

REPORT NO.: 214D-MGA-99-09

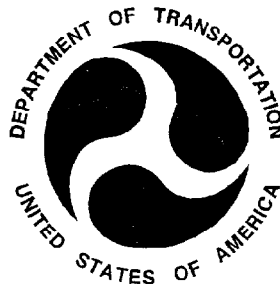
V2989

NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TESTING
PASSENGER CARS

FORD MOTOR COMPANY

1999 LINCOLN TOWNCAR
4 DOOR
NHTSA NO: MX0207

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: December 10, 1998

Report Date: December 23, 1998

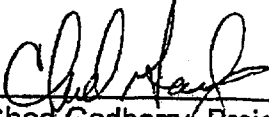
FINAL REPORT

Prepared For:

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
SAFETY PERFORMANCE STANDARDS
OFFICE OF CRASHWORTHINESS STANDARDS
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				14. Sponsoring Agency Code NPS-10																			
15. Supplementary Notes																							
16. Abstract A 90° Moving Deformable Barrier NCAP side impact was conducted on the subject 1999 Lincoln Town Car 4 Door to obtain new car assessment and research data indicant of FMVSS No. 214D performance. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on December 10, 1998. The impact velocity of the Moving Deformable Barrier (MDB) was 61.6 kph, and the ambient temperature at the struck side (driver's) of the target vehicle at the time of impact was 20 °C. The target vehicle post test maximum crush was 507 mm at level 3. The test vehicle's performance follows: <table border="0"> <thead> <tr> <th></th> <th><u>DRIVER</u></th> <th><u>PASS.</u></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib (LUR) Accel., g</td> <td>43</td> <td>63</td> </tr> <tr> <td>Left Lower Rib (LLR) Accel., g</td> <td>48</td> <td>67</td> </tr> <tr> <td>Lower Spine (T₁₂) Accel., g</td> <td>73</td> <td>56</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td>61</td> <td>61</td> </tr> <tr> <td>Pelvis (PEV) Accel., g</td> <td>65</td> <td>97</td> </tr> </tbody> </table> The rear door on the struck side of the vehicle did not separate from the body at the hinges or latch and the opposite doors did not open during the side impact event. The front door on the struck side of the vehicle did not separate from the body at the hinges, but did separate at the latch.							<u>DRIVER</u>	<u>PASS.</u>	Left Upper Rib (LUR) Accel., g	43	63	Left Lower Rib (LLR) Accel., g	48	67	Lower Spine (T ₁₂) Accel., g	73	56	Thoracic Trauma Index (TTI)	61	61	Pelvis (PEV) Accel., g	65	97
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17. Key Words New Car Assessment Program (NCAP) FMVSS No. 214D Side Impact Dummy (SID) Occupant Side Impact Protection				18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Adm. Technical Ref. Division, Room 5108 (NAD-52) 400 Seventh Street, S.W. Washington, D.C. 20590																			
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SECTION 1
PURPOSE AND TEST PROCEDURE

This side impact test is part of the FY99 NCAP Side Impact Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-97-D-22001. The purpose of this test was to evaluate side impact protection of a 1999 Lincoln Towncar 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 1999 Lincoln Towncar 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 38.3 mph (61.6 kph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by MGA Research Corporation in Burlington, Wisconsin, on December 10, 1998. Pre- and post-test photographs of the test vehicle, the MDB and the side impact dummies (SIDs) are included in Appendix A.

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

The SIDs were instrumented with the following accelerometers.

1. Left Upper Rib (LUR) uniaxial accelerometer (Y-direction)
2. Left Lower Rib (LLR) uniaxial accelerometer (Y-direction)
3. Lower Thoracic Spine (T₁₂) uniaxial accelerometer (Y-direction)
4. Pelvic (PEV) section uniaxial accelerometer (Y-direction)
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)	61	61
Pelvis (g)	65	97

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

DATA SHEET NO. 1
GENERAL VEHICLE TEST PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1999/Lincoln/Towncar/4-Door
Vehicle NHTSA No.: MX0207 VIN: 1LNHM81W0XY645490
Vehicle Body Color: Silver Build Date: 11/98
Engine Data: 8 Cylinders; CID; 4.6 Liter; cc
Placement X Longitudinal; Lateral
Transmission: 4 Speed; Manual; X Automatic; X Overdrive
Final Drive: X Rear Wheel Drive; Frt. Wheel Drive; Four Wheel Drive

Odometer Reading 50 miles
Options: X A/C; X Pwr. Steering; X Pwr. Brakes; X Pwr. Windows;
X Cruise Control; X Tilt Wheel; X Power Door Locks;

DATA FROM TIRE PLACARD:

Tire Pressure (at capacity): 32 Psi FRONT
32 Psi REAR
Recommended Tire Size: P225/60R16
Tires on Test Vehicle: P225/60R16 Manufacturer: Michelin
Vehicle Capacity Data:
Number of Occupants: 3 Front; 3 Rear; 3rd Seat, 6 Total
Type of Front Seats: Bucket; Bench; X Split Bench
Type of Front Seat Back: Fixed; X Adjustable with Lever X Power
Vehicle Maximum Capacity Loading = 499.0 kg (A)
No. of Occupants x 68.04 kg. = 408.2 kg (B)
Cargo Capacity (A-B) = 90.8 kg

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

Right Front	=	<u>513.9</u> kg	Right Rear	=	<u>412.8</u> kg
Left Front	=	<u>526.6</u> kg	Left Rear	=	<u>400.1</u> kg
TOTAL FRONT	=	<u>1040.5</u> kg	TOTAL REAR	=	<u>812.9</u> kg
% of Total Vehicle Weight =		<u>56.1</u> %;	% of Total Weight =		<u>43.9</u> %
TOTAL WEIGHT = <u>1853.4</u> kg					

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)Year/Make/Model/Body Style: 1999/Lincoln/Towncar/4-DoorVehicle NHTSA No.: MX0207 Test Date: December 10, 1998CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Test Vehicle Delivered Weight with Maximum Fluids	=	<u>1853.4</u> kg
Cargo Carrying Capacity of Test Vehicle	=	<u>90.8</u> kg
Weight of 2 Side Impact Dummies (2 x <u>80.7</u> kg.)	=	<u>161.4</u> kg
TEST VEHICLE TARGET WEIGHT	=	<u>2105.6</u> kg

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

Right Front	=	<u>502.1</u> kg	Right Rear	=	<u>507.1</u> kg
Left Front	=	<u>580.1</u> kg	Left Rear	=	<u>514.4</u> kg
TOTAL FRONT	=	<u>1082.2</u> kg	TOTAL REAR	=	<u>1021.5</u> kg
% of Total Weight	=	<u>51.4</u> %	% of Total Weight	=	<u>48.6</u> %
TOTAL TEST WEIGHT	=	<u>2103.7</u> kg			

TEST VEHICLE ATTITUDE:

CURB WEIGHT ATTITUDE:

Right Front 734 mm Left Front 738 mm Right Rear 719 mm Left Rear 711 mm

FULLY LOADED WEIGHT ATTITUDE:

Right Front 725 mm Left Front 723 mm Right Rear 710 mm Left Rear 699 mm

TEST ATTITUDE:

Right Front 731 mm Left Front 728 mm Right Rear 727 mm Left Rear 709 mm

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Test Vehicle Wheelbase: 3000 mm

C.G. = 1441 mm rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

Right Side = 5120 mm

Centerline = 5382 mm

Left Side = 5120 mm

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)Year/Make/Model/Body Style: 1999/Lincoln/Towncar/4-DoorVehicle NHTSA No.: MX0207 Test Date: December 10, 1998FRONT SEAT CUSHION PLACEMENT:Total Length of Adjustment Travel: 250 mmTest Position: Mid-position (power adjustment)FRONT SEAT BACK ADJUSTMENT POSITION:Seat Back Angle = 29.0°SECOND POSITION SEAT:Total Length of Fore/Aft Adjustment Travel: Non-adjustableSeat Back Adjustment Position: Non-adjustableADJUSTABLE STEERING COLUMN POSITION: Mid-position (3rd of 5 positions)

<u>WINDOW POSITIONS:</u>	Left Front <u>Closed</u>	Left Rear <u>Closed</u>
	Right Front <u>Open</u>	Right Rear <u>Open</u>

AMOUNT OF STODDARD SOLVENT IN FUEL TANK:Fuel system usable capacity = 19.0 gallonsTest Volume: 17.7 gallons 93 % of capacityLOCATIONS OF IMPACT POINT ON TEST VEHICLE SIDE TO BE IMPACTED:Wheelbase: = 3000 mmImpact Point is 508 mm rearward of front axle centerline

DATA SHEET NO. 2
TEST VEHICLE SUMMARY OF RESULTS

Year/Make/Model/Body Style: 1999/Lincoln/Towncar/4-Door

Vehicle NHTSA No.: MX0207 Test Date: December 10, 1998

Overall Length = 5382 mm; Overall Width = 1988 mm

TEST WEIGHT:

Right Front = 518.5 kg Right Rear = 502.6 kg

Left Front = 571.5 kg Left Rear = 504.8 kg

TOTAL FRONT = 1090.0 kg TOTAL REAR = 1007.4 kg

% of Total Weight = 52.0 % % of Total Weight = 48.0 %

TOTAL VEHICLE WEIGHT = 2097.4 kg

Wheelbase = 3000 mm

Longitudinal C.G. from Center of Front Axle = 1441 mm

Impact Angle with Respect to Impactor = 90 ° degrees

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1 (315 mm above ground) = 425 mm

2. LEVEL 2 (542 mm above ground) = 496 mm

3. LEVEL 3 (634 mm above ground) = 507 mm

4. LEVEL 4 (940 mm above ground) = 389 mm

5. LEVEL 5 (1375 mm above ground) = 166 mm

Maximum Post-Test Intrusion = 507 mm

OCCUPANTS:

	<u>Driver</u>	<u>Left Rear Passenger</u>
Type of Dummy	<u>SID</u>	<u>SID</u>
Restraints Used	<u>Type II belt with frontal</u> <u>and side airbags</u>	<u>Type II belt</u>

TEST VEHICLE SUMMARY OF RESULTS (Cont'd)

INSTRUMENTATION:

Number of Vehicle Data Channels:		=	<u>25</u>
Number of Cameras:	Onboard Vehicle	=	<u>3</u>
	Offboard Vehicle	=	<u>4</u>
	Deformable Barrier	=	<u>2</u>
	TOTAL	=	<u>9</u>

DATA SHEET NO. 3

MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTSYear/Make/Model/Body Style: 1999/Lincoln/Towncar/4-DoorVehicle NHTSA No.: MX0207 Test Date: December 10, 1998POSITION OF IMPACT (MDB) ON MONORAIL:Crabbed 27° to leftMDB DETAILS:Overall Width of Framework Carriage = 1252 mmOverall Length of MDB (incl. honeycomb impact face) = 4115 mmWheelbase of Framework Carriage = 2591 mmTread of Framework Carriage (Front & Rear) = 1880 mmC.G. Location Rearward of Front Axle = 1098 mmC.G. Location From Center Line = -15 mmC.G. Location Above Ground Level = 485 mmMDB WEIGHT:Left Front = 457.7 kg Left Rear = 235.1 kgRight Front = 328.1 kg Right Rear = 342.6 kgTOTAL FRONT = 785.8 kg TOTAL REAR = 577.7 kgTOTAL MDB WEIGHT = 1363.5 kgImpact Angle (MDB C/L to Target Vehicle C/L) = 90° degreesImpact Speed = Primary: 38.3 mph (61.6 kph) Secondary: 38.6 mph (62.1 kph)

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

- | | | |
|----|---------------------------------|-----------------|
| 1. | Row A Top of Stack (813 mm) | = <u>133</u> mm |
| 2. | Row B Mid Stack (686 mm) | = <u>121</u> mm |
| 3. | Row C Top of Bumper (533 mm) | = <u>113</u> mm |
| 4. | Row D Center of Bumper (432 mm) | = <u>171</u> mm |

INSTRUMENTATION:

Number of MDB Data Channels = 7

DATA SHEET NO. 4
POST-TEST OBSERVATIONS

Year/Make/Model/Body Style: 1999/Lincoln/Towncar/4-Door

Vehicle NHTSA No.: MX0207 Test Date: December 10, 1998

VISIBLE DUMMY CONTACT POINTS:

	<u>LEFT FRONT SID</u>	<u>LEFT REAR SID</u>
Head	<u>Side airbag</u>	<u>C-post</u>
Arm	<u>Side airbag</u>	<u>Rear of door above</u> <u>armrest/armrest</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: 27 mm rearward Vertical: 5 mm high

ARM REST LOCATIONS:

Front: 253 mm from bottom of window

Rear: 270 mm from bottom of window

* Latch separated from the striker by approximately 50 mm.

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

Front Seat Back: 125 mm Front Seat Cushion: 100 mm
Left Rear Seat Back: 167 mm Rear Seat Cushion: 208 mm

GLAZING DAMAGE:

Windshield cracked; left side windows broke

PILLAR PERFORMANCE:

No failure noted

SILL SEPARATION:

None noted

OTHER NOTABLE IMPACT EFFECTS:

Left front door latch separated from striker

AIRBAG DEPLOYMENT STATUS:

	<u>DRIVER</u>	<u>PASSENGER</u>
Frontal	<u>No</u>	<u>No</u>
Side	<u>Yes</u>	<u>No</u>

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

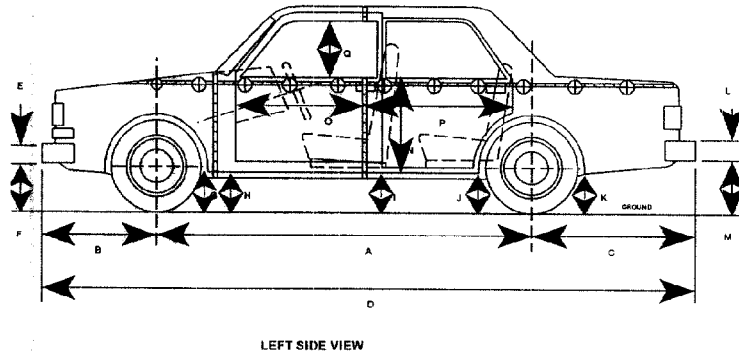
Year/Make/Model/Body Style: 1999/Lincoln/Towncar/4-Door

Vehicle NHTSA No.: MX0207 Test Date: December 10, 1998

	Driver SID ID # 271			Left Passenger SID ID # 272		
	Pos. Direct.		Neg. Direct.	Pos. Direct.		Neg. Direct.
	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)
RIB ACCELERATIONS						
Left Upper Rib (LUR) Y	43.4	33	-18.6	90	62.7	48
Left Lower Rib (LLR) Y	48.2	39	-22.9	89	67.1	48
SPINE ACCELERATIONS						
Lower Lateral Y	73.3	37	-27.4	82	55.8	44
PELVIS ACCELERATIONS						
Lateral Y	65.3	37	-35.5	78	96.9	39

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

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



D = Length at Centerline

R = Right Side Length

S = Left Side Length

T = Width at B Post

E & L = Bumper Thickness

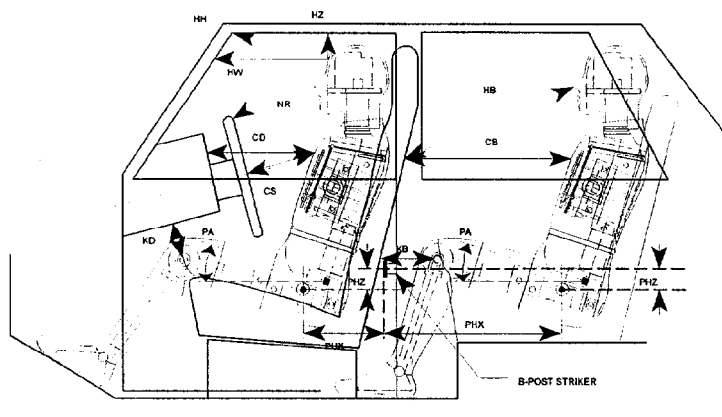
J1 = To Pinch Weld

J2 = To Sill

ALL MEASUREMENTS IN (mm)

	PRE-TEST	POST-TEST	Δ CHANGE
A	3000	2920	80
B	1040	1040	0
C	1349	1350	1
D	5382	5310	72
E	135	135	0
F	380	403	23
G	193	182	11
H	189	183	6
I	197	202	5
J1/J2	186/194	166/183	20/11
K	239	287	48
L	208	208	0
M	403	437	34
N	664	641	23
O	735	704	31
P	1287	1113	174
Q	434	419	15
R	5120	5125	5
S	5120	4985	135
T	1988	1584	404

DATA SHEET NO. 7

SIDE IMPACT DUMMY (SID) LONGITUDINAL CLEARANCE DIMENSIONSYear/Make/Model/Body Style: 1999/Lincoln/Towncar/4-DoorNHTSA NO.: MX0207 Test Date: December 10, 1998

LEFT SIDE VIEW

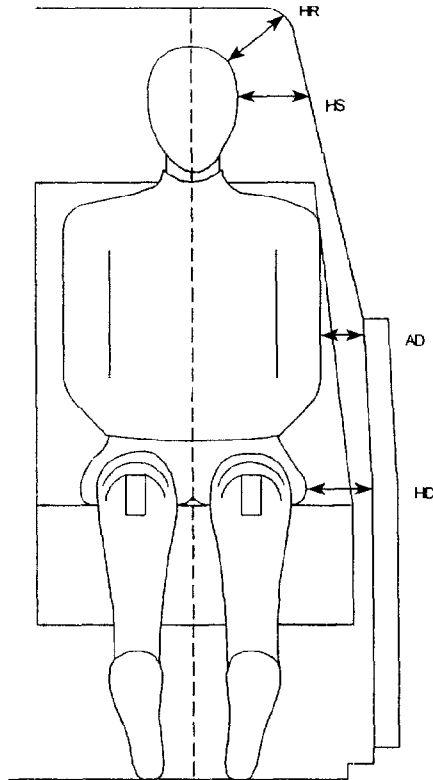
NOTE: 2-DOOR VEHICLE SHOWN.
 REAR DUMMY PLACED PHZ
 MEASUREMENTS FOR A 4-DOOR
 VEHICLE WOULD USE THE C-POST
 STRIKER AS A REFERENCE POINT

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

	DRIVER SID ID # 271		LEFT REAR PASSENGER SID ID # 272
HH	272	HZ	172
HW	570	NB	667
HZ	165	CB	572
NR	407	KBL (KBA)	302 (0.0°)
CD	534	KBR (KBA)	308 (0.0°)
CS	298	PA°	24.1°
KDL(KDA°)	175 (0.0°)	PHX	174
KDR(KDA°)	224 (0.0°)	PHZ	282
PA°	23.7°		
PHX	177		
PHZ	85		

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

DATA SHEET NO. 8

SIDE IMPACT DUMMY (SID) LATERAL CLEARANCE DIMENSIONSYear/Make/Model/Body Style: 1999/Lincoln/Towncar/4-DoorNHTSA NO.: MX0207 Test Date: December 10, 1998

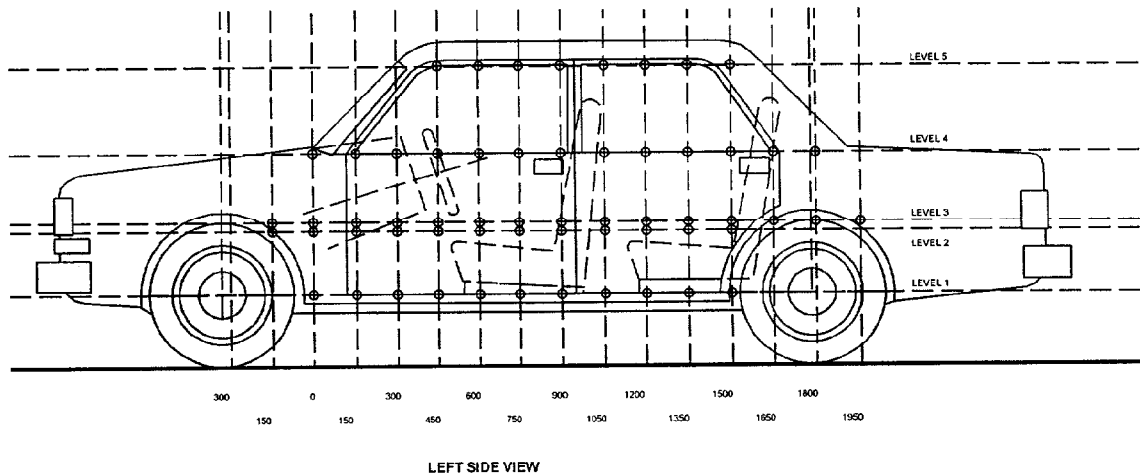
NOTE: All dimensions are in mm

	DRIVER SID ID # 271	LEFT REAR PASSENGER SID ID # 272
HR	197	196
HS	349	297
AD	117	87
HD	156	156

DATA SHEET NO. 9
VEHICLE SIDE MEASUREMENTS

Year/Make/Model/Body Style: 1999/Lincoln/Towncar/4-Door

NHTSA NO.: MX0207 Test Date: December 10, 1998



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)

= 315 mm

Level 2 @ Occupant H-Point

= 542 mm

Level 3 @ Mid Door

= 634 mm

Level 4 @ Window Sill

= 940 mm

Level 5 @ Window Top

= 1375 mm

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

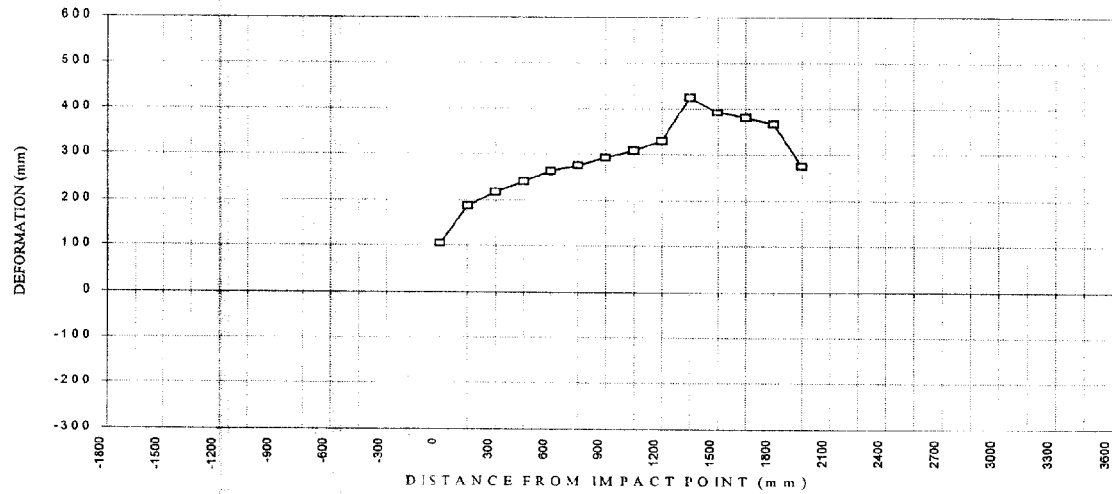
Longitudinal Distance (mm)	Level 1 - Axle Centerline		
	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1800			
-1650			
-1500			
-1350			
-1200			
-1050			
-900			
-750			
-600			
-450			
-300			
-150			
0 (impact point)	645	750	105
150	640	828	188
300	636	854	218
450	633	874	241
600	629	892	263
750	628	904	276
900	624	917	293
1050	624	932	308
1200	623	952	329
1350	621	1046	425
1500	621	1012	391
1650	622	1001	379
1800	624	989	365

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

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

	Level 1 - Axle Centerline		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
1950	624	899	275
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

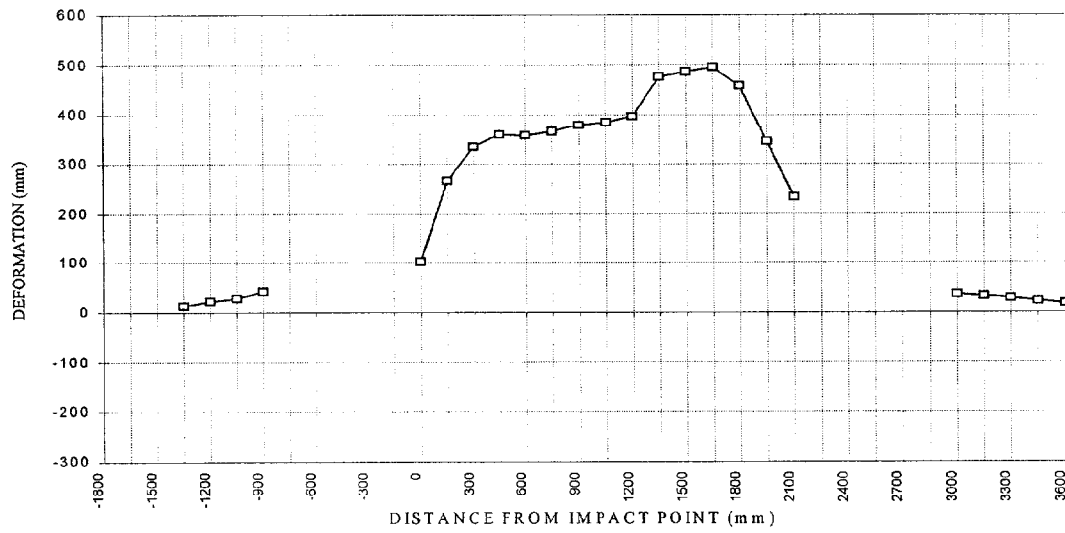
	Level 2 - Occupant H-Point		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1800			
-1650			
-1500			
-1350	767	780	13
-1200	724	746	22
-1050	694	722	28
-900	669	711	42
-750			
-600			
-450			
-300			
-150			
0 (impact point)	622	724	102
150	614	881	267
300	609	944	335
450	604	964	360
600	601	959	358
750	598	964	366
900	594	973	379
1050	594	979	385
1200	592	989	397
1350	591	1068	477
1500	589	1076	487
1650	589	1085	496
1800	588	1047	459

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

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

	Level 2 - Occupant H-Point		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
1950	589	935	346
2100	591	826	235
2250			
2400			
2550			
2700			
2850			
3000	616	652	36
3150	632	665	33
3300	651	680	29
3450	677	700	23
3600	710	728	18

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

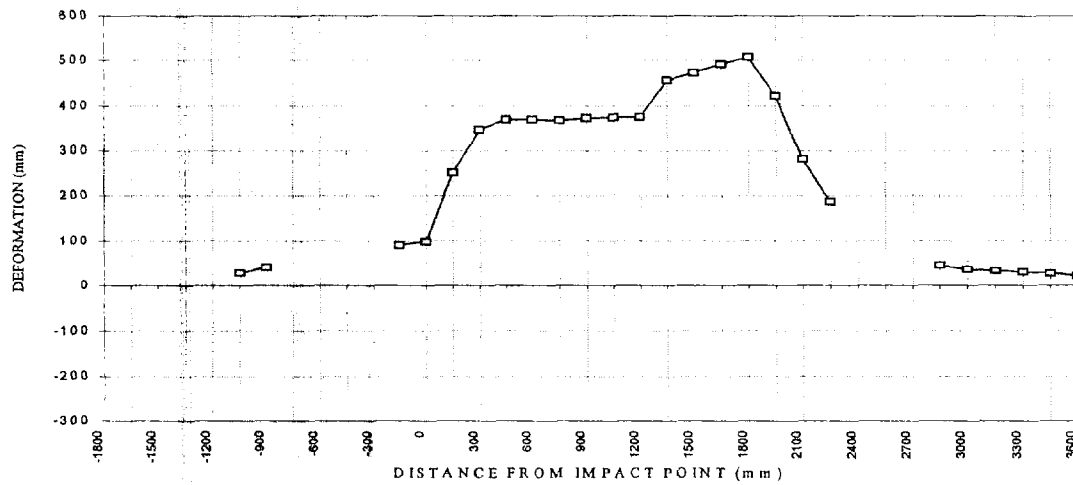
Longitudinal Distance (mm)	Level 3 - Mid-Door		
	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1800			
-1650			
-1500			
-1350			
-1200			
-1050	705	734	29
-900	677	719	42
-750			
-600			
-450			
-300			
-150	630	721	91
0 (impact point)	623	722	99
150	615	866	251
300	609	957	348
450	604	974	370
600	601	971	370
750	596	964	368
900	592	965	373
1050	591	966	375
1200	590	966	376
1350	588	1045	457
1500	587	1060	473
1650	587	1079	492
1800	587	1094	507

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	587	1009	422
2100	588	869	281
2250	588	775	187
2400			
2550			
2700			
2850	605	652	47
3000	628	665	37
3150	650	684	34
3300	674	705	31
3450	704	732	28
3600	742	764	22

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

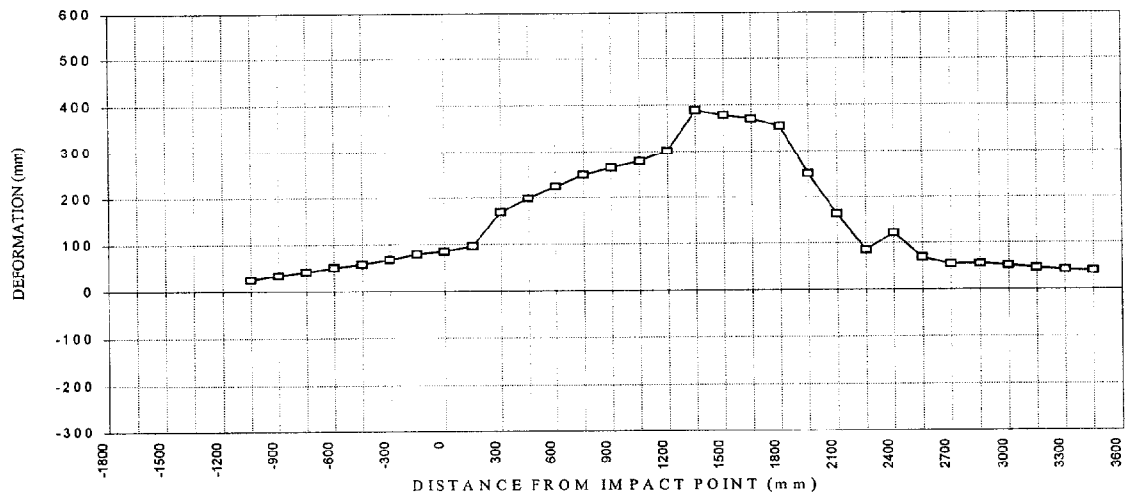
	Level 4 - Window Sill		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1800			
-1650			
-1500			
-1350			
-1200			
-1050	785	809	24
-900	762	796	34
-750	744	786	42
-600	731	782	51
-450	721	779	58
-300	714	782	68
-150	705	785	80
0 (impact point)	701	786	85
150	695	791	96
300	693	862	169
450	690	889	199
600	687	912	225
750	684	934	250
900	683	948	265
1050	683	962	279
1200	681	982	301
1350	683	1072	389
1500	683	1062	379
1650	685	1056	371
1800	685	1040	355

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

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

Longitudinal Distance (mm)	Level 4 - Window Sill		
	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
1950	685	936	251
2100	688	851	163
2250	694	779	85
2400	701	822	121
2550	710	779	69
2700	720	775	55
2850	733	789	56
3000	749	801	52
3150	767	814	47
3300	787	830	43
3450	811	852	41
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

	Level 5 - Window Top		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1800			
-1650			
-1500			
-1350			
-1200			
-1050			
-900			
-750			
-600			
-450			
-300			
-150			
0 (impact point)			
150			
300			
450			
600			
750			
900	957	1046	89
1050	960	1073	113
1200	962	1103	141
1350	964	1130	166
1500	959	1102	143
1650	957	1045	88
1800	957	988	31

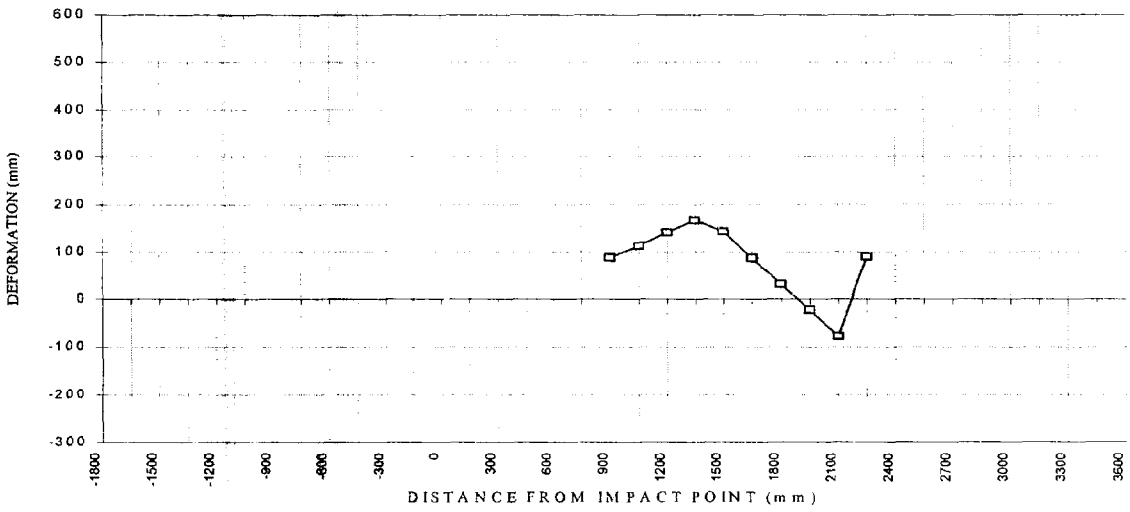
Reference plane is parallel to test vehicle longitudinal centerline.
 Given dimensions = Reference plane to car body

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	956	934	-22
2100	957	879	-78
2250	957	1048	91
2400			
2550			
2700			
2850			
3000			
3150			
3300			
3450			
3600			

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

VEHICLE EXTERIOR STATIC CRUSH

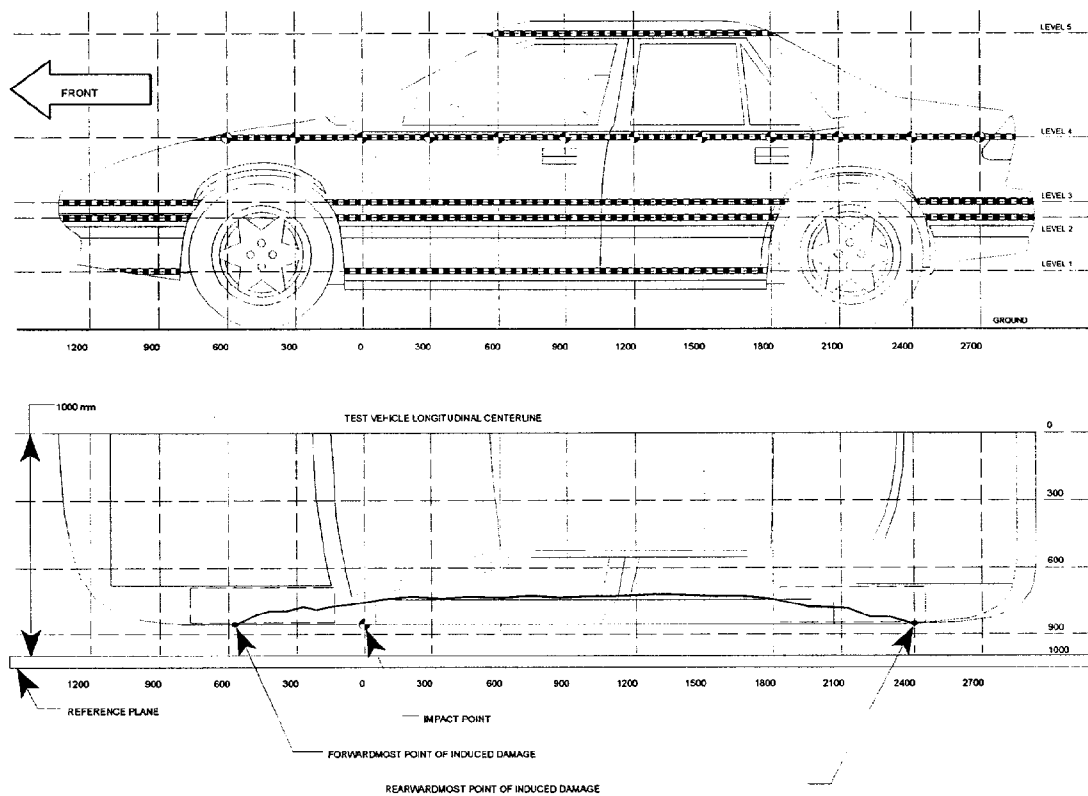


LEVEL 5 - WINDOW TOP

DATA SHEET NO. 11
VEHICLE DAMAGE PROFILE DISTANCES

Year/Make/Model/Body Style: 1999/Lincoln/Towncar/4-Door

NHTSA NO.: MX0207 Test Date: December 10, 1998



NOTE: All measurements are in millimeters (mm)

DPD MEASUREMENTS	POST-TEST (mm)	PRE-TEST (mm)	STATIC CRUSH (mm)
1. (LF = <u>-300</u> mm)	782	714	68
2. 290 mm	952	693	259
3. 890 mm	985	683	302
4. 1545 mm	1089	683	406
5. 2225 mm	775	694	81
6. (LR = <u>2850</u> mm)	789	733	56

DATA SHEET NO. 12
EXTERIOR STATIC CRUSH FOR SIDE IMPACTOR

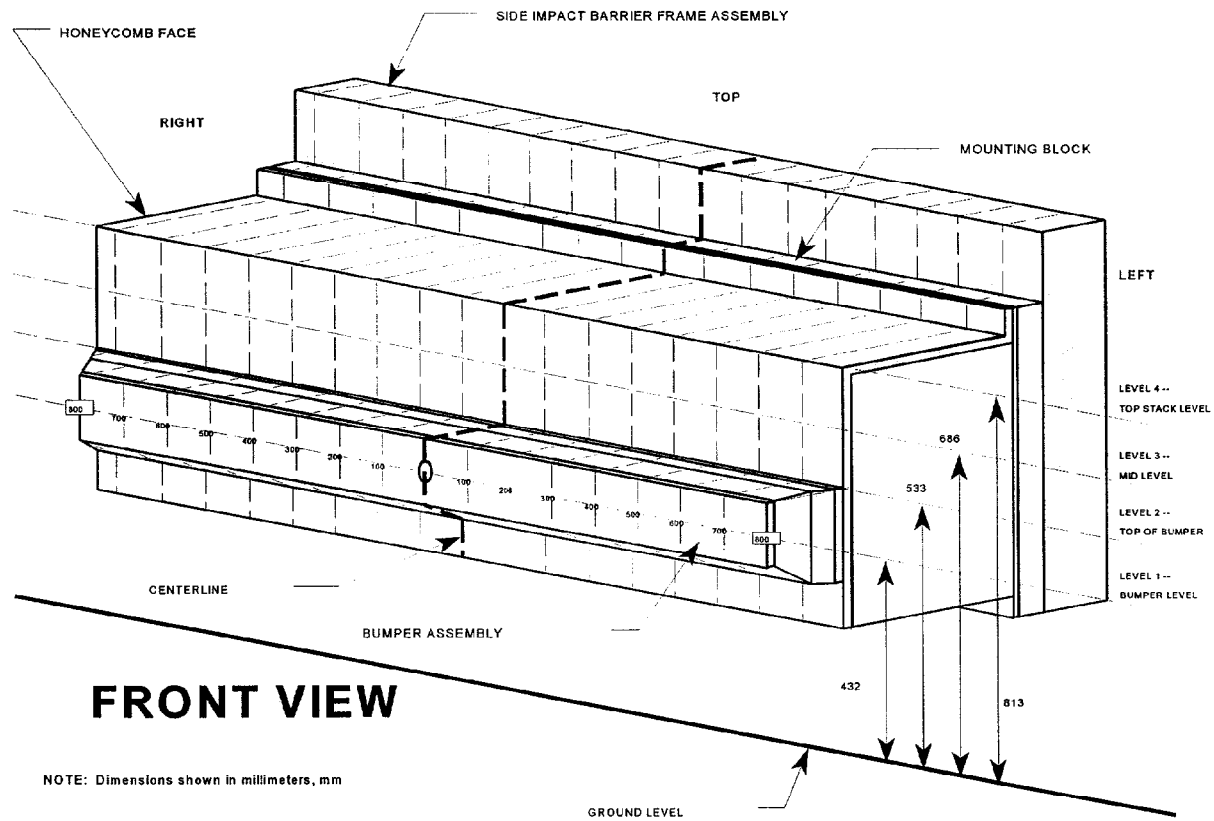
Year/Make/Model/Body Style: 1999/Lincoln/Towncar/4-Door

Vehicle NHTSA No.: MX0207 Test Date: December 10, 1998

		Distance Right of Center (mm)									Distance Left of Center (mm)							
Location	Height at CL	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
Top Stack Level 4	813 mm	30	0	2	3	5	7	8	24	28	20	22	24	32	41	67	84	133
Mid Level Level 3	686 mm	-2	-4	-3	-2	2	11	15	6	6	8	9	10	12	14	19	48	121
Top Bumper Level 2	533 mm	39	35	35	31	34	32	26	28	31	34	45	54	63	79	91	103	113
Mid Bumper Level 1	432 mm	71	50	33	31	37	39	38	40	47	54	62	72	83	96	114	140	171

See next page for Barrier Face Graphic

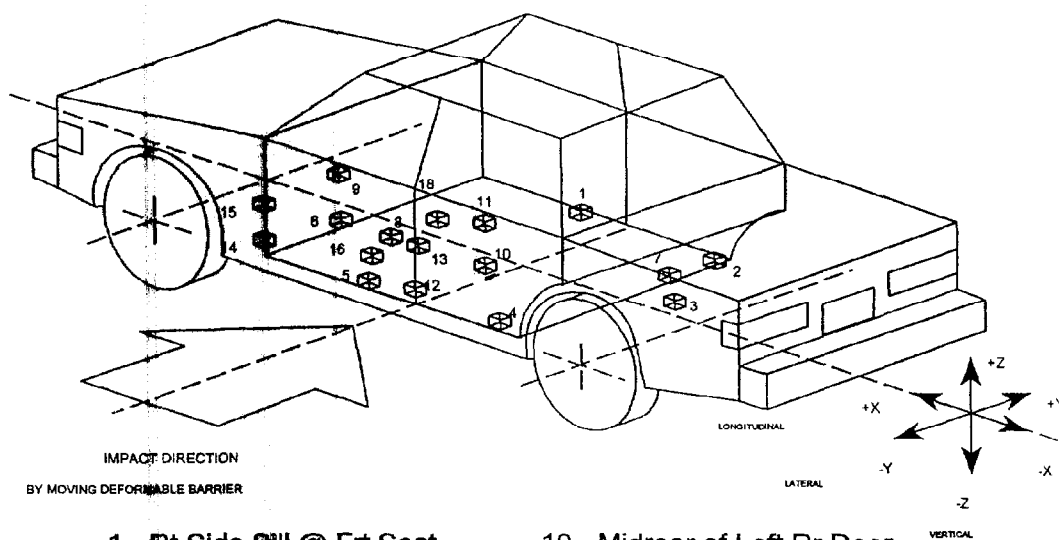
DATA SHEET NO. 12 (Cont'd)



DATA SHEET 13
TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1999/Lincoln/Towncar/4-Door

Vehicle NHTSA No.: MX0207 Test Date: December 10, 1998



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

DATA SHEET NO. 13

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1999/Lincoln/Towncar/4-Door

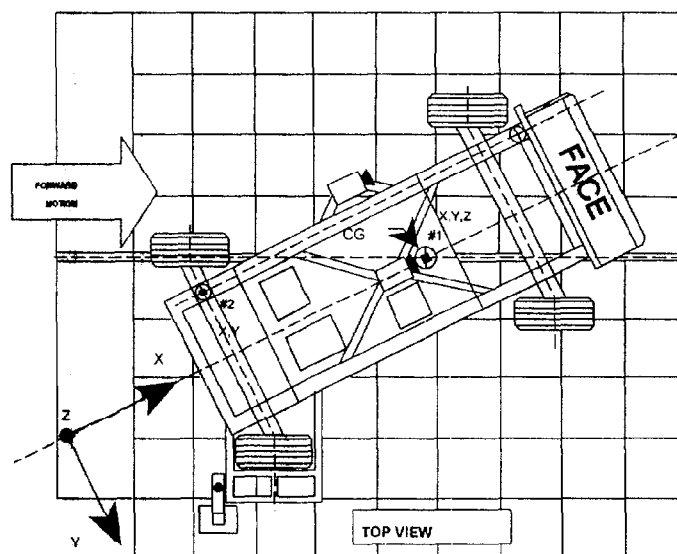
Vehicle NHTSA No.: MX0207 Test Date: December 10, 1998

Accel. No.	Description	Coordinates (mm)*			Long. (X) Maximums (g's)		Lat. (Y) Maximums (g's)		Vert. (Z) Maximums (g's)		Resultant (g's)
		X	Y	Z	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	
1	Rt. Side Sill @ Front Seat	2825	760	250	5.1	-6.8	16.4	-3.2	3.9	-4.3	16.8
2	Rt. Side Sill @ Rear Seat	1865	762	198	5.8	-7.3	22.2	-10.0	4.0	-5.5	23.8
3	Rr. Floorpan Above Axle	1345	0	662	11.5	-45.2	10.2	-47.8	15.4	-28.5	67.2
4	Left Side Sill @ Rr. Seat**	1860	-762	185	---	---	102.4	-95.0	---	---	---
5	Left Side Sill @ Frt. Seat	2798	-770	200	---	---	112.2	-29.7	---	---	---
6	Left Front Door Centerline	3170	-810	730	---	---	91.4	-137.7	---	---	---
7	Right Rear Occupant Compartment	2165	350	318	---	---	15.0	-3.7	---	---	---
8	Mid Rear of Left Front Door	2770	-838	662	---	---	178.6	-99.7	---	---	---
9	Left Front Door Upper Centerline	3132	-825	686	---	---	105.1	-61.9	---	---	---
10	Left Rear Door Mid Rear	1892	-820	656	---	---	133.1	-36.6	---	---	---
11	Left Rear Door Upper Centerline	2118	-808	840	---	---	67.2	-58.6	---	---	---
12	Left Lower B-Post	2522	-773	372	---	---	189.0	-63.7	---	---	---
13	Left Mid B-Post	2505	-767	865	---	---	108.6	-55.8	---	---	---
14	Left Lower A-Post	2569	-748	400	---	---	125.5	-31.4	---	---	---
15	Left Mid A-Post	3542	-830	989	---	---	44.6	-25.5	---	---	---
16	Driver Seat Track***	2727	-555	320	---	---	103.4	-1.5	---	---	---
18	Vehicle CG	3135	0	505	4.0	-6.3	39.4	-7.8	32.6	-32.7	40.5

*Reference: X - Rear Bumper (+ Forward)
 ** - Data not valid after 63 msec.
 Y - Vehicle Centerline (+ To right)
 *** - Data not valid after 51 msec.

Z - Ground Level (+ Up)

DATA SHEET NO. 14

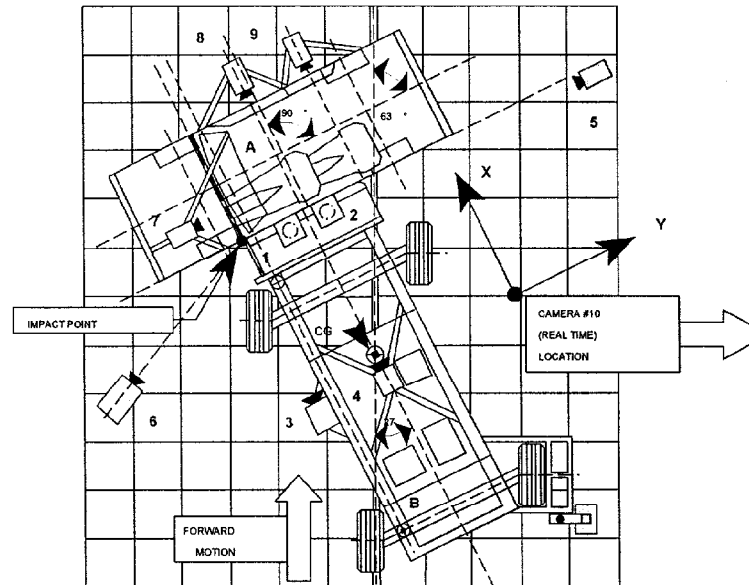
MOVING DEFORMABLE BARRIER (MDB) ACCELEROMETER LOCATIONS AND DATA SUMMARYYear/Make/Model/Body Style: 1999/Lincoln/Towncar/4-DoorVehicle NHTSA No.: MX0207 Test Date: December 10, 1998

Accel. No.	Description	Coordinates (mm)*			(+) Positive		(-) Negative	
		X	Y	Z	Max. (g)	Time (msec)	Max. (g)	Time (msec)
1	MDB Center of Gravity	-1092	0	483				
	Longitudinal (X)	---	---	---	1.7	196	-16.8	35
	Lateral (Y)	---	---	---	0.0	60	-7.3	41
	Vertical (Z)	---	---	---	17.5	35	-12.2	41
	Resultant (R)	---	---	---	24.8	35	---	---
2	Rear Frame Member	-2501	-625	622				
	Longitudinal (X)	---	---	---	1.4	199	-21.0	37
	Lateral (Y)	---	---	---	8.8	32	-0.7	106

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

DATA SHEET NO. 15
HIGH SPEED CAMERA LOCATIONS AND DATA

Year/Make/Model/Body Style: 1999/Lincoln/Towncar/4-Door
 Vehicle NHTSA No.: MX0207 Test Date: December 10, 1998



Camera No.	View	Coordinates (mm)*			Lens (mm)	Film Speed (fps)
		X	Y	Z		
	Real Time					
1	Top Overall	-180	1210	5000	8	943
2	Top Impact	-250	55	5000	13	957
3	Cart Pointer				35	1000
4	Cart Overall				13	962
5	Right Impact	-405	10590	1870	25	1010
6	Left Impact	-420	-2585	1660	13	1000
7	Onboard Hood				13	1020
8	Onboard Driver				8	1124
9	Onboard Passenger				8	943

* Reference: (from point of impact)

+X = Forward
 +Y = To Right
 +Z = Upward

DATA SHEET 16
FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

Vehicle Year/Make/Model/Body Style: 1999/Lincoln/Towncar/4-Door

Vehicle NHTSA No.: MX0207 Test Date: December 10, 1998

TEST REQUIREMENTS:

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

TEST VEHICLE IMPACT TYPE: X Side Impact MDB 38.3 mph (61.6 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

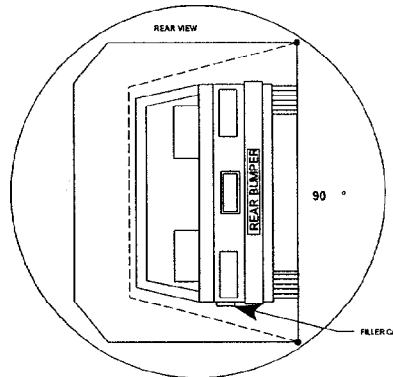
FUEL SPILLAGE LOCATION(S): None

DATA SHEET 16
FMVSS 301 STATIC ROLLOVER TEST DATA

Vehicle Year/Make/Model/Body Style: 1999/Lincoln/Towncar/4-Door

Vehicle NHTSA No.: MX0207 Test Date: December 10, 1998

TEST PHASE: 0° - 90°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 42 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 42 seconds

Next Whole Minute Interval = 8 minutes

FUEL SPILLAGE MEASUREMENT:

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

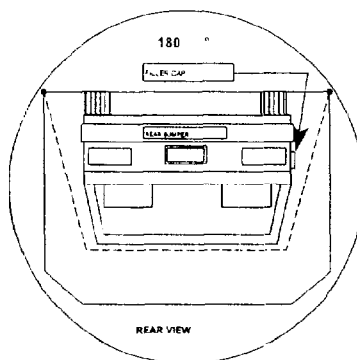
FUEL SPILLAGE LOCATIONS(S): None

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

Vehicle Year/Make/Model/Body Style: 1999/Lincoln/Towncar/4-Door

Vehicle NHTSA No.: MX0207 Test Date: December 10, 1998

TEST PHASE: 90° - 180°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 29 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 29 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

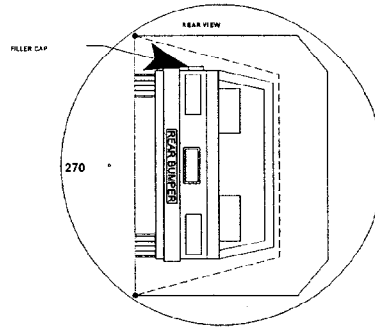
FUEL SPILLAGE LOCATIONS(S): None

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

Vehicle Year/Make/Model/Body Style: 1999/Lincoln/Towncar/4-Door

Vehicle NHTSA No.: MX0207 Test Date: December 10, 1998

TEST PHASE: 180° - 270°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 16 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 16 seconds

Next Whole Minute Interval = 8 minutes

FUEL SPILLAGE MEASUREMENT:

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

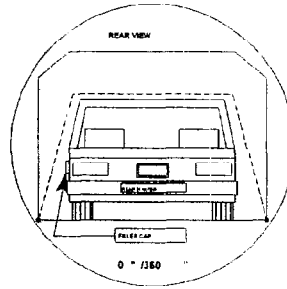
FUEL SPILLAGE LOCATIONS(S): None

DATA SHEET 16
FMVSS 301 STATIC ROLLOVER TEST DATA

Vehicle Year/Make/Model/Body Style: 1999/Lincoln/Towncar/4-Door

Vehicle NHTSA No.: MX0207 Test Date: December 10, 1998

TEST PHASE: 270° - 360°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 48 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 48 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

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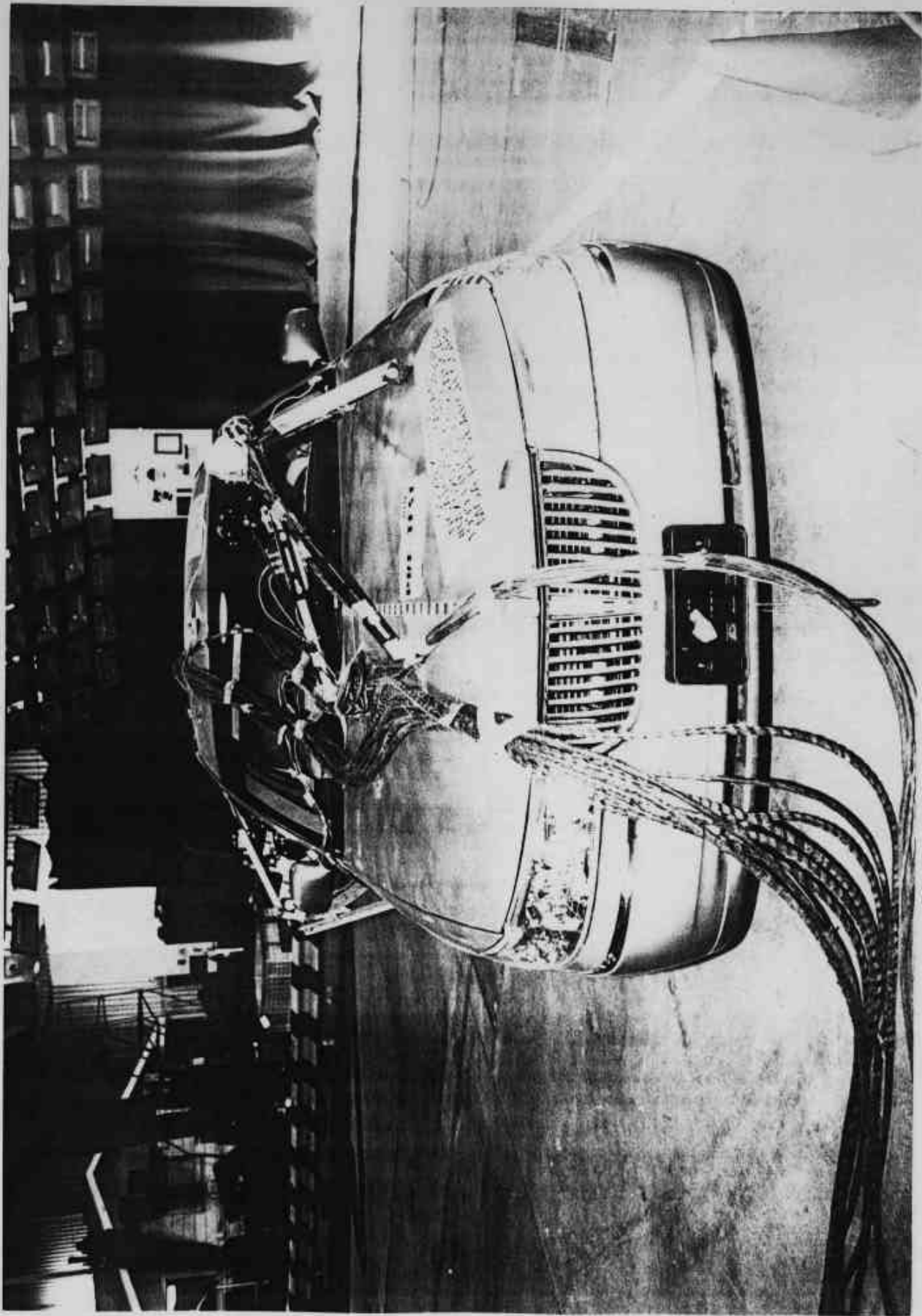


Photo No. A-1 - Pre-Test Front View of Test Vehicle

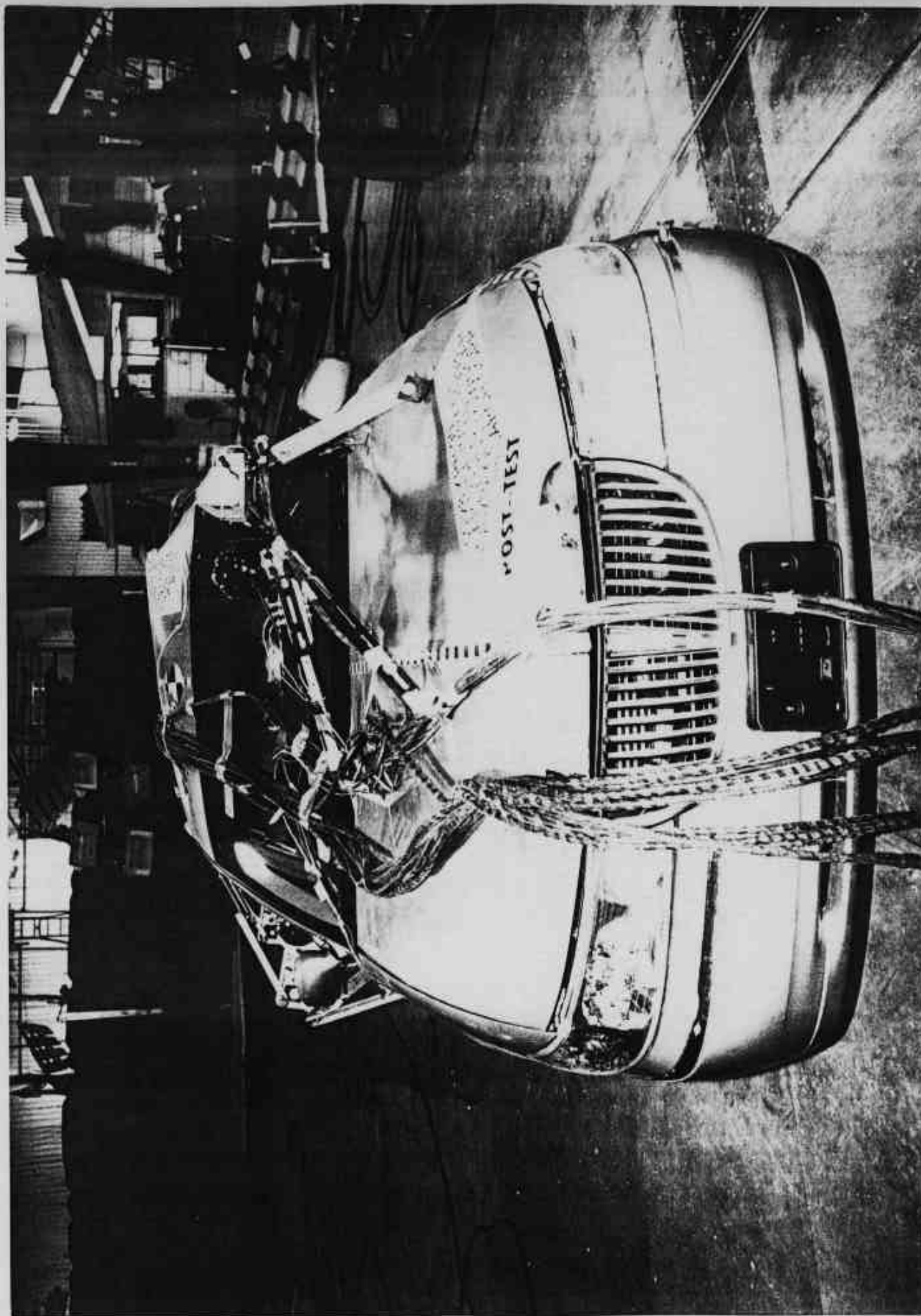


Photo No. A-2 - Post-Test Front View of Test Vehicle



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

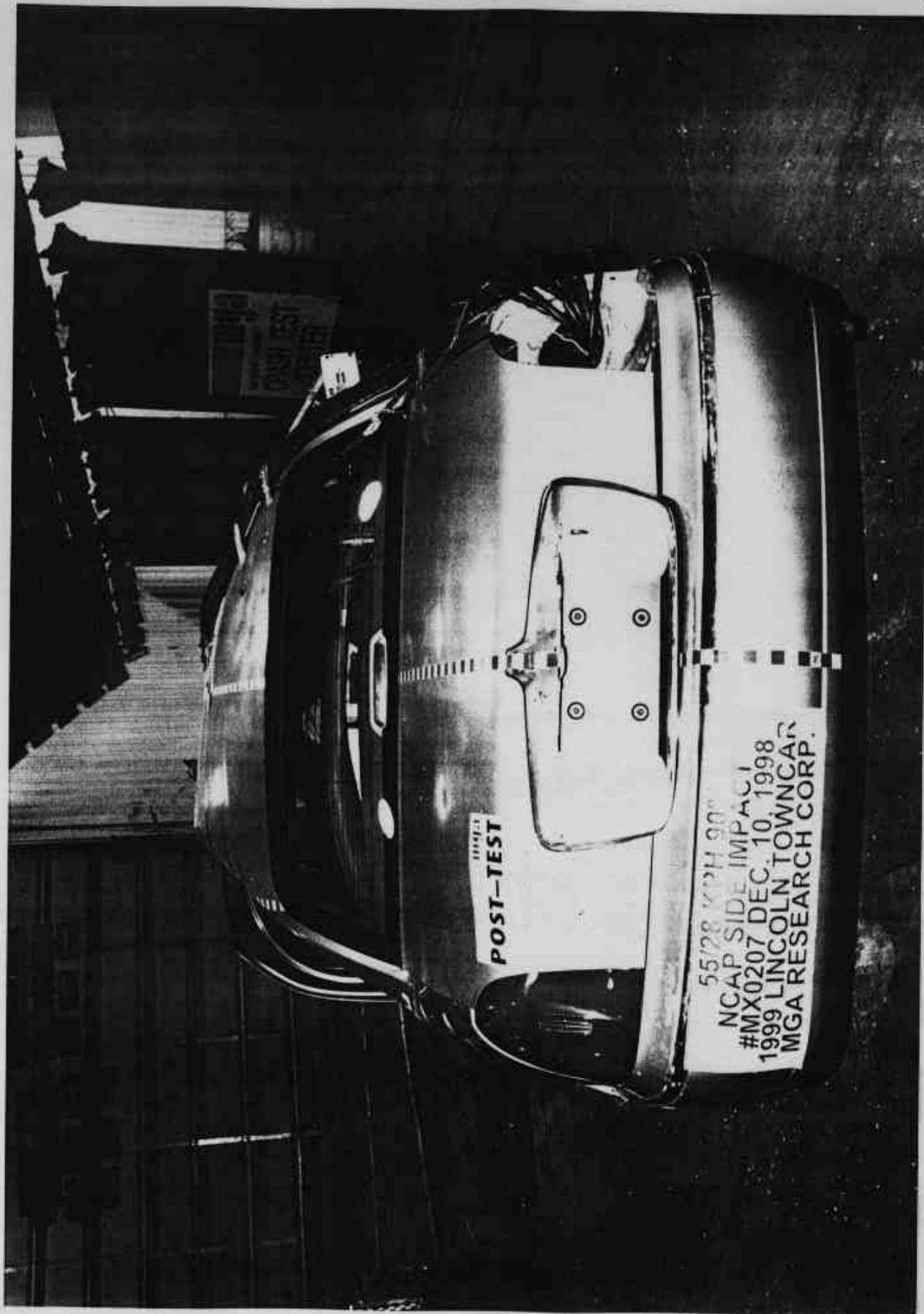


Photo No. A-4 - Post-Test Rear View of Test Vehicle

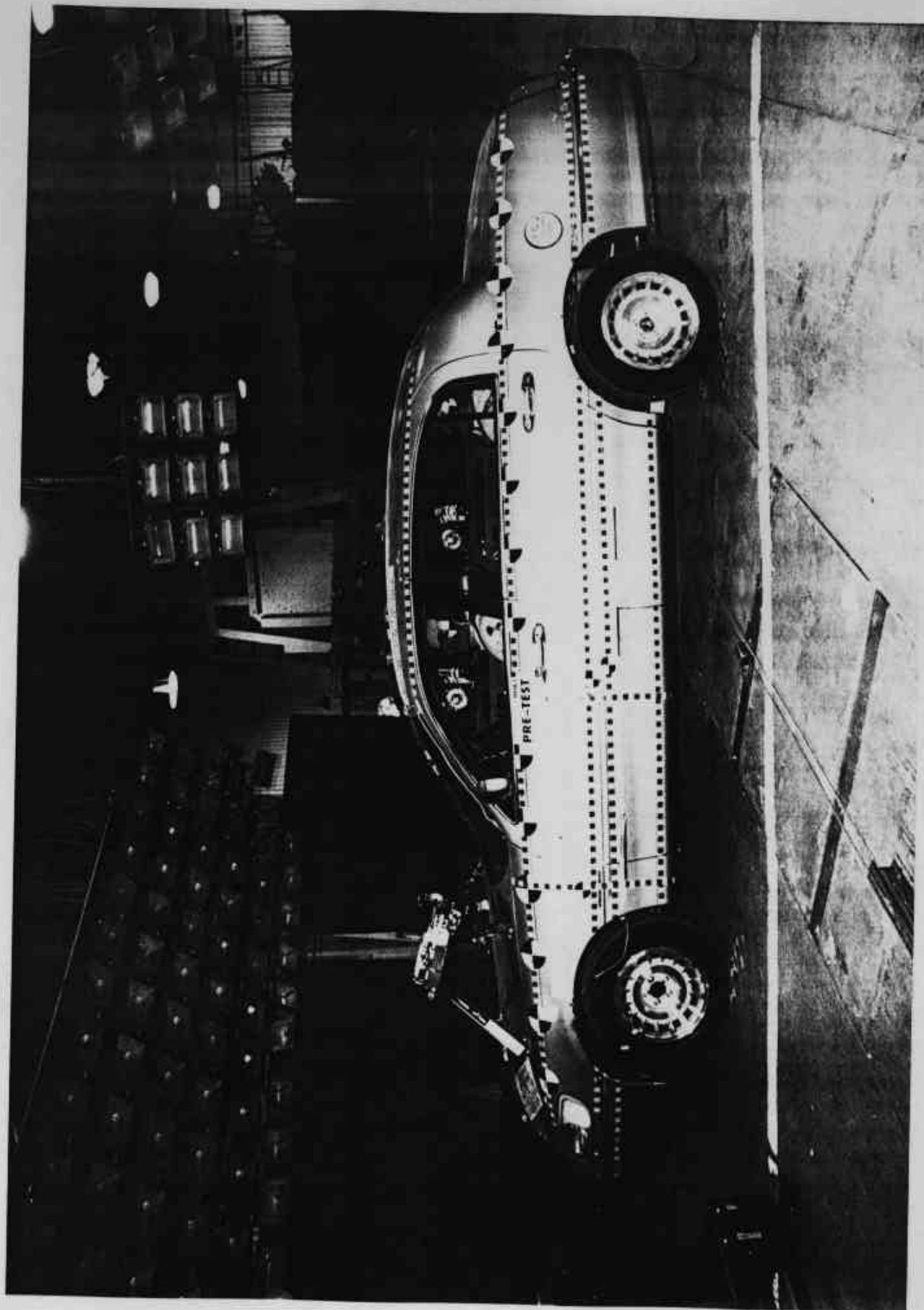


Photo No. A-5 - Pre-Test Left Side View of Test Vehicle

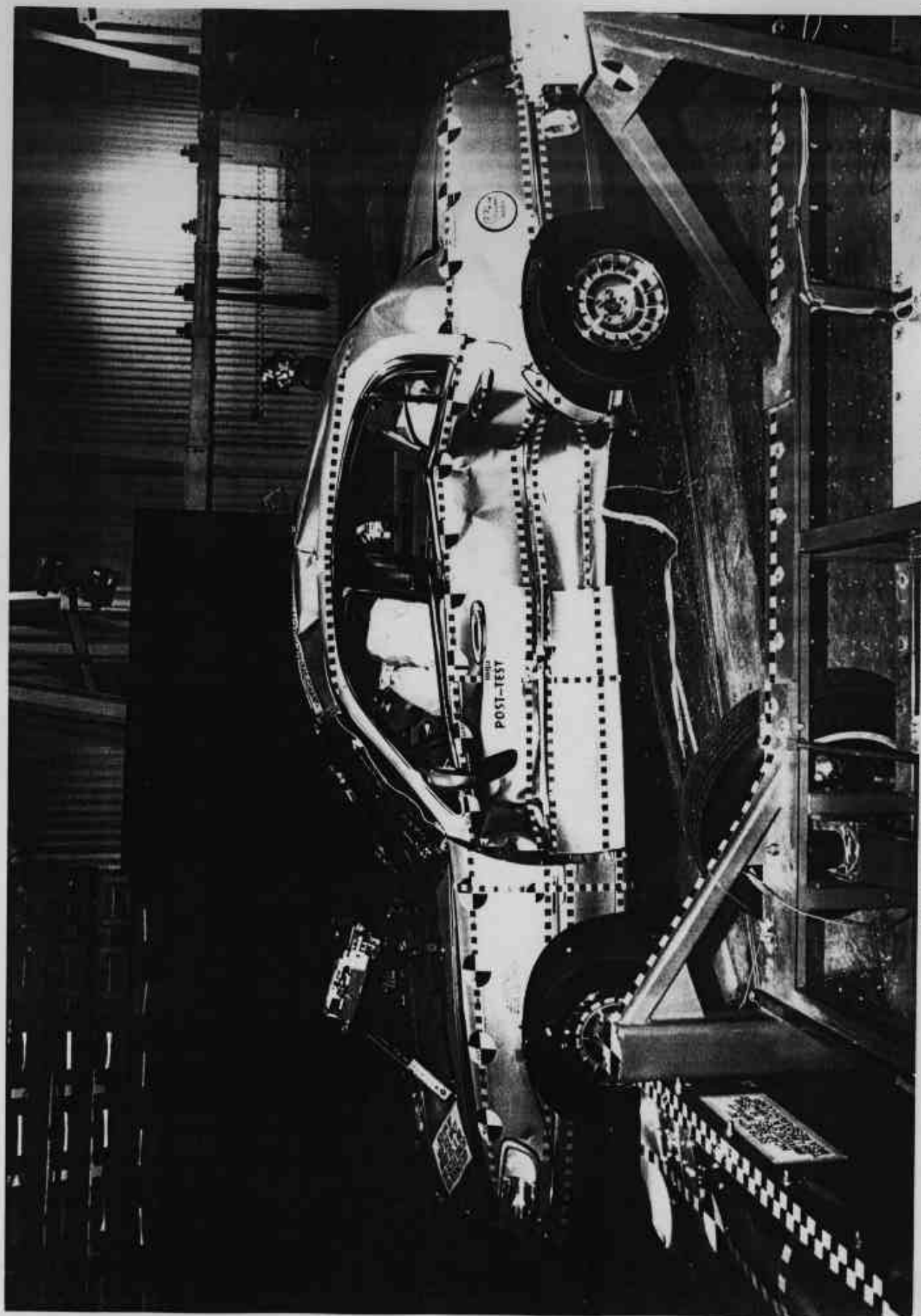


Photo No. A-6 - Post-Test Left Side View of Test Vehicle

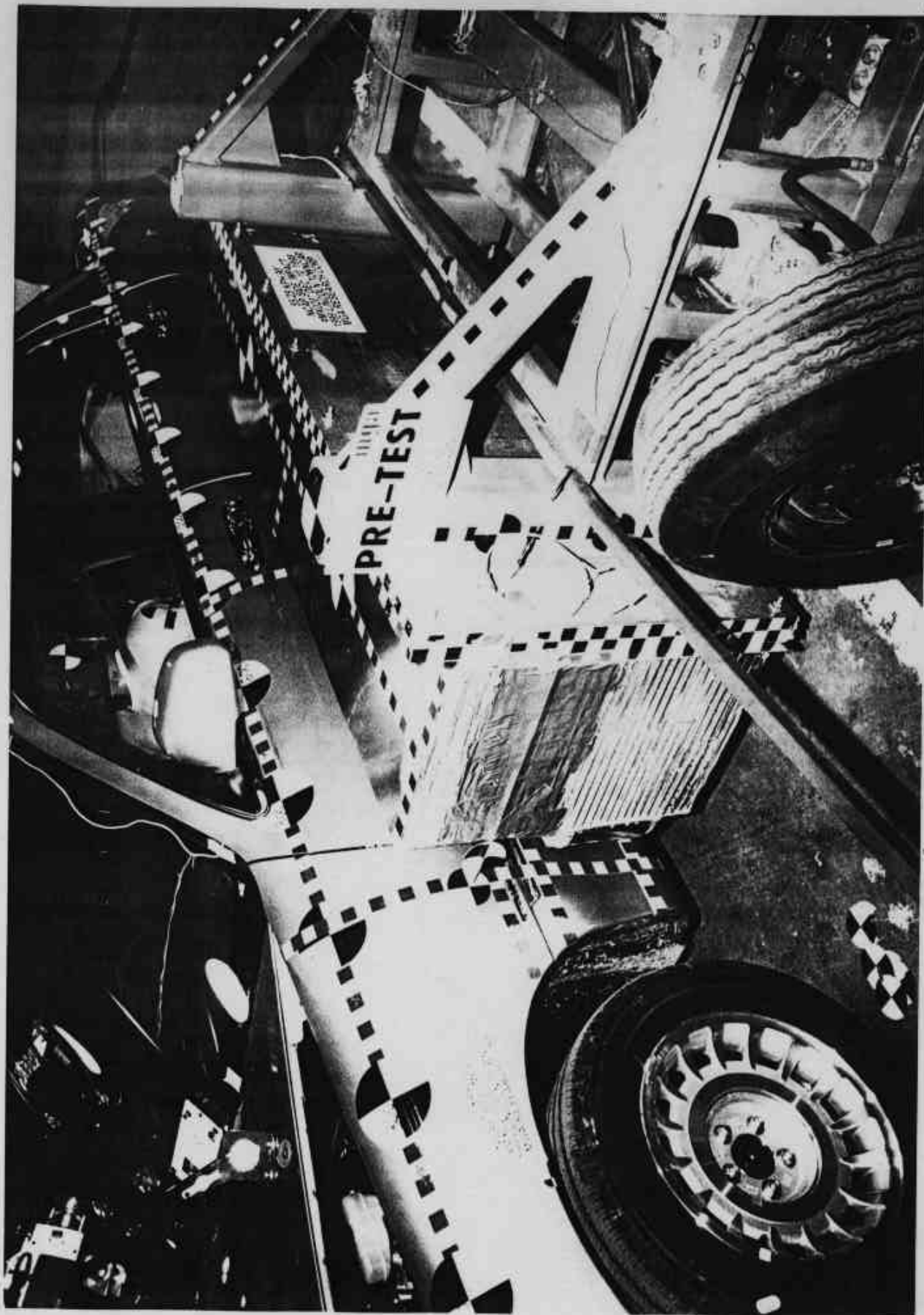


Photo No. A-7 - Pre-Test MDB Positioned Against Vehicle (left side)

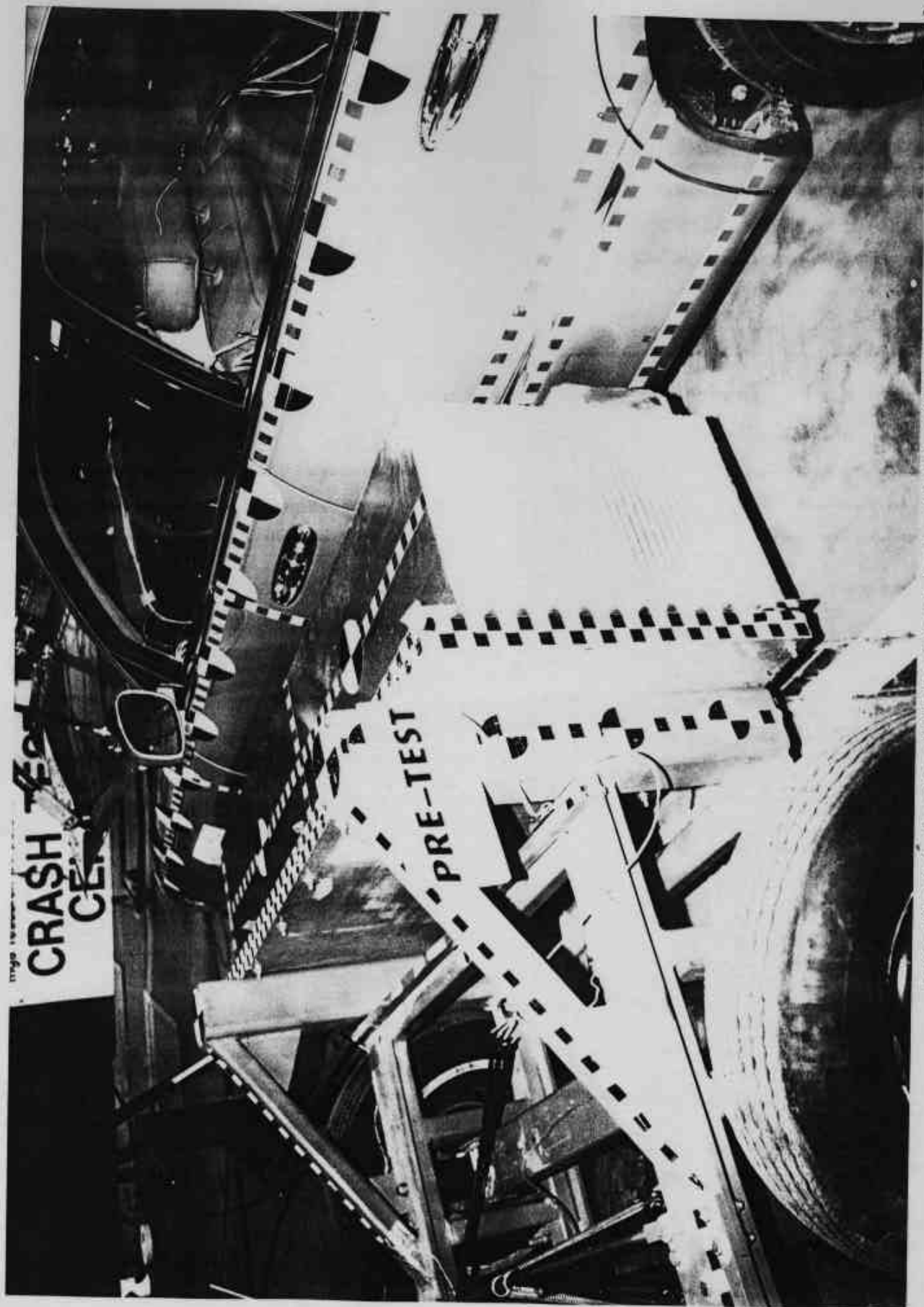


Photo No. A-8 - Pre-Test MDB Positioned Against Vehicle (right side)

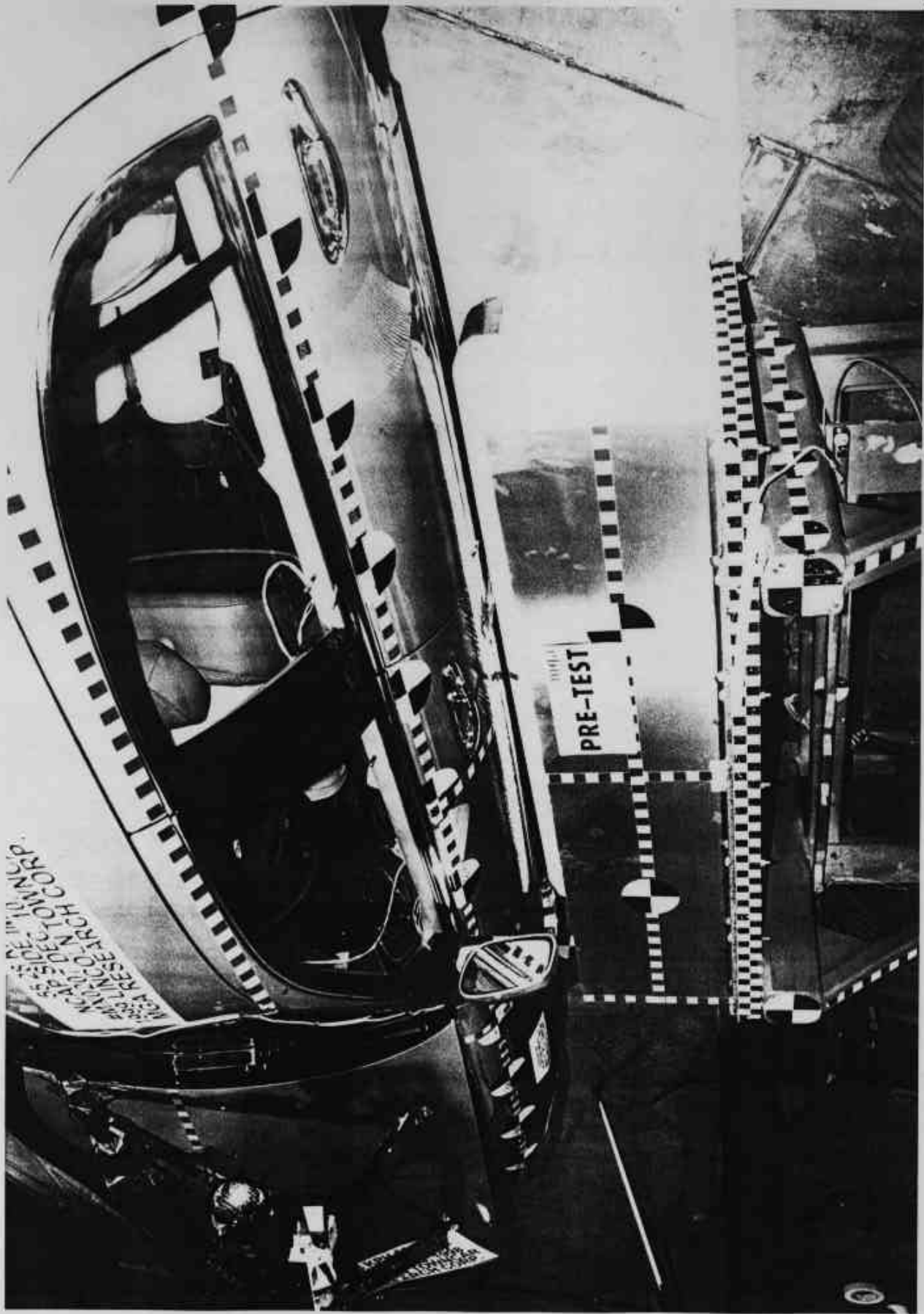


Photo No. A-9 - Pre-Test MDB Positioned Against Vehicle Overhead View

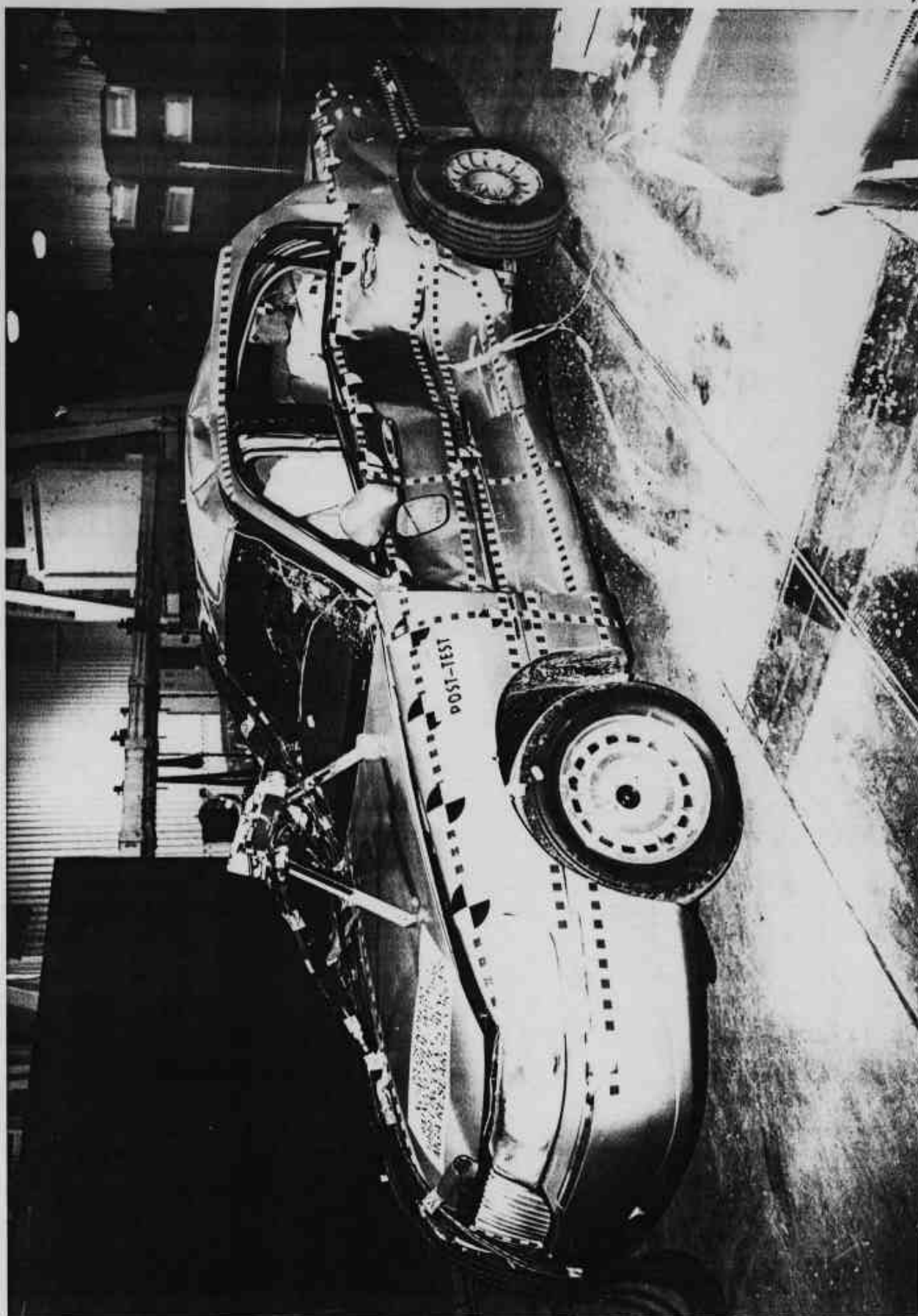


Photo No. A-10 - Post-Test MDB Positioned Against Vehicle (left side)



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



55/28 KPH 90°
NCAP SIDE IMPACT
#MX0207 DEC. 10, 1998
1999 LINCOLN TOWNCAR
MGA RESEARCH CORP.

POST TEST

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

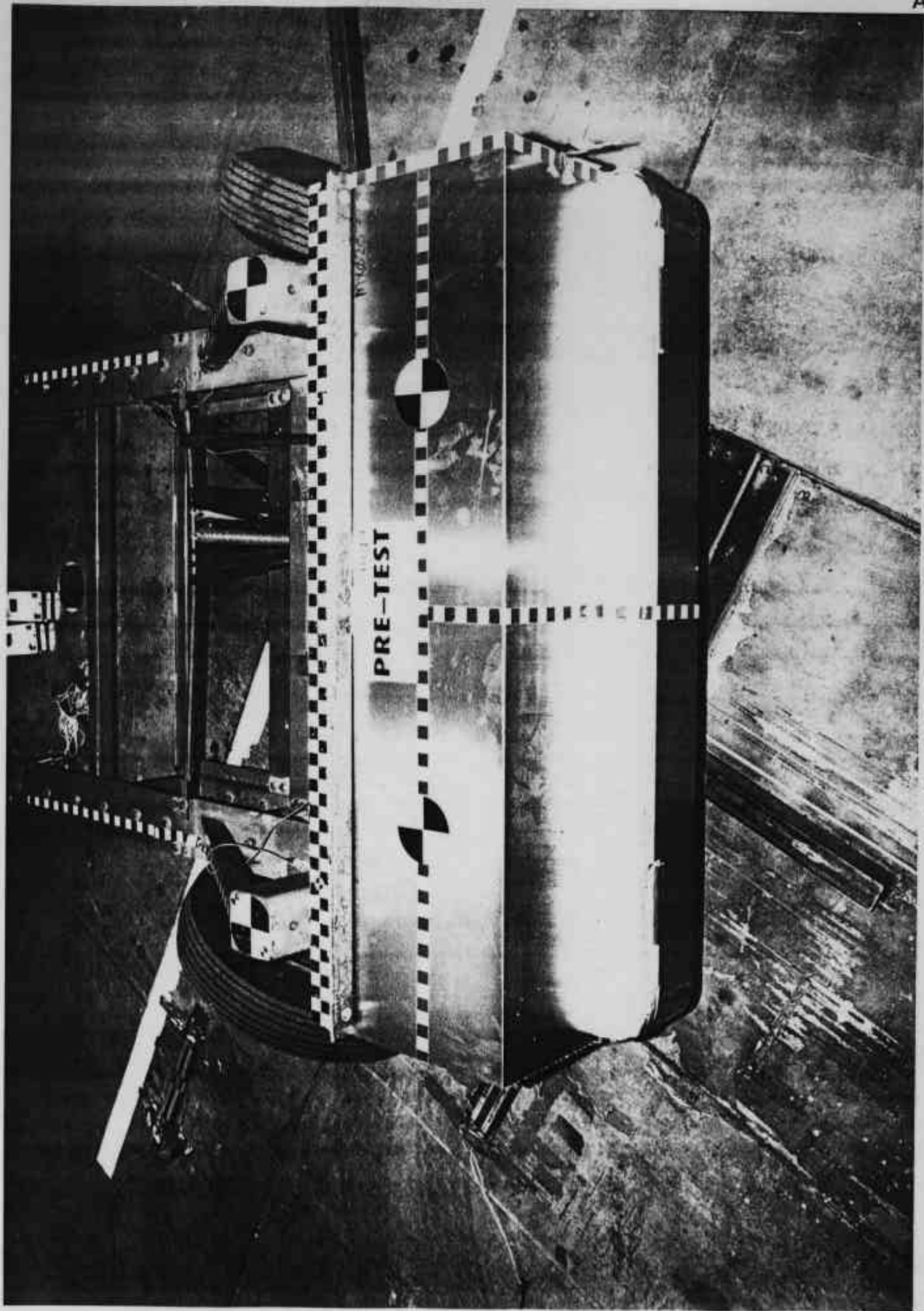


Photo No. A-13 - Pre-Test MDB Top View

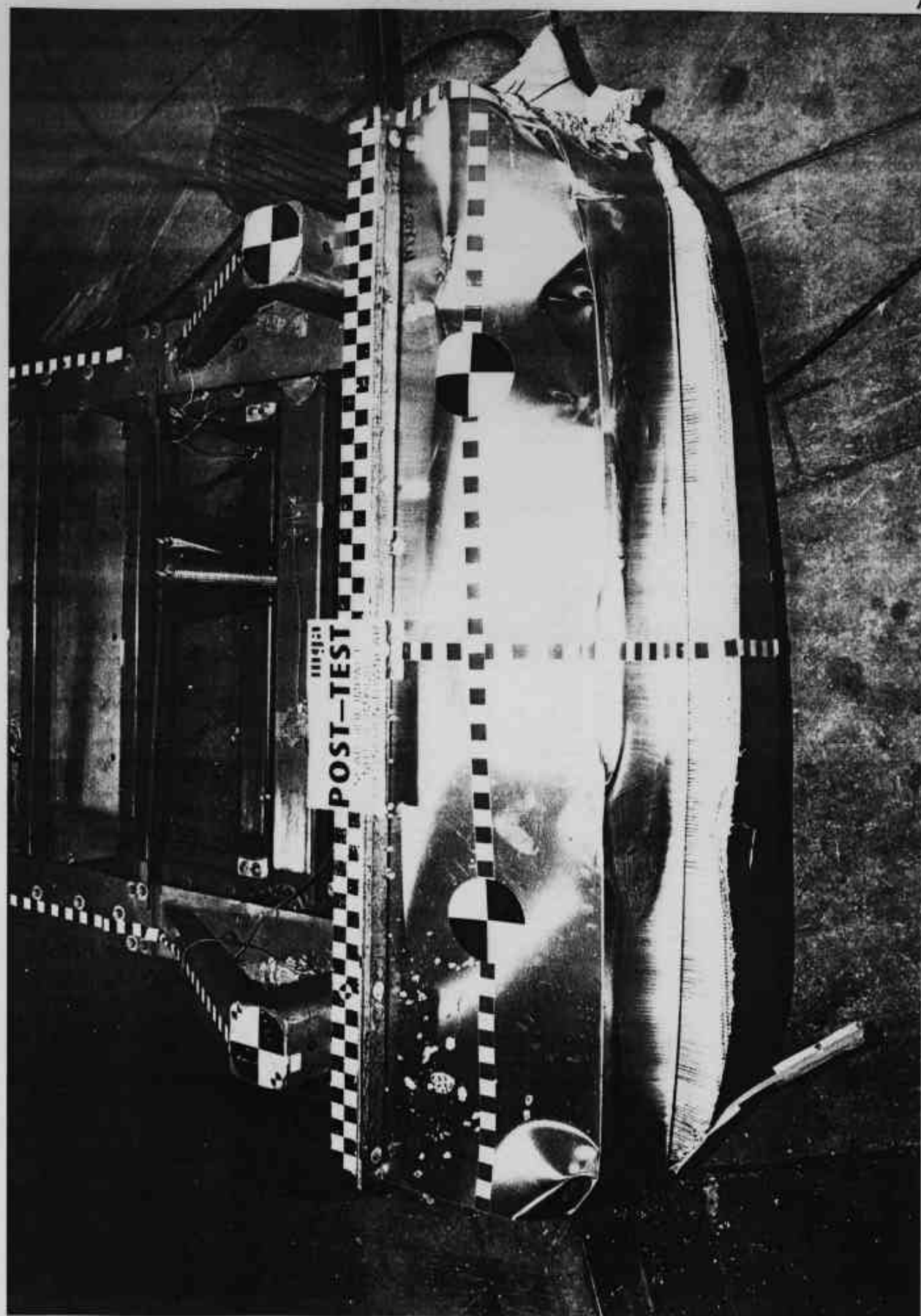


Photo No. A-14 - Post-Test MDB Top View

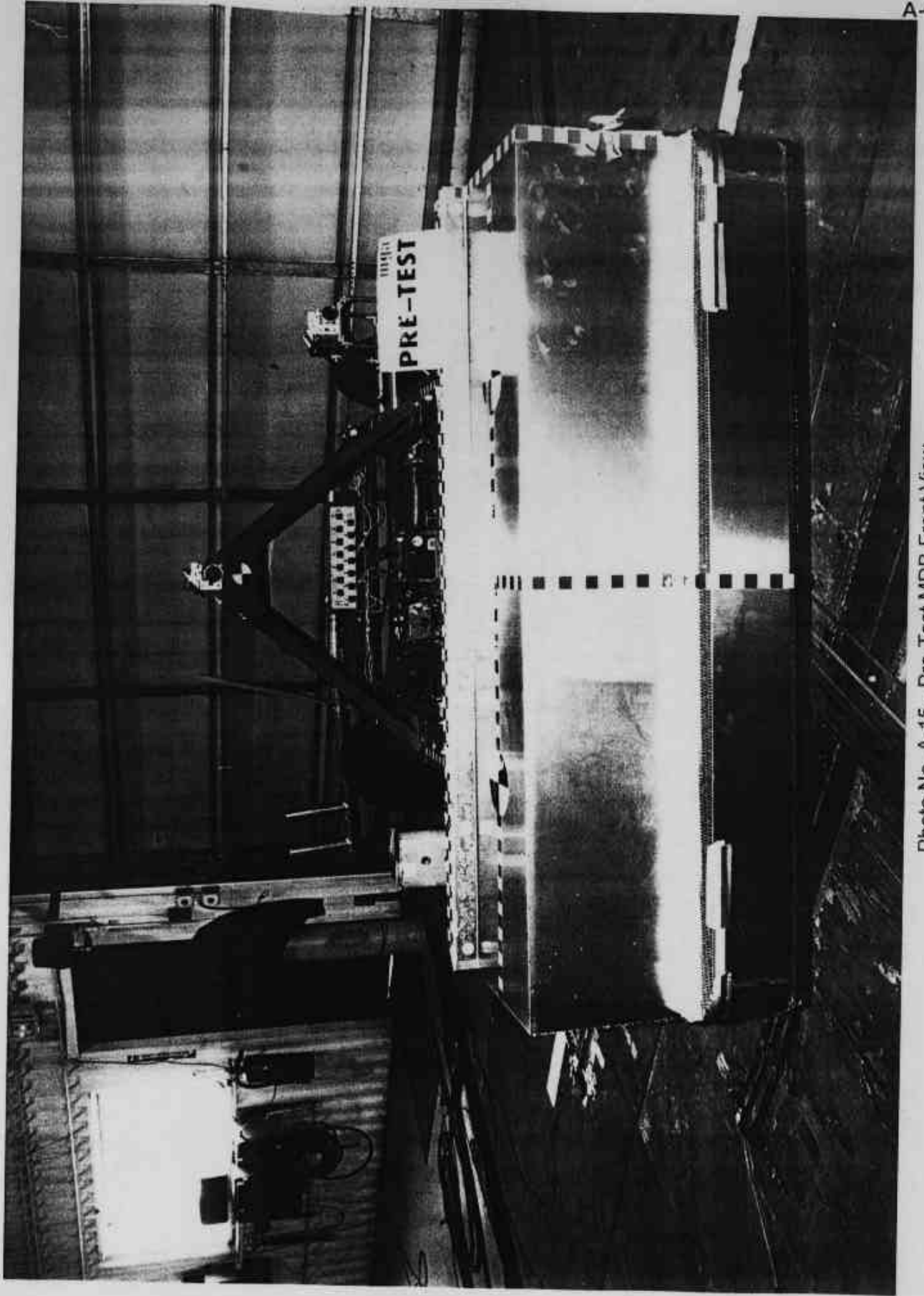


Photo No. A-15 - Pre-Test MDB Front View

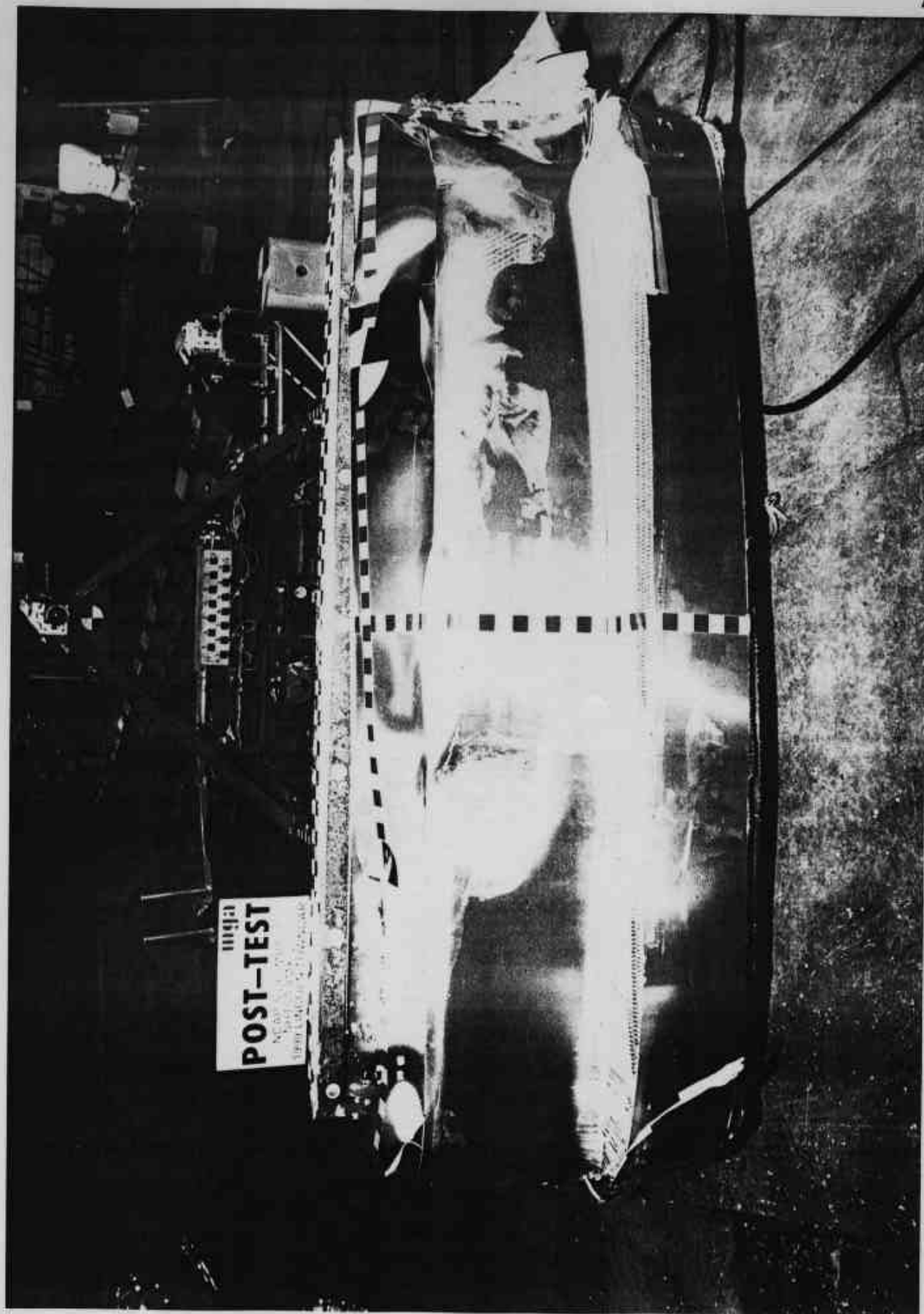


Photo No. A-16 - Post-Test MDB Front View

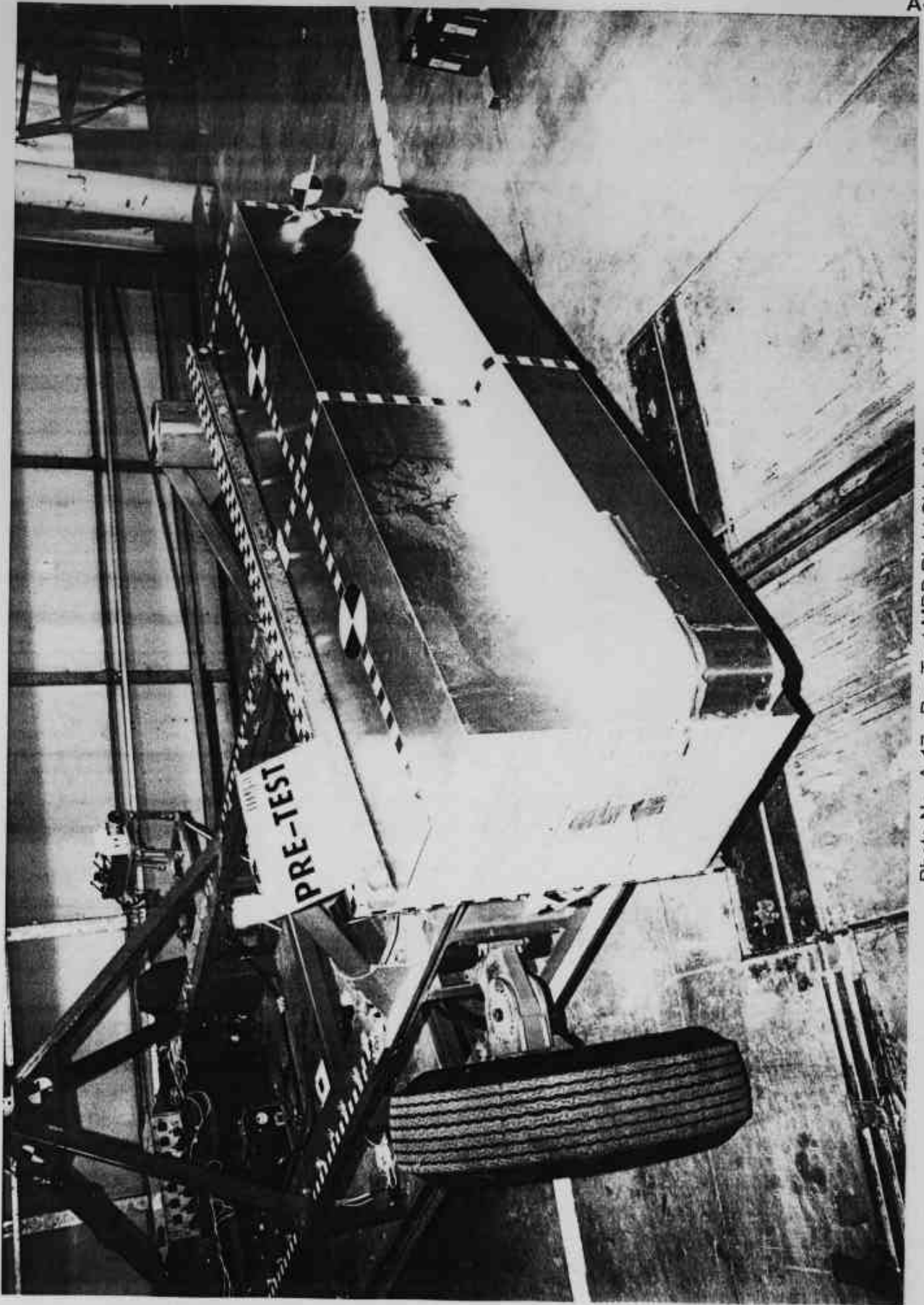


Photo No. A-17 - Pre-Test MDB Right Side View

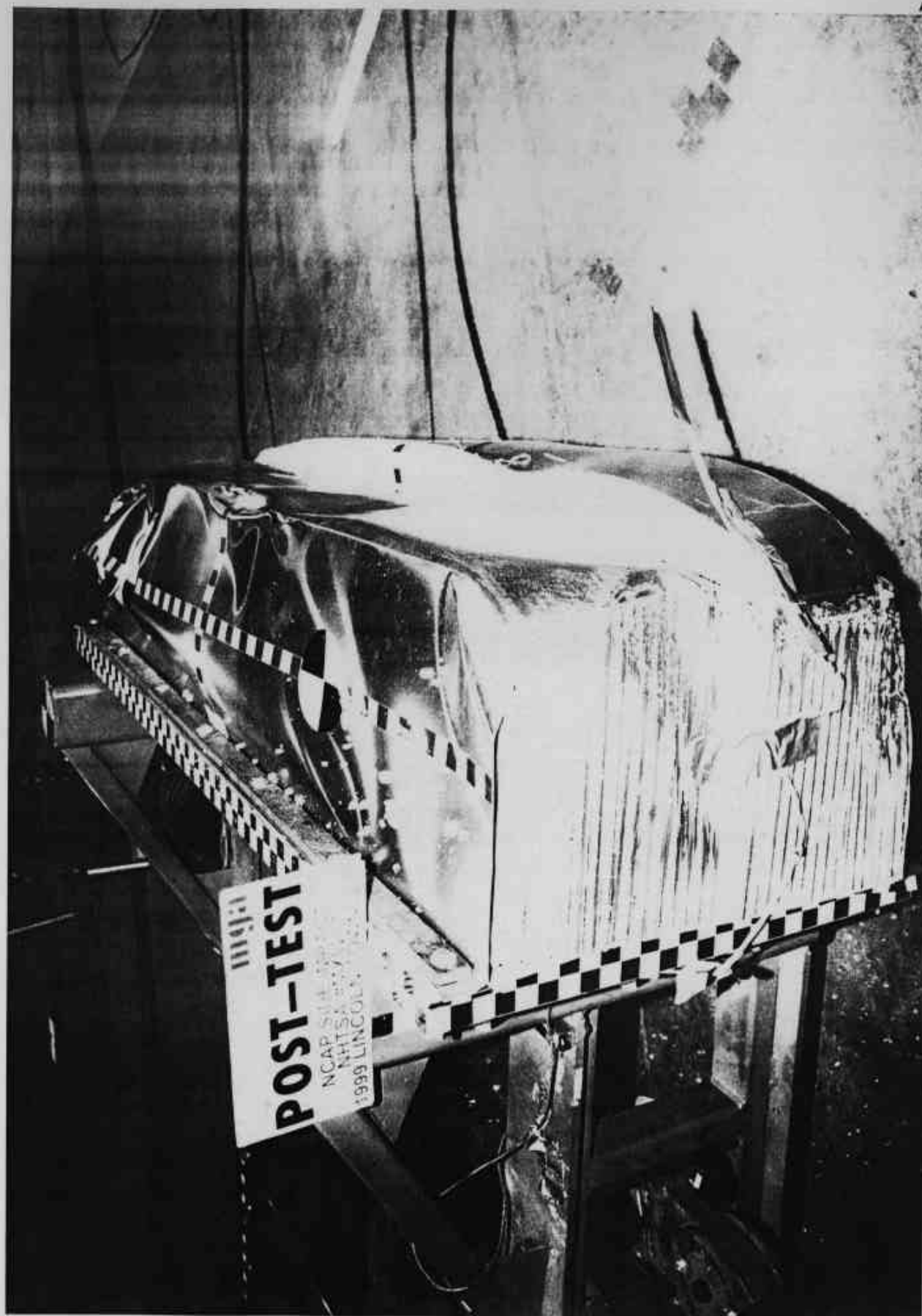


Photo No. A-18 - Post-Test MDB Right Side View

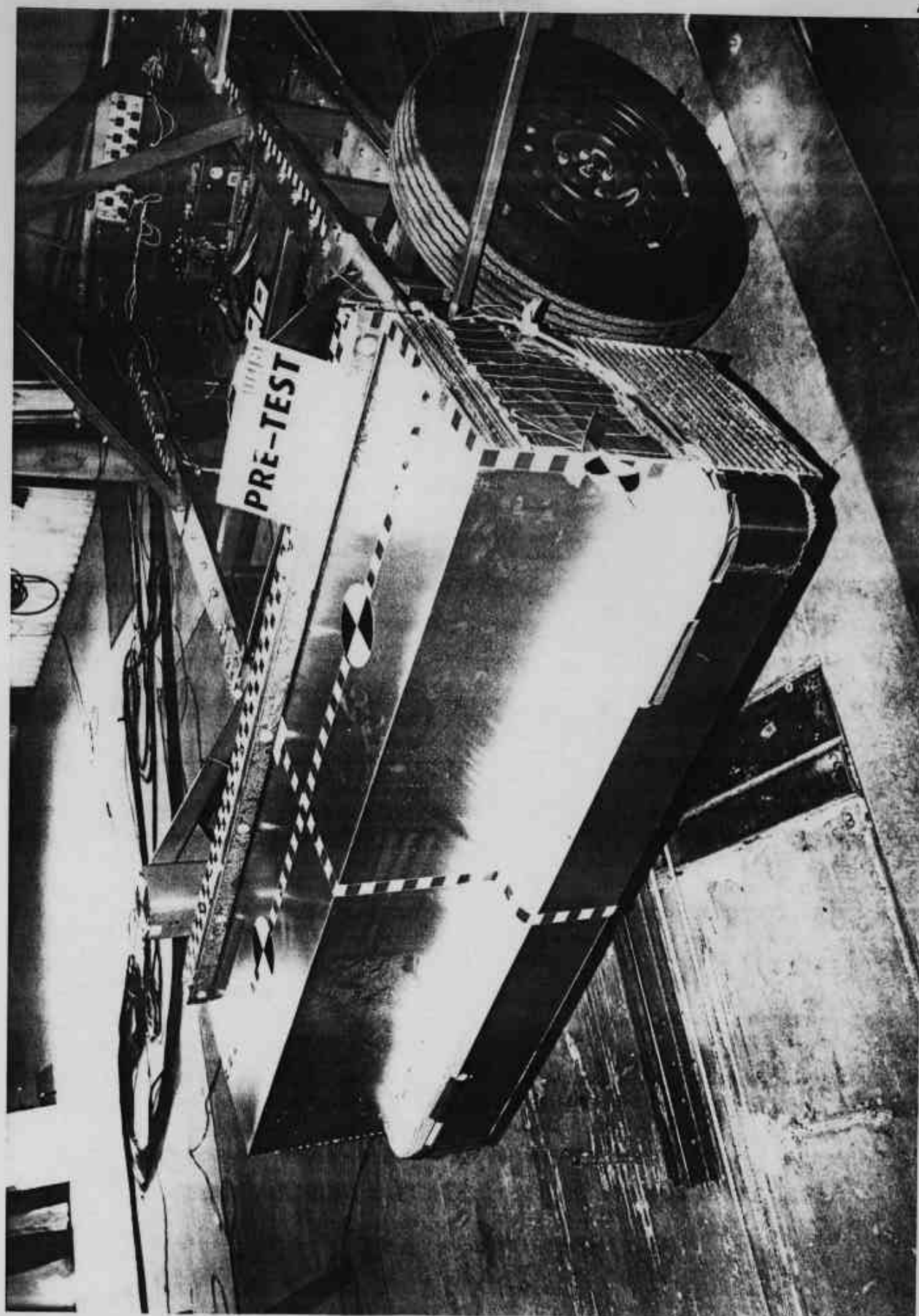


Photo No. A-19 - Pre-Test MDB Left Side View

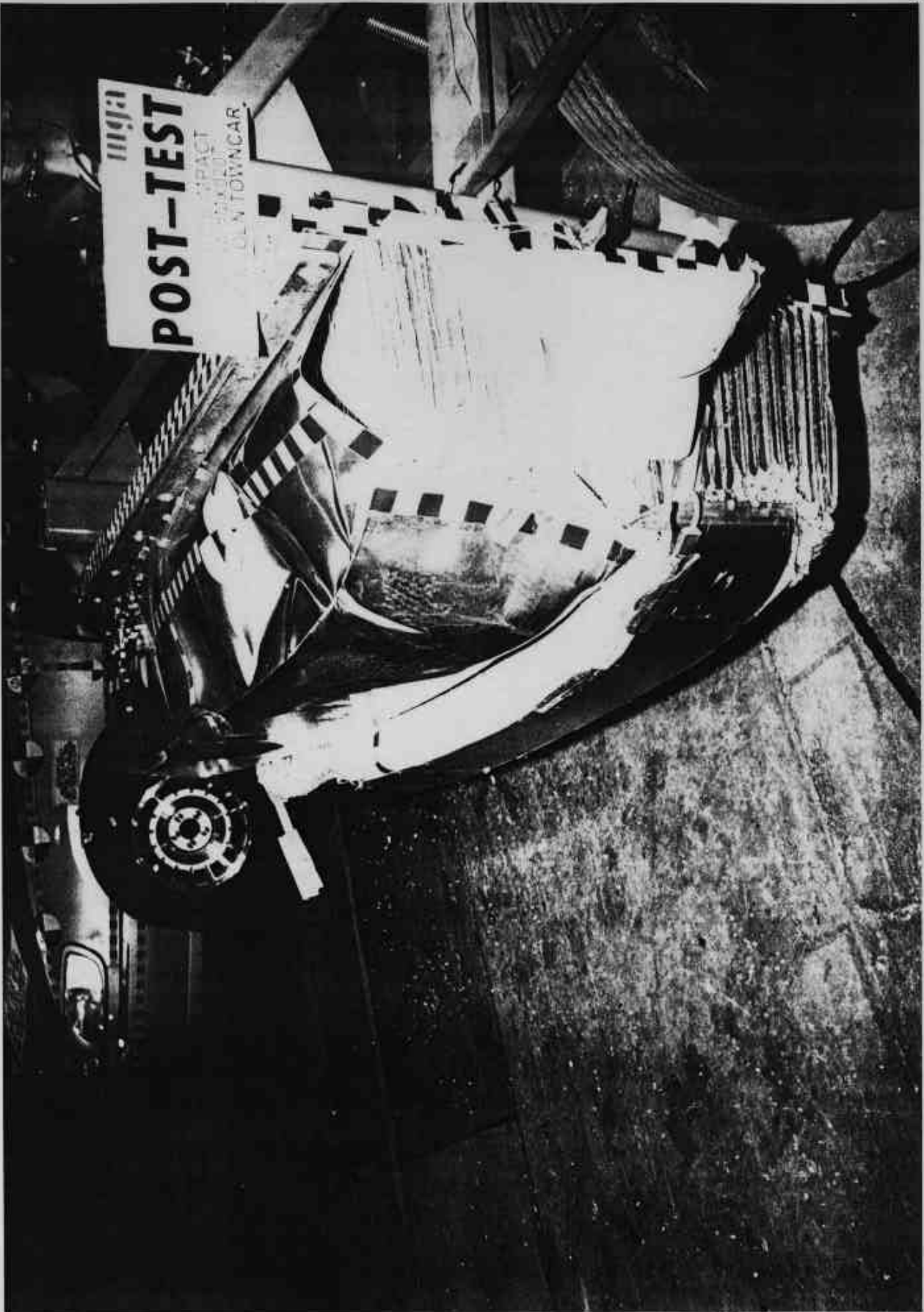


Photo No. A-20 - Post-Test MDB Left Side View



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



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



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



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

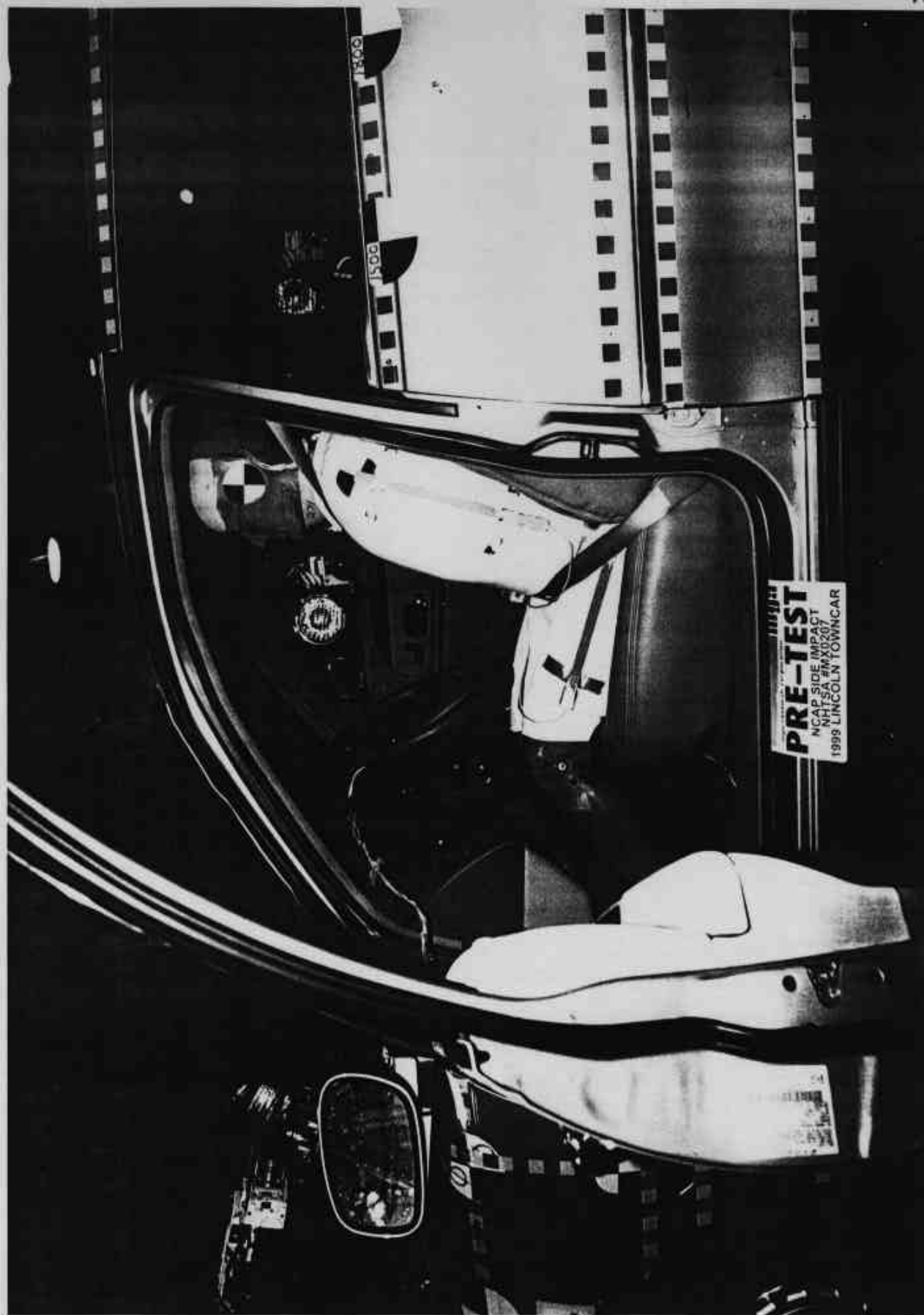


Photo No. A-25 - Pre-Test Driver Dummy Left Side View (Door Open)



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

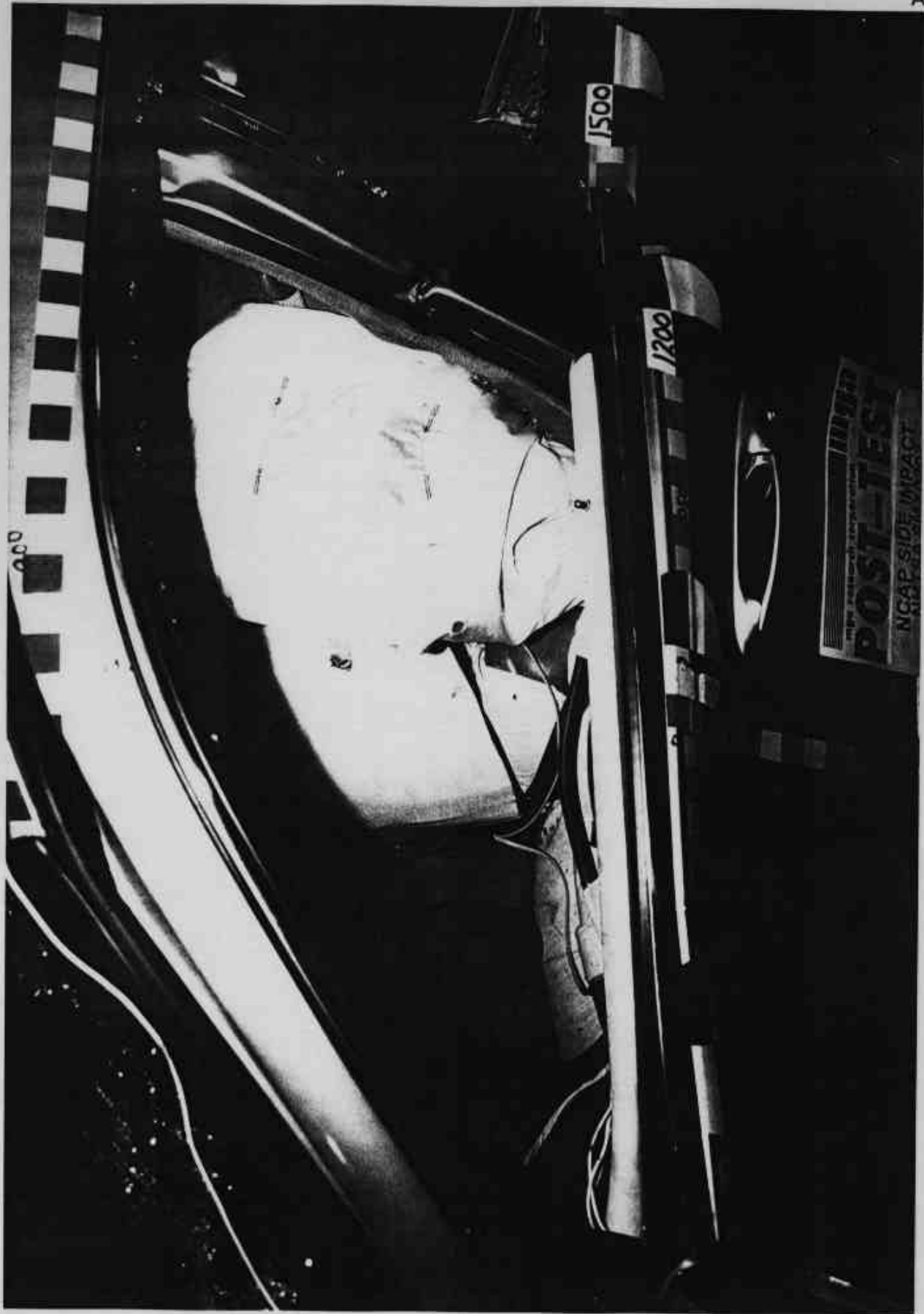


Photo No. A-27 - Post-Test Driver Dummy Shoulder and Door Top View



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

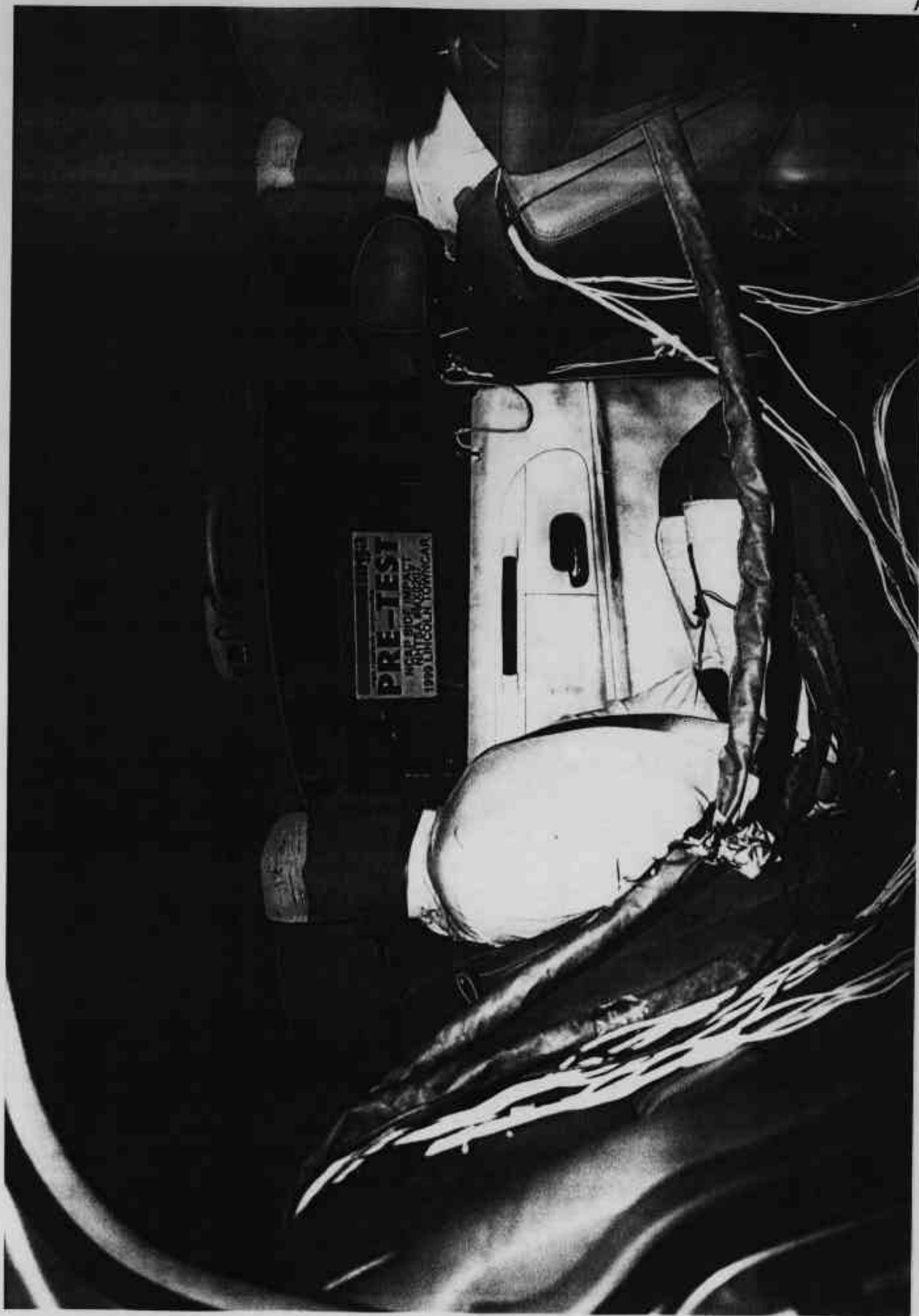


Photo No. A-29 - Pre-Test Passenger Dummy Right Side View

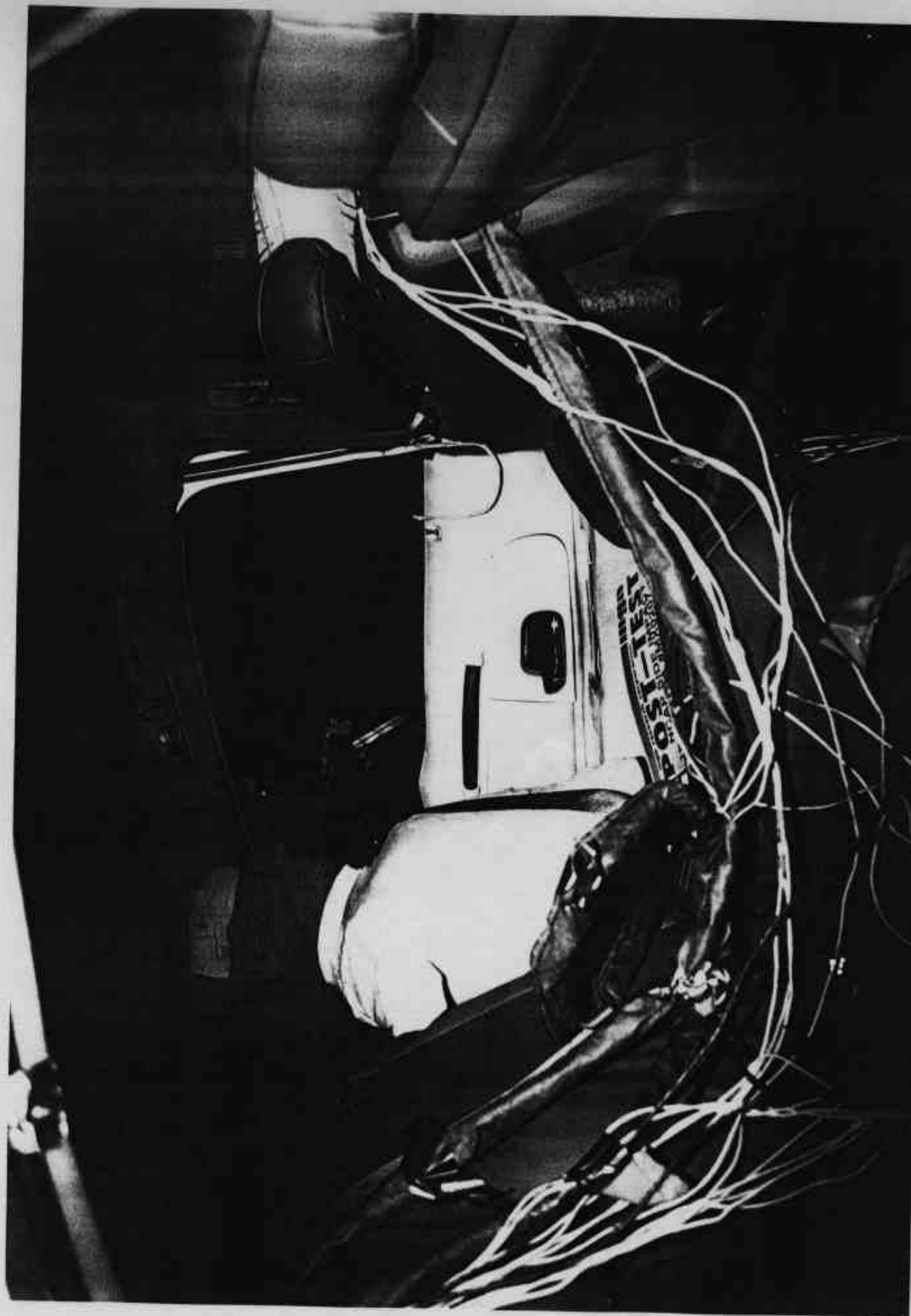


Photo No. A-30 - Post-Test Passenger Dummy Right Side View

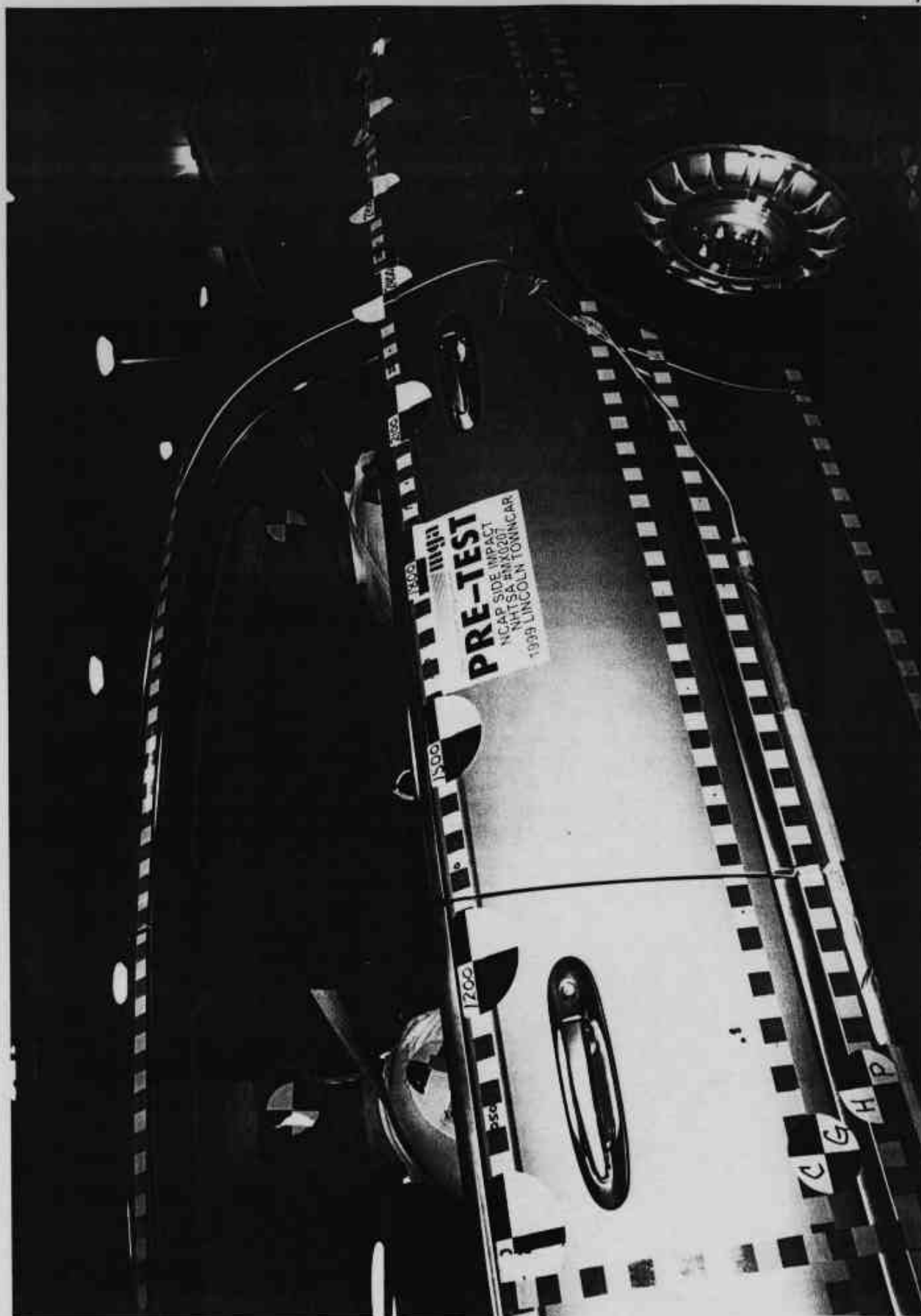


Photo No. A-31 - Pre-Test Passenger Dummy Left Side View

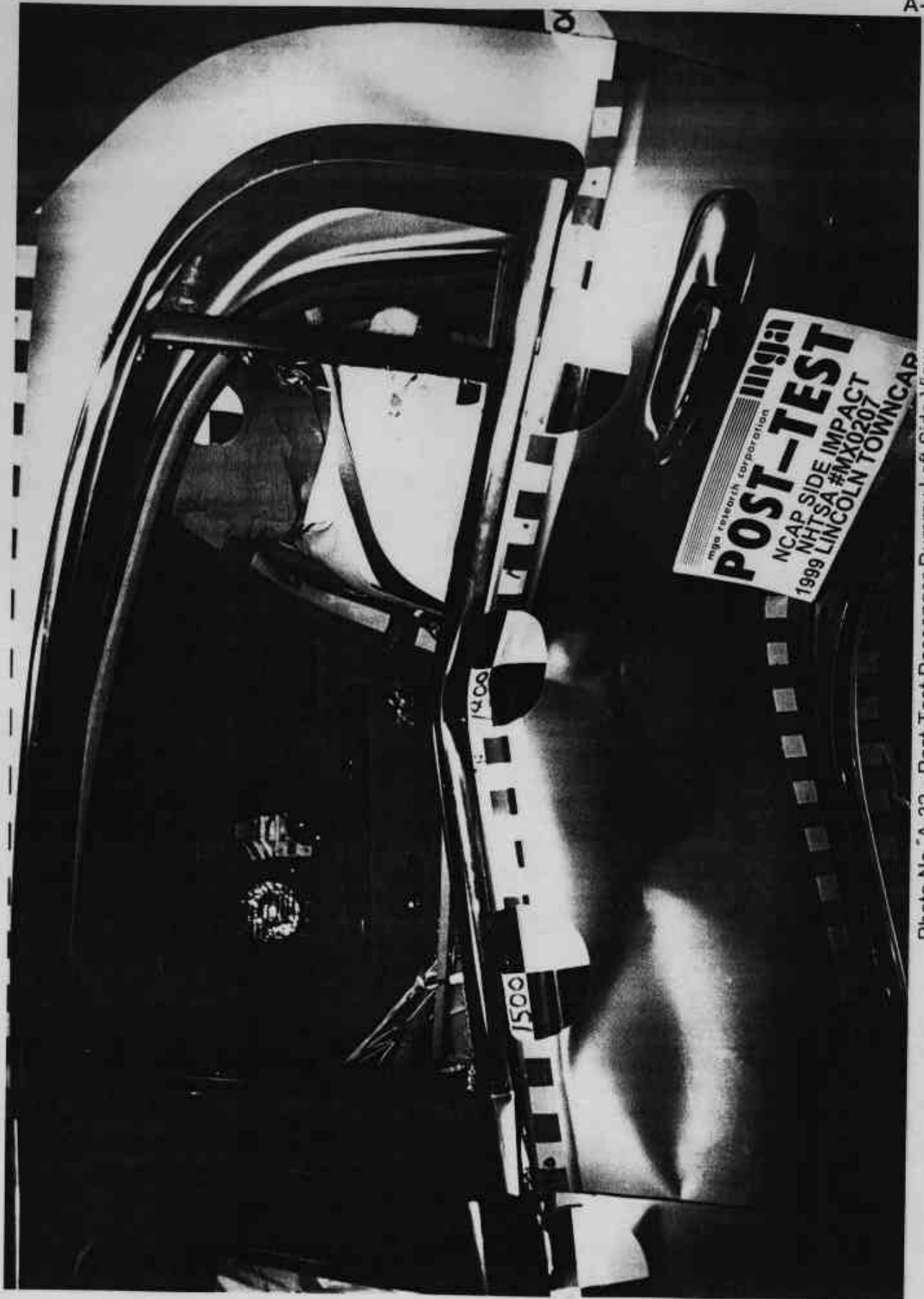


Photo No. A-32 - Post-Test Passenger Dummy Left Side View

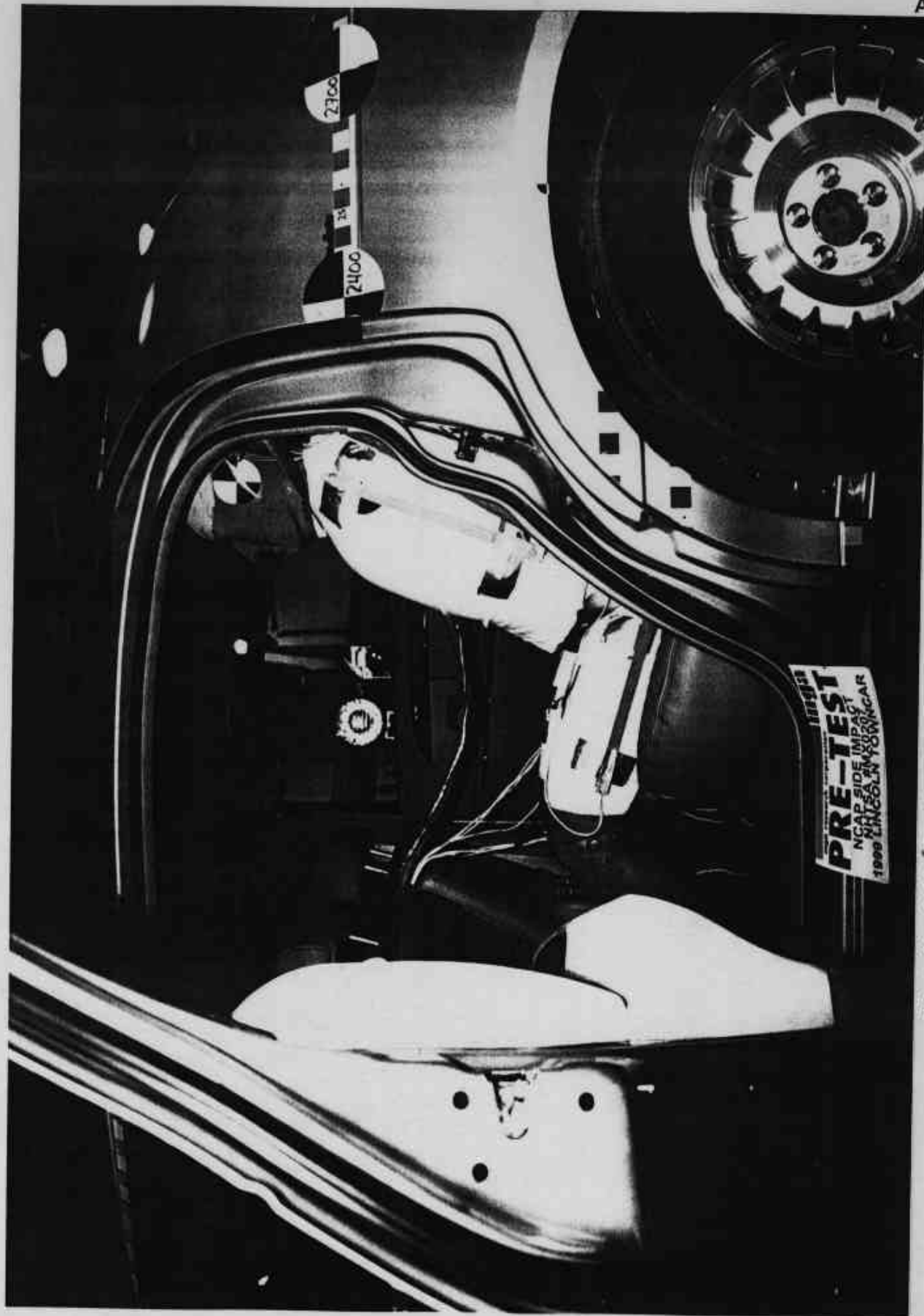


Photo No. A-33 - Pre-Test Passenger Dummy Left Side View (Door Open)



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



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

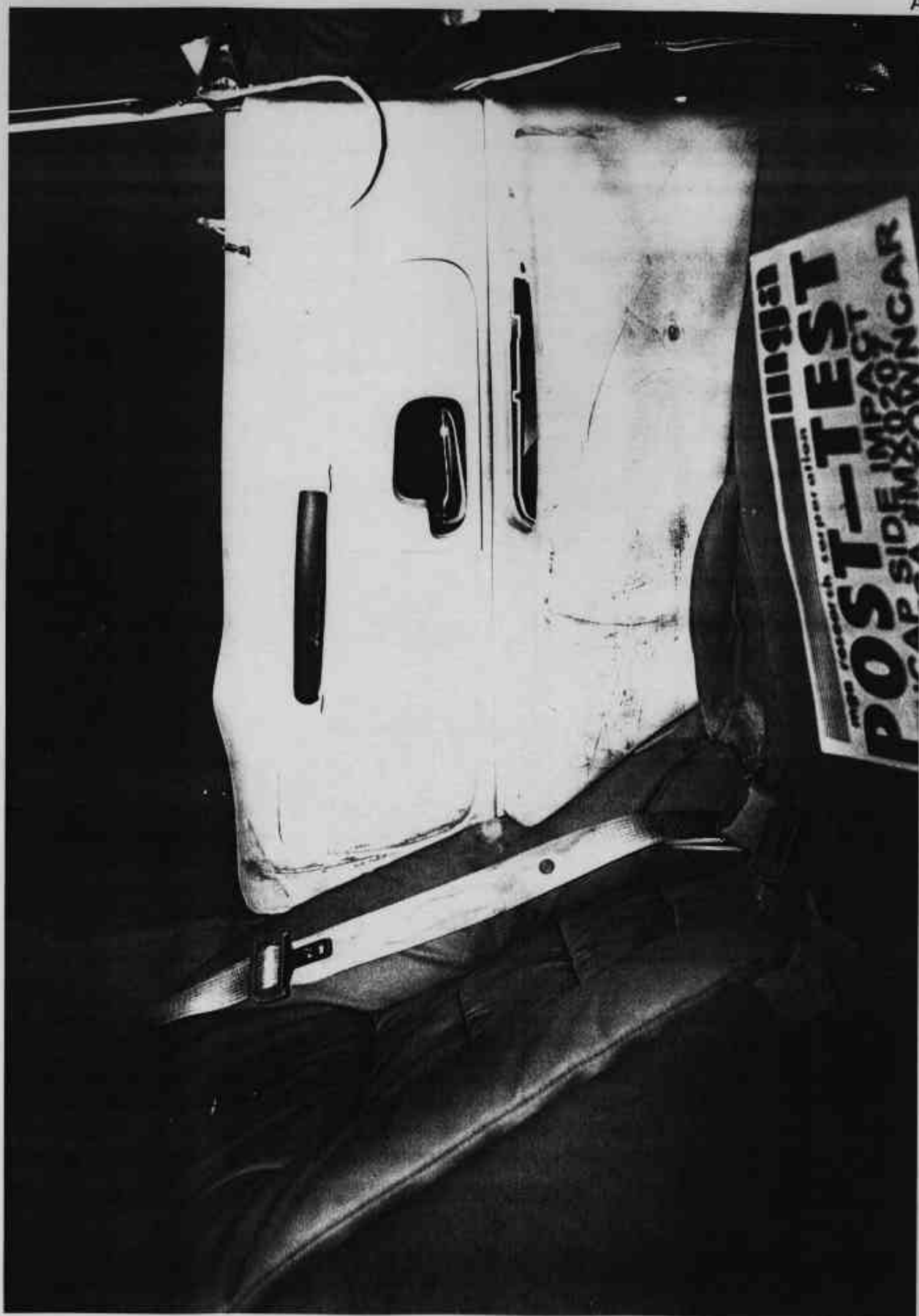


Photo No. A-36 - Post-Test Passenger Dummy Contact

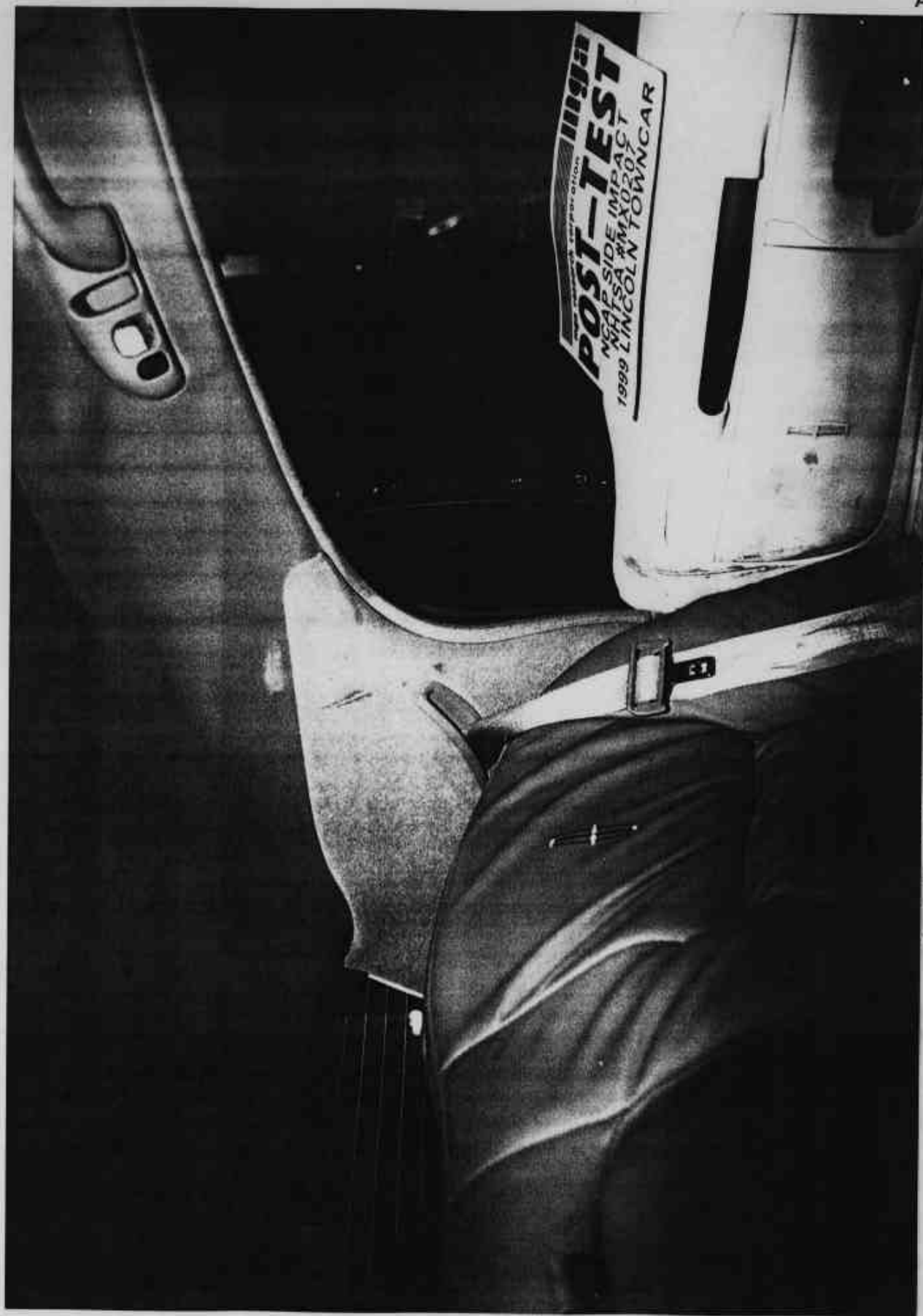


Photo No. A-37 - Post-Test Passenger Dummy Head Contact



Photo No. A-38 - Pre-Test Left Front Impact Point on Vehicle



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

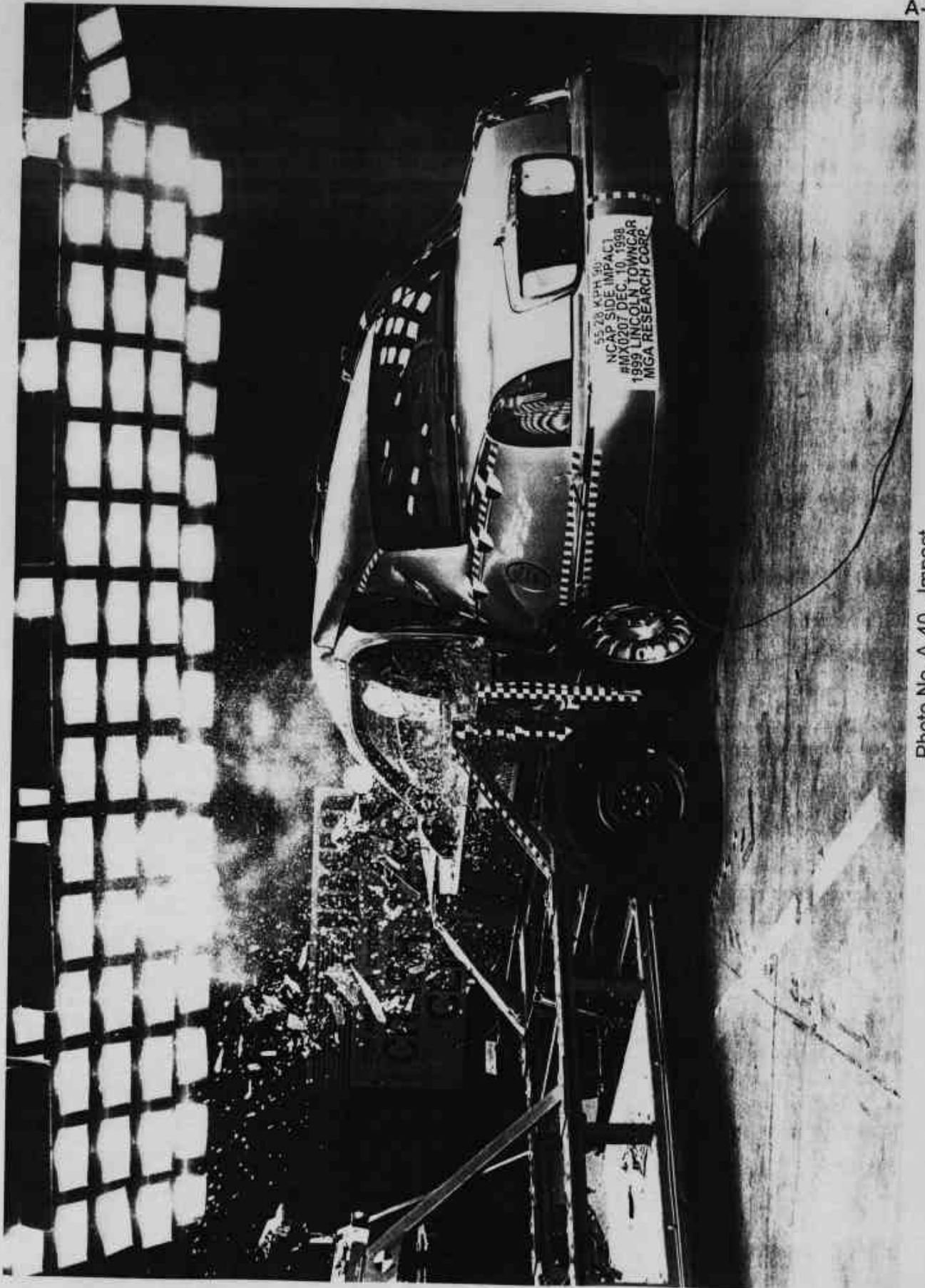


Photo No. A-40 - Impact

MFD. BY FORD MOTOR CO. IN U.S.A.
 DATE: 11/98 GWR: 2448KG/5398LB
 FRONT GWR: 1211KG/2670LB REAR GWR: 1241KG/2738LB
 THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR
 VEHICLE SAFETY, BUMPER, AND THEFT PREVENTION STANDARDS
 IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.
 VIN: 1LNHM81W0XY645490 TYPE: PASSENGER
 MAXIMUM LOAD = OCCUPANTS + LUGGAGE = 499KG/1100LB
 OCCUPANTS = 6 TOTAL: 3 FR, 3 RR
 LUGGAGE = 91KG/200LB
 TIRE: P225/60SR16
 PRESSURE(FR): 221 kPa/32 PSI COLD
 PRESSURE(RR): 221 kPa/32 PSI COLD



1LNHM81W0XY645490

TRAILER TOWING - SEE OWNER GUIDE

EXL PNE: AQ	IRG: 42	LD50:	F0097
BRX: 4	TR: 6	TR: 6	R0116
SH: 4	JY: 6	H: 6	
	UBC		VF80B 5420472 AB

Photo No. A-41 - Vehicle Certification Label and Tire Placard

A-42

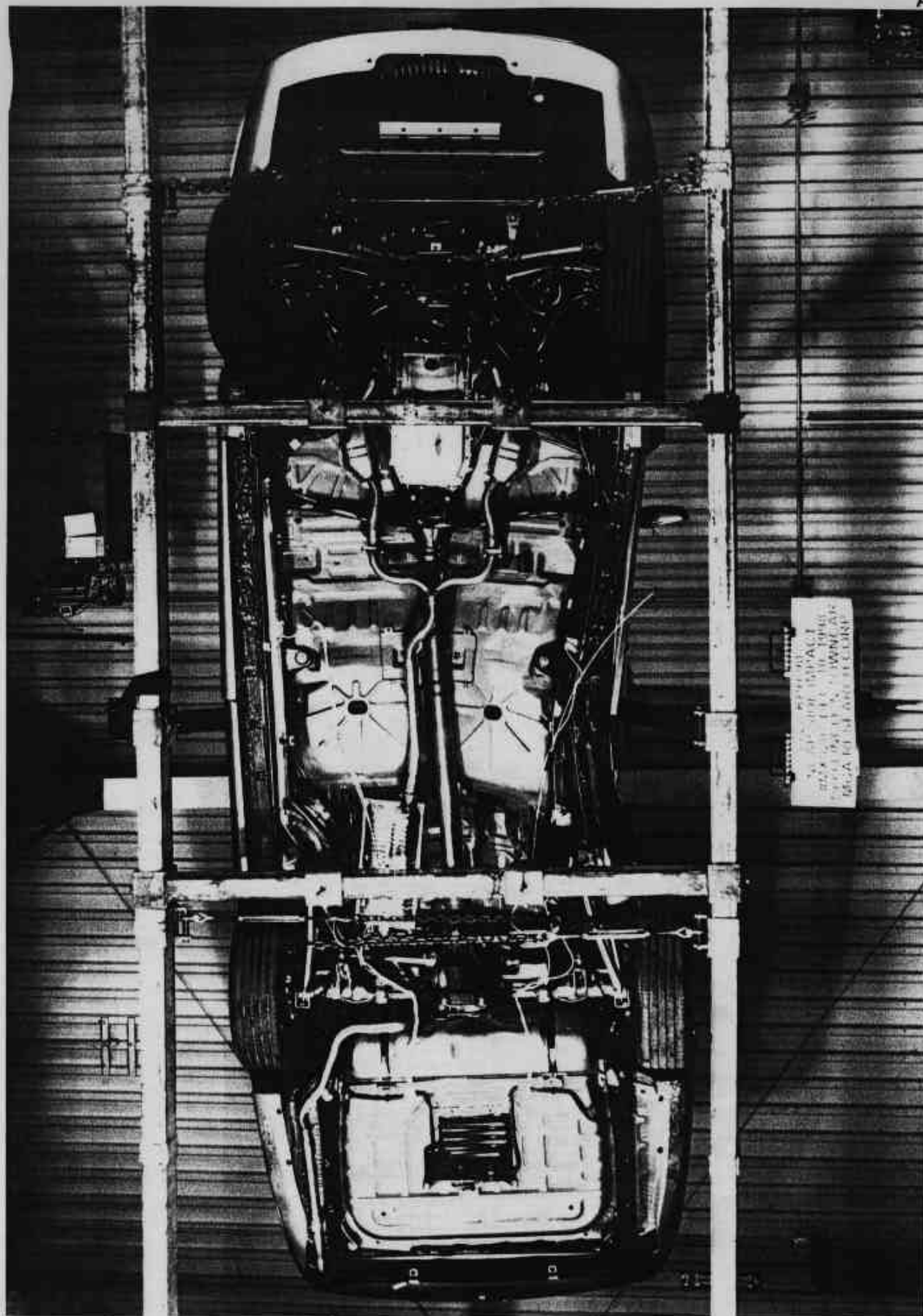


Photo No. A-42 - Rollover 90°

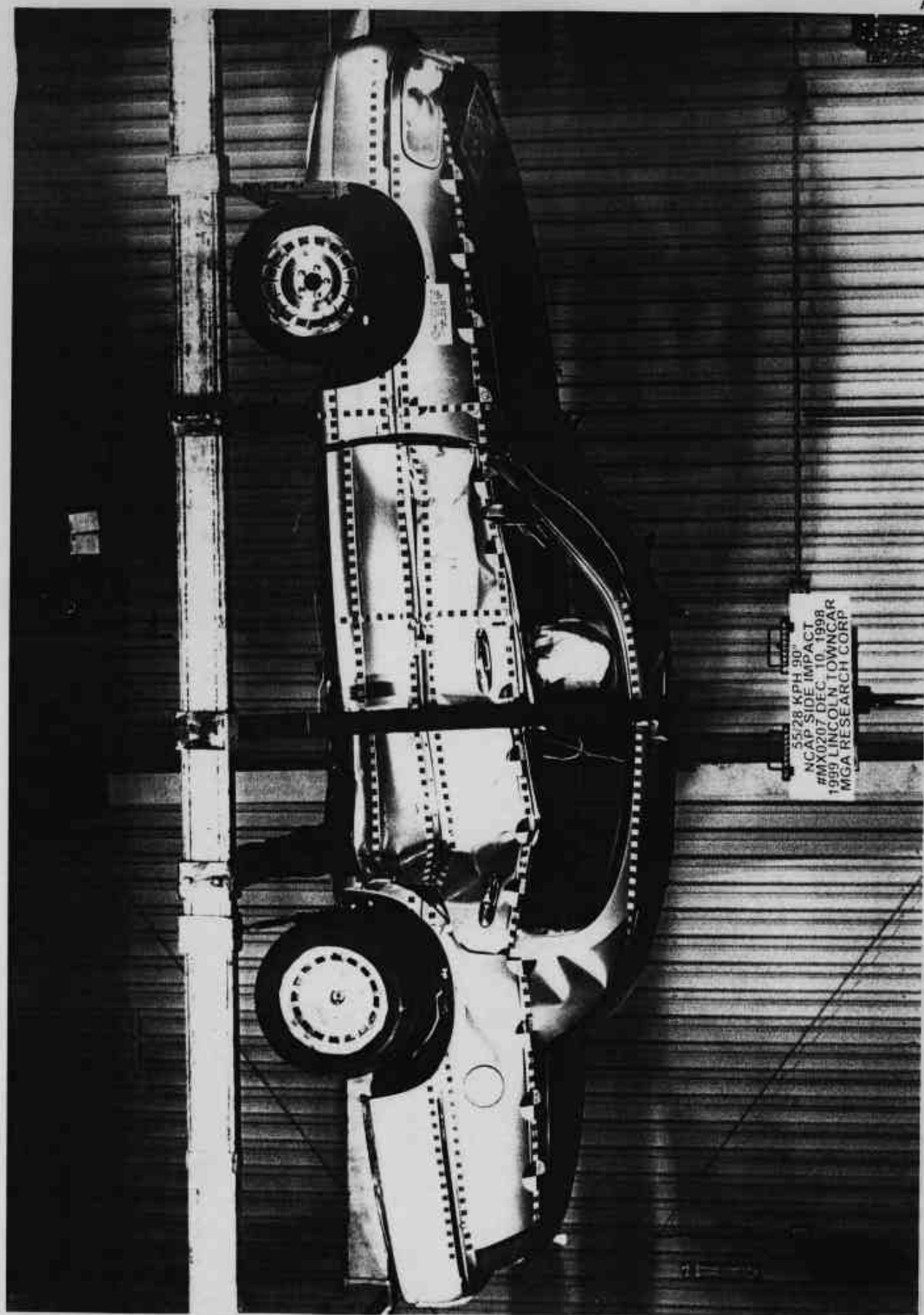


Photo No. A-43 - Rollover 180°

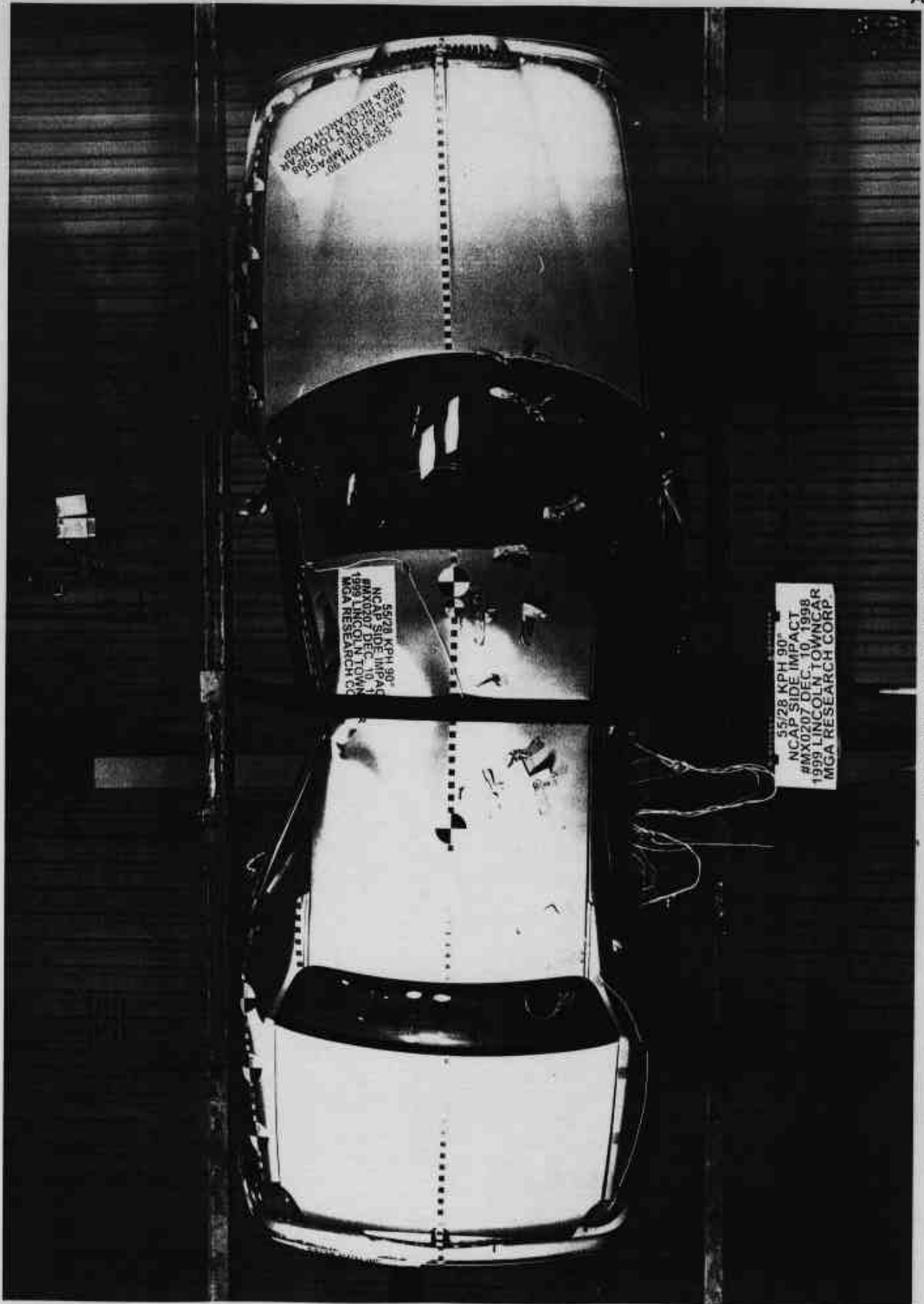
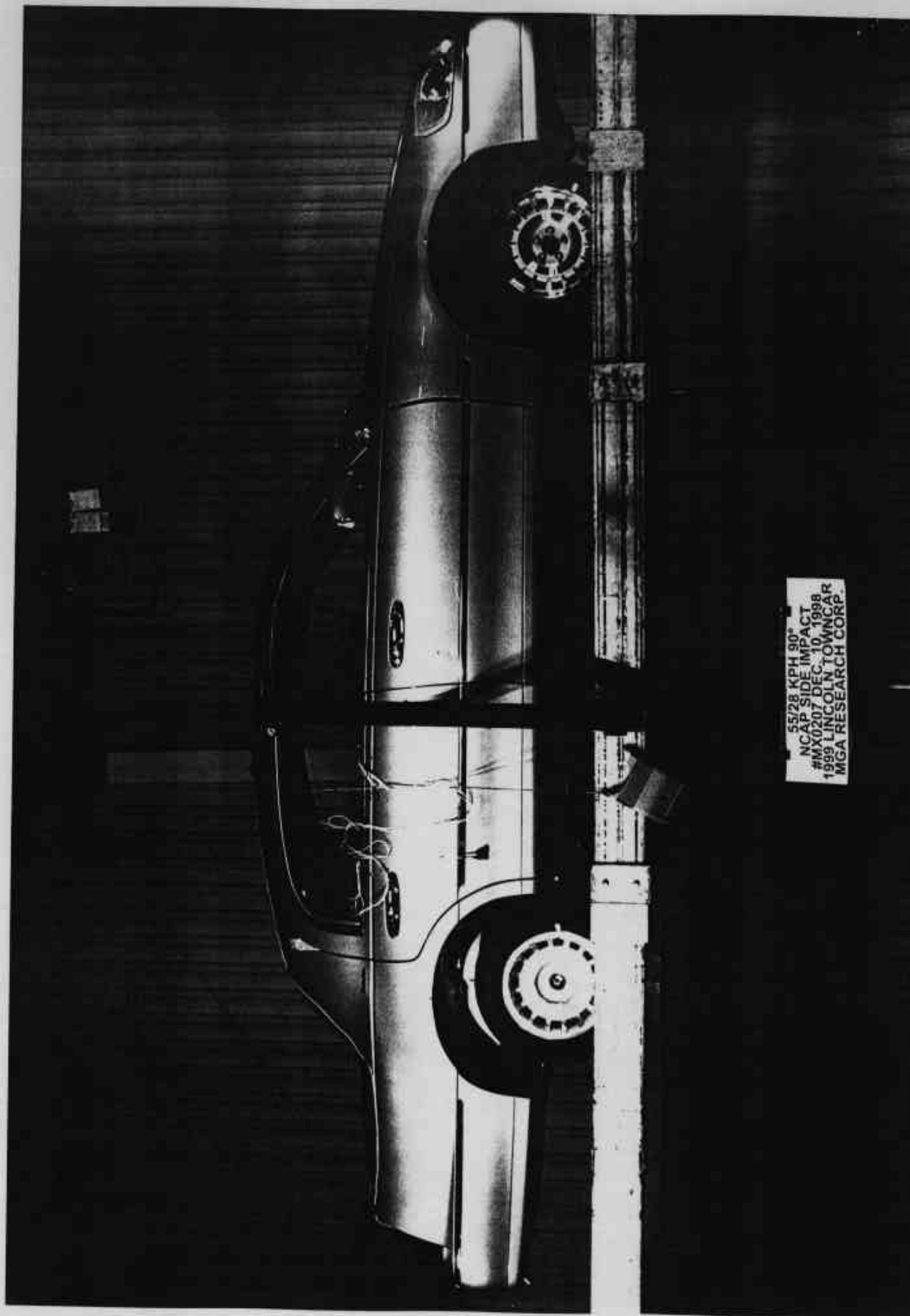


Photo No. A-44 - Rollover 270°



55/28 KPH 90°
NCAP SIDE IMPACT
#MX0207 DEC. 10, 1998
1999 LINCOLN TOWNCAR
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Photo No. A-45 - Rollover 360°

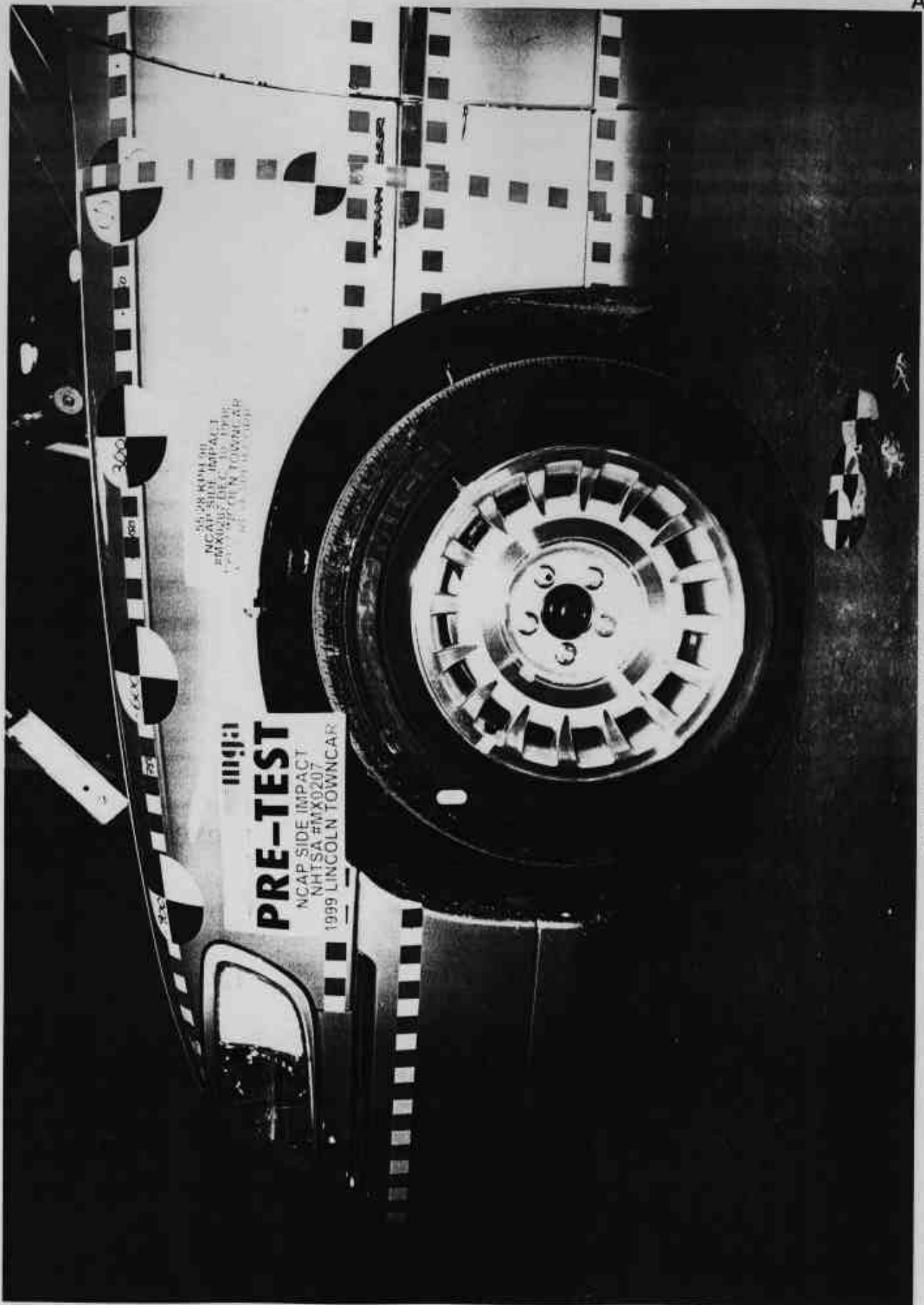


Photo No. A-46 - Left Front Attitude Point

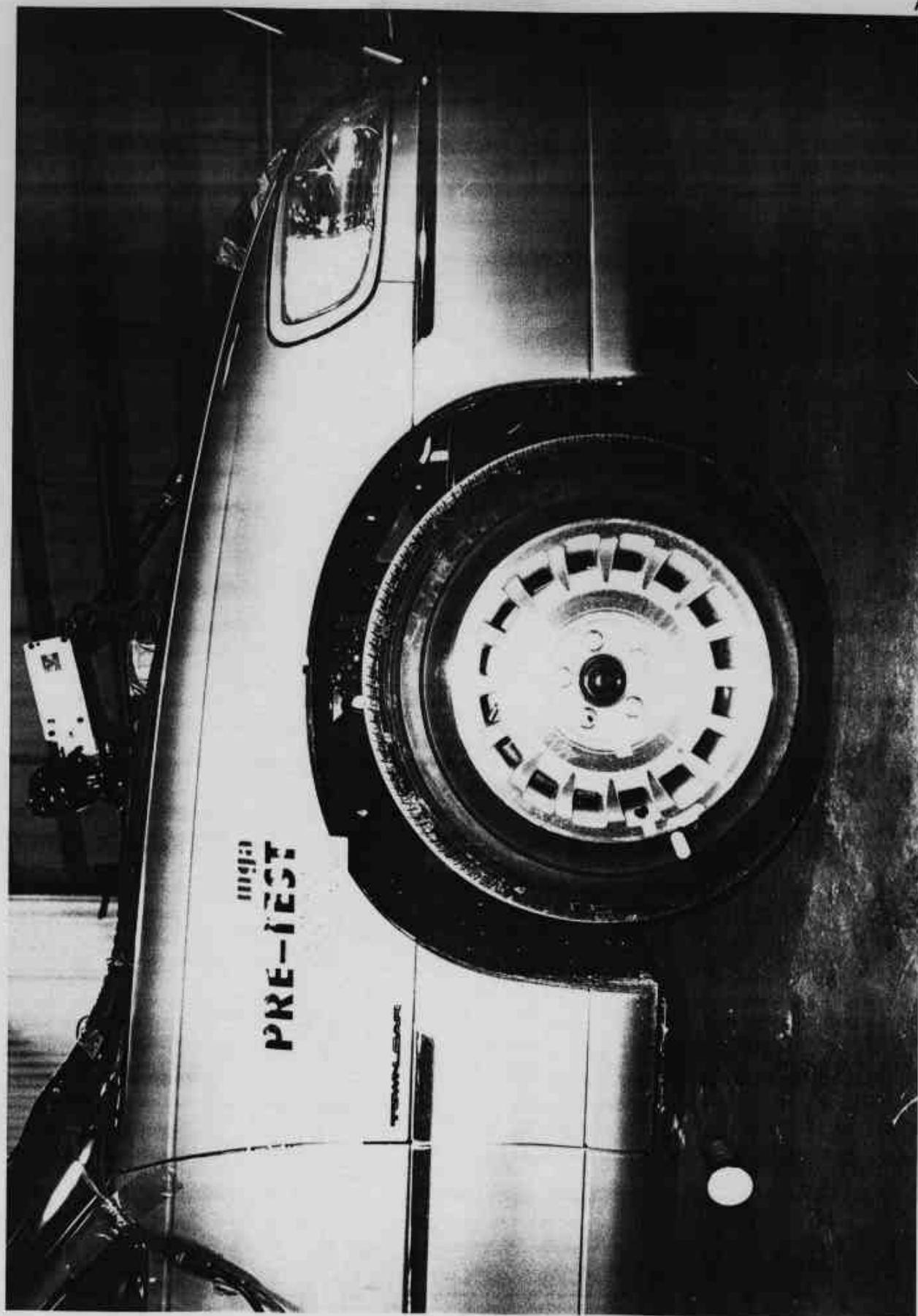


Photo No. A-47 - Right Front Attitude Point

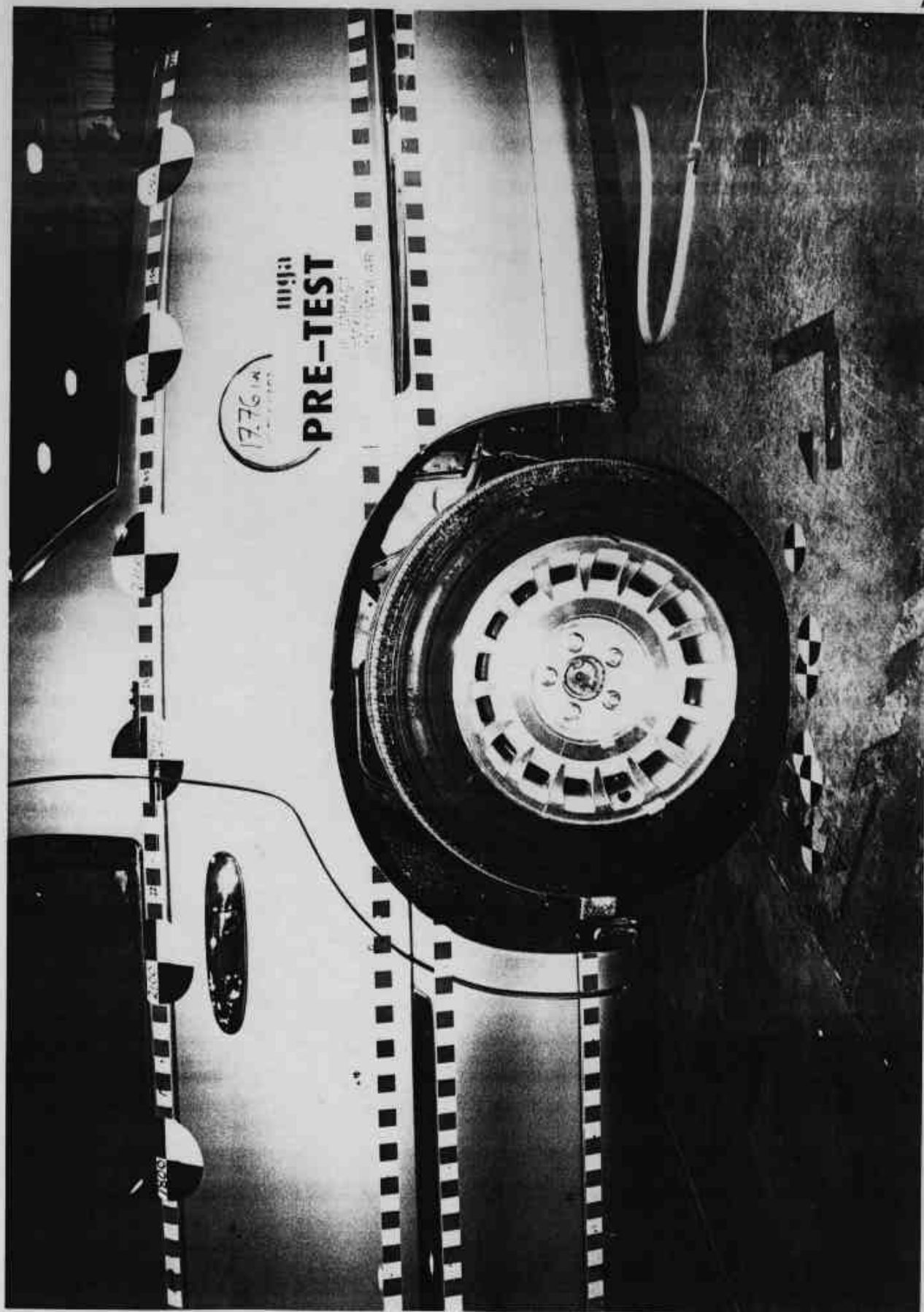


Photo No. A-48 - Left Rear Attitude Point

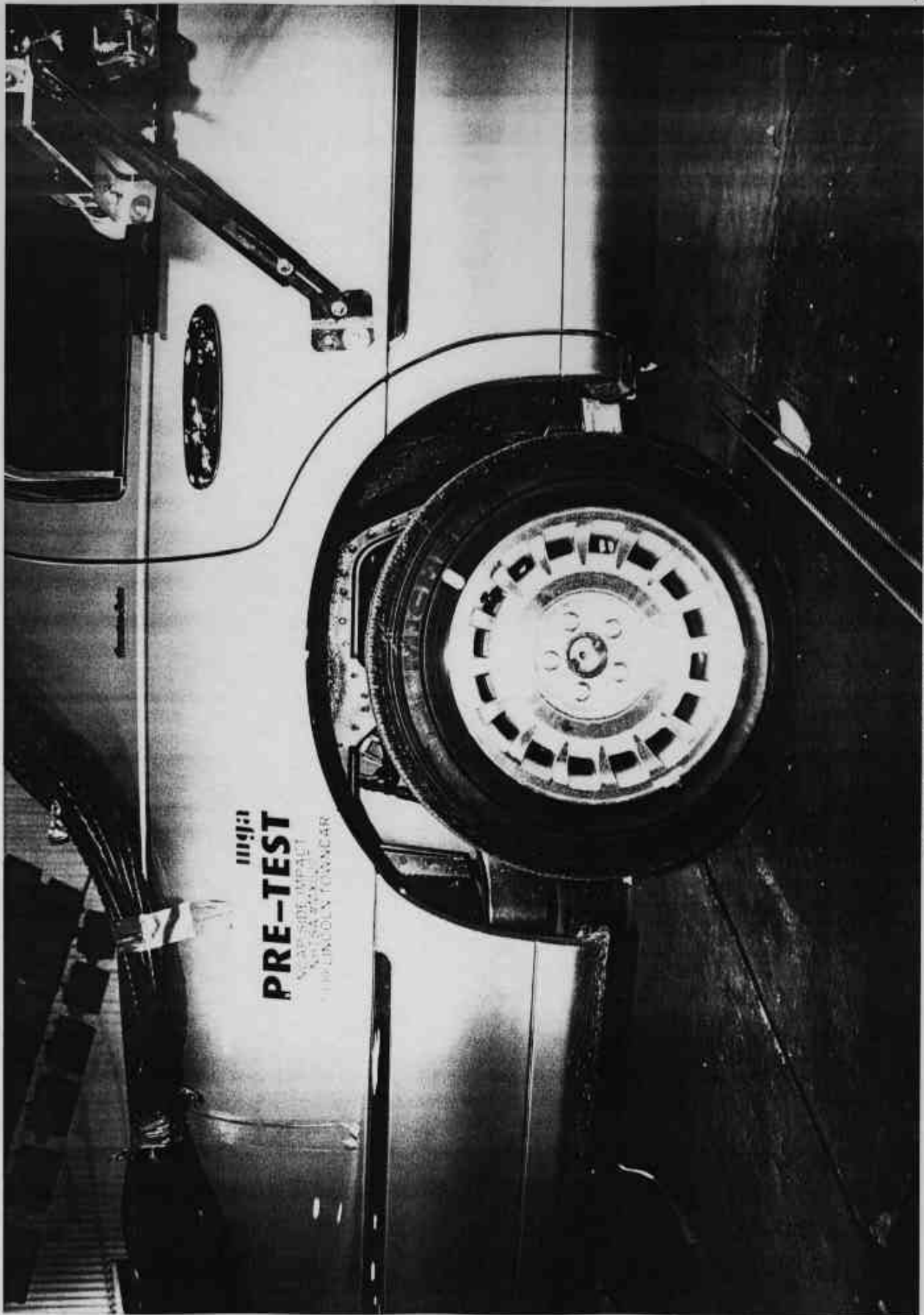


Photo No. A-49 - Right Rear Attitude Point

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* Data not valid after 63 msec.

** Data not valid after 51 msec.

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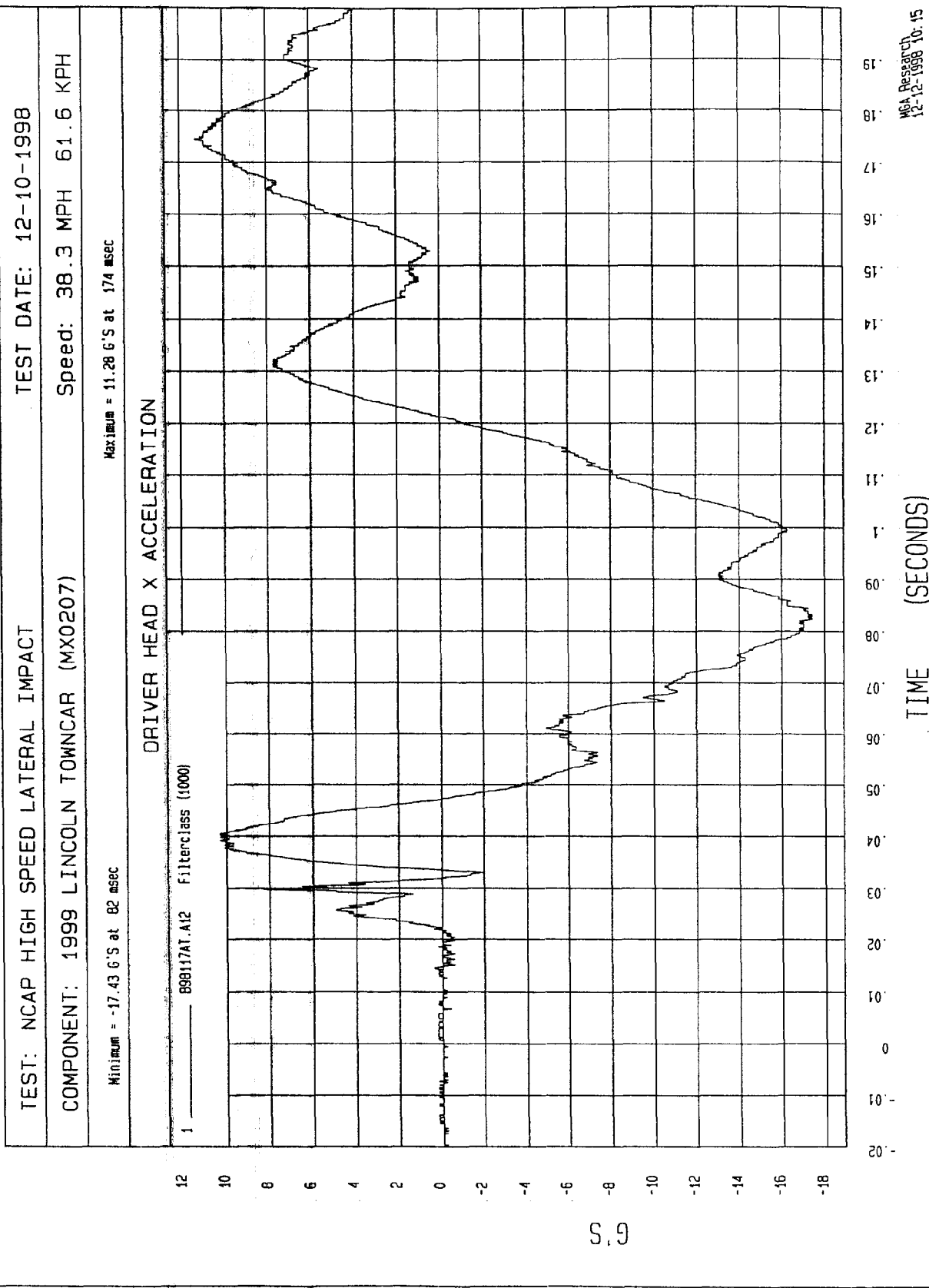
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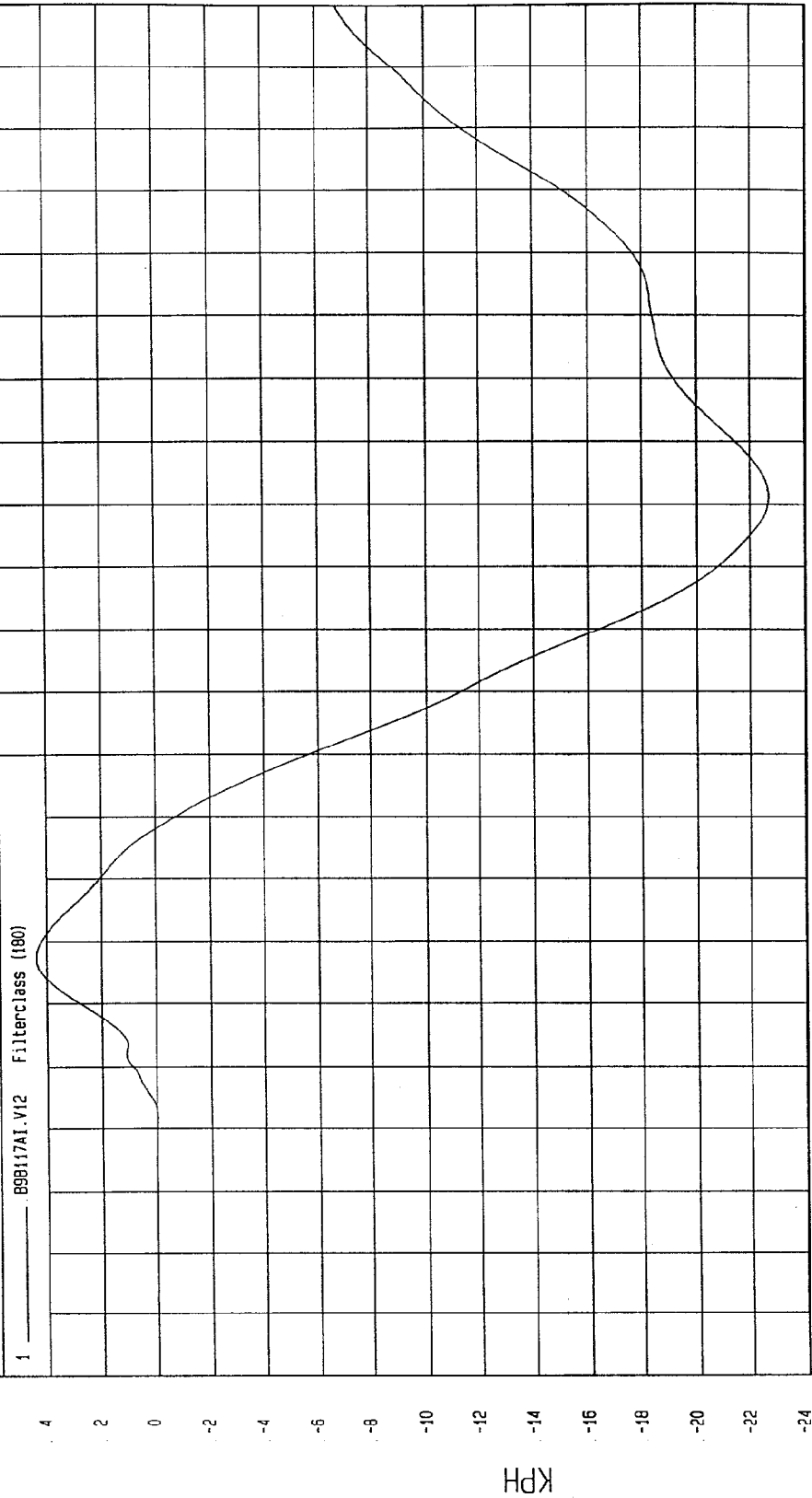


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -22.69 KPH at 121 msec Maximum = 4.39 KPH at 47 msec

DRIVER HEAD X VELOCITY



TIME Seconds

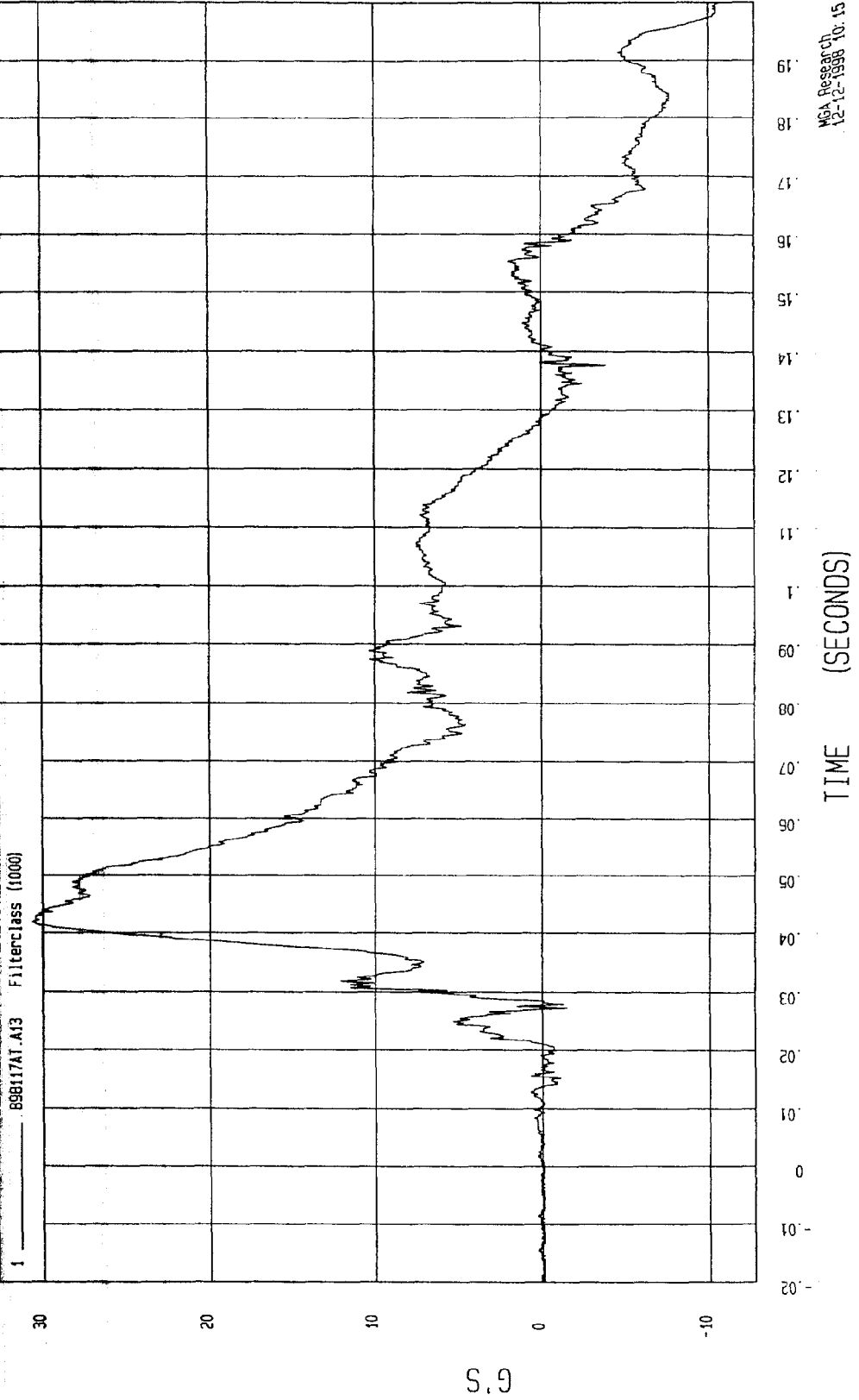
MGA Research
12-12-1998 10:56

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -10.66 G'S at 200 msec Maximum = 30.64 G'S at 42 msec

DRIVER HEAD Y ACCELERATION

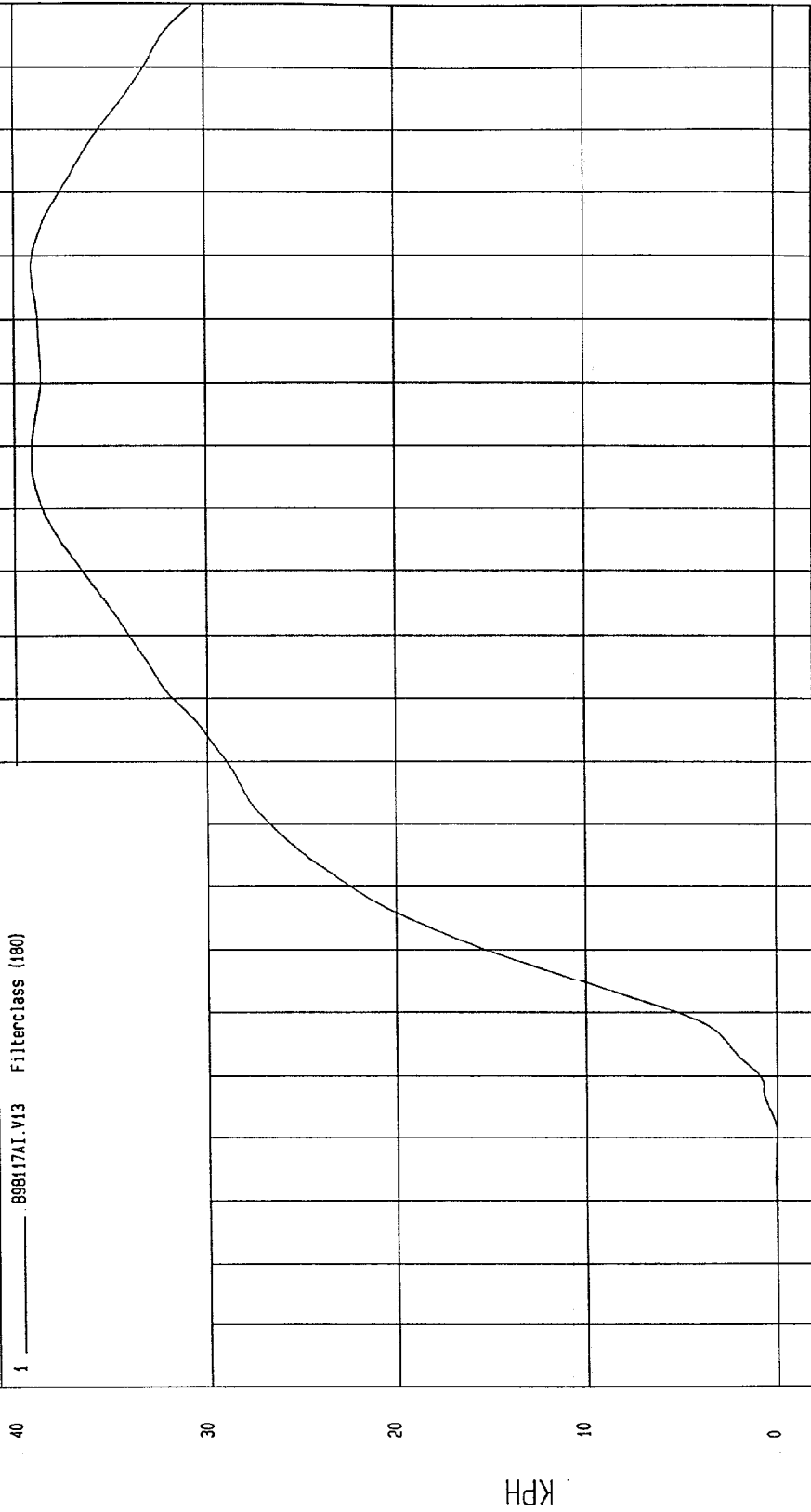


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -7.39E-03 KPH at -16 msec Maximum = 39.12 KPH at 129 msec

DRIVER HEAD Y VELOCITY



TIME Seconds

MSA Research
12-12-1998 10:56

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

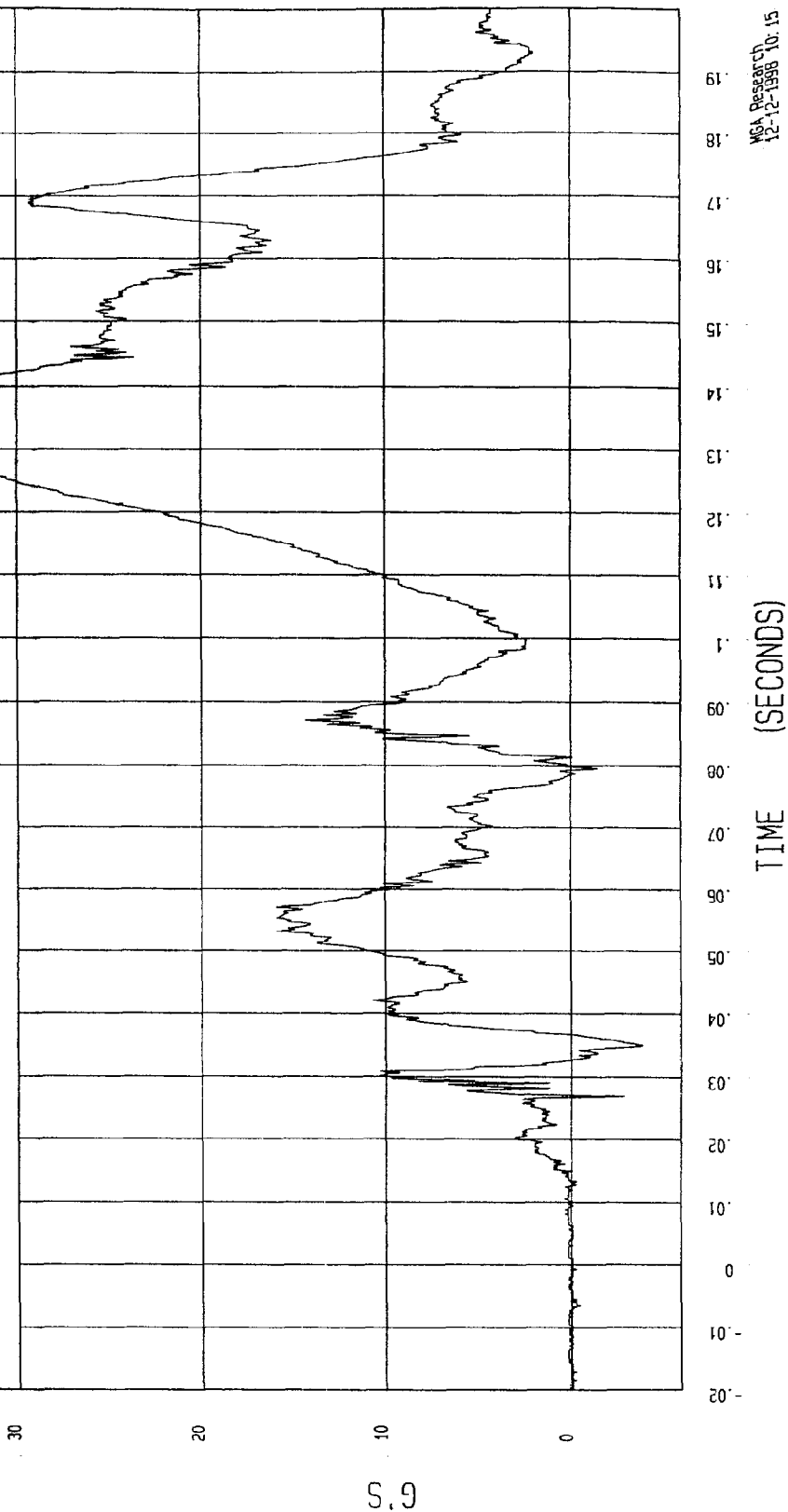
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Minimum = -3.9 G'S at 35 msec

Maximum = 36.62 G'S at 130 msec

DRIVER HEAD Z ACCELERATION

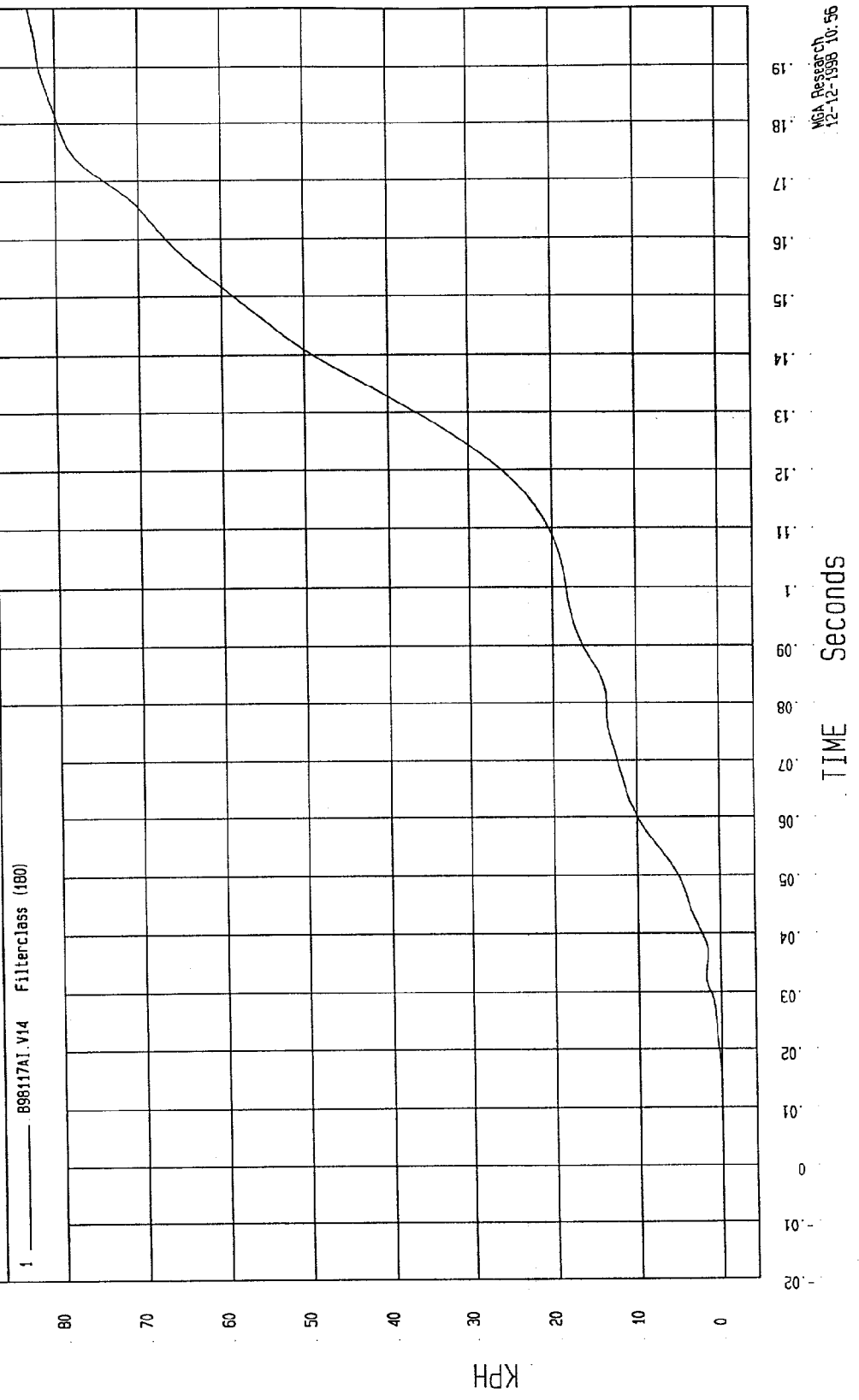
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MOA Research
12-12-1998 10:15

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH
Minimum = -7.16E-03 KPH at -16 msec Maximum = 83.21 KPH at 200 msec

DRIVER HEAD Z VELOCITY



WCA Research
12-12-1998 10:56

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

SPEED: 38.3 MPH 61.6 KPH

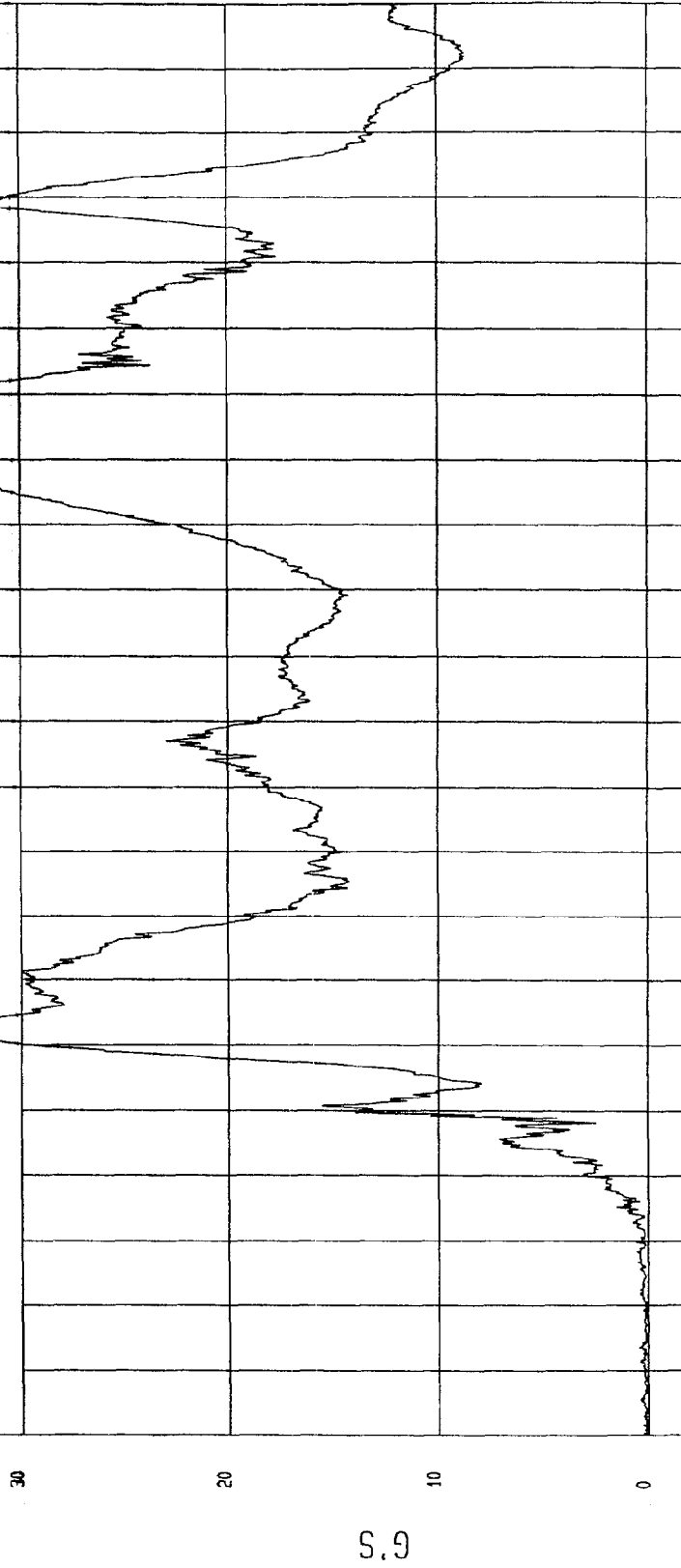
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 37.36 G's at 130 msec

Minimum = 9.77E-02 G's at -20 msec

DRIVER HEAD RESULTANT ACCELERATION

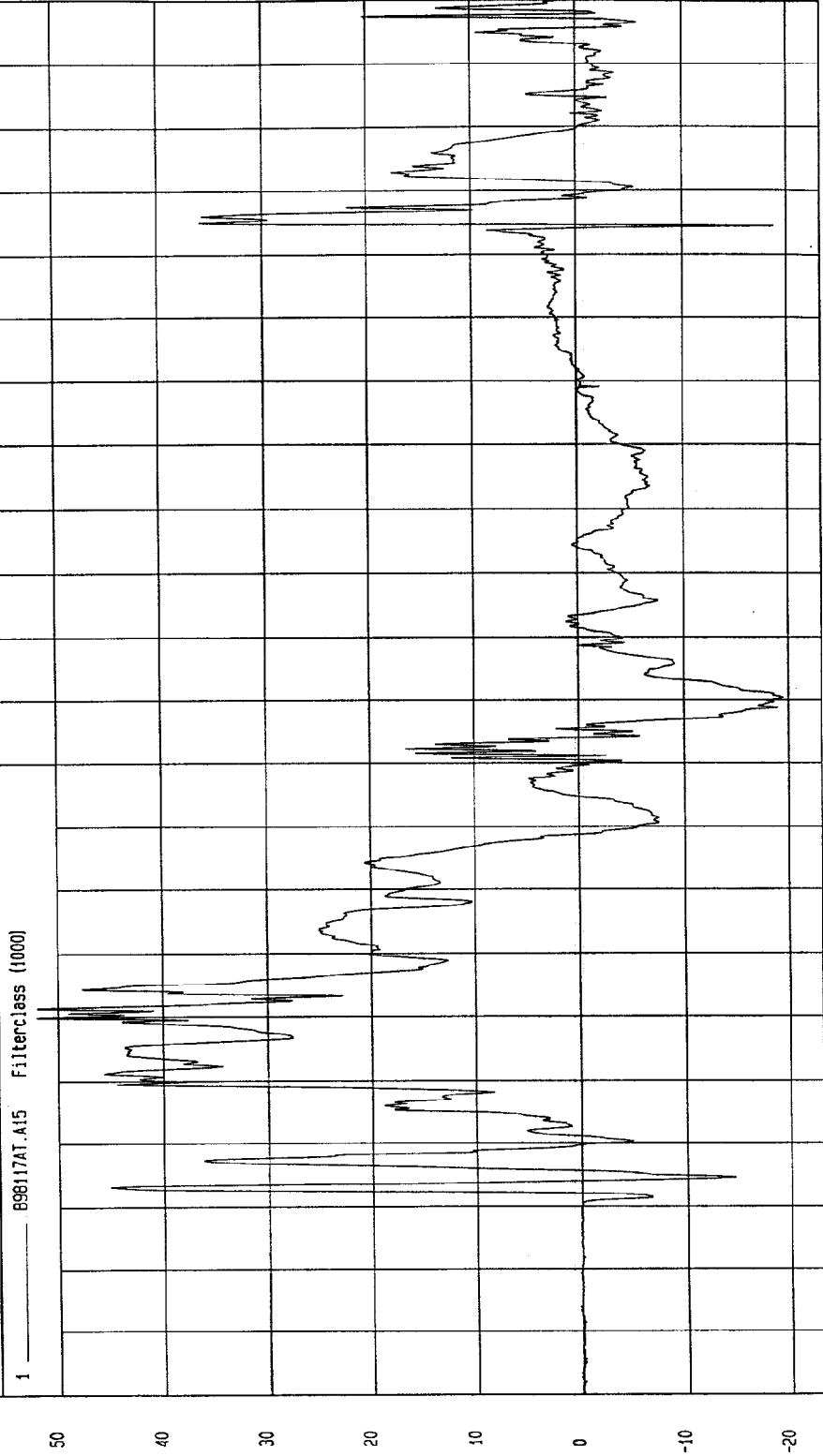
1 — 898117AV.A12 FilterClass (1000)



MCA Research
12-12-1998 10:15

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998
 COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH
 Minimum = -19.54 G'S at 90 msec Maximum = 52.02 G'S at 40 msec

DRIVER UPPER RIB Y ACCELERATION



MCA Research
 12-12-1998 10:19

TIME (SECONDS)

G'S

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

Speed: 38.3 MPH 61.6 KPH

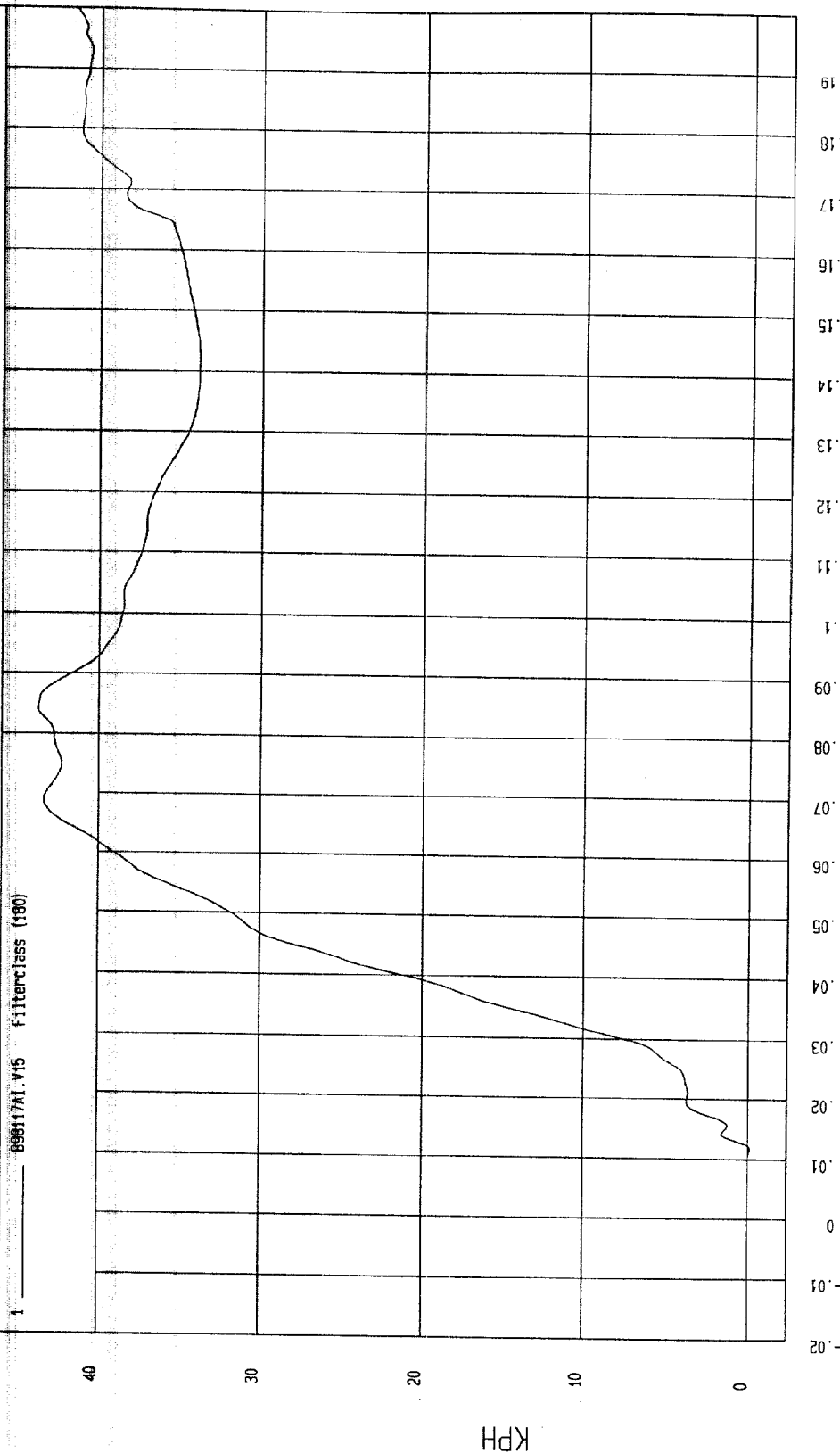
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 43.62 KPH at 84 msec

Minimum = -1.13 KPH at 12 msec

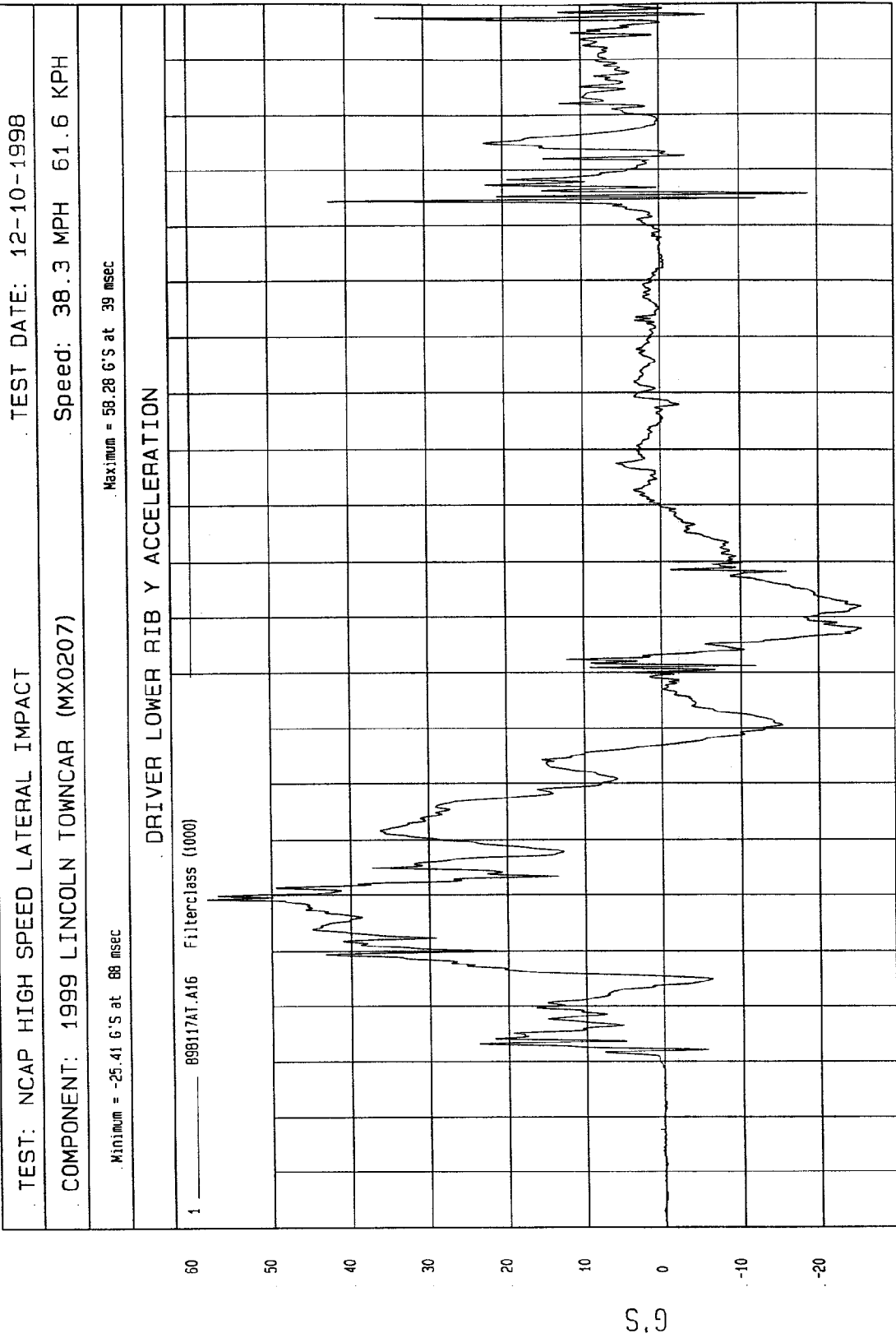
DRIVER UPPER RIB Y VELOCITY

1 B98117A1.V15 Filterclass (180)



MCA Research
12-12-1998 10:56

TIME Seconds



MCA Research
12-12-1998 10:19

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

Speed: 38.3 MPH 61.6 KPH

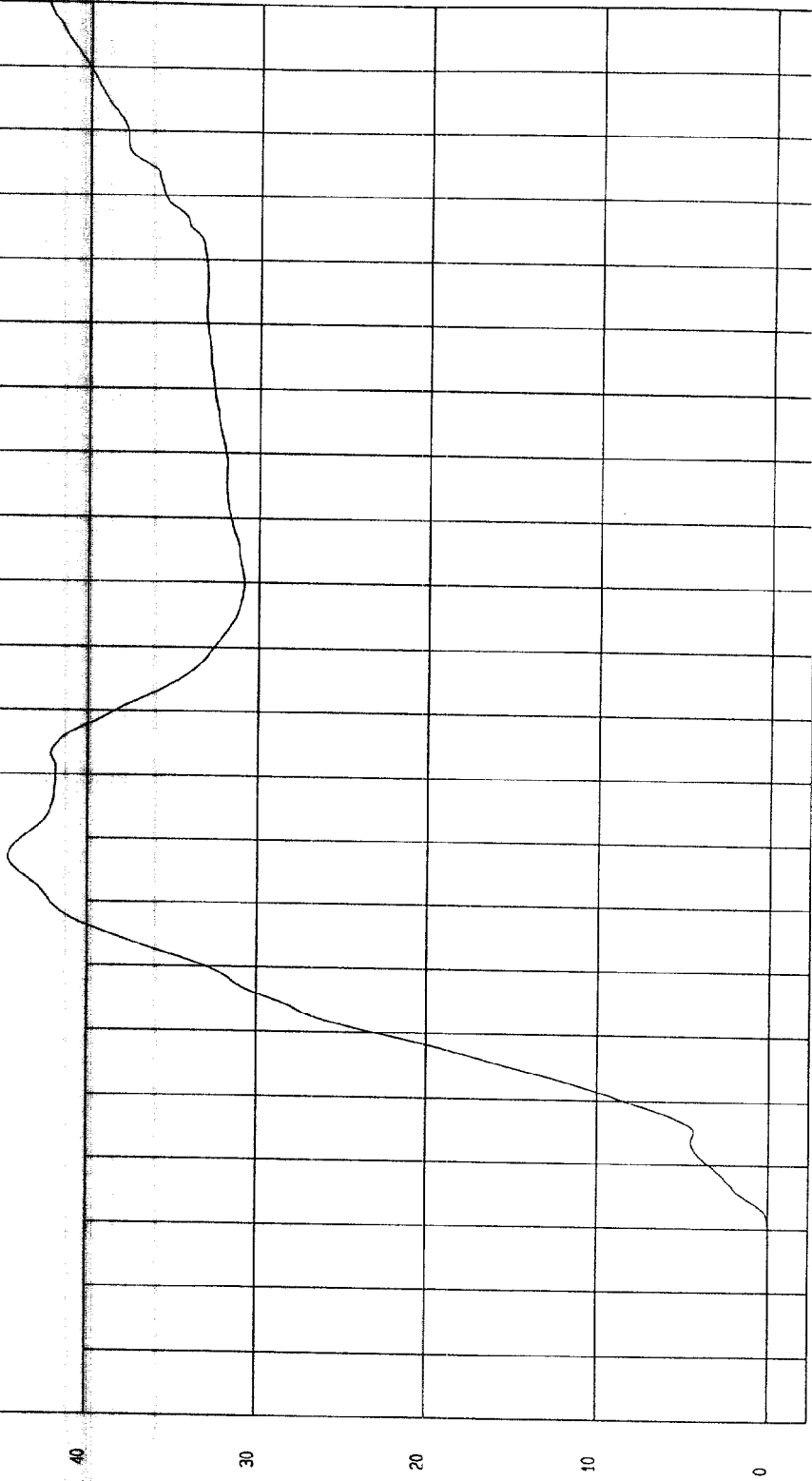
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 44.61 KPH at 67 msec

Minimum = -1.20E-02 KPH at -8 msec

DRIVER LOWER RIB Y VELOCITY

1 69817A1.V16 Filter:lass (180)



MOA Research
12-12-1998 10:56

TIME Seconds

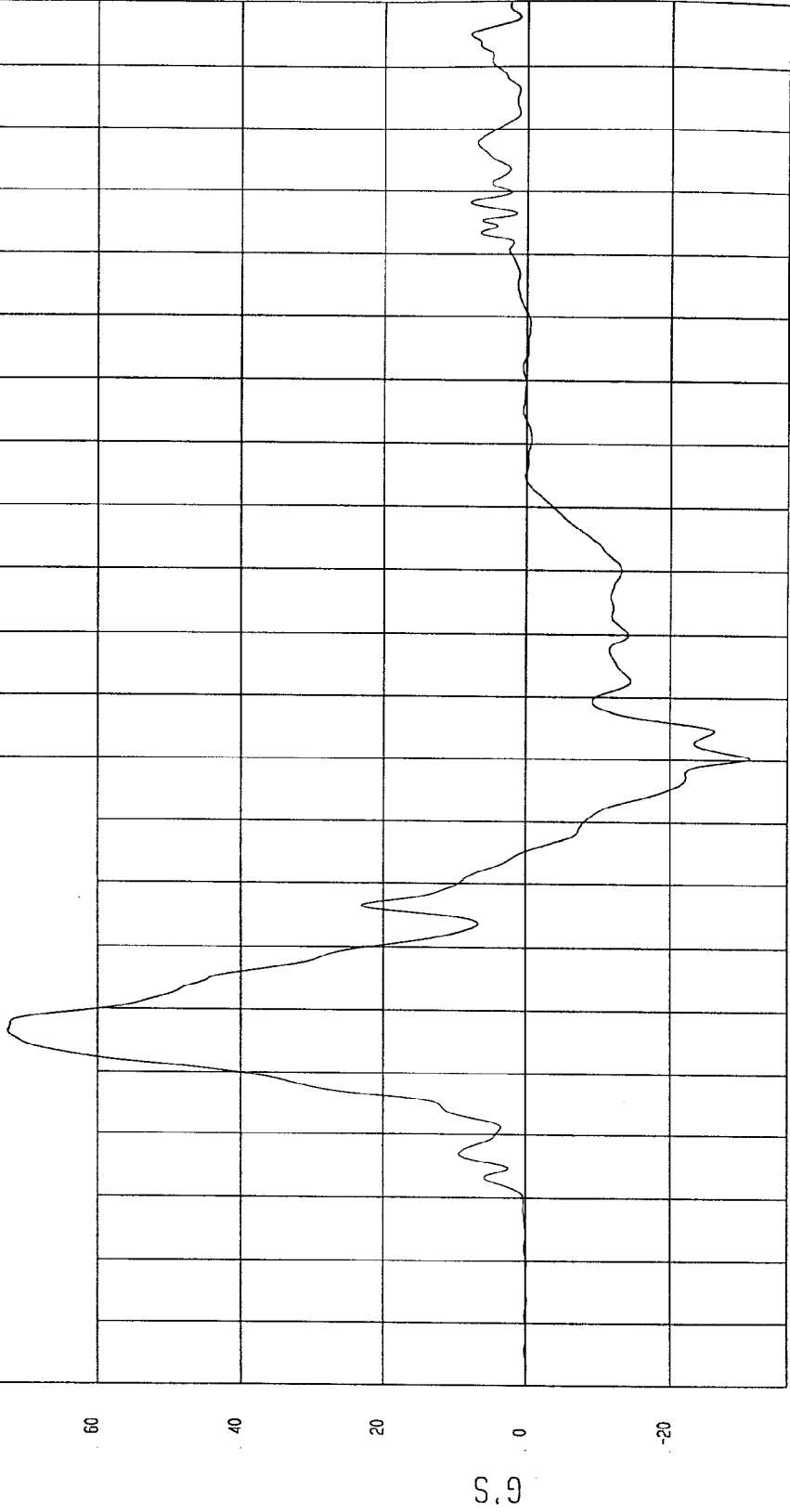
TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -31.1 G'S at 80 msec Maximum = 72.52 G'S at 36 msec

DRIVER LOWER SPINE Y ACCELERATION

1 _____ B98117AF.A17 Filterclass (180)



MGA Research
12-12-1998 10:19

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

Speed: 38.3 MPH 61.6 KPH

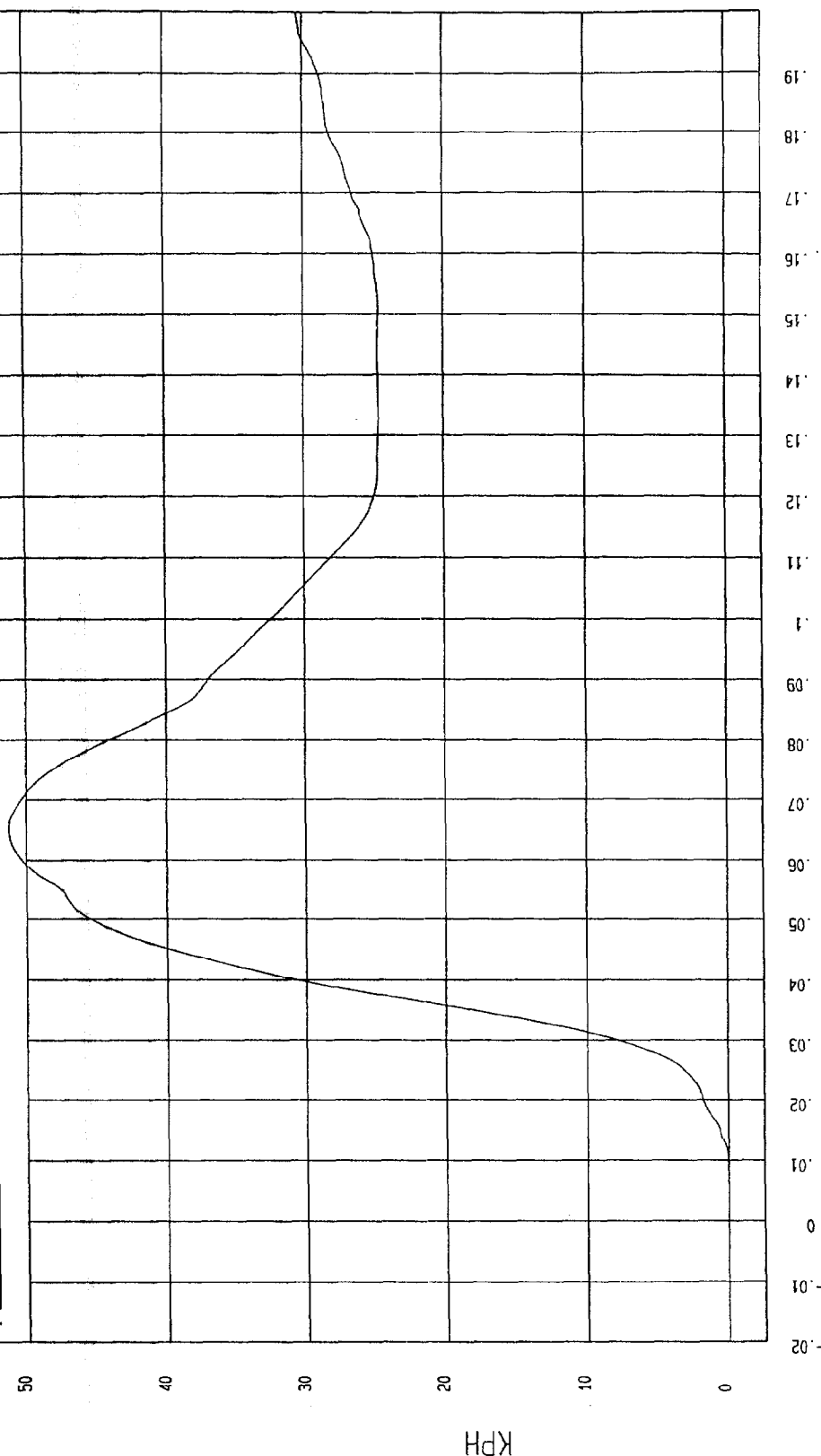
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 51.22 KPH at 65 msec

Minimum = -1.54E-02 KPH at 1 msec

DRIVER LOWER SPINE Y VELOCITY

1 ——— 898117A1.V17 Filterclass (180)



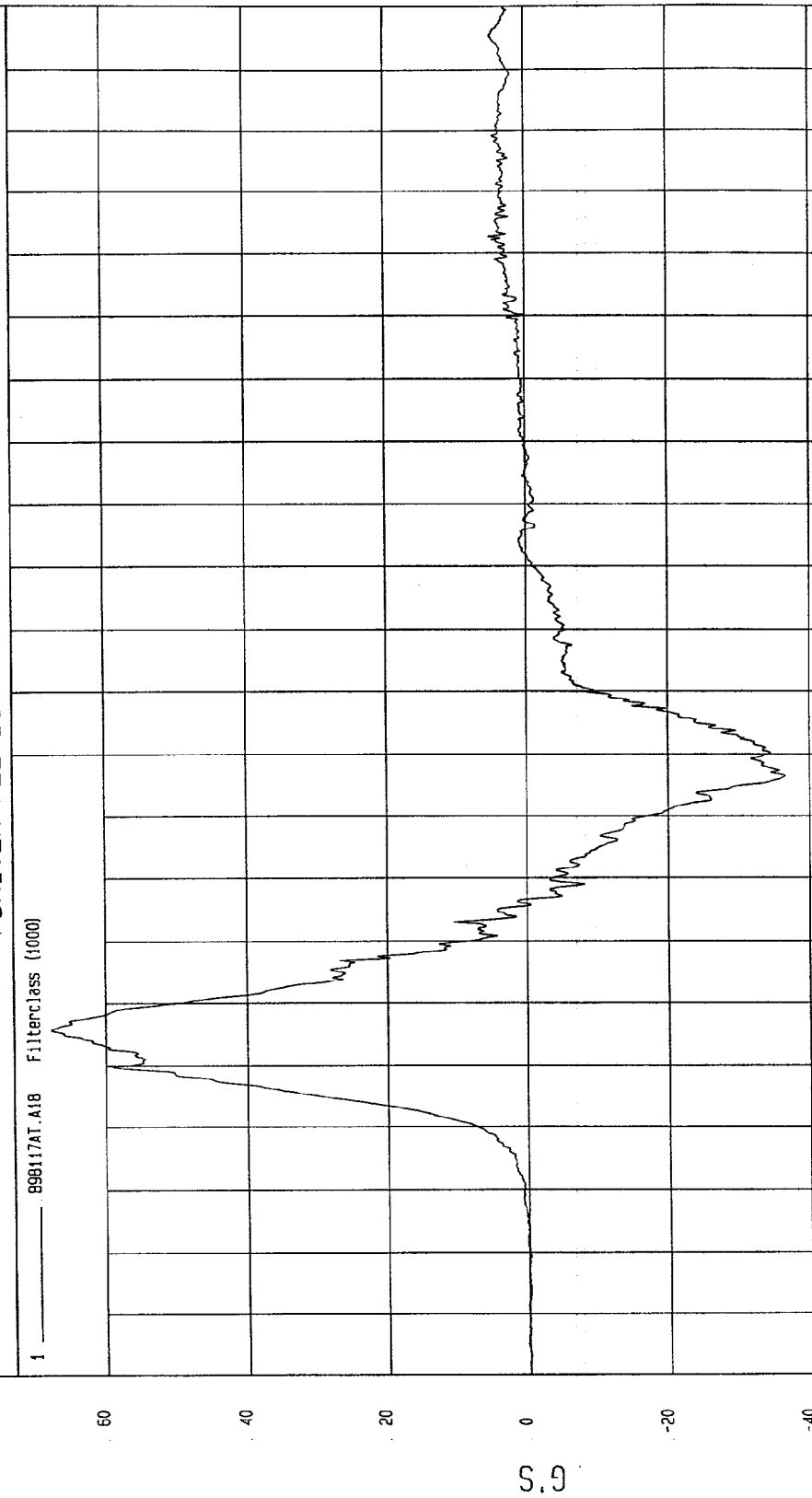
MCA Research
12-12-1998 10:56

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -36.55 G'S at 76 msec Maximum = 67.69 G'S at 36 msec

DRIVER PELVIS Y ACCELERATION



NGA Research
12-12-1998 10:19

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

Speed: 38.3 MPH 61.6 KPH

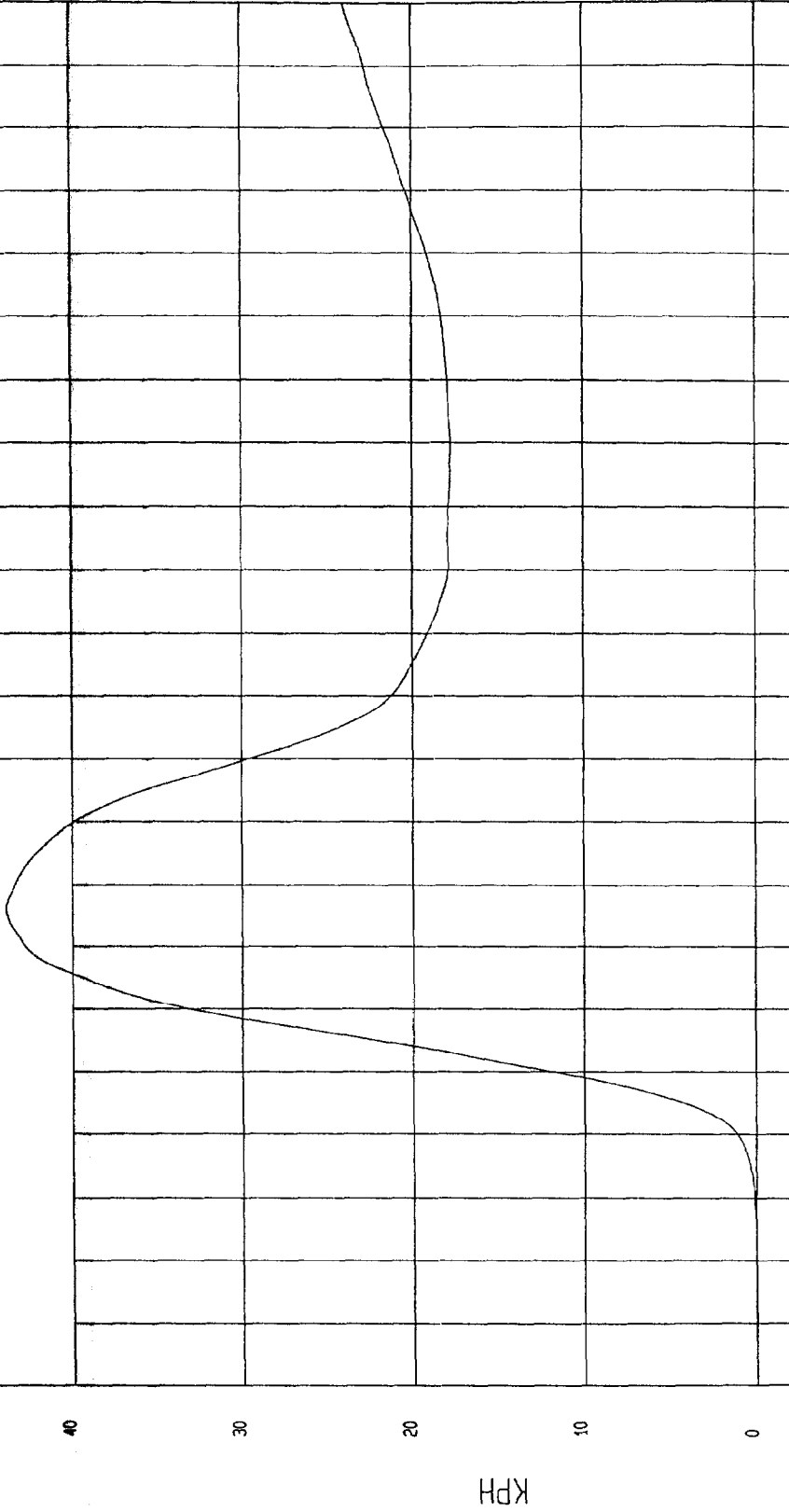
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 43.9 KPH at 56 msec

Minimum = -3.08E-03 KPH at -16 msec

DRIVER PELVIS Y VELOCITY

1 898117A1.VIB Filterclass (180)

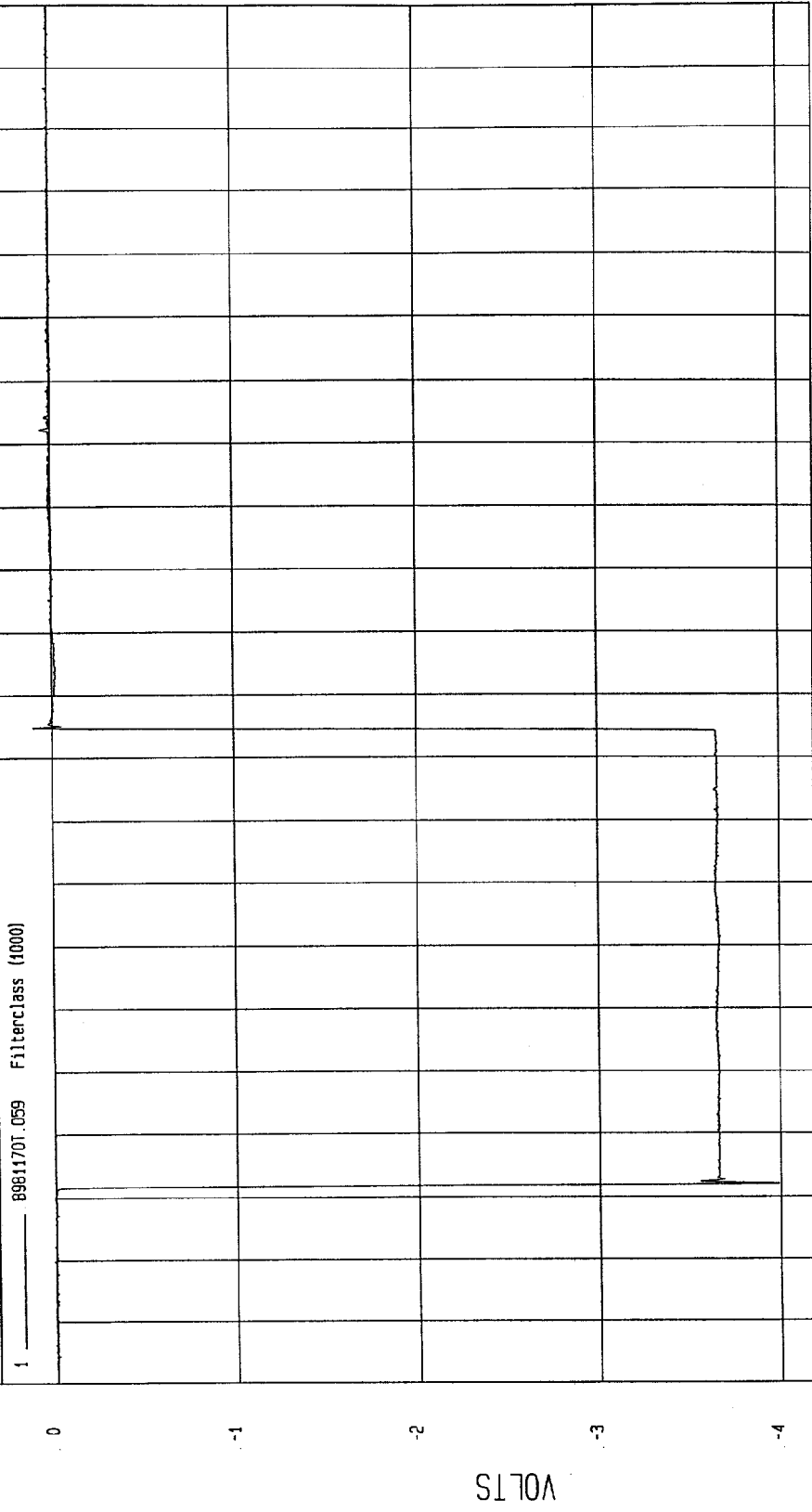


MGA Research
12-12-1998 10:56

TIME Seconds

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH
Minimum = -3.99 VOLTS at 12 msec Maximum = .11 VOLTS at 85 msec

DRIVER SHOULDER CONTACT



MGA Research
12-12-1998 10:17

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

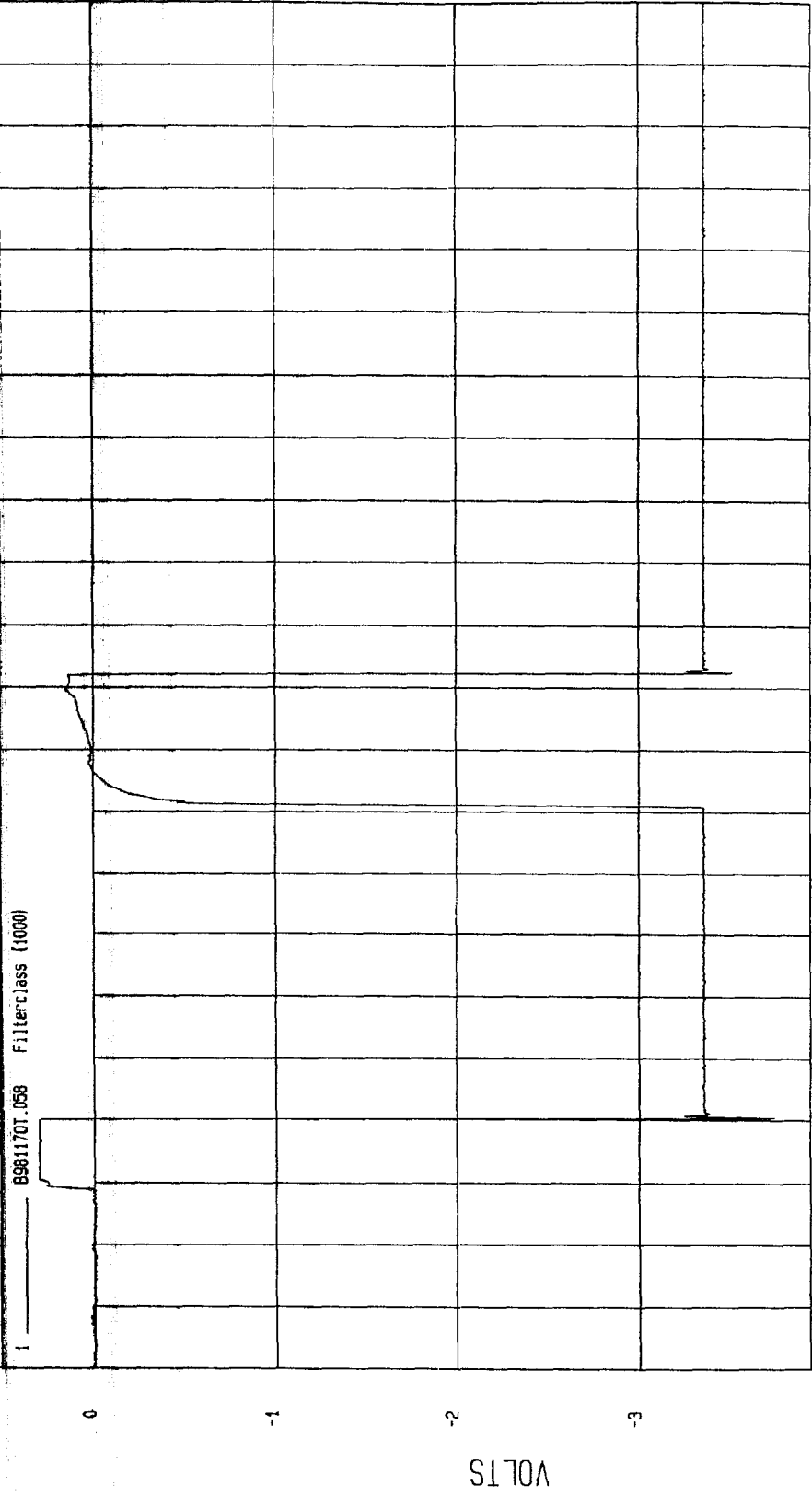
SPEED: 38.3 MPH 61.6 KPH

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Minimum = -3.74 VOLTS at 20 msec

Maximum = .31 VOLTS at 12 msec

DRIVER PELVIS CONTACT



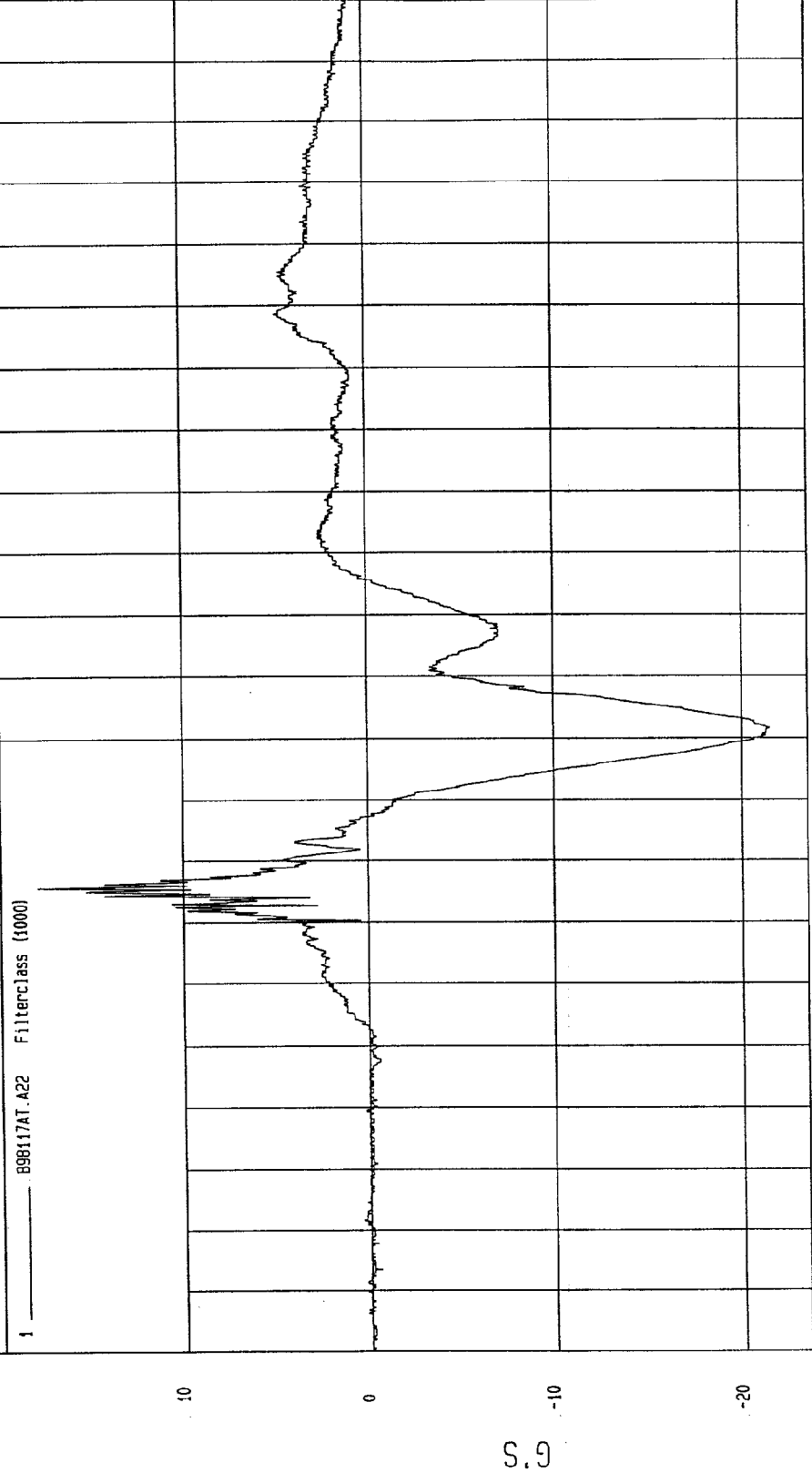
MGA Research
12-12-1998 10:17

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -21.46 G'S at 82 msec Maximum = 17.76 G'S at 56 msec

REAR PASSENGER HEAD X ACCELERATION



MSA Research
12-12-1998 10:15

TIME (SECONDS)

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

Speed: 38.3 MPH 61.6 KPH

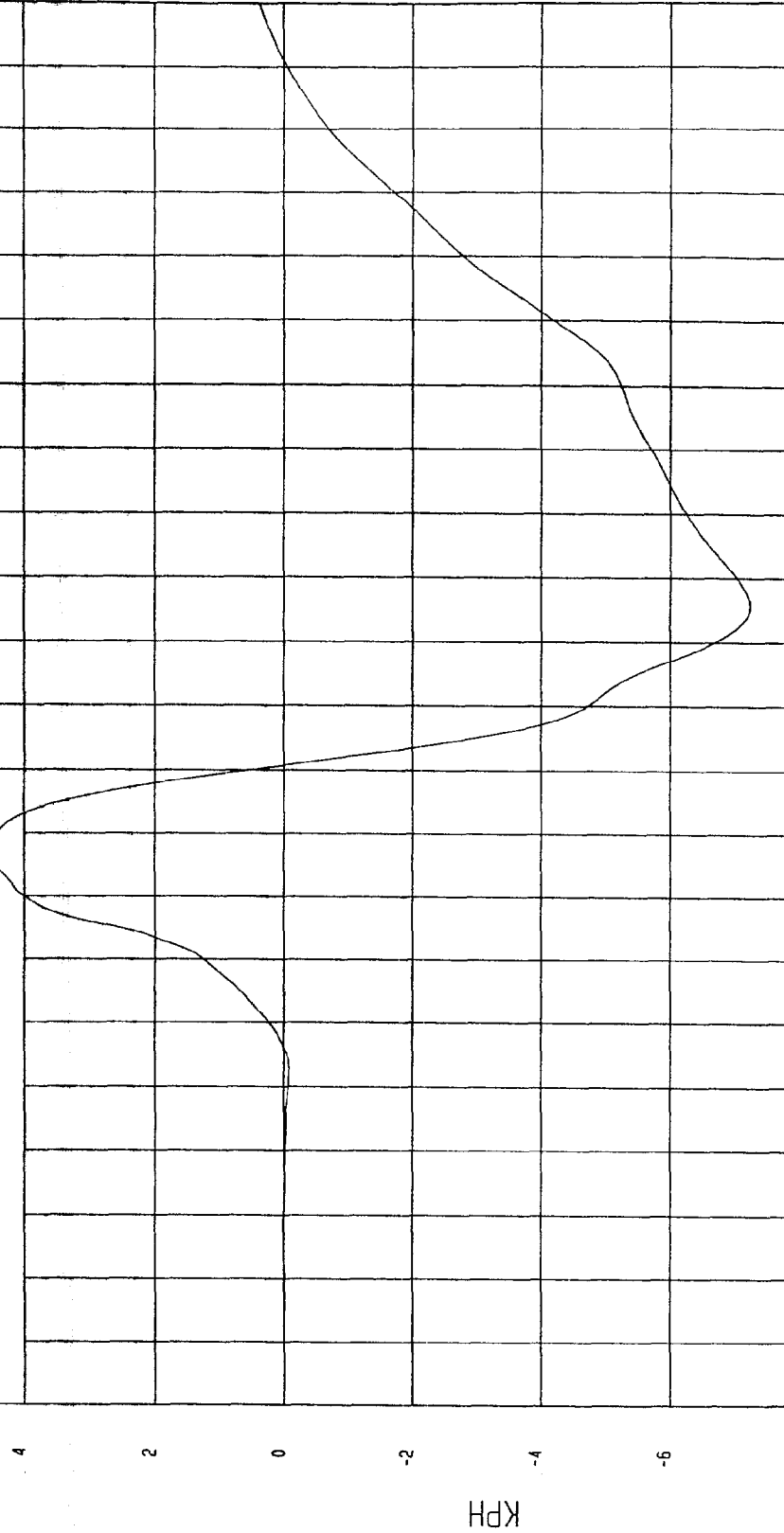
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 4.51 KPH at 67 msec

Minimum = -7.24 KPH at 106 msec

REAR PASSENGER HEAD X VELOCITY

1 ——— 89817A1.V22 Filterclass (180)



TIME Seconds

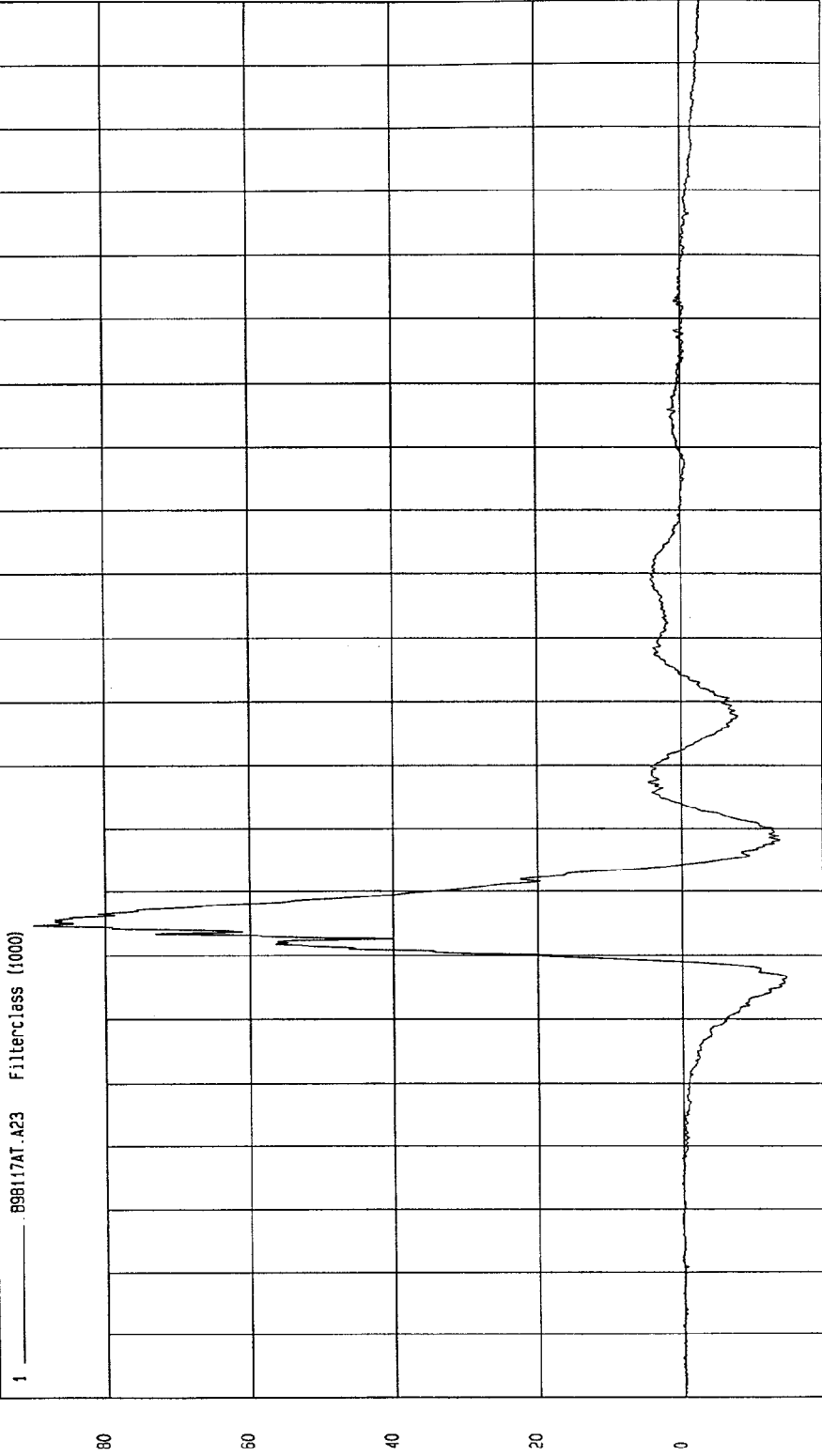
MGA Research
12-12-1998 10:56

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -14.25 G'S at 46 msec Maximum = 89.96 G'S at 55 msec

REAR PASSENGER HEAD Y ACCELERATION



TIME (SECONDS)

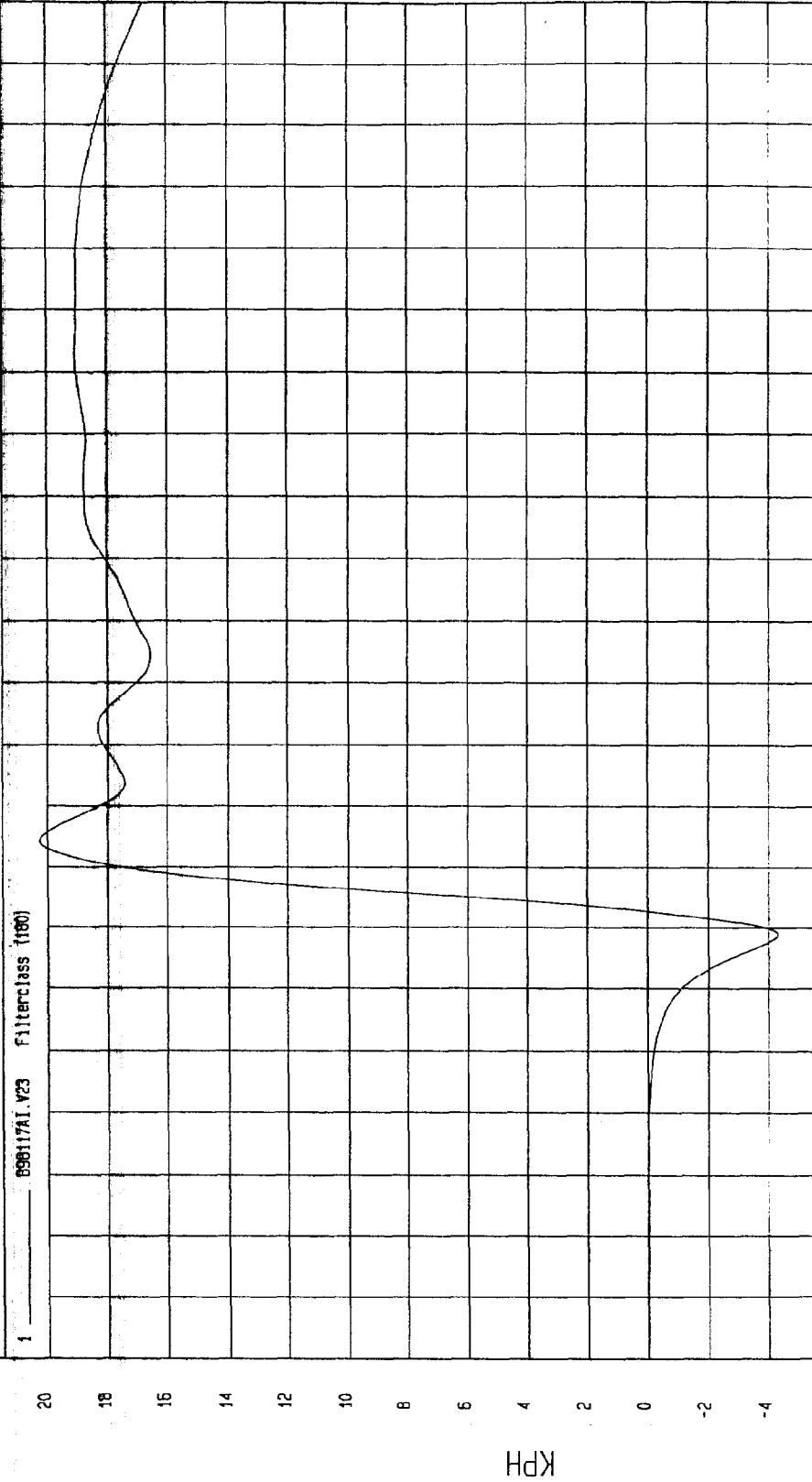
NGA Research
12-12-1998 10:15

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -4.3 KPH at 49 msec Maximum = 20.26 KPH at 64 msec

REAR PASSENGER HEAD Y VELOCITY



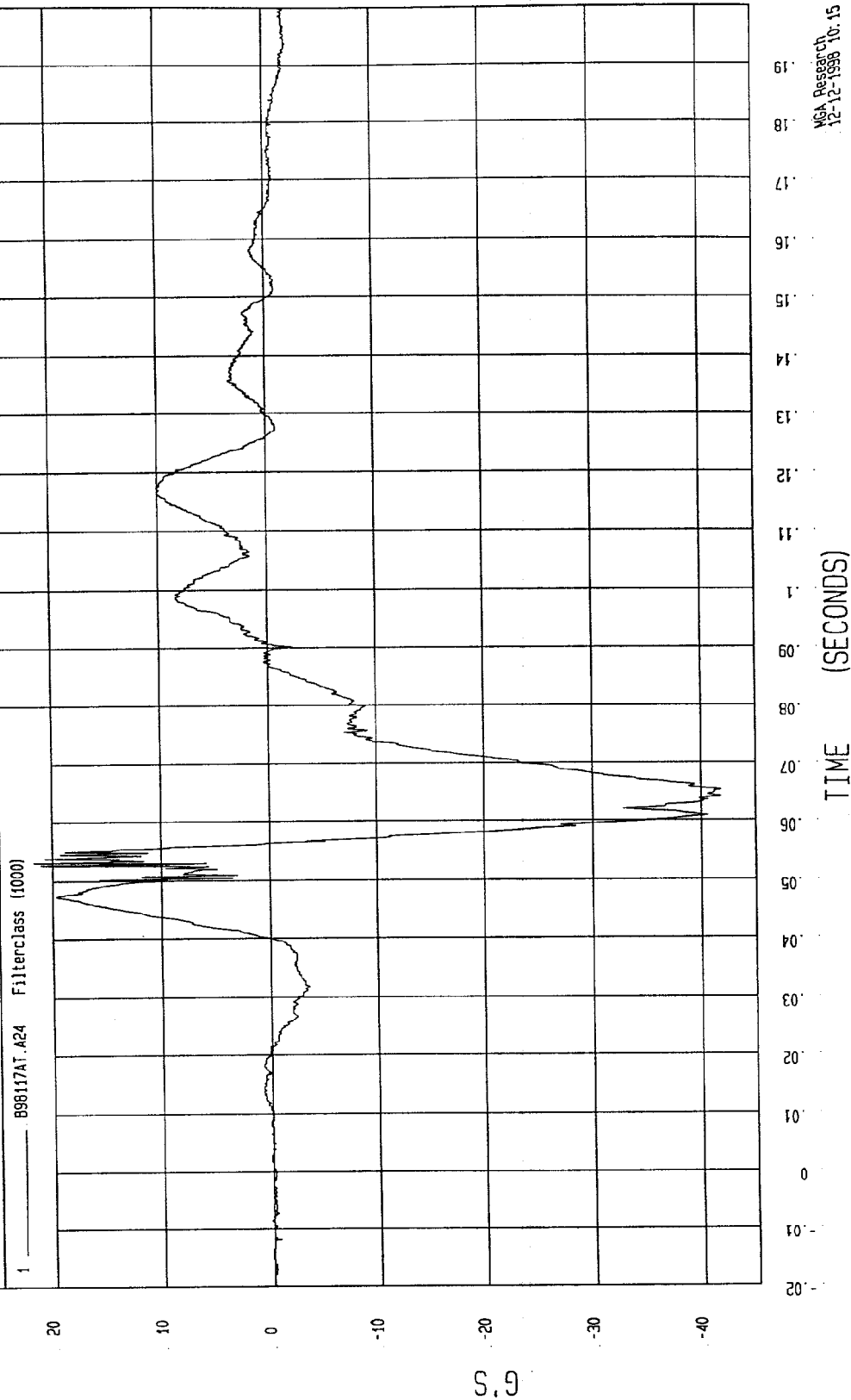
MGA Research
12-12-1998 10:56

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -41.86 G'S at 64 msec Maximum = 21.67 G'S at 53 msec

REAR PASSENGER HEAD Z ACCELERATION



TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

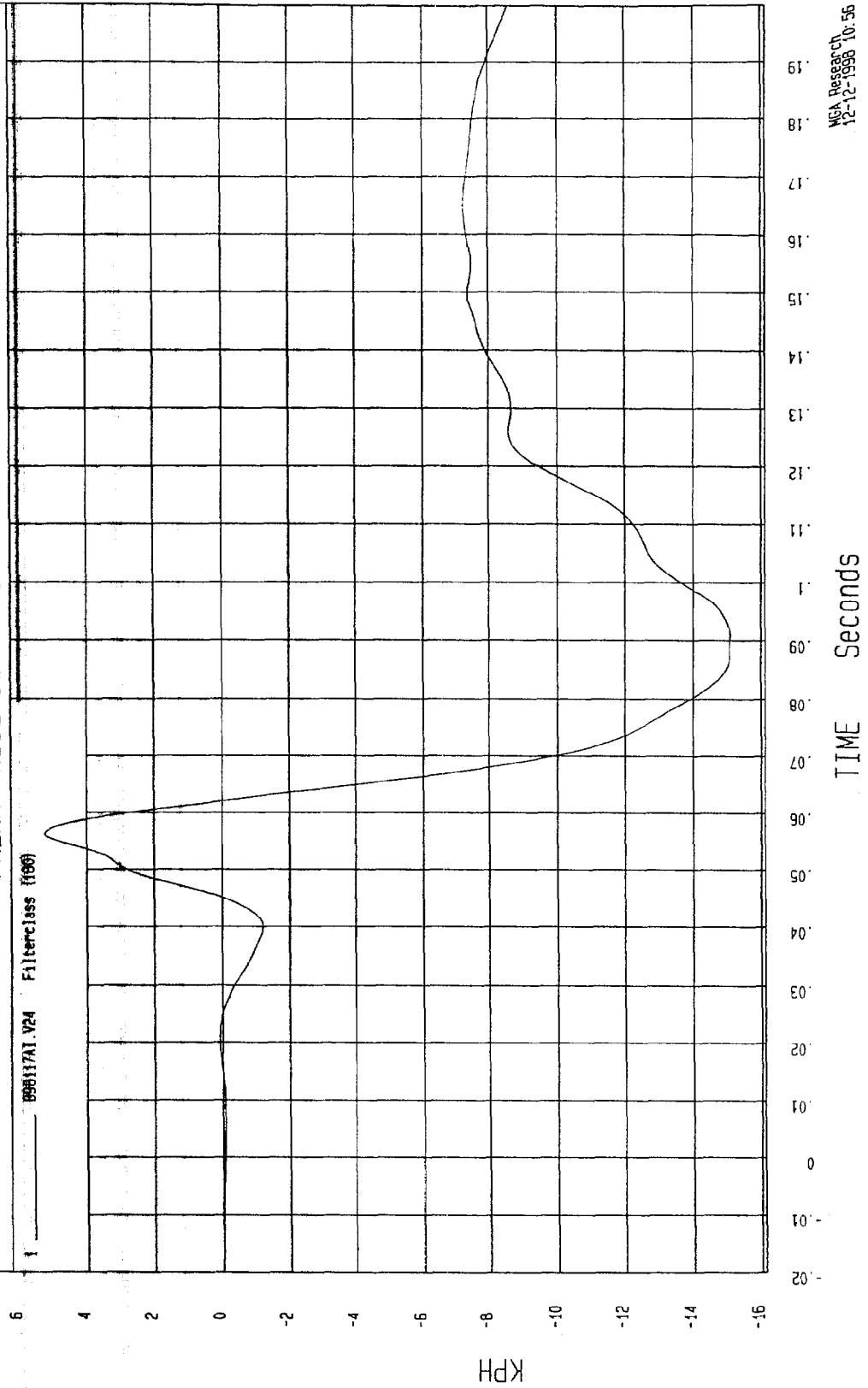
Speed: 38.3 MPH 61.6 KPH

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 5.21 KPH at 56 msec

Minimum = -15.1 KPH at 91 msec

REAR PASSENGER HEAD Z VELOCITY

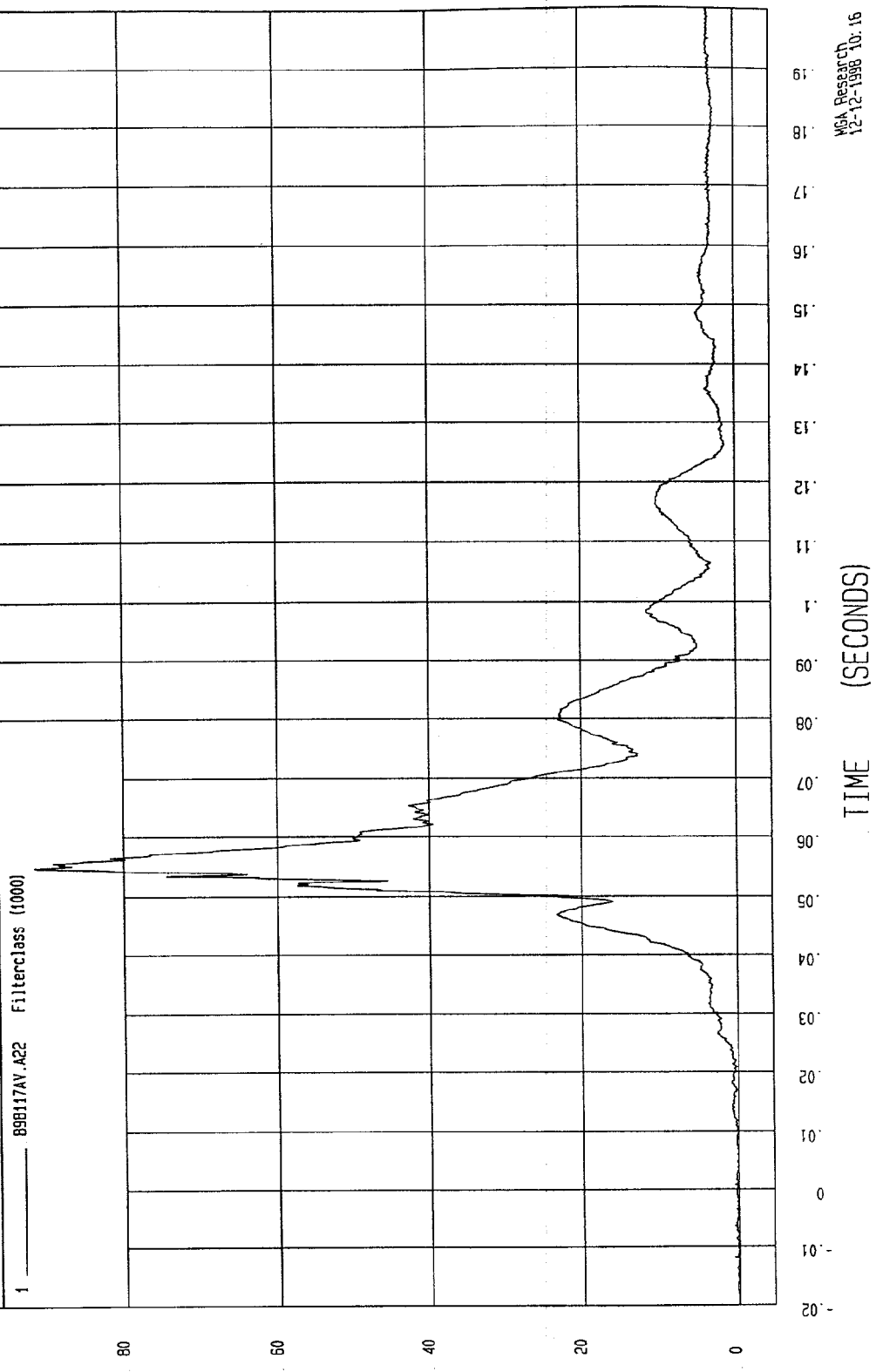


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = 7.34E-02 G'S at -20 msec Maximum = 91.73 G'S at 55 msec

REAR PASSENGER HEAD RESULTANT ACCELERATION



G.S

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

Speed: 38.3 MPH 61.6 KPH

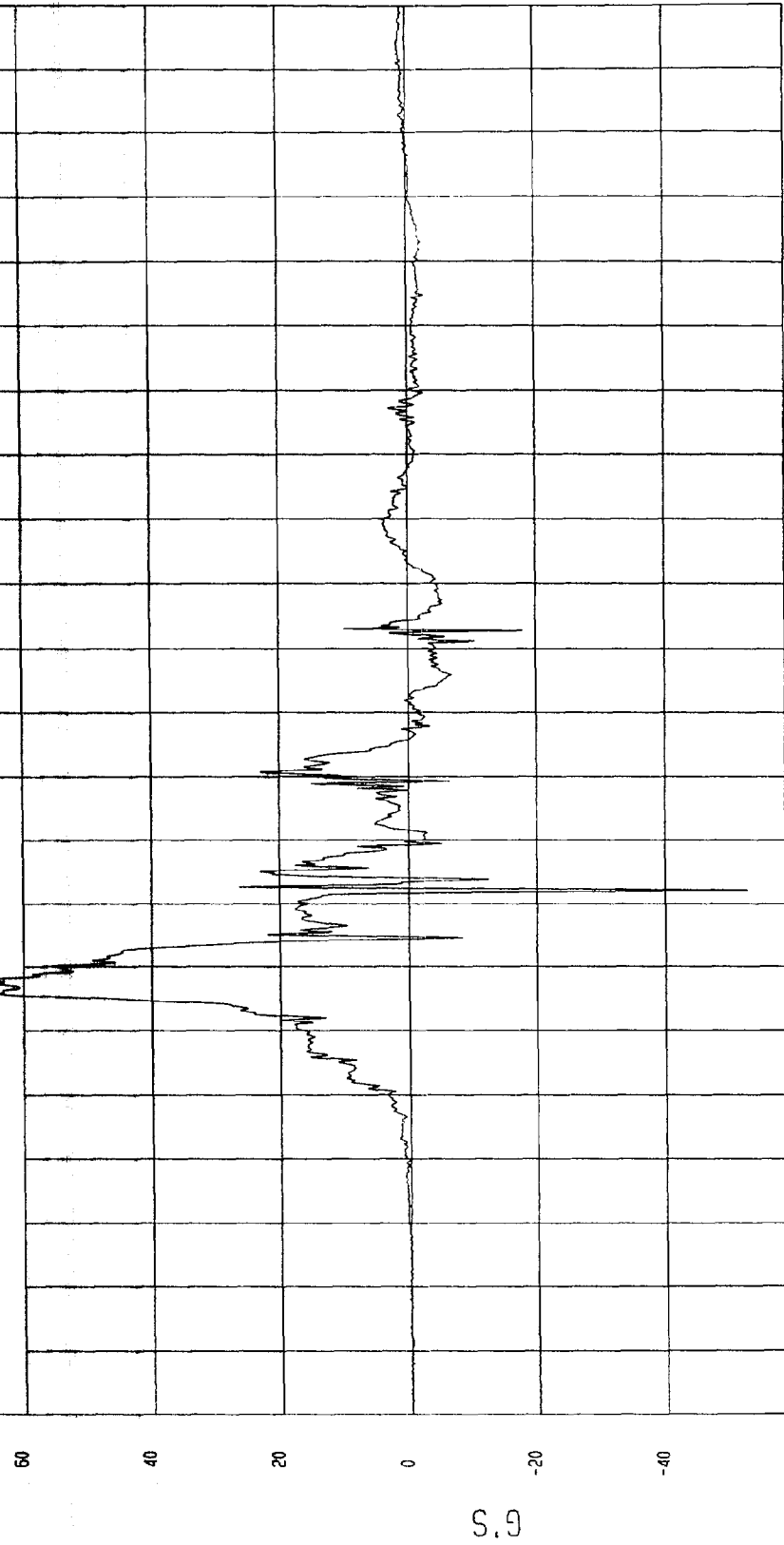
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 65.29 G'S at 48 msec

Minimum = -52.74 G'S at 62 msec

REAR PASSENGER UPPER RIB Y ACCELERATION

1 B9817AT.A25 Filterclass (1000)



MSA Research
12-12-1998 10:20

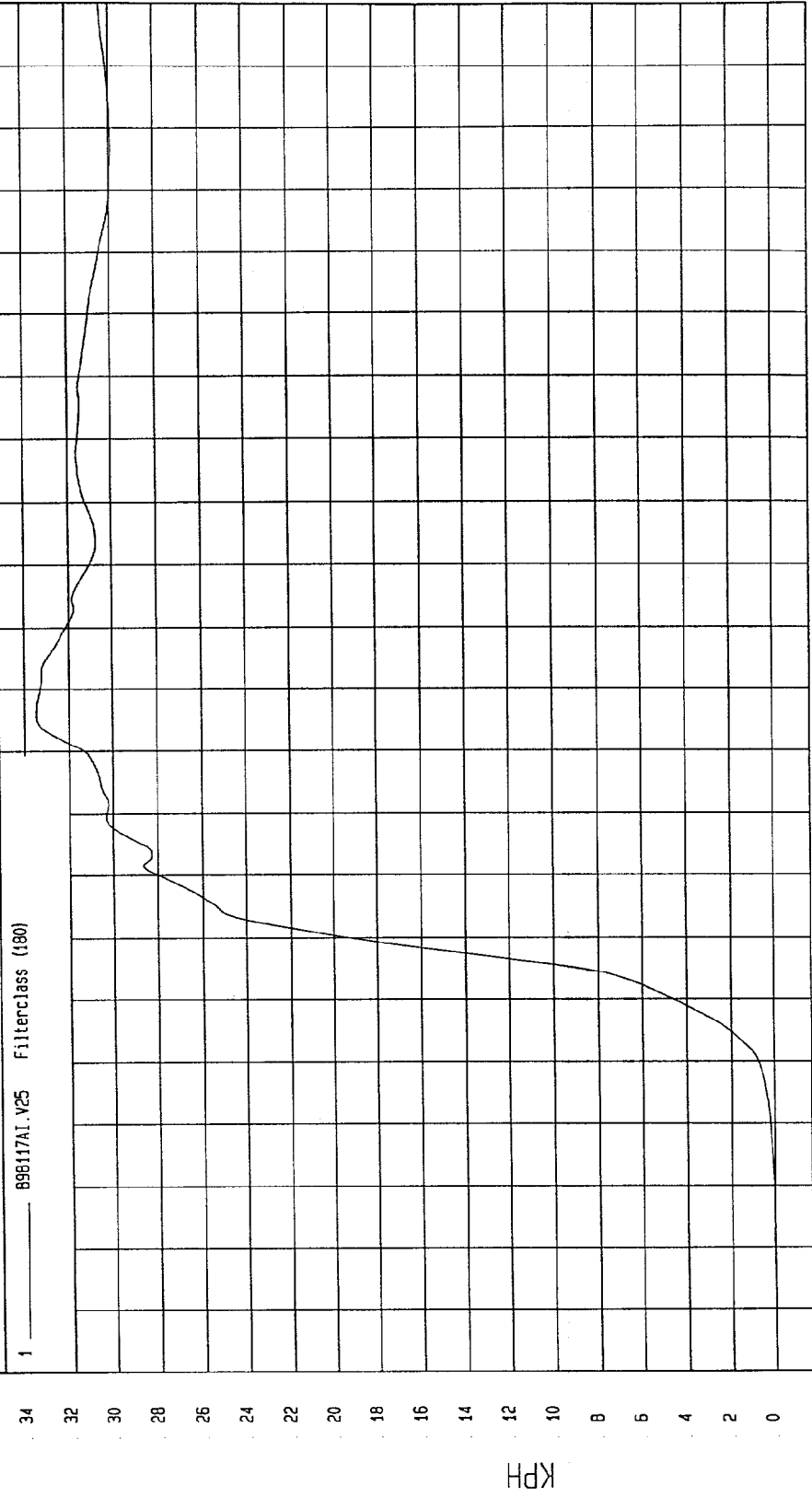
TIME (SECONDS)

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -5.32E-04 KPH at -20 msec Maximum = 33.49 KPH at 86 msec

REAR PASSENGER UPPER RIB Y VELOCITY



MECA Research
12-12-1998 10:56

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

SPEED: 38.3 MPH 61.6 KPH

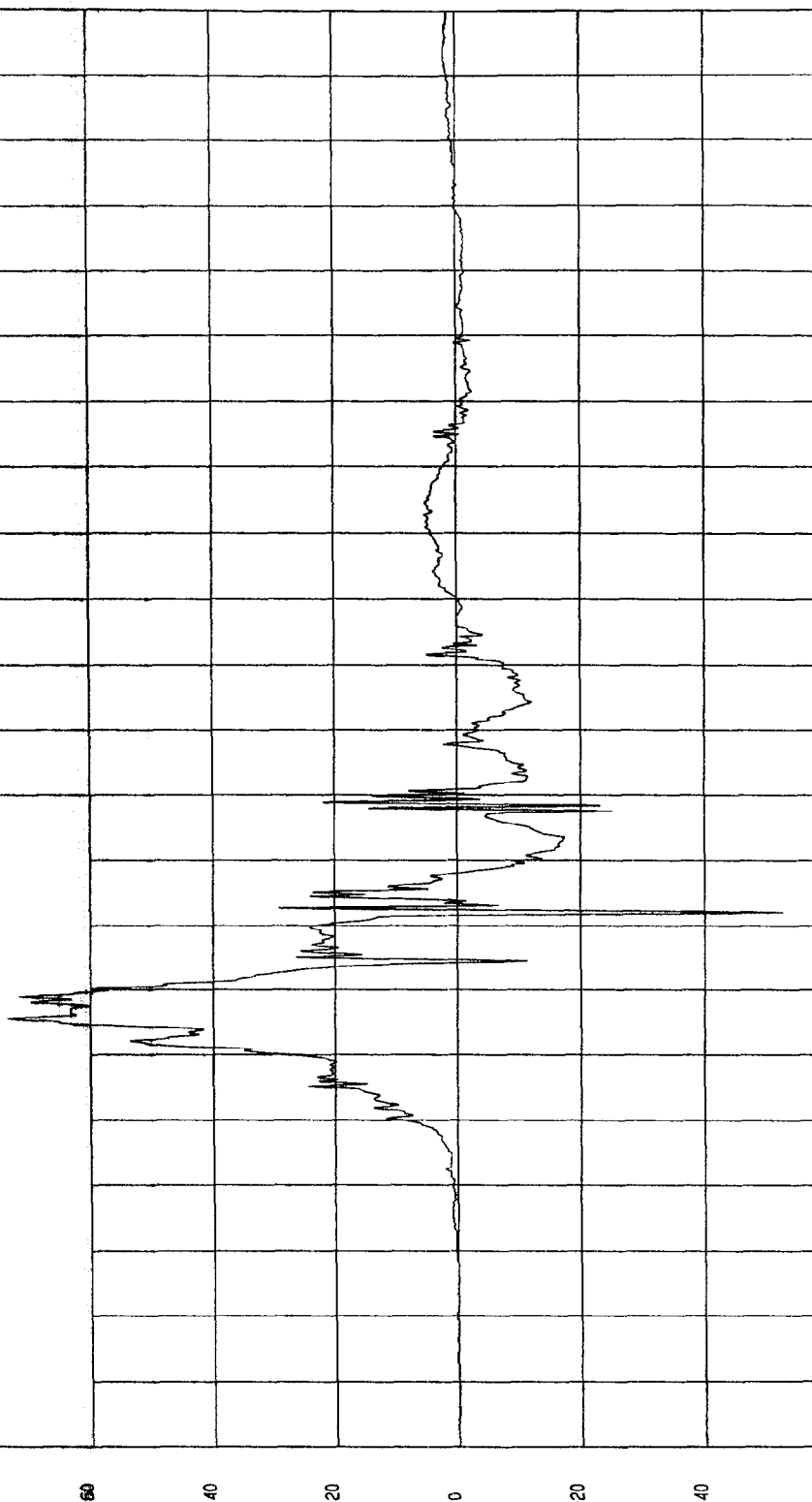
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 73.41 G'S at 46 msec

Minimum = -52.71 G'S at 52 msec

REAR PASSENGER LOWER RIB Y ACCELERATION

1 898117AT.A26 F11terc1ass (1000)



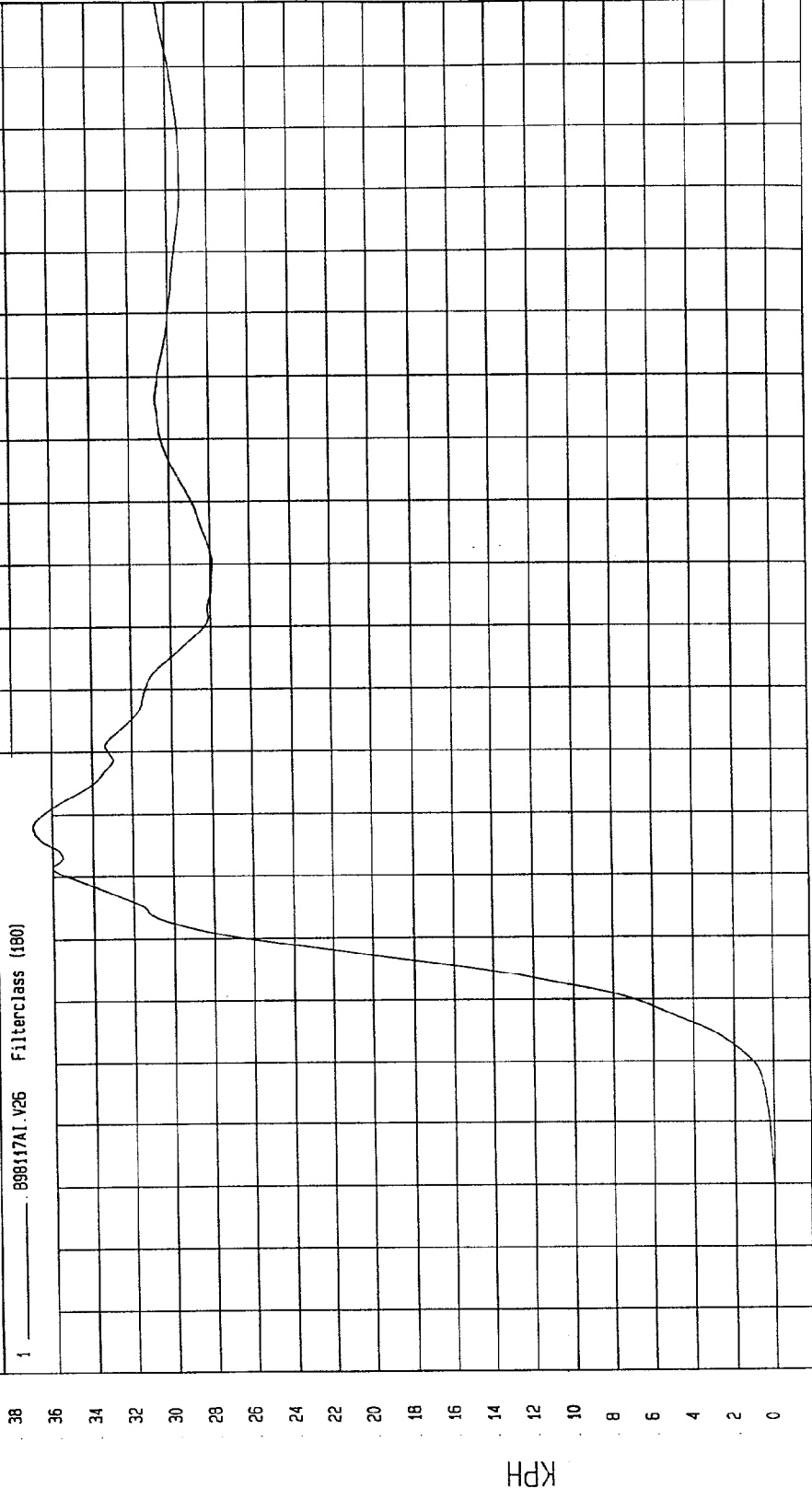
MSA Research
12-12-1998 10:20

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -1.88E-03 KPH at -8 msec Maximum = 36.95 KPH at 68 msec

REAR PASSENGER LOWER RIB Y VELOCITY



TIME Seconds

MCA Research
12-12-1998 10:56

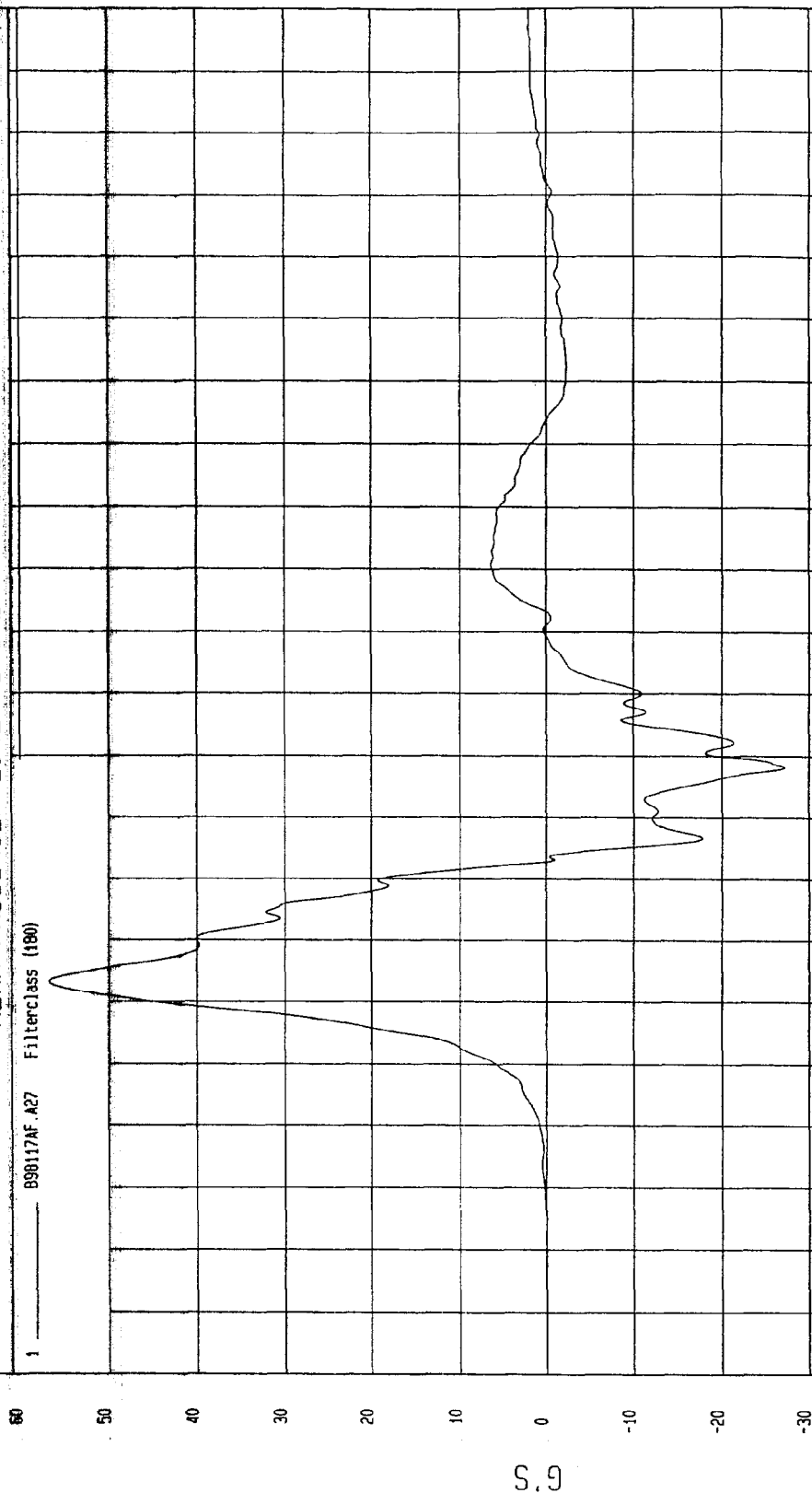
TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -27.27 G'S at 78 msec Maximum = 56.8 G'S at 43 msec

REAR PASSENGER LOWER SPINE Y ACCELERATION

1 B9817AF.A27 FilterClass (180)



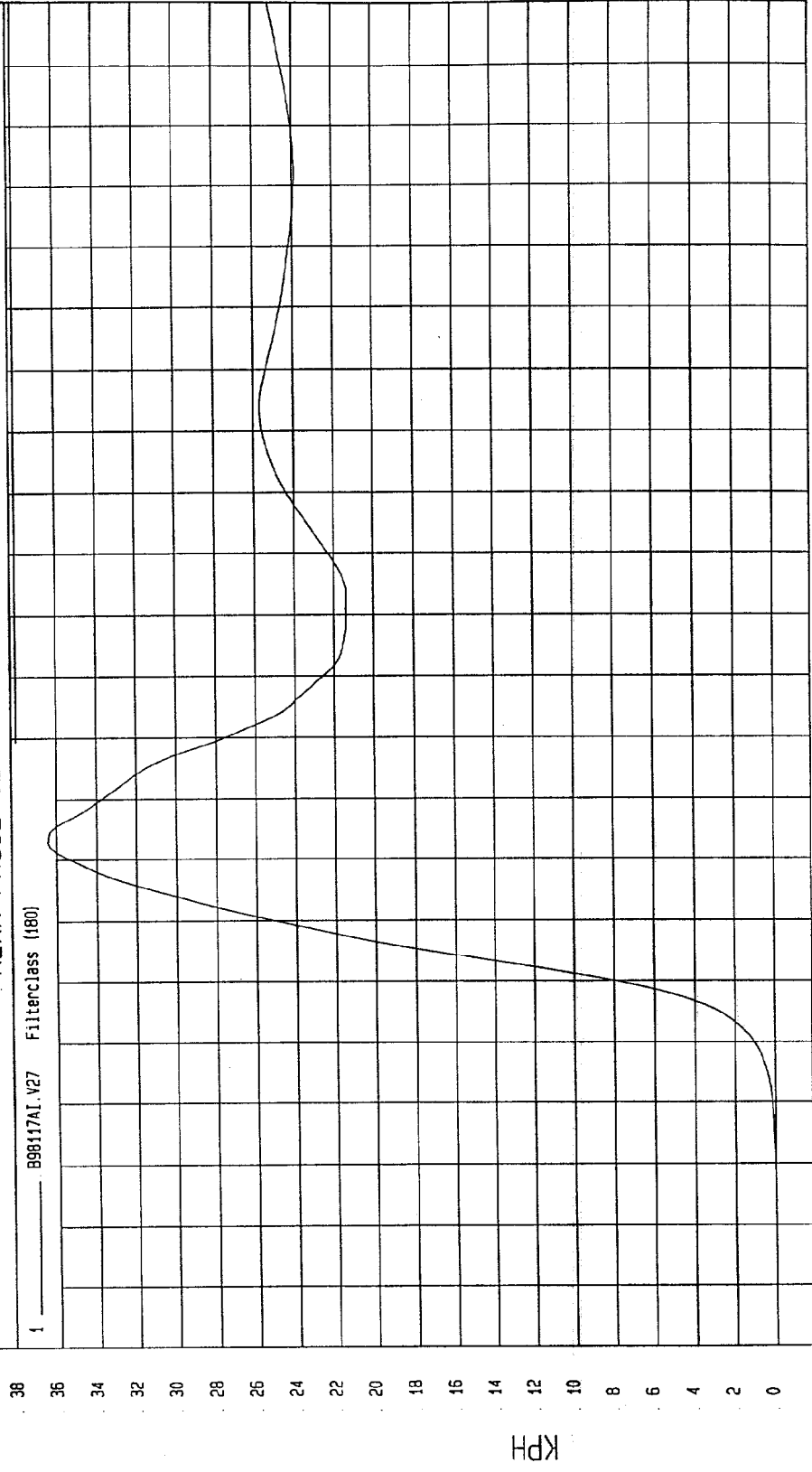
MCA Research
12-12-1998 10:20

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -9.12E-03 KPH at 1 msec Maximum = 36.42 KPH at 63 msec

REAR PASSENGER LOWER SPINE Y VELOCITY



TIME Seconds

MSA Research
12-12-1998 10:56

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

SPEED: 38.3 MPH 61.6 KPH

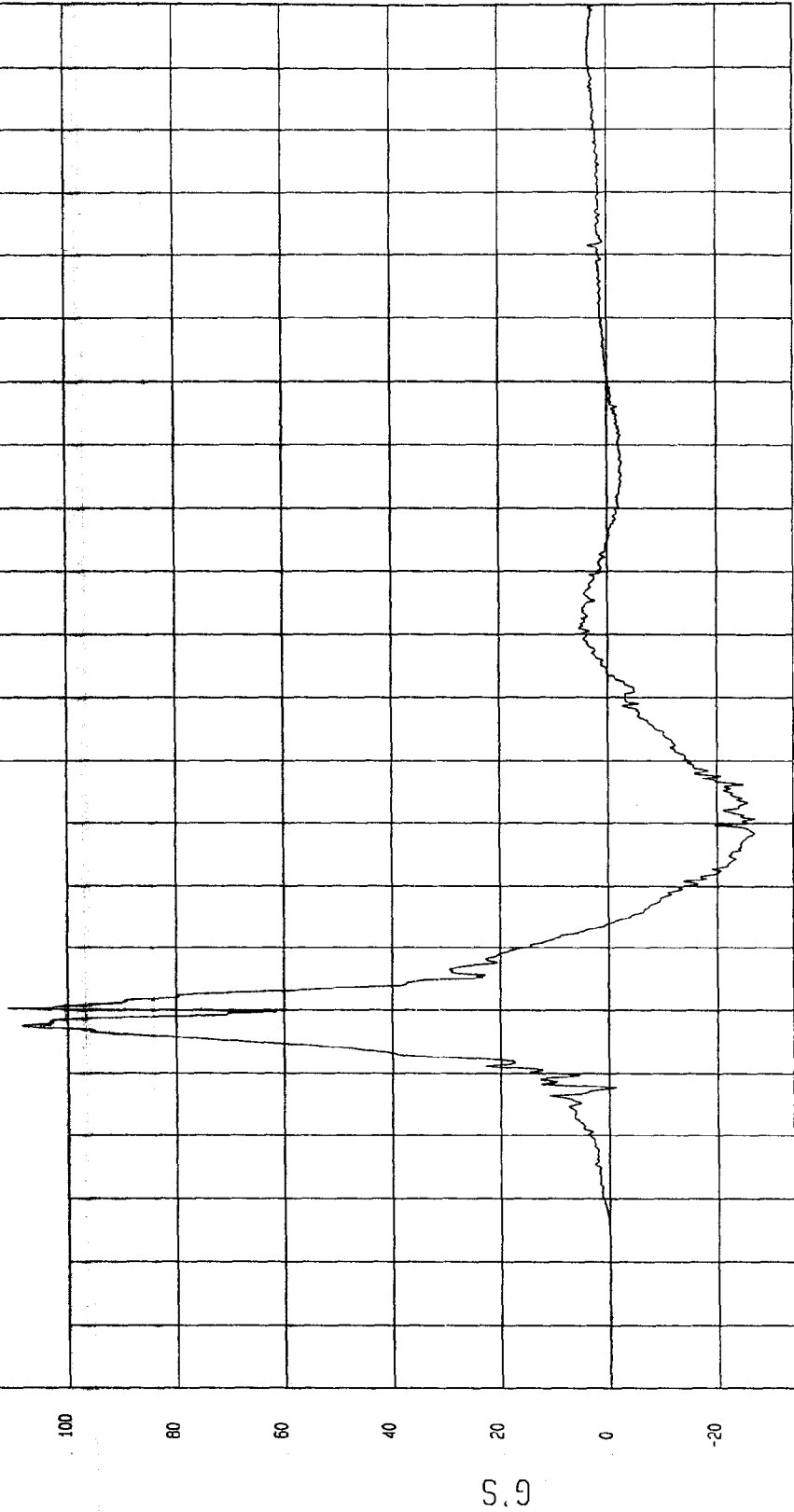
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 110.94 G'S at 40 msec

Minimum = -26.97 G'S at 71 msec

REAR PASSENGER PELVIS Y ACCELERATION

1 890117AT.A20 Filterclass (1000)



WGA Research
12-12-1998 10:20

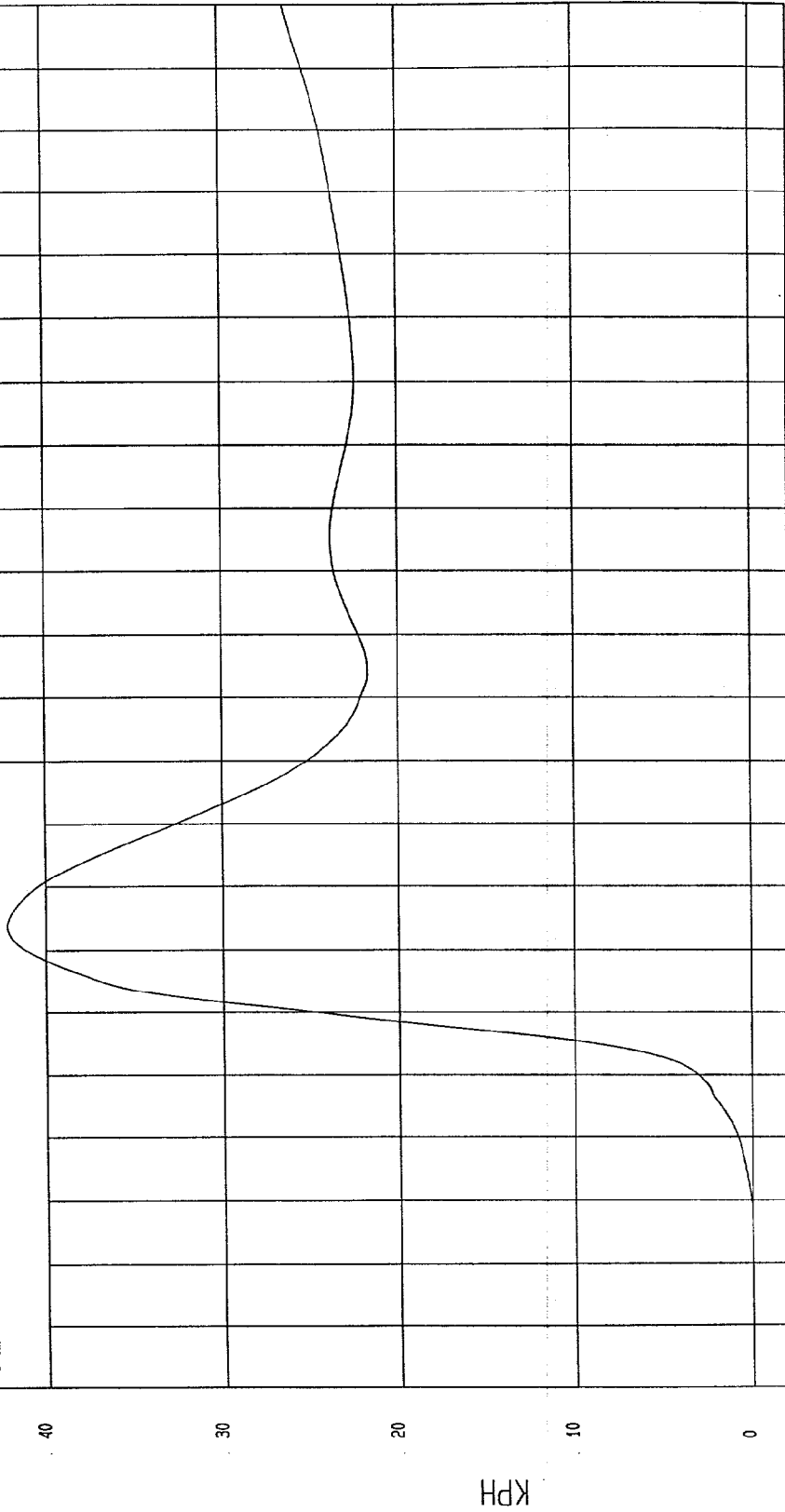
TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -0.44E-04 KPH at -8 msec Maximum = 42.16 KPH at 54 msec

REAR PASSENGER PELVIS Y VELOCITY

1 _____ 098117A1.V28 Filterclass (100)



TIME Seconds

WCA Research
12-12-1998 10:56

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

Speed: 38.3 MPH 61.6 KPH

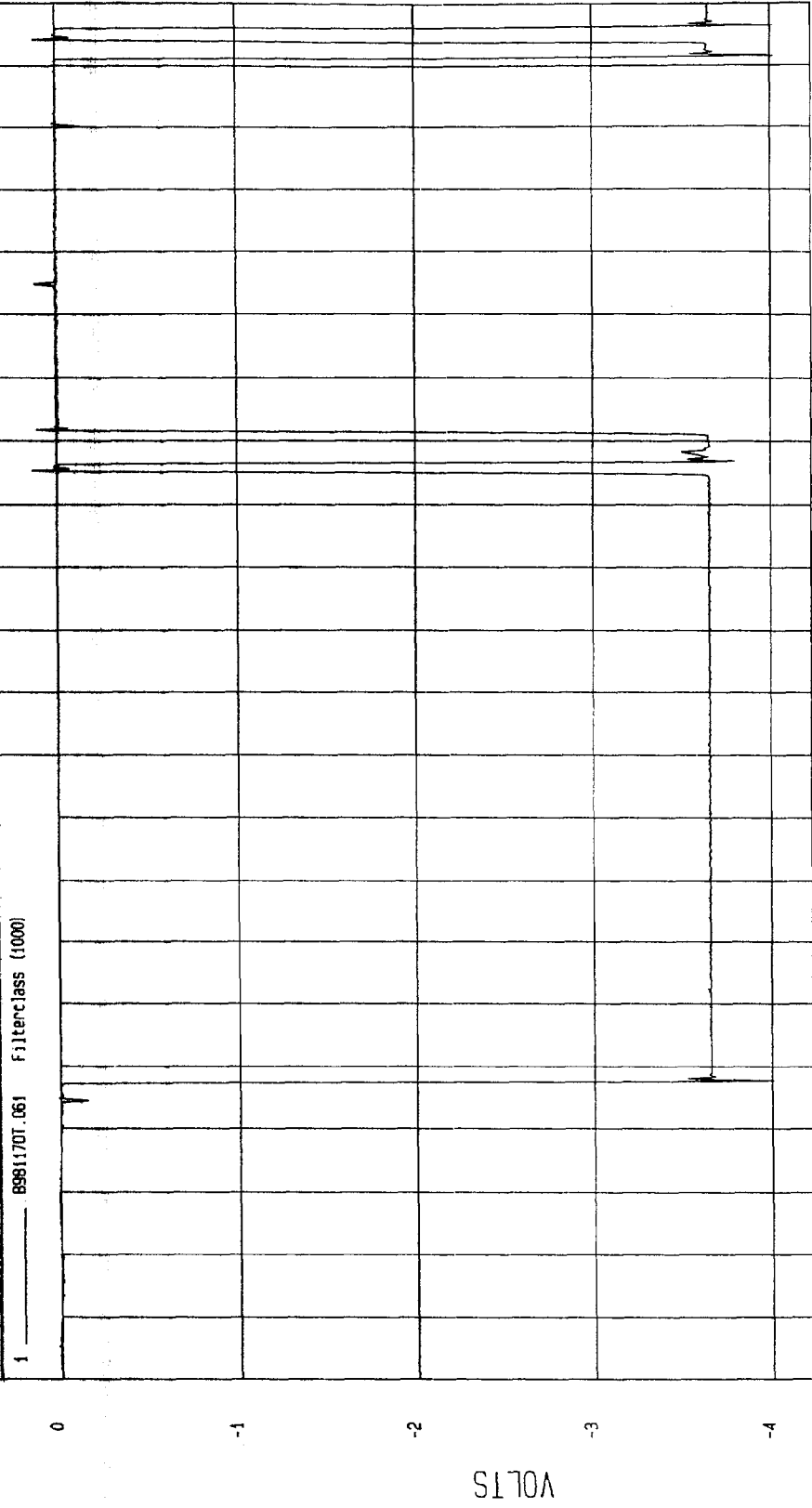
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = .14 VOLTS at 125 msec

Minimum = -4.02 VOLTS at 192 msec

REAR PASSENGER SHOULDER CONTACT

1 8981170T.061 Filterclass (1000)



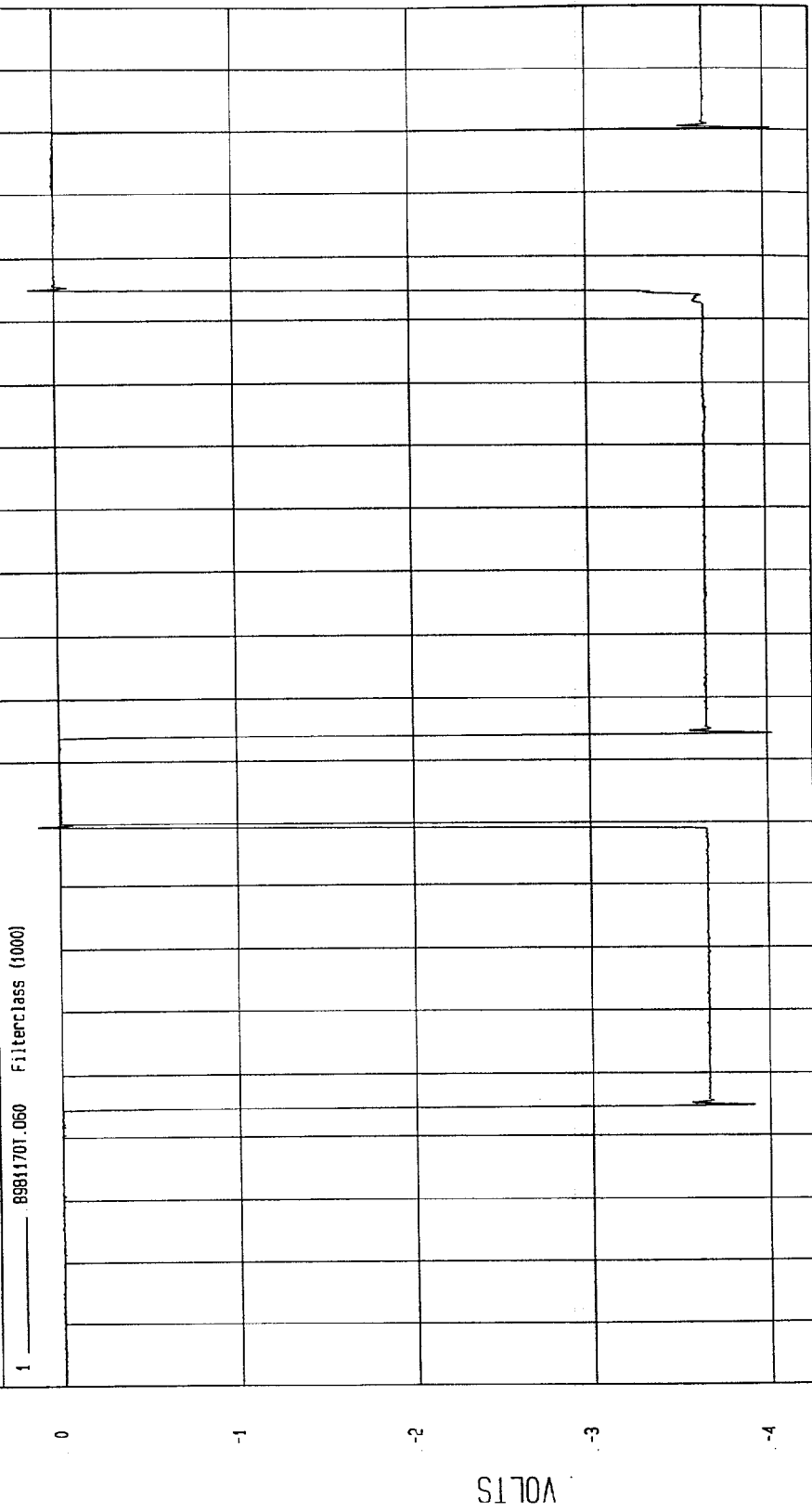
WCA Research
12-12-1998 10:15

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -4.04 VOLTS at 180 msec Maximum = .14 VOLTS at 155 msec

REAR PASSENGER PELVIS CONTACT



TIME (SECONDS)

MOA Research
12-12-1998 10:15

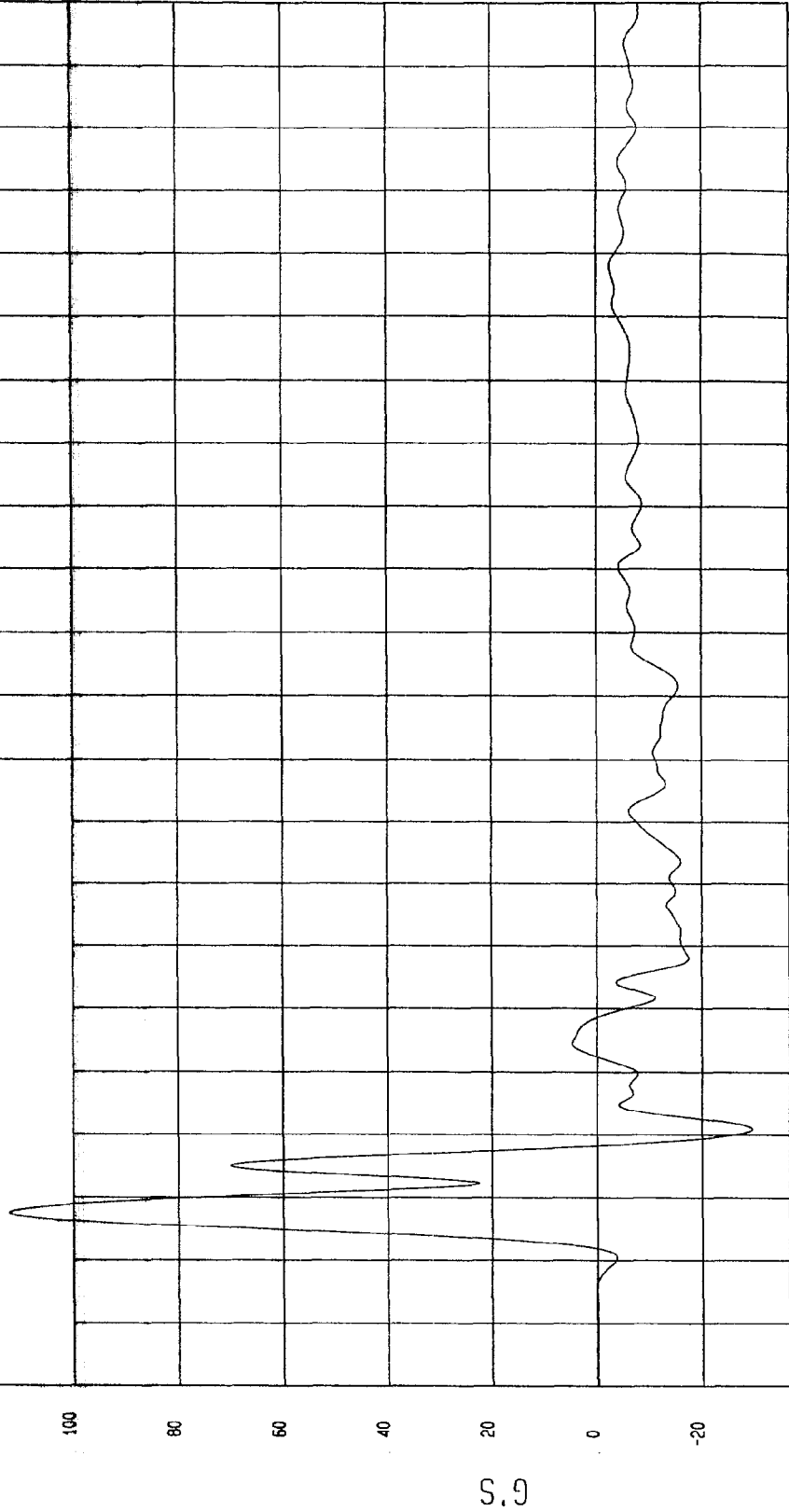
TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -29.7 G'S at 21 msec Maximum = 112.18 G'S at 8 msec

LEFT SIDE SILL AT FRONT SEAT Y ACCELERATION

1 ——— 89817AF.A38 Filterclass (60)



TIME (SECONDS)

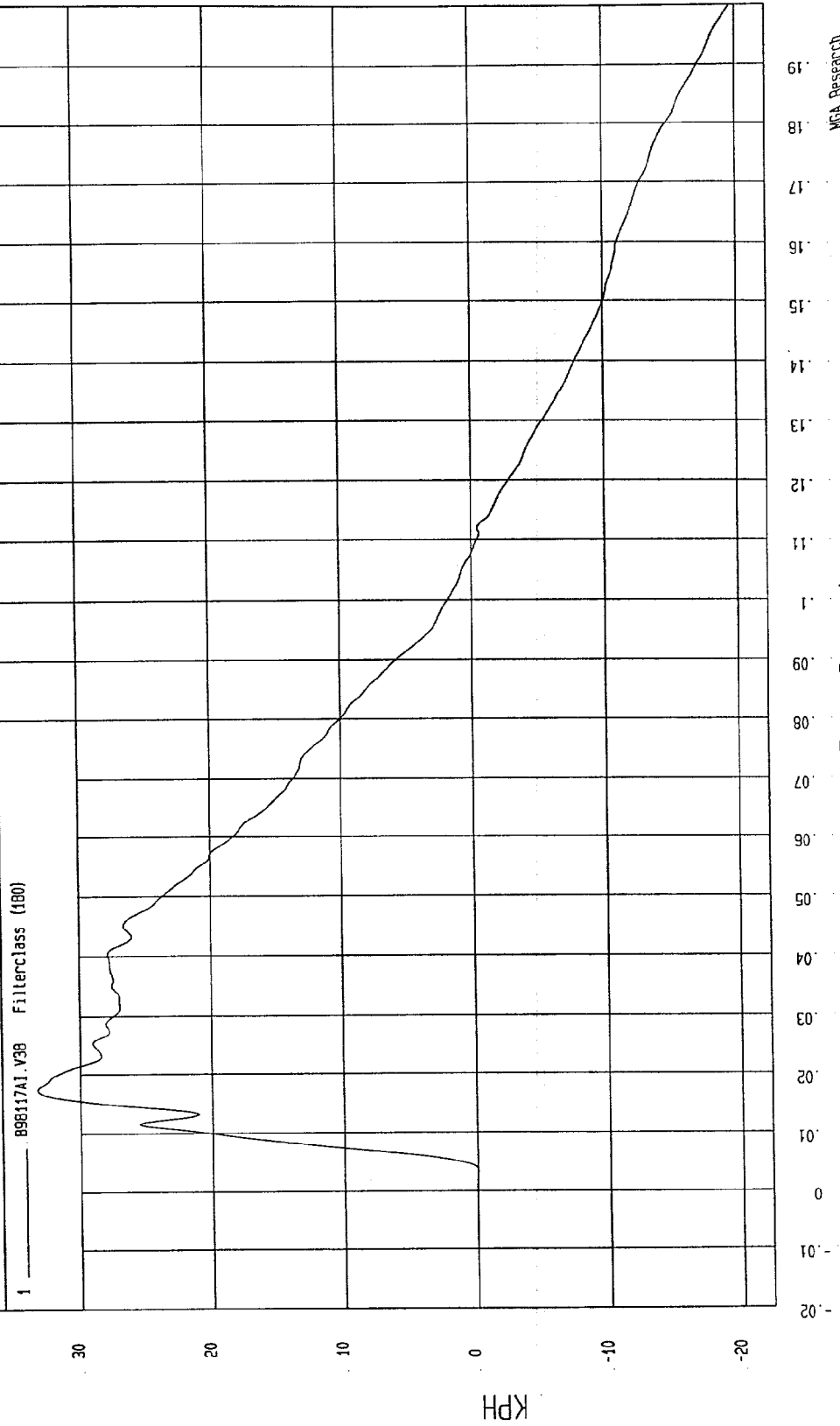
NGA Research
12-12-1998 11:00

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -19.6 KPH at 200 msec Maximum = 33.16 KPH at 17 msec

LEFT SIDE SILL AT FRONT SEAT Y VELOCITY



MCA Research
12-12-1998 11:21

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

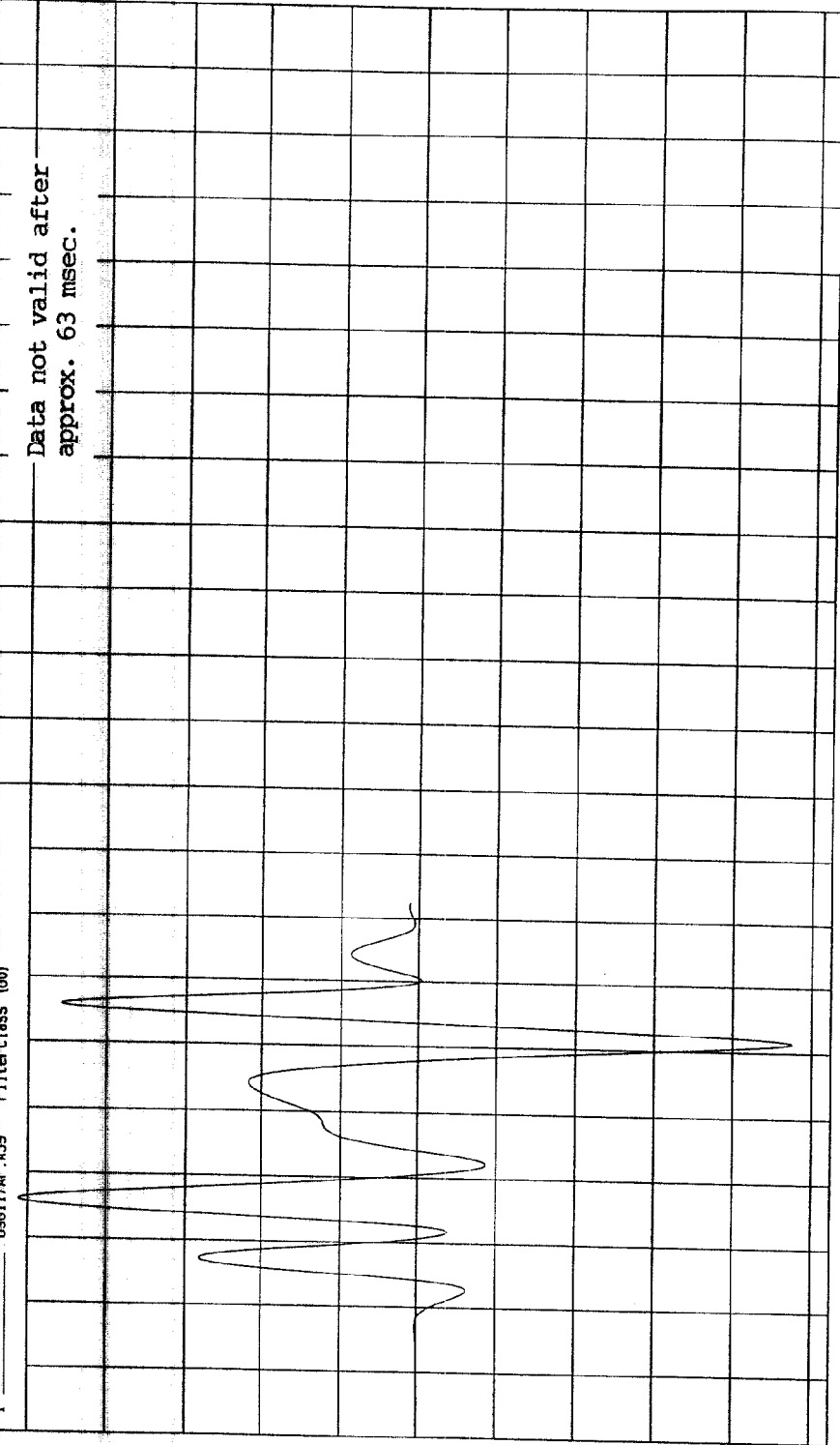
Minimum = -94.97 G'S at 41 msec Maximum = 102.35 G'S at 16 msec

LEFT SIDE SILL AT REAR SEAT Y ACCELERATION

886174F.139 Filterclass (60)

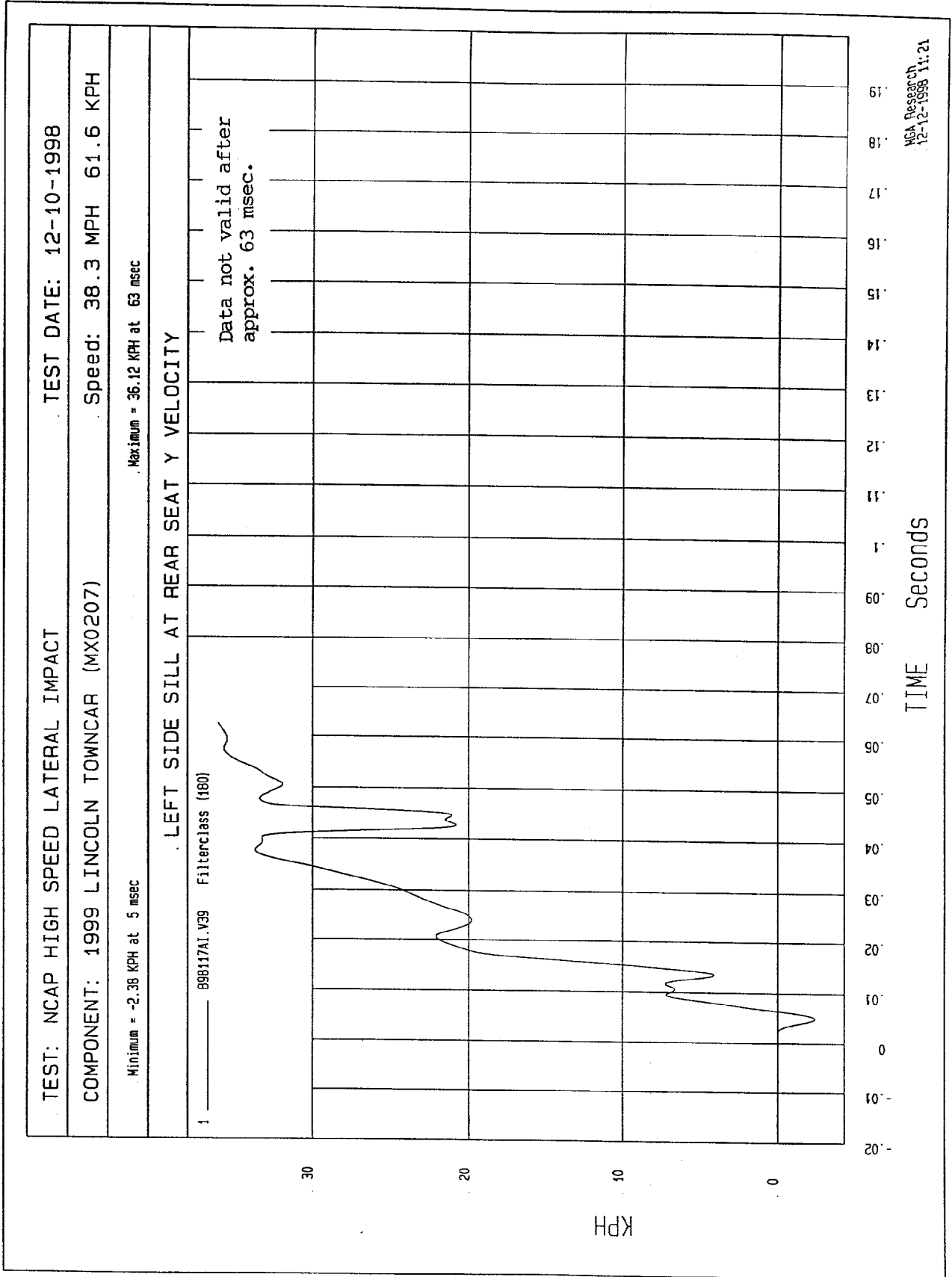
Data not valid after approx. 63 msec.

G.S



MCA Research
12-12-1998 11:16

TIME (SECONDS)

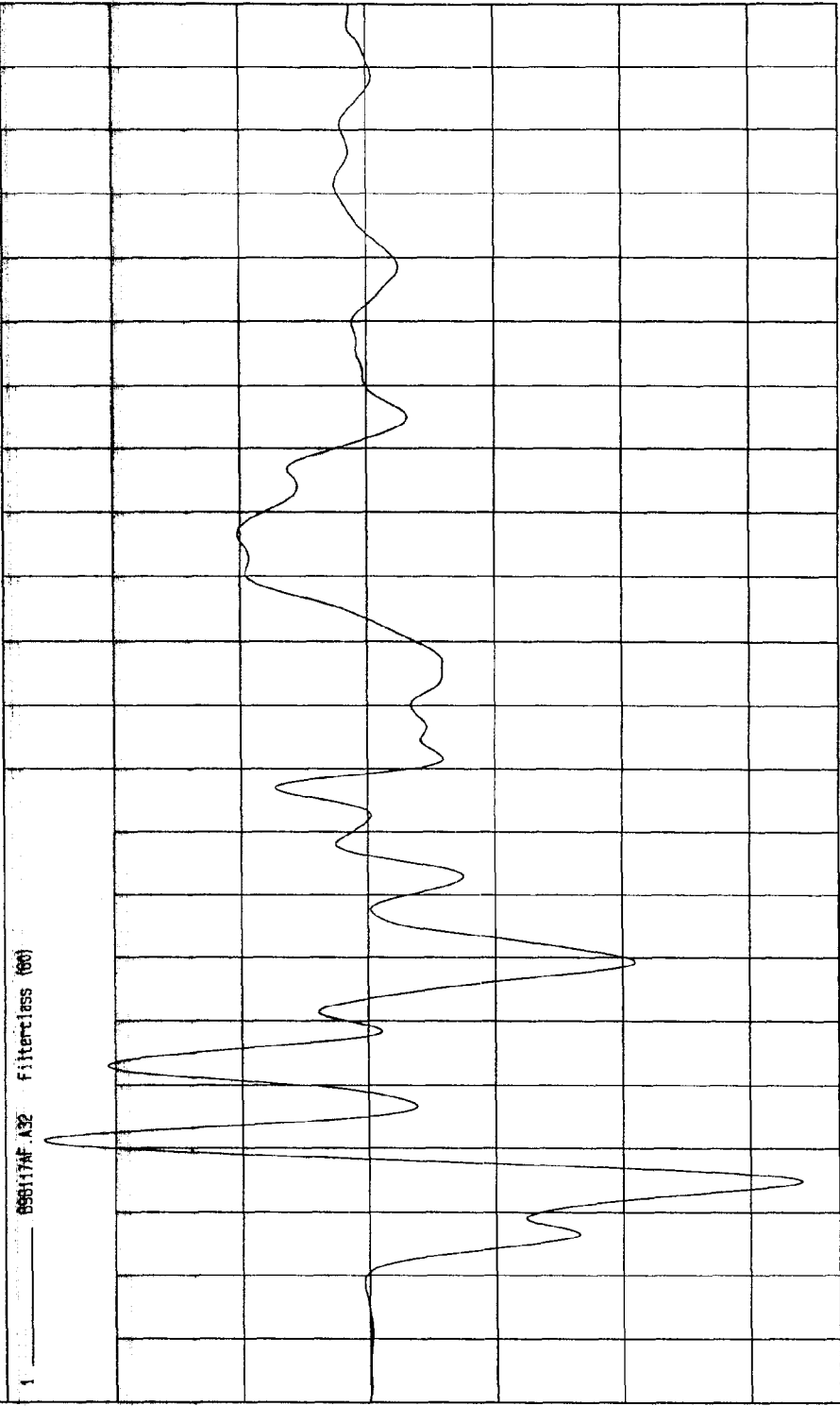


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -6.79 G'S at 15 msec Maximum = 5.13 G'S at 21 msec

RIGHT SIDE SILL AT FRONT SEAT X ACCELERATION



TIME (SECONDS)

MSA Research
12-12-1998 11:01

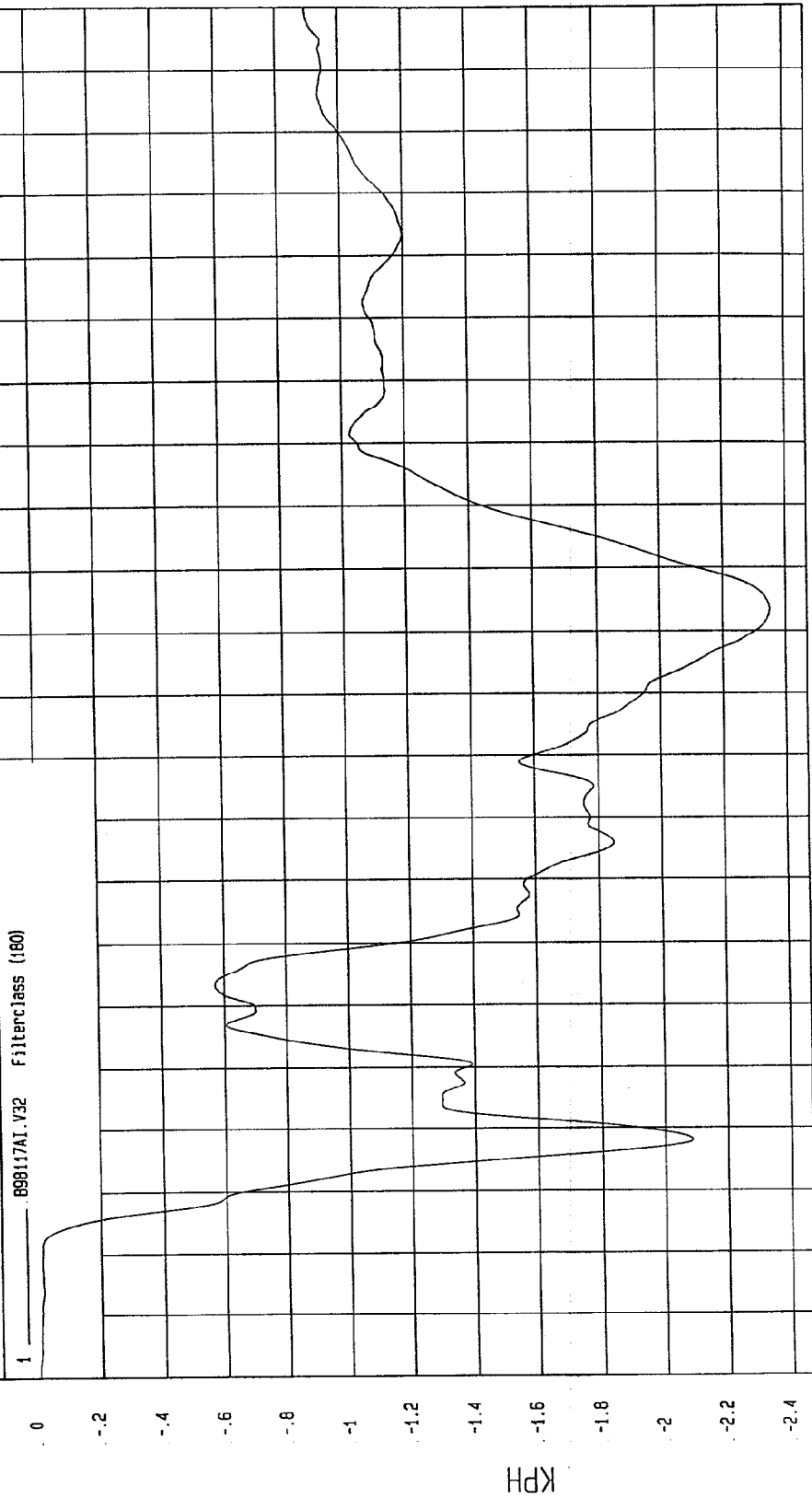
G.S

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -2.35 KPH at 103 msec Maximum = 5.87E-04 KPH at -19 msec

RIGHT SIDE SILL AT FRONT SEAT X VELOCITY



TIME Seconds

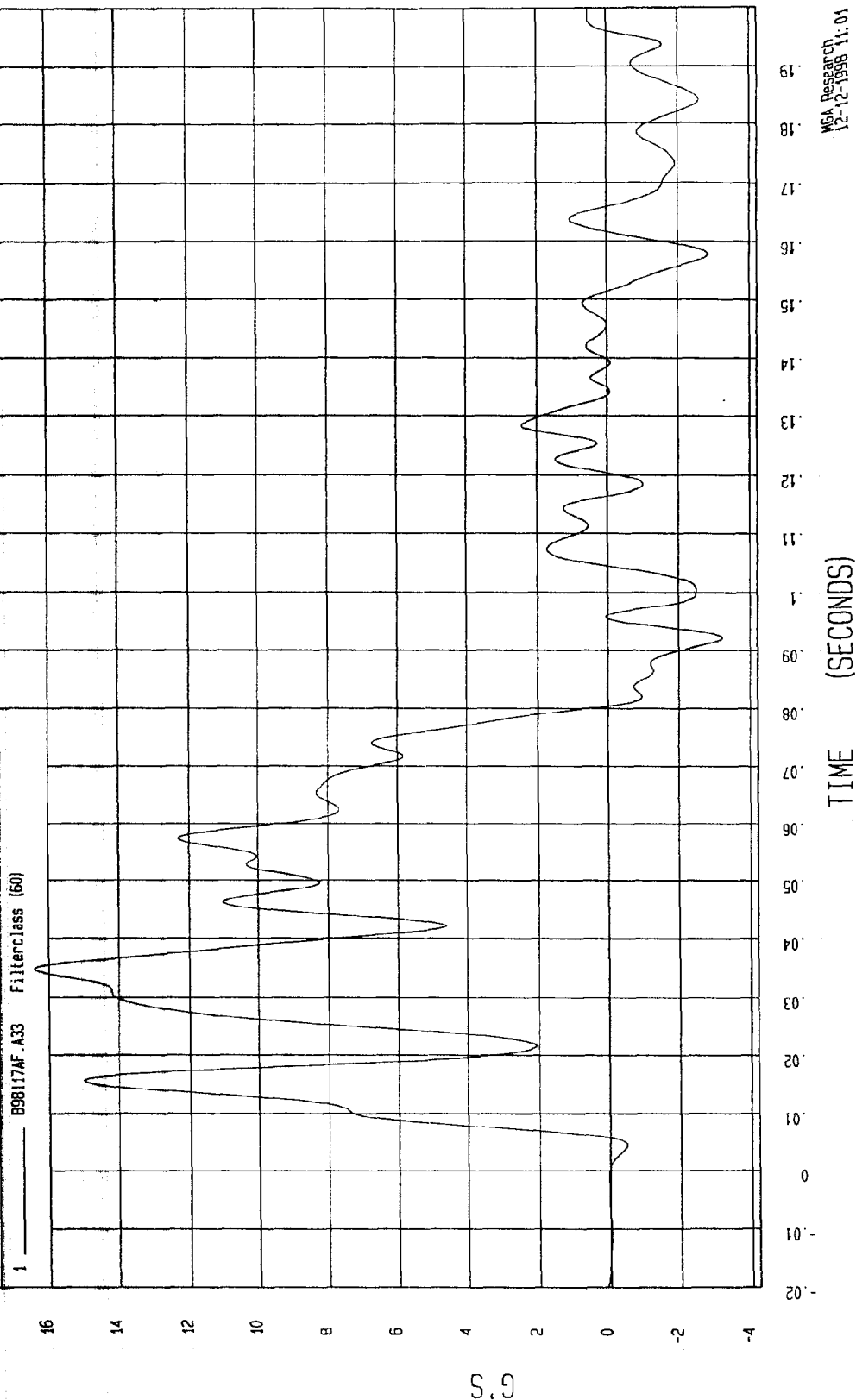
MOA Research
12-12-1998 11:21

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -3.23 G'S at 92 msec Maximum = 16.42 G'S at 35 msec

RIGHT SIDE SILL AT FRONT SEAT Y ACCELERATION

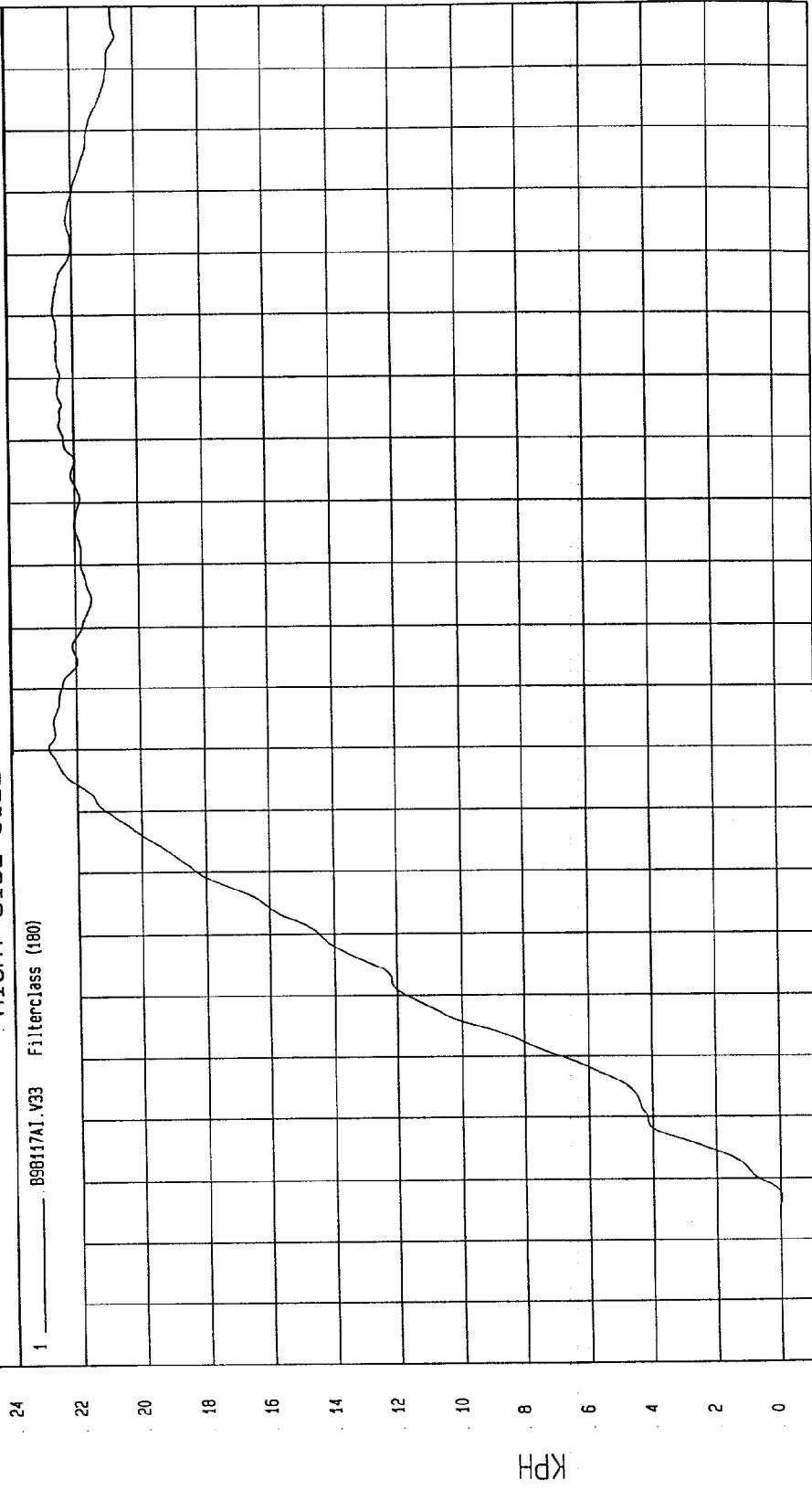


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -6.42E-02 KPH at 7 msec Maximum = 22.89 KPH at 80 msec

RIGHT SIDE SILL AT FRONT SEAT Y VELOCITY



NGA Research
12-12-1998 11:22

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

Speed: 38.3 MPH 61.6 KPH

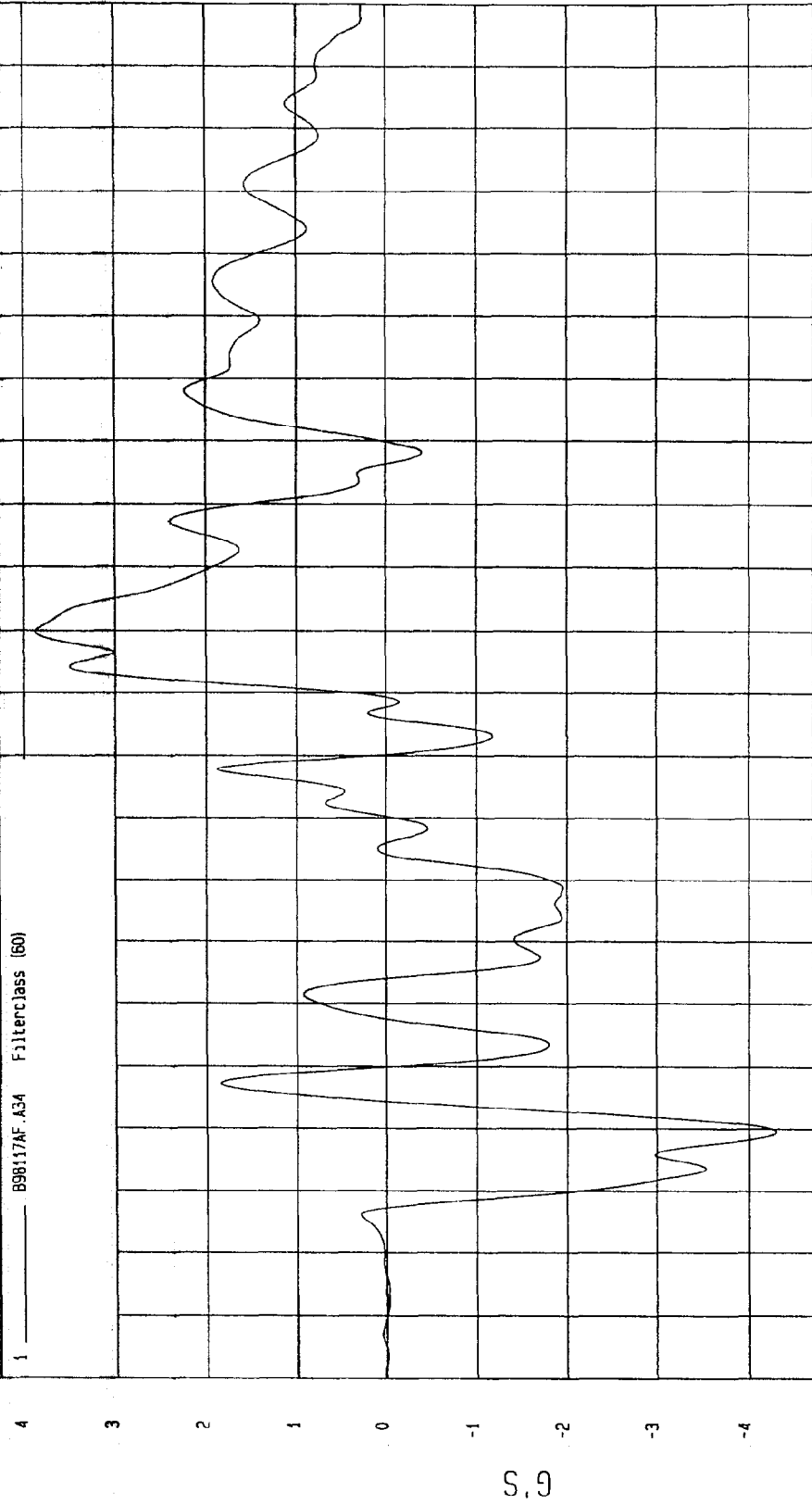
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 3.88 G'S at 100 msec

Minimum = -4.31 G'S at 20 msec

RIGHT SIDE SILL AT FRONT SEAT Z ACCELERATION

1 ——— B9817AF.A34 FilterClass (60)



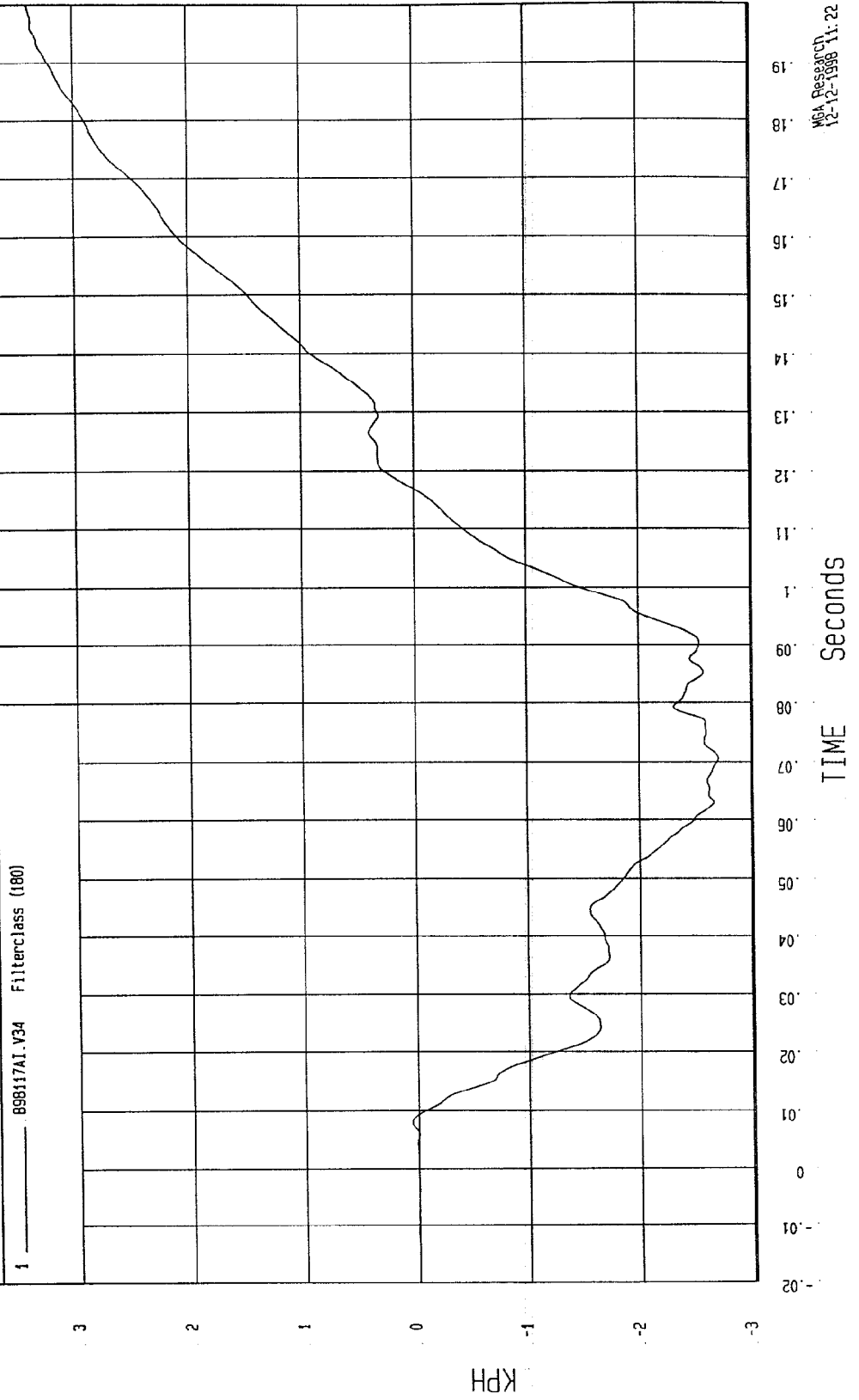
MCA Research
12-12-1998 11:01

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -2.71 KPH at 71 msec Maximum = 3.41 KPH at 200 msec

RIGHT SIDE SILL AT FRONT SEAT Z VELOCITY



MEA Research
12-12-1998 11:22

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

Speed: 38.3 MPH 61.6 KPH

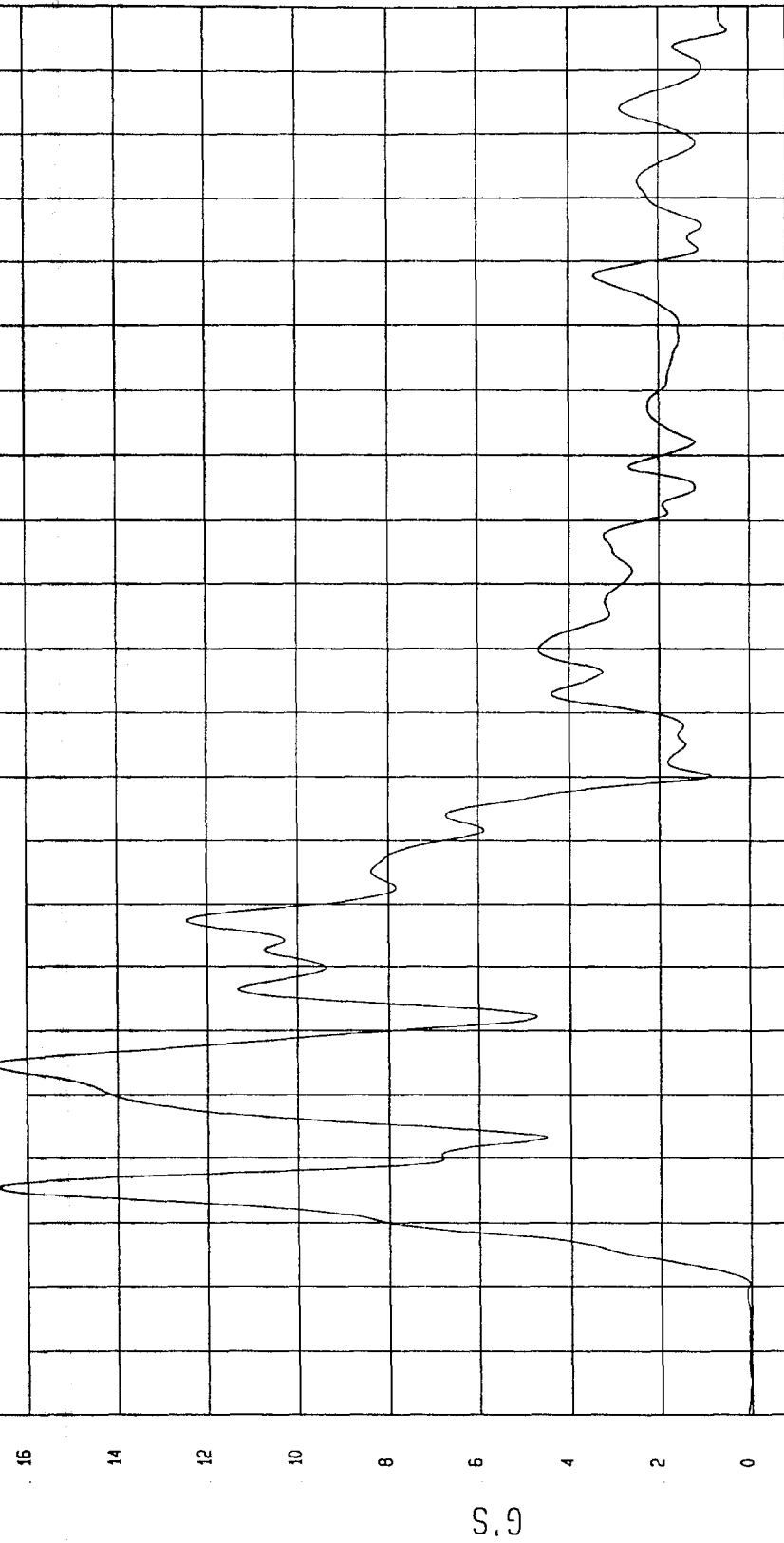
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 16.8 G'S at 35 msec

Minimum = 1.81E-02 G'S at -15 msec

RIGHT SIDE SILL AT FRONT SEAT RESULTANT ACCELERATION

1 B98117AV.A32 FilterClass (60)



MGA Research
12-12-1998 11:01

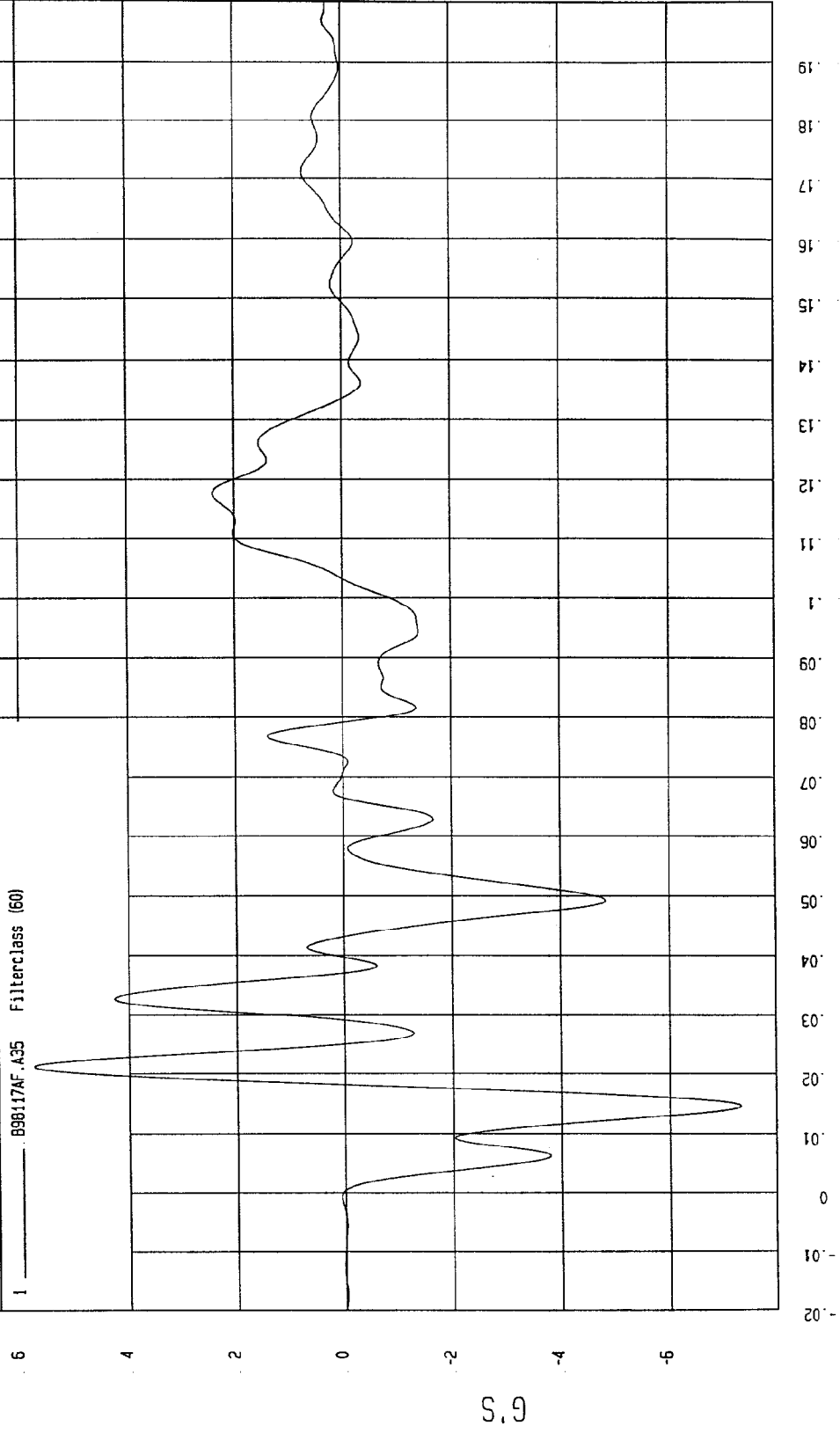
TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -7.29 G'S at 15 msec Maximum = 5.75 G'S at 21 msec

RIGHT SIDE SILL AT REAR SEAT X ACCELERATION

1 B98117AF.A35 Filterclass (60)



MCA Research
12-12-1998 11:01

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

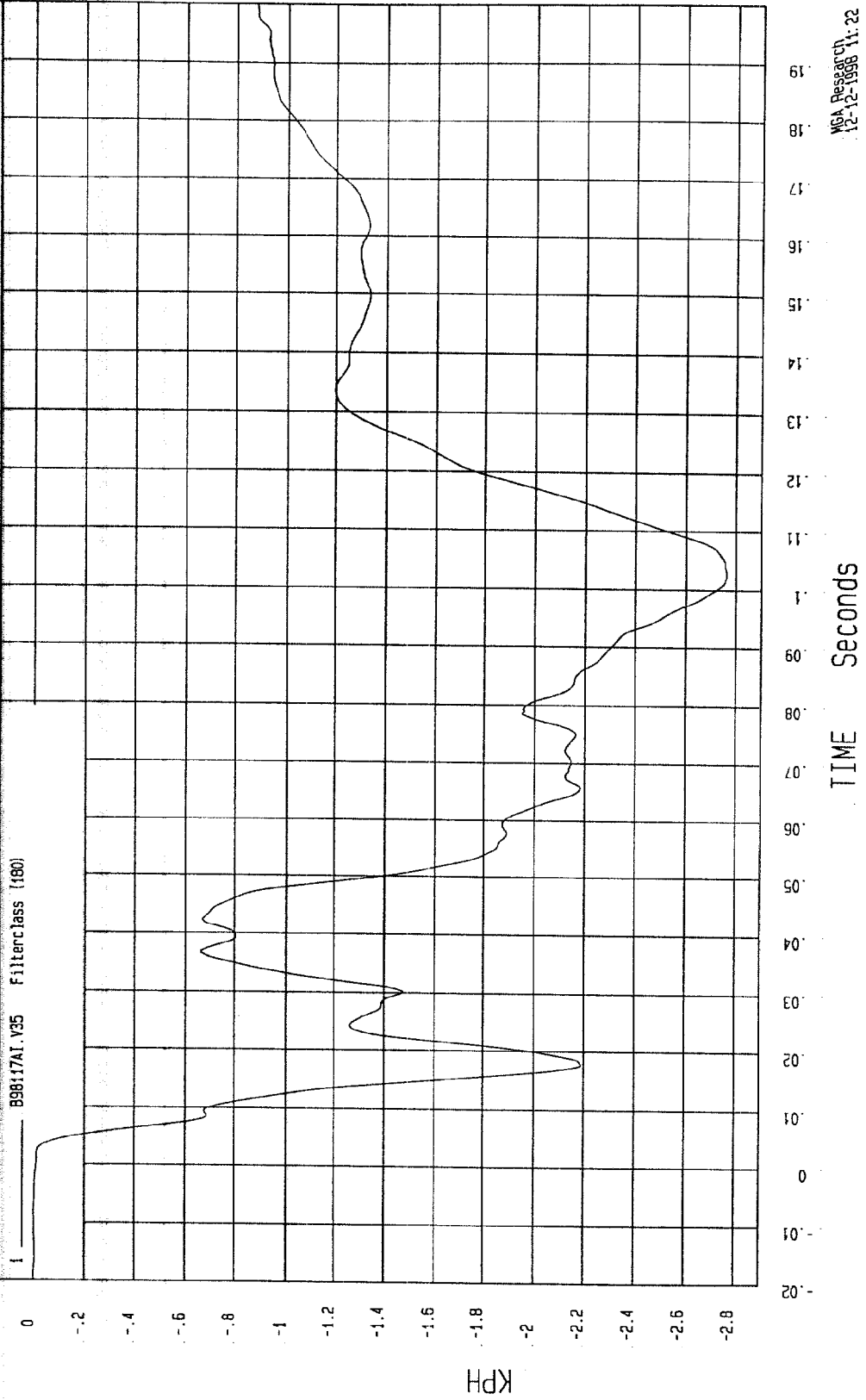
Speed: 38.3 MPH 61.6 KPH

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 3.10E-04 KPH at -19 msec

Minimum = -2.76 KPH at 103 msec

RIGHT SIDE SILL AT REAR SEAT X VELOCITY

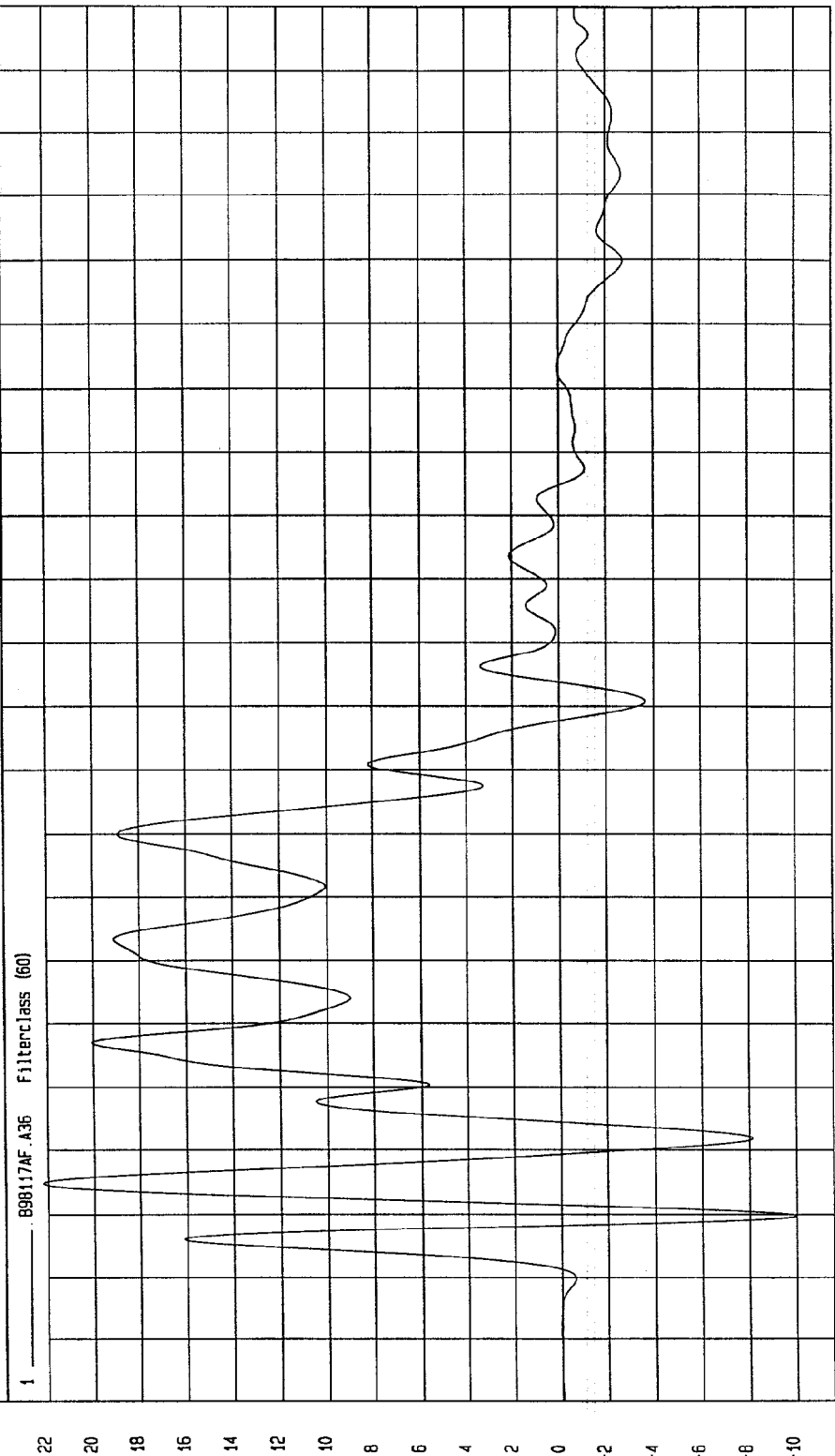


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -9.99 G'S at 10 msec Maximum = 22.2 G'S at 15 msec

RIGHT SIDE SILL AT REAR SEAT Y ACCELERATION



NSA Research
12-12-1998 11:01

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

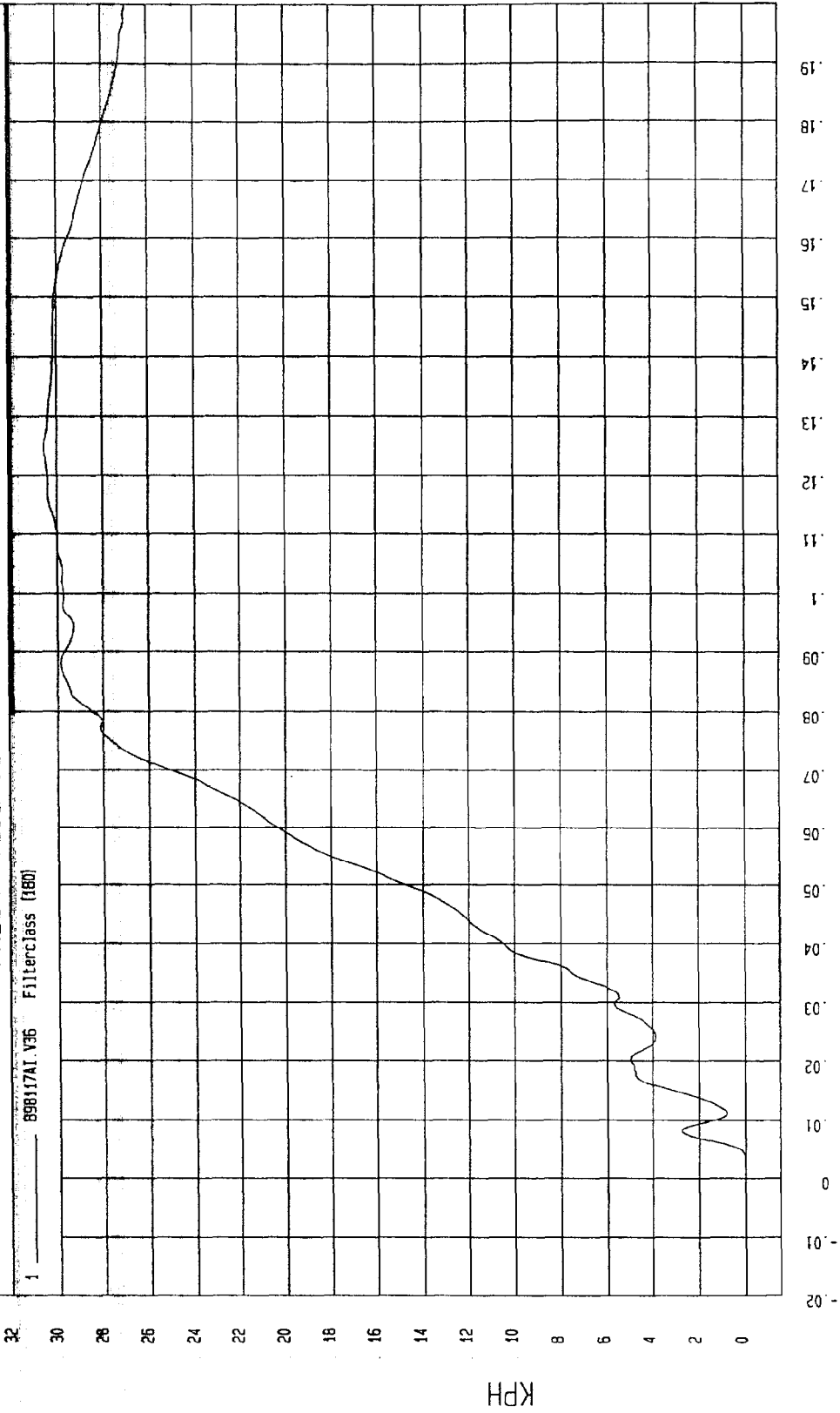
Speed: 38.3 MPH 61.6 KPH

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

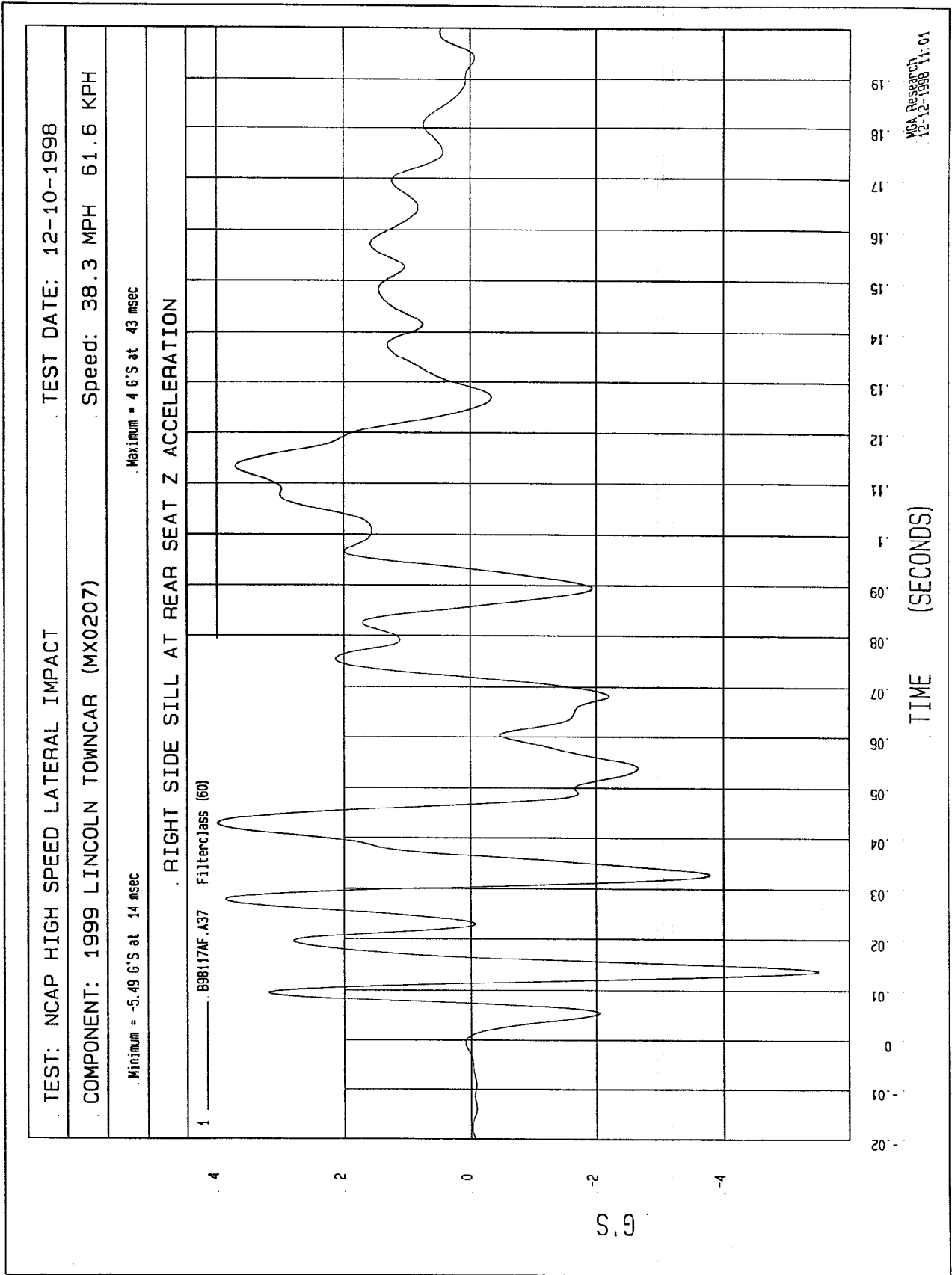
Maximum = 30.56 KPH at 125 msec

Minimum = -4.04E-03 KPH at -16 msec

RIGHT SIDE SILL AT REAR SEAT Y VELOCITY



MOA Research
12-12-1998 11:22



TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

Speed: 38.3 MPH 61.6 KPH

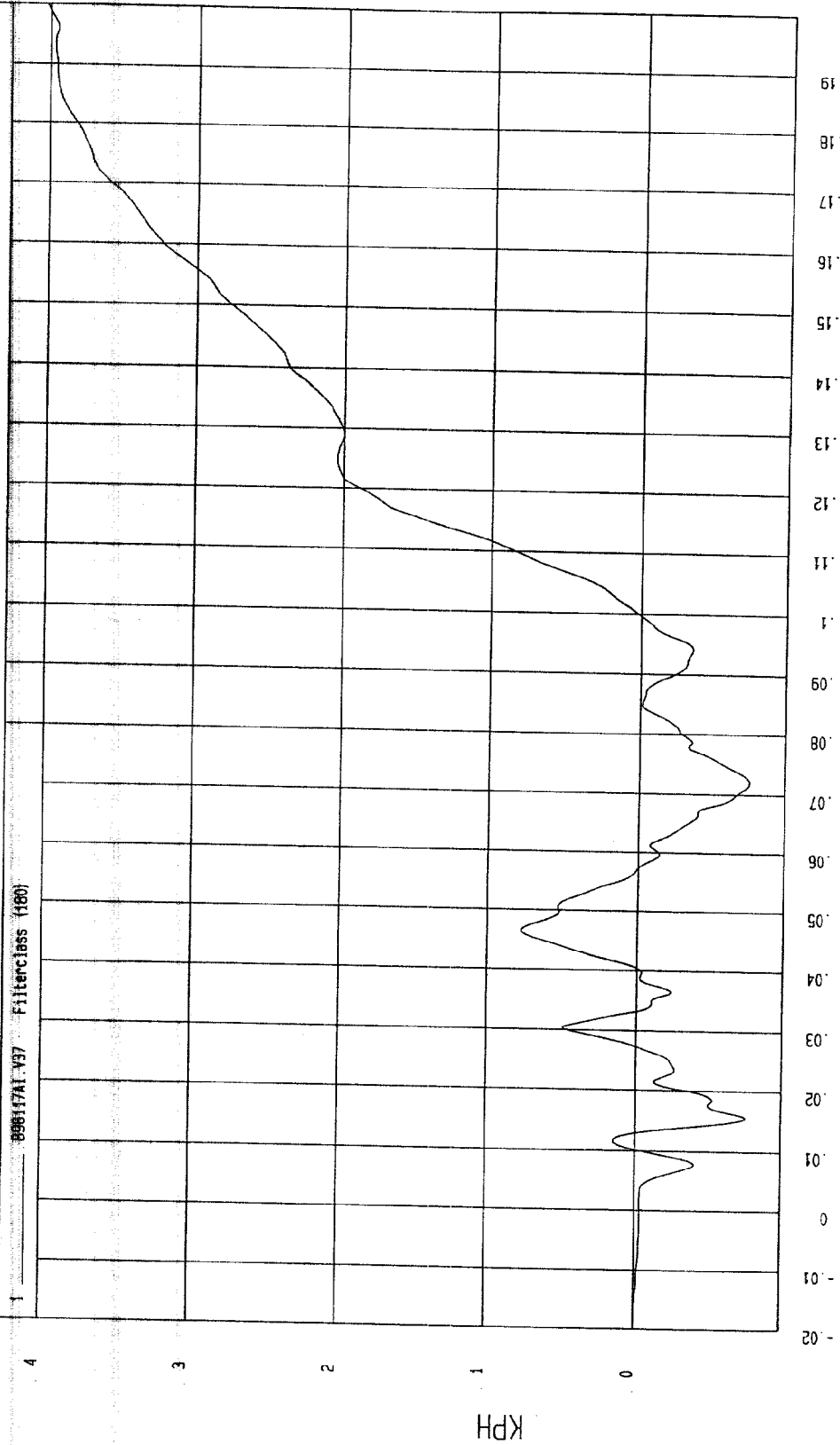
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Minimum = - .73 KPH at 72 msec

Maximum = 4.02 KPH at 200 msec

RIGHT SIDE SILL AT REAR SEAT Z VELOCITY

098147A1 V37 Filterclass (480)



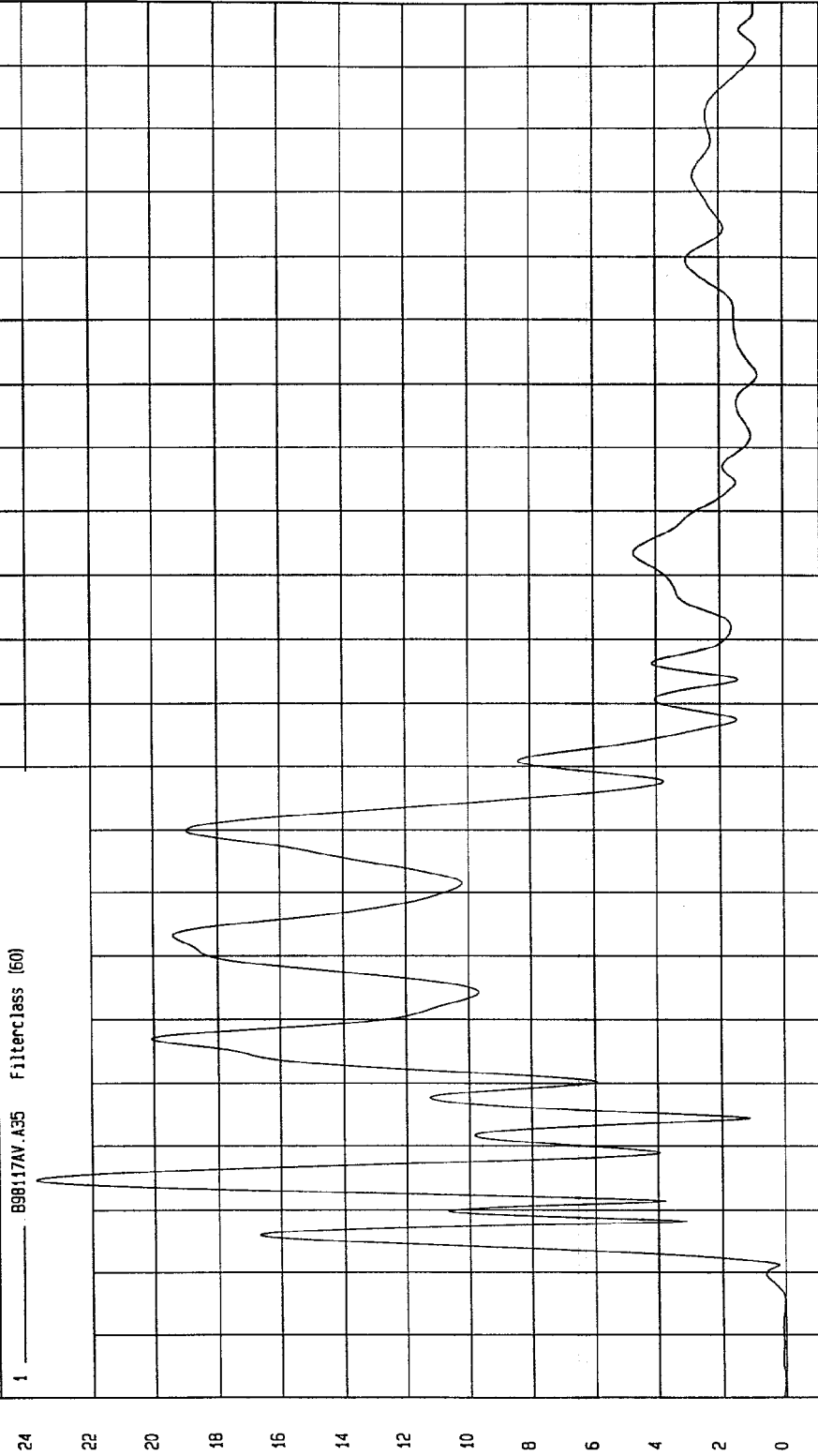
NCA Research
12-12-1998 11:22

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = 4.01E-02 G'S at -4 msec Maximum = 23.75 G'S at 15 msec

RIGHT SIDE SILL AT REAR SEAT RESULTANT ACCELERATION



MCA Research
12-12-1998 11:01

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

Speed: 38.3 MPH 61.6 KPH

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 103.38 G'S at 41 msec

Minimum = -1.51 G'S at 0 msec

DRIVER SEAT TRACK Y ACCELERATION

1 098177R A40 Filterclass (50)

Data not valid after
approx. 51 msec.

Data is questionable

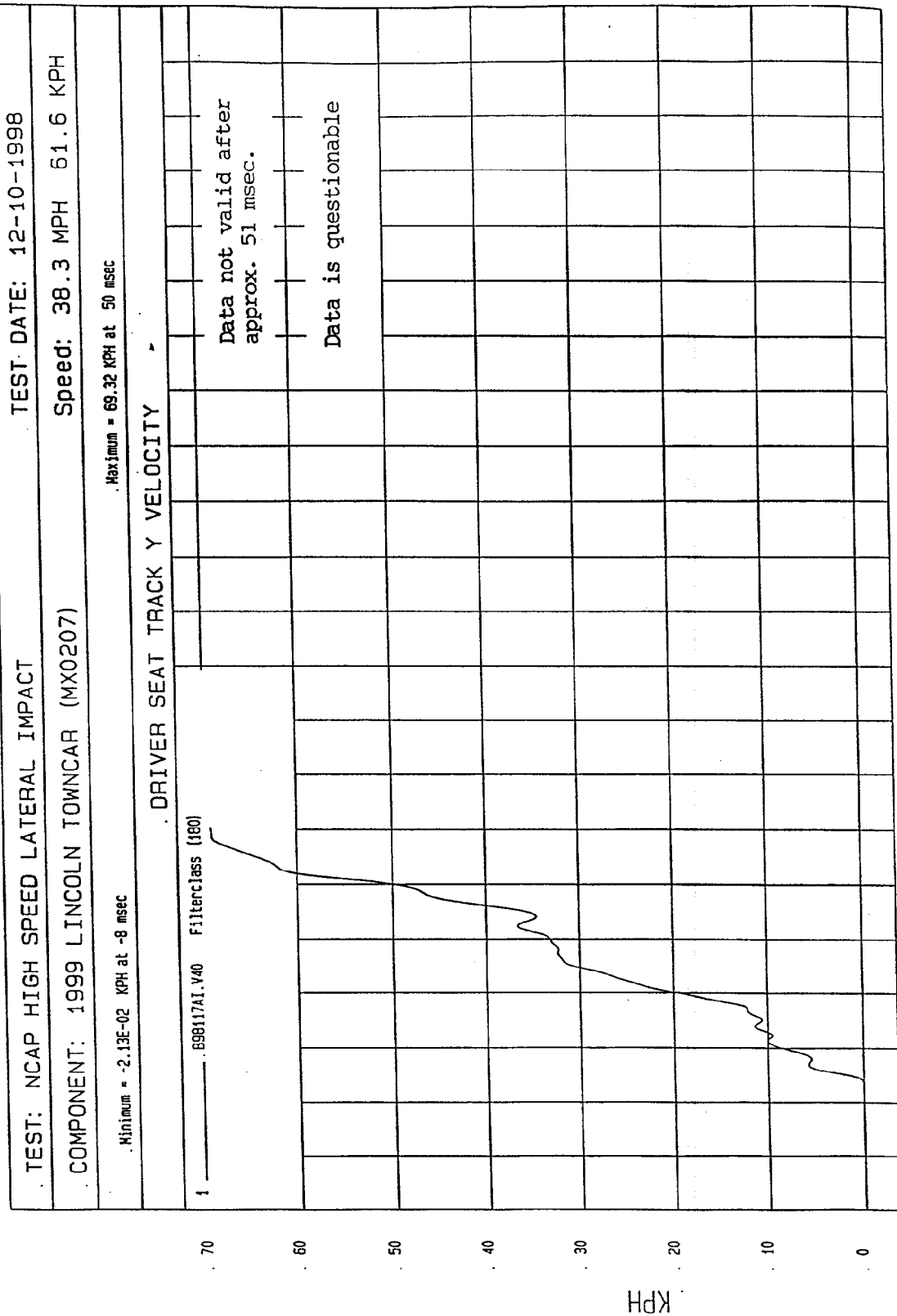
100
80
60
40
20
0

G.S

TIME (SECONDS)

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

WGL Research
12-12-1998 11:47



NCAP Research
12-12-1998 11:22

TIME Seconds

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

SPEED: 38.3 MPH 61.6 KPH

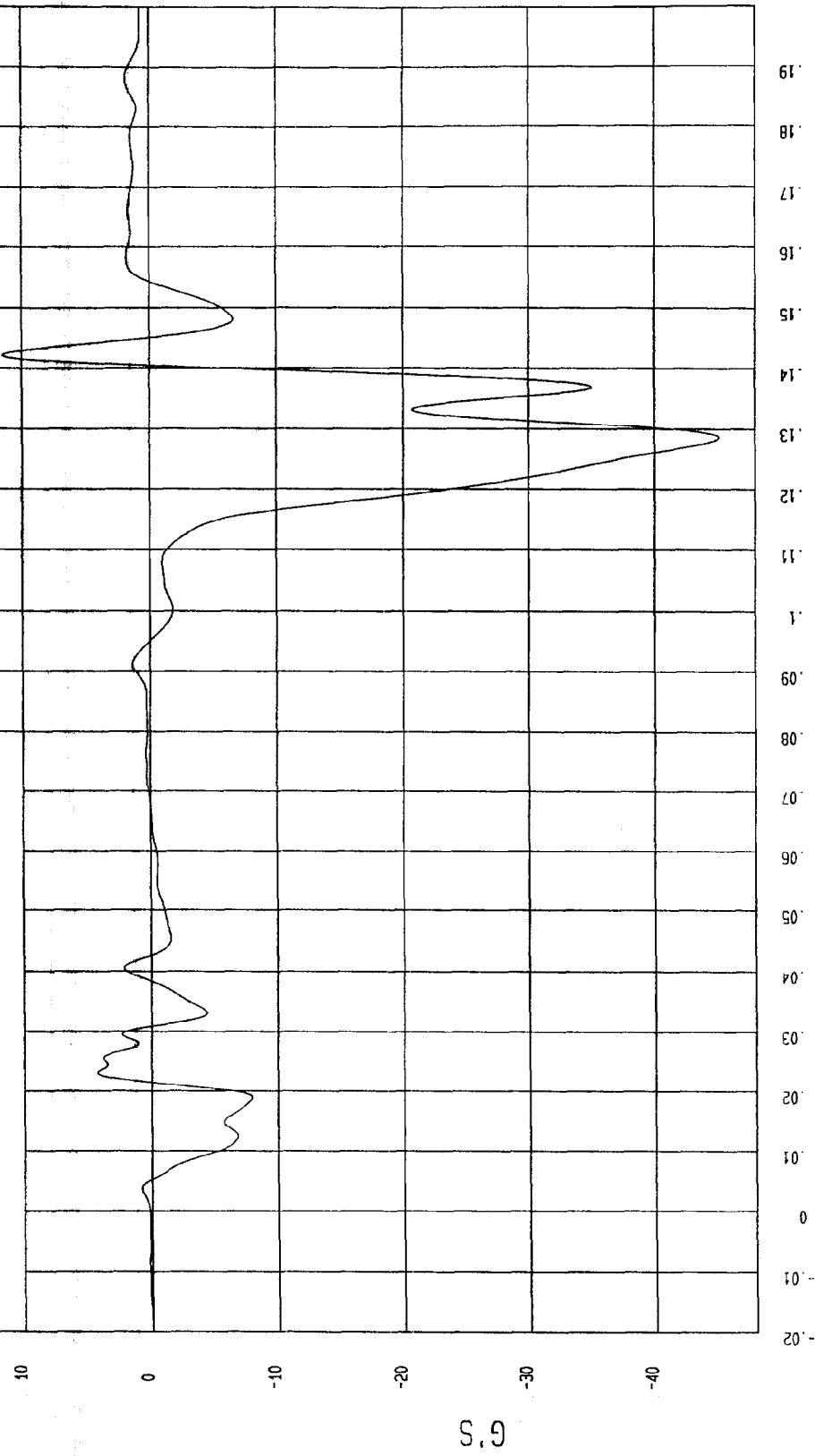
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 11.52 G'S at 142 msec

Minimum = -45.17 G'S at 128 msec

REAR FLOORPAN ABOVE AXLE X ACCELERATION

1 898117AF.A08 Filterclass (60)



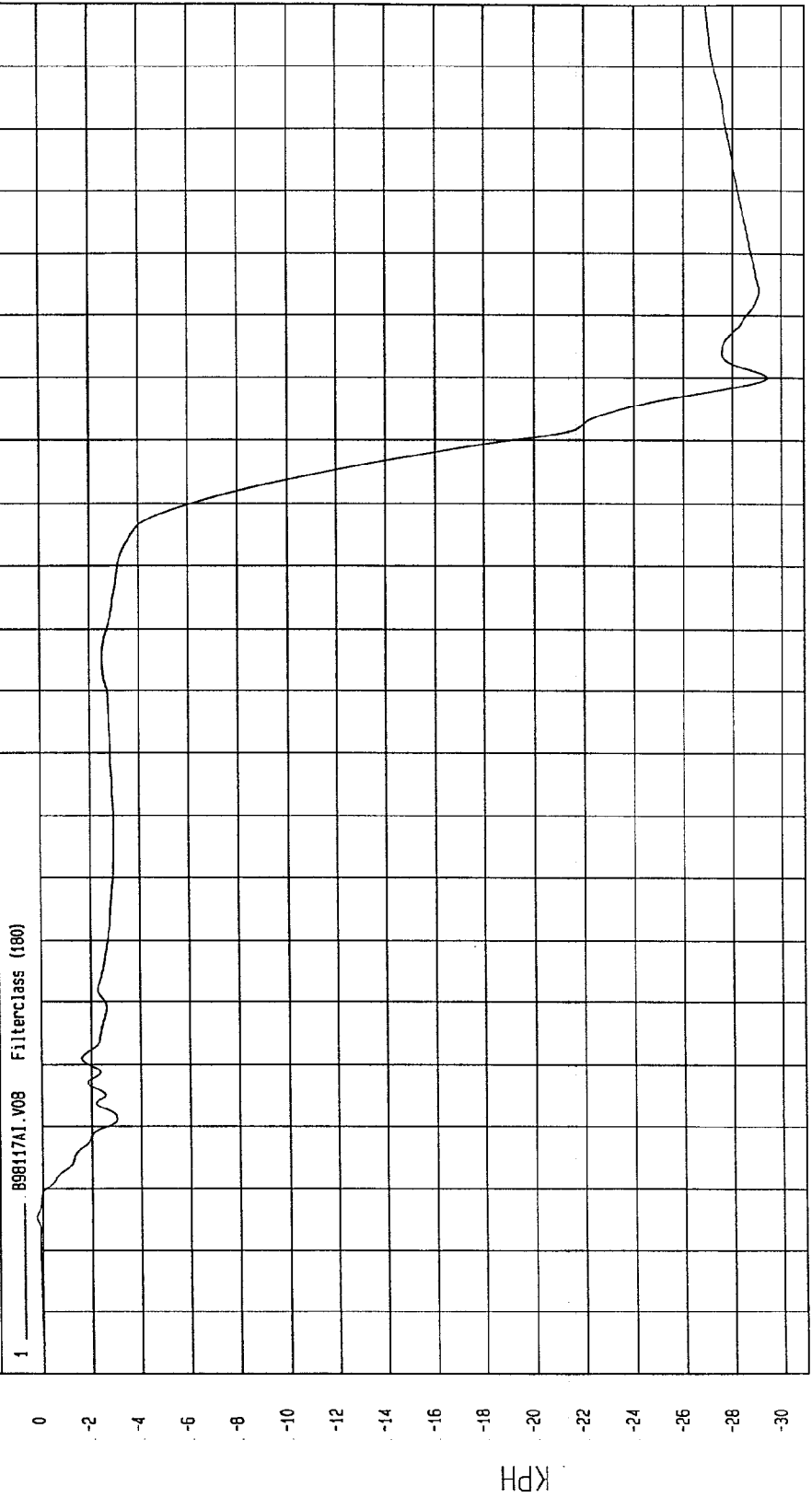
MGA Research
12-12-1998 11:01

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -29.43 KPH at 140 msec Maximum = .25 KPH at 5 msec

REAR FLOORPAN ABOVE AXLE X VELOCITY



MGA Research
12-12-1998 11:22

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

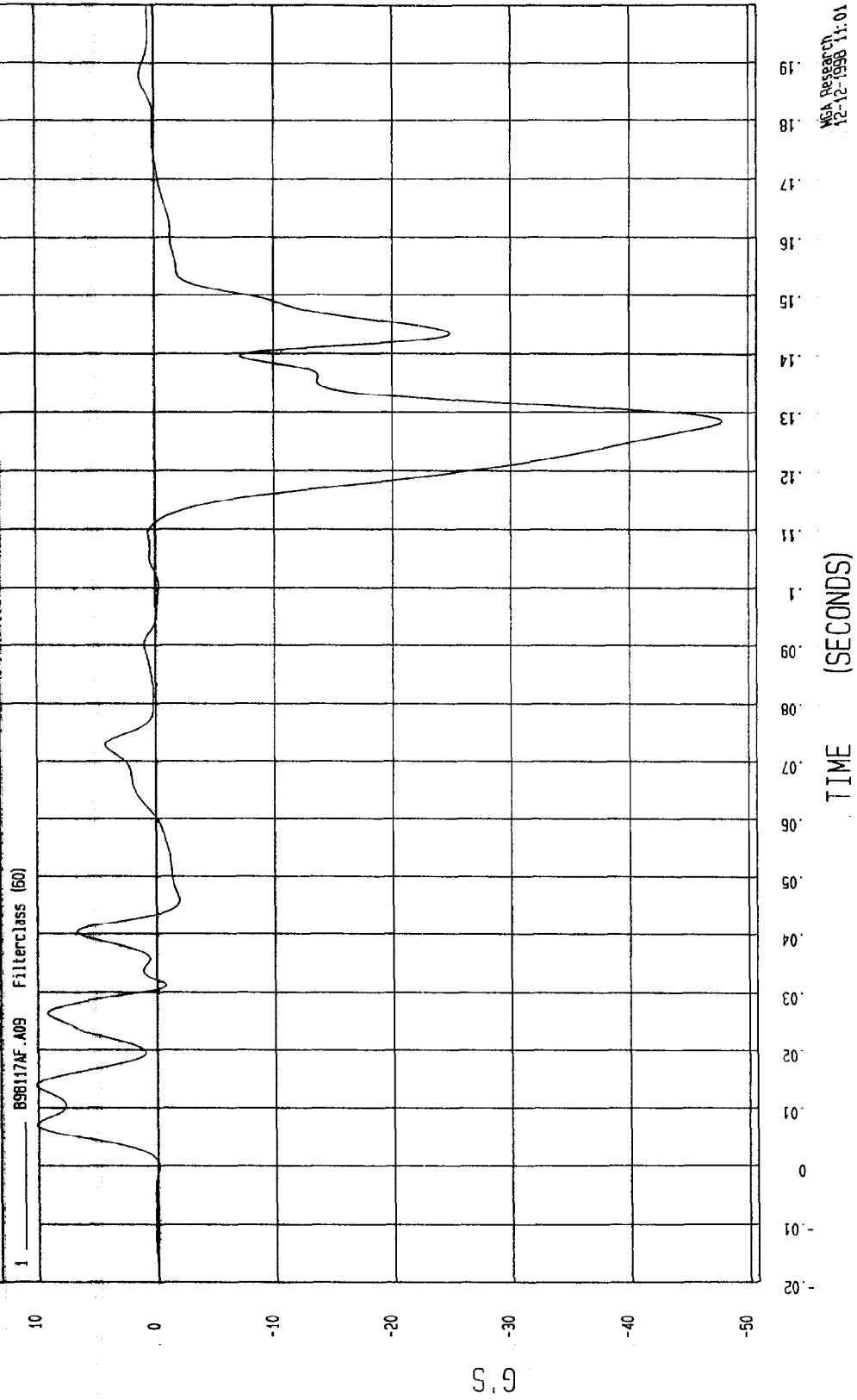
SPEED: 38.3 MPH 61.6 KPH

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 10.17 G'S at 14 msec

Minimum = -47.79 G'S at 128 msec

REAR FLOORPAN ABOVE AXLE Y ACCELERATION



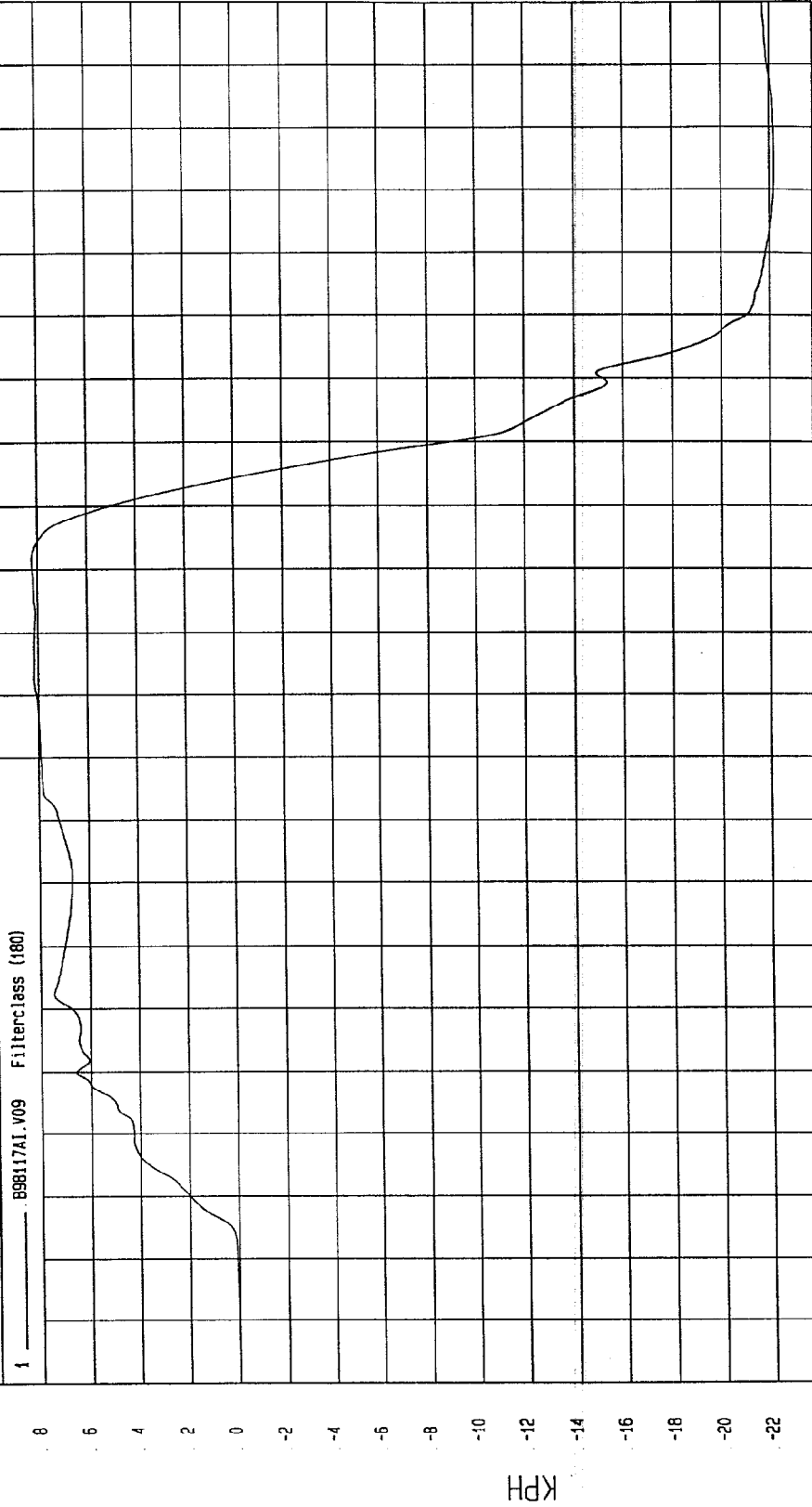
MCA Research
12-12-1998 11:01

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -22.19 KPH at 174 msec Maximum = 8.24 KPH at 111 msec

REAR FLOORPAN ABOVE AXLE Y VELOCITY



MGA Research
12-12-1998 11:22

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

SPEED: 38.3 MPH 61.6 KPH

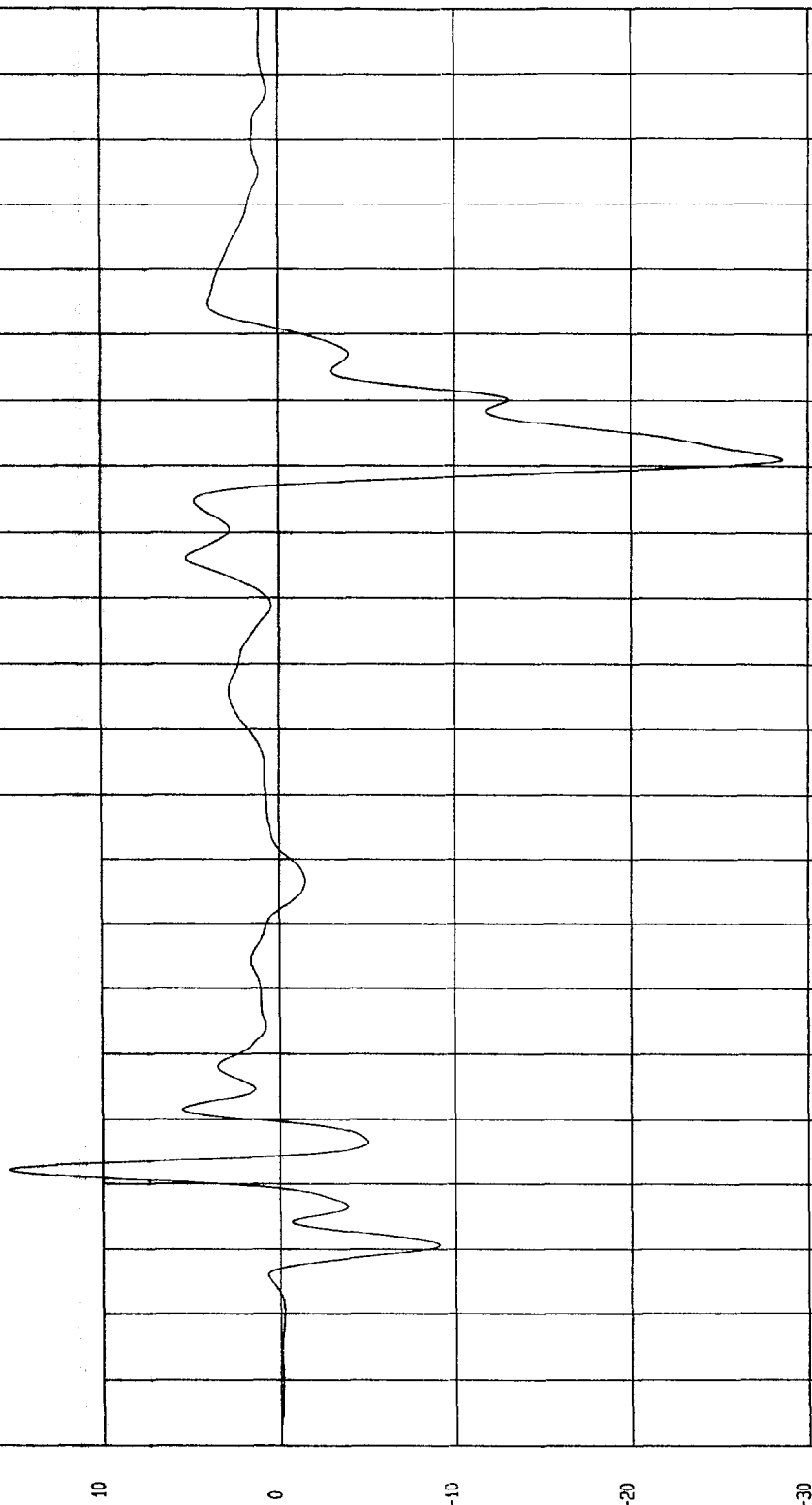
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 15.36 G'S at 22 msec

Minimum = -28.53 G'S at 131 msec

REAR FLOORPAN ABOVE AXLE Z ACCELERATION

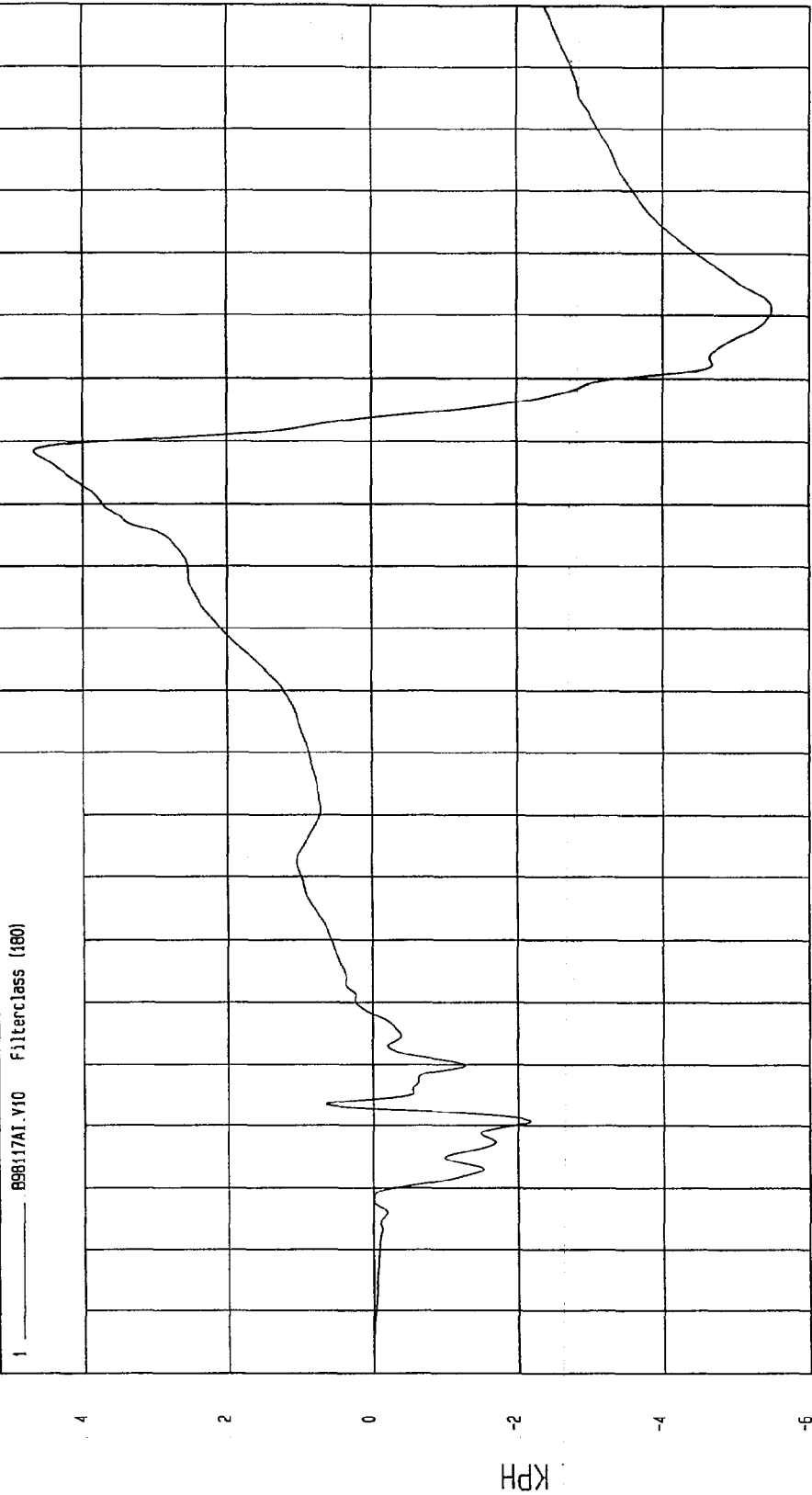
1 89B117AF.A10 Filterclass (60)



MGA Research
12-12-1998 11:01

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 51.6 KPH
Minimum = -5.5 KPH at 151 msec Maximum = 4.69 KPH at 128 msec

REAR FLOORPAN ABOVE AXLE Z VELOCITY

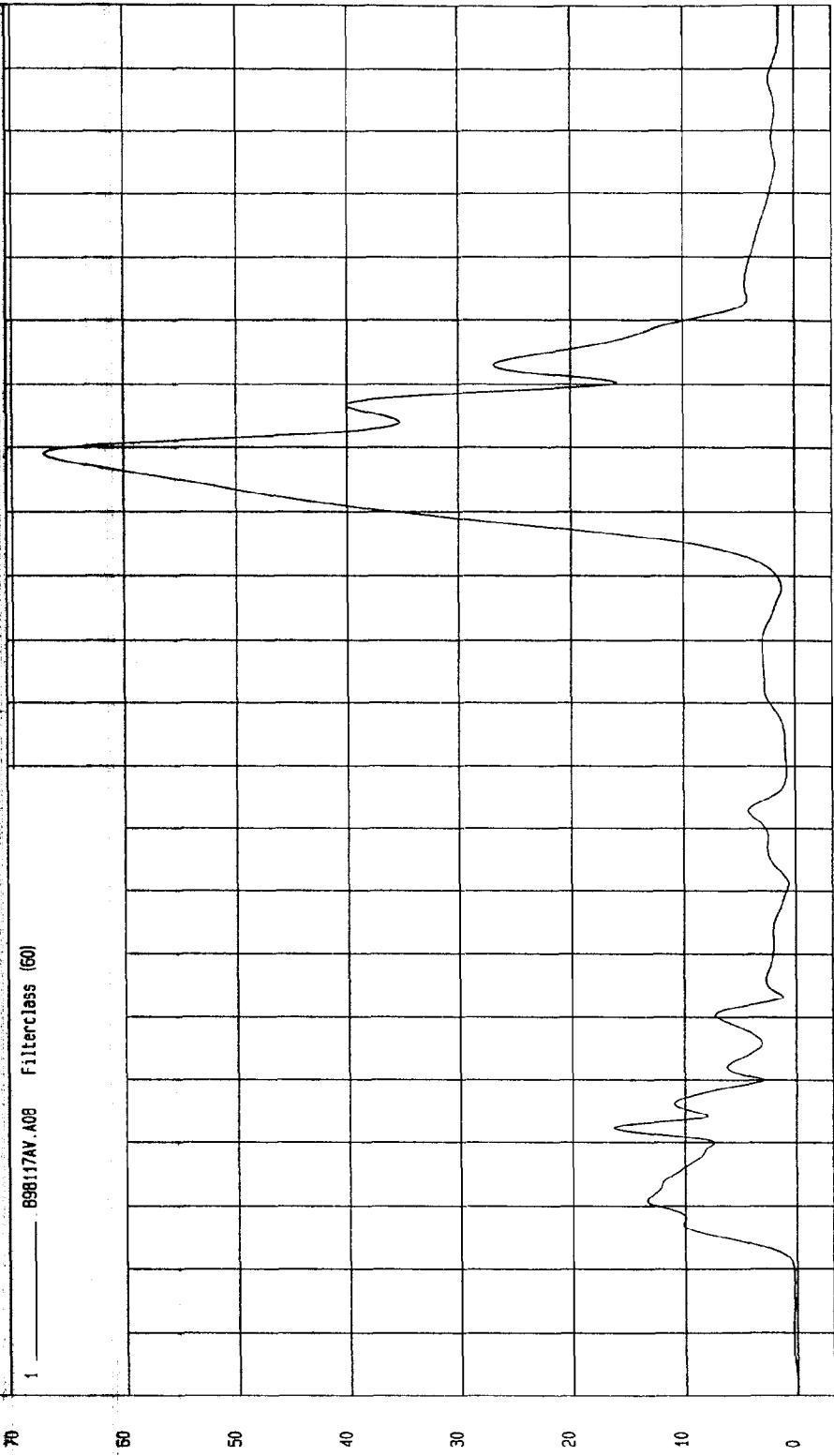


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = 2.61E-02 G'S at -18 msec Maximum = 67.18 G'S at 129 msec

REAR FLOORPAN ABOVE AXLE RESULTANT ACCELERATION



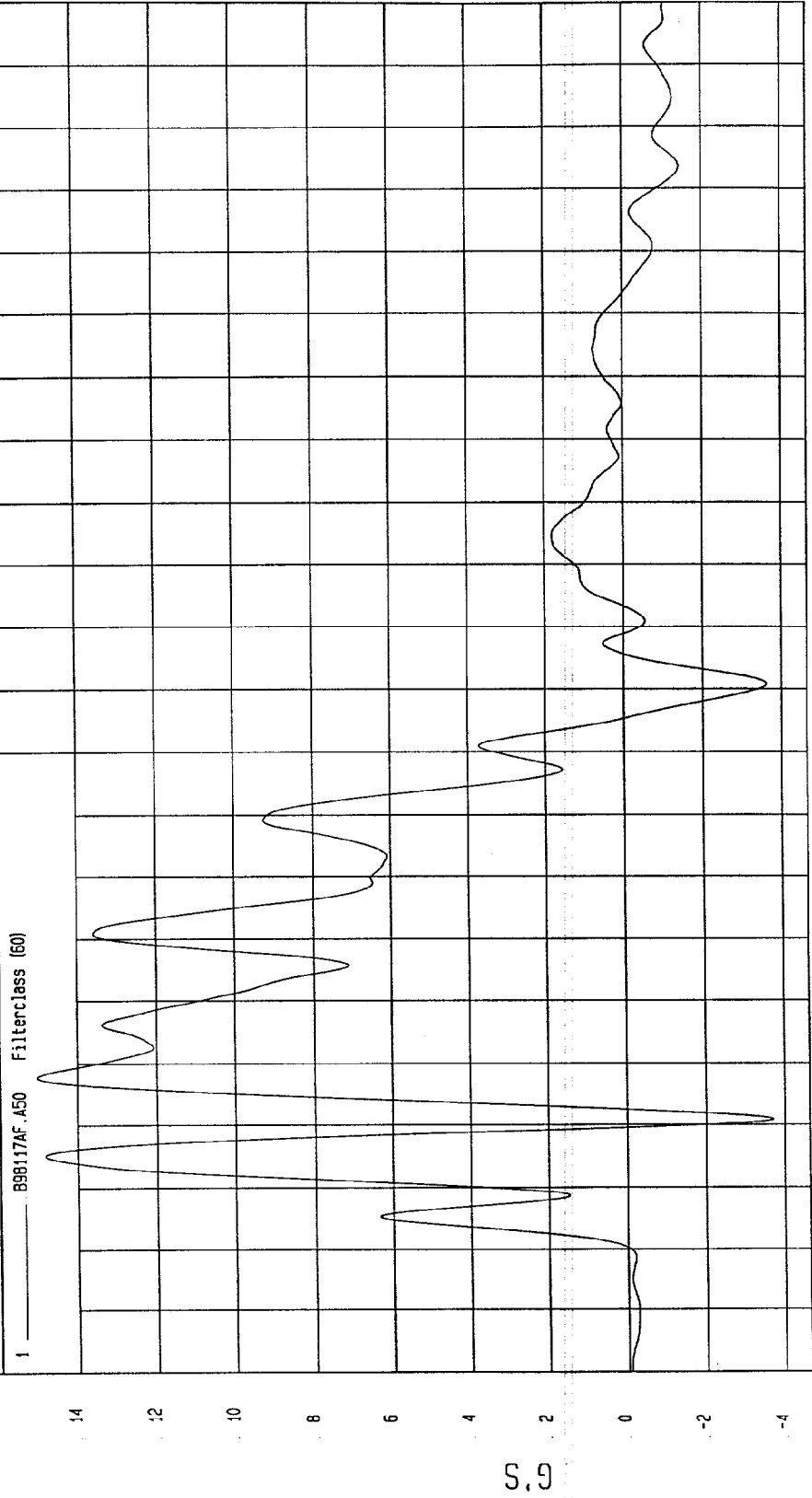
MSA Research
12-12-1998 11:01

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -3.71 G'S at 21 msec Maximum = 15.04 G'S at 28 msec

RIGHT REAR OCCUPANT COMPARTMENT Y ACCELERATION



NGA Research
12-12-1998 11:01

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

Speed: 38.3 MPH 61.6 KPH

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 23.38 KPH at 154 msec

Minimum = -.11 KPH at -.1 msec

RIGHT REAR OCCUPANT COMPARTMENT Y VELOCITY

Filter: class (180)

898117A1.V50

1

24

22

20

18

16

14

12

10

8

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4

2

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KPH

19

18

17

16

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-.01

-.02

TIME Seconds

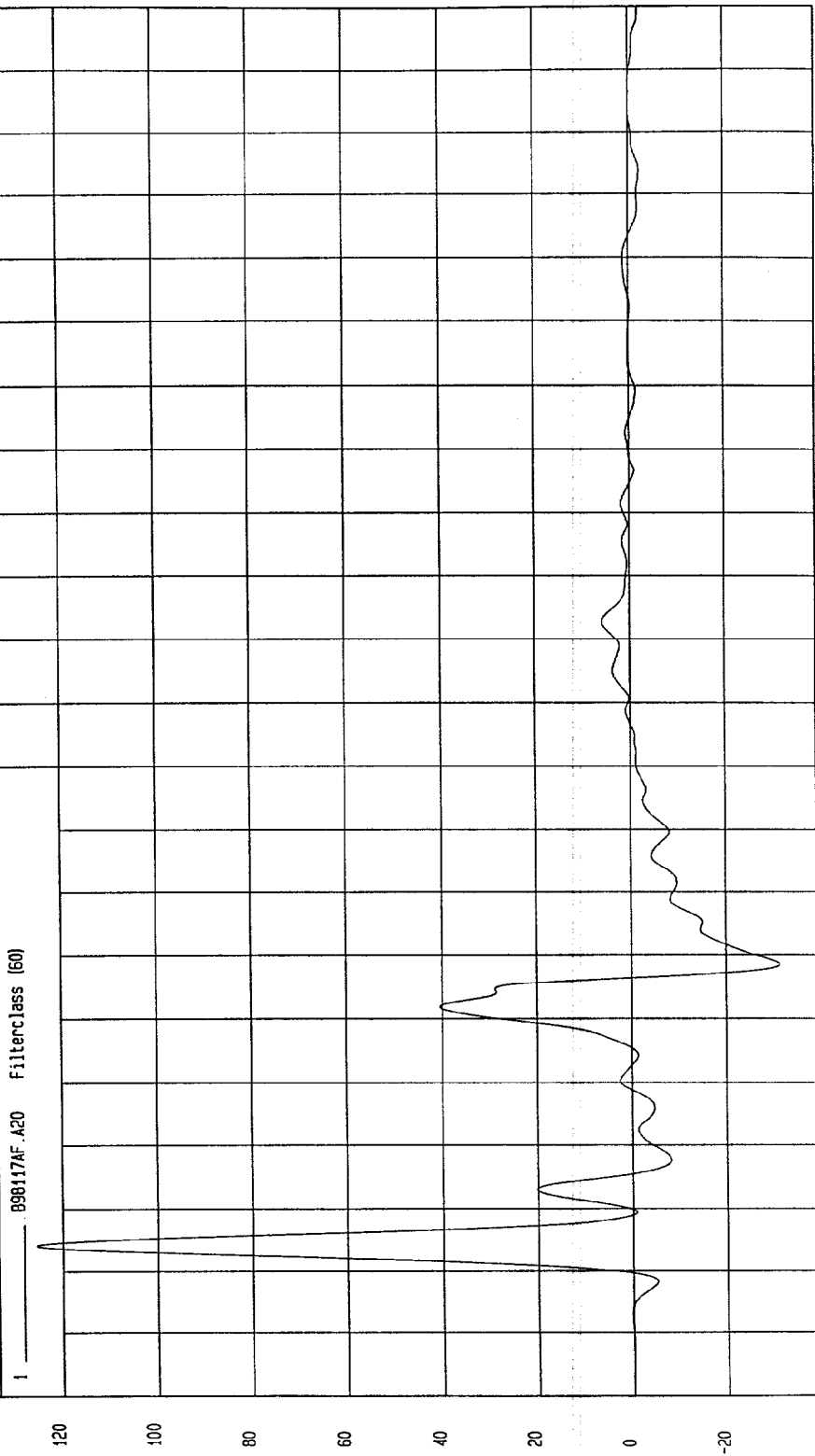
WGA Research
12-12-1998 11:22

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -31.41 G'S at 48 msec Maximum = 125.45 G'S at 4 msec

LEFT LOWER A-POST Y ACCELERATION



MGA Research
12-12-1998 11:01

TIME (SECONDS)

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

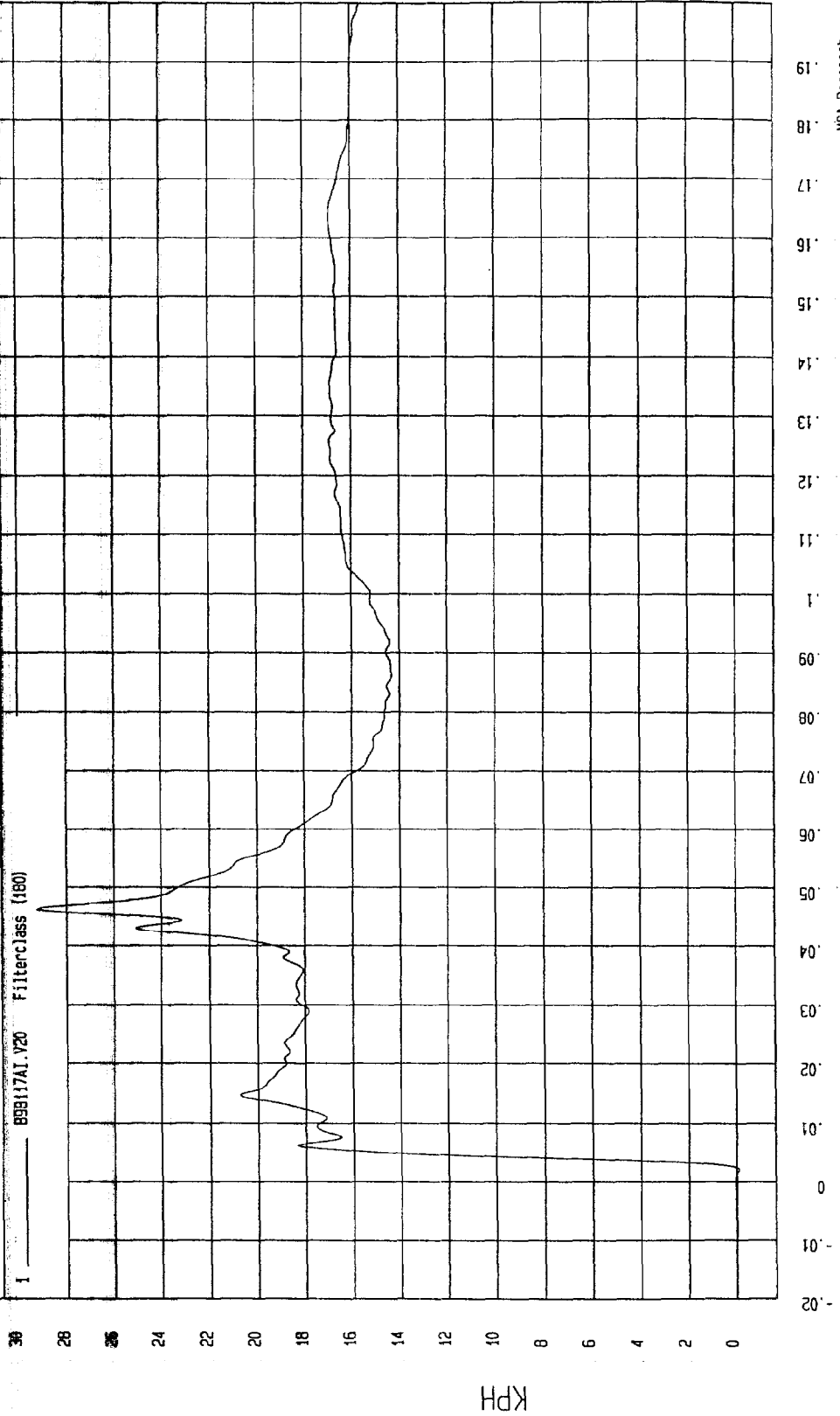
Speed: 38.3 MPH 61.6 KPH

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 29.23 KPH at 46 msec

Minimum = -.11 KPH at 2 msec

LEFT LOWER A-POST Y VELOCITY



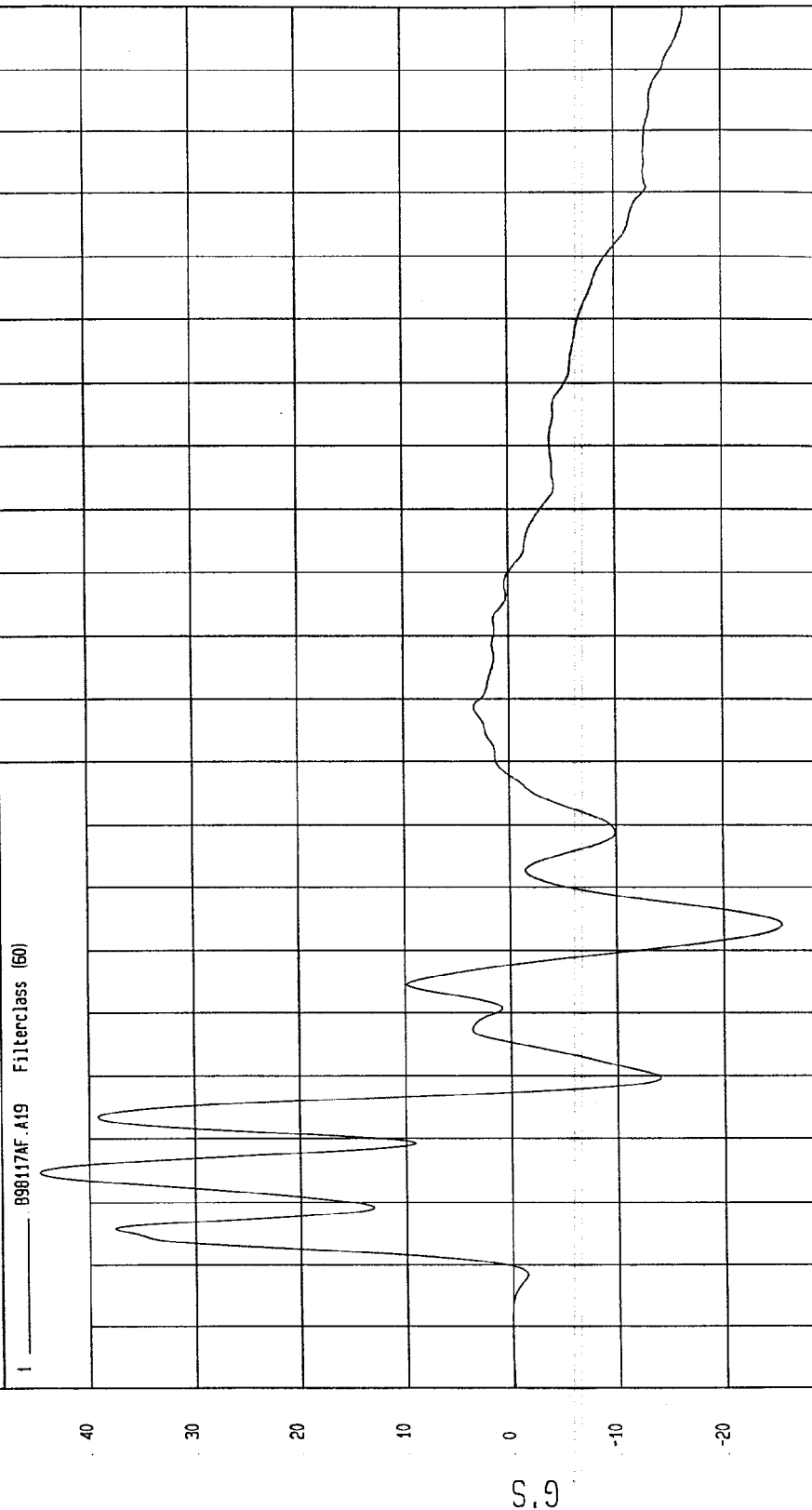
WGA Research
12-12-1998 11:22

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -25.51 G'S at 54 msec Maximum = 44.61 G'S at 15 msec

LEFT MID A-POST Y ACCELERATION



MSA Research
12-12-1998 11:02

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

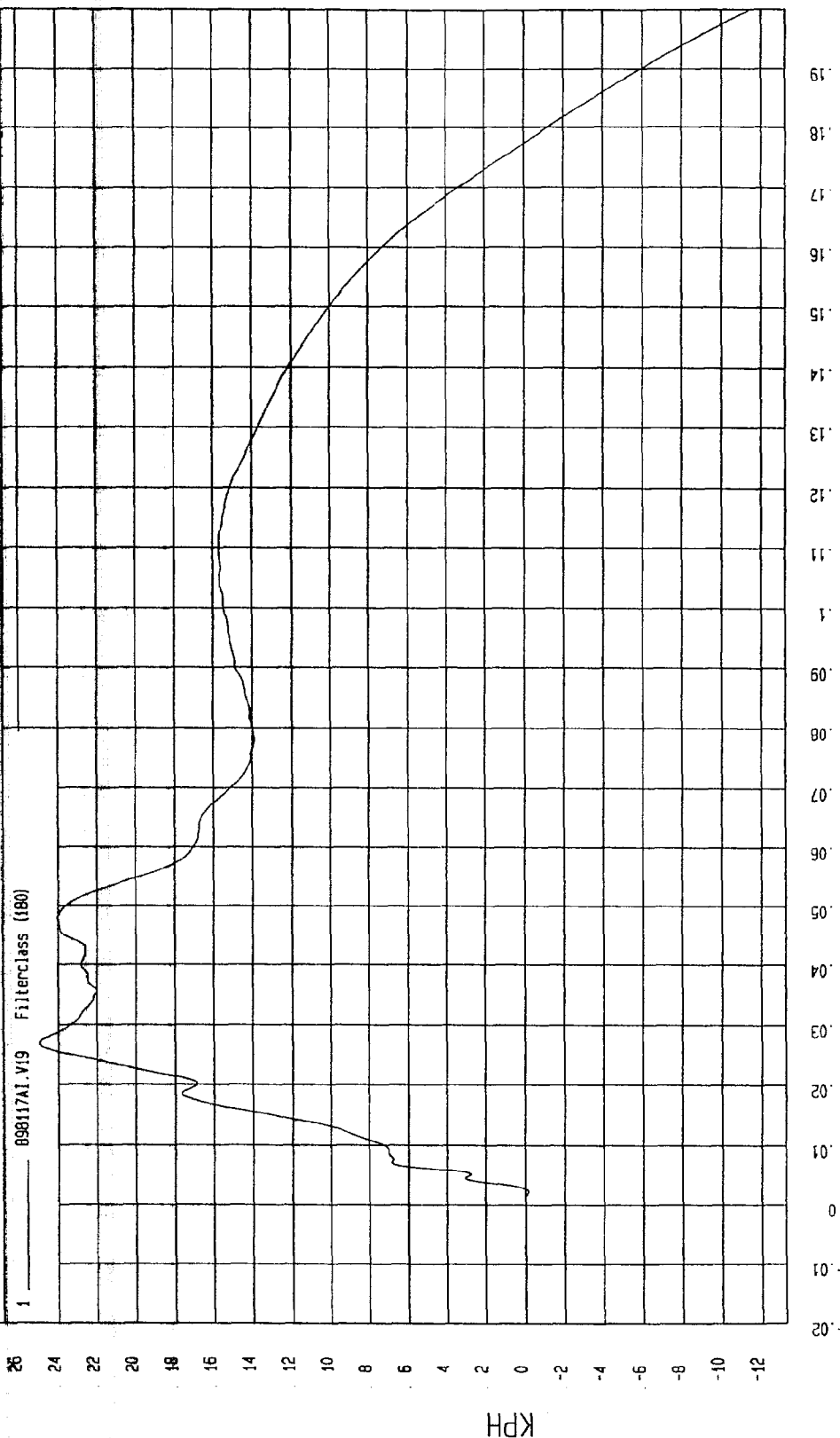
Speed: 38.3 MPH 61.6 KPH

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 24.96 KPH at 27 msec

Minimum = -11.43 KPH at 200 msec

LEFT MID A-POST Y VELOCITY



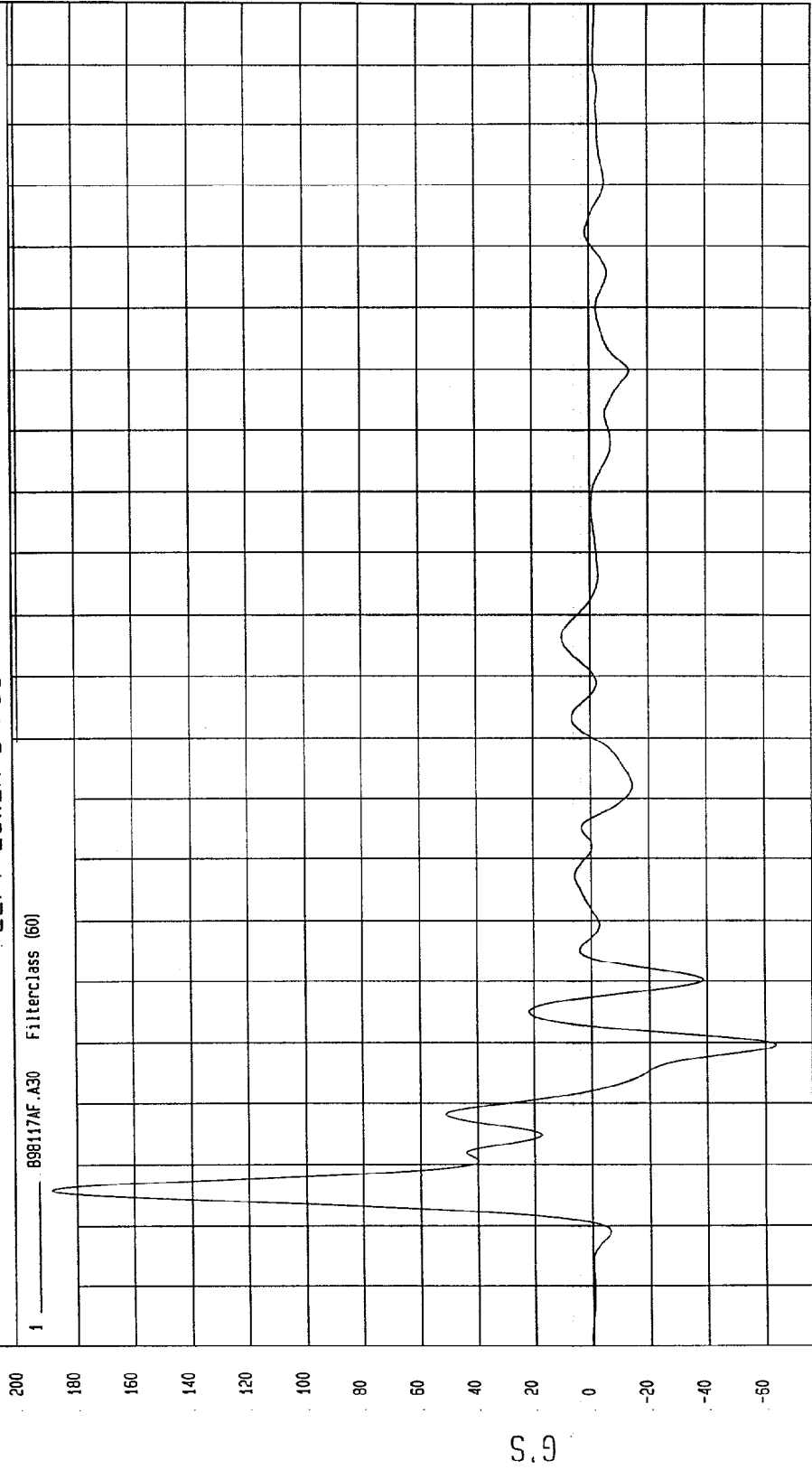
MGA Research
12-12-1998 11:22

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -63.68 G'S at 30 msec Maximum = 188.98 G'S at 6 msec

LEFT LOWER B-POST Y ACCELERATION



TIME (SECONDS)

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

MSA Research
12-12-1998 11:02

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

SPEED: 38.3 MPH 61.6 KPH

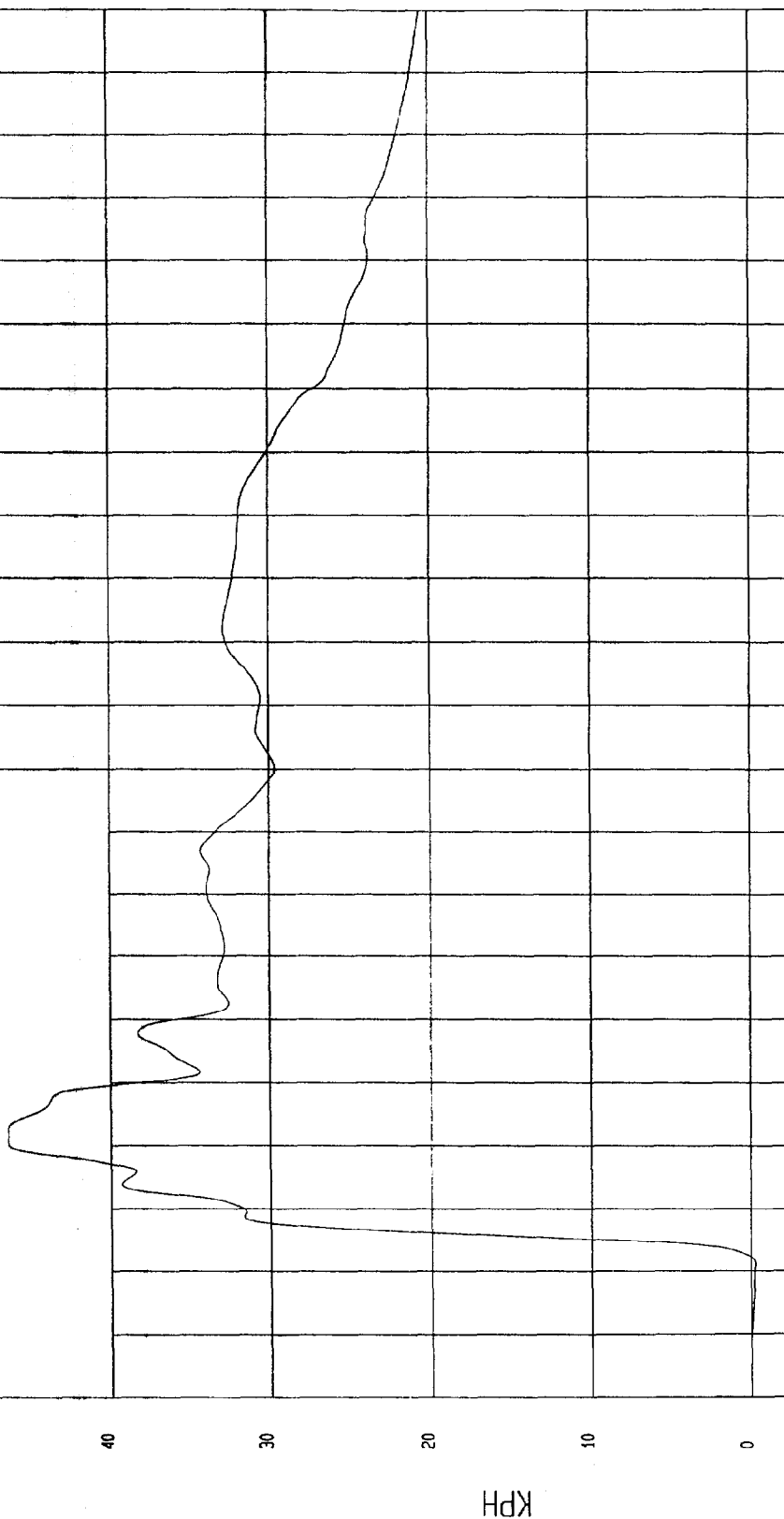
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 46.47 KPH at 22 msec

Minimum = -26 KPH at 1 msec

LEFT LOWER B-POST Y VELOCITY

1 ——— B9817A1.V30 Filterclass (180)



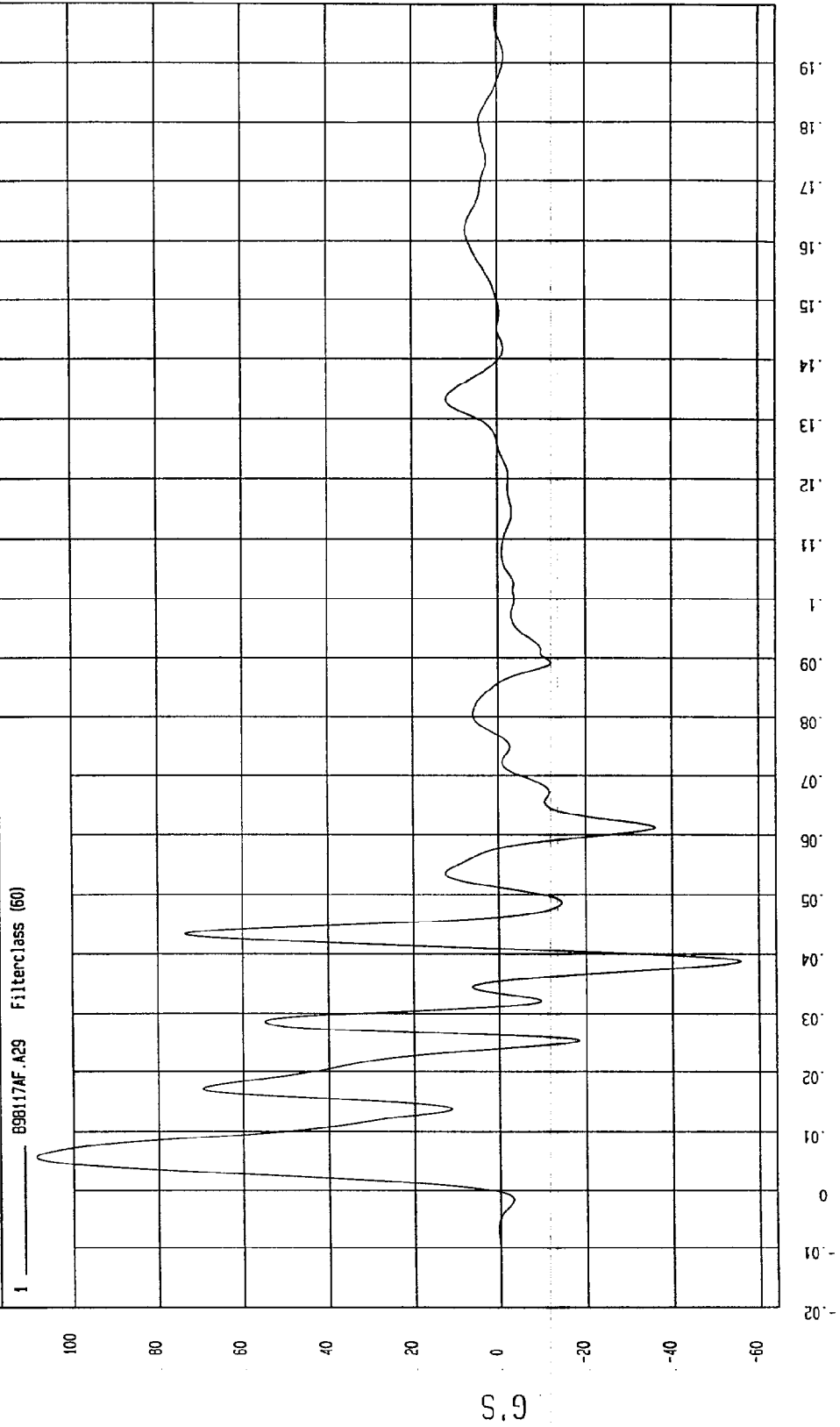
WCA Research
12-12-1998 11:22

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -55.76 G'S at 39 msec Maximum = 108.59 G'S at 6 msec

LEFT MID B-POST Y ACCELERATION



MGA Research
12-12-1998 11:02

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

Speed: 38.3 MPH 61.6 KPH

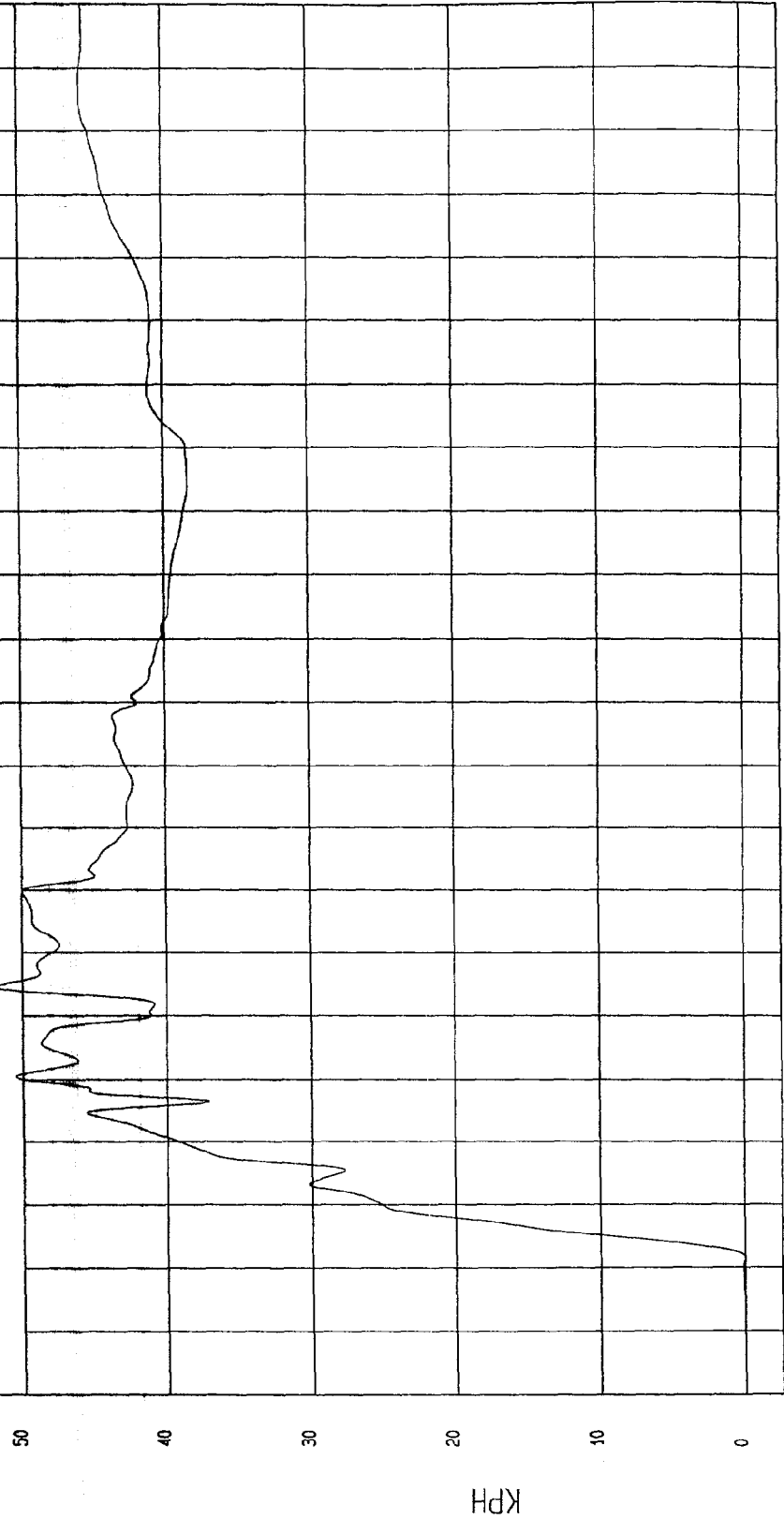
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 51.82 KPH at 45 msec

Minimum = -1.34E-04 KPH at -20 msec

LEFT MID B-POST Y VELOCITY

1 B98117A1.V29 Filterclass (180)



WCA Research
12-12-1998 11:22

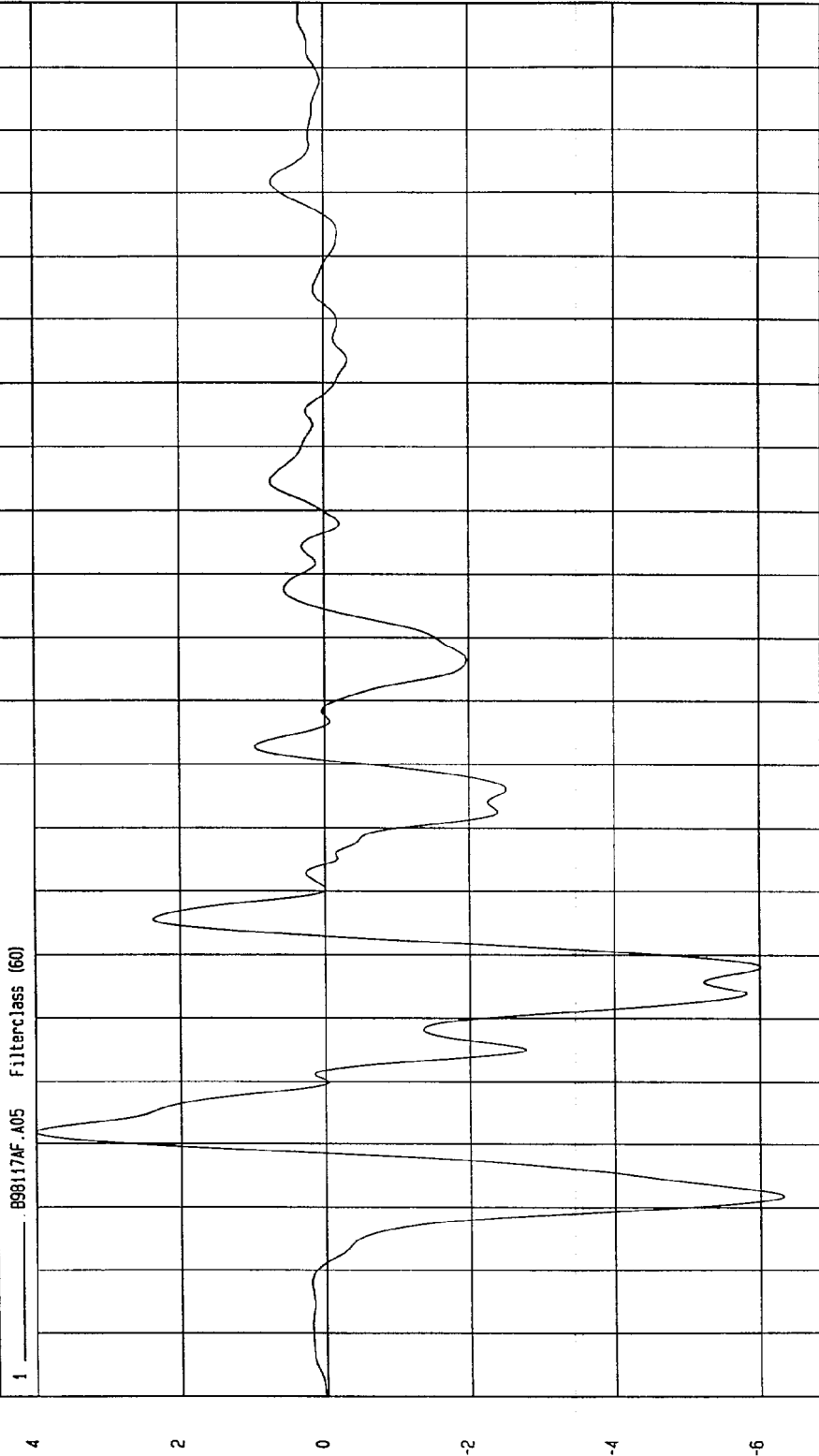
TIME Seconds

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -6.32 G'S at 12 msec Maximum = 4.01 G'S at 22 msec

VEHICLE CG X ACCELERATION



MSA Research
12-12-1998 11:02

TIME (SECONDS)

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

Speed: 38.3 MPH 61.6 KPH

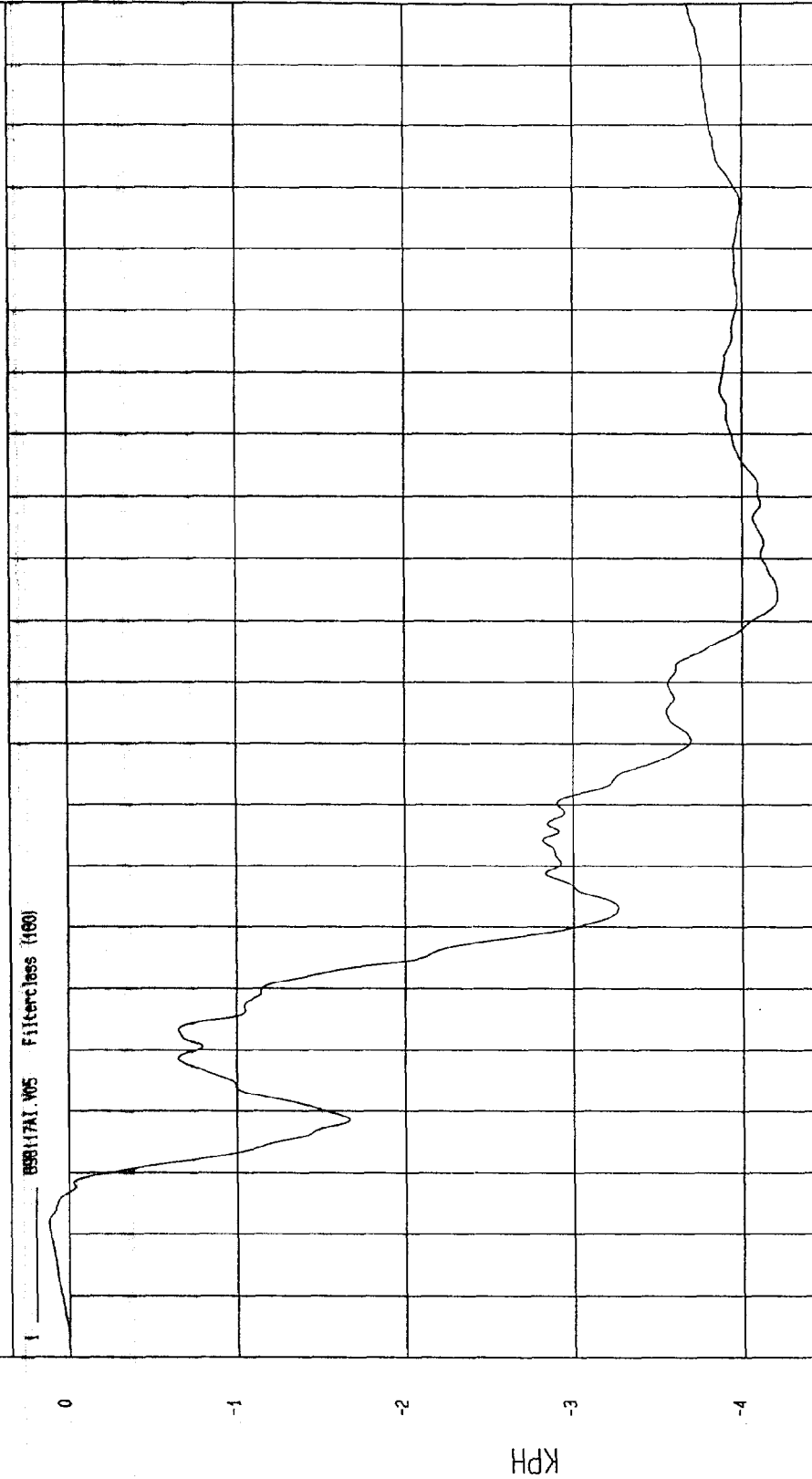
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = .12 KPH at 2 msec

Minimum = -4.21 KPH at 104 msec

VEHICLE CG X VELOCITY

00017A1.V05 Filterless (100)



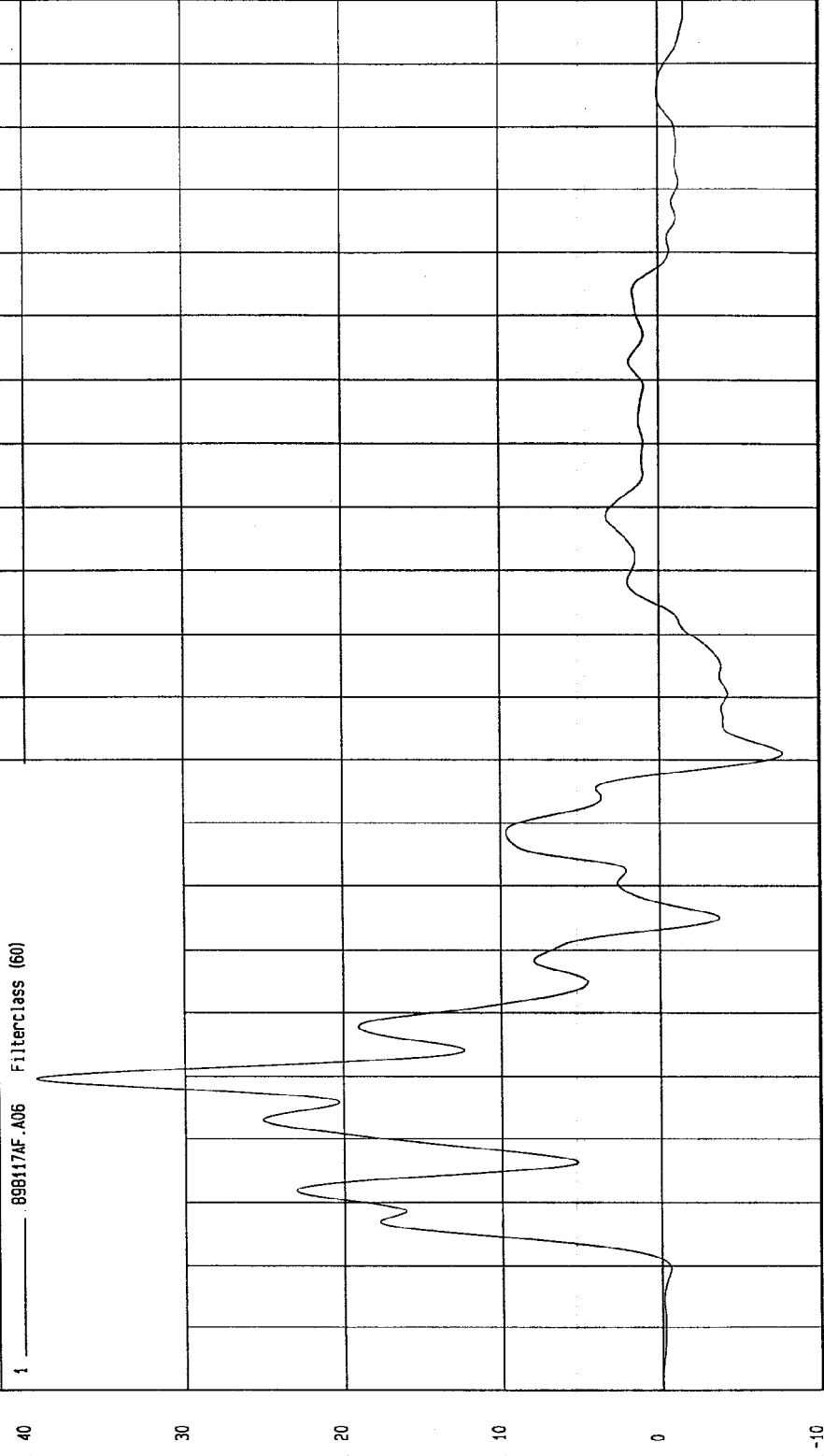
MCA Research
12-12-1998 11:22

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -7.75 G'S at 81 msec Maximum = 39.41 G'S at 30 msec

VEHICLE CG Y ACCELERATION



MCA Research
12-12-1998 11:02

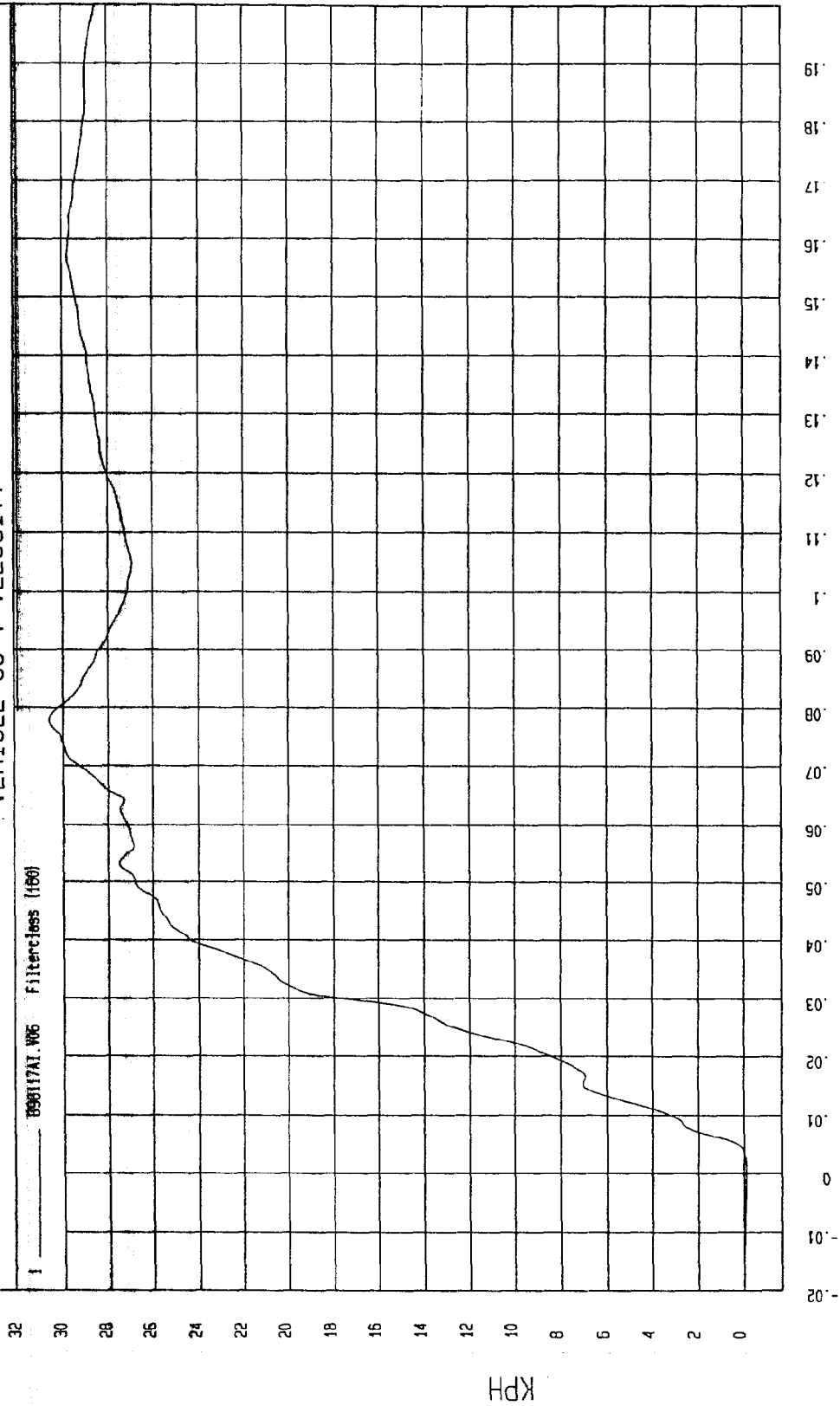
TIME (SECONDS)

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

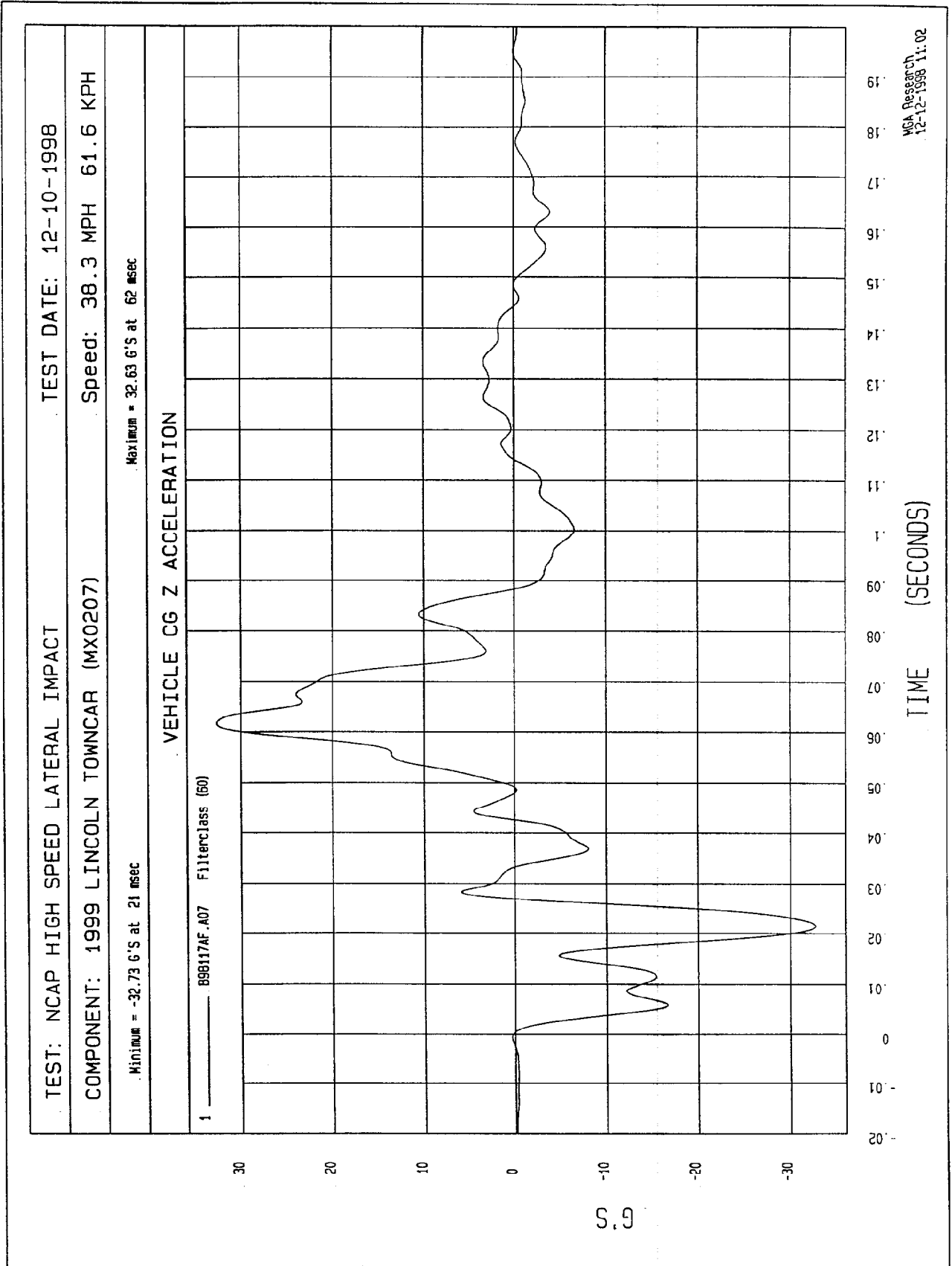
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -12 KPH at 1 msec Maximum = 30.62 KPH at 78 msec

VEHICLE CG Y VELOCITY



WGA Research
12-12-1998 11:22



TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

Speed: 38.3 MPH 61.6 KPH

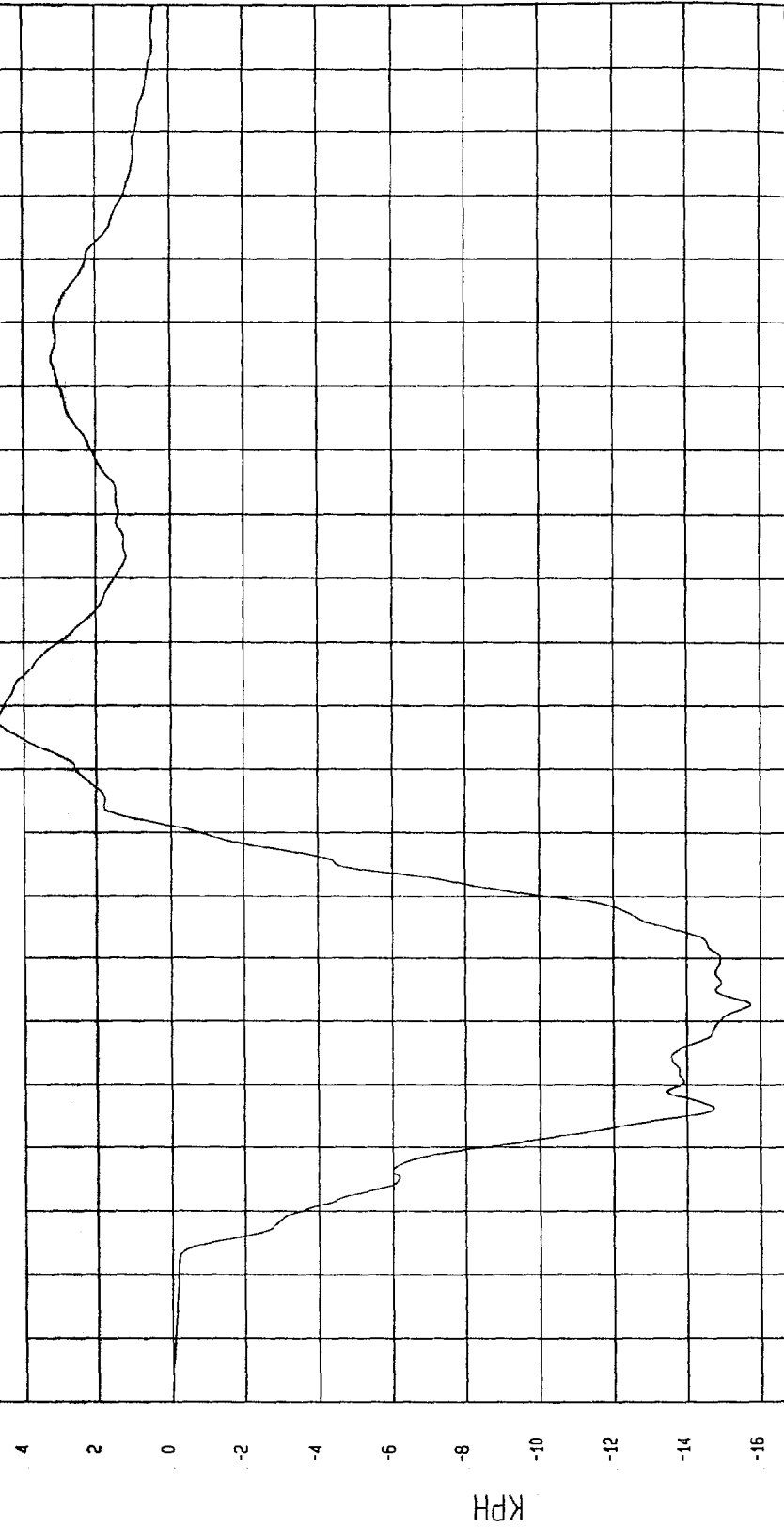
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 4.77 KPH at 88 msec

Minimum = -15.72 KPH at 43 msec

VEHICLE CG Z VELOCITY

1 898117AI.V07 Filterclass (180)



MCA Research
12-12-1998 11:22

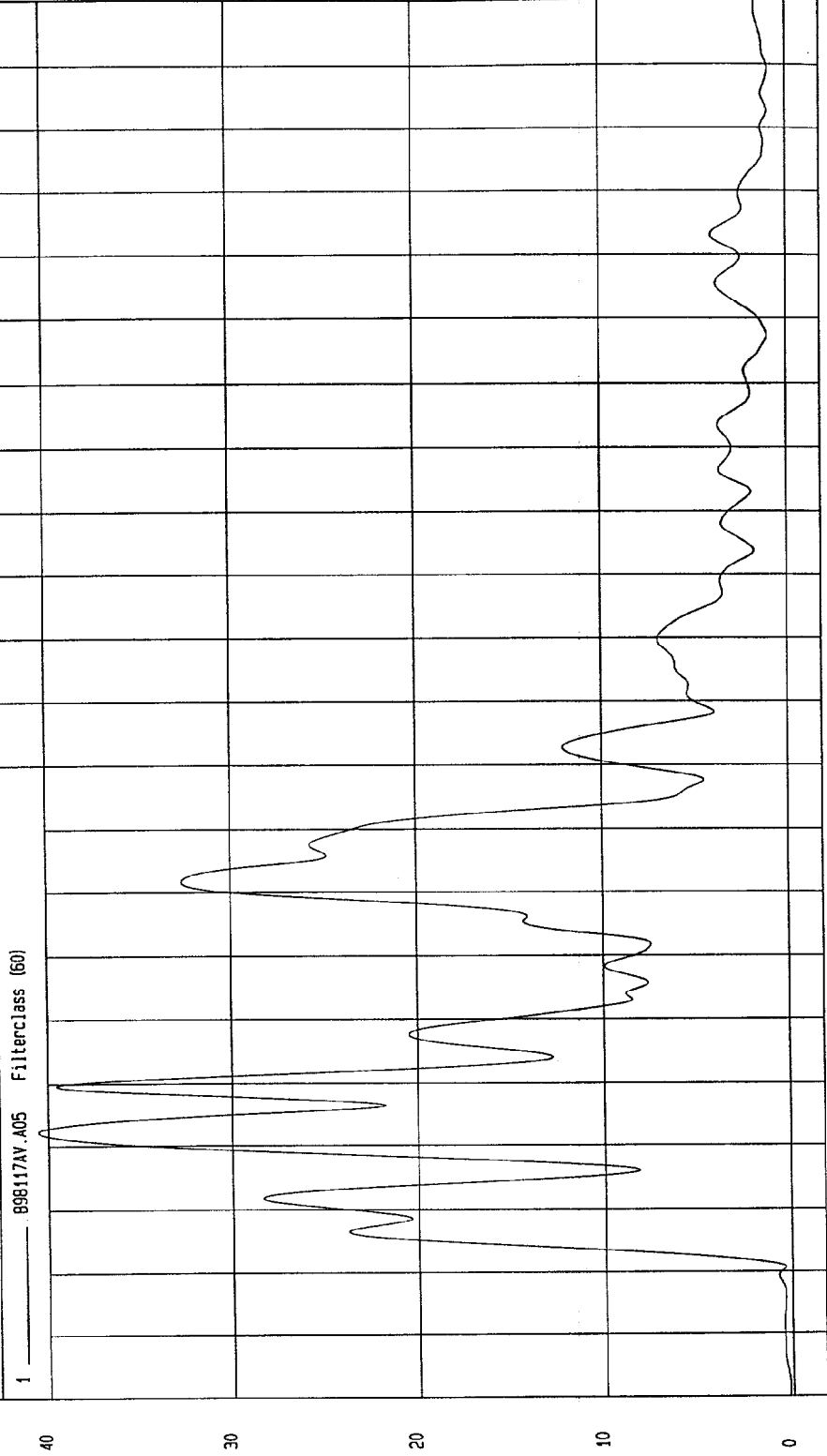
TIME Seconds

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = .16 G'S at -.19 msec Maximum = 40.54 G'S at 22 msec

VEHICLE CG RESULTANT ACCELERATION



MGA Research
12-12-1998 11:02

TIME (SECONDS)

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

SPEED: 38.3 MPH 61.6 KPH

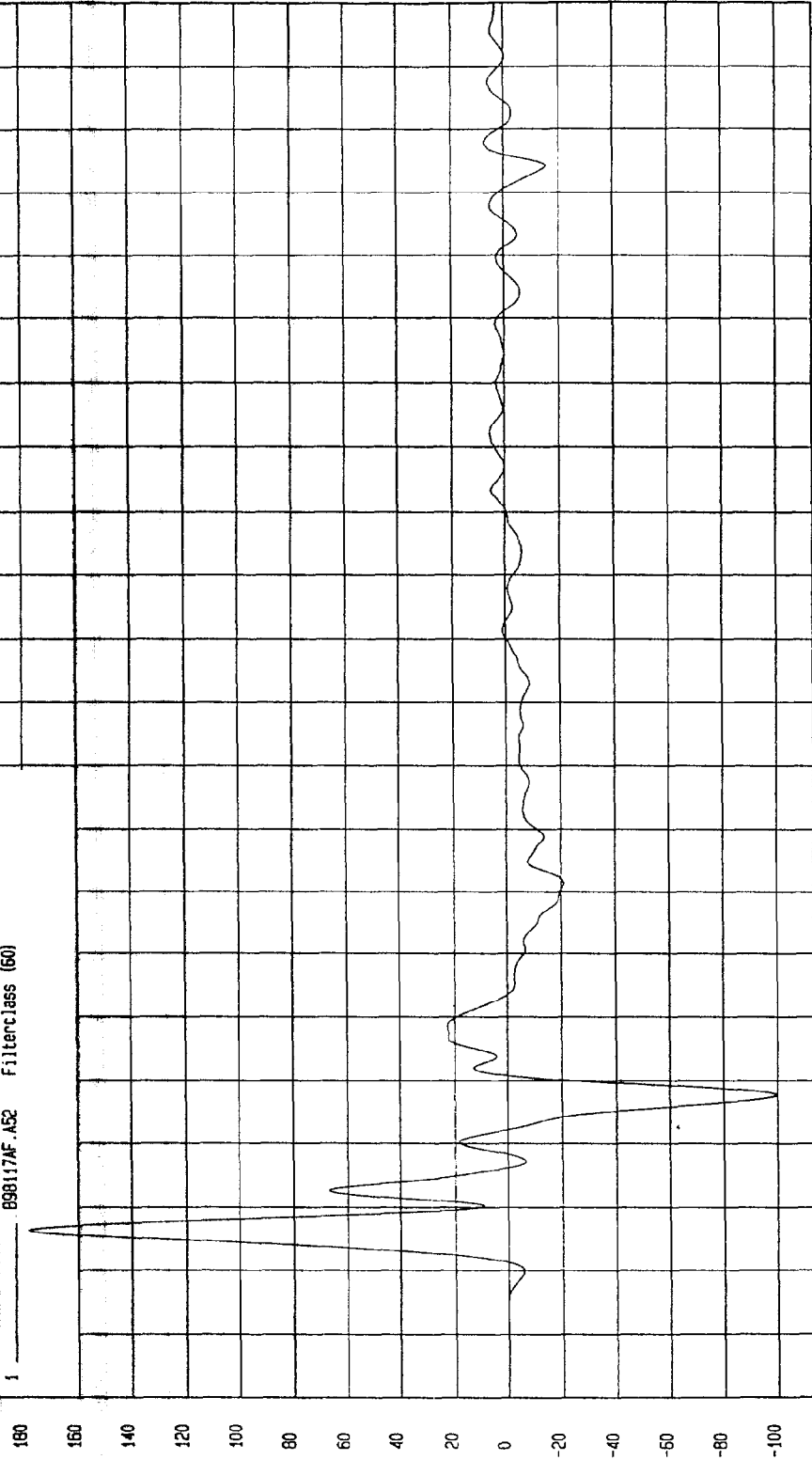
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 178.62 G'S at 6 msec

Minimum = -99.71 G'S at 28 msec

LEFT FRONT DOOR MIDREAR Y ACCELERATION

1 B98117AF.A52 Filter: class (60)



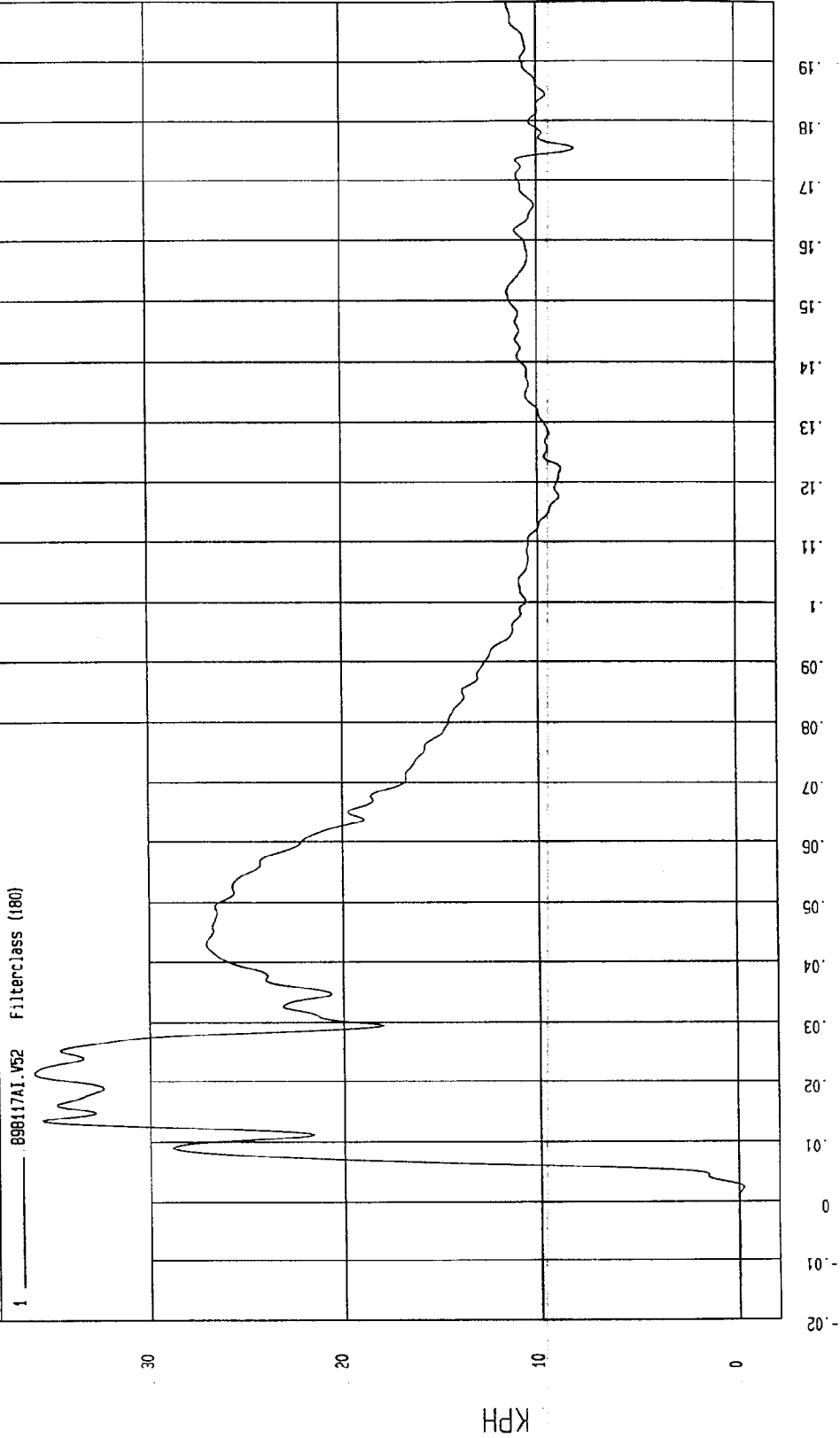
MSA Research
12-12-1998 11:02

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -.27 KPH at 2 msec Maximum = 35.95 KPH at 21 msec

LEFT FRONT DOOR MIDREAR Y VELOCITY



NGA Research
12-12-1998 11:22

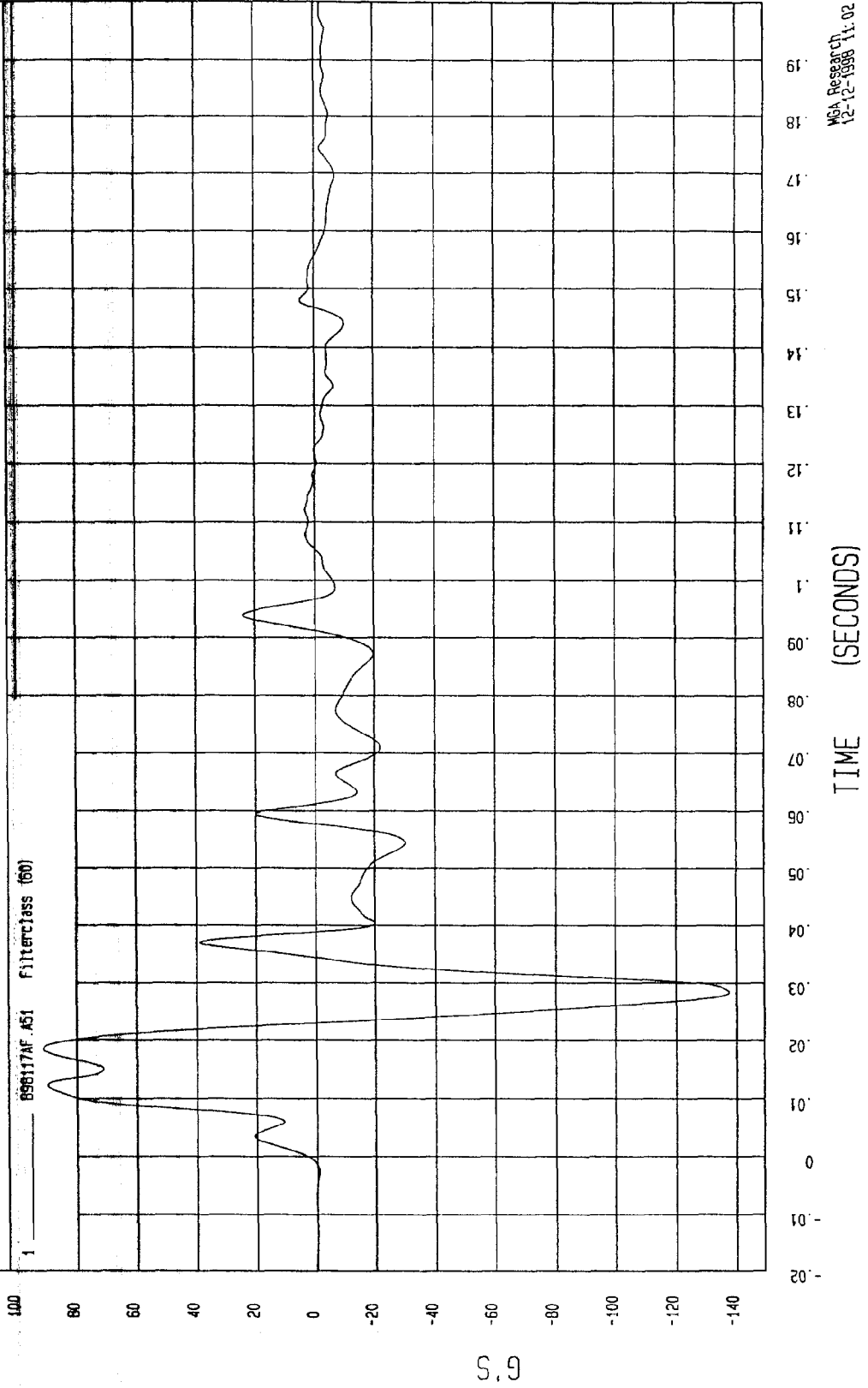
TIME Seconds

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -137.71 G'S at 28 msec Maximum = 91.35 G'S at 18 msec

LEFT FRONT DOOR CENTERLINE Y ACCELERATION



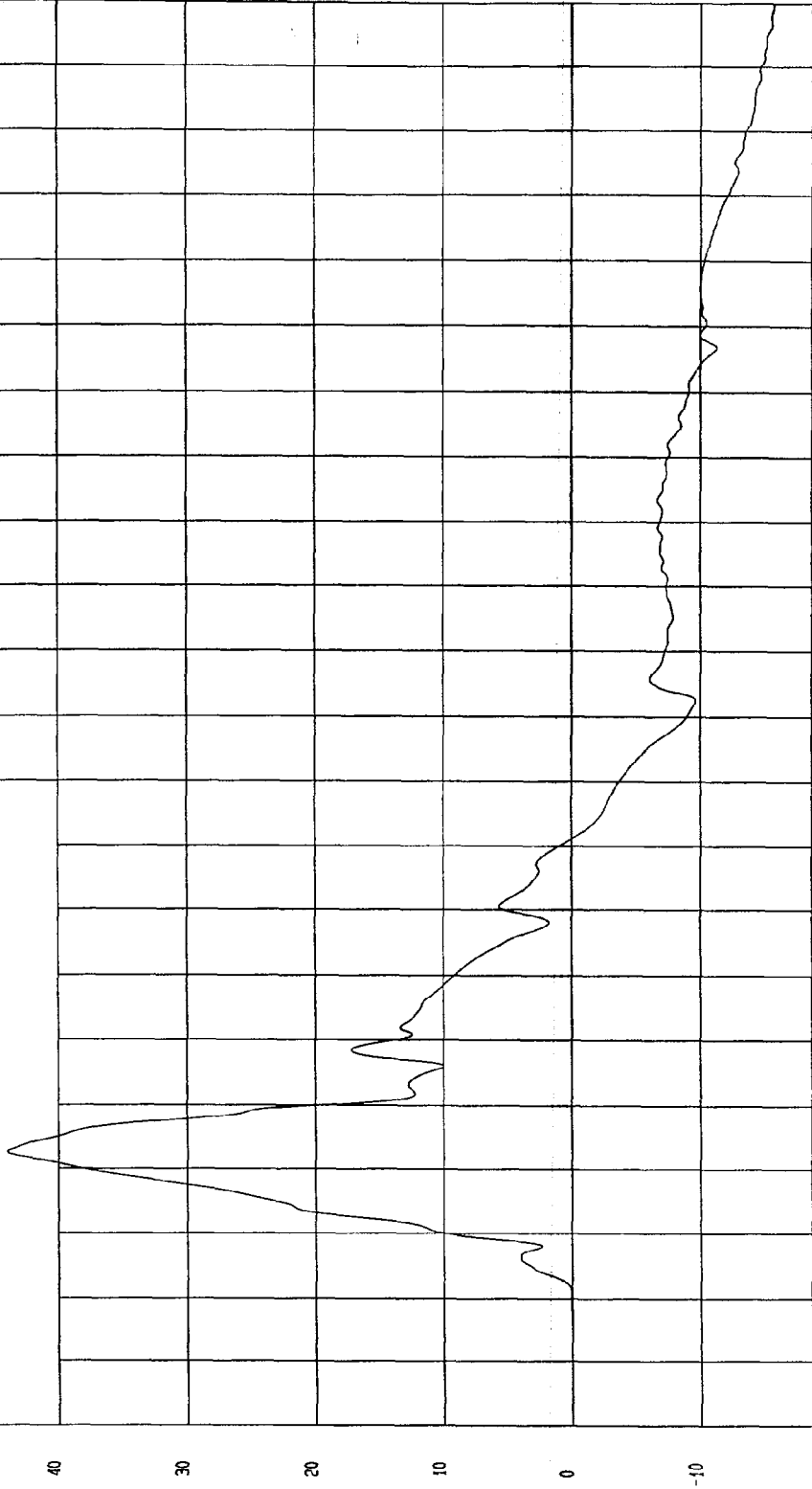
TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -15.71 KPH at 200 msec Maximum = 44.08 KPH at 23 msec

LEFT FRONT DOOR CENTERLINE Y VELOCITY

1 898117A1.V51 Filterclass (100)



TIME Seconds

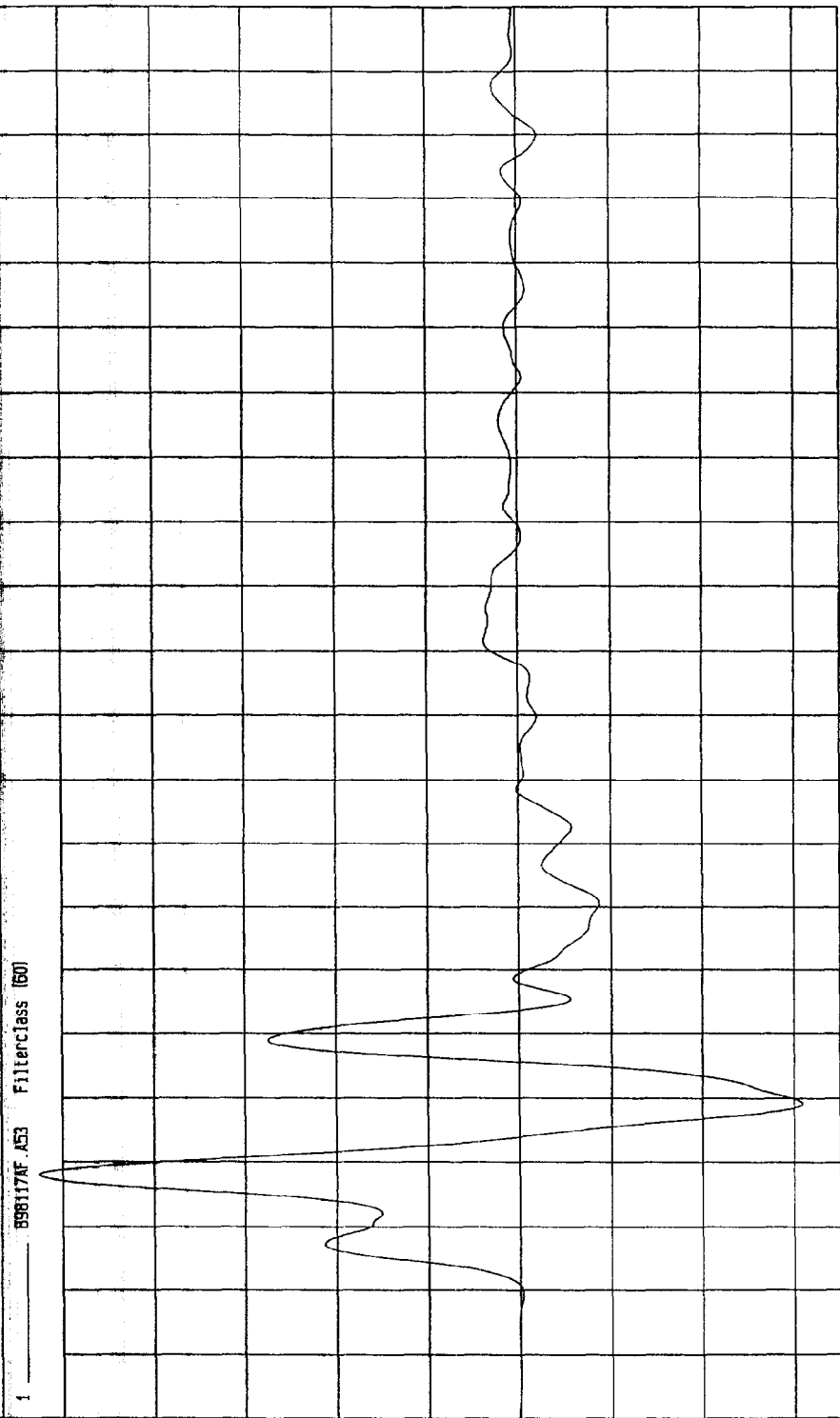
NCA Research
12-12-1998 11:22

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -61.85 G'S at 29 msec Maximum = 105.06 G'S at 18 msec

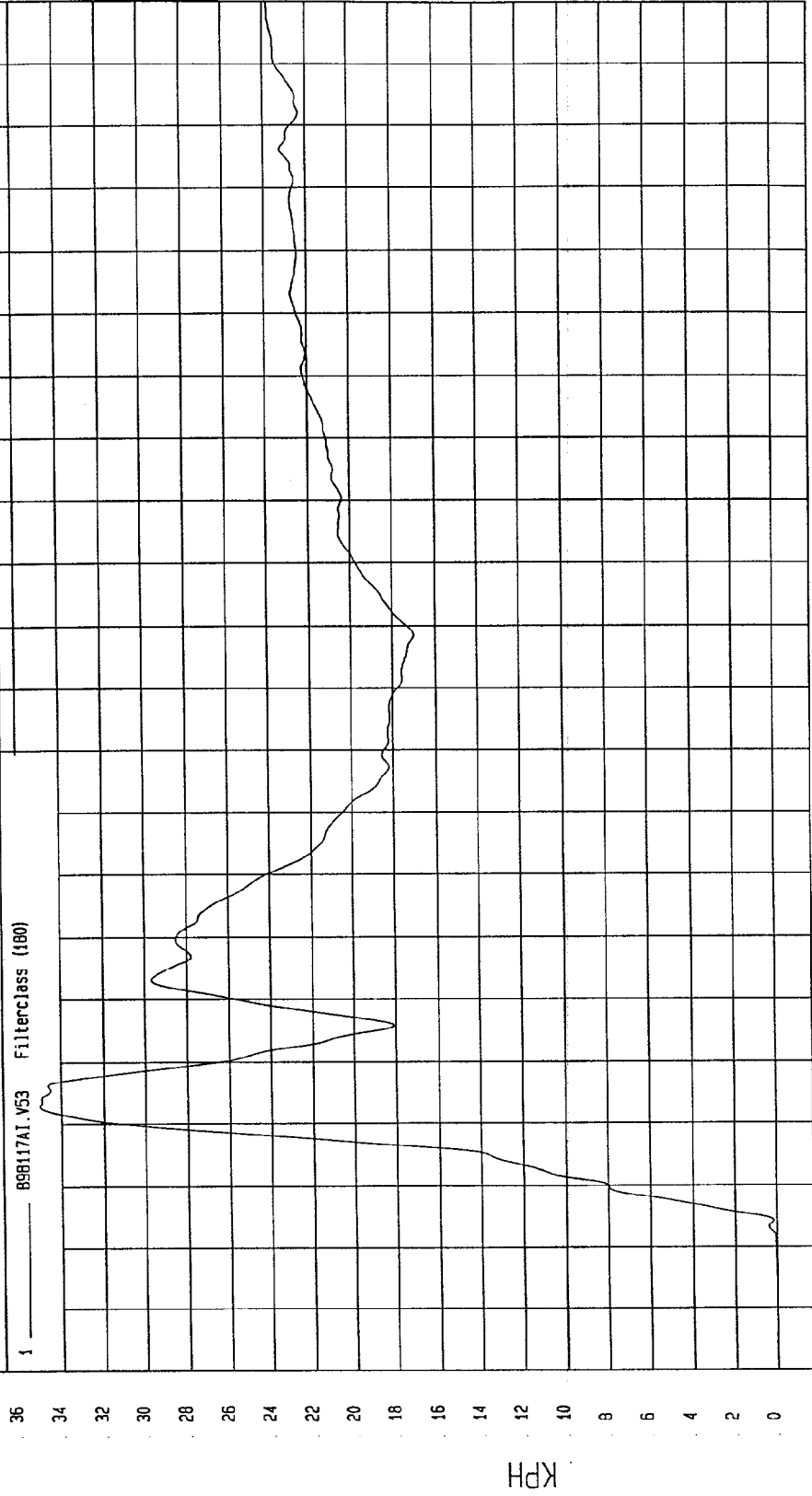
LEFT FRONT DOOR UPPER CENTERLINE Y ACCELERATION



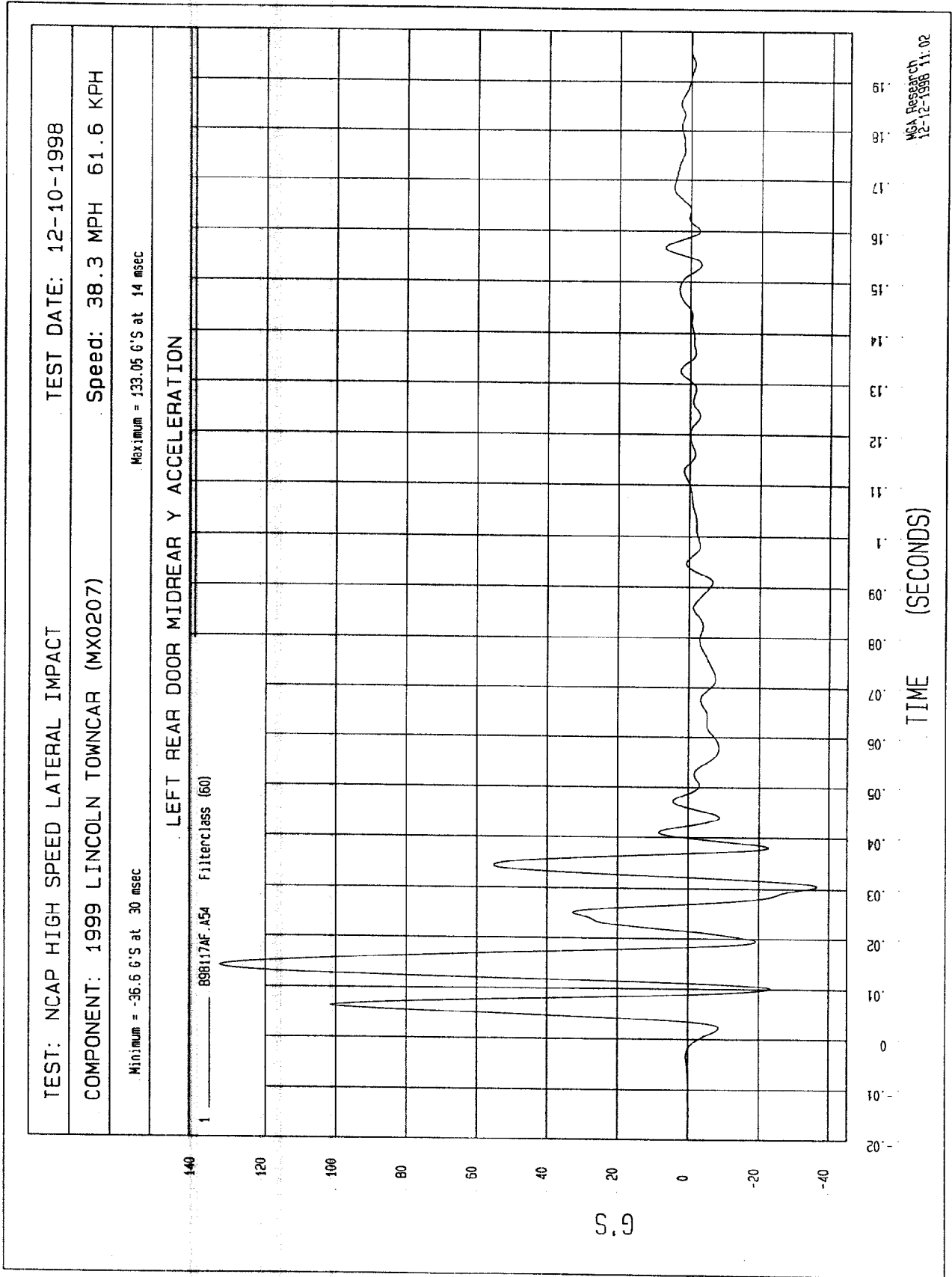
NSA Research
12-12-1998 11:02

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH
Minimum = -8.00E-03 KPH at -7 msec Maximum = 34.97 KPH at 23 msec

LEFT FRONT DOOR UPPER CENTERLINE Y VELOCITY



MEA Research
12-12-1998 11:22

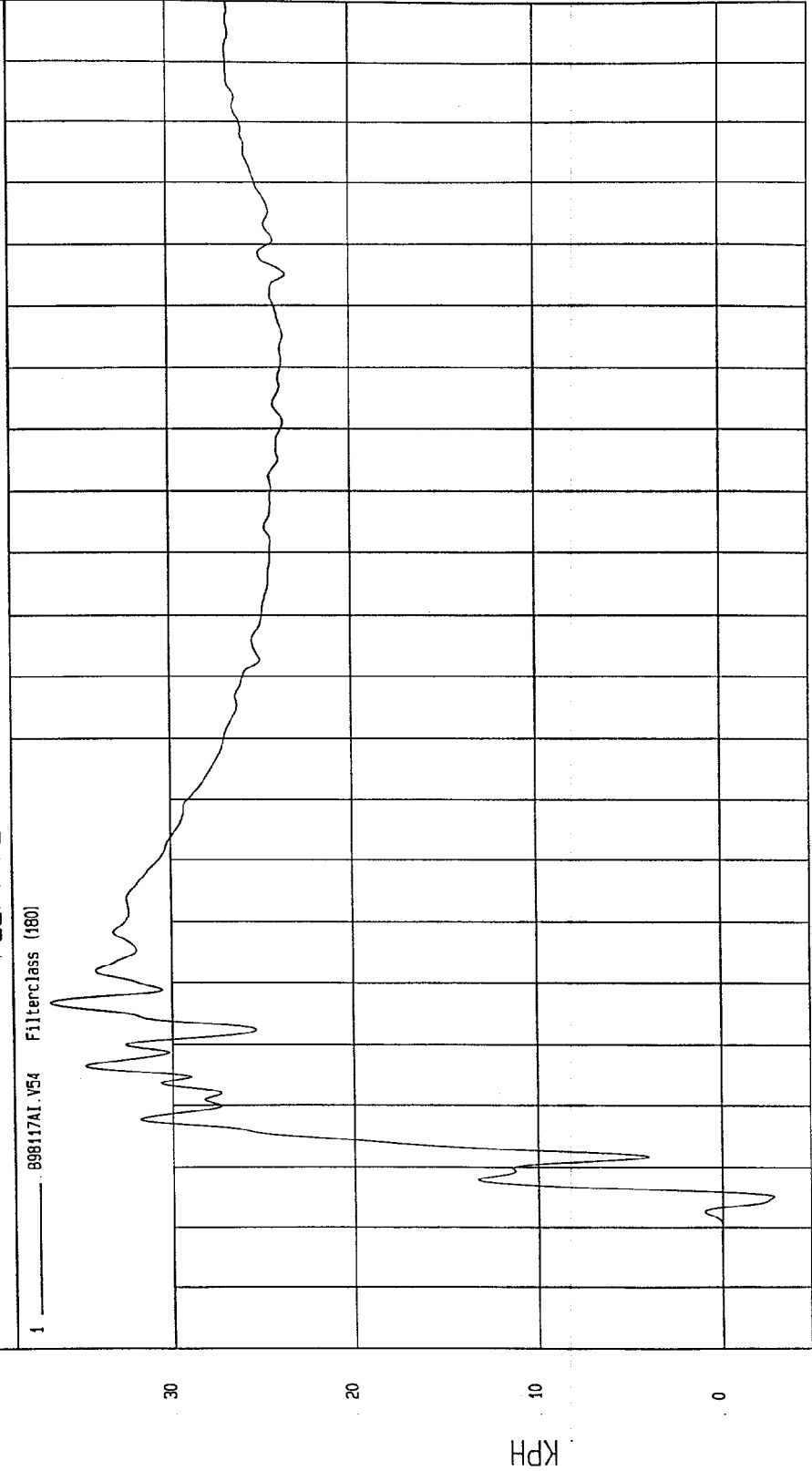


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -2.95 KPH at 5 msec Maximum = 36.67 KPH at 37 msec

LEFT REAR DOOR MIDREAR Y VELOCITY



TIME Seconds

NSA Research
12-12-1998 11:22

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

Speed: 38.3 MPH 61.6 KPH

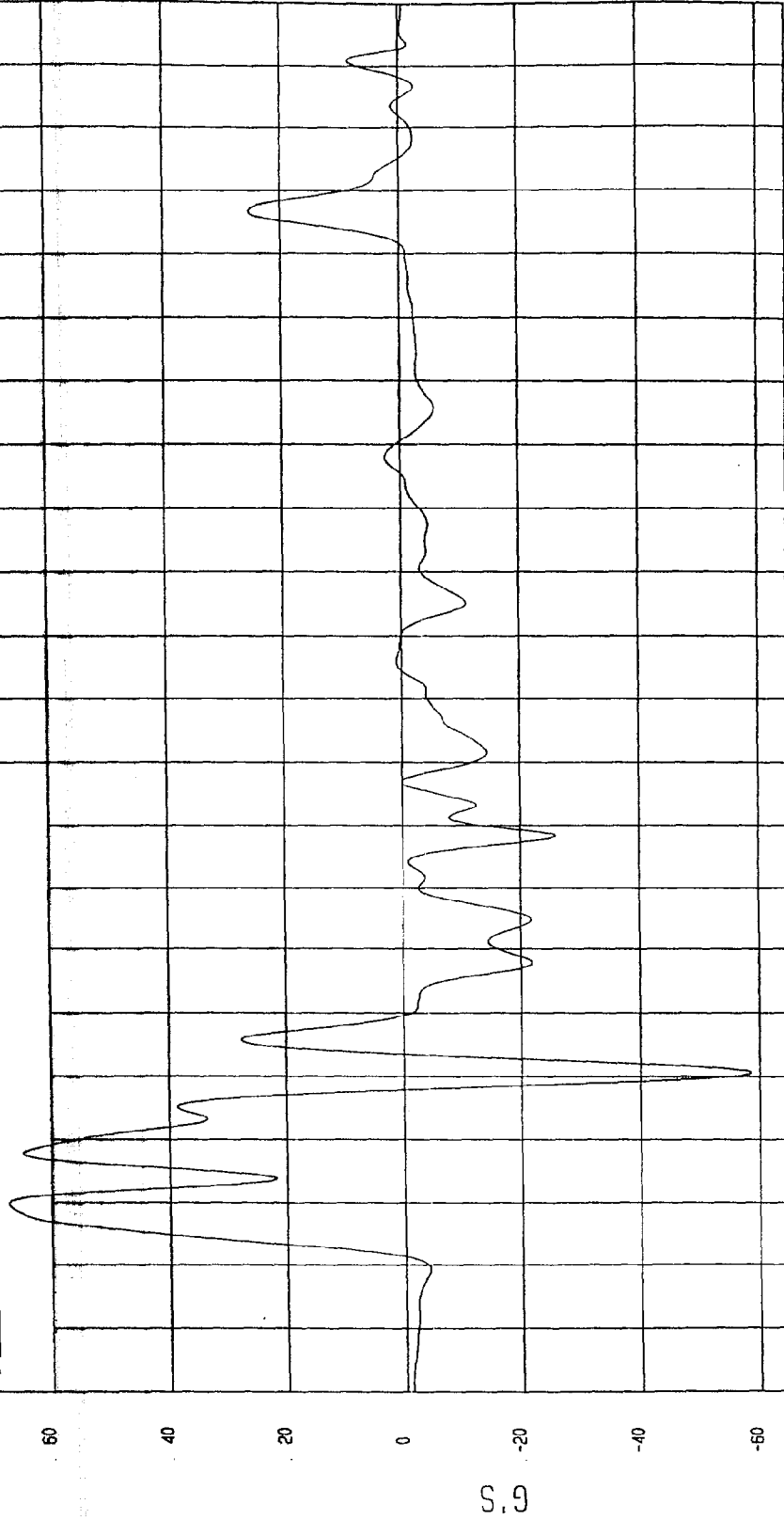
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 67.15 G'S at 10 msec

Minimum = -58.61 G'S at 31 msec

LEFT REAR DOOR UPPER CENTERLINE Y ACCELERATION

1 B9817AF.A55 FilterClass5 (60)



MSA Research
12-12-1998 11:02

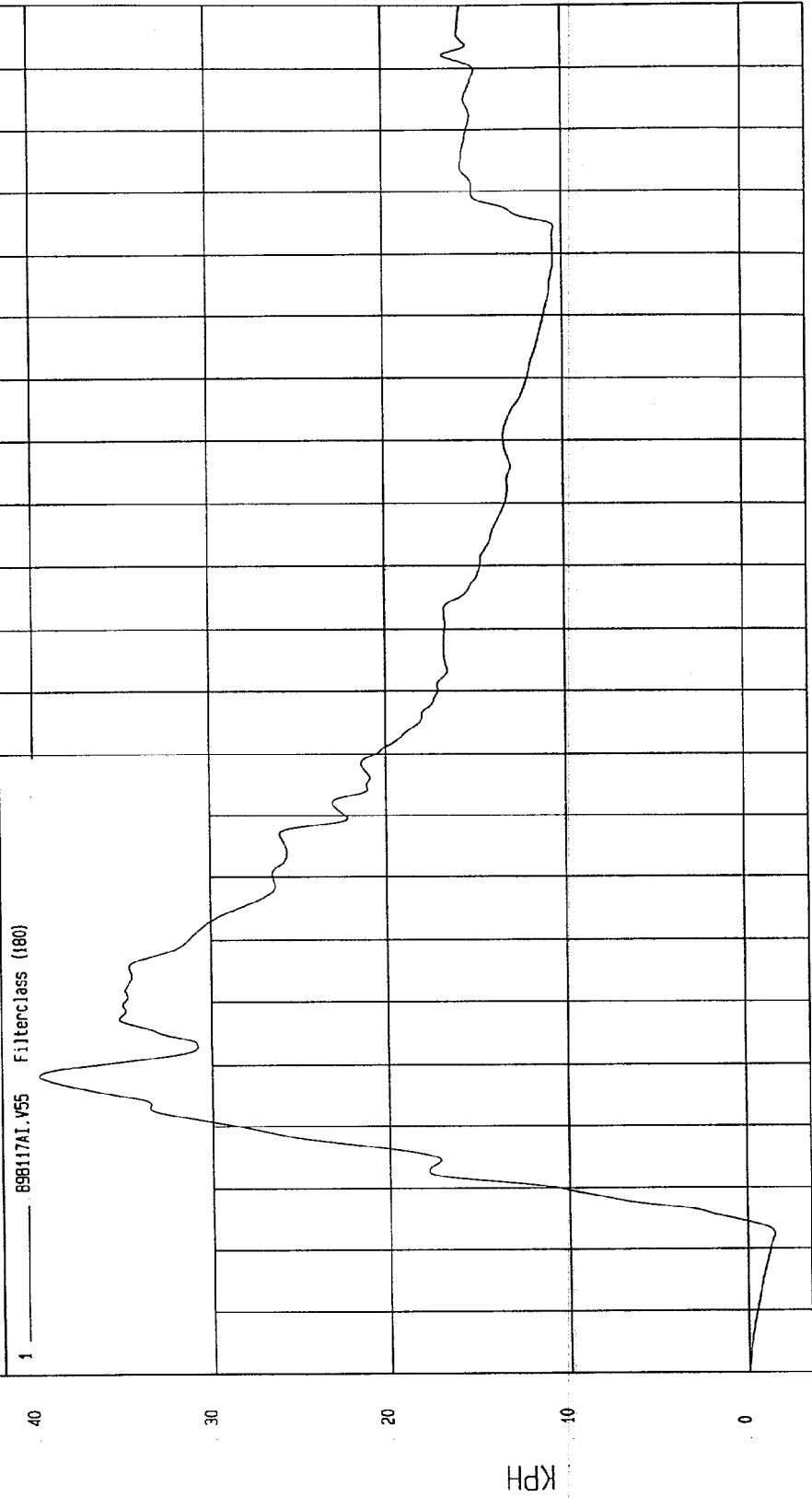
TIME (SECONDS)

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -1.55 KPH at 2 msec Maximum = 39.8 KPH at 28 msec

LEFT REAR DOOR UPPER CENTERLINE Y VELOCITY



TIME Seconds

MCA Research
12-12-1998 11:23

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

SPEED: 38.3 MPH 61.6 KPH

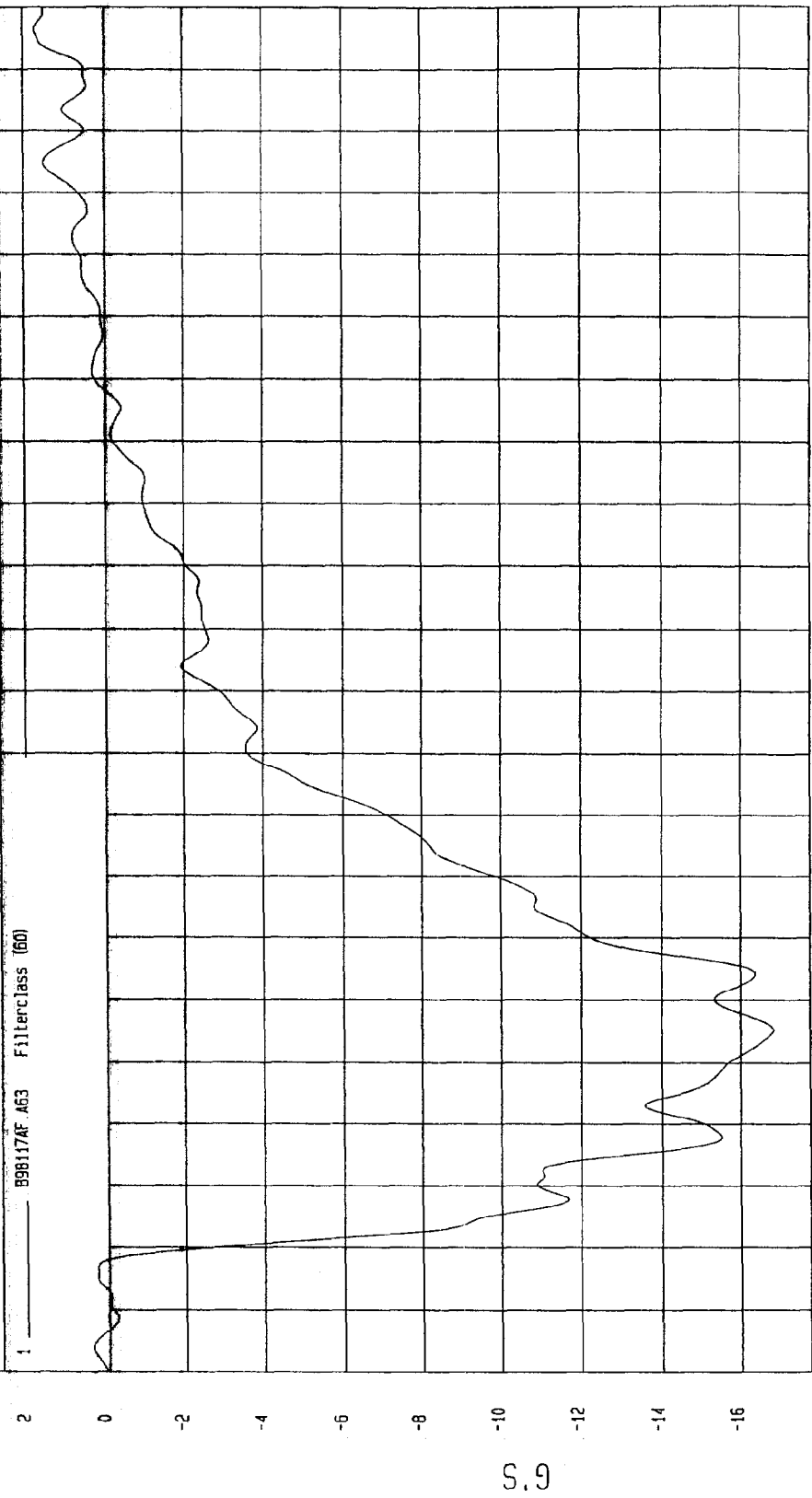
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 1.71 G'S at 196 msec

Minimum = -16.8 G'S at 35 msec

MOVING BARRIER CG X ACCELERATION

1 ——— 99817AF A63 Filterclass (60)



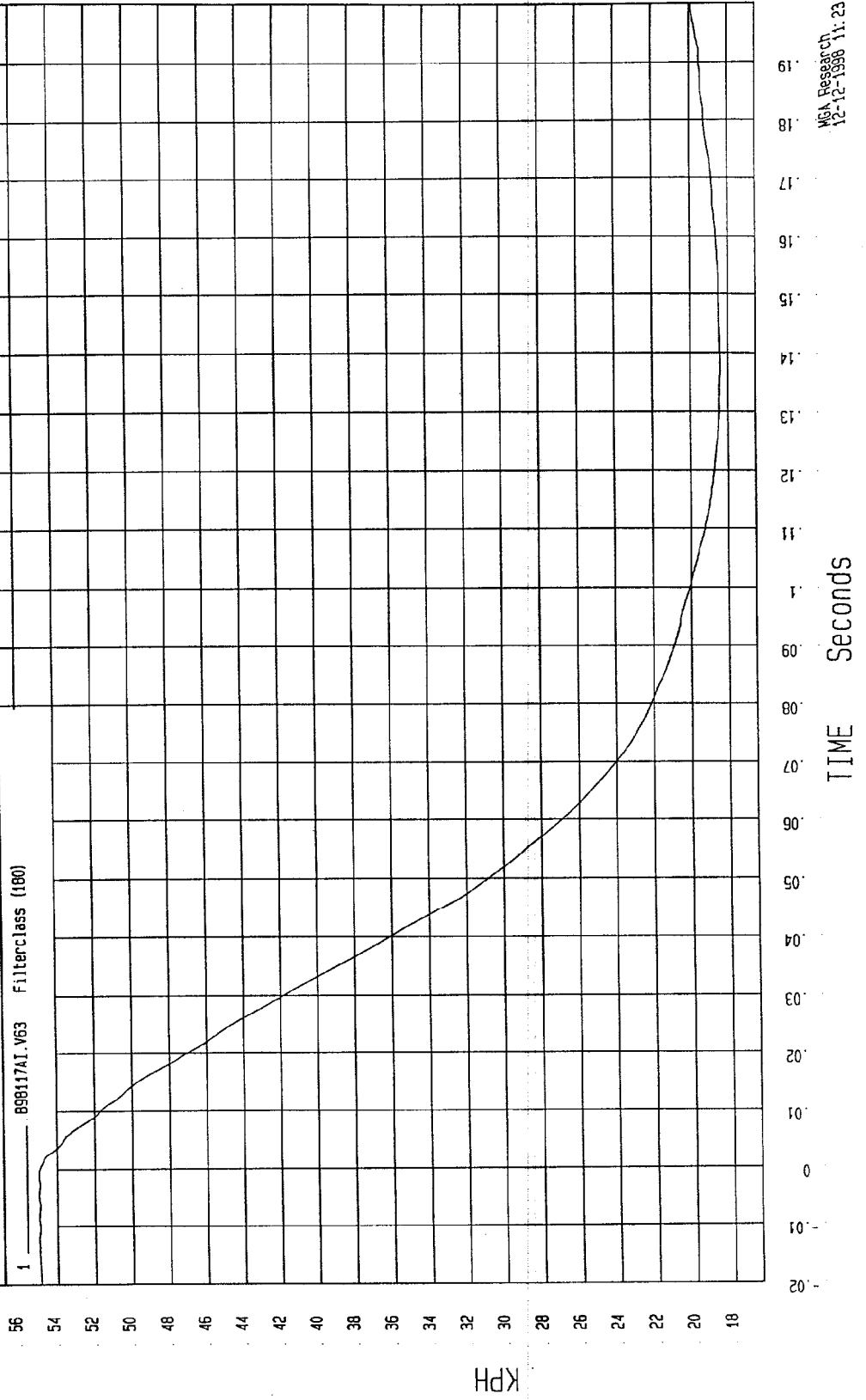
MEA Research
12-12-1998 11:02

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = 18.39 KPH at 138 msec Maximum = 54.97 KPH at -1 msec

MOVING BARRIER CG X VELOCITY

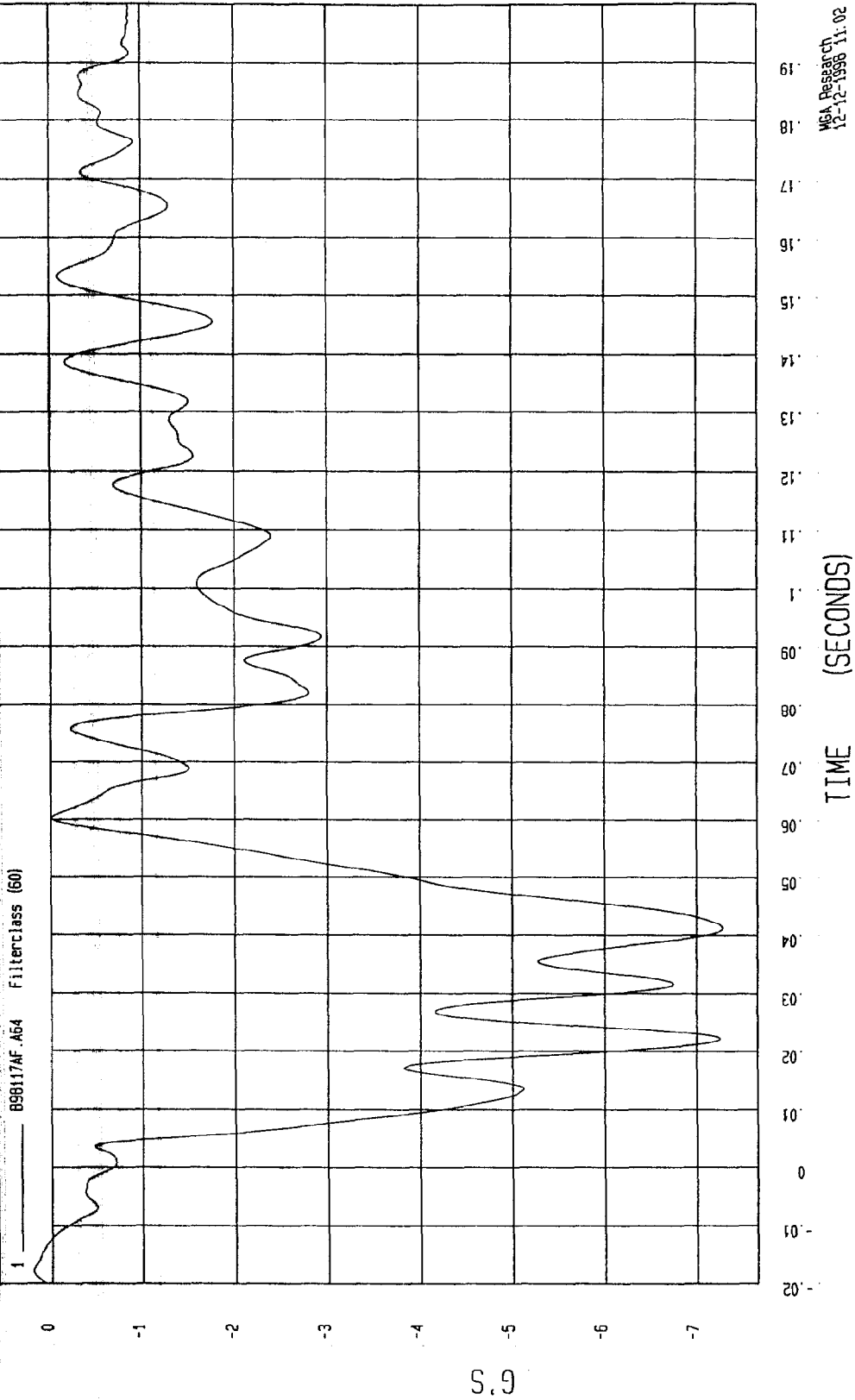


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -7.29 G'S at 41 msec Maximum = .19 G'S at -18 msec

MOVING BARRIER CG Y ACCELERATION

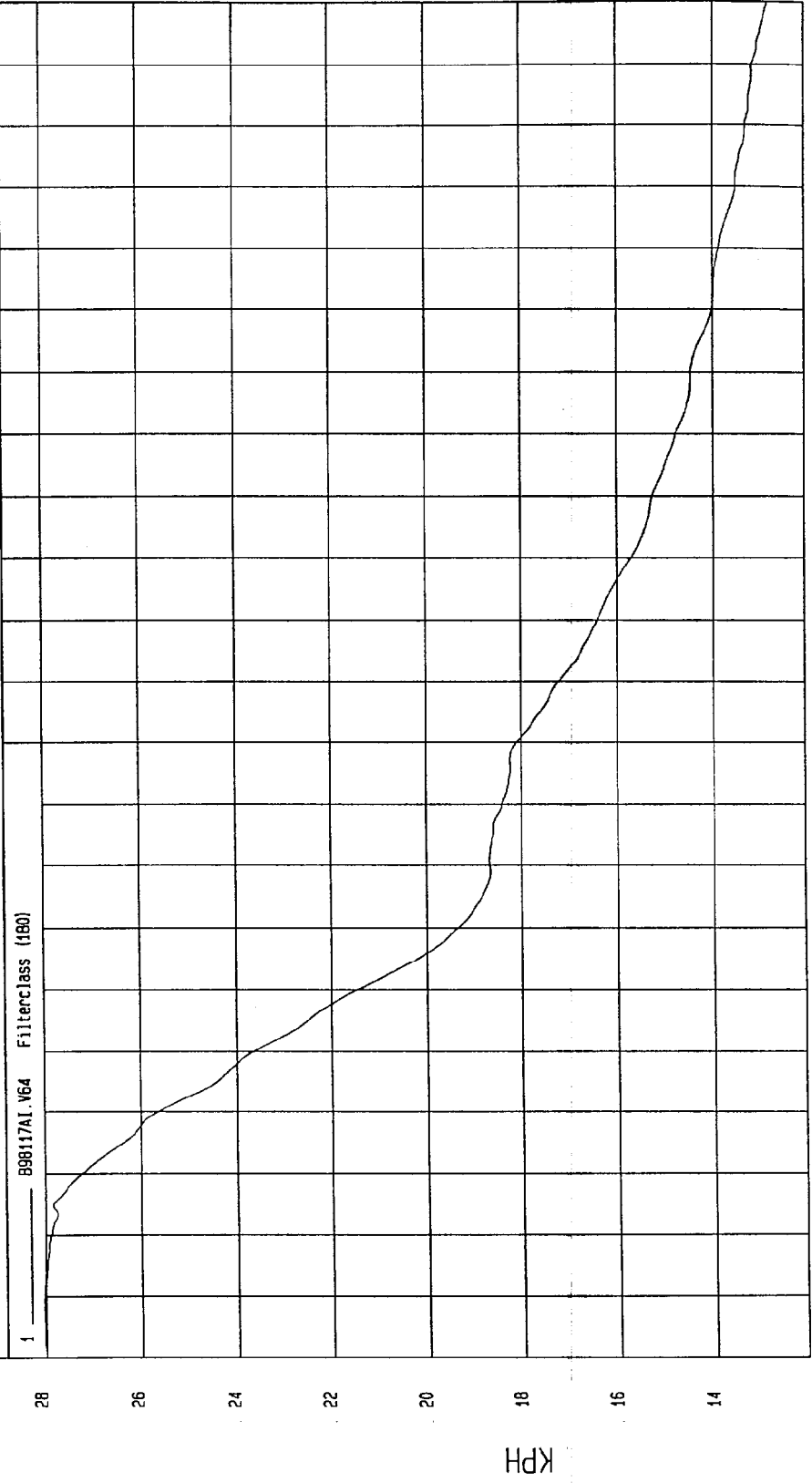


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = 12.85 KPH at 200 msec Maximum = 28.04 KPH at -12 msec

MOVING BARRIER CG Y VELOCITY



TIME Seconds

MGA Research
12-12-1998 11:23

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

Speed: 38.3 MPH 61.6 KPH

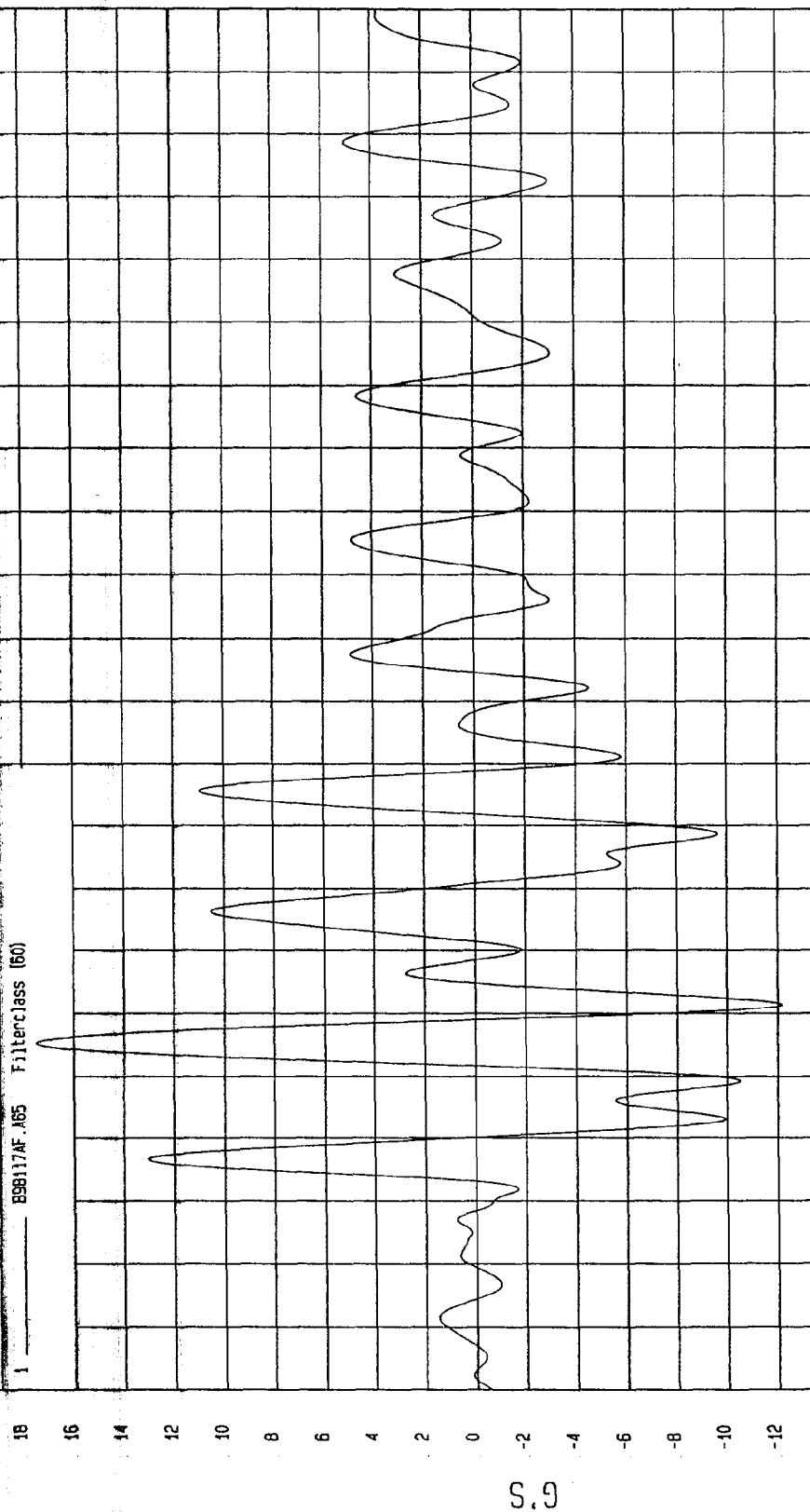
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 17.47 G'S at 35 msec

Minimum = -12.15 G'S at 41 msec

MOVING BARRIER CG Z ACCELERATION

1 B98117AF.A65 Filterclass (60)

MSA Research
12-12-1998 11:02

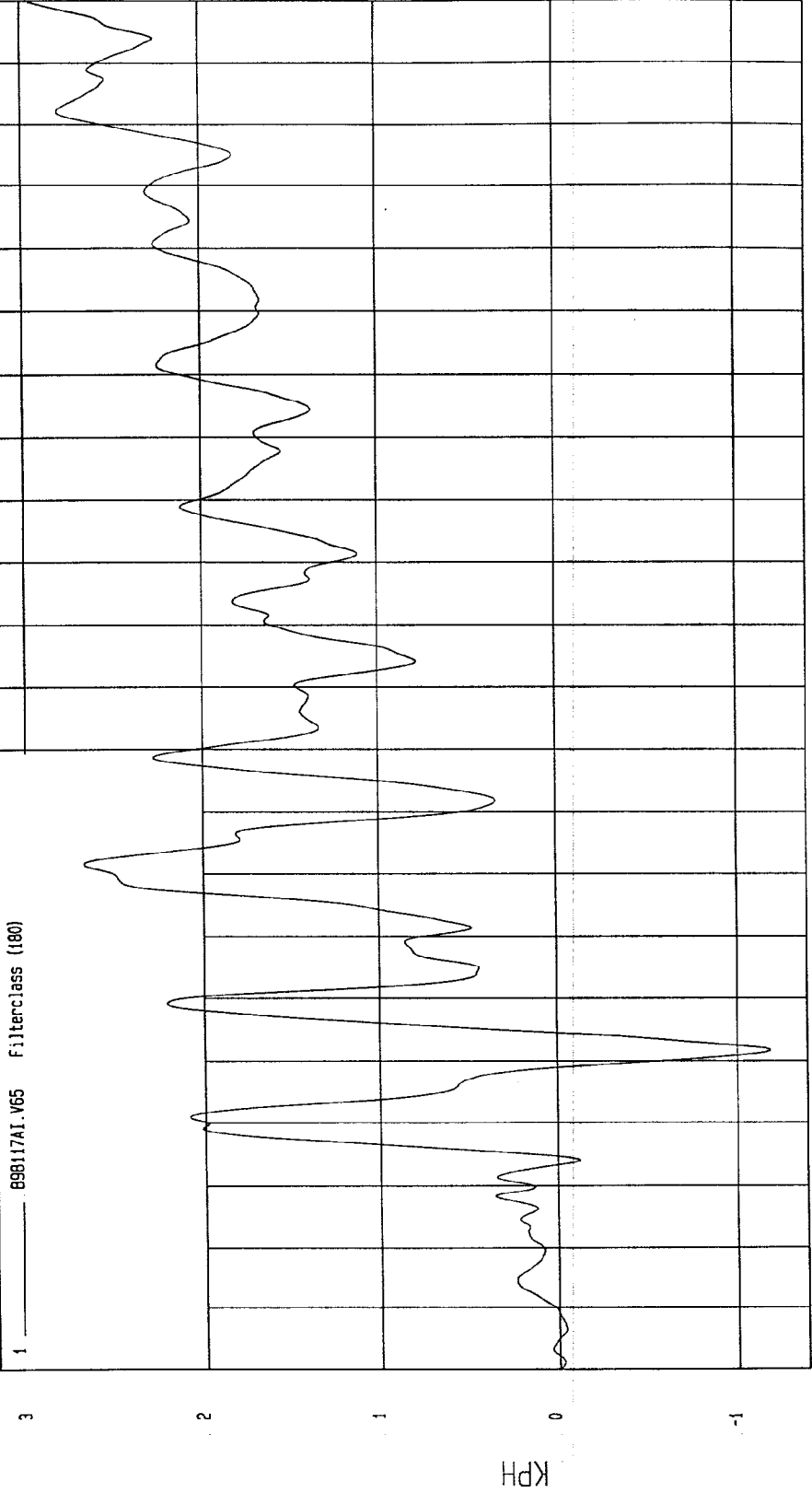
TIME (SECONDS)

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -1.19 KPH at 32 msec Maximum = 2.96 KPH at 200 msec

MOVING BARRIER CG Z VELOCITY



TIME 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

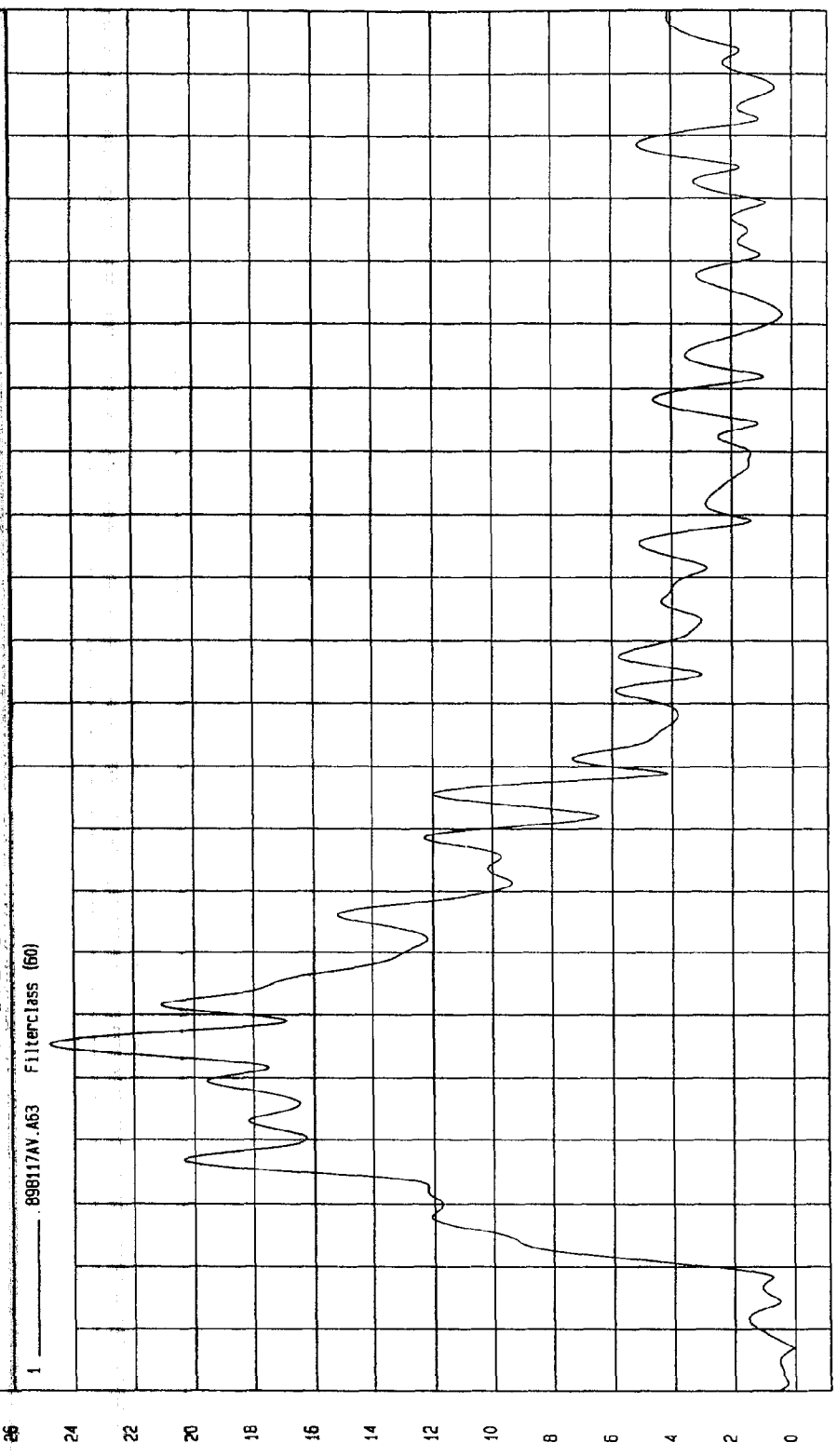
MGA Research
12-12-1998 11:23

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = 5.78E-02 G'S at -13 msec Maximum = 24.81 G'S at 35 msec

MOVING BARRIER CG RESULTANT ACCELERATION



TIME (SECONDS)

0.19 0.18 0.17 0.16 0.15 0.14 0.13 0.12 0.11 0.10 0.09 0.08 0.07 0.06 0.05 0.04 0.03 0.02 0.01 0 -0.01 -0.02

26 24 22 20 18 16 14 12 10 8 6 4 2 0

G.S.

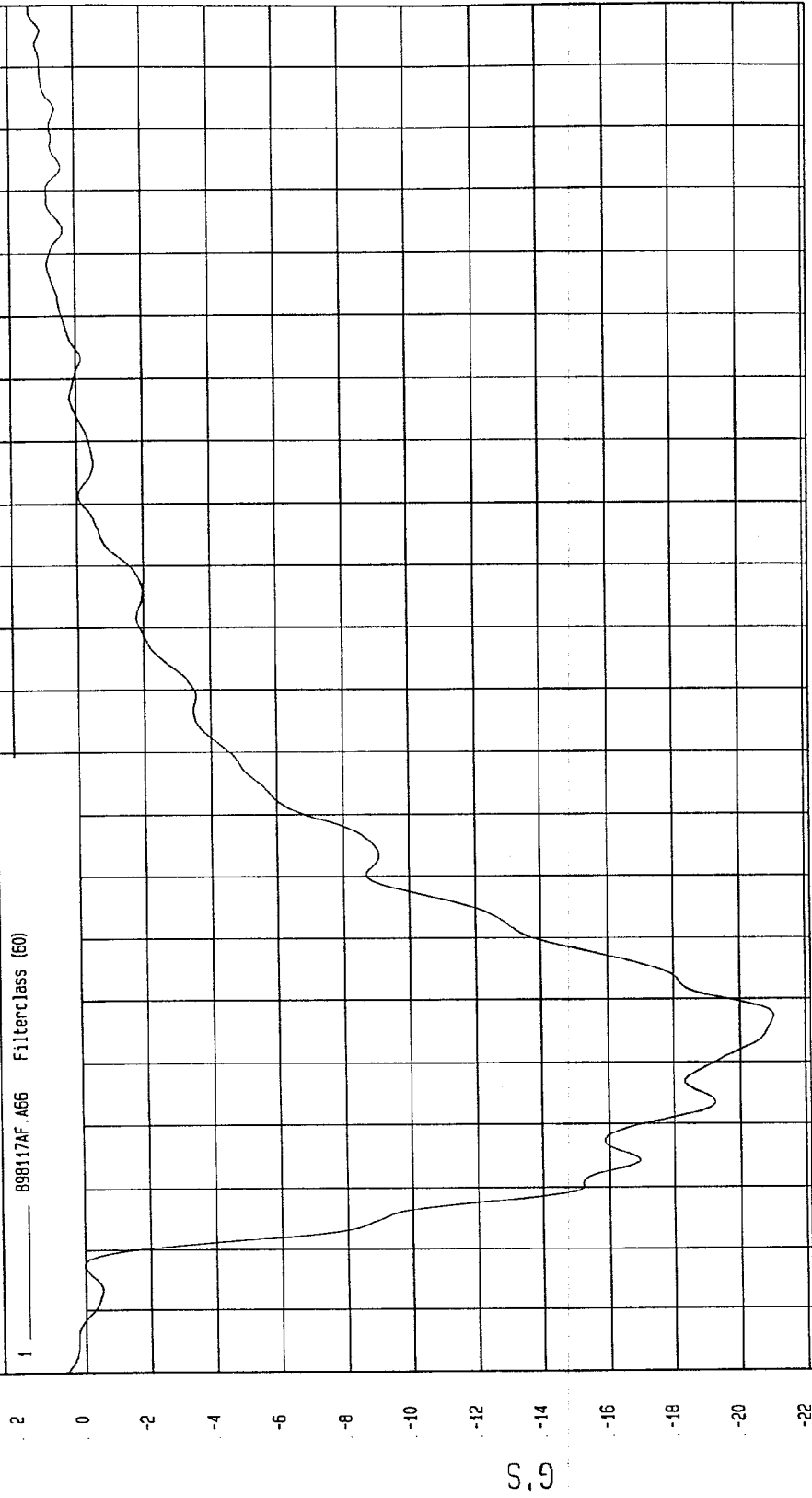
MGA Research
12-12-1998 11:02

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -21.03 G'S at 37 msec Maximum = 1.37 G'S at 199 msec

MOVING BARRIER REAR AXLE X ACCELERATION



TIME (SECONDS)

MGA Research
12-12-1998 11:02

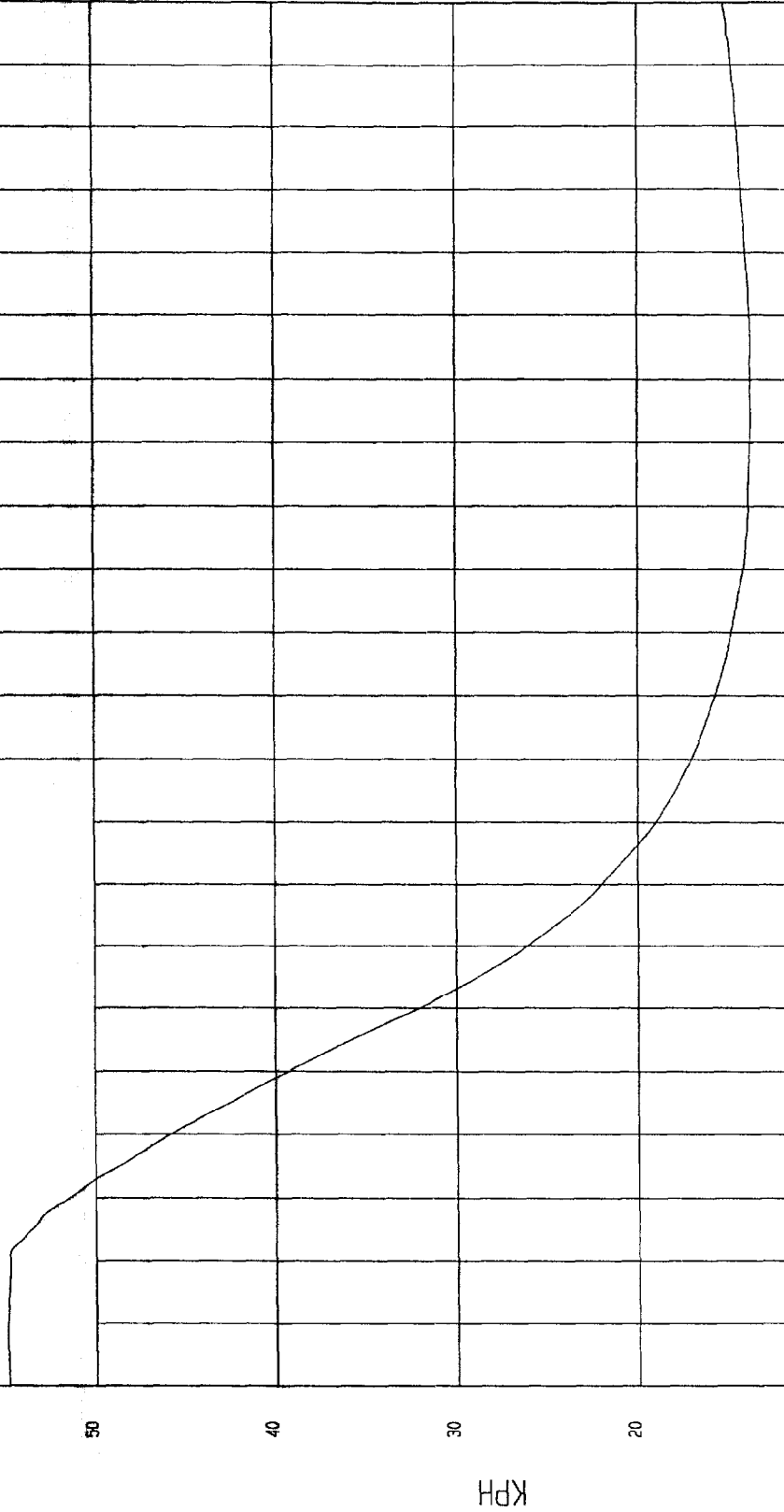
TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = 13.76 KPH at 133 msec Maximum = 54.98 KPH at -11 msec

MOVING BARRIER REAR AXLE X VELOCITY

1 898117A1.V66 Filterclass (180)



TIME Seconds

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

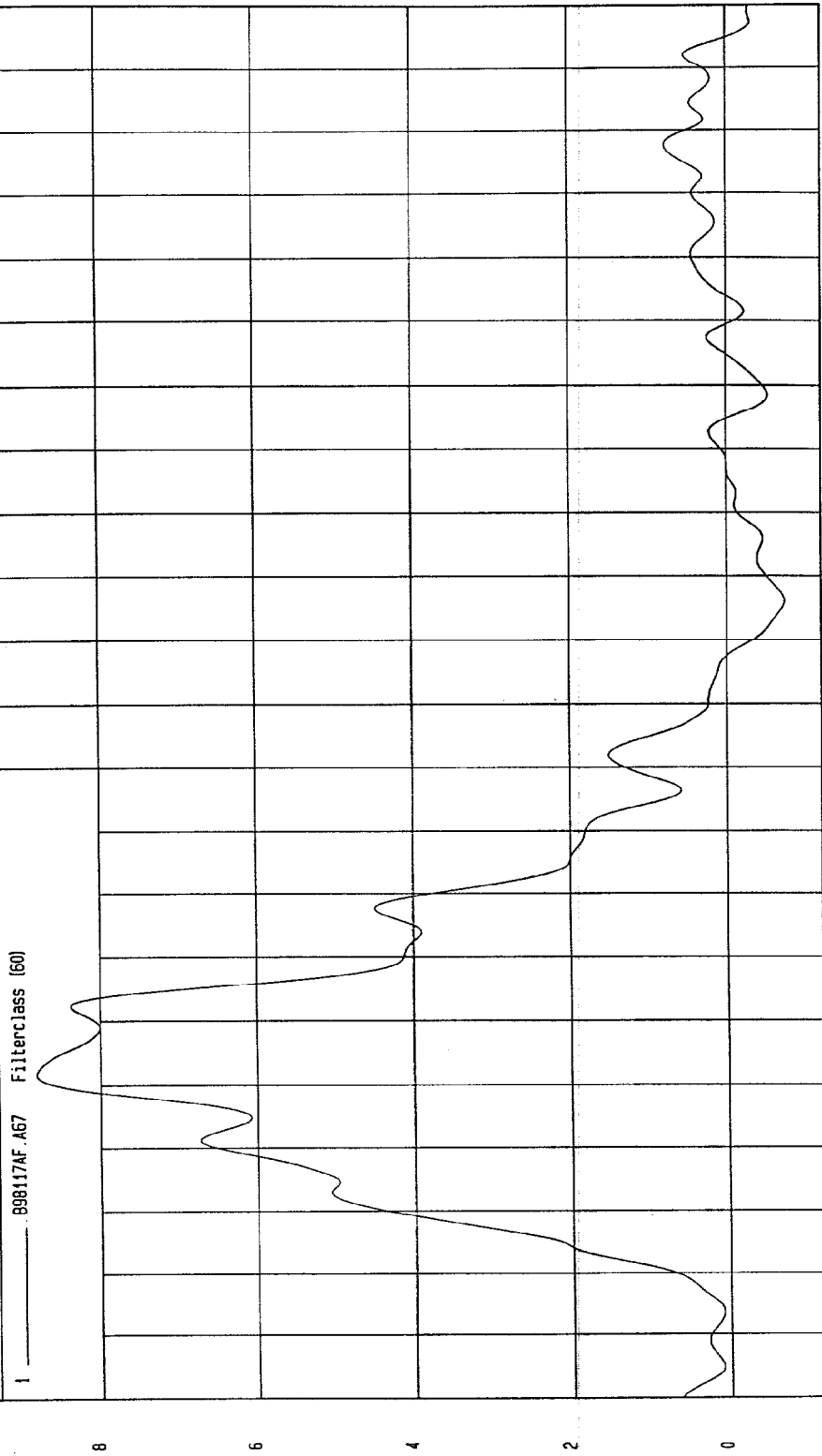
MOA Research
12-12-1998 11:23

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -.73 G'S at 106 msec Maximum = 8.83 G'S at 32 msec

MOVING BARRIER REAR AXLE Y ACCELERATION



MGA Research
12-12-1998 11:03

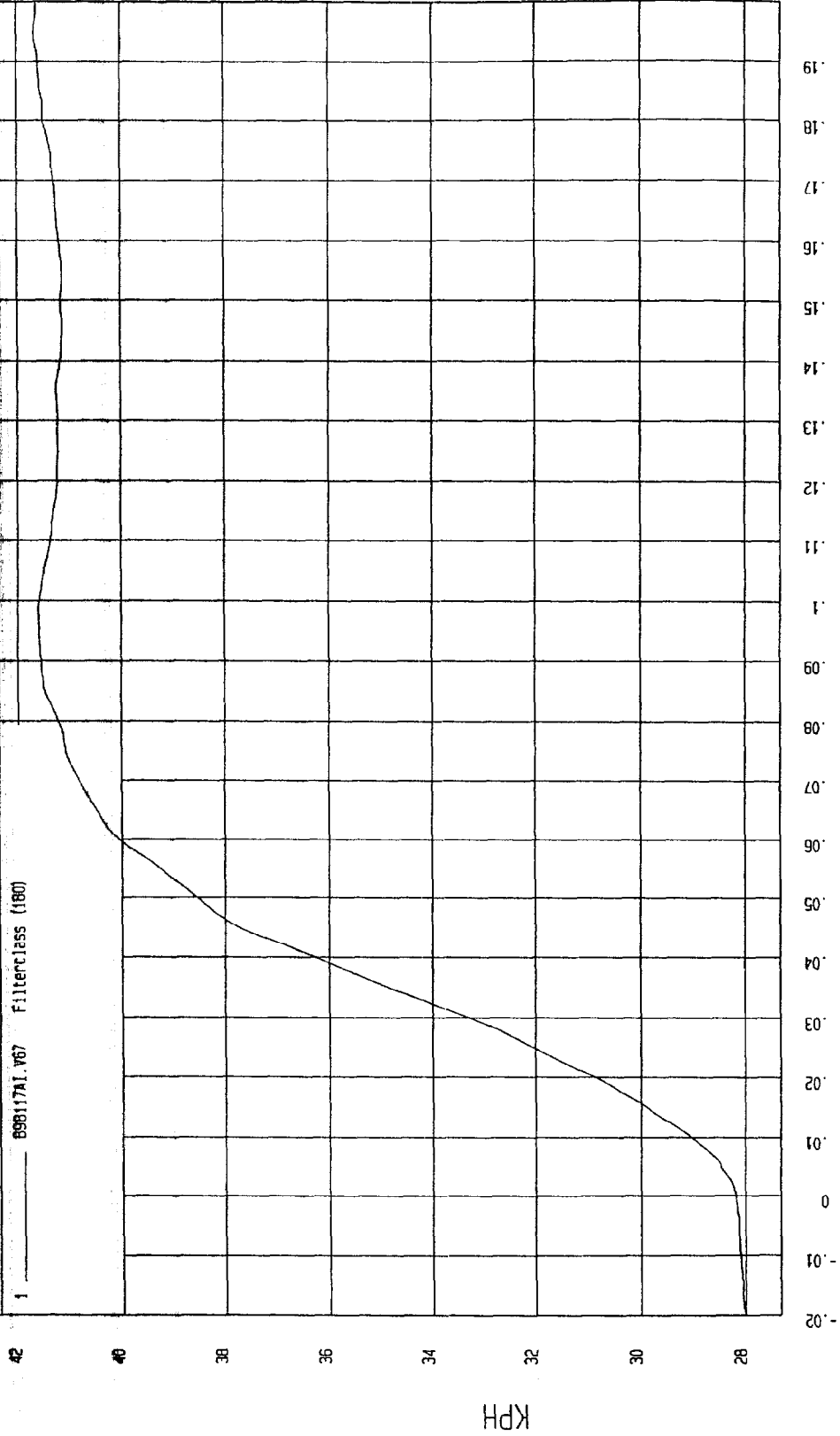
TIME (SECONDS)

G'S

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = 28 KPH at -20 msec Maximum = 41.68 KPH at 194 msec

MOVING BARRIER REAR AXLE Y VELOCITY



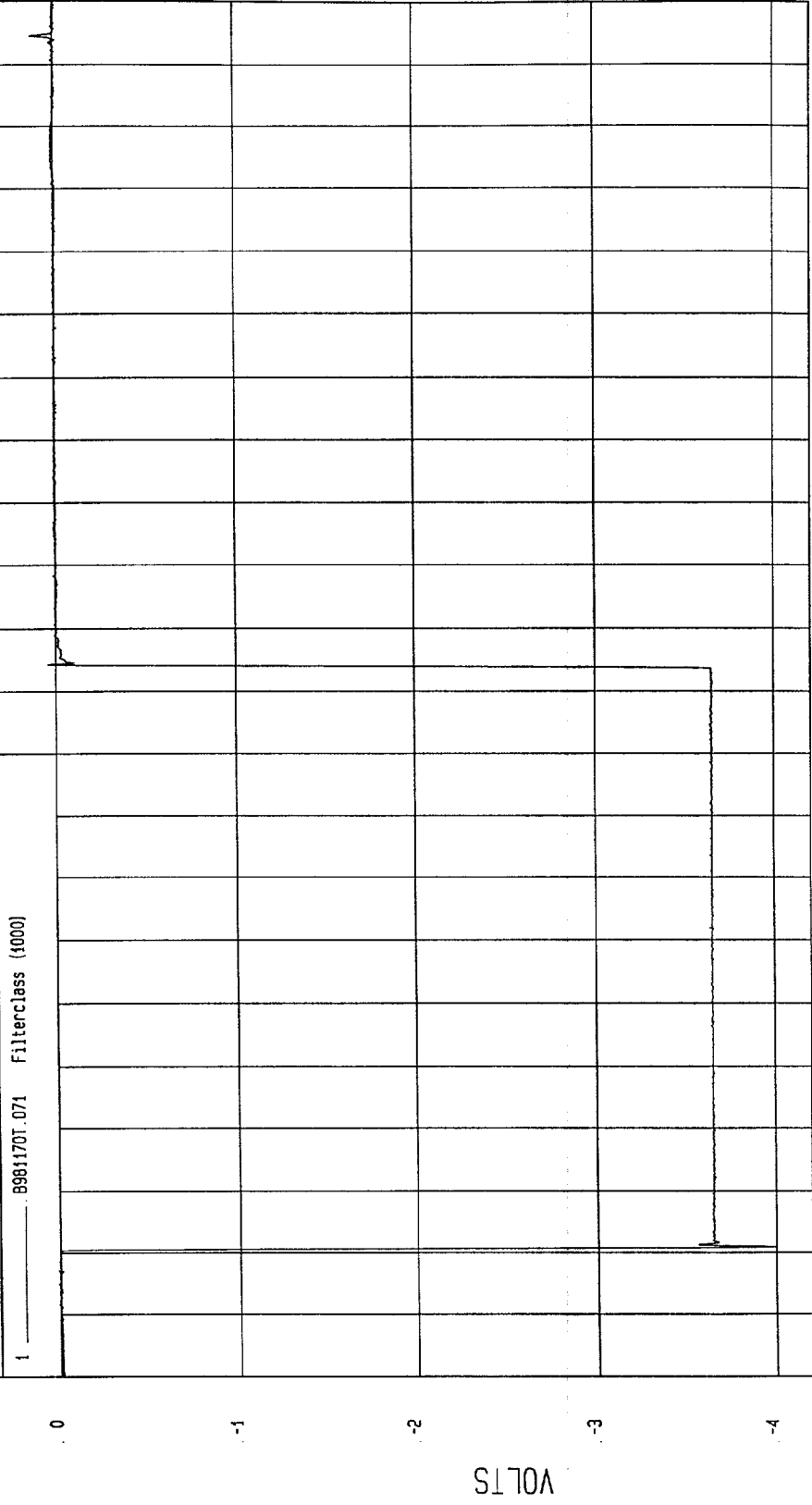
MGA Research
12-12-1998 11:23

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -4 VOLTS at 1 msec Maximum = .13 VOLTS at 194 msec

LEFT BARRIER CONTACT



MCA Research
12-12-1998 11:03

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

SPEED: 38.3 MPH 61.6 KPH

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 5.71E-02 VOLTS at 195 msec

Minimum = -4.02 VOLTS at 1 msec

RIGHT BARRIER CONTACT

1 89811701.072 Filterclass (1000)

0 -1 -2 -3 -4

VOLTS

19

18

17

16

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-1

-2

TIME (SECONDS)

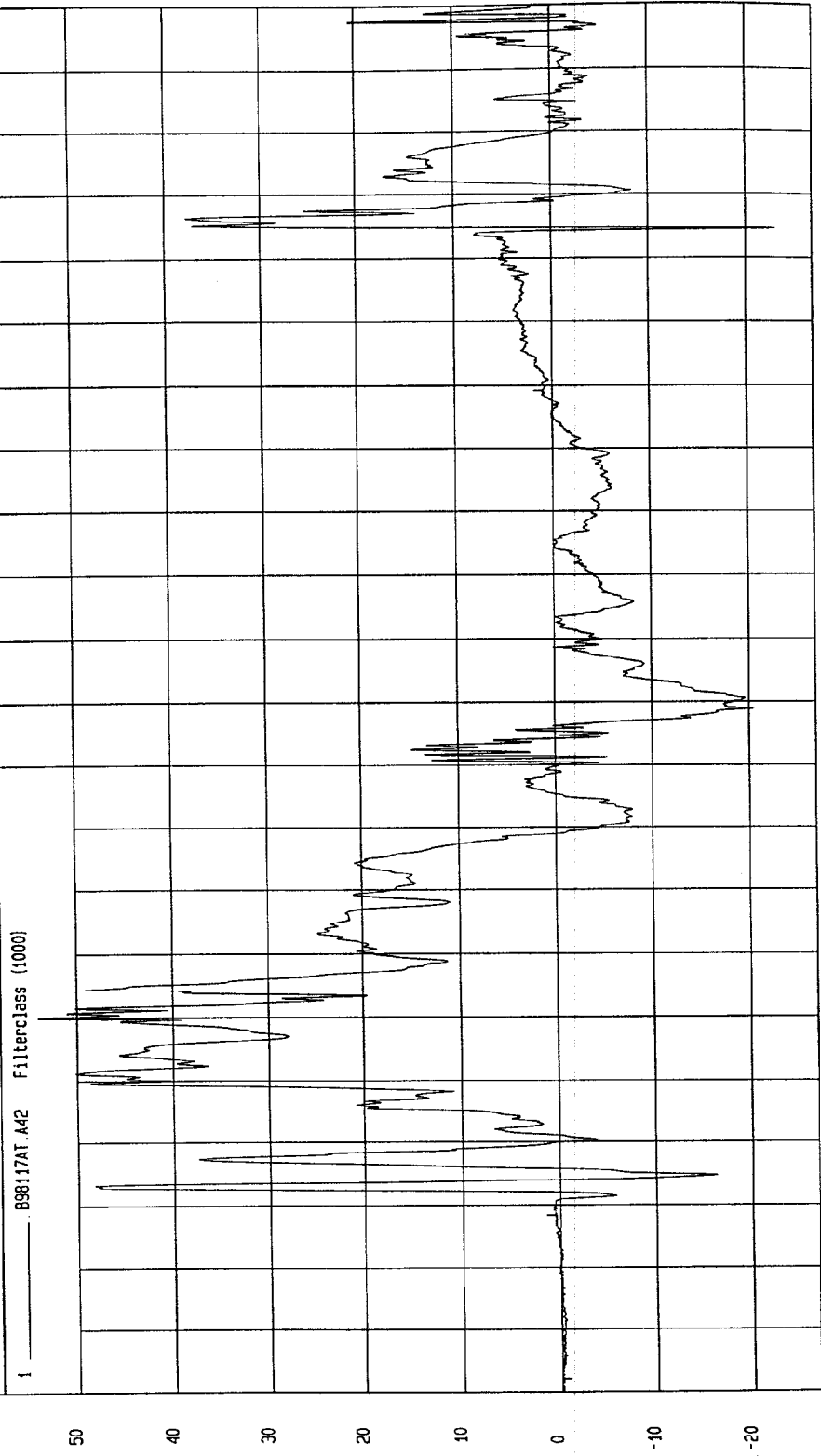
MSA Research
12-12-1998 11:03

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -23.11 G'S at 165 msec Maximum = 54.6'S at 40 msec

DRIVER UPPER RIB Y REDUNDANT ACCELERATION



MCA Research
12-12-1998 10:20

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

Speed: 38.3 MPH 61.6 KPH

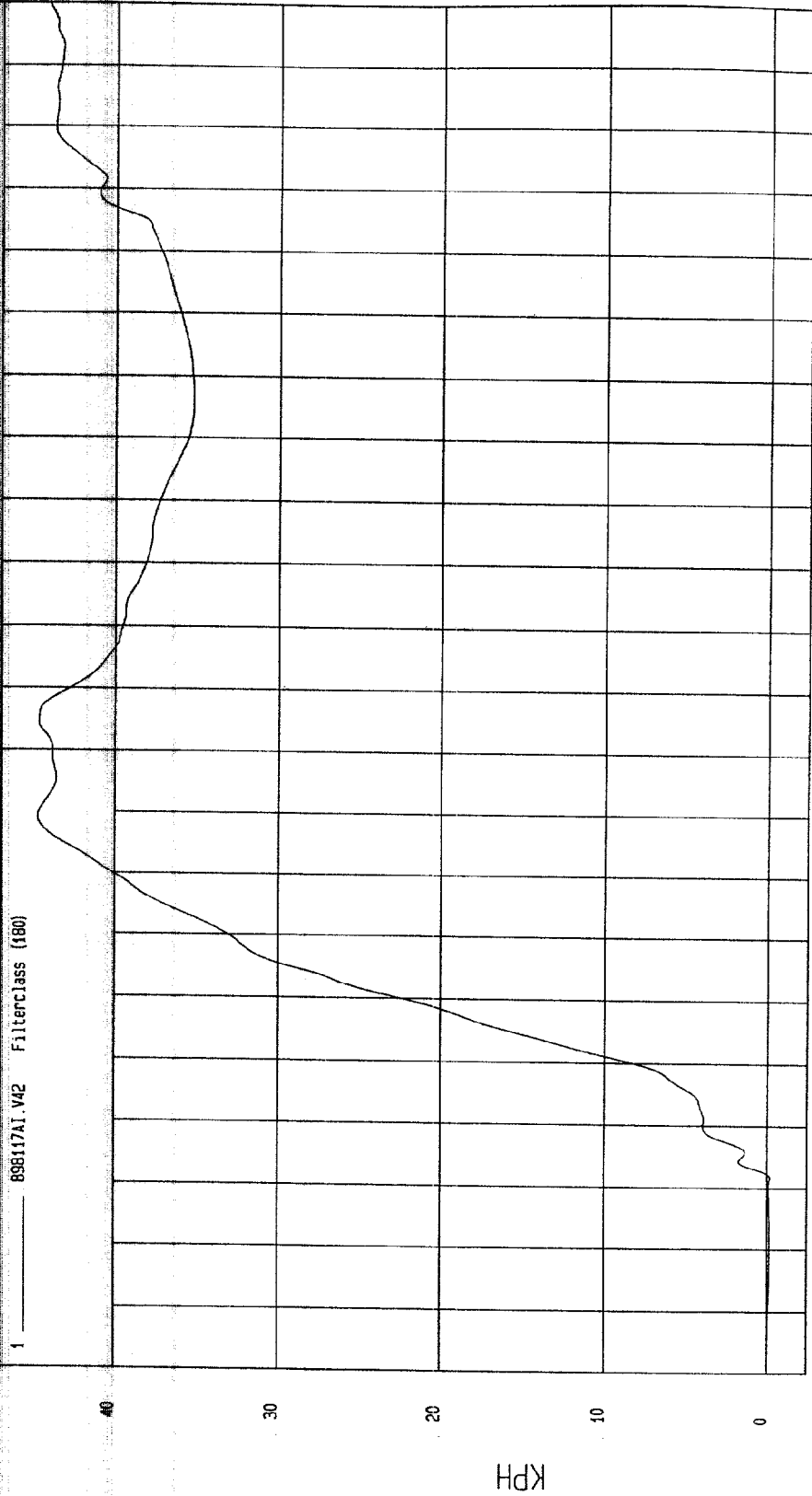
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Minimum = -17 KPH at 12 msec

Maximum = 44.66 KPH at 69 msec

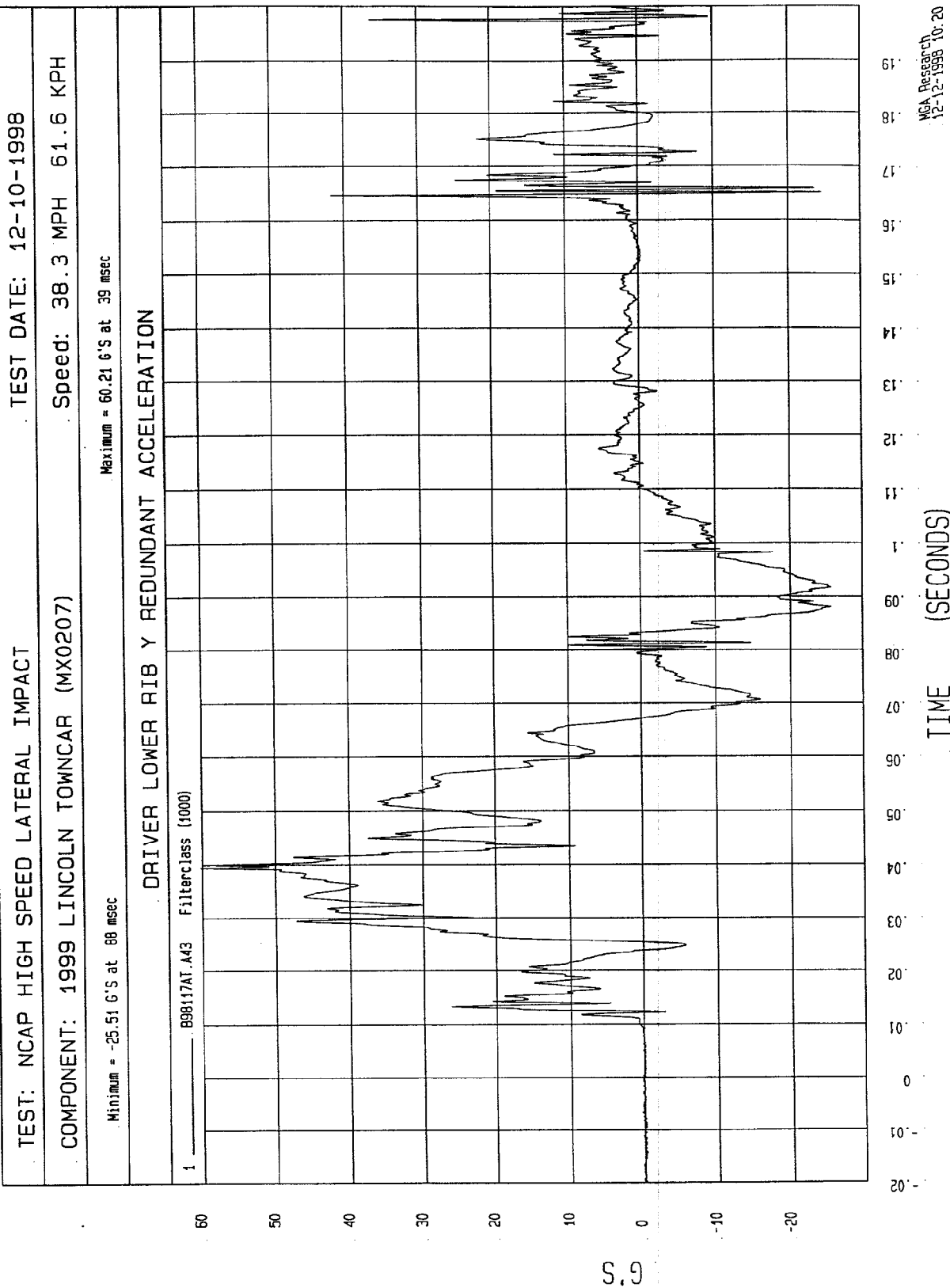
DRIVER UPPER RIB Y REDUNDANT VELOCITY

1 89817A1.VA2 Filterclass (180)



MSA Research
12-12-1998 10:56

TIME Seconds



TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

Speed: 38.3 MPH 61.6 KPH

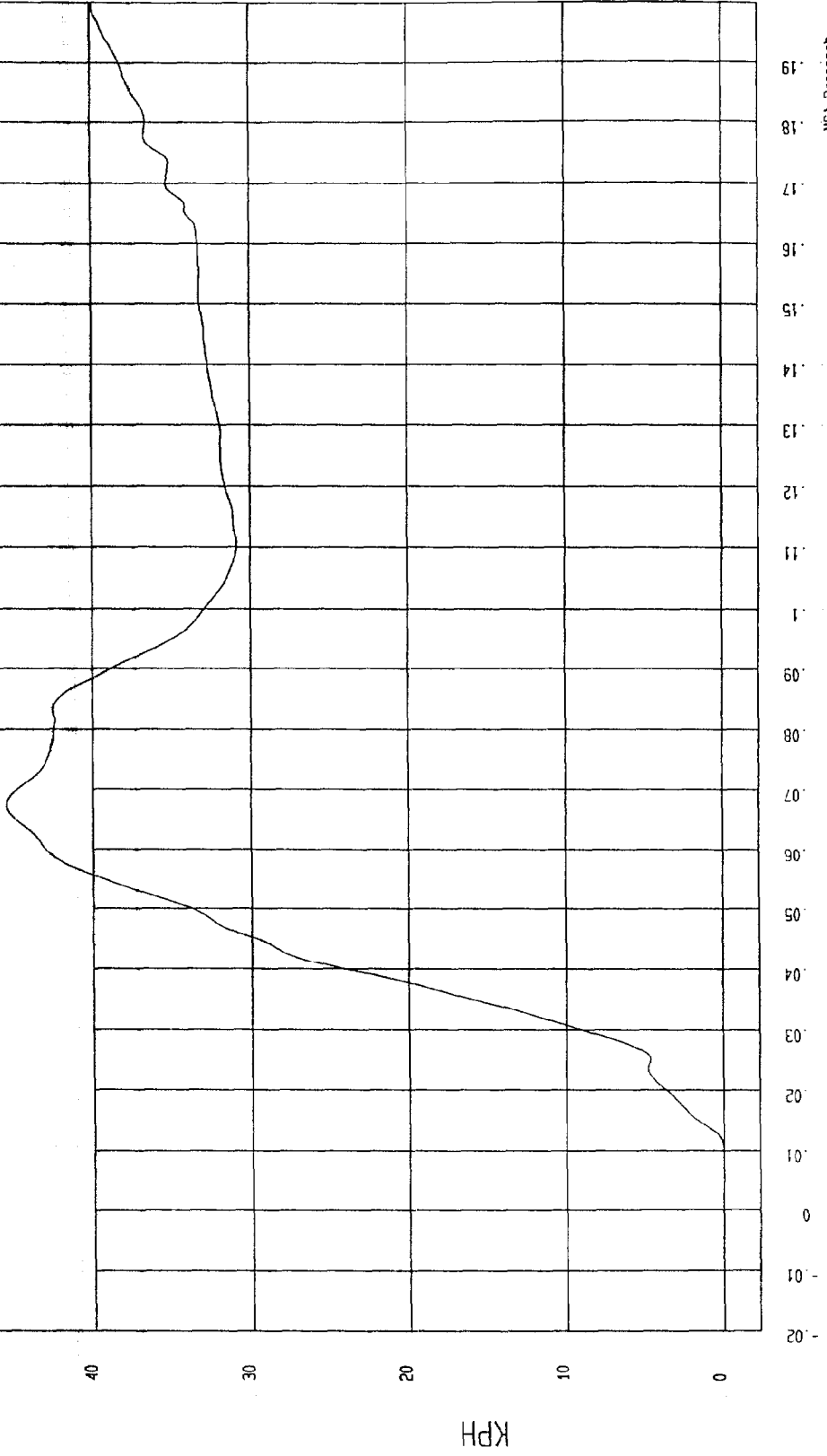
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 45.49 KPH at 67 msec

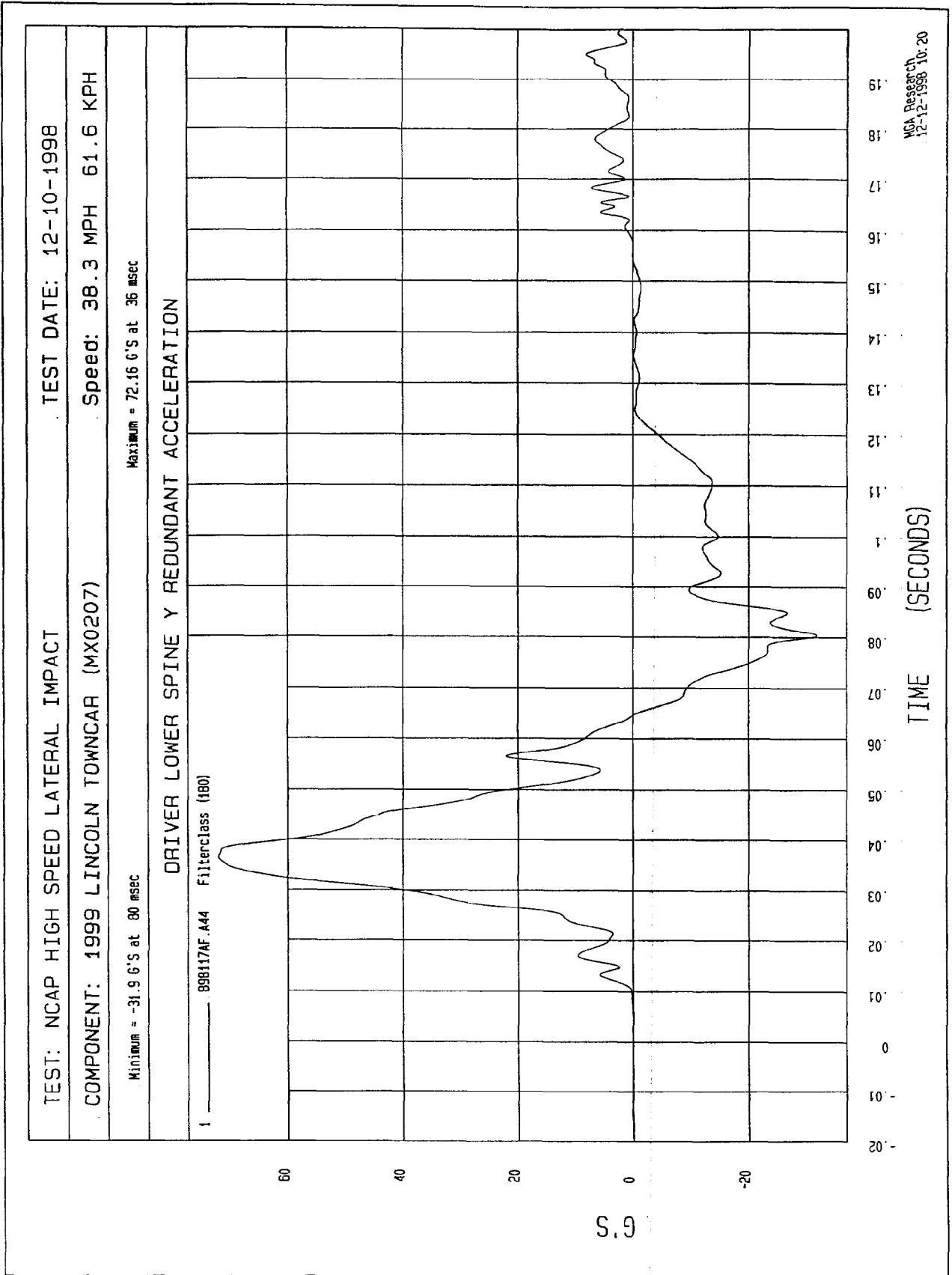
Minimum = -6.10E-03 KPH at -8 msec

DRIVER LOWER RIB Y REDUNDANT VELOCITY

1 B98117A1.V43 Filterclass (180)



WGA Research
12-12-1998 10:56



TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

Speed: 38.3 MPH 61.6 KPH

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 50.17 KPH at 65 msec

Minimum = -0.01 KPH at 6 msec

DRIVER LOWER SPINE Y REDUNDANT VELOCITY

1 89817A1.V44 Filterclass (480)



MOA Research
12-12-1998 10:56

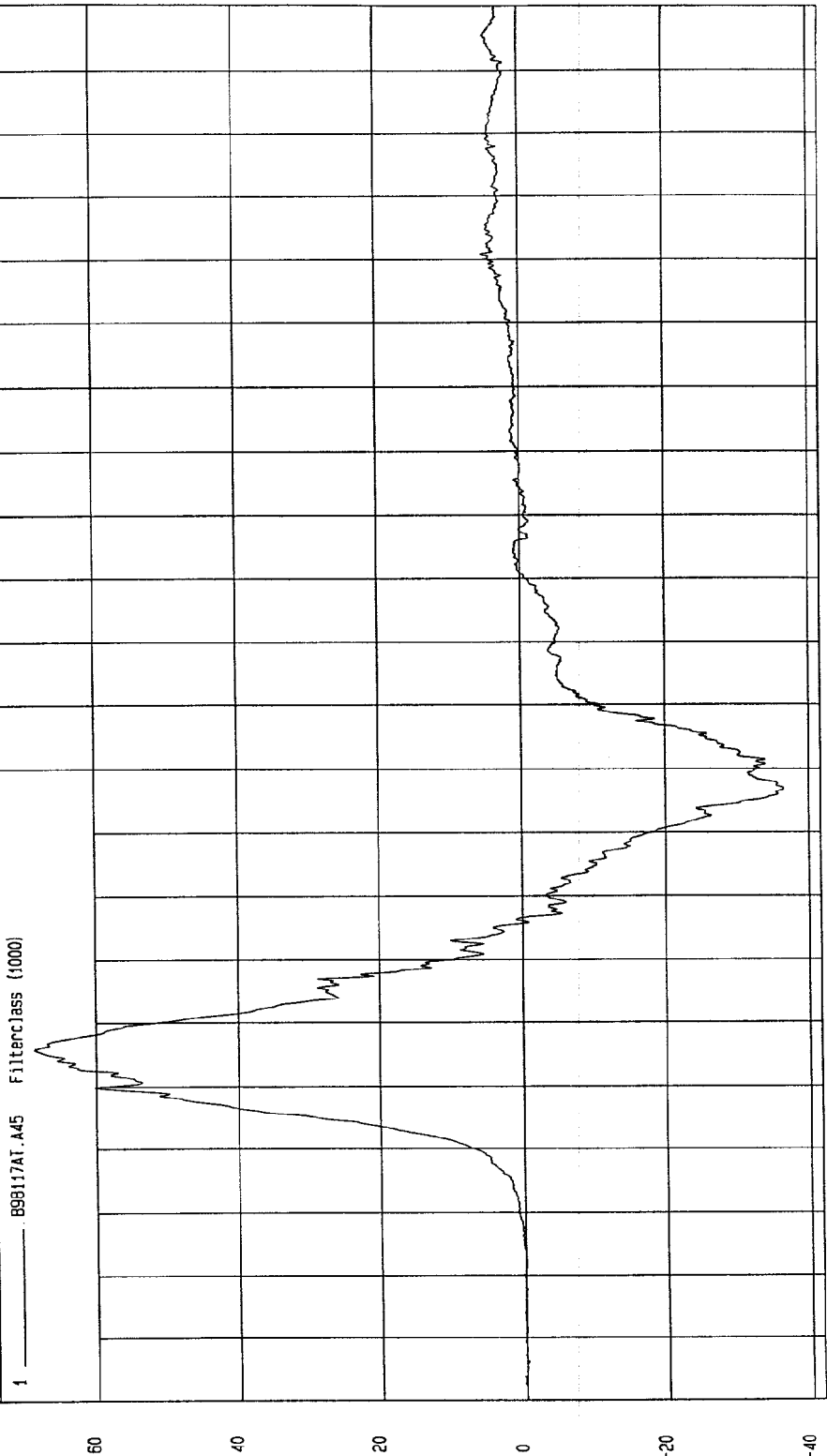
TIME Seconds

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -36.37 G'S at 77 msec Maximum = 68.52 G'S at 36 msec

DRIVER PELVIS Y REDUNDANT ACCELERATION



MCA Research
12-12-1998 10:20

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

Speed: 38.3 MPH 61.6 KPH

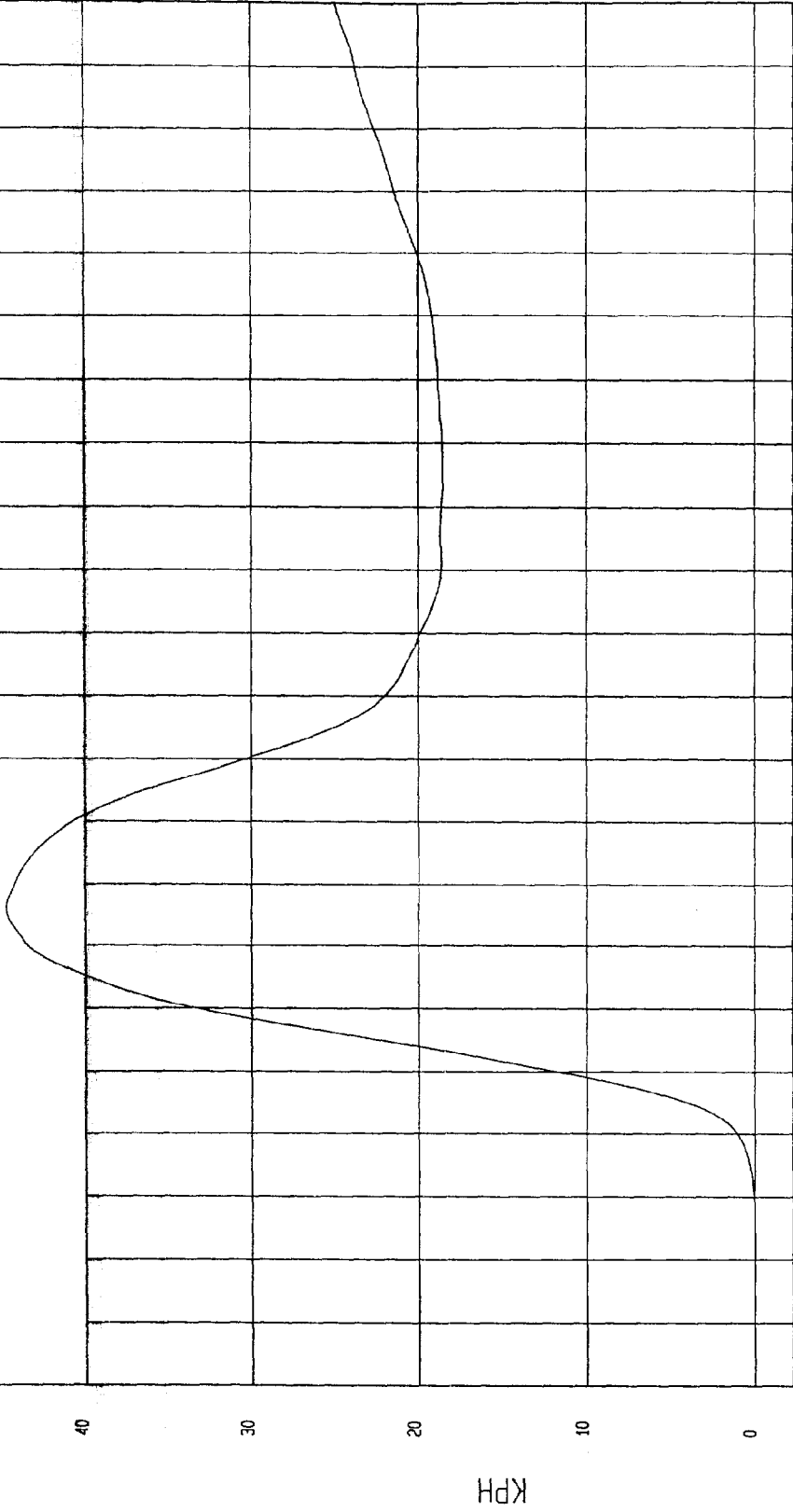
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 44.74 KPH at 56 msec

Minimum = -7.26E-03 KPH at -8 msec

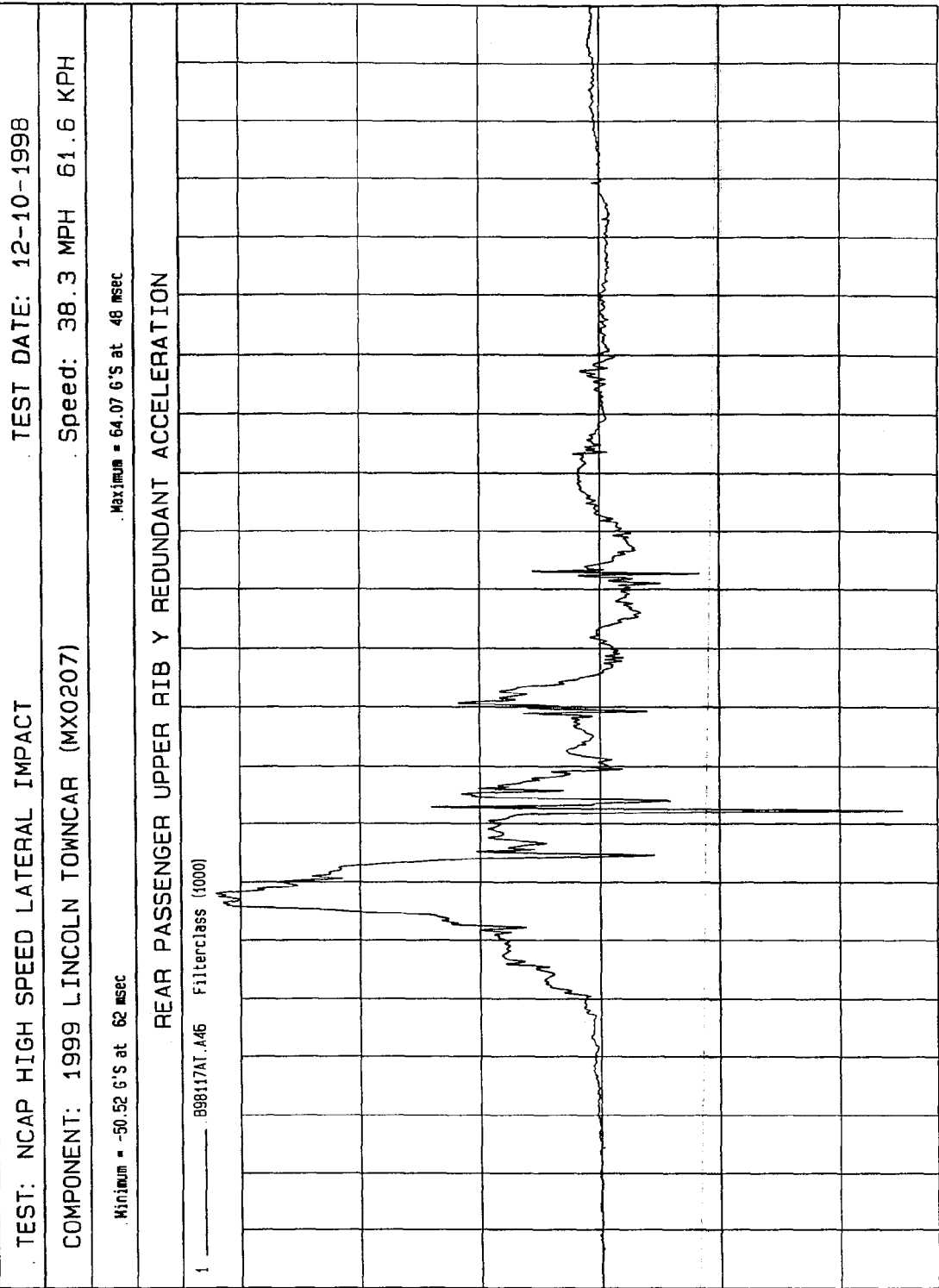
DRIVER PELVIS Y REDUNDANT VELOCITY

1 ——— 030117A1 V45 Filtered (ms (100))



TIME Seconds

MSA Research
12-12-1998 10:56



NSA Research
12-12-1998 10:20

TIME (SECONDS)

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

Speed: 38.3 MPH 61.6 KPH

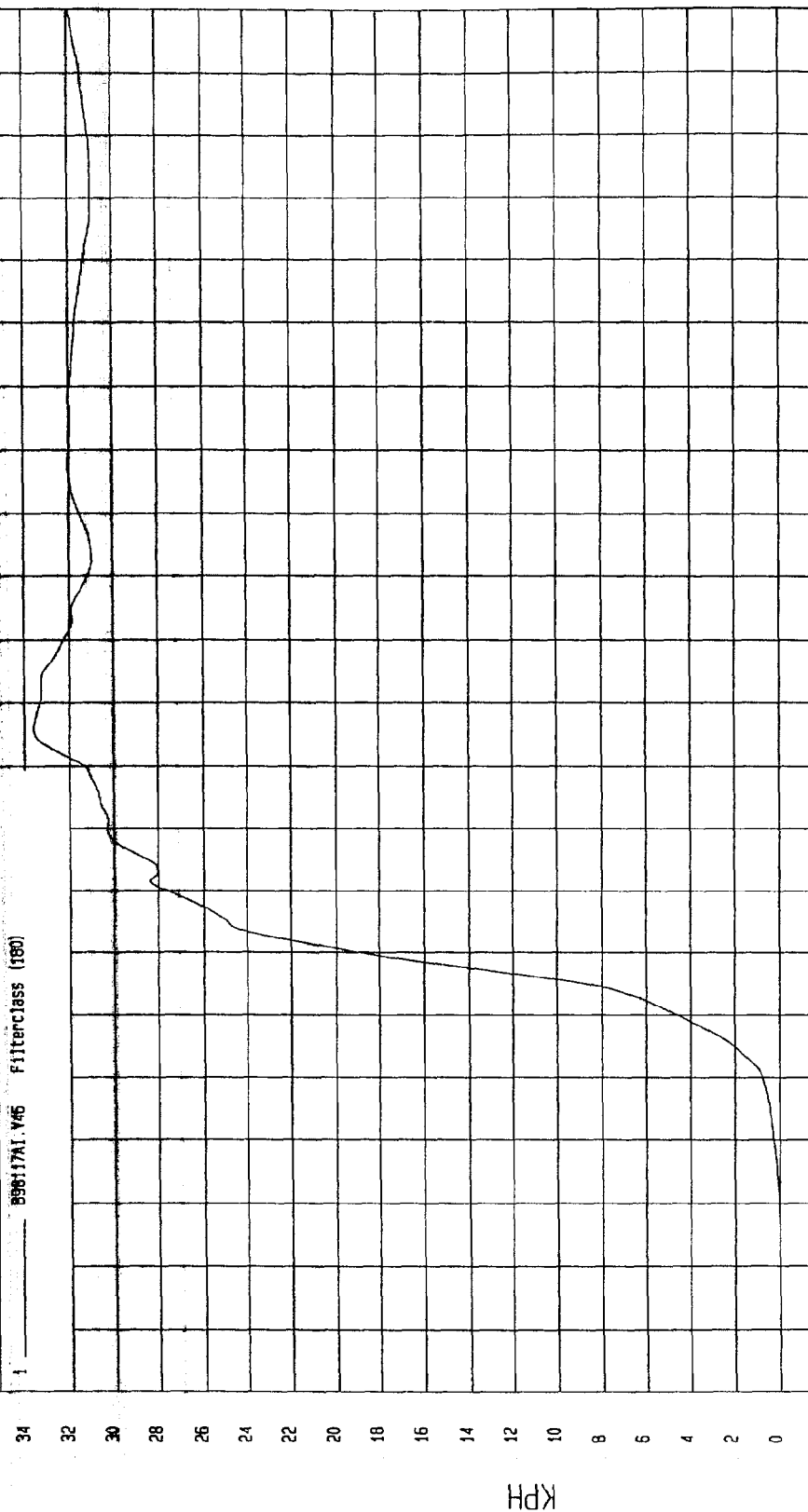
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 33.56 KPH at 86 msec

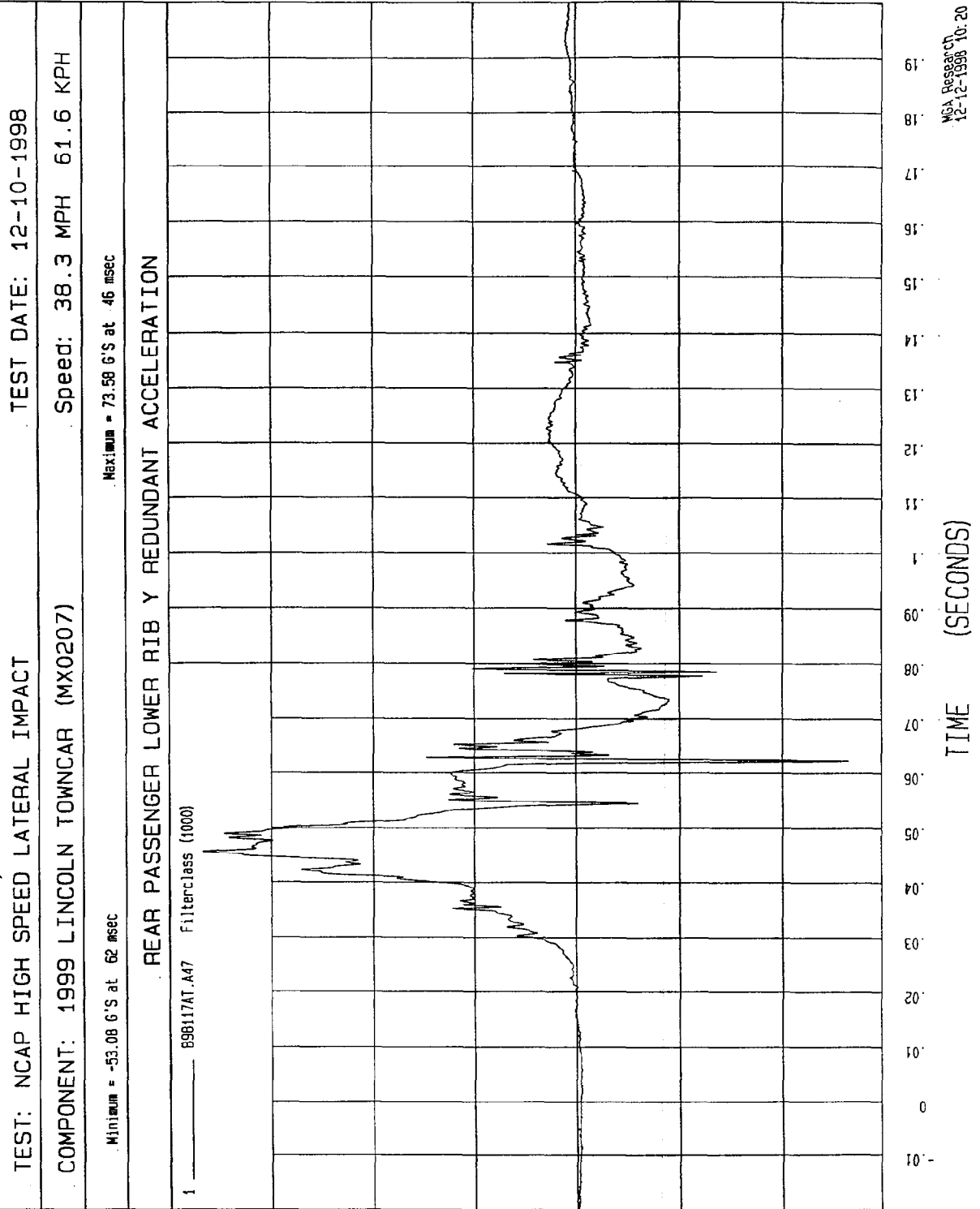
Minimum = -2.42E-02 KPH at -7 msec

REAR PASSENGER UPPER RIB Y REDUNDANT VELOCITY

1 89617A1.V46 FilterClass (180)



MSA Research
12-12-1998 10:56



G.S

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

Speed: 38.3 MPH 61.6 KPH

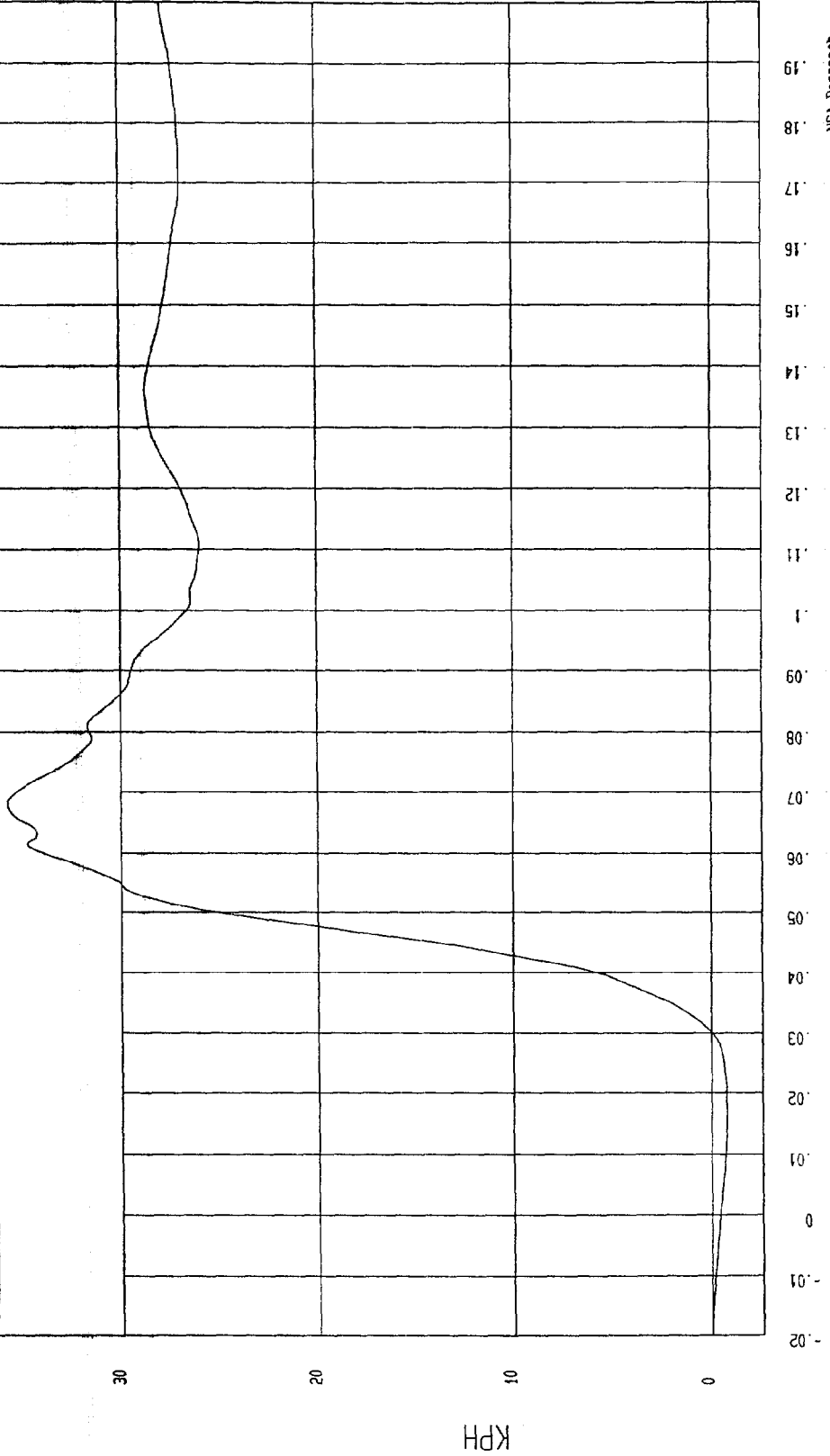
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 35.77 KPH at 68 msec

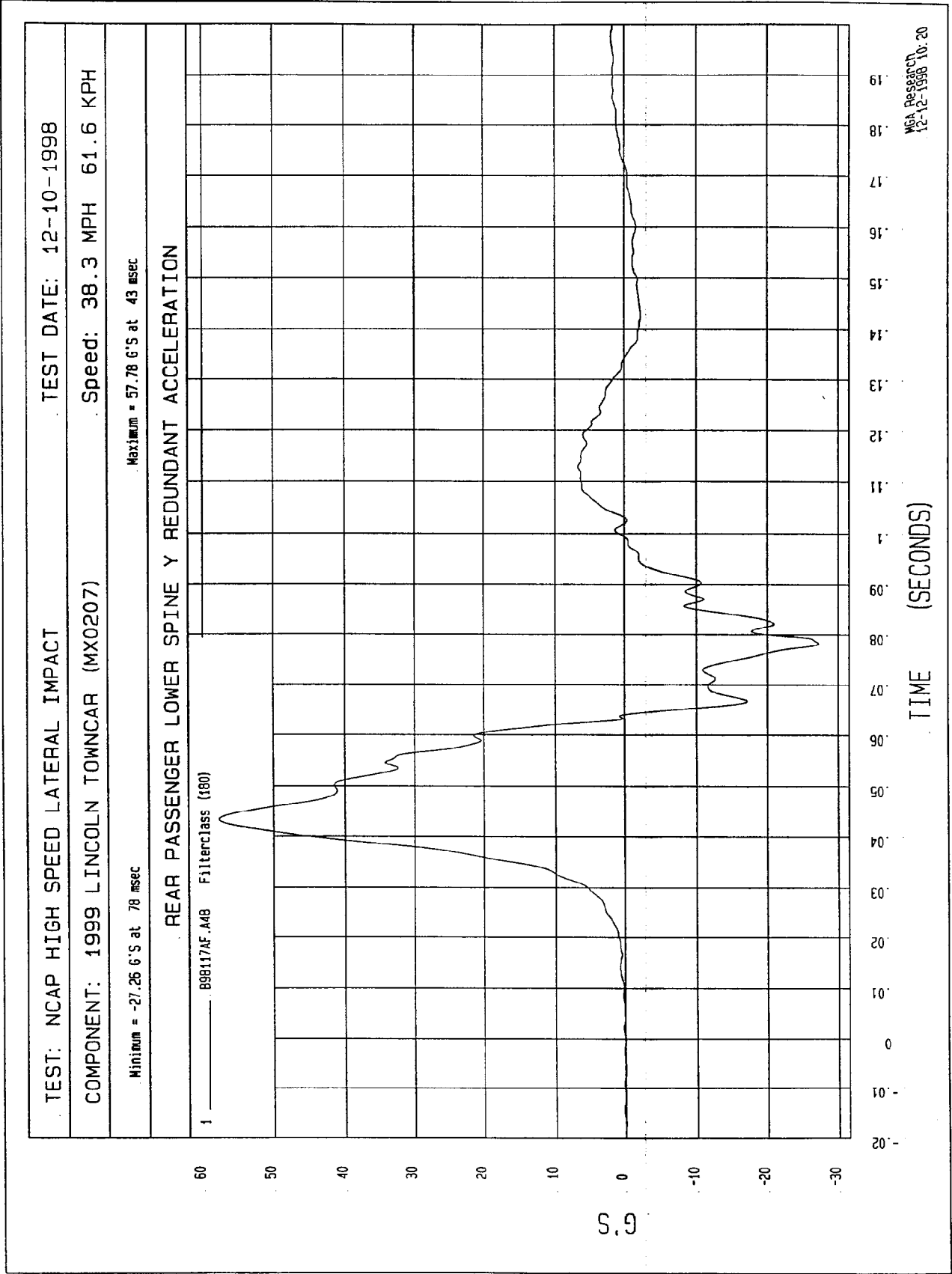
Minimum = -.75 KPH at 15 msec

REAR PASSENGER LOWER RIB Y REDUNDANT VELOCITY

1 896117A1.V47 Filterclass (180)



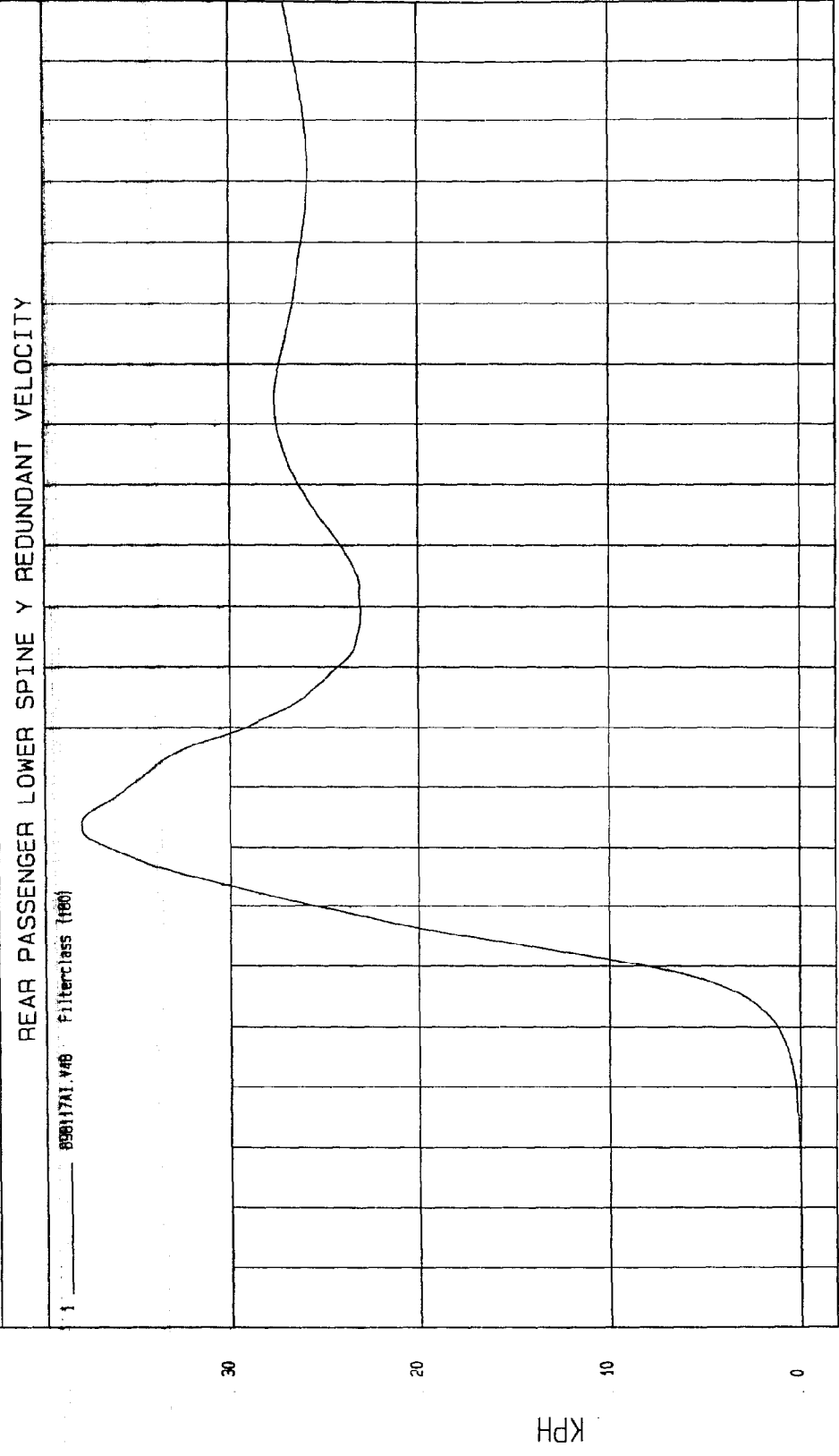
MGA Research
12-12-1998 10:56



TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

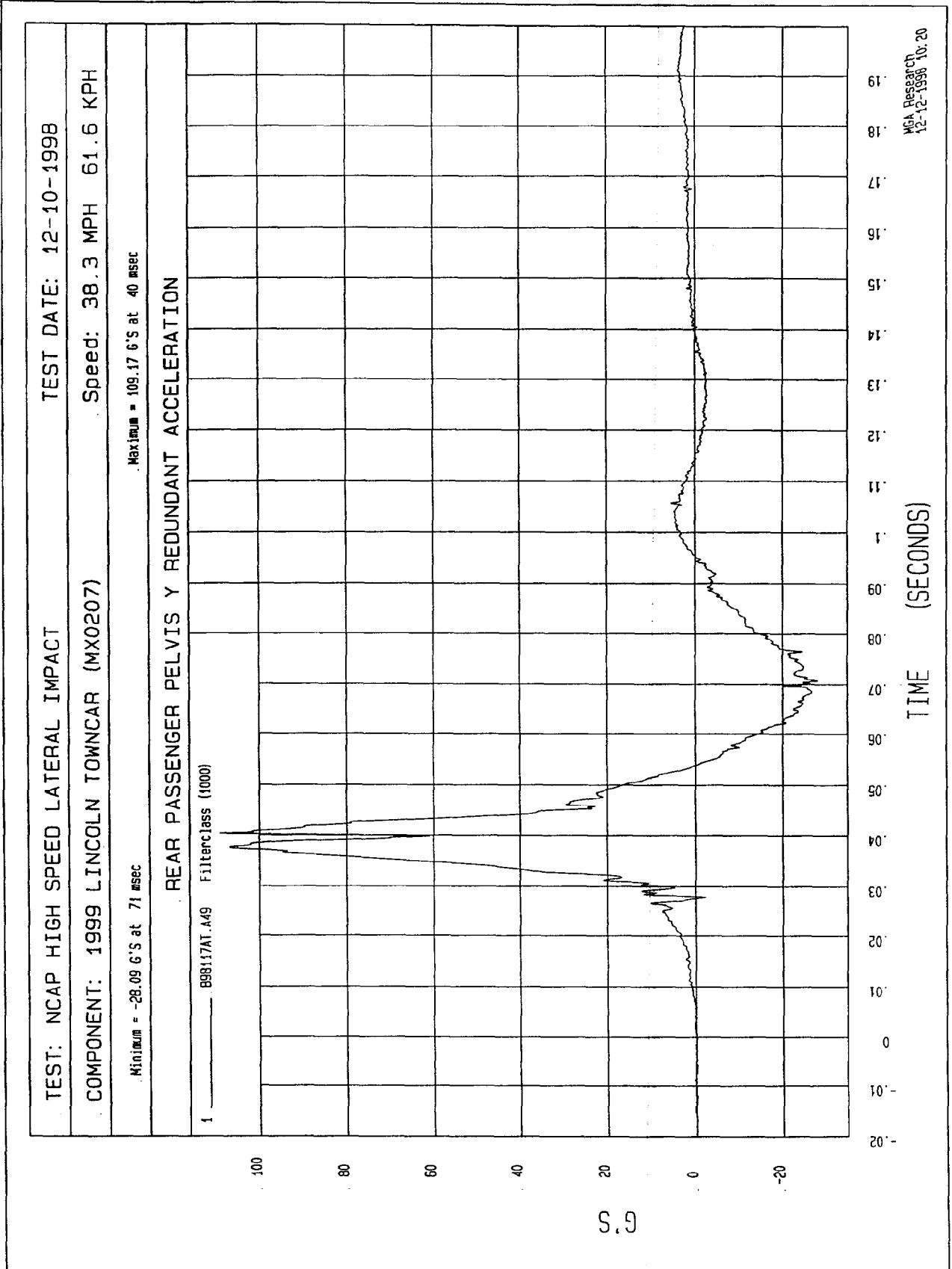
Minimum = -4.85E-03 KPH at -16 msec Maximum = 37.8 KPH at 64 msec



TIME Seconds

0.02 0.04 0.06 0.07 0.08 0.09 0.10 0.11 0.12 0.13 0.14 0.15 0.16 0.17 0.18 0.19

MGA Research
12-12-1998 10:56

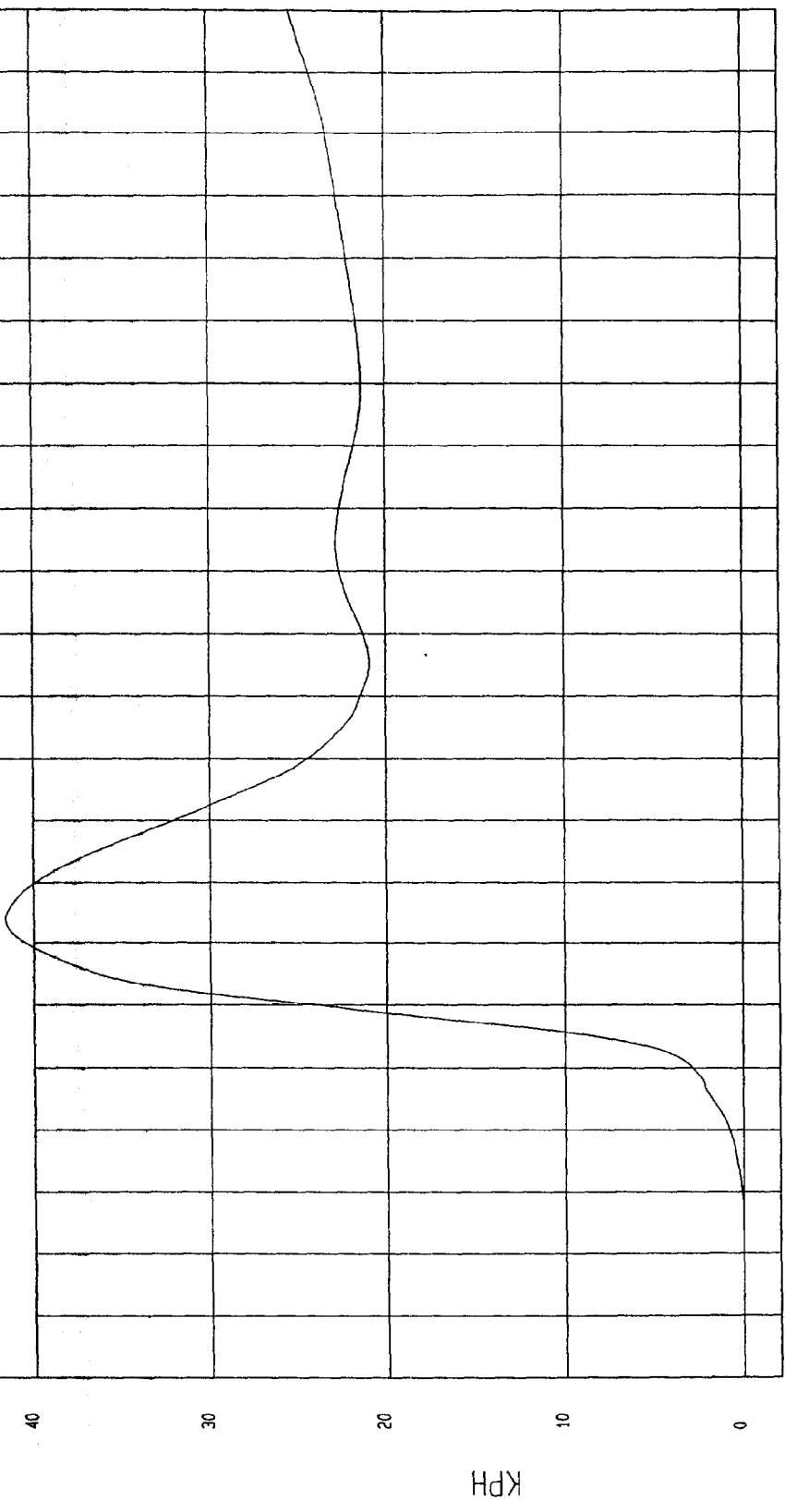


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -7.89E-03 KPH at -16 msec Maximum = 41.58 KPH at 54 msec

REAR PASSENGER PELVIS Y REDUNDANT VELOCITY

1 _____ 898117A1.V49 Filterclass (180)



TIME Seconds

MGA Research
12-12-1998 10:56

FINITE IMPULSE RESPONSE (FIR) FILTERED DATA

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

SPEED: 38.3 MPH 61.6 KPH

Maximum = 43.4 G'S at 32 msec

TEST: NCAP HIGH SPEED LATERAL IMPACT

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Minimum = -18.6 G'S at 90 msec

DRIVER UPPER RIB Y ACCELERATION

1 8981171.R45 Filterclass (FIR Filtered)



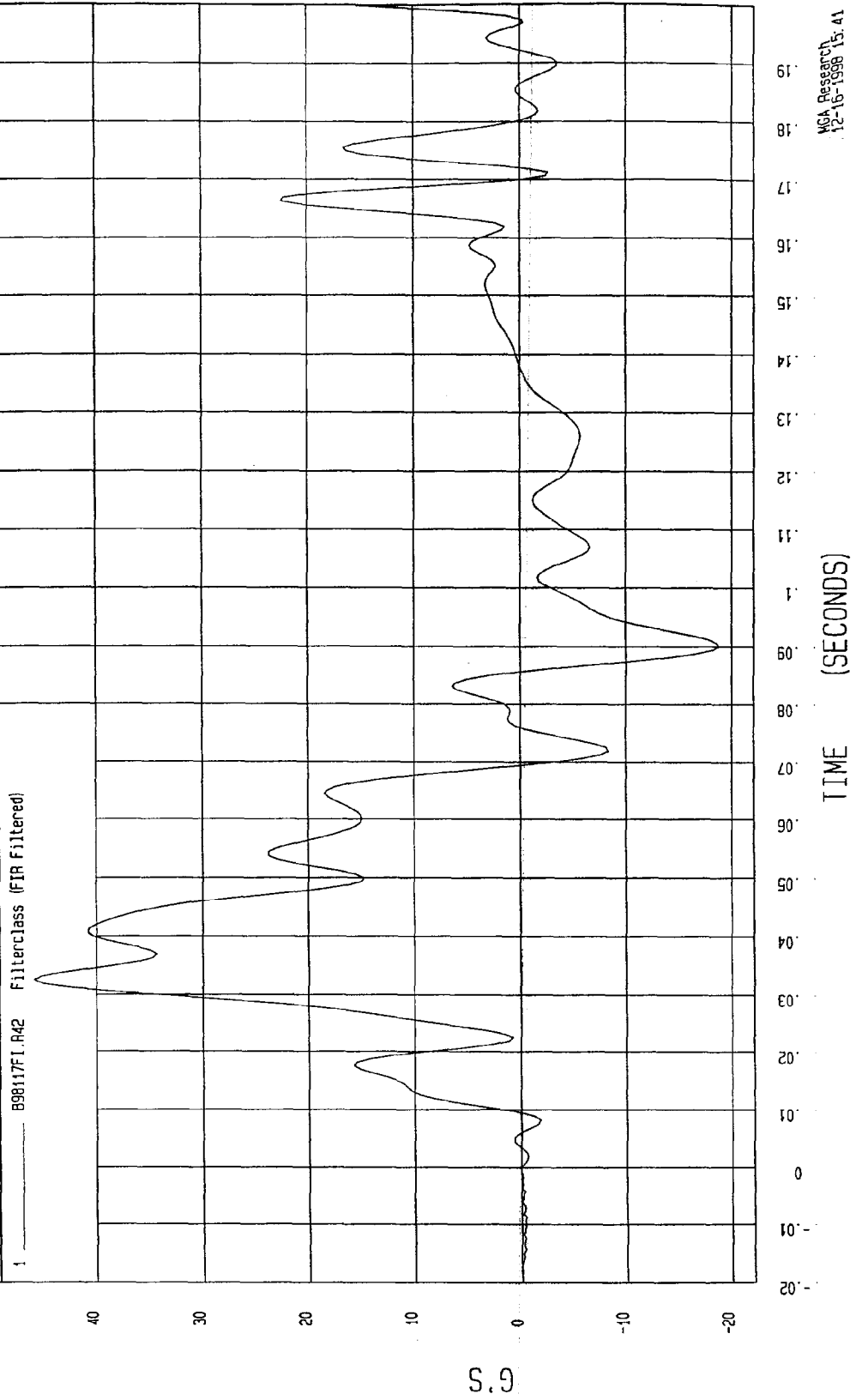
MGA Research
12-16-1998 15:41

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -18.81 G'S at 90 msec Maximum = 45.84 G'S at 32 msec

DRIVER UPPER RIB Y REDUNDANT ACCELERATION

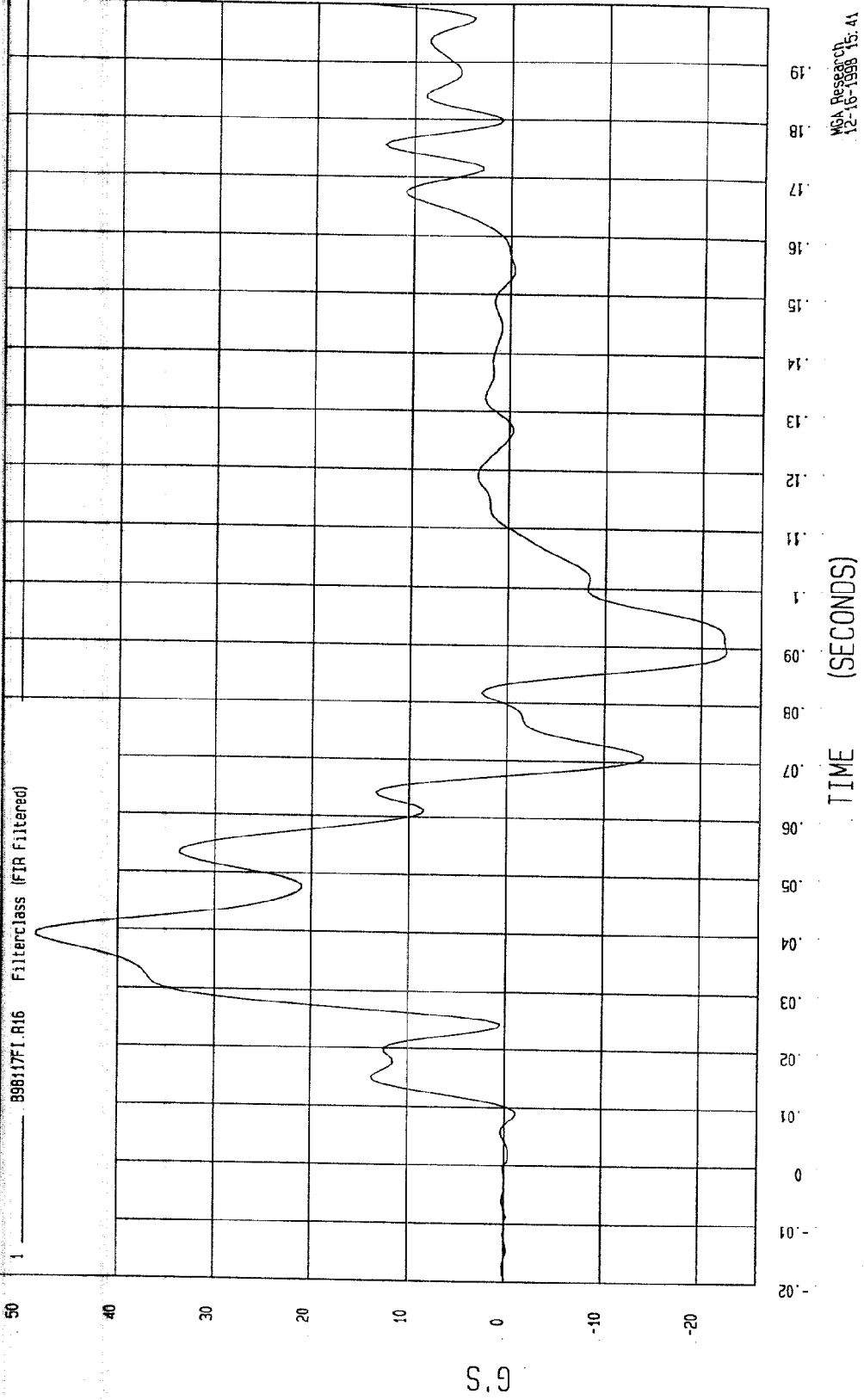


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -22.59 G'S at 89 msec Maximum = 48.42 G'S at 39 msec

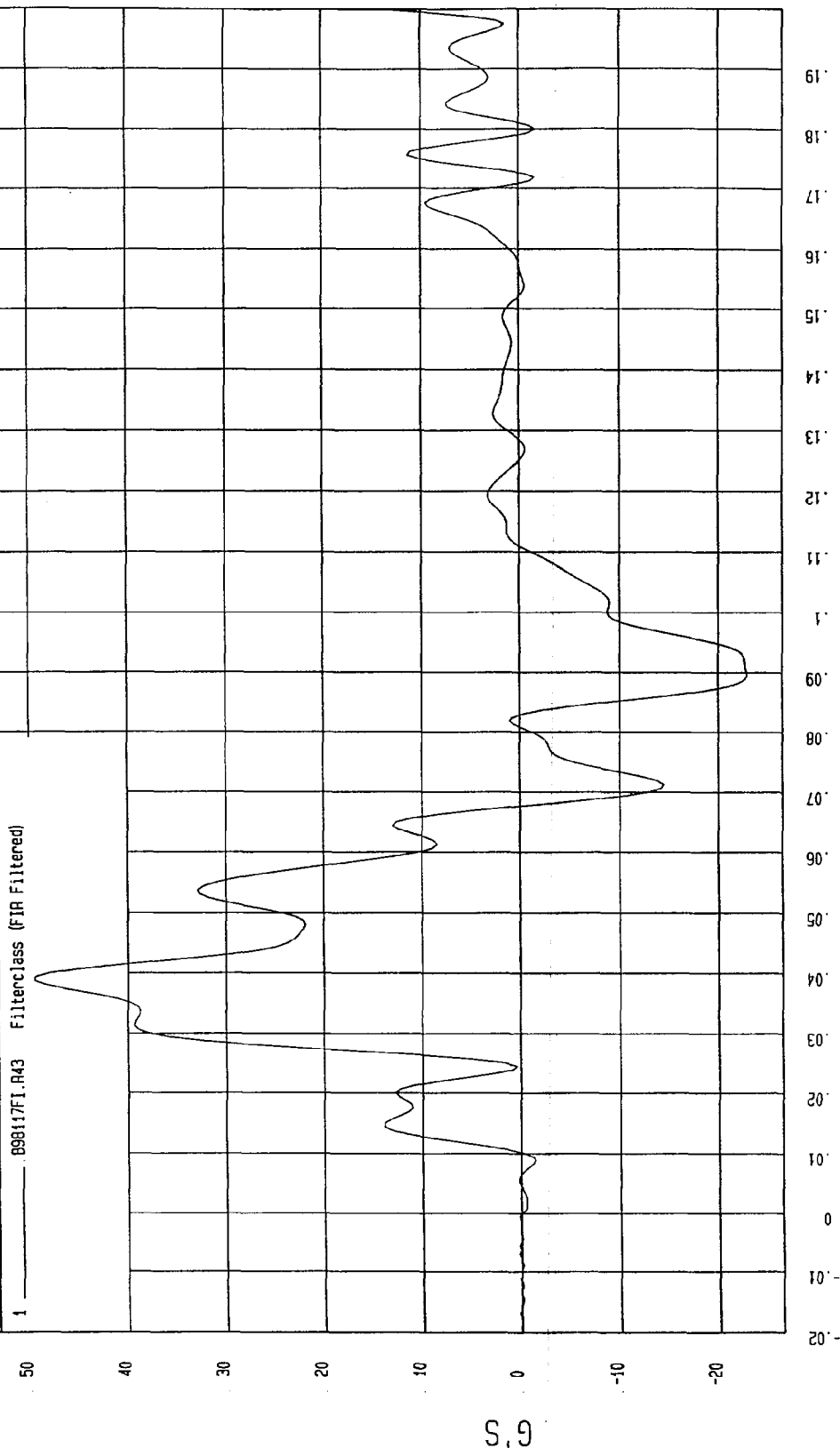
DRIVER LOWER RIB Y ACCELERATION



TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998
 COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -22.9 G'S at 89 msec Maximum = 49.5 G'S at 39 msec

DRIVER LOWER RIB Y REDUNDANT ACCELERATION



MSA Research
 12-16-1998 15:41

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

Speed: 38.3 MPH 61.6 KPH

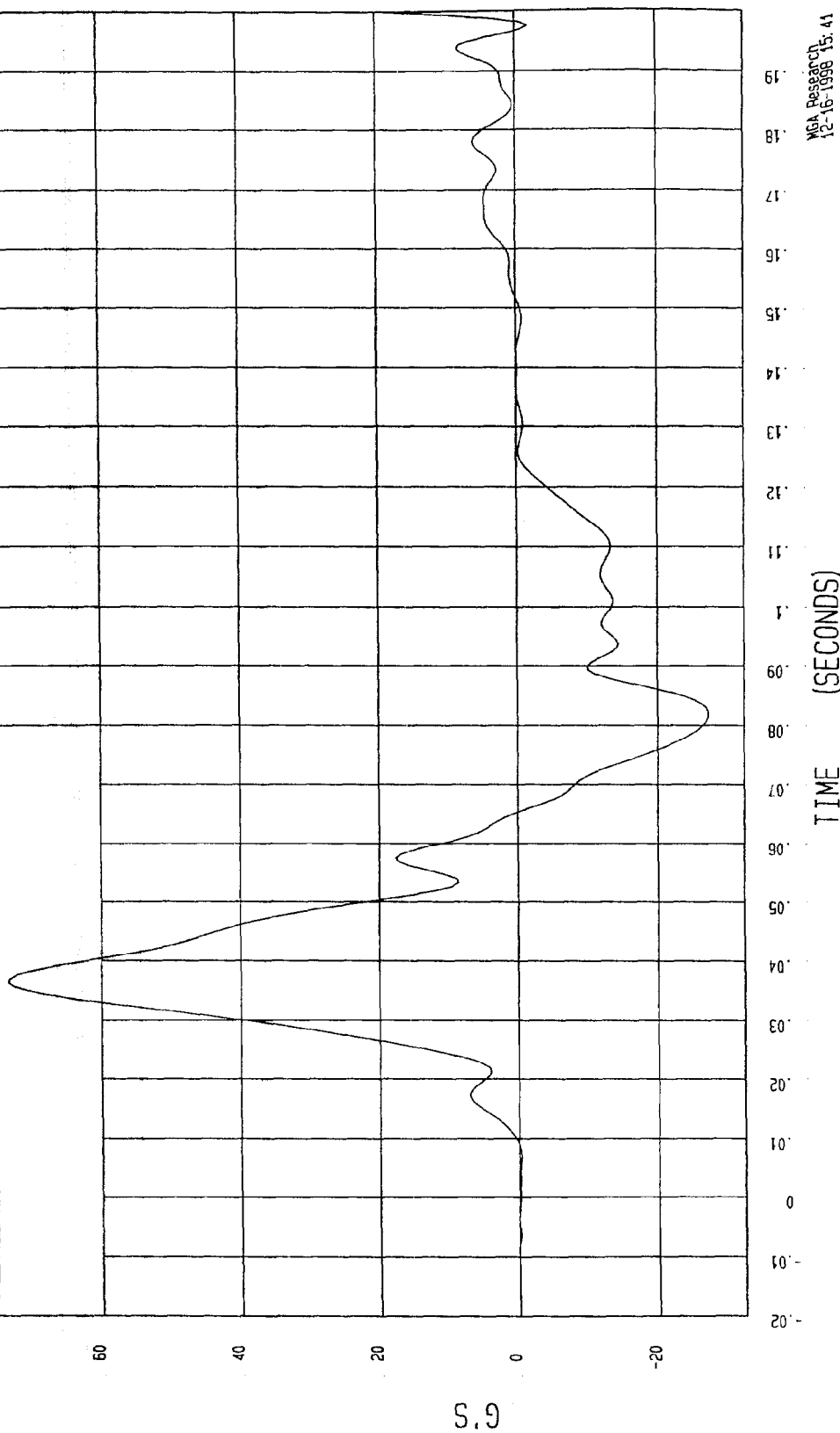
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 73.23 G'S at 36 msec

Minimum = -27.41 G'S at 82 msec

DRIVER LOWER SPINE Y ACCELERATION

1 B981171.R17 Filterclass (FIR Filtered)

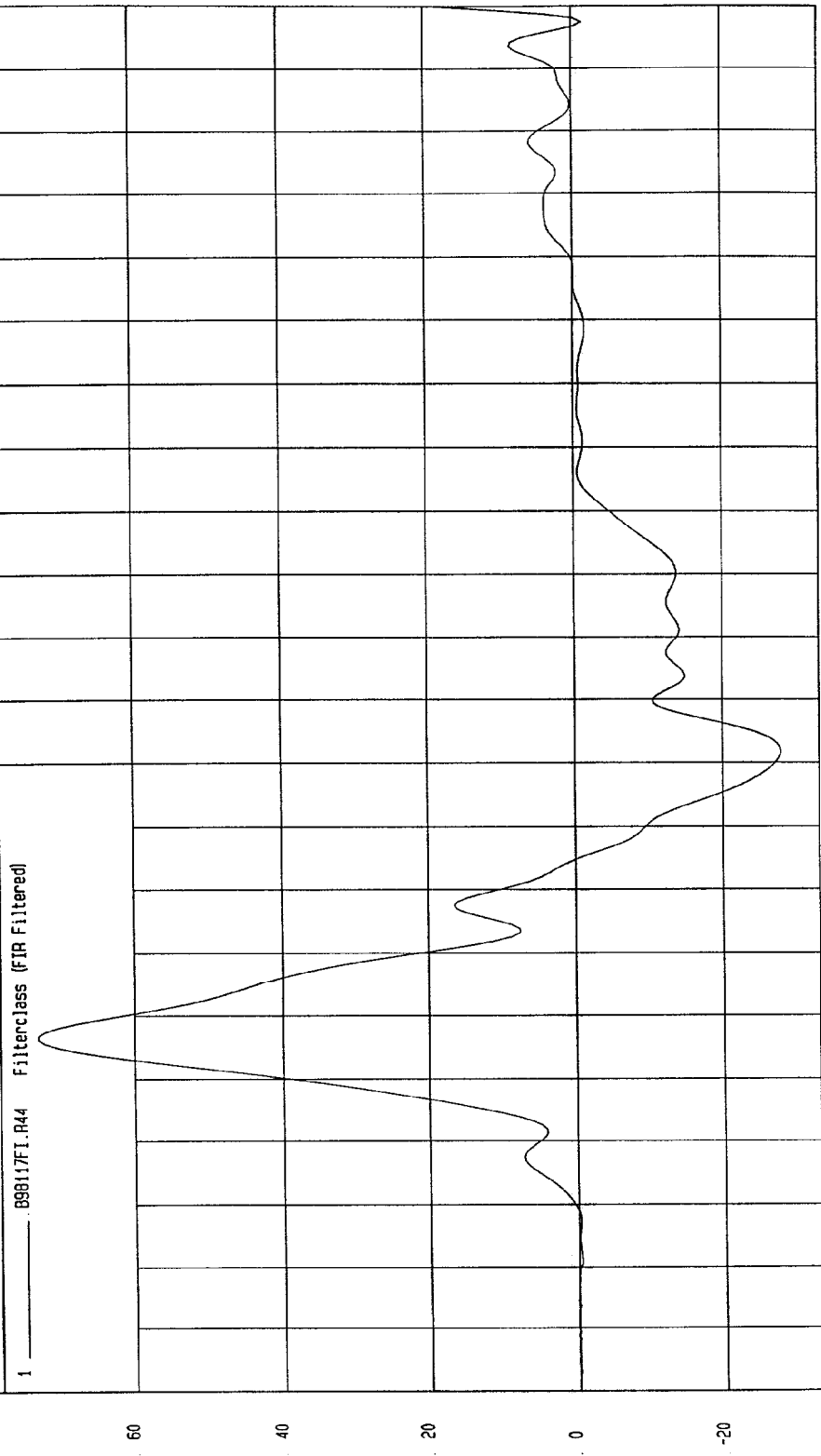
MGA Research
12-16-1998 15: 41

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -27.9 G'S at 82 msec Maximum = 73.06 G'S at 36 msec

DRIVER LOWER SPINE Y REDUNDANT ACCELERATION



MGA Research
12-15-1998 15:41

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

Speed: 38.3 MPH 61.6 KPH

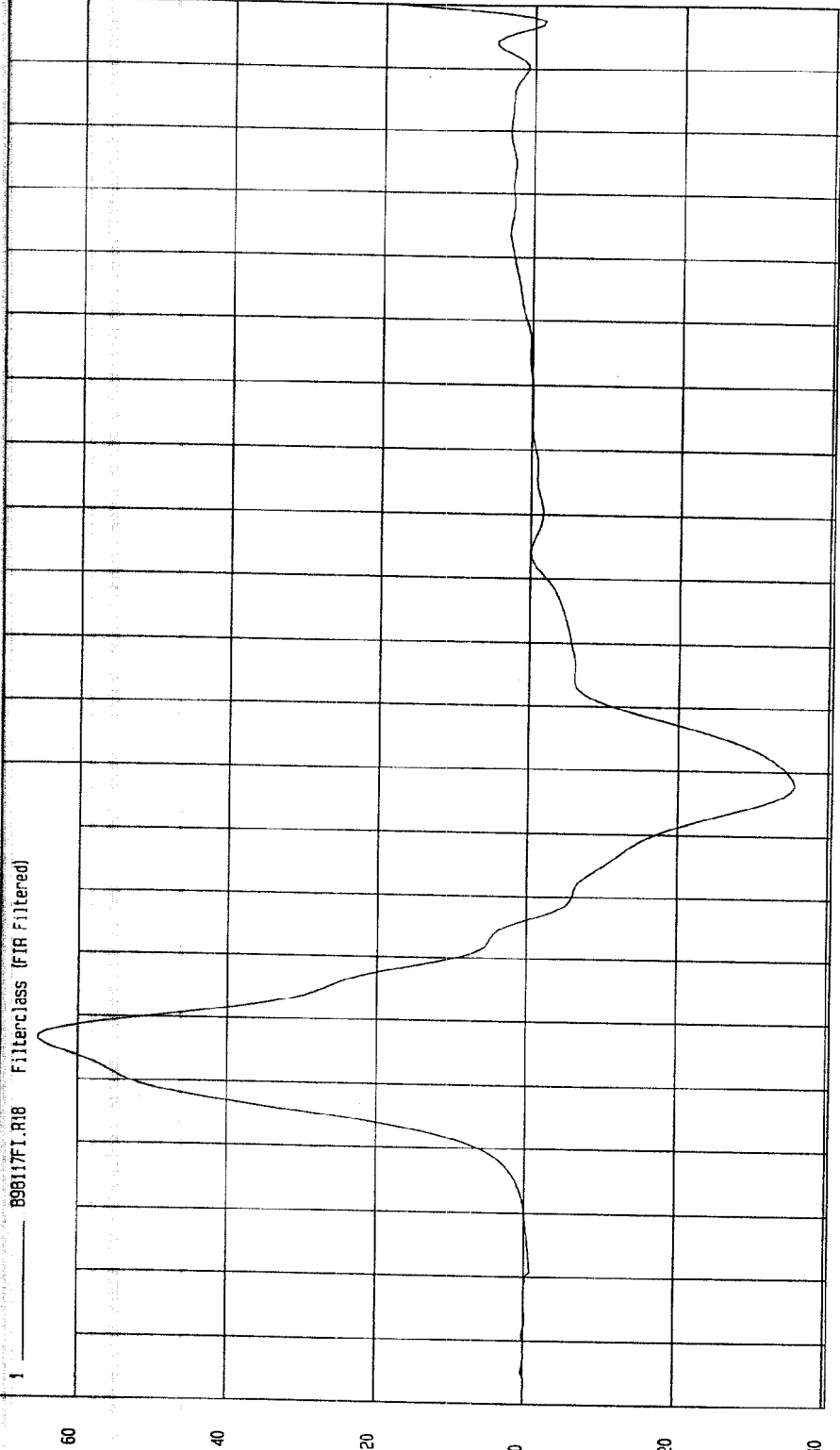
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Minimum = -35.47 G'S at 78 msec

Maximum = 65.28 G'S at 36 msec

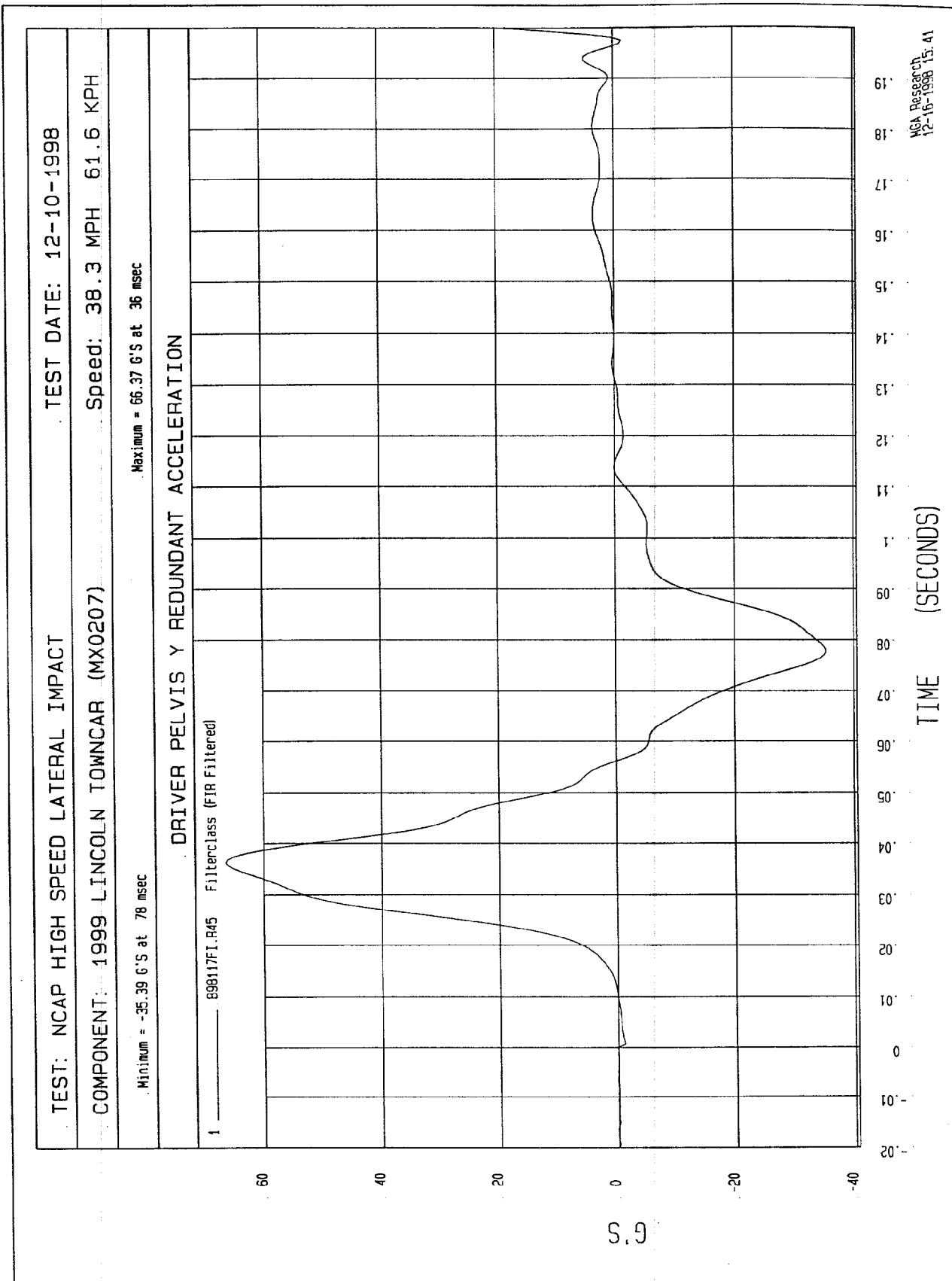
DRIVER PELVIS Y ACCELERATION

1 898117F1.R18 Filterclass (FIR Filtered)



MCA Research
12-16-1998 15:41

TIME (SECONDS)



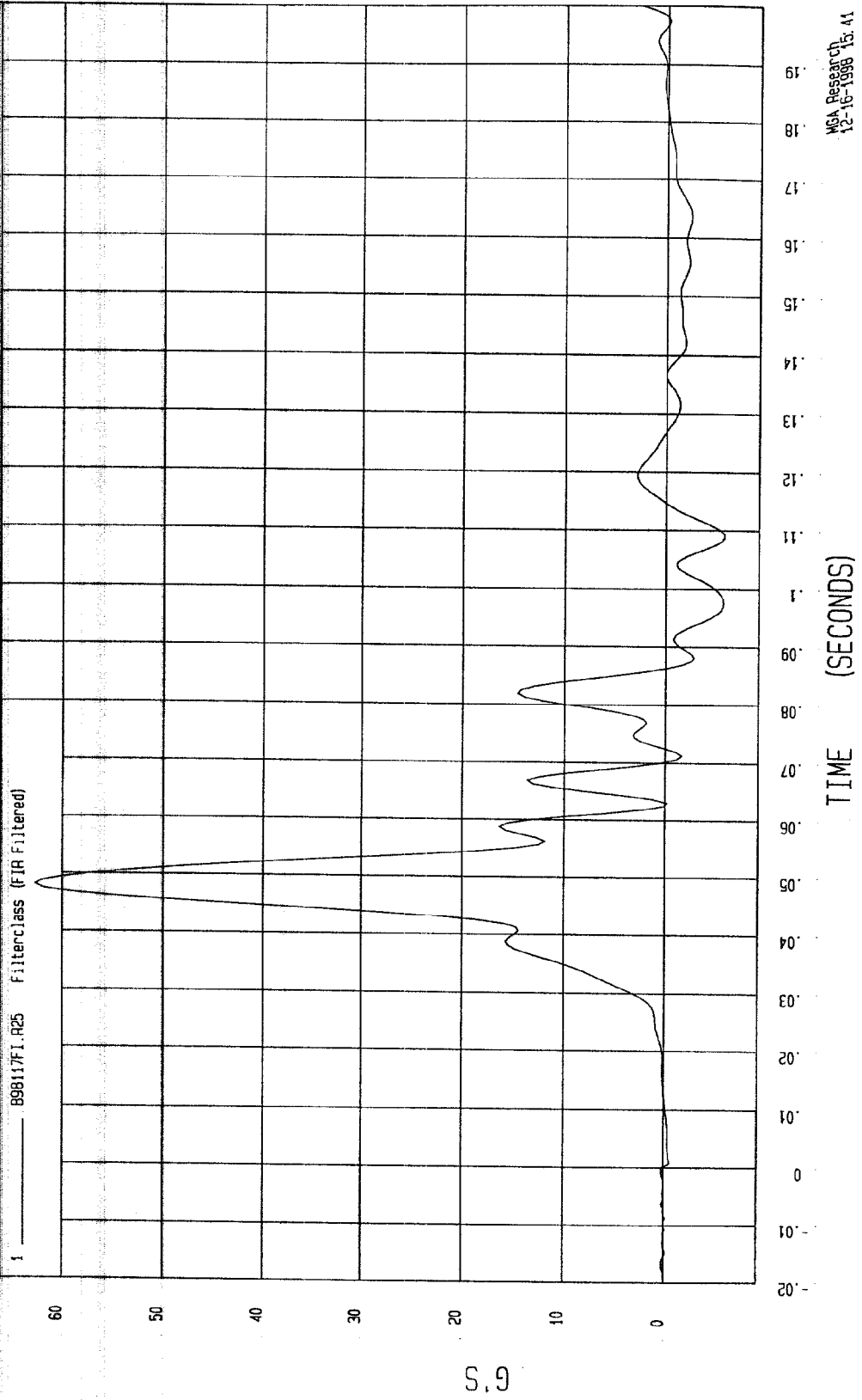
NGA Research
12-16-1998 15:41

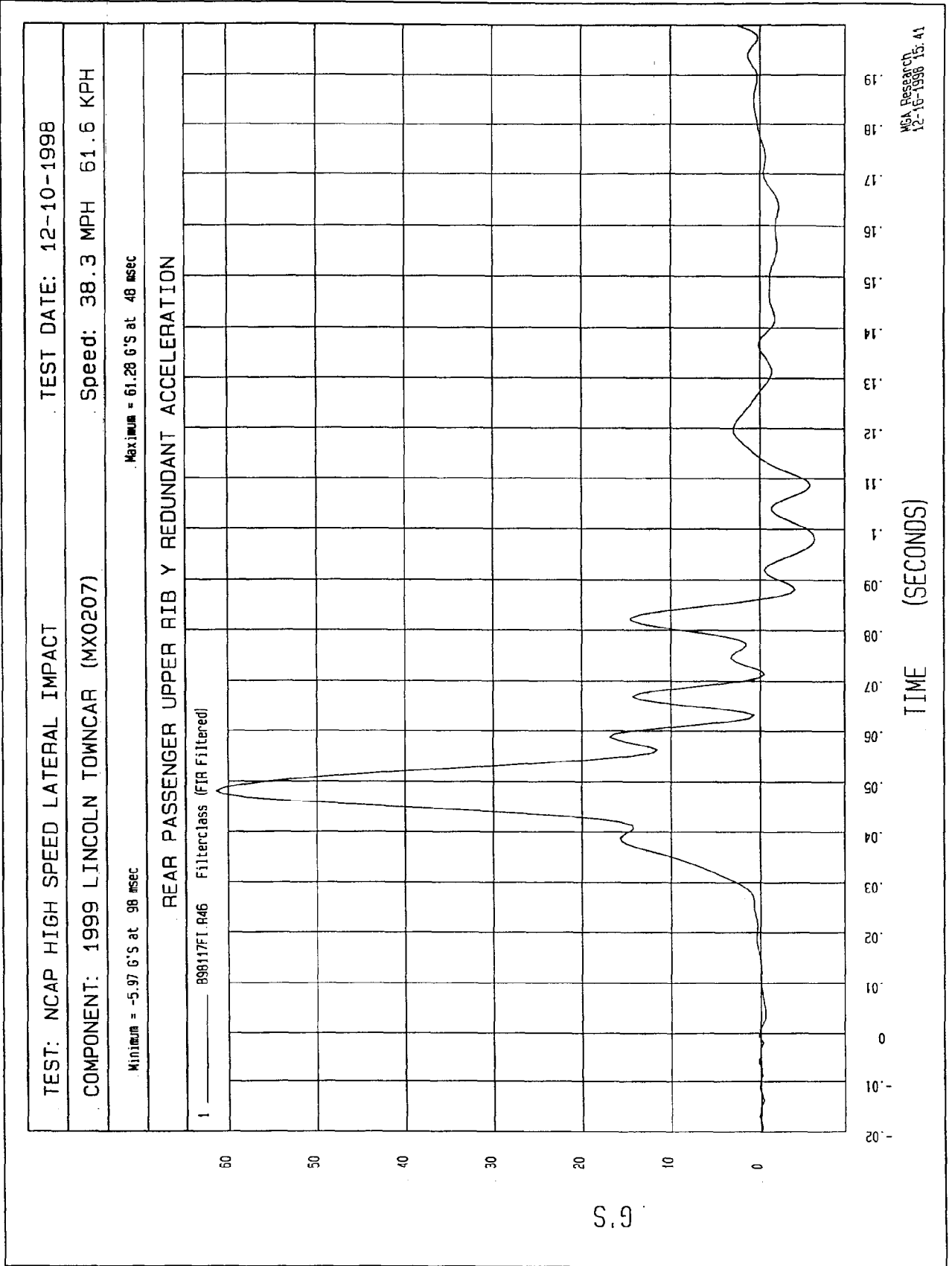
TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -5.81 G'S at 109 msec Maximum = 62.72 G'S at 48 msec

REAR PASSENGER UPPER RIB Y ACCELERATION





TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

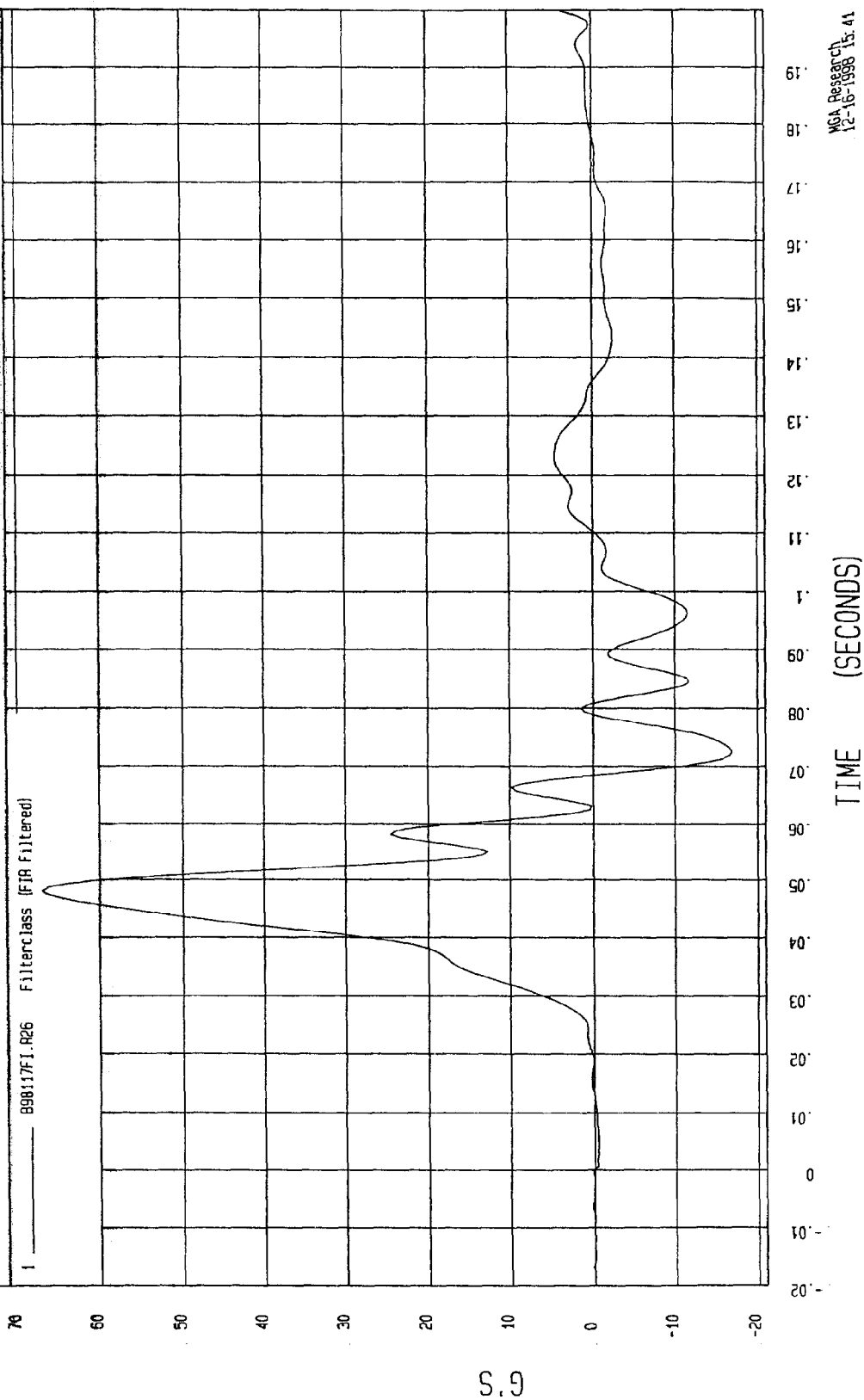
Speed: 38.3 MPH 61.6 KPH

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 67 G'S at 48 msec

Minimum = -16.76 G'S at 72 msec

REAR PASSENGER LOWER RIB Y ACCELERATION



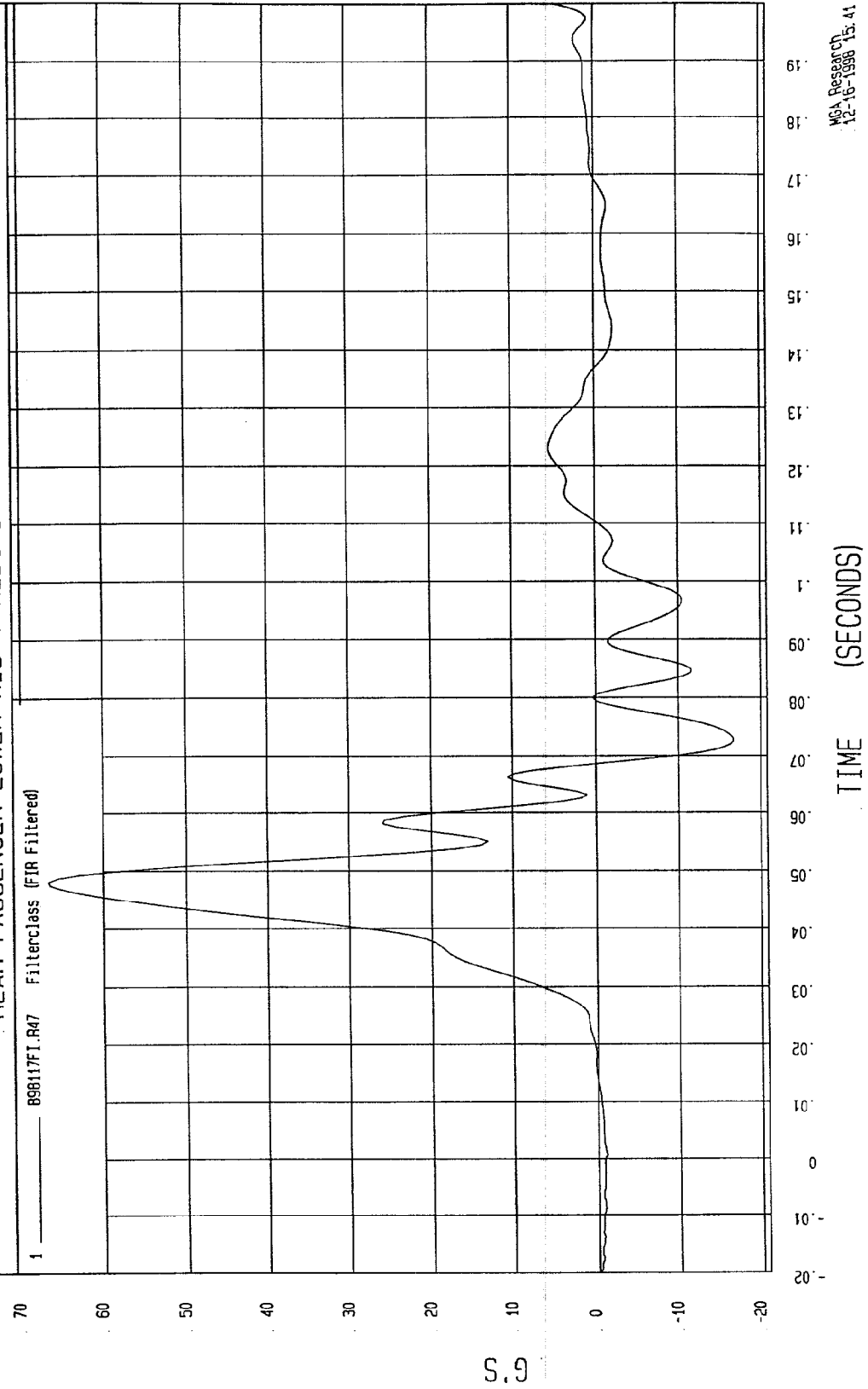
MSA Research
12-16-1998 15:41

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -16.61 G'S at 72 msec Maximum = 66.74 G'S at 48 msec

REAR PASSENGER LOWER RIB Y REDUNDANT ACCELERATION



McA Research
12-16-1998 15:41

TEST: NCAP HIGH SPEED LATERAL IMPACT

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

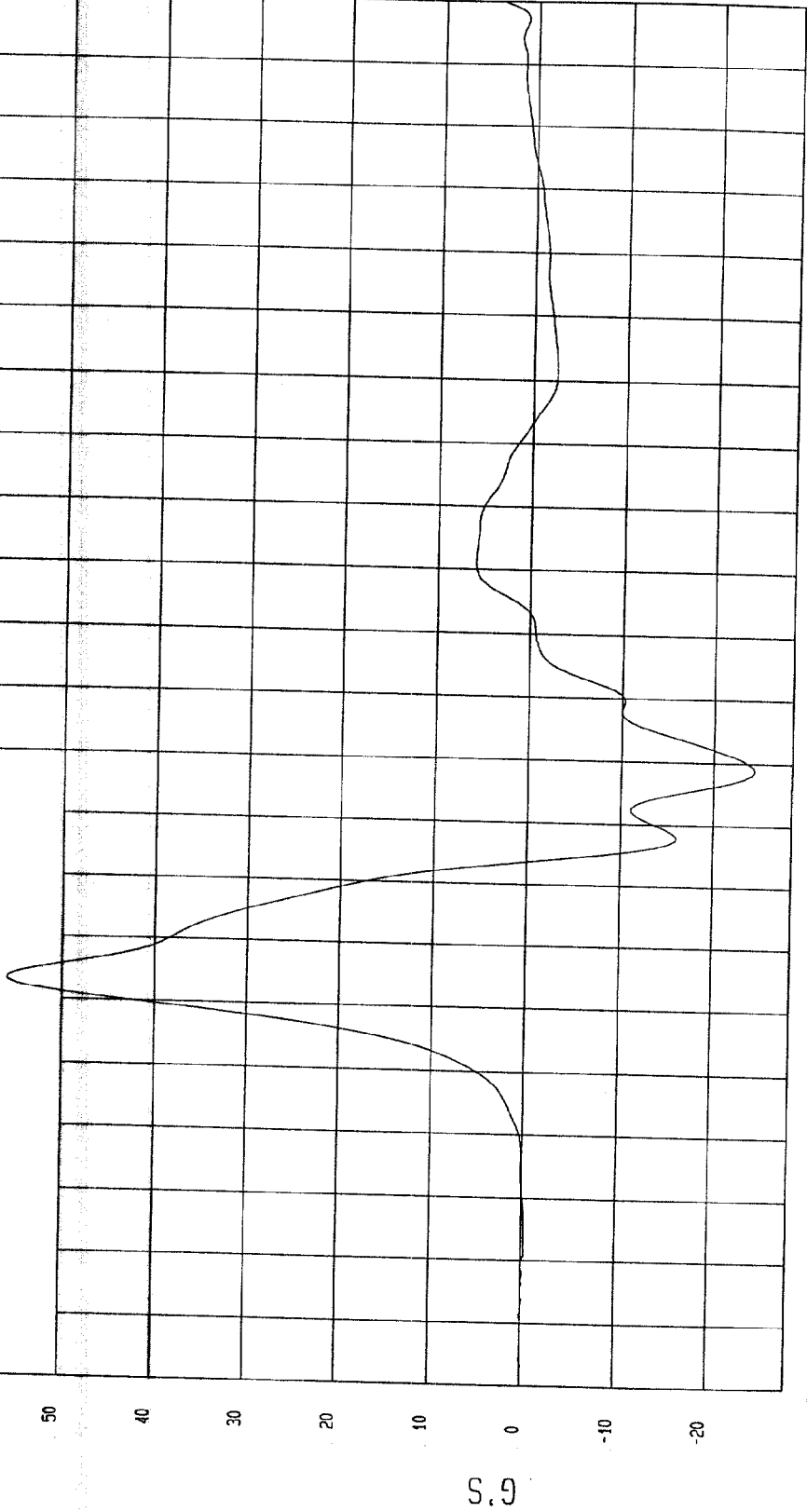
Speed: 38.3 MPH 61.6 KPH

Minimum = -24.46 G'S at 79 msec

Maximum = 55.86 G'S at 43 msec

REAR PASSENGER LOWER SPINE Y ACCELERATION

1 8981171.R27 FilterClass (FIR Filtered)



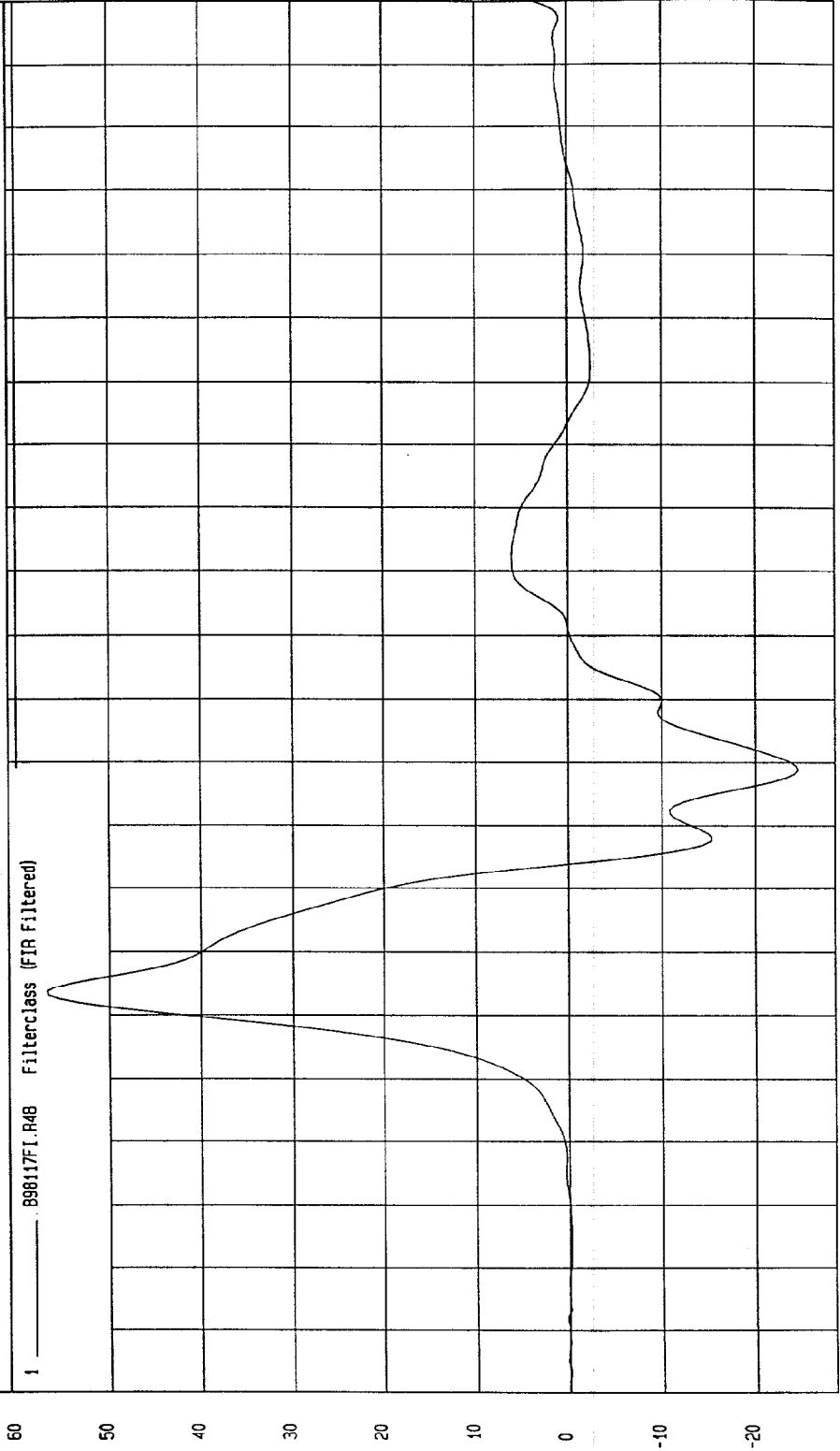
MGA Research
12-16-1998 15:42

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 12-10-1998

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207) Speed: 38.3 MPH 61.6 KPH

Minimum = -24.64 G'S at 79 msec Maximum = 56.78 G'S at 44 msec

REAR PASSENGER LOWER SPINE Y REDUNDANT ACCELERATION



MEA Research
12-16-1998 15:42

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

Speed: 38.3 MPH 61.6 KPH

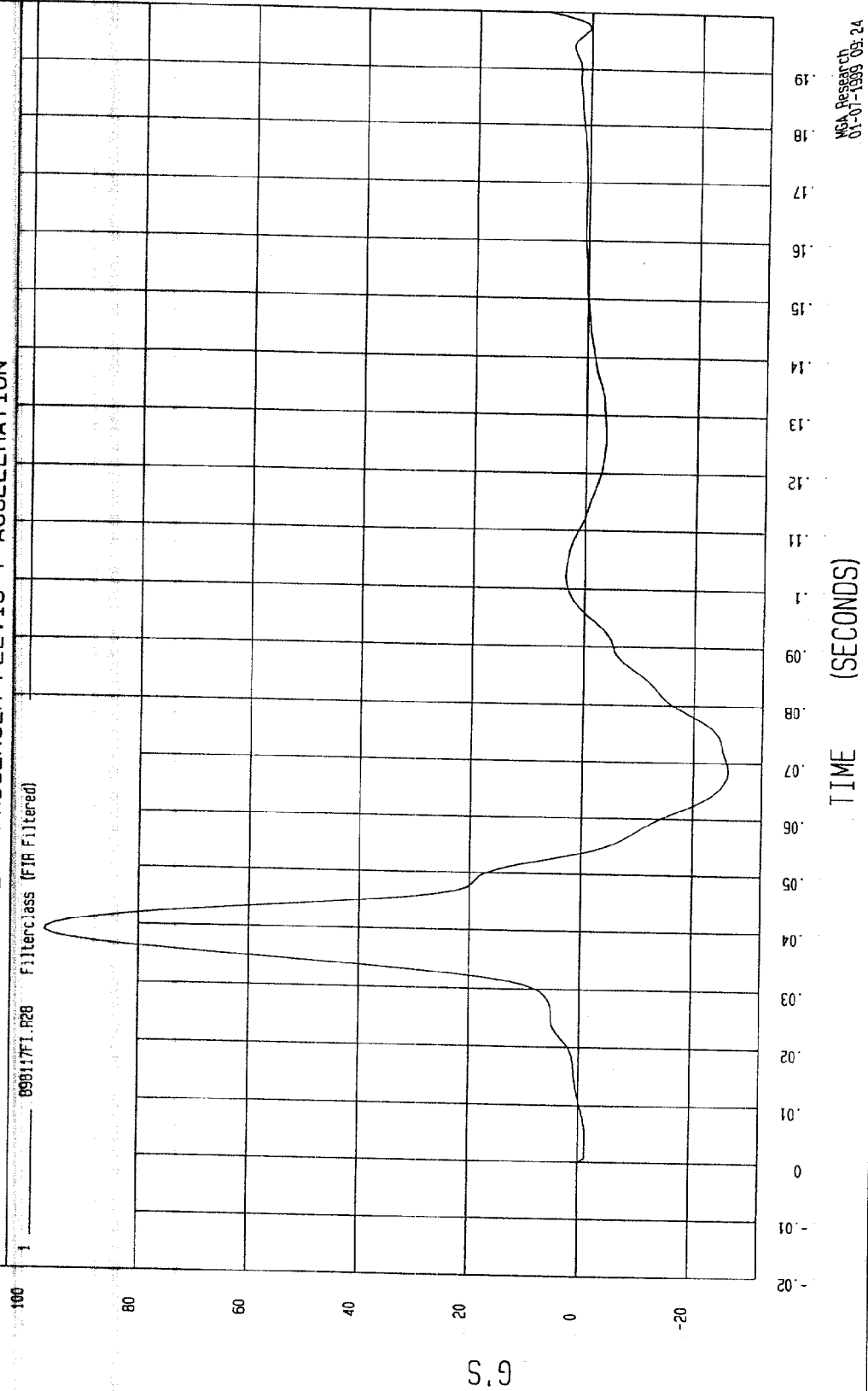
COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Minimum = -26.19 G's at 69 msec

Maximum = 96.88 G's at 39 msec

REAR PASSENGER PELVIS Y ACCELERATION

1 098117F1.R28 Filter: class (FIR Filtered)



WCA Research
01-01-1999 09:24

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 12-10-1998

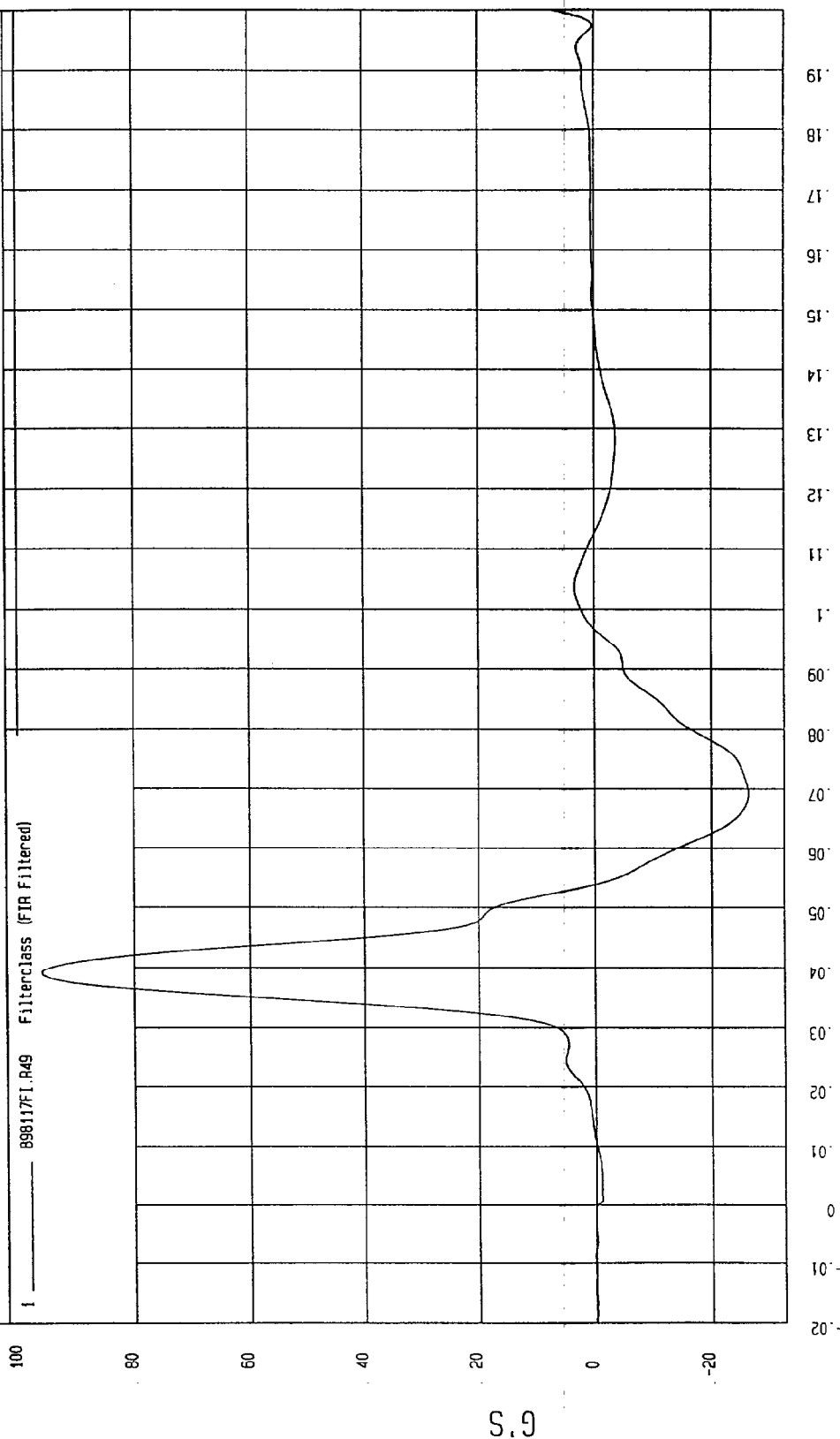
Speed: 38.3 MPH 61.6 KPH

COMPONENT: 1999 LINCOLN TOWNCAR (MX0207)

Maximum = 95.98 G'S at 39 msec

Minimum = -26.39 G'S at 69 msec

REAR PASSENGER PELVIS Y REDUNDANT ACCELERATION



WCA Research
01-01-1999 09:24

APPENDIX C
SID CONFIGURATION AND PERFORMANCE VERIFICATION

PRE-TEST CERTIFICATION DATA

Driver Dummy Serial Number: 271

Calibration Test Results Summary

Driver Dummy Serial Number: 271

Pre-Test Calibration

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

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY SERIAL NUMBER: 271DATE OF VERIFICATION: December 9, 1998

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

MEASUREMENTS BY: APPROVED BY: 

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: December 9, 1998DUMMY SERIAL NUMBER: 271TEST NUMBER: D981592

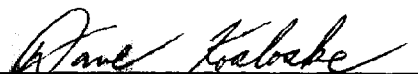
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	24%
PROBE SPEED (m/s)	4.27 - 4.33	4.29
UPPER RIB (g's)	37 - 46 g's	42
LOWER RIB (g's)	37 - 46 g's	42
LOWER SPINE (g's)	15 - 22 g's	22

TEST MEETS SPECIFICATIONS

TECHNICIAN



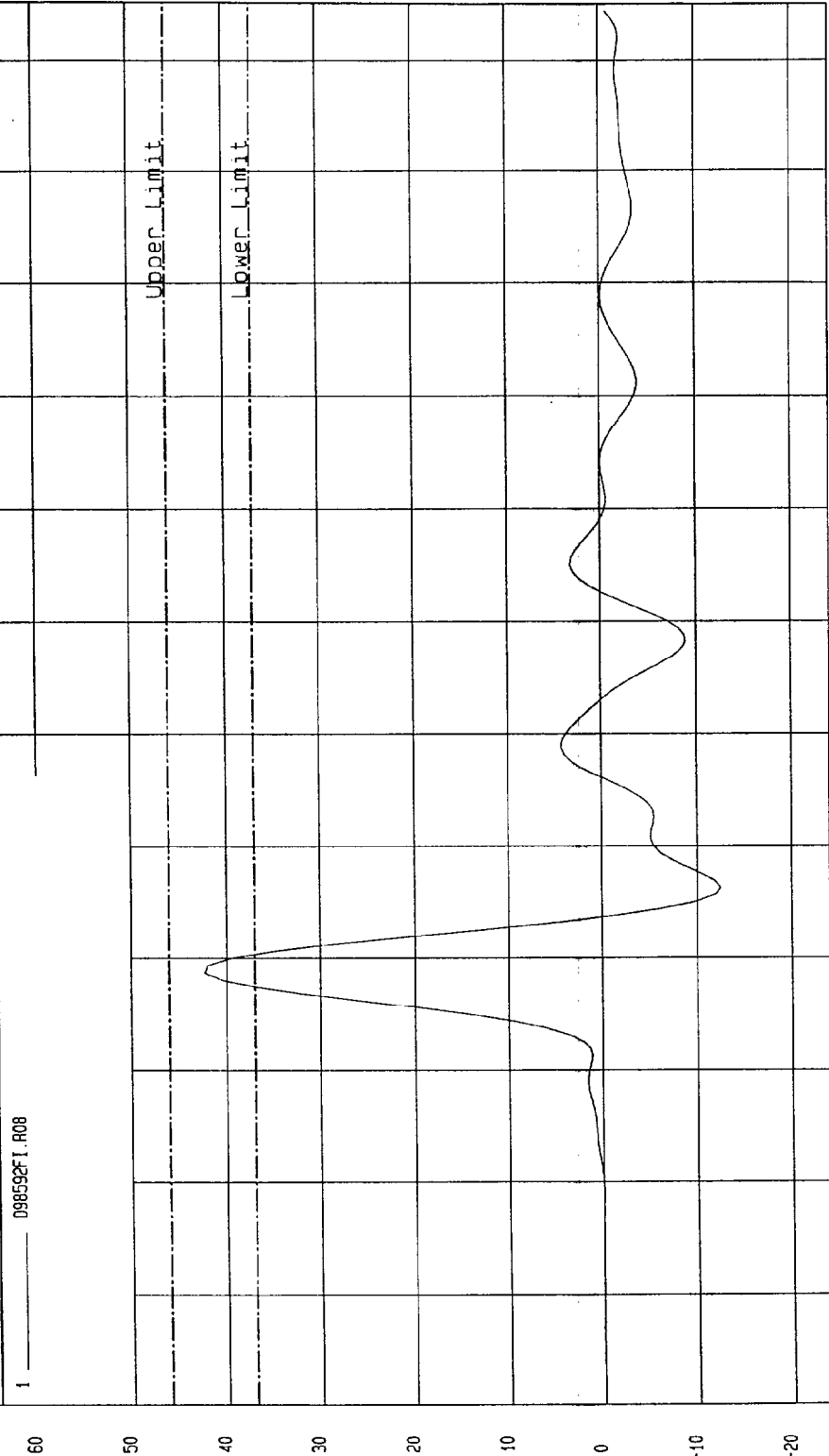
APPROVED BY



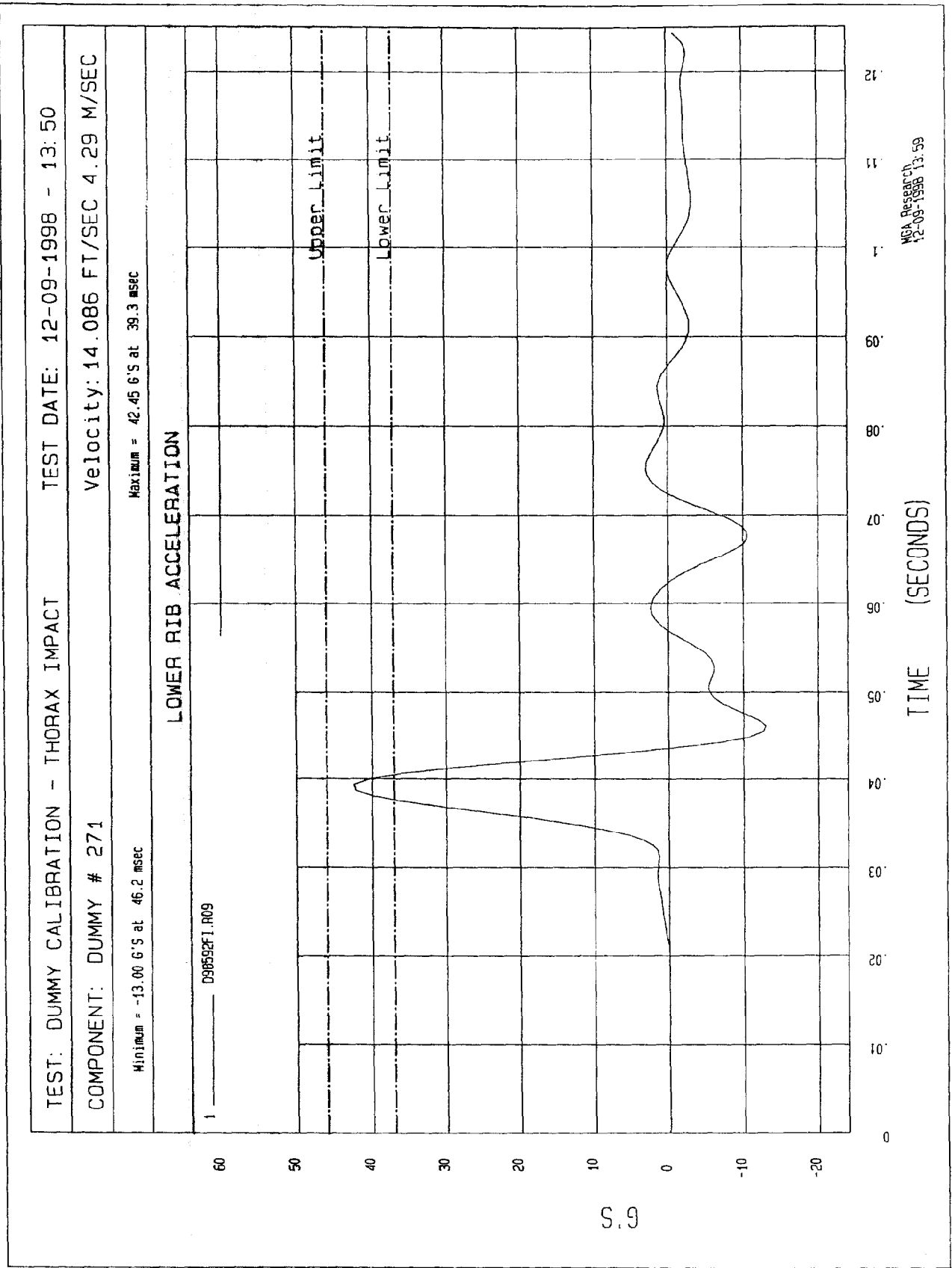
TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 12-09-1998 - 13:50
 COMPONENT: DUMMY # 271 Velocity: 14.086 FT/SEC 4.29 M/SEC

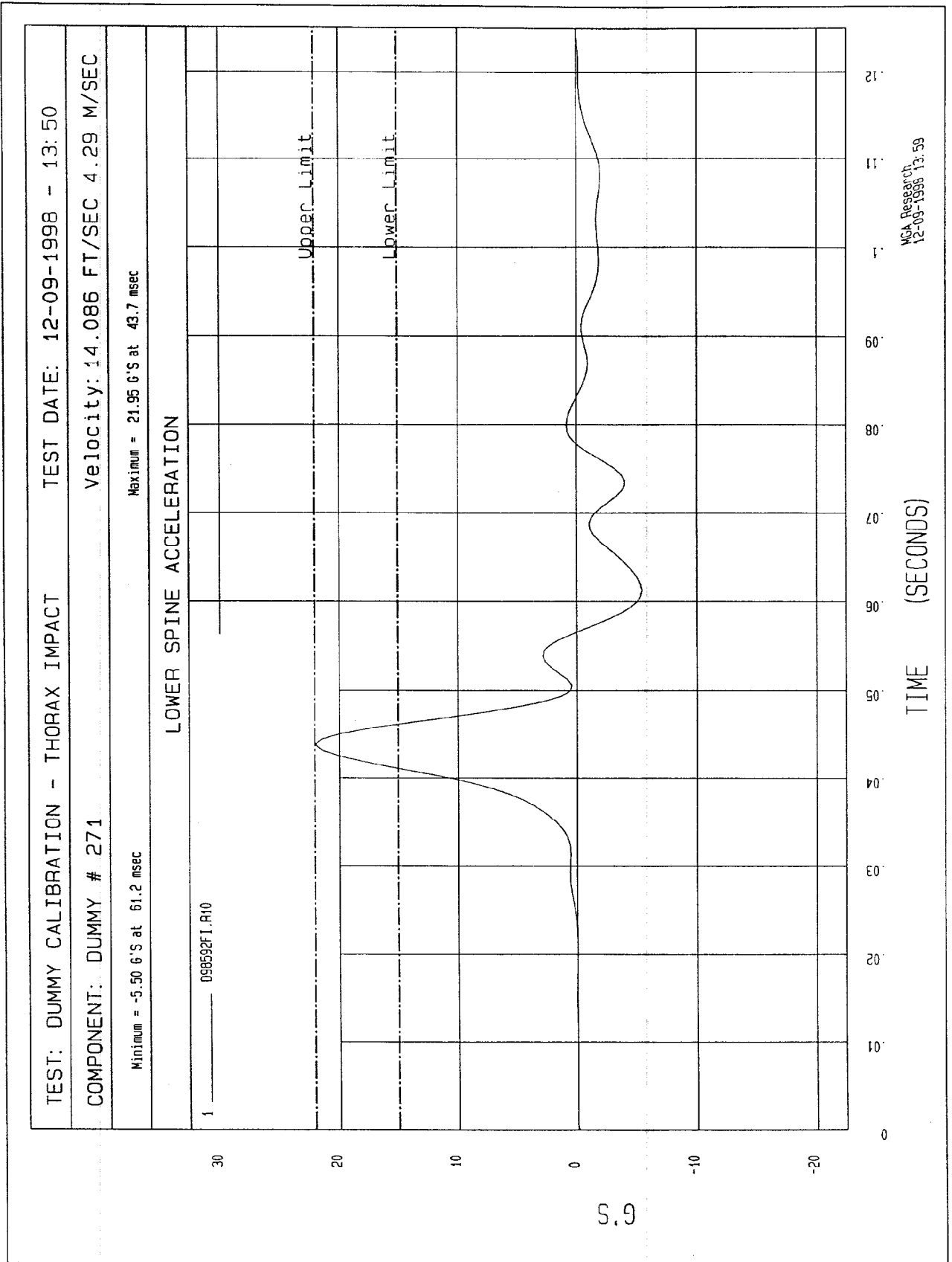
Minimum = -12.53 G'S at 46.2 msec
 Maximum = 42.32 G'S at 38.7 msec

UPPER RIB ACCELERATION



NSA Research
 12-09-1998 13:59





MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: December 9, 1998DUMMY SERIAL NUMBER: 271TEST NUMBER: D981593

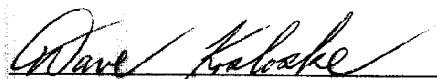
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	25%
PROBE SPEED (m/s)	4.27 - 4.33	4.28
PELVIS ACCELERATION (g's)	40 - 60	55

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY

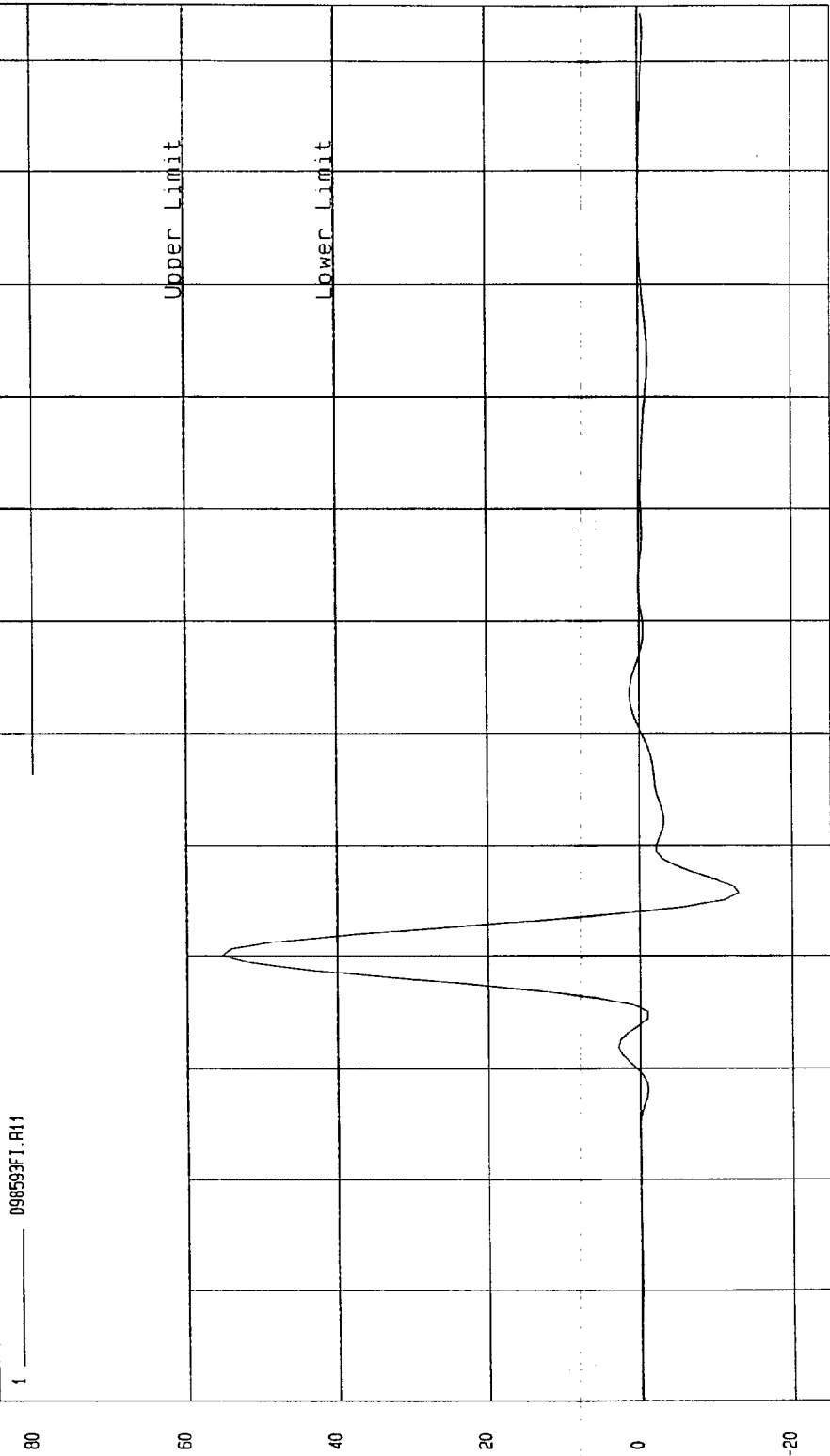


TEST: DUMMY CALIBRATION - PELVIS IMPACT TEST DATE: 12-09-1998 - 13:58

COMPONENT: DUMMY # 271 Velocity: 14.04 FT/SEC 4.28 M/SEC

Minimum = -13.01 G'S at 45.6 msec Maximum = 55.29 G'S at 40 msec

PELVIS ACCELERATION



MGA RESEARCH CORPORATION

ABDOMINAL COMPRESSION TEST

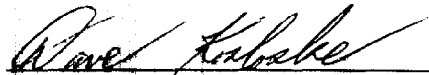
(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

DATE: December 9, 1998DUMMY SERIAL NUMBER: 271TEST NUMBER: D981594

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	25%
FORCE @ 12.7 mm	104 - 162	142
FORCE @ 19.0 mm	163 - 222	197
FORCE @ 25.4 mm	222 - 280	258
FORCE @ 33 mm	325 - 391	353

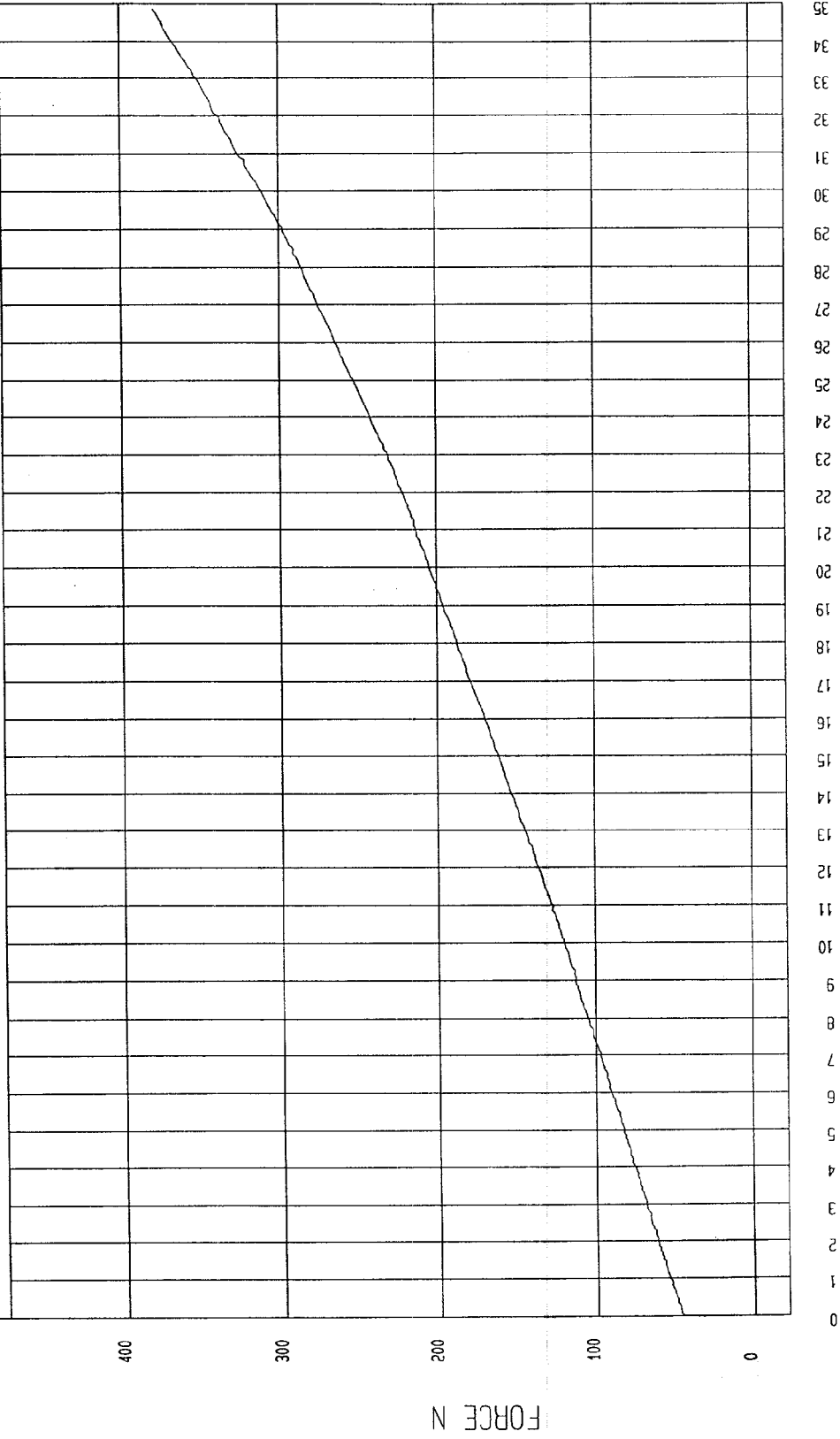
TEST MEETS SPECIFICATIONS

TECHNICIAN APPROVED BY 

TEST: DUMMY CALIBRATION - ABDOMEN COMPRESSION TEST DATE: 12-09-1998 - 16:38:21

COMPONENT: DUMMY # 271

FORCE as a function of DISPLACEMENT



MCA Research
12-09-1998 16:38

MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

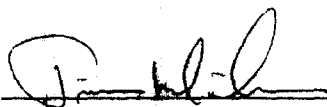
SIDE IMPACT DUMMY (SID)

DATE: December 9, 1998DUMMY SERIAL NUMBER: 271TEST NUMBER: D981595

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	110.1
FORCE @ 30°	151.2 - 204.6	158.2
FORCE @ 40°	204.6 - 258.0	214.4
RETURN ANGLE	12° maximum	4°

TEST MEETS SPECIFICATIONS

TECHNICIAN



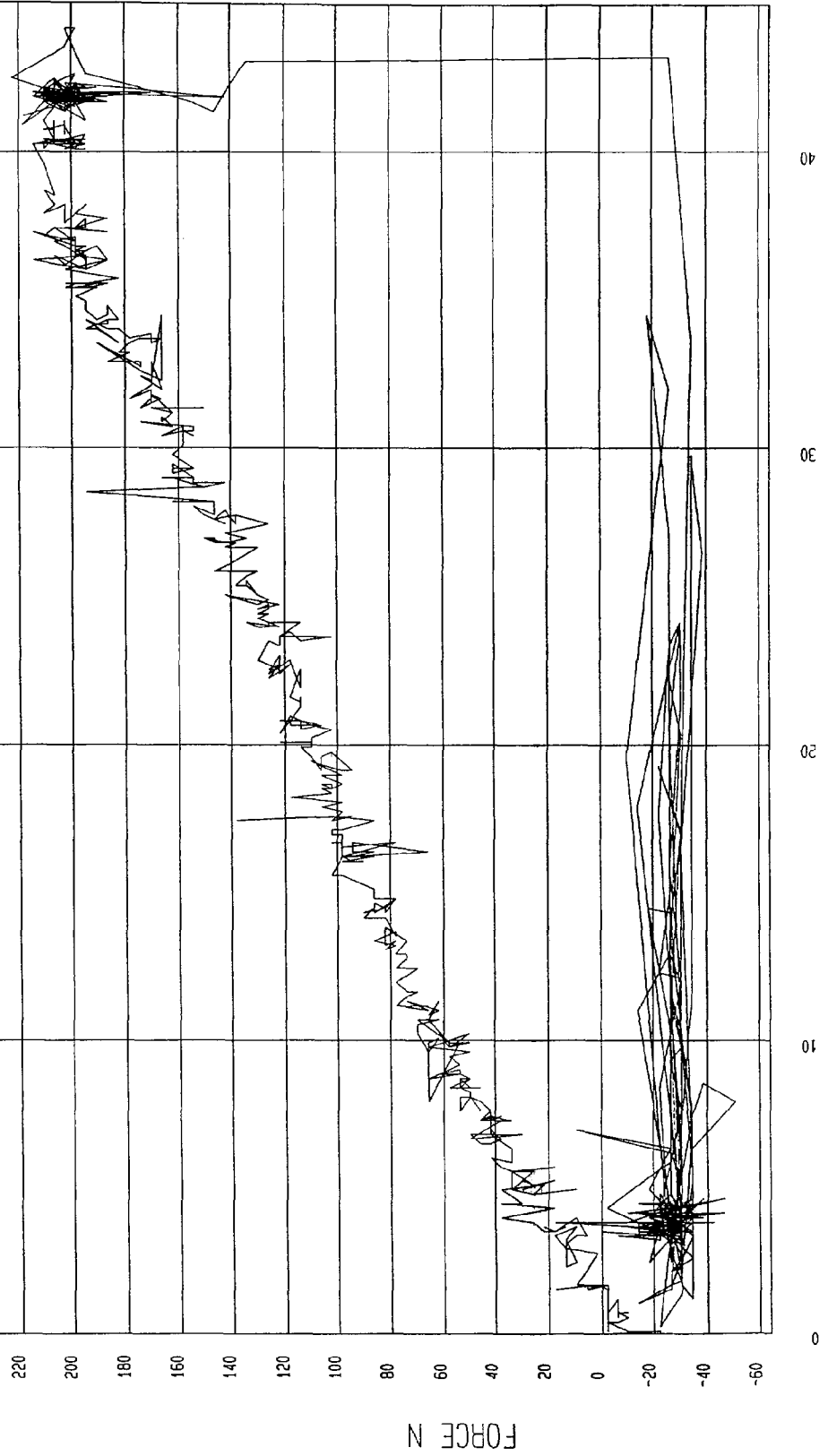
APPROVED BY



TEST: DUMMY CALIBRATION - LUMBAR FLEXION TEST DATE: 12-09-1998 - 15:42:37

COMPONENT: DUMMY # 271

FORCE as a function of TORSO ROTATION



HSA Research
12-09-1998 16:16

PRE-TEST CERTIFICATION DATA

Passenger Dummy Serial Number: 272

Calibration Test Results Summary

Passenger Dummy Serial Number: 272

Pre-Test Calibration

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

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY SERIAL NUMBER: 272DATE OF VERIFICATION: December 9, 1998

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height (mm)	889 - 909	892
RH - Rib Height (mm)	501 - 521	512
HP - Hip Pivot Height (mm)	99 ref.	99
RD - Rib From Back Line (mm)	229 - 241	238
KV - Knee Pivot From Back Line (mm)	511 - 526	523
SW - Knee Pivot to Floor (mm)	490 - 505	493
HW - Hip Width (mm)	356 - 391	378

MEASUREMENTS BY: J. W. Q.APPROVED BY: Dave Lombardi

MGA RESEARCH CORPORATION

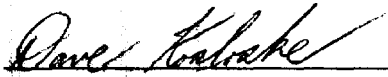
THORAX IMPACT TEST

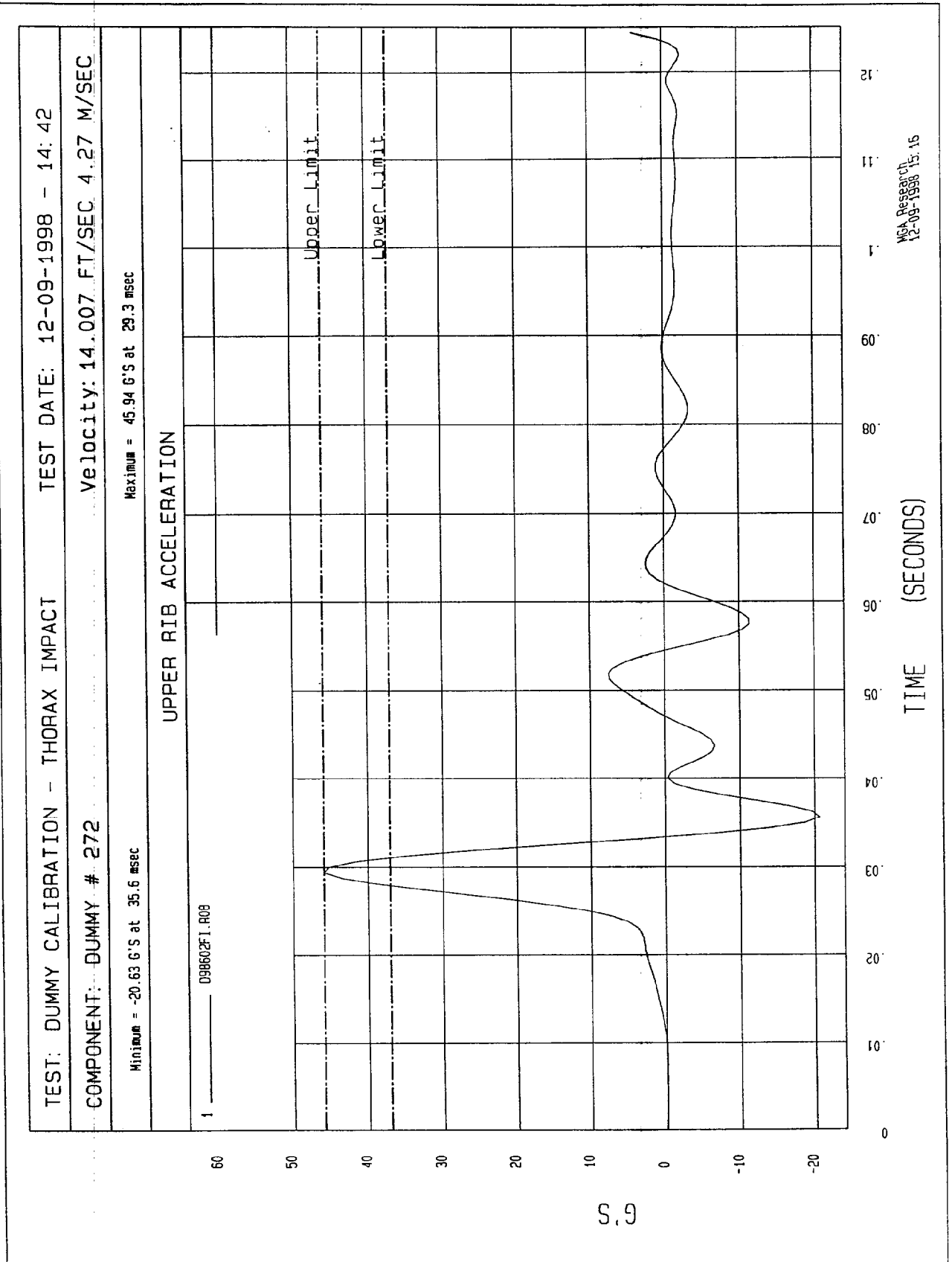
SIDE IMPACT DUMMY (SID)

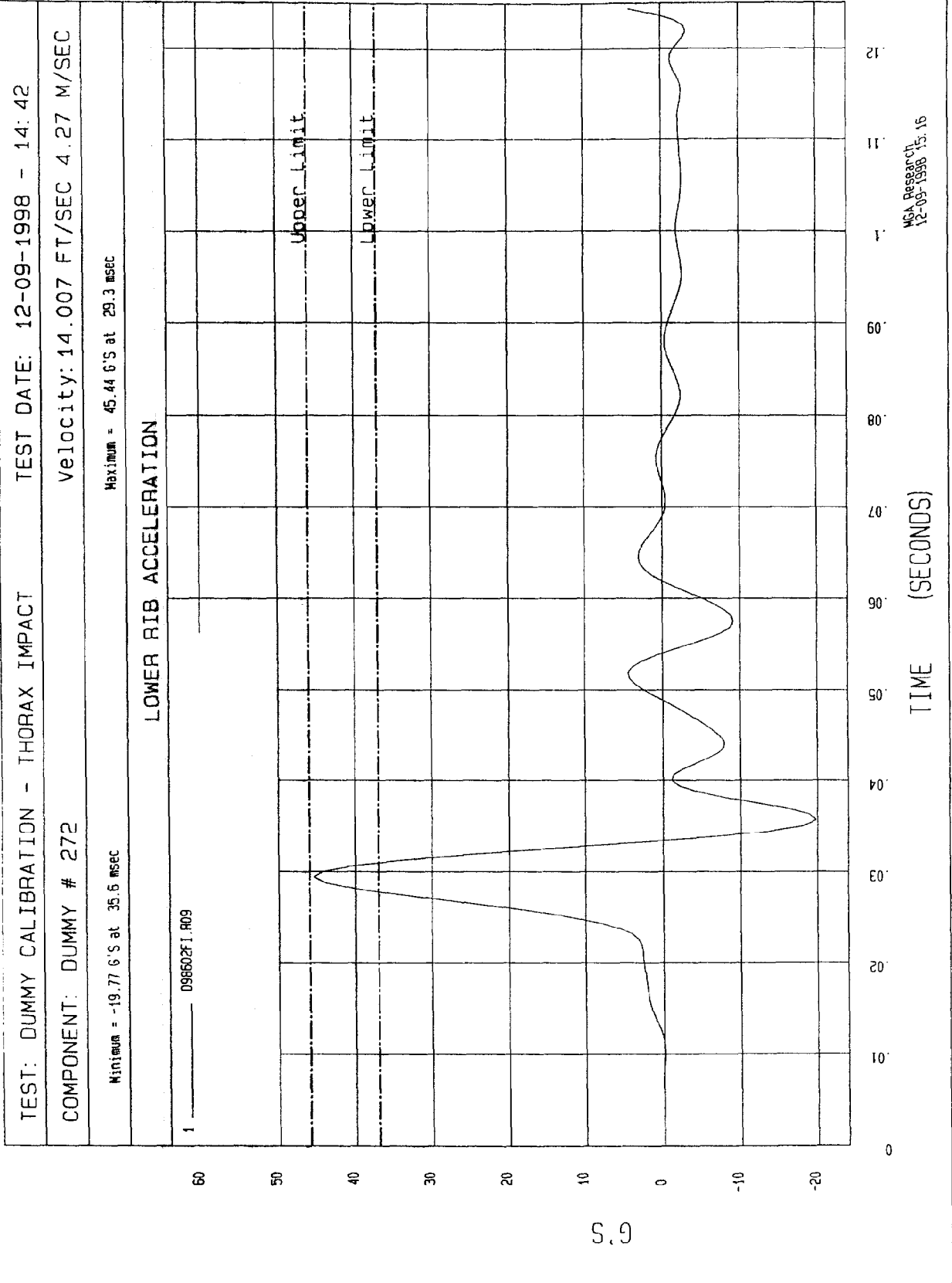
DATE: December 9, 1998DUMMY SERIAL NUMBER: 272 TEST NUMBER: D981602

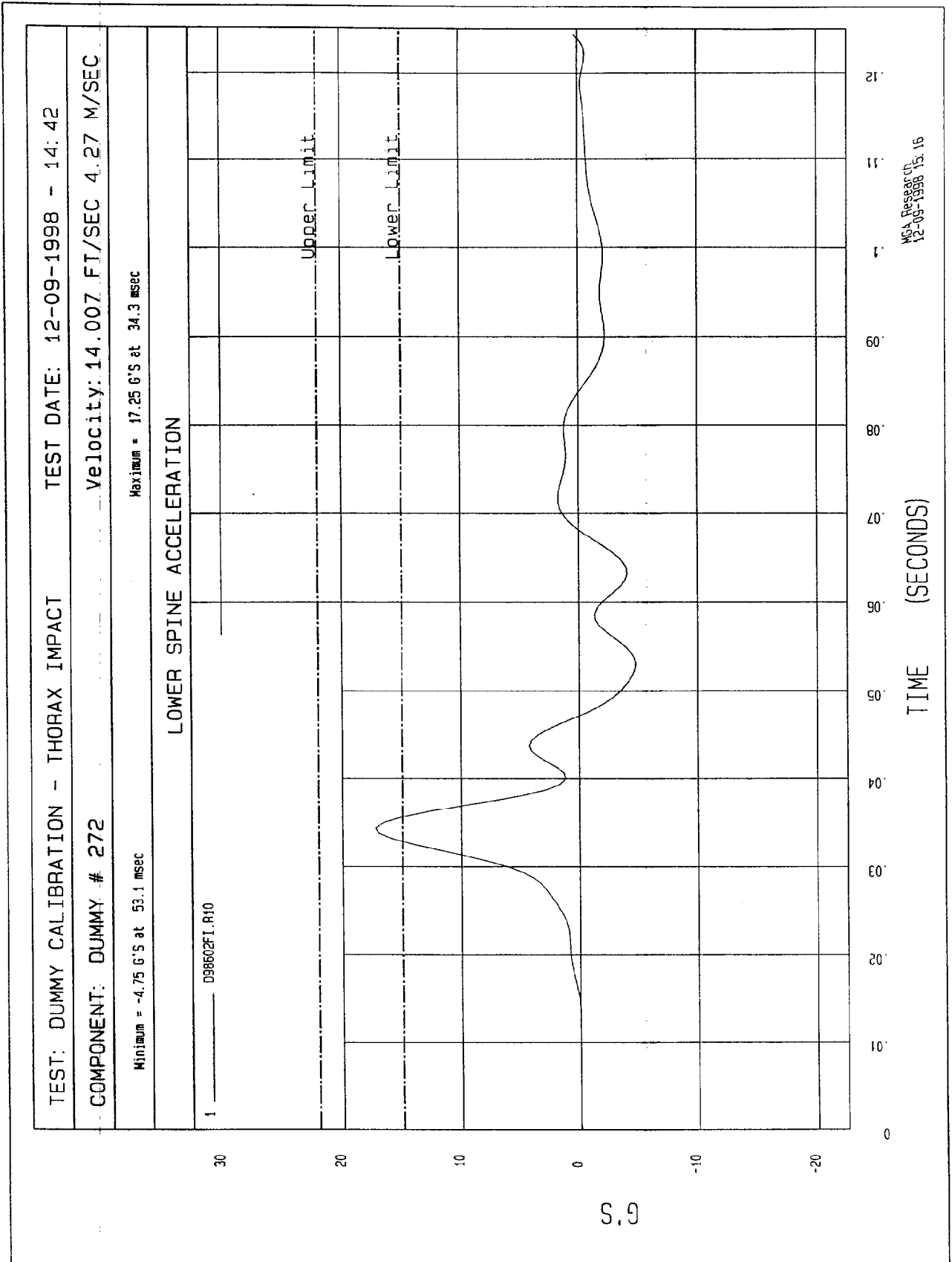
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	25%
PROBE SPEED (m/s)	4.27 - 4.33	4.27
UPPER RIB (g's)	37 - 46 g's	46
LOWER RIB (g's)	37 - 46 g's	45
LOWER SPINE (g's)	15 - 22 g's	17

TEST MEETS SPECIFICATIONS

TECHNICIAN APPROVED BY 







MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

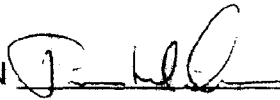
SIDE IMPACT DUMMY (SID)

DATE: December 9, 1998DUMMY SERIAL NUMBER: 272TEST NUMBER: D981603

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	25%
PROBE SPEED (m/s)	4.27 - 4.33	4.28
PELVIS ACCELERATION (g's)	40 - 60	60

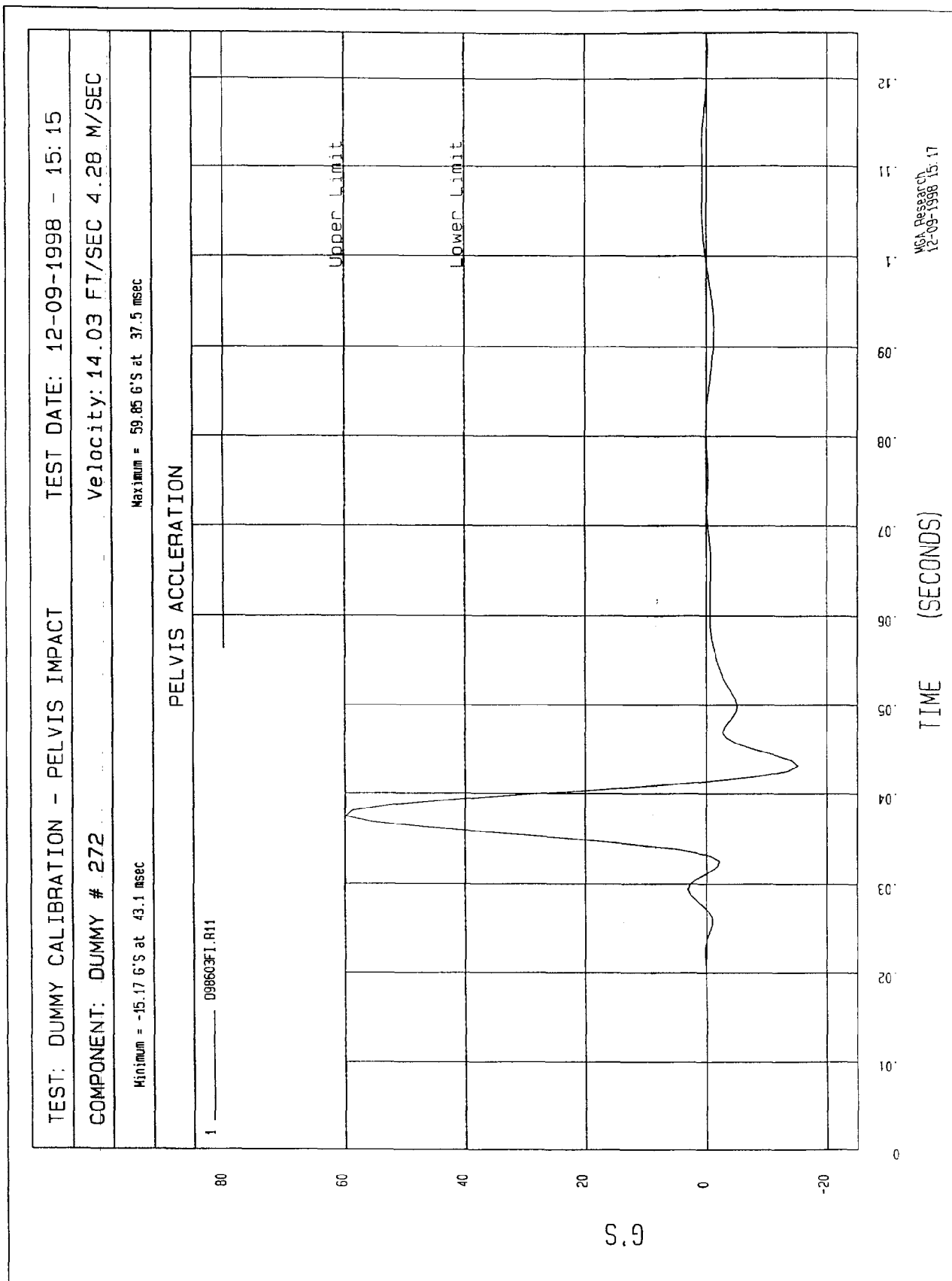
TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY





MGA RESEARCH CORPORATION

ABDOMINAL COMPRESSION TEST

(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

DATE: December 9, 1998DUMMY SERIAL NUMBER: 272TEST NUMBER: D981604

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	25%
FORCE @ 12.7 mm	104 - 162	140
FORCE @ 19.0 mm	163 - 222	189
FORCE @ 25.4 mm	222 - 280	250
FORCE @ 33 mm	325 - 391	344

TEST MEETS SPECIFICATIONS

TECHNICIAN



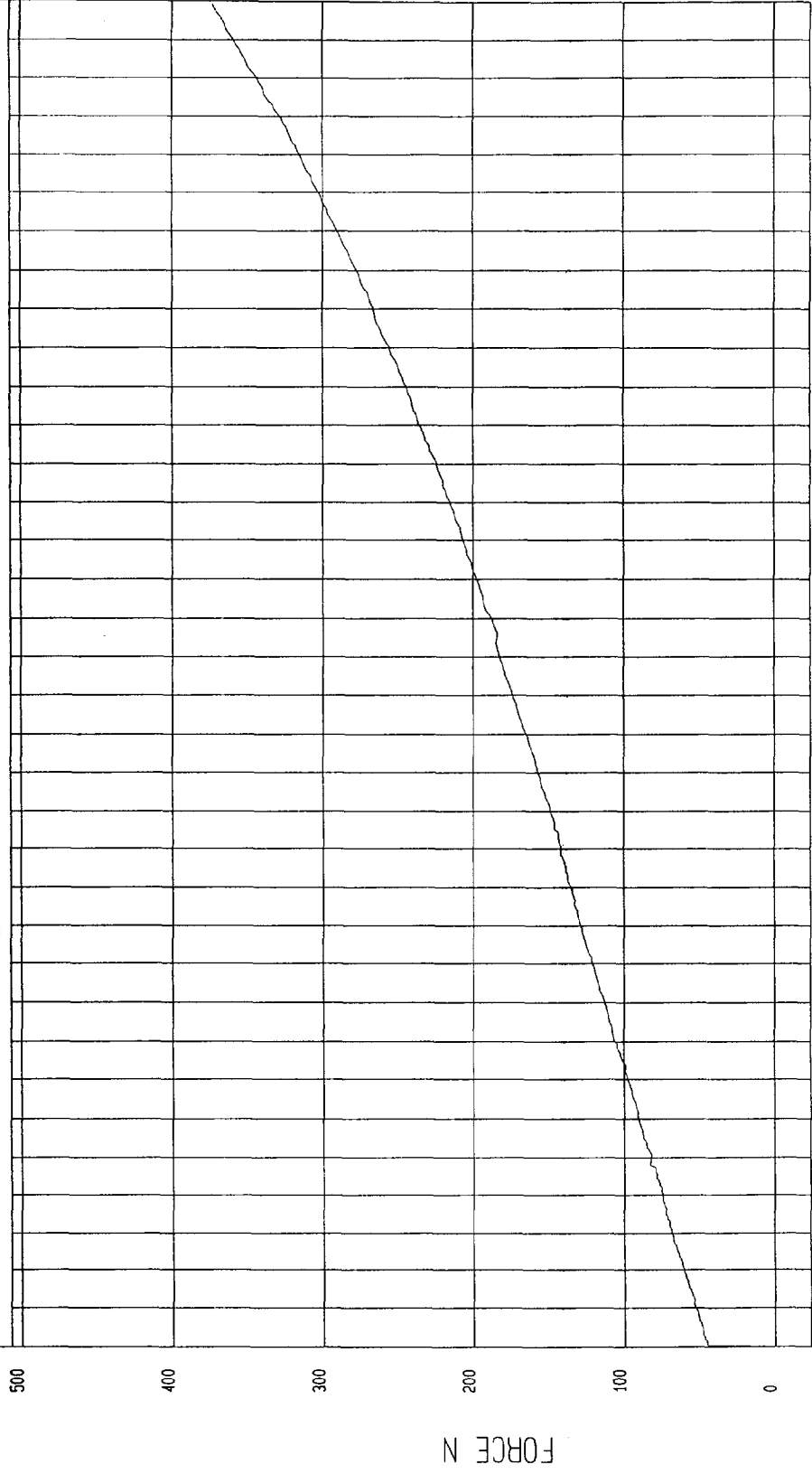
APPROVED BY



TEST: DUMMY CALIBRATION - ABDOMEN COMPRESSION TEST DATE: 12-09-1998 - 13:26:42

COMPONENT: DUMMY # 272

FORCE as a function of DISPLACEMENT



MCA Research
01-13-1999 10:30

DISPLACEMENT mm

MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

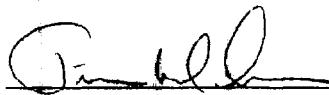
SIDE IMPACT DUMMY (SID)

DATE: December 9, 1998DUMMY SERIAL NUMBER: 272TEST NUMBER: D981605

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	114.6
FORCE @ 30°	151.2 - 204.6	186.8
FORCE @ 40°	204.6 - 258.0	218.9
RETURN ANGLE	12° maximum	3°

TEST MEETS SPECIFICATIONS

TECHNICIAN



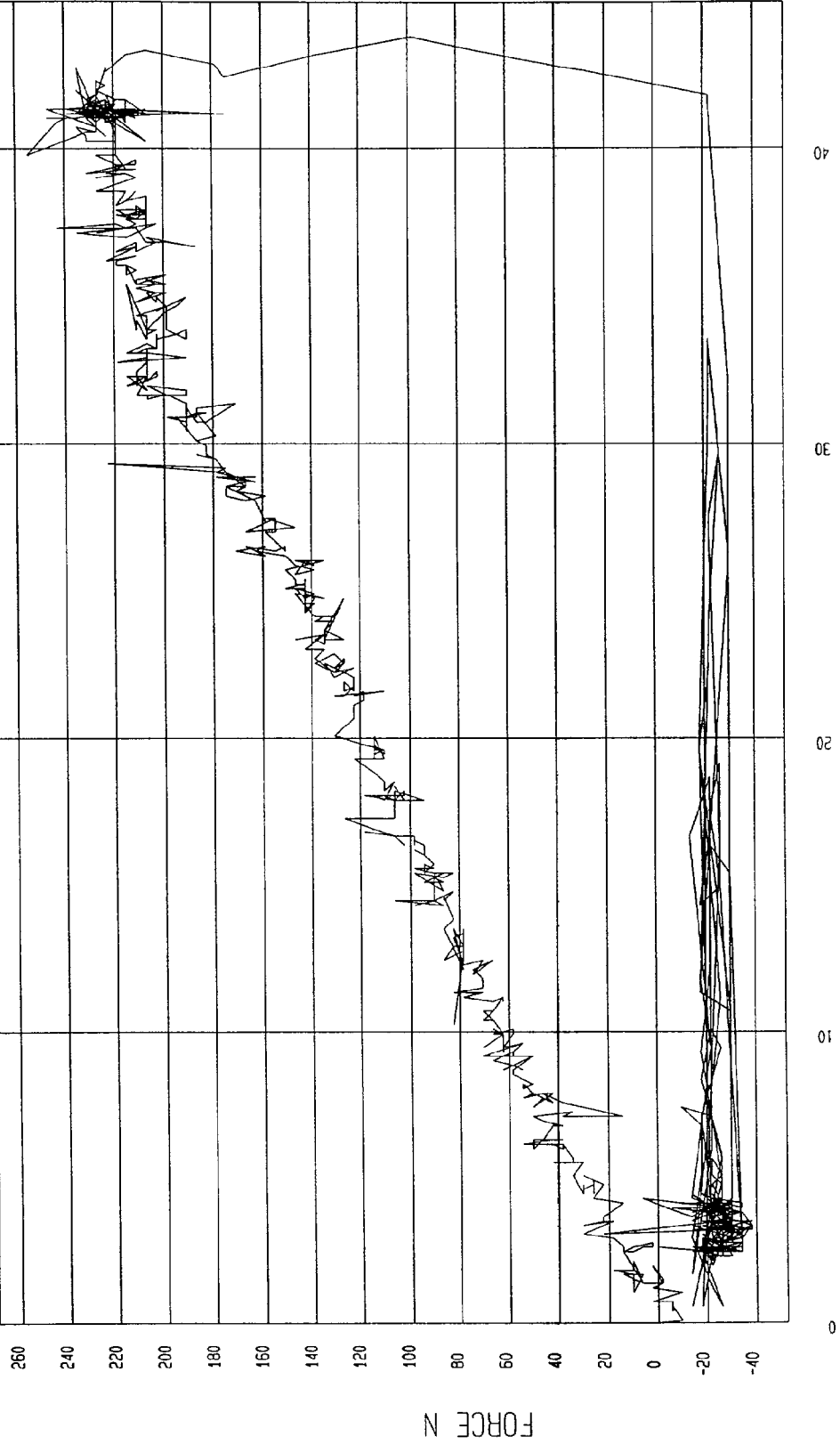
APPROVED BY



TEST: DUMMY CALIBRATION - LUMBAR FLEXION TEST DATE: 12-09-1998 - 16:13:36

COMPONENT: DUMMY # 272

FORCE as a function of TORSO ROTATION



MCA Research
12-09-1998 16:16

POST-TEST CERTIFICATION DATA

Driver Dummy Serial Number: 271

Calibration Test Results Summary

Driver Dummy Serial Number: 271

Post-Test Calibration

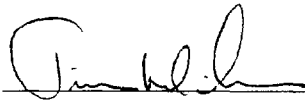
External Dimensions:	The dummy passed all external dimension requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion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

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY SERIAL NUMBER: 271DATE OF VERIFICATION: December 16, 1998

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

MEASUREMENTS BY:



APPROVED BY:



MGA RESEARCH CORPORATION

THORAX IMPACT TEST

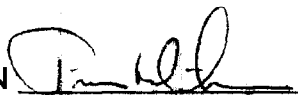
SIDE IMPACT DUMMY (SID)

DATE: December 15, 1998DUMMY SERIAL NUMBER: 271TEST NUMBER: D981682

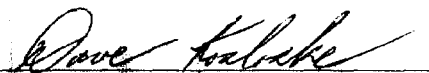
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	22%
PROBE SPEED (m/s)	4.27 - 4.33	4.29
UPPER RIB (g's)	37 - 46 g's	42
LOWER RIB (g's)	37 - 46 g's	43
LOWER SPINE (g's)	15 - 22 g's	22

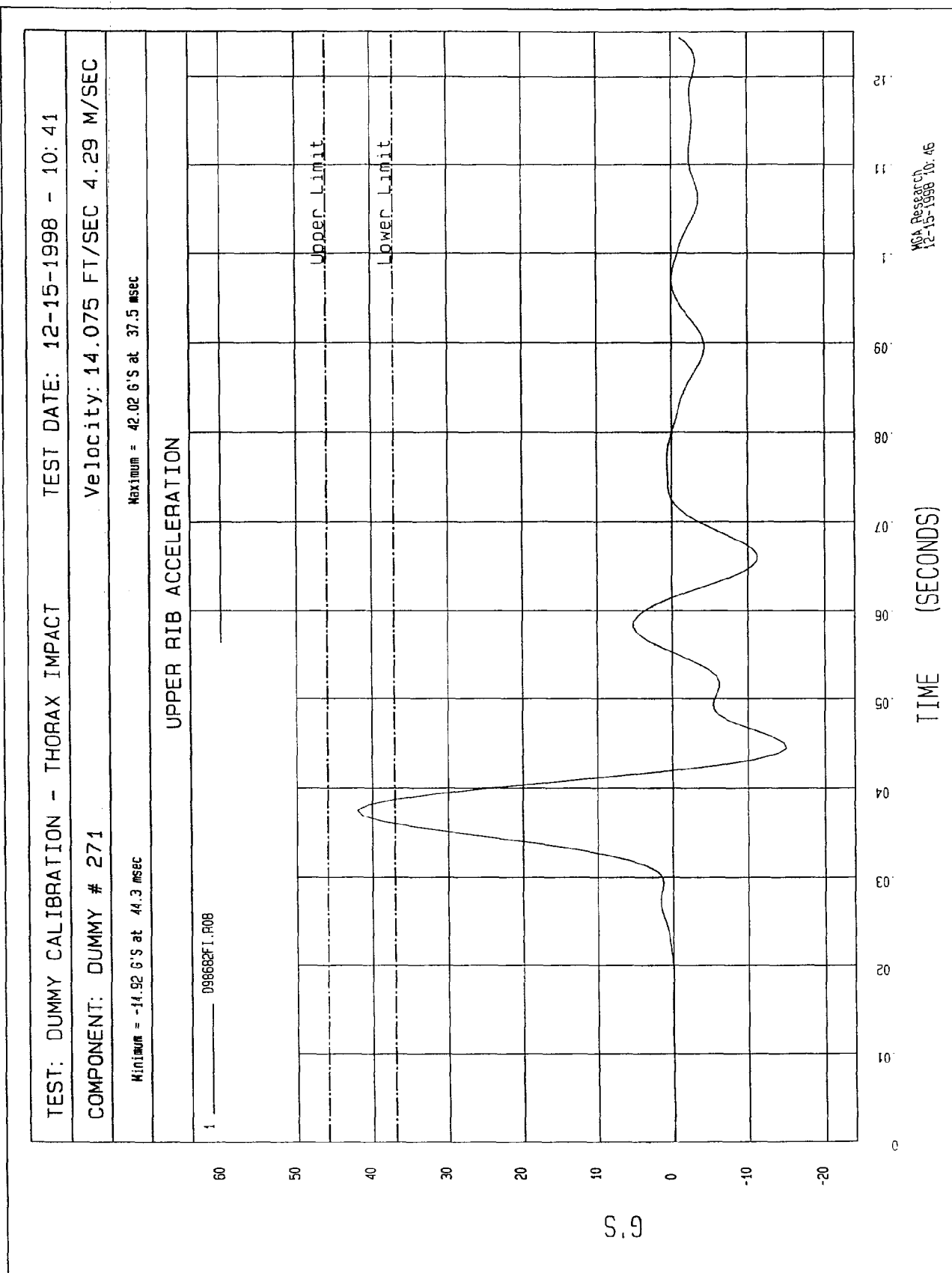
TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY



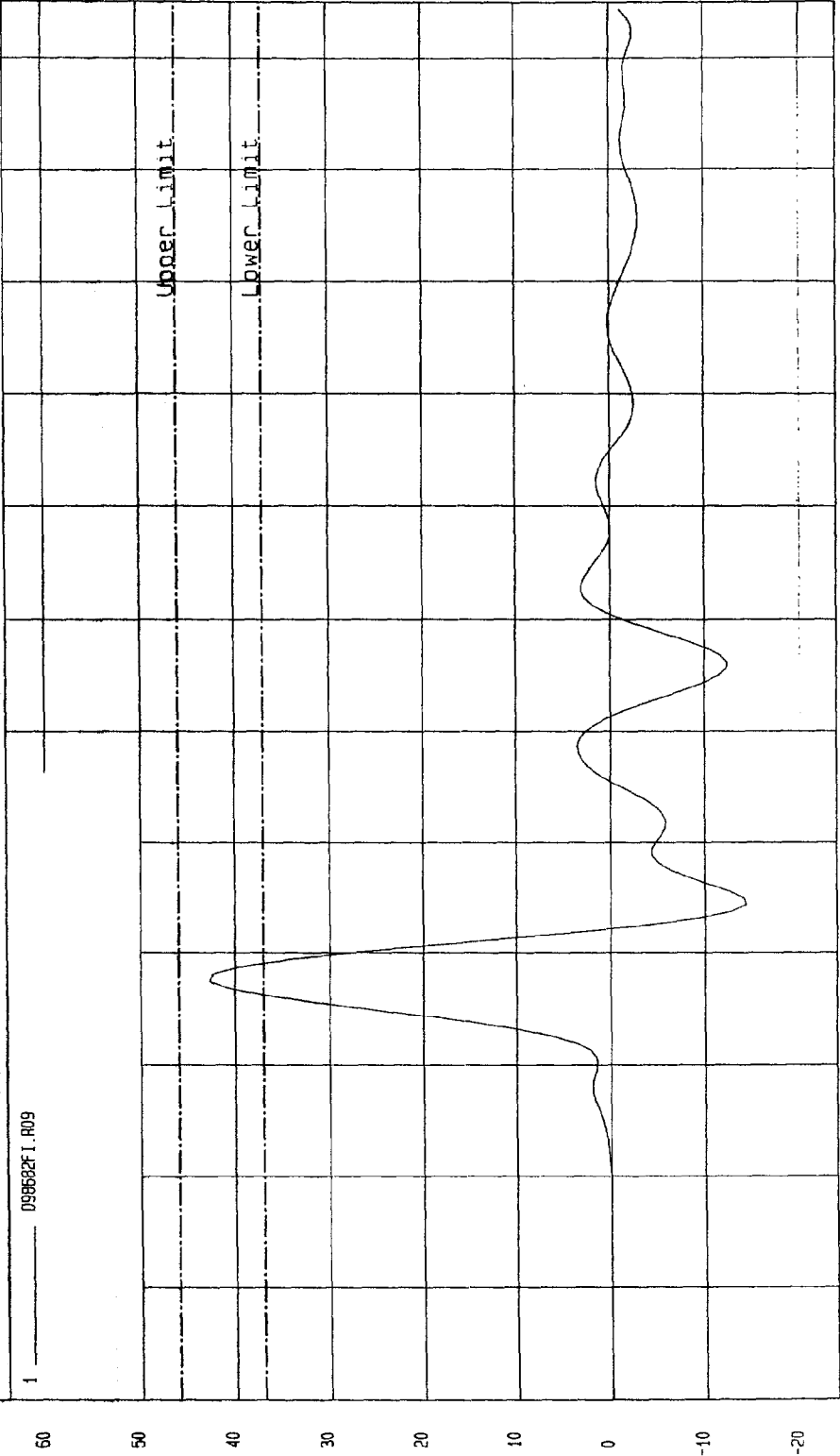


TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 12-15-1998 - 10:41

COMPONENT: DUMMY # 271 Velocity: 14.075 FT/SEC 4.29 M/SEC

Minimum = -14.26 G'S at 44.3 msec Maximum = 42.73 G'S at 37.5 msec

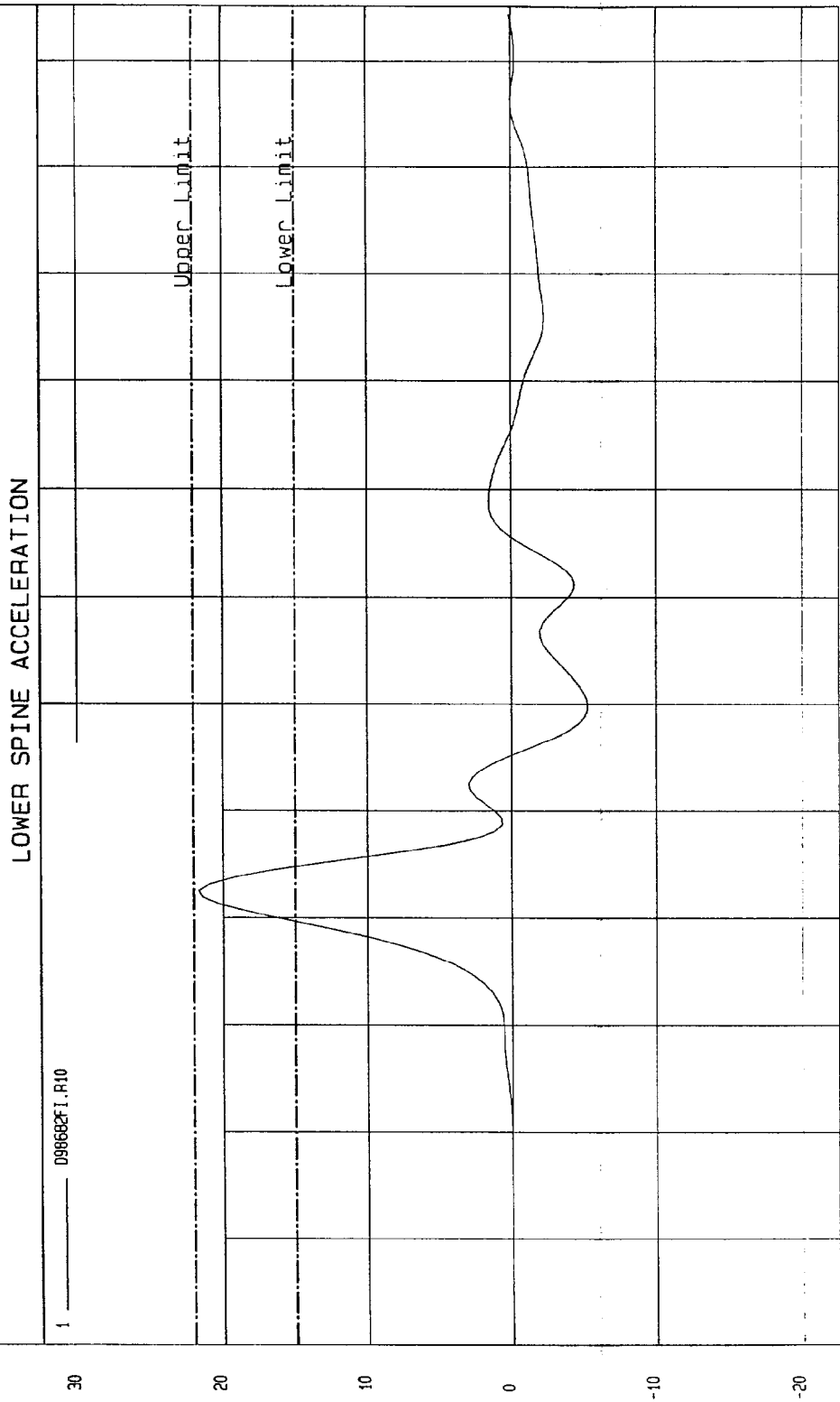
LOWER RIB ACCELERATION



MSA Research
12-15-1998 10:47

TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 12-15-1998 - 10:41
 COMPONENT: DUMMY # 271 Velocity: 14.075 FT/SEC 4.29 M/SEC

Minimum = -5.33 G's at 60 msec Maximum = 21.64 G's at 42.5 msec



TIME (SECONDS)

MCA Research
12-15-1998 10:47

MGA RESEARCH CORPORATION

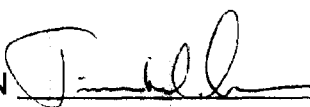
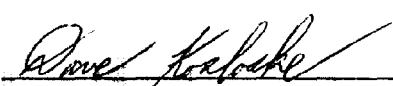
PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: December 15, 1998DUMMY SERIAL NUMBER: 271 TEST NUMBER: D981683

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	22%
PROBE SPEED (m/s)	4.27 - 4.33	4.29
PELVIS ACCELERATION (g's)	40 - 60	46

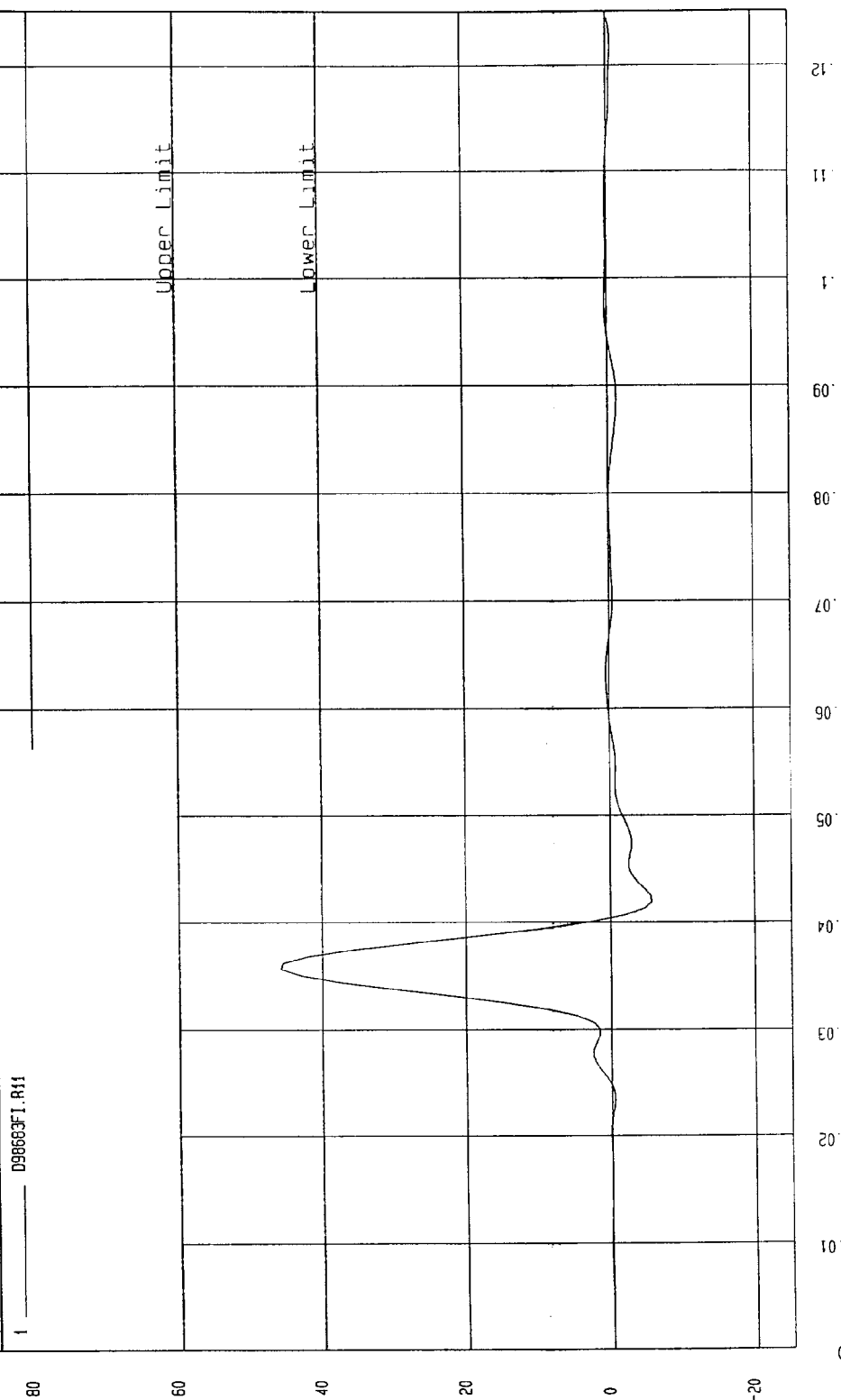
TEST MEETS SPECIFICATIONS

TECHNICIAN APPROVED BY 

TEST: DUMMY CALIBRATION - PELVIS IMPACT TEST DATE: 12-15-1998 - 10:46
COMPONENT: DUMMY # 271 Velocity: 14.062 FT/SEC 4.29 M/SEC

Minimum = -5.79 G'S at 41.8 msec
Maximum = 45.92 G'S at 35.6 msec

PELVIS ACCELERATION



NCA Research
12-15-1998 10:47

G.S.

MGA RESEARCH CORPORATION

ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

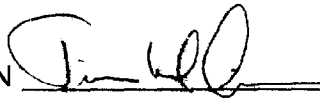
SIDE IMPACT DUMMY (SID)

DATE: December 16, 1998DUMMY SERIAL NUMBER: 271TEST NUMBER: D981684

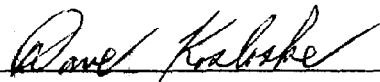
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	23%
FORCE @ 12.7 mm	104 - 162	145
FORCE @ 19.0 mm	163 - 222	203
FORCE @ 25.4 mm	222 - 280	268
FORCE @ 33 mm	325 - 391	374

TEST MEETS SPECIFICATIONS

TECHNICIAN



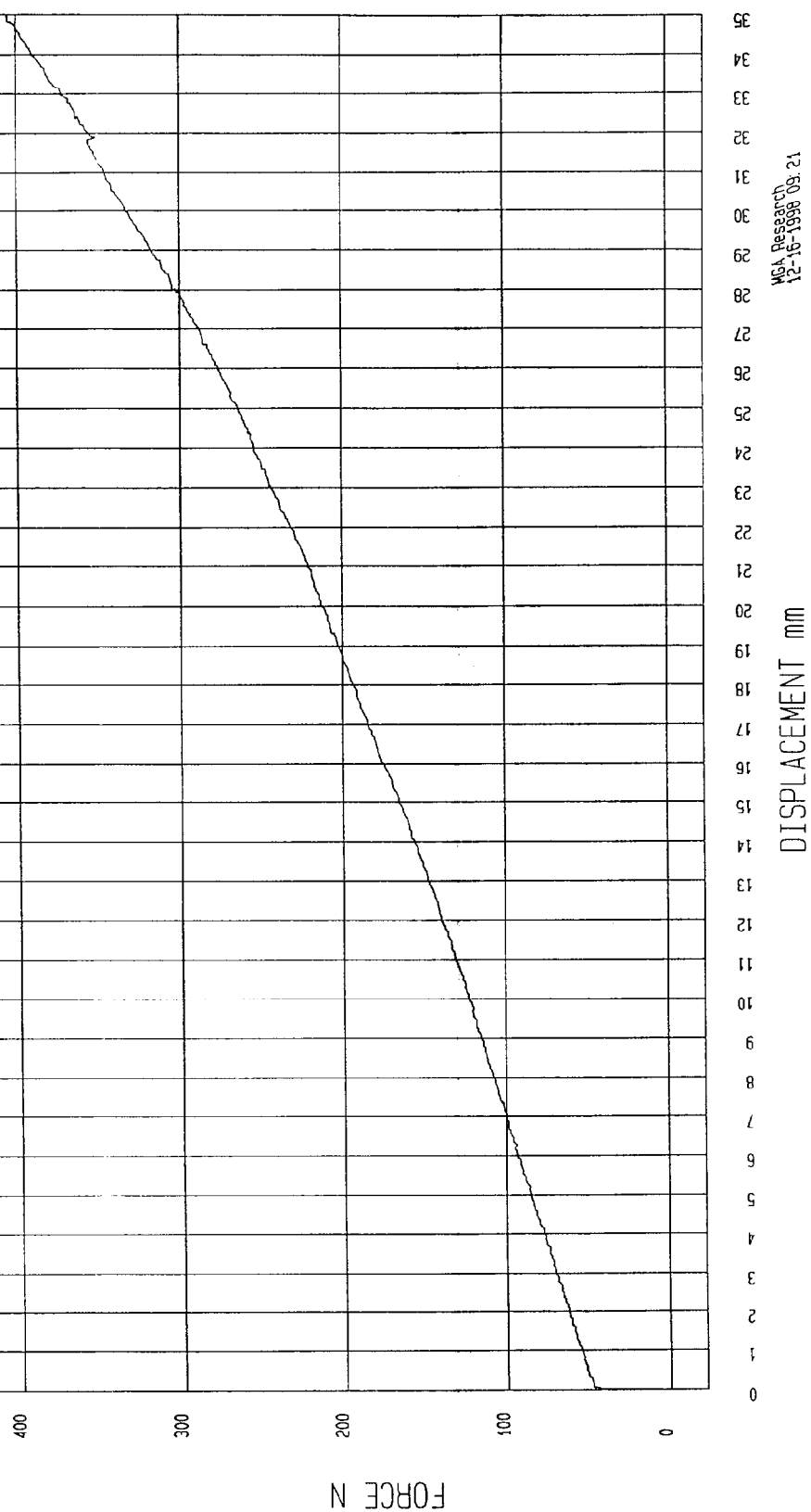
APPROVED BY



TEST: DUMMY CALIBRATION - ABDOMEN COMPRESSION TEST DATE: 12-16-1998 - 09:11:27

COMPONENT: DUMMY # 271

FORCE as a function of DISPLACEMENT



WGA Research
12-16-1998 09:21

MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: December 16, 1998DUMMY SERIAL NUMBER: 271TEST NUMBER: D981685

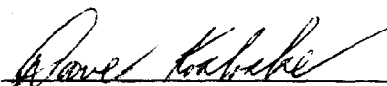
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	23%
FORCE @ 0°	0 - 26.7	0
FORCE @ 20°	97.9 - 151.2	124.6
FORCE @ 30°	151.2 - 204.6	156.7
FORCE @ 40°	204.6 - 258.0	216.9
RETURN ANGLE	12° maximum	4°

TEST MEETS SPECIFICATIONS

TECHNICIAN



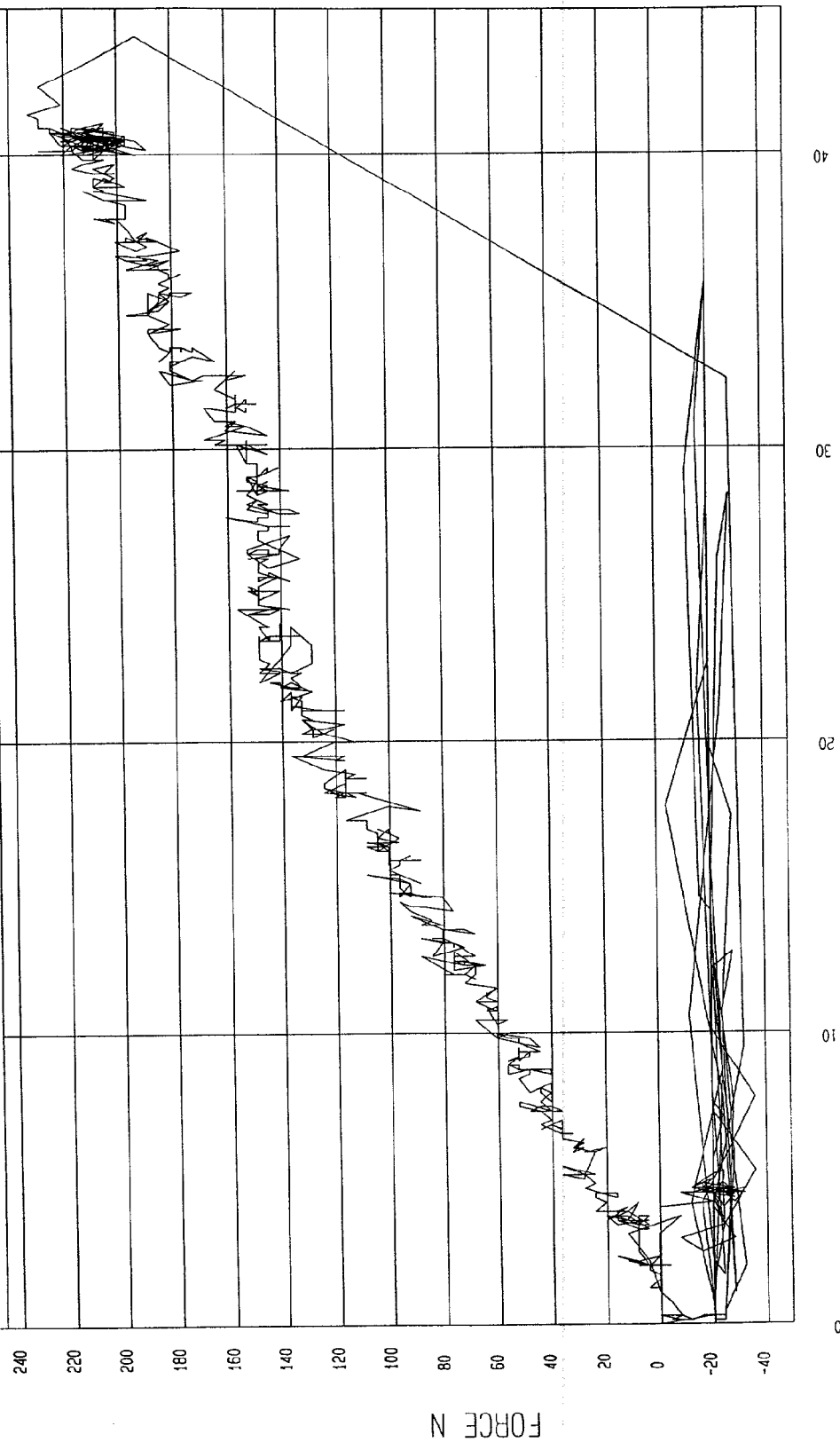
APPROVED BY



TEST: DUMMY CALIBRATION - LUMBAR FLEXION TEST DATE: 12-16-1998 - 10:37:52

COMPONENT: DUMMY # 271

FORCE as a function of TORSO ROTATION



MGA Research
12-16-1998 10:54

TORSO ROTATION DEGREES

POST-TEST CERTIFICATION DATA

Passenger Dummy Serial Number: 272

Calibration Test Results Summary

Passenger Dummy Serial Number: 272

Post-Test Calibration

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

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY SERIAL NUMBER: 272DATE OF VERIFICATION: December 16, 1998

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height (mm)	889 - 909	892
RH - Rib Height (mm)	501 - 521	512
HP - Hip Pivot Height (mm)	99 ref.	99
RD - Rib From Back Line (mm)	229 - 241	238
KV - Knee Pivot From Back Line (mm)	511 - 526	523
SW - Knee Pivot to Floor (mm)	490 - 505	493
HW - Hip Width (mm)	356 - 391	378

MEASUREMENTS BY: Jim HallAPPROVED BY: Dave Kelske

MGA RESEARCH CORPORATION

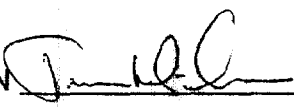
THORAX IMPACT TEST

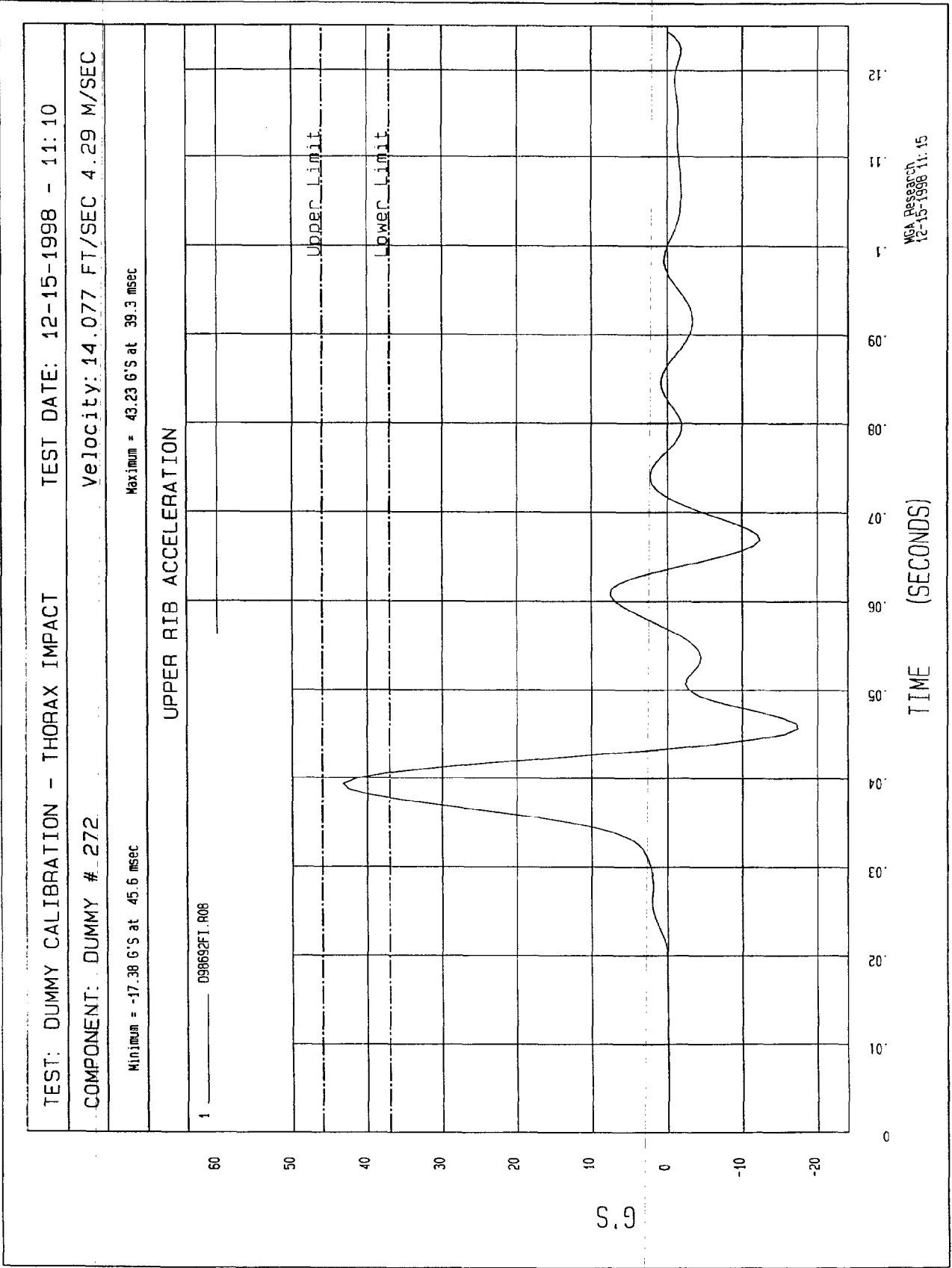
SIDE IMPACT DUMMY (SID)

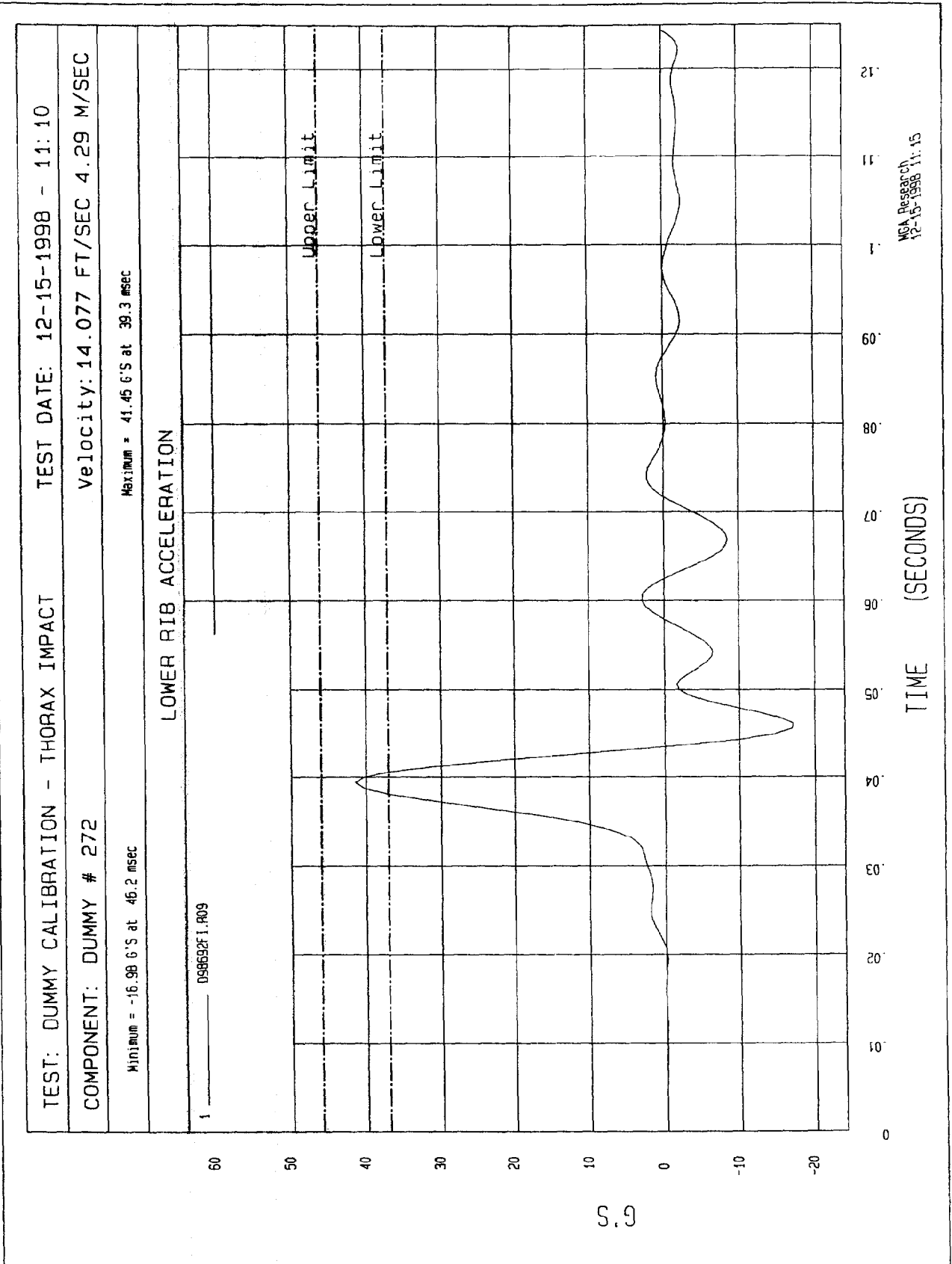
DATE: December 15, 1998DUMMY SERIAL NUMBER: 272TEST NUMBER: D981692

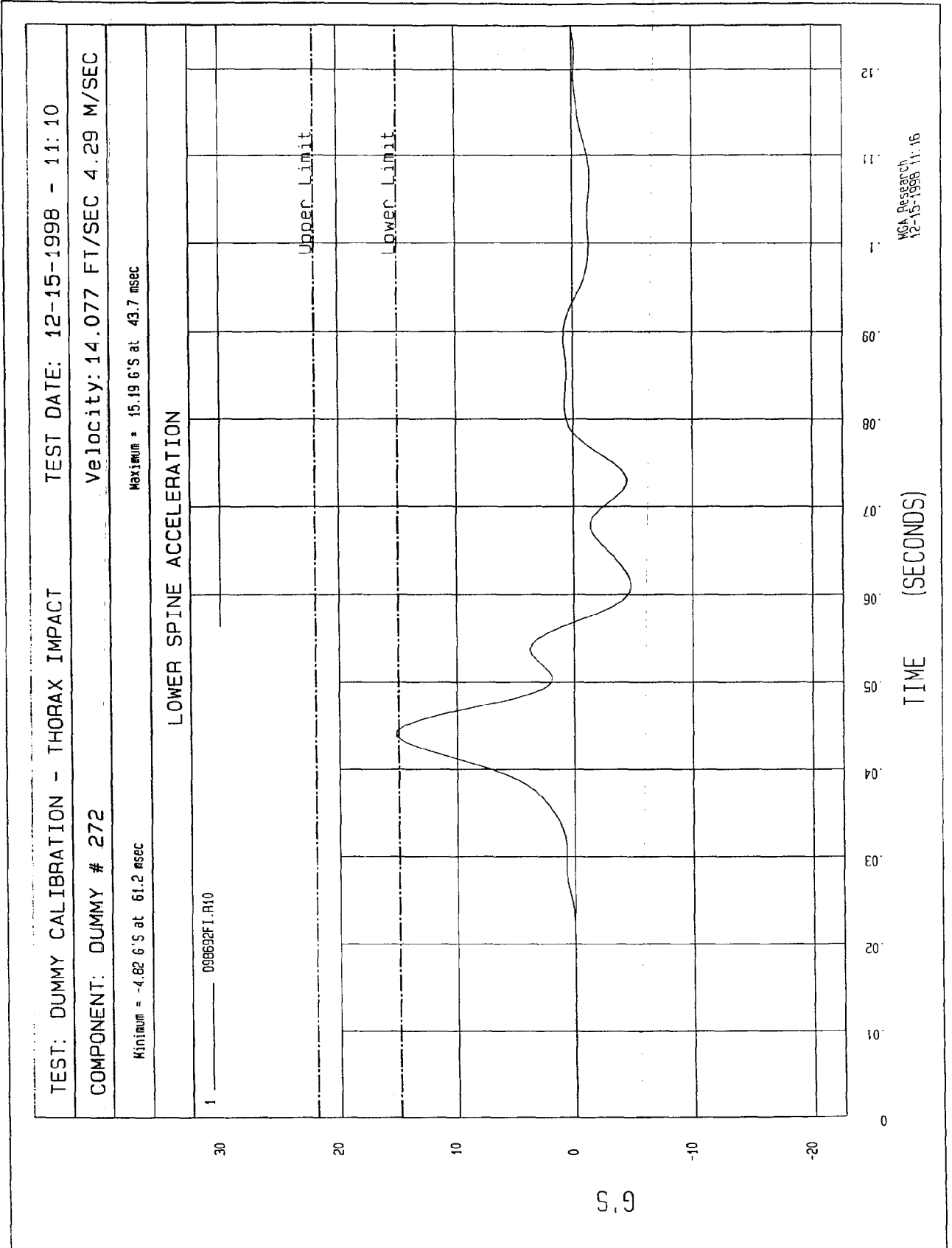
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	22%
PROBE SPEED (m/s)	4.27 - 4.33	4.29
UPPER RIB (g's)	37 - 46 g's	43
LOWER RIB (g's)	37 - 46 g's	41
LOWER SPINE (g's)	15 - 22 g's	15

TEST MEETS SPECIFICATIONS

TECHNICIAN APPROVED BY 







MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: December 15, 1998DUMMY SERIAL NUMBER: 272TEST NUMBER: D981693

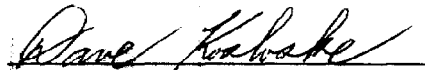
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	22%
PROBE SPEED (m/s)	4.27 - 4.33	4.29
PELVIS ACCELERATION (g's)	40 - 60	53

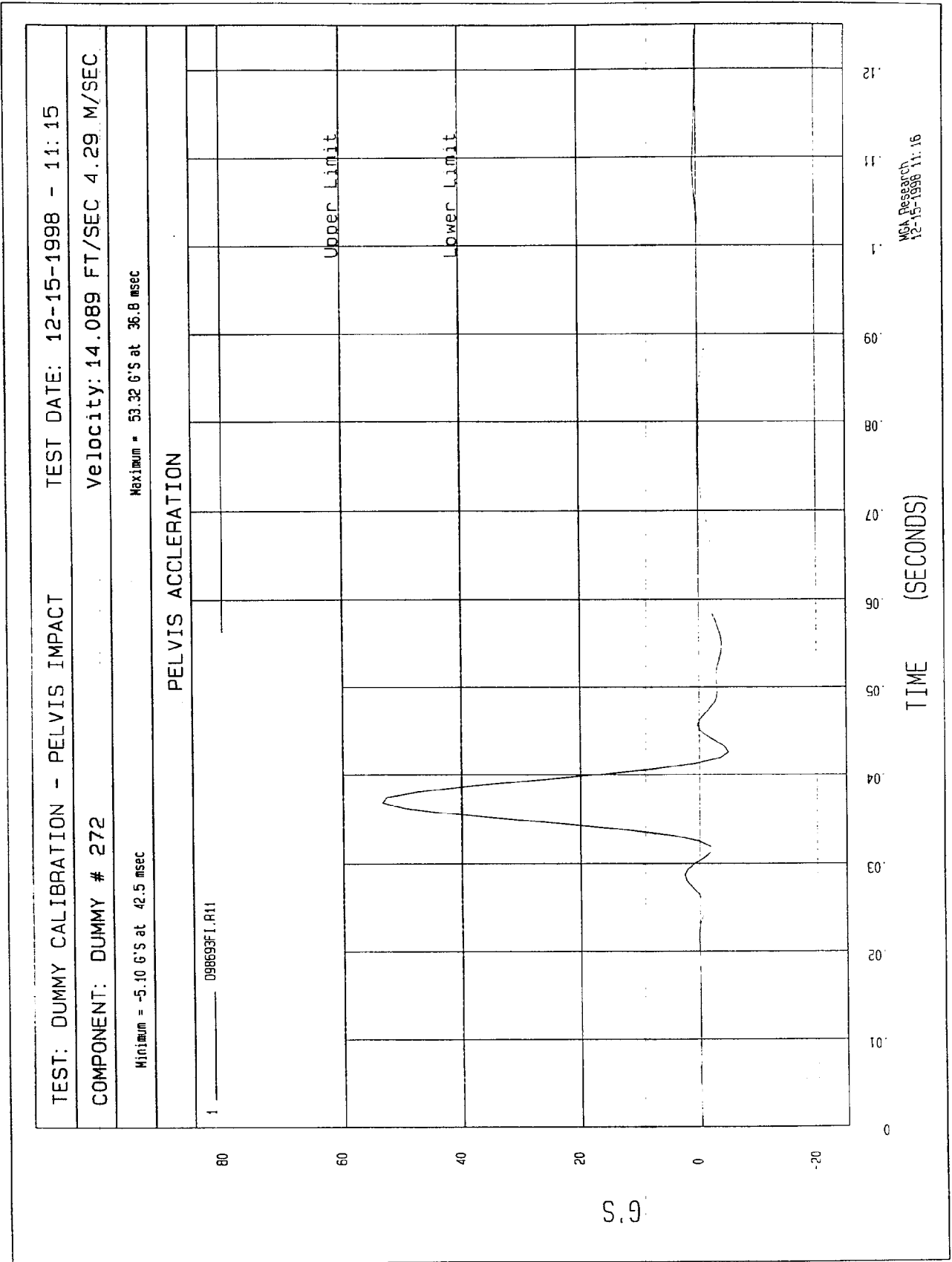
TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY





MGA RESEARCH CORPORATION

ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

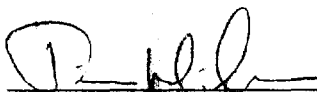
SIDE IMPACT DUMMY (SID)

DATE: December 16, 1998DUMMY SERIAL NUMBER: 272 TEST NUMBER: D981694

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	23%
FORCE @ 12.7 mm	104 - 162	143
FORCE @ 19.0 mm	163 - 222	198
FORCE @ 25.4 mm	222 - 280	260
FORCE @ 33 mm	325 - 391	353

TEST MEETS SPECIFICATIONS

TECHNICIAN



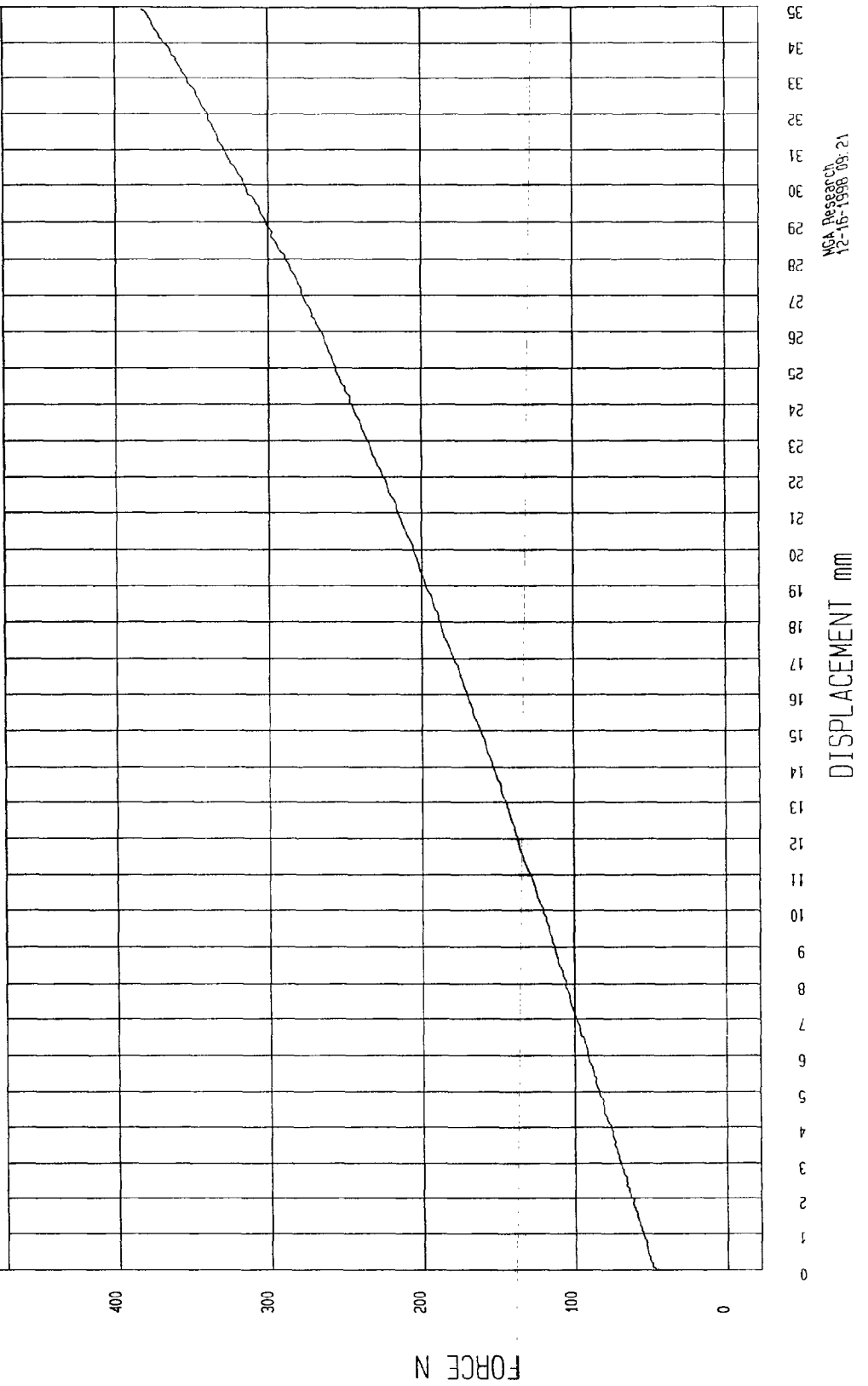
APPROVED BY



TEST: DUMMY CALIBRATION - ABDOMEN COMPRESSION TEST DATE: 12-16-1998 - 09:15:30

COMPONENT: DUMMY # 272

FORCE as a function of DISPLACEMENT



MCA Research
12-16-1998 09:21

MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: December 16, 1998DUMMY SERIAL NUMBER: 272TEST NUMBER: D981695

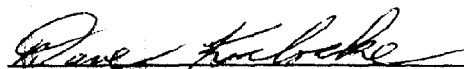
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	23%
FORCE @ 0°	0 - 26.7	0
FORCE @ 20°	97.9 - 151.2	106.4
FORCE @ 30°	151.2 - 204.6	182.7
FORCE @ 40°	204.6 - 258.0	226.8
RETURN ANGLE	12° maximum	4°

TEST MEETS SPECIFICATIONS

TECHNICIAN



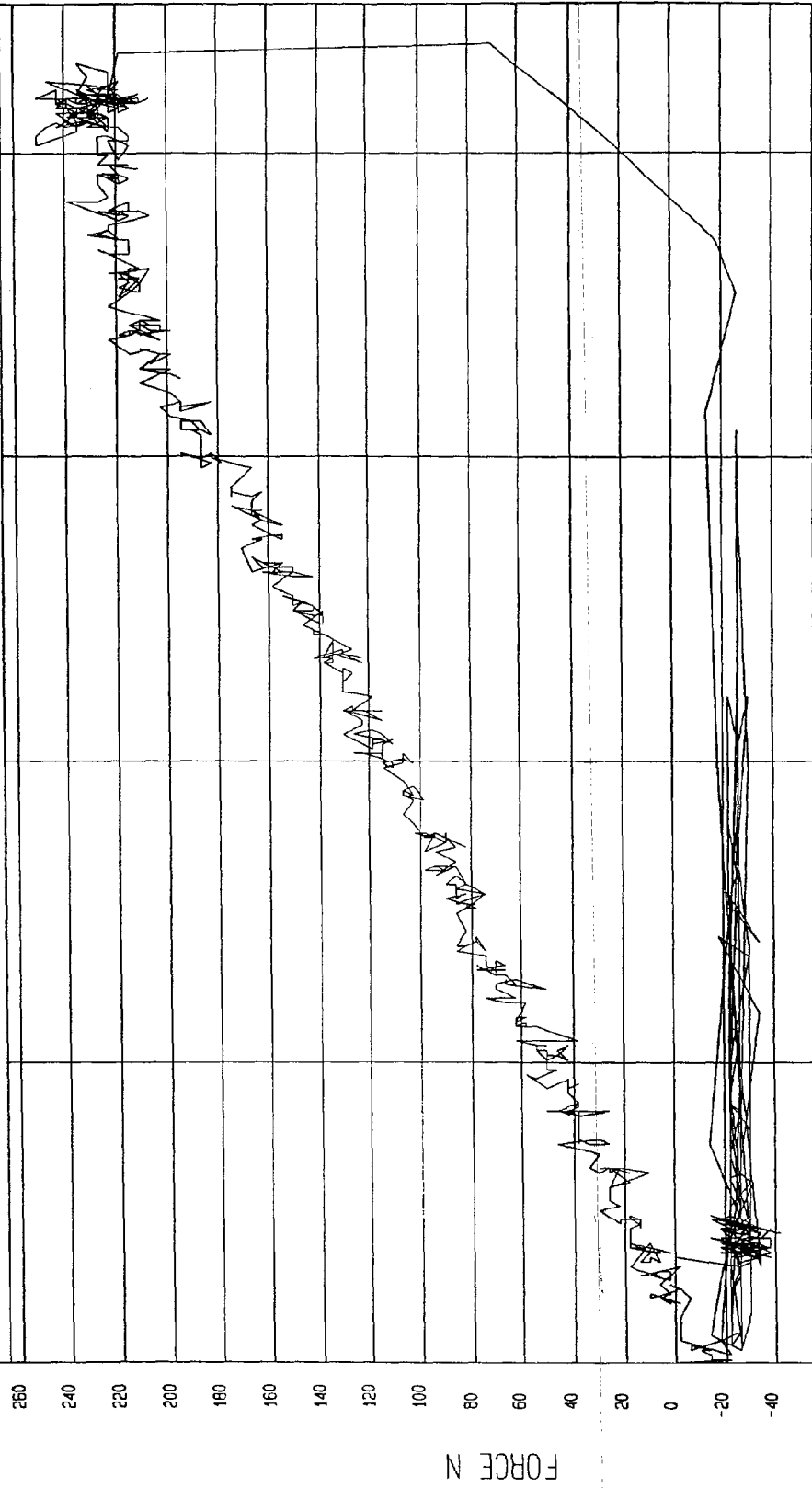
APPROVED BY



TEST: DUMMY CALIBRATION - LUMBAR FLEXION TEST DATE: 12-16-1998 - 10:10:48

COMPONENT: DUMMY # 272

FORCE as a function of TORSO ROTATION



MCA Research
12-16-1998 10:54

POST-TEST DRIVER DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Serial Number: 271

Inspected By: Tim Michnay

Date: December 16, 1998

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

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

POST-TEST PASSENGER DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Serial Number: 272

Inspected By: Tim Michnay

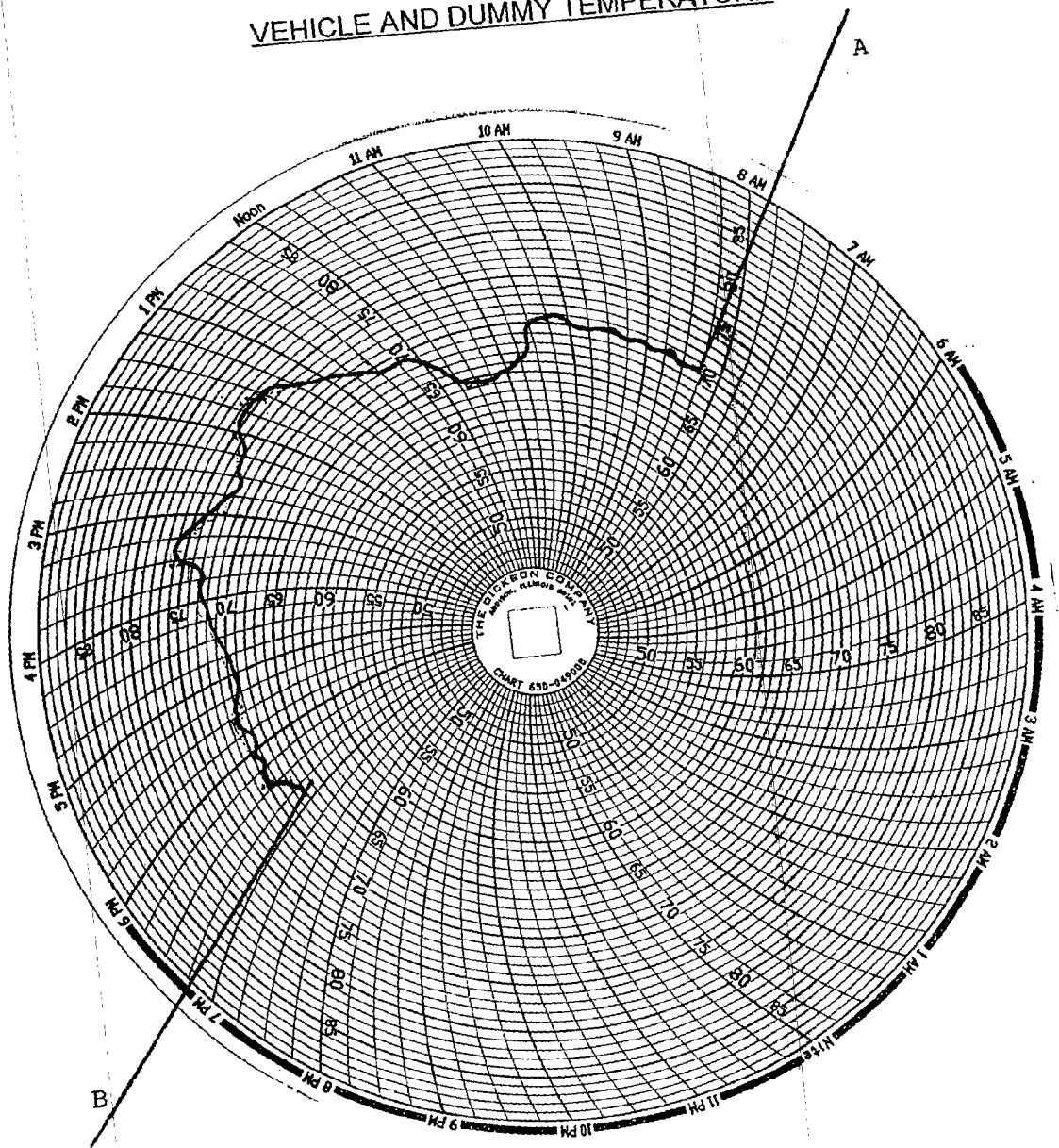
Date: December 15, 1998

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

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

Zipper torn from chest flesh—Jacket replaced

VEHICLE AND DUMMY TEMPERATURE



A = dummies installed in vehicle
B = test conducted

APPENDIX D
TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

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

	DRIVER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	AH0N9	Endevco	October 20, 1998
Lower Rib Y	AGP53	Endevco	October 20, 1998
Lower Spine Y	J12450	Endevco	October 20, 1998
Pelvis Y	AJ417	Endevco	October 20, 1998
Upper Rib Redundant Y	AHT20	Endevco	October 20, 1998
Lower Rib Redundant Y	AHTC3	Endevco	October 20, 1998
Lower Spine Redundant Y	J12461	Endevco	October 20, 1998
Pelvis Redundant Y	AGP20	Endevco	October 20, 1998
Head Center of Gravity X	J20392	Endevco	July 28, 1998
Head Center of Gravity Y	AWGA4	Endevco	July 28, 1998
Head Center of Gravity Z	ALBA7	Endevco	July 28, 1998

DUMMY AND VEHICLE CALIBRATION DATA
INSTRUMENTS FOR PASSENGER DUMMY NO. 272

LEFT REAR PASSENGER			
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	AKAF3	Endevco	October 9, 1998
Lower Rib Y	ALEC1	Endevco	October 9, 1998
Lower Spine Y	J14120	Endevco	October 14, 1998
Pelvis Y	AKAH3	Endevco	October 14, 1998
Upper Rib Redundant Y	ALCN9	Endevco	October 9, 1998
Lower Rib Redundant Y	J10411	Endevco	October 9, 1998
Lower Spine Redundant Y	AP2F7	Endevco	October 14, 1998
Pelvis Redundant Y	AGM32	Endevco	October 14, 1998
Head Center of Gravity X	AJ9B0	Endevco	October 14, 1998
Head Center of Gravity Y	AHTR2	Endevco	October 14, 1998
Head Center of Gravity Z	AGTE9	Endevco	October 14, 1998

VEHICLE INSTRUMENT CALIBRATION

VEHICLE ACCELEROMETERS			
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Moving Barrier CG X	J06-D22	Entran	June 22, 1998
Moving Barrier CG Y	I18-E18	Entran	September 16, 1998
Moving Barrier CG Z	F12-G02	Entran	June 28, 1998
Moving Barrier Rear Axle X	J10-E14	Entran	June 16, 1998
Moving Barrier Rear Axle Y	F07-A14	Entran	June 16, 1998
Left Mid A-Post Y	F18-G11	Entran	September 15, 1998
Left Lower A-Post Y	D05-R25	Entran	June 16, 1998
Left Mid B-Post Y	F20-G01	Entran	December 8, 1998
Left Lower B-Post Y	I25-J18	Entran	December 8, 1998
Rear Floorpan Above Axle X	J10-E16	Entran	June 22, 1998
Rear Floorpan Above Axle Y	J10-E03	Entran	June 16, 1998
Rear Floorpan Above Axle Z	F11-G09	Entran	June 28, 1998
Driver Seat Track Y	C14-Z05	Entran	June 16, 1998
Right Side Sill at Front Seat X	F18-G07	Entran	September 15, 1998
Right Side Sill at Front Seat Y	F18-G13	Entran	September 15, 1998
Right Side Sill at Front Seat Z	F20-G10	Entran	September 15, 1998
Right Side Sill at Rear Seat X	E25-G07	Entran	June 28, 1998
Right Side Sill at Rear Seat Y	I14-D16	Entran	June 25, 1998
Right Side Sill at Rear Seat Z	MGA095	Entran	June 25, 1998

VEHICLE INSTRUMENT CALIBRATION

VEHICLE ACCELEROMETERS			
	SERIAL NO	MANUFACTURER	CALIBRATION DATE
Left Side Sill at Front Seat Y	I18-E15	Entran	September 16, 1998
Left Side Sill at Rear Seat Y	K16-X10	Entran	August 27, 1998
Right Rear Occupant Compartment Y	I25-J19	Entran	September 24, 1998
Vehicle CG X	E10-F03	Entran	June 18, 1998
Vehicle CG Y	F11-G08	Entran	June 18, 1998
Vehicle CG Z	I25-J05	Entran	September 24, 1998
Left Front Door on Centerline	G13-B15	Entran	June 16, 1998
Midrear of Left Front Door	F20-G12	Entran	September 16, 1998
Left Front Door Upper Centerline	G01-J02	Entran	June 17, 1998
Midrear of Left Rear Door	H02-J16	Entran	June 16, 1998
Left Rear Door Upper Centerline	G01-J09	Entran	June 28, 1998

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