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REPORT NO.: 214-MGA-2000-03
SAFETY COMPLIANCE TESTING FOR FMVSS NO. 214
"SIDE IMPACT PROTECTION"

General Motors Corporation
2000 Buick LeSabre
NHTSA NO: CY0100

MGA RESEARCH CORPORATION
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: October 19, 1999

Report Date: October 25, 1999

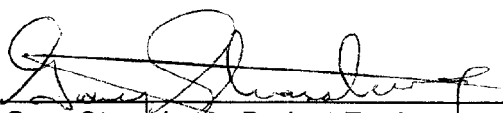
FINAL REPORT

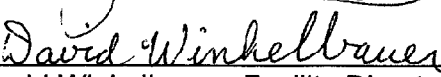
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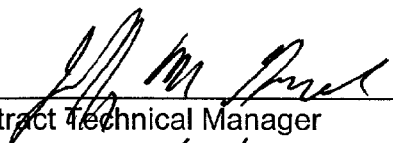
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16. Abstract A 48/24 kph 90° Impact (Moving Deformable Barrier) Compliance Test was conducted on the subject 2000 Buick LeSabre in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP- 214D-05 for the determination of FMVSS No. 214 Side Impact Protection compliance. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on October 19, 1999. The impact velocity of the Moving Deformable Barrier (MDB) was 52.6 kph, and the ambient temperature at the struck side of the target vehicle at the time of impact was 23°C. The target vehicle post test maximum crush was 332 mm at level 2. The test vehicle's performance follows: <table border="0" style="width: 100%;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>DRIVER.</u></th> <th style="text-align: center;"><u>LEFT REAR PASS.</u></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib (LUR) Accel., g</td> <td style="text-align: center;">45</td> <td style="text-align: center;">56</td> </tr> <tr> <td>Left Lower Rib (LLR) Accel., g</td> <td style="text-align: center;">44</td> <td style="text-align: center;">58</td> </tr> <tr> <td>Lower Spine (T₁₂) Accel., g</td> <td style="text-align: center;">65</td> <td style="text-align: center;">65</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td style="text-align: center;">55</td> <td style="text-align: center;">62</td> </tr> <tr> <td>Pelvis (PEV) Accel., g</td> <td style="text-align: center;">57</td> <td style="text-align: center;">74</td> </tr> </tbody> </table> The doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.					<u>DRIVER.</u>	<u>LEFT REAR PASS.</u>	Left Upper Rib (LUR) Accel., g	45	56	Left Lower Rib (LLR) Accel., g	44	58	Lower Spine (T ₁₂) Accel., g	65	65	Thoracic Trauma Index (TTI)	55	62	Pelvis (PEV) Accel., g	57	74
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17. Key Words Compliance Testing Side Impact Protection FMVSS 214 Side Impact Dummy (SID)		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Adm. Technical Ref. Division, Room 5108 (NAD-52) 400 Seventh Street, S.W. Washington, D.C. 20590 Telephone No. 202-366-4946																			
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SECTION 1
PURPOSE AND TEST PROCEDURE

This side impact test is part of the FY 2000 FMVSS 214 Side Impact Protection Compliance Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-97-C-11033. The purpose of this test was to evaluate side impact protection of a 2000 Buick LeSabre.

This side impact test was conducted in accordance with the Office of Vehicle Safety Compliance's FMVSS 214 test procedure (TP-214D-05, dated August 2, 1999).

MGA does not endorse or certify products. The manufacturer's name appears solely for identification purposes only.

SECTION 2

SUMMARY OF SIDE IMPACT TEST

A 2000 Buick LeSabre was impacted on the left 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 52.6 kph (32.7 mph). 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 October 19, 1999. 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 left front and left rear designated seating positions according to instructions specified in the OVSC Side Impact Laboratory Test Procedure which is dated August 2, 1999. The side impact event was documented by nine high speed cameras. Camera locations and other pertinent camera information can be found in this report.

The SIDs were instrumented with the following accelerometers.

1. Left Upper Rib (LUR) uniaxial accelerometer (Y-direction)
2. Left Lower Rib (LLR) uniaxial accelerometer (Y-direction)
3. Lower Thoracic Spine (T_{12}) uniaxial accelerometer (Y-direction)
4. Pelvic (PEV) section uniaxial accelerometer (Y-direction)

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

The following table summarizes the results of the FMVSS 214 Left Side Impact test:

Injury Criteria	Front SID	Rear SID
TTI (g)	55	62
Pelvis (g)	57	74

TEST NOTES

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

Left Front Door on Centerline

Midrear of Left Front Door

Left Front Door Upper Centerline

Midrear of Left Rear Door

Left Rear Door Upper Centerline

Rear Seat Track

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

DATA SHEET NO. 1
GENERAL VEHICLE TEST PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2000/Buick/LeSabre/4 Door
Vehicle NHTSA No.: CY0100 VIN: 1G4HP54K3YU127364
Vehicle Body Color: Brown Build Date: June 1999
Engine Data: 6 Cylinders; CID; 3.8 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 26 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): 33 Psi FRONT
33 Psi REAR
Recommended Tire Size: P215/70R15
Tires on Test Vehicle: P215/70R15 Manufacturer: General

Vehicle Capacity Data:

Number of Occupants: 2 Front; 3 Rear; 3rd Seat 5 Total
Type of Front Seats: X Bucket; Bench; Split Bench
Type of Front Seat Back: Fixed; X Adjustable with Lever Knob X Power
Vehicle Maximum Capacity Loading = 420.0 kg (A)
No. of Occupants x 68.04 kg. = 340.2 kg (B)
Cargo Capacity (A-B) = 79.8 kg

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

WEIGHT OF TEST VEHICLE WITH MAXIMUM FLUIDS:

Right Front =	<u>506.7</u> kg	Right Rear =	<u>305.7</u> kg
Left Front =	<u>498.5</u> kg	Left Rear =	<u>309.8</u> kg
TOTAL FRONT =	<u>1005.2</u> kg	TOTAL REAR =	<u>615.5</u> kg
% of Total Weight =	<u>62.0</u> %	% of Total Weight =	<u>38.0</u> %
TOTAL WEIGHT =	<u>1620.7</u> kg		

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Test Vehicle Delivered Weight with Maximum Fluids	= <u>1620.7</u> kg
Cargo Carrying Capacity of Test Vehicle*	= <u>79.8</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>1861.9</u> kg

ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO: (FULLY LOADED)

Right Front =	<u>508.9</u> kg	Right Rear =	<u>377.8</u> kg
Left Front =	<u>549.8</u> kg	Left Rear =	<u>424.6</u> kg
TOTAL FRONT =	<u>1058.7</u> kg	TOTAL REAR =	<u>802.4</u> kg
% of Total Weight =	<u>56.9</u> %	% of Total Weight =	<u>43.1</u> %
TOTAL WEIGHT =	<u>1861.1</u> kg		

TEST VEHICLE ATTITUDE:

CURB WEIGHT ATTITUDE:

Right Front 726 mm Left Front 732 mm Right Rear 752 mm Left Rear 748 mm

FULLY LOADED WEIGHT ATTITUDE:

Right Front 720 mm Left Front 715 mm Right Rear 738 mm Left Rear 717 mm

TEST ATTITUDE:

Right Front 716 mm Left Front 723 mm Right Rear 732 mm Left Rear 718 mm

* light trucks and MPVs RCW is 136.1 kgs or manufacturer's value, whichever is less

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Test Vehicle Wheelbase: 2847 mm

C.G. As Tested = 1214 mm rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

Right Side = 4192 mm

Centerline = 5037 mm

Left Side = 4192 mm

FRONT SEAT CUSHION PLACEMENT:

Total Length of Adjustment Travel: 215 mm

Test Position: 107 mm rearward (power seat)

FRONT SEAT BACK ADJUSTMENT POSITION:

Seat Back Angle = 18°

REAR POSITION SEAT:

Total Length of Fore/Aft Adjustment Travel: NA

Seat Back Adjustment Position: NA

ADJUSTABLE STEERING COLUMN POSITION: Mid (third position up out of 6 possible)

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

AMOUNT OF STODDARD SOLVENT IN FUEL TANK:

Fuel system usable capacity = 66.2 liters

Test Volume: 61.6 liters 93.1 % of capacity

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

Wheelbase: = 2847 mm

Impact Point is 484 mm rearward of front axle centerline

DATA SHEET NO. 2
TEST VEHICLE SUMMARY OF RESULTS

Year/Make/Model/Body Style: 2000/Buick/LeSabre/4 Door

Vehicle NHTSA No.: CY0100 Test Date: October 19, 1999

Overall Length = 5037 mm; Overall Width = 1858 mm

TEST WEIGHT:

Right Front =	<u>516.2</u> kg	Right Rear =	<u>382.4</u> kg
Left Front =	<u>546.6</u> kg	Left Rear =	<u>407.8</u> kg
TOTAL FRONT =	<u>1062.8</u> kg	TOTAL REAR =	<u>790.2</u> kg
% of Total Weight =	<u>57.4</u> %	% of Total Weight =	<u>42.6</u> %
TOTAL WEIGHT =	<u>1853.0</u> kg		
Wheelbase =	<u>2847</u> mm		

Longitudinal C.G. from Center of Front Axle = 1215 mm

Impact Angle with Respect to Impactor = 0 ° degrees

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1 (268 mm above ground) = 160 mm
2. LEVEL 2 (530 mm above ground) = 332 mm
3. LEVEL 3 (630 mm above ground) = 278 mm
4. LEVEL 4 (930 mm above ground) = 243 mm
5. LEVEL 5 (1580 mm above ground) = 235 mm

Maximum Post-Test Intrusion = 332 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</u> <u>frontal & side airbags</u>	<u>type II belt</u>

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

Number of Vehicle Data Channels: = 20

Number of Cameras: Onboard Vehicle = 4

Offboard Vehicle = 3

Deformable Barrier = 2

TOTAL = 9

DATA SHEET NO. 3

MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTSYear/Make/Model/Body Style: 2000/Buick/LeSabre/4 DoorVehicle NHTSA No.: CY0100 Test Date: October 19, 1999POSITION OF IMPACT (MDB) ON MONORAIL:Crabbed 27° to leftMDB DETAILS:

Overall Width of Framework Carriage	= <u>1252</u> mm
Overall Length of MDB (incl. honeycomb impact face)	= <u>4115</u> mm
Wheelbase of Framework Carriage	= <u>2591</u> mm
Tread of Framework Carriage (Front & Rear)	= <u>1880</u> mm
C.G. Location Rearward of Front Axle	= <u>1100</u> mm
C.G. Location From Center Line	= <u>-10</u> mm
C.G. Location Above Ground Level	= <u>477</u> mm

MDB WEIGHT:

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

Impact Angle (MDB C/L to Target Vehicle C/L) = 90° degreesImpact Speed = Primary: 32.7 mph (52.6 kph) Secondary: 32.8 mph (52.8 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>105</u> | mm |
| 2. | Row B Mid Stack (686 mm) | = | <u>59</u> | mm |
| 3. | Row C Top of Bumper (533 mm) | = | <u>64</u> | mm |
| 4. | Row D Center of Bumper (432 mm) | = | <u>113</u> | mm |

INSTRUMENTATION:

Number of MDB Data Channels = 7

DATA SHEET NO. 4
POST-TEST OBSERVATIONS

Year/Make/Model/Body Style: 2000/Buick/LeSabre/4 Door

Vehicle NHTSA No.: CY0100 Test Date: October 19, 1999

VISIBLE DUMMY CONTACT POINTS:

	<u>DRIVER</u>	<u>LEFT REAR SIDE</u>
Head	<u>to shoulder</u>	<u>to c-post</u>
Arm	<u>to side airbag</u>	<u>to door panel</u>
Pelvis	<u>to side airbag & armrest</u>	<u>to armrest</u>
Left Knee	<u>to door panel</u>	<u>to door panel</u>
Right Knee	<u>to left knee</u>	<u>to left knee</u>

DOOR OPENING:

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

MDB DISTANCE FROM TARGET IMPACT POINT:

Horizontal: 10 mm rearward Vertical: 7 mm up

ARM REST LOCATIONS:

Front: 230 mm from bottom of window
 Rear: 285 mm from bottom of window

POST-TEST OBSERVATIONS (Cont'd)SEAT CRUSH:Front Seat Back: 76 mm Front Seat Cushion: 43 mmLeft Rear Seat Back: 170 mm Rear Seat Cushion: 109 mmGLAZING DAMAGE:Left windows broke, Windshield crackedPILLAR PERFORMANCE:No separationSILL SEPARATION:NoneFRONTAL AIRBAGS:Driver Deployed: No Passenger Deployed: NoSIDE AIRBAGS:Driver Deployed: Yes Passenger Deployed: NAOTHER NOTABLE IMPACT EFFECTS:The roof panel separated

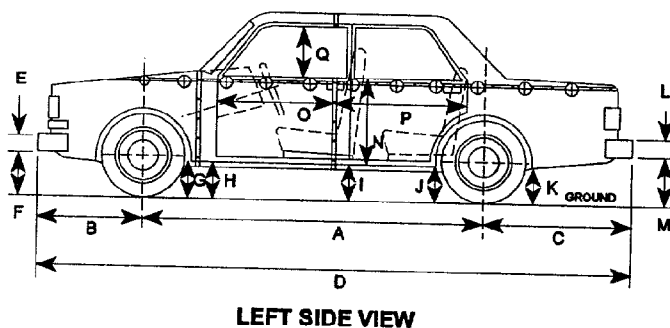
SECTION 4
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 5
SIDE IMPACT DUMMY (SID) INSTRUMENTATION DATA
 Year/Make/Model/Body Style: 2000/Buick/LeSabre/4 Door
 Vehicle NHTSA No.: CY0100 Test Date: October 19, 1999

	Front SID ID #037				Rear SID ID #036			
	Pos. Direct.		Neg. Direct		Pos. Direct.		Neg. Direct	
	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)
RIB ACCELERATIONS								
Left Upper Rib (LUR) Y	44.7	39	-7.9	83	55.8	48	-6.3	132
Left Lower Rib (LLR) Y	43.5	37	-9.9	114	58.3	48	-11.7	84
SPINE ACCELERATIONS								
Lower Lateral Y	64.5	43	-10.0	108	65.4	47	-30.5	78
PELVIS ACCELERATIONS								
Lateral Y	57.3	36	-14.5	104	74.4	41	-9.8	81

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
 J1 = To Pinch Weld
 J2 = To Sill

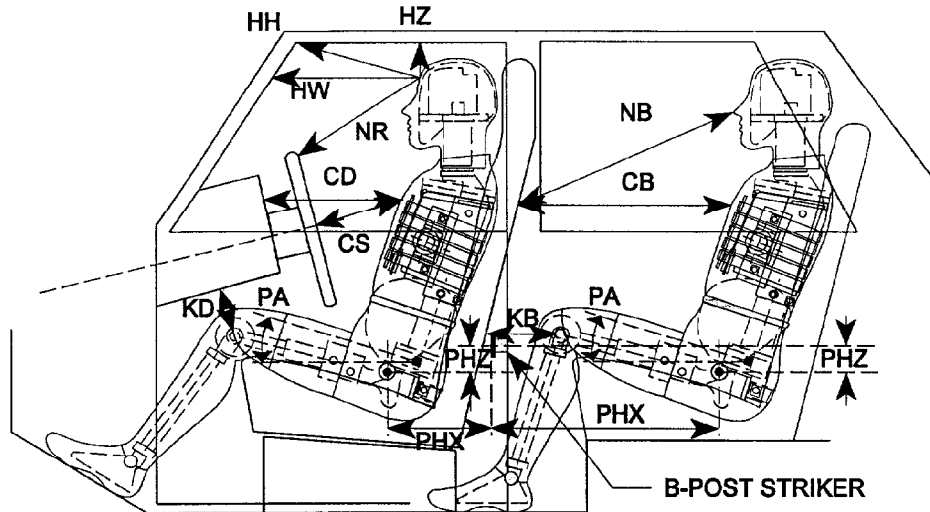
E & L = Bumper Thickness

ALL MEASUREMENTS IN (mm)

	PRE-TEST	POST-TEST	Δ CHANGE
A	2847	2806	41
B	1054	1018	36
C	1136	1148	-12
D	5037	4972	65
E	165	165	0
F	308	322	-14
G	185	NR	NA
H	188	NR	NA
I	178	234	-56
J1/J2	173/171	163/166	10/5
K	222	220	2
L	190	190	0
M	404	405	-1
N	725	653	72
O	839	756	83
P	1206	1128	78
Q	476	504	-28
R	4192	4195	-3
S	4192	4152	40
T	1858	1678	180

DATA SHEET NO. 7

SIDE IMPACT DUMMY (SID) LONGITUDINAL CLEARANCE DIMENSIONS

Year/Make/Model/Body Style: 2000/Buick/LeSabre/4 DoorNHTSA NO.: CY0100 Test Date: October 19, 1999NOTE: All dimensions are in mm with tolerance of ± 3 mm

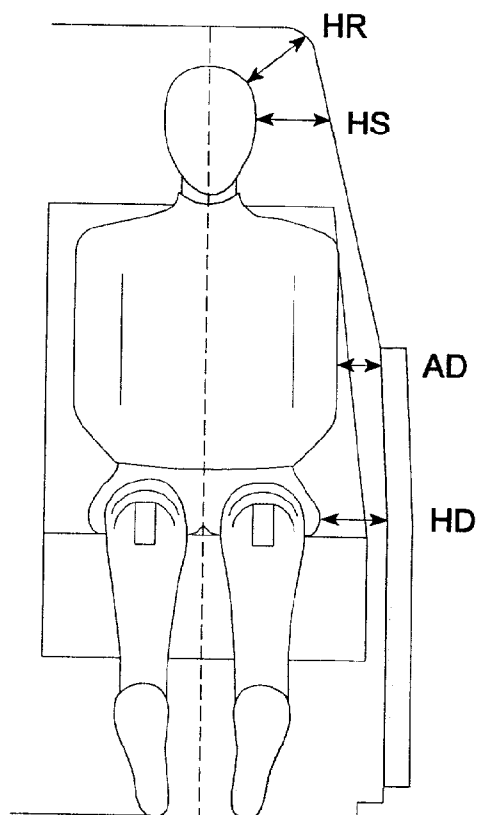
	DRIVER ID #037		REAR PASSENGER SID ID #036
HH	389	HZ	187
HW	643	NB	653
HZ	180	CB	564
NR	418	KBL (KBA)	230 (0.0°)
CD	503	KBR (KBA)	252 (0.0°)
CS	331	PA°	24.5°
KDL (KDA°)	165 (36.9°)	PHX	296
KDR (KDA°)	165 (40.9°)	PHZ	354
PA°	24.6°		
PHX	197		
PHZ	154		

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

DATA SHEET NO. 8
SIDE IMPACT DUMMY (SID) LATERAL CLEARANCE DIMENSIONS

Year/Make/Model/Body Style: 2000/Buick/LeSabre/4 Door

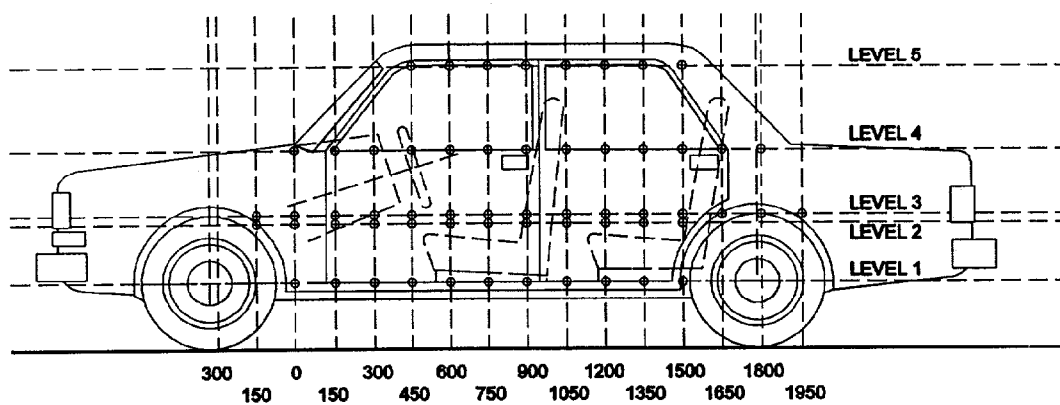
NHTSA NO.: CY0100 Test Date: October 19, 1999



NOTE: All dimensions are in mm

	DRIVER ID #037	REAR PASSENGER ID #036
HR	223	182
HS	340	336
AD	117	128
HD	189	170

DATA SHEET NO. 9

VEHICLE SIDE MEASUREMENTSYear/Make/Model/Body Style: 2000/Buick/LeSabre/4 DoorNHTSA NO.: CY0100 Test Date: October 19,1999**LEFT SIDE VIEW**

NOTE: All measurements are in millimeters (mm)

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

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

MEASUREMENTS ALONG THE VERTICAL 750 mm. LINE SHOWN ABOVE

Level 1 @ Axle Centerline Height

(or Sill Top Height) = 268 mm

Level 2 @ Occupant H-Point = 530 mm

Level 3 @ Mid Door = 630 mm

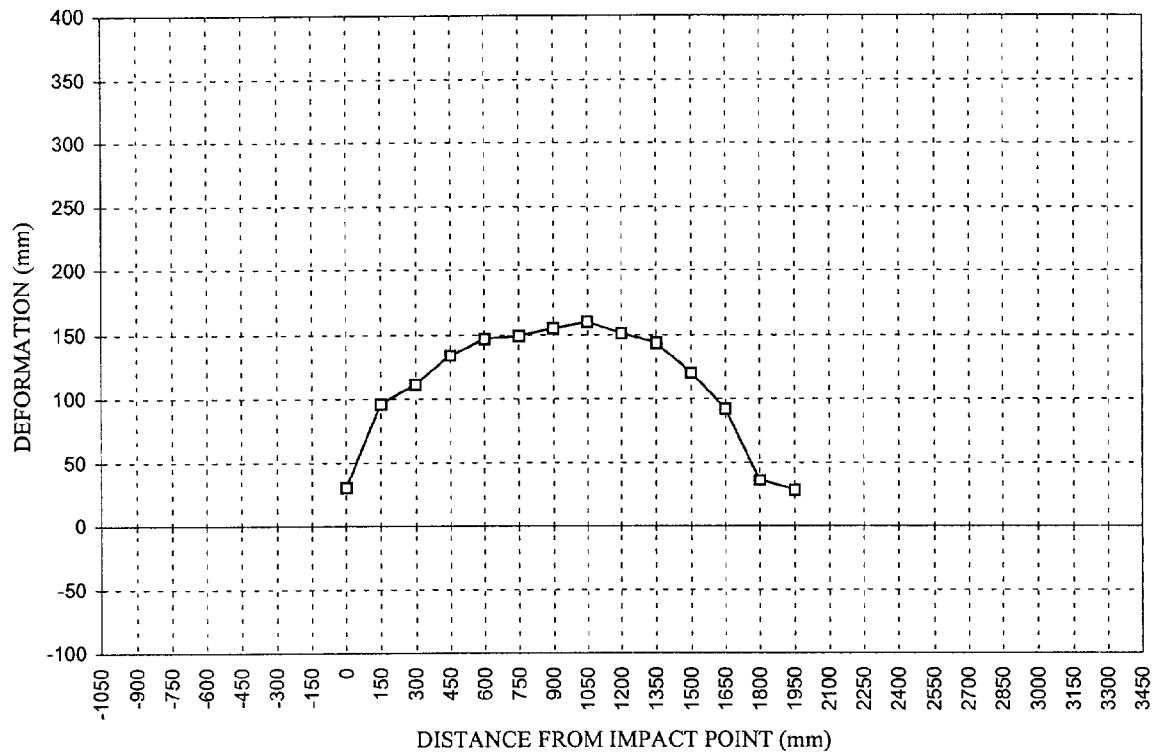
Level 4 @ Window Sill = 930 mm

Level 5 @ Window Top = 1580 mm

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

Longitudinal Distance (mm)	Level 1 - Axle Centerline		
	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1200			
-1050			
-900			
-750			
-600			
-450			
-300			
-150			
0 (impact point)	756	786	30
150	759	855	96
300	757	868	111
450	757	891	134
600	759	906	147
750	757	906	149
900	757	912	155
1050	758	918	160
1200	757	908	151
1350	757	901	144
1500	757	877	120
1650	756	848	92
1800	757	793	36
1950	733	761	28
2100			
2250			
2400			
2550			
2700			
2850			
3000			
3150			
3300			

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

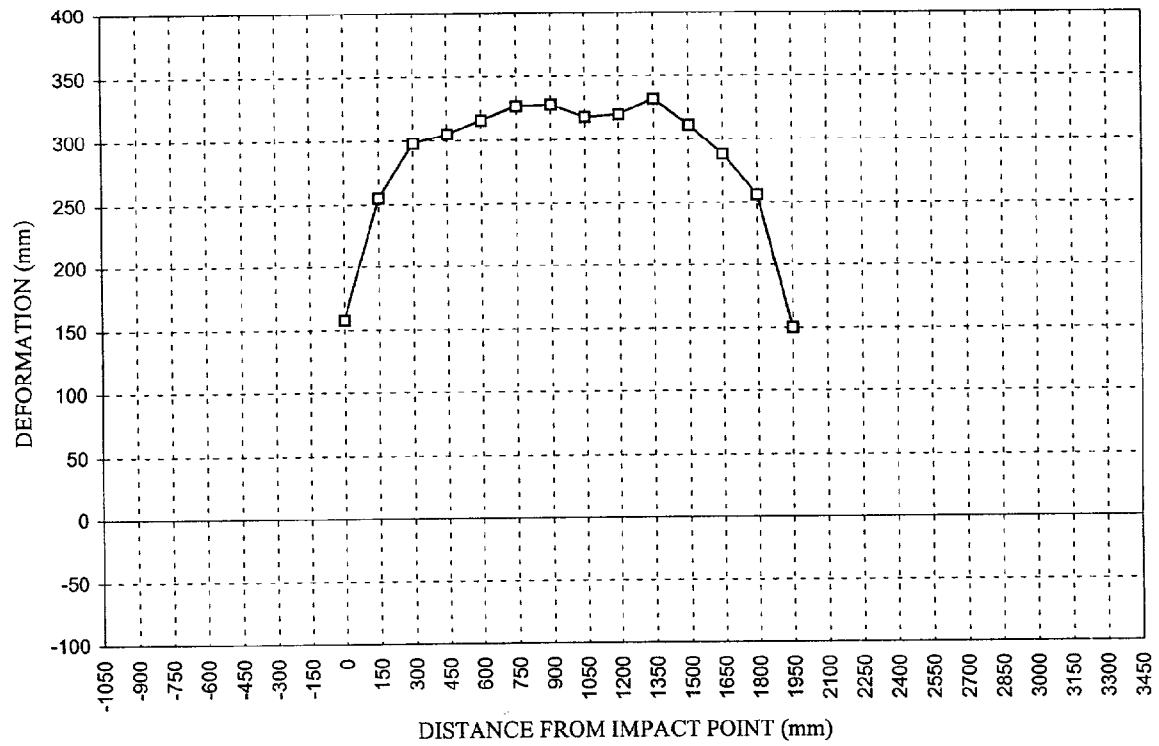
VEHICLE EXTERIOR STATIC CRUSH (Cont'd)

LEVEL 1 - AXLE CENTERLINE

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

Longitudinal Distance (mm)	Level 2 - Occupant H Point		
	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1200			
-1050			
-900			
-750			
-600			
-450			
-300			
-150			
0 (impact point)	667	825	158
150	666	921	255
300	666	964	298
450	668	973	305
600	668	984	316
750	671	998	327
900	672	1000	328
1050	676	994	318
1200	676	996	320
1350	675	1007	332
1500	673	984	311
1650	669	957	288
1800	670	926	256
1950	671	821	150
2100			
2250			
2400			
2550			
2700			
2850			
3000			
3150			
3300			

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

VEHICLE EXTERIOR STATIC CRUSH (Cont'd)

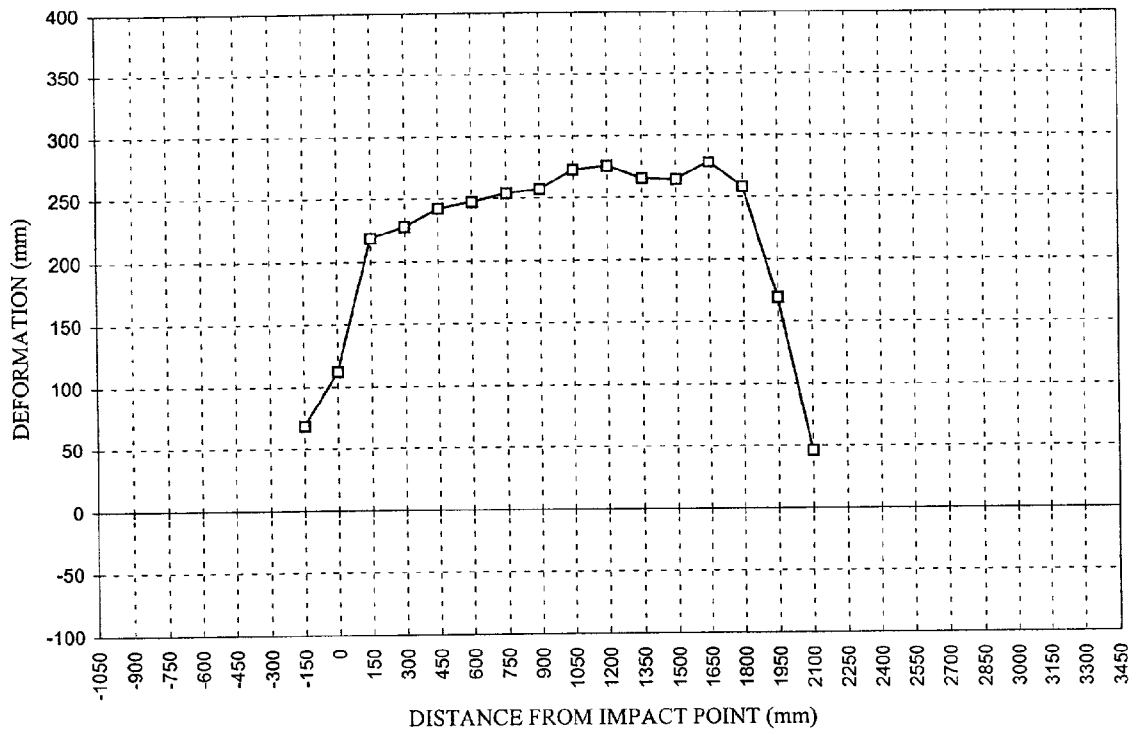
LEVEL 2 - OCCUPANT H-POINT

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

Longitudinal Distance (mm)	Level 3 - Mid Door		
	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1200			
-1050			
-900			
-750			
-600			
-450			
-300			
-150	662	730	68
0 (impact point)	663	775	112
150	663	882	219
300	665	893	228
450	666	908	242
600	666	913	247
750	667	921	254
900	670	927	257
1050	673	945	272
1200	673	948	275
1350	674	939	265
1500	672	936	264
1650	669	947	278
1800	669	927	258
1950	669	838	169
2100	669	715	46
2250			
2400			
2550			
2700			
2850			
3000			
3150			
3300			

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

VEHICLE EXTERIOR STATIC CRUSH (Cont'd)

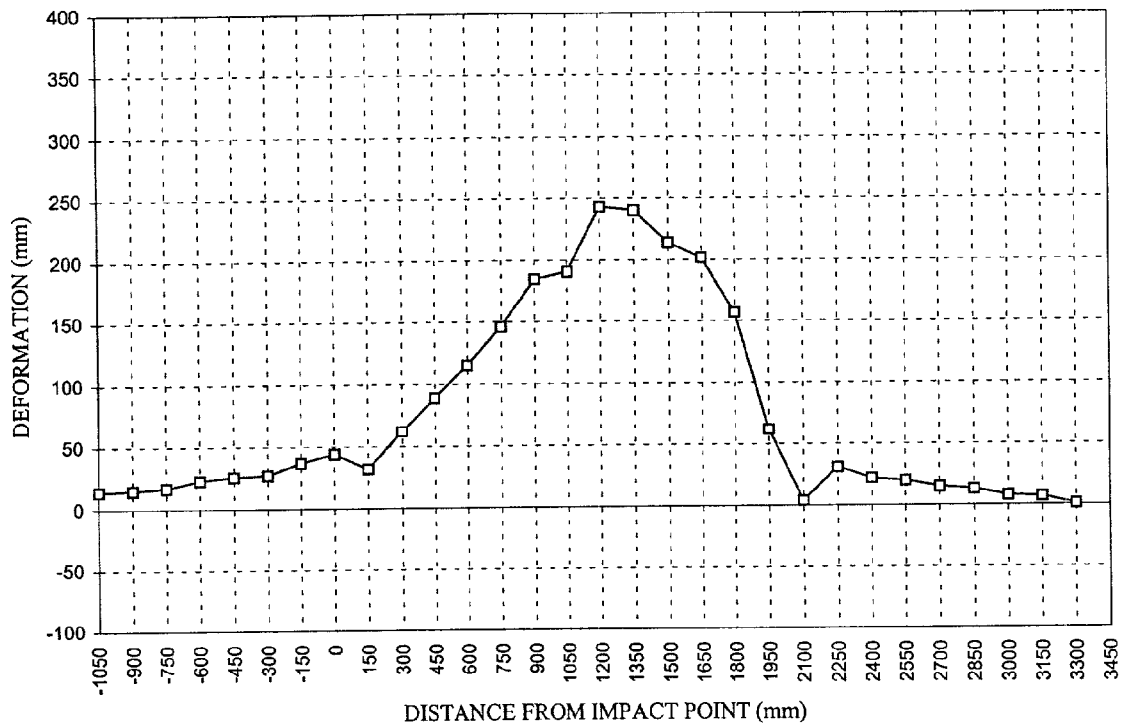


LEVEL 3 - MID DOOR

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

Longitudinal Distance (mm)	Level 4 - Window Sill		
	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1200	792	798	6
-1050	771	785	14
-900	762	777	15
-750	754	771	17
-600	748	771	23
-450	742	768	26
-300	740	767	27
-150	735	772	37
0 (impact point)	735	779	44
150	732	764	32
300	732	794	62
450	730	819	89
600	730	845	115
750	731	877	146
900	730	915	185
1050	731	922	191
1200	731	974	243
1350	731	971	240
1500	729	943	214
1650	724	926	202
1800	723	880	157
1950	723	785	62
2100	724	728	4
2250	730	761	31
2400	737	759	22
2550	746	766	20
2700	758	773	15
2850	771	784	13
3000	792	800	8
3150	812	819	7
3300	848	849	1

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

VEHICLE EXTERIOR STATIC CRUSH (Cont'd)

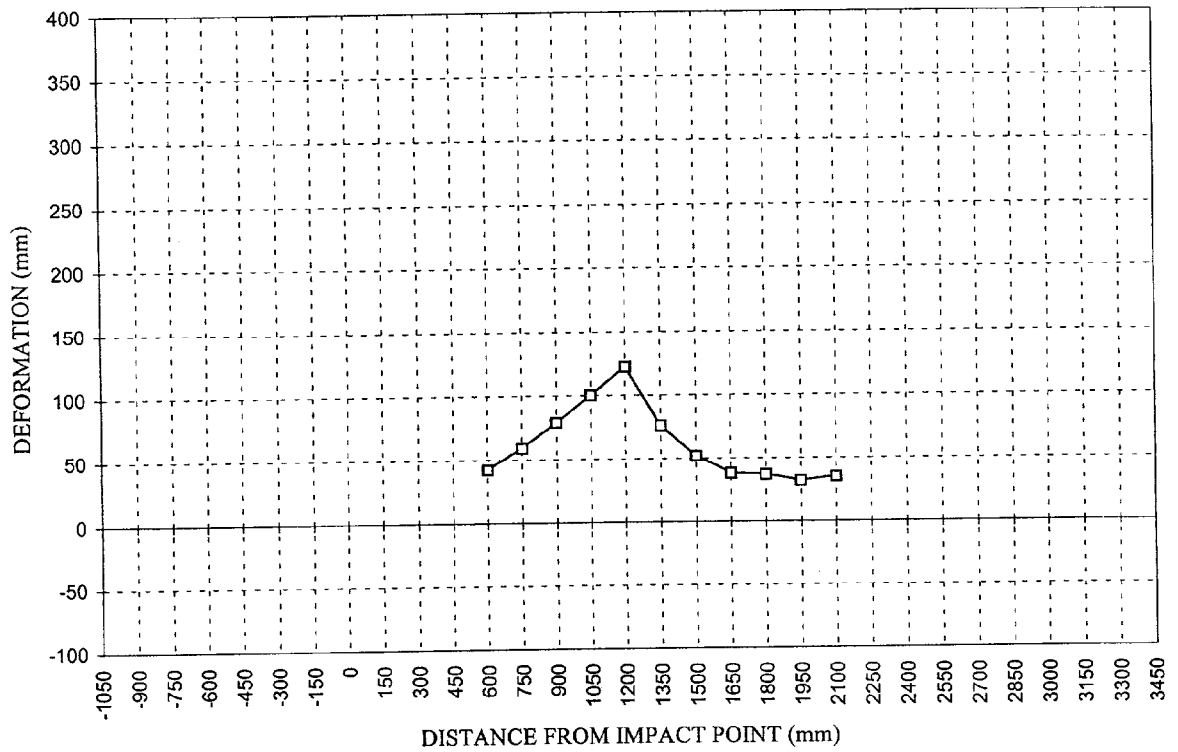
LEVEL 4 - WINDOW SILL

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

Longitudinal Distance (mm)	Level 5 - Window Top		
	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1200			
-1050			
-900			
-750			
-600			
-450			
-300			
-150			
0 (Impact point)			
150			
300			
450			
600	1004	1046	42
750	990	1049	59
900	988	1067	79
1050	990	1090	100
1200	988	1110	122
1350	988	1064	76
1500	984	1036	52
1650	980	1018	38
1800	978	1015	37
1950	984	1016	32
2100	986	1021	35
2250			
2400			
2550			
2700			
2850			
3000			
3150			
3300			

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

VEHICLE EXTERIOR STATIC CRUSH (Cont'd)



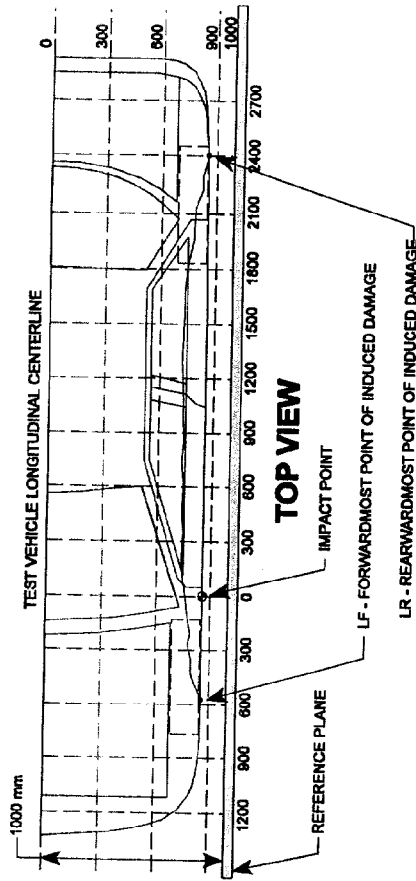
LEVEL 5 - WINDOW TOP

DATA SHEET NO. 11

VEHICLE DAMAGE PROFILE DISTANCES

Year/Make/Model/Body Style: 2000/Buick/LeSabre/4 Door

NHTSA NO.: CY0100 Test Date: October 19, 1999



MEASUREMENT CONVENTIONS:

Forward of the impact point (towards front of vehicle) is considered negative (-).

Rearward of the impact point (toward rear of vehicle) is considered positive (+).

DPD MEASUREMENTS	POST-TEST (mm)	PRE-TEST (mm)	STATIC CRUSH (mm)
1. (LR = 3300 mm)	849	848	1
2. 2400 mm	759	737	22
3. 1412 mm	1014	675	339
4. 570 mm	1009	668	341
5. -317 mm	774	740	34
6. (LF = -1200 mm)	798	792	6

DATA SHEET NO. 12

EXTERIOR STATIC CRUSH FOR SIDE IMPACTOR

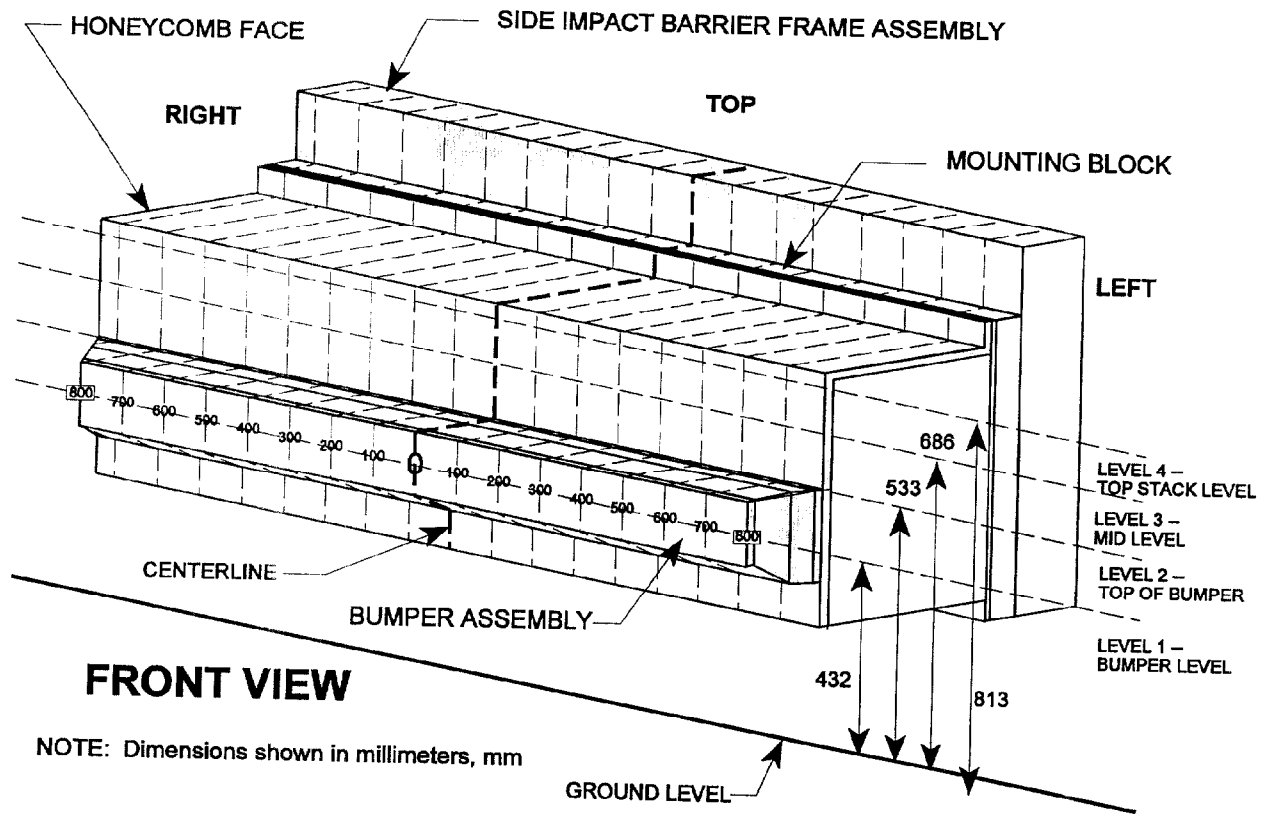
Year/Make/Model/Body Style: 2000/Buick/LeSabre/4 Door

Vehicle NHTSA No.: CY0100 Test Date: October 19, 1999

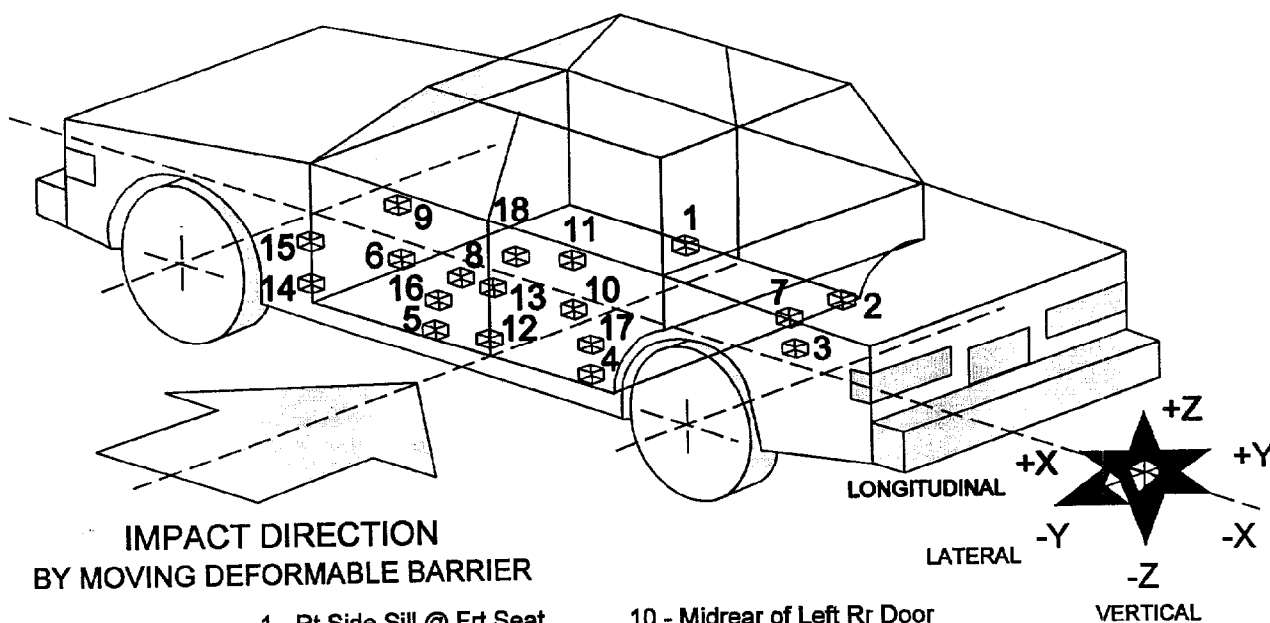
		Distance Right of Center (mm)									Distance Left of Center (mm)							
		800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
Location	Height at CL*																	
Top Stack Level 4	813 mm	45	12	-1	-5	-5	-3	0	0	0	0	2	4	8	19	35	59	105
Mid Level Level 3	686 mm	11	5	-3	-3	-3	-2	-1	0	0	1	2	3	5	8	8	34	59
Top Bumper Level 2	533 mm	52	35	22	16	16	18	15	7	5	7	11	14	16	21	24	35	64
Mid Bumper Level 1	432 mm	78	65	50	40	43	60	53	43	37	37	41	43	46	50	57	77	113

* See next page for Barrier Face Graphic

DATA SHEET NO. 12 (Cont'd)



DATA SHEET 13

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARYYear/Make/Model/Body Style: 2000/Buick/LeSabre/4 DoorVehicle NHTSA No.: CY0100 Test Date: October 19, 1999

**IMPACT DIRECTION
BY MOVING DEFORMABLE BARRIER**

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

DATA SHEET NO. 13 (Cont'd)

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 2000/Buick/LeSabre/4 Door

Vehicle NHTSA No.: CY0100 Test Date: October 19, 1999

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	Right Side Sill @ Front Seat	2680	770	193	2.2	-3.8	14.9	-1.9	4.5	-5.3	15.9
2	Right Side Sill @ Rear Seat	1756	770	182	3.0	-2.3	16.9	-2.9	6.6	-6.4	18.0
3	Rear Floorpan Above Axle	1146	0	570	3.9	-5.4	15.9	-2.7	10.0	-15.5	17.0
4	Left Side Sill @ Rear Seat	1793	-770	198	---	---	35.3	-7.3	---	---	---
5	Left Side Sill @ Front Seat	2708	-770	204	---	---	42.8	-6.1	---	---	---
7	Right Rear Occupant Compartment	2026	364	382	---	---	15.2	-2.2	---	---	---
12	Left Lower B-Post	2274	-695	335	---	---	45.8	-10.4	---	---	---
13	Left Middle B-Post	2255	-733	783			173.6	-124.7			
14	Left Lower A-Post	3388	-708	330	---	---	44.6	-13.3	---	---	---
15	Left Mid A-Post	3452	-860	925	---	---	28.2	-3.1	---	---	---
16	Driver Seat Track	2359	-625	345	---	---	43.0	-10.2	---	---	---
18	Vehicle CG	2816	0	430	11.9	-30.1	89.2	-30.3	29.4	-16.2	94.2

*Reference: X - Rear Bumper (+ Forward)

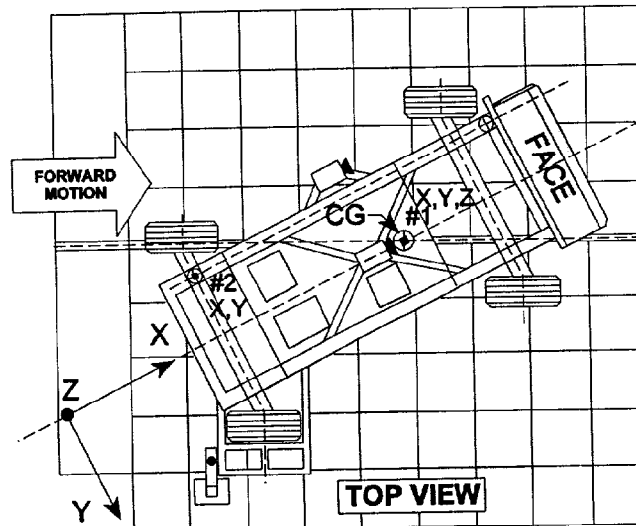
Y - Vehicle Centerline (+ To right)

Z - Ground Level (+ Up)

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

Year/Make/Model/Body Style: 2000/Buick/LeSabre/4 Door

Vehicle NHTSA No.: CY0100 Test Date: October 19, 1999

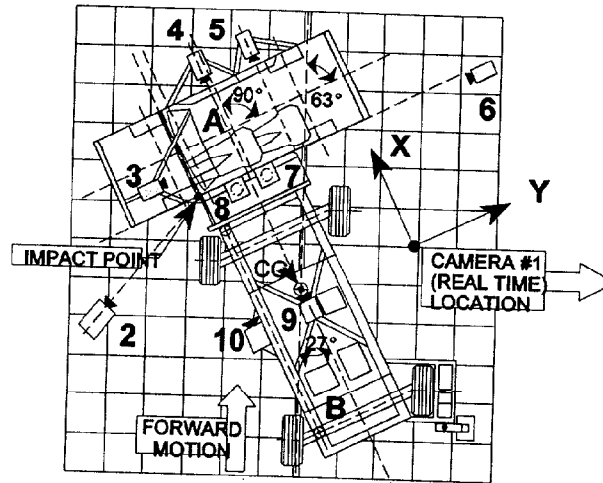


Accel. No.	Description	Coordinates (mm)*			(+) Positive		(-) Negative	
		X	Y	Z	Max. (g)	Time (msec)	Max. (g)	Time (msec)
1	MDB Center of Gravity	-1092	0	483				
	Longitudinal (X)	---	---	---	1.3	162	-16.4	37
	Lateral (Y)	---	---	---	1.1	63	-6.8	32
	Vertical (Z)	---	---	---	14.8	60	-11.8	23
	Resultant (R)	---	---	---			20.7	37
2	Rear Frame Member	-2591	-625	622				
	Longitudinal (X)	---	---	---	1.7	147	-21.4	36
	Lateral (Y)	---	---	---	1.2	193	-4.3	30

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

DATA SHEET NO. 15
HIGH SPEED CAMERA LOCATIONS AND DATA

Year/Make/Model/Body Style: 2000/Buick/LeSabre/4 Door
 Vehicle NHTSA No.: CY0100 Test Date: October 19, 1999



Camera No.	View	Coordinates (mm)*			Lens (mm)	Film Speed (fps)
		X	Y	Z		
1	Real Time				10	24
2	Left Impact	-1540	2400	1820	13	1000
3	Onboard Hood				13	1000
4	Onboard Front Occupant				8	712
5	Onboard Rear Occupant				8	1005
6	Right Impact	500	10100	1780	25	1000
7	Top Overall	-360	1120	5000	8	930
8	Top Impact	-250	25	5000	13	1005
9	Cart Overall				13	1010
10	Cart Impact				13	727

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

DATA SHEET 16

FUEL SYSTEM INTEGRITY POST IMPACT TEST DATAVehicle Year/Make/Model/Body Style: 2000/Buick/LeSabre/4 DoorVehicle NHTSA No.: CY0100 Test Date: October 19, 1999TEST 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.

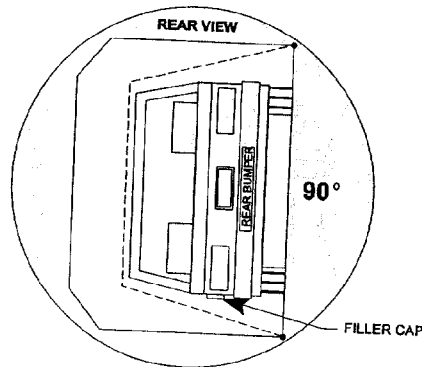
TEST VEHICLE IMPACT TYPE: X Left Side Impact MDB 32.7 mph (52.6 kph)

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

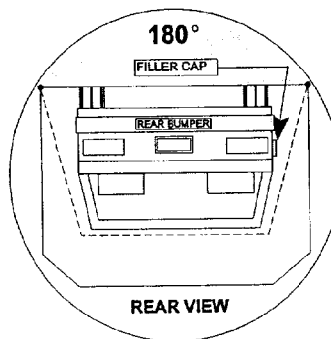
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATAVehicle Year/Make/Model/Body Style: 2000/Buick/LeSabre/4 DoorVehicle NHTSA No.: CY0100 Test Date: October 19, 1999TEST PHASE: 0° - 90°DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:Rollover Fixture 90° Rotation Time = 2 minutes 46 seconds
(Spec. Range = 1 to 3 minutes)FMVSS 301 Position Hold Time = 5 minutes 0 secondsTOTAL TIME = 7 minutes 46 secondsNext Whole Minute Interval = 8 minutesFUEL SPILLAGE MEASUREMENT:

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

FUEL SPILLAGE LOCATIONS(S): None

DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA (Cont'd)Vehicle Year/Make/Model/Body Style: 2000/Buick/LeSabre/4 DoorVehicle NHTSA No.: CY0100 Test Date: October 19, 1999TEST PHASE: 90° - 180°DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:Rollover Fixture 90° Rotation Time = 2 minutes 17 seconds

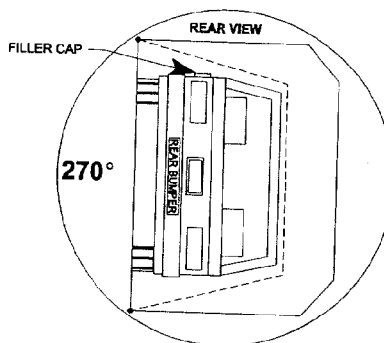
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 secondsTOTAL TIME = 7 minutes 17 secondsNext Whole Minute Interval = 8 minutesFUEL SPILLAGE MEASUREMENT:

90° TO 180° ROTATION	TEST RESULTS	MAXIMUM ALLOWABLE
1. First 5 Minutes From Onset of Rotation	0 oz	5 oz
2. Sixth Minute From Onset of Rotation	0 oz	1 oz
3. Seventh Minute From Onset of Rotation	0 oz	1 oz
4. Eighth Minute if Required	0 oz	1 oz

FUEL SPILLAGE LOCATIONS(S): None

DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA (Cont'd)Vehicle Year/Make/Model/Body Style: 2000/Buick/LeSabre/4 DoorVehicle NHTSA No.: CY0100 Test Date: October 19, 1999TEST PHASE: 180° - 270°DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:Rollover Fixture 90° Rotation Time = 2 minutes 23 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 secondsTOTAL TIME = 7 minutes 23 secondsNext Whole Minute Interval = 8 minutesFUEL SPILLAGE MEASUREMENT:

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

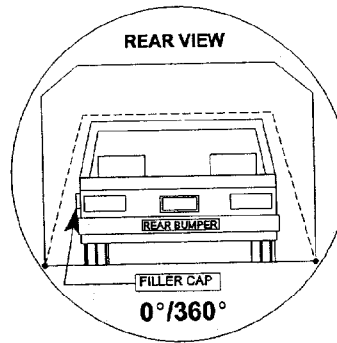
FUEL SPILLAGE LOCATIONS(S): None

DATA SHEET 16
FMVSS 301 STATIC ROLLOVER TEST DATA

Vehicle Year/Make/Model/Body Style: 2000/Buick/LeSabre/4 Door

Vehicle NHTSA No.: CY0100 Test Date: October 19, 1999

TEST PHASE: 270° - 360°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 41 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 41 seconds

Next Whole Minute Interval = 8 minutes

FUEL SPILLAGE MEASUREMENT:

270° TO 360° ROTATION	TEST RESULTS	MAXIMUM ALLOWABLE
1. First 5 Minutes From Onset of Rotation	0 oz	5 oz
2. Sixth Minute From Onset of Rotation	0 oz	1 oz
3. Seventh Minute From Onset of Rotation	0 oz	1 oz
4. Eighth Minute if Required	0 oz	1 oz

FUEL SPILLAGE LOCATIONS(S): None

APPENDIX A - PHOTOGRAPHS

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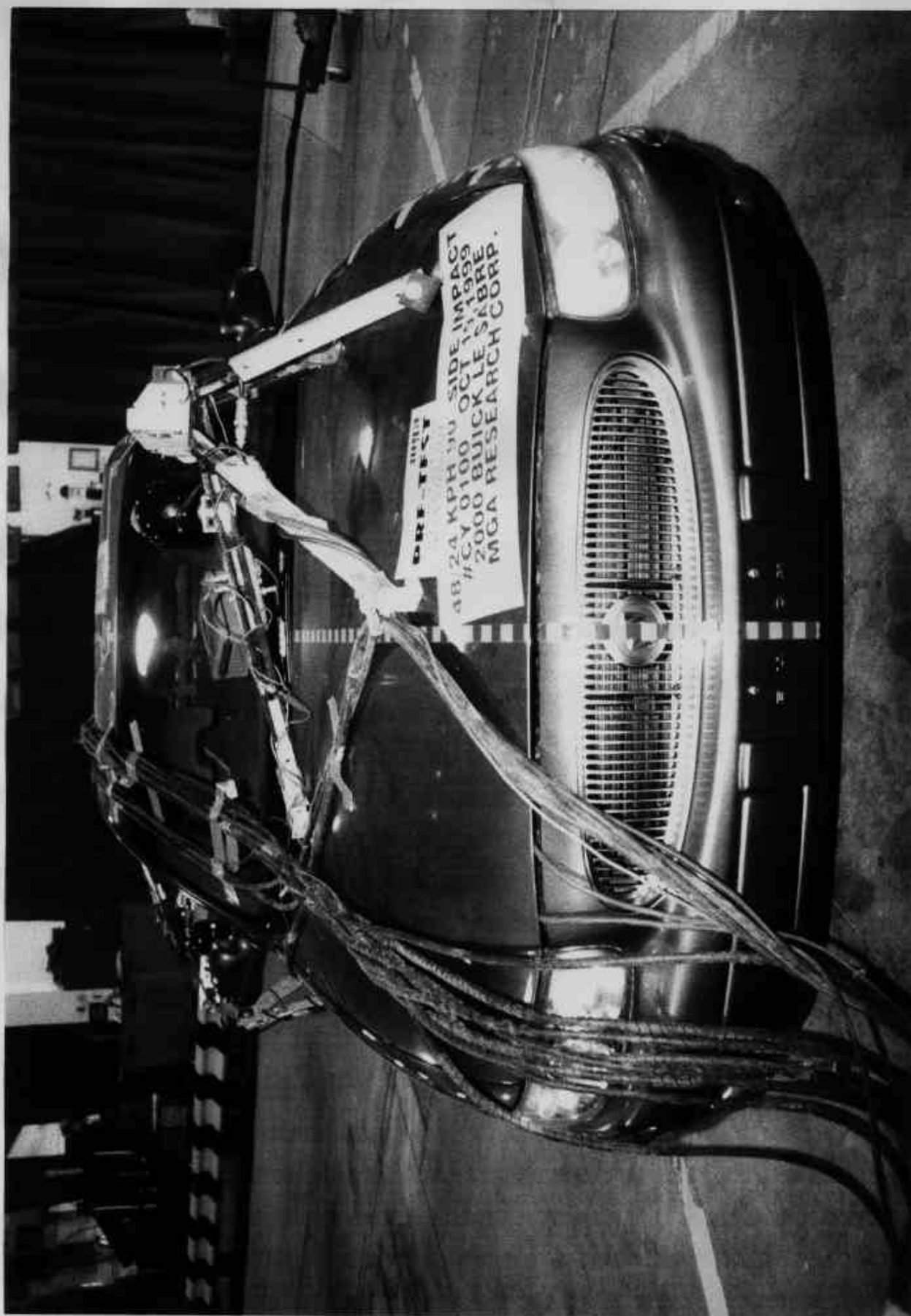


Photo No. A-1 - Pre-Test Front View of Test Vehicle

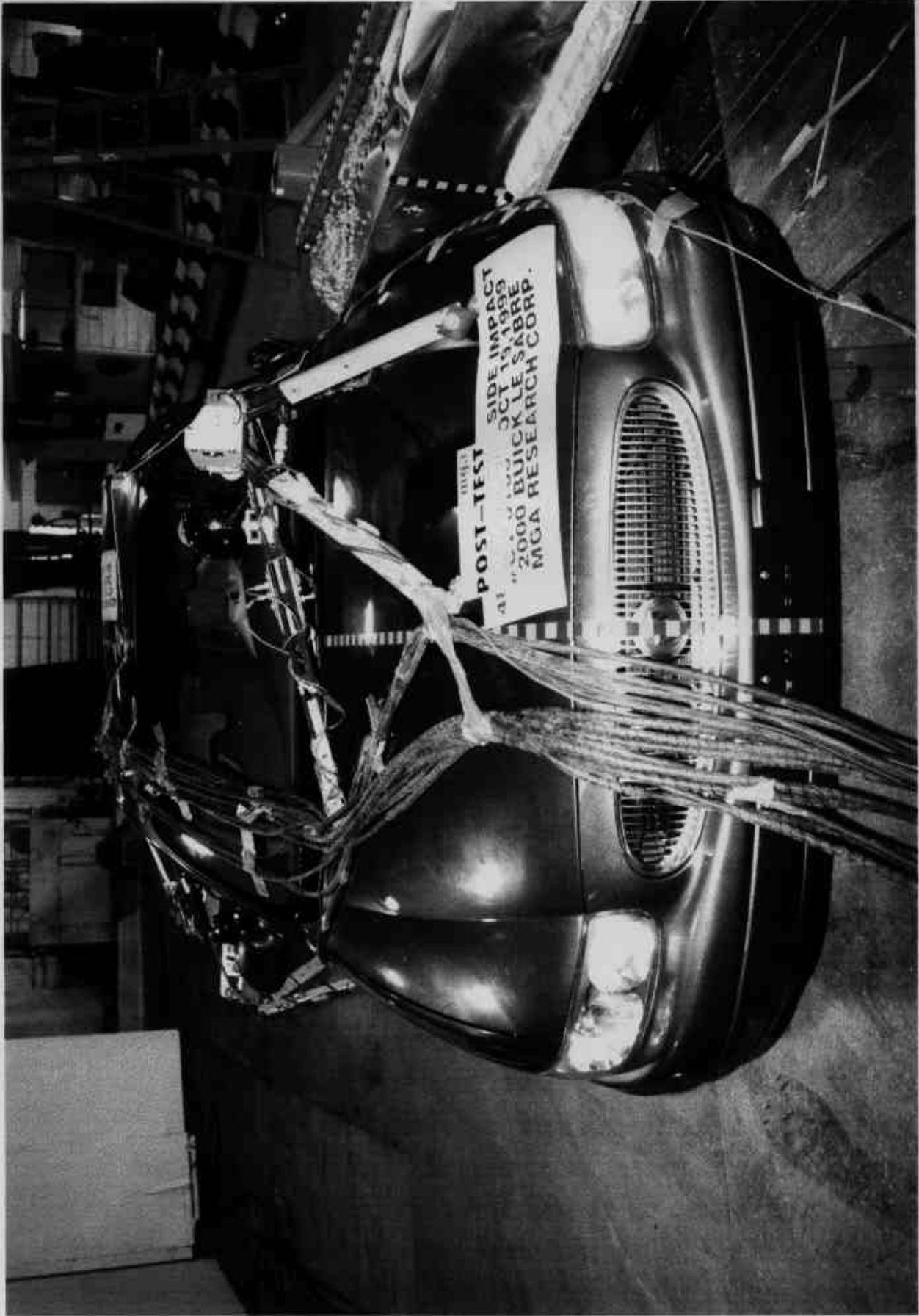


Photo No. A-2 - Post-Test Front View of Test Vehicle

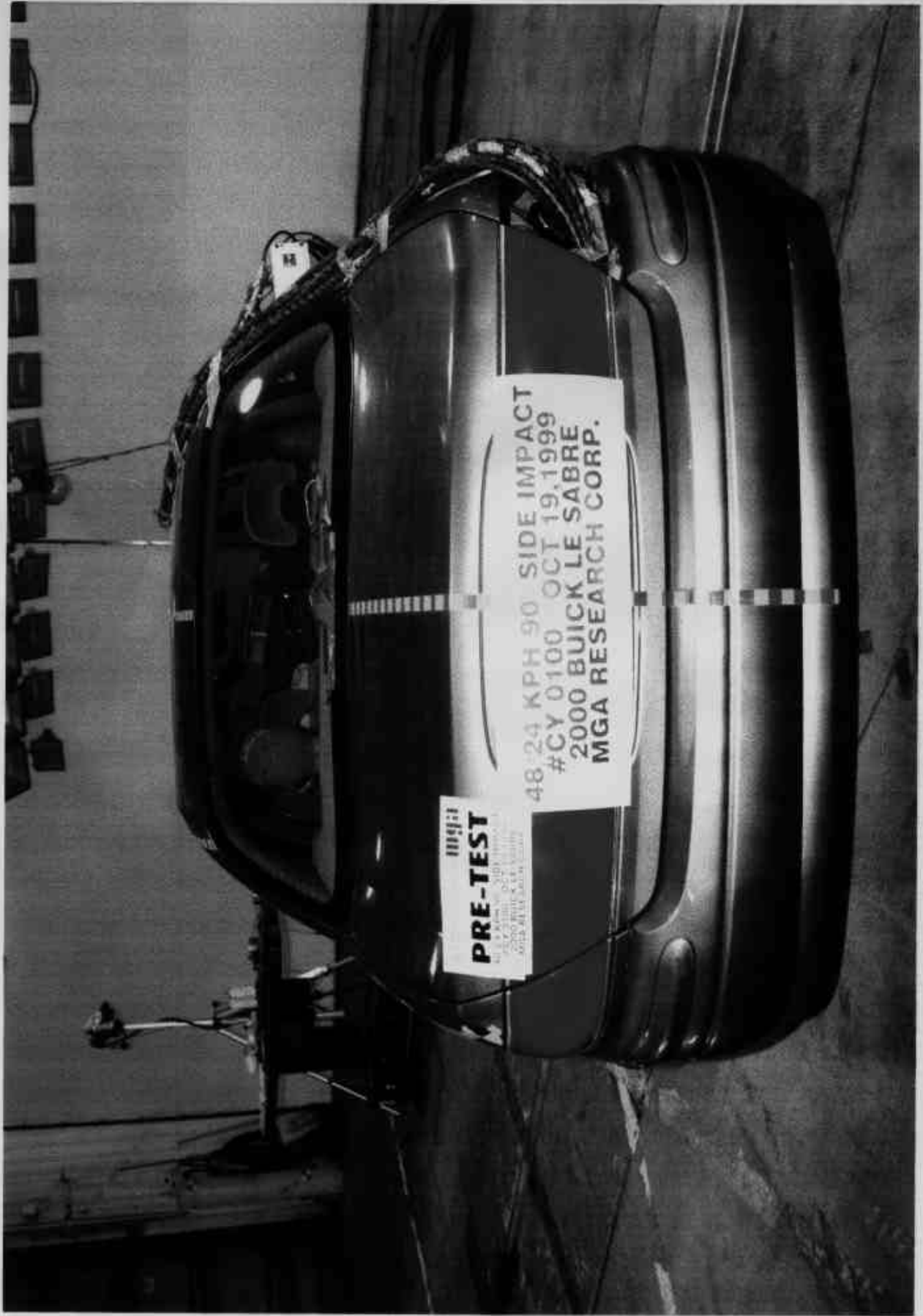


Photo No. A-3 - Pre-Test Rear View of Test Vehicle



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

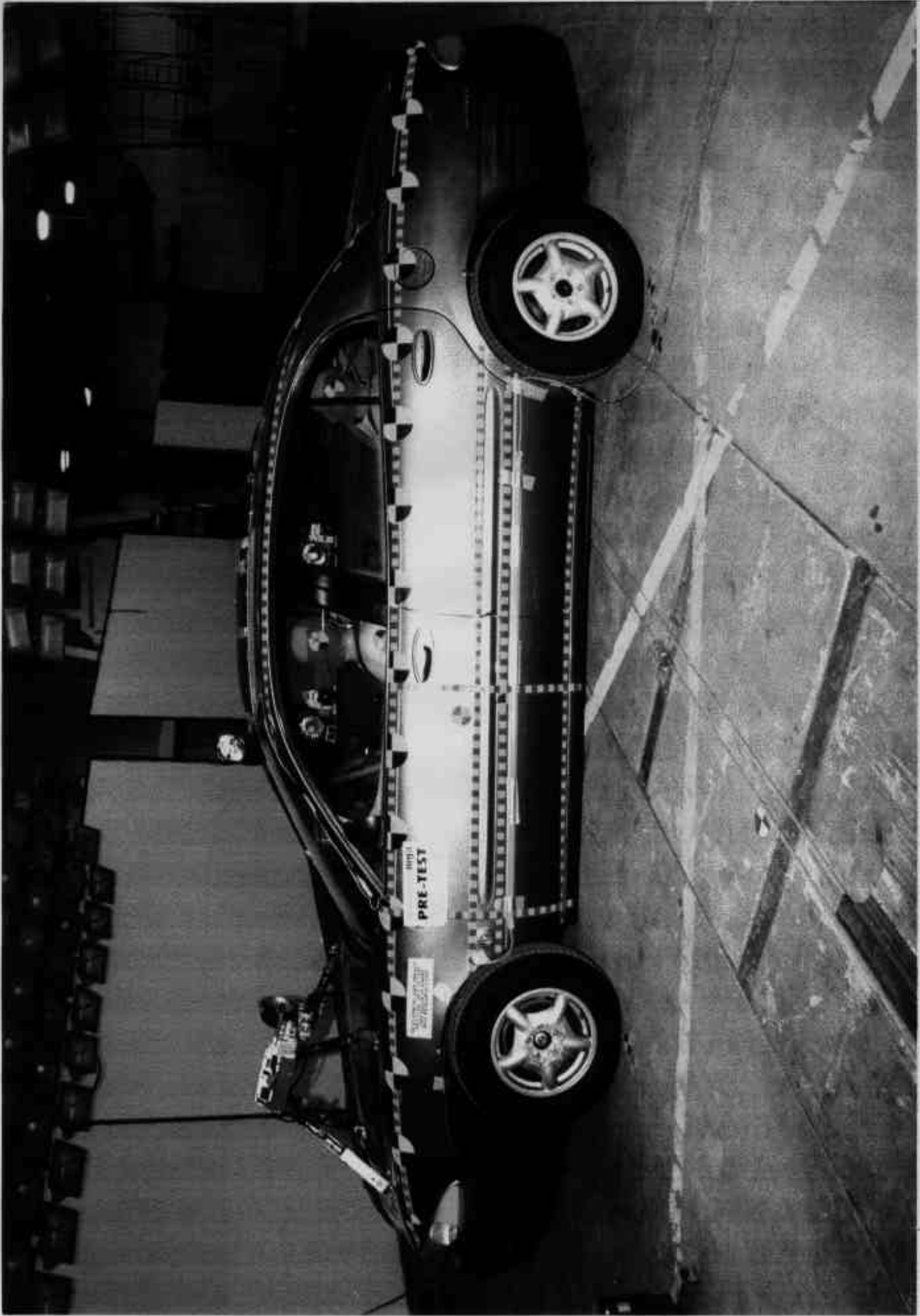


Photo No. A-5 - Pre-Test Left Side View of Test Vehicle



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

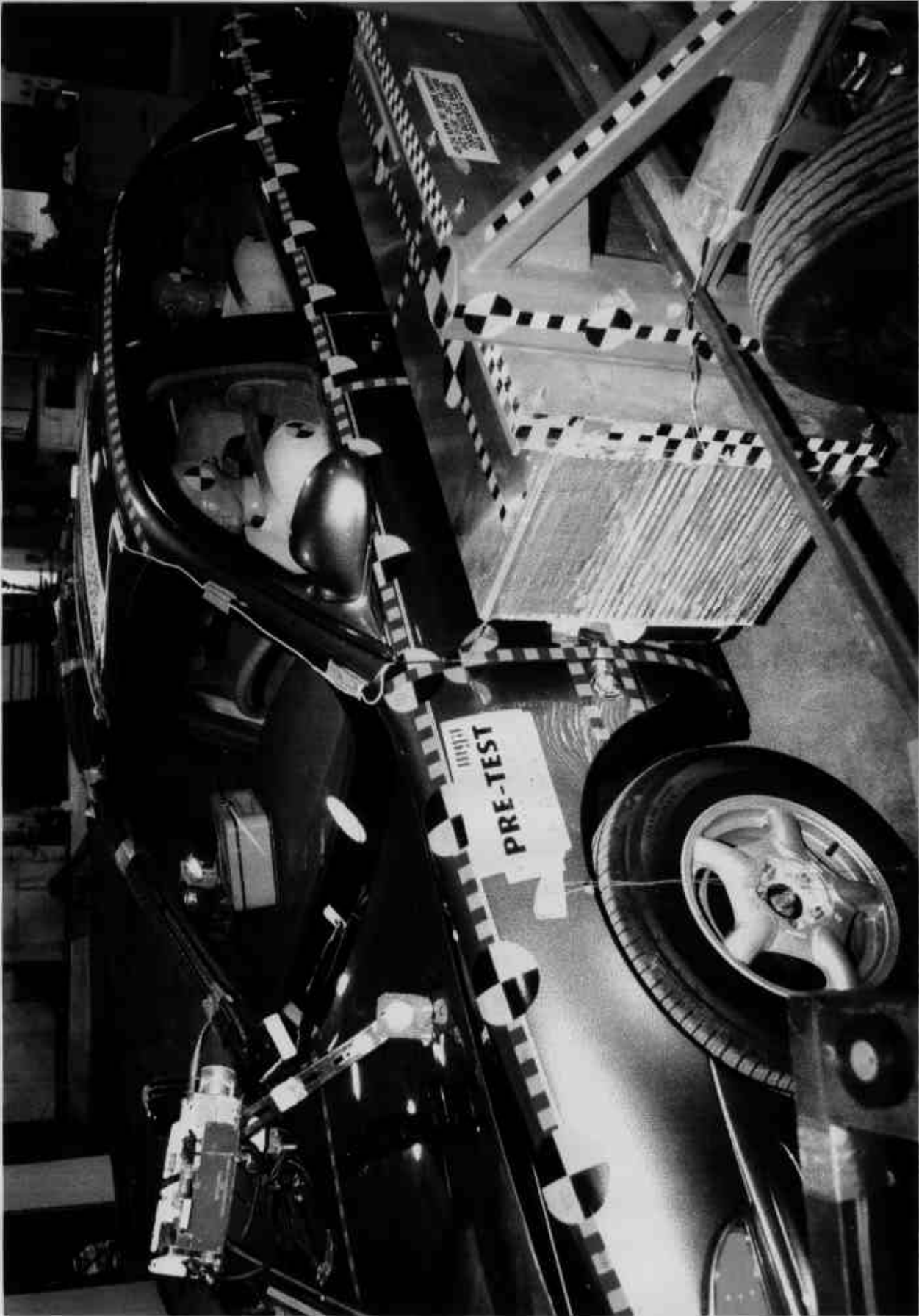


Photo No. A-7 - Pre-Test MDB Positioned Against Vehicle (left side)

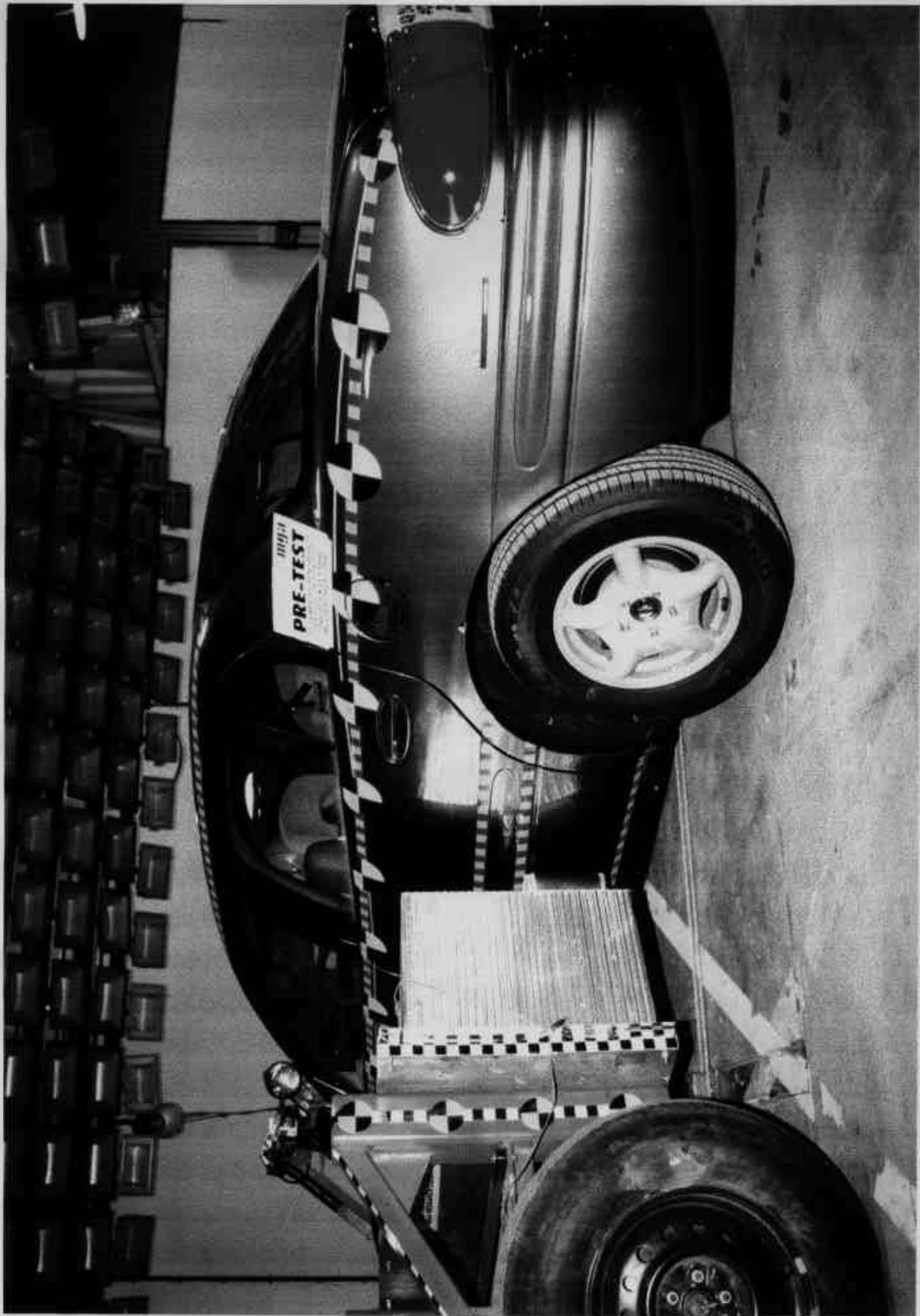


Photo No. A-8 - Pre-Test MDB Positioned Against Vehicle (right side)

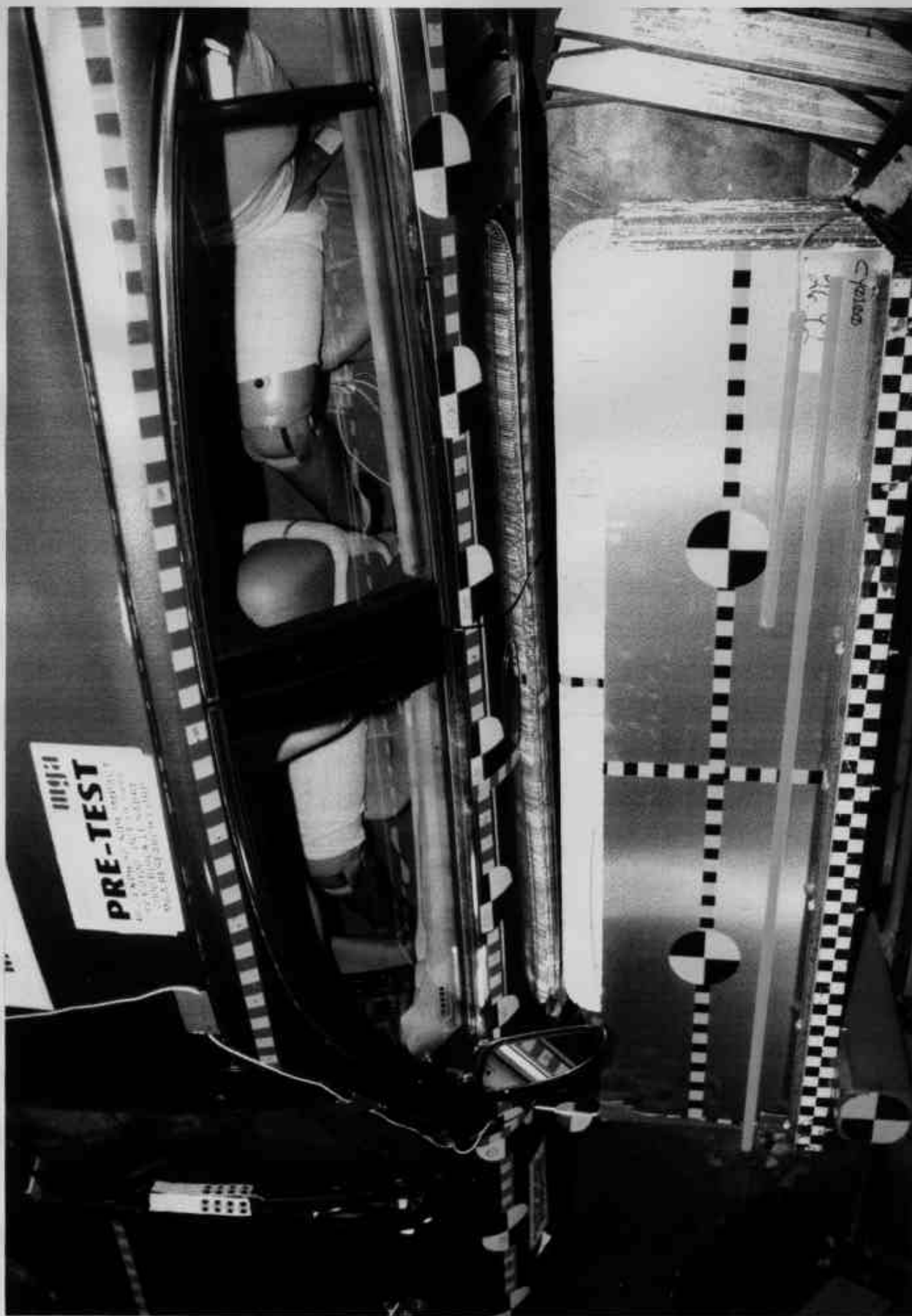


Photo No. A-9 - Pre-Test MDB Positioned Against Vehicle Overhead View

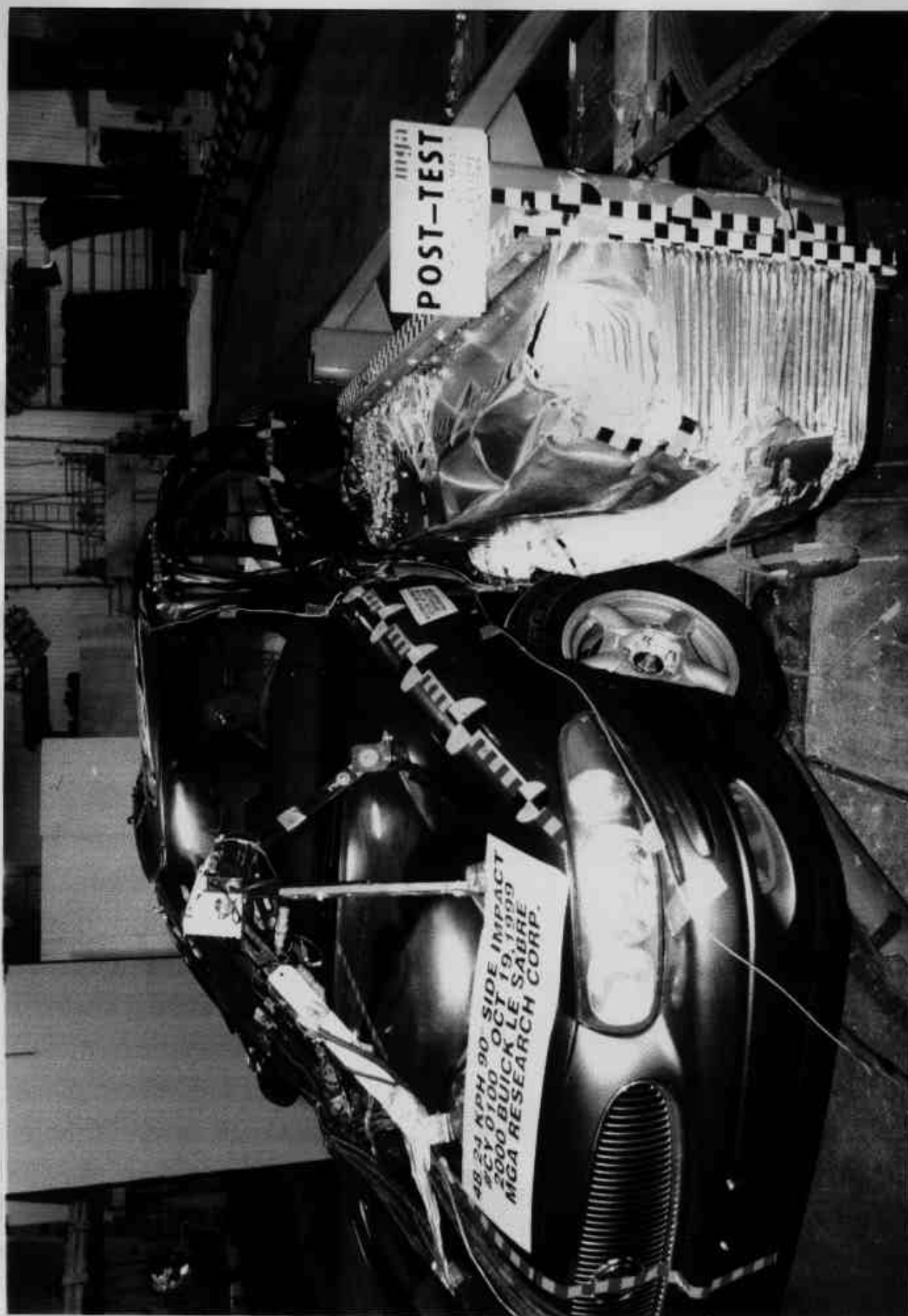


Photo No. A-10 - Post-Test MDB Immediately After Test (left side)



Photo No. A-11 - Post-Test MDB Immediately After Test (right side)

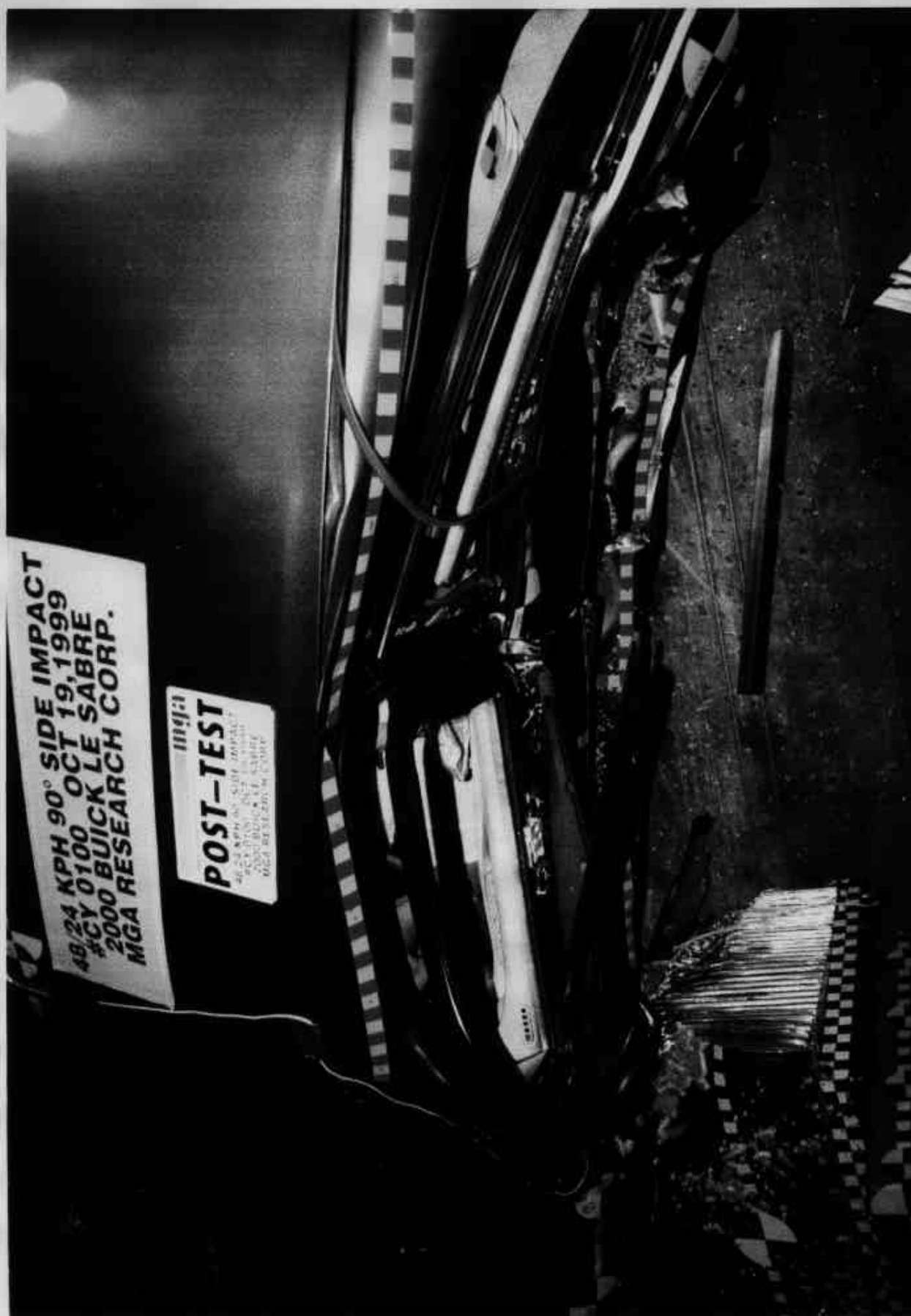


Photo No. A-12 - Post-Test MDB Immediately After Test Overhead View

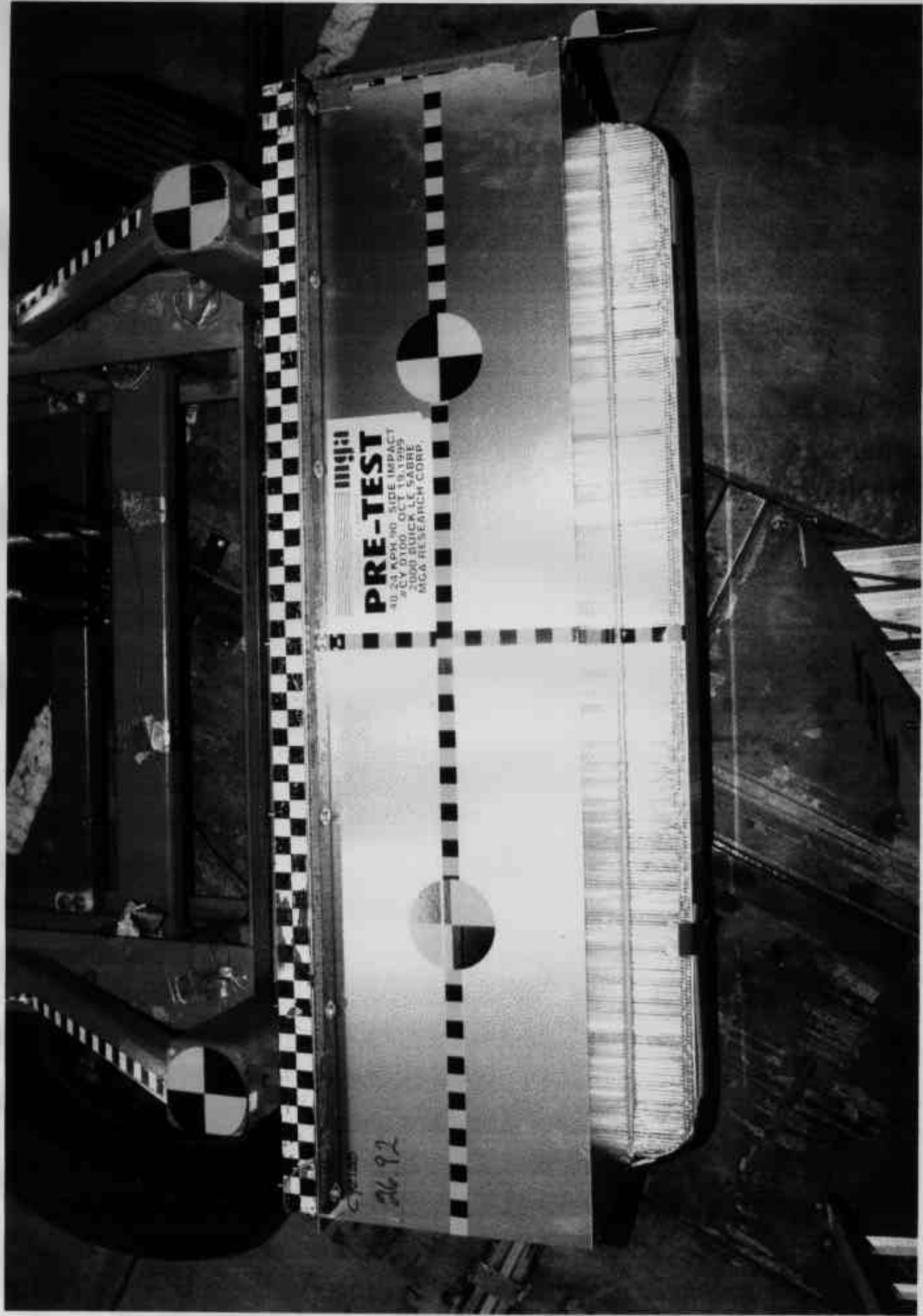


Photo No. A-13 - Pre-Test MDB Top View

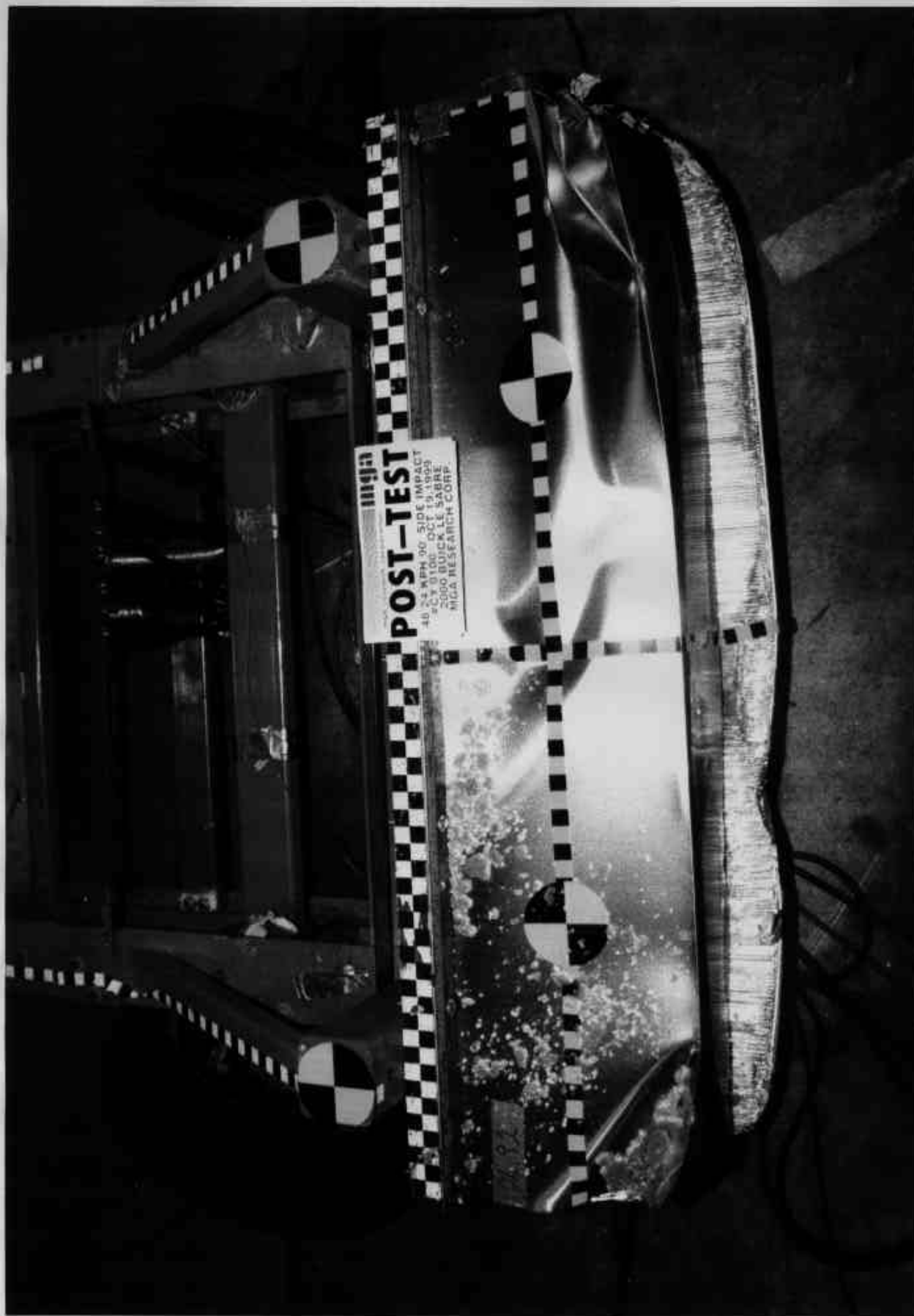


Photo No. A-14 - Post-Test MDB Top View

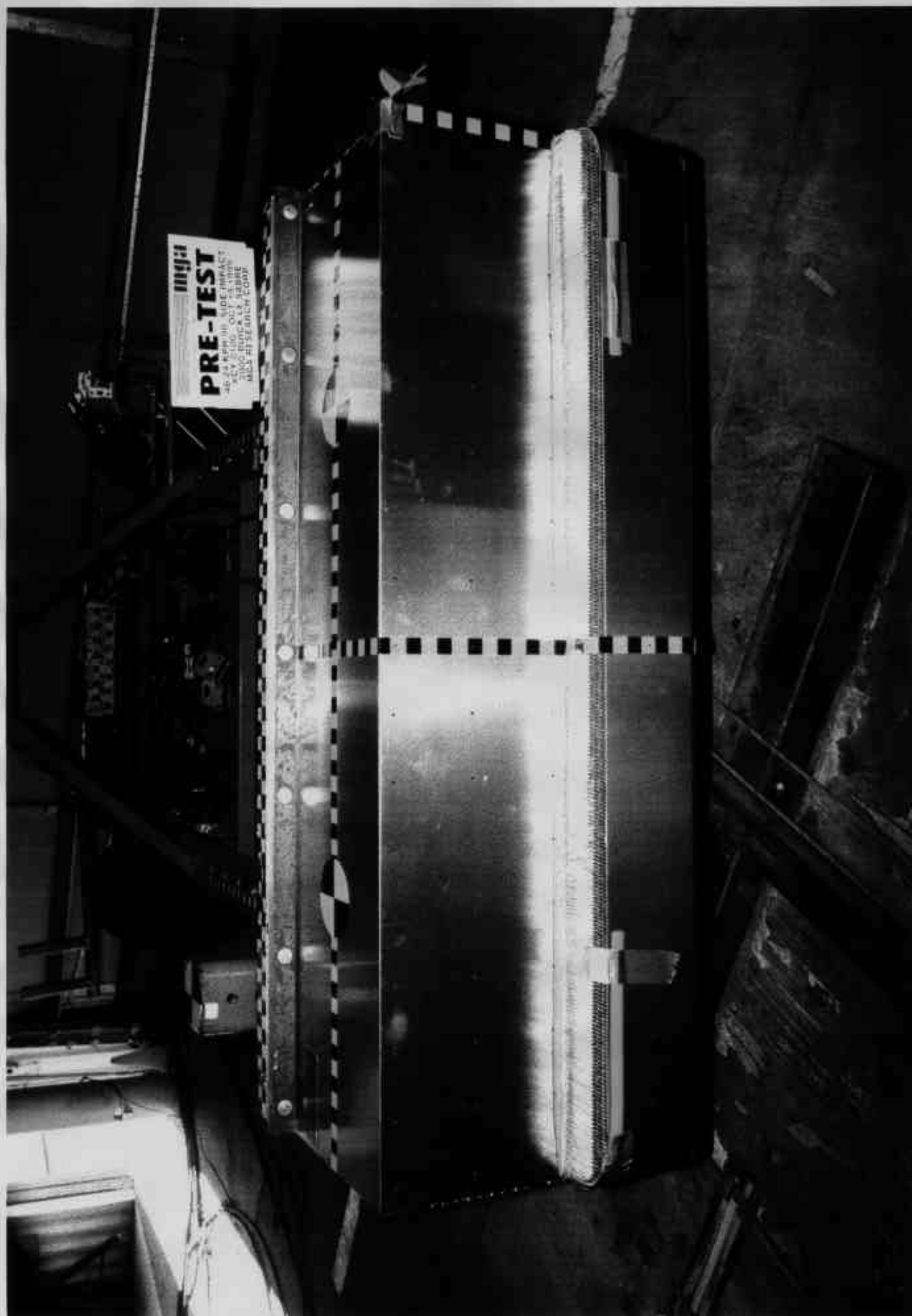


Photo No. A-15 - Pre-Test MDB Front View

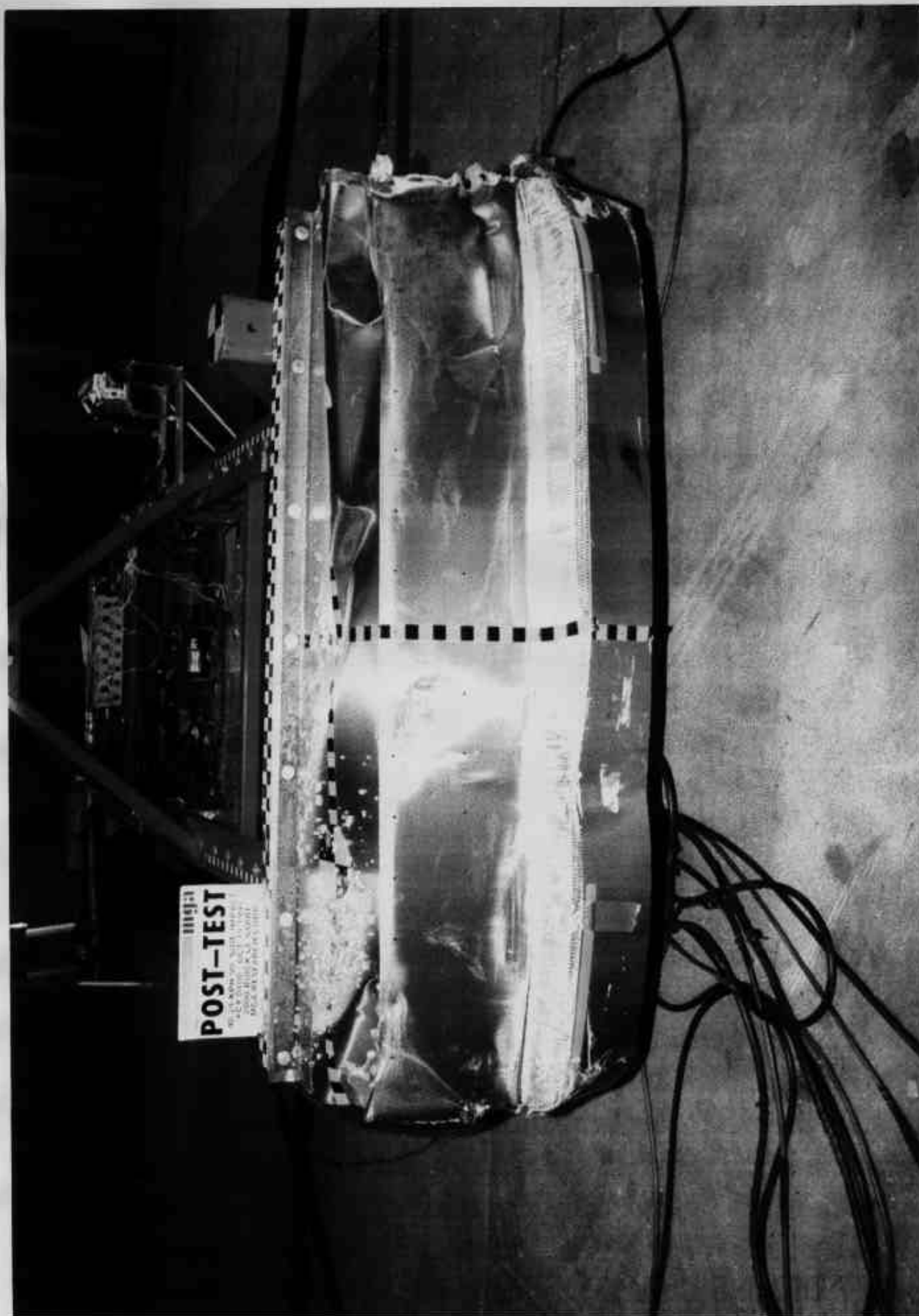


Photo No. A-16 - Post-Test MDB Front View

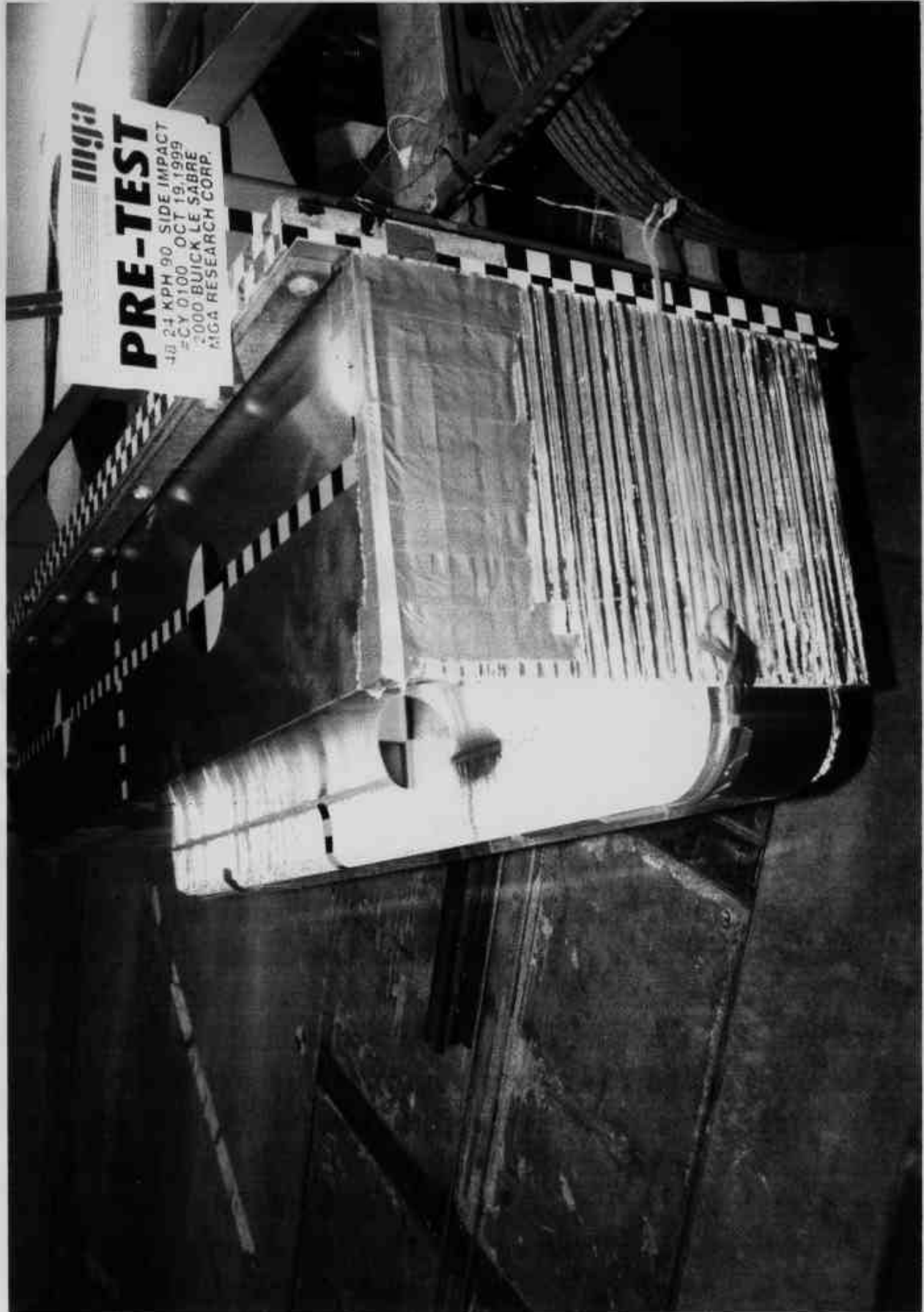


Photo No. A-17 - Pre-Test MDB Left Side View

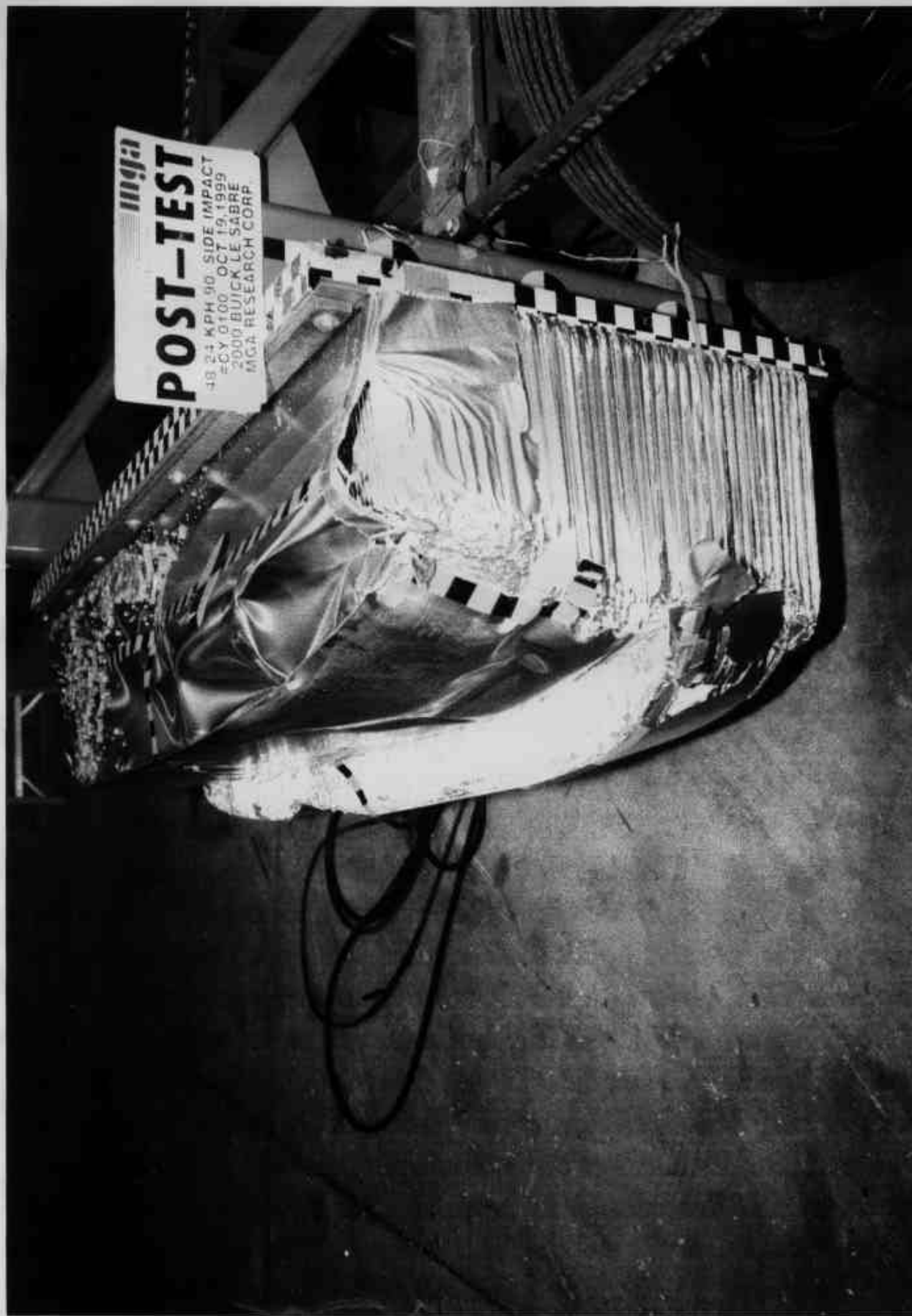


Photo No. A-18 - Post-Test MDB Left Side View

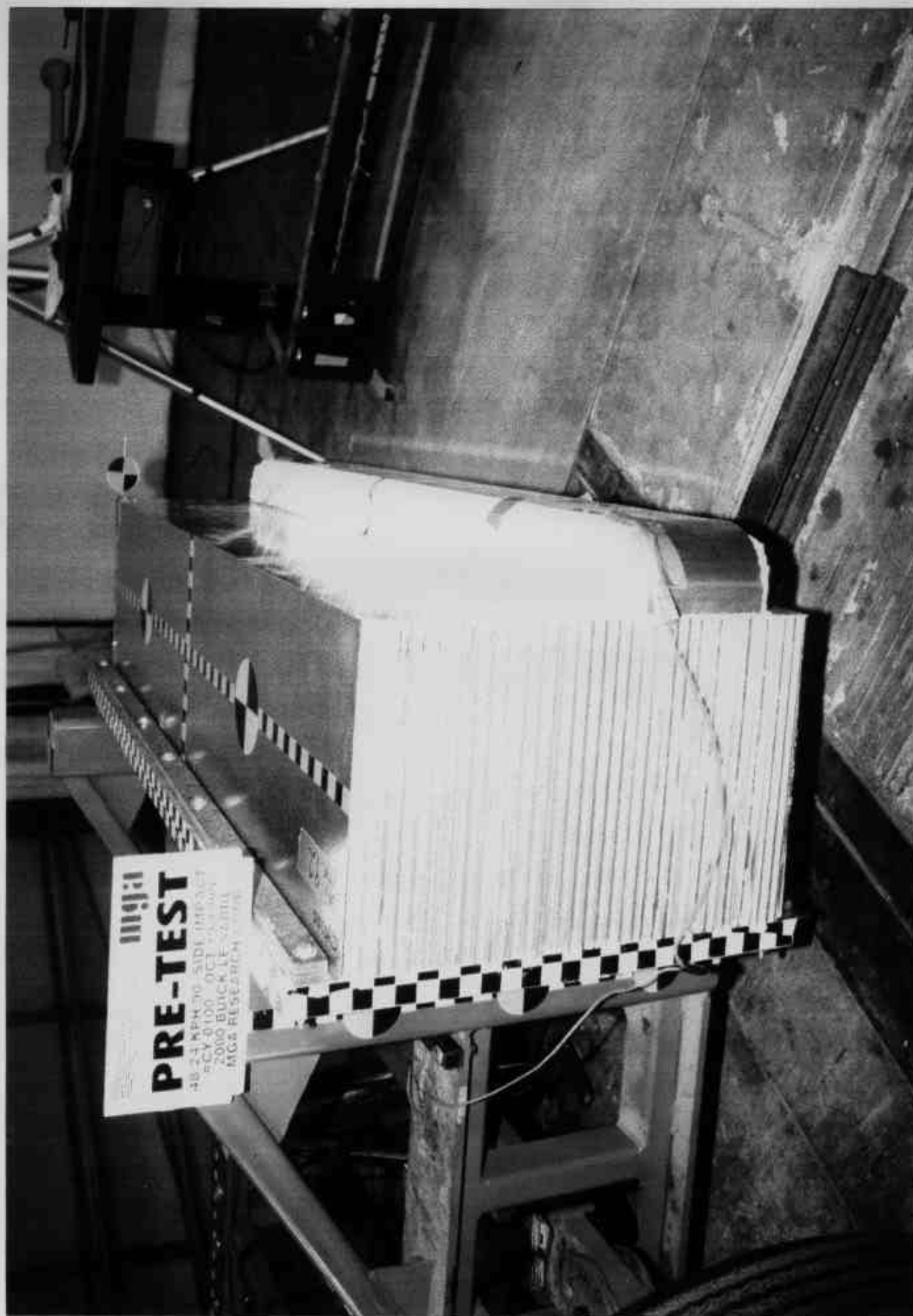


Photo No. A-19 - Pre-Test MDB Right Side View



POST-TEST
48/24 KPH 90° SIDE IMPACT
#CY 0100 OCT 19, 1999
2000 BUICK LE SABRE
MGA RESEARCH CORP.

Photo No. A-20 - Post-Test MDB Right 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)

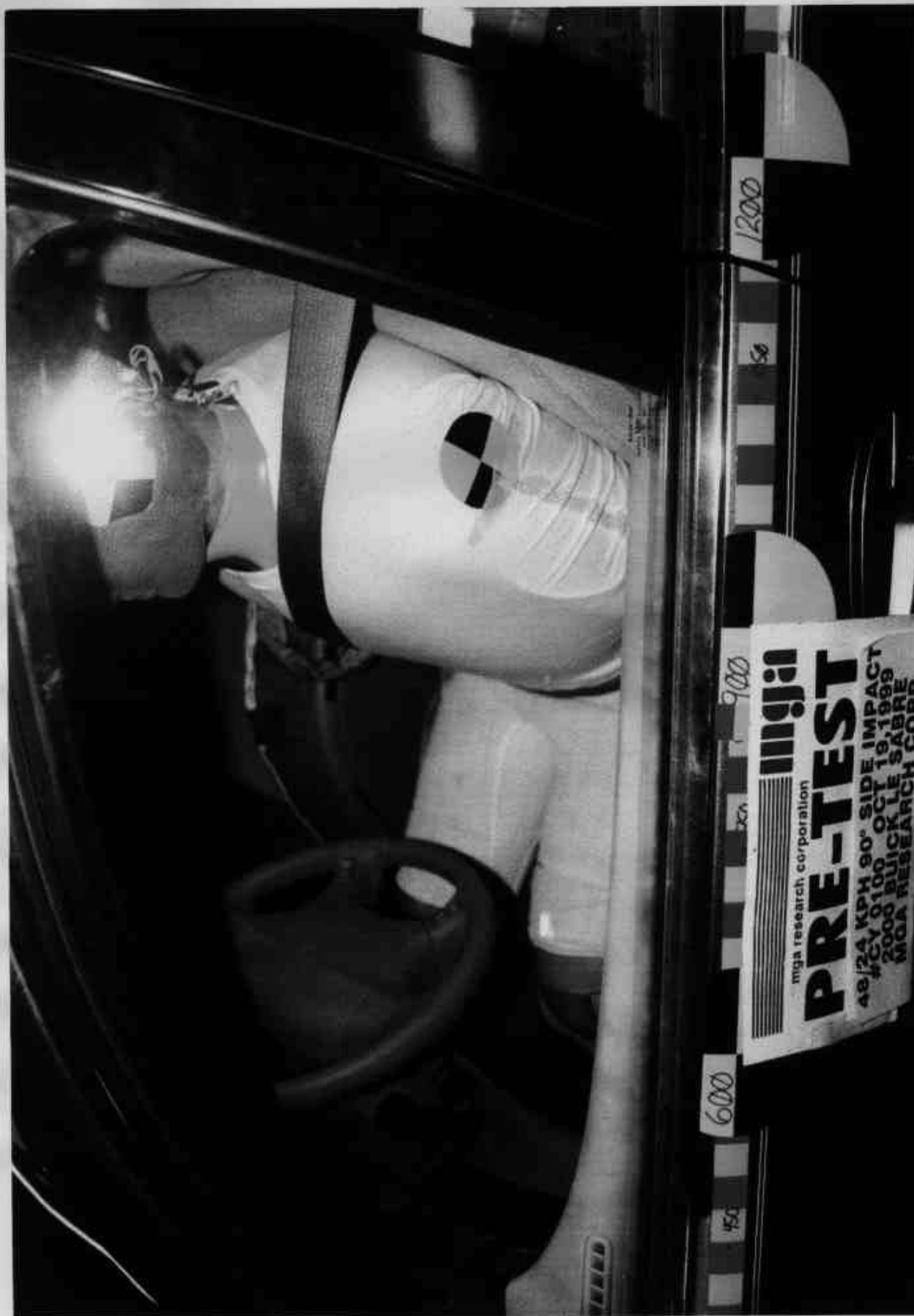


Photo No. A-26 - Pre-Test Driver Shoulder and Door Top View



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



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



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



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



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



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



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



Photo No. A-34 - Pre-Test Rear Passenger Dummy Shoulder View



Photo No. A-35 - Post-Test Rear Passenger Dummy Shoulder View



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



Photo No. A-37 - Pre-Test Right Front Impact Point on Vehicle



Photo No. A-38 - Post-Test Right Front Impact Point on Vehicle



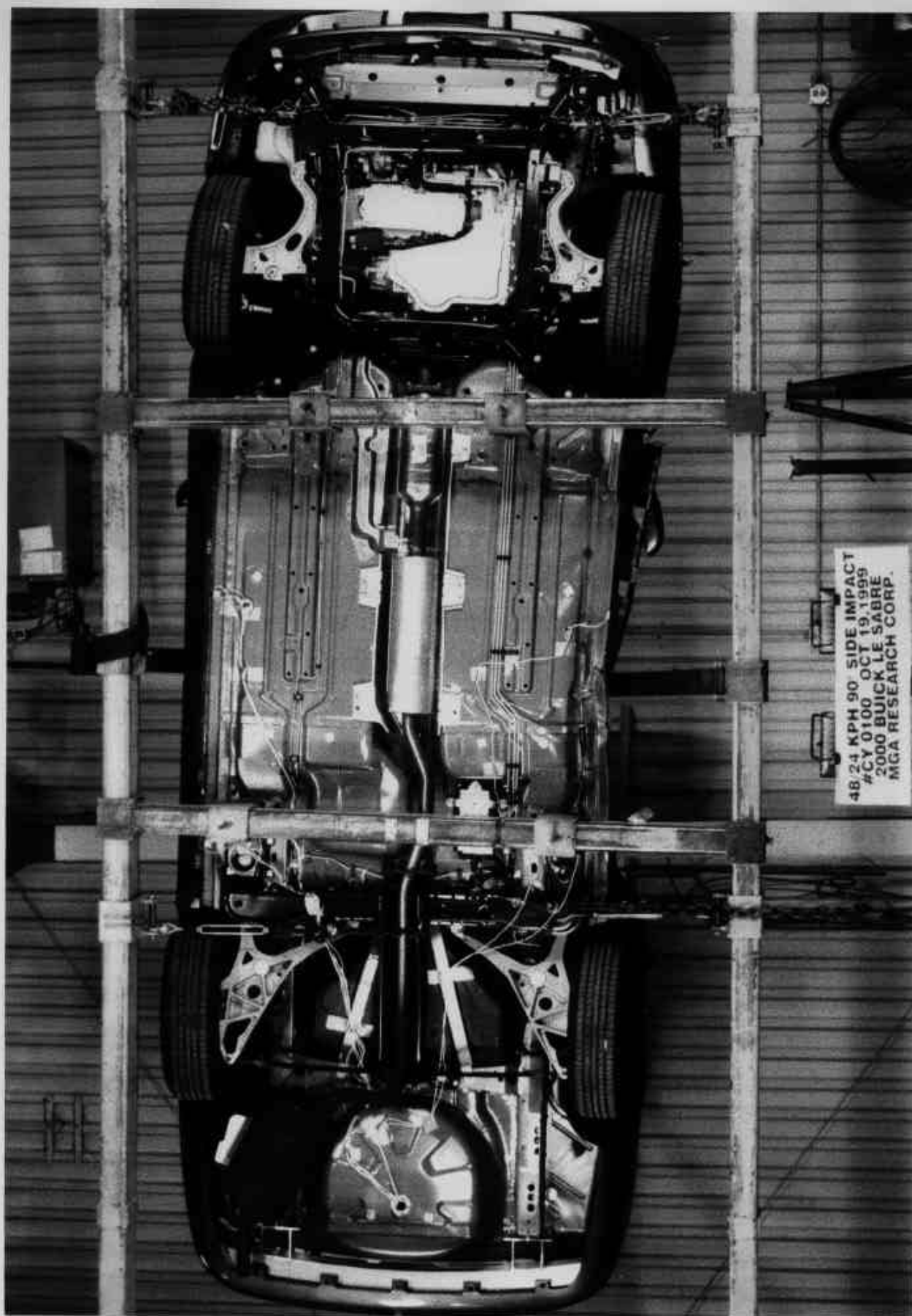
Photo No. A-39 - Impact

	MFD BY GENERAL MOTORS CORP			
DATE	GVWR	GAWR FRT	GAWR RR	
06/99	2057 KG	1120 KG	937 KG	
	4535 LB	2468 LB	2067 LB	
THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY, BUMPER, AND THEFT PREVENTION STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.				
1G4HP54K3YU127364		TYPE: PASS CAR		

Photo No. A-40 - Vehicle Certification Label

TIRE - LOADING INFORMATION			
OCCUPANTS			VEHICLE CAP. WT.
FRT.	CTR.	RR.	TOTAL
2	0	3	5
			LBS 925
MAX. LOADING @ GVWR SAME AS VEHICLE CAPACITY WEIGHT.			
1G4HP54K3YU127364			
MODEL: HP69 HBM			
TIRE SIZE		SPEED RTG	COLD TIRE PRESSURE
FRT	P215/70R15	S	230KPA(33PSI)
RR	P215/70R15	S	230KPA(33PSI)
SPA	T125/70R16	M	420KPA(60PSI)
IF TIRES ARE HOT, ADD 28KPA(4PSI)			
SEE OWNER'S MANUAL FOR MORE INFORMATION			

Photo No. A-41 - Tire Placard



48/24 KPH 90 SIDE IMPACT
#CY 0100 OCT 19, 1999
2000 BUICK LE SABRE
MGA RESEARCH CORP.

Photo No. A-42 - Rollover 90°

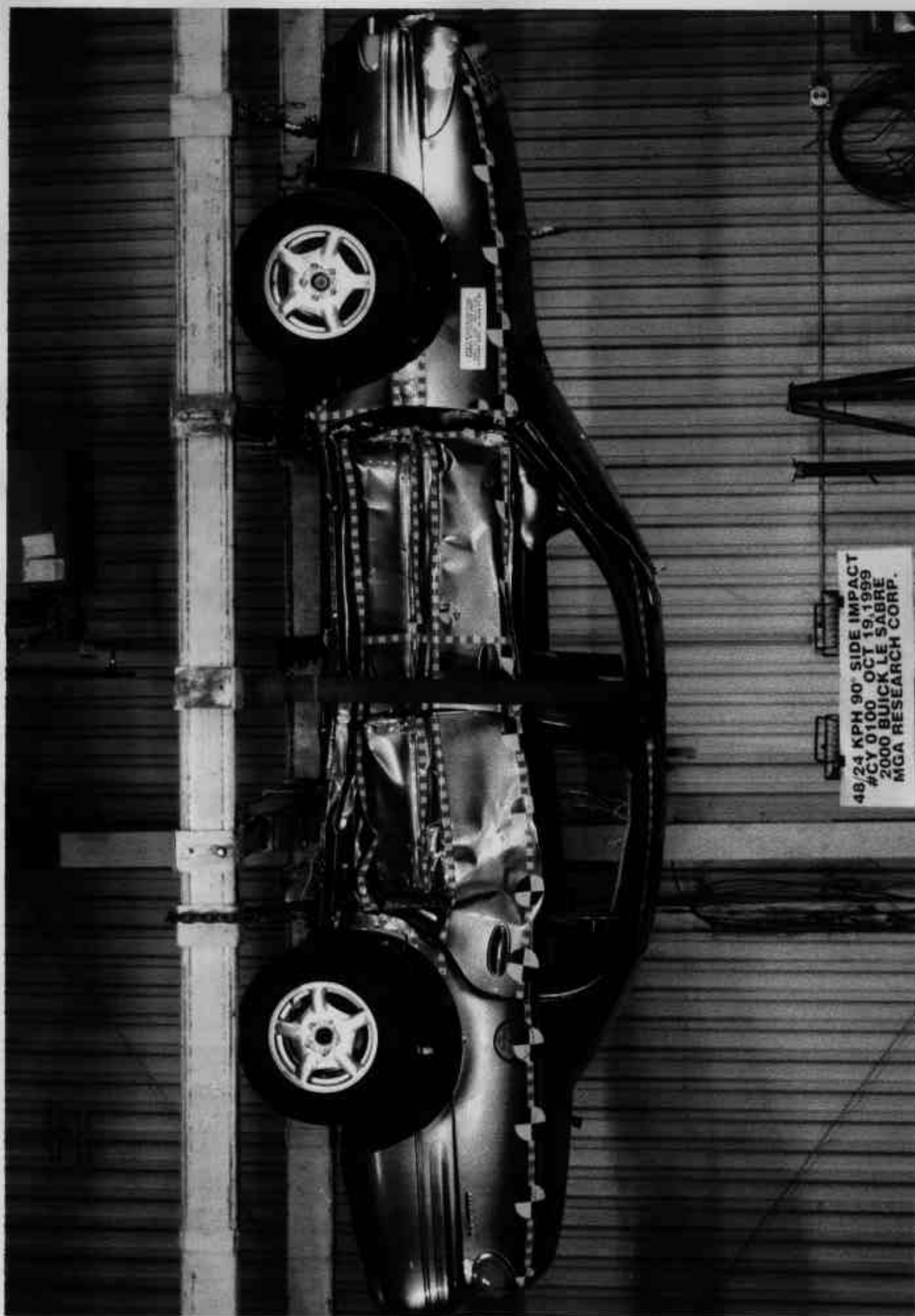


Photo No. A-43 - Rollover 180°



Photo No. A-44 - Rollover 270°



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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* There is a shift in the data

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TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

COMPONENT: 2000 BUICK LESABRE (CY0100)

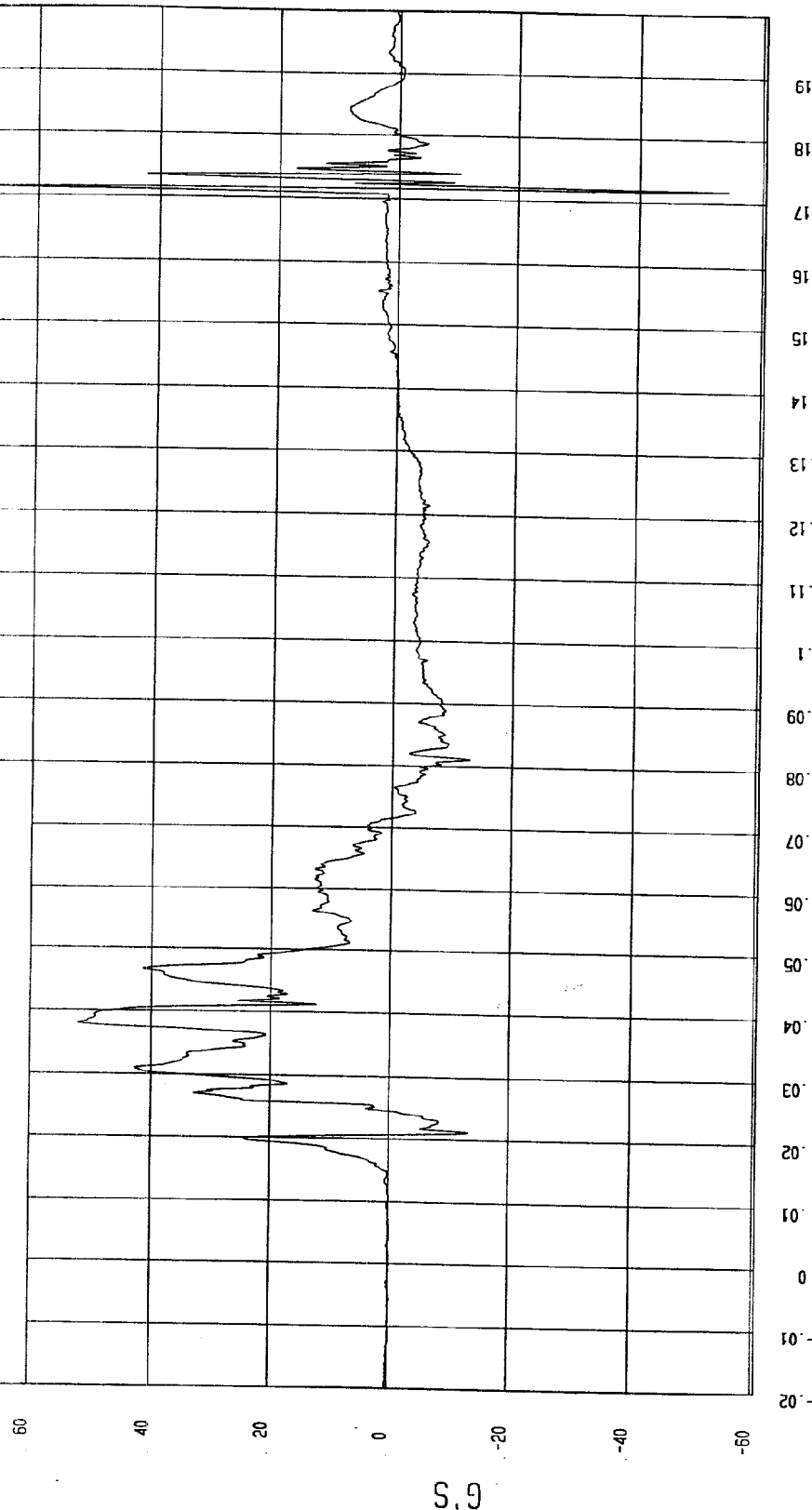
Speed: 32.7 MPH 52.6 KPH

Minimum = -54.34 G'S at 172 msec

Maximum = 70.22 G'S at 171 msec

DRIVER UPPER RIB Y ACCELERATION

1 899067AT.A15 Filterclass (1000)



TIME (SECONDS)

WCA Research
10-25-1999 10:39

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

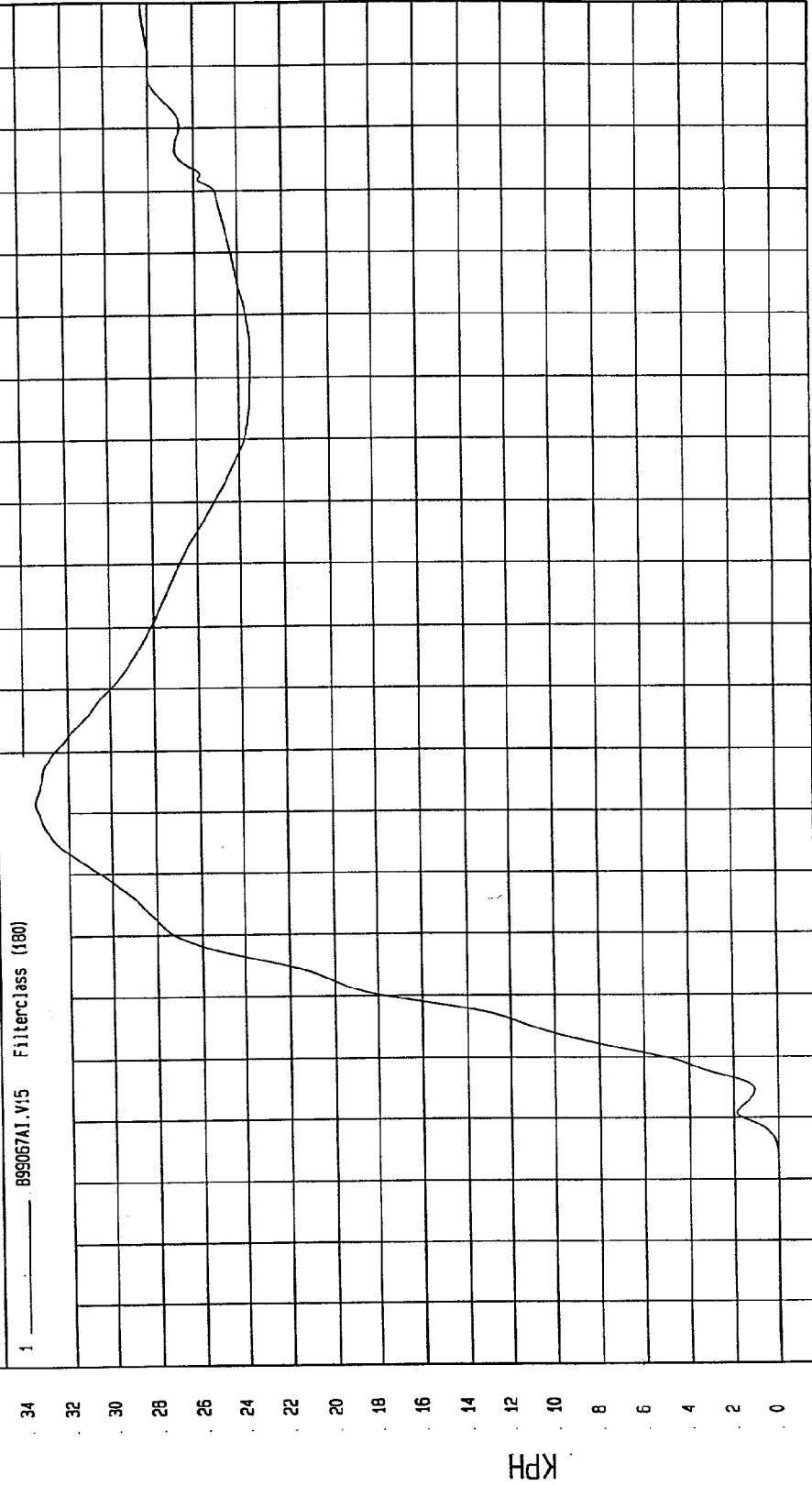
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 33.49 KPH at 72 msec

Minimum = 0 KPH at -20 msec

DRIVER UPPER RIB Y VELOCITY

1 ——— B99067A1.V15 Filterclass (180)



MCA Research
10-25-1999 10:40

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

COMPONENT: 2000 BUICK LESABRE (CY0100)

Speed: 32.7 MPH 52.6 KPH

Minimum = -74.95 G'S at 172 msec

Maximum = 92.02 G'S at 171 msec

DRIVER LOWER RIB Y ACCELERATION

1 899057AT.A16 Filterclass (1000)

100

80

60

40

20

0

-20

-40

-60

-80

G.S

-02

-01

0

01

02

03

04

05

06

07

08

09

1

11

12

13

14

15

16

17

18

19

TIME (SECONDS)

WGA Research
10-25-1999 10:40

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

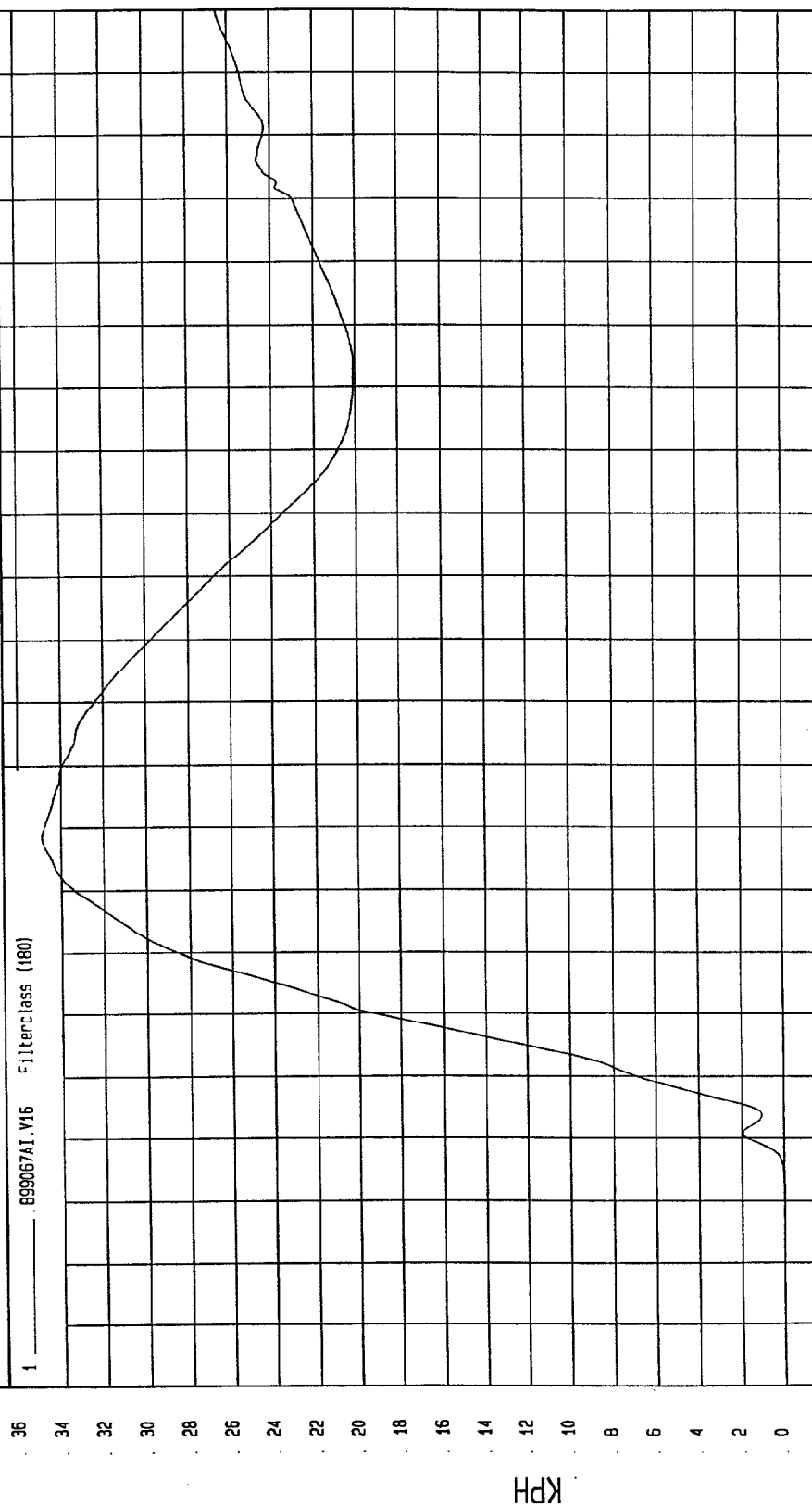
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 34.91 KPH at 68 msec

Minimum = -2.81E-02 KPH at 8 msec

DRIVER LOWER RIB Y VELOCITY

1 899067AI.V16 Filterclass (180)



WGA Research
10-25-1999 10:40

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

COMPONENT: 2000 BUICK LESABRE (CY0100)

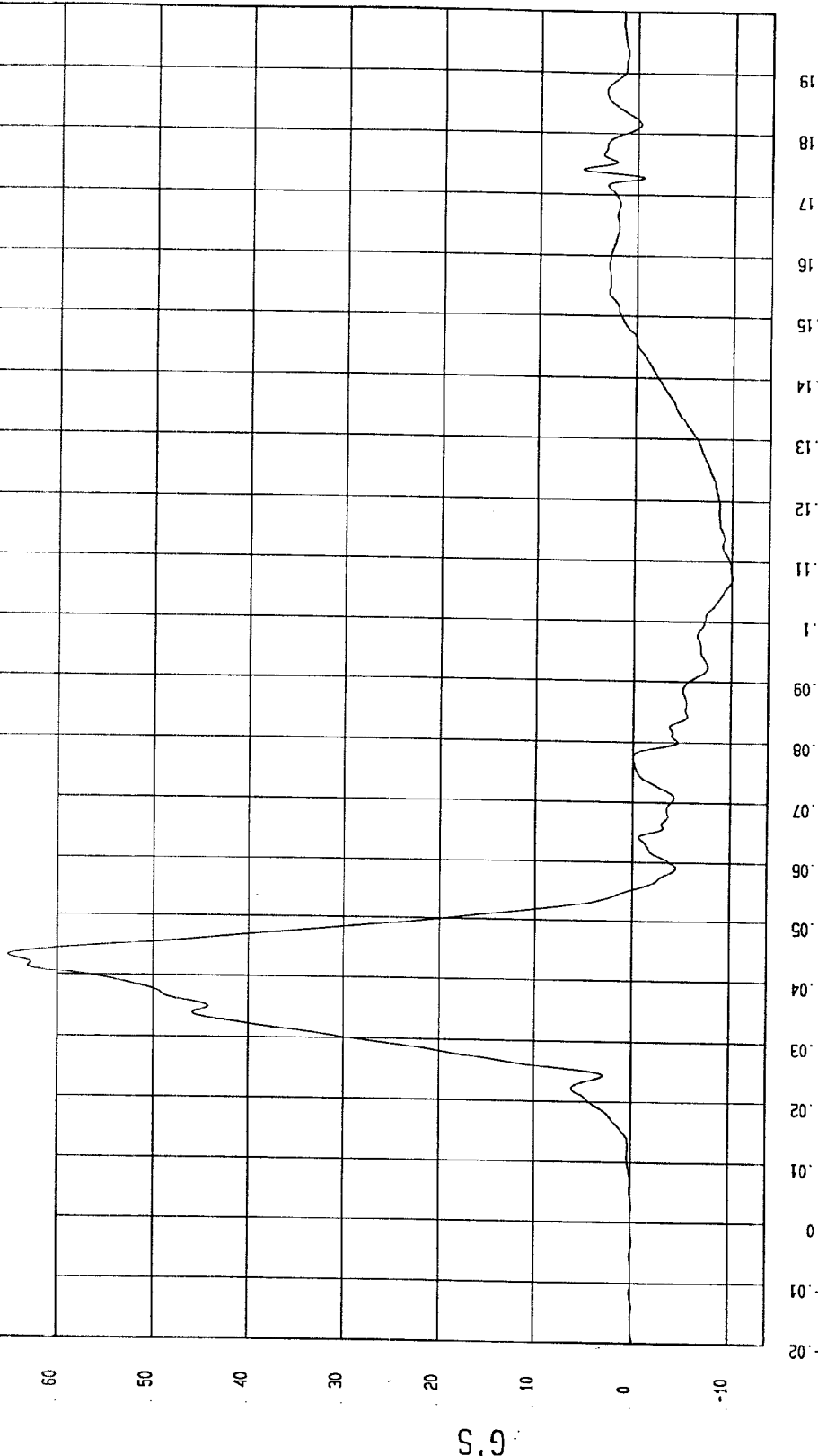
Speed: 32.7 MPH 52.6 KPH

Minimum = -10.1 G'S at 107 msec

Maximum = 65.04 G'S at 43 msec

DRIVER LOWER SPINE Y ACCELERATION

1 B89067AF.A17 Filterclass (180)



MSA Research
10-25-1999 10:40

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

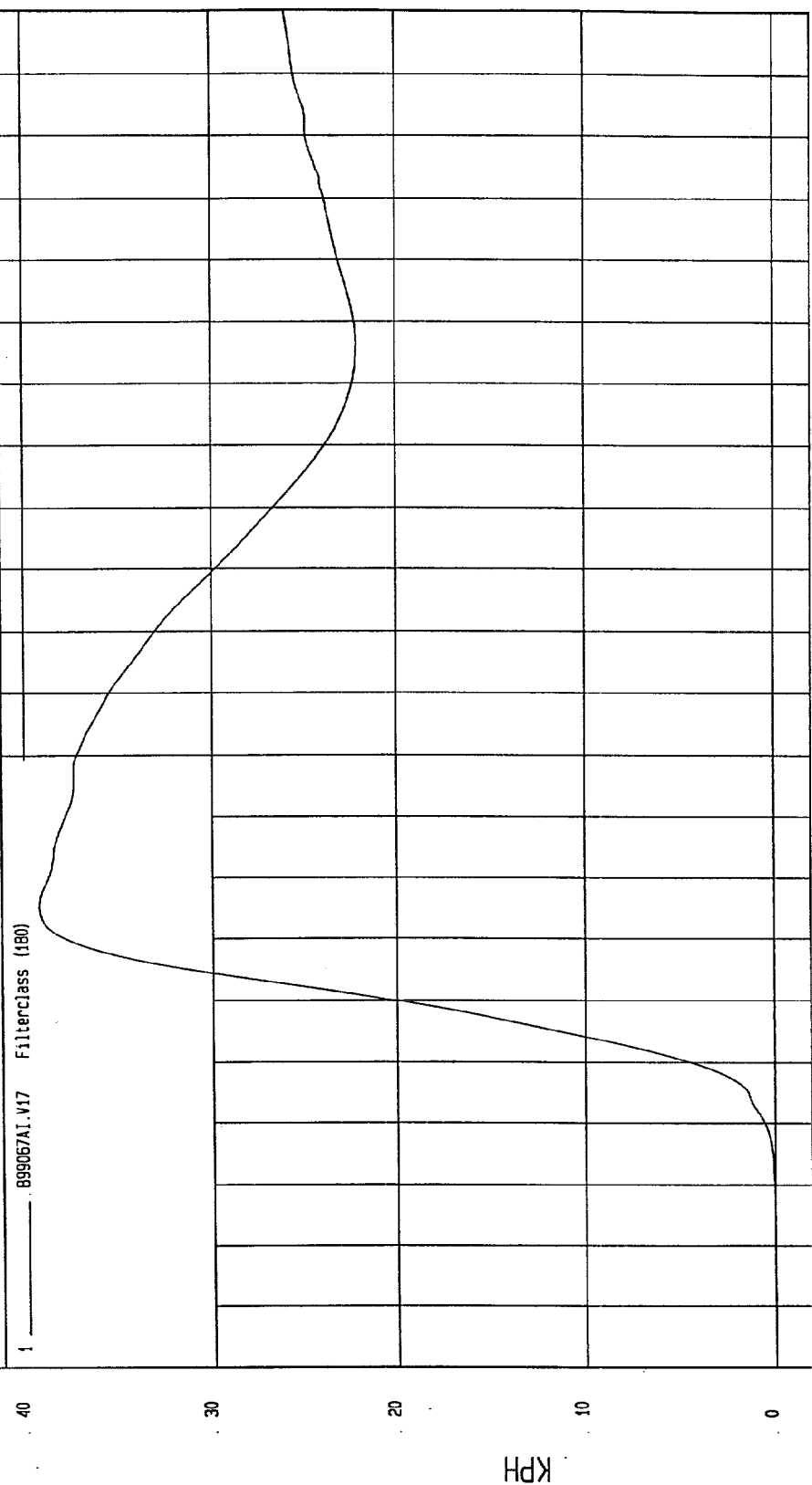
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 39.22 KPH at 55 msec

Minimum = -.01 KPH at -13 msec

DRIVER LOWER SPINE Y VELOCITY

1 899067A1.V17 FilterClass (180)



TIME Seconds

MCA Research
10-25-1999 10:40

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

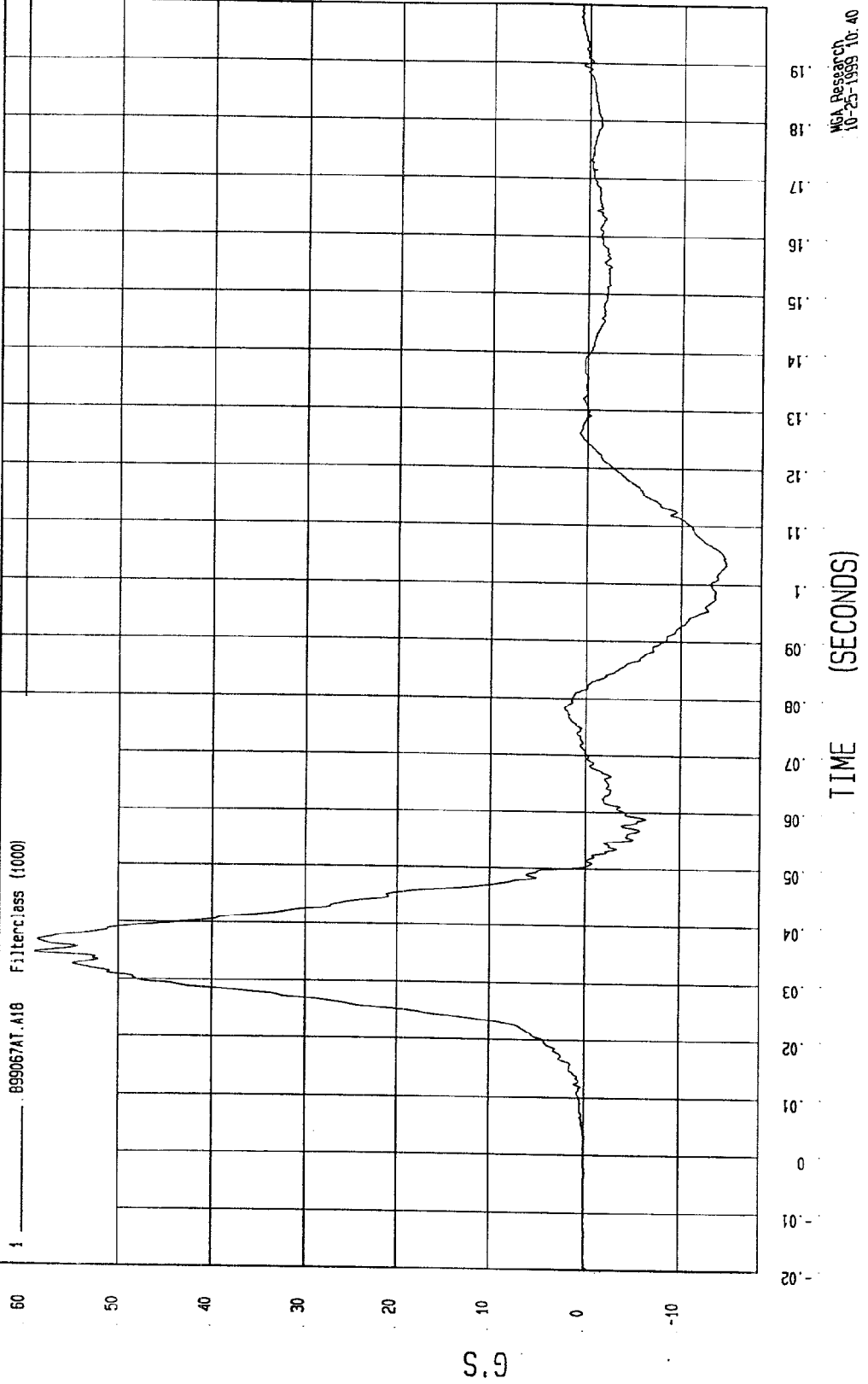
Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 59 G'S at 35 msec

Minimum = -14.72 G'S at 103 msec

DRIVER PELVIS Y ACCELERATION



TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

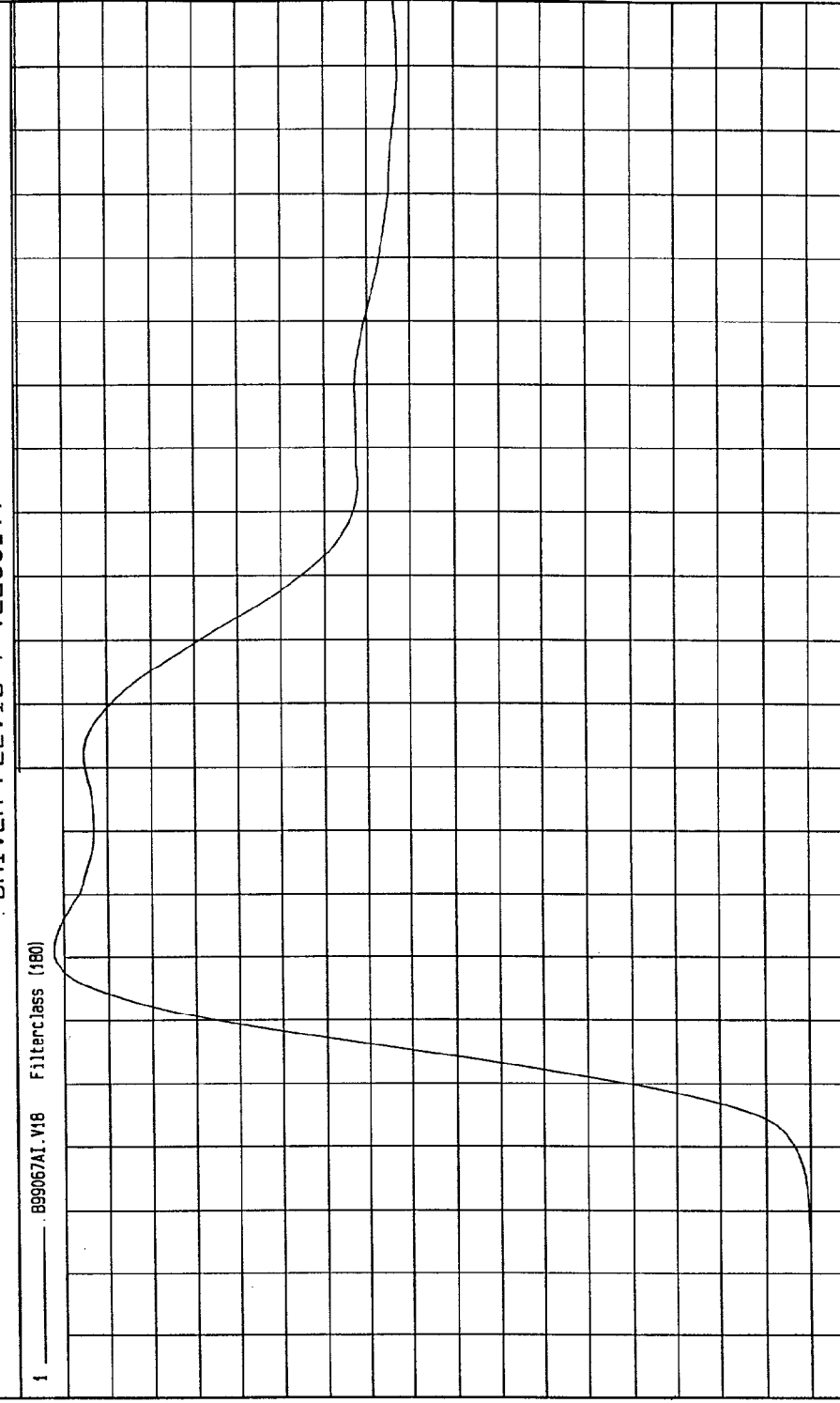
Maximum = 34.45 KPH at 51 msec

Minimum = -0.93E-03 KPH at -13 msec

DRIVER PELVIS Y VELOCITY

1 _____ B99067A1.V18 Filterclass (160)

KPH



TIME Seconds

WSA Research
10-25-1999 10:40

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

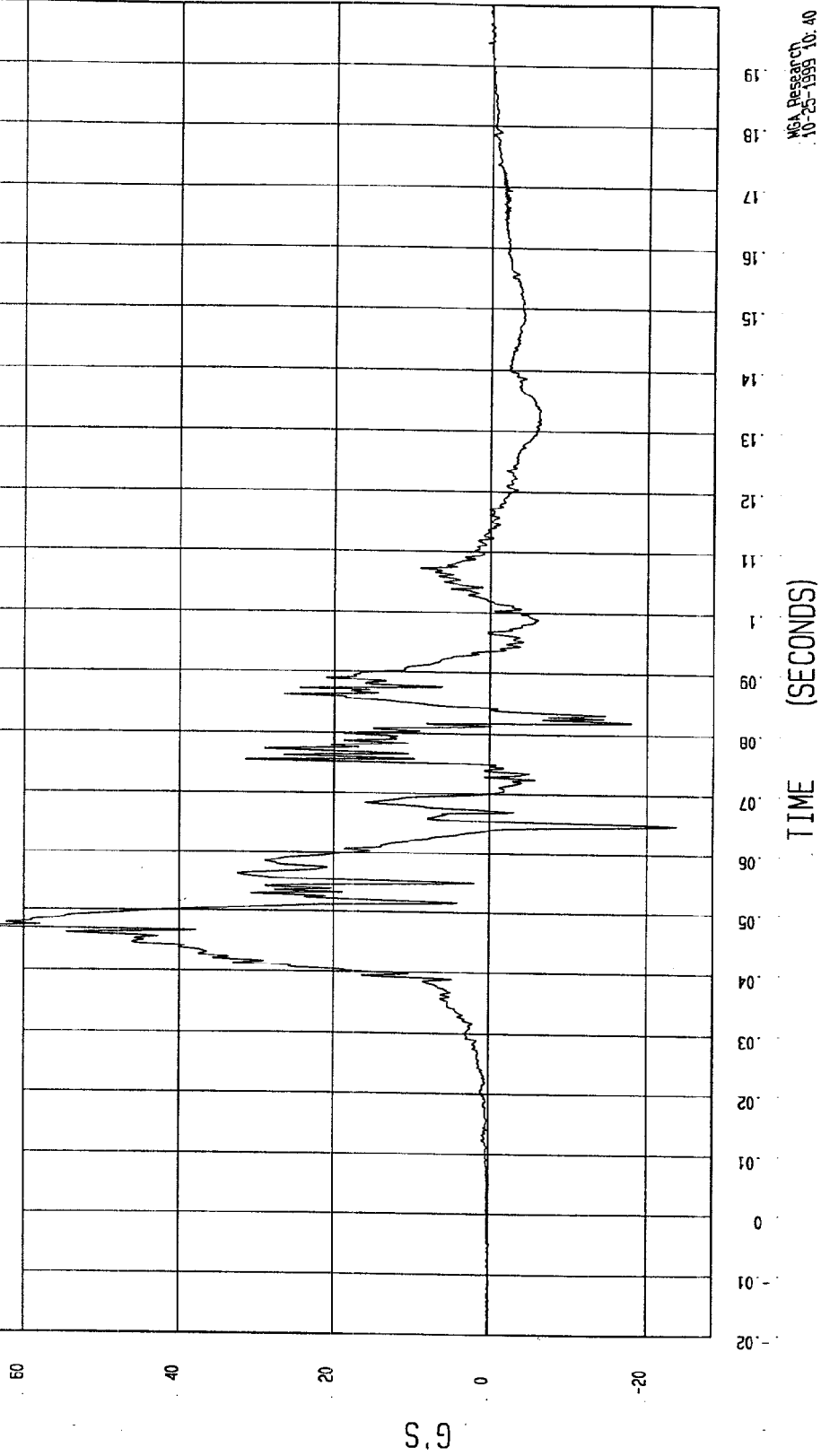
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 68.68 G'S at 47 msec

Minimum = -23.79 G'S at 65 msec

REAR PASSENGER UPPER RIB Y ACCELERATION

1 899067AT.A25 Filter: class (1000)



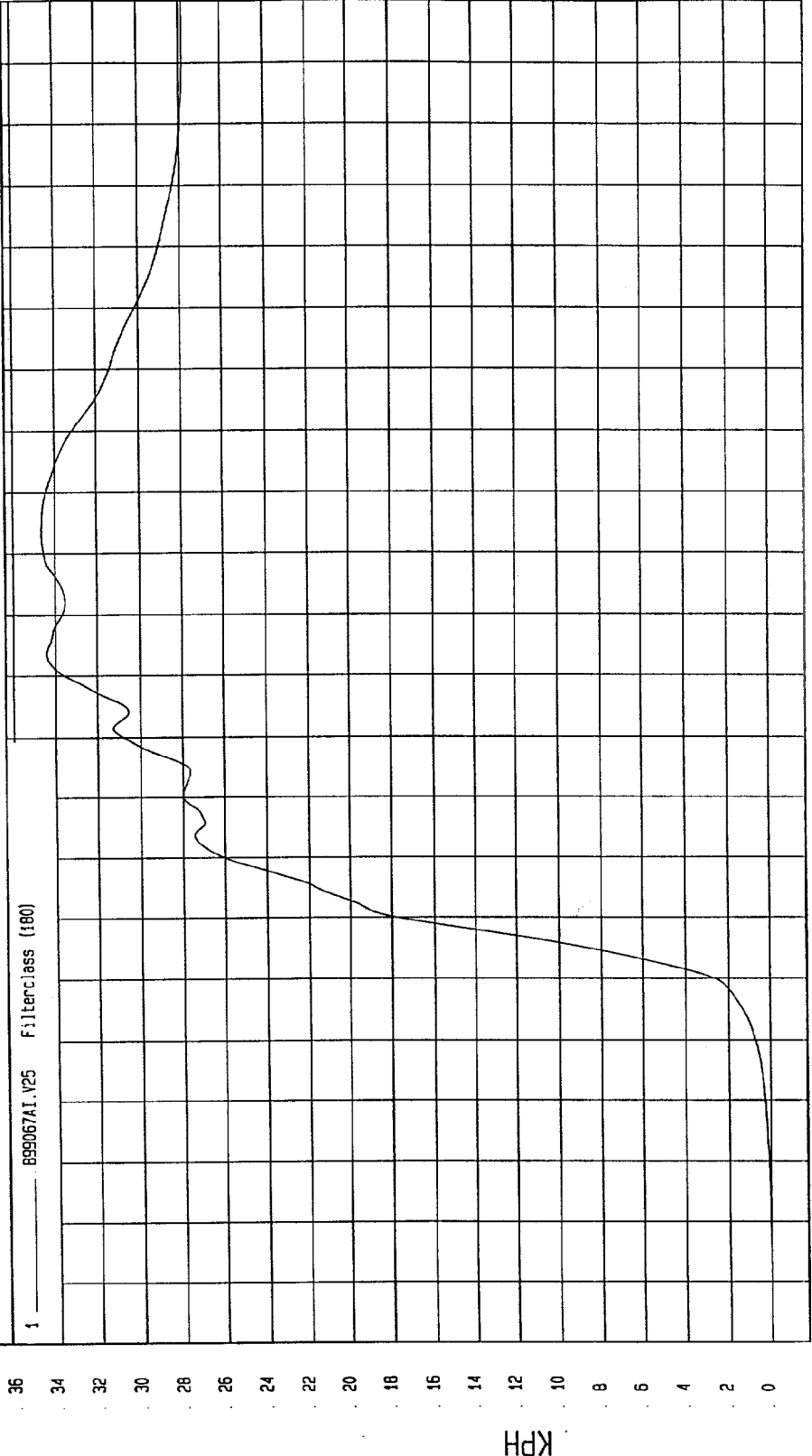
MGA Research
10-25-1999 10:40

TEST: FMVSS 214 DYNAMIC SIDE IMPACT TEST DATE: 10-19-1999

COMPONENT: 2000 BUICK LESABRE (CY0100) Speed: 32.7 MPH 52.6 KPH

Minimum = 0 KPH at -20 msec Maximum = 34.65 KPH at 114 msec

REAR PASSENGER UPPER RIB Y VELOCITY



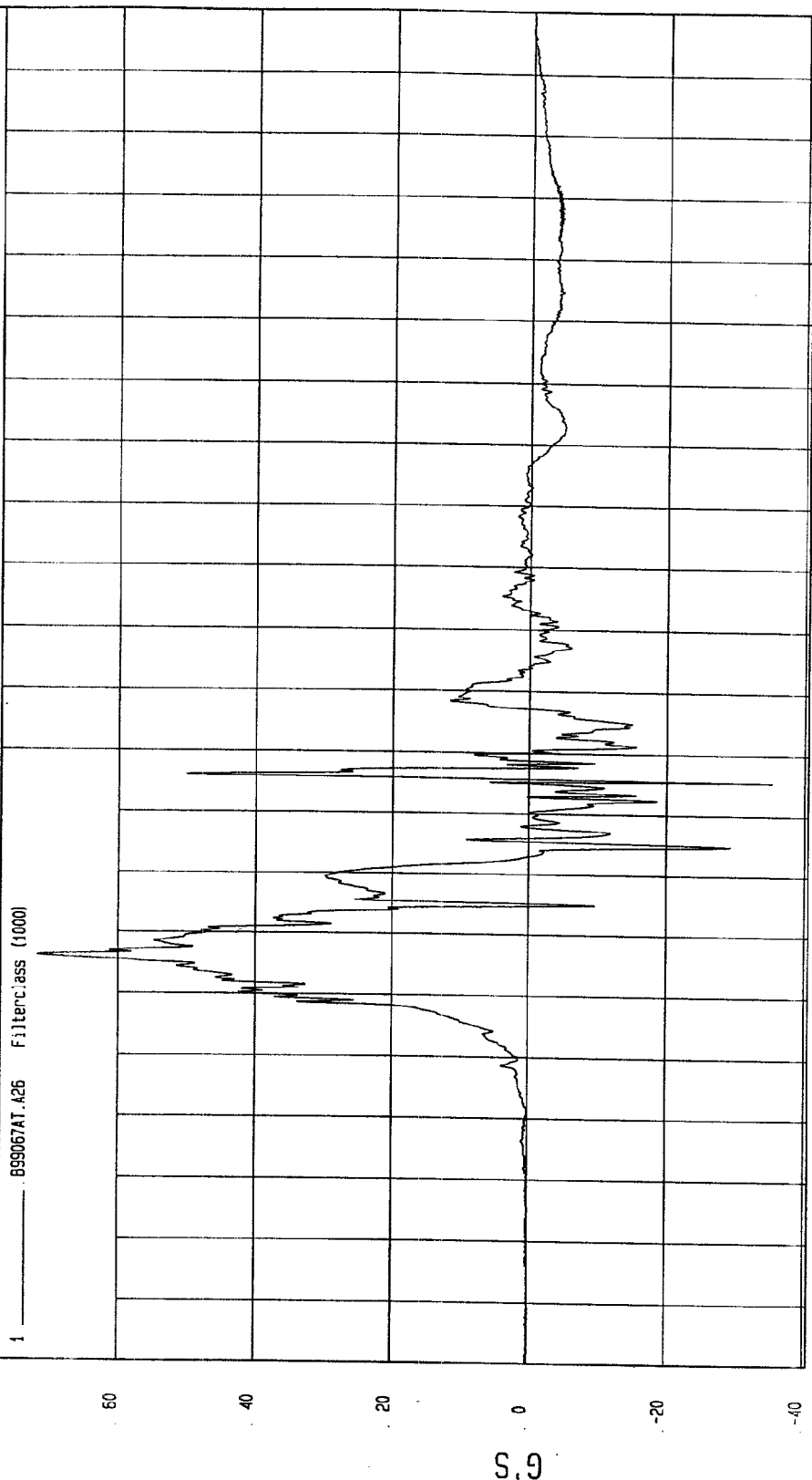
TIME Seconds

69
18
17
16
15
14
13
12
11
1
09
08
07
06
05
04
03
02
01
0
-01
-02

HGA Research
10-25-1999 10:40

TEST: FMVSS 214 DYNAMIC SIDE IMPACT
 COMPONENT: 2000 BUICK LESABRE (CY0100)
 Minimum = -35.22 G'S at 75 msec
 Maximum = 71.77 G'S at 46 msec

REAR PASSENGER LOWER RIB Y ACCELERATION



MGA Research
 10-25-1999 10:40

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

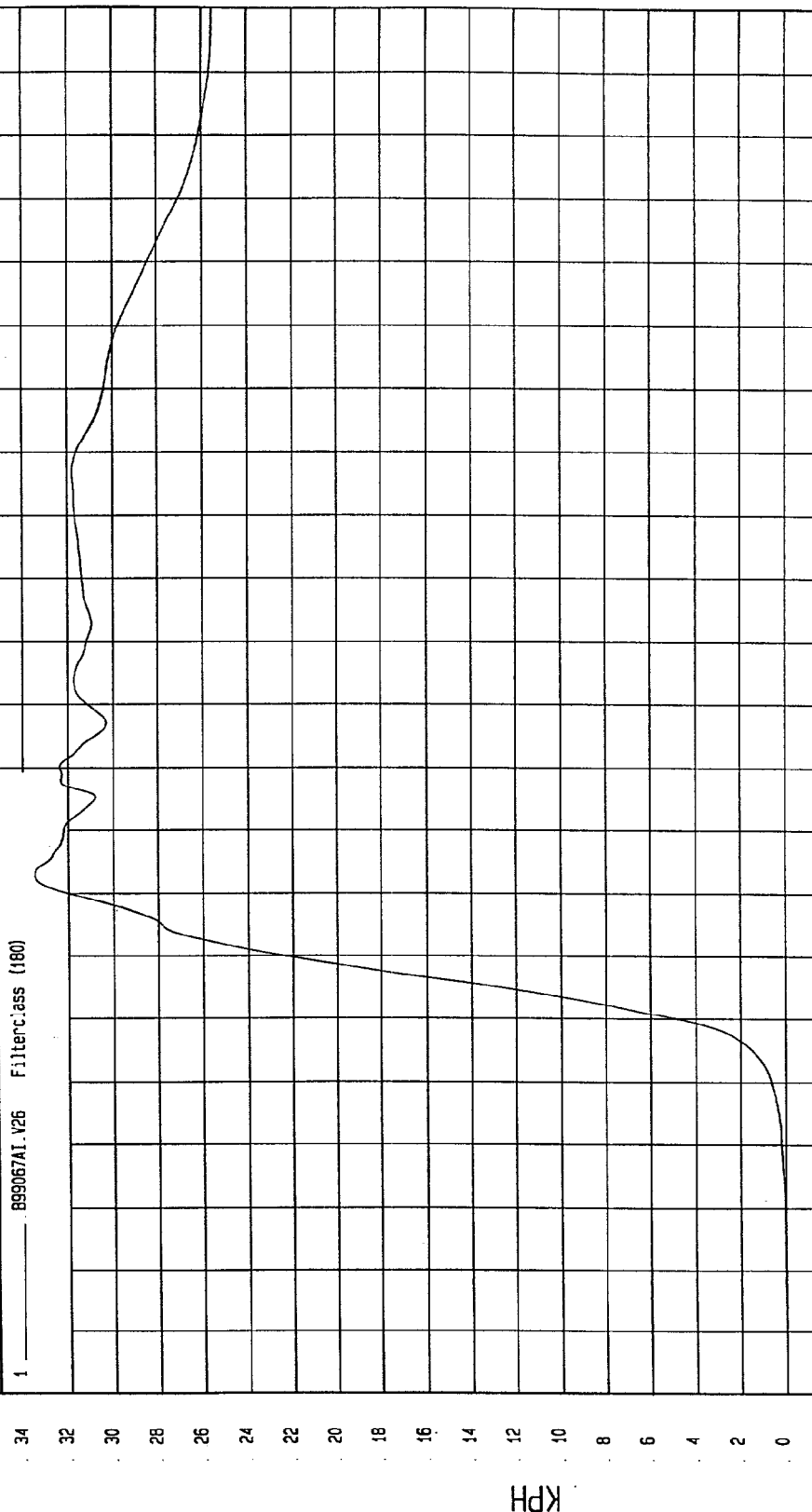
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 33.47 KPH at 63 msec

Minimum = -1.71E-03 KPH at -5 msec

REAR PASSENGER LOWER RIB Y VELOCITY

1 _____ B99067A1.V26 Filter: class (180)



WCA Research
10-25-1999 10:40

TIME Seconds

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

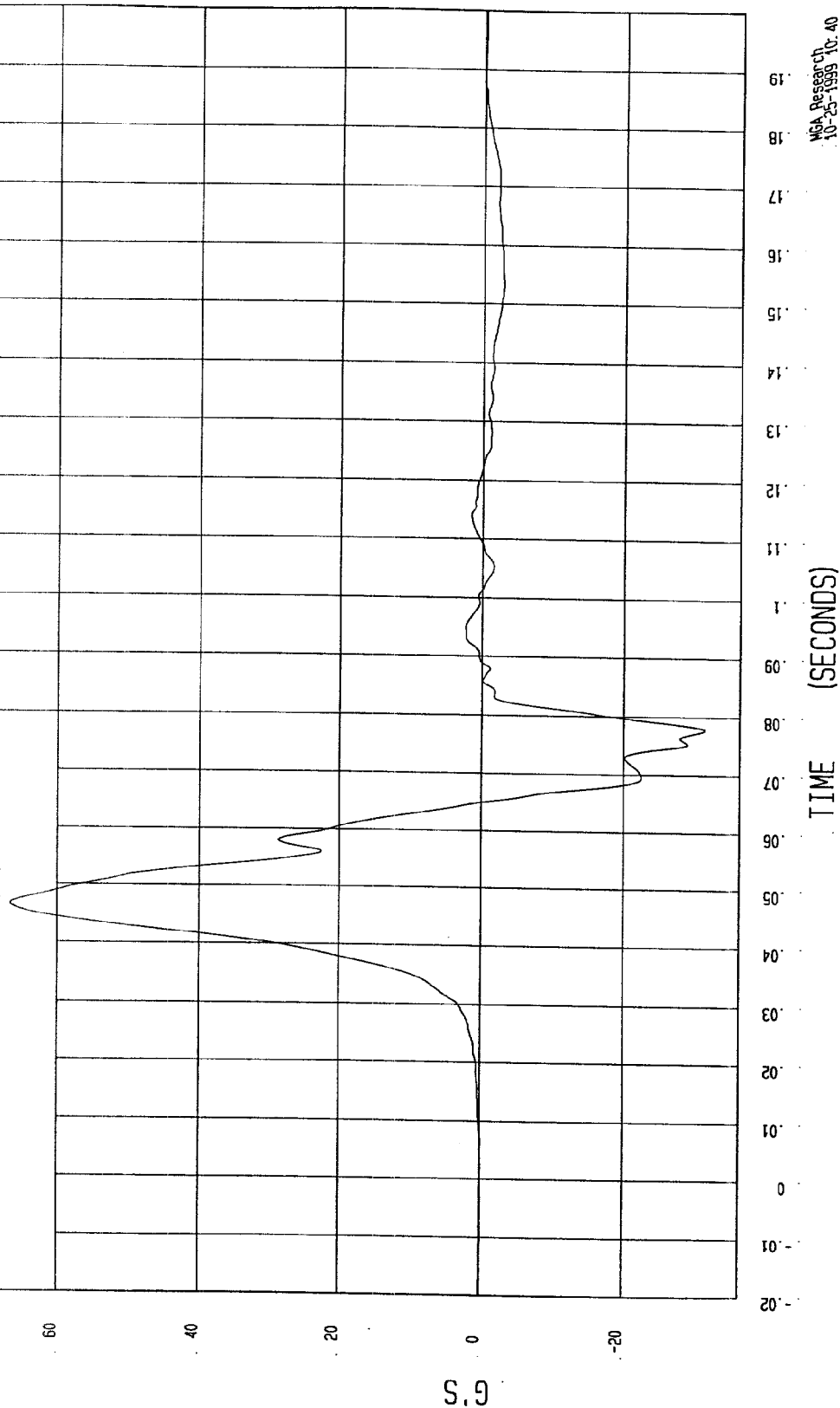
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 55.5 G'S at 47 msec

Minimum = -31.45 G'S at 78 msec

REAR PASSENGER LOWER SPINE Y ACCELERATION

1 ——— B99067AF.A27 FilterClass (180)

WSA Research
10-25-1999 10:40

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

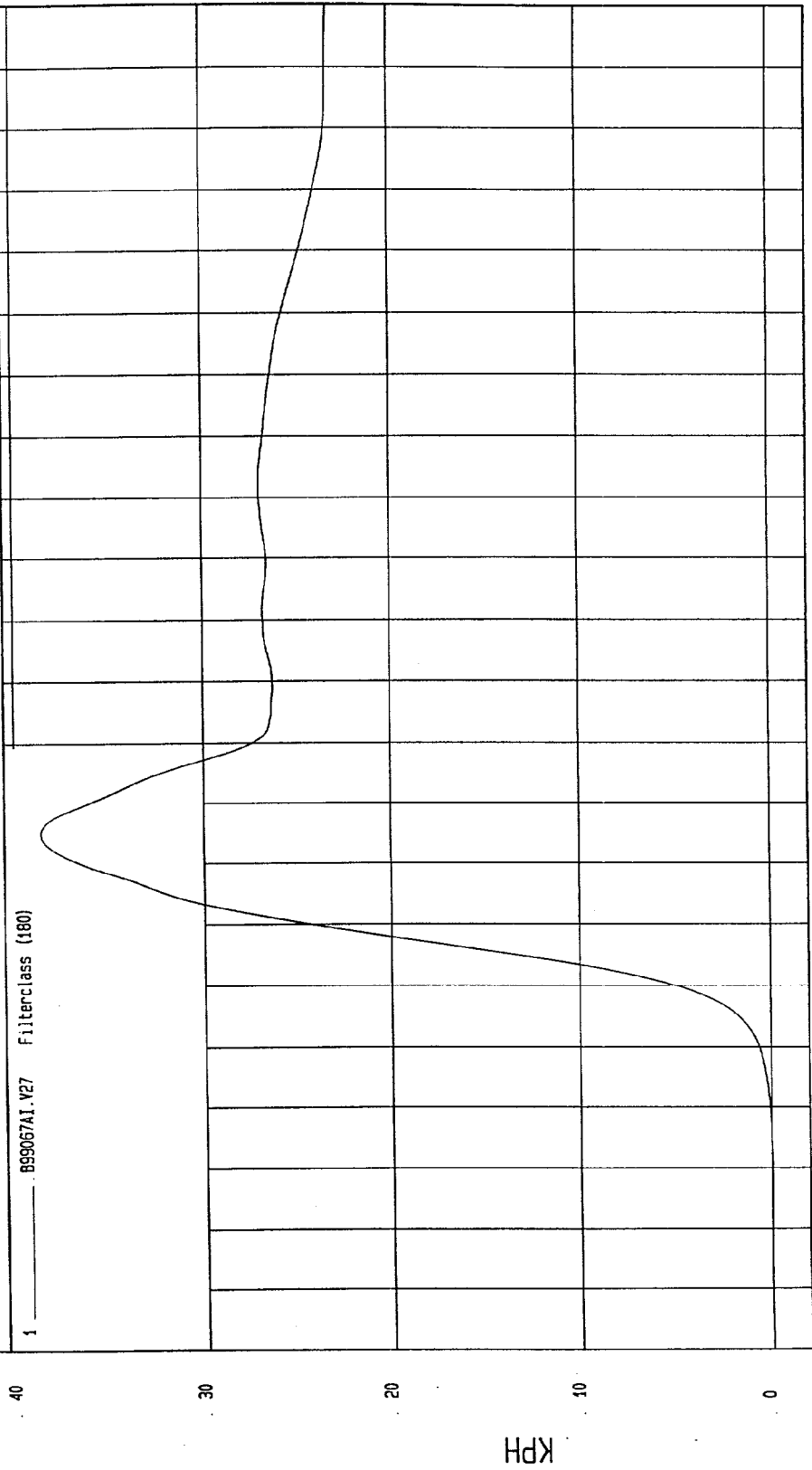
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 38.6 KPH at 65 msec

Minimum = -4.01E-02 KPH at 8 msec

REAR PASSENGER LOWER SPINE Y VELOCITY

1 _____ B99067A1.V27 Filterclass (180)

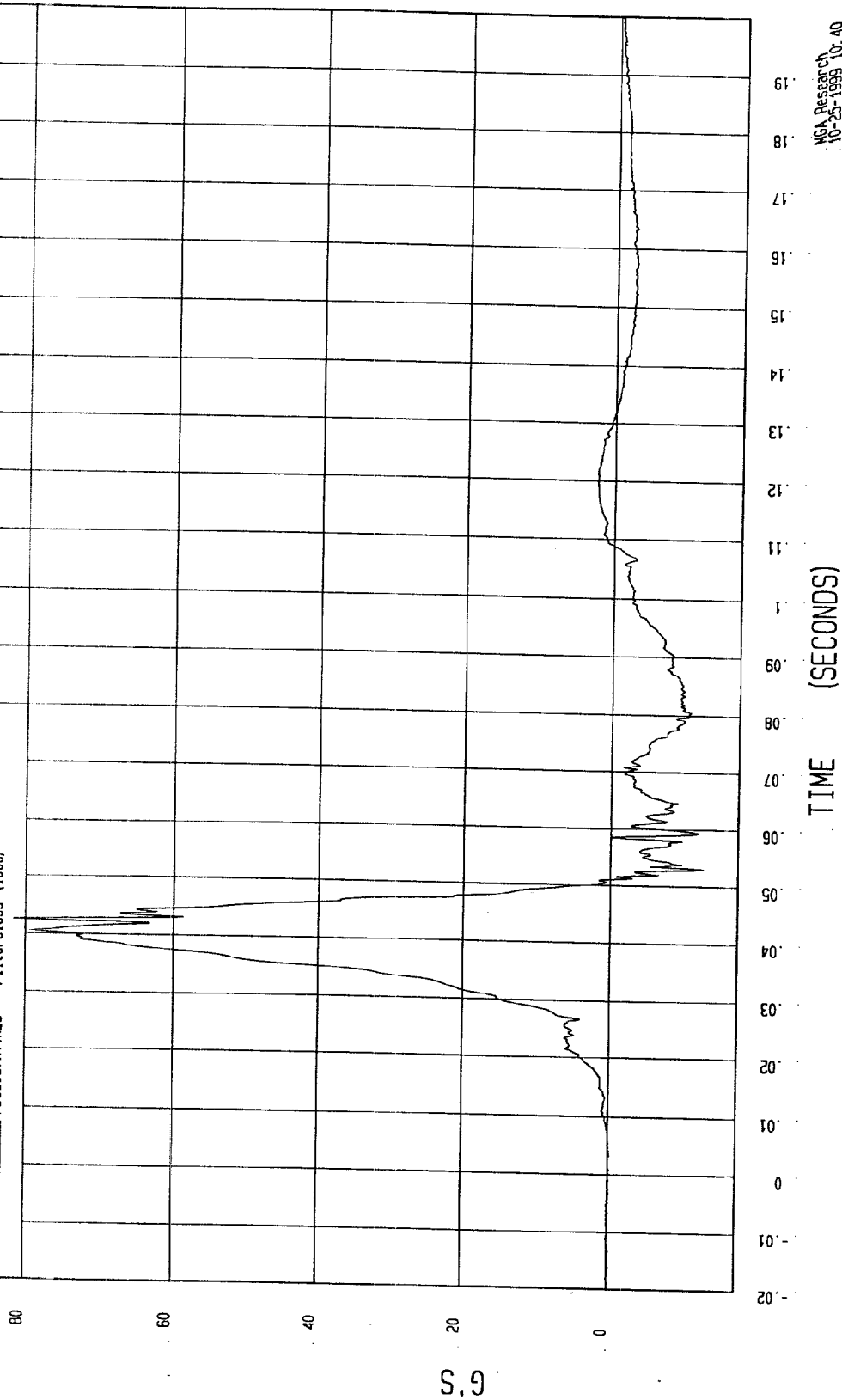


NCA Research
10-25-1999 10:40

TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 10-19-1999
COMPONENT: 2000 BUICK LESABRE (CY0100)
Speed: 32.7 MPH 52.6 KPH
Minimum = -12.36 G'S at 53 msec
Maximum = 81.57 G'S at 43 msec

REAR PASSENGER PELVIS Y ACCELERATION

1 .899057AT.A2B Filterclass (1000)

MCA Research
10-26-1999 10:40

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

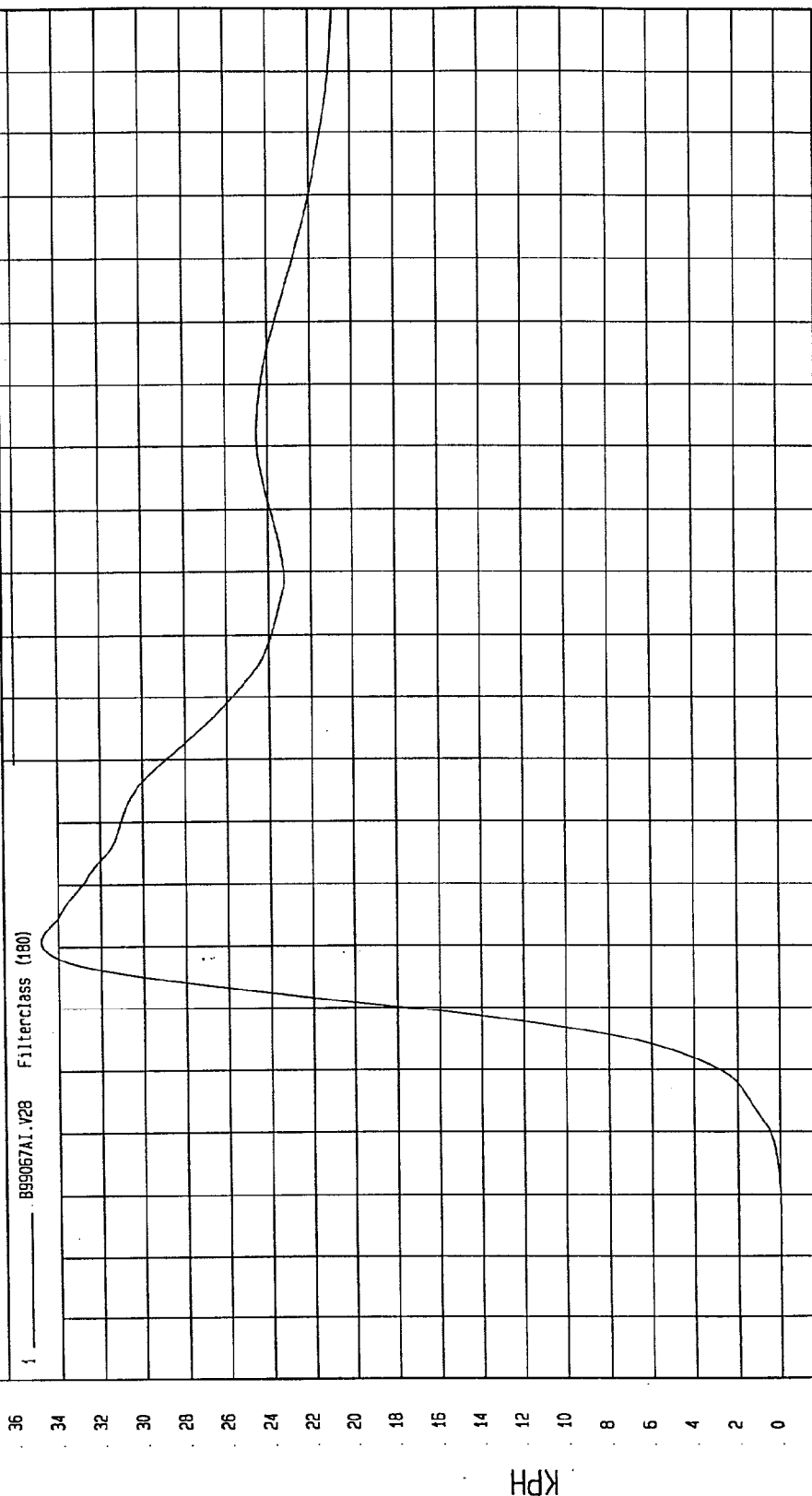
COMPONENT: 2000 BUICK LESABRE (CY0100)

Speed: 32.7 MPH 52.6 KPH

Maximum = 34.79 KPH at 51 msec

Minimum = -3.70E-02 KPH at 6 msec

REAR PASSENGER PELVIS Y VELOCITY



WCA Research
10-25-1999 10:40

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

COMPONENT: 2000 BUICK LESABRE (CY0100)

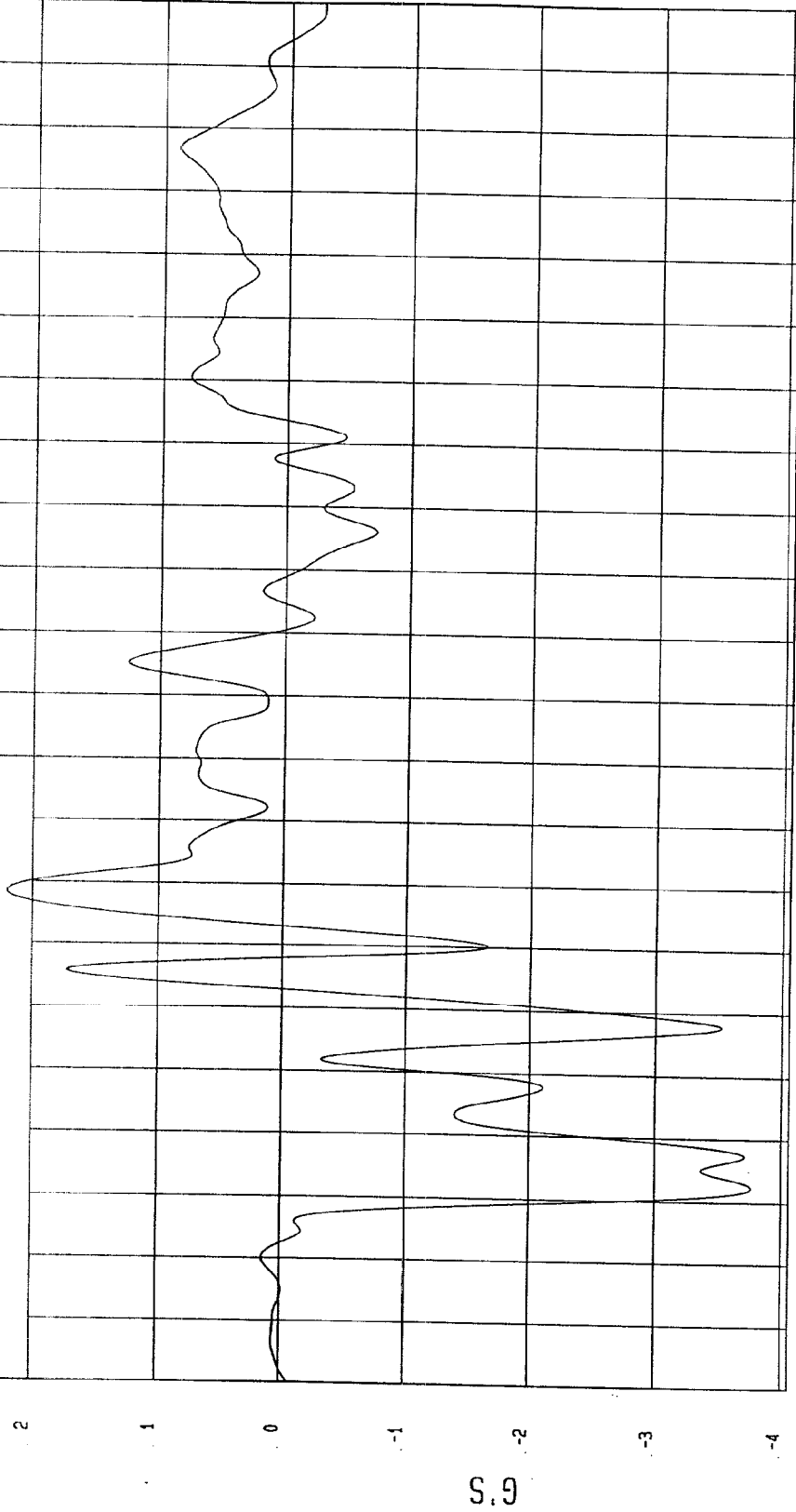
Speed: 32.7 MPH 52.6 KPH

Minimum = -3.76 G'S at 12 msec

Maximum = 2.2 G'S at 58 msec

RIGHT SIDE SILL AT FRONT SEAT X ACCELERATION

1 ——— B99067AF.A32 Filterclass (60)



MOA Research
10-19-1999 14:28

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

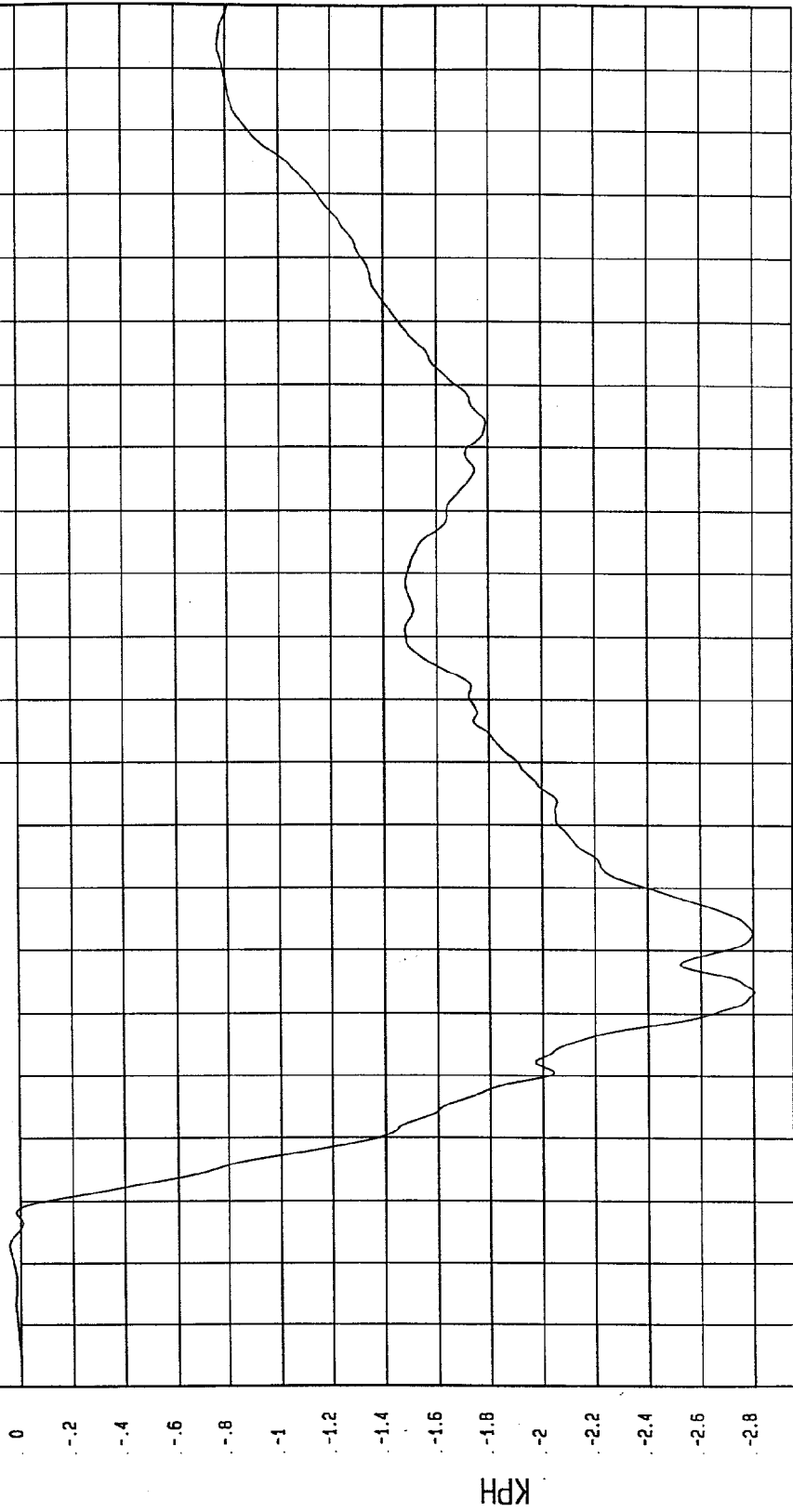
Maximum = 4.03E-02 KPH at 3 msec

Minimum = -2.8 KPH at 44 msec

RIGHT SIDE SILL AT FRONT SEAT X VELOCITY

Filterclass (180)

1 B99067A1.V32



MCA Research
10-19-1999 14:28

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

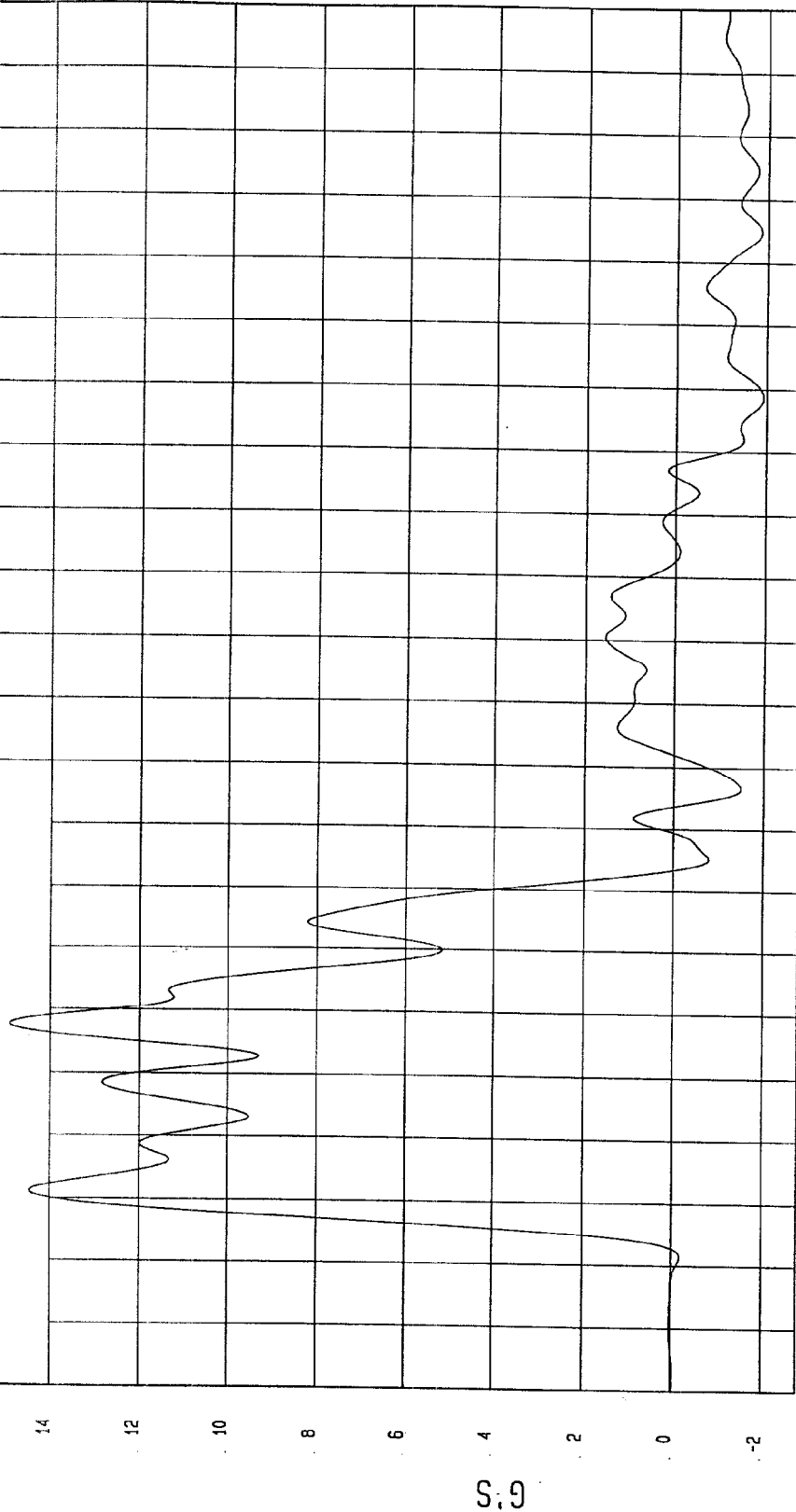
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 14.91 G'S at 38 msec

Minimum = -1.93 G'S at 139 msec

RIGHT SIDE SILL AT FRONT SEAT Y ACCELERATION

1 _____ B99057AF.A33 Filterclass (50)



TIME (SECONDS)

MGA Research
10-19-1999 14:28

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

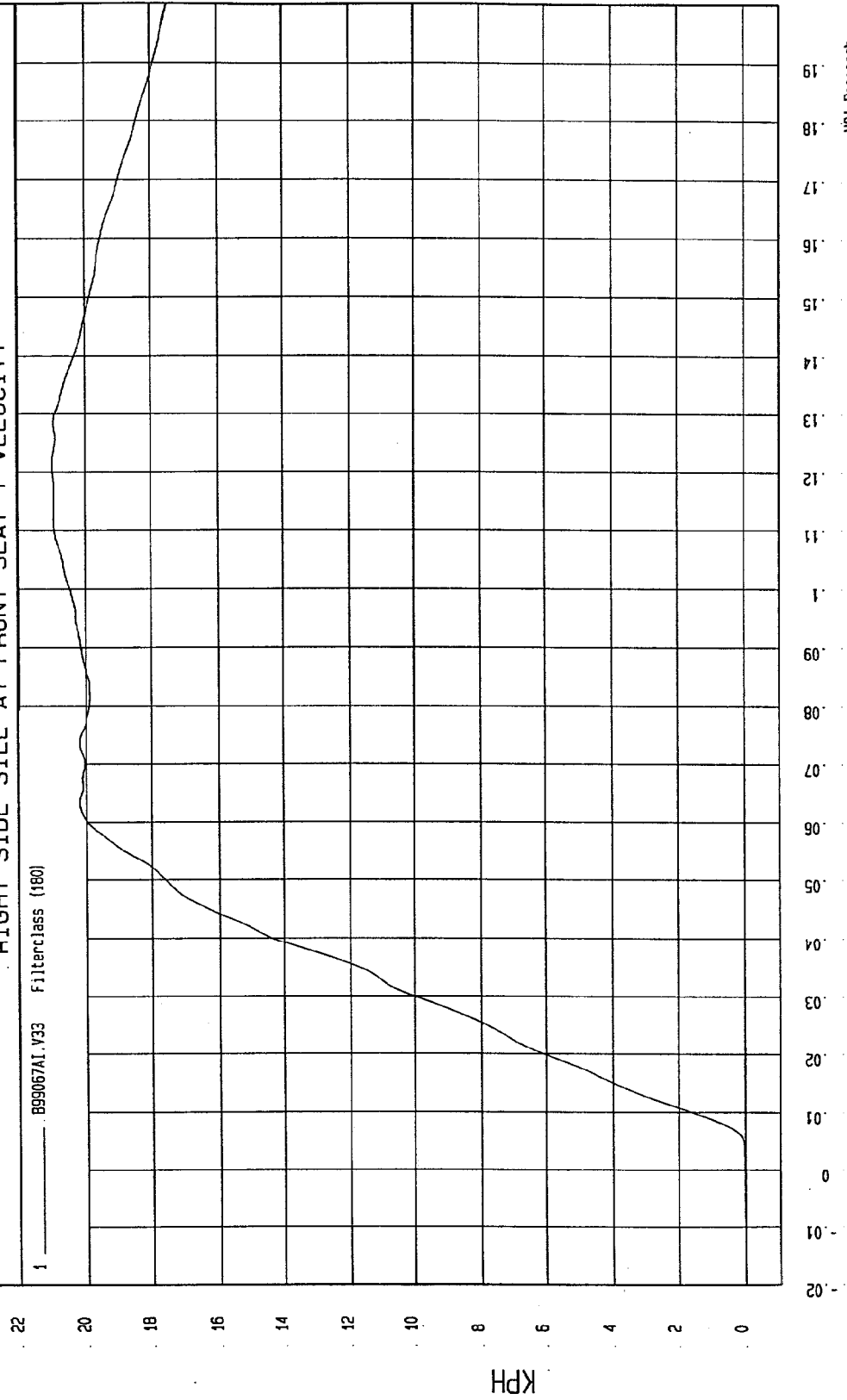
Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Minimum = -3.49E-03 KPH at -14 msec

Maximum = 20.99 KPH at 121 msec

RIGHT SIDE SILL AT FRONT SEAT Y VELOCITY



MCA Research
10-19-1999 14:29

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

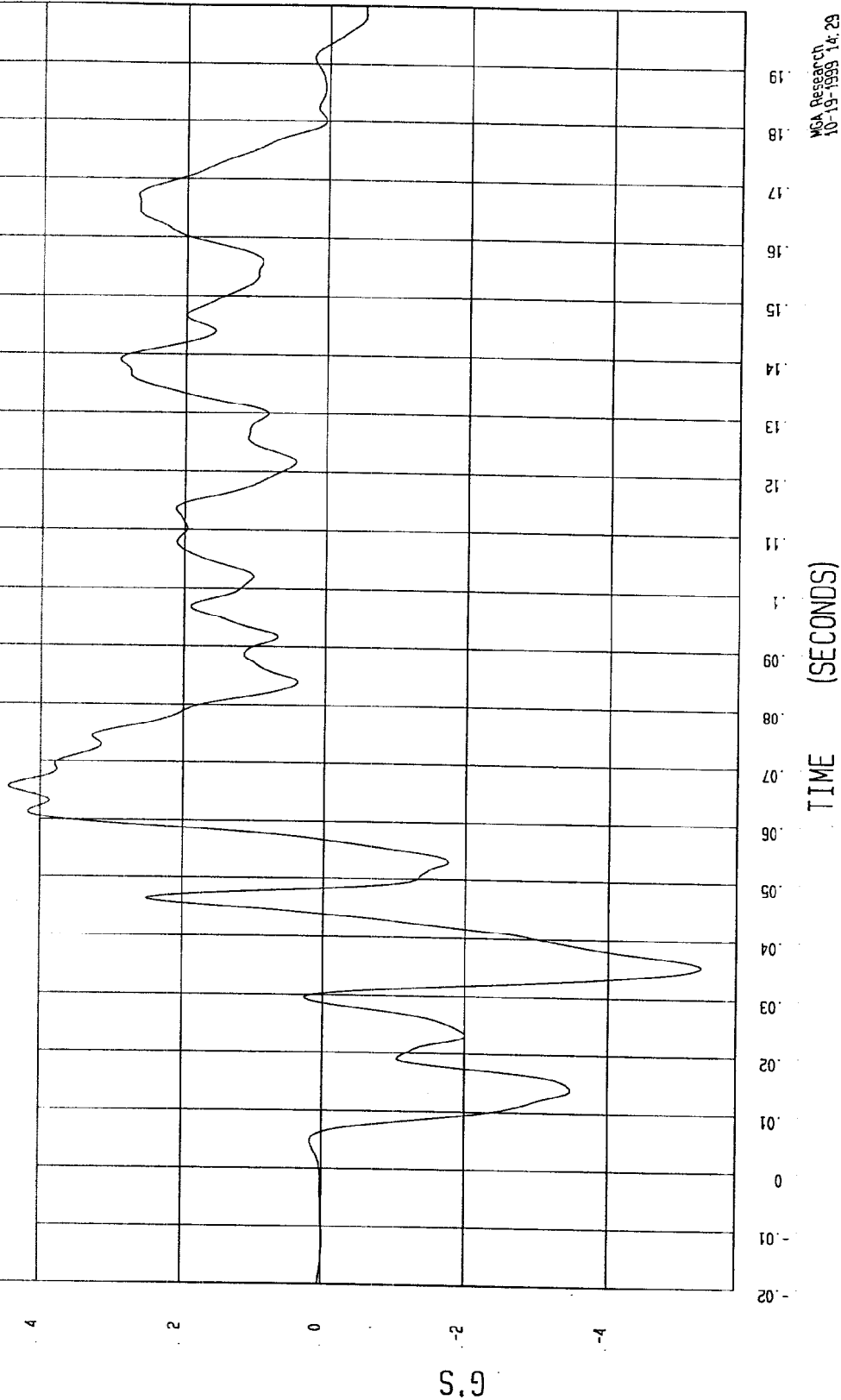
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 4.45 G'S at 55 msec

Minimum = -5.3 G'S at 35 msec

RIGHT SIDE SILL AT FRONT SEAT Z ACCELERATION

1 ——— B99067AF.A34 Filterclass (60)

MGA Research
10-19-1999 14:29

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

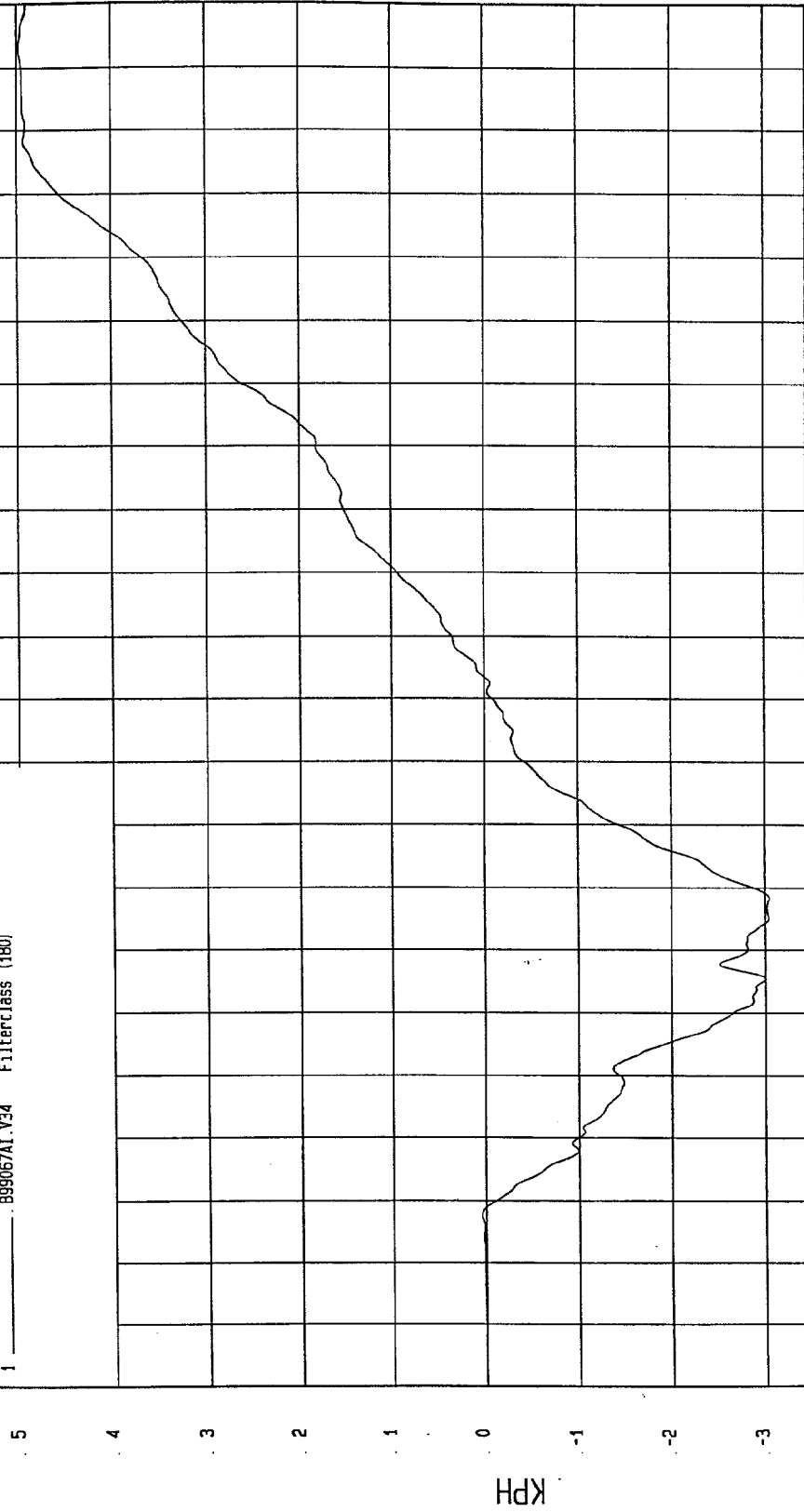
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 4.93 KPH at 193 msec

Minimum = -3.05 KPH at 58 msec

RIGHT SIDE SILL AT FRONT SEAT Z VELOCITY

1 B99067A1.V34 FilterClass (180)



NSA Research
10-19-1999 14:29

TIME Seconds

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

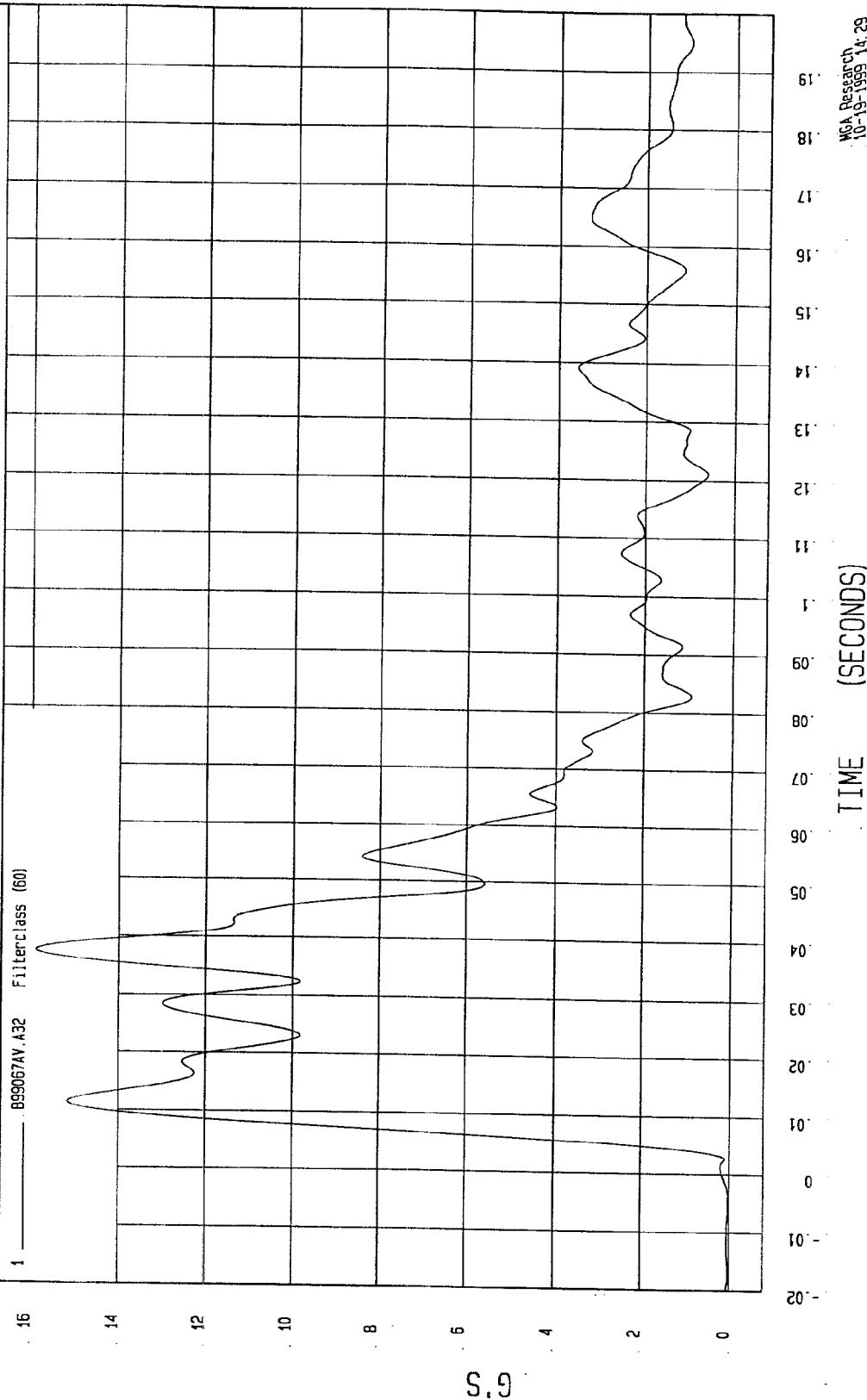
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 15.89 G'S at 38 msec

Minimum = 3.04E-02 G'S at -6 msec

RIGHT SIDE SILL AT FRONT SEAT RESULTANT ACCELERATION

1 ——— B99067AV.A32 Filterclass (60)



MCA Research
10-19-1999 14:29

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 2.99 G'S at 57 msec

Minimum = -2.26 G'S at 18 msec

RIGHT SIDE SILL AT REAR SEAT X ACCELERATION

1 _____ B99067AF.A35 Filterclass (60)

3

2

1

0

-1

-2

G.S

19

18

17

16

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

-02

TIME (SECONDS)

NCA Report
10-19-1999 14:29

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

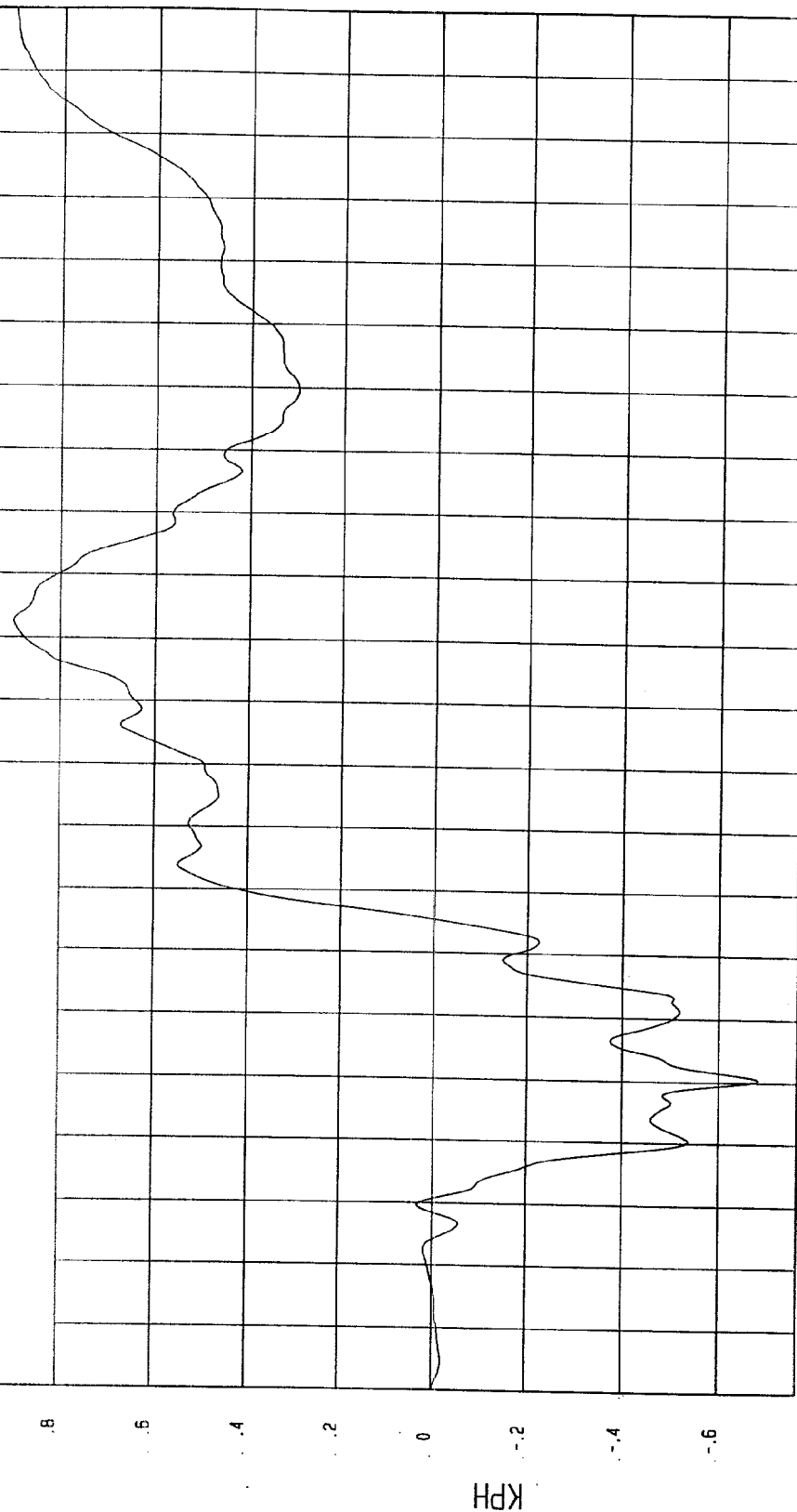
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = .9 KPH at 200 msec

Minimum = -.68 KPH at 30 msec

RIGHT SIDE SILL AT REAR SEAT X VELOCITY

1 _____ B99067AI V35 Filterclass (180)



NSA Research
10-19-1999 14:29

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

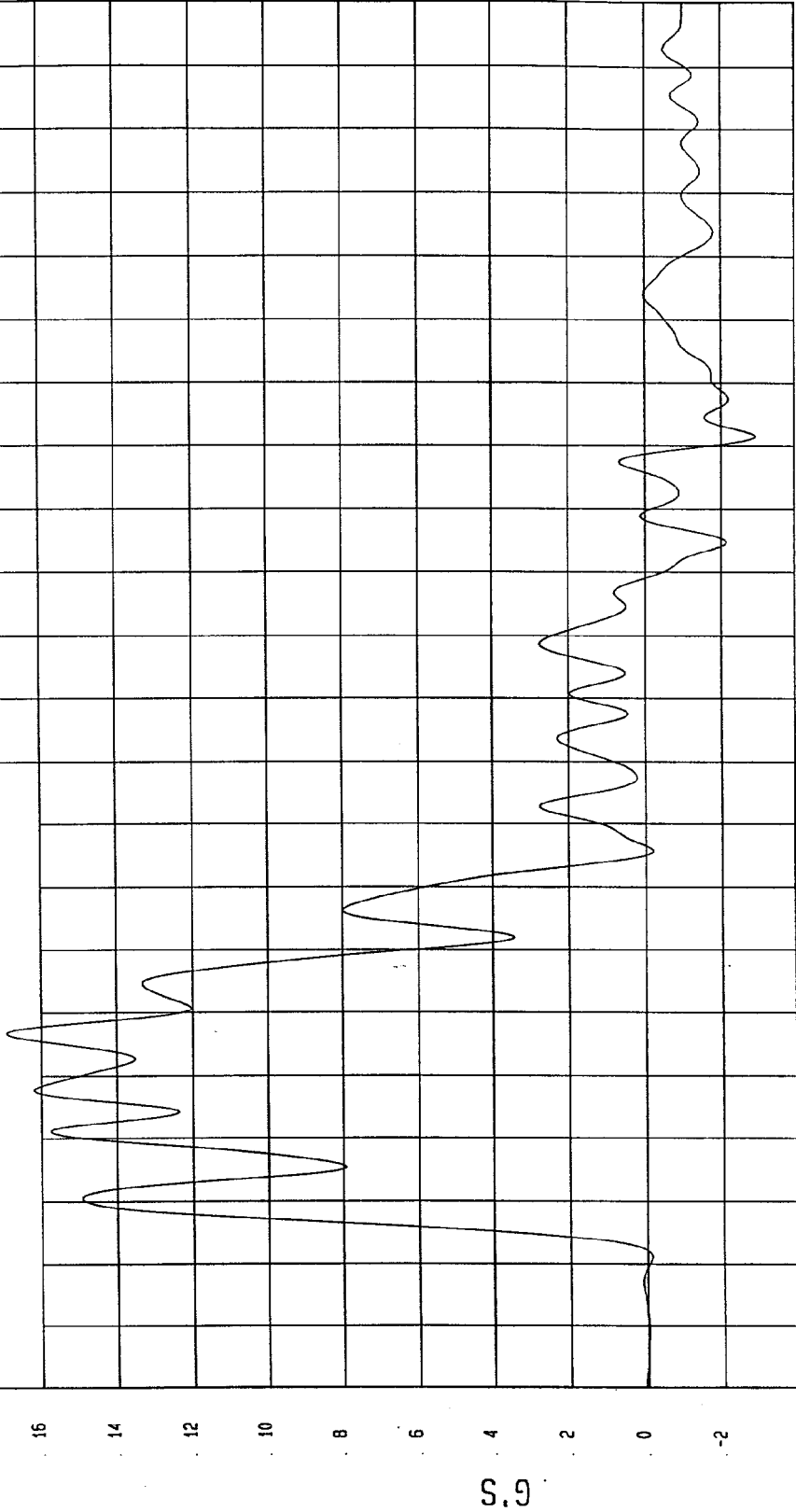
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 16.09 G'S at 37 msec

Minimum = -2.9 G'S at 132 msec

RIGHT SIDE SILL AT REAR SEAT Y ACCELERATION

1 899067AF.A36 FilterClass (60)



MCA Research
10-19-1999 14:29

TIME (SECONDS)

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

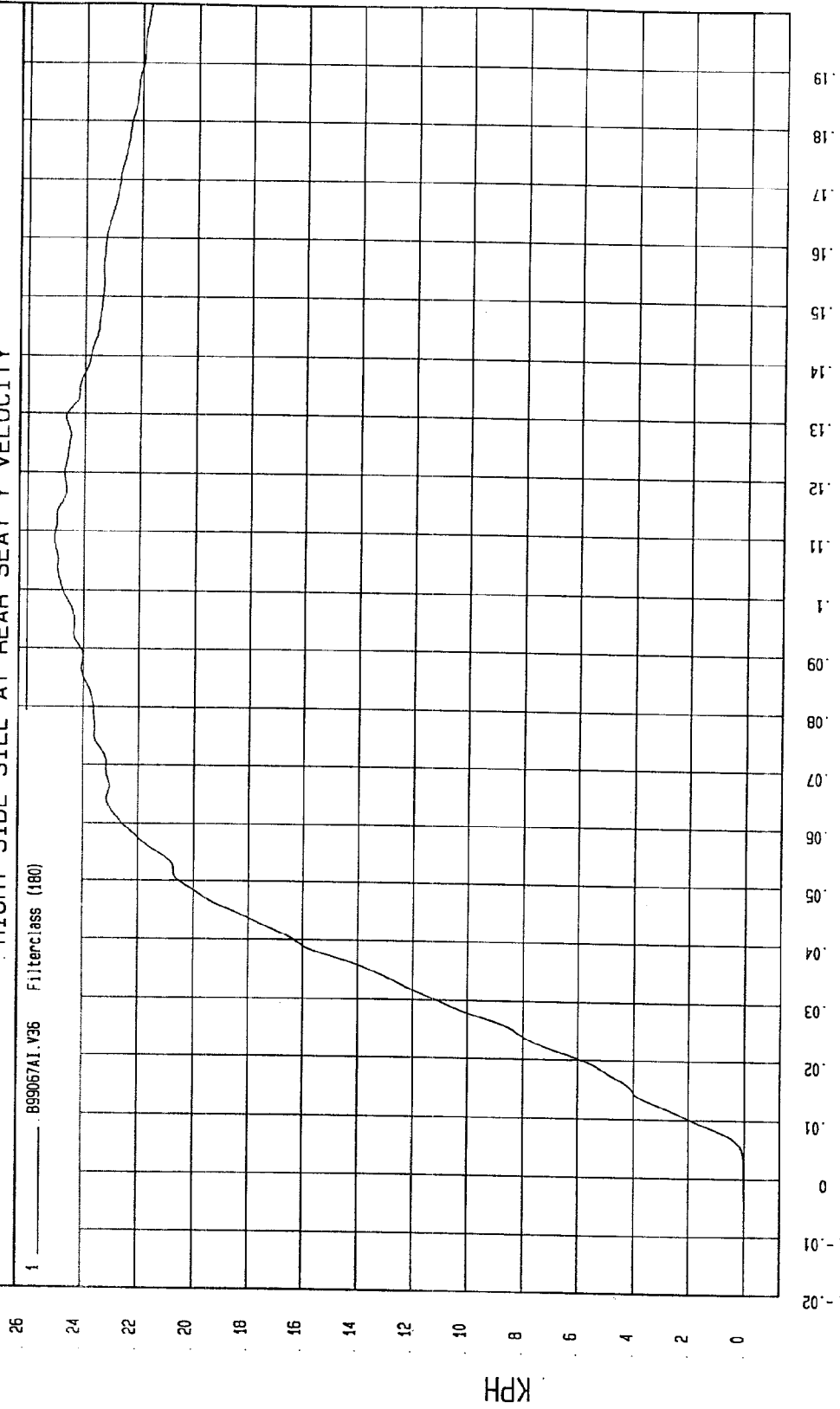
COMPONENT: 2000 BUICK LESABRE (CY0100)

Minimum = 0 KPH at -20 msec

Maximum = 25.05 KPH at 109 msec

RIGHT SIDE SILL AT REAR SEAT Y VELOCITY

1 ——— B99057AI.Y36 Filterclass (180)



W&A Research
10-19-1999 14:29

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 6.59 G'S at 64 msec

Minimum = -6.44 G'S at 38 msec

RIGHT SIDE SILL AT REAR SEAT Z ACCELERATION

1 B99067AF.A37 Filterclass (60)

G.S

6
4
2
0
-2
-4
-6

TIME (SECONDS)

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

MCA Research
10-19-1999 14:29

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

COMPONENT: 2000 BUICK LESABRE (CY0100)

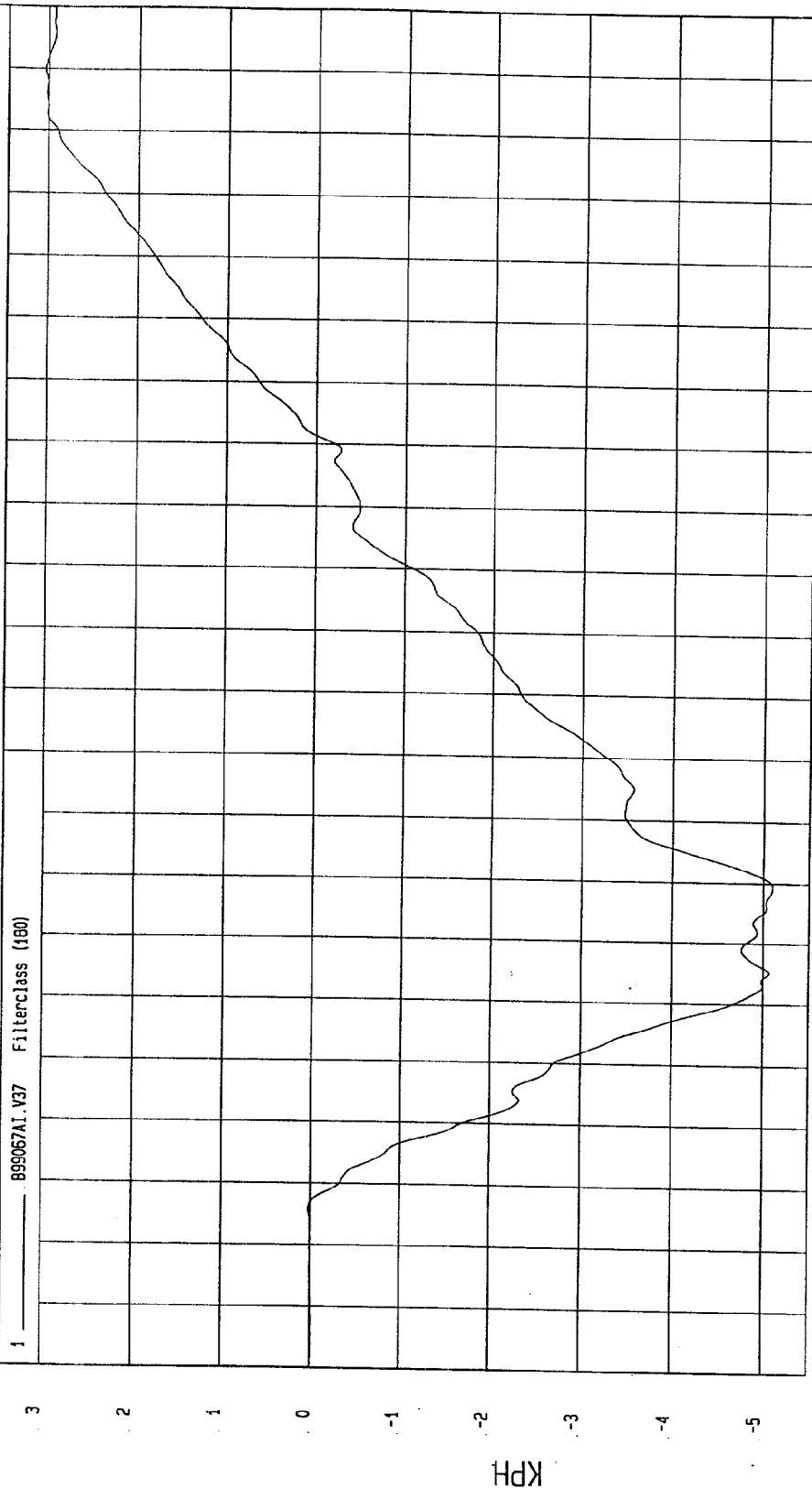
Speed: 32.7 MPH 52.6 KPH

Minimum = -5.1 KPH at 60 msec

Maximum = 3.03 KPH at 190 msec

RIGHT SIDE SILL AT REAR SEAT Z VELOCITY

1 — 899067A1.V37 Filterclass (480)



MOA Research
10-19-1999 14:29

TIME Seconds

KPH

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 18.03 G'S at 37 msec

Minimum = 1.29E-02 G'S at -15 msec

RIGHT SIDE SILL AT REAR SEAT RESULTANT ACCELERATION

1 899067AV A35 Filterclass (60)

18

16

14

12

10

8

6

4

2

0

G.S

19

18

17

16

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

-02

TIME (SECONDS)

MGA Research
10-19-1999 14:29

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 3.88 G'S at 42 msec

Minimum = -5.35 G'S at 65 msec

PEAR FLOORPAN ABOVE AXLE X ACCELERATION

1 _____ B99067AF.A08 Filterclass (60)

4

2

0

-2

-4

G'S

TIME (SECONDS)

MSA Research
10-19-1999 14:29

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 5.94E-02 KPH at 8 msec

Minimum = -5.32 KPH at 89 msec

REAR FLOORPAN ABOVE AXLE X VELOCITY

1 899067AI.V08 Filterclass (180)

KPH

0
-1
-2
-3
-4
-5

TIME Seconds

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

WGA Research
10-19-1999 14:29

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

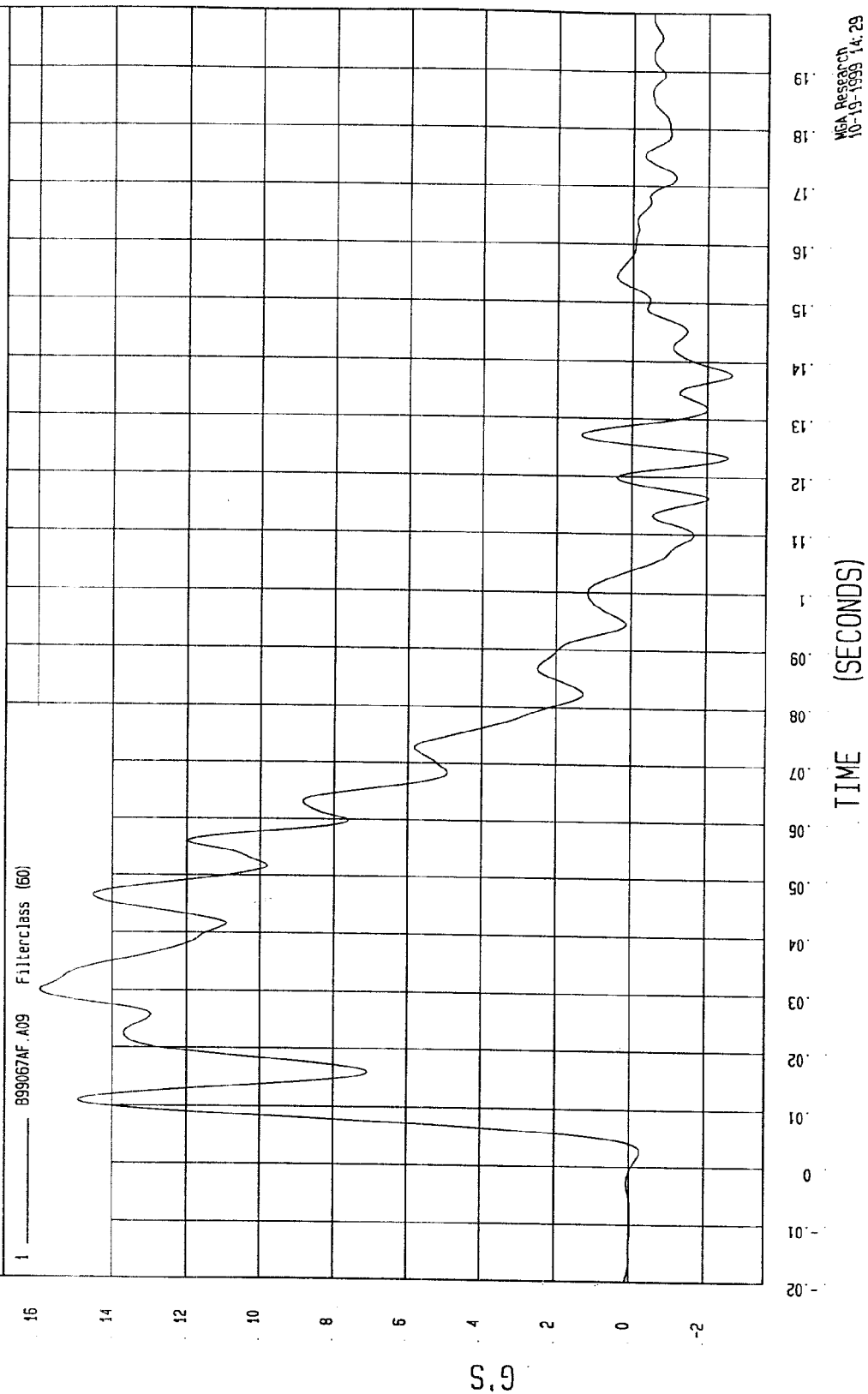
COMPONENT: 2000 BUICK LESABRE (CY0100)

Speed: 32.7 MPH 52.6 KPH

Minimum = -2.66 G'S at 138 msec

Maximum = 15.93 G'S at 30 msec

REAR FLOORPAN ABOVE AXLE Y ACCELERATION



TEST: FMVSS 214 DYNAMIC SIDE IMPACT TEST DATE: 10-19-1999

SPEED: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 27.99 KPH at 104 msec

Minimum = -3.42E-03 KPH at -4 msec

REAR FLOORPAN ABOVE AXLE Y VELOCITY

1 B99067AT.V09 Filterclass (180)

28

26

24

22

20

18

16

14

12

10

8

6

4

2

0

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

NGA Research
10-19-1999 14:29

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

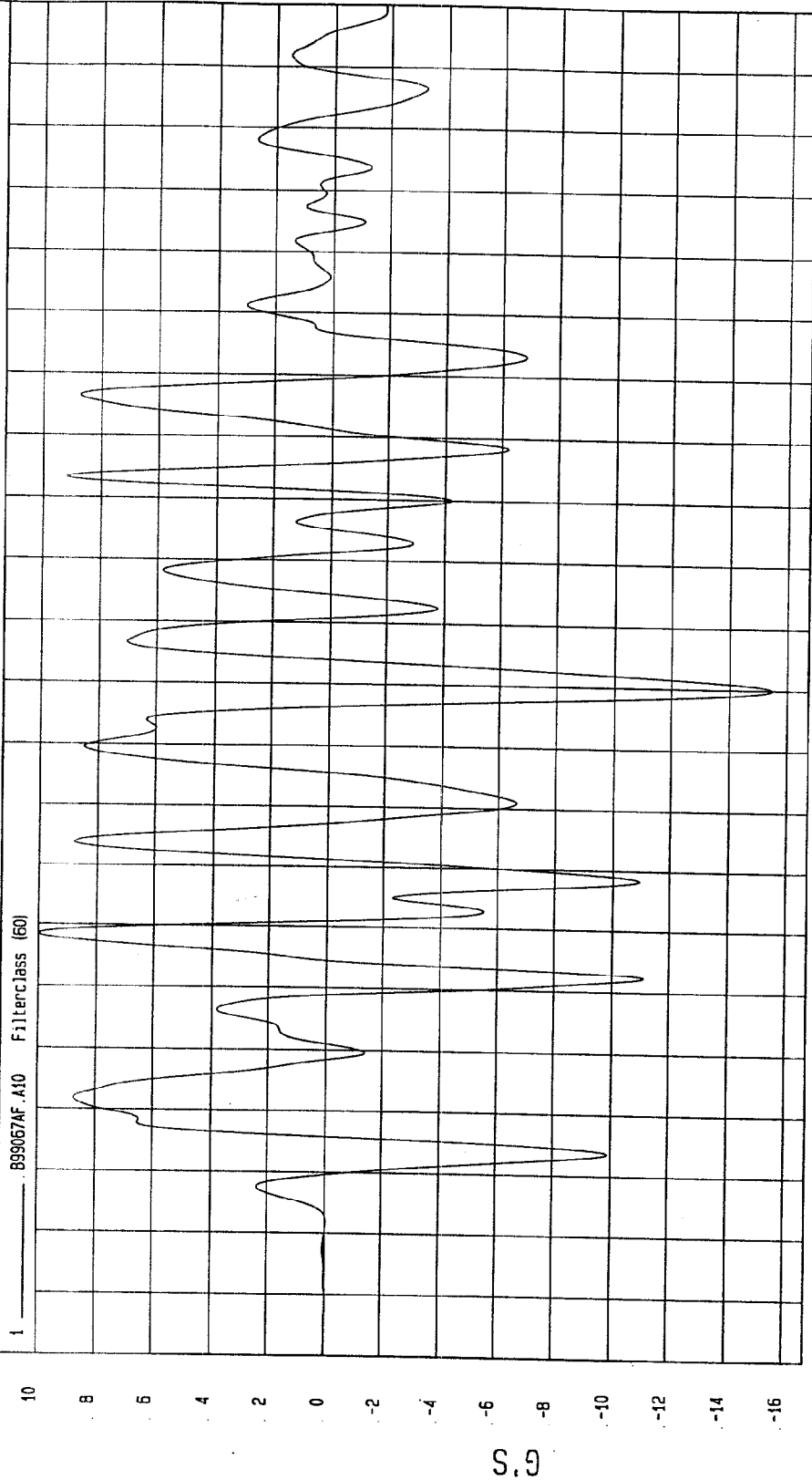
Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

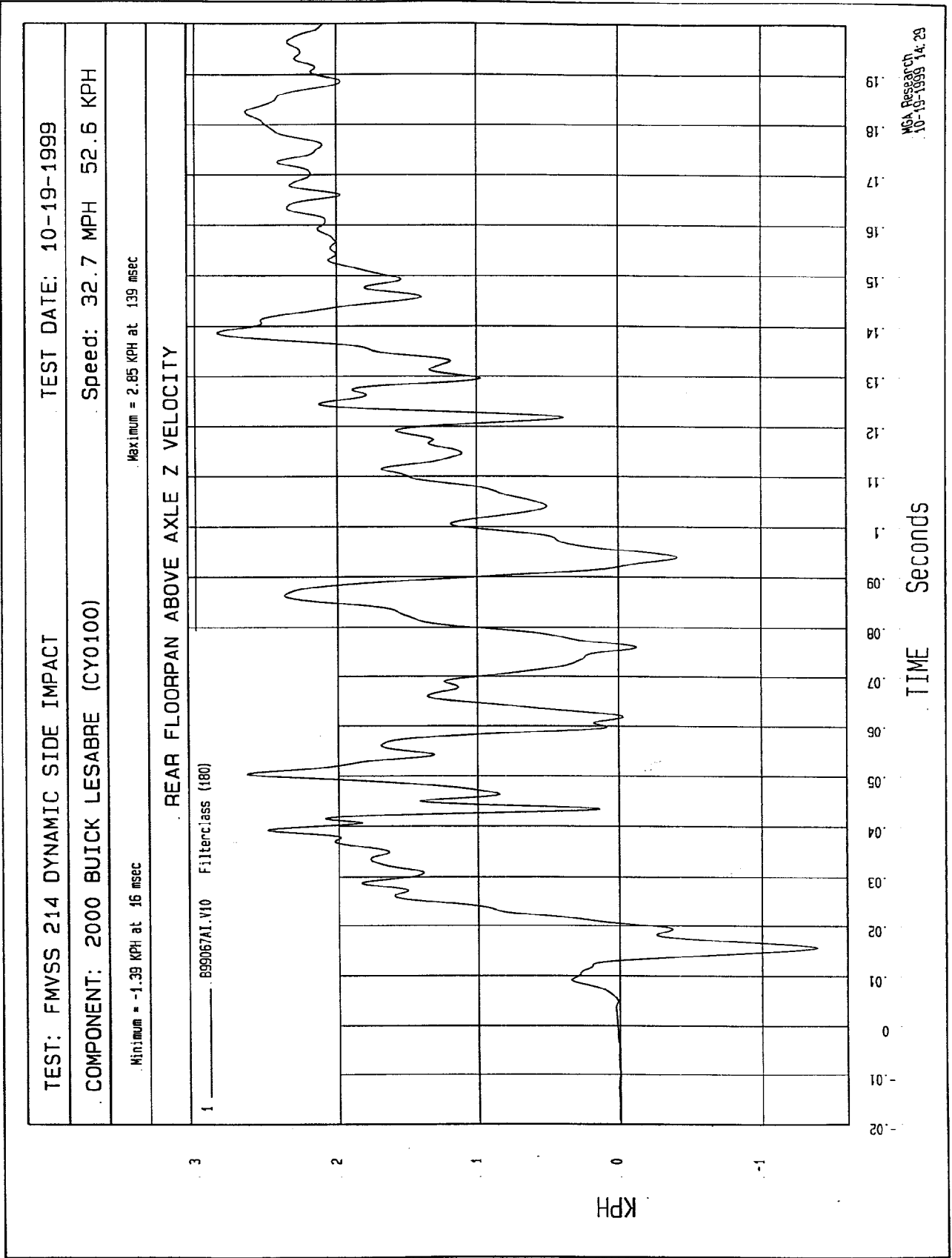
Minimum = -15.47 G'S at 90 msec

Maximum = 10.01 G'S at 48 msec

REAR FLOORPAN ABOVE AXLE Z ACCELERATION



MCA Research
10-19-1999 1A: 29



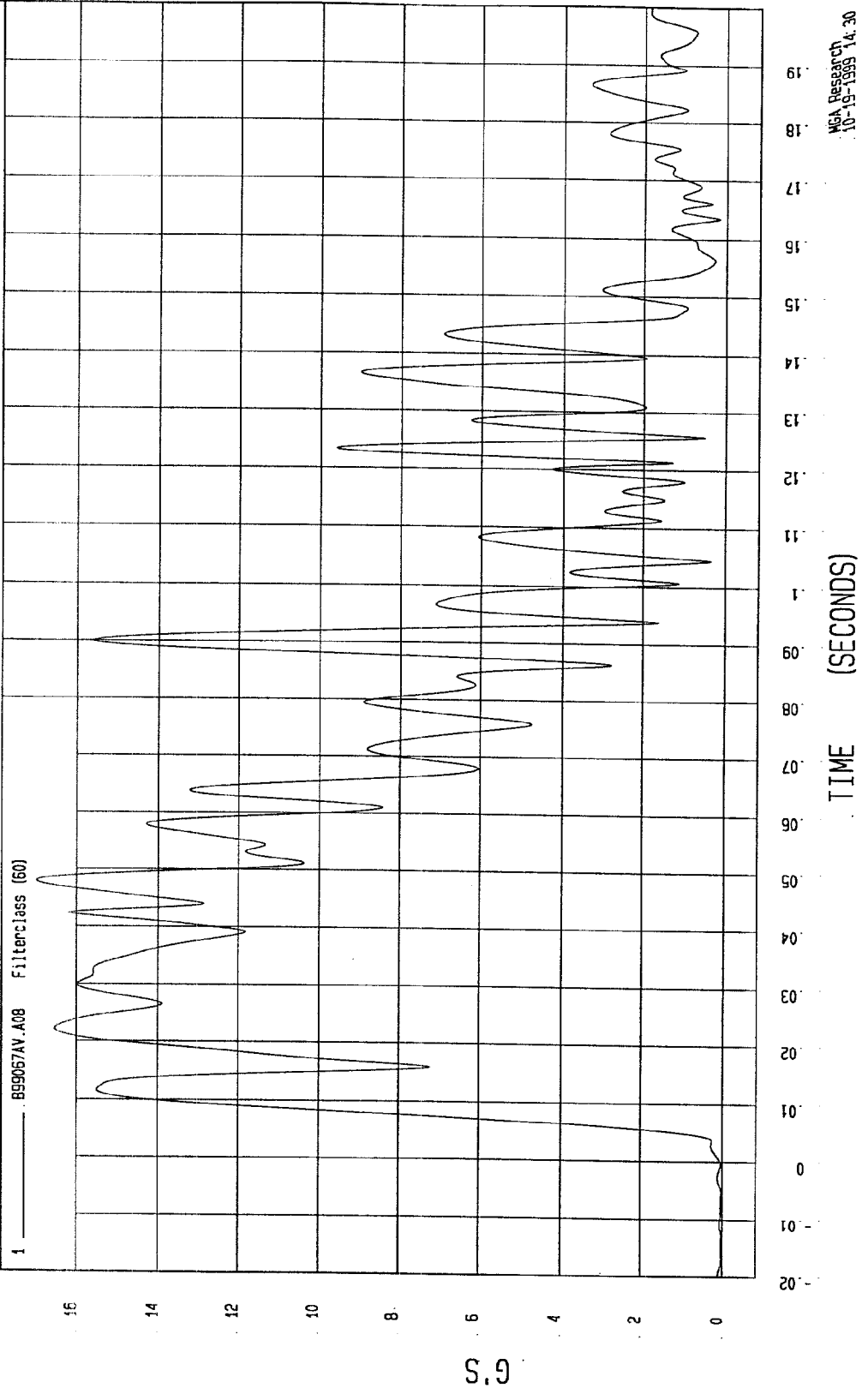
MSA Research
10-19-1999 14:29

TEST: FMVSS 214 DYNAMIC SIDE IMPACT TEST DATE: 10-19-1999

COMPONENT: 2000 BUICK LESABRE (CY0100) Speed: 32.7 MPH 52.6 KPH

Minimum = 1.28E-02 G'S at -13 msec Maximum = 17.01 G'S at 48 msec

REAR FLOORPAN ABOVE AXLE RESULTANT ACCELERATION



TEST DATE: 10-19-1999

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

Speed: 32.7 MPH 52.6 KPH

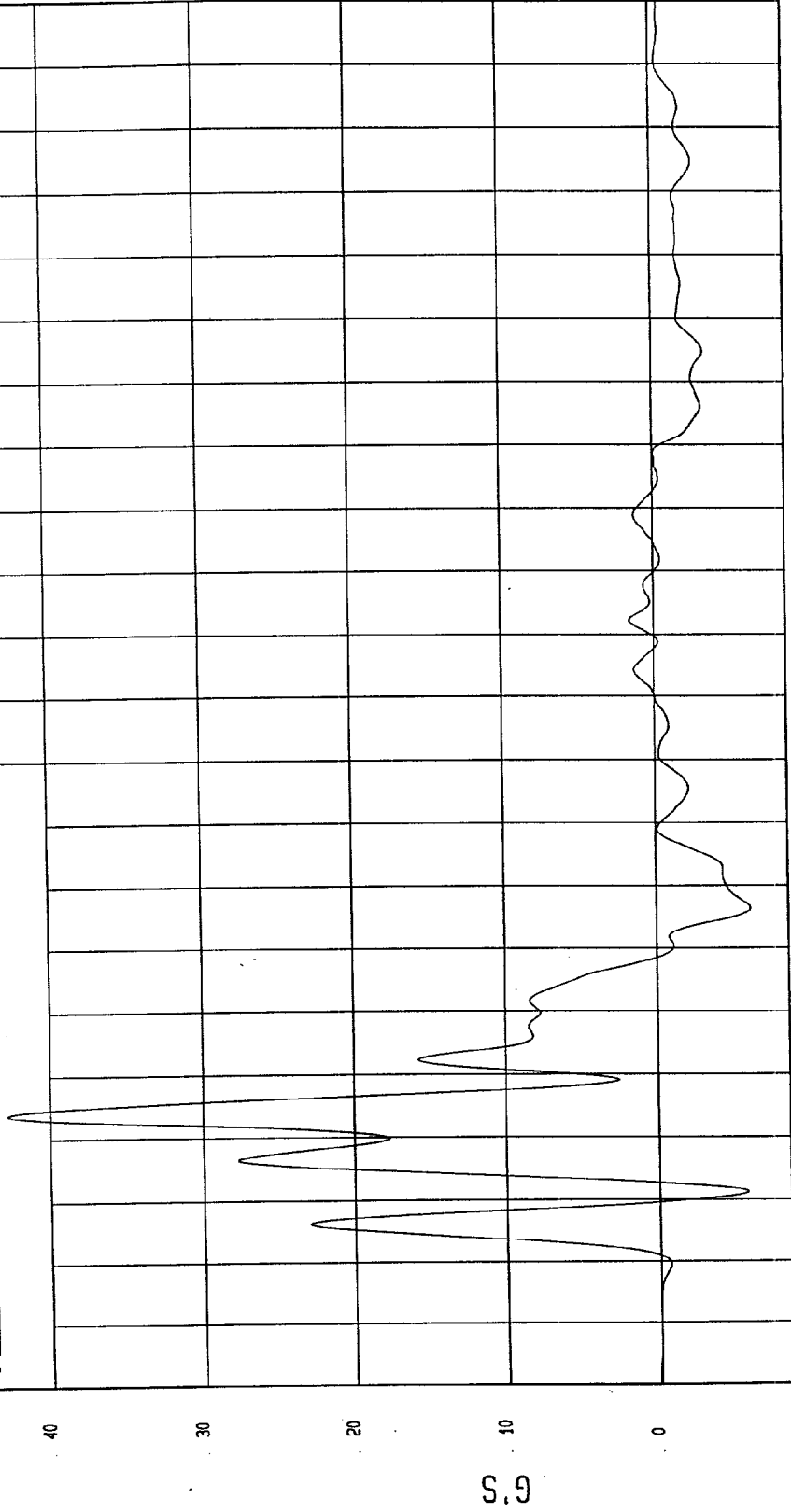
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 42.77 G'S at 24 msec

Minimum = -6.06 G'S at 56 msec

LEFT SIDE SILL AT FRONT SEAT Y ACCELERATION

1 _____ B99067AF.A38 Filterclass (60)



WGA Research
10-25-1999 15:38

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

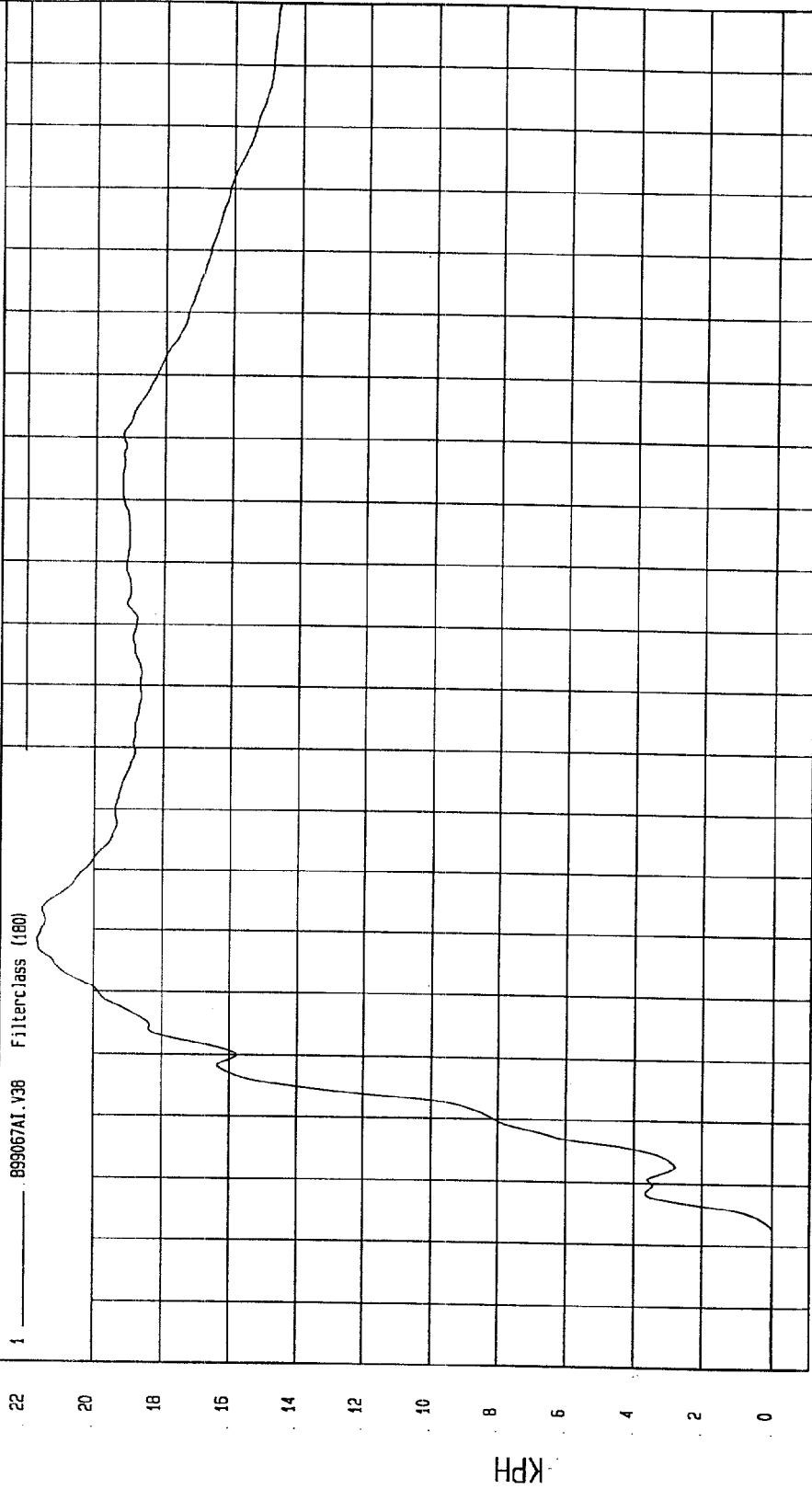
COMPONENT: 2000 BUICK LESABRE (CY0100)

Minimum = -2.31E-03 KPH at 1 msec

Maximum = 21.65 KPH at 48 msec

LEFT SIDE SILL AT FRONT SEAT Y VELOCITY

1 ——— B99067A1.V38 FilterClass (180)



WCA Research
10-25-1999 15:39

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

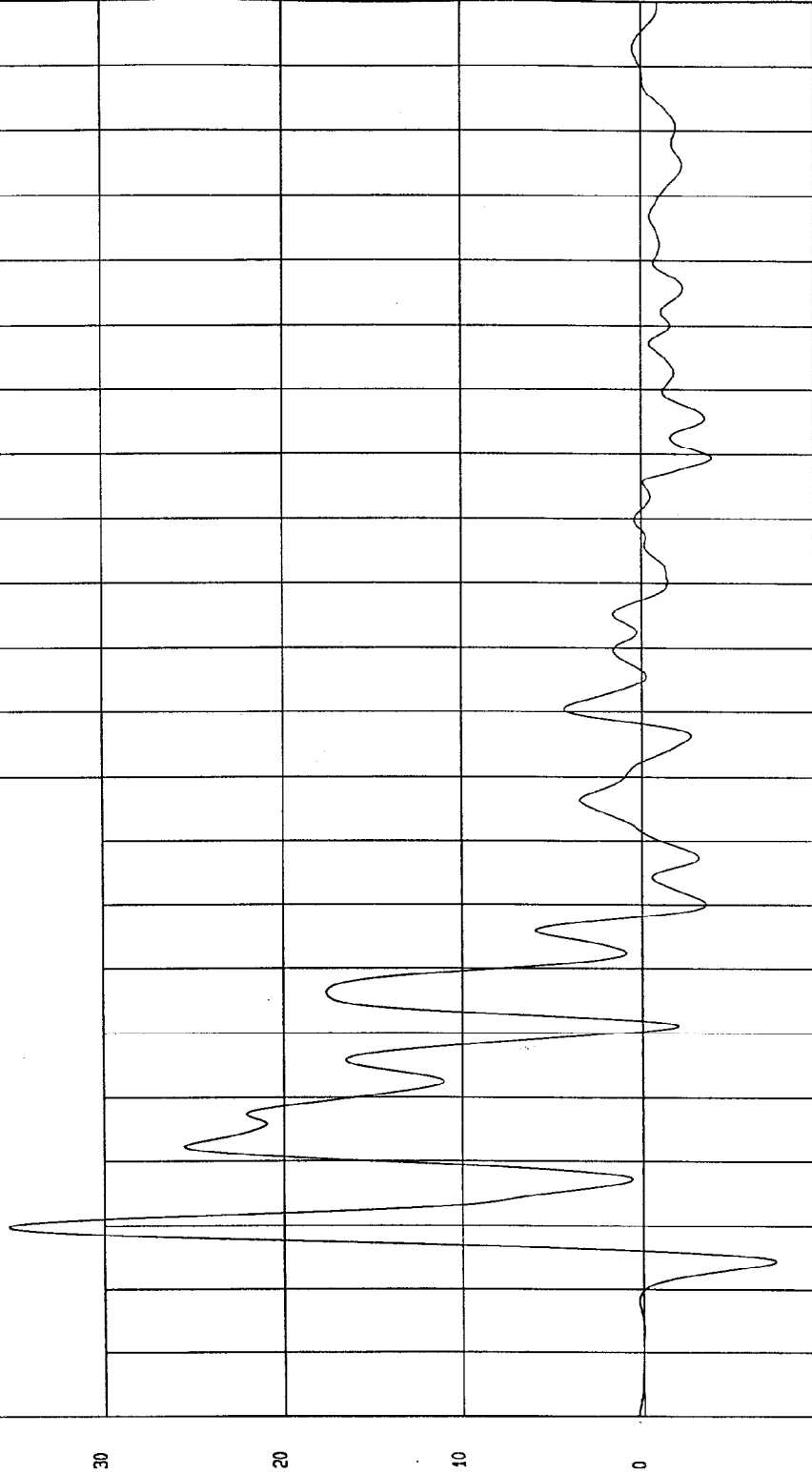
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 35.31 G'S at 10 msec

Minimum = -7.3 G'S at 4 msec

LEFT SIDE SILL AT REAR SEAT Y ACCELERATION

1 — B99067AF.A39 Filterclass (60)



MGA Research
10-19-1999 14:28

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

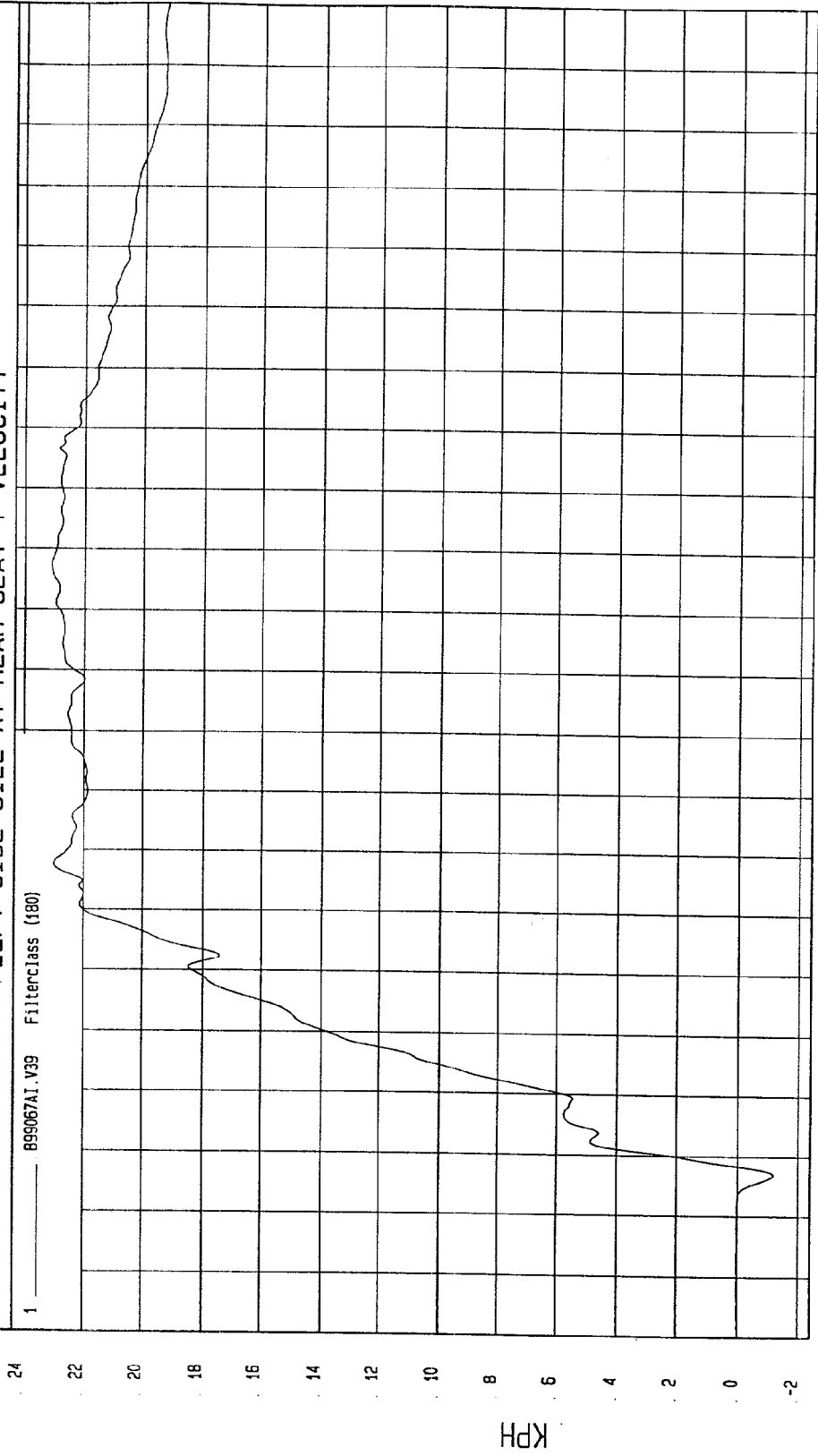
COMPONENT: 2000 BUICK LESABRE (CY0100)

Minimum = -1.18 KPH at 7 msec

Maximum = 23.11 KPH at 108 msec

LEFT SIDE SILL AT REAR SEAT Y VELOCITY

1 ——— B99067A1.V39 FilterClass (180)



WCA Research
10-19-1999 14:28

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 15.22 G'S at 22 msec

Minimum = -2.21 G'S at 138 msec

RIGHT REAR OCCUPANT COMPARTMENT Y ACCELERATION

1 _____ B99067AF.A50 Filterclass (60)

16

14

12

10

8

6

4

2

0

-2

G.S.

19

18

17

16

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

-02

TIME (SECONDS)

WCA Research
10-19-1999 14:30

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

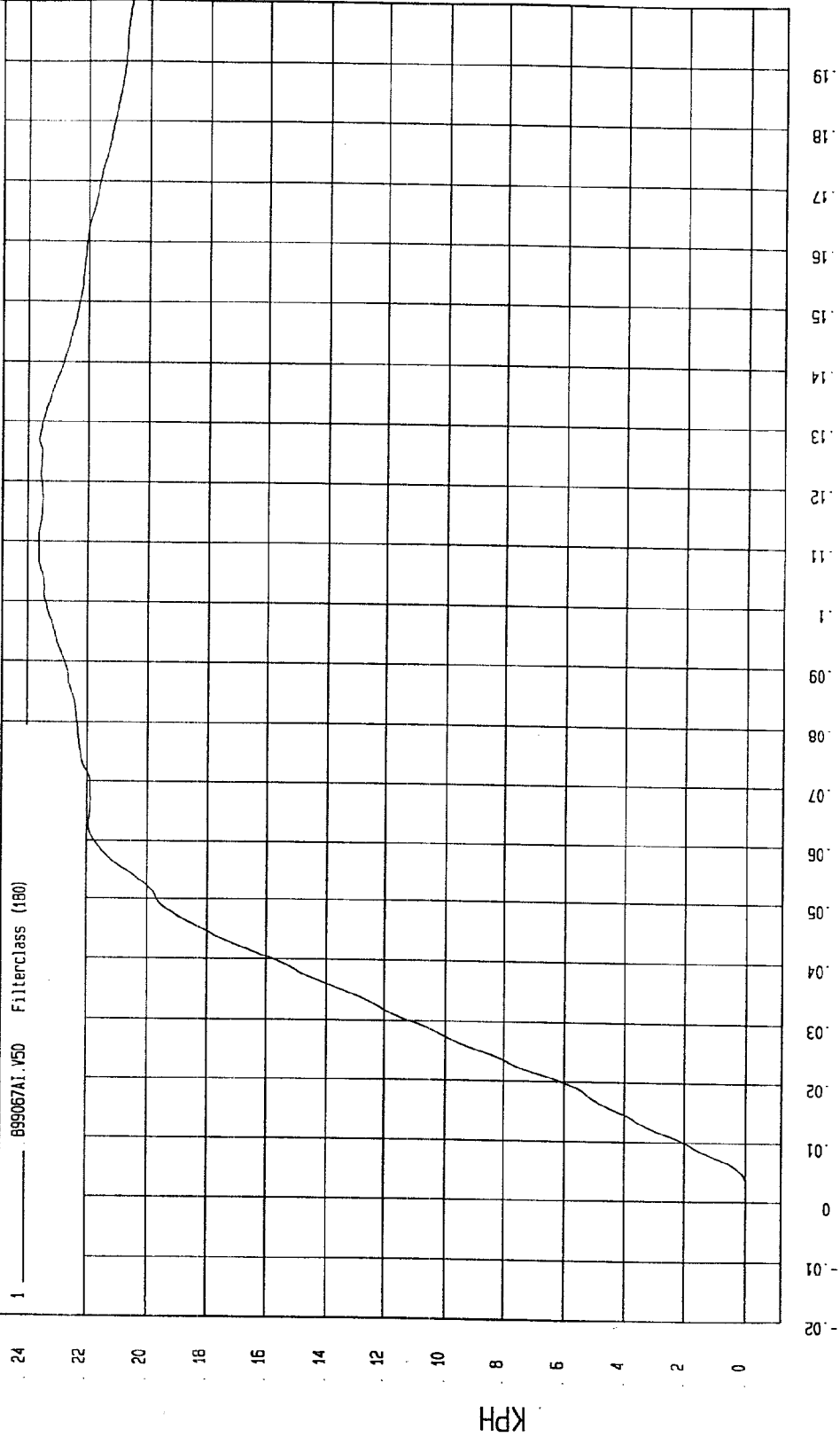
Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 23.64 KPH at 110 msec

Minimum = -1.45E-02 KPH at -13 msec

RIGHT REAR OCCUPANT COMPARTMENT Y VELOCITY



MSA Research
10-19-1999 14:30

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

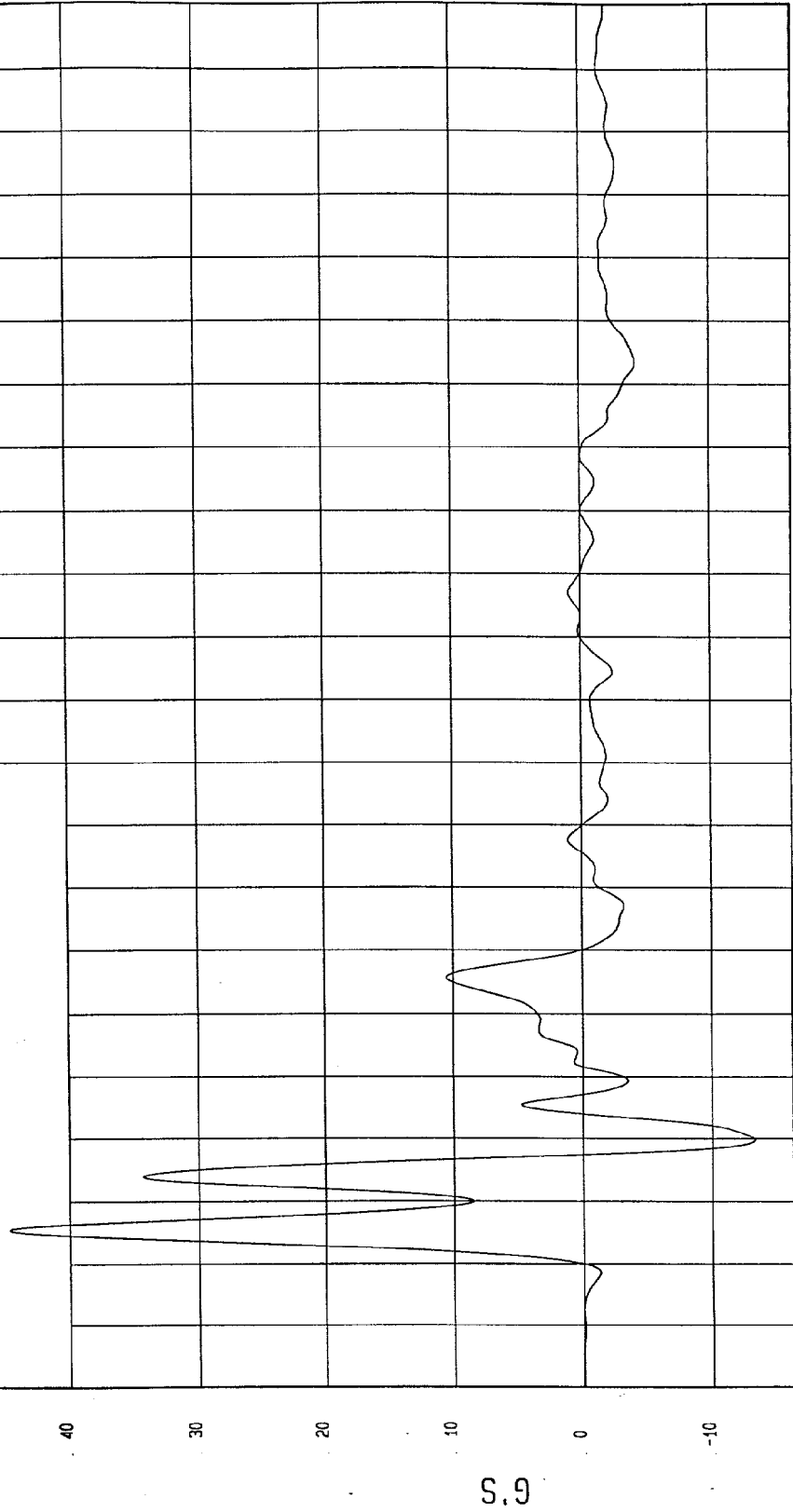
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 44.63 G'S at 6 msec

Minimum = -13.31 G'S at 20 msec

LEFT LOWER A-POST Y ACCELERATION

1 899067AF A20 Filterclass (60)



MGA Research
10-19-1999 14:30

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

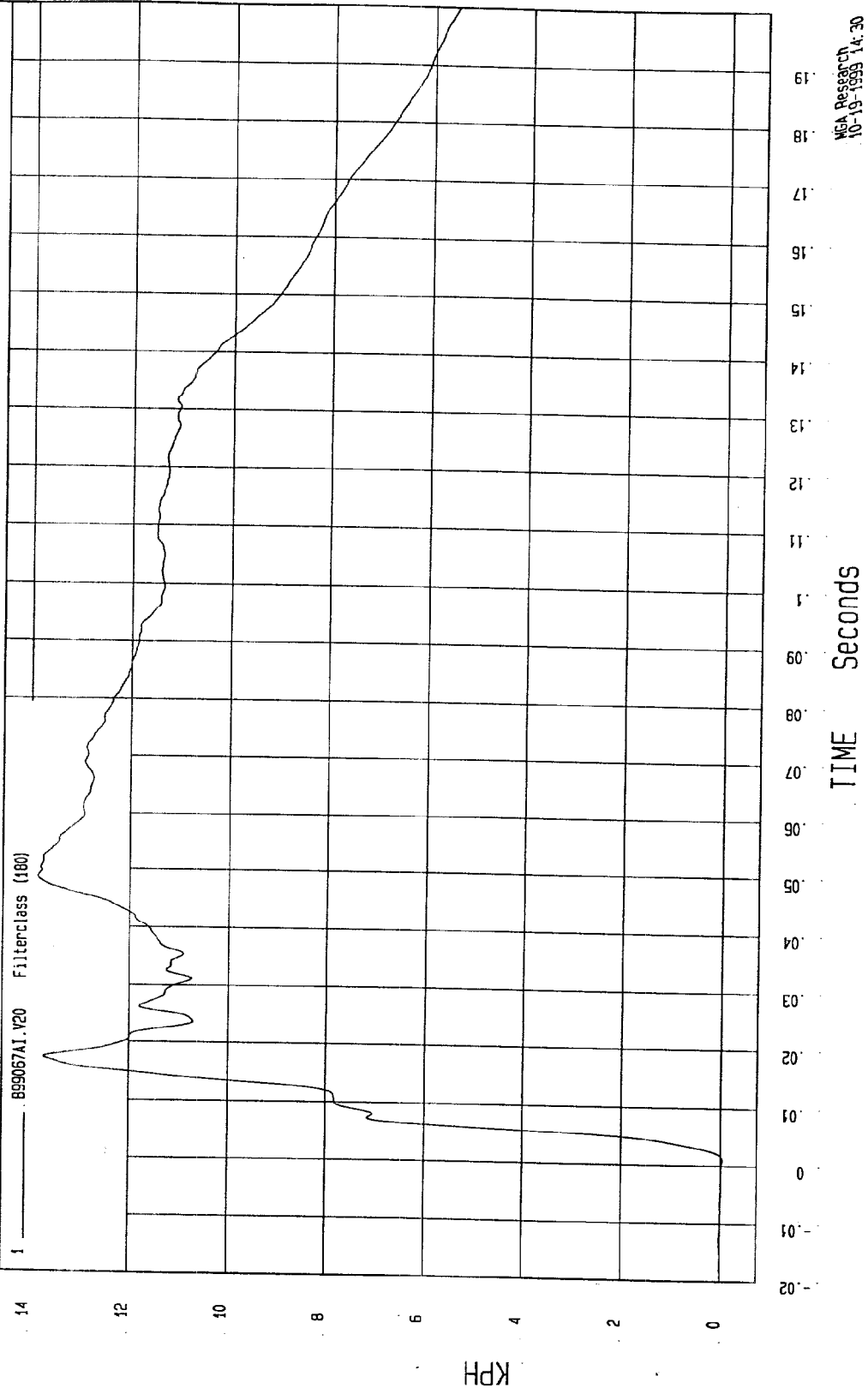
COMPONENT: 2000 BUICK LESABRE (CY0100)

Speed: 32.7 MPH 52.6 KPH

Minimum = -3.25E-02 KPH at 1 msec

Maximum = 13.86 KPH at 49 msec

LEFT LOWER A-POST Y VELOCITY



TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

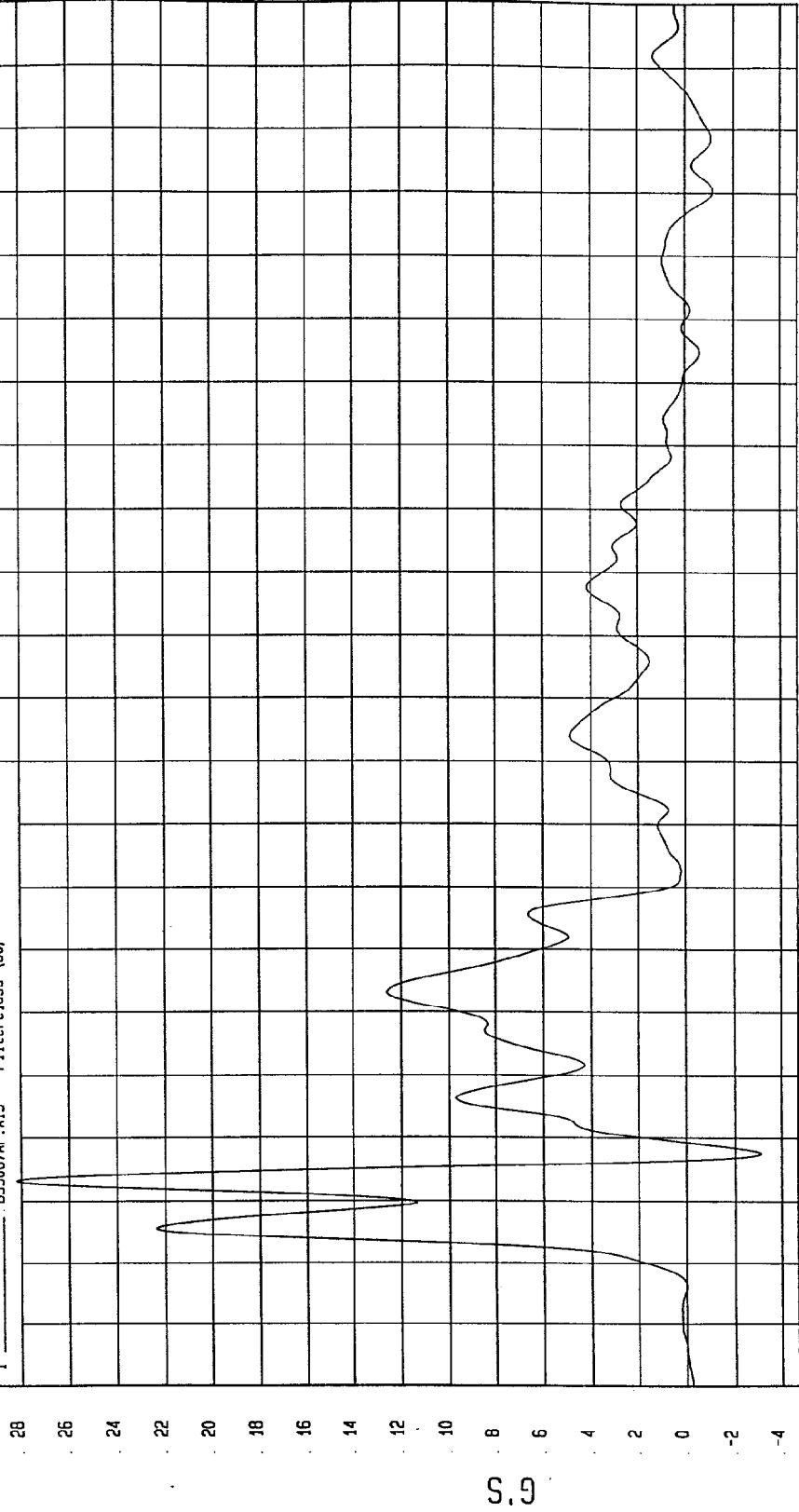
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 28.23 G's at 13 msec

Minimum = -3.13 G's at 18 msec

LEFT MID A-POST Y ACCELERATION

1 _____ BS9067AF.A19 FilterClass (60)



WCA Research
10-19-1999 14:30

TIME (SECONDS)

TEST: FMVSS 214 DYNAMIC SIDE IMPACT TEST DATE: 10-19-1999

COMPONENT: 2000 BUICK LESABRE (CY0100) Speed: 32.7 MPH 52.6 KPH

Minimum = -3.23E-02 KPH at -13 msec Maximum = 24.98 KPH at 166 msec

LEFT MID A-POST Y VELOCITY

1 899067A1 V19 Filterclass (180)

26

24

22

20

18

16

14

12

10

8

6

4

2

0

KPH

-02

-01

0

01

02

03

04

05

06

07

08

09

1

11

12

13

14

15

16

17

18

19

TIME Seconds

MSA Research
10-19-1999 14:30

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

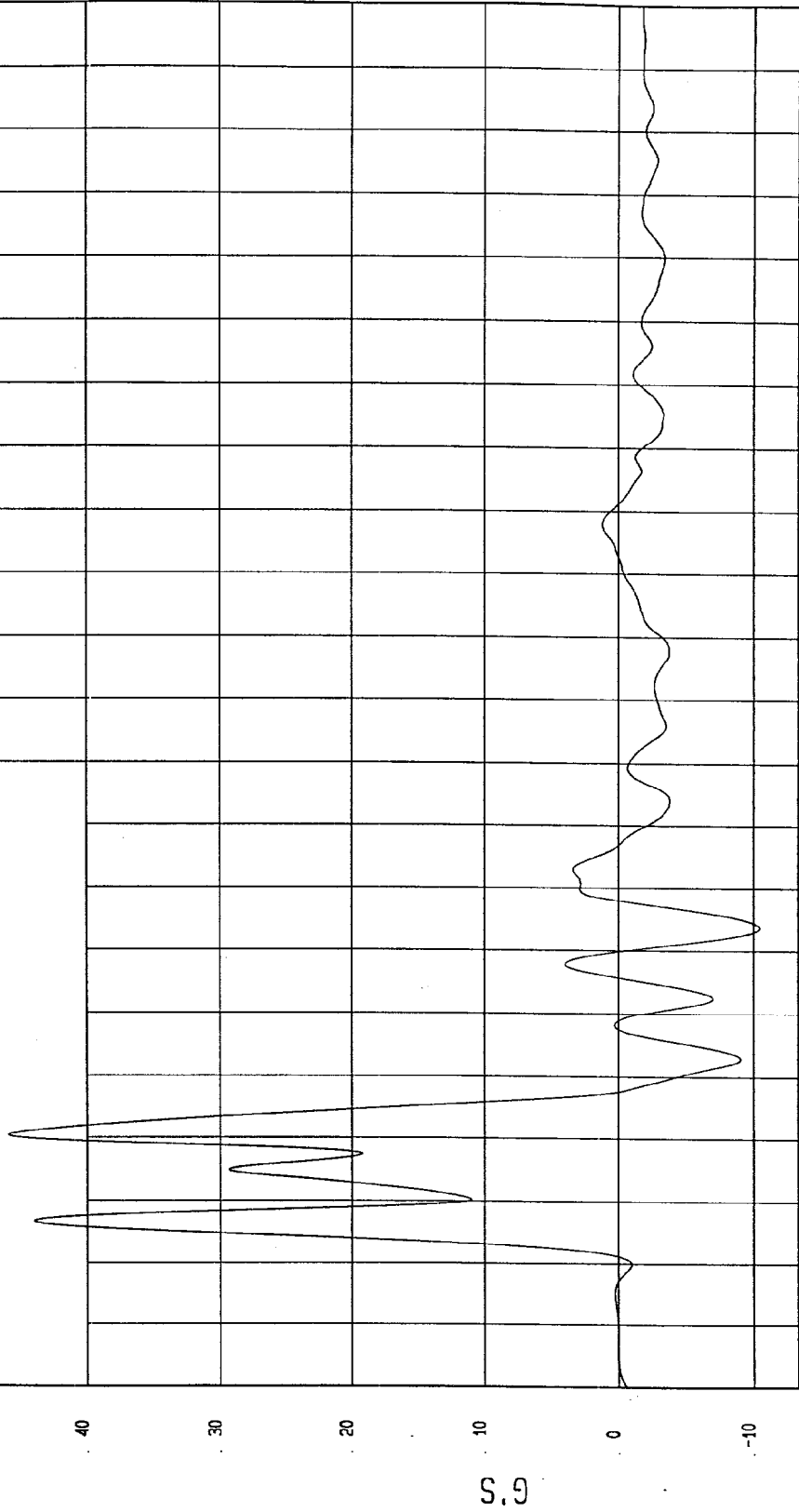
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 45.83 G'S at 20 msec

Minimum = -10.43 G'S at 54 msec

LEFT LOWER B-POST Y ACCELERATION

1 B99067AF.A30 Filterclass (60)



MCA Research
10-19-1999 14:30

TIME (SECONDS)

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

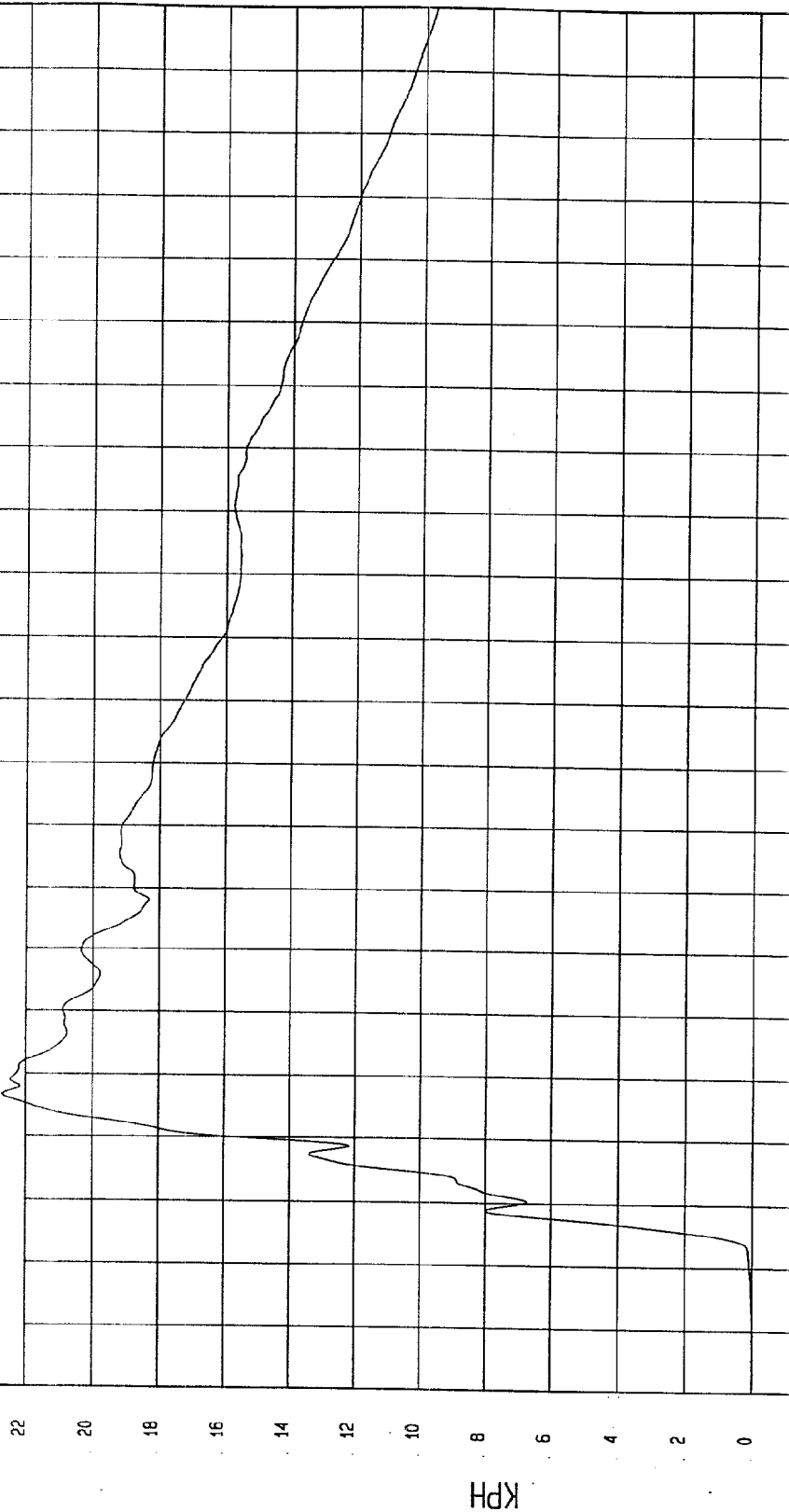
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 22.7 KPH at 27 msec

Minimum = -1.35E-02 KPH at -15 msec

LEFT LOWER B-POST Y VELOCITY

1 B99067A1.Y30 Filterclass (180)



NGA Research
10-19-1999 14:30

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

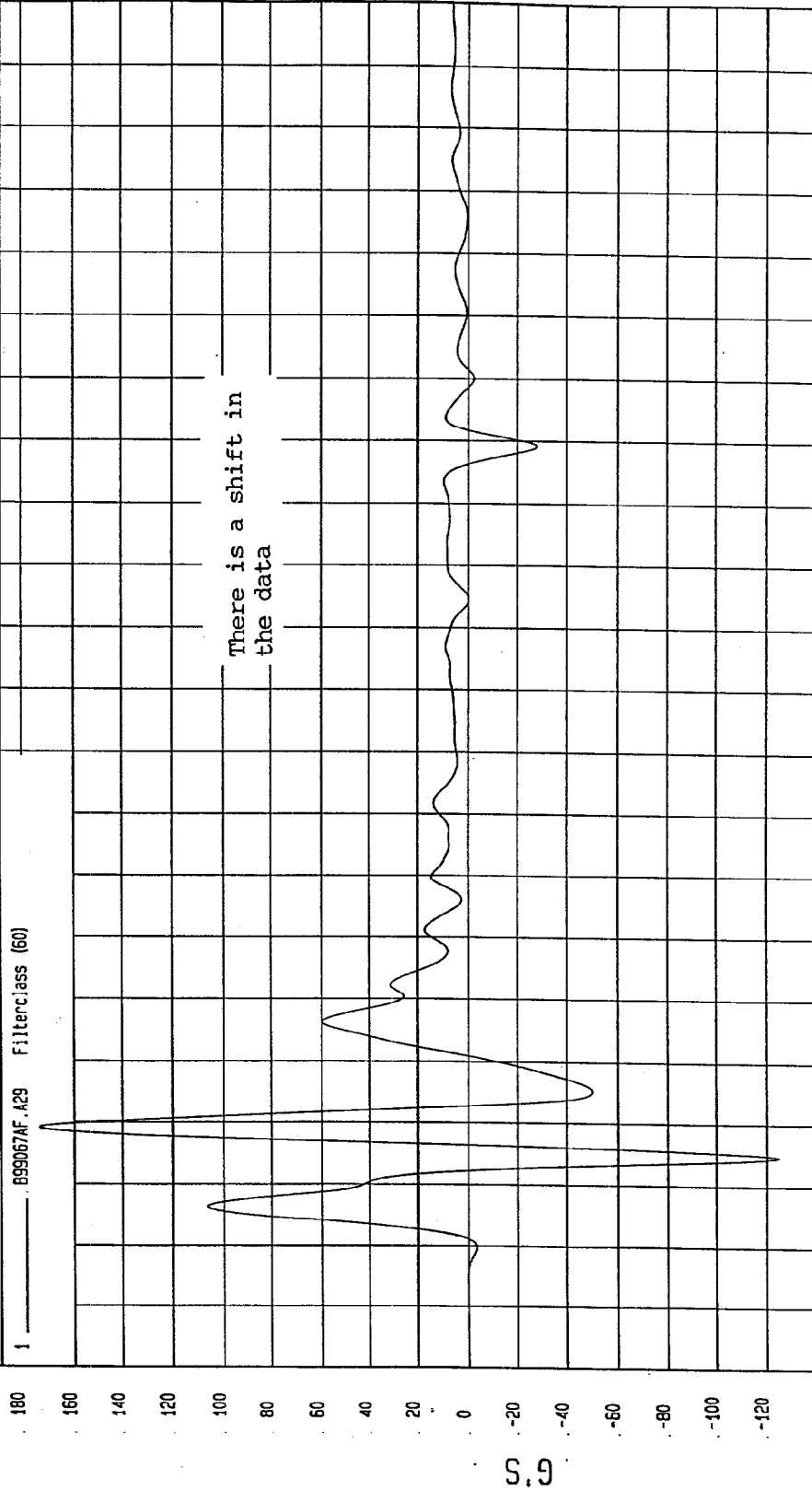
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 173.58 G'S at 19 msec

Minimum = -124.66 G'S at 15 msec

LEFT MID B-POST Y ACCELERATION

1 B99067AF.A29 Filterclass (60)

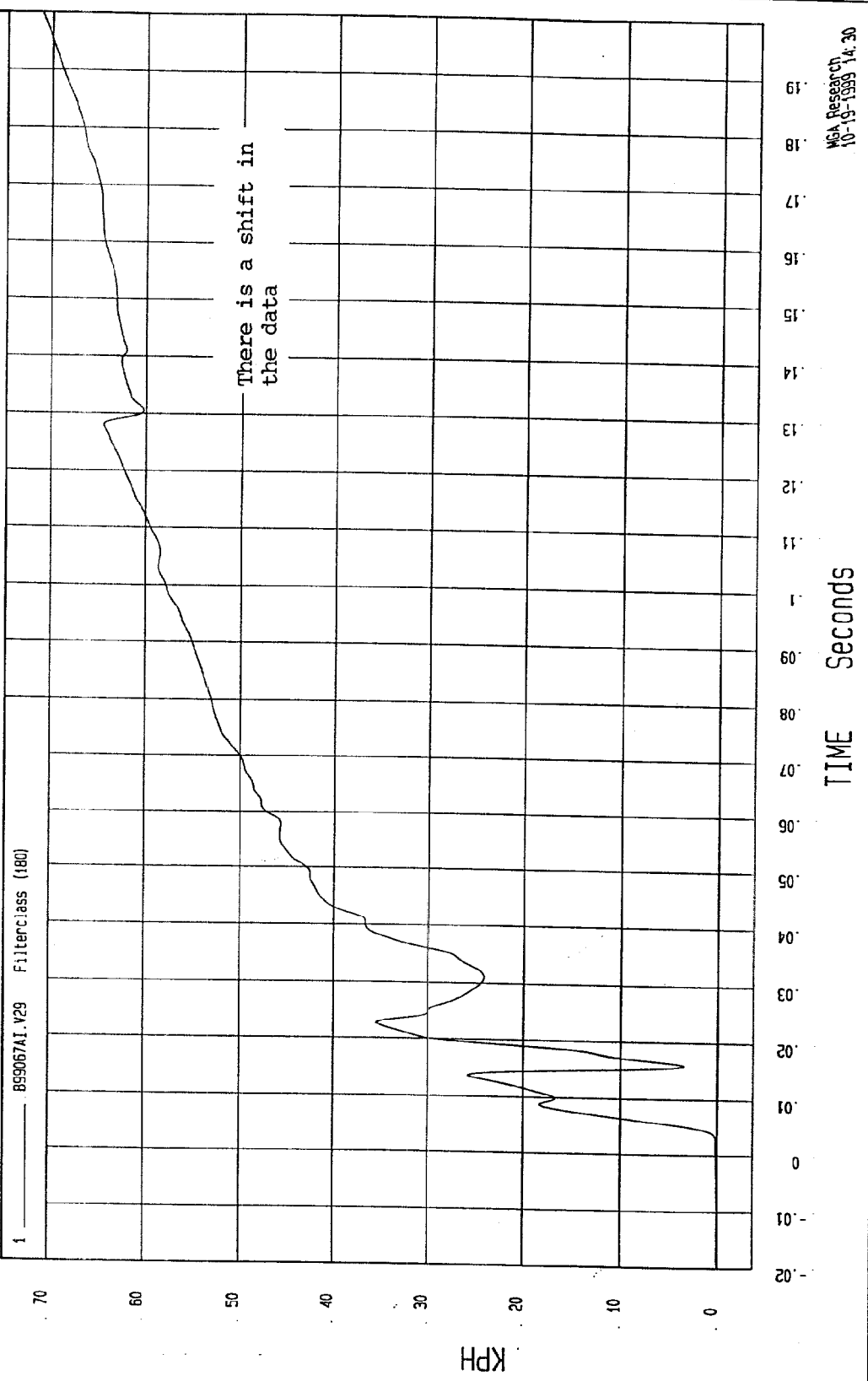


MCA Research
10-19-1999 14:30

TIME (SECONDS)

TEST: FMVSS 214 DYNAMIC SIDE IMPACT
TEST DATE: 10-19-1999
COMPONENT: 2000 BUICK LESABRE (CY0100)
Speed: 32.7 MPH 52.6 KPH
Minimum = -6.25E-03 KPH at -17 msec
Maximum = 71.01 KPH at 200 msec

LEFT MID B-POST Y VELOCITY



MCA Research
10-19-1999 14:30

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

SPEED: 32.7 MPH 52.6 KPH

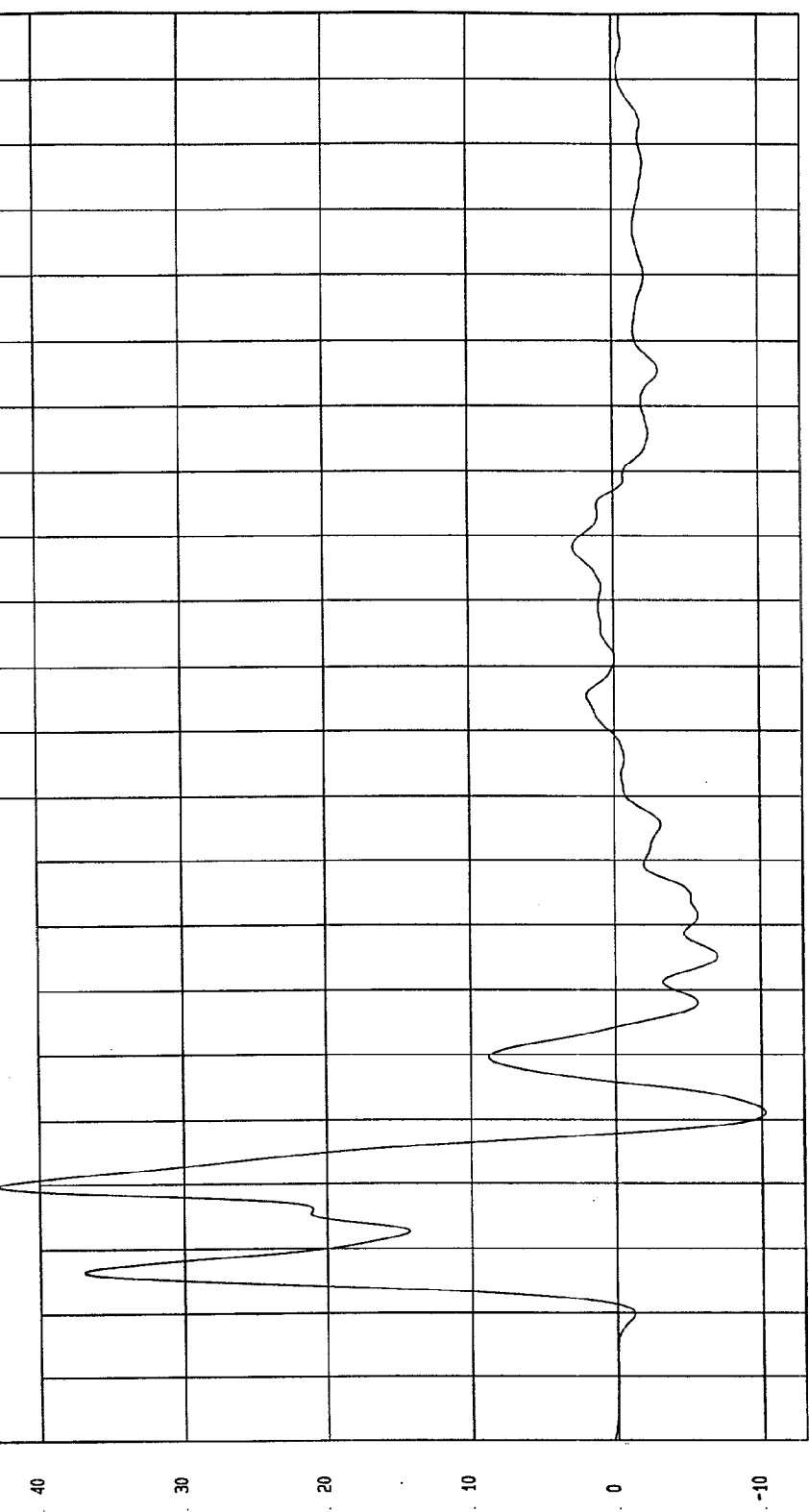
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 42.95 G'S at 20 msec

Minimum = -10.23 G'S at 31 msec

DRIVER SEAT TRACK Y ACCELERATION

1 B99057AF.A40 Filterclass (50)



MGA Research
10-19-1999 14:29

TIME (SECONDS)

G.S

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

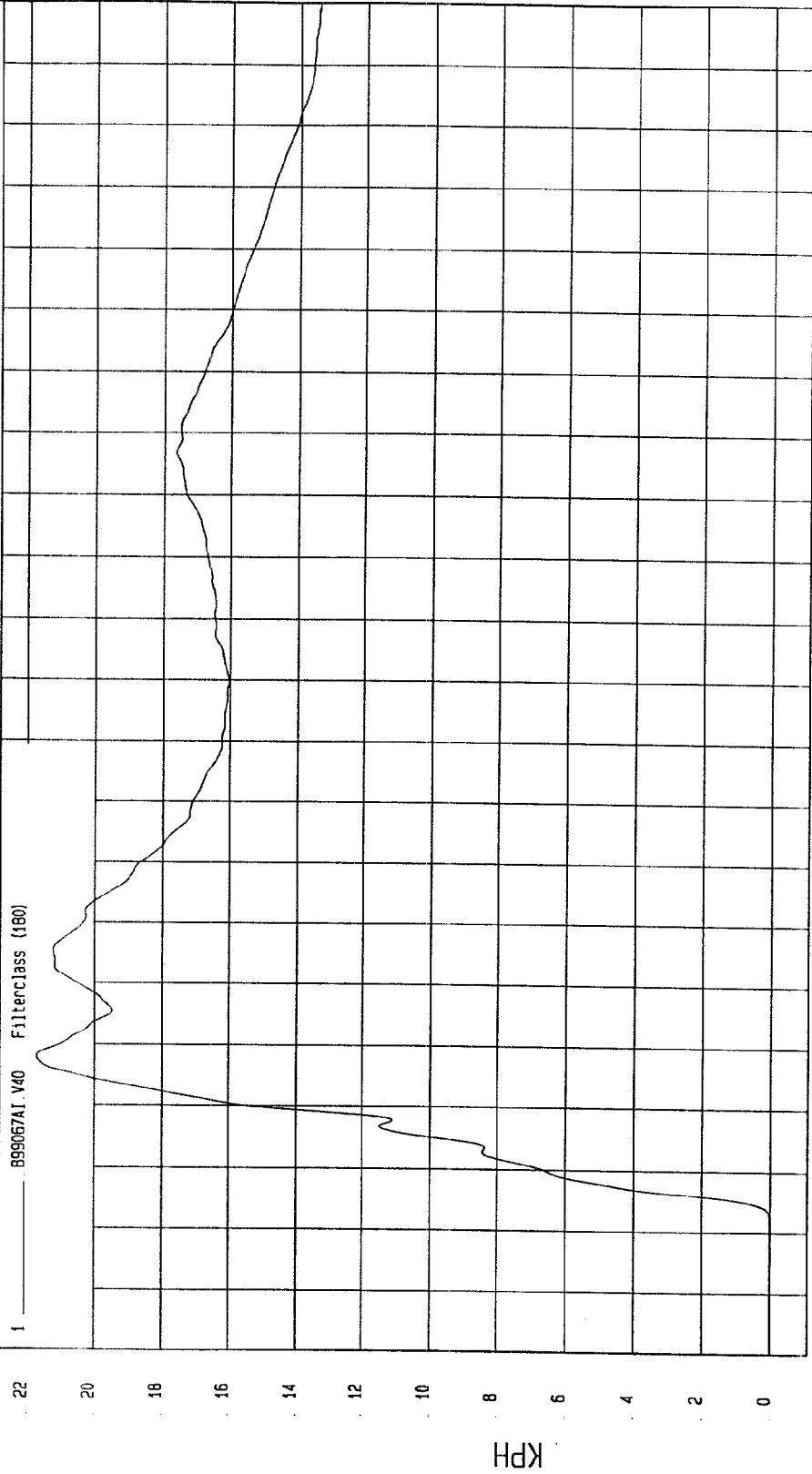
COMPONENT: 2000 BUICK LESABRE (CY0100)

Minimum = 0 KPH at -20 msec

Maximum = 21.72 KPH at 28 msec

DRIVER SEAT TRACK Y VELOCITY

1 ——— B99067AI.V40 Filterclass (180)



WCA Research
10-19-1999 14:29

TIME Seconds

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

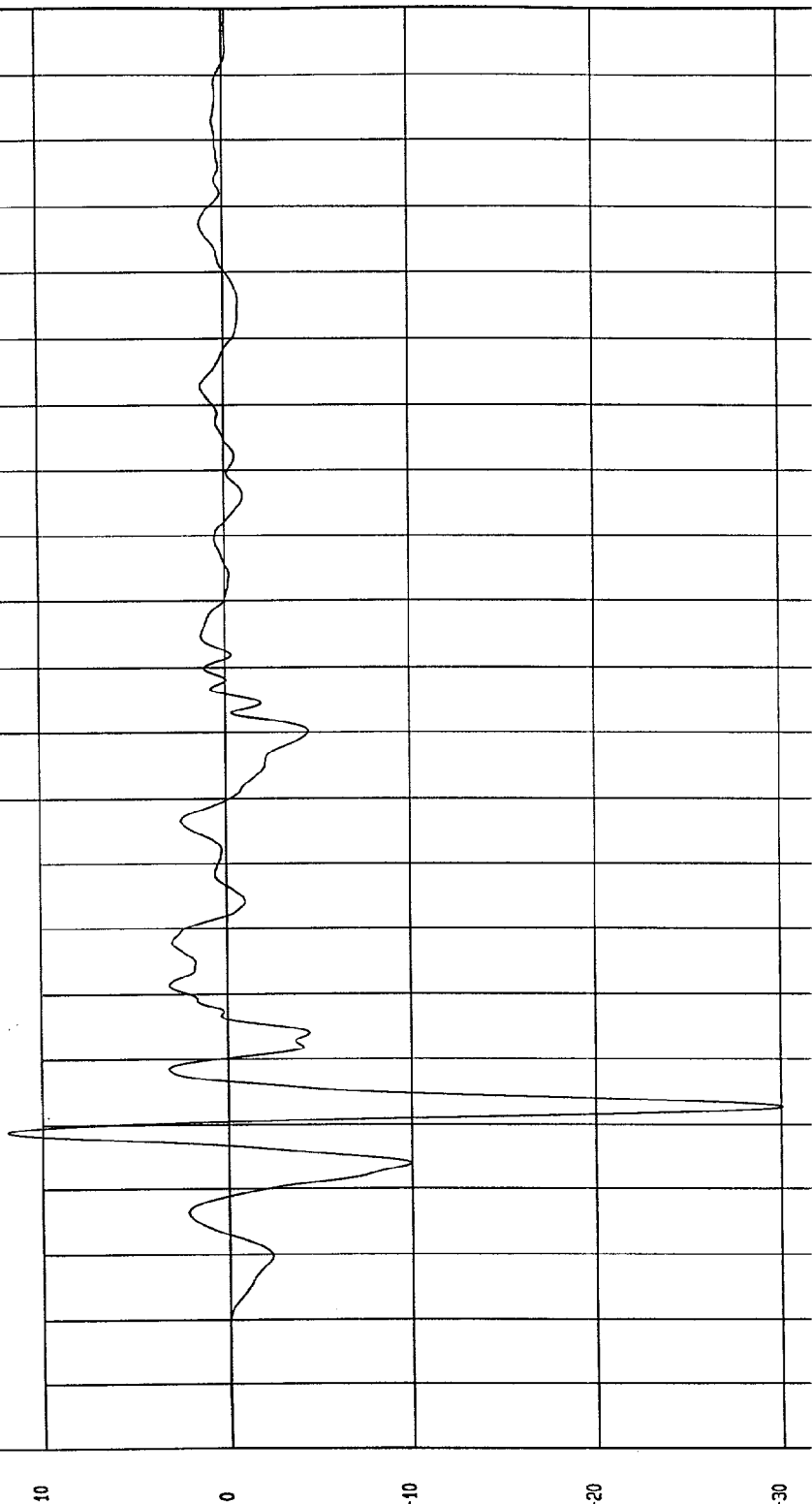
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 11.89 G'S at 29 msec

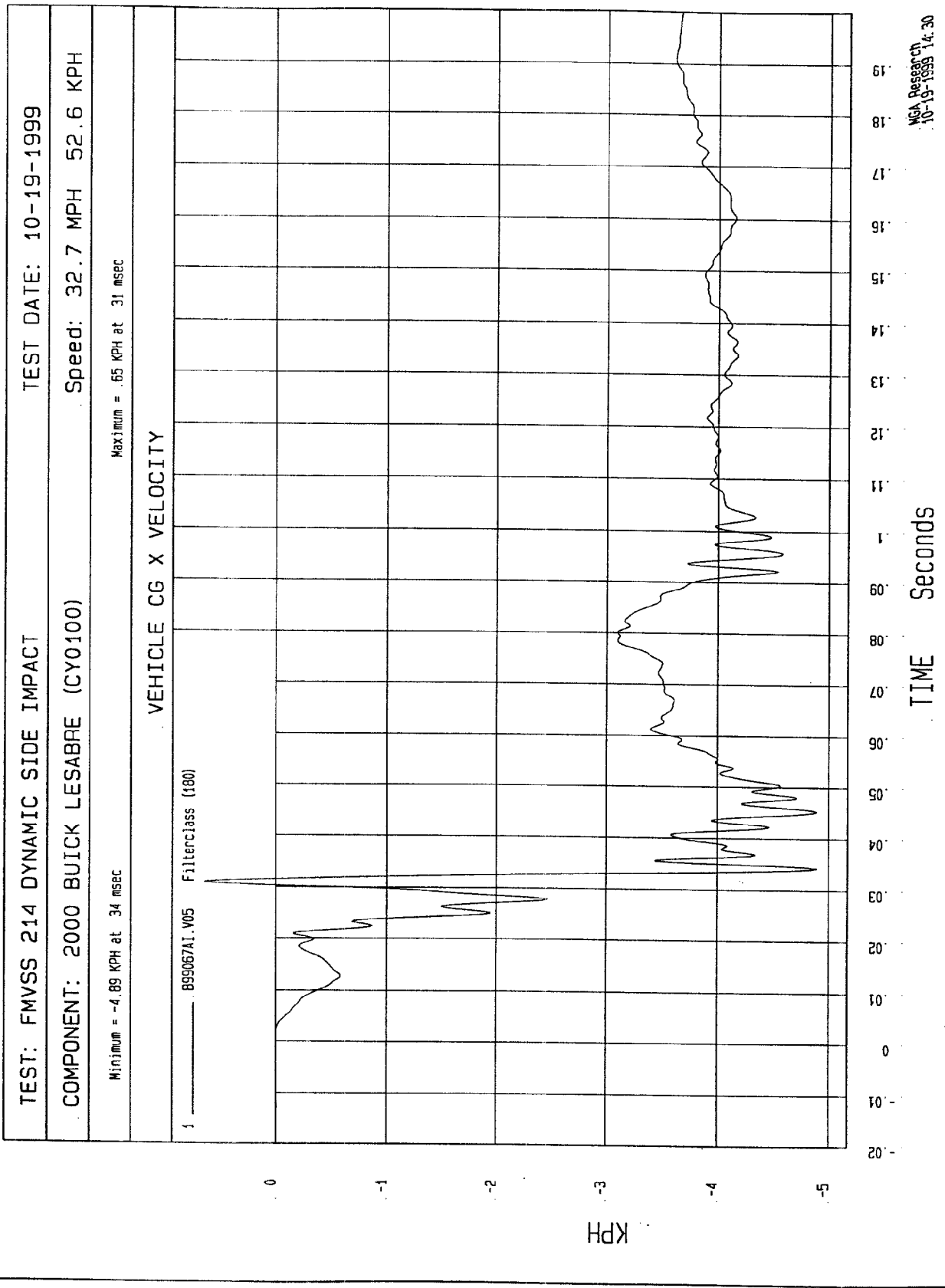
Minimum = -30.12 G'S at 33 msec

VEHICLE CG X ACCELERATION

1 _____ B99067AF.A05 FilterClass (60)



NSA Research
10-19-1999 14:30



TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

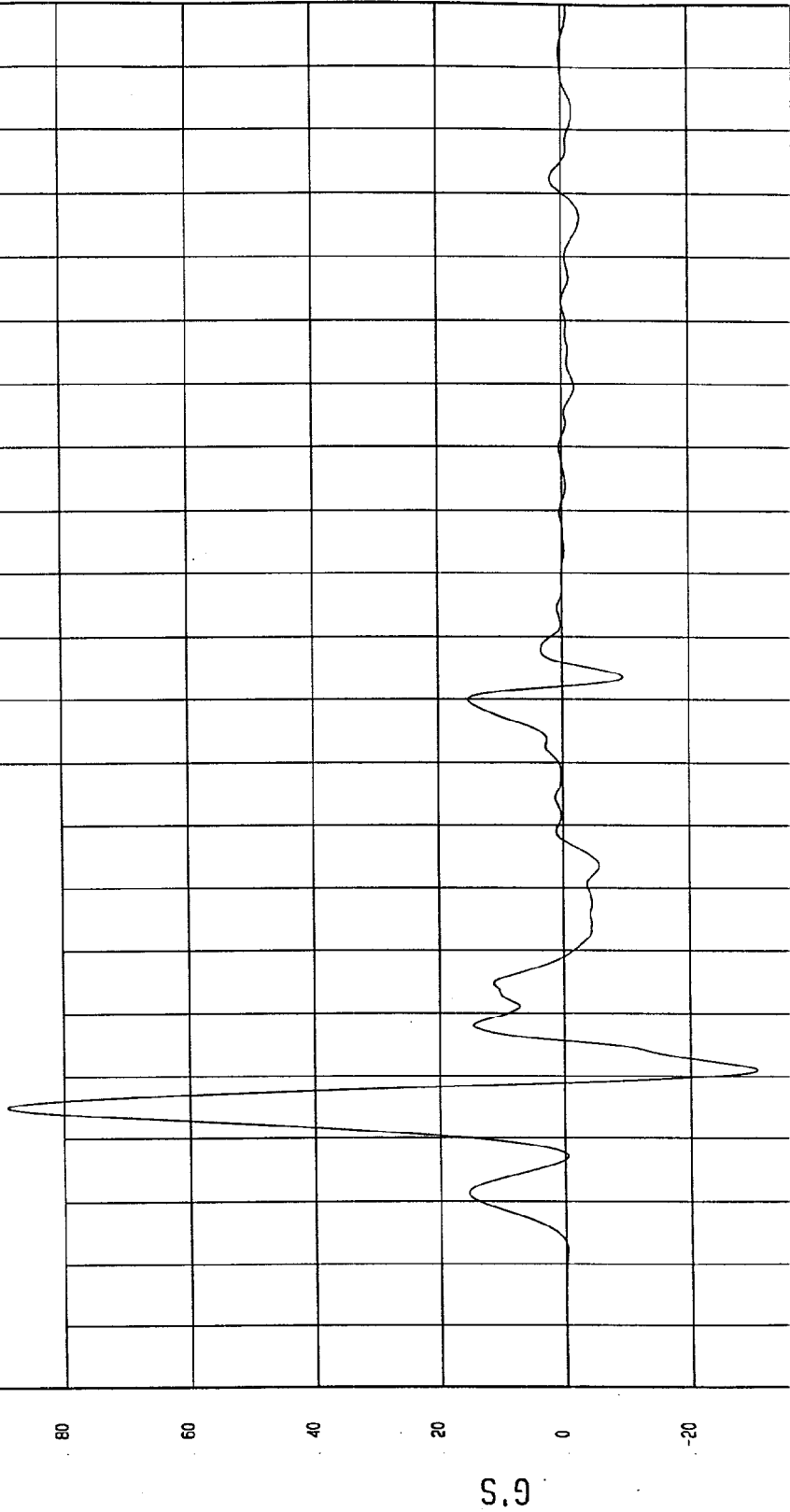
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 89.16 G'S at 25 msec

Minimum = -30.3 G'S at 31 msec

VEHICLE CG Y ACCELERATION

1 899067AF.A05 Filterclass (50)



TIME (SECONDS)

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

VEA Research
10-25-1999 15:37

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

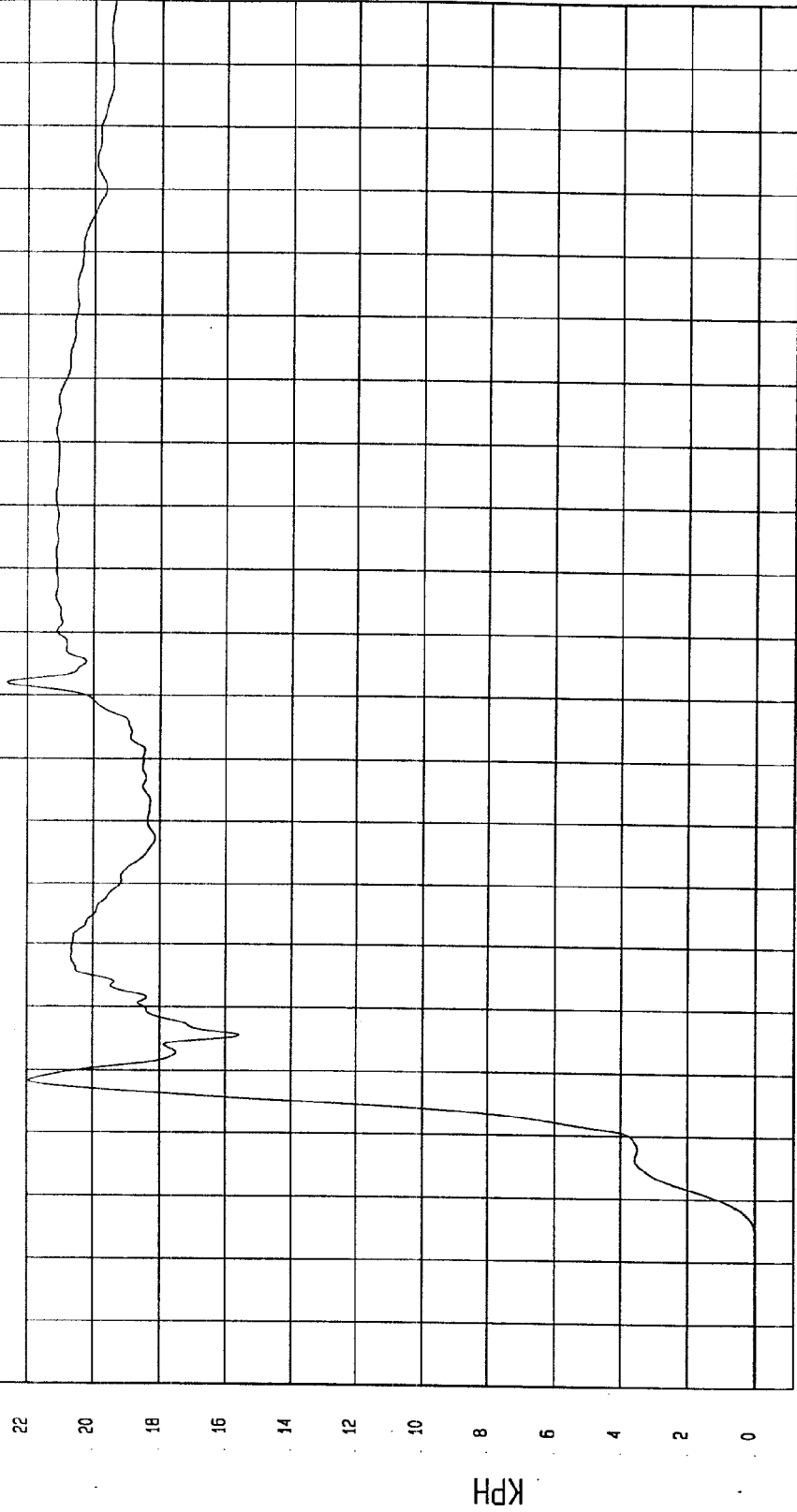
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 22.02 KPH at 92 msec

Minimum = -1.21E-02 KPH at -12 msec

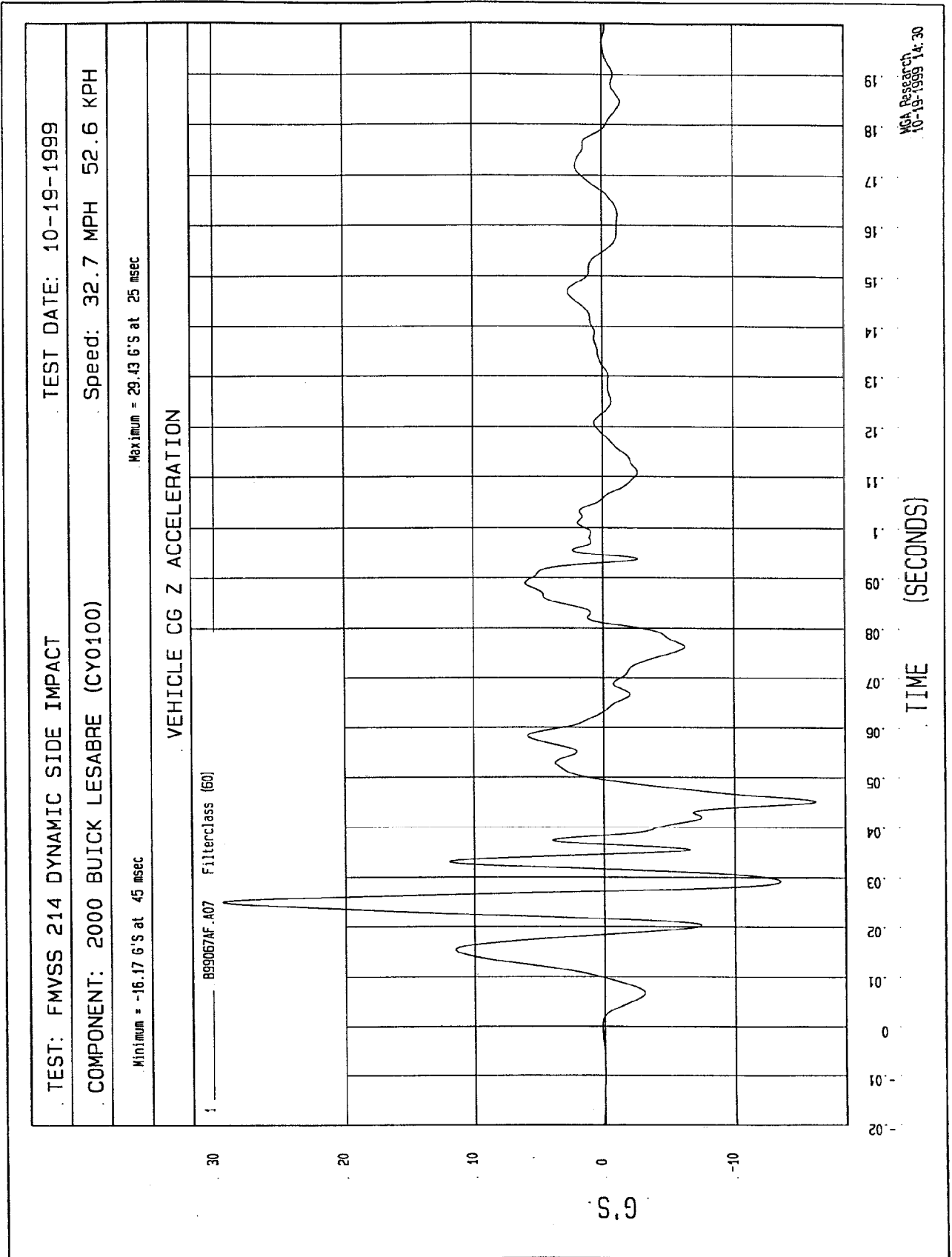
VEHICLE CG Y VELOCITY

1 ——— B99067A1.V06 Filterclass (180)



MSA Research
10-25-1999 15:37

TIME Seconds



TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

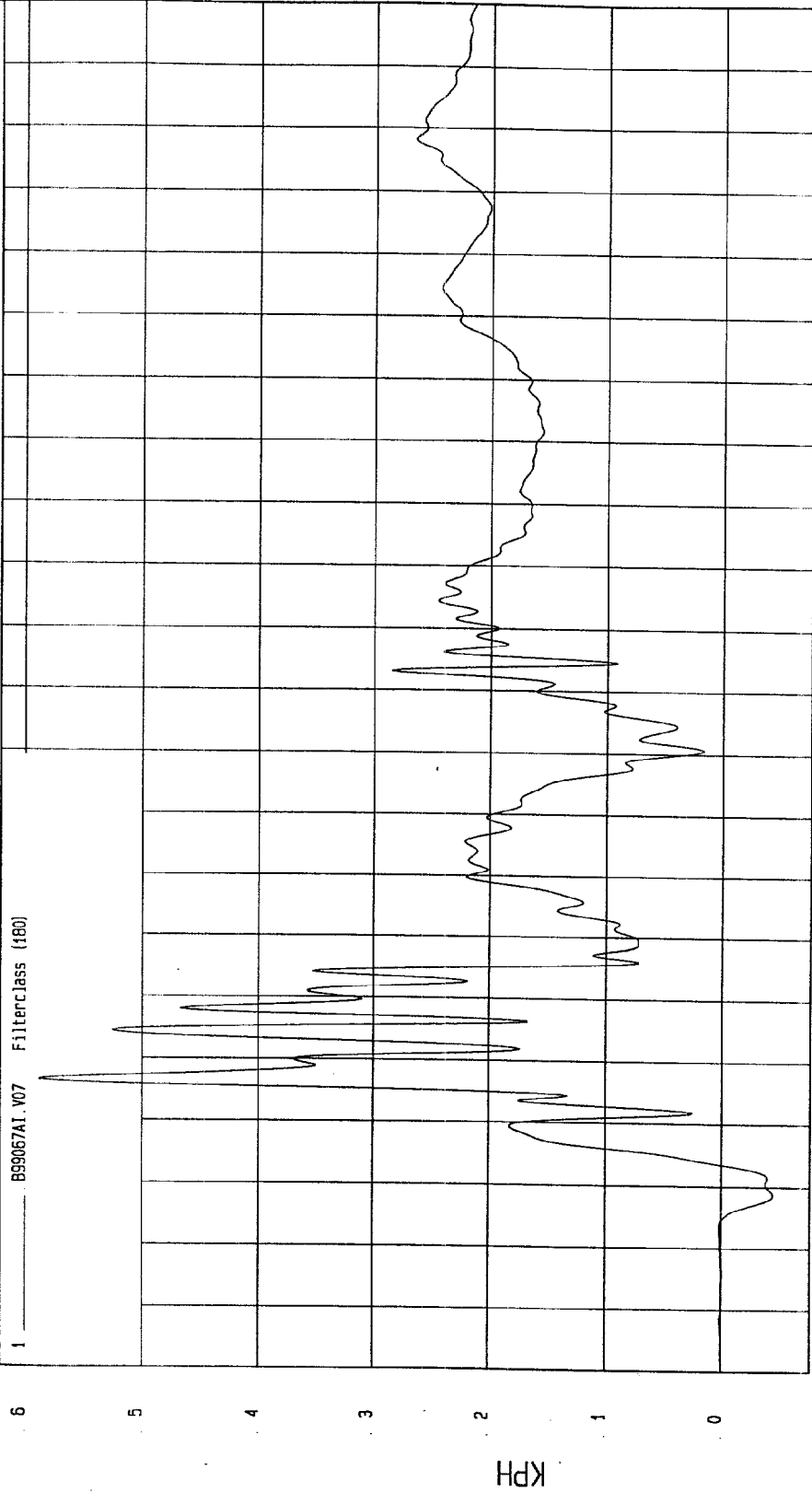
Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Minimum = .44 KPH at 9 msec

Maximum = 5.9 KPH at 26 msec

VEHICLE CG Z VELOCITY



NSA Research
10-19-1999 14:30

TIME Seconds

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 94.16 G'S at 25 msec

Minimum = 1.23E-02 G'S at -13 msec

VEHICLE CG RESULTANT ACCELERATION

1 B99067AV.A05 Filterclass (60)

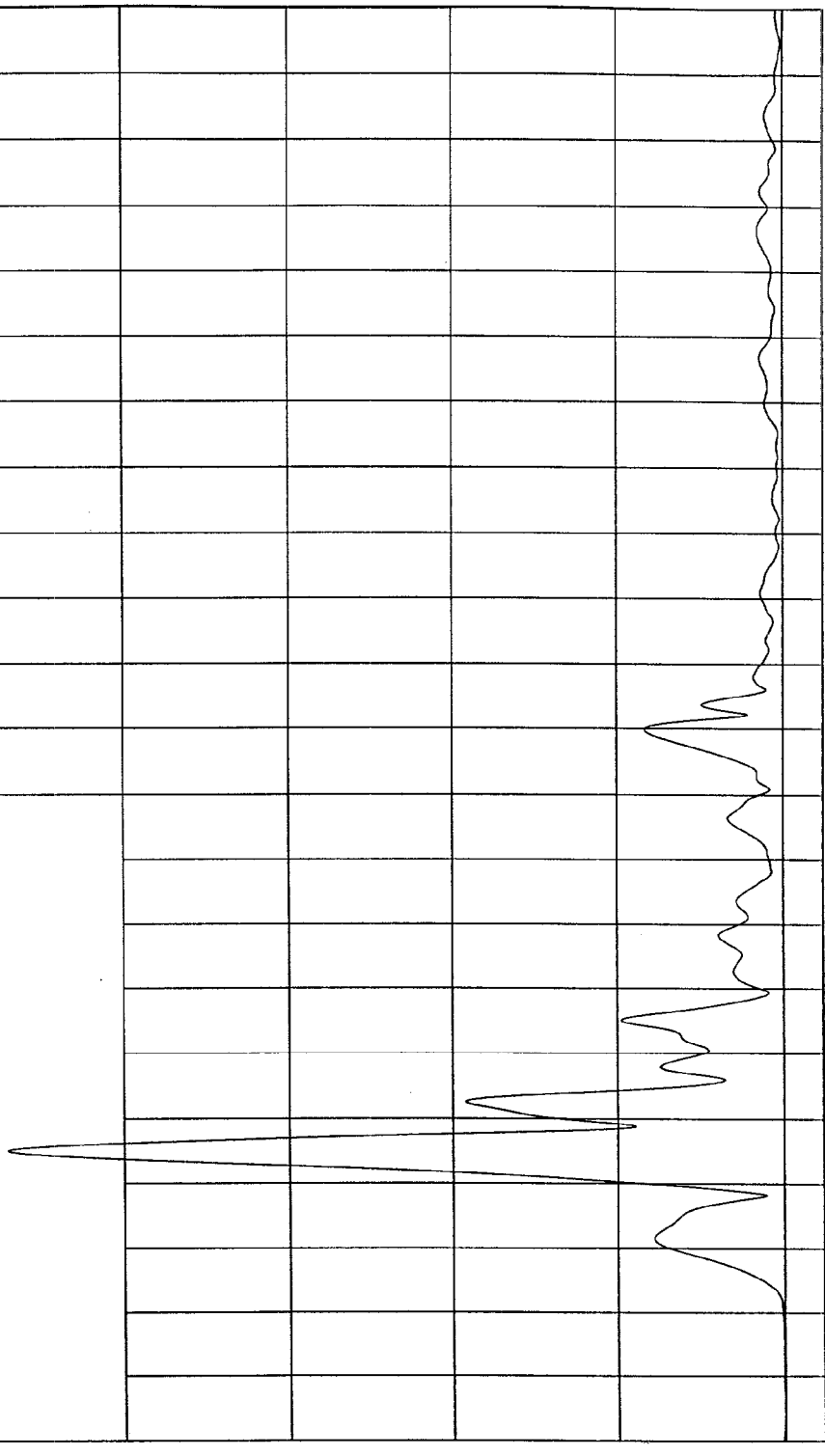
80
50
40
20
0

G.S

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

TIME (SECONDS)

MCA Research
10-19-1999 14:30



TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 1.27 G'S at 162 msec

Minimum = -16.44 G'S at 37 msec

MOVING BARRIER CG X ACCELERATION

1 — 899067AF.M63 Filterclass (60)

2

0

-2

-4

-6

-8

-10

-12

-14

-16

G'S

16

15

14

13

12

11

10

9

8

7

6

5

4

3

2

1

0

-1

-2

-3

-4

-5

-6

-7

-8

-9

-10

-11

TIME (SECONDS)

M&A Research
10-19-1999 14:31

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

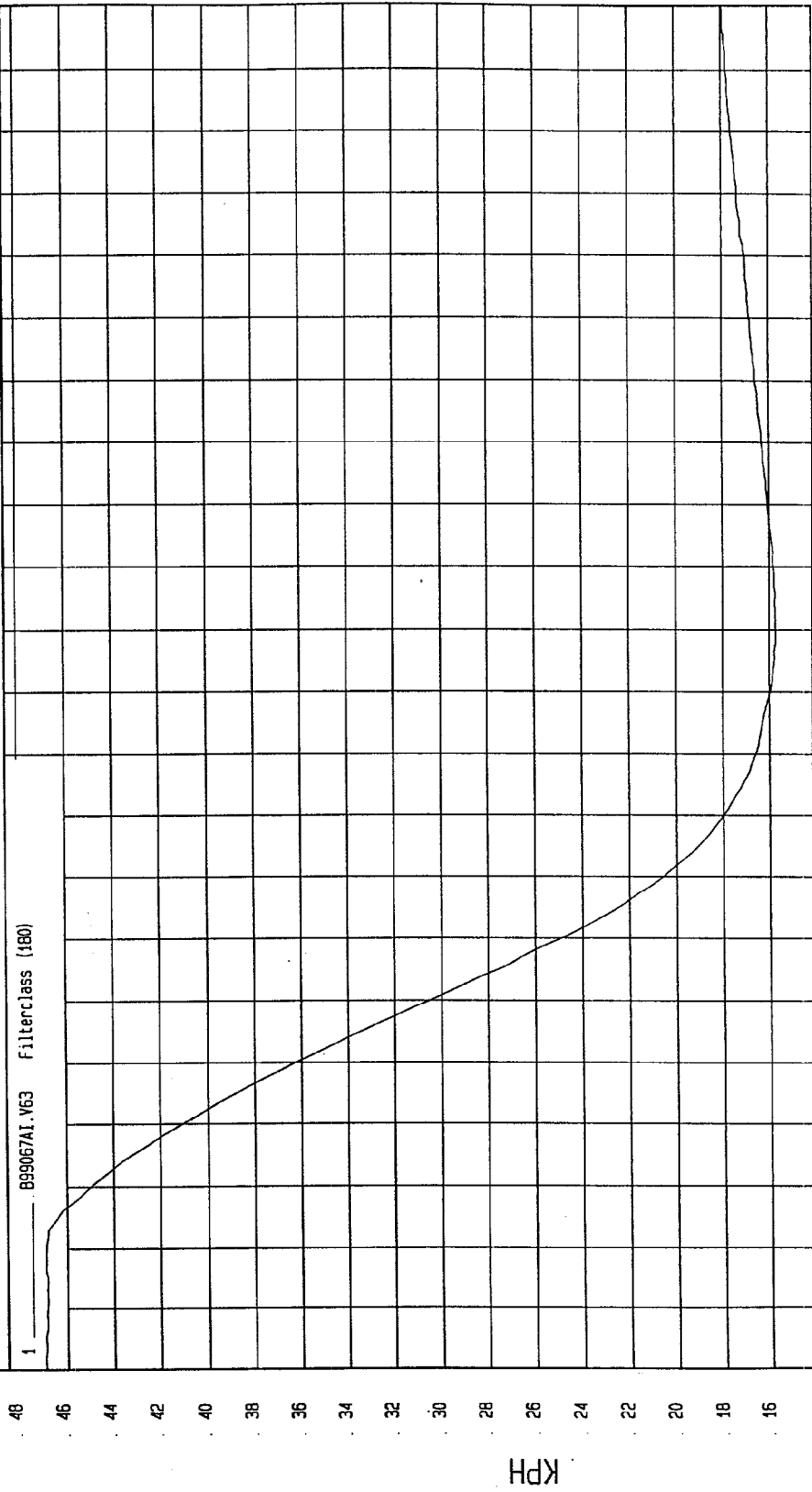
Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 46.93 KPH at -18 msec

Minimum = 15.72 KPH at 99 msec

MOVING BARRIER CG X VELOCITY



MOA Research
10-19-1999 14:31

TIME Seconds

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

Speed: 32.7 MPH 52.6 KPH

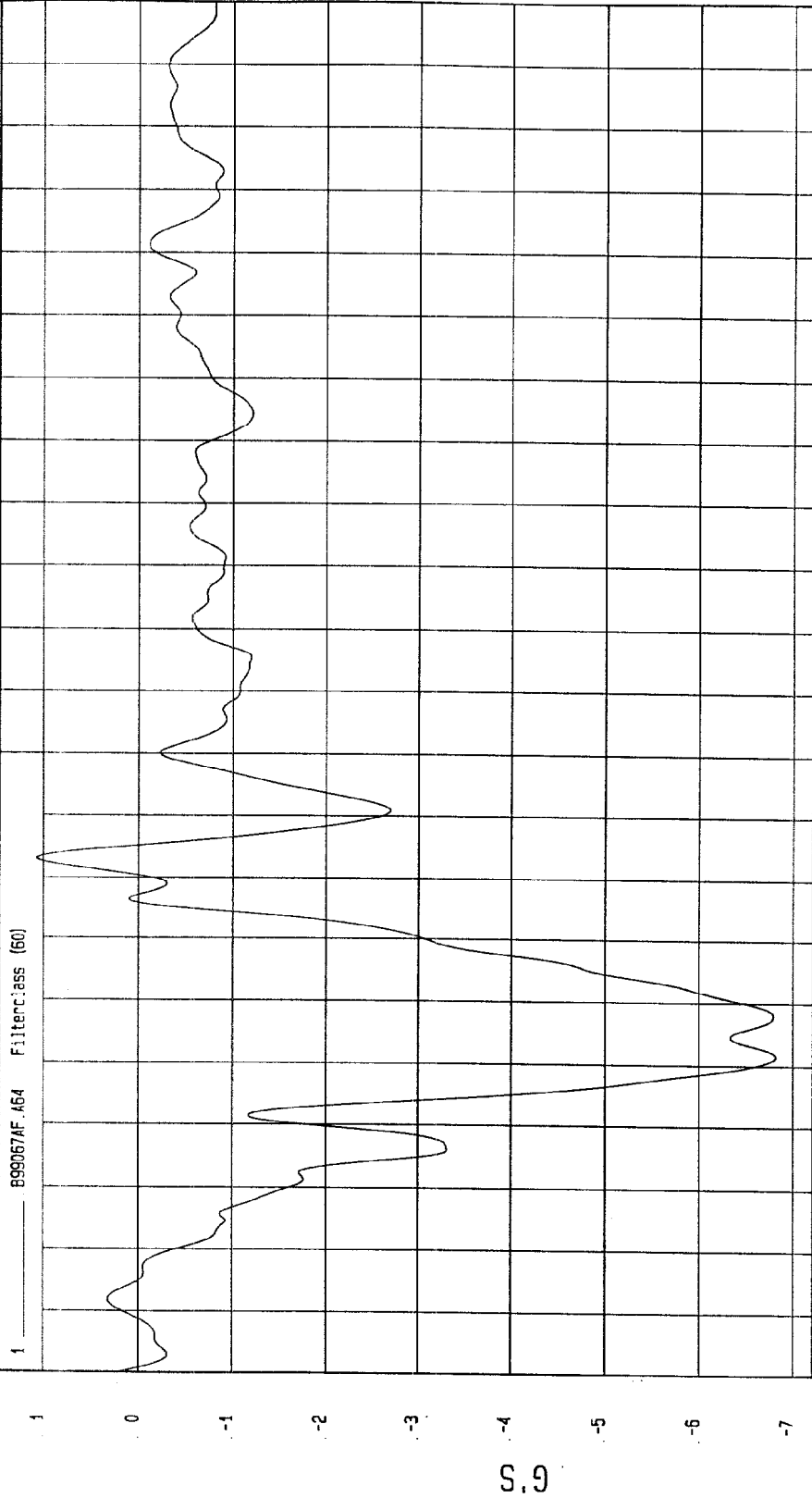
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 1.07 G'S at 63 msec

Minimum = -6.82 G'S at 32 msec

MOVING BARRIER CG Y ACCELERATION

1 B99067AF.A64 Filter: class (60)



TIME (SECONDS)

MGA Research
10-19-1999 14:31

TEST: FMVSS 214 DYNAMIC SIDE IMPACT TEST DATE: 10-19-1999

SPEED: 32.7 MPH 52.6 KPH

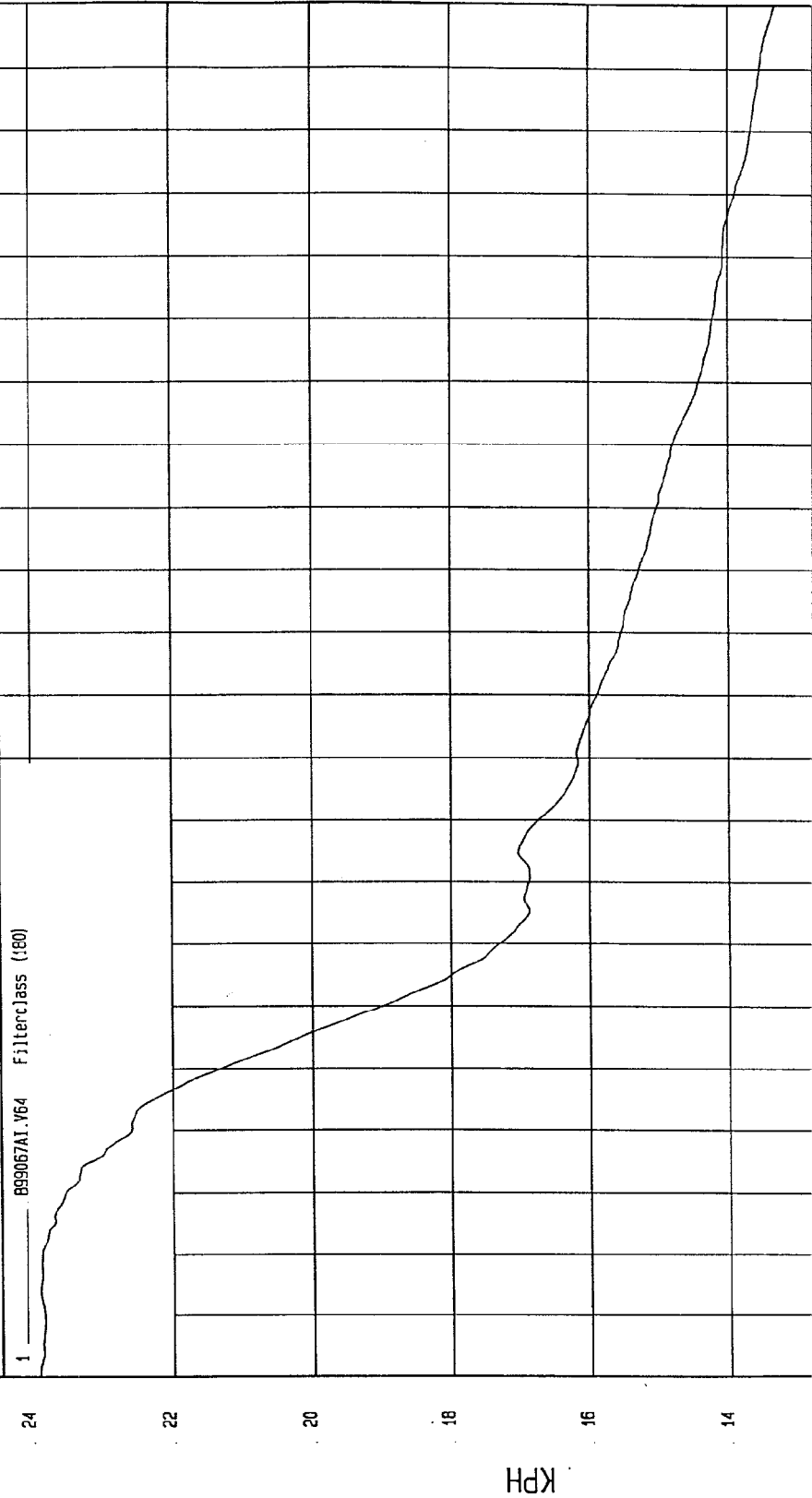
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 23.9 KPH at -19 msec

Minimum = 13.33 KPH at 200 msec

MOVING BARRIER CG Y VELOCITY

1 ——— 899067A1.V64 Filterclass (180)



MCA Research
10-19-1999 14:31

TEST: FMVSS 214 DYNAMIC SIDE IMPACT TEST DATE: 10-19-1999

COMPONENT: 2000 BUICK LESABRE (CY0100) Speed: 32.7 MPH 52.6 KPH

Minimum = -11.81 G'S at 23 msec Maximum = 14.77 G'S at 60 msec

MOVING BARRIER CG Z ACCELERATION

1 — 899067AF.A65 Filterclass (60)

16

14

12

10

8

6

4

2

0

-2

-4

-6

-8

-10

-12

G'S

-0.02

0

.01

.02

.03

.04

.05

.06

.07

.08

.09

.1

.11

.12

.13

.14

.15

.16

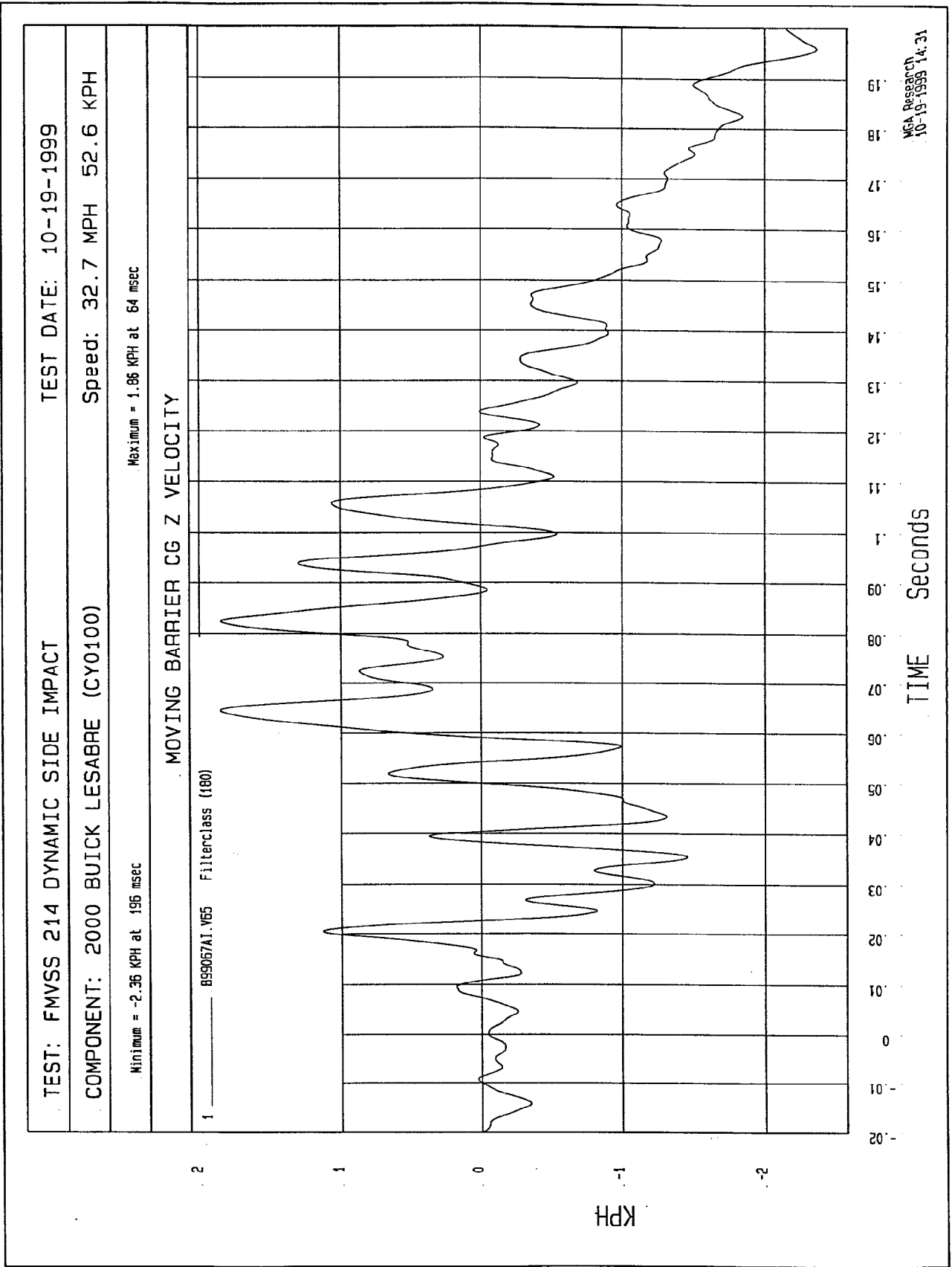
.17

.18

.19

TIME (SECONDS)

M&A Research
10-19-1999 14:31



TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

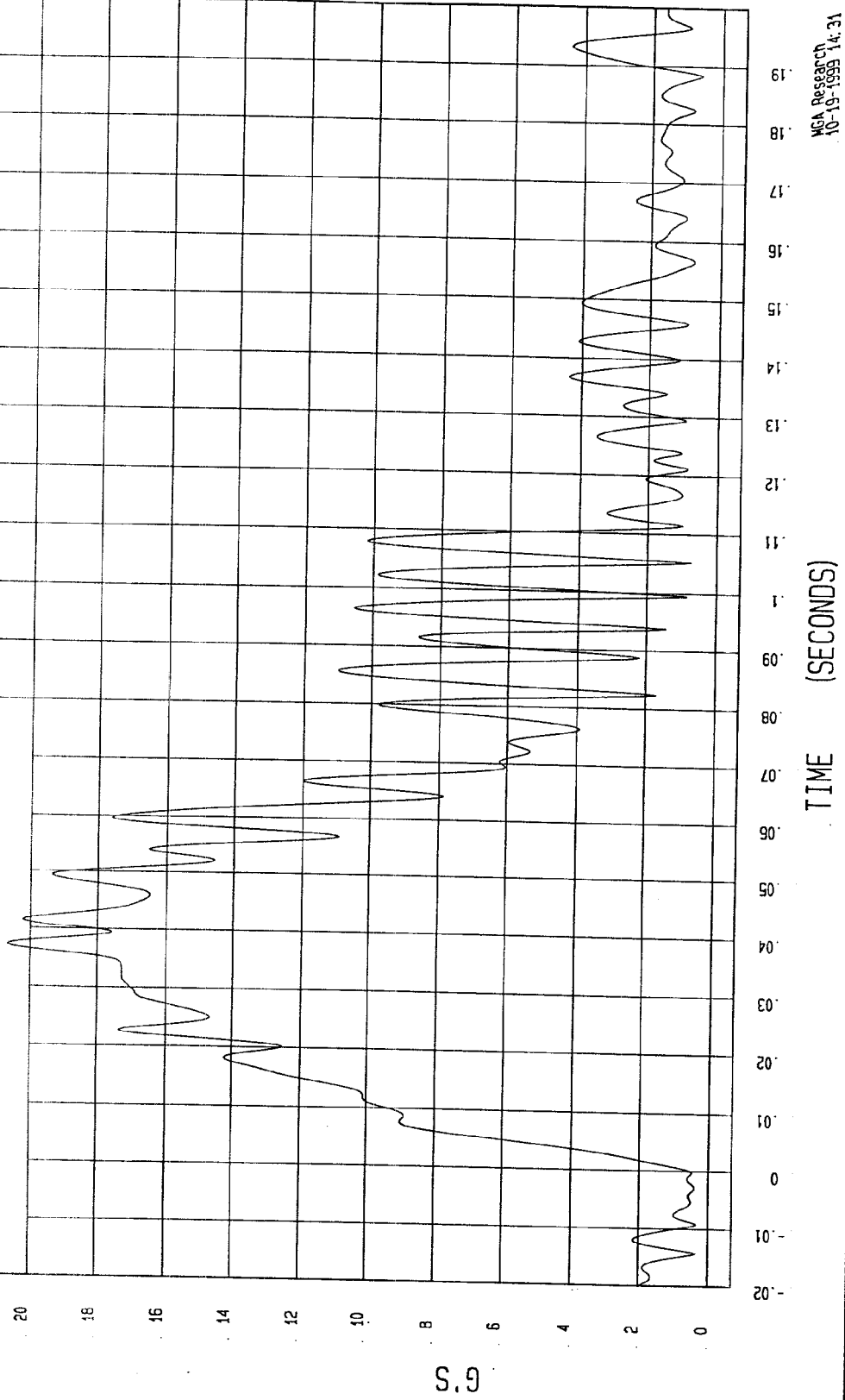
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 20.67 G'S at 37 msec

Minimum = .34 G'S at -9 msec

MOVING BARRIER CG RESULTANT ACCELERATION

1 _____ B99067AV.A63 Filterclass [60]



WGA Research
10-19-1999 14:31

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 1.72 G'S at 147 msec

Minimum = -21.36 G'S at 36 msec

MOVING BARRIER REAR AXLE X ACCELERATION

1 B99067AF.A66 Filterclass (60)

2

0

-2

-4

-6

-8

-10

-12

-14

-16

-18

-20

-22

G'S

HCA Research
10-19-1999 14:31

TIME (SECONDS)

0.02 0.01 0.03 0.04 0.05 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

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

COMPONENT: 2000 BUICK LESABRE (CY0100)

Speed: 32.7 MPH 52.6 KPH

Minimum = 12.13 KPH at 97 msec

Maximum = 46.9 KPH at -20 msec

MOVING BARRIER REAR AXLE X VELOCITY

48

1 899067A1.V66 Filterclass (180)

46

44

42

40

38

36

34

32

30

28

26

24

22

20

18

16

14

12

KPH

-02

-01

0

01

02

03

04

05

06

07

08

09

1

11

12

13

14

15

16

17

18

19

TIME Seconds

MGA Research
10-19-1999 14:31

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

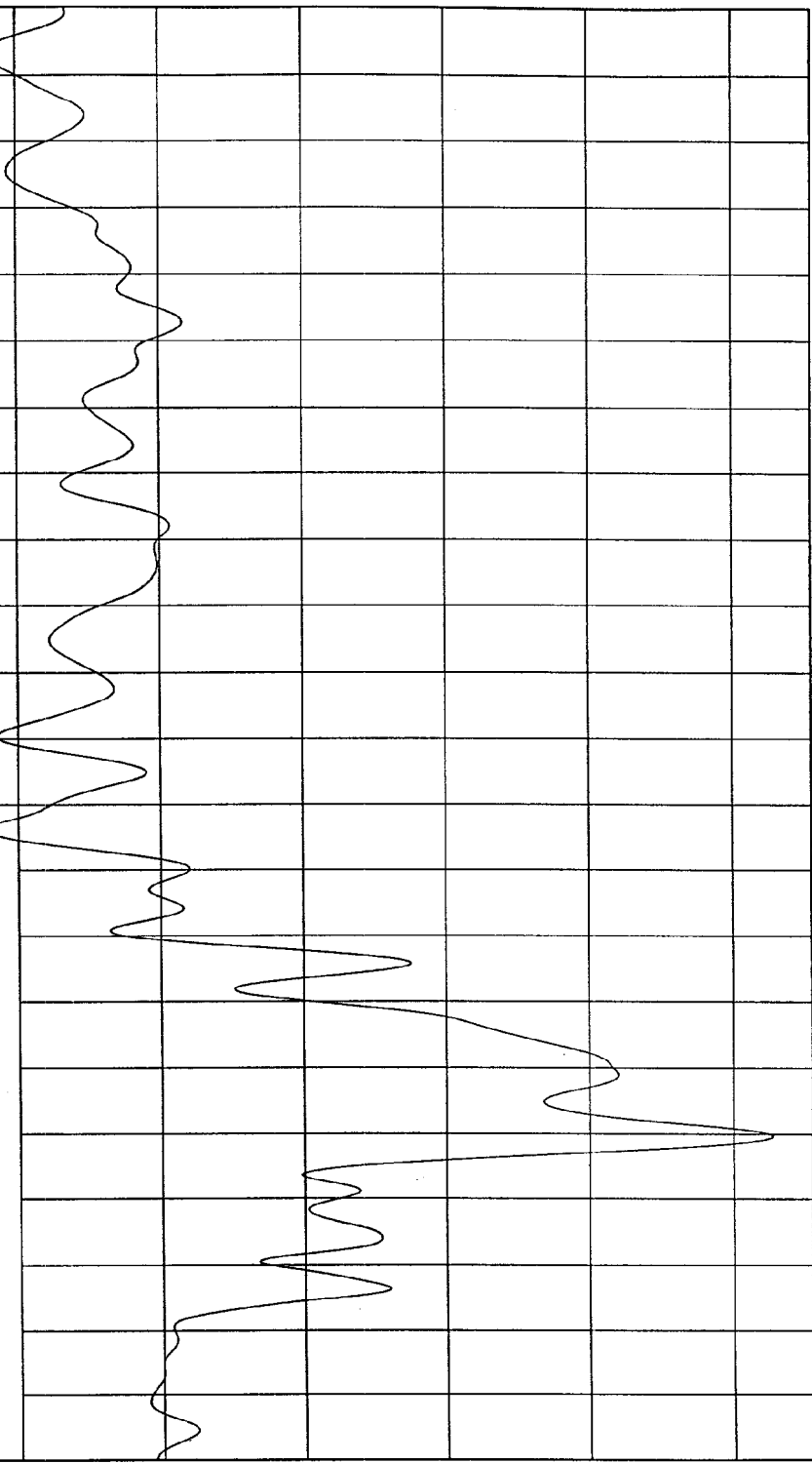
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 1.22 G'S at 193 msec

Minimum = -4.27 G'S at 30 msec

MOVING BARRIER REAR AXLE Y ACCELERATION

1 _____ B99067AF.A57 Filterclass (60)



MSA Research
10-19-1999 14:31

TIME (SECONDS)

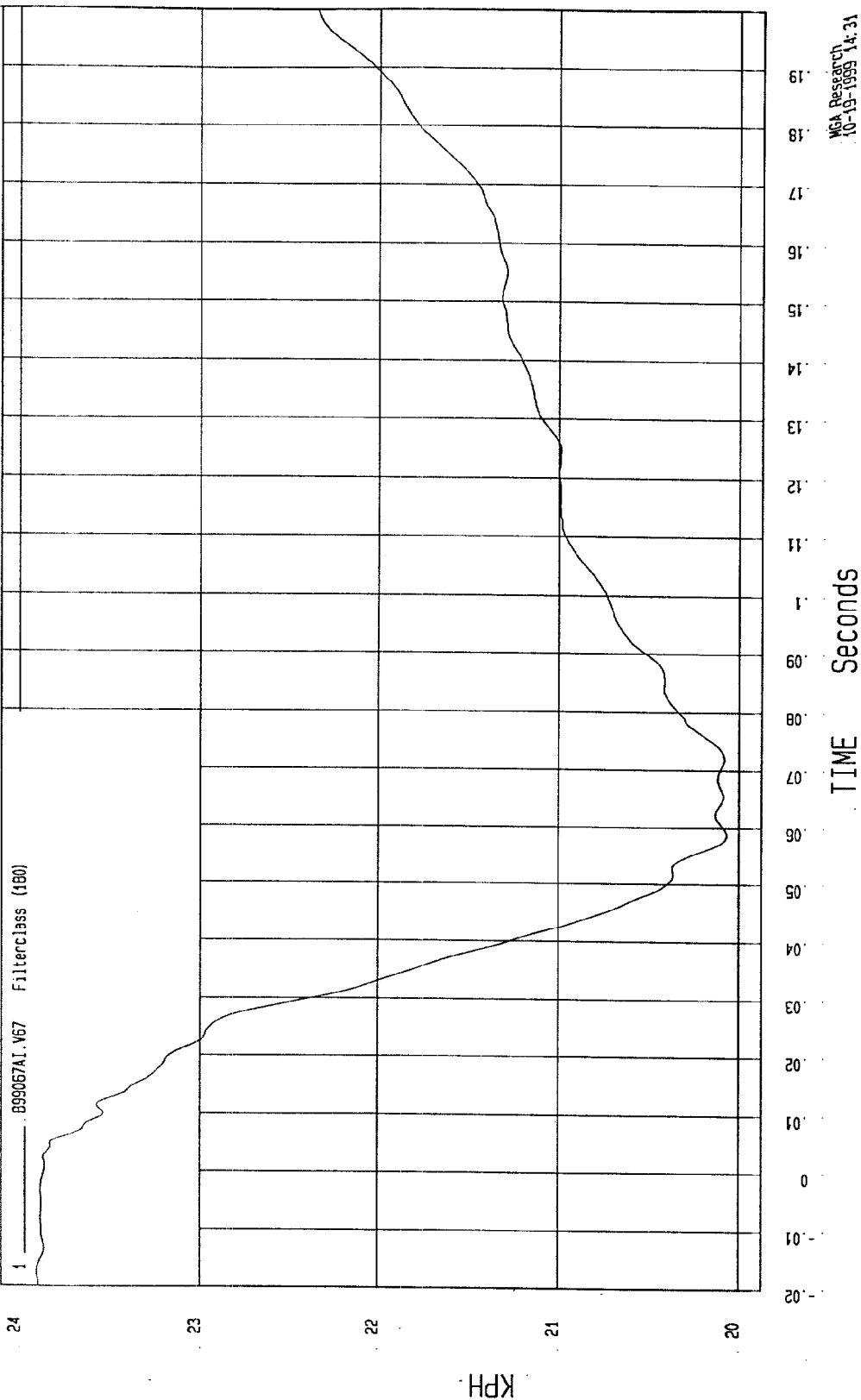
G's

TEST: FMVSS 214 DYNAMIC SIDE IMPACT TEST DATE: 10-19-1999

COMPONENT: 2000 BUICK LESABRE (CY0100) Speed: 32.7 MPH 52.6 KPH

Minimum = 20.07 KPH at 59 msec Maximum = 23.91 KPH at -18 msec

MOVING BARRIER REAR AXLE Y VELOCITY



WCA Research
10-19-1999 14:31

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 4.58E-02 VOLTS at 86 msec

Minimum = -4.04 VOLTS at 1 msec

LEFT BARRIER CONTACT

1 8990670T.071 Filterclass (1000)

0

-1

-2

-3

-4

VOLTS

TIME (SECONDS)

MCA Research
10-25-1999 10:38

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

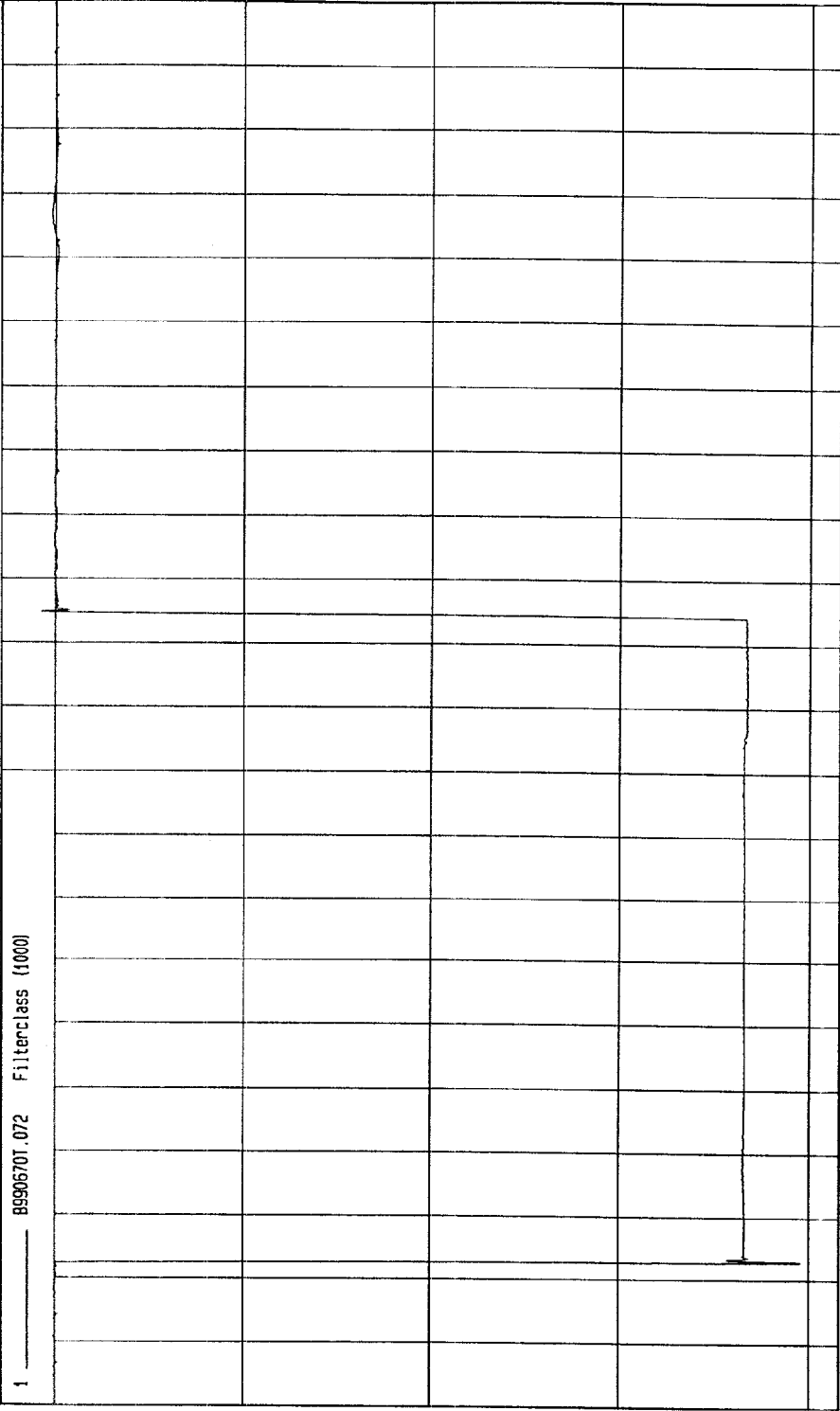
Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 7.53E-02 VOLTS at 105 msec

Minimum = -3.96 VOLTS at 3 msec

RIGHT BARRIER CONTACT



MOA Research
10-25-1999 10:39

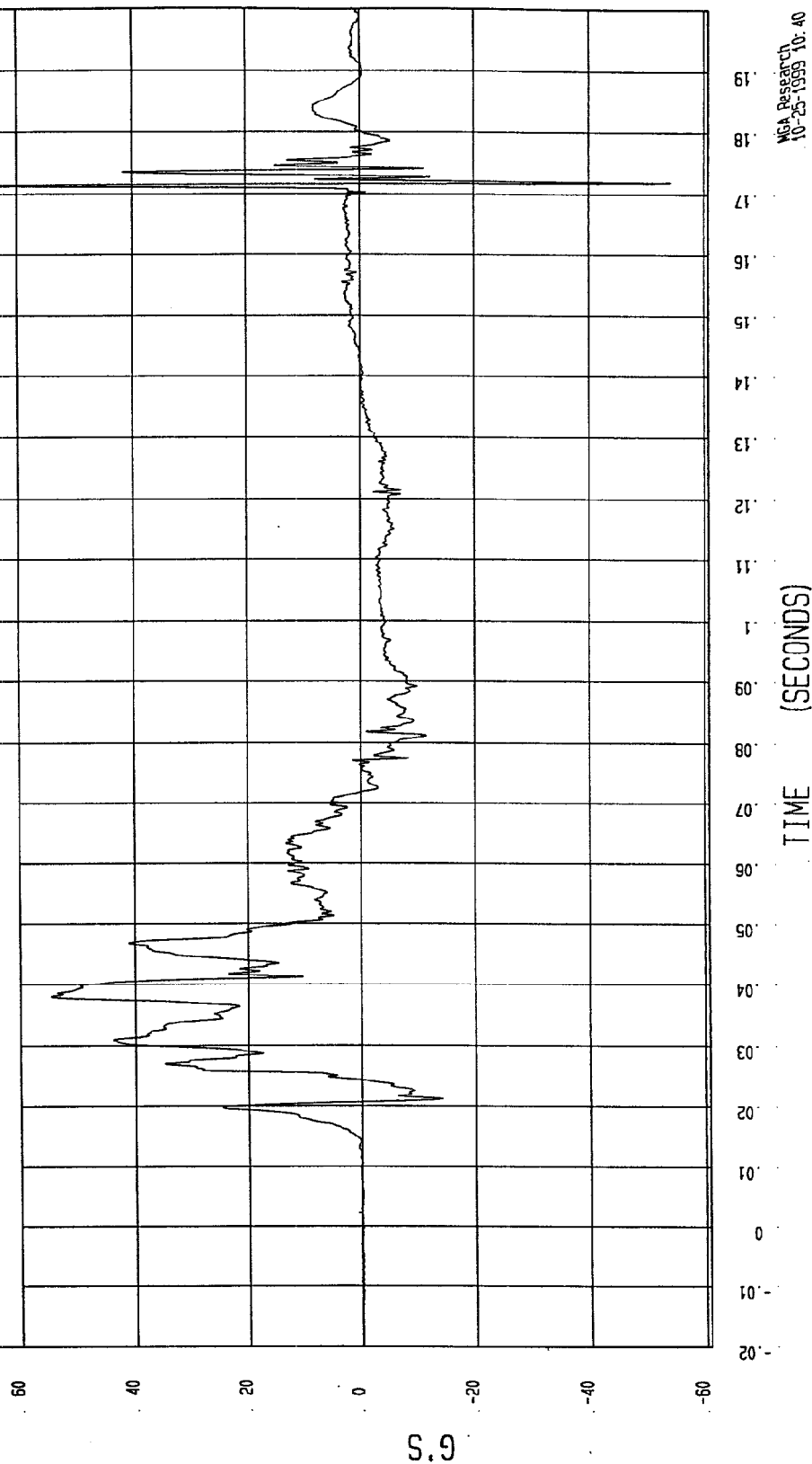
TEST: FMVSS 214 DYNAMIC SIDE IMPACT TEST DATE: 10-19-1999

COMPONENT: 2000 BUICK LESABRE (CY0100) Speed: 32.7 MPH 52.6 KPH

Minimum = -54.37 G'S at 172 msec Maximum = 72.26 G'S at 171 msec

DRIVER UPPER RIB Y REDUNDANT ACCELERATION

1 _____ B99067AT.A42 Filterclass (1000)

MGA Research
10-25-1999 10:40

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

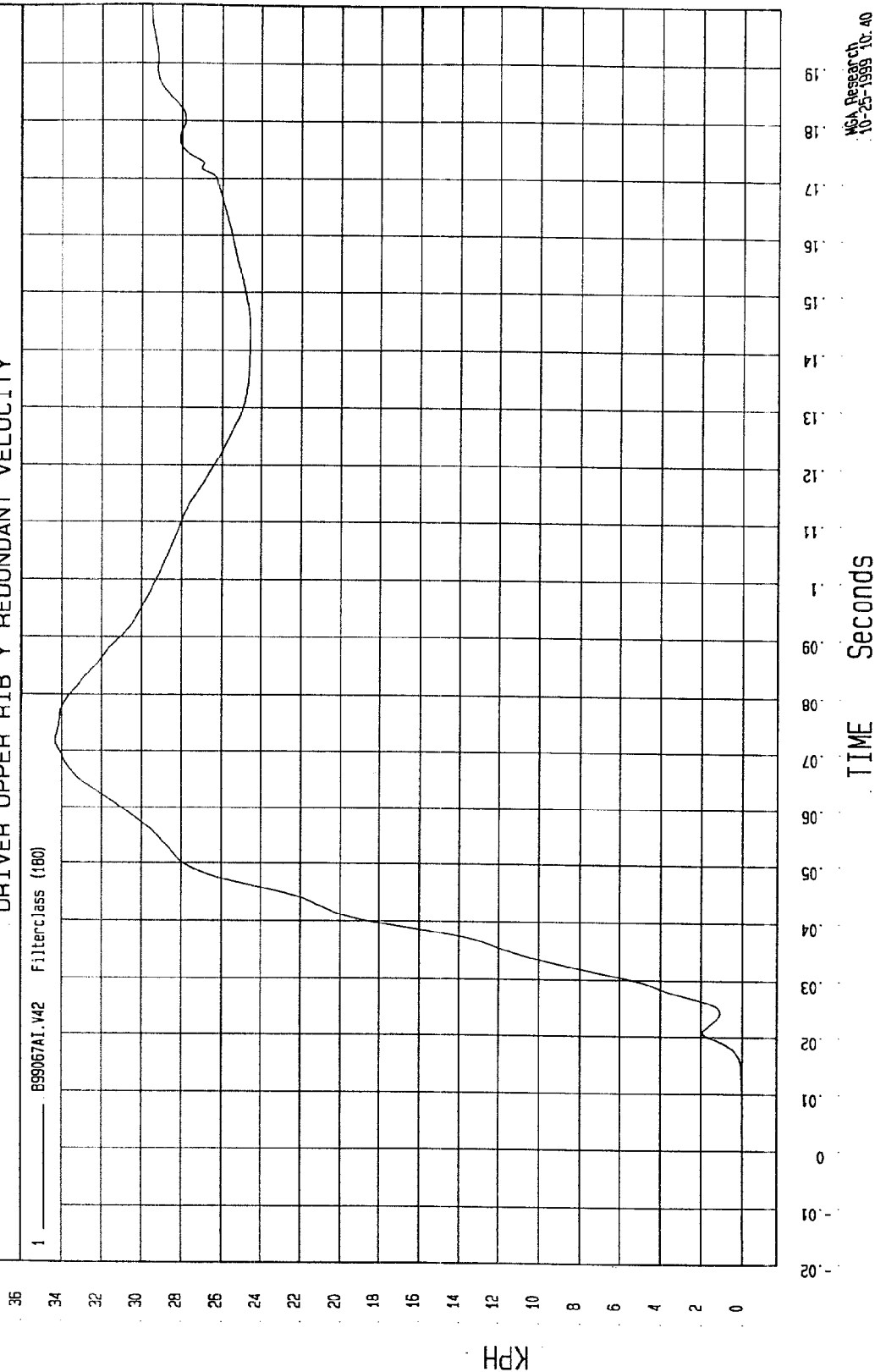
Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Minimum = -1.97E-03 KPH at -4 msec

Maximum = 34.31 KPH at 72 msec

DRIVER UPPER RIB Y REDUNDANT VELOCITY



NCA Research
10-25-1999 10:40

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 92.29 G'S at 171 msec

Minimum = -73.13 G'S at 172 msec

DRIVER LOWER RIB Y REDUNDANT ACCELERATION

1 _____ B99067AT.A43 Filter: class (1000)

100

80

60

40

20

0

G.S.

-20

-40

-60

-80

19

18

17

16

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

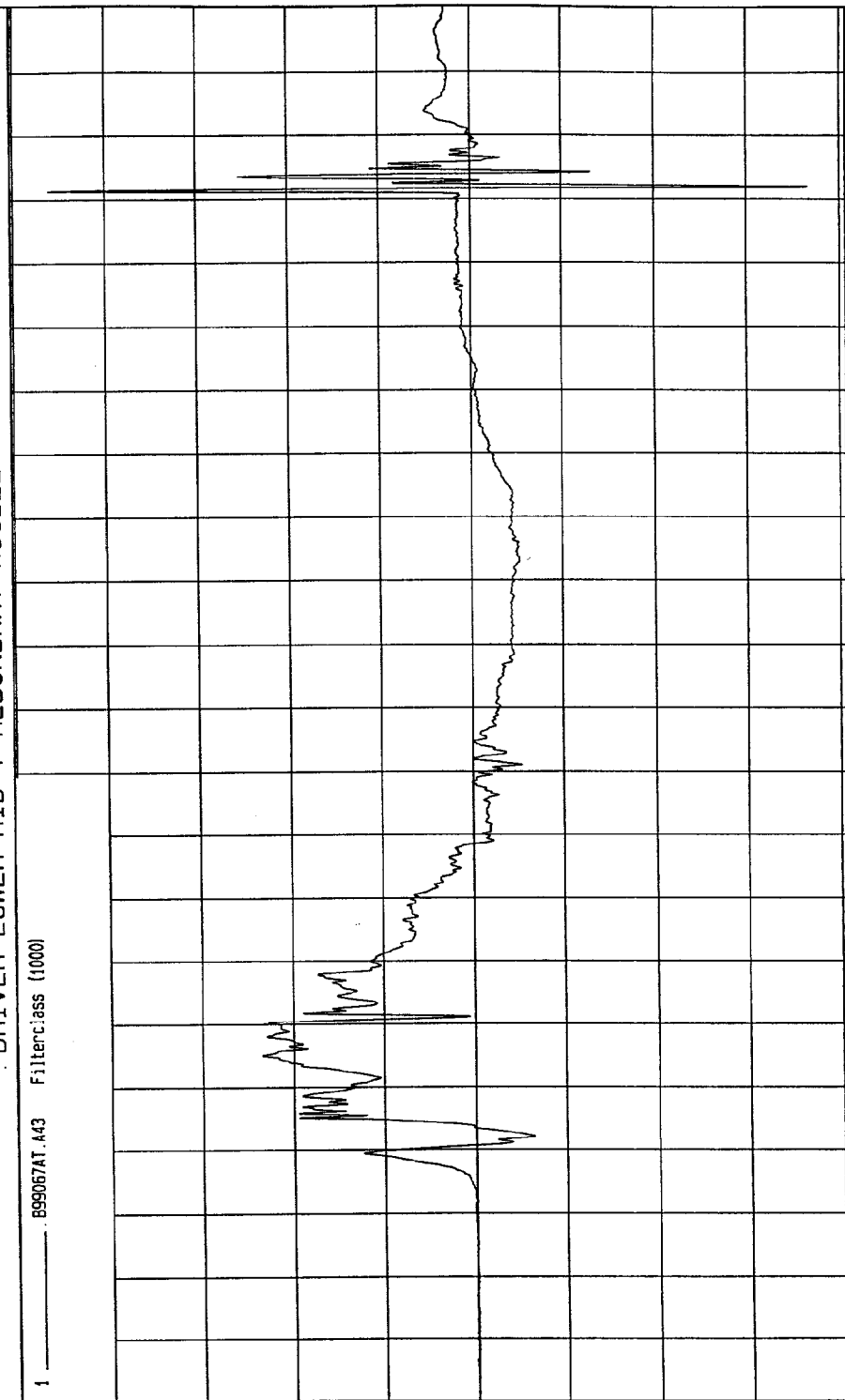
0

-01

-02

TIME (SECONDS)

MGA Research
10-25-1999 10:40



TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

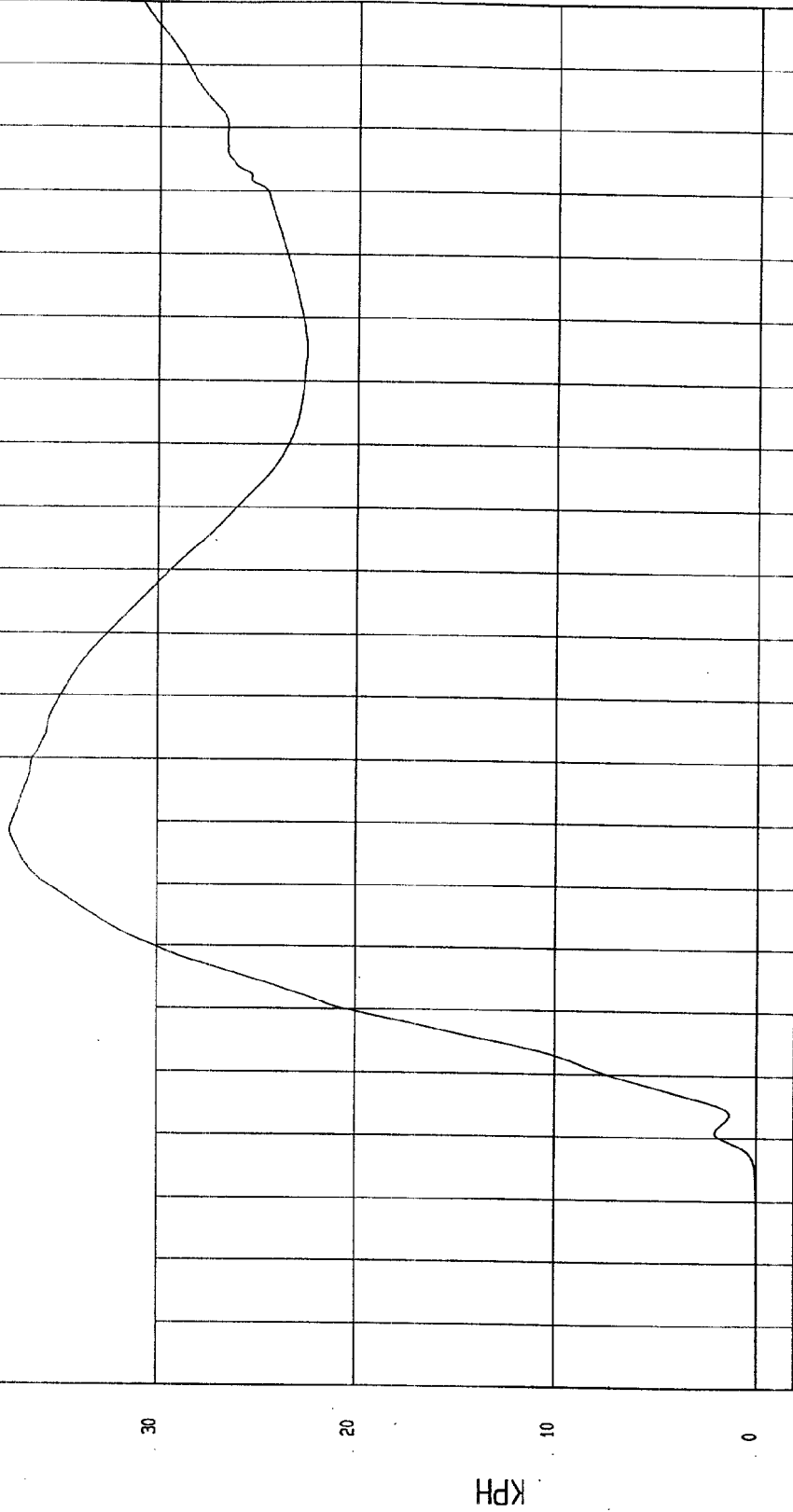
COMPONENT: 2000 BUICK LESABRE (CY0100)

Minimum = -4.10E-04 KPH at -5 msec

Maximum = 37.34 KPH at 68 msec

DRIVER LOWER RIB Y REDUNDANT VELOCITY

1 ——— B99067A1.V43 Filterclass (180)



MCA Research
10-25-1999 10:40

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

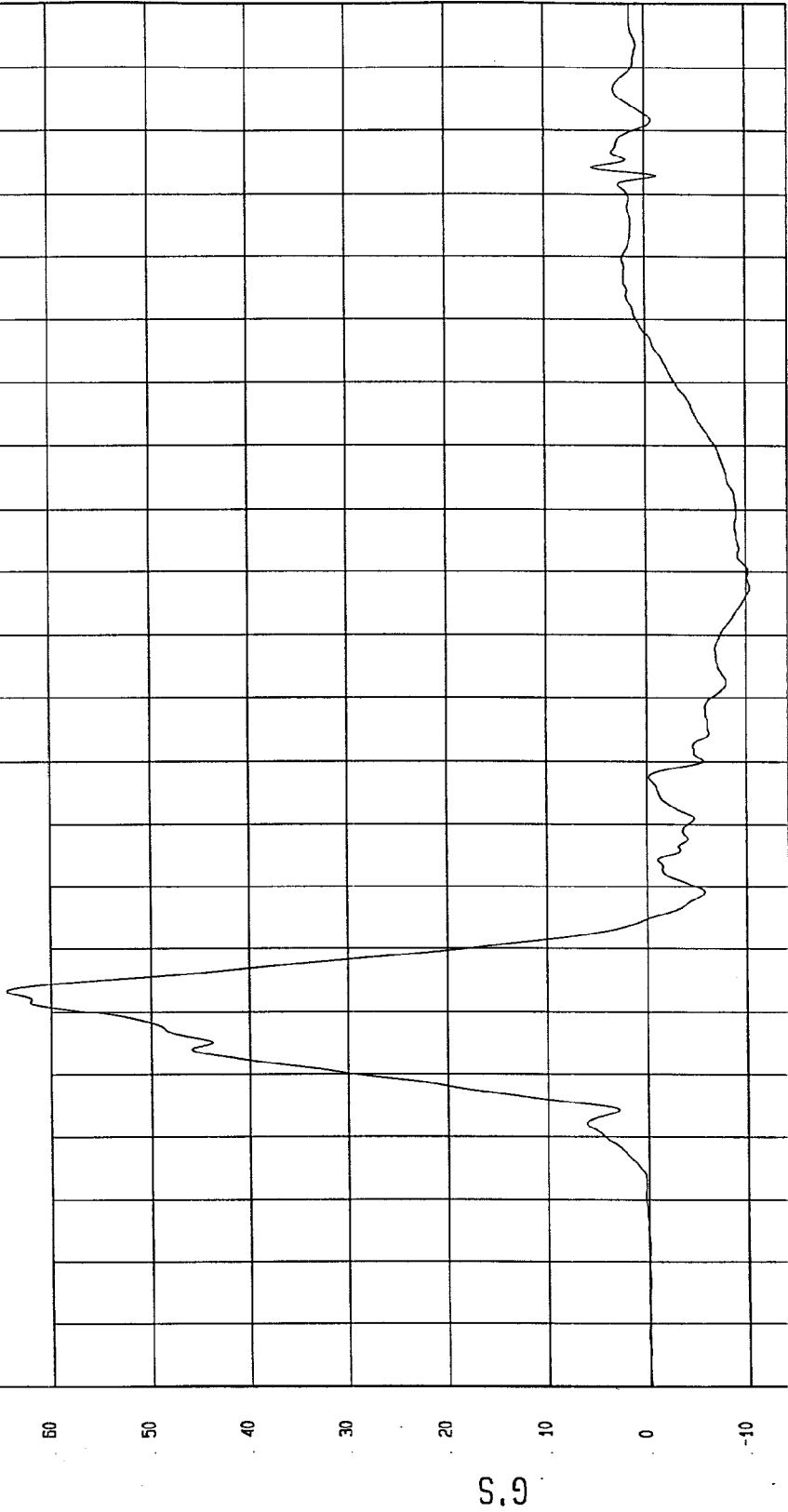
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 64.38 G'S at 43 msec

Minimum = -10.41 G'S at 107 msec

DRIVER LOWER SPINE Y REDUNDANT ACCELERATION

1 899067AF.A44 Filterclass (180)



TIME (SECONDS)

MCA Research
10-25-1999 10:41

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

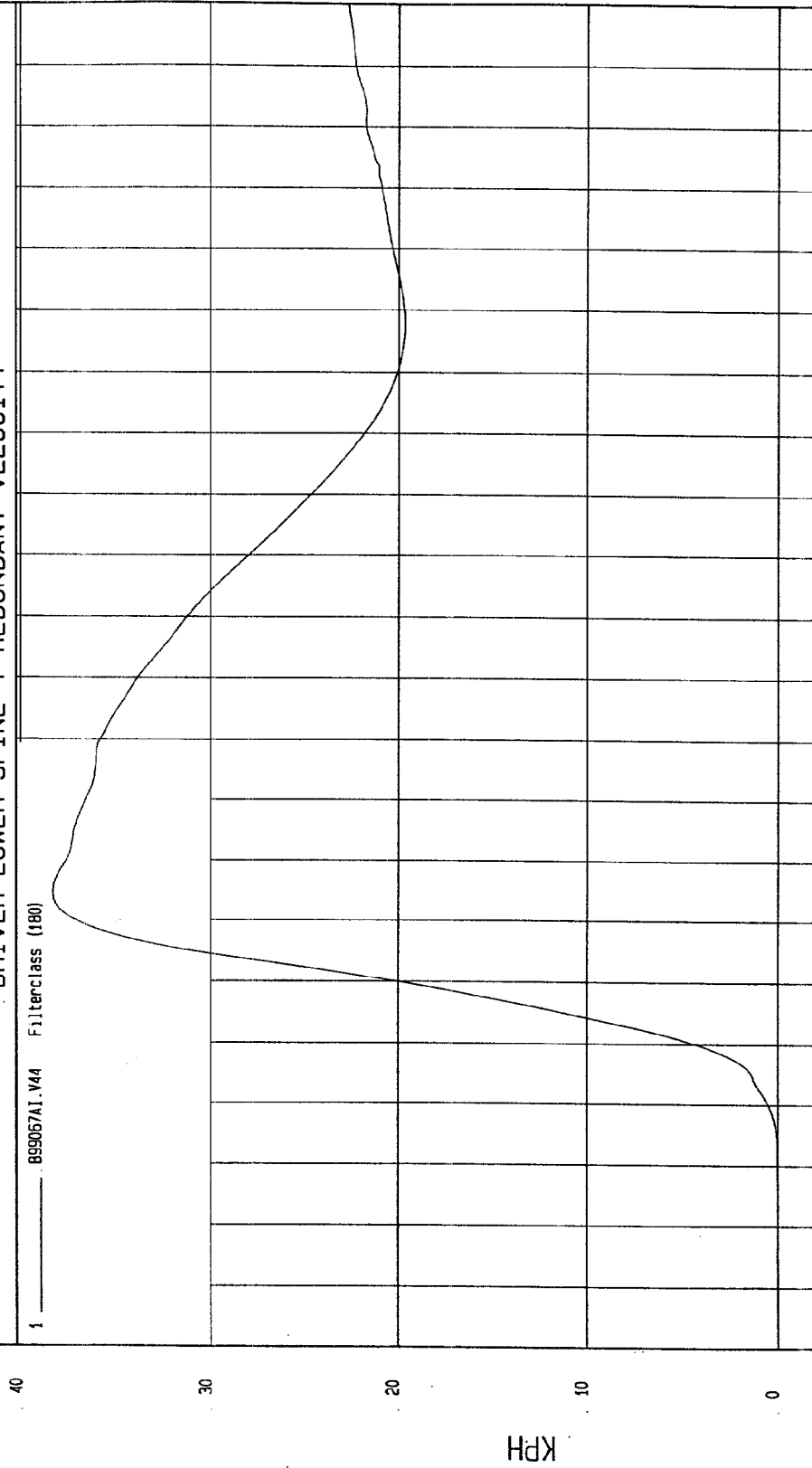
COMPONENT: 2000 BUICK LESABRE (CY0100)

Minimum = -9.32E-03 KPH at 4 msec

Maximum = 38.33 KPH at 55 msec

DRIVER LOWER SPINE Y REDUNDANT VELOCITY

1 _____ 899067A1.V44 Filterclass (180)



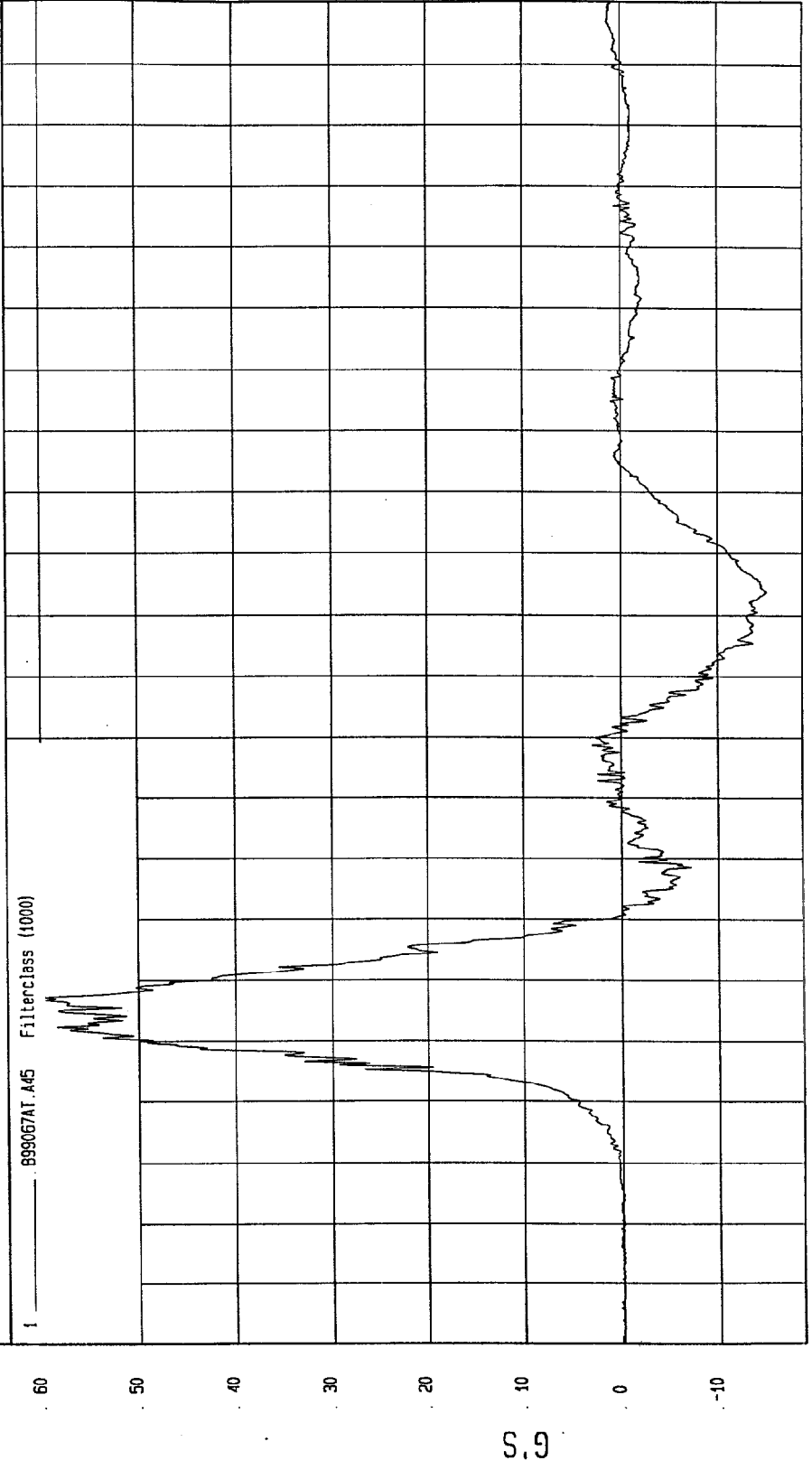
WCA Research
10-25-1999 10:41

TEST: FMVSS 214 DYNAMIC SIDE IMPACT TEST DATE: 10-19-1999

COMPONENT: 2000 BUICK LESABRE (CY0100) Speed: 32.7 MPH 52.6 KPH

Minimum = -14.97 G'S at 104 msec Maximum = 59.74 G'S at 37 msec

DRIVER PELVIS Y REDUNDANT ACCELERATION



TIME (SECONDS)

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

NGA Research
10-25-1999 10:41

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

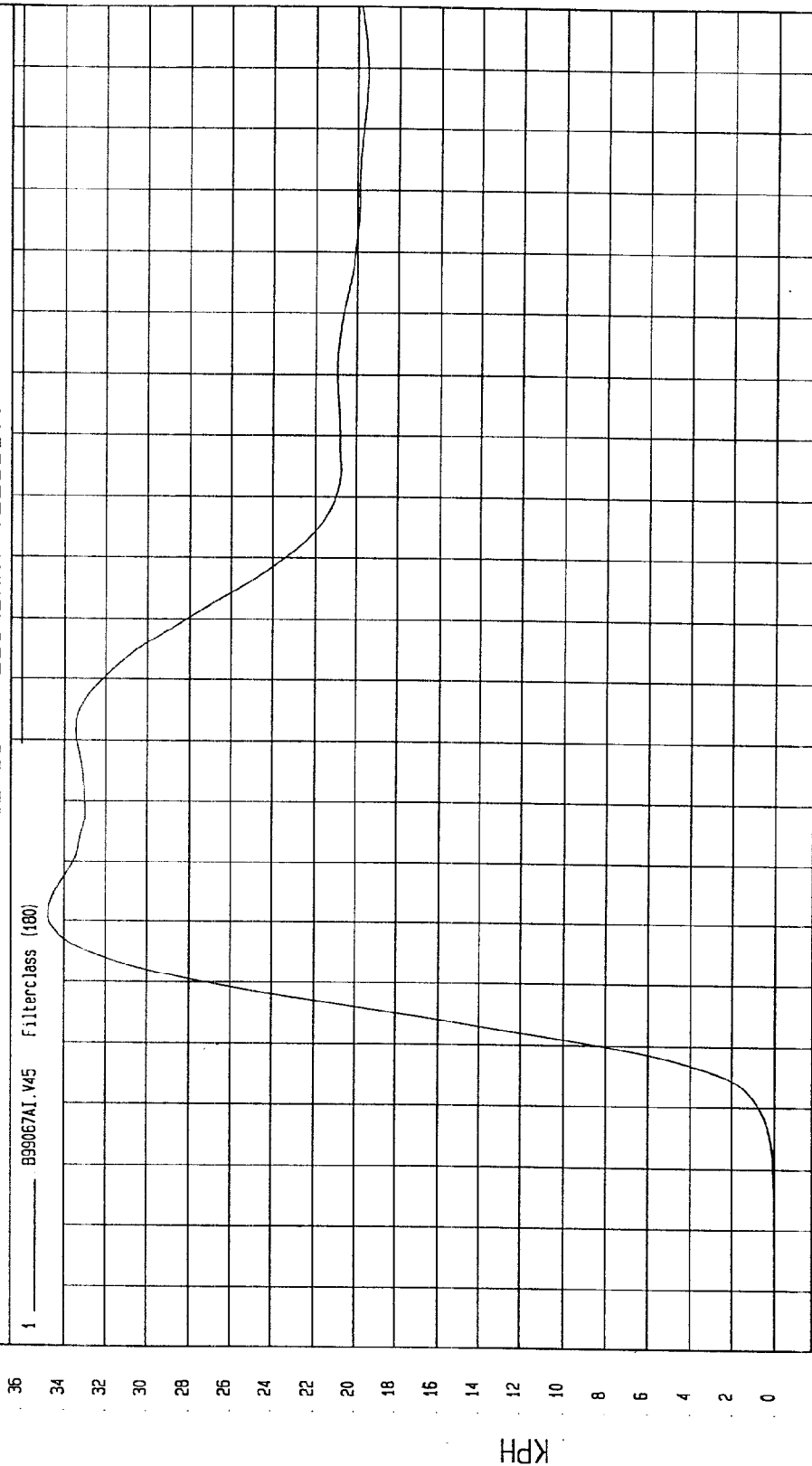
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 34.78 KPH at 51 msec

Minimum = 0 KPH at -20 msec

DRIVER PELVIS Y REDUNDANT VELOCITY

1 B99067A1.V45 Filterclass (100)



MSA Research
10-25-1999 10:41

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 69.26 G'S at 47 msec

Minimum = -23.21 G'S at 65 msec

REAR PASSENGER UPPER RIB Y REDUNDANT ACCELERATION

1 _____ 899067AT.A46 FilterClass (1000)

60

40

20

G'S

0

-20

19

18

17

16

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

-02

TIME (SECONDS)

MCA Research
10-25-1999 10:41

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

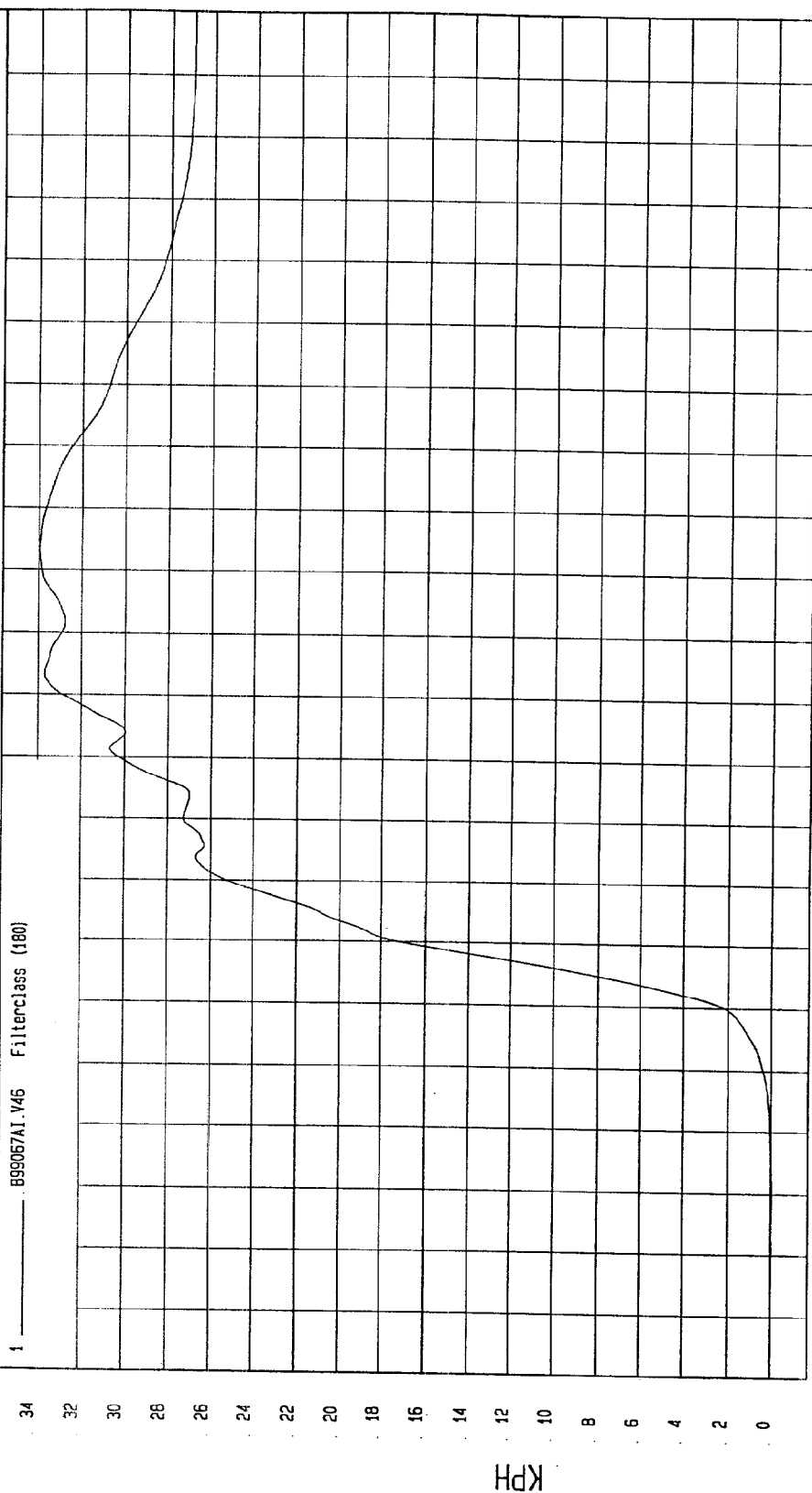
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 33.94 KPH at 113 msec

Minimum = -3.74E-02 KPH at 8 msec

REAR PASSENGER UPPER RIB Y REDUNDANT VELOCITY

1 B99057A1.V46 Filterclass (180)



MSA Research
10-25-1999 10:41

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

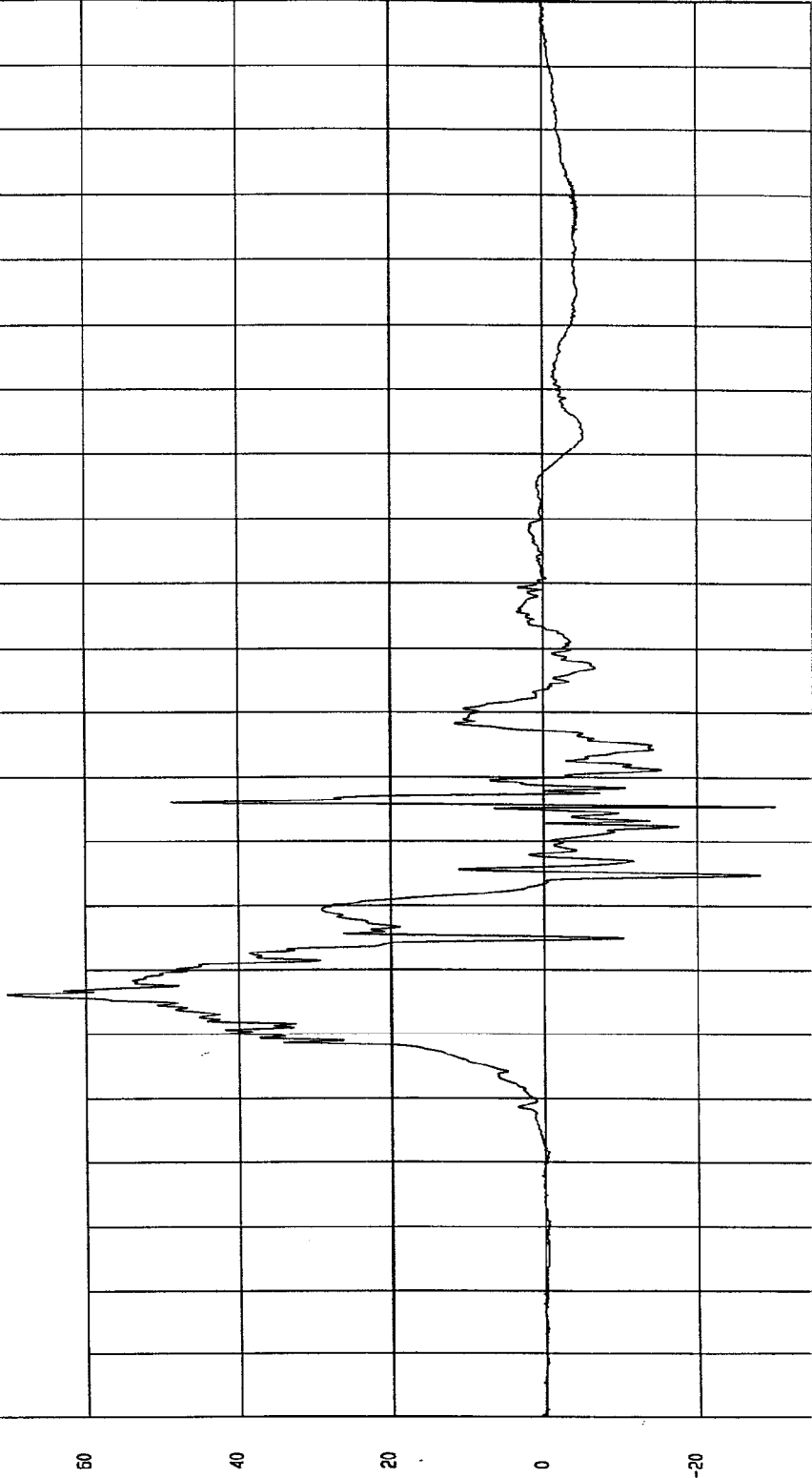
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 70.38 G'S at 46 msec

Minimum = -30.06 G'S at 75 msec

REAR PASSENGER LOWER RIB Y REDUNDANT ACCELERATION

1 B99057AT.A47 Filterclass (1000)



MCA Research
10-25-1999 10:41

TIME (SECONDS)

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 32.59 KPH at 63 msec

Minimum = -2 KPH at 22 msec

REAR PASSENGER LOWER RIB Y REDUNDANT VELOCITY

1 B99067A1.V47 Filter: class (180)

34

32

30

28

26

24

22

20

18

16

14

12

10

8

6

4

2

0

KPH

-0.02

0

0.01

0.02

0.03

0.04

0.05

0.06

0.07

0.08

0.09

0.1

0.11

0.12

0.13

0.14

0.15

0.16

0.17

0.18

0.19

TIME Seconds

MCA Research
10-25-1999 10:41

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

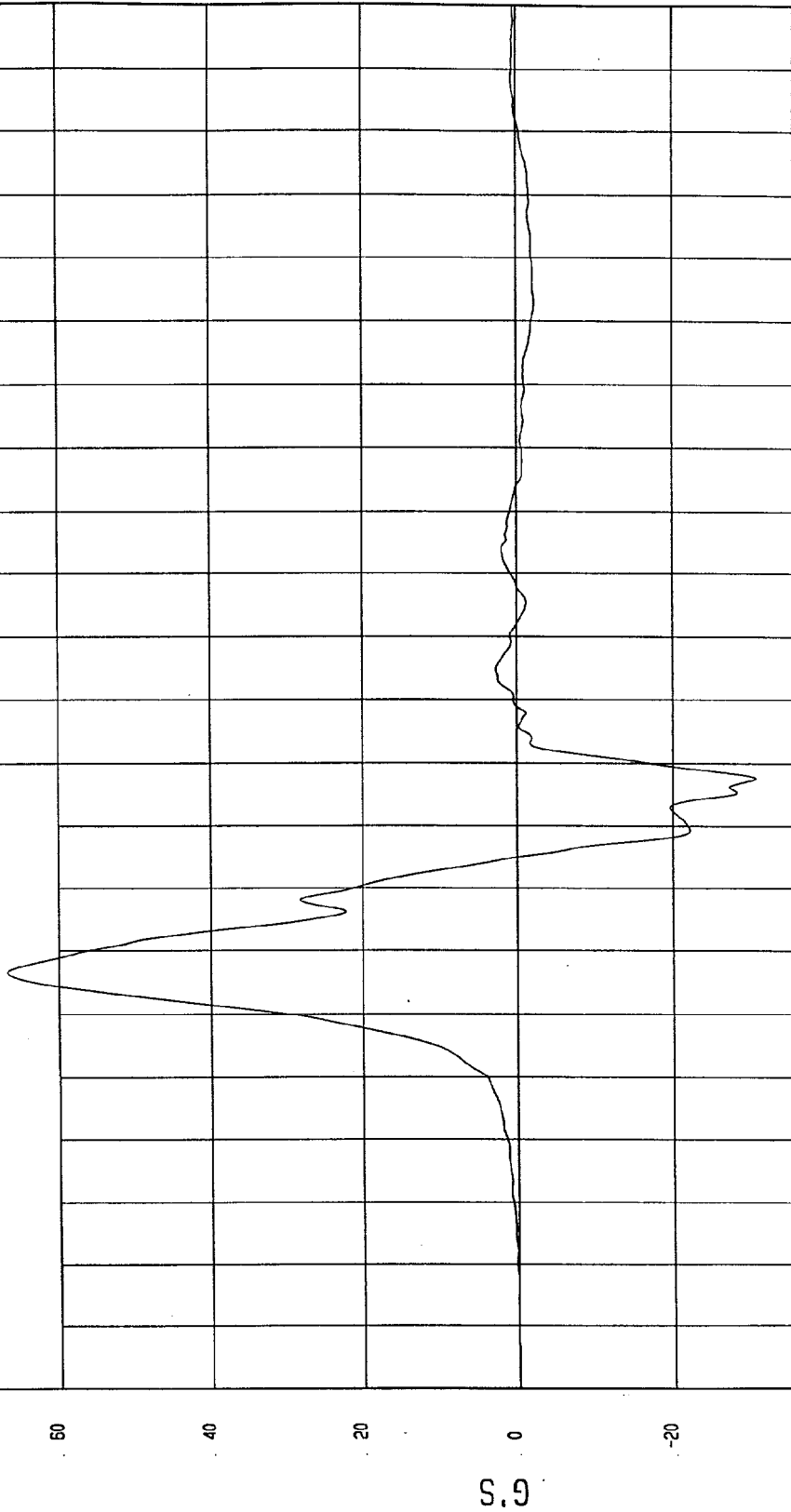
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 66.74 G'S at 47 msec

Minimum = -30.67 G'S at 78 msec

REAR PASSENGER LOWER SPINE Y REDUNDANT ACCELERATION

1 B99057AF.A48 FilterClass (180)



MGA Research
10-25-1999 10:41

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

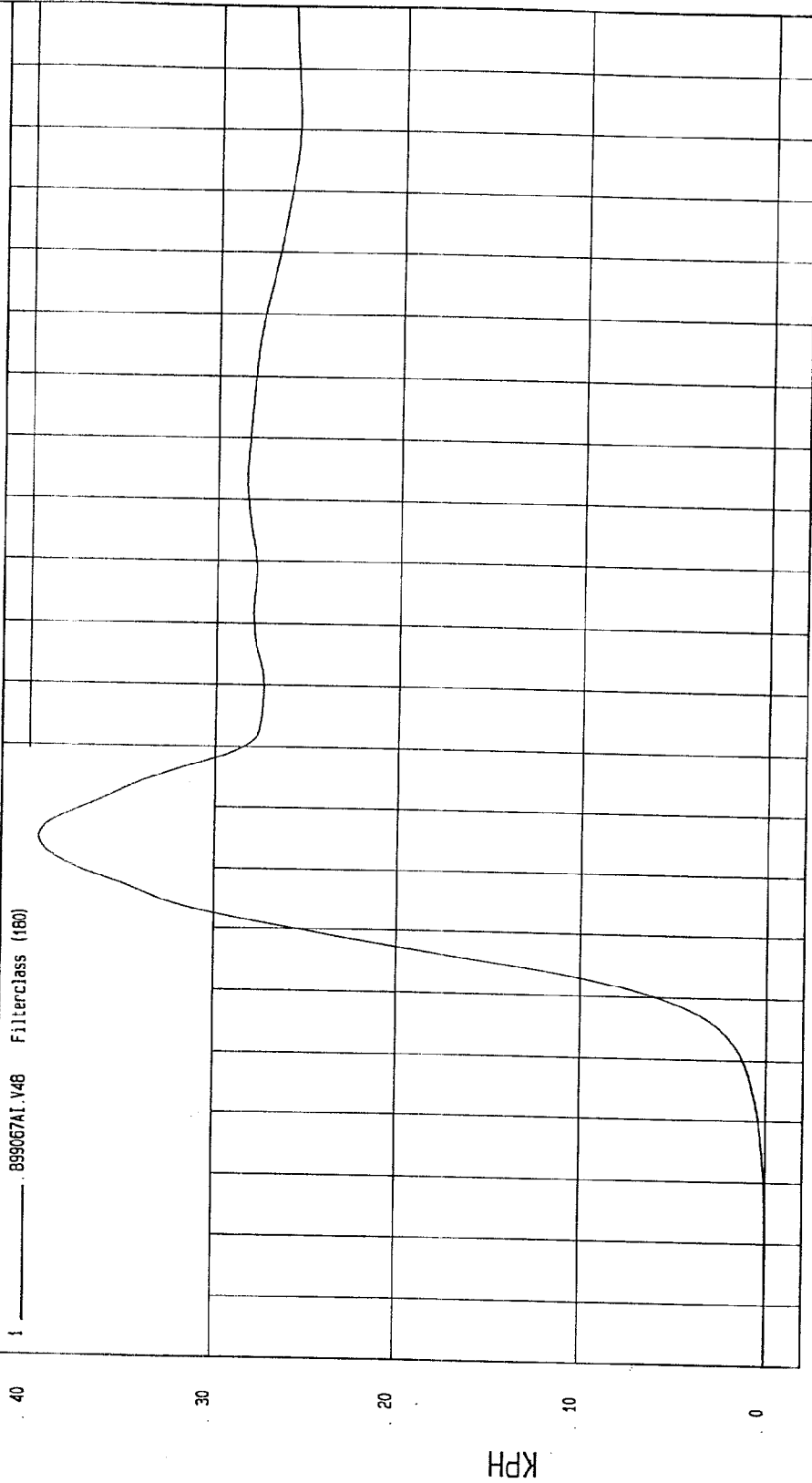
COMPONENT: 2000 BUICK LESABRE (CY0100)

Minimum = -2.57E-02 KPH at -2 msec

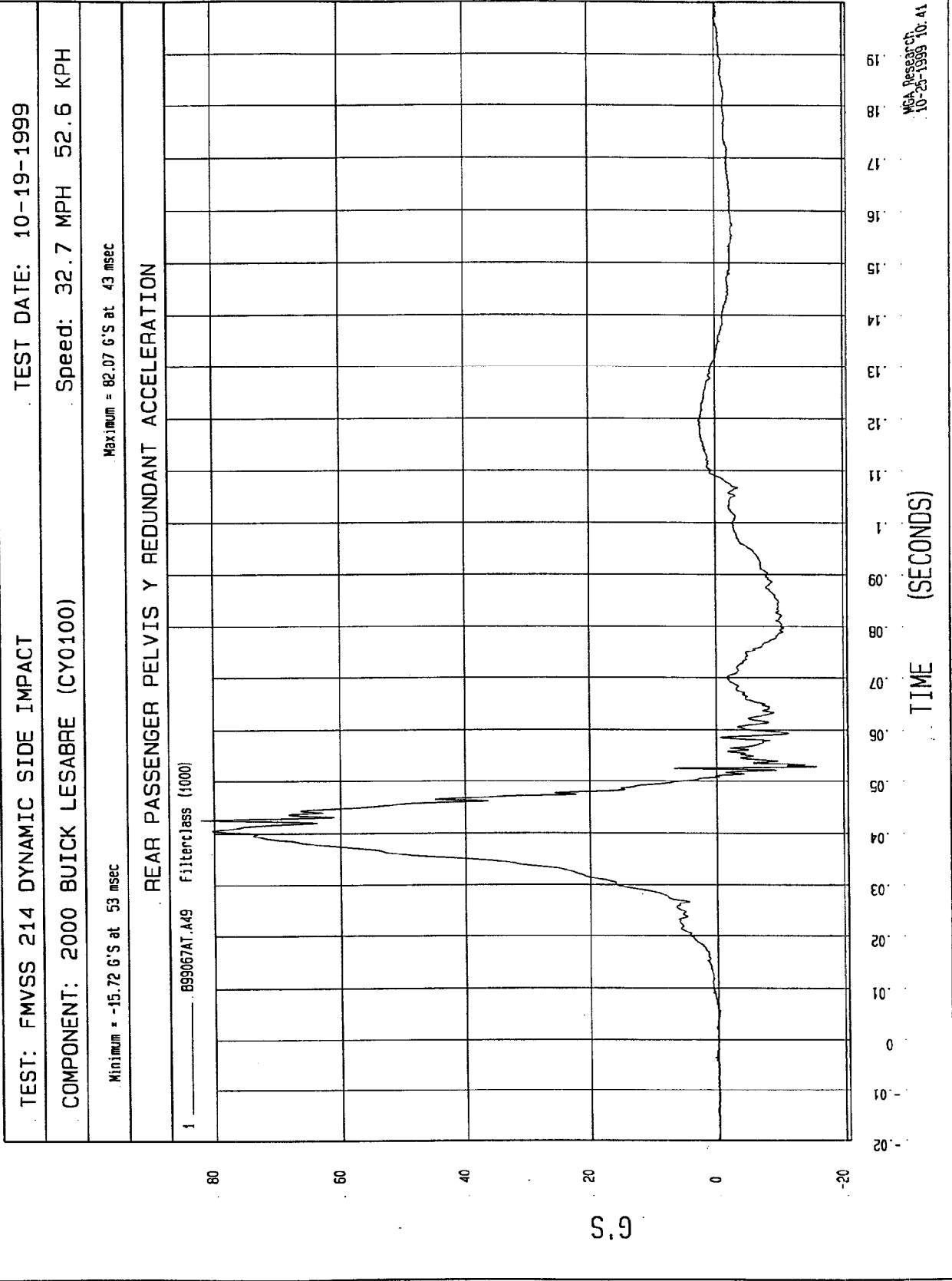
Maximum = 39.48 KPH at 65 msec

REAR PASSENGER LOWER SPINE Y REDUNDANT VELOCITY

1 ——— .899067A1.V48 Filterclass (f80)



WGA Research
10-25-1999 10:41



TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

COMPONENT: 2000 BUICK LESABRE (CY0100)

Speed: 32.7 MPH 52.6 KPH

Minimum = -1.42E-03 KPH at -5 msec

Maximum = 35.52 KPH at 51 msec

REAR PASSENGER PELVIS Y REDUNDANT VELOCITY

1 ——— B99067A1.V49 Filterclass (160)

36

34

32

30

28

26

24

22

20

18

16

14

12

10

8

6

4

2

0

KPH

-02

-01

0

01

02

03

04

05

06

07

08

09

1

11

12

13

14

15

16

17

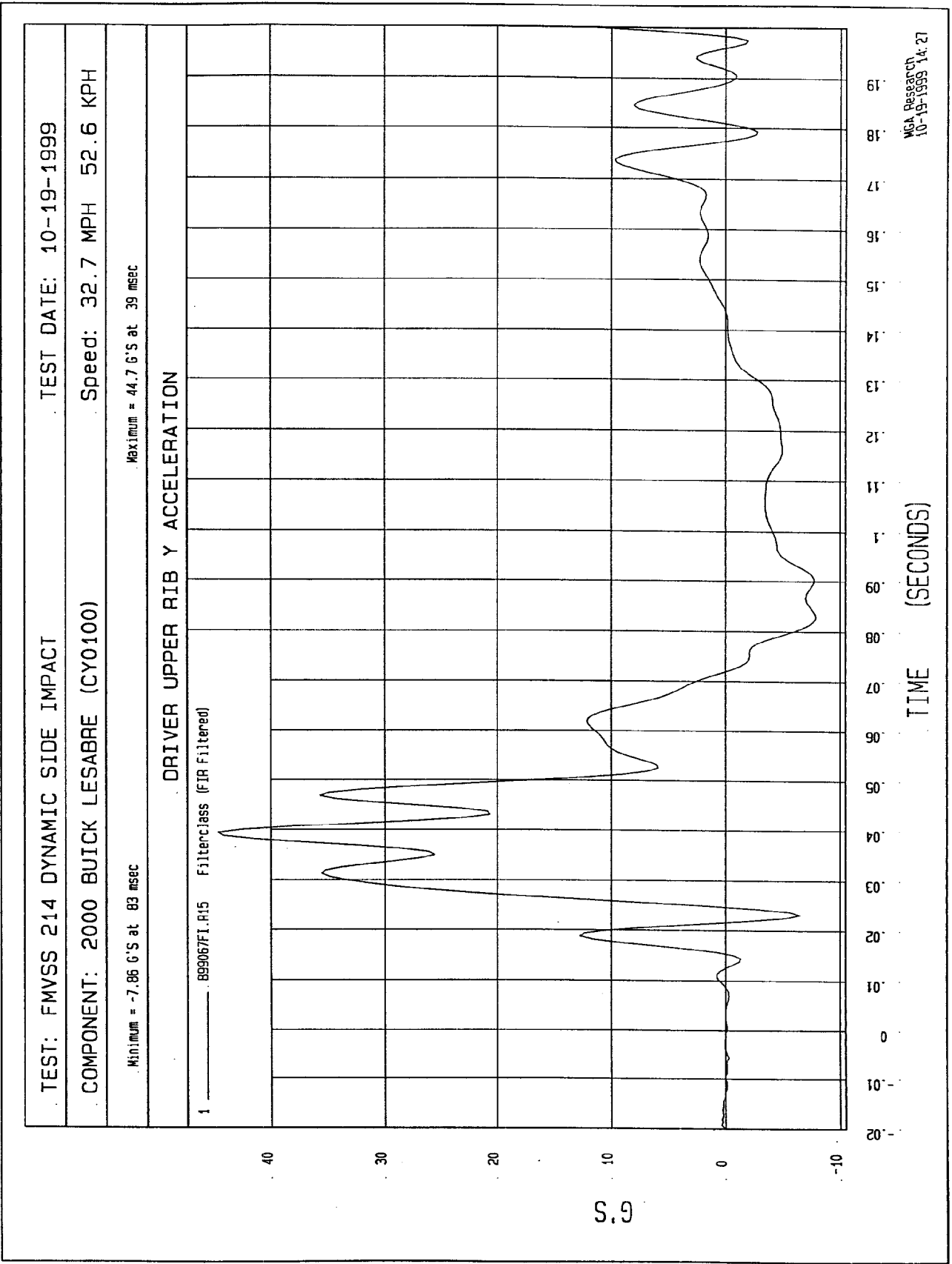
18

19

TIME Seconds

MGA Research
10-25-1999 10:41

FINITE IMPULSE RESPONSE (FIR) FILTERED DATA



TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

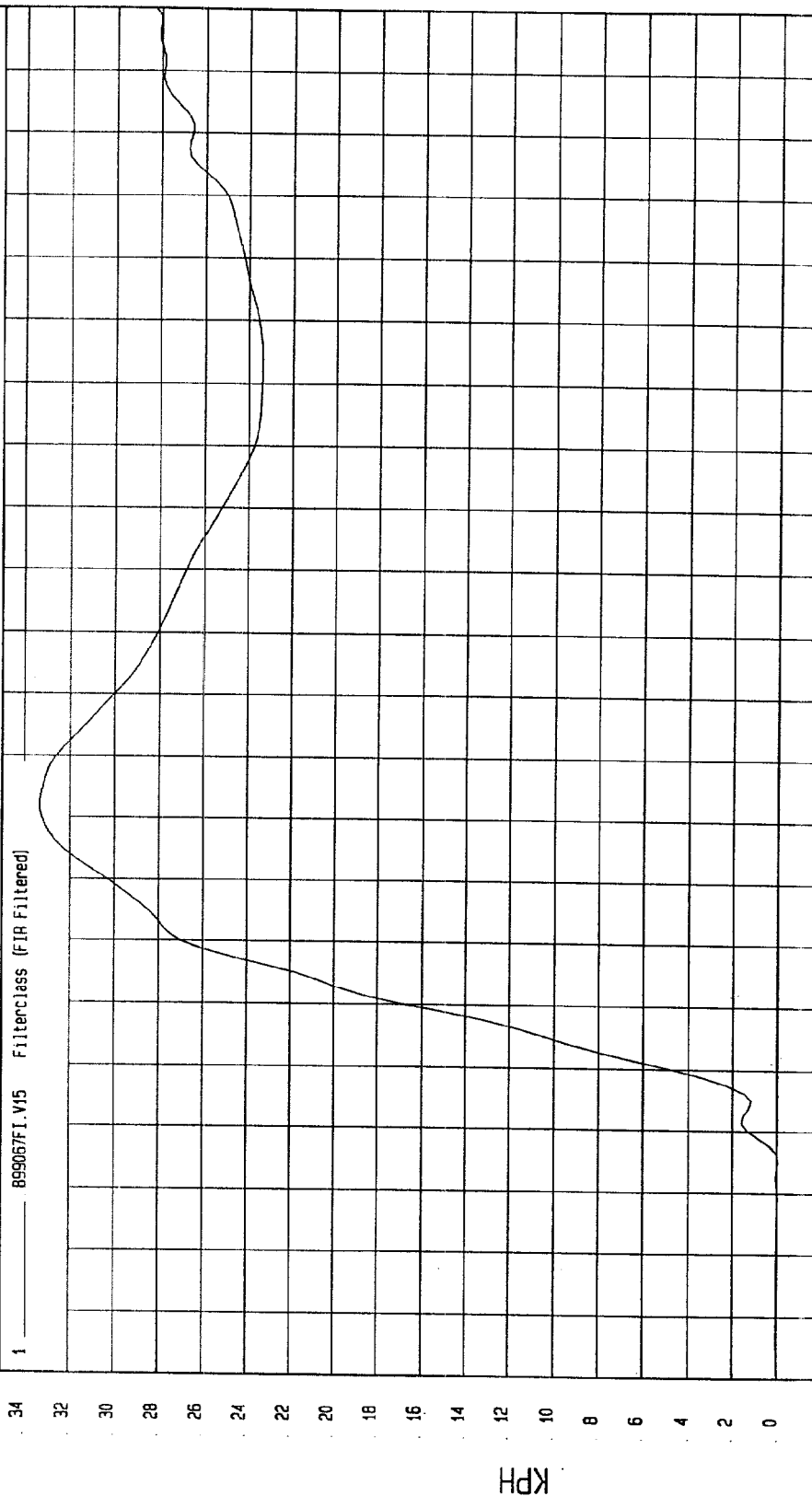
Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Minimum = -2.77E-02 KPH at 15 msec

Maximum = 33.34 KPH at 72 msec

DRIVER UPPER RIB Y VELOCITY



MOA Research
10-25-1999 10: 41

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Minimum = -9.9 G'S at 114 msec

Maximum = 43.45 G'S at 37 msec

DRIVER LOWER RIB Y ACCELERATION

1 _____ B990671.R16 Filterclass (FIR Filtered)



MCA Research
10-19-1999 14:27

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

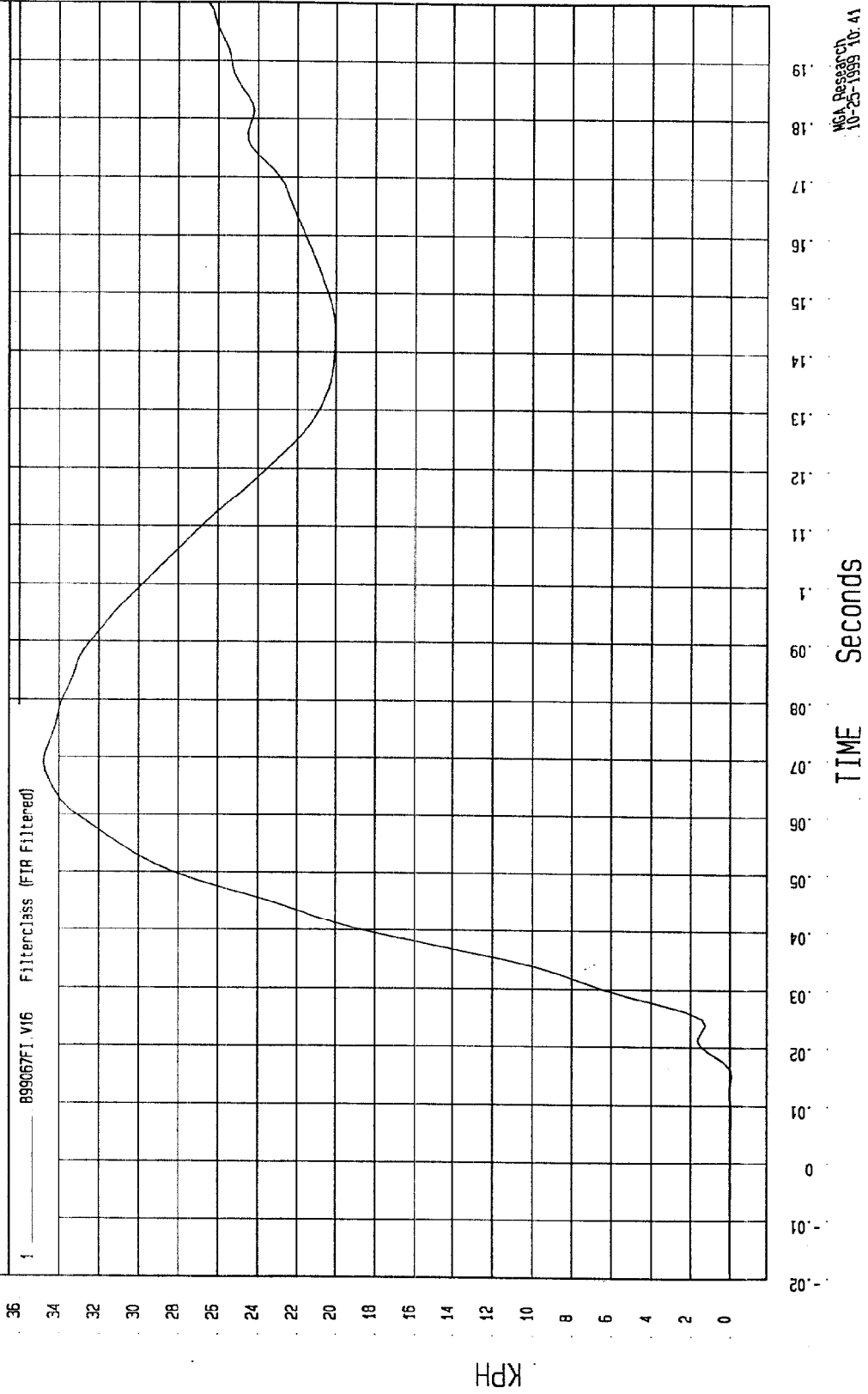
SPEED: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 34.77 KPH at 69 msec

Minimum = -8.20E-02 KPH at 15 msec

DRIVER LOWER RIB Y VELOCITY



TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

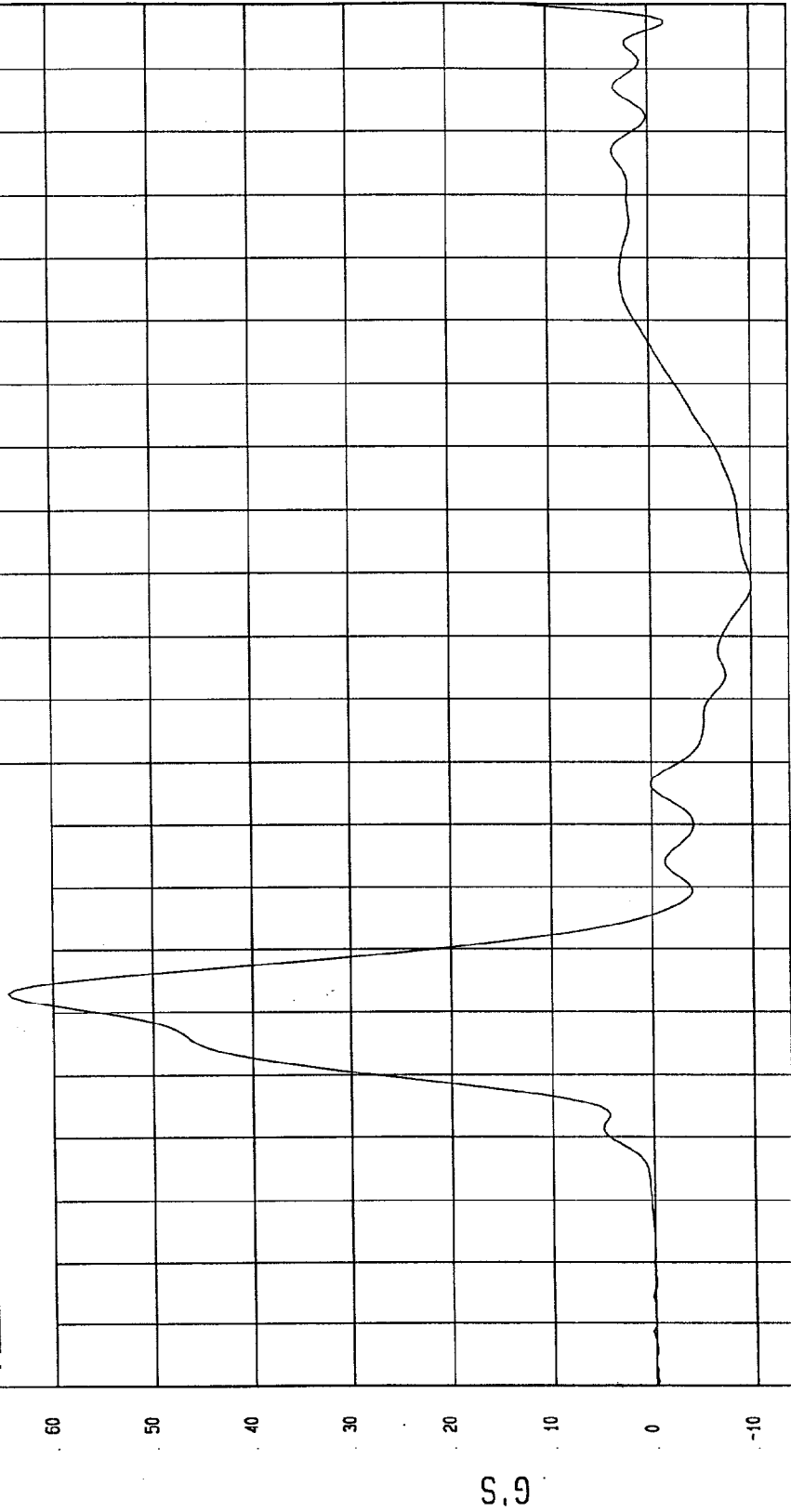
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 64.51 G'S at 43 msec

Minimum = -10.01 G'S at 108 msec

DRIVER LOWER SPINE Y ACCELERATION

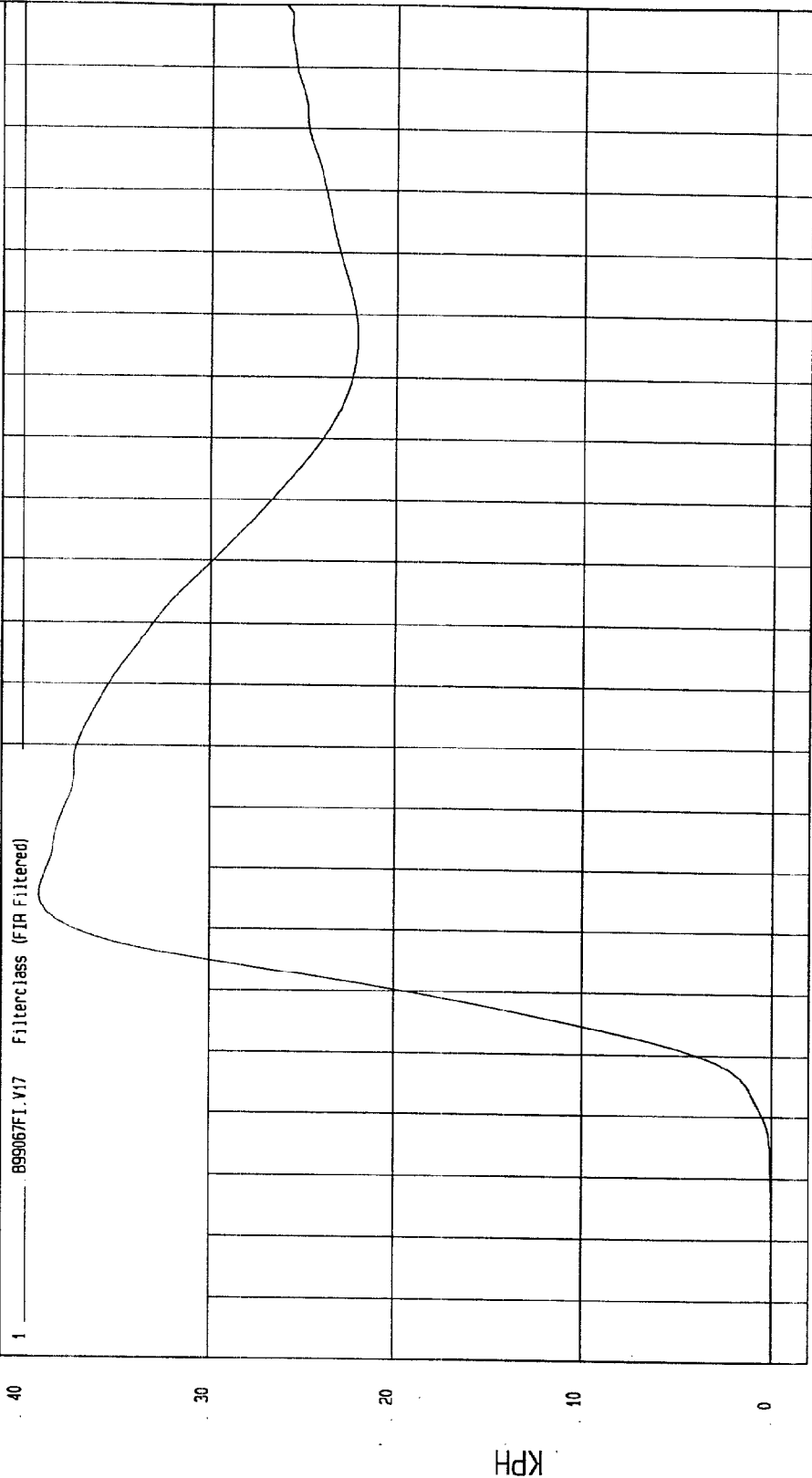
1 899067FI.R17 FilterClass (FIR Filtered)



MSA Research
10-19-1999 14:27

TEST: FMVSS 214 DYNAMIC SIDE IMPACT
 TEST DATE: 10-19-1999
 COMPONENT: 2000 BUICK LESABRE (CY0100)
 Speed: 32.7 MPH 52.6 KPH
 Minimum = -1.35E-02 KPH at -12 msec
 Maximum = 39.14 KPH at 56 msec

DRIVER LOWER SPINE Y VELOCITY



MGA Research
 10-25-1999 10: 41

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

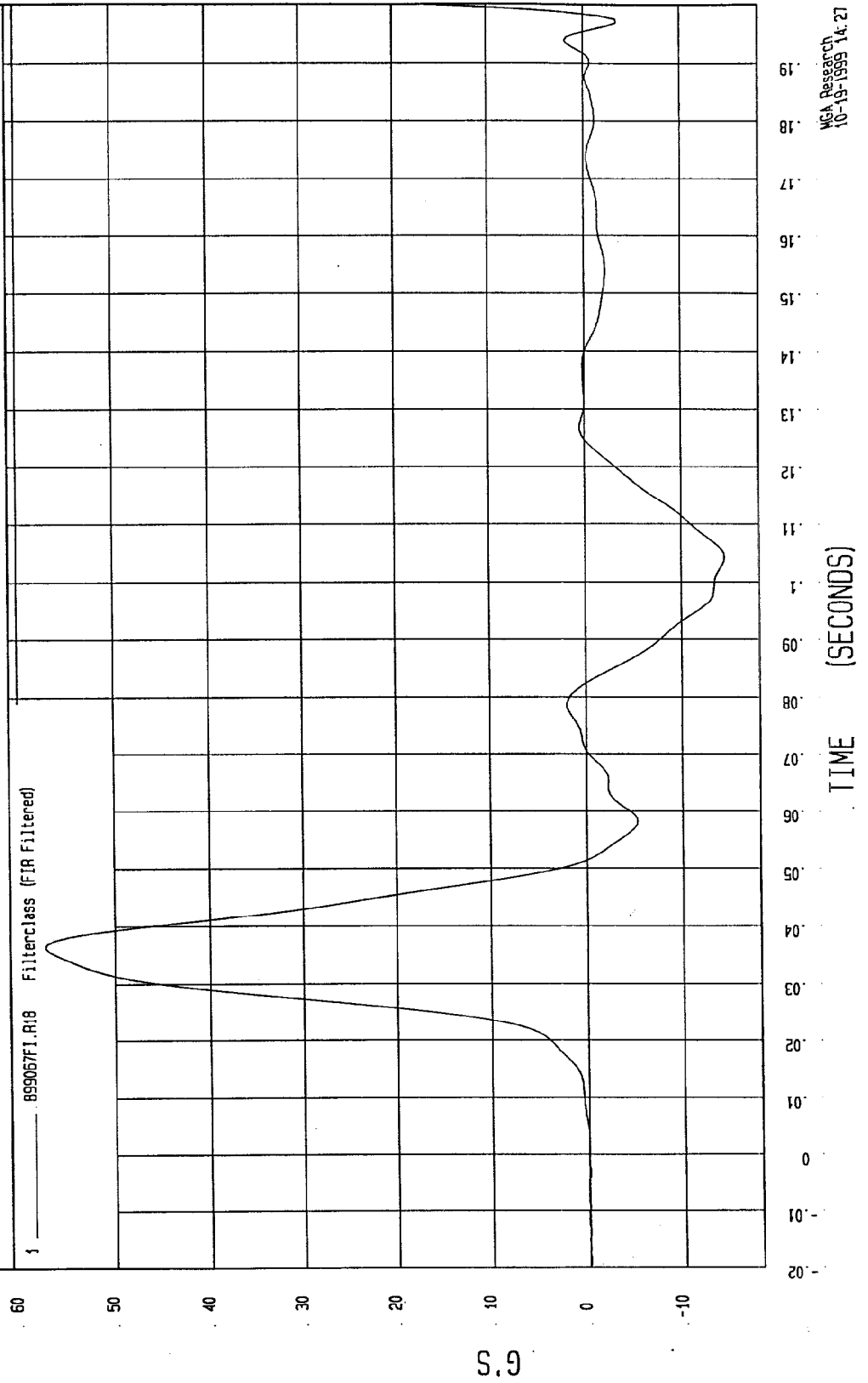
Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 57.29 G's at 36 msec

Minimum = -14.47 G's at 104 msec

DRIVER PELVIS Y ACCELERATION



TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

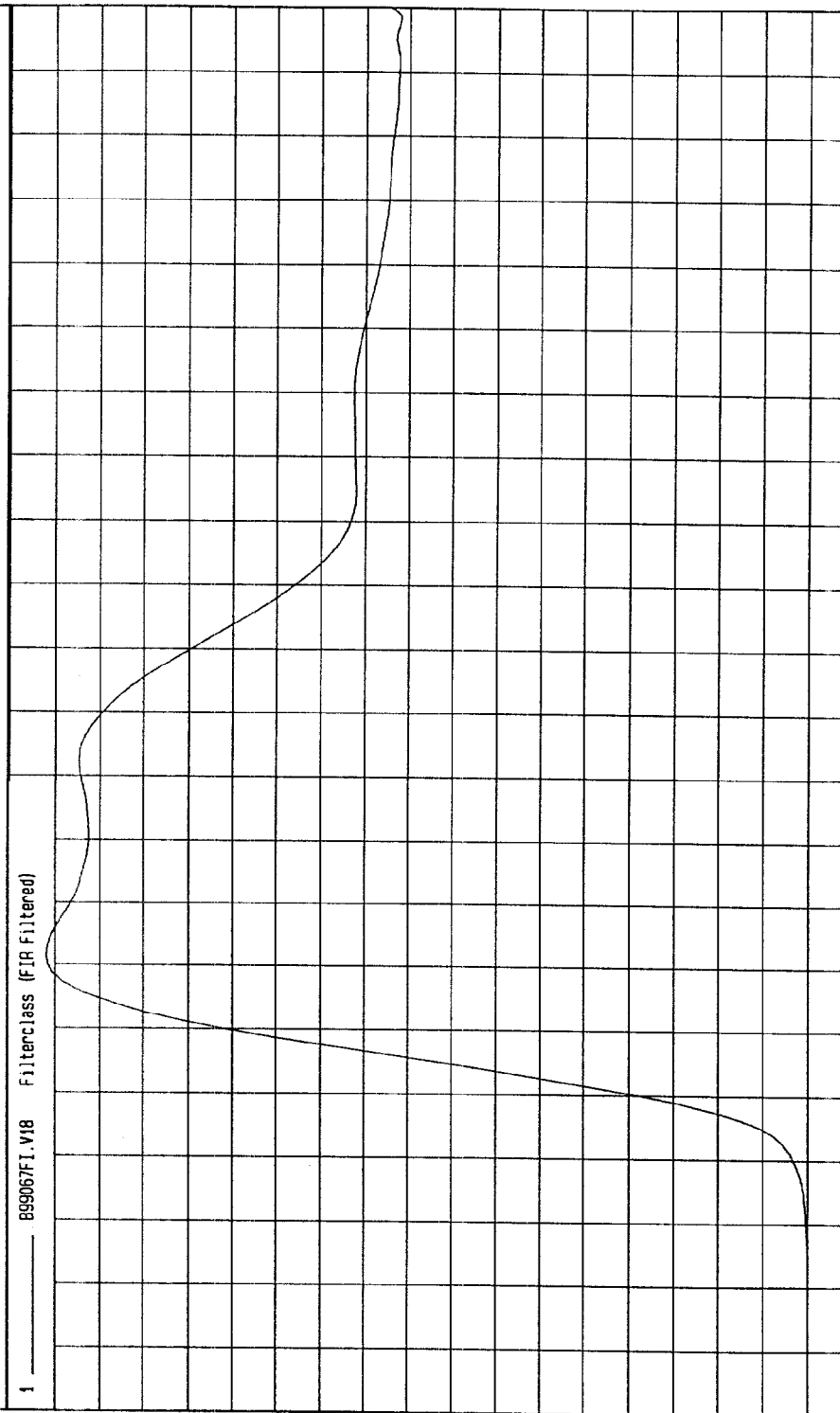
Minimum = -8.61E-03 KPH at -12 msec

Maximum = 34.38 KPH at 51 msec

DRIVER PELVIS Y VELOCITY

1 899067F1.V18 Filterclass (FIR Filtered)

KPH



MGA Research
10-25-1999 10:41

TIME Seconds

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

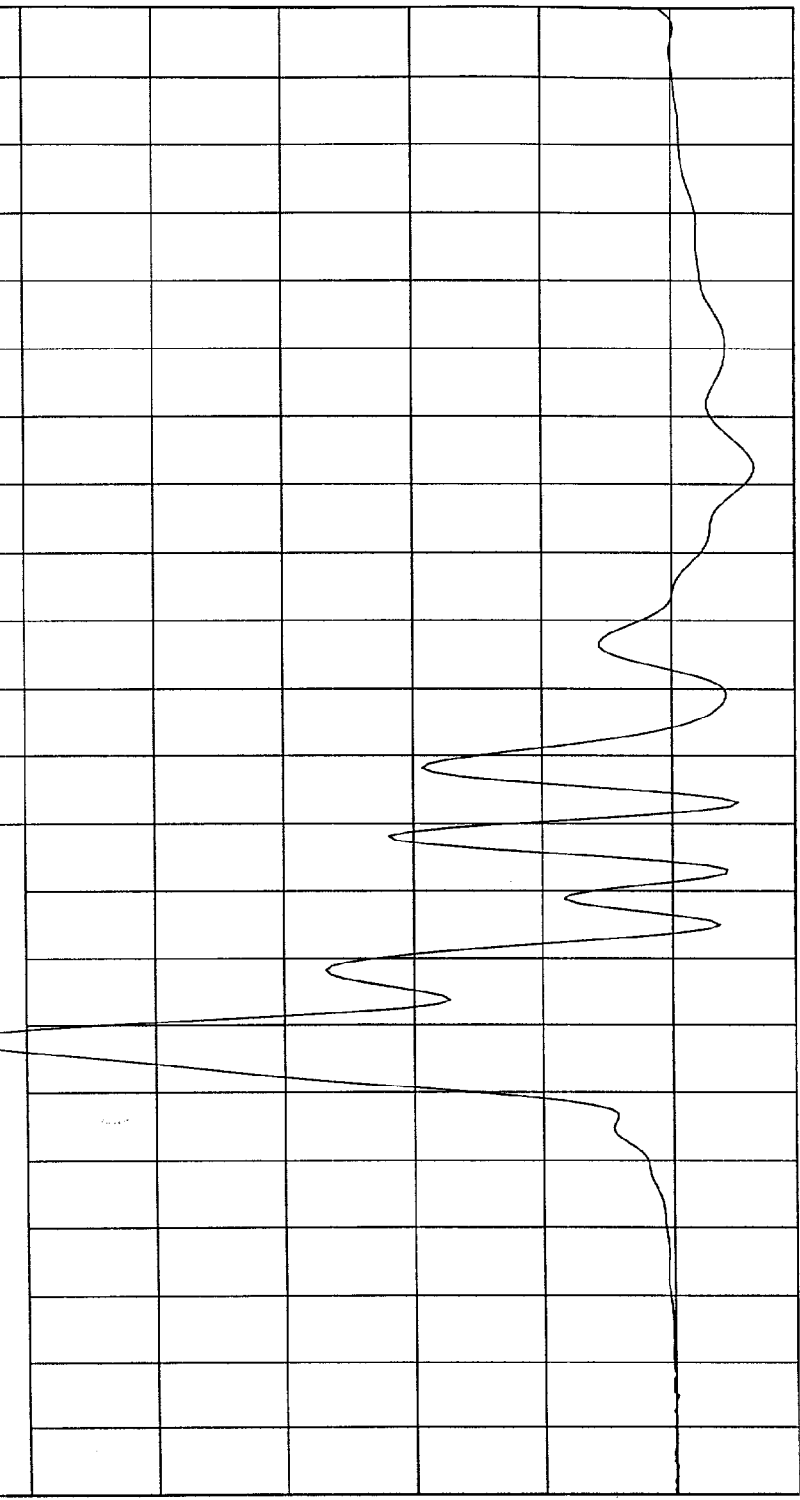
Maximum = 55.76 G'S at 48 msec

Minimum = -6.34 G'S at 132 msec

REAR PASSENGER UPPER RIB Y ACCELERATION

1 899067FT.R25 Filterclass (FTR Filtered)

G.S



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

MSC Research
10-19-1999 14:27

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

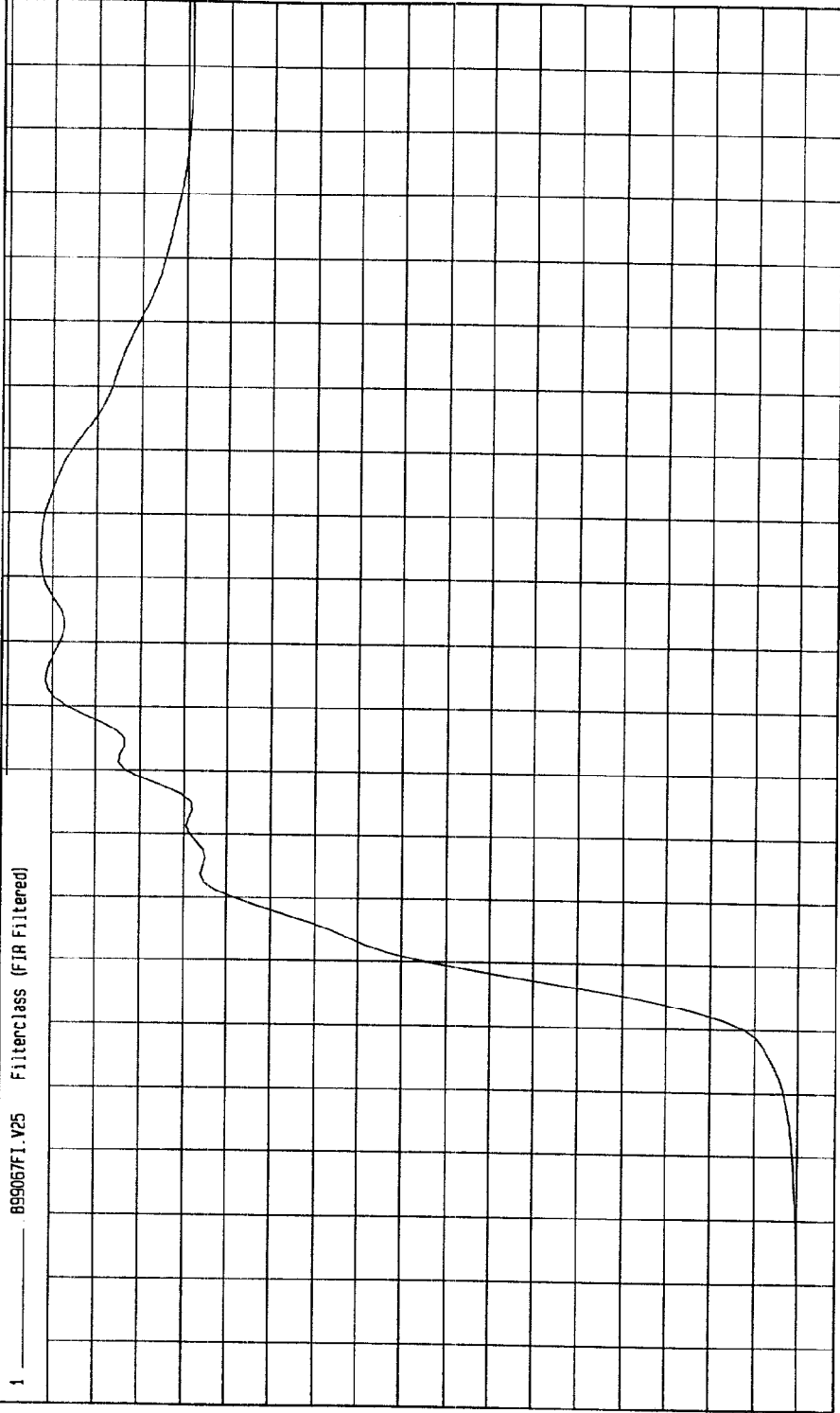
Minimum = 0 KPH at -20 msec

Maximum = 34.55 KPH at 114 msec

REAR PASSENGER UPPER RIB Y VELOCITY

1 8990671.V25 Filterclass (FIR Filtered)

KPH



TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

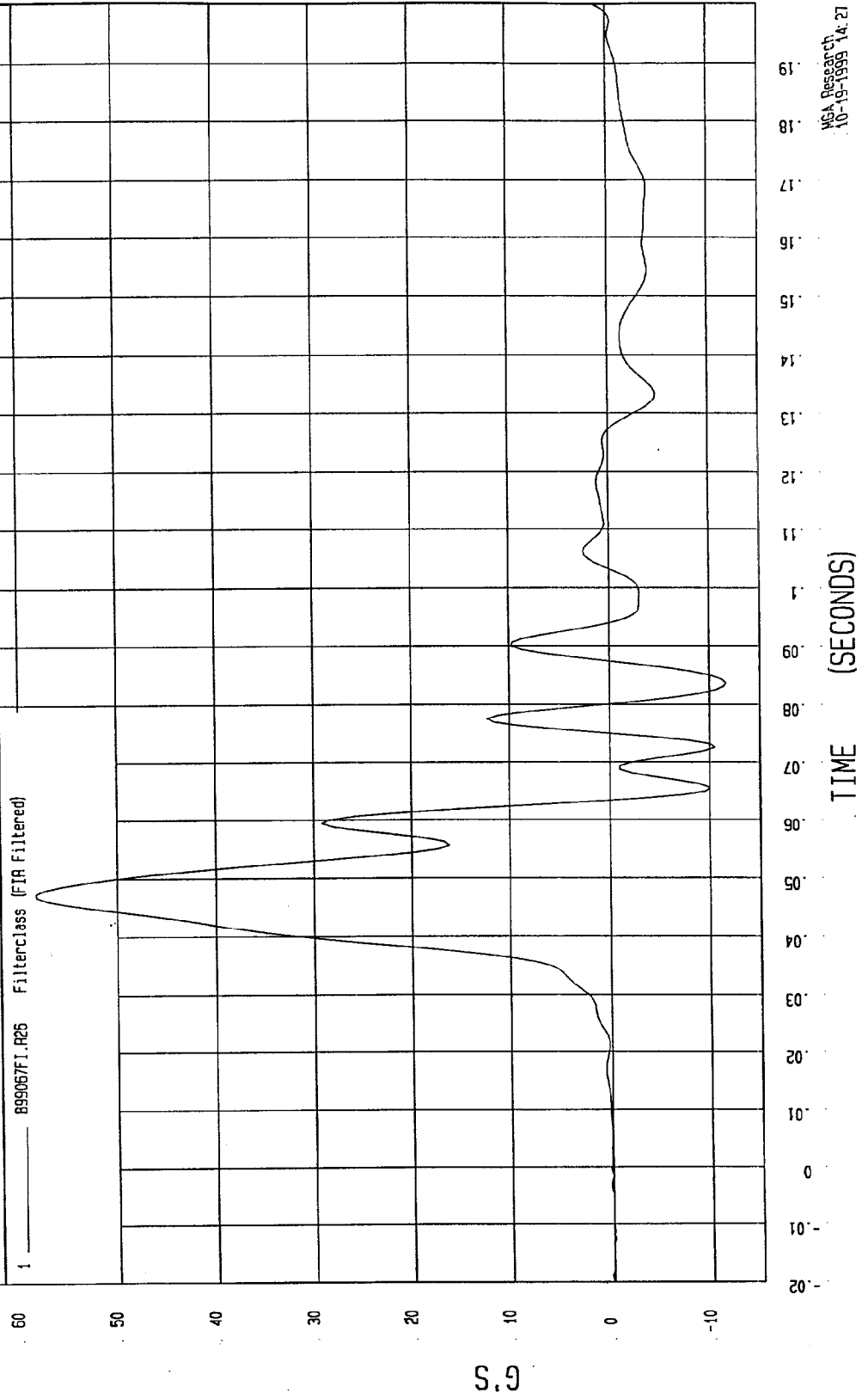
Speed: 32.7 MPH 52.6 KPH

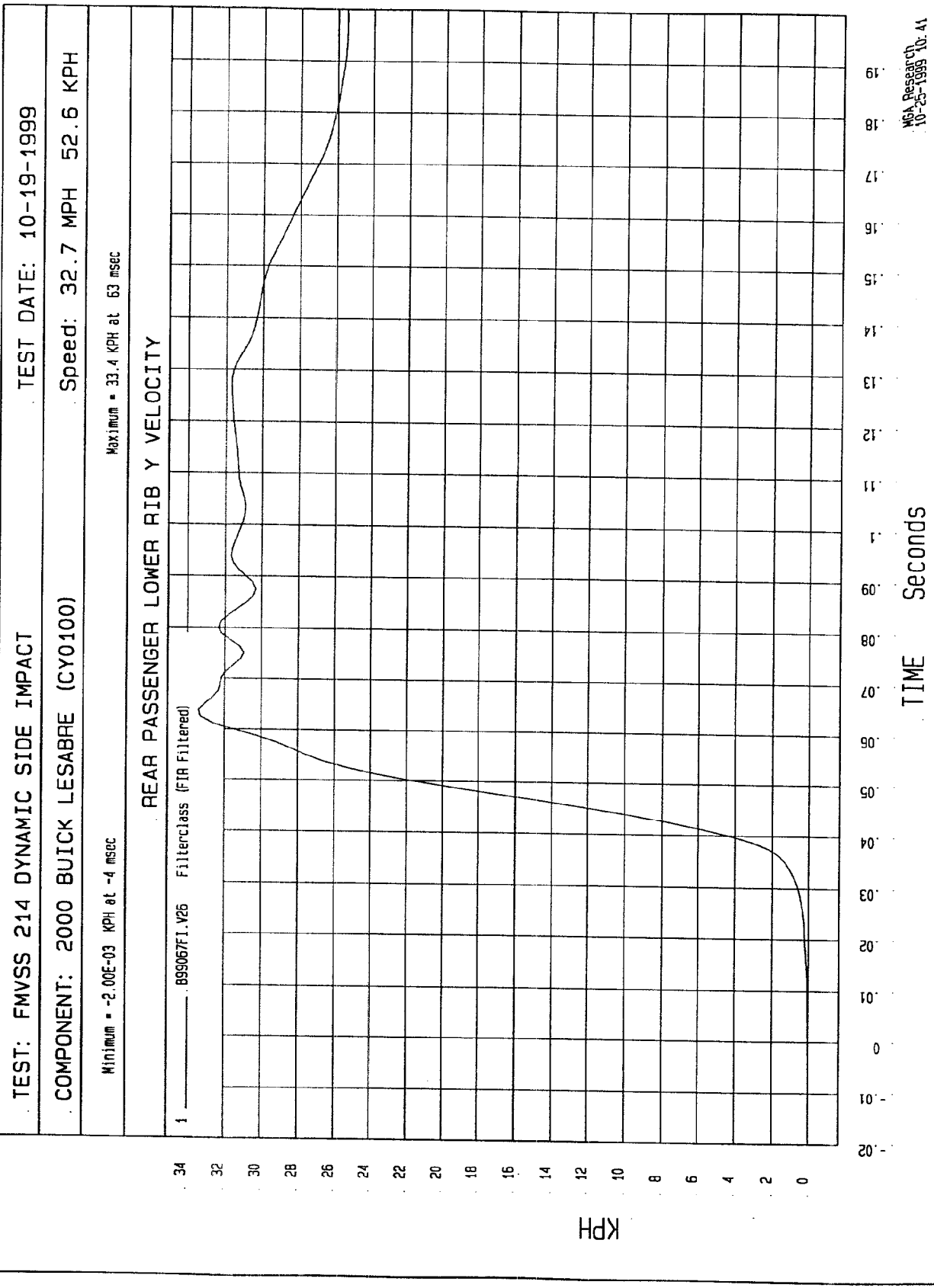
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 58.29 G'S at 48 msec

Minimum = -11.71 G'S at 84 msec

REAR PASSENGER LOWER RIB Y ACCELERATION





TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

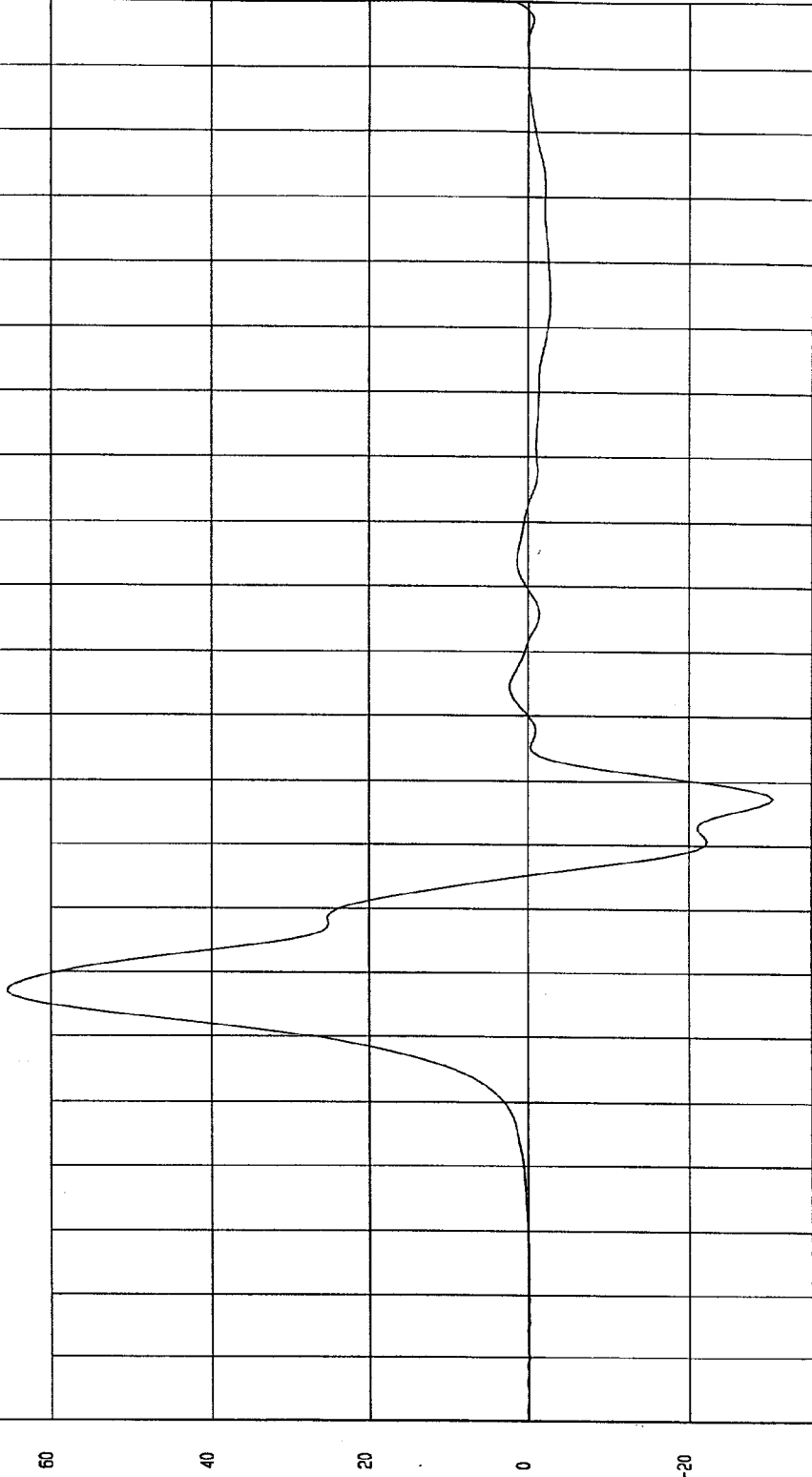
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 65.38 G'S at 47 msec

Minimum = -30.53 G'S at 78 msec

REAR PASSENGER LOWER SPINE Y ACCELERATION

1 _____ .B99067F1.R27 Filterclass (FIR Filtered)



WCA Research
10-19-1999 14:27

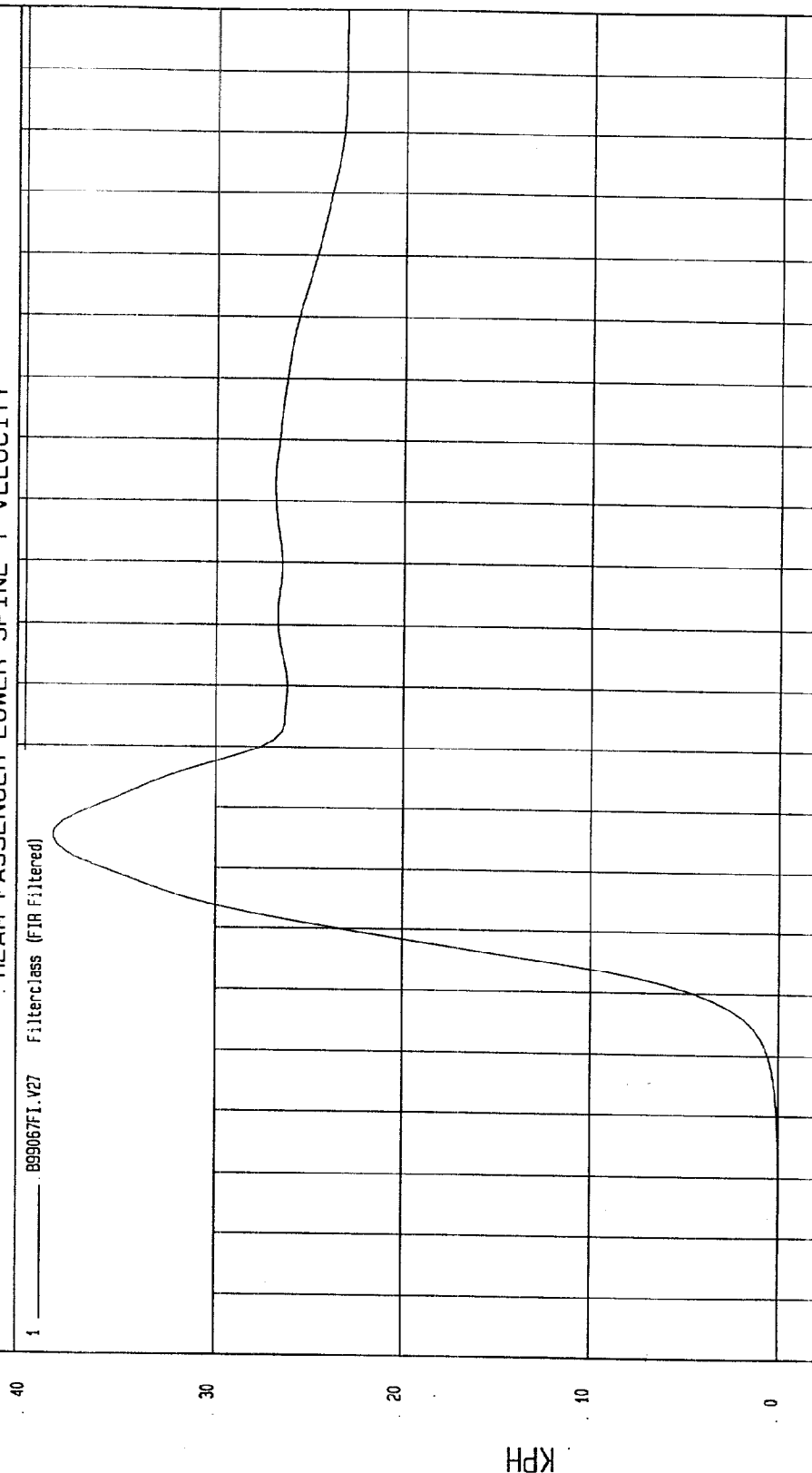
TEST: FMVSS 214 DYNAMIC SIDE IMPACT TEST DATE: 10-19-1999

COMPONENT: 2000 BUICK LESABRE (CY0100) Speed: 32.7 MPH 52.6 KPH

Minimum = -3.35E-02 KPH at 8 msec Maximum = 38.53 KPH at 65 msec

REAR PASSENGER LOWER SPINE Y VELOCITY

1 B99057F1.V27 Filterclass (FIR Filtered)



WCA Research
10-25-1999 10:41

TIME Seconds

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 74.4 G'S at 41 msec

Minimum = -9.81 G'S at 81 msec

REAR PASSENGER PELVIS Y ACCELERATION

1 B99067F1.R28 Filterclass (FIR Filtered)

70
60
50
40
30
20
10
0
-10

G.S

TIME (SECONDS)

.19
.18
.17
.16
.15
.14
.13
.12
.11
.1
.09
.08
.07
.06
.05
.04
.03
.02
.01
0
-.01
-.02MCA Research
10-19-1999 14:27

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

COMPONENT: 2000 BUICK LESABRE (CY0100)

Speed: 32.7 MPH 52.6 KPH

Minimum = -3.77E-02 KPH at 7 msec

Maximum = 34.72 KPH at 51 msec

REAR PASSENGER PELVIS Y VELOCITY

1 ——— B990671.V2B Filterclass (FIR Filtered)

36

34

32

30

28

26

24

22

20

18

16

14

12

10

8

6

4

2

0

KPH

-02

-01

0

01

02

03

04

05

06

07

08

09

1

11

12

13

14

15

16

17

18

19

TIME Seconds

NSA Research
10-25-1999 10: 41

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

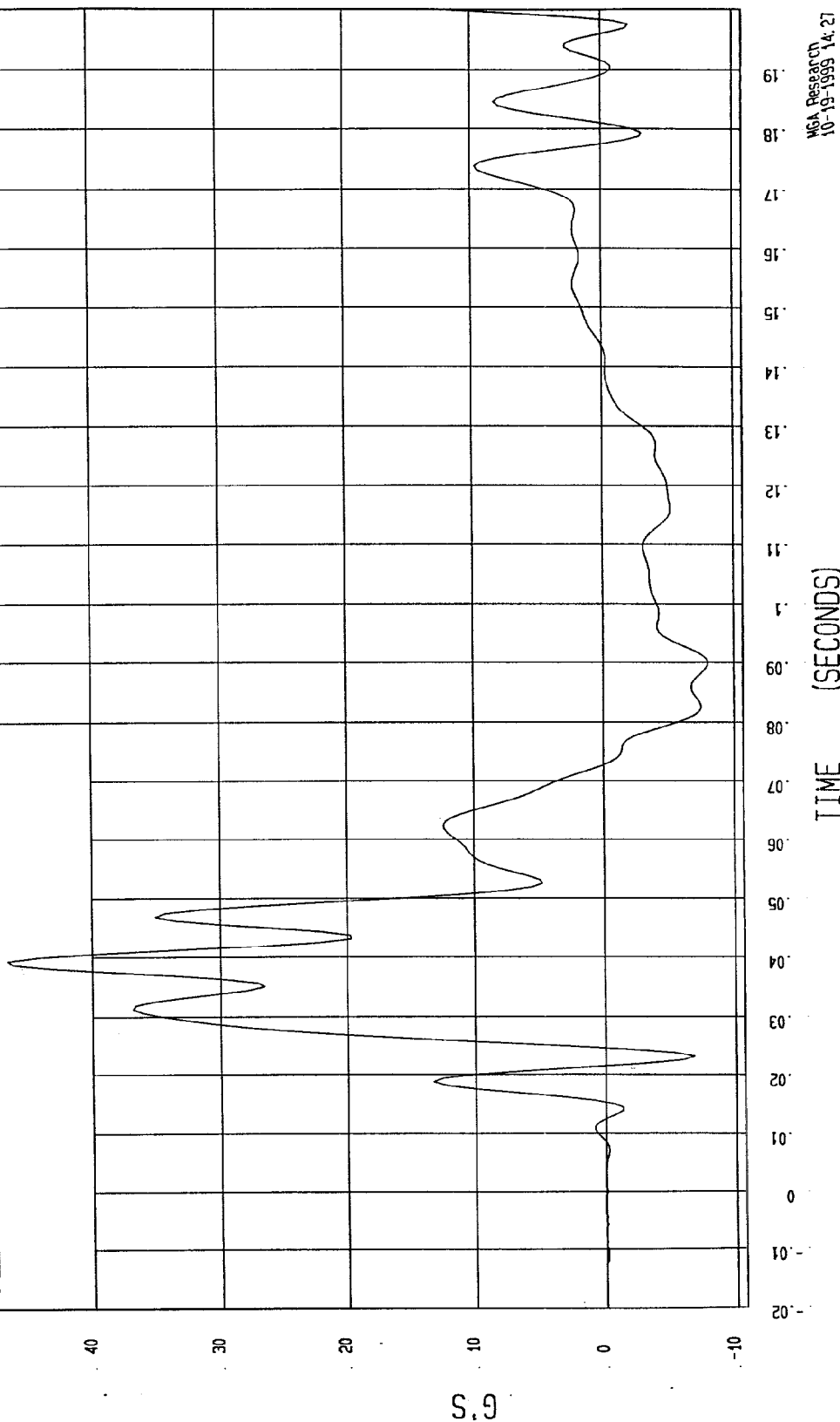
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 46.59 G'S at 39 msec

Minimum = -7.99 G'S at 90 msec

DRIVER UPPER RIB Y REDUNDANT ACCELERATION

1 899057F1.R42 Filter: class (FIR Filtered)

WGA Research
10-19-1999 14:27

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

COMPONENT: 2000 BUICK LESABRE (CY0100)

Speed: 32.7 MPH 52.6 KPH

Minimum = -9.96E-03 KPH at 15 msec

Maximum = 34.18 KPH at 72 msec

DRIVER UPPER RIB Y REDUNDANT VELOCITY



NSA Research
10-25-1999 10: 41

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

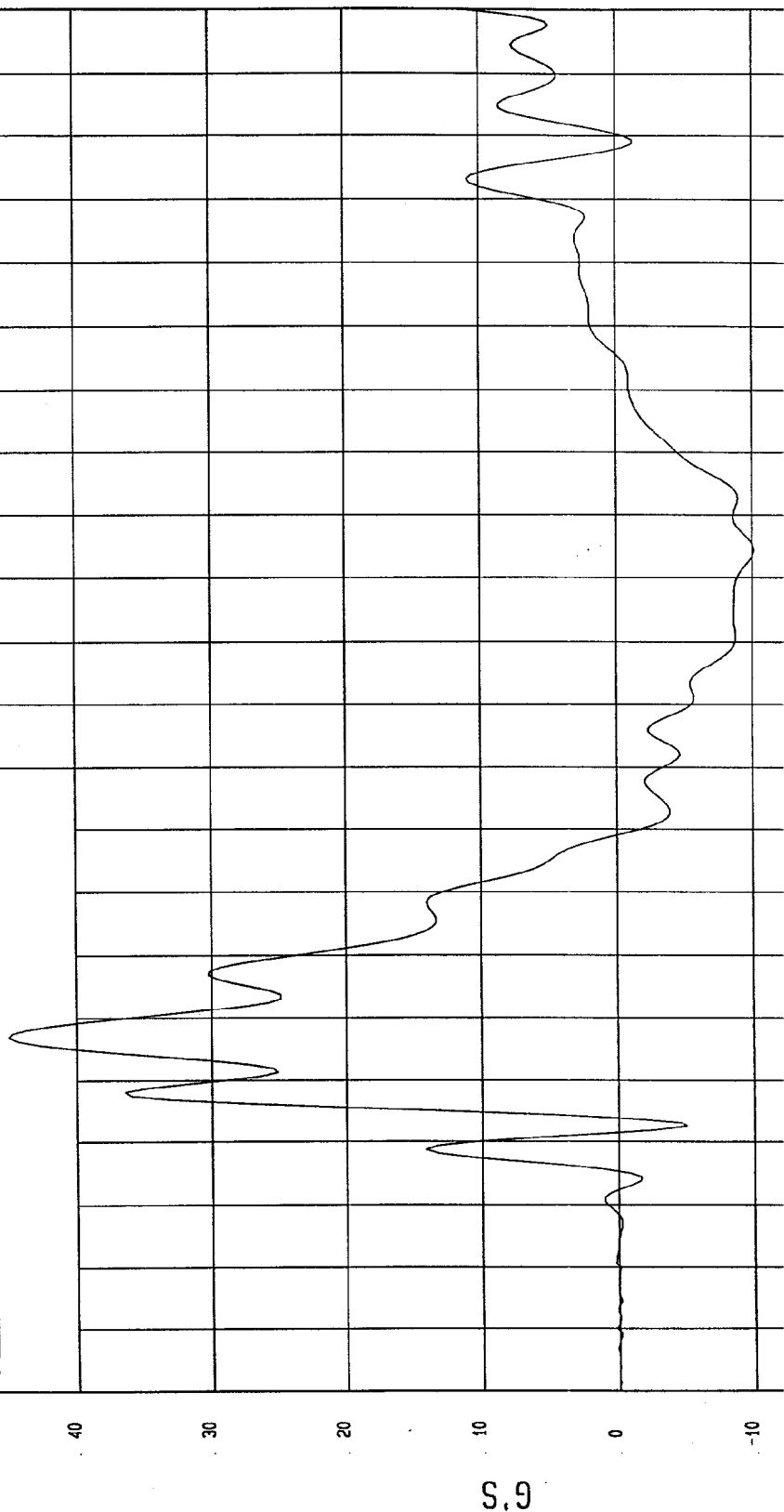
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 45.06 G'S at 37 msec

Minimum = -10.14 G'S at 114 msec

DRIVER LOWER RIB Y REDUNDANT ACCELERATION

1 _____ 899067FI.R43 Filterclass (FIR Filtered)



H&A Research
10-19-1999 14.27

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

COMPONENT: 2000 BUICK LESABRE (CY0100)

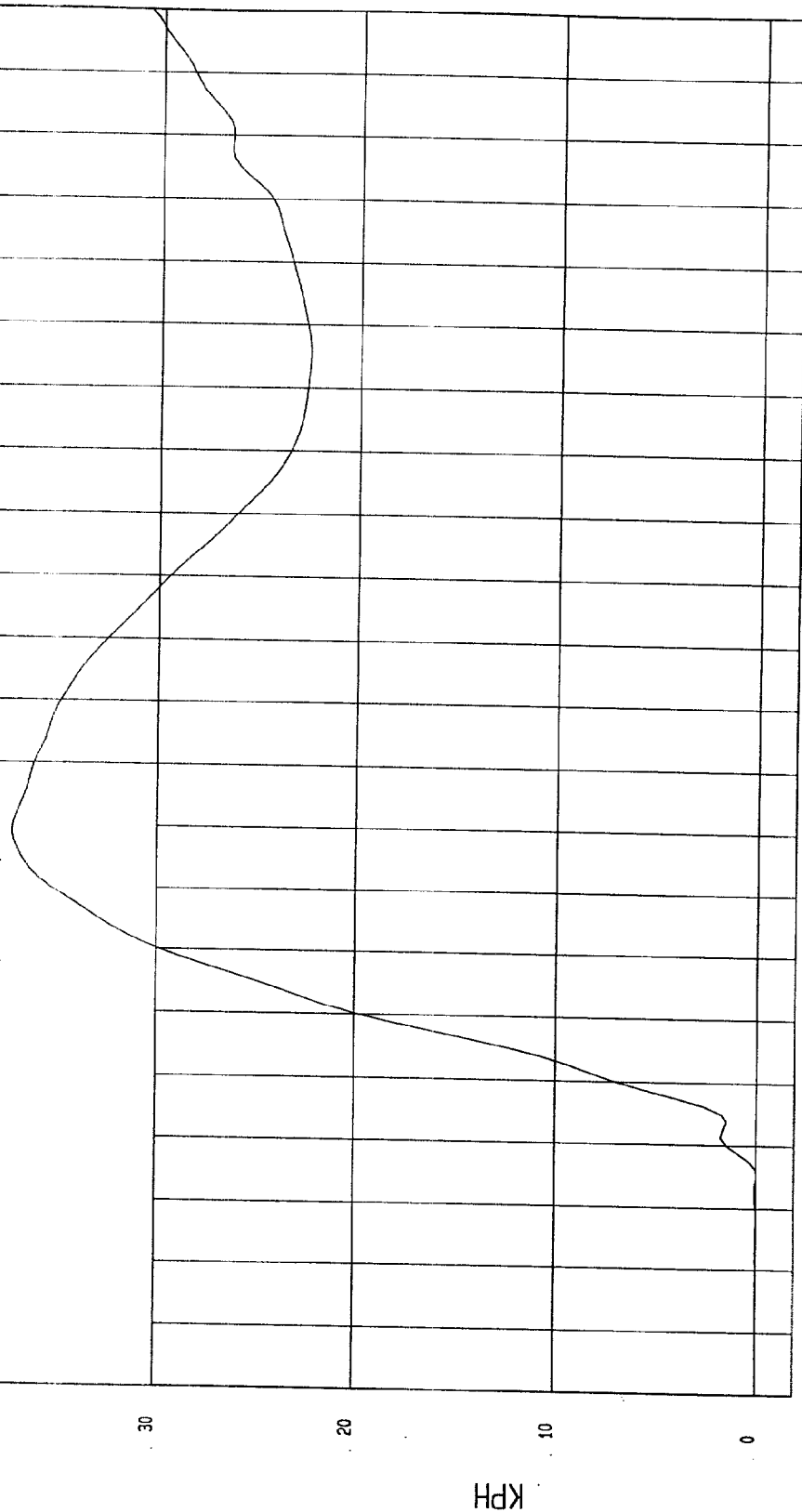
Speed: 32.7 MPH 52.6 KPH

Minimum = -2.17E-02 KPH at 15 msec

Maximum = 37.19 KPH at 69 msec

DRIVER LOWER RIB Y REDUNDANT VELOCITY

1 ——— 899057F1.V43 Filterclass (FIR Filtered)



TIME Seconds

NSA Research
10-25-1999 10:42

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

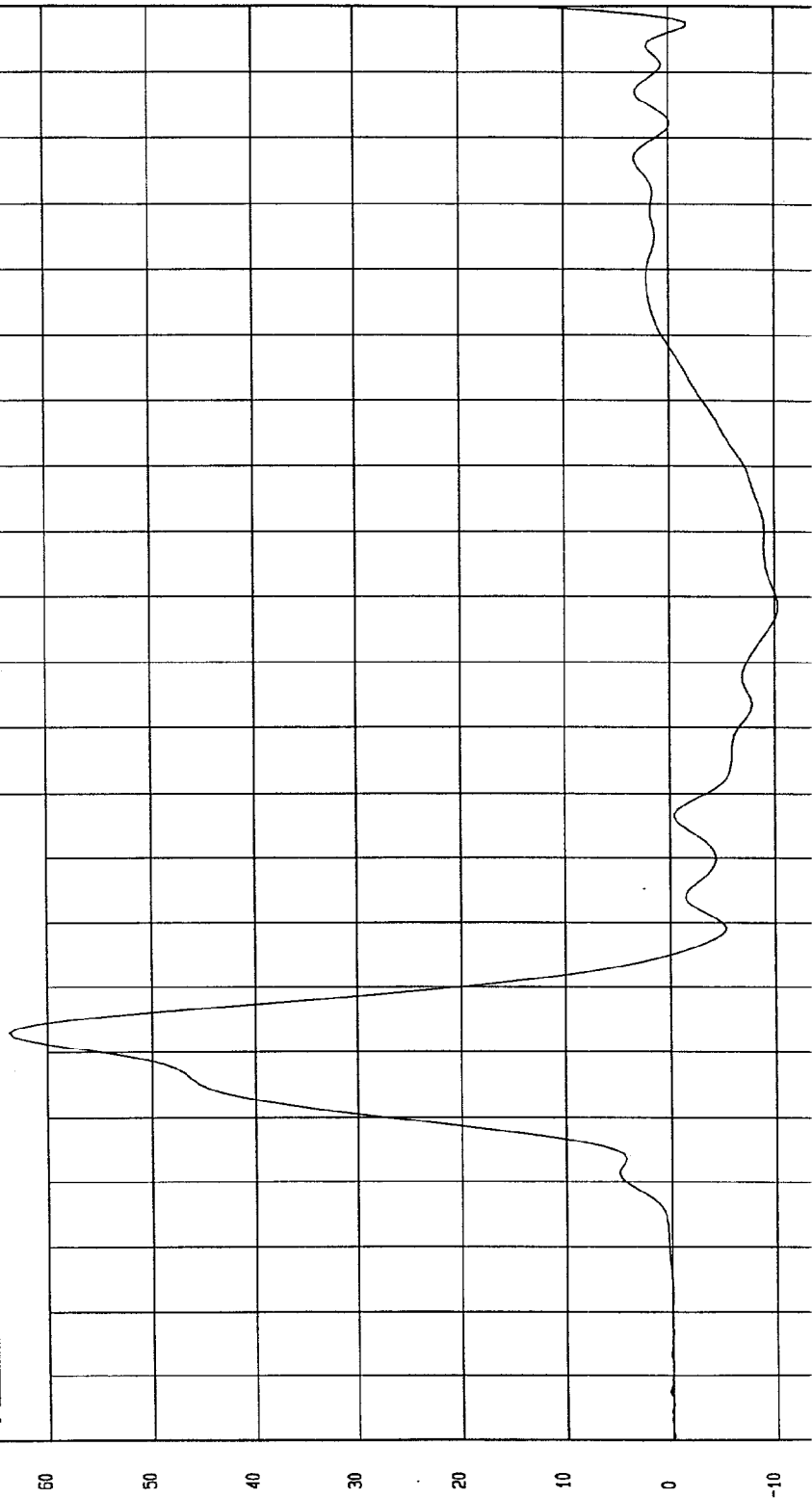
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 63.66 G'S at 43 msec

Minimum = -10.32 G'S at 109 msec

DRIVER LOWER SPINE Y REDUNDANT ACCELERATION

1 B99067F1.R44 Filterclass (FIR Filtered)



NCA Research
10-19-1999 14:27

TIME (SECONDS)

G's

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

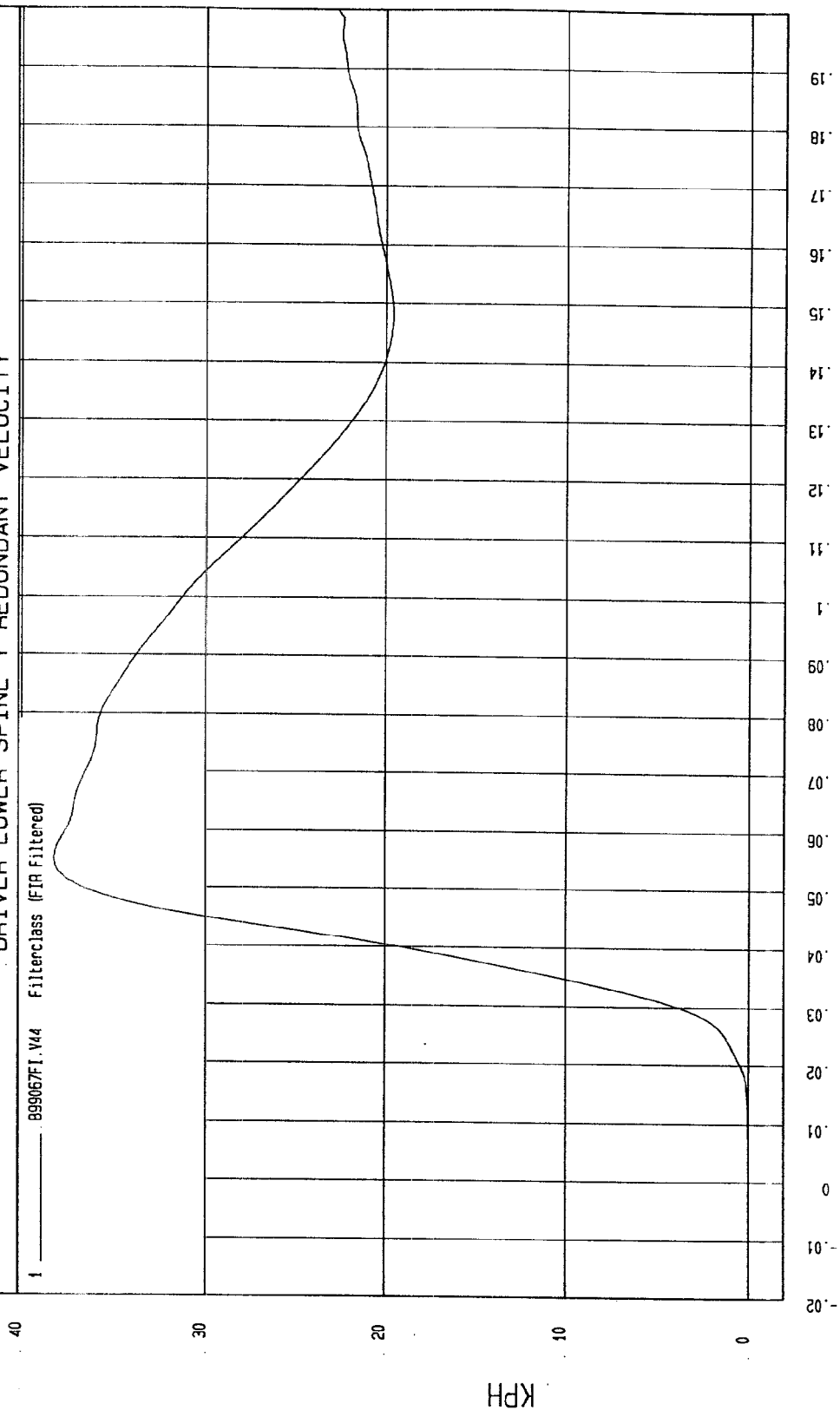
COMPONENT: 2000 BUICK LESABRE (CY0100)

Minimum = -2.70E-03 KPH at -19 msec

Maximum = 38.27 KPH at 55 msec

DRIVER LOWER SPINE Y REDUNDANT VELOCITY

1 899067I.V44 Filterclass (FIR Filtered)



MSA Research
10-25-1999 10:42

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

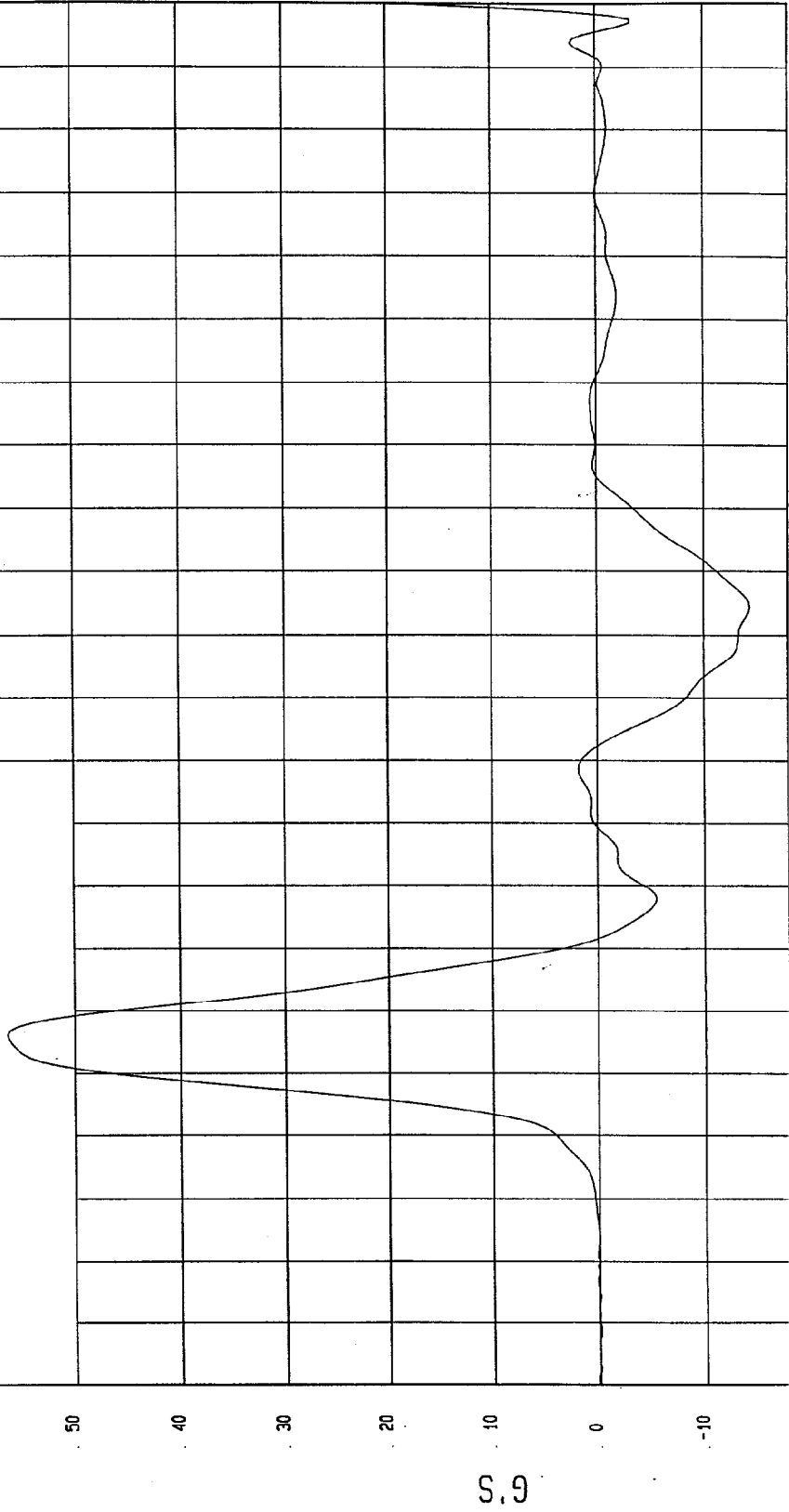
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 56.31 G'S at 36 msec

Minimum = -14.42 G'S at 104 msec

DRIVER PELVIS Y REDUNDANT ACCELERATION

1 899067FI.R45 FilterClass (FIR Filtered)



MCA Research
10-19-1999 14:27

TIME (SECONDS)

G.S

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

COMPONENT: 2000 BUICK LESABRE (CY0100)

Speed: 32.7 MPH 52.6 KPH

Minimum = -1.54E-04 KPH at -10 msec

Maximum = 34.7 KPH at 51 msec

DRIVER PELVIS Y REDUNDANT VELOCITY

1 8990671.V45 Filterclass (FIR Filtered)

36

34

32

30

28

26

24

22

20

18

16

14

12

10

8

6

4

2

0

KPH

-02

-01

0

01

02

03

04

05

06

07

08

09

1

11

12

13

14

15

16

17

18

19

TIME Seconds

NSA Research
10-25-1999 10:42

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

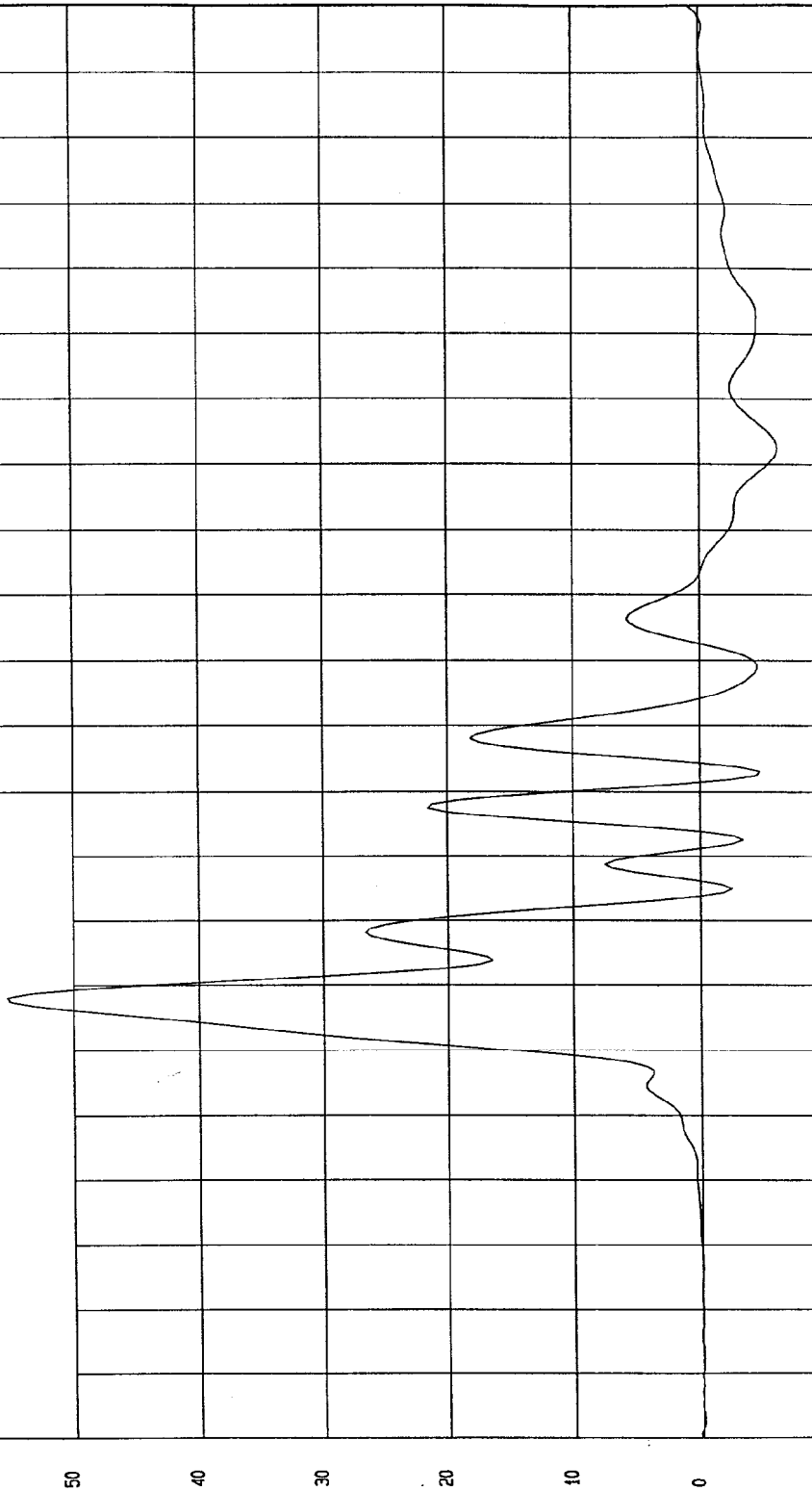
COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 55.22 G'S at 48 msec

Minimum = -6.13 G'S at 132 msec

REAR PASSENGER UPPER RIB Y REDUNDANT ACCELERATION

1 899067F1.R46 Filterclass (FIR Filtered)



MGA Research
10-19-1999 14: 27

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

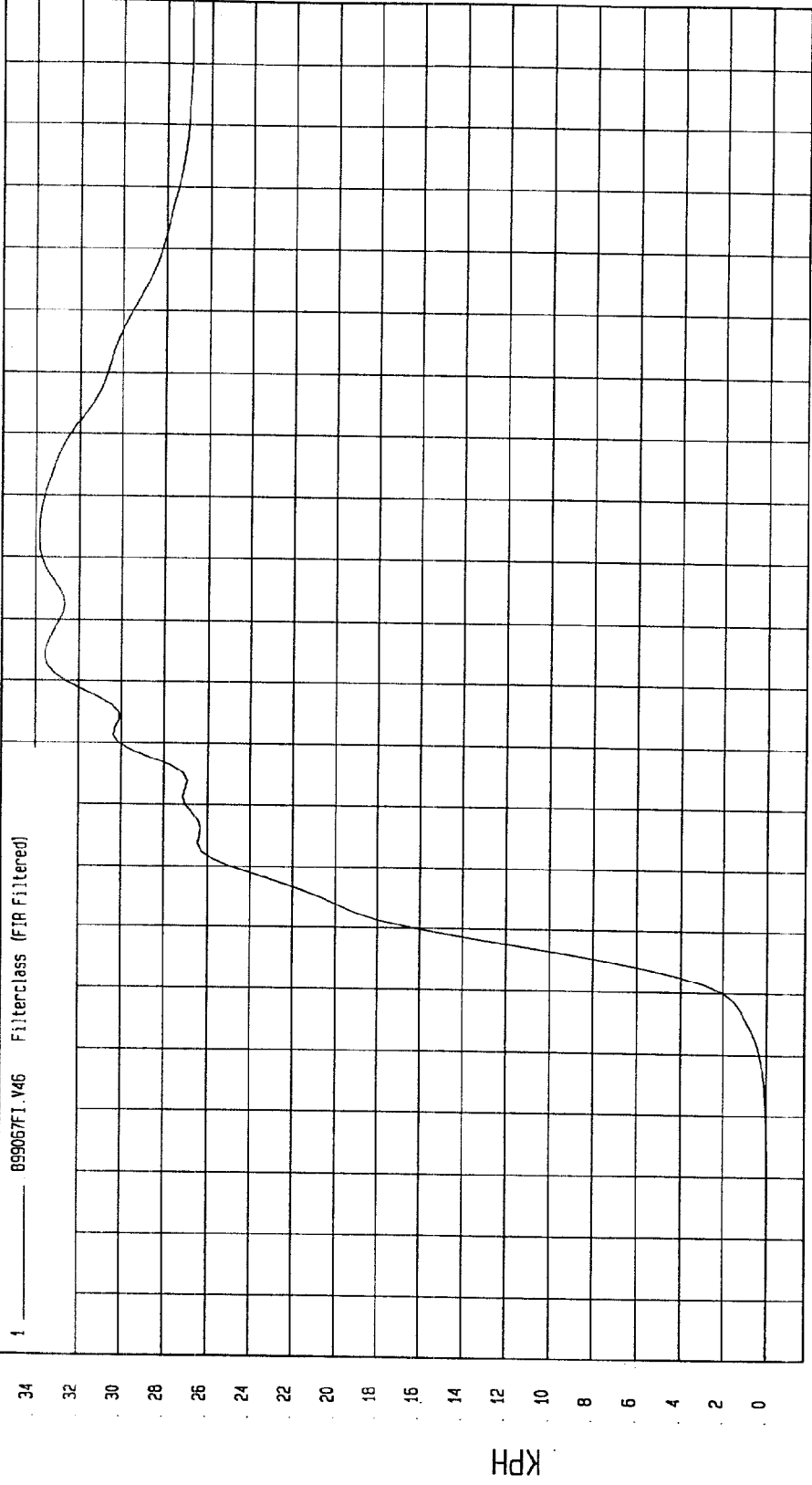
COMPONENT: 2000 BUICK LESABRE (CY0100)

Speed: 32.7 MPH 52.6 KPH

Minimum = -4.50E-02 KPH at 9 msec

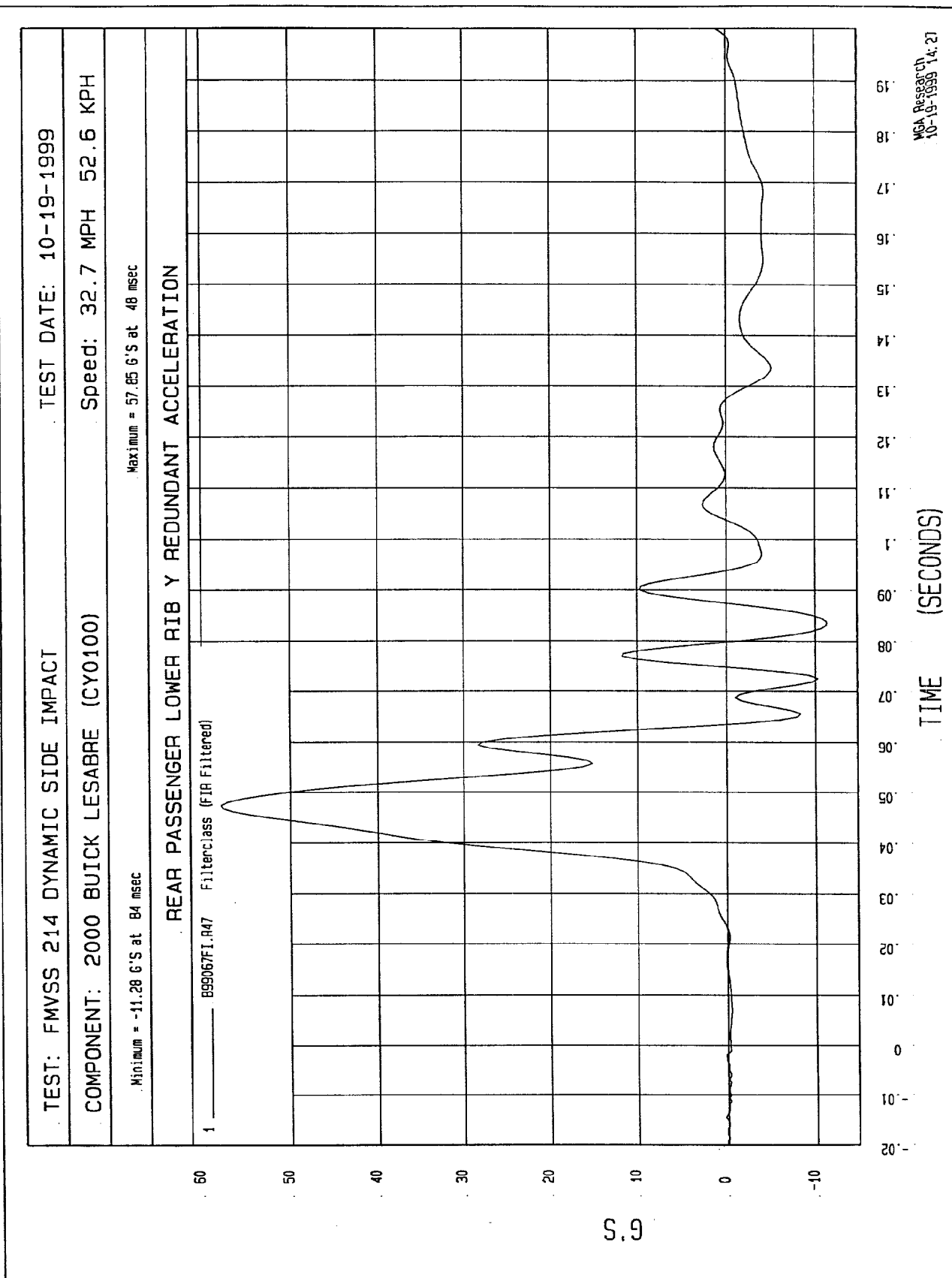
Maximum = 33.83 KPH at 113 msec

REAR PASSENGER UPPER RIB Y REDUNDANT VELOCITY



MGA Research
10-25-1999 10.42

TIME Seconds



TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

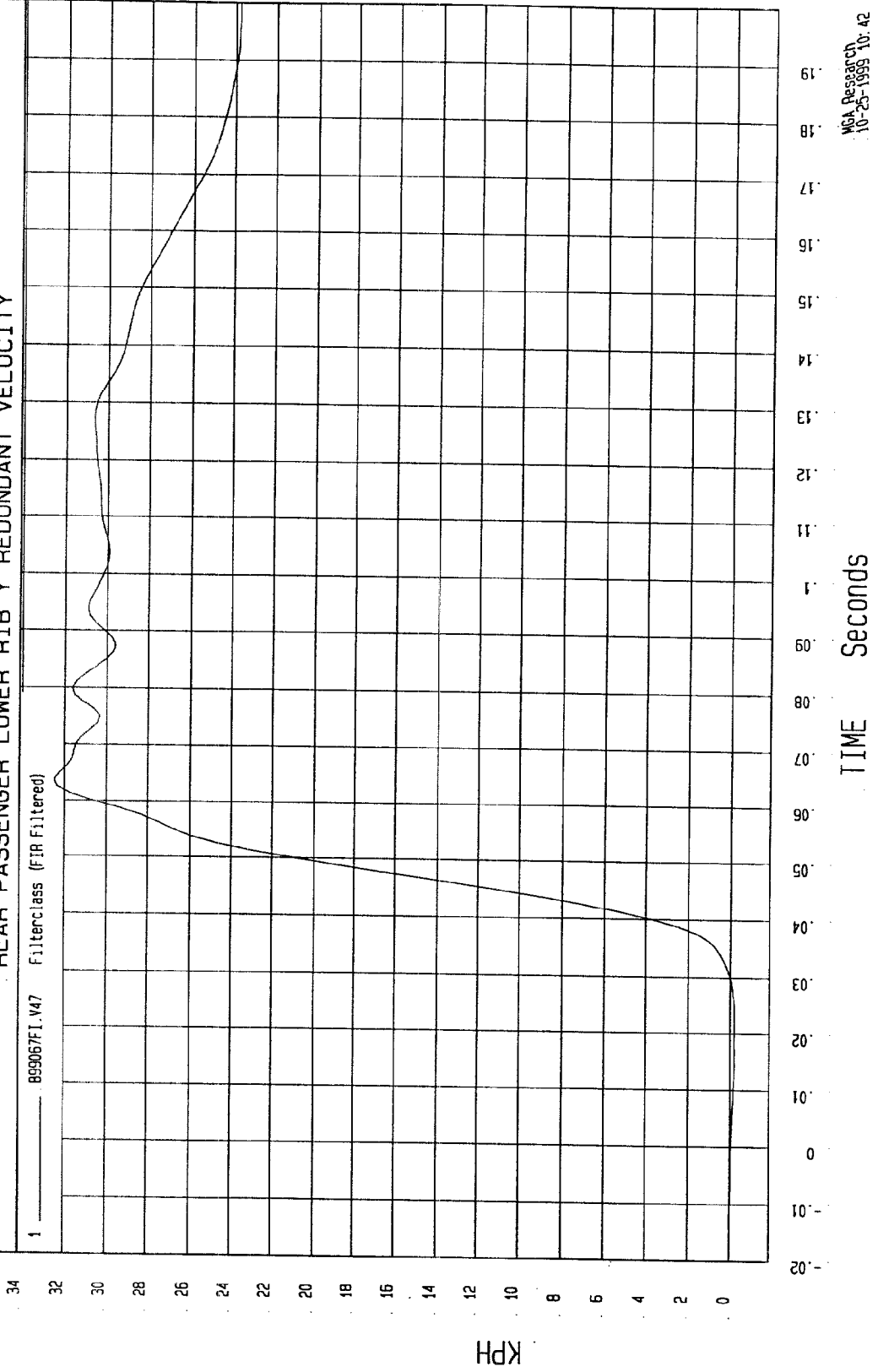
Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 32.43 KPH at 64 msec

Minimum = -21 KPH at 23 msec

REAR PASSENGER LOWER RIB Y REDUNDANT VELOCITY



TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

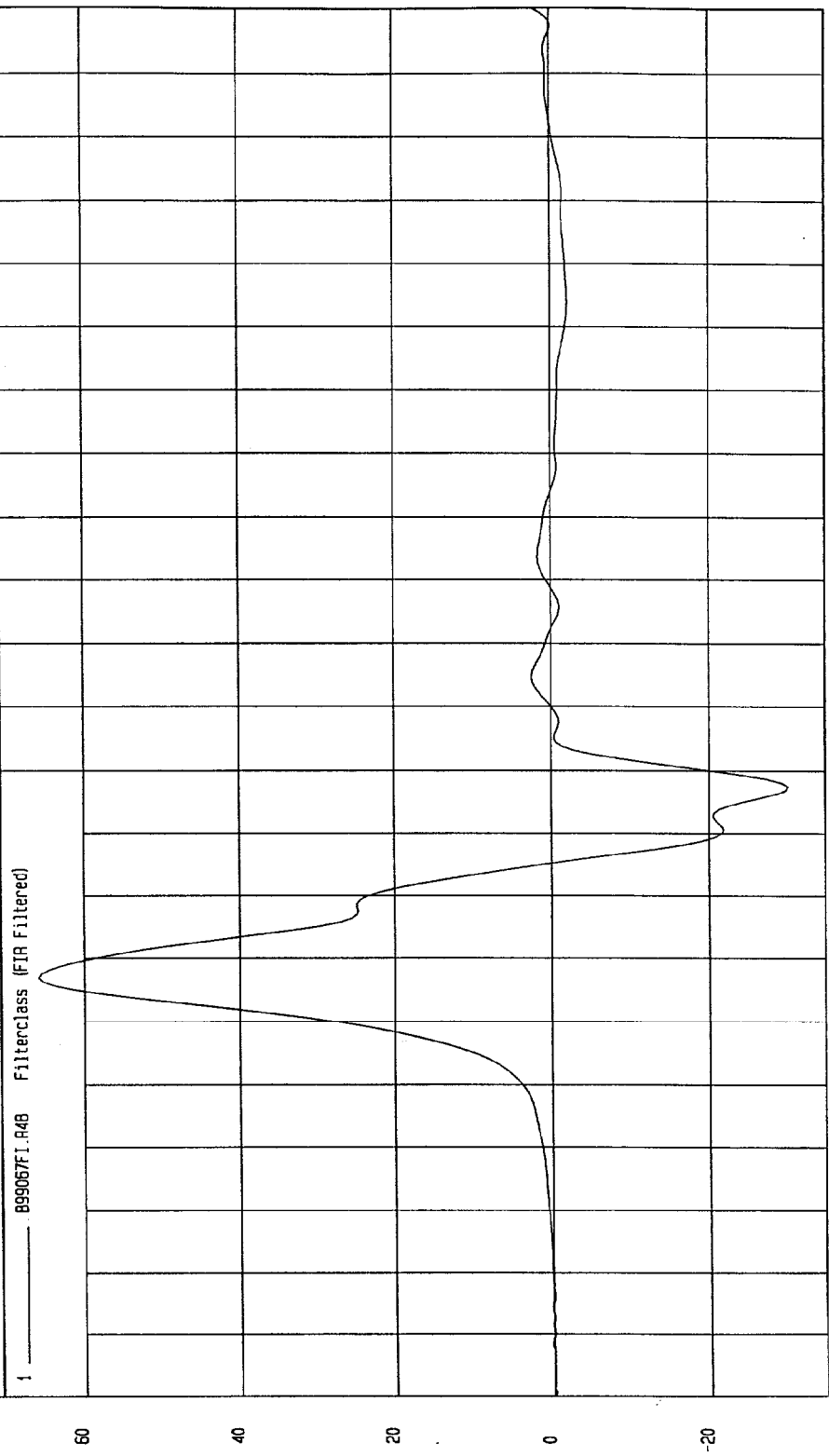
Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 65.67 G'S at 47 msec

Minimum = -29.79 G'S at 78 msec

REAR PASSENGER LOWER SPINE Y REDUNDANT ACCELERATION



1 899057F1.R4B FilterClass (FIR Filtered)

MCA Research
10-19-1999 14: 27

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

SPEED: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Minimum = -2.97E-02 KPH at -6 msec

Maximum = 39.4 KPH at 65 msec

REAR PASSENGER LOWER SPINE Y REDUNDANT VELOCITY

1 _____ B99067F1.V48 FilterClass (FIR Filtered)

40

30

20

10

0

KPH

-02

-01

0

01

02

03

04

05

06

07

08

09

10

11

12

13

14

15

16

17

18

19

TIME Seconds

MCA Research
10-25-1999 10:42

TEST: FMVSS 214 DYNAMIC SIDE IMPACT

TEST DATE: 10-19-1999

Speed: 32.7 MPH 52.6 KPH

COMPONENT: 2000 BUICK LESABRE (CY0100)

Maximum = 75.35 G'S at 41 msec

Minimum = -10.29 G'S at 81 msec

REAR PASSENGER PELVIS Y REDUNDANT ACCELERATION

1 B9906/F1.R49 Filterclass (FIR Filtered)



NGA Research
10-19-1999 14:27

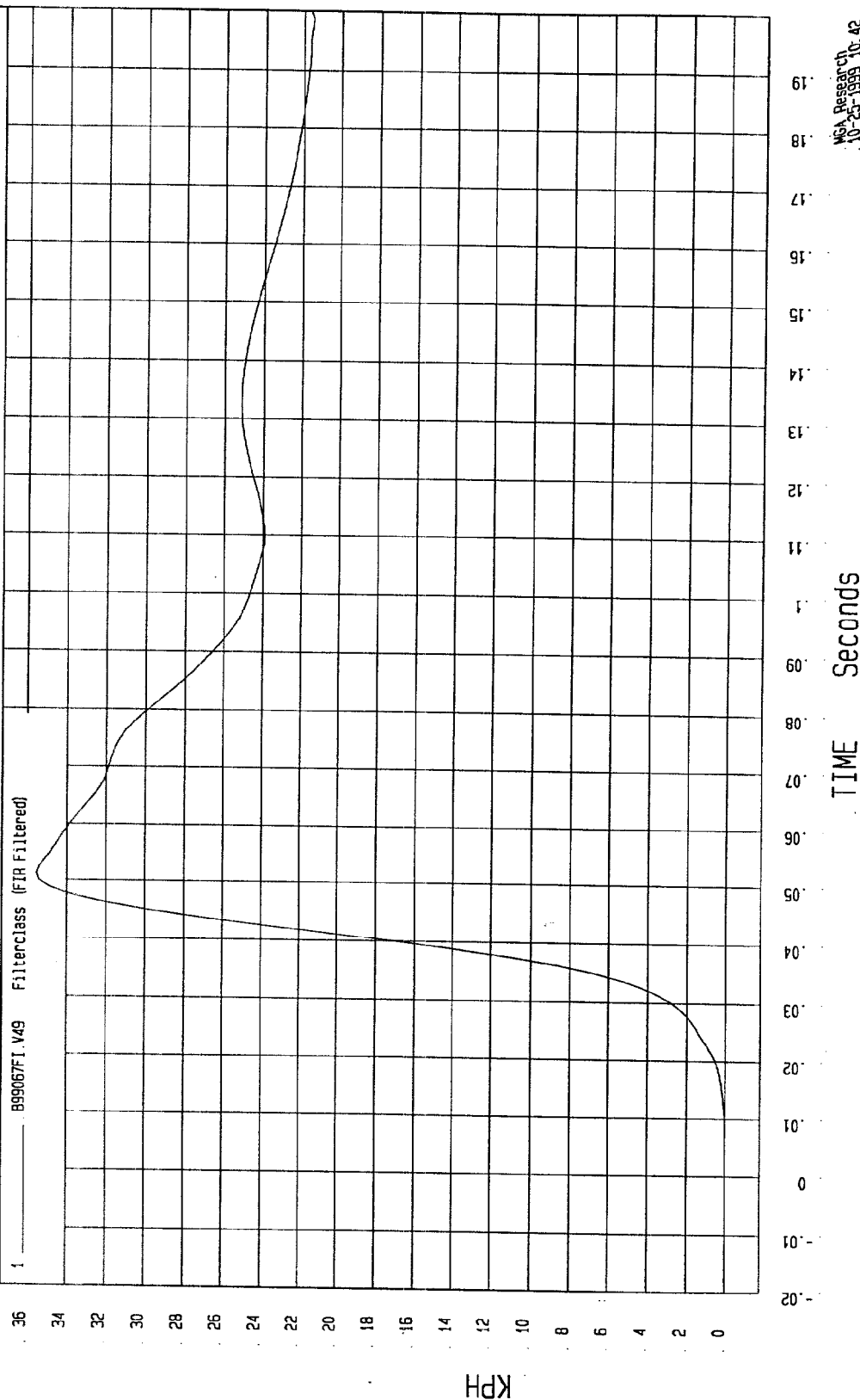
TIME (SECONDS)

G.S

TEST: FMVSS 214 DYNAMIC SIDE IMPACT TEST DATE: 10-19-1999
 COMPONENT: 2000 BUICK LESABRE (CY0100) Speed: 32.7 MPH 52.6 KPH

Minimum = -5.82E-03 KPH at -4 msec Maximum = 35.53 KPH at 51 msec

REAR PASSENGER PELVIS Y REDUNDANT VELOCITY



NGA Research
 10-25-1999 10:42

APPENDIX C

SID CONFIGURATION AND PERFORMANCE VERIFICATION

SUMMARY
SIDE PRE & POST-TEST CALIBRATION
CONFIGURED TO LEFT SIDE IMPACT

Report Date: October 25, 1999Technician: Tim MichnayTest Date: October 19, 1999

Test Parameter	Specification	Dummy Serial No: 037		Dummy Serial No: 036	
		Pre-Test	Post-Test	Pre-Test	Post-Test
SH-Seated Height (mm)	889 - 909	903	903	902	902
RH-Rib Height (mm)	501 - 521	510	510	507	507
HP-Hip Pivot Height (mm)	99 ref.	99	99	99	99
RD-Rib from Back Line (mm)	229 - 241	235	237	237	235
KV-Knee Pivot from Back Line (mm)	511 - 526	519	522	522	519
SW-Knee Pivot to Floor (mm)	490 - 505	494	493	493	494
HW-Hip Width (mm)	356 - 391	370	378	378	370
Thorax Impacts					
Temperature (°C)	18.9 - 25.5	21.0	21.0	21.0	21.0
Relative Humidity (%)	10 - 70	34	34	34	36
Probe Speed (m/s)	4.27 - 4.33	4.28	4.29	4.28	4.30
Upper Rib (g's)	37 - 46	38	45	46	45
Lower Rib (g's)	37 - 46	39	42	43	45
Lower Spine (g's)	15 - 22	21	22	20	20
Pelvis Impact					
Temperature (°C)	18.9 - 25.5	21.0	21.0	21.0	21.0
Relative Humidity (%)	10 - 70	34	34	34	36
Probe Speed (m/s)	4.27 - 4.33	4.30	4.28	4.27	4.31
Pelvis ('gs)	40 - 60	53	47	49	47

REMARKS:

PRE-TEST CERTIFICATION DATA

Dummy Serial Number: 037

Calibration Test Results Summary

Dummy Serial Number: 037

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.

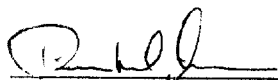
Lumbar Flexion Test: The lumbar passed all flexion test requirements.

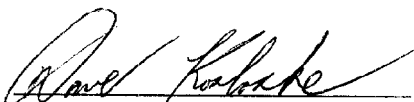
SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA **C-4**

DUMMY SERIAL NO.: 037

DATE OF VERIFICATION: September 21, 1999

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height (mm)	889 - 909	903
RH - Rib Height (mm)	501 - 521	510
HP - Hip Pivot Height (mm)	99 ref.	99
RD - Rib From Back Line (mm)	229 - 241	237
KV - Knee Pivot From Back Line (mm)	511 - 526	522
SW - Knee Pivot to Floor (mm)	490 - 505	493
HW - Hip Width (mm)	356 - 391	378

TECHNICIAN: 

APPROVED BY: 

MGA RESEARCH CORPORATION

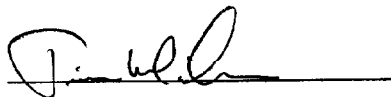
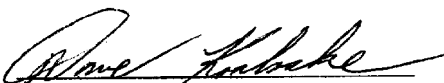
THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: September 21, 1999DUMMY SERIAL NUMBER: 037TEST NUMBER: D991073

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0
RELATIVE HUMIDITY (%)	10 - 70	34
PROBE SPEED (m/s)	4.27 - 4.33	4.28
UPPER RIB (g's)	37 - 46 g's	38
LOWER RIB (g's)	37 - 46 g's	39
LOWER SPINE (g's)	15 - 22 g's	21

TEST MEETS SPECIFICATIONS

TECHNICIAN: APPROVED BY: 

TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 09-21-1999 - 11:26

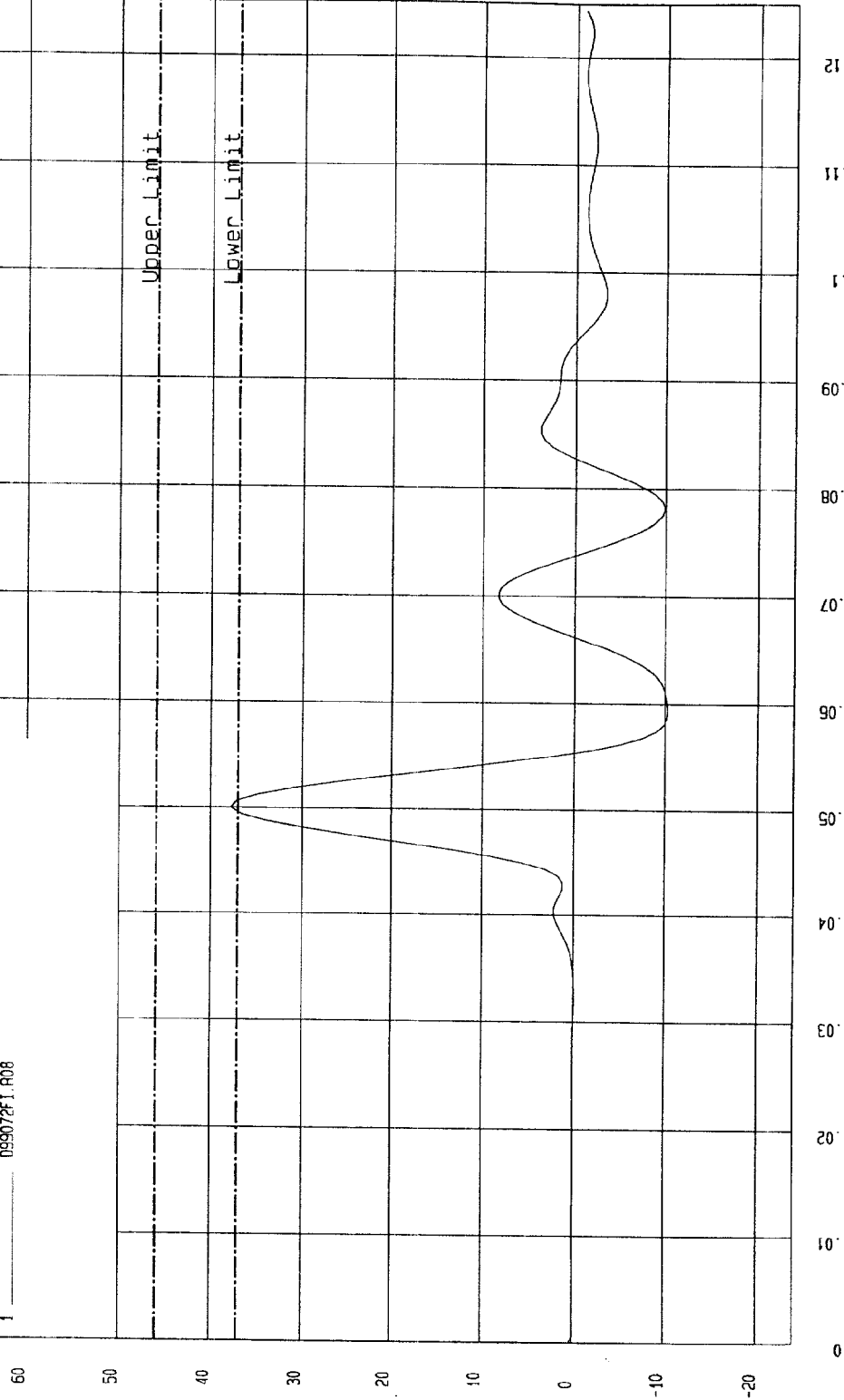
COMPONENT: DUMMY # 037 Velocity: 14.041 FT/SEC 4.28 M/SEC

Minimum = -10.29 G'S at 59.3 msec

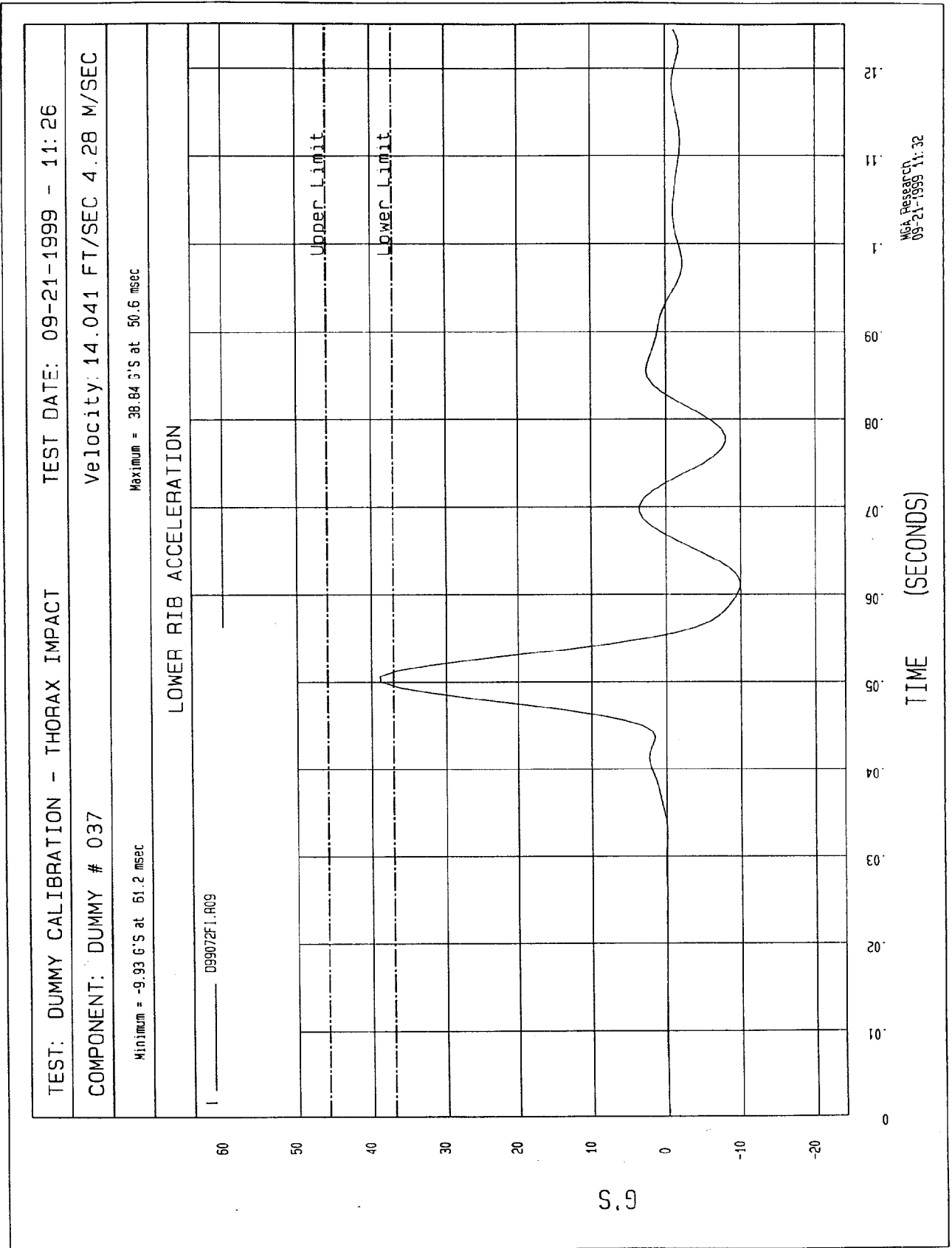
Maximum = 37.77 G'S at 50 msec

UPPER RIB ACCELERATION

1 099072FI R08

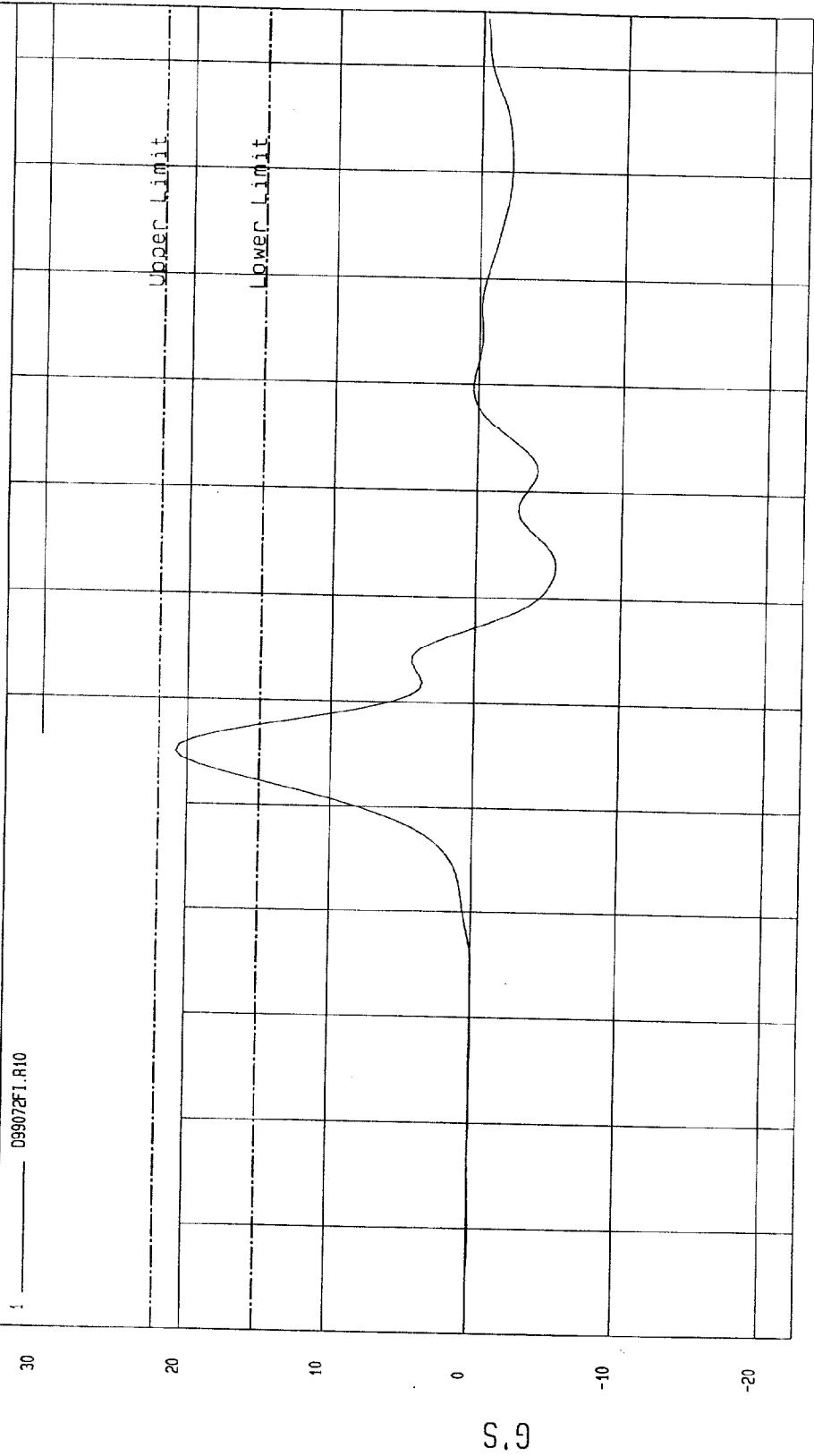


NSA Research
09-21-1999 11:32



TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 09-21-1999 - 11:26
COMPONENT: DUMMY # 037 Velocity: 14.041 FT/SEC 4.28 M/SEC
Minimum = -5.47 G'S at 73.1 msec Maximum = 20.82 G'S at 55 msec

LOWER SPINE ACCELERATION



MGA RESEARCH CORPORATION

C-9

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

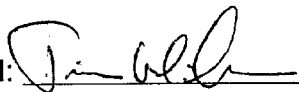
DATE: September 21, 1999

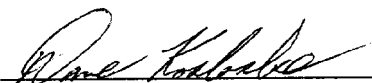
DUMMY SERIAL NUMBER: 037

TEST NUMBER: D991073

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0
RELATIVE HUMIDITY (%)	10 - 70	34
PROBE SPEED (m/s)	4.27 - 4.33	4.30
PELVIS ACCELERATION (g's)	40 - 60	53

TEST MEETS SPECIFICATIONS

TECHNICIAN: 

APPROVED BY: 

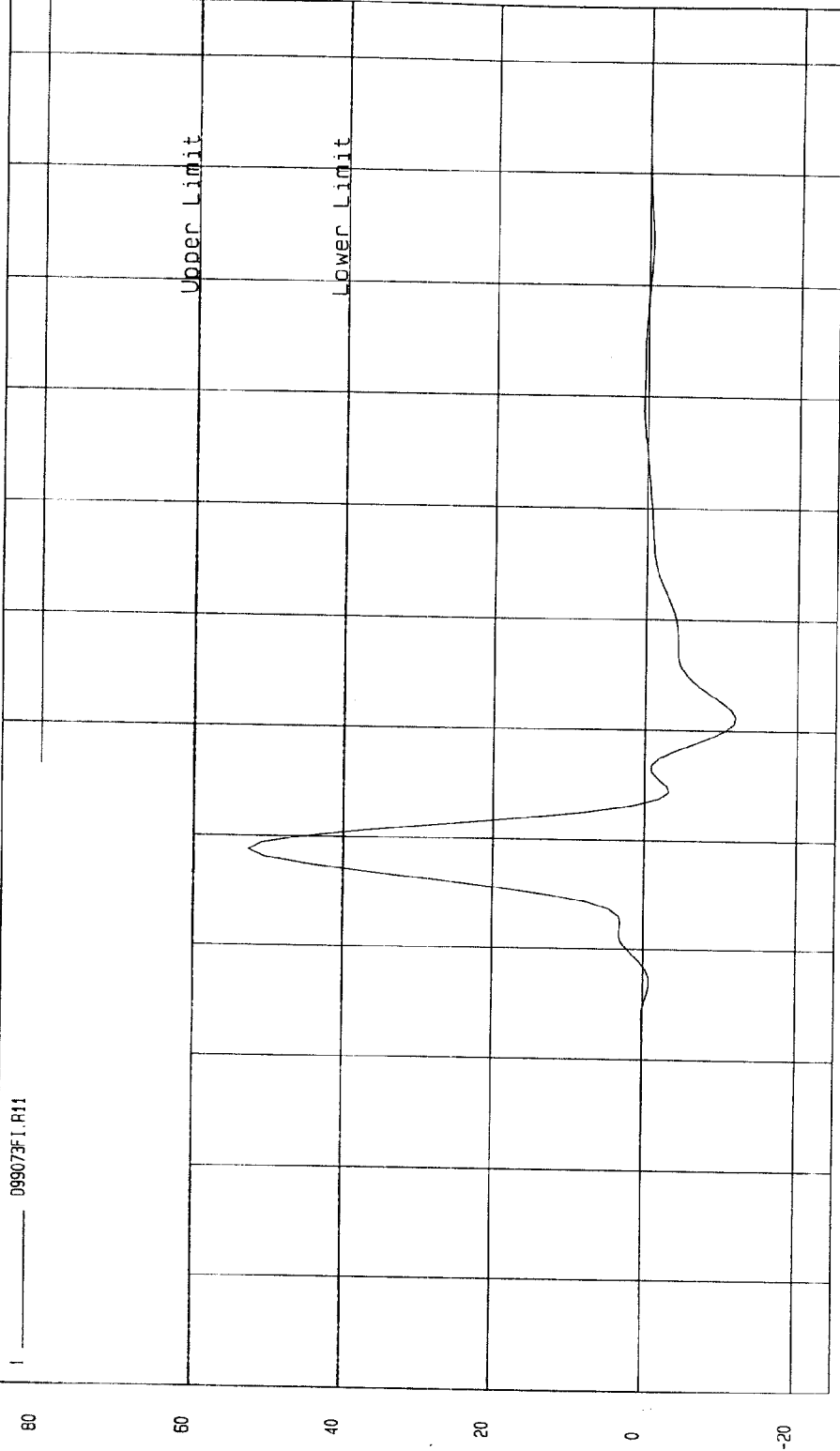
TEST: DUMMY CALIBRATION - PELVIS IMPACT TEST DATE: 09-21-1999 - 11:31

COMPONENT: DUMMY # 037 Velocity: 14.104 FT/SEC 4.3 M/SEC

Minimum = -11.92 G'S at 61.2 msec Maximum = 52.70 G'S at 48.7 msec

PELVIS ACCELERATION

1 _____ 099073F1.R11



NCA Research
09-21-1999 11:33

MGA RESEARCH CORPORATION

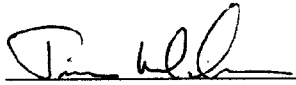
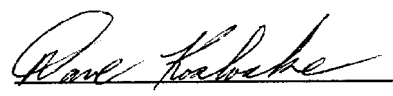
ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

DATE: September 21, 1999DUMMY SERIAL NUMBER: 037TEST NUMBER: D991074

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0
RELATIVE HUMIDITY (%)	10 - 70	34
FORCE @ 12.7 mm	104 - 162	138
FORCE @ 19.0 mm	163 - 222	192
FORCE @ 25.4 mm	222 - 280	256
FORCE @ 33 mm	325 - 391	352

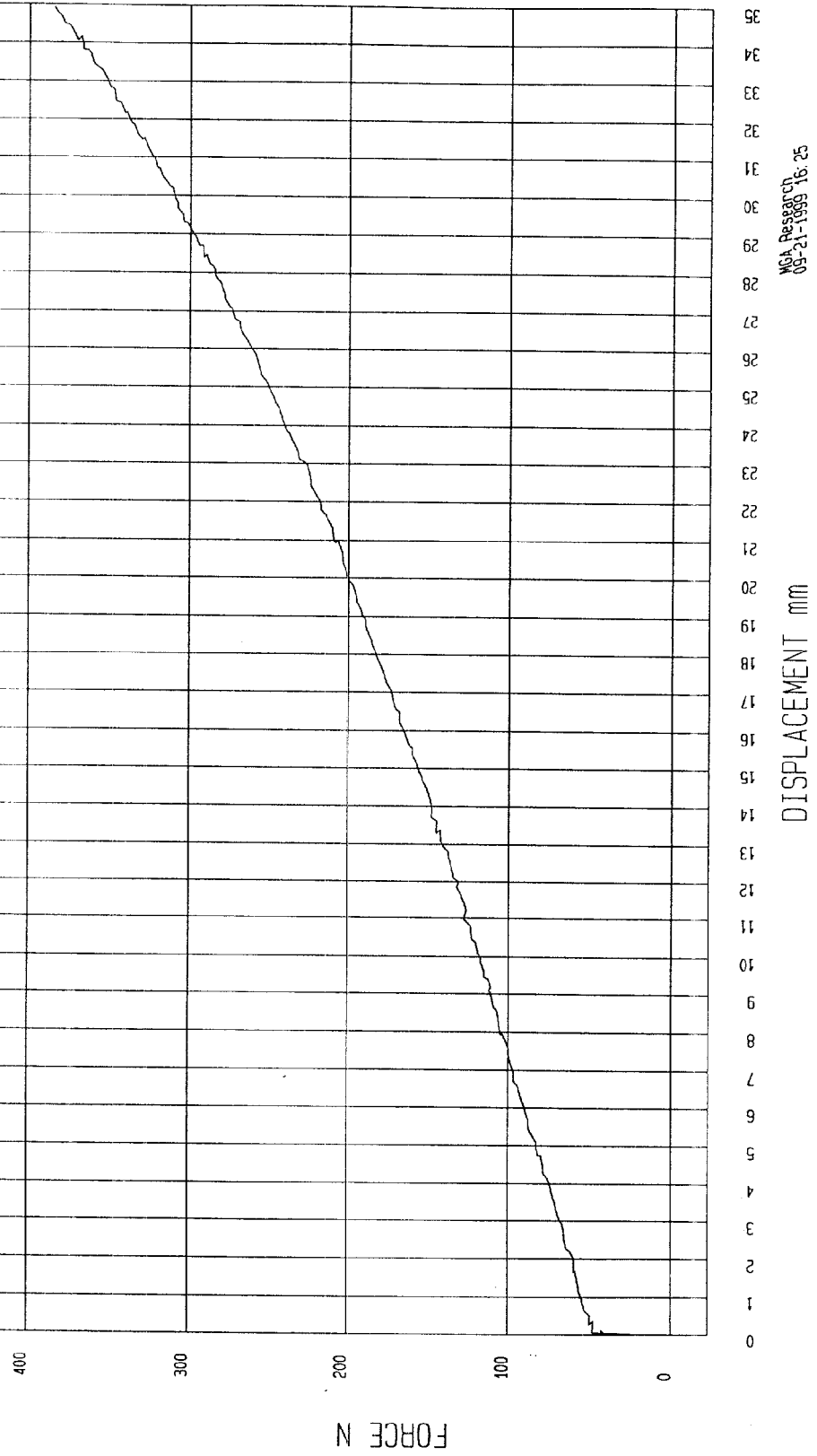
TEST MEETS SPECIFICATIONS

TECHNICIAN: APPROVED BY: 

TEST: DUMMY CALIBRATION - ABDOMEN COMPRESSION TEST DATE: 09-21-1999 - 16:02:24

COMPONENT: DUMMY # 037

FORCE as a function of DISPLACEMENT



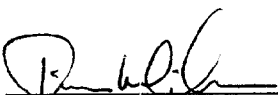
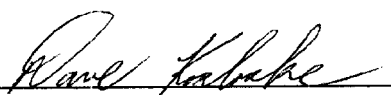
WCA Research
09-21-1999 16:25

LUMBAR FLEXION TEST
SIDE IMPACT DUMMY (SID)

DATE: September 21, 1999DUMMY SERIAL NUMBER: 037TEST NUMBER: D991075

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0
RELATIVE HUMIDITY (%)	10 - 70	34
FORCE @ 0°	0 - 26.7	0
FORCE @ 20°	97.9 - 151.2	103.3
FORCE @ 30°	151.2 - 204.6	159.1
FORCE @ 40°	204.6 - 258.0	226.9
RETURN ANGLE	12° maximum	2

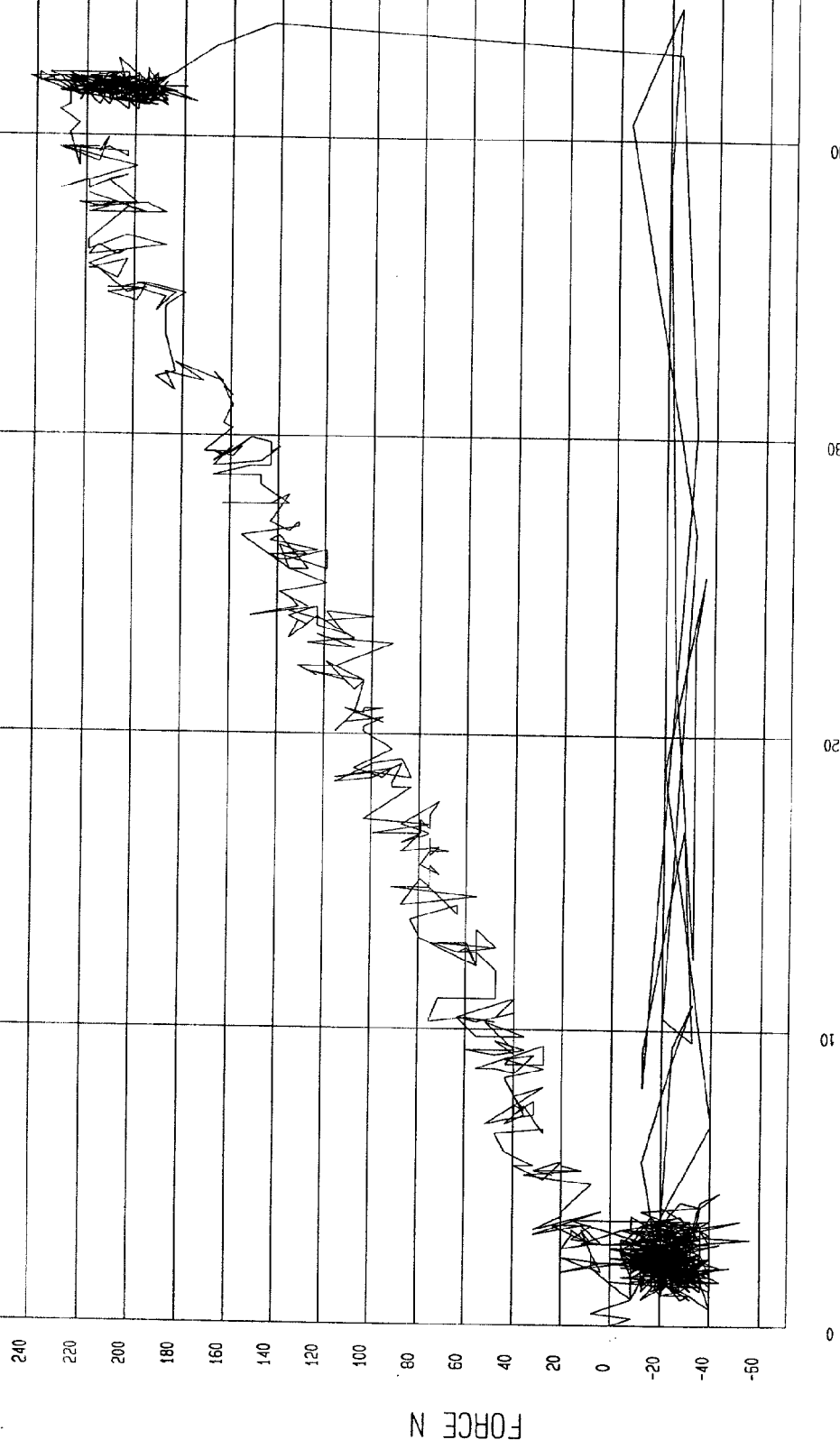
TEST MEETS SPECIFICATIONS

TECHNICIAN: APPROVED BY: 

TEST: DUMMY CALIBRATION - LUMBAR FLEXION TEST DATE: 09-21-1999 - 16:58:42

COMPONENT: DUMMY # 037

FORCE as a function of TORSO ROTATION



MGA Research
09-21-1999 17:50

PRE-TEST CERTIFICATION DATA

Dummy Serial Number: 036

Calibration Test Results Summary

Dummy Serial Number: 036

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.

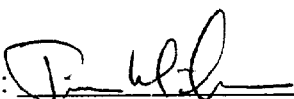
Lumbar Flexion Test: The lumbar passed all flexion test requirements.

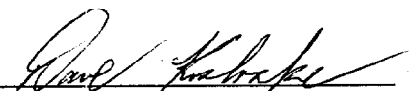
SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA C-17

DUMMY SERIAL NO.: 036

DATE OF VERIFICATION: September 21, 1999

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height (mm)	889 - 909	902
RH - Rib Height (mm)	501 - 521	507
HP - Hip Pivot Height (mm)	99 ref.	99
RD - Rib From Back Line (mm)	229 - 241	235
KV - Knee Pivot From Back Line (mm)	511 - 526	519
SW - Knee Pivot to Floor (mm)	490 - 505	494
HW - Hip Width (mm)	356 - 391	370

TECHNICIAN: 

APPROVED BY: 

MGA RESEARCH CORPORATION

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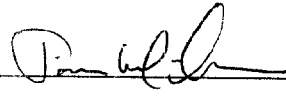
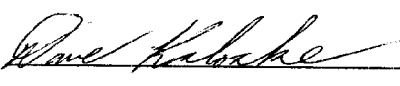
THORAX IMPACT TEST

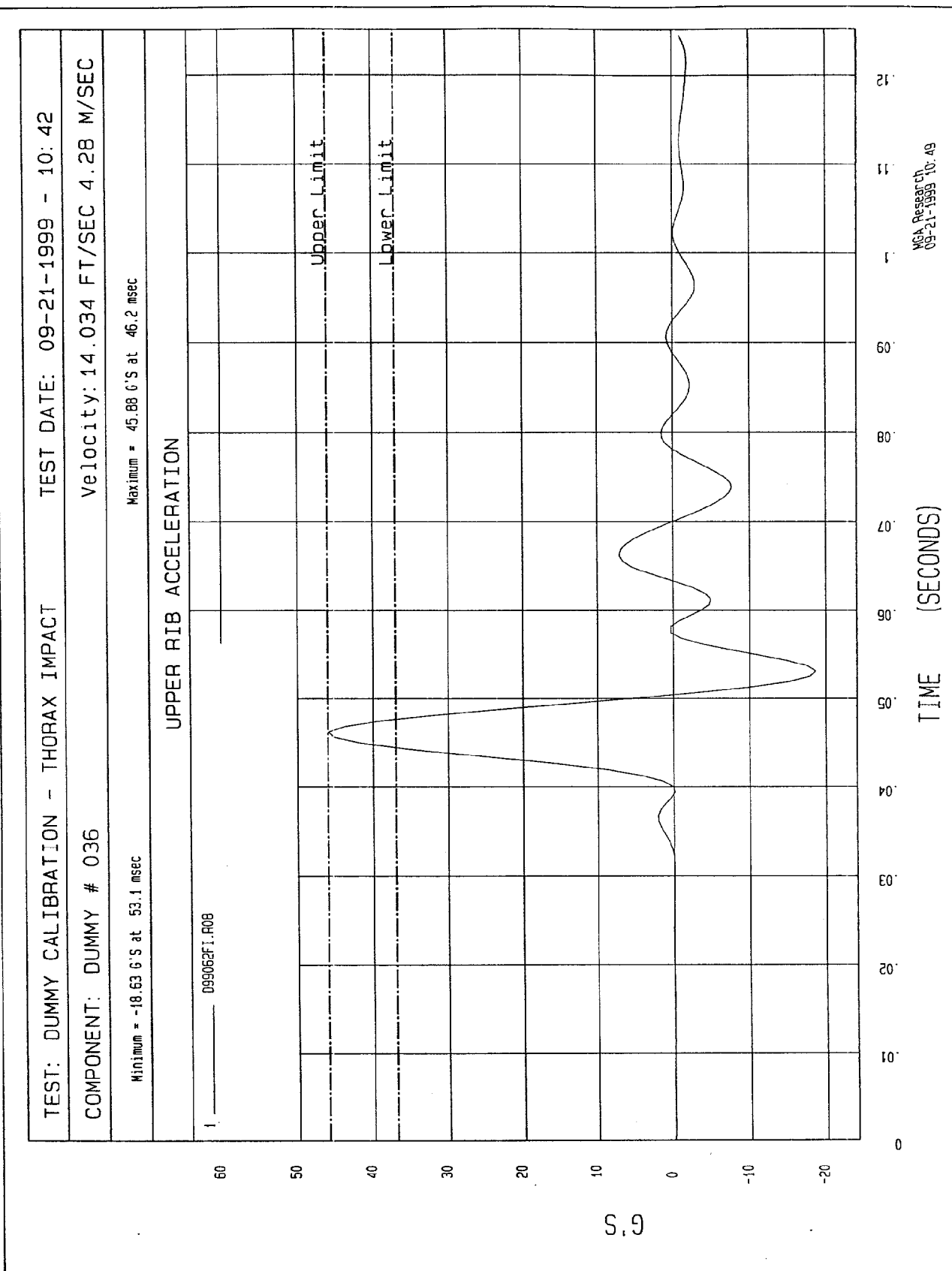
SIDE IMPACT DUMMY (SID)

DATE: September 21, 1999DUMMY SERIAL NUMBER: 036TEST NUMBER: D991062

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0
RELATIVE HUMIDITY (%)	10 - 70	34
PROBE SPEED (m/s)	4.27 - 4.33	4.28
UPPER RIB (g's)	37 - 46	46
LOWER RIB (g's)	37 - 46	43
LOWER SPINE (g's)	15 - 22	20

TEST MEETS SPECIFICATIONS

TECHNICIAN: APPROVED BY: 



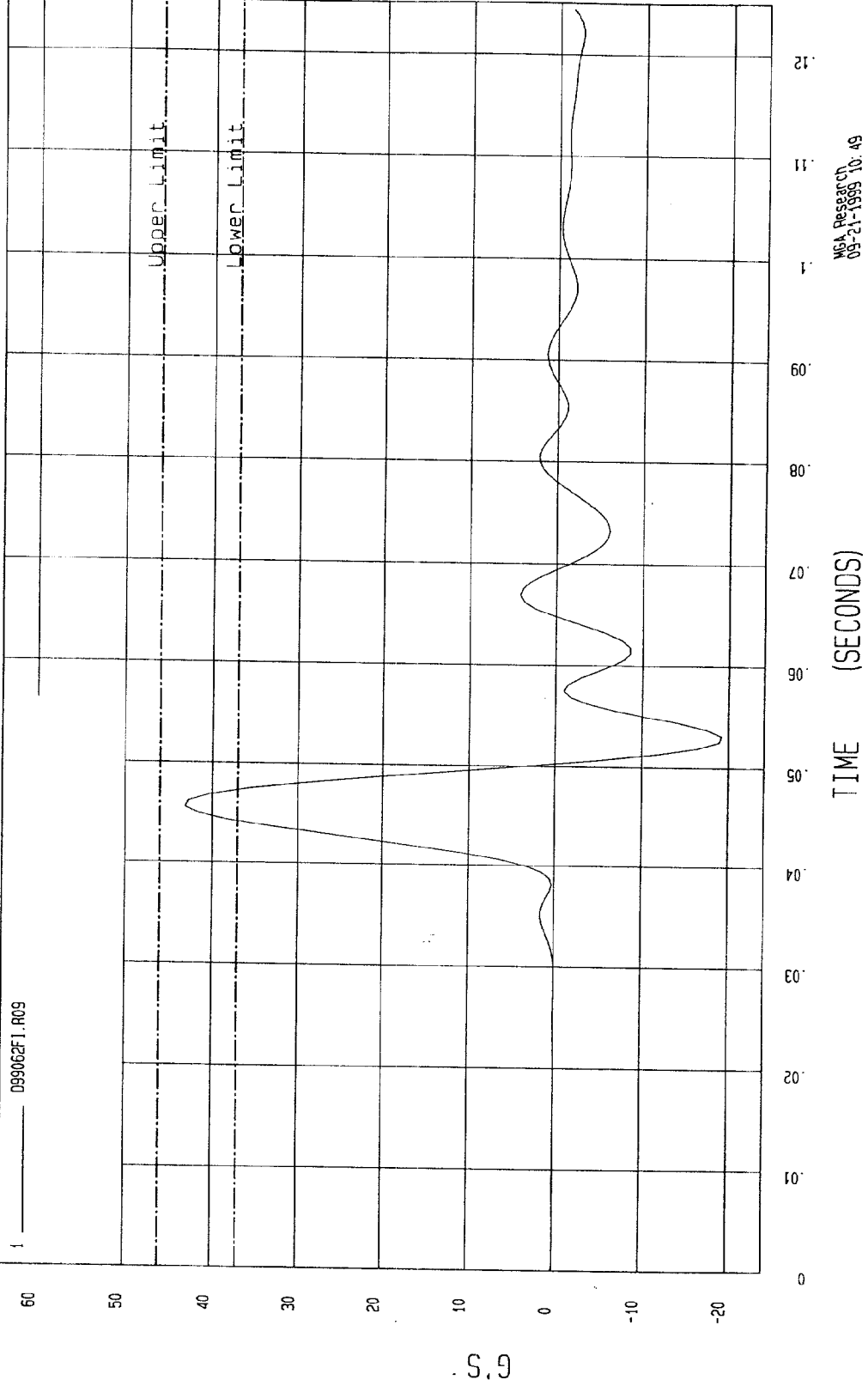
TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 09-21-1999 - 10:42

COMPONENT: DUMMY # 036 Velocity: 14.034 FT/SEC 4.28 M/SEC

Minimum = -19.21 G'S at 53.1 msec

Maximum = 43.16 G'S at 45.6 msec

LOWER RIB ACCELERATION



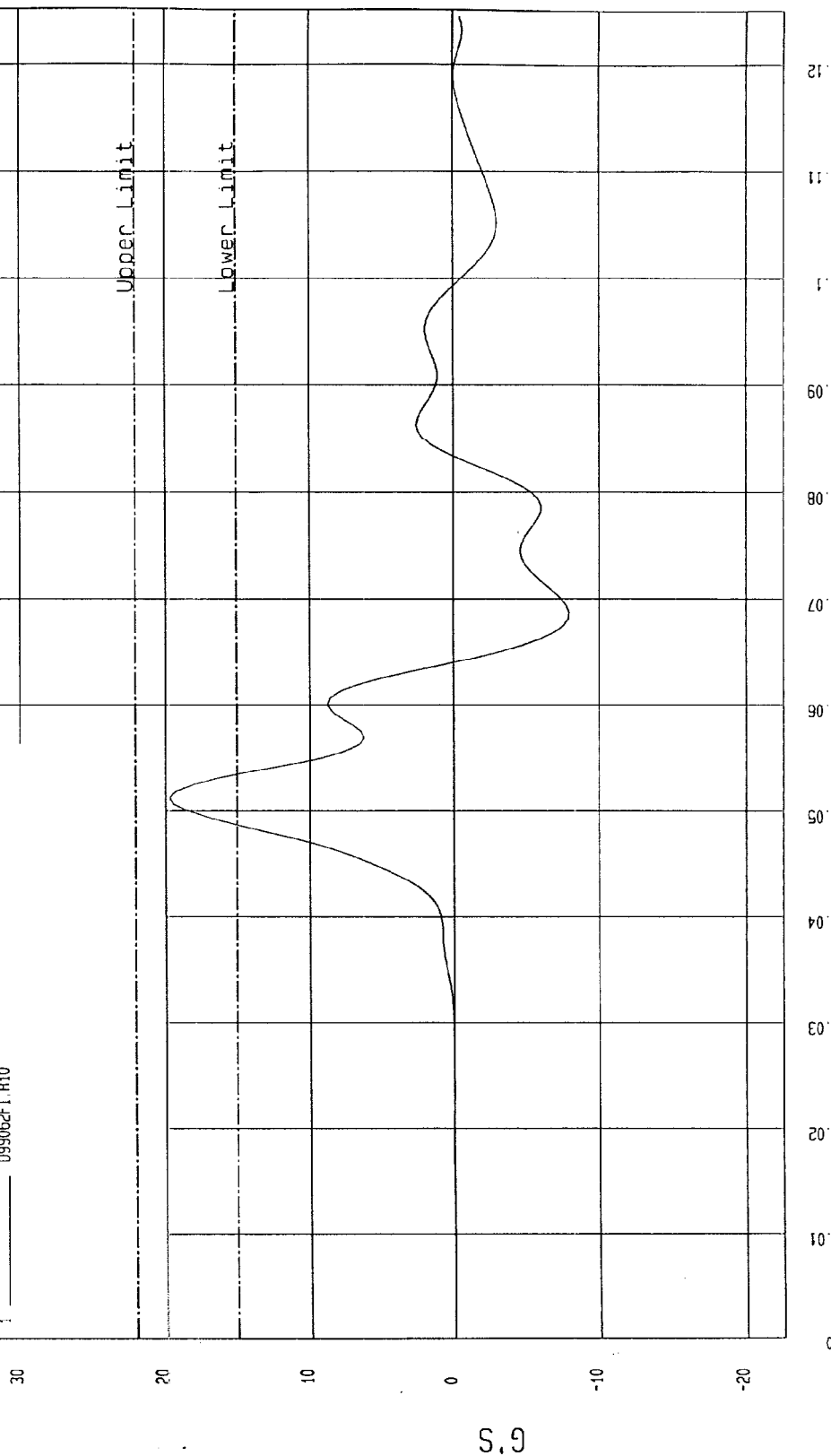
Maximum = 19.77 G'S at 51.2 msec

LOWER SPINE ACCELERATION

099062FI, R10

Upper Limit

Lower Limit.



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C-22

PELVIS IMPACT TEST

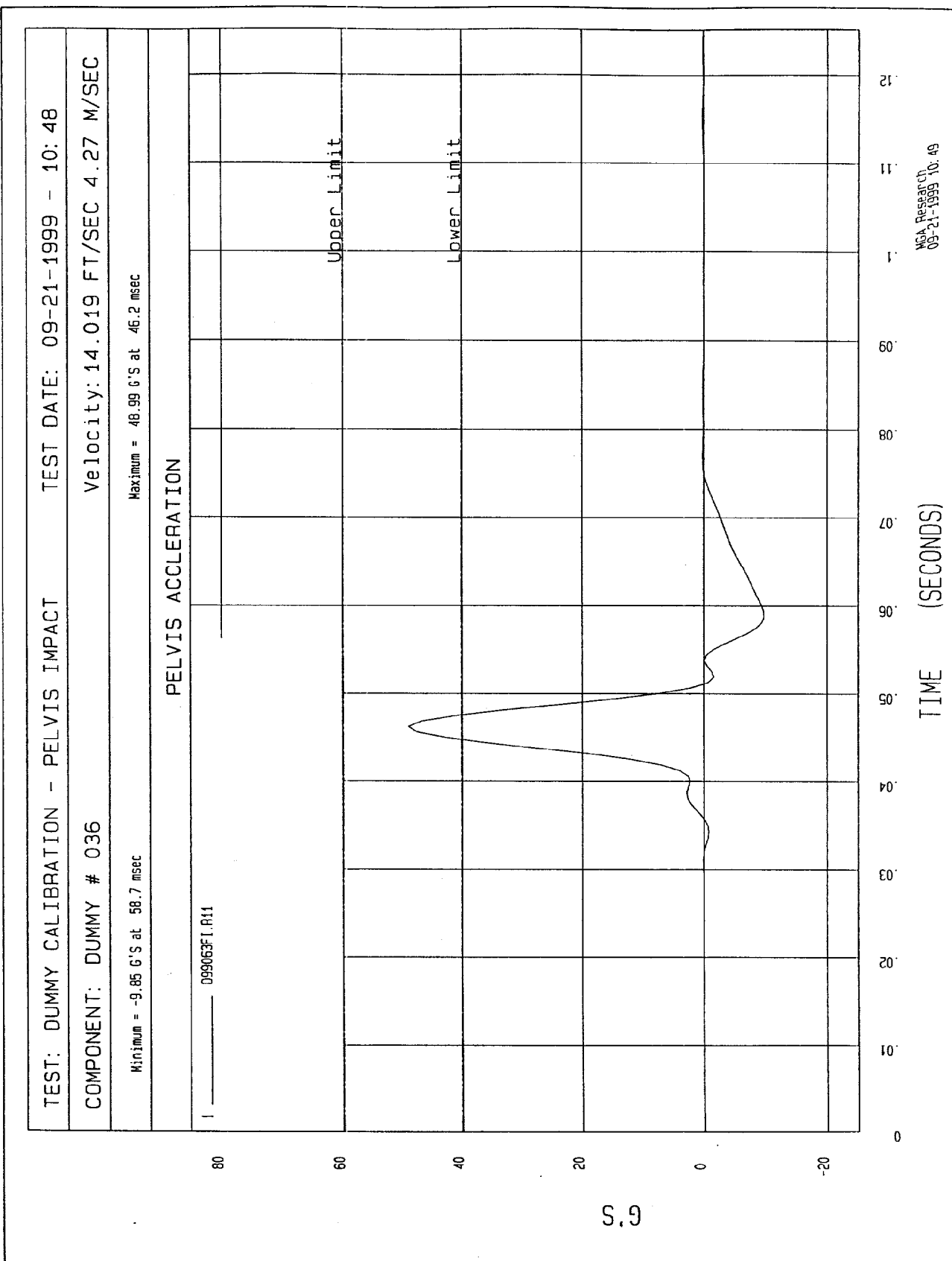
SIDE IMPACT DUMMY (SID)

DATE: September 21, 1999DUMMY SERIAL NUMBER: 036TEST NUMBER: D991063

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	4.27
PELVIS ACCELERATION (g's)	40 - 60	49

TEST MEETS SPECIFICATIONS

TECHNICIAN: Jim W. SmithAPPROVED BY: Robert K. Kabele



MGA RESEARCH CORPORATION

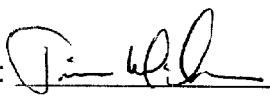
ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

DATE: September 21, 1999DUMMY SERIAL NUMBER: 036TEST NUMBER: D991064

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0
RELATIVE HUMIDITY (%)	10 - 70	34
FORCE @ 12.7 mm	104 - 162	139
FORCE @ 19.0 mm	163 - 222	192
FORCE @ 25.4 mm	222 - 280	250
FORCE @ 33 mm	325 - 391	347

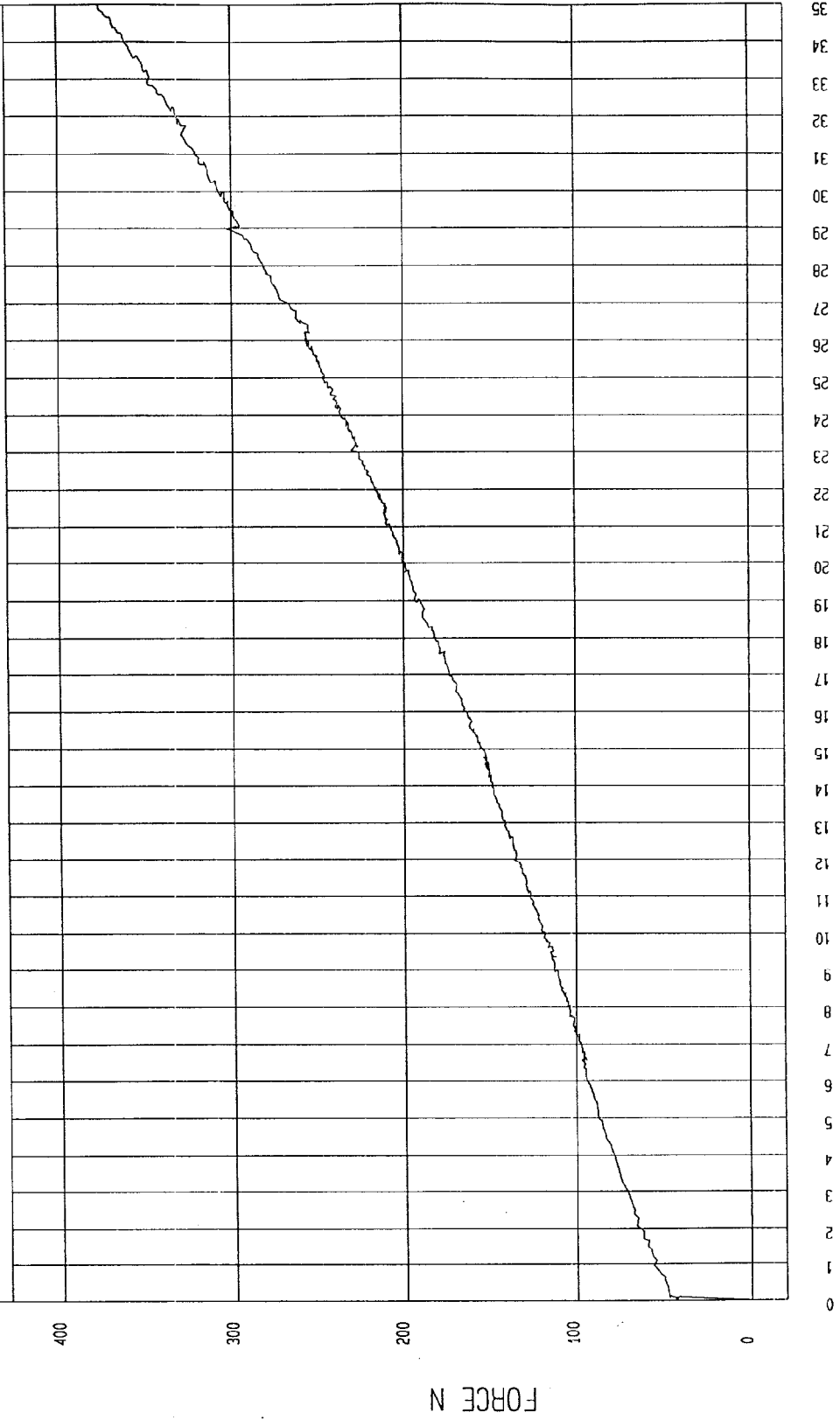
TEST MEETS SPECIFICATIONS

TECHNICIAN: APPROVED BY: 

TEST: DUMMY CALIBRATION - ABDOMEN COMPRESSION TEST DATE: 09-21-1999 - 16:04:20

COMPONENT: DUMMY # 036

FORCE as a function of DISPLACEMENT



MCA Research
09-21-1999 16:25

DISPLACEMENT mm

MGA RESEARCH CORPORATION

C-26

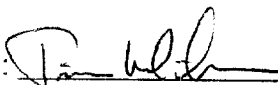
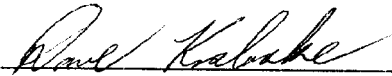
LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: September 21, 1999DUMMY SERIAL NUMBER: 036TEST NUMBER: D991065

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0
RELATIVE HUMIDITY (%)	10 - 70	34
FORCE @ 0°	0 - 26.7	0
FORCE @ 20°	97.9 - 151.2	99.4
FORCE @ 30°	151.2 - 204.6	156.1
FORCE @ 40°	204.6 - 258.0	230.5
RETURN ANGLE	12° maximum	3

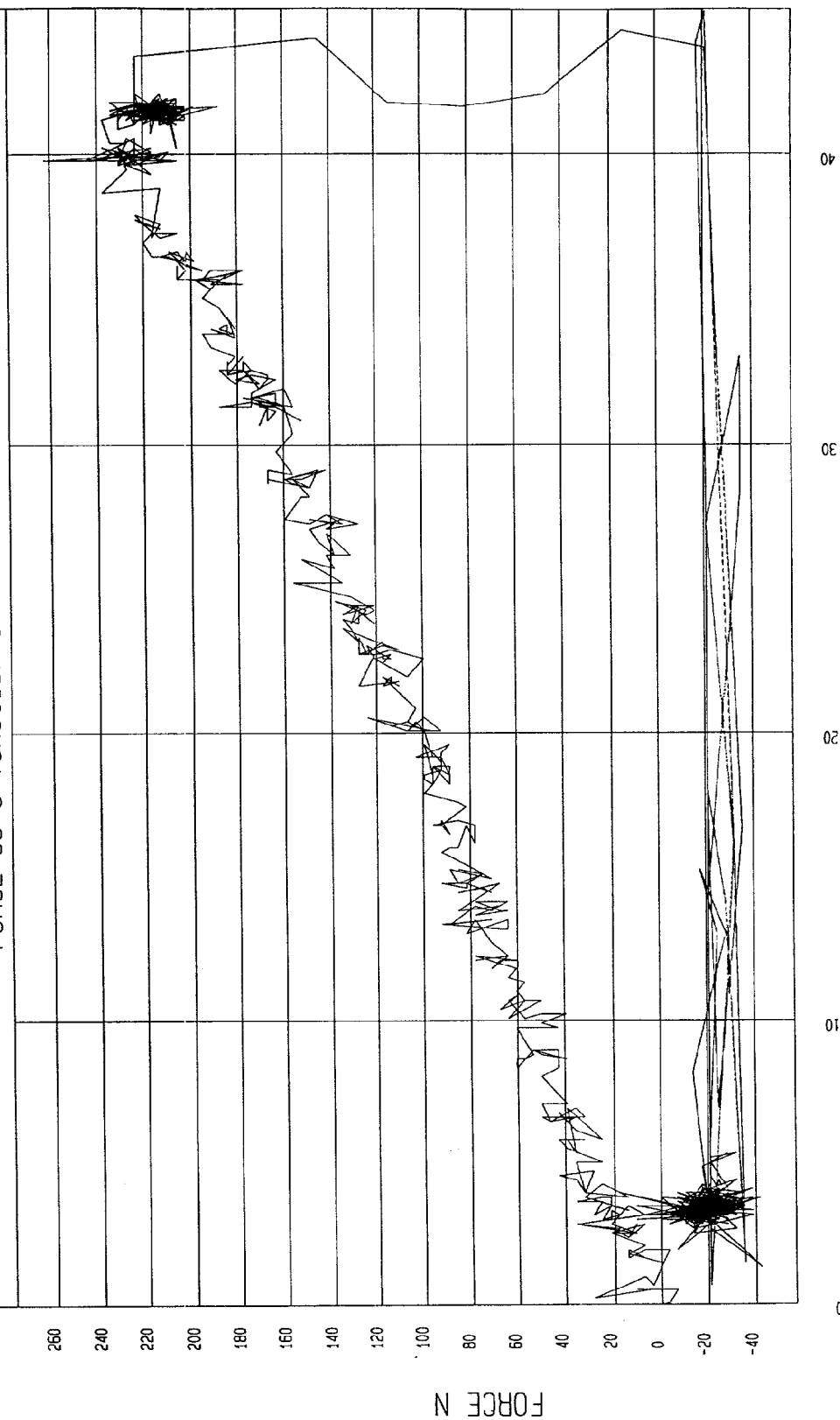
TEST MEETS SPECIFICATIONS

TECHNICIAN: APPROVED BY: 

TEST: DUMMY CALIBRATION - LUMBAR FLEXION TEST DATE: 09-21-1999 - 16:33:57

COMPONENT: DUMMY # 036

FORCE as a function of TORSO ROTATION

NSA Research
09-21-1999 17:50

POST-TEST CERTIFICATION DATA

Dummy Serial Number: 037

Calibration Test Results Summary

Dummy Serial Number: 037

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.

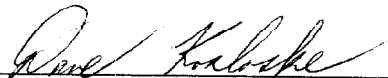
SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA C-30

DUMMY SERIAL NO.: 037

DATE OF VERIFICATION: October 21, 1999

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height (mm)	889 - 909	903
RH - Rib Height (mm)	501 - 521	510
HP - Hip Pivot Height (mm)	99 ref.	99
RD - Rib From Back Line (mm)	229 - 241	237
KV - Knee Pivot From Back Line (mm)	511 - 526	522
SW - Knee Pivot to Floor (mm)	490 - 505	493
HW - Hip Width (mm)	356 - 391	378

TECHNICIAN: 

APPROVED BY: 

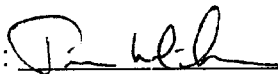
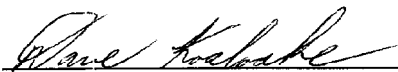
THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: October 21, 1999DUMMY SERIAL NUMBER: 037TEST NUMBER: D991152

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0
RELATIVE HUMIDITY (%)	10 - 70	34
PROBE SPEED (m/s)	4.27 - 4.33	4.29
UPPER RIB (g's)	37 - 46	45
LOWER RIB (g's)	37 - 46	42
LOWER SPINE (g's)	15 - 22	22

TEST MEETS SPECIFICATIONS

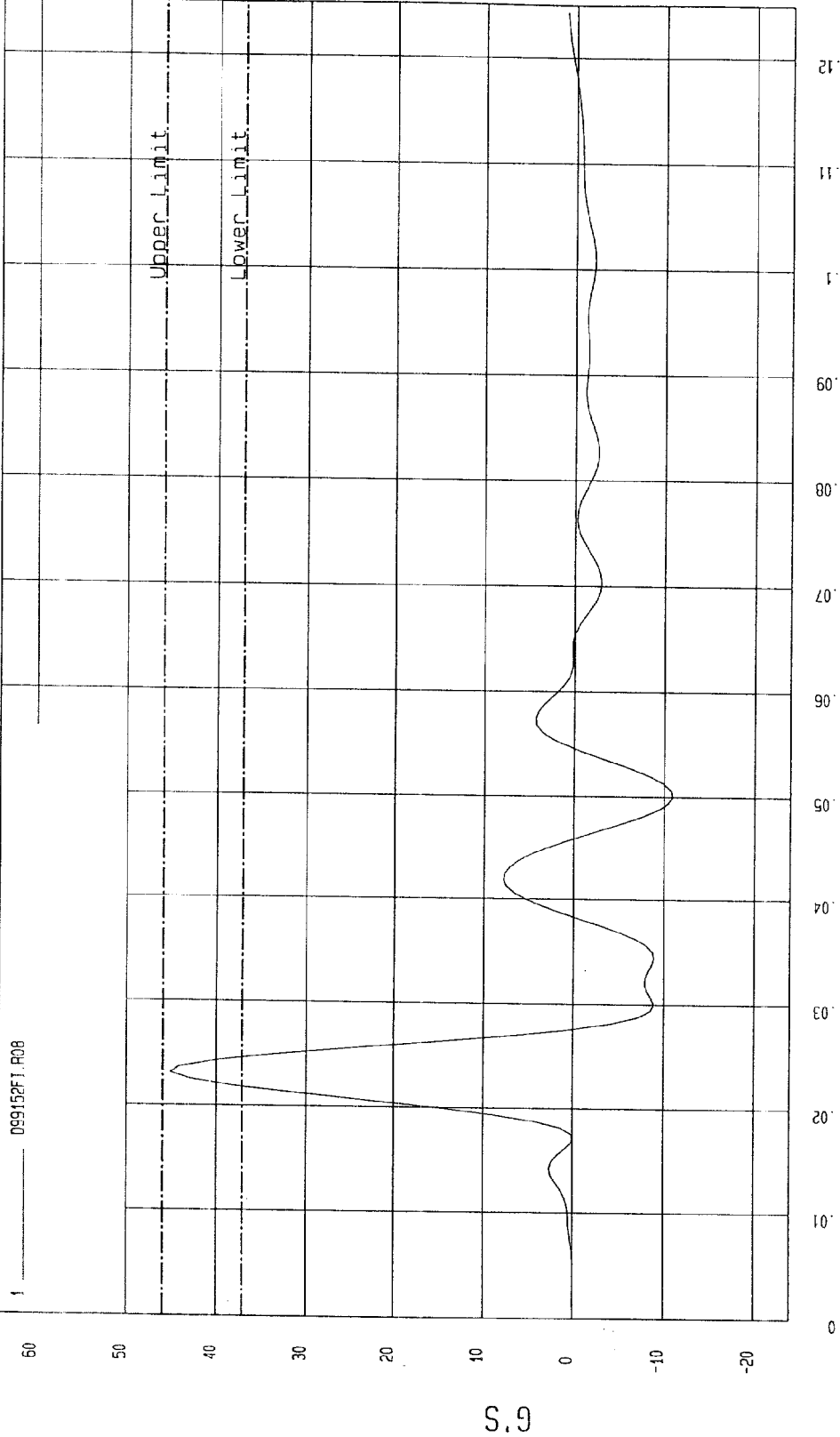
TECHNICIAN: APPROVED BY: 

TEST: Dummy Calibration - Thorax Impact TEST DATE: 10-21-1999 - 15:06:34

COMPONENT: Dummy # 037 Velocity: 14.06 FT/SEC 4.29 M/SEC

Minimum = -10.90 G'S at 50 msec Maximum = 45.22 G'S at 23.1 msec

UPPER RIB ACCELERATION



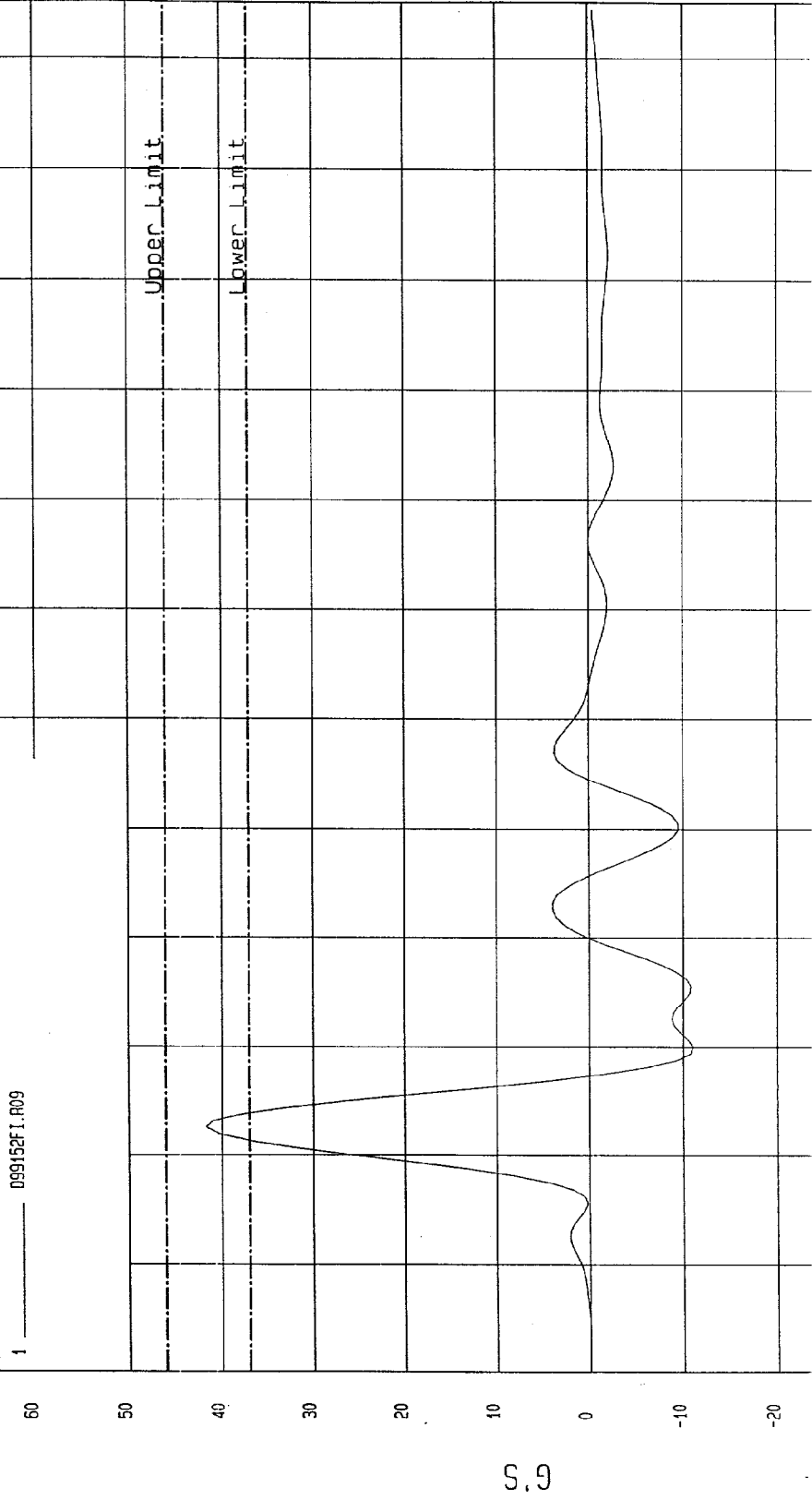
NCA Research
10-26-1999 09:54

TEST: Dummy Calibration - Thorax Impact TEST DATE: 10-21-1999 - 15:06:34

COMPONENT: Dummy # 037 Velocity: 14.06 FT/SEC 4.29 M/SEC

Minimum = -11.05 G'S at 30 msec Maximum = 41.71 G'S at 22.5 msec

LOWER RIB ACCELERATION

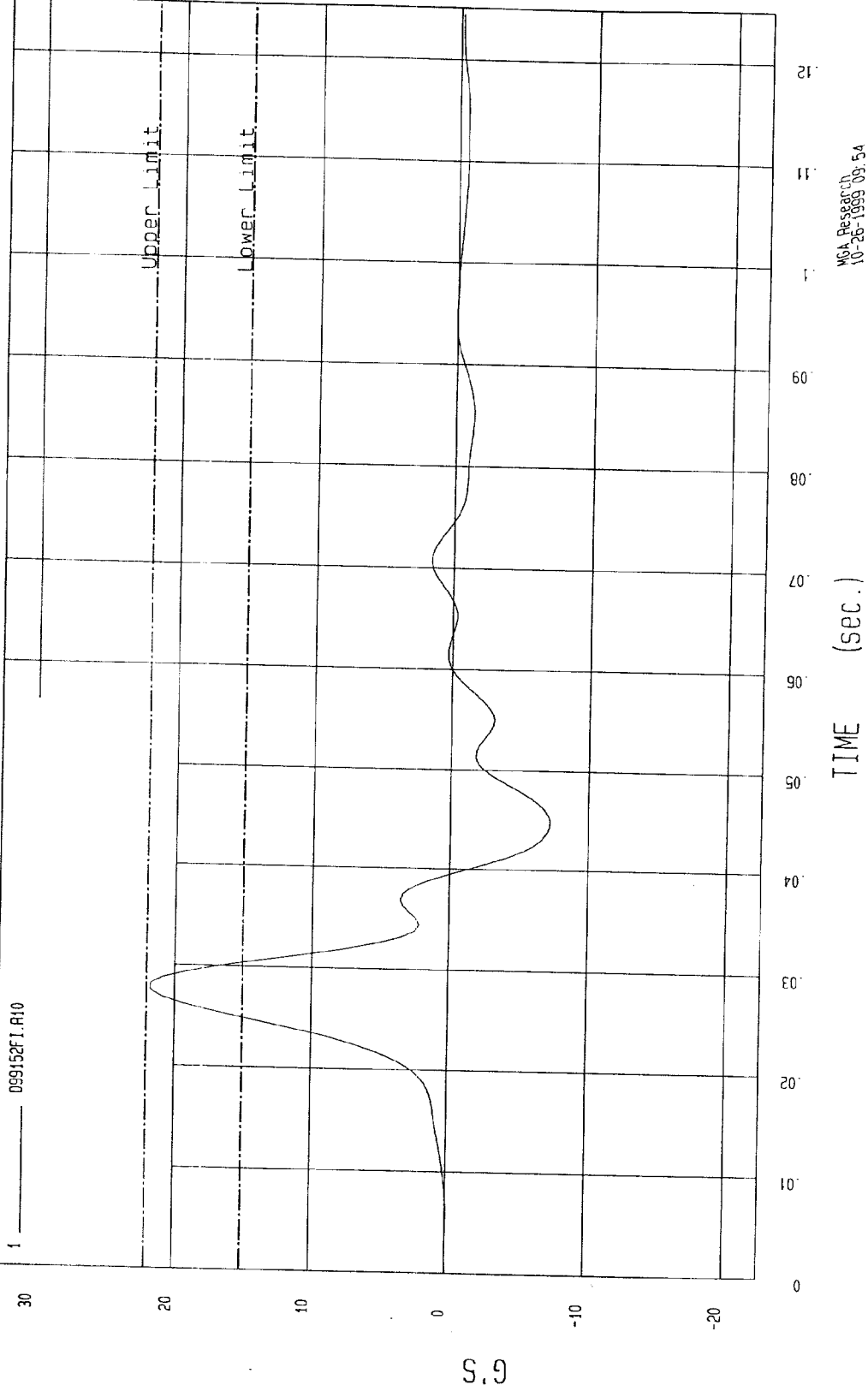


MCA Research
10-26-1999 09:54

TEST: Dummy Calibration - Thorax Impact TEST DATE: 10-21-1999 - 15:06:34
COMPONENT: Dummy # 037 Velocity: 14.06 FT/SEC 4.29 M/SEC

Minimum = -7.26 G'S at 45 msec Maximum = 21.76 G'S at 27.5 msec

LOWER SPINE ACCELERATION



PELVIS IMPACT TEST

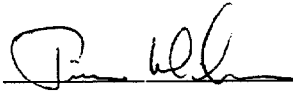
SIDE IMPACT DUMMY (SID)

DATE: October 21, 1999DUMMY SERIAL NUMBER: 037TEST NUMBER: D991153

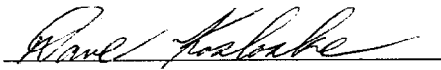
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0
RELATIVE HUMIDITY (%)	10 - 70%	34
PROBE SPEED (m/s)	4.27 - 4.33	4.28
PELVIS ACCELERATION (g's)	40 - 60	47

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY



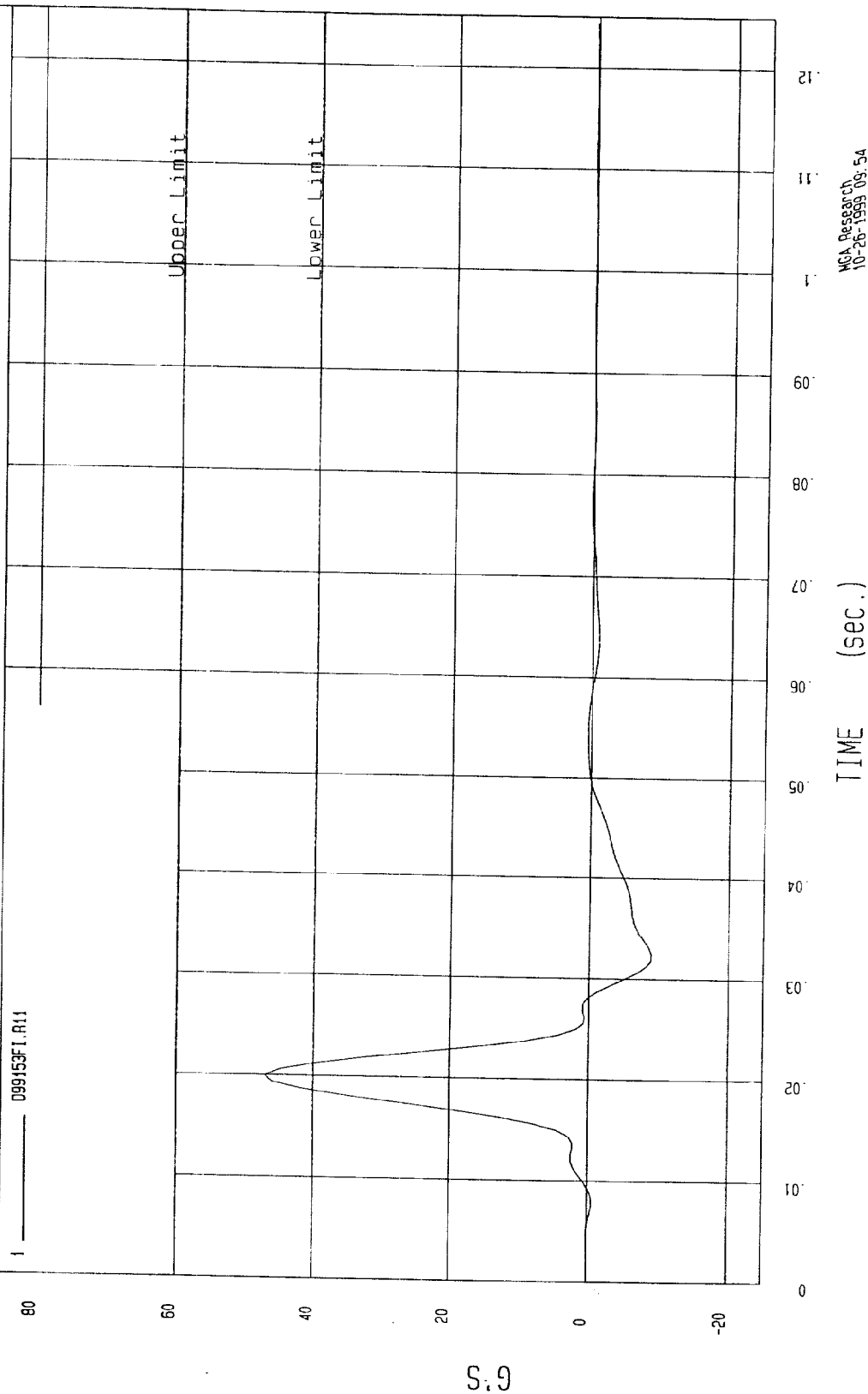
TEST: Dummy Calibration - Pelvis Impact TEST DATE: 10-21-1999 - 15:28:12

COMPONENT: Dummy # 037 Velocity: 14.04 FT/SEC 4.28 M/SEC

Minimum = -9.07 G'S at 32.5 msec

Maximum = 46.98 G'S at 20 msec

PELVIS ACCELERATION



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ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

DATE: October 20, 1999DUMMY SERIAL NUMBER: 037TEST NUMBER: D991154

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0
RELATIVE HUMIDITY (%)	10 - 70	34
FORCE @ 12.7 mm	104 - 162	137
FORCE @ 19.0 mm	163 - 222	192
FORCE @ 25.4 mm	222 - 280	262
FORCE @ 33 mm	325 - 391	357

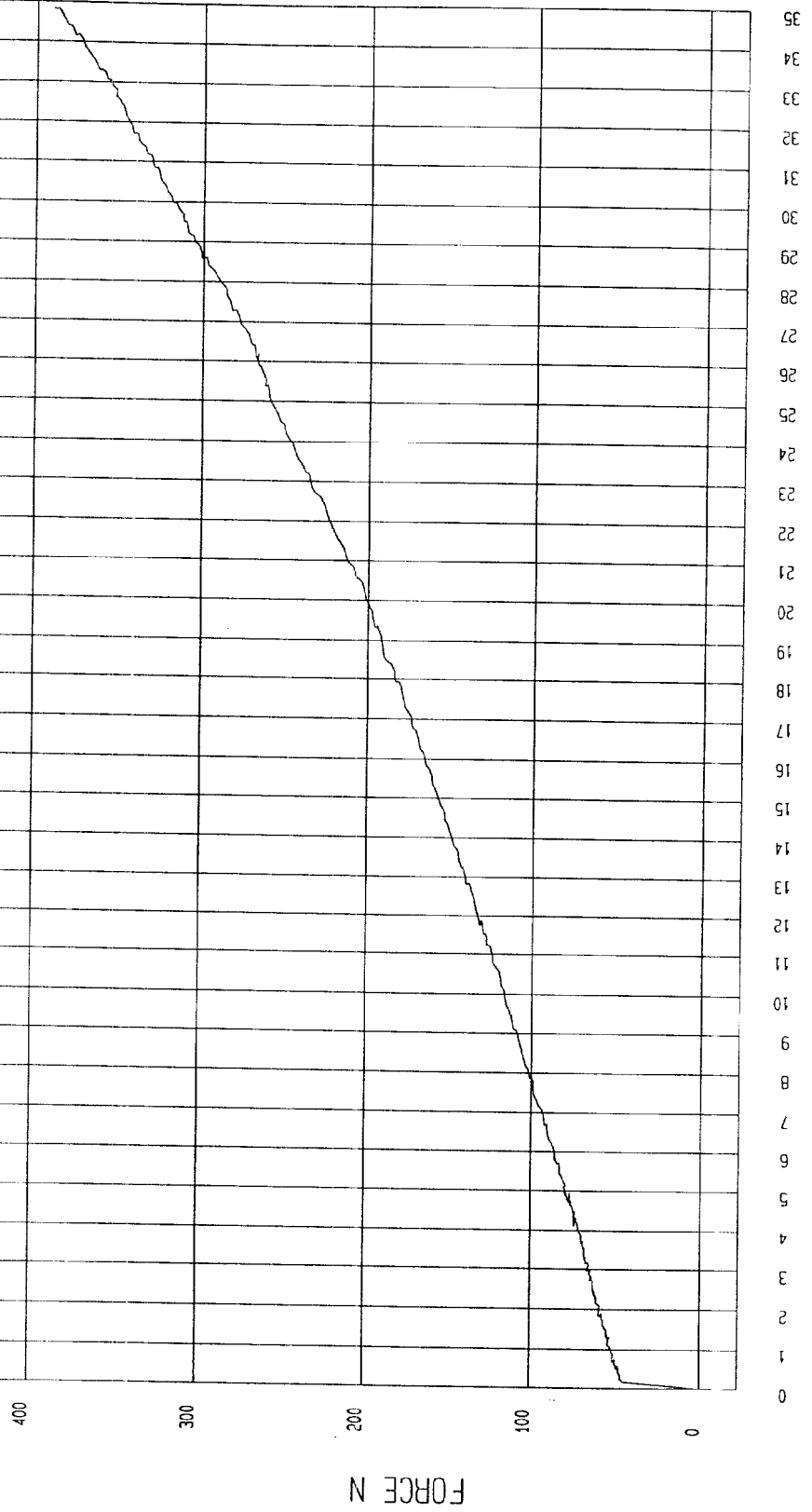
TEST MEETS SPECIFICATIONS

TECHNICIAN Jim WhiteAPPROVED BY Dave Kabeche

TEST: DUMMY CALIBRATION - ABDOMEN COMPRESSION TEST DATE: 10-20-1999 - 10:26:45

COMPONENT: DUMMY # 37

FORCE as a function of DISPLACEMENT



MCA Research
10-26-1999 11:03

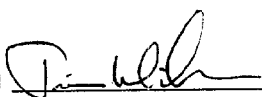
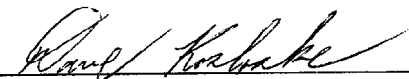
LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: October 20, 1999DUMMY SERIAL NUMBER: 037TEST NUMBER: D991155

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0
RELATIVE HUMIDITY (%)	10 - 70	35
FORCE @ 0°	0 - 26.7	0
FORCE @ 20°	97.9 - 151.2	117.1
FORCE @ 30°	151.2 - 204.6	174.7
FORCE @ 40°	204.6 - 258.0	227.5
RETURN ANGLE	12° maximum	1

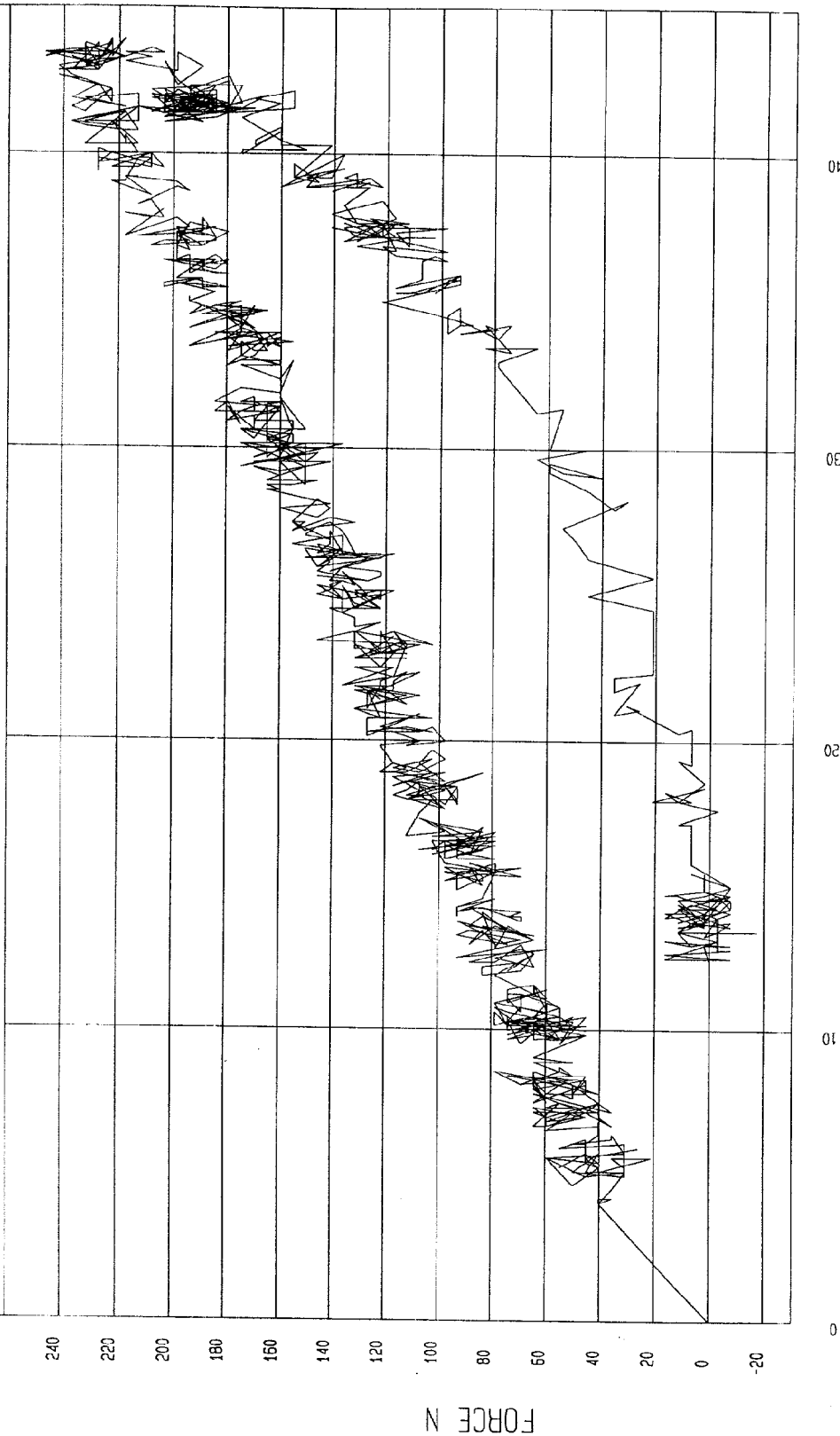
TEST MEETS SPECIFICATIONS

TECHNICIAN APPROVED BY 

TEST: DUMMY CALIBRATION - LUMBAR FLEXION TEST DATE: 10-20-1999 - 10:53:00

COMPONENT: DUMMY # 37

FORCE as a function of TORSO ROTATION



MSA Research
10-26-1999 11:18

POST-TEST CERTIFICATION DATA

Dummy Serial Number: 036

Calibration Test Results Summary

Dummy Serial Number: 036

Post-Test Calibration

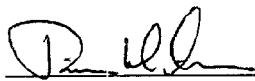
External Dimensions:	The dummy passed all external dimension requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion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

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA C-43

DUMMY SERIAL NO.: 036

DATE OF VERIFICATION: October 20, 1999

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height (mm)	889 - 909	902
RH - Rib Height (mm)	501 - 521	507
HP - Hip Pivot Height (mm)	99 ref.	99
RD - Rib From Back Line (mm)	229 - 241	235
KV - Knee Pivot From Back Line (mm)	511 - 526	519
SW - Knee Pivot to Floor (mm)	490 - 505	494
HW - Hip Width (mm)	356 - 391	370

MEASUREMENTS BY: 

APPROVED BY: 

MGA RESEARCH CORPORATION

C-44

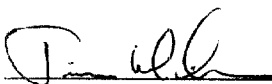
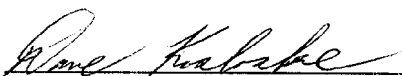
THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: October 20, 1999DUMMY SERIAL NUMBER: 036TEST NUMBER: D991142

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0
RELATIVE HUMIDITY (%)	10 - 70	36
PROBE SPEED (m/s)	4.27 - 4.33	4.30
UPPER RIB (g's)	37 - 46	45
LOWER RIB (g's)	37 - 46	45
LOWER SPINE (g's)	15 - 22	20

TEST MEETS SPECIFICATIONS

TECHNICIAN APPROVED BY 

TEST: Dummy Calibration - Thorax Impact TEST DATE: 10-20-1999 - 14:30:27

COMPONENT: Dummy # 036 Velocity: 14.12 FT/SEC 4.3 M/SEC

Minimum = -12.82 G'S at 31.8 msec

Maximum = 44.62 G'S at 24.3 msec

UPPER RIB ACCELERATION

1 099142FI.R08

60

50

40

30

20

10

S.G

0

-10

-20

Upper Limit

Lower Limit

12

11

10

50

60

70

80

90

100

110

120

MCA Research
10-25-1999 09:53

TIME (sec.)

TEST: Dummy Calibration - Thorax Impact TEST DATE: 10-20-1999 - 14:30:27

COMPONENT: Dummy # 036

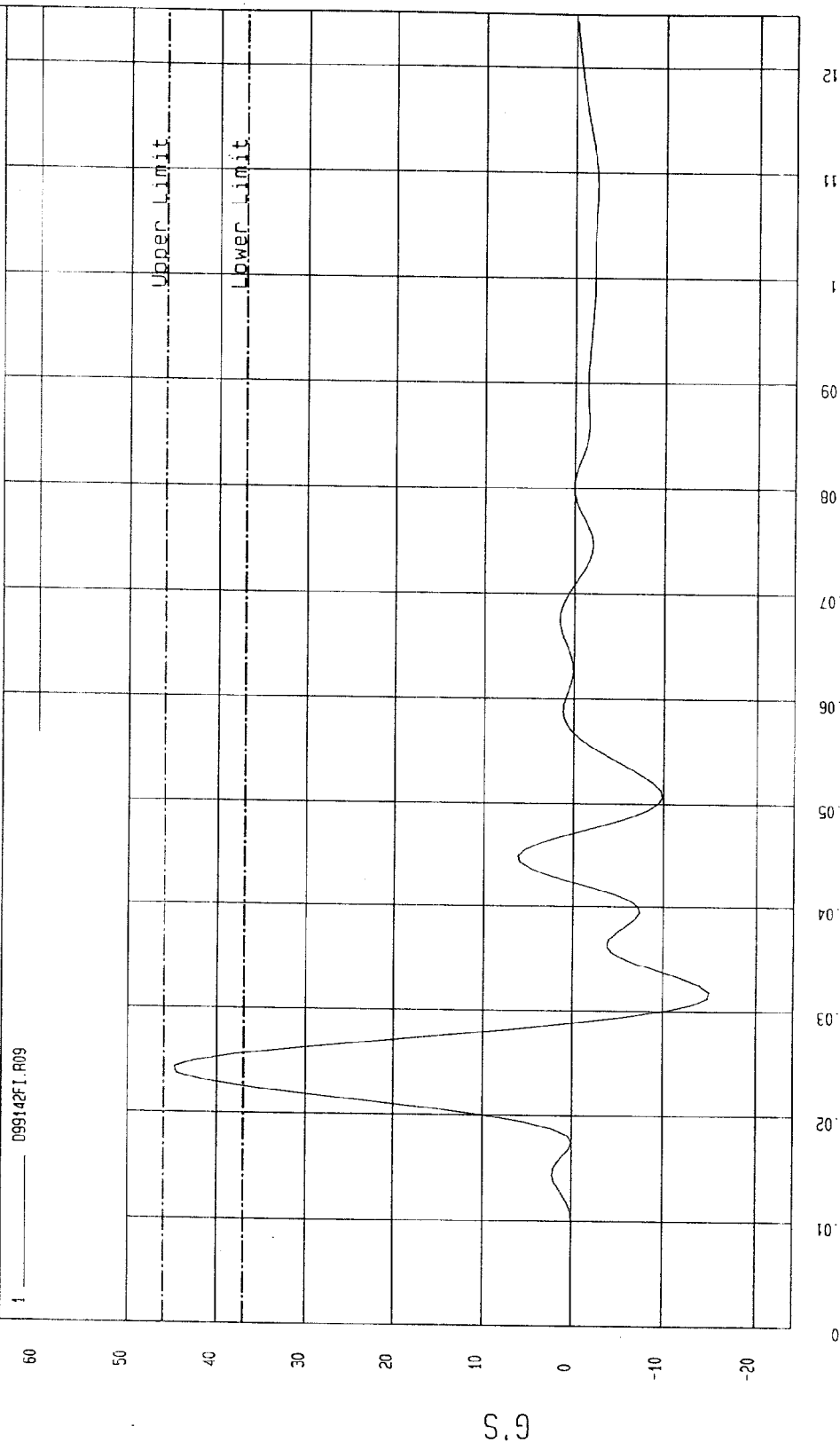
Velocity: 14.12 FT/SEC 4.3 M/SEC

Minimum = -14.99 G'S at 31.8 msec

Maximum = 44.80 G'S at 24.3 msec

LOWER RIB ACCELERATION

1 ——— 099142FI.R09



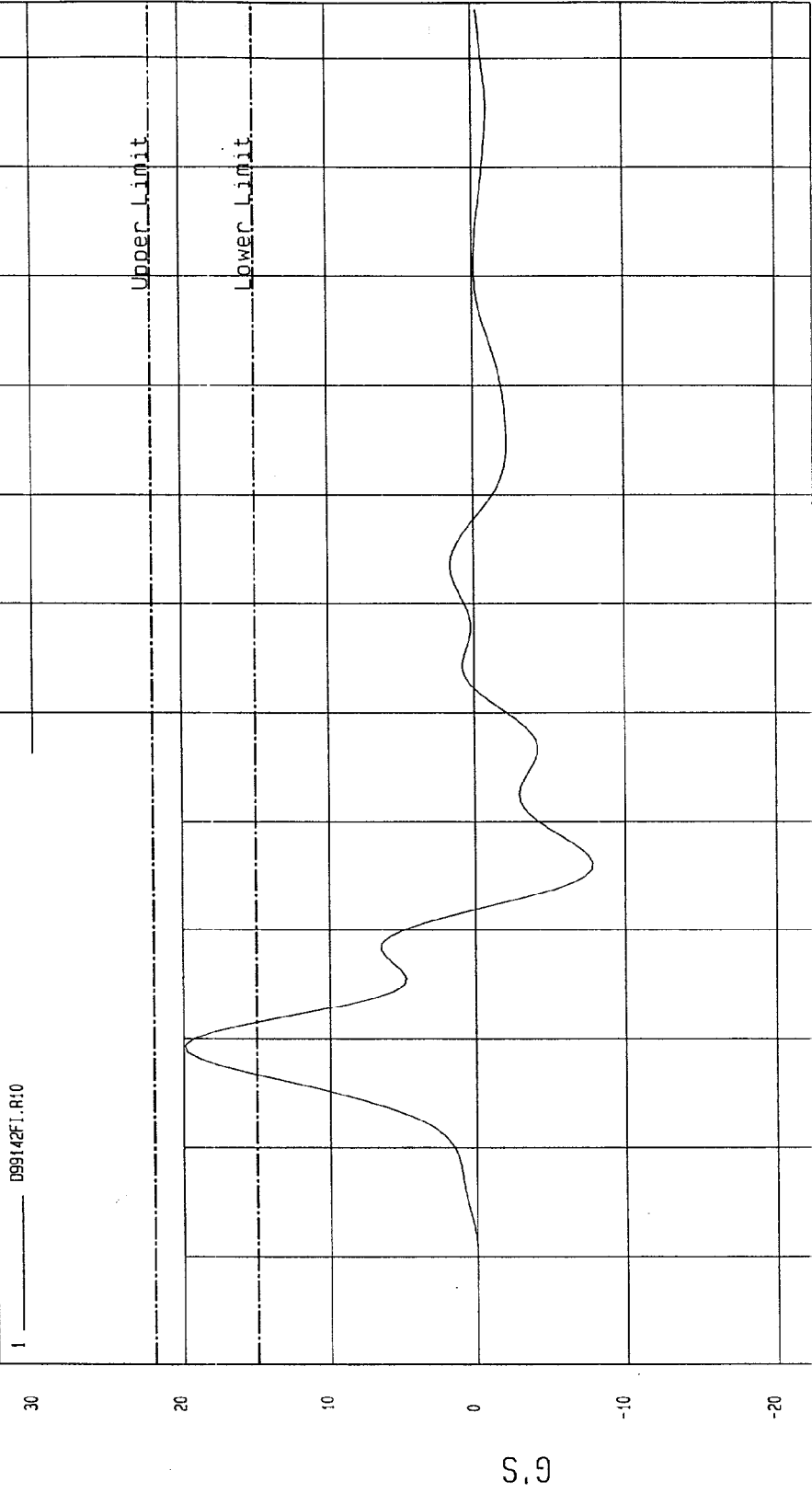
HGA Research
10-26-1999 09:54

TEST: Dummy Calibration - Thorax Impact TEST DATE: 10-20-1999 - 14:30:27

COMPONENT: Dummy # 036 Velocity: 14.12 FT/SEC 4.3 M/SEC

Minimum = -7.81 G'S at 46.2 msec Maximum = 19.89 G'S at 29.3 msec

LOWER SPINE ACCELERATION



NCA Research
10-26-1999 09:54

MGA RESEARCH CORPORATION

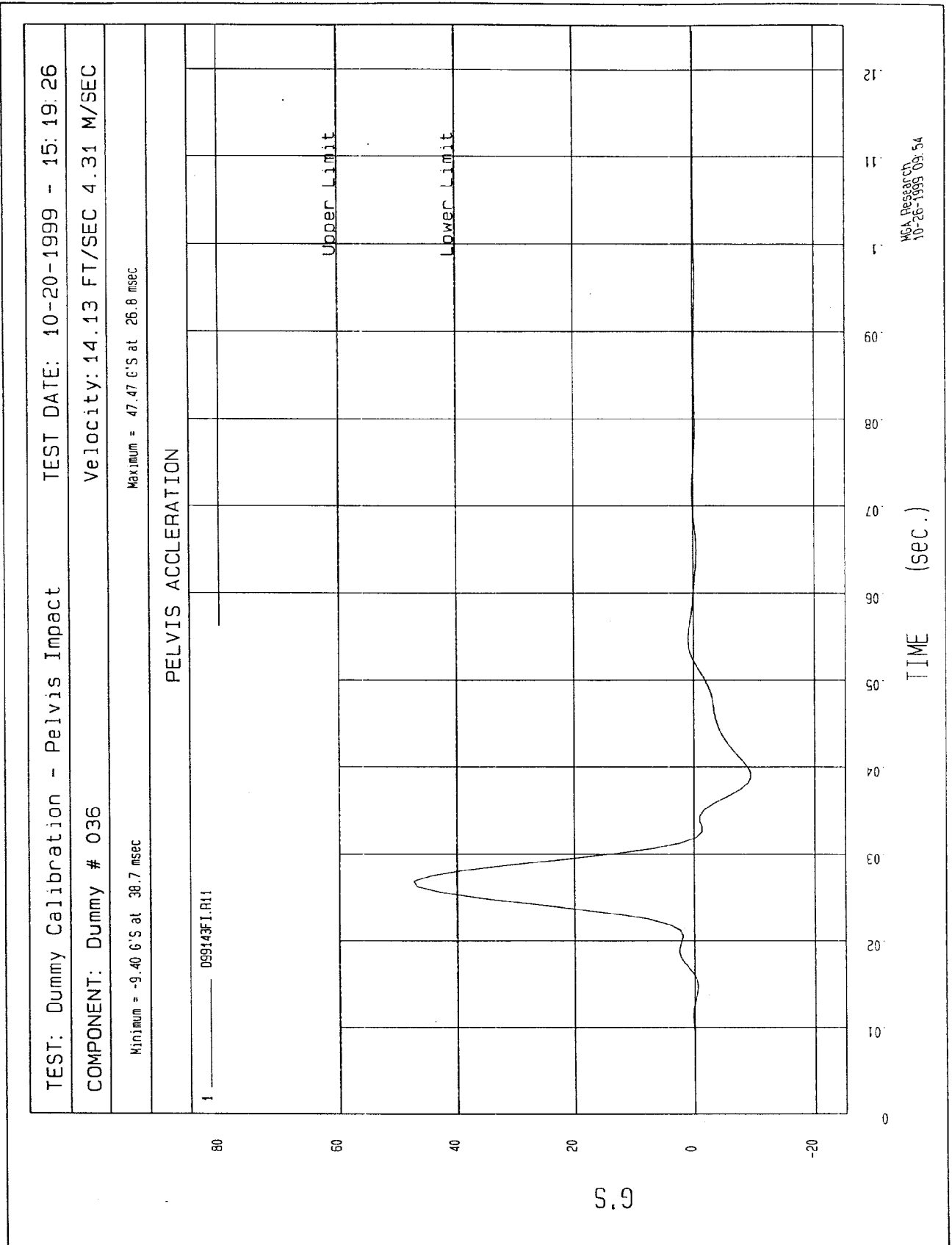
C-48

PELVIS IMPACT TEST
SIDE IMPACT DUMMY (SID)DATE: October 20, 1999DUMMY SERIAL NUMBER: 036TEST NUMBER: D991143

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0
RELATIVE HUMIDITY (%)	10 - 70	36
PROBE SPEED (m/s)	4.27 - 4.33	4.31
PELVIS ACCELERATION (g's)	40 - 60	47

TEST MEETS SPECIFICATIONS

TECHNICIAN Tam W. L.APPROVED BY Paul K. Kabe



MGA RESEARCH CORPORATION

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ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

DATE: October 20, 1999DUMMY SERIAL NUMBER: 036TEST NUMBER: D991144

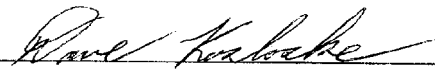
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0
RELATIVE HUMIDITY (%)	10 - 70	36
FORCE @ 12.7 mm	104 - 162	137
FORCE @ 19.0 mm	163 - 222	187
FORCE @ 25.4 mm	222 - 280	250
FORCE @ 33 mm	325 - 391	342

TEST MEETS SPECIFICATIONS

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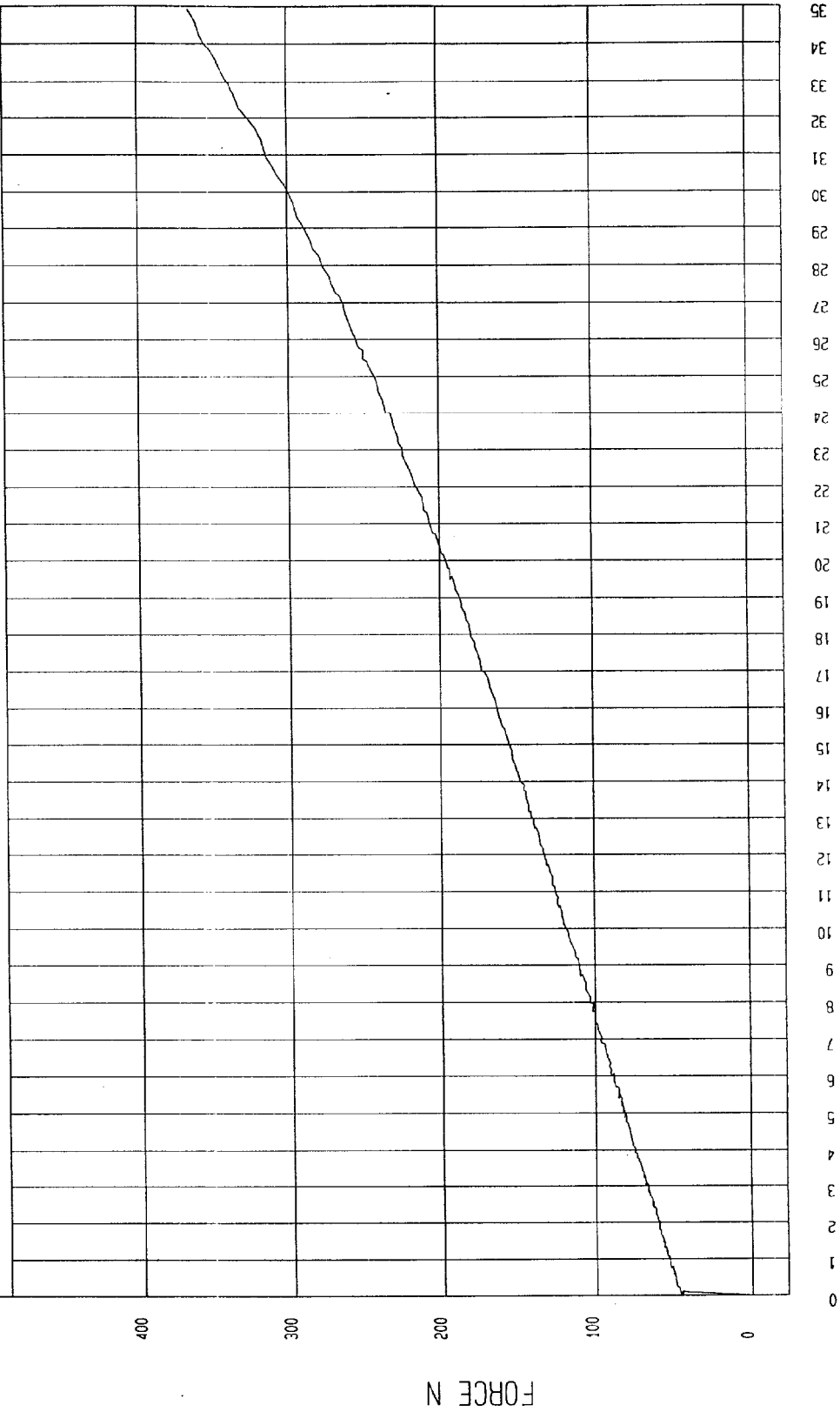
APPROVED BY



TEST: DUMMY CALIBRATION - ABDOMEN COMPRESSION TEST DATE: 10-20-1999 - 10:22:23

COMPONENT: DUMMY # 36

FORCE as a function of DISPLACEMENT



MSA Research
10-26-1999 11:03

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LUMBAR FLEXION TEST

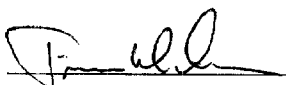
SIDE IMPACT DUMMY (SID)

DATE: October 20, 1999DUMMY SERIAL NUMBER: 036TEST NUMBER: D991145

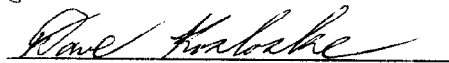
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0
RELATIVE HUMIDITY (%)	10 - 70	35
FORCE @ 0°	0 - 26.7	0
FORCE @ 20°	97.9 - 151.2	102.9
FORCE @ 30°	151.2 - 204.6	160.5
FORCE @ 40°	204.6 - 258.0	251.7
RETURN ANGLE	12° maximum	3

TEST MEETS SPECIFICATIONS

TECHNICIAN



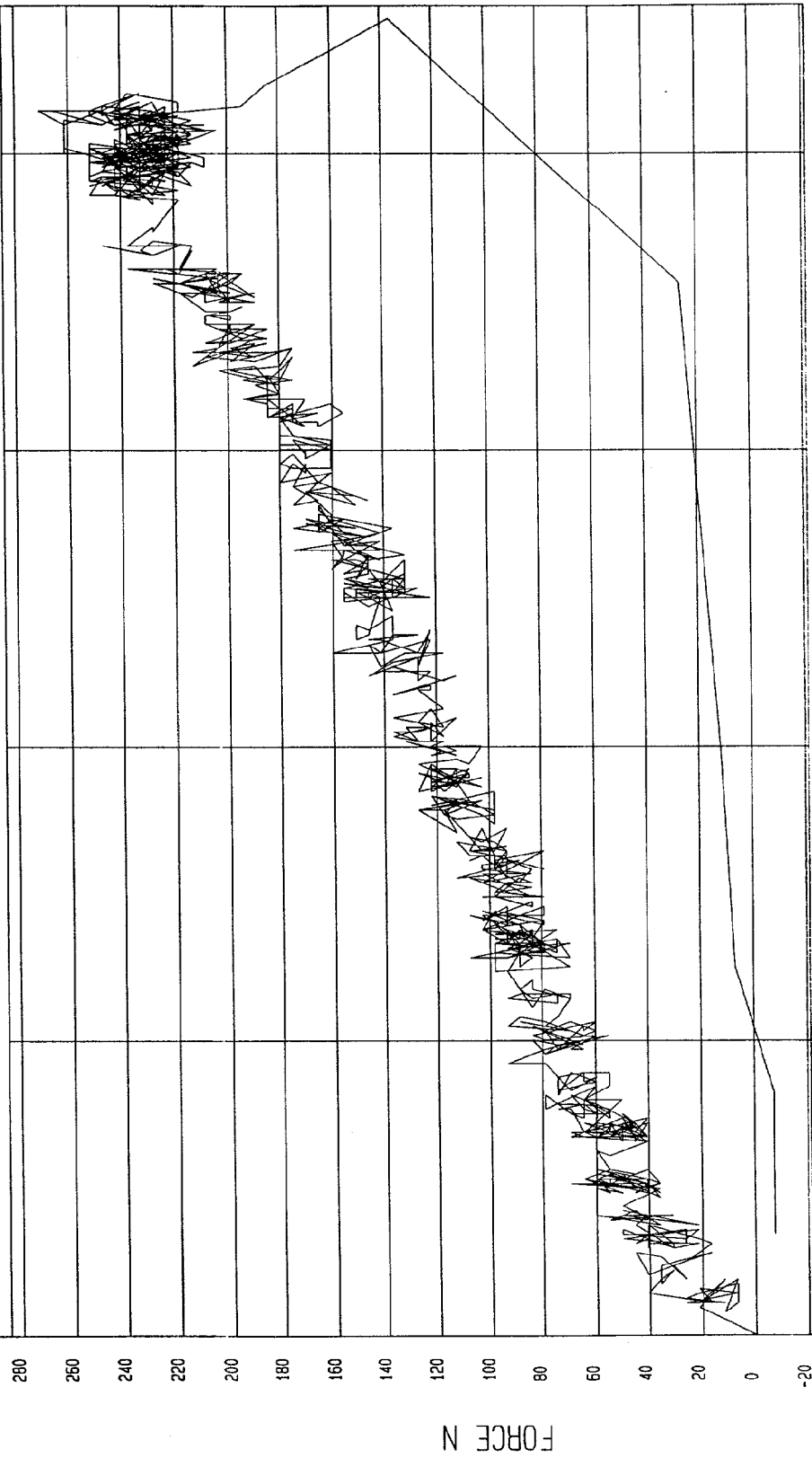
APPROVED BY



TEST: DUMMY CALIBRATION - LUMBAR FLEXION TEST DATE: 10-20-1999 - 10:24:03

COMPONENT: DUMMY # 36

FORCE as a function of TORSO ROTATION



TORSO ROTATION DEGREES

MGA Research
10-26-1999 11:18

POST-TEST DRIVER DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Dummy Serial Number: 037

Inspected By: Tim Michnay

Date: October 21, 1999

<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

Dummy Serial Number: 036

Inspected By: Tim Michnay

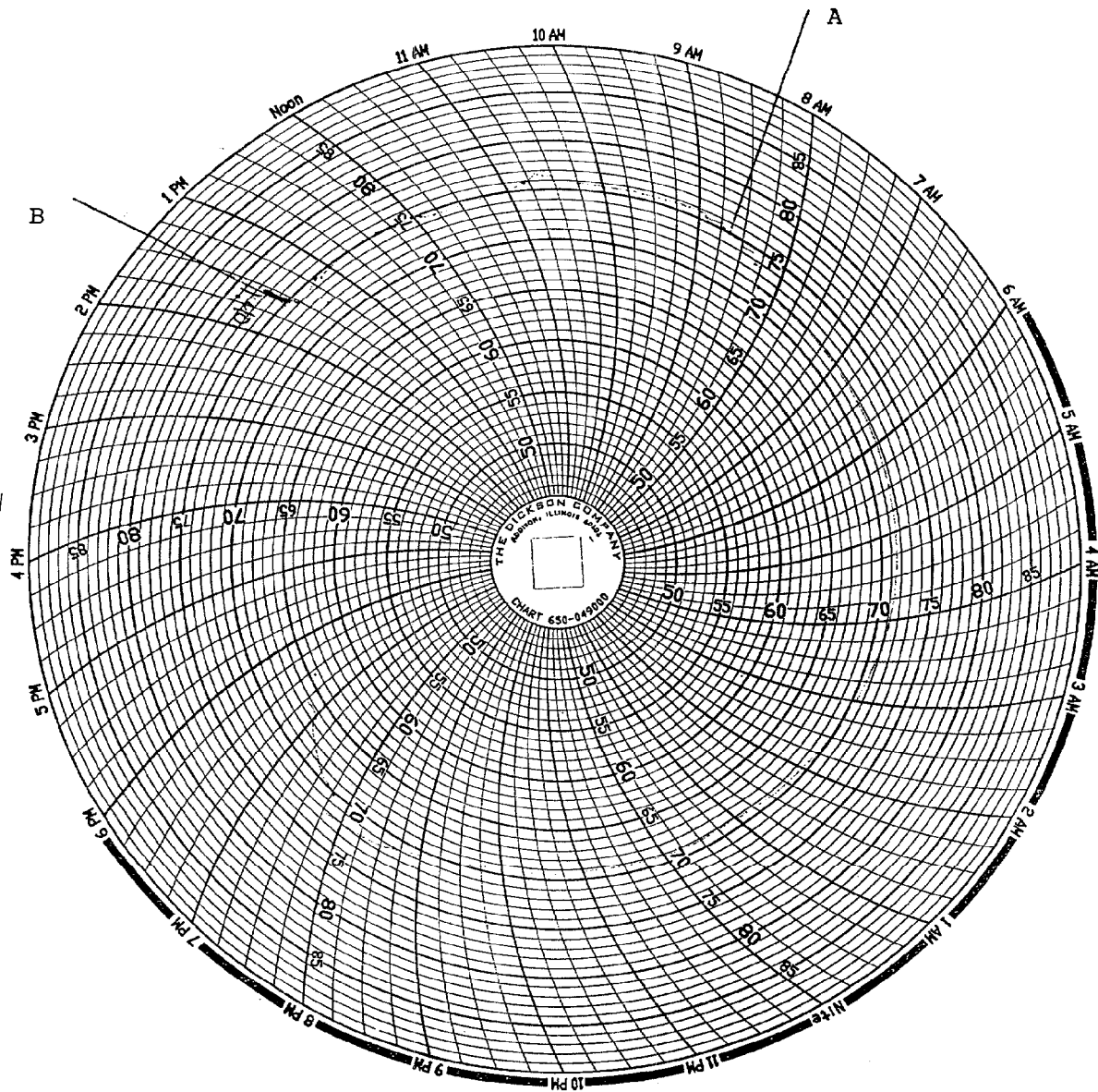
Date: October 21, 1999

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

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

VEHICLE AND DUMMY TEMPERATURE

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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. 037

	LEFT FRONT PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	AHRP6	Endevco	July 30, 1999
Lower Rib Y	AH0N9	Endevco	July 30, 1999
Lower Spine Y	AJ9P7	Endevco	July 30, 1999
Pelvis Y	J18260	Endevco	July 30, 1999
Upper Rib Redundant Y	AJ412	Endevco	August 2, 1999
Lower Rib Redundant Y	AHT20	Endevco	July 30, 1999
Lower Spine Redundant Y	AJ462	Endevco	July 30, 1999
Pelvis Redundant Y	AKAH1	Endevco	July 30, 1999

INSTRUMENTS FOR LEFT REAR PASSENGER DUMMY NO. 036

	LEFT REAR PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	AKAF3	Endevco	August 2, 1999
Lower Rib Y	AGP53	Endevco	July 30, 1999
Lower Spine Y	J12450	Endevco	August 2, 1999
Pelvis Y	AP0G2	Endevco	August 2, 1999
Upper Rib Redundant Y	ALCN9	Endevco	August 2, 1999
Lower Rib Redundant Y	AHTC3	Endevco	July 30, 1999
Lower Spine Redundant Y	J12461	Endevco	August 2, 1999
Pelvis Redundant Y	AP138	Endevco	August 2, 1999

VEHICLE INSTRUMENT CALIBRATION

VEHICLE AND MDB ACCELEROMETERS			
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Moving Barrier CG X	J10-E05	Entran	August 17, 1999
Moving Barrier CG Y	J04-F10	Entran	August 16, 1999
Moving Barrier CG Z	I18-E18	Entran	August 17, 1999
Moving Barrier Rear Axle X	C25-A17	Entran	August 6, 1999
Moving Barrier Rear Axle Y	I25-J12	Entran	August 6, 1999
Left Mid A-Post Y	J10-E12	Entran	August 17, 1999
Left Lower A-Post Y	E13-D18	Entran	August 17, 1999
Left B-Post Y	F10-D04	Entran	August 16, 1999
Left Lower B-Post Y	K16-X07	Entran	May 12, 1999
Rear Floorpan Above Axle X	H02-J15	Entran	August 17, 1999
Rear Floorpan Above Axle Y	G01-J10	Entran	August 6, 1999
Rear Floorpan Above Axle Z	B14-R14	Entran	May 12, 1999
Driver Seat Track Y	F20-G05	Entran	August 17, 1999
Right Side Sill at Front Seat X	F18-G03	Entran	August 16, 1999
Right Side Sill at Front Seat Y	J13-F18	Entran	August 16, 1999
Right Side Sill at Front Seat Z	G01-J05	Entran	May 5, 1999
Right Side Sill at Rear Seat X	C25-A09	Entran	August 17, 1999
Right Side Sill at Rear Seat Y	I26-D15	Entran	August 17, 1999
Right Side Sill at Rear Seat Z	E24-G07	Entran	August 17, 1999

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE AND MDB ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Left Side Sill at Front Seat Y	F07-A24	Entran	August 16, 1999
Left Side Sill at Rear Seat Y	K16-X08	Entran	May 12, 1999
Rear Occupant Compartment Y	K11-J10	Entran	August 16, 1999
Vehicle CG X	F12-G01	Entran	August 16, 1999
Vehicle CG Y	K11-J18	Entran	May 12, 1999
Vehicle CG Z	G01-J03	Entran	August 17, 1999

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