

REPORT NO.: 214D-MGA-2000-06

122460

NEW CAR ASSESSMENT PROGRAM  
SIDE IMPACT TESTING

*NHTSA 98-3835-60*

GENERAL MOTORS CORPORATION

2000 SATURN SL2  
4-DOOR

MGA PROVING GROUNDS  
5000 WARREN ROAD  
BURLINGTON, WI 53105



Test Date: July 24, 2000

Report Date: July 25, 2000

FINAL REPORT

Prepared For:

U.S. DEPARTMENT OF TRANSPORTATION  
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION  
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GENERAL MOTORS CORPORATION

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15. Supplementary Notes																					
<p>16. Abstract</p> <p>A 90° Moving Deformable Barrier NCAP side impact was conducted on the subject 2000 Saturn SL2 4-Door Sedan 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 July 24, 2000.</p> <p>The impact velocity of the Moving Deformable Barrier (MDB) was 62.6 kph, and the ambient temperature at the struck side (driver's) of the target vehicle at the time of impact was 21°C. The target vehicle post test maximum crush was 381 mm at level 2. The test vehicle's performance follows:</p> <table border="1"> <thead> <tr> <th></th> <th><u>DRIVER</u></th> <th><u>PASS.</u></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib (LUR) Accel., g</td> <td>70</td> <td>106</td> </tr> <tr> <td>Left Lower Rib (LLR) Accel., g</td> <td>64</td> <td>92</td> </tr> <tr> <td>Lower Spine (T<sub>12</sub>) Accel., g</td> <td>100</td> <td>86</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td>85</td> <td>96</td> </tr> <tr> <td>Pelvis (PEV) Accel., g</td> <td>100</td> <td>84</td> </tr> </tbody> </table> <p>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.</p>					<u>DRIVER</u>	<u>PASS.</u>	Left Upper Rib (LUR) Accel., g	70	106	Left Lower Rib (LLR) Accel., g	64	92	Lower Spine (T <sub>12</sub> ) Accel., g	100	86	Thoracic Trauma Index (TTI)	85	96	Pelvis (PEV) Accel., g	100	84
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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 FY00 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 2000 Saturn SL2 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.

## SECTION 2

### SUMMARY OF SIDE IMPACT TEST

A 2000 Saturn SL2 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 38.9 mph (62.6 kph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by MGA Research Corporation in Burlington, Wisconsin, on July 24, 2000. 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 (T<sub>12</sub>) 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	Rear SID
TTI (g)	85	96
Pelvis (g)	100	84

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: 2000/Saturn/SL2/4 Door

VIN: 1G8ZJ5273YZ239393

Vehicle Body Color: Bronze Build Date: 4/00

Engine Data: 4 Cylinders;     CID;     Liter;     cc

Placement:     Longitudinal;   X   Lateral

Transmission:   5   Speed;   X   Manual;     Automatic;     Overdrive

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

Odometer Reading:  59  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

 26  Psi REAR

Recommended Tire Size: P185/65R15

Tires on Test Vehicle: P185/65R15 Manufacturer: Firestone

Vehicle Capacity Data:

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

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

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

Vehicle Maximum Capacity Loading =  384.6  kg (A)

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

Cargo Capacity (A-B) =   44.4  kg

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

Right Front =	<u>333.4</u>	kg	Right Rear =	<u>215.5</u>	kg
Left Front =	<u>324.8</u>	kg	Left Rear =	<u>218.6</u>	kg
TOTAL FRONT =	<u>658.2</u>	kg	TOTAL REAR =	<u>434.1</u>	kg
% of Total Weight =	<u>60.3</u>	%	% of Total Weight =	<u>39.7</u>	%
TOTAL WEIGHT =	<u>1092.3</u>	kg			

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Test Vehicle Delivered Weight with Maximum Fluids	=	<u>1092.3</u>	kg
Cargo Carrying Capacity of Test Vehicle*	=	<u>44.4</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>1298.1</u>	kg

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

Right Front =	<u>340.7</u>	kg	Right Rear =	<u>269.0</u>	kg
Left Front =	<u>381.0</u>	kg	Left Rear =	<u>307.5</u>	kg
TOTAL FRONT =	<u>721.7</u>	kg	TOTAL REAR =	<u>576.5</u>	kg
% of Total Weight =	<u>55.6</u>	%	% of Total Weight =	<u>44.4</u>	%
TOTAL WEIGHT =	<u>1298.2</u>	kg			

TEST VEHICLE ATTITUDE:

## CURB WEIGHT ATTITUDE:

Right Front 667 mm Left Front 676 mm Right Rear 670 mm Left Rear 672 mm

## FULLY LOADED WEIGHT ATTITUDE:

Right Front 660 mm Left Front 659 mm Right Rear 646 mm Left Rear 637 mm

## TEST ATTITUDE:

Right Front 660 mm Left Front 668 mm Right Rear 646 mm Left Rear 640 mm

\* light trucks and MPV's RCW is 136 kgs or manufacturer's value, whichever is less

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Test Vehicle Wheelbase: 2596 mm

C.G. = 1138 mm rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

Right Side = 4128 mm

Centerline = 4542 mm

Left Side = 4128 mm

FRONT SEAT CUSHION PLACEMENT:

Total Length of Adjustment Travel: 210 mm

Test Position: 11<sup>th</sup> detent rearward of 20 total

FRONT SEAT BACK ADJUSTMENT POSITION:

Seat Back Angle = 6.6° on headrest post

SECOND POSITION SEAT:

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

Seat Back Adjustment Position: non-adjustable

ADJUSTABLE STEERING COLUMN POSITION: mid position

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

AMOUNT OF STODDARD SOLVENT IN FUEL TANK:

Fuel system usable capacity = 47.3 liters

Test Volume: 44.5 liters 94 % of capacity

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

Wheelbase: = 2596 mm

Impact Point is 358 mm rearward of front axle centerline

DATA SHEET NO. 2  
TEST VEHICLE SUMMARY OF RESULTS

Year/Make/Model/Body Style: 2000/Saturn/SL2/4 Door

Test Date: July 24, 2000

Overall Length = 4542 mm; Overall Width = 1674 mm

TEST WEIGHT:

Right Front = 349.3 kg      Right Rear = 271.7 kg

Left Front = 376.0 kg      Left Rear = 294.8 kg

TOTAL FRONT = 725.3 kg      TOTAL REAR = 566.5 kg

% of Total Weight = 56.1 %      % of Total Weight = 43.9 %

TOTAL WEIGHT = 1291.8 kg

Wheelbase = 2596 mm

Longitudinal C.G. from Center of Front Axle = 1138 mm

Impact Angle with Respect to Impactor = 90° degrees

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1 (276 mm above ground) = 239 mm

2. LEVEL 2 (444 mm above ground) = 381 mm

3. LEVEL 3 (552 mm above ground) = 375 mm

4. LEVEL 4 (832 mm above ground) = 295 mm

5. LEVEL 5 (1262 mm above ground) = 78 mm

Maximum Post-Test Intrusion = 381 mm

OCCUPANTS:

	<u>Driver</u>	<u>Left Rear Passenger</u>
Type of Dummy	<u>SID</u>	<u>SID</u>
Restraints Used	<u>Type II seat belt</u>	<u>Type II seat belt</u>
	<u>Frontal airbag</u>	

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

Number of Vehicle Data Channels:		=	<u>23</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 RESULTSYear/Make/Model/Body Style: 2000/Saturn/SL2/4 DoorTest Date: July 24, 2000POSITION 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>1100 mm</u>
C.G. Location From Center Line	=	<u>-10 mm</u>
C.G. Location Above Ground Level	=	<u>477 mm</u>

MDB WEIGHT:

Left Front	=	<u>458.8 kg</u>	Left Rear	=	<u>230.3 kg</u>
Right Front	=	<u>324.4 kg</u>	Right Rear	=	<u>350.6 kg</u>
TOTAL FRONT	=	<u>783.2 kg</u>	TOTAL REAR	=	<u>580.9 kg</u>
TOTAL MDB WEIGHT = <u>1364.1 kg</u>					

Impact Angle (MDB C/L to Target Vehicle C/L) = 90° degreesImpact Speed = Primary: 38.9 mph (62.6 kph) Secondary: 38.7 mph (62.3 kph)

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

1. Row A Top of Stack (813 mm) = 133 mm
2. Row B Mid Stack (686 mm) = 100 mm
3. Row C Top of Bumper (533 mm) = 93 mm
4. Row D Center of Bumper (432 mm) = 86 mm

INSTRUMENTATION:

Number of MDB Data Channels = 5

DATA SHEET NO. 4  
POST-TEST OBSERVATIONS

Year/Make/Model/Body Style: 2000/Saturn/SL2/4 Door

Test Date: July 24, 2000

VISIBLE DUMMY CONTACT POINTS:

	<u>LEFT FRONT SID</u>	<u>LEFT REAR SID</u>
Head	<u>Window sill, D ring</u>	<u>C post</u>
Arm	<u>Rear of door</u>	<u>Rear of door</u>
Pelvis	<u>Armrest</u>	<u>Armrest</u>
Left Knee	<u>Mid door below armrest</u>	<u>Mid door below armrest</u>
Right Knee	<u>Left knee</u>	<u>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: 11 mm rear      Vertical: 14 mm high

ARM REST LOCATIONS:

Front: 248 mm from below window

Rear: 259 mm from below window

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

Front Seat Back: 170 mm      Front Seat Cushion: 233 mm  
Left Rear Seat Back: 151 mm      Rear Seat Cushion: 5 mm

GLAZING DAMAGE:

Both left side windows broke, windshield cracked

PILLAR PERFORMANCE:

No failures noted

SILL SEPARATION:

None noted

OTHER NOTABLE IMPACT EFFECTS:

None noted

AIRBAG DEPLOYMENT STATUS:

	<u>DRIVER</u>	<u>FRONT PASSENGER</u>	<u>REAR PASSENGER</u>
Frontal	<u>Yes</u>	<u>Yes</u>	<u>N/A</u>
Side	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>

SECTION 4  
OCCUPANT AND VEHICLE INFORMATION

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

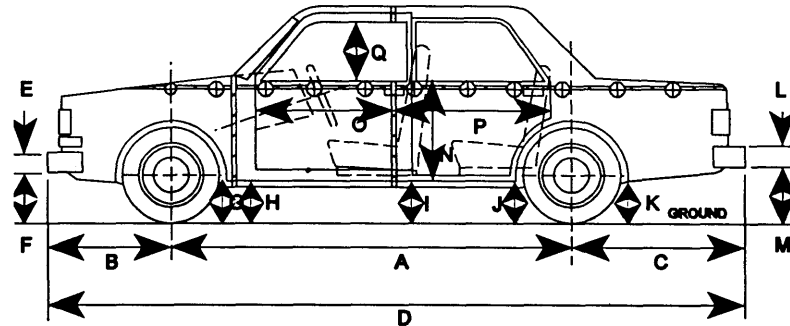
Year/Make/Model/Body Style: 2000/Saturn/SL2/4 Door

Test Date: July 24, 2000

	Driver SID ID # 269				Left Rear Passenger SID 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)
<b>HEAD ACCELERATORS</b>								
Longitudinal	15.9	159	42.8	70	10.7	179	21.9	68
Lateral	59.5	40	13.1	177	159.3	51	13.0	41
Vertical	51.9	50	0.6	20	26.8	51	54.3	57
Resultant	61.5	42	-	-	161.2	51	-	-
HIC	440				997			
<b>RIB ACCELERATIONS</b>								
Left Upper Rib (LUR) Y	69.7	26	28.8	72	105.6	36	9.9	91
Left Lower Rib (LLR) Y	64.0	29	22.0	69	92.1	36	26.2	64
<b>SPINE ACCELERATIONS</b>								
Lower Lateral Y	100.3	29	41.7	62	86.2	39	29.6	67
<b>PELVIS ACCELERATIONS</b>								
Lateral Y	100.0	28	22.9	58	83.7	29	12.6	66

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

DATA SHEET NO. 6  
VEHICLE PRE AND POST-TEST MEASUREMENTS



**LEFT SIDE VIEW**

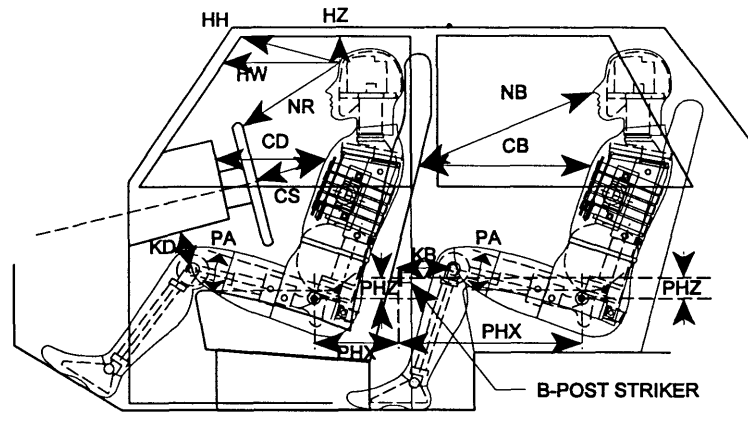
D = Length at Centerline  
 R = Right Side Length  
 S = Left Side Length  
 T = Width at B Post  
 J1 = To Pinch Weld  
 E & L = Bumper Thickness

J2 = To Sill

ALL MEASUREMENTS IN (mm)

	PRE-TEST	POST-TEST	Δ CHANGE
A	2603	2593	10
B	973	973	0
C	966	923	43
D	4542	4506	36
E	175	175	0
F	354	404	50
G	190	242	52
H	184	246	62
I	179	226	47
J1/J2	170/166	180/184	10/18
K	196	186	10
L	183	183	0
M	354	369	15
N	634	580	54
O	704	636	68
P	1082	1100	18
Q	455	450	5
R	4128	4030	98
S	4129	4065	64
T	1674	1465	209

## DATA SHEET NO. 7

SIDE IMPACT DUMMY (SID) LONGITUDINAL CLEARANCE DIMENSIONSYear/Make/Model/Body Style: 2000/Saturn/SL2/4 DoorNOTE: All dimensions are in mm with tolerance of  $\pm 3$  mm

	DRIVER SID ID # 269	LEFT REAR PASSENGER SID ID # 270	
HH	375	HZ	164
HW	681	NB	547
HZ	196	CB	472
NR	426	KBL (KBA)	160 (0.0)
CD	495	KBR (KBA)	189 (0.0)
CS	334	PA°	24.2
KDL(KDA°)	229 (0.0)	PHX	274
KDR(KDA°)	209 (0.0)	PHZ	394
PA°	24.5		
PHX	174		
PHZ	185		

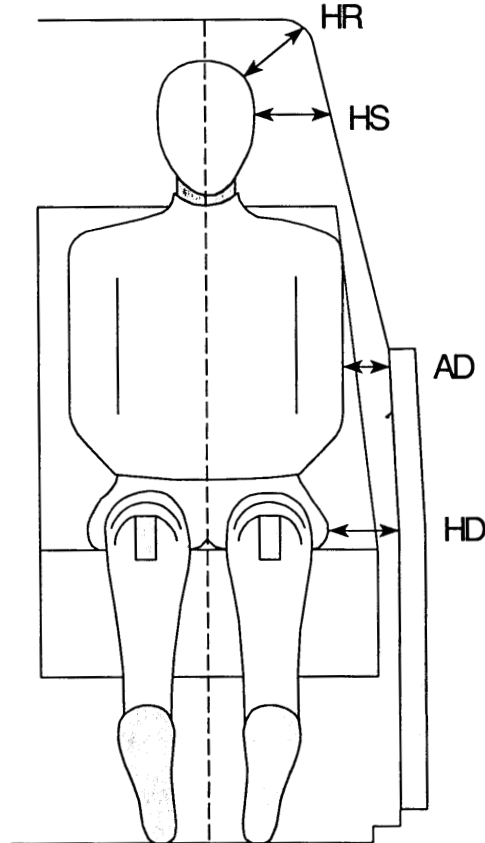
NOTE: 2-door vehicle shown. Rear dummy PHX & PHZ measurements for 4-door vehicle would use the C-post striker as reference point.

DATA SHEET NO. 8

SIDE IMPACT DUMMY (SID) LATERAL CLEARANCE DIMENSIONS

Year/Make/Model/Body Style: 2000/Saturn/SL2/4 Door

Test Date: July 24, 2000



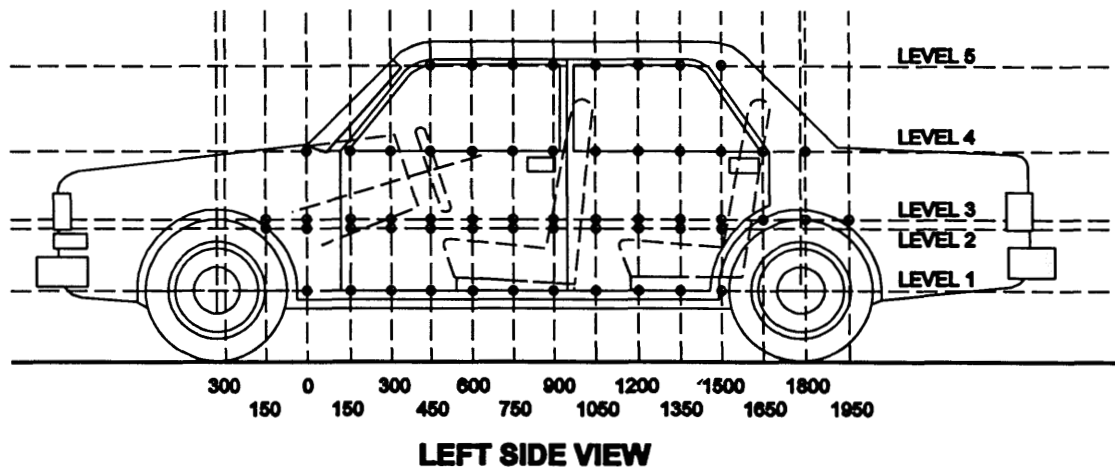
NOTE: All dimensions are in mm

	DRIVER SID ID # 269	LEFT REAR PASSENGER SID ID # 270
HR	192	204
HS	335	311
AD	70	98
HD	136	152

DATA SHEET NO. 9  
VEHICLE SIDE MEASUREMENTS

Year/Make/Model/Body Style: 2000/Saturn/SL2/4 Door

Test Date: July 24, 2000



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)	= <u>276</u> mm
Level 2 @ Occupant H-Point	= <u>444</u> mm
Level 3 @ Mid Door	= <u>552</u> mm
Level 4 @ Window Sill	= <u>832</u> mm
Level 5 @ Window Top	= <u>1262</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)
-1800		.	
-1650			
-1500			
-1350			
-1200			
-1050			
-900			
-750			
-600		.	
-450			
-300			
-150			
0 (impact point)			
150	734	781	47
300	736	973	237
450	737	976	239
600	738	962	224
750	738	956	218
900	738	947	209
1050	738	943	205
1200	741	920	179
1350	739	922	183
1500	739	930	191
1650	736	884	148
1800	738	826	88

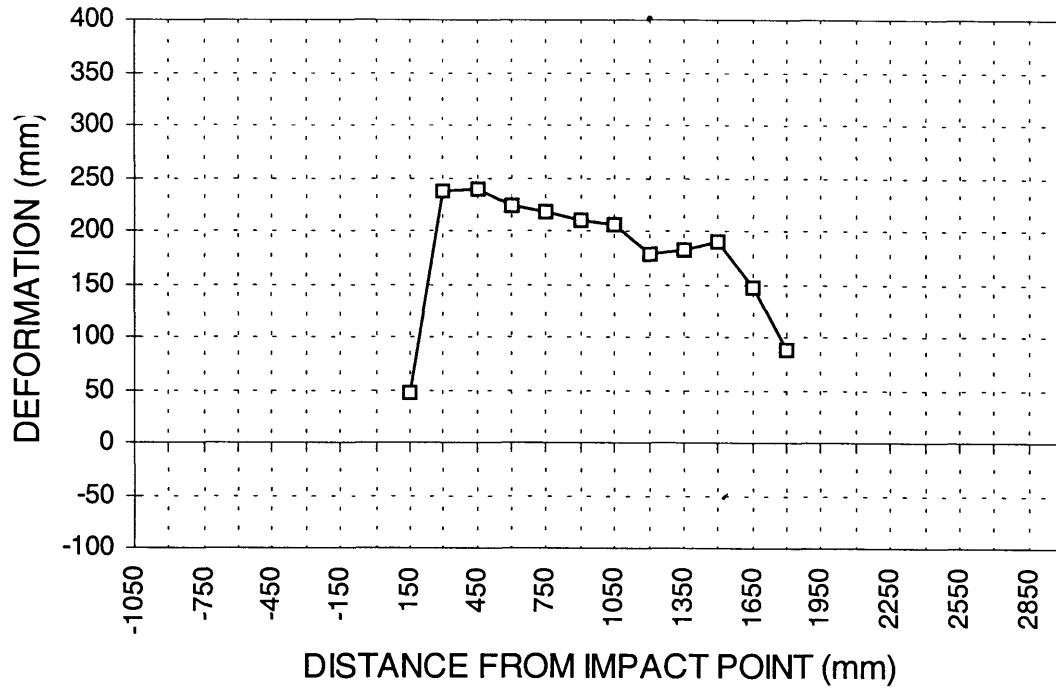
Reference plane is parallel to test vehicle longitudinal centerline.  
 Given dimensions = Reference plane to car body

DATA SHEET NO. 10  
VEHICLE EXTERIOR CRUSH PROFILES

Longitudinal Distance (mm)	Level 1 - Axle Centerline		
	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 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)
-1800			
-1650			
-1500			
-1350			
-1200			
-1050			
-900			
-750			
-600			
-450			
-300			
-150			
0 (impact point)	692	743	51
150	693	1032	339
300	691	1071	380
450	690	1071	381
600	689	1065	376
750	689	1056	367
900	689	1047	358
1050	690	1041	351
1200	687	1045	358
1350	685	1042	357
1500	684	1024	340
1650	680	893	213
1800	682	895	213

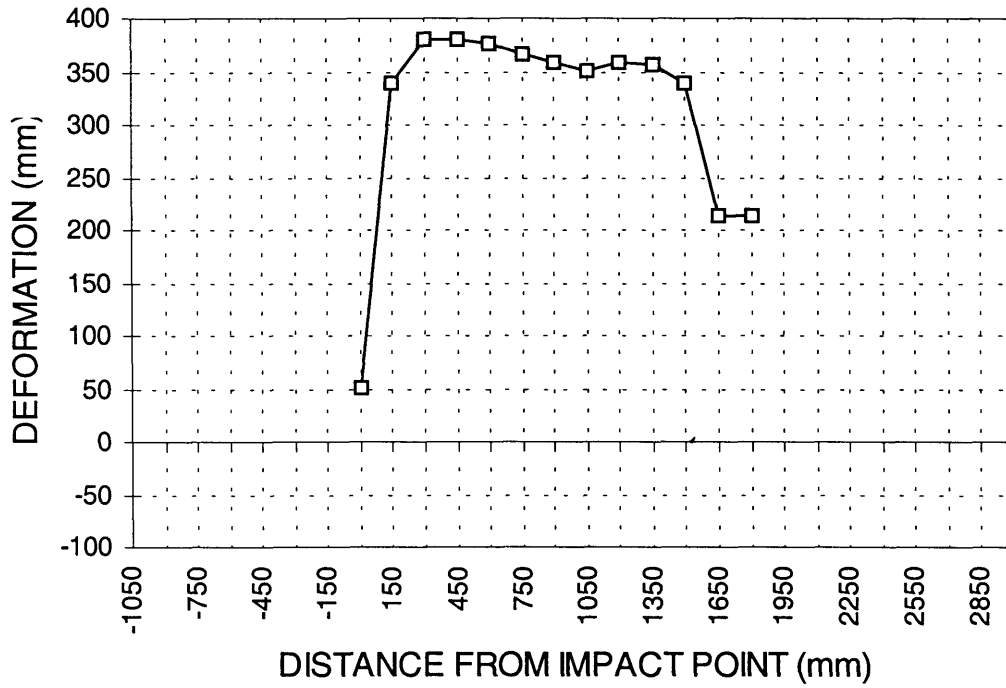
Reference plane is parallel to test vehicle longitudinal centerline.  
Given dimensions = Reference plane to car body

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)
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 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)
-1800		.	
-1650			
-1500			
-1350			
-1200			
-1050			
-900			
-750			
-600		.	
-450			
-300			
-150			
0 (impact point)	687	731	44
150	688	987	299
300	686	1032	346
450	685	1027	342
600	685	1025	340
750	685	1028	343
900	686	1029	343
1050	690	1028	338
1200	687	1062	375
1350	685	1039	354
1500	682	1008	326
1650	681	972	291
1800	682	939	257

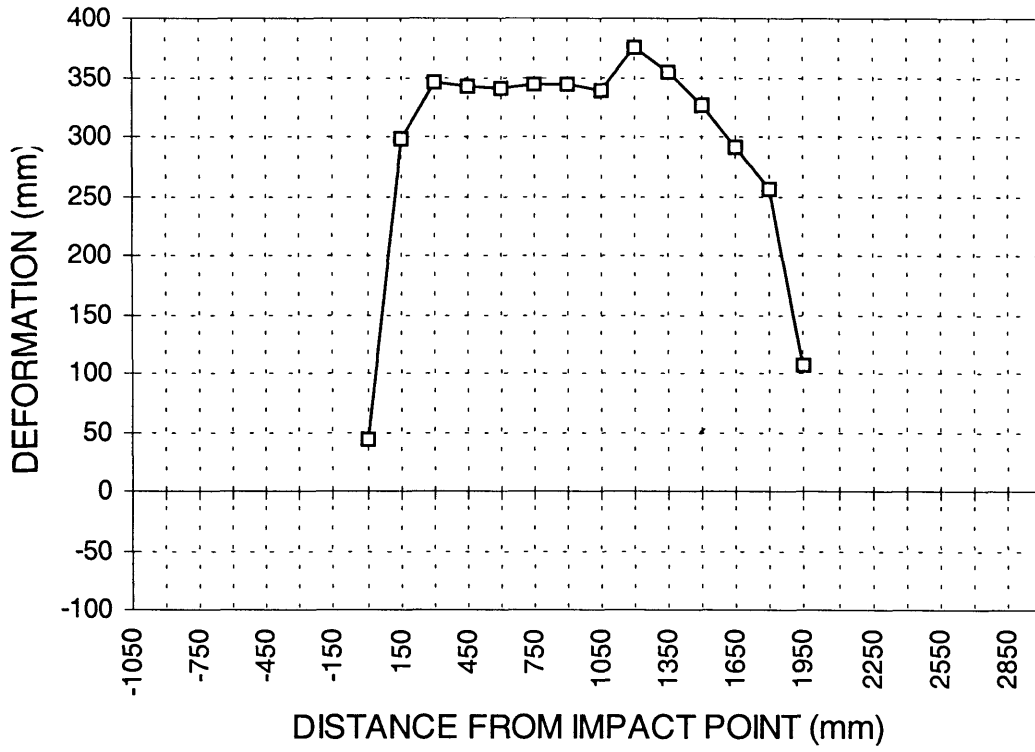
Reference plane is parallel to test vehicle longitudinal centerline.  
Given dimensions = Reference plane to car body

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	682	789	107
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 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			
-900	799	794	-5
-750	780	780	0
-600	758	764	6
-450	748	761	13
-300	737	760	23
-150	731	765	34
0 (impact point)	728	765	37
150	726	764	38
300	724	929	205
450	724	936	212
600	724	944	220
750	728	956	228
900	728	969	241
1050	732	989	257
1200	734	1029	295
1350	737	1002	265
1500	736	970	234
1650	737	944	207
1800	742	882	140

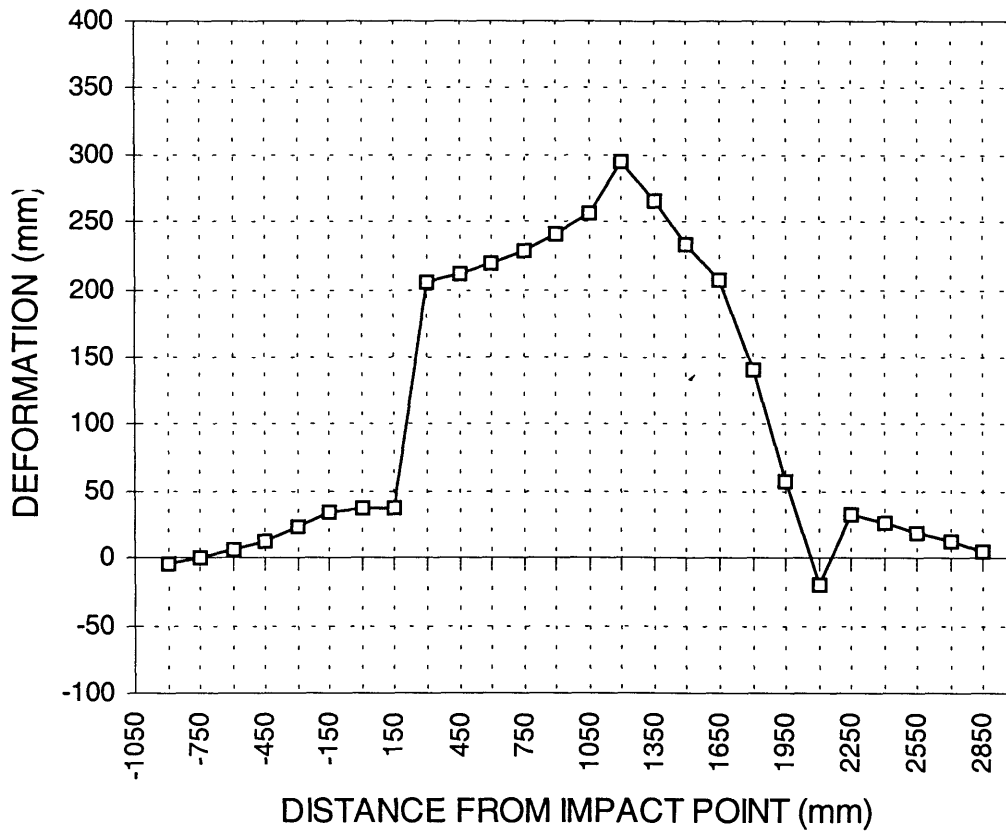
Reference plane is parallel to test vehicle longitudinal centerline.  
Given dimensions = Reference plane to car body

**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	747	804	57
2100	755	736	-19
2250	767	800	33
2400	777	804	27
2550	791	810	19
2700	809	821	12
2850	829	834	5
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 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)
-1800			
-1650			
-1500			
-1350			
-1200			
-1050			
-900			
-750			
-600			
-450			
-300			
-150			
0 (impact point)			
150			
300			
450			
600			
750			
900	975	1016	41
1050	980	1037	57
1200	982	1060	78
1350	983	1036	53
1500	982	1025	43
1650	980	1018	38
1800	985	1015	30

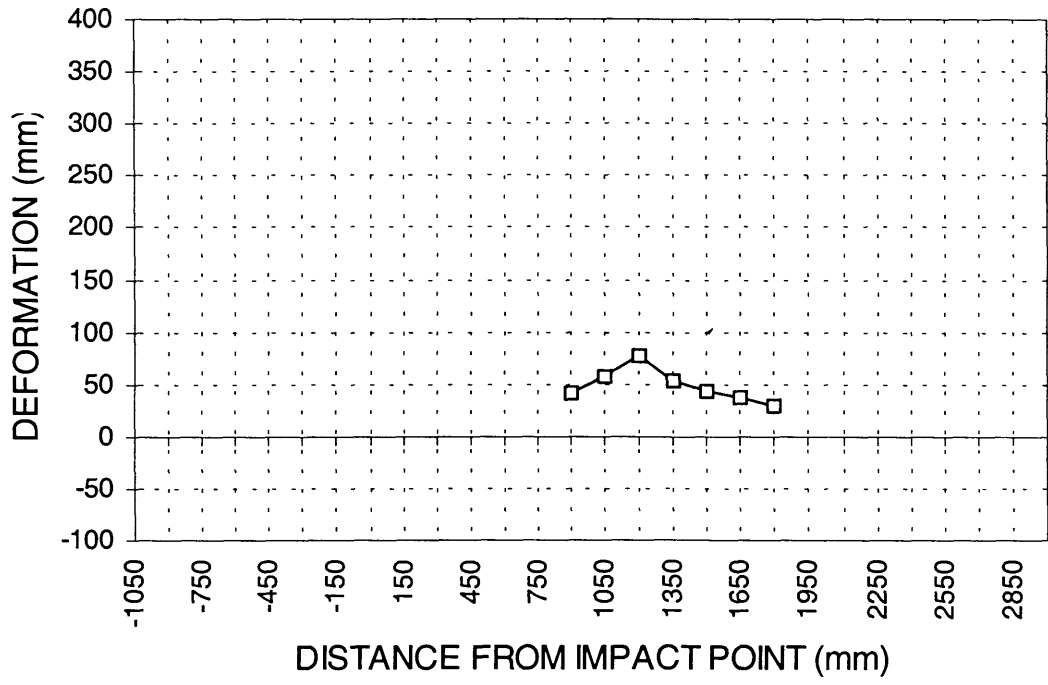
Reference plane is parallel to test vehicle longitudinal centerline.  
Given dimensions = Reference plane to car body

**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

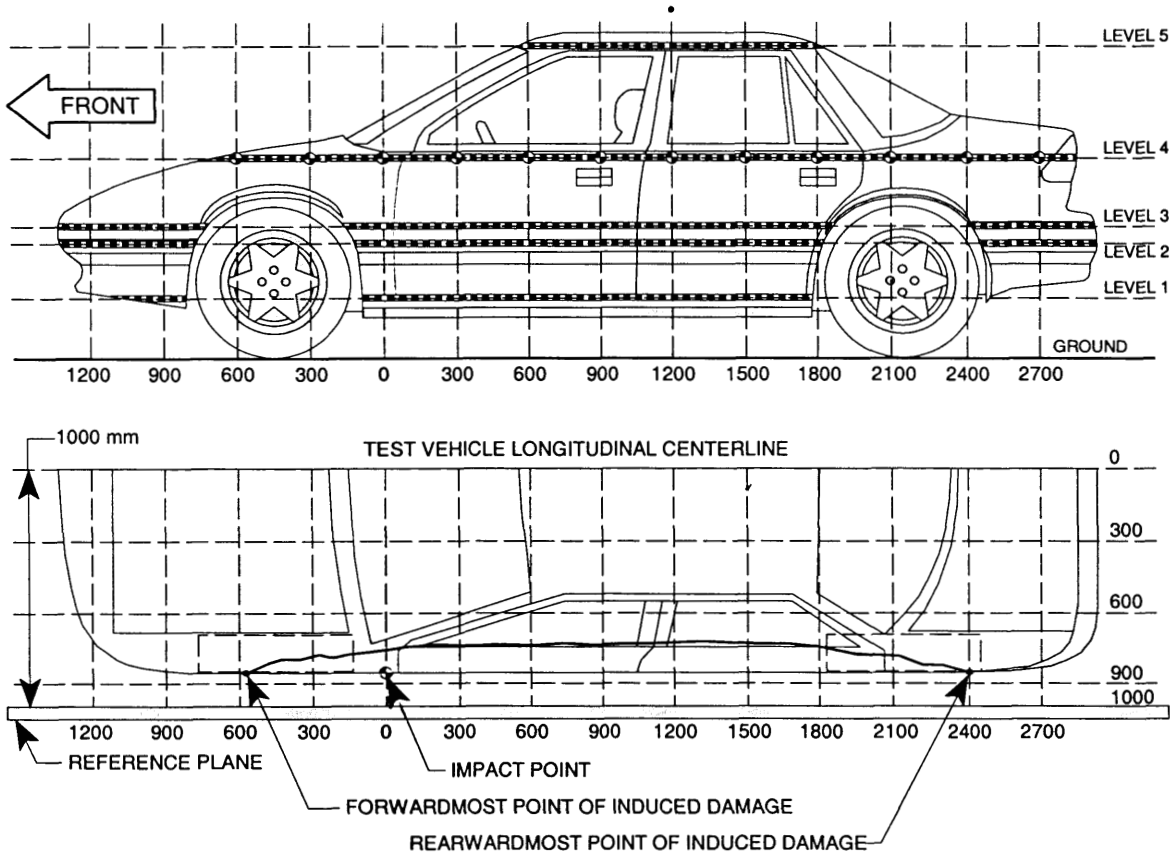


LEVEL 5 - WINDOW TOP

DATA SHEET NO. 11  
VEHICLE DAMAGE PROFILE DISTANCES

Year/Make/Model/Body Style: 2000/Saturn/SL2/4 Door

Test Date: July 24, 2000



NOTE: All measurements are in millimeters (mm)

DPD MEASUREMENTS	POST-TEST (mm)	PRE-TEST (mm)	STATIC CRUSH (mm)
1. (LR = <u>2850</u> mm)	799	799	0
2. 2123 mm	736	757	-21
3. 1273 mm	1057	687	370
4. 525 mm	1069	689	380
5. -170 mm	728	732	-4
6. (LF = <u>-900</u> mm)	834	834	0

DATA SHEET NO. 12  
EXTERIOR STATIC CRUSH FOR SIDE IMPACTOR

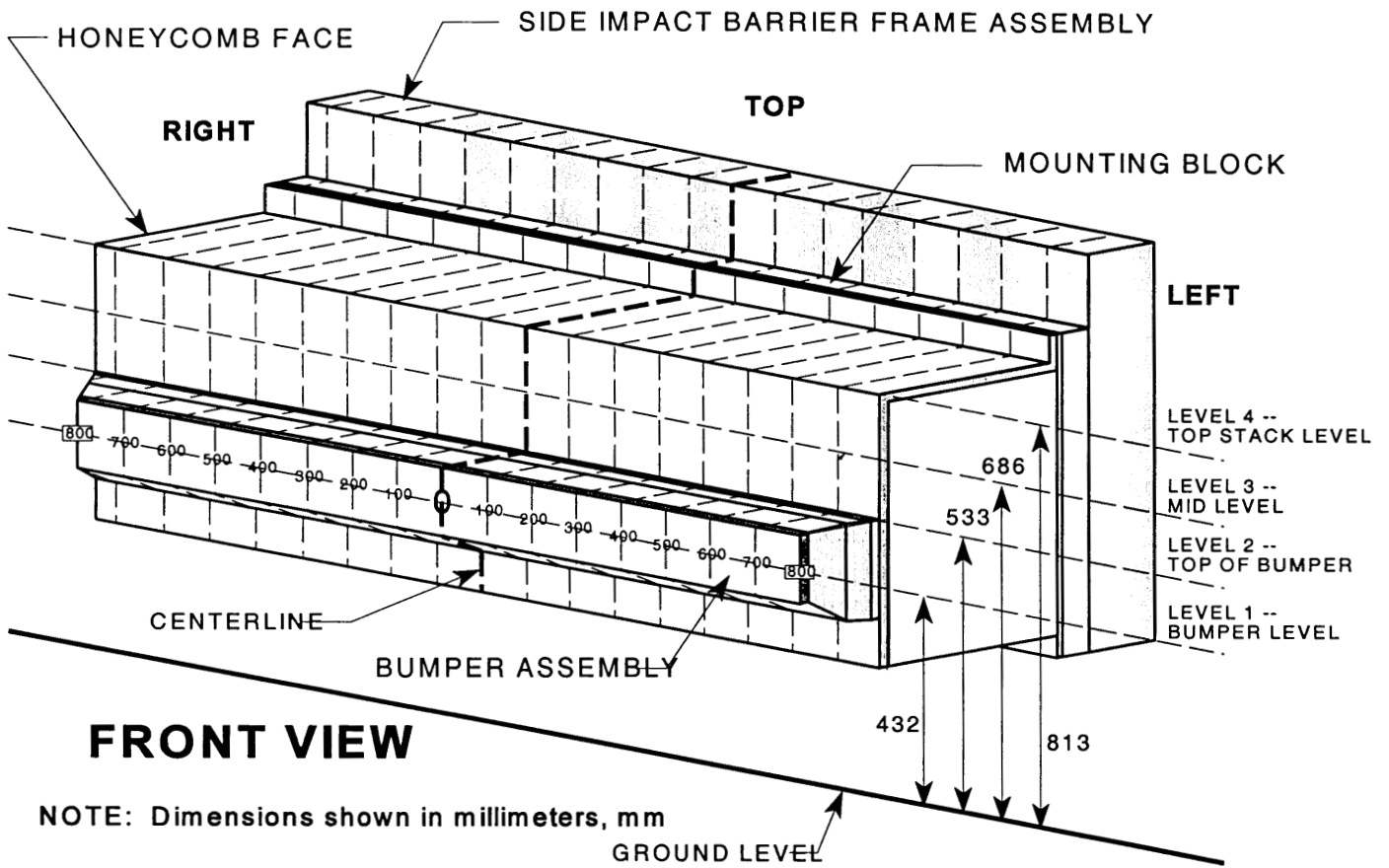
Year/Make/Model/Body Style: 2000/Saturn/SL2/4 Door

Test Date: July 24, 2000

Location	Height at CL	Distance Right of Center (mm)								Distance Left of Center (mm)								
		800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
Top Stack Level 4	813 mm	75	32	14	2	2	4	7	10	12	13	13	17	21	34	65	104	133
Mid Level Level 3	686 mm	63	27	8	5	5	7	12	13	13	13	13	11	13	17	22	59	100
Top Bumper Level 2	533 mm	93	76	61	47	38	29	35	36	30	29	31	34	34	38	38	43	57
Mid Bumper Level 1	432 mm	86	85	66	53	44	48	47	46	46	46	48	49	51	51	55	69	72

See next page for Barrier Face Graphic

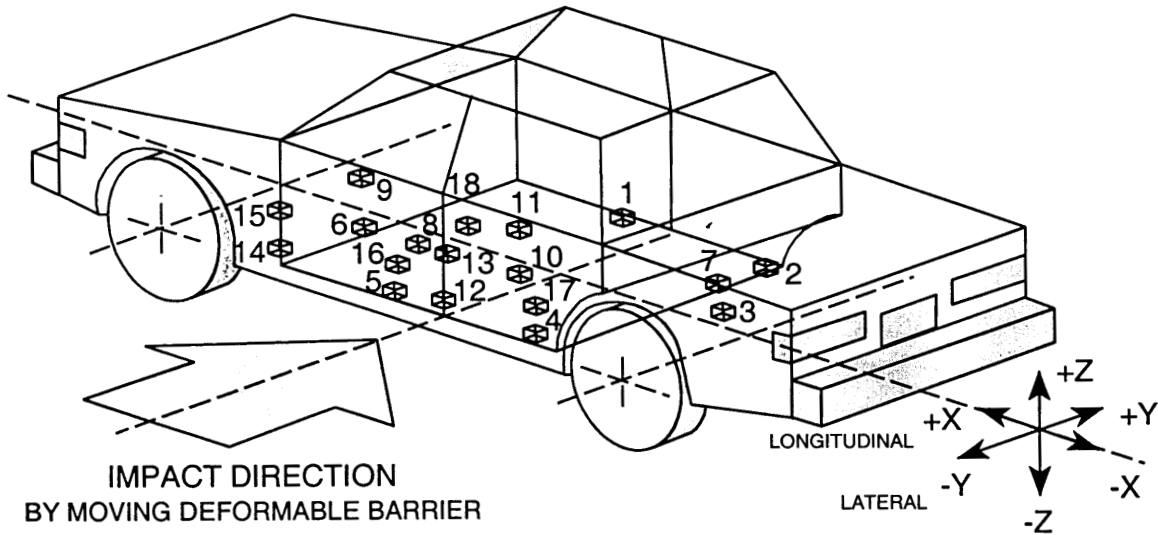
DATA SHEET NO. 12 (Cont'd)



**DATA SHEET 13**  
**TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY**

Year/Make/Model/Body Style: 2000/Saturn/SL2/4 Door

Test Date: July 24, 2000



**IMPACT DIRECTION  
 BY MOVING DEFORMABLE BARRIER**

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>1 - Rt Side Sill @ Frt Seat</li> <li>2 - Rt Side Sill @ Rr Seat</li> <li>3 - Rr Floorpan Above Axle</li> <li>4 - Left Side Sill @ Rr Seat</li> <li>5 - Left Side Sill @ Frt Seat</li> <li>6 - Left Frt Door on Centerline</li> <li>7 - Rt Rr Occ Compartment</li> <li>8 - Midrear of Left Frt Door</li> <li>9 - Left Frt Door Upr C/Line</li> </ul> | <ul style="list-style-type: none"> <li>10 - Midrear of Left Rr Door</li> <li>11 - Left Rr Door Upr C/Line</li> <li>12 - Left Lwr B-Post</li> <li>13 - Left Middle B-Post</li> <li>14 - Left Lwr A-Post</li> <li>15 - Left Middle A-Post</li> <li>16 - Frt Seat Track</li> <li>17 - Rr Seat Track</li> <li>18 - Vehicle C.G.</li> </ul> |
|--|--|

DATA SHEET NO. 13  
**TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY**  
 Year/Make/Model/Body Style: 2000/Saturn/SL2/4 Door  
 Test Date: July 24, 2000

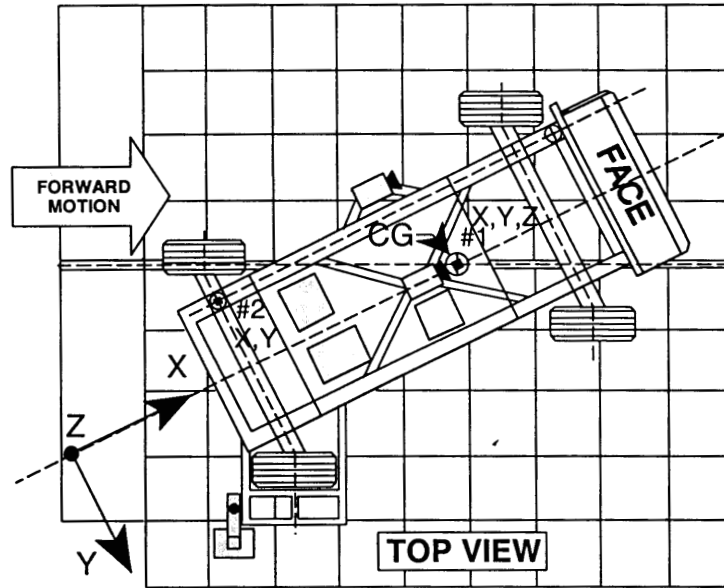
Accel. No.	Description	Coordinates (mm)*			Long. (X) Maximums (g's)		Lat. (Y) Maximums (g's)		Vert. (Z) Maximums (g's)		Resultant (g's)
		X	Y	Z	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	
1	Rt. Side Sill @ Front Seat	2412	631	178	5.0	10.3	28.3	3.3	3.2	7.4	29.9
2	Rt. Side Sill @ Rear Seat	1328	635	194	5.6	10.1	23.9	3.0	5.5	10.3	25.7
3	Rr. Floorpan Above Axle	932	0	506	2.8	10.2	24.2	2.4	9.1	6.7	25.1
4	Left Side Sill @ Rr. Seat	1372	-635	204	---	---	42.1	5.7	---	---	---
5	Left Side Sill @ Frt. Seat	2417	-631	183	---	---	61.9	16.0	---	---	---
6	Left Front Door Centerline	2524	-716	612	---	---	217.1	95.2	---	---	---
7	Right Rear Occupant Compartment	1754	328	268	---	---	22.3	2.7	---	---	---
8	Mid Rear of Left Front Door	2272	-713	631	---	---	98.5	84.5	---	---	---
9	Left Front Door Upper Centerline	2497	-706	823	---	---	173.5	99.4	---	---	---
10	Left Rear Door Mid Rear	1586	-720	685	---	---	240.2	90.8	---	---	---
11	Left Rear Door Upper Centerline	1609	-717	863	---	---	132.9	68.6	---	---	---
14	Left Lower A-Post	3002	-635	273	---	---	71.8	12.5	---	---	---
15	Left Mid A-Post	3026	-695	865	---	---	130.1	23.6	---	---	---
16	Driver Left Seat Track	2176	-502	235	---	---	86.0	35.5	---	---	---
18	Vehicle CG	2422	0	417	8.5	13.6	33.3	4.8	8.3	10.0	33.9

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

DATA SHEET NO. 14  
MOVING DEFORMABLE BARRIER (MDB) ACCELEROMETER LOCATIONS AND DATA  
SUMMARY

Year/Make/Model/Body Style: 2000/Saturn/SL2/4 Door

Test Date: July 24, 2000



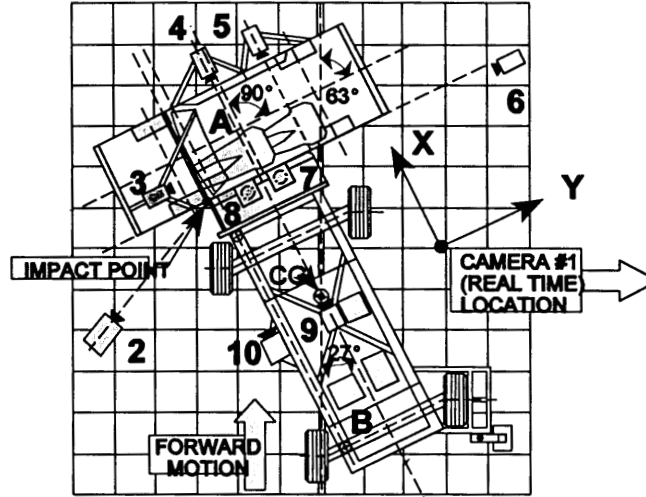
Accel. No.	Description	Coordinates (mm)*			(+ ) Positive		(- ) Negative	
		X	Y	Z	Max. (g)	Time (msec)	Max. (g)	Time (msec)
1	MDB Center of Gravity	-1092	0	483				
	Longitudinal (X)	---	---	---	1.7	132	18.5	36
	Lateral (Y)	---	---	---	2.9	58	7.4	27
	Vertical (Z)	---	---	---	21.4	74	22.8	90
	Resultant (R)	---	---	---	25.9	37	-	--
2	Rear Frame Member	-2501	-625	622				
	Longitudinal (X)	---	---	---	2.1	117	20.7	32
	Lateral (Y)	---	---	---	3.6	27	1.3	56

\*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: 2000 Saturn SL2 4 door

Test Date: July 24, 2000



Camera No.	View	Coordinates (mm)*			Lens (mm)	Film Speed (fps)
		X	Y	Z		
1	Real Time				10	24
2	Left Impact	-1620	-2310	1840	13	1000
3	Onboard Hood				13	1010
4	Onboard Front				8	1026
5	Onboard Rear				13	957
6	Right Impact	480	10100	1790	29	1005
7	Top Overall	-100	1250	5000	8	913
8	Top Impact	215	60	5000	13	985
9	Cart Overall				13	741
10	Cart Impact				35	837

\* 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: 2000/Saturn/SL2/4 Door

Test Date: July 24, 2000

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:  Side Impact MDB 38.9 mph (62.6 kph)

FUEL SPILLAGE MEASUREMENT:

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

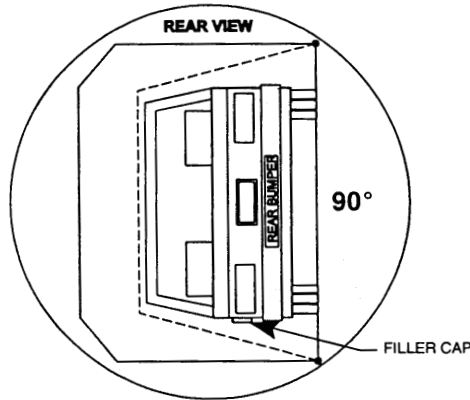
FUEL SPILLAGE LOCATION(S): None

DATA SHEET 16  
FMVSS 301 STATIC ROLLOVER TEST DATA

Vehicle Year/Make/Model/Body Style: 2000/Saturn/SL2/4 Door

Test Date: July 24, 2000

TEST PHASE: 0° - 90°



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:

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

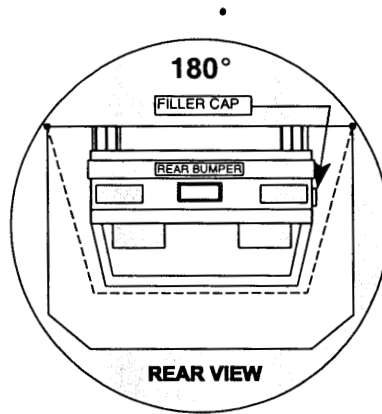
FUEL SPILLAGE LOCATIONS(S): None

DATA SHEET 16  
FMVSS 301 STATIC ROLLOVER TEST DATA (Cont'd)

Vehicle Year/Make/Model/Body Style: 2000/Saturn/SL2/4 Door

Test Date: July 24, 2000

TEST PHASE: 90° - 180°



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:

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

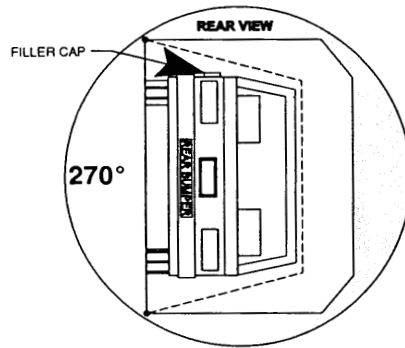
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA (Cont'd)

Vehicle Year/Make/Model/Body Style: 2000/Saturn/SL2/4 Door

Test Date: July 24, 2000

TEST PHASE: 180° - 270°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time =  2  minutes  19  seconds  
 (Spec. Range = 1 to 3 minutes)  
 FMVSS 301 Position Hold Time =  5  minutes  0  seconds  
 TOTAL TIME =  7  minutes  19  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

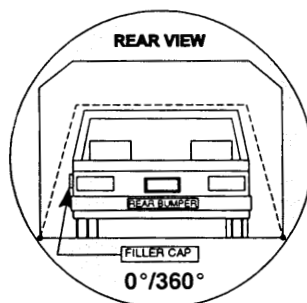
FUEL SPILLAGE LOCATIONS(S): None

DATA SHEET 16  
FMVSS 301 STATIC ROLLOVER TEST DATA

Vehicle Year/Make/Model/Body Style: 2000/Saturn/SL2/4 Door

Test Date: July 24, 2000

TEST PHASE: 270° - 360°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 37 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 37 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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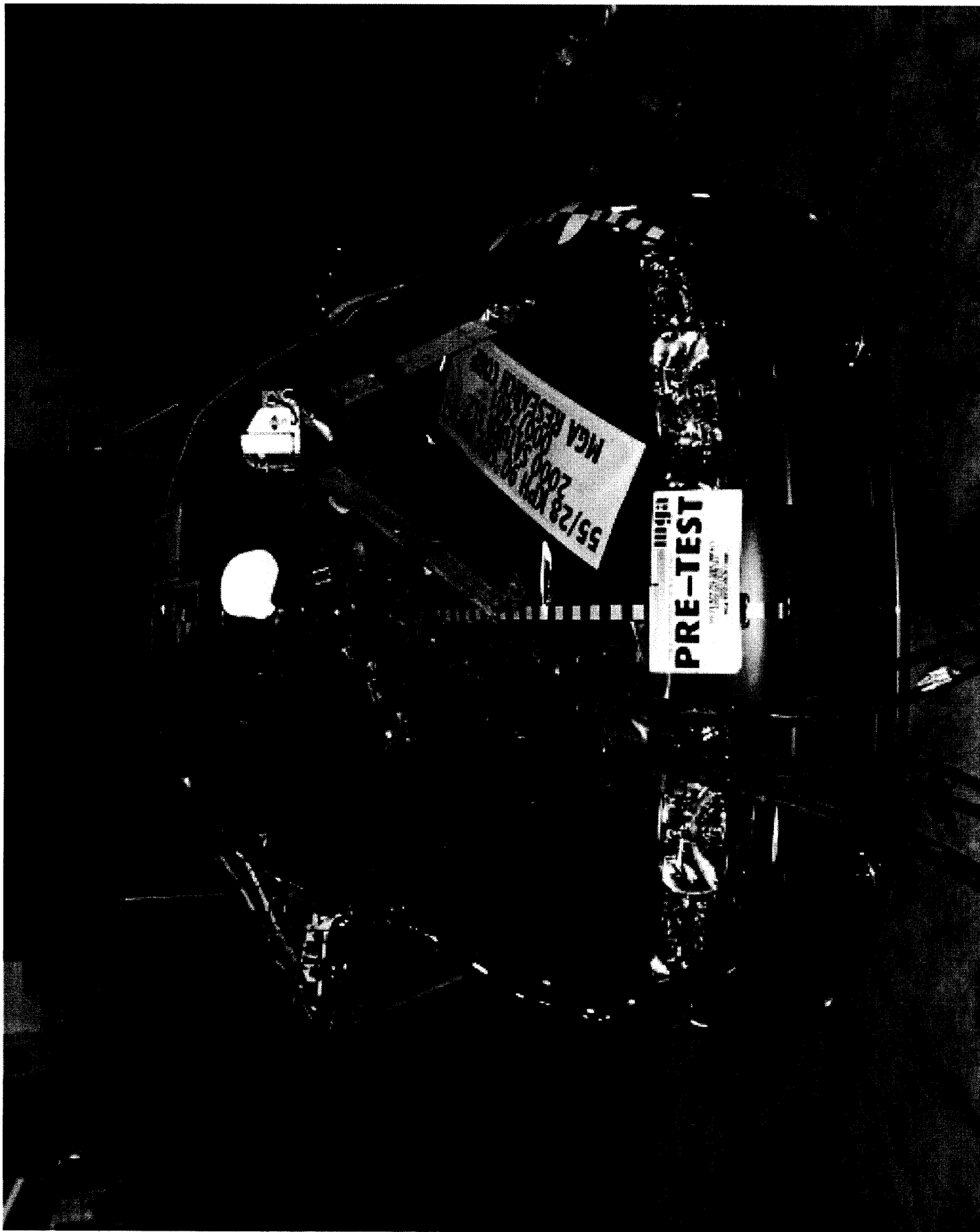


Photo No. A-1 - Pre-Test Front View of Test Vehicle

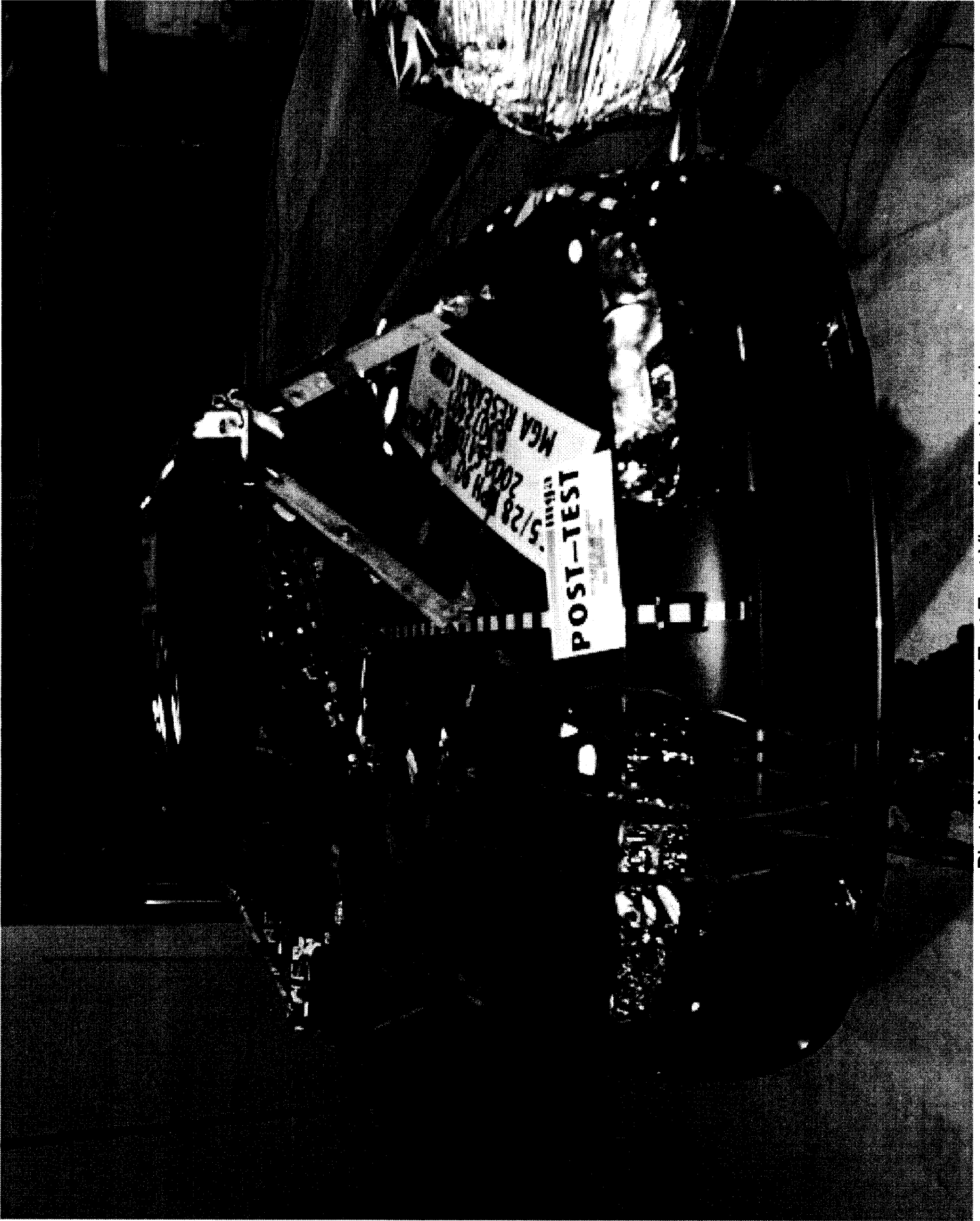


Photo No. A-2 - Post-Test Front View of Test Vehicle

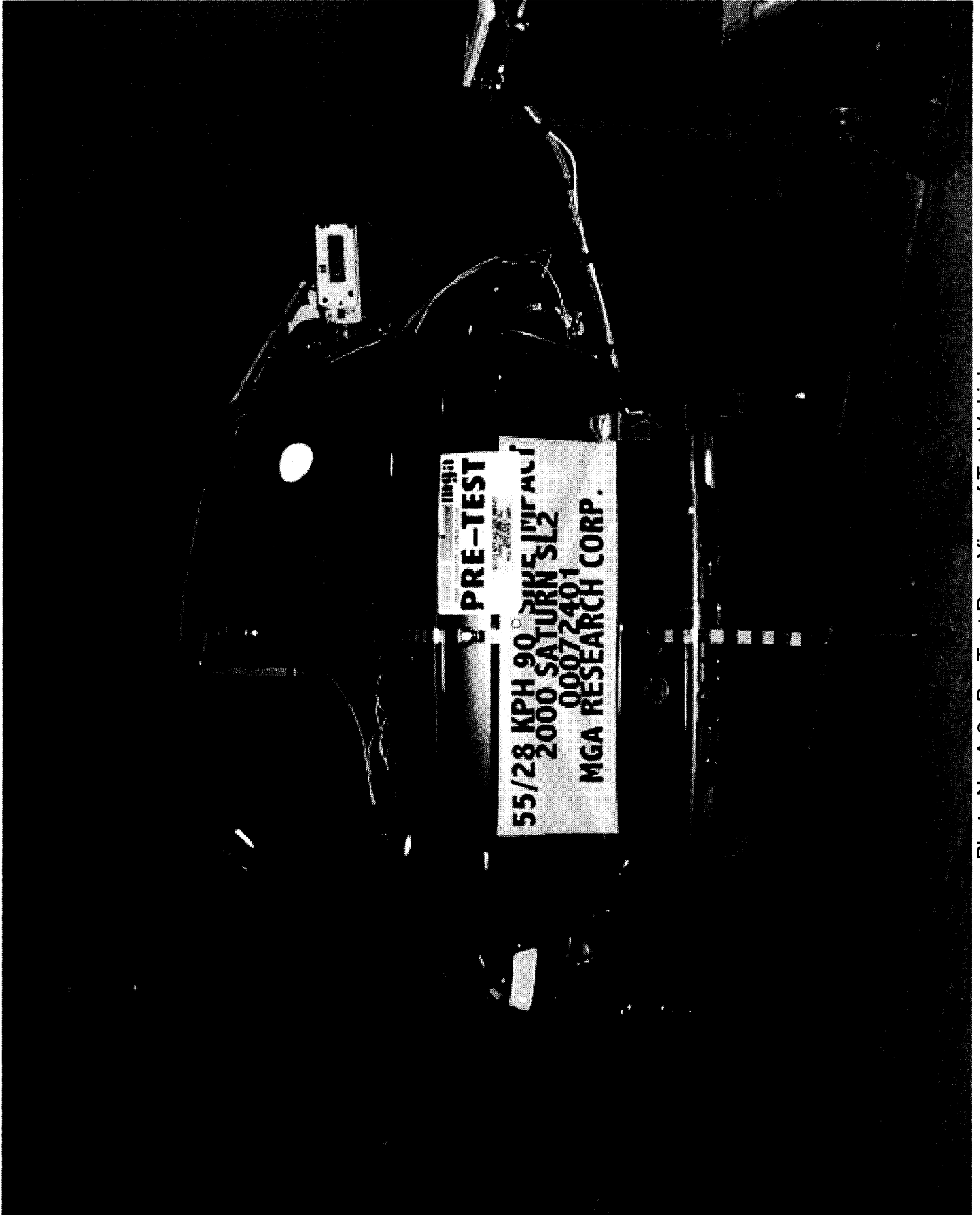


Photo No. A-3 - Pre-Test Rear View of Test Vehicle



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

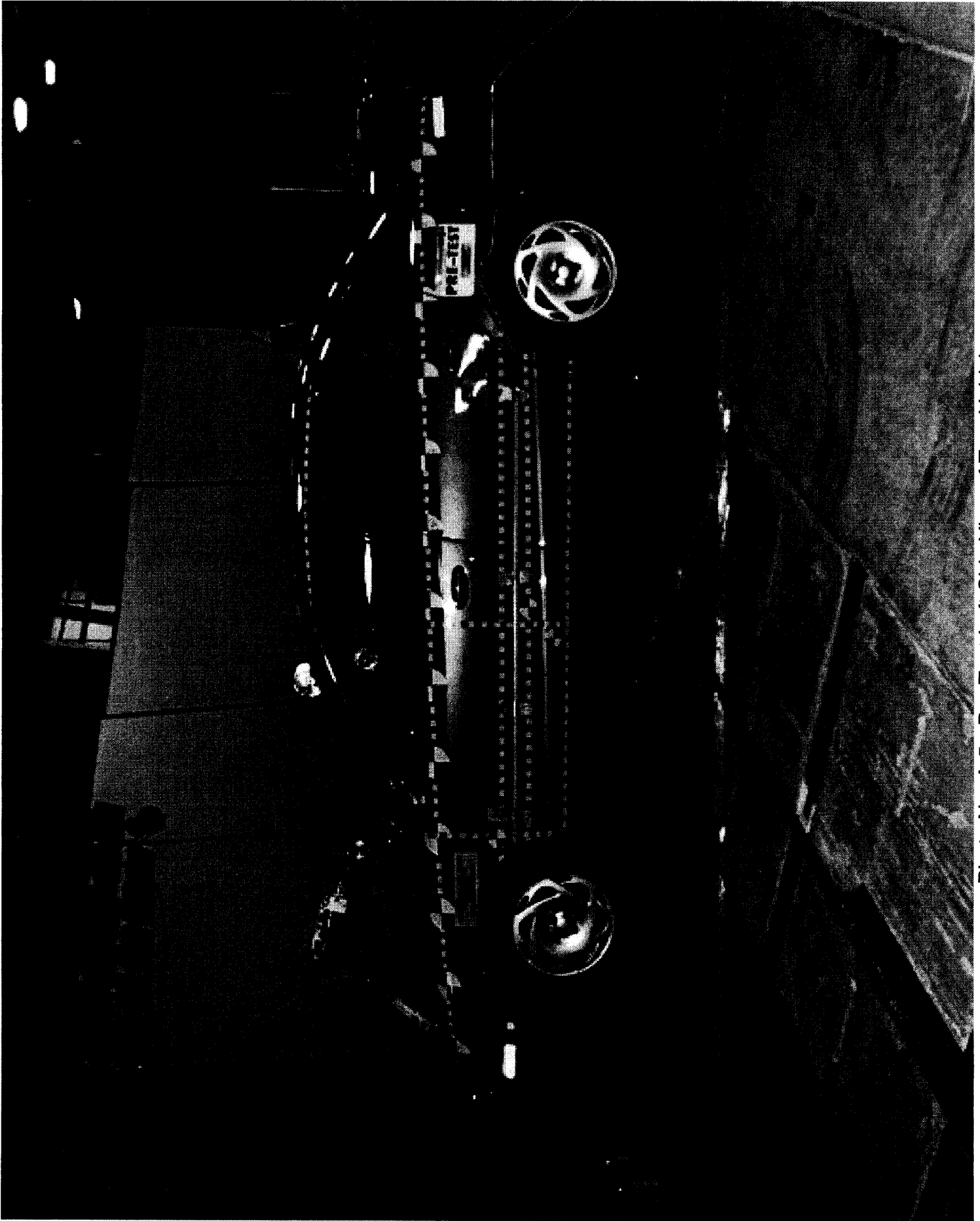


Photo No. A-5 - Pre-Test Left Side View of Test Vehicle

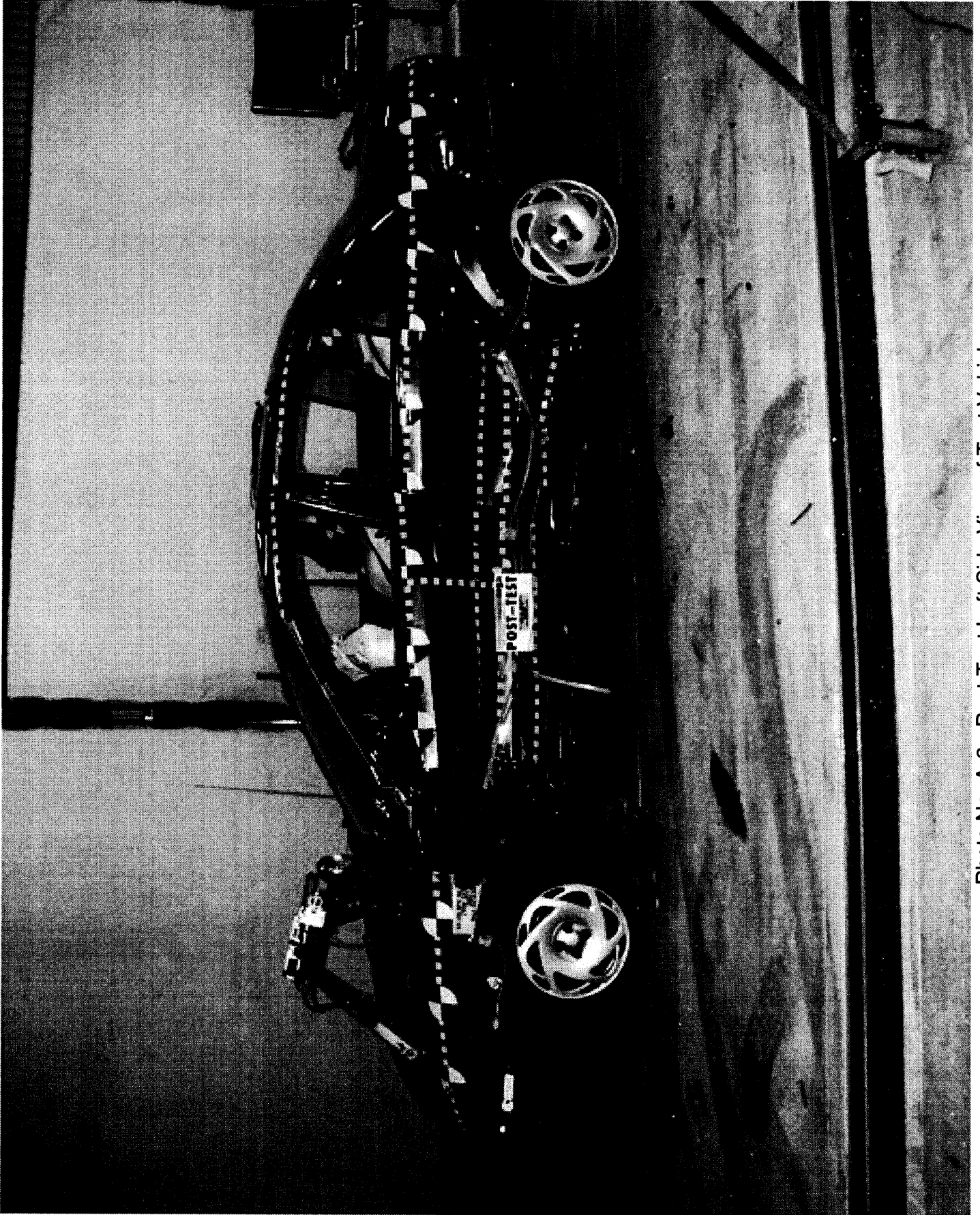


Photo No. A-6 - Post-Test Left Side View of Test Vehicle

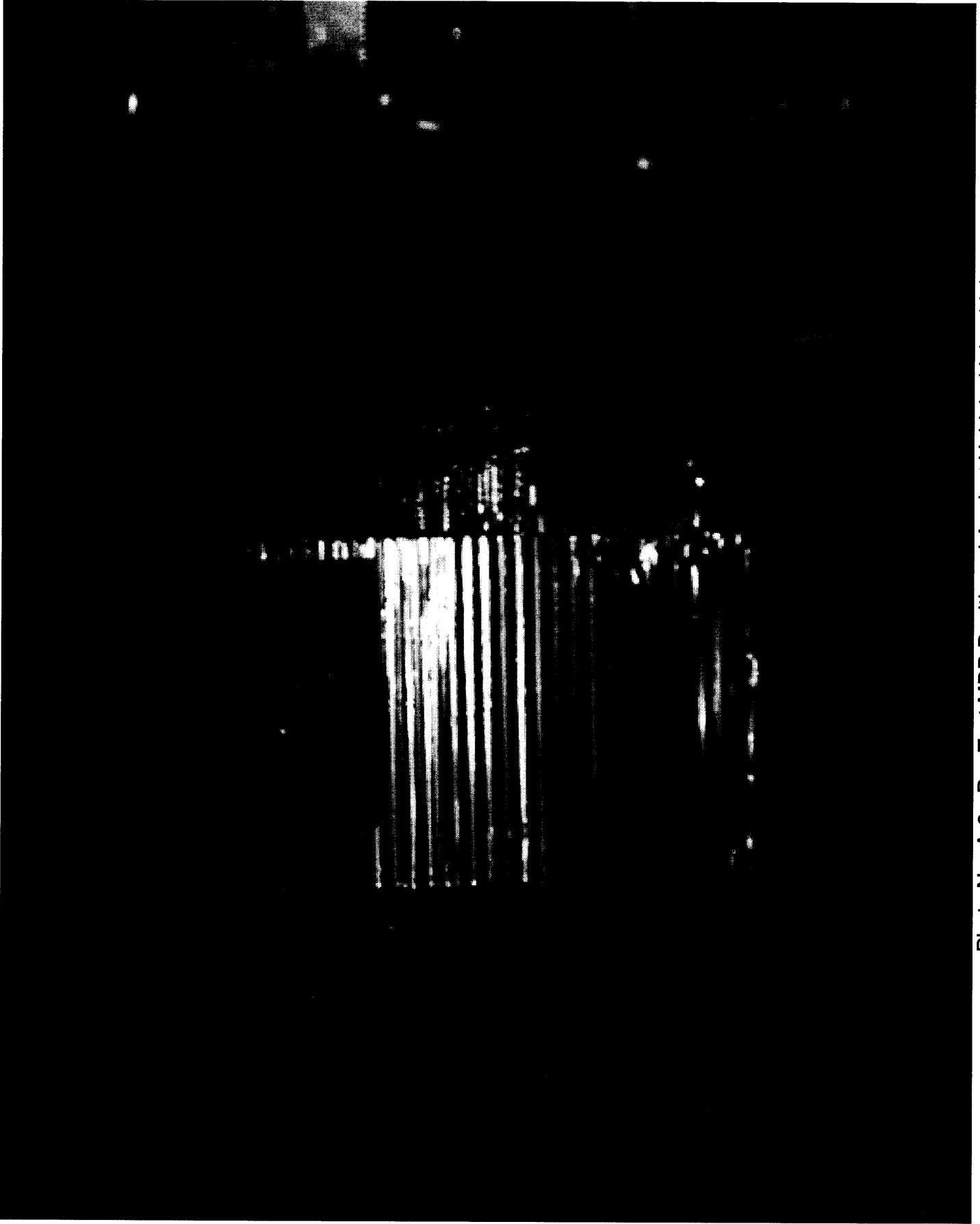


Photo No. A-8 - Pre-Test MDB Positioned Against Vehicle (right side)

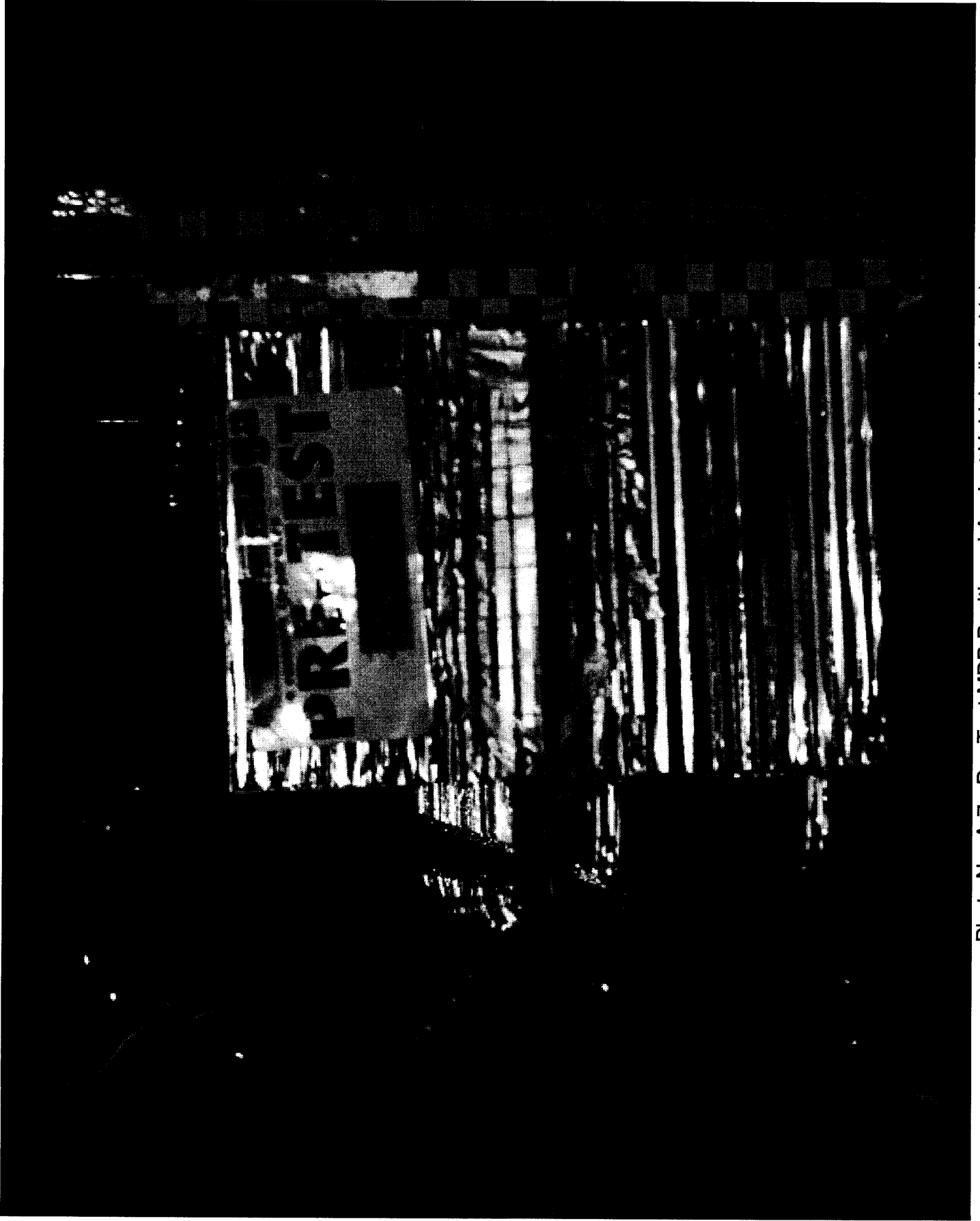


Photo No. A-7 - Pre-Test MDB Positioned Against Vehicle (left side)

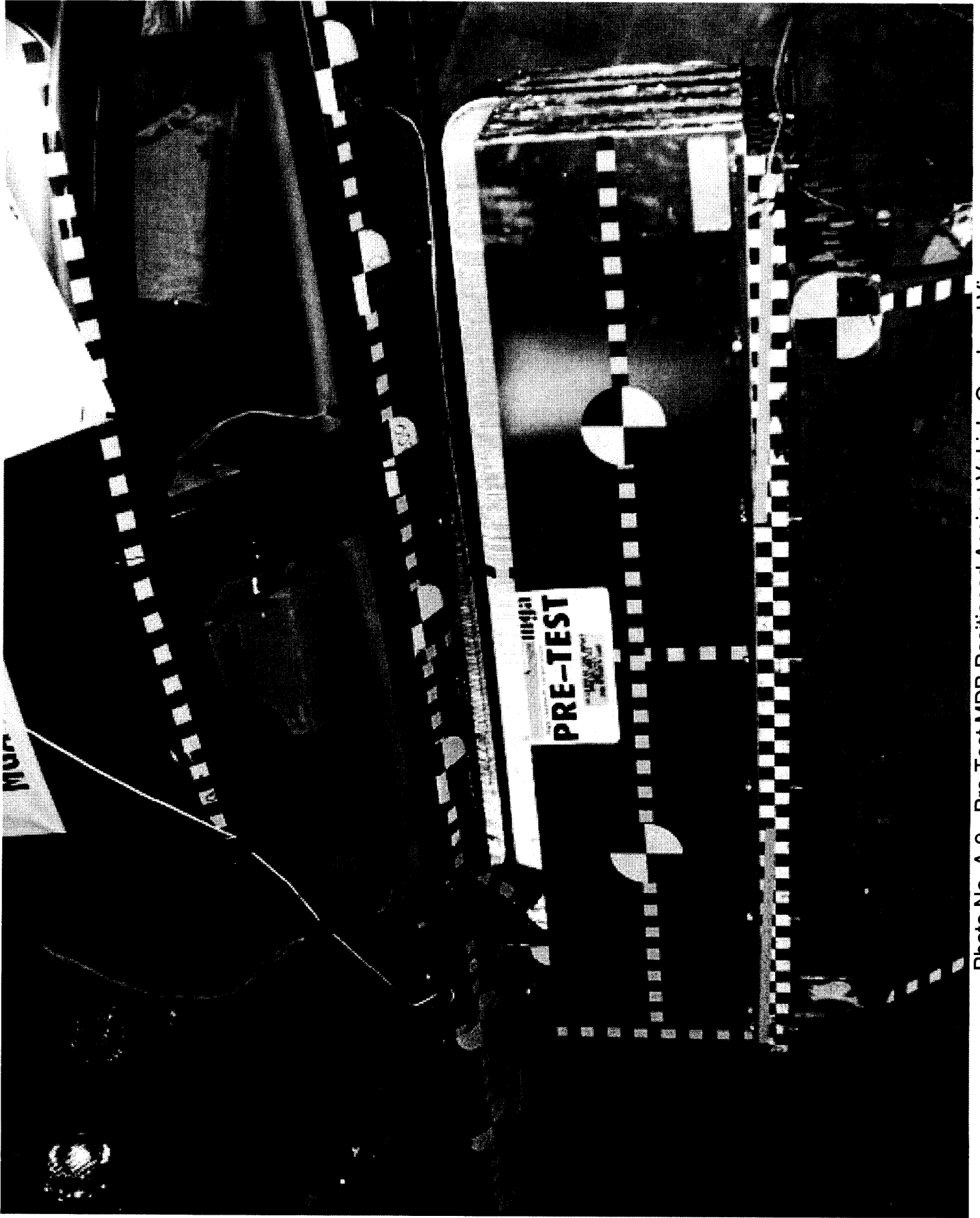


Photo No. A-9 - Pre-Test MDB Positioned Against Vehicle Overhead View

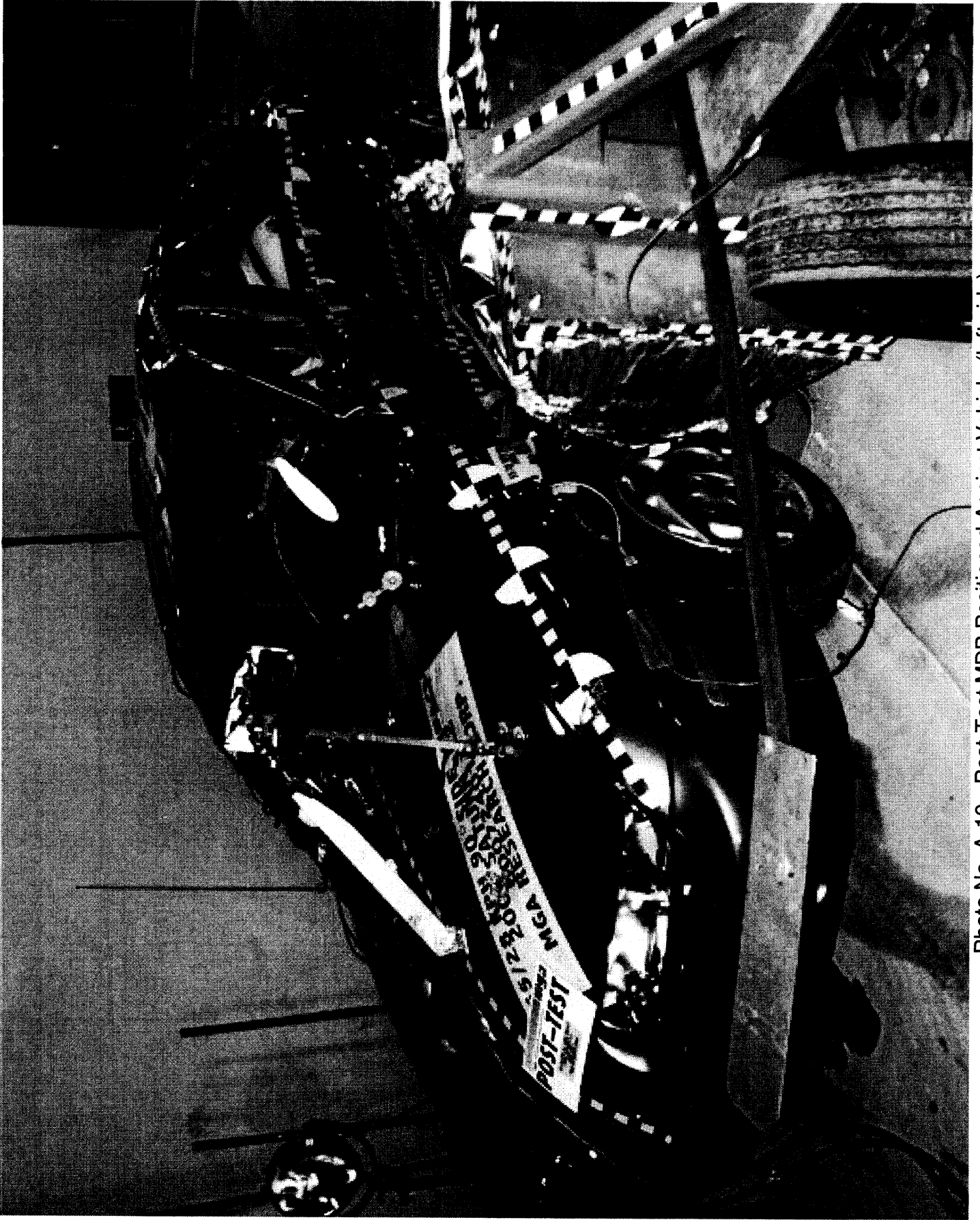


Photo No. A-10 - Post-Test MDB Positioned Against Vehicle (left side)

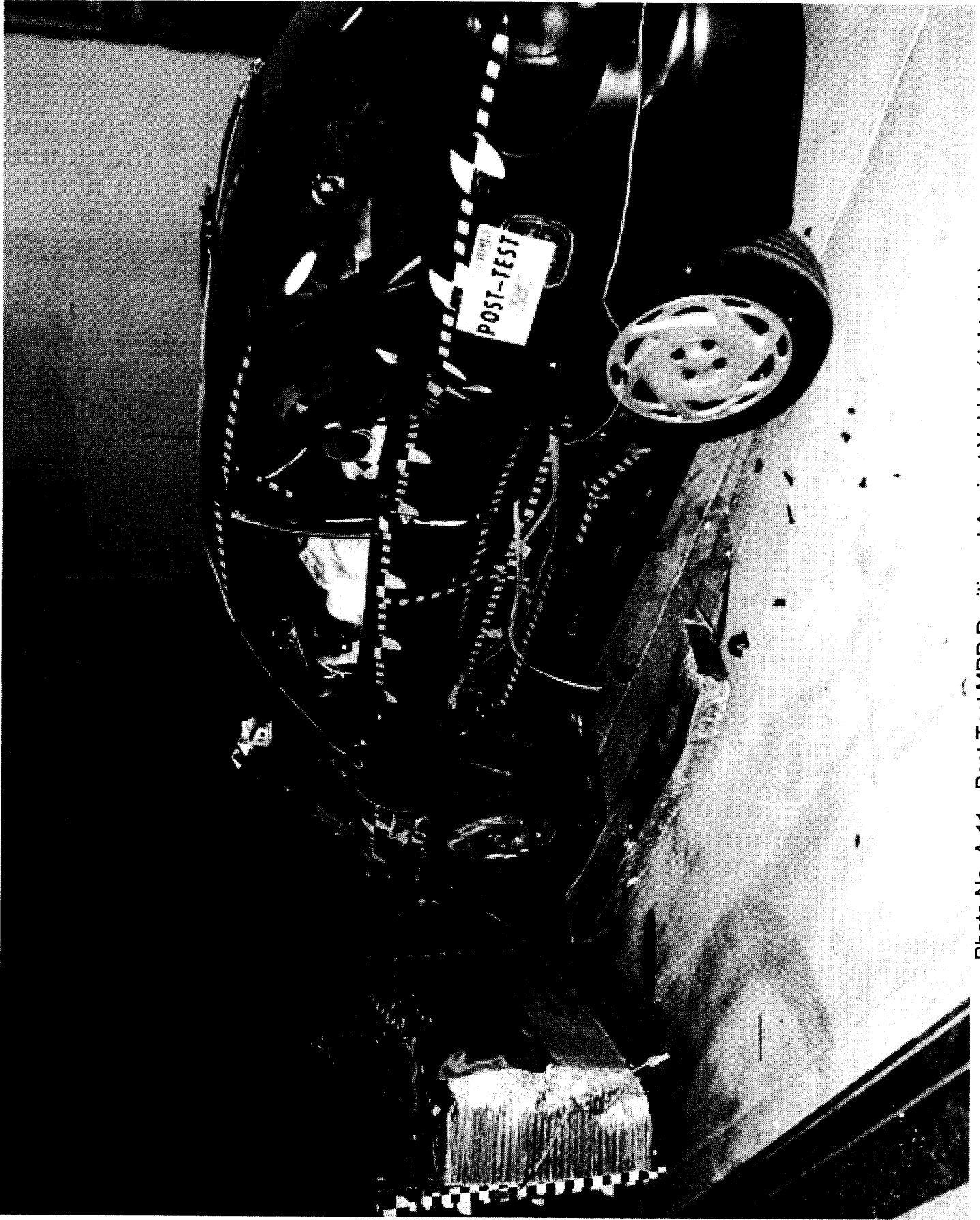


Photo No. A-11 - Post-Test MDB Positioned Against Vehicle (right side)



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

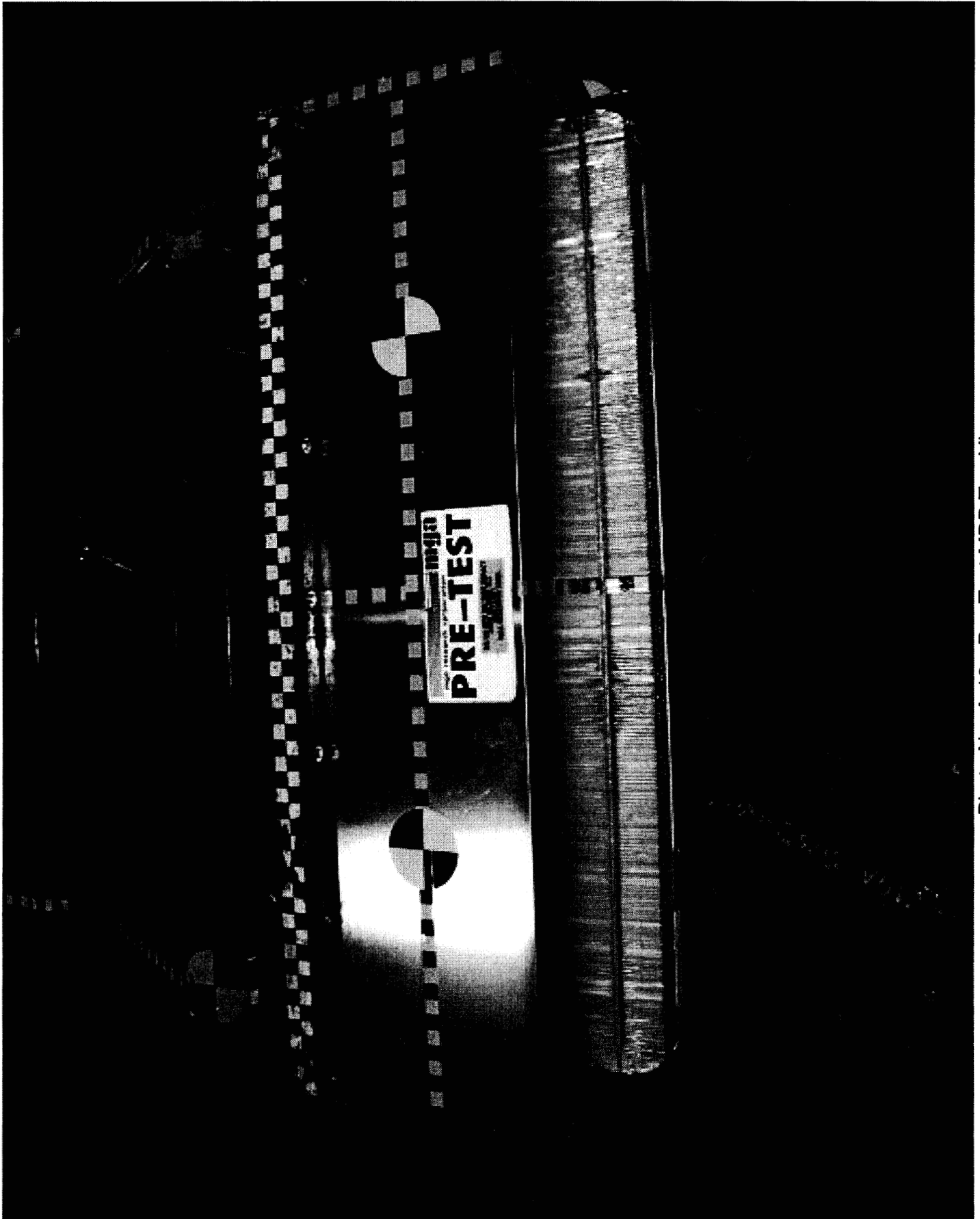


Photo No. A-13 - Pre-Test MDB Top View

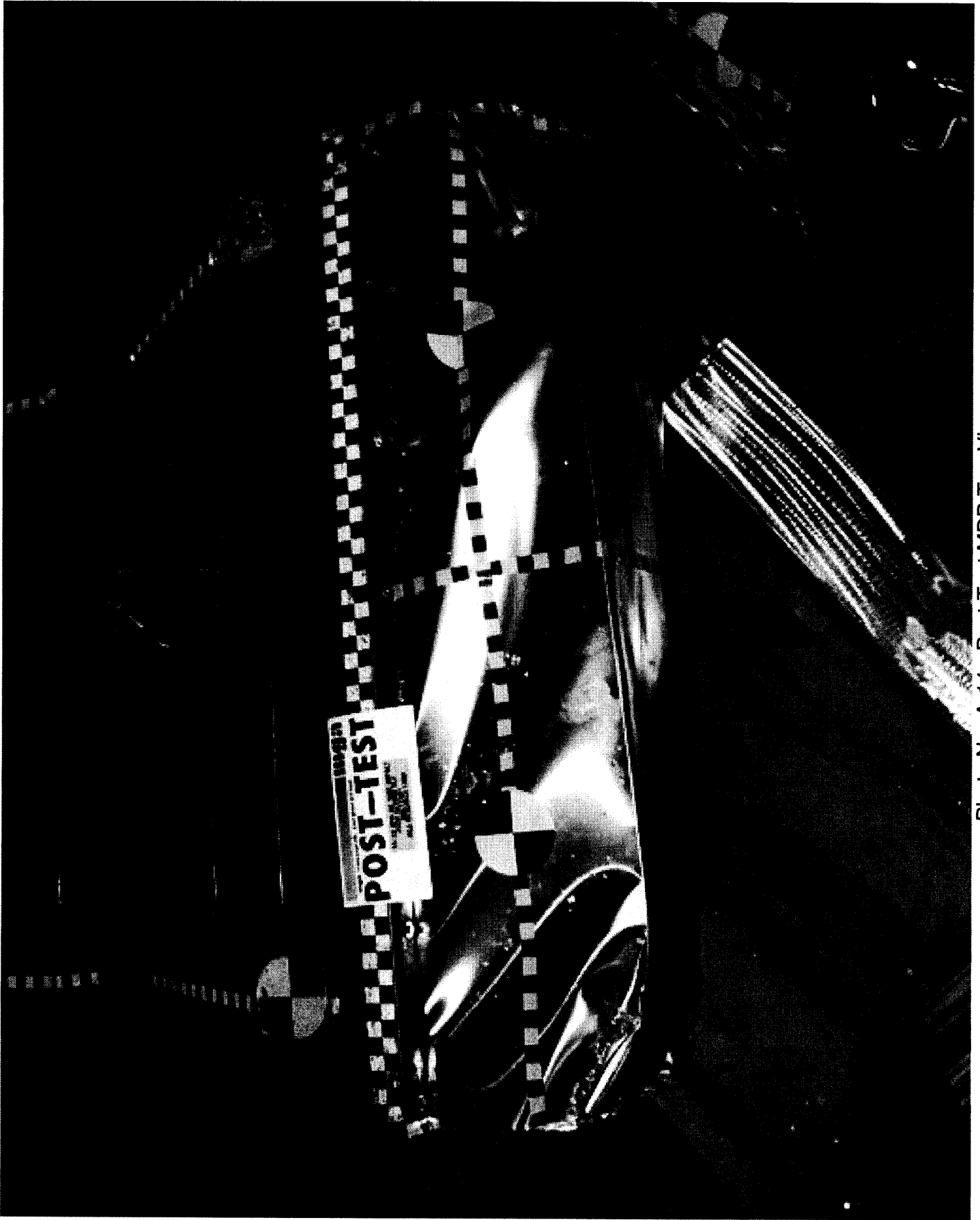


Photo No. A-14 - Post-Test MDB Top View

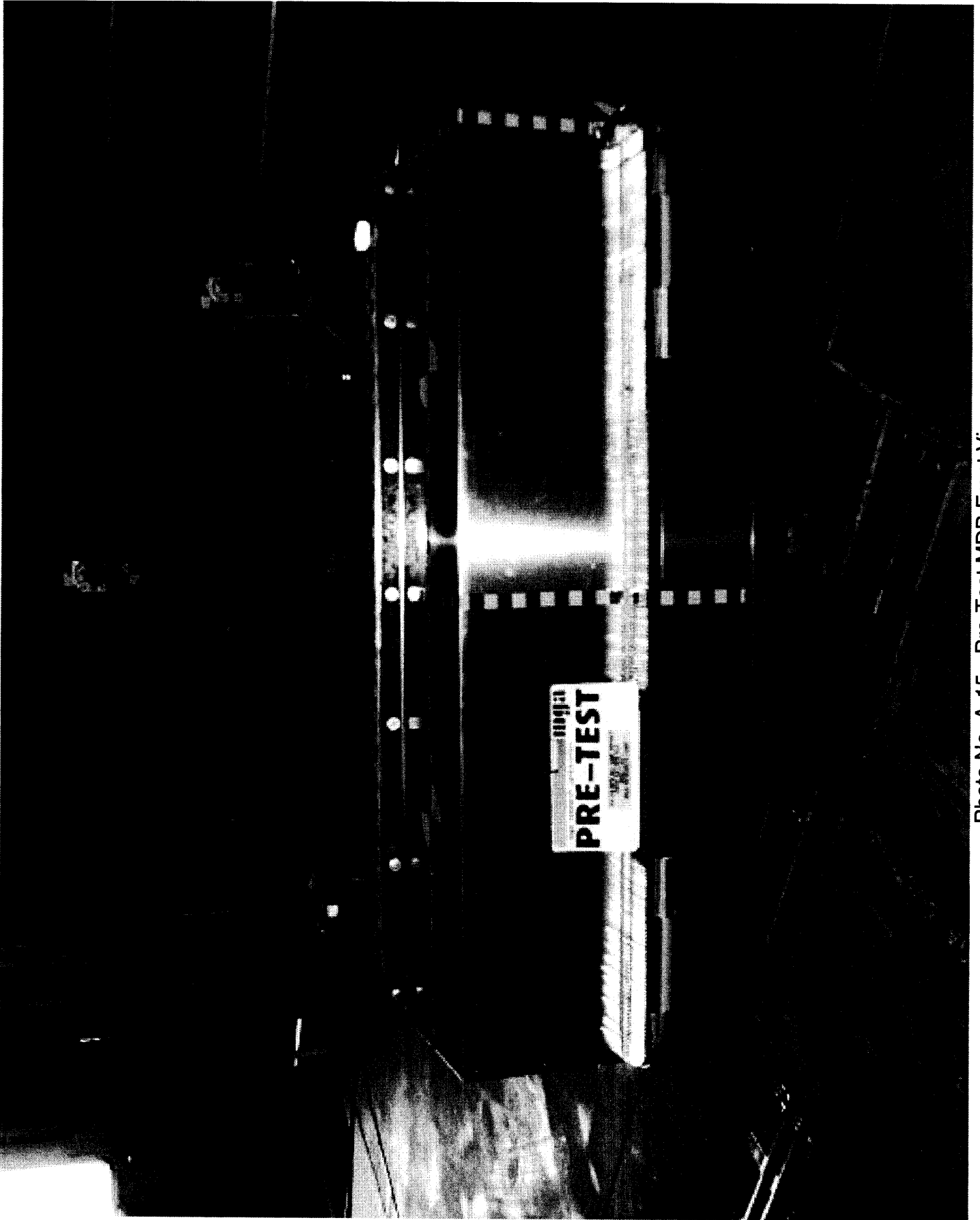


Photo No. A-15 - Pre-Test MDB Front View

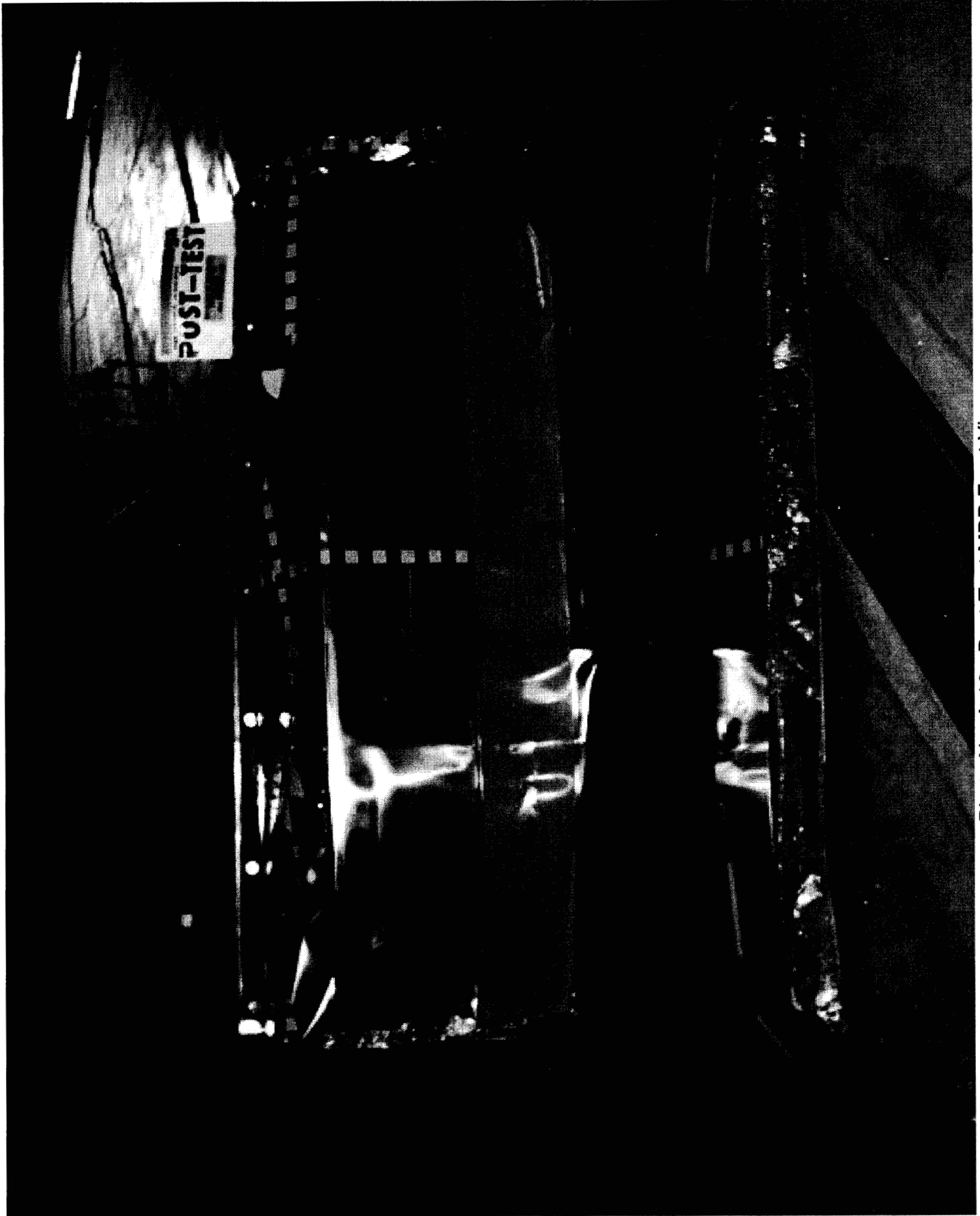


Photo No. A-16 - Post-Test MDB Front View

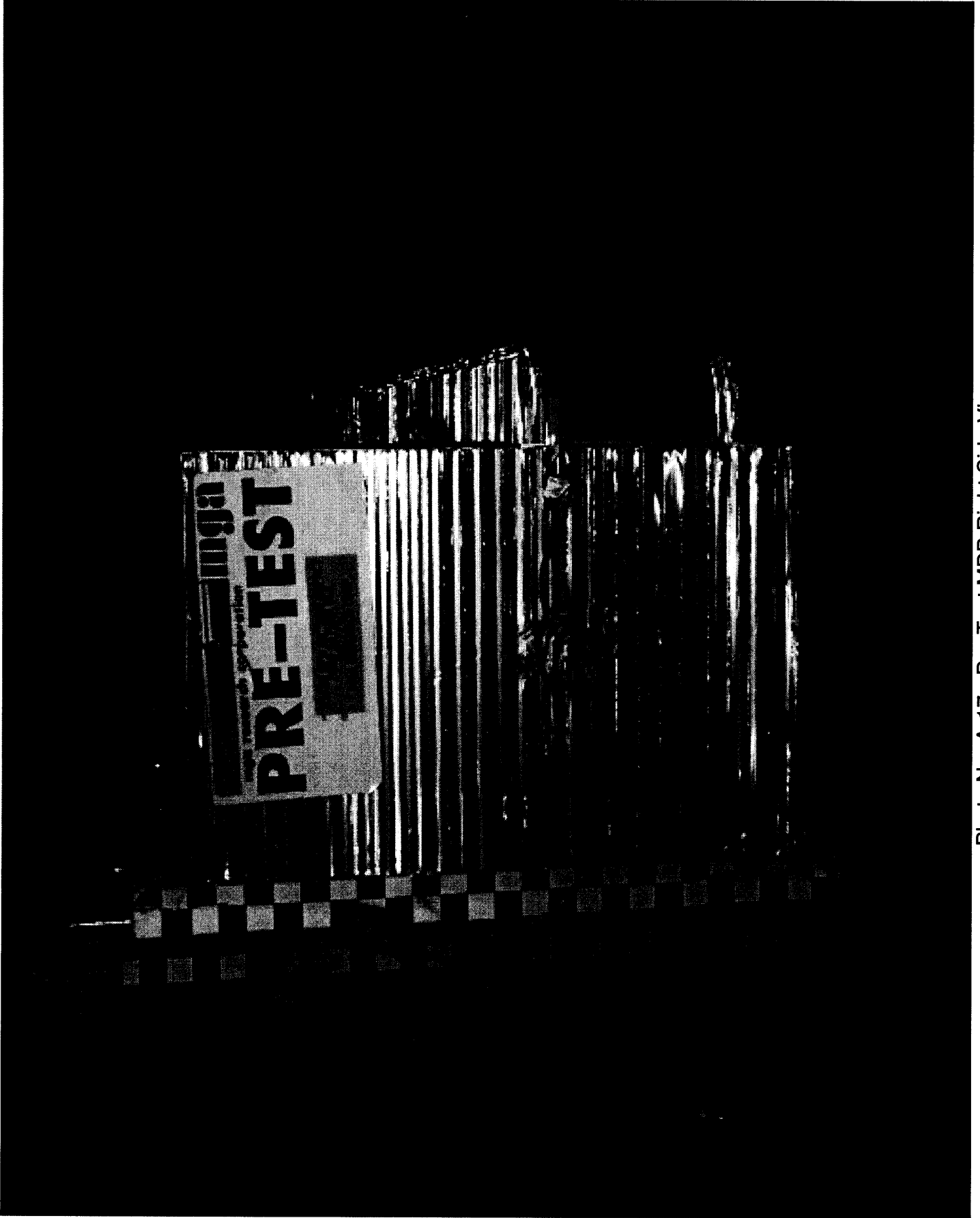


Photo No. A-17 - Pre-Test MDB Right Side View

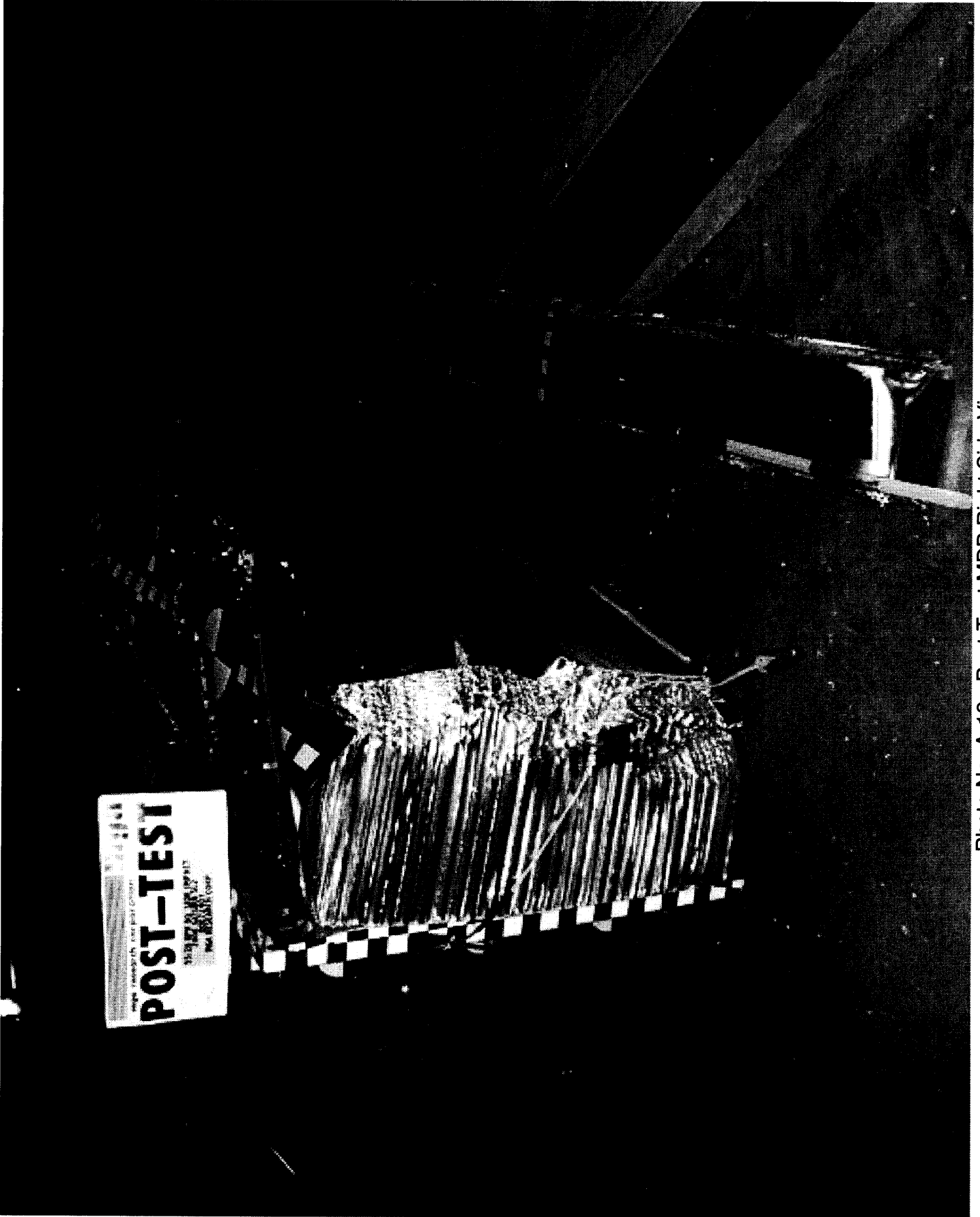


Photo No. A-18 - Post-Test MDB Right Side View



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

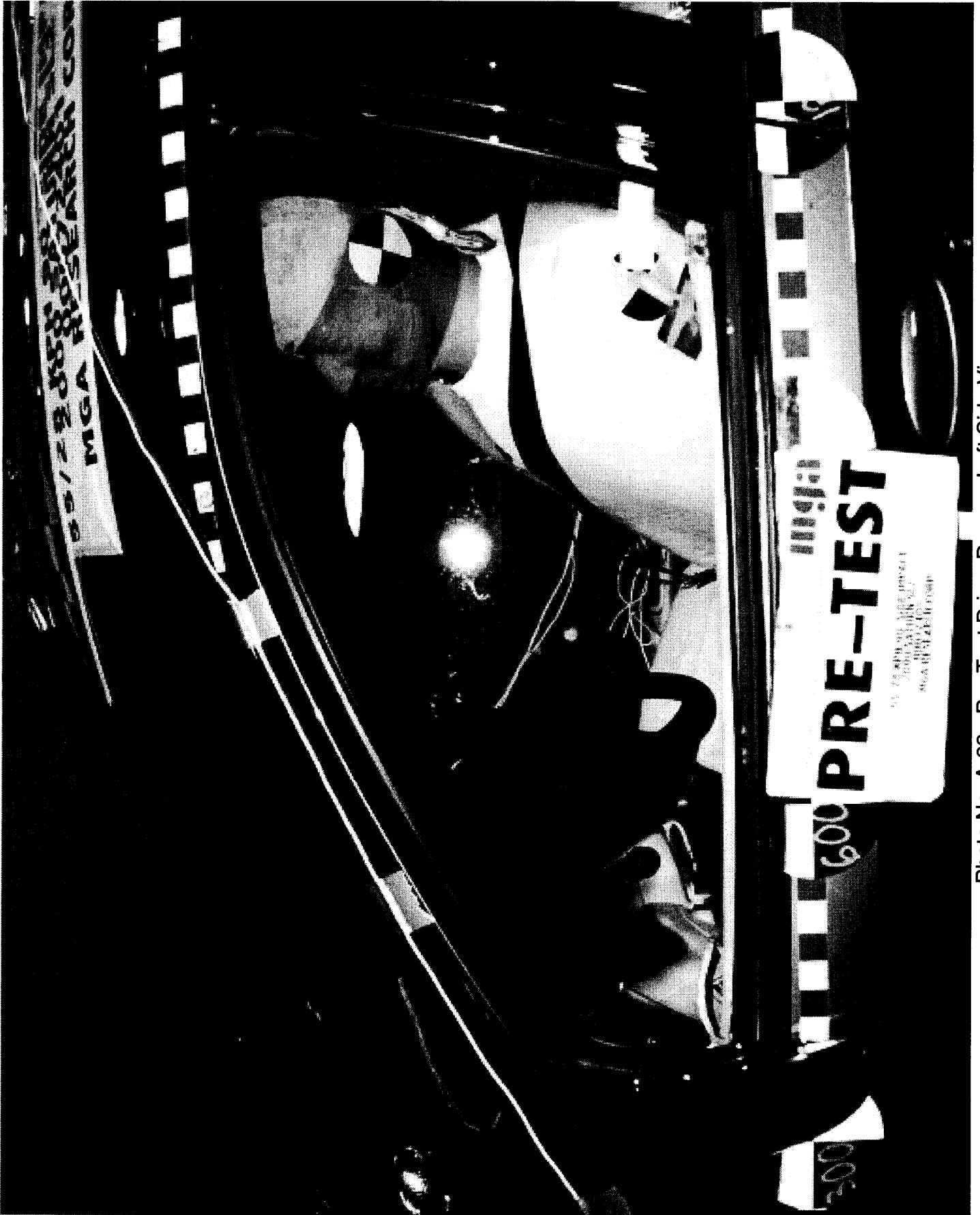


Photo No. A-23 - Pre-Test Driver Dummy Left Side View

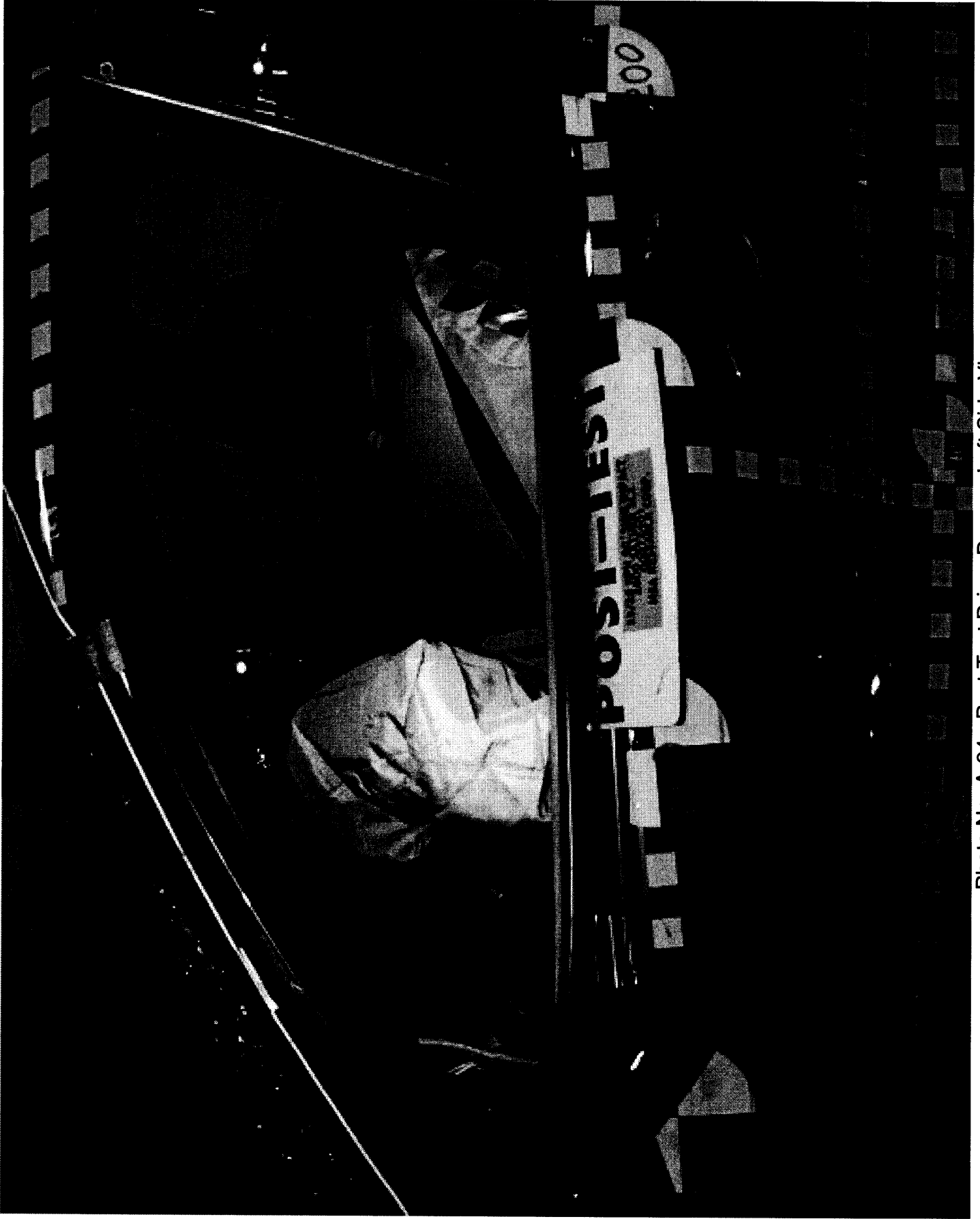


Photo No. A-24 - Post-Test Driver Dummy Left Side View



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



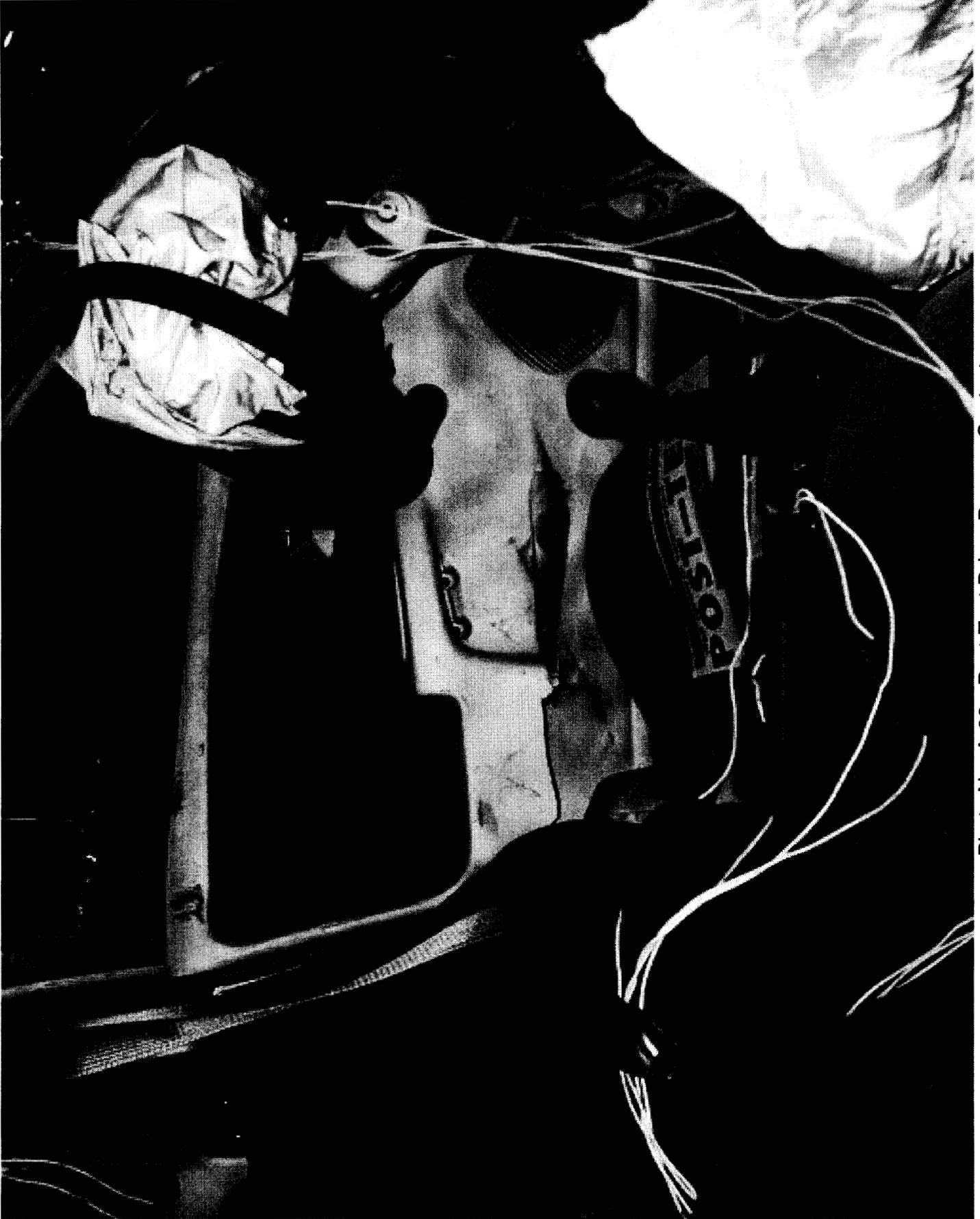


Photo No. A-28 - Post-Test Driver Dummy Contact



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

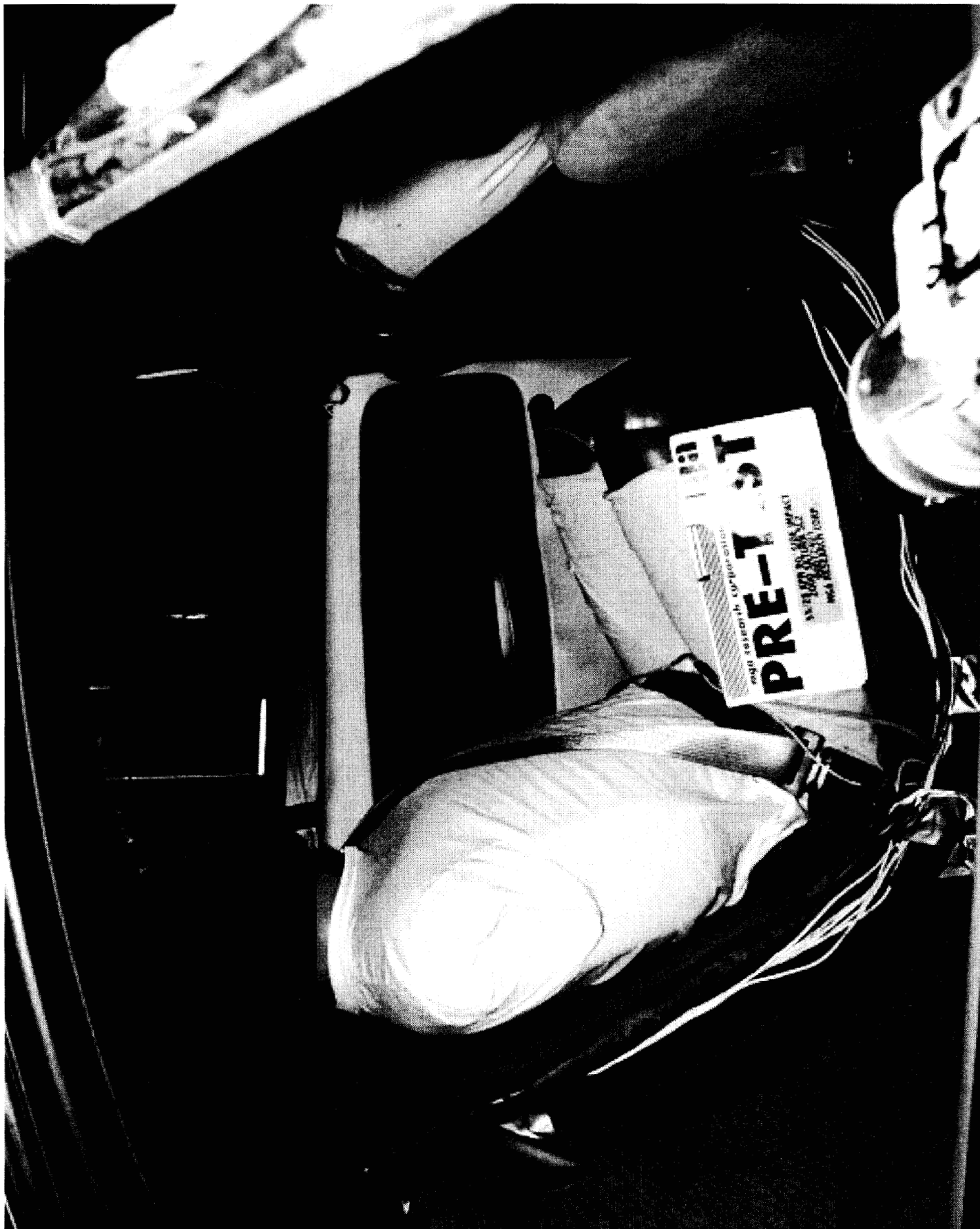


Photo No. A-30 - Pre-Test Passenger Dummy Right Side View

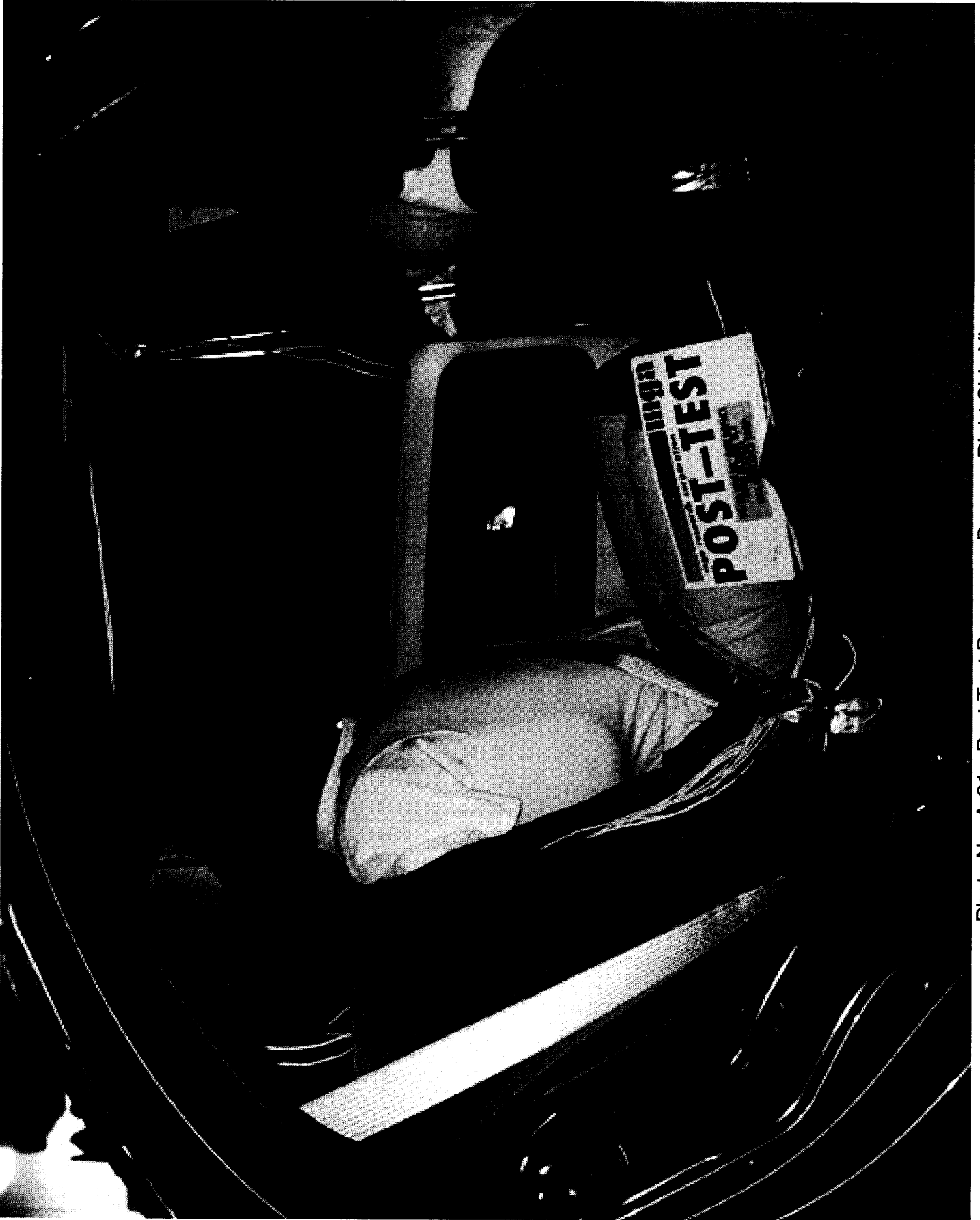


Photo No. A-31 - Post-Test Passenger Dummy Right Side View



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

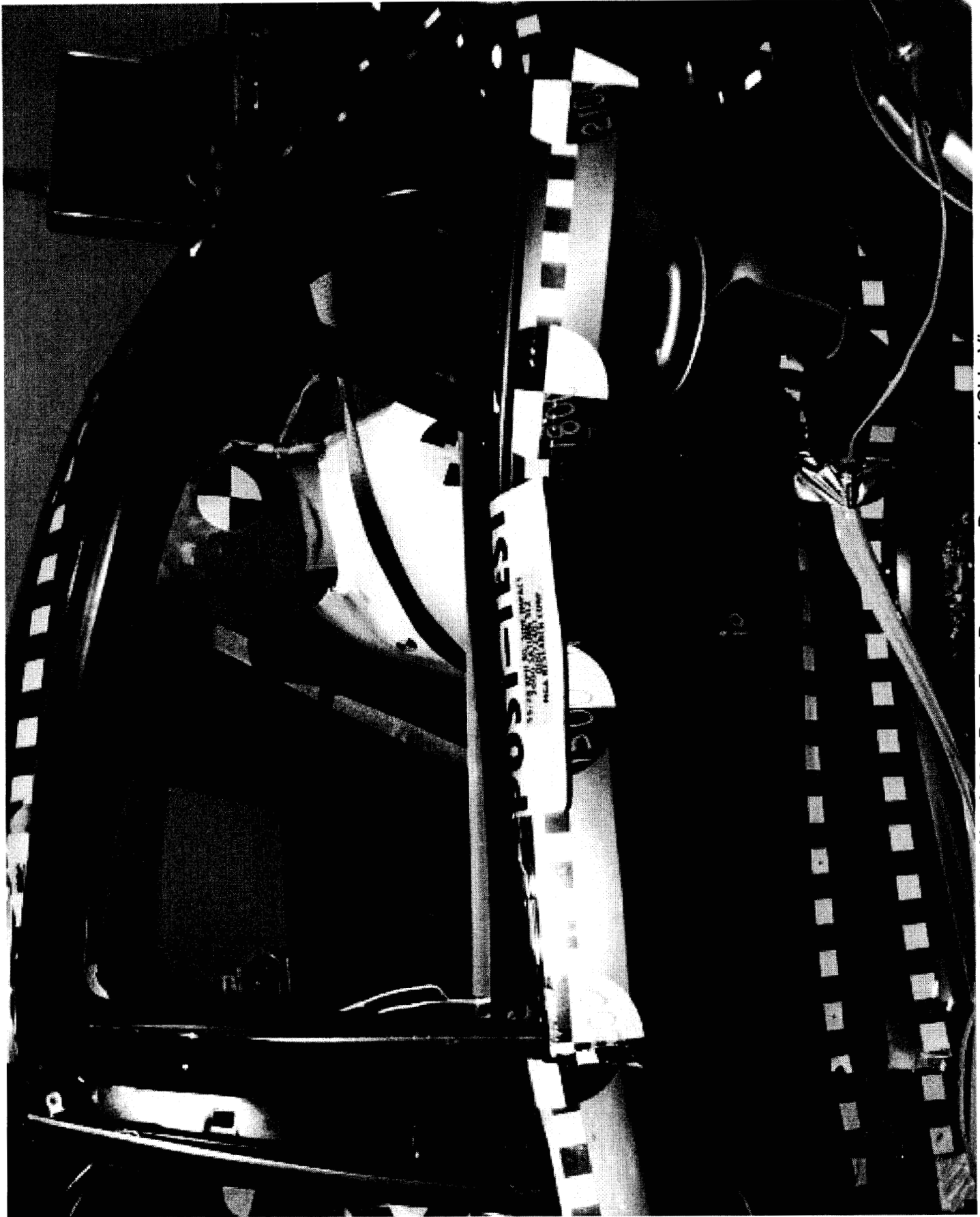


Photo No. A-33 - Post-Test Passenger Dummy Left Side View



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

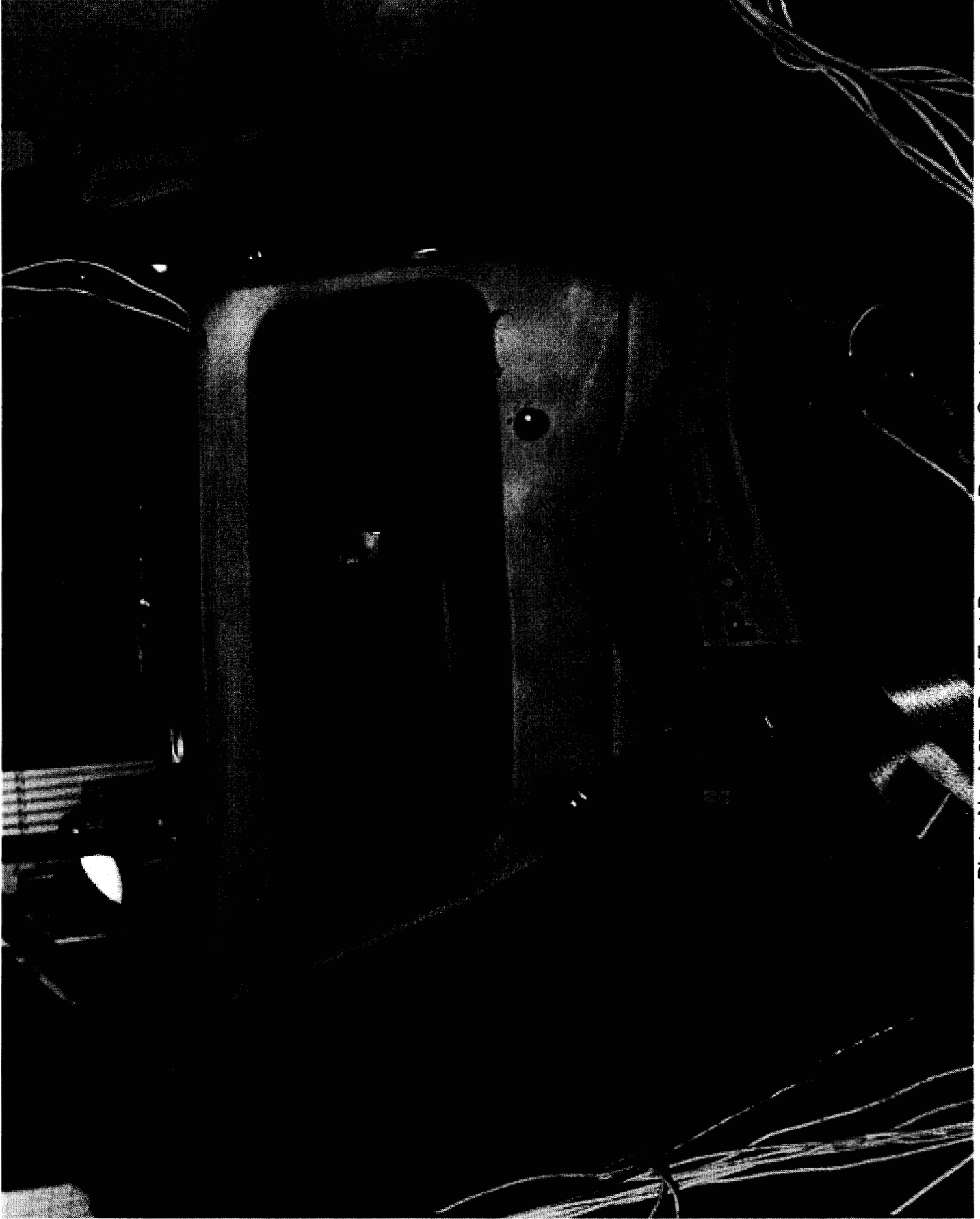


Photo No. A-37 - Post-Test Passenger Dummy Contact



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



**FRK**

55/23


MC

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



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

OCC  
FRT  
MAX  
SAR  
LBB

 MFD BY SATURN CORPORATION

DATE	GVWR	GAWR FRT	GAWR RR
04/00	3322LB	1677LB	1645LB
	1507KG	0761KG	0746KG

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

1G8ZJ5273YZ239393      PASS CAR

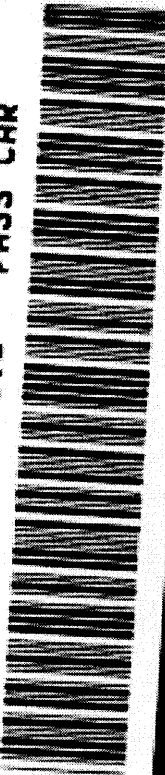


Photo No. A-41 - Vehicle Certification Label

**TIRE-LOADING INFORMATION**

**OCCUPANTS** **VEHICLE CAPACITY WT.**  
**FRT. CTR. RB. TOTAL**  
 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

**MAXIMUM LOADING AT CURB!**  
**SAME AS VEHICLE CAPACITY WEIGHT**  
 2270

**COLD TIRE PRESSURE**

FRONT	TIRE SIZE	SPEED RATING	FRONT PRESSURE
FRONT	P185/65R15	H	32
REAR	P185/65R15	H	32
SPARE	T115/70R14	H	32

**IF TIRES ARE HOT, ADD 4 PSI (28 LBS)**  
**SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION**

Photo No. A-42 - Tire Placard

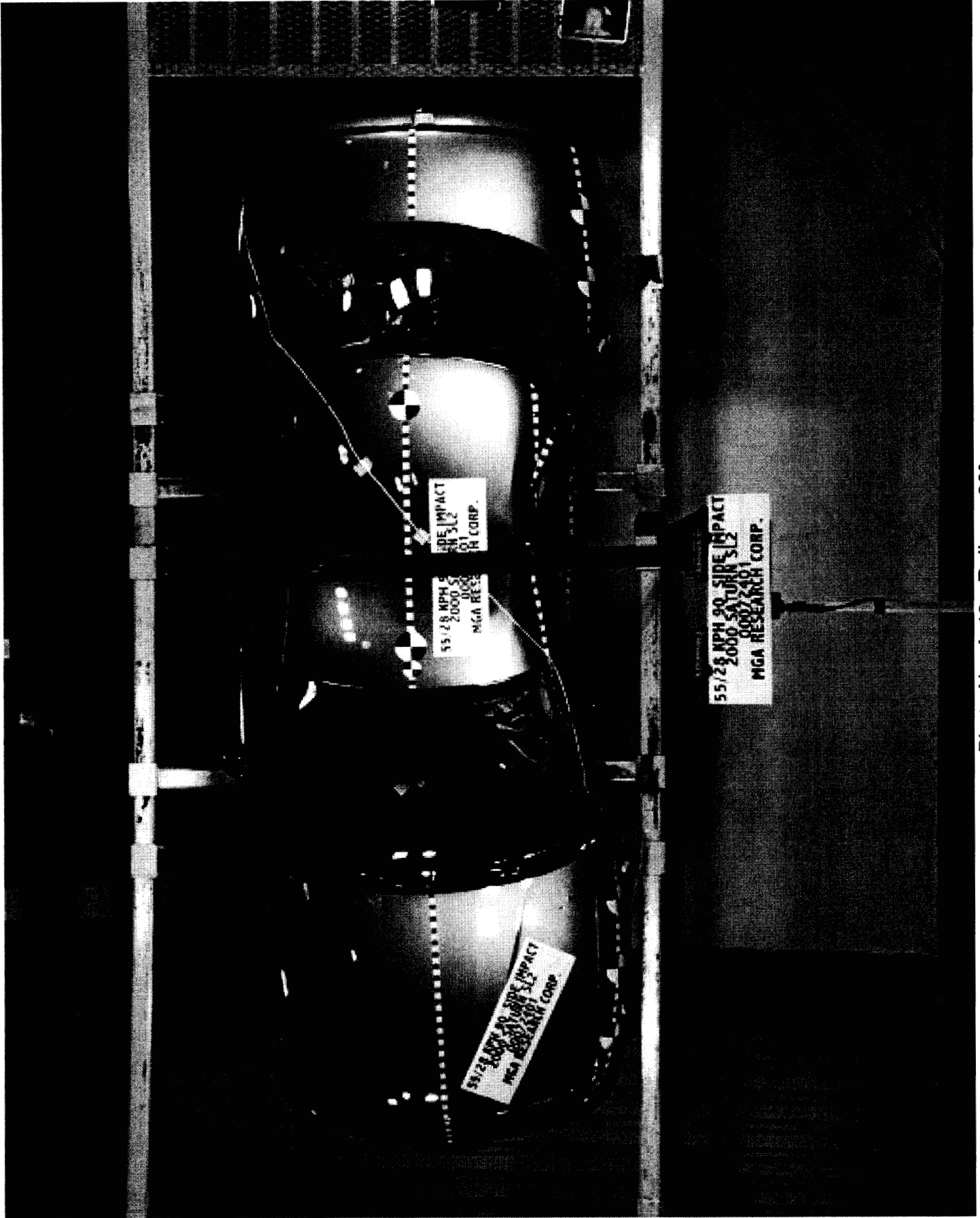


Photo No. A-43 - Rollover 90°

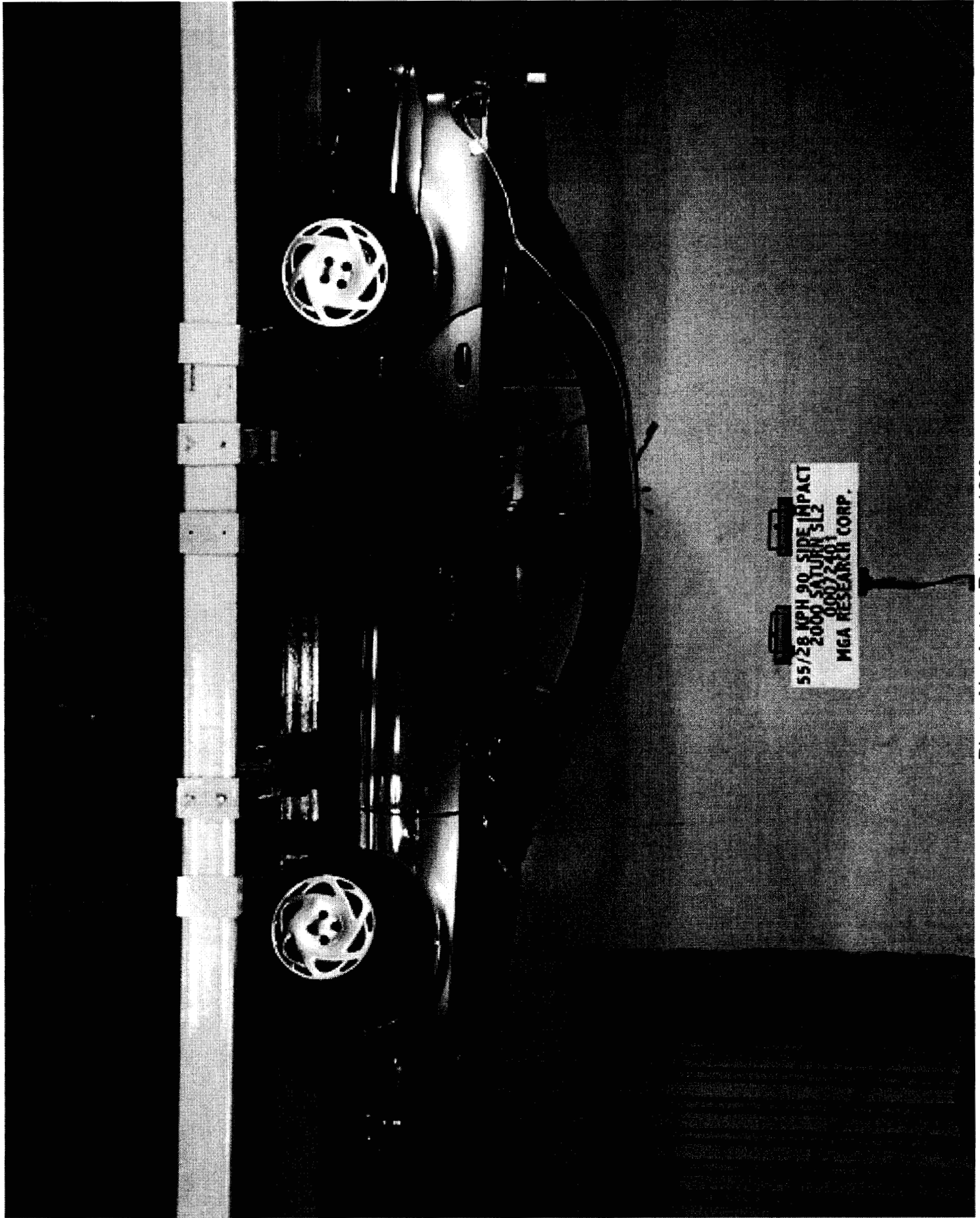


Photo No. A-44 - Rollover 180°

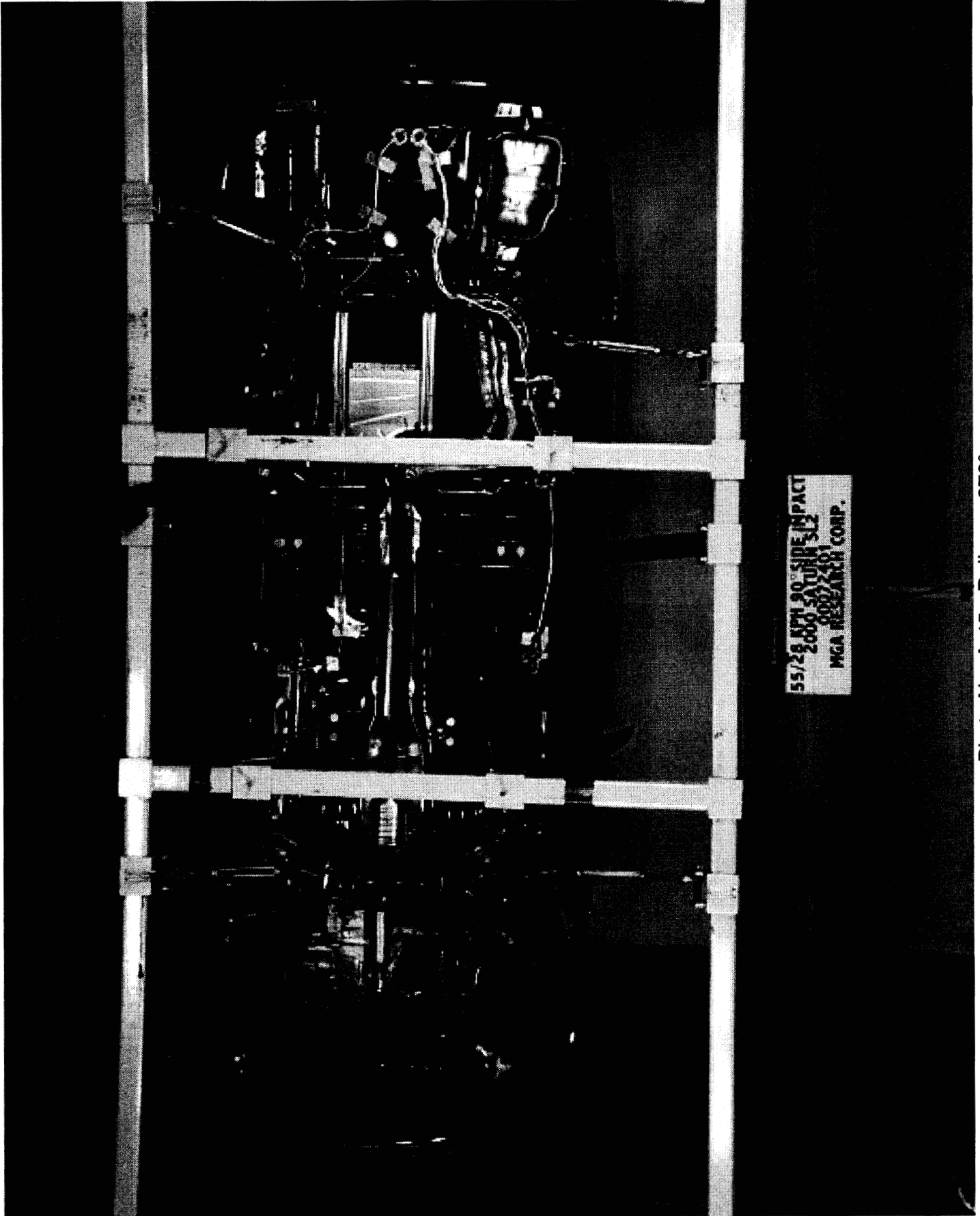


Photo No. A-45 - Rollover 270°

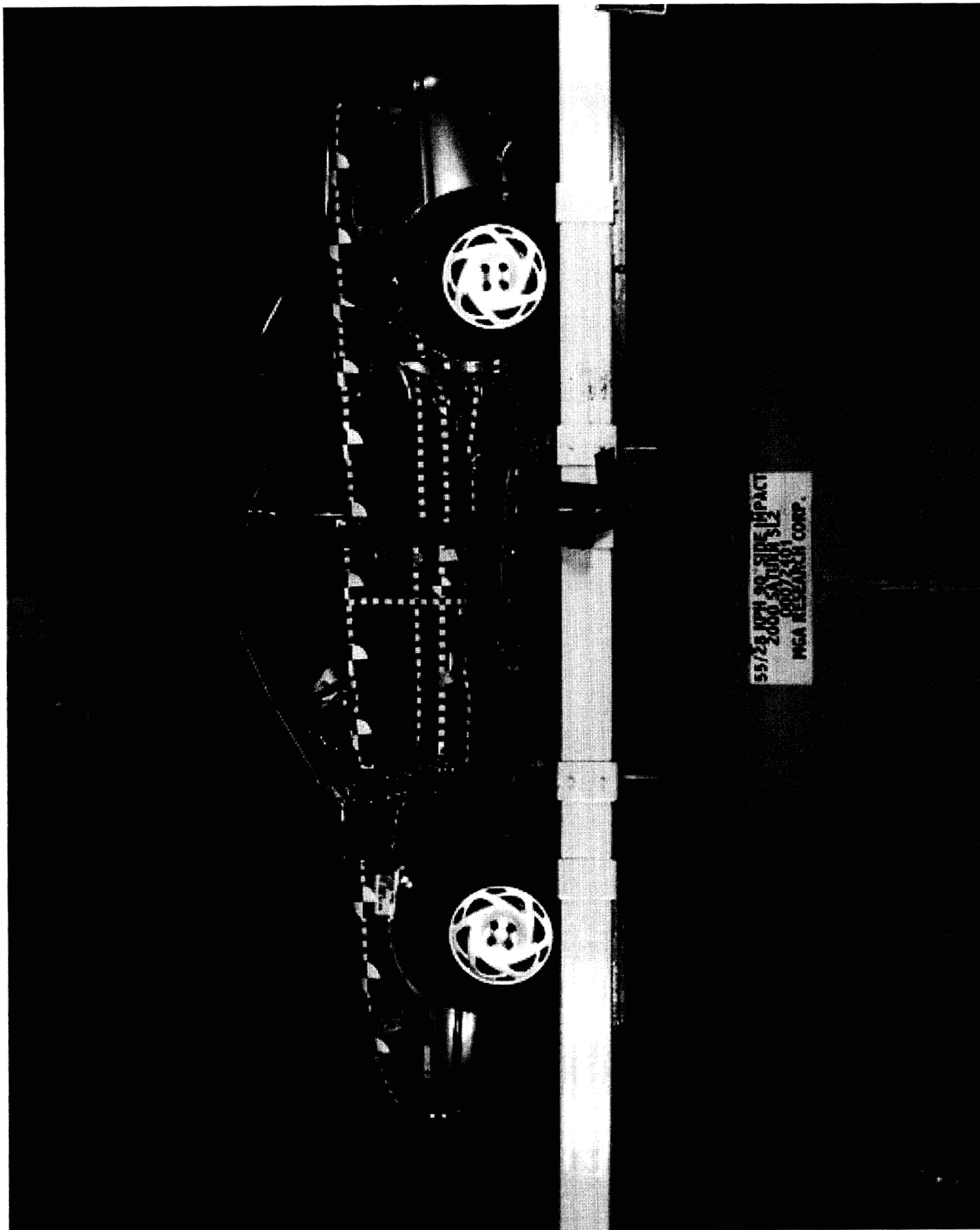


Photo No. A-46 - Rollover 360°

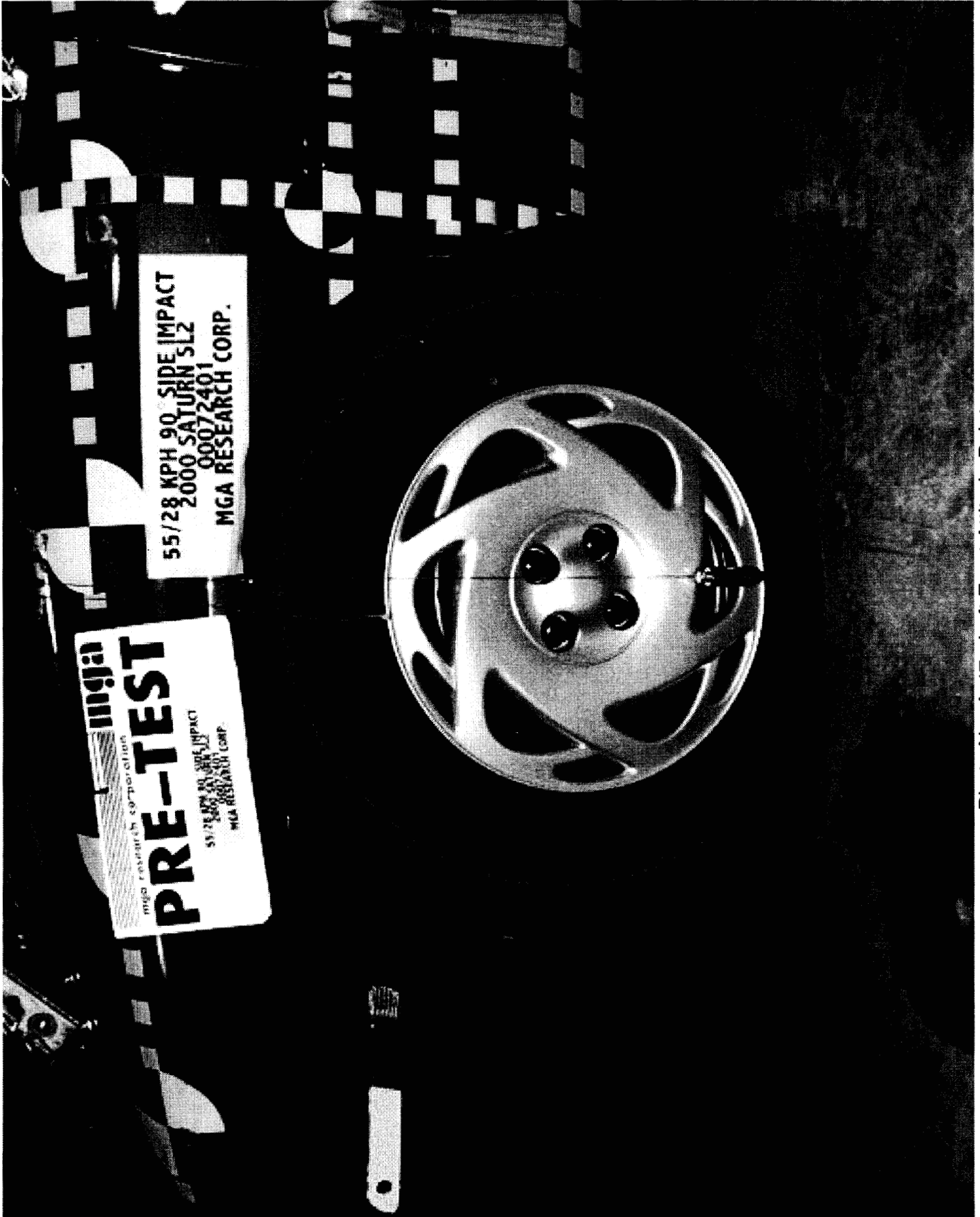


Photo No. A-47 - Left Front Attitude Point



Photo No. A-48 - Right Front Attitude Point



Photo No. A-49 - Left Rear Attitude Point



Photo No. A-50 - Right Rear Attitude Point

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TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

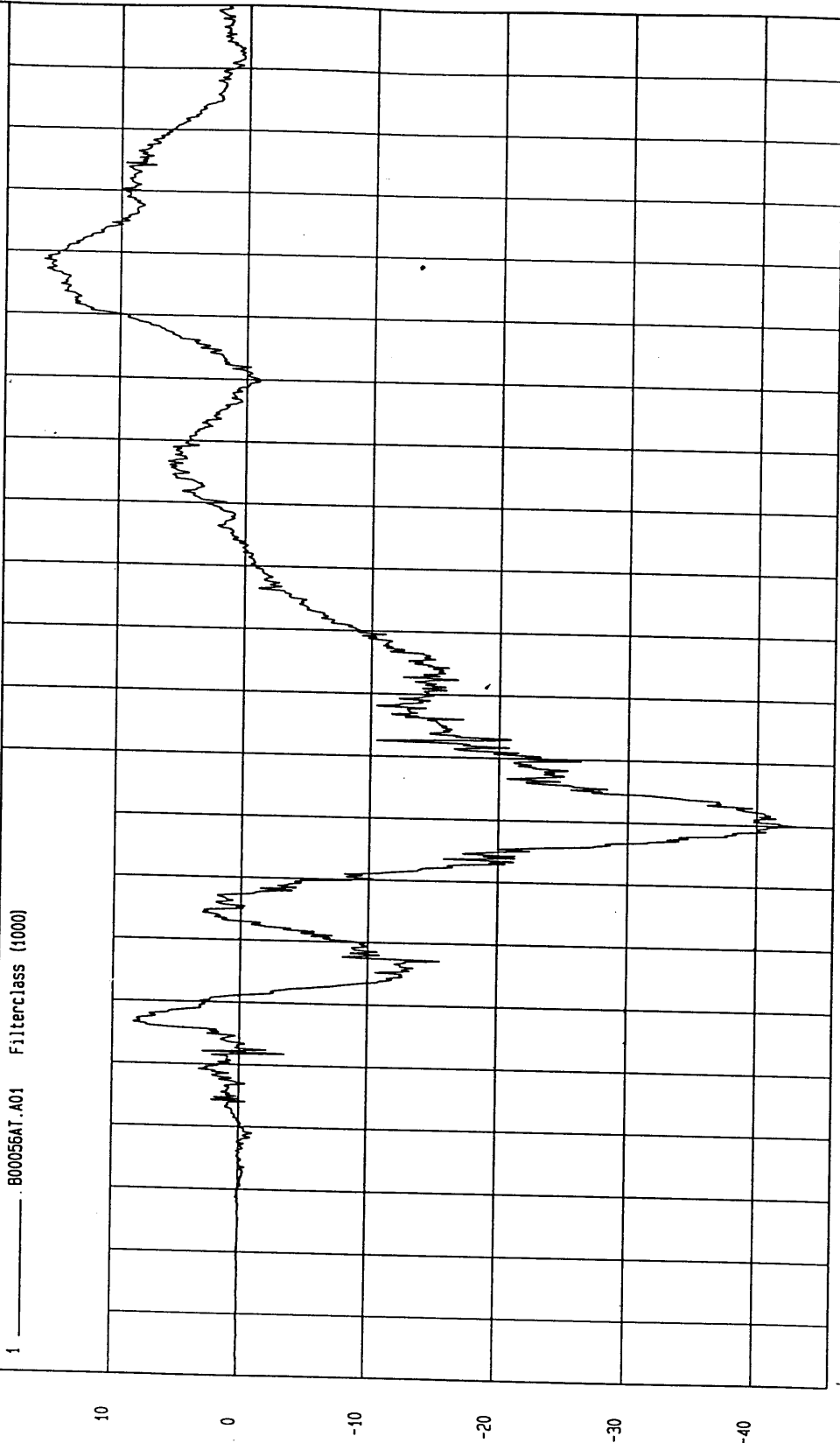
Speed: 38.9 MPH 62.6 KPH

Minimum = -42.78 G's at 70 msec

Maximum = 15.94 G's at 159 msec

DRIVER HEAD X ACCELERATION

1 — .B00056AT.A01 Filterclass (1000)



Seconds

NSA Research  
07-25-2000 11:03

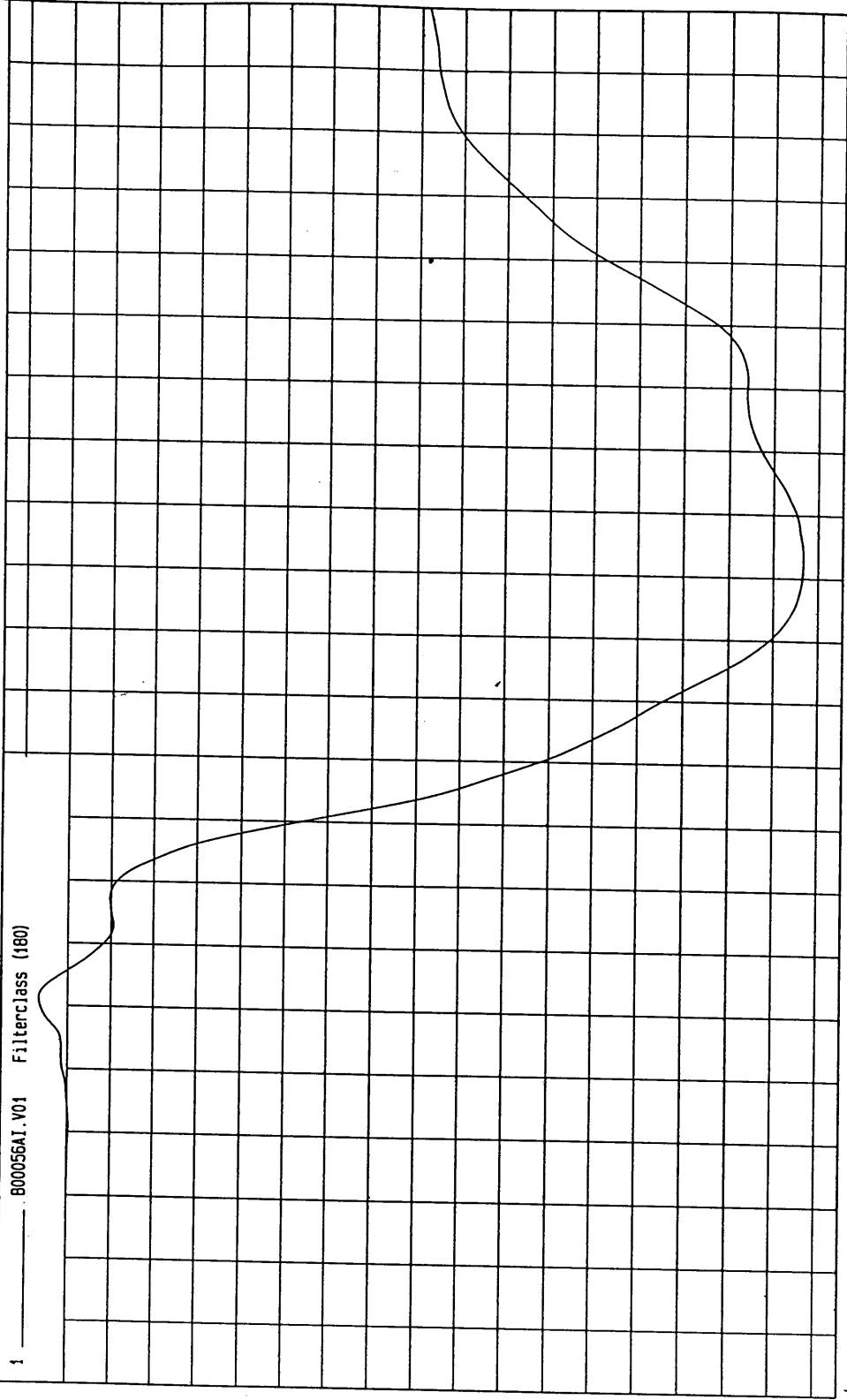
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -33.34 KPH at 113 msec Maximum = 1.33 KPH at 41 msec

DRIVER HEAD X VELOCITY

1 800056AI.V01 Filterclass (180)



MGA Research  
07-25-2000 11:02

TIME Seconds

KPH

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

Speed: 38.9 MPH 62.6 KPH

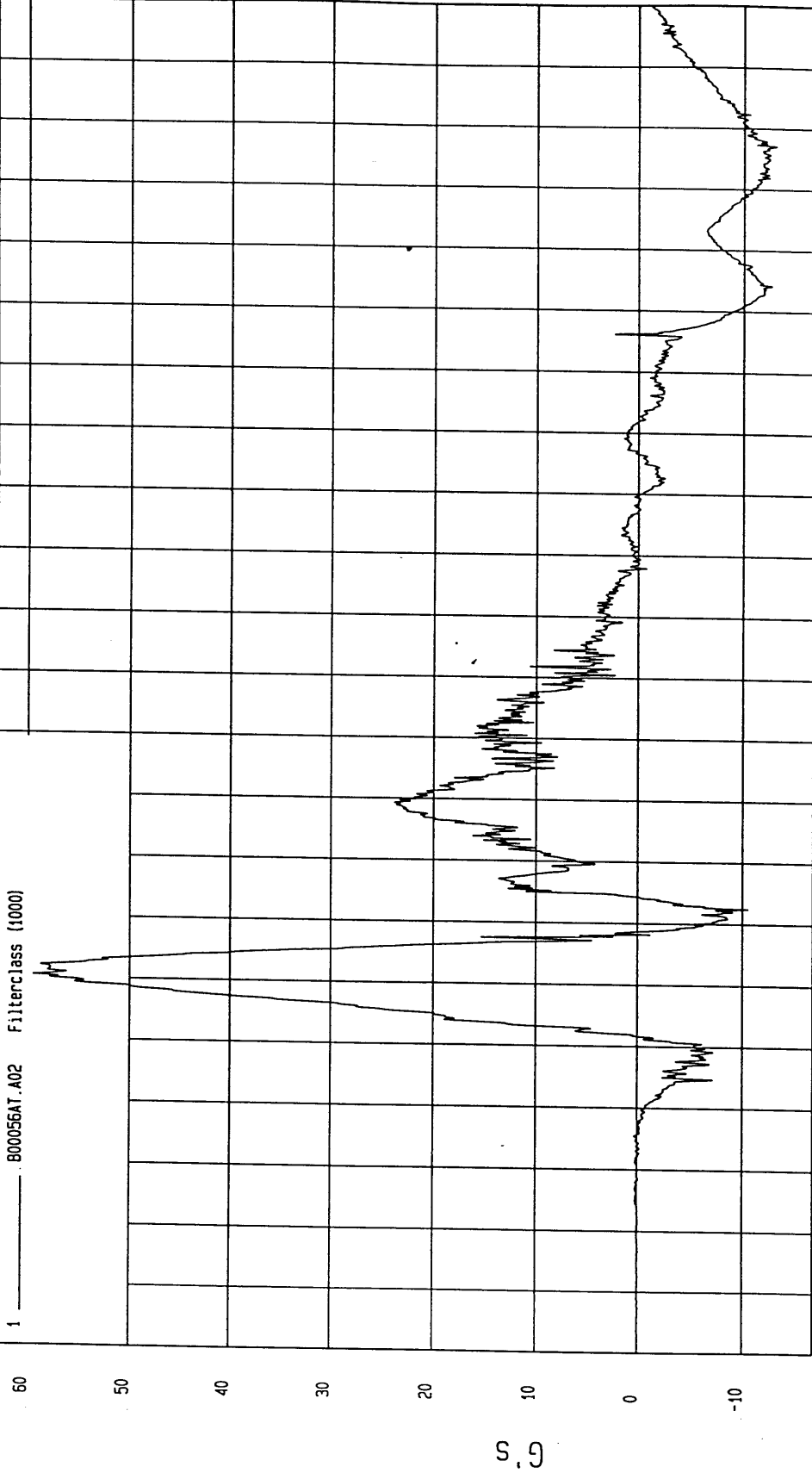
COMPONENT: 2000 SATURN SL2 4 DOOR

Minimum = -13.1 G's at 177 msec

Maximum = 59.46 G's at 40 msec

DRIVER HEAD Y ACCELERATION

1 800056AT.A02 Filterclass (1000)



MGA Research  
07-25-2000 11:03

Seconds

G's

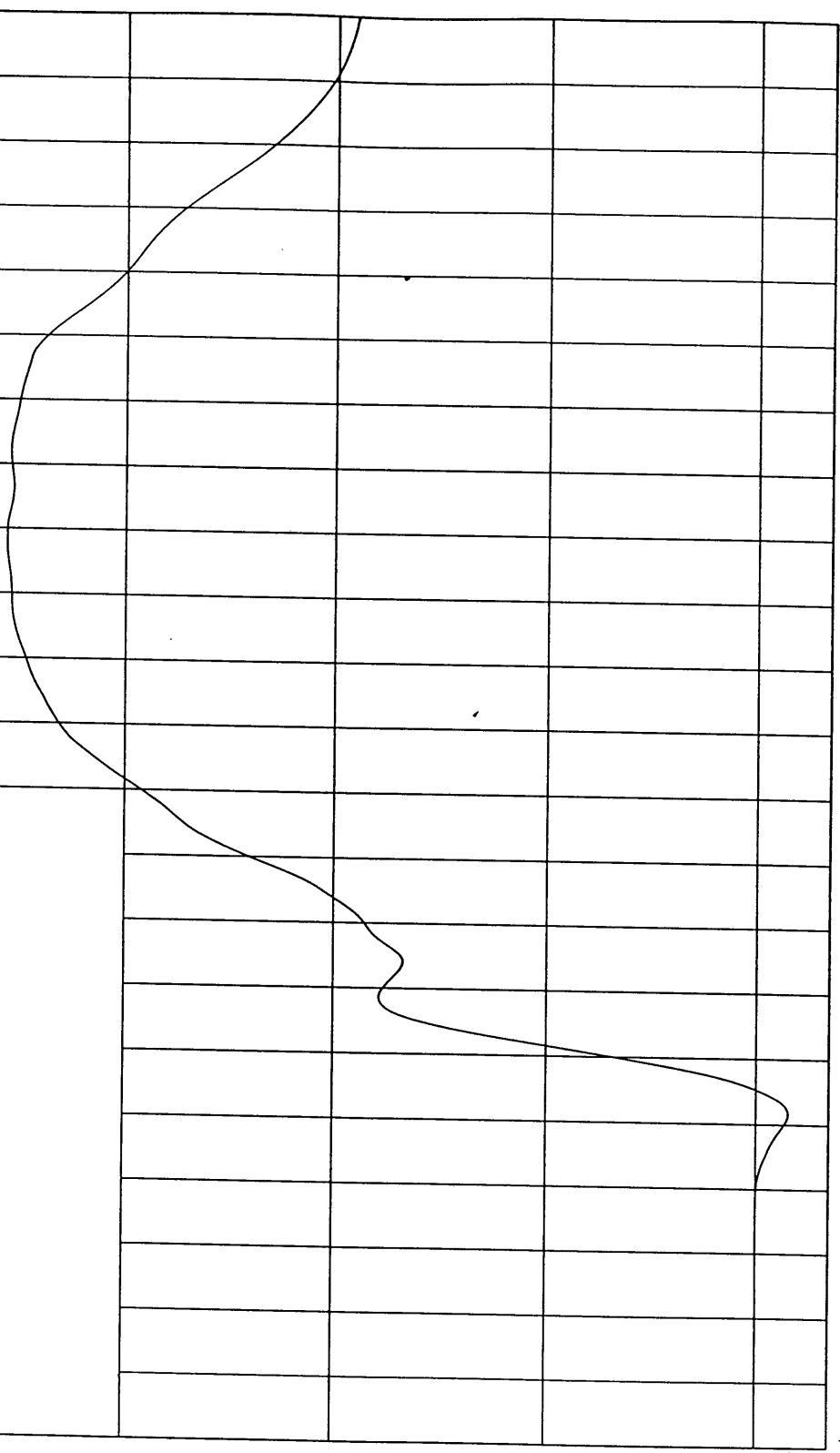
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -1.53 KPH at 32 msec Maximum = 35.64 KPH at 119 msec

DRIVER HEAD Y VELOCITY

1 800056A1.V02 FilterClass (480)



TIME Seconds

MGA Research  
07-25-2000 11:02

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

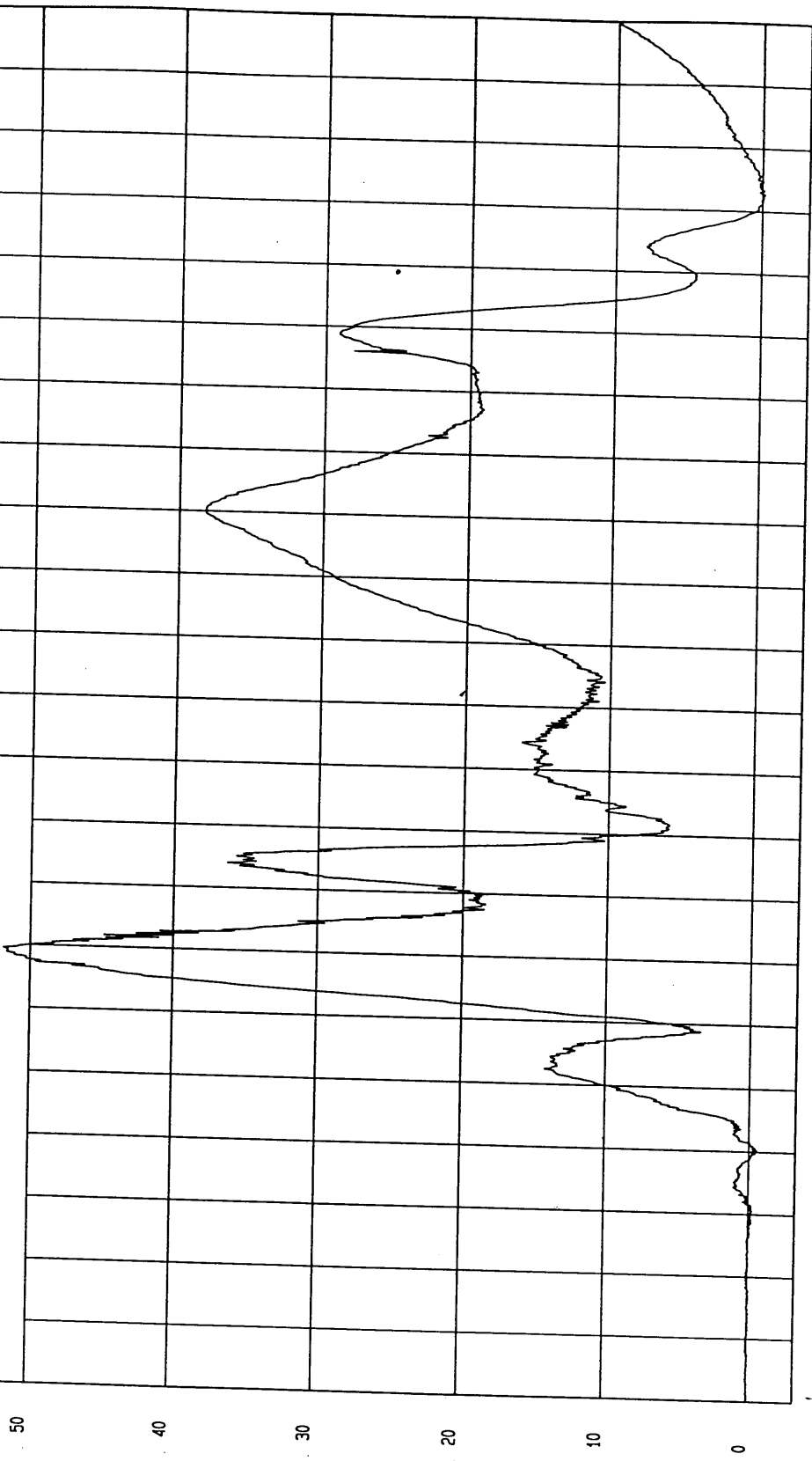
Speed: 38.9 MPH 62.6 KPH

Minimum = -.55 G's at 20 msec

Maximum = 51.91 G's at 50 msec

DRIVER HEAD Z ACCELERATION

1 ——— B00056AT.A03 Filterclass (1000)



Seconds

MGA Research  
07-25-2000 11:03

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

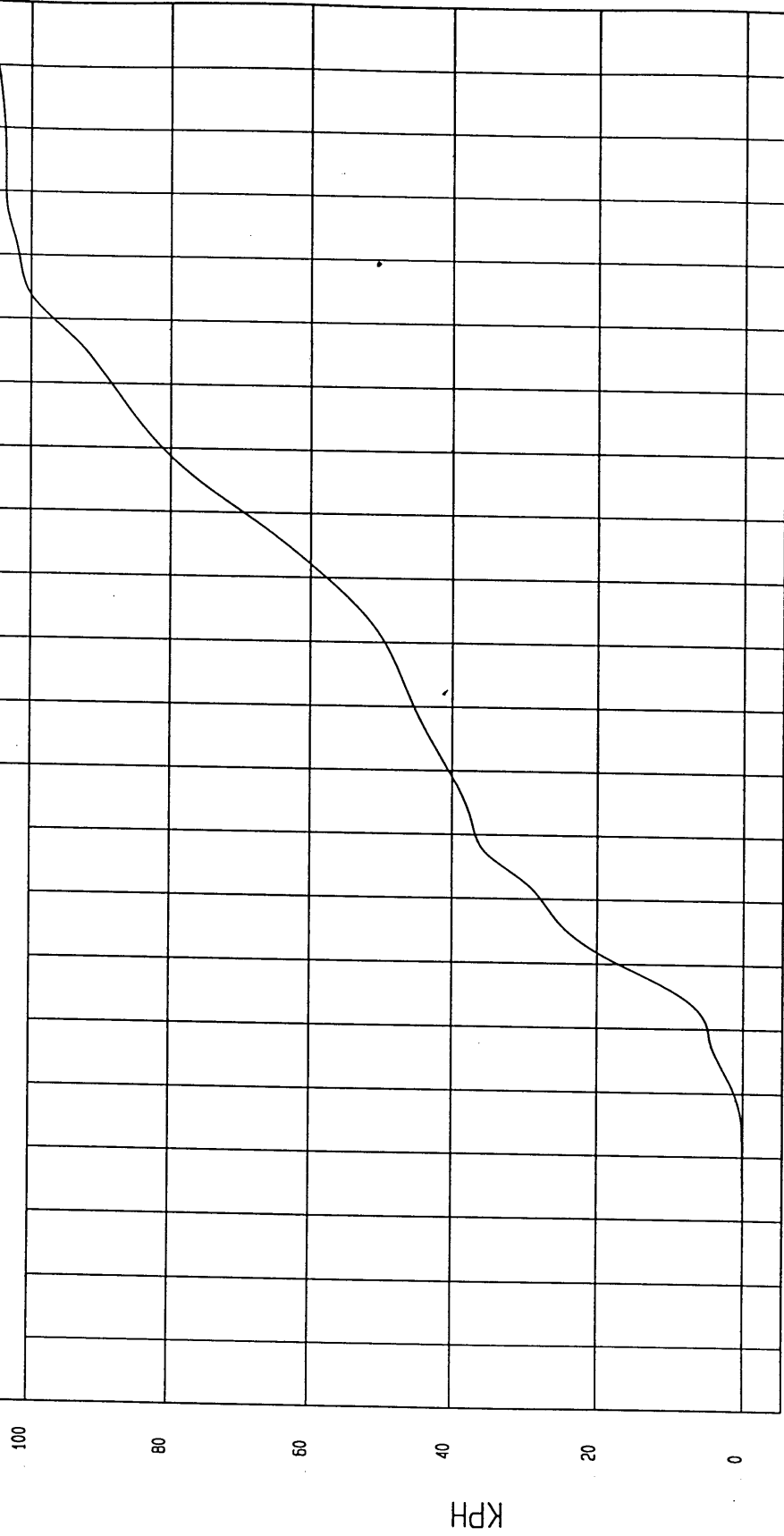
Speed: 38.9 MPH 62.6 KPH

Minimum = -.02 KPH at 12 msec

Maximum = 107.04 KPH at 200 msec

DRIVER HEAD Z VELOCITY

1 ——— 800056AI.V03 Filterclass (180)



MOA Research  
07-25-2000 11:02

TEST DATE: 07-24-2000

Speed: 38.9 MPH 62.6 KPH

TEST: HIGH SPEED LATERAL IMPACT

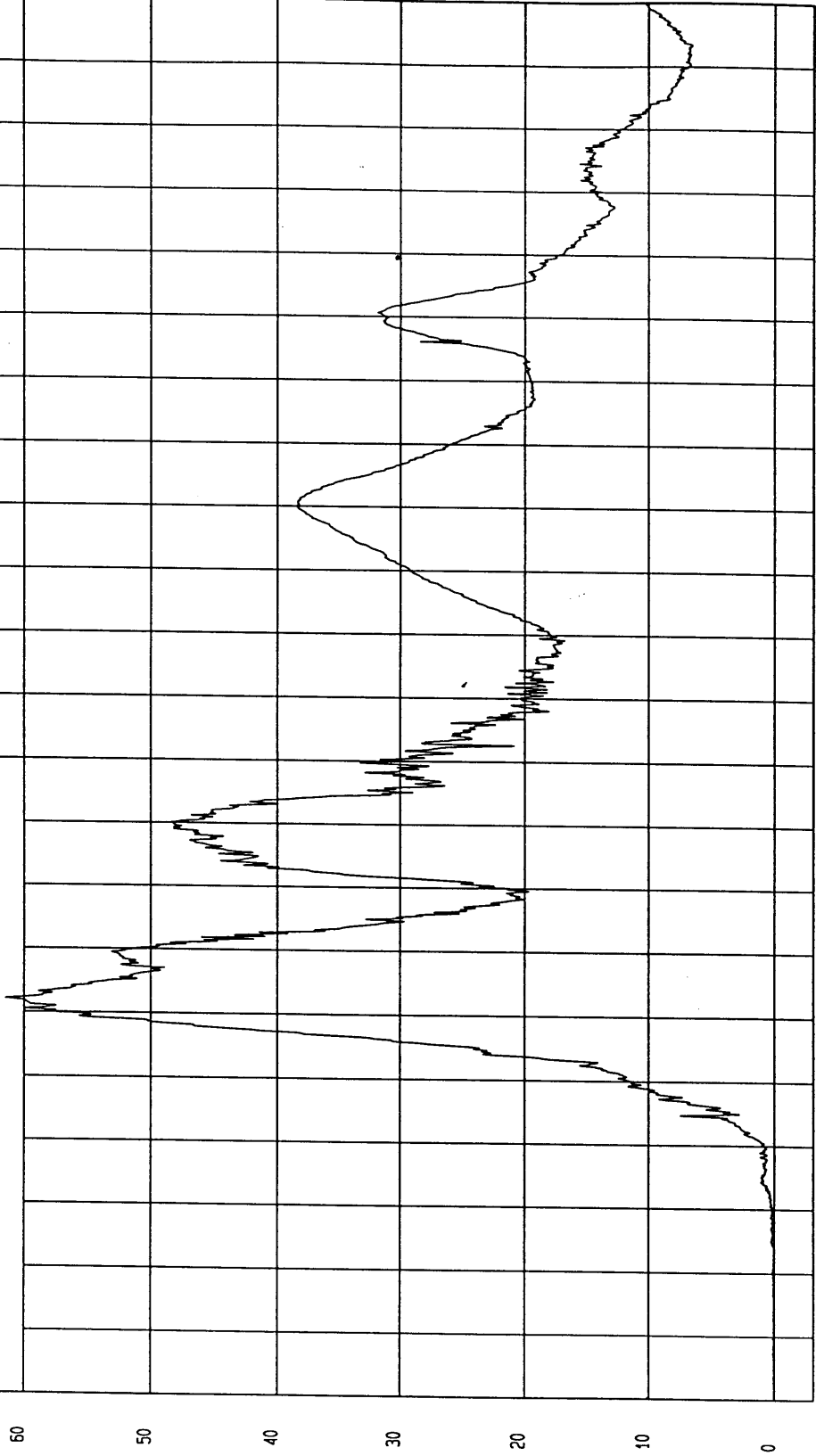
COMPONENT: 2000 SATURN SL2 4 DOOR

Minimum = .01 G's at -5 msec

Maximum = 61.52 G's at 42 msec

DRIVER HEAD RESULTANT

1 ——— B00056AV.A01 Filterclass (1000)



Seconds

NSA Research  
01-25-2000 11:03

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

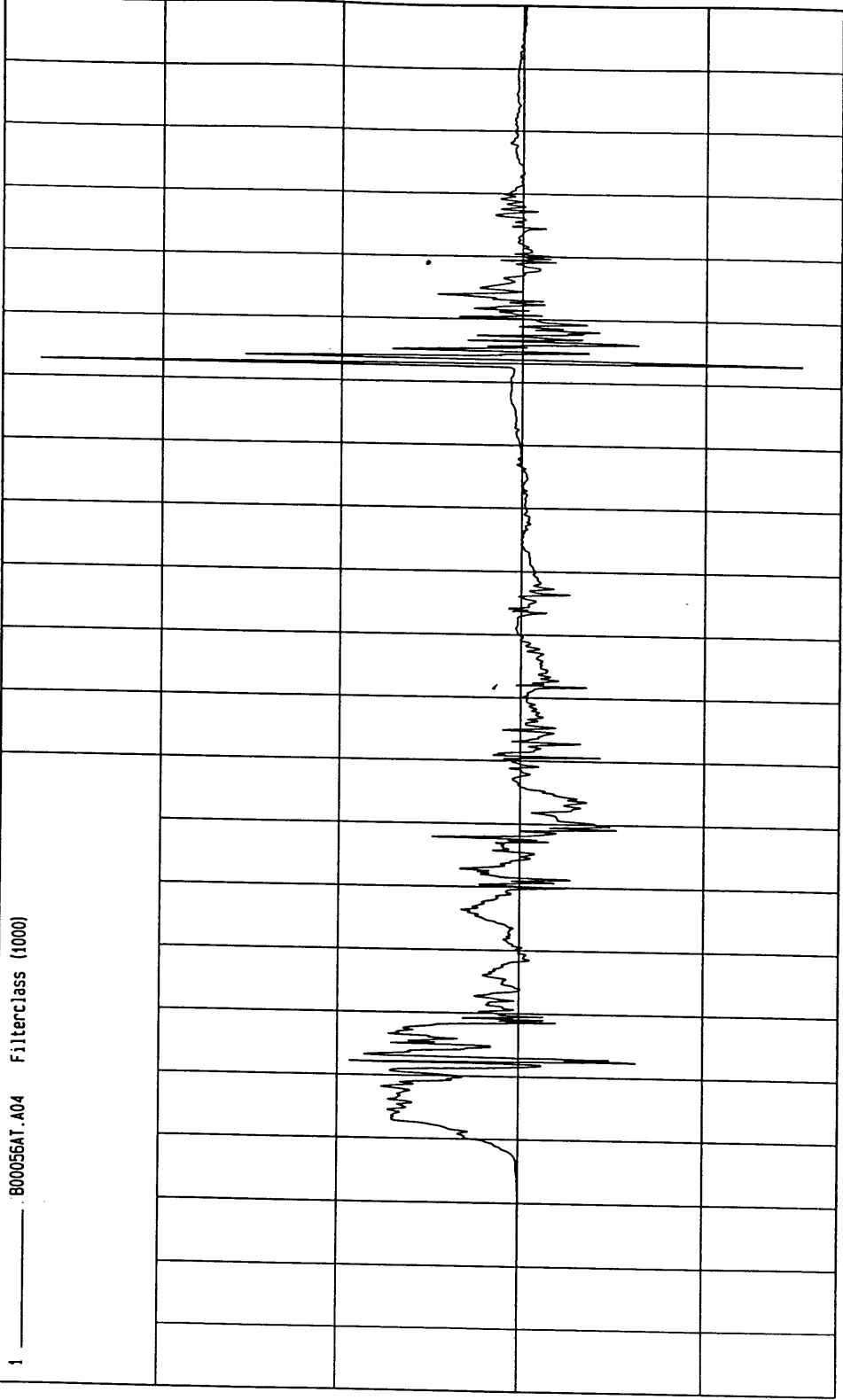
Speed: 38.9 MPH 62.6 KPH

Minimum = -152.17 G's at 143 msec

Maximum = 267.68 G's at 143 msec

DRIVER UPPER RIB Y ACCELERATION

1 \_\_\_\_\_ 800056AT.A04 Filterclass (1000)



200  
100  
0  
-100  
G's

-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  
Seconds

MGA Research  
07-25-2000 11:03

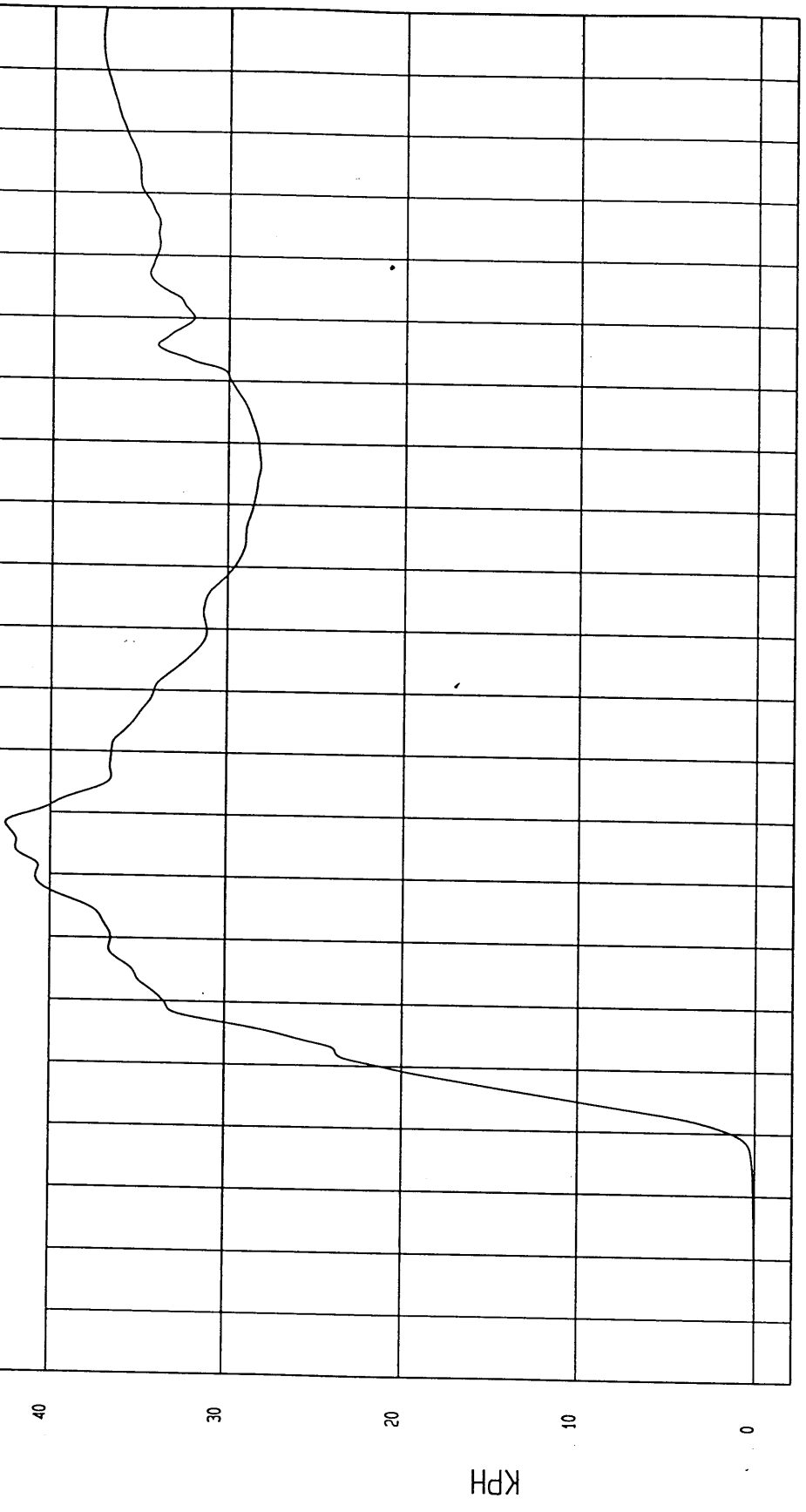
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -1.04E-03 KPH at -15 msec  
Maximum = 42.62 KPH at 68 msec

DRIVER UPPER RIB Y VELOCITY

1 ——— B00056A1.V04 Filterclass (160)



TIME Seconds  
MVA Research  
07-25-2000 11:02

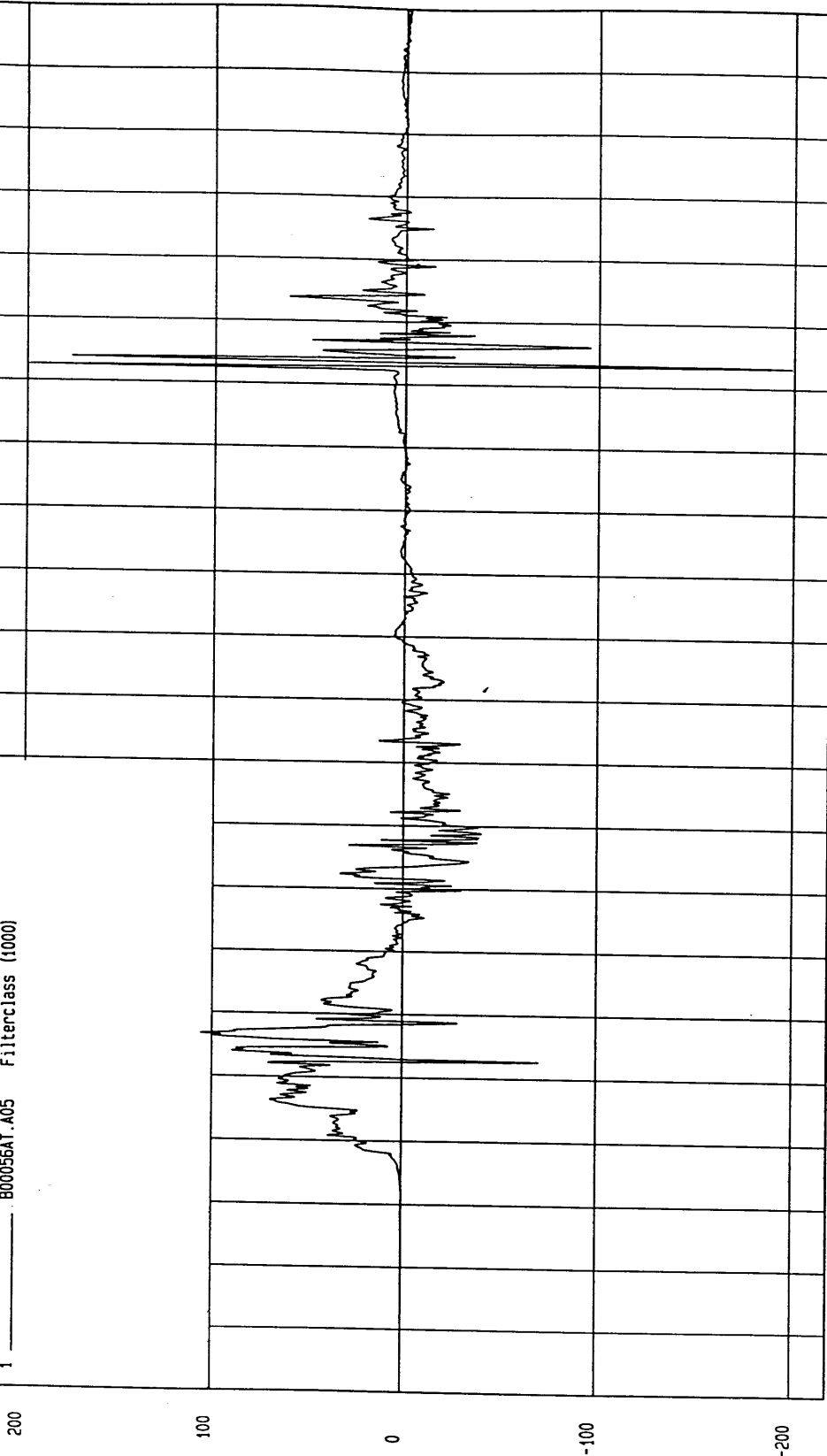
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -198.7 G's at 143 msec  
Maximum = 198.8 G's at 143 msec

DRIVER LOWER RIB Y ACCELERATION

1 B00056AT.A05 Filterclass (1000)



MSA Research  
07-25-2000 11:03

Seconds

G's

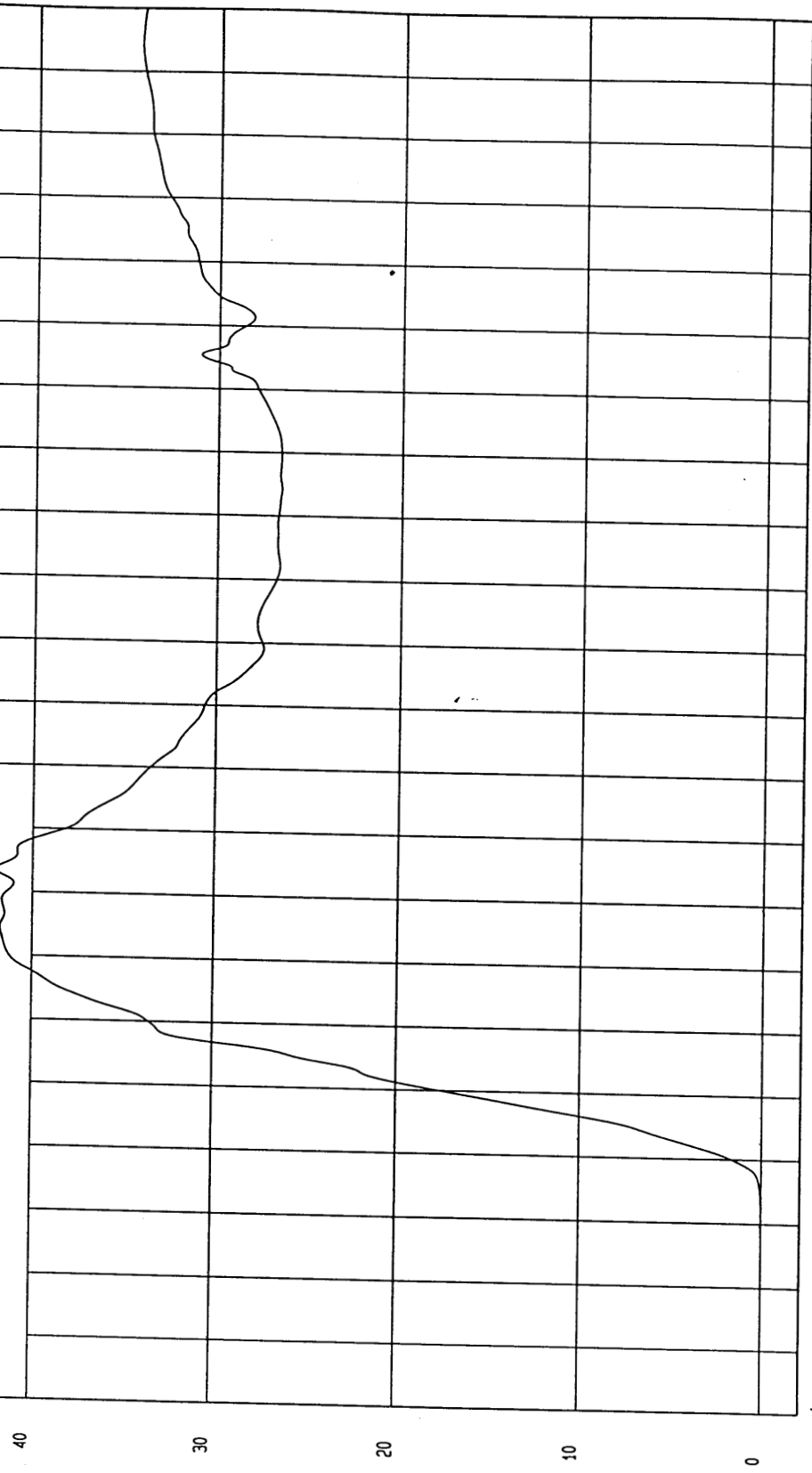
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -1.50E-03 KPH at 6 msec  
Maximum = 42.1 KPH at 64 msec

DRIVER LOWER RIB Y VELOCITY

1 ——— .800056AI.V05 Filterclass (180)



TIME Seconds

NSA Research  
07-25-2000 11:02

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

Speed: 38.9 MPH 62.6 KPH

Minimum = -56.54 G's at 61 msec

Maximum = 106.45 G's at 29 msec

DRIVER LOWER SPINE Y ACCELERATION

1 ——— 800056AF.A06 Filterclass (180)



Seconds

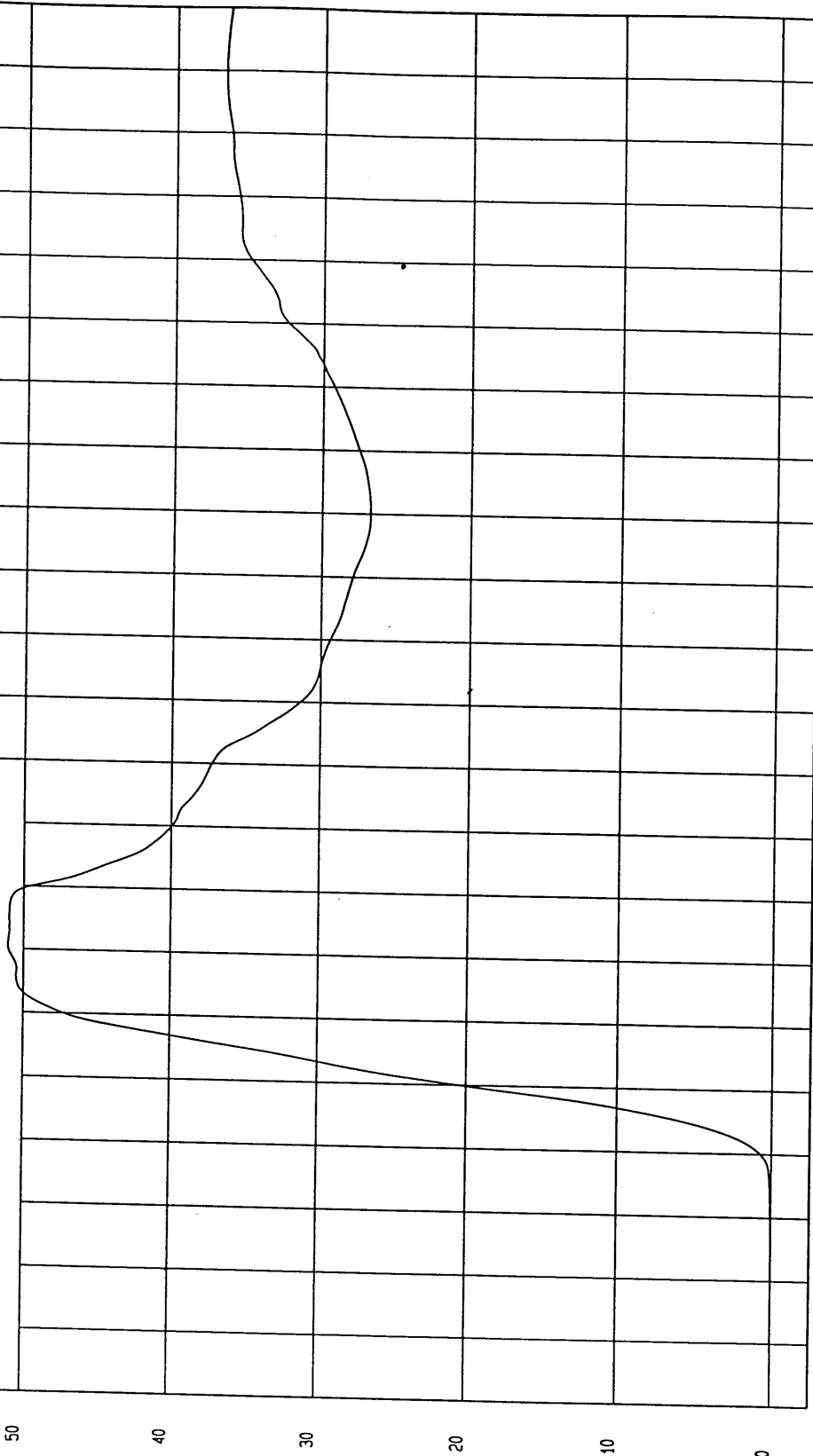
NSI Research  
07-23-2000 11:03

TEST: HIGH SPEED LATERAL IMPACT  
TEST DATE: 07-24-2000  
COMPONENT: 2000 SATURN SL2 4 DOOR  
Speed: 38.9 MPH 62.6 KPH

Minimum = 0 KPH at -20 msec  
Maximum = 51.09 KPH at 51 msec

DRIVER LOWER SPINE Y VELOCITY

1 800056A1.V06 Filterclass (180)



TIME Seconds  
MGA Research  
07-25-2000 11:02

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

Speed: 38.9 MPH 62.6 KPH

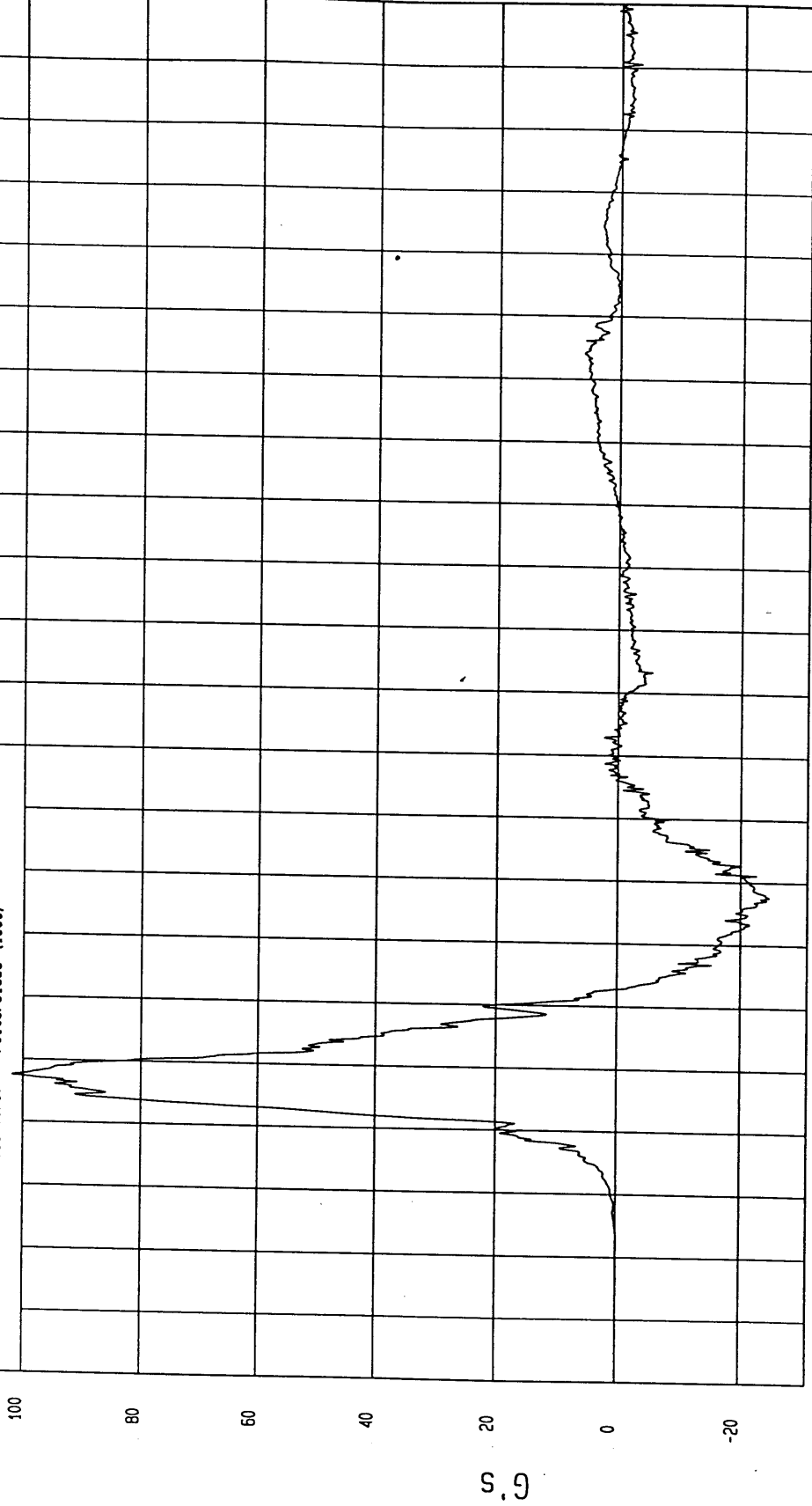
COMPONENT: 2000 SATURN SL2 4 DOOR

Minimum = -24.67 G's at 58 msec

Maximum = 101.89 G's at 28 msec

DRIVER PELVIS Y ACCELERATION

1 B00056A1.A07 Filterclass (1000)



Seconds

NSA Research  
07-25-2000 11:03

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

Speed: 38.9 MPH 62.6 KPH

Minimum = -1.93E-02 KPH at 4 msec

Maximum = 42.51 KPH at 43 msec

DRIVER PELVIS Y VELOCITY

1 ——— 800056AI.V07 Filterclass (180)



TIME Seconds

MSA Research  
07-25-2000 11:02

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

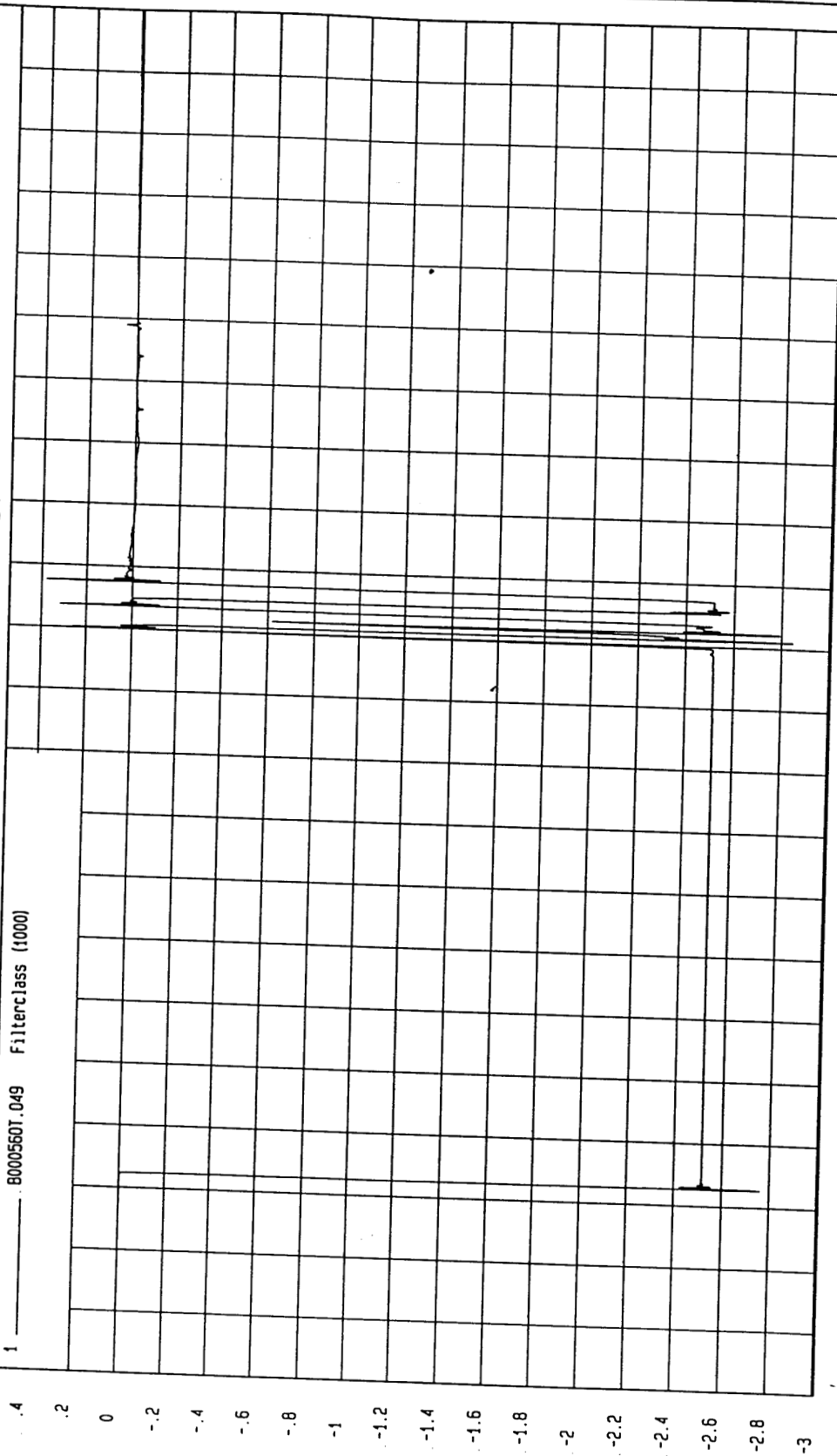
Speed: 38.9 MPH 62.6 KPH

Minimum = -2.85 Volts at 101 msec

Maximum = .38 Volts at 108 msec

DRIVER SHOULDER CONTACT

1 8000560T.049 FilterClass (1000)



Seconds

MGA Research  
07-25-2000 11:04

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

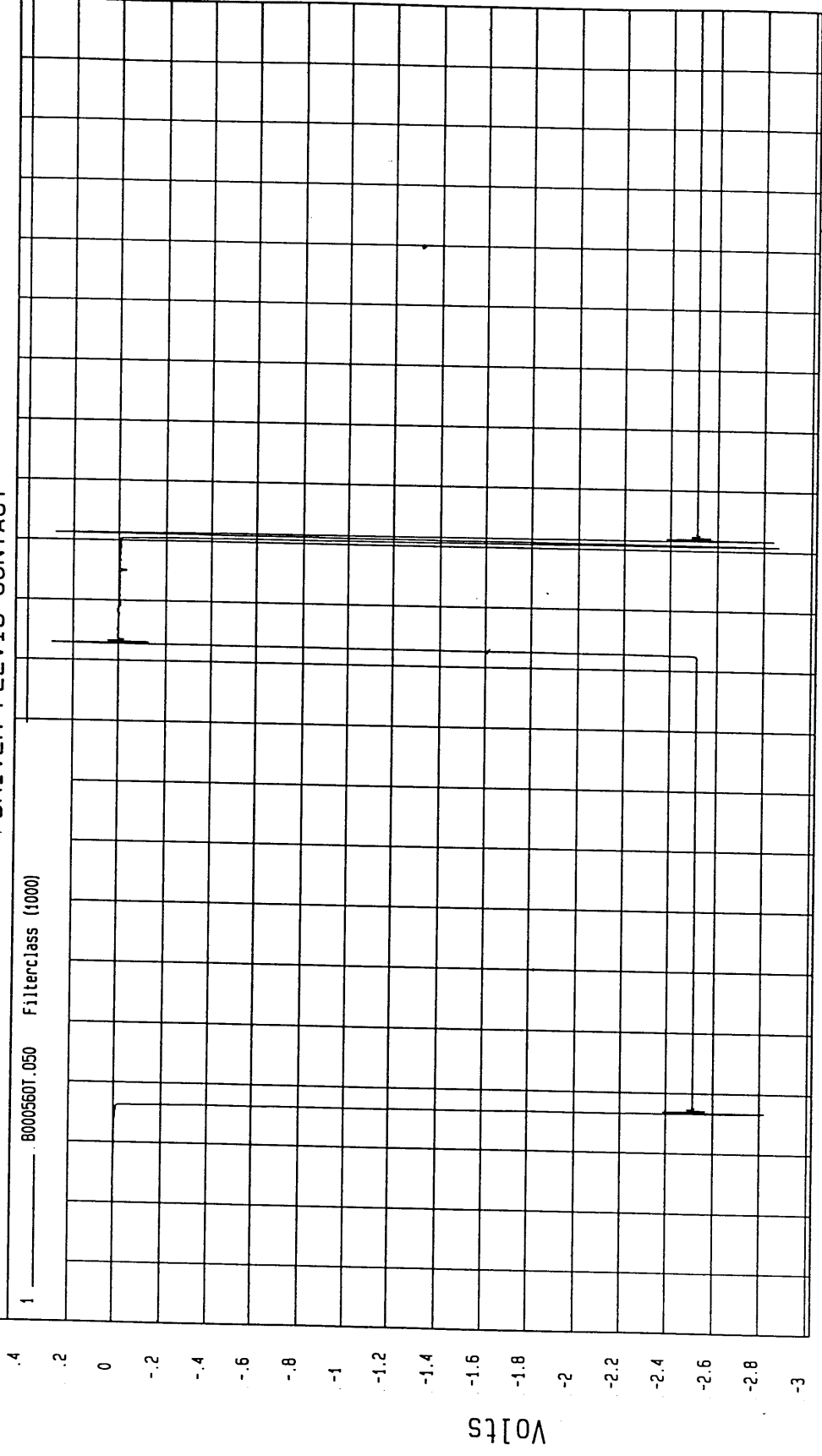
Speed: 38.9 MPH 62.6 KPH

Minimum = -2.86 Volts at 111 msec

Maximum = .3 Volts at 93 msec

DRIVER PELVIS CONTACT

1 8000560T.050 Filterclass (1000)



MCA Research  
07-25-2000 11:04

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

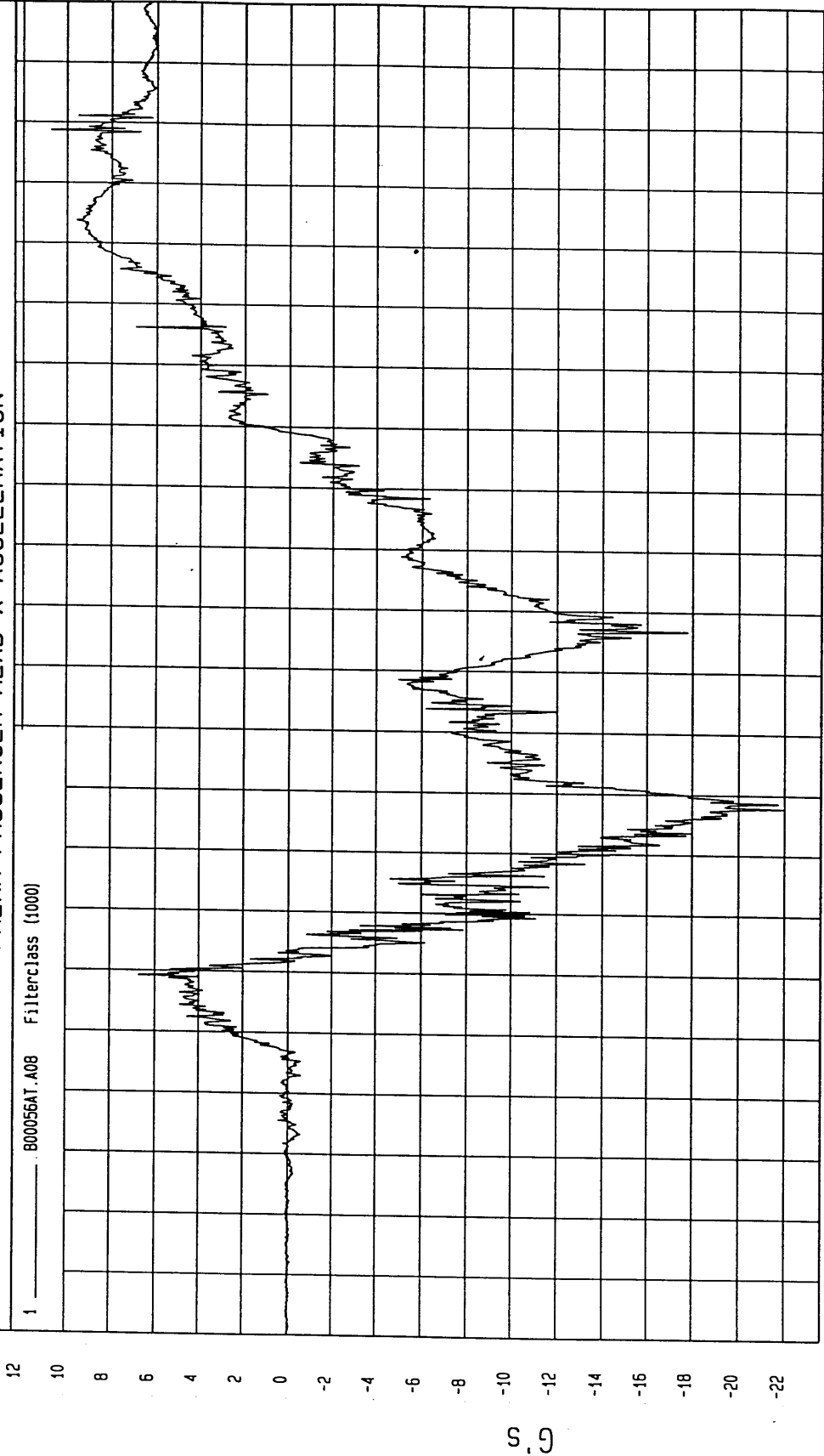
Speed: 38.9 MPH 62.6 KPH

COMPONENT: 2000 SATURN SL2 4 DOOR

Maximum = 10.74 G's at 179 msec

Minimum = -21.94 G's at 68 msec

REAR PASSENGER HEAD X ACCELERATION



NSA Research  
07-25-2000 11:04

Seconds

G's

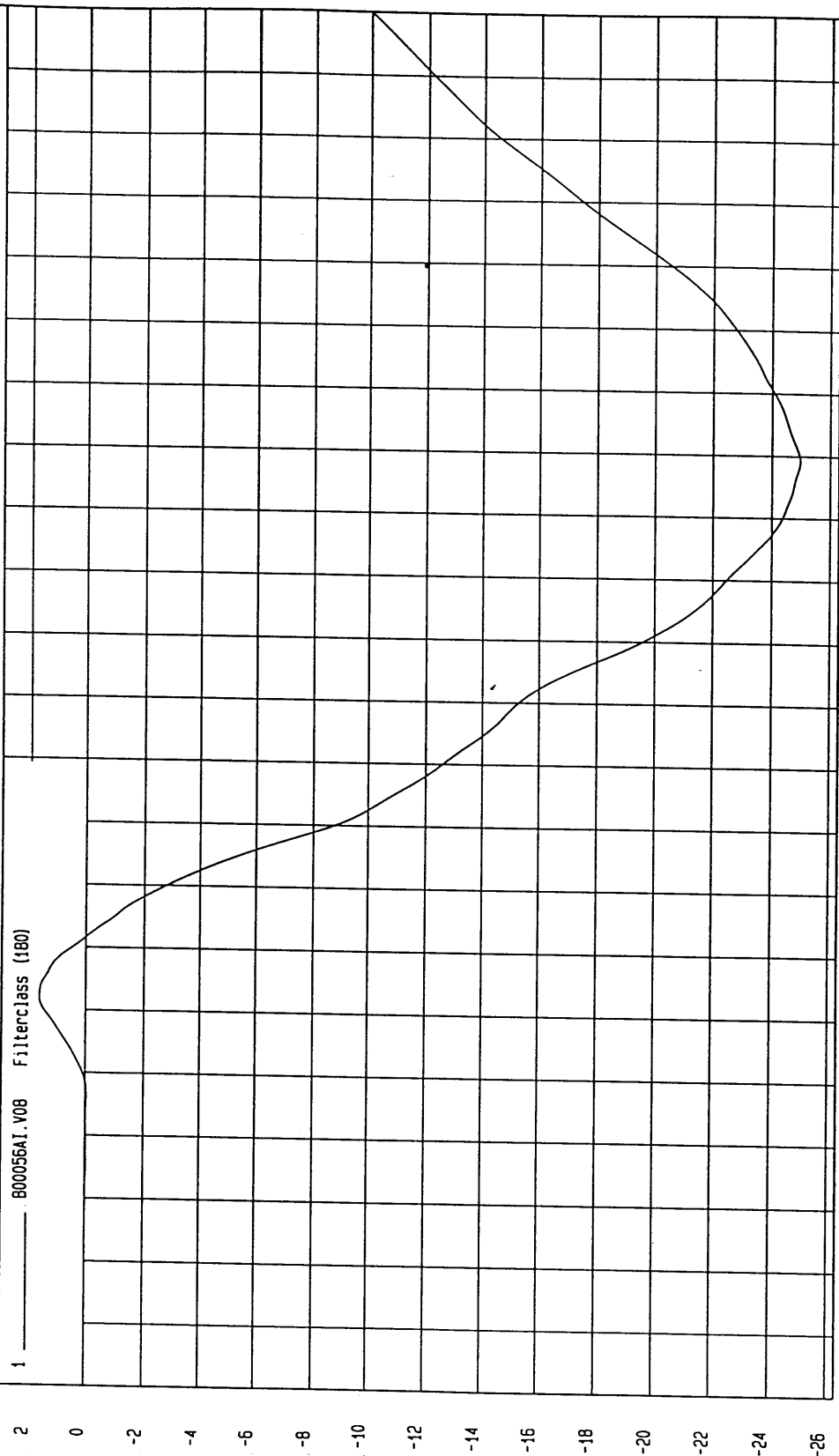
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -24.97 KPH at 129 msec  
Maximum = 1.68 KPH at 42 msec

REAR PASSENGER HEAD X VELOCITY

1 800056A1.V08 Filterclass (180)



TIME Seconds

MGA Research  
07-25-2000 11:02

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

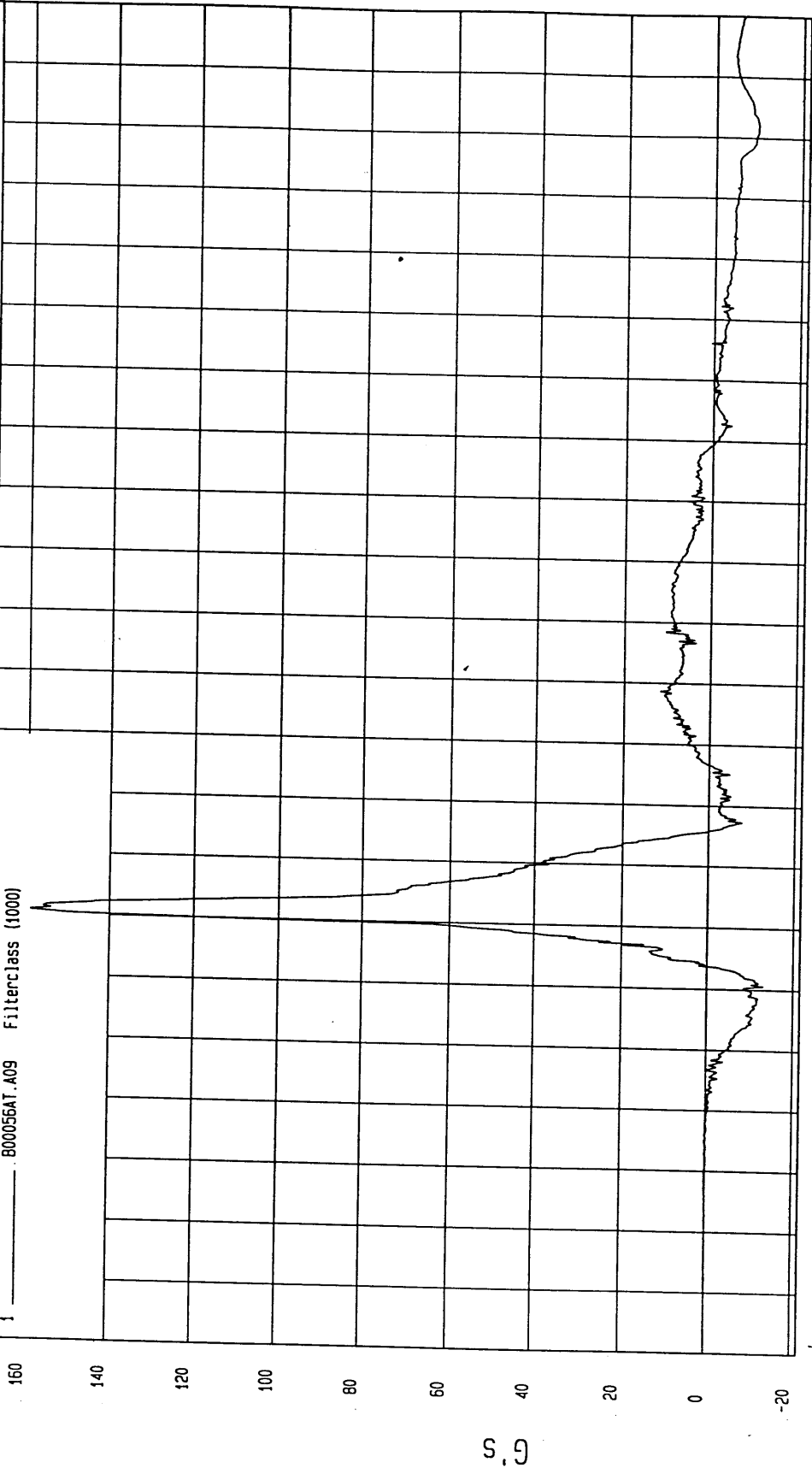
Speed: 38.9 MPH 62.6 KPH

Minimum = -12.97 G's at 41 msec

Maximum = 159.33 G's at 51 msec

REAR PASSENGER HEAD Y ACCELERATION

1 . . . . . 800056AT.A09 Filterclass (1000)



Seconds

MSA Research  
07-25-2000 11:04

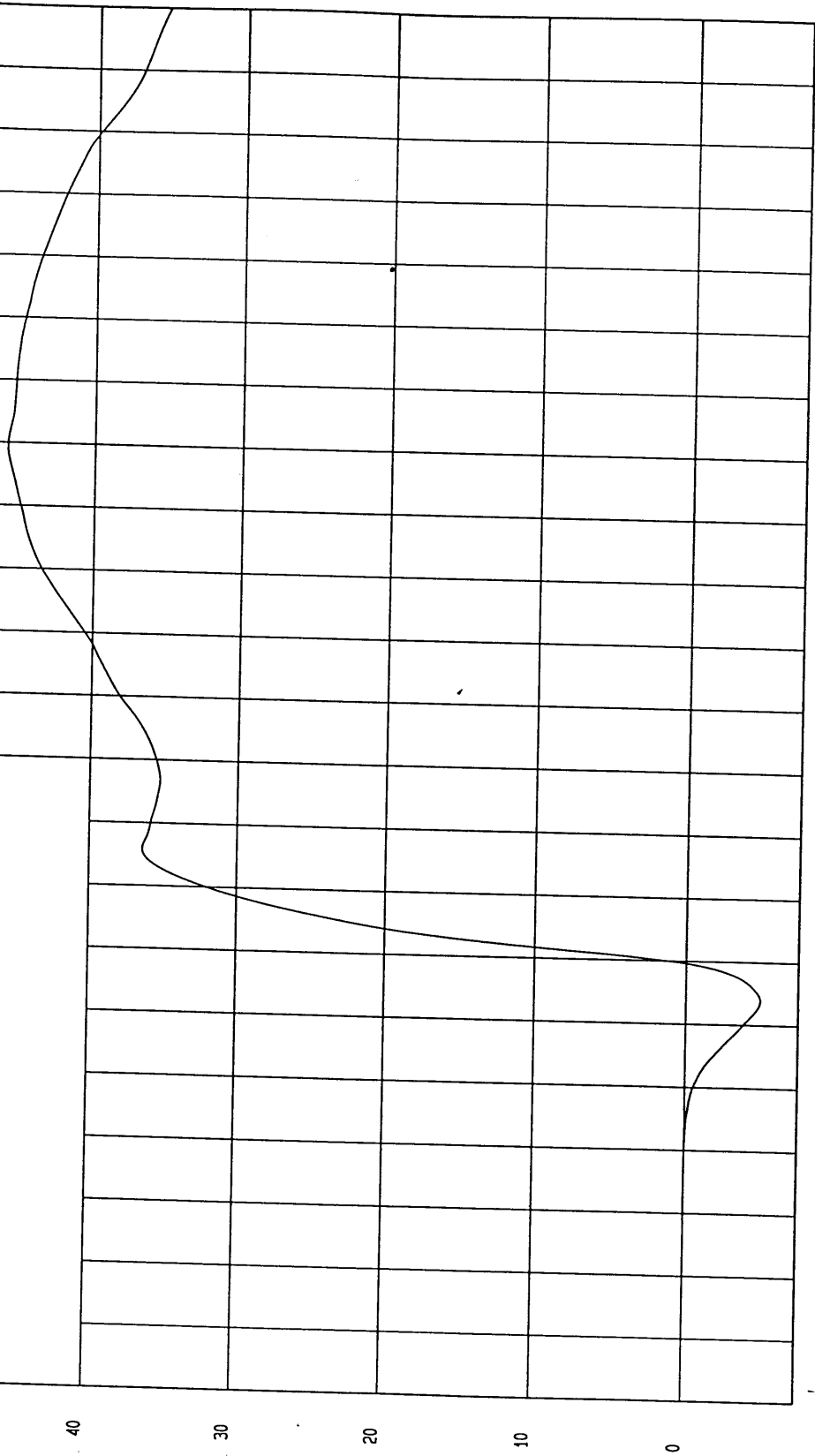
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -4.69 KPH at 44 msec  
Maximum = 45.94 KPH at 129 msec

REAR PASSENGER HEAD Y VELOCITY

1 \_\_\_\_\_ 800056A1.V09 Filterclass (180)



MECA Research  
07-25-2000 11:02

TIME Seconds

KPH

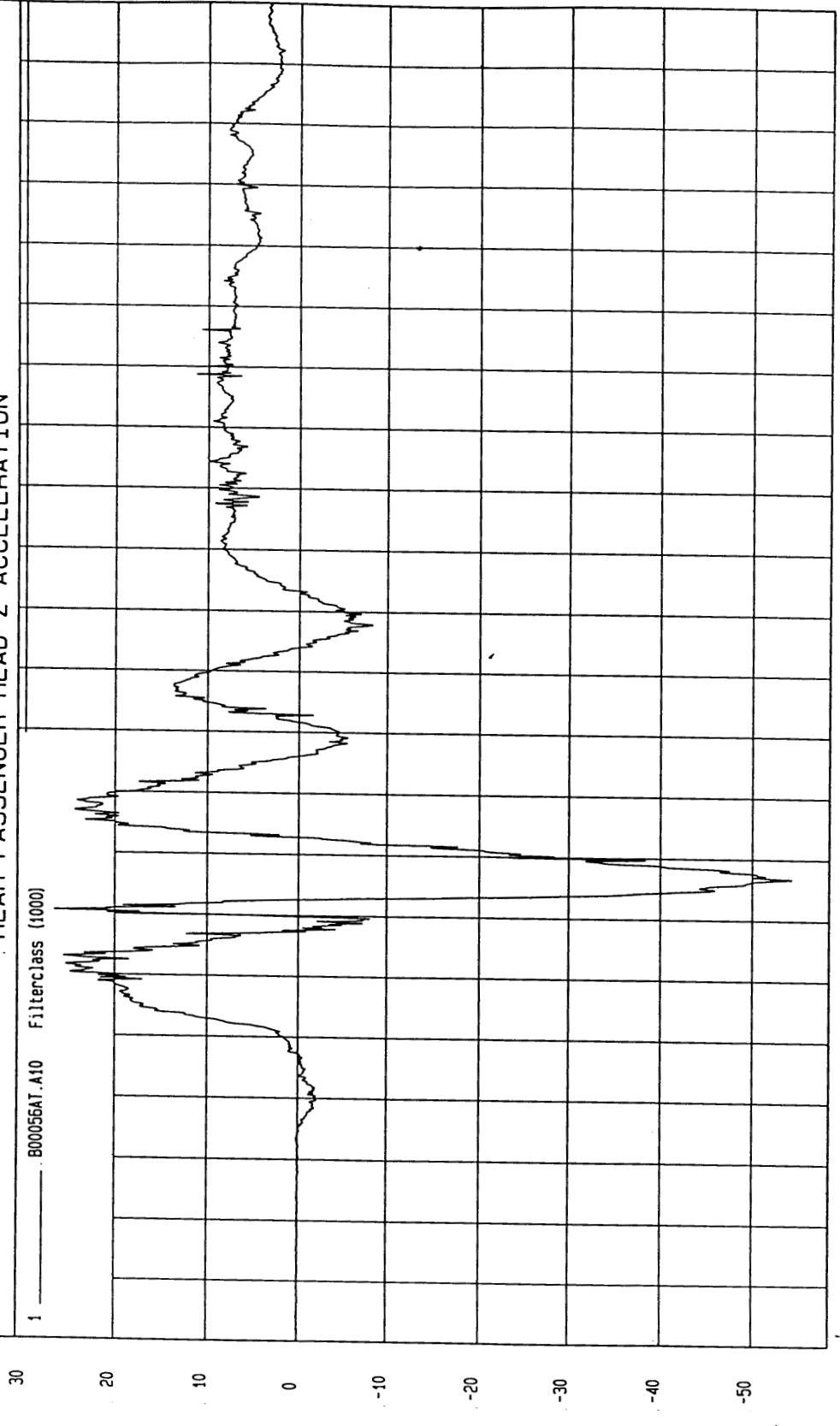
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -54.33 G's at 57 msec Maximum = 26.8 G's at 51 msec

REAR PASSENGER HEAD Z ACCELERATION

1 B00056AT.A10 Filterclass (1000)



MGA Research  
07-25-2000 11:04

Seconds

G's

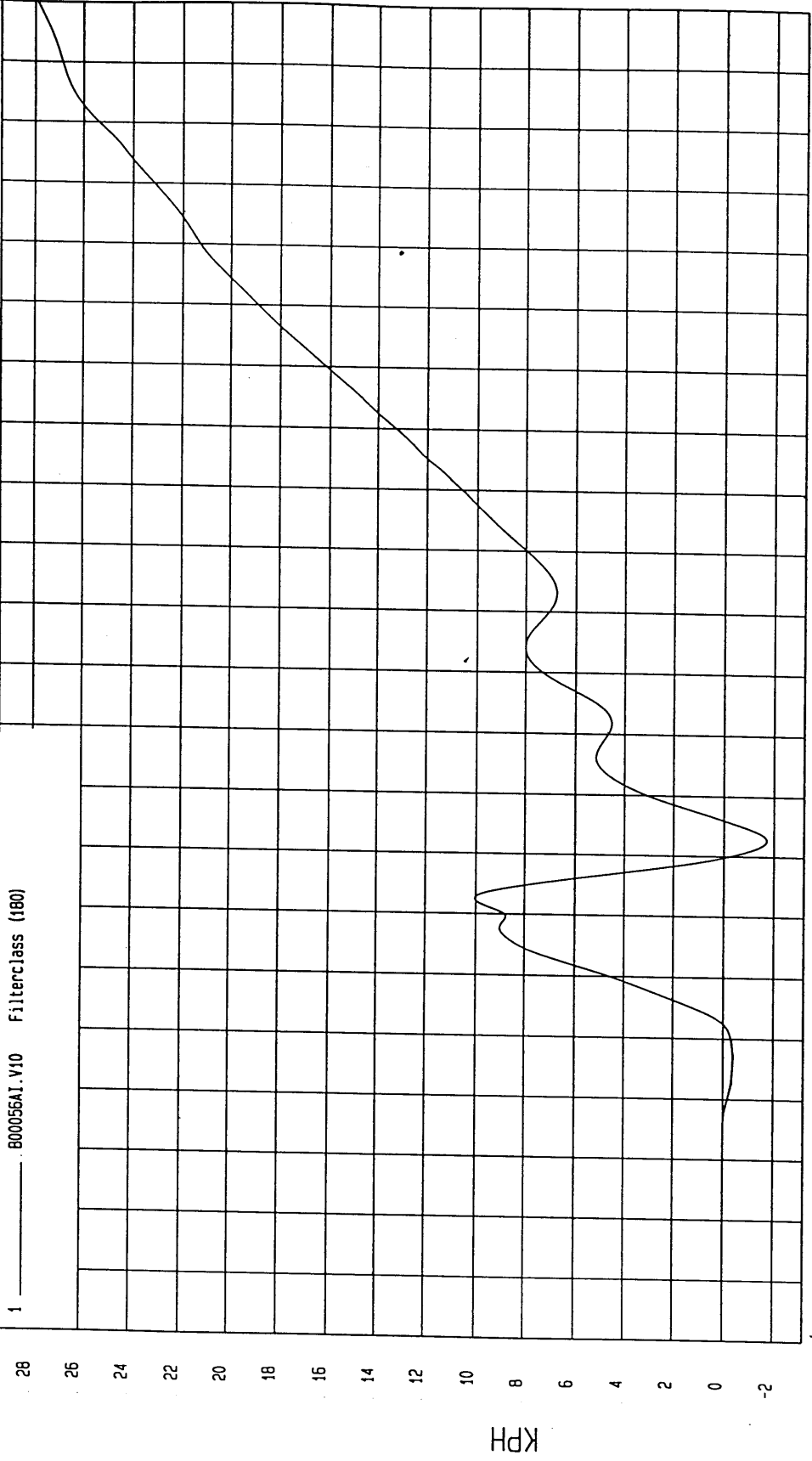
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -1.71 KPH at 63 msec Maximum = 27.88 KPH at 200 msec

REAR PASSENGER HEAD Z VELOCITY

1 800056A1.V10 Filterclass (180)



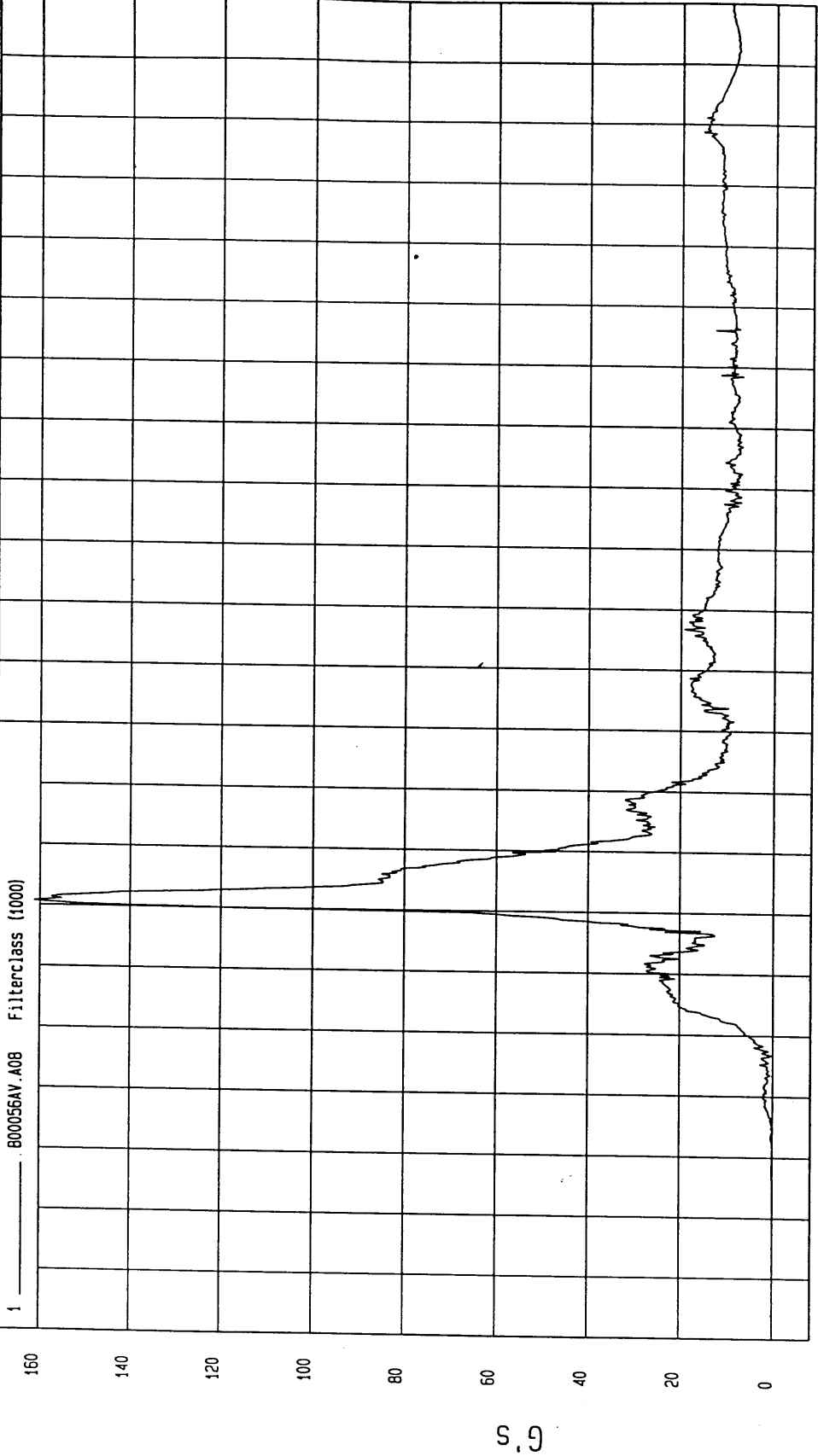
KPH TIME Seconds

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = 1.33E-02 G's at -17 msec  
Maximum = 161.21 G's at 51 msec

REAR PASSENGER HEAD RESULTANT



MGA Research  
07-25-2000 11:04

Seconds

G's

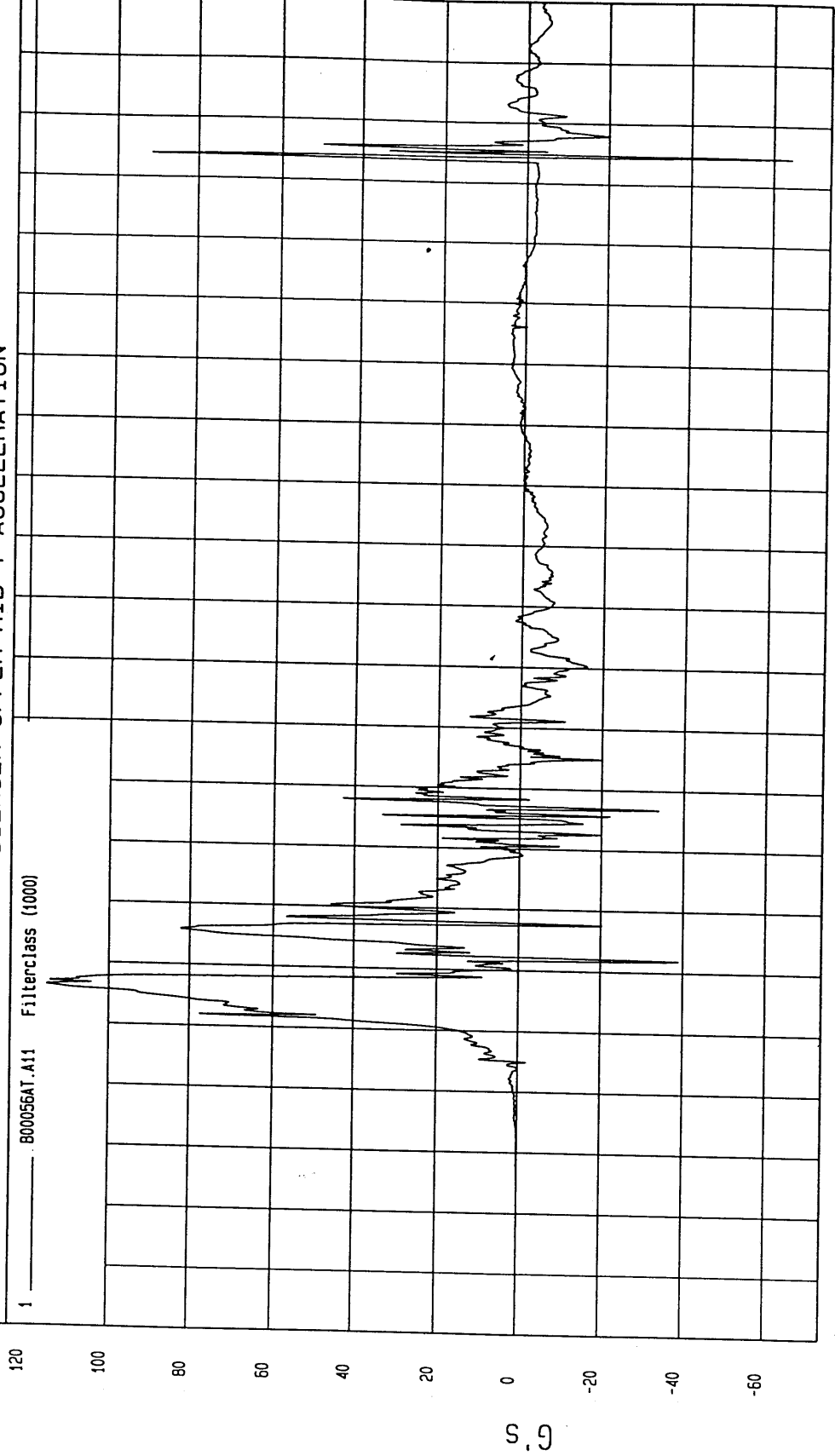
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -64.19 G's at 175 msec  
Maximum = 114.98 G's at 36 msec

REAR PASSENGER UPPER RIB Y ACCELERATION

1 800056AT.A11 Filterclass (1000)



Seconds  
MGA Research  
07-25-2000 11:04

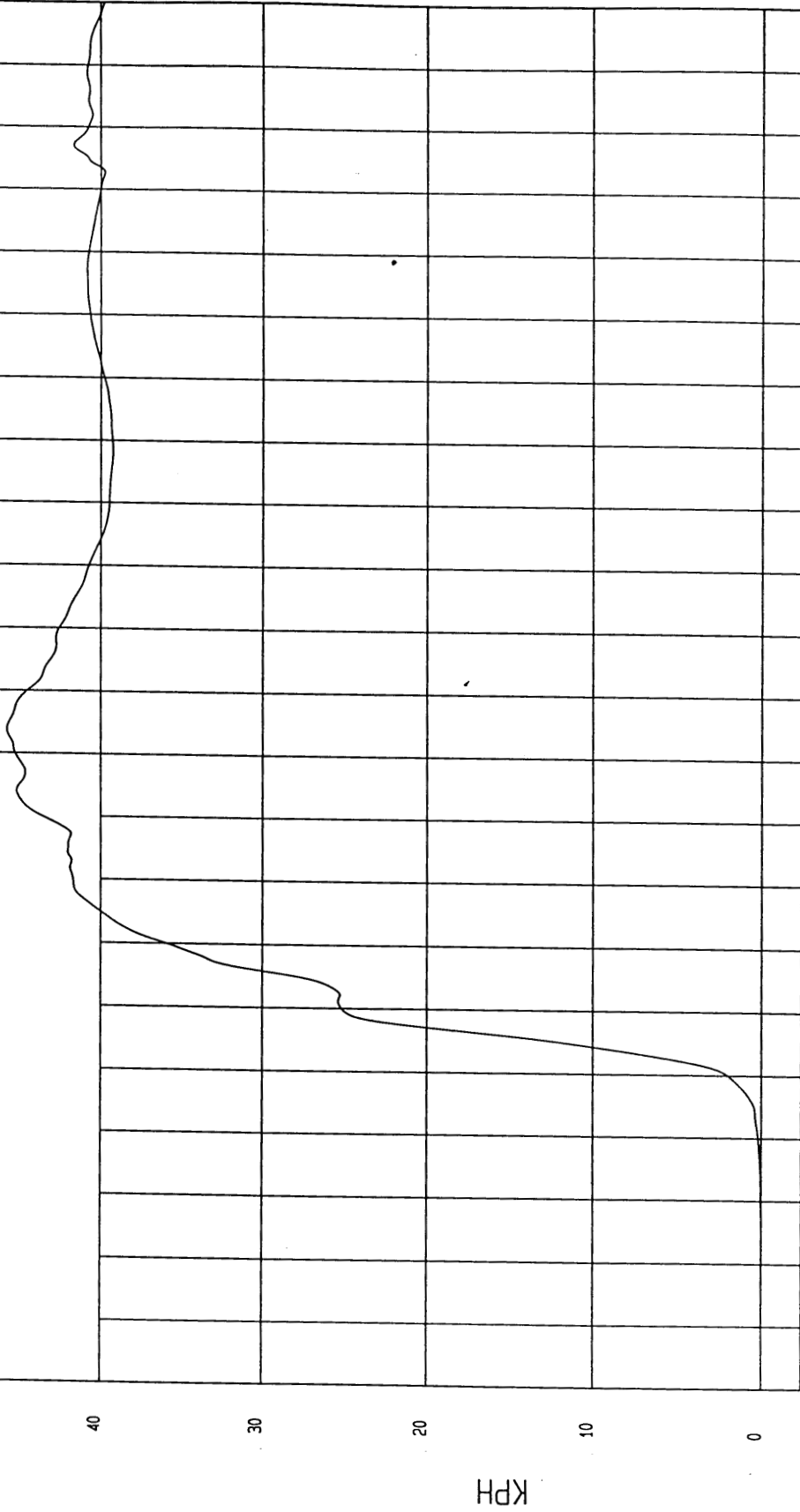
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -7.60E-04 KPH at -9 msec Maximum = 45.74 KPH at 84 msec

REAR PASSENGER UPPER RIB Y VELOCITY

1 800056A1.V11 Filterclass (180)



MVA Research  
07-25-2000 11:02

TIME Seconds

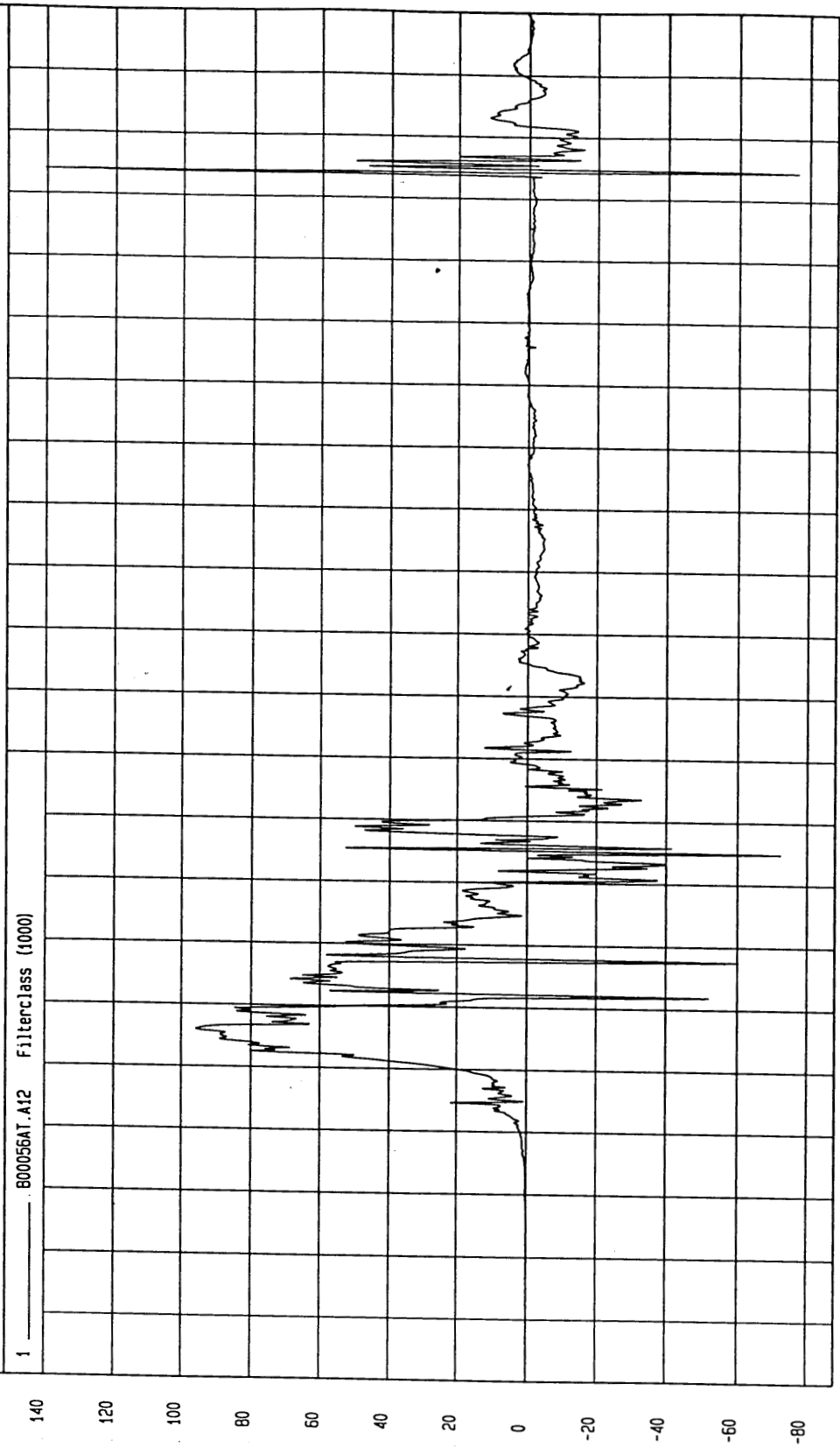
KPH

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -76.8 G's at 174 msec Maximum = 140.48 G's at 174 msec

REAR PASSENGER LOWER RIB Y ACCELERATION



Seconds  
MSA Research  
07-25-2000 11:04

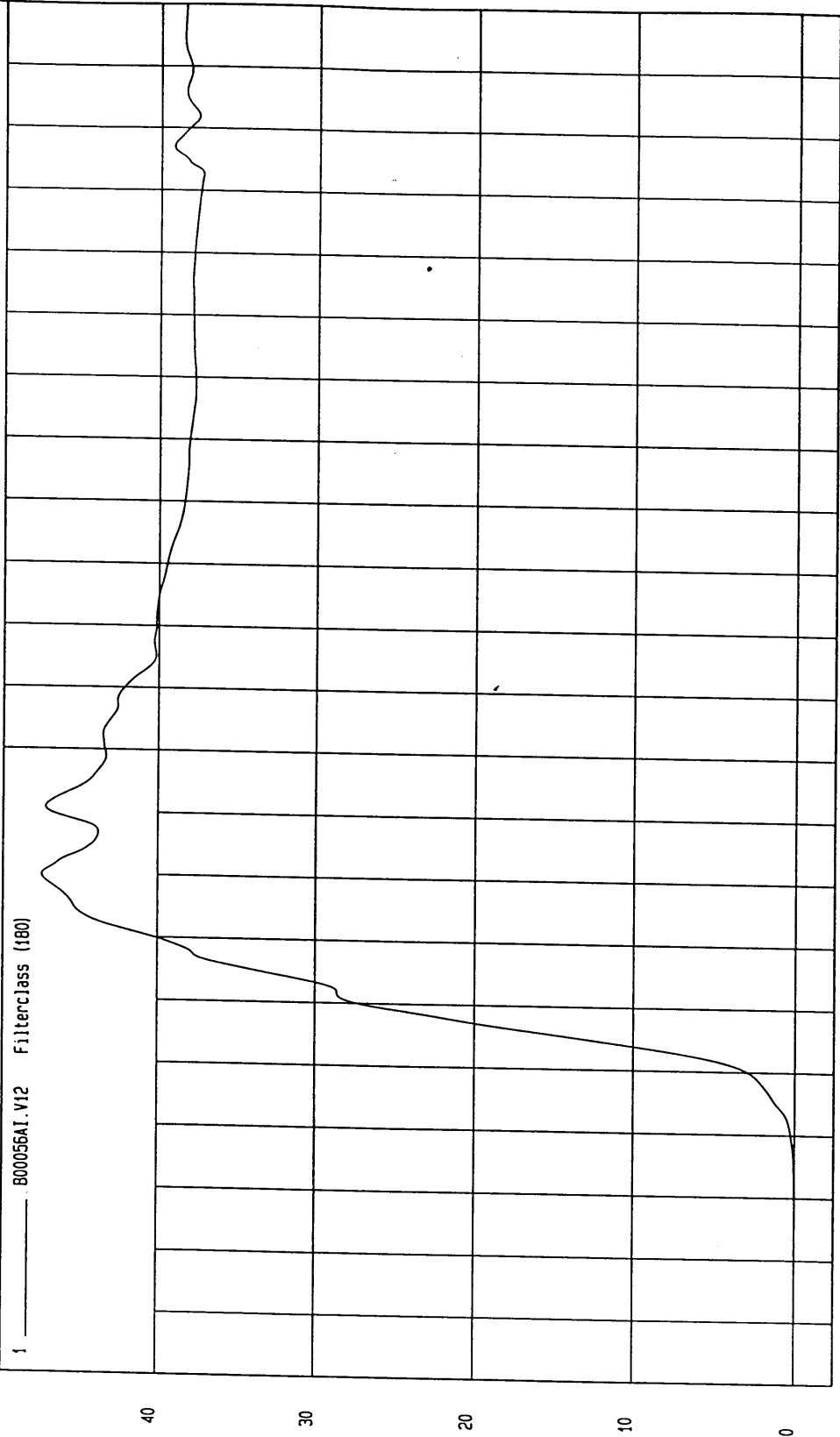
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -1.78E-03 KPH at -14 msec  
Maximum = 47.28 KPH at 60 msec

REAR PASSENGER LOWER RIB Y VELOCITY

1 ——— 800056A1.V12 FilterClass (180)



TIME Seconds  
MSA Research  
07-25-2000 11:03

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

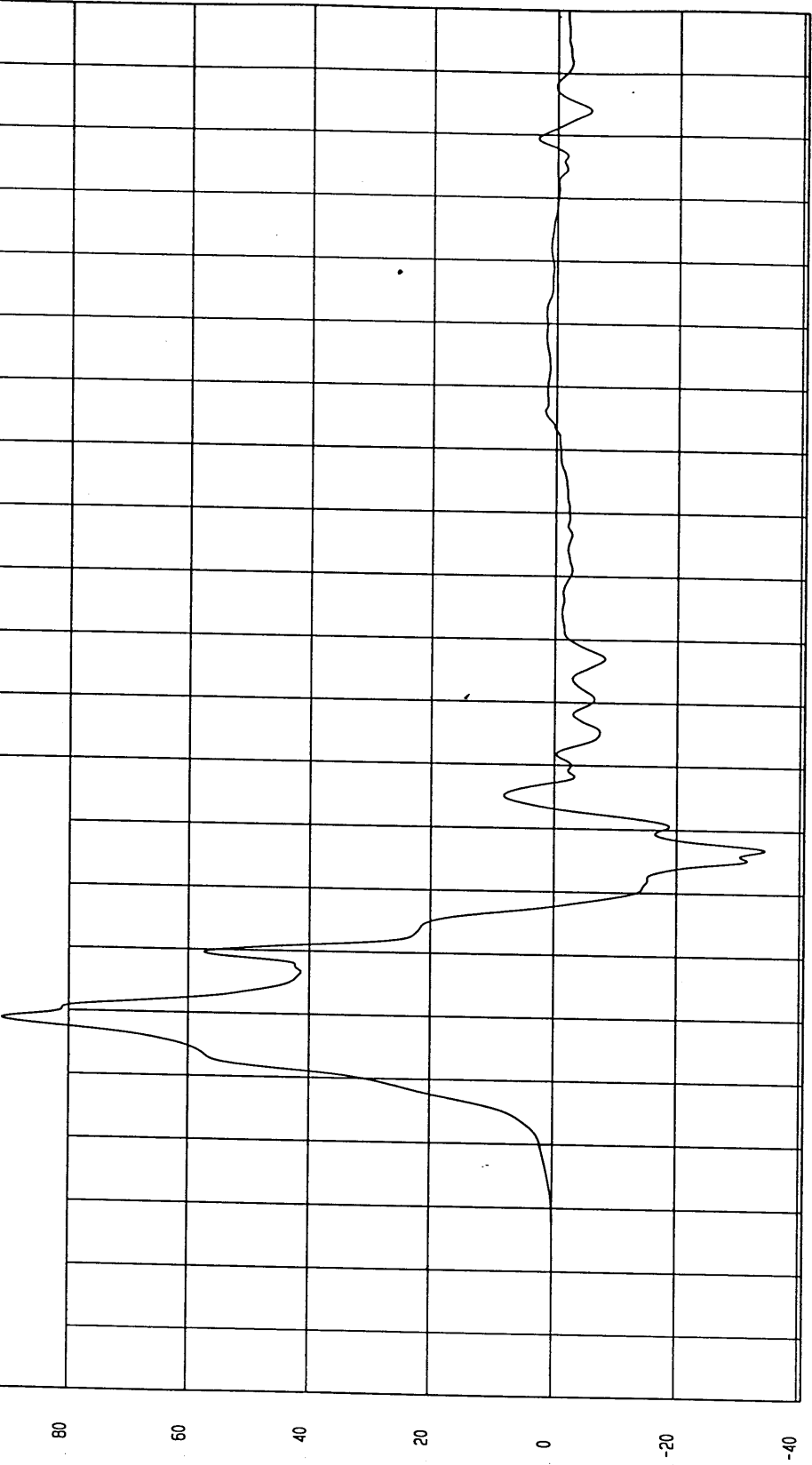
Speed: 38.9 MPH 62.6 KPH

Minimum = -34.42 G's at 67 msec

Maximum = 91.18 G's at 39 msec

REAR PASSENGER LOWER SPINE Y ACCELERATION

1 800056AF.A13 Filterclass (180)



Seconds

MGA Research  
07-25-2000 11:04

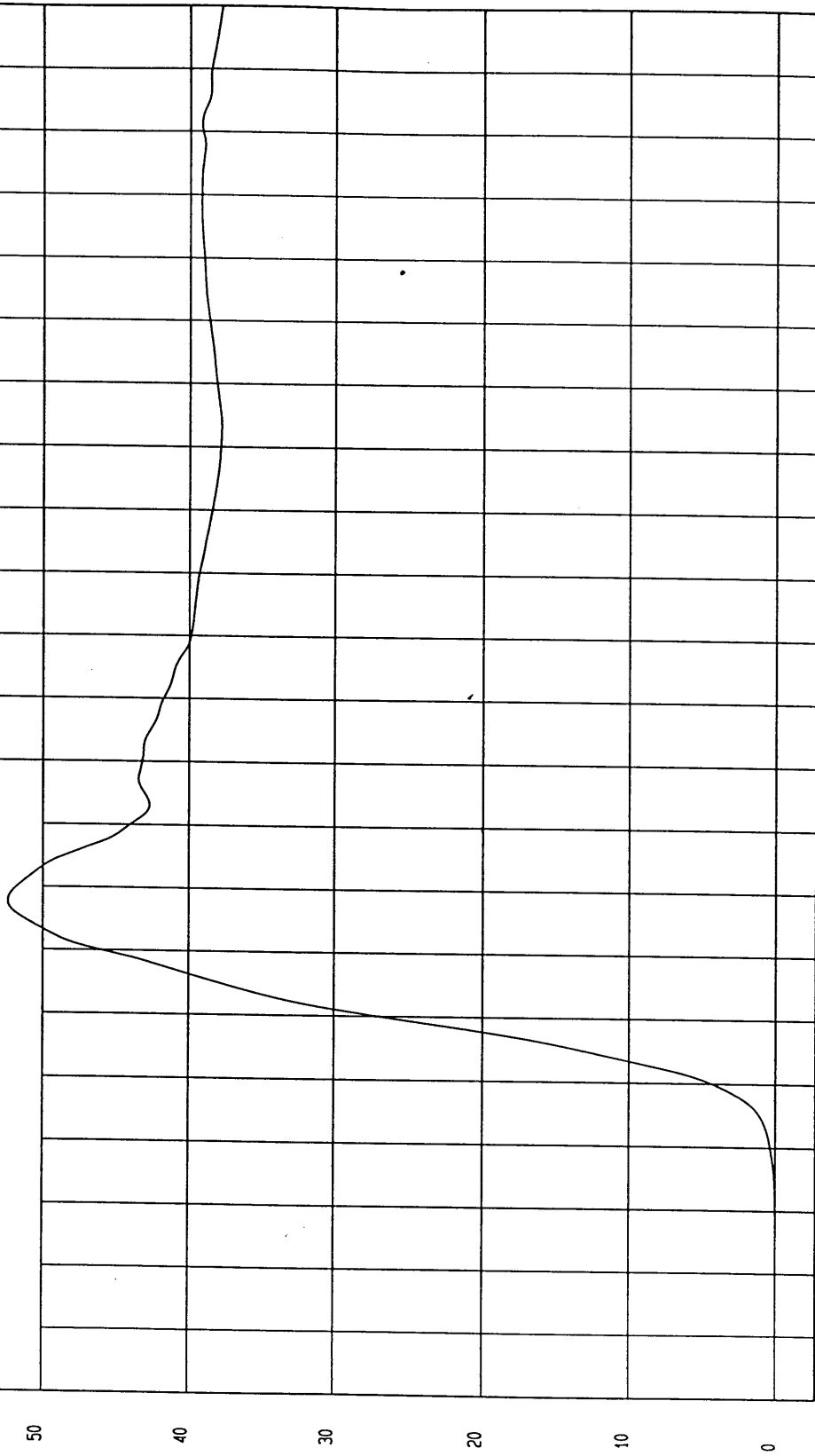
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -3.46E-04 KPH at -18 msec Maximum = 52.36 KPH at 58 msec

REAR PASSENGER LOWER SPINE Y VELOCITY

1 ——— 800056A1.V13 Filterclass (180)



TIME Seconds

MGA Research  
07-25-2000 11:03

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

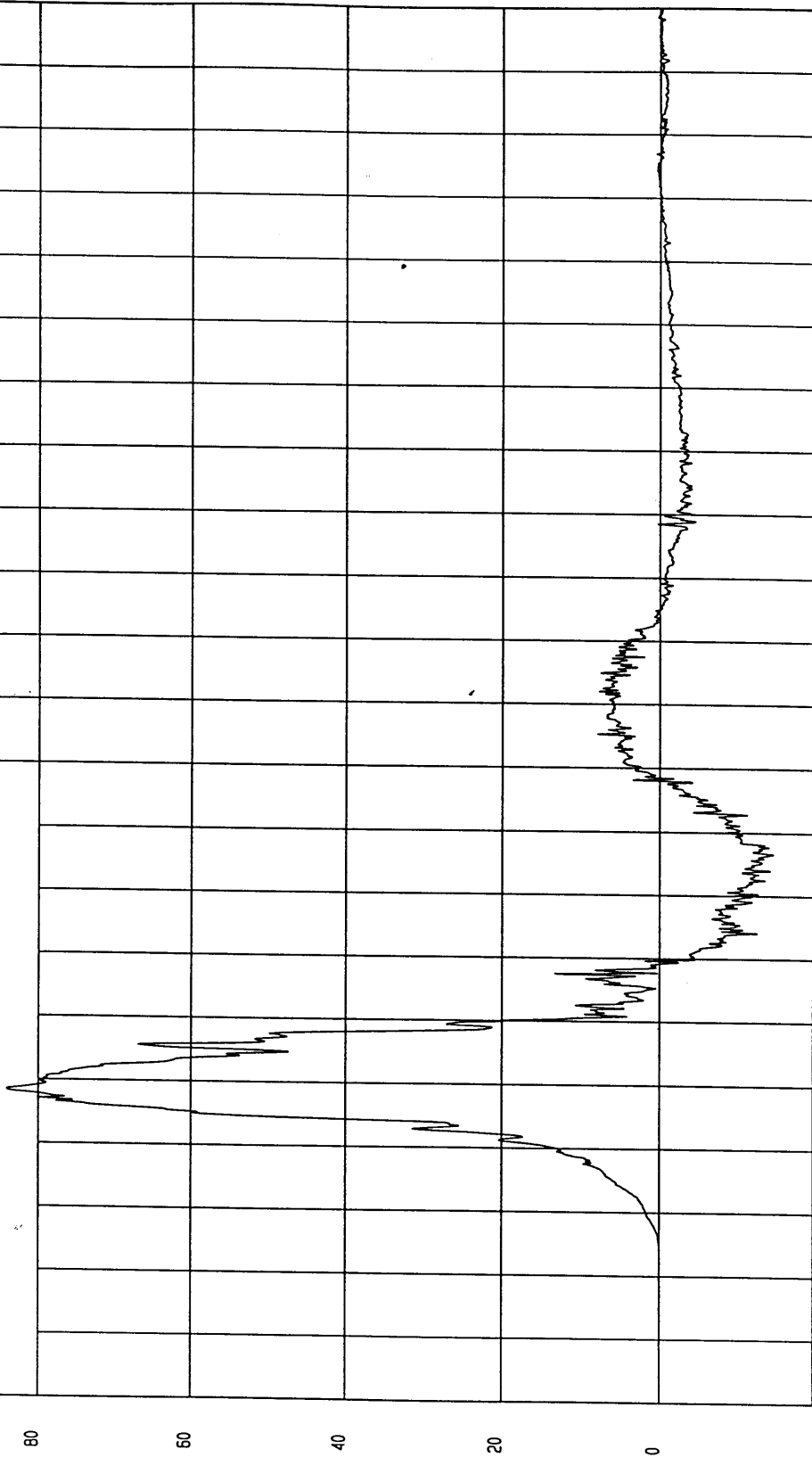
COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -14.38 G's at 67 msec

Maximum = 84.06 G's at 28 msec

REAR PASSENGER PELVIS Y ACCELERATION

1 800056AT.A14 Filterclass (1000)



Seconds

MGA Research  
07-25-2000 11:04

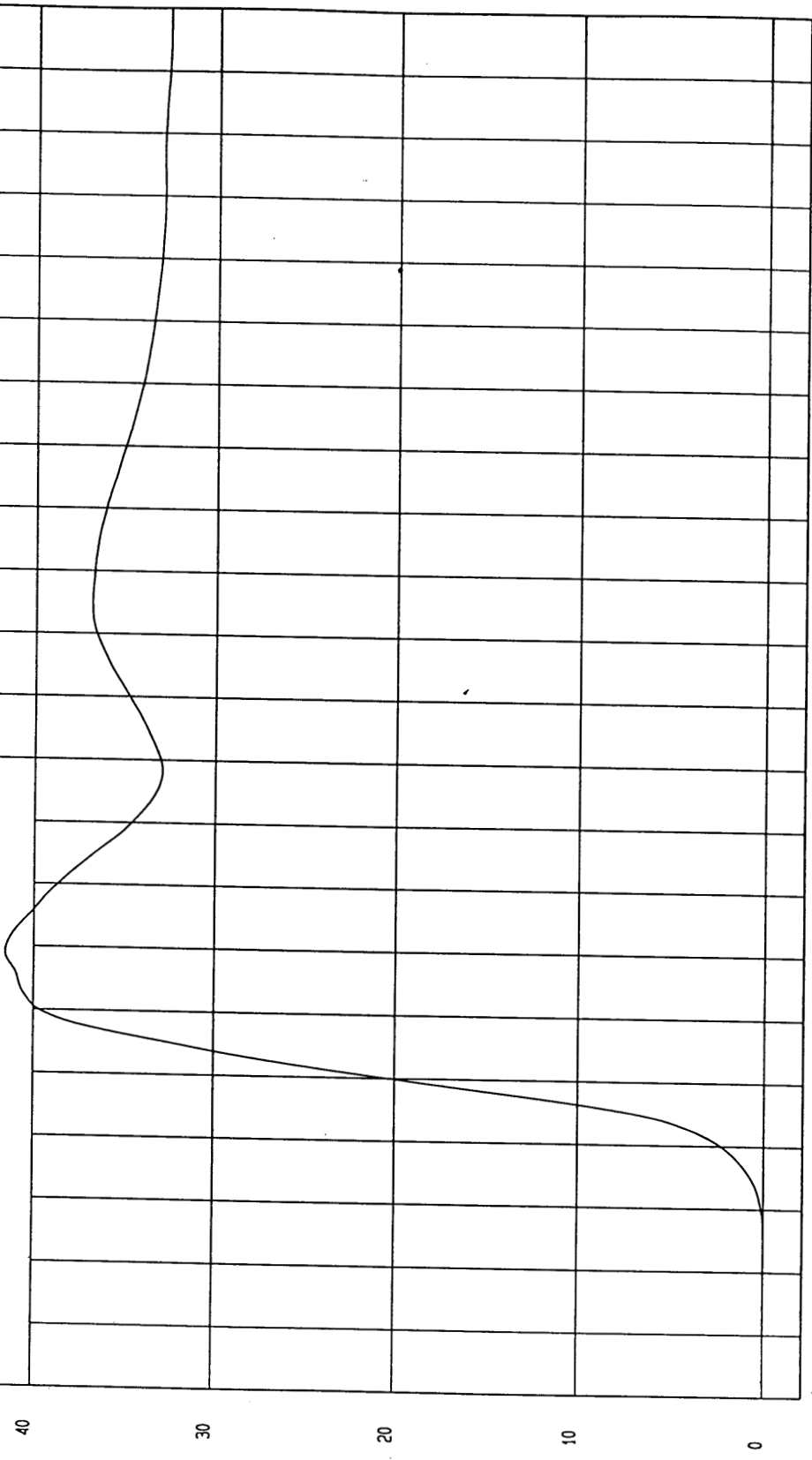
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -1.40E-03 KPH at -17 msec  
Maximum = 41.54 KPH at 49 msec

REAR PASSENGER PELVIS Y VELOCITY

1 ——— B00056A1.V14 FilterClass (180)



TIME Seconds

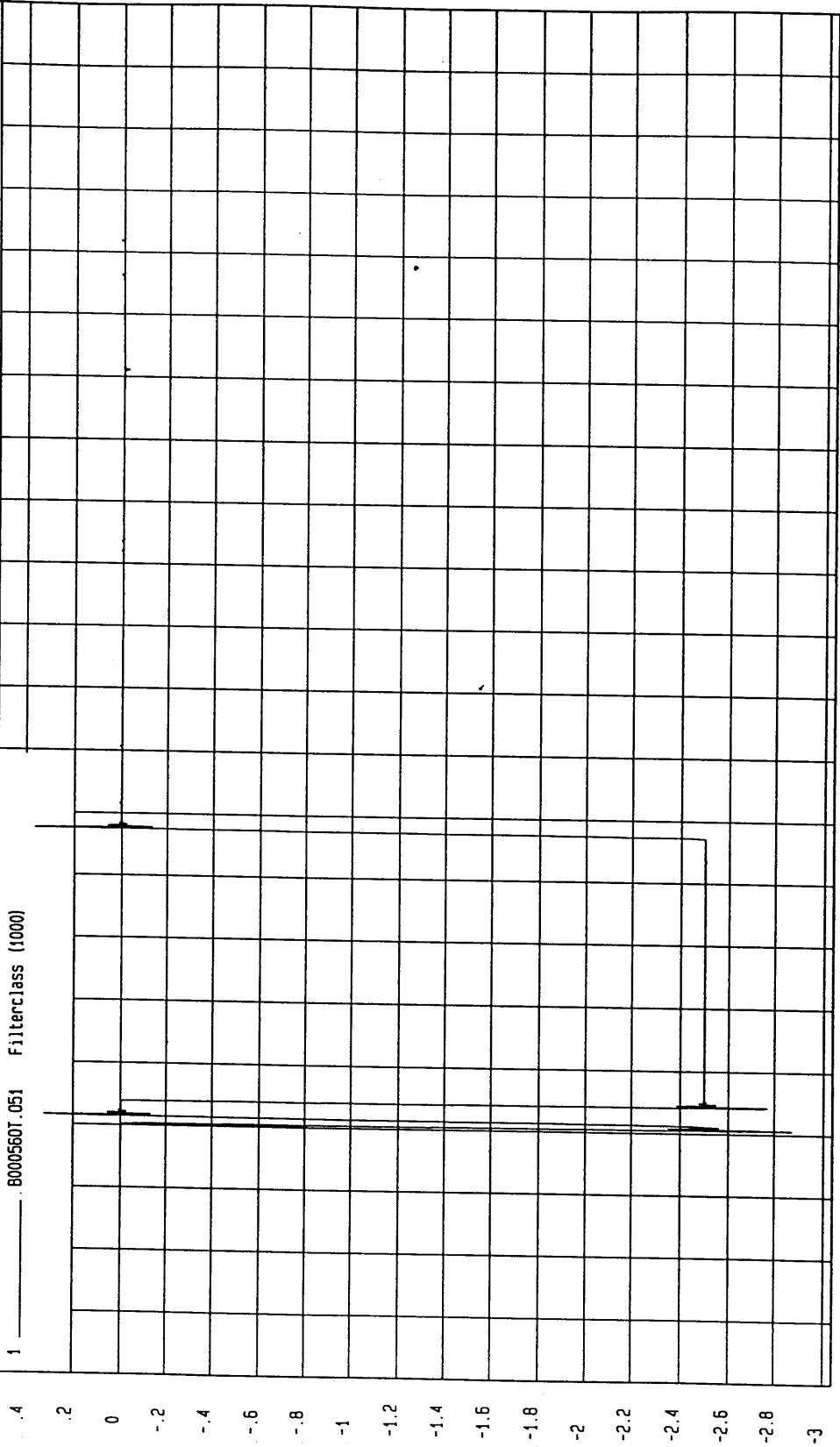
MGA Research  
07-25-2000 11:03

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -2.87 Volts at 21 msec  
Maximum = .36 Volts at 68 msec

REAR PASSENGER SHOULDER CONTACT



TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

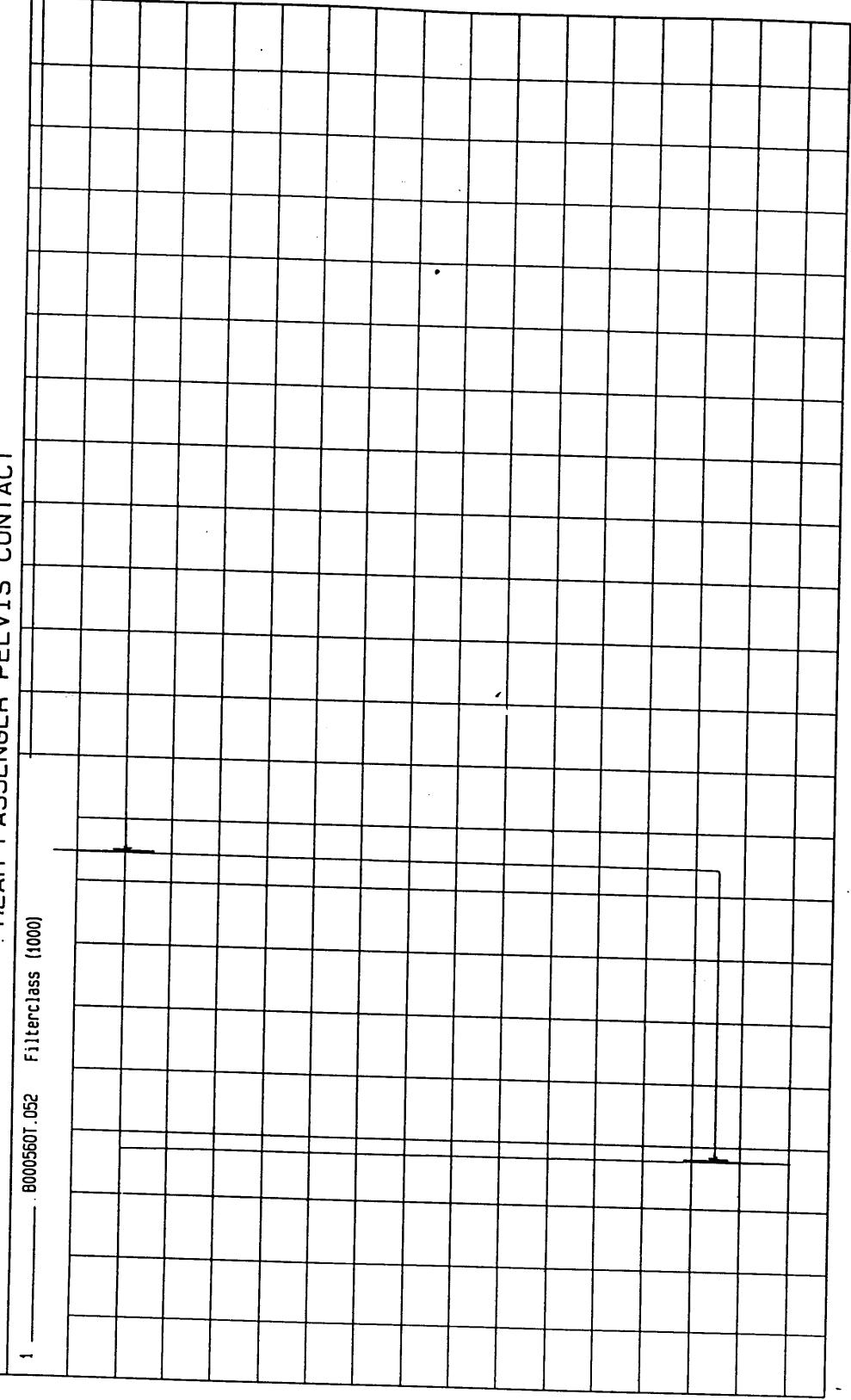
COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -2.81 Volts at 18 msec

Maximum = .3 Volts at 65 msec

REAR PASSENGER PELVIS CONTACT

1 8000560T.052 Filterclass (1000)



MPA Research  
07-25-2000 11:04

Seconds

Volts

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

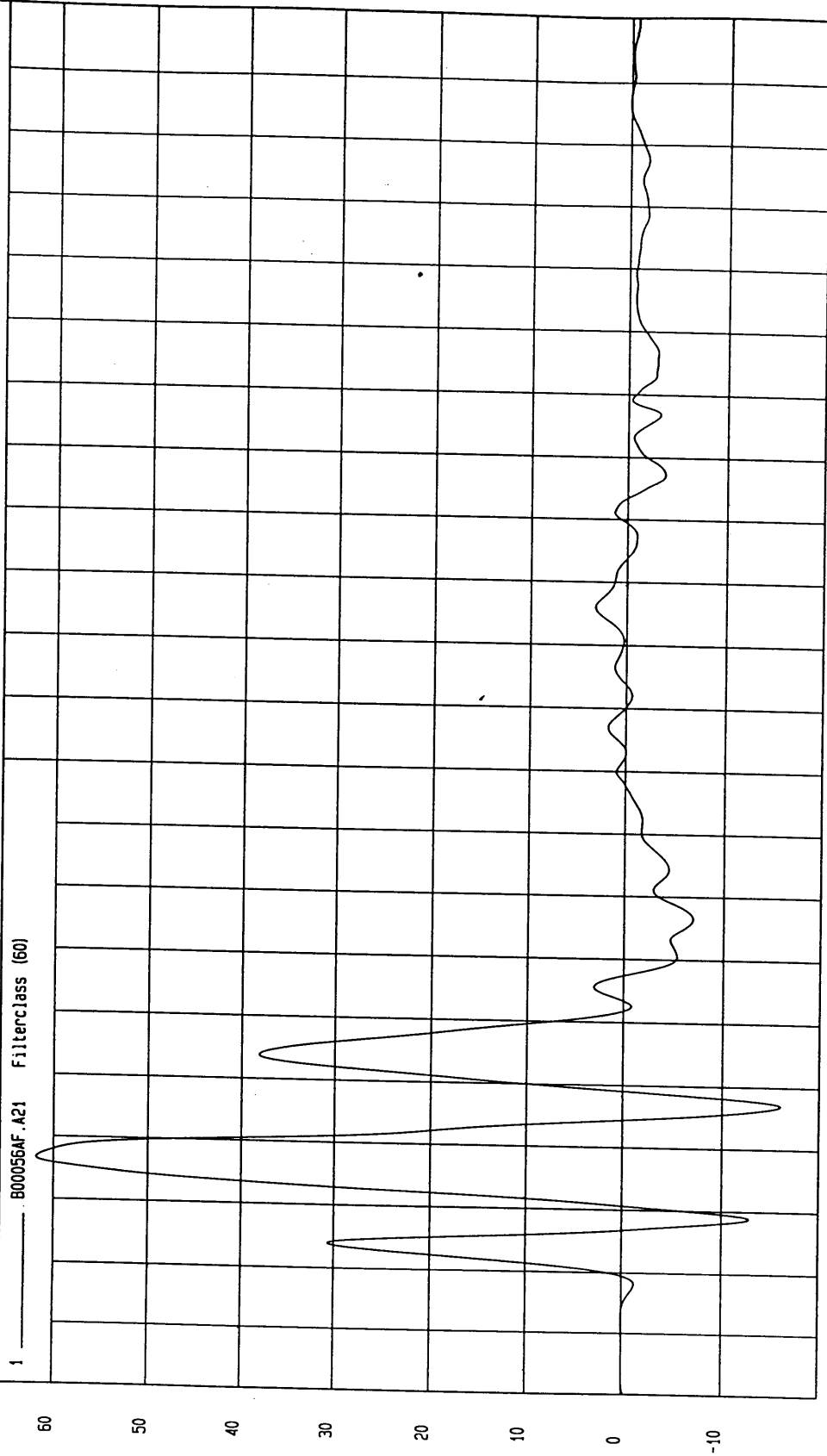
COMPONENT: 2000 SATURN SL2 4 DOOR

Speed: 38.9 MPH 62.6 KPH

Minimum = -15.98 G's at 27 msec

Maximum = 61.89 G's at 17 msec

LEFT SIDE SILL AT FRONT SEAT Y ACCELERATION



Seconds

MCA Research  
07-25-2000 10:59

G's

TEST: HIGH SPEED LATERAL IMPACT  
TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

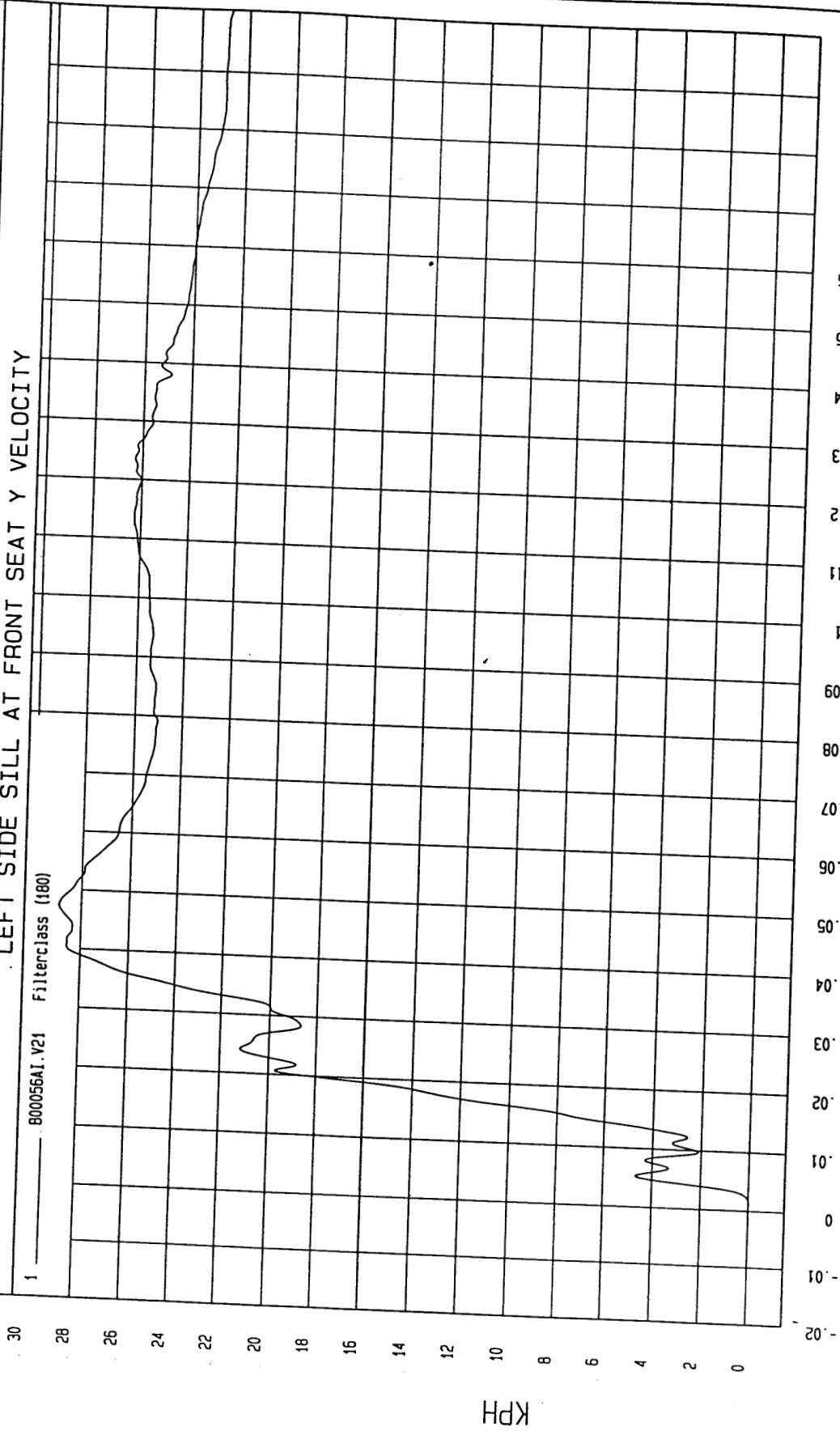
Speed: 38.9 MPH 62.6 KPH

Minimum = -1.18E-02 KPH at 1 msec

Maximum = 28.92 KPH at 47 msec

LEFT SIDE SILL AT FRONT SEAT Y VELOCITY

1 800056A1.V21 Filterclass (180)



MGA Research  
07-25-2000 10:59

TIME Seconds

KPH

TEST DATE: 07-24-2000

Speed: 38.9 MPH 62.6 KPH

TEST: HIGH SPEED LATERAL IMPACT

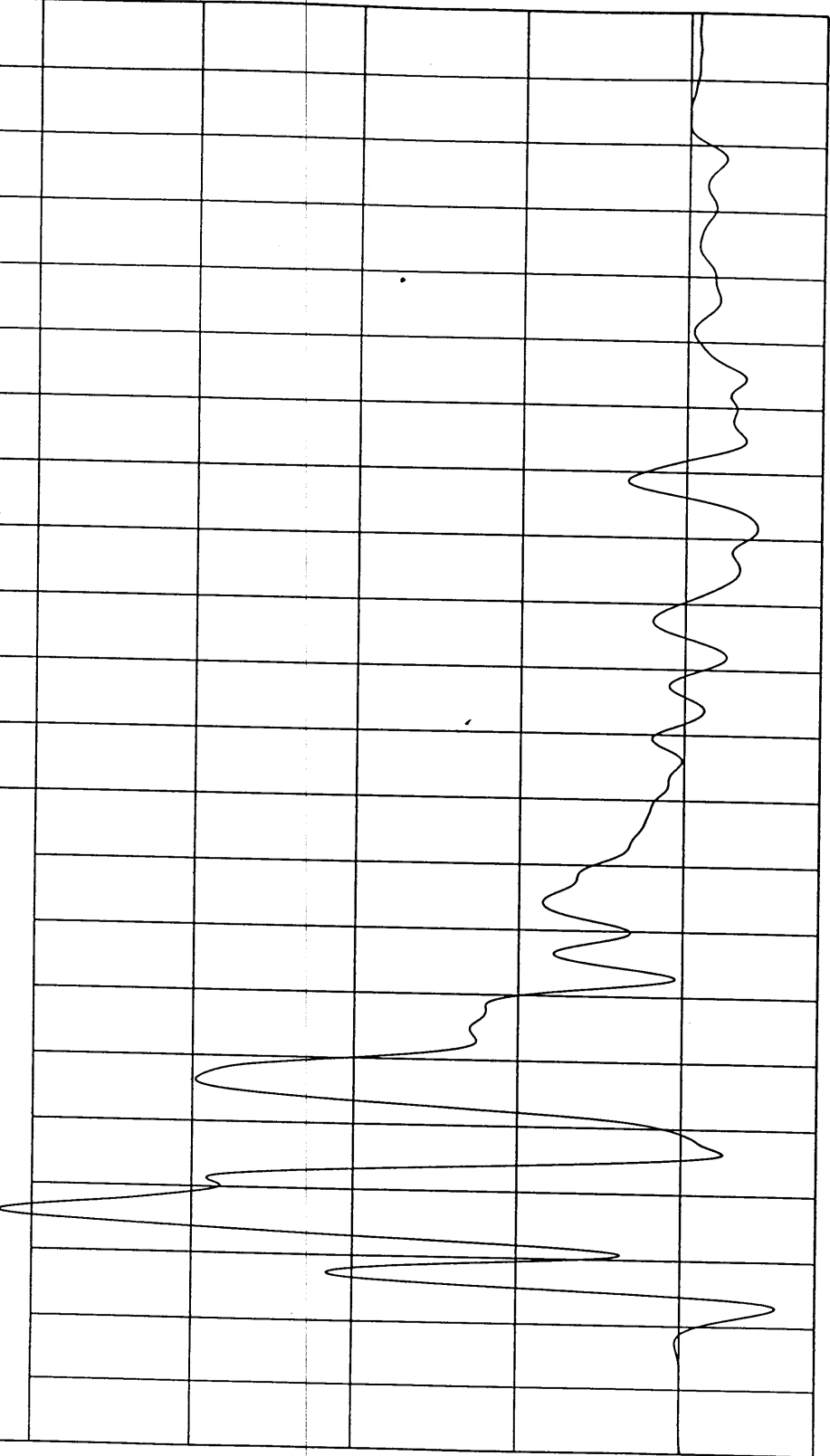
COMPONENT: 2000 SATURN SL2 4 DOOR

Maximum = 42.14 G's at 16 msec

Minimum = -5.7 G's at 3 msec

LEFT SIDE SILL AT REAR SEAT Y ACCELERATION

1 800056AF.A22 Filterclass (60)



Seconds

MCA Research  
07-25-2000 10:59

G's

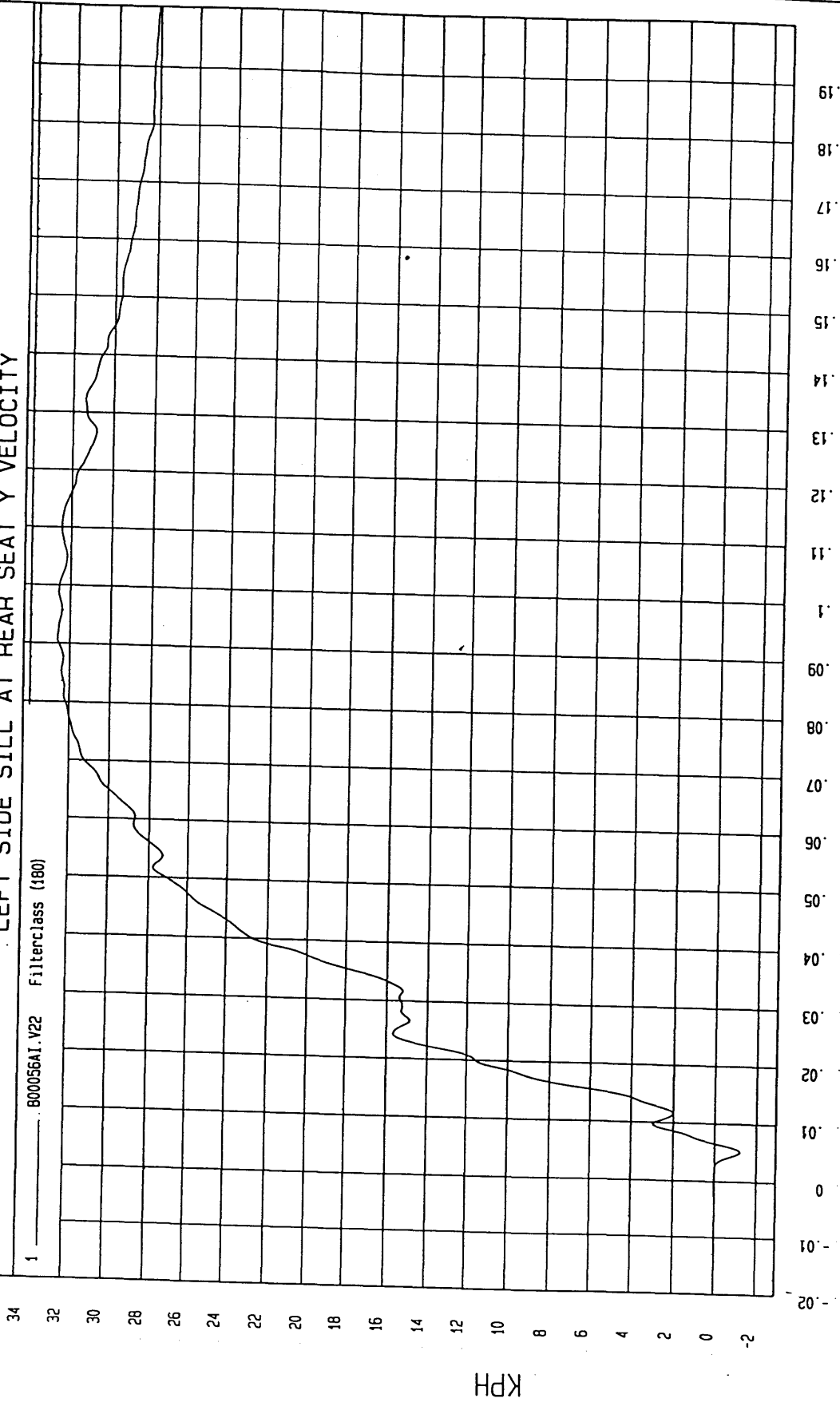
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -1.21 KPH at 5 msec Maximum = 32.64 KPH at 91 msec

LEFT SIDE SILL AT REAR SEAT Y VELOCITY

1 B00056A1.V22 Filterclass (180)



MGA Research  
07-25-2000 10:59

TIME Seconds

KPH

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

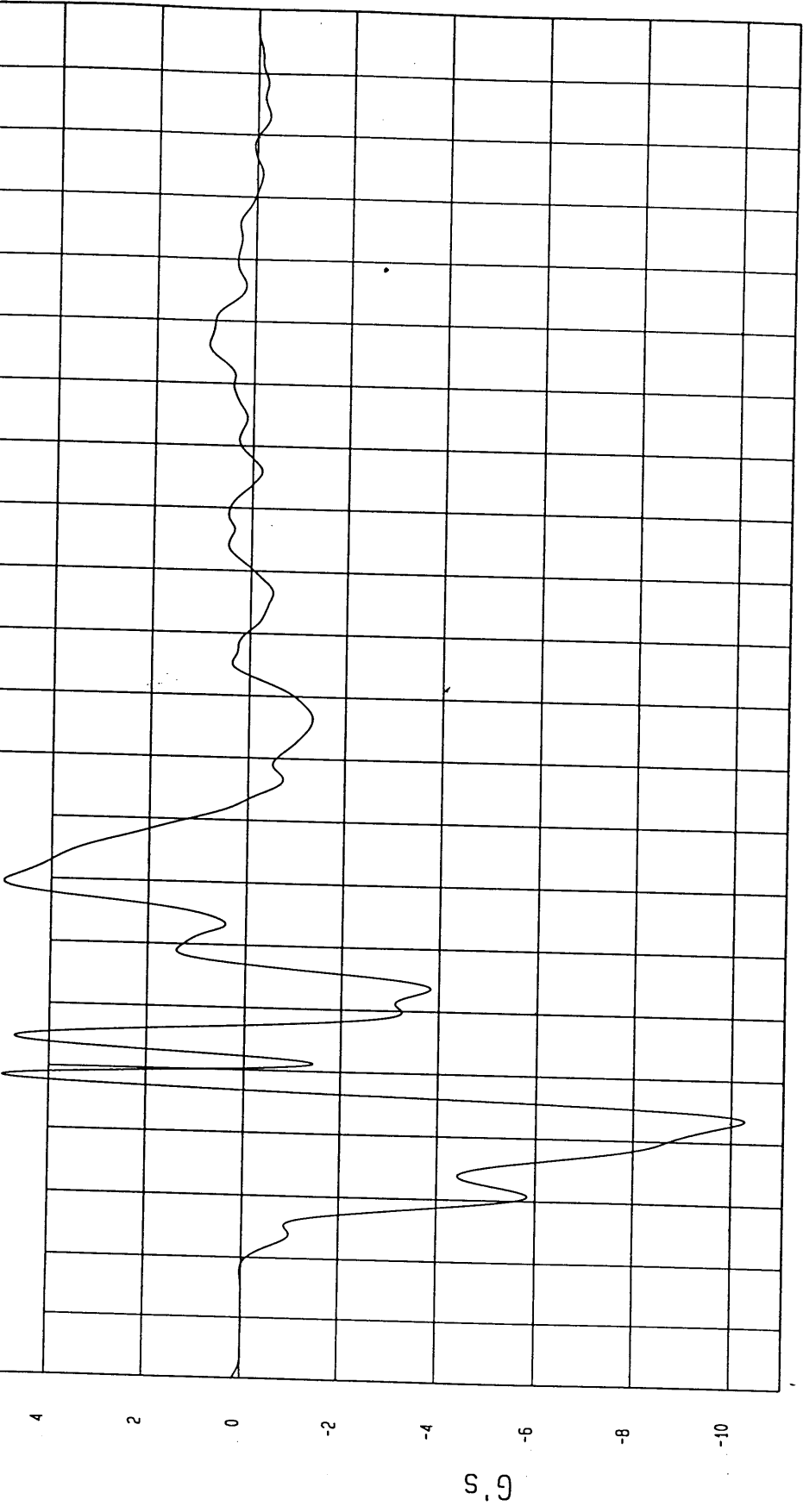
Speed: 38.9 MPH 62.6 KPH

Minimum = -10.27 G's at 24 msec

Maximum = 4.96 G's at 60 msec

RIGHT SIDE SILL AT FRONT SEAT X ACCELERATION

1 ——— 800056AF.A15 Filterclass (60)



Seconds

MGA Research  
07-25-2000 10:46

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

Speed: 38.9 MPH 62.6 KPH

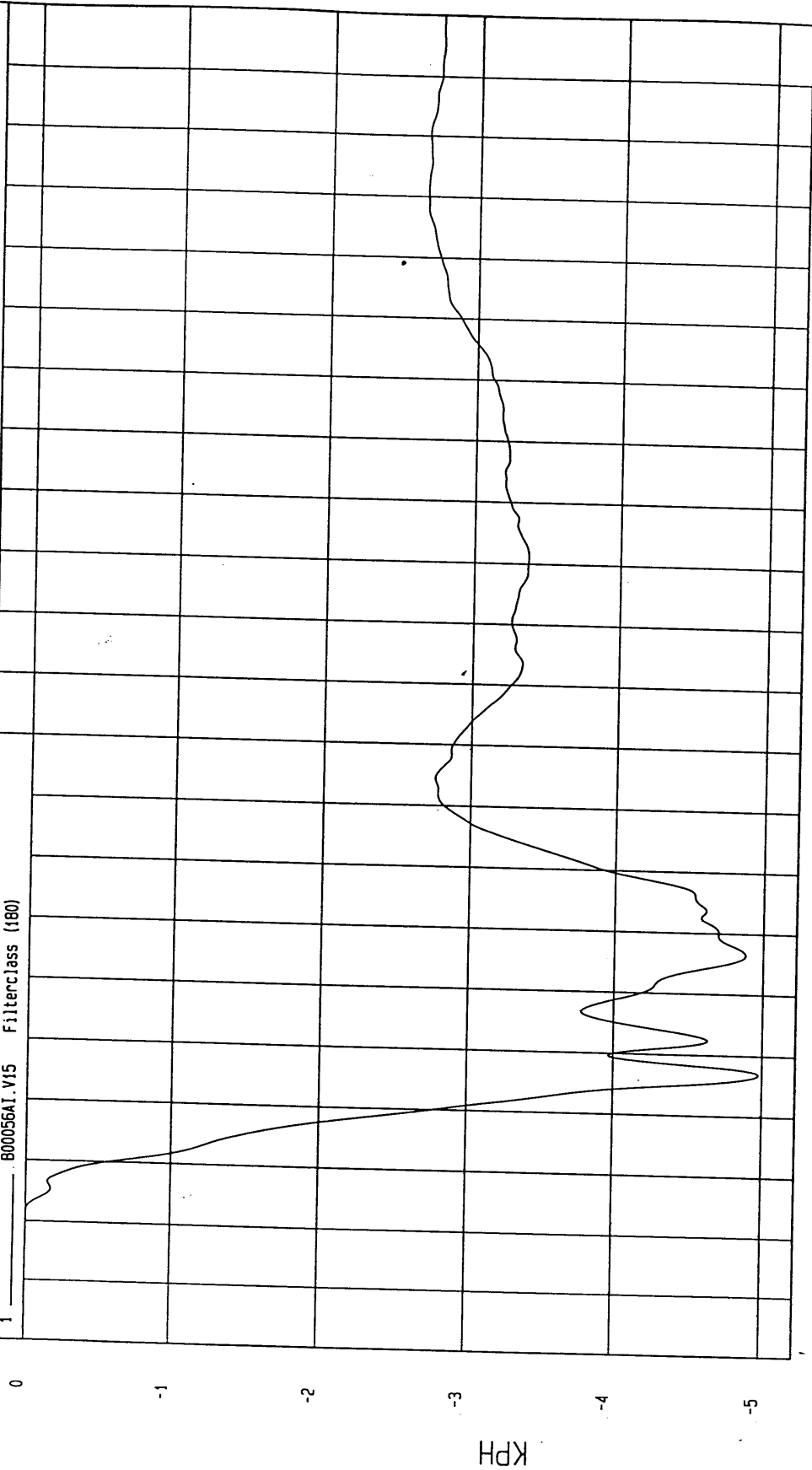
COMPONENT: 2000 SATURN SL2 4 DOOR

Minimum = -4.98 KPH at 27 msec

Maximum = 4.21E-03 KPH at -12 msec

RIGHT SIDE SILL AT FRONT SEAT X VELOCITY

1 - B00056A1.V15 Filterclass (180)



TIME Seconds

MCA Research  
07-25-2000 10:46

TEST DATE: 07-24-2000

Speed: 38.9 MPH 62.6 KPH

TEST: HIGH SPEED LATERAL IMPACT

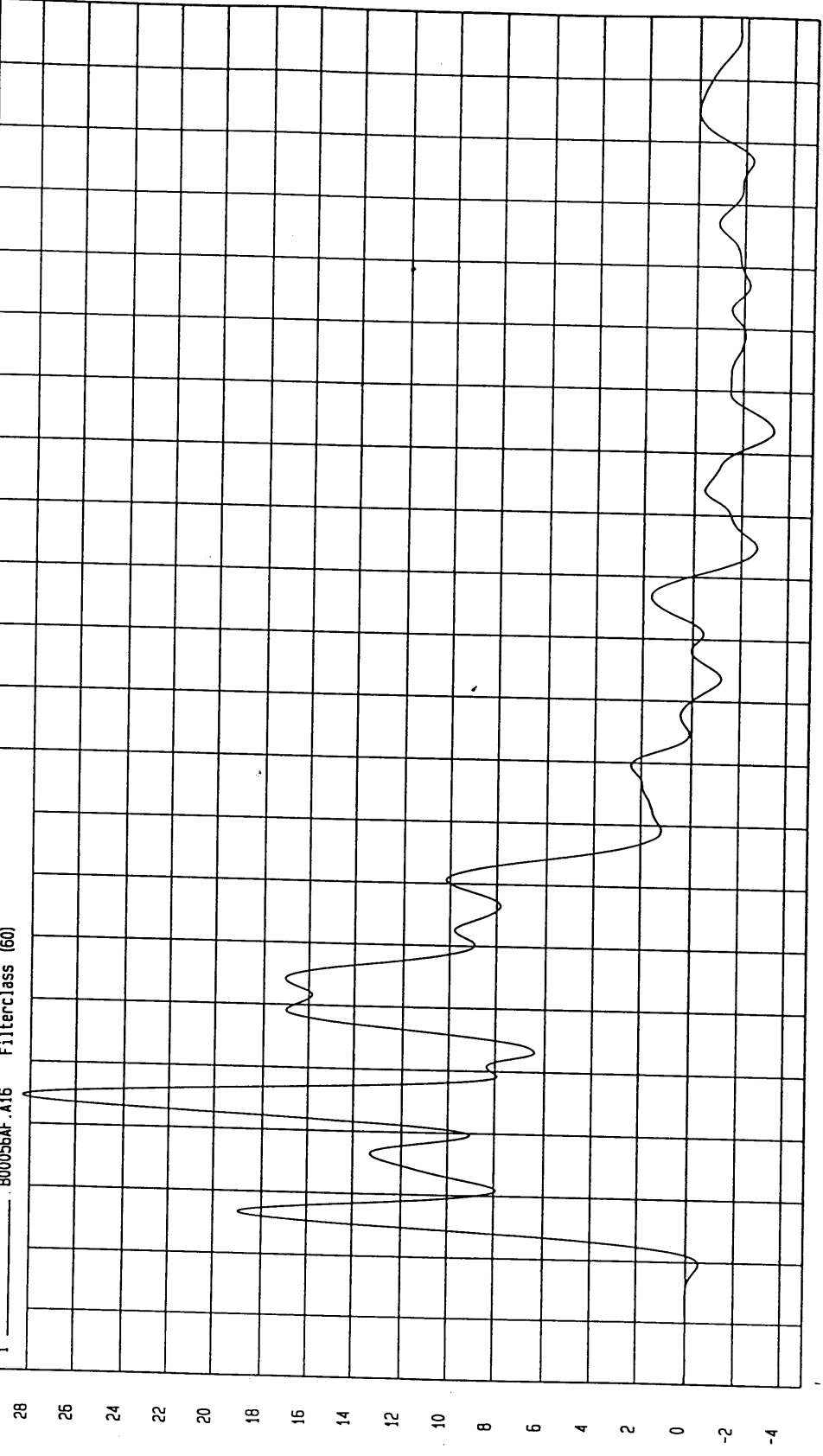
COMPONENT: 2000 SATURN SL2 4 DOOR

Maximum = 28.34 G's at 25 msec

Minimum = -3.34 G's at 134 msec

RIGHT SIDE SILL AT FRONT SEAT Y ACCELERATION

1 - B00056AF.A16 Filterclass (50)



Seconds

MGA Research  
07-25-2000 10:46

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

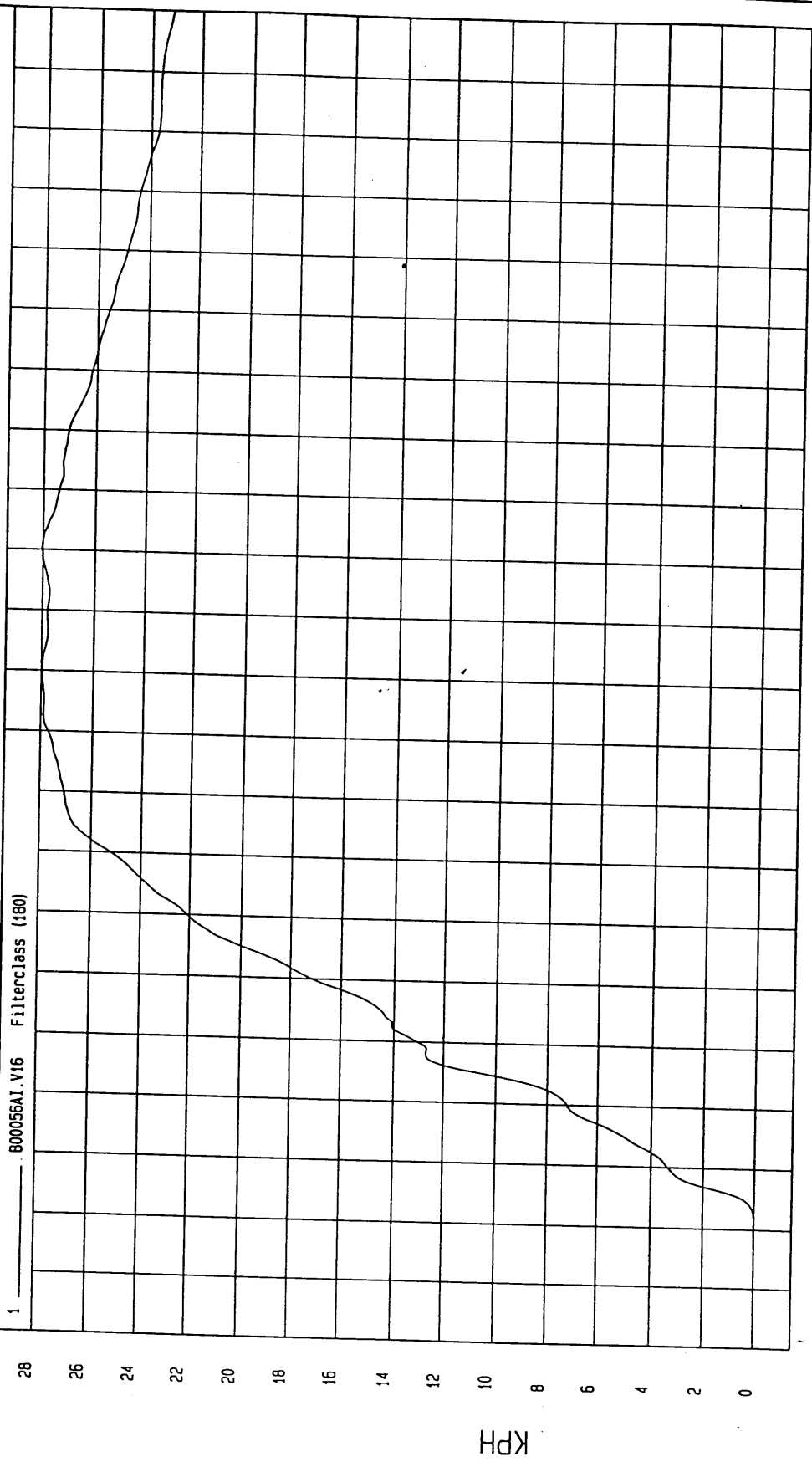
COMPONENT: 2000 SATURN SL2 4 DOOR

Speed: 38.9 MPH 62.6 KPH

Minimum = -1.92E-04 KPH at -16 msec

Maximum = 28.05 KPH at 110 msec

RIGHT SIDE SILL AT FRONT SEAT Y VELOCITY



MCA Research  
07-25-2000 10:46

TIME Seconds

KPH

TEST DATE: 07-24-2000

TEST: HIGH SPEED LATERAL IMPACT

Speed: 38.9 MPH 62.6 KPH

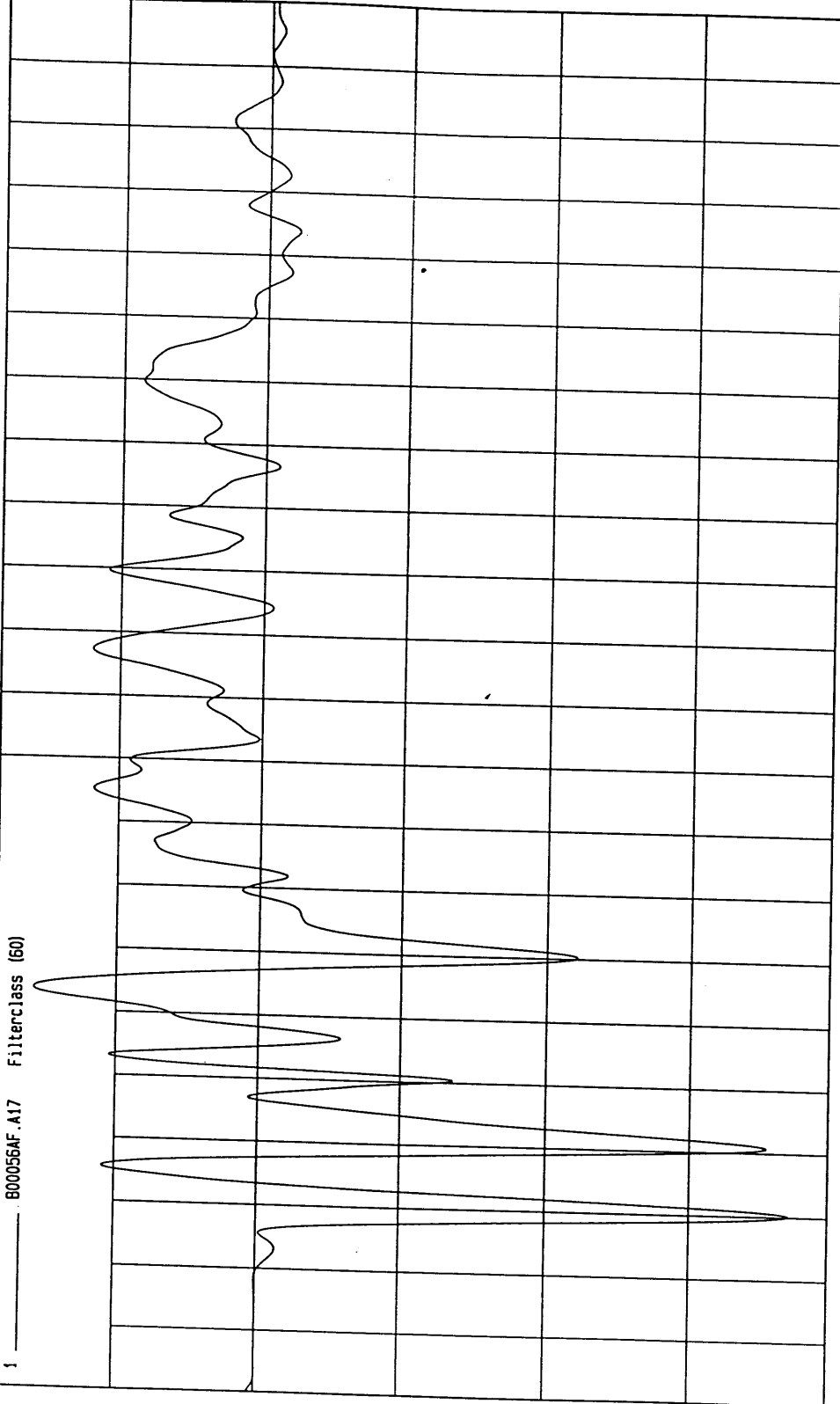
COMPONENT: 2000 SATURN SL2 4 DOOR

Minimum = -7.36 G's at 10 msec

Maximum = 3.16 G's at 44 msec

RIGHT SIDE SILL AT FRONT SEAT Z ACCELERATION

1 ——— B00056AF.A17 Filterclass (60)



Seconds

NGA Research  
07-25-2000 10.46

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

Speed: 38.9 MPH 62.6 KPH

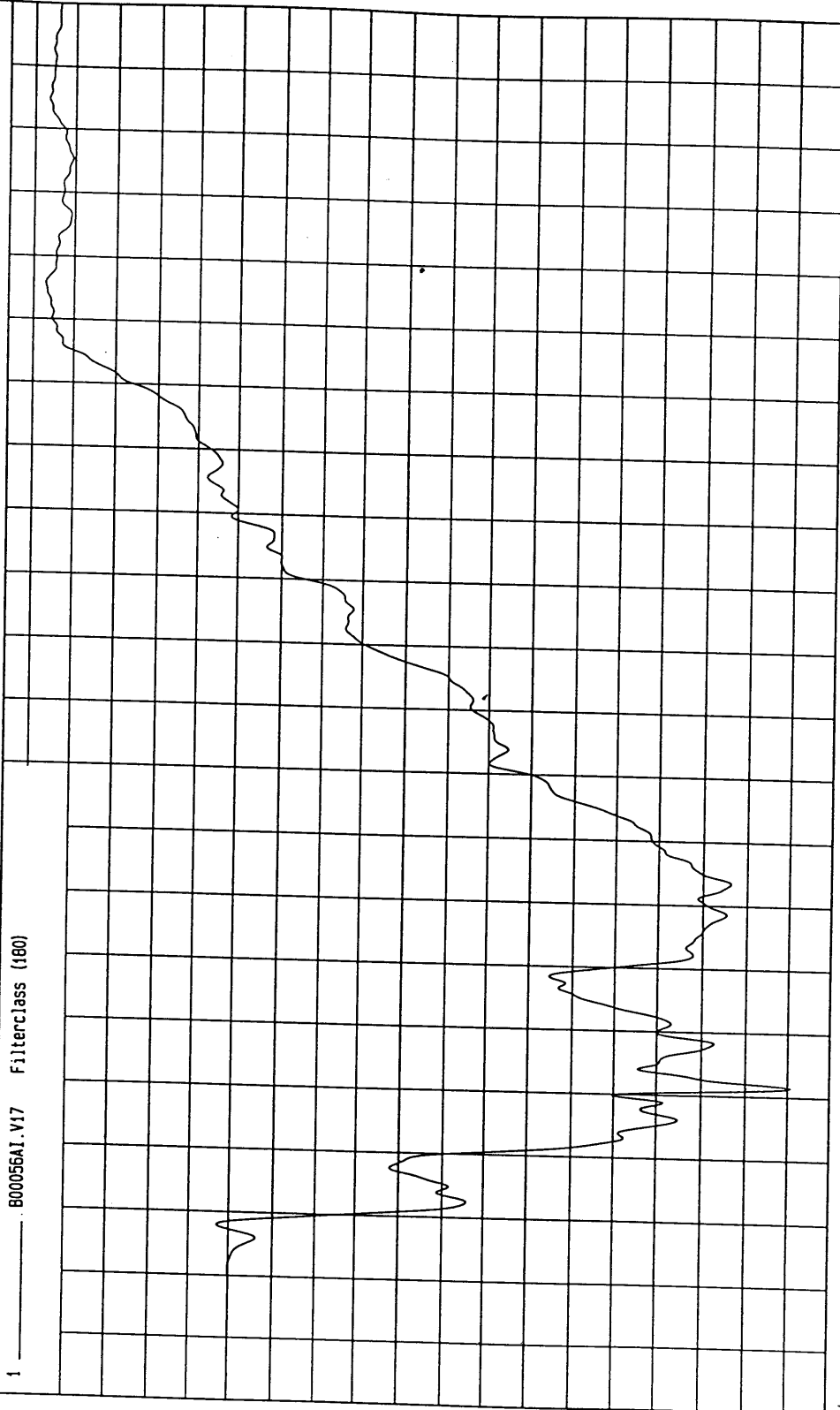
COMPONENT: 2000 SATURN SL2 4 DOOR

Minimum = -2.61 KPH at 31 msec

Maximum = .94 KPH at 156 msec

RIGHT SIDE SILL AT FRONT SEAT Z VELOCITY

1 B00056A1.V17 Filterclass (180)



NSA Research  
07-25-2000 10:46

TIME Seconds

KPH

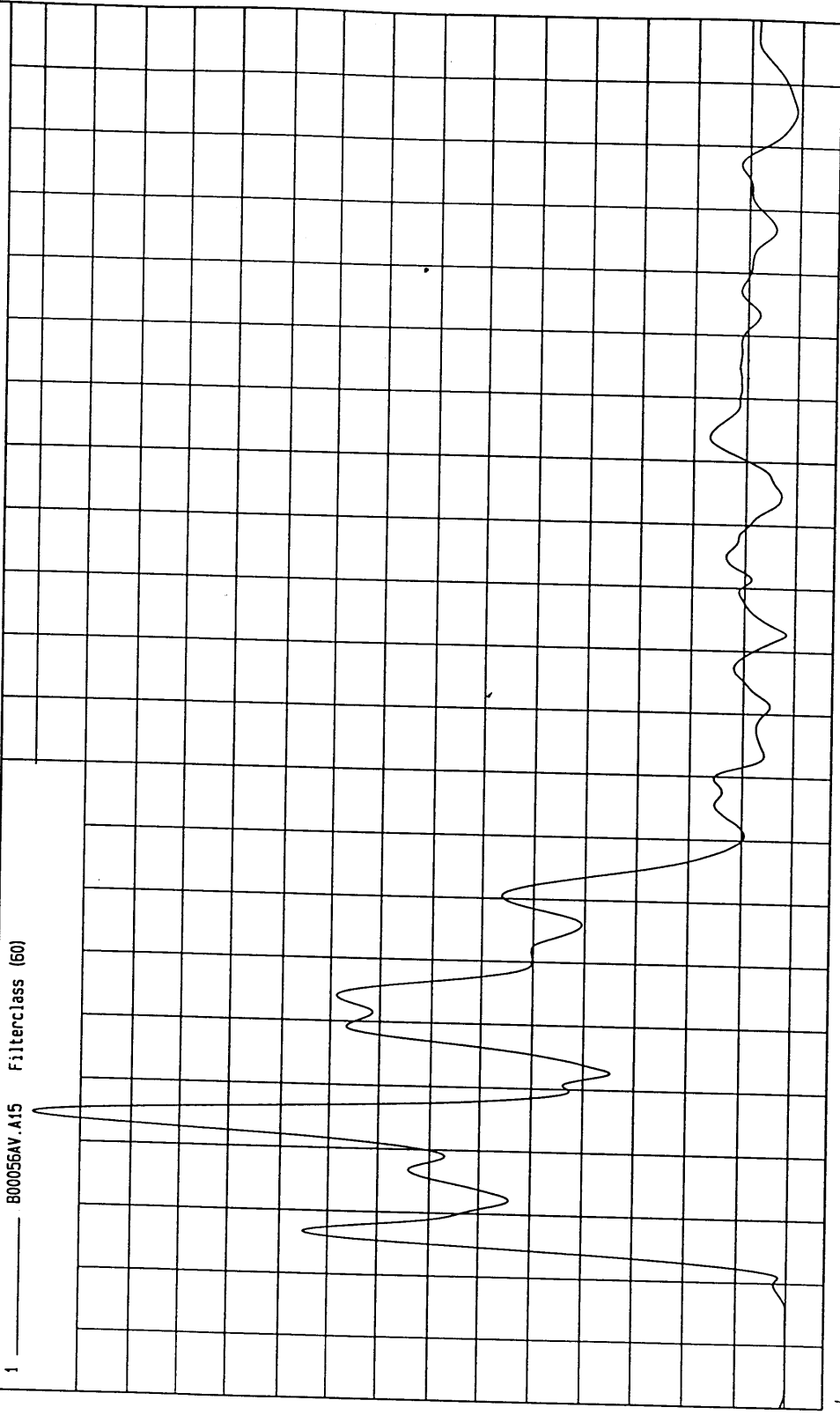
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = 4.25E-03 G's at -15 msec  
Maximum = 29.94 G's at 24 msec

RIGHT SIDE SILL AT FRONT SEAT RESULTANT ACCELERATION

1 ——— 800056AV.A15 Filterclass (60)



MGA Research  
07-25-2000 10:46

Seconds

G's

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

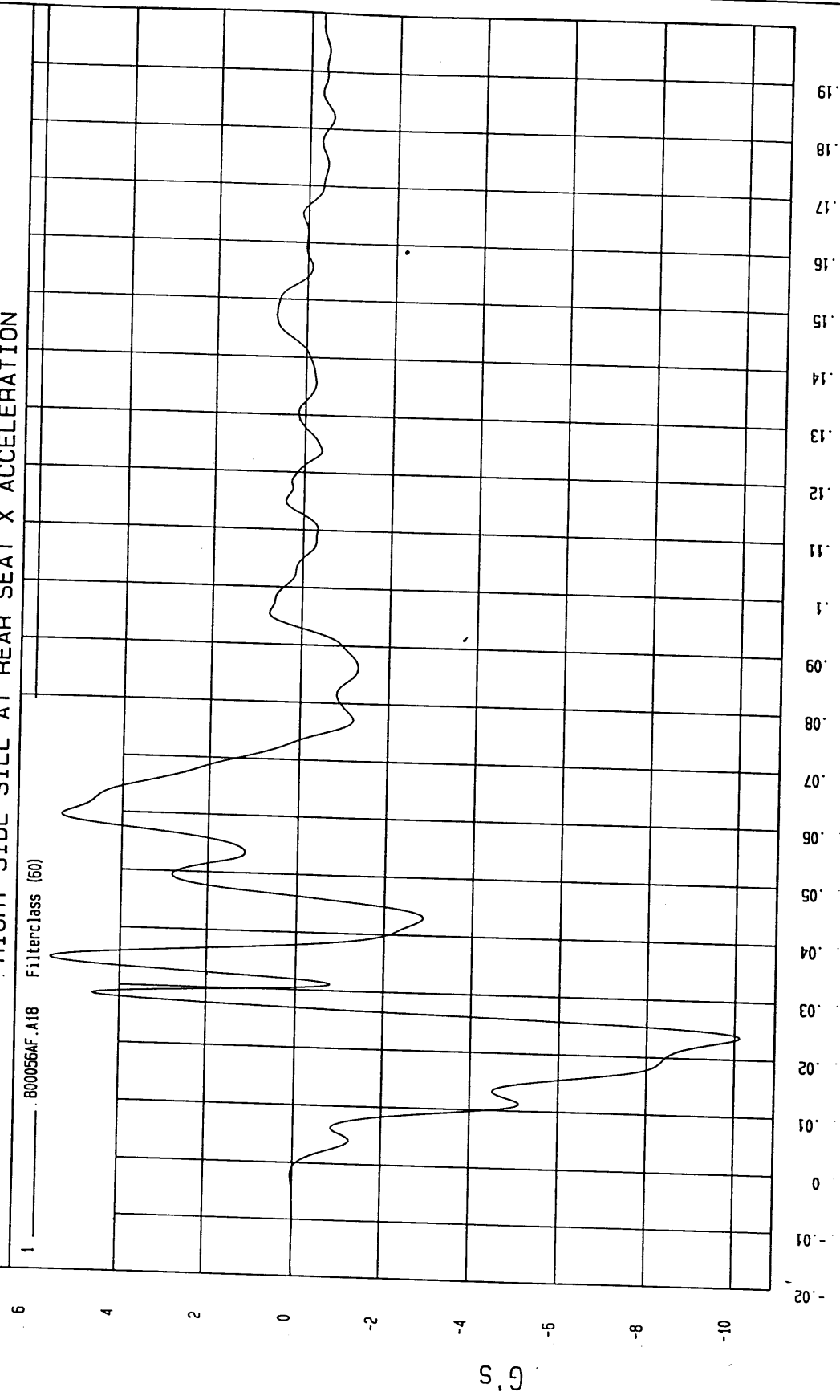
Speed: 38.9 MPH 62.6 KPH

Minimum = -10.11 G's at 24 msec

Maximum = 5.57 G's at 35 msec

RIGHT SIDE SILL AT REAR SEAT X ACCELERATION

1 .800056AF.A18 Filterclass (60)



Seconds

MGA Research  
07-25-2000 10:47

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

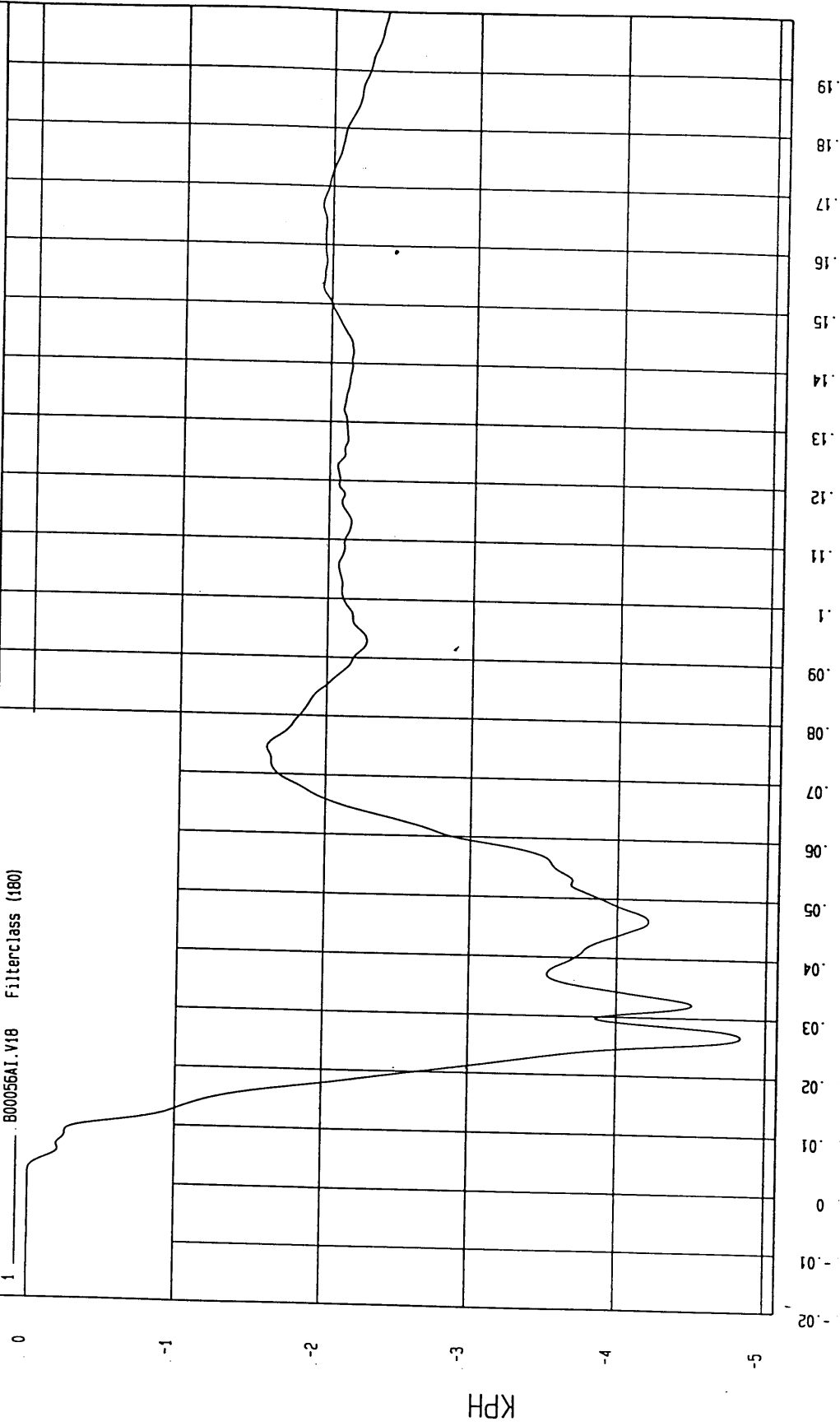
COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -4.83 KPH at 27 msec

Maximum = 1.42E-03 KPH at -17 msec

RIGHT SIDE SILL AT REAR SEAT X VELOCITY

1 800056A1.V18 FilterClass (180)



TIME Seconds

MGA Research  
07-25-2000 10:47

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

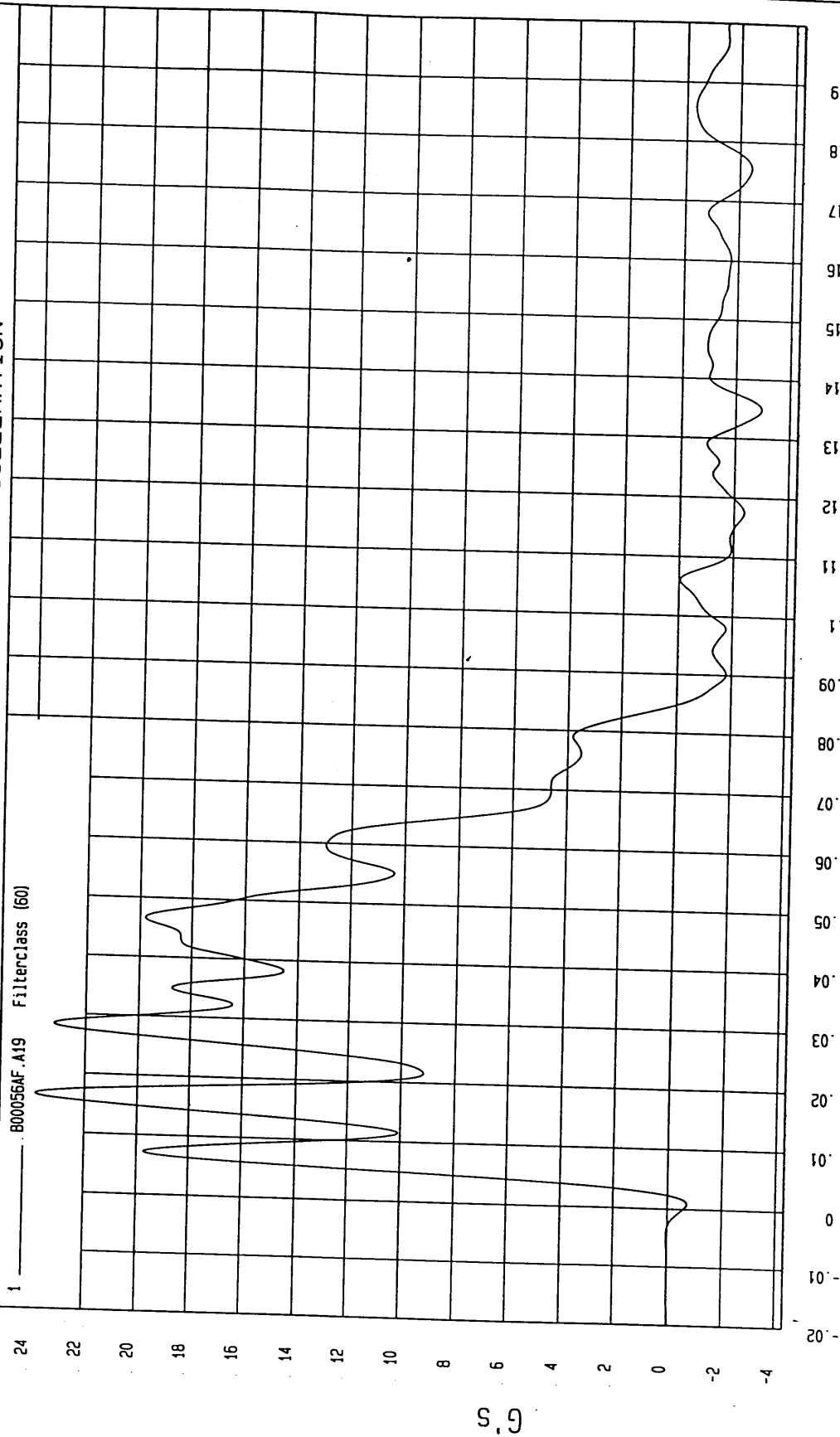
COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -2.96 G's at 135 msec

Maximum = 23.87 G's at 16 msec

RIGHT SIDE SILL AT REAR SEAT Y ACCELERATION

1 ——— .600056AF.A19 FilterClass (60)



Seconds

WCA Research  
07-25-2000 10:47

TEST: HIGH SPEED LATERAL IMPACT  
TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

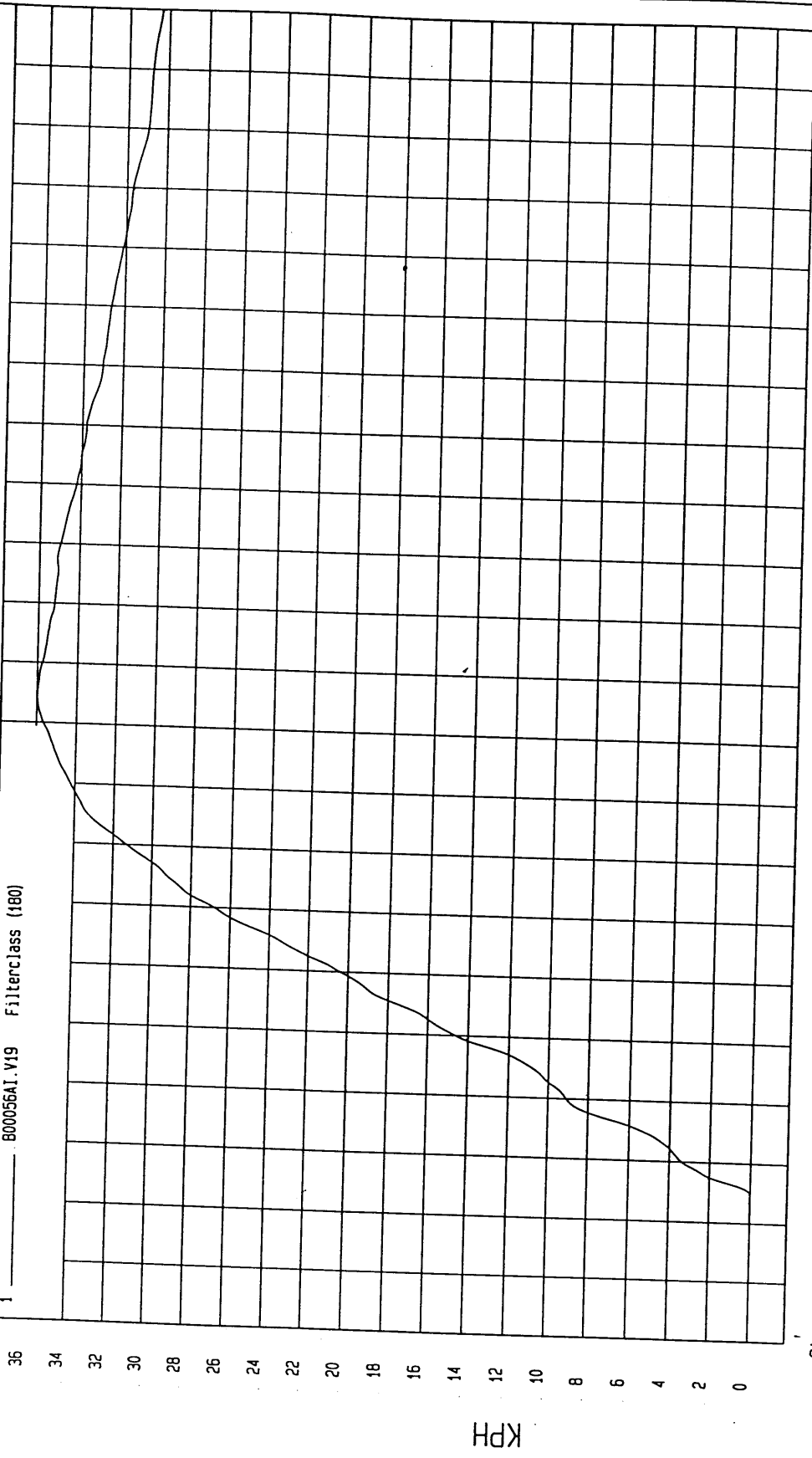
Speed: 38.9 MPH 62.6 KPH

Minimum = -2.71E-03 KPH at -17 msec

Maximum = 35.97 KPH at 84 msec

RIGHT SIDE SILL AT REAR SEAT Y VELOCITY

1 ——— 800056A1.V19 FilterClass (f80)



TIME Seconds

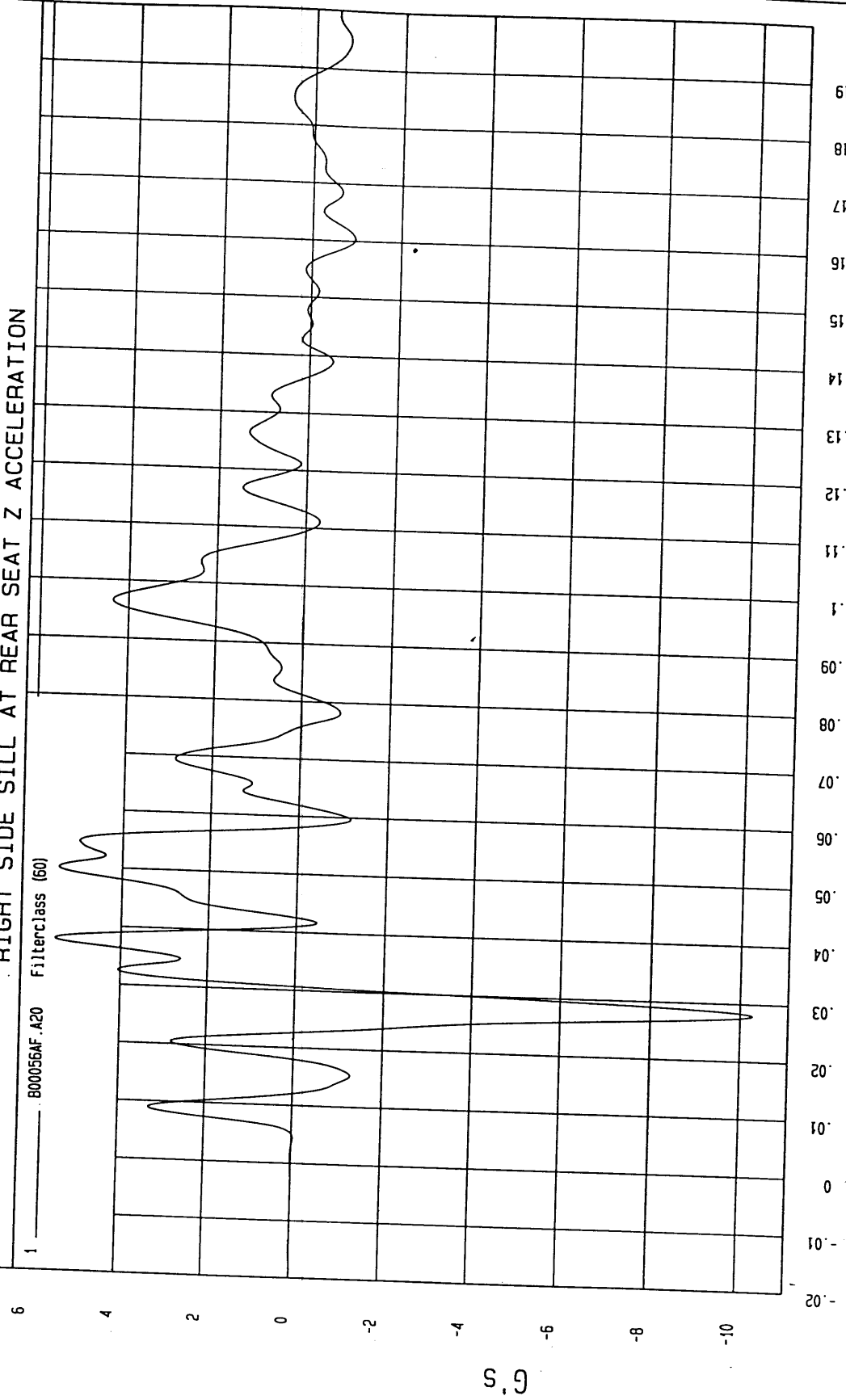
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -10.26 G's at 28 msec  
Maximum = 5.49 G's at 38 msec

RIGHT SIDE SILL AT REAR SEAT Z ACCELERATION

1 800056AF.A20 Filterclass (50)



Seconds

NSA Research  
07-23-2000 10: 47

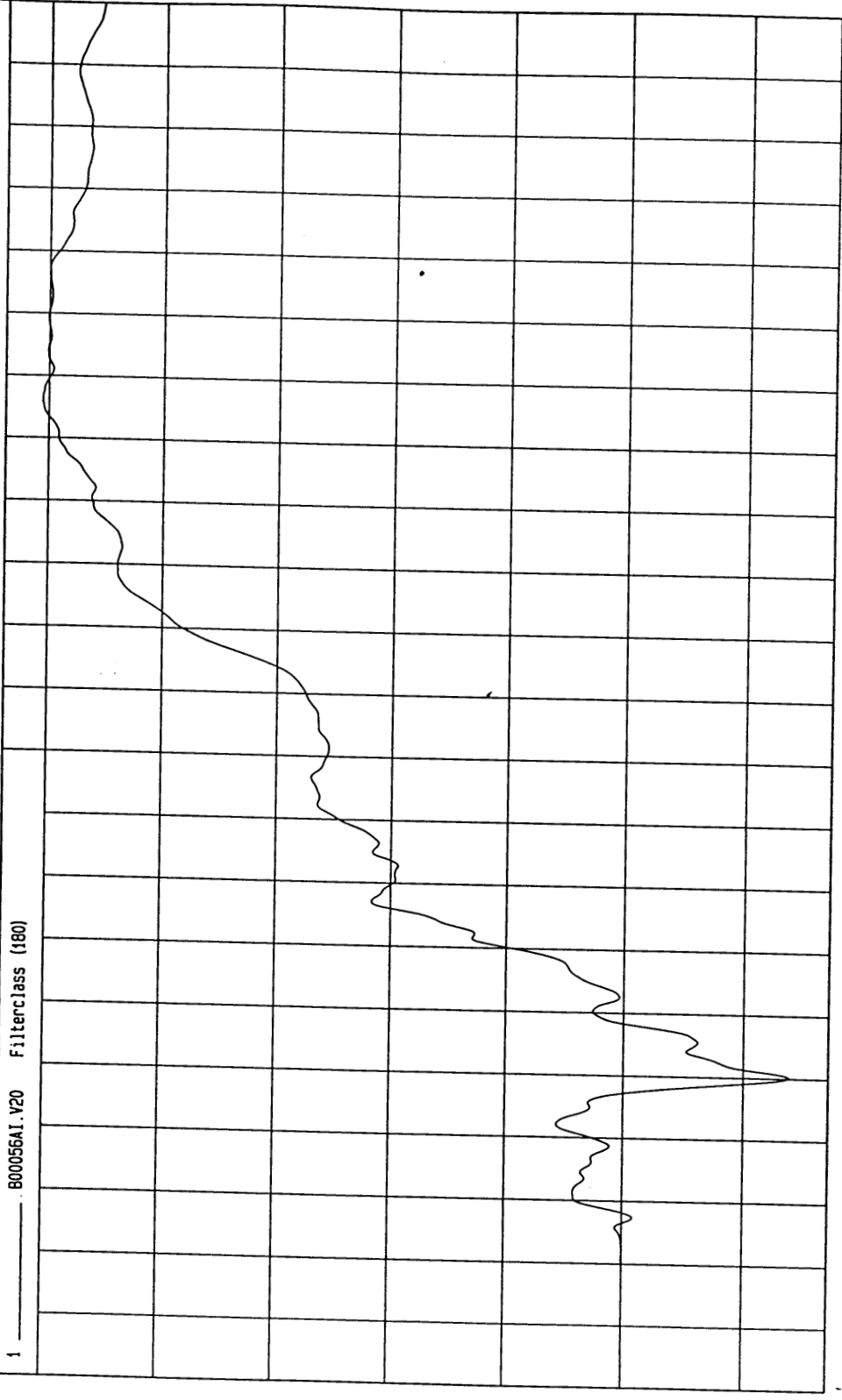
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -1.38 KPH at 30 msec Maximum = 5.05 KPH at 136 msec

RIGHT SIDE SILL AT REAR SEAT Z VELOCITY

1 ——— B00056A1.V20 Filter:lass (180)



MGA Research  
07-25-2000 10:47

TIME Seconds

KPH

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

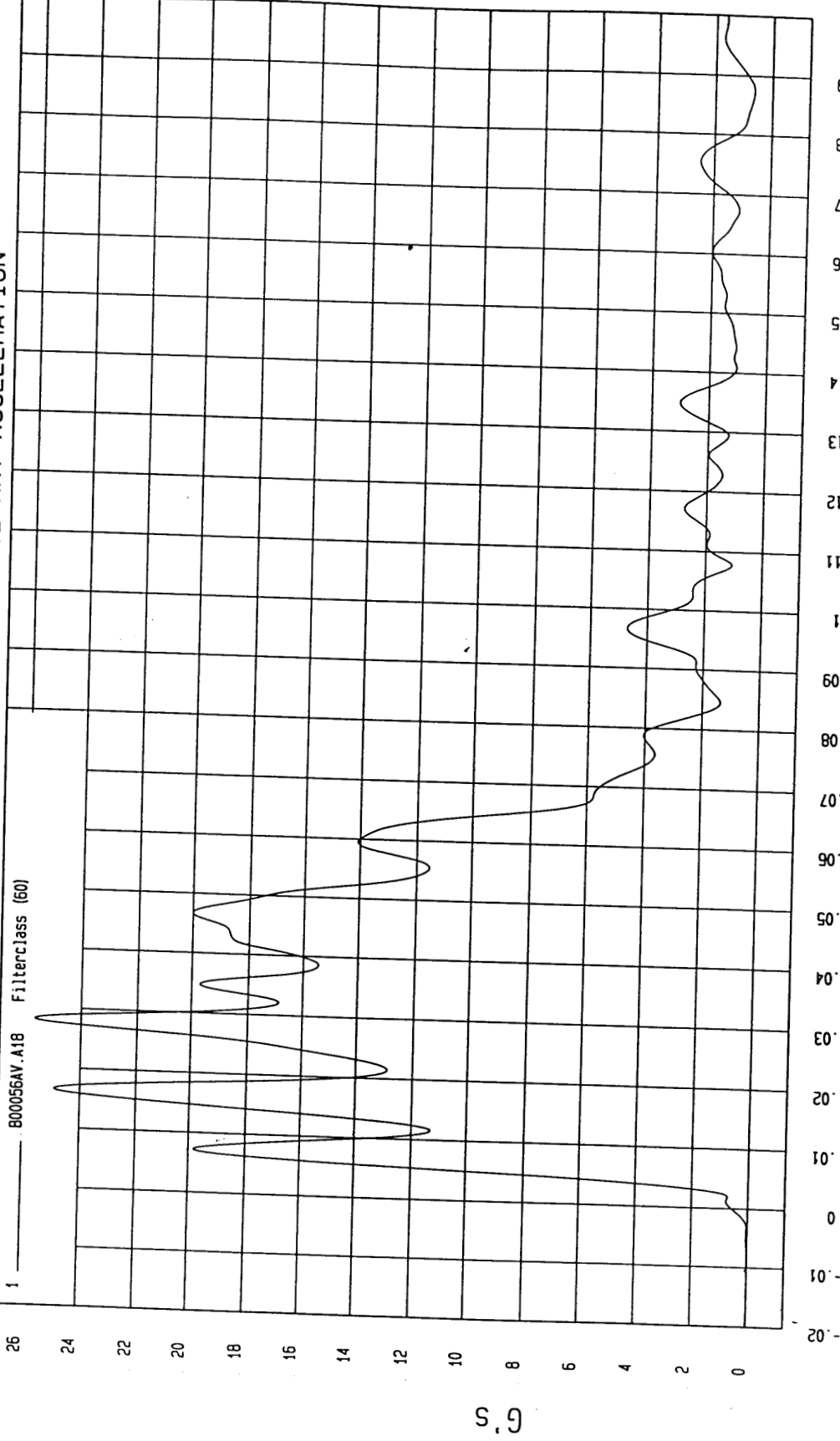
Speed: 38.9 MPH 62.6 KPH

Minimum = 5.08E-03 G's at -17 msec

Maximum = 25.68 G's at 28 msec

RIGHT SIDE SILL AT REAR SEAT RESULTANT ACCELERATION

1 800056AV.A18 Filterclass (60)



Seconds

MSA Research  
07-25-2000 10:47

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

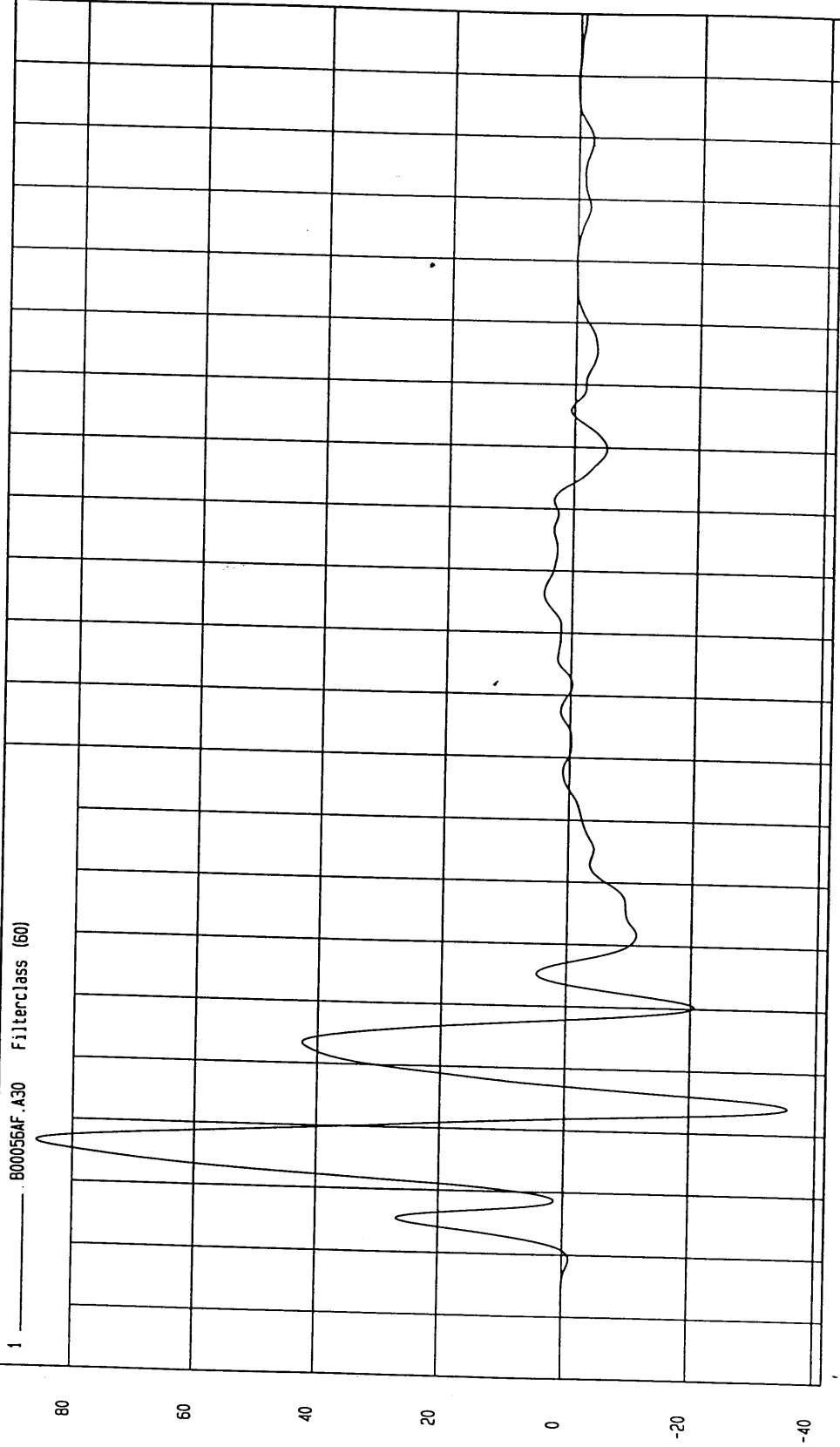
Speed: 38.9 MPH 62.6 KPH

Minimum = -35.49 G's at 24 msec

Maximum = 86.01 G's at 16 msec

DRIVER SEAT TRACK Y ACCELERATION

1 \_\_\_\_\_ 800056AF.A30 Filterclass (50)



Seconds

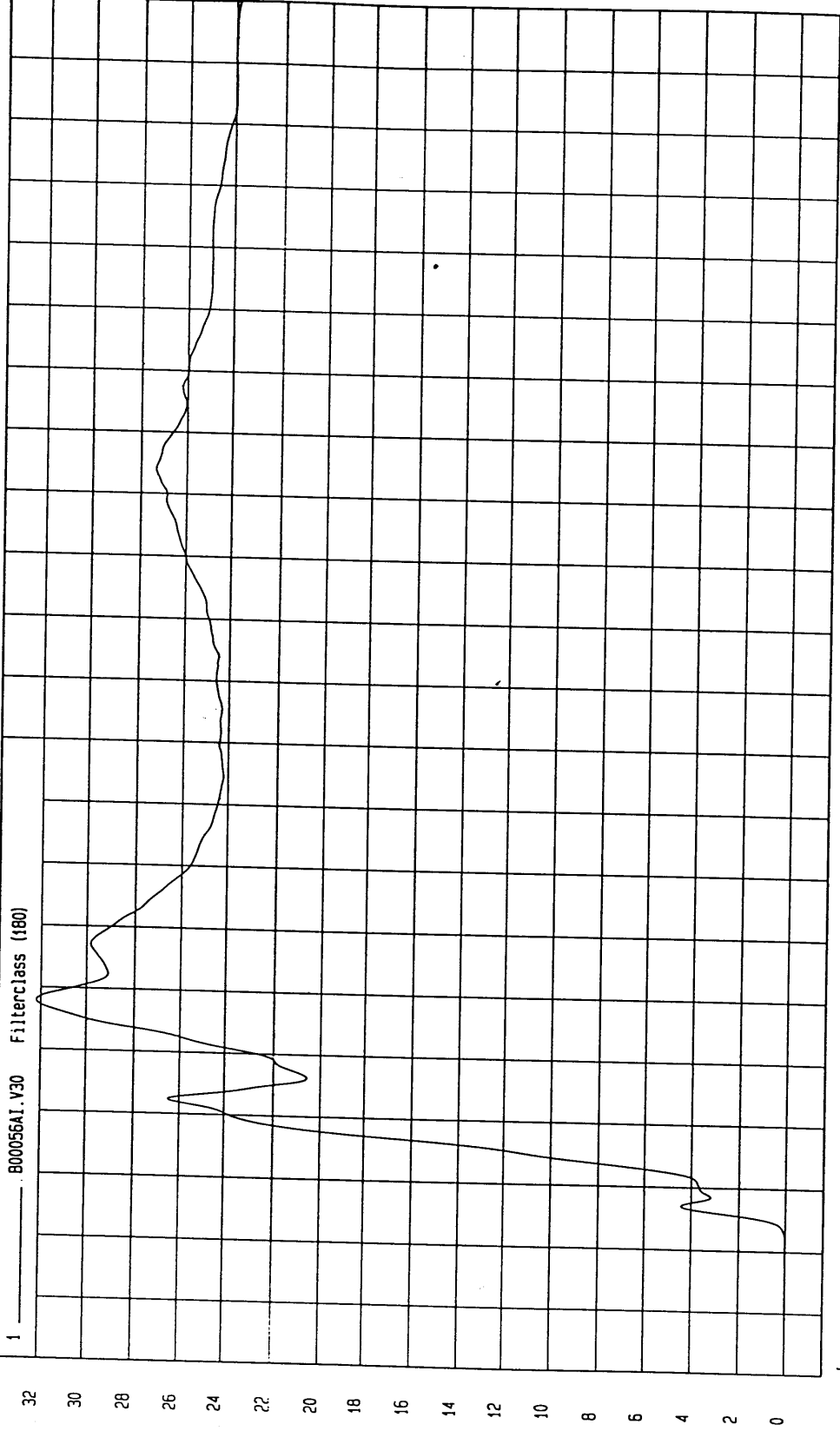
MGA Research  
07-25-2000 10: 47

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -1.58E-03 KPH at -15 msec  
Maximum = 32.2 KPH at 38 msec

DRIVER SEAT TRACK Y VELOCITY



WGA Research  
07-25-2000 10:47

TIME Seconds

KPH

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

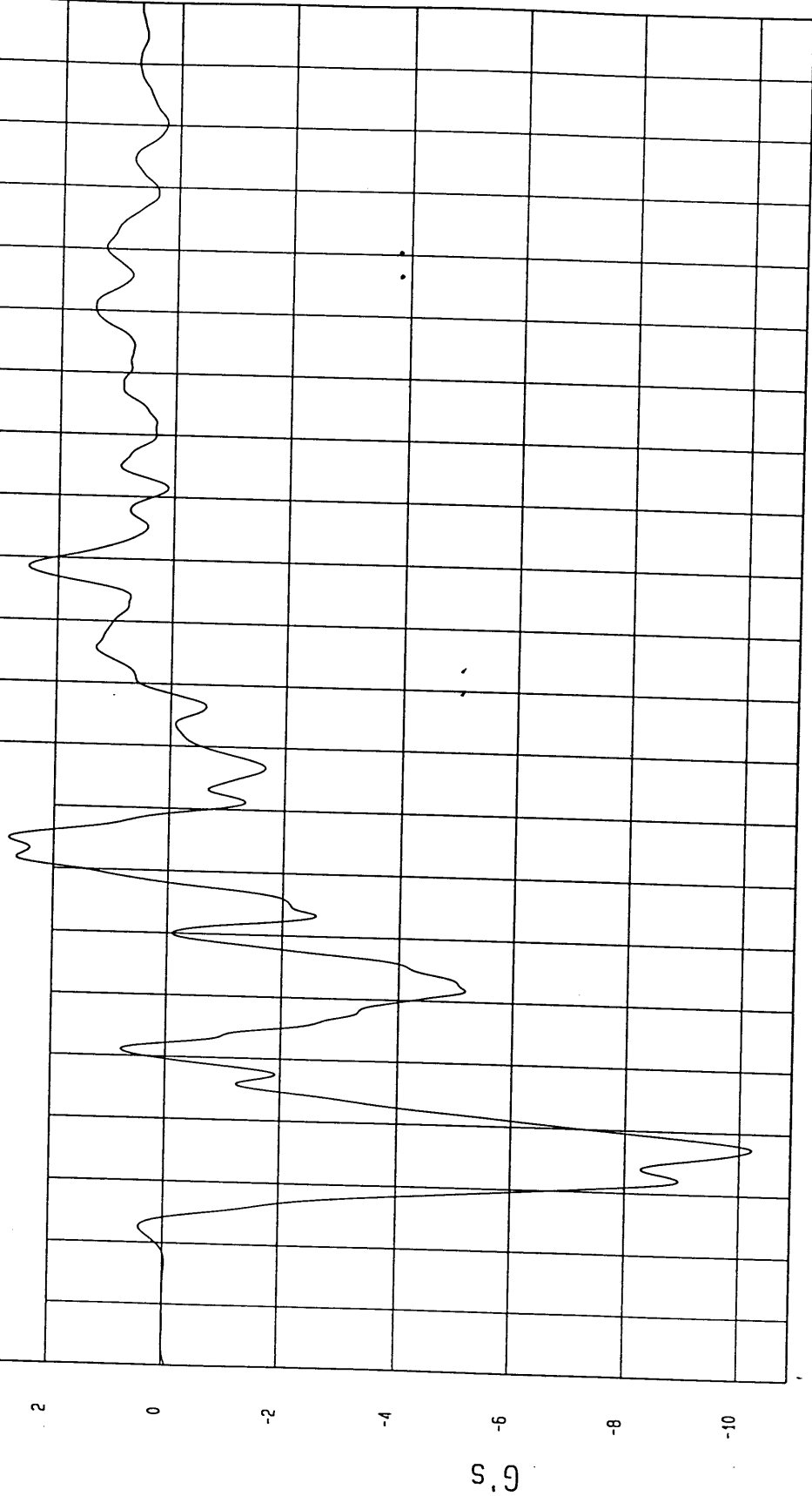
COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -10.22 G's at 17 msec

Maximum = 2.78 G's at 65 msec

REAR FLOORPAN ABOVE AXLE X ACCELERATION

1 800056AF.A23 Filterclass (60)



-10  
-8  
-6  
-4  
-2  
0  
2  
-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

Seconds

MGA Research  
07-25-2000 10:47

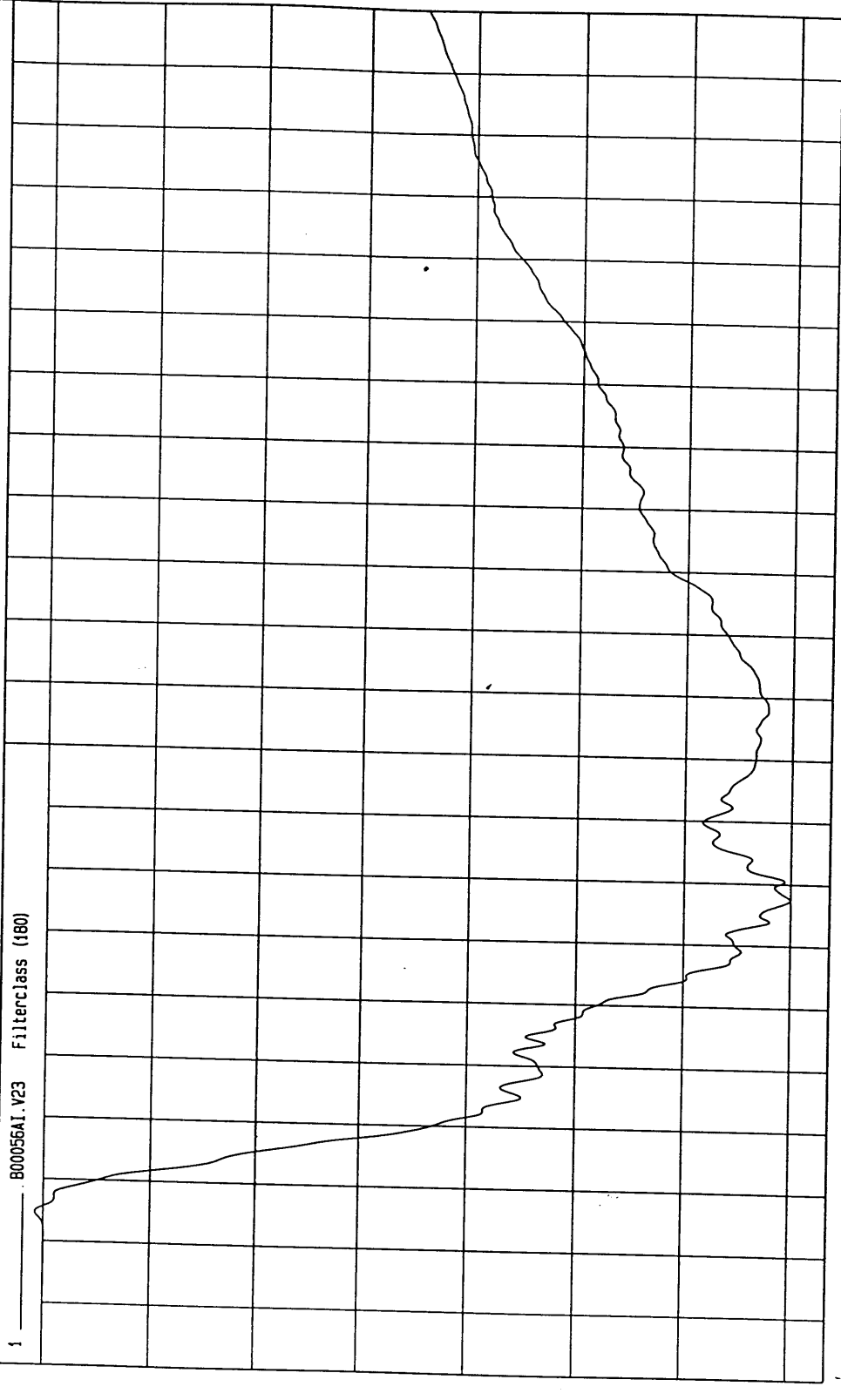
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -6.99 KPH at 58 msec Maximum = 8.33E-02 KPH at 5 msec

REAR FLOORPAN ABOVE AXLE X VELOCITY

1 800056A1.V23 Filterclass (180)



TIME Seconds  
MCA Research  
07-25-2000 10: 47

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

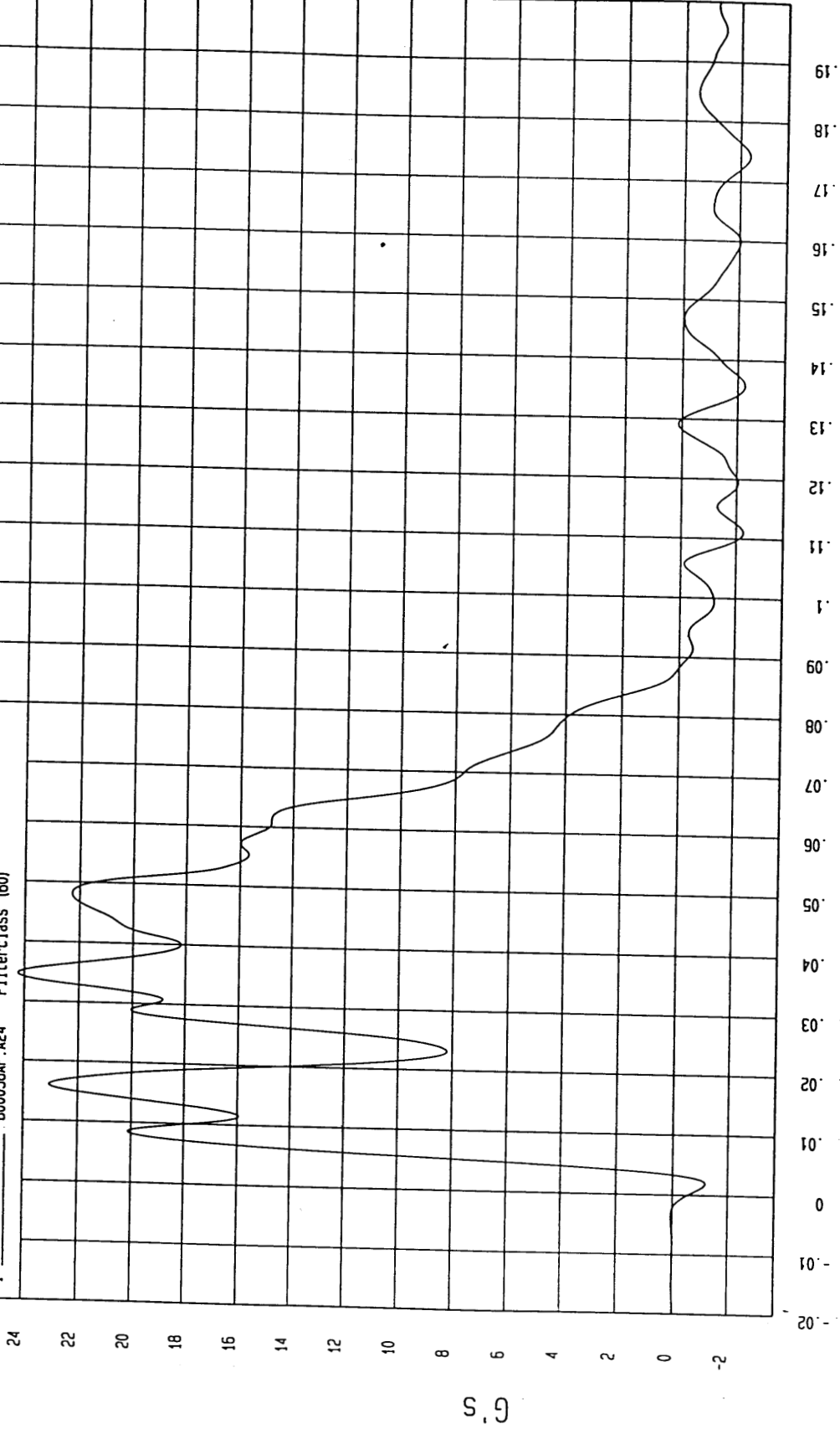
Speed: 38.9 MPH 62.6 KPH

Minimum = -2.35 G's at 174 msec

Maximum = 24.24 G's at 35 msec

REAR FLOORPAN ABOVE AXLE Y ACCELERATION

1 800056AF.A24 Filterclass (60)



MSA Research  
07-25-2000 10:47

Seconds

G's

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

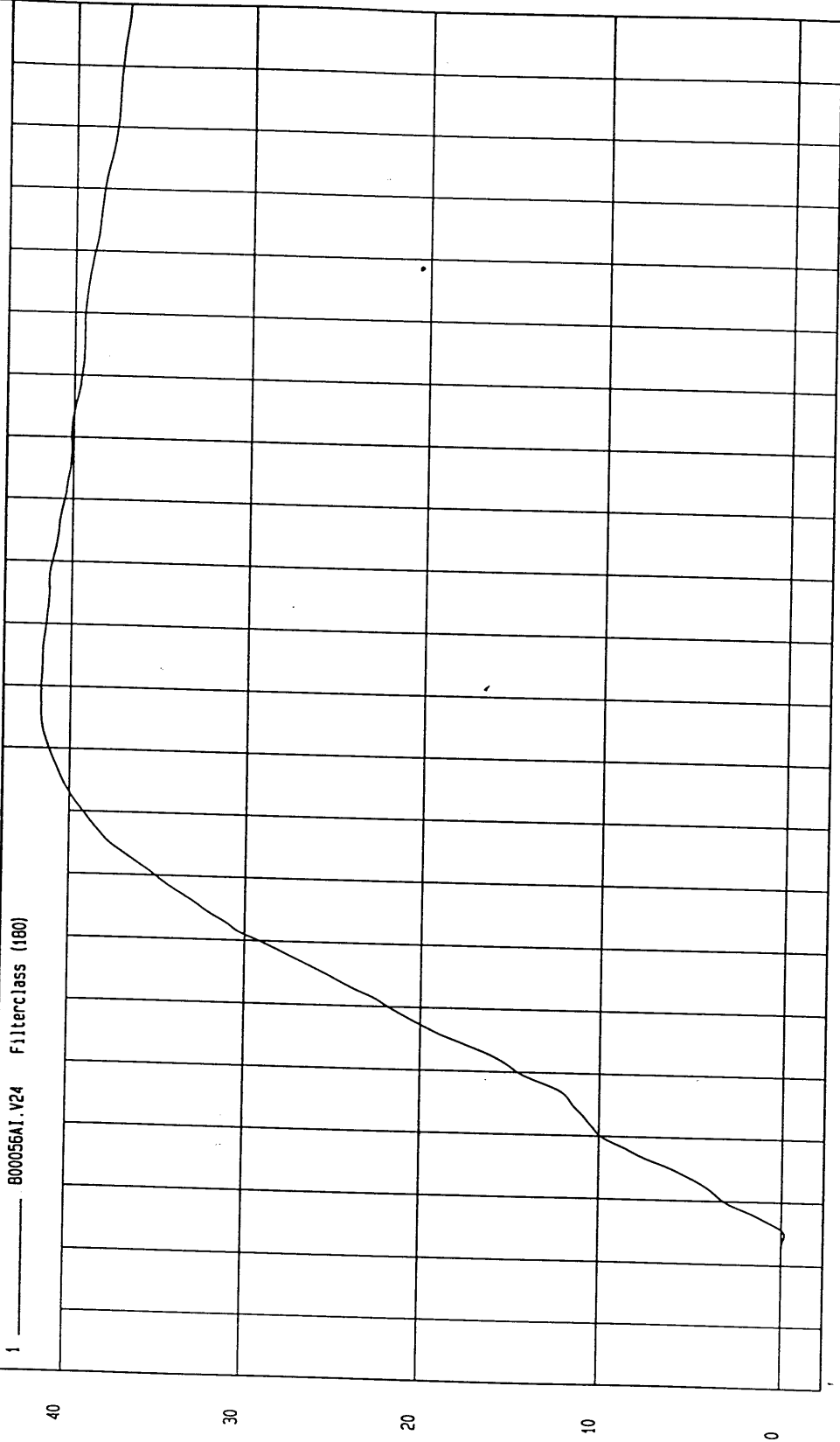
COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -.18 KPH at 5 msec

Maximum = 41.67 KPH at 89 msec

REAR FLOORPAN ABOVE AXLE Y VELOCITY

1 ——— 800056A1.V24 Filterclass (180)



KPH TIME Seconds

MCA Research  
07-25-2000 10:47

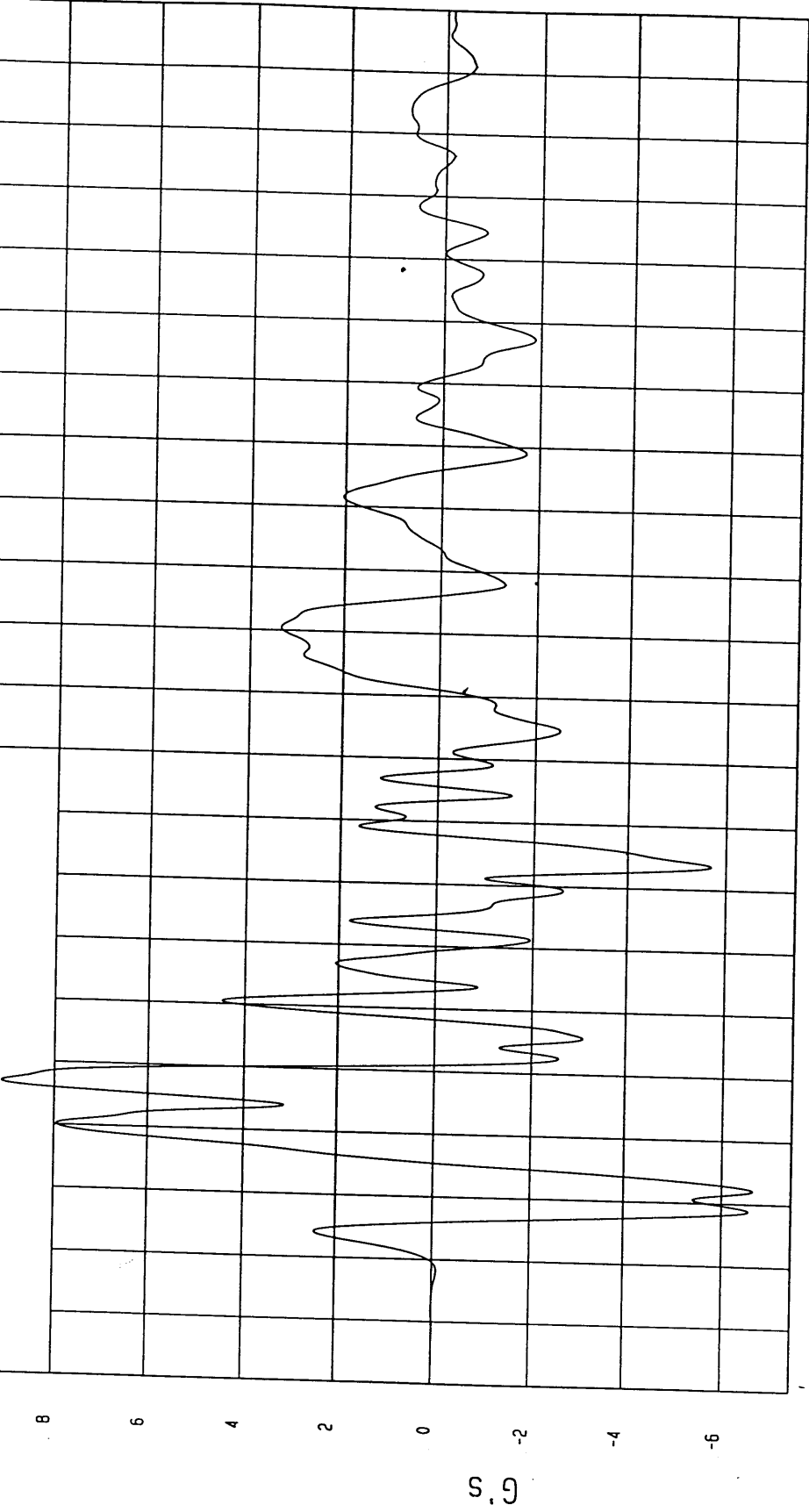
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -6.68 G's at 12 msec  
Maximum = 9.13 G's at 27 msec

REAR FLOORPAN ABOVE AXLE Z ACCELERATION

1 800056AF.A25 Filterclass (60)



Seconds  
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

NSA Research  
01-25-2000 10:47

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

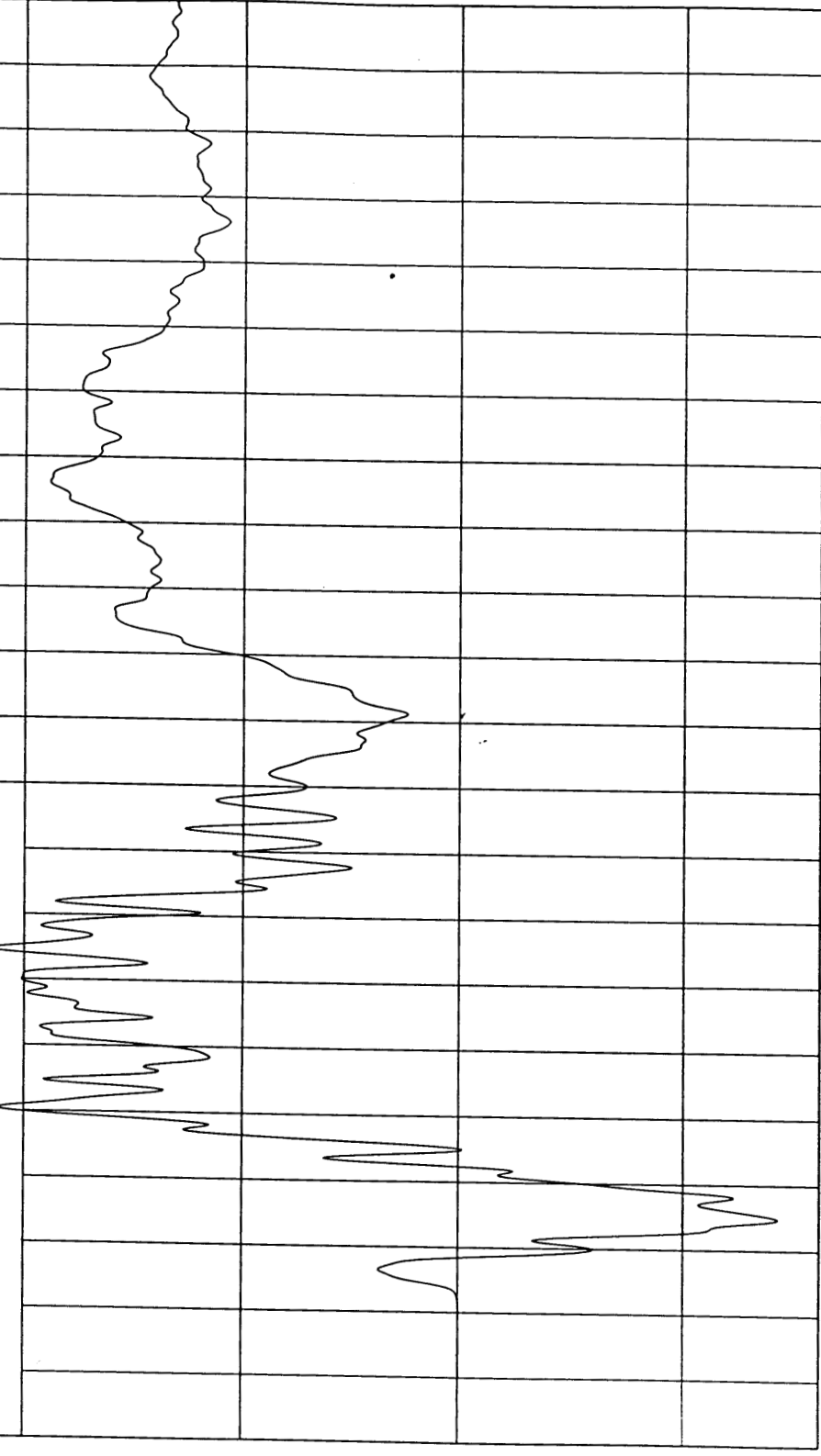
Speed: 38.9 MPH 62.6 KPH

Minimum = -1.42 KPH at 15 msec

Maximum = 2.16 KPH at 55 msec

REAR FLOORPAN ABOVE AXLE Z VELOCITY

1 ——— 800056A1.V25 Filterclass (180)



-2  
-1  
0  
1  
2  
TIME Seconds  
0  
.01  
.02  
.03  
.04  
.05  
.06  
.07  
.08  
.09  
.1  
.11  
.12  
.13  
.14  
.15  
.16  
.17  
.18  
.19  
MGA Research  
07-25-2000 10:47

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

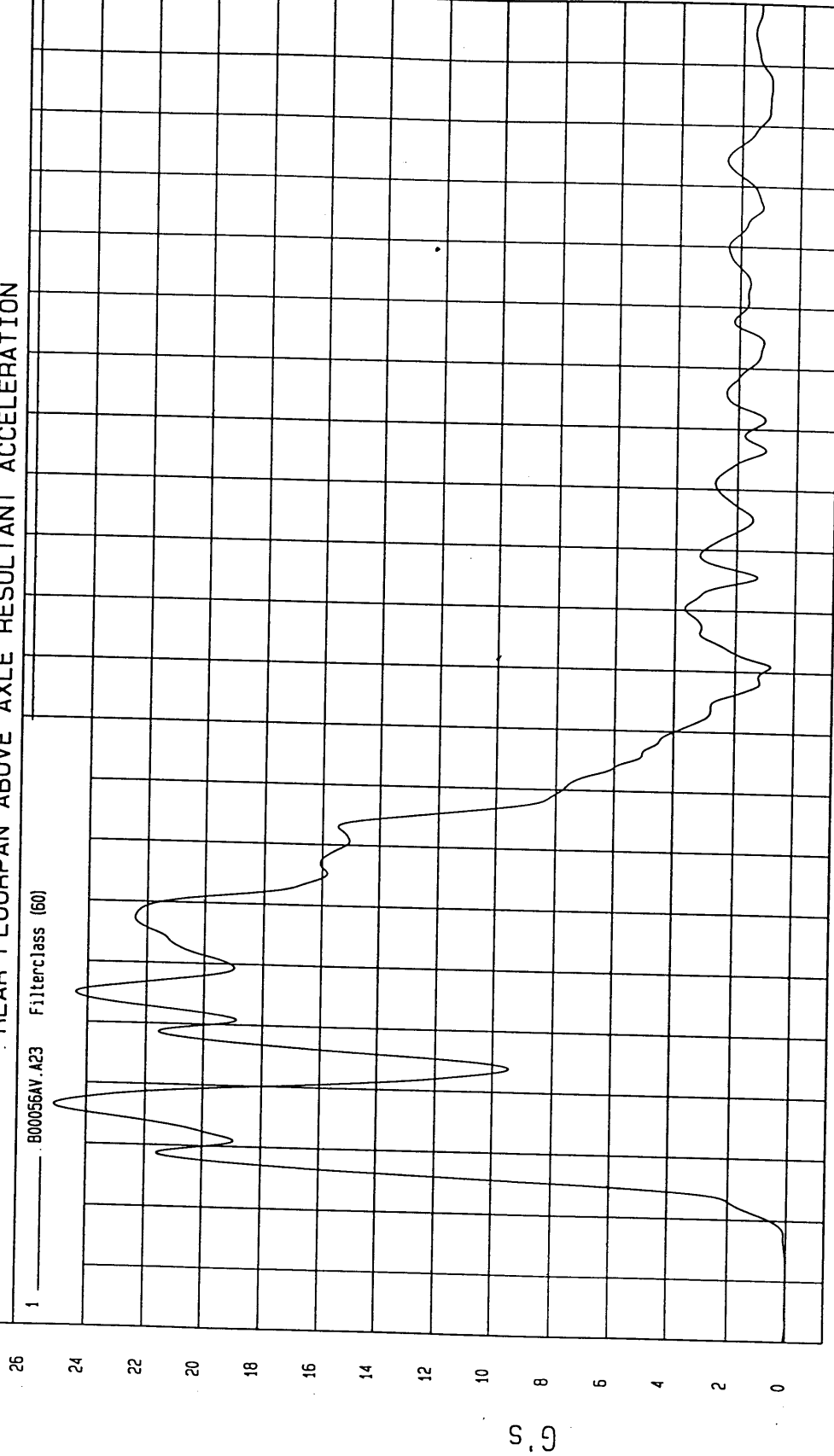
COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = 3.15E-03 G's at -9 msec

Maximum = 25.09 G's at 16 msec

REAR FLOORPAN ABOVE AXLE RESULTANT ACCELERATION

1 800056AV.A23 Filterclass (60)



Seconds

MCA Research  
07-25-2000 10:47

TEST DATE: 07-24-2000

Speed: 38.9 MPH 62.6 KPH

TEST: HIGH SPEED LATERAL IMPACT

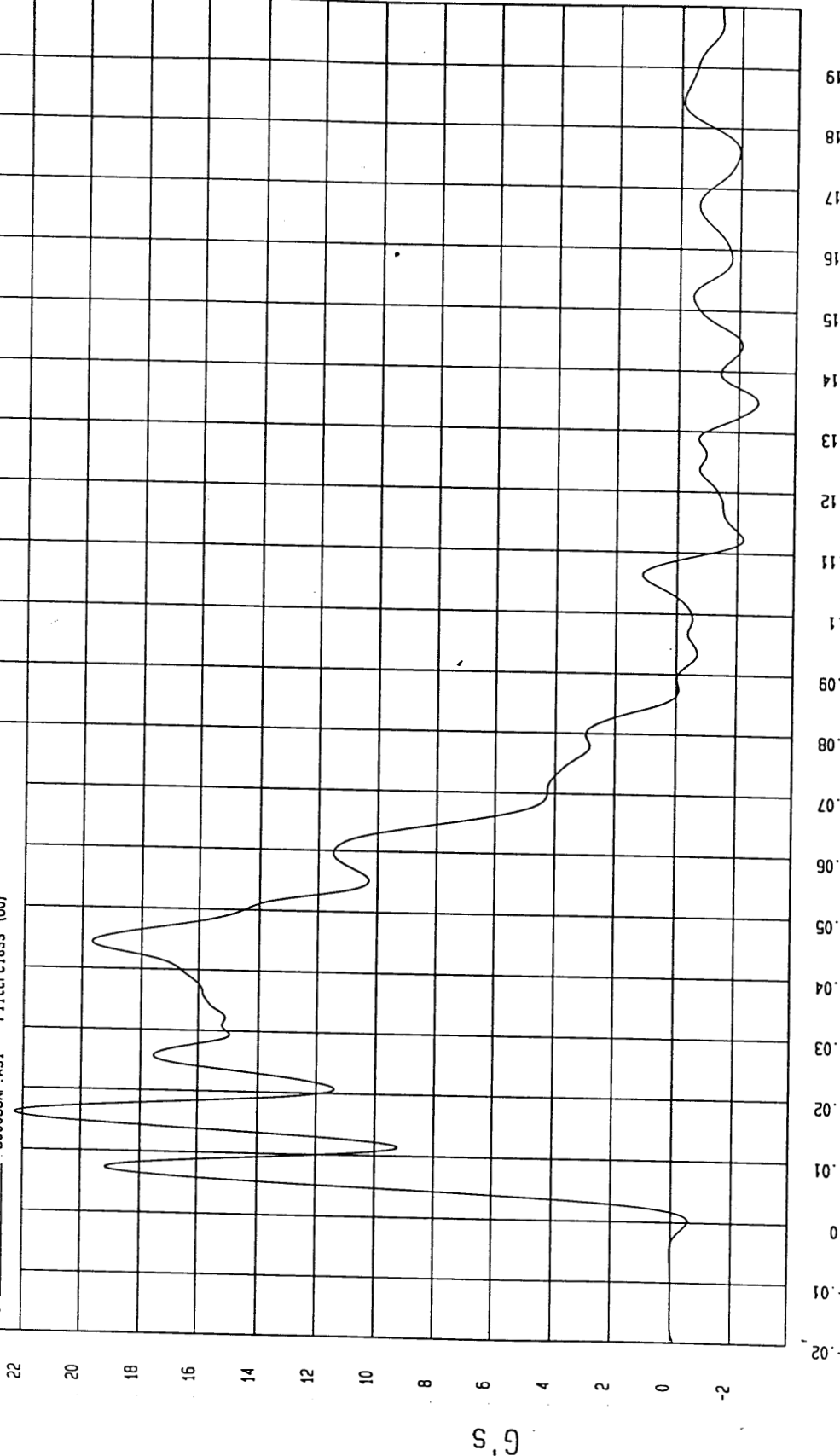
COMPONENT: 2000 SATURN SL2 4 DOOR

Minimum = -2.65 G's at 135 msec

Maximum = 22.28 G's at 16 msec

RIGHT REAR OCCUPANT COMPARTMENT Y ACCELERATION

1 800056AF.A31 Filterclass (60)



NSA Research  
01-25-2000 10:47

Seconds

G's

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

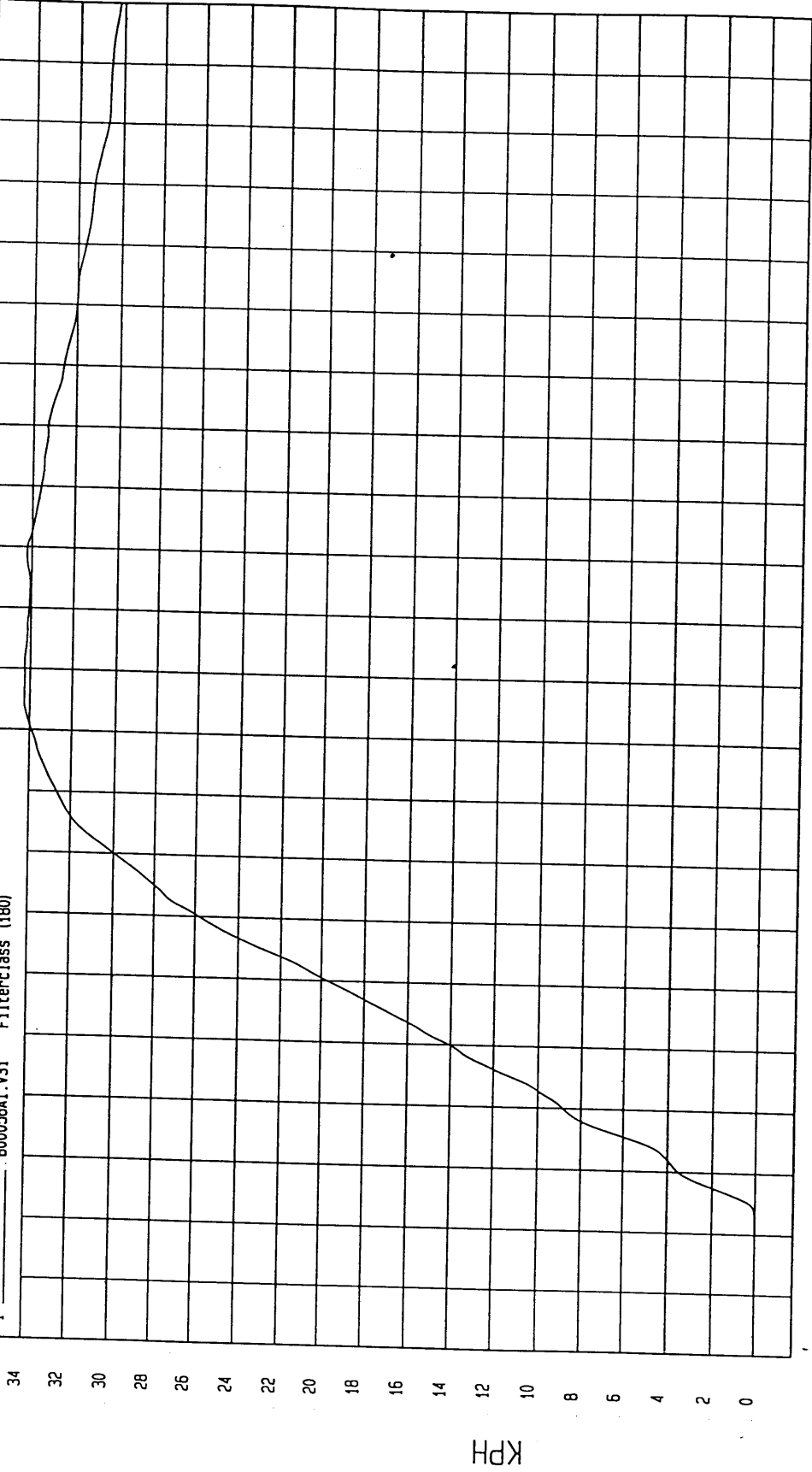
COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -1.22E-03 KPH at -19 msec

Maximum = 34.28 KPH at 91 msec

RIGHT REAR OCCUPANT COMPARTMENT Y VELOCITY

1 800056AI.V31 Filterclass (180)



TIME Seconds

MGA Research  
07-25-2000 10:47

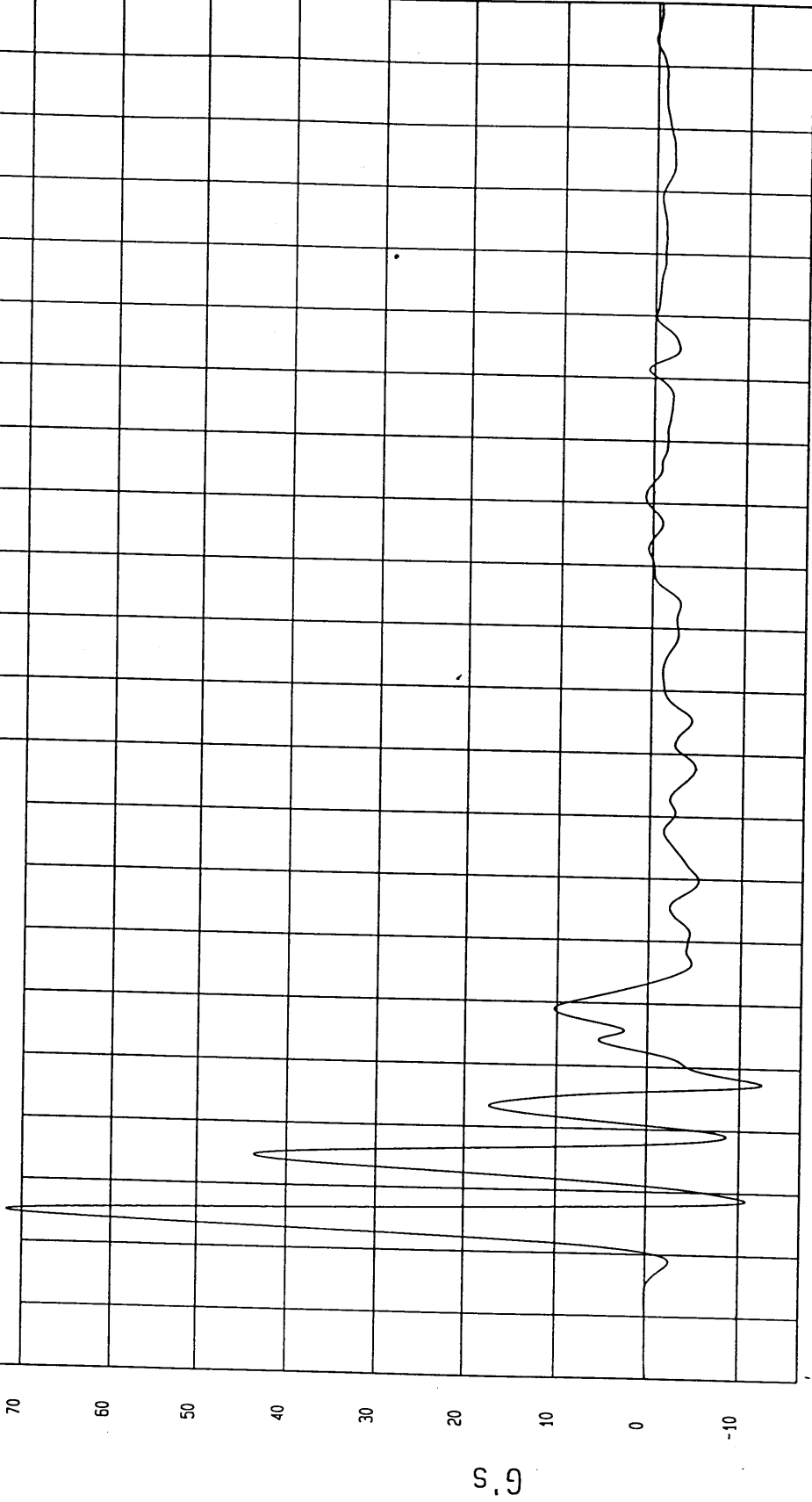
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -12.47 G's at 28 msec  
Maximum = 71.81 G's at 5 msec

LEFT LOWER A-POST Y ACCELERATION

1 800056AF.A27 Filterclass (60)



MPA Research  
07-25-2000 10:47

Seconds

G's

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

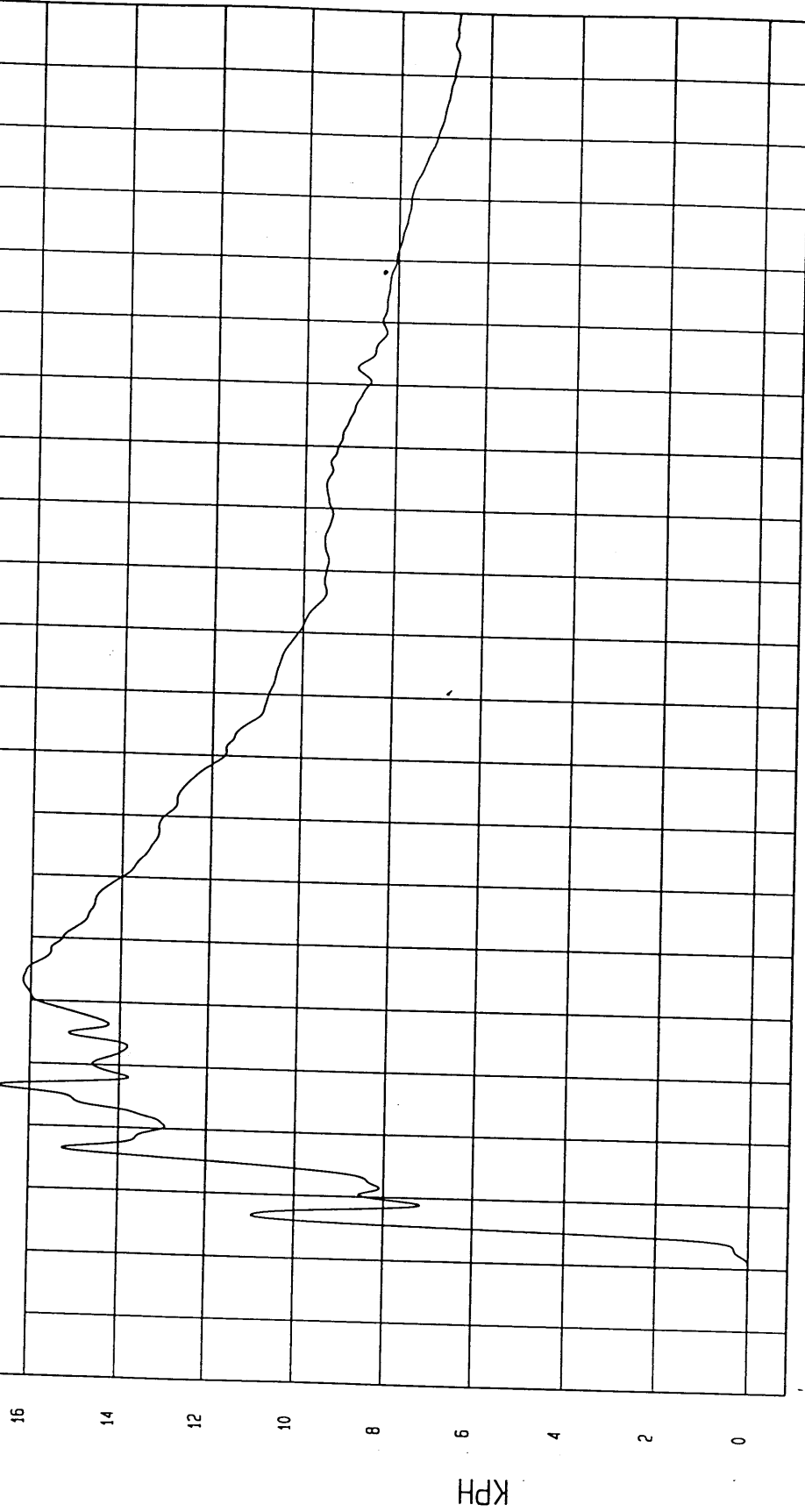
Speed: 38.9 MPH 62.6 KPH

Minimum = 0 KPH at 0 msec

Maximum = 16.75 KPH at 26 msec

LEFT LOWER A-POST Y VELOCITY

1 ——— 800056A1.V27 Filterclass (180)



KPH

TIME Seconds

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

Speed: 38.9 MPH 62.6 KPH

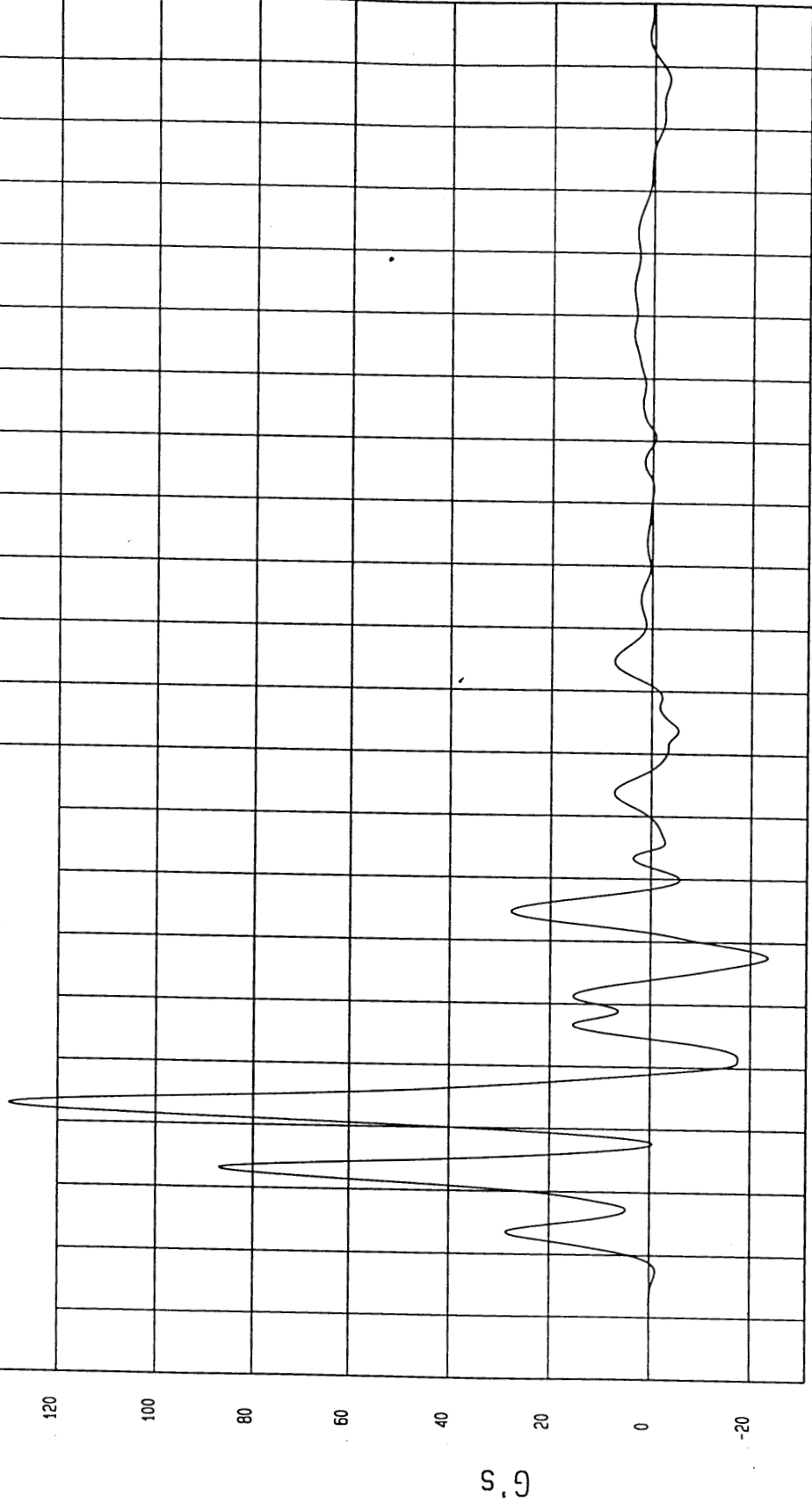
COMPONENT: 2000 SATURN SL2 4 DOOR

Maximum = 130.12 G's at 23 msec

Minimum = -23.56 G's at 48 msec

LEFT MID A-POST Y ACCELERATION

1 ——— .800056AF.A26 Filterclass (50)



Seconds

MCA Research  
07-25-2000 10:48

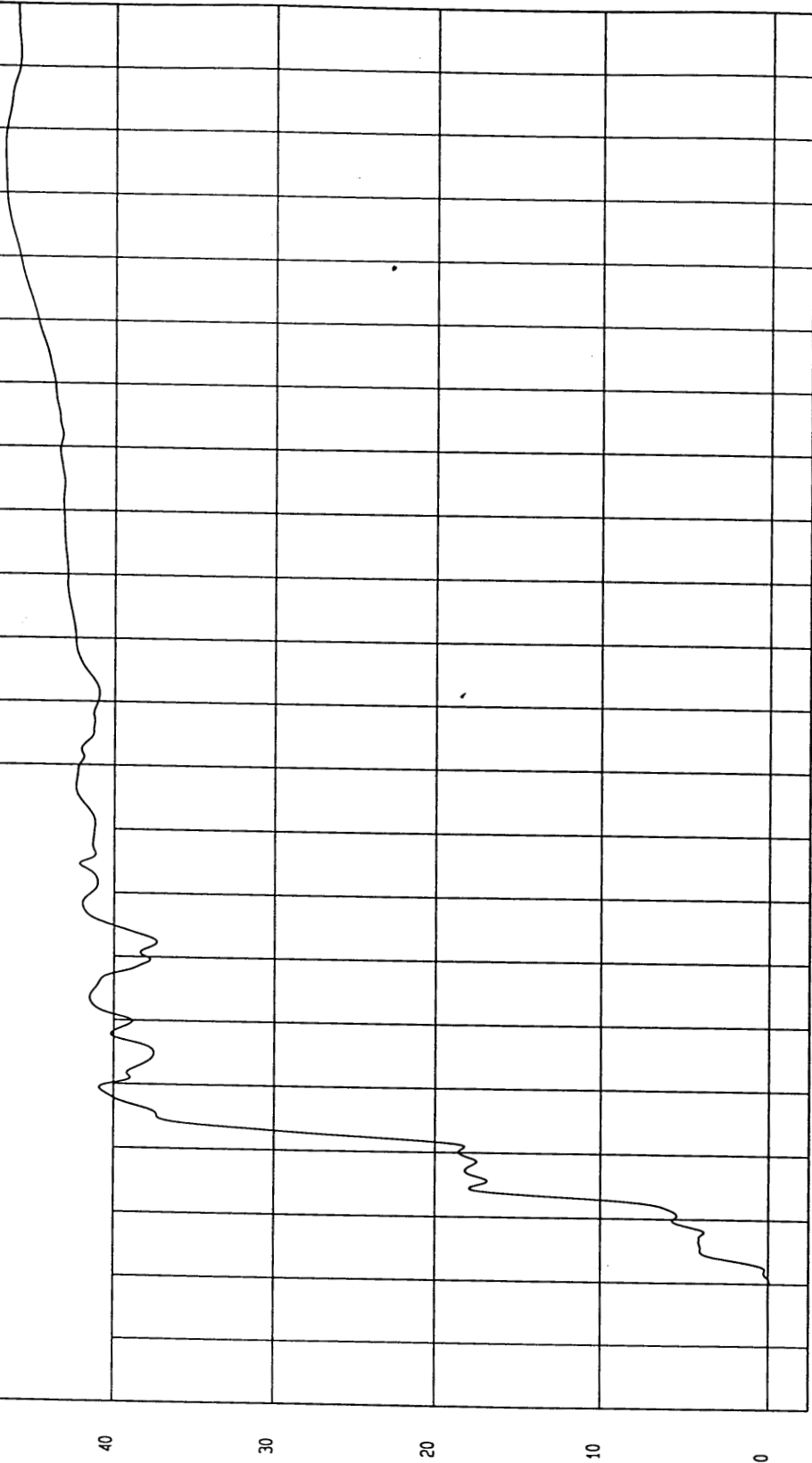
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -6.16E-02 KPH at 0 msec Maximum = 46.88 KPH at 177 msec

LEFT MID A-POST Y VELOCITY

1 ——— .B00056A1.V26 Filterclass (180)



MGA Research  
07-25-2000 10:48

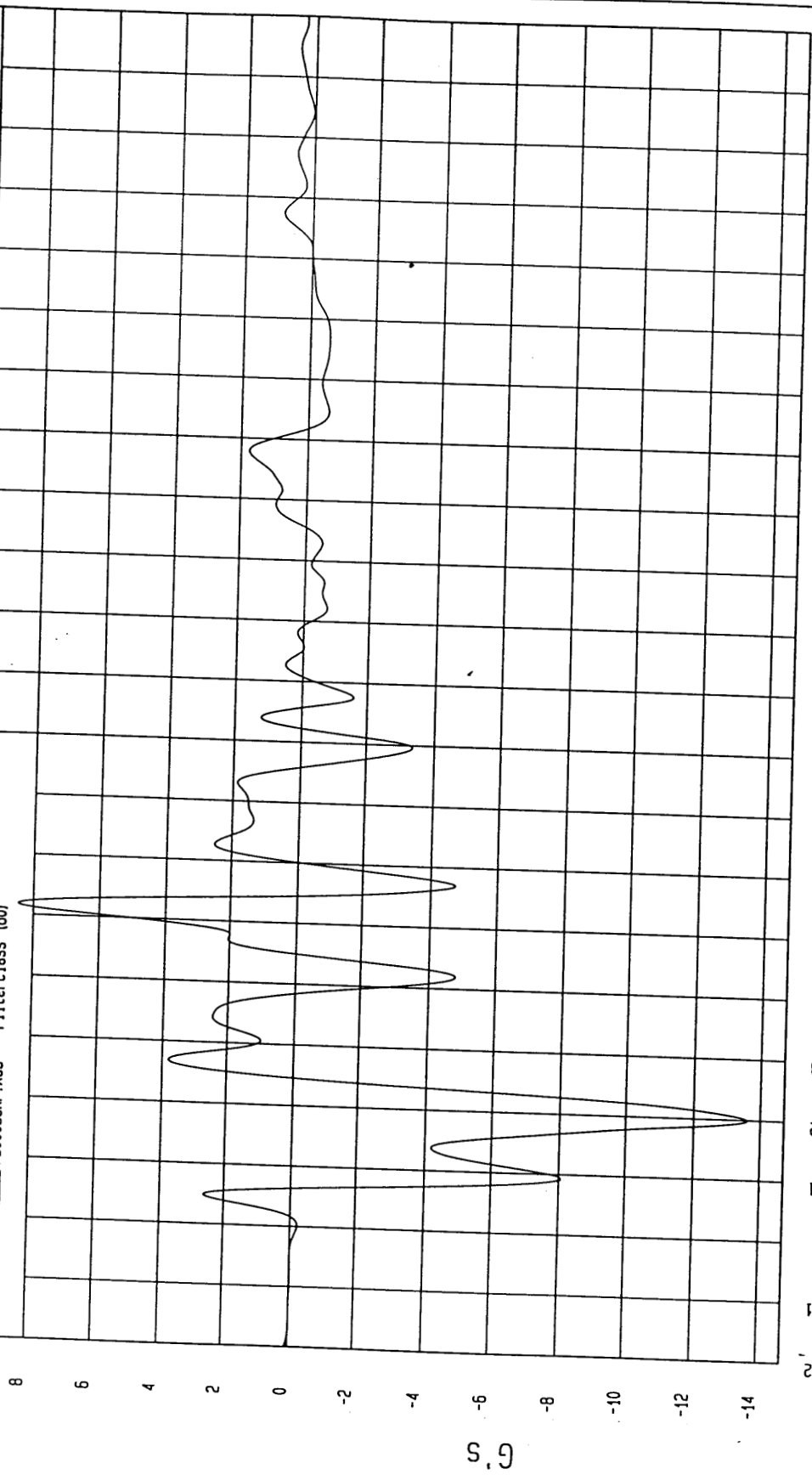
TIME Seconds

TEST: HIGH SPEED LATERAL IMPACT  
TEST DATE: 07-24-2000  
Component: 2000 SATURN SL2 4 DOOR  
Speed: 38.9 MPH 62.6 KPH

Minimum = -13.6 G's at 20 msec  
Maximum = 8.46 G's at 52 msec

VEHICLE CG X ACCELERATION

1 800056AF.A33 Filterclass (60)



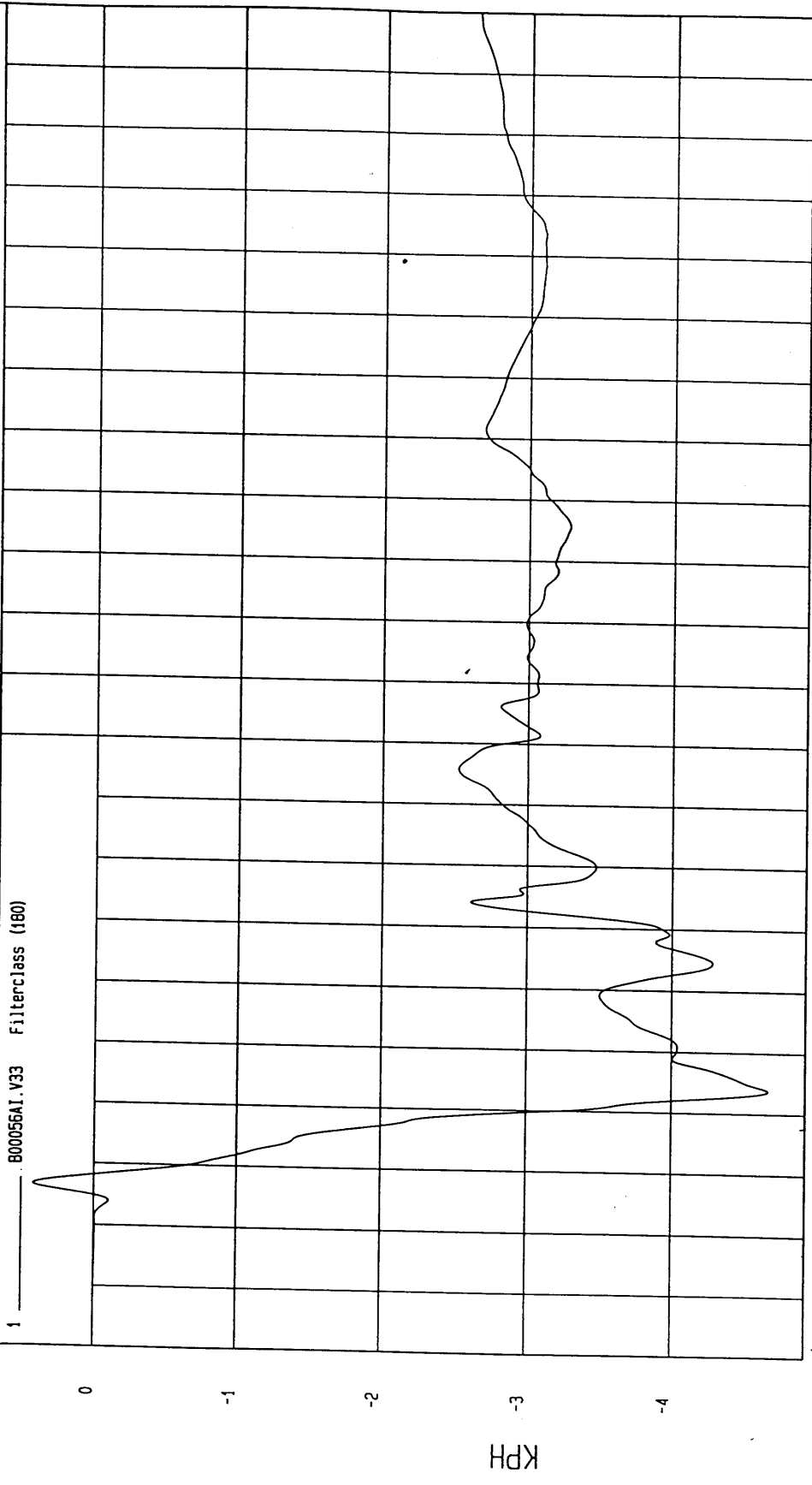
Seconds  
MGA Research  
07-25-2000 10:48

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -4.66 KPH at 24 msec Maximum = .44 KPH at 7 msec

VEHICLE CG X VELOCITY



TIME Seconds

NBA Research  
07-25-2000 10:48

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

Speed: 38.9 MPH 62.6 KPH

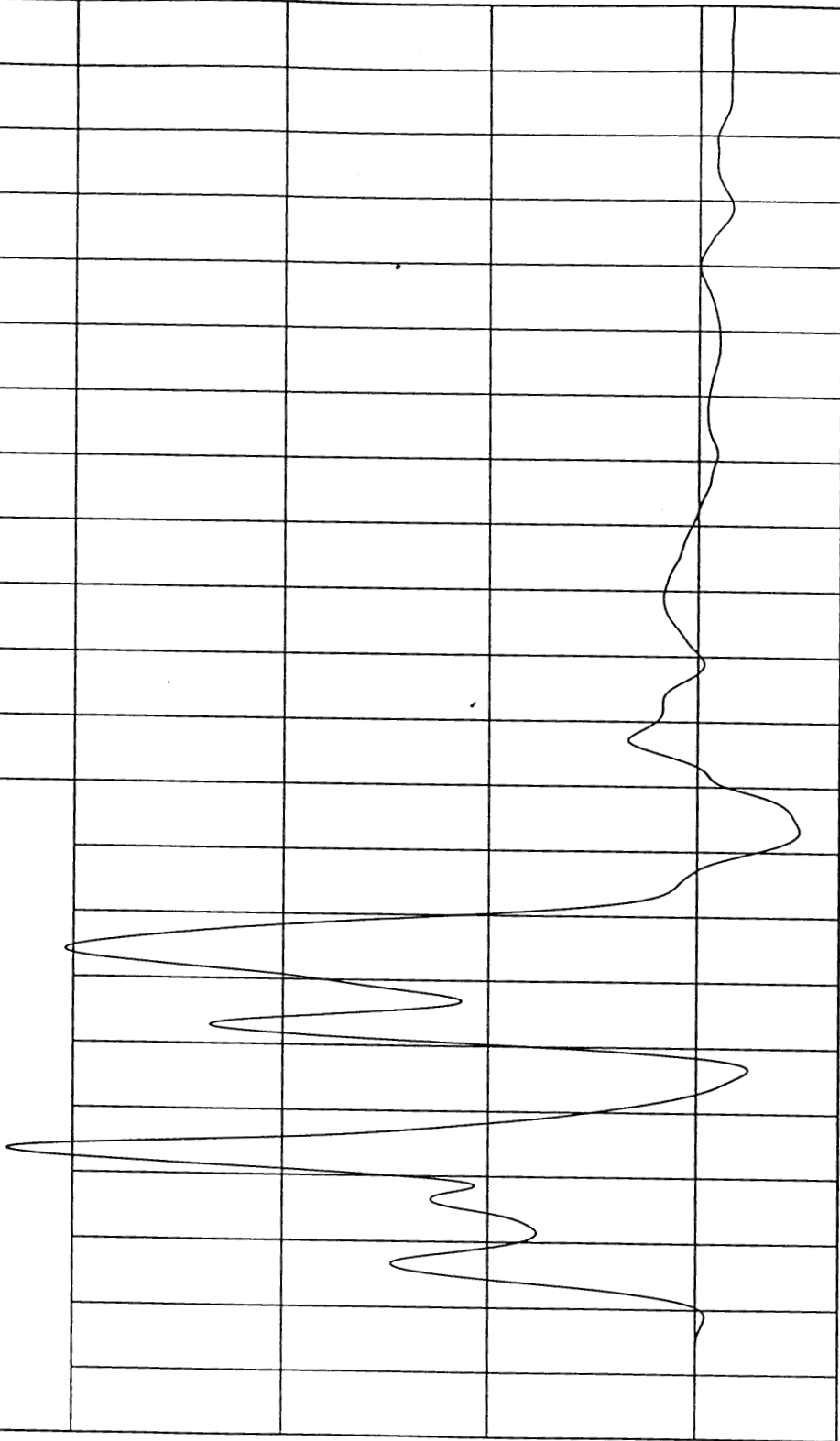
COMPONENT: 2000 SATURN SL2 4 DOOR

Maximum = 33.27 G's at 24 msec

Minimum = -4.82 G's at 73 msec

VEHICLE CG Y ACCELERATION

1 ——— 800056AF.A34 Filterclass (60)



MGA Research  
07-25-2000 10:48

Seconds

G's

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

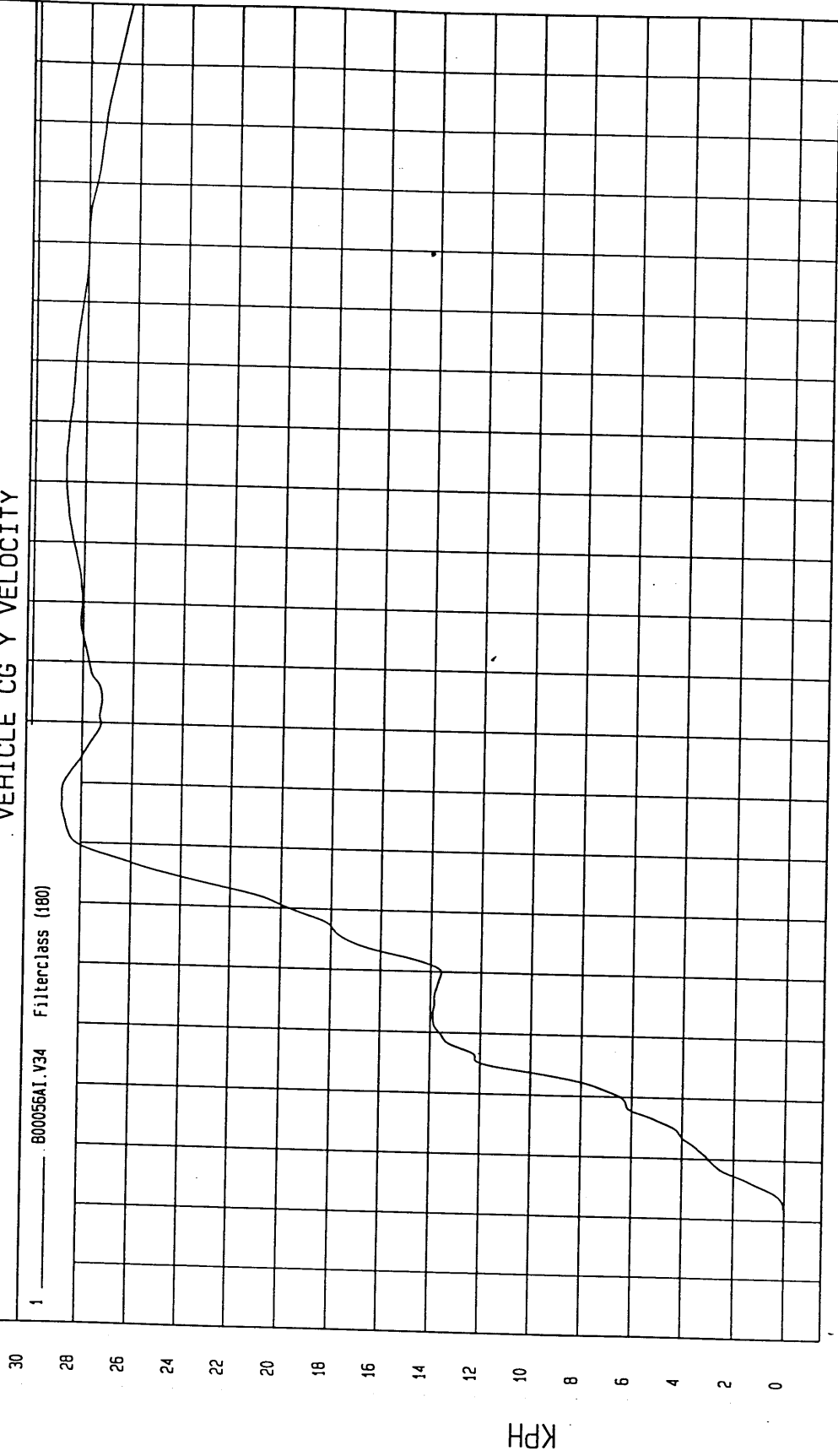
Speed: 38.9 MPH 62.6 KPH

Minimum = -5.90E-03 KPH at 1 msec

Maximum = 28.78 KPH at 68 msec

VEHICLE CG Y VELOCITY

1 ——— 800056A1.V34 Filterclass (180)



TIME Seconds

MCA Research  
07-25-2000 10:48

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

Speed: 38.9 MPH 62.6 KPH

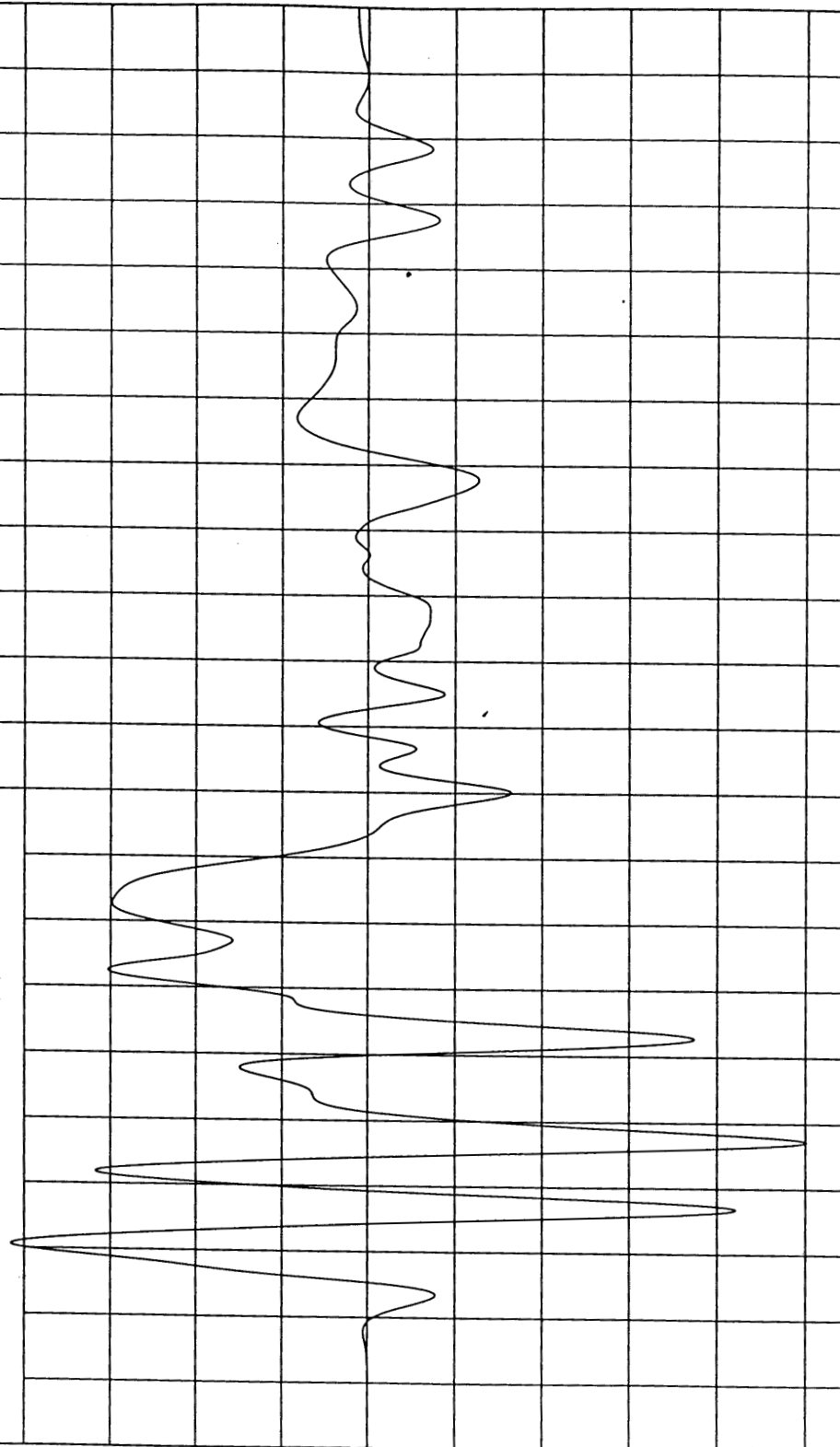
COMPONENT: 2000 SATURN SL2 4 DOOR

Minimum = -10.03 G's at 27 msec

Maximum = 8.32 G's at 11 msec

VEHICLE CG Z ACCELERATION

1 800056AF.A35 Filterclass (50)



Seconds

MCA Research  
01-25-2000 10:48

G's

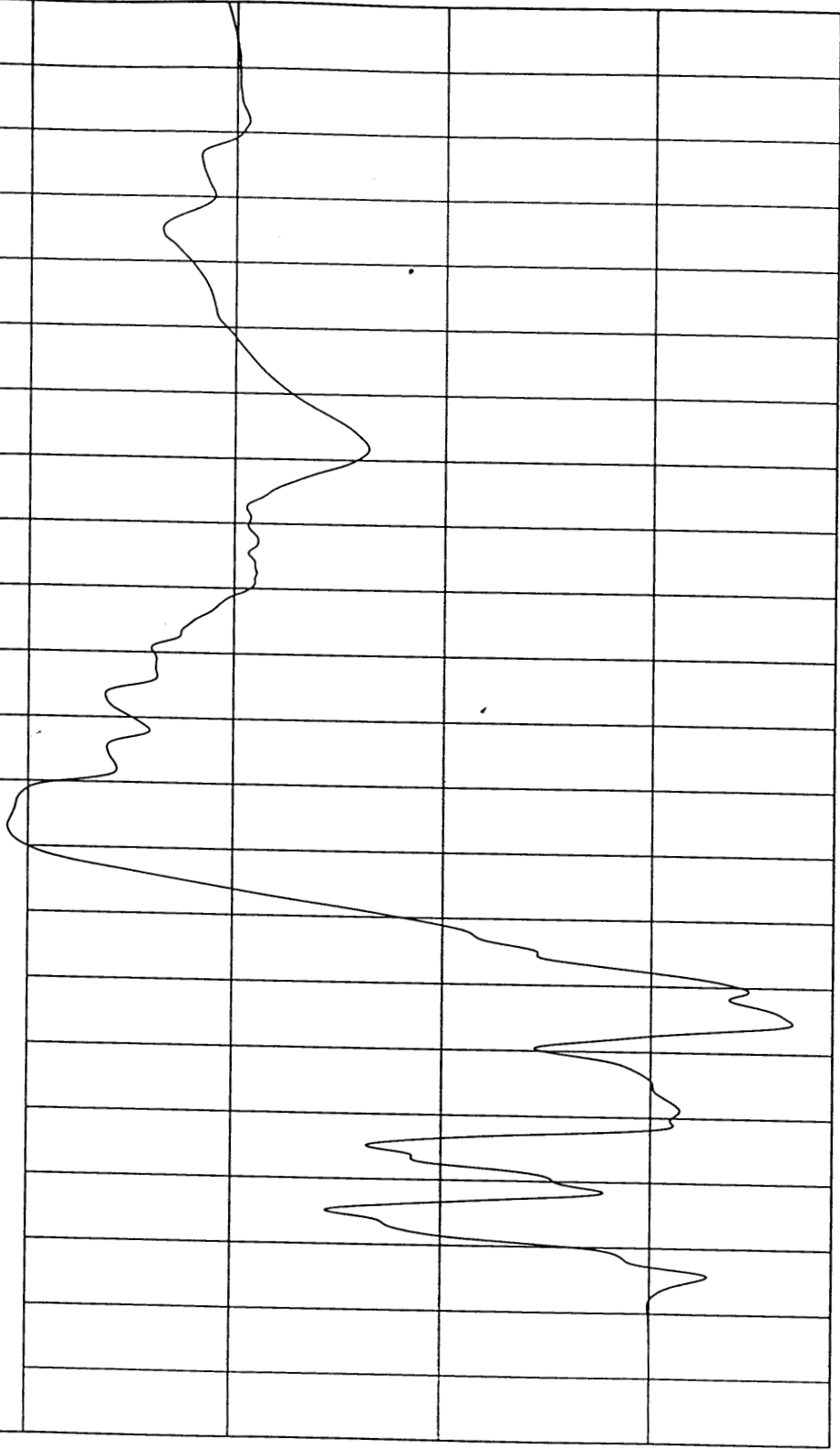
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -.67 KPH at 45 msec Maximum = 3.1 KPH at 73 msec

VEHICLE CG Z VELOCITY

1 ——— .80056A1.V35 Filterclass (180)



MGA Research  
07-25-2000 10:48

TIME Seconds

KPH

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

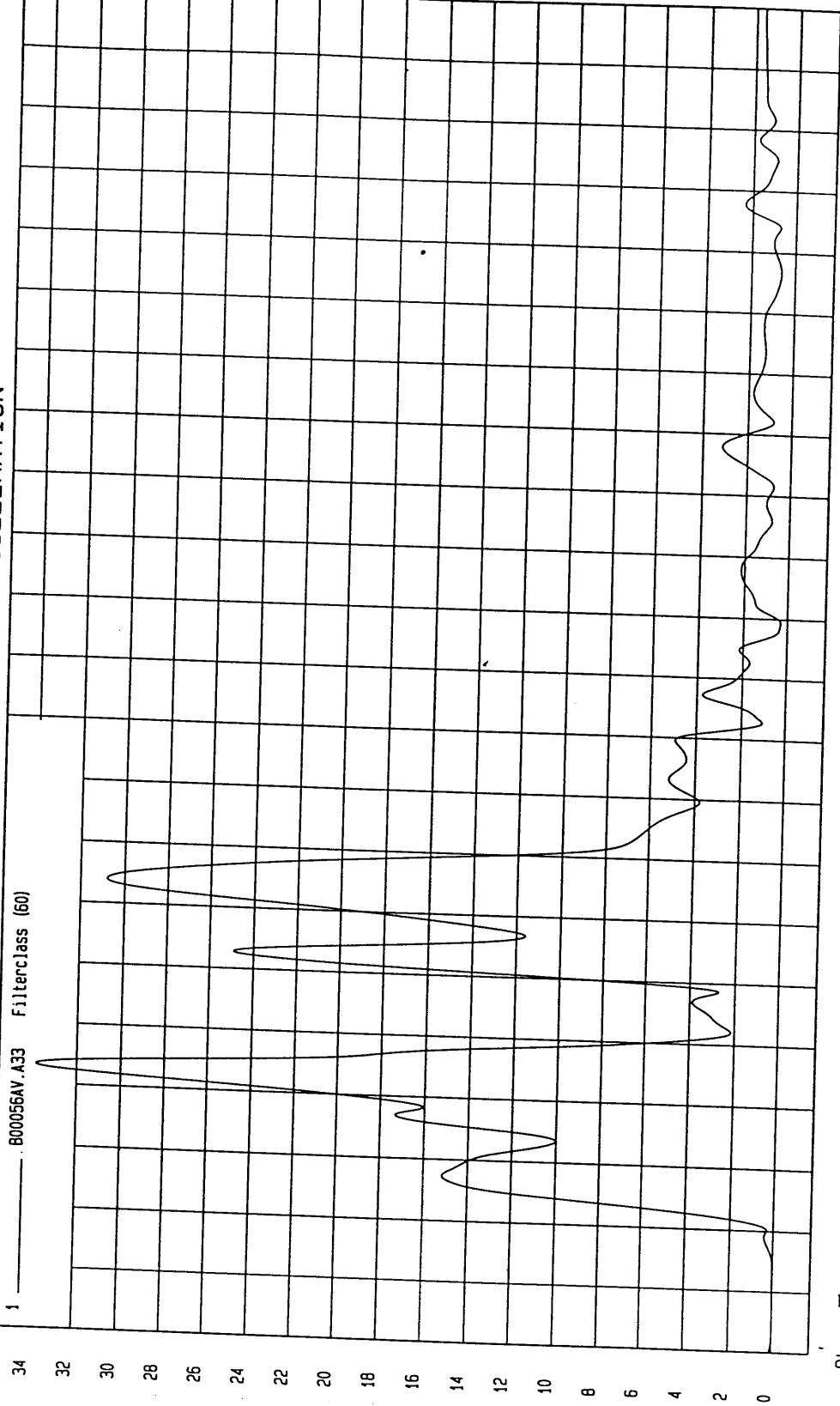
Speed: 38.9 MPH 62.6 KPH

Minimum = 2.82E-03 G's at -17 msec

Maximum = 33.85 G's at 23 msec

VEHICLE CG RESULTANT ACCELERATION

1 ——— B00056AV.A33 Filterclass (60)



Seconds

MGA Research  
07-25-2000 10:48

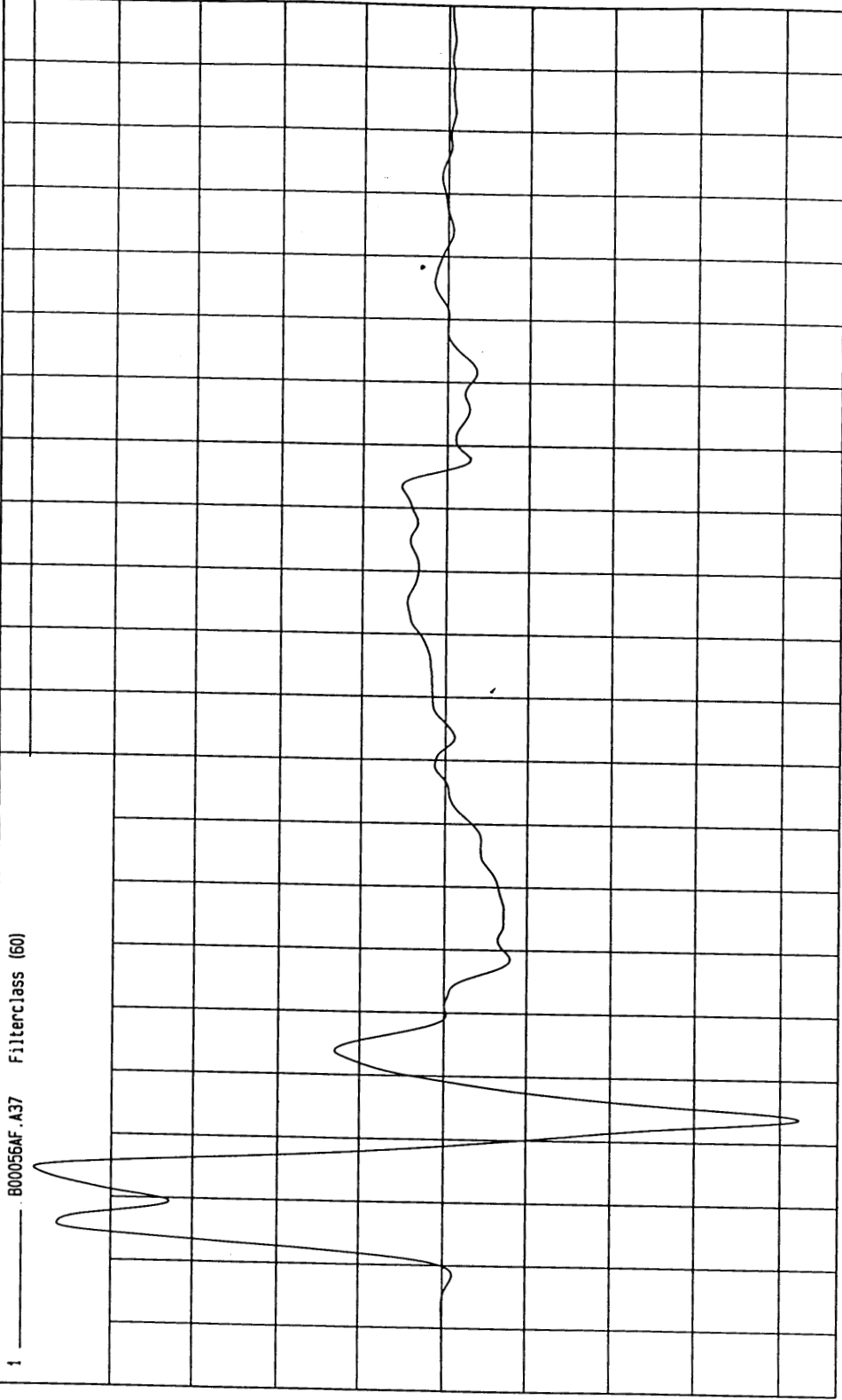
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -84.49 G's at 24 msec Maximum = 98.45 G's at 14 msec

LEFT FRONT DOOR MIDREAR Y ACCELERATION

1 B00056AF.A37 Filterclass (60)



MGA Research  
07-25-2000 10:48

Seconds

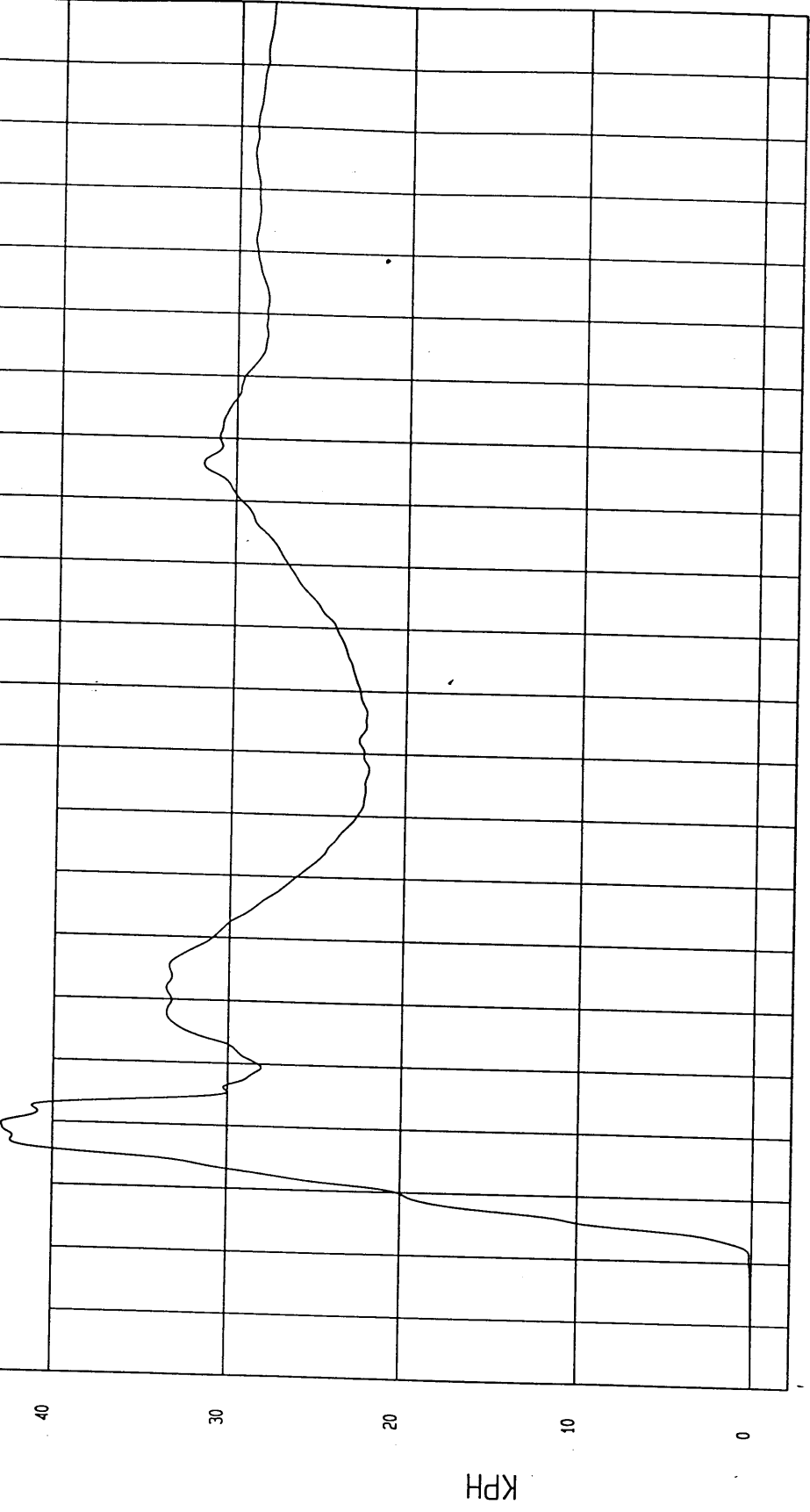
G's

TEST: HIGH SPEED LATERAL IMPACT  
TEST DATE: 07-24-2000  
Speed: 38.9 MPH 62.6 KPH

COMPONENT: 2000 SATURN SL2 4 DOOR  
Minimum = -9.23E-05 KPH at -20 msec  
Maximum = 43.03 KPH at 20 msec

LEFT FRONT DOOR MIDREAR Y VELOCITY

1 800056A1.V37 Filterclass (180)



TIME Seconds  
NCA Research  
07-25-2000 10:48

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

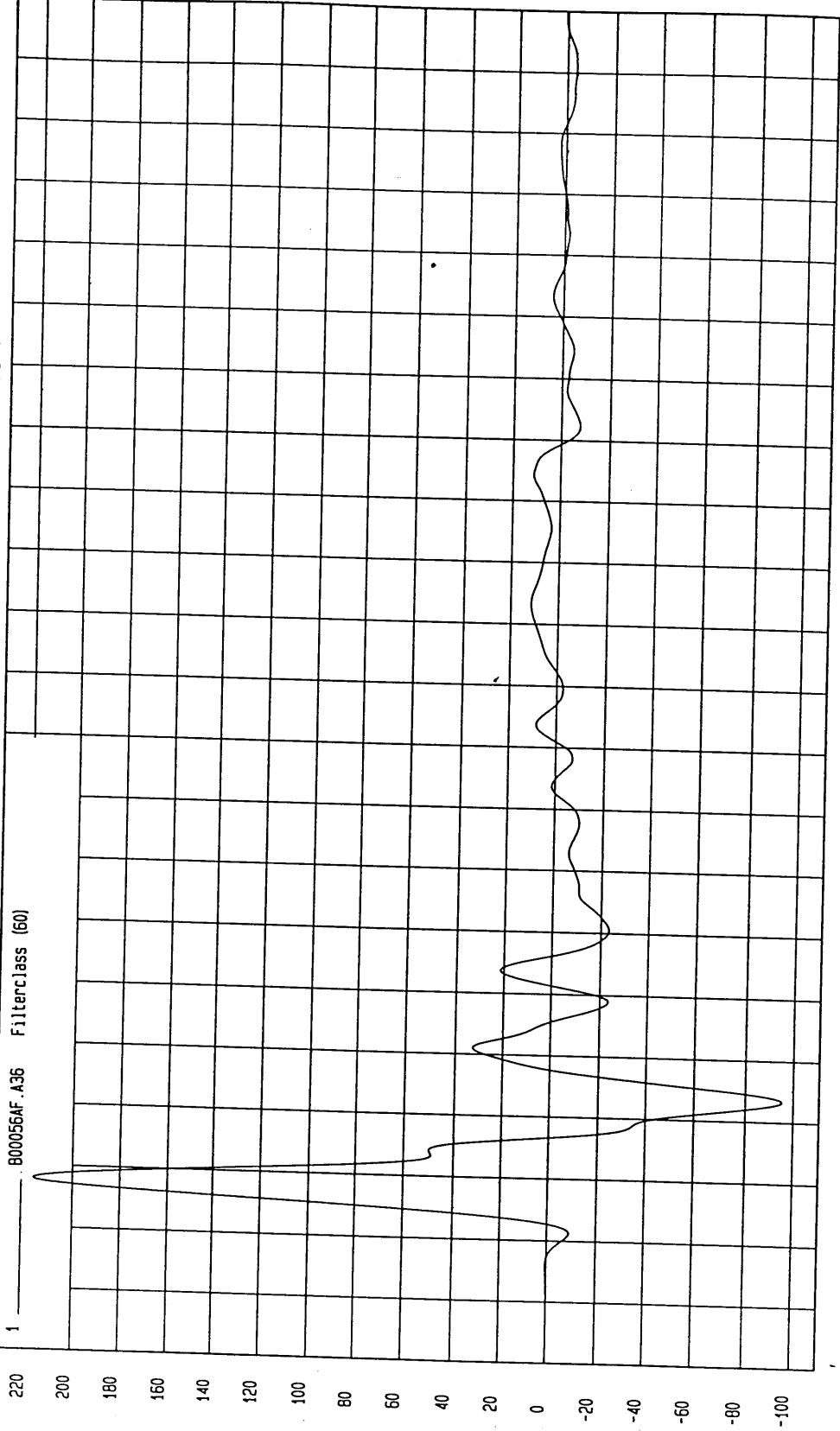
Speed: 38.9 MPH 62.6 KPH

Minimum = -95.24 G's at 23 msec

Maximum = 217.1 G's at 8 msec

LEFT FRONT DOOR CENTERLINE Y ACCELERATION

1 800056AF.A36 Filterclass (60)



Seconds

NBA Research  
07-25-2000 10:48

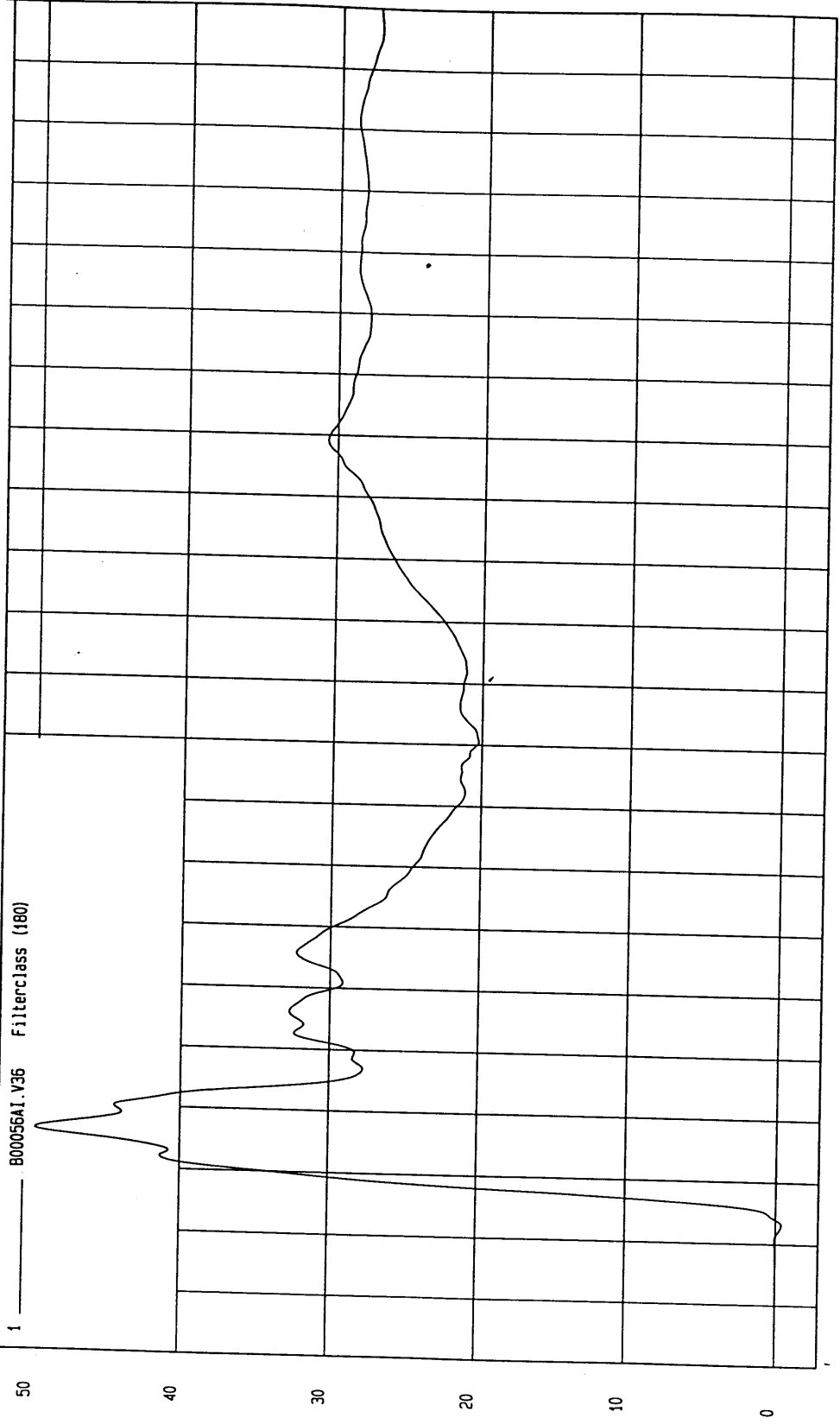
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -.38 KPH at 3 msec Maximum = 49.91 KPH at 16 msec

LEFT FRONT DOOR CENTERLINE Y VELOCITY

1 — 800056A1.V36 Filterclass (480)



TIME Seconds

MCA Research  
07-25-2000 10:48

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

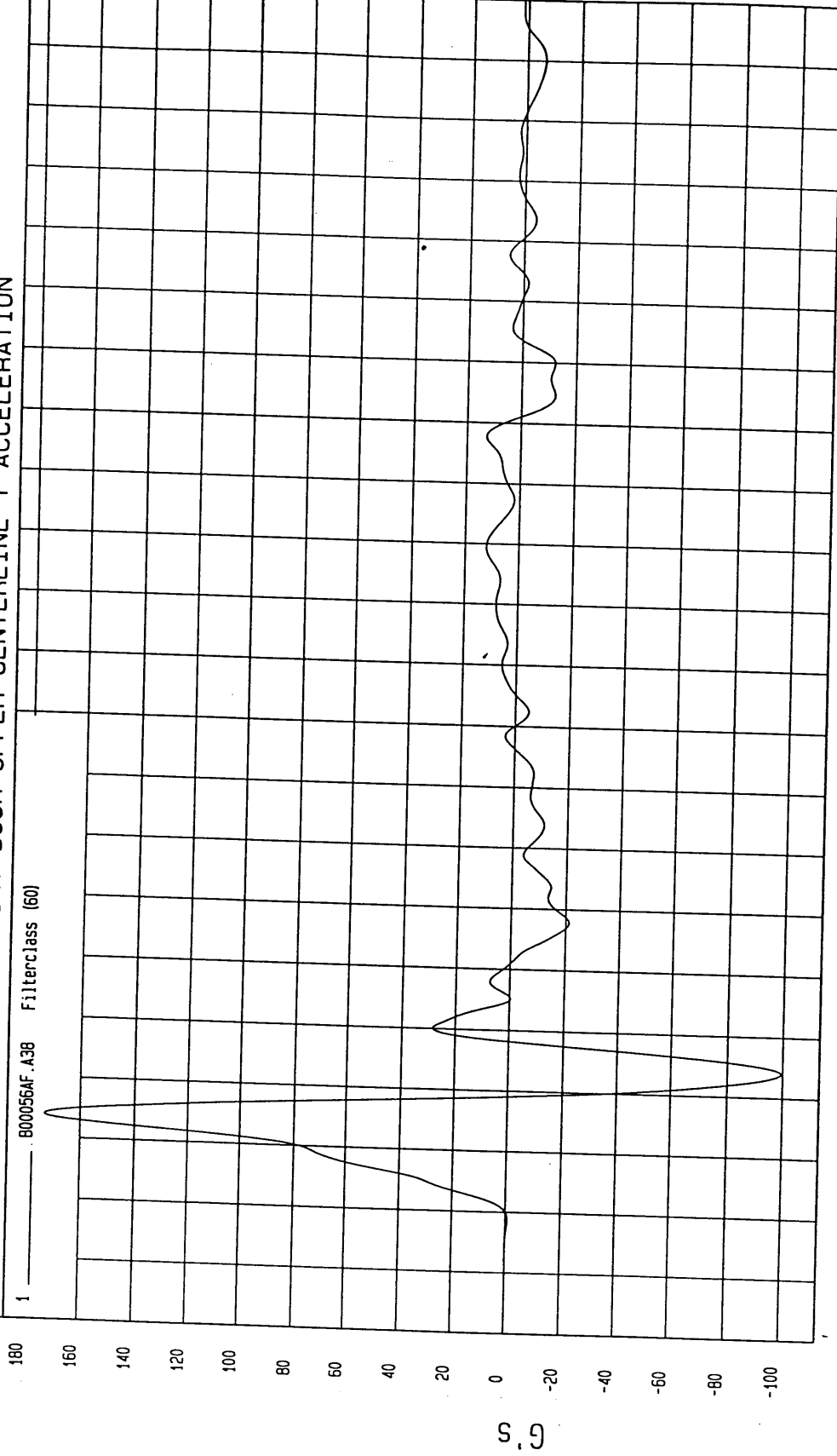
Speed: 38.9 MPH 62.6 KPH

Minimum = -99.41 G's at 24 msec

Maximum = 173.51 G's at 14 msec

LEFT FRONT DOOR UPPER CENTERLINE Y ACCELERATION

1 800056AF.A38 Filterclass (60)



MGA Research  
07-25-2000 10:48

Seconds

G's

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

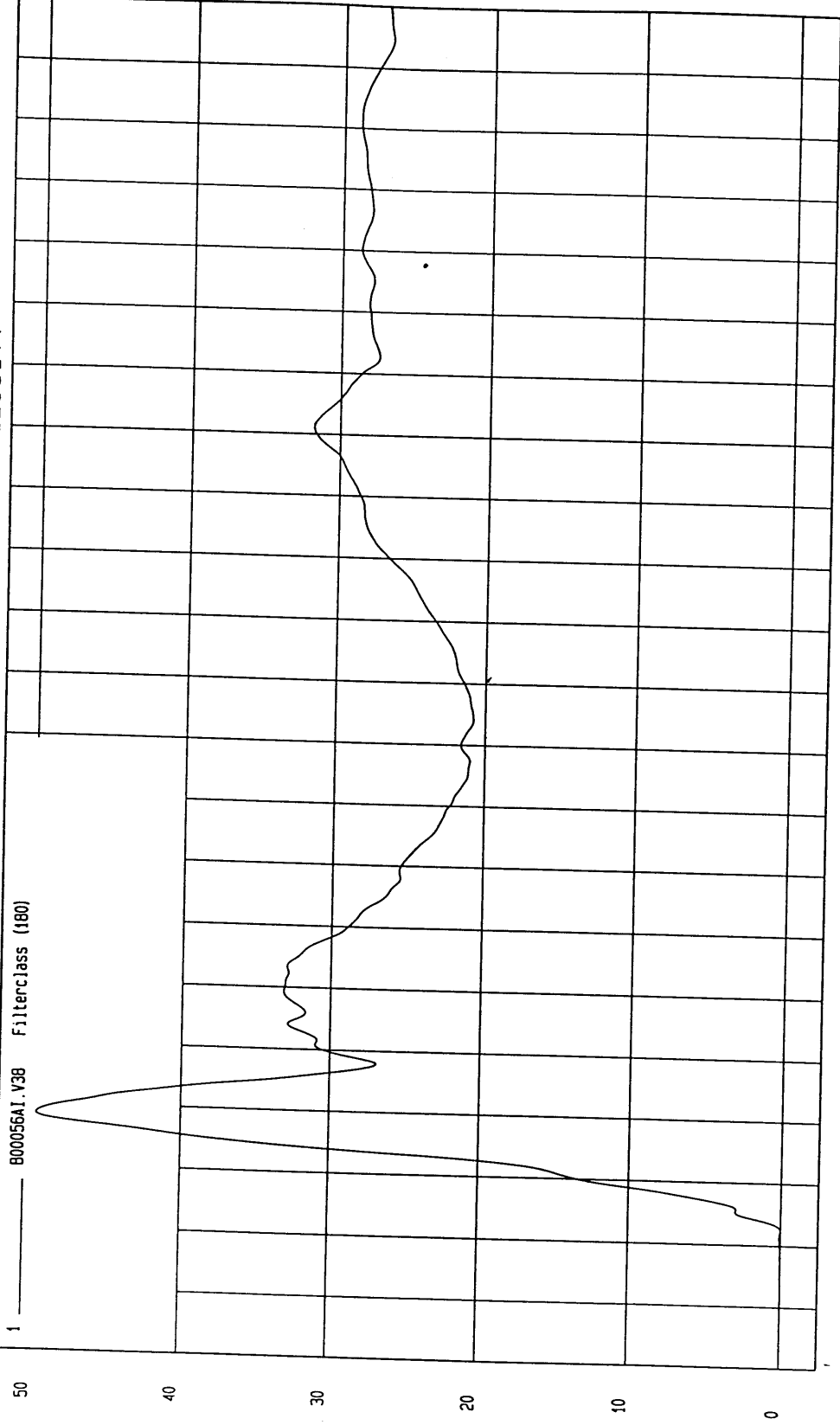
Speed: 38.9 MPH 62.6 KPH

Minimum = 0 KPH at -20 msec

Maximum = 49.76 KPH at 19 msec

LEFT FRONT DOOR UPPER CENTERLINE Y VELOCITY

1 ——— 800056AI.V38 FilterClass (180)



WGA Research  
07-25-2000 10:48

TIME Seconds

KPH

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

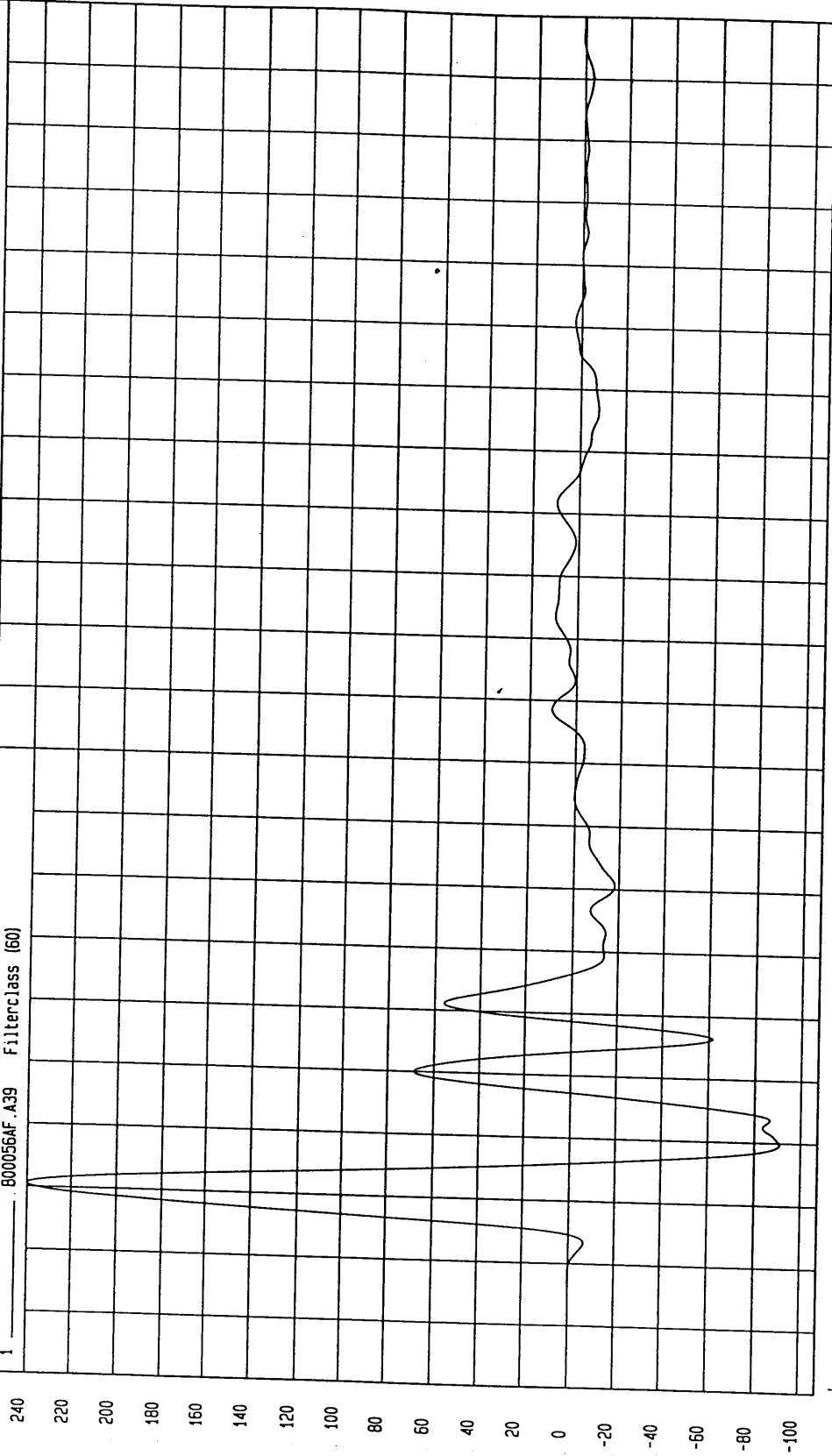
Speed: 38.9 MPH 62.6 KPH

Minimum = -90.84 G's at 20 msec

Maximum = 240.19 G's at 11 msec

LEFT REAR DOOR MIDREAR Y ACCELERATION

1 800056AF.A39 Filterclass (60)



Seconds

MGA Research  
07-25-2000 10:48

G's

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

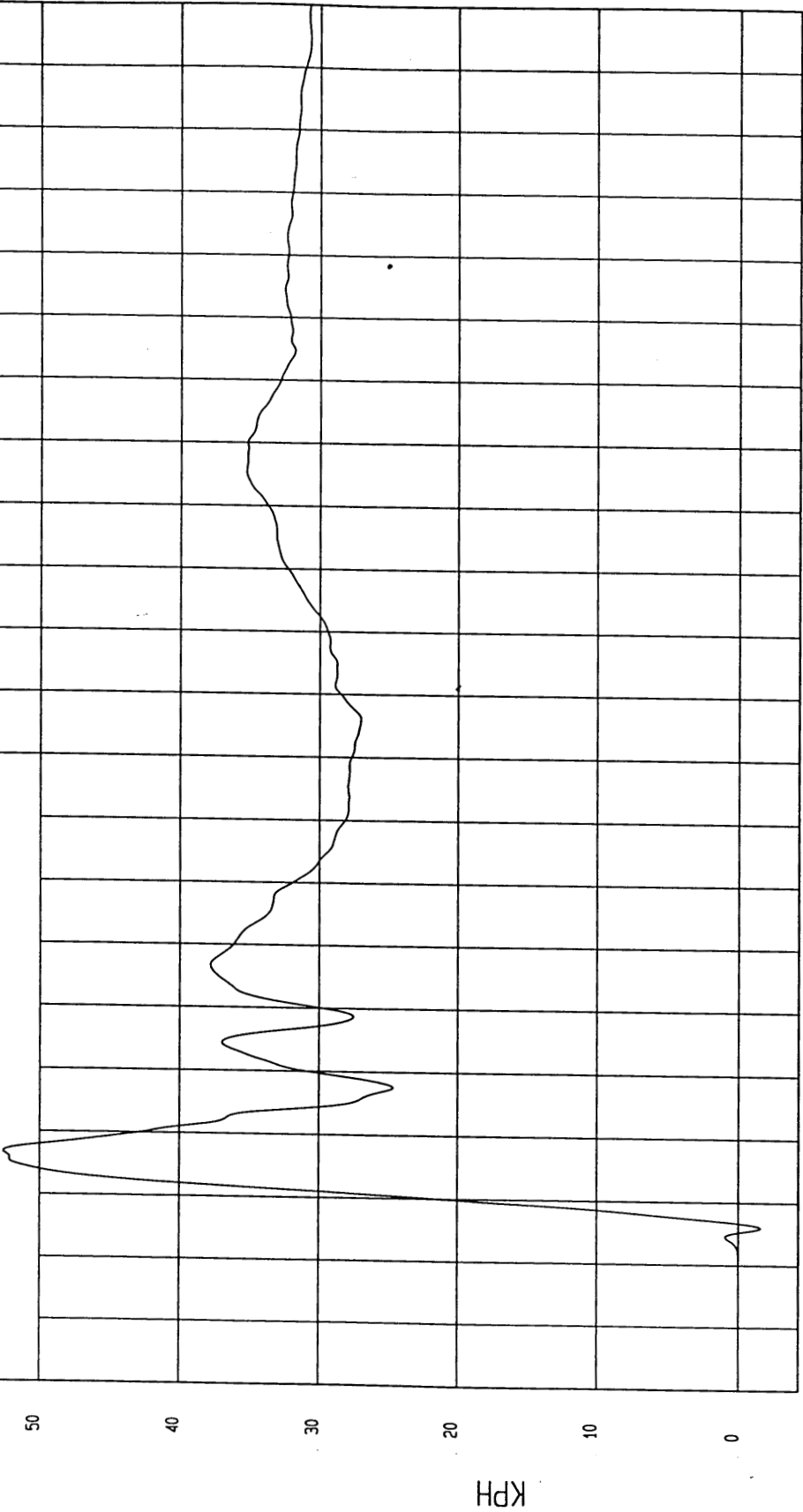
Speed: 38.9 MPH 62.6 KPH

Minimum = -1.59 KPH at 6 msec

Maximum = 52.68 KPH at 17 msec

LEFT REAR DOOR MIDREAR Y VELOCITY

1 800056A1.V39 Filterclass (180)



MCA Research  
07-25-2000 10:48

TIME Seconds

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

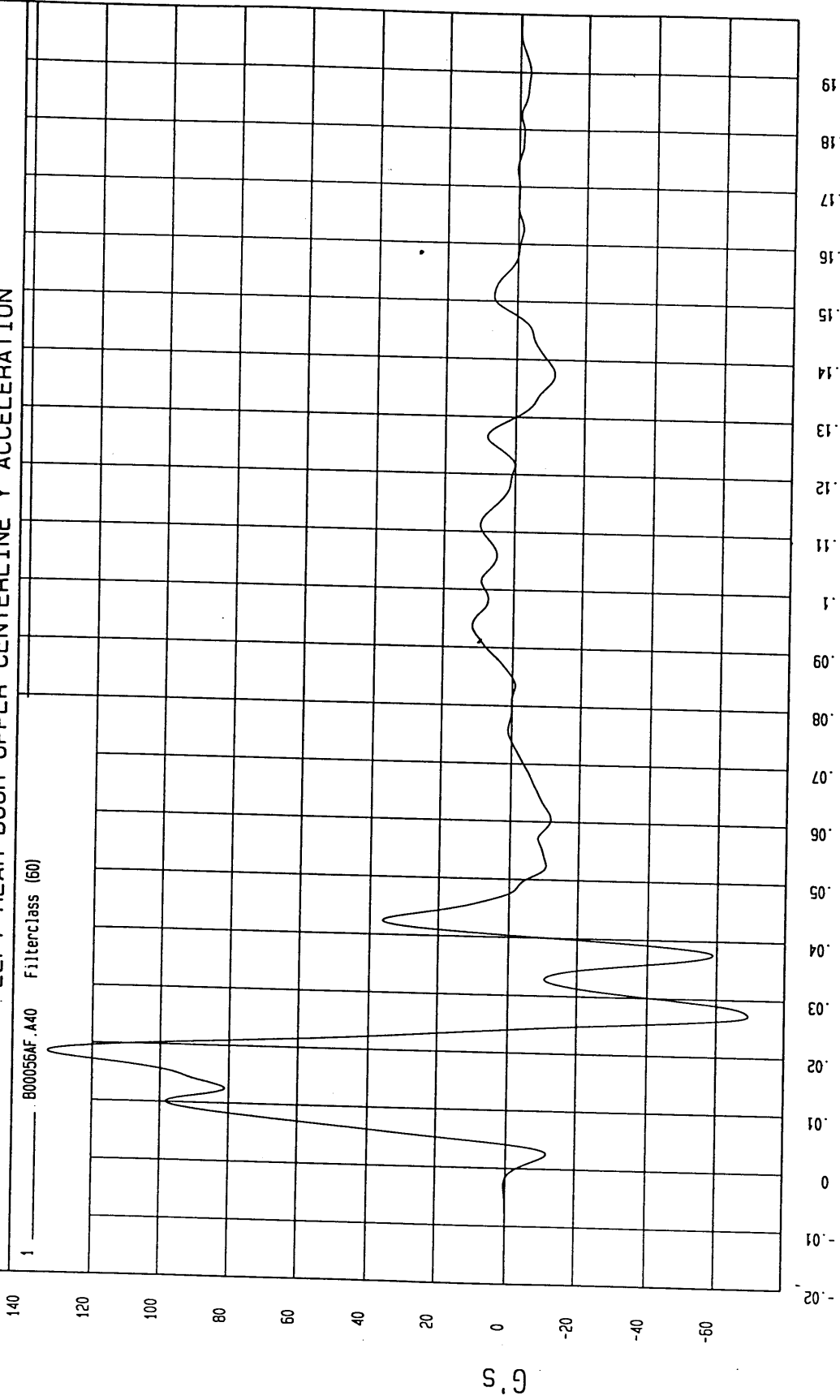
COMPONENT: 2000 SATURN SL2 4 DOOR

Speed: 38.9 MPH 62.6 KPH

Minimum = -68.64 G's at 27 msec

Maximum = 132.91 G's at 18 msec

LEFT REAR DOOR UPPER CENTERLINE Y ACCELERATION



MCA Research  
07-25-2000 10:48

Seconds

G's

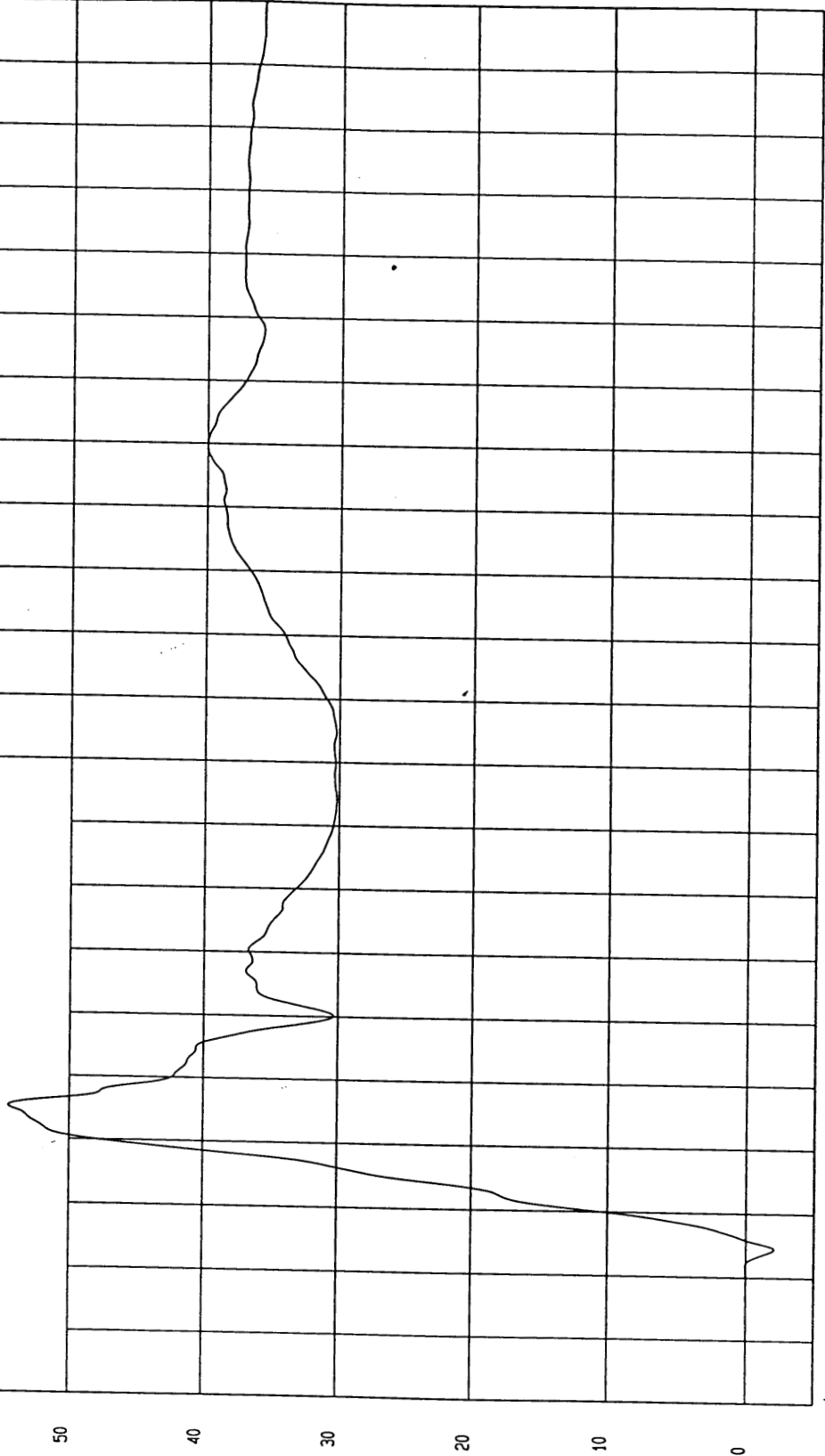
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -2.02 KPH at 4 msec Maximum = 54.69 KPH at 25 msec

LEFT REAR DOOR UPPER CENTERLINE Y VELOCITY

1 ——— B00056A1.V40 Filterclass (180)



MCA Research  
07-25-2000 10:49

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

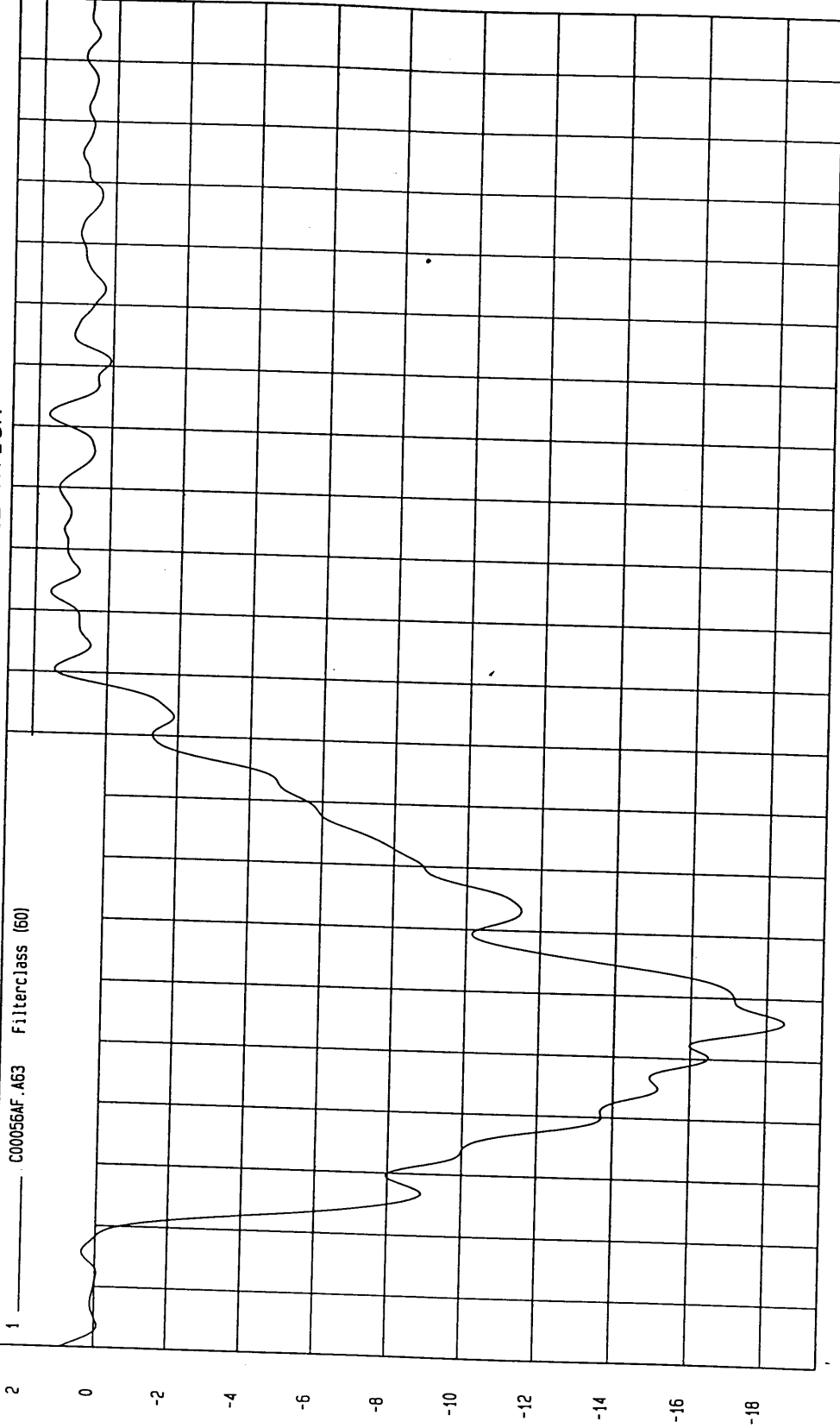
Speed: 38.9 MPH 62.6 KPH

Minimum = -18.47 G'S at 36 msec

Maximum = 1.7 G'S at 132 msec

MOVING BARRIER CG X ACCELERATION

1 \_\_\_\_\_ C00056AF.A63 Filterclass (60)



TIME (SECONDS)

MSA Research  
07-25-2000 10:40

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

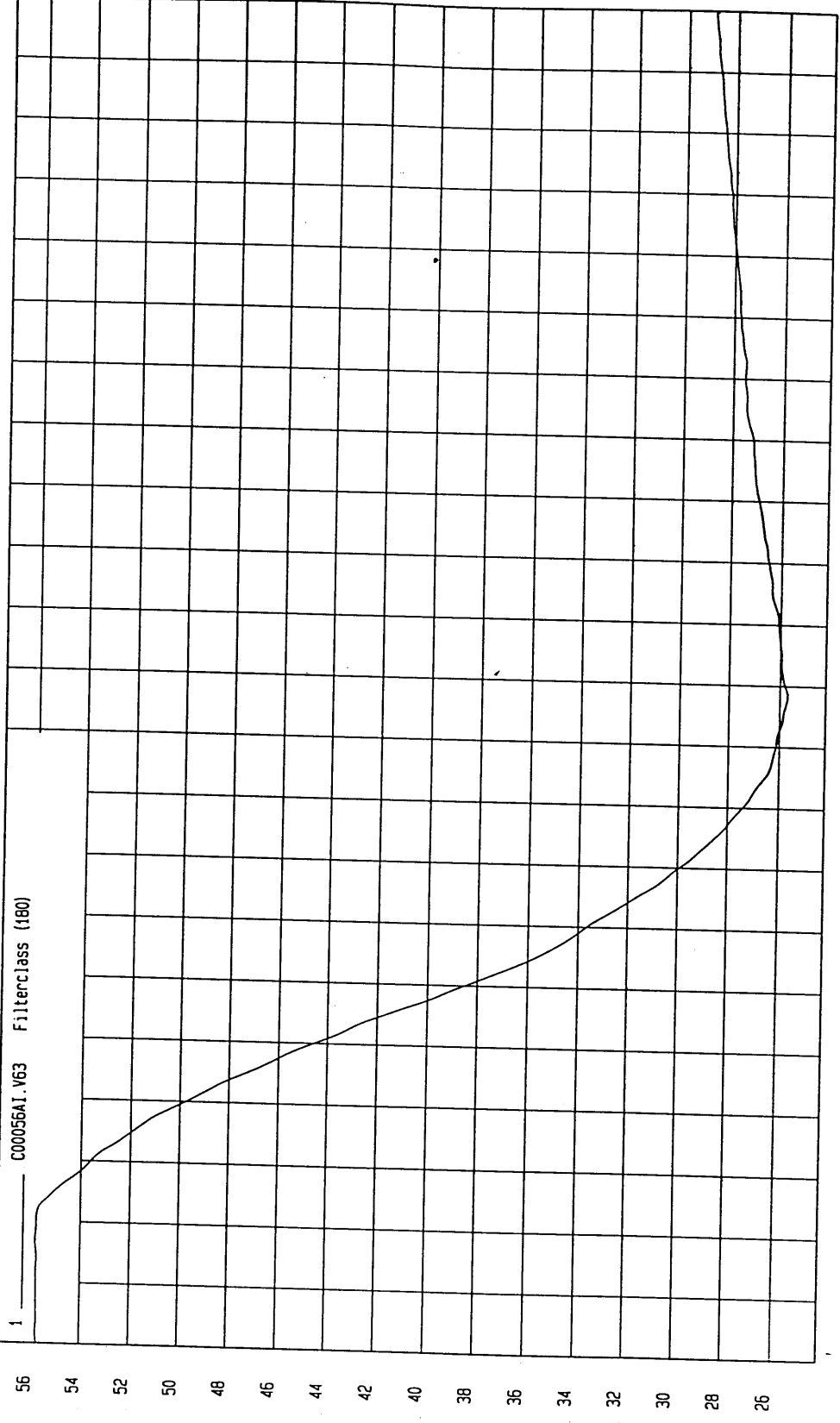
Speed: 38.9 MPH 62.6 KPH

Minimum = 25.71 KPH at 88 msec

Maximum = 55.87 KPH at -3 msec

MOVING BARRIER CG X VELOCITY

1 C00056A1.V63 Filterclass (180)



MCA Research  
07-23-2000 10.40

TIME Seconds

KPH

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

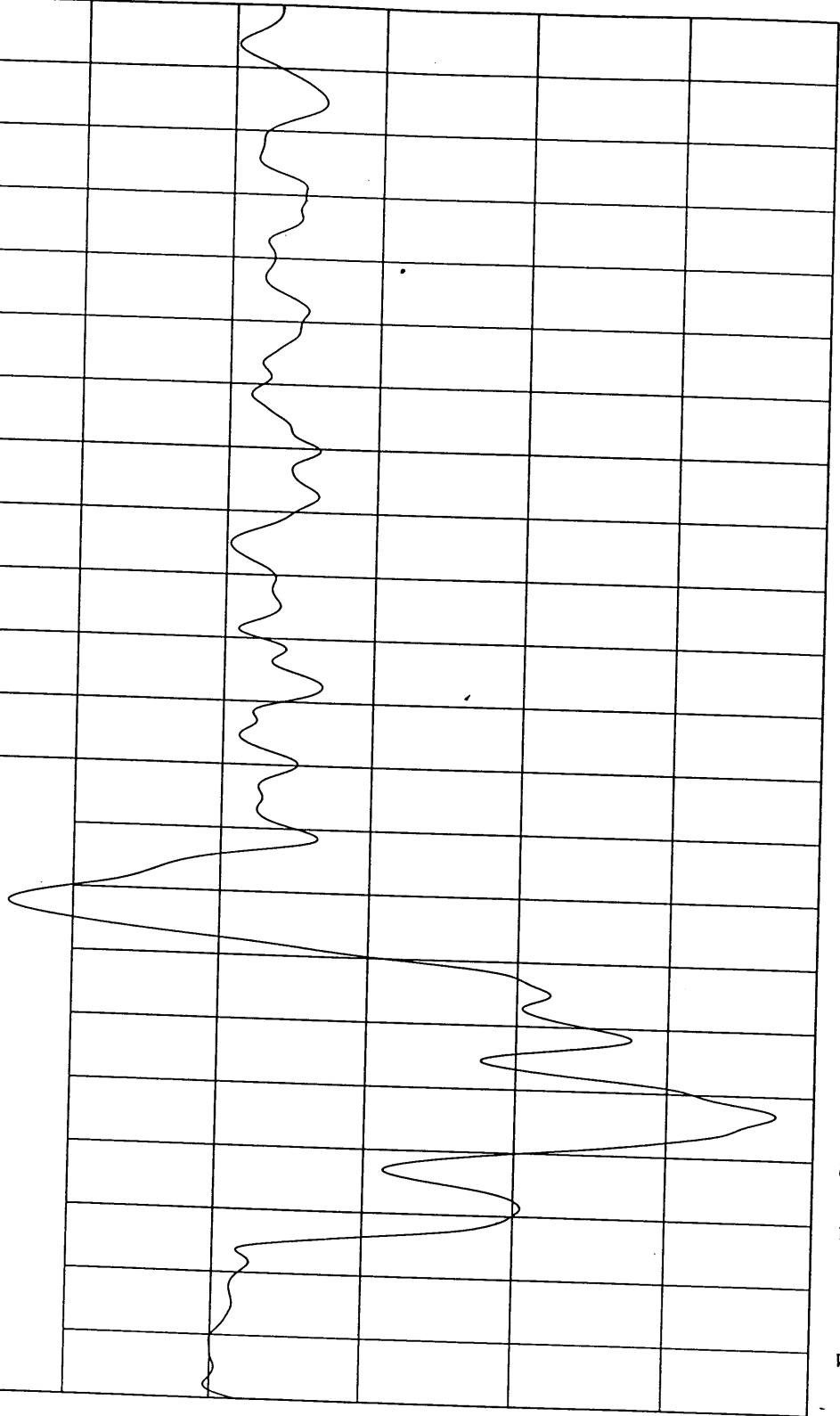
Speed: 38.9 MPH 62.6 KPH

Minimum = -7.4 G'S at 27 msec

Maximum = 2.89 G'S at 58 msec

MOVING BARRIER CG Y ACCELERATION

1 C00056AF.A64 Filterclass (60)



TIME (SECONDS)

MGA Research  
07-25-2000 10:40

G.S

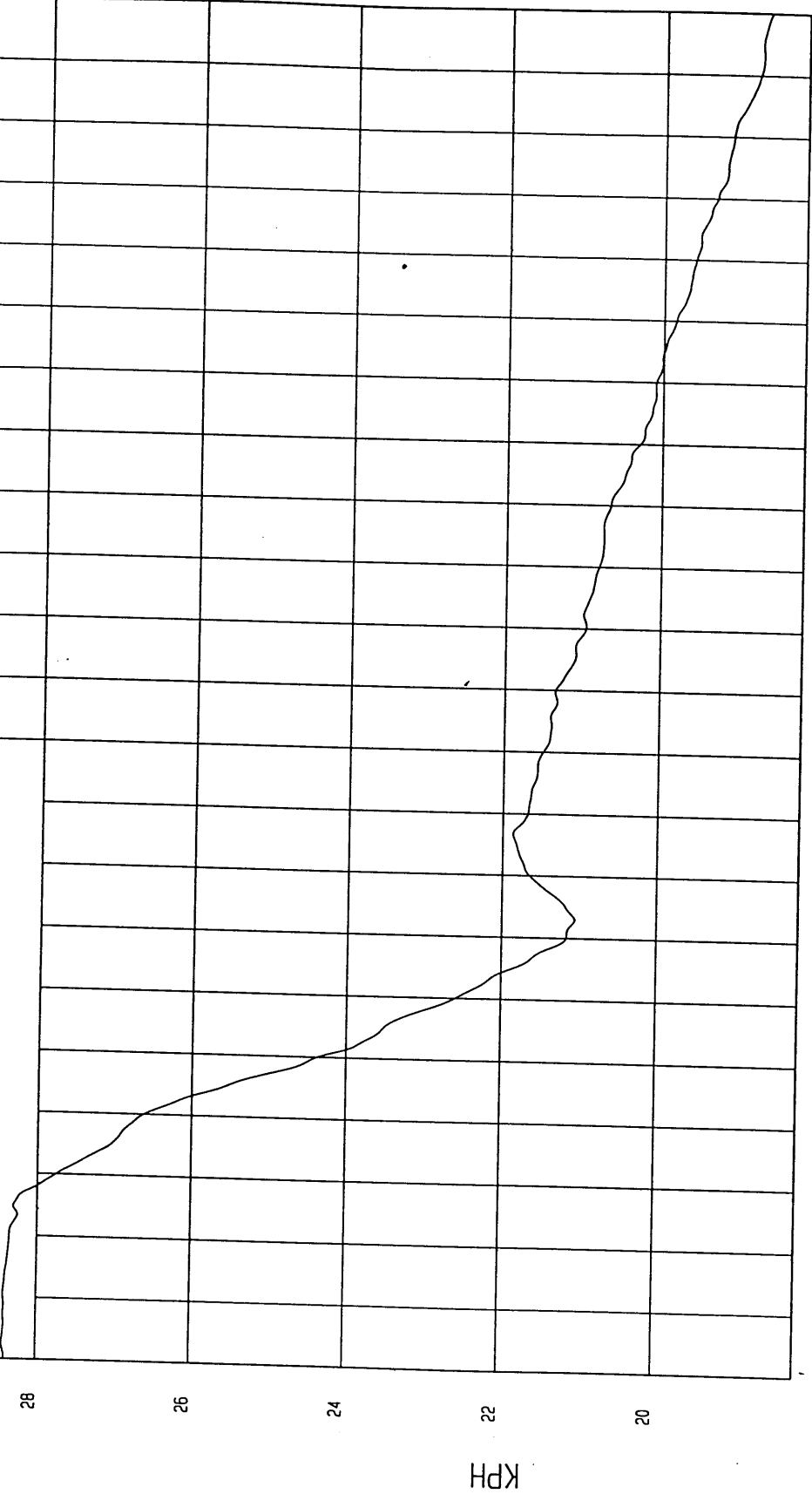
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = 18.69 KPH at 200 msec  
Maximum = 28.45 KPH at -17 msec

MOVING BARRIER CG Y VELOCITY

1 C00056A1.V64 Filterclass (180)



MGA Research  
07-25-2000 10:40

TIME Seconds

KPH

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

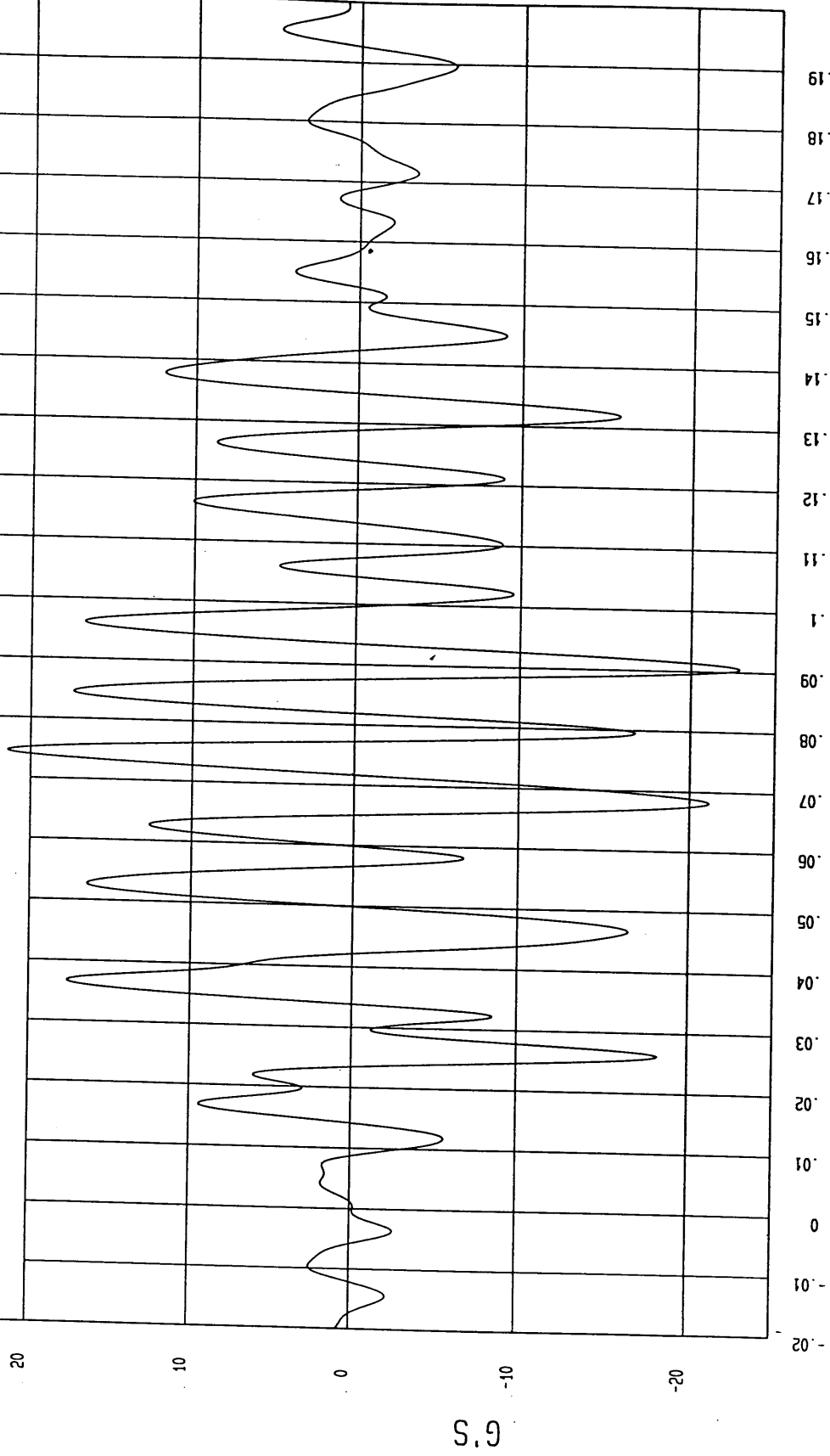
Speed: 38.9 MPH 62.6 KPH

Minimum = -22.83 G'S at 90 msec

Maximum = 21.42 G'S at 74 msec

MOVING BARRIER CG Z ACCELERATION

1 C00056AF.A65 Filterclass (60)



TIME (SECONDS)

MSA Research  
07-25-2000 10:40

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

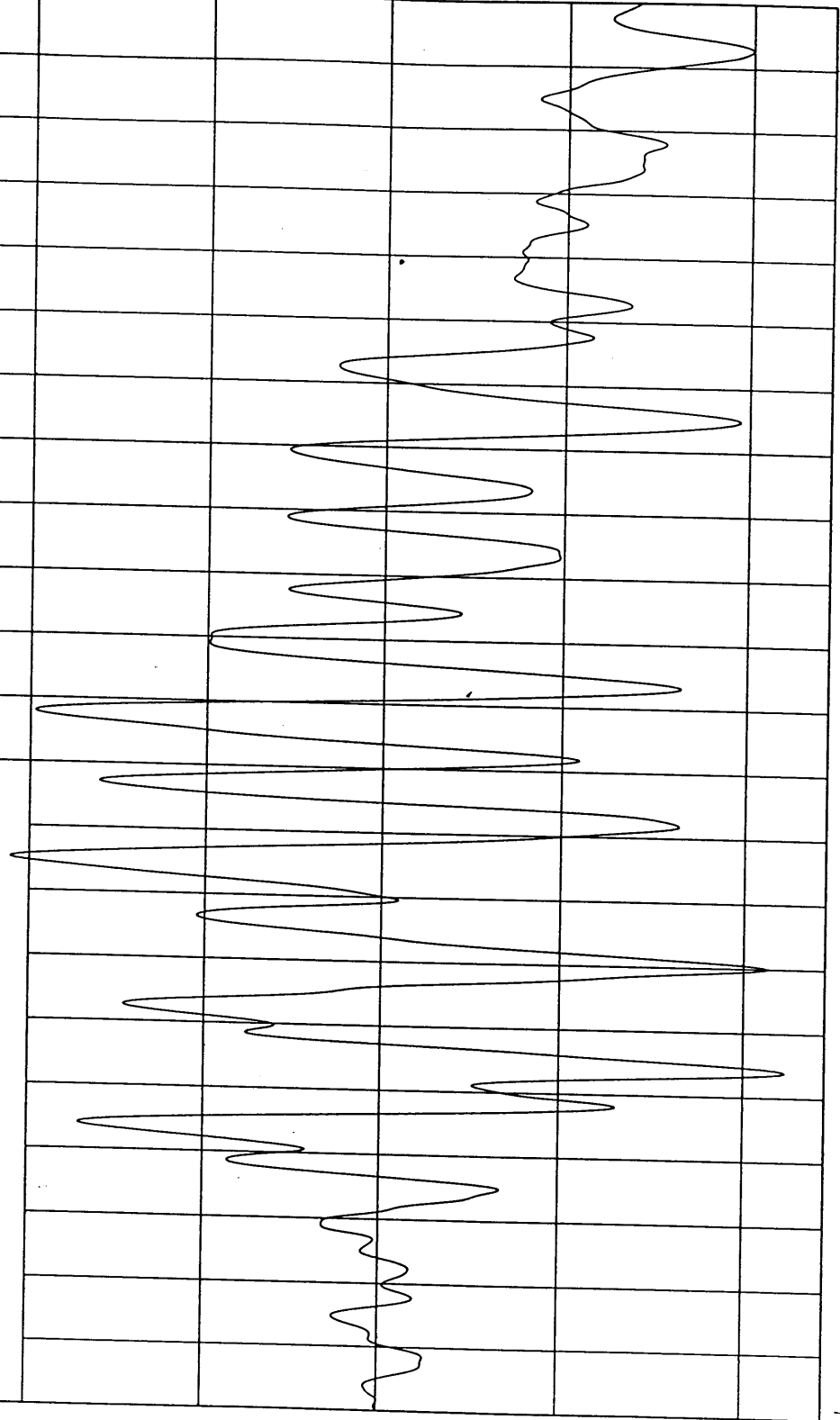
Speed: 38.9 MPH 62.6 KPH

Minimum = -2.23 KPH at 34 msec

Maximum = 2.11 KPH at 65 msec

MOVING BARRIER CG Z VELOCITY

1 C0005GAI.V65 Filterclass (160)



MCA Research  
07-25-2000 10:40

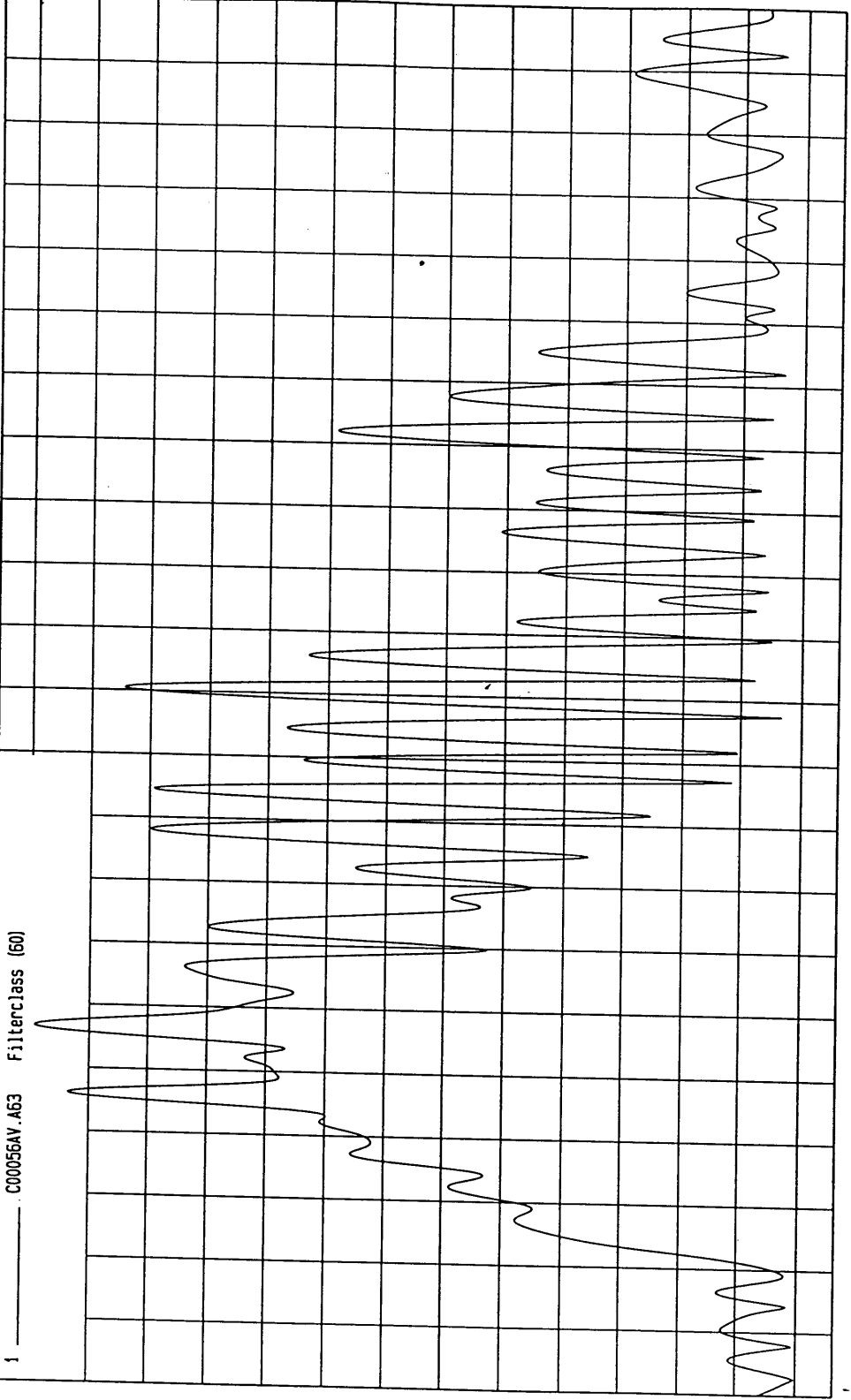
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = 6.61E-02 G'S at -17 msec Maximum = 25.86 G'S at 37 msec

MOVING BARRIER CG RESULTANT ACCELERATION

1 C00056AV.A63 Filterclass (50)



TIME (SECONDS)

MSA Research  
07-25-2000 10:40

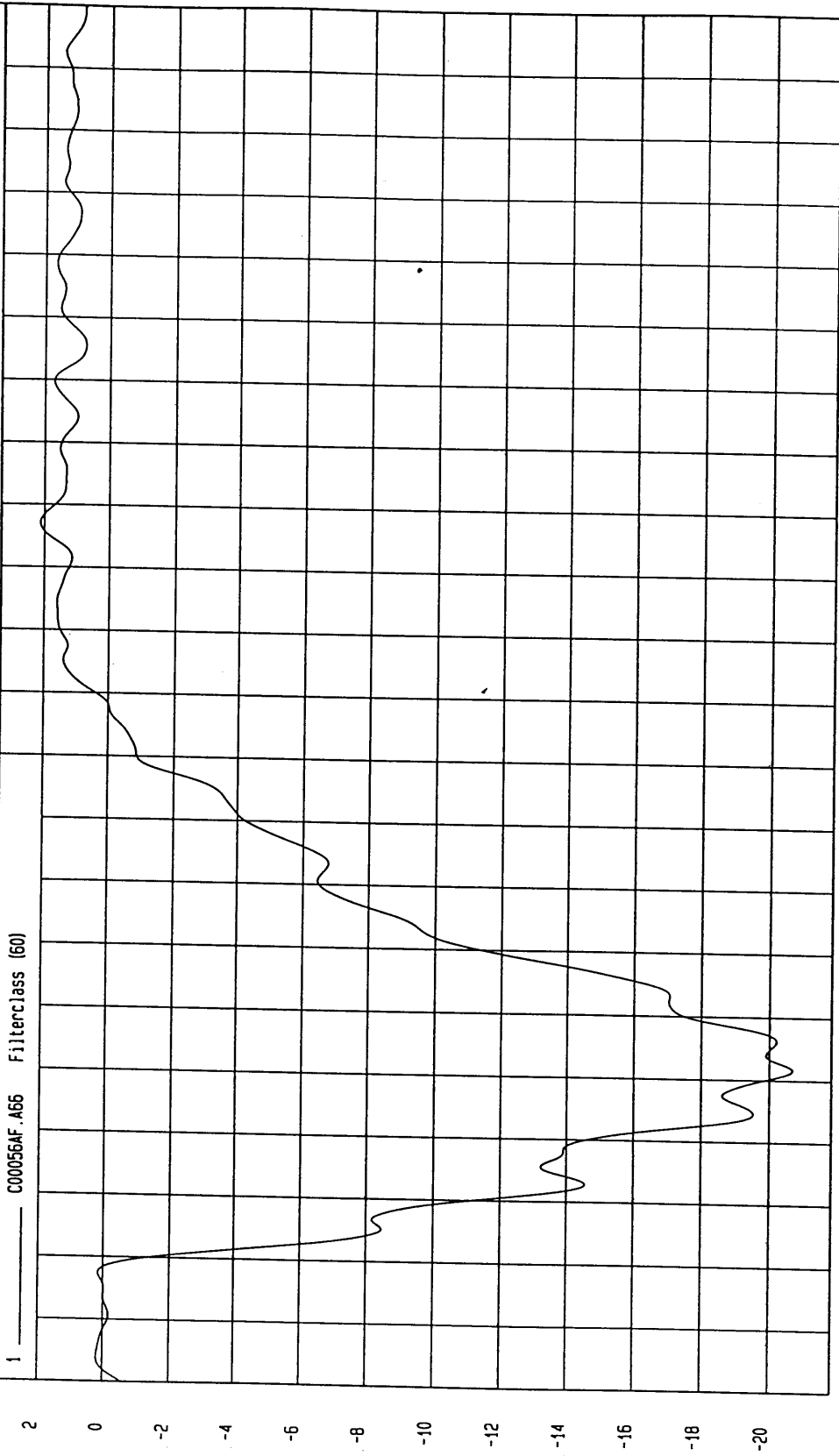
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -20.67 G'S at 32 msec Maximum = 2.12 G'S at 117 msec

MOVING BARRIER REAR AXLE X ACCELERATION

1 C00056AF.A66 Filterclass (60)



MSA Research  
07-25-2000 10:40

TIME (SECONDS)

G.S

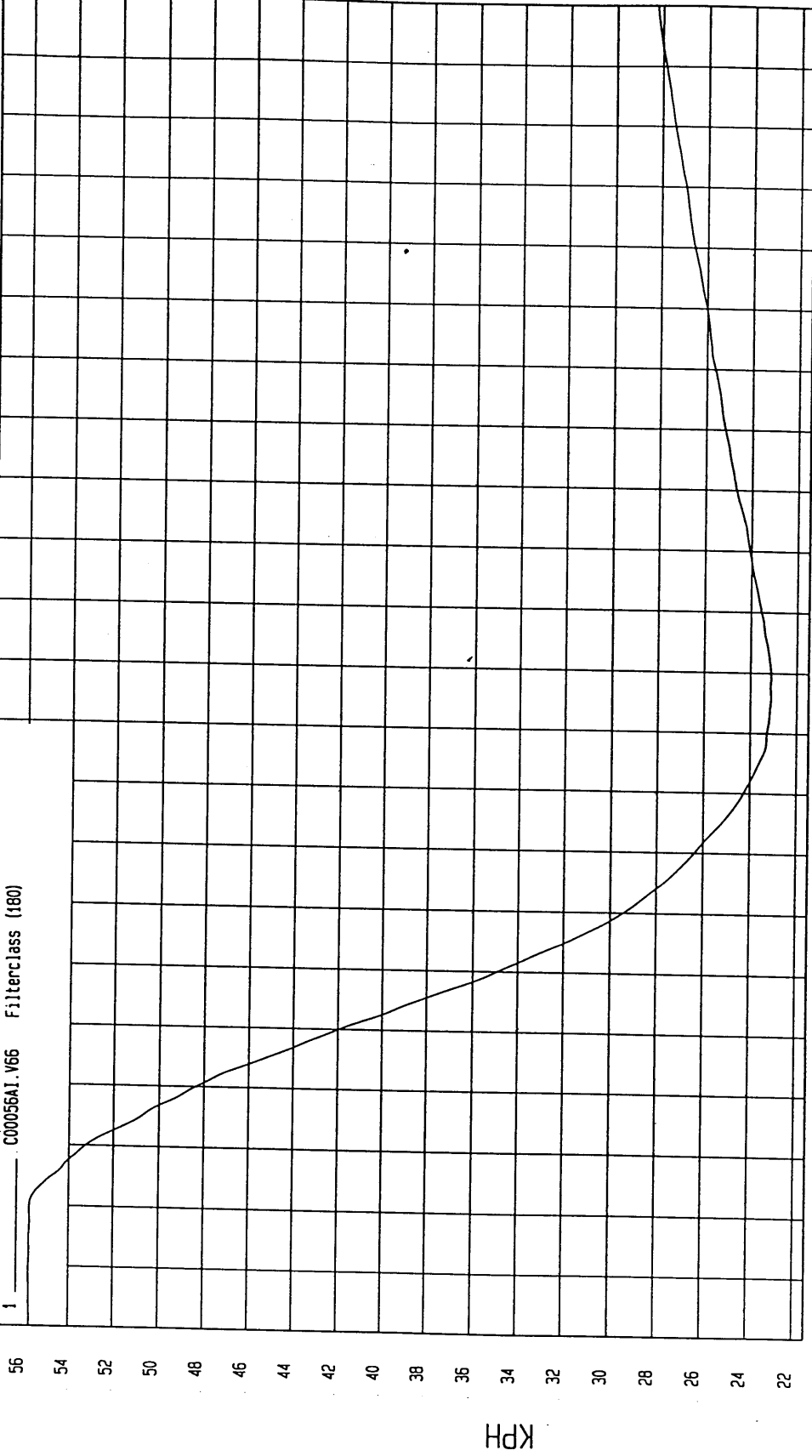
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = 23.12 KPH at 90 msec  
Maximum = 55.8 KPH at -11 msec

MOVING BARRIER REAR AXLE X VELOCITY

1 C00056A1.V66 Filterclass (180)



MCA Research  
01-25-2000 10:40

TIME Seconds

KPH

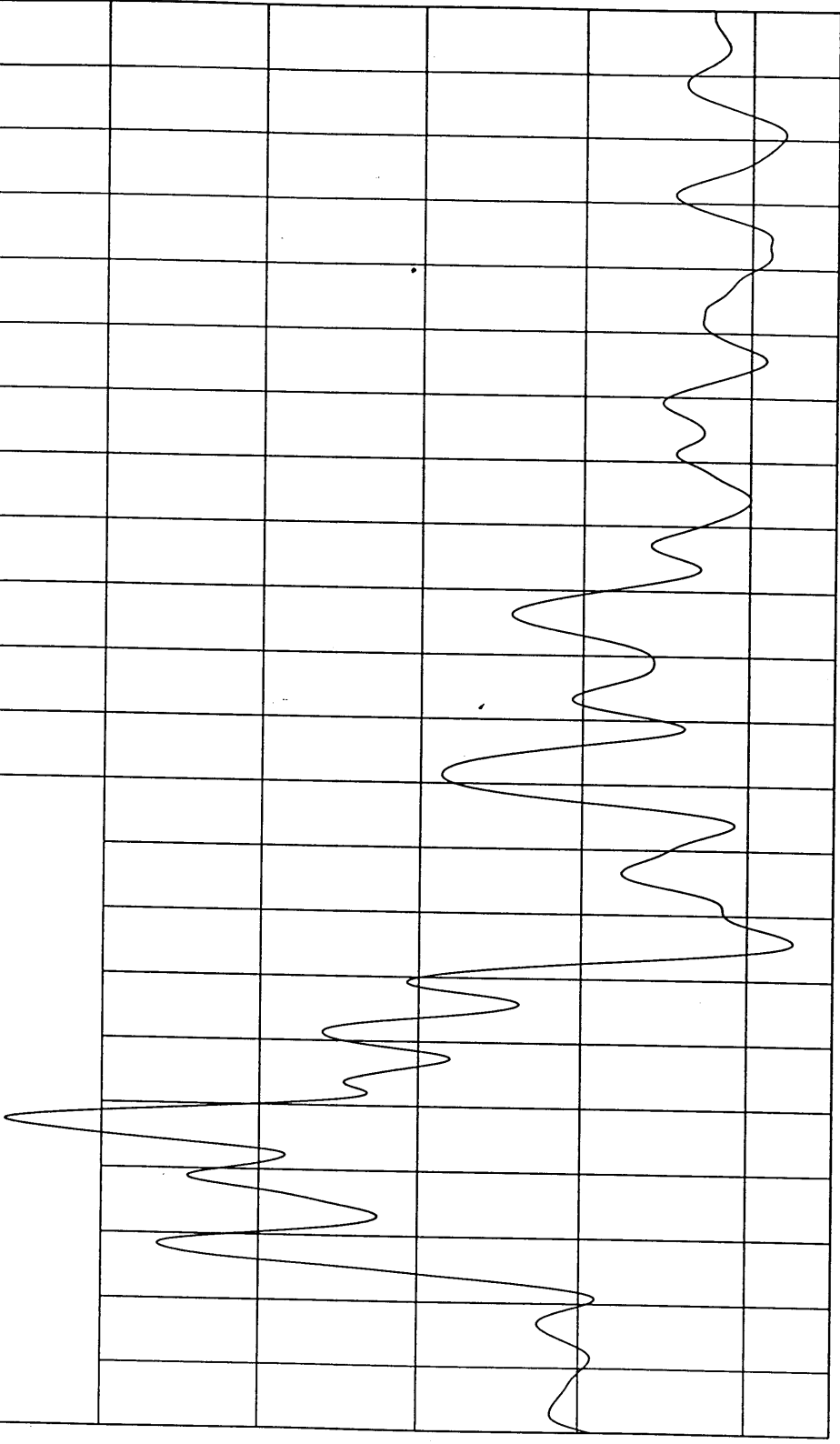
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -1.27 G'S at 56 msec Maximum = 3.61 G'S at 27 msec

MOVING BARRIER REAR AXLE Y ACCELERATION

1 C00056AF.A67 Filterclass (60)



MGA Research  
07-25-2000 10:40

TIME (SECONDS)

G.S

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

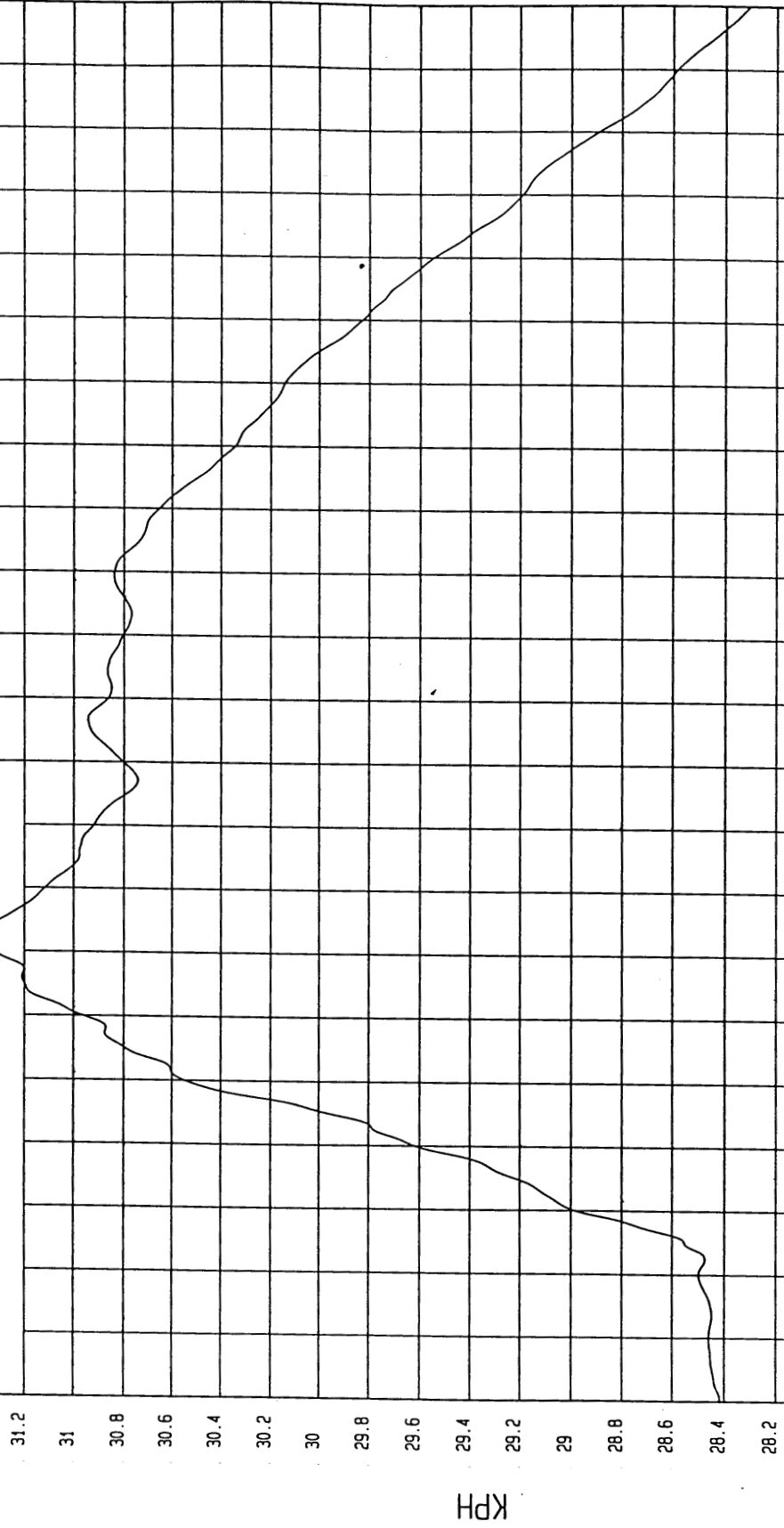
COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = 28.31 KPH at 200 msec

Maximum = 31.39 KPH at 53 msec

MOVING BARRIER REAR AXLE Y VELOCITY

1 C00056A1.V67 Filterclass (180)



MSA Research  
07-25-2000 10:40

TIME Seconds

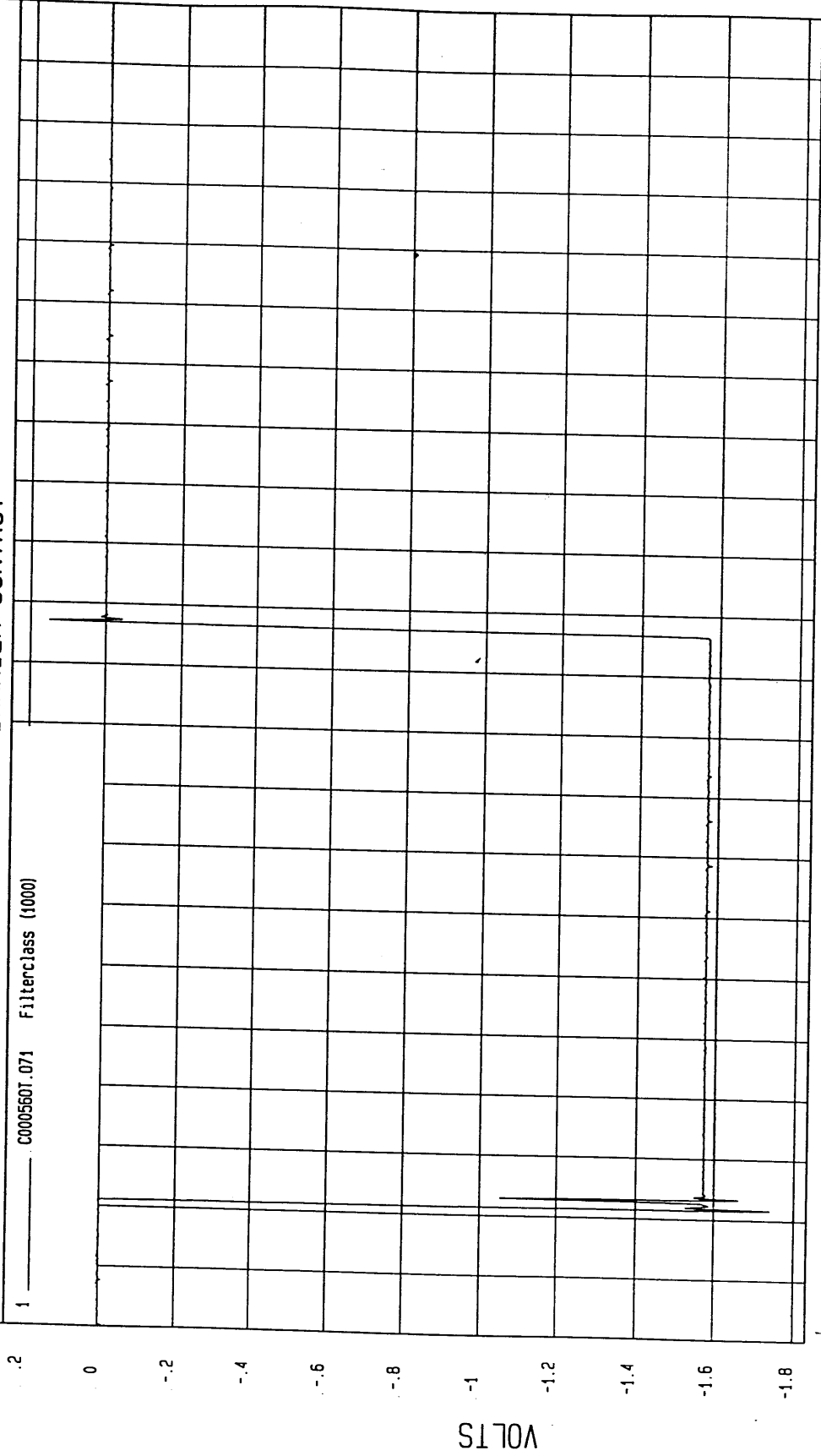
TEST: HIGH SPEED LATERAL IMPACT  
TEST DATE: 07-24-2000  
Speed: 38.9 MPH 62.6 KPH

COMPONENT: 2000 SATURN SL2 4 DOOR

Minimum = -1.74 VOLTS at 2 msec  
Maximum = .15 VOLTS at 97 msec

LEFT BARRIER CONTACT

1 \_\_\_\_\_ C000560T.071 Filterclass (1000)



NCA Research  
07-25-2000 10:40

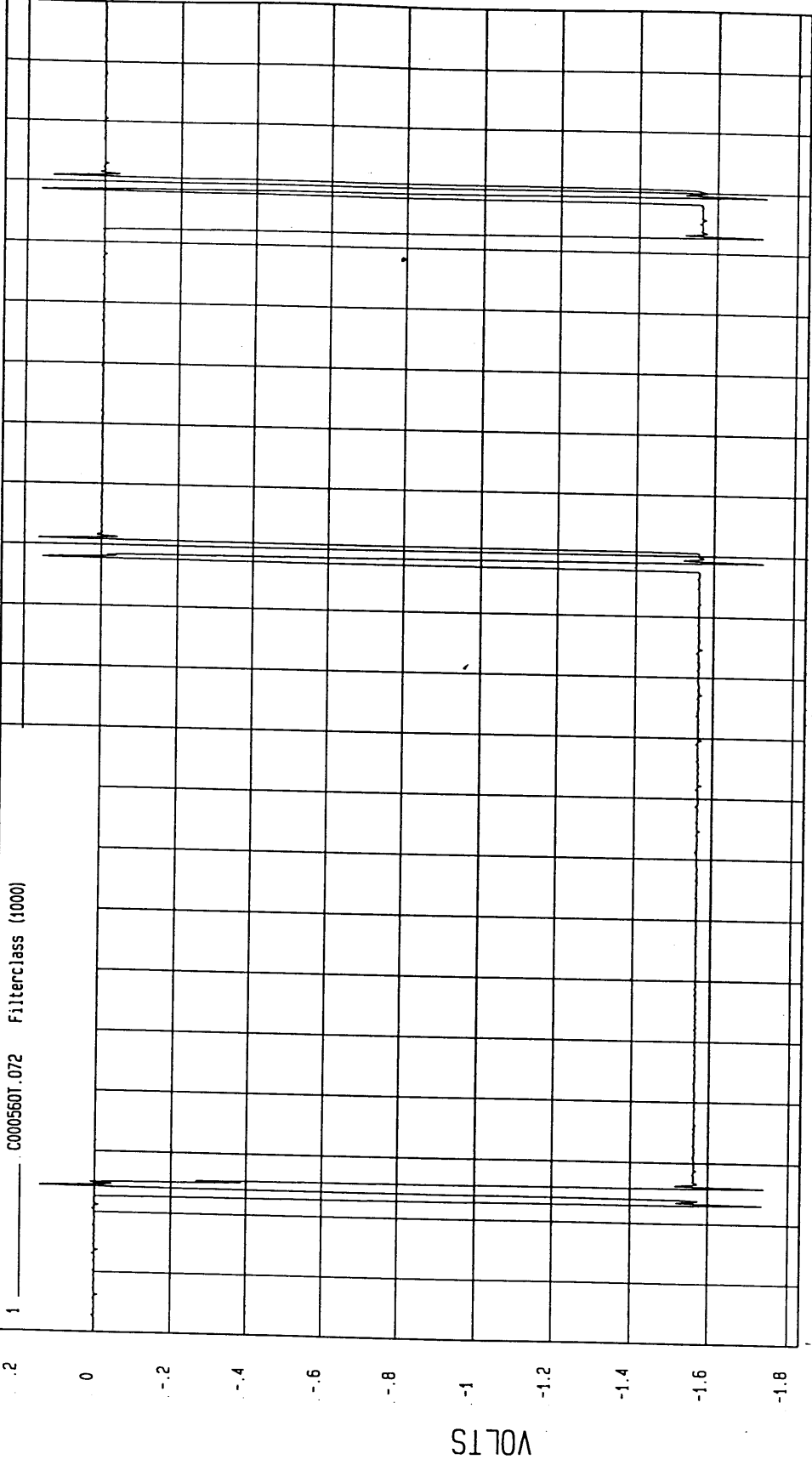
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -1.74 VOLTS at 6 msec  
Maximum = .16 VOLTS at 111 msec

RIGHT BARRIER CONTACT

1 C000560T.072 Filterclass (1000)



MGA Research  
07-25-2000 10:40

TIME (SECONDS)

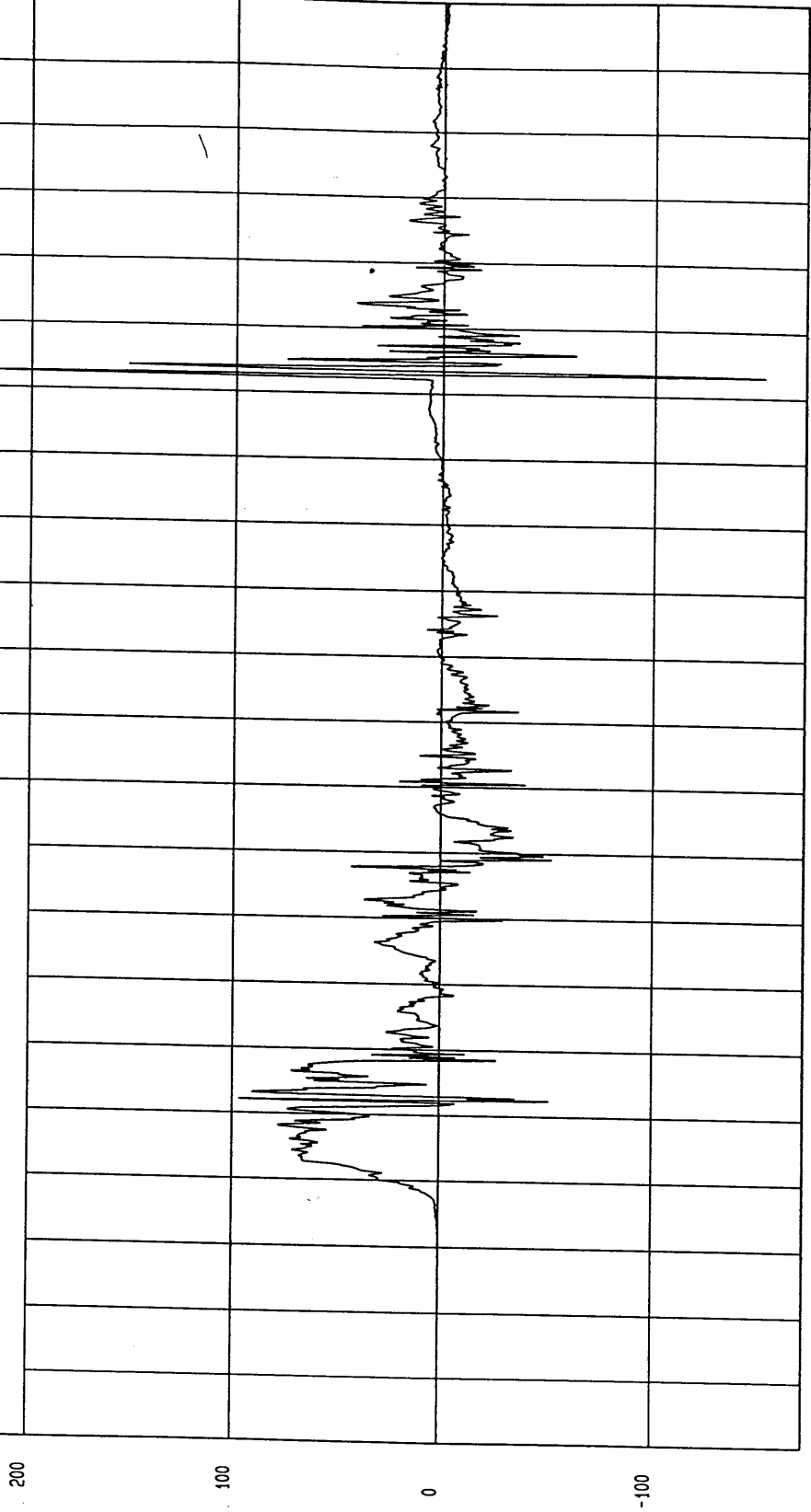
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -150.21 G's at 143 msec Maximum = 228.05 G's at 143 msec

DRIVER UPPER RIB Y REDUNDANT ACCELERATION

1 B00056A1.A41 Filterclass (1000)



Seconds

MSA Research  
07-25-2000 11:04

G's

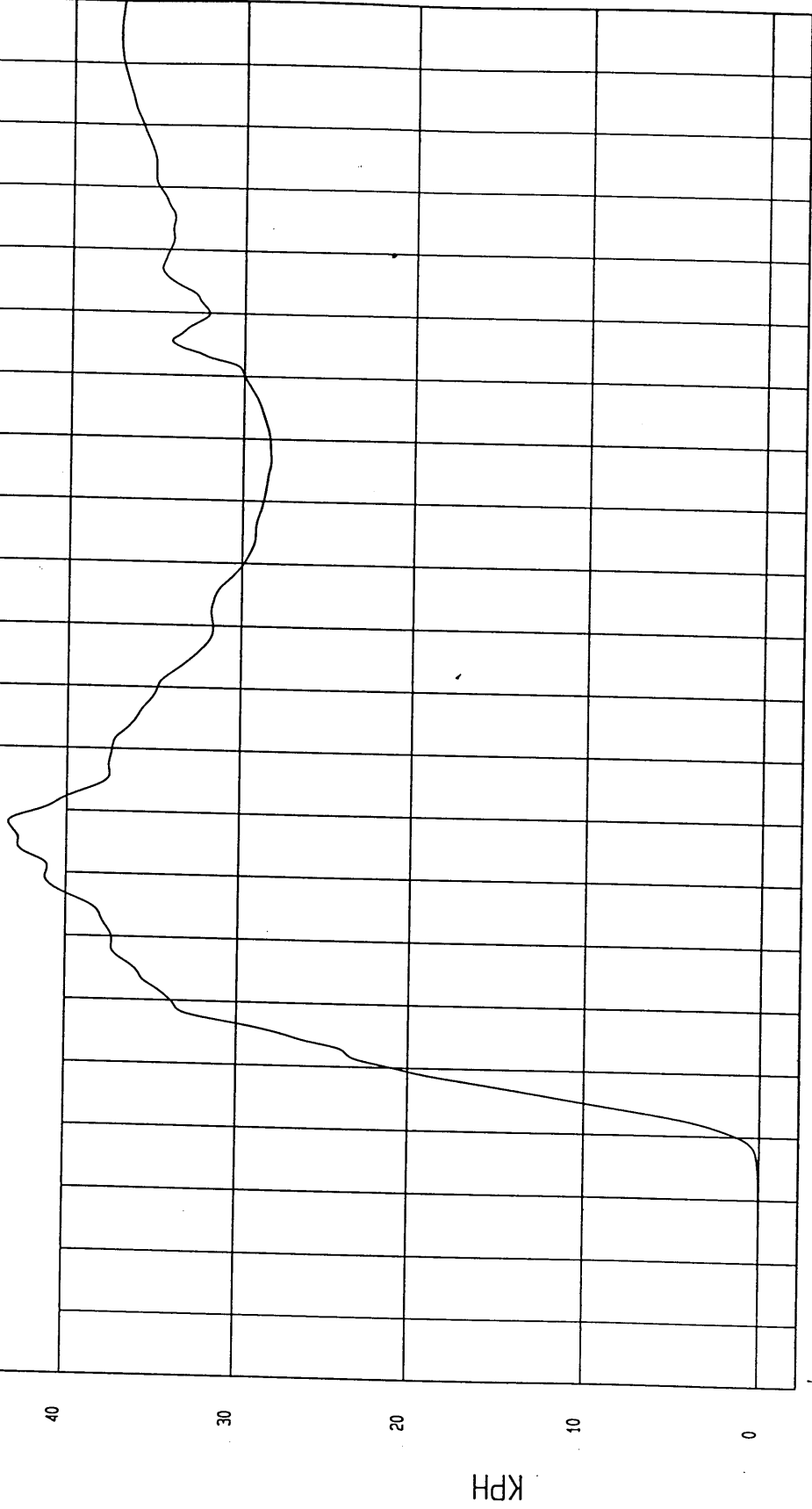
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -7.42E-03 KPH at -11 msec  
Maximum = 43.36 KPH at 68 msec

DRIVER UPPER RIB Y REDUNDANT VELOCITY

1 ——— 800056A1.V41 Filterclass (180)



MCA Research  
07-25-2000 11.03

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

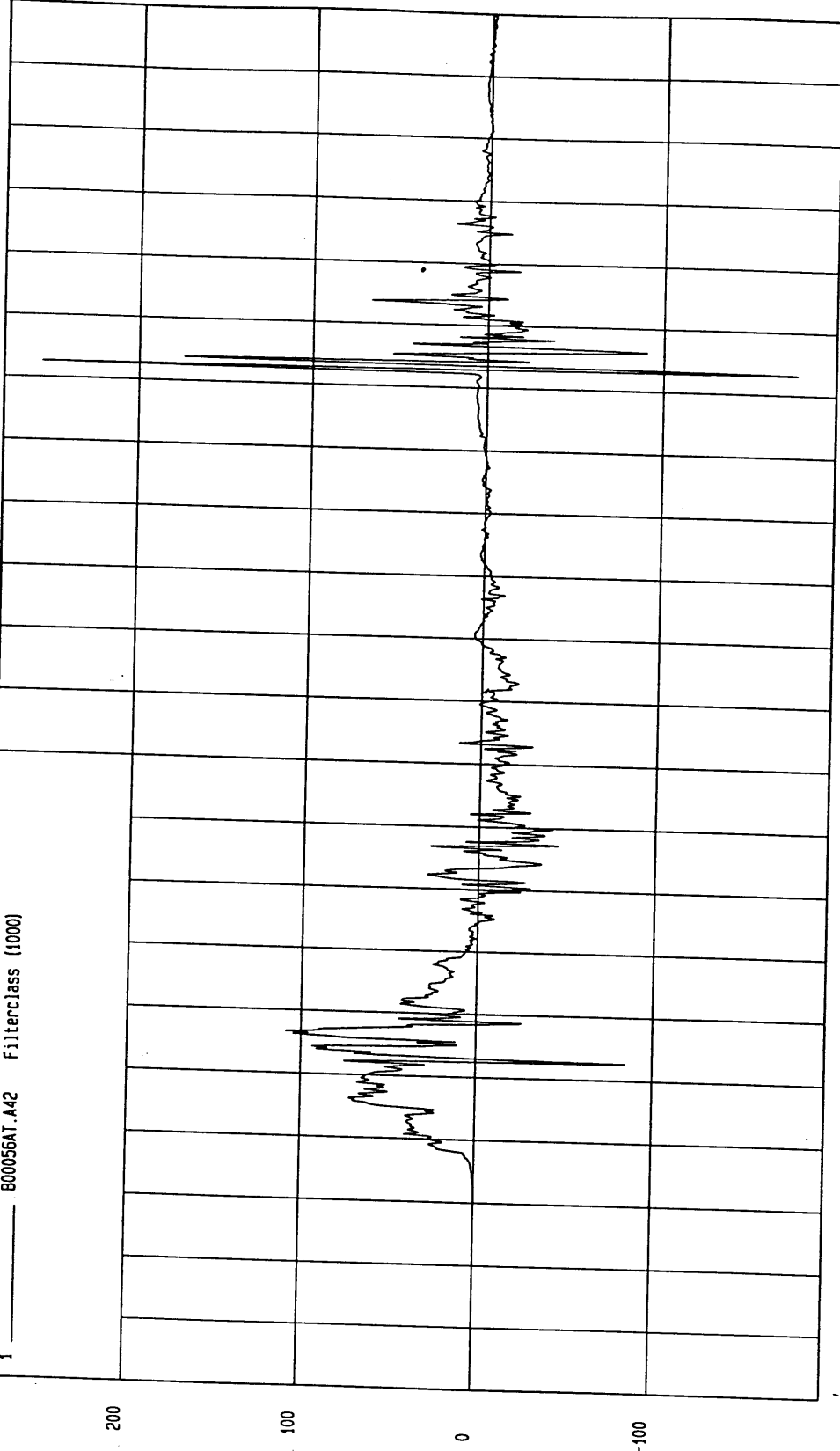
Speed: 38.9 MPH 62.6 KPH

Minimum = -175.04 G's at 143 msec

Maximum = 255.47 G's at 143 msec

DRIVER LOWER RIB Y REDUNDANT ACCELERATION

1 \_\_\_\_\_ 800056AT.A42 Filterclass (1000)



Seconds

MCA Research  
07-25-2000 11:04

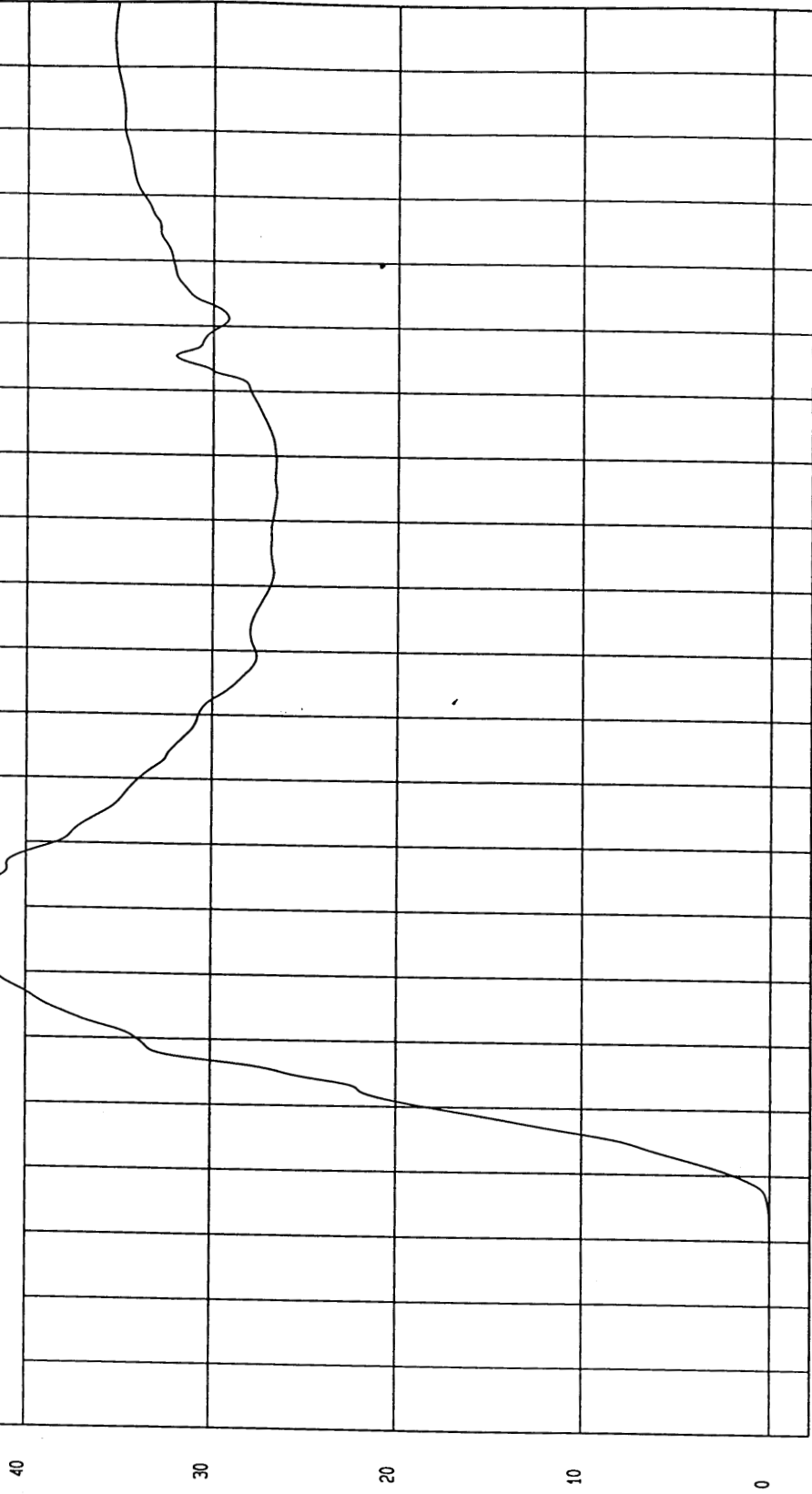
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -8.94E-03 KPH at 5 msec  
Maximum = 42.34 KPH at 63 msec

DRIVER LOWER RIB Y REDUNDANT VELOCITY

1 B00056A1.V42 Filterclass (180)



MGA Research  
07-25-2000 11:03

TIME Seconds

KPH

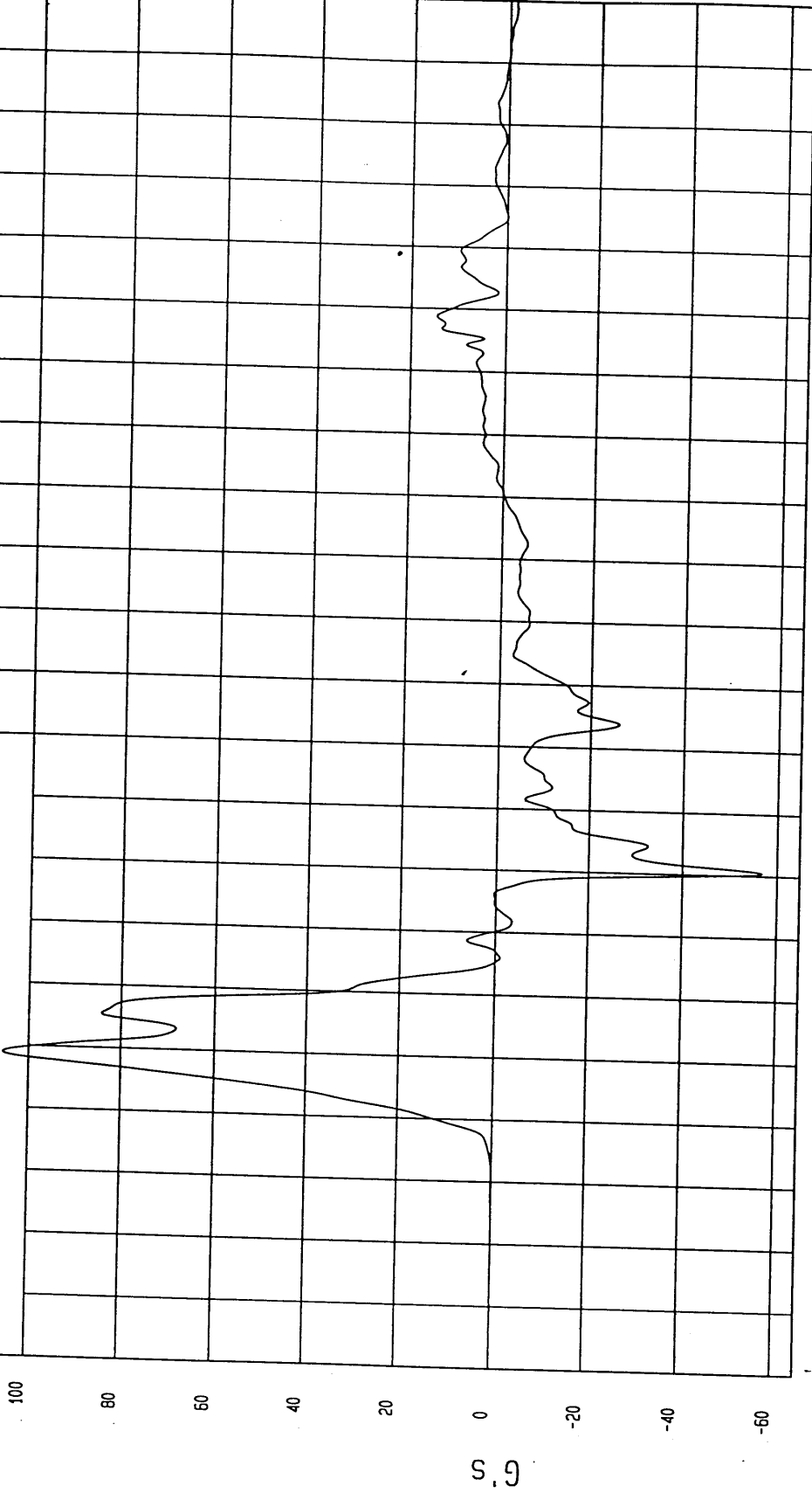
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -56.77 G's at 60 msec  
Maximum = 105.43 G's at 29 msec

DRIVER LOWER SPINE Y REDUNDANT ACCELERATION

1 800056AF.A43 Filterclass (180)



MGA Research  
07-25-2000 11:04

Seconds

TEST DATE: 07-24-2000

Speed: 38.9 MPH 62.6 KPH

Maximum = 50.39 KPH at 50 msec

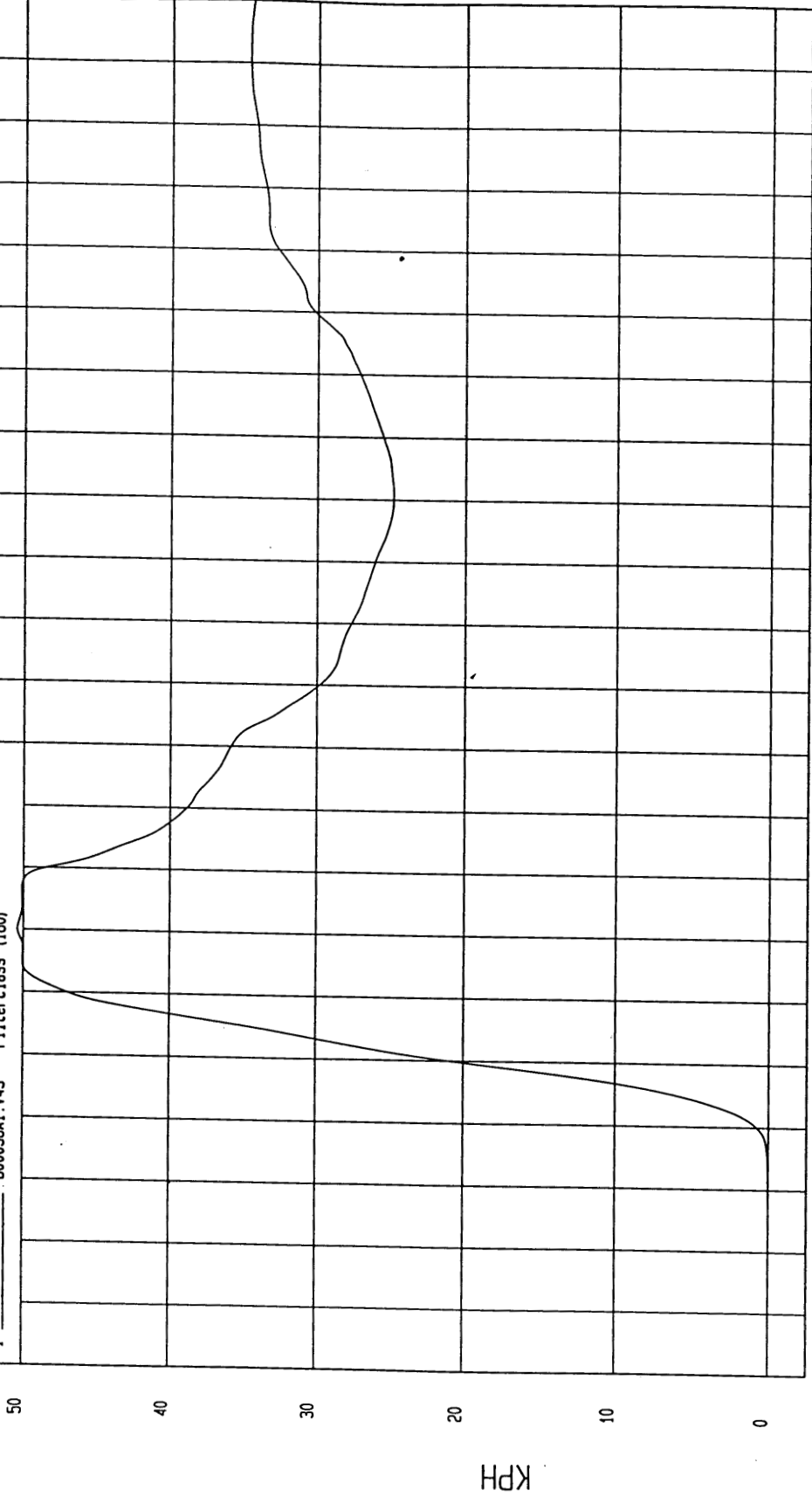
TEST: HIGH SPEED LATERAL IMPACT

COMPONENT: 2000 SATURN SL2 4 DOOR

Minimum = -2.80E-03 KPH at -7 msec

DRIVER LOWER SPINE Y REDUNDANT VELOCITY

1 800056A1.V43 Filterclass (180)



TIME Seconds

NSA Research  
07-25-2000 11:03

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

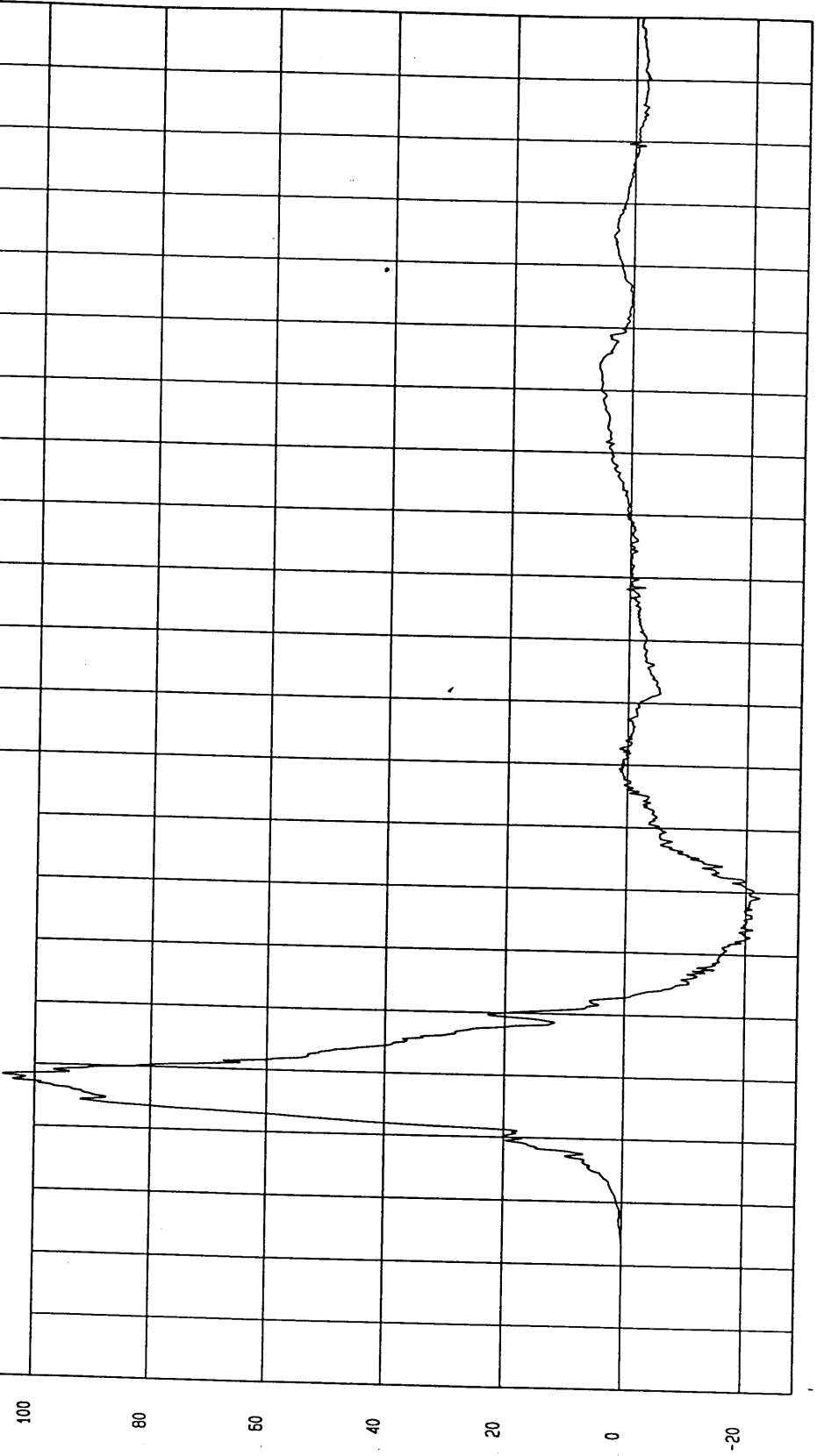
Speed: 38.9 MPH 62.6 KPH

Minimum = -22.34 G's at 59 msec

Maximum = 105.57 G's at 28 msec

DRIIVER PELVIS Y REDUNDANT ACCELERATION

1 800056AT.A44 Filterclass (1000)



Seconds

NQA Research  
07-25-2000 11:04

MGA Research  
07-25-2000 11:03

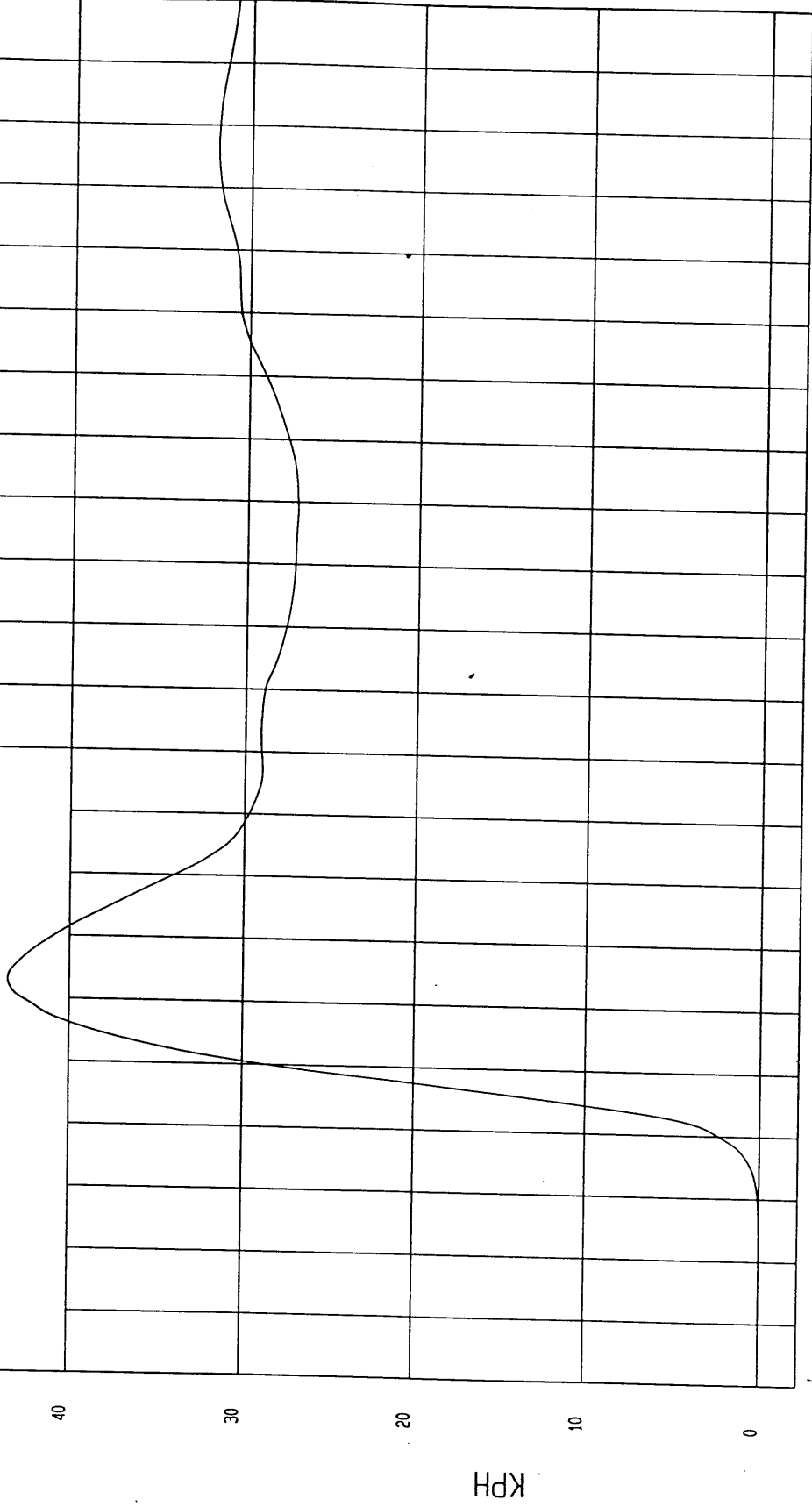
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -1.00E-03 KPH at -13 msec Maximum = 43.51 KPH at 43 msec

DRIVER PELVIS Y REDUNDANT VELOCITY

1 ——— 800056A1.V44 FilterClass (180)



TIME Seconds

KPH

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

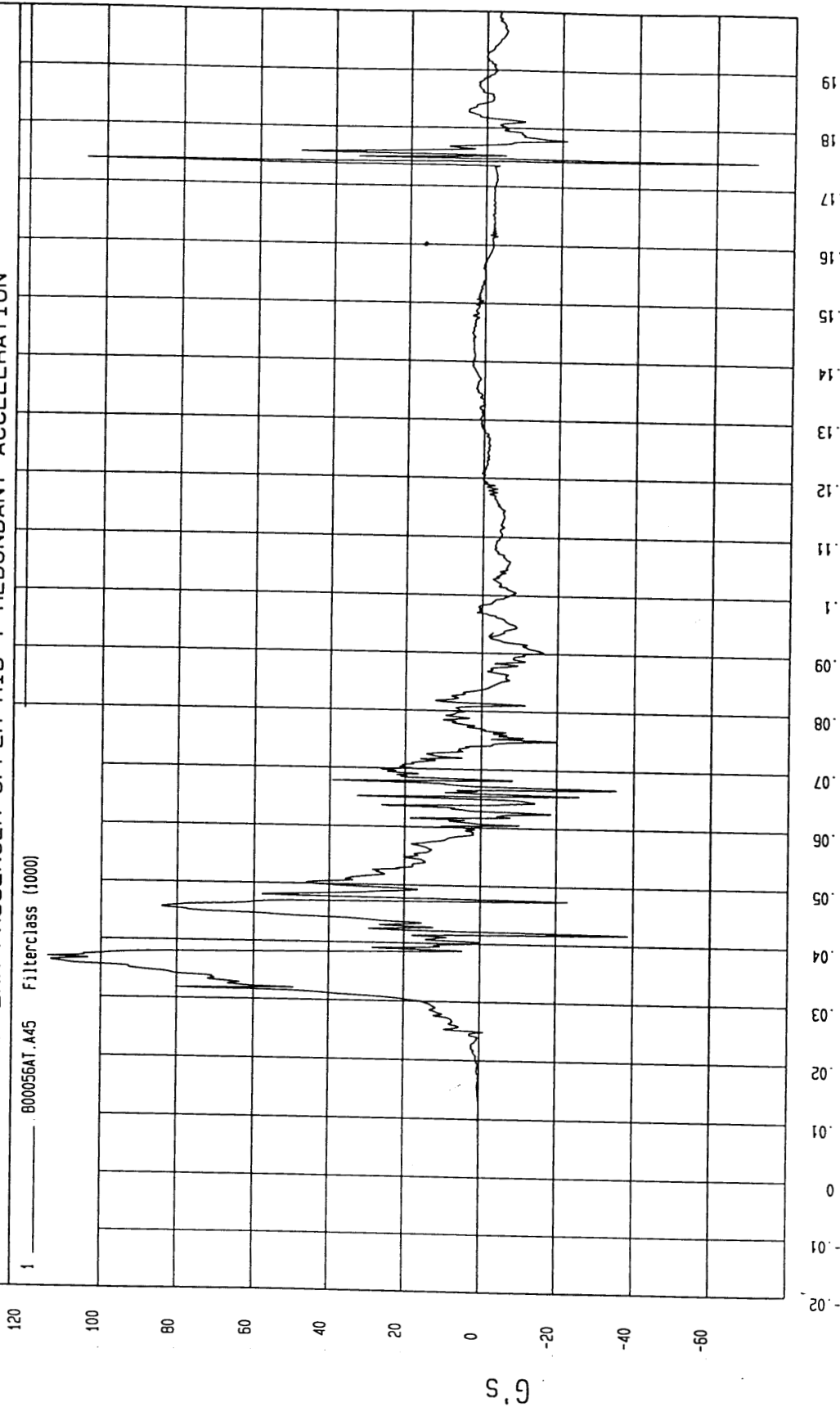
COMPONENT: 2000 SATURN SL2 4 DOOR

Speed: 38.9 MPH 62.6 KPH

Minimum = -70.27 G's at 174 msec

Maximum = 113.76 G's at 37 msec

REAR PASSENGER UPPER RIB Y REDUNDANT ACCELERATION



MGA Research  
07-25-2000 11:04

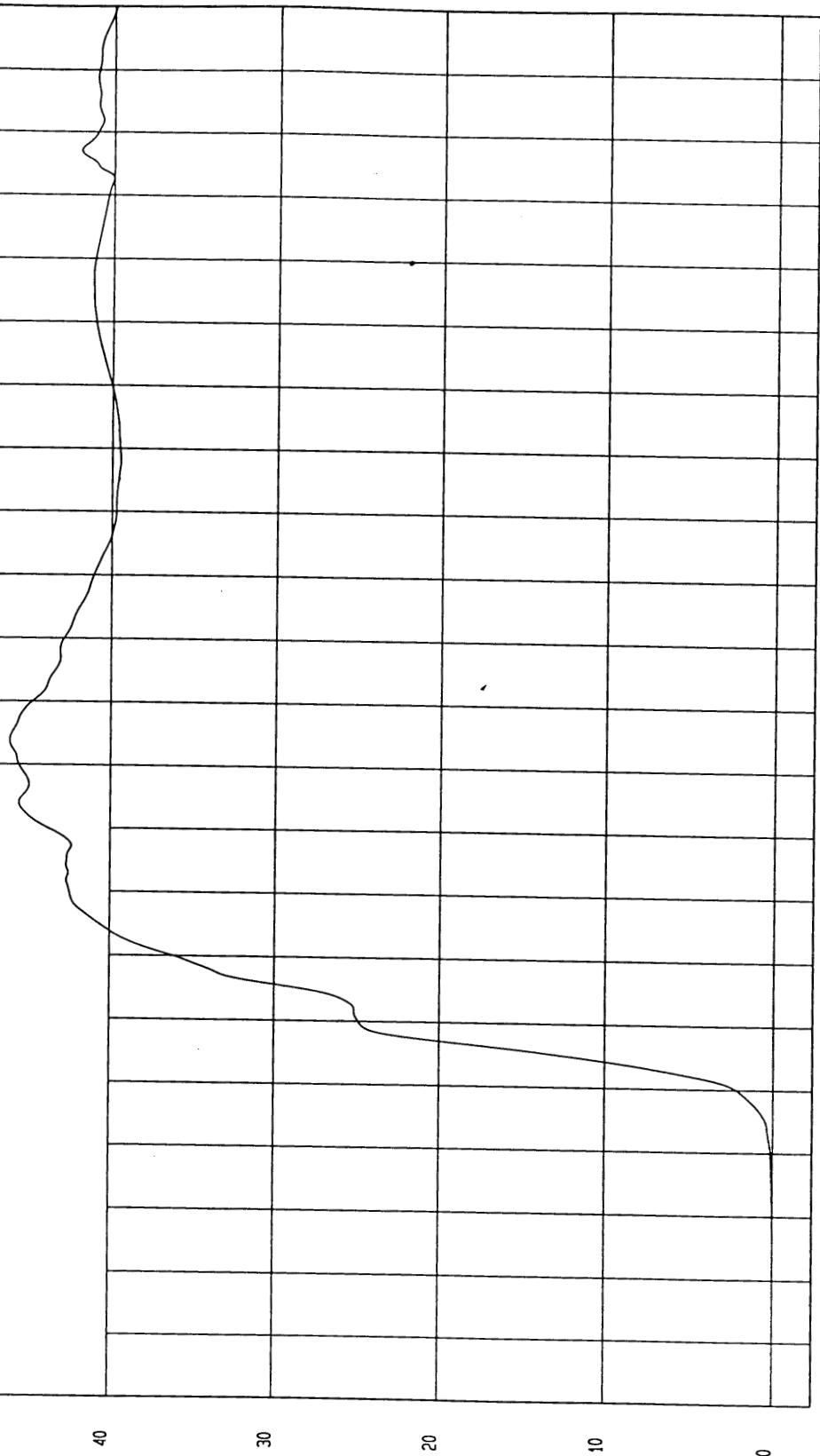
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -6.22E-03 KPH at -8 msec Maximum = 46.16 KPH at 84 msec

REAR PASSENGER UPPER RIB Y REDUNDANT VELOCITY

1 800056A1.V45 Filterclass (180)



TIME Seconds

MGA Research  
07-25-2000 11:03

TEST: HIGH SPEED LATERAL IMPACT  
TEST DATE: 07-24-2000  
Speed: 38.9 MPH 62.6 KPH

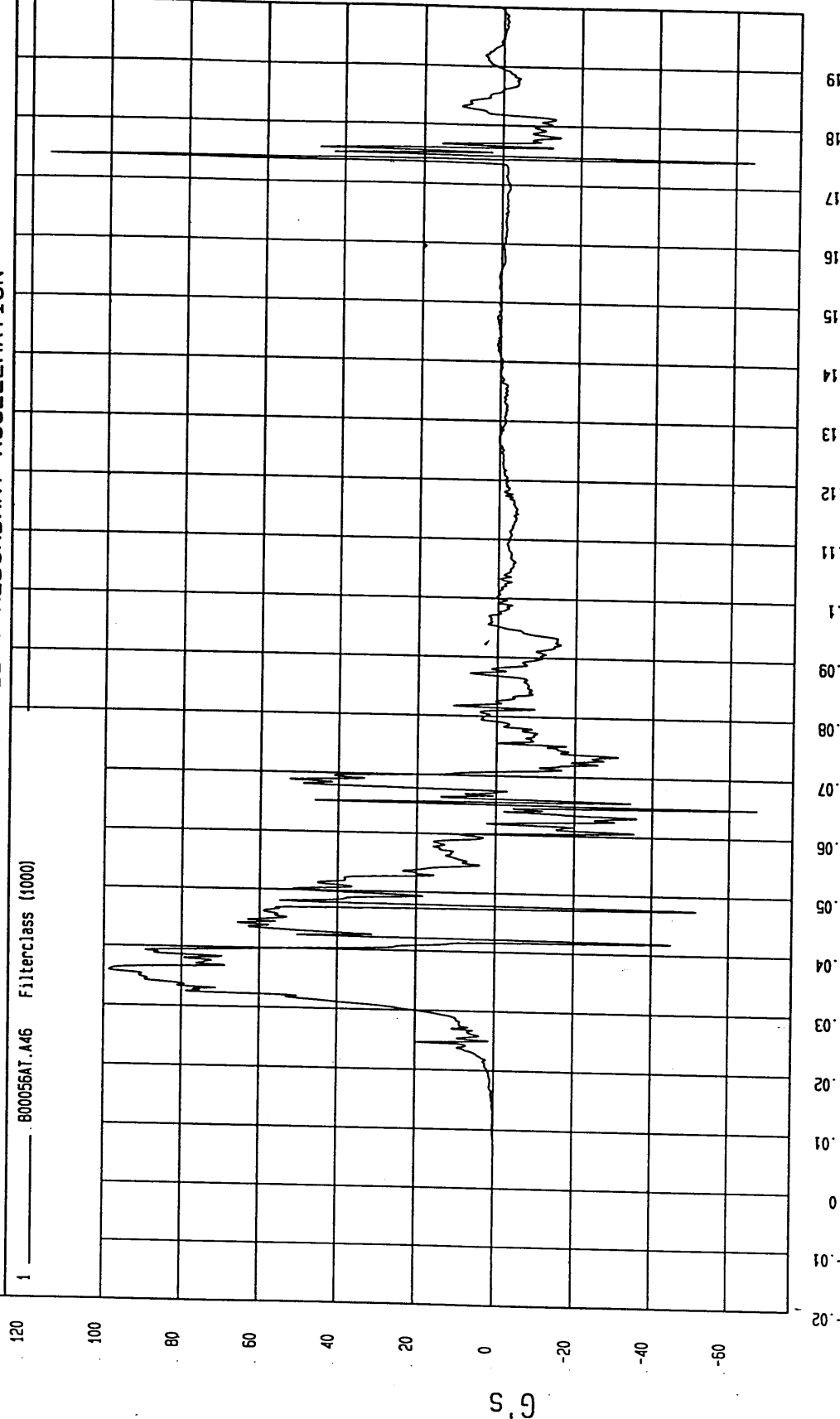
COMPONENT: 2000 SATURN SL2 4 DOOR

Minimum = -67.1 G's at 65 msec

Maximum = 115.43 G's at 174 msec

REAR PASSENGER LOWER RIB Y REDUNDANT ACCELERATION

1 800056AT.A46 Filterclass (1000)



Seconds

NCA Research  
07-25-2000 11:04

MGA Research  
07-25-2000 11:03

TEST DATE: 07-24-2000

TEST: HIGH SPEED LATERAL IMPACT

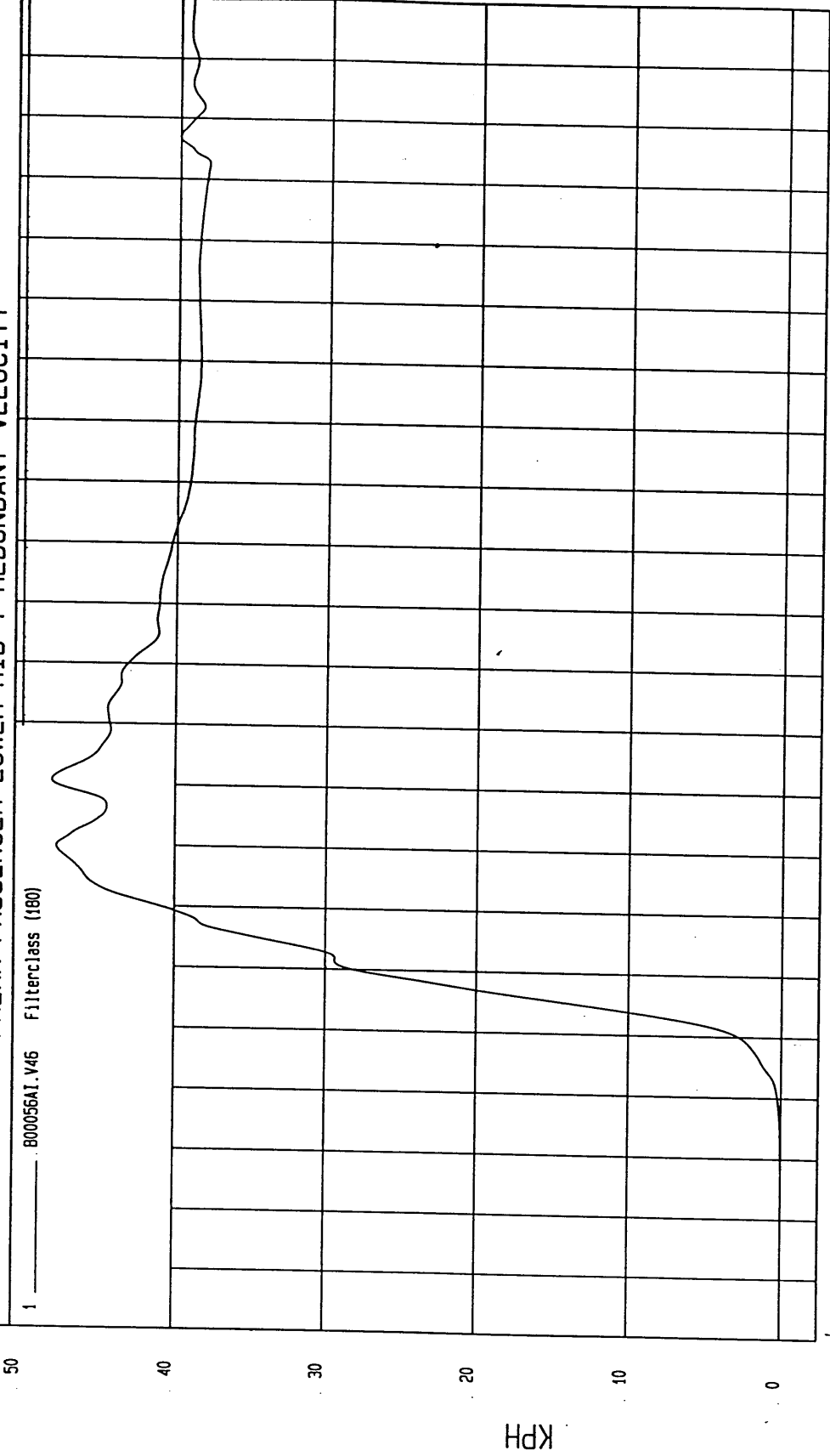
Speed: 38.9 MPH 62.6 KPH

COMPONENT: 2000 SATURN SL2 4 DOOR

Minimum = 0 KPH at -20 msec

Maximum = 48.1 KPH at 71 msec

REAR PASSENGER LOWER RIB Y REDUNDANT VELOCITY



TIME Seconds

KPH

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

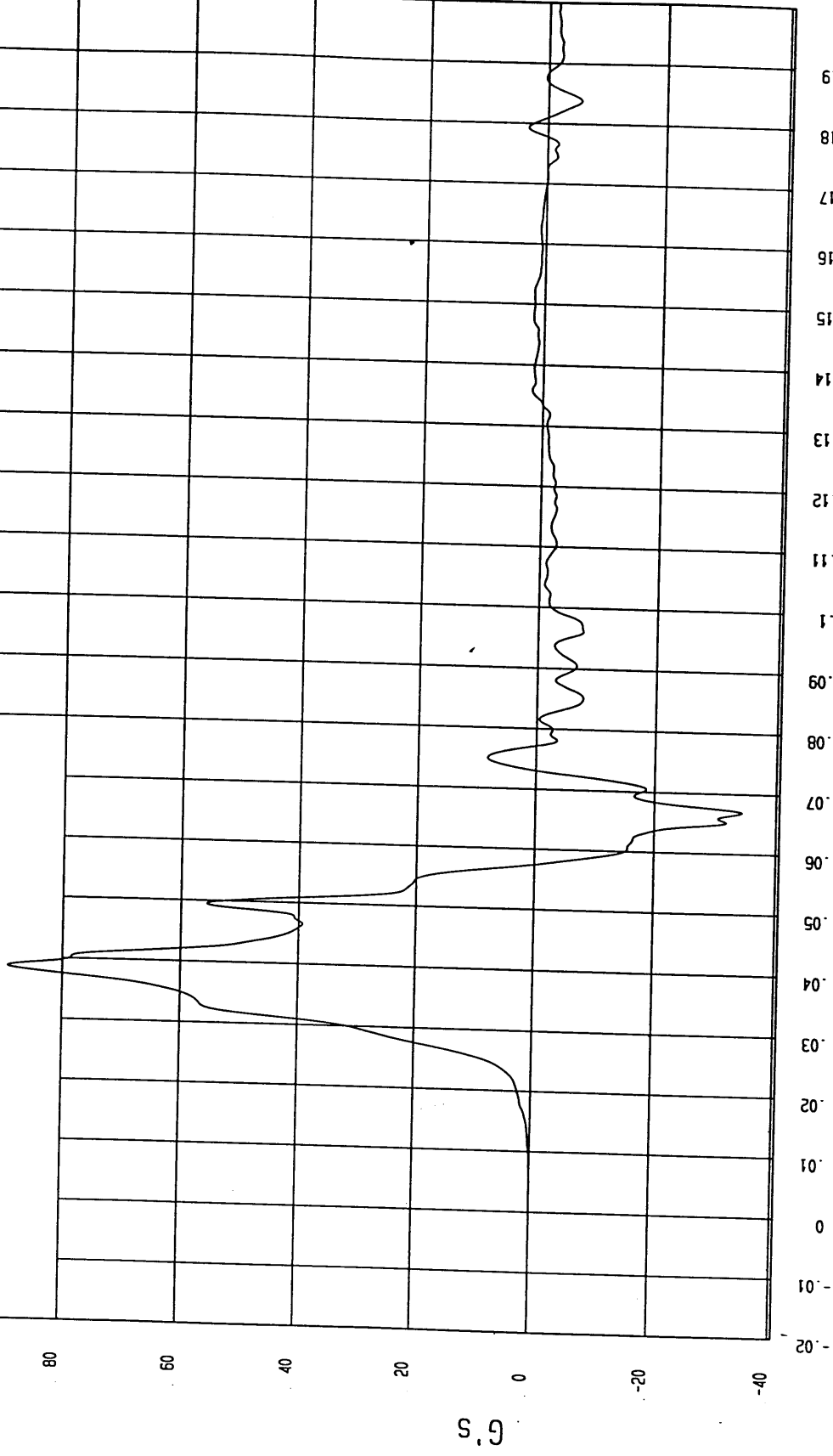
Speed: 38.9 MPH 62.6 KPH

Minimum = -34.39 G's at 67 msec

Maximum = 89.32 G's at 39 msec

REAR PASSENGER LOWER SPINE Y REDUNDANT ACCELERATION

1 800056AF.A47 Filterclass (180)



Seconds

MGA Research  
07-25-2000 11:05

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

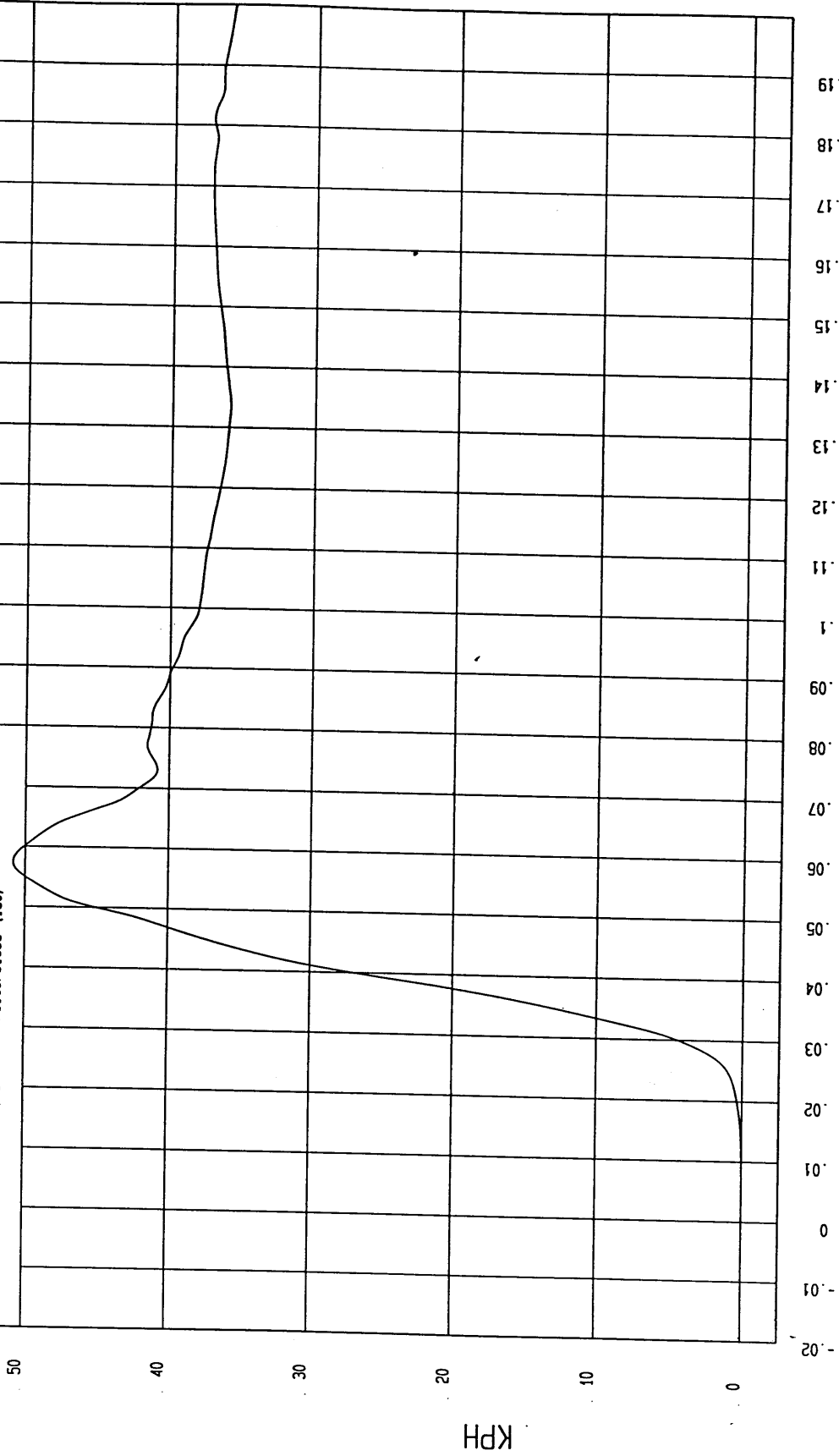
COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -5.23E-05 KPH at -20 msec

Maximum = 50.87 KPH at 57 msec

REAR PASSENGER LOWER SPINE Y REDUNDANT VELOCITY

1 800056A1.V47 Filterclass (180)



MCA Research  
07-25-2000 11:03

TIME Seconds

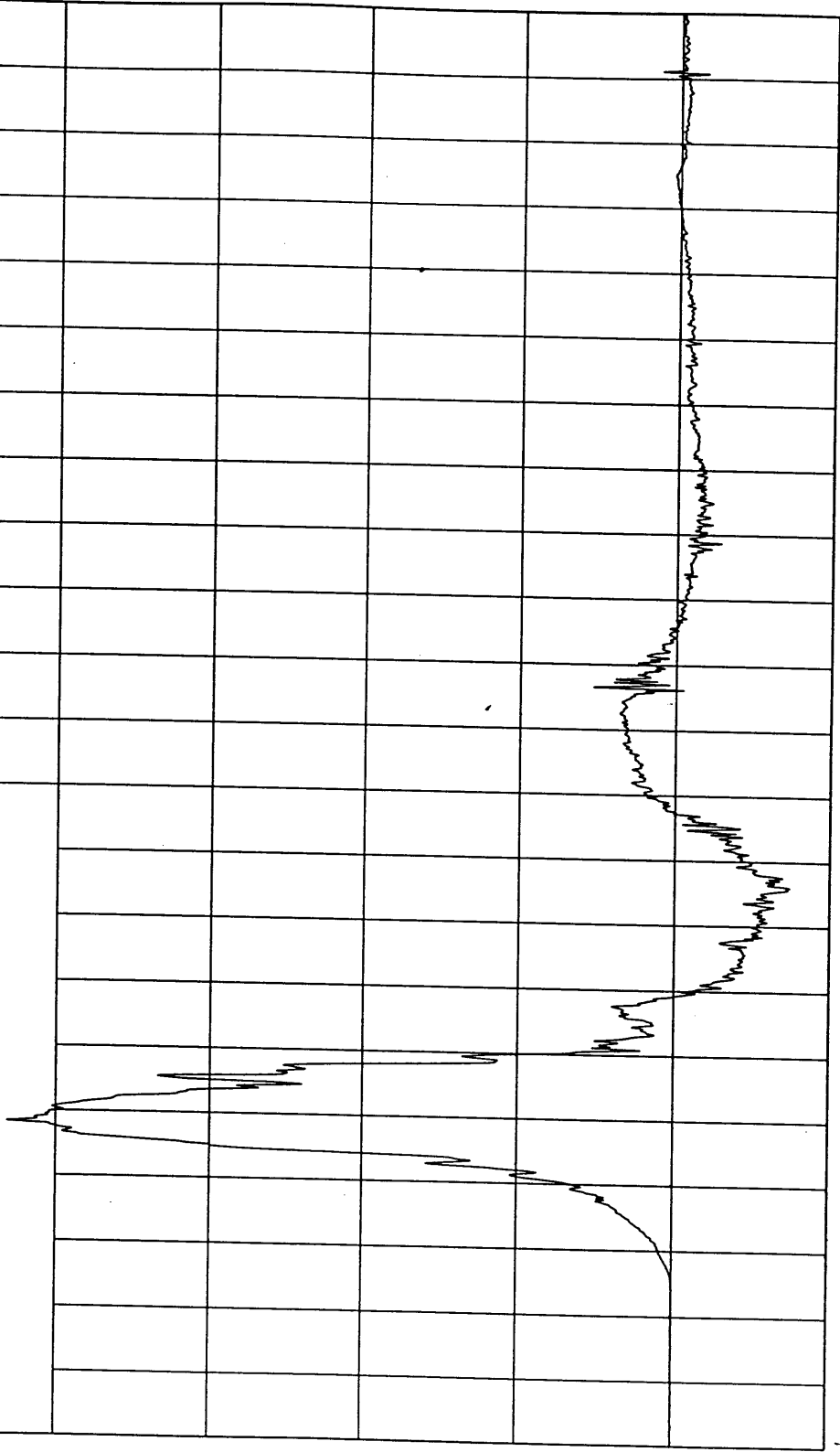
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -14.67 G's at 66 msec  
Maximum = 86.38 G's at 28 msec

REAR PASSENGER PELVIS Y REDUNDANT ACCELERATION

1 80005GAT.A48 Filterclass (1000)

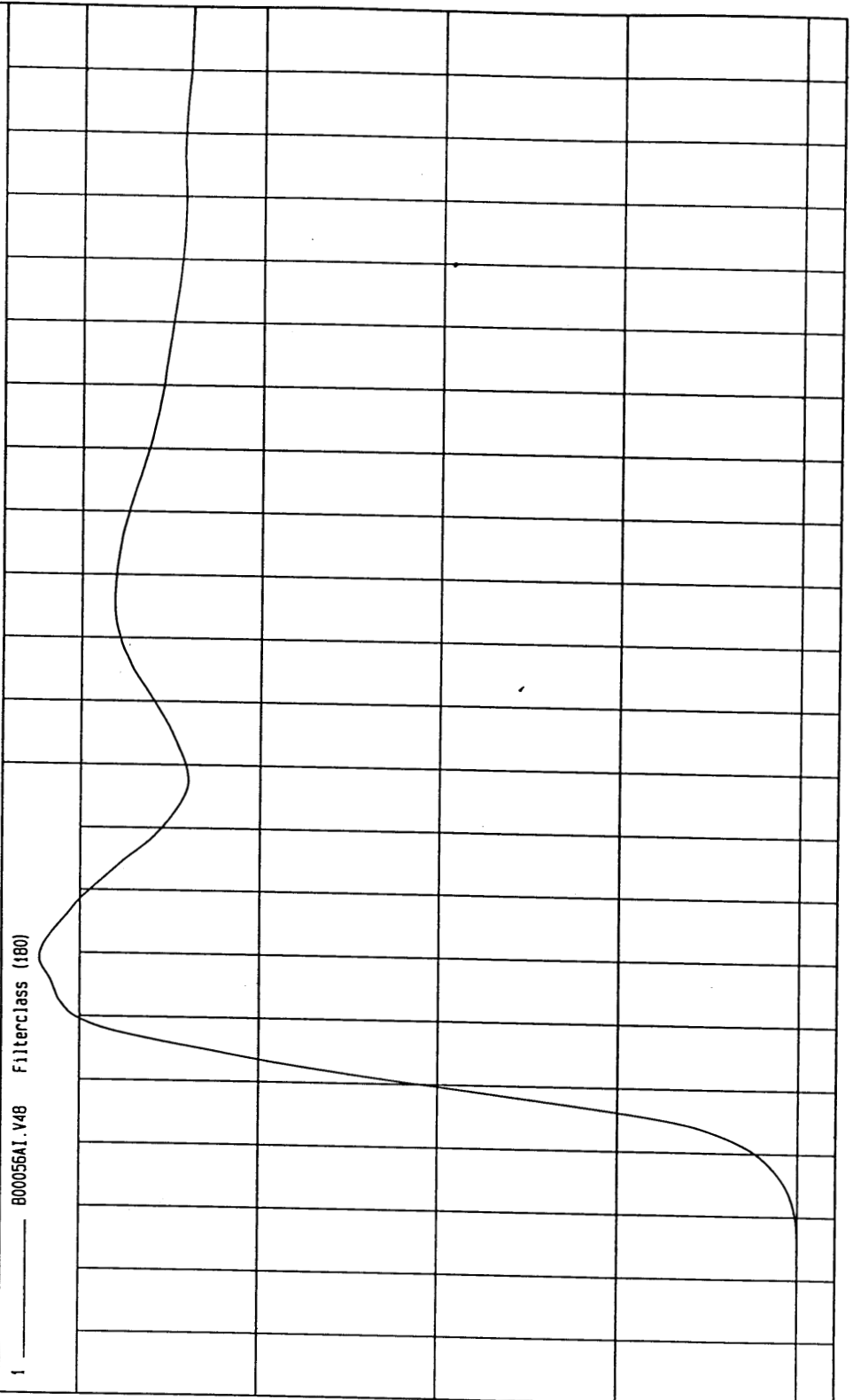


Seconds

MGA Research  
07-25-2000 11:05

TEST: HIGH SPEED LATERAL IMPACT      TEST DATE: 07-24-2000  
COMPONENT: 2000 SATURN SL2 4 DOOR      Speed: 38.9 MPH 62.6 KPH  
Minimum = -1.22E-03 KPH at -11 msec      Maximum = 42.23 KPH at 49 msec

REAR PASSENGER PELVIS Y REDUNDANT VELOCITY



NGA Research  
07-25-2000 11:03

TIME Seconds

KPH

FINITE IMPULSE RESPONSE (FIR) FILTERED DATA

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

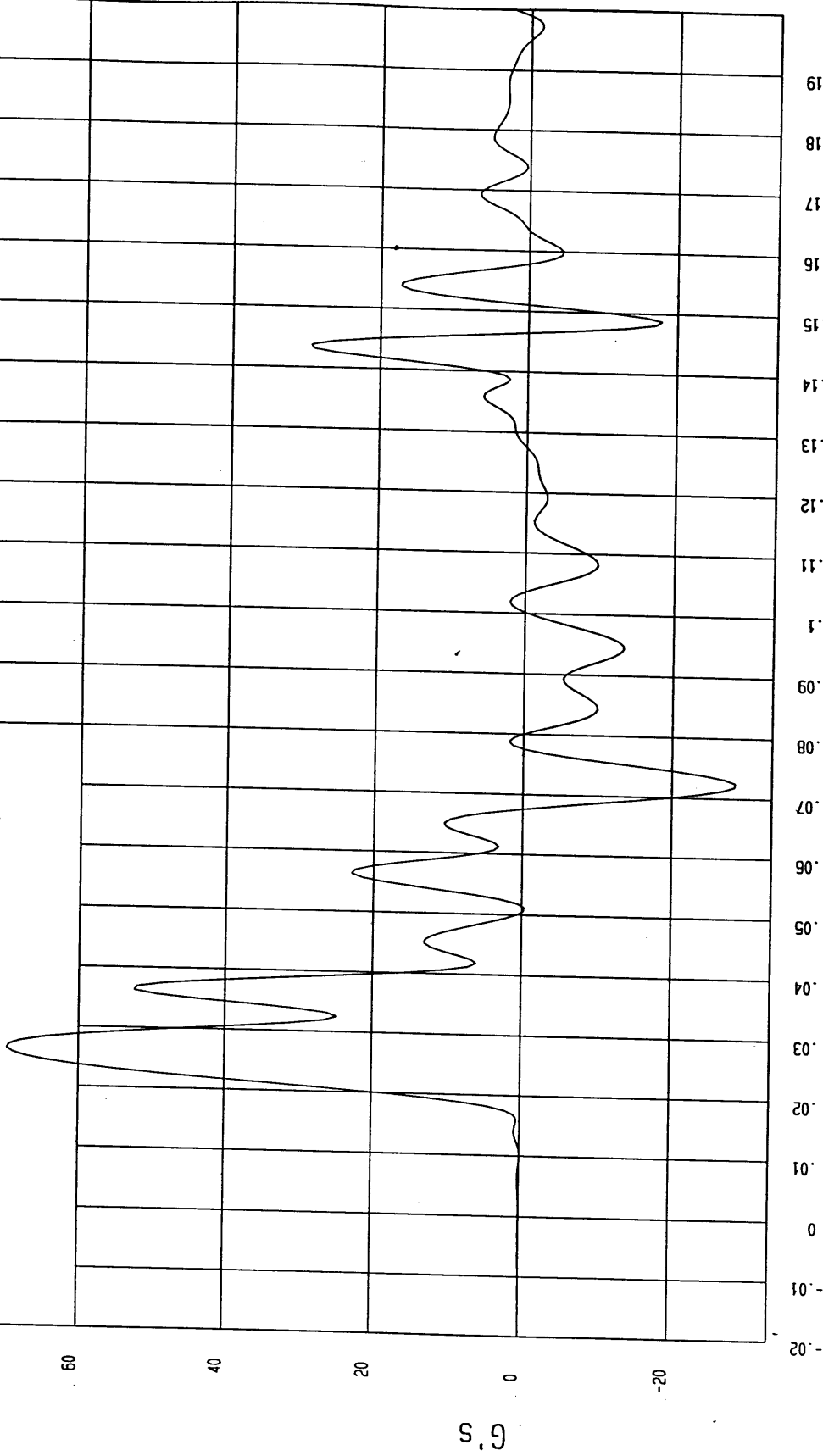
Speed: 38.9 MPH 62.6 KPH

Minimum = -28.75 G's at 72 msec

Maximum = 69.66 G's at 26 msec

DRIVER UPPER RIB Y ACCELERATION

1 ——— B00056FI.R04 Filterclass (FIR Filtered)



Seconds

MGA Research  
07-25-2000 10:34

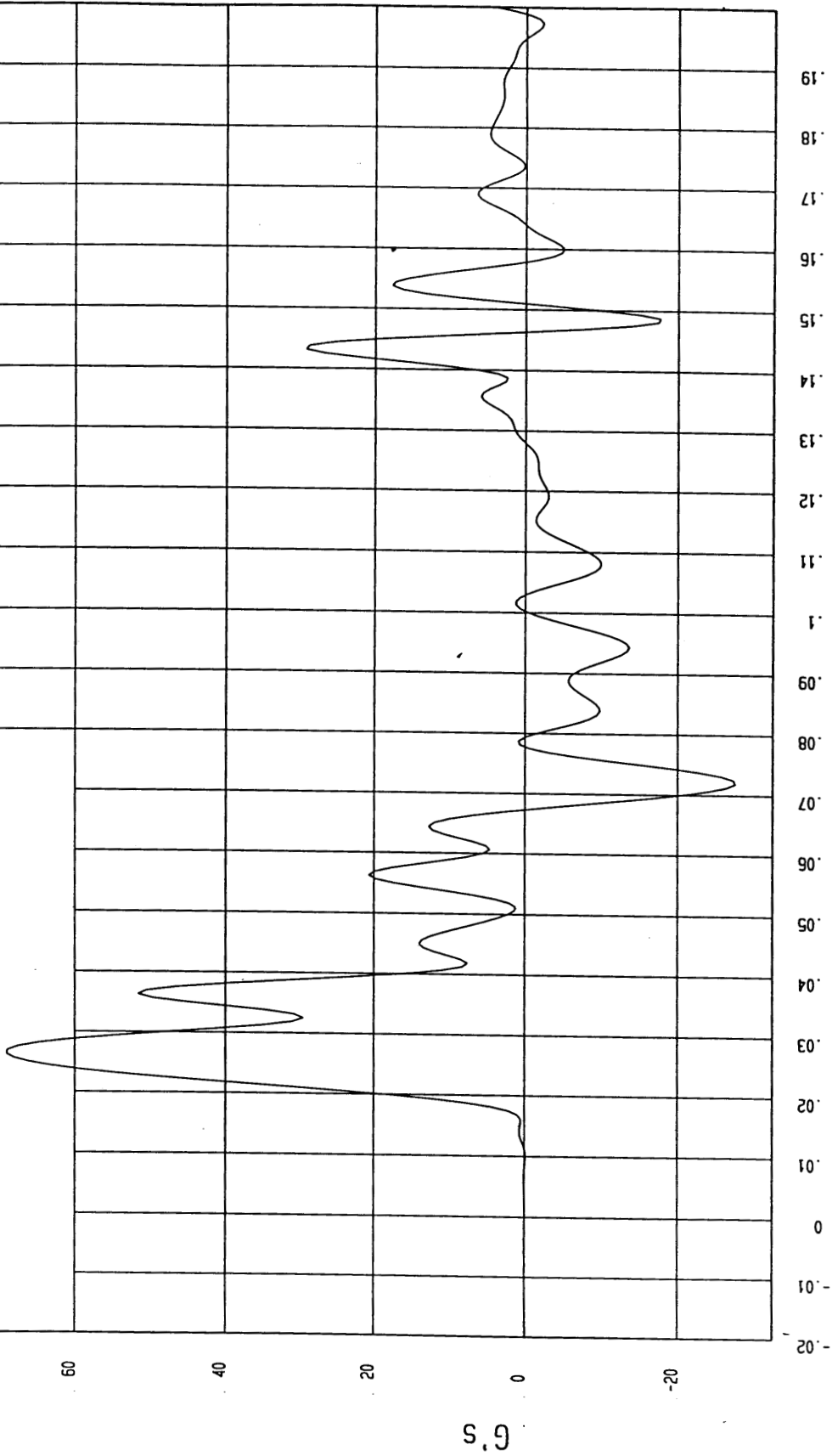
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -27.66 G's at 72 msec  
Maximum = 69.08 G's at 26 msec

DRIVER UPPER RIB Y REDUNDANT ACCELERATION

1 ——— B00056F1.R41 Filterclass (FIR Filtered)



MCA Research  
07-25-2000 10:34

Seconds

G's

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

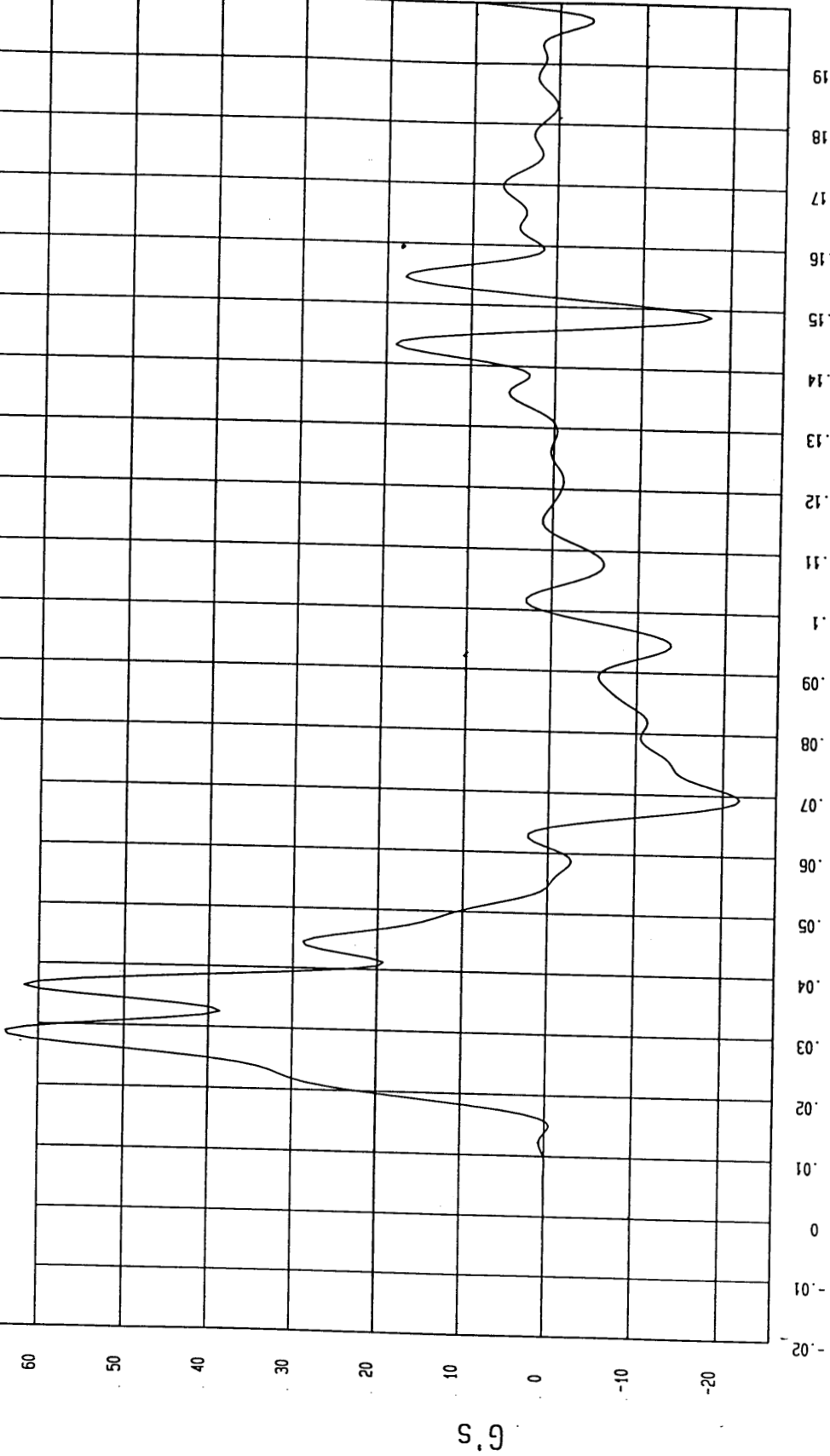
Speed: 38.9 MPH 62.6 KPH

Minimum = -21.95 G's at 69 msec

Maximum = 64 G's at 29 msec

DRIVER LOWER RIB Y ACCELERATION

1 . . . . . B00056FI.R05 Filterclass (FIR Filtered)



Seconds

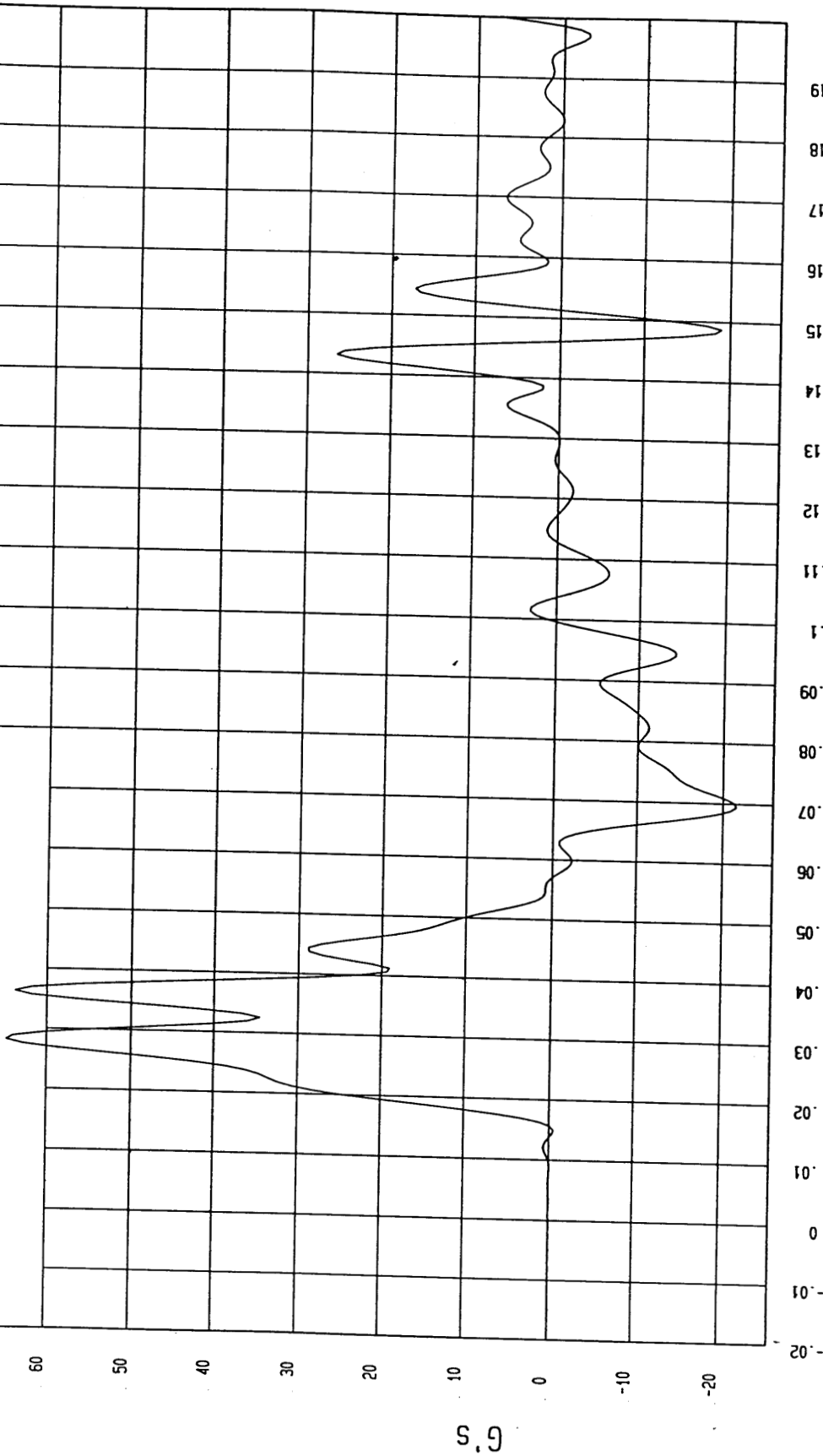
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -21.57 G's at 69 msec  
Maximum = 64.92 G's at 28 msec

DRIVER LOWER RIB REDUNDANT Y ACCELERATION

1 800056F1.R42 Filterclass (FIR Filtered)



Seconds

MCA Research  
08-10-2000 11:07

TEST DATE: 07-24-2000

Speed: 38.9 MPH 62.6 KPH

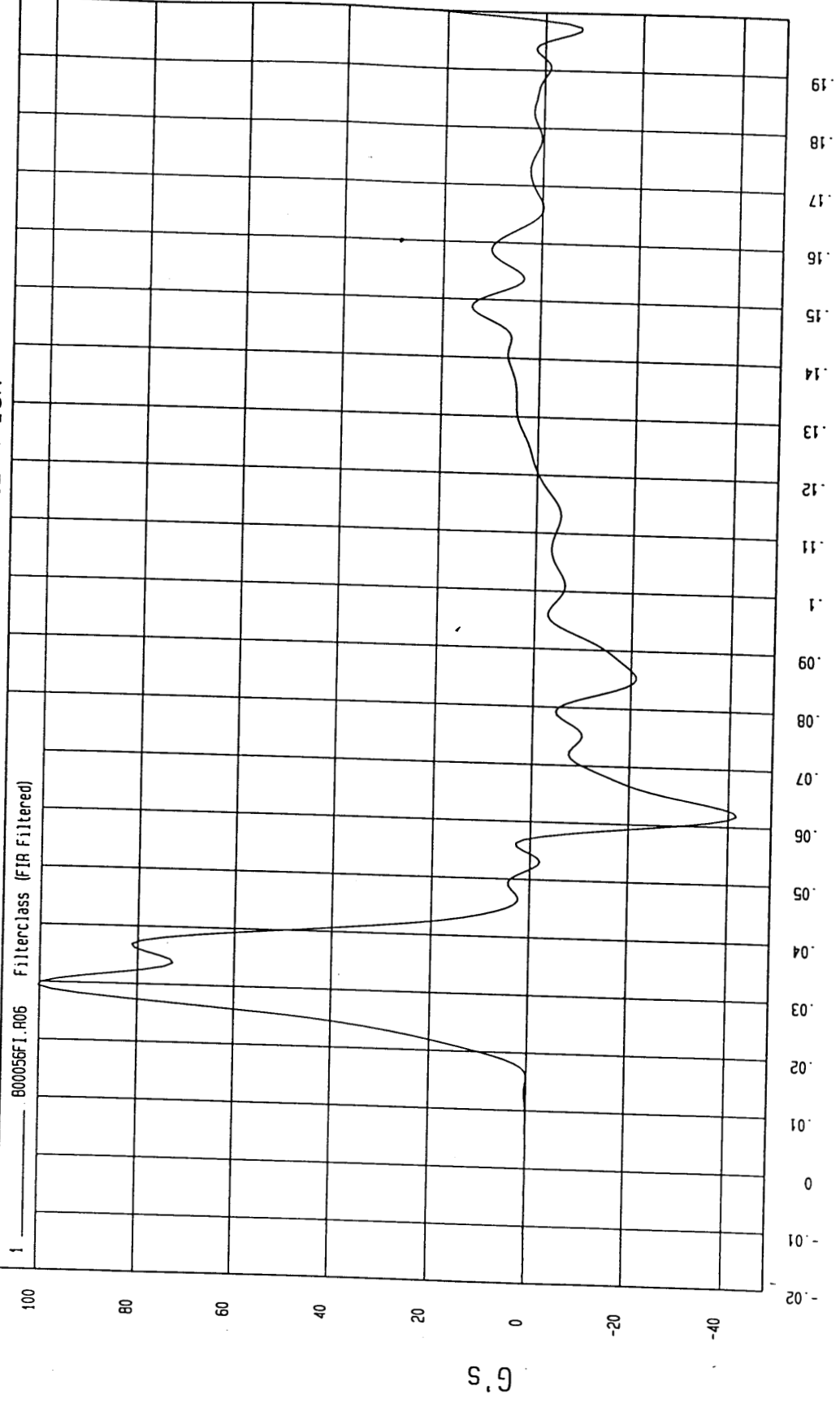
TEST: HIGH SPEED LATERAL IMPACT

COMPONENT: 2000 SATURN SL2 4 DOOR

Minimum = -41.65 G's at 62 msec

Maximum = 100.26 G's at 29 msec

DRIVER LOWER SPINE Y ACCELERATION



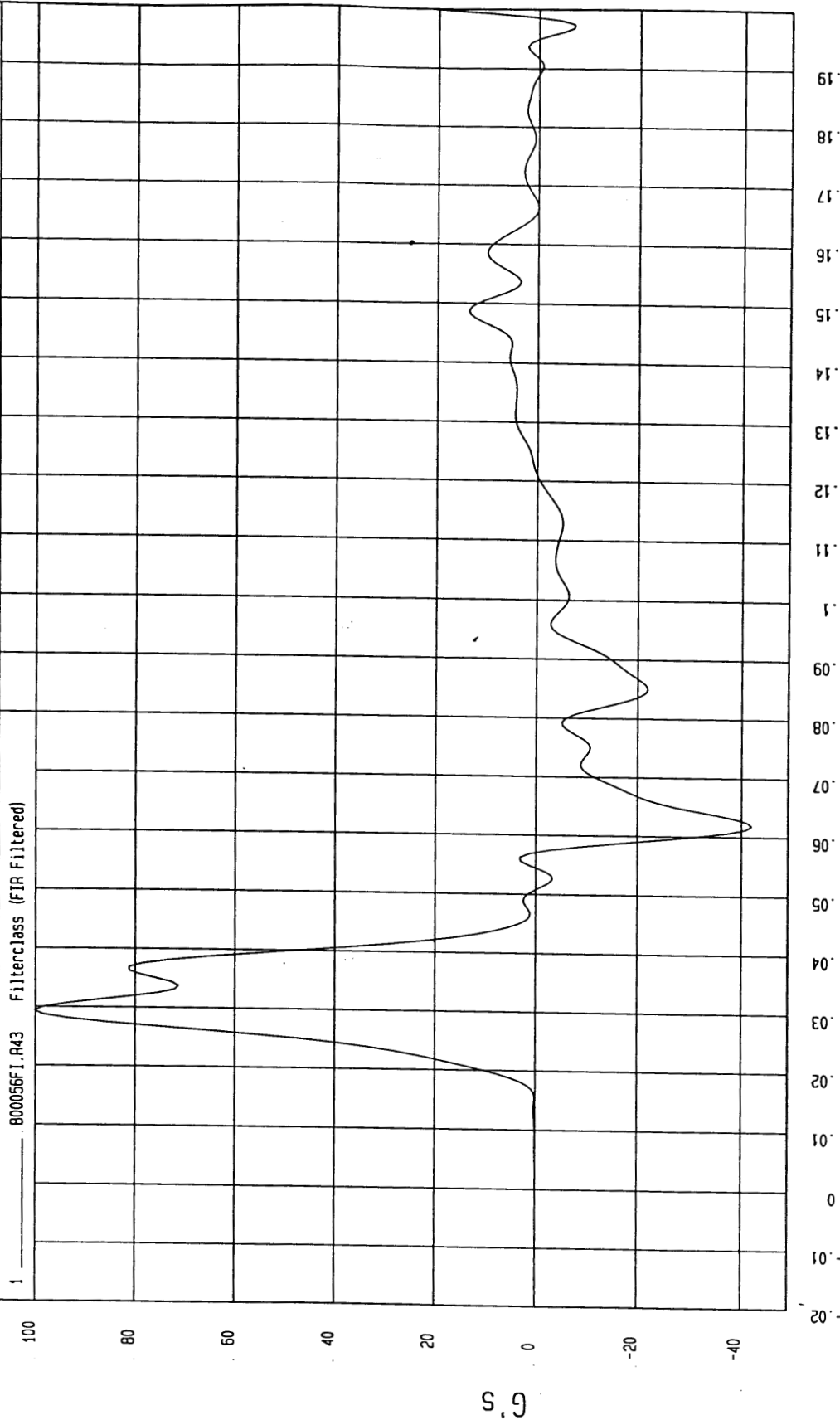
MCA Research  
07-25-2000 10:34

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -41.97 G's at 62 msec Maximum = 100.19 G's at 29 msec

DRIVER LOWER SPINE Y REDUNDANT ACCELERATION



Seconds

MCA Research  
07-25-2000 10:34

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

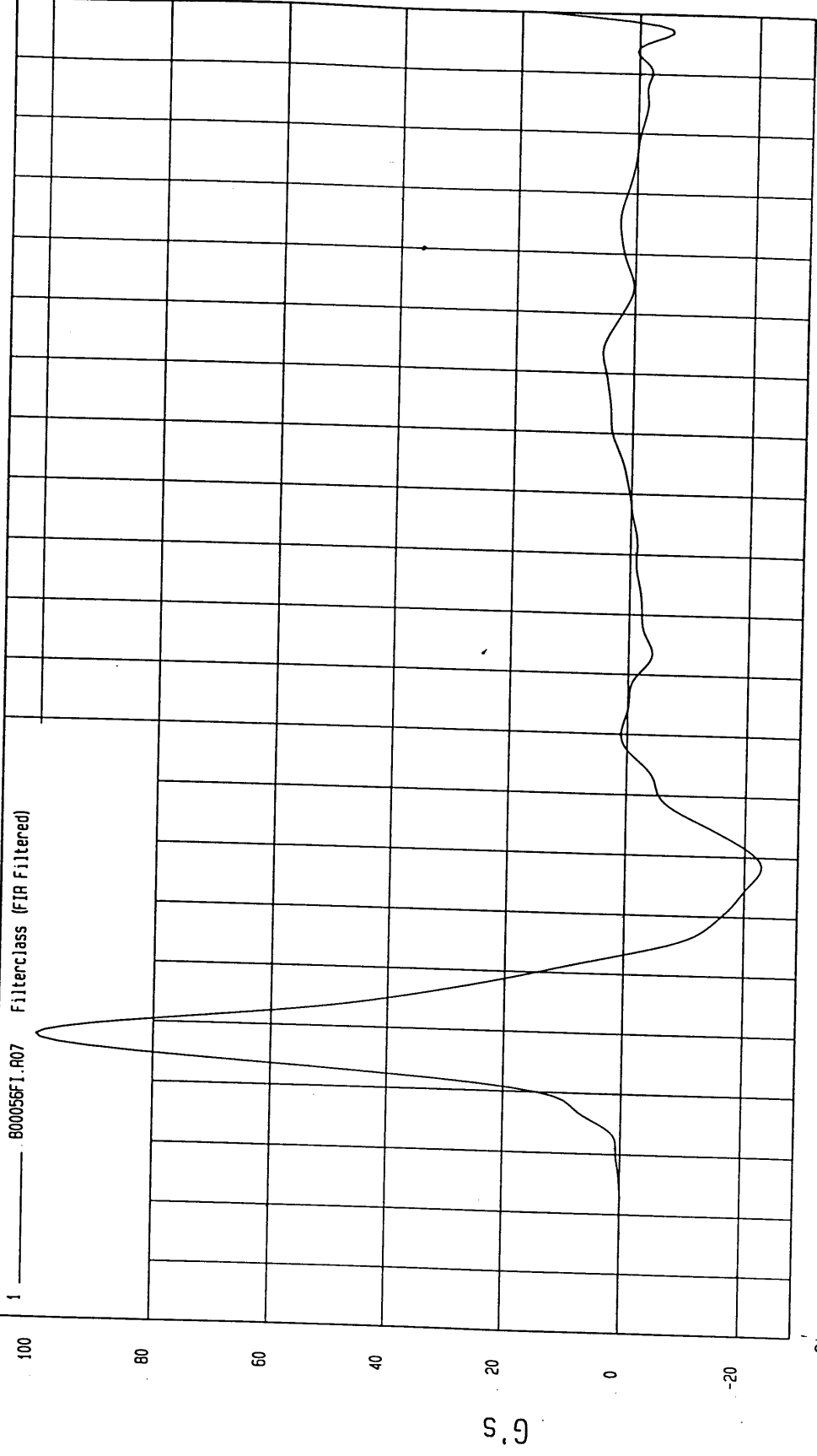
Speed: 38.9 MPH 62.6 KPH

COMPONENT: 2000 SATURN SL2 4 DOOR

Minimum = -22.86 G's at 58 msec

Maximum = 99.96 G's at 28 msec

### DRIVER PELVIS Y ACCELERATION



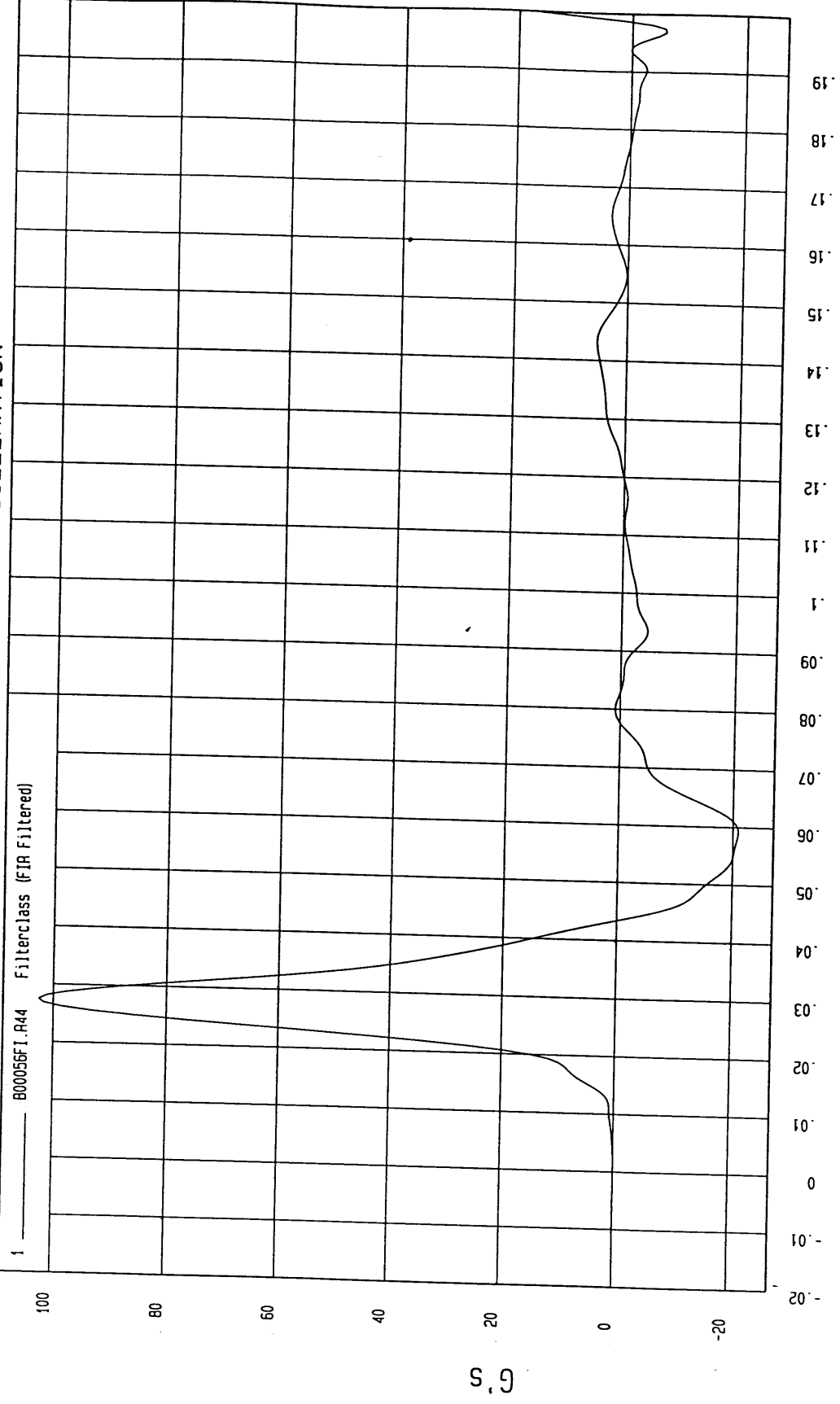
Seconds

MGA Research  
07-25-2000 10:34

TEST: HIGH SPEED LATERAL IMPACT  
TEST DATE: 07-24-2000  
Speed: 38.9 MPH 62.6 KPH

COMPONENT: 2000 SATURN SL2 4 DOOR  
Minimum = -20.96 G's at 59 msec  
Maximum = 102.54 G's at 28 msec

DRIVER PELVIS Y REDUNDANT ACCELERATION



MGA Research  
07-23-2000 10.34

Seconds

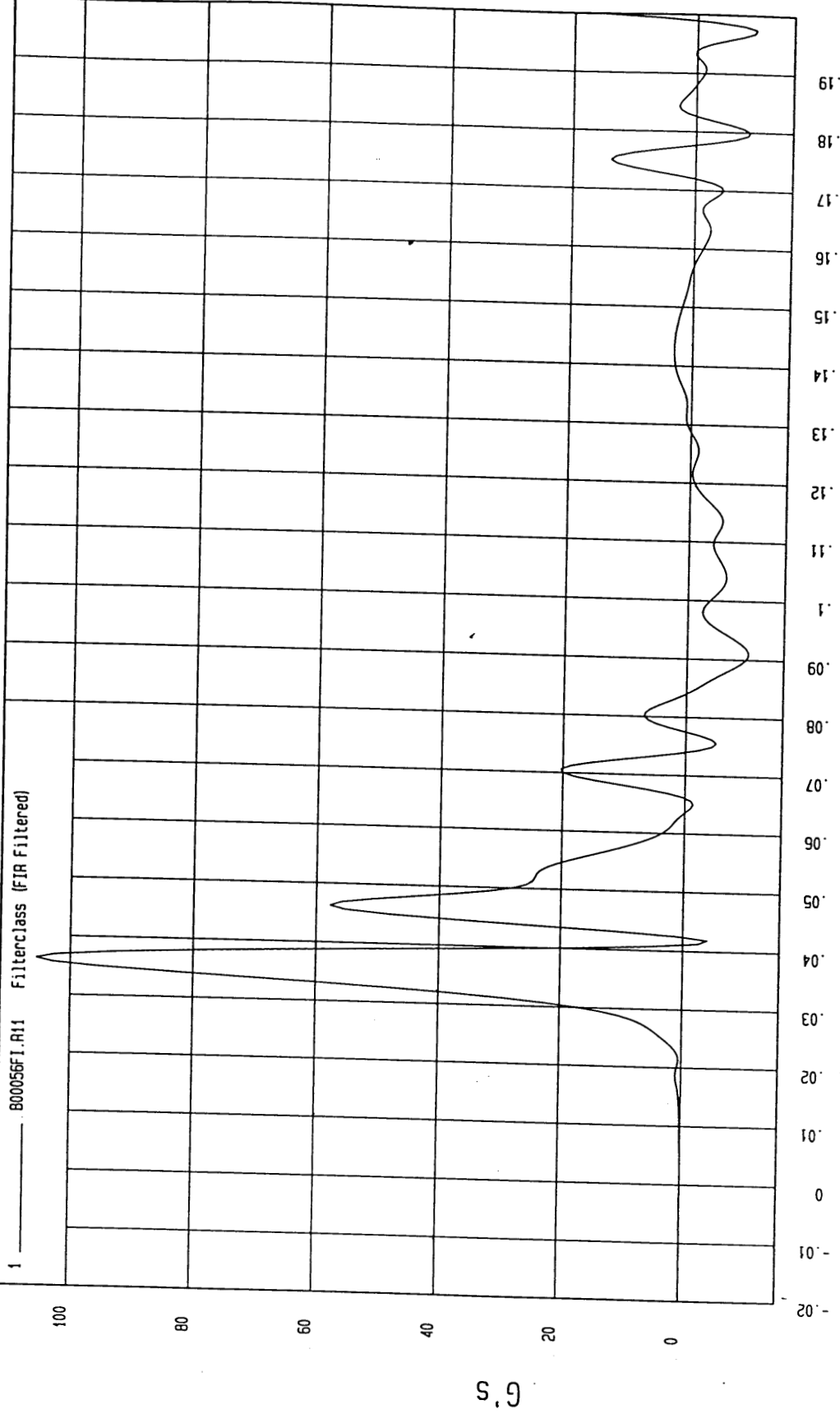
G's

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -9.88 G's at 91 msec  
Maximum = 105.6 G's at 36 msec

REAR PASSENGER UPPER RIB Y ACCELERATION



MGA Research  
07-25-2000 10:34

Seconds

G's

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

Speed: 38.9 MPH 62.6 KPH

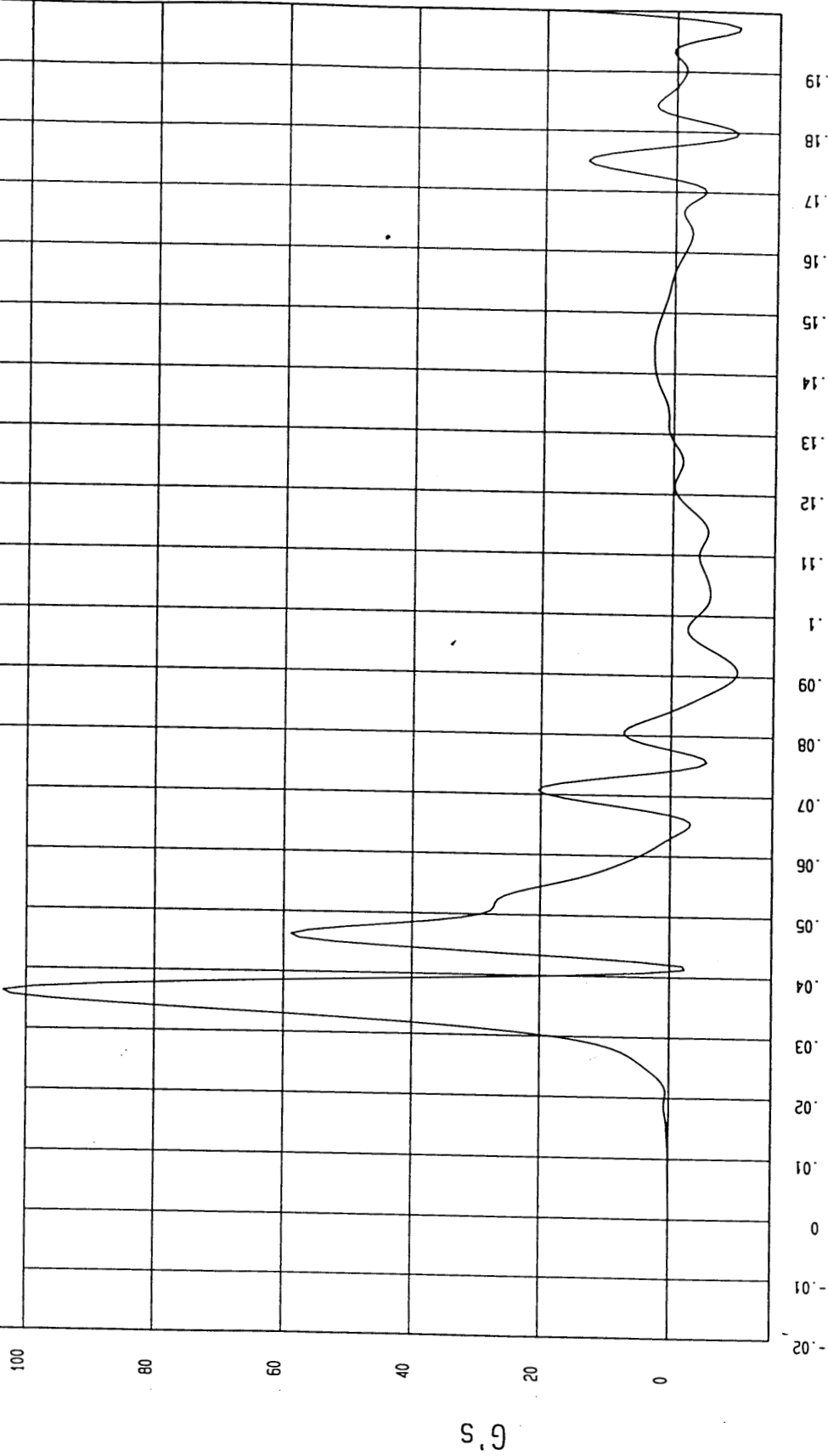
COMPONENT: 2000 SATURN SL2 4 DOOR

Minimum = -10.08 G's at 91 msec

Maximum = 103.58 G's at 36 msec

REAR PASSENGER UPPER RIB Y REDUNDANT ACCELERATION

1 — 800056FI.R45 Filterclass (FIR Filtered)



Seconds

MCA Research  
07-25-2000 10:34

TEST DATE: 07-24-2000

TEST: HIGH SPEED LATERAL IMPACT

Speed: 38.9 MPH 62.6 KPH

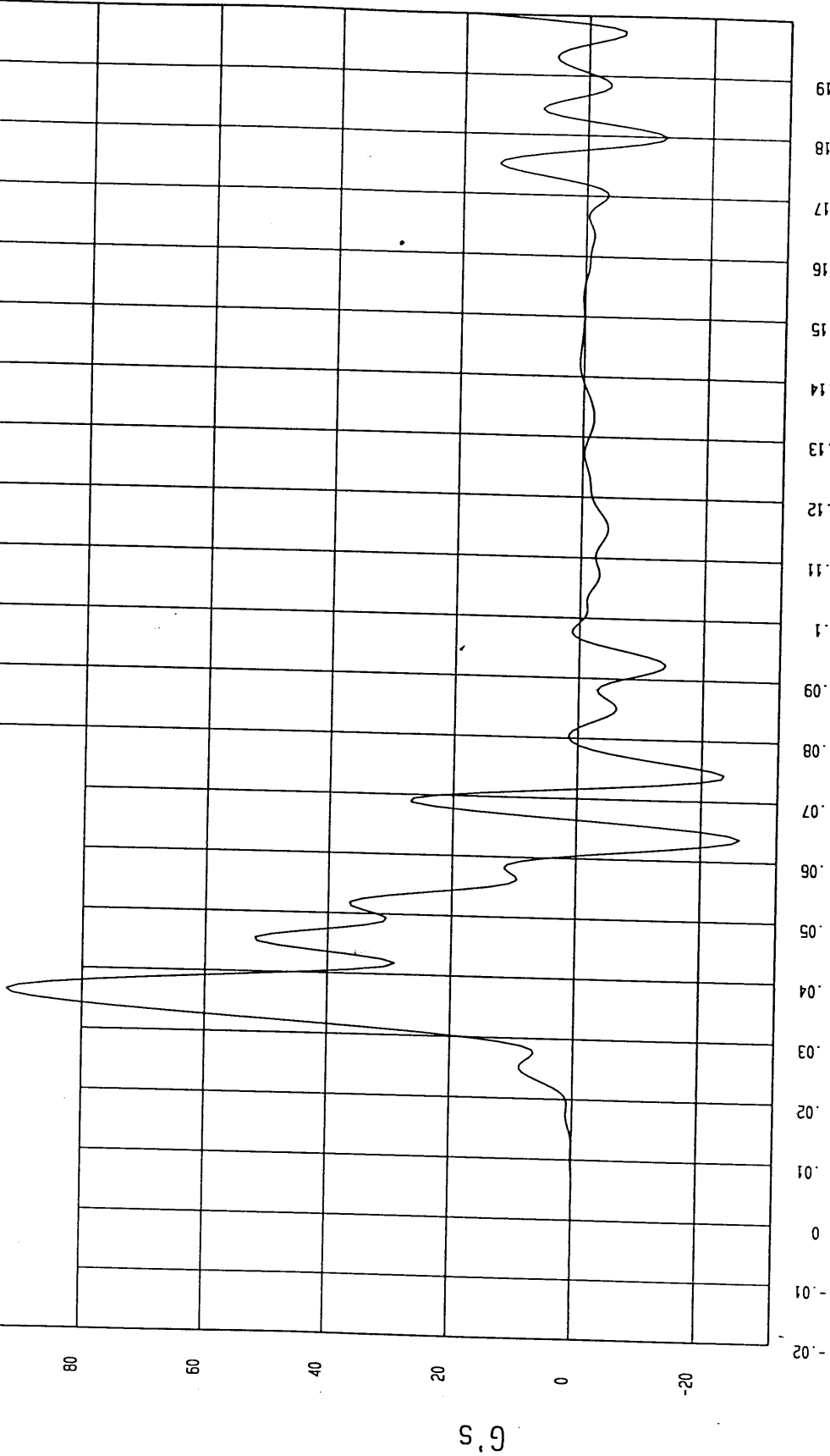
COMPONENT: 2000 SATURN SL2 4 DOOR

Maximum = 92.13 G's at 36 msec

Minimum = -26.2 G's at 64 msec

REAR PASSENGER LOWER RIB Y ACCELERATION

1 800056FI.R12 Filterclass (FIR Filtered)



MCA Research  
07-25-2000 10:34

Seconds

G's

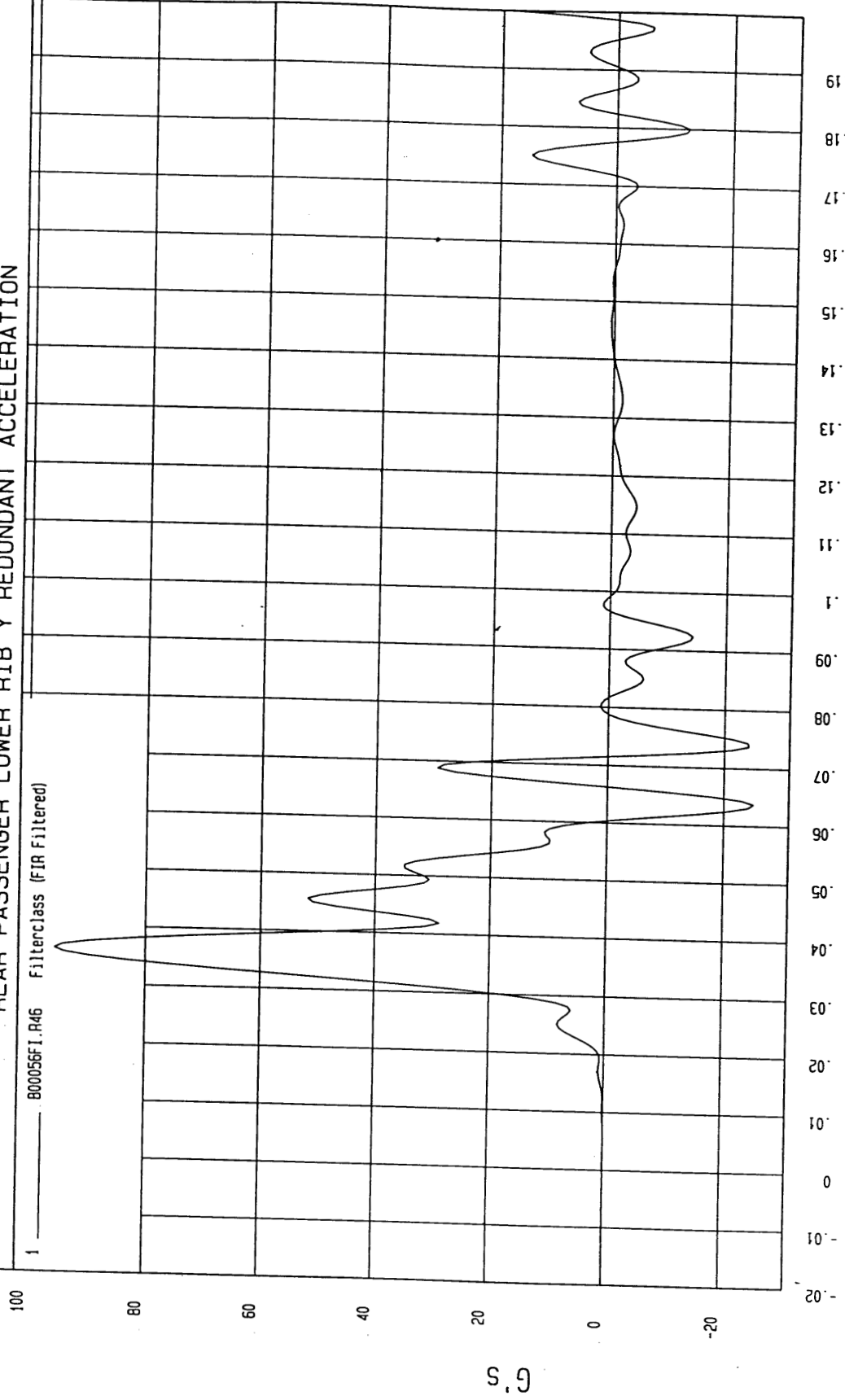
TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -25.13 G's at 64 msec  
Maximum = 95.52 G's at 36 msec

REAR PASSENGER LOWER RIB Y REDUNDANT ACCELERATION

1 800056F1.R46 Filterclass (FIR Filtered)



Seconds

MCA Research  
07-25-2000 10:34

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

Speed: 38.9 MPH 62.6 KPH

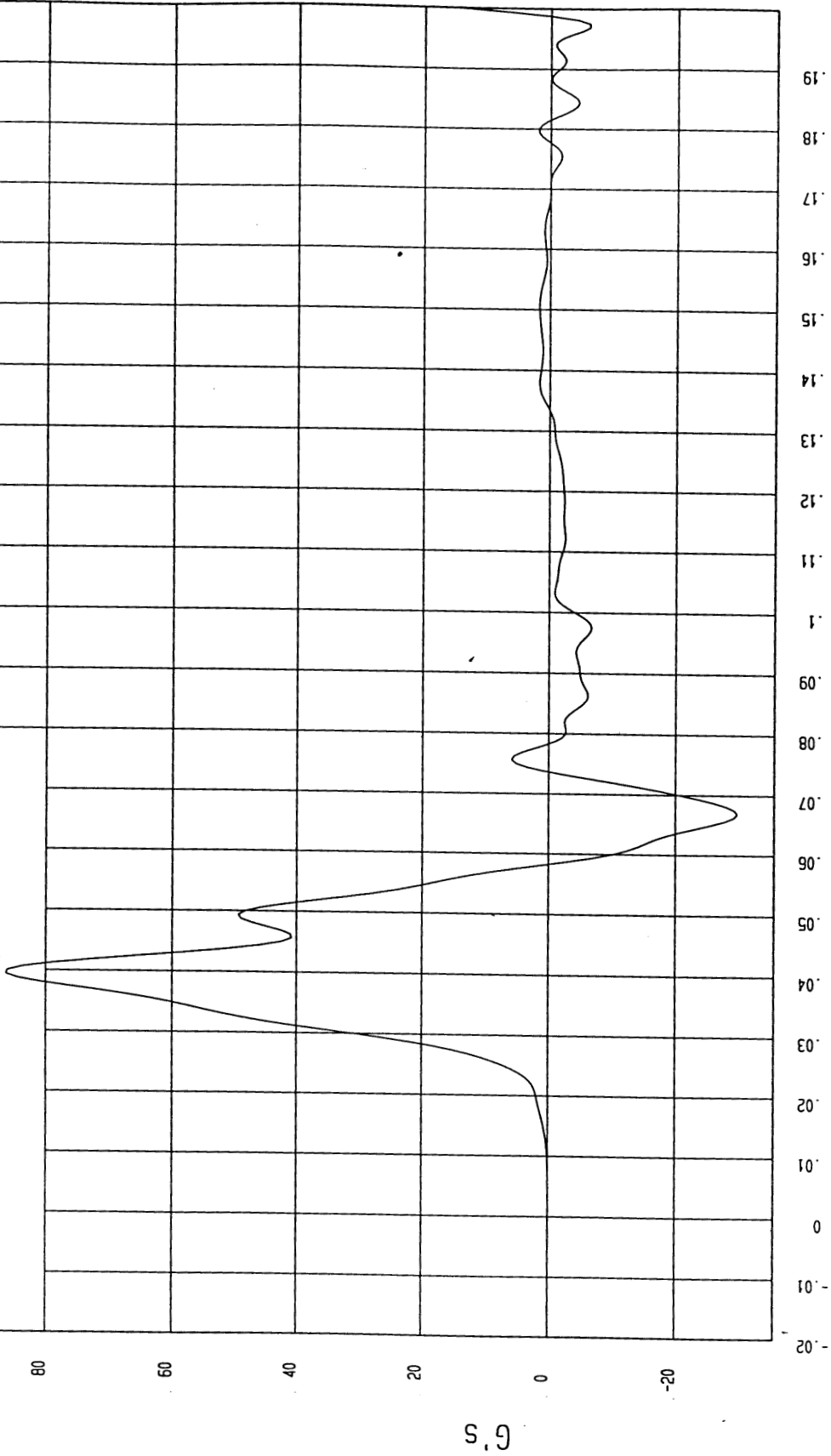
COMPONENT: 2000 SATURN SL2 4 DOOR

Minimum = -29.62 G's at 67 msec

Maximum = 86.18 G's at 39 msec

REAR PASSENGER LOWER SPINE Y ACCELERATION

1 800056FI.R13 Filterclass (FIR Filtered)



MCA Research  
07-25-2000 10:34

Seconds

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

Speed: 38.9 MPH 62.6 KPH

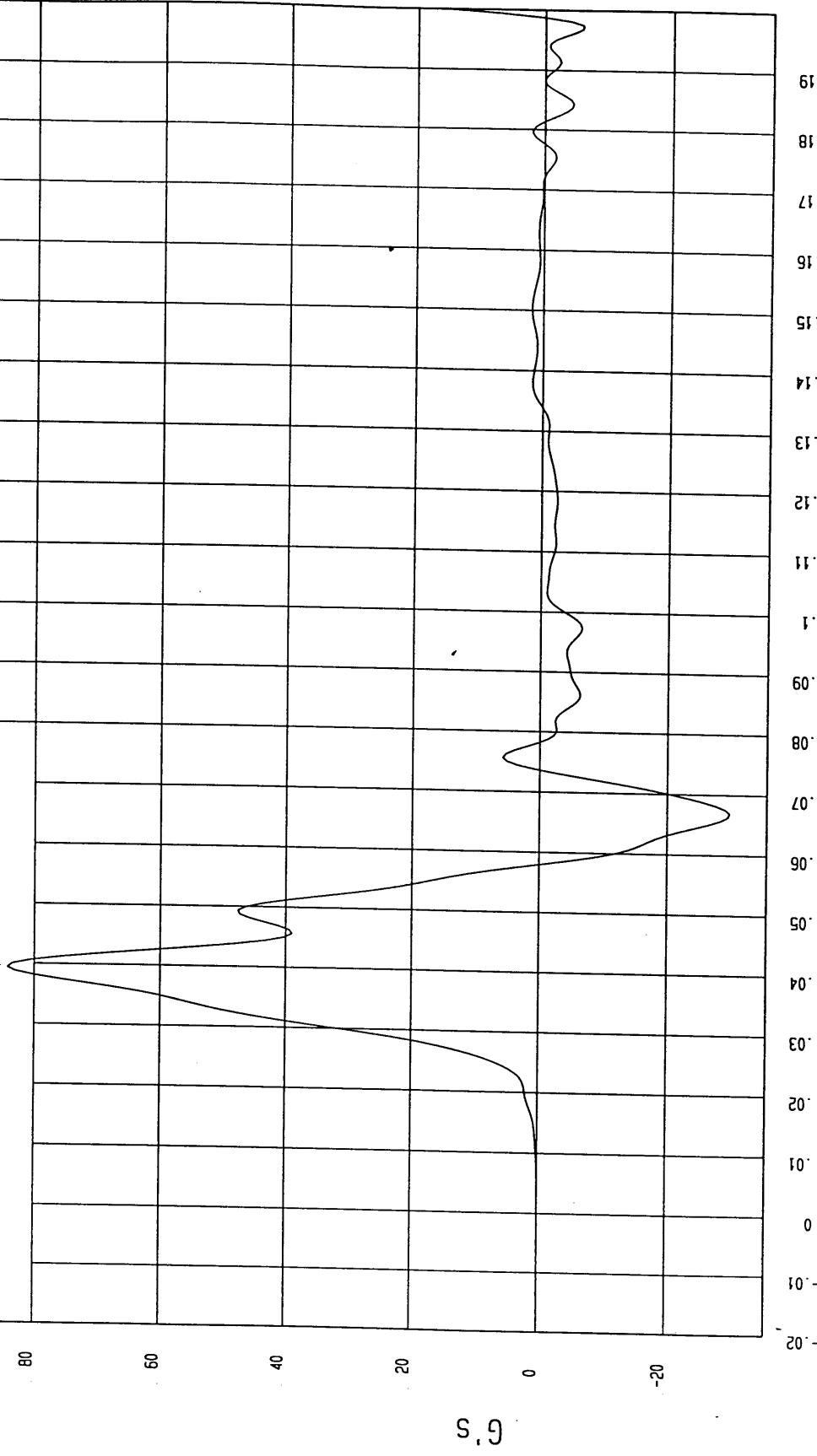
COMPONENT: 2000 SATURN SL2 4 DOOR

Maximum = 84.22 G's at 39 msec

Minimum = -29.74 G's at 67 msec

REAR PASSENGER LOWER SPINE Y REDUNDANT ACCELERATION

1 800056FI.R47 Filterclass (FIR Filtered)



Seconds

MGA Research  
07-25-2000 10:34

TEST: HIGH SPEED LATERAL IMPACT

TEST DATE: 07-24-2000

COMPONENT: 2000 SATURN SL2 4 DOOR

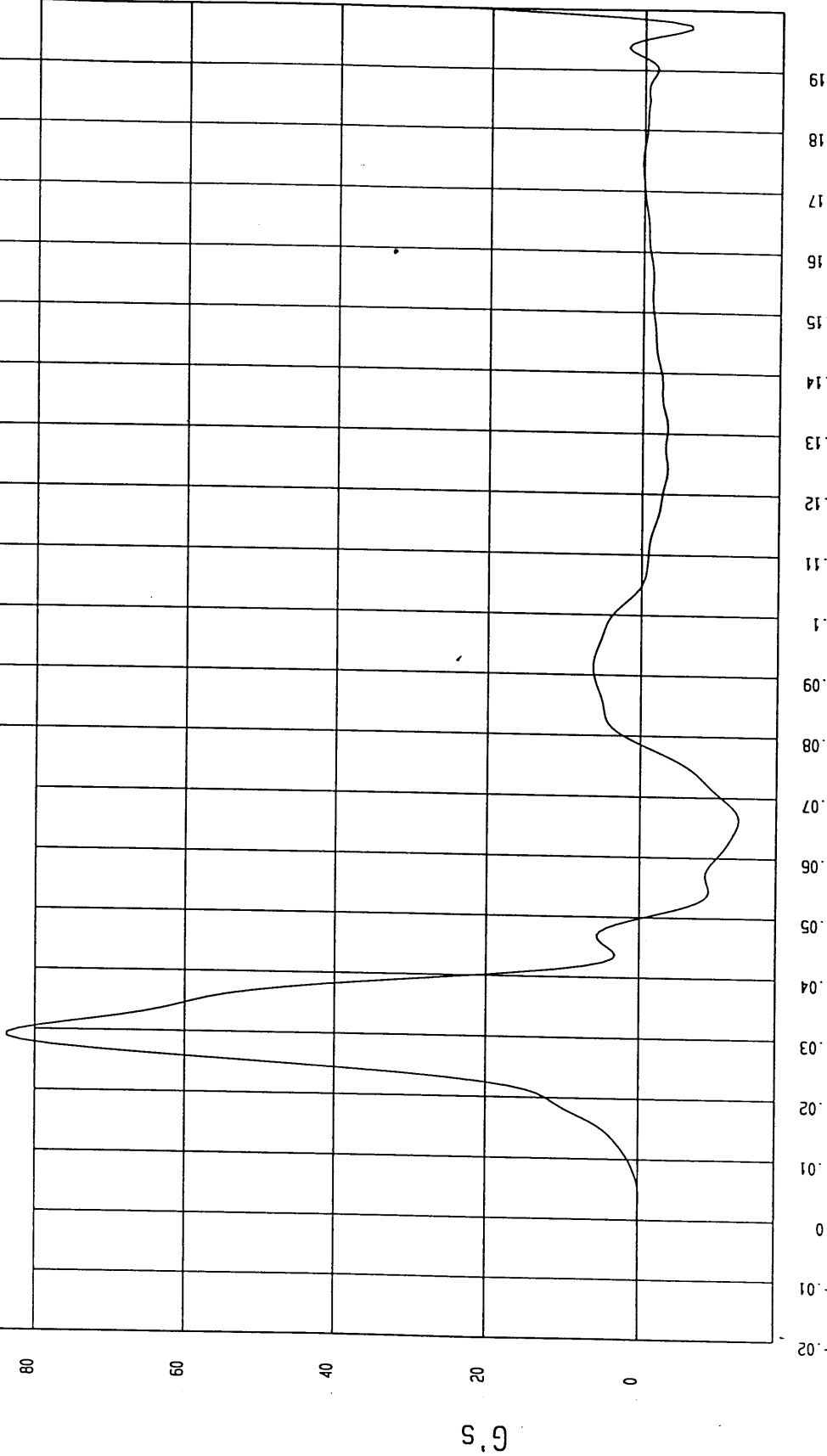
Speed: 38.9 MPH 62.6 KPH

Minimum = -12.64 G's at 66 msec

Maximum = 83.67 G's at 29 msec

REAR PASSENGER PELVIS Y ACCELERATION

1 800056FI.R14 Filterclass (FIR Filtered)



Seconds

NSA Research  
07-25-2000 10:34

TEST: HIGH SPEED LATERAL IMPACT TEST DATE: 07-24-2000

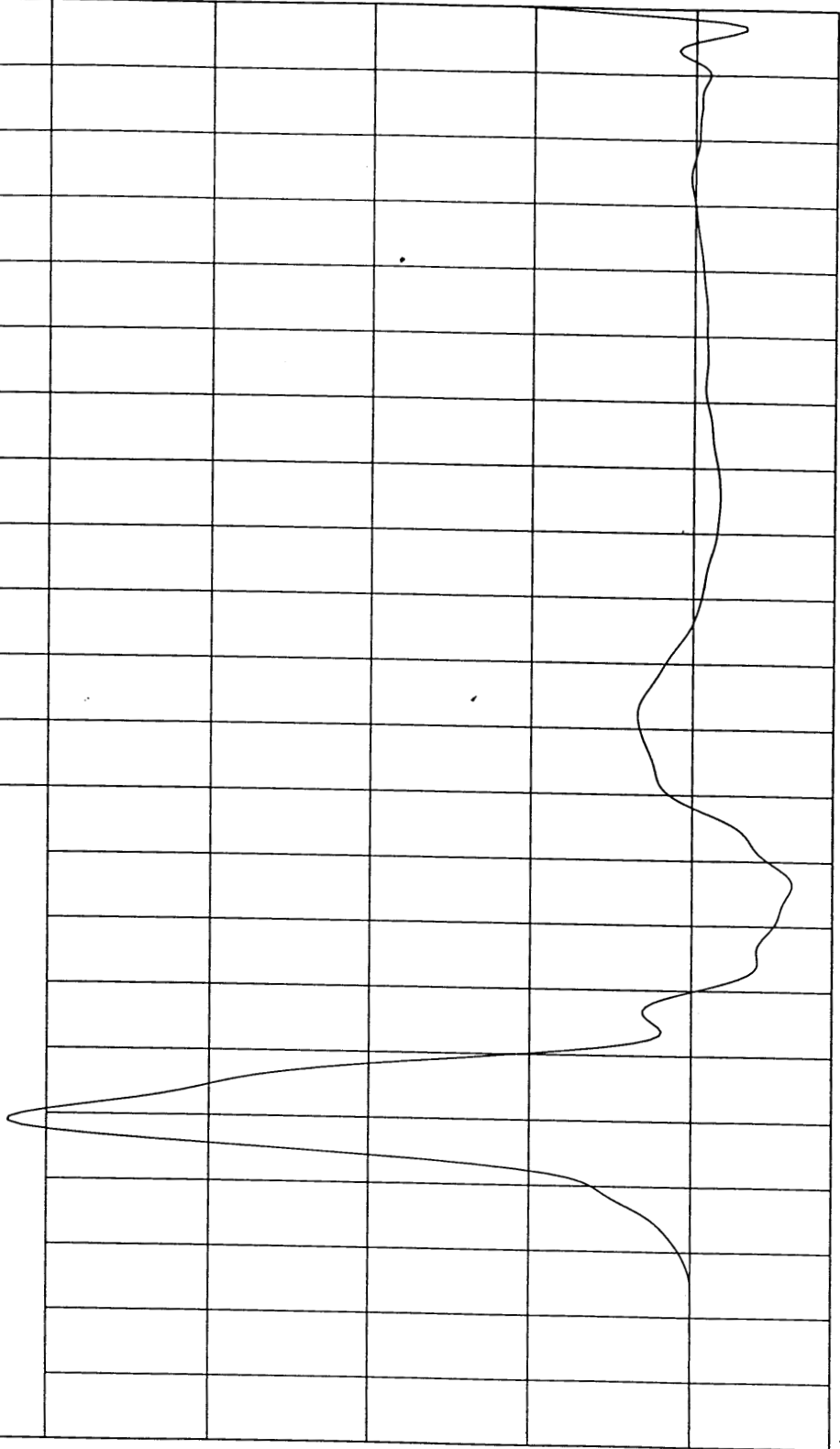
COMPONENT: 2000 SATURN SL2 4 DOOR Speed: 38.9 MPH 62.6 KPH

Minimum = -12.42 G's at 66 msec

Maximum = 84.72 G's at 29 msec

REAR PASSENGER PELVIS Y REDUNDANT ACCELERATION

1 800056F1.R48 Filterclass (FIR Filtered)



Seconds

MEA Research  
07-25-2000 10:34

APPENDIX C  
SID CONFIGURATION AND PERFORMANCE VERIFICATION

PRE-TEST CERTIFICATION DATA

C-1

Driver Dummy Serial Number: 269

Calibration Test Results Summary

Dummy Serial Number: 269

Pre-test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Head Drop Test:	The head passed all drop test 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.

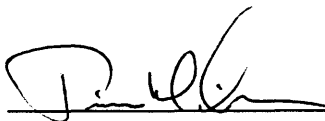
SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA **C-3**

Date of Verification: February 18, 2000

Dummy Serial Number: 269

Test Number: D0029

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH-Seated Height (mm)	889 – 909	899
RH-Rib Height (mm)	501 – 521	518
HP-Hip Pivot Height (mm)	99 ref.	99
RD-Rib From Back Line (mm)	229 - 241	231
KV-Knee Pivot From Back Line (mm)	511 – 526	520
SW-Knee Pivot to Floor (mm)	490 – 505	495
HW – Hip Width (mm)	356 – 391	371

Technician: 

Approved By: David Winkelbauer

MGA RESEARCH CORPORATION  
HEAD DROP TEST  
SIDE IMPACT DUMMY (SID)

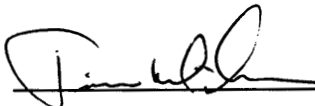
Date: February 18, 2000


Dummy Serial Number: 269

Test Number: D00291

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 - 25.5	21.0
Relative Humidity (%)	10 - 70	25
Peak Resultant Acceleration	210 - 260 g's	256
Peak Lateral Acceleration	< 10 g's	5
Time Above 100 g.	0.9 - 1.5 msec.	1.1

TEST MEETS SPECIFICATIONS

Technician: 

Approved By: 

TEST: Dummy Calibration - Head Drop TEST DATE: 02-18-2000 - 09:17:09

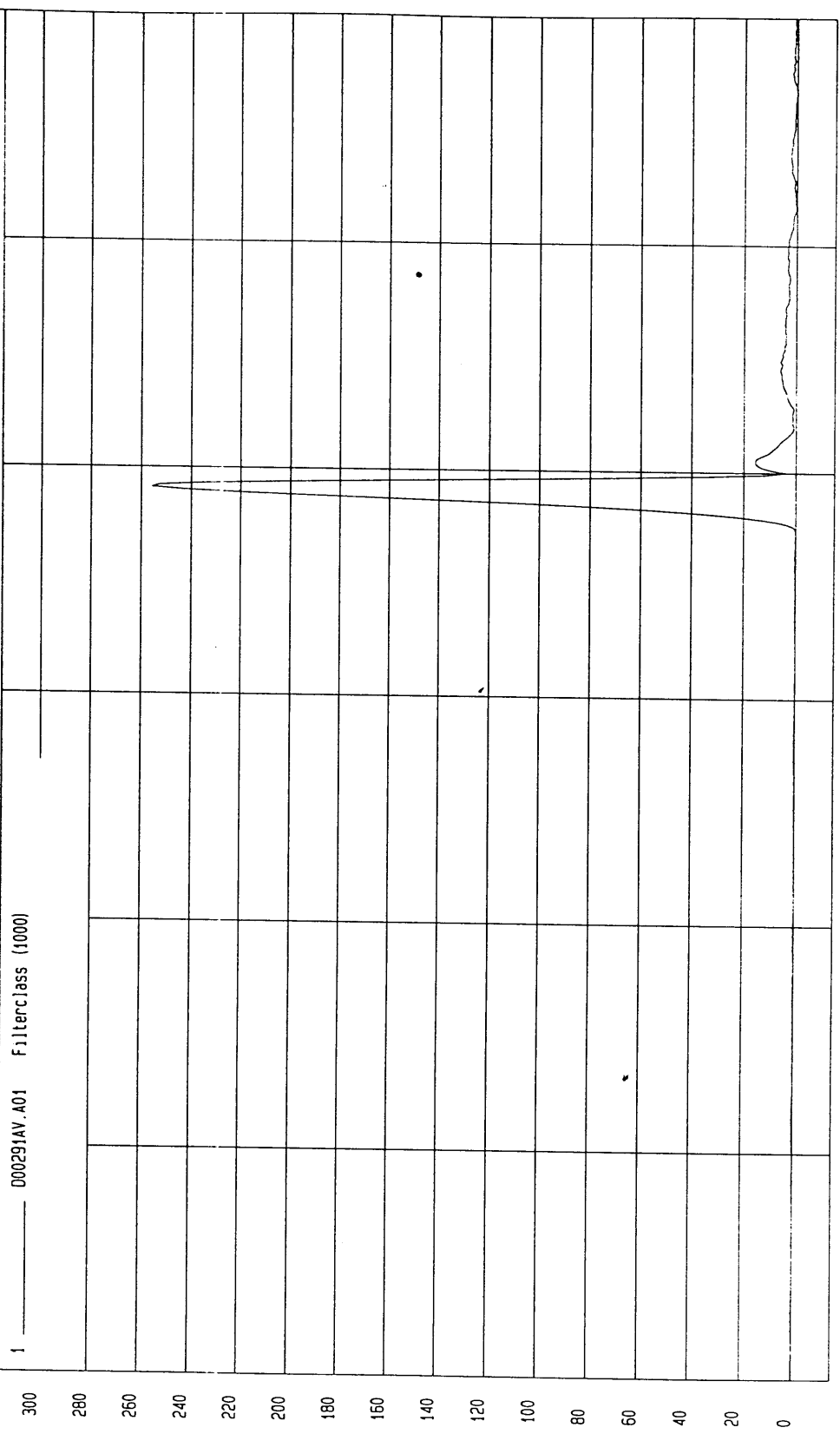
COMPONENT: Dummy # 269

Minimum = 3.47E-02 G'S at 1.2 msec

Maximum = 255.68 G'S at 39.1 msec

PEAK RESULTANT ACCELERATION

1 \_\_\_\_\_ 000291AV.A01 Filterclass (1000)



G.S TIME (SEC.)

TEST: Dummy Calibration - Head Drop

TEST DATE: 02-18-2000 - 09:17:09

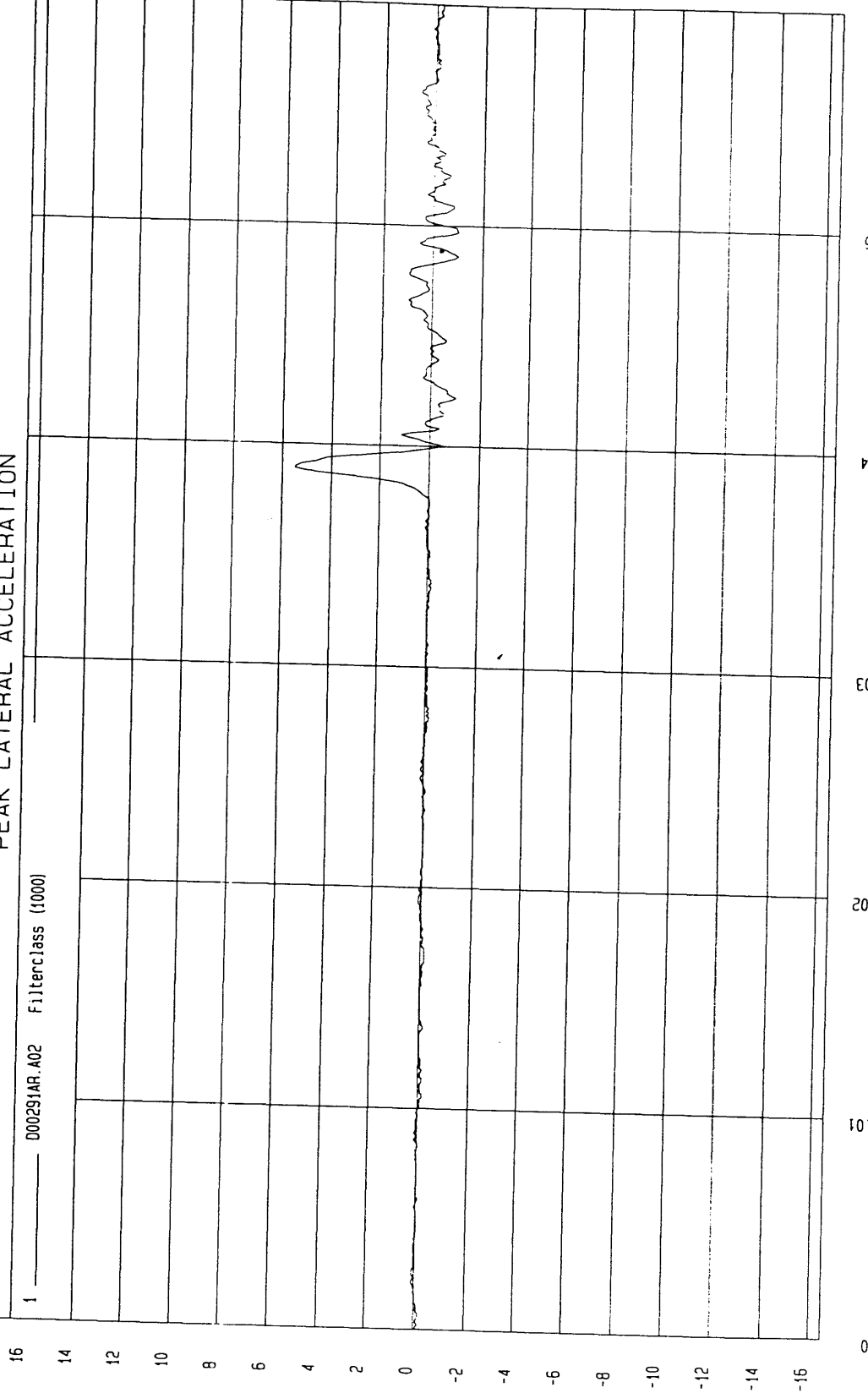
COMPONENT: Dummy # 269

Minimum = -1.76 G'S at 122 msec

Maximum = 5.49 G'S at 38.9 msec

PEAK LATERAL ACCELERATION

1 \_\_\_\_\_ 000291AR.A02 Filterclass (1000)



MGA RESEARCH CORPORATION  
THORAX IMPACT TEST  
SIDE IMPACT DUMMY (SID)

Date: February 16, 2000

Dummy Serial Number: 269

Test Number: D00292

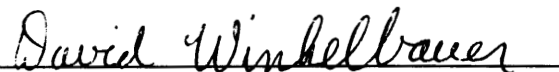
TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.0
Relative Humidity (%)	10 – 70	26
Probe Speed (m/s)	4.27 – 4.33	4.29
Upper Rib (g's)	37 – 46	45
Lower Rib (g's)	37 – 46	43
Lower Spine (g's)	15 - 22	20

TEST MEETS SPECIFICATIONS

Technician: \_\_\_\_\_



Approved By: \_\_\_\_\_



TEST: Dummy Calibration - Thorax Impact TEST DATE: 02-16-2000 - 10:54:37

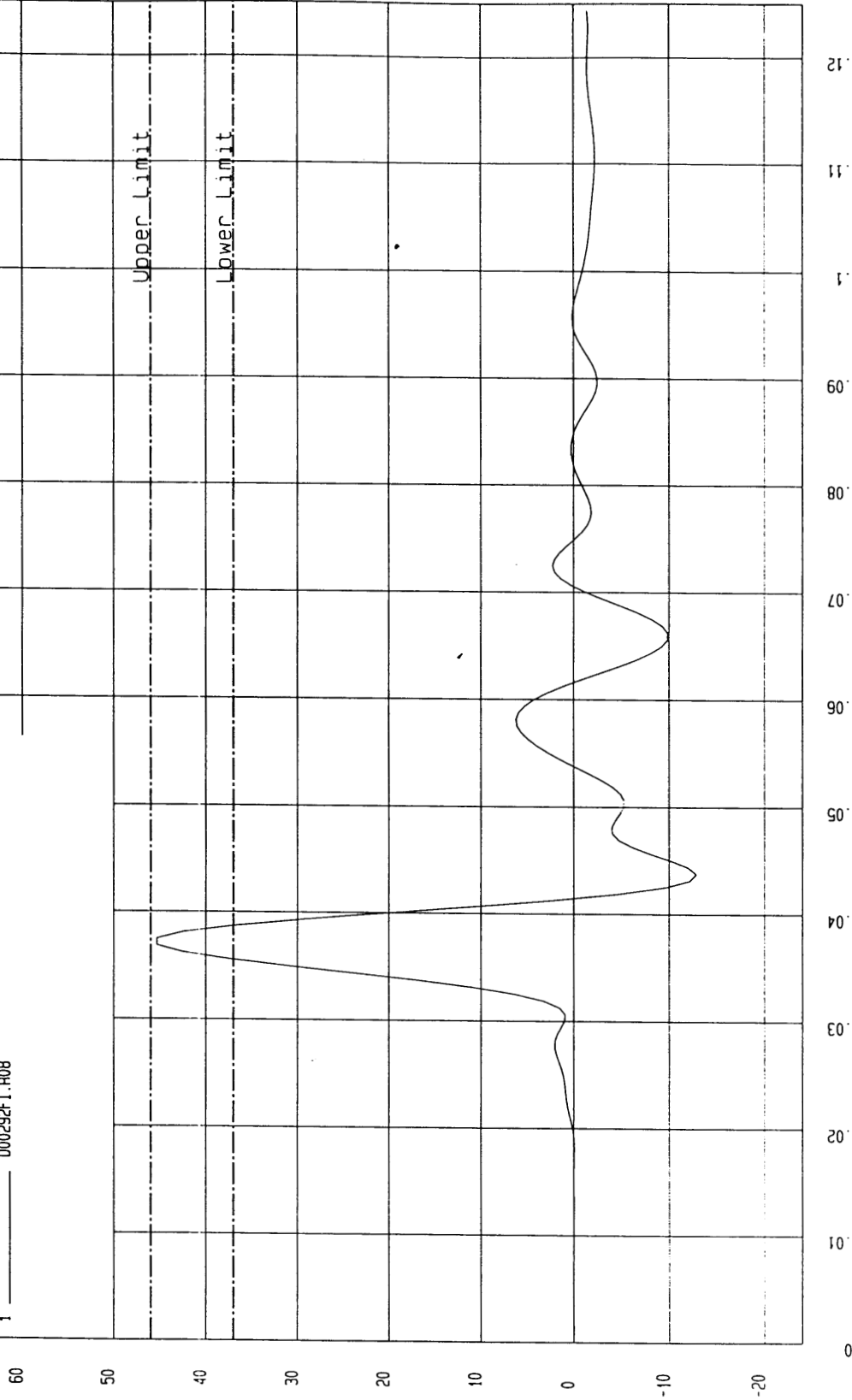
COMPONENT: Dummy # 269 Velocity: 14.072 FT/SEC 4.29 M/SEC

Minimum = -12.84 G'S at 43.7 msec

Maximum = 45.34 G'S at 36.8 msec

UPPER RIB ACCELERATION

1 ——— 000292FI.R08



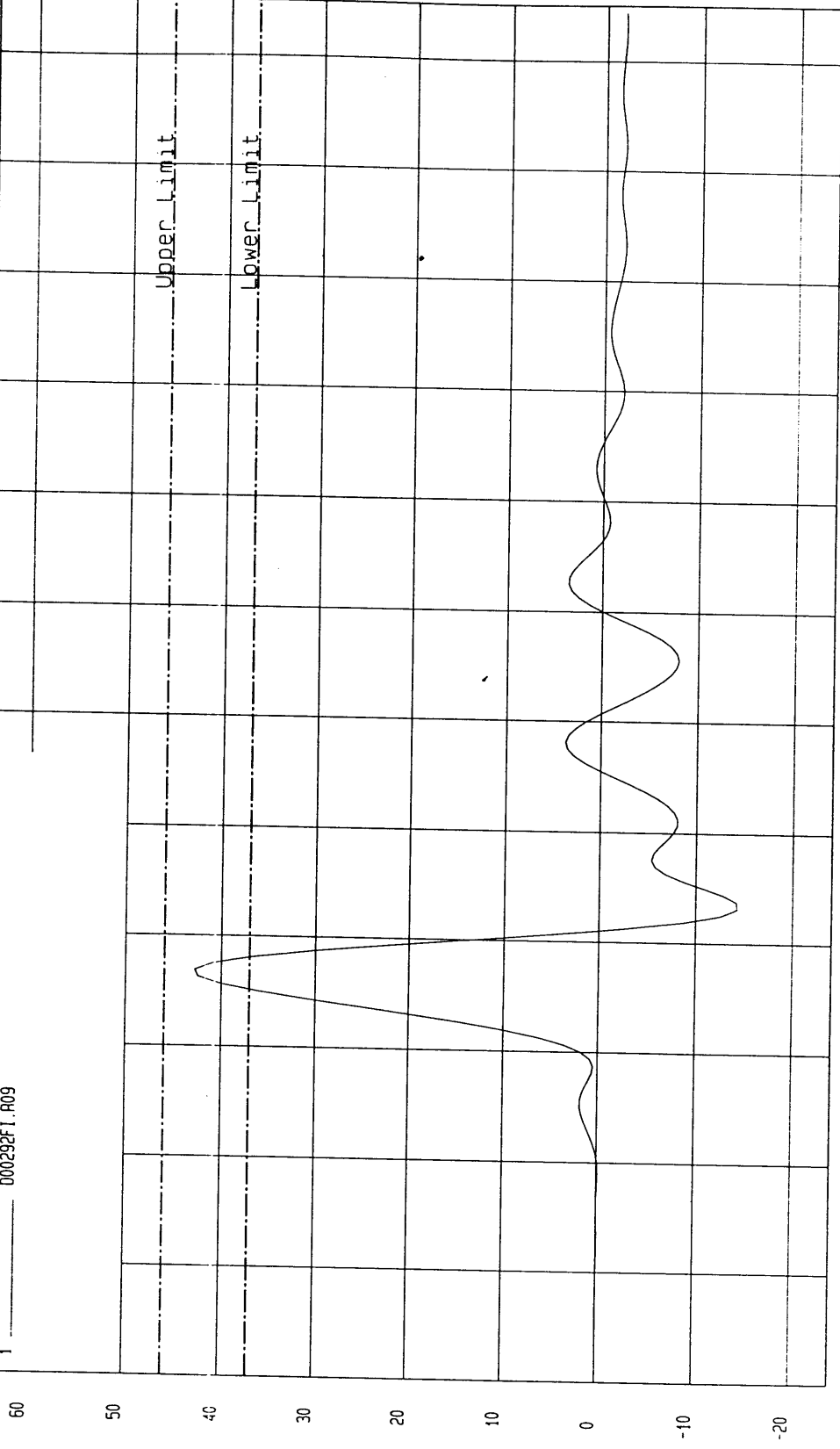
TEST: Dummy Calibration - Thorax Impact TEST DATE: 02-16-2000 - 10:54:37

COMPONENT: Dummy # 269 Velocity: 14.072 FT/SEC 4.29 M/SEC

Minimum = -14.31 G'S at 43.1 msec Maximum = 42.83 G'S at 36.8 msec

LOWER RIB ACCELERATION

1 000292FL.R09



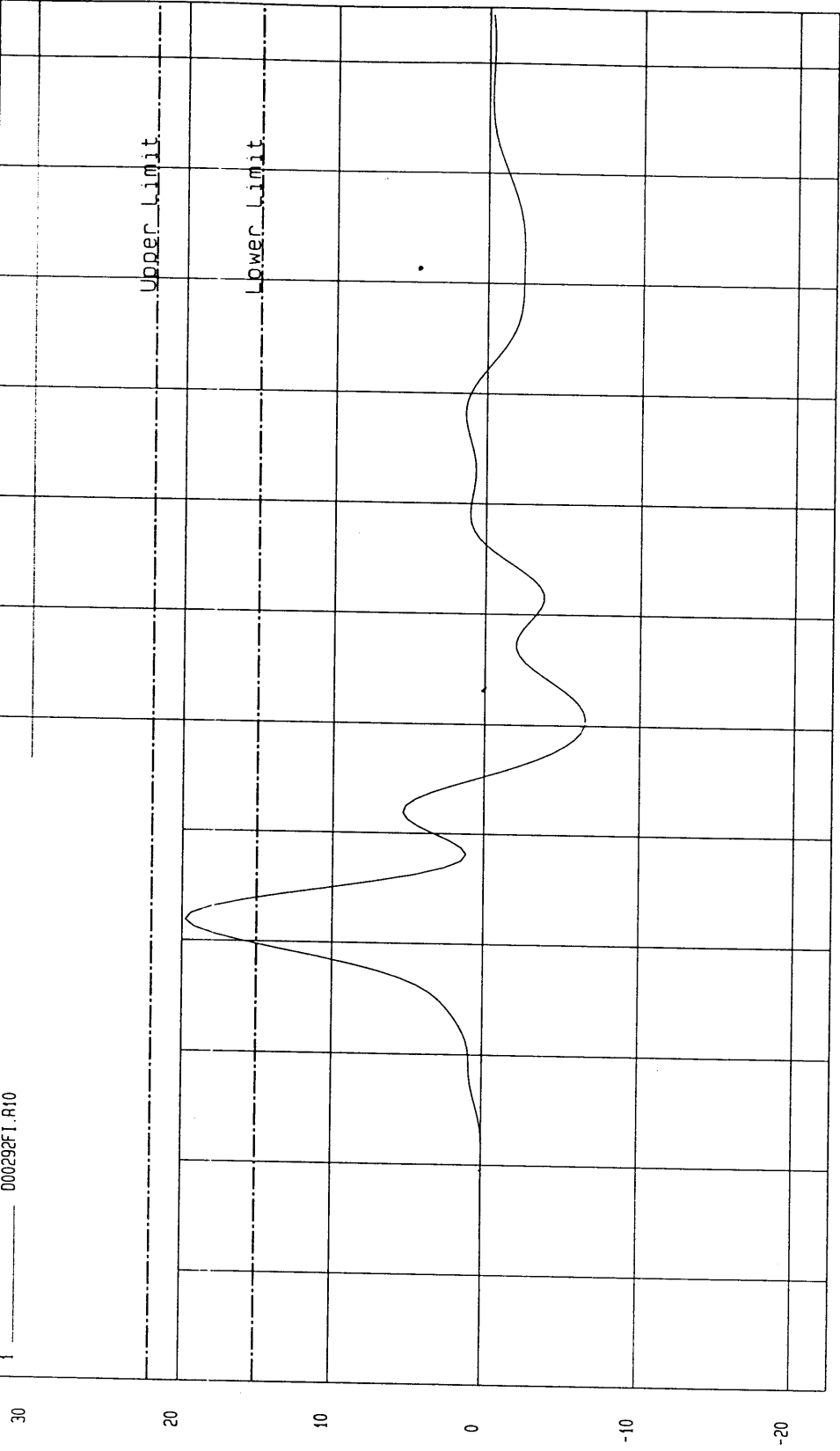
TEST: Dummy Calibration - Thorax Impact TEST DATE: 02-16-2000 - 10:54:37

COMPONENT: Dummy # 269 Velocity: 14.072 FT/SEC 4.29 M/SEC

Minimum = -6.55 G'S at 60.6 msec  
Maximum = 19.78 G'S at 41.8 msec

LOWER SPINE ACCELERATION

1 000292FI.R10



MGA RESEARCH CORPORATION  
PELVIS IMPACT TEST  
SIDE IMPACT DUMMY (SID)

Date: February 16, 2000

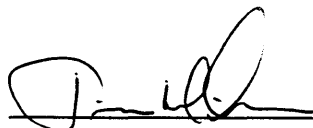
Dummy Serial Number: 269

Test Number: D00293

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.0
Relative Humidity (%)	10 – 70	26
Probe Speed (m/s)	4.27 – 4.33	4.28
Pelvis Acceleration (g's)	40 – 60	53

TEST MEETS SPECIFICATIONS

Technician: \_\_\_\_\_



Approved By: \_\_\_\_\_



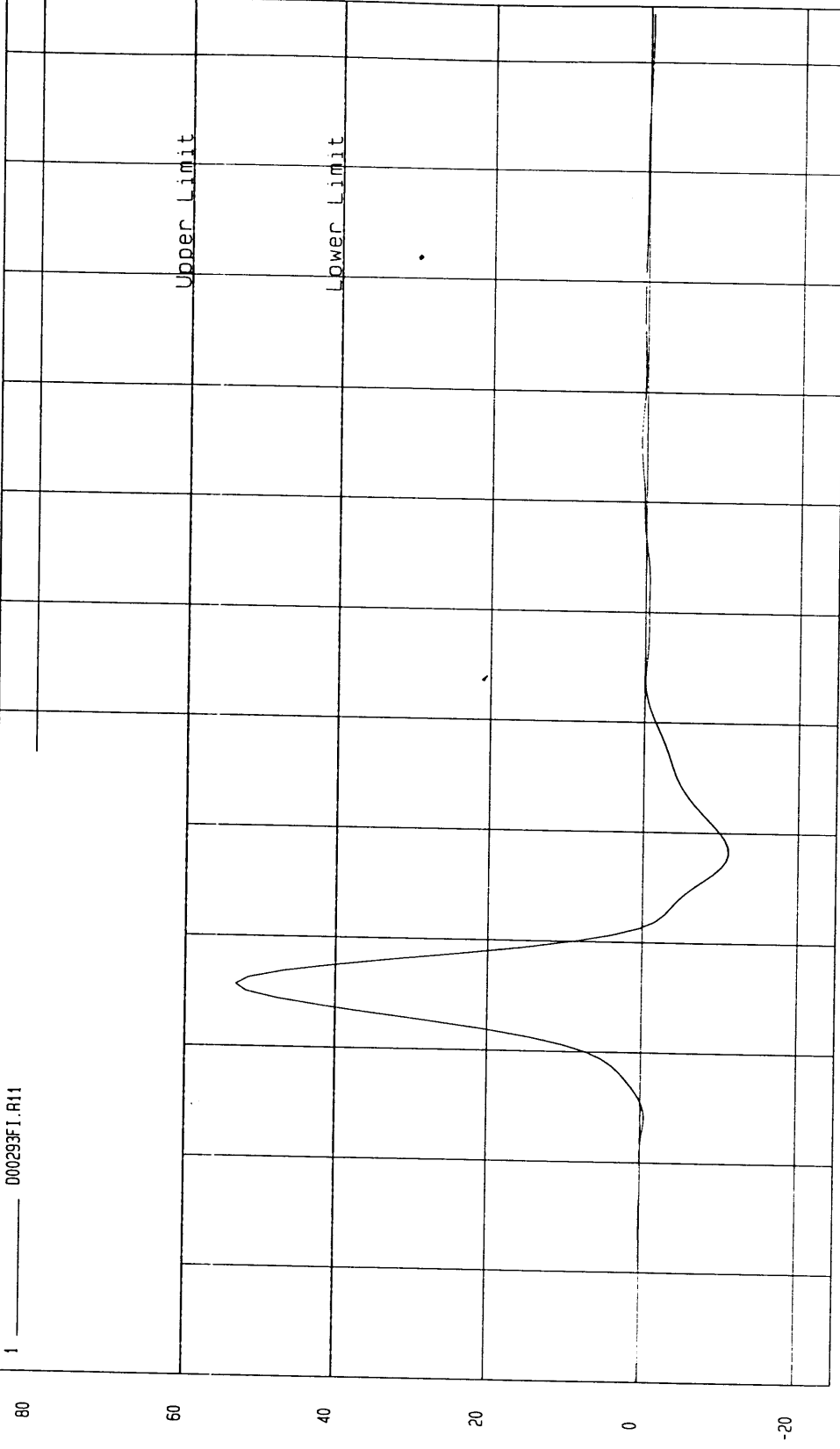
TEST: Dummy Calibration - Pelvis Impact TEST DATE: 02-16-2000 - 11:02:52

COMPONENT: Dummy # 269 Velocity: 14.05 FT/SEC 4.28 M/SEC

Minimum = -11.05 G'S at 48.1 msec Maximum = 53.20 G'S at 35.6 msec

PELVIS ACCELERATION

1 ——— D00293F1.R11



MGA Research  
02-16-2000 11:03

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

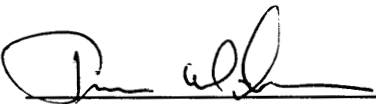
Date: February 16, 2000

Dummy Serial Number: 269

Test Number: D00294

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.0
Relative Humidity (%)	10 – 70	26
Force @ 12.7 mm	104 – 162	134
Force @ 19 mm	163 – 222	185
Force @ 25.4 mm	222 – 280	248
Force @ 33 mm	325 - 391	334

TEST MEETS SPECIFICATIONS

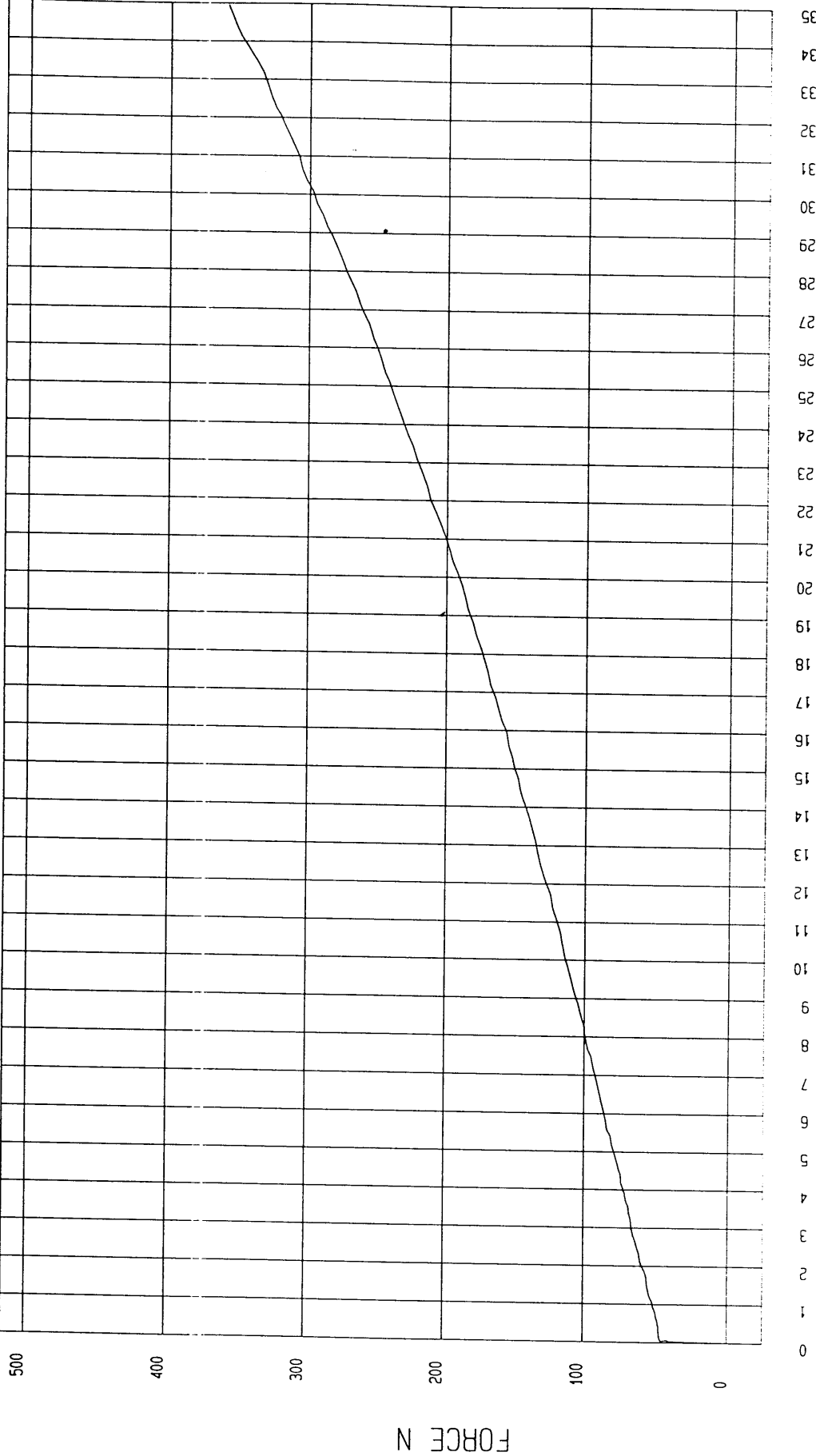
Technician: 

Approved By: David Winkelbauer

TEST: DUMMY CALIBRATION - ABDOMEN COMPRESSION TEST DATE: 02-16-2000 - 15:24:25

COMPONENT: DUMMY # 269

FORCE as a function of DISPLACEMENT



MGA Research  
02-16-2000 07:58

DISPLACEMENT mm

FORCE N

MGA RESEARCH CORPORATION  
LUMBAR FLEXION TEST  
SIDE IMPACT DUMMY (SID)


Date: February 18, 2000


Dummy Serial Number: 269

Test Number: D00295

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.0
Relative Humidity (%)	10 – 70	25
Force @ 0°	0 – 26.7	0
Force @ 20°	97.9 – 151.2	104.0
Force @ 30°	151.2 – 204.6	172.9
Force @ 40°	204.6 – 258.0	253.9
Return Angle	12° maximum	2°

TEST MEETS SPECIFICATIONS

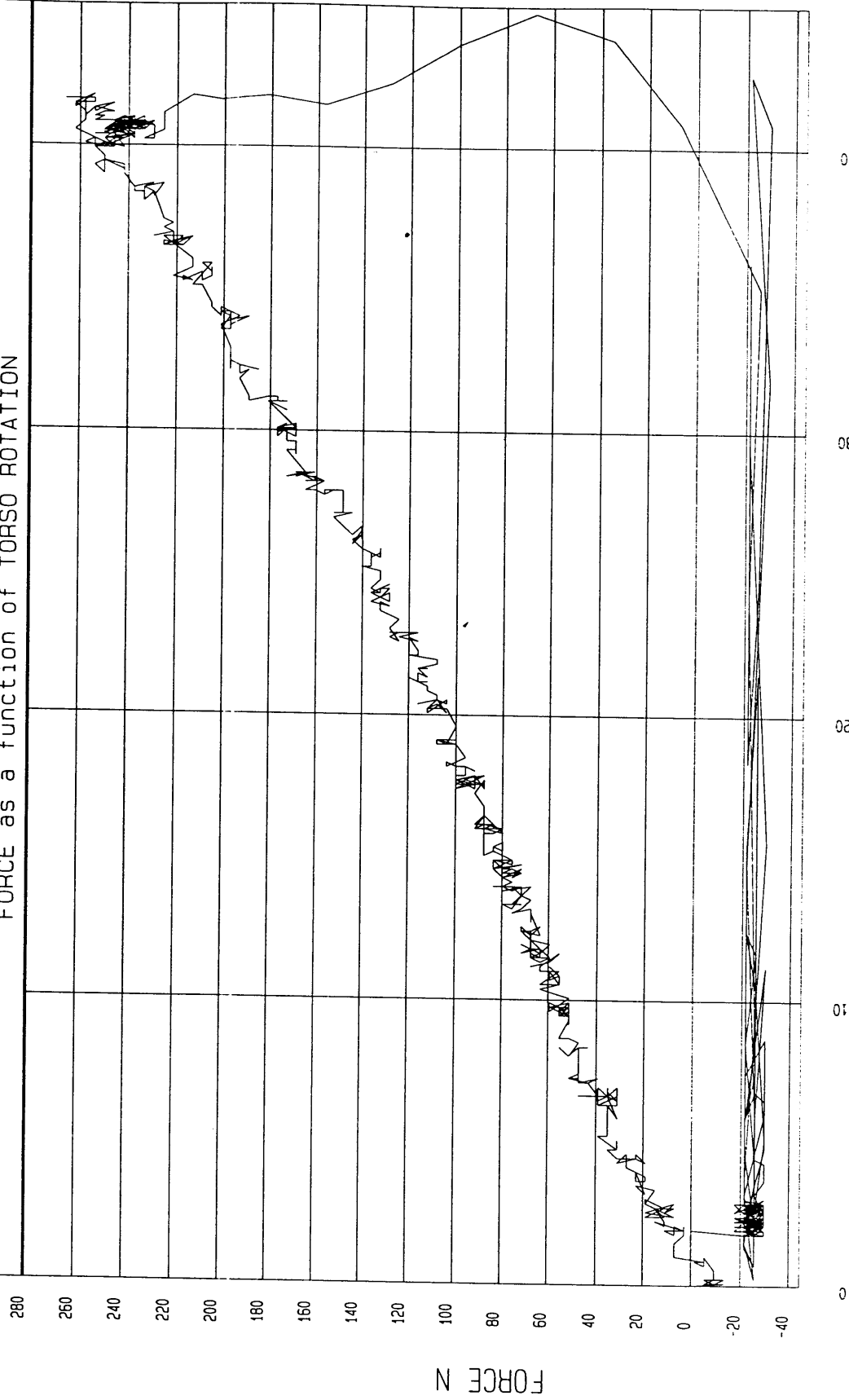
Technician: 

Approved By: 

TEST: DUMMY CALIBRATION - LUMBAR FLEXION TEST DATE: 02-18-2000 - 07:31:24

COMPONENT: DUMMY # 269

FORCE as a function of TORSO ROTATION



MSA Research  
02-18-2000 07:59

PRE-CERTIFICATION DATA

**C-17**

Dummy Serial Number: 270

Calibration Test Results Summary

Dummy Serial Number: 270

## Pre-test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Head Drop Test:	The head passed all drop test 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.

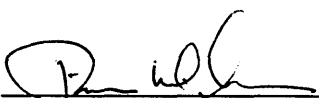
SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA **C-19**

Date of Verification: February 18, 2000

Dummy Serial Number: 270

Test Number: D0030

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH-Seated Height (mm)	889 – 909	898
RH-Rib Height (mm)	501 – 521	503
HP-Hip Pivot Height (mm)	99 ref.	99
RD-Rib From Back Line (mm)	229 - 241	230
KV-Knee Pivot From Back Line (mm)	511 – 526	525
SW-Knee Pivot to Floor (mm)	490 – 505	500
HW – Hip Width (mm)	356 – 391	368

Technician: 

Approved By: David Winkelbauer

MGA RESEARCH CORPORATION  
HEAD DROP TEST  
SIDE IMPACT DUMMY (SID)

Date: February 18, 2000

Dummy Serial Number: 270

Test Number: D00301

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 - 25.5	21.0
Relative Humidity (%)	10 - 70	25
Peak Resultant Acceleration	210 - 260 g's	210
Peak Lateral Acceleration	< 10 g's	6
Time Above 100 g.	0.9 - 1.5 msec.	1.2

TEST MEETS SPECIFICATIONS

Technician: 

Approved By: David Winhelbauer

TEST: Dummy Calibration - Head Drop TEST DATE: 02-18-2000 - 08:48:50

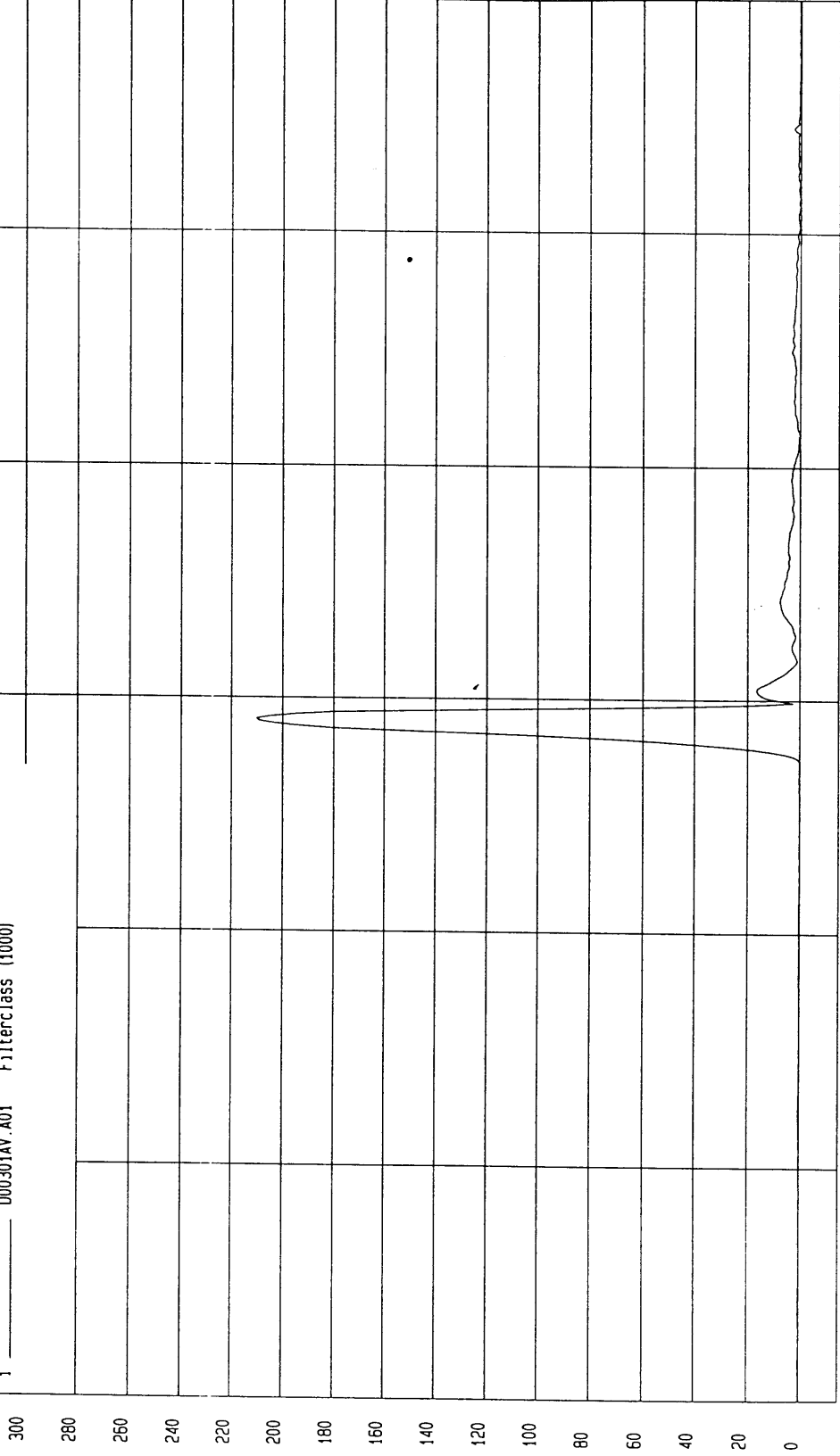
COMPONENT: Dummy # 270

Minimum = 7.30E-02 G'S at 2.9 msec

Maximum = 210.13 G'S at 29.1 msec

PEAK RESULTANT ACCELERATION

1 \_\_\_\_\_ 000301AV.A01 Filterclass (1000)



TIME (SEC.)

S.G

TEST: Dummy Calibration - Head Drop TEST DATE: 02-18-2000 - 08:54:17

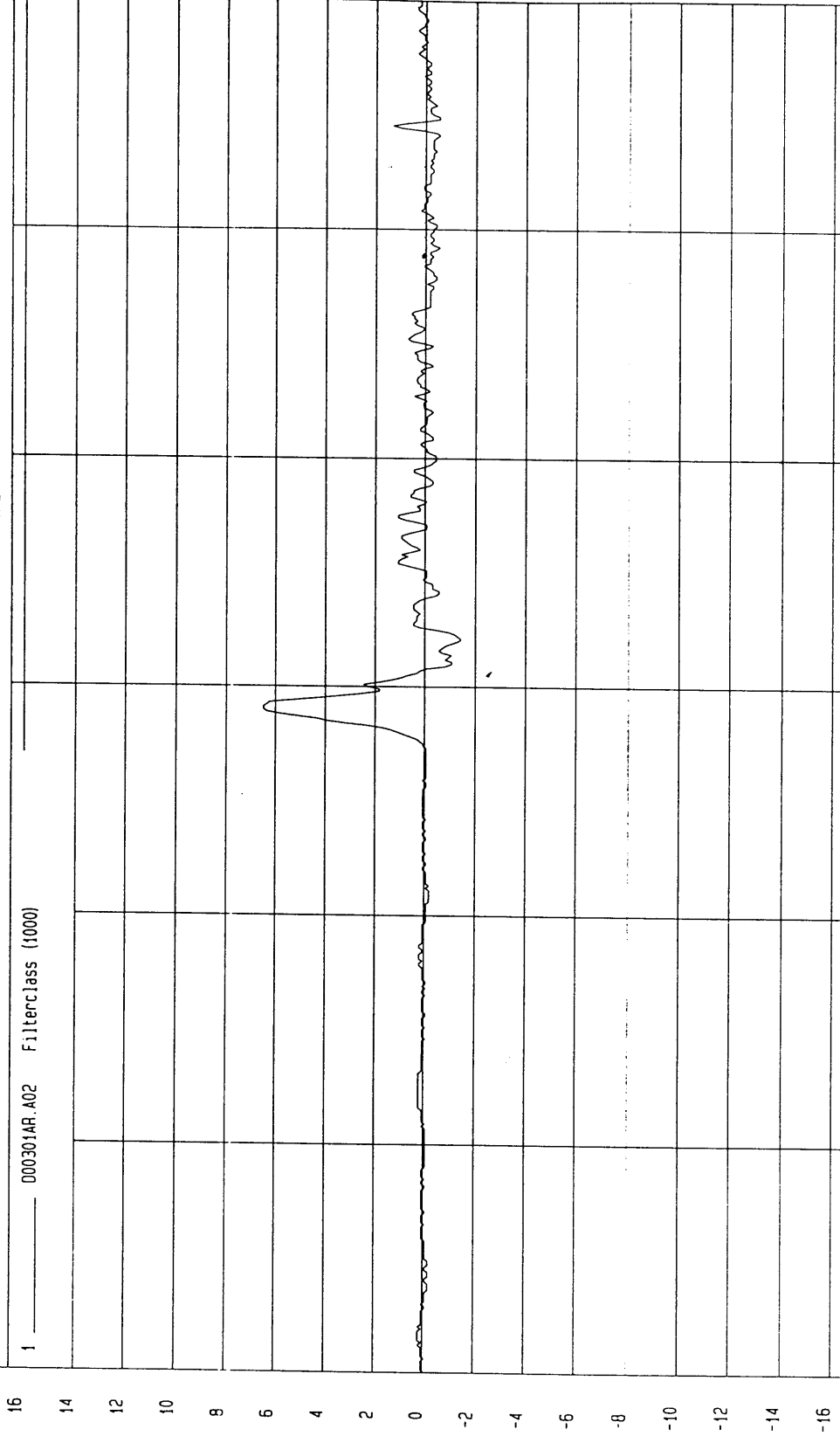
COMPONENT: Dummy # 270

Minimum = -1.44 G'S at 32.1 msec

Maximum = 6.48 G'S at 29 msec

PEAK LATERAL ACCELERATION

1 000301AR.A02 Filterclass (1000)



16  
14  
12  
10  
8  
6  
4  
2  
0  
-2  
-4  
-6  
-8  
-10  
-12  
-14  
-16

TIME (SEC.)

MCA Research  
02-18-2000 08:55

G.S

MGA RESEARCH CORPORATION  
THORAX IMPACT TEST  
SIDE IMPACT DUMMY (SID)

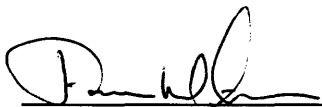
Date: February 16, 2000

Dummy Serial Number: 270

Test Number: D00302

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.0
Relative Humidity (%)	10 – 70	27
Probe Speed (m/s)	4.27 – 4.33	4.29
Upper Rib (g's)	37 – 46	42
Lower Rib (g's)	37 – 46	43
Lower Spine (g's)	15 - 22	22

TEST MEETS SPECIFICATIONS

Technician: 

Approved By: 

TEST: Dummy Calibration - Thorax Impact TEST DATE: 02-16-2000 - 11:23:48

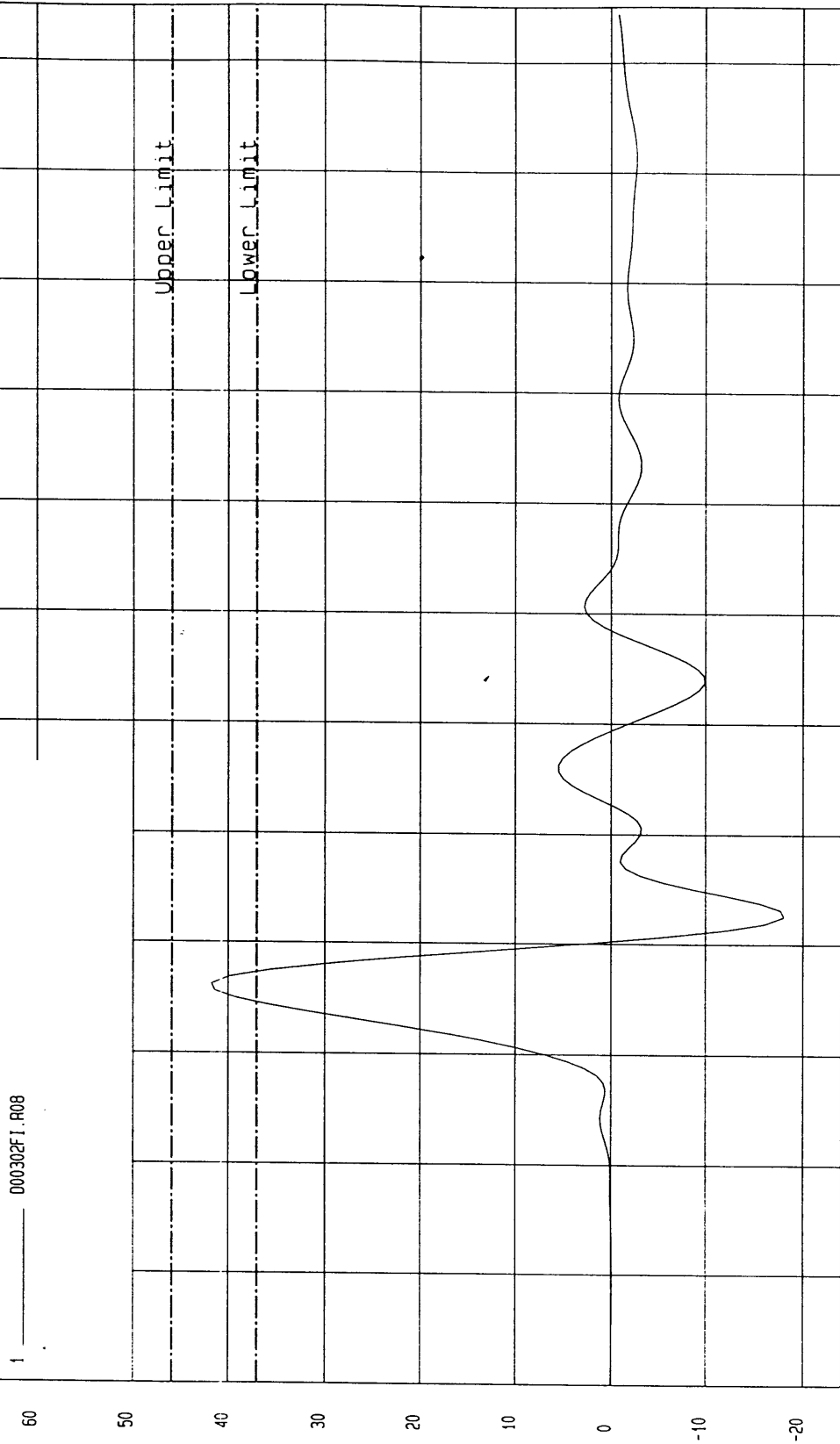
COMPONENT: Dummy # 270 Velocity: 14.075 FT/SEC 4.29 M/SEC

Minimum = -17.96 G'S at 42.5 msec

Maximum = 41.76 G'S at 36.2 msec

UPPER RIB ACCELERATION

1 000302FT.R08



TEST: Dummy Calibration - Thorax Impact TEST DATE: 02-16-2000 - 11:23:48

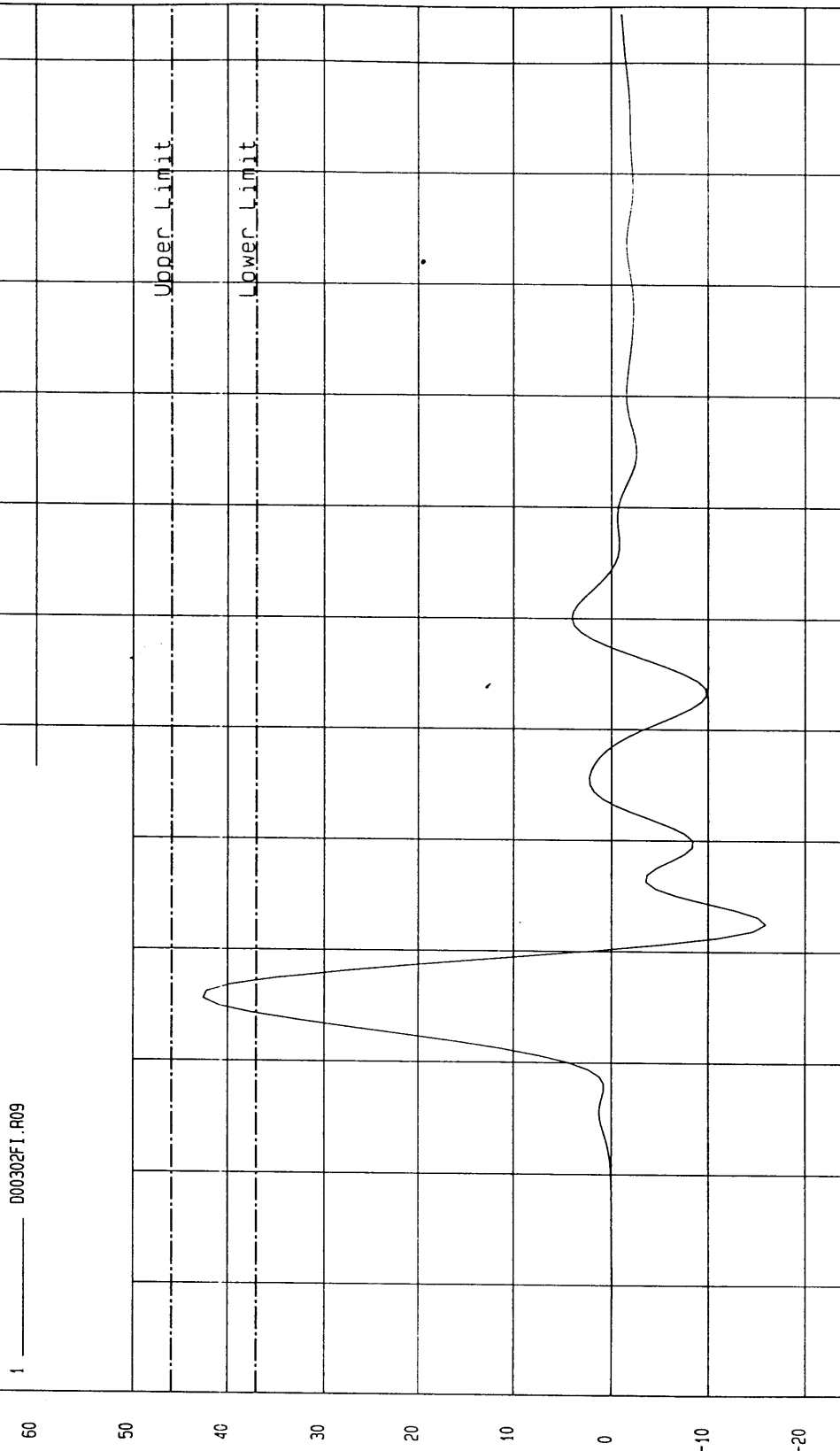
COMPONENT: Dummy # 270 Velocity: 14.075 FT/SEC 4.29 M/SEC

Minimum = -15.86 G'S at 42.5 msec

Maximum = 42.63 G'S at 35.6 msec

LOWER RIB ACCELERATION

1 ——— D00302FI.R09



MGA Research  
02-16-2000 11:33

TEST: Dummy Calibration - Thorax Impact TEST DATE: 02-16-2000 - 11:26:51

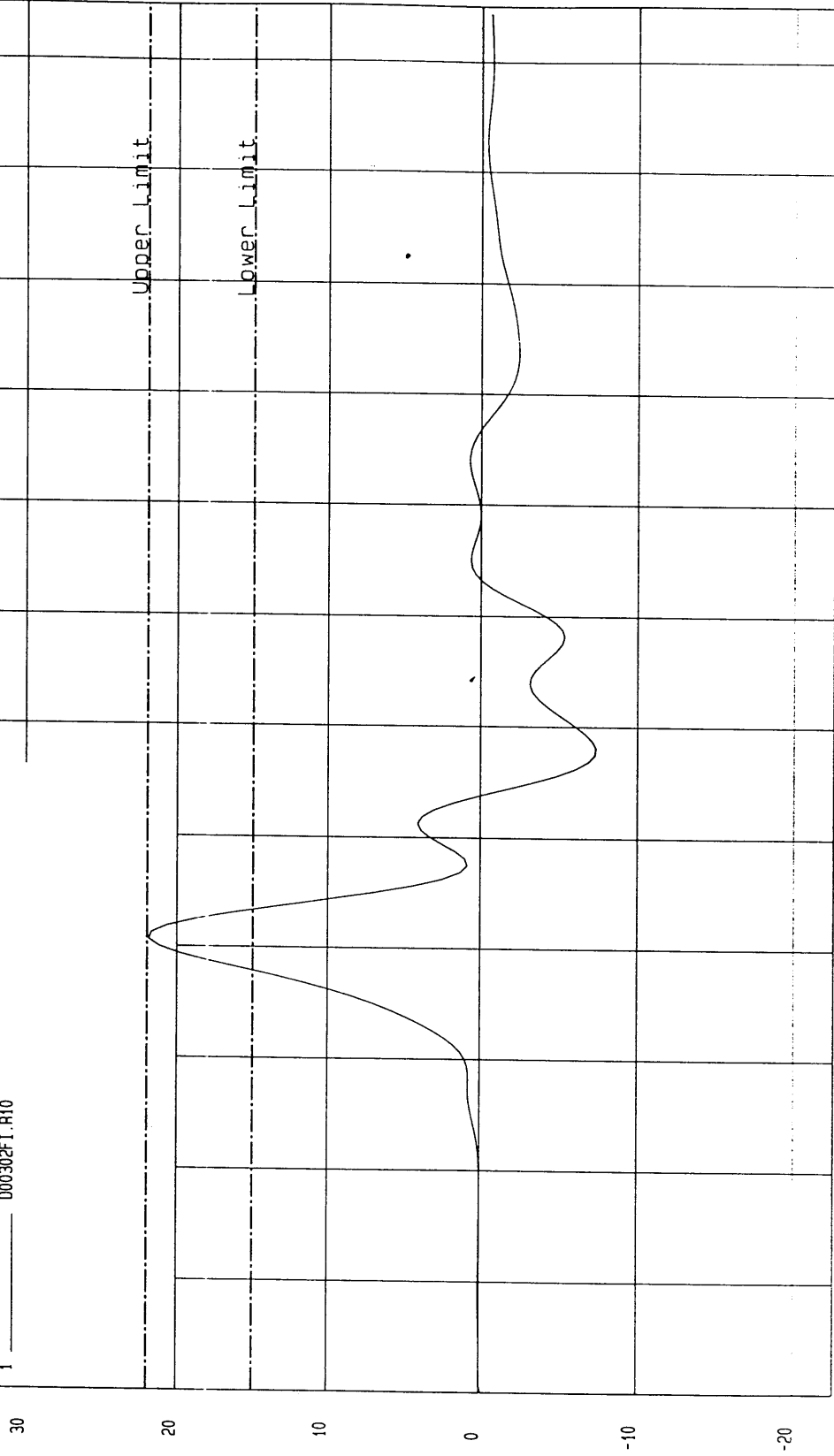
COMPONENT: Dummy # 270 Velocity: 14.075 FT/SEC 4.29 M/SEC

Minimum = -7.37 G'S at 50.1 msec

Maximum = 21.88 G'S at 40.6 msec

LOWER SPINE ACCELERATION

1 \_\_\_\_\_ 000302F1.R10



MCA Research  
02-16-2000 11:33

G.S

MGA RESEARCH CORPORATION  
PELVIS IMPACT TEST  
SIDE IMPACT DUMMY (SID)

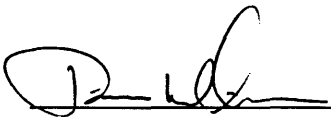
Date: February 16, 2000

Dummy Serial Number: 270

Test Number: D00303

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.0
Relative Humidity (%)	10 – 70	27
Probe Speed (m/s)	4.27 – 4.33	4.28
Pelvis Acceleration (g's)	40 – 60	43

TEST MEETS SPECIFICATIONS

Technician: 

Approved By: David Winhelbroner

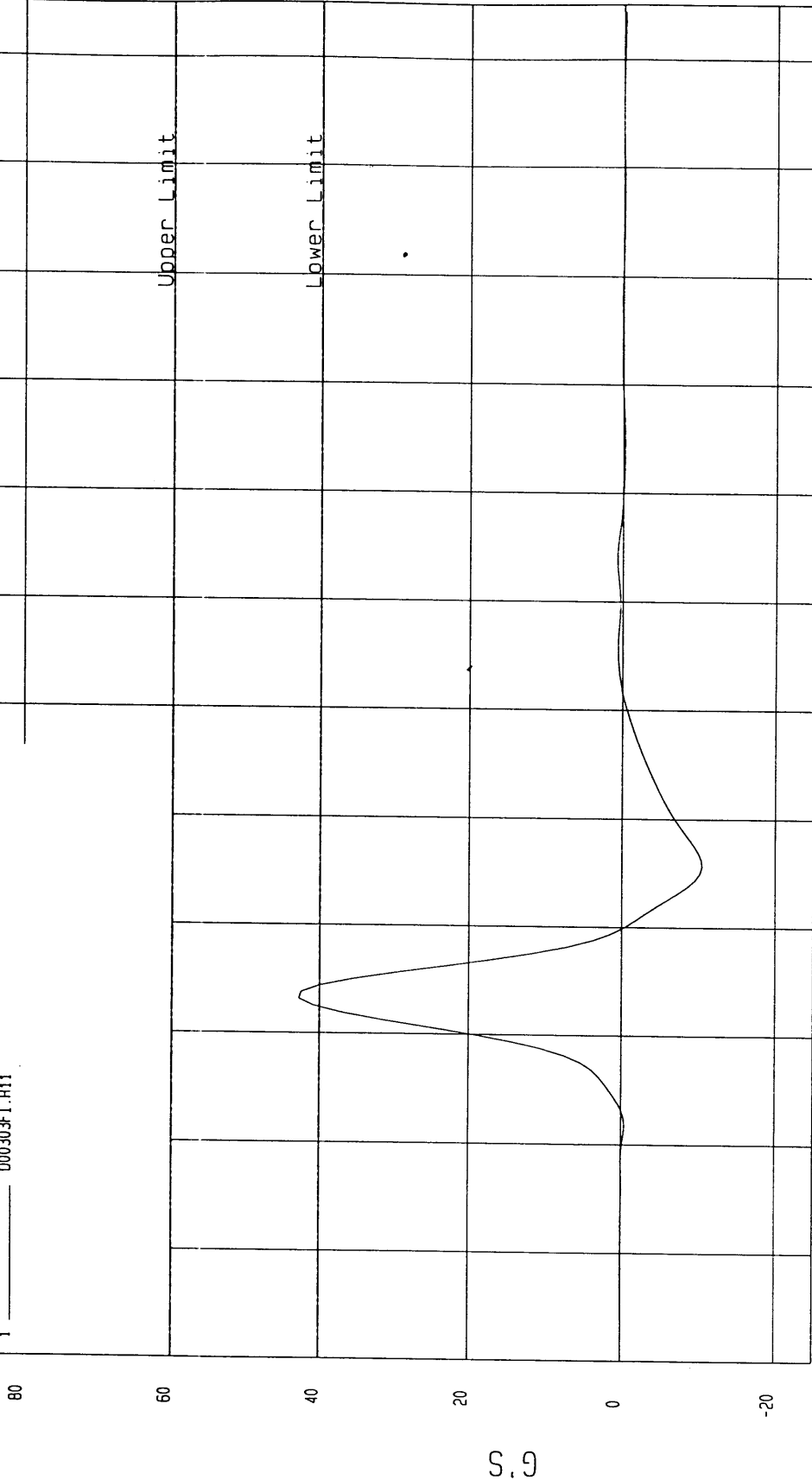
TEST: Dummy Calibration - Pelvis Impact TEST DATE: 02-16-2000 - 11:33:02

COMPONENT: Dummy # 270 Velocity: 14.054 FT/SEC 4.28 M/SEC

Minimum = -10.47 G'S at 45.6 msec  
Maximum = 42.80 G'S at 33.1 msec

PELVIS ACCELERATION

1 ——— 000303FI.R11



MGA Research  
02-16-2000 11:33

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

Date: February 17, 2000

Dummy Serial Number: 270

Test Number: D00304

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.0
Relative Humidity (%)	10 – 70	26
Force @ 12.7 mm	104 – 162	142
Force @ 19 mm	163 – 222	194
Force @ 25.4 mm	222 – 280	250
Force @ 33 mm	325 - 391	343

TEST MEETS SPECIFICATIONS

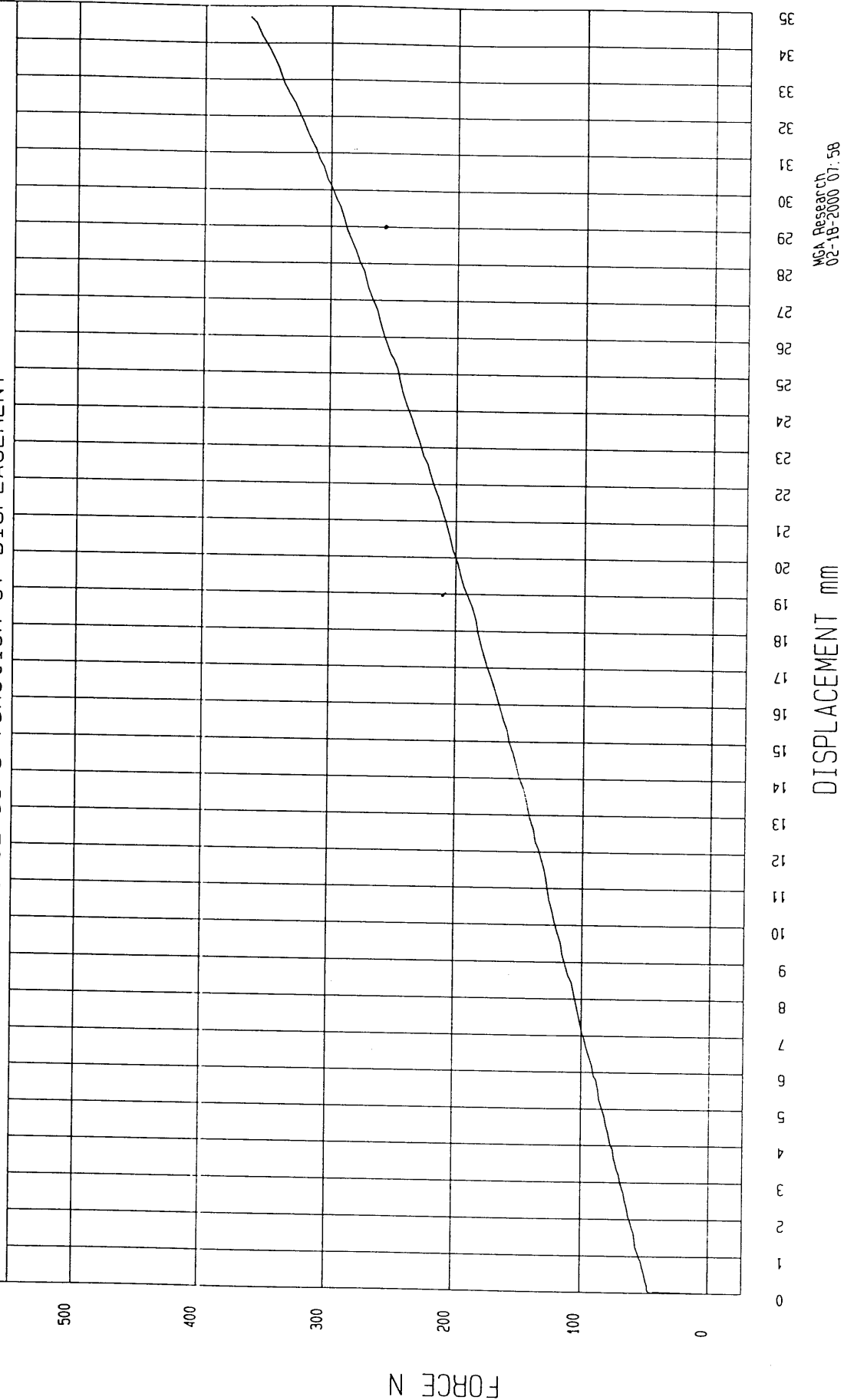
Technician: 

Approved By: David Winkelbauer

TEST: DUMMY CALIBRATION - ABDOMEN COMPRESSION TEST DATE: 02-17-2000 - 14:01:28

COMPONENT: DUMMY # 270

FORCE as a function of DISPLACEMENT



MCA Research  
02-18-2000 07:58

MGA RESEARCH CORPORATION  
LUMBAR FLEXION TEST  
SIDE IMPACT DUMMY (SID)

Date: February 18, 2000

Dummy Serial Number: 270

Test Number: D00305

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.0
Relative Humidity (%)	10 – 70	25
Force @ 0°	0 – 26.7	0
Force @ 20°	97.9 – 151.2	104.5
Force @ 30°	151.2 – 204.6	153.1
Force @ 40°	204.6 – 258.0	222.2
Return Angle	12° maximum	2°

TEST MEETS SPECIFICATIONS

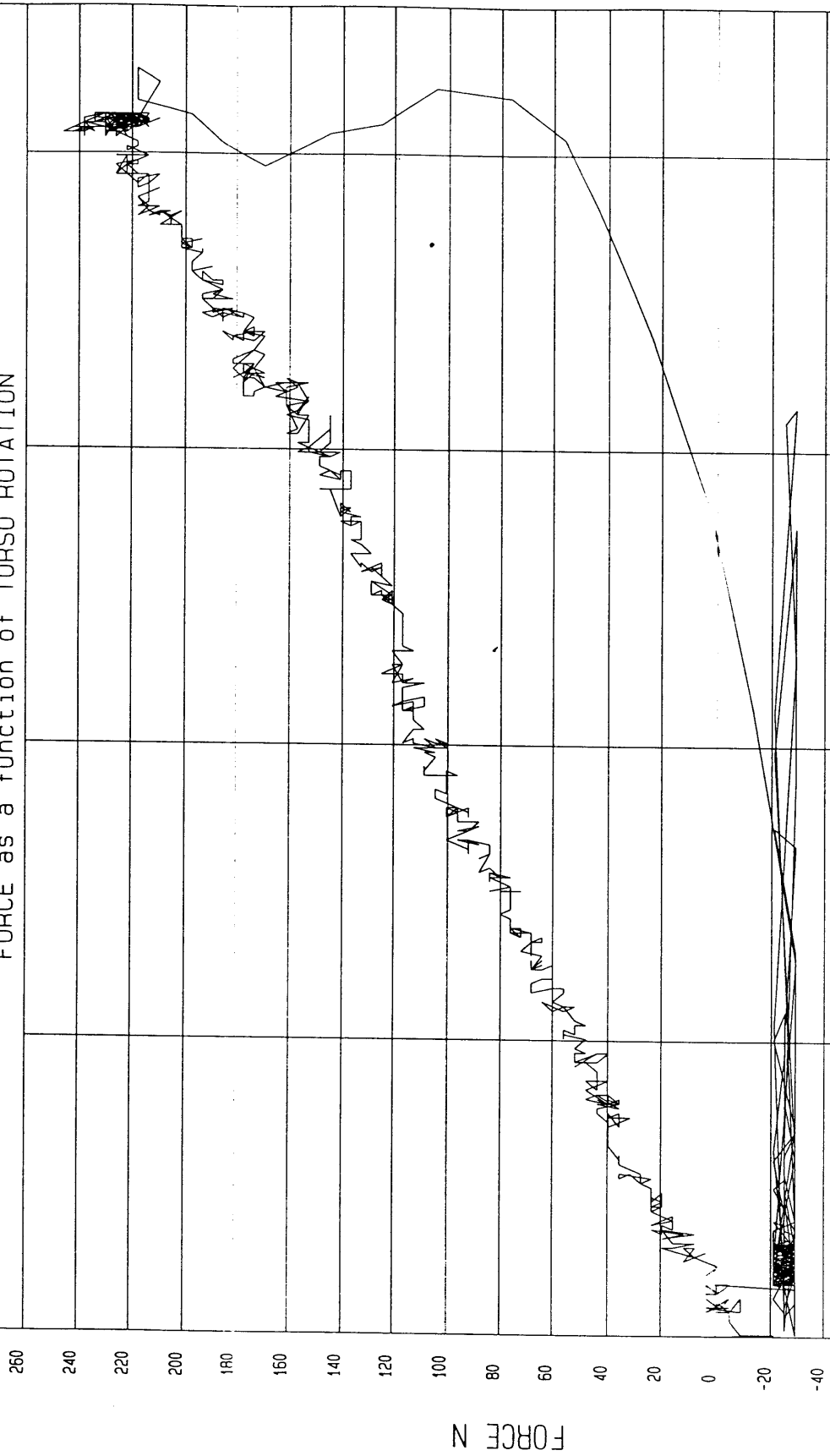
Technician: 

Approved By: 

TEST: DUMMY CALIBRATION - LUMBAR FLEXION TEST DATE: 02-18-2000 - 07:51:22

COMPONENT: DUMMY # 270

FORCE as a function of TORSO ROTATION



MCA Research  
02-18-2000 07:59

POST-TEST CERTIFICATION DATA

**C-33**

Dummy Serial Number: 269

Calibration Test Results Summary

Dummy Serial Number: 269

## Post-Test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Head Drop Test:	The head passed all drop test 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

Date of Verification: July 28, 2000

Dummy Serial Number: 269

Test Number: D0088

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH-Seated Height (mm)	889 – 909	899
RH-Rib Height (mm)	501 – 521	518
HP-Hip Pivot Height (mm)	99 ref.	99
RD-Rib From Back Line (mm)	229 - 241	231
KV-Knee Pivot From Back Line (mm)	511 – 526	520
SW-Knee Pivot to Floor (mm)	490 – 505	495
HW – Hip Width (mm)	356 – 391	371

Technician: 

Approved By: David Winkelbauer

MGA RESEARCH CORPORATION  
HEAD DROP TEST  
SIDE IMPACT DUMMY (SID)

Date: July 28, 2000

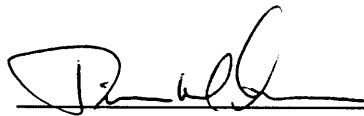
Dummy Serial Number: 269

Test Number: D00881

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 - 25.5	21.0
Relative Humidity (%)	10 - 70	50
Peak Resultant Acceleration	210 - 260 g's	244
Peak Lateral Acceleration	< 10 g's	5
Time Above 100 g.	0.9 - 1.5 msec.	1.5

TEST MEETS SPECIFICATIONS

Technician: \_\_\_\_\_



Approved By: \_\_\_\_\_



TEST: Dummy Calibration - Head Drop TEST DATE: 07-28-2000 - 07:31:17

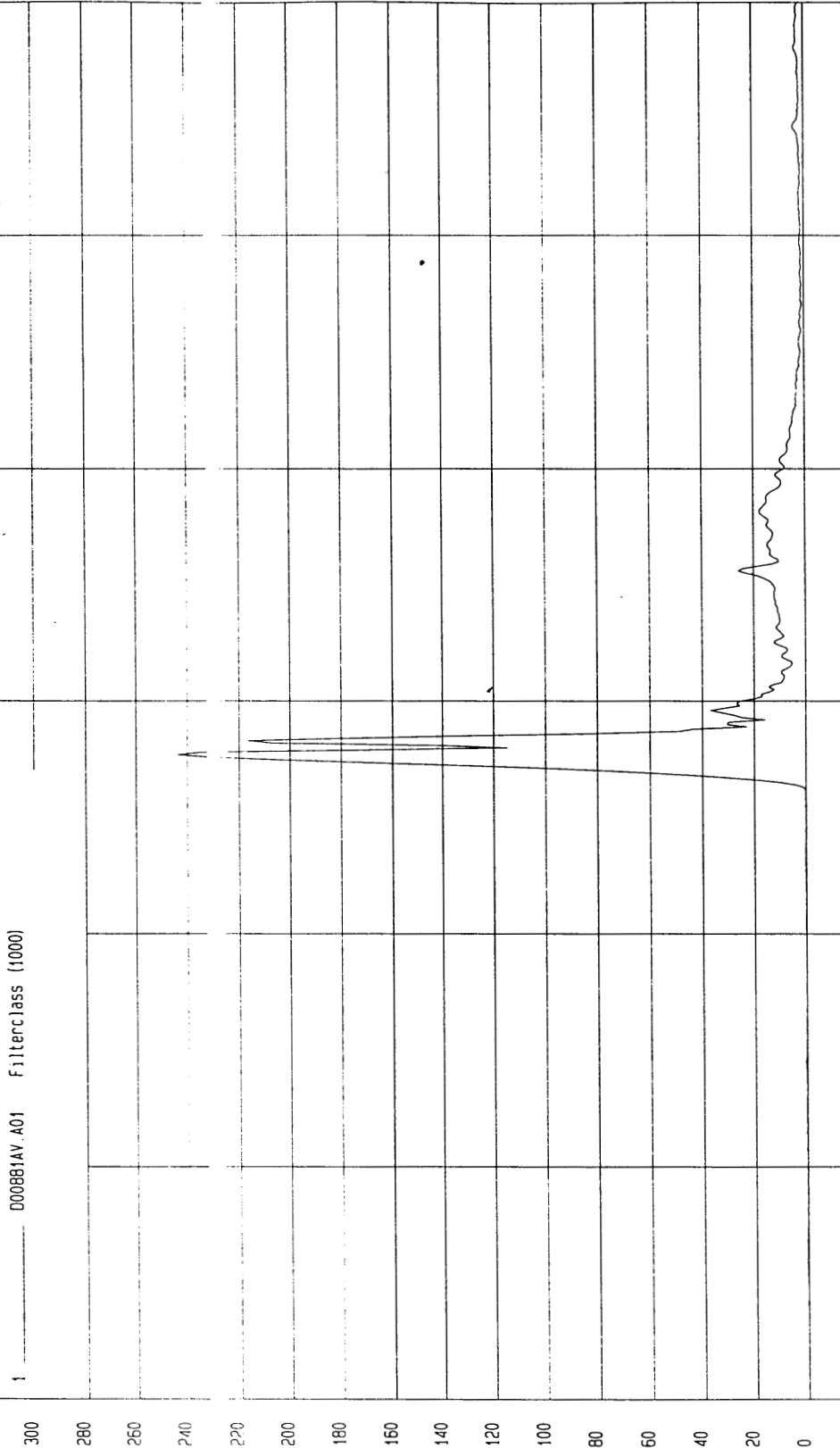
COMPONENT: Dummy #269

Minimum = 4.98E-02 G'S at .2 msec

Maximum = 243.86 G'S at 27.7 msec

PEAK RESULTANT ACCELERATION

000881AV A01 Filterclass (1000)



300  
280  
260  
240  
220  
200  
180  
160  
140  
120  
100  
80  
60  
40  
20  
0

0 10 20 30 40 50 60 70 80 90

MGA Research  
07-28-2000 07:46

S.G

TEST: Dummy Calibration - Head Drop TEST DATE: 07-28-2000 - 07:46:03

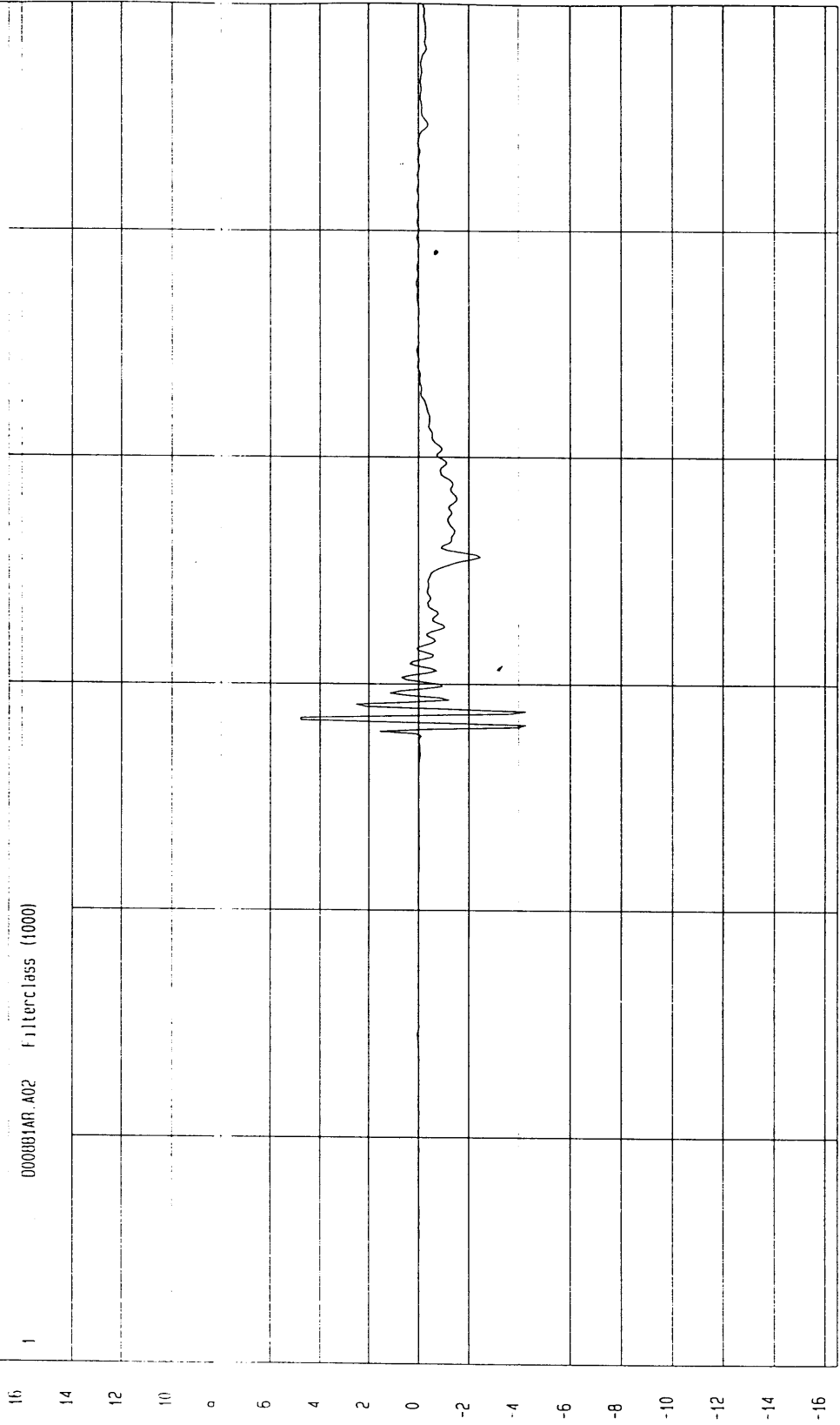
COMPONENT: Dummy #269

Minimum = -4.26 G'S at 28.8 msec

Maximum = 4.78 G'S at 28.5 msec

PEAK LATERAL ACCELERATION

000081AR.A02 Filterclass (1000)



TIME (SEC.)

MGA Research  
07-28-2000 07:46

MGA RESEARCH CORPORATION  
THORAX IMPACT TEST  
SIDE IMPACT DUMMY (SID)

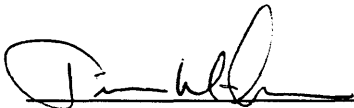
Date: July 25, 2000

Dummy Serial Number: 269

Test Number: D00882

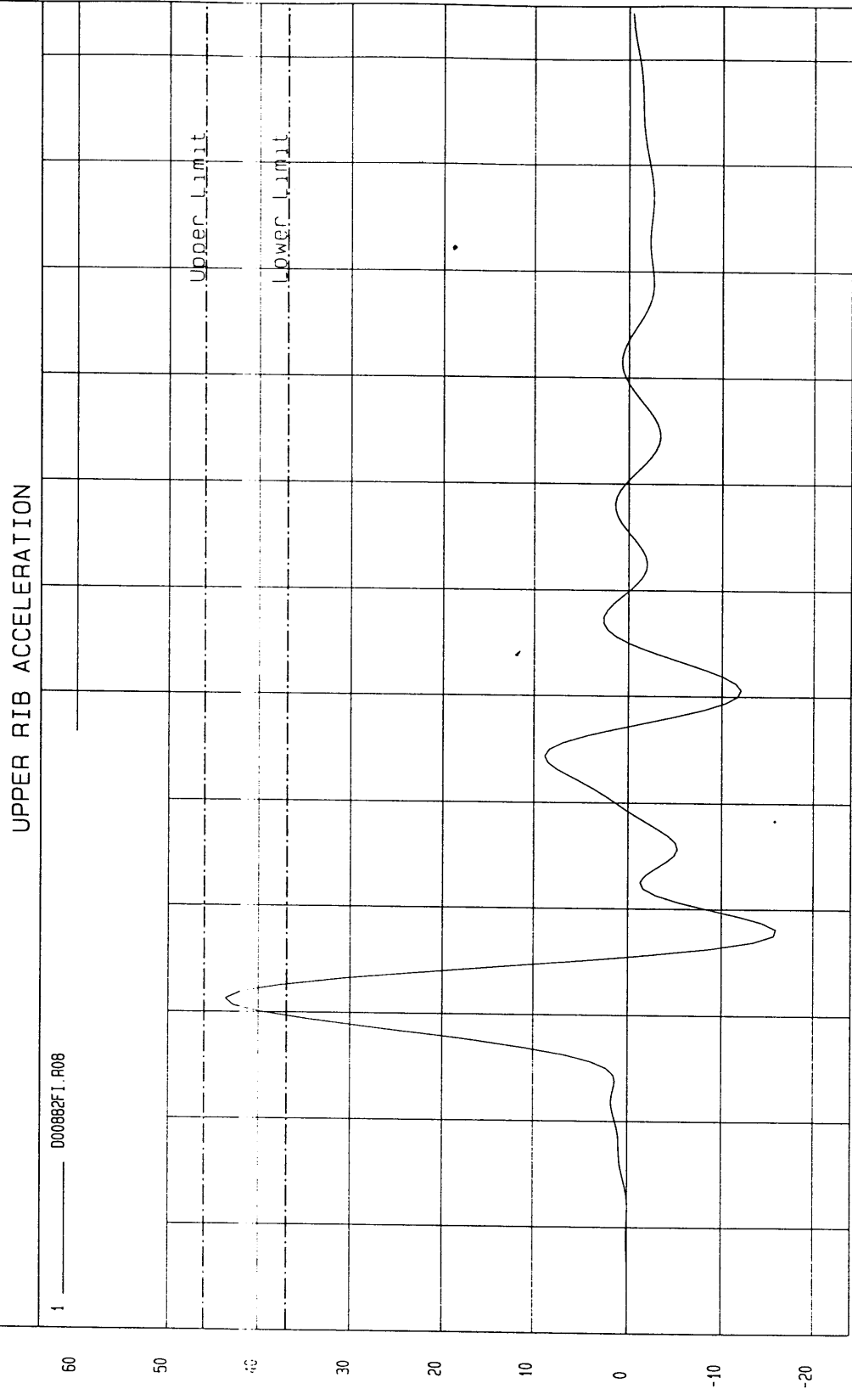
TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.0
Relative Humidity (%)	10 – 70	47
Probe Speed (m/s)	4.27 – 4.33	4.29
Upper Rib (g's)	37 – 46	44
Lower Rib (g's)	37 – 46	41
Lower Spine (g's)	15 - 22'	21

TEST MEETS SPECIFICATIONS

Technician: 

Approved By: David Winhelbauer

TEST: Dummy Calibration - Thorax Impact      TEST DATE: 07-25-2000 - 11:16:16  
COMPONENT: Dummy #269      Velocity: 14.086 FT/SEC 4.29 M/SEC  
Minimum = -15.87 G'S at 38.1 msec      Maximum = 43.62 G'S at 31.2 msec



NGA Research  
07-25-2000 11:30

TEST: Dummy Calibration - Thorax Impact TEST DATE: 07-25-2000 - 11:16:16

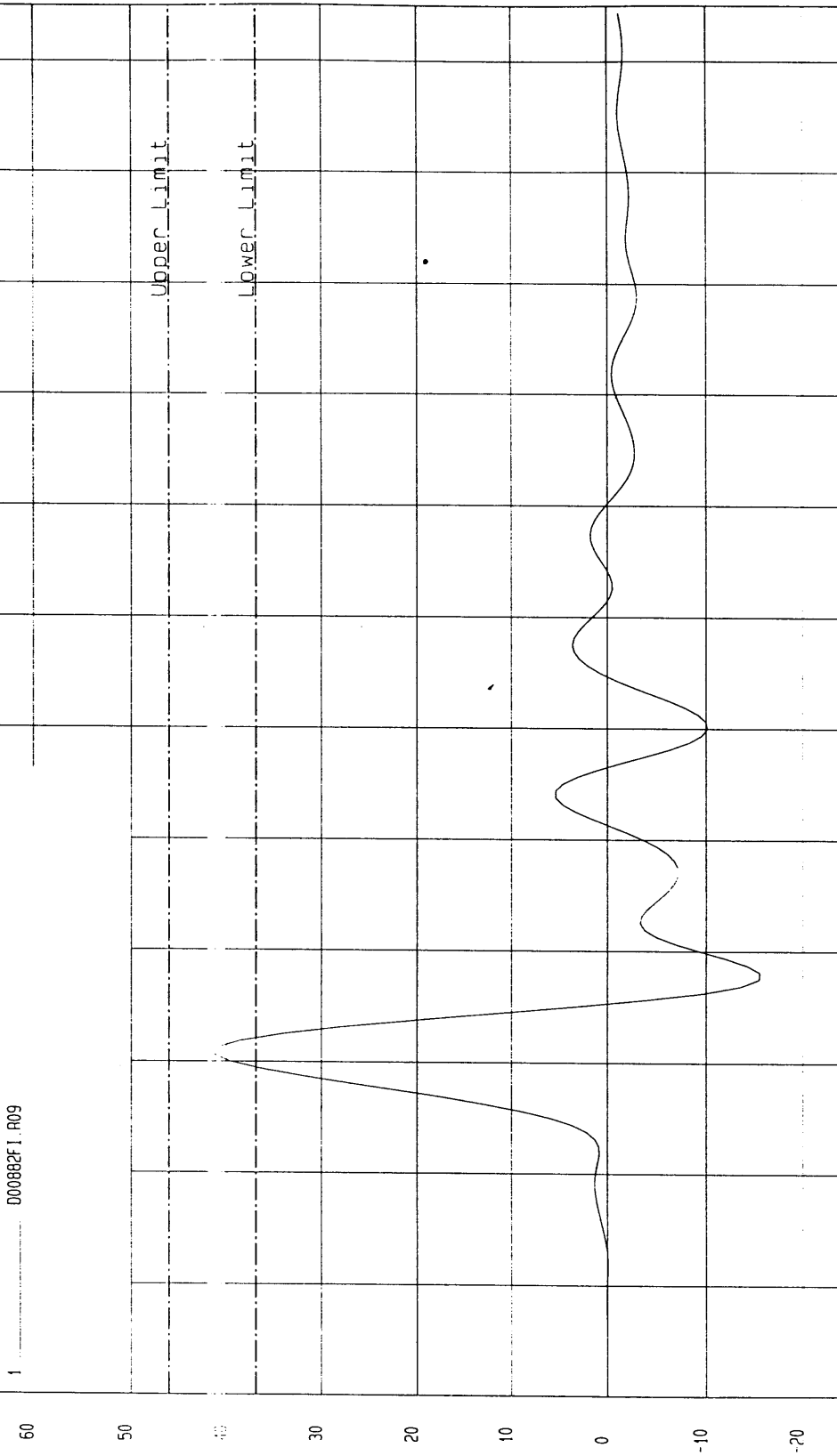
COMPONENT: Dummy #269 Velocity: 14.086 FT/SEC 4.29 M/SEC

Minimum = -15.61 G'S at 38.1 msec

Maximum = 41.30 G'S at 30.6 msec

LOWER RIB ACCELERATION

000882F1.R09

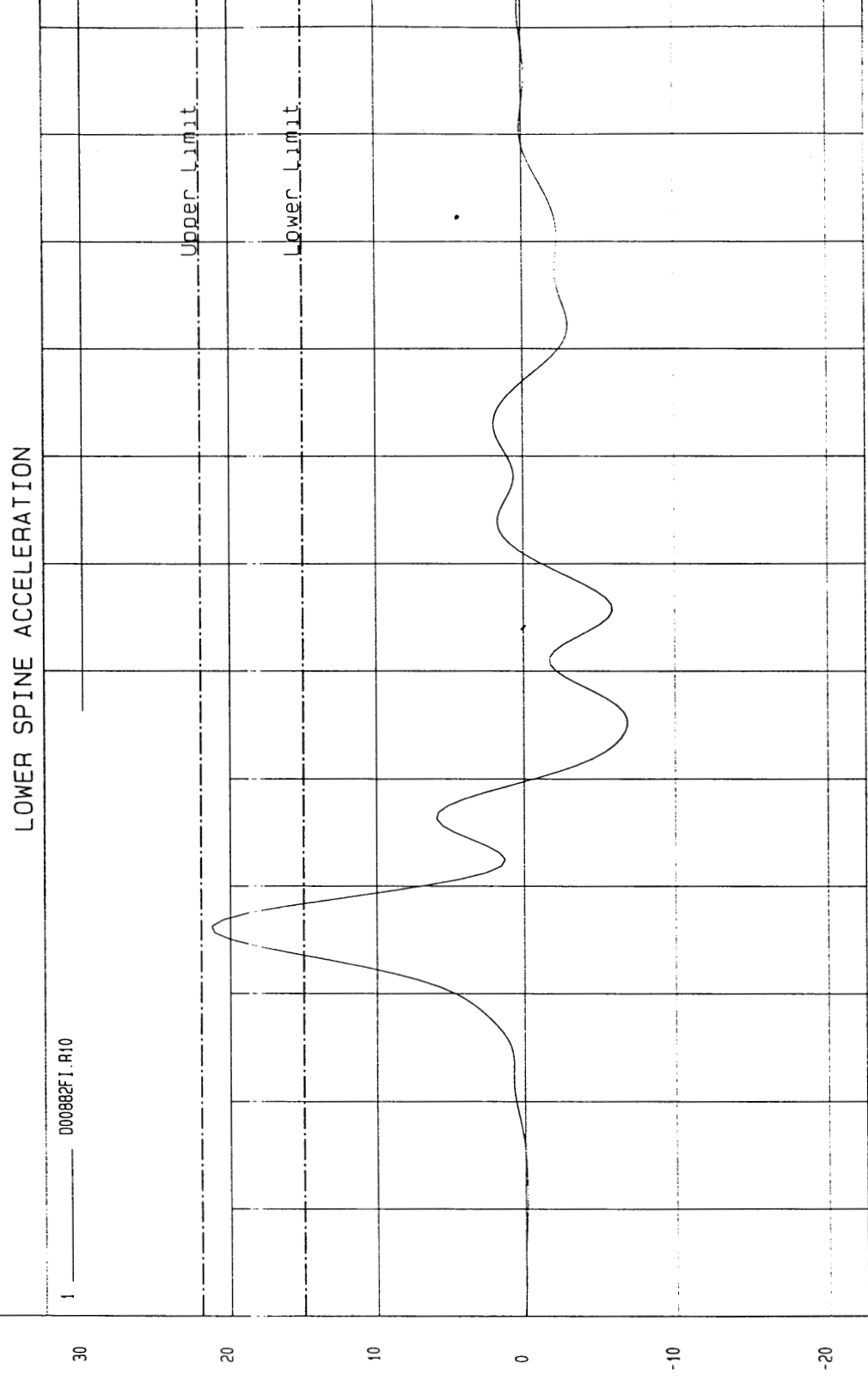


NCA Research  
07-25-2000 11:30

TEST: Dummy Calibration - Thorax Impact TEST DATE: 07-25-2000 - 11:16:16

COMPONENT: Dummy #269 Velocity: 14.086 FT/SEC 4.29 M/SEC

Minimum = -6.84 G'S at 55 msec Maximum = 21.28 G'S at 36.2 msec



TIME (SEC.)

MGA Research  
07-25-2000 11:30

G.S

MGA RESEARCH CORPORATION  
PELVIS IMPACT TEST  
SIDE IMPACT DUMMY (SID)

Date: July 25, 2000

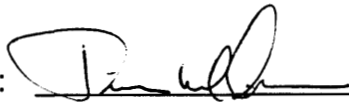
Dummy Serial Number: 269

Test Number: D00883

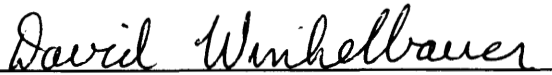
TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.0
Relative Humidity (%)	10 – 70	47
Probe Speed (m/s)	4.27 – 4.33	4.29
Pelvis Acceleration (g's)	40 – 60	47

TEST MEETS SPECIFICATIONS

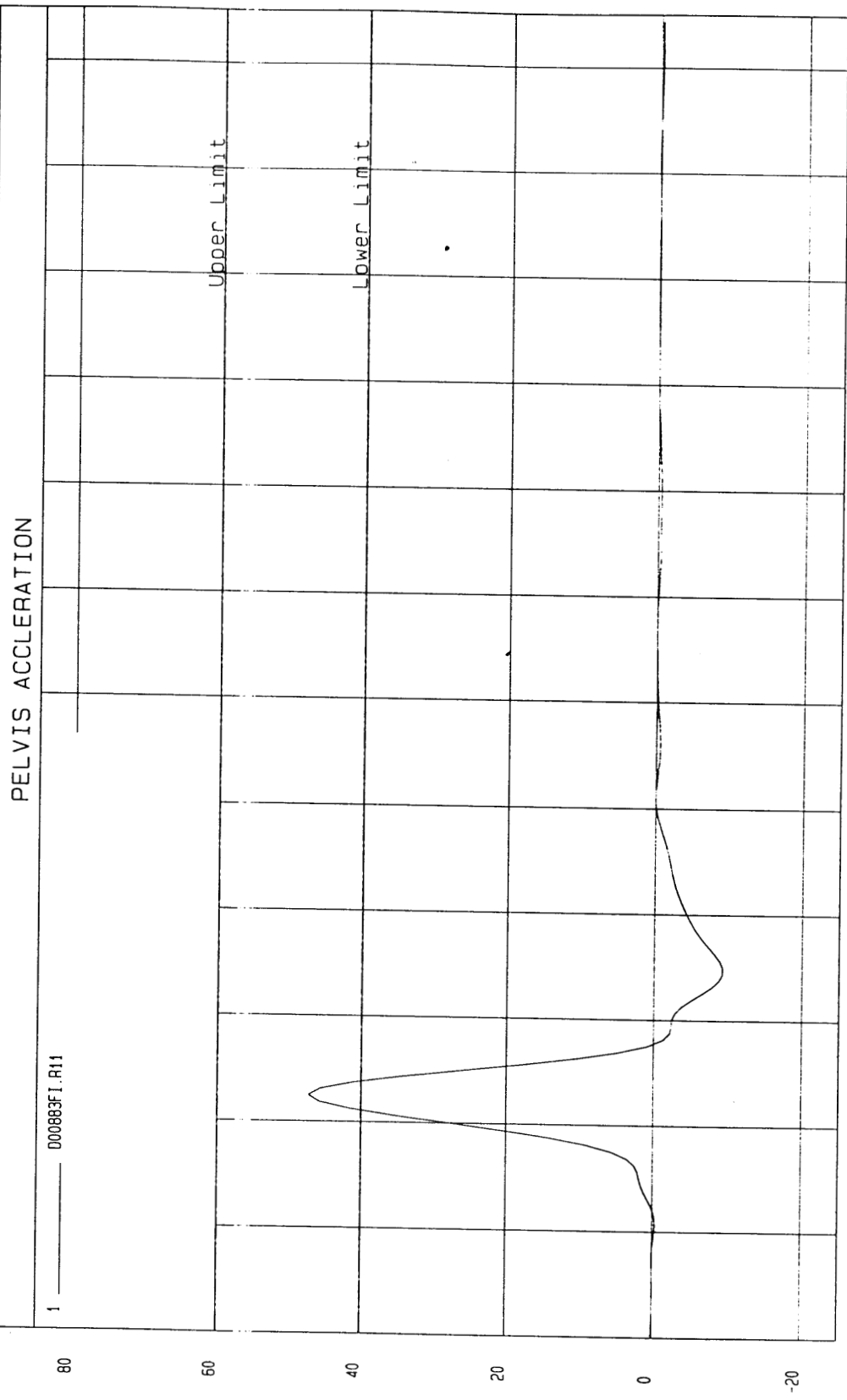
Technician: \_\_\_\_\_



Approved By: \_\_\_\_\_



TEST: Dummy Calibration - Pelvis Impact      TEST DATE: 07-25-2000 - 11:27:28  
COMPONENT: Dummy #269      Velocity: 14.091 FT/SEC 4.29 M/SEC  
Minimum = -9.16 G'S at 34.3 msec      Maximum = 47.33 G'S at 22.5 msec



NSA Research  
07-25-2000 11:30

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

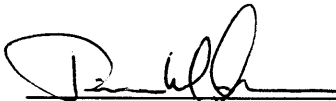
Date: July 27, 2000

Dummy Serial Number: 269

Test Number: D00884

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.0
Relative Humidity (%)	10 – 70	53
Force @ 12.7 mm	104 – 162	140
Force @ 19 mm	163 – 222	196
Force @ 25.4 mm	222 – 280	260
Force @ 33 mm	325 - 391	355

TEST MEETS SPECIFICATIONS

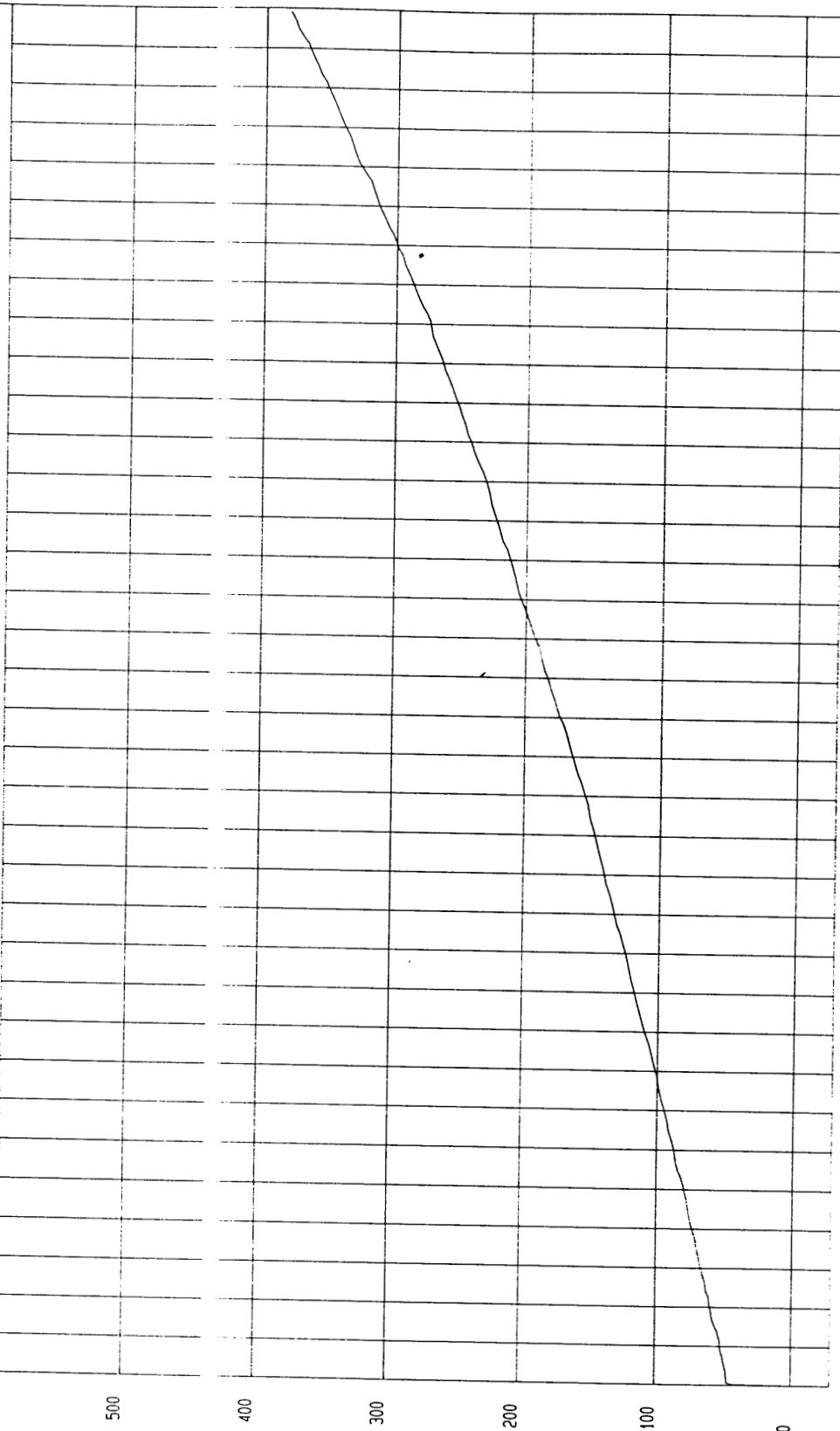
Technician: 

Approved By: 

TEST: DUMMY CALIBRATION - ABDOMEN COMPRESSION TEST DATE: 07-27-2000 - 15:40:17

COMPONENT: DUMMY # 269

FORCE as a function of DISPLACEMENT



MGA Research  
07-27-2000 15:40

DISPLACEMENT mm

FORCE N

MGA RESEARCH CORPORATION  
LUMBAR FLEXION TEST  
SIDE IMPACT DUMMY (SID)

C-47

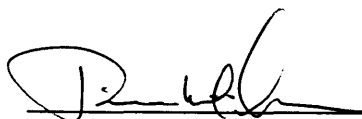
Date: July 27, 2000


Dummy Serial Number: 269

Test Number: D0885

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.0
Relative Humidity (%)	10 – 70	54
Force @ 0°	0 – 26.7	0
Force @ 20°	97.9 – 151.2	99.5
Force @ 30°	151.2 – 204.6	155.6
Force @ 40°	204.6 – 258.0	207.8
Return Angle	12° maximum	3°

TEST MEETS SPECIFICATIONS

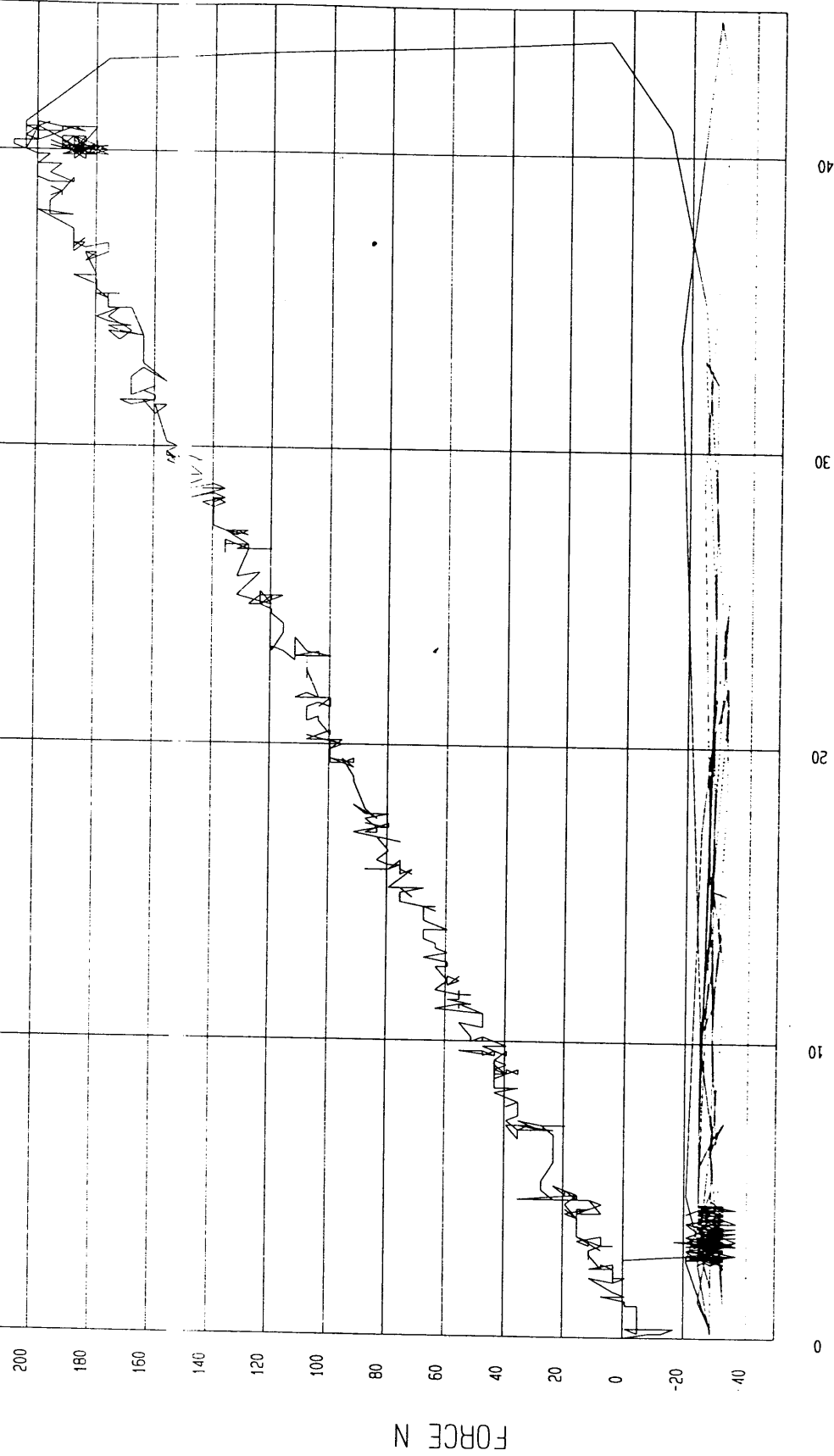
Technician: 

Approved By: 

TEST: DUMMY CALIBRATION - LUMBAR FLEXION TEST DATE: 07-27-2000 - 16:08:47

COMPONENT: DUMMY # 269

FORCE as a function of TORSO ROTATION



DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Dummy Serial Number: 269

Inspected By: Tim Michnay

Date: 7/28/00

<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):

Rib Wrap torn from rivets on impact side. Replace before next test.

POST-TEST CERTIFICATION DATA

Dummy Serial Number: 270

Calibration Test Results Summary

Dummy Serial Number: 270

Post-Test Calibration

External Dimensions:	The dummy passed all external dimension requirements.
Head Drop Test:	The head passed all drop test 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 **C-52**

Date of Verification: July 28, 2000

Dummy Serial Number: 270

Test Number: D0089

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH-Seated Height (mm)	889 – 909	898
RH-Rib Height (mm)	501 – 521	503
HP-Hip Pivot Height (mm)	99 ref.	99
RD-Rib From Back Line (mm)	229 - 241	230
KV-Knee Pivot From Back Line (mm)	511 – 526	525
SW-Knee Pivot to Floor (mm)	490 – 505	500
HW – Hip Width (mm)	356 – 391	368

Technician: 

Approved By: David Winkelbauer

MGA RESEARCH CORPORATION  
HEAD DROP TEST  
SIDE IMPACT DUMMY (SID)

C-53

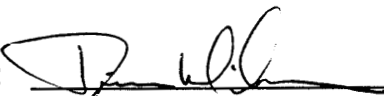
Date: July 28, 2000

Dummy Serial Number: 270

Test Number: D00891

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 - 25.5	21.0
Relative Humidity (%)	10 - 70	50
Peak Resultant Acceleration	210 - 260 g's	249
Peak Lateral Acceleration	< 10 g's	-9
Time Above 100 g.	0.9 - 1.5 msec.	1.1

TEST MEETS SPECIFICATIONS

Technician: 

Approved By: David Winhelbauer

TEST: Dummy Calibration - Head Drop TEST DATE: 07-28-2000 - 08:08:06

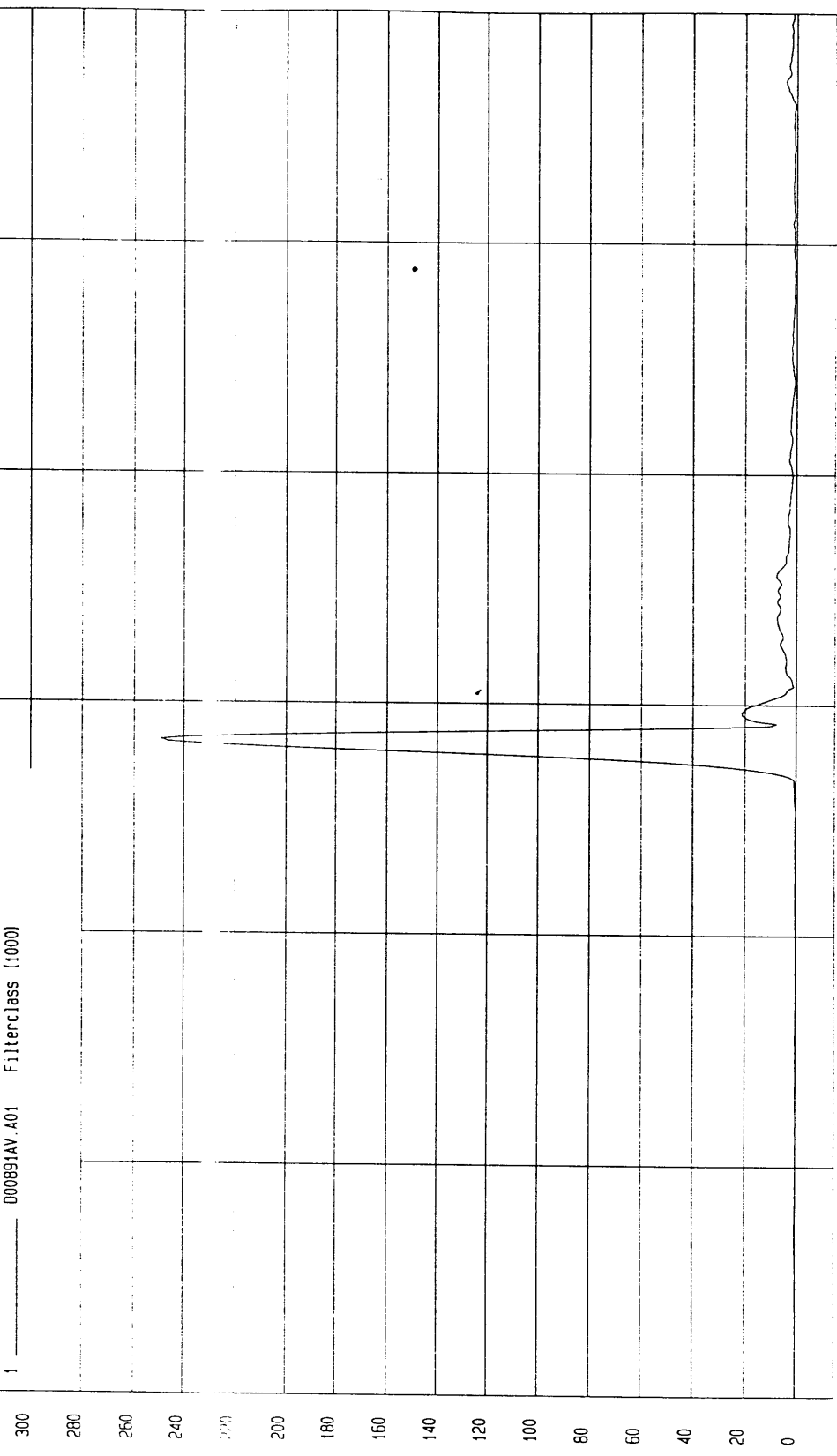
COMPONENT: Dummy #270

Minimum = 7.91E-02 G'S at 1.1 msec

Maximum = 249.41 G'S at 28.4 msec

PEAK RESULTANT ACCELERATION

1 000891AV.A01 Filterclass (1000)



300  
280  
260  
240  
220  
200  
180  
160  
140  
120  
100  
80  
60  
40  
20  
0

TIME (sec.)

0.0

0.04

0.08

0.20

0.40

0

MCA Research  
07-28-2000 08:09

S.S

TEST: Dummy Calibration - Head Drop TEST DATE: 07-28-2000 - 08:05:46

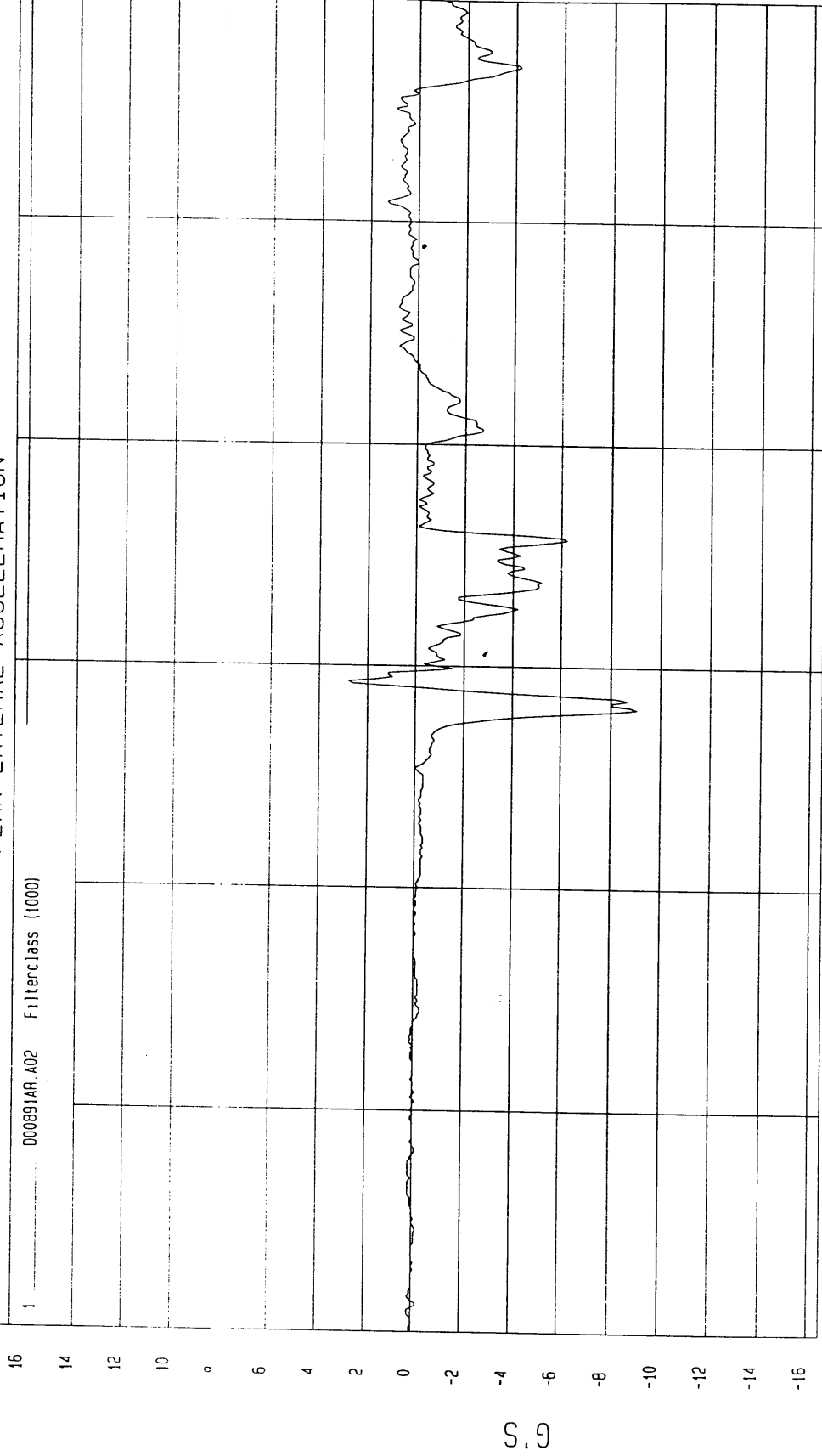
COMPONENT: Dummy #270

Minimum = -9.12 G'S at 189. msec

Maximum = 5.70 G'S at 133. msec

PEAK LATERAL ACCELERATION

1 D00891AR.A02 Filterclass (1000)



0 2 4 6 8 10 12 14 16 0.01 0.02 0.03 0.04 0.05

TIME (sec.)

MCA Research  
07-28-2000 08:09

MGA RESEARCH CORPORATION  
THORAX IMPACT TEST  
SIDE IMPACT DUMMY (SID)

C-56


Date: July 27, 2000


Dummy Serial Number: 270

Test Number: D00892

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.0
Relative Humidity (%)	10 – 70	47
Probe Speed (m/s)	4.27 – 4.33	4.31
Upper Rib (g's)	37 – 46	43
Lower Rib (g's)	37 – 46	40
Lower Spine (g's)	15 - 22'	21

TEST MEETS SPECIFICATIONS

Technician: 

Approved By: 

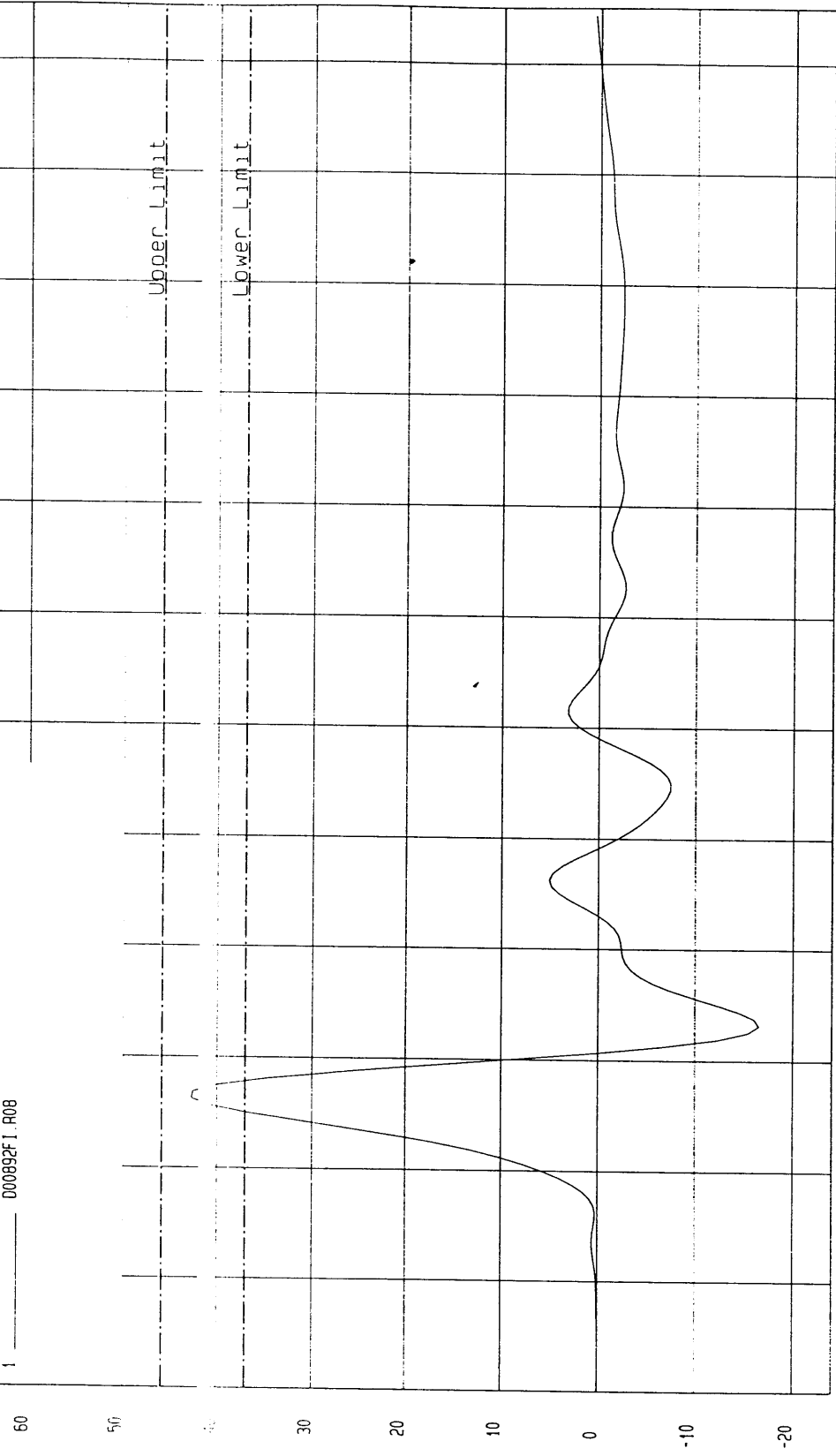
TEST: Dummy Calibration - Thorax Impact TEST DATE: 07-27-2000 - 11:22:10

COMPONENT: Dummy #270 Velocity: 14.126 FT/SEC 4.31 M/SEC

Minimum = -16.43 G'S at 33.1 msec Maximum = 42.78 G'S at 26.2 msec

UPPER RIB ACCELERATION

1 000892FT.R08



MCA Research  
07-27-2000 11:41

TIME (SEC.)

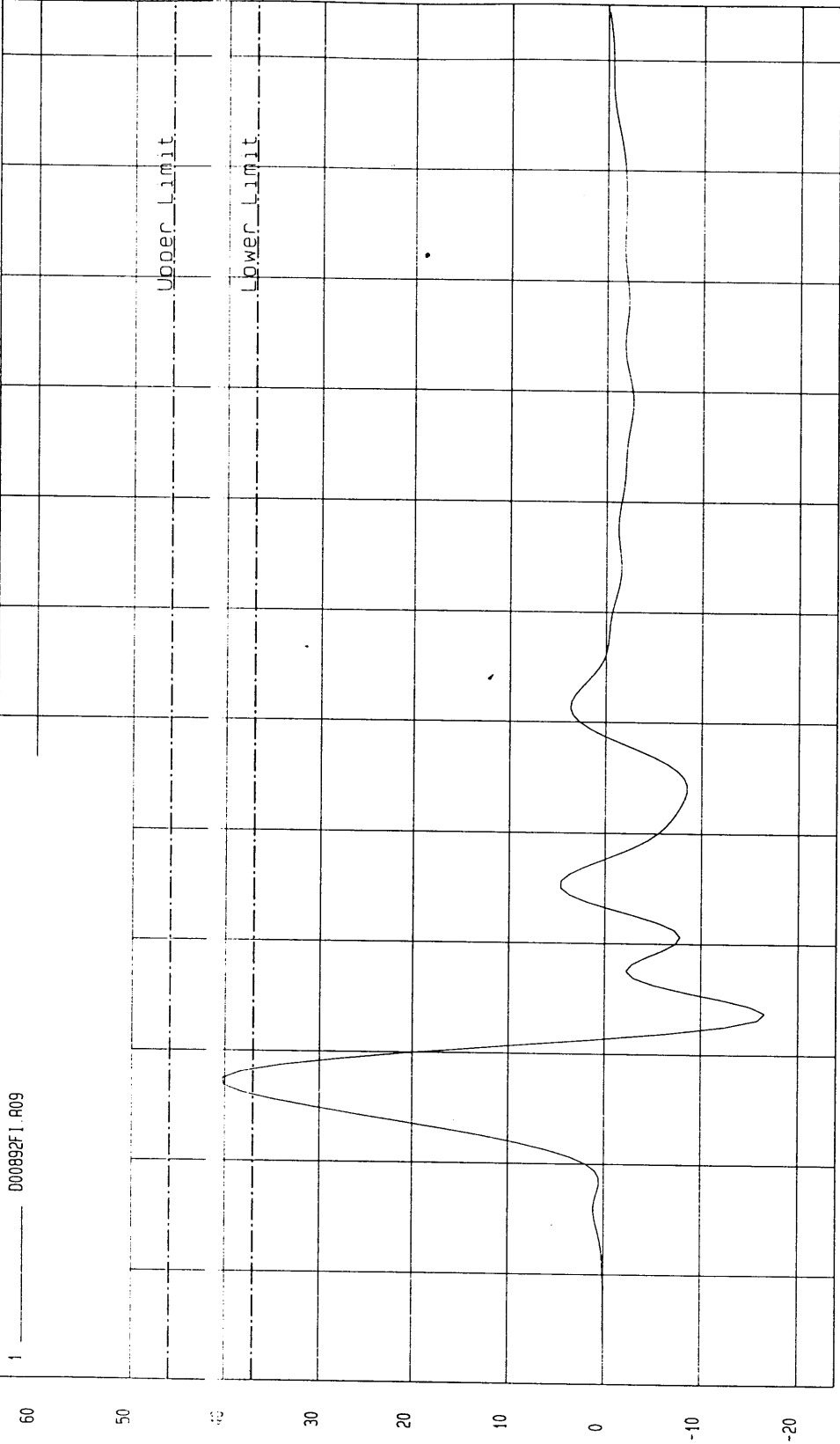
G.S.

TEST: Dummy Calibration - Thorax Impact TEST DATE: 07-27-2000 - 11:26:57

COMPONENT: Dummy #270 Velocity: 14.126 FT/SEC 4.31 M/SEC

Minimum = -16.47 G'S at 33.7 msec  
Maximum = 40.27 G'S at 27.5 msec

LOWER RIB ACCELERATION



MGA Research  
07-27-2000 11:41

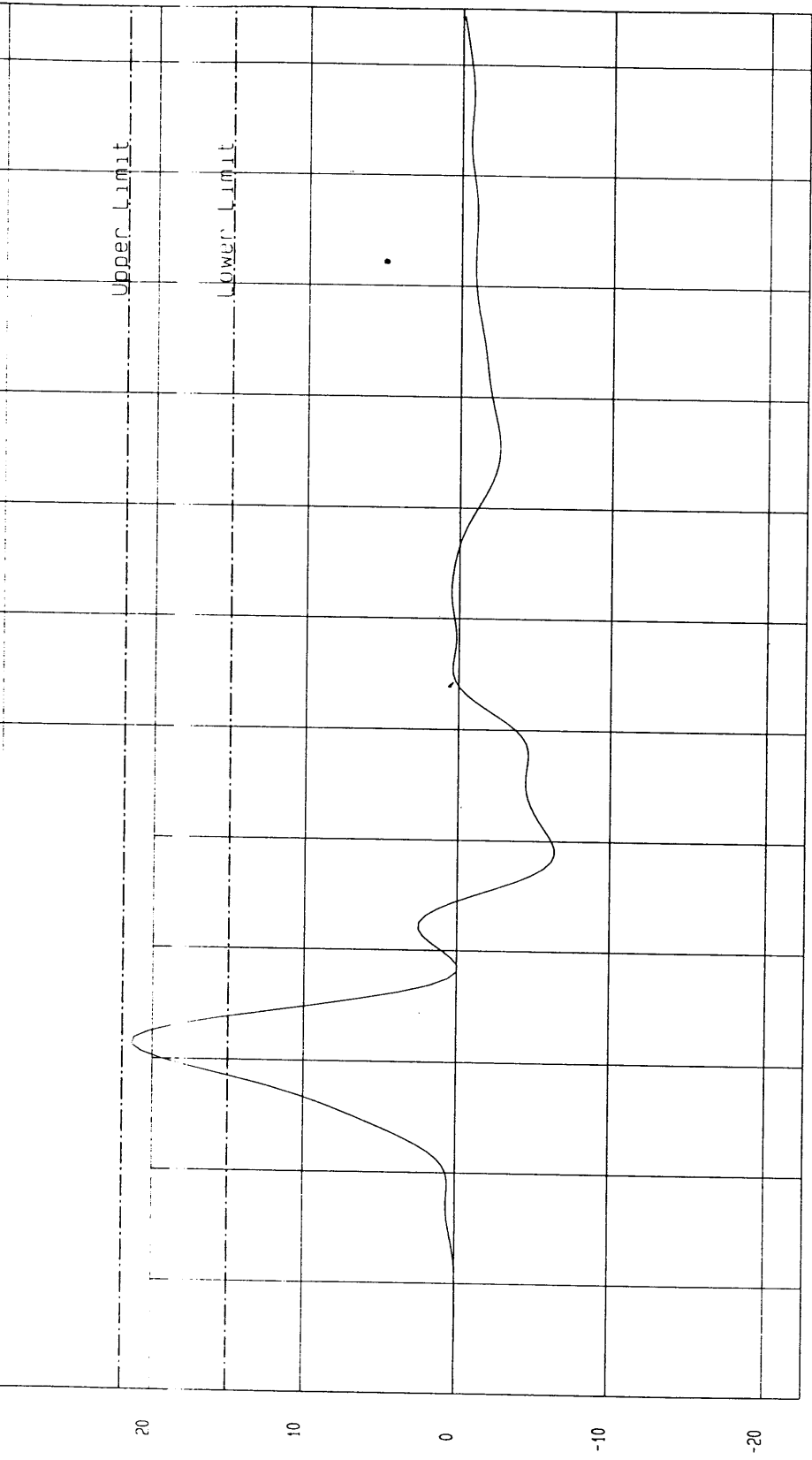
TEST: Dummy Calibration - Thorax Impact TEST DATE: 07-27-2000 - 11:22:10

COMPONENT: Dummy #270 Velocity: 14.126 FT/SEC 4.31 M/SEC

Minimum = -6.29 G'S at 48.7 msec Maximum = 21.38 G'S at 31.2 msec

LOWER SPINE ACCELERATION

1 000892FI.R10



MGA Research  
07-27-2000 11:42

MGA RESEARCH CORPORATION  
PELVIS IMPACT TEST  
SIDE IMPACT DUMMY (SID)

C-60

Date: July 27, 2000


Dummy Serial Number: 270

Test Number: D00893

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.0
Relative Humidity (%)	10 – 70	47
Probe Speed (m/s)	4.27 – 4.33	4.28
Pelvis Acceleration (g's)	40 – 60	43

TEST MEETS SPECIFICATIONS

Technician: 

Approved By: 

TEST: Dummy Calibration -

TEST DATE: 07-27-2000 - 11:40:58

COMPONENT: Dummy #270

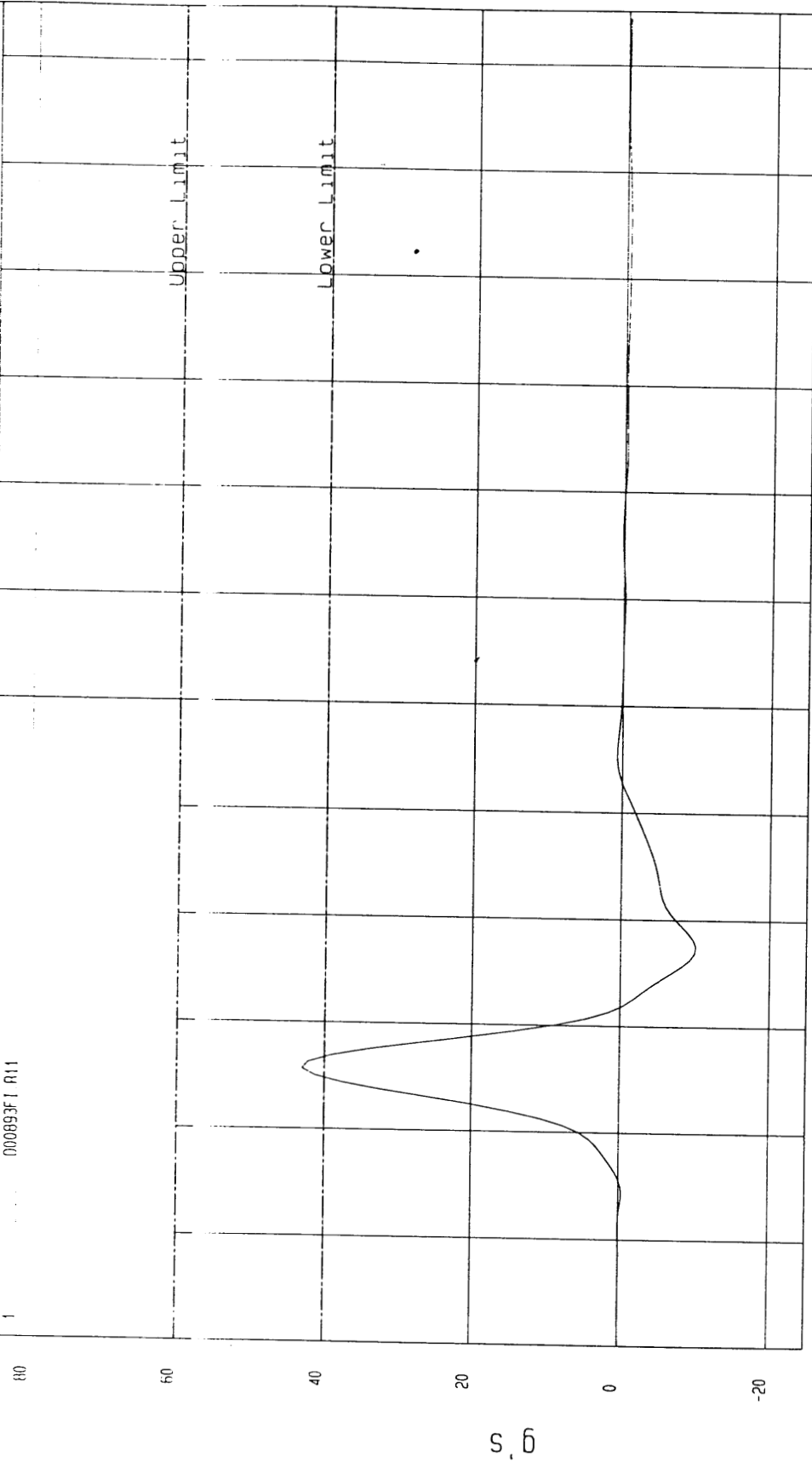
Velocity: 14.053 FT/SEC 4.28 M/SEC

Minimum = -10.08 g's at 37.5 msec

Maximum = 43.08 g's at 25.6 msec

PELVIS ACCELERATION

000893F1 R11



MGA Research  
07-27-2000 11:42

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

Date: July 27 2000


Dummy Serial Number: 270

Test Number: D00894

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.0
Relative Humidity (%)	10 – 70	54
Force @ 12.7 mm	104 – 162	145
Force @ 19 mm	163 – 222	204
Force @ 25.4 mm	222 – 280	273
Force @ 33 mm	325 - 391	379

TEST MEETS SPECIFICATIONS

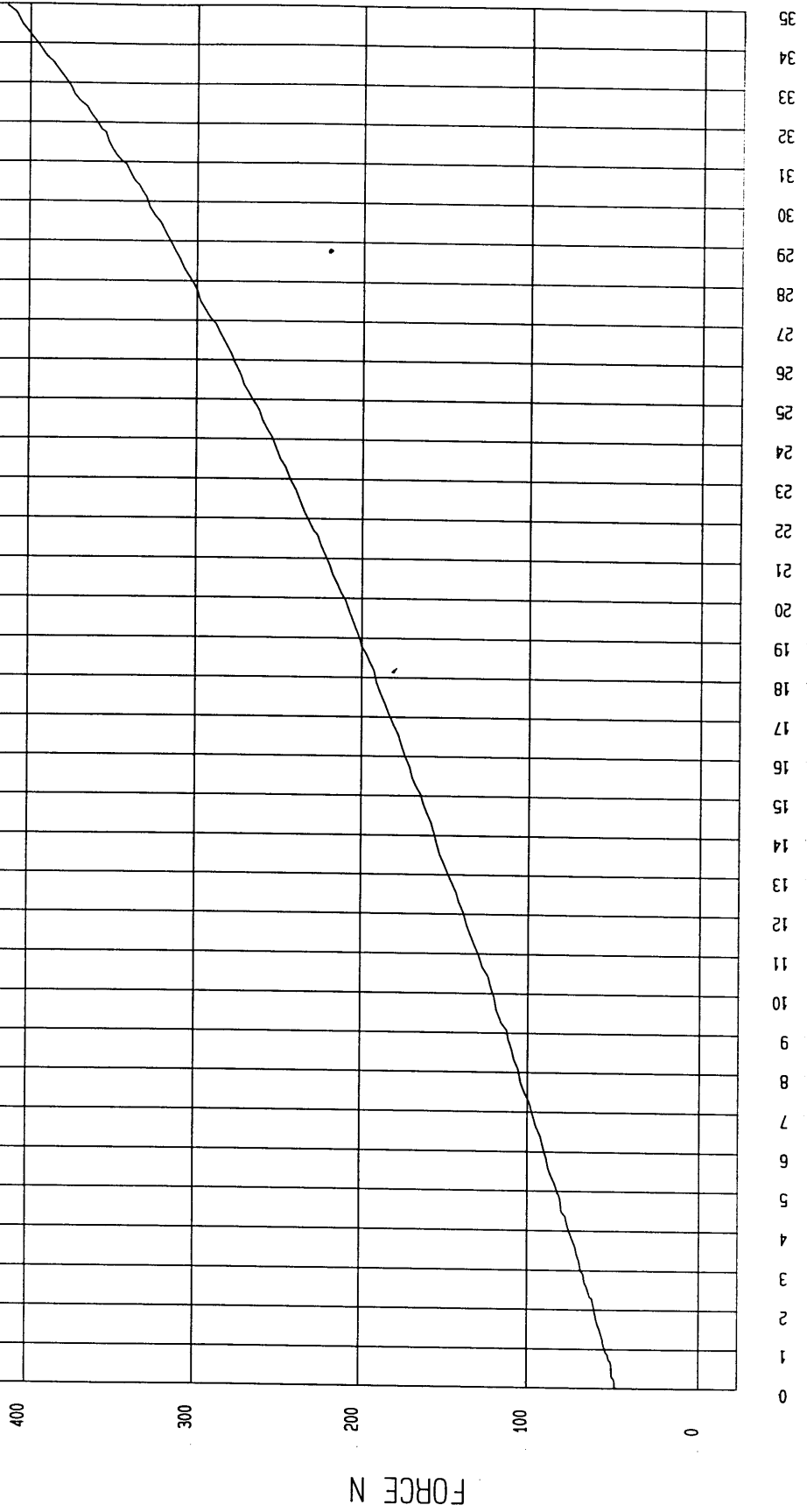
Technician: 

Approved By: 

TEST: DUMMY CALIBRATION - ABDOMEN COMPRESSIONTEST DATE: 07-27-2000 - 12:05:22

COMPONENT: DUMMY # 270

FORCE as a function of DISPLACEMENT



MGA Research  
10-16-2000 12:06

DISPLACEMENT mm

FORCE N

MGA RESEARCH CORPORATION  
LUMBAR FLEXION TEST  
SIDE IMPACT DUMMY (SID)

Date: July 27, 2000

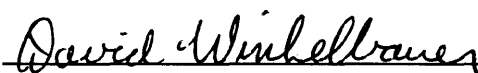
Dummy Serial Number: 270

Test Number: D00894

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature (°C)	18.9 – 25.5	21.0
Relative Humidity (%)	10 – 70	54
Force @ 0°	0 – 26.7	0
Force @ 20°	97.9 – 151.2	100.0
Force @ 30°	151.2 – 204.6	152.1
Force @ 40°	204.6 – 258.0'	216.3
Return Angle	12° maximum	3°

TEST MEETS SPECIFICATIONS

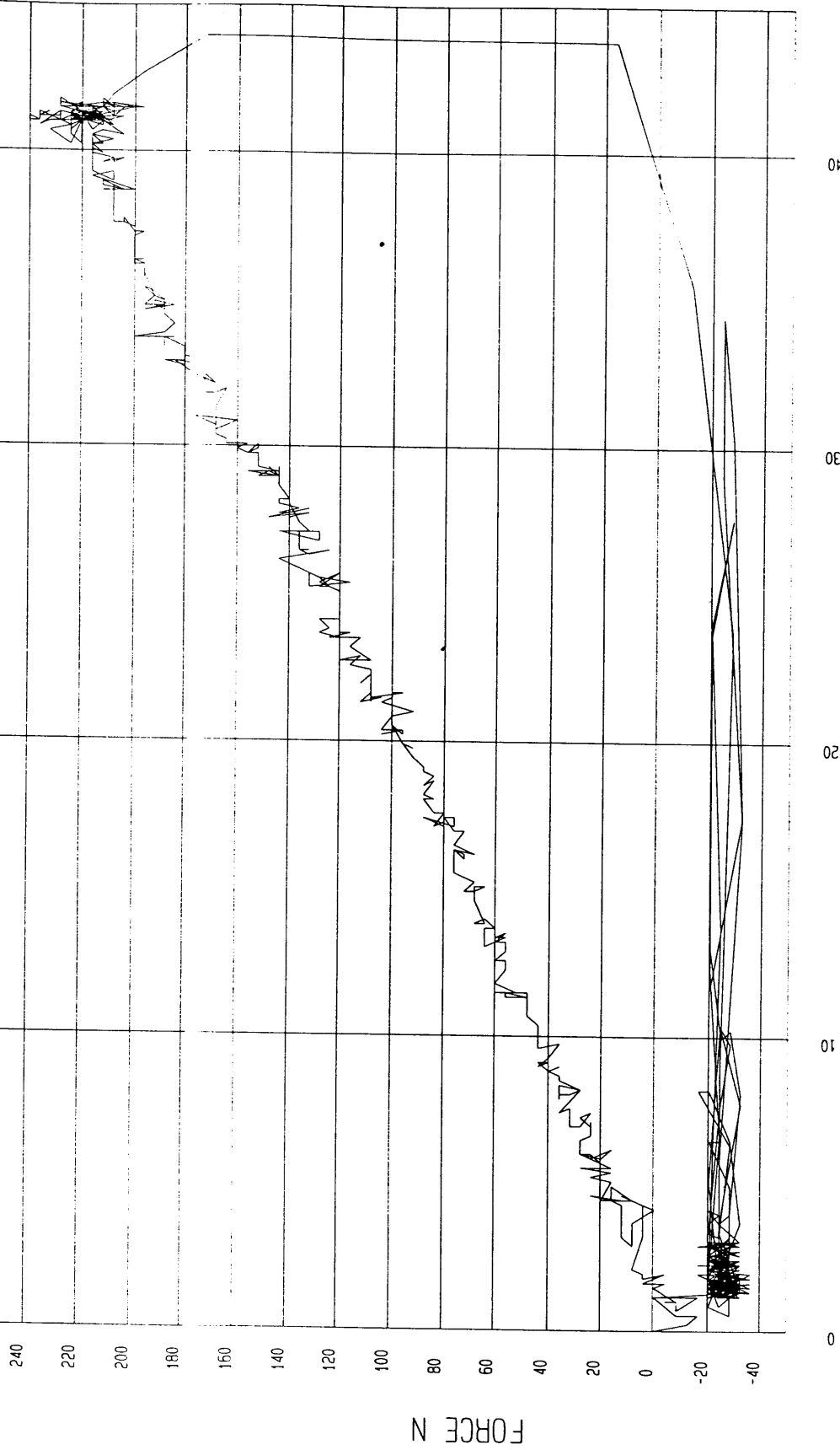
Technician: 

Approved By: 

TEST: DUMMY CALIBRATION - LUMBAR FLEXION TEST DATE: 07-27-2000 - 16:31:36

COMPONENT: DUMMY # 270

FORCE as a function of TORSO ROTATION



DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Dummy Serial Number: 270

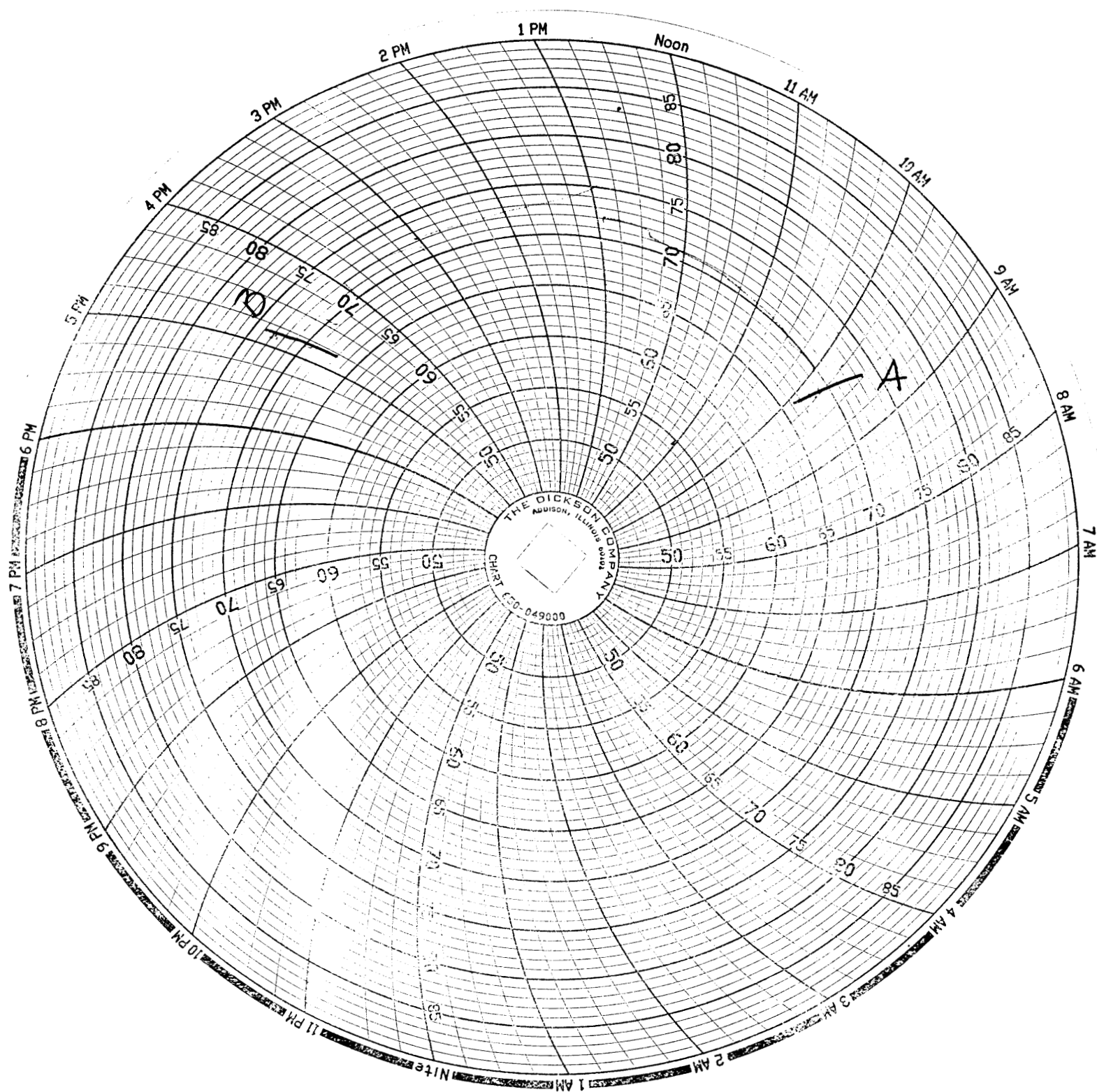
Inspected By: Tim Michnay

Date: 7/28/00

<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. 269

	DRIVER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	ANBP7	Endevco	2/10/00
Lower Rib Y	J14120	Endevco	2/10/00
Lower Spine Y	J10431	Endevco	2/10/00
Pelvis Y	AJ417	Endevco	2/10/00
Upper Rib Redundant Y	AP1C6	Endevco	2/10/00
Lower Rib Redundant Y	APY16	Endevco	2/10/00
Lower Spine Redundant Y	AN9E3	Endevco	2/10/00
Pelvis Redundant Y	AGP20	Endevco	2/10/00
Head Center of Gravity X	J14896	Endevco	7/7/00
Head Center of Gravity Y	J14771	Endevco	7/7/00
Head Center of Gravity Z	J14774	Endevco	7/7/00

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

	LEFT REAR PASSENGER	
	SERIAL NO.	CALIBRATION DATE
Upper Rib Y	AN8L6 Endevco	2/10/00
Lower Rib Y	ALEC1 Endevco	2/10/00
Lower Spine Y	AJ9A7 Endevco	2/10/00
Pelvis Y	AGM32 Endevco	2/10/00
Upper Rib Redundant Y	APY13 Endevco	2/10/00
Lower Rib Redundant Y	J10411 Endevco	2/10/00
Lower Spine Redundant Y	AKAD6 Endevco	2/10/00
Pelvis Redundant Y	AKAH3 Endevco	2/10/00
Head Center of Gravity X	J13772 Endevco	2/10/00
Head Center of Gravity Y	J140087 Endevco	2/10/00
Head Center of Gravity Z	J14028 Endevco	2/10/00

VEHICLE INSTRUMENT CALIBRATION

VEHICLE ACCELEROMETERS		
SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Moving Barrier CG X	K11-J18 Entran	7/11/00
Moving Barrier CG Y	F12-G01 Entran	7/11/00
Moving Barrier CG Z	G10-J14 Entran	7/11/00
Moving Barrier Rear Axle X	G01-J12 Entran	2/11/00
Moving Barrier Rear Axle Y	G01-J11 Entran	2/11/00
Left Mid A-Post Y	E10-F18 Entran	7/11/00
Left Lower A-Post Y	I14-D13 Entran	2/11/00
Rear Floorpan Above Axle X	G01-J15 Entran	2/11/00
Rear Floorpan Above Axle Y	G13-B07 Entran	6/2/00
Rear Floorpan Above Axle Z	G08-B07 Entran	2/11/00
Driver Seat Track Y	K16-X08 Entran	7/11/00
Right Side Sill at Front Seat X	J06-D19 Entran	2/11/00
Right Side Sill at Front Seat Y	J10-E18 Entran	2/11/00
Right Side Sill at Front Seat Z	E10-F03 Entran	2/11/00
Right Side Sill at Rear Seat X	K16-X03 Entran	3/17/00
Right Side Sill at Rear Seat Y	K11-J12 Entran	6/2/00
Right Side Sill at Rear Seat Z	F12-G08 Entran	6/2/00

VEHICLE INSTRUMENT CALIBRATION

VEHICLE ACCELEROMETERS			
	SERIAL NO	MANUFACTURER	CALIBRATION DATE
Left Side Sill at Front Seat Y	A09-G02	Entran	2/11/00
Left Side Sill at Rear Seat Y	E24-G01	Entran	3/16/00
Right Rear Occupant Compartment Y	L22-G05	Entran	3/20/00
Vehicle CG X	J13-F22	Entran	7/11/00
Vehicle CG Y	A09-G09	Entran	7/11/00
Vehicle CG Z	I18-E03	Entran	4/7/00
Left Front Door on Centerline	F20-G06	Entran	7/11/00
Midrear of Left Front Door	D05-R10	Entran	7/11/00
Left Front Door Upper Centerline	G01-J09	Entran	7/11/00
Midrear of Left Rear Door	F07-A14	Entran	2/11/00
Left Rear Door Upper Centerline	K19-A15	Entran	7/11/00

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