

REPORT NO.: 214-MGA-97-06
SAFETY COMPLIANCE TESTING FOR
FMVSS 214 "SIDE IMPACT PROTECTION -
PASSENGER CARS"

V2502

GENERAL MOTORS CORPORATION
1997 BUICK LESABRE SEDAN
NHTSA NO: CV0108

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: October 23, 1996

Report Date: December 4, 1996

FINAL REPORT

Prepared For:

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
MAIL CODE: NSA-30
400 SEVENTH STREET, SW ROOM 6115
WASHINGTON, D.C. 20590

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. 214-MGA-97-06		2. Government Accession No.		3. Recipient's Catalog No.																			
4. Title and Subtitle Final Report of FMVSS No.214 Compliance Side Impact Protection Testing of a 1997 Buick LeSabre NHTSA No. CV0108				5. Report Date December 4, 1996																			
				6. Performing Organization Code MGA																			
7. Author(s) Dave Kosloske, Project Engineer				8. Performing Organization Report No. MGA-DOT-214-06																			
9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105				10. Work Unit No.																			
				11. Contract or Grant No. DTNH22-93-C-02047																			
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Compliance (Mail Code: NSA-30) 400 Seventh St., S.W., Room 6115 Washington, D.C. 20590				13. Type of Report and Period Covered Final Test Report October 23 to December 4, 1996																			
				14. Sponsoring Agency Code NSA-30																			
15. Supplementary Notes																							
16. Abstract A 48/24 kph 90° Impact (Moving Deformable Barrier) Compliance Test was conducted on the subject 1997 Buick LeSabre Sedan in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-214D-04 for the determination of FMVSS No. 214 Side Impact Protection compliance. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on October 23, 1996. The impact velocity of the Moving Deformable Barrier (MDB) was 52.9 kph, and the ambient temperature at the struck side of the target vehicle at the time of impact was 21.1 °C. The target vehicle post test maximum crush was 425 mm at level 2. The test vehicle's performance follows: <table border="0"> <thead> <tr> <th></th> <th><u>RIGHT FRONT PASS.</u></th> <th><u>RIGHT REAR PASS.</u></th> </tr> </thead> <tbody> <tr> <td>Right Upper Rib (RUR) Accel., g</td> <td>56</td> <td>60</td> </tr> <tr> <td>Right Lower Rib (RLR) Accel., g</td> <td>58</td> <td>68</td> </tr> <tr> <td>Lower Spine (T₁₂) Accel., g</td> <td>72</td> <td>60</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td>65</td> <td>64</td> </tr> <tr> <td>Pelvis (PEV) Accel., g</td> <td>68</td> <td>72</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>RIGHT FRONT PASS.</u>	<u>RIGHT REAR PASS.</u>	Right Upper Rib (RUR) Accel., g	56	60	Right Lower Rib (RLR) Accel., g	58	68	Lower Spine (T ₁₂) Accel., g	72	60	Thoracic Trauma Index (TTI)	65	64	Pelvis (PEV) Accel., g	68	72
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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 Attn: Robert Hornickle																			
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of Pages																			
				22. Price																			

This Final Report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-93-C-02047.

This document is disseminated under the sponsorship of the U. S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its content or use thereof.

Prepared By: *Dave Kosloske*
Dave Kosloske, Project Engineer

Approved By: *John Fleck*
John Fleck, Facility Director

Approval Date: 12-6-96

FINAL REPORT ACCEPTED BY (OVSC):

Accepted By: *Jeffrey M. Sinigaglia*
Contract Technical Manager

Acceptance Date: 2/25/97

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SECTION 1
PURPOSE AND TEST PROCEDURE

This side impact test is part of the FY 96 FMVSS 214 Side Impact Protection Compliance Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-93-C-02047. The purpose of this test was to evaluate side impact protection of a 1997 Buick LeSabre.

This side impact test was conducted in accordance with the Vehicle Safety Compliance's FMVSS 214 test procedure (TP-214D-04, dated September 1, 1995).

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

SECTION 2

SUMMARY OF SIDE IMPACT TEST

A 1997 Buick LeSabre Sedan was impacted on the right 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 32.9 mph (52.9 kph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by MGA Research Corporation in Burlington, Wisconsin, on October 23, 1996. 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 right front and right rear designated seating positions according to instructions specified in the OVSC Side Impact Laboratory Test Procedure which is dated September 1, 1995. 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. Right Upper Rib (RUR) uniaxial accelerometer (Y-direction)
2. Right Lower Rib (RLR) uniaxial accelerometer (Y-direction)
3. Lower Thoracic Spine (T₁₂) uniaxial accelerometer (Y-direction)
4. Pelvic (PEV) section uniaxial accelerometer (Y-direction)

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

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

Injury Criteria	Front SID	Rear SID
TTI (g)	65.1	63.7
Pelvis (g)	68.1	72.1

TEST NOTES

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

Right Front Door on Centerline

Midrear of Right Front Door

Right Front Door Upper Centerline

Midrear of Right Rear Door

Right Rear Door Upper Centerline

Rear Seat Track

2. Subsequent to the test, it was determined that the CG locations and moment of inertias for the MDB were not within specifications per Part 587.6D.

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

DATA SHEET NO. 1
GENERAL VEHICLE TEST PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1997/Buick/LeSabre/Sedan
Vehicle NHTSA No.: CV0108 VIN: 1G4HP52K1VH478264
Vehicle Body Color: Light Adriatic Blue Build Date: 8/96
Engine Data: 6 Cylinders; CID; 3.8 Liter; cc
Placement Longitudinal; X Lateral
Transmission: 3 speed; Manual; X Automatic; X Overdrive
Final Drive: Rear Wheel Drive; X Frt. Wheel Drive; Four Wheel Drive

Odometer Reading 183 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): 30 Psi FRONT
30 Psi REAR
Recommended Tire Size: P205/70R15
Tires on Test Vehicle: P205/70R15 Manufacturer: General

Vehicle Capacity Data:

Number of Occupants: 3 Front; 3 Rear; 3rd Seat 6 Total
Type of Front Seats: Bucket; Bench; X Split Bench
Type of Front Seat Back: Fixed; X Adjustable with X Lever
Vehicle Maximum Capacity Loading = 488.1 kg (A)
No. of Occupants x 68.04 kg. = 408.2 kg (B)
Cargo Capacity (A-B) = 79.9 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>276.7</u> kg
Left Front	=	<u>505.3</u> kg	Left Rear	=	<u>273.5</u> kg
TOTAL FRONT	=	<u>1012.0</u> kg	TOTAL REAR	=	<u>550.2</u> kg
% of Total Vehicle Weight		= <u>64.8</u> %;	% of Total Weight		= <u>35.2</u> %
TOTAL WEIGHT = <u>1562.2</u> kg					

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Year/Make/Model/Body Style: 1997/Buick/LeSabre/Sedan

Vehicle NHTSA No.: CV0108 Test Date October 23, 1996

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Test Vehicle Delivered Weight with Maximum Fluids	= <u>1562.2</u> kg
Cargo Carrying Capacity of Test Vehicle	= <u>79.9</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>1803.5</u> kg

ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO:

Right Front	= <u>551.6</u> kg	Right Rear	= <u>371.0</u> kg
Left Front	= <u>517.5</u> kg	Left Rear	= <u>354.8</u> kg
TOTAL FRONT	= <u>1069.1</u> kg	TOTAL REAR	= <u>725.8</u> kg
% of Total Weight	= <u>59.6</u> %	% of Total Weight	= <u>40.4</u> %
TOTAL TEST WEIGHT	= <u>1794.9</u> kg		

TEST VEHICLE ATTITUDE:

CURB WEIGHT ATTITUDE:

Right Front 741 mm Left Front 735 mm Right Rear 734 mm Left Rear 734 mm

FULLY LOADED WEIGHT ATTITUDE:

Right Front 719 mm Left Front 731 mm Right Rear 675 mm Left Rear 693 mm

TEST ATTITUDE:

Right Front 725 mm Left Front 731 mm Right Rear 688 mm Left Rear 690 mm

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Test Vehicle Wheelbase: 2820 mm

C.G. = 1140 mm rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

Right Side = 4830 mm

Centerline = 5117 mm

Left Side = 4830 mm

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Year/Make/Model/Body Style: 1997/Buick/LeSabre/Sedan

Vehicle NHTSA No.: CV0108 Test Date: October 23, 1996

FRONT SEAT CUSHION PLACEMENT:

Total Length of Adjustment Travel: 210 mm

Test Position: 12th position rearward out of 22 total

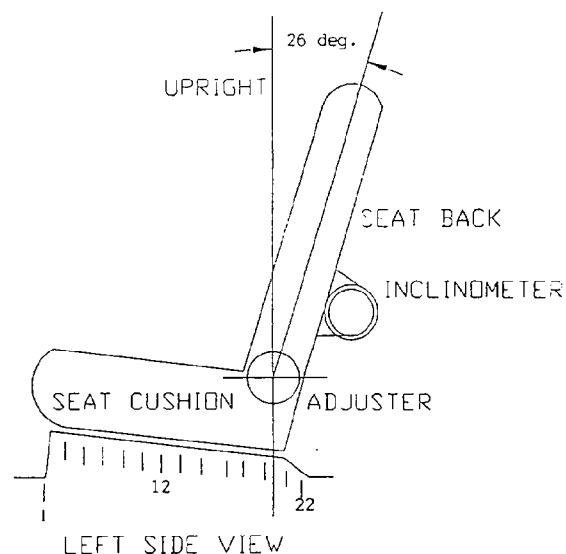
FRONT SEAT BACK ADJUSTMENT POSITION:

Seat Back Angle = 26° from the vertical position

REAR POSITION SEAT:

Total Length of Fore/Aft Adjustment Travel: N/A

Seat Back Adjustment Position: N/A



ADJUSTABLE STEERING COLUMN POSITION: 4th position down out of 6 total

WINDOW POSITIONS: Left Front Down Left Rear Down

Right Front Up Right Rear Up

AMOUNT OF STODDARD SOLVENT IN FUEL TANK:

Fuel system usable capacity = 68.5 liters

Test Volume: 63.7 liters 93 % of capacity

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

Wheelbase: = 2820 mm

Impact Point is 470 mm rearward of front axle centerline

DATA SHEET NO. 2
TEST VEHICLE SUMMARY OF RESULTS

Year/Make/Model/Body Style: 1997/Buick/LeSabre/Sedan

Vehicle NHTSA No.: CV0108 Test Date: October 23, 1996

Overall Length = 5117 mm; Overall Width = 1888 mm

TEST WEIGHT:

Right Front = 551.6 kg Right Rear = 371.0 kg
Left Front = 517.5 kg Left Rear = 354.8 kg
TOTAL FRONT = 1069.1 kg TOTAL REAR = 725.8 kg
% of Total Weight = 59.6 % % of Total Weight = 40.4 %
TOTAL VEHICLE WEIGHT = 1794.9 kg
Wheelbase = 2820 mm
Longitudinal C.G. from Center of Front Axle = 1140 mm
Impact Angle with Respect to Impactor = 0° degrees

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1 (257 mm above ground) = 258 mm
 2. LEVEL 2 (500 mm above ground) = 425 mm
 3. LEVEL 3 (622 mm above ground) = 363 mm
 4. LEVEL 4 (889 mm above ground) = 306 mm
 5. LEVEL 5 (1332 mm above ground) = 95 mm
- Maximum Post-Test Intrusion = 425 mm

OCCUPANTS:

	<u>Right Front Passenger</u>	<u>Right Rear Passenger</u>
Type of Dummy	<u>SID</u>	<u>SID</u>
Restraints Used	<u>type II belt with 2</u> <u>retractors</u>	<u>type II belt with 1</u> <u>retractor</u>

TEST VEHICLE SUMMARY OF RESULTS (Cont'd)

INSTRUMENTATION:

Number of Vehicle Data Channels:	=	<u>20</u>
Number of Cameras: Onboard Vehicle	=	<u>3</u>
Offboard Vehicle	=	<u>4</u>
Deformable Barrier	=	<u>2</u>
TOTAL	=	<u>9</u>

DATA SHEET NO. 3

MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS

Year/Make/Model/Body Style: 1997/Buick/LeSabre/Sedan

Vehicle NHTSA No.: CV0108 Test Date: October 23, 1996

POSITION OF IMPACT (MDB) ON MONORAIL:

Crabbed 27° to right

MDB DETAILS:

Overall Width of Framework Carriage	= <u>1252 mm</u>
Overall Length of MDB (incl. honeycomb impact face)	= <u>4115 mm</u>
Wheelbase of Framework Carriage	= <u>2591 mm</u>
Tread of Framework Carriage (Front & Rear)	= <u>1880 mm</u>
C.G. Location Rearward of Front Axle	= <u>1096 mm</u>
C.G. Location From Center Line	= <u>50 mm</u>
C.G. Location Above Ground Level	= <u>488 mm</u>

MDB WEIGHT:

Left Front	= <u>412.8 kg</u>	Left Rear	= <u>230.0 kg</u>
Right Front	= <u>370.5 kg</u>	Right Rear	= <u>344.7 kg</u>
TOTAL FRONT	= <u>783.3 kg</u>	TOTAL REAR	= <u>574.7 kg</u>
TOTAL MDB WEIGHT = <u>1358.0 kg</u>			

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

Impact Speed = Primary: 32.9 mph (52.9 kph) Secondary: 32.9 mph (52.9 kph)

CRASH TEST SUMMARY FOR SIDE IMPACTOR (Cont'd)

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

- | | | |
|----|---------------------------------|-----------------|
| 1. | Row A Top of Stack (813 mm) | = <u>135</u> mm |
| 2. | Row B Mid Stack (686 mm) | = <u>87</u> mm |
| 3. | Row C Top of Bumper (533 mm) | = <u>46</u> mm |
| 4. | Row D Center of Bumper (432 mm) | = <u>74</u> mm |

INSTRUMENTATION:

Number of MDB Data Channels = 5

DATA SHEET NO. 4
POST-TEST OBSERVATIONS

Year/Make/Model/Body Style: 1997/Buick/LeSabre/Sedan

Vehicle NHTSA No.: CV0108 Test Date: October 23, 1996

VISIBLE DUMMY CONTACT POINTS:

	<u>RIGHT FRONT SID</u>	<u>RIGHT REAR SID</u>
Head	<u>to B-Post and driver's headrest</u>	<u>to C Post</u>
Arm	<u>to door</u>	<u>to door</u>
Pelvis	<u>to armrest</u>	<u>to armrest</u>
Left Knee	<u>to right knee</u>	<u>to right knee</u>
Right Knee	<u>to door</u>	<u>to door</u>

DOOR OPENING:

	<u>LEFT SIDE</u>	<u>RIGHT SIDE</u>
Front	<u>No</u>	<u>No</u>
Rear	<u>No</u>	<u>No</u>

MDB DISTANCE FROM TARGET IMPACT POINT:

Horizontal: 5 mm rearward Vertical: 5 mm high

ARM REST LOCATIONS:

Front: 225 mm from bottom of window
Rear: 255 mm from bottom of window

POST-TEST OBSERVATIONS (Cont'd)

SEAT CRUSH:

Front Seat Back: 101 mm Front Seat Cushion: 122 mm

Rear Seat Back: 64 mm Rear Seat Cushion: 230 mm

GLAZING DAMAGE:

Windshield cracked; front and rear passenger side door glass broken

PILLAR PERFORMANCE:

No failure noted

SILL SEPARATION:

Approximately 180 mm of separation on the right rear dog leg

OTHER NOTABLE IMPACT EFFECTS:

Driver and front passenger airbags deployed

SECTION 4
OCCUPANT AND VEHICLE INFORMATION

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

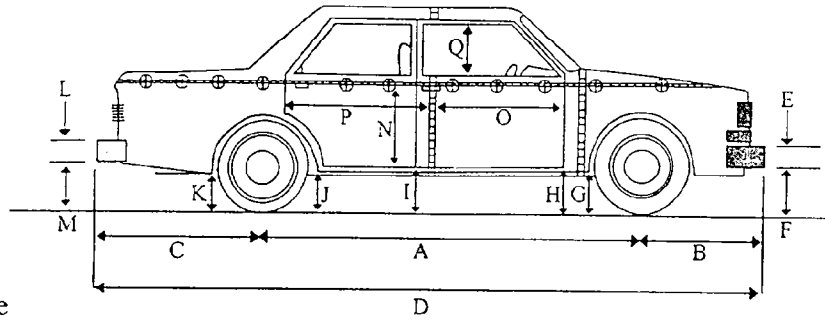
Year/Make/Model/Body Style: 1997/Buick/LeSabre/Sedan
Vehicle NHTSA No.: CV0108 Test Date: October 23, 1996

	Front SID ID #271				Rear SID ID #270			
	Pos. Direct.		Neg. Direct		Pos. Direct.		Neg. Direct	
	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)
RIB ACCELERATIONS								
Right Upper Rib (RUR) Y	19.8	81	-55.5	37	4.8	73	-59.9	50
Right Lower Rib (RLR) Y	16.1	101	-58.3	37	18.3	73	-67.9	48
SPINE ACCELERATIONS								
Lower Lateral Y	20.8	75	-72.0	39	30.7	76	-59.6	45
PELVIS ACCELERATIONS								
Lateral Y	20.0	91	-68.1	37	19.8	80	-72.1	41

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

Negative Direction - Longitudinal (X) = rearward
 Lateral (Y) = to left
 Vertical (Z) = up

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



D = Length at Centerline

R = Right Side Length

S = Left Side Length

T = Width at B Post

E & L = Bumper Thickness

J1 = To Pinch Weld

J2 = To Sill

ALL MEASUREMENTS IN (mm)

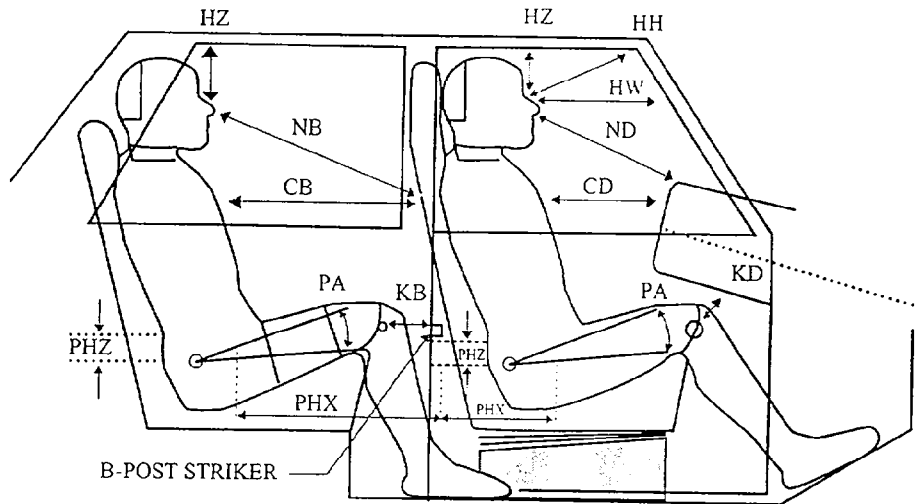
	PRE-TEST	POST-TEST	Δ CHANGE
A	2820	2820	0
B	1101	1128	27
C	1196	1118	78
D	5117	5066	51
E	227	227	0
F	391	420	29
G	208	223	15
H	197	232	35
I	198	259	61
J1/J2	222/192	251/211	29/19
K	244	283	39
L	205	205	0
M	352	395	43
N	678	570	108
O	799	744	55
P	1244	1068	176
Q	504	473	31
R	4830	4772	58
S	4830	4807	23
T	1888	1592	296

DATA SHEET NO. 7

SIDE IMPACT DUMMY (SID) LONGITUDINAL CLEARANCE DIMENSIONS

Year/Make/Model/Body Style: 1997/Buick/LeSabre/Sedan

NHTSA NO.: CV0108 Test Date: October 23, 1996



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

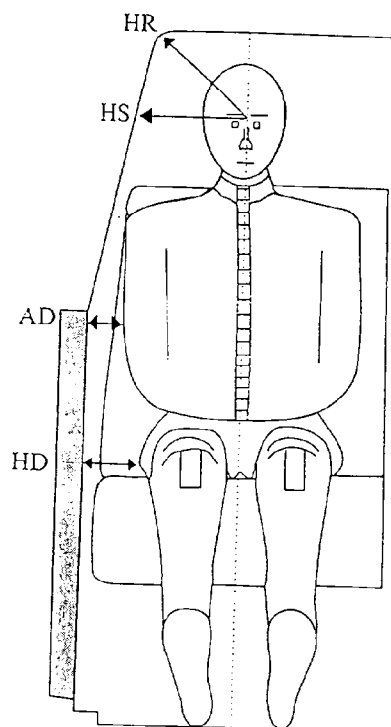
	FRONT PASSENGER ID #271		REAR PASSENGER SID ID #270
HH	405	HZ	157
HW	723	NB	743
HZ	179	CB	646
ND	640	KBL (KBA)	271 (27.1°)
CD	561	KBR (KBA)	253 (21.6°)
CS	N/A	PA°	24.1°
KDL(KDA°)	191 (31.2°)	PHX	228
KDR(KDA°)	147 (29.0°)	PHZ	292
PA°	24.8°		
PHX	223		
PHZ	126		

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

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

Year/Make/Model/Body Style: 1997/Buick/LeSabre/Sedan

NHTSA NO.: CV0108 Test Date: October 23, 1996



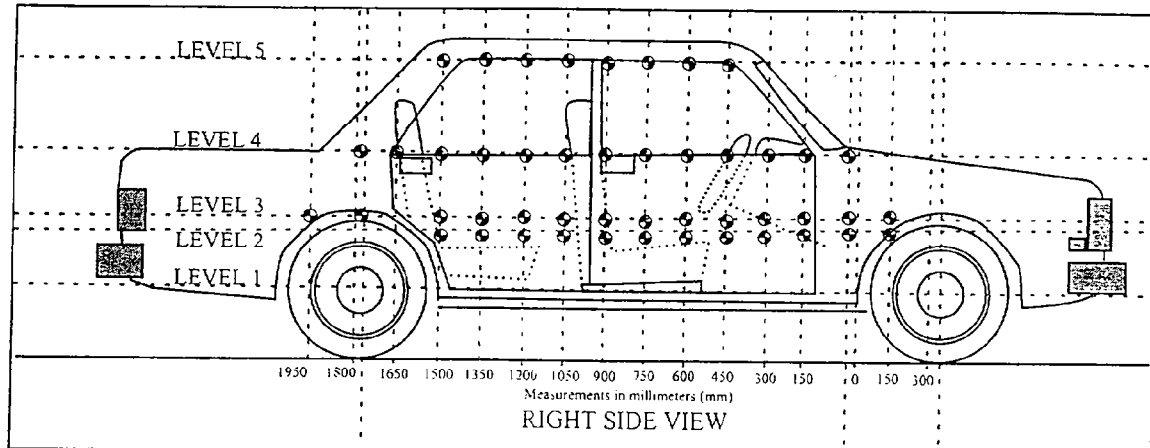
NOTE: All dimensions are in mm

	FRONT PASSENGER ID #271	REAR PASSENGER ID #270
HR	258	225
HS	385	225
AD	134	117
HD	133	160

DATA SHEET NO. 9
VEHICLE SIDE MEASUREMENTS

Year/Make/Model/Body Style: 1997/Buick/LeSabre/Sedan

NHTSA NO.: CV0108 Test Date: October 23, 1996



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

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

MEASUREMENTS ALONG THE VERTICAL 750 mm LINE SHOWN ABOVE

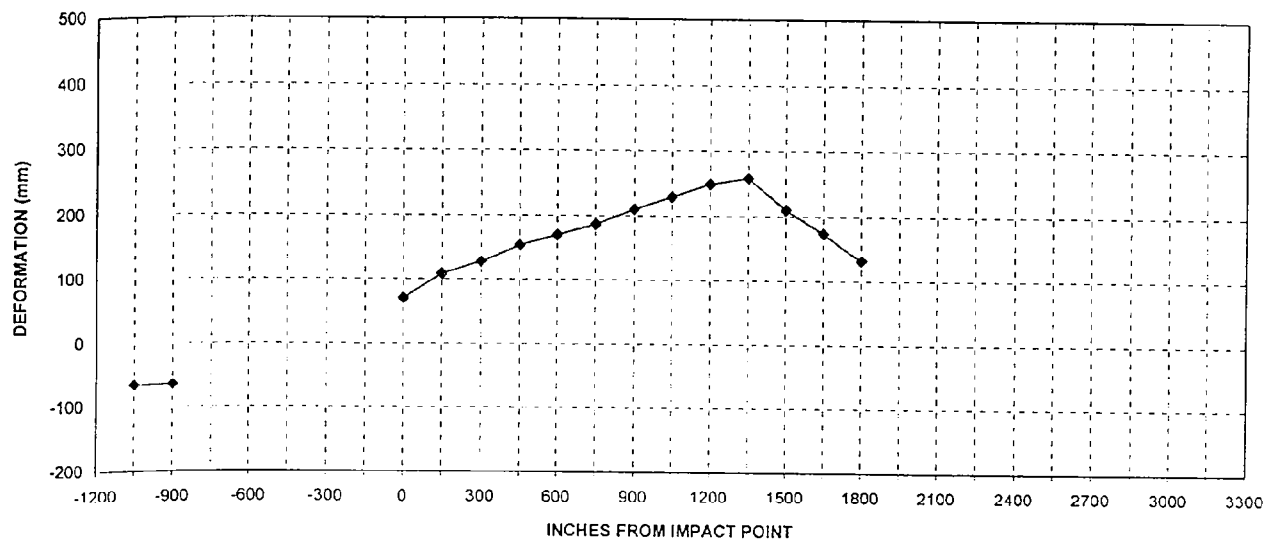
Level 1 @ Axle Centerline Height	
(or Sill Top Height)	= <u>257</u> mm
Level 2 @ Occupant H-Point	= <u>500</u> mm
Level 3 @ Mid Door	= <u>622</u> mm
Level 4 @ Window Sill	= <u>889</u> mm
Level 5 @ Window Top	= <u>1332</u> mm

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

Longitudinal Distance (mm)	Level 1 - Axle Centerline		
	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1200			
-1050	626	560	-66
-900	607	542	-65
-750			
-600			
-450			
-300			
-150			
0 (impact point)	581	651	70
150	579	687	108
300	585	712	127
450	586	740	154
600	581	751	170
750	583	770	187
900	581	791	210
1050	584	813	229
1200	585	834	249
1350	586	844	258
1500	589	799	210
1650	590	764	174
1800	593	724	131
1950			
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)



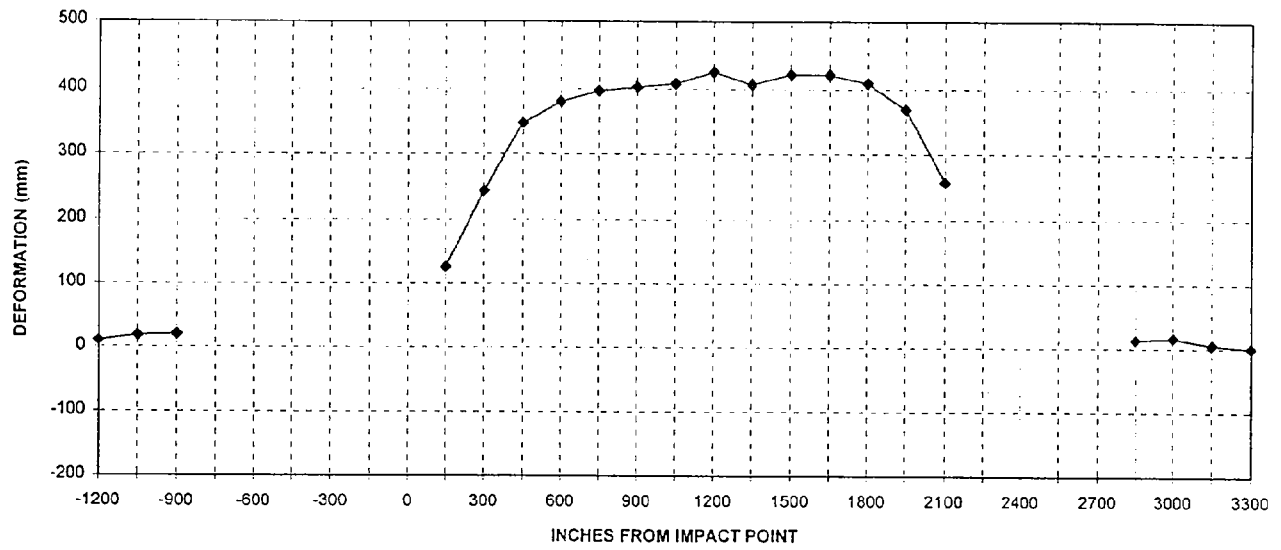
LEVEL 1 - AXLE CENTERLINE

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	547	557	10
-1050	522	540	18
-900	507	527	20
-750			
-600			
-450			
-300			
-150			
0 (impact point)	458	584	126
150	455	698	243
300	456	804	348
450	455	836	381
600	452	849	397
750	452	855	403
900	453	861	408
1050	454	879	425
1200	456	863	407
1350	457	879	422
1500	457	878	421
1650	457	866	409
1800	462	832	370
1950	465	722	257
2100			
2250			
2400			
2550			
2700			
2850	524	537	13
3000	537	553	16
3150	559	564	5
3300	595	595	0

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

VEHICLE EXTERIOR STATIC CRUSH (Cont'd)



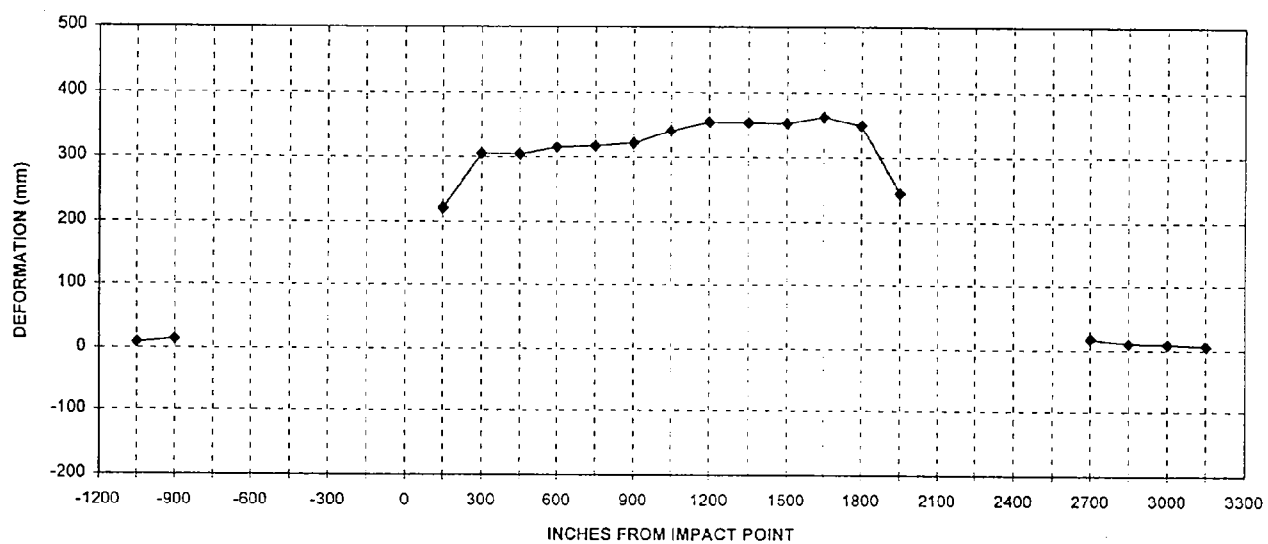
LEVEL 2 - OCCUPANT H-POINT

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	535	544	9
-900	520	534	14
-750			
-600			
-450			
-300			
-150			
0 (impact point)			
150	474	695	221
300	470	775	305
450	468	772	304
600	469	784	315
750	471	788	317
900	470	792	322
1050	471	812	341
1200	470	825	355
1350	470	824	354
1500	471	824	353
1650	470	833	363
1800	471	821	350
1950	471	716	245
2100			
2250			
2400			
2550			
2700	527	544	17
2850	547	557	10
3000	571	580	9
3150	602	608	6
3300			

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

VEHICLE EXTERIOR STATIC CRUSH (Cont'd)



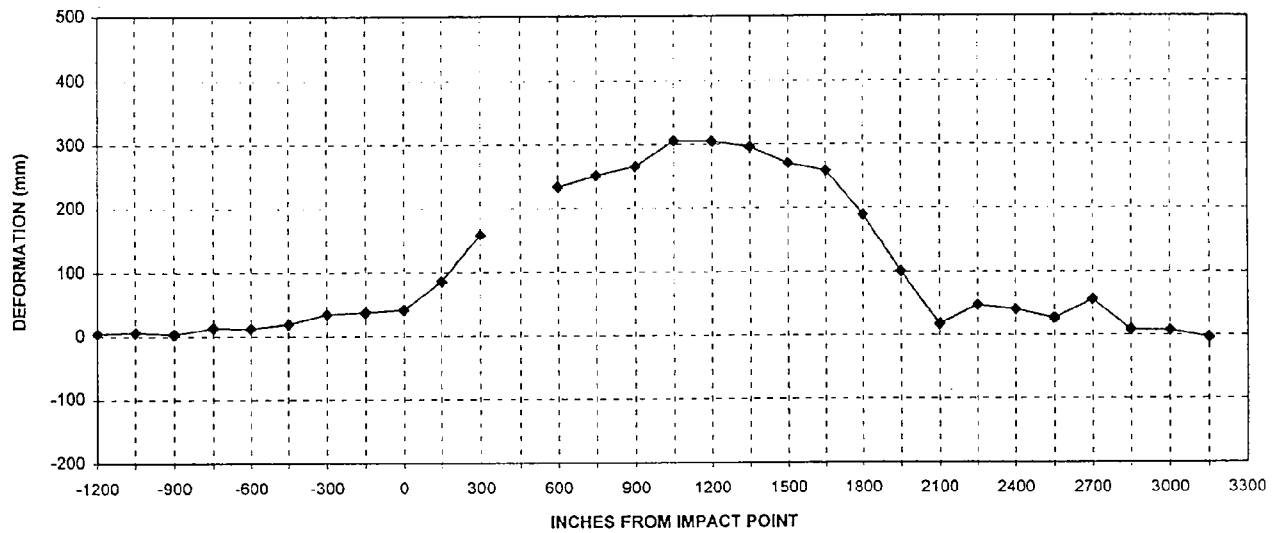
LEVEL 3 - MID DOOR

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	606	610	4
-1050	580	586	6
-900	566	569	3
-750	555	568	13
-600	545	557	12
-450	536	555	19
-300	526	560	34
-150	523	560	37
0 (impact point)	521	562	41
150	518	604	86
300	517	676	159
450			
600	518	751	233
750	518	769	251
900	520	786	266
1050	521	827	306
1200	523	828	305
1350	524	820	296
1500	526	796	270
1650	531	789	258
1800	534	723	189
1950	538	638	100
2100	540	557	17
2250	551	598	47
2400	554	594	40
2550	568	594	26
2700	580	636	56
2850	602	610	8
3000	623	630	7
3150	653	649	-4
3300			

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

VEHICLE EXTERIOR STATIC CRUSH (Cont'd)



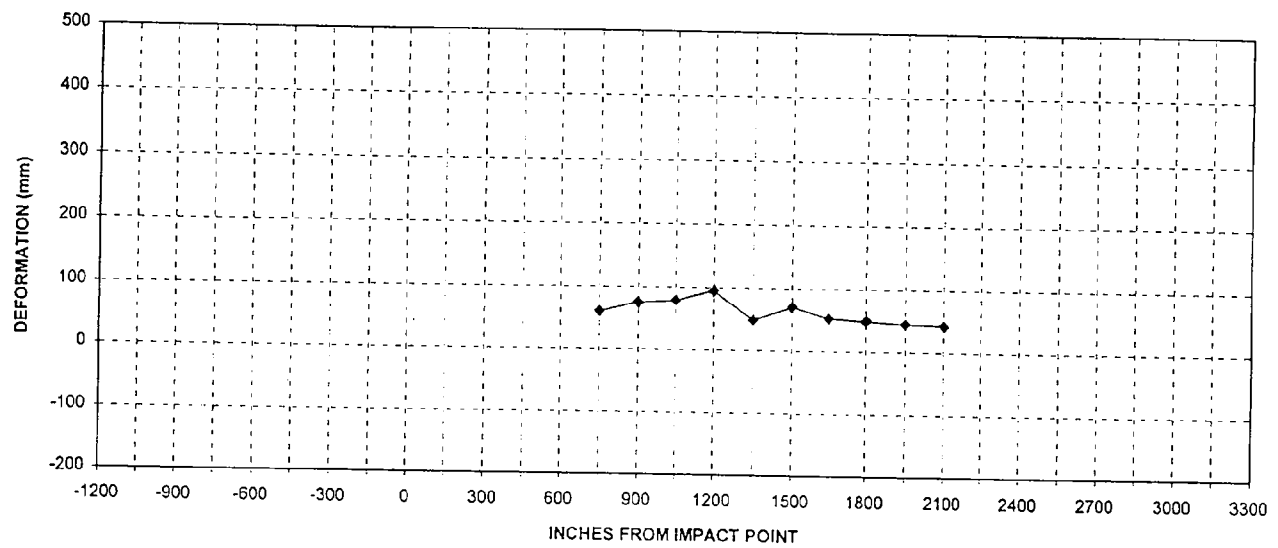
LEVEL 4 - WINDOW SILL

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

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			
750	780	840	60
900	782	857	75
1050	785	864	79
1200	789	884	95
1350	788	866	78
1500	790	860	70
1650	794	846	52
1800	802	850	48
1950	807	851	44
2100	822	864	42
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)

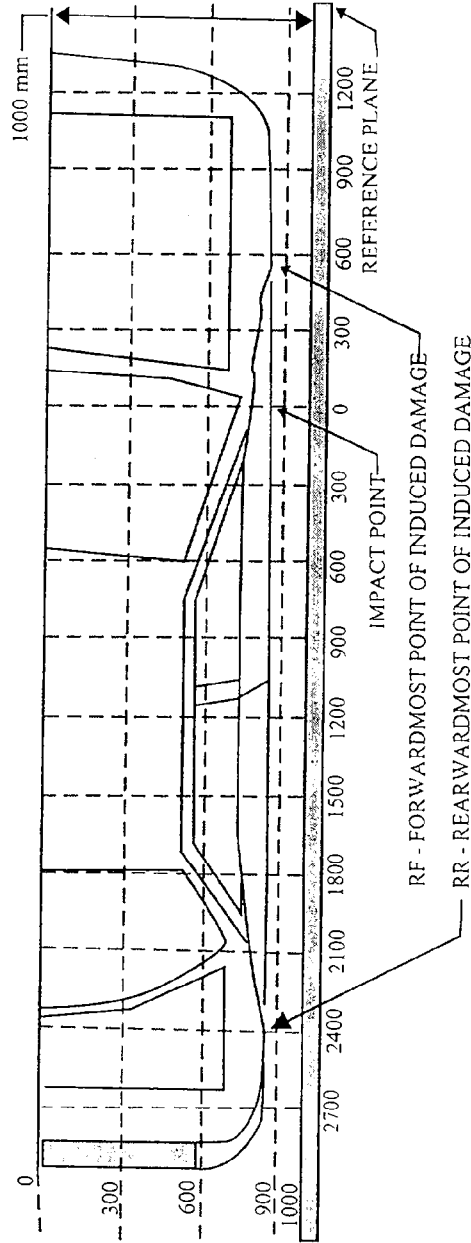


LEVEL 5 - WINDOW TOP

DATA SHEET NO. 11
VEHICLE DAMAGE PROFILE DISTANCES

Year/Make/Model/Body Style: 1997/Buick/LeSabre/Sedan

NHTSA NO.: CV0108 Test Date: October 23, 1996



DPD MEASUREMENTS	POST-TEST (mm)	PRE-TEST (mm)	STATIC CRUSH (mm)
1. (RF = 3300 mm)	595	595	0
2. 2400 mm	554	594	40
3. 1500 mm	457	878	421
4. 600 mm	452	849	397
5. -300 mm	523	560	37
6. (RR = -1200 mm)	547	557	10

DATA SHEET NO. 12

EXTERIOR STATIC CRUSH FOR SIDE IMPACTOR

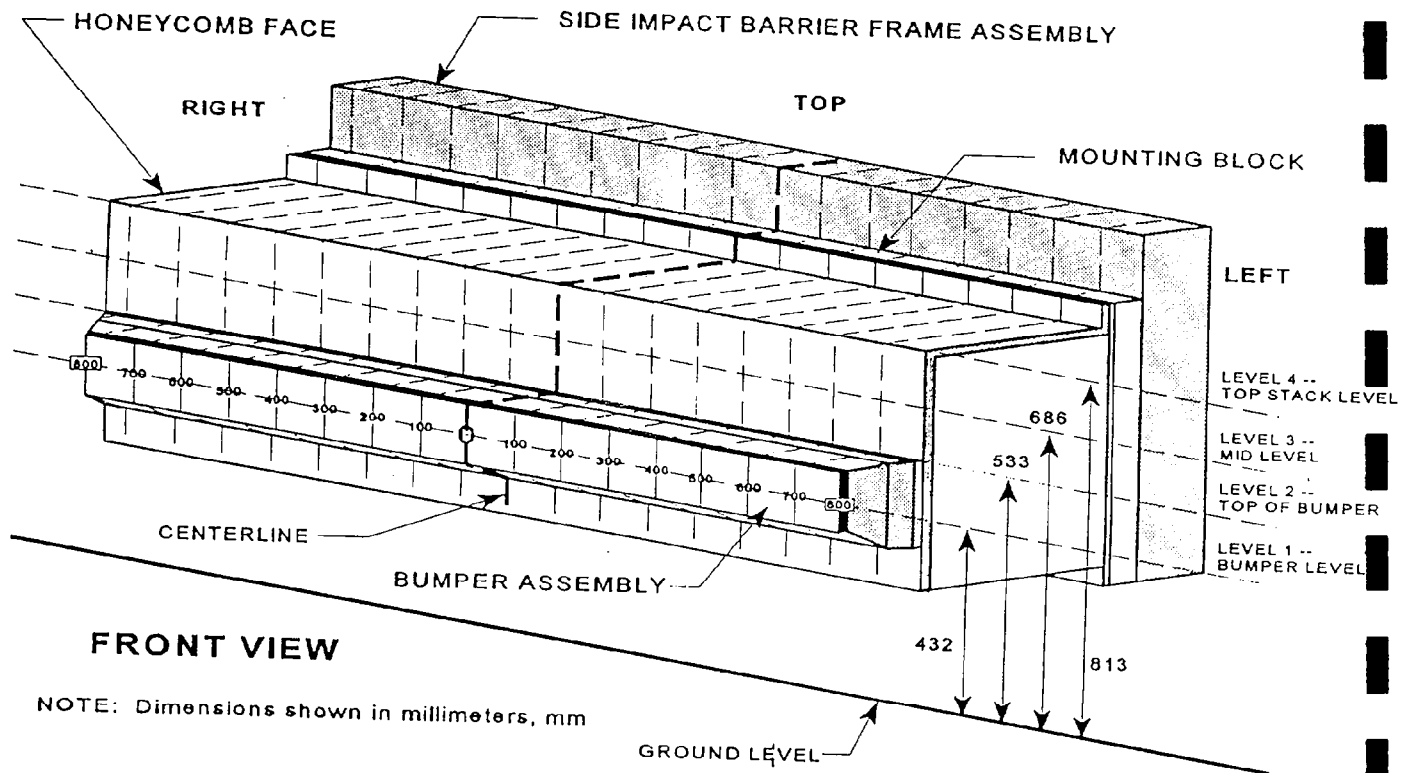
Year/Make/Model/Body Style: 1997/Buick/LeSabre/Sedan

Vehicle NHTSA No.: CV0108 Test Date: October 23, 1996

Location	Height at CL	Distance Right of Center (mm)									Distance Left of Center (mm)							
		800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
Top Stack Level 4	813 mm	135	79	45	28	11	4	2	1	2	0	0	-1	-2	-2	-3	-2	17
Mid Level Level 3	686 mm	87	28	13	7	7	6	6	5	4	3	3	3	3	2	1	-1	1
Top Bumper Level 2	533 mm	46	31	20	16	16	14	14	12	9	11	10	11	10	9	8	15	26
Mid Bumper Level 1	432 mm	74	45	25	20	20	18	17	16	17	19	27	25	19	16	19	34	53

See next page for Barrier Face Graphic

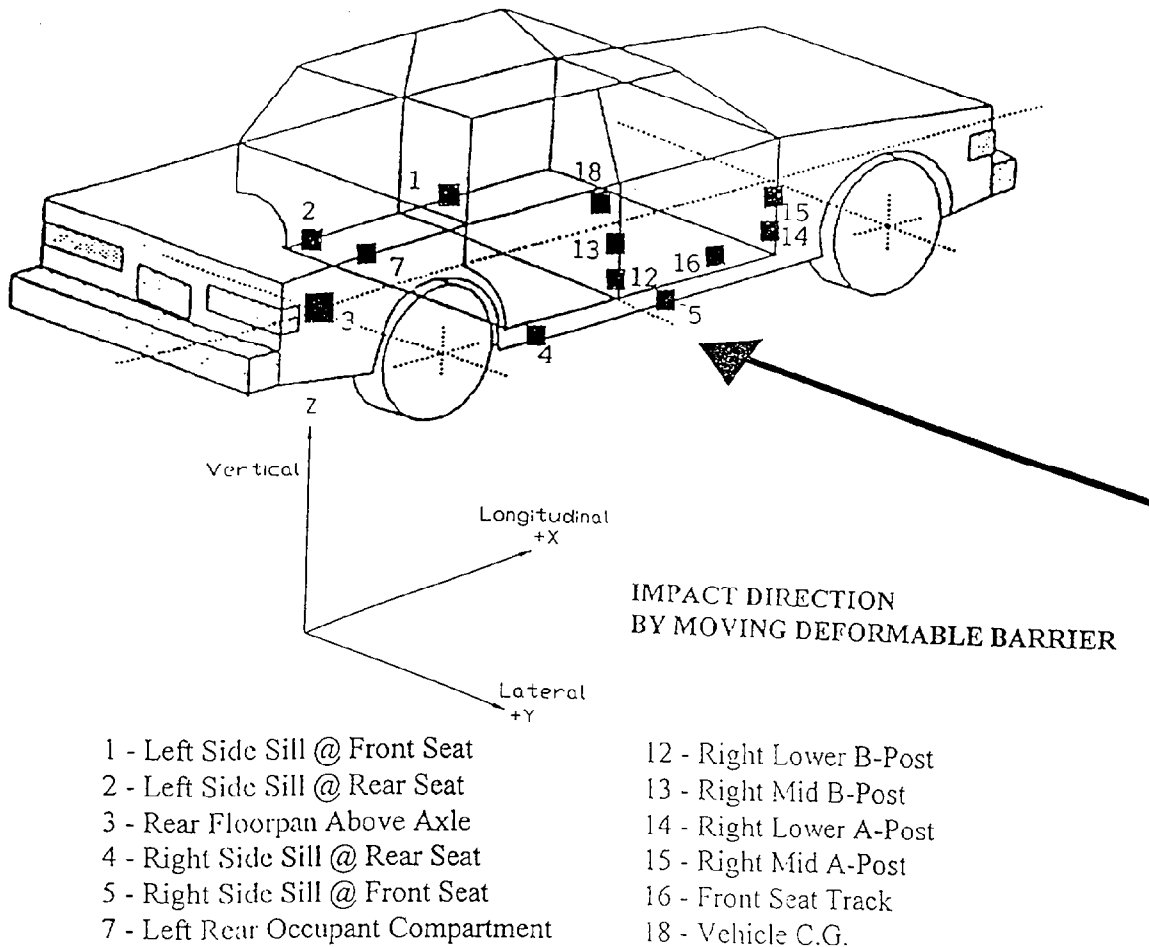
DATA SHEET NO. 12 (Cont'd)



DATA SHEET 13
TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1997/Buick/LeSabre/Sedan

Vehicle NHTSA No.: CV0108 Test Date: October 23, 1996



DATA SHEET NO. 13

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1997/Buick/LeSabre/Sedan

Vehicle NHTSA No.: CV0108 Test Date: October 23, 1996

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	Left Side Sill @ Front Seat	2916	-715	228	3.3	-5.9	2.0	-20.7	4.7	-9.2	20.8
2	Left Side Sill @ Rear Seat	1537	-726	212	3.6	-4.1	2.6	-17.7	5.1	-5.3	18.0
3	Rr. Floorpan Above Axle	1175	-8	733	1.7	-6.0	1.7	-21.8	5.4	-5.1	22.8
4	Right Side Sill @ Rr. Seat	1555	726	224	---	---	20.0	-51.1	---	---	---
5	Right Side Sill @ Frt. Seat	2960	715	224	---	---	15.2	-45.2	---	---	---
7	Left Rear Occupant Compartment	1983	-328	312	---	---	3.5	-20.9	---	---	---
12	Right Lower B-Post	2318	658	305	---	---	32.6	-71.3	---	---	---
13	Right Mid B-Post	2330	758	512	---	---	27.2	-98.6	---	---	---
14	Right Lower A-Post	3326	724	392	---	---	31.2	-105.0	---	---	---
15	Right Mid A-Post	3332	776	872	---	---	7.9	-30.2	---	---	---
16	Right Front Passenger Seat Track	2381	622	275	---	---	19.0	-53.8	---	---	---
18	Vehicle CG	2792	0	364	3.8	-4.0	1.6	-20.2	12.4	-19.2	23.3

*Reference: X - Rear Bumper (+ Forward)

Y - Vehicle Centerline (+ To right)

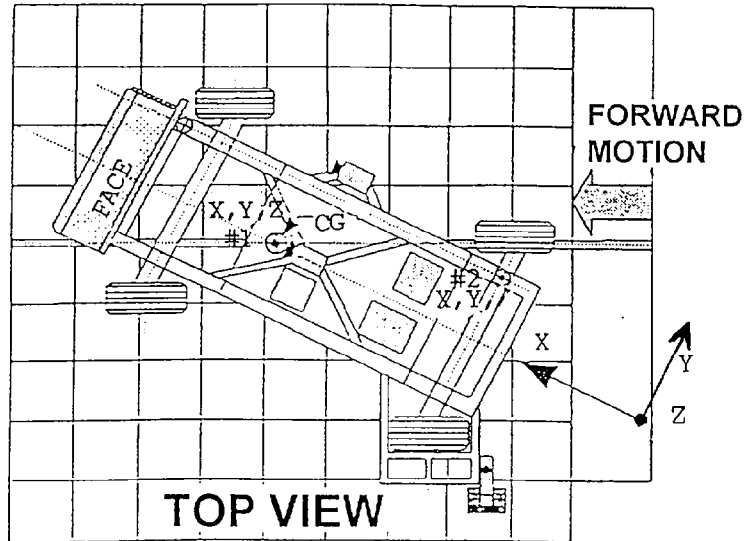
Z - Ground Level (+ Up)

DATA SHEET NO. 14

MOVING DEFORMABLE BARRIER (MDB) ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1997/Buick/LeSabre/Sedan

Vehicle NHTSA No.: CV0108 Test Date: October 23, 1996



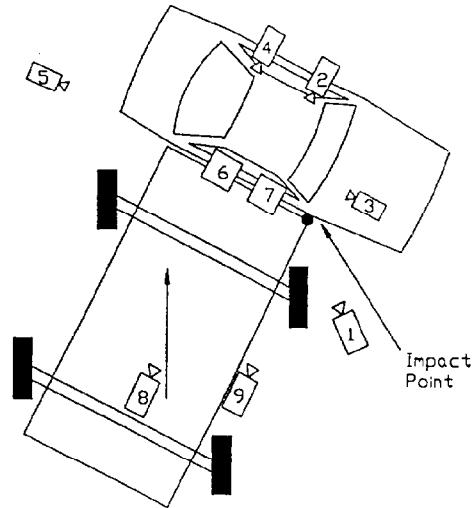
Accel. No.	Description	Coordinates (mm)*			(+) Positive		(-) Negative	
		X	Y	Z	Max. (g)	Time (msec)	Max. (g)	Time (msec)
1	MDB Center of Gravity	-1092	0	483				
	Longitudinal (X)	---	---	---	1.2	171	-14.0	46
	Lateral (Y)	---	---	---	0.8	70	-8.1	42
	Vertical (Z)	---	---	---	6.9	35	-16.2	22
	Resultant (R)	---	---	---	18.9	22	---	---
2	Rear Frame Member	-2591	-625	622				
	Longitudinal (X)	---	---	---	1.5	132	-17.8	42
	Lateral (Y)	---	---	---	1.7	80	-3.3	42

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

DATA SHEET NO. 15
HIGH SPEED CAMERA LOCATIONS AND DATA

Year/Make/Model/Body Style: 1997/Buick/LeSabre/Sedan

Vehicle NHTSA No.: CV0108 Test Date: October 23, 1996



Camera No.	View	Coordinates (mm)*			Angle	Lens (mm)	Film Speed (fps)
		X	Y	Z			
	Real Time					13	24
1	Front Impact	-990	2090	1585	90°	13	962
2	Onboard Front Passenger					8	976
3	Onboard Hood					13	1000
4	Onboard Rear Passenger					8	980
5	Rear Impact	390	-9550	1585	90°	25	1020
6	Top Wide	-190	-1190	5200	90°	8	1053
7	Top Impact	-230	90	5200	90°	13	935
8	Cart Wide					13	1010
9	Cart Impact					35	1000

* Reference: (from impact point)

+X = Forward

+Y = To Right

+Z = Upward from floor level

DATA SHEET 16
FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

Vehicle Year/Make/Model/Body Style: 1997/Buick/LeSabre/Sedan

Vehicle NHTSA No.: CV0108 Test Date: October 23, 1996

TEST REQUIREMENTS:

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

TEST VEHICLE IMPACT TYPE: X Side Impact MDB 32.9 mph (52.9 kph)

FUEL SPILLAGE MEASUREMENT:

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

FUEL SPILLAGE LOCATION(S): None

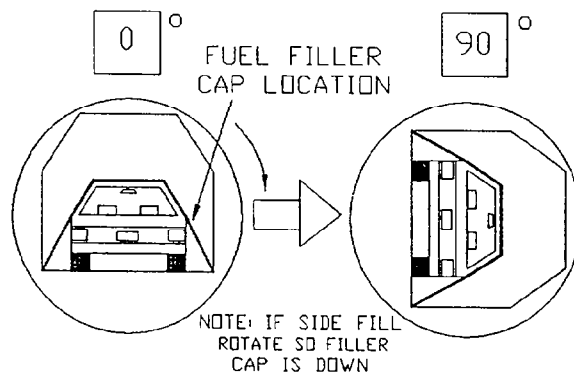
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA

Vehicle Year/Make/Model/Body Style: 1997/Buick/LeSabre/Sedan

Vehicle NHTSA No.: CV0108 Test Date: October 23, 1996

TEST PHASE: 0° - 90°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 35 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 35 seconds

Next Whole Minute Interval = 8 minutes

FUEL SPILLAGE MEASUREMENT:

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

FUEL SPILLAGE LOCATIONS(S): None

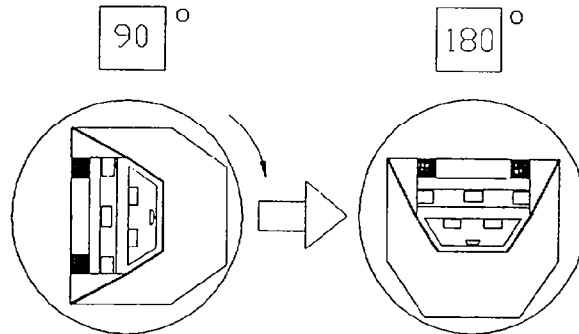
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA (Cont'd)

Vehicle Year/Make/Model/Body Style: 1997/Buick/LeSabre/Sedan

Vehicle NHTSA No.: CV0108 Test Date: October 23, 1996

TEST PHASE: 90° - 180°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 30 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 30 seconds

Next Whole Minute Interval = 8 minutes

FUEL SPILLAGE MEASUREMENT:

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

FUEL SPILLAGE LOCATIONS(S): None

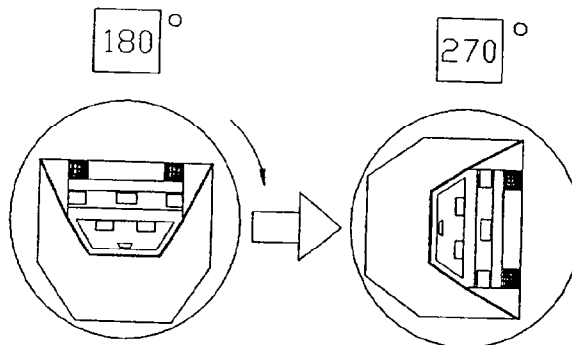
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA (Cont'd)

Vehicle Year/Make/Model/Body Style: 1997/Buick/LeSabre/Sedan

Vehicle NHTSA No.: CV0108 Test Date: October 23, 1996

TEST PHASE: 180° - 270°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 20 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 20 seconds

Next Whole Minute Interval = 8 minutes

FUEL SPILLAGE MEASUREMENT:

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

FUEL SPILLAGE LOCATIONS(S): None

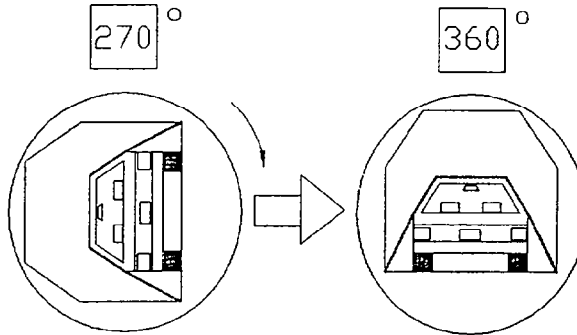
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA

Vehicle Year/Make/Model/Body Style: 1997/Buick/LeSabre/Sedan

Vehicle NHTSA No.: CV0108 Test Date: October 23, 1996

TEST PHASE: 270° - 360°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 40 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 40 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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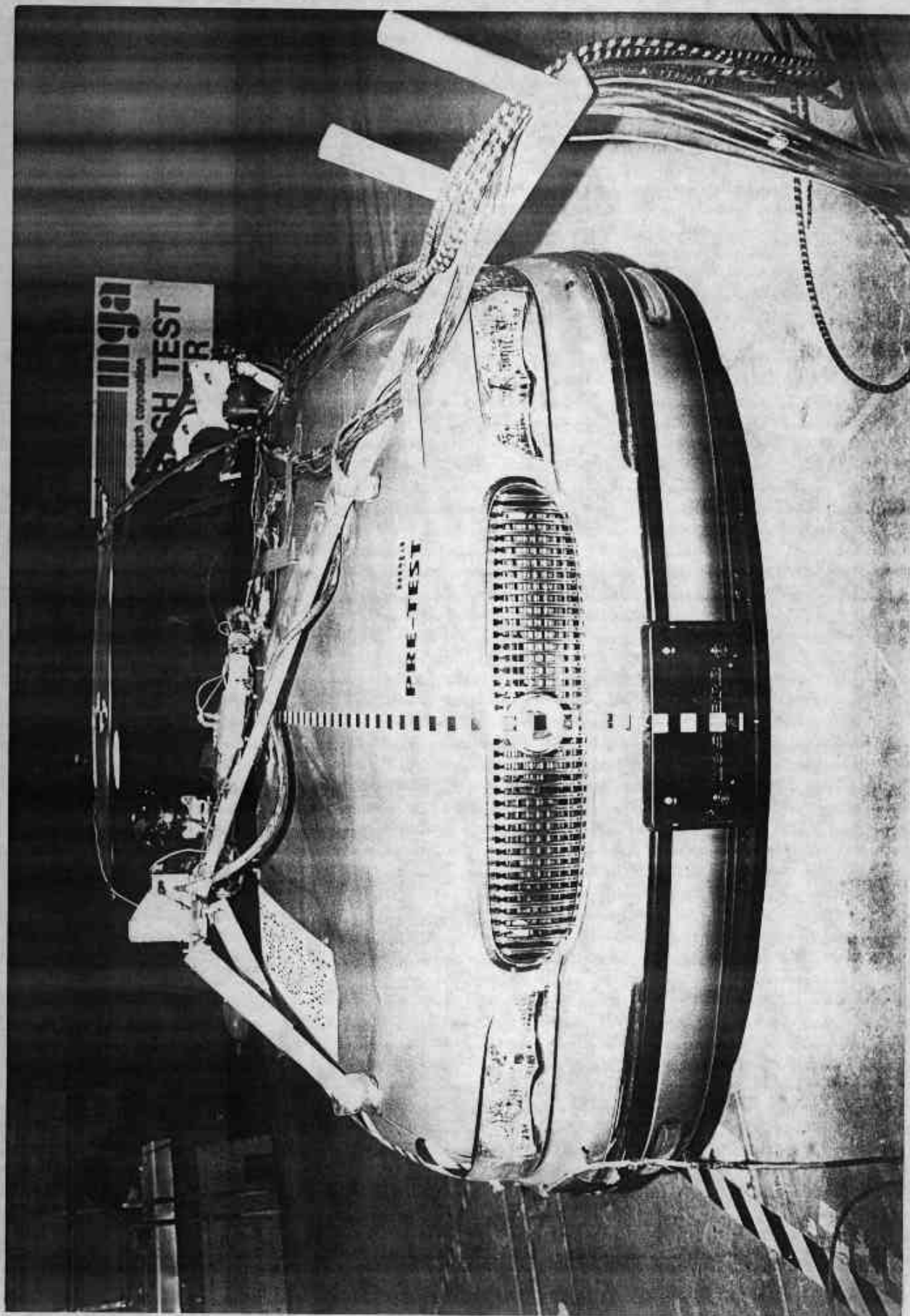


Photo No. A-1 - Pre-Test Front View of Test Vehicle

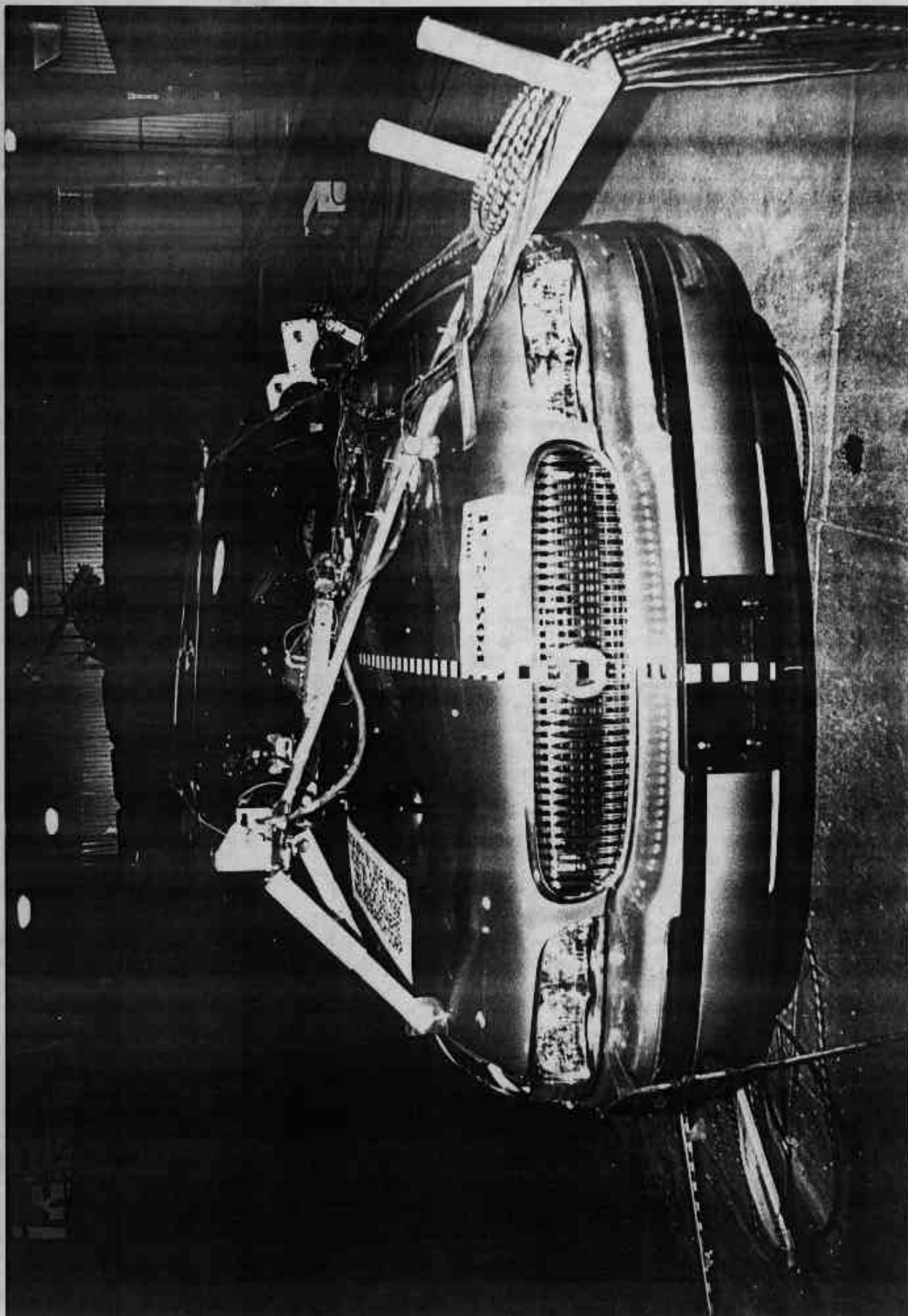


Photo No. A-2 - Post-Test Front View of Test Vehicle

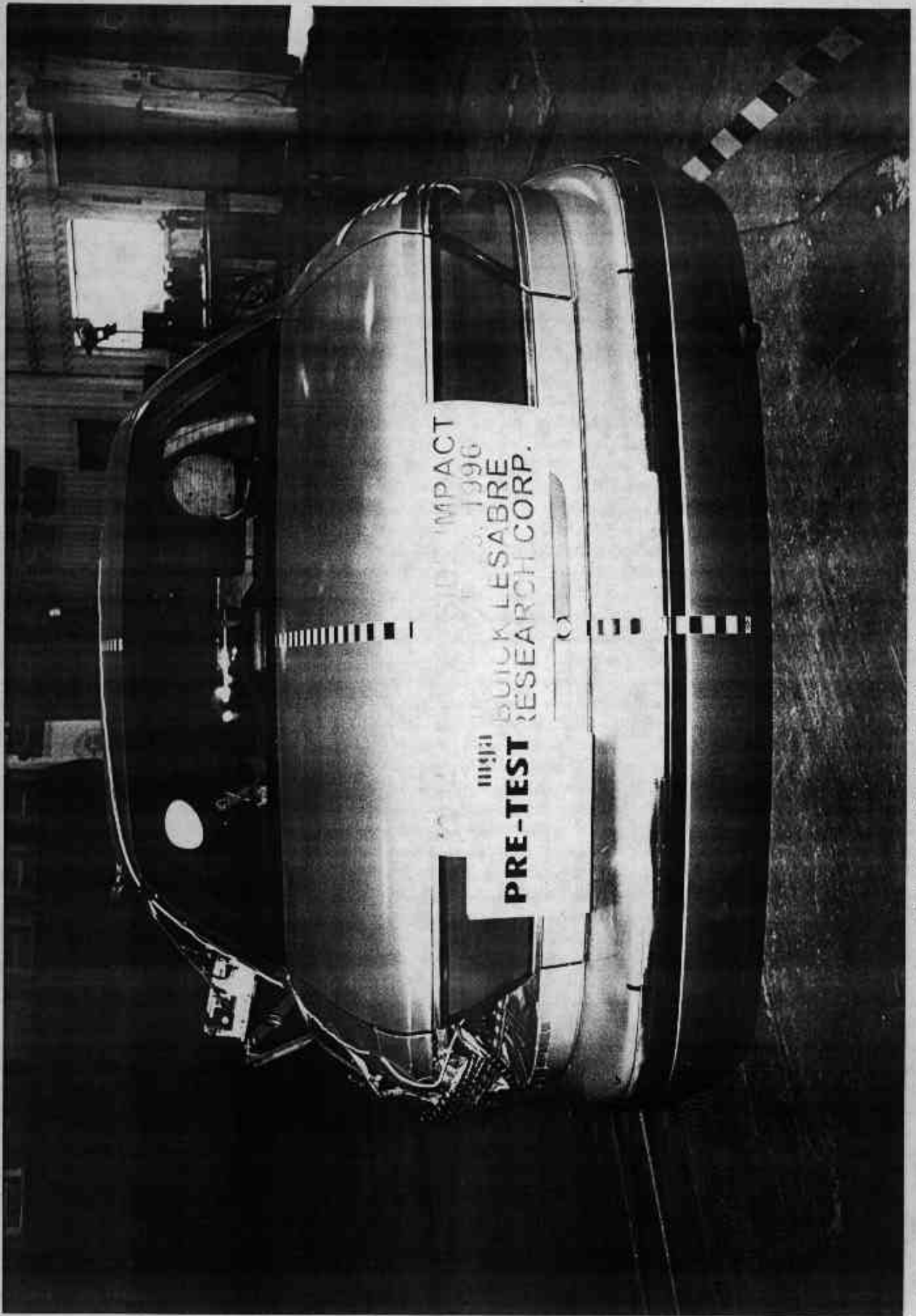


Photo No. A-3 - Pre-Test Rear View of Test Vehicle

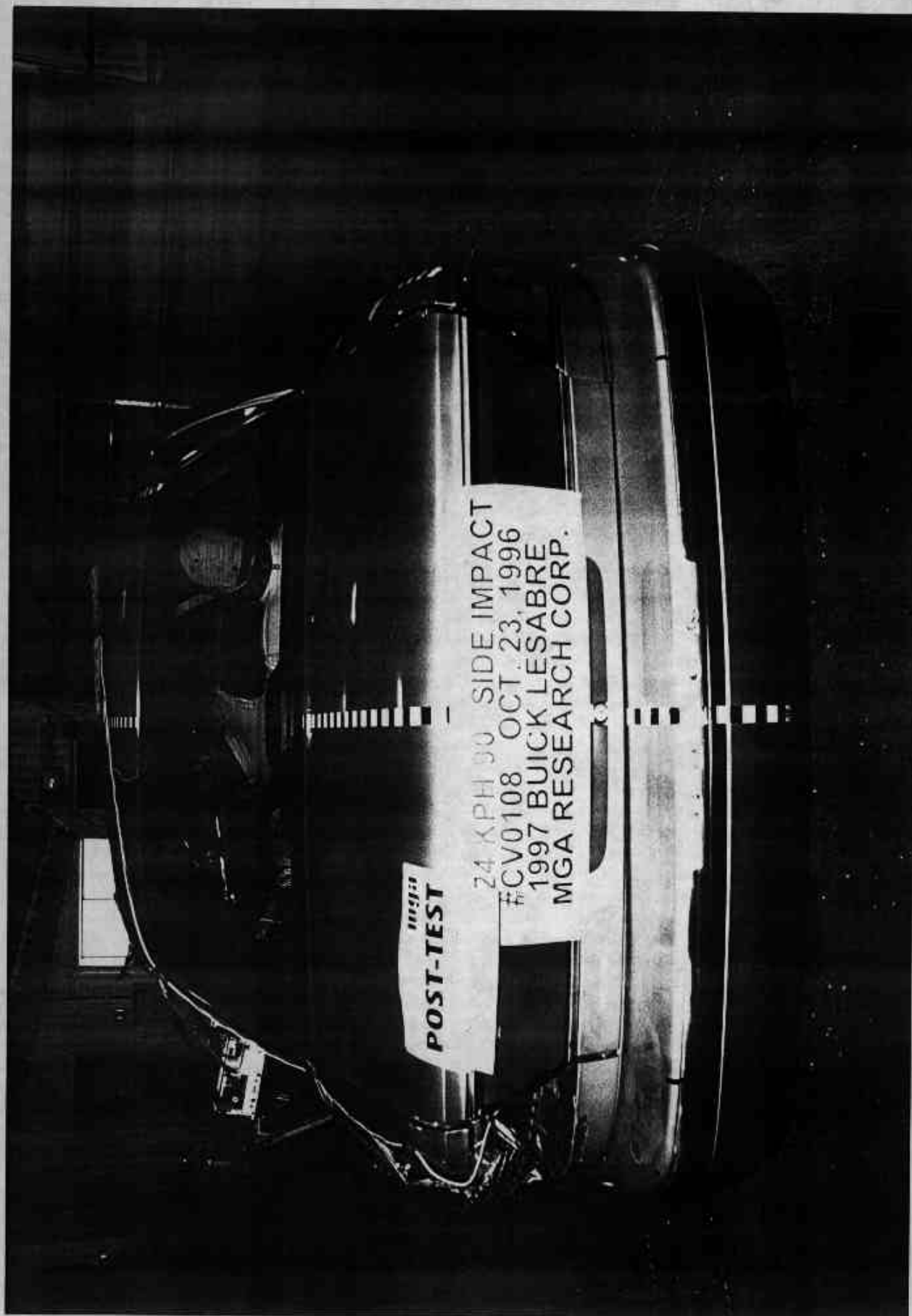


Photo No. A-4 - Post-Test Rear View of Test Vehicle

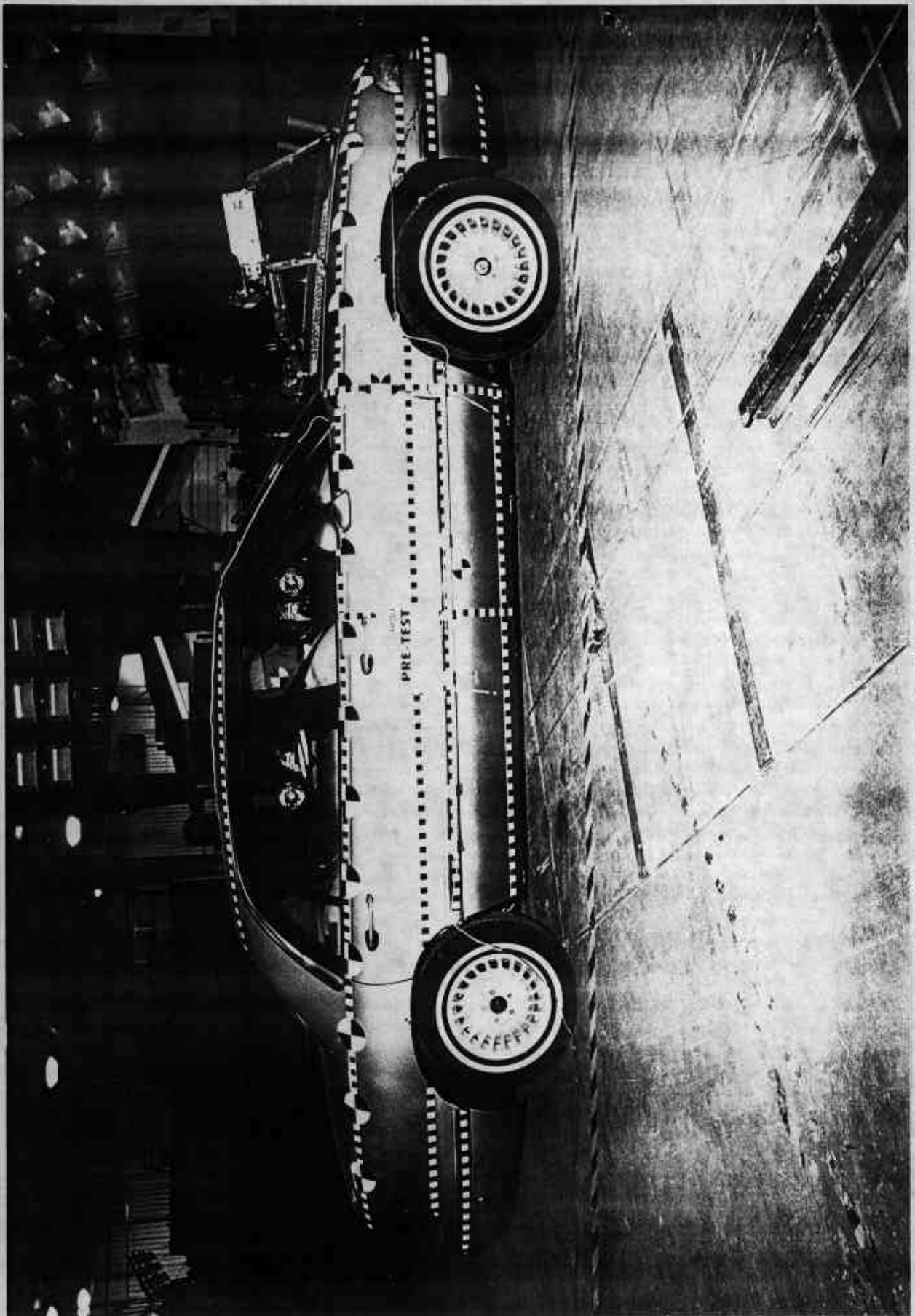


Photo No. A-5 - Pre-Test Right Side View of Test Vehicle

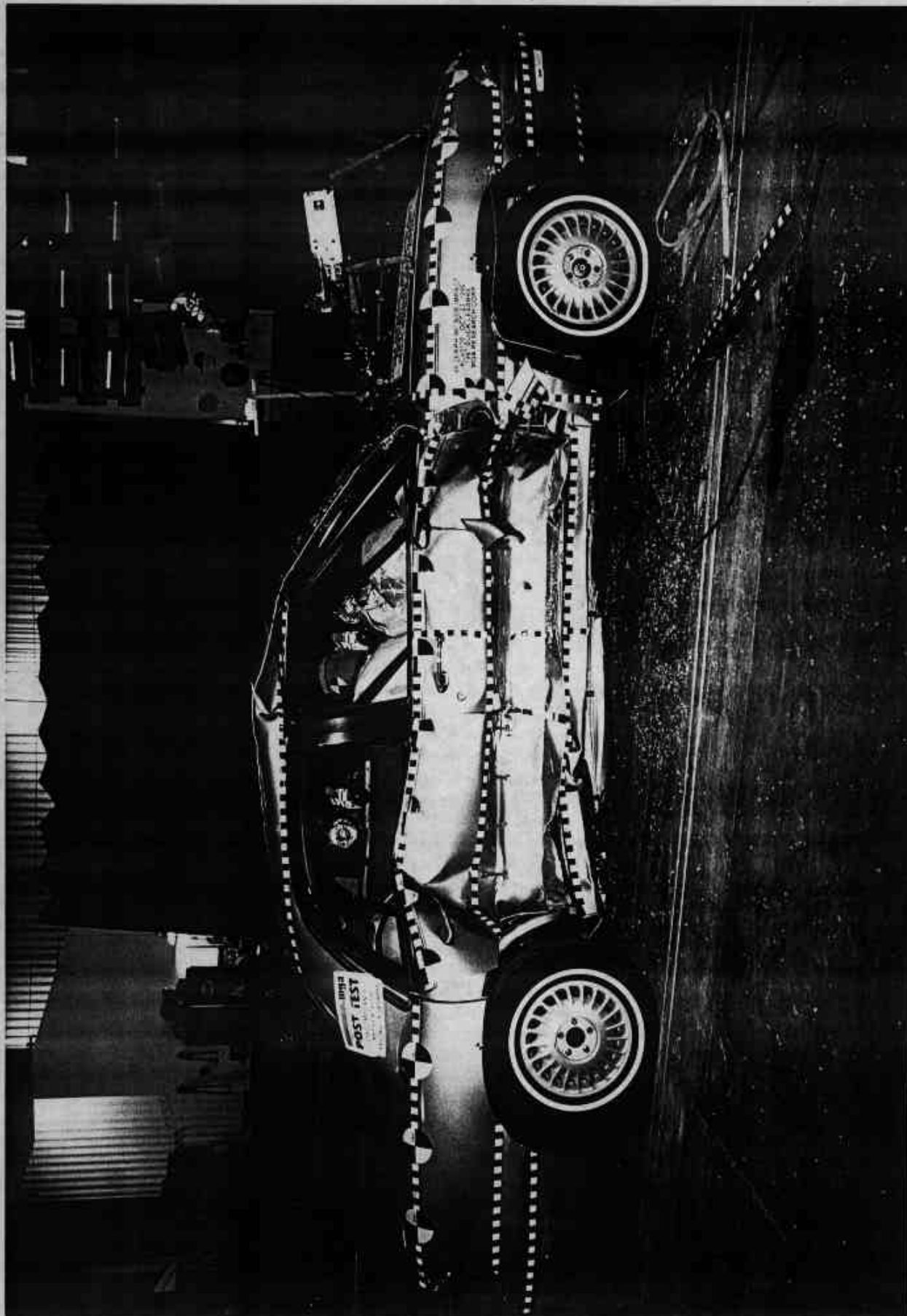


Photo No. A-6 - Post-Test Right Side View of Test Vehicle

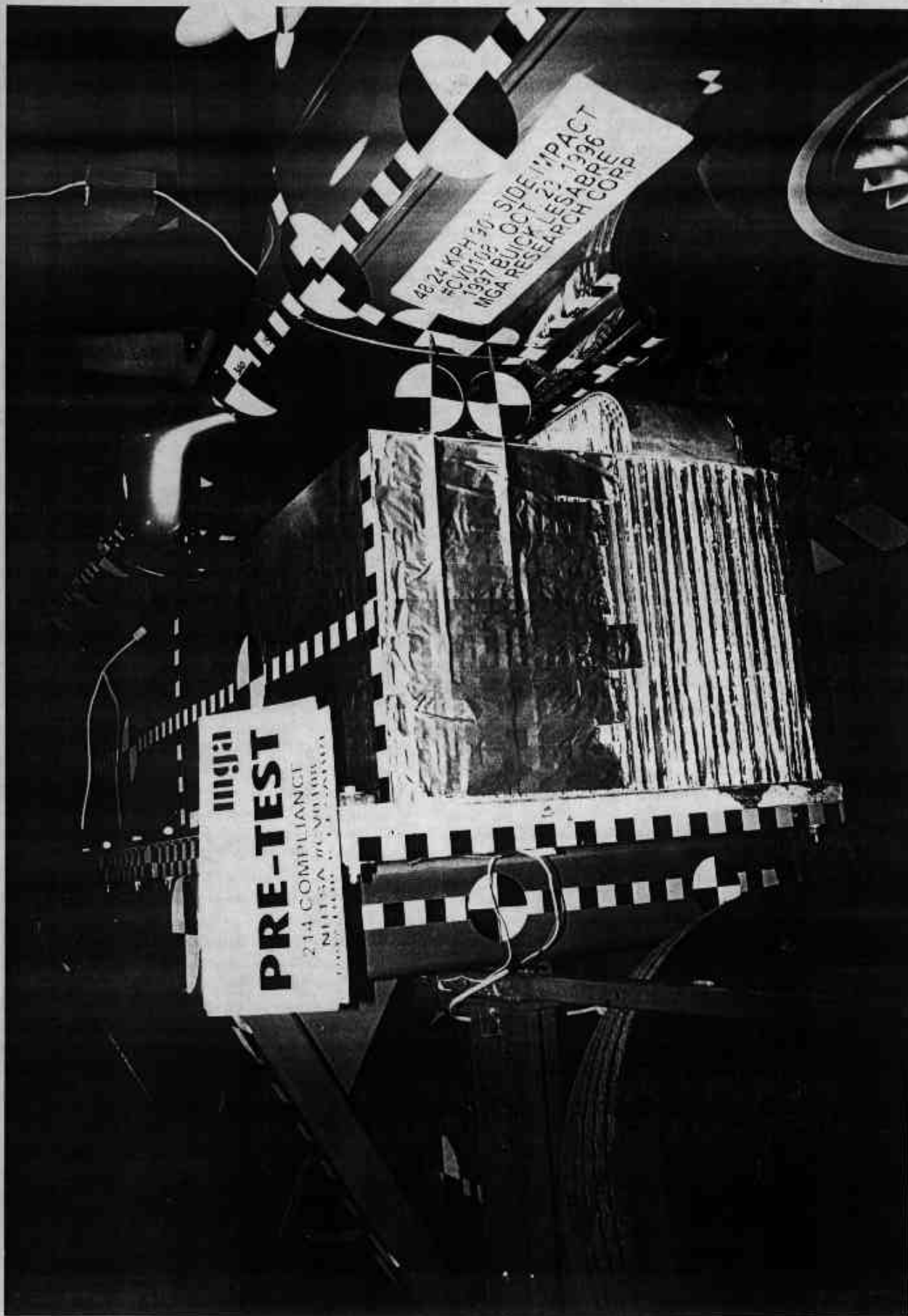


Photo No. A-7 - Pre-Test MDB Positioned Against Vehicle (right side)

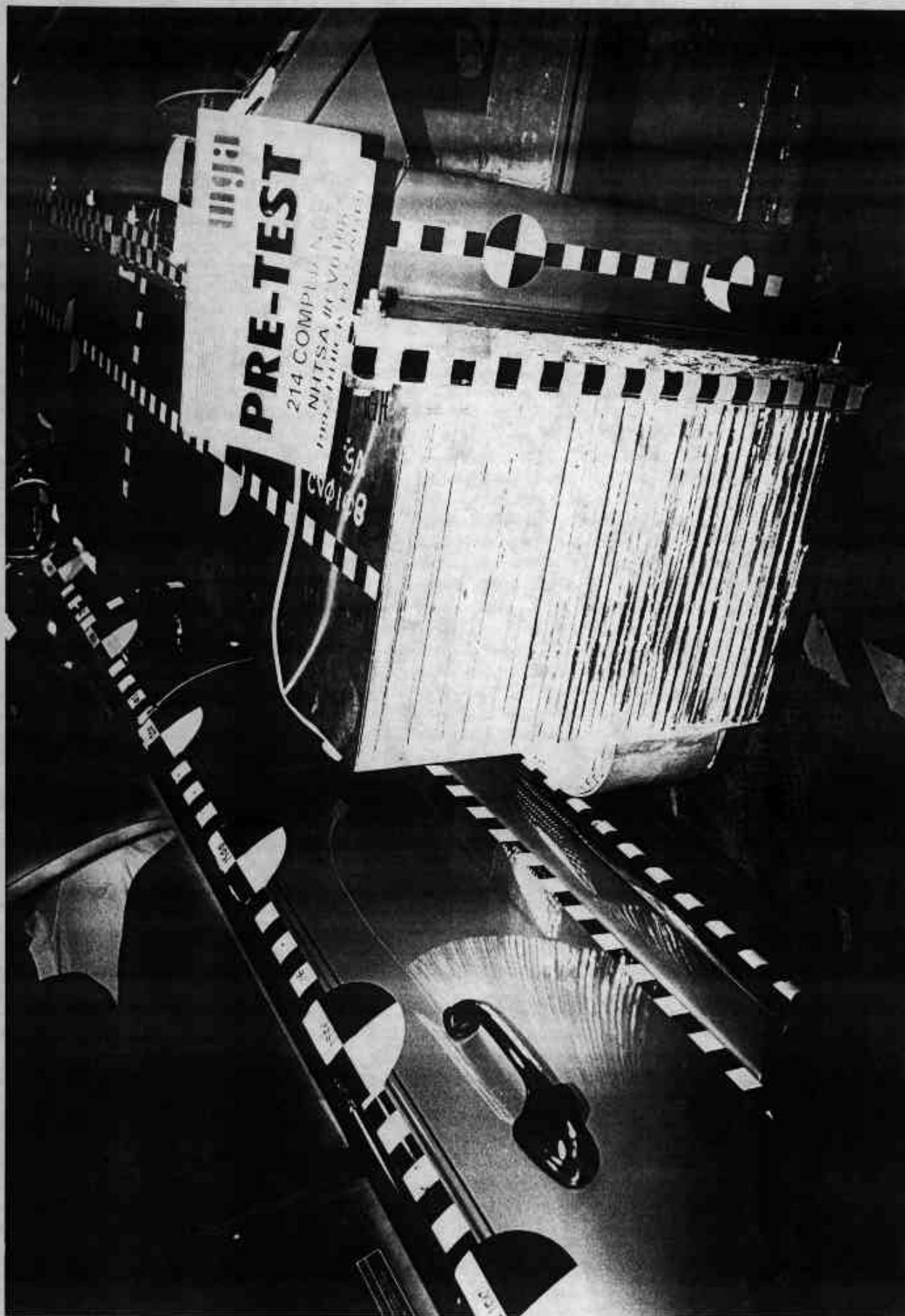


Photo No. A-8 - Pre-Test MDB Positioned Against Vehicle (left side)

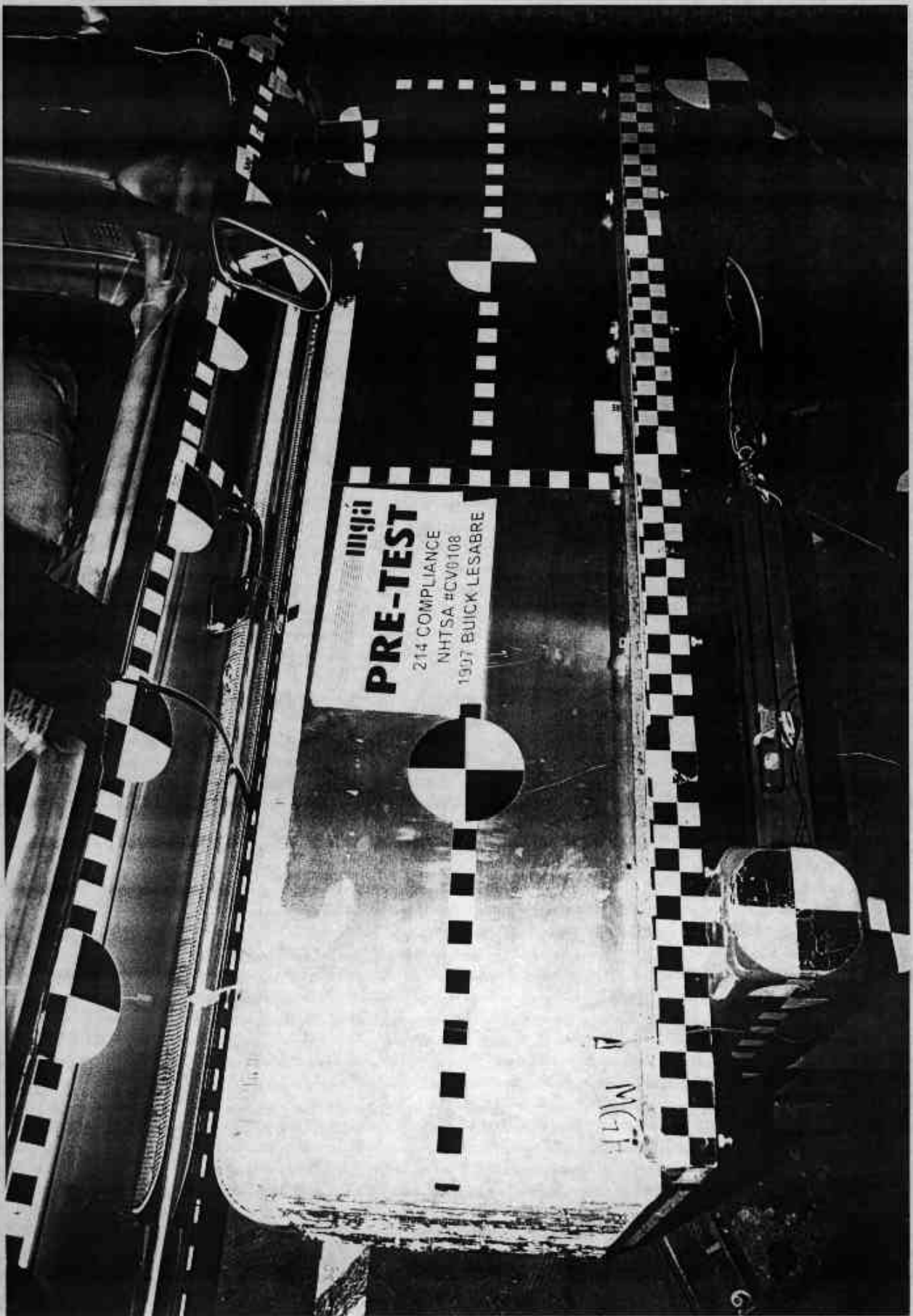


Photo No. A-9 - Pre-Test MDB Positioned Against Vehicle Overhead View



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

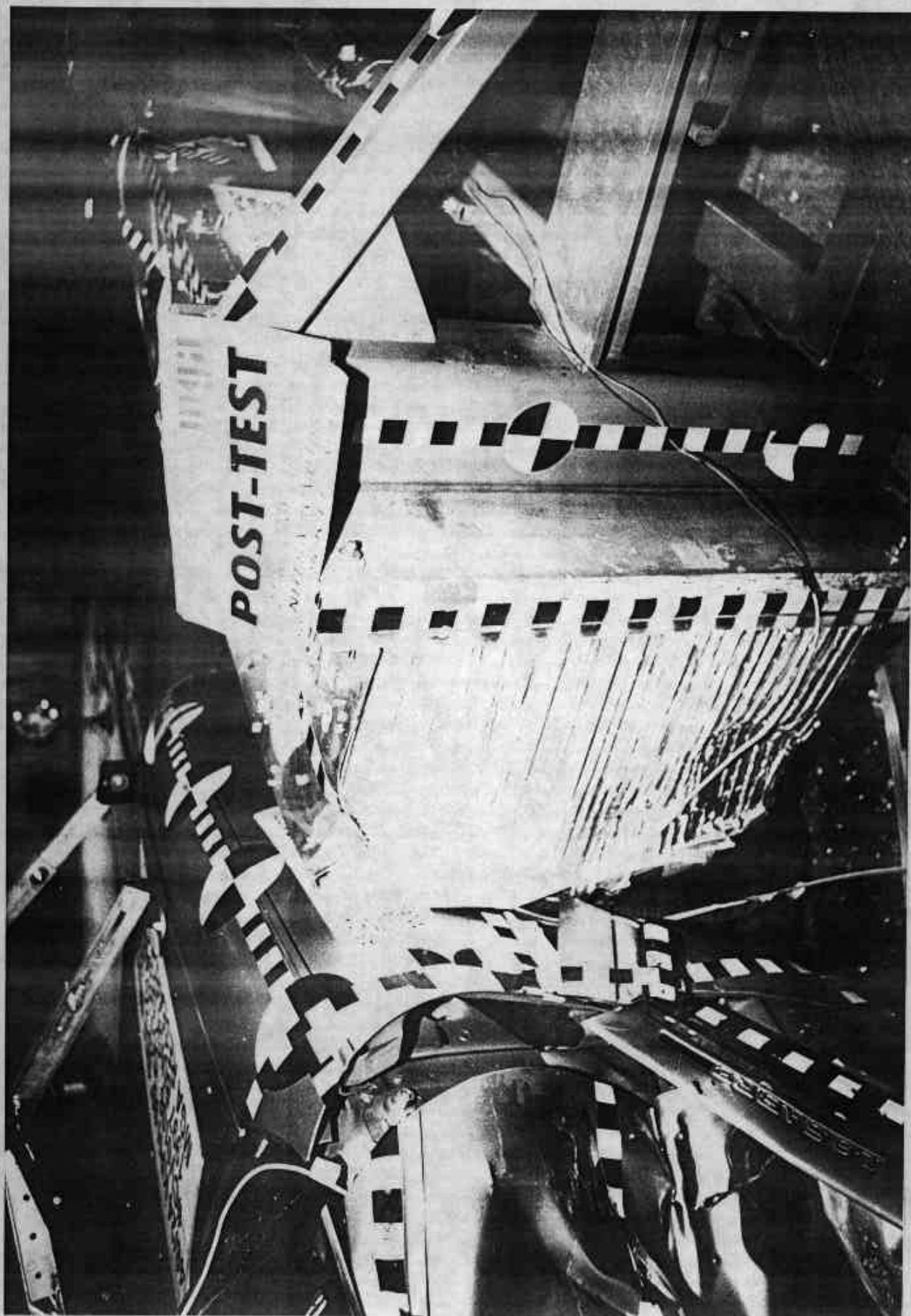


Photo No. A-11 - Post-Test MDB Positioned Against Vehicle (left side)

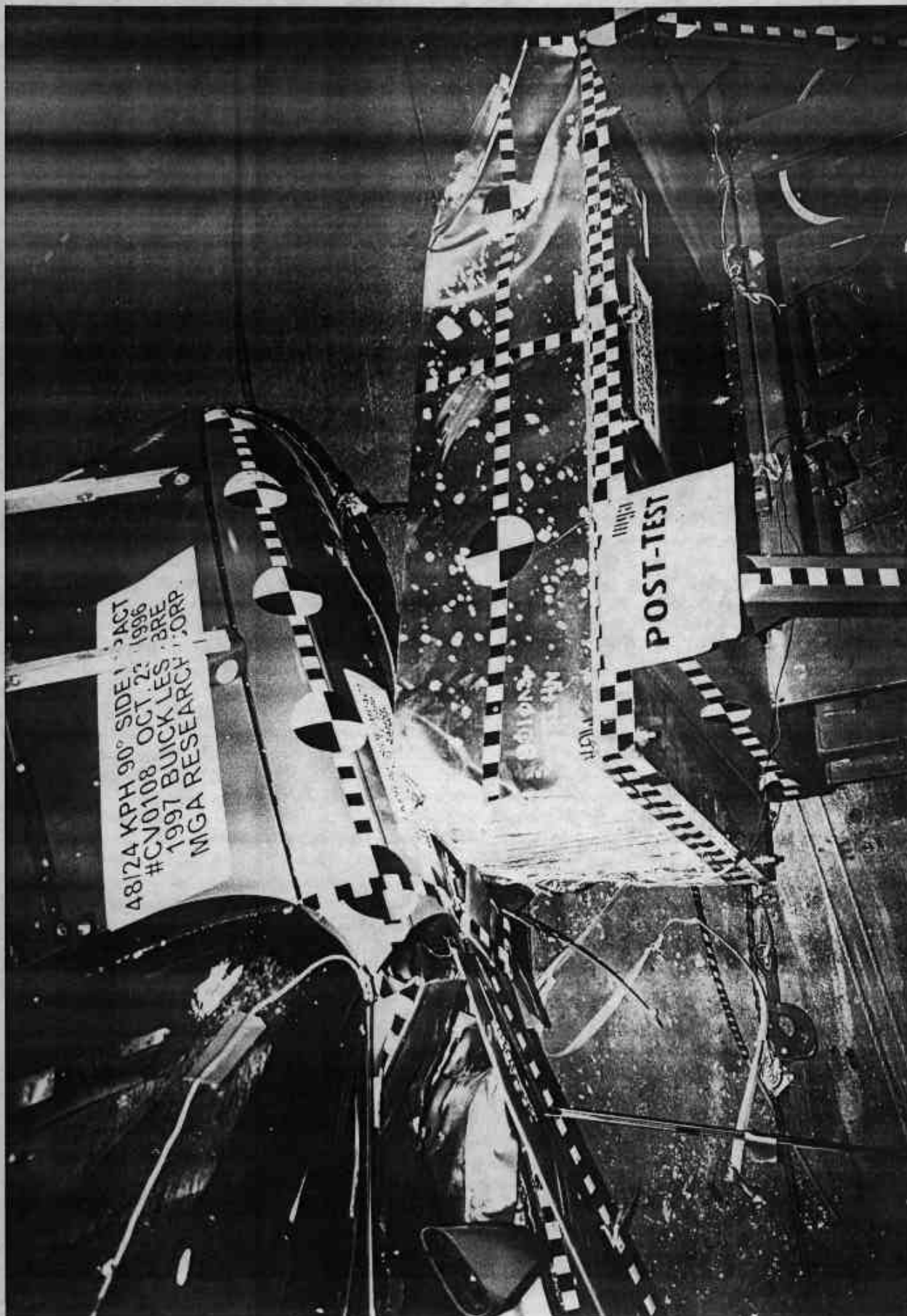


Photo No. A-12 - Post-Test MDB Positioned Against Vehicle Overhead View

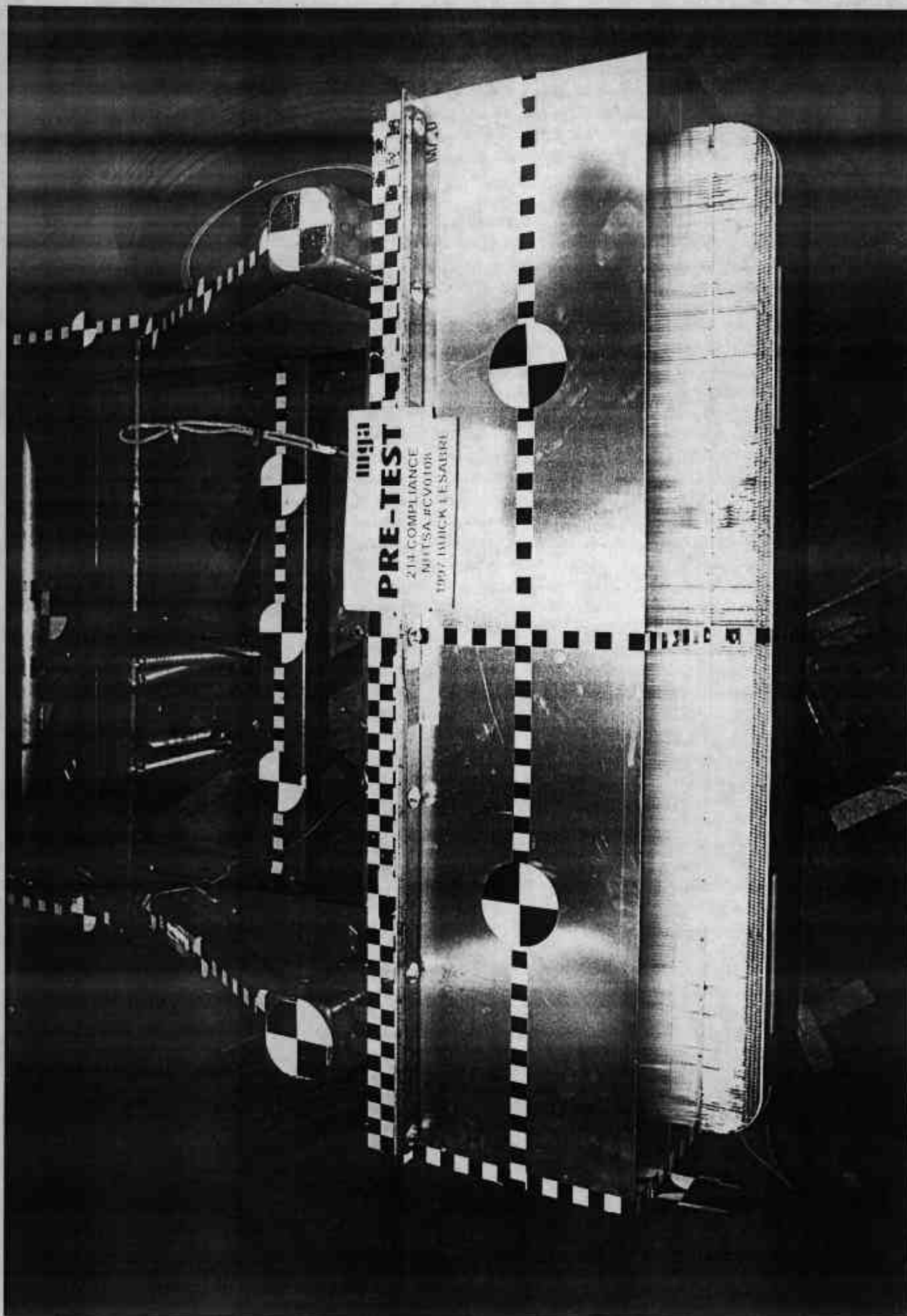


Photo No. A-13 - Pre-Test MDB Top View

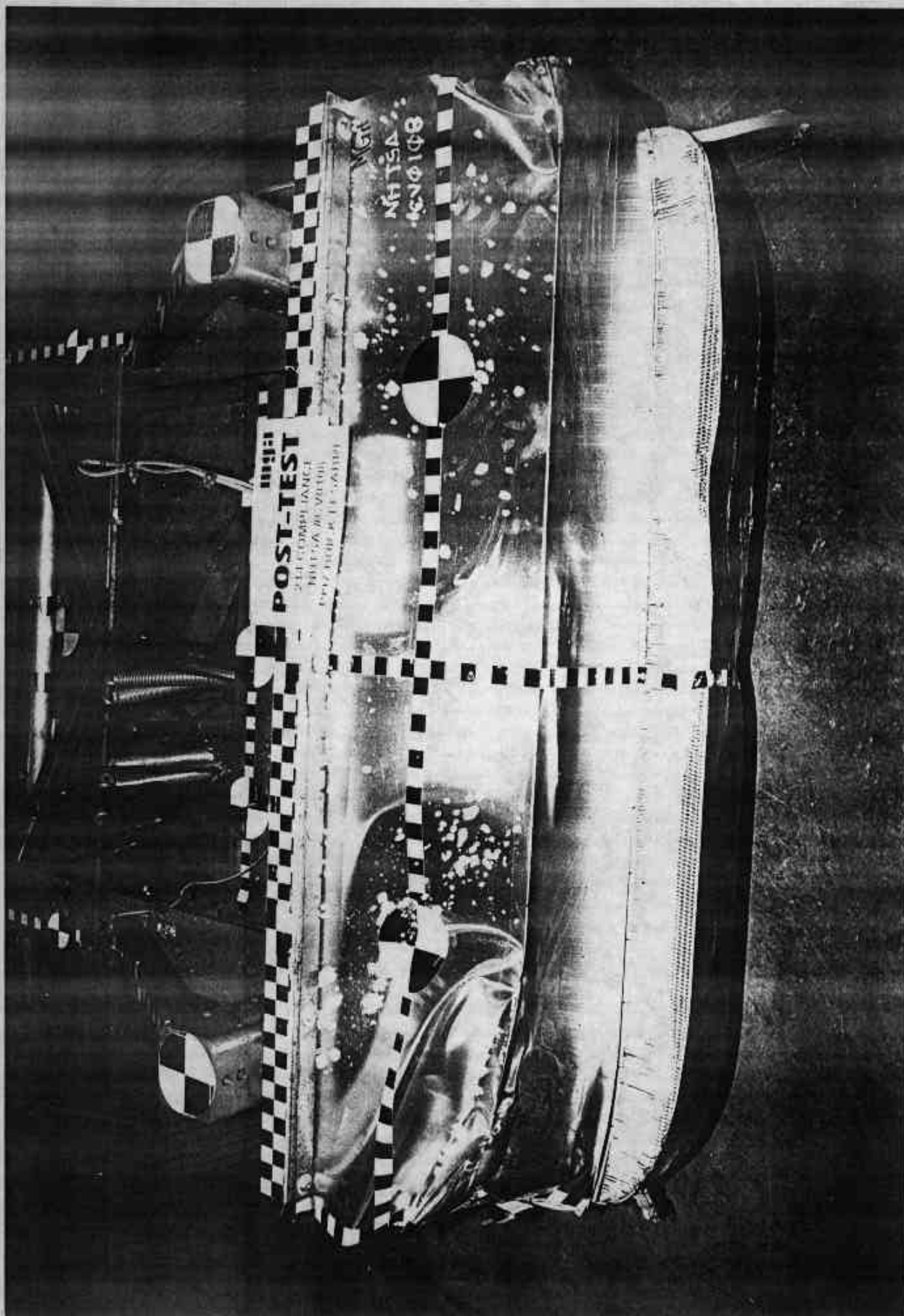


Photo No. A-14 - Post-Test MDB Top View

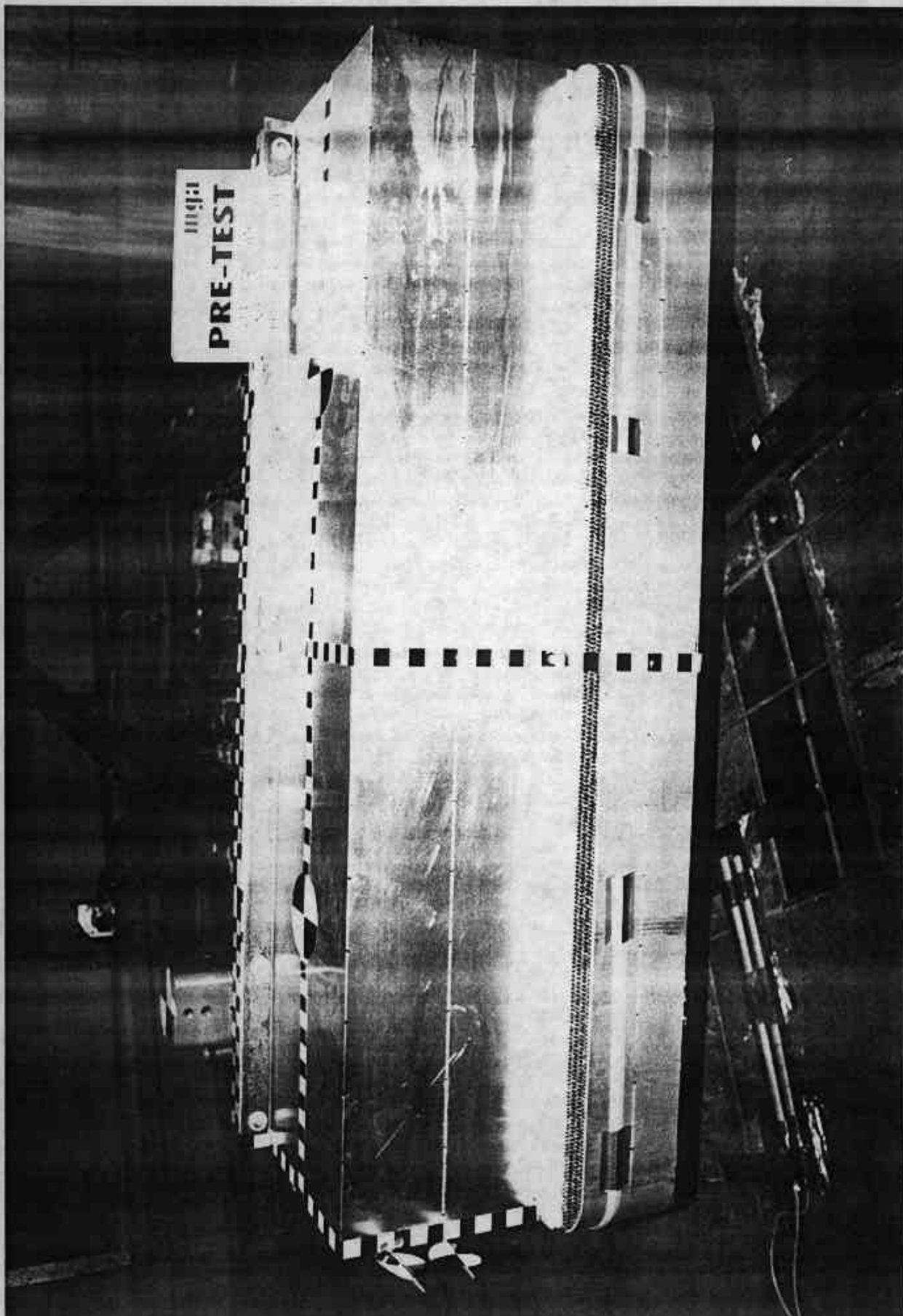


Photo No. A-15 - Pre-Test MDB Front View

A-15



A-16

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

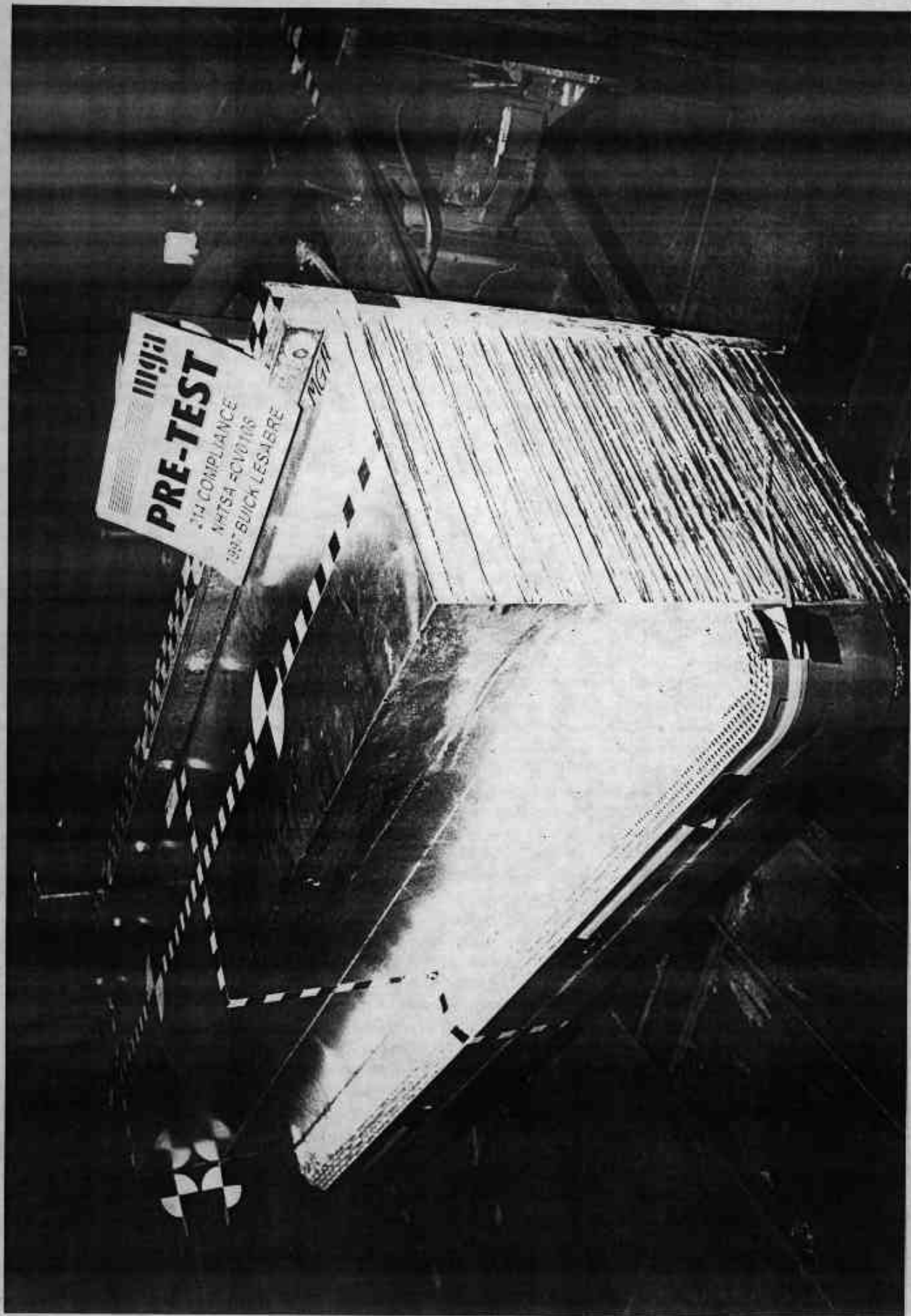


Photo No. A-17 - Pre-Test MDB Left Side View

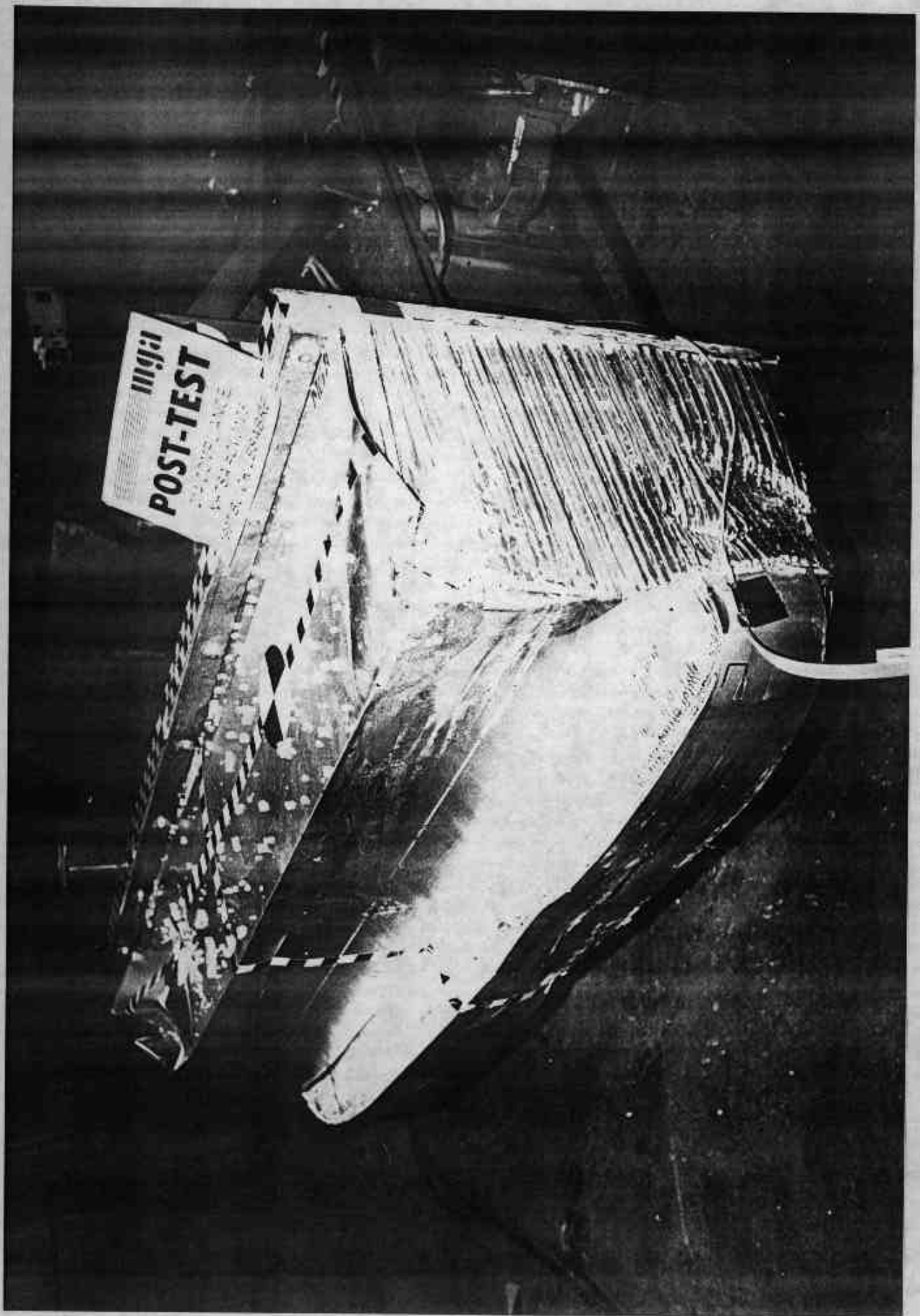


Photo No. A-18 - Post-Test MDB Left Side View

A-18

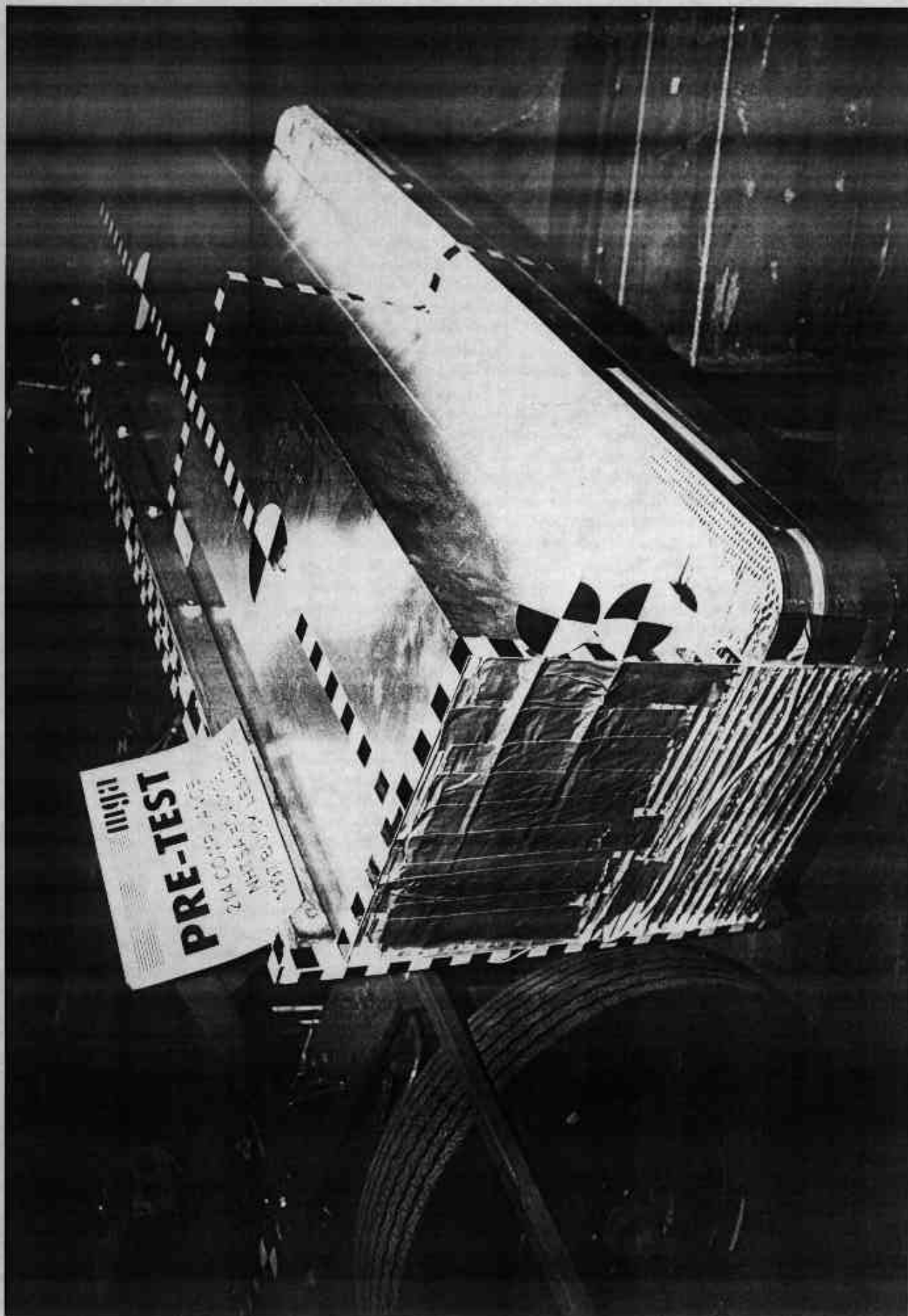


Photo No. A-19 - Pre-Test MDB Right Side View



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

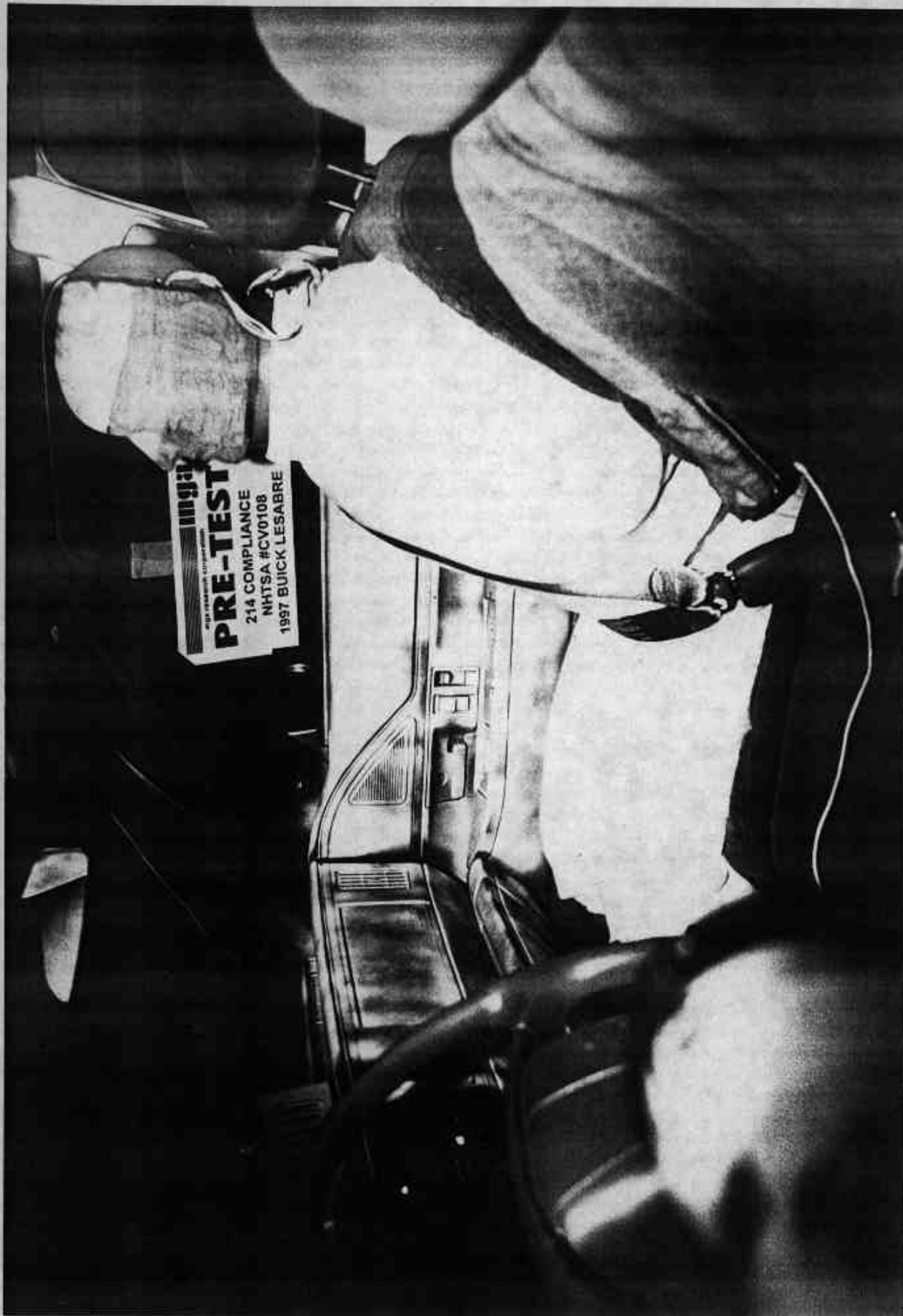


Photo No. A-21 - Pre-Test Front Passenger Dummy Left Side View

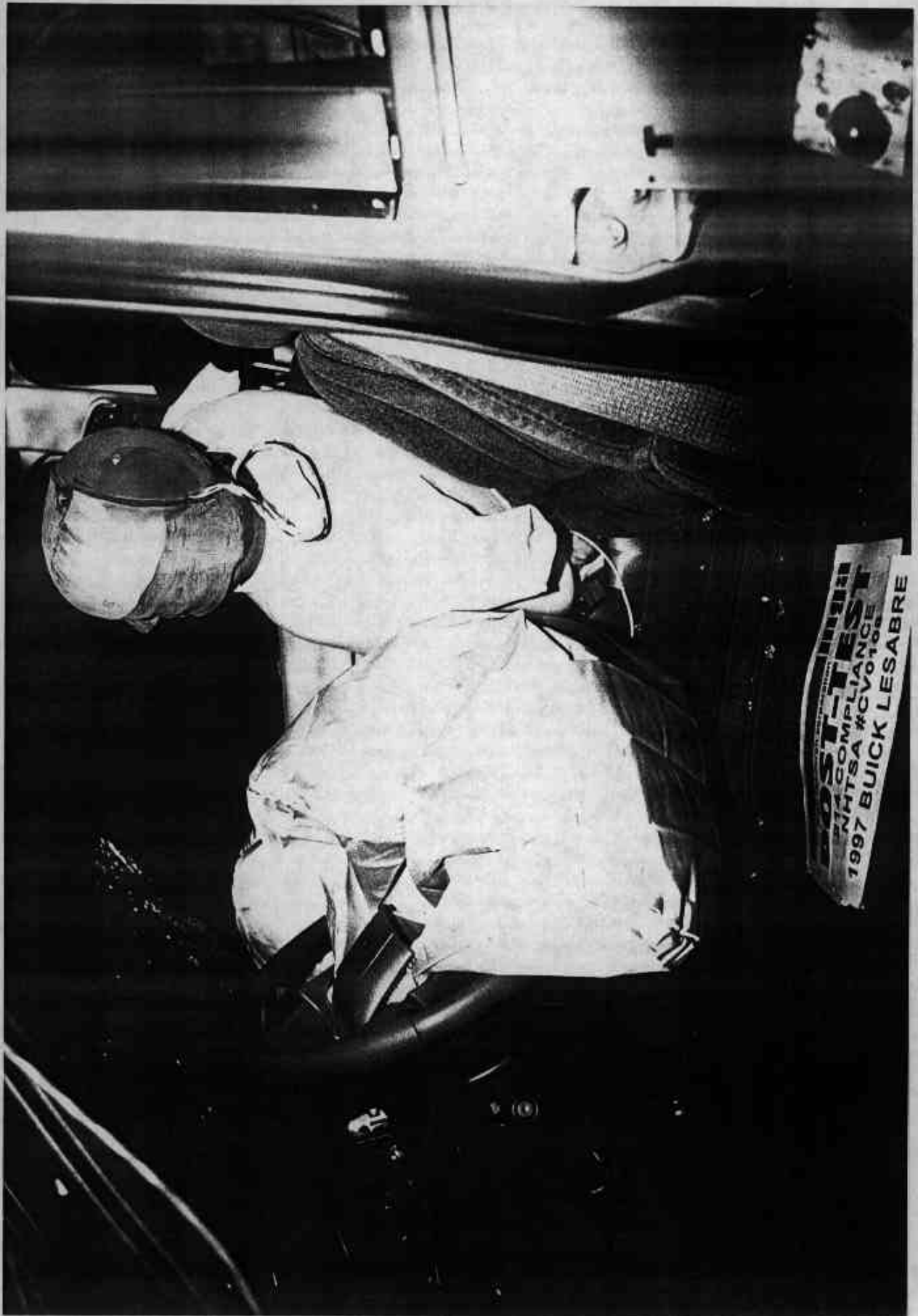


Photo No. A-22 - Post-Test Front Passenger Dummy Left Side View

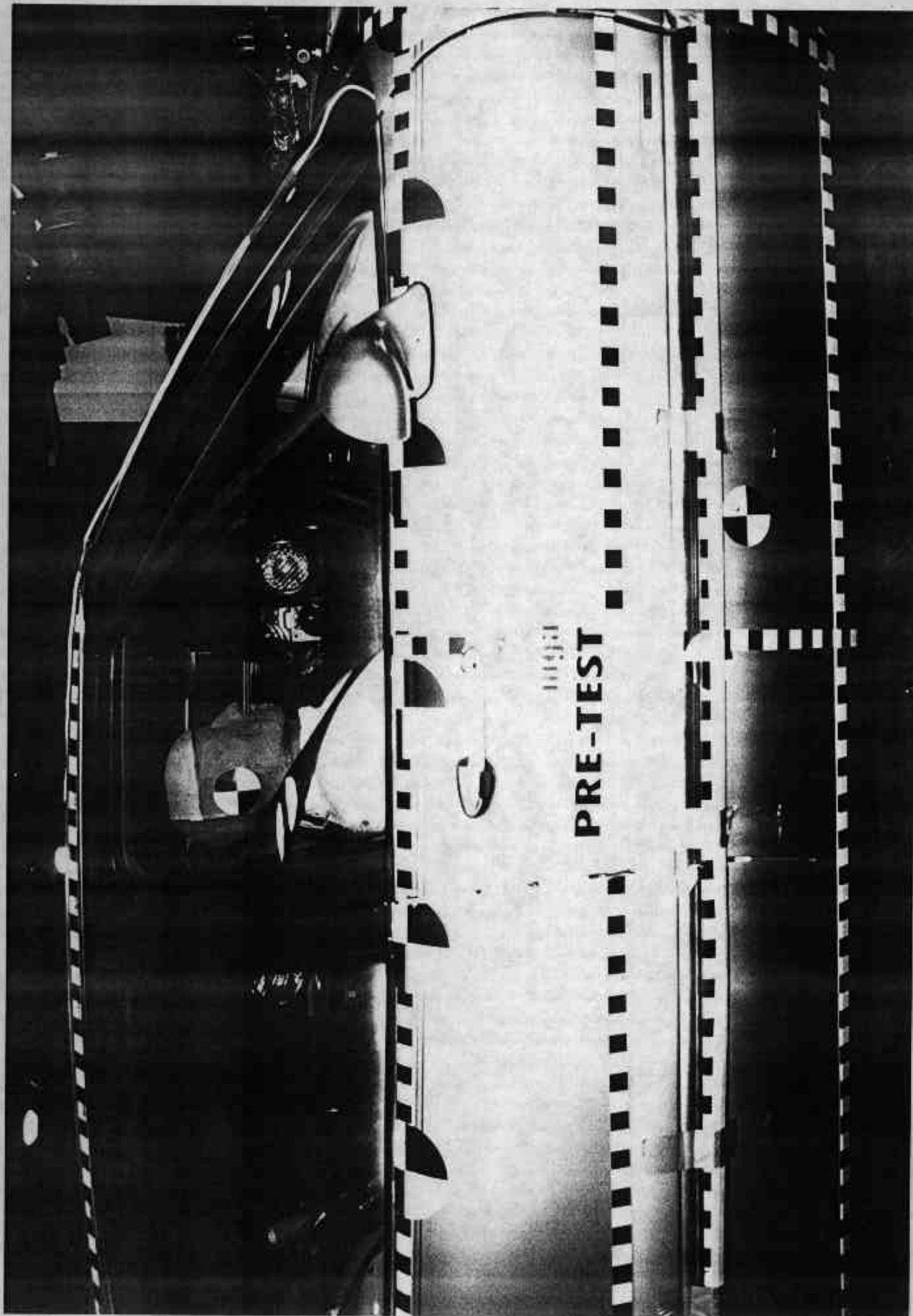


Photo No. A-23 - Pre-Test Front Passenger Dummy Right Side View

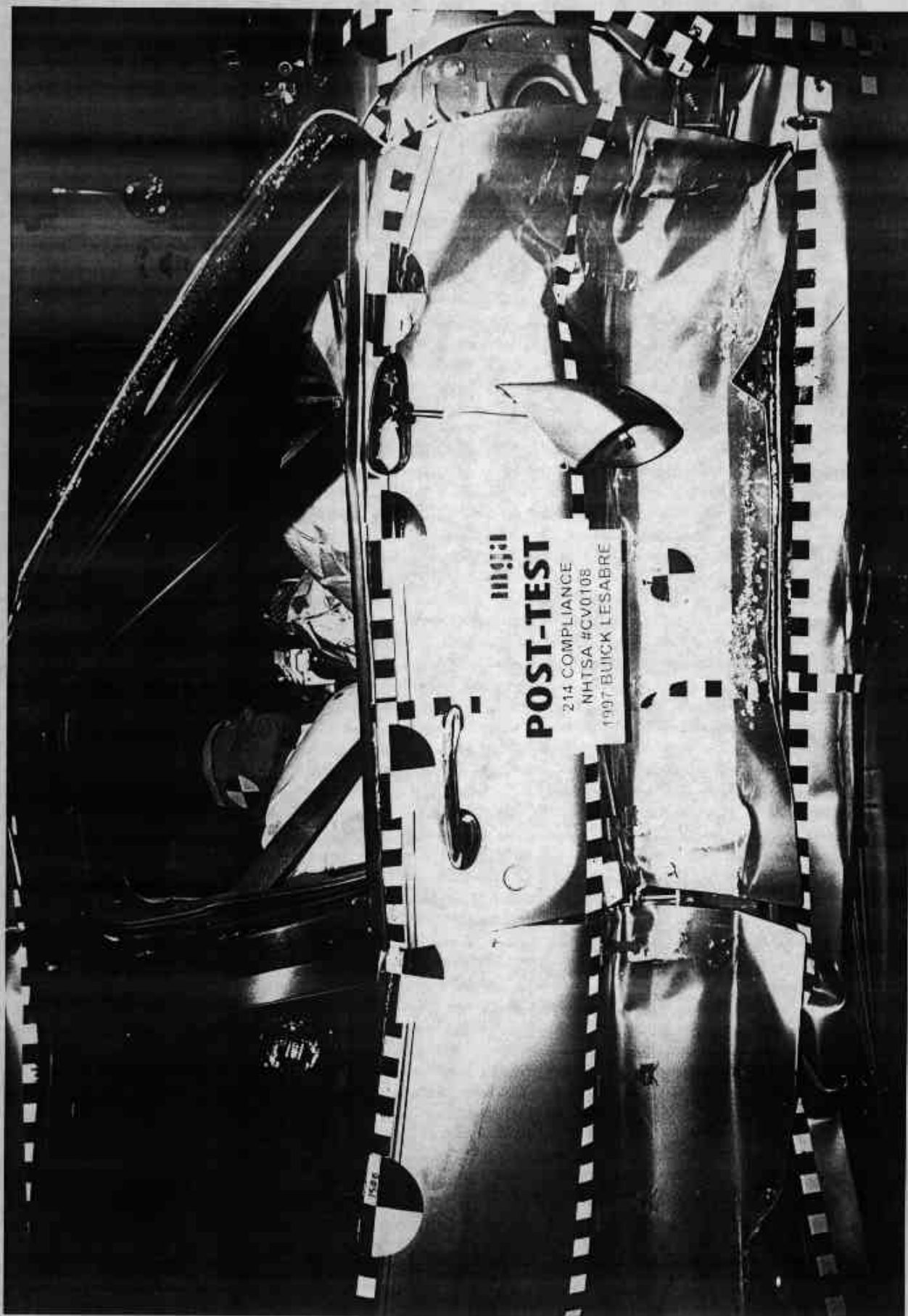


Photo No. A-24 - Post-Test Front Passenger Dummy Right Side View



A-25

Photo No. A-25 - Pre-Test Front Passenger Dummy Right Side View (Door Open)



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



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



Photo No. A-28 - Post-Test Front Passenger Dummy Contact



Photo No. A-29 - Post-Test Front Passenger Head Contact



Photo No. A-30 - Post-Test Front Passenger Head Contact



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

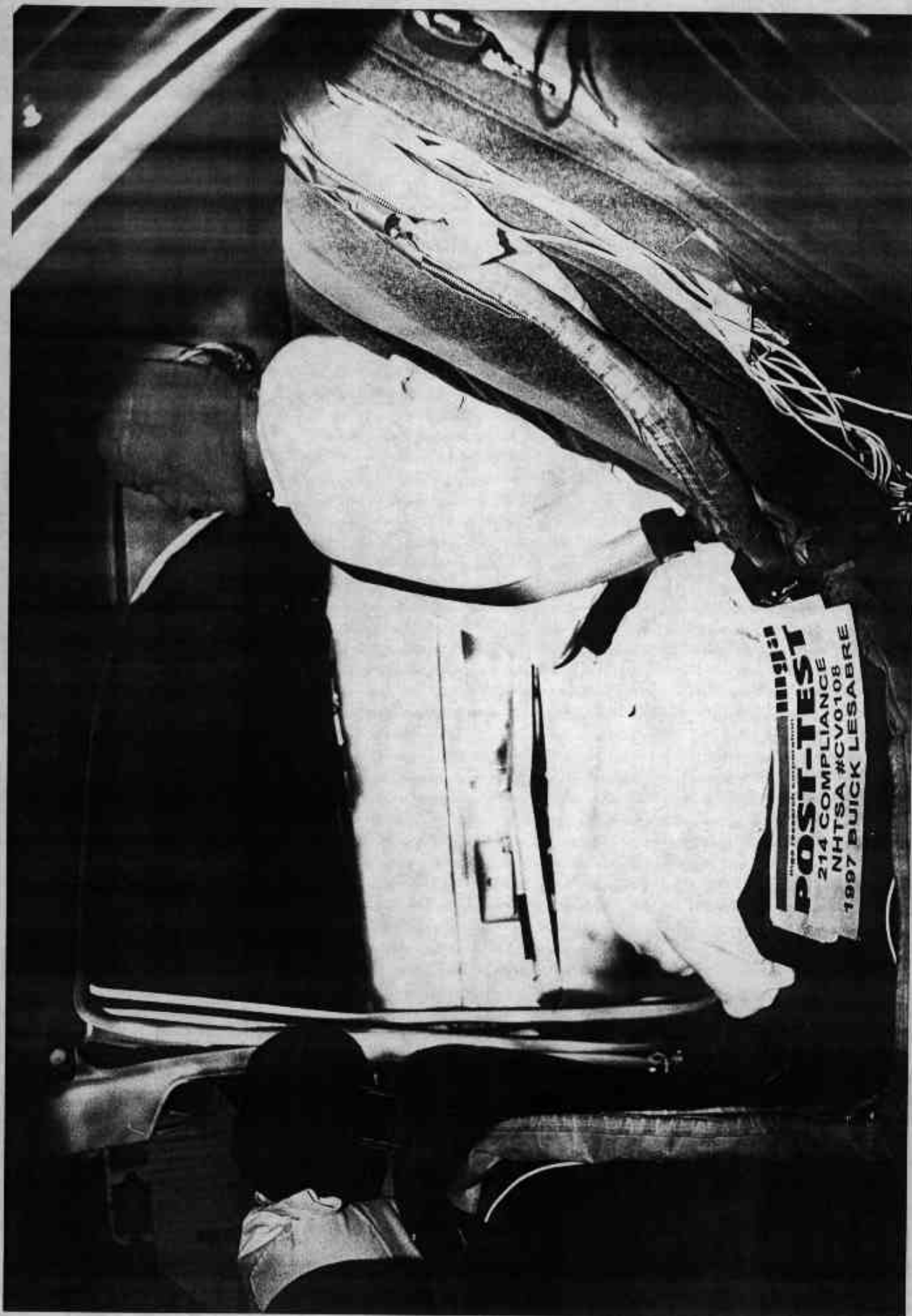


Photo No. A-32 - Post-Test Rear Passenger Dummy Left Side View

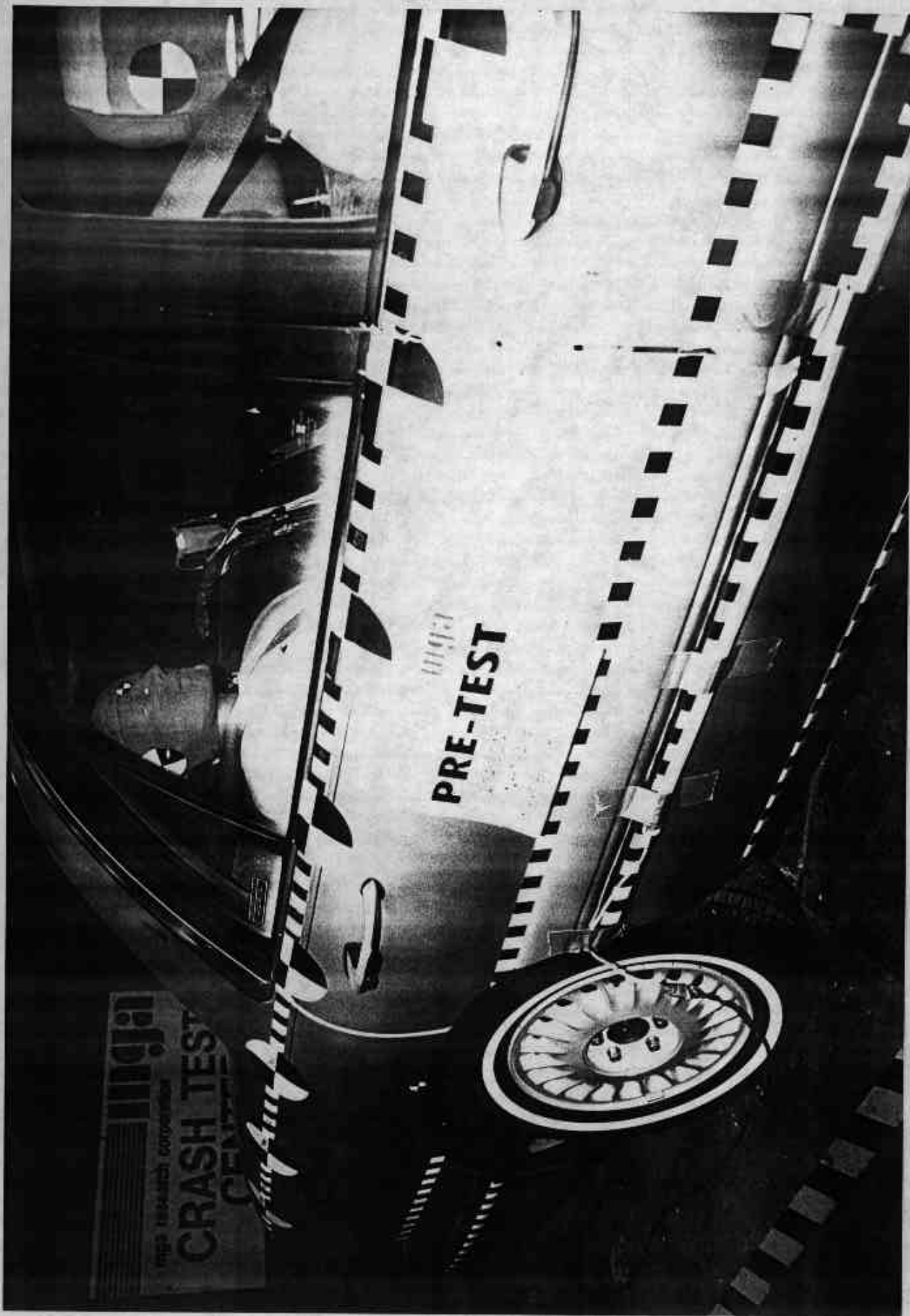


Photo No. A-33 - Pre-Test Rear Passenger Dummy Right Side View



Photo No. A-34 - Post-Test Rear Passenger Dummy Right Side View

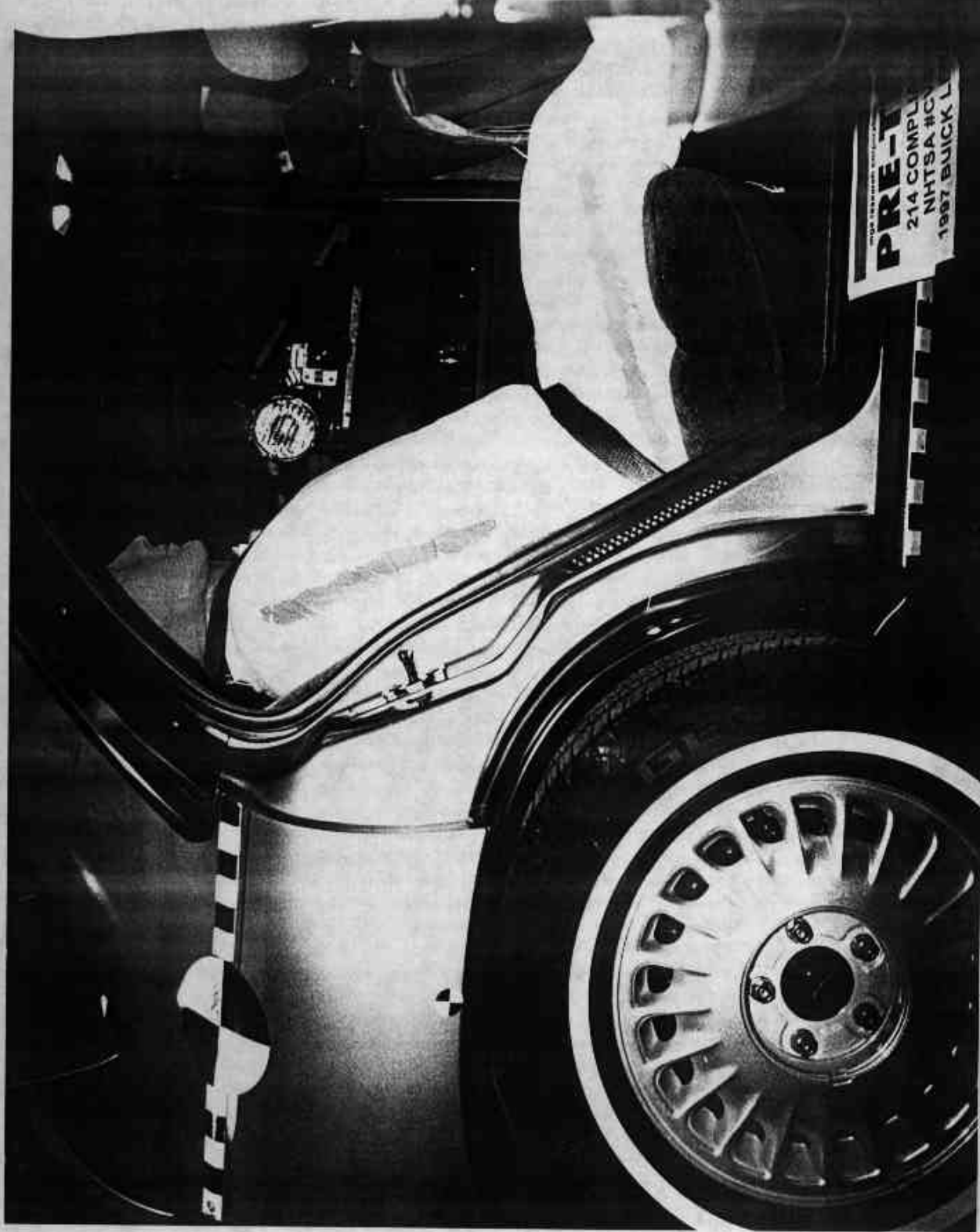


Photo No. A-35 - Pre-Test Rear Passenger Dummy Right Side View (Door Open)



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



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



PRE-TEST

48/24 KPH 90° SIDE IMP
#CV0108 OCT 23, 1999
1997 BUICK LESABRE
MGA RESEARCH CORP

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

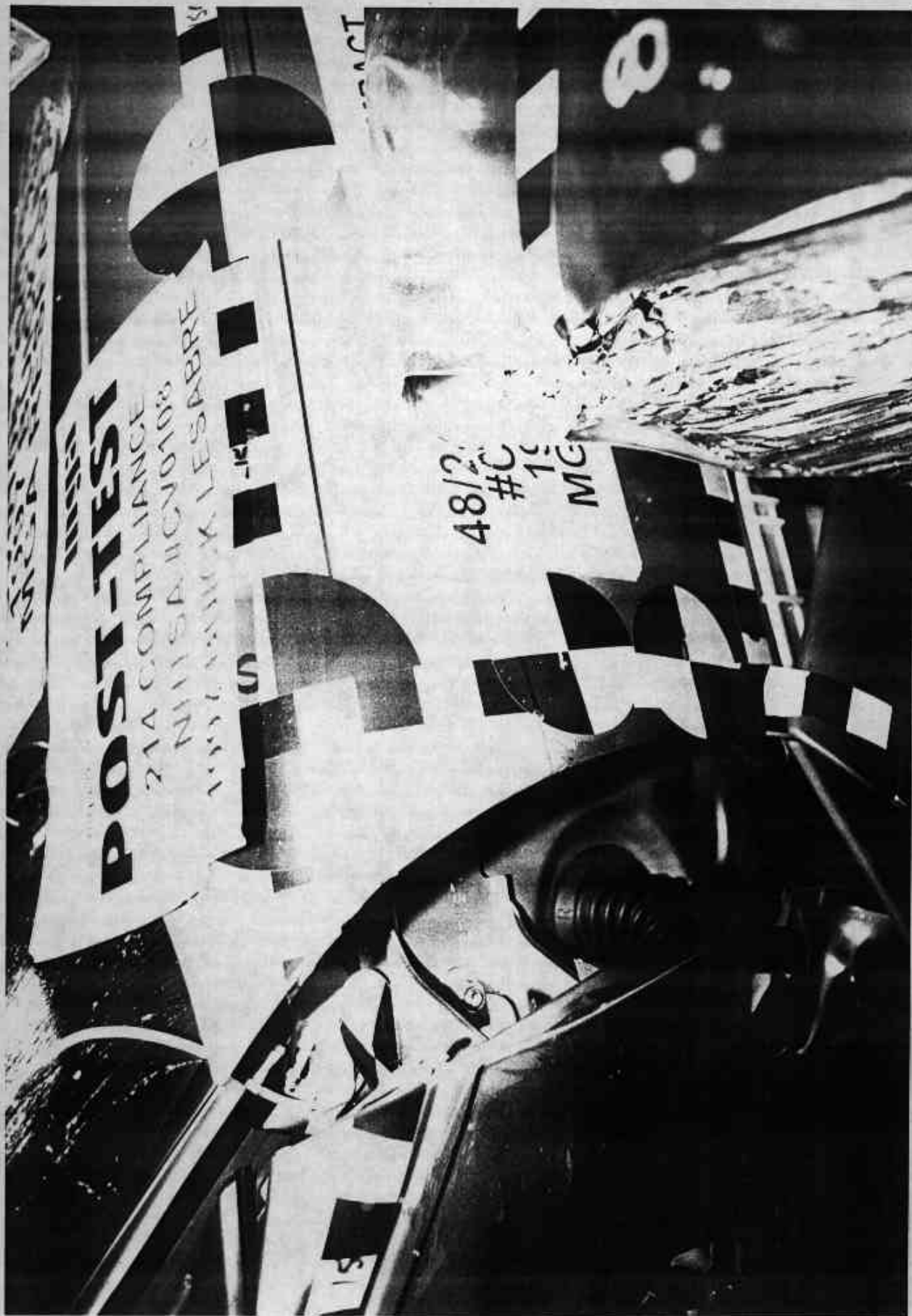
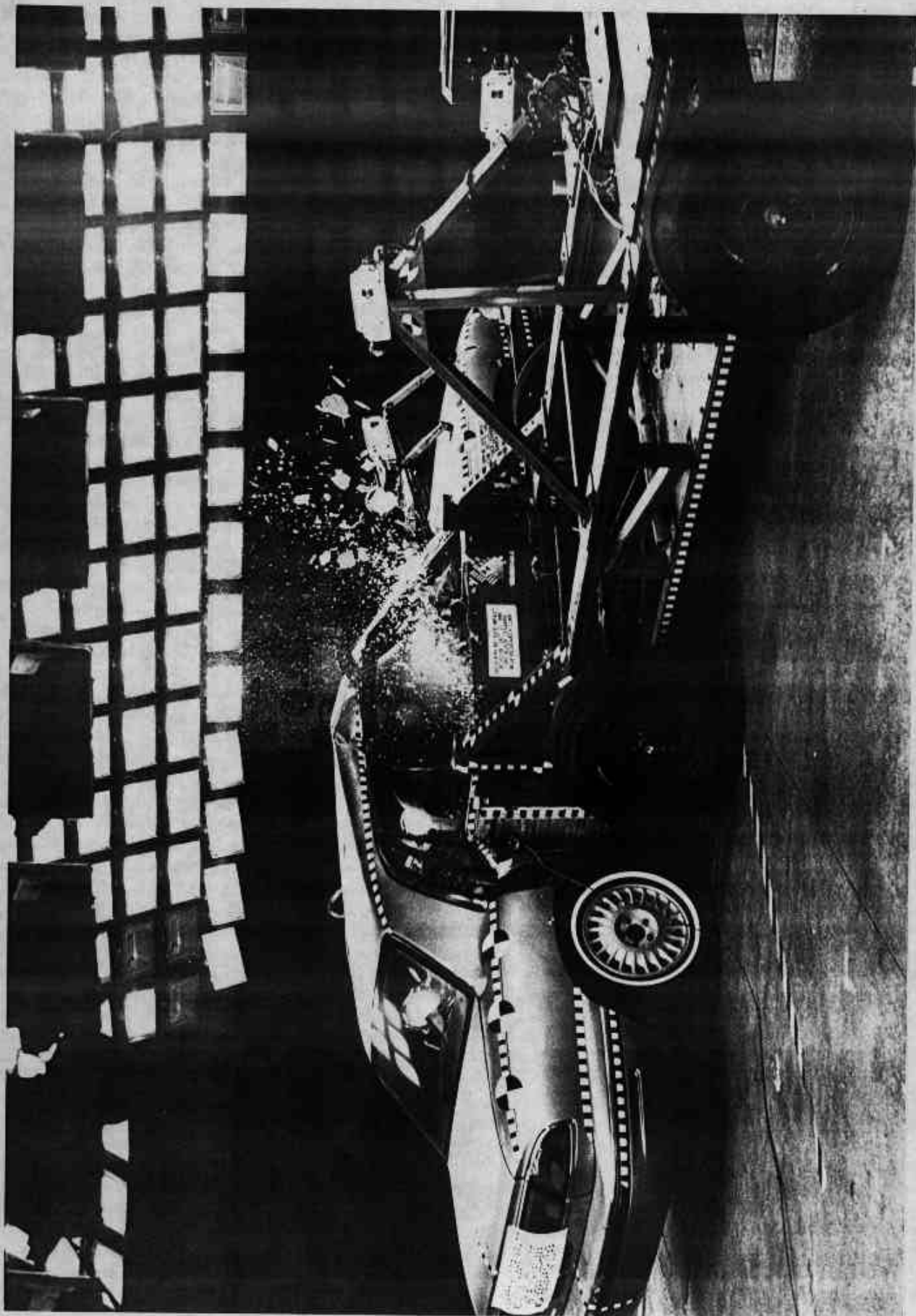


Photo No. A-40 - Post-Test Right Front Impact Point on Vehicle



A-41

Photo No. A-41 - Impact



MFD BY GENERAL MOTORS CORP

DATE
08/96

GVWR
4545 LB
2062 KG

GAWR FRT
2530 LB
1148 KG

GAWR RR
2015 LB
914 KG

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.

1G4HP52K1VH478264

TYPE: PASS CAR



TIRE - LOADING INFORMATION

OCCUPANTS			VEHICLE CAP. WT.	
FRT.	CTR.	RR.	TOTAL	
3	0	3	6	LBS
				KG
				1076
				488

MAX. LOADING @ GVWR SAME AS VEHICLE CAPACITY WEIGHT.
1G4HP52K1VH478264

MODEL: HP69 HAA

TIRE SIZE		SPEED RTG	COLD TIRE PRESSURE
FRT	P205/70R15	S	30/210 PSI/KPA
RR	P205/70R15	S	30/210 PSI/KPA
SPA	T125/70D15	M	60/420 PSI/KPA

IF TIRES ARE HOT, ADD 4 PSI / 28 KPA
SEE OWNER'S MANUAL FOR MORE INFORMATION

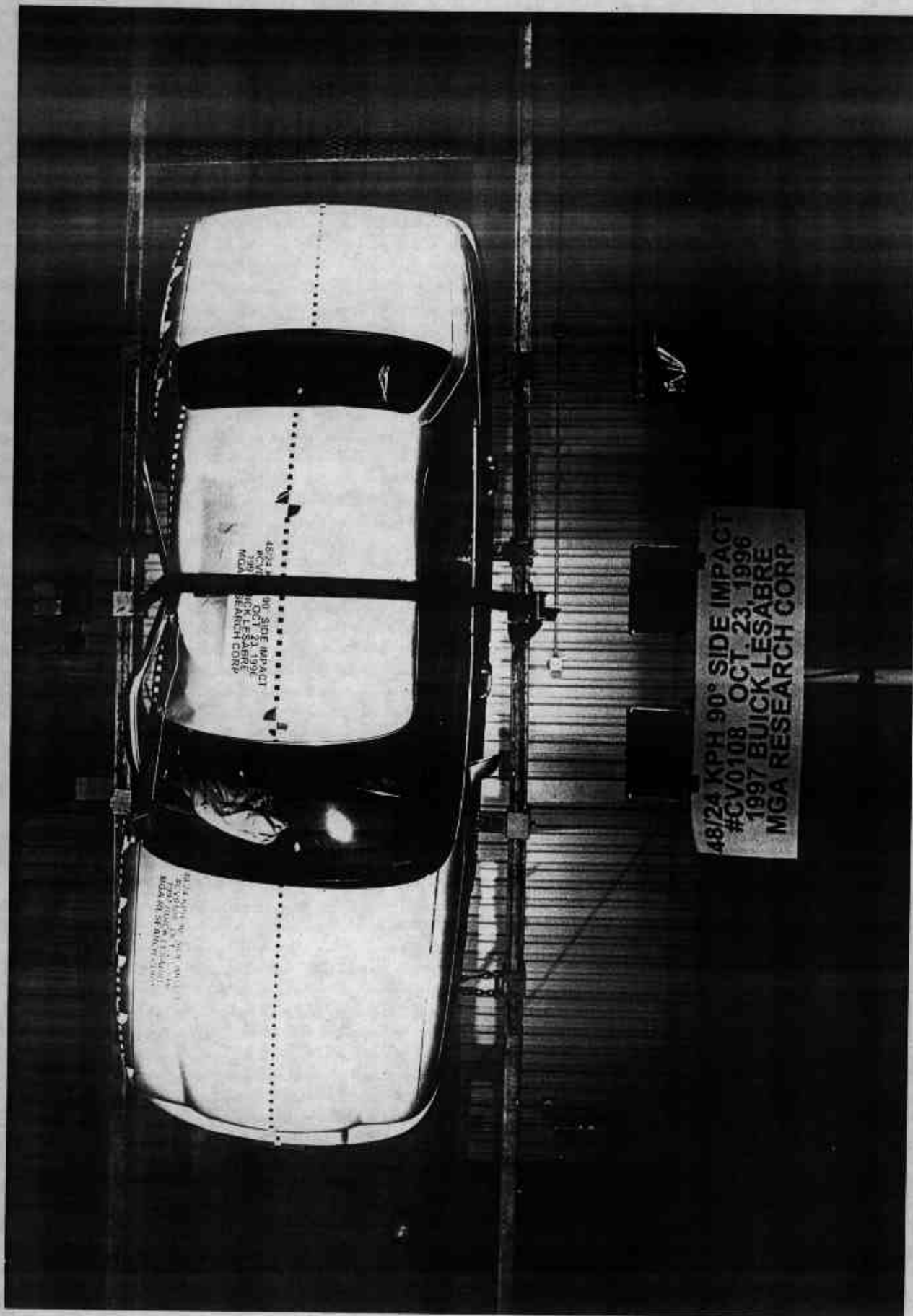


Photo No. A-44 - Rollover 90°

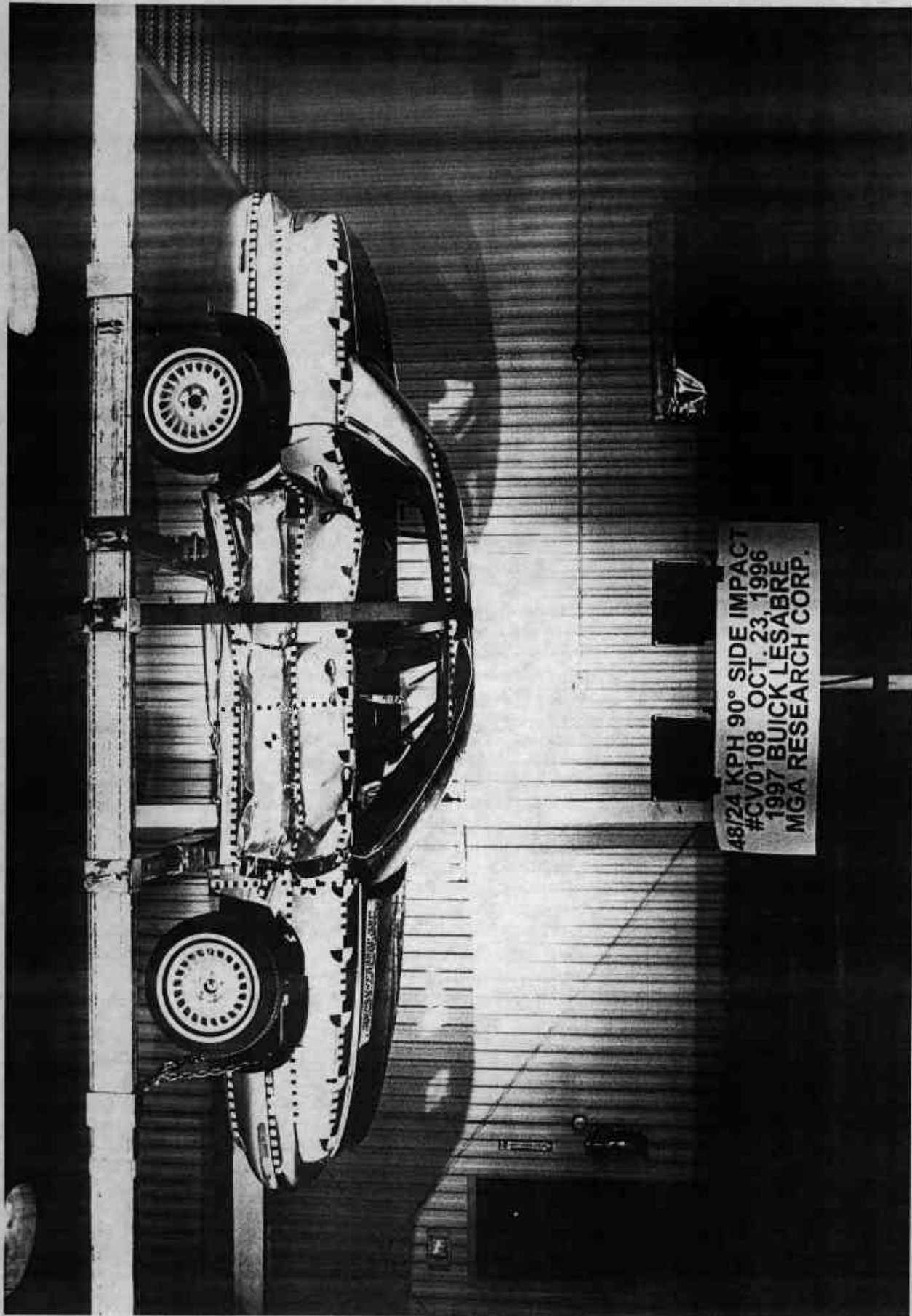
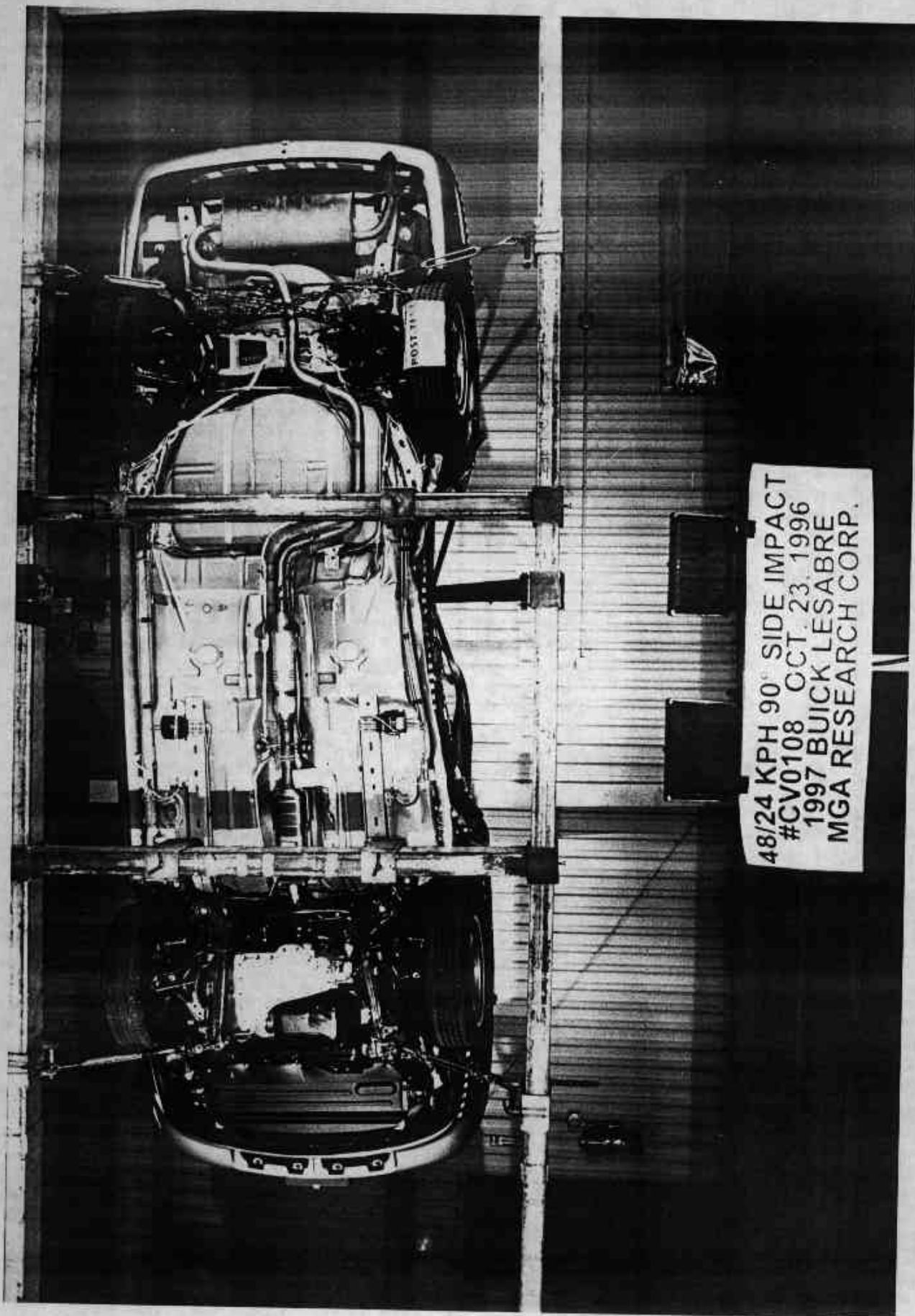
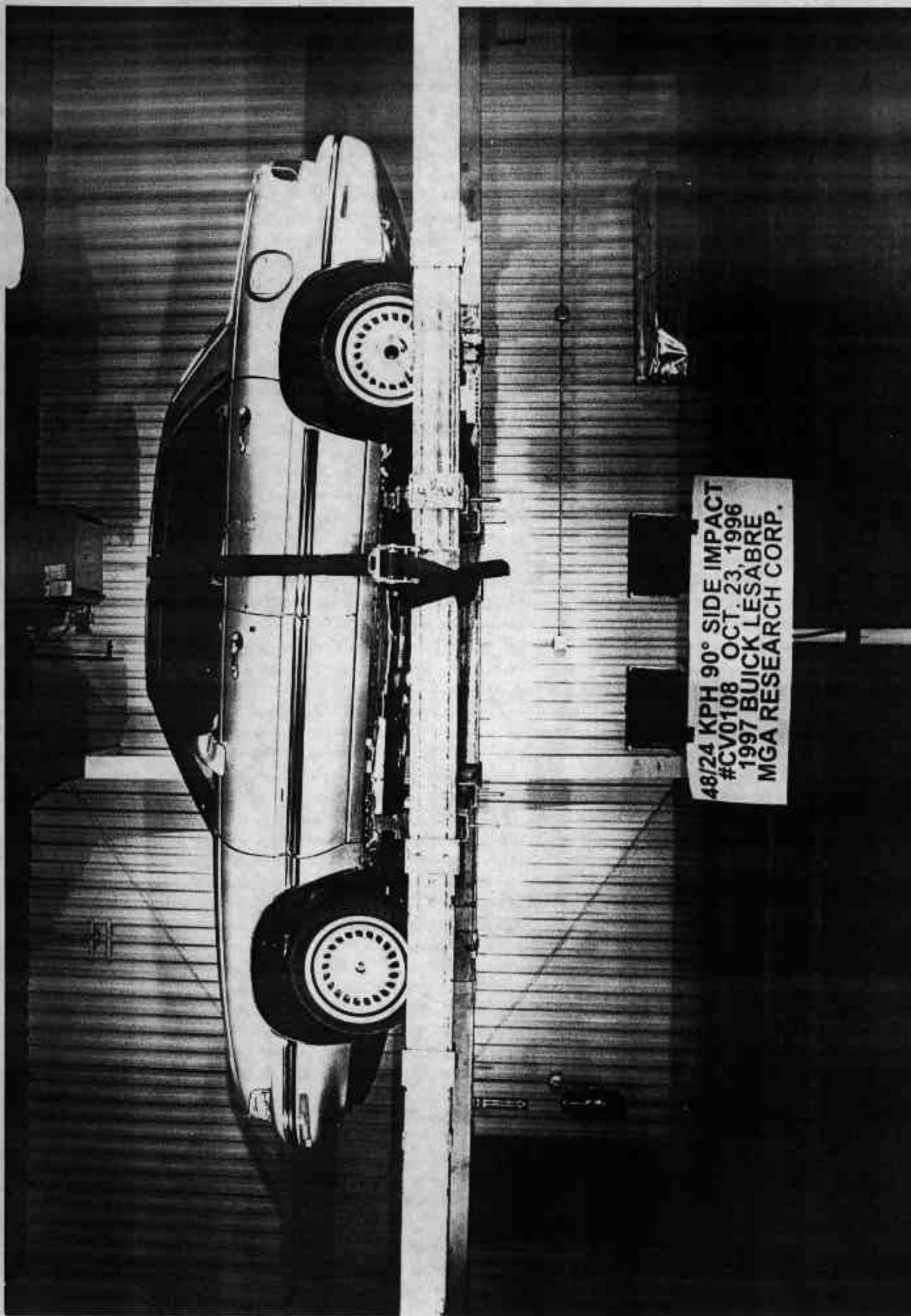


Photo No. A-45 - Rollover 180°



48/24 KPH 90° SIDE IMPACT
#CV0108 OCT. 23, 1996
1997 BUICK LESABRE
MGA RESEARCH CORP.

Photo No. A-46 - Rollover 270°



A-47

Photo No. A-47 - Rollover 360°

48/24 KPH 90° SIDE IMPACT
#CV0108 OCT. 23, 1996
1997 BUICK LESABRE
MGA RESEARCH

PRE-TEST

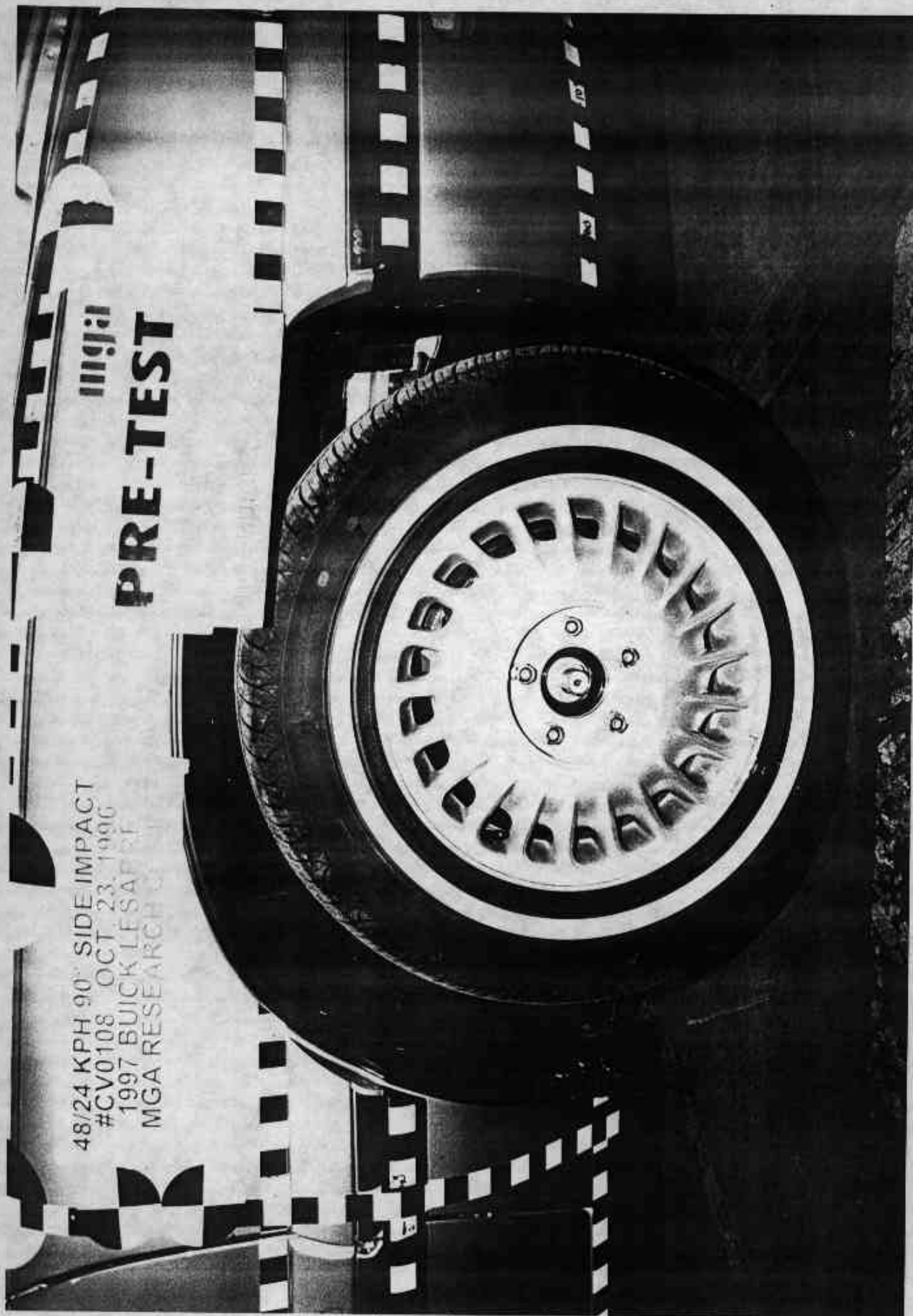


Photo No. A-48 - Right Front Attitude Point

11111111

PRE-TEST

2014 COMPI

2014 COMPI

2014 COMPI

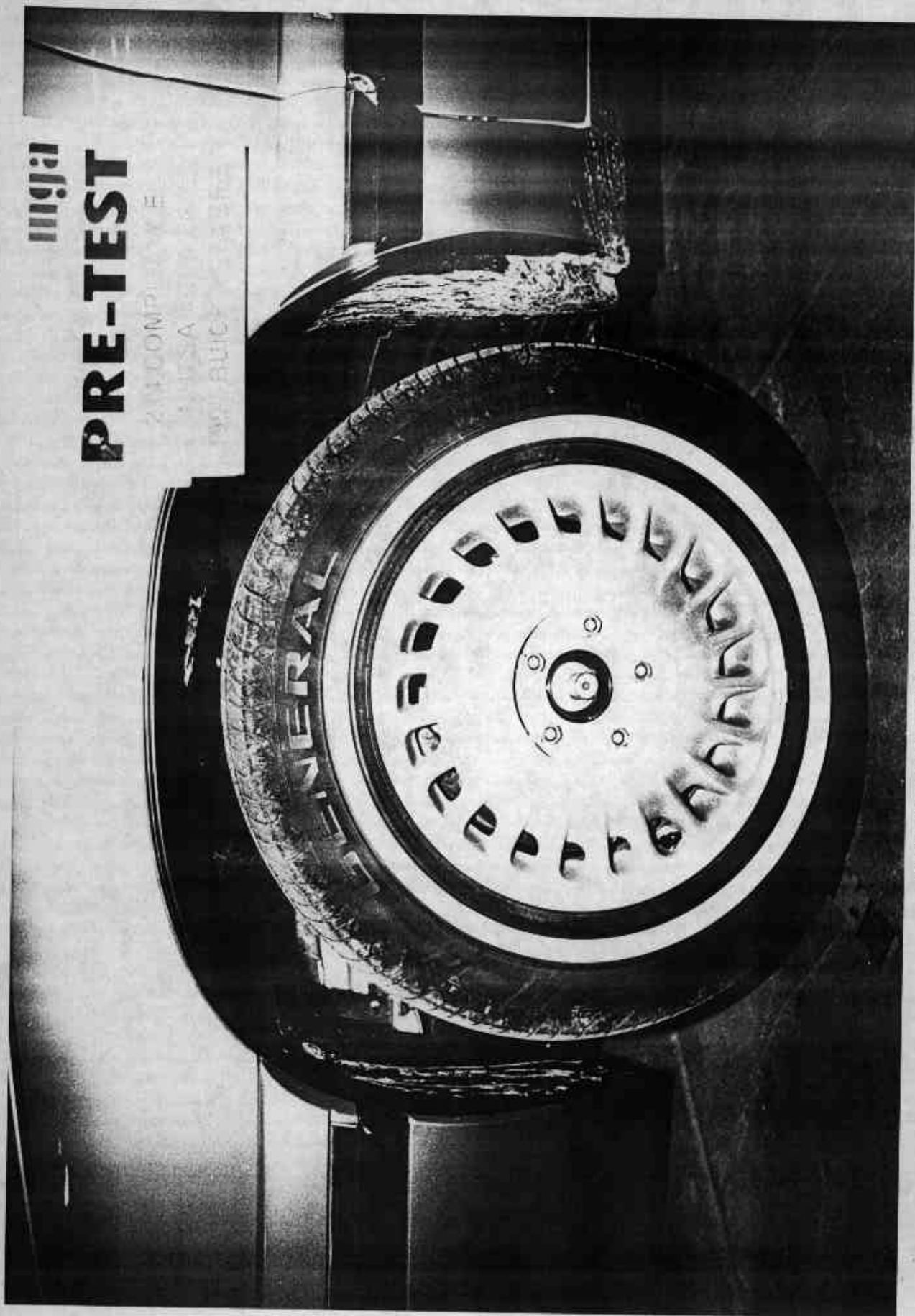


Photo No. A-49 - Left Front Attitude Point

PRE-TEST

214 COMPLETE

NHTSA #CV

1997 BUICK LESABRE

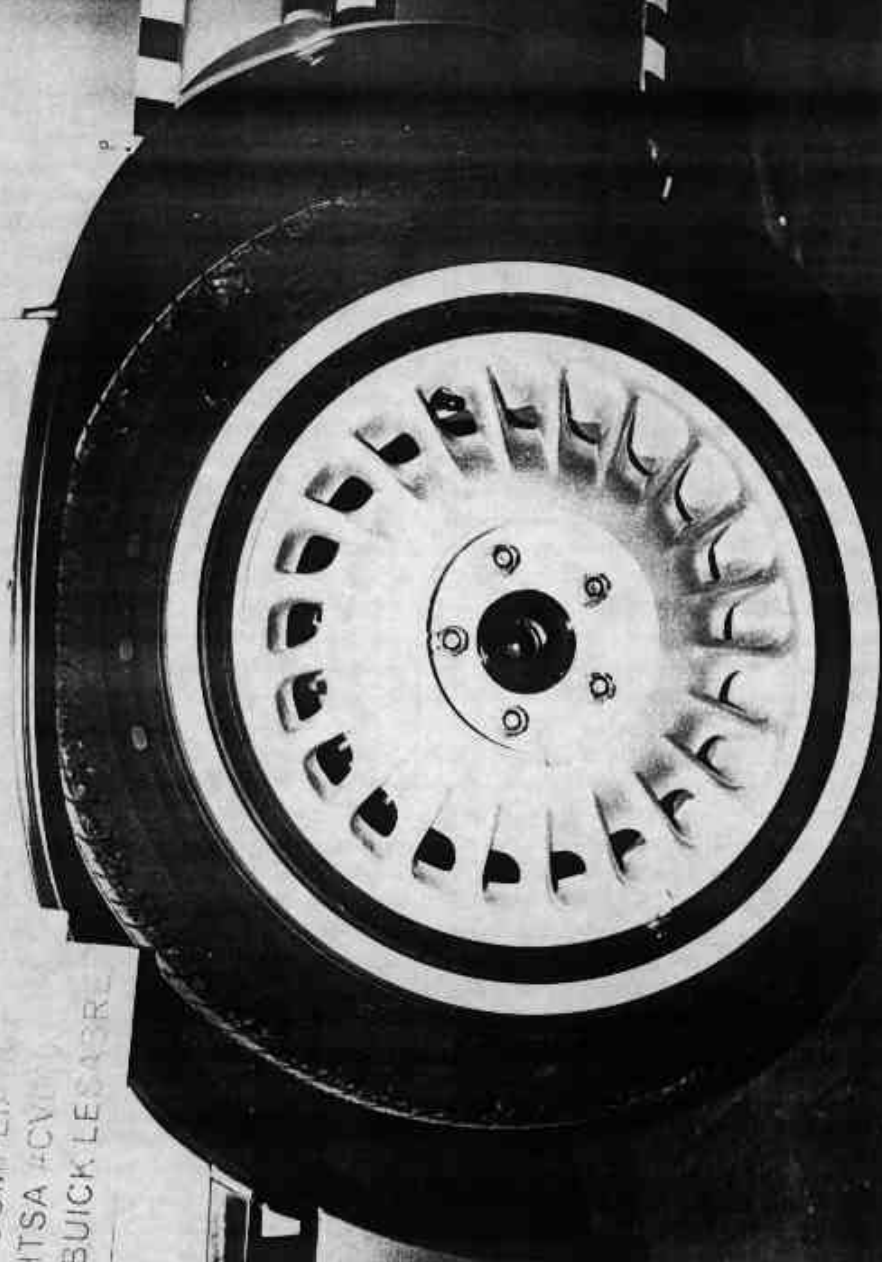


Photo No. A-50 - Right Rear Attitude Point



Photo No. A-51 - Left Rear Attitude Point

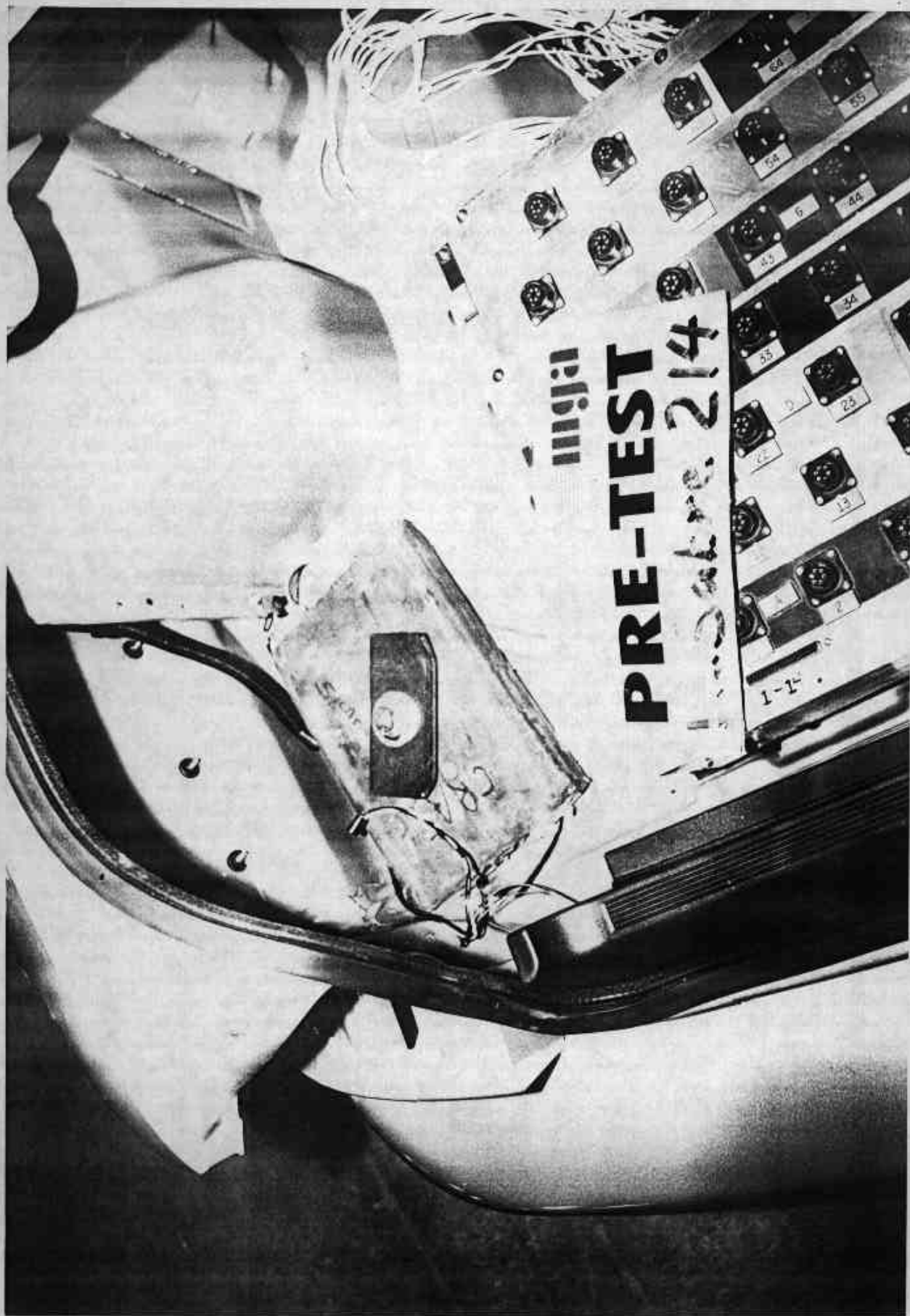


Photo No. A-52 - Added Ballast in Trunk Area



Photo No. A-53 - Added Ballast in Trunk Area

A-53

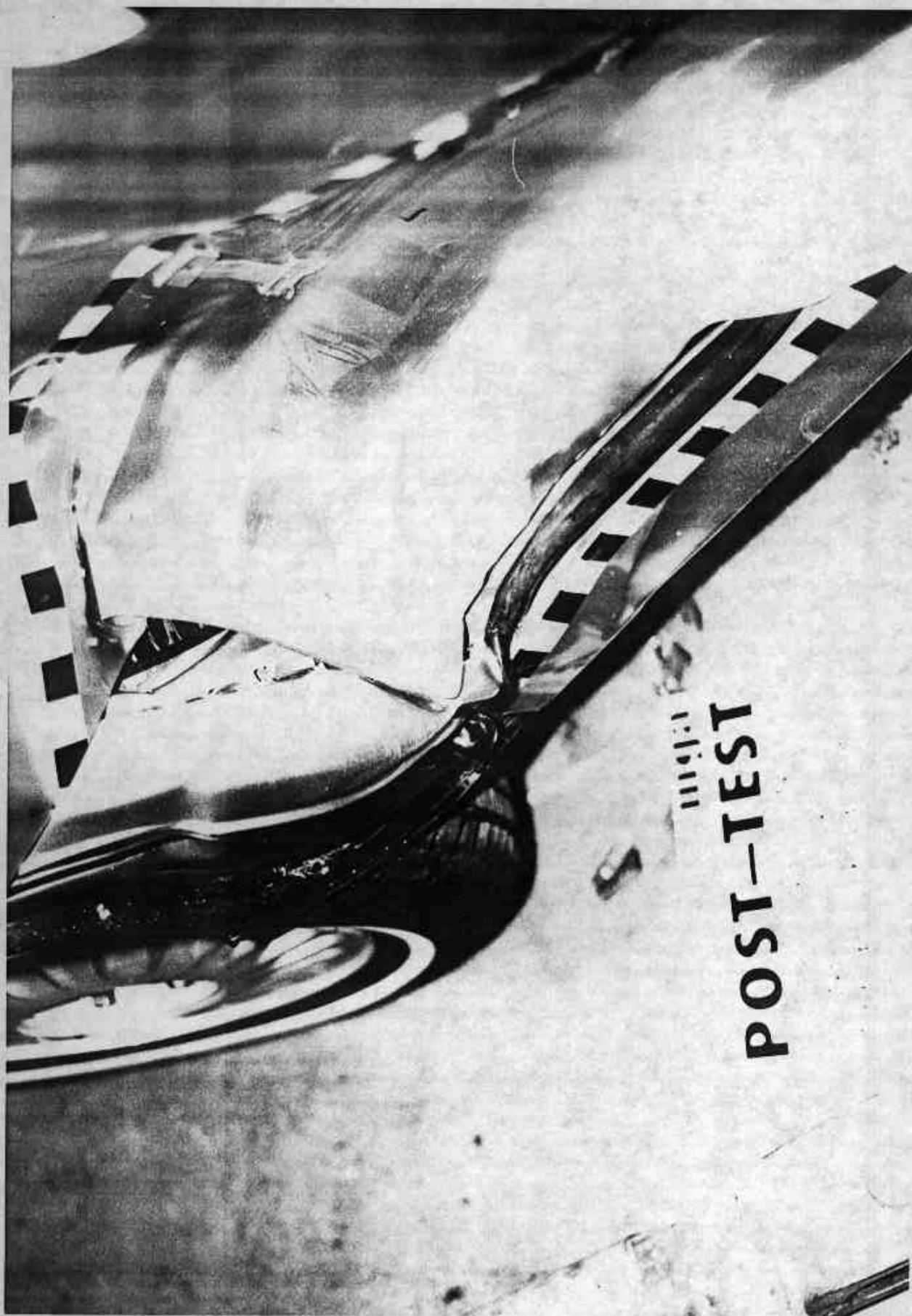


Photo No. A-54 - Right Rear Dog Leg Separation

A-54

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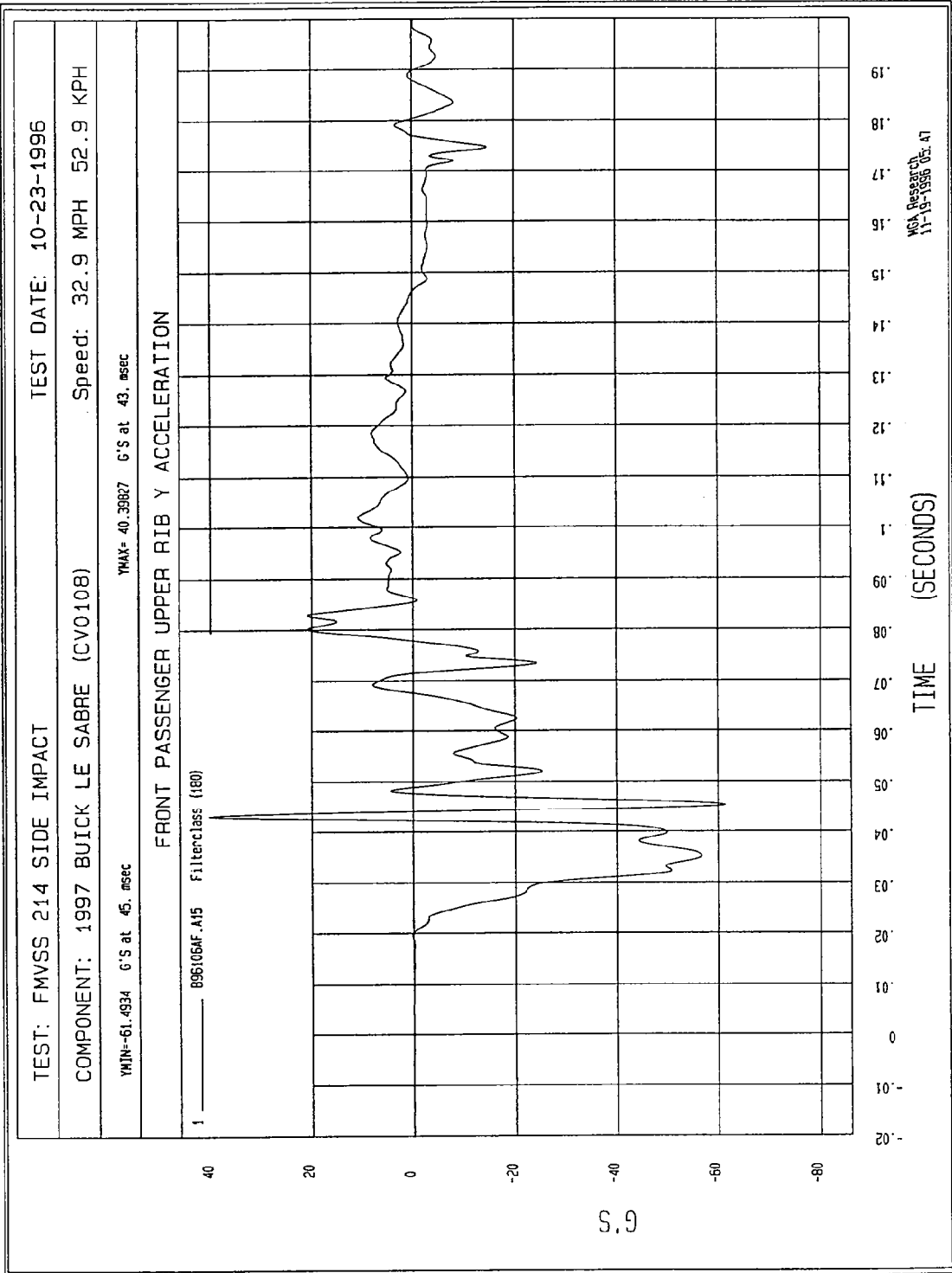
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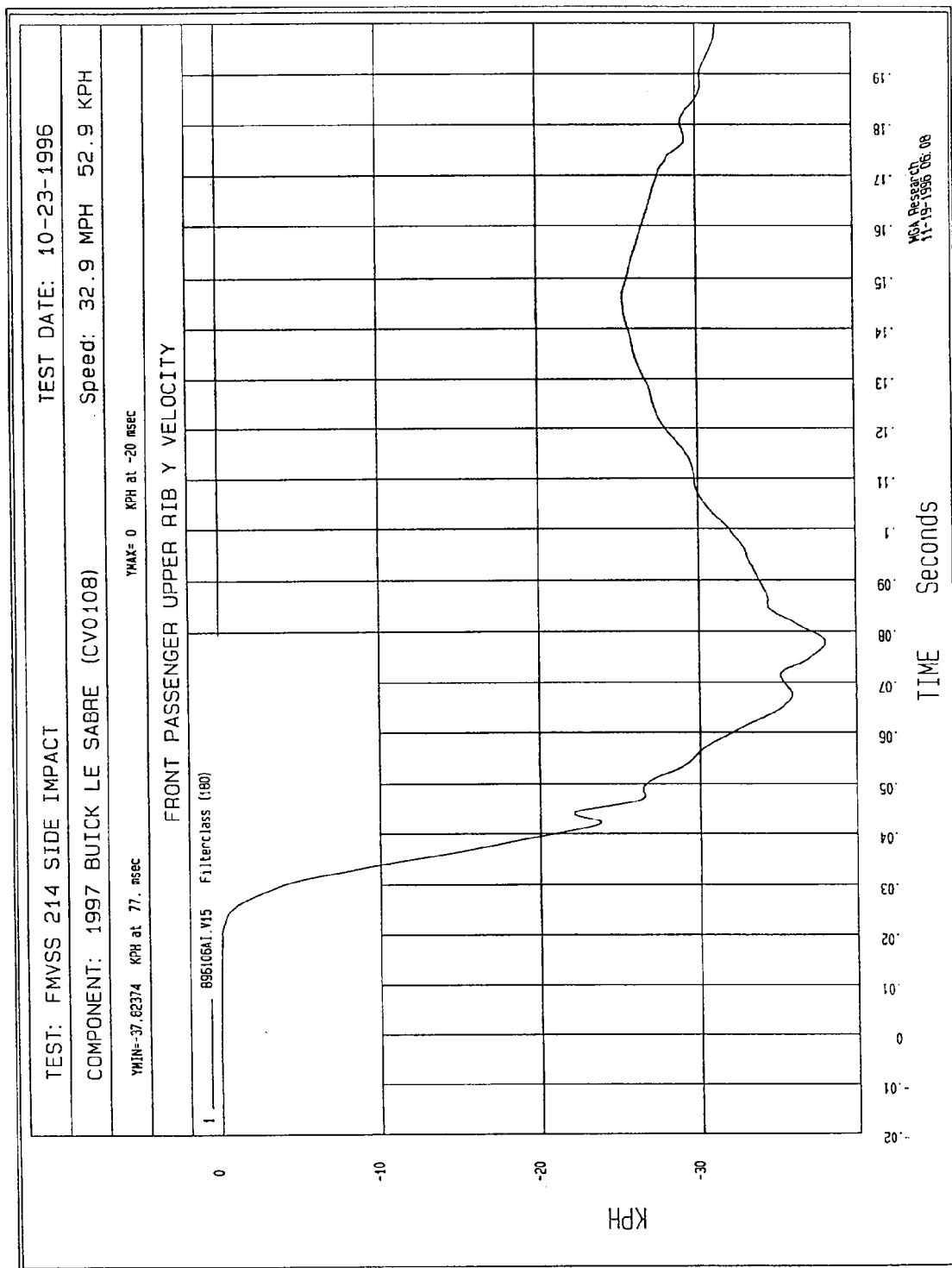
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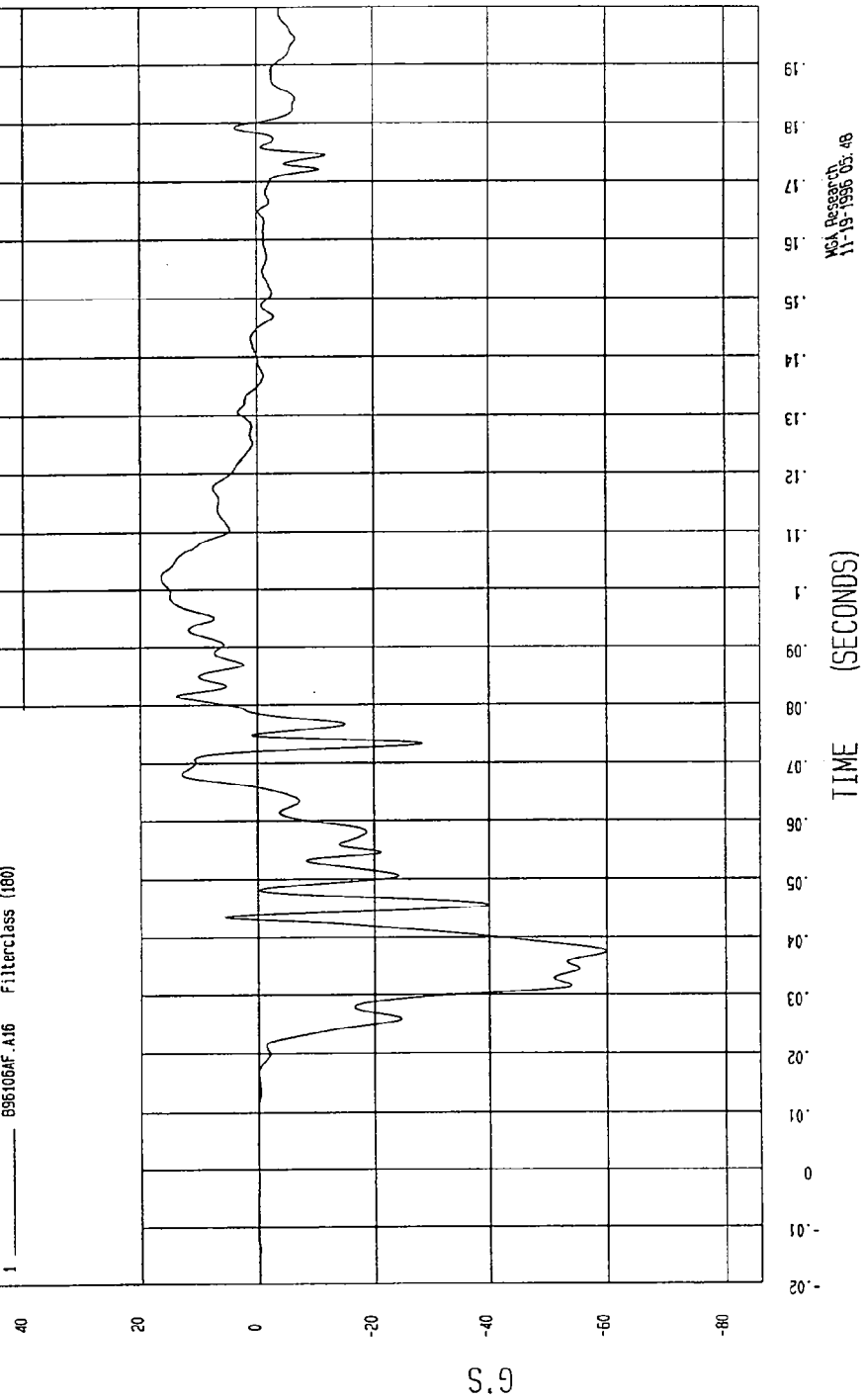
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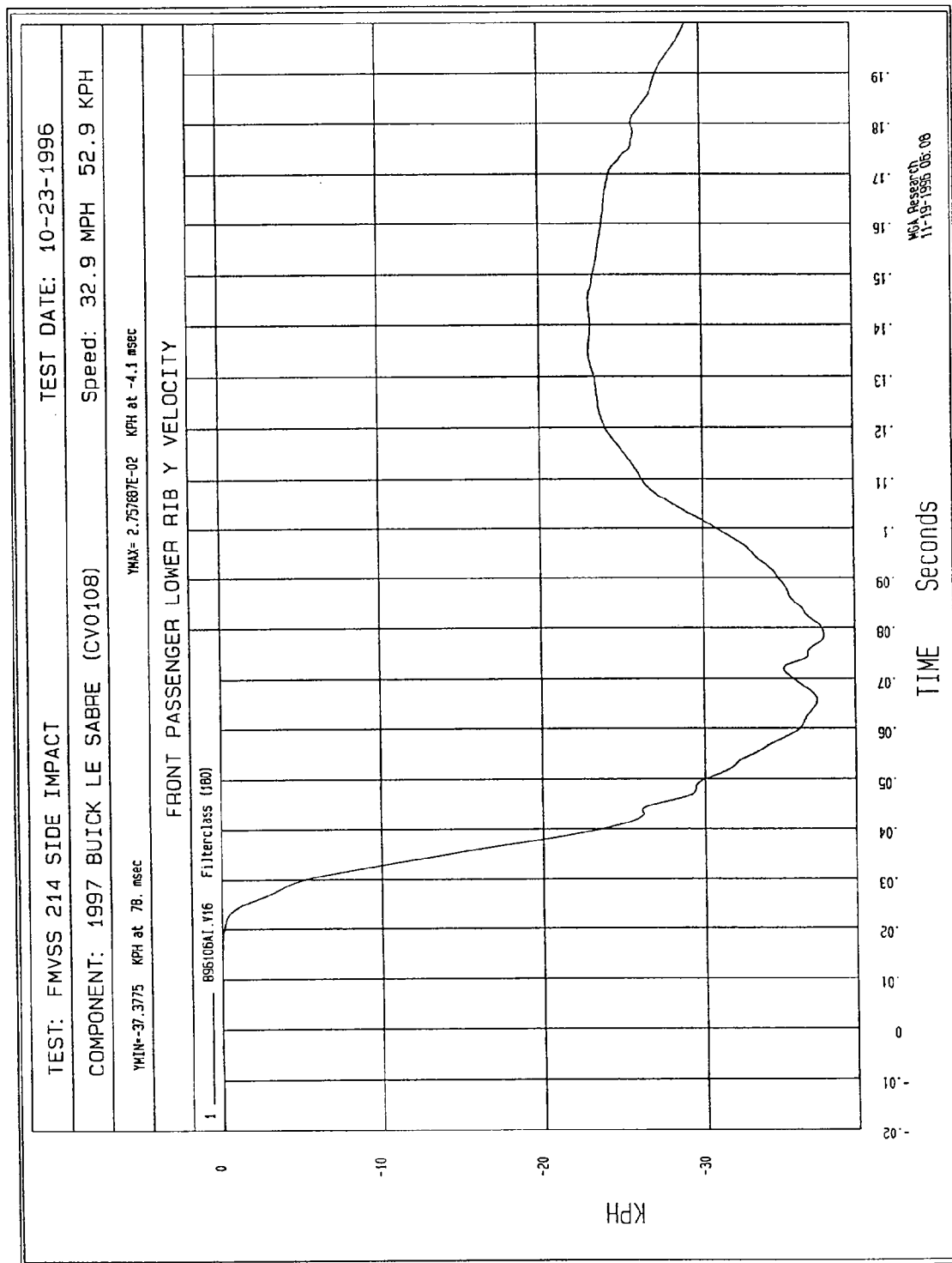
Speed: 32.9 MPH 52.9 KPH

YMAX= 16.3203 G'S at 102 msec

FRONT PASSENGER LOWER RIB Y ACCELERATION

1	895106AF.A16	Filterclass (180)





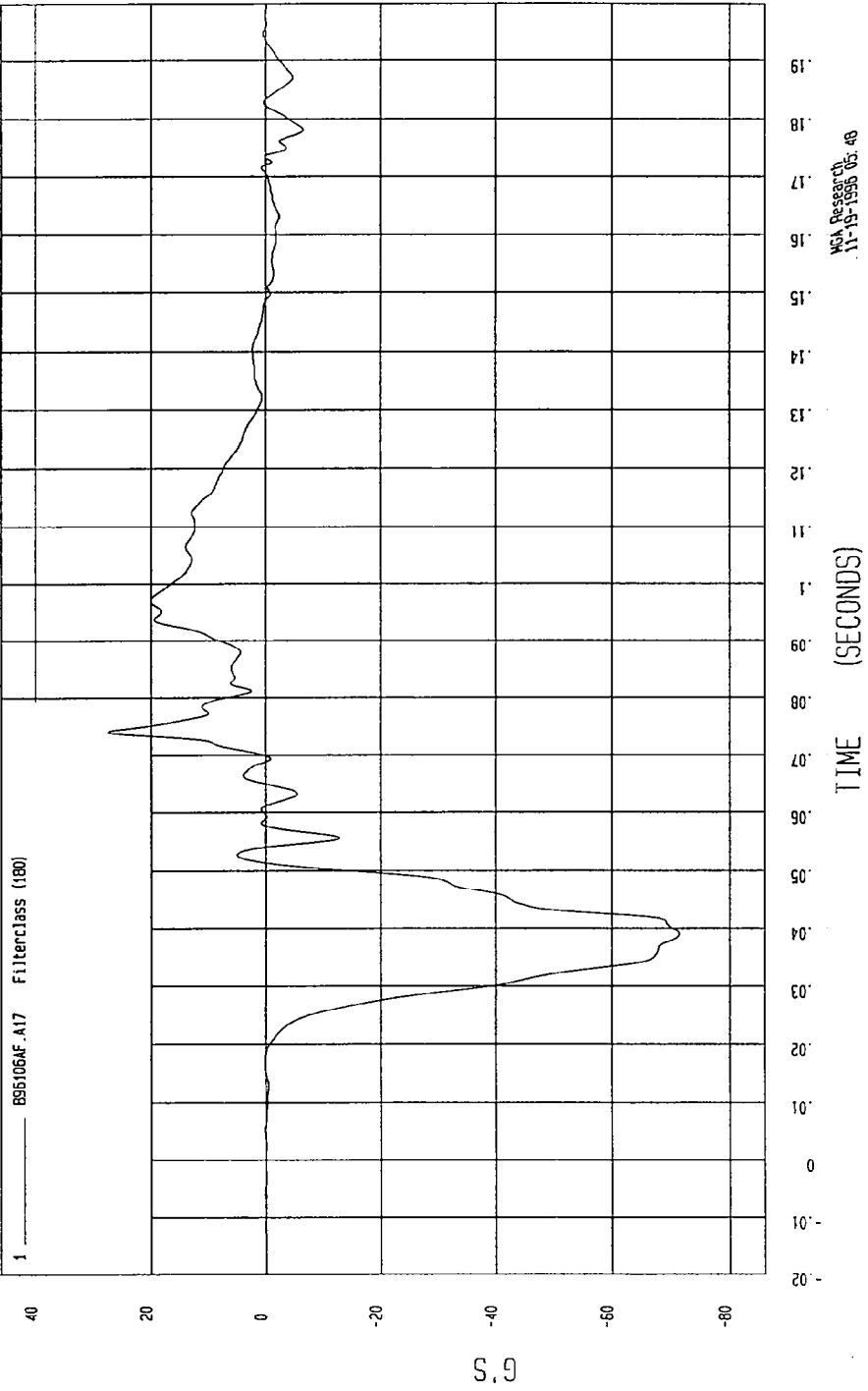
TEST: FMVSS 214 SIDE IMPACT

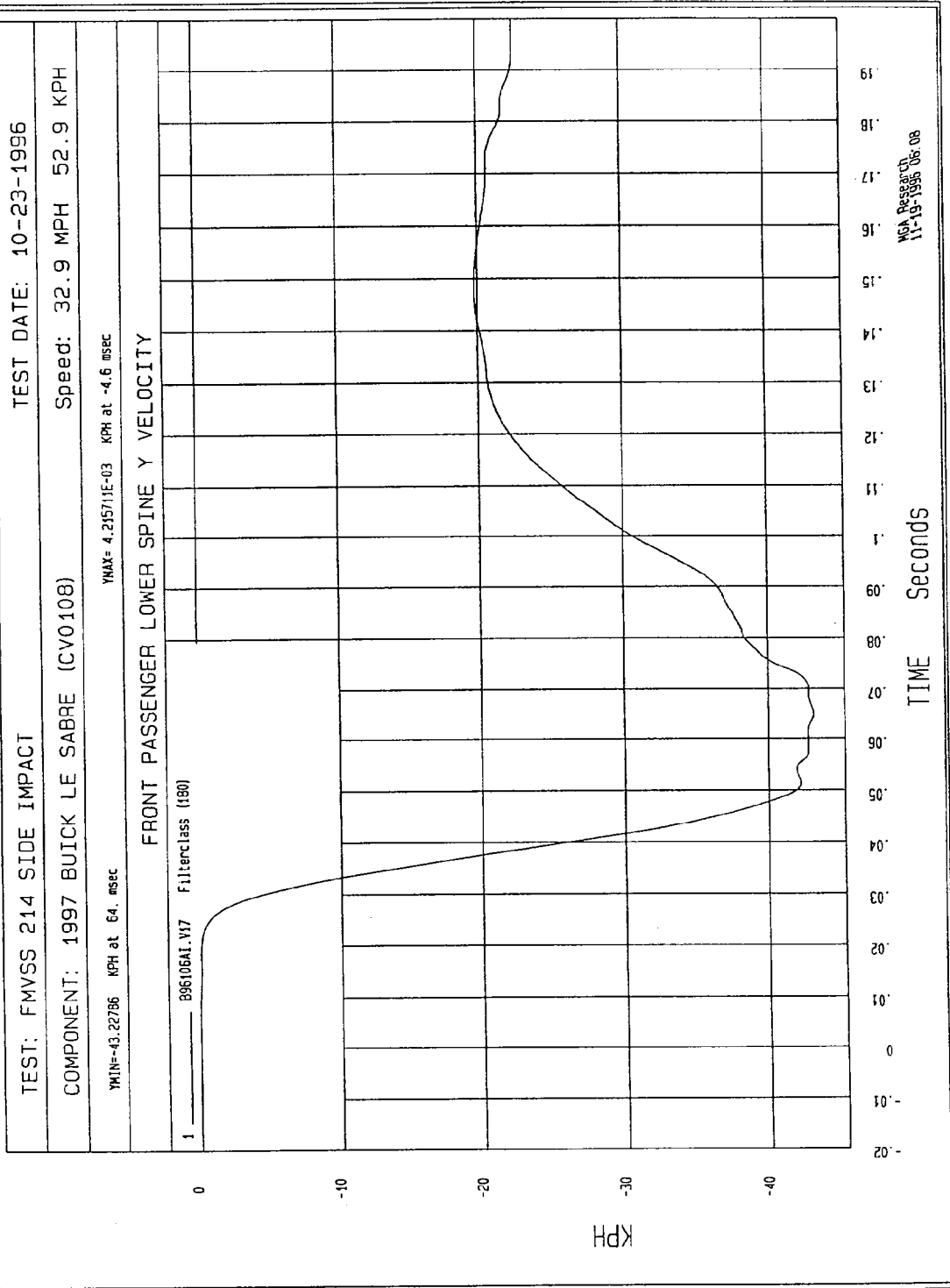
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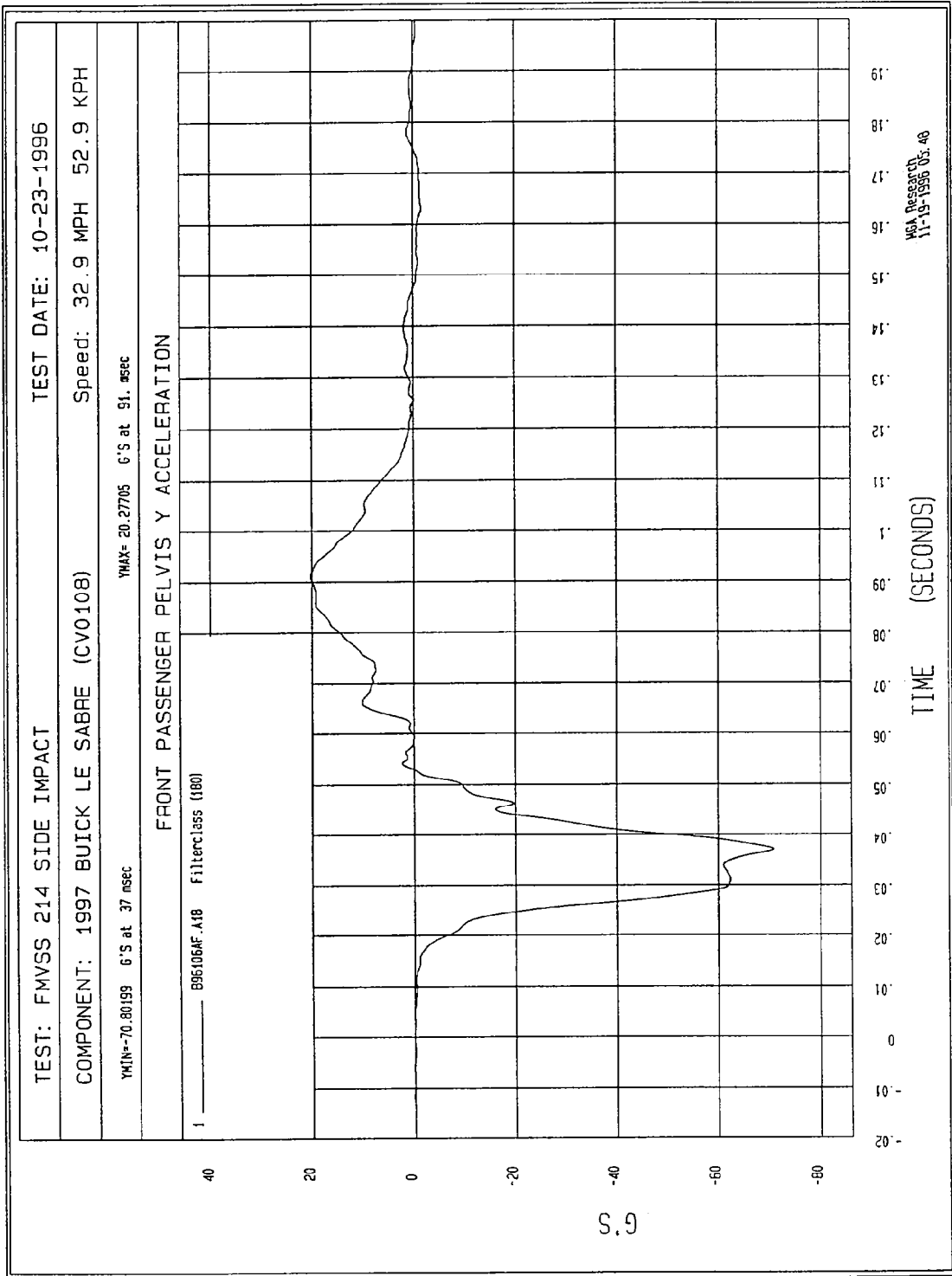
COMPONENT: 1997 BUICK LE SABRE (CV0108) Speed: 32.9 MPH 52.9 KPH

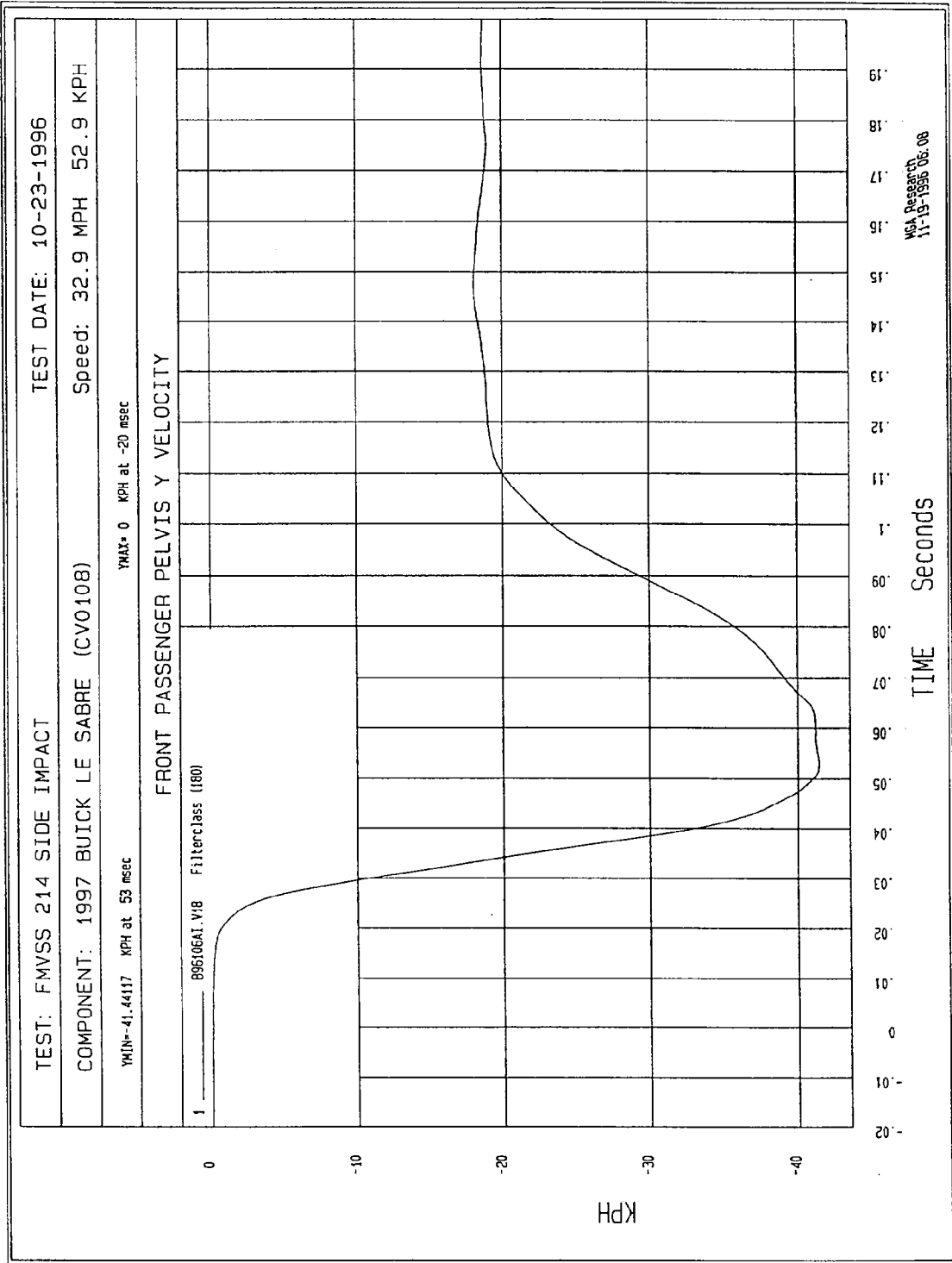
WIN-71.40804 G'S at 39 msec YMAX= 27.48887 G'S at 74 msec

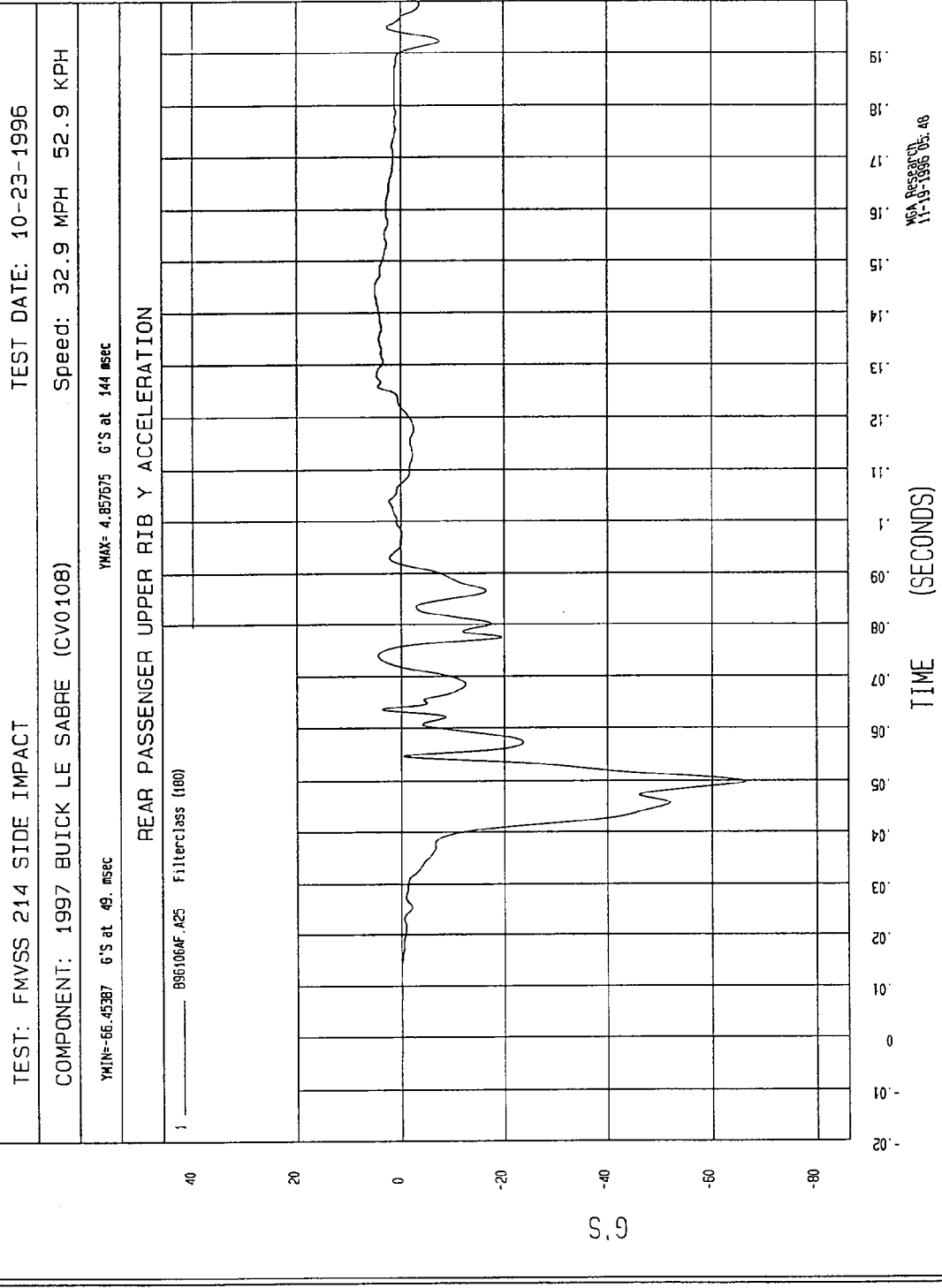
FRONT PASSENGER LOWER SPINE Y ACCELERATION

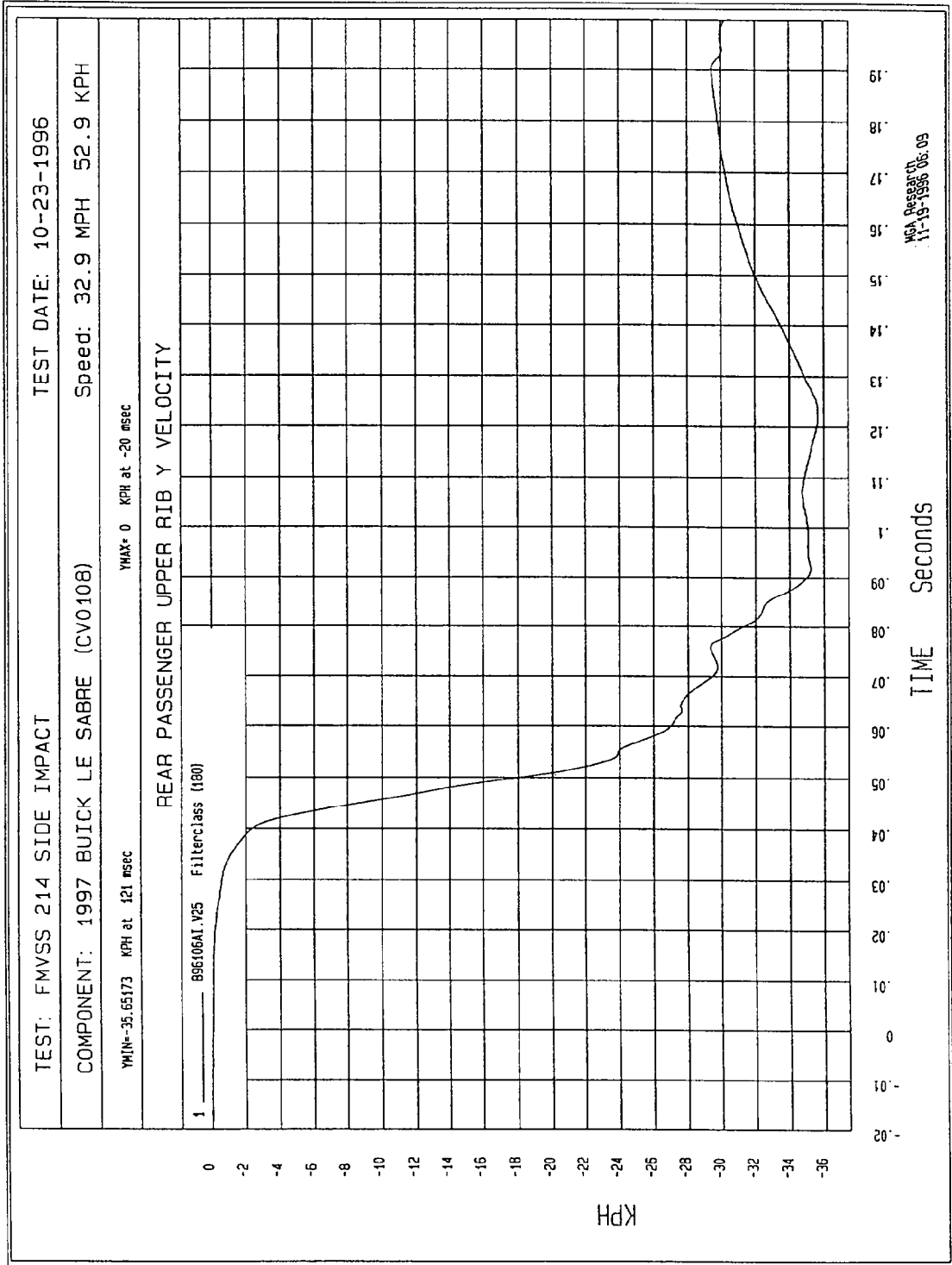


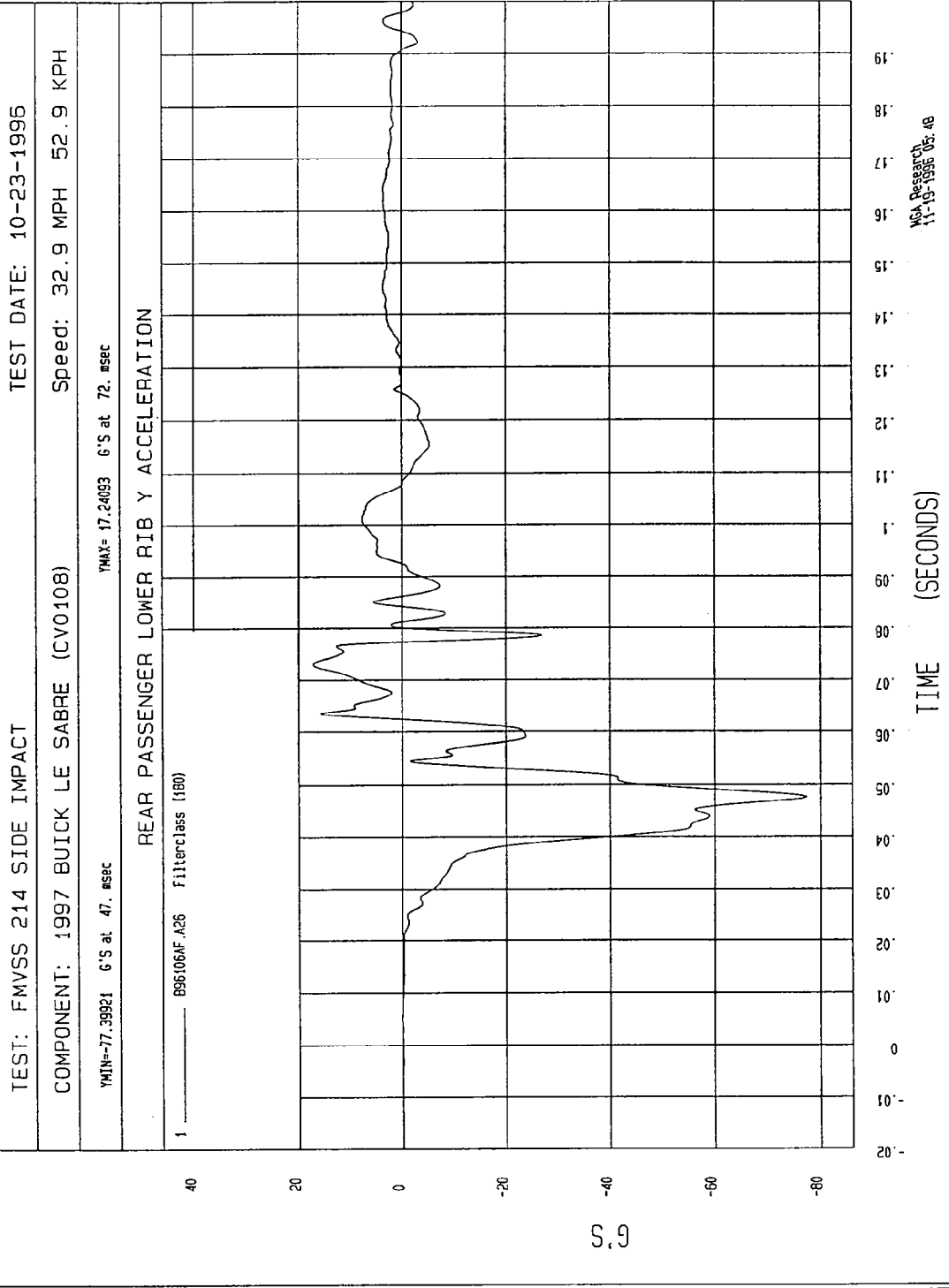


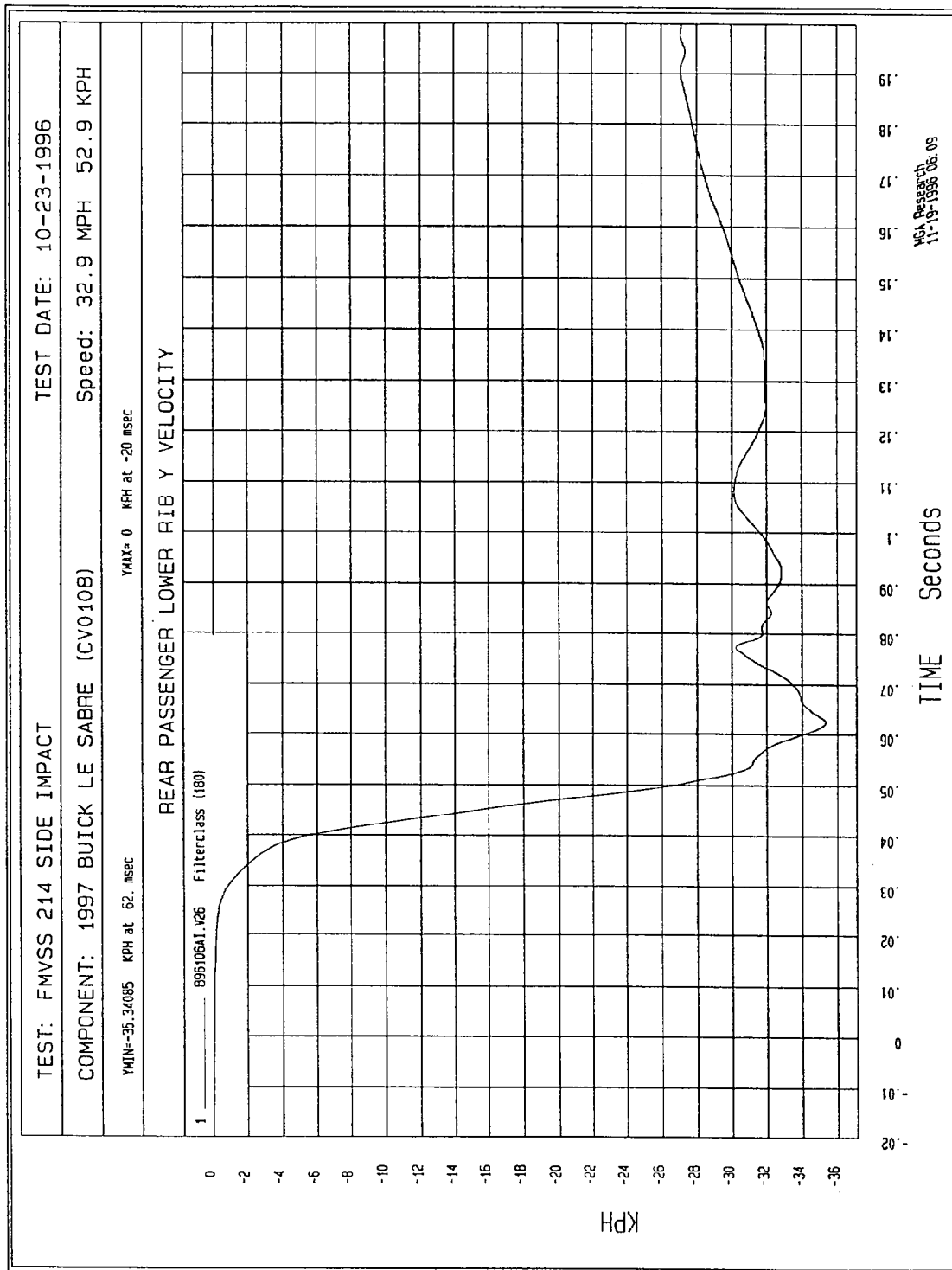


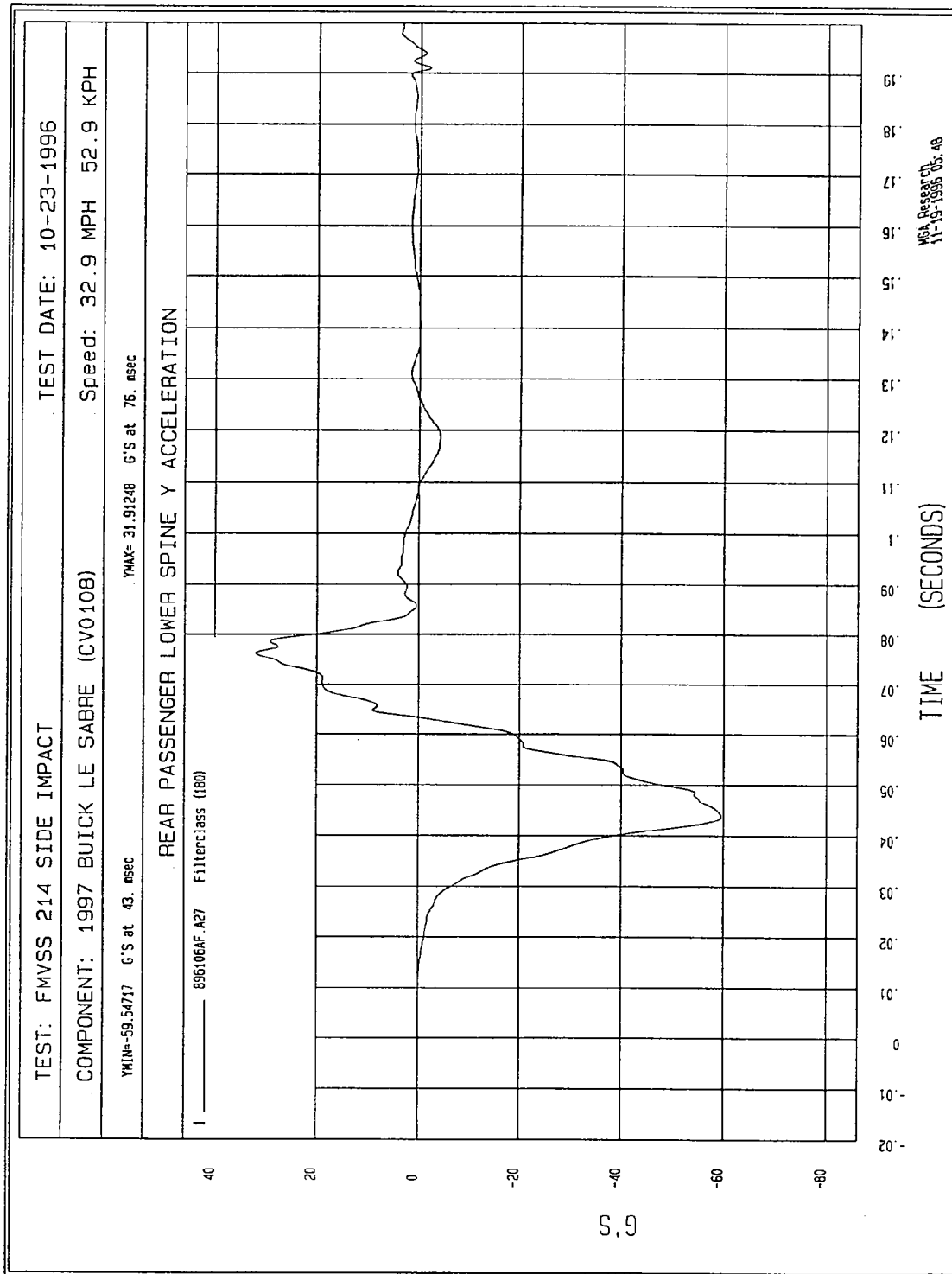


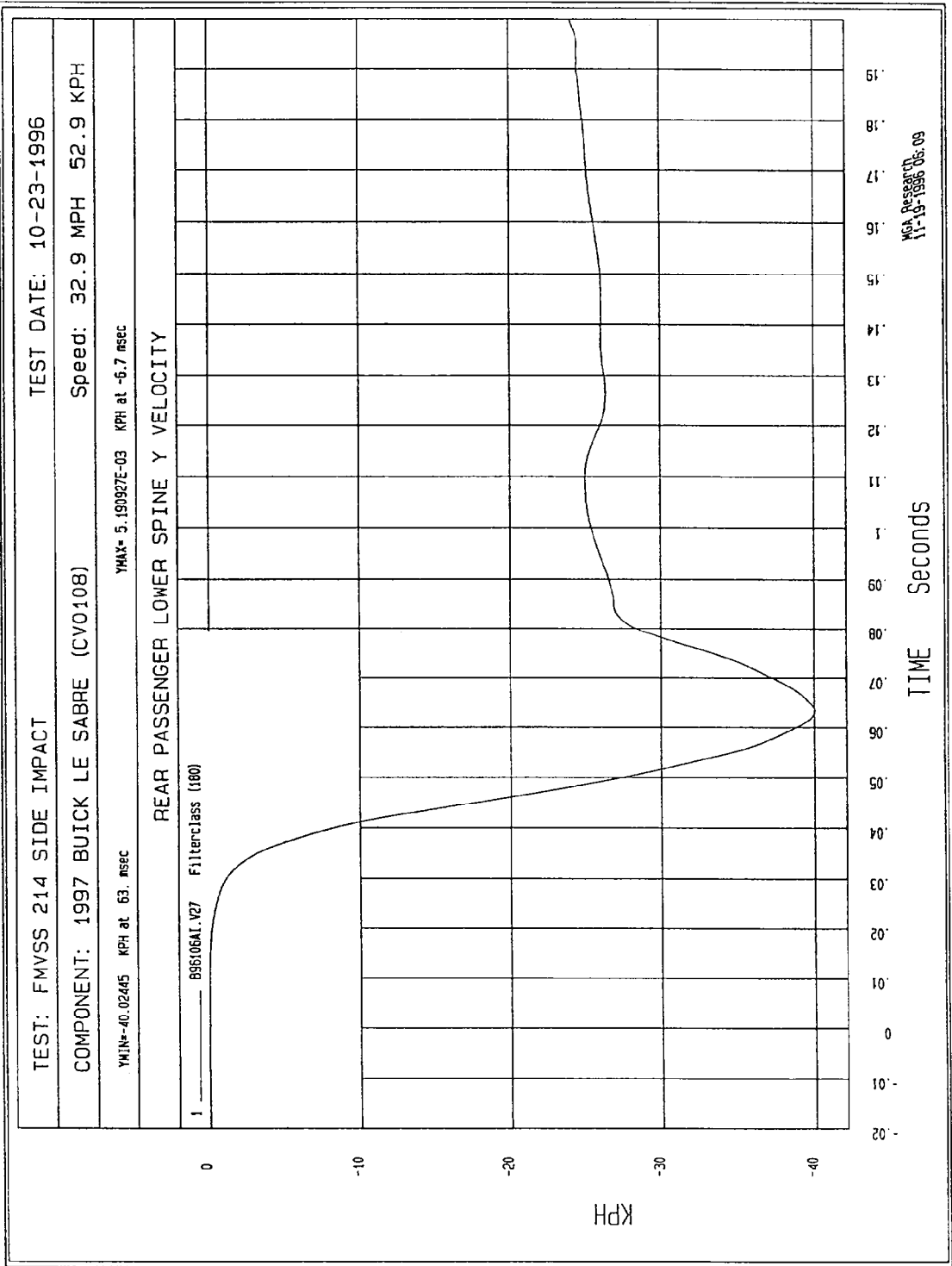


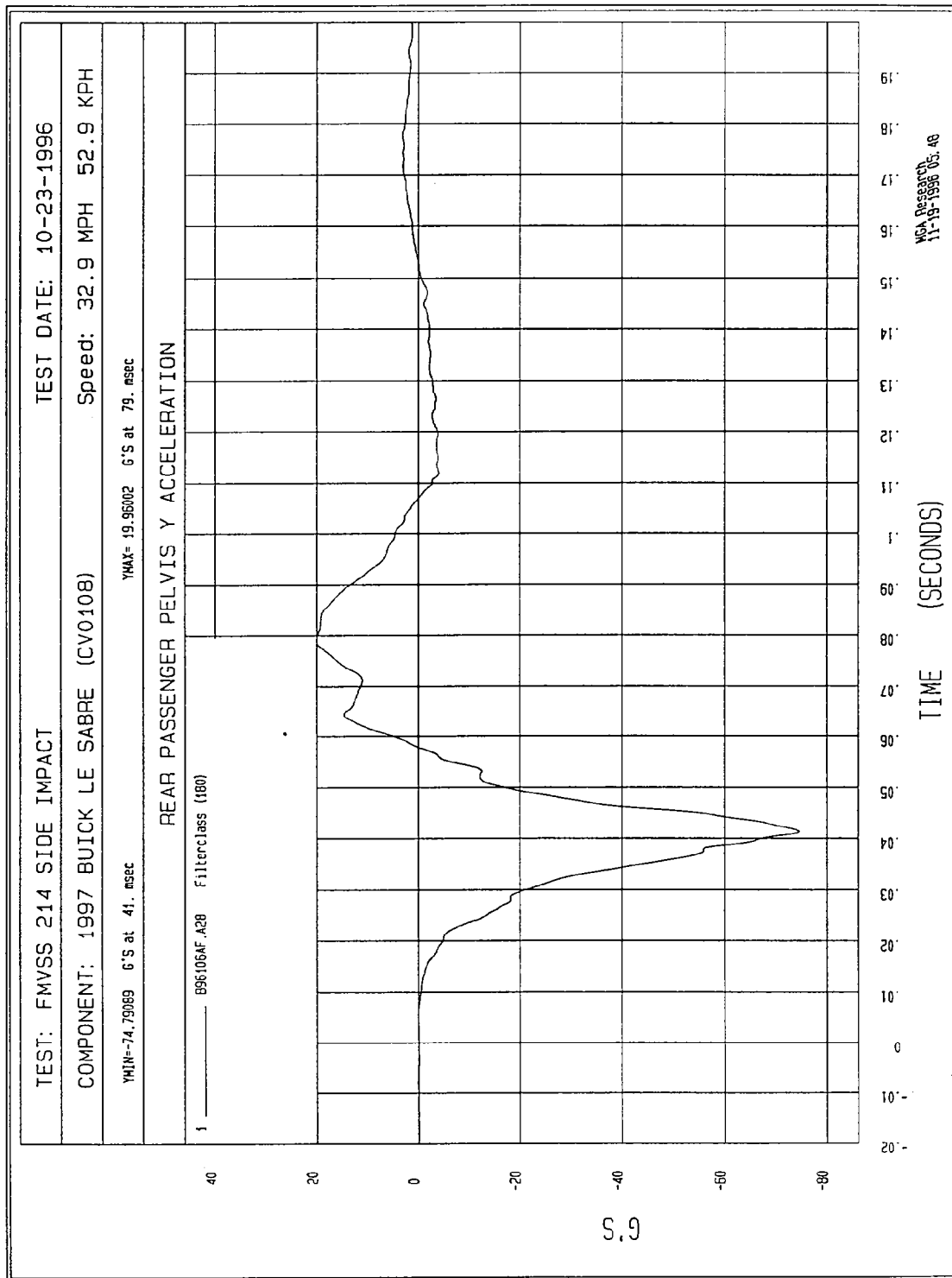


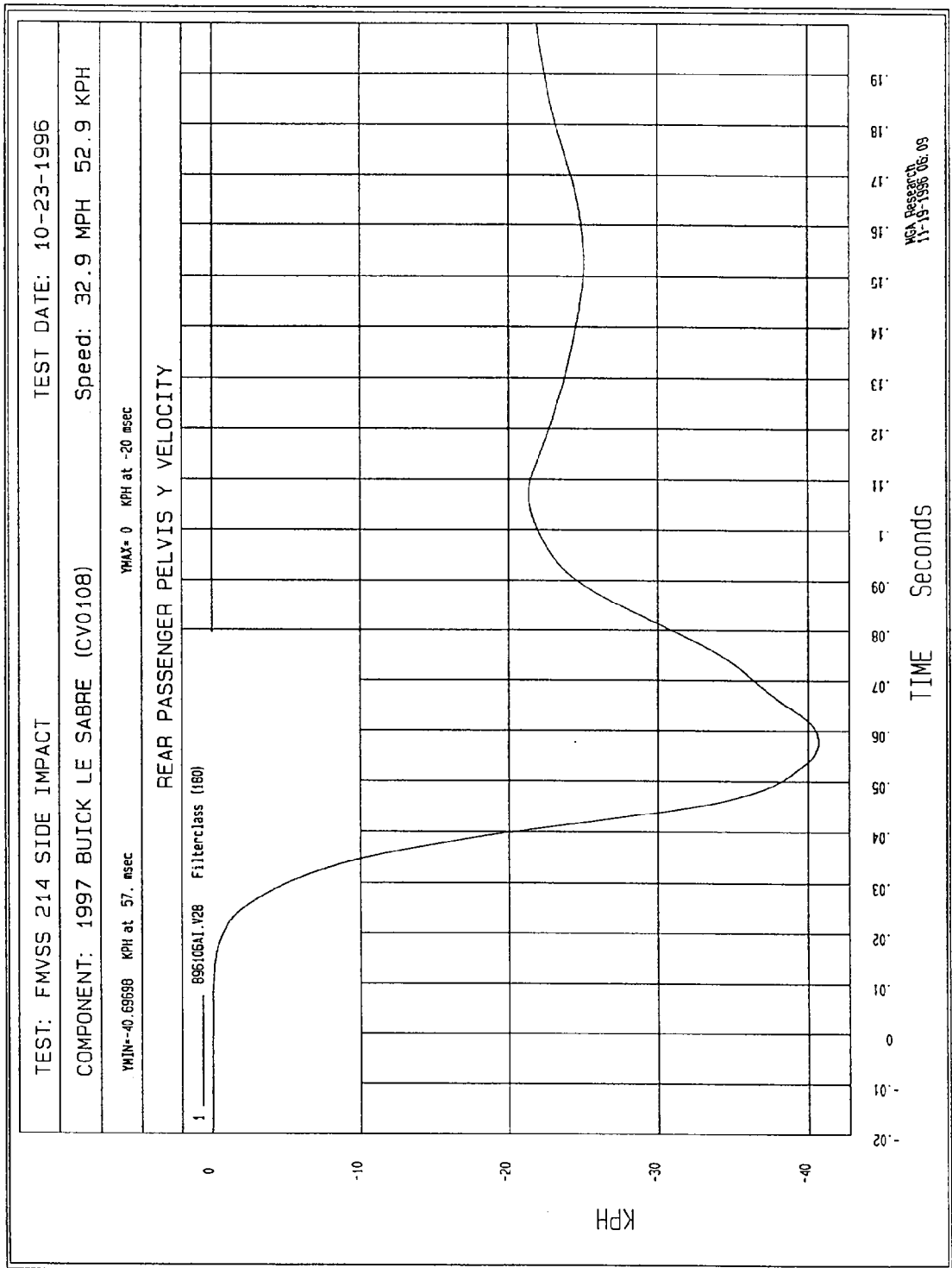


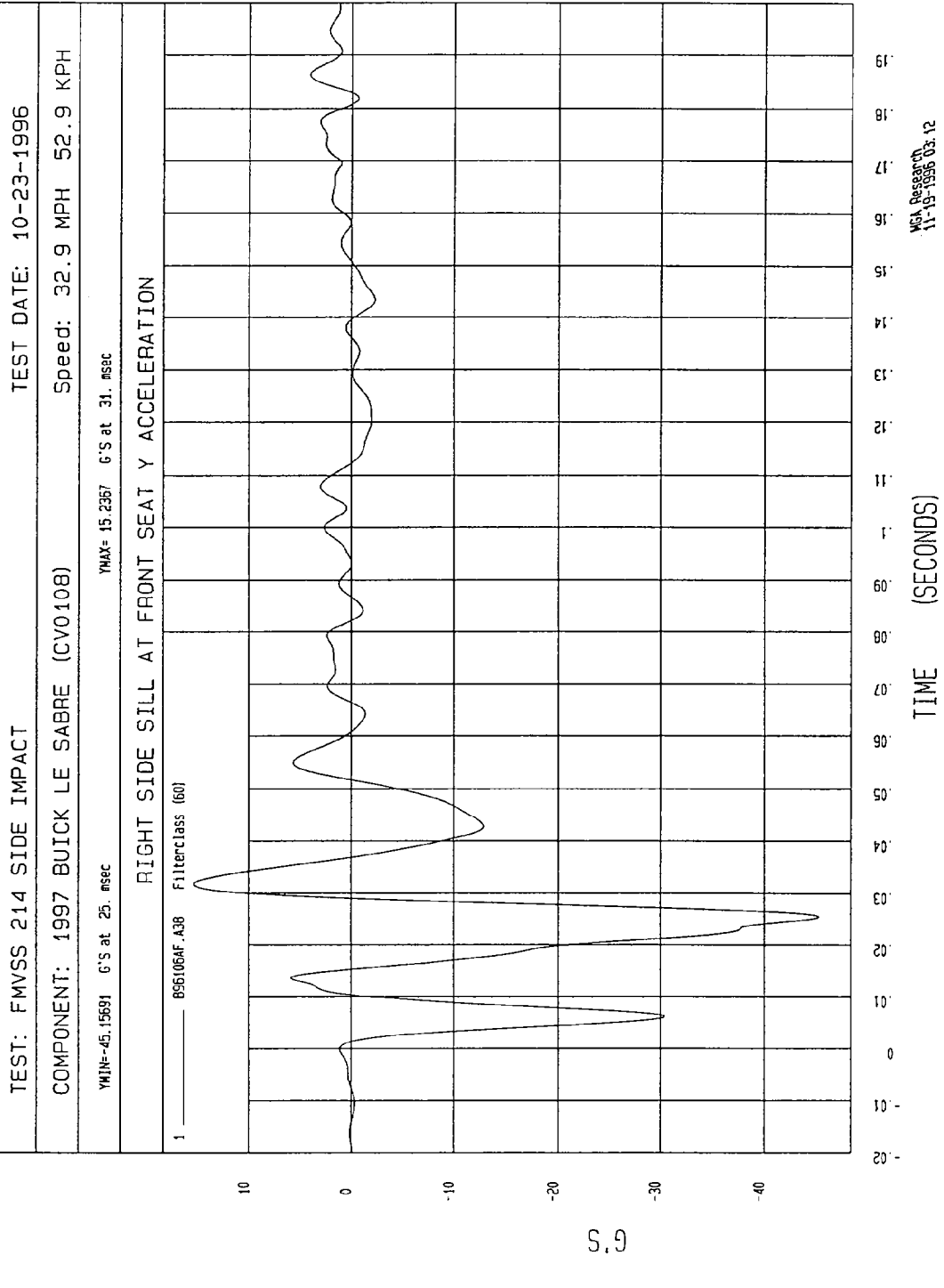


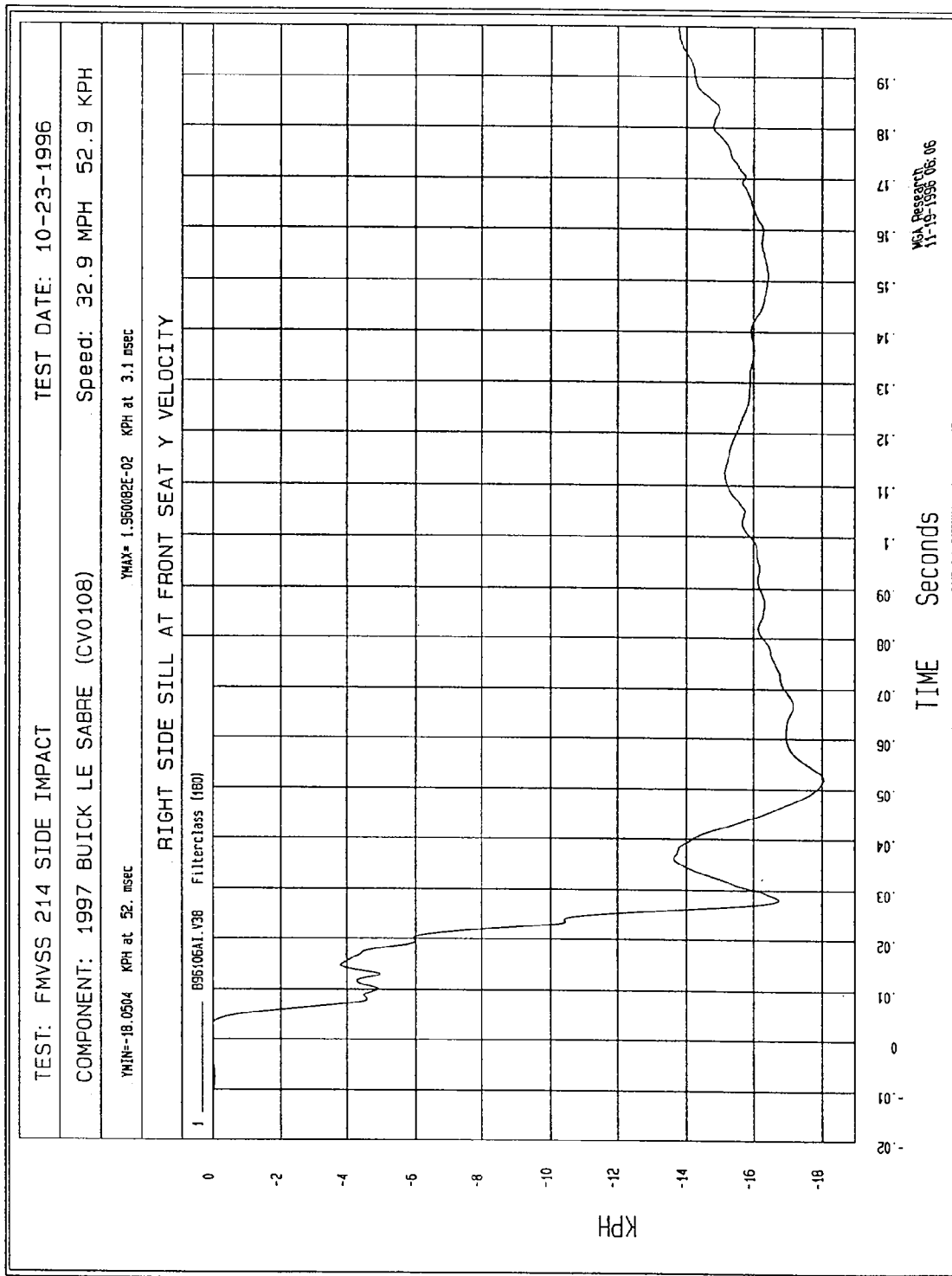










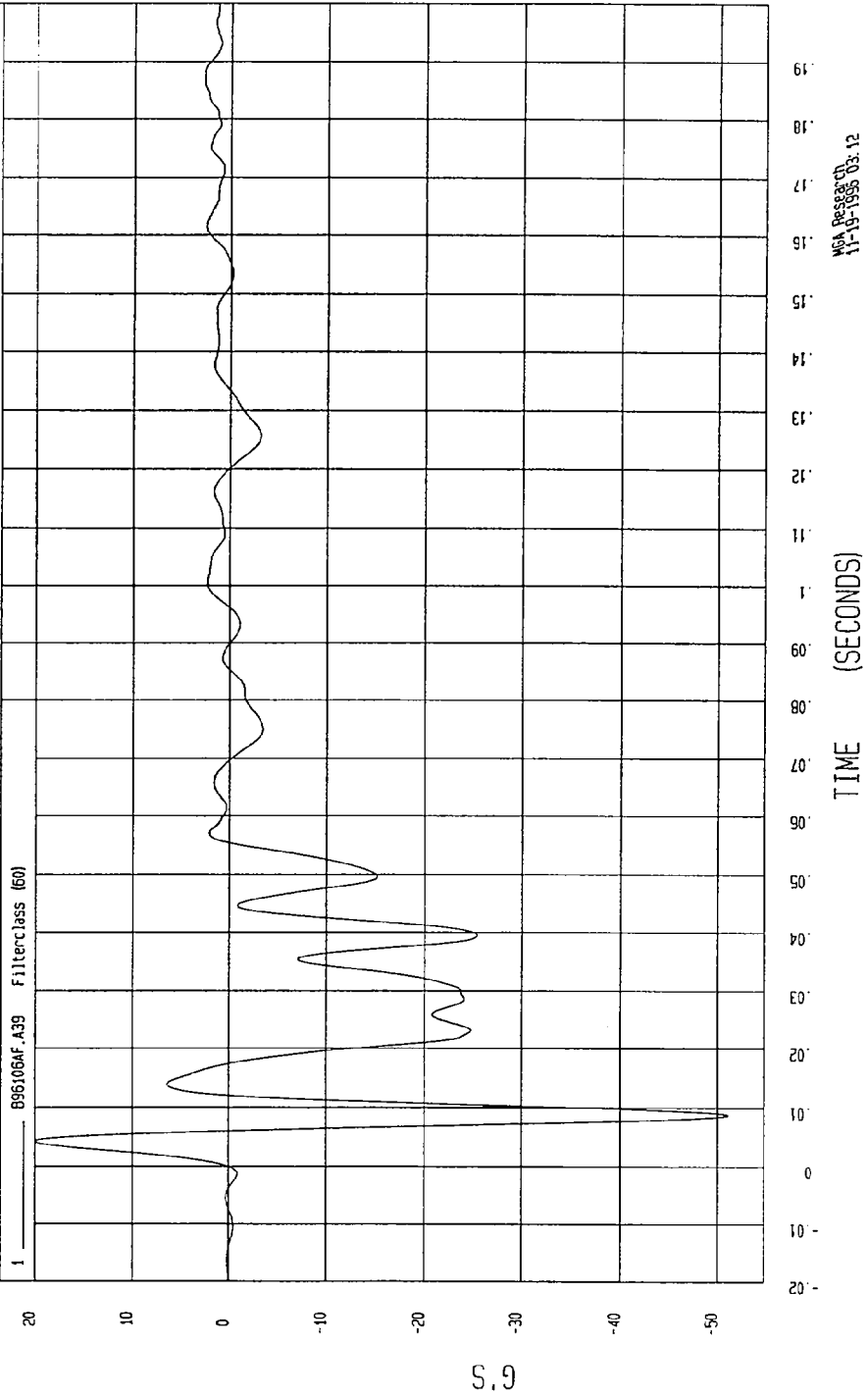


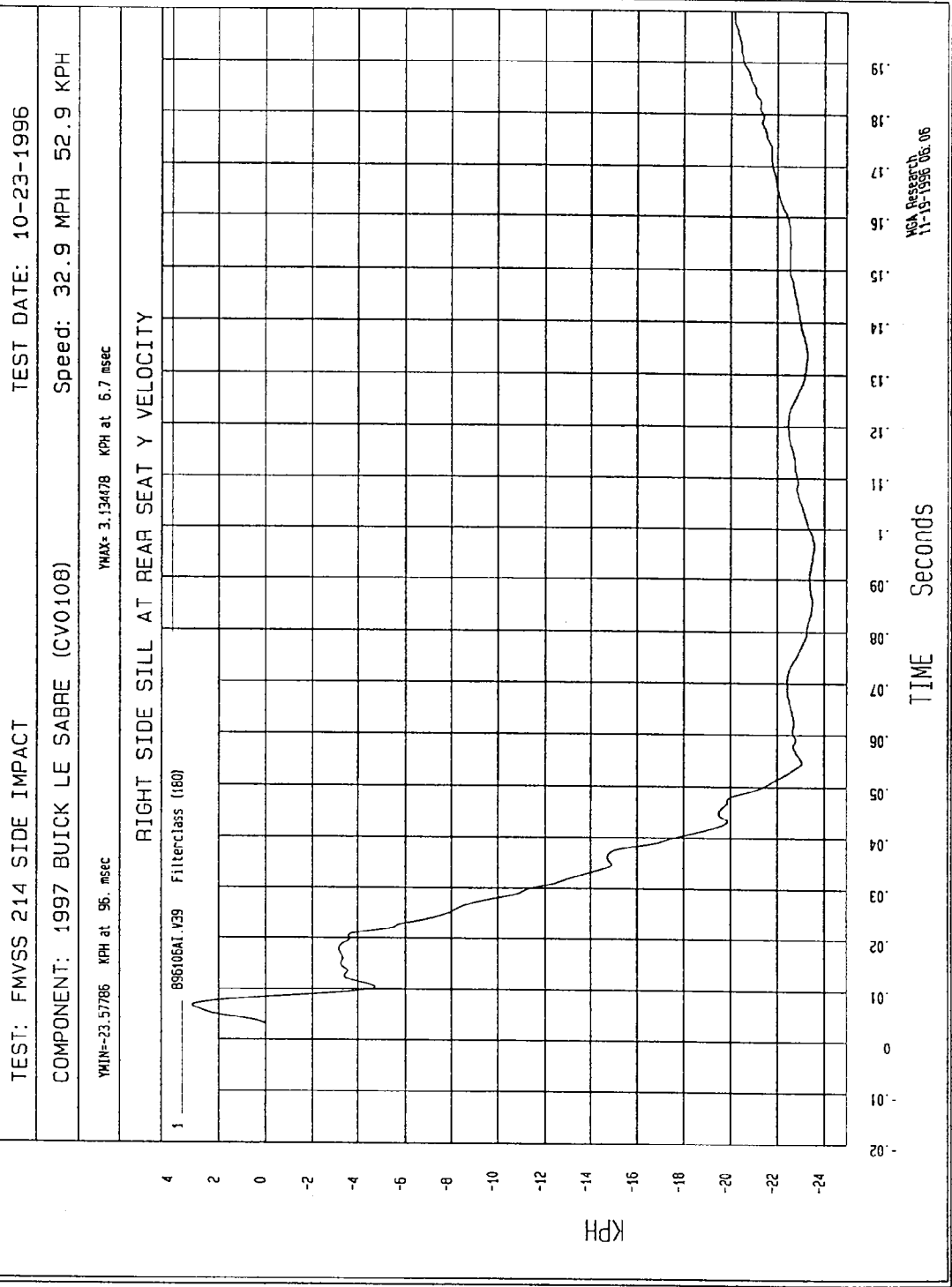
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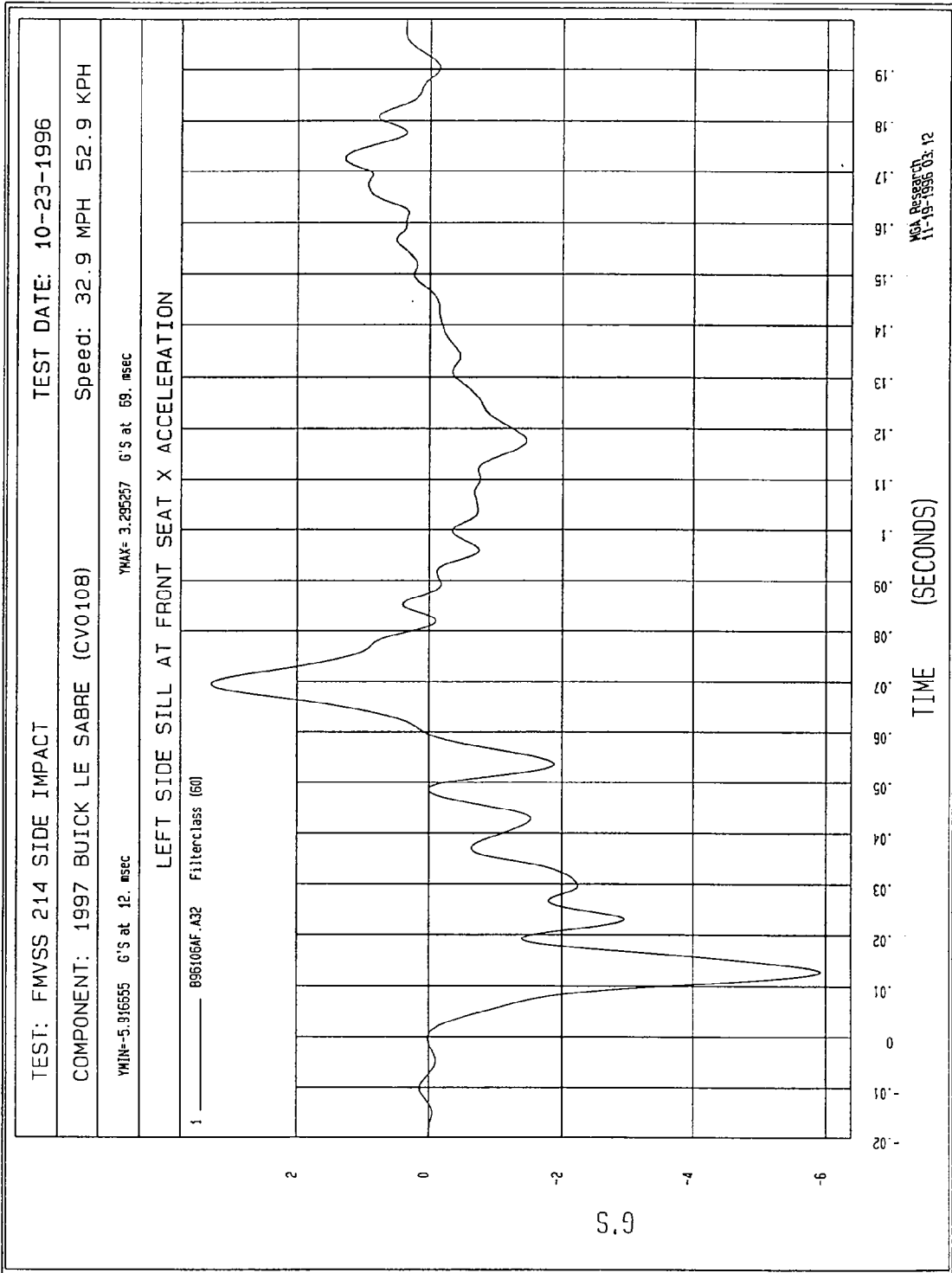
COMPONENT: 1997 BUICK LE SABRE (CV0108) Speed: 32.9 MPH 52.9 KPH

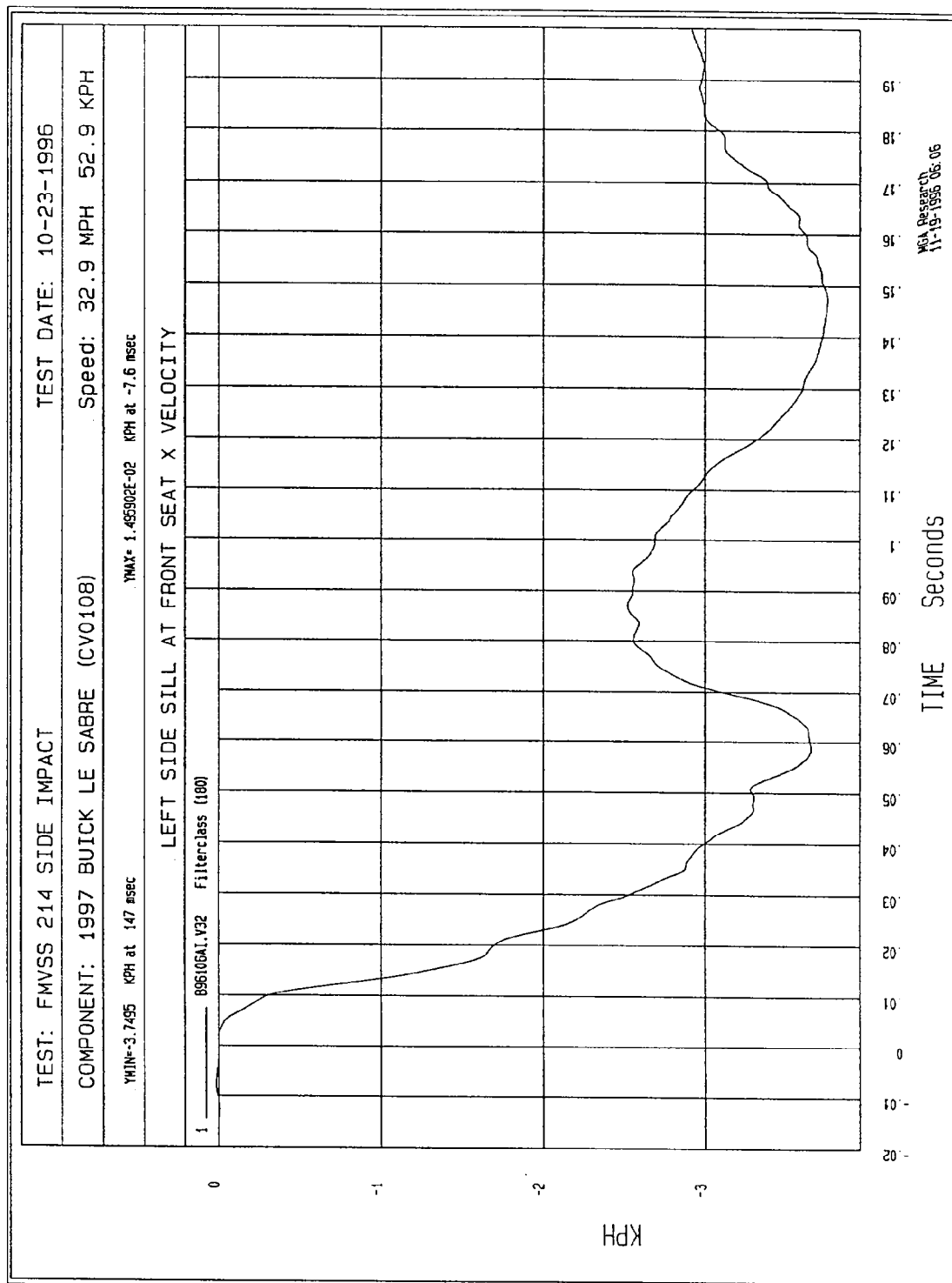
YMIN=-51.08363 G'S at 8.6 msec YMAX= 20.03485 G'S at 4.1 msec

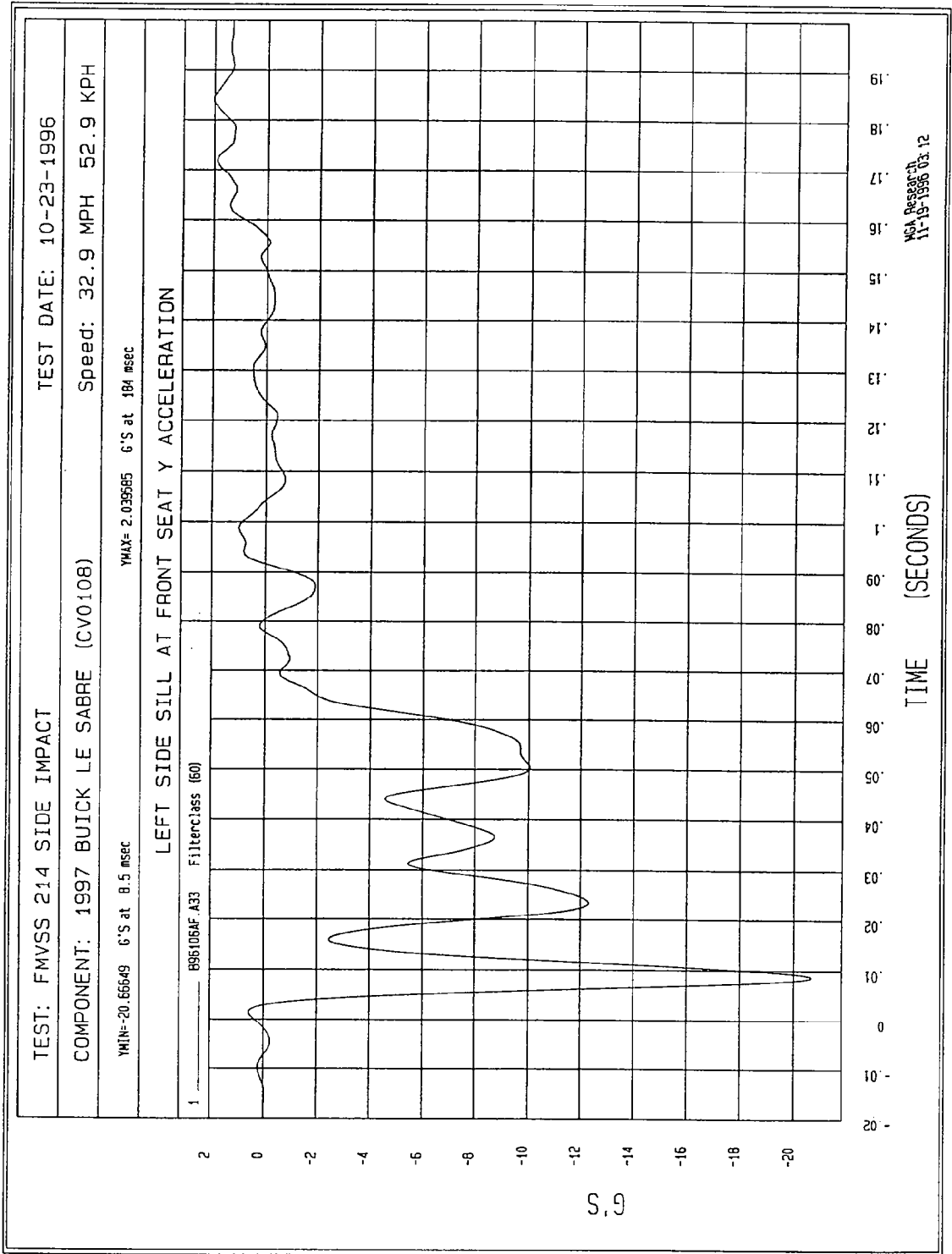
RIGHT SIDE SILL AT REAR SEAT Y ACCELERATION

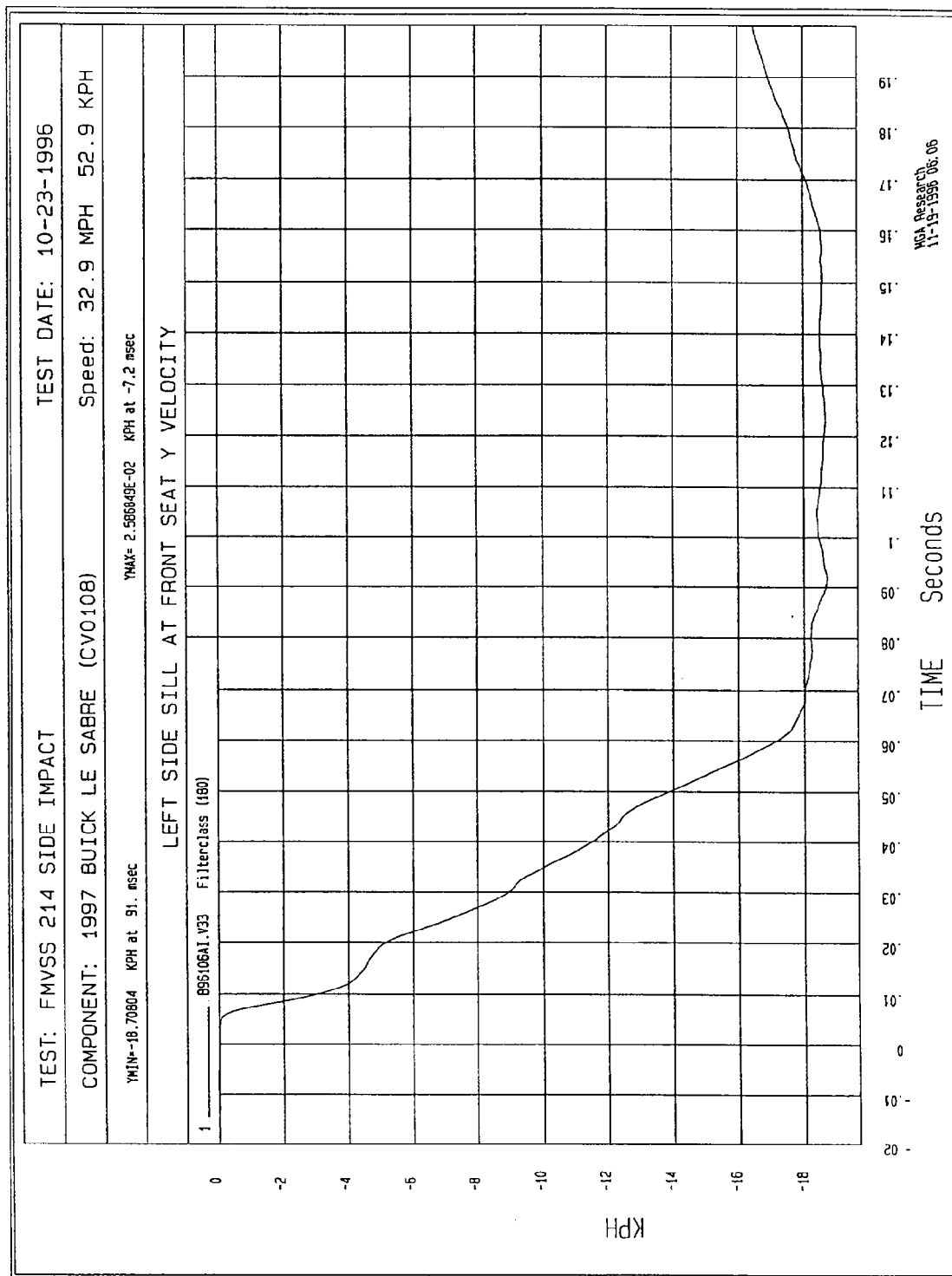


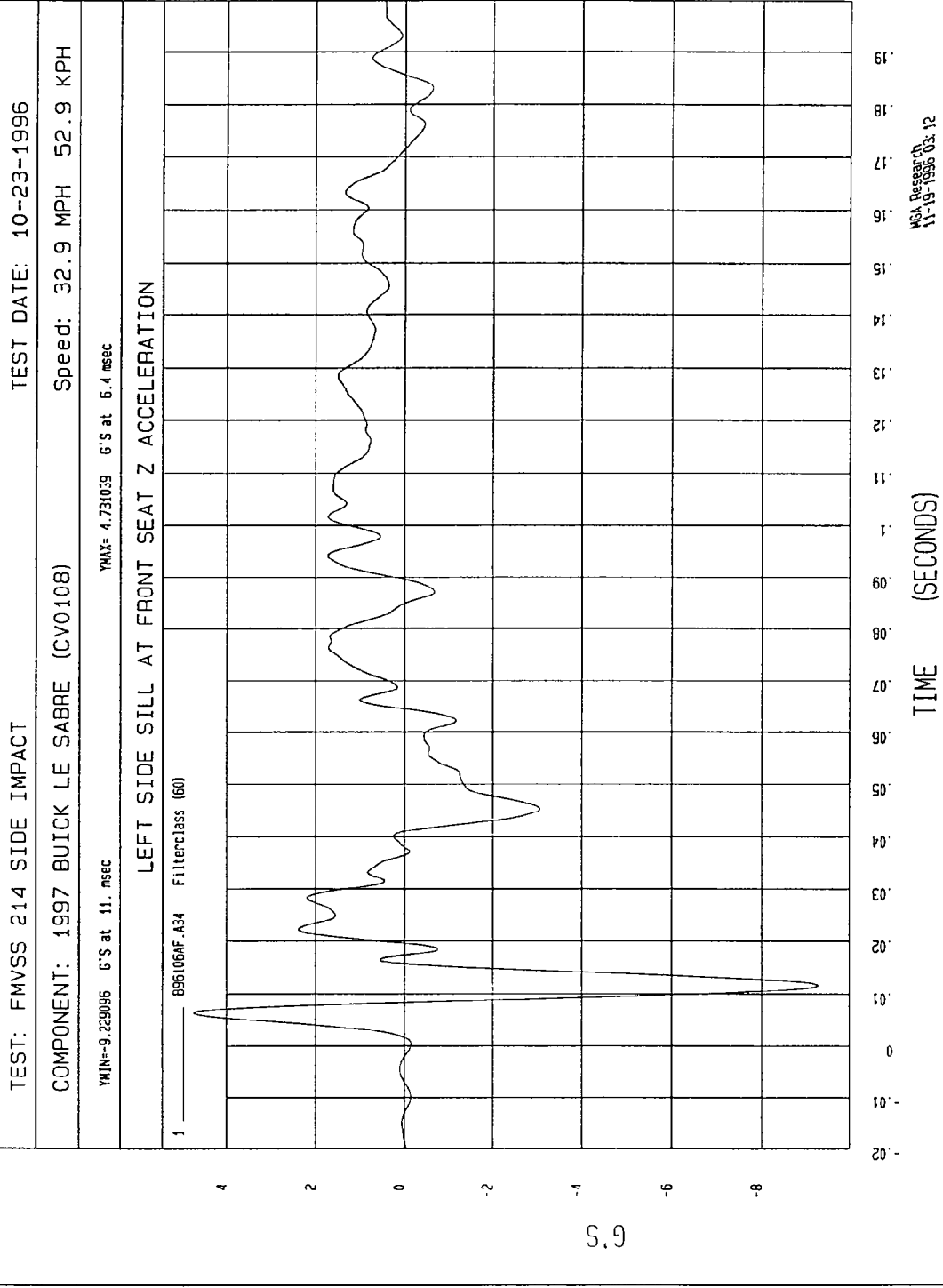


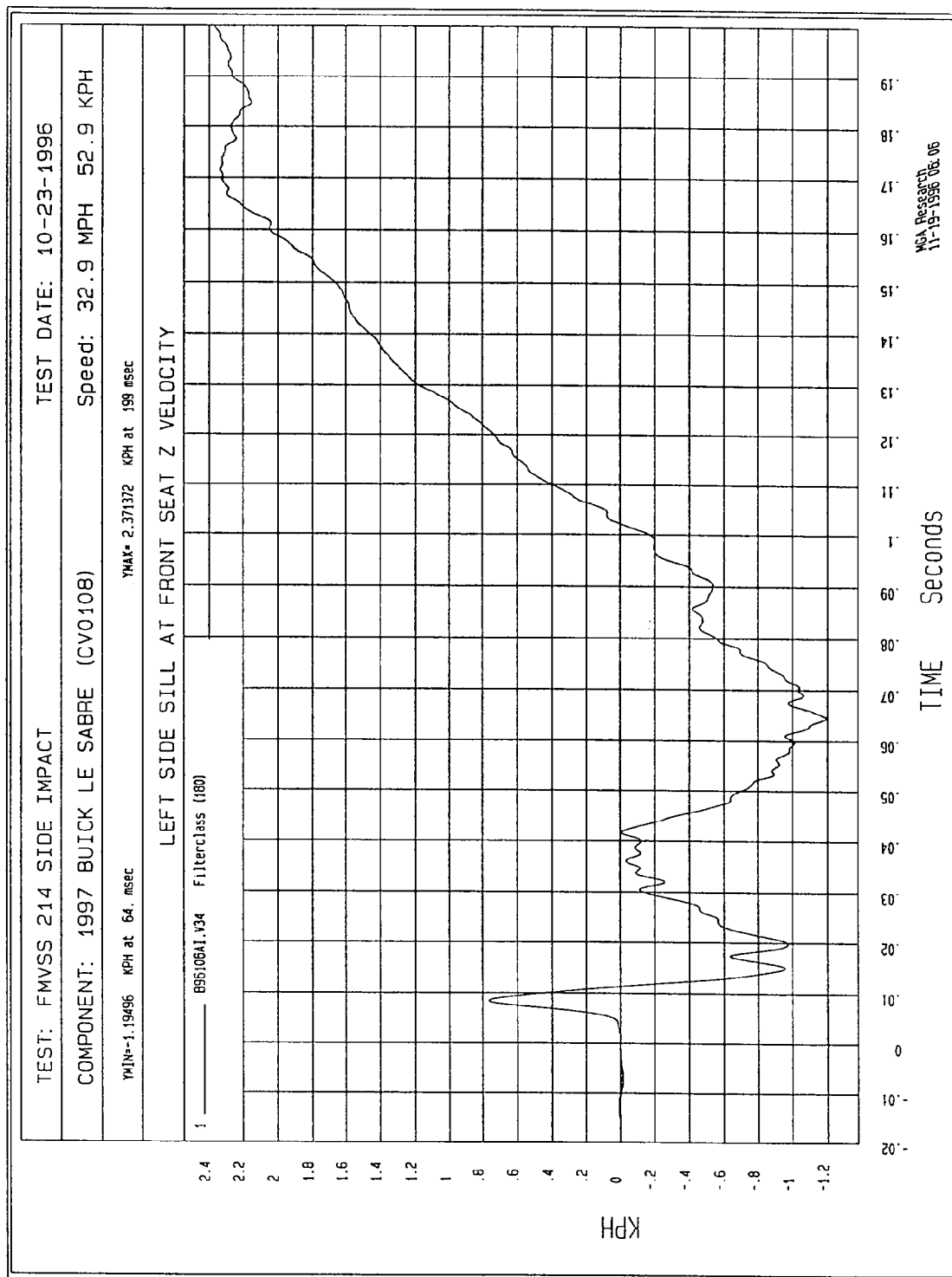


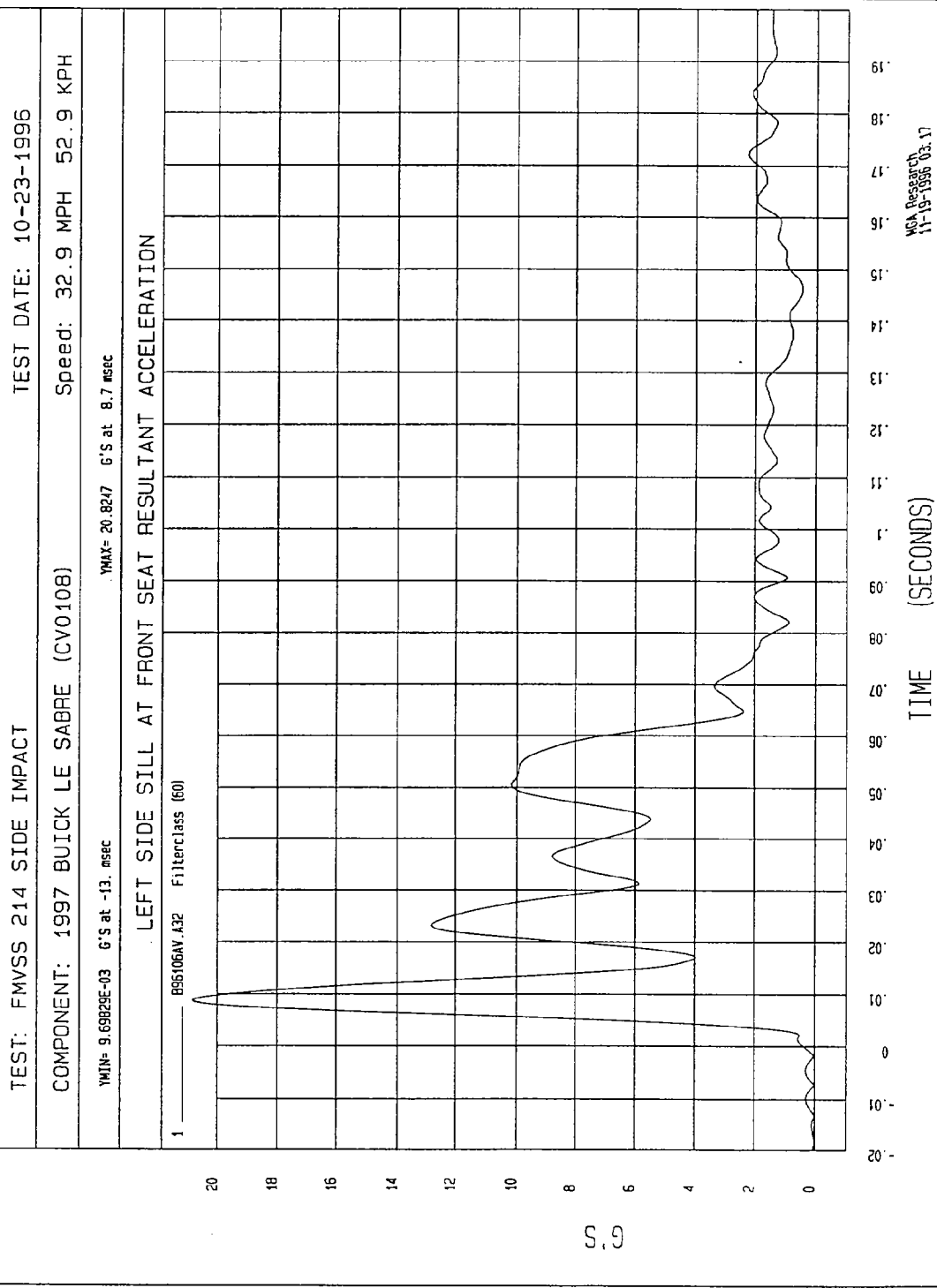


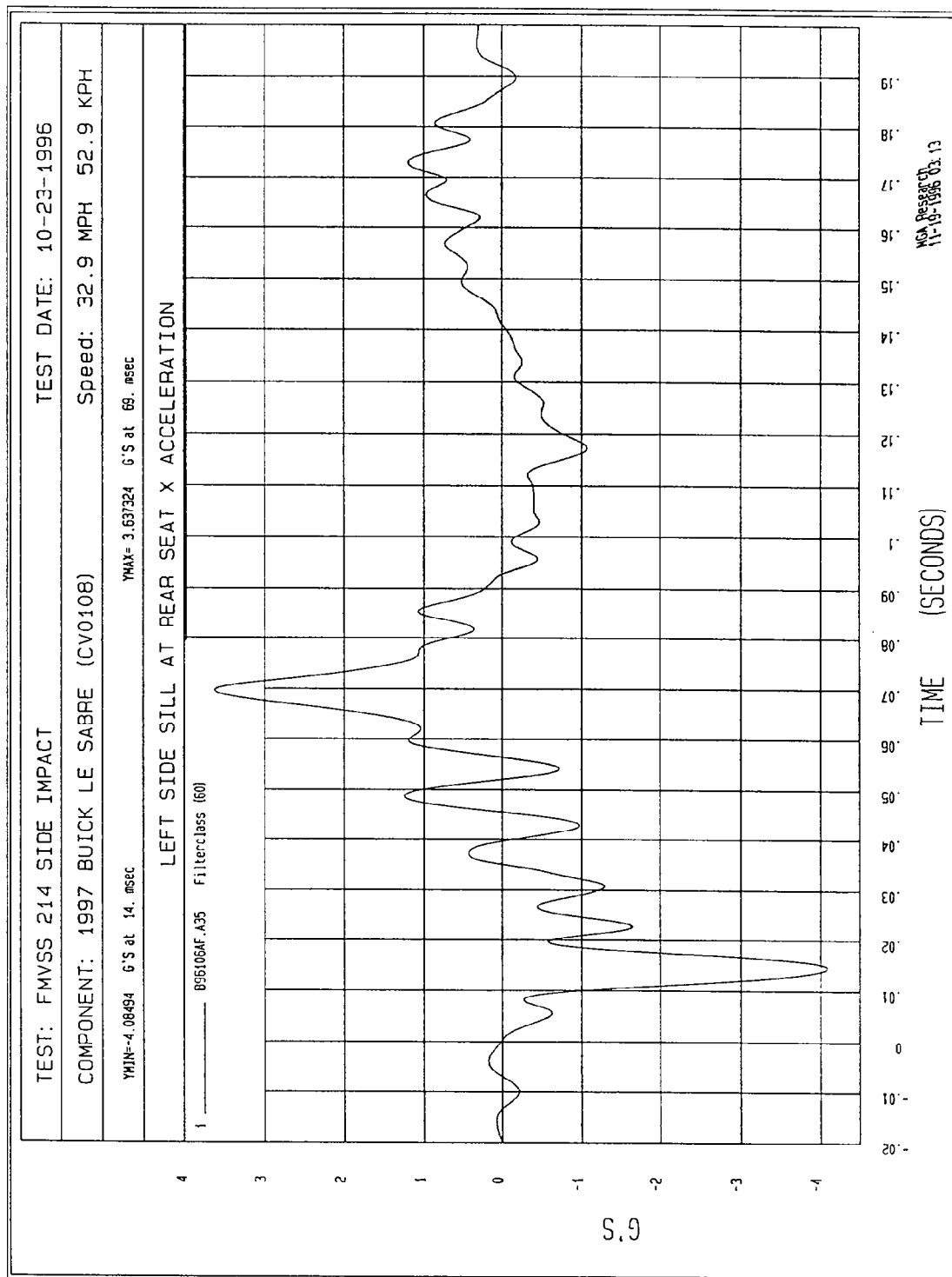










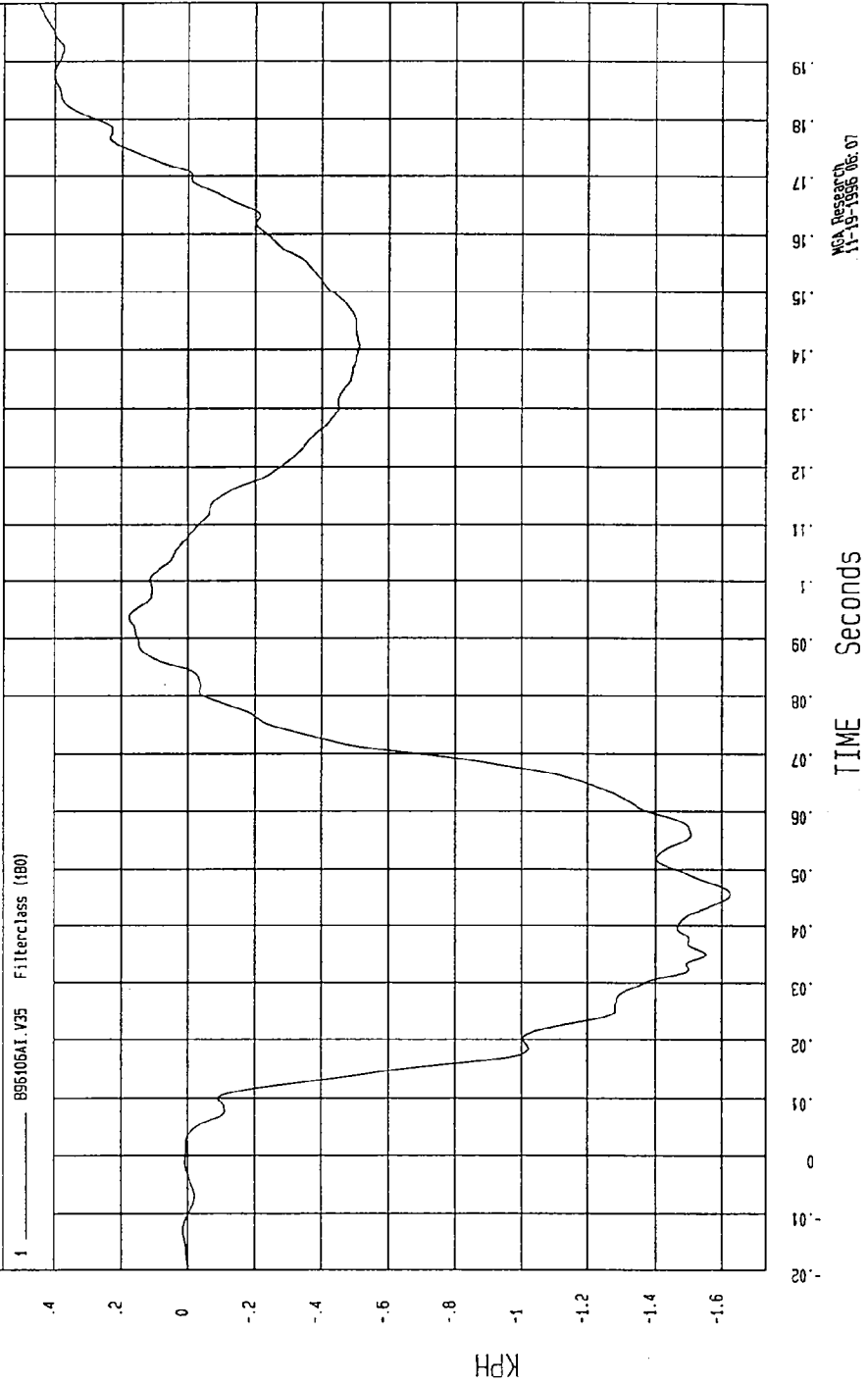


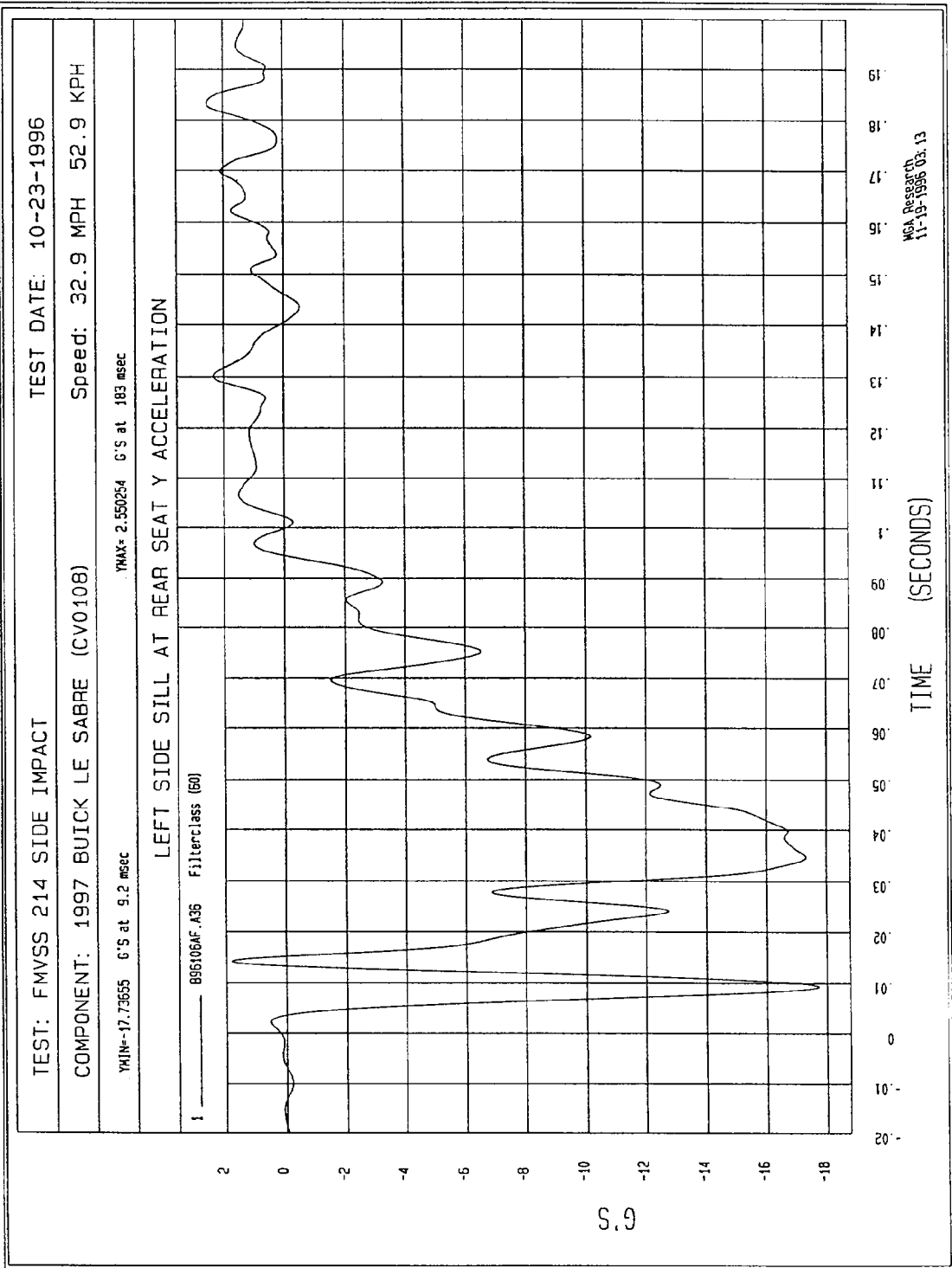
TEST: FMVSS 214 SIDE IMPACT TEST DATE: 10-23-1996

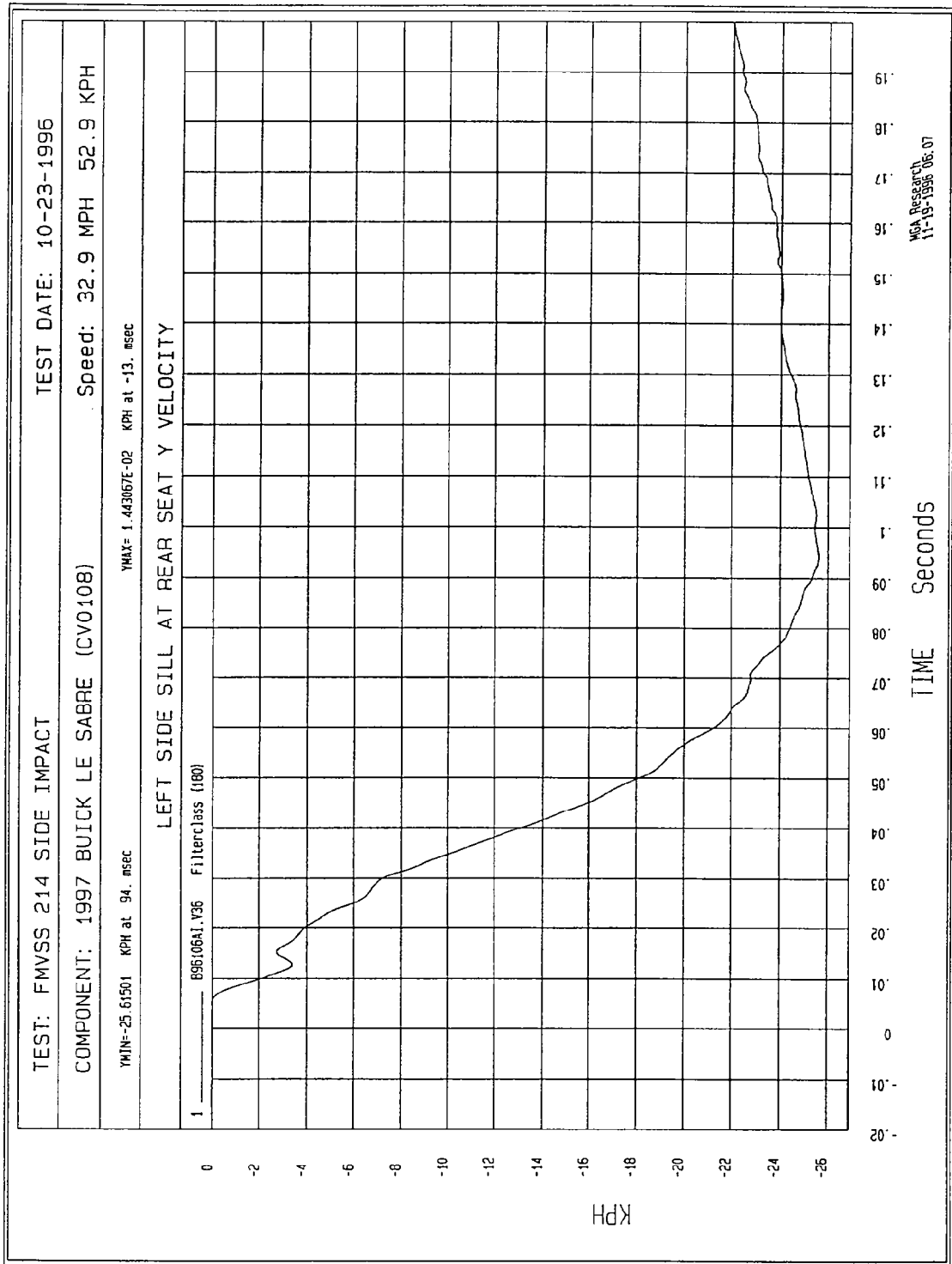
COMPONENT: 1997 BUICK LE SABRE (CV0108) Speed: 32.9 MPH 52.9 KPH

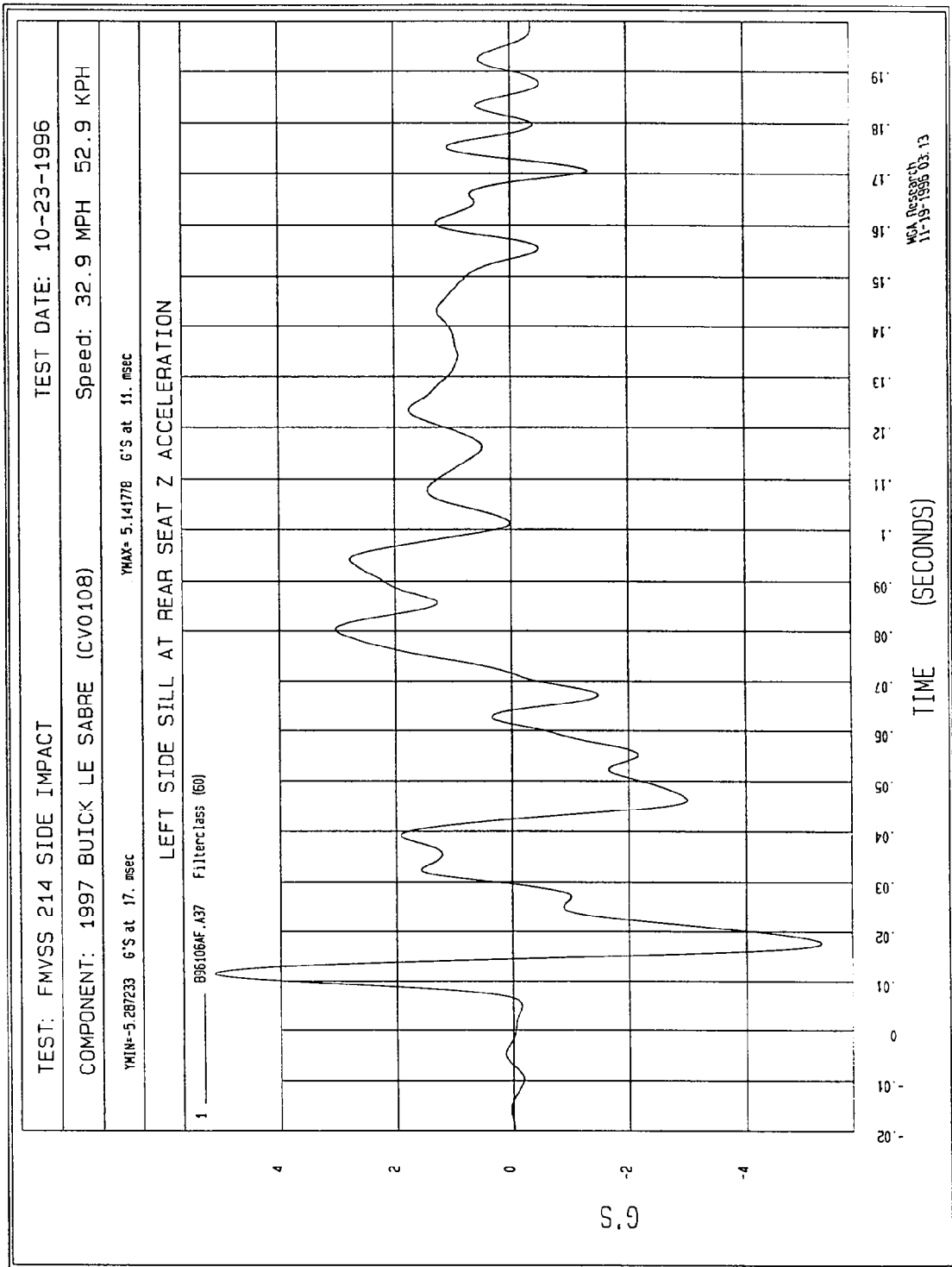
YMIN=-1.624682 KPH at 45. msec YMAX= .4504722 KPH at 199 msec

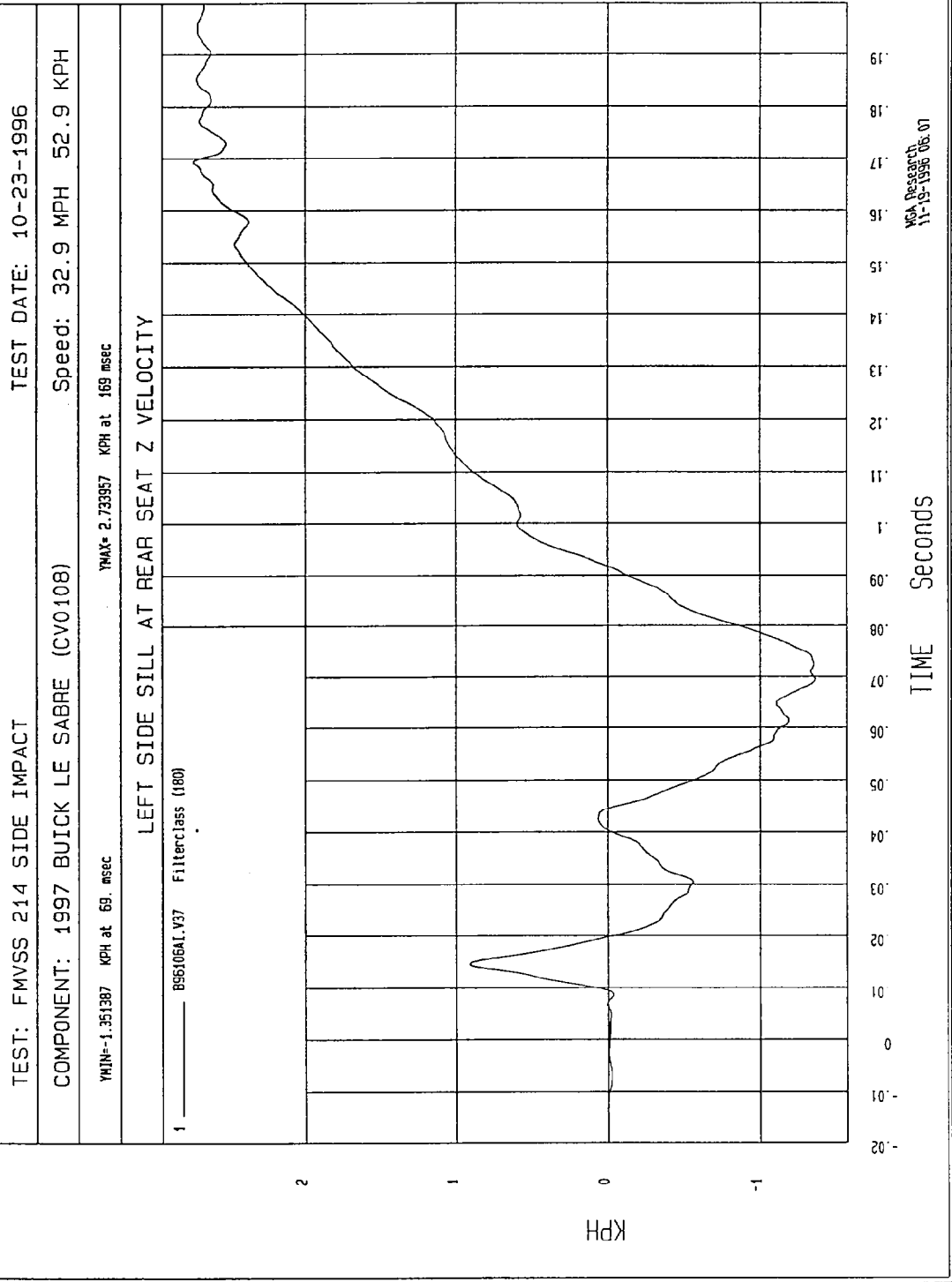
LEFT SIDE SILL AT REAR SEAT X VELOCITY

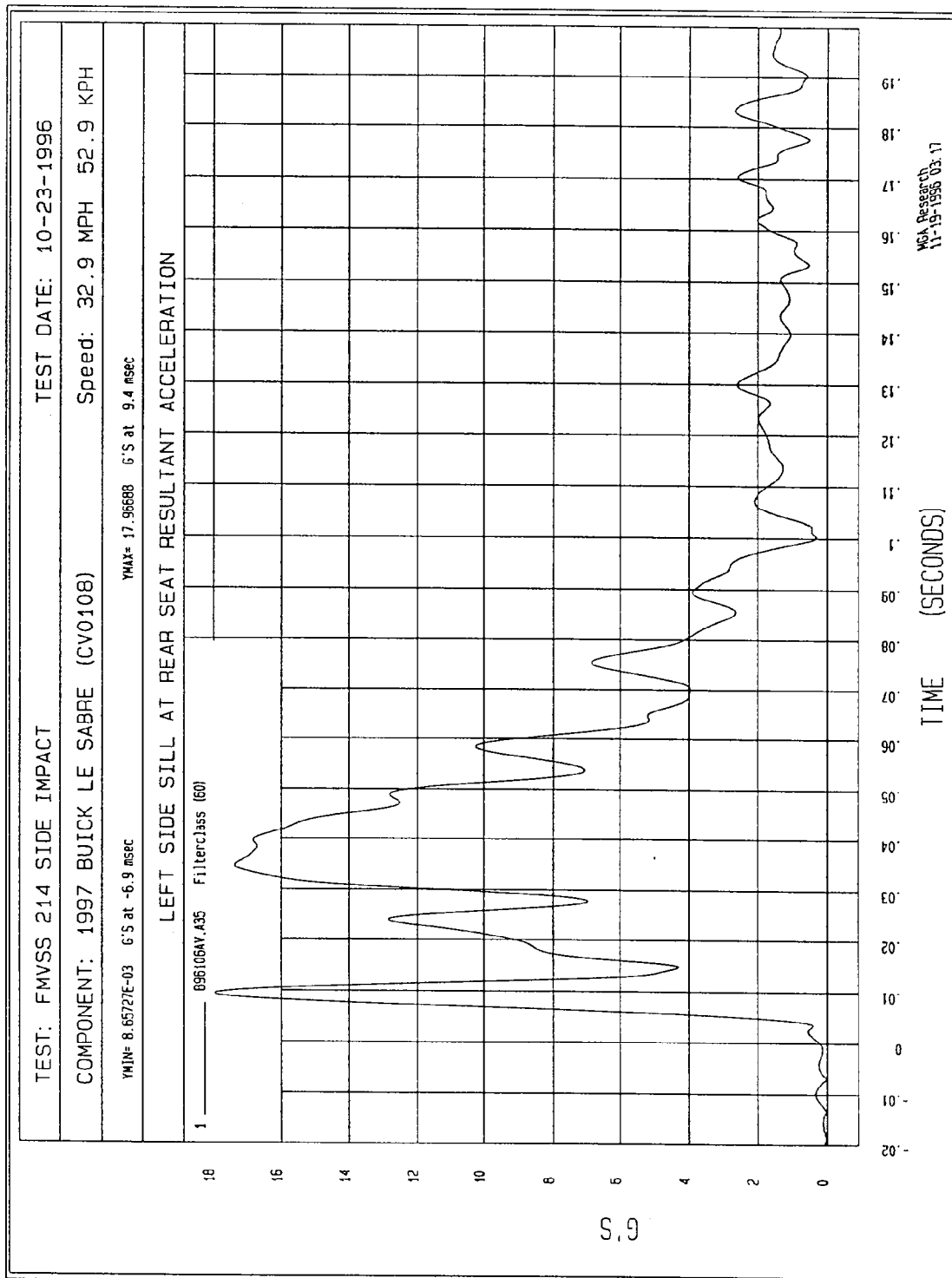


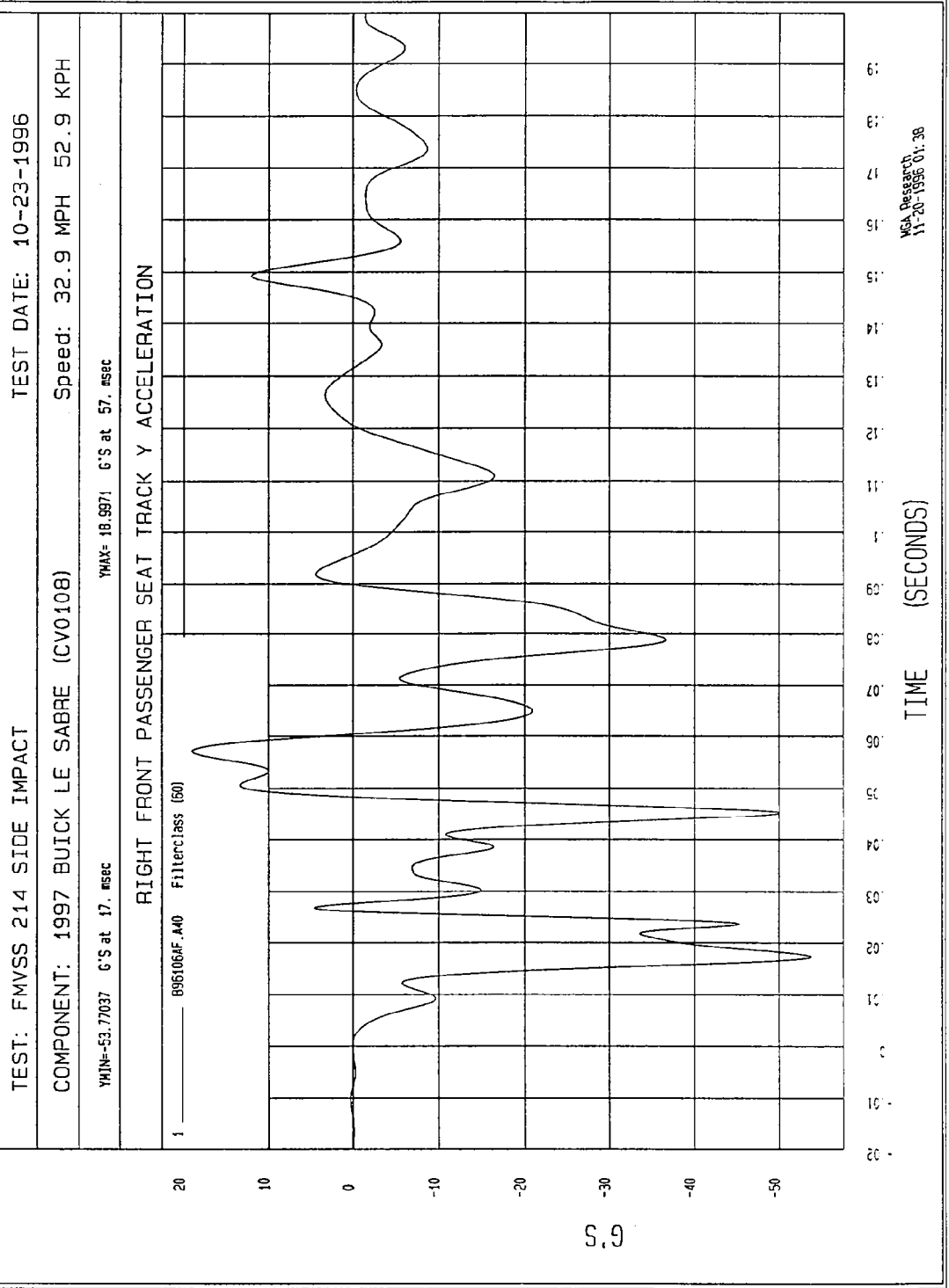


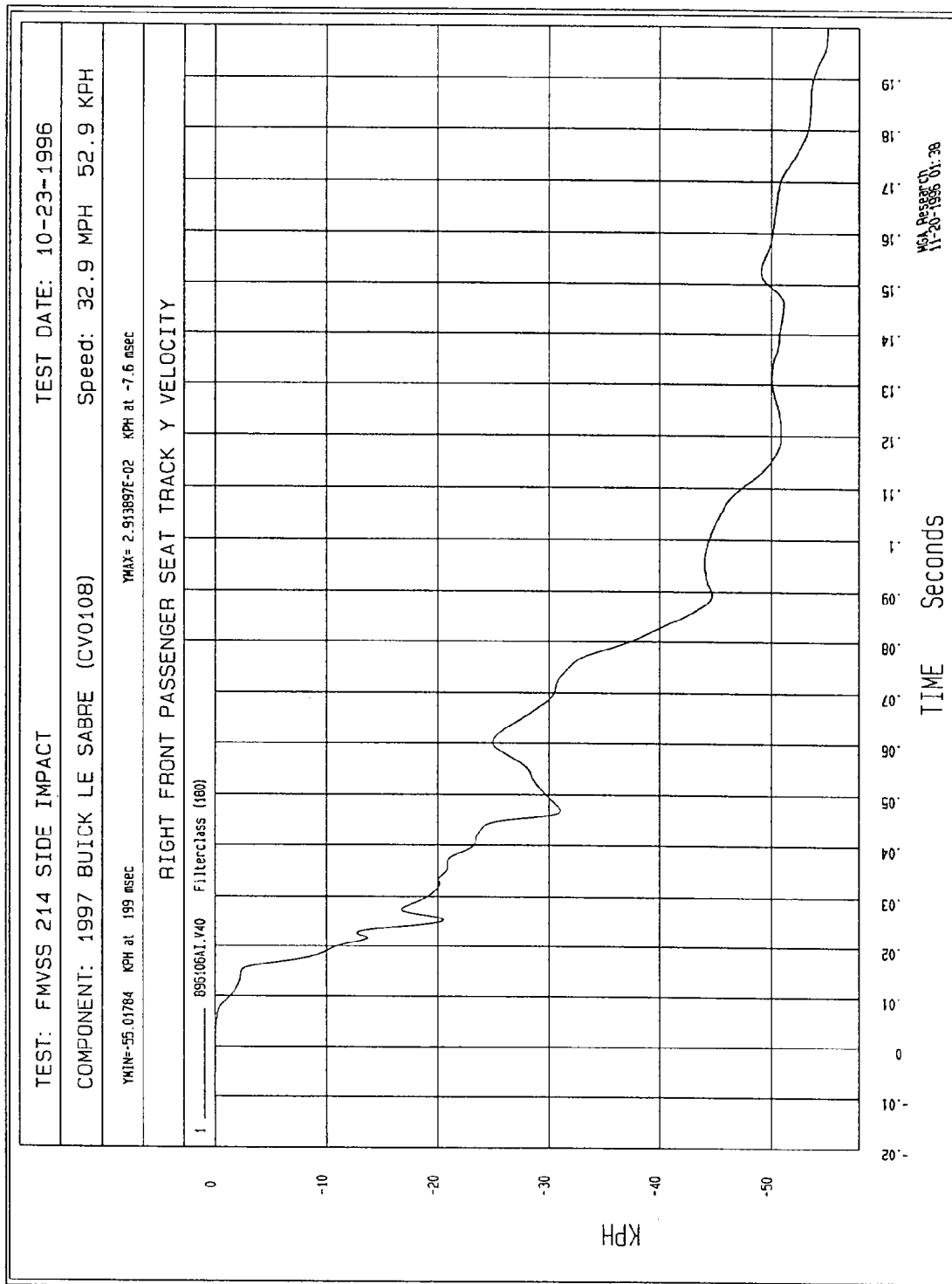


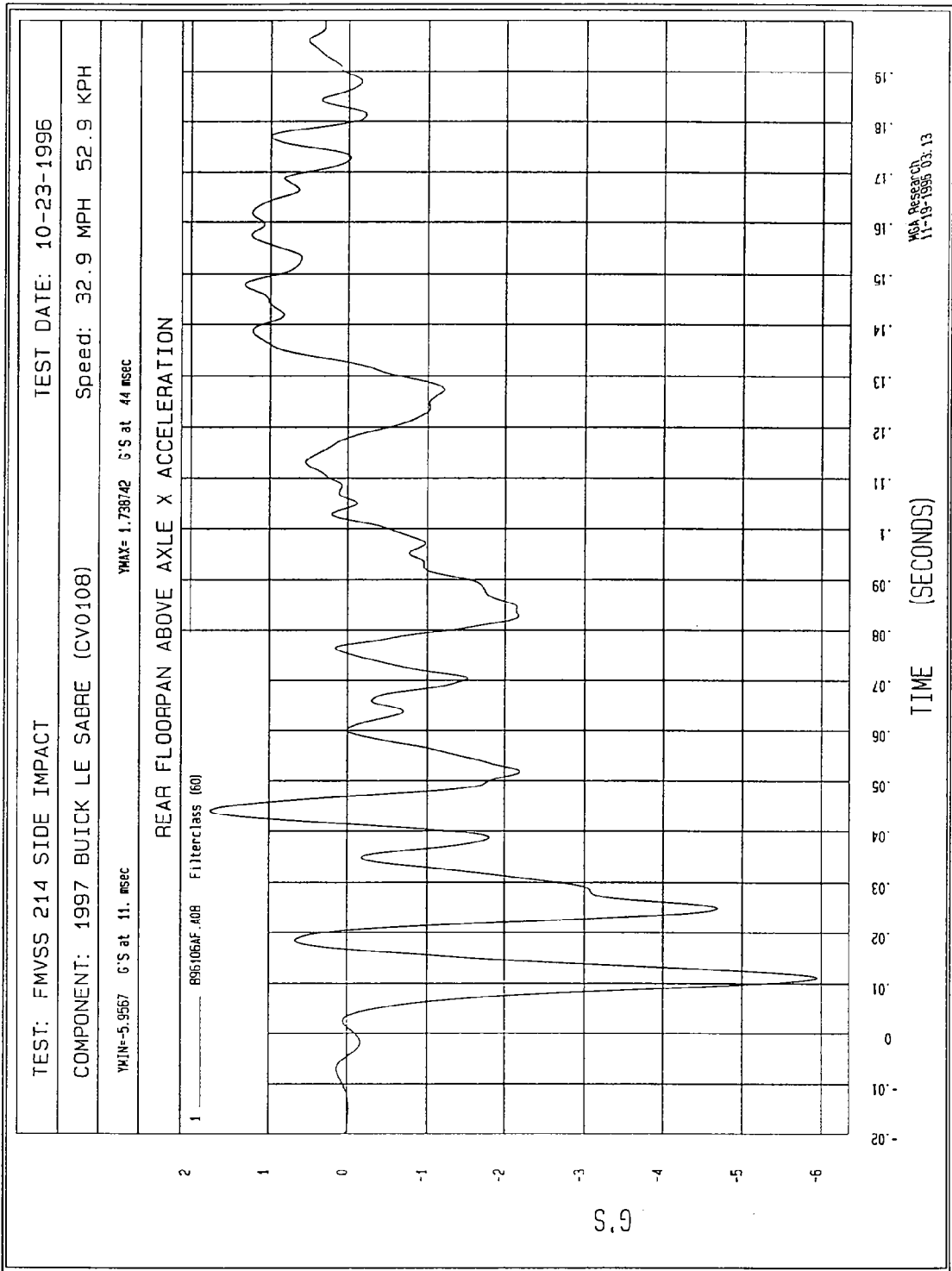


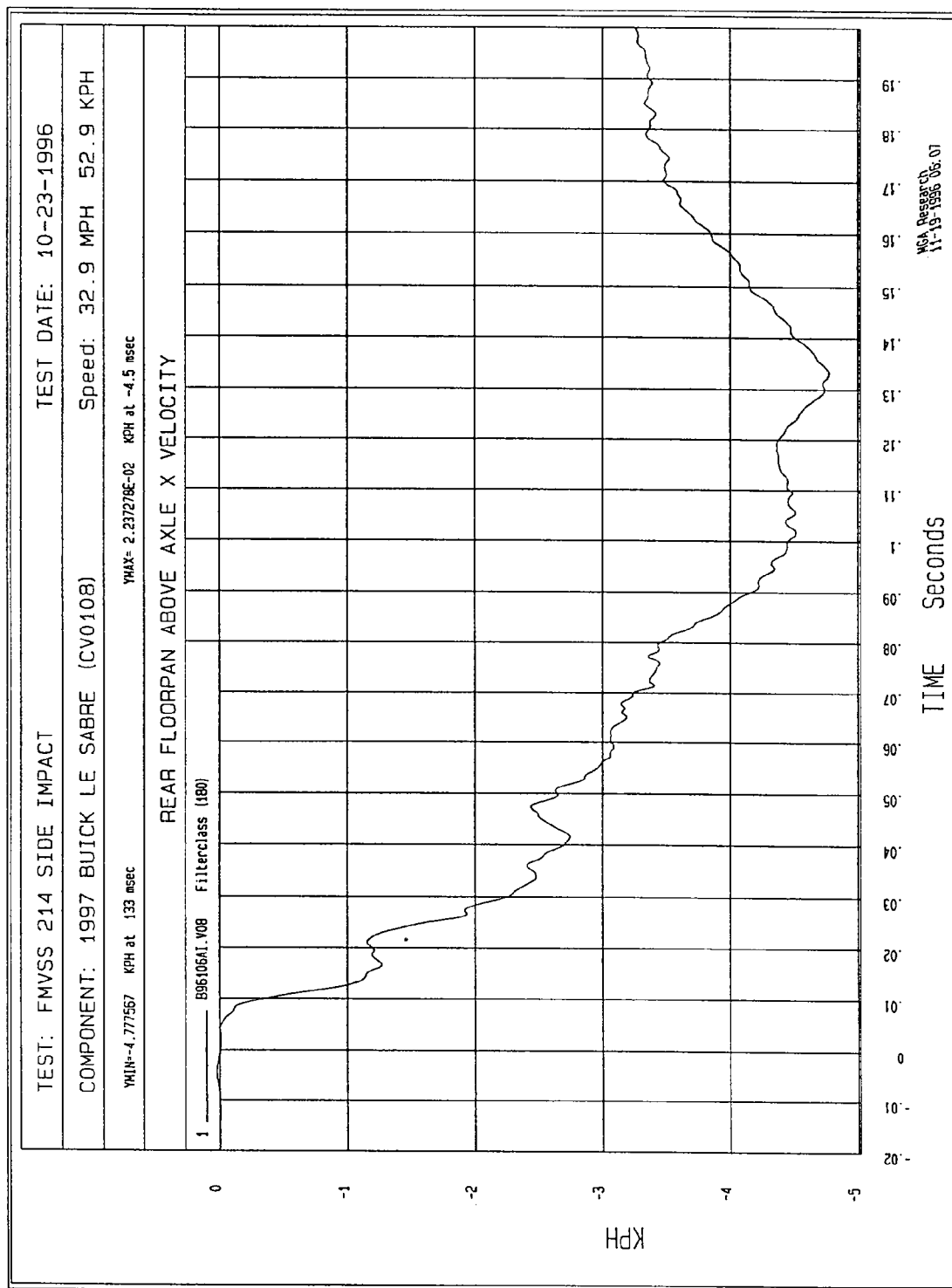


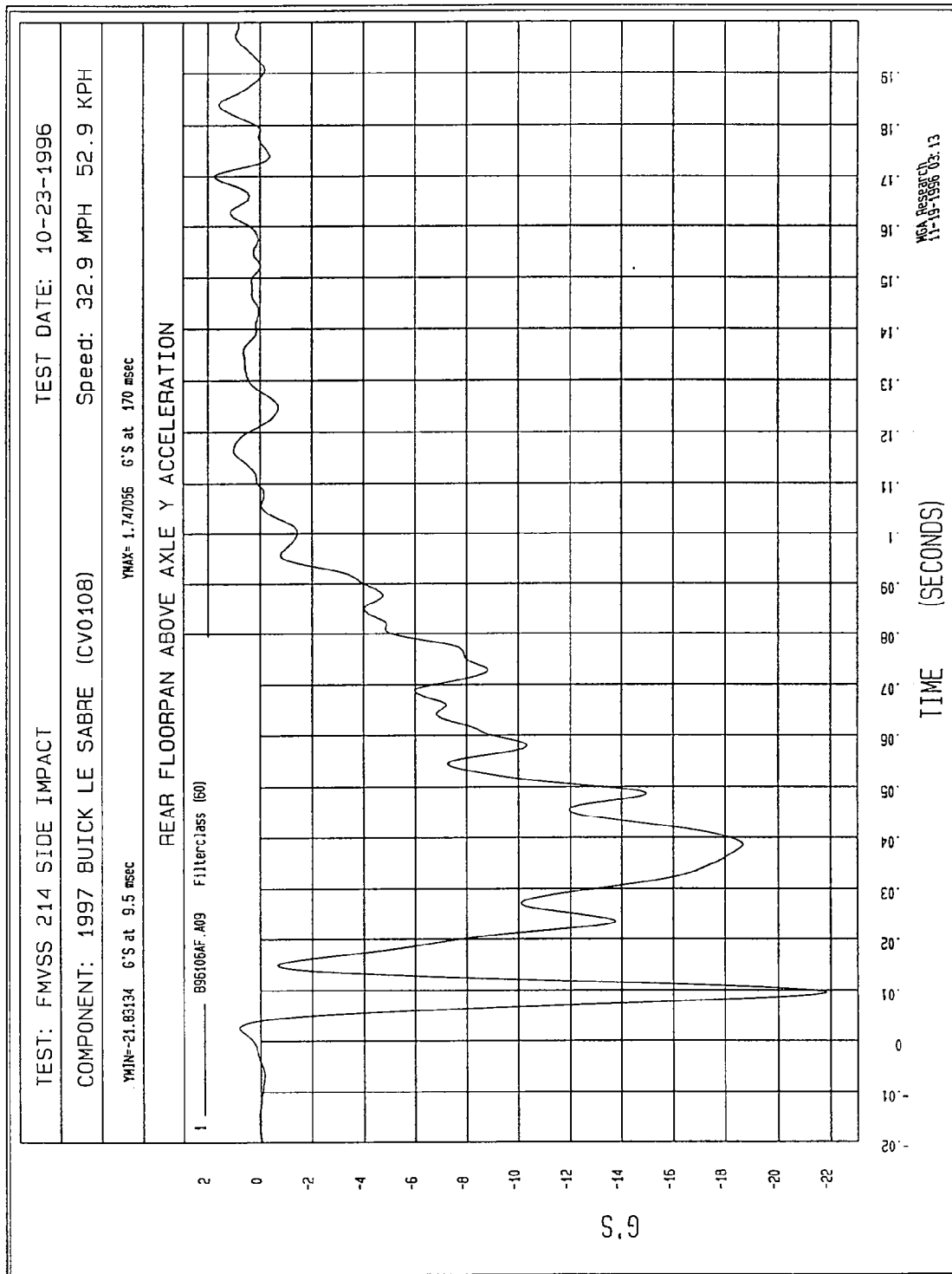


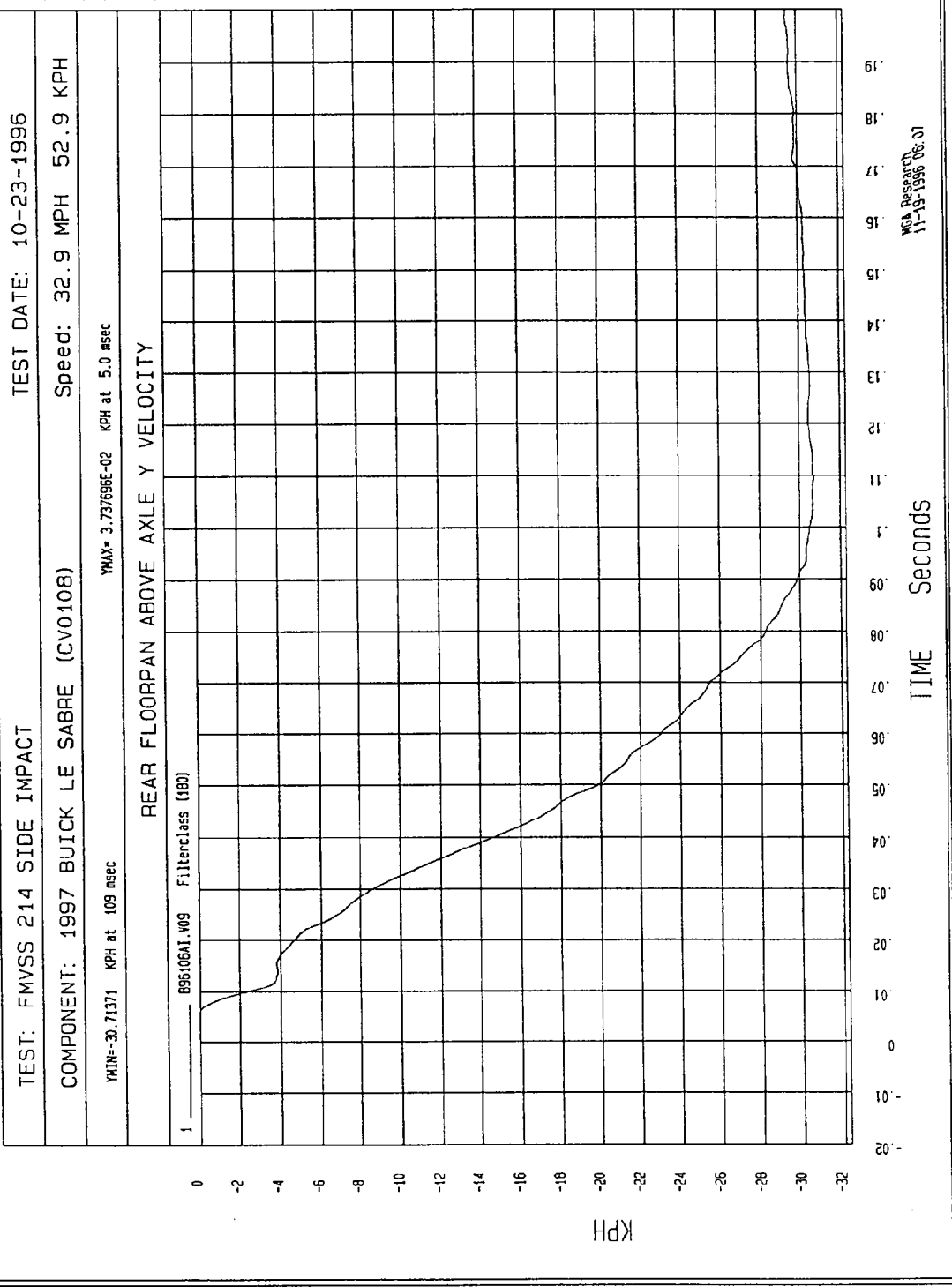


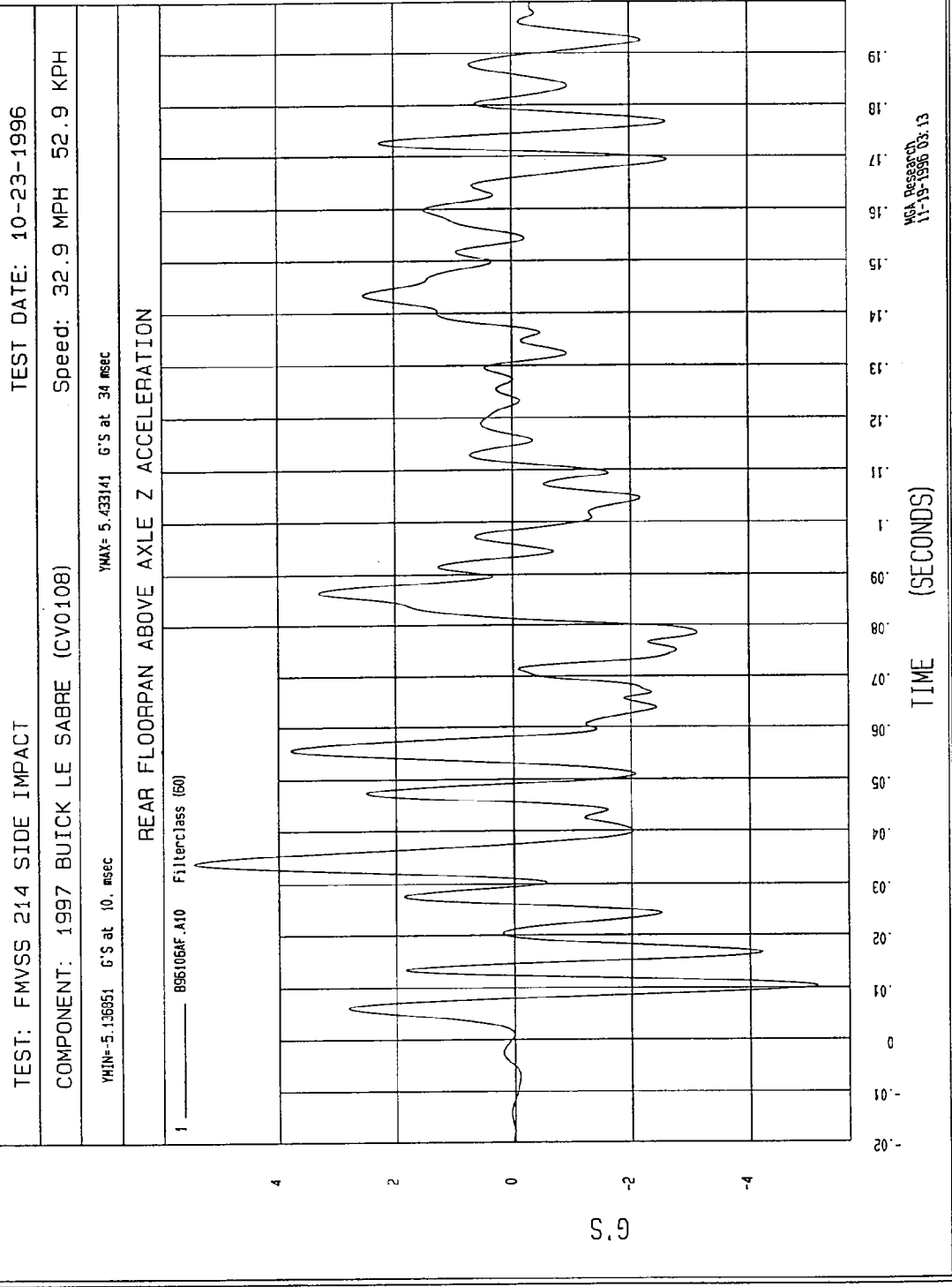


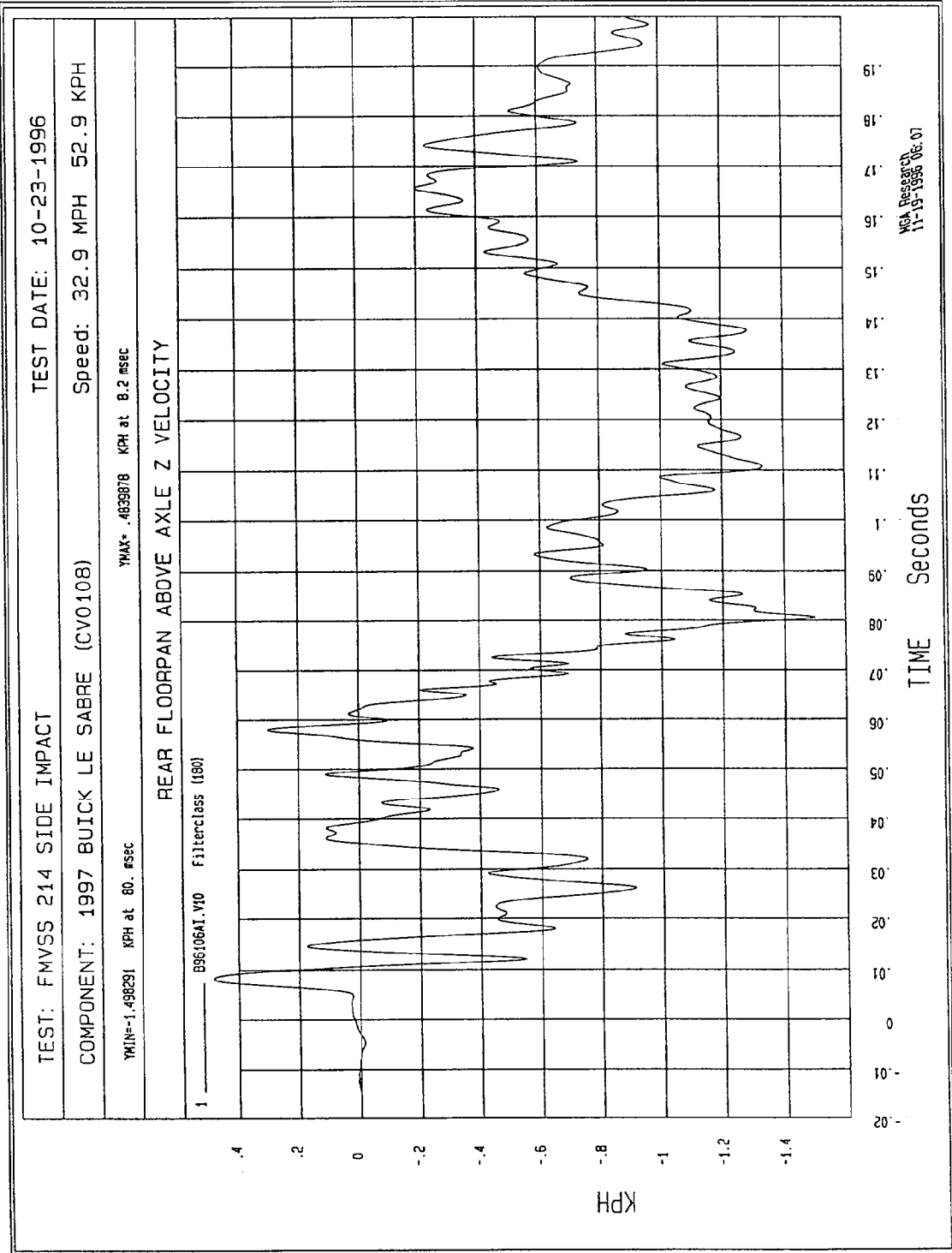


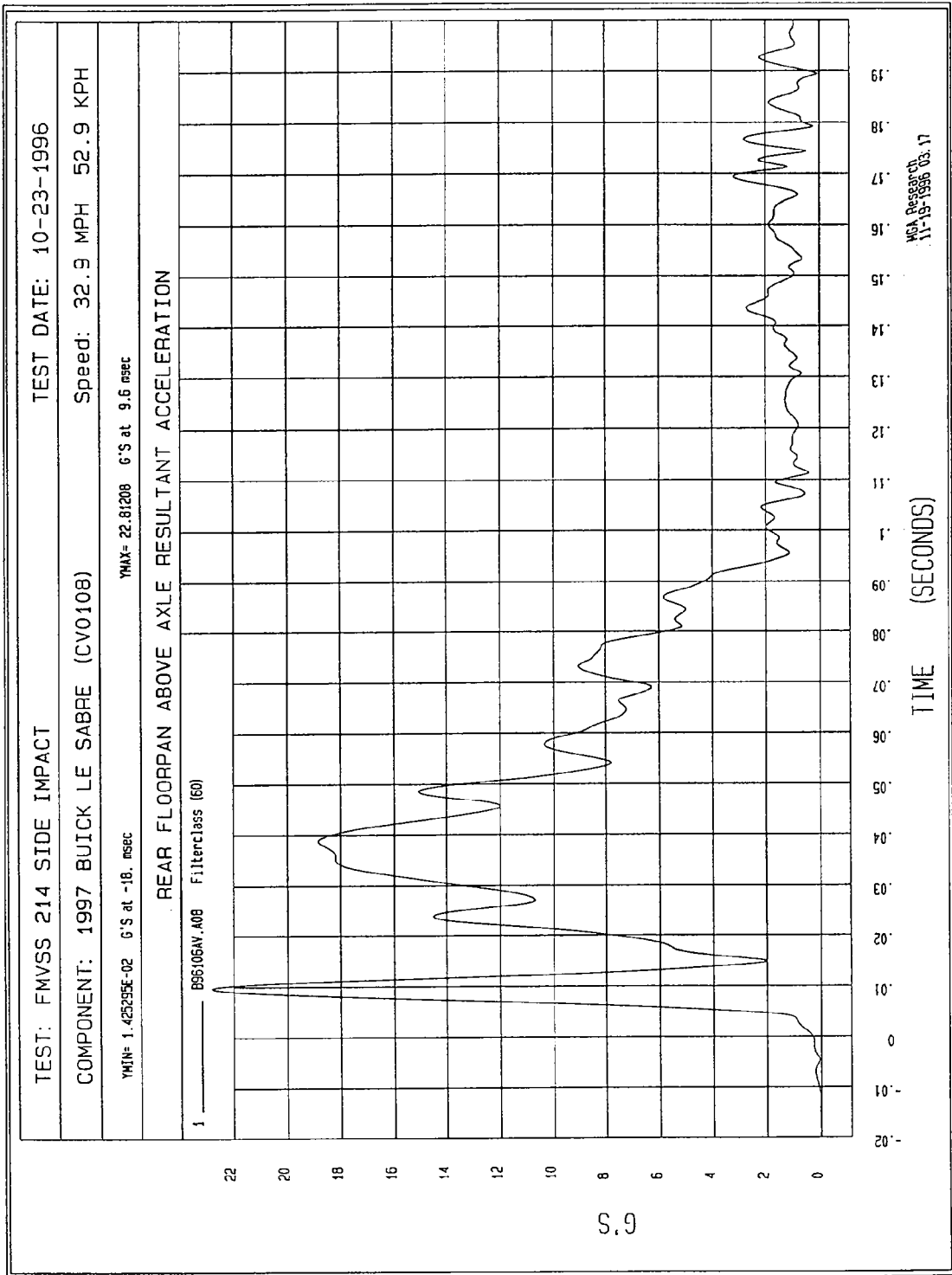


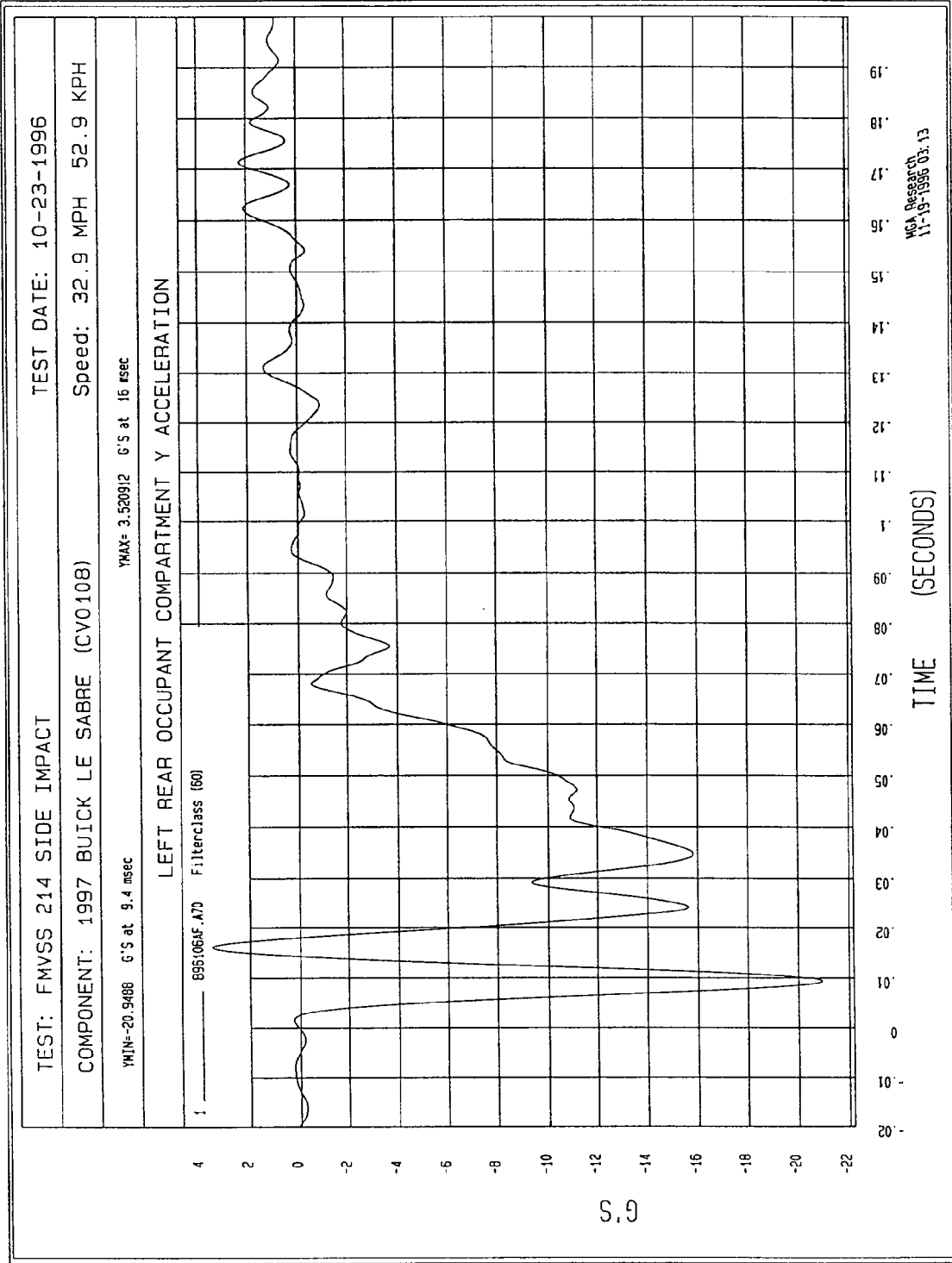


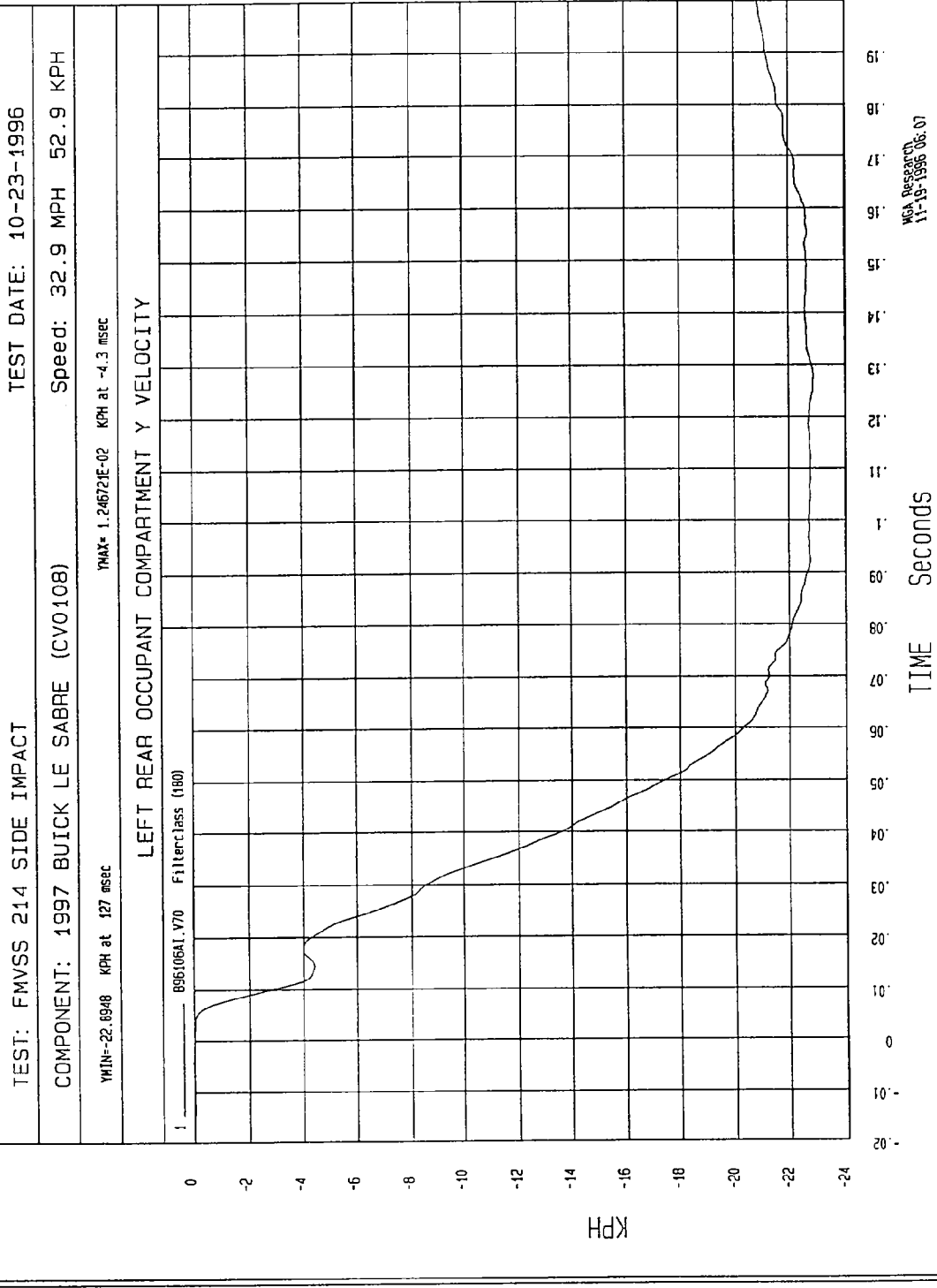


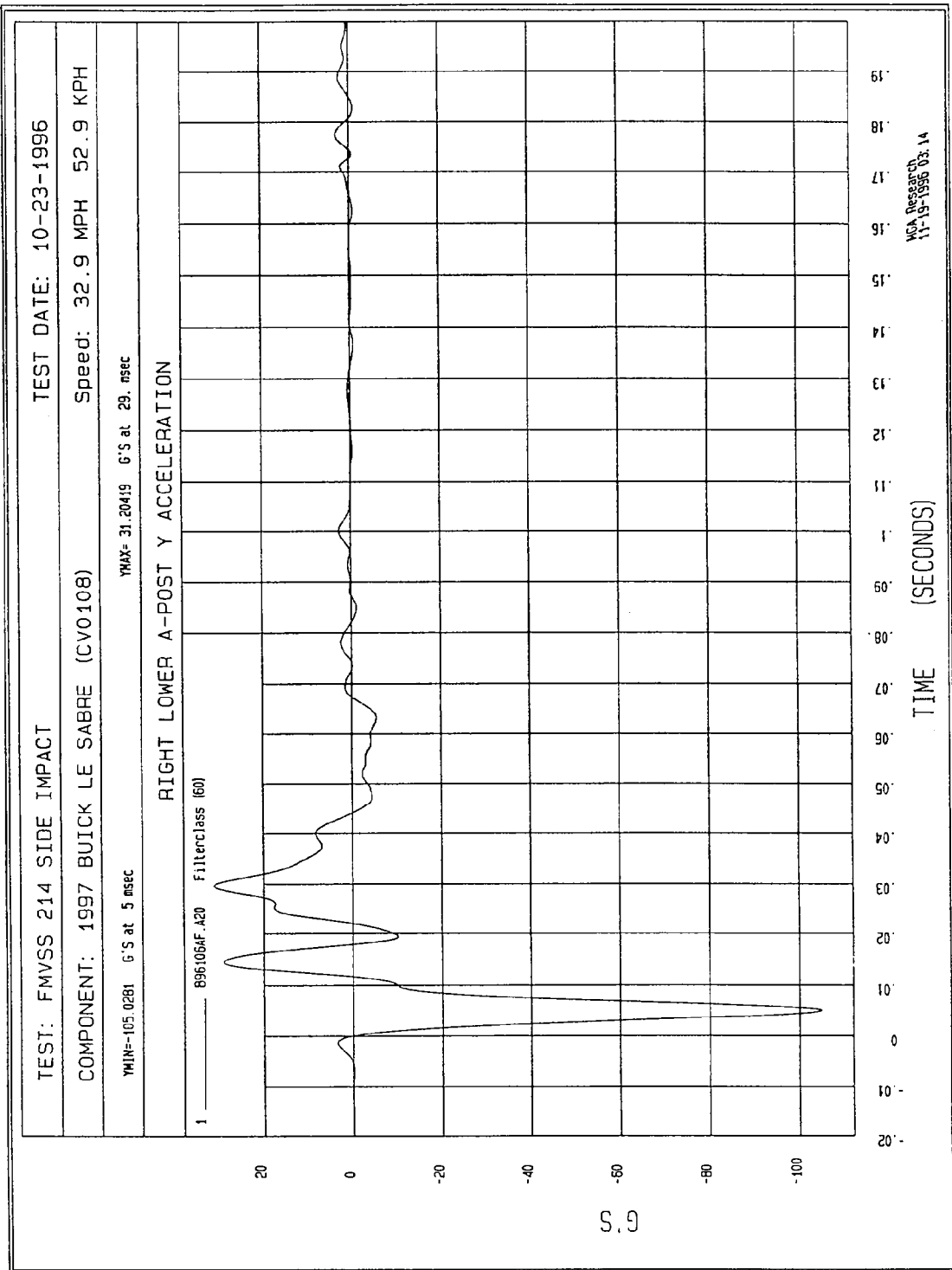


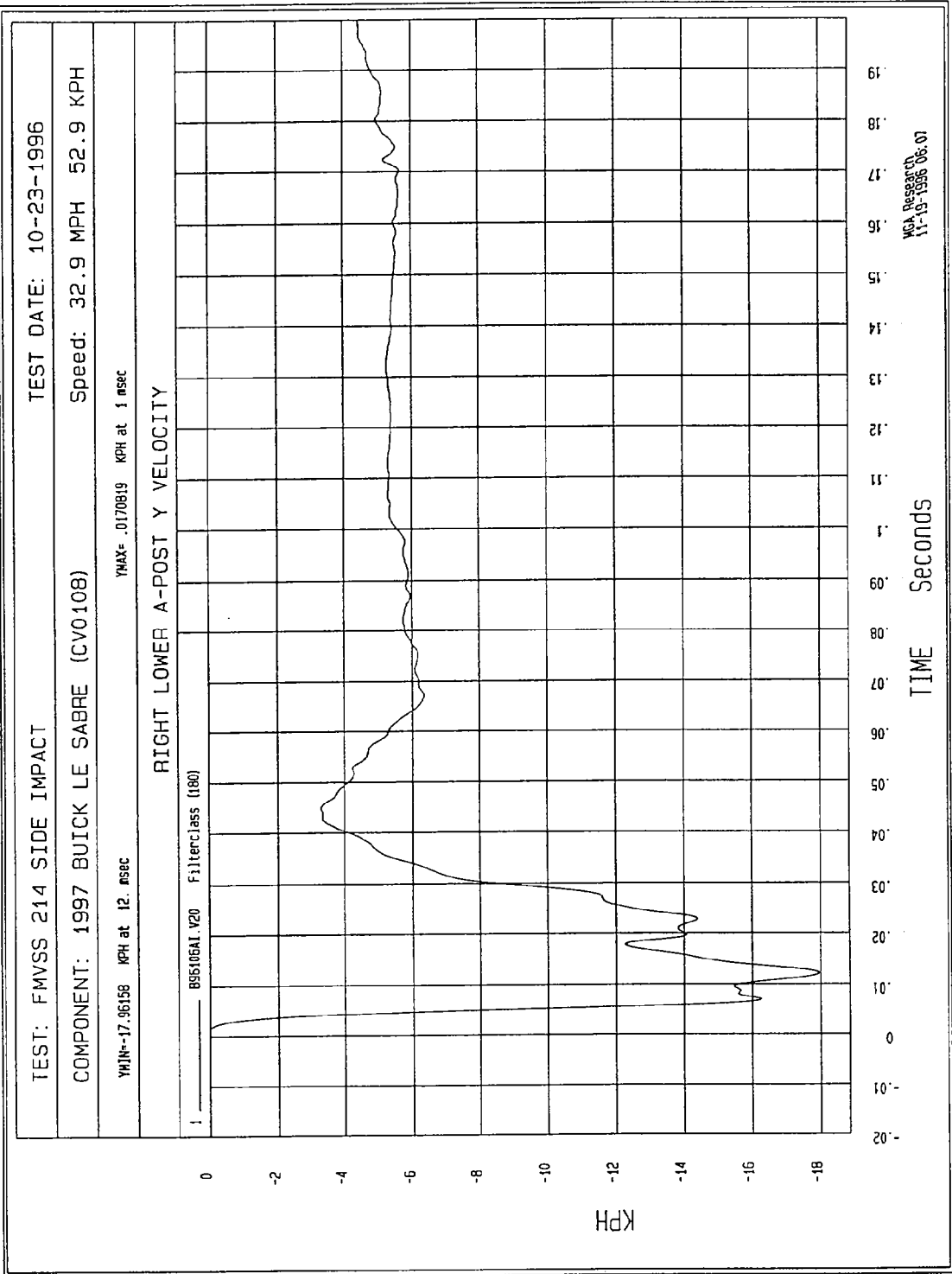


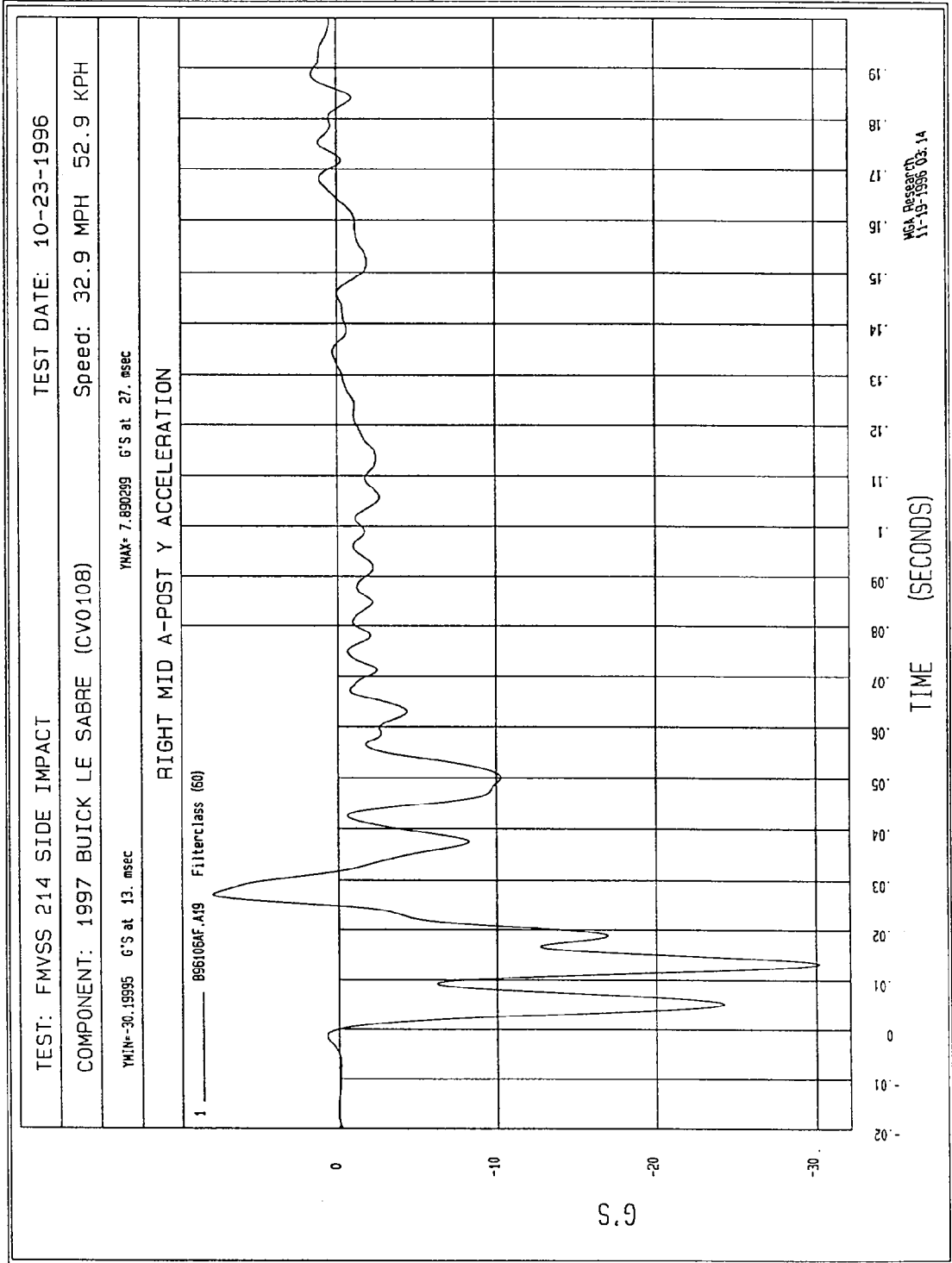












TEST: FMVSS 214 SIDE IMPACT

TEST DATE: 10-23-1996

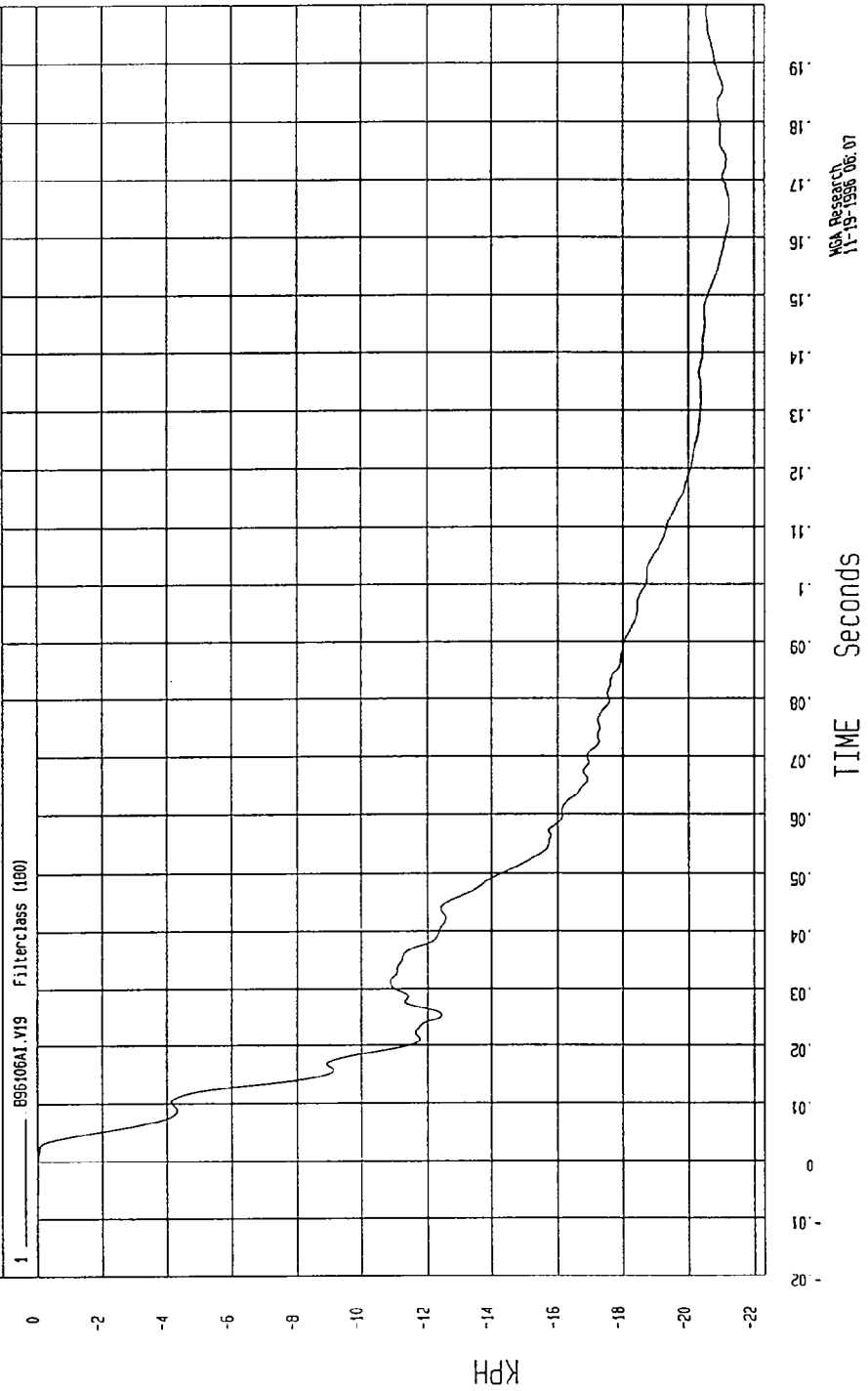
COMPONENT: 1997 BUICK LE SABRE (CV0108)

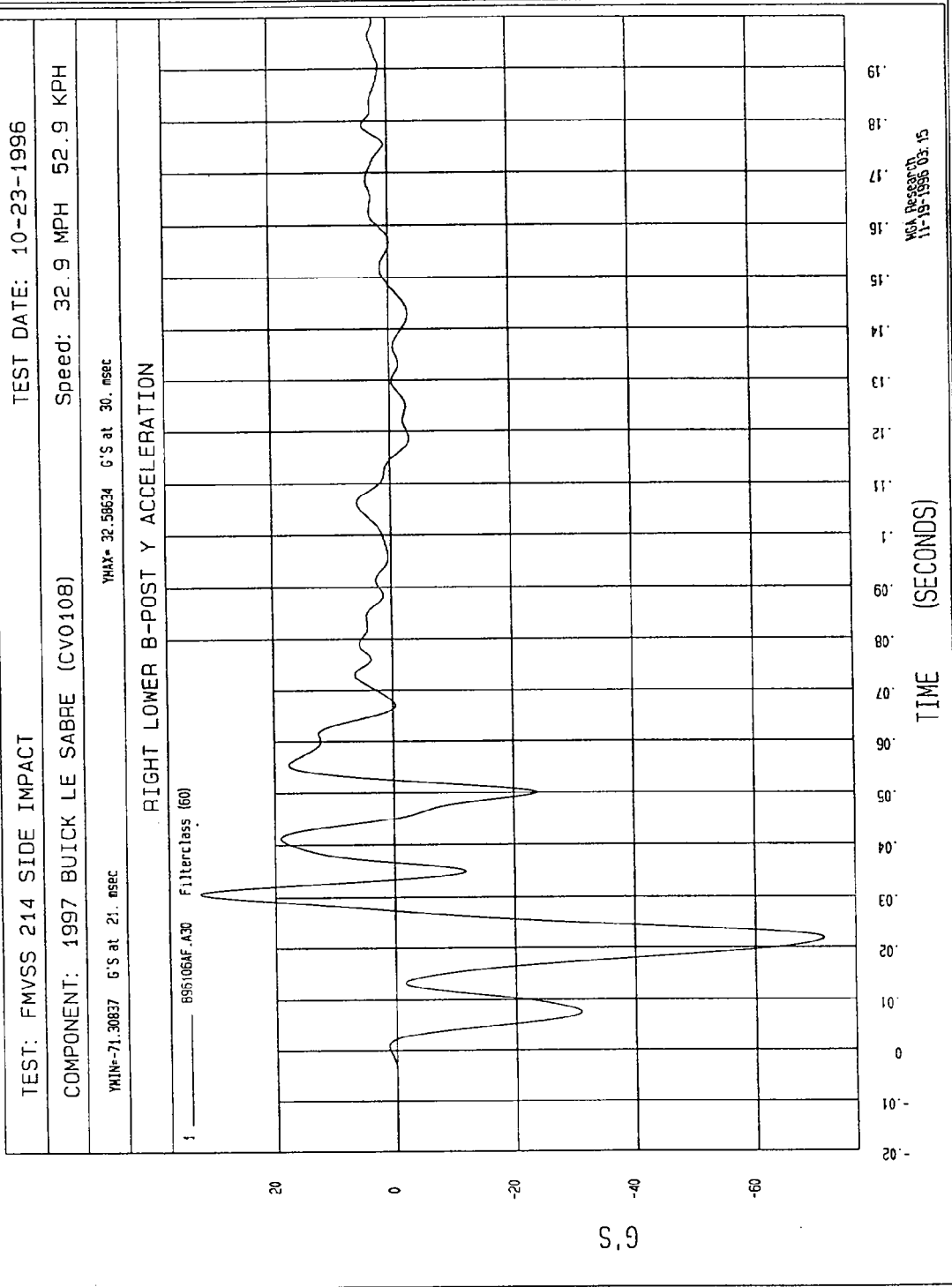
Speed: 32.9 MPH 52.9 KPH

WIN-21.24534 KPH at 163 msec

YMAX= 1.163921E-02 KPH at -13. msec

RIGHT MID A-POST Y VELOCITY





TEST: FMVSS 214 SIDE IMPACT TEST DATE: 10-23-1996

SPEED: 32.9 MPH 52.9 KPH

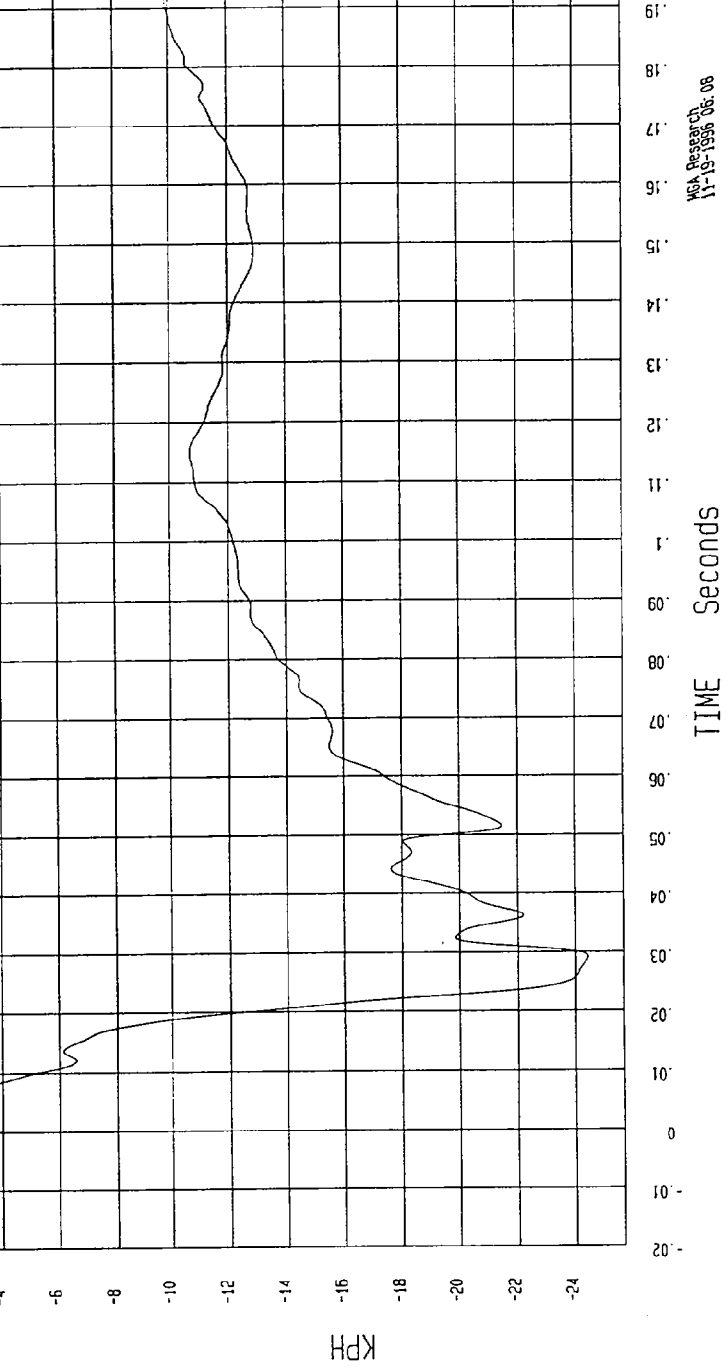
COMPONENT: 1997 BUICK LE SABRE (CV0108)

YMIN=-24.43018 KPH at 29. msec

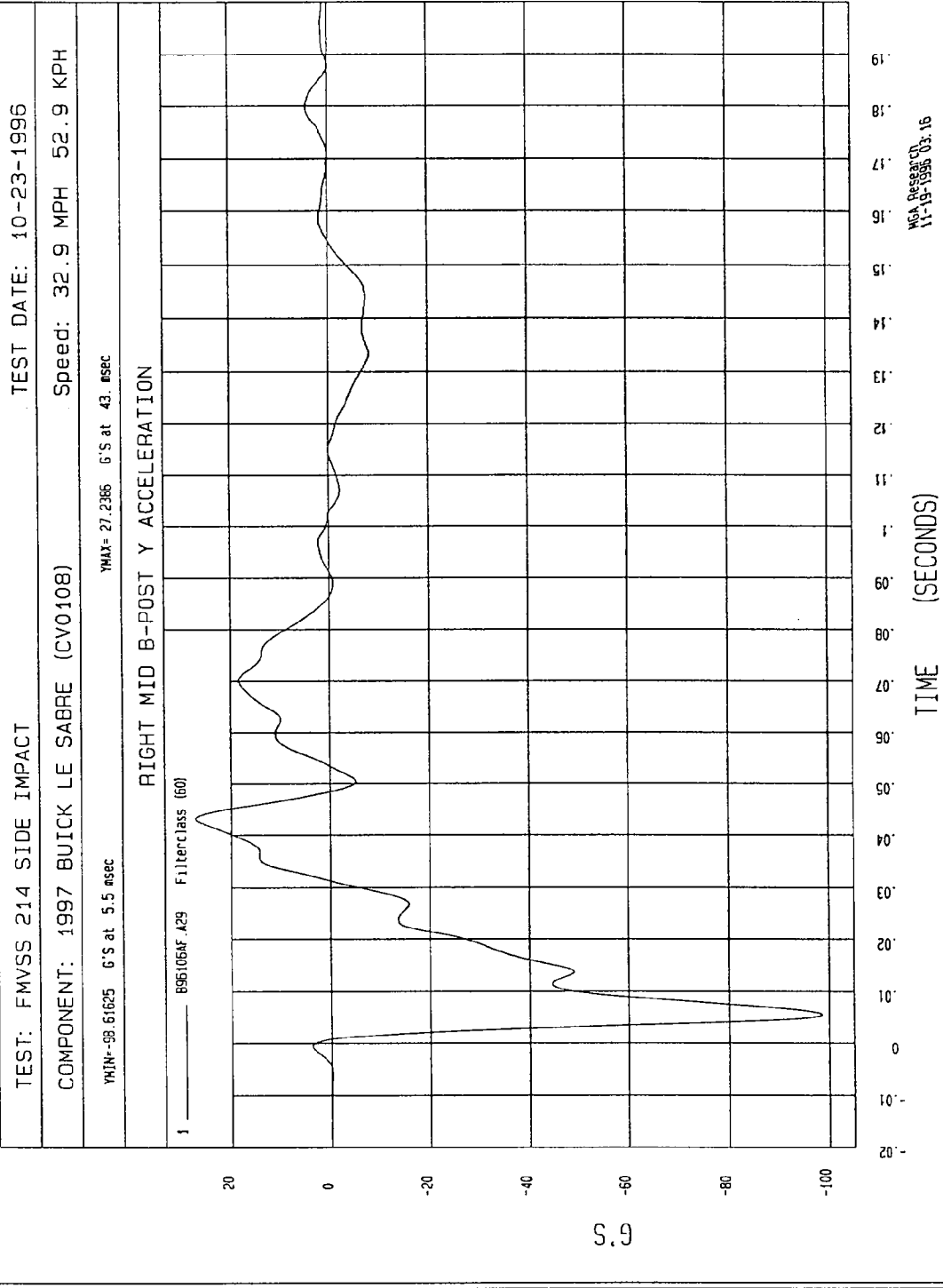
YMAX= .1438237 KPH at 4.0 msec

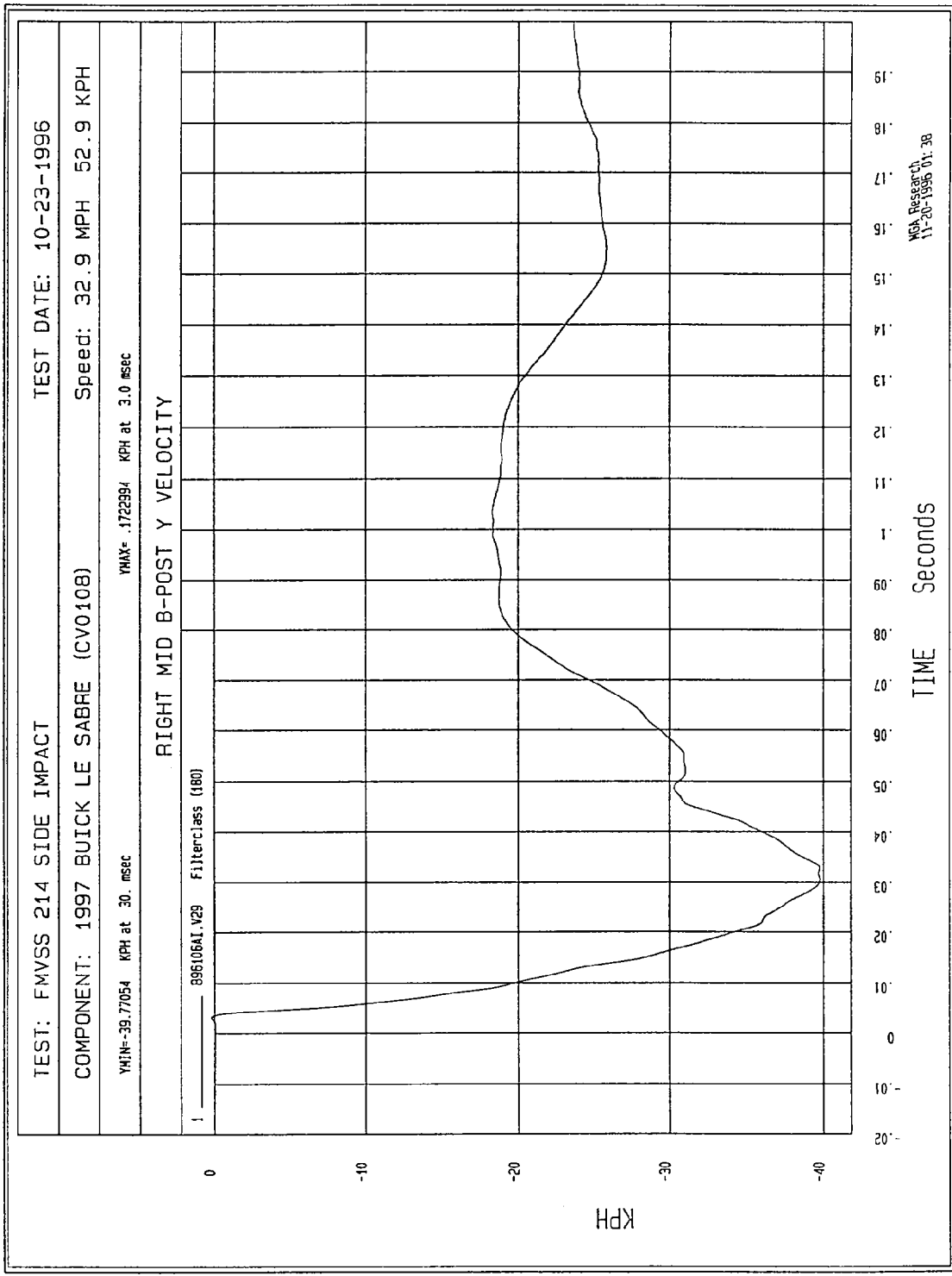
RIGHT LOWER B-POST Y VELOCITY

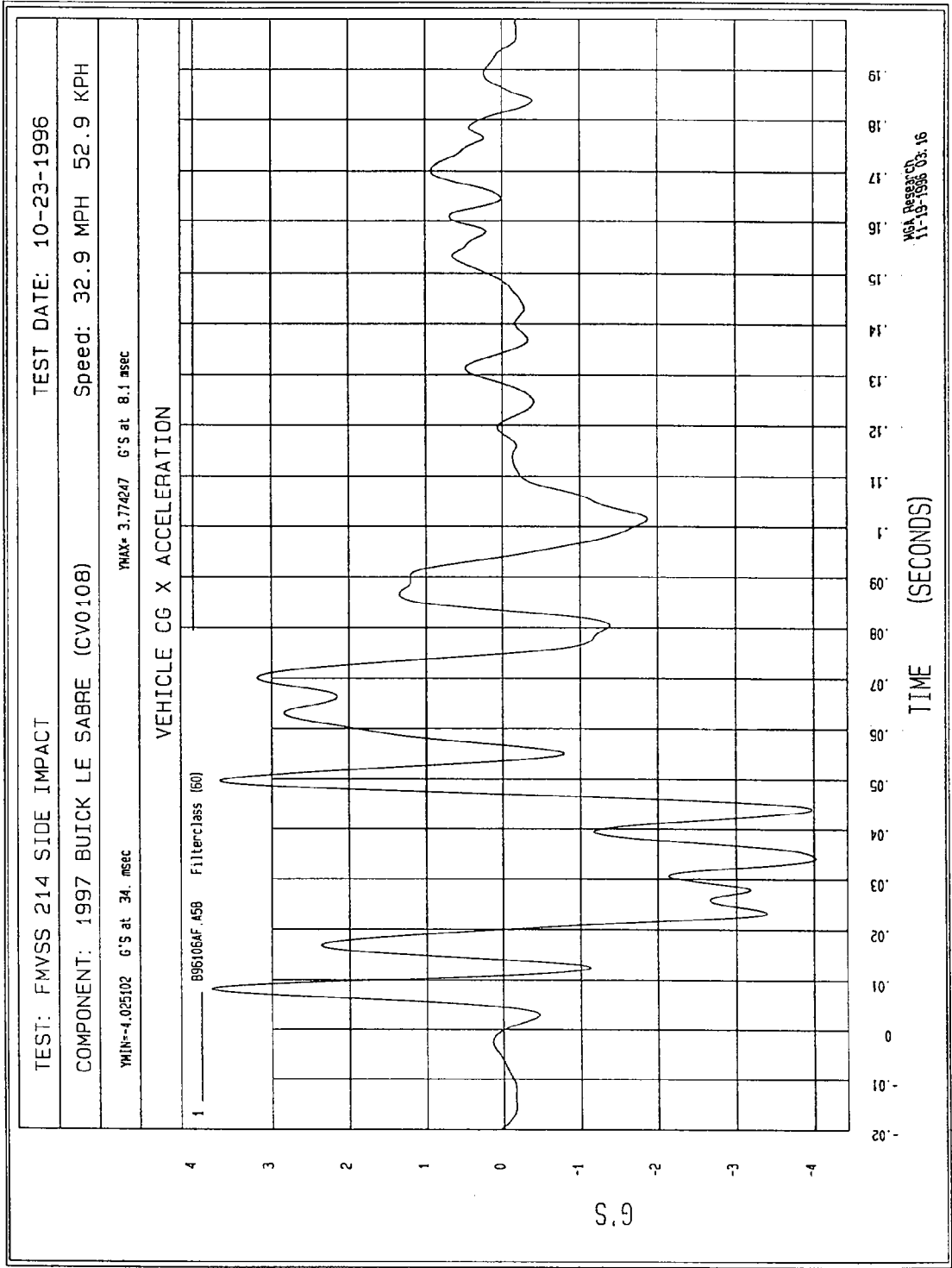
1 B96106A1.730 Filterclass (180)

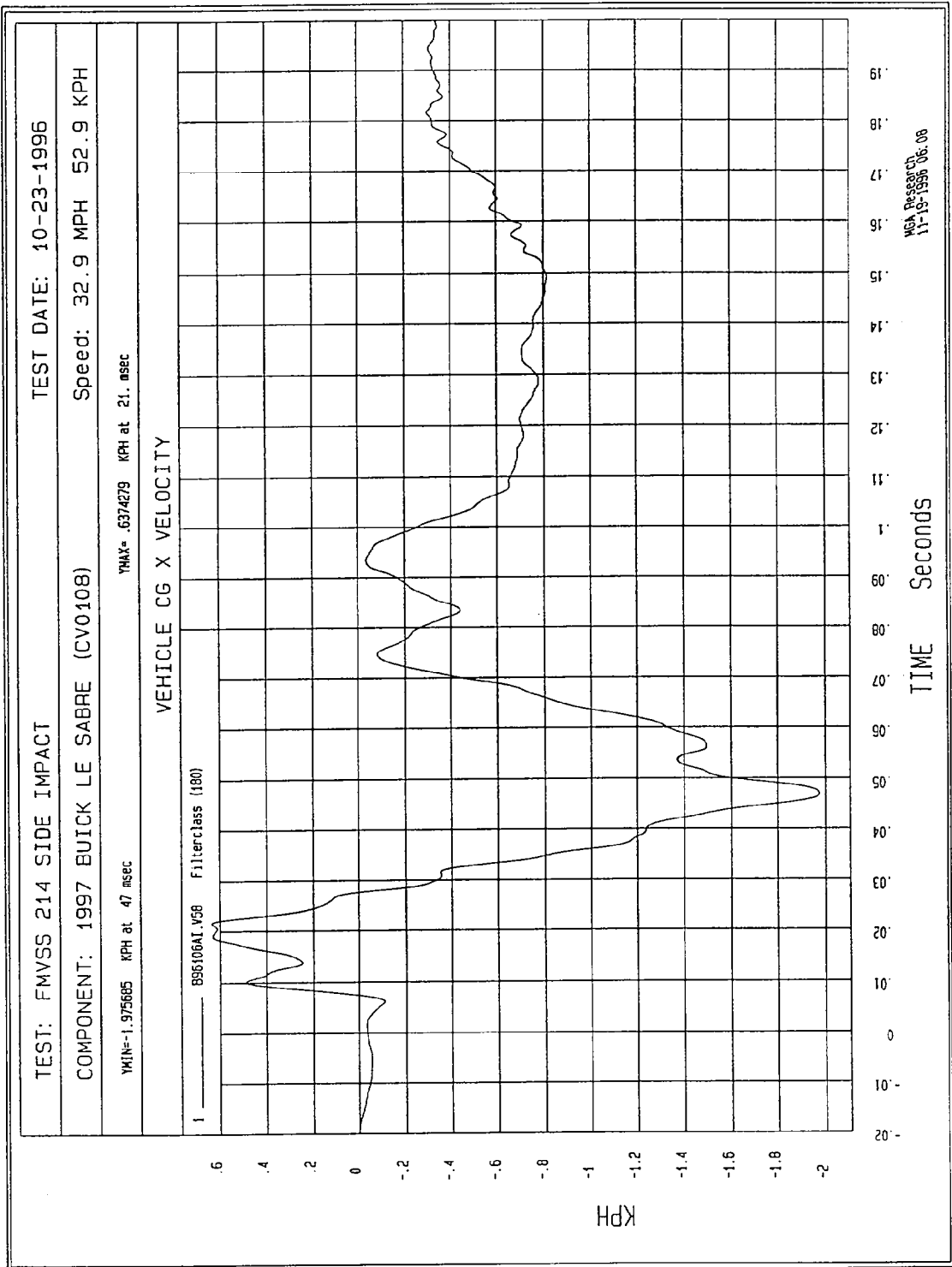


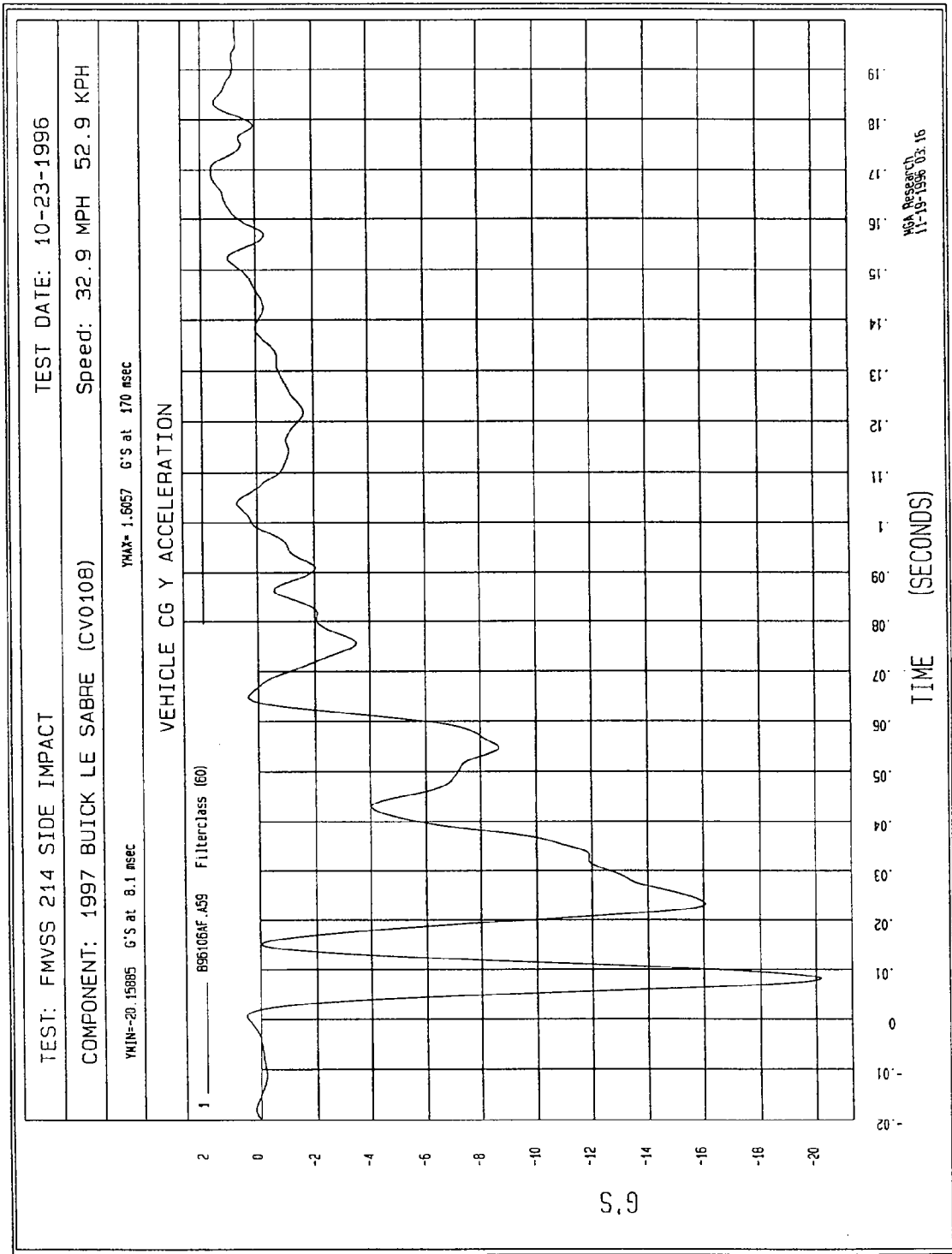
MCA Report
11-15-1996 08:08

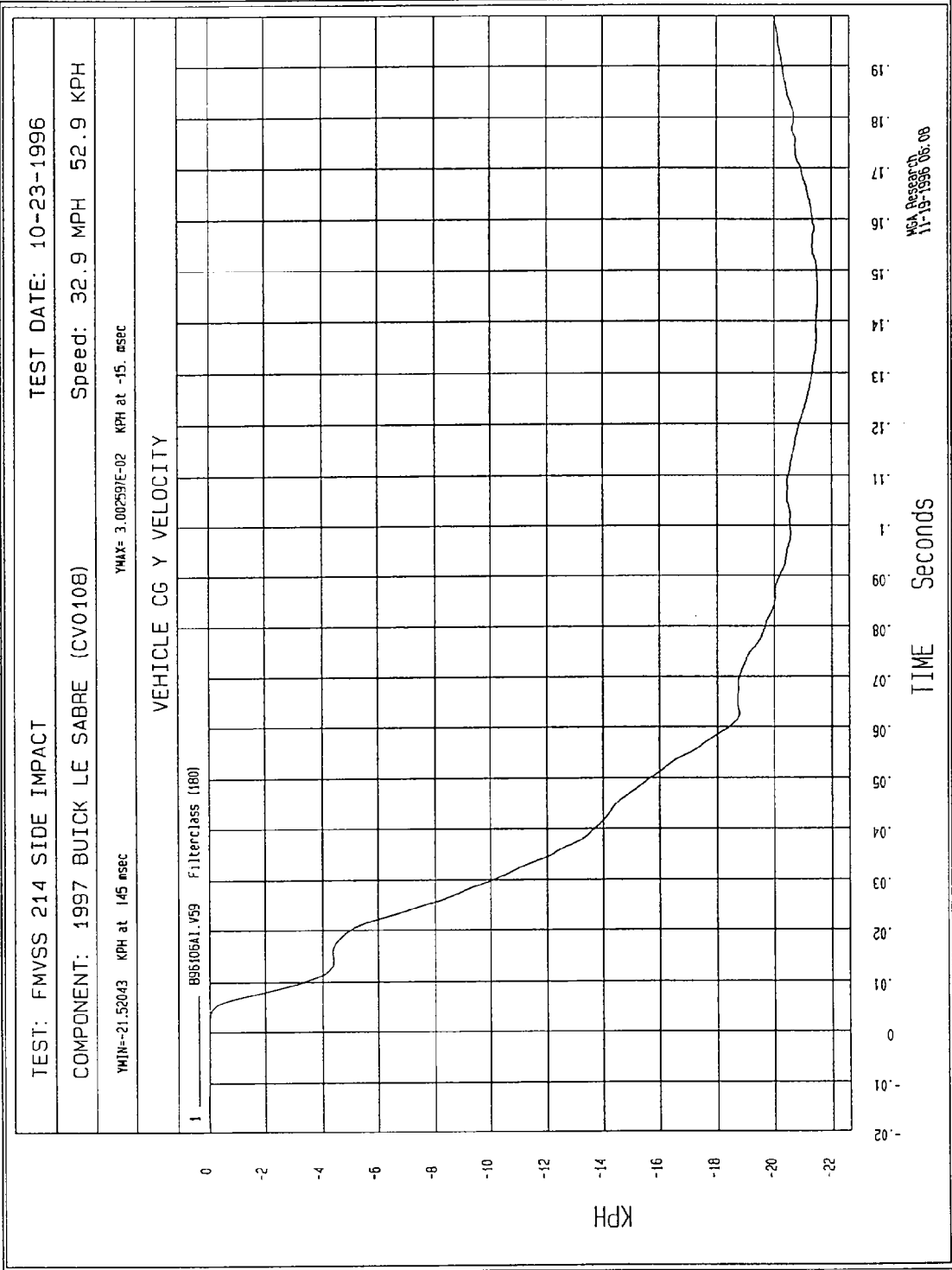


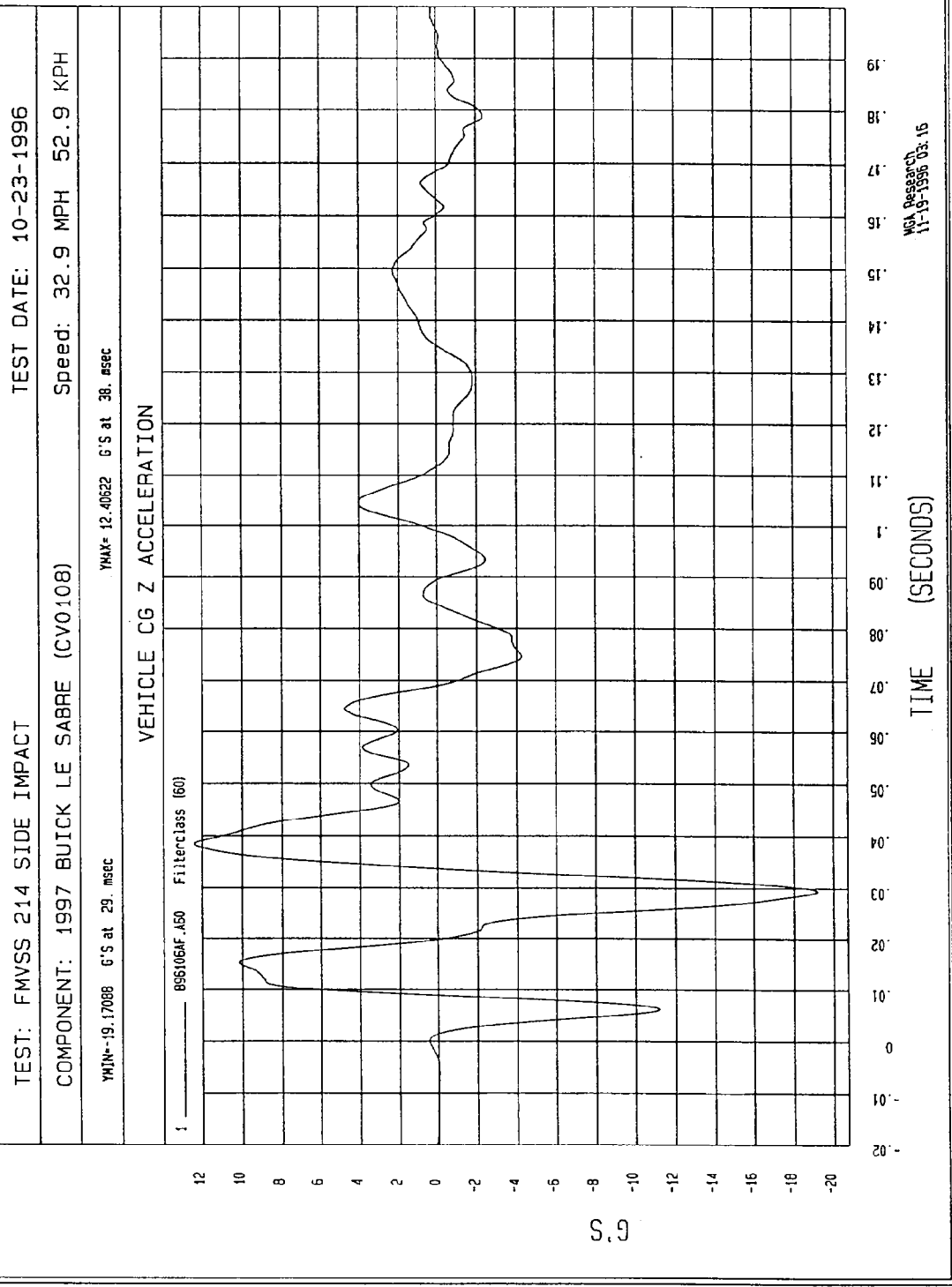


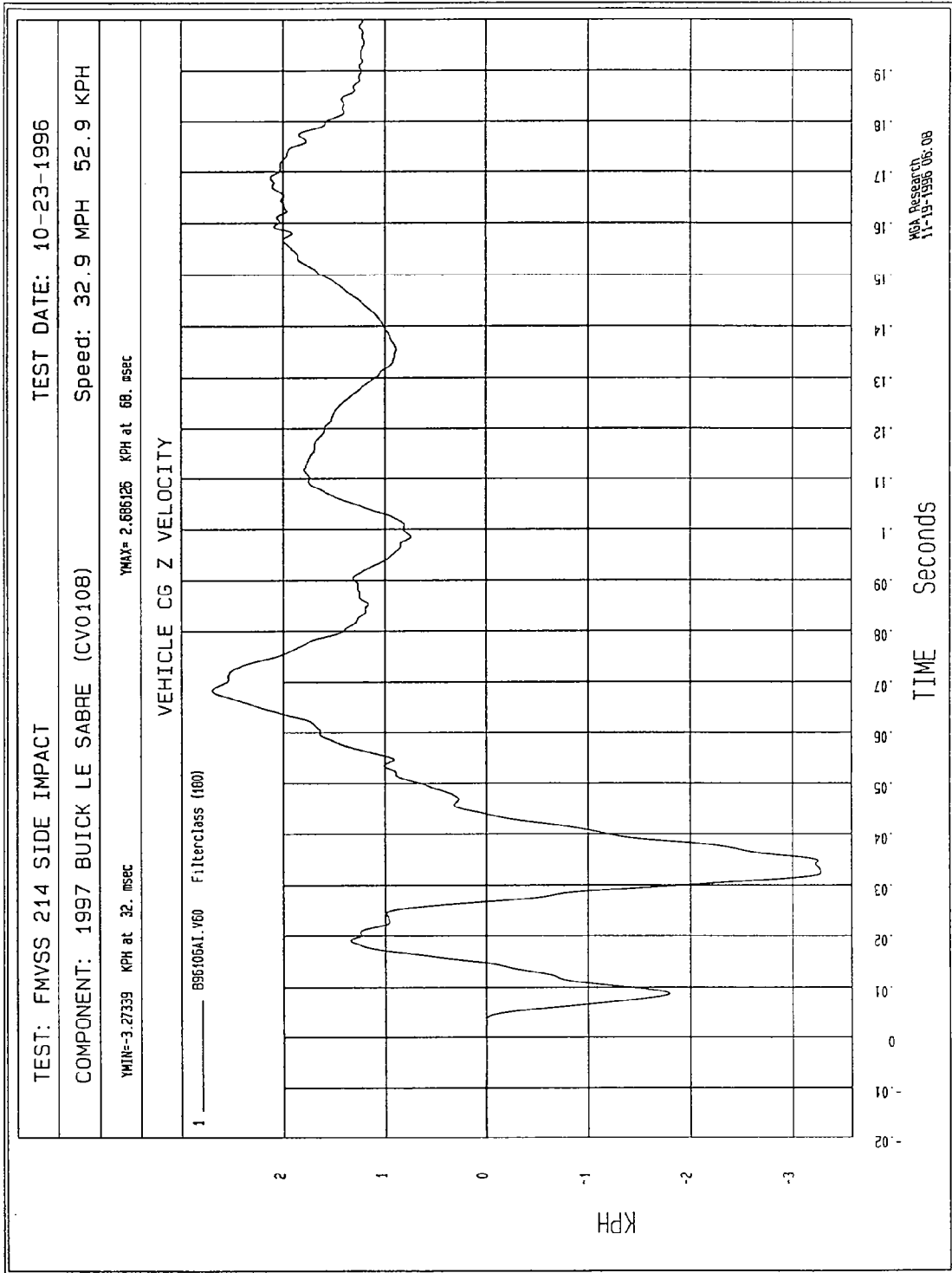


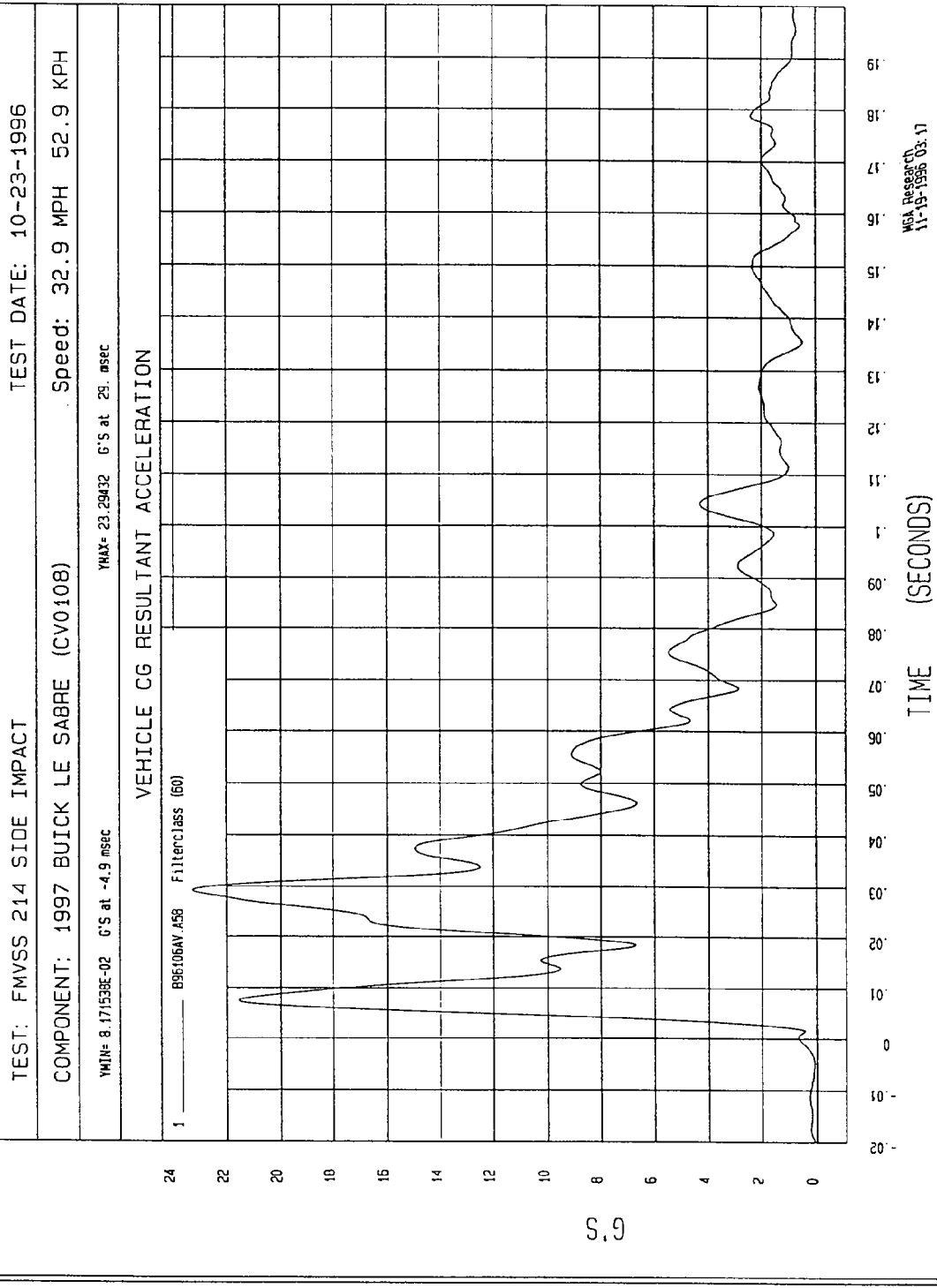


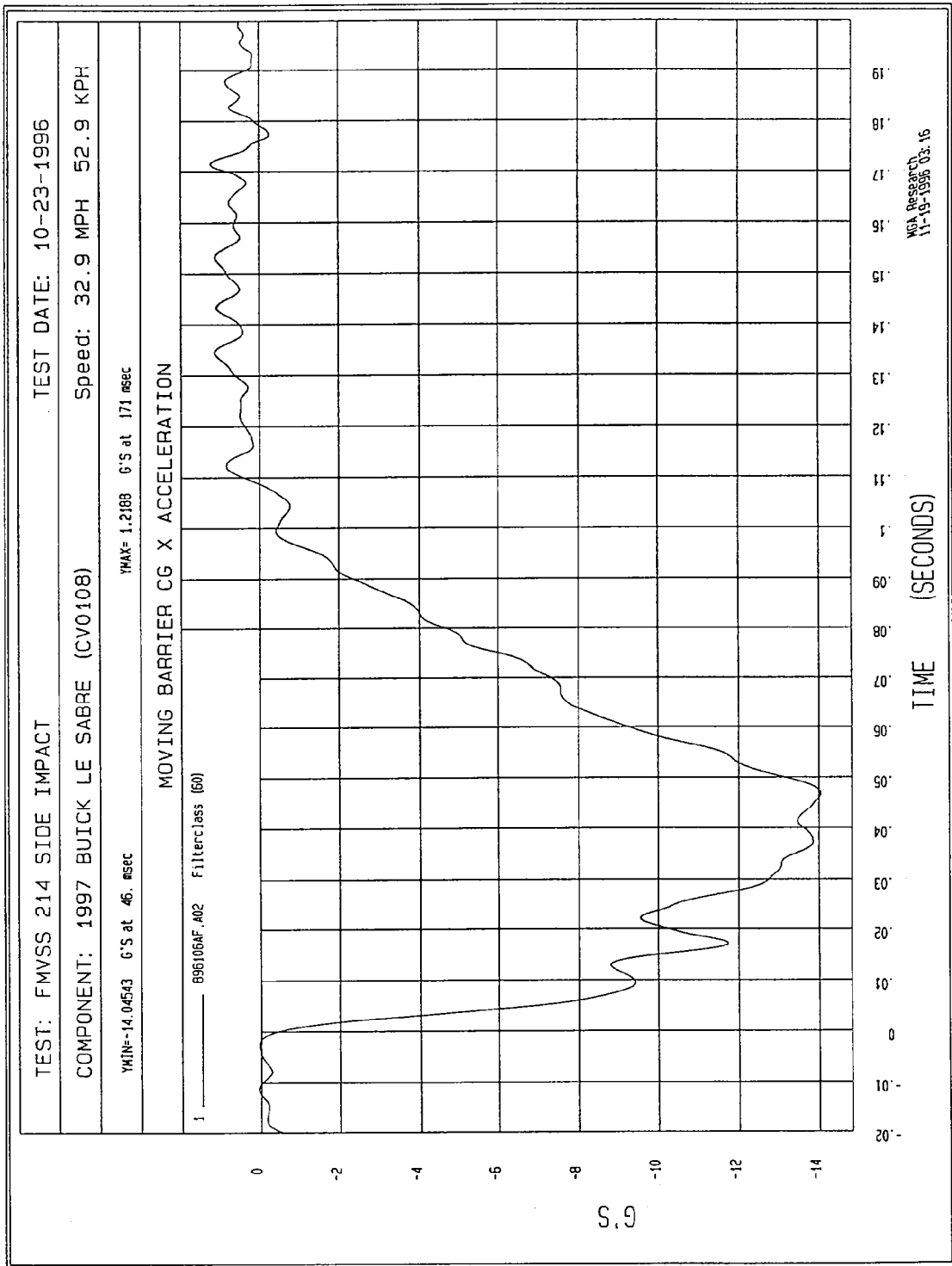


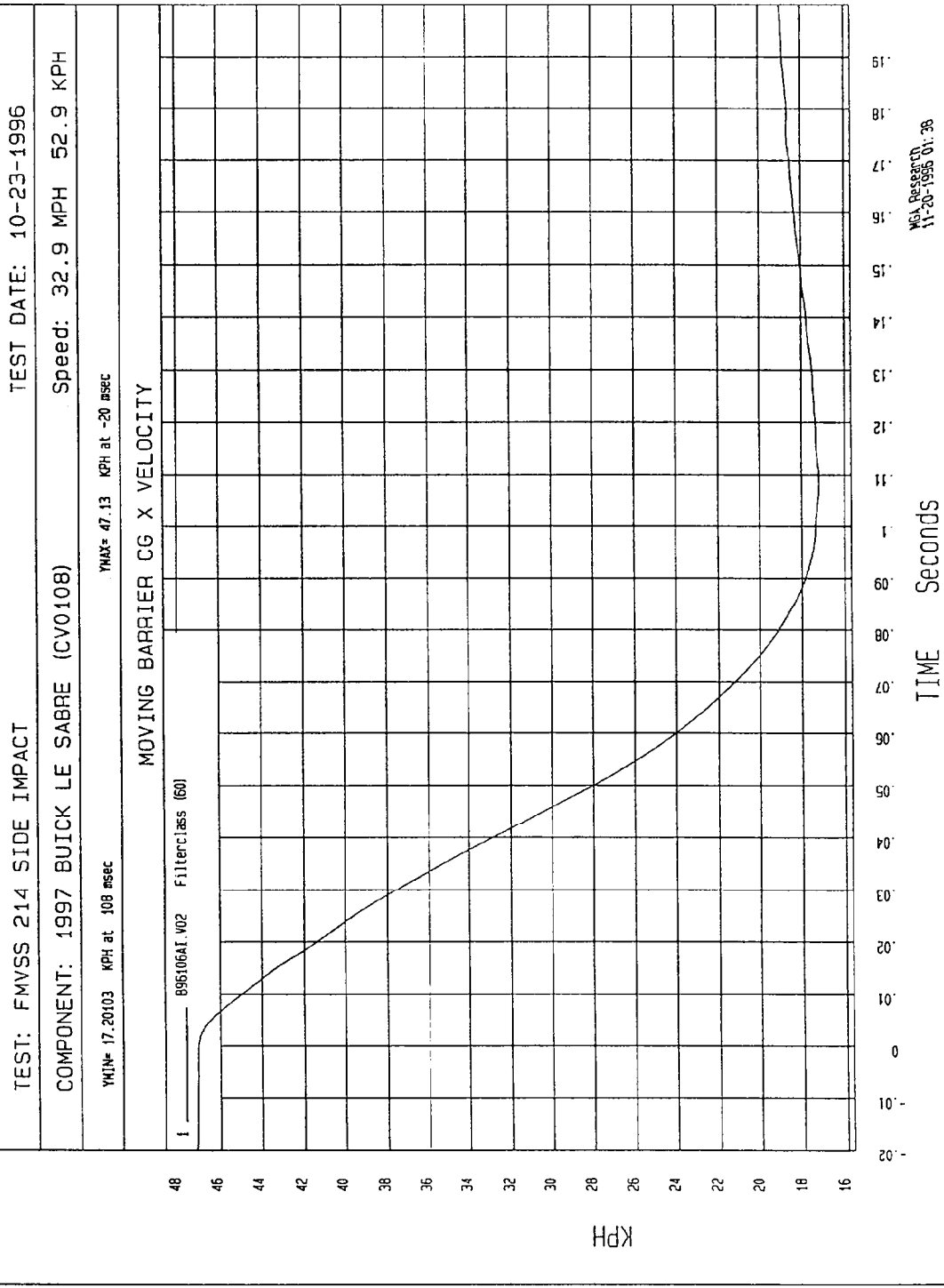










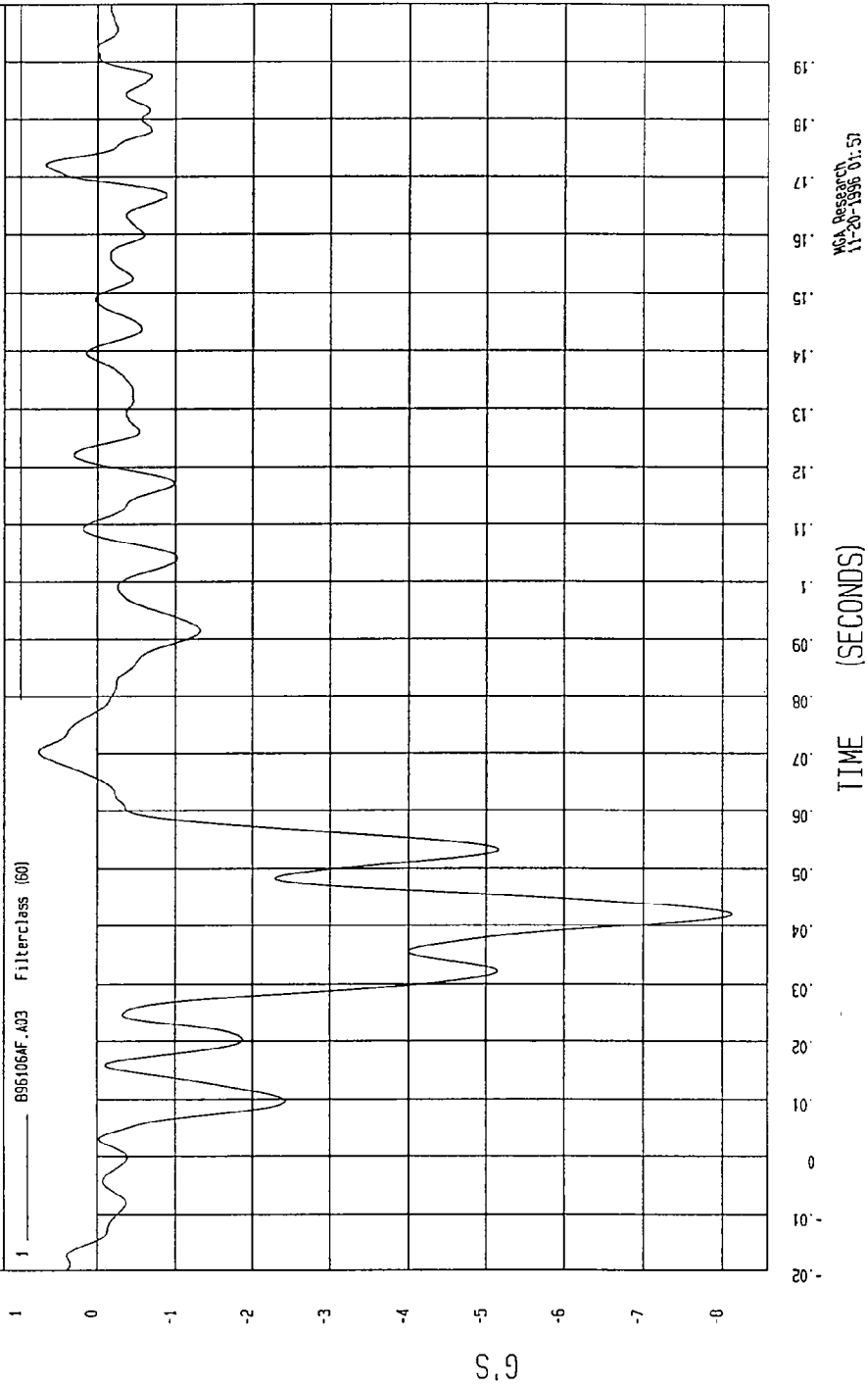


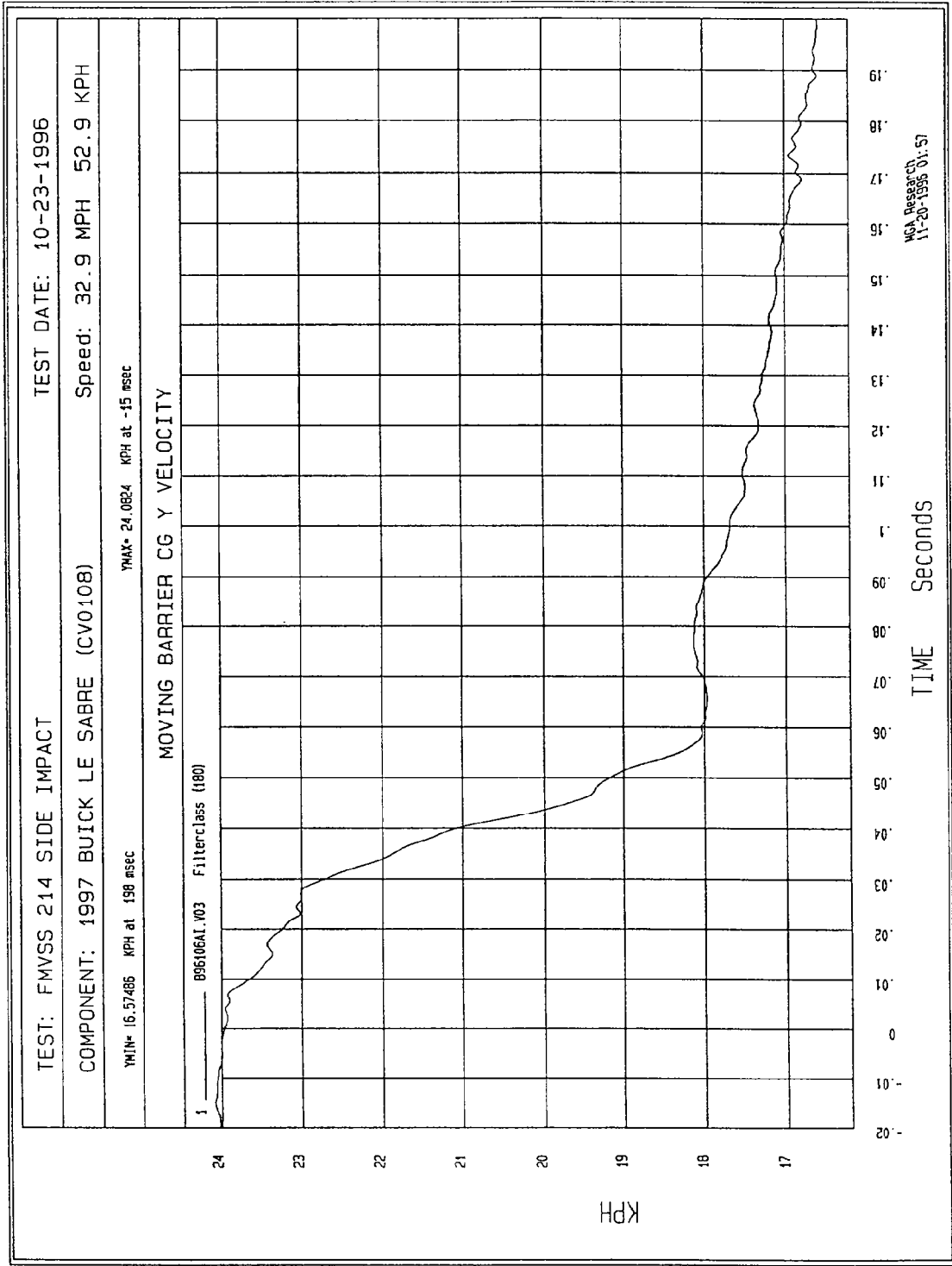
TEST: FMVSS 214 SIDE IMPACT TEST DATE: 10-23-1996

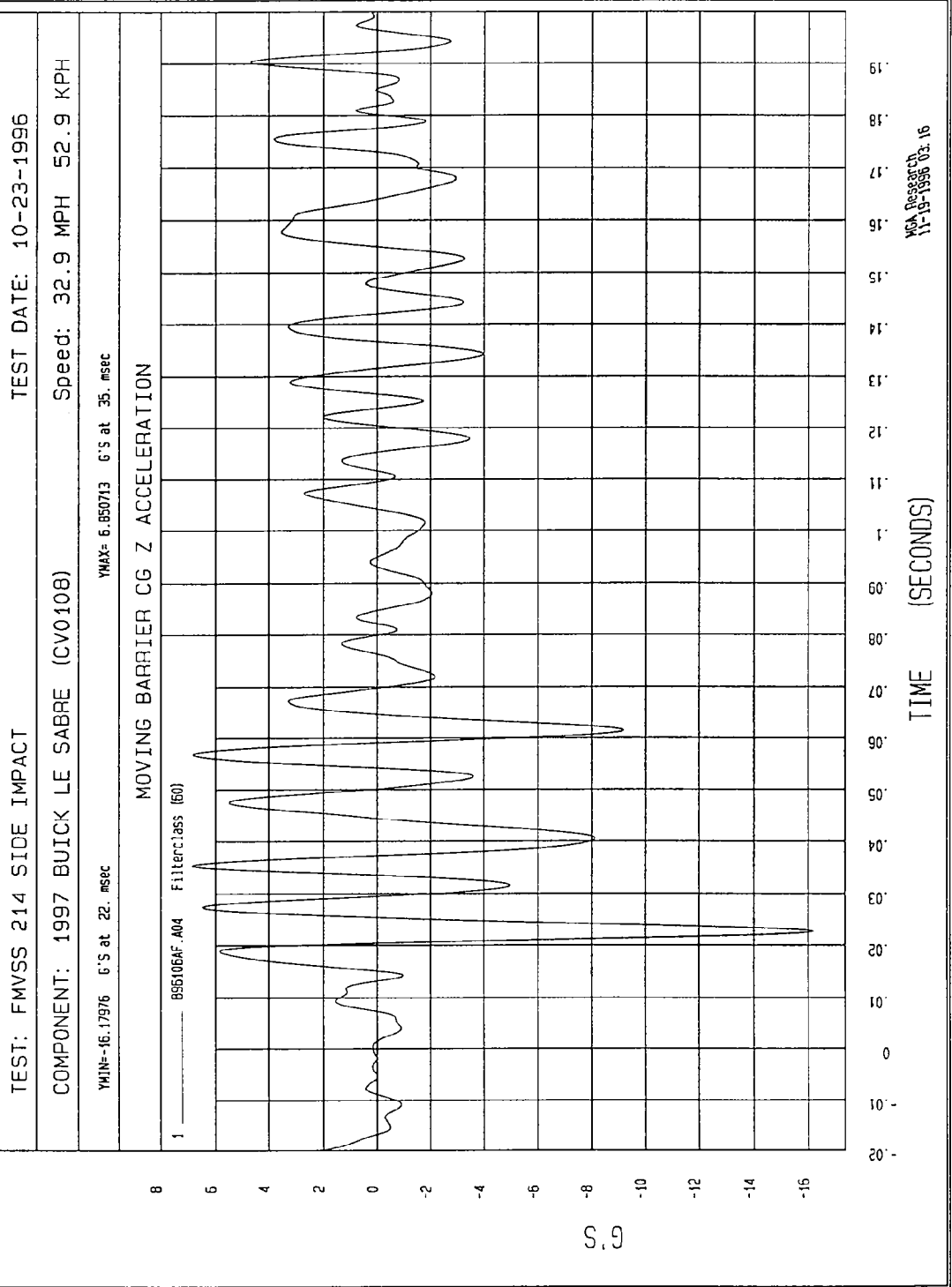
COMPONENT: 1997 BUICK LE SABRE (CV0108) Speed: 32.9 MPH 52.9 KPH

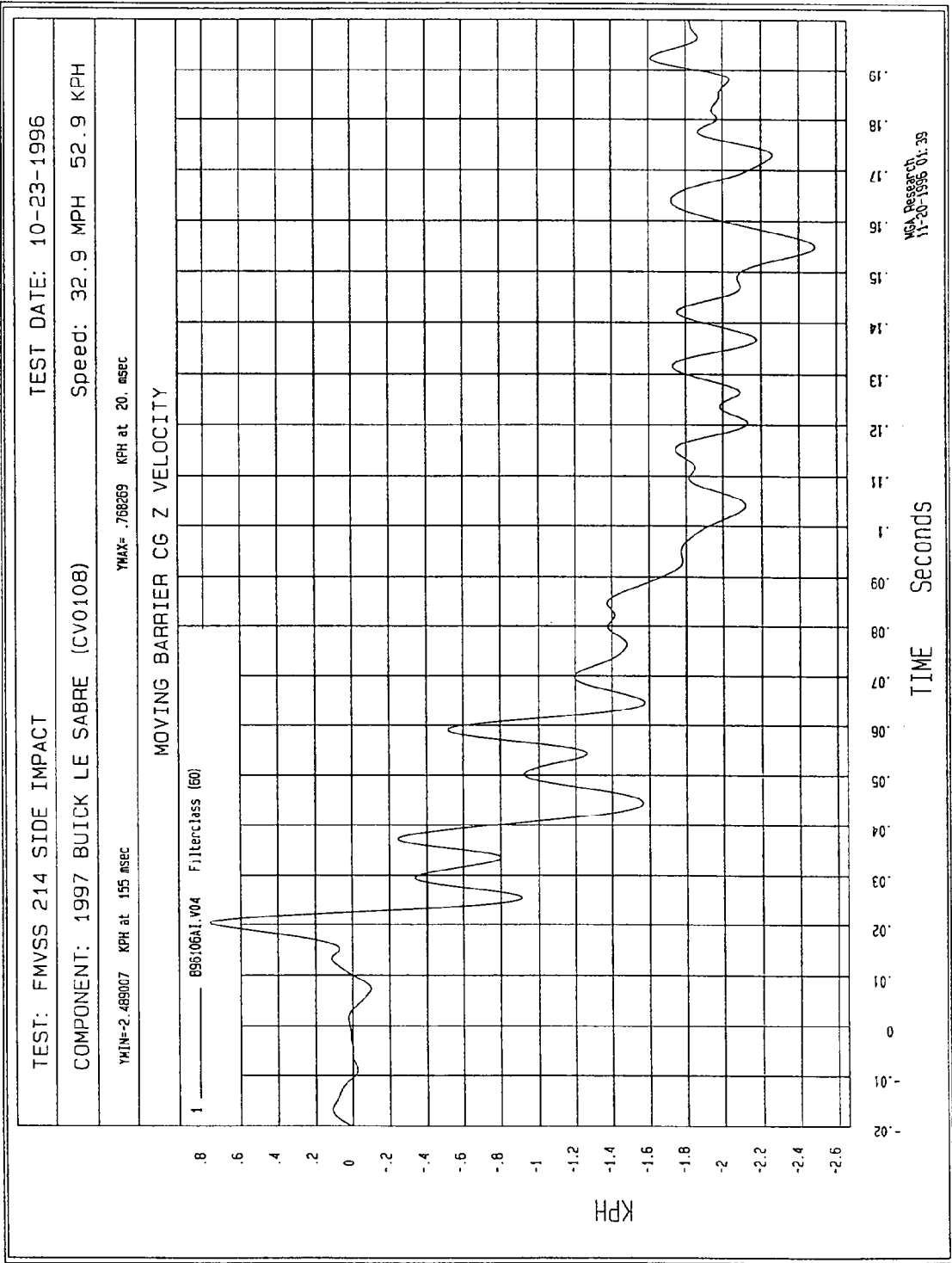
YMIN=-8.127255 G'S at 42 msec YMAX=.761635 G'S at 70. msec

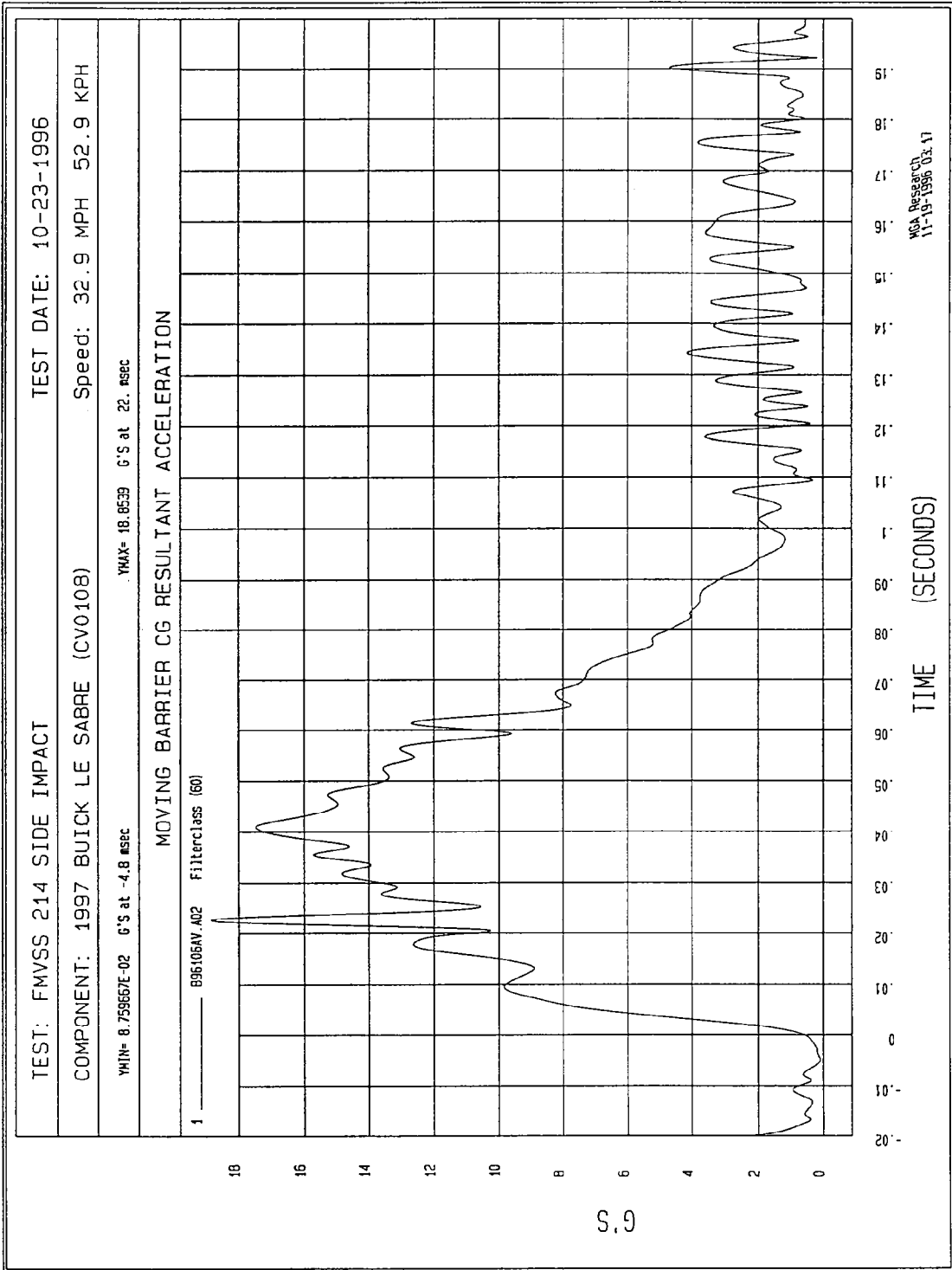
MOVING BARRIER CG Y ACCELERATION

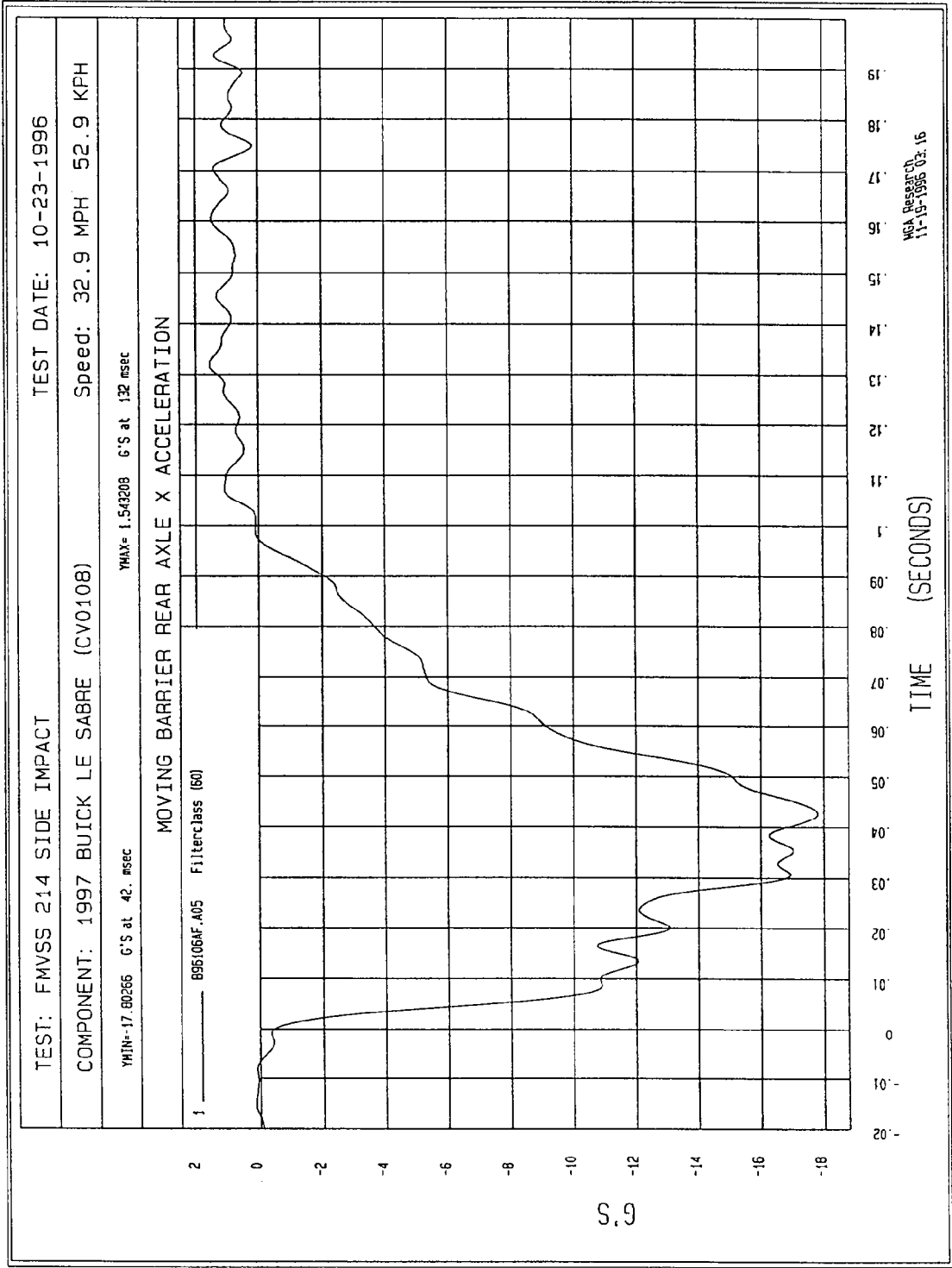












TEST: FMVSS 214 SIDE IMPACT

TEST DATE: 10-23-1996

COMPONENT: 1997 BUICK LE SABRE (CV0108)

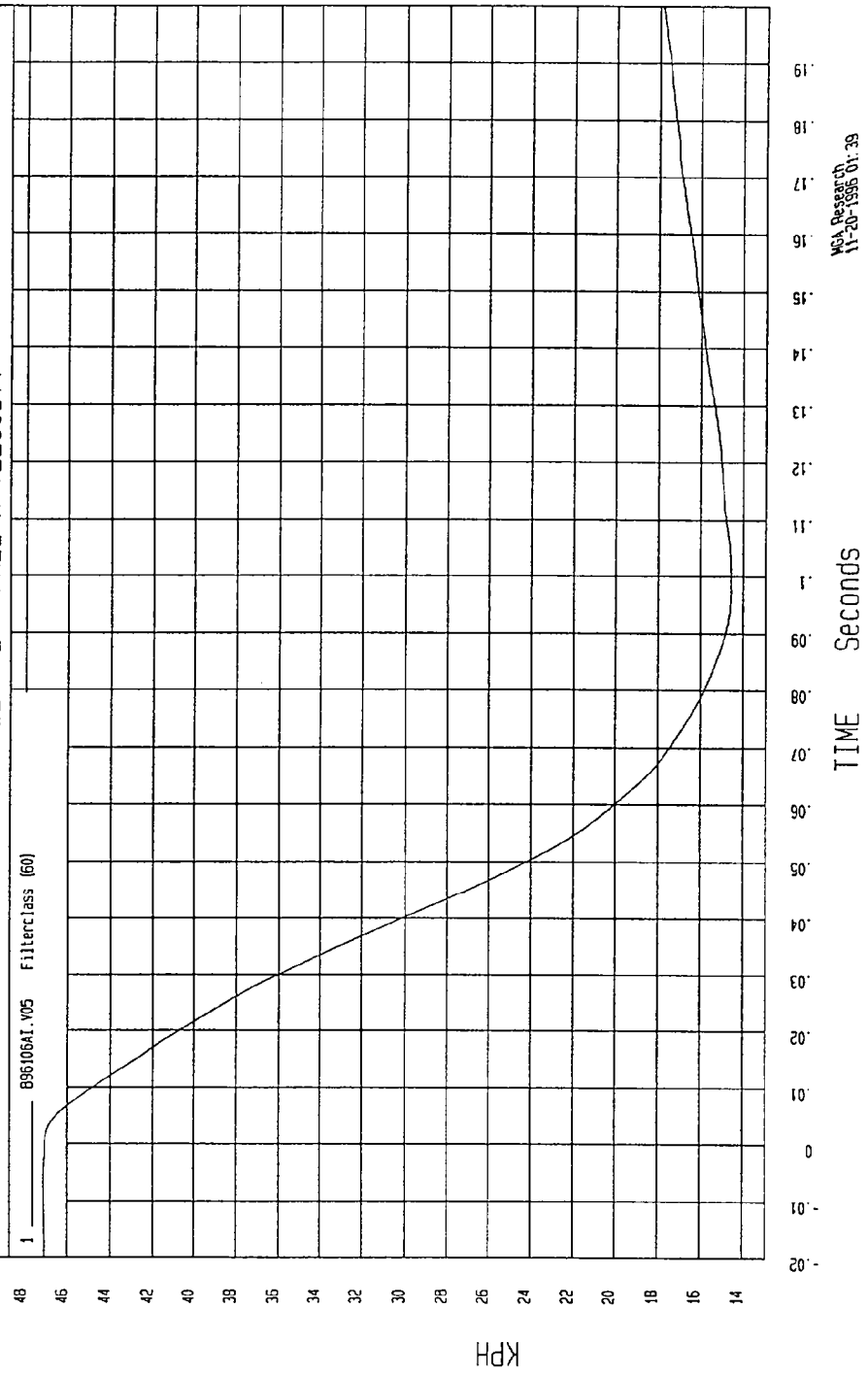
Speed: 32.9 MPH 52.9 KPH

YMIN= 14.5618 KPH at 97. msec

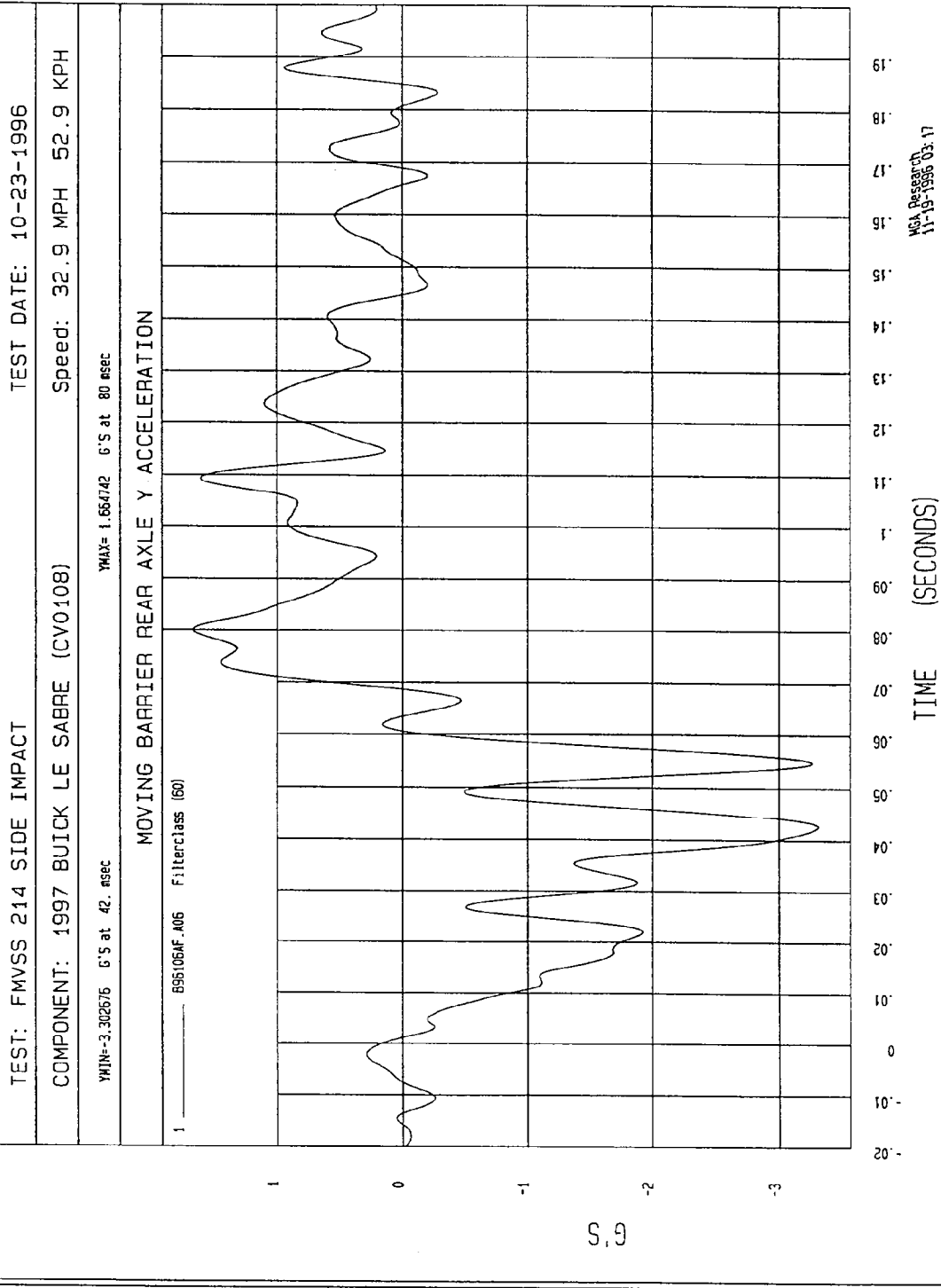
YMAX= 47.15782 KPH at -6.6 msec

MOVING BARRIER REAR AXLE X VELOCITY

1 — 896106A1.V05 Filterclass (60)



WCA Research
11-20-1996 01:39



TEST: FMVSS 214 SIDE IMPACT

TEST DATE: 10-23-1996

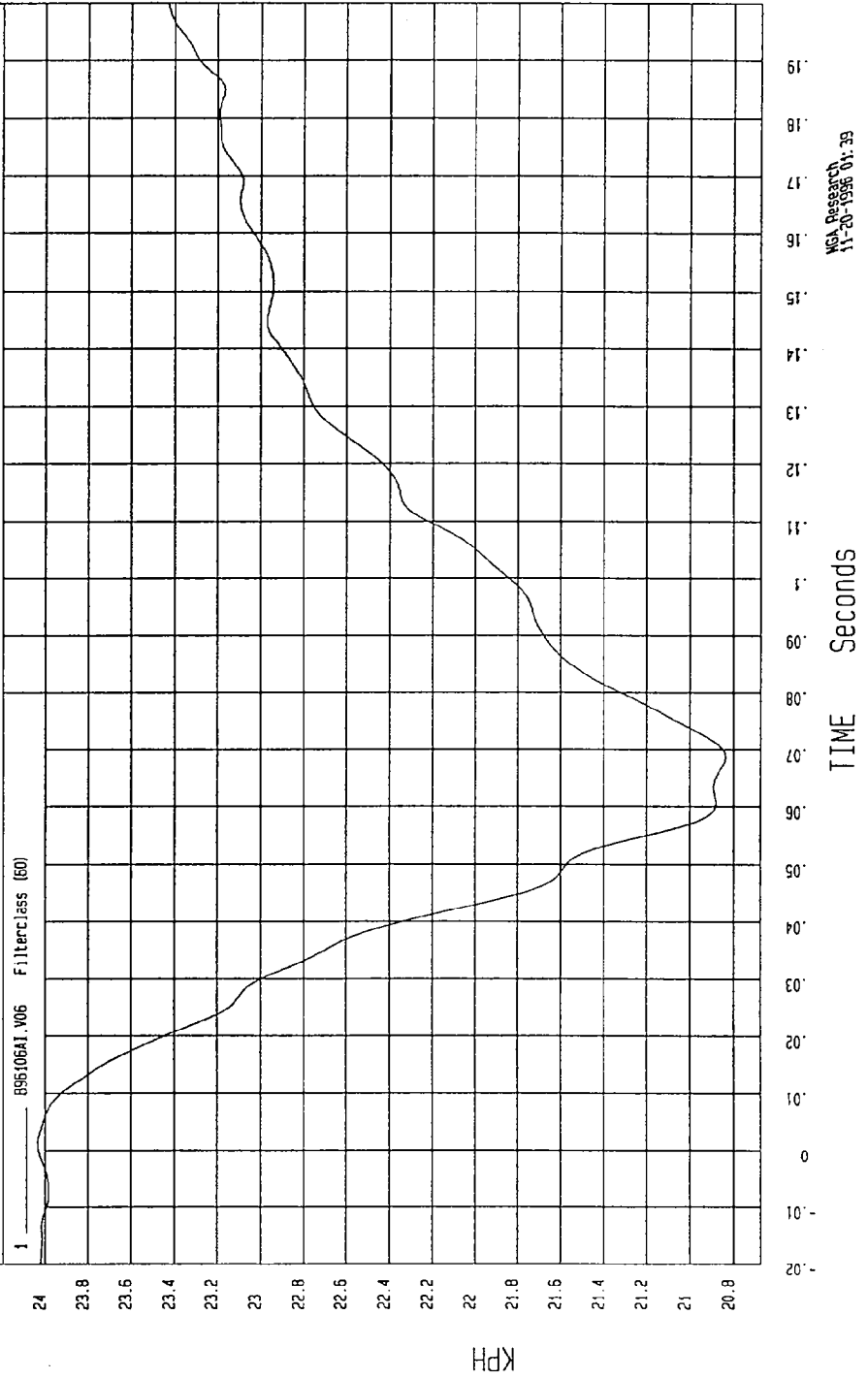
COMPONENT: 1997 BUICK LE SABRE (CV0108)

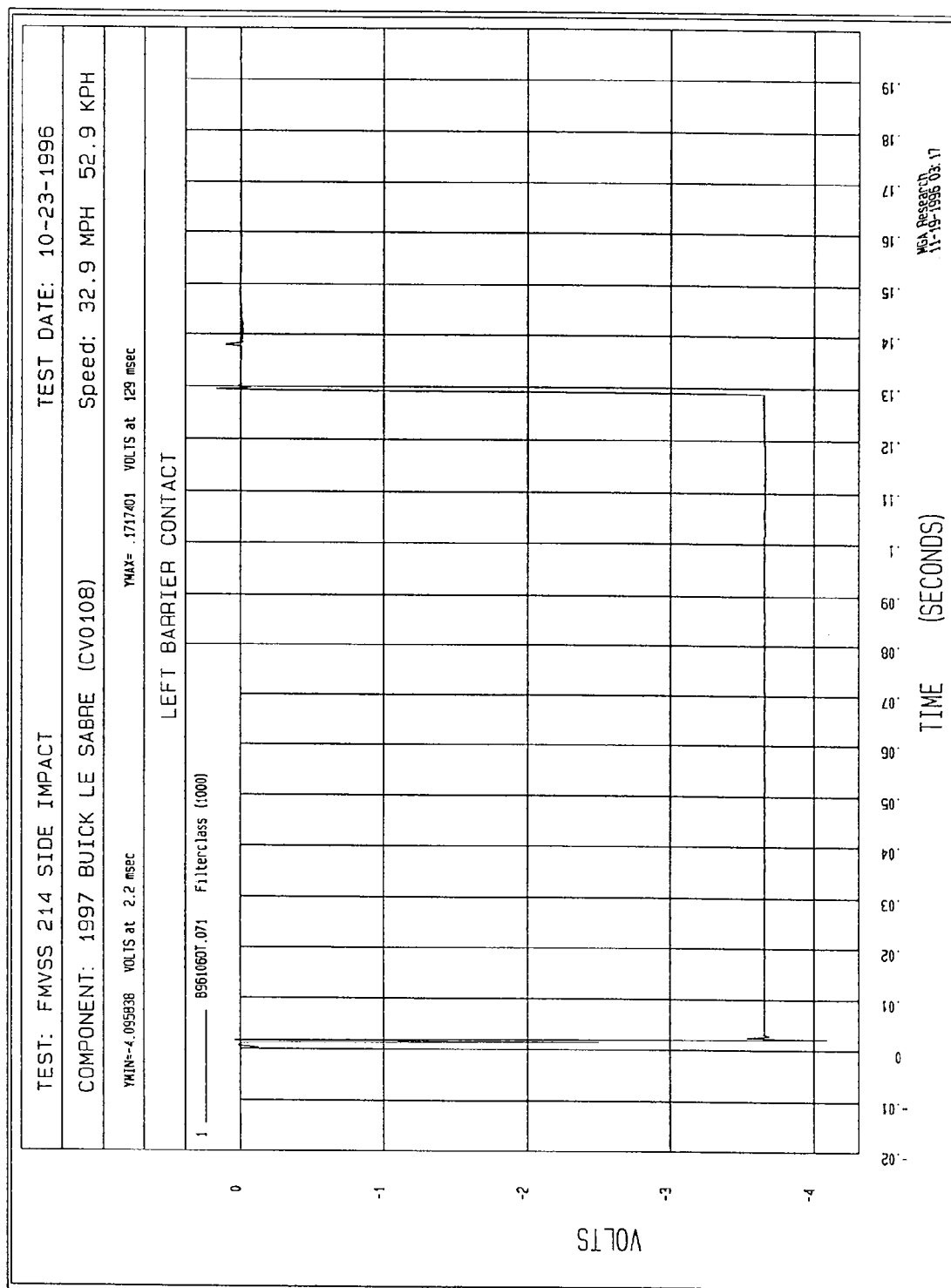
Speed: 32.9 MPH 52.9 KPH

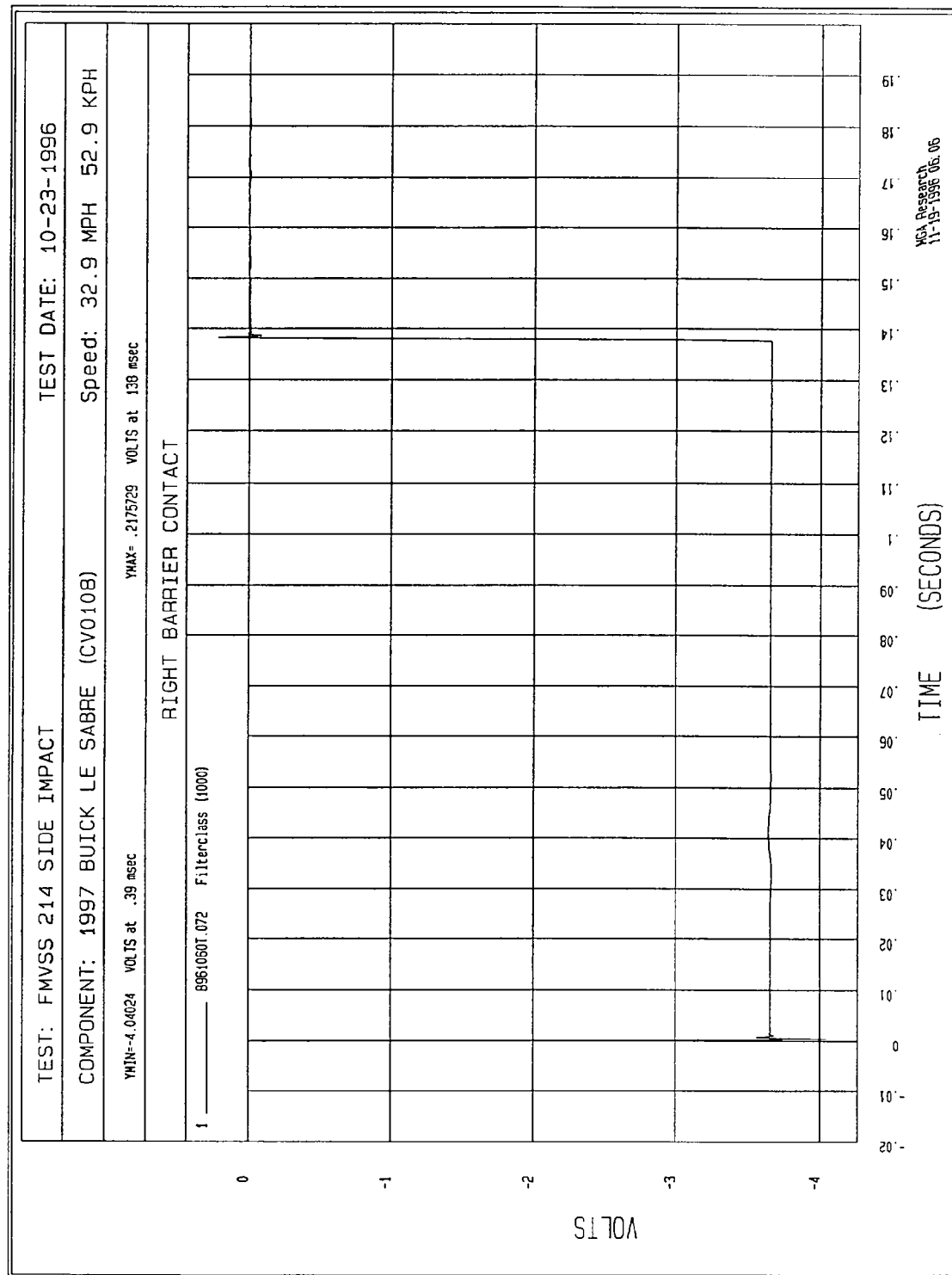
YMIN= 20.837 KPH at 68. msec

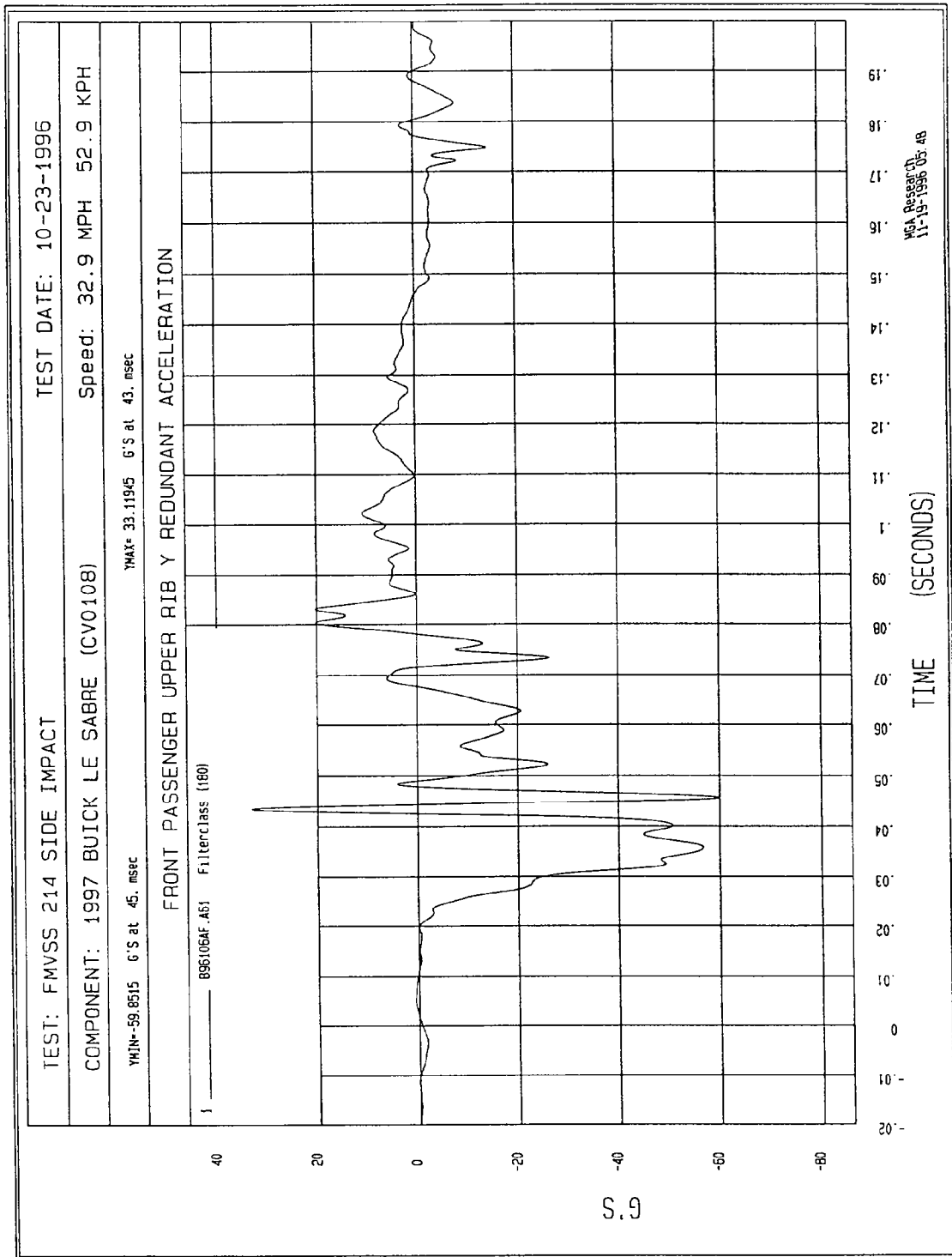
YMAX= 24.03425 KPH at 1.1 msec

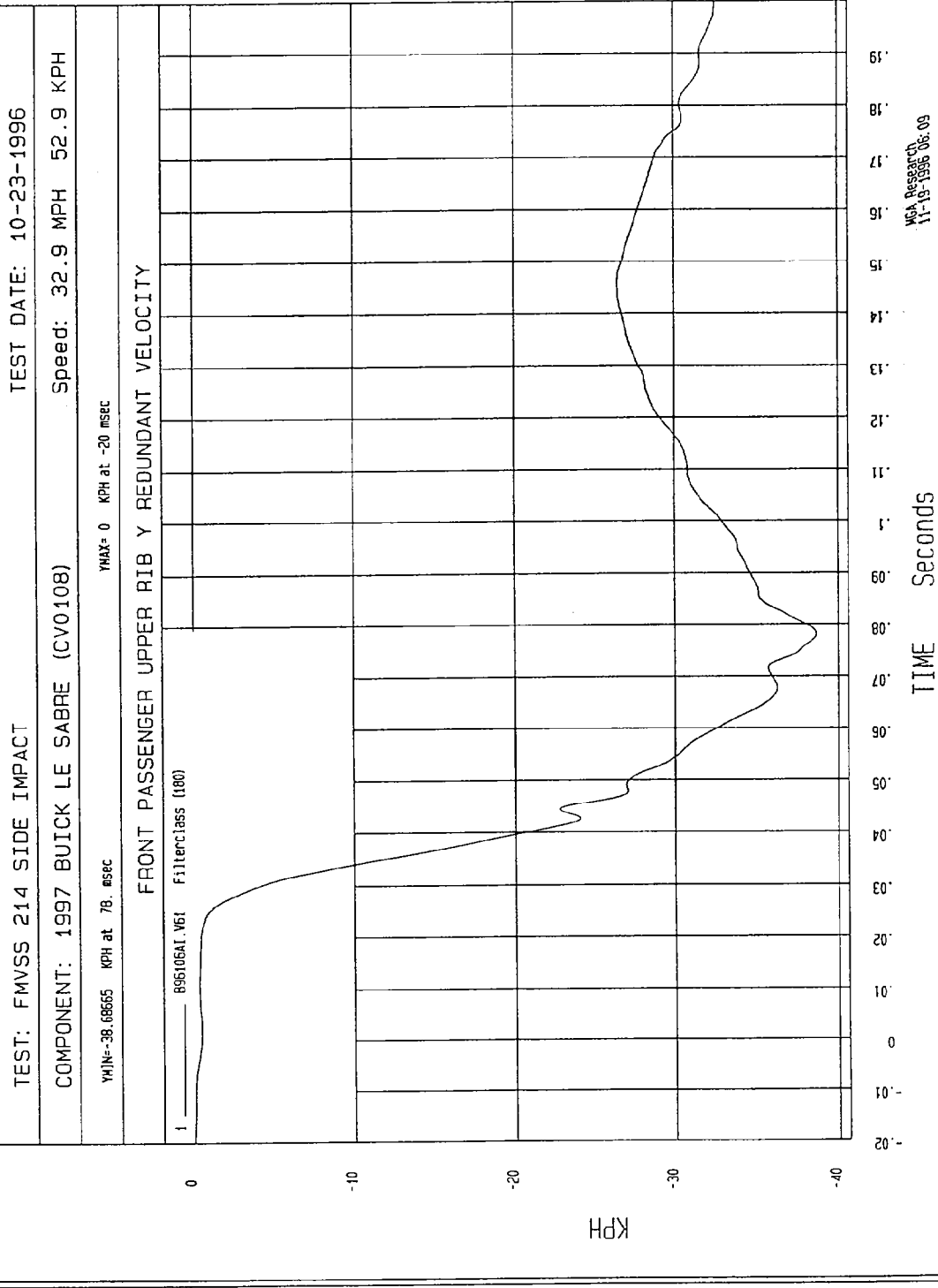
MOVING BARRIER REAR AXLE Y VELOCITY

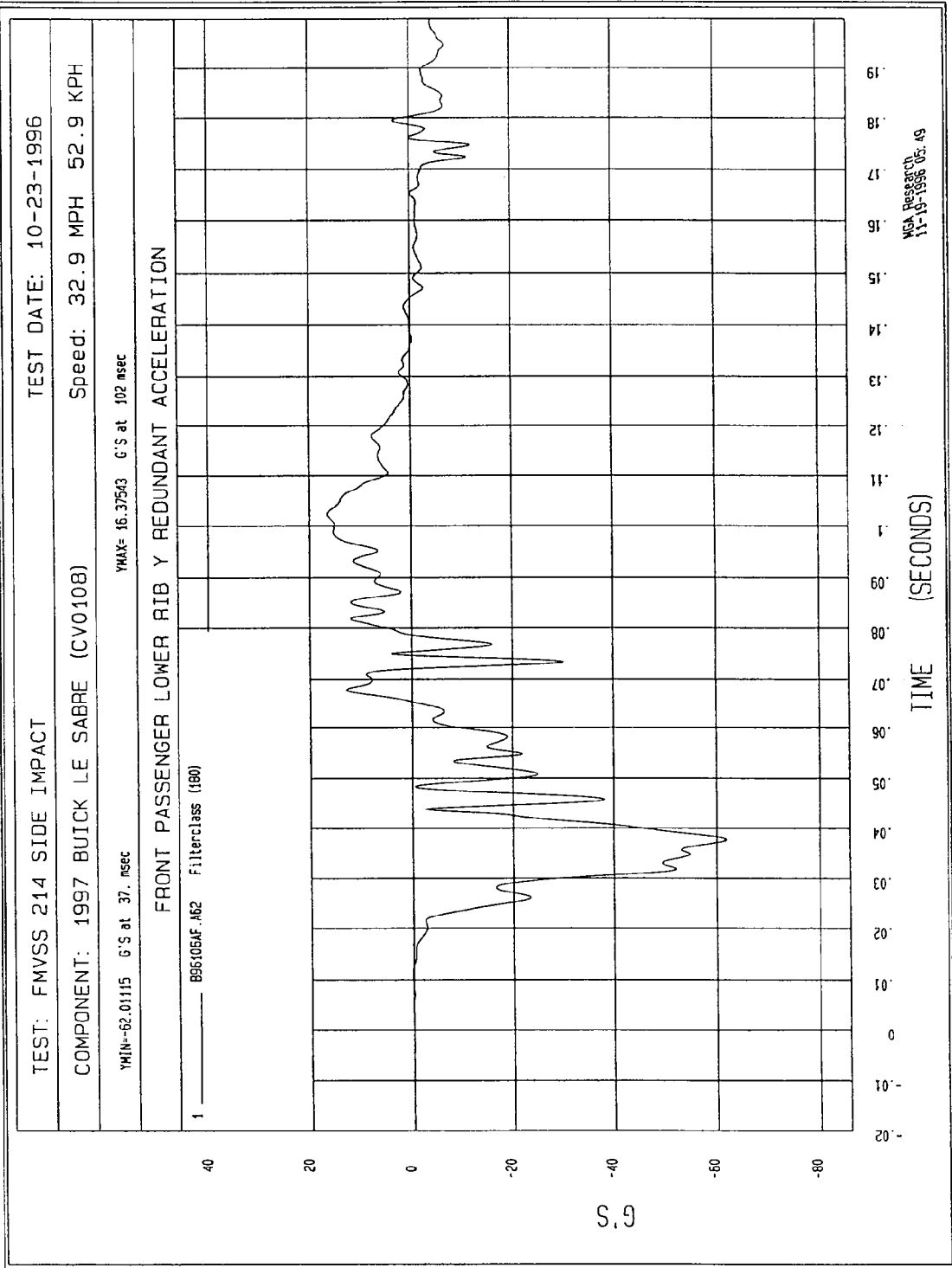


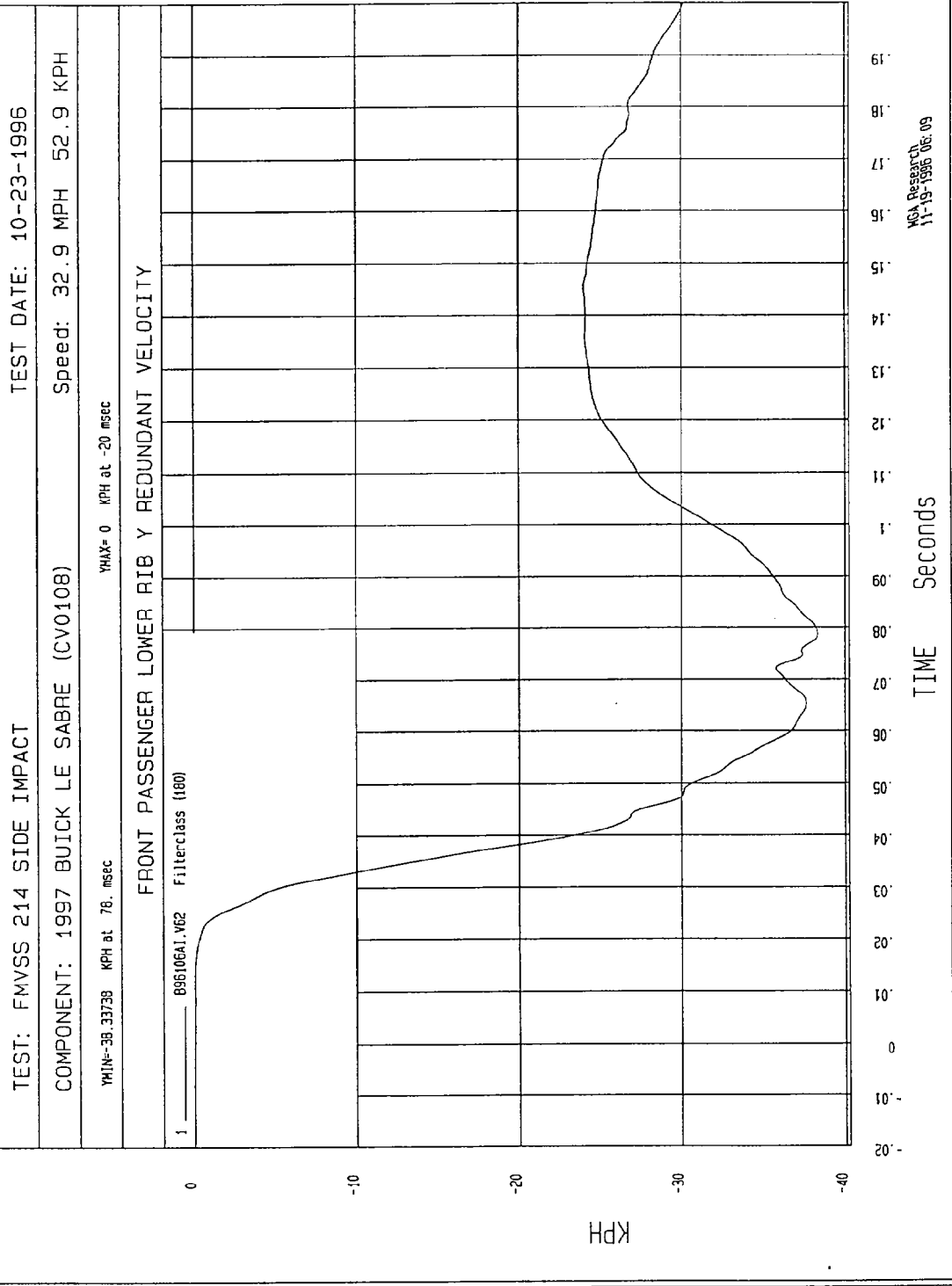


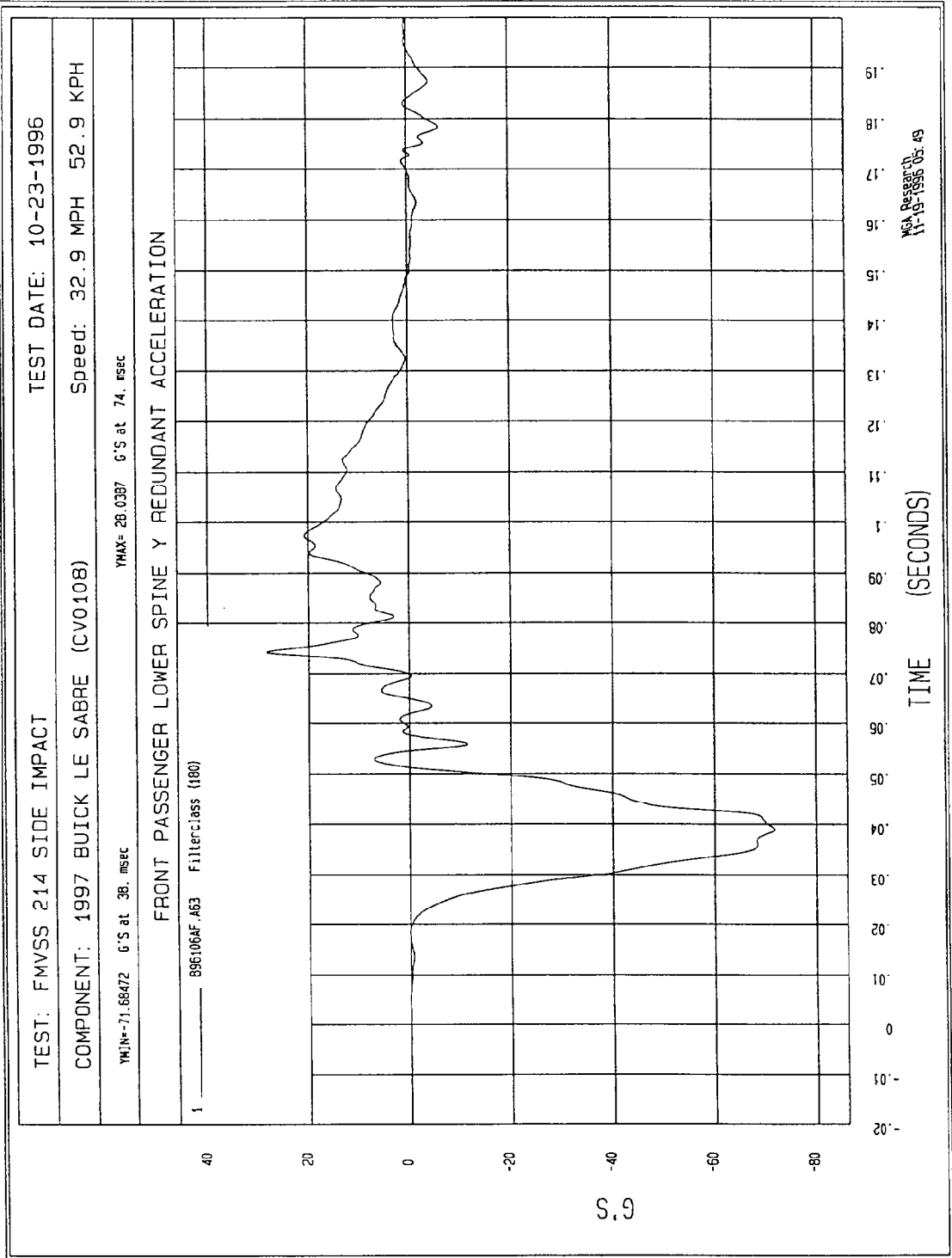










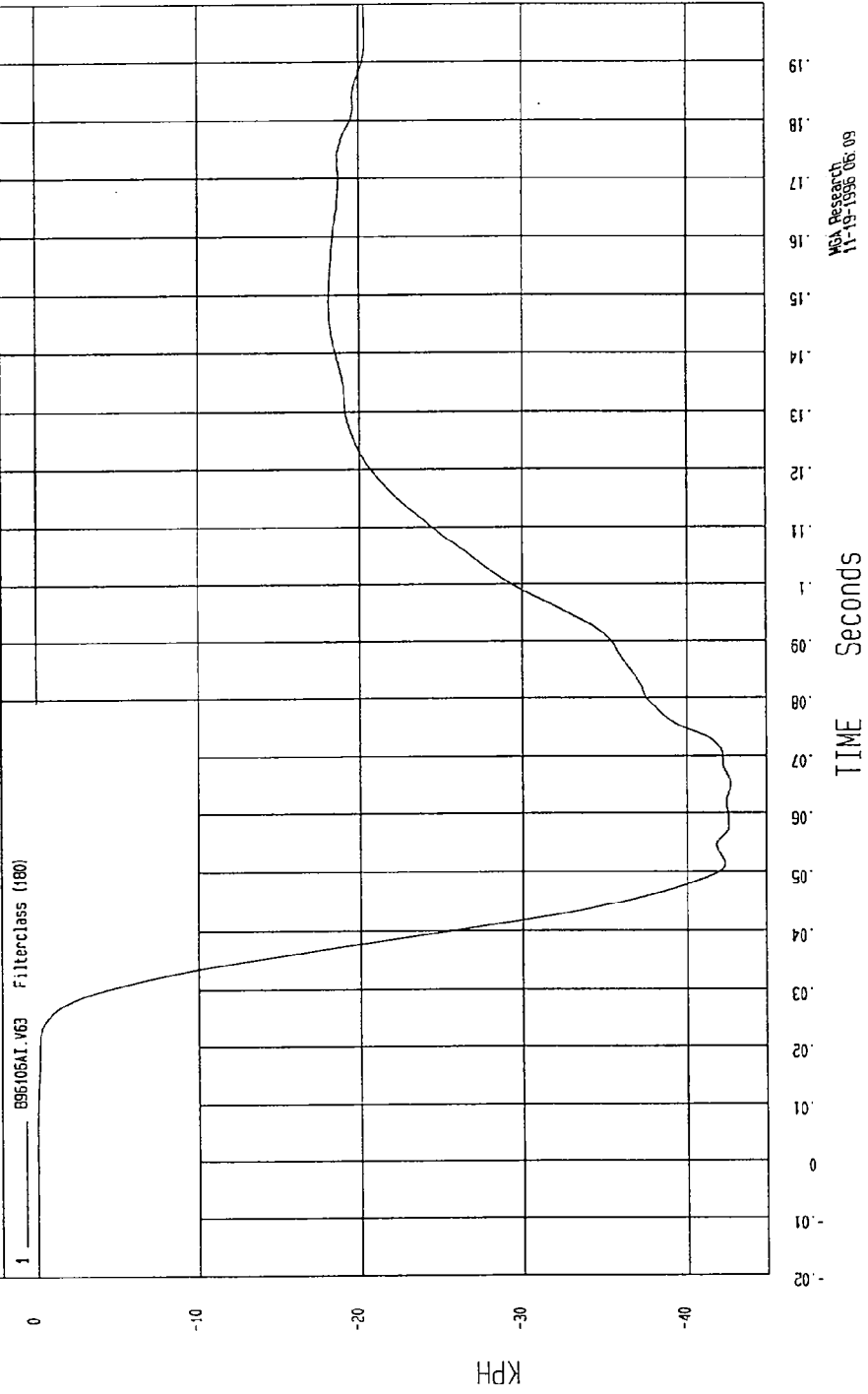


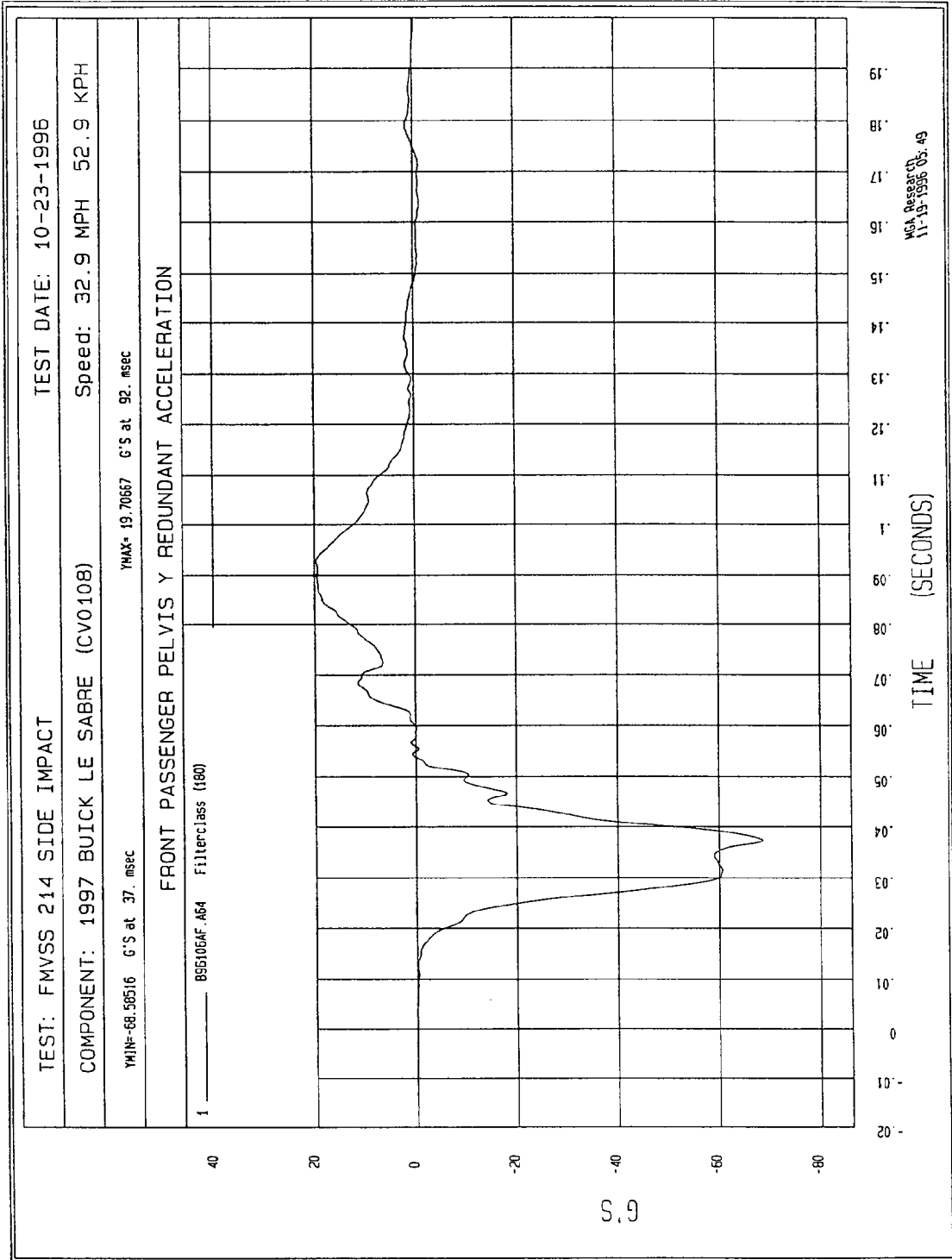
TEST: FMVSS 214 SIDE IMPACT TEST DATE: 10-23-1996

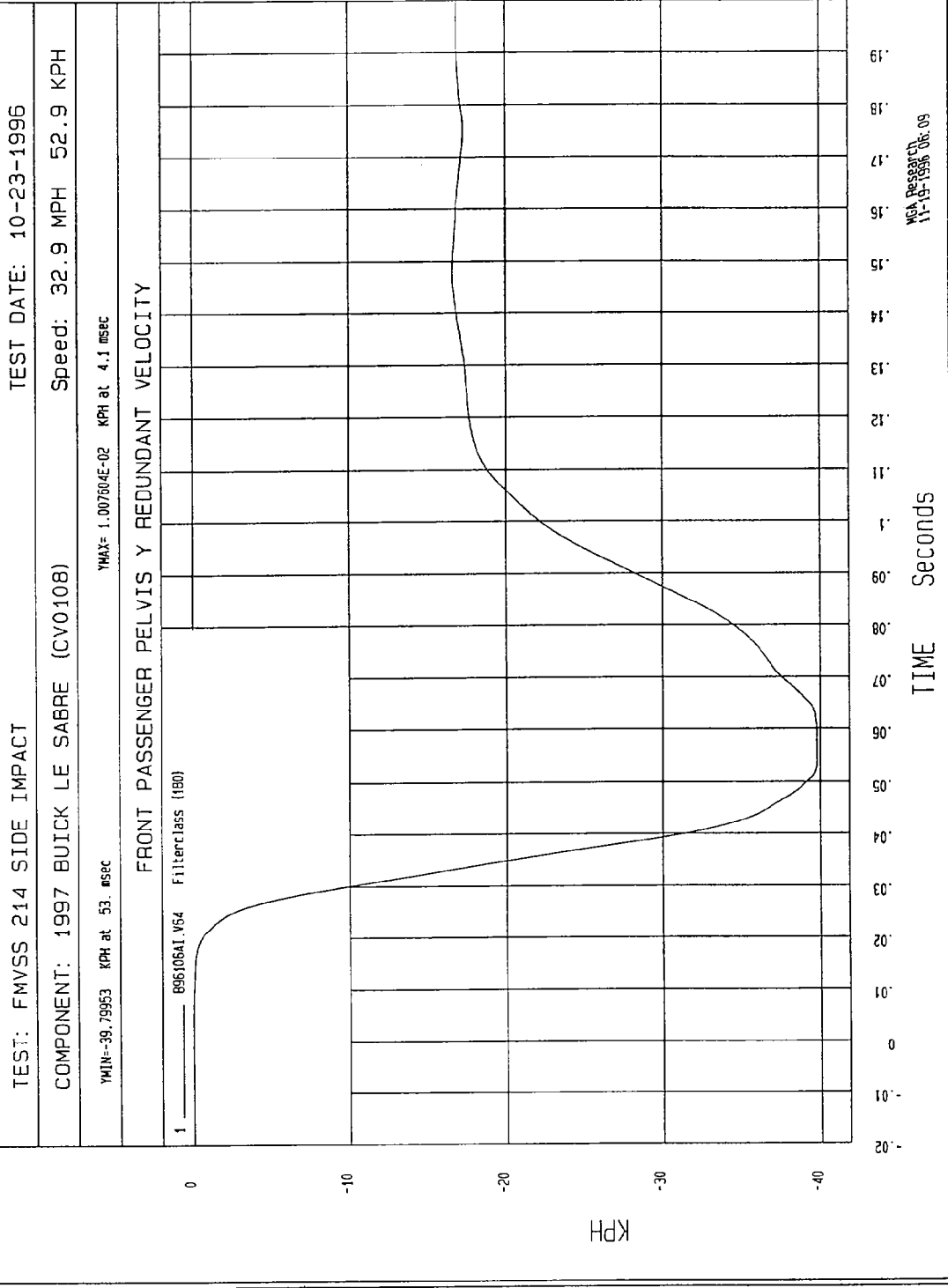
COMPONENT: 1997 BUICK LE SABRE (CVO108) Speed: 32.9 MPH 52.9 KPH

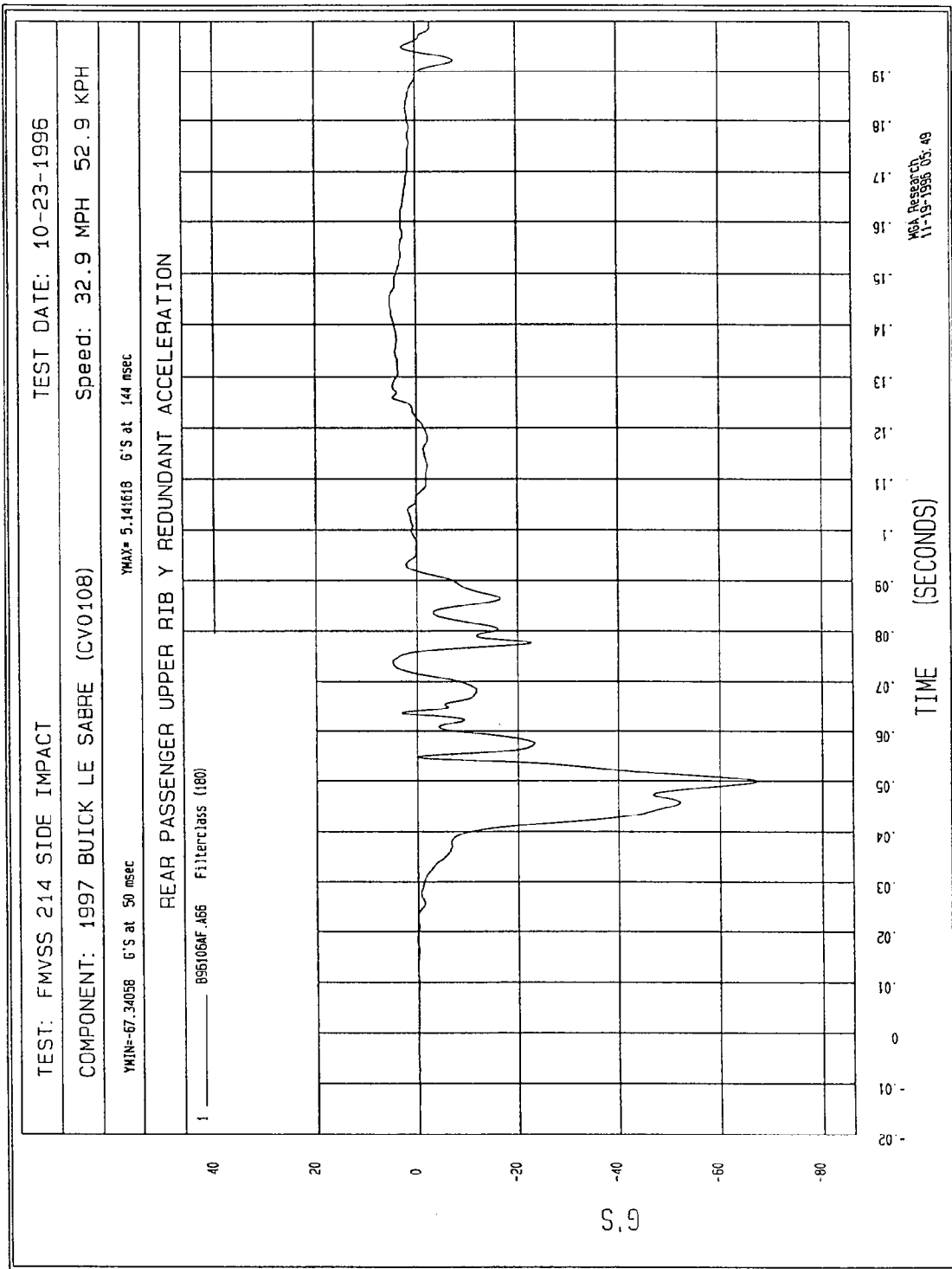
YMIN=-42.62063 KPH at 64. msec YMAX= 2.722057E-03 KPH at -3.9 msec

FRONT PASSENGER LOWER SPINE Y REDUNDANT VELOCITY







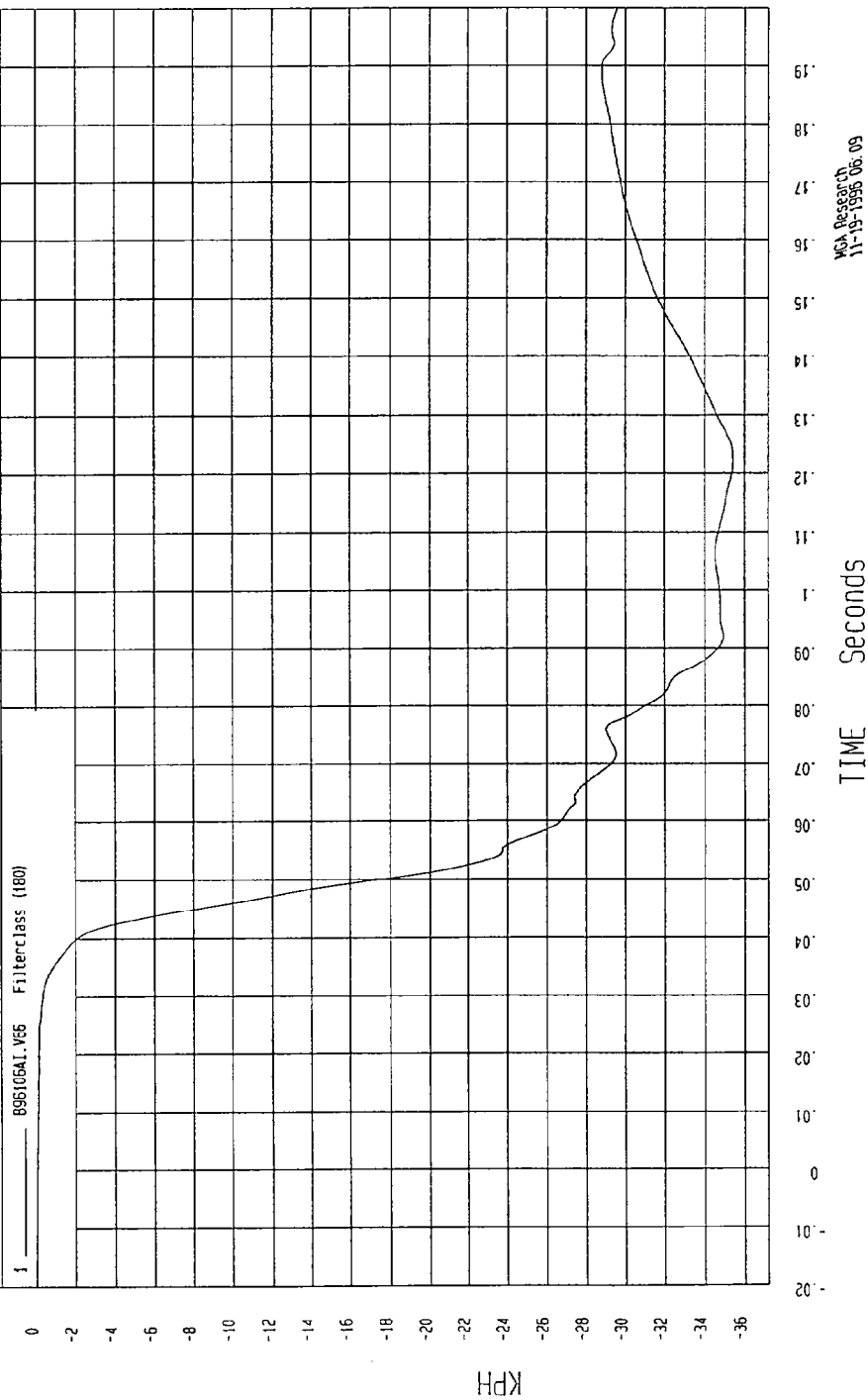


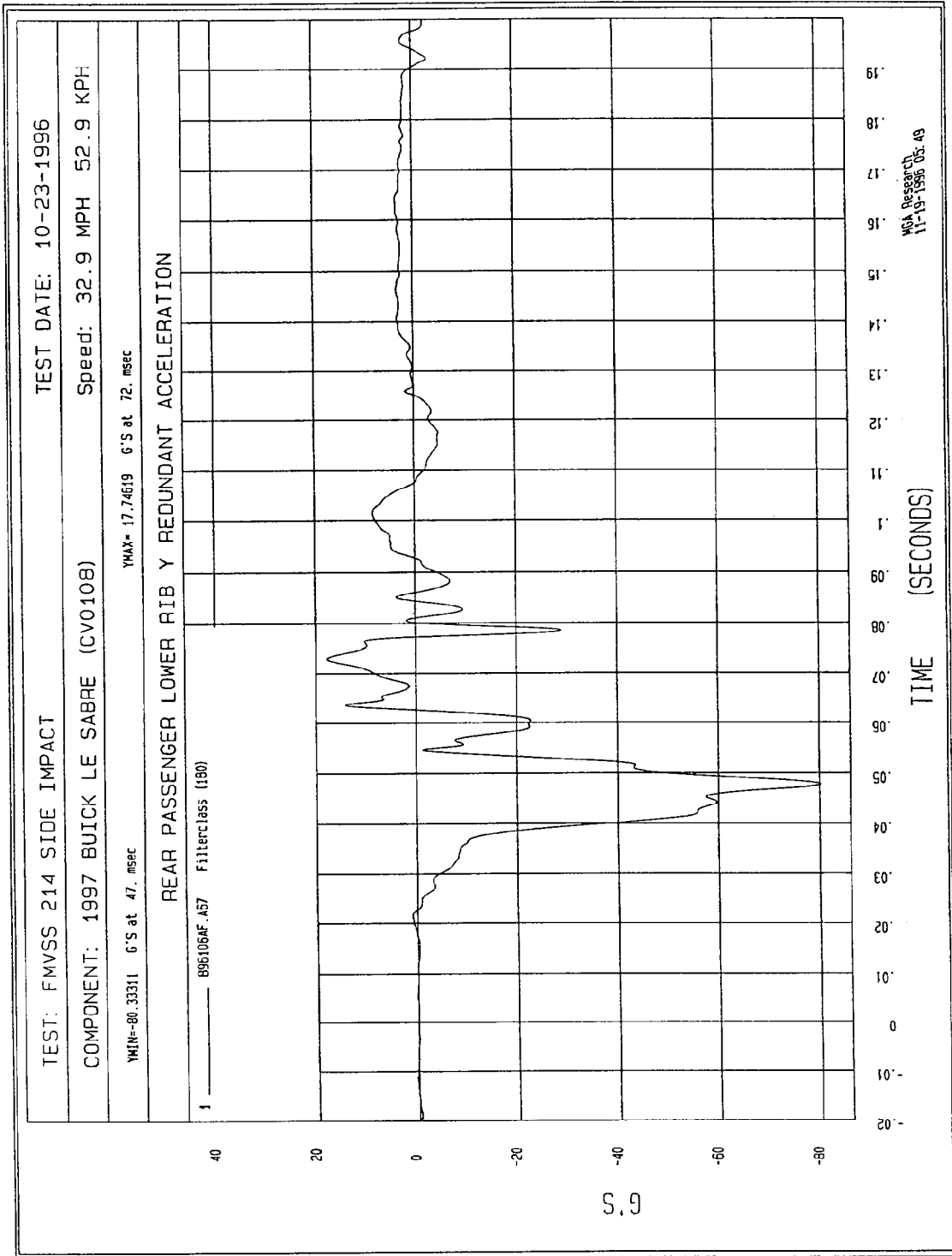
TEST: FMVSS 214 SIDE IMPACT TEST DATE: 10-23-1996

COMPONENT: 1997 BUICK LE SABRE (CV0108) Speed: 32.9 MPH 52.9 KPH

YMIN=-35.42468 KPH at 122 msec YMAX= 1.355631E-03 KPH at -18. msec

REAR PASSENGER UPPER RIB Y REDUNDANT VELOCITY



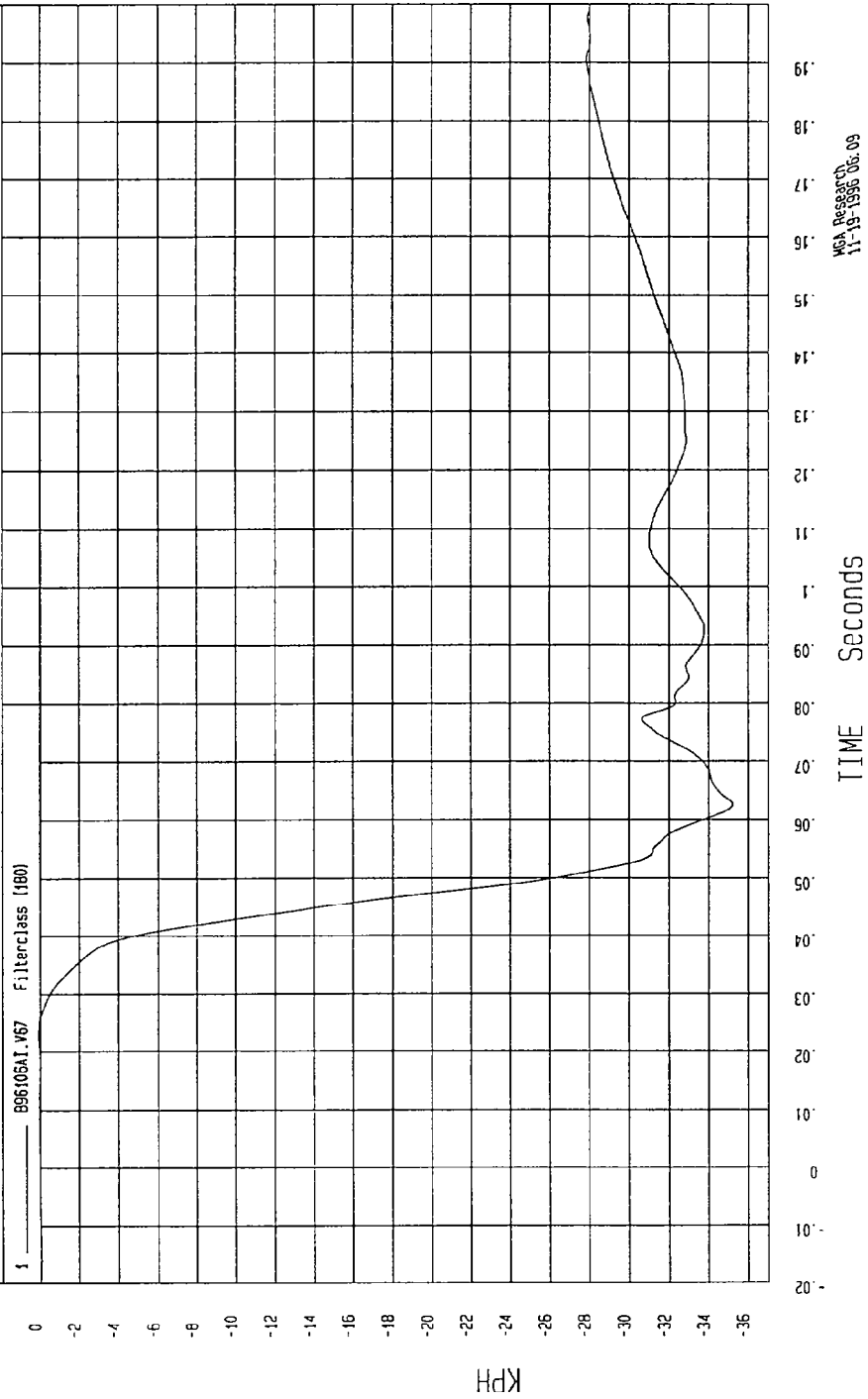


TEST: FMVSS 214 SIDE IMPACT TEST DATE: 10-23-1996

COMPONENT: 1997 BUICK LE SABRE (CV0108) Speed: 32.9 MPH 52.9 KPH

YMIN=-35.2216 KPH at 62. msec YMAX= 9.432317E-02 KPH at 22. msec

REAR PASSENGER LOWER RIB Y REDUNDANT VELOCITY



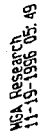
TEST DATE: 10-23-1996

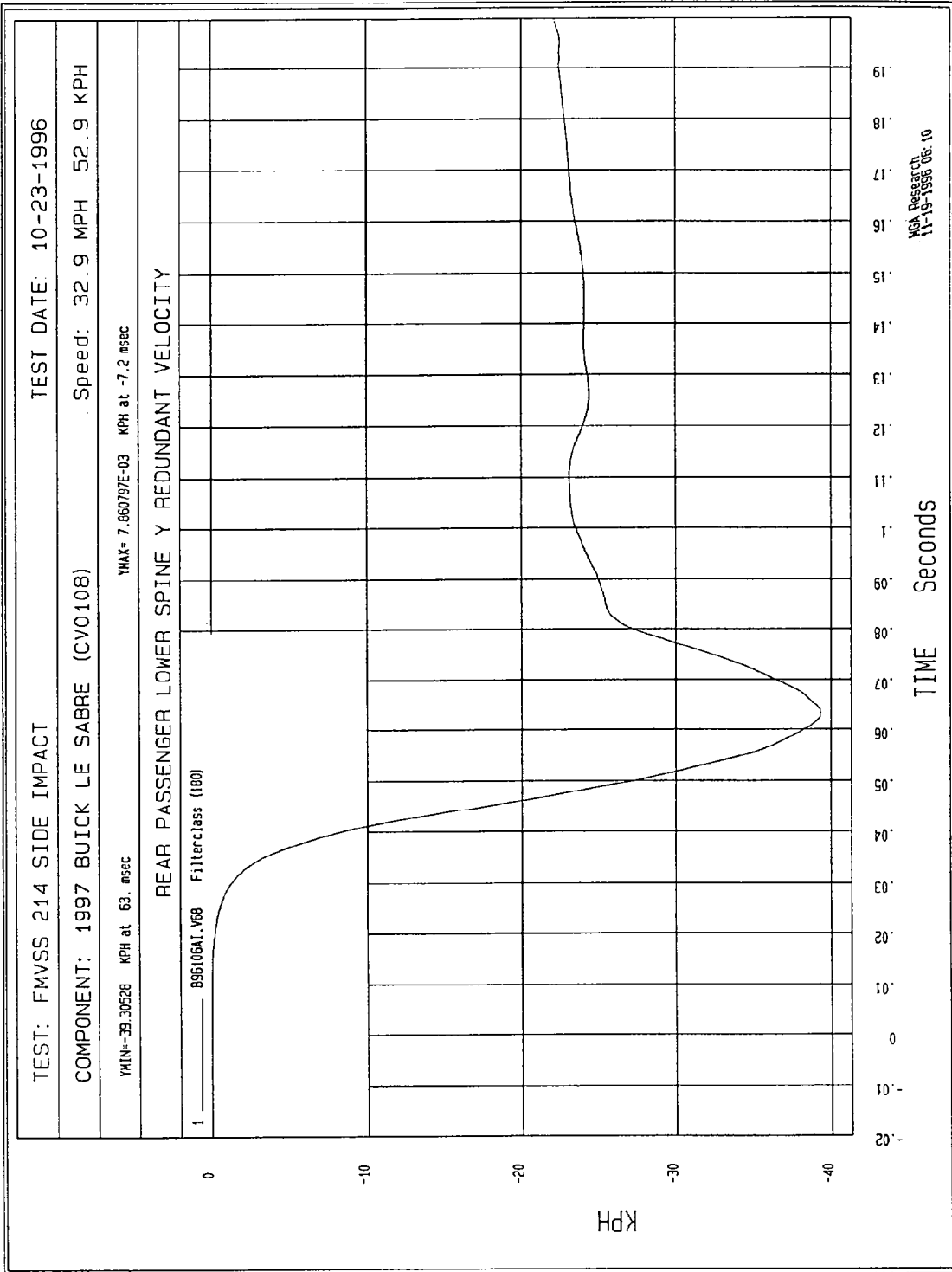
Speed: 32.9 MPH 52.9 KPH

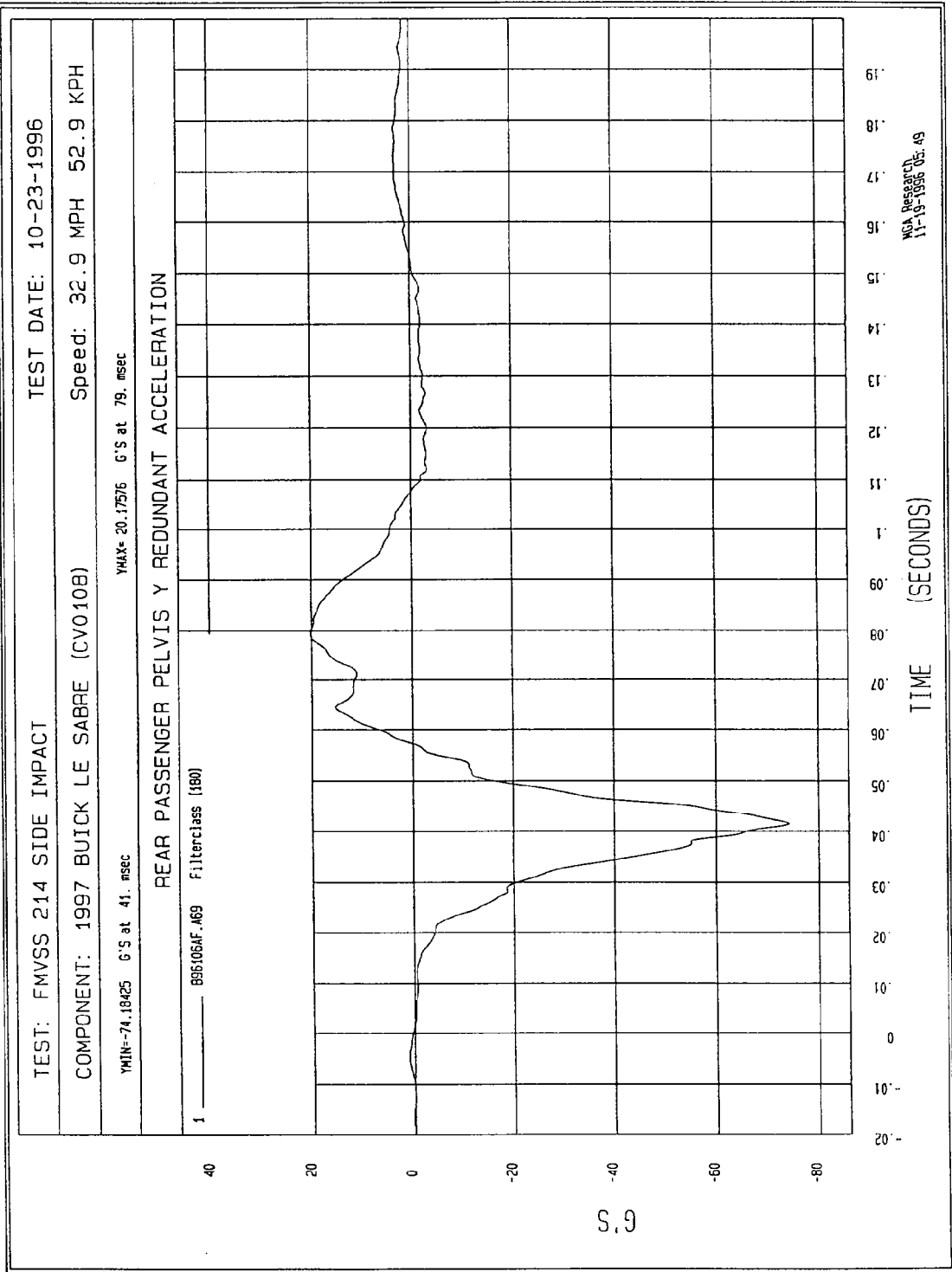
YMAX= 31.9618 G'S at 76. nsec

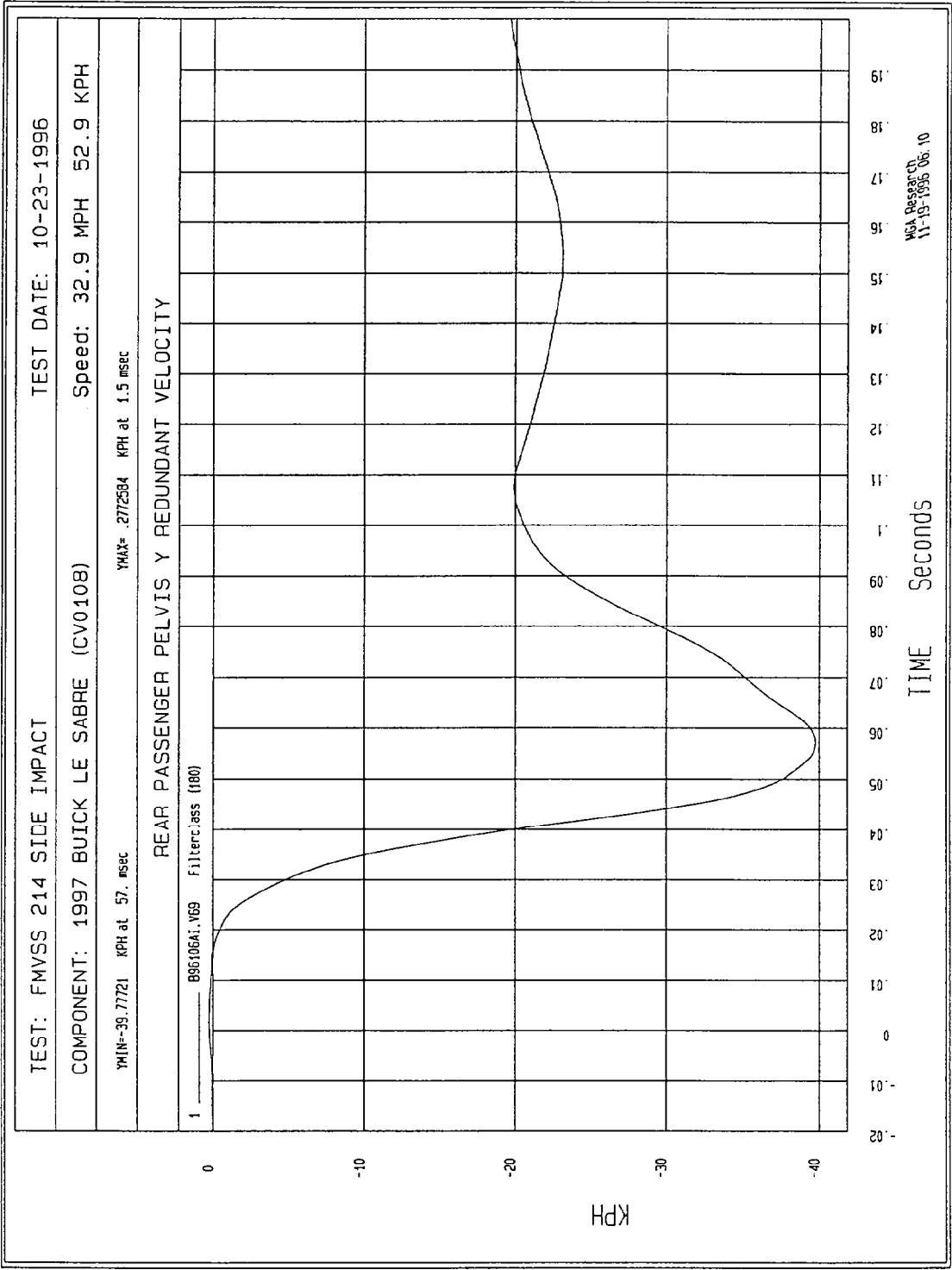
REAR PASSENGER LOWER SPINE Y REDUNDANT ACCELERATION

1	896105AF.A58	Filterclass (180)

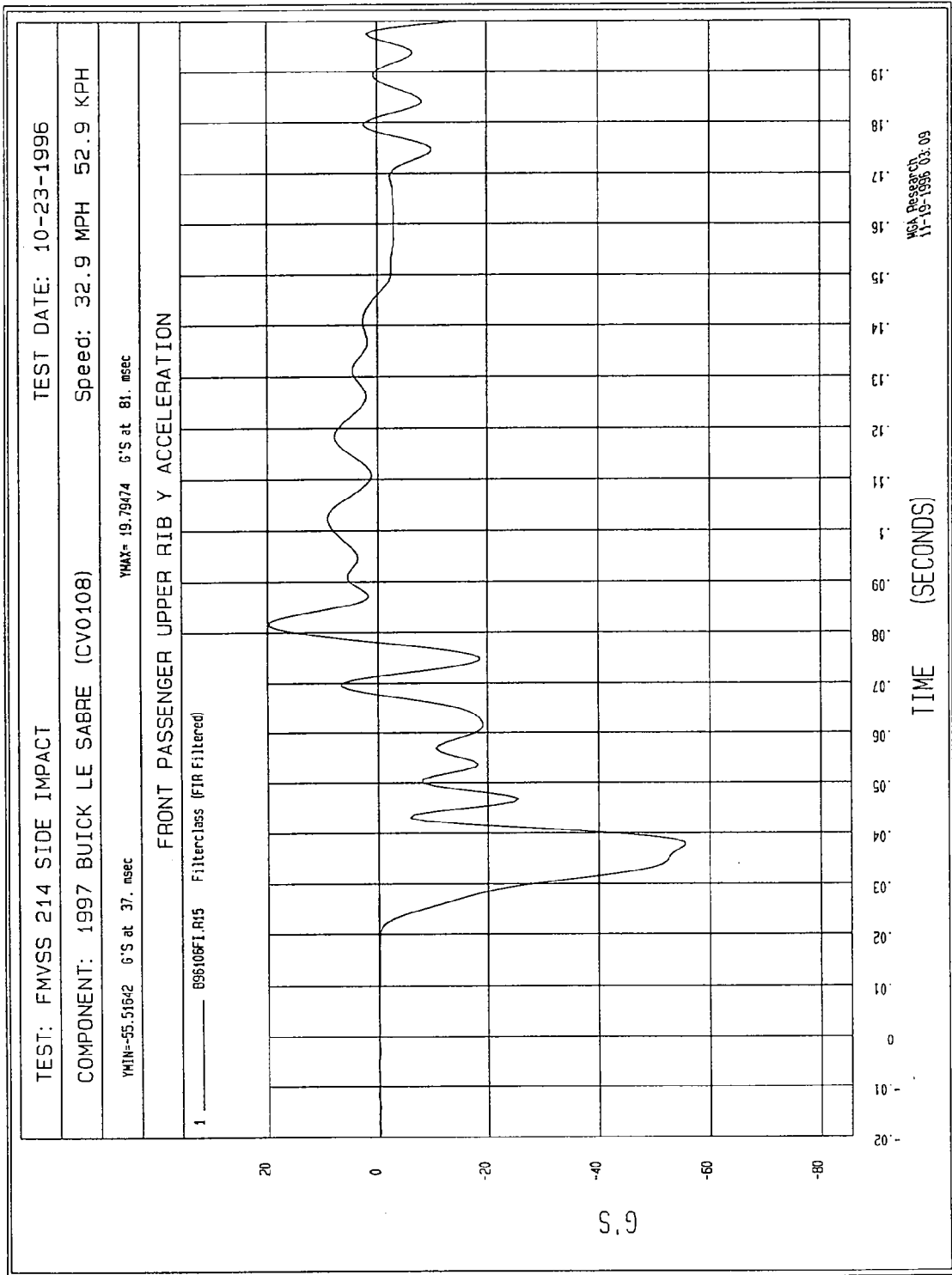


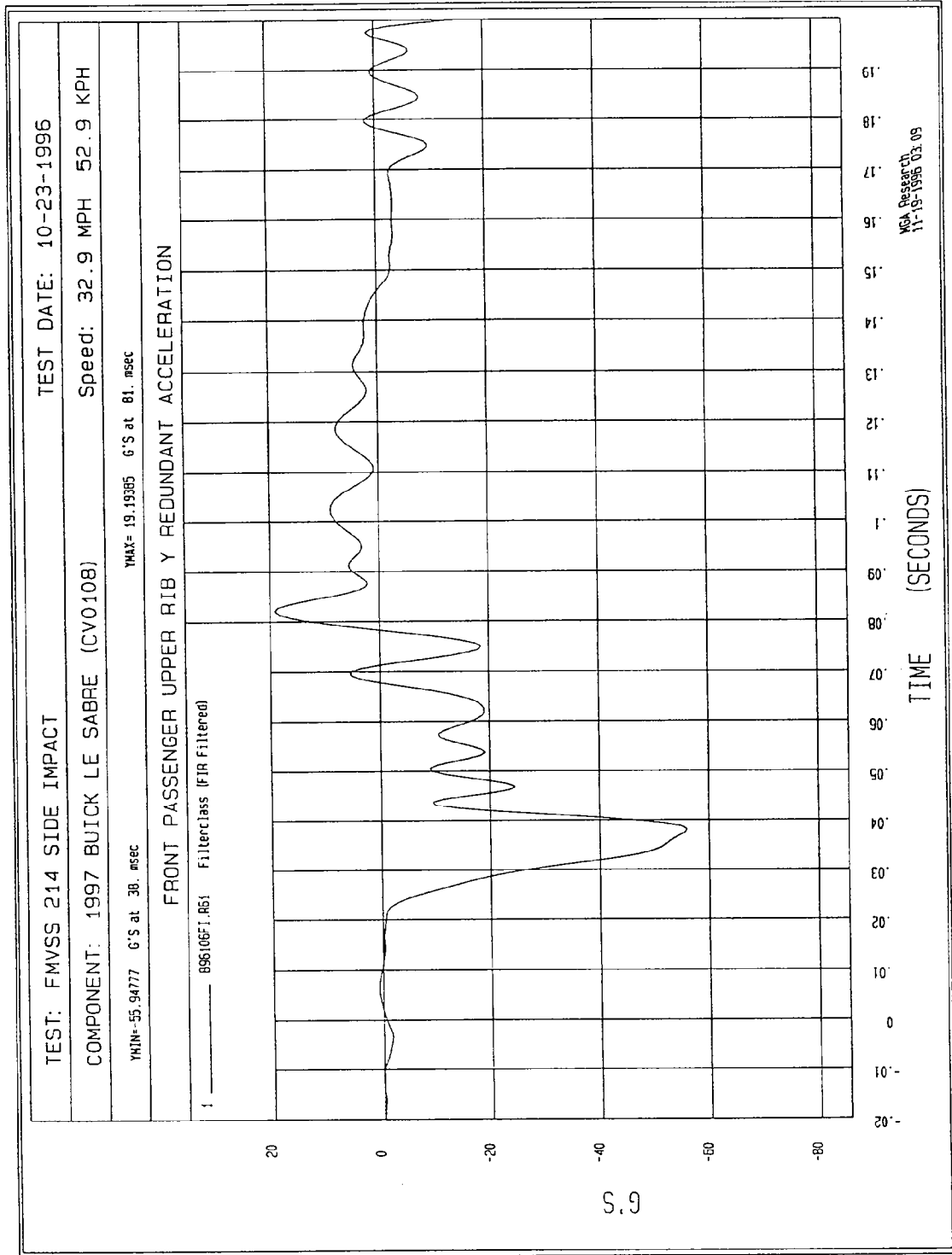


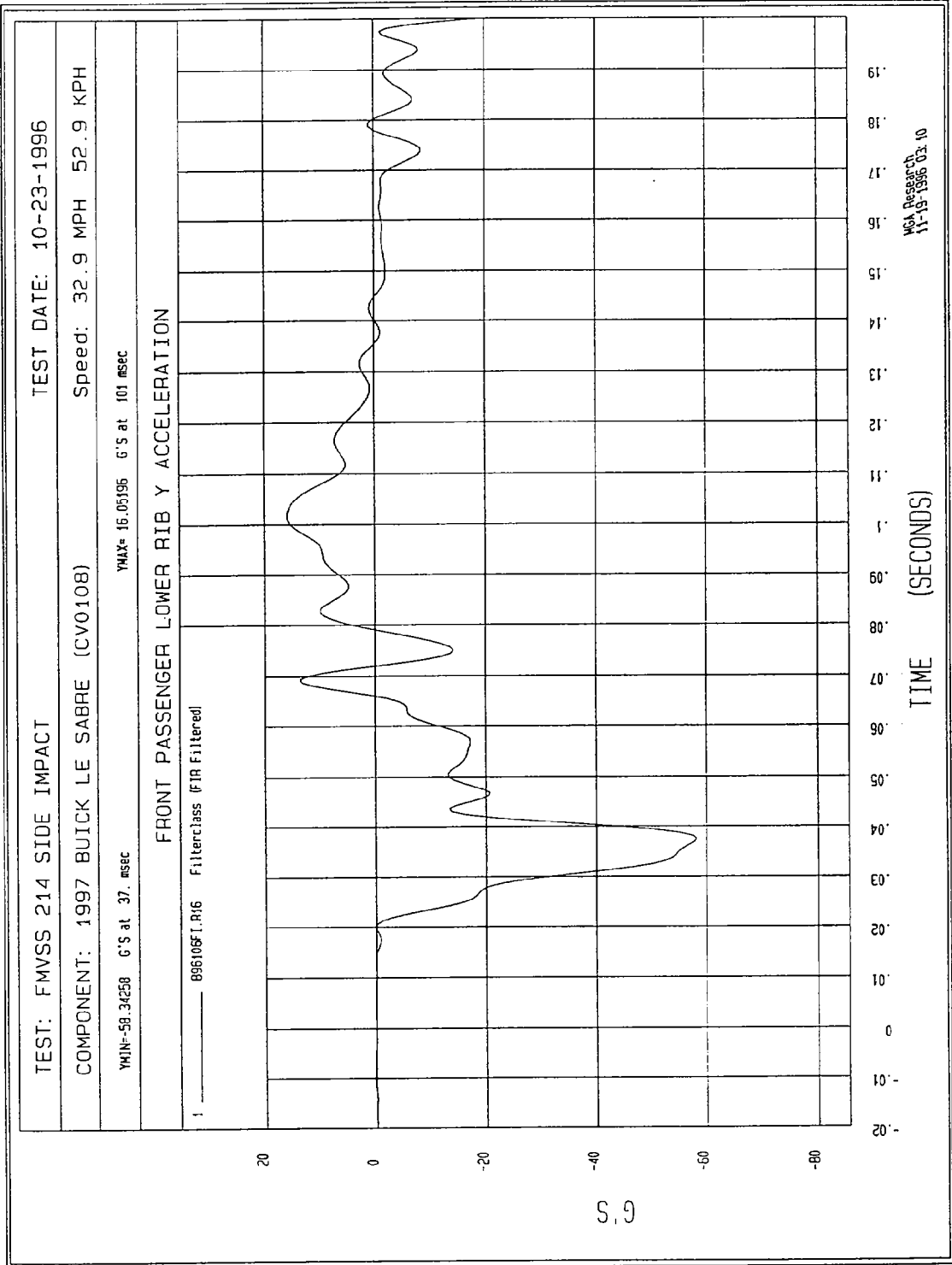


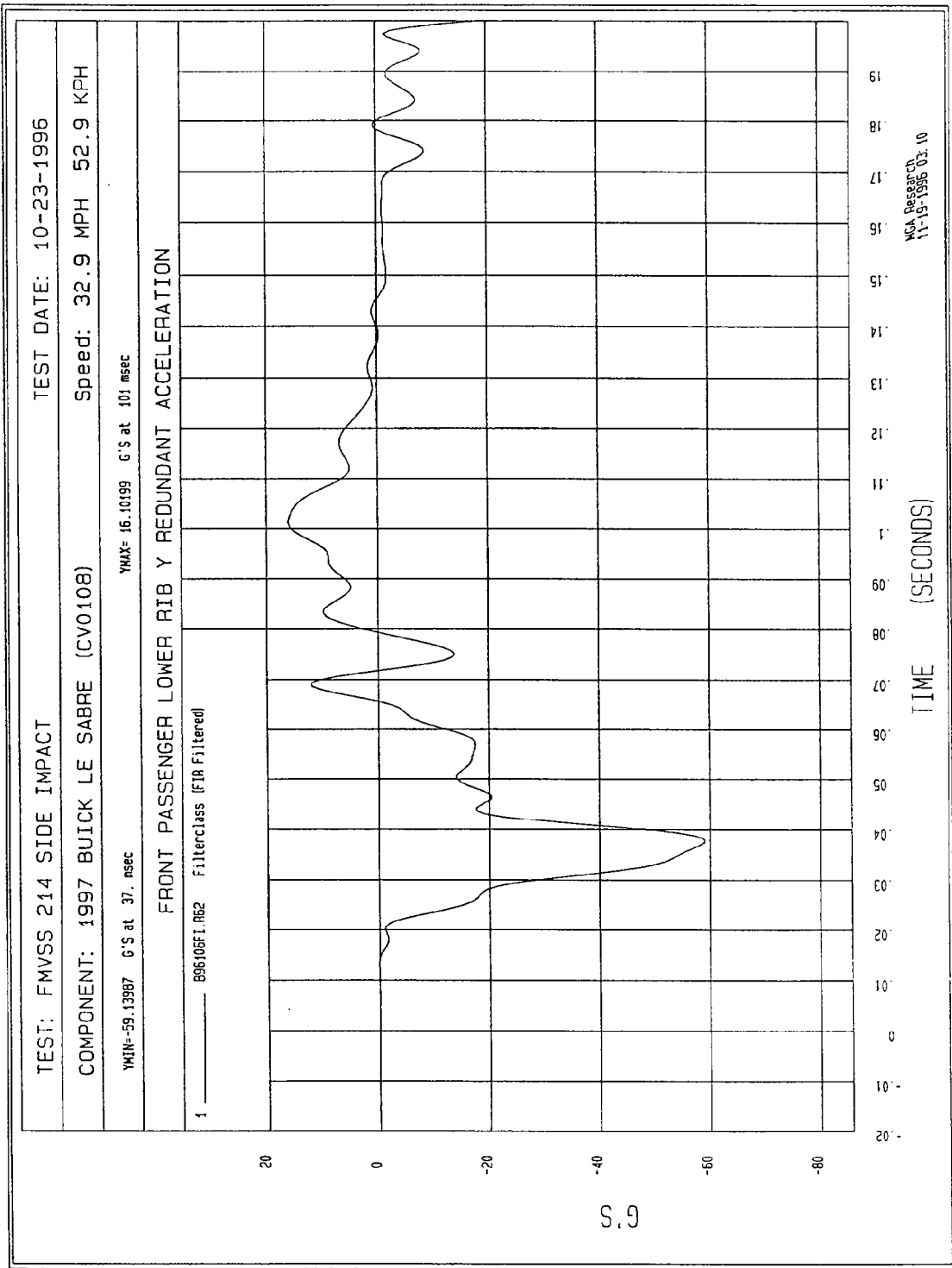


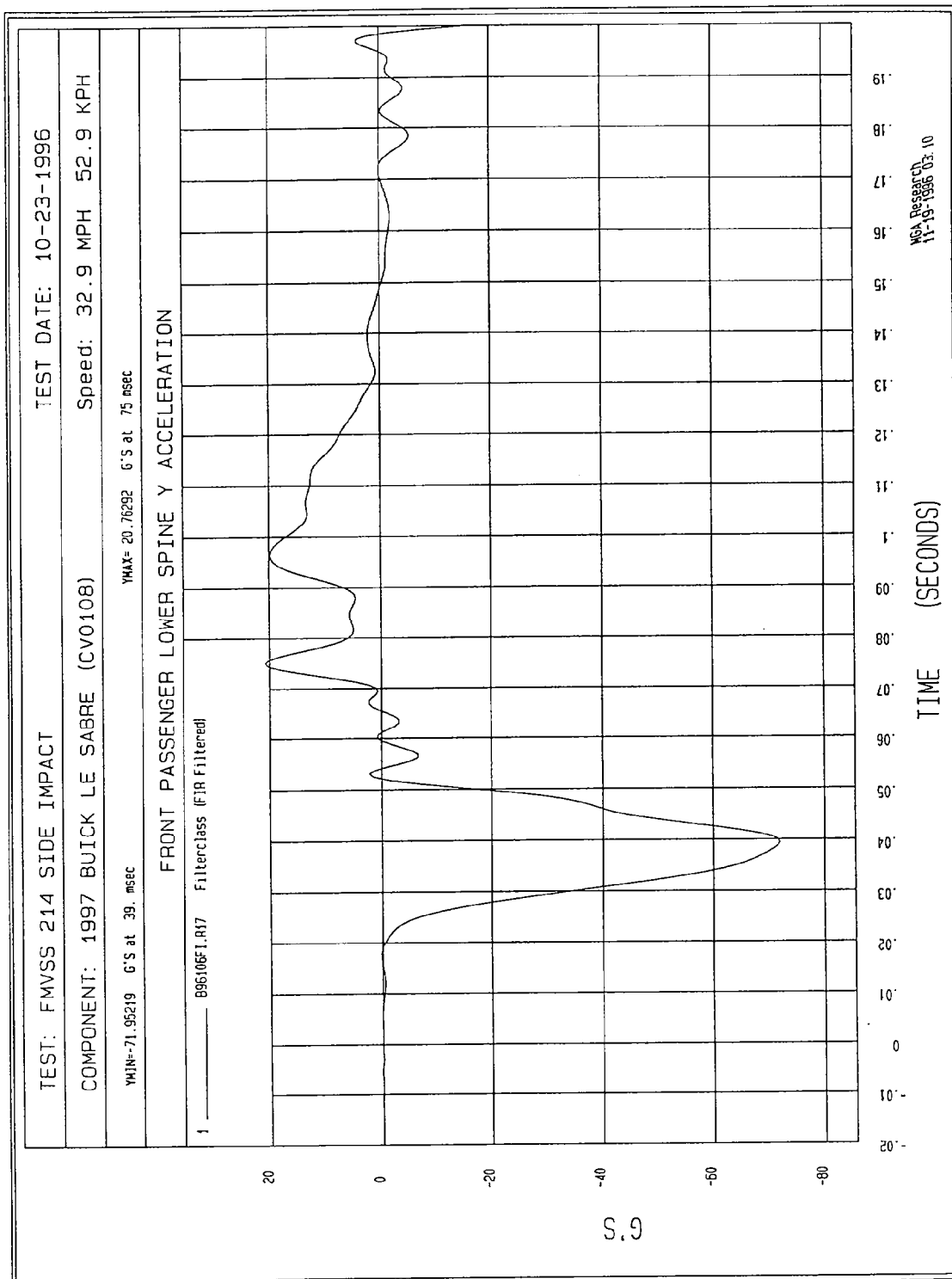
FINITE IMPULSE RESPONSE (FIR) FILTERED DATA

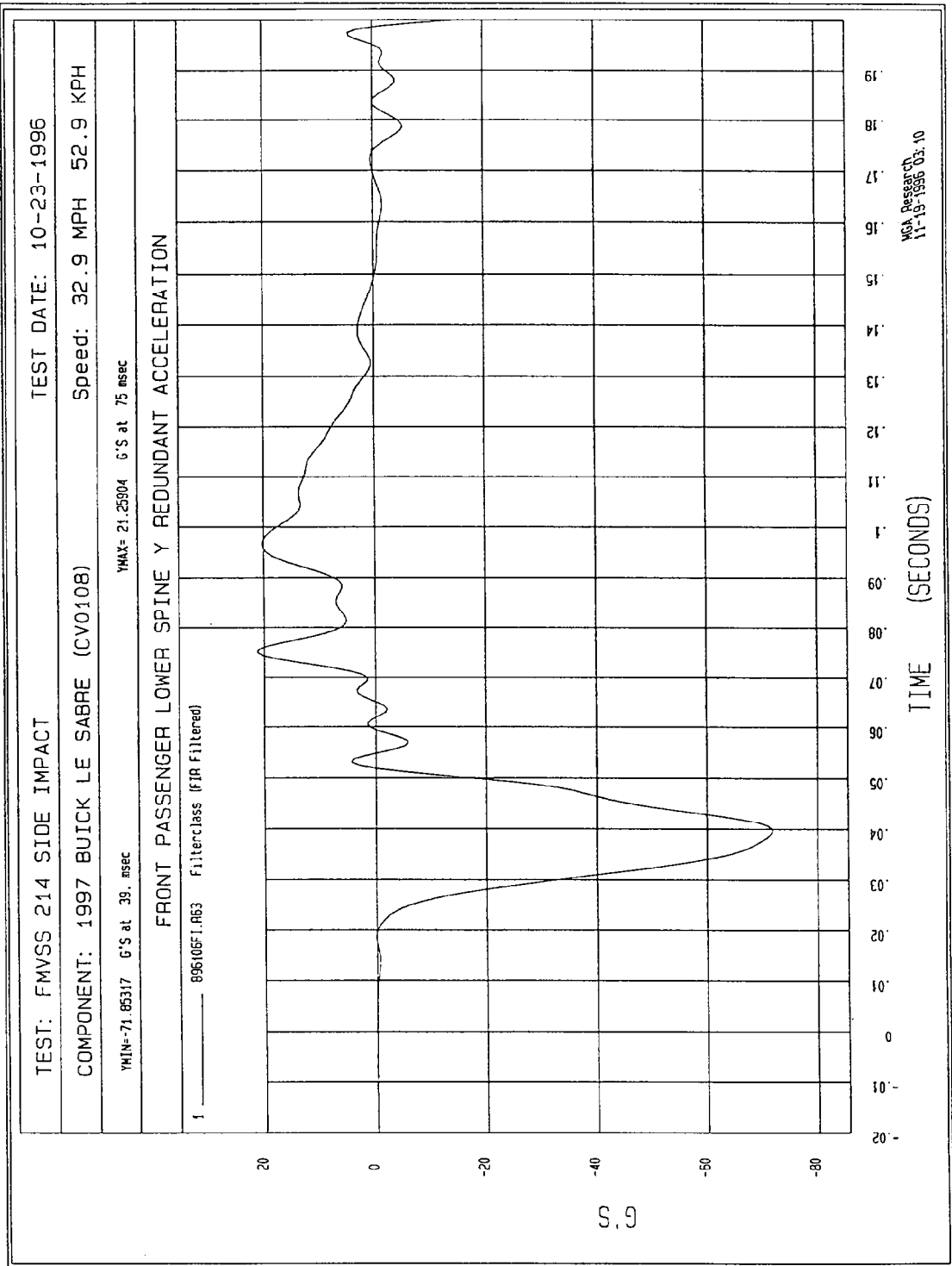


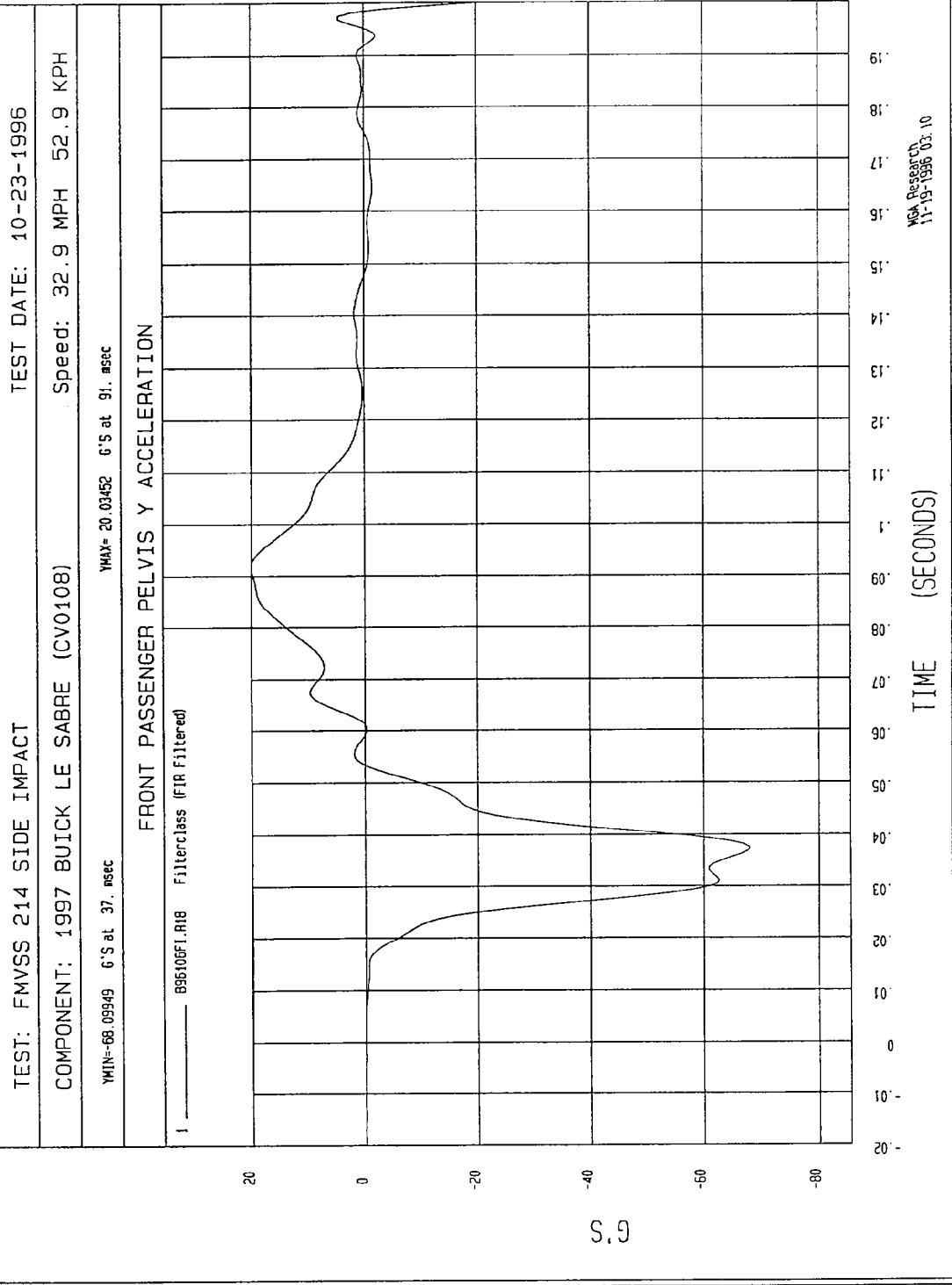


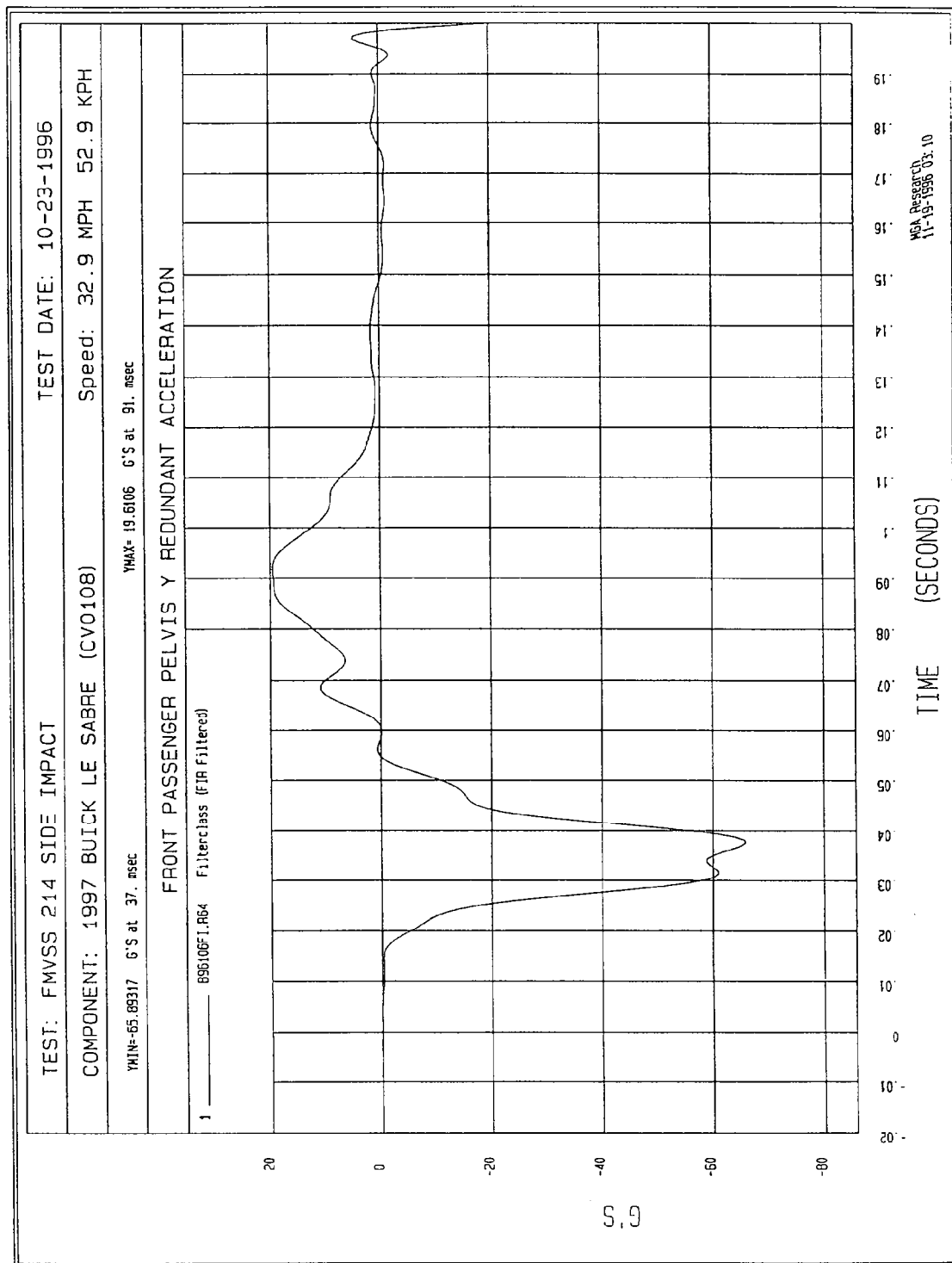


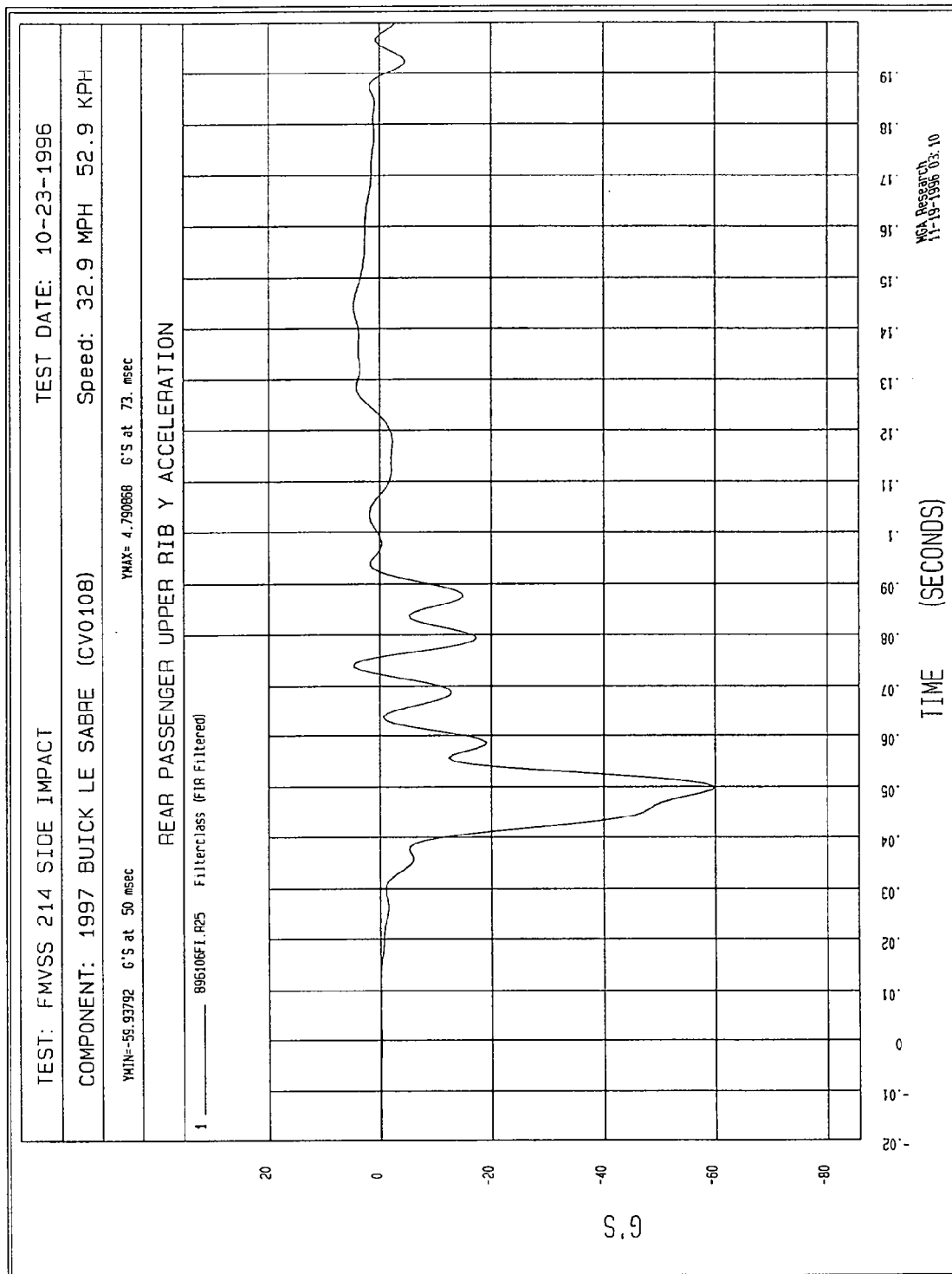


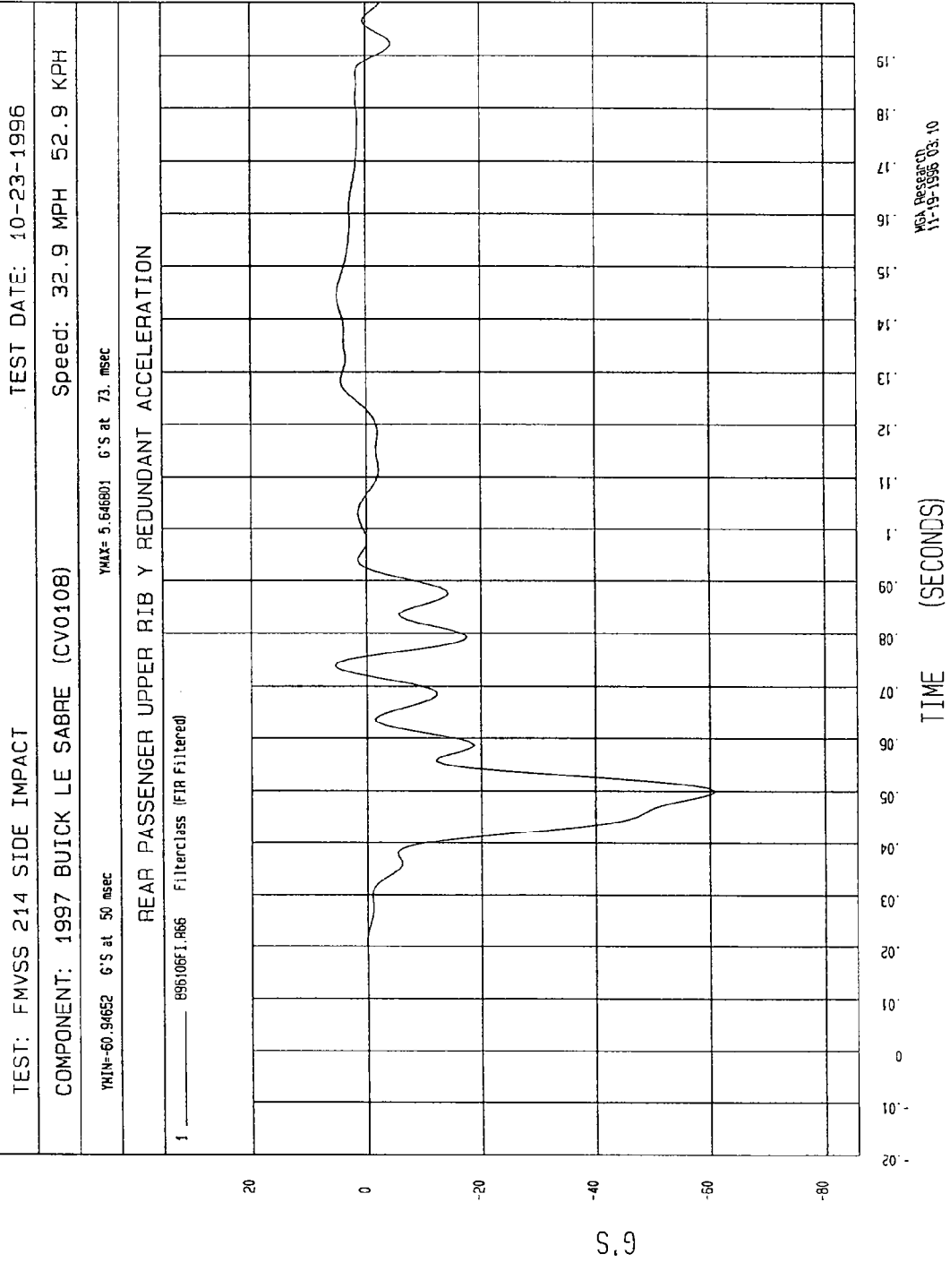












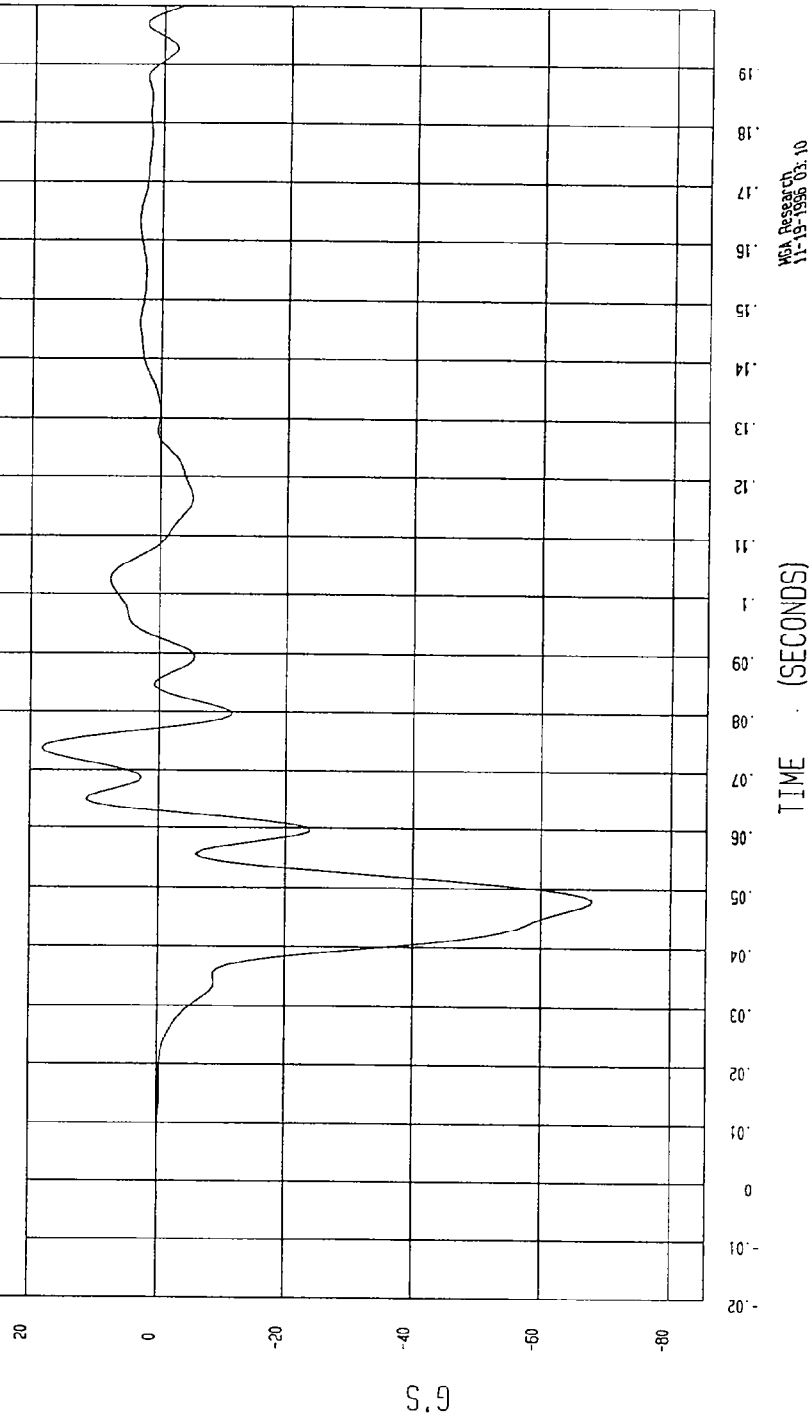
TEST DATE: 10-23-1996

Speed: 32.9 MPH 52.9 KPH

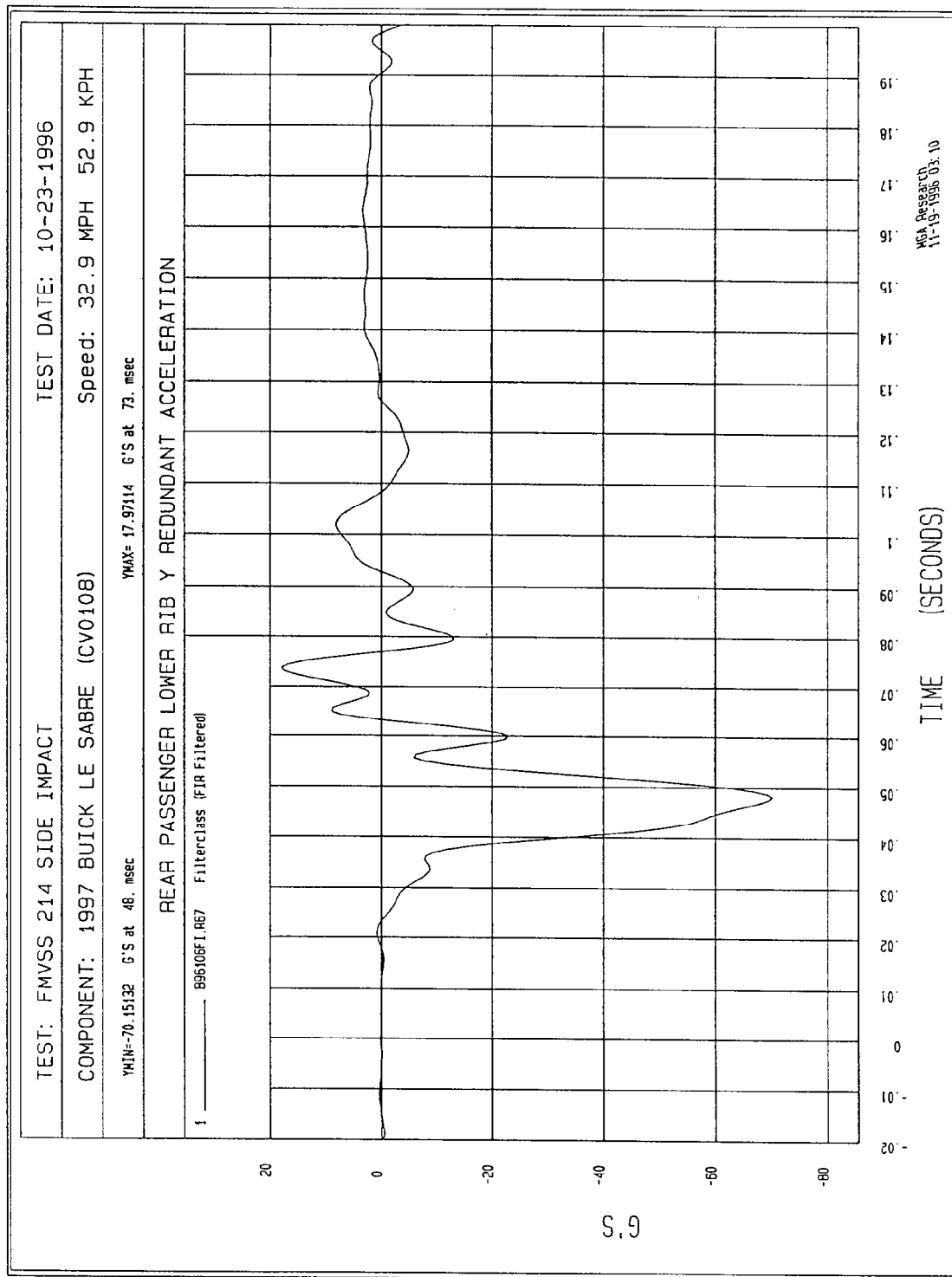
YMAX= 18.25231 G'S at 73. msec

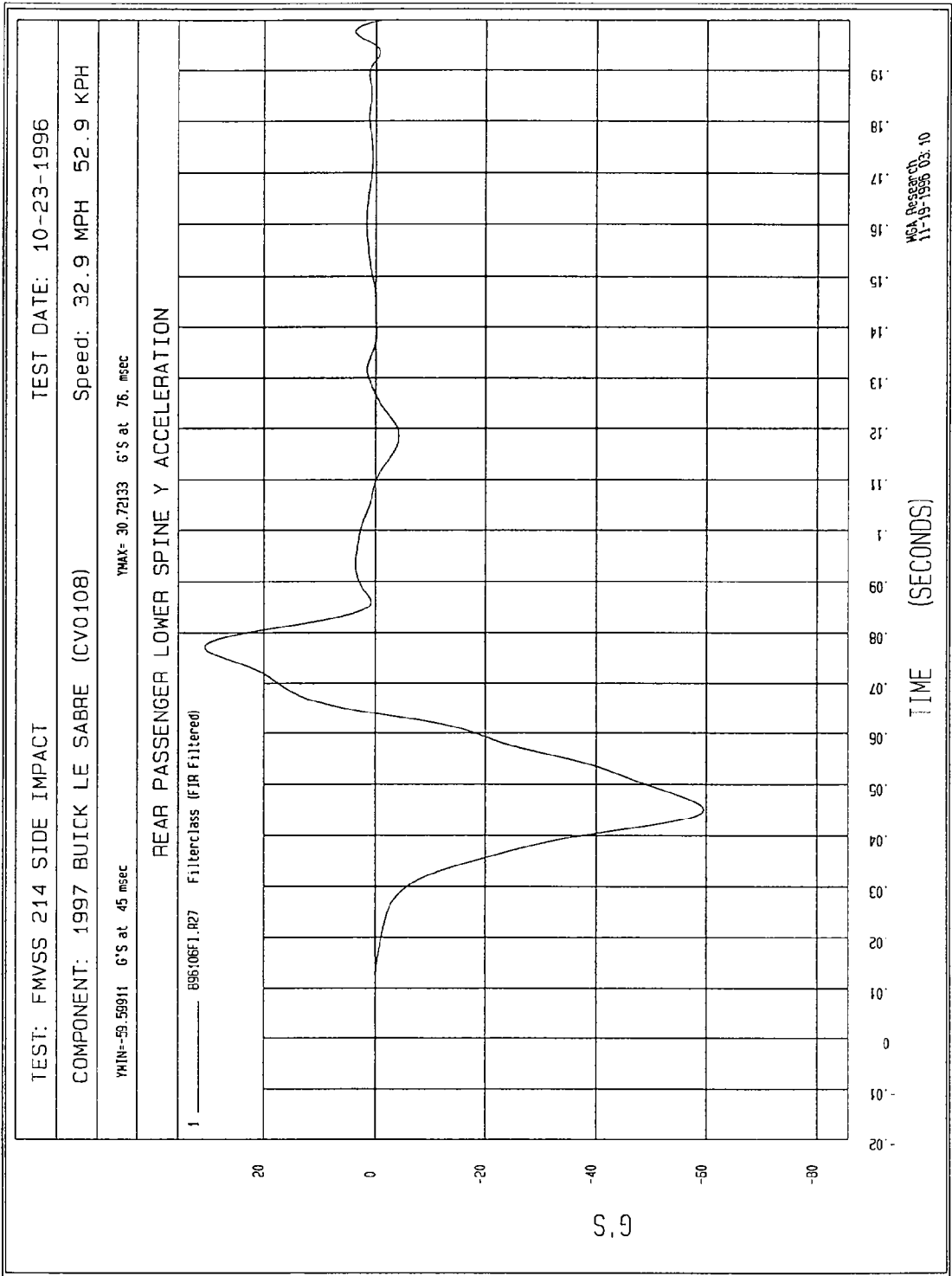
REAR PASSENGER LOWER RIB Y ACCELERATION

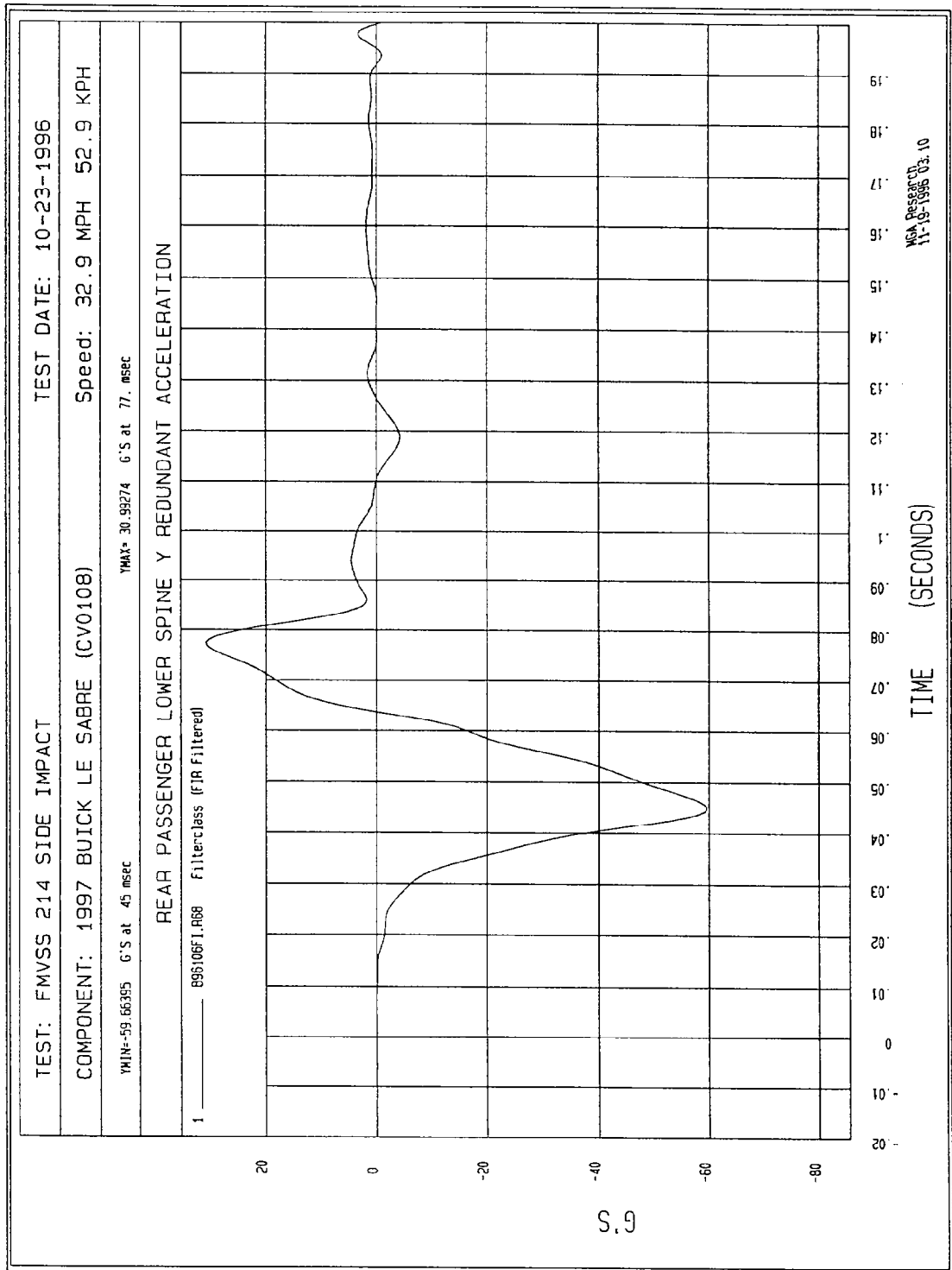
1	_____	896106FI.A26	Filterclass (FIA Filtered)



WGA Research
11-19-1996 03:10







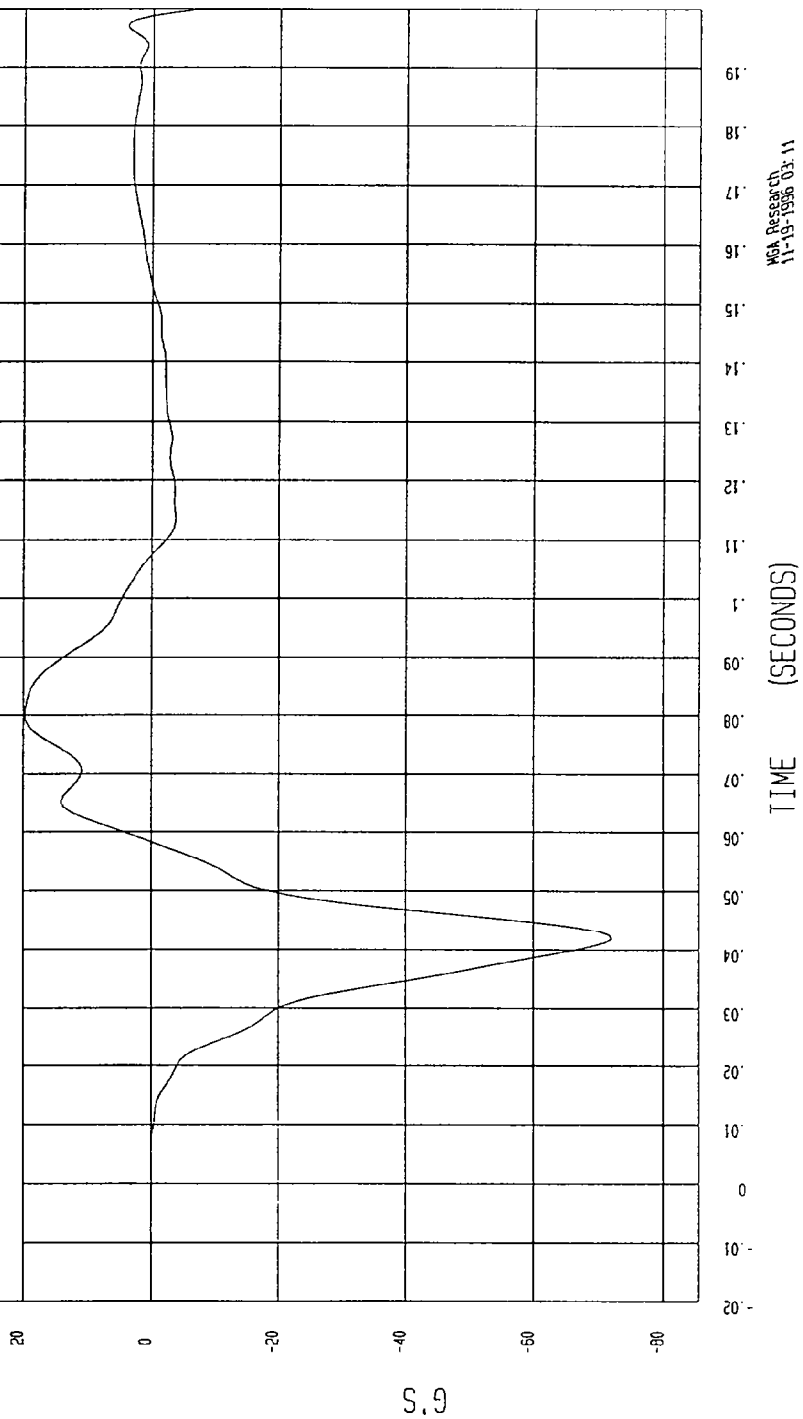
TEST DATE: 10-23-1996

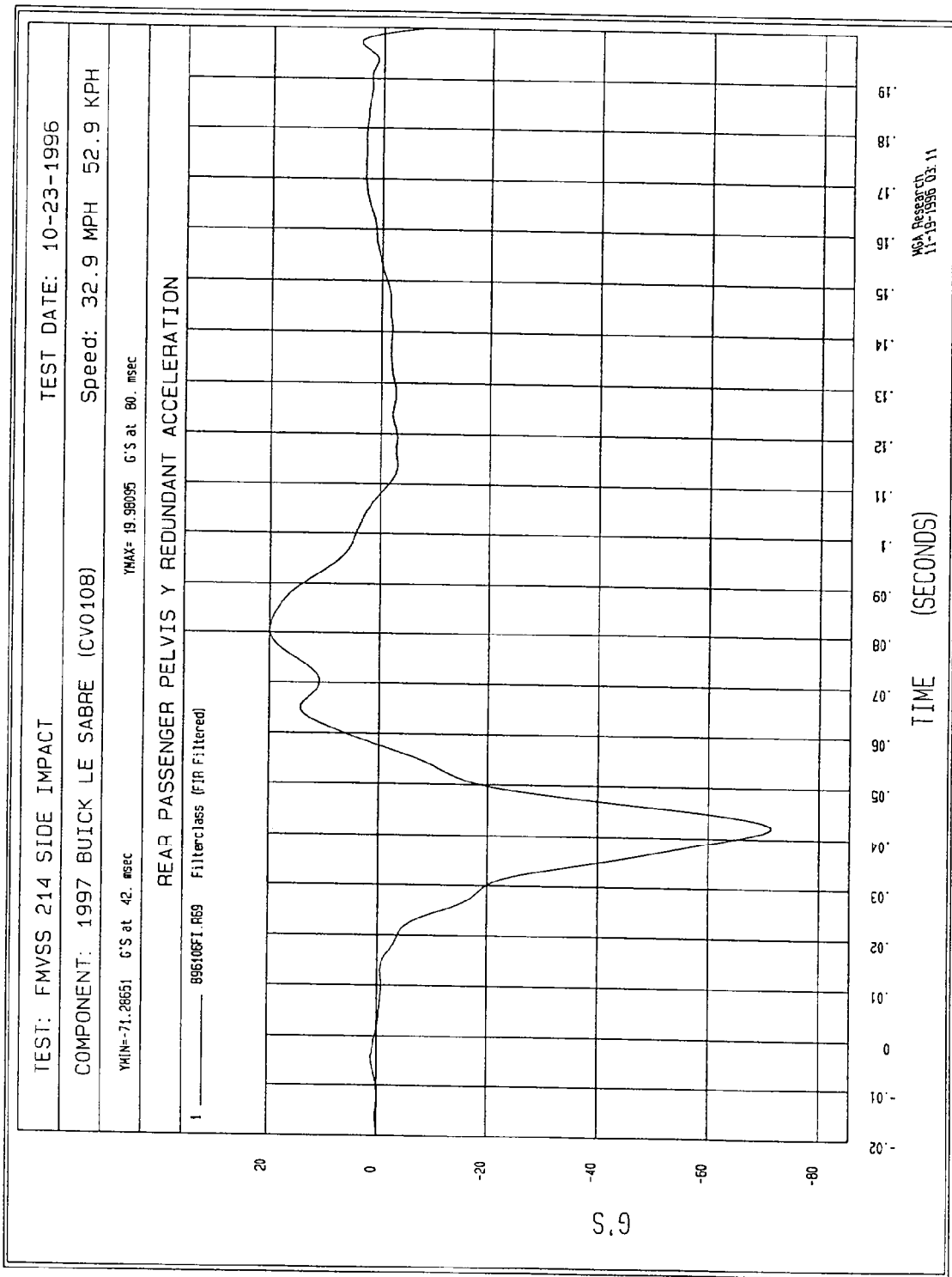
Speed: 32.9 MPH 52.9 KPH

YMAX= 19.81554 G'S at 80 msec

REAR PASSENGER PELVIS Y ACCELERATION

1	_____	895105FY.R28	FilterClass (FIR Filtered)
1	_____	895105FY.R28	FilterClass (FIR Filtered)





APPENDIX C
SID CONFIGURATION AND PERFORMANCE VERIFICATION

REPORT NO. MGA-96-DC06

DUMMY PERFORMANCE CALIBRATIONS

FMVSS 214 - SIDE IMPACT TEST

GENERAL MOTORS CORPORATION
1997 BUICK LESABRE 4 DOOR SEDAN
NHTSA NO. CV0108

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: October 23, 1996

Report Date: December 4, 1996

FINAL REPORT

Prepared For:

U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
MAIL CODE: NEF-30
400 SEVENTH STREET, S.W., ROOM 6115
Washington, D.C. 20590

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PRE-TEST CERTIFICATION DATA

Front Dummy Serial Number: 271

Calibration Test Results Summary

Dummy Serial Number: 271

Pre-Test Calibration

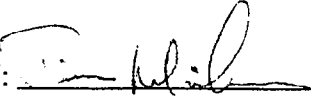
External Dimensions:	The dummy passed all external dimension requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion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

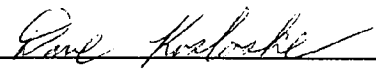
SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 271

DATE OF VERIFICATION: October 22, 1996

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.4
RH - Rib Height	19.75" - 20.50"	20.40
HP - Hip Pivot Height	3.9" ref.	3.9
RD - Rib From Back Line	9.0" to 9.5"	9.4
KV - Knee Pivot From Back Line	20.1" - 20.7"	20.4
SW - Knee Pivot to Floor	19.3" - 19.9"	19.5
HW - Hip Width	14.0" - 15.4"	15.0

MEASUREMENTS BY: 

APPROVED BY: 

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: October 22, 1996

DUMMY NUMBER: 271

TEST NUMBER: D961562

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	40%
PROBE SPEED	13.8 - 14.2 fps	14.1
UPPER RIB	37 - 46 g's	37
LOWER RIB	37 - 46 g's	40
LOWER SPINE	15 - 22 g's	20

TEST MEETS SPECIFICATIONS

TECHNICIAN

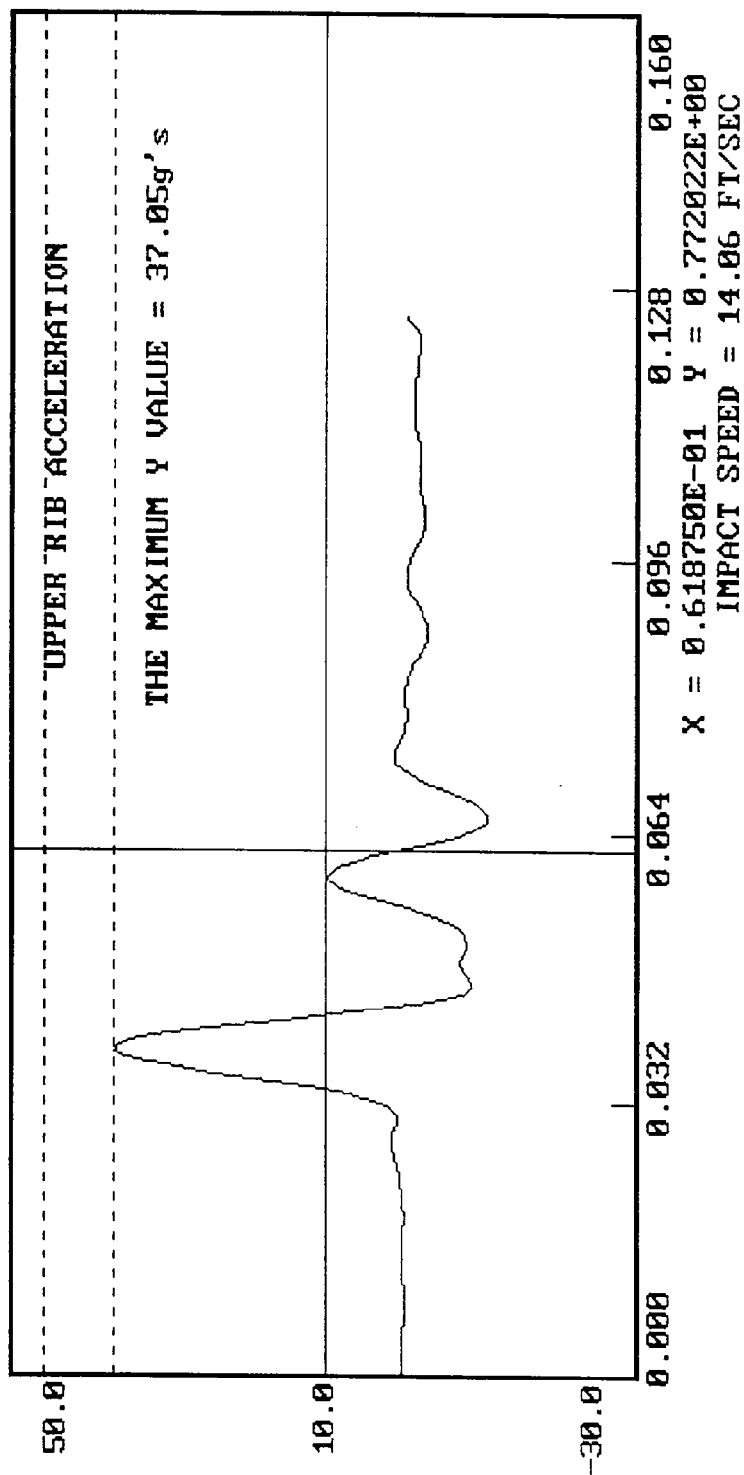
Jim White

APPROVED BY

David Korbake

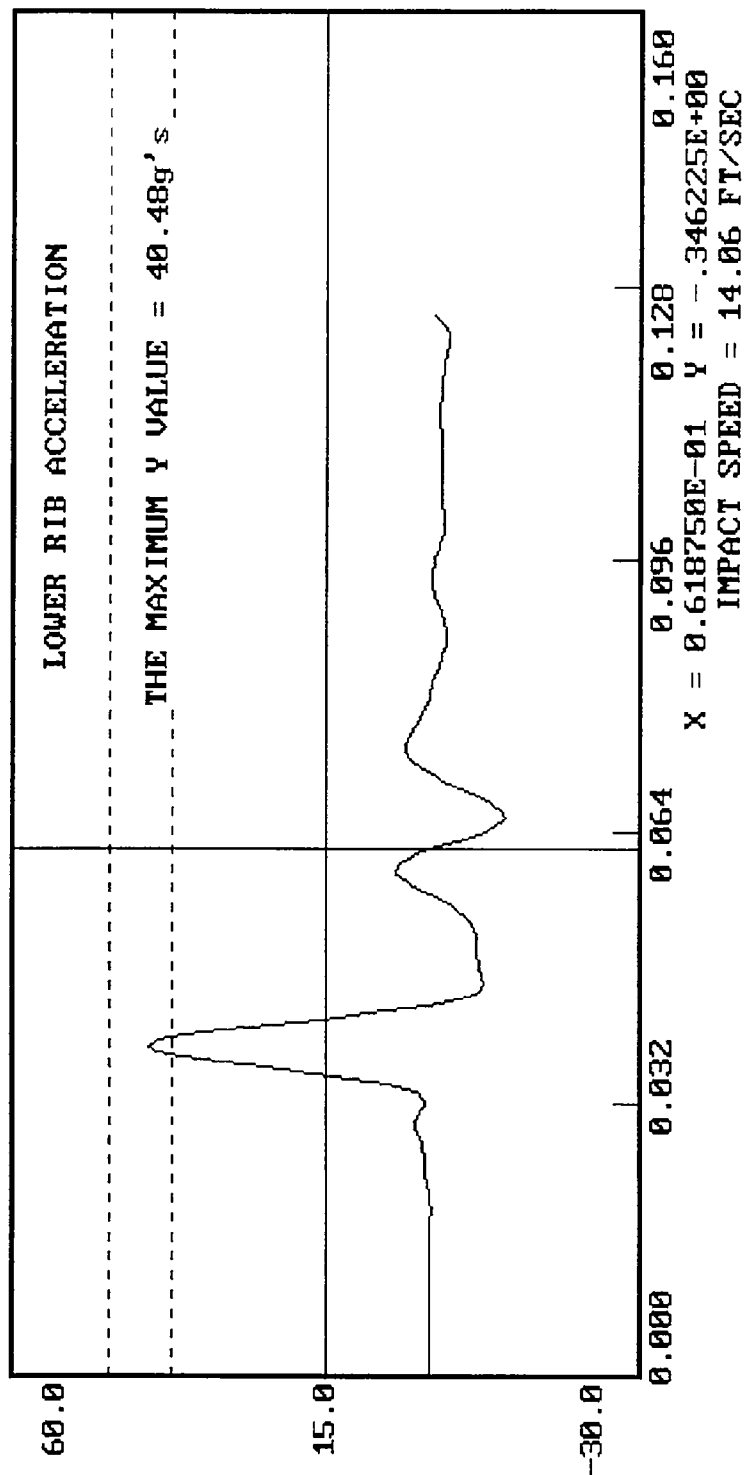
10-22-1996 09:42

DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 271 RIGHT IMPACT
ACCELERATION (G'S) VS. TIME ((SECONDS))



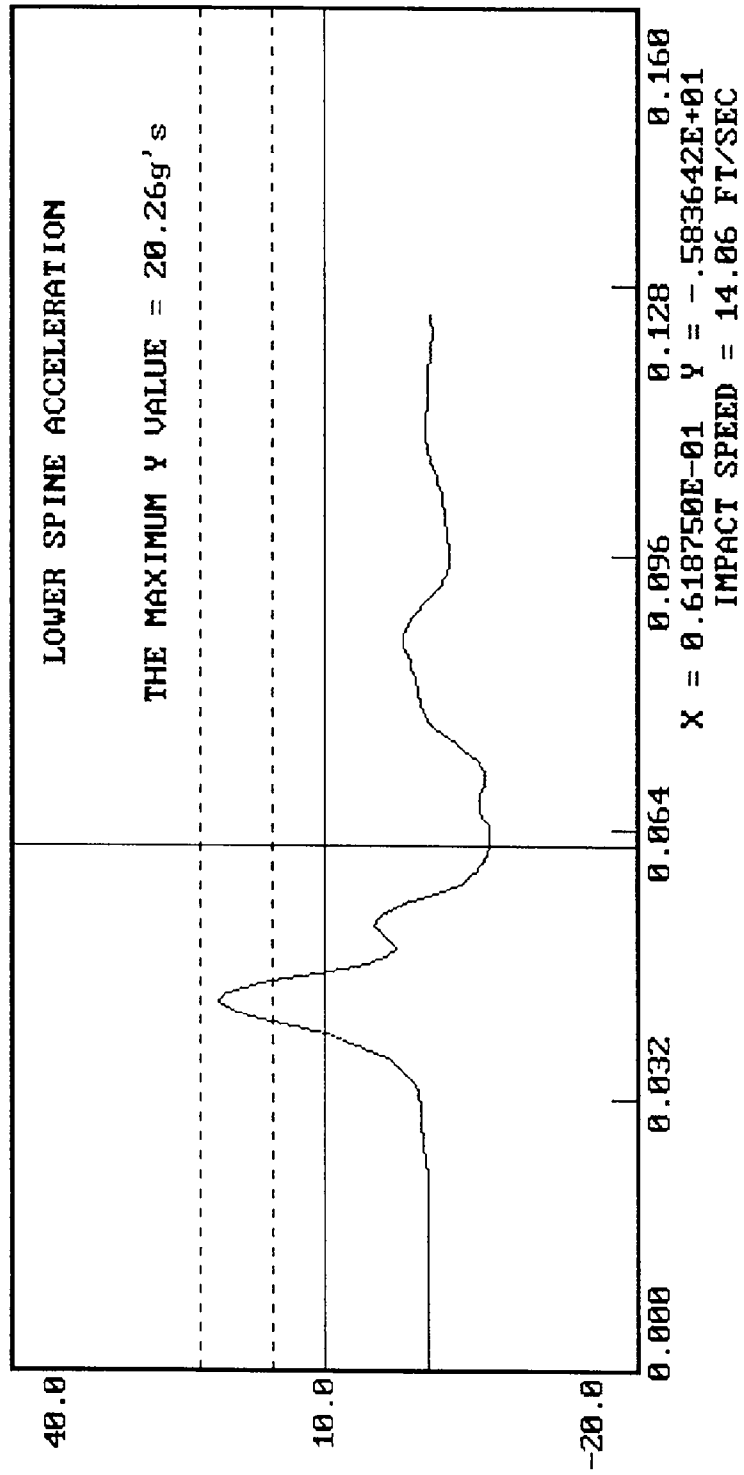
DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 271 RIGHT IMPACT
 ACCELERATION (G'S) VS. TIME ((SECONDS))

10-22-1996 09:42



10-22-1996 09:42

DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 271 RIGHT IMPACT
ACCELERATION (G'S) VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

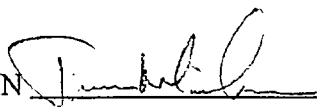
DATE: October 22, 1996

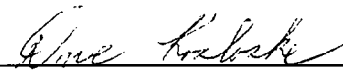
DUMMY NUMBER: 271

TEST NUMBER: D961563

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

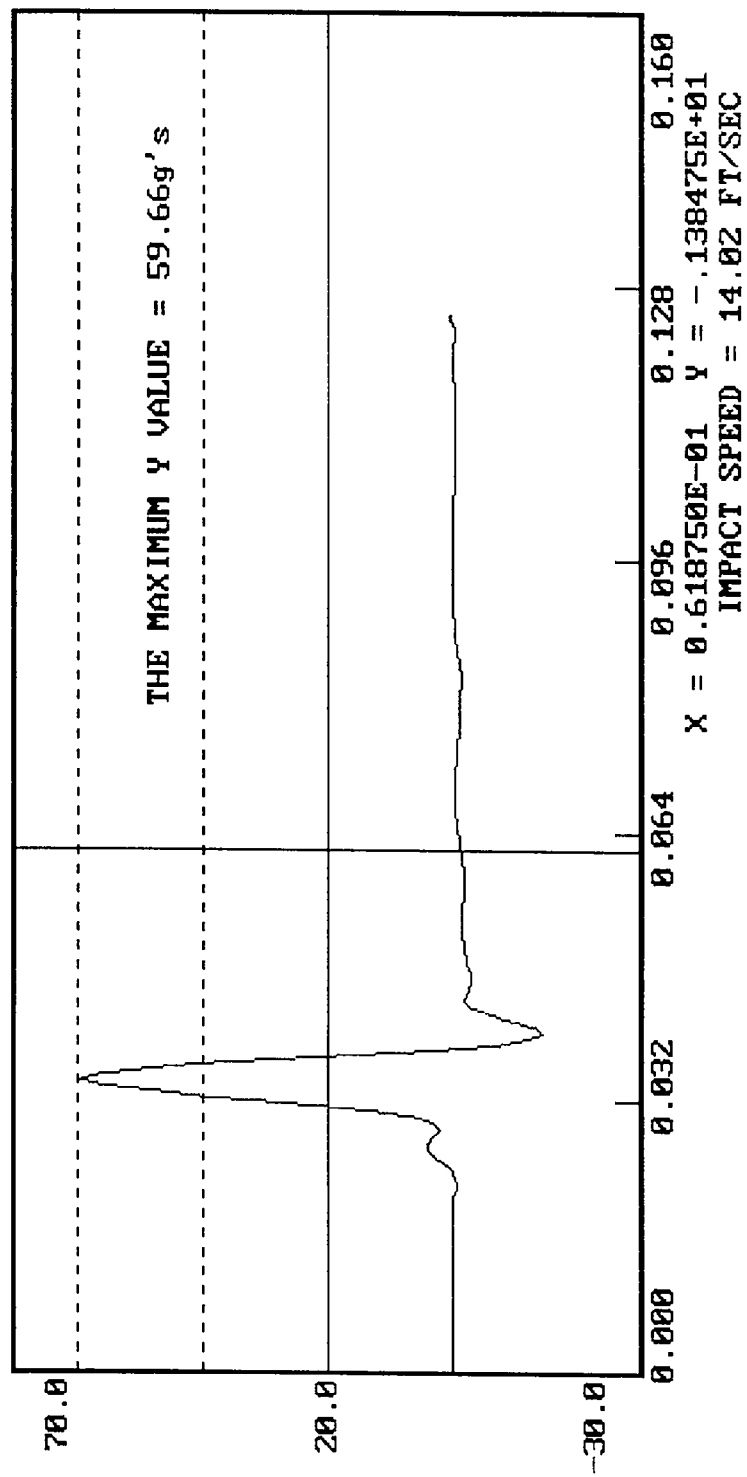
TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

DUMMY CALIBRATION - PELVIS IMPACT
 DUMMY # 271 RIGHT IMPACT
 ACCELERATION (G'S) VS. TIME ((SECONDS))

10-22-1996 09:52



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

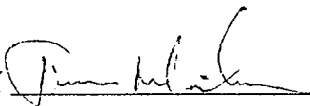
DATE: October 18, 1996

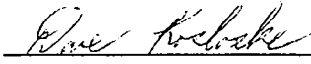
DUMMY NUMBER: 271

TEST NUMBER: D961564

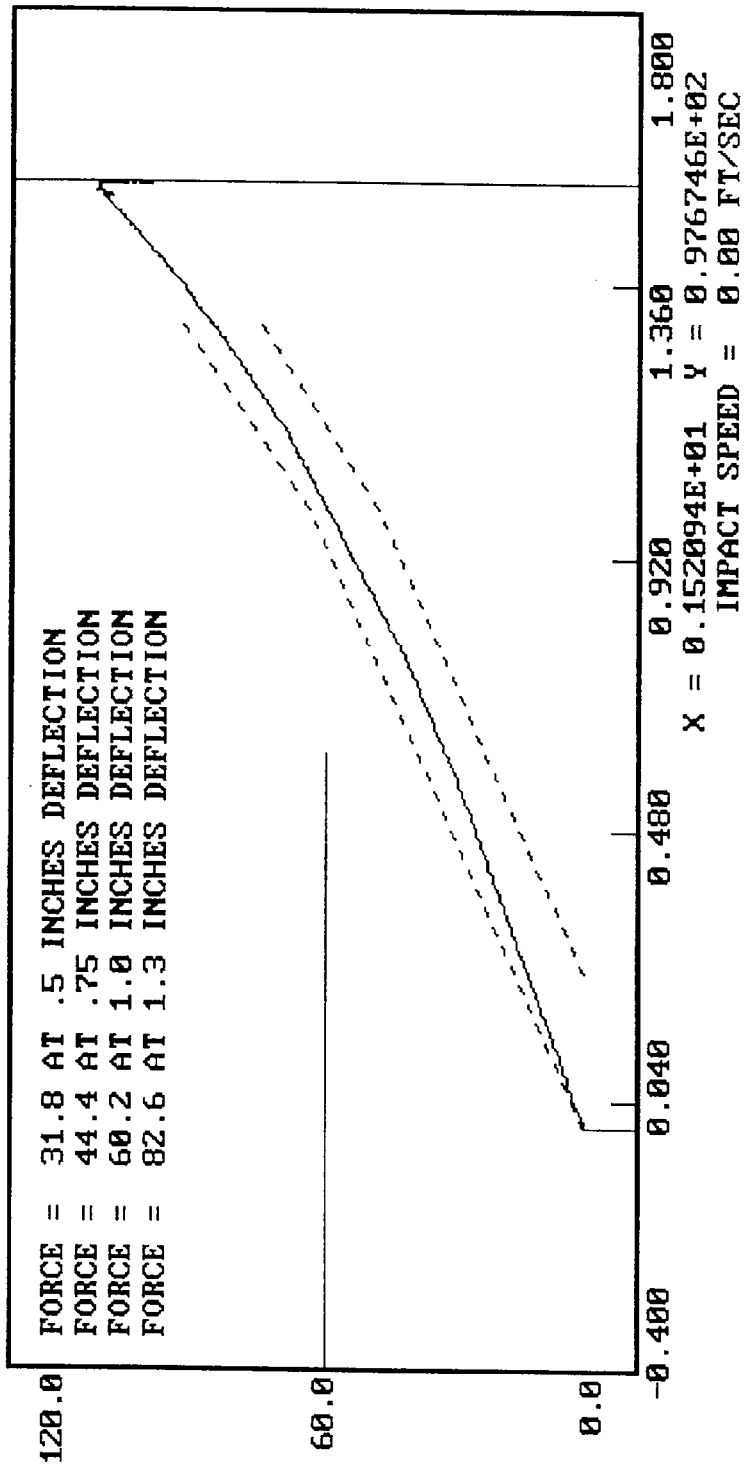
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	35%
FORCE @ 0.5 in	23.3 - 36.5 lbs	31.8
FORCE @ 0.75 in	36.7 - 49.8 lbs	44.4
FORCE @ 1.0 in	50 - 63 lbs	60
FORCE @ 1.3 in	73 - 88 lbs	83

TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

DUMMY CALIBRATION - ABDOMEN COMPRESSION
 DUMMY # 271
 10-18-1996 08:21
 ABDOMEN FORCE (LBS) VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

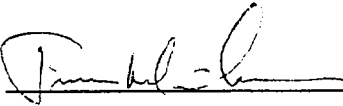
DATE: October 21, 1996

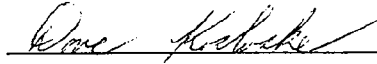
DUMMY NUMBER: 271

TEST NUMBER: D961565

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	35%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	23
FORCE @ 30°	34 - 46 lbs	36
FORCE @ 40°	46 - 58 lbs	52
RETURN ANGLE	12° maximum	8°

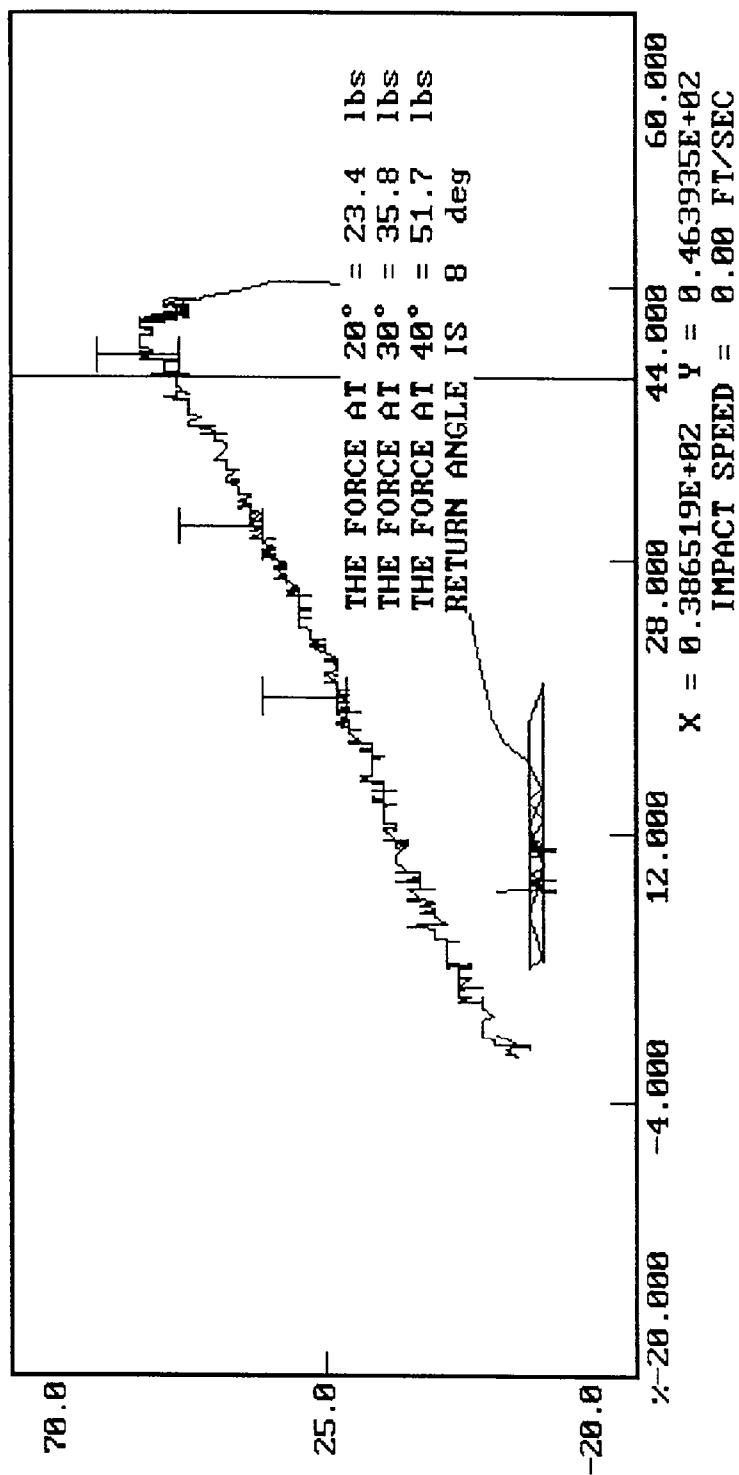
TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

DUMMY CALIBRATION - LUMBAR FLEXION
 DUMMY # 271
 FORCE (LBS) VS. TORSO ROTATION (DEGREES)

10-21-1996 12:38



PRE-TEST CERTIFICATION DATA

Rear Dummy Serial Number: 270

Calibration Test Results Summary

Passenger Serial Number: 270

Pre-Test Calibration

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

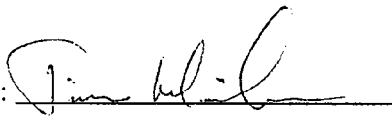
SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 270

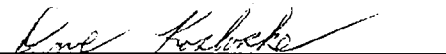
DATE OF VERIFICATION: October 22, 1996

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.2
RH - Rib Height	19.75" - 20.50"	20.50
HP - Hip Pivot Height	3.9" ref.	3.9
RD - Rib From Back Line	9.0" to 9.5"	9.5
KV - Knee Pivot From Back Line	20.1" - 20.7"	20.6
SW - Knee Pivot to Floor	19.3" - 19.9"	19.5
HW - Hip Width	14.0" - 15.4"	15.0

MEASUREMENTS BY:



APPROVED BY:



MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: October 22, 1996

DUMMY NUMBER: 270

TEST NUMBER: D961552

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	40%
PROBE SPEED	13.8 - 14.2 fps	14.0
UPPER RIB	37 - 46 g's	40
LOWER RIB	37 - 46 g's	42
LOWER SPINE	15 - 22 g's	20

TEST MEETS SPECIFICATIONS

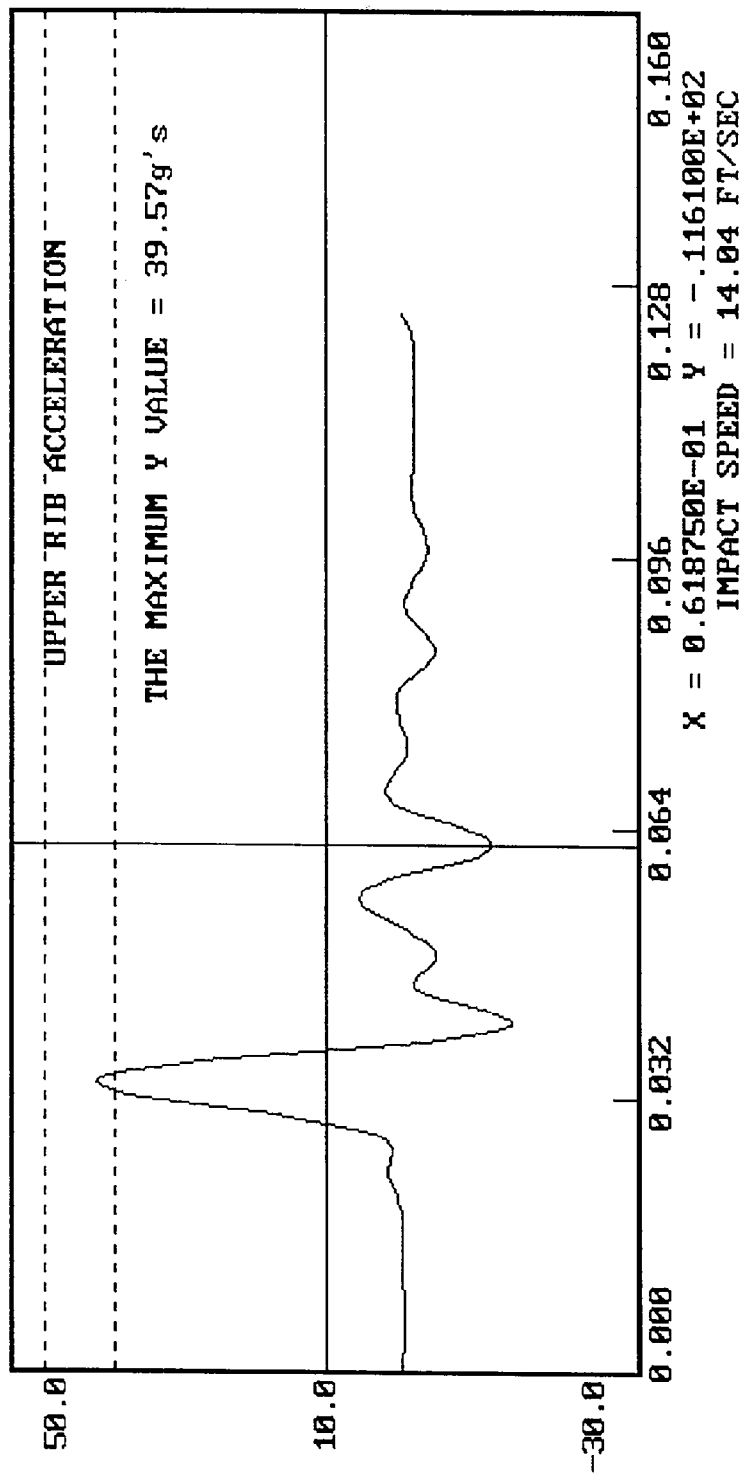
TECHNICIAN

Jim Hahn

APPROVED BY

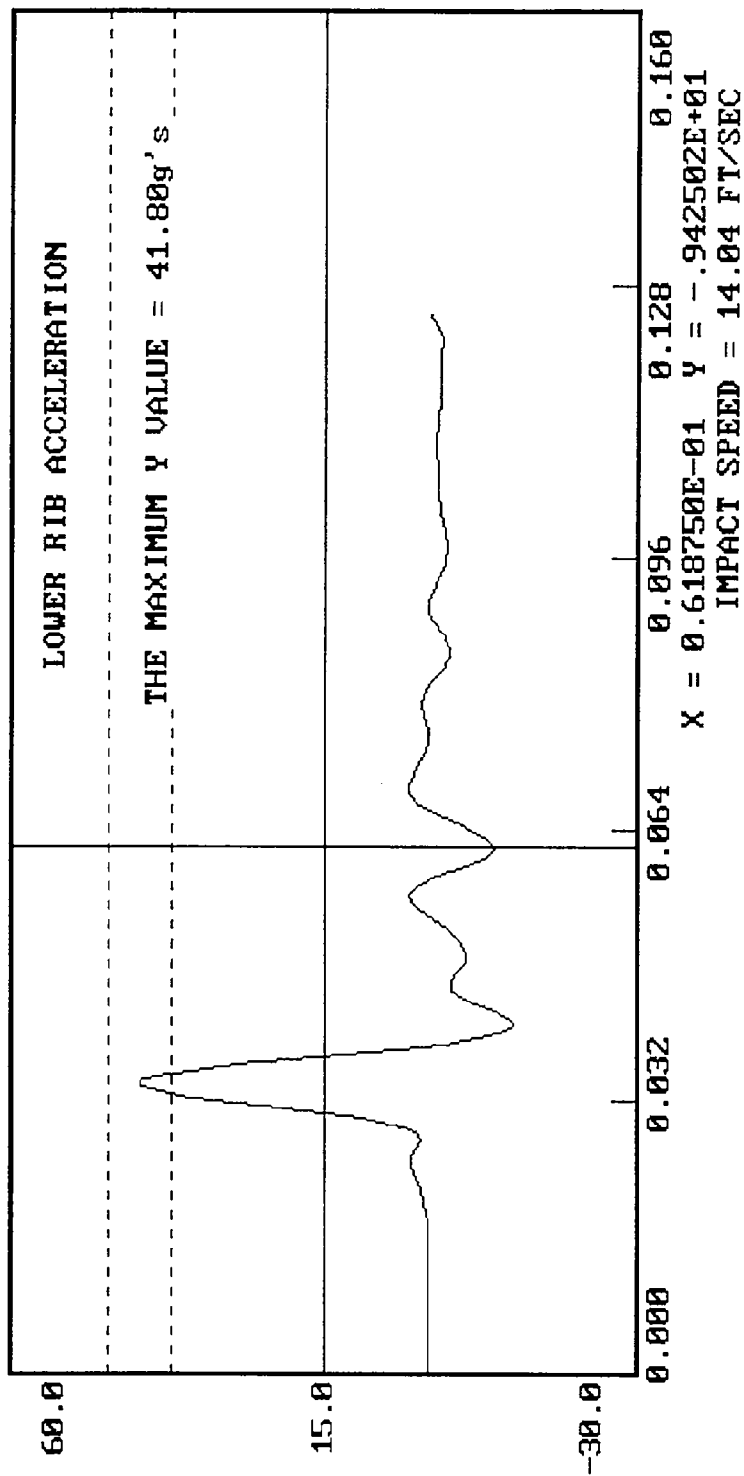
Paul Kishak

DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 270 RIGHT IMPACT
 10-22-1996 08:45
 ACCELERATION (G'S) VS. TIME ((SECONDS))



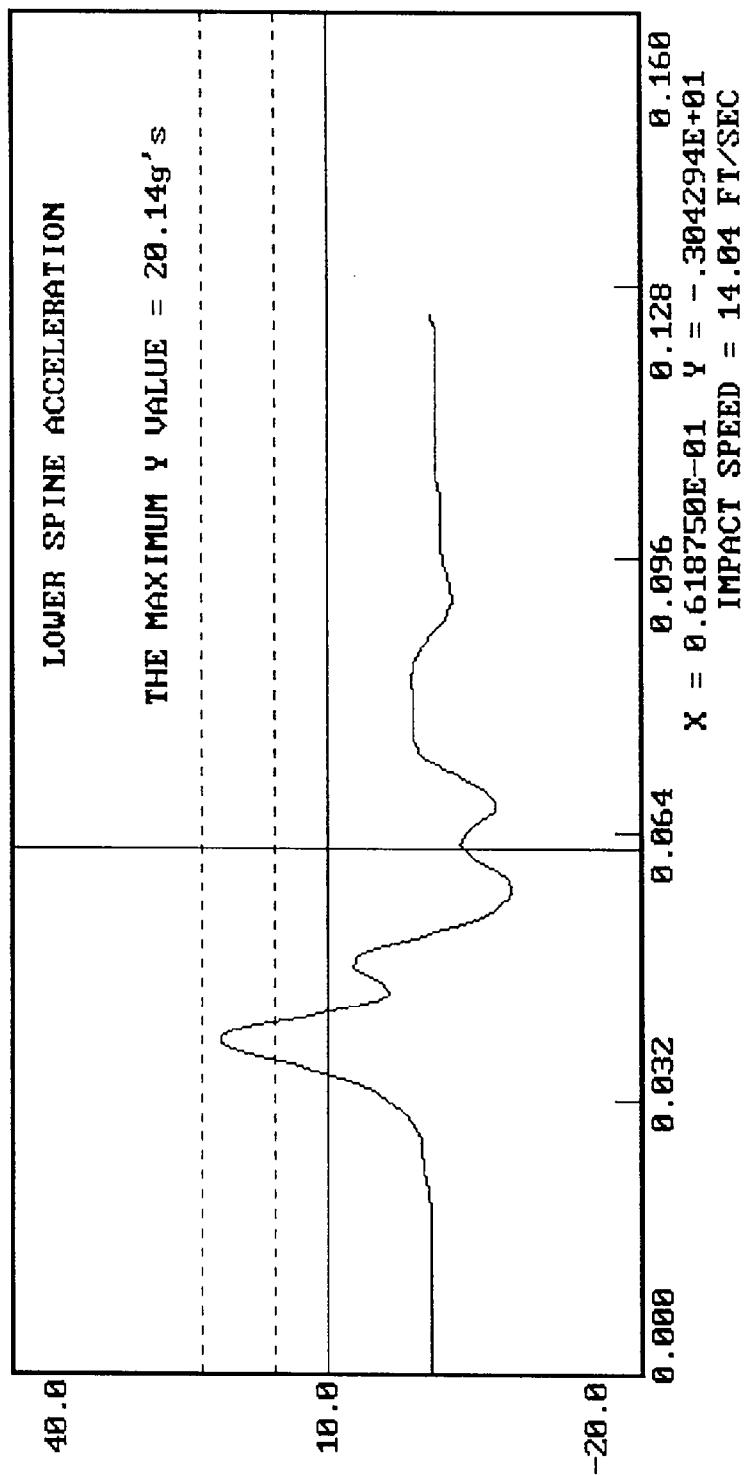
10-22-1996 08:45

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



10-22-1996 08:45

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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: October 22, 1996

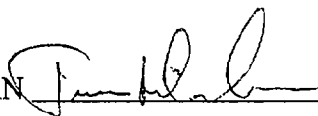
DUMMY NUMBER: 270

TEST NUMBER: D961553

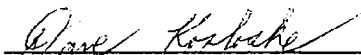
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	40%
PROBE SPEED	13.8 - 14.2 f/s	14.0
PELVIS ACCELERATION	40 - 60 g's	57

TEST MEETS SPECIFICATIONS

TECHNICIAN

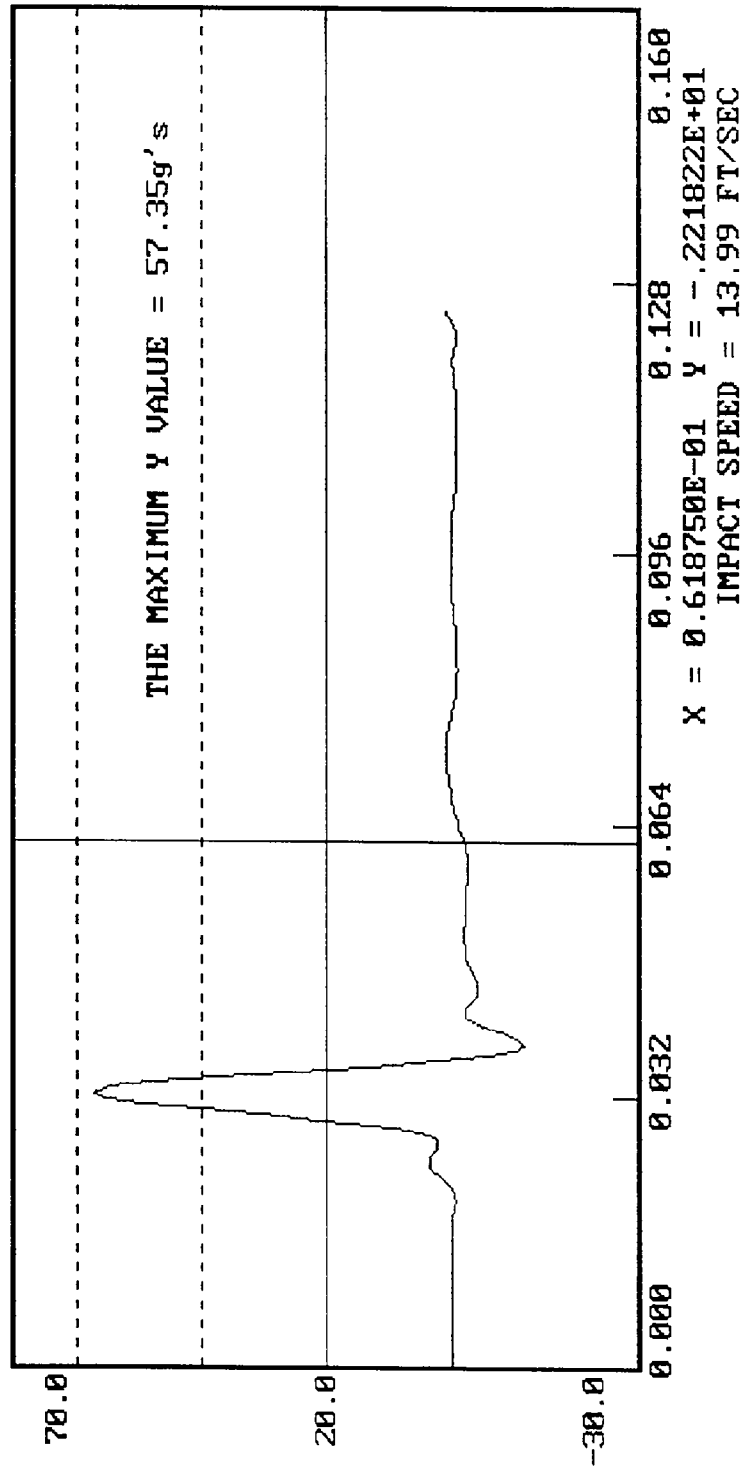


APPROVED BY



10-22-1996 09:07

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



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

DATE: October 18, 1996

DUMMY NUMBER: 270

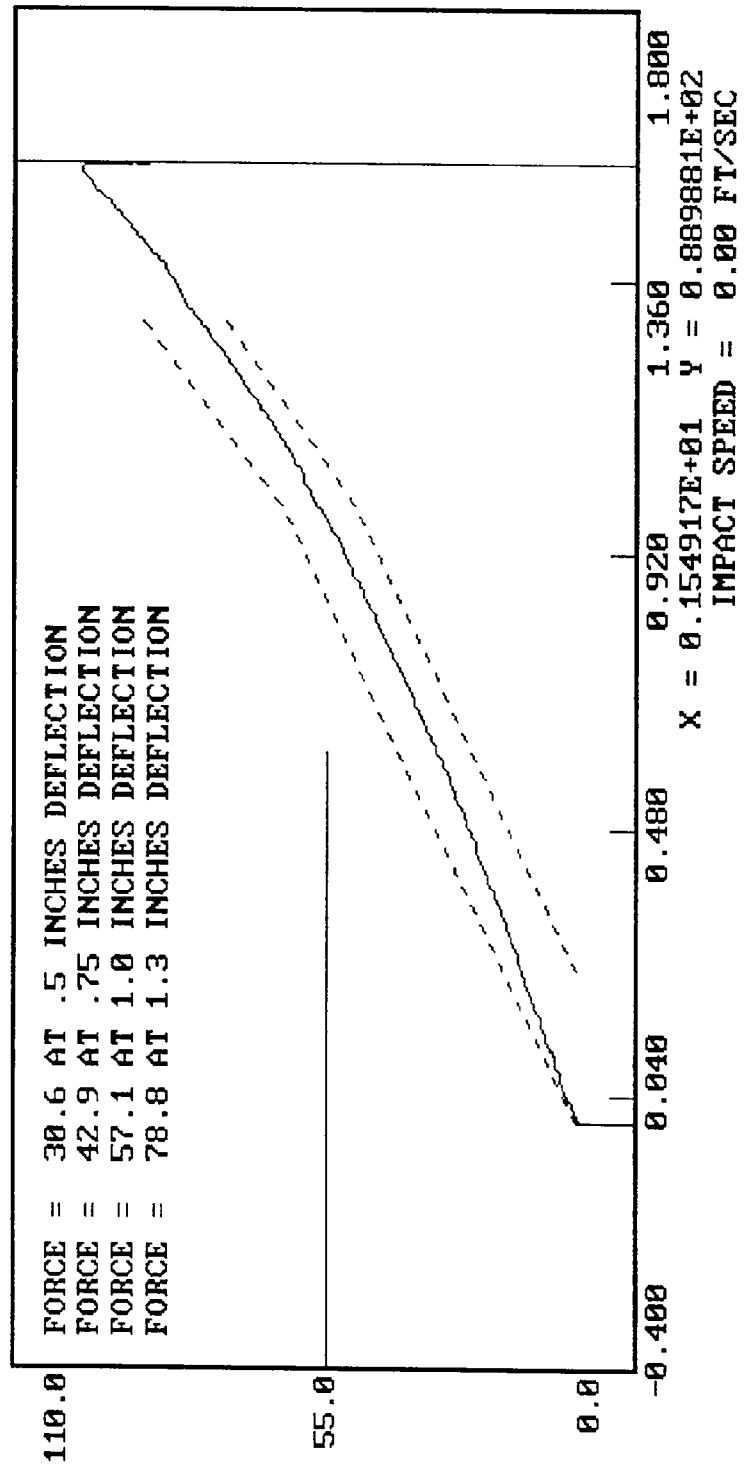
TEST NUMBER: D961554

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	35%
FORCE @ 0.5 in	23.3 - 36.5 lbs	30.6
FORCE @ 0.75 in	36.7 - 49.8 lbs	42.9
FORCE @ 1.0 in	50 - 63 lbs	57
FORCE @ 1.3 in	73 - 88 lbs	79

TEST MEETS SPECIFICATIONS

TECHNICIAN Jim Wilson

APPROVED BY Gene Kelske



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: October 21, 1996

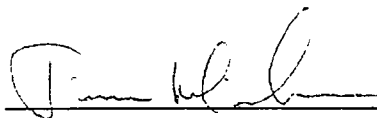
DUMMY NUMBER: 270

TEST NUMBER: D961555

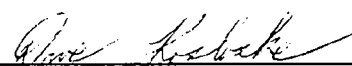
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	35%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	25
FORCE @ 30°	34 - 46 lbs	37
FORCE @ 40°	46 - 58 lbs	46
RETURN ANGLE	12° maximum	4°

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY

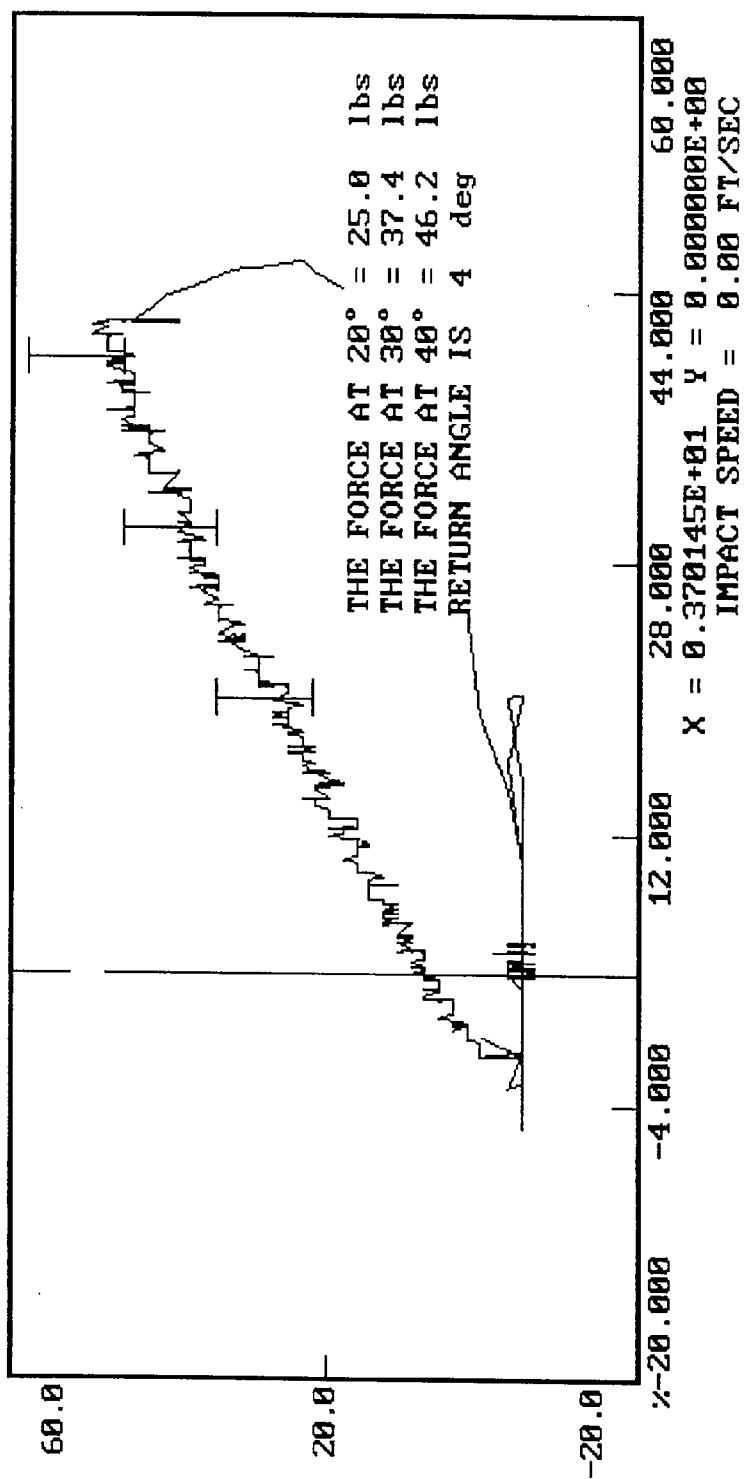


DUMMY CALIBRATION - LUMBAR FLEXION

DUMMY # 270

FORCE (LBS) VS. TORSO ROTATION (DEGREES)

10-21-1996 13:40



POST-TEST CERTIFICATION DATA

Front Dummy Serial Number: 271

Calibration Test Results Summary

Dummy Serial Number: 271

Post-Test Calibration

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

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 271

DATE OF VERIFICATION: November 08, 1996

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.4
RH - Rib Height	19.75" - 20.50"	20.40
HP - Hip Pivot Height	3.9" ref.	3.9
RD - Rib From Back Line	9.0" to 9.5"	9.4
KV - Knee Pivot From Back Line	20.1" - 20.7"	20.4
SW - Knee Pivot to Floor	19.3" - 19.9"	19.5
HW - Hip Width	14.0" - 15.4"	15.0

MEASUREMENTS BY: Tim White

APPROVED BY: Gene Kosloski

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: November 08, 1996

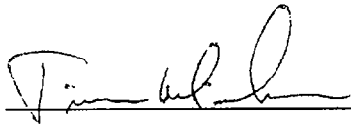
DUMMY NUMBER: 271

TEST NUMBER: D961602

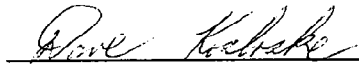
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	28%
PROBE SPEED	13.8 - 14.2 fps	13.9
UPPER RIB	37 - 46 g's	40
LOWER RIB	37 - 46 g's	42
LOWER SPINE	15 - 22 g's	20

TEST MEETS SPECIFICATIONS

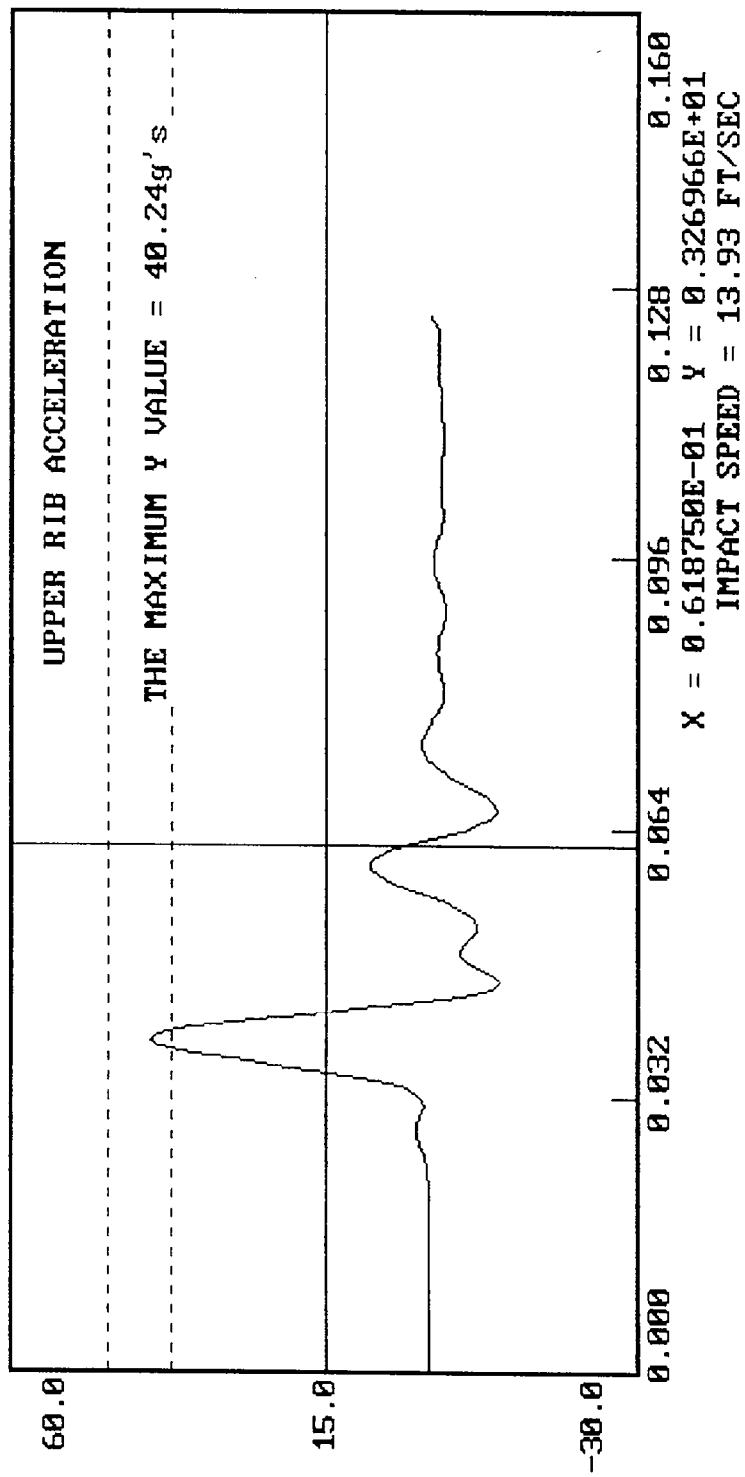
TECHNICIAN



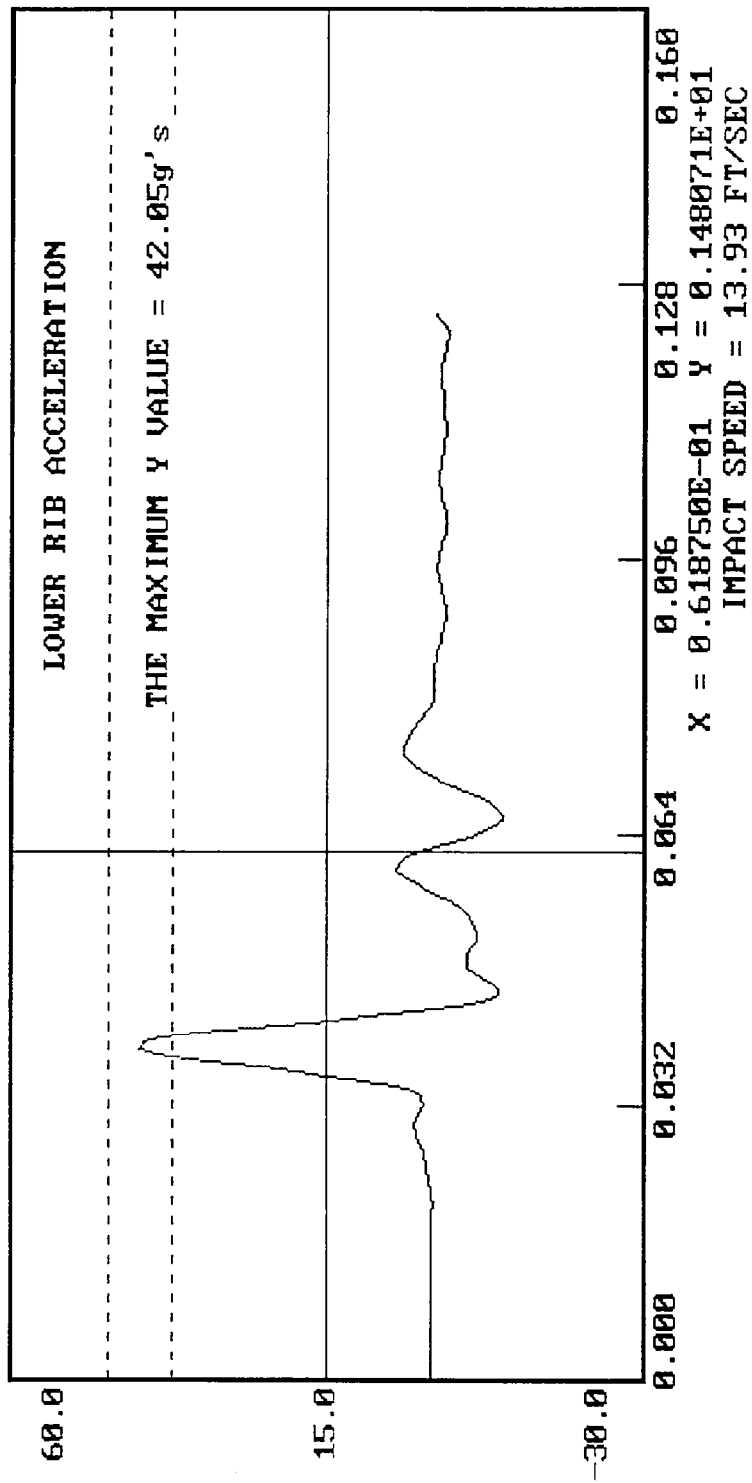
APPROVED BY



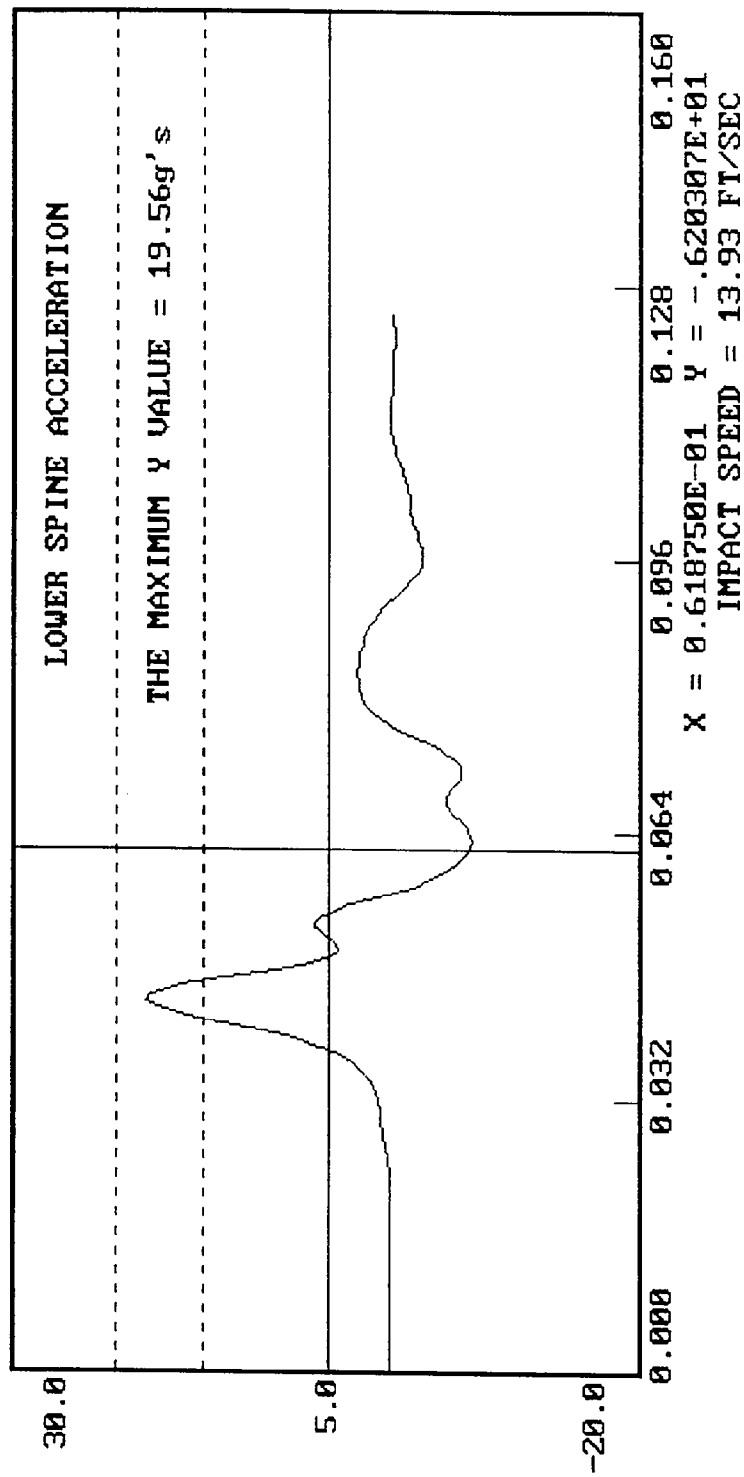
DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 271
 11-08-1996 09:01
 ACCELERATION (G'S) VS. TIME ((SECONDS))



DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 271
 11-08-1996 09:01
 ACCELERATION (G'S) VS. TIME ((SECONDS))



DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 271
 11-08-1996 09:01
 ACCELERATION (G'S) VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: November 08, 1996

DUMMY NUMBER: 271

TEST NUMBER: D961603

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	28%
PROBE SPEED	13.8 - 14.2 f/s	14.0
PELVIS ACCELERATION	40 - 60 g's	59

TEST MEETS SPECIFICATIONS

TECHNICIAN

Tim White

APPROVED BY

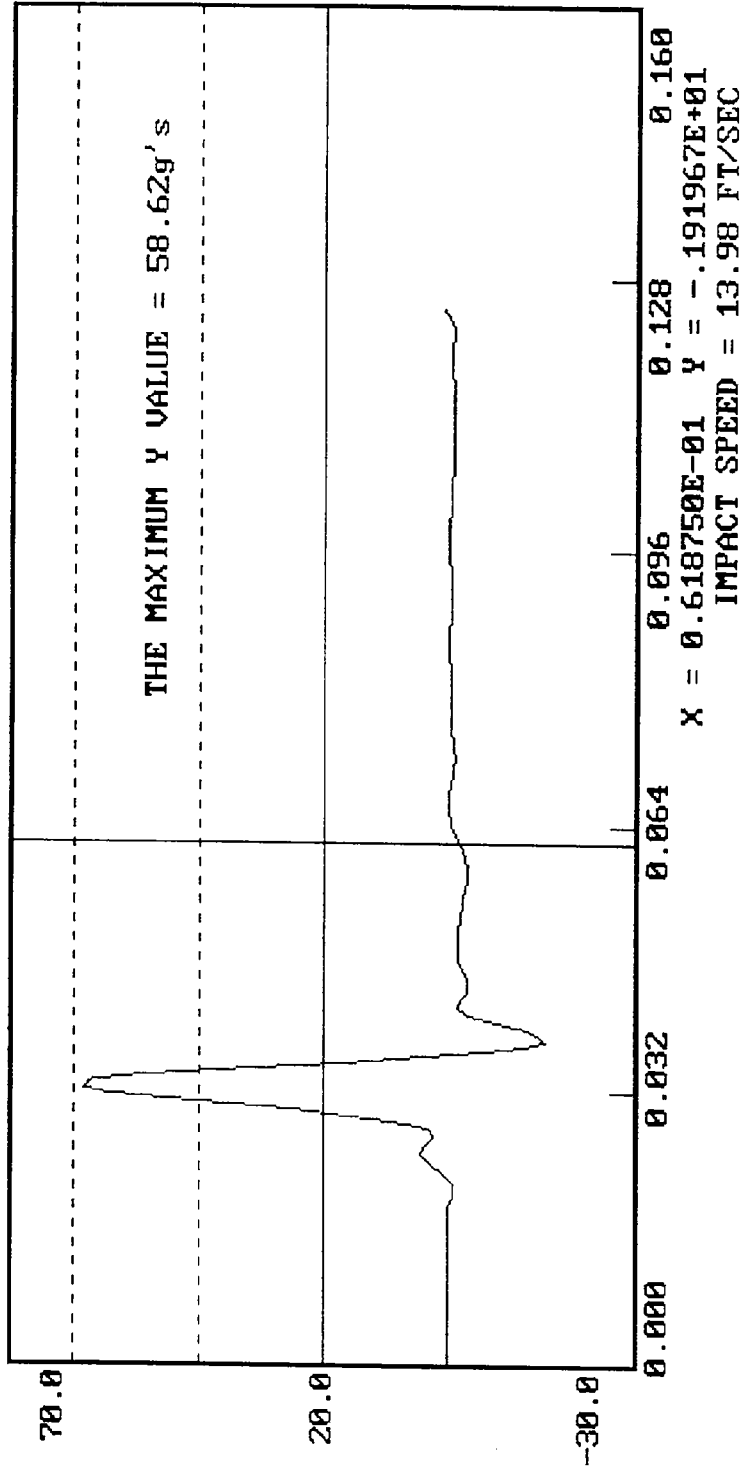
Dave Korbach

11-08-1996 09:08

DUMMY CALIBRATION - PELVIS IMPACT

DUMMY # 270

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



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

DATE: November 07, 1996

DUMMY NUMBER: 271

TEST NUMBER: D961604

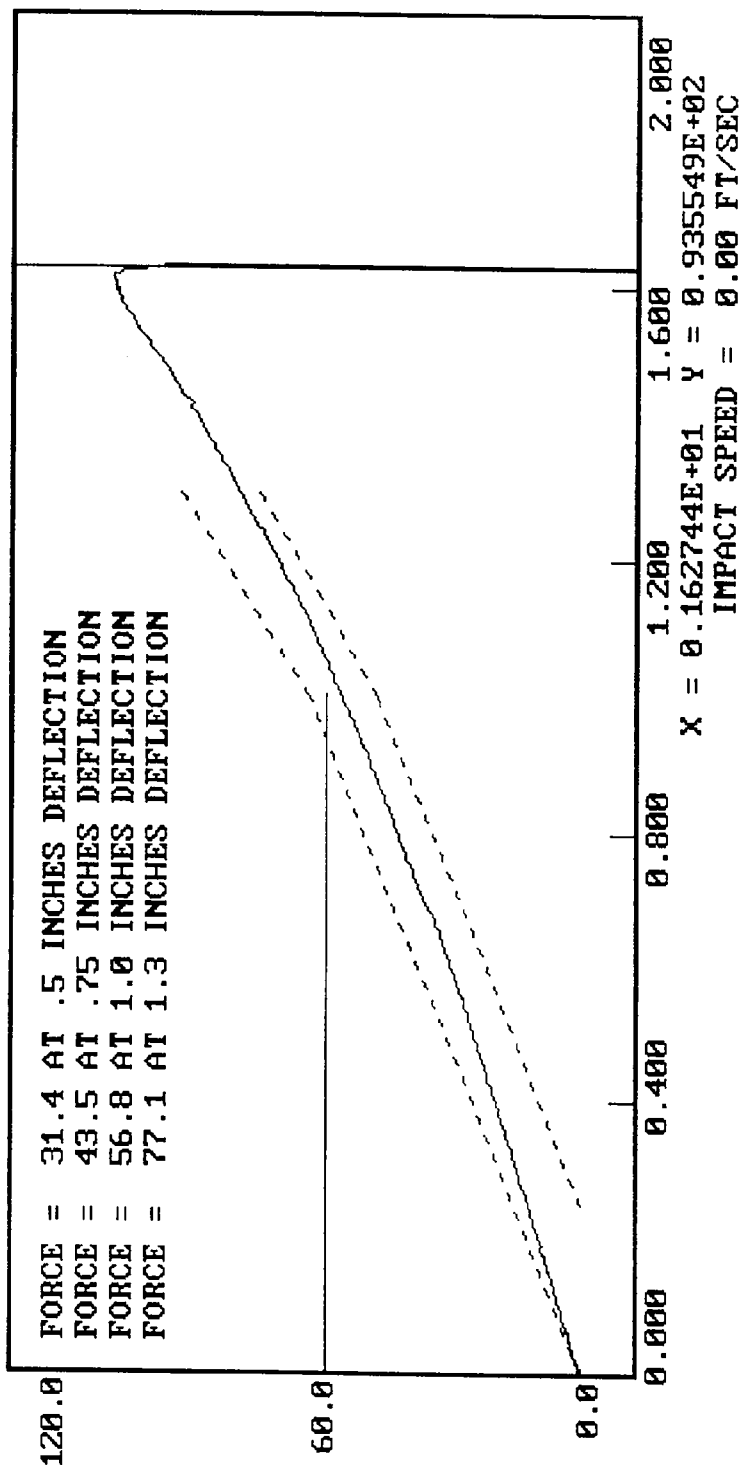
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	35%
FORCE @ 0.5 in	23.3 - 36.5 lbs	31.4
FORCE @ 0.75 in	36.7 - 49.8 lbs	43.5
FORCE @ 1.0 in	50 - 63 lbs	57
FORCE @ 1.3 in	73 - 88 lbs	77

TEST MEETS SPECIFICATIONS

TECHNICIAN Jim White

APPROVED BY Dave Haskins

DUMMY CALIBRATION - ABDOMEN COMPRESSION
 DUMMY # 271
 11-07-1996 12:16
 ABDOMEN FORCE (LBS) VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: October 31, 1996

DUMMY NUMBER: 271

TEST NUMBER: D961605

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	18%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	28
FORCE @ 30°	34 - 46 lbs	39
FORCE @ 40°	46 - 58 lbs	48
RETURN ANGLE	12° maximum	7°

TEST MEETS SPECIFICATIONS

TECHNICIAN

Tim White

APPROVED BY

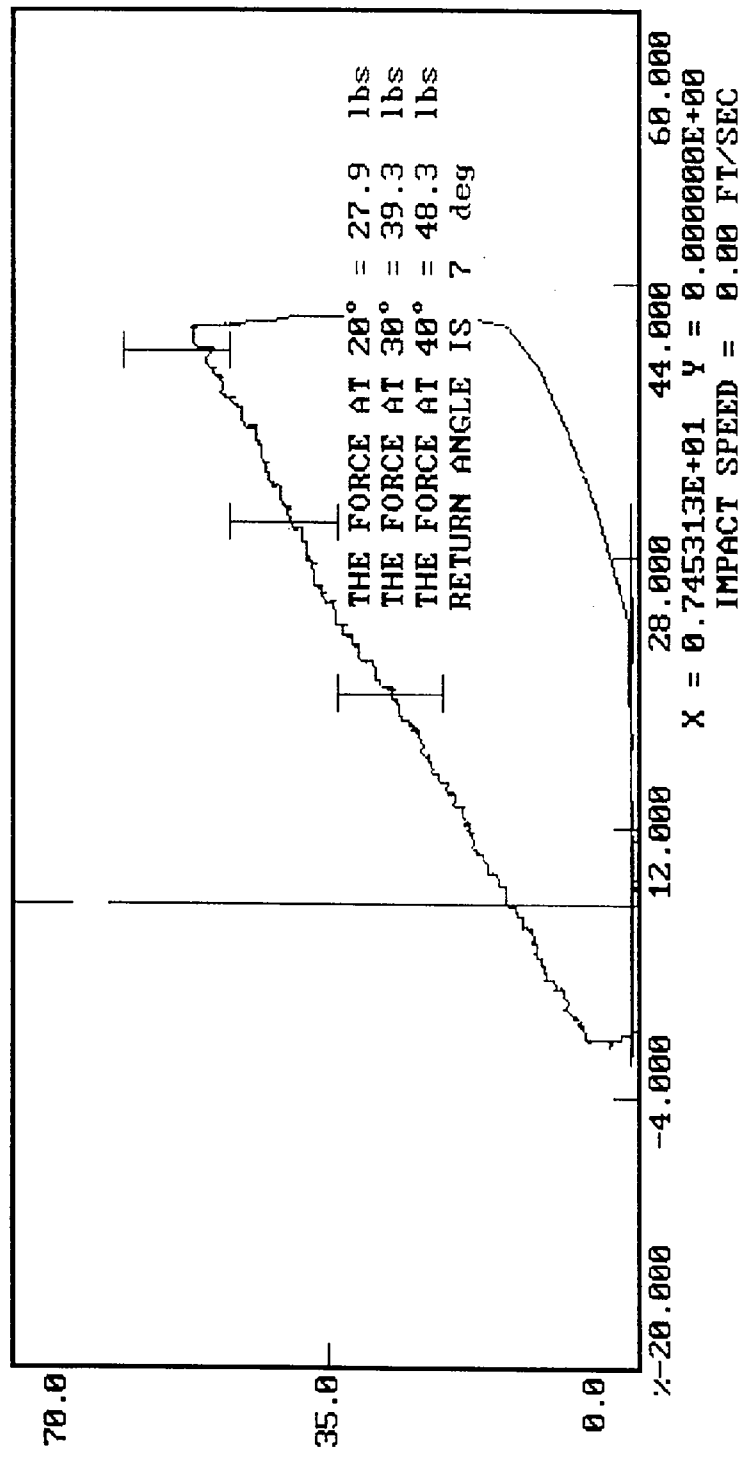
Gene Kuchinke

DUMMY CALIBRATION - LUMBAR FLEXION

DUMMY # 271

FORCE (LBS) VS. TORSO ROTATION (DEGREES)

10-31-1996 12:11



POST-TEST CERTIFICATION DATA

Rear Dummy Serial Number: 270

Calibration Test Results Summary

Dummy Serial Number: 270

Post-Test Calibration

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

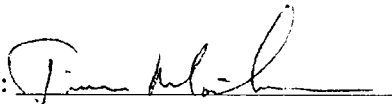
SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 270

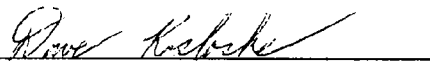
DATE OF VERIFICATION: November 08, 1996

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.2
RH - Rib Height	19.75" - 20.50"	20.50
HP - Hip Pivot Height	3.9" ref.	3.9
RD - Rib From Back Line	9.0" to 9.5"	9.5
KV - Knee Pivot From Back Line	20.1" - 20.7"	20.6
SW - Knee Pivot to Floor	19.3" - 19.9"	19.5
HW - Hip Width	14.0" - 15.4"	15.0

MEASUREMENTS BY:



APPROVED BY:



MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: November 07, 1996

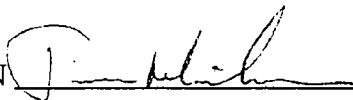
DUMMY NUMBER: 270

TEST NUMBER: D961592

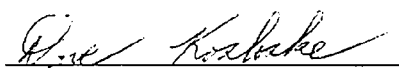
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	30%
PROBE SPEED	13.8 - 14.2 fps	14.0 13.9
UPPER RIB	37 - 46 g's	37
LOWER RIB	37 - 46 g's	41
LOWER SPINE	15 - 22 g's	18

TEST MEETS SPECIFICATIONS

TECHNICIAN

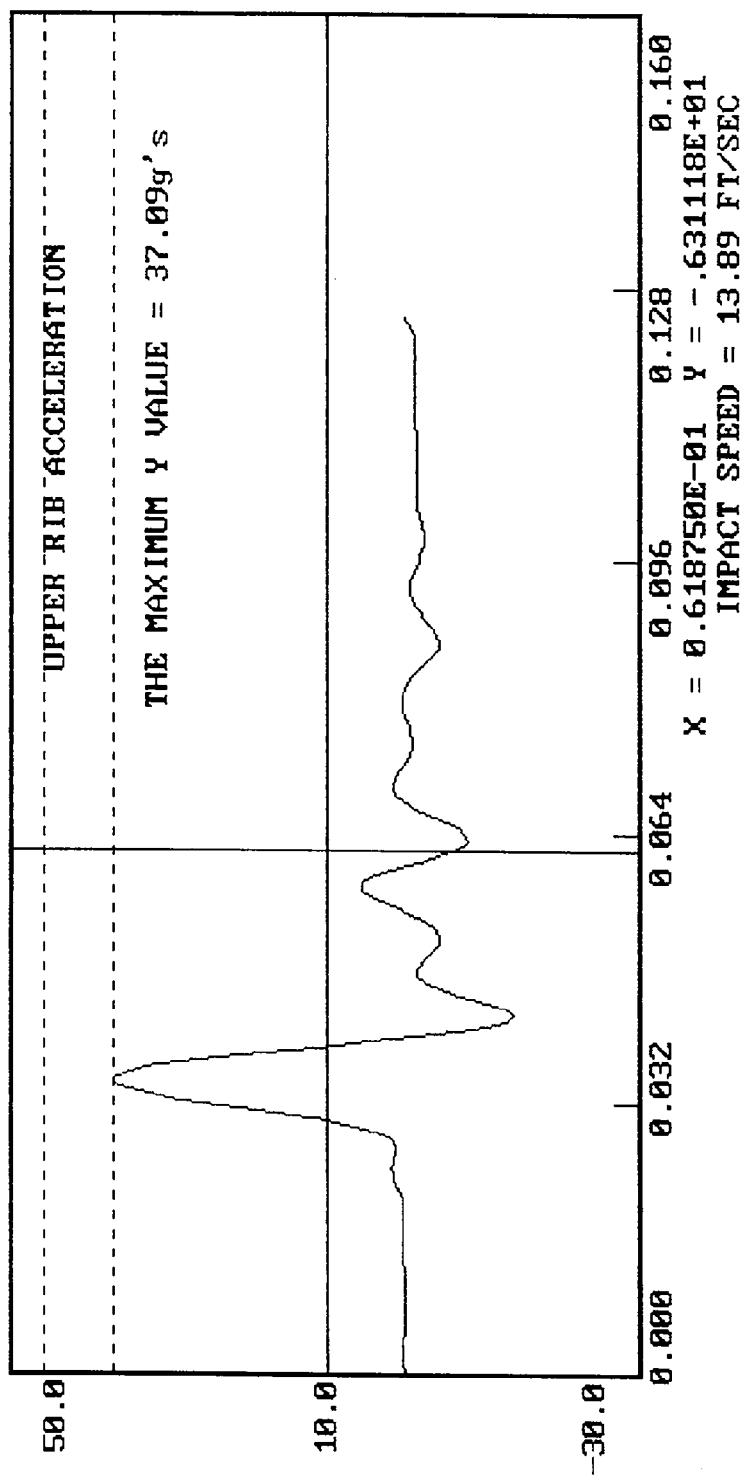


APPROVED BY

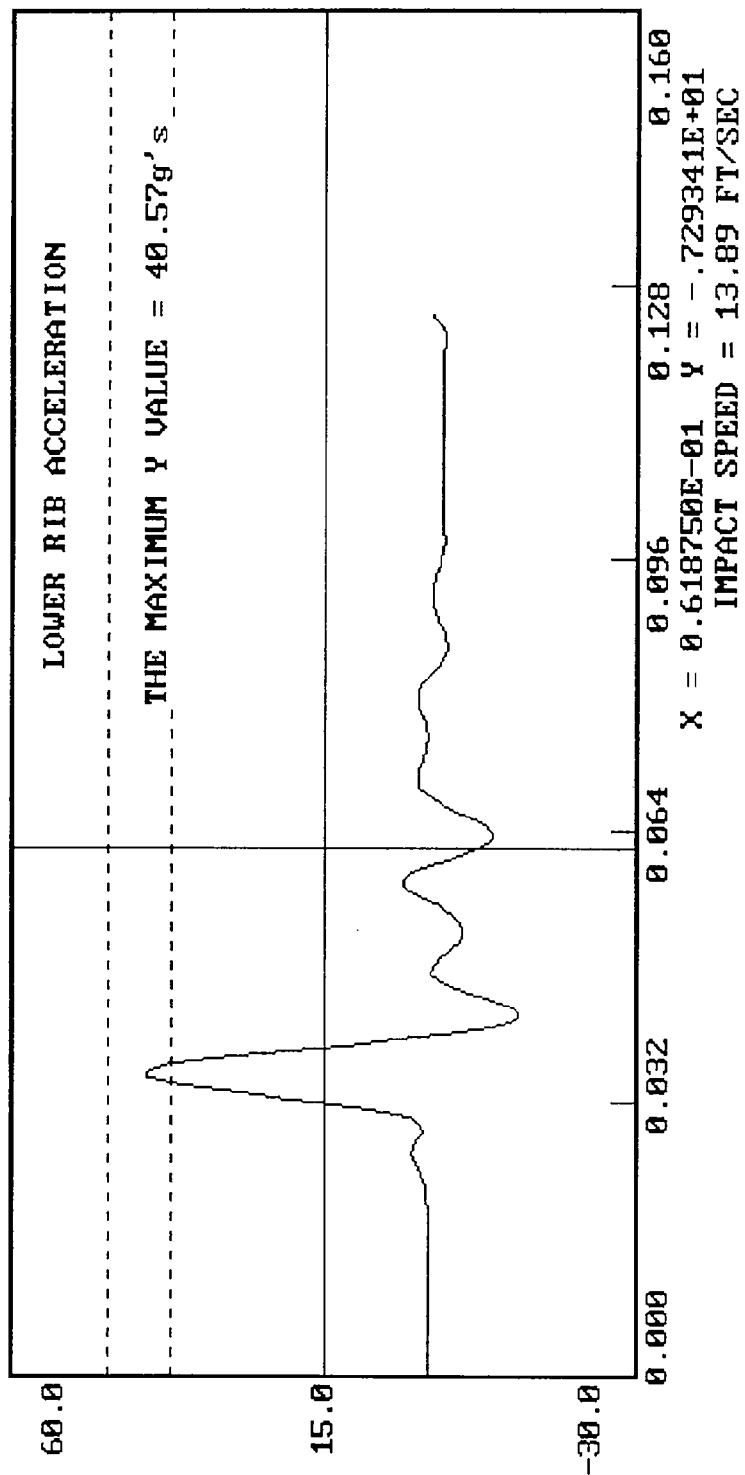


DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 270
11-07-1996 16:00

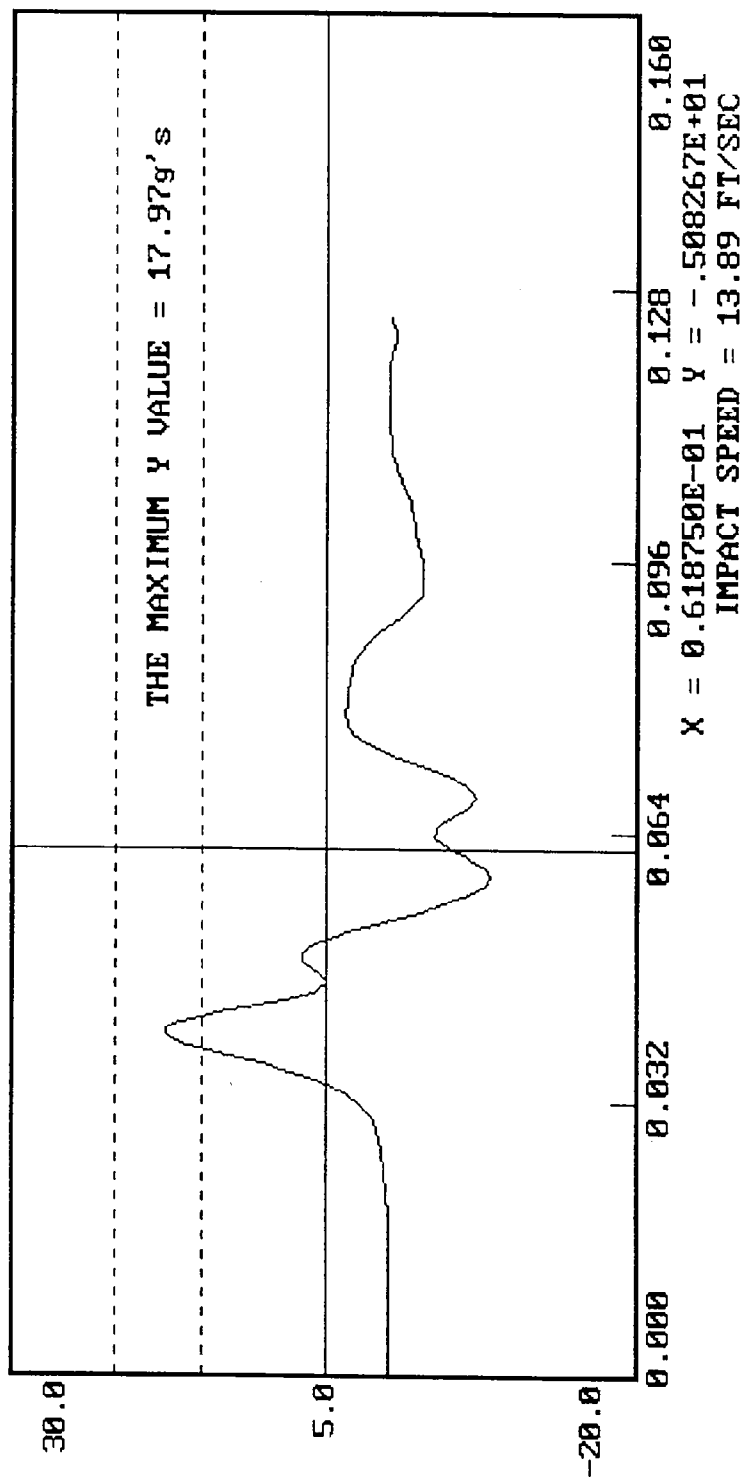
ACCELERATION (G'S) VS. TIME ((SECONDS))



DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 270
 11-07-1996 16:00
 ACCELERATION (G'S) VS. TIME ((SECONDS))



DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 270
 11-07-1996 16:05
 ACCELERATION (G'S) VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

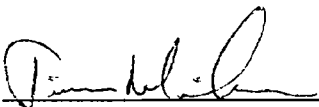
DATE: November 08, 1996

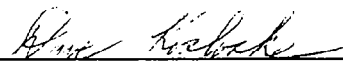
DUMMY NUMBER: 270

TEST NUMBER: D961593

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	28%
PROBE SPEED	13.8 - 14.2 f/s	13.9
PELVIS ACCELERATION	40 - 60 g's	46

TEST MEETS SPECIFICATIONS

TECHNICIAN 

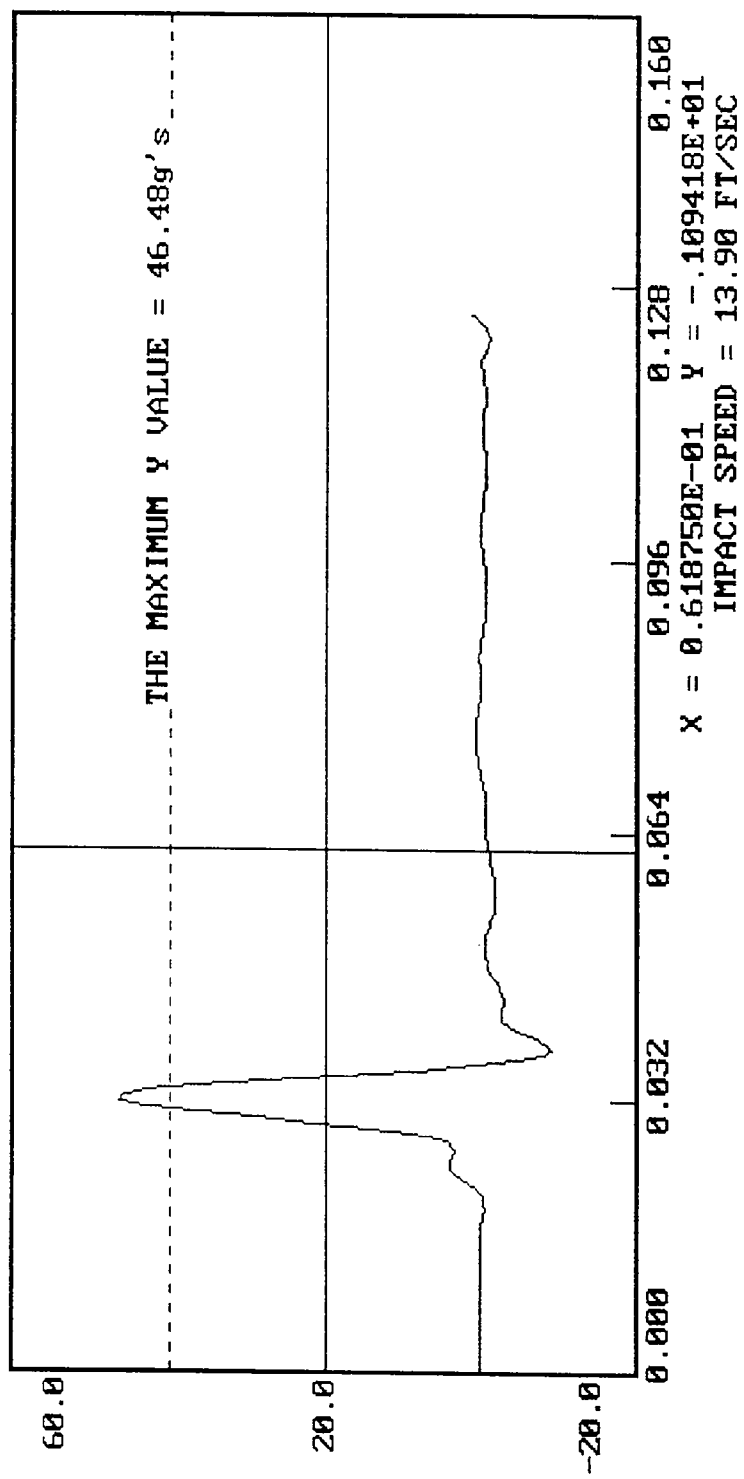
APPROVED BY 

11-08-1996 08:17

DUMMY CALIBRATION - PELVIS IMPACT

DUMMY # 270

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



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

DATE: November 07, 1996

DUMMY NUMBER: 270

TEST NUMBER: D961594

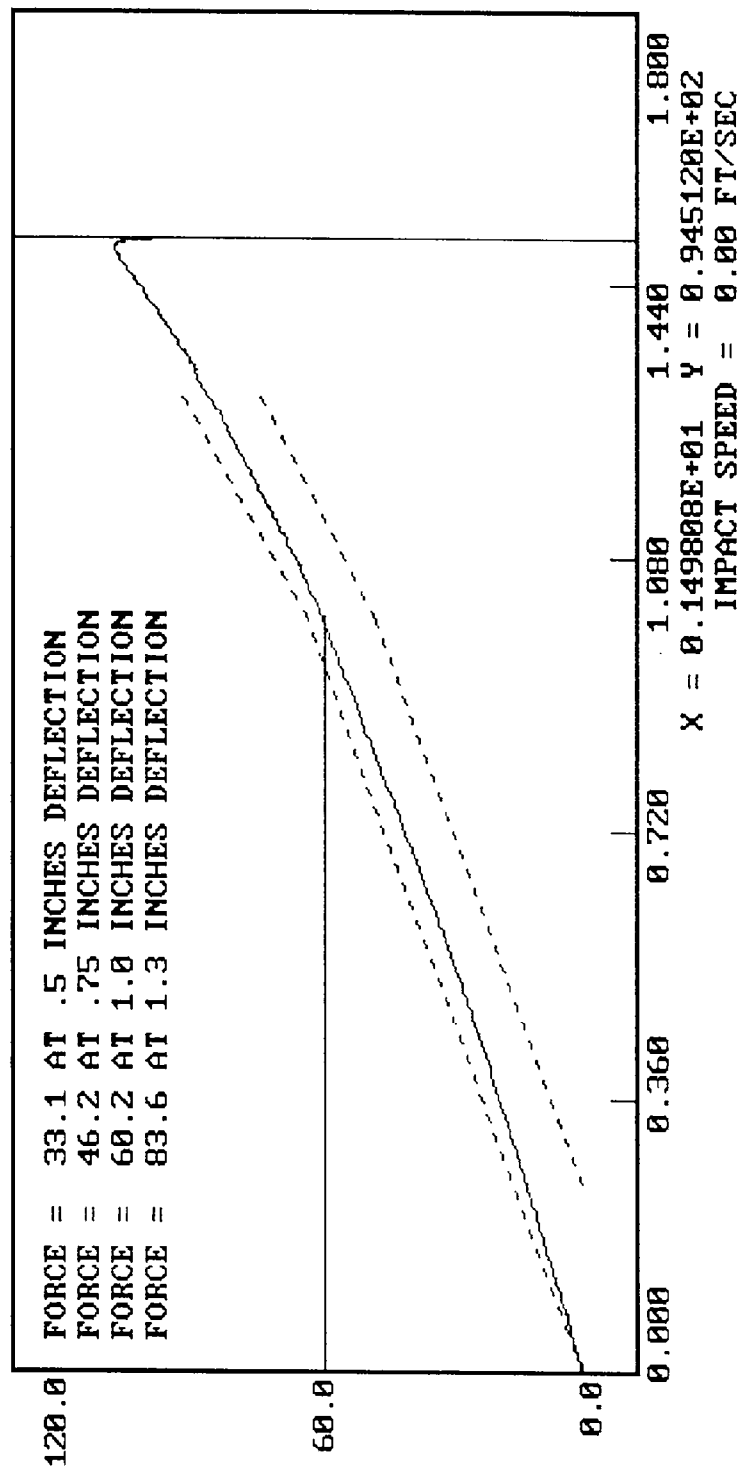
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	35%
FORCE @ 0.5 in	23.3 - 36.5 lbs	33.1
FORCE @ 0.75 in	36.7 - 49.8 lbs	46.2
FORCE @ 1.0 in	50 - 63 lbs	60
FORCE @ 1.3 in	73 - 88 lbs	84

TEST MEETS SPECIFICATIONS

TECHNICIAN Tim White

APPROVED BY Don Koebke

DUMMY CALIBRATION - ABDOMEN COMPRESSION
 DUMMY # 270
 11-07-1996 12:32
 ABDOMEN FORCE (LBS) VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: October 31, 1996

DUMMY NUMBER: 270

TEST NUMBER: D961595

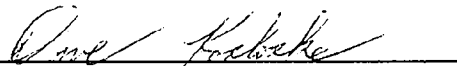
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	18%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	30
FORCE @ 30°	34 - 46 lbs	39
FORCE @ 40°	46 - 58 lbs	51
RETURN ANGLE	12° maximum	4°

TEST MEETS SPECIFICATIONS

TECHNICIAN

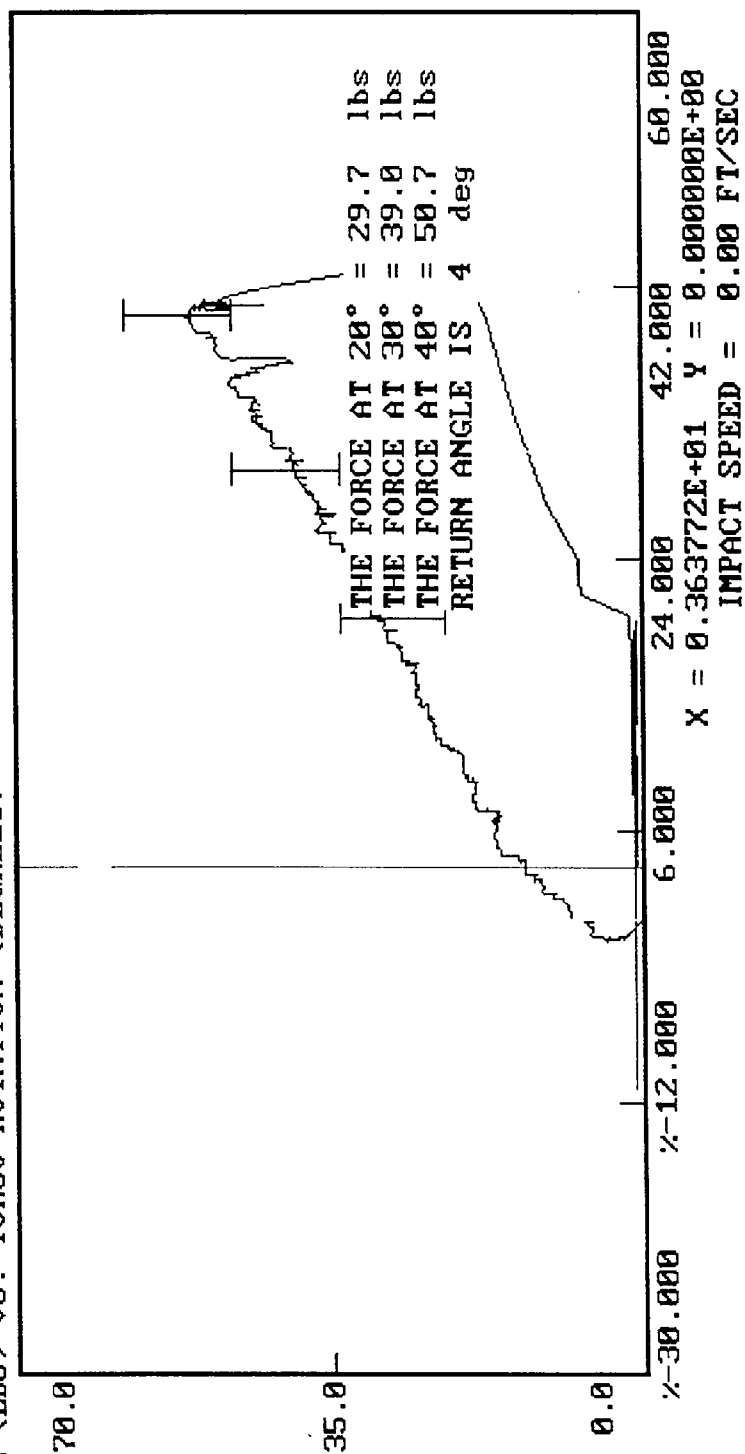


APPROVED BY



10-31-1996 11:38

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



POST-TEST DRIVER DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Serial Number: 271

Inspected By: Tim Michnay

Date: November 08, 1996

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

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

POST-TEST PASSENGER DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Serial Number: 270

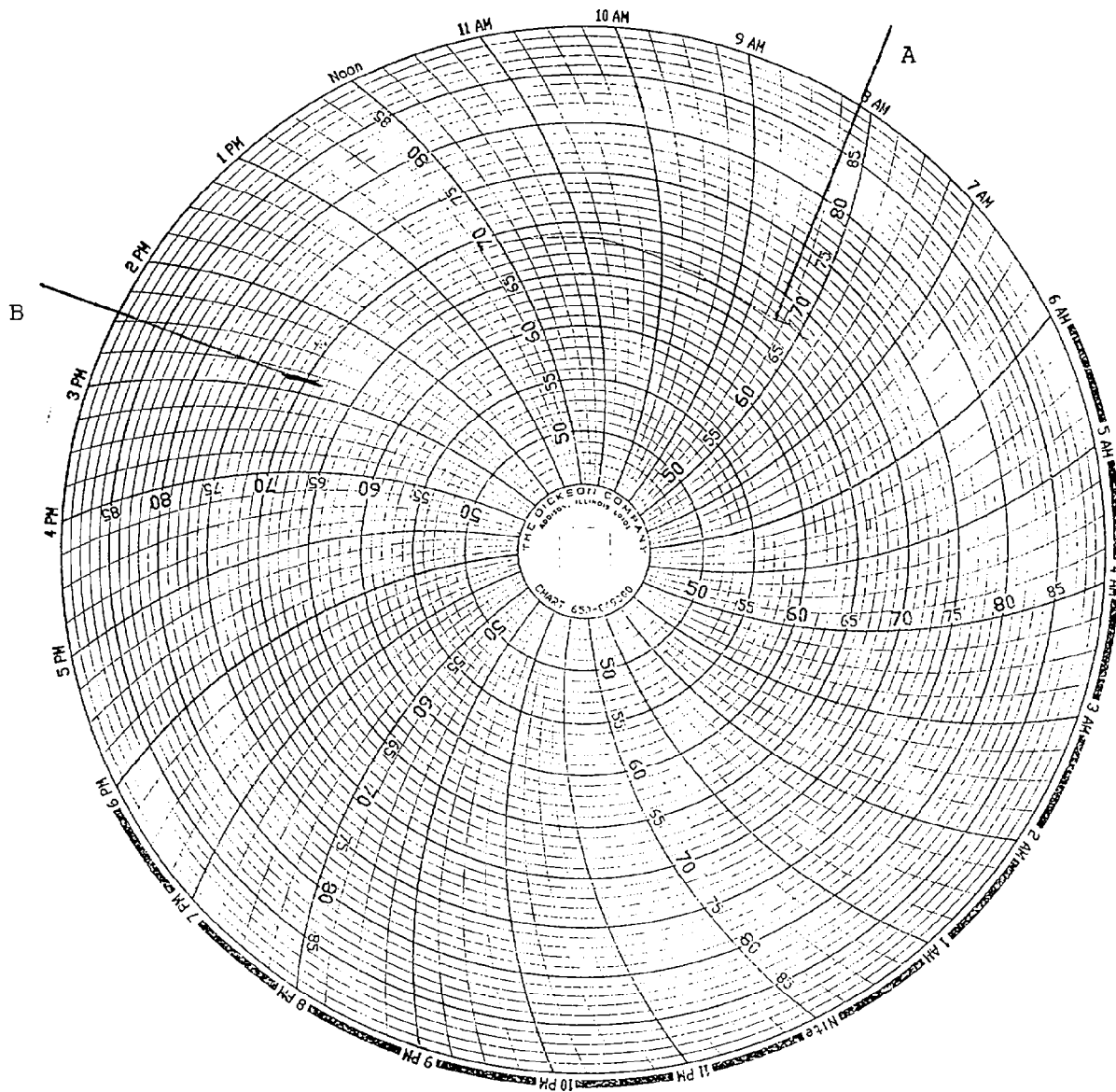
Inspected By: Tim Michnay

Date: November 08, 1996

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

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

VEHICLE AND DUMMY TEMPERATURE



A = Dummies installed in vehicle
B = Test conducted

APPENDIX D

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

DUMMY AND VEHICLE CALIBRATION DATA
INSTRUMENTS FOR RIGHT FRONT PASSENGER DUMMY NO. 271

	RIGHT FRONT PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	AP2A4	Endevco	September 16, 1996
Lower Rib Y	AP1B3	Endevco	September 16, 1996
Lower Spine Y	ANAP1	Endevco	September 16, 1996
Pelvis Y	AHTC3	Endevco	September 16, 1996
Upper Rib Redundant Y	AP2D8	Endevco	September 16, 1996
Lower Rib Redundant Y	AP1C6	Endevco	September 16, 1996
Lower Spine Redundant Y	ANAT6	Endevco	September 16, 1996
Pelvis Redundant Y	AGP53	Endevco	September 16, 1996

INSTRUMENTS FOR RIGHT REAR PASSENGER DUMMY NO. 270

	RIGHT REAR PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	AP1H2	Endevco	September 10, 1996
Lower Rib Y	AJ9C2	Endevco	September 09, 1996
Lower Spine Y	AP2D7	Endevco	September 10, 1996
Pelvis Y	ALCH7	Endevco	September 09, 1996
Upper Rib Redundant Y	AH0B0	Endevco	September 10, 1996
Lower Rib Redundant Y	AHTT2	Endevco	September 9, 1996
Lower Spine Redundant Y	AP1T8	Endevco	September 10, 1996
Pelvis Redundant Y	AJ420	Endevco	September 09, 1996

VEHICLE INSTRUMENT CALIBRATION

VEHICLE AND MDB ACCELEROMETERS			
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Moving Barrier CG X	D05-R01	Entran	July 03, 1996
Moving Barrier CG Y	D06-A09	Entran	July 03, 1996
Moving Barrier CG Z	C14-Z07	Entran	July 11, 1996
Moving Barrier Rear Axle X	B14-R09	Entran	July 15, 1996
Moving Barrier Rear Axle Y	E25-G11	Entran	October 01, 1996
Right Mid A-Post Y	J10-E14	Entran	July 10, 1996
Right Lower A-Post Y	C14-Z08	Entran	July 11, 1996
Right Mid B-Post Y	D05-R14	Entran	July 11, 1996
Right Lower B-Post Y	D05-R25	Entran	July 12, 1996
Rear Floorpan Above Axle X	B13-Z02	Entran	July 11, 1996
Rear Floorpan Above Axle Y	B13-Z03	Entran	July 15, 1996
Rear Floorpan Above Axle Z	C14-Z11	Entran	July 11, 1996
Right Front Passenger Seat Track Y	C14-Z05	Entran	June 04, 1996
Left Side Sill at Front Seat X	A10-G04	Entran	July 11, 1996
Left Side Sill at Front Seat Y	B28-B03	Entran	July 11, 1996
Left Side Sill at Front Seat Z	A09-G07	Entran	July 11, 1996
Left Side Sill at Rear Seat X	A10-G01	Entran	June 04, 1996
Left Side Sill at Rear Seat Y	L14-D08	Entran	July 03, 1996
Left Side Sill at Rear Seat Z	B14-R01	Entran	July 15, 1996
Right Side Sill at Front Seat Y	C14-Z15	Entran	July 11, 1996

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE AND MDB ACCELEROMETERS		
	SERIAL NO	MANUFACTURER	CALIBRATION DATE
Right Side Sill at Rear Seat Y	D05-R13	Entran	June 04, 1996
Right Rear Occupant Compartment Y	H16-X11	Entran	June 04, 1996
Vehicle CG X	A09-G01	Entran	July 15, 1996
Vehicle CG Y	A09-G02	Entran	July 15, 1996
Vehicle CG Z	J06-D19	Entran	July 11, 1996

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