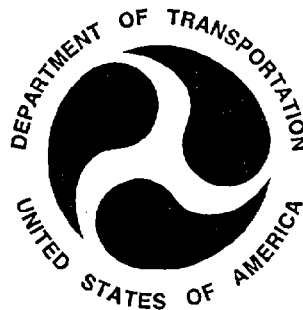


REPORT NO.: 214-MGA-97-05
SAFETY COMPLIANCE TESTING FOR
FMVSS 214 "SIDE IMPACT PROTECTION -
PASSENGER CARS"

V2503

GENERAL MOTORS CORPORATION
1997 CHEVROLET CAMARO CONVERTIBLE
NHTSA NO: CV0103

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: October 22, 1996

Report Date: November 27, 1996

FINAL REPORT

Prepared For:

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
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4. Title and Subtitle Final Report of FMVSS No.214 Compliance Side Impact Protection Testing of a 1997 Chevrolet Camaro NHTSA No. CV0103		5. Report Date November 27, 1996																			
		6. Performing Organization Code MGA																			
7. Author(s) John Fleck, Facility Director		8. Performing Organization Report No. MGA-DOT-214-05																			
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		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 Chevrolet Camaro Convertible 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 22, 1996. The impact velocity of the Moving Deformable Barrier (MDB) was 53.1 kph, and the ambient temperature at the struck side of the target vehicle at the time of impact was 20.6 °C. The target vehicle post test maximum crush was 294 mm at level 2. The test vehicle's performance follows: <table border="0"> <thead> <tr> <th></th> <th><u>RF PASS.</u></th> <th><u>RR PASS.</u></th> </tr> </thead> <tbody> <tr> <td>Right Upper Rib (RUR) Accel., g</td> <td>67</td> <td>47</td> </tr> <tr> <td>Right Lower Rib (RLR) Accel., g</td> <td>60</td> <td>55</td> </tr> <tr> <td>Lower Spine (T₁₂) Accel., g</td> <td>69</td> <td>63</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td>68</td> <td>59</td> </tr> <tr> <td>Pelvis (PEV) Accel., g</td> <td>66</td> <td>54</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>RF PASS.</u>	<u>RR PASS.</u>	Right Upper Rib (RUR) Accel., g	67	47	Right Lower Rib (RLR) Accel., g	60	55	Lower Spine (T ₁₂) Accel., g	69	63	Thoracic Trauma Index (TTI)	68	59	Pelvis (PEV) Accel., g	66	54
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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																			
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Approved By: John Fleck
John Fleck, Project Engineer

Approval Date: 11-27-96

FINAL REPORT ACCEPTED BY (OVSC):

Accepted By: Jeff M. Hume
Contract Technical Manager

Acceptance Date: 2/27/97

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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 Chevrolet Camaro Convertible.

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 Chevrolet Camaro Convertible 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 33.0 mph (53.1 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 22, 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 rear right 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)	68.0	59.0
Pelvis (g)	66.2	53.6

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
Right Mid B-Post

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.
3. The right rear SID could not be positioned in the vehicle according to the FMVSS 214 test procedure. The data is provided for informational purposes only, since the rear position is exempt from performance requirements.

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/Chevrolet/Camaro Convertible

Vehicle NHTSA No.: CV0103 VIN: 2G1FP32K2V2101755

Vehicle Body Color: White Build Date: 7/96

Engine Data: 6 Cylinders; CID; 3.8 Liter; cc

Placement X Longitudinal; Lateral

Transmission: 5 speed; X Manual; Automatic; Overdrive

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

Odometer Reading 52 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: P235/55R16

Tires on Test Vehicle: P235/55R16 Manufacturer: Goodyear *

Vehicle Capacity Data:

Number of Occupants: 2 Front; 2 Rear; 3rd Seat 4 Total

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

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

Vehicle Maximum Capacity Loading = 318.0 kg (A)

No. of Occupants x 68.04 kg. = 272.0 kg (B)

Cargo Capacity (A-B) = 46.0 kg

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

WEIGHT OF TEST VEHICLE WITH MAXIMUM FLUIDS:

Right Front	=	<u>436.8</u>	kg	Right Rear	=	<u>364.2</u>	kg
Left Front	=	<u>433.6</u>	kg	Left Rear	=	<u>355.6</u>	kg
TOTAL FRONT	=	<u>870.4</u>	kg	TOTAL REAR	=	<u>719.8</u>	kg
% of Total Vehicle Weight = <u>55.0</u> %;				% of Total Weight = <u>45.0</u> %			
TOTAL WEIGHT = <u>1590.2</u> kg							

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Year/Make/Model/Body Style: 1997/Chevrolet/Camaro Convertible

Vehicle NHTSA No.: CV0103 Test Date: October 22, 1996

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Test Vehicle Delivered Weight with Maximum Fluids	= <u>1590.2</u> kg
Cargo Carrying Capacity of Test Vehicle	= <u>46.0</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>1797.6</u> kg

ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO:

Right Front	= <u>460.4</u> kg	Right Rear	= <u>427.7</u> kg
Left Front	= <u>481.7</u> kg	Left Rear	= <u>419.6</u> kg
TOTAL FRONT	= <u>942.1</u> kg	TOTAL REAR	= <u>847.3</u> kg
% of Total Weight	= <u>53.0</u> %	% of Total Weight	= <u>47.0</u> %
TOTAL TEST WEIGHT	= <u>1789.4</u> kg		

TEST VEHICLE ATTITUDE:

CURB WEIGHT ATTITUDE:

Right Front 696 mm Left Front 696 mm Right Rear 717 mm Left Rear 714 mm

FULLY LOADED WEIGHT ATTITUDE:

Right Front 678 mm Left Front 693 mm Right Rear 661 mm Left Rear 671 mm

TEST ATTITUDE:

Right Front 686 mm Left Front 690 mm Right Rear 681 mm Left Rear 681 mm

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Test Vehicle Wheelbase: 2575 mm

C.G. = 1219 mm rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

Right Side = 4460 mm

Centerline = 4862 mm

Left Side = 4460 mm

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Year/Make/Model/Body Style: 1997/Chevrolet/Camaro Convertible

Vehicle NHTSA No.: CV0103 Test Date: October 22, 1996

FRONT SEAT CUSHION PLACEMENT:

Total Length of Adjustment Travel: 160 mm

Test Position: 4th position rearward out of 8 total

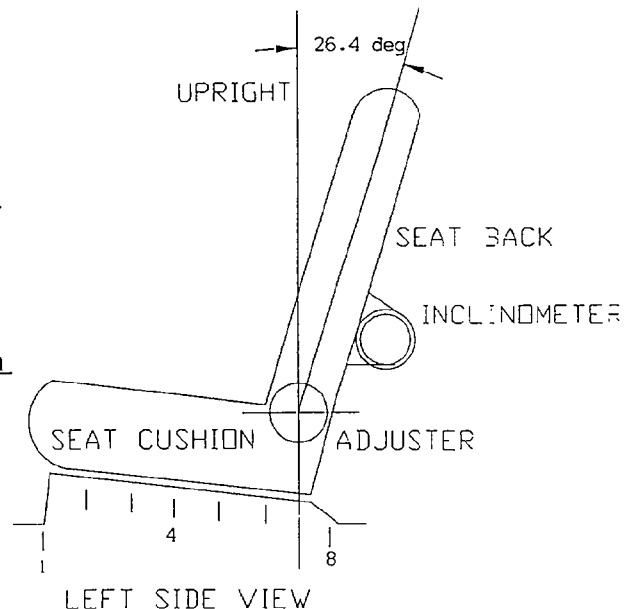
FRONT SEAT BACK ADJUSTMENT POSITION:

Seat Back Angle = 26.4° from the vertical position

REAR POSITION SEAT:

Total Length of Fore/Aft Adjustment Travel: 0

Seat Back Adjustment Position: Non-Adjustable



ADJUSTABLE STEERING COLUMN POSITION: Set to 3rd position of 5 total

WINDOW POSITIONS: Left Front Open Left Rear N/A

Right Front Closed Right Rear N/A

AMOUNT OF STODDARD SOLVENT IN FUEL TANK:

Fuel system usable capacity = 15.5 liters

Test Volume: 14.4 liters 93 % of capacity

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

Wheelbase: = 2575 mm

Impact Point is 347.5 mm rearward of front axle centerline

DATA SHEET NO. 2
TEST VEHICLE SUMMARY OF RESULTS

Year/Make/Model/Body Style: 1997/Chevrolet/Camaro Convertible
Vehicle NHTSA No.: CV0103 Test Date: October 22, 1996
Overall Length = 4682 mm; Overall Width = 1883 mm

TEST WEIGHT:

Right Front = 460.4 kg Right Rear = 427.7 kg
Left Front = 481.7 kg Left Rear = 419.6 kg
TOTAL FRONT = 942.1 kg TOTAL REAR = 847.3 kg
% of Total Weight = 53.0 % % of Total Weight = 47.0 %
TOTAL VEHICLE WEIGHT = 1789.4 kg
Wheelbase = 2575 mm
Longitudinal C.G. from Center of Front Axle = 1219 mm
Impact Angle with Respect to Impactor = 0° degrees

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1 (231 mm above ground) = 101 mm
 2. LEVEL 2 (433 mm above ground) = 294 mm
 3. LEVEL 3 (544 mm above ground) = 247 mm
 4. LEVEL 4 (824 mm above ground) = 211 mm
 5. LEVEL 5 (N/A mm above ground) = 89 mm
- Maximum Post-Test Intrusion = 294 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</u>	<u>type II belt</u>

TEST VEHICLE SUMMARY OF RESULTS (Cont'd)

INSTRUMENTATION:

Number of Vehicle Data Channels:	=	<u>19</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/Chevrolet/Camaro Convertible

Vehicle NHTSA No.: CV0103 Test Date: October 22, 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>412.7 kg</u>	Left Rear	= <u>230.0 kg</u>
Right Front	= <u>370.6 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: 33.0 mph (53.1 kph) Secondary: 33.0 mph (53.1 kph)

CRASH TEST SUMMARY FOR SIDE IMPACTOR (Cont'd)

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

- | | | |
|----|---------------------------------|-----------------|
| 1. | Row A Top of Stack (813 mm) | = <u>100</u> mm |
| 2. | Row B Mid Stack (686 mm) | = <u>90</u> mm |
| 3. | Row C Top of Bumper (533 mm) | = <u>102</u> mm |
| 4. | Row D Center of Bumper (432 mm) | = <u>150</u> mm |

INSTRUMENTATION:

Number of MDB Data Channels = 5

DATA SHEET NO. 4
POST-TEST OBSERVATIONS

Year/Make/Model/Body Style: 1997/Chevrolet/Camaro Convertible

Vehicle NHTSA No.: CV0103 Test Date: October 22, 1996

VISIBLE DUMMY CONTACT POINTS:

	<u>RIGHT FRONT SID</u>	<u>RIGHT REAR SID</u>
Head	<u>to header</u>	<u>to roof</u>
Arm	<u>to door</u>	<u>to trim panel</u>
Pelvis	<u>to door</u>	<u>to trim panel</u>
Left Knee	<u>to right knee</u>	<u>to right knee</u>
Right Knee	<u>to door</u>	<u>to back of front door</u>

DOOR OPENING:

	<u>LEFT SIDE</u>	<u>RIGHT SIDE</u>
Front	<u>Remained closed</u>	<u>Remained Closed</u>
Rear	<u>N/A</u>	<u>N/A</u>

MDB DISTANCE FROM TARGET IMPACT POINT:

Horizontal: 1 mm forward Vertical: 6 mm high

ARM REST LOCATIONS:

Front: 252 mm from bottom of window

Rear: N/A

POST-TEST OBSERVATIONS (Cont'd)

SEAT CRUSH:

Front Seat Back: 25 mm Front Seat Cushion: 18 mm

Left Rear Seat Back: 1 mm Rear Seat Cushion: 0 mm

GLAZING DAMAGE:

Side door glass broken, windshield cracked

PILLAR PERFORMANCE:

No separation noted

SILL SEPARATION:

Separated from 145 mm, 568 mm forward of rear axle

OTHER NOTABLE IMPACT EFFECTS:

None

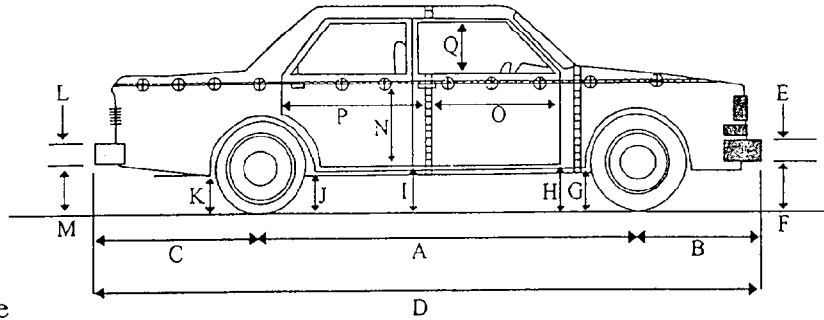
SECTION 4
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 5
SIDE IMPACT DUMMY (SID) INSTRUMENTATION DATA
 Year/Make/Model/Body Style: 1997/Chevrolet/Camaro Convertible
 Vehicle NHTSA No.: CV0103 Test Date: October 22, 1996

	Front SID ID #272				Rear SID ID #269			
	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	7.3	110	66.6	39	10.2	73	46.7	45
Right Lower Rib (RLR) Y	9.2	68	59.7	40	10.7	58	54.7	27
SPINE ACCELERATIONS								
Lower Lateral Y	13.9	67	68.8	43	15.6	78	63.0	41
PELVIS ACCELERATIONS								
Lateral Y	17.1	77	66.2	39	7.8	80	53.6	38

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

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



D = Length at Centerline

R = Right Side Length

S = Left Side Length

T = Width at B Post

E & L = Bumper Thickness

J1 = To Pinch Weld

J2 = To Sill

ALL MEASUREMENTS IN (mm)

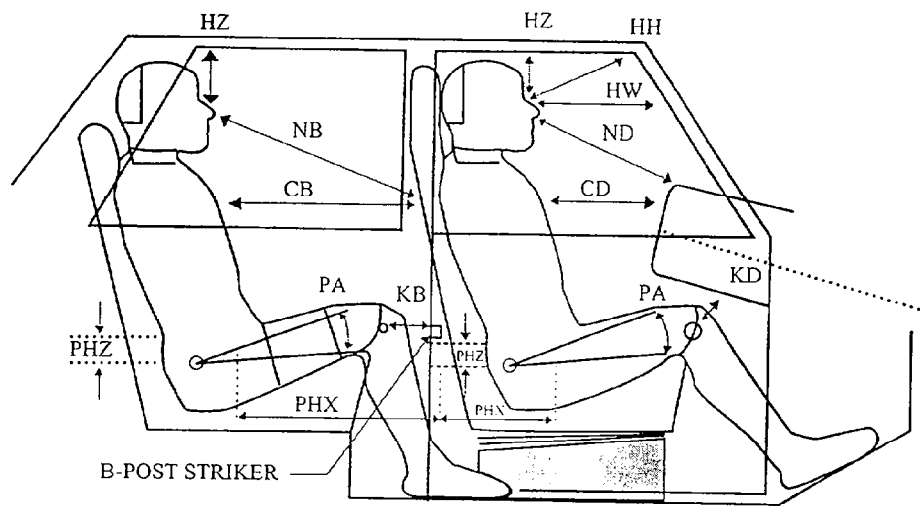
	PRE-TEST	POST-TEST	Δ CHANGE
A	2572	2578	6
B	1112	1092	20
C	1178	1150	28
D	4862	4820	42
E	198	198	0
F	291	284	7
G	186	219	33
H	137	170	33
I	192	224	32
J1/J2	154/153	218/207	64/54
K	213	300	87
L	160	160	0
M	327	410	83
N	642	582	60
O	555	550	5
P	873	889	16
Q	317	286	31
R	4460	4434	26
S	4460	4493	33
T	1883	1680	203

DATA SHEET NO. 7

SIDE IMPACT DUMMY (SID) LONGITUDINAL CLEARANCE DIMENSIONS

Year/Make/Model/Body Style: 1997/Chevrolet/Camaro Convertible

NHTSA NO.: CV0103 Test Date: October 22, 1996



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

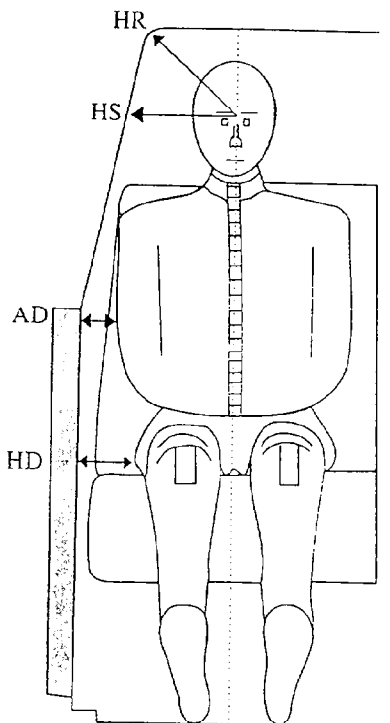
	FRONT PASSENGER ID #272		REAR PASSENGER SID ID #269
HH	404	HZ	203
HW	737	NB	305
HZ	142	CB	300
ND	617	KBL (KBA)	97 (37.8°)
CD	509	KBR (KBA)	69 (10.4°)
CS	N/A	PA°	N/A
KDL(KDA°)	170 (12.9°)	PHX	233
KDR(KDA°)	152 (35.5°)	PHZ	241
PA°	23.5°		
PHX	544		
PHZ	199		

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/Chevrolet/Camaro Convertible

NHTSA NO.: CV0103 Test Date: October 22, 1996



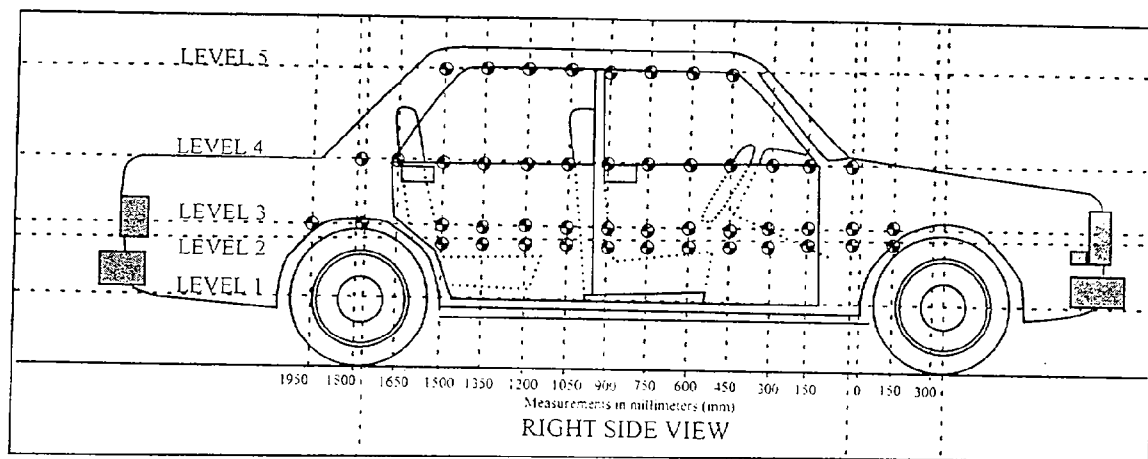
NOTE: All dimensions are in mm

	FRONT PASSENGER ID #272	REAR PASSENGER ID #269
HR	164	243
HS	286	269
AD	116	0
HD	179	69

DATA SHEET NO. 9
VEHICLE SIDE MEASUREMENTS

Year/Make/Model/Body Style: 1997/Chevrolet/Camaro Convertible

NHTSA NO.: CV0103 Test Date: October 22, 1996



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

MEASUREMENTS ALONG THE VERTICAL 750 mm. LINE SHOWN ABOVE

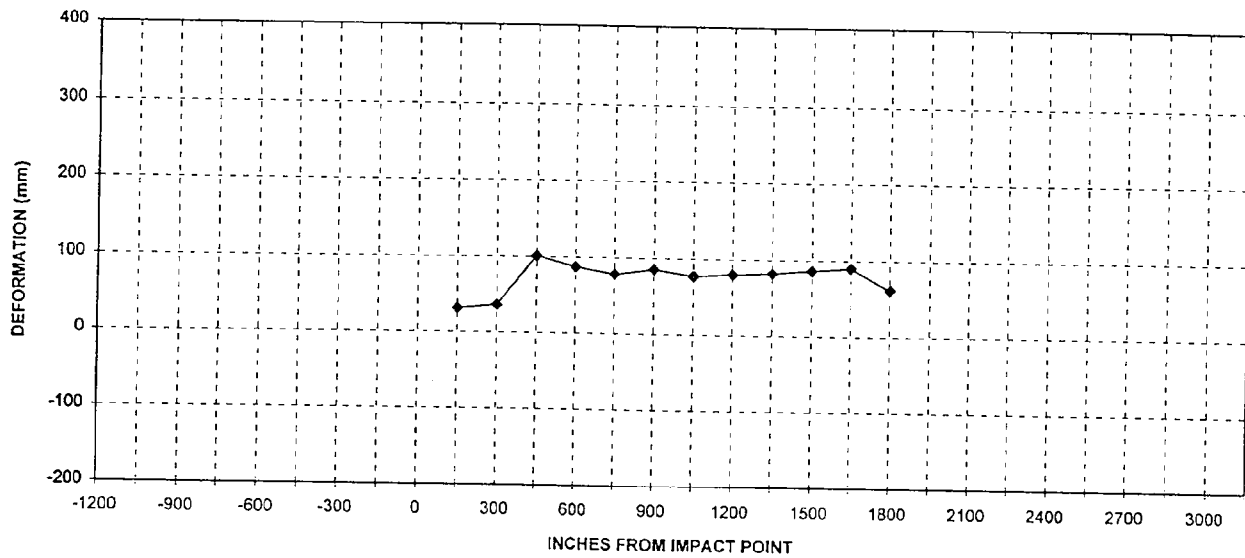
Level 1 @ Axle Centerline Height (or Sill Top Height)	= <u>231</u> mm
Level 2 @ Occupant H-Point	= <u>433</u> mm
Level 3 @ Mid Door	= <u>544</u> mm
Level 4 @ Window Sill	= <u>824</u> mm
Level 5 @ Window Top	= <u>N/A</u> mm

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

Longitudinal Distance (mm)	Level 1 - Axle Centerline		
	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1200			
-1050			
-900			
-750			
-600			
-450			
-300			
-150			
0 (impact point)			
150	616	647	31
300	616	652	36
450	616	717	101
600	620	707	87
750	624	702	78
900	624	709	85
1050	624	701	77
1200	622	702	80
1350	621	703	82
1500	621	707	86
1650	622	712	90
1800	622	683	61
1950			
2100			
2250			
2400			
2550			
2700			
2850			
3000			

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

VEHICLE EXTERIOR STATIC CRUSH (Cont'd)



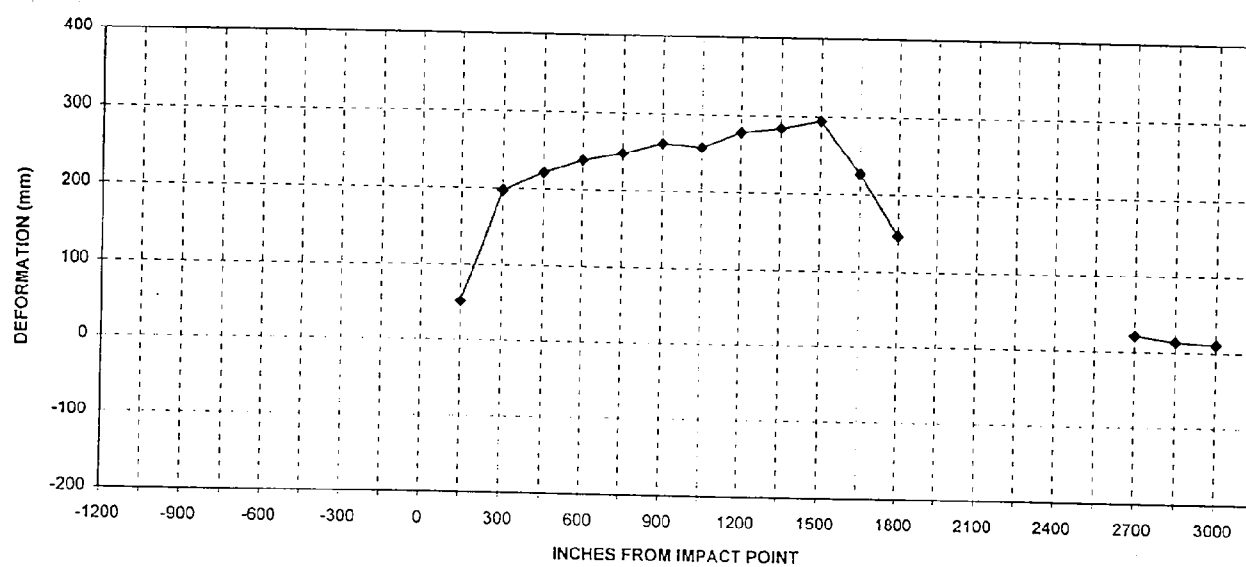
LEVEL 1 - AXLE CENTERLINE

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)			
150	588	638	50
300	592	789	197
450	590	811	221
600	596	834	238
750	598	846	248
900	588	850	262
1050	586	844	258
1200	582	860	278
1350	582	866	284
1500	580	874	294
1650	580	806	226
1800	577	724	147
1950			
2100			
2250			
2400			
2550			
2700	612	633	21
2850	623	636	13
3000	642	652	10

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

VEHICLE EXTERIOR STATIC CRUSH (Cont'd)



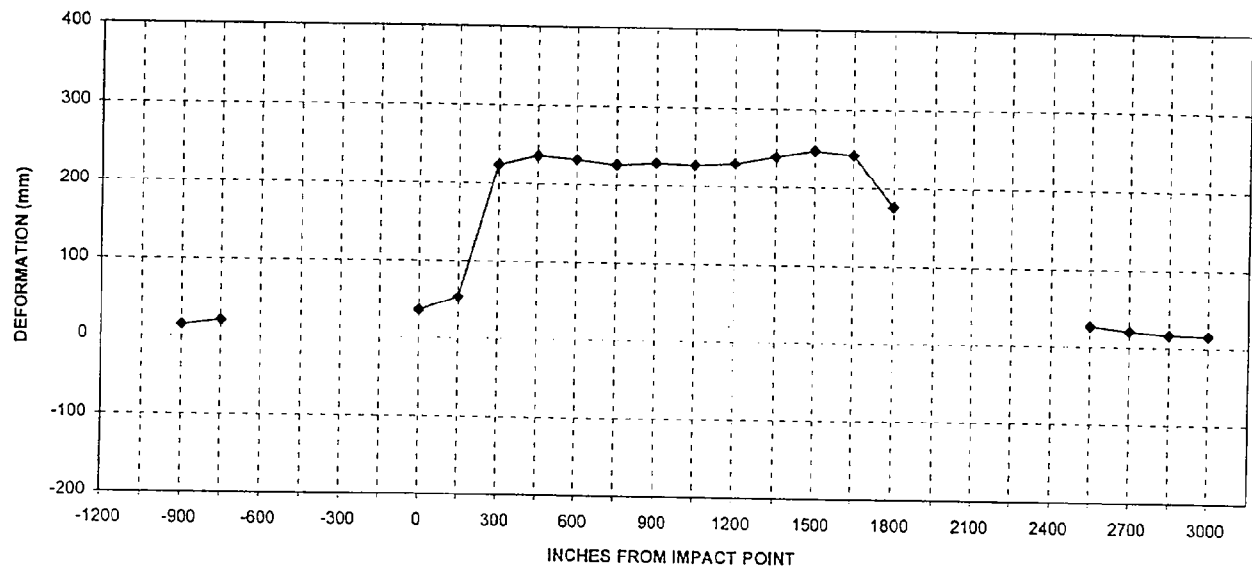
LEVEL 2 - OCCUPANT H-POINT

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

	Level 3 - Mid Door		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1200			
-1050			
-900	634	648	14
-750	602	622	20
-600			
-450			
-300			
-150			
0 (impact point)	566	601	35
150	563	616	53
300	566	790	224
450	569	805	236
600	574	806	232
750	576	802	226
900	574	803	229
1050	571	798	227
1200	568	798	230
1350	563	802	239
1500	559	806	247
1650	558	800	242
1800	558	734	176
1950			
2100			
2250			
2400			
2550	578	604	26
2700	591	611	20
2850	606	622	16
3000	640	655	15

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

VEHICLE EXTERIOR STATIC CRUSH (Cont'd)



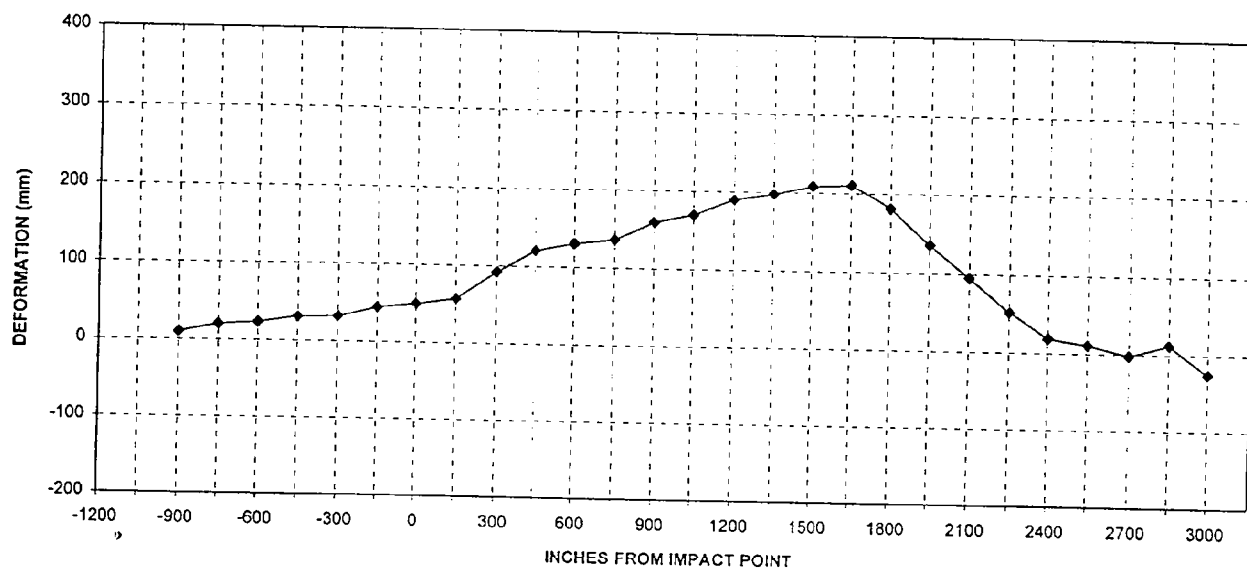
LEVEL 3 - MID DOOR

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

	Level 4 - Window Sill		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1200			
-1050			
-900	672	682	10
-750	650	670	20
-600	634	657	23
-450	619	650	31
-300	618	650	32
-150	612	657	45
0 (impact point)	618	668	50
150	621	678	57
300	622	714	92
450	622	742	120
600	629	759	130
750	632	768	136
900	631	790	159
1050	632	801	169
1200	628	817	189
1350	633	830	197
1500	629	838	209
1650	629	840	211
1800	629	810	181
1950	632	768	136
2100	635	730	95
2250	640	692	52
2400	648	667	19
2550	659	670	11
2700	672	670	-2
2850	693	681	12
3000	717	692	-25

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

VEHICLE EXTERIOR STATIC CRUSH (Cont'd)



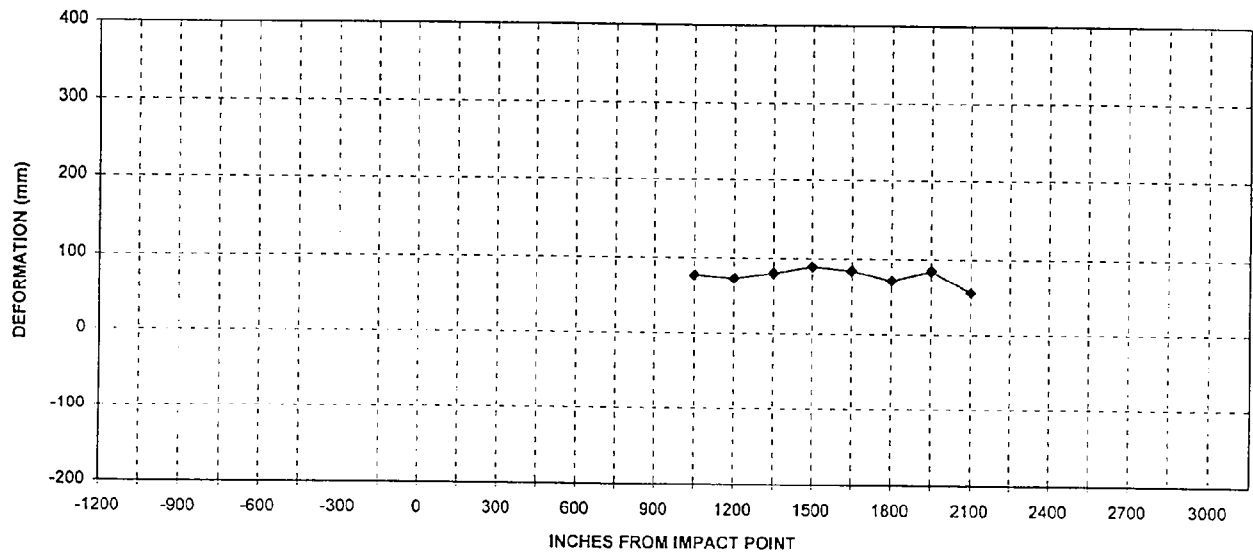
LEVEL 4 - WINDOW SILL

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			
750			
900			
1050	890	967	77
1200	900	973	73
1350	908	988	80
1500	916	1005	89
1650	926	1010	84
1800	938	1009	71
1950	942	1026	84
2100	961	1016	55
2250			
2400			
2550			
2700			
2850			
3000			

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

VEHICLE EXTERIOR STATIC CRUSH (Cont'd)

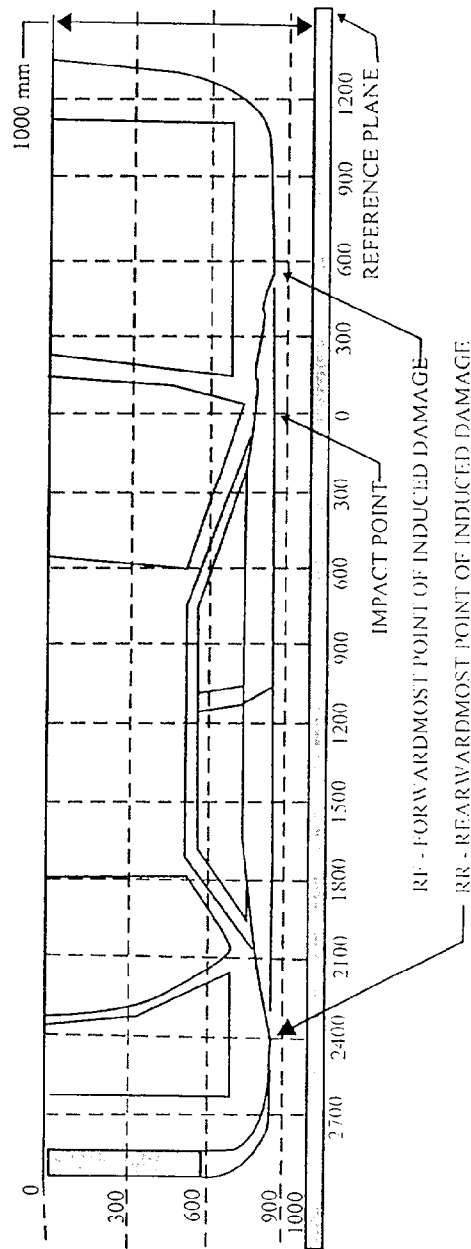


LEVEL 5 - WINDOW TOP

DATA SHEET NO. 11
VEHICLE DAMAGE PROFILE DISTANCES

Year/Make/Model/Body Style: 1997/Chevrolet/Camaro Convertible

NHTSA NO.: CV0103 Test Date: October 22, 1996



DPD MEASUREMENTS	POST-TEST (mm)	PRE-TEST (mm)	STATIC CRUSH (mm)
1. (RF = <u>-900</u> mm)	682	682	0
2. <u>-193</u> mm	657	614	43
3. <u>503</u> mm	821	591	230
4. <u>1222</u> mm	855	582	273
5. <u>1986</u> mm	755	633	122
6. (RR = <u>2700</u> mm)	670	670	0

DATA SHEET NO. 12

EXTERIOR STATIC CRUSH FOR SIDE IMPACTOR

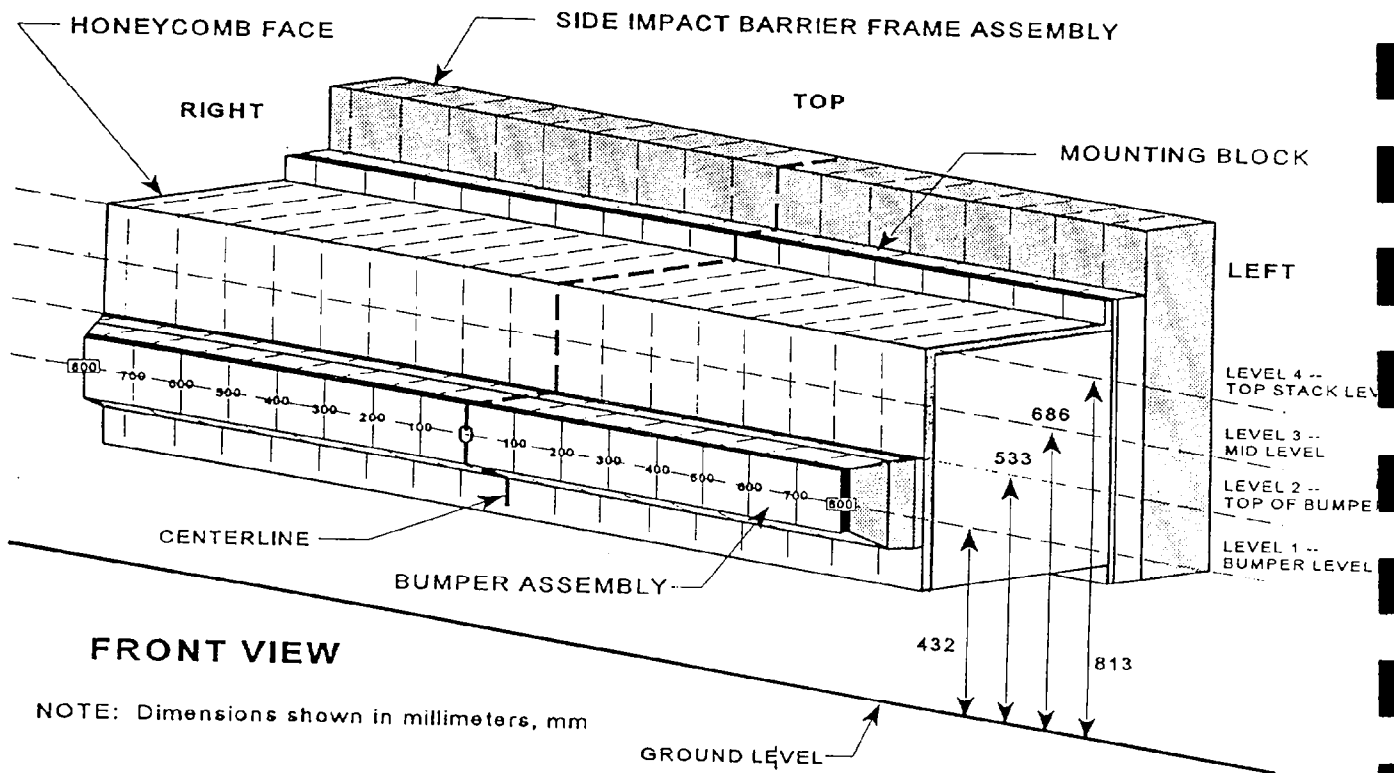
Year/Make/Model/Body Style: 1997/Chevrolet/Camaro Convertible

Vehicle NHTSA No.: CV0103 Test Date: October 22, 1996

		Distance Right of Center (mm)									Distance Left of Center (mm)							
Location	Height at CL	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
Top Stack Level 4	813 mm	100	82	84	49	40	30	25	15	11	7	4	2	2	0	0	2	60
Mid Level Level 3	686 mm	86	46	63	39	18	11	7	5	4	0	0	2	0	0	2	25	90
Top Bumper Level 2	533 mm	61	56	54	48	37	23	22	22	18	16	14	11	10	10	19	56	102
Mid Bumper Level 1	432 mm	92	96	110	89	59	45	40	35	31	28	25	23	21	33	67	110	150

See next page for Barrier Face Graphic

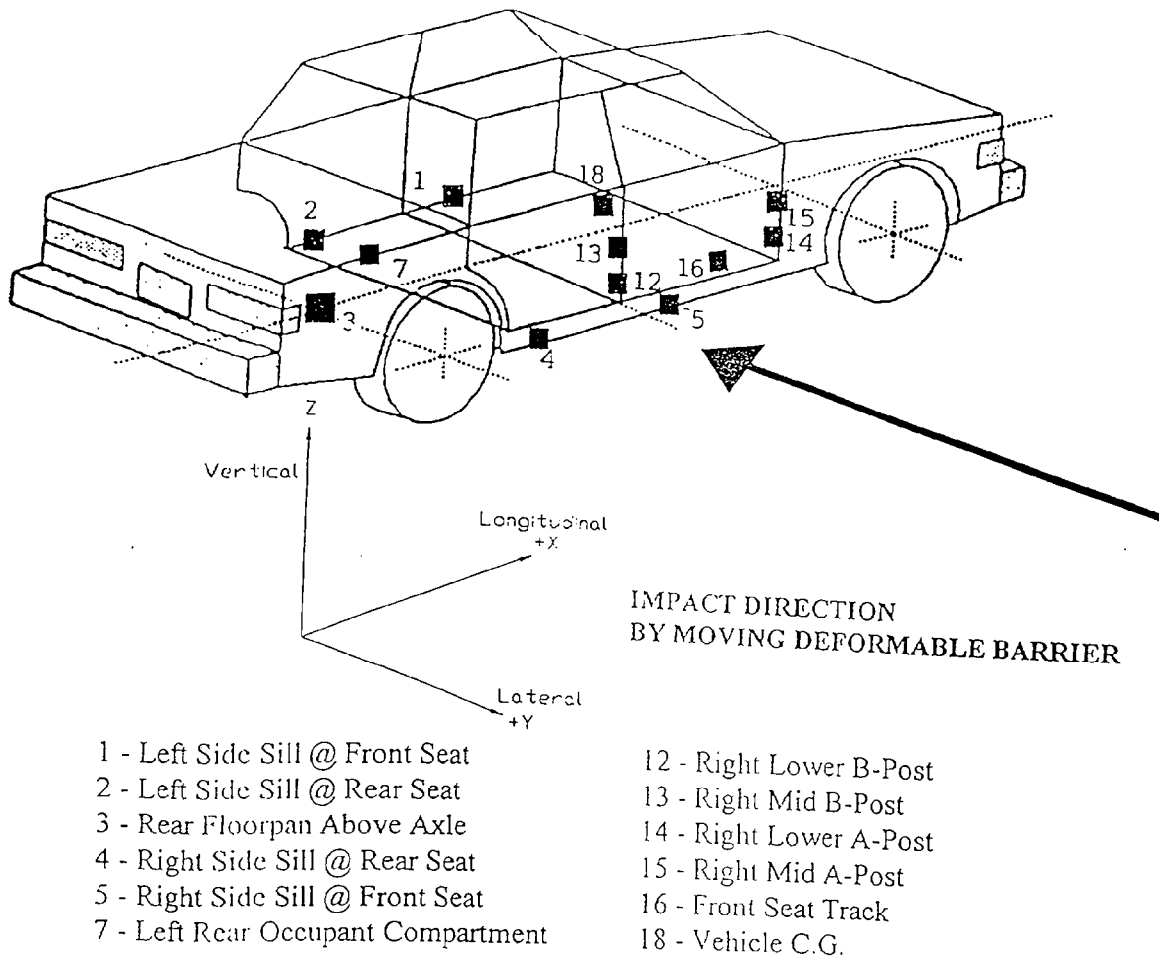
DATA SHEET NO. 12 (Cont'd)



DATA SHEET 13
TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1997/Chevrolet/Camaro Convertible

Vehicle NHTSA No.: CV0103 Test Date: October 22, 1996



DATA SHEET NO. 13

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1997/Chevrolet/Camaro Convertible

Vehicle NHTSA No.: CV0103 Test Date: October 22, 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	2669	-670	165	4.5	4.9	2.3	15.0	6.9	3.4	15.5
2	Left Side Sill @ Rear Seat	1586	-660	207	5.3	4.8	2.0	18.9	6.5	4.0	19.3
3	Rr. Floorpan Above Axle	709	0	682	1.4	8.8	2.3	17.8	6.5	4.6	19.8
4	Right Side Sill @ Rr. Seat	1569	650	198	---	---	19.3	49.2	---	---	---
5	Right Side Sill @ Frt. Seat	2656	640	178	---	---	14.9	37.0	---	---	---
7	Left Rear Occupant Compartment	1882	384	316	---	---	1.5	17.6	---	---	---
12	Right Lower B-Post	1762	560	374	---	---	25.6	46.5	---	---	---
14	Right Lower A-Post	3009	678	312	---	---	5.2	39.0	---	---	---
15	Right Mid A-Post	3002	754	811	---	---	35.3①	25.9①	---	---	---
16	Right Front Passenger Seat Track	2247	570	222	---	---	27.1	55.3	---	---	---
18	Vehicle CG	2474	0	484	②	②	②	②	②	②	②

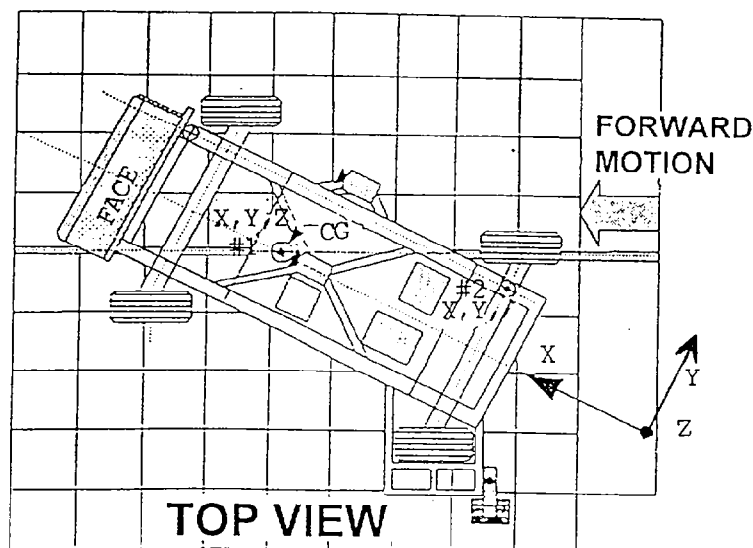
* Reference: X - Rear Bumper (+ Forward) ① Data not valid after 40 msec.
Y - Vehicle Centerline (+ To right) ② Data not valid after 30 msec.
Z - Ground Level (+ Up)

DATA SHEET NO. 14

MOVING DEFORMABLE BARRIER (MDB) ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1997/Chevrolet/Camaro Convertible

Vehicle NHTSA No.: CV0103 Test Date: October 22, 1996



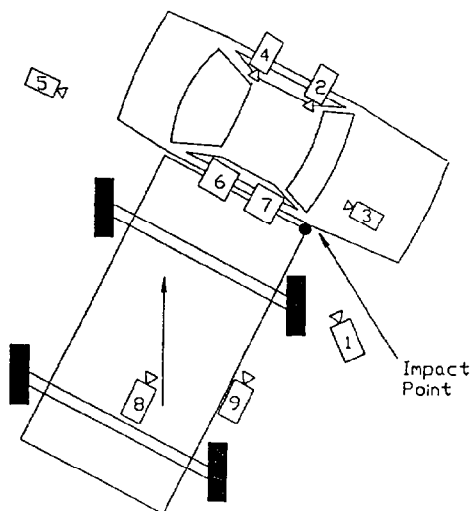
Accel. No.	Description	Coordinates (mm)*			(+) Positive		(-) Negative	
		X	Y	Z	Max. (g)	Time (msec)	Max. (g)	Time (msec)
1	MDB Center of Gravity	-1092	0	483				
	Longitudinal (X)	---	---	---	.9	136	19.5	38
	Lateral (Y)	---	---	---	6.8	26	1.3	53
	Vertical (Z)	---	---	---	23.5	38	27.7	25
	Resultant (R)	---	---	---	33.0	25	---	---
2	Rear Frame Member	-2591	-625	622				
	Longitudinal (X)	---	---	---	1.9	105	20.4	27
	Lateral (Y)	---	---	---	2.6	69	4.5	28

*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/Chevrolet/Camaro Convertible

Vehicle NHTSA No.: CV0103 Test Date: October 22, 1996



Camera No.	View	Coordinates (mm)*			Angle	Lens (mm)	Film Speed (fps)
		X	Y	Z			
	Real Time					13	24
1	Right Impact	-990	2090	1590	90°	13	943
2	Onboard Front Passenger					8	985
3	Onboard Hood					13	1015
4	Onboard Rear Passenger					8	980
5	Left Impact	390	-9550	1510	90°	13	1020
6	Top Wide	-190	-1190	5200	90°	8	1070
7	Top Impact	-230	90	5200	90°	13	1005
8	Cart Wide					13	NT
9	Cart Impact					35	1005

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

NT - No timing available

DATA SHEET 16
FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

Vehicle Year/Make/Model/Body Style: 1997/Chevrolet/Camaro Convertible

Vehicle NHTSA No.: CV0103 Test Date: October 22, 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 33.0 mph (53.1 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

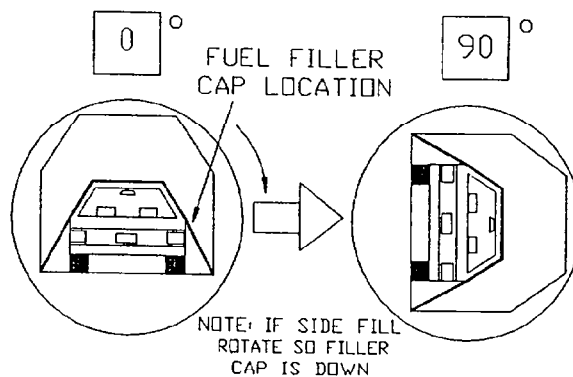
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA

Vehicle Year/Make/Model/Body Style: 1997/Chevrolet/Camaro Convertible

Vehicle NHTSA No.: CV0103 Test Date: October 22, 1996

TEST PHASE: 0° - 90°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 52 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 52 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

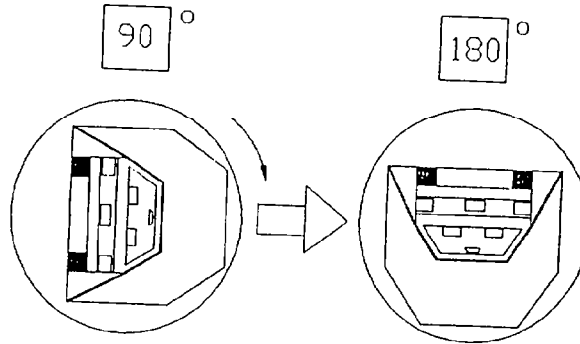
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA (Cont'd)

Vehicle Year/Make/Model/Body Style: 1997/Chevrolet/Camaro Convertible

Vehicle NHTSA No.: CV0103 Test Date: October 22, 1996

TEST PHASE: 90° - 180°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 28 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 28 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

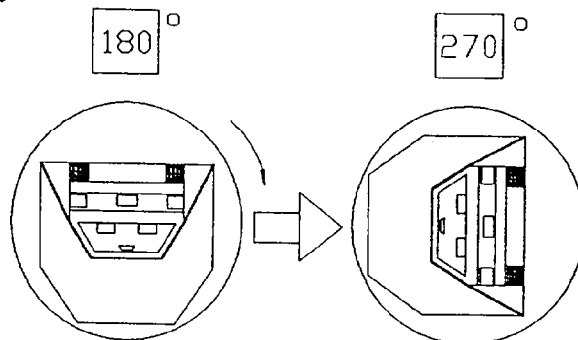
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA (Cont'd)

Vehicle Year/Make/Model/Body Style: 1997/Chevrolet/Camaro Convertible

Vehicle NHTSA No.: CV0103 Test Date: October 22, 1996

TEST 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 seconds

TOTAL TIME = 7 minutes 23 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

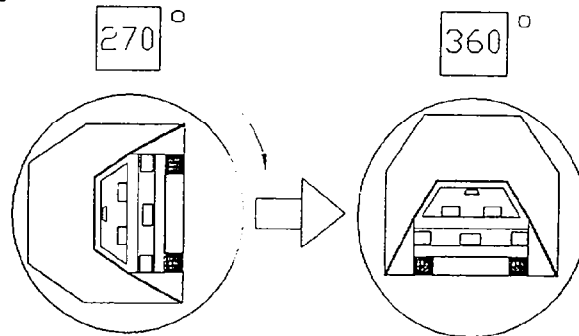
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA

Vehicle Year/Make/Model/Body Style: 1997/Chevrolet/Camaro Convertible

Vehicle NHTSA No.: CV0103 Test Date: October 22, 1996

TEST PHASE: 270° - 360°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 42 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 42 seconds

Next Whole Minute Interval = 8 minutes

FUEL SPILLAGE MEASUREMENT:

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-46 - Right Rear Attitude Point	A-46
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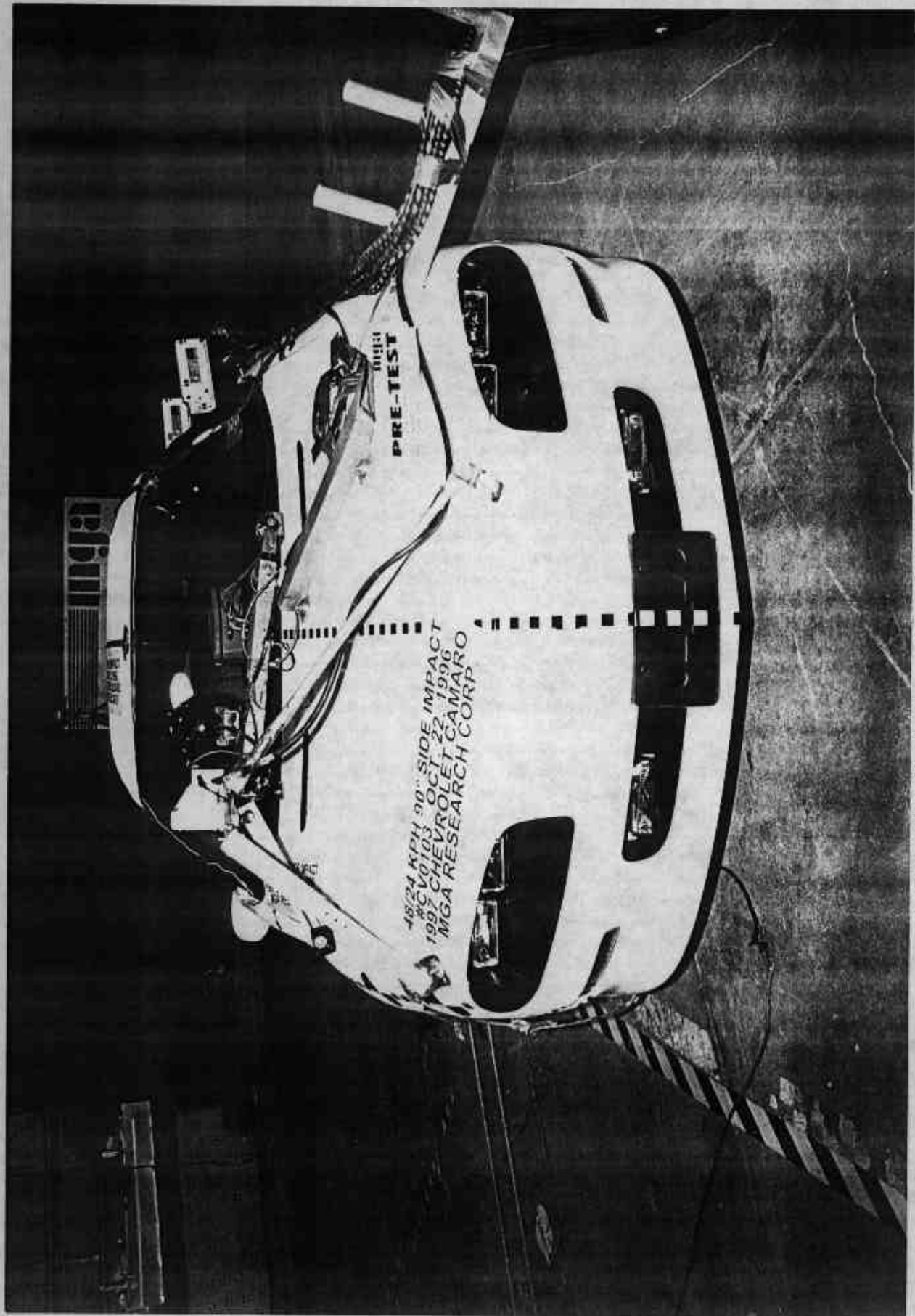


Photo No. A-1 - Pre-Test Front View of Test Vehicle

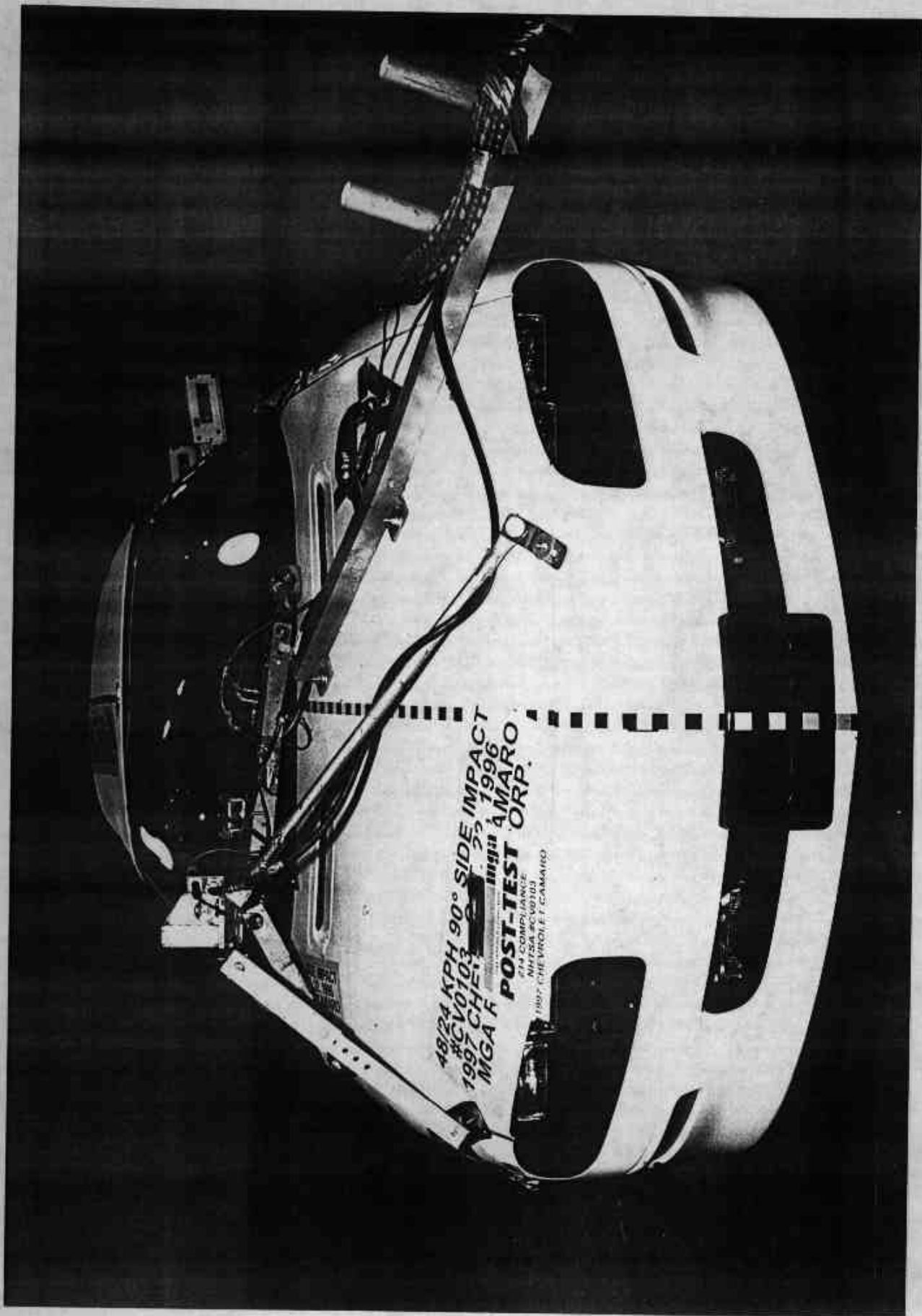


Photo No. A-2 - Post-Test Front View of Test Vehicle

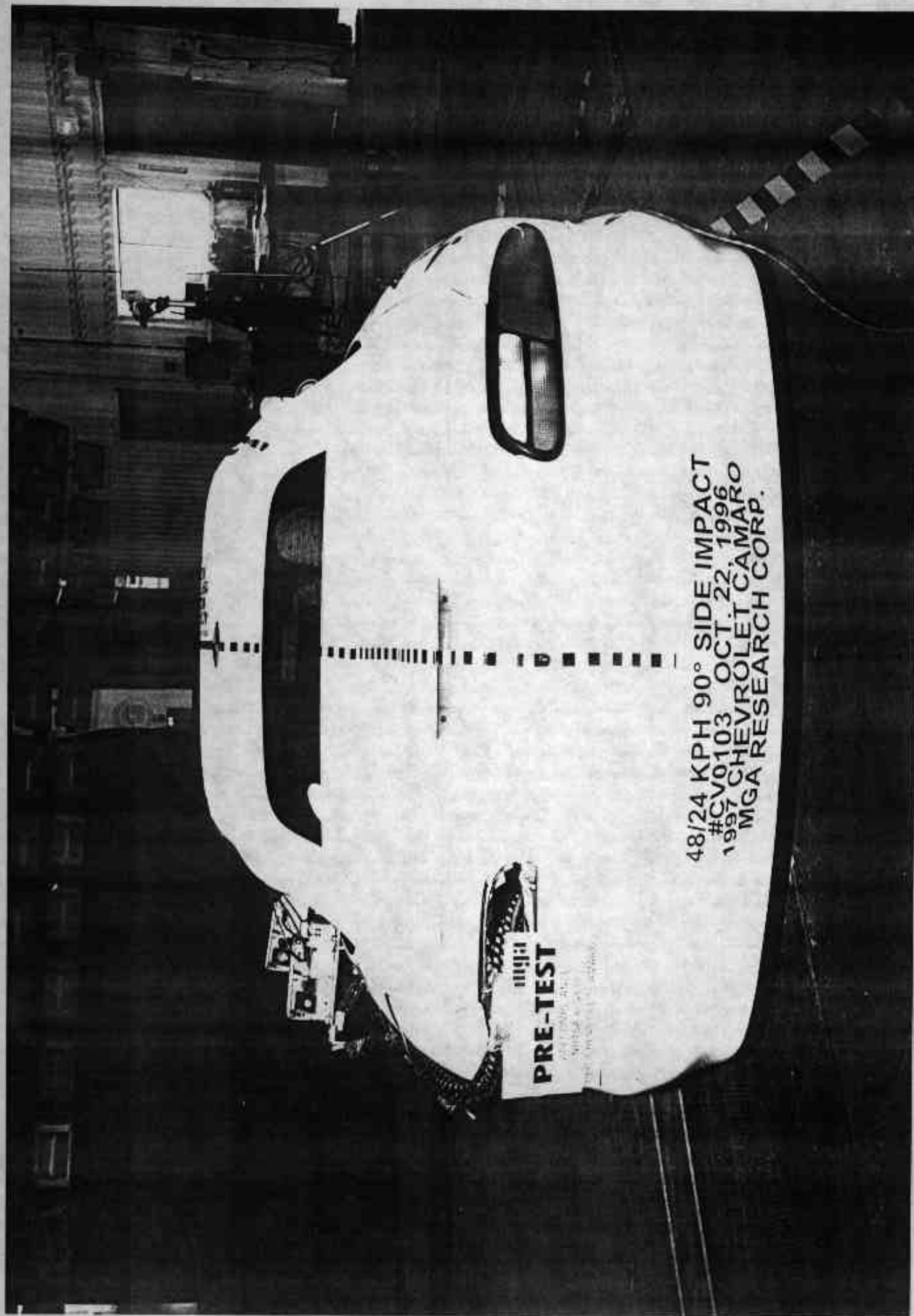


Photo No. A-3 - Pre-Test Rear View of Test Vehicle

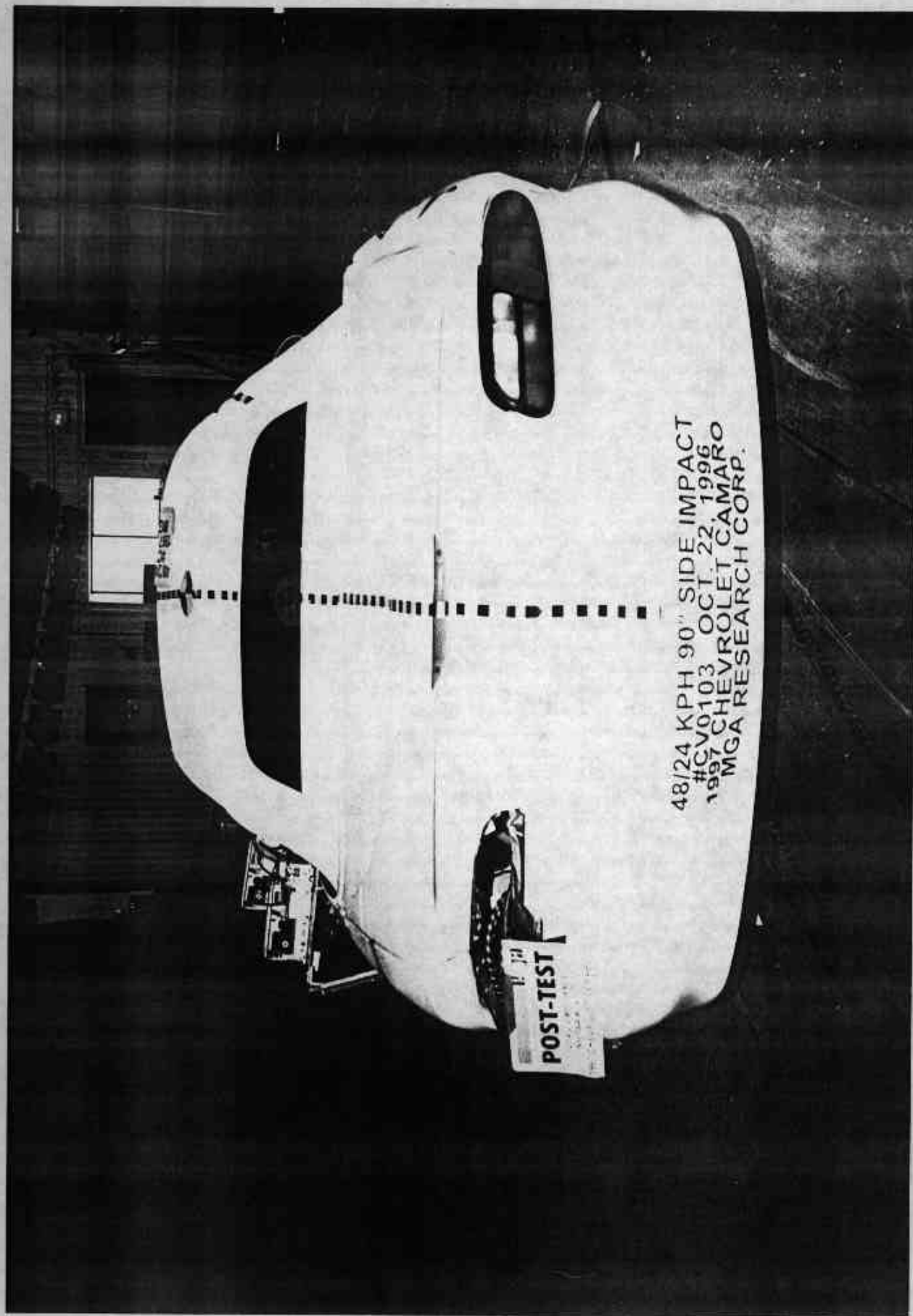


Photo No. A-4 - Post-Test Rear View of Test Vehicle

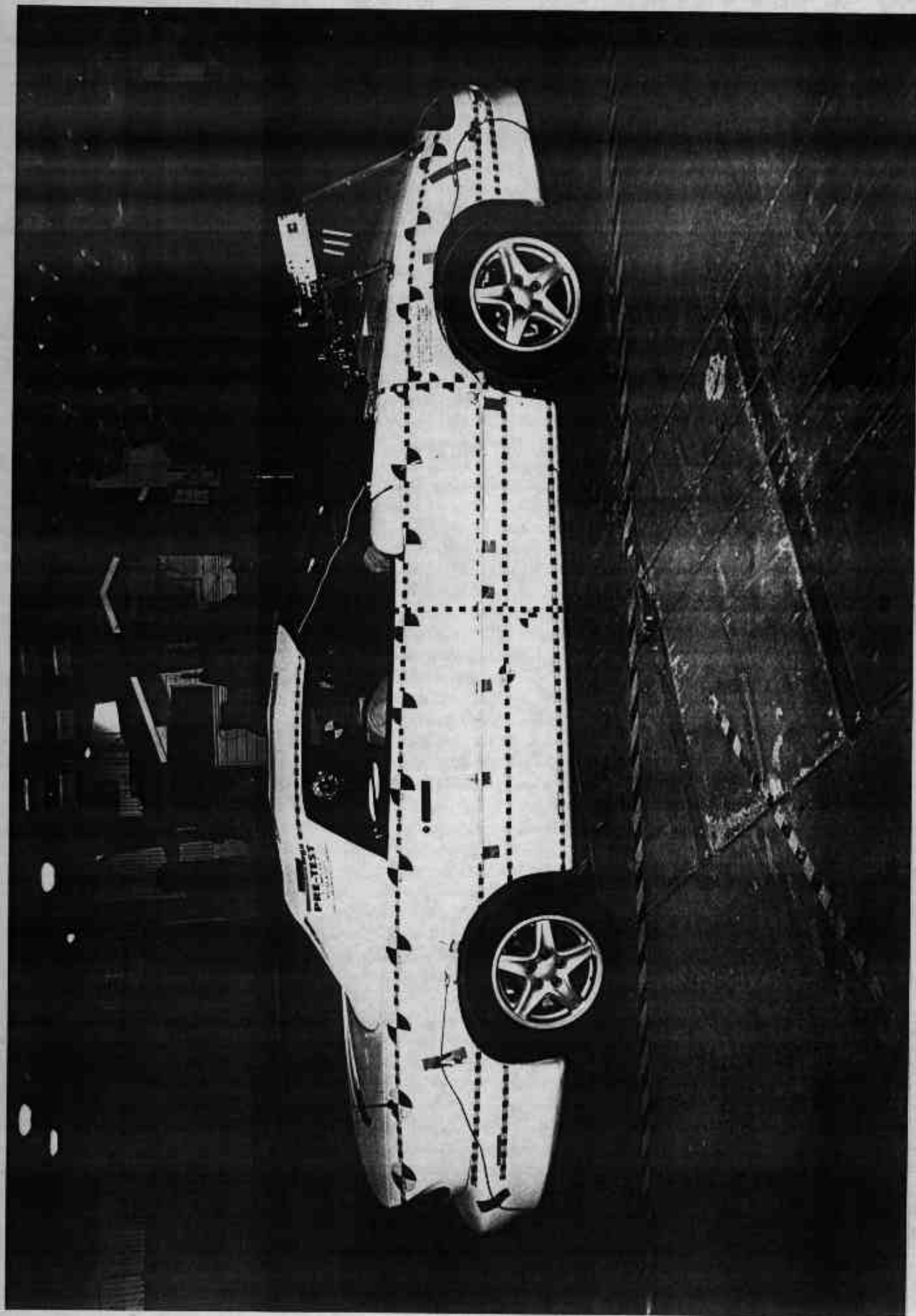


Photo No. A-5 - Pre-Test Right Side View of Test Vehicle

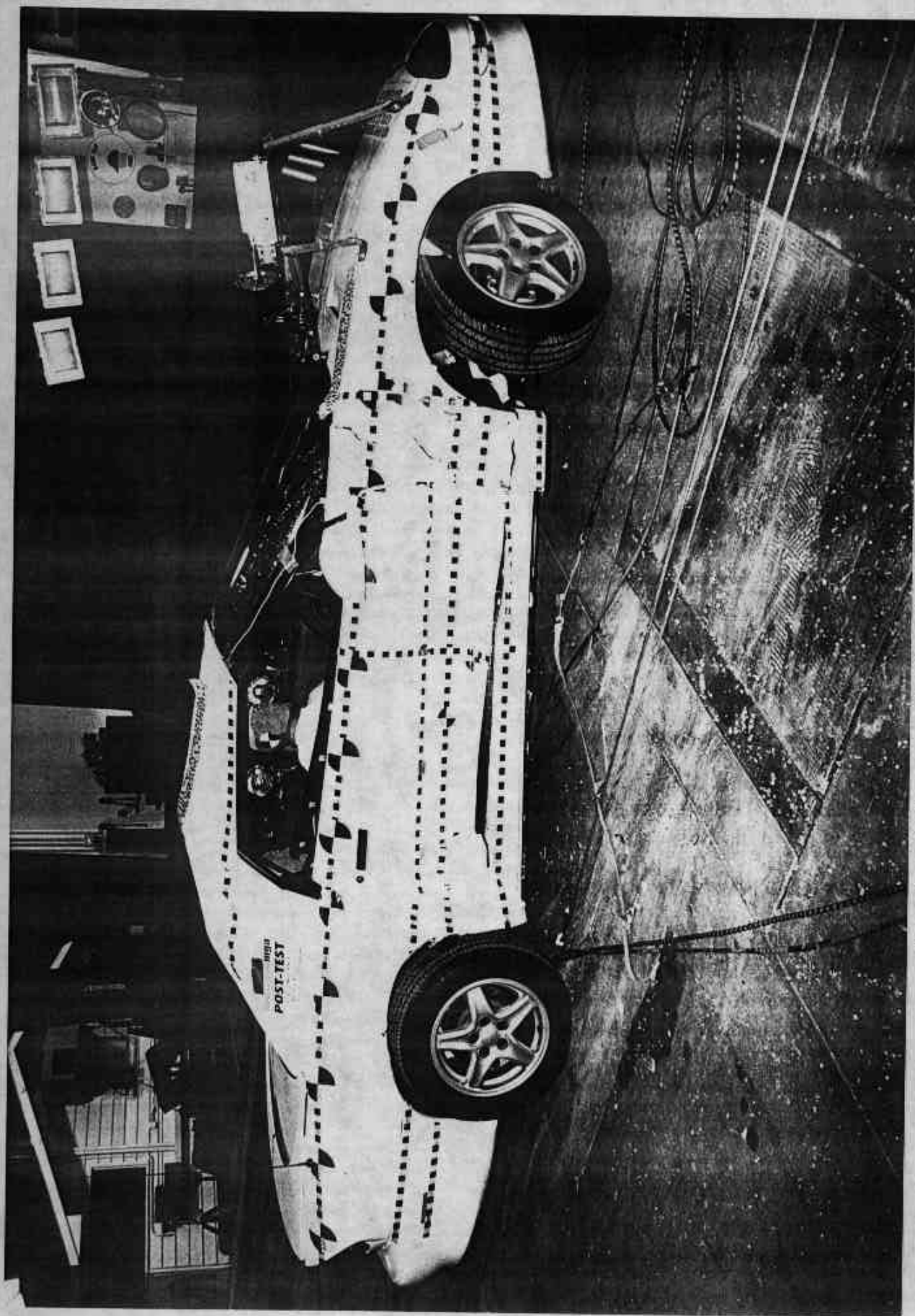


Photo No. A-6 - Post-Test Right Side View of Test Vehicle

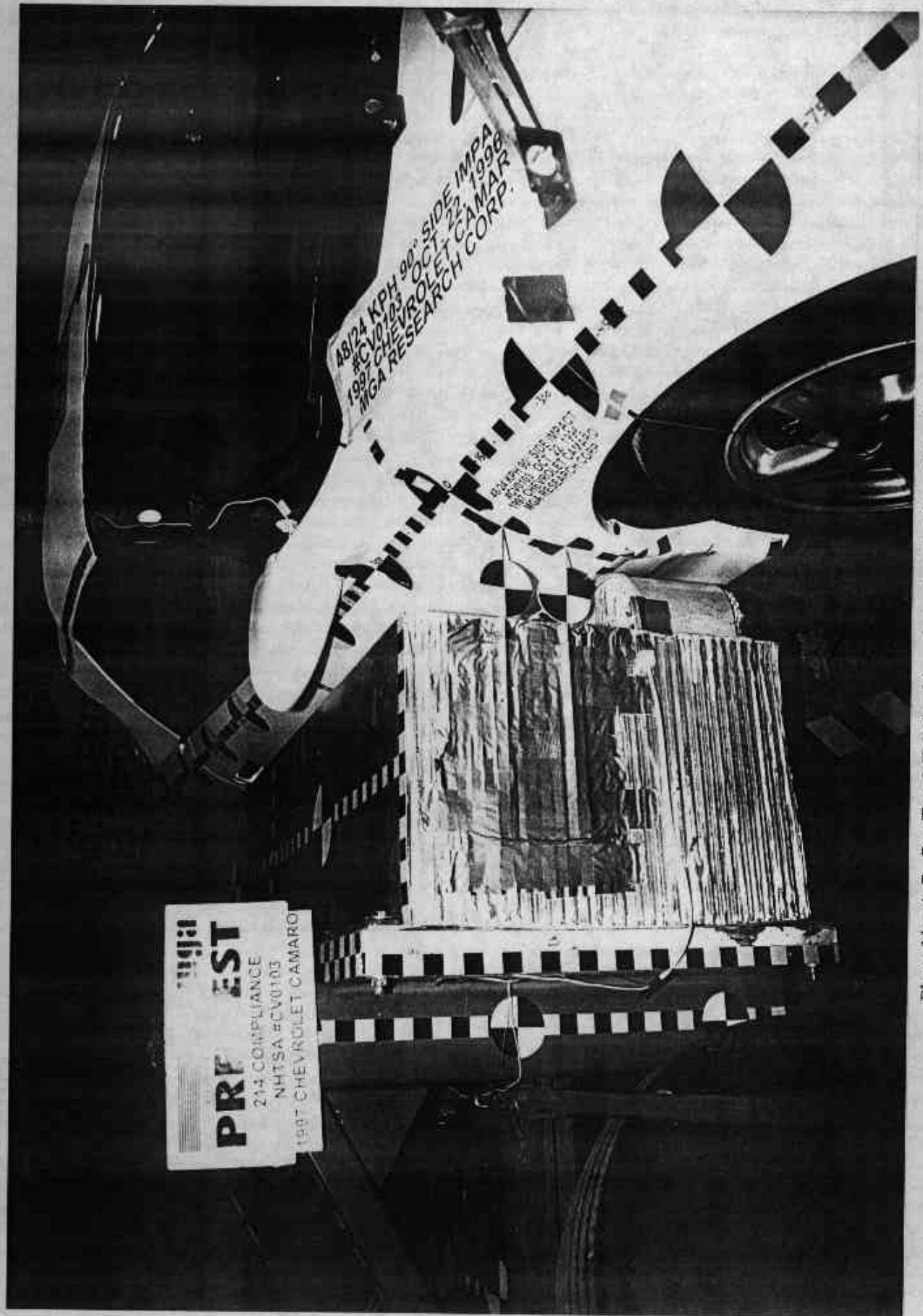


Photo No. A-7 - Pre-Test MDB Positioned Against Vehicle (right side)

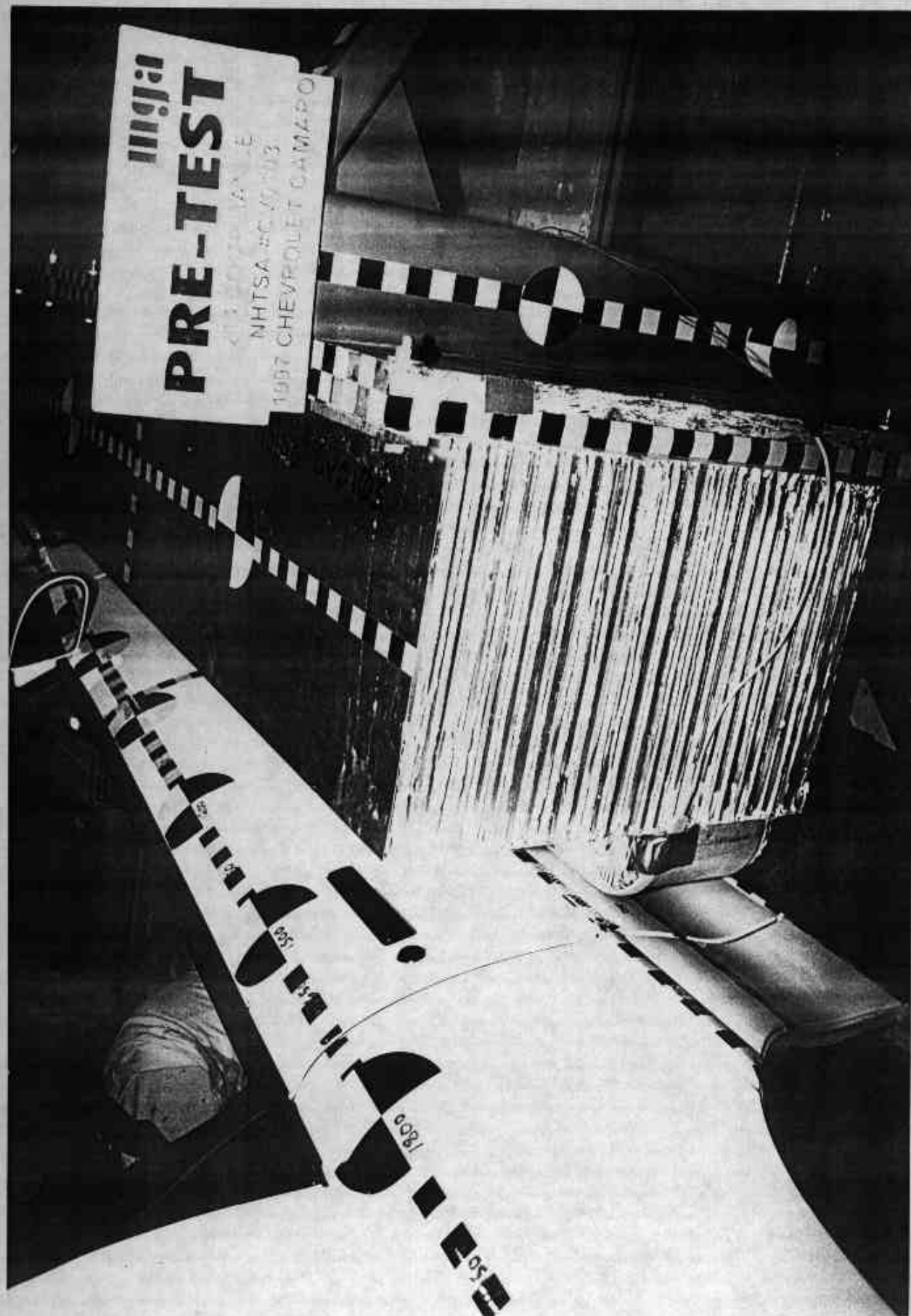


Photo No. A-8 - Pre-Test MDB Positioned Against Vehicle (left side)

A-8

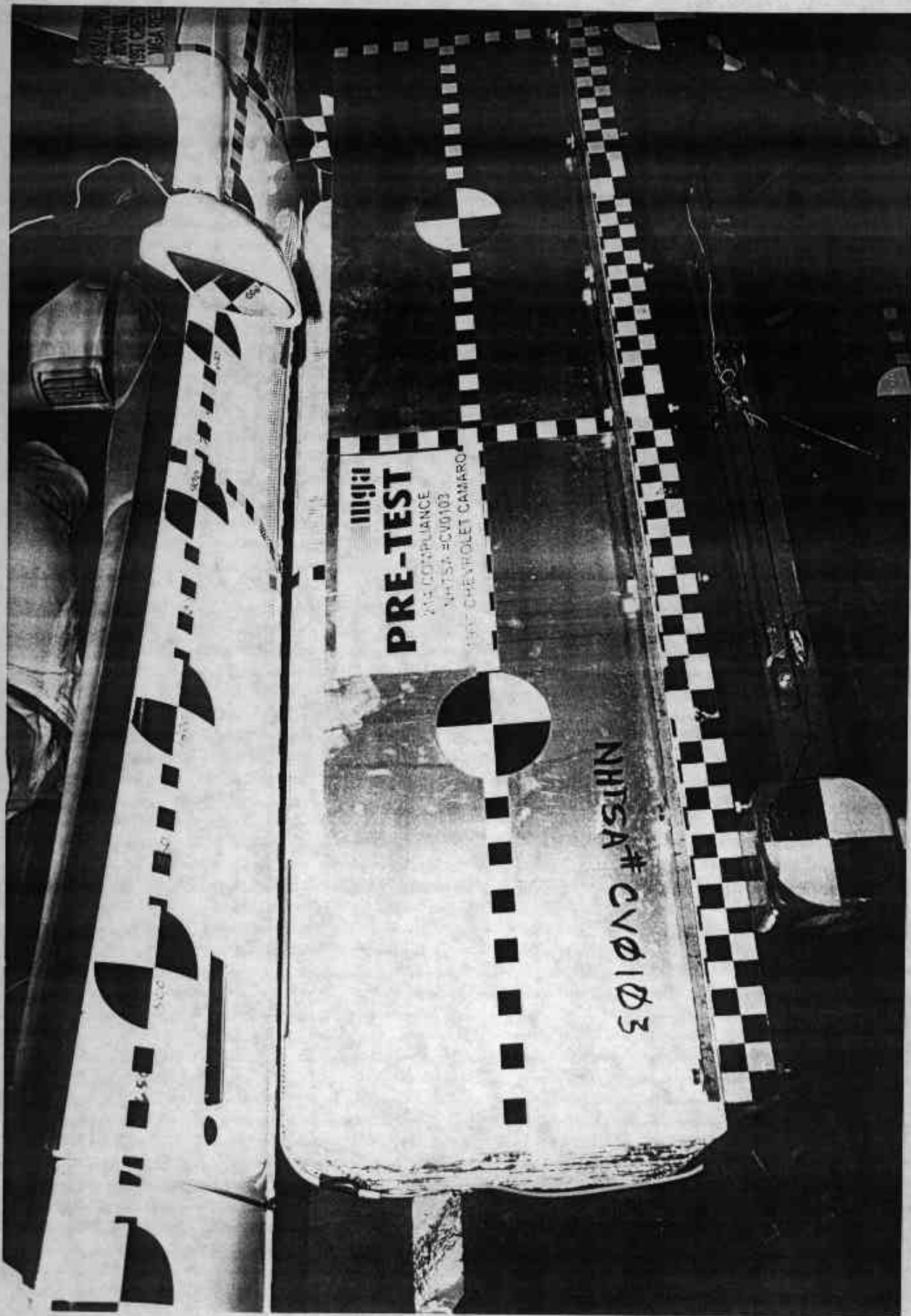


Photo No. A-9 - Pre-Test MDB Positioned Against Vehicle Overhead View

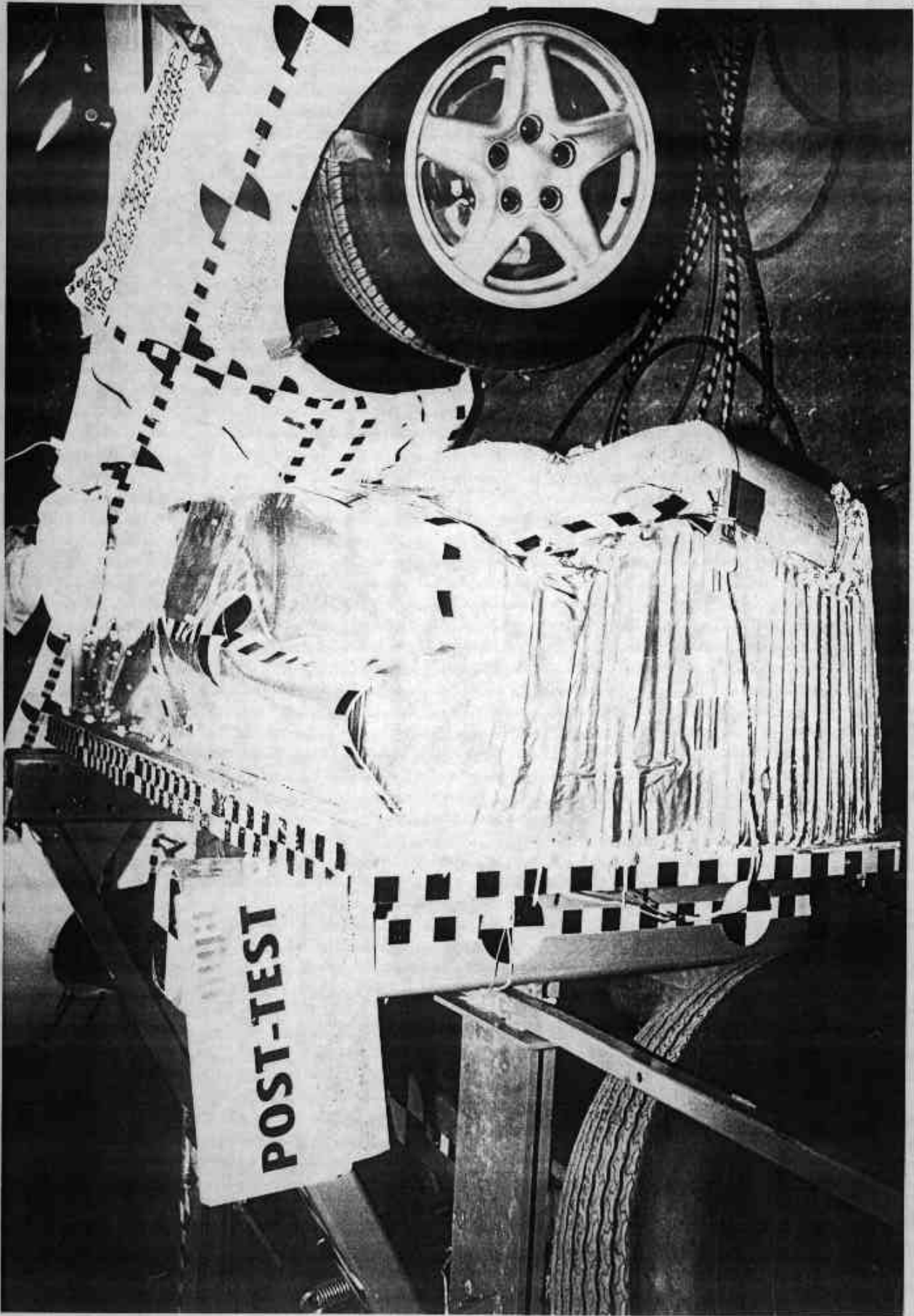


Photo No. A-10 - Post-Test MDB Positioned Against Vehicle (right side)

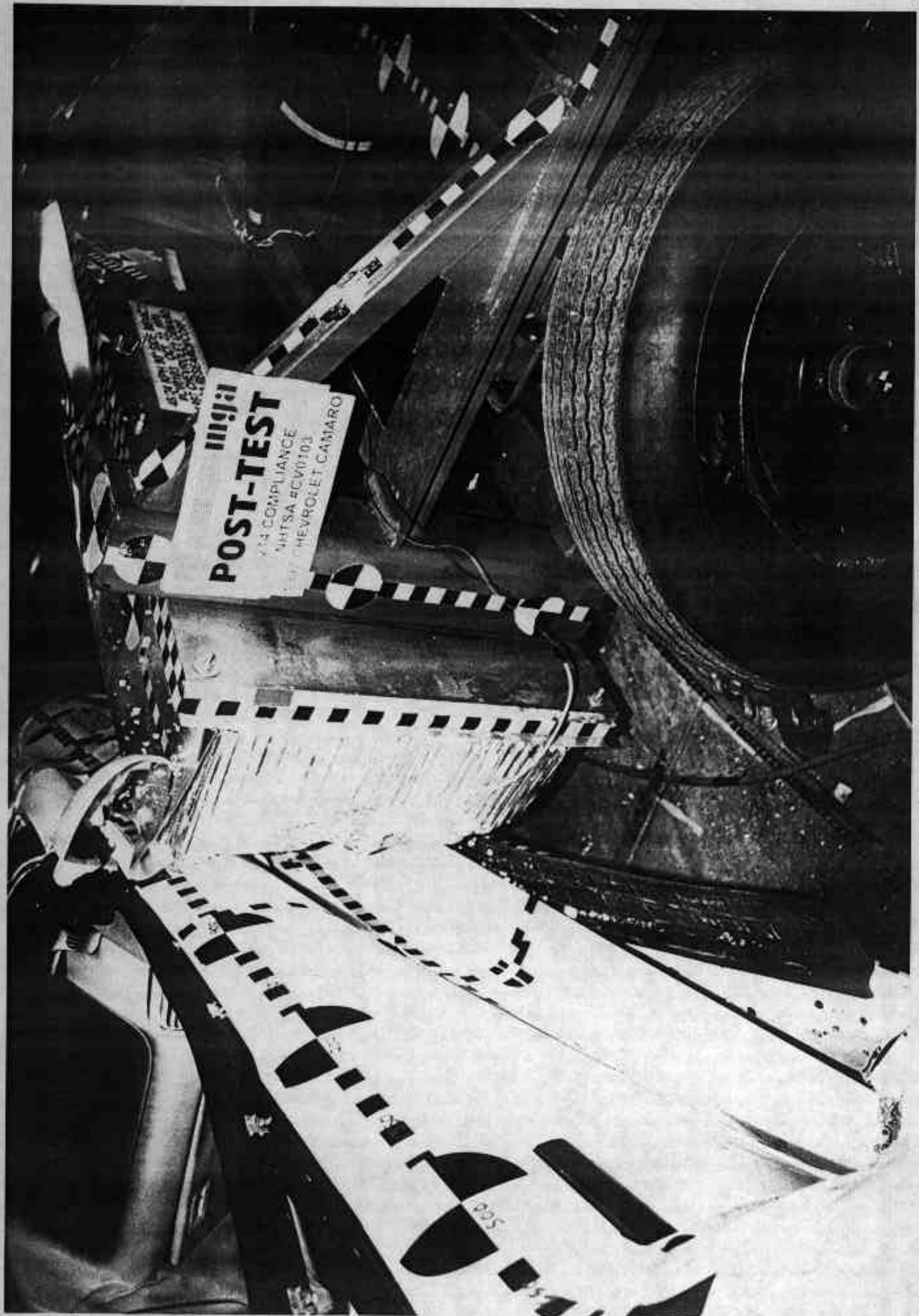


Photo No. A-11 - Post-Test MDB Positioned Against Vehicle (left side)

A-11

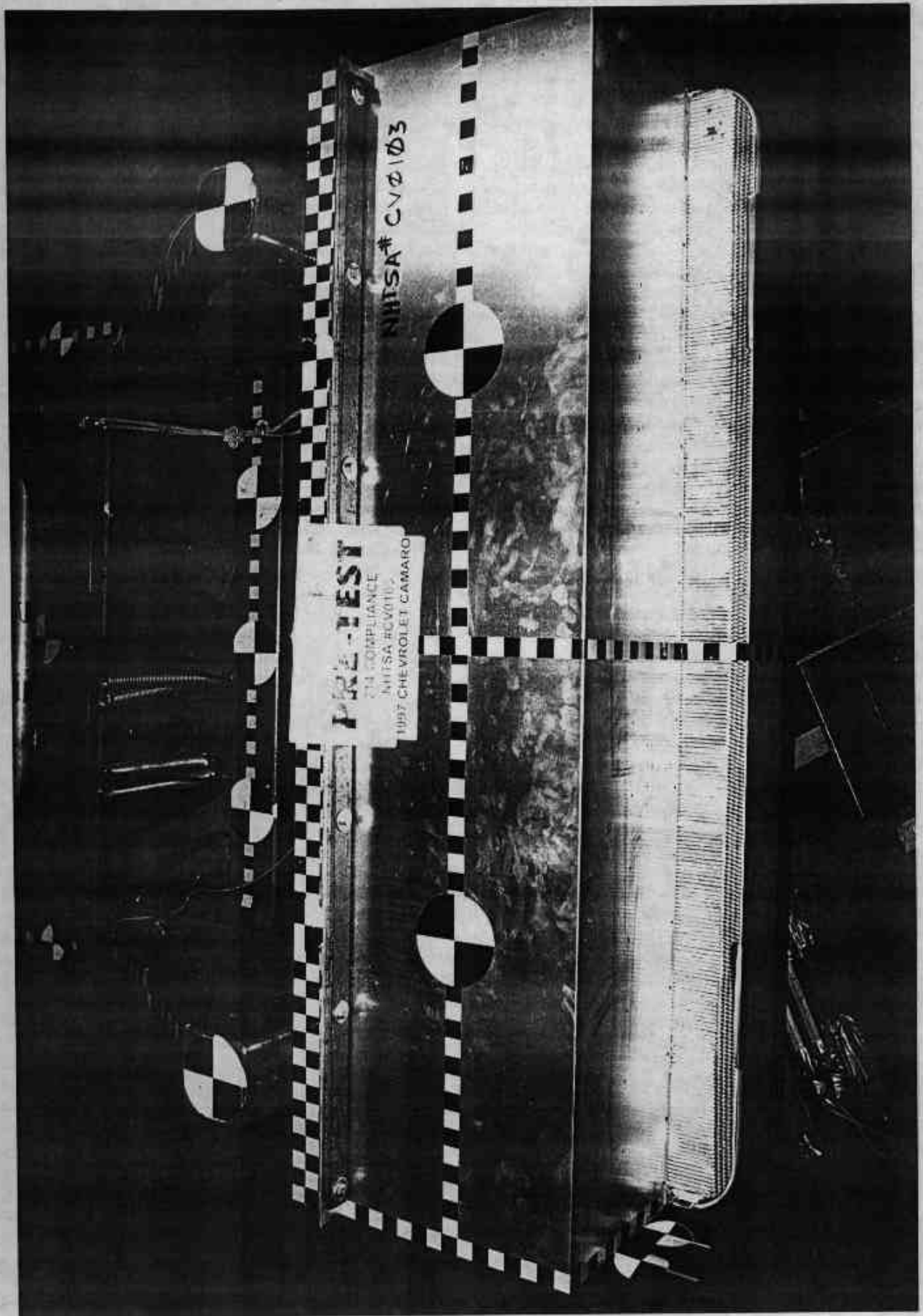


Photo No. A-13 - Pre-Test MDB Top View

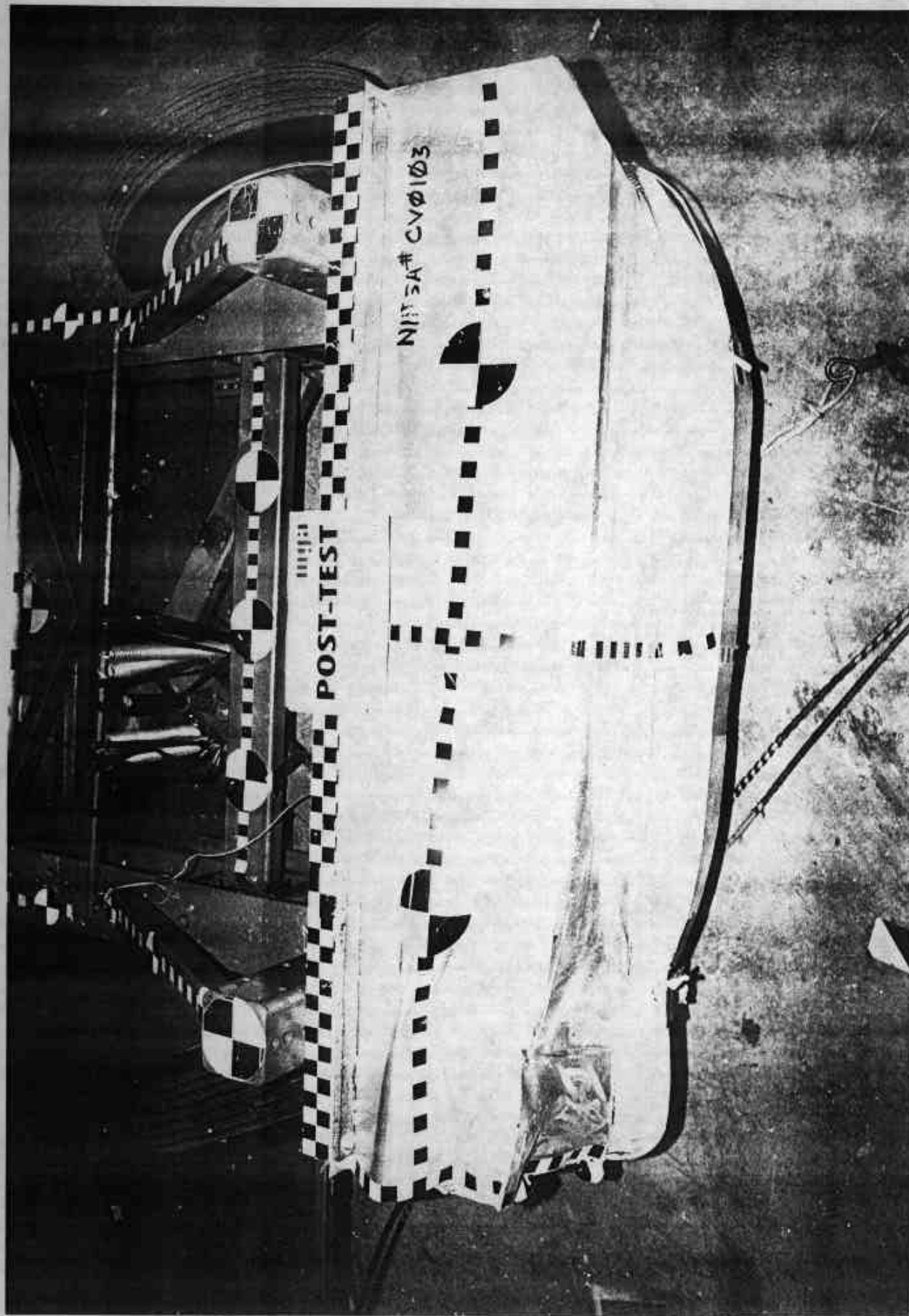


Photo No. A-14 - Post-Test MDB Top View

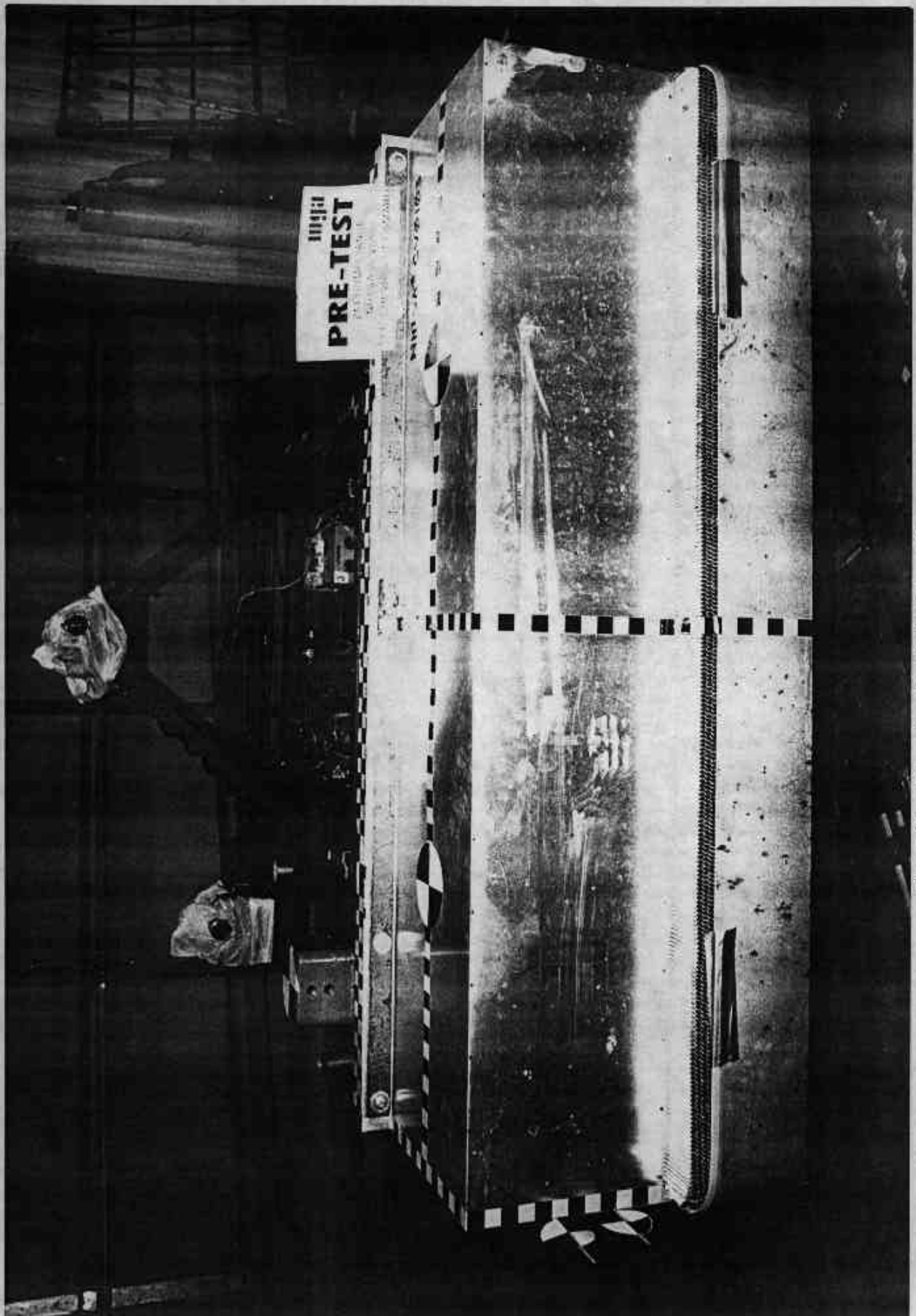


Photo No. A-15 - Pre-Test MDB Front View

A-15

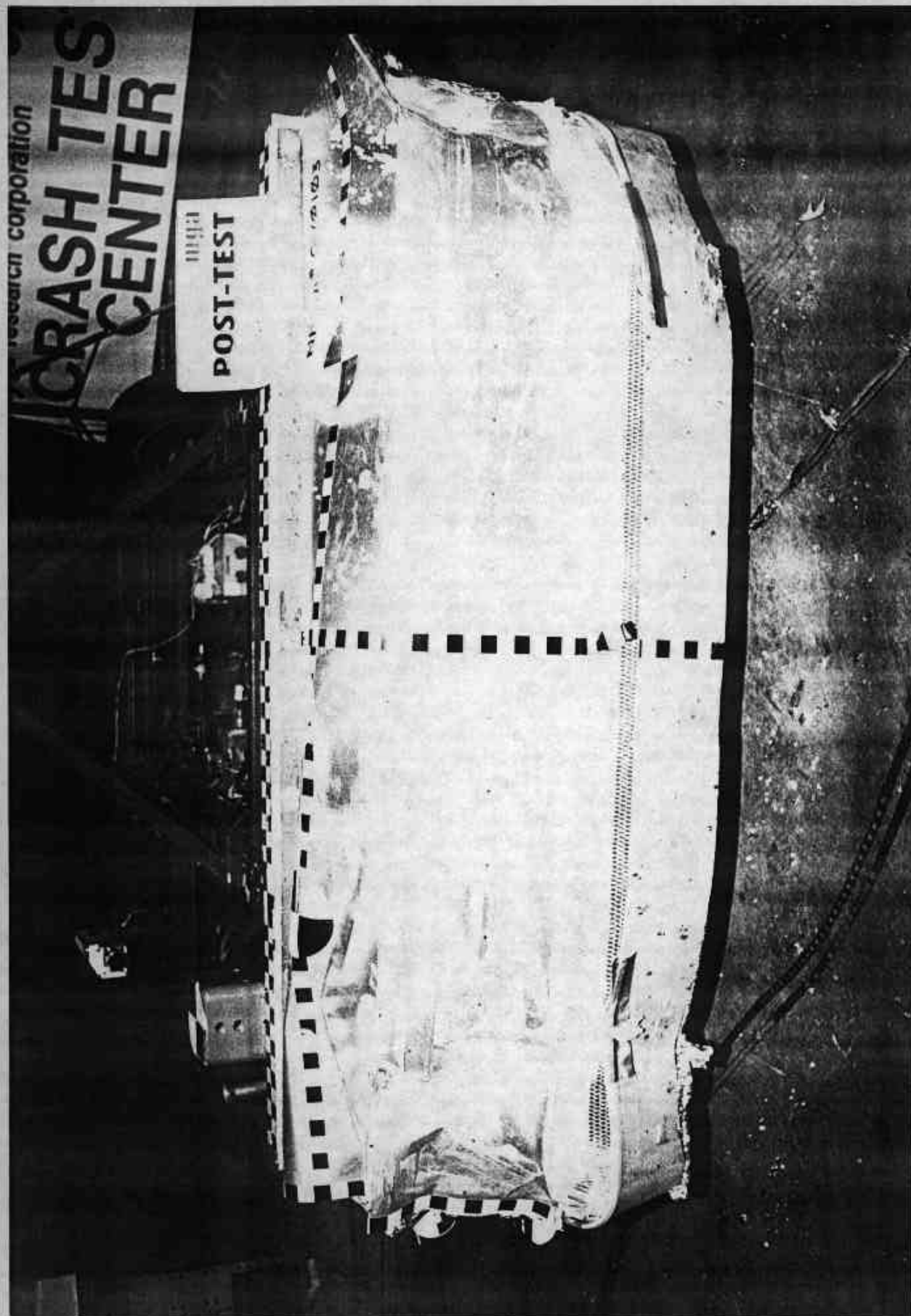


Photo No. A-16 - Post-Test MDB Front View

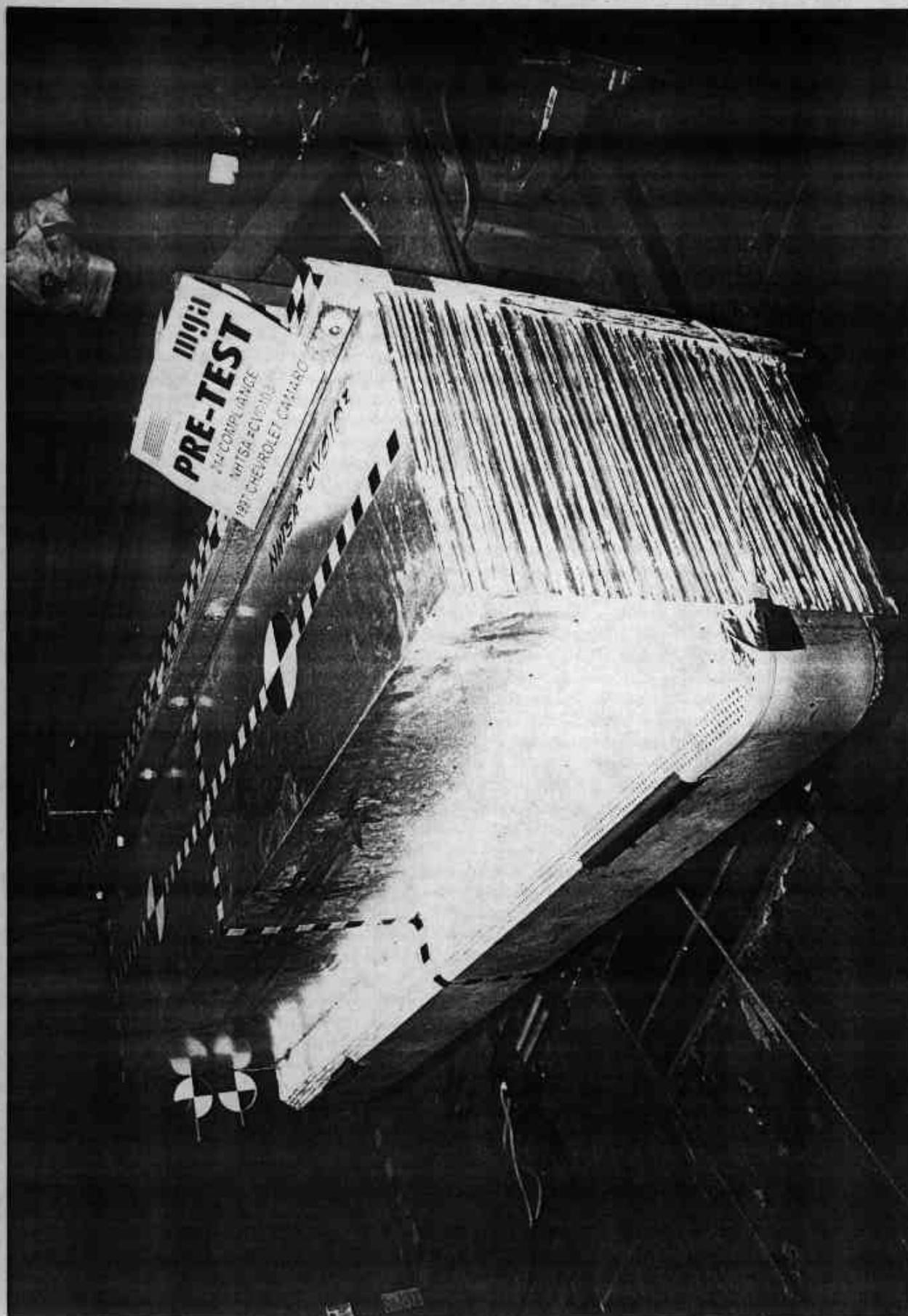


Photo No. A-17 - Pre-Test MDB Left Side View

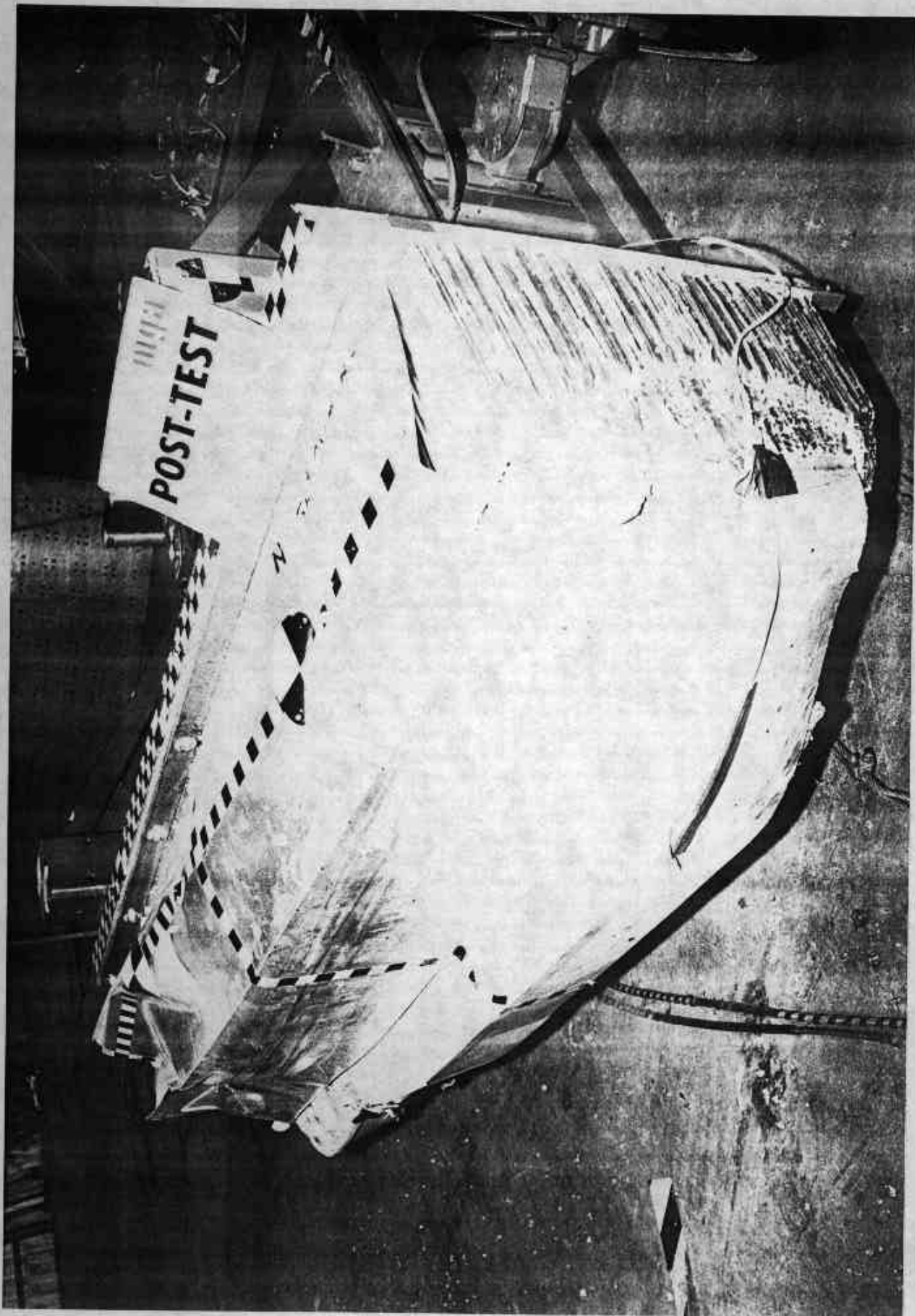


Photo No. A-18 - Post-Test MDB Left Side View

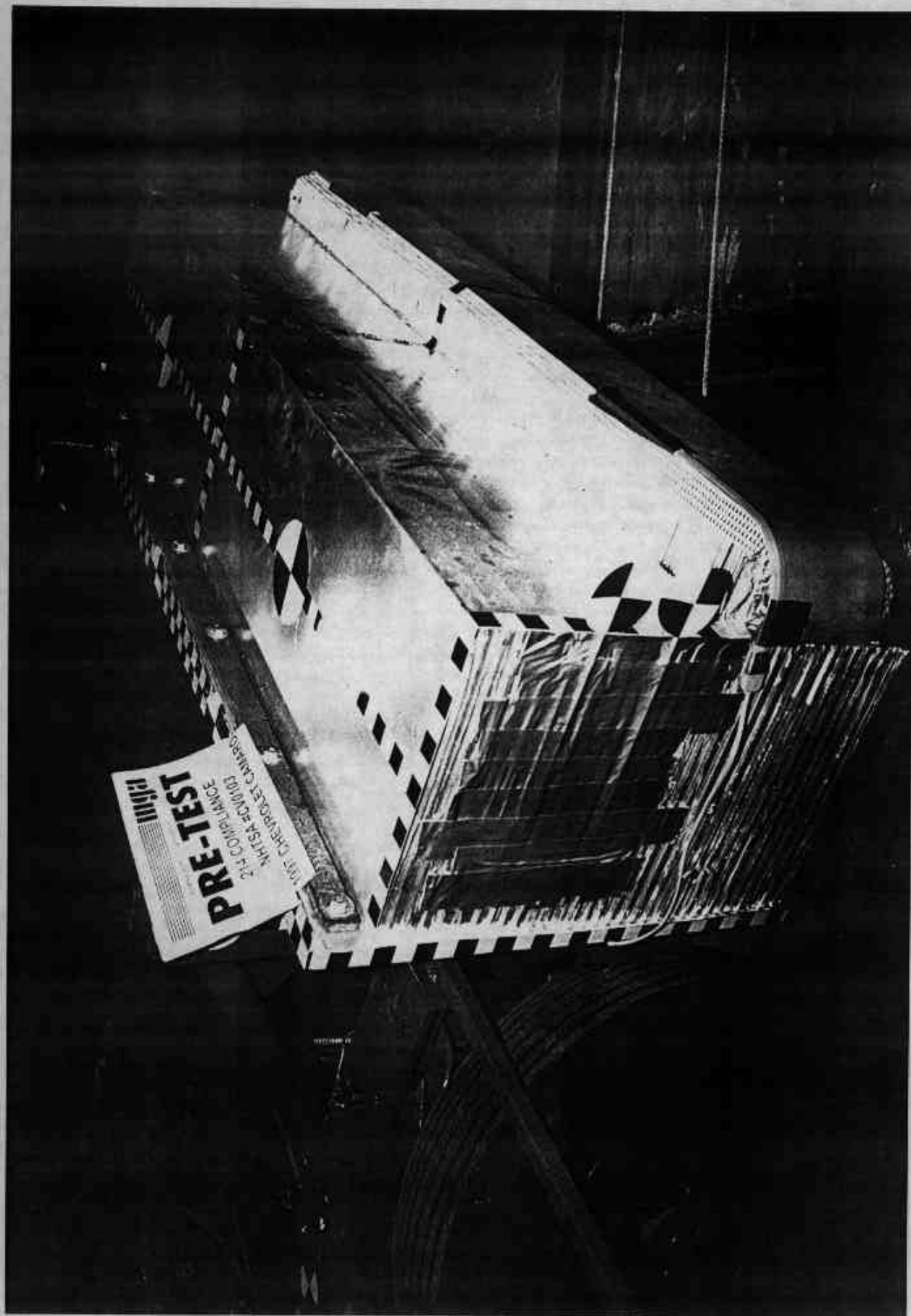


Photo No. A-19 - Pre-Test MDB Right Side View

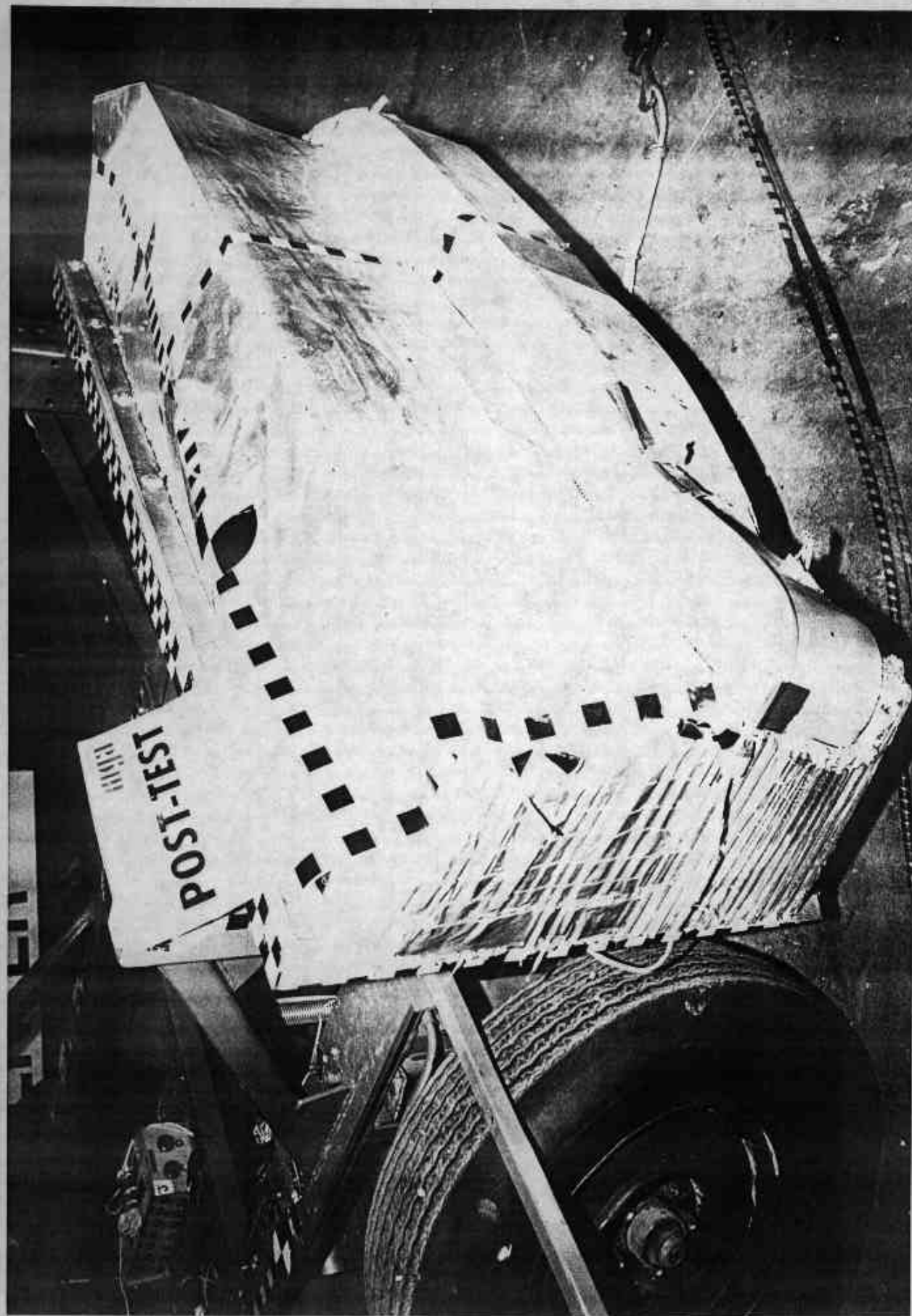


Photo No. A-20 - Post-Test MDB Right Side View



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

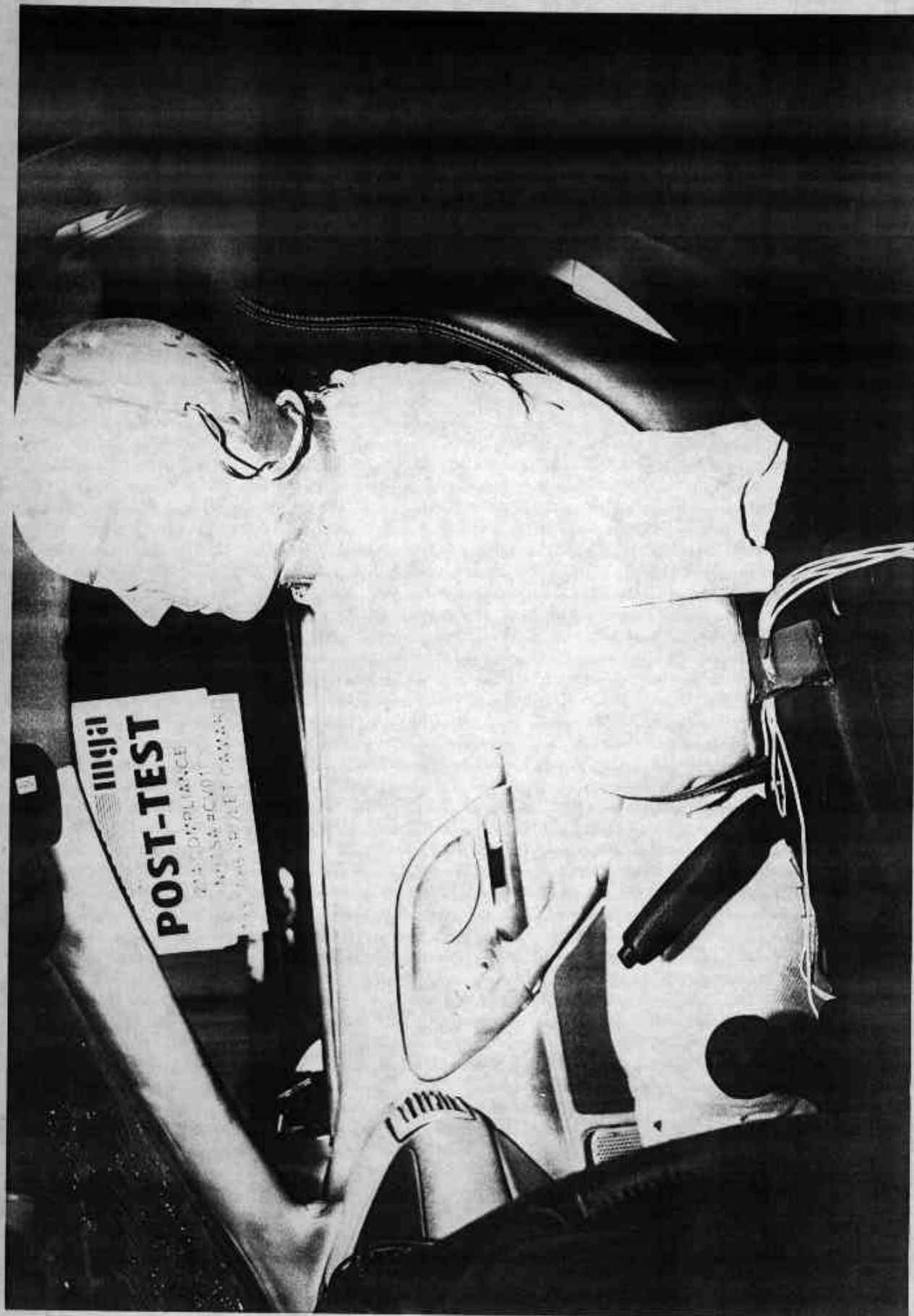


Photo No. A-22 - Post-Test Front Passenger Dummy Left Side View

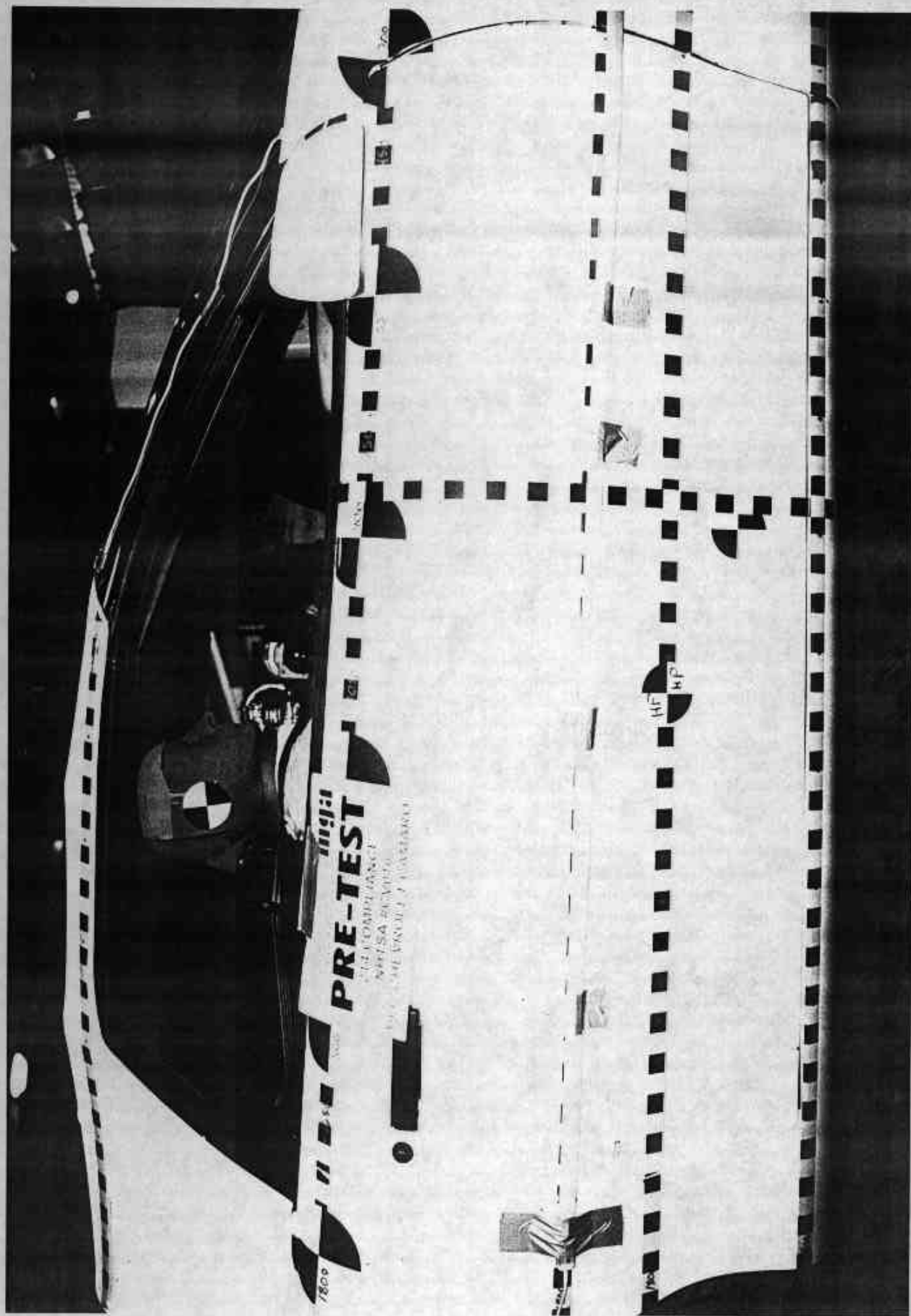
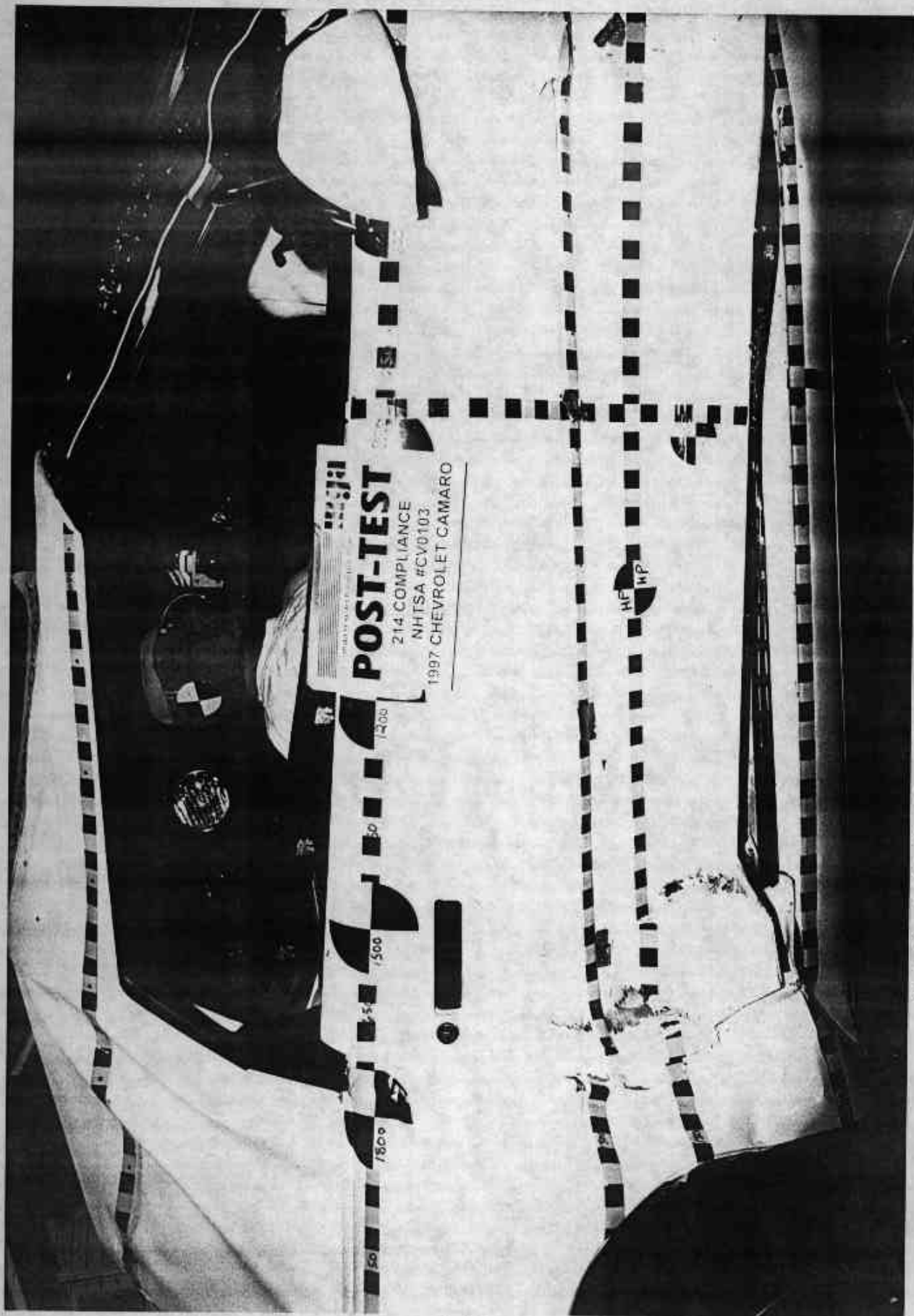


Photo No. A-23 - Pre-Test Front Passenger Dummy Right Side View



A-24

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

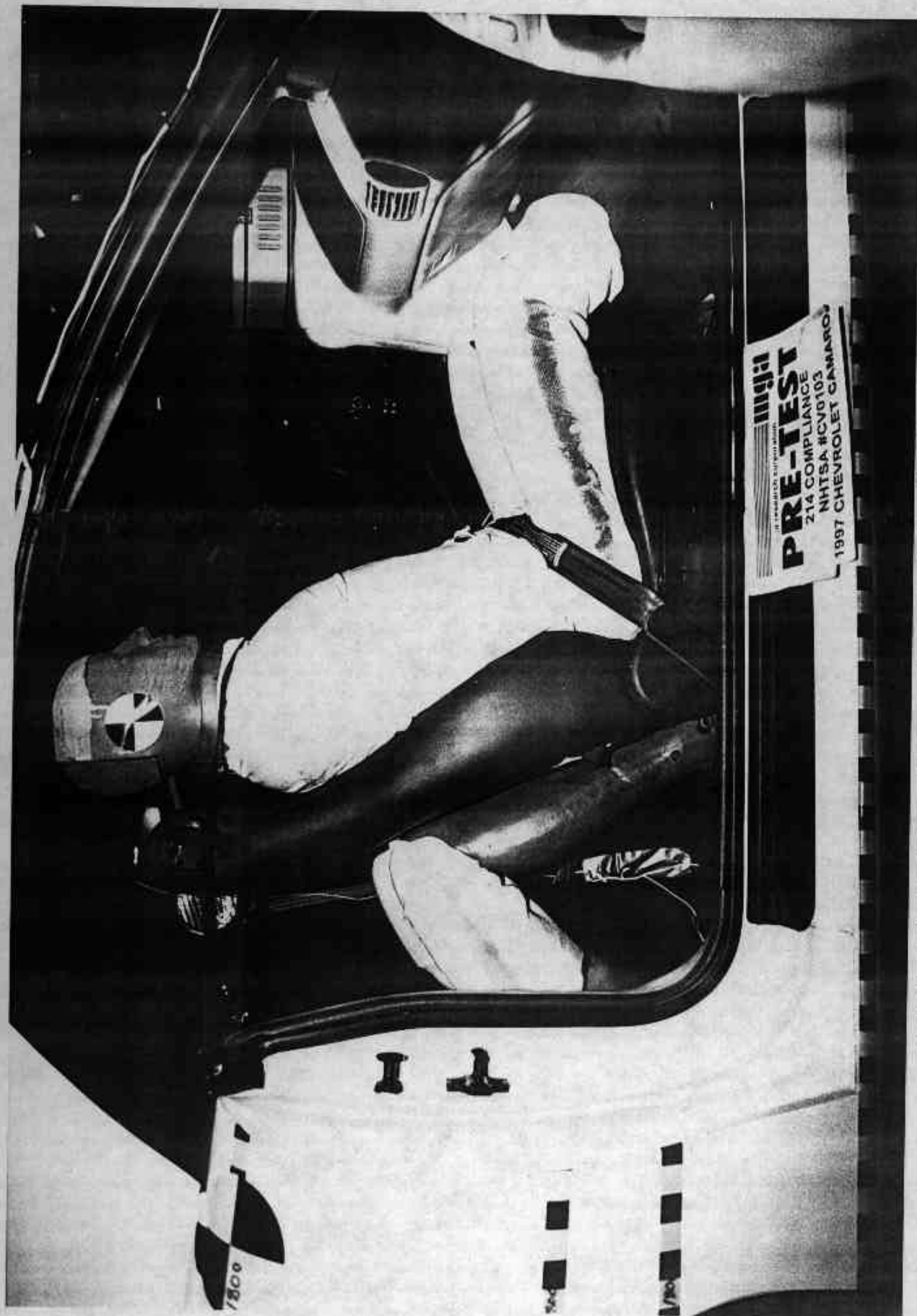


Photo No. A-25 - Pre-Test Front Passenger Dummy Right Side View (Door Open)

A-25



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

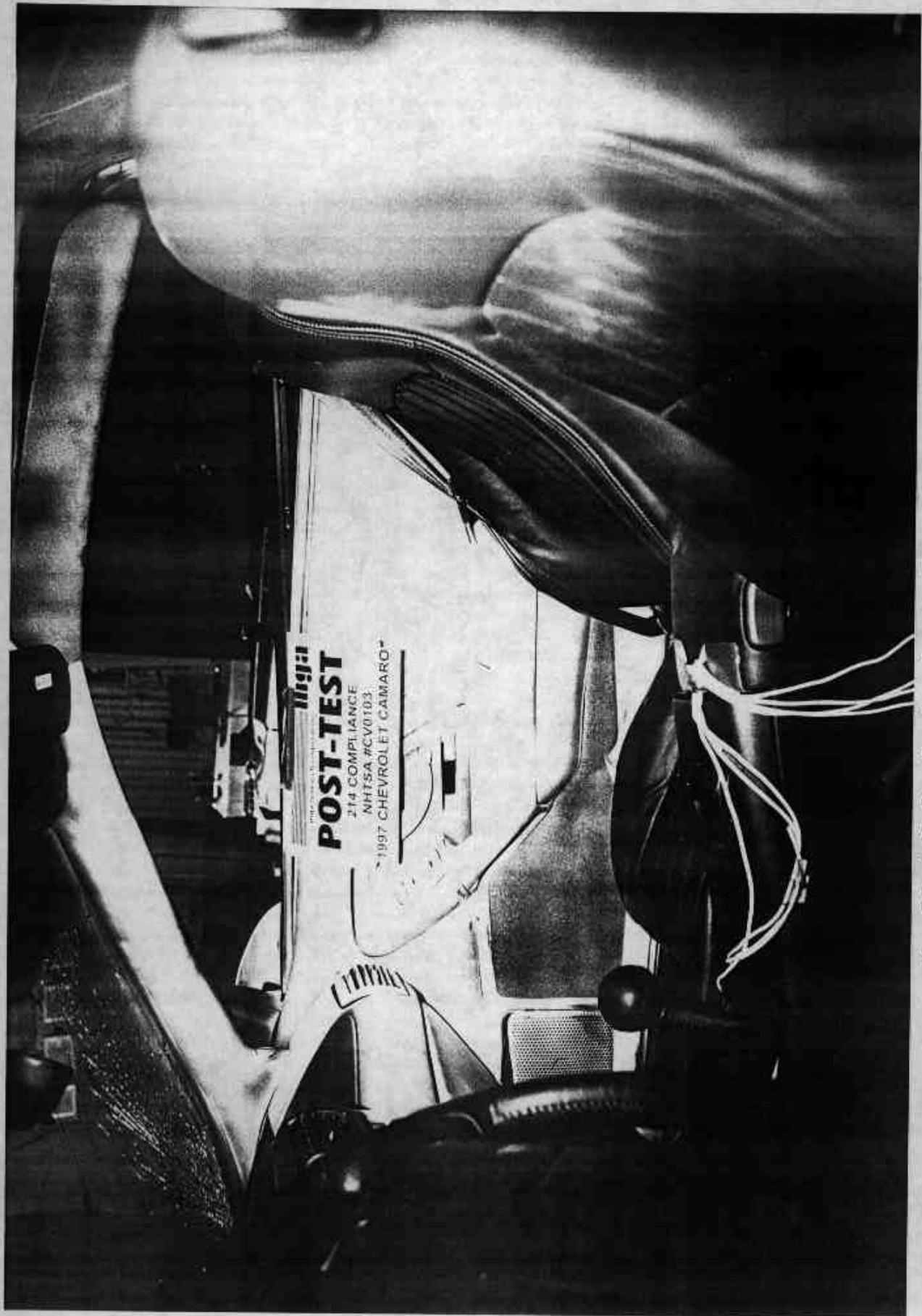


Photo No. A-28 - Post-Test Front Passenger Dummy Contact



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

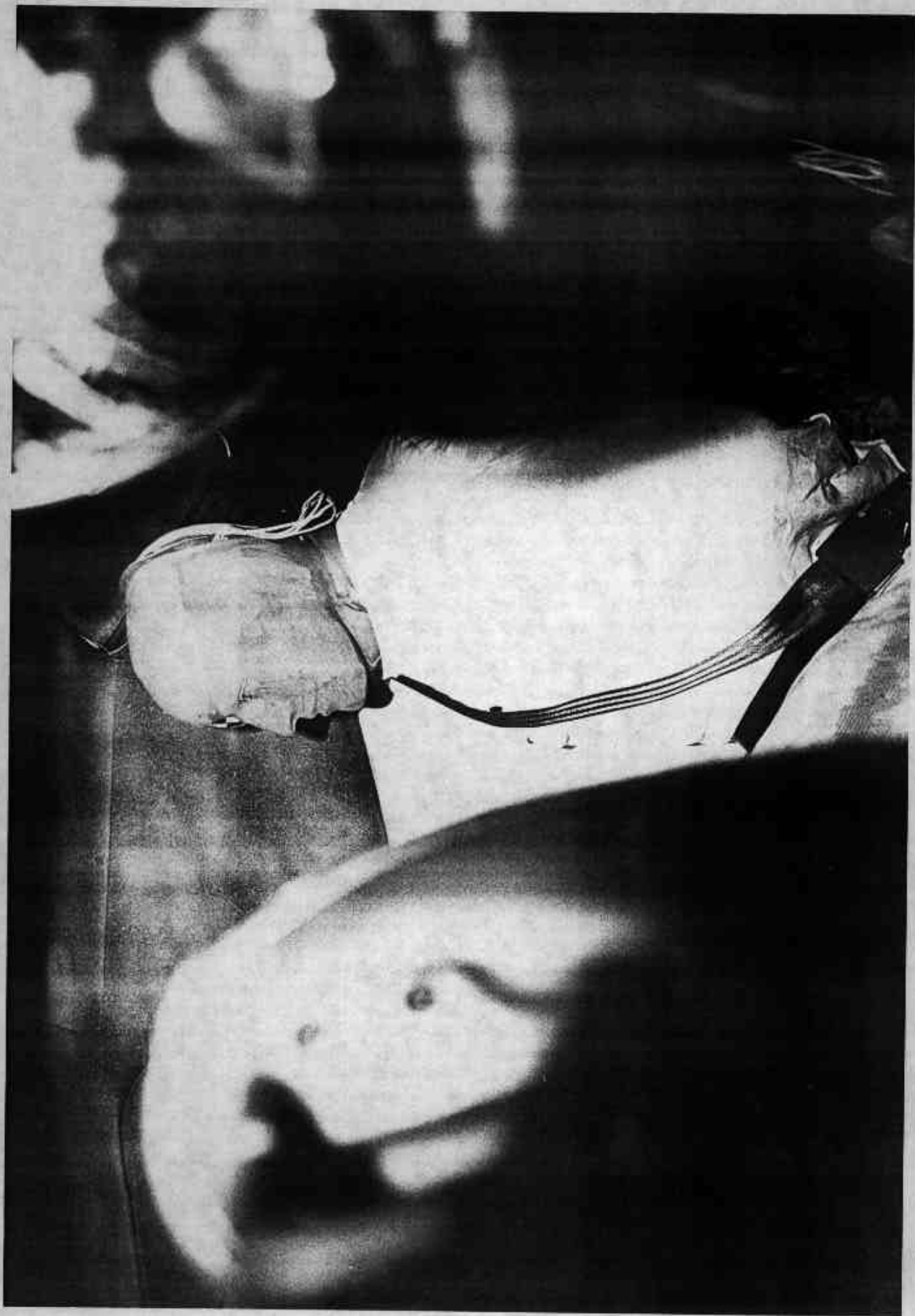


Photo No. A-30 - Pre-Test Rear Passenger Dummy Left Side View



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



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

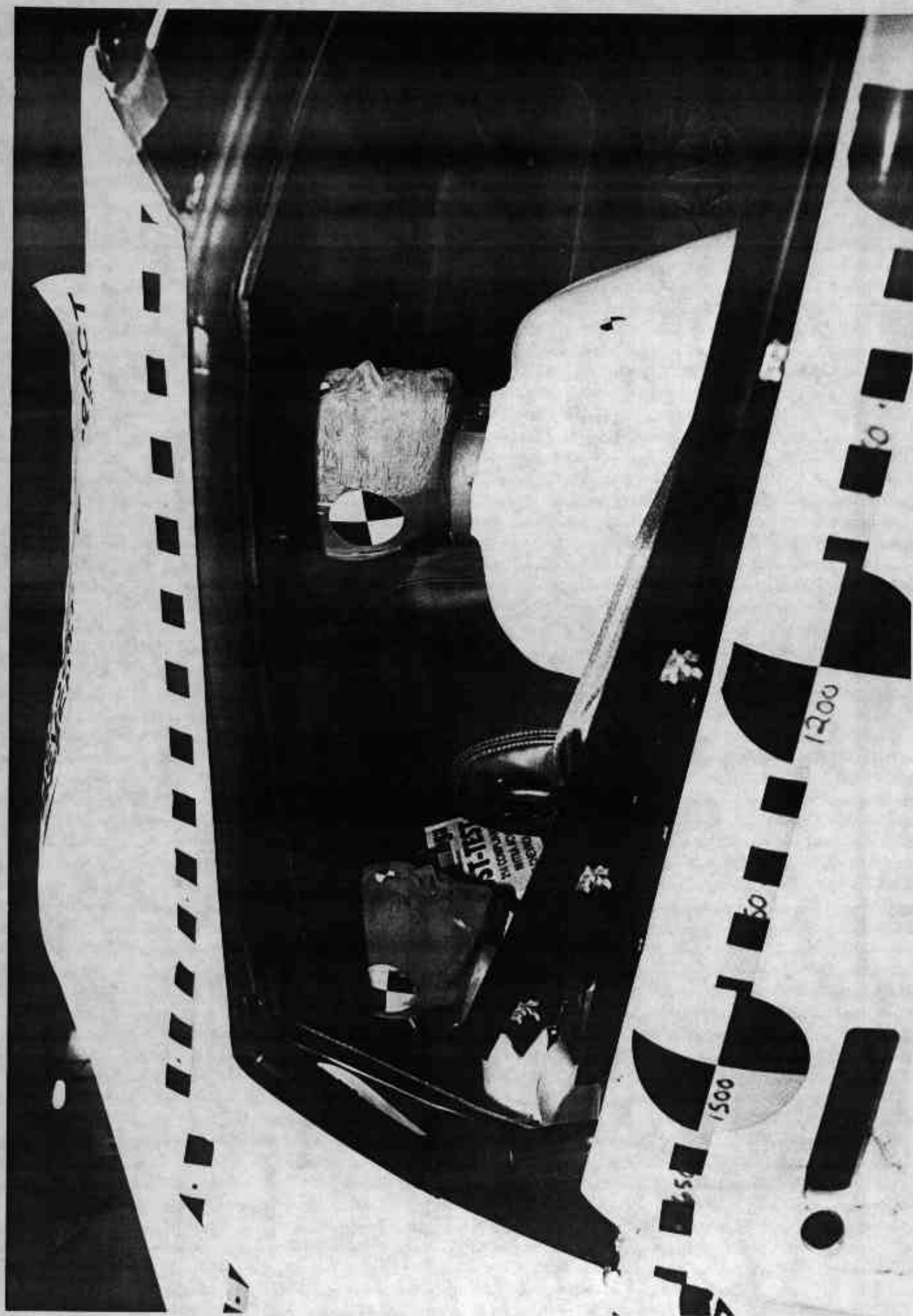


Photo No. A-33 - Post-Test Rear Passenger Dummy Right Side View

A-33



Photo No. A-34 - Post-Test Rear Passenger Dummy Contact

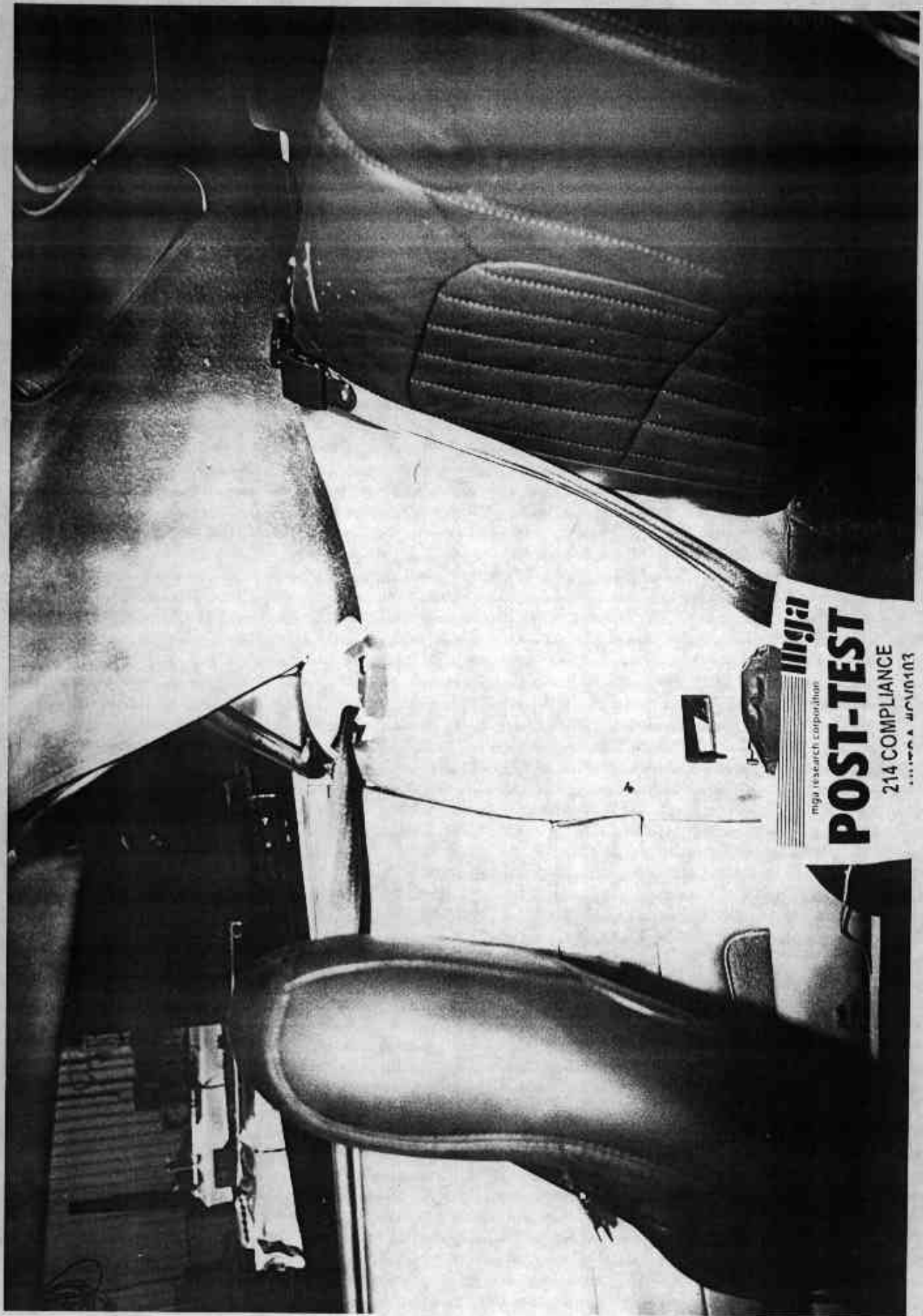


Photo No. A-35 - Post-Test Rear Passenger Dummy Head Contact

A-35



Photo No. A-36 - Pre-Test Right Front Impact Point on Vehicle

POST-TEST

WILLIAMS
CV0103

OLET CAMARO

24 KPH 90 SIDE IN
CV0103 OCT. 22,
1997 CHEVROLET CA
MGA RESEARCH C

A-37

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

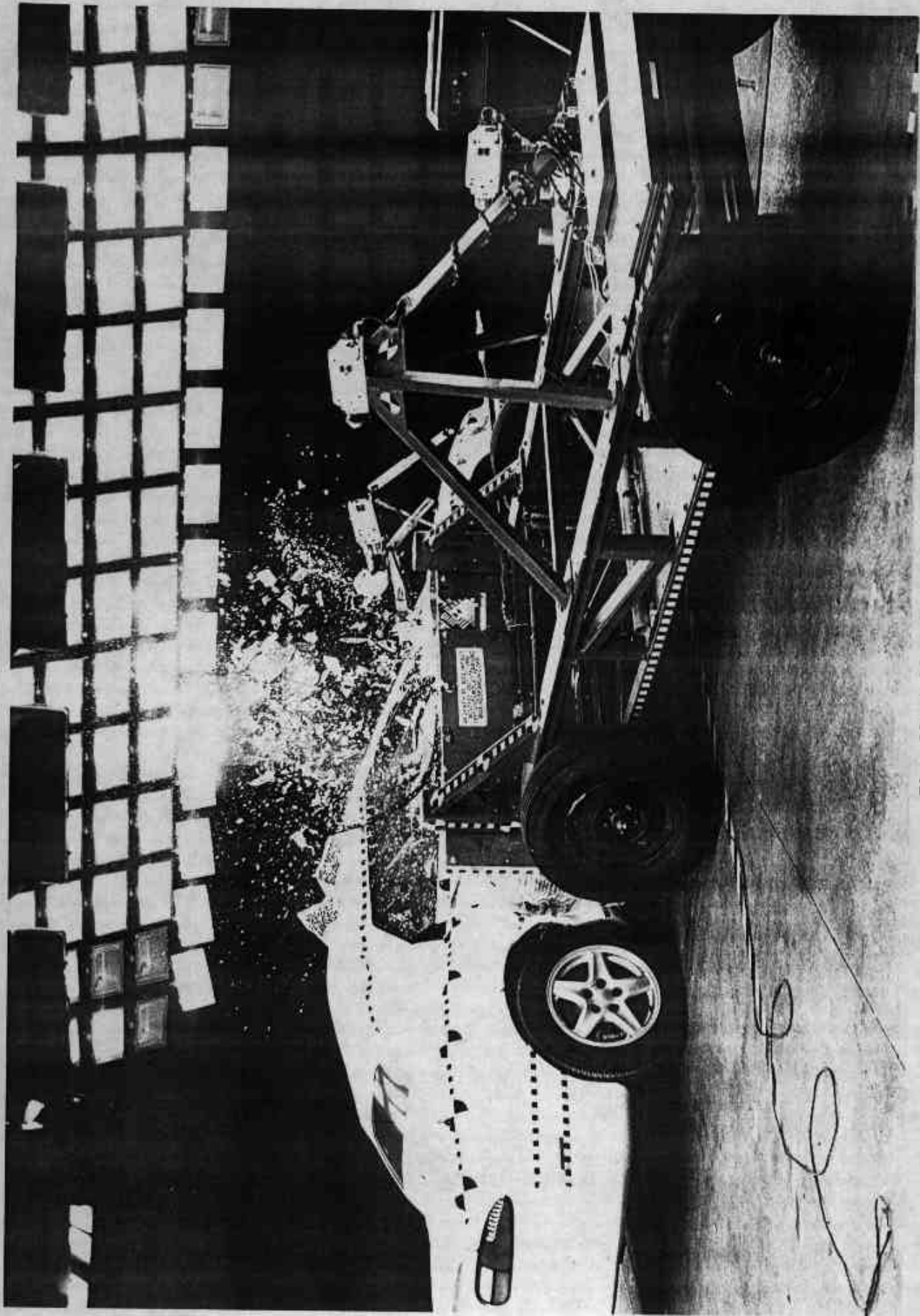


Photo No. A-38 - Impact

A-38



MFD BY GENERAL MOTORS OF CANADA LTD.

DATE	GVWR	GAWR FRT	GAWR RR
07/96	4228 LB	2107 LB	2121 LB
	1918 KG	956 KG	962 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.

2G1FP32K2V2101755 TYPE: PASS CAR



TIRE - LOADING INFORMATION

OCCUPANTS			VEHICLE CAP. WT.		
FRT.	CTR.	RR.	TOTAL	LBS	KG
2	0	2	4	701	318

MAX. LOADING @ GVWR SAME AS VEHICLE CAPACITY WEIGHT.
2G1FP32K2V2101755

MODEL: FP67 FAK

TIRE SIZE	SPEED RTG	COLD TIRE PRESSURE
FRT P235/55R16	T	30/210 PSI/KPA
RR P235/55R16	T	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

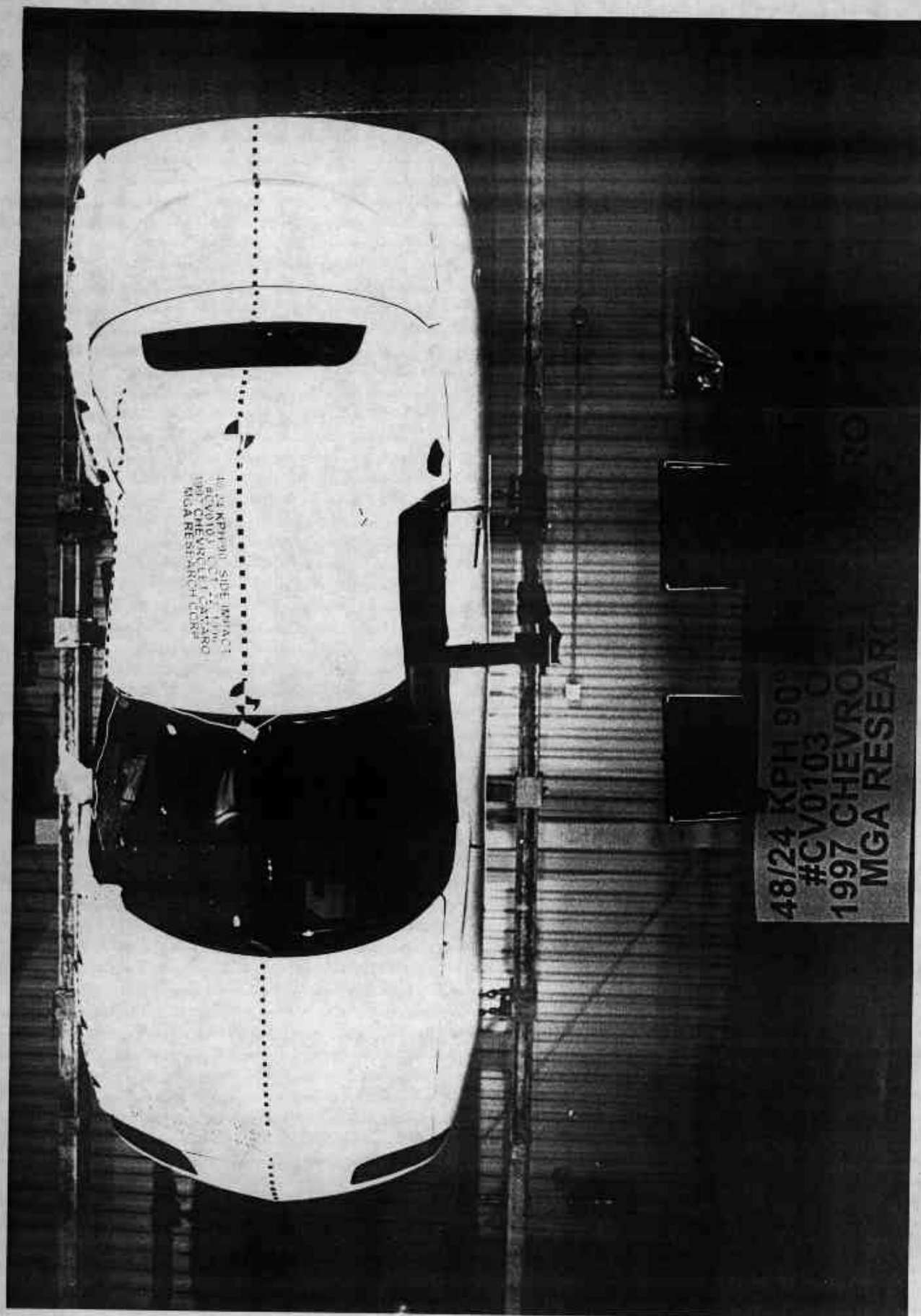


Photo No. A-40 - Rollover 90°

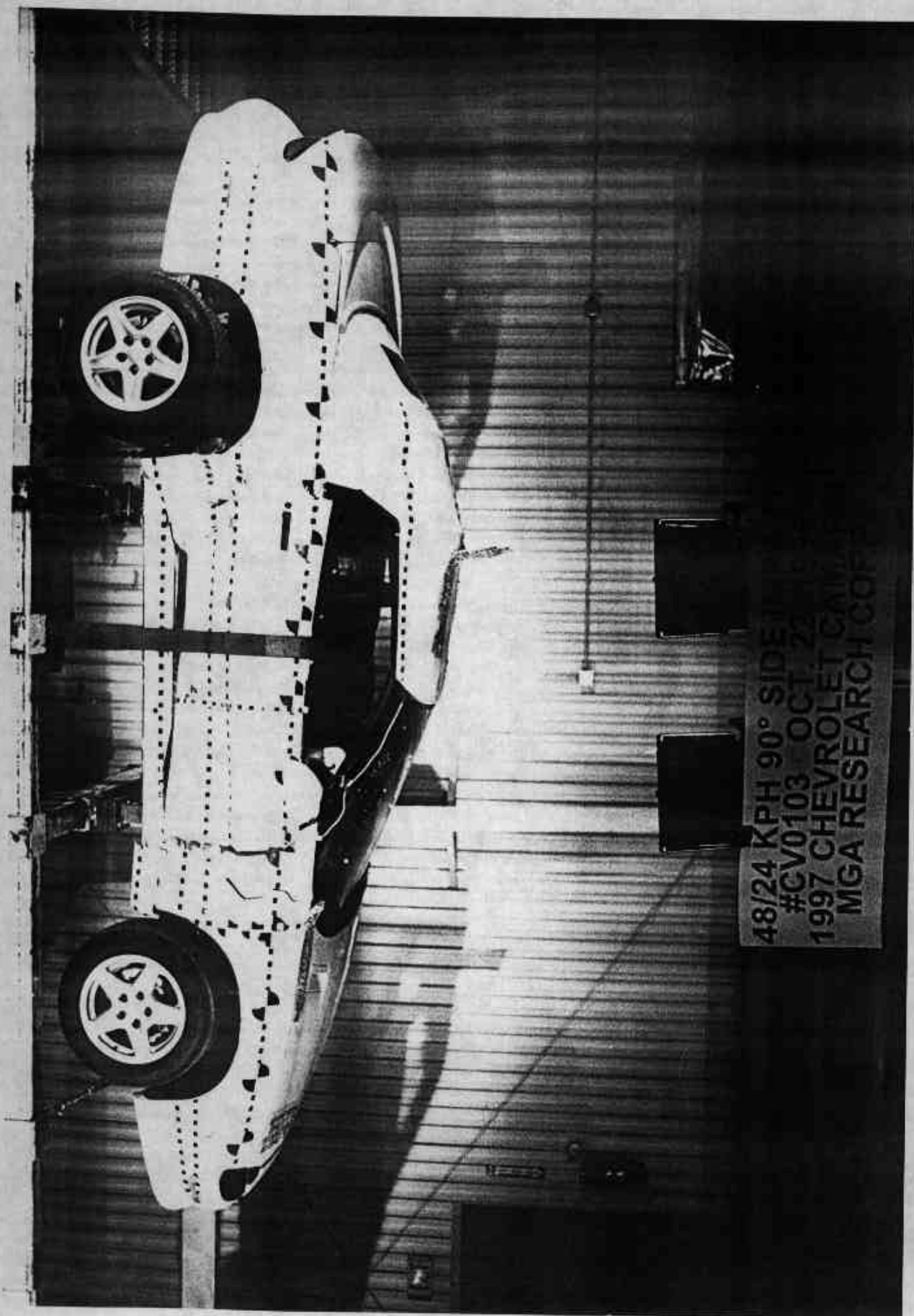


Photo No. A-41 - Rollover 180°

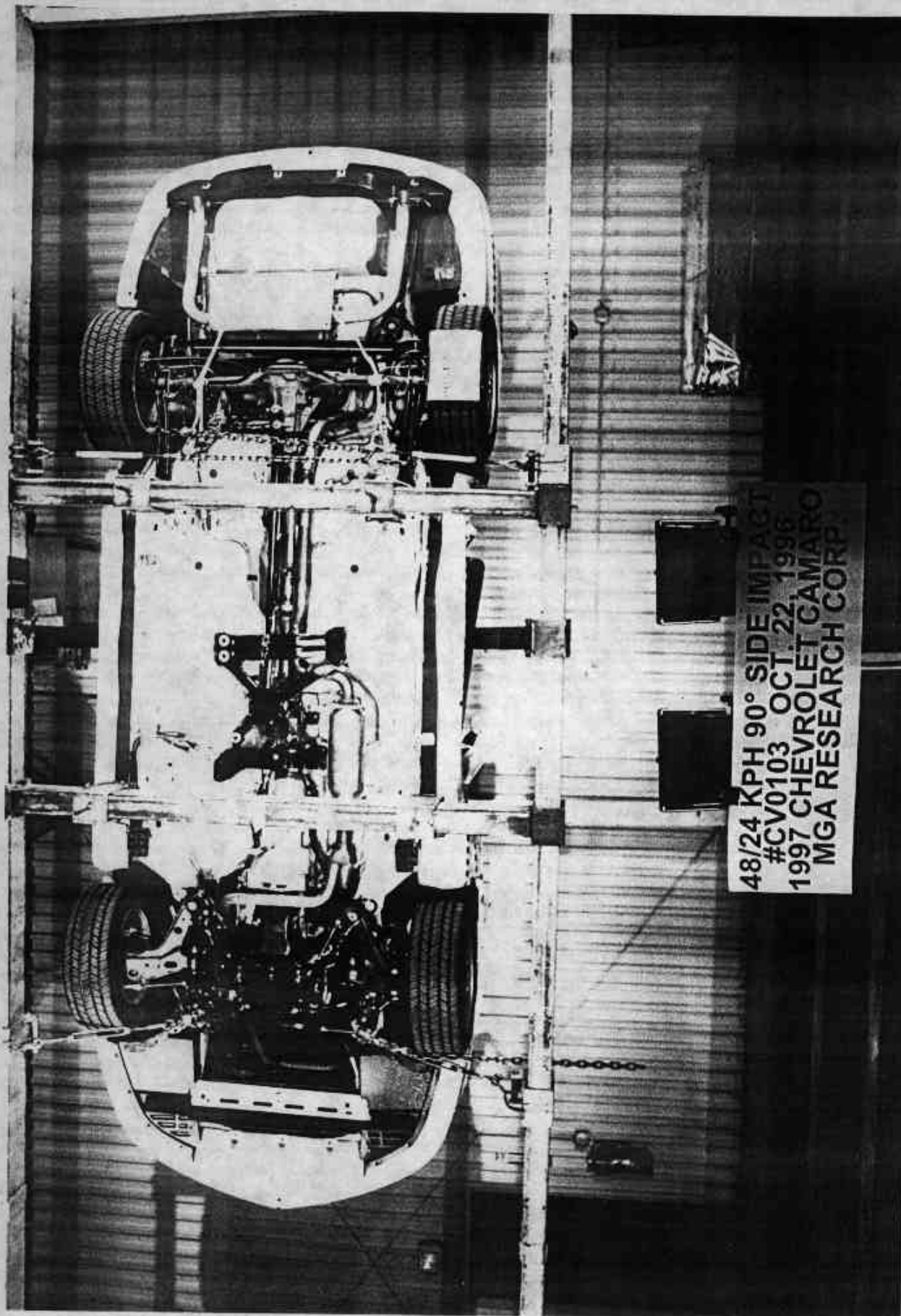


Photo No. A-42 - Rollover 270°

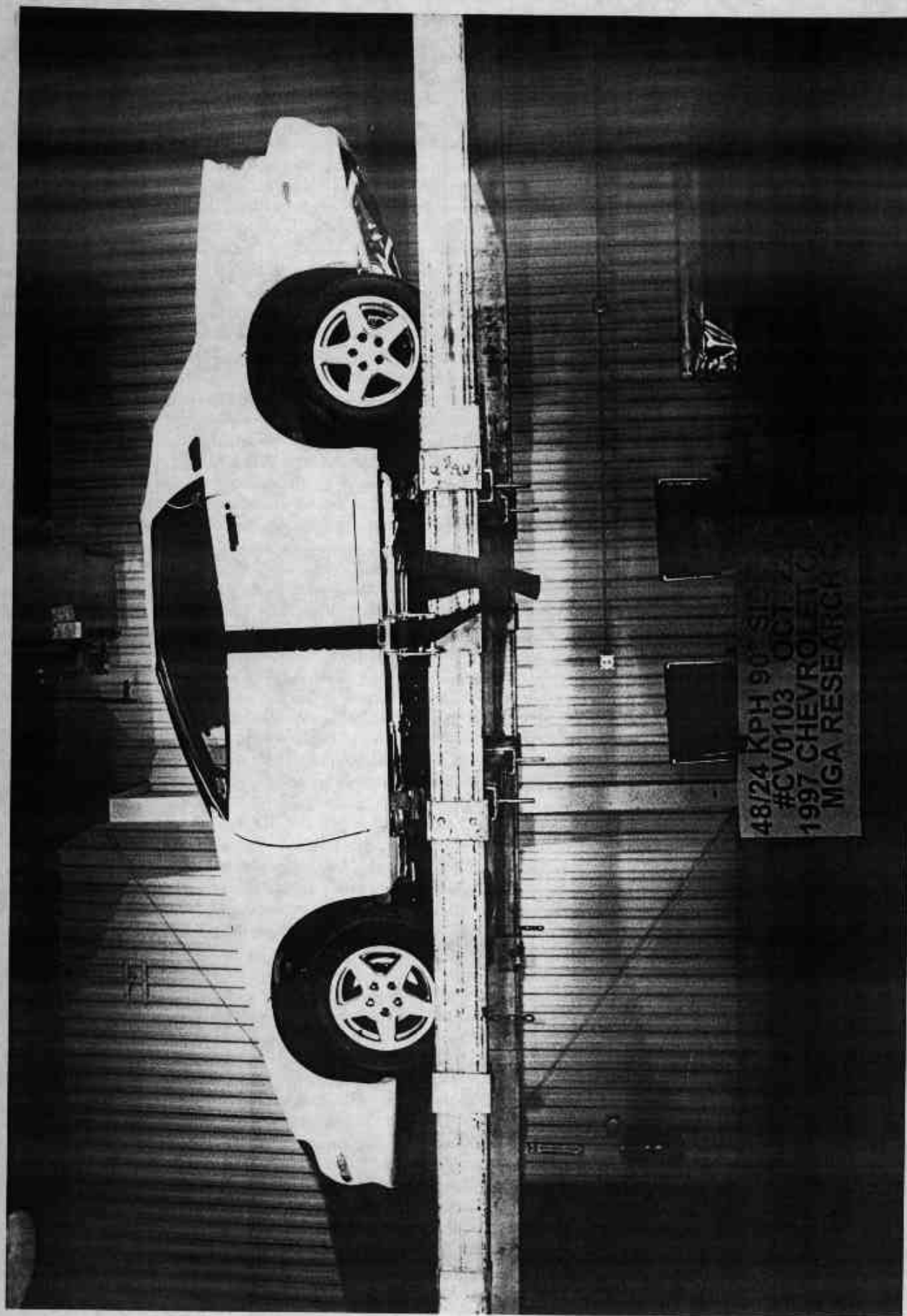


Photo No. A-43 - Rollover 360°



Photo No. A-44 - Right Front Attitude Point



PRE-TEST

214 COMPLIANCE

NHTSA #CV0103

1997 CHEVROLET CAMARO

Photo No. A-45 - Left Front Attitude Point

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PRE-TEST

214 COMPLIANCE

NHTSA #CV0103

1997 CHEVROLET CAMARO



Photo No. A-46 - Right Rear Attitude Point

PRE-TEST

21A COMPLIANCE

NHTSA #CV0103

CHEVROLET CAMARO

1474



Photo No. A-47 - Left Rear Attitude Point

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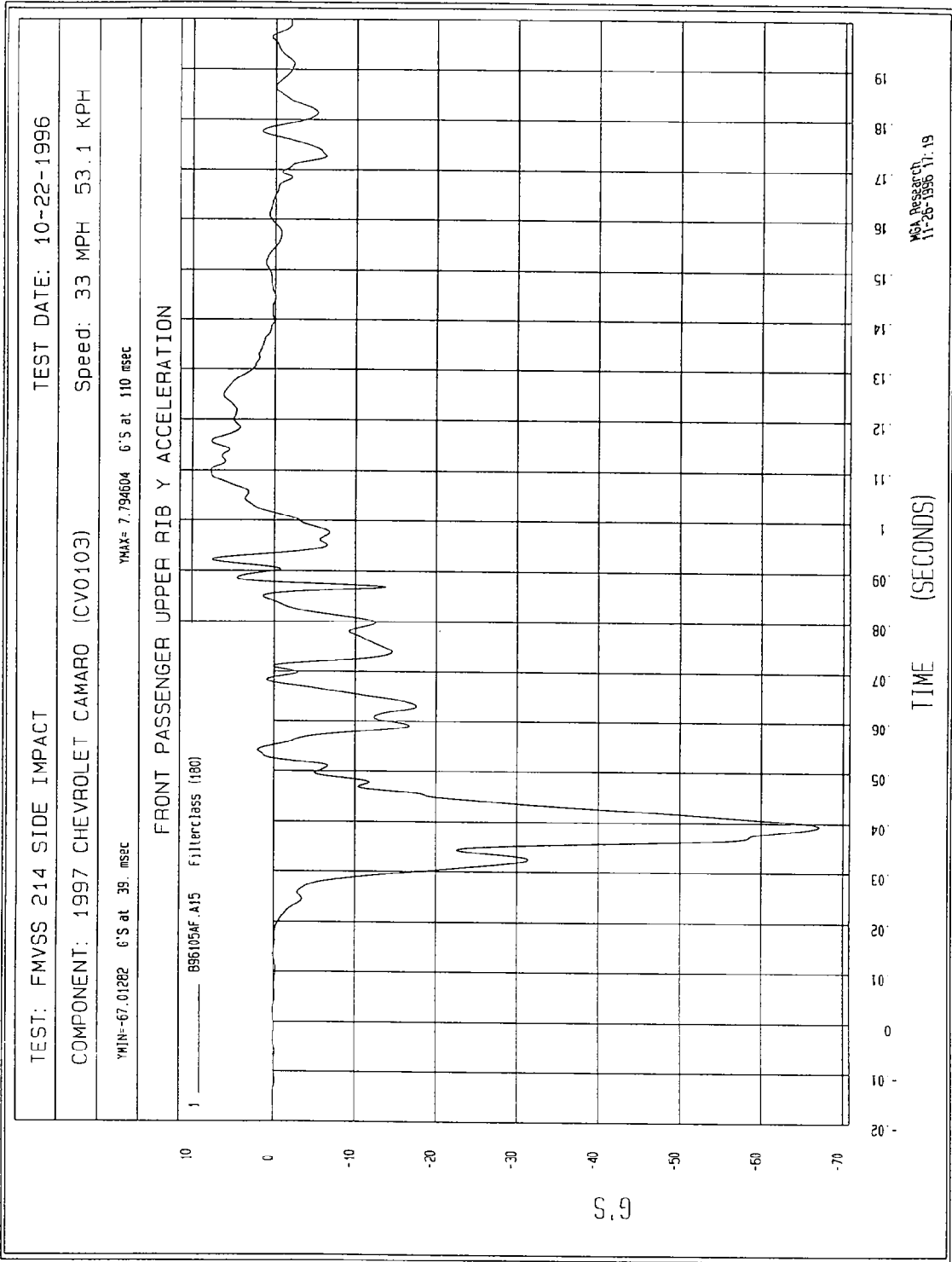
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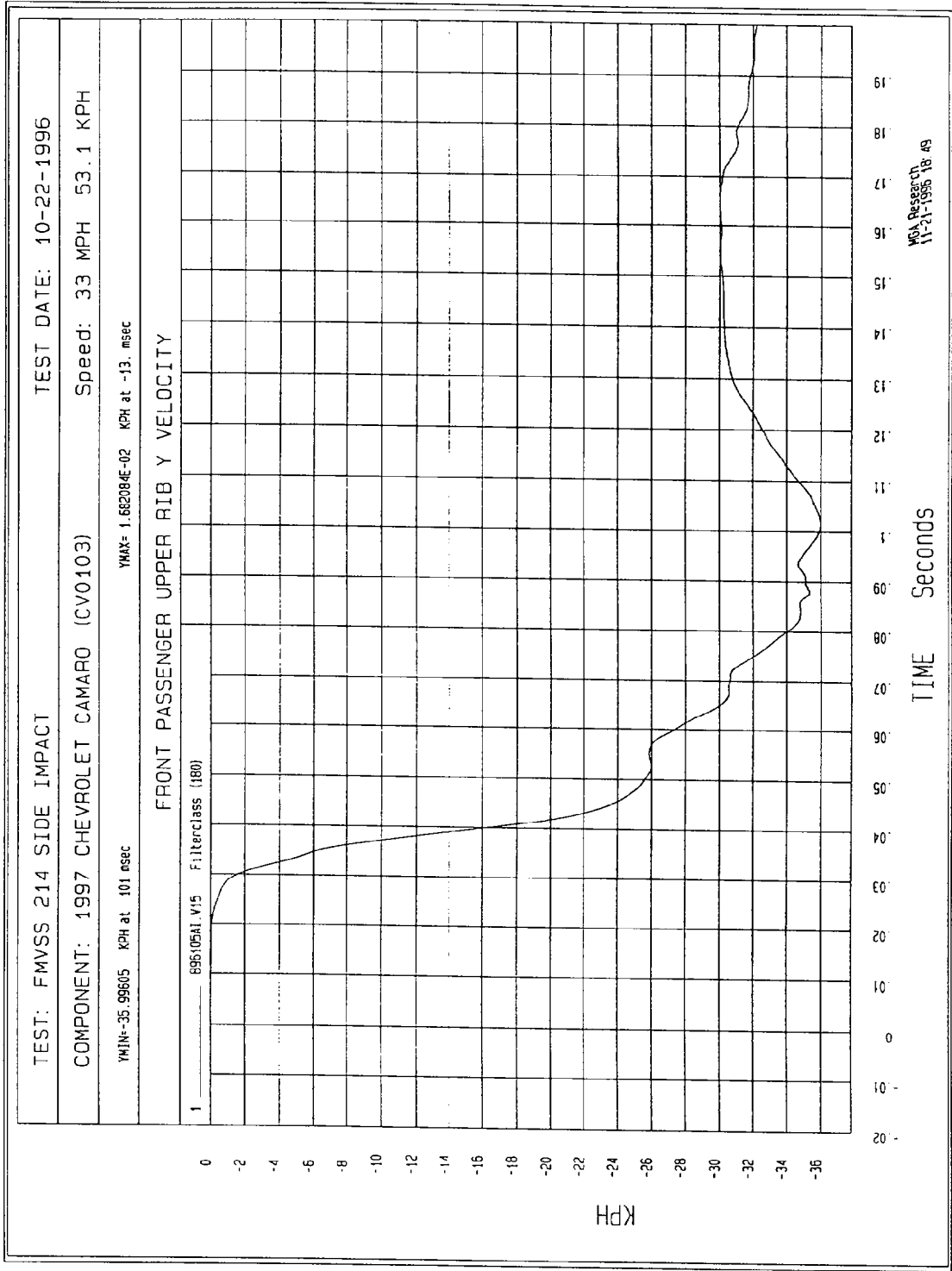
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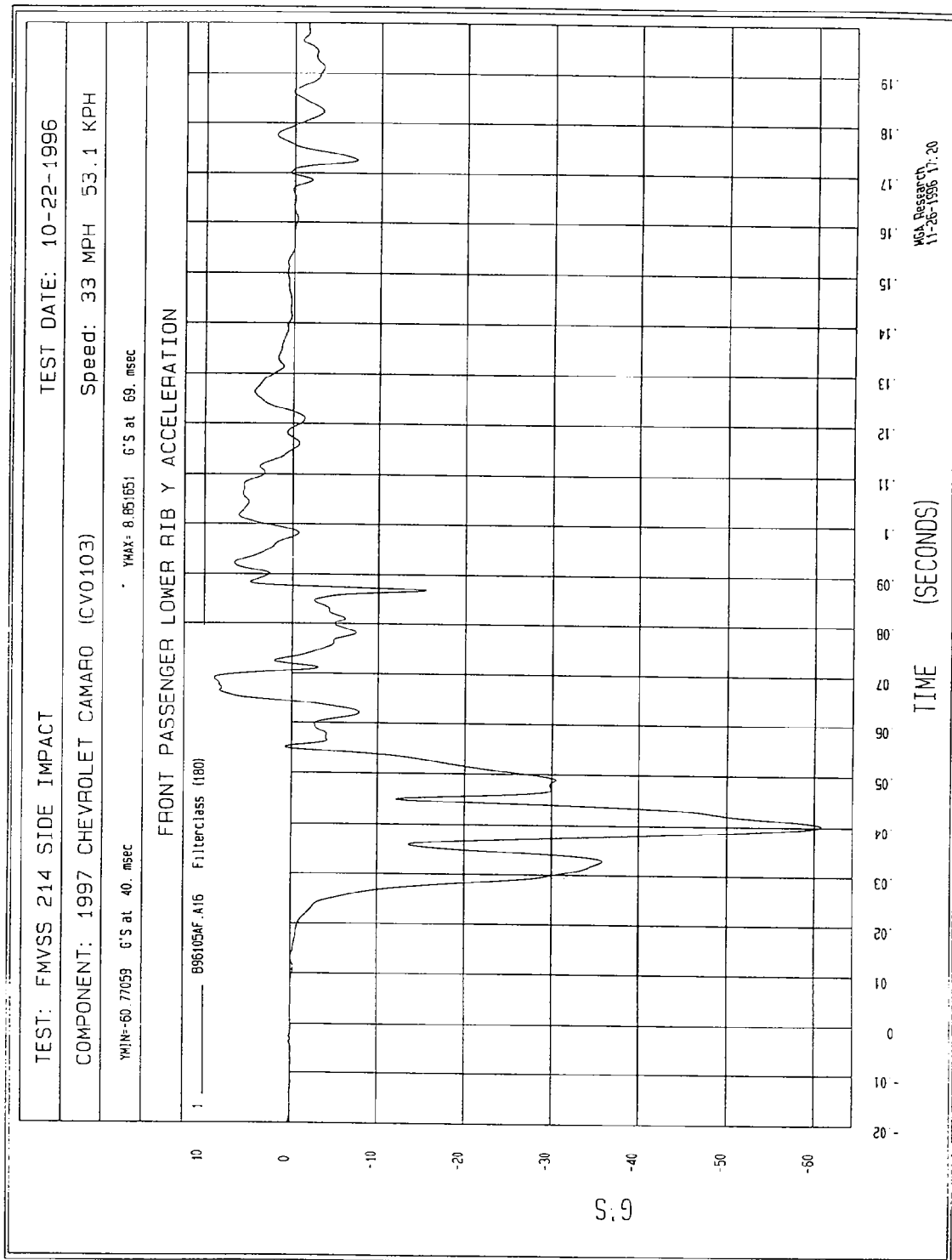
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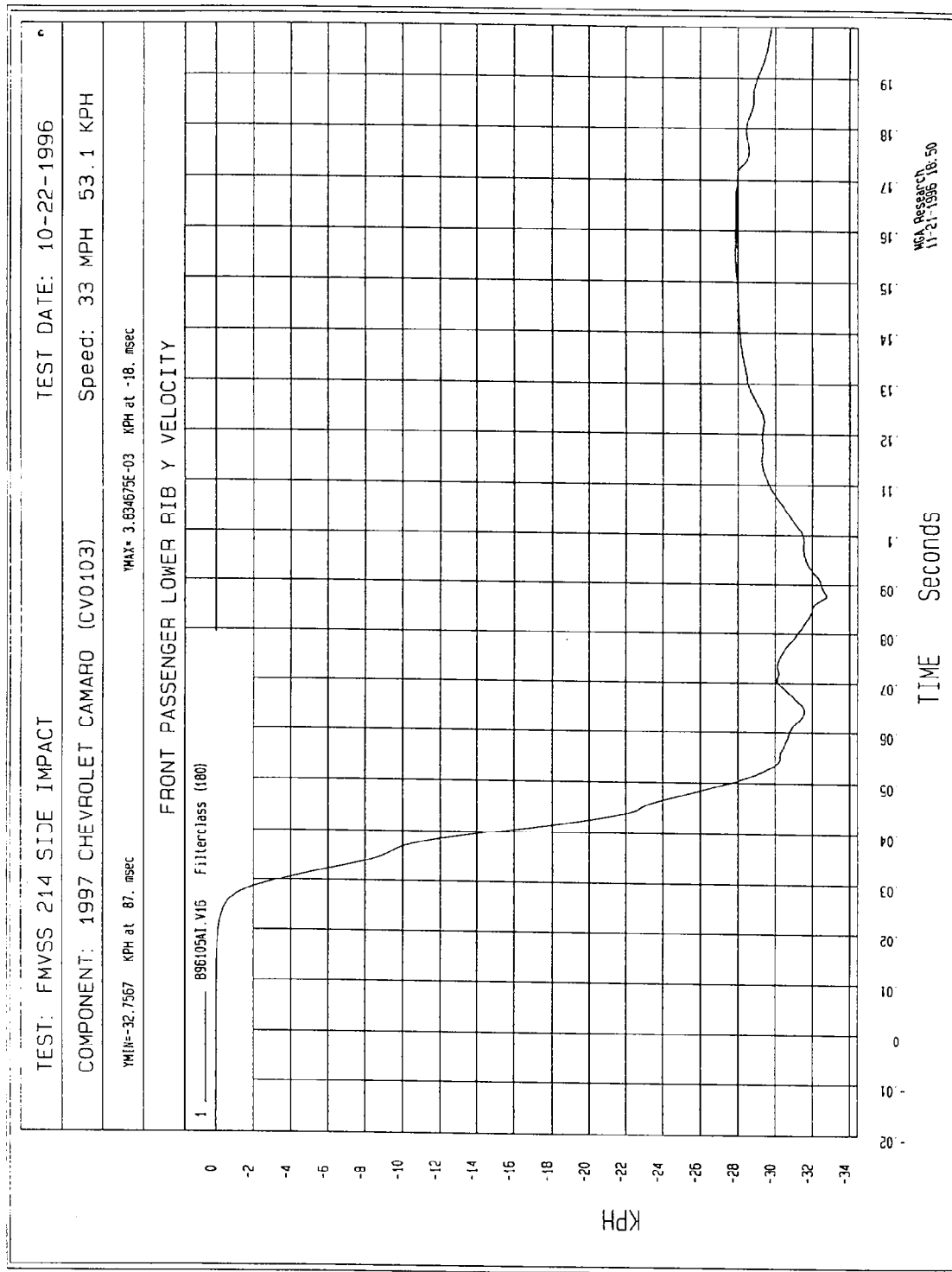
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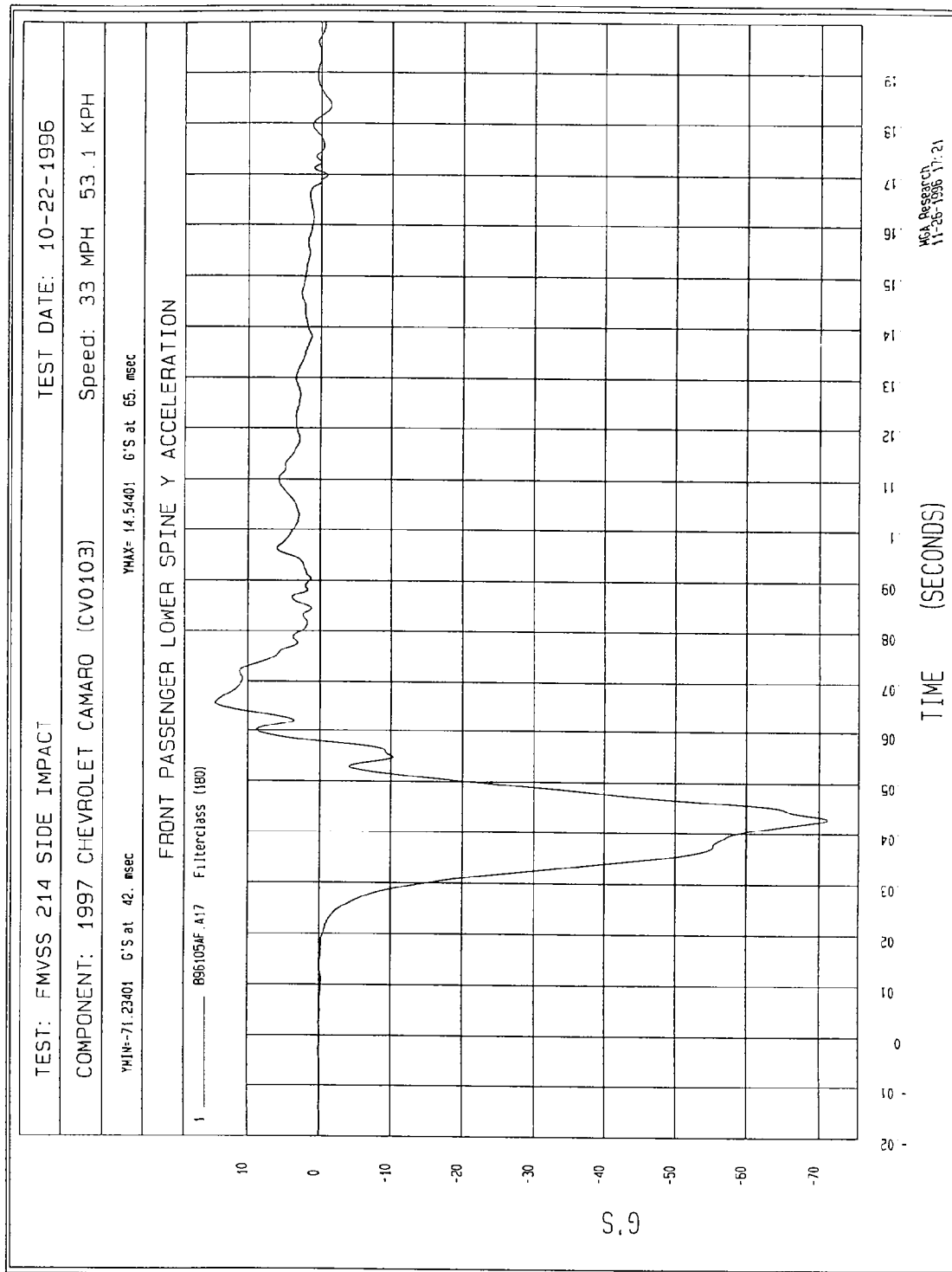
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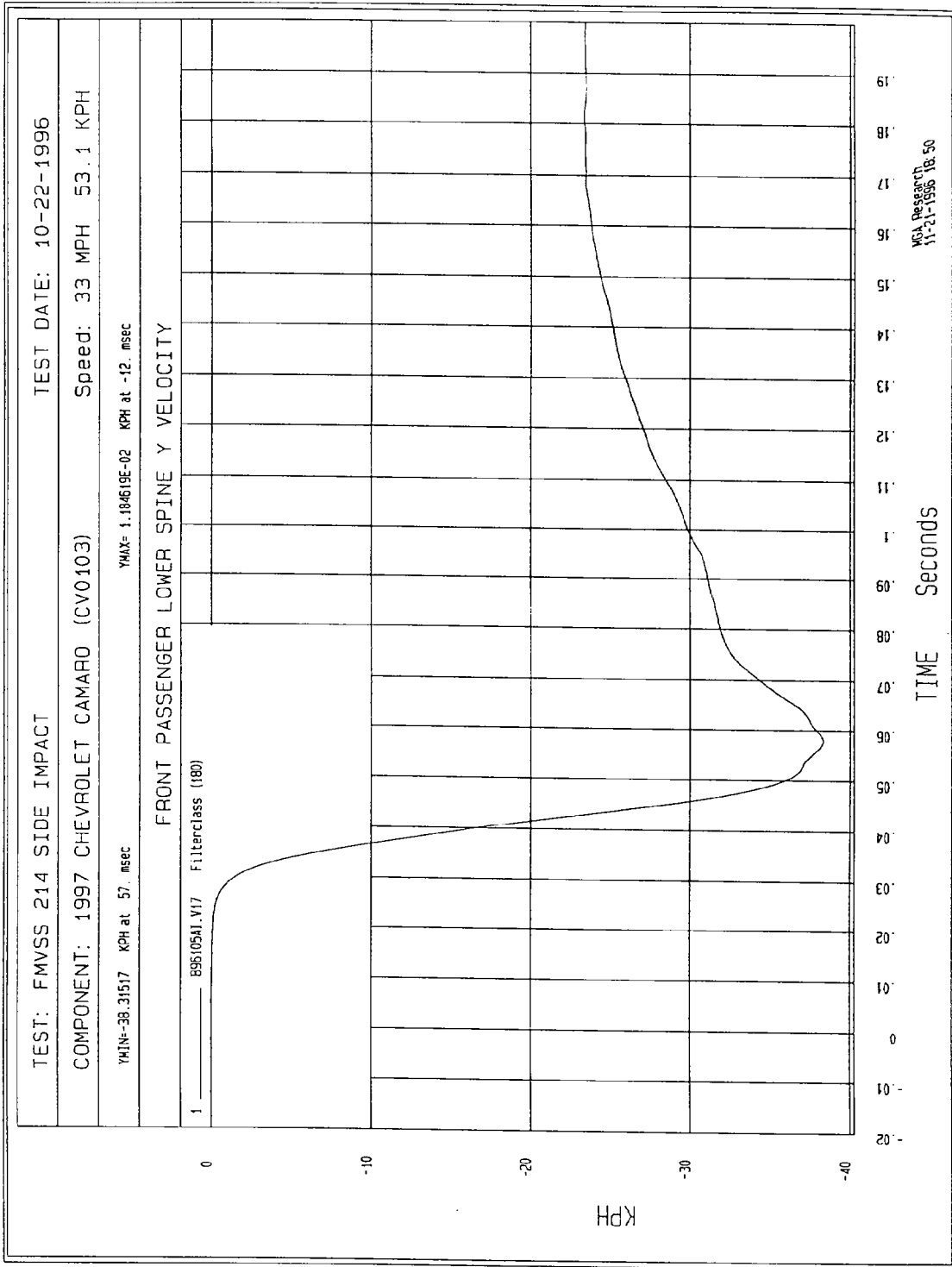


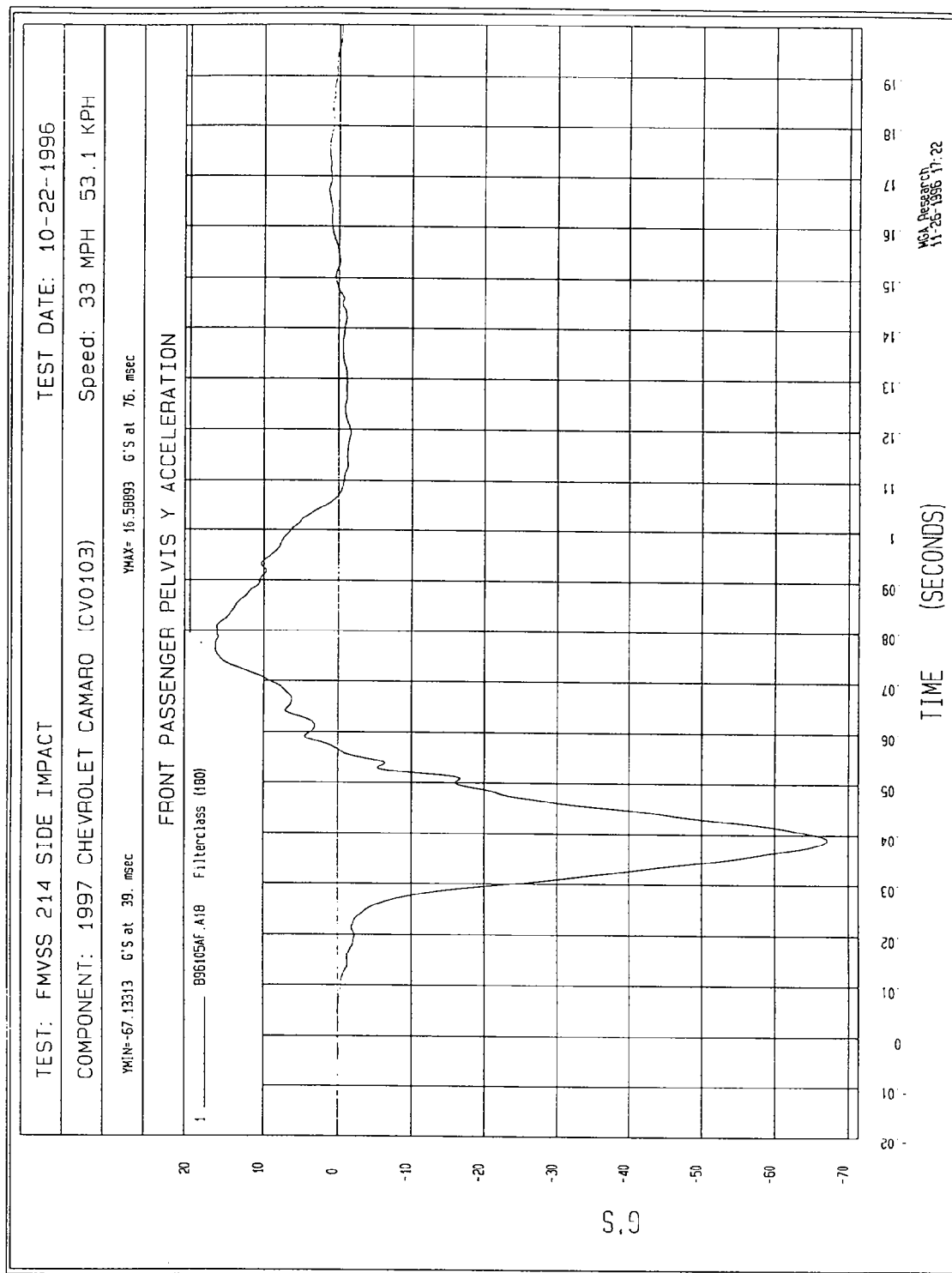


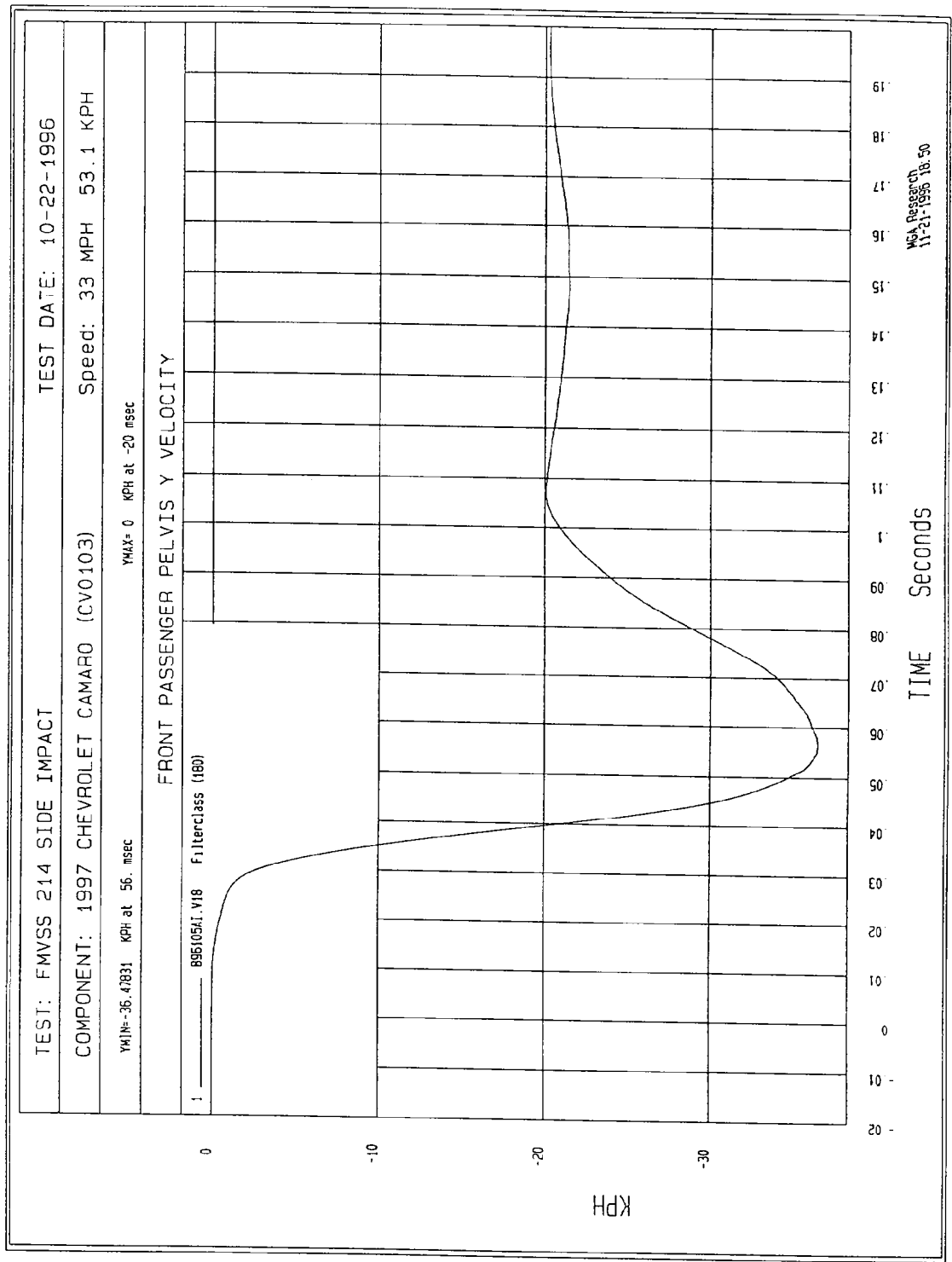


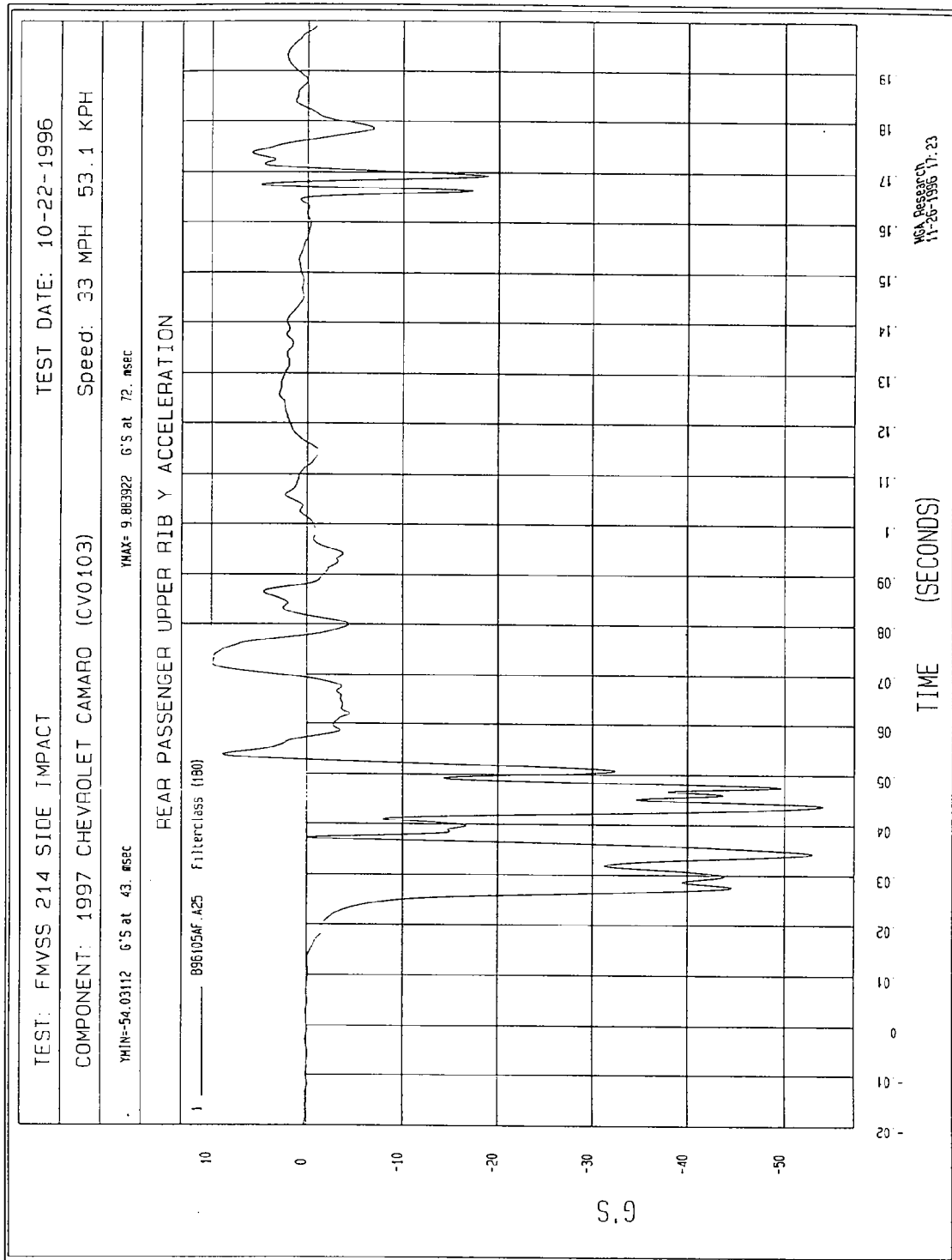


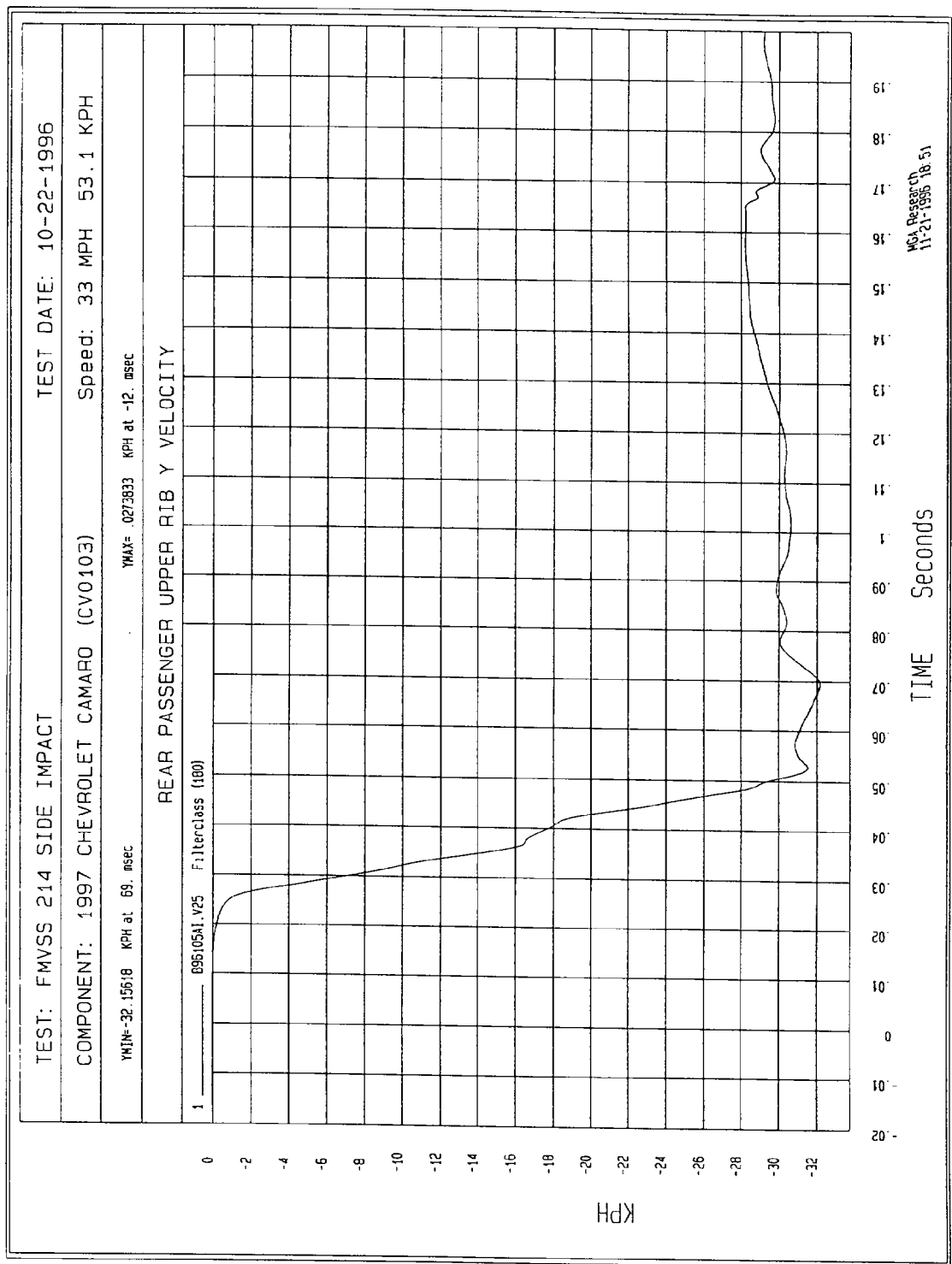












TEST DATE: 10-22-1996

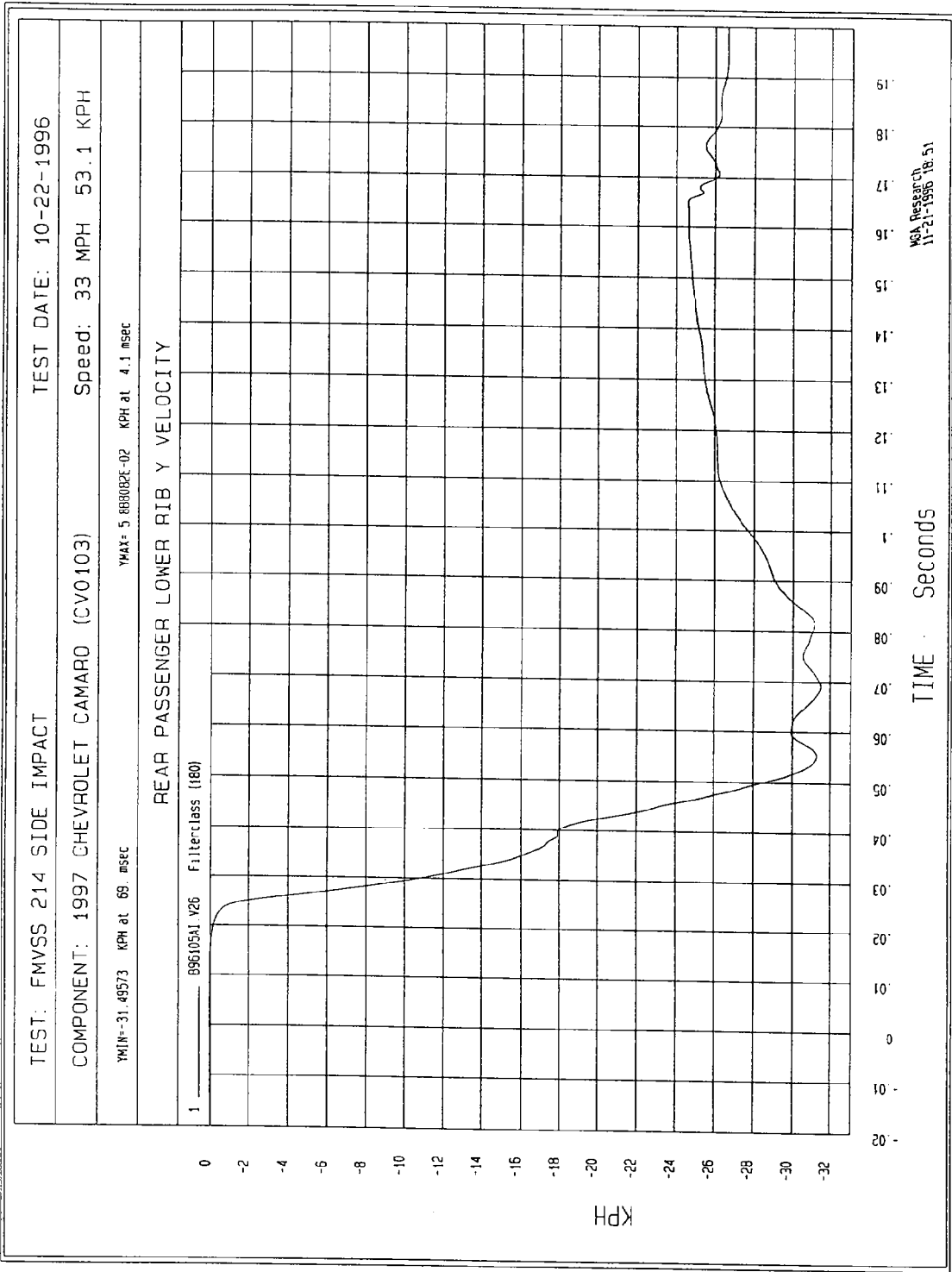
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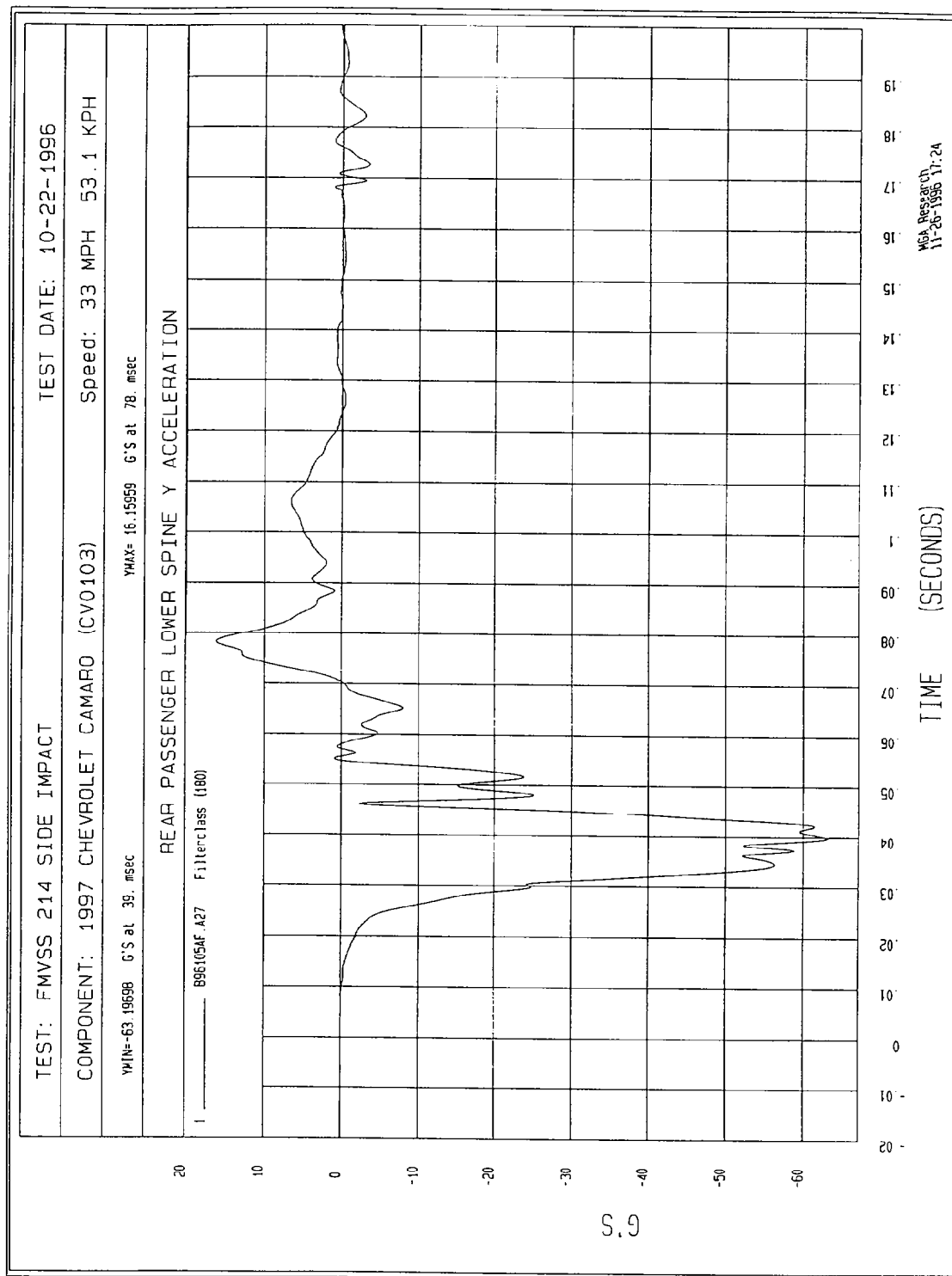
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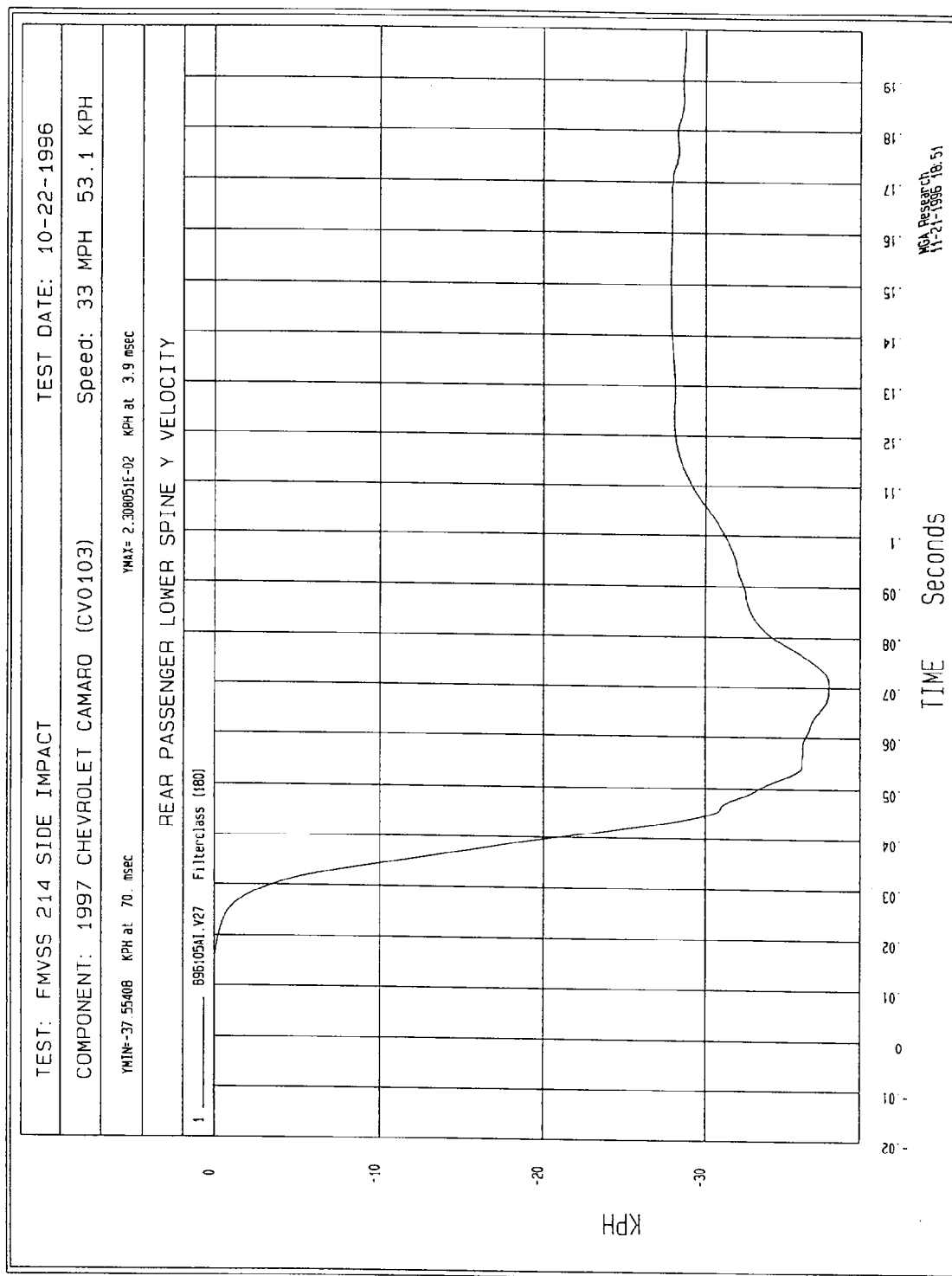
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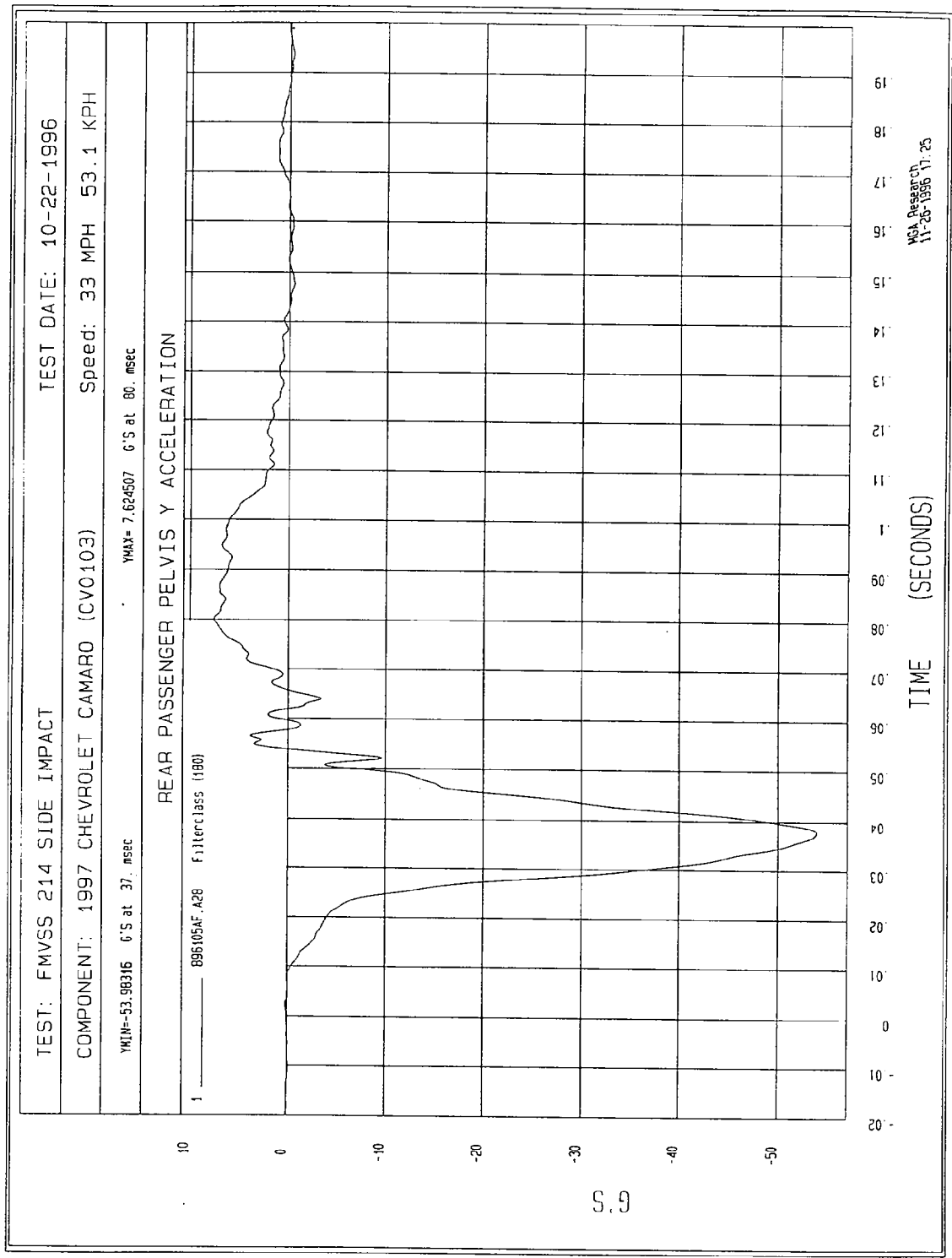
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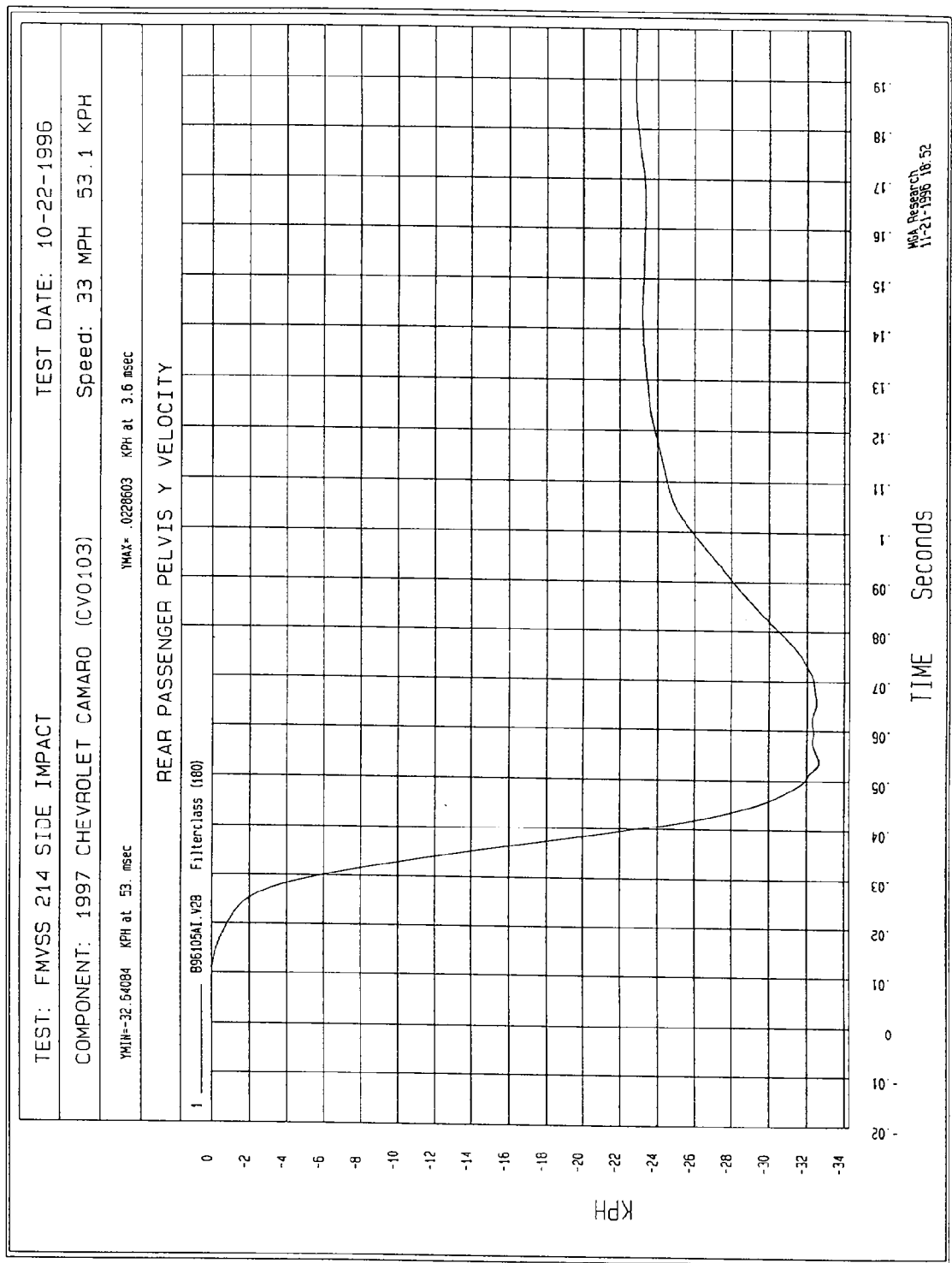


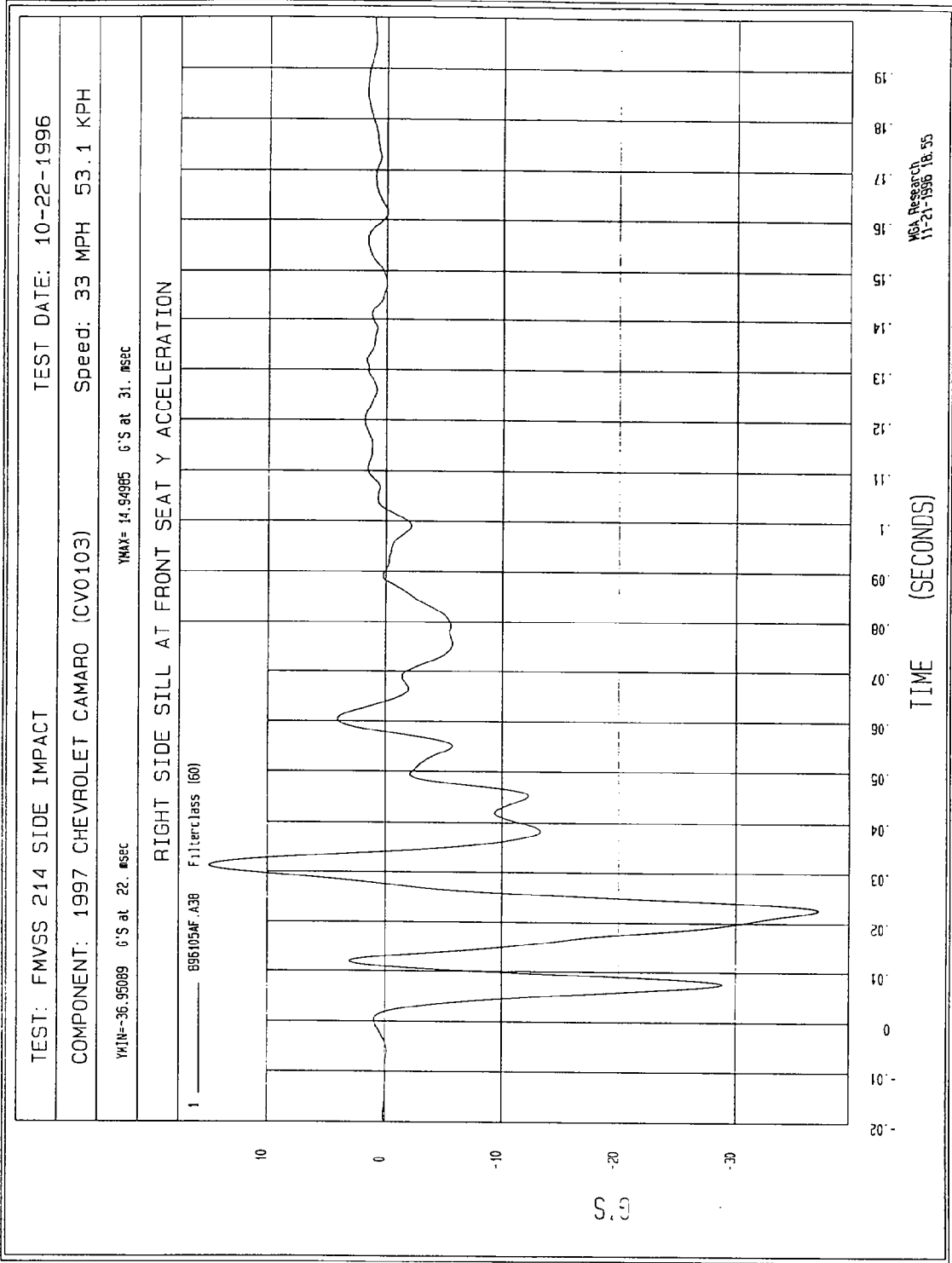


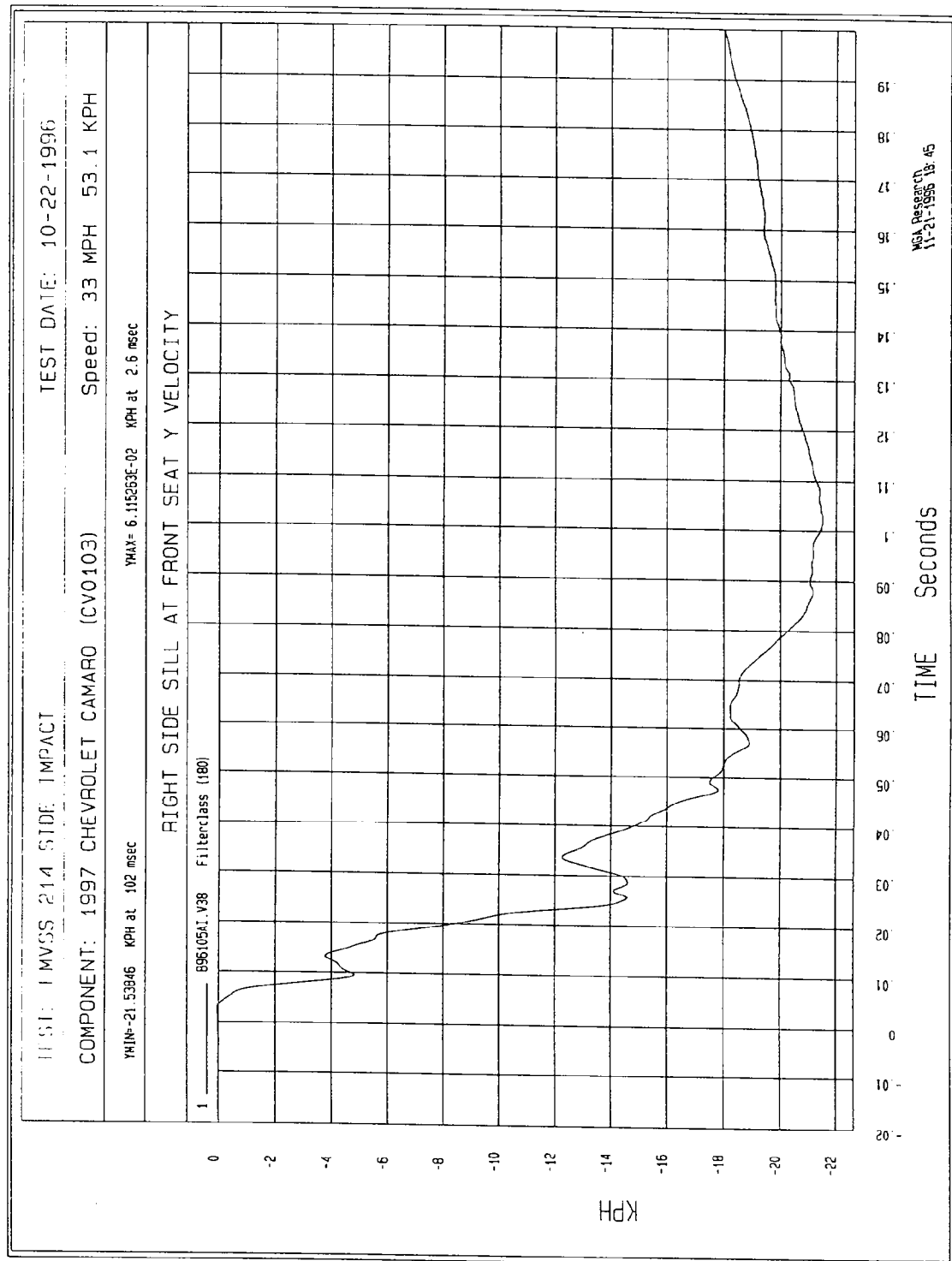


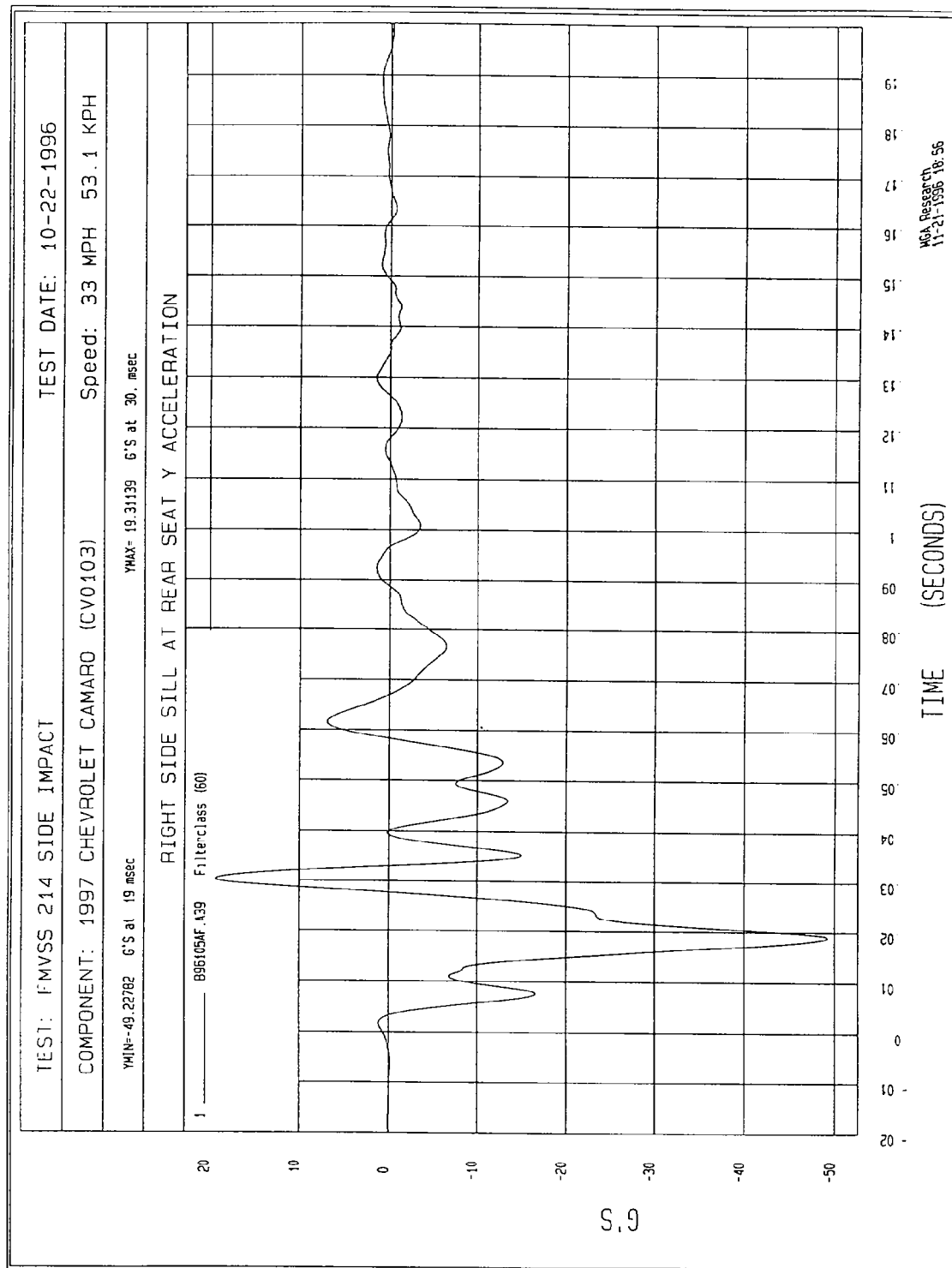


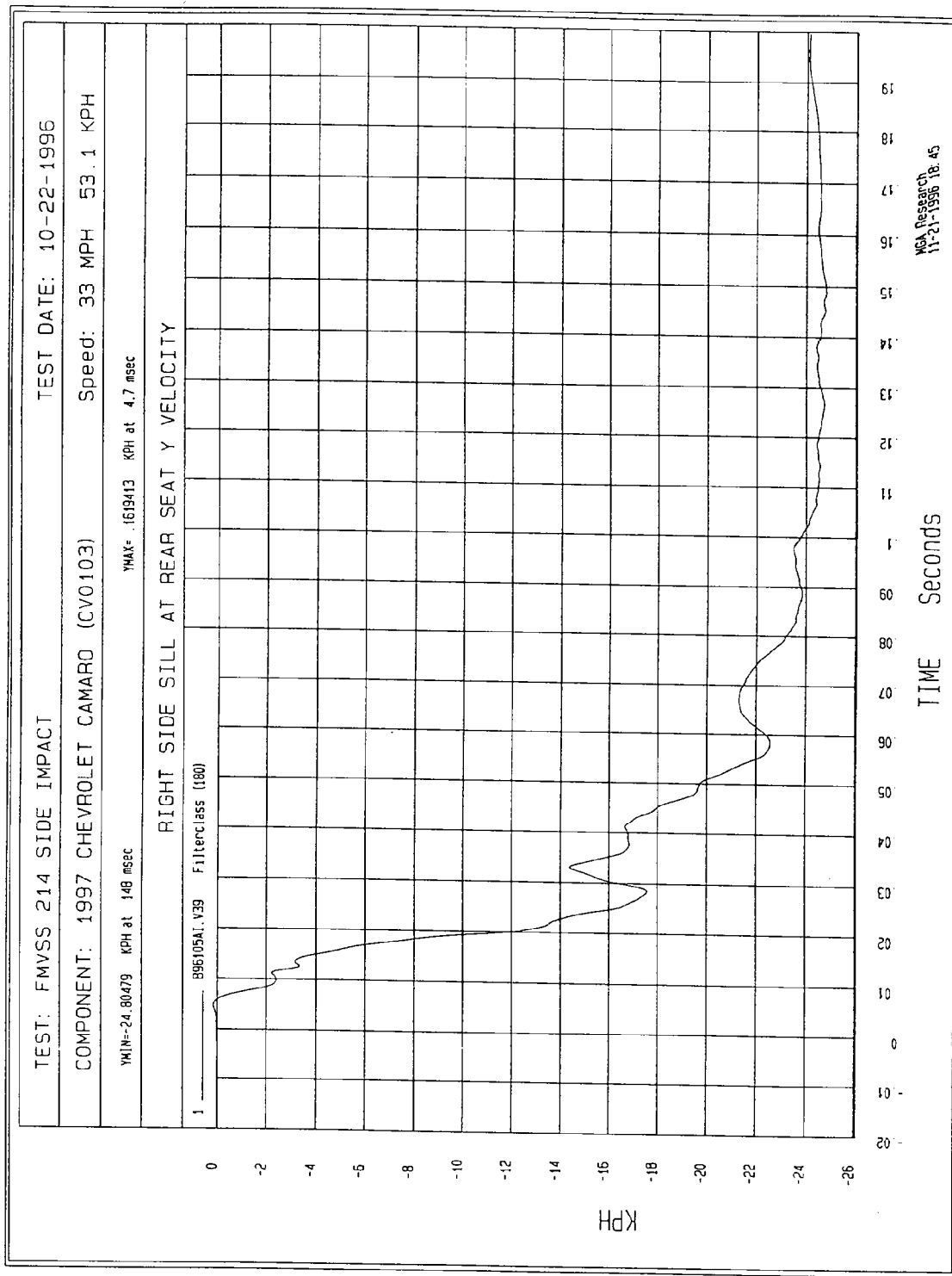


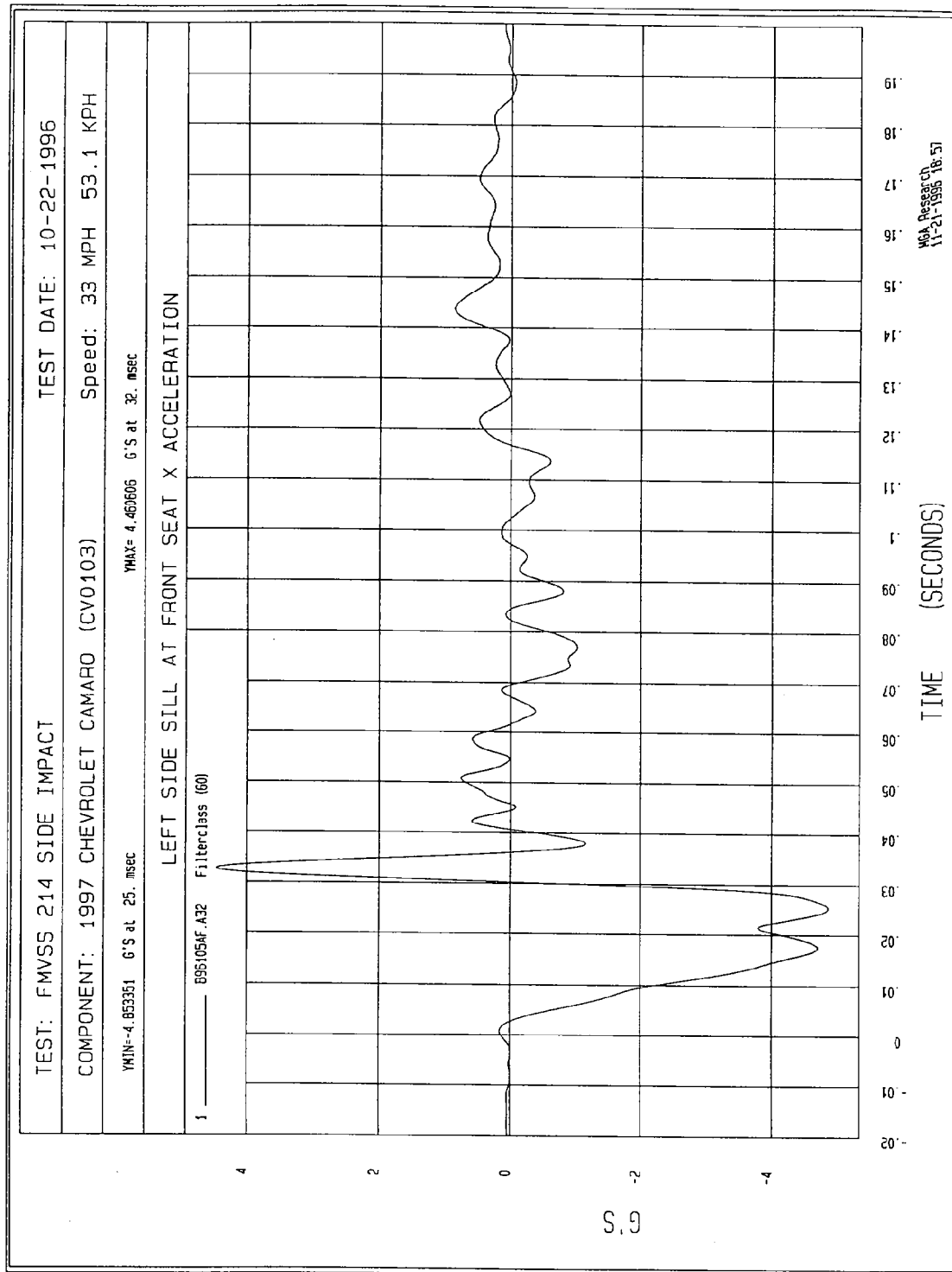


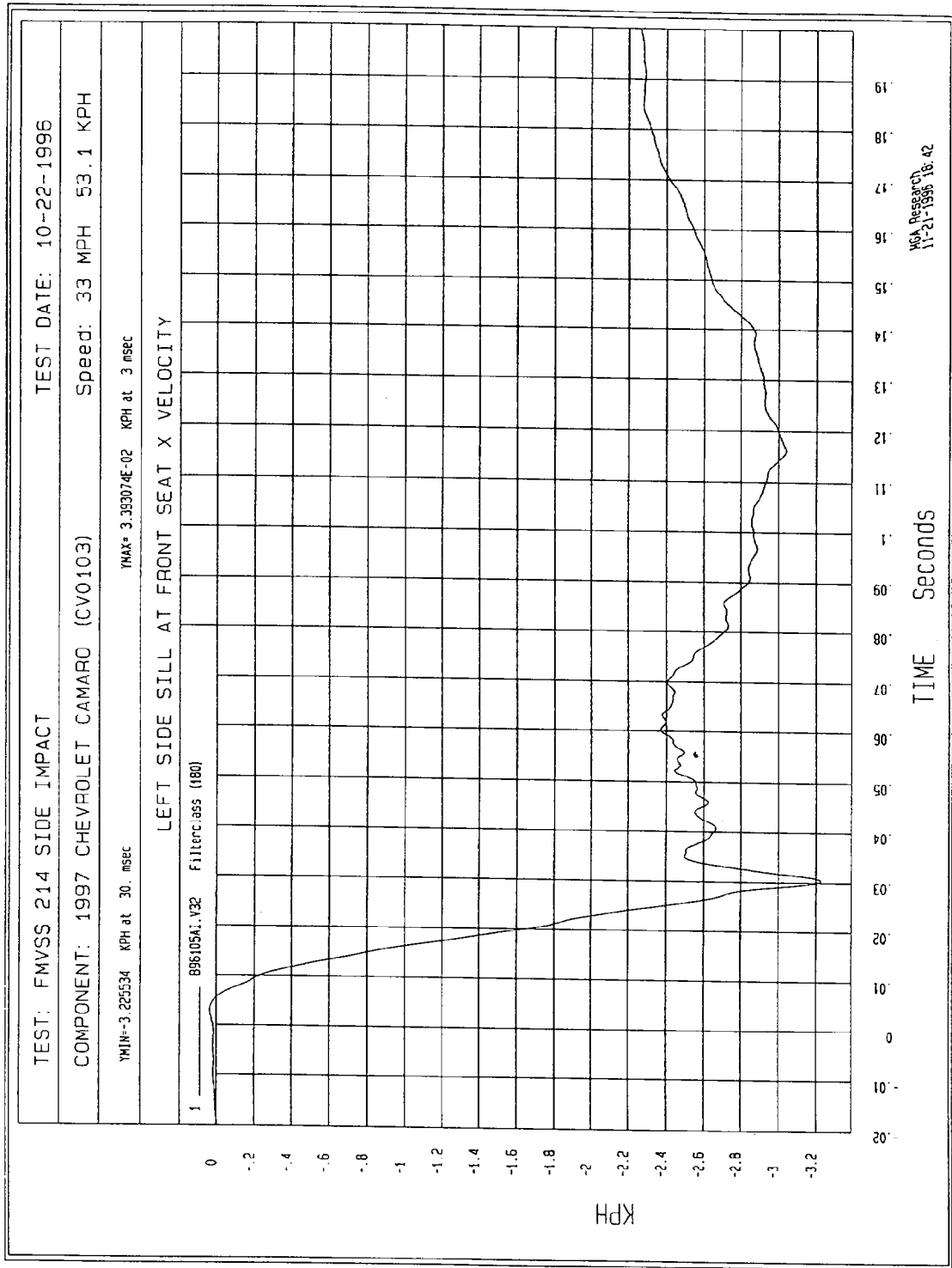


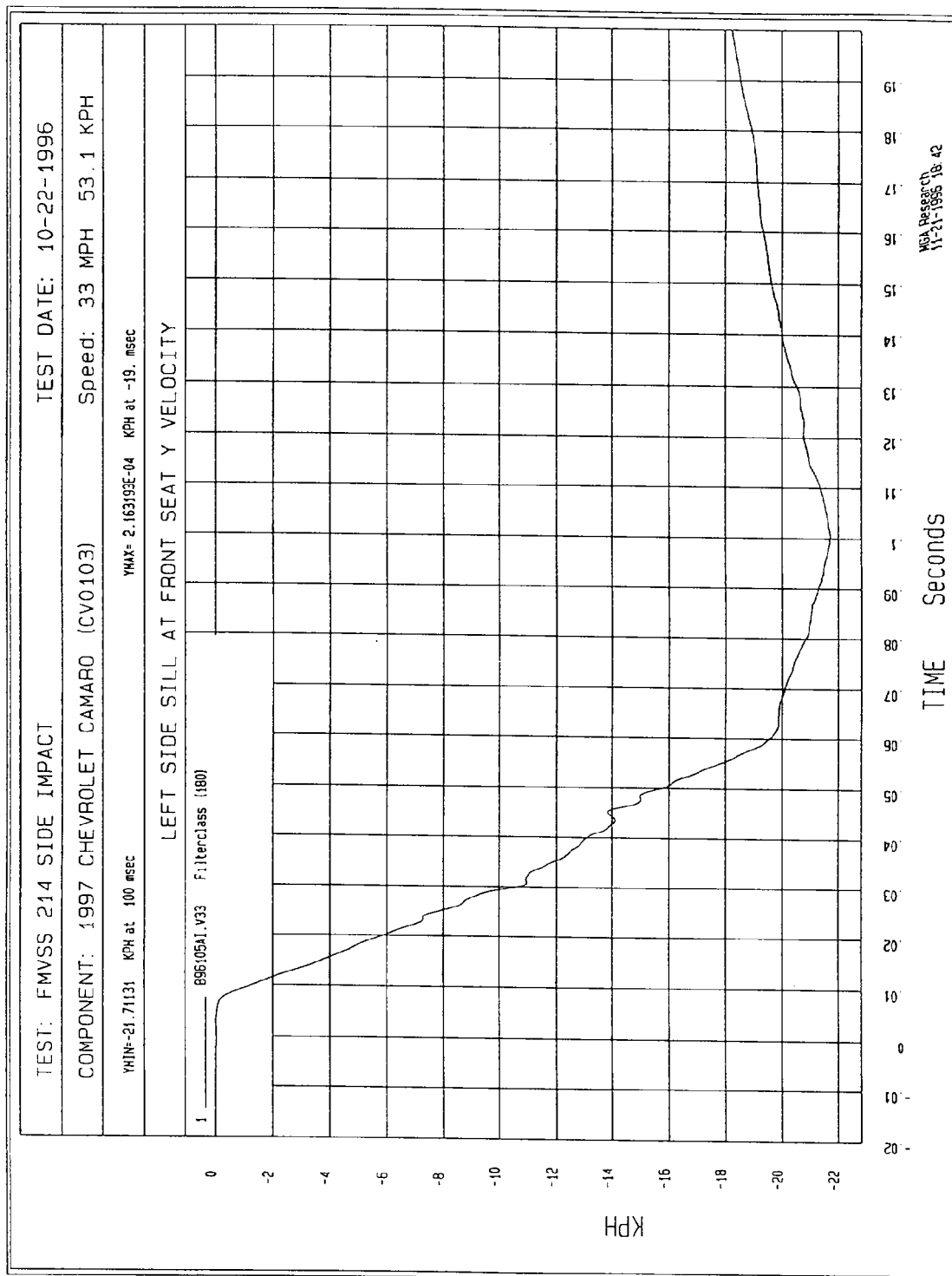


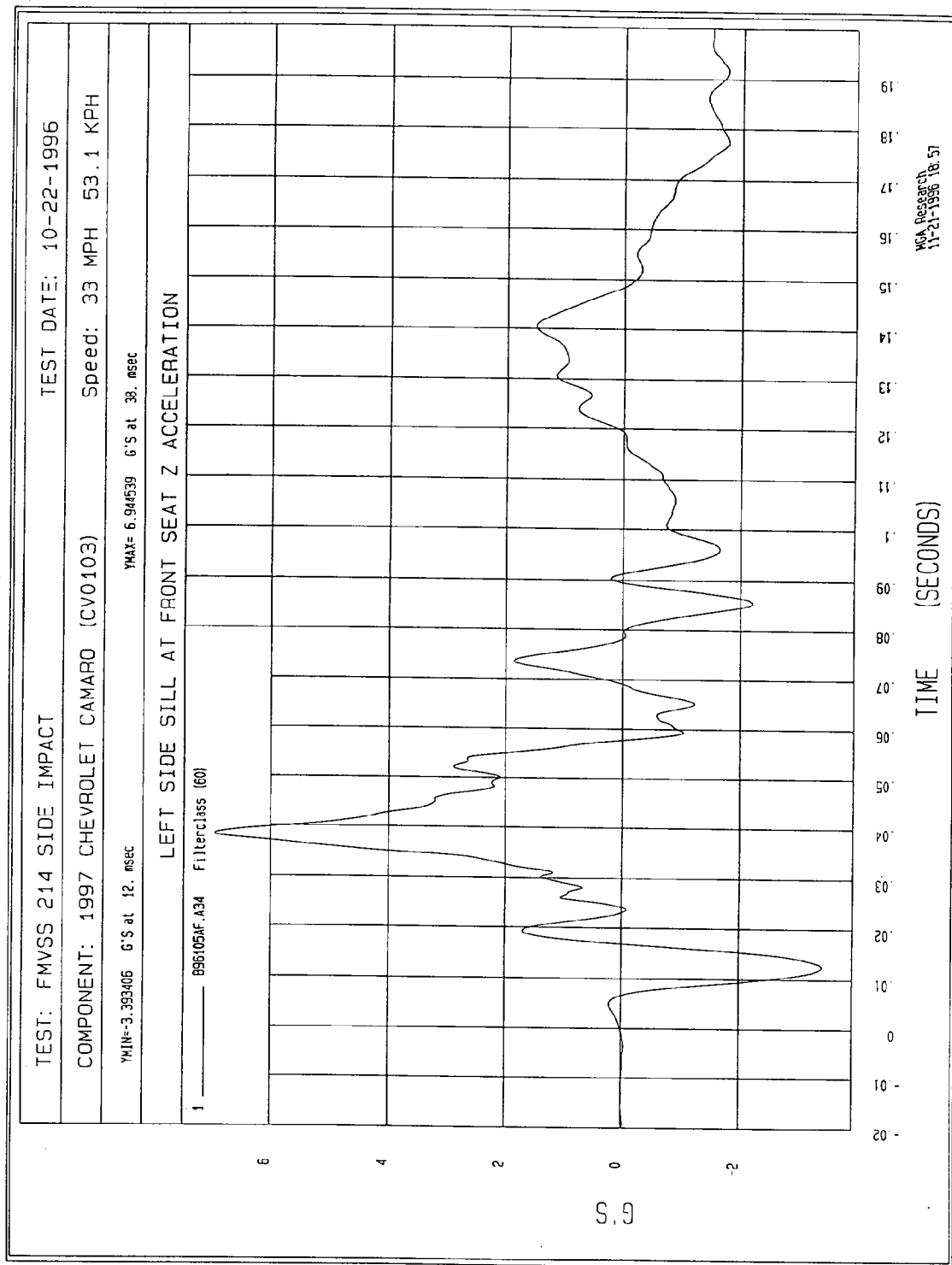


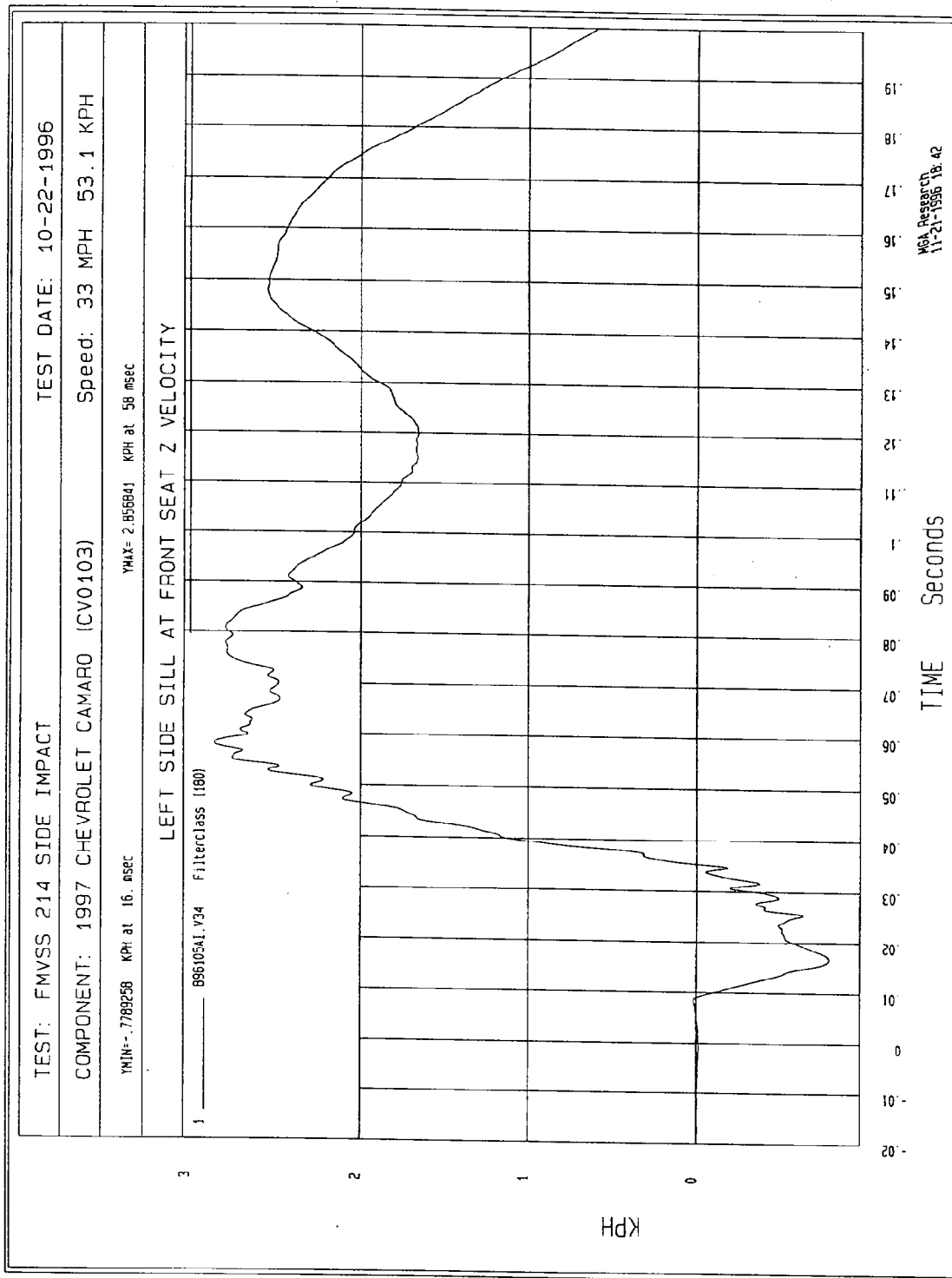


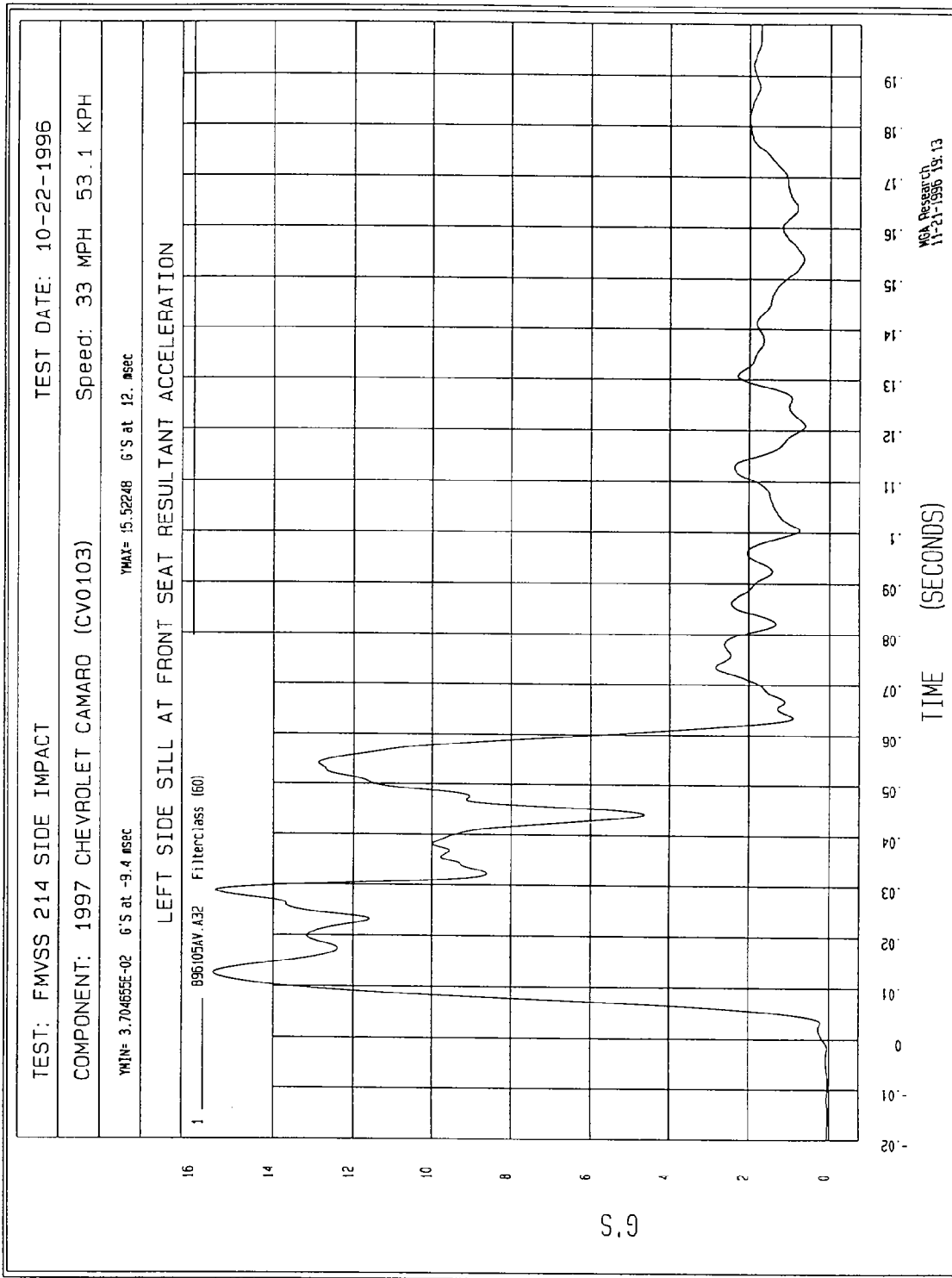


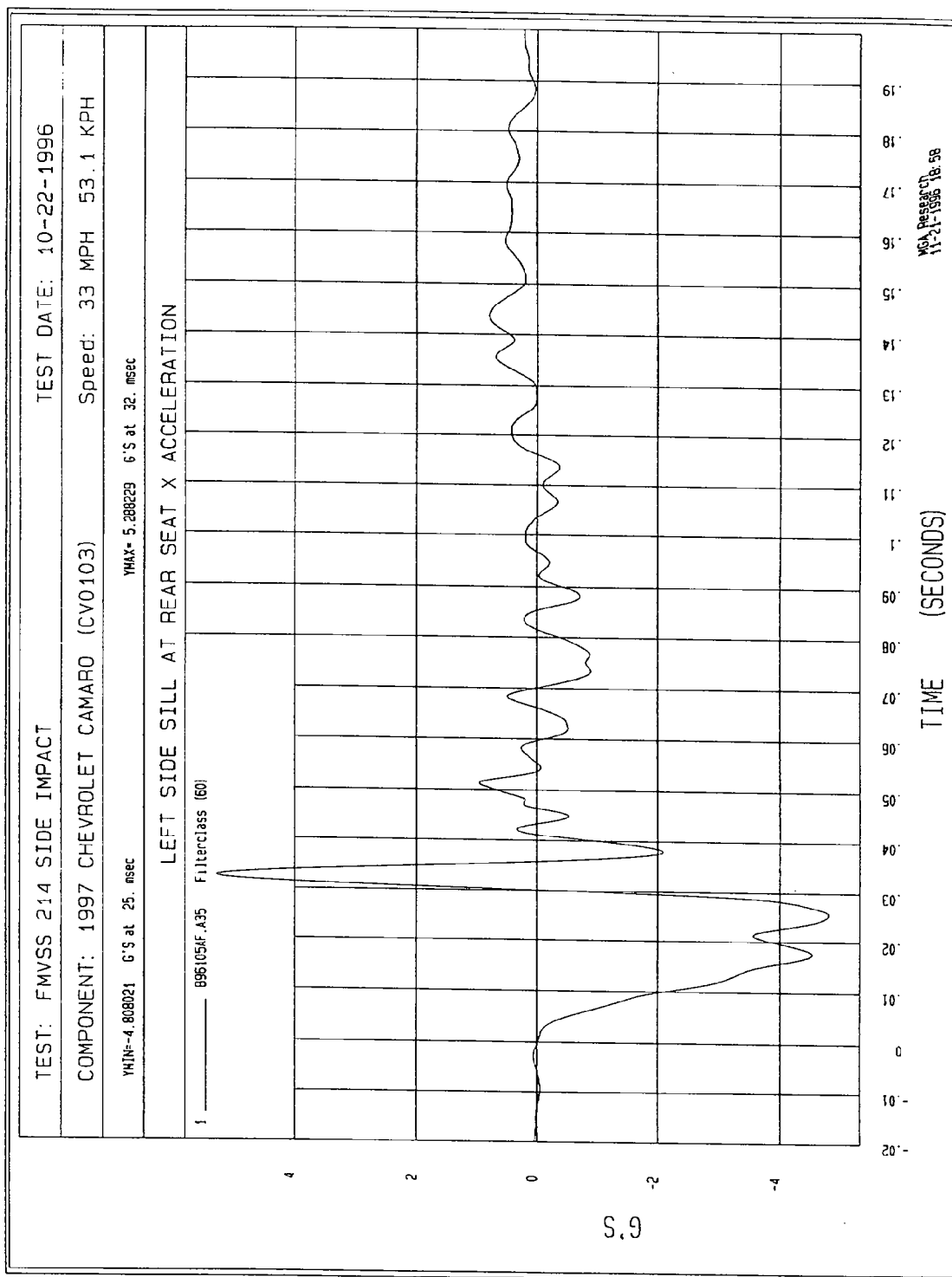












TEST: FMVSS 214 SIDE IMPACT

TEST DATE: 10-22-1996

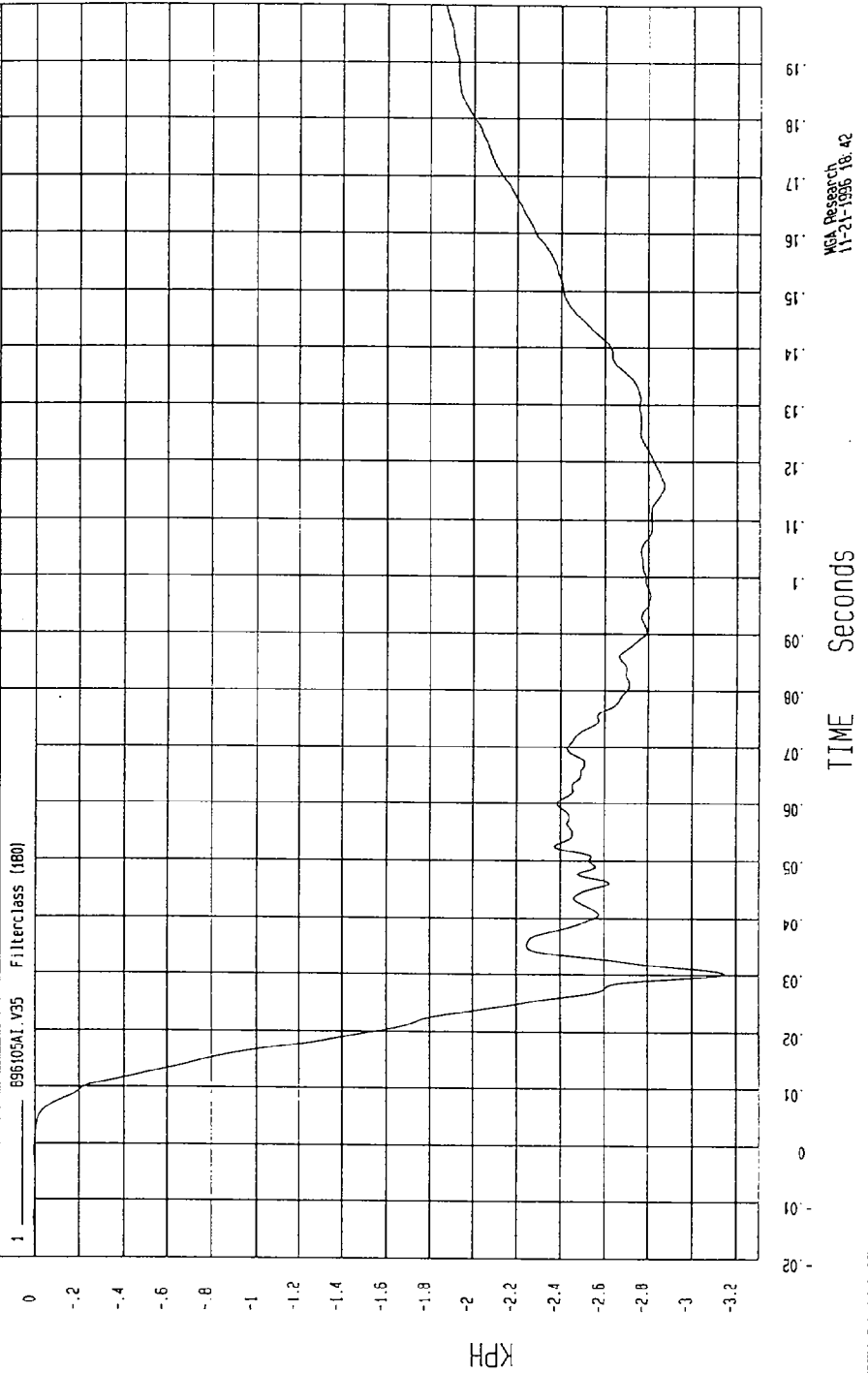
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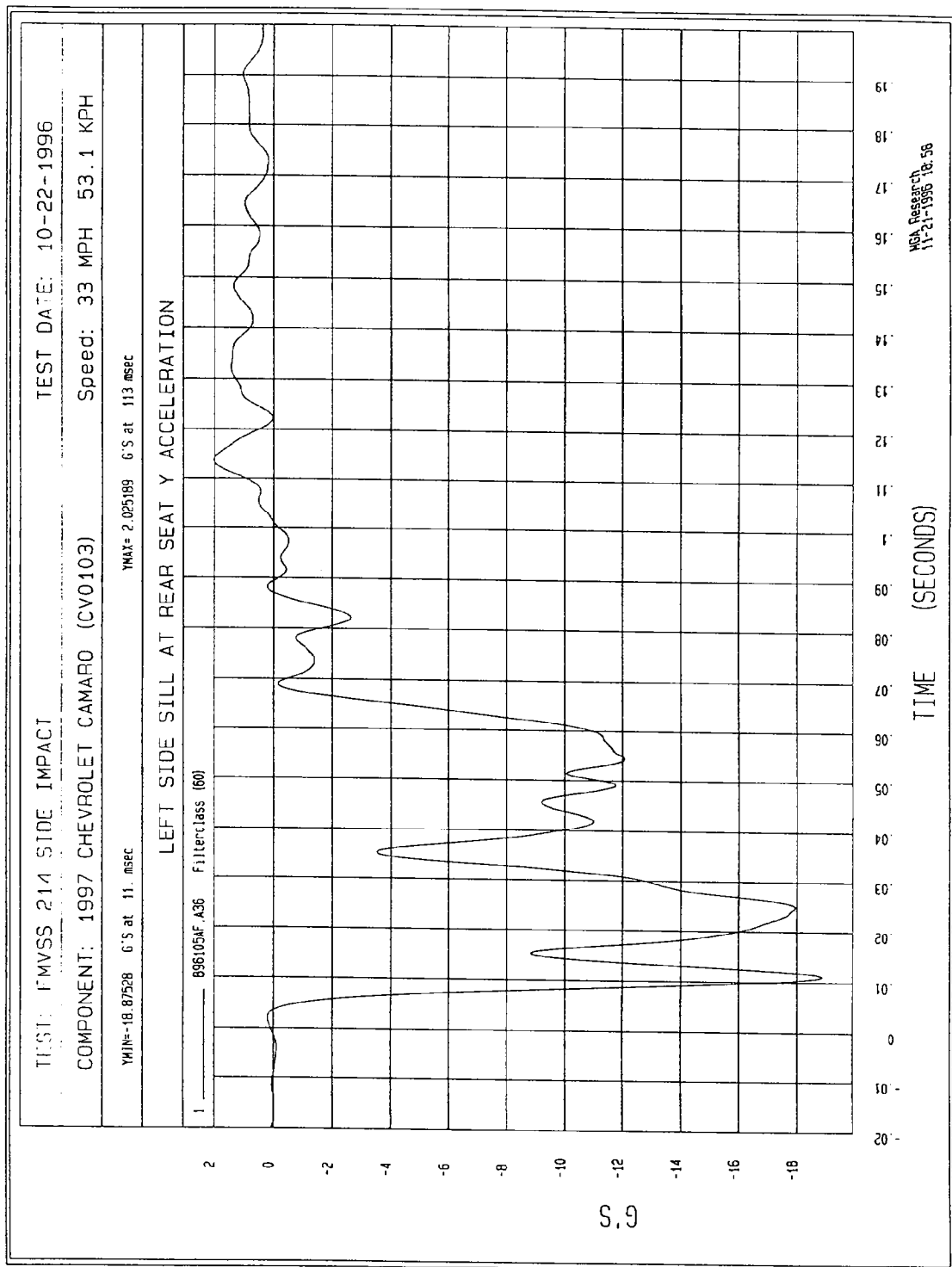
COMPONENT: 1997 CHEVROLET CAMARO (CV0103)

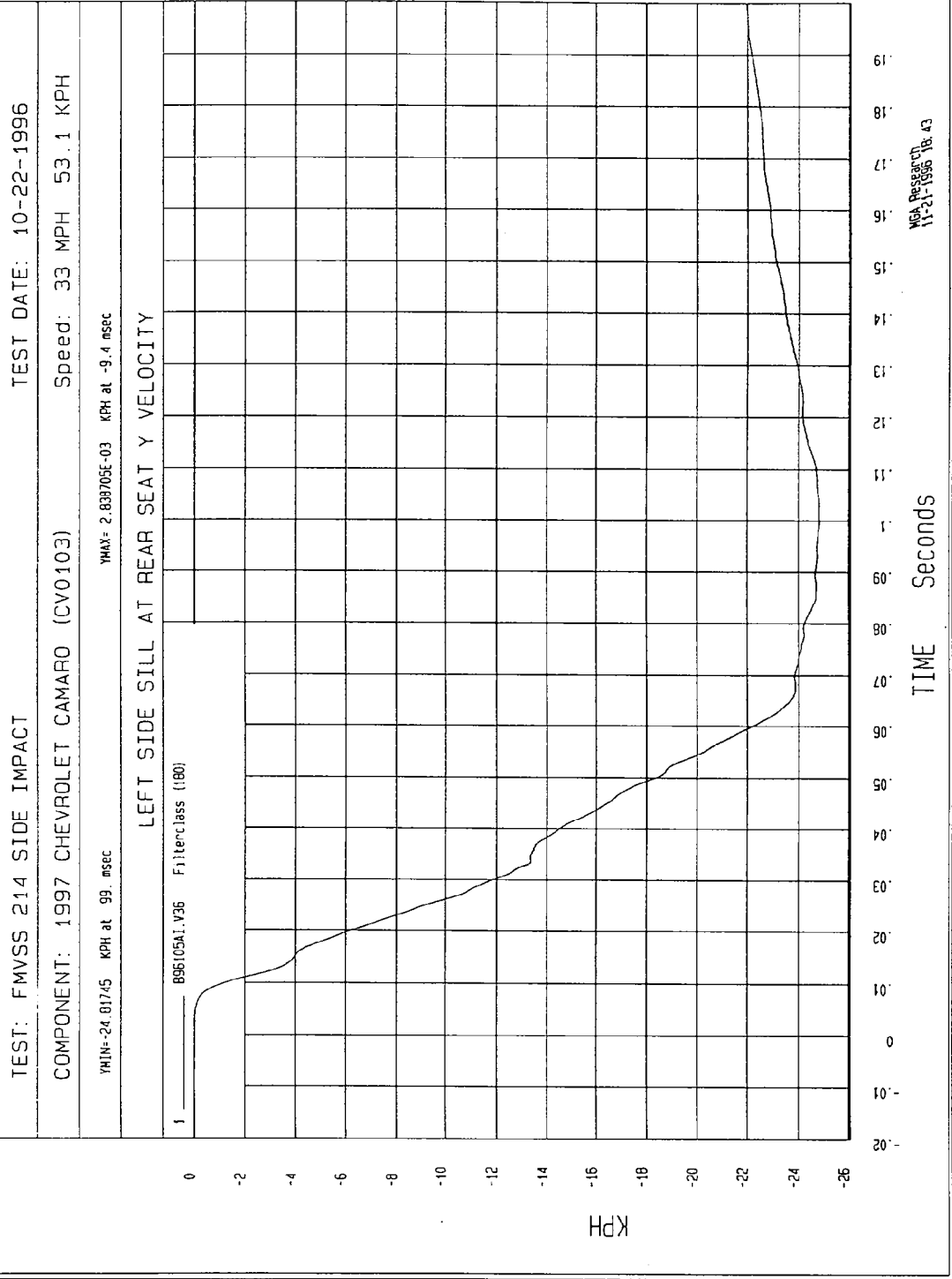
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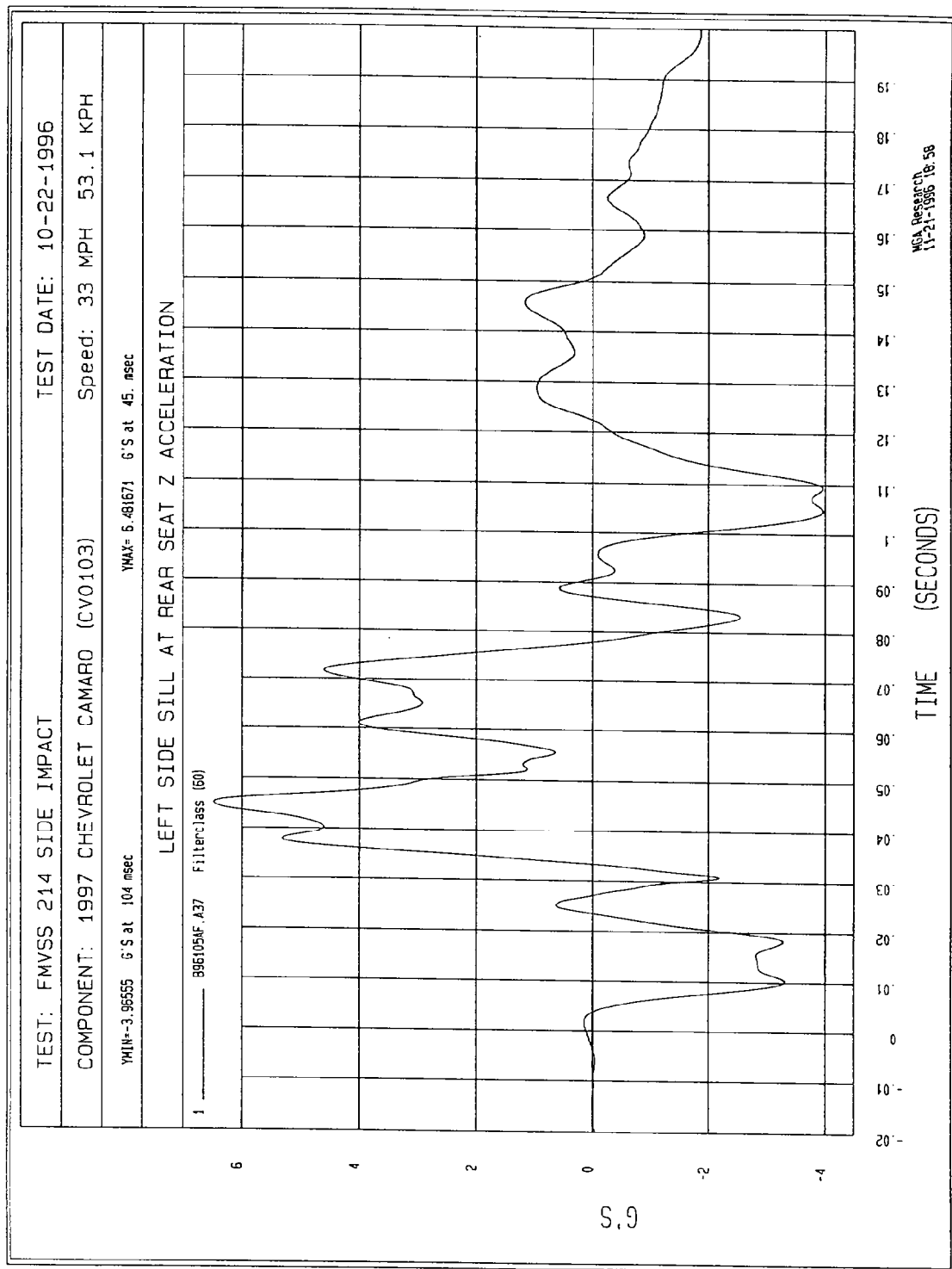
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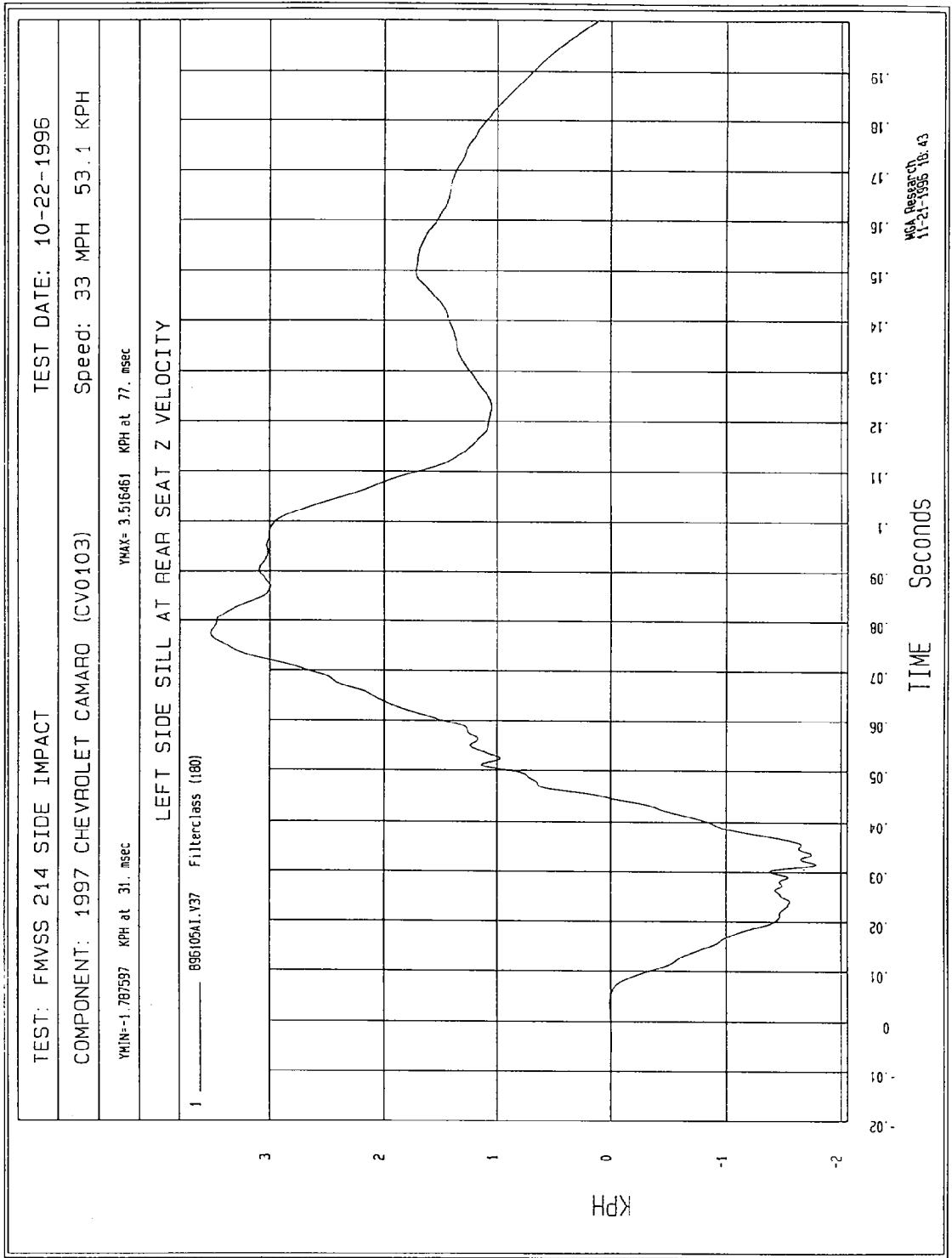
LEFT SIDE SILL AT REAR SEAT X VELOCITY

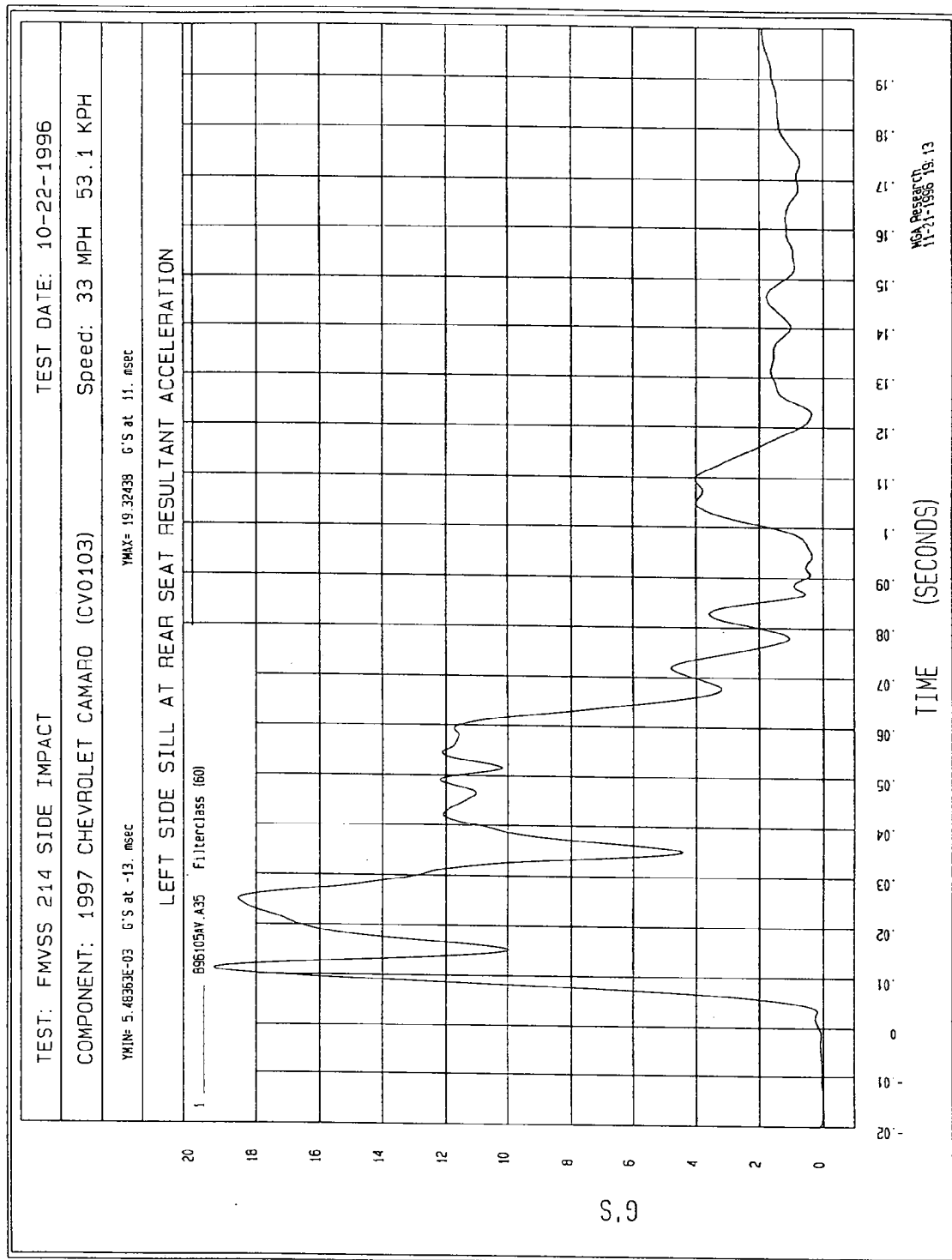


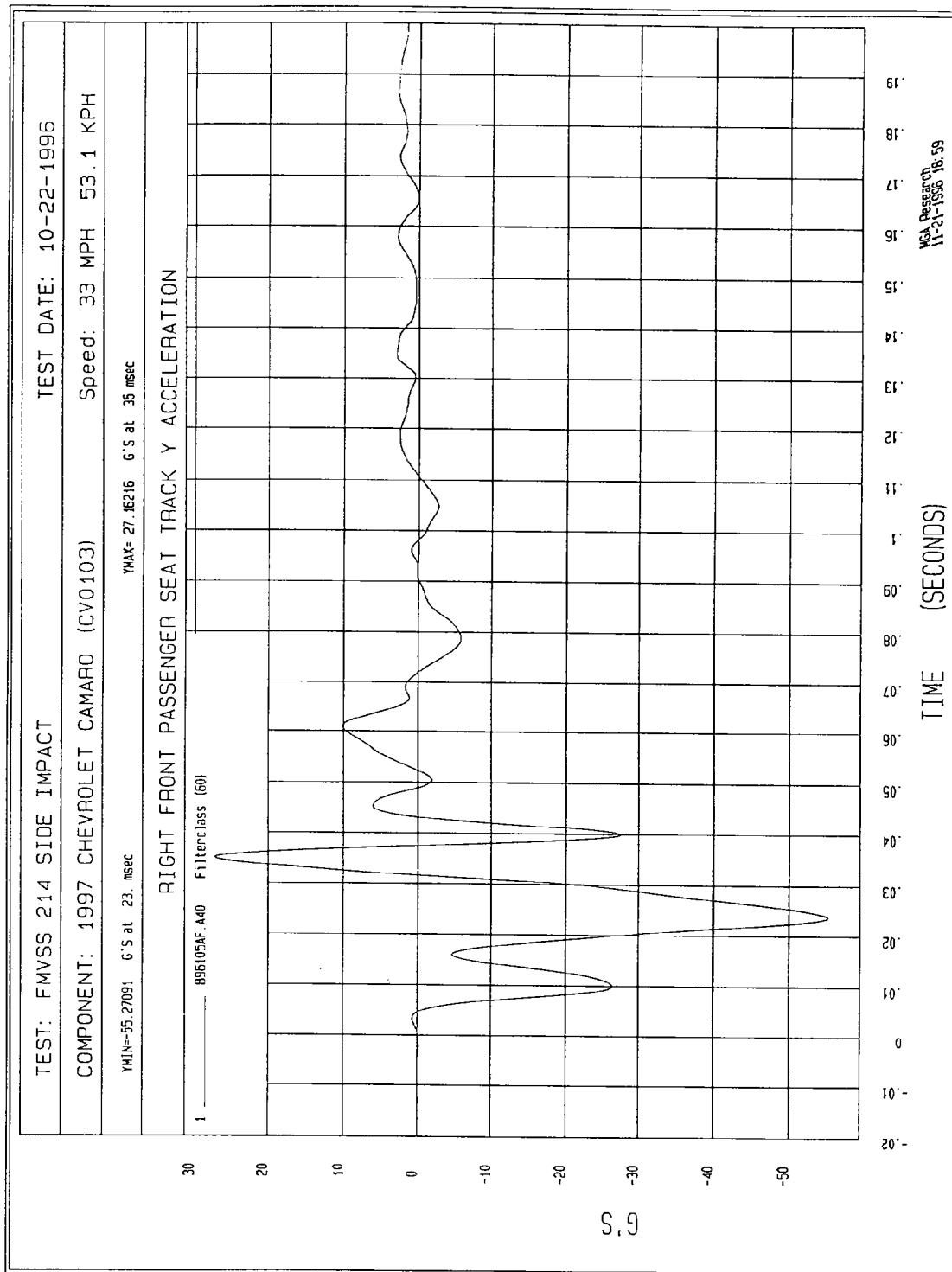


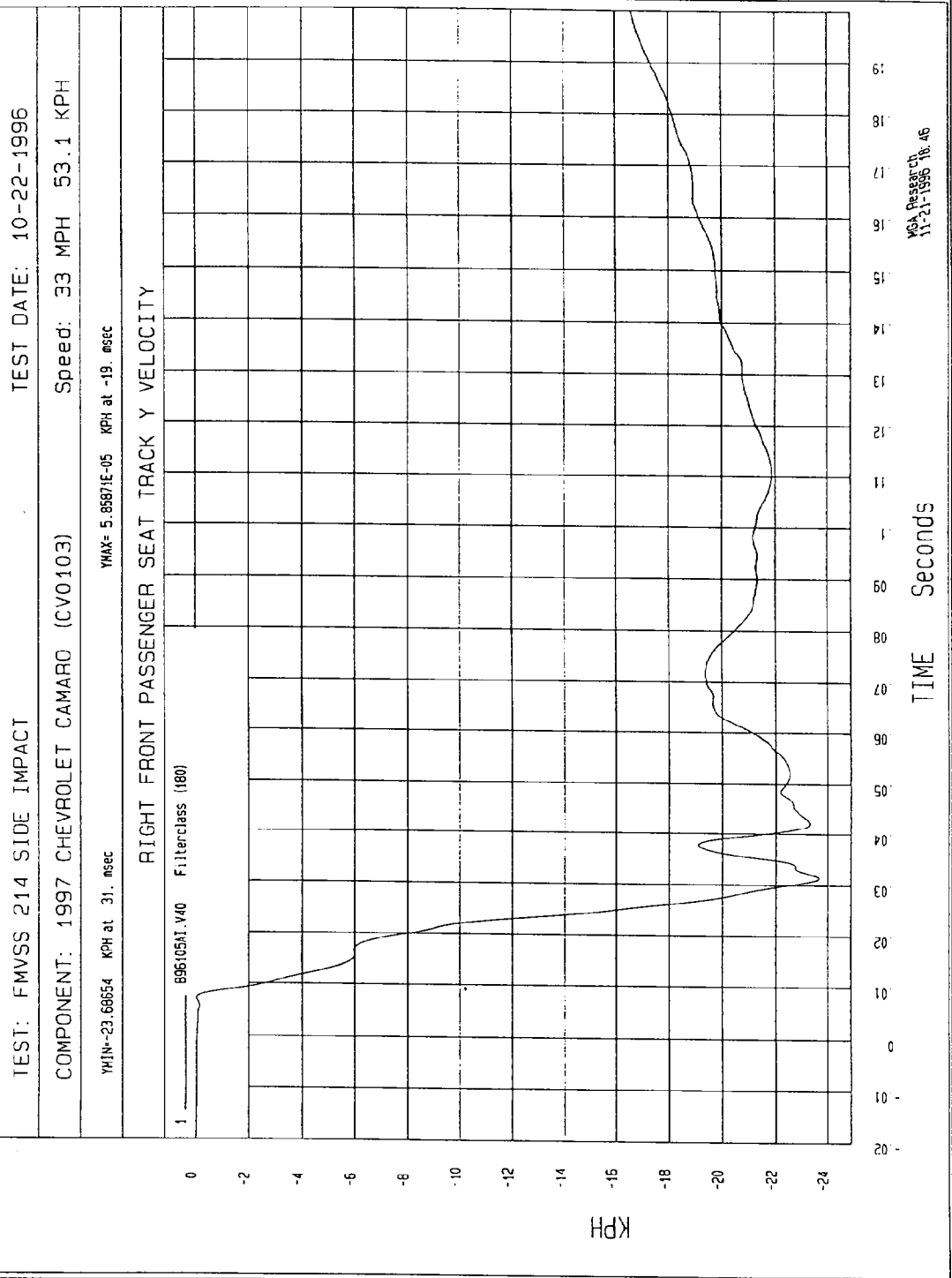












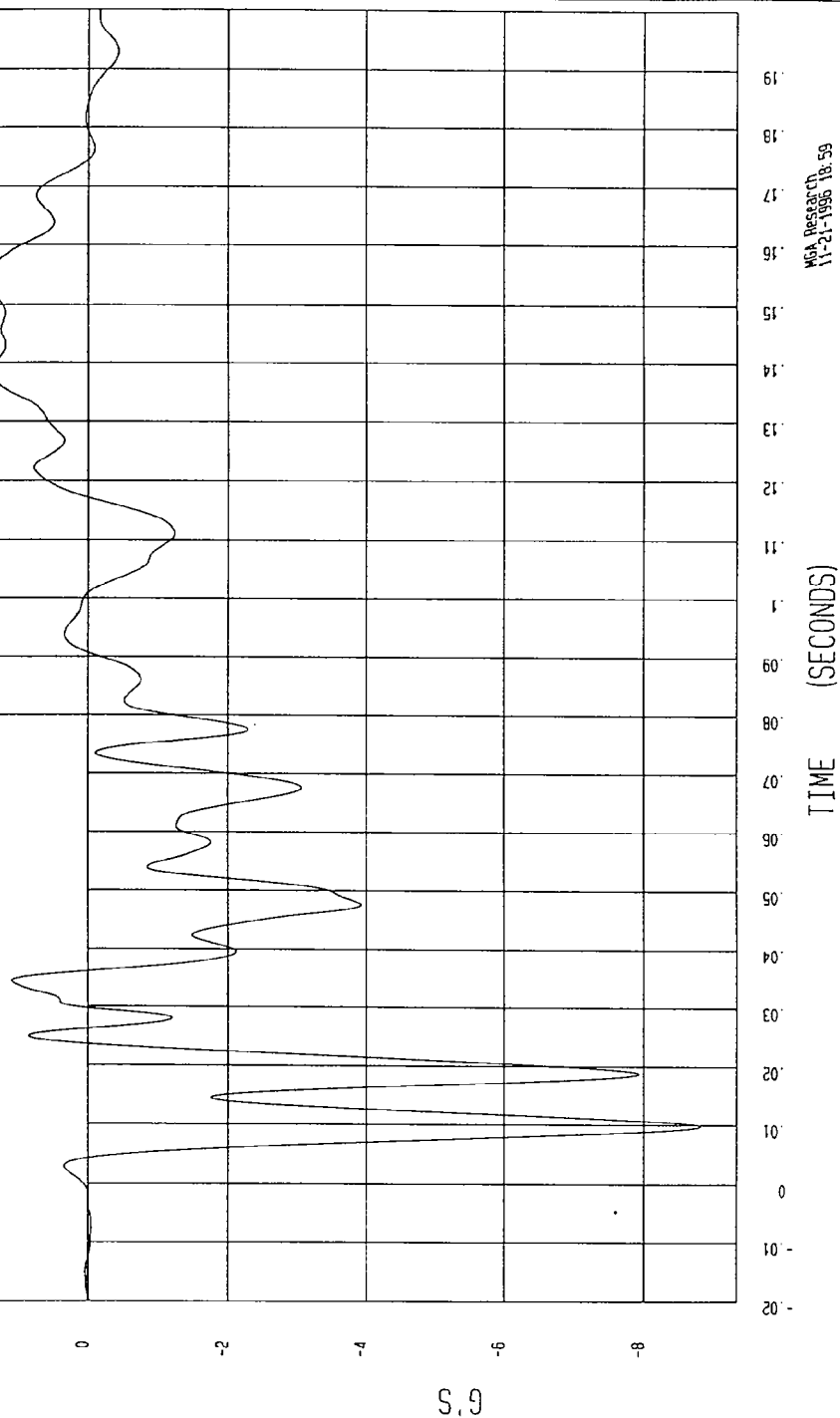
TEST DATE: 10-22-1996

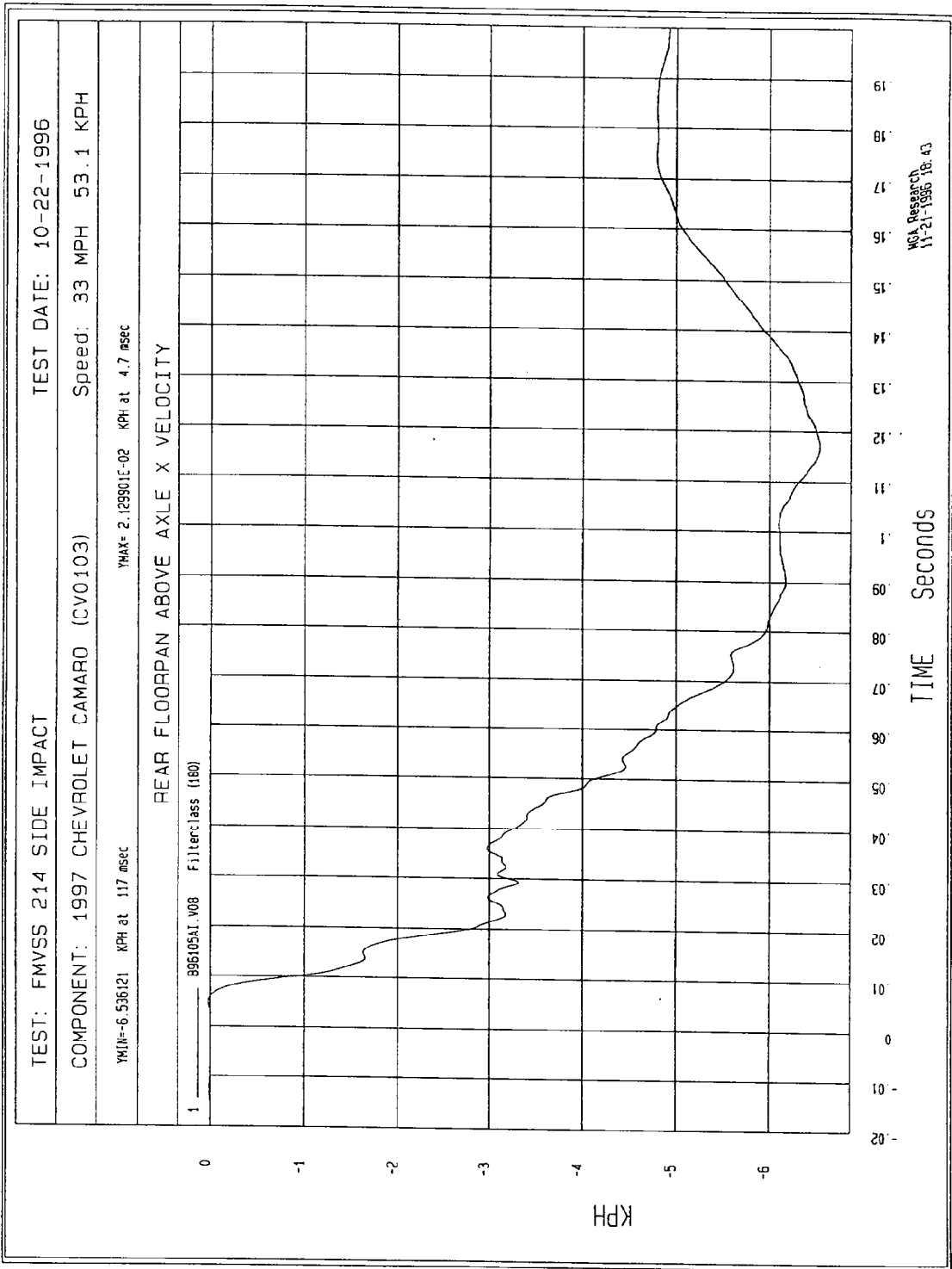
Speed: 33 MPH 53.1 KPH

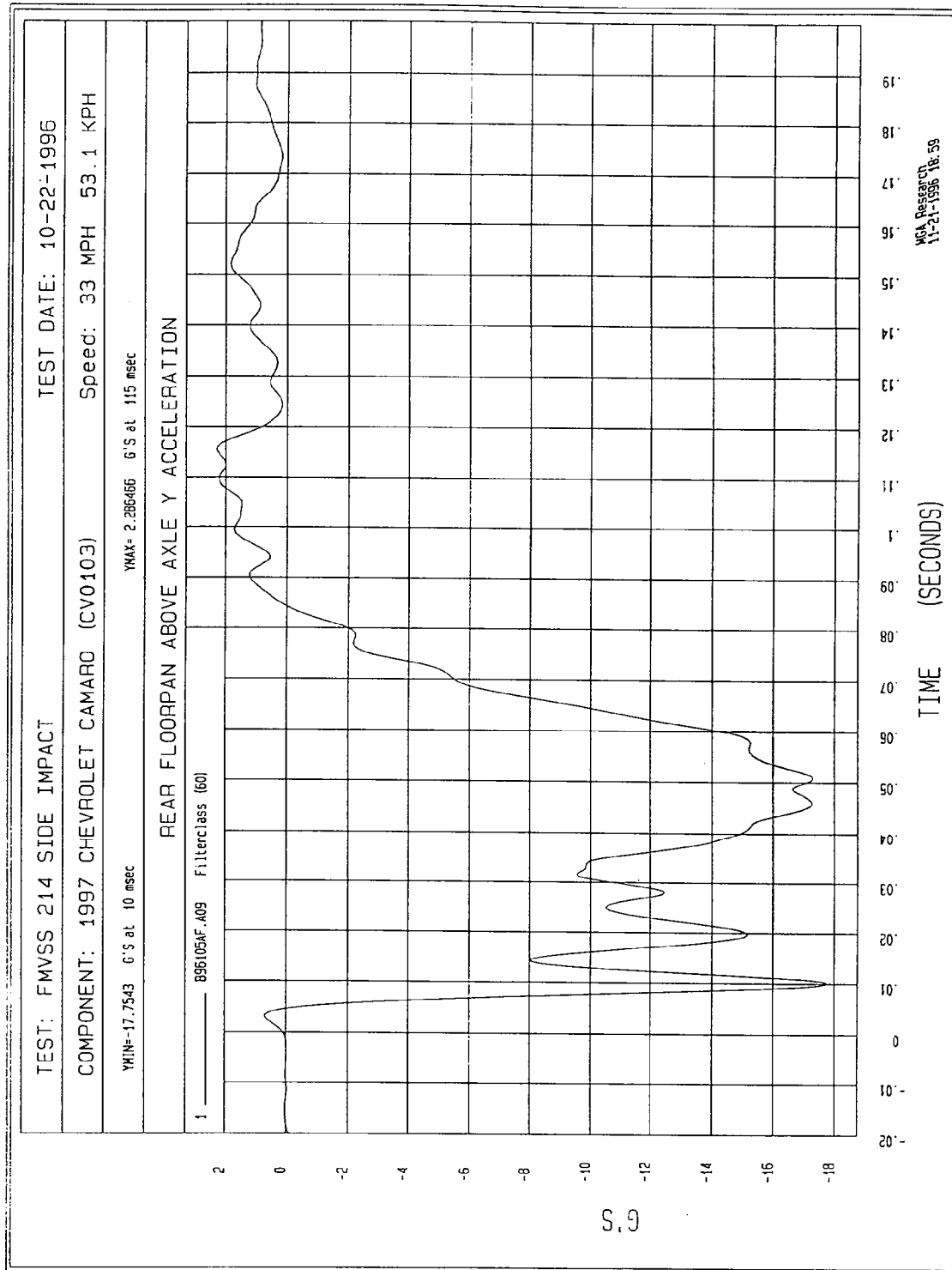
YMAX= 1.435297 G'S at 154 msec

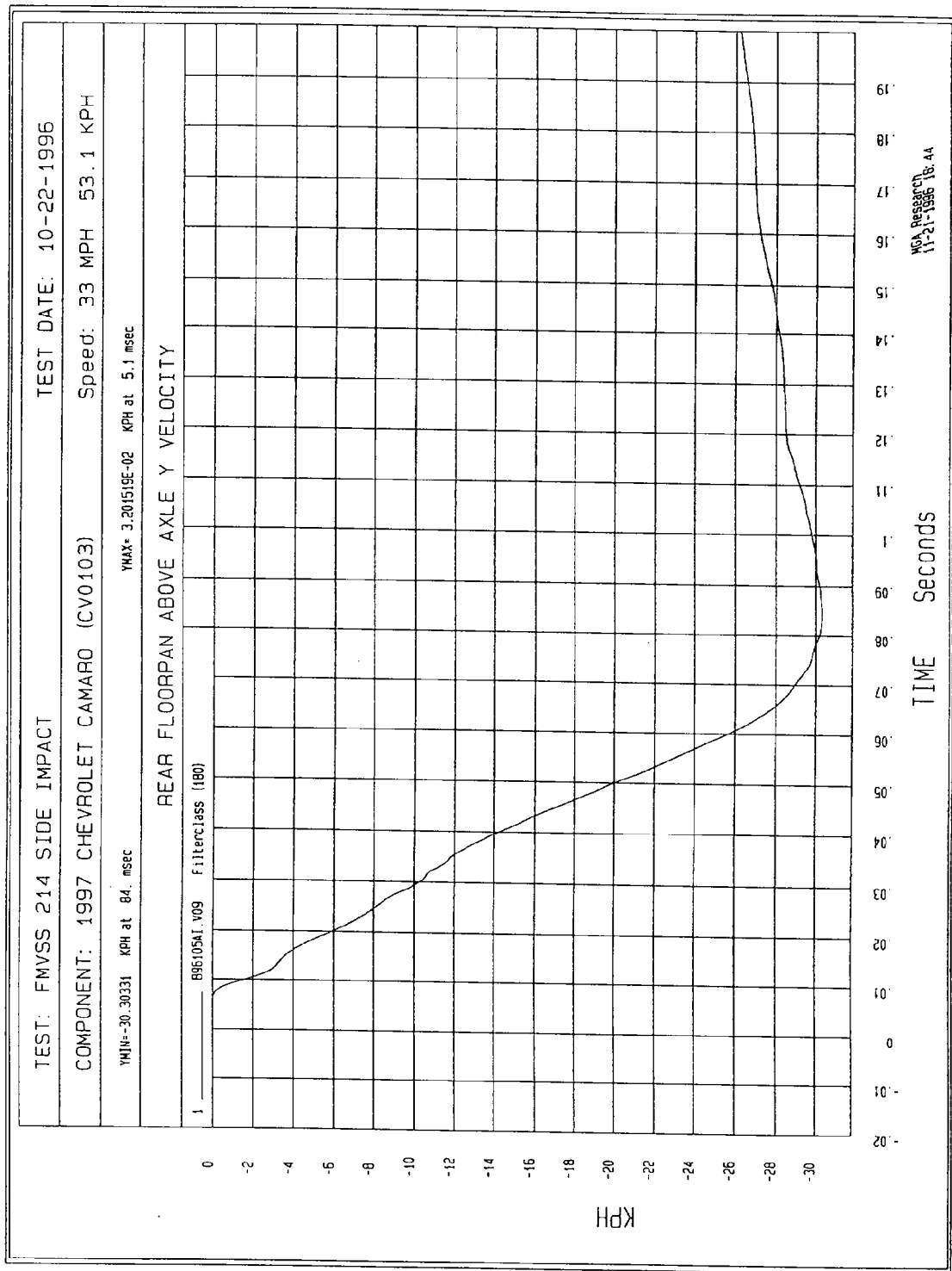
AXLE X ACCELERATION

Filter	Filter class
896105AF.A08	Filter class (60)









TEST: FMVSS 214 SIDE IMPACT TEST DATE: 10-22-1996

SPEED: 33 MPH 53.1 KPH

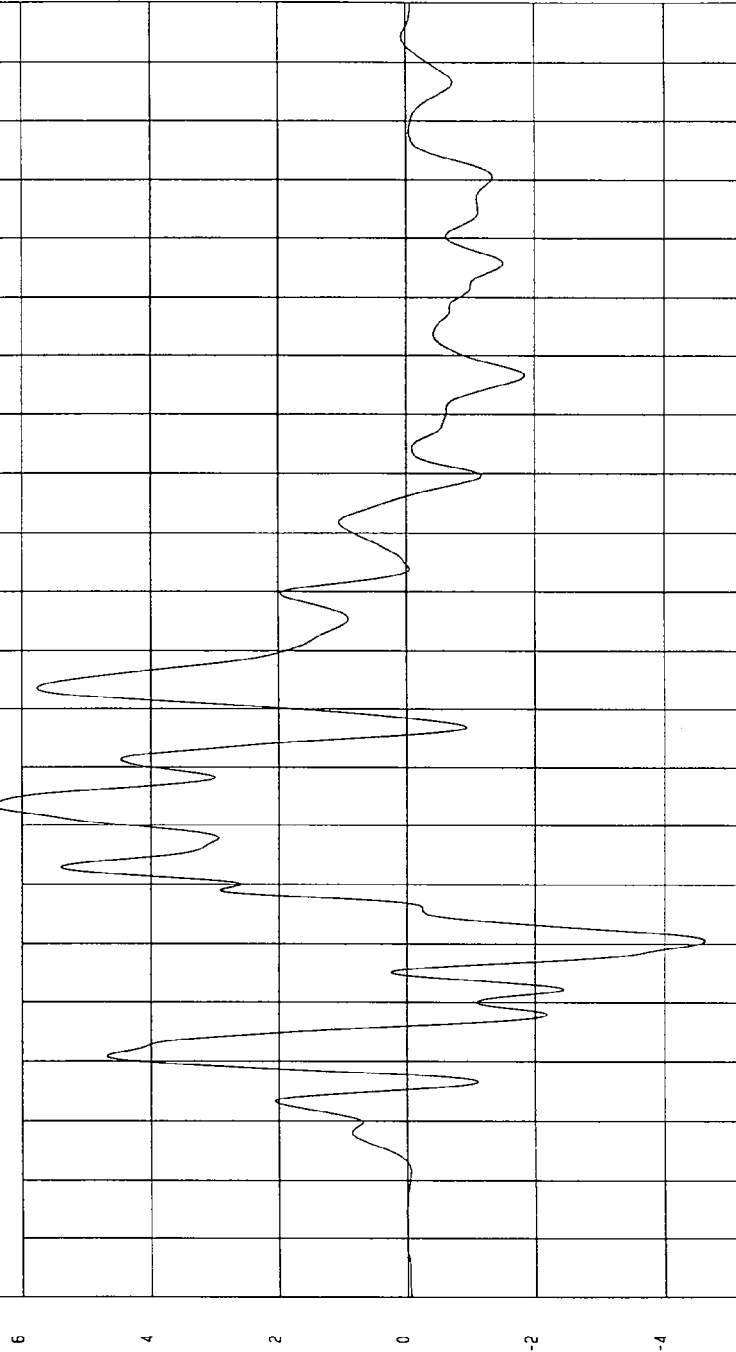
COMPONENT: 1997 CHEVROLET CAMARO (CV0103)

YMAX= 6.486526 G'S at 63. msec

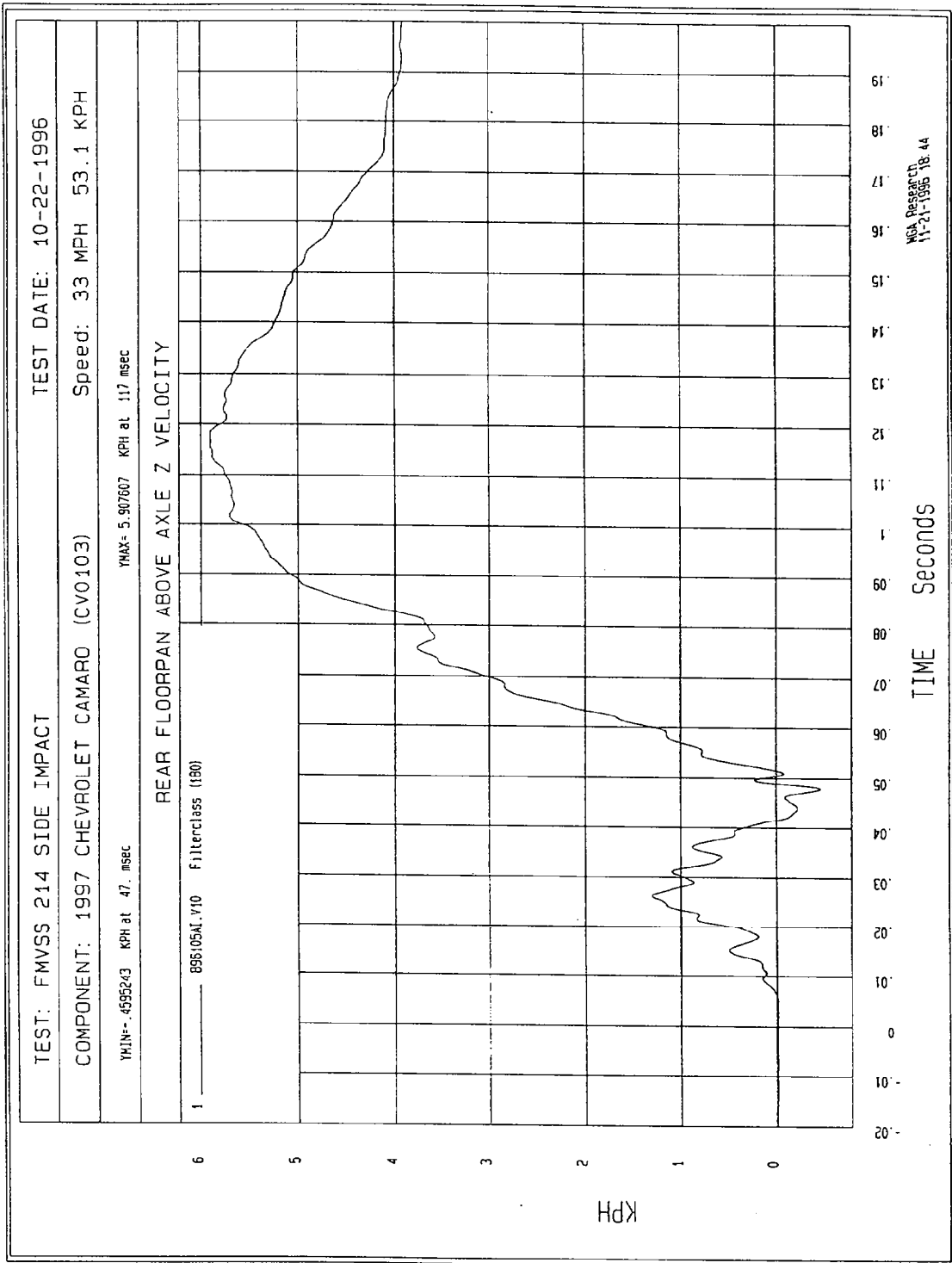
YMIN= -4.62364 G'S at 40. msec

REAR FLOORPAN ABOVE AXLE Z ACCELERATION

1 ——— B95105AF A10 Filterclass (60)



WCA Research
11-21-1996 19:00



TEST: FMVSS 214 SIDE IMPACT

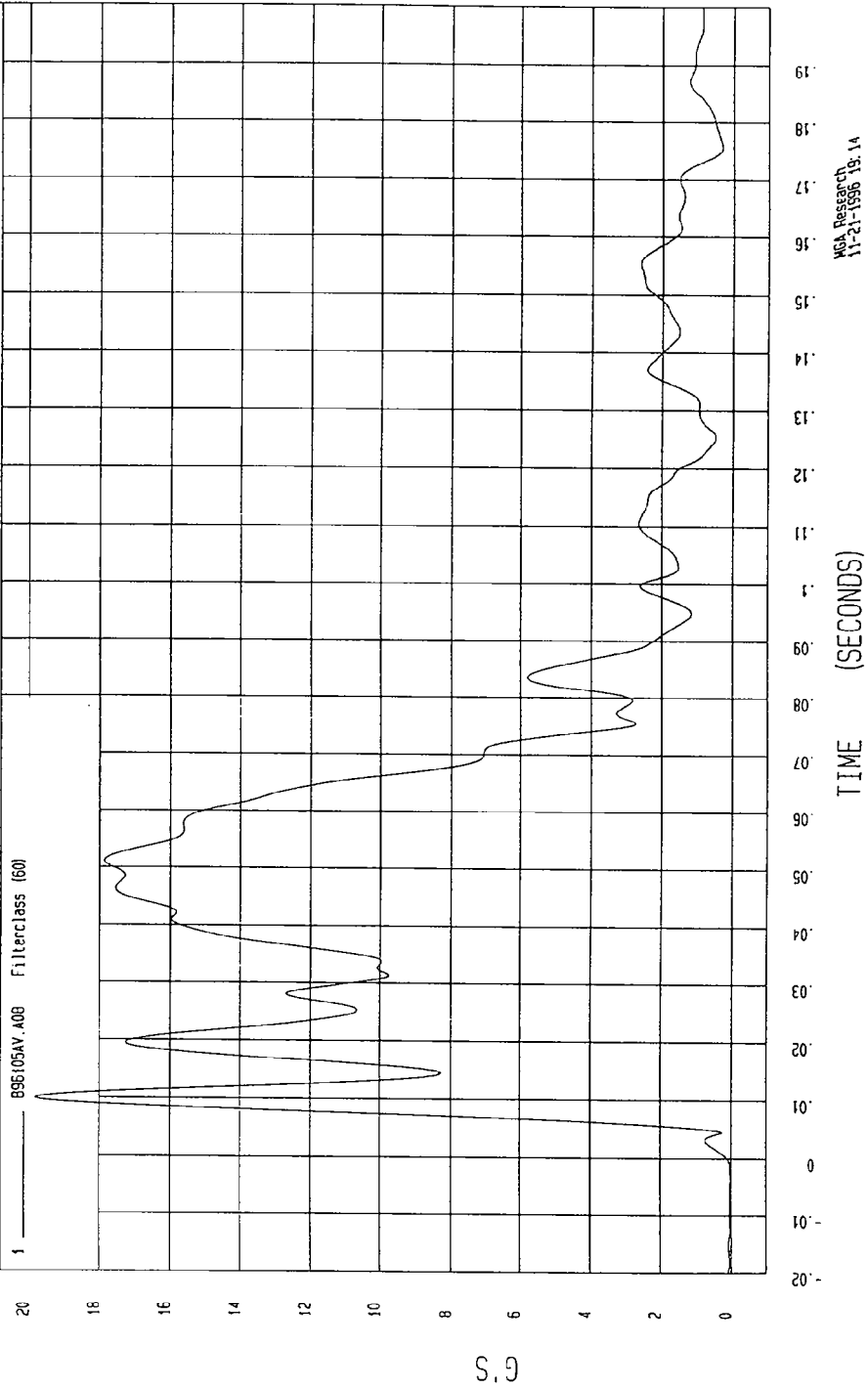
TEST DATE: 10-22-1996

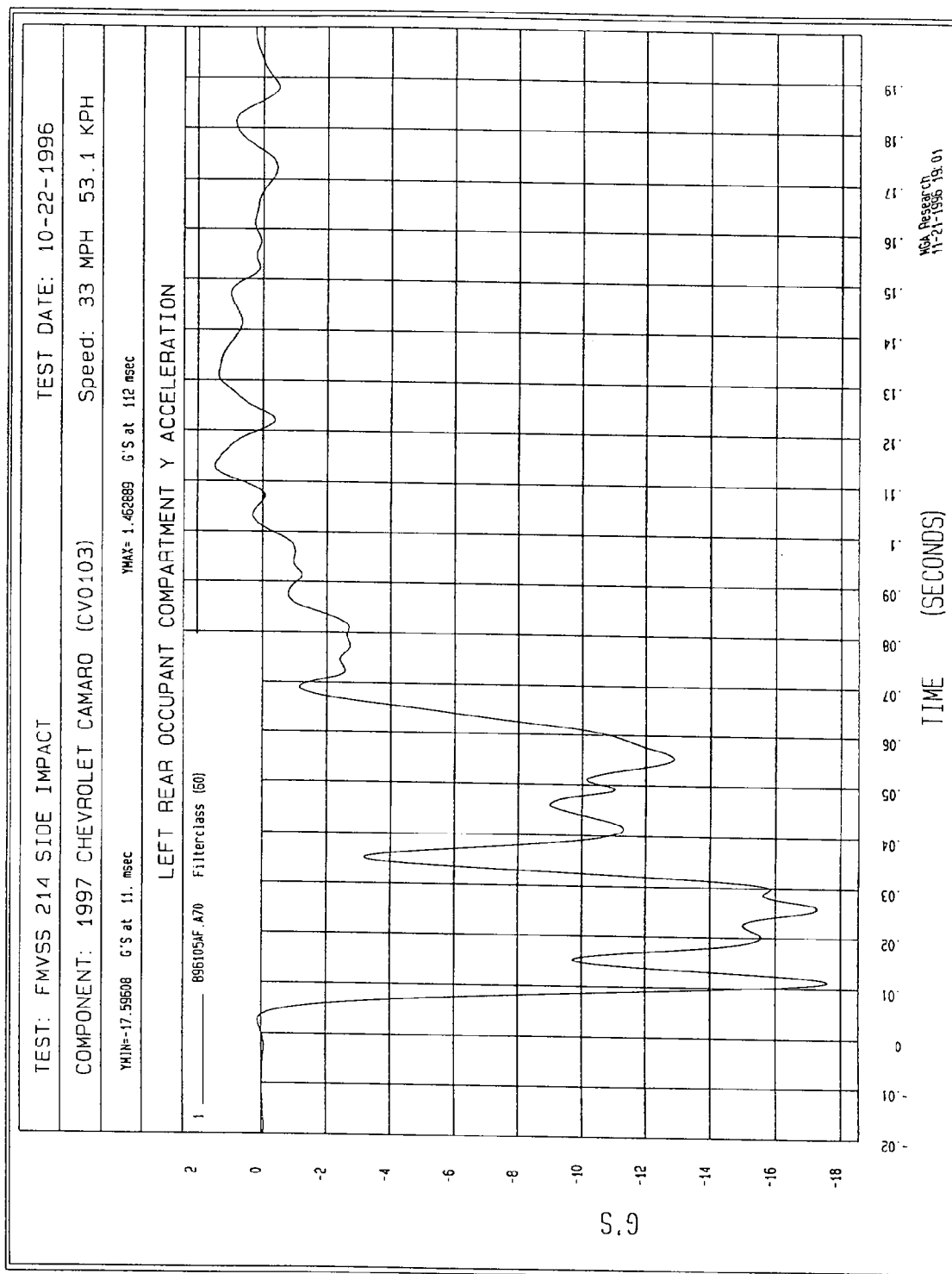
COMPONENT: 1997 CHEVROLET CAMARO (CV0103) Speed: 33 MPH 53.1 KPH

YH/N= 7.972114E-03 G'S at -3.9 msec

YHAX= 19.80861 G'S at 10 msec

REAR FLOORPAN ABOVE AXLE RESULTANT ACCELERATION





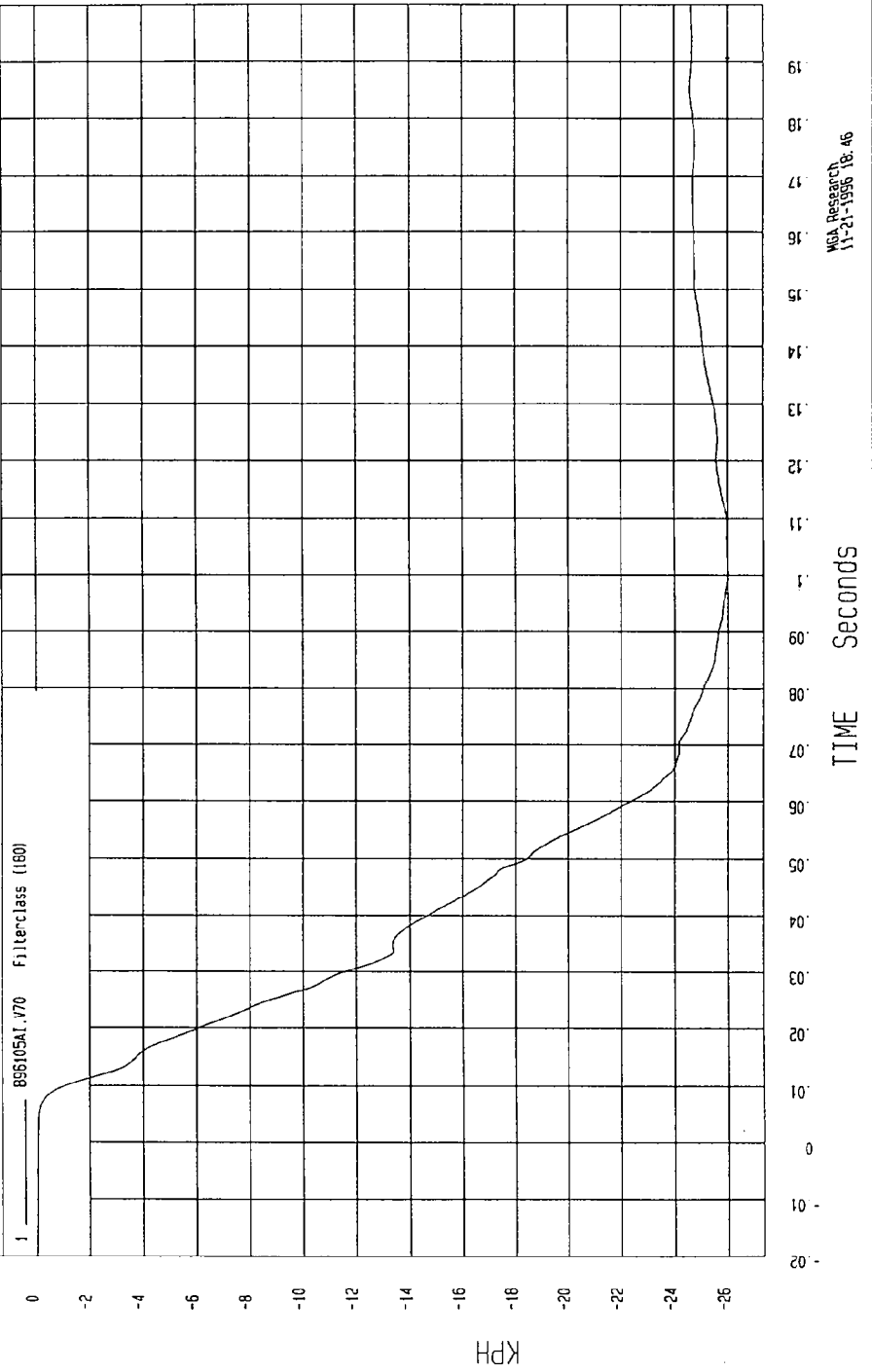
TEST: FMVSS 214 SIDE IMPACT

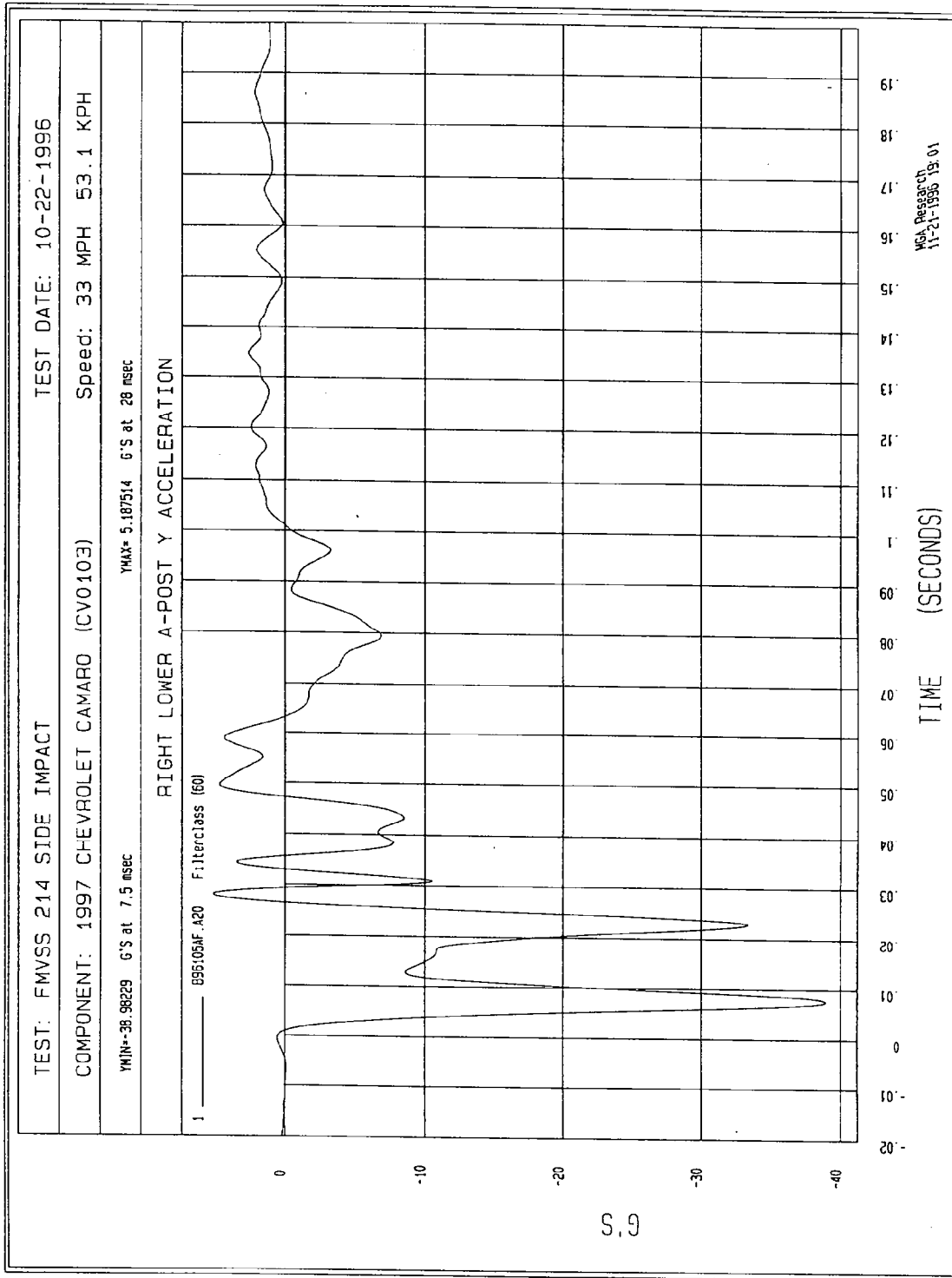
TEST DATE: 10-22-1996

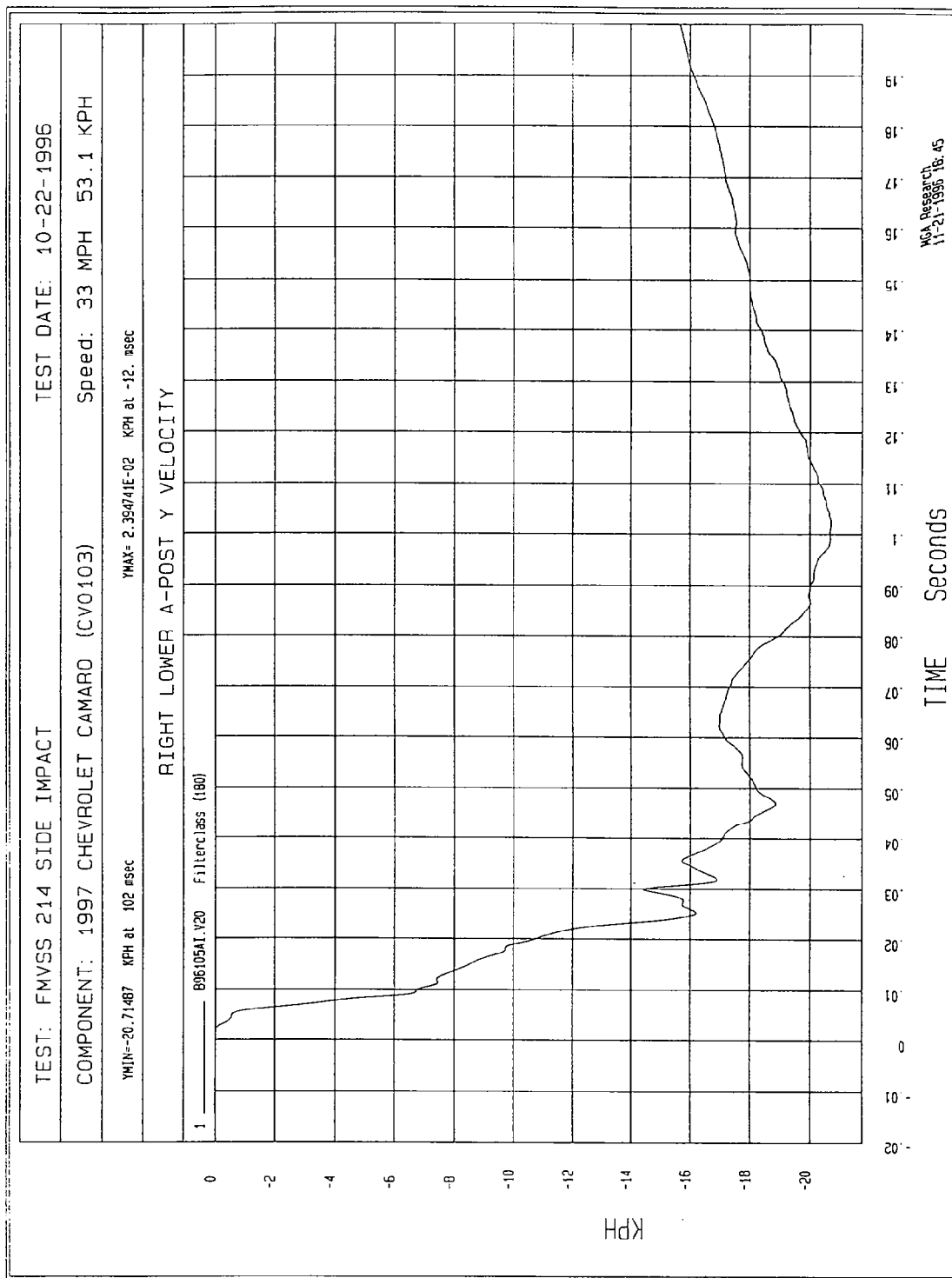
COMPONENT: 1997 CHEVROLET CAMARO (CV0103) Speed: 33 MPH · 53.1 KPH

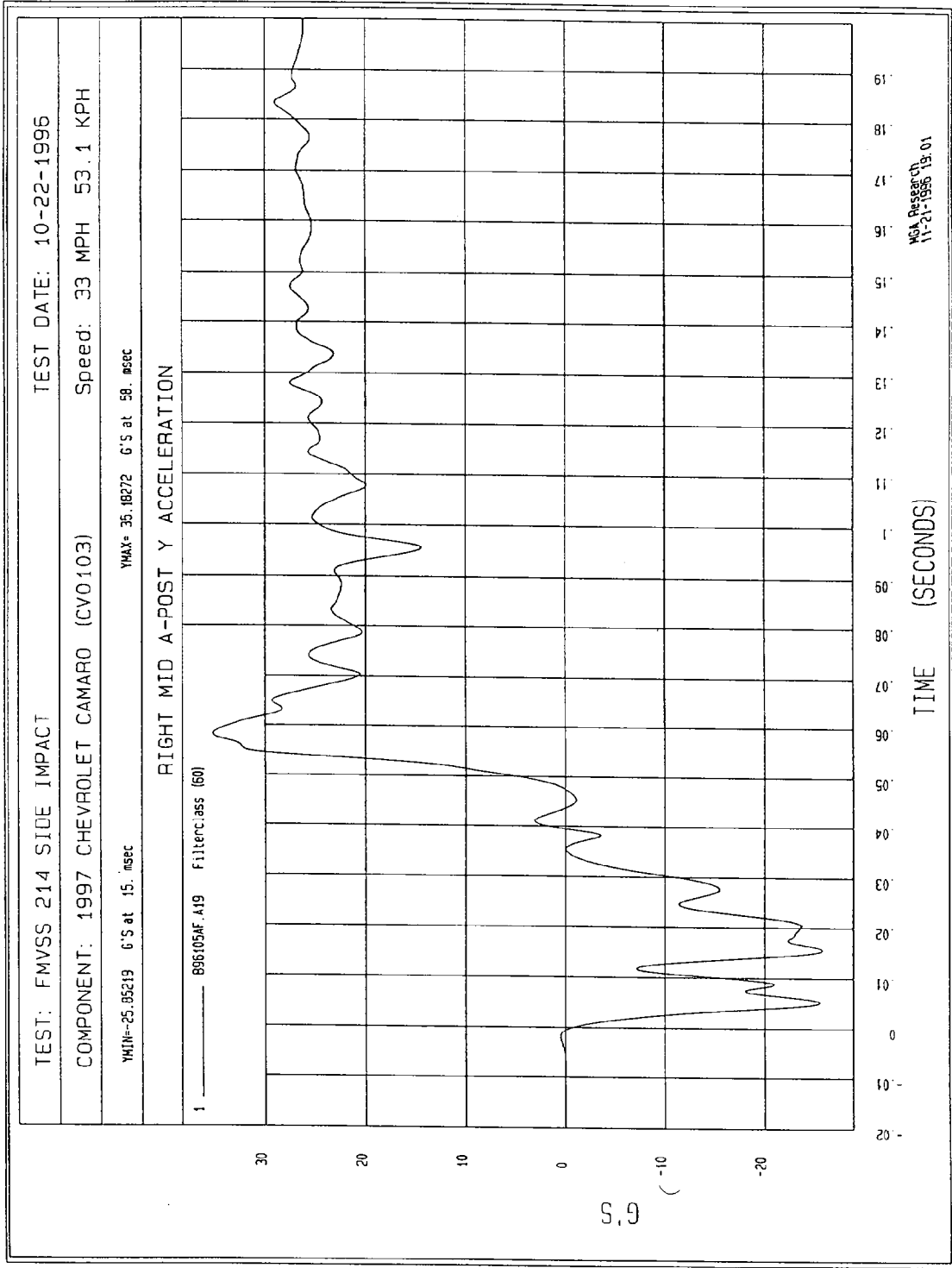
YMIN=-26.00089 KPH at 100 msec YMAX= 0 KPH at -20 msec

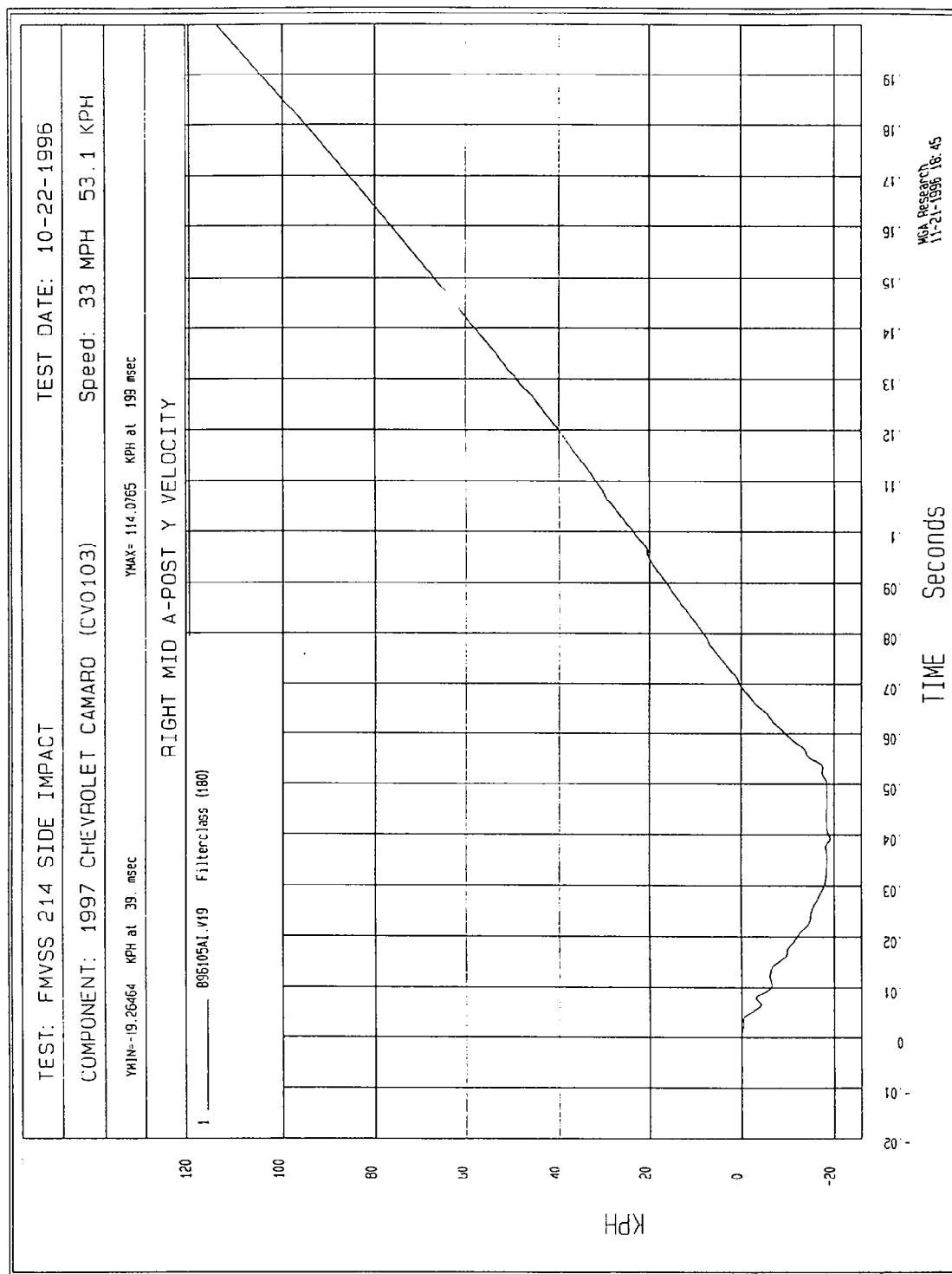
LEFT REAR OCCUPANT COMPARTMENT Y VELOCITY

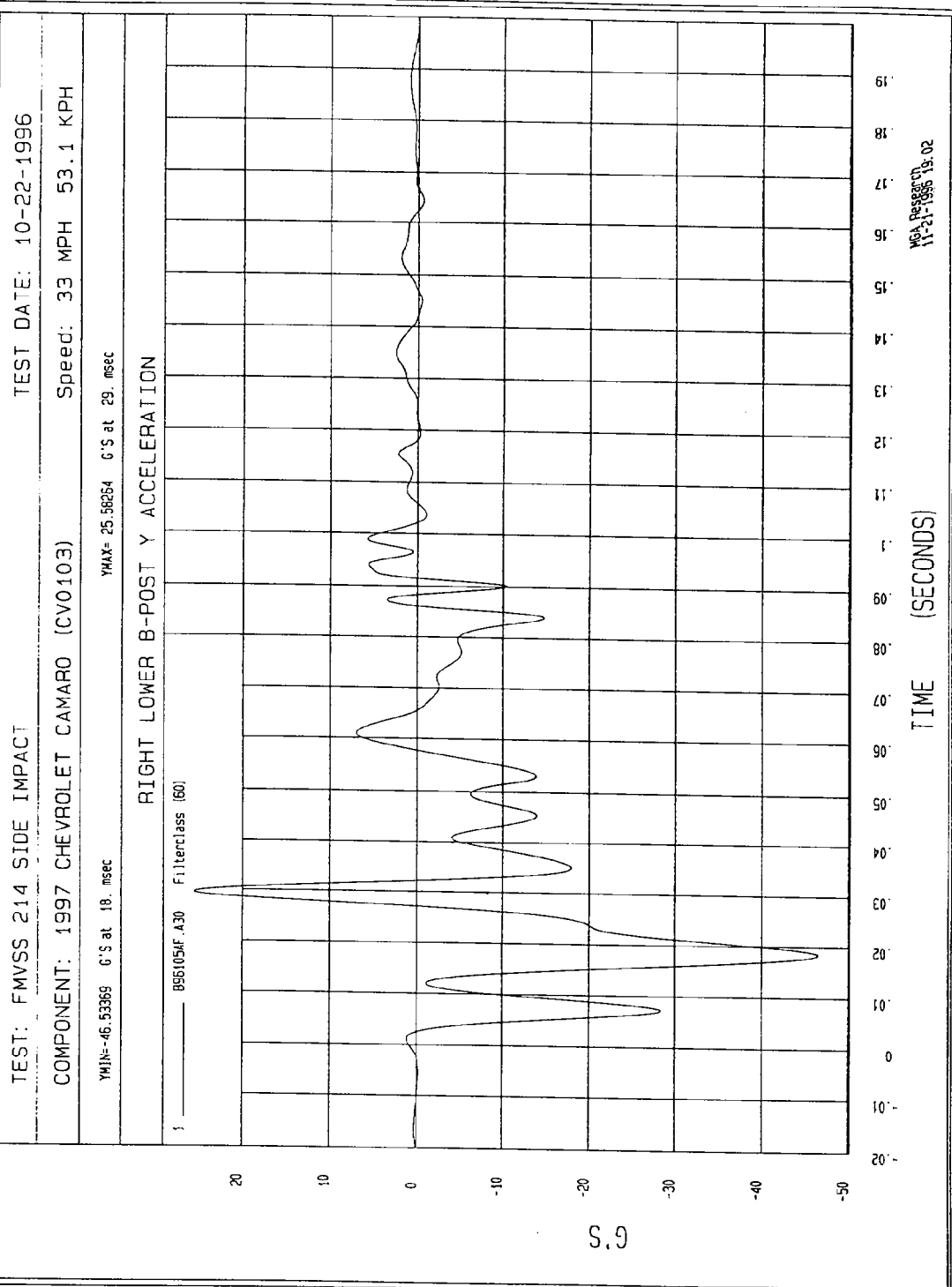










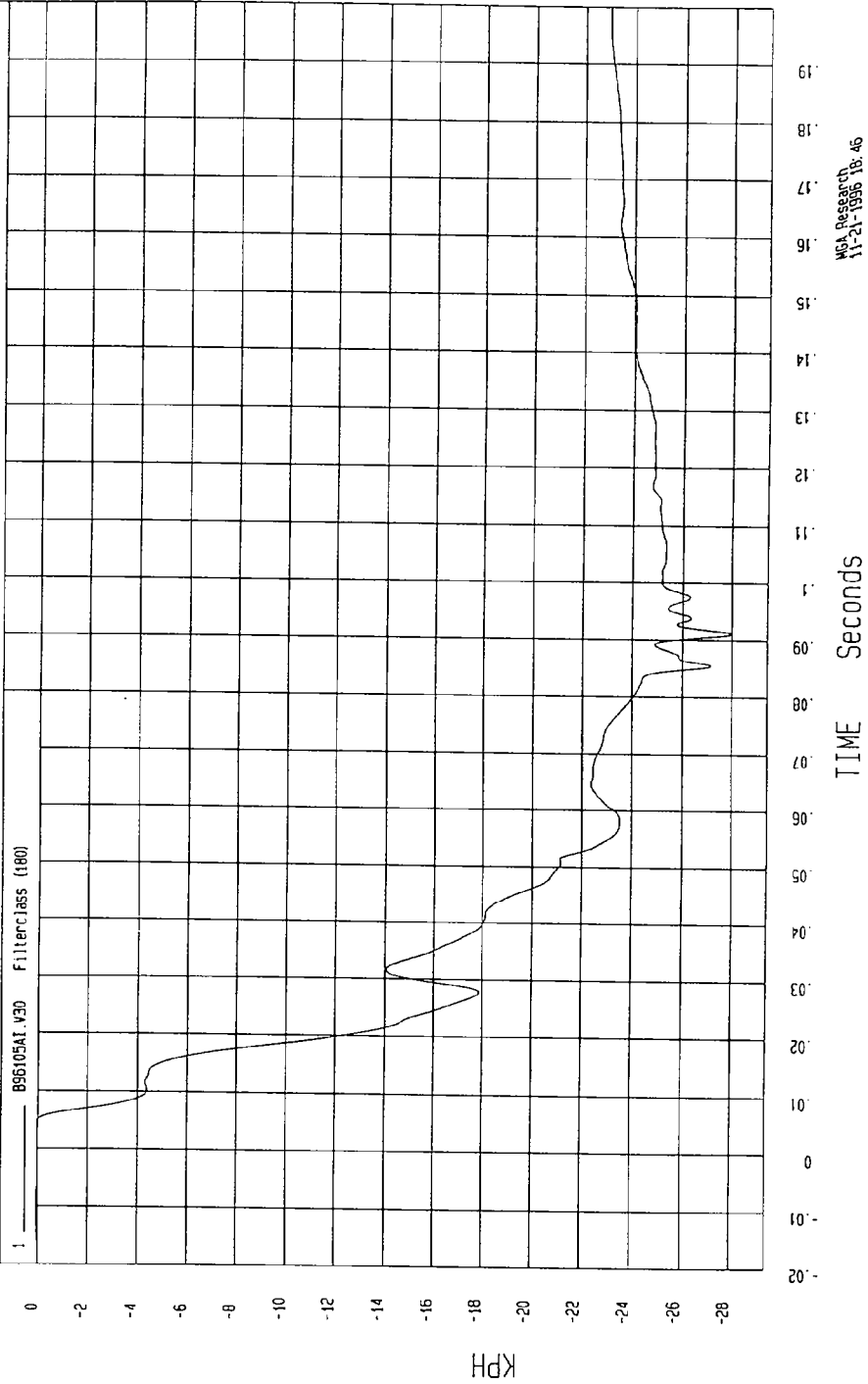


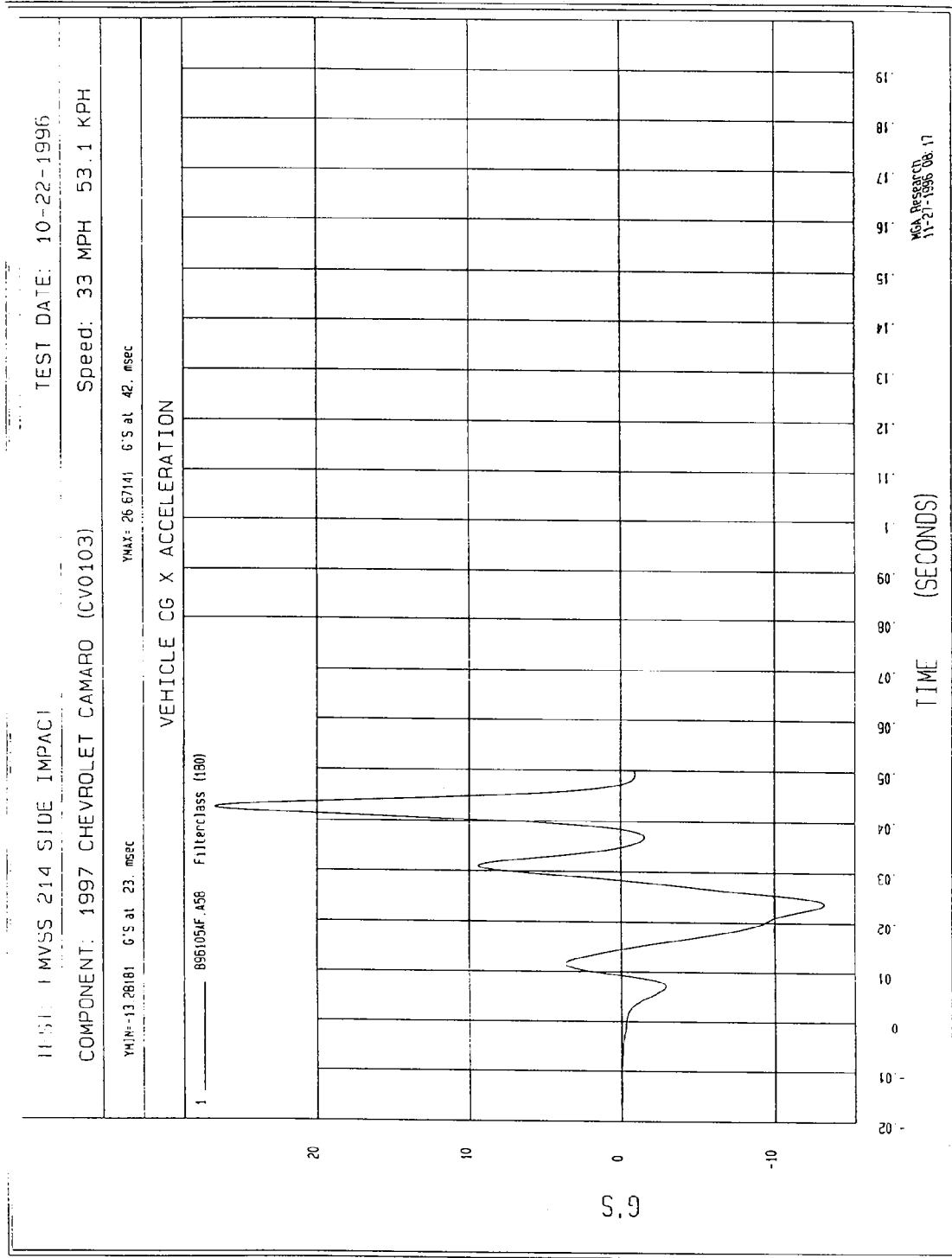
TEST: FMVSS 214 SIDE IMPACT TEST DATE: 10-22-1996

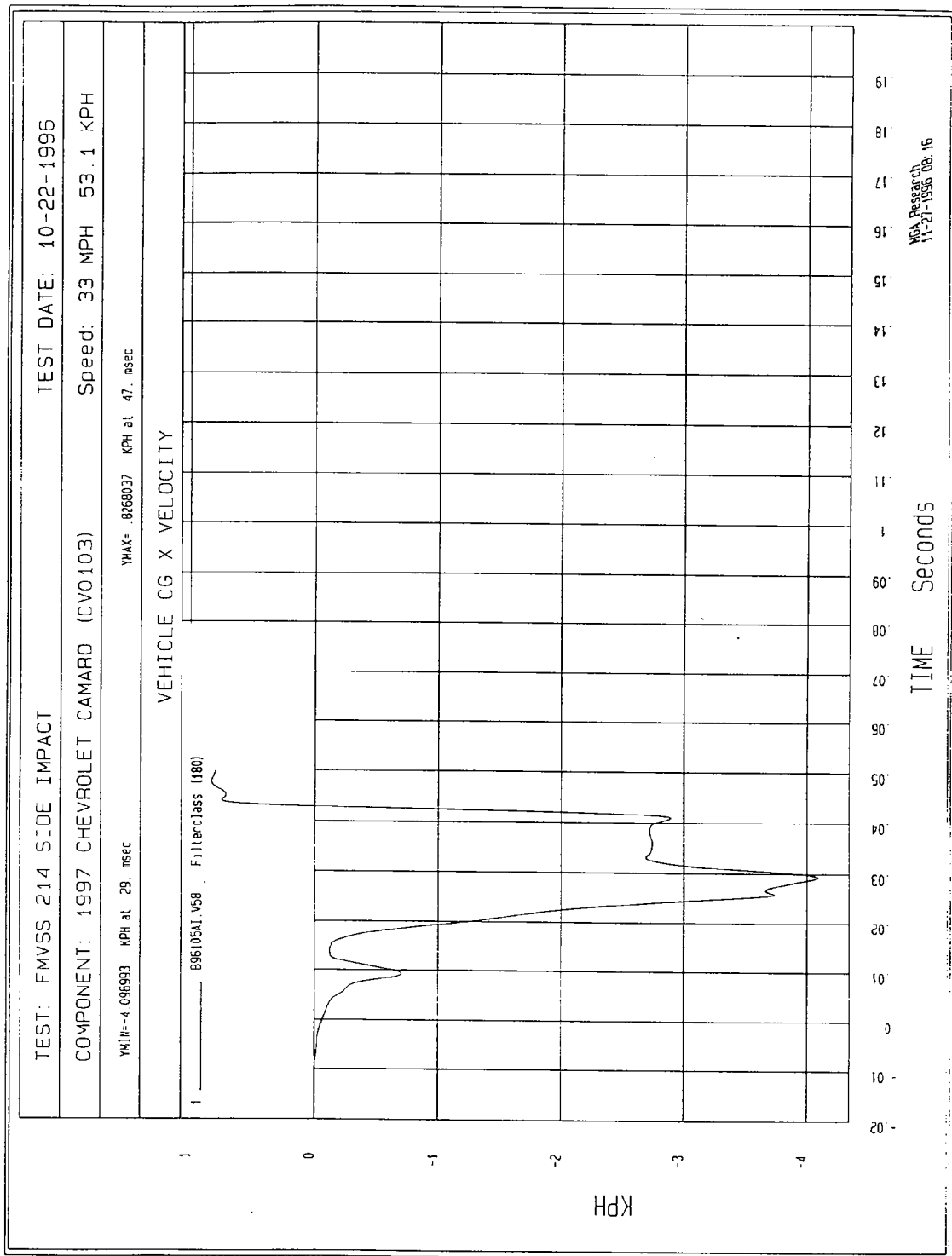
COMPONENT: 1997 CHEVROLET CAMARO (CV0103) Speed: 33 MPH 53.1 KPH

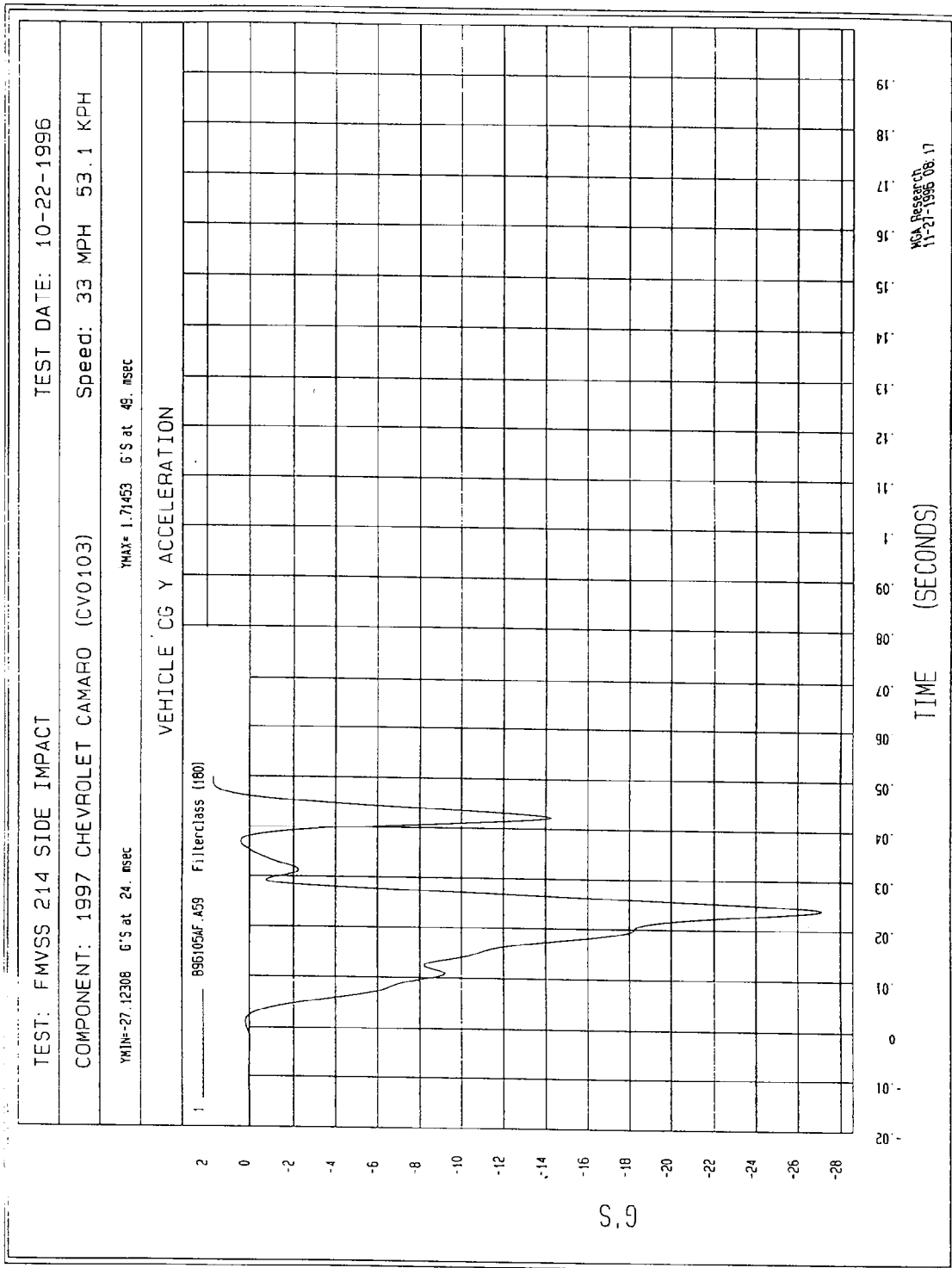
YMIN=-28.01717 KPH at 91. msec YMAX= 7.47142E-02 KPH at -9.5 msec

RIGHT LOWER B-POST Y VELOCITY









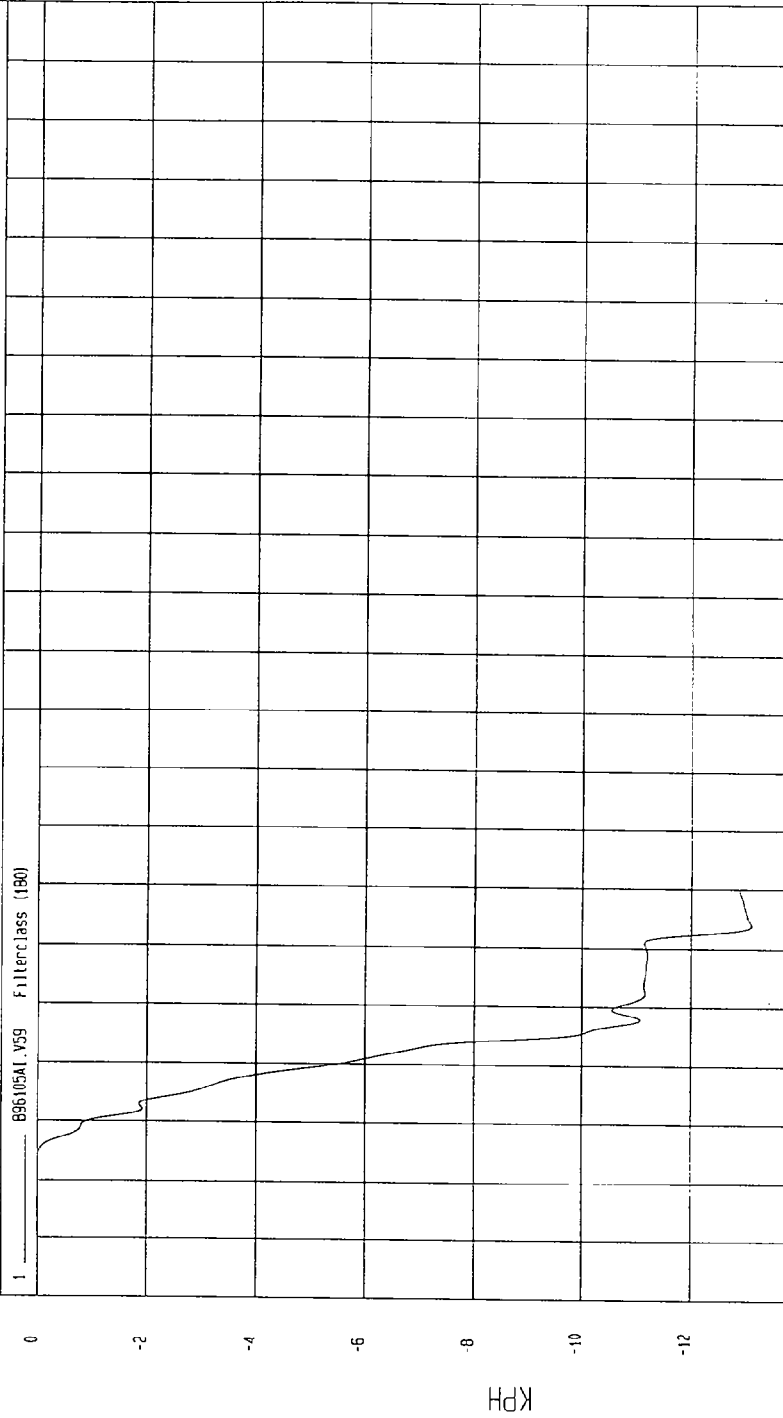
TEST: FMVSS 214 SIDE IMPACT TEST DATE: 10-22-1996

COMPONENT: 1997 CHEVROLET CAMARO (CV0103) Speed: 33 MPH 53.1 KPH

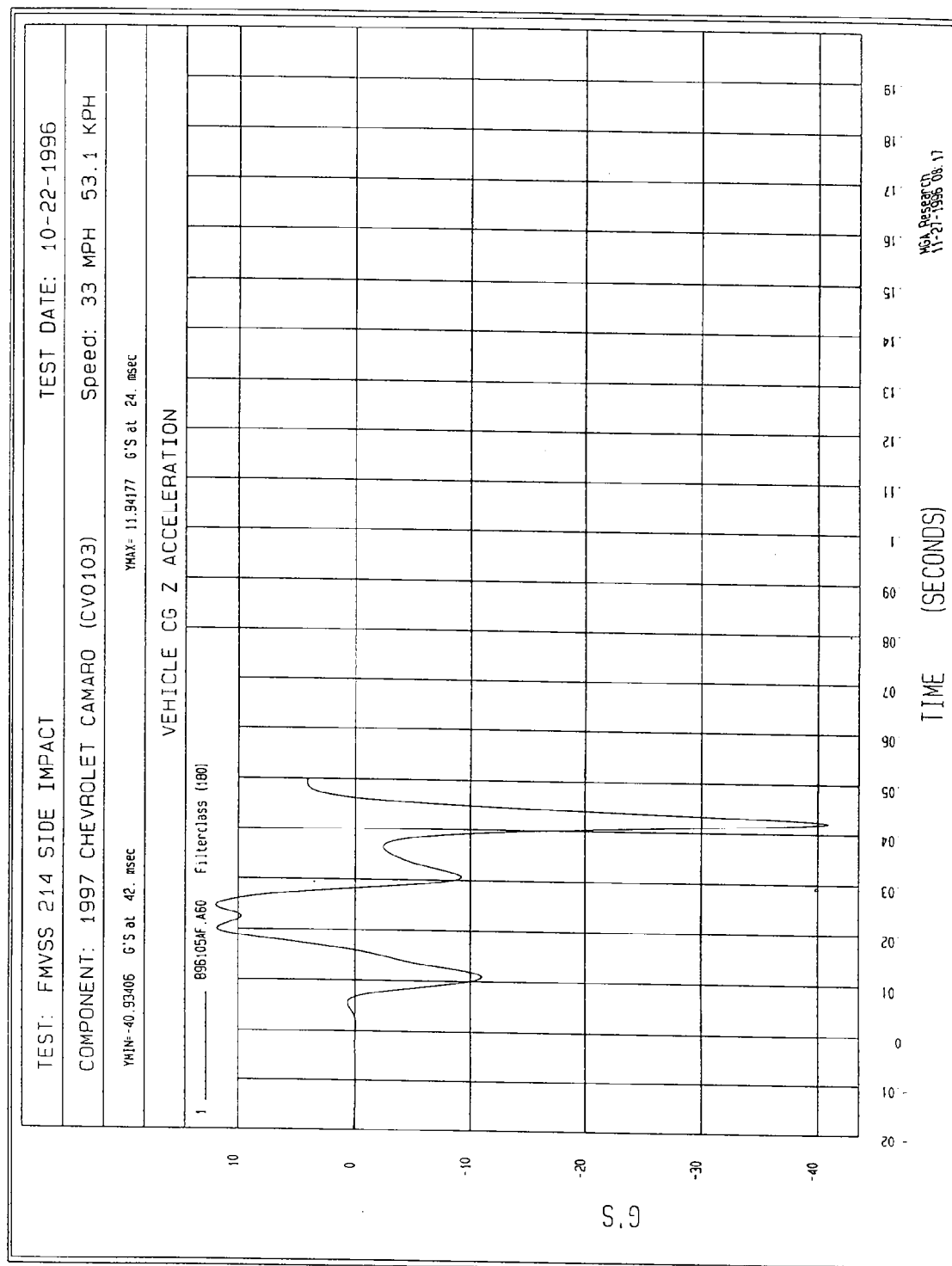
YMIN=-13.10544 KPH at 43. msec YMAX= 7.572053E-03 KPH at -3.5 msec

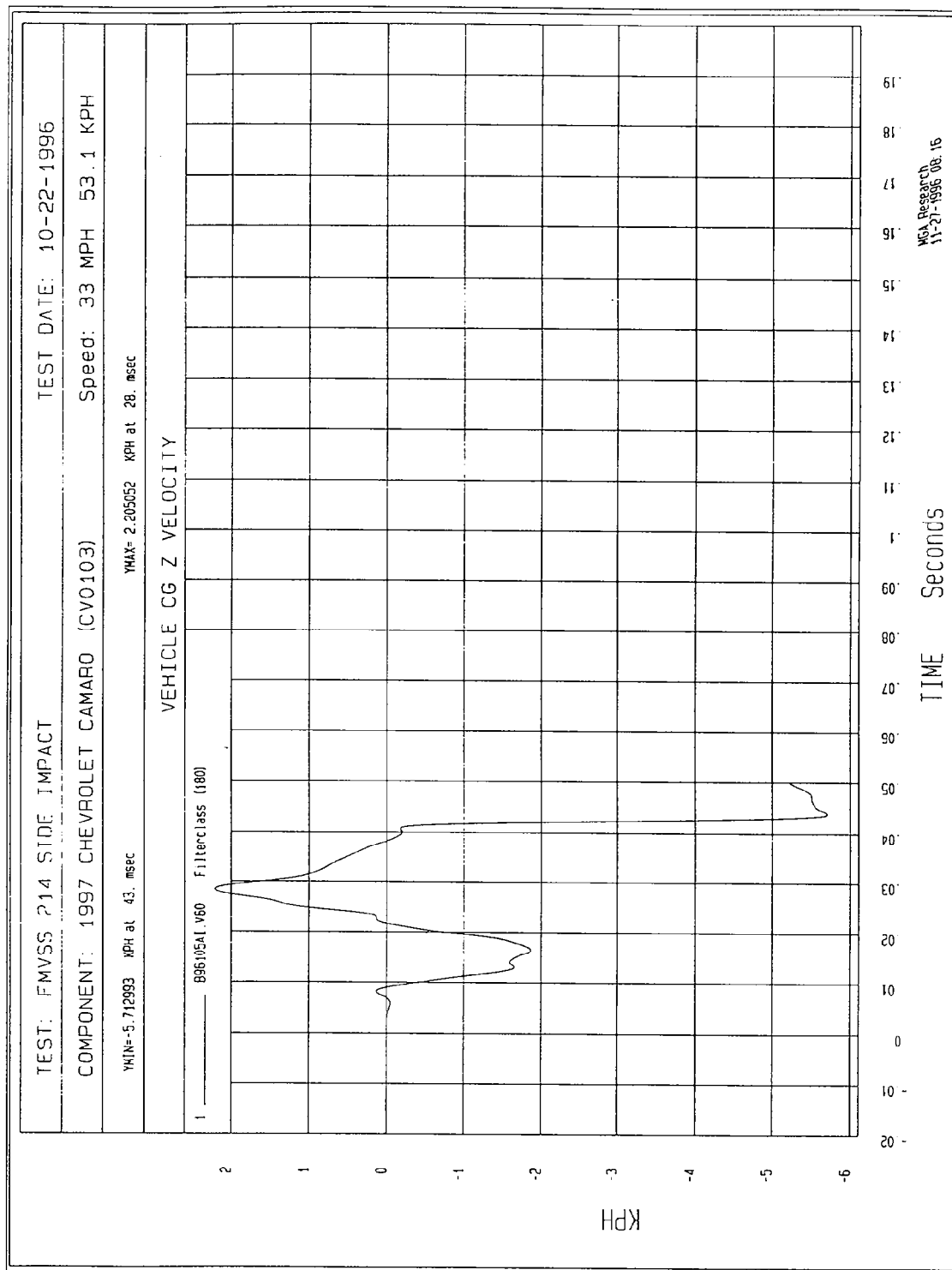
VEHICLE CG Y VELOCITY

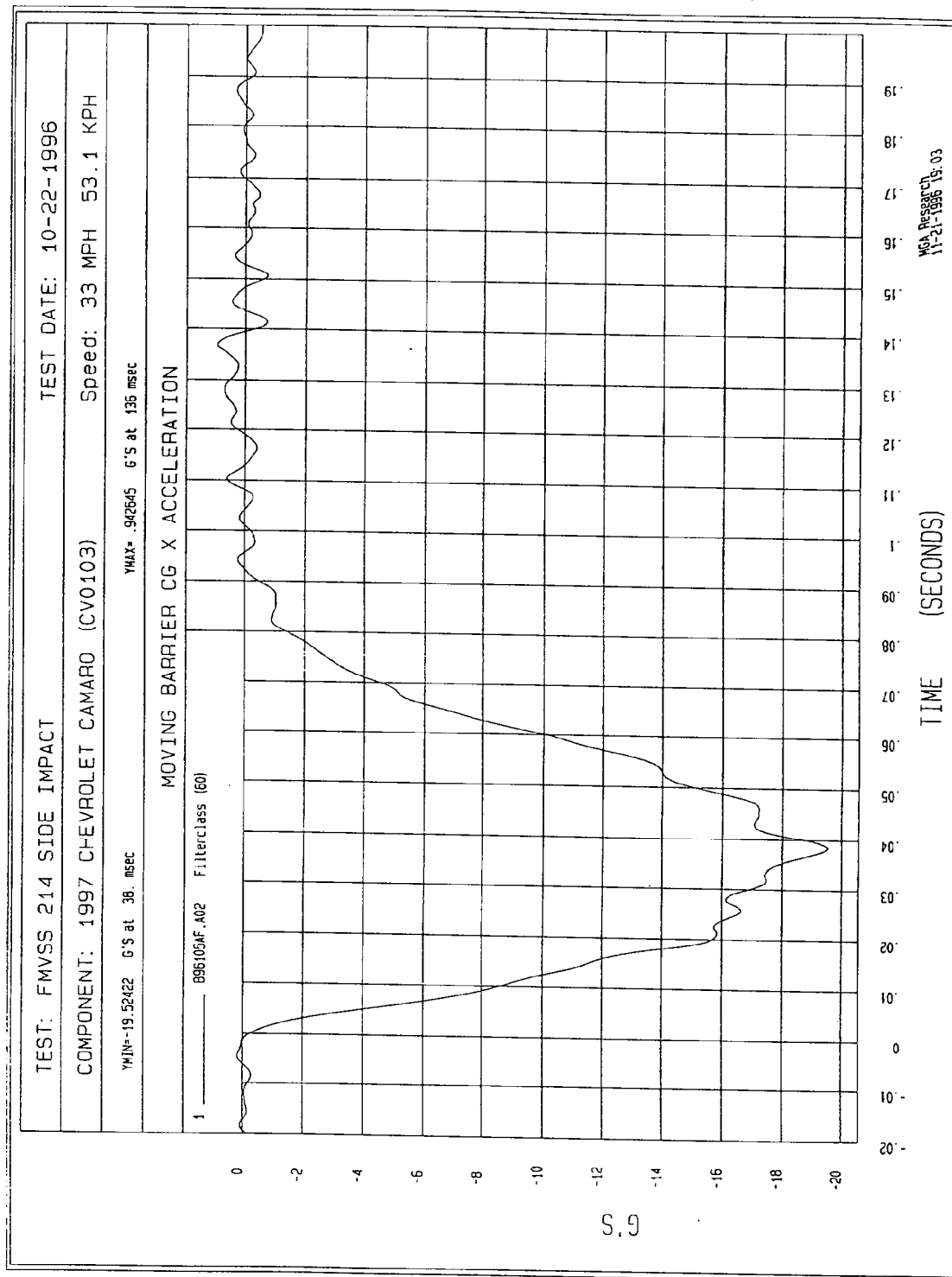
1 896105A1.V59 Filterclass (180)



MSA Research
11-27-1996 08:16







TEST: FMVSS 214 SIDE IMPACT

TEST DATE: 10-22-1996

COMPONENT: 1997 CHEVROLET CAMARO (CV0103)

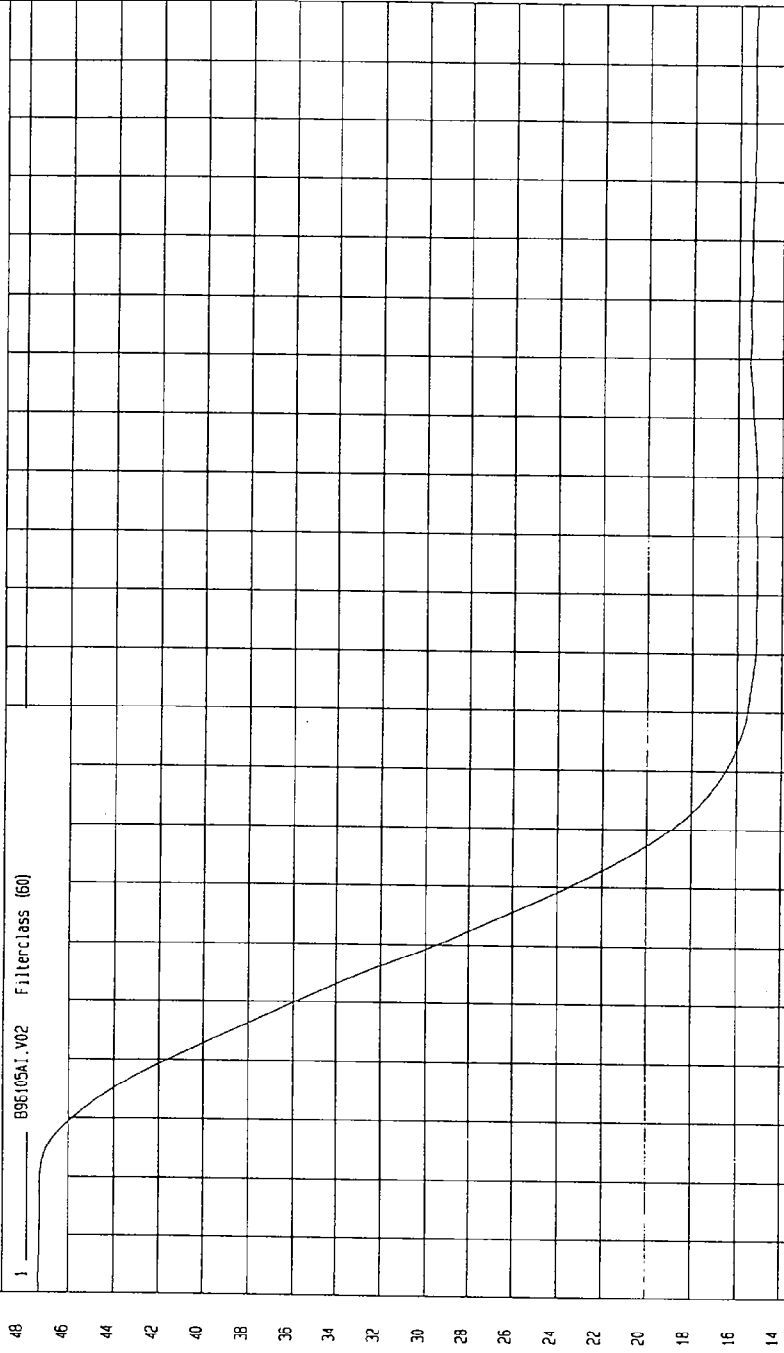
Speed: 33 MPH 53.1 KPH

YMIN= 15.12148 KPH at 100 msec

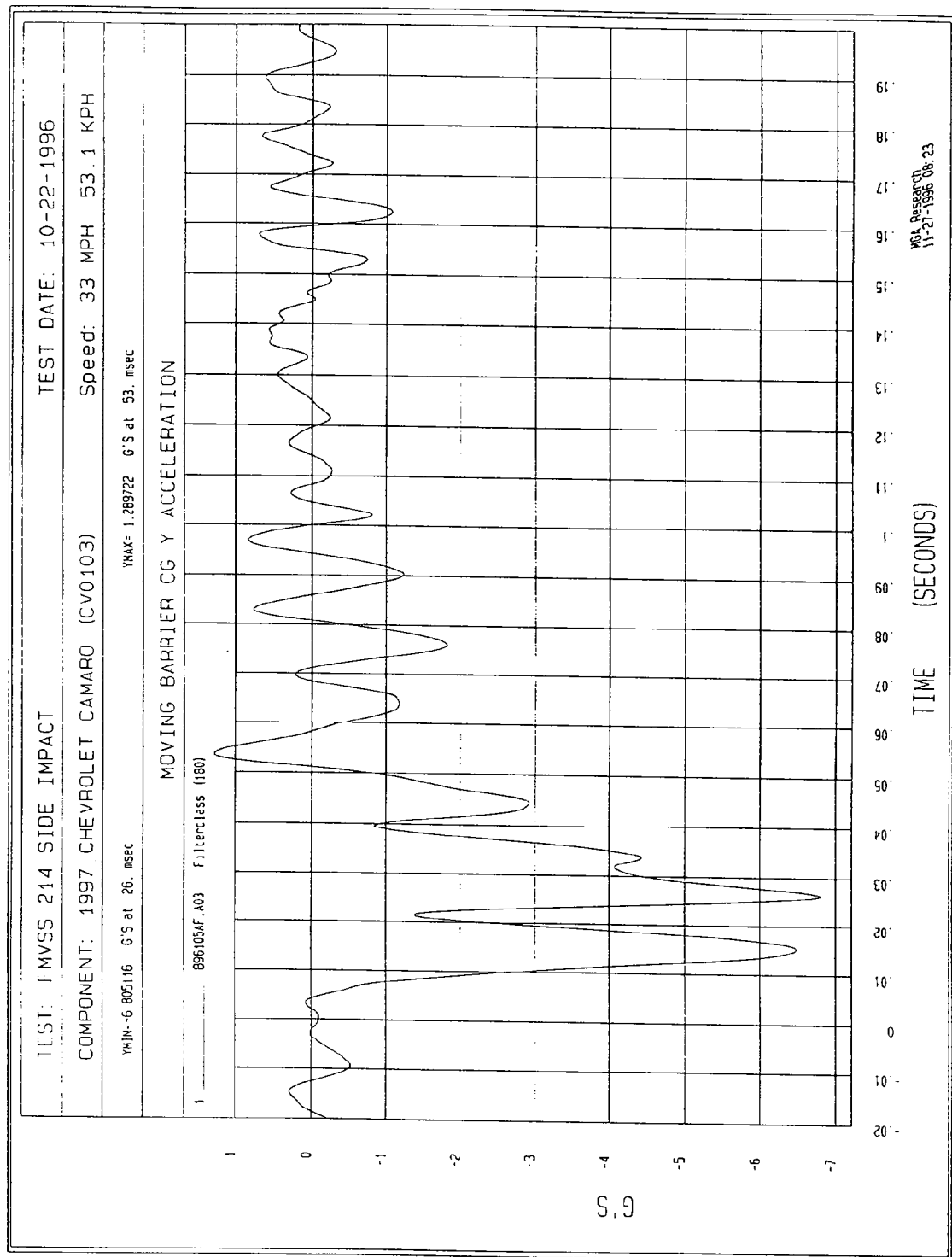
YMAX= 47.30225 KPH at -17. msec

MOVING BARRIER CG X VELOCITY

1 — B96105A1.V02 Filterclass (60)



WCA Research
11-2-1996 08:01



TEST: FMVSS 214 SIDE IMPACT

TEST DATE: 10-22-1995

COMPONENT: 1997 CHEVROLET CAMARO (CV0103)

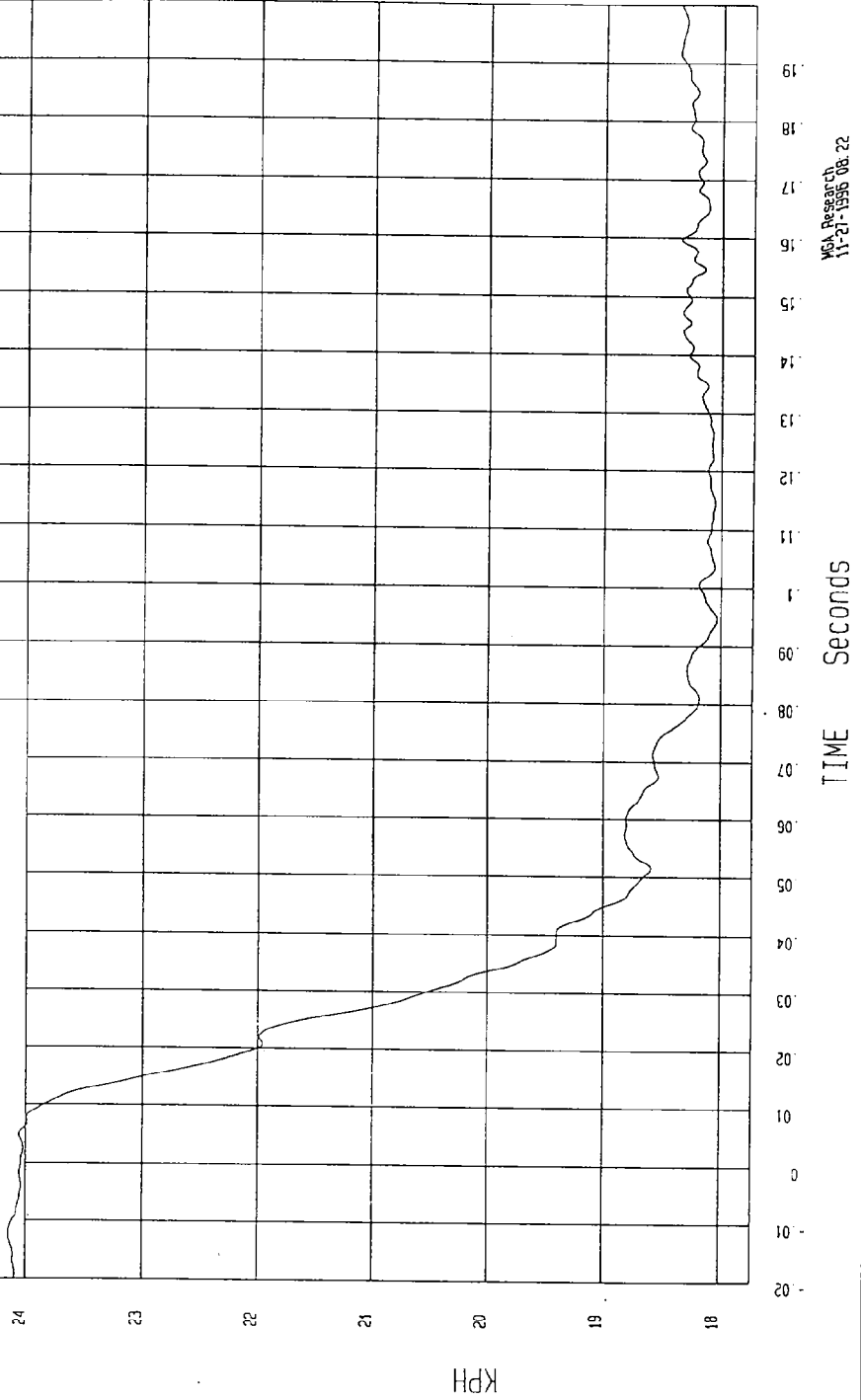
Speed: 33 MPH 53.1 KPH

YMIN= 18.03095 KPH at 94. msec

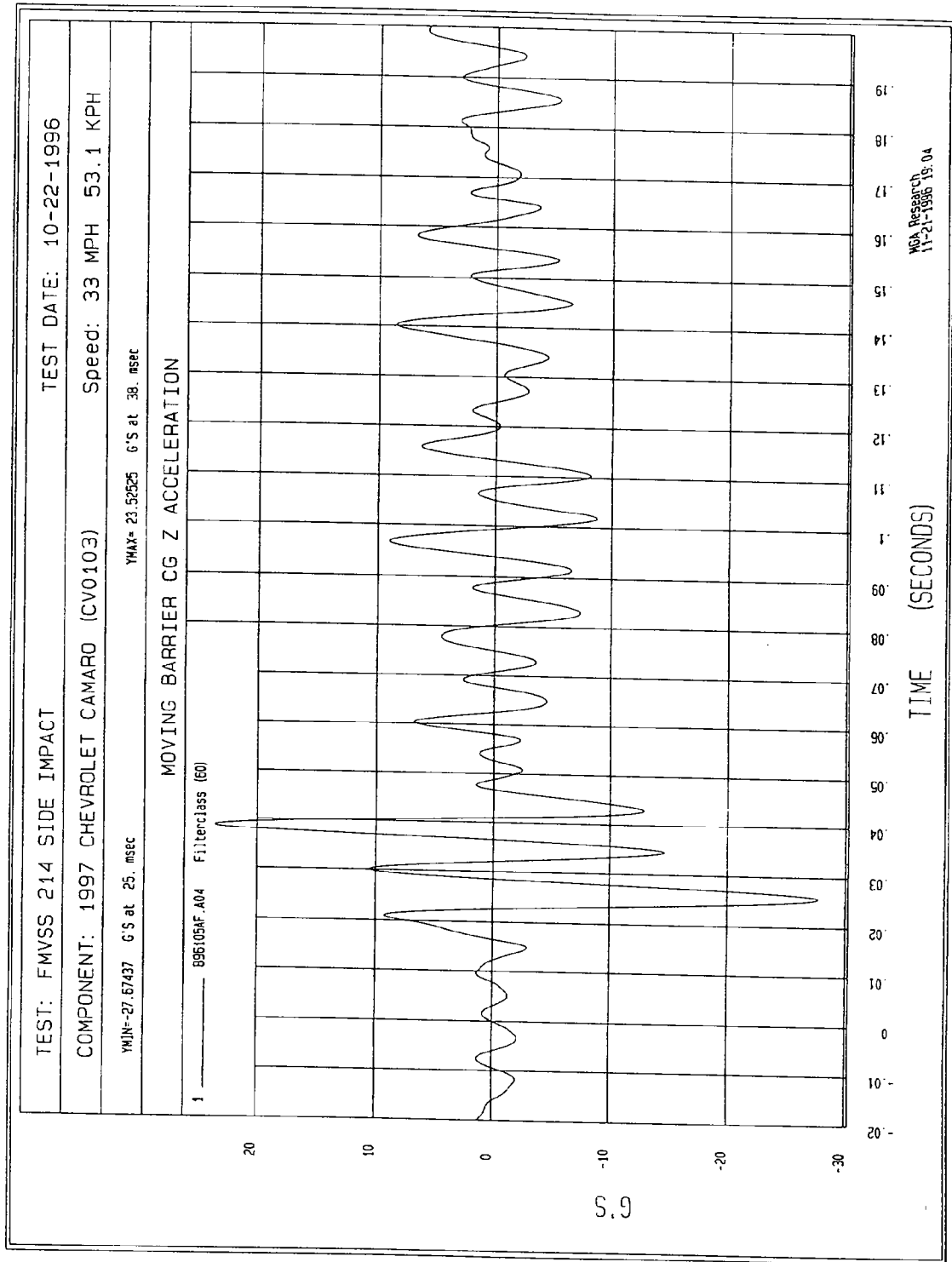
YMAX= 24.14712 KPH at -12. msec

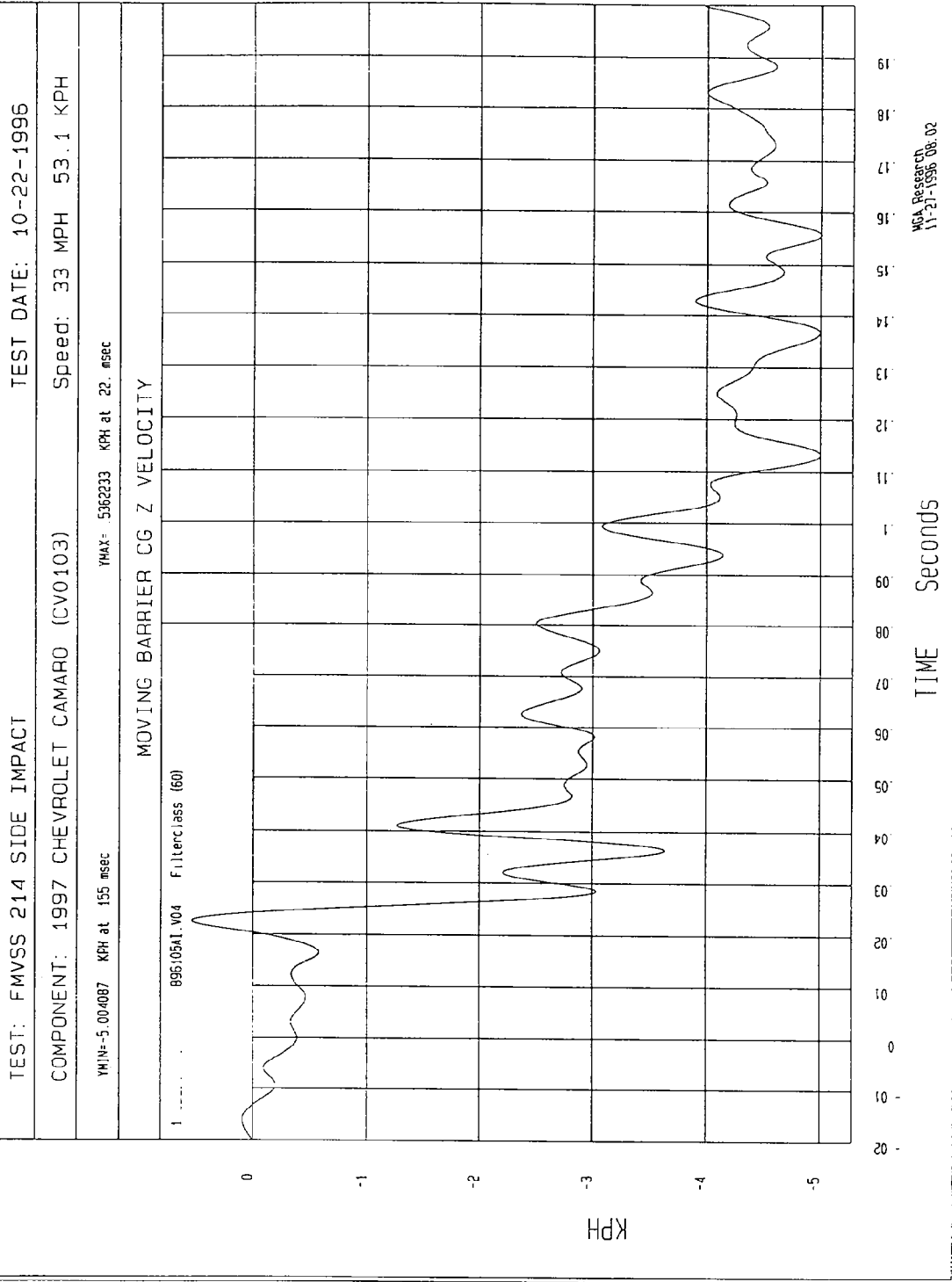
MOVING BARRIER CG Y VELOCITY

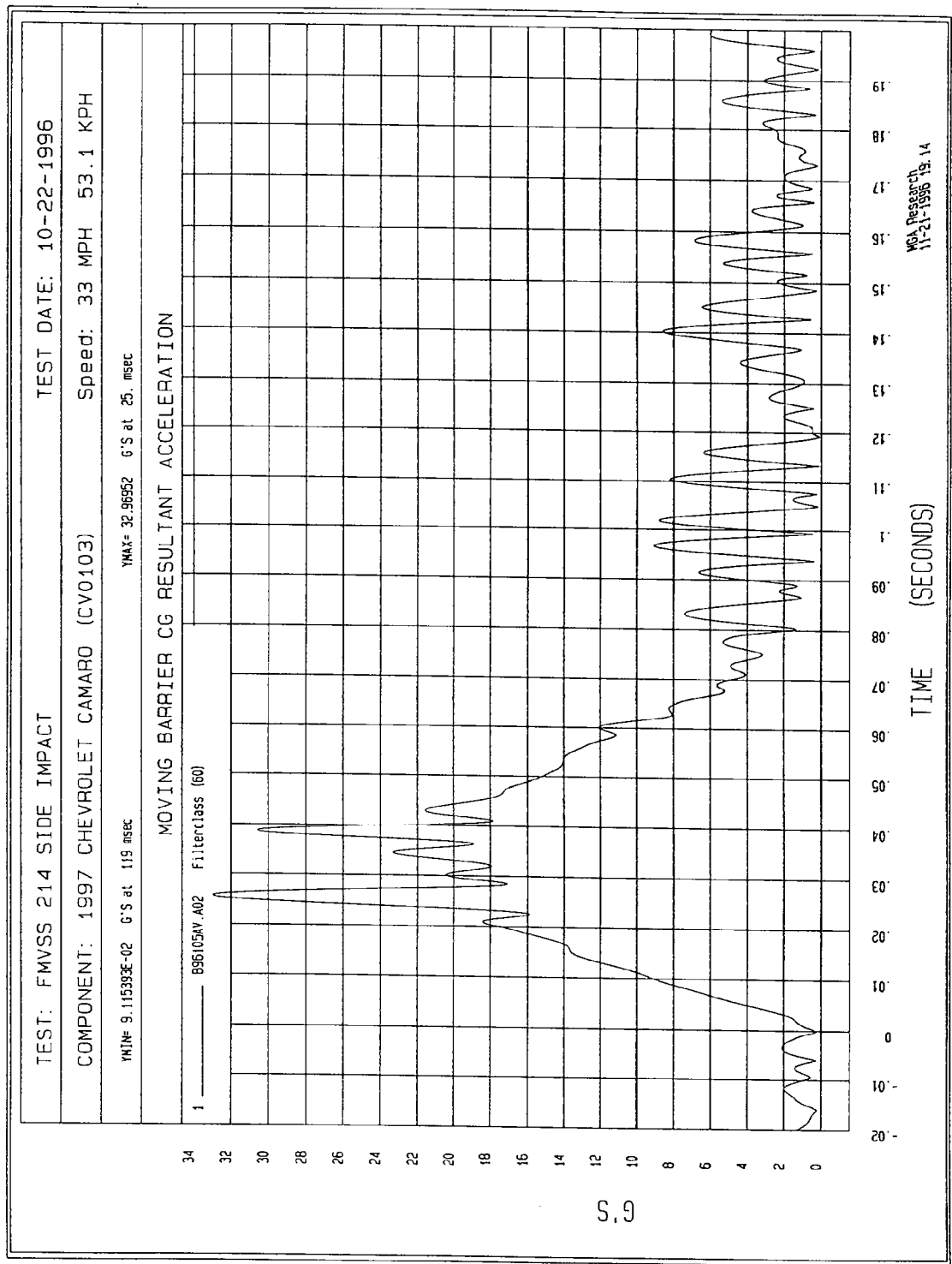
1 — B96105A1.V03 Filterclass (180)

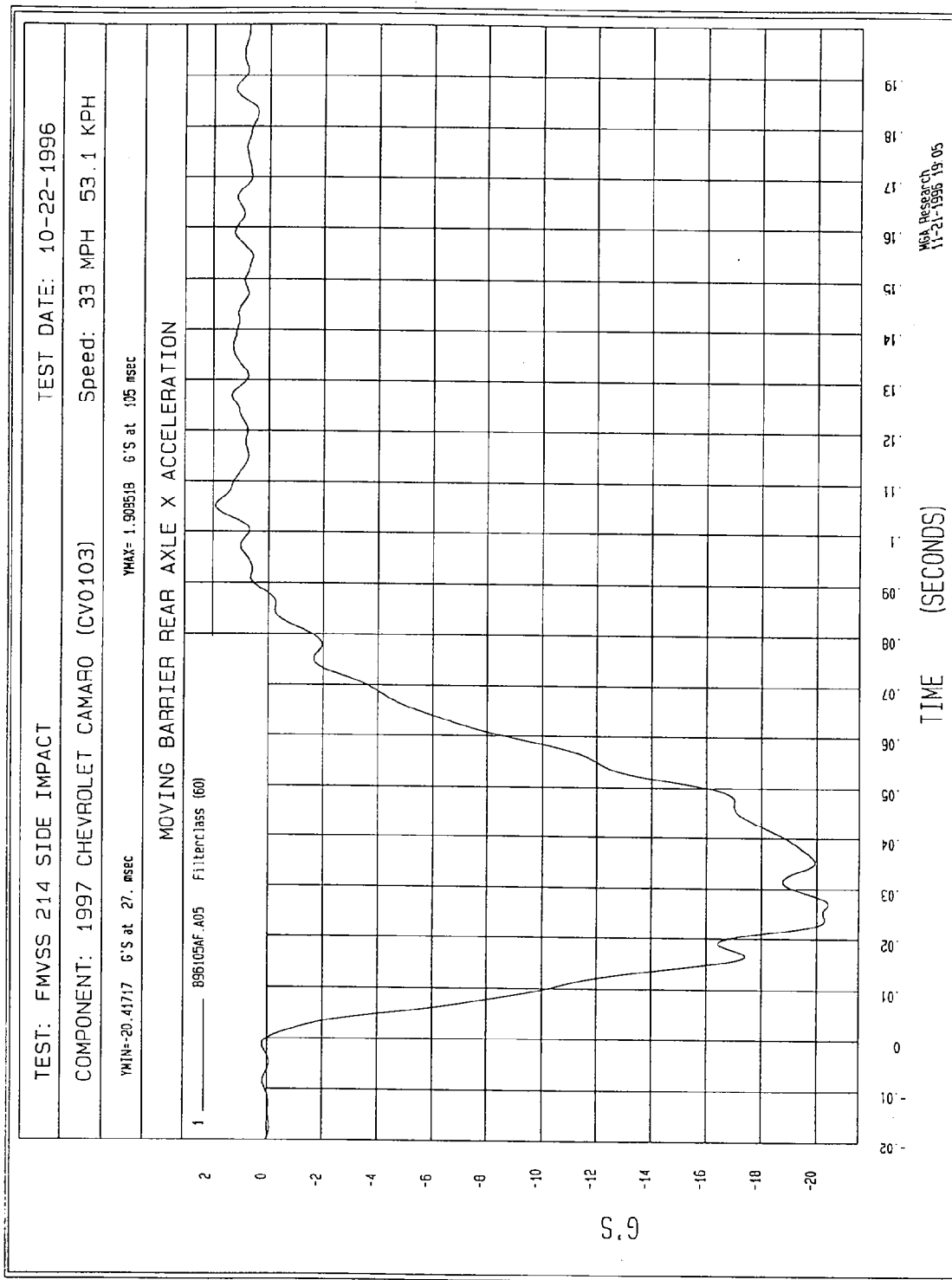


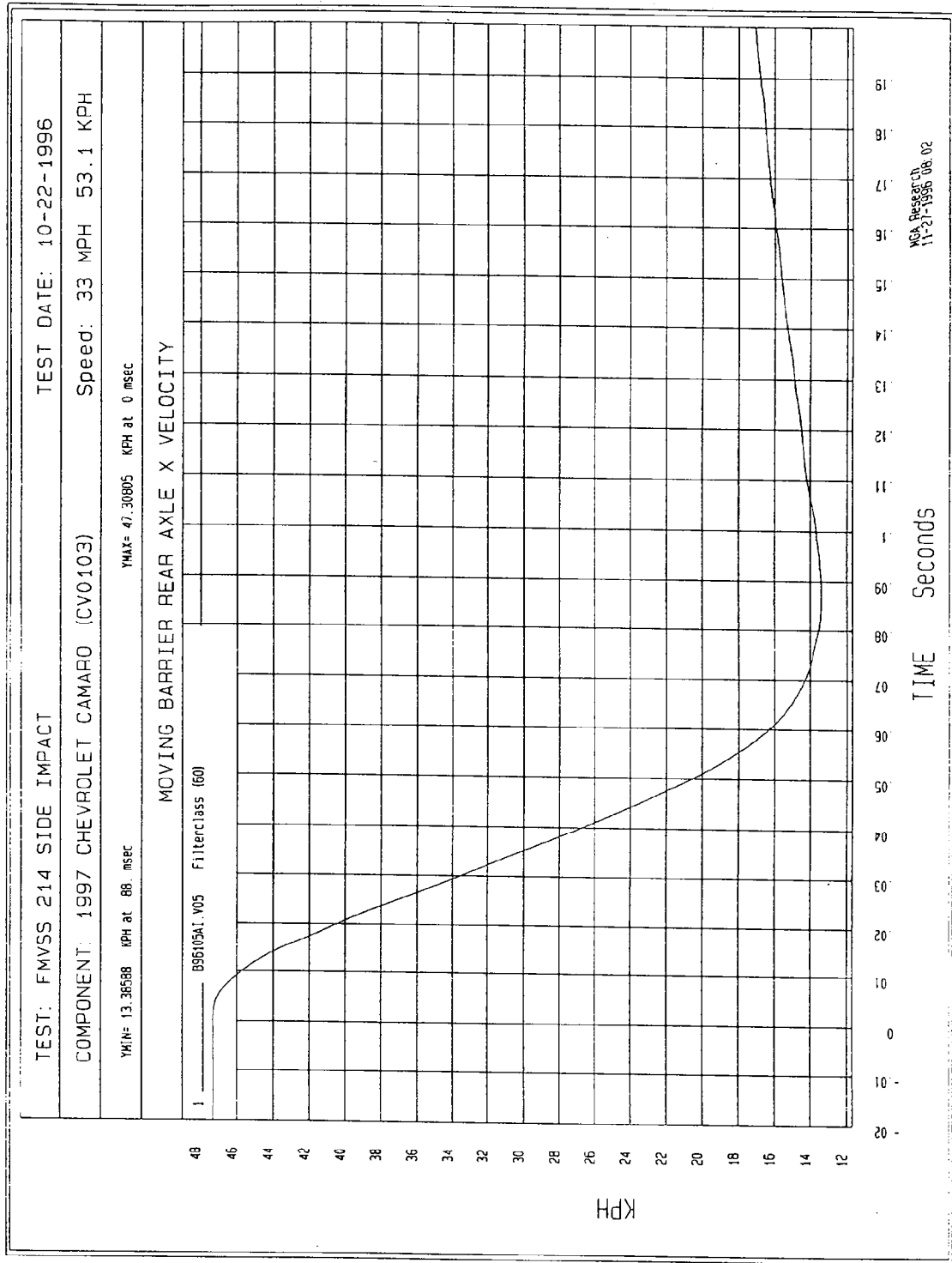
MOA Research
11-21-1996 08:22

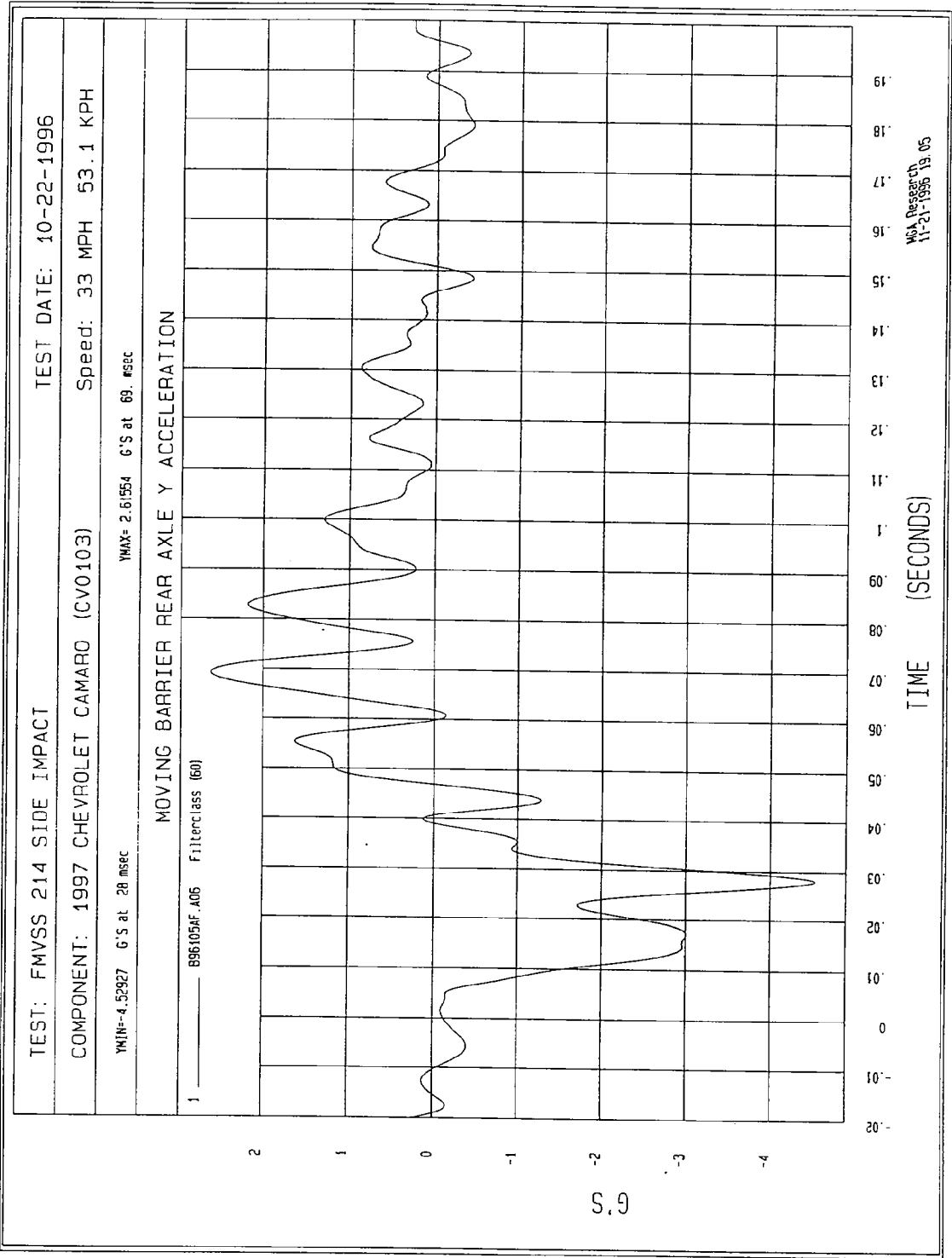


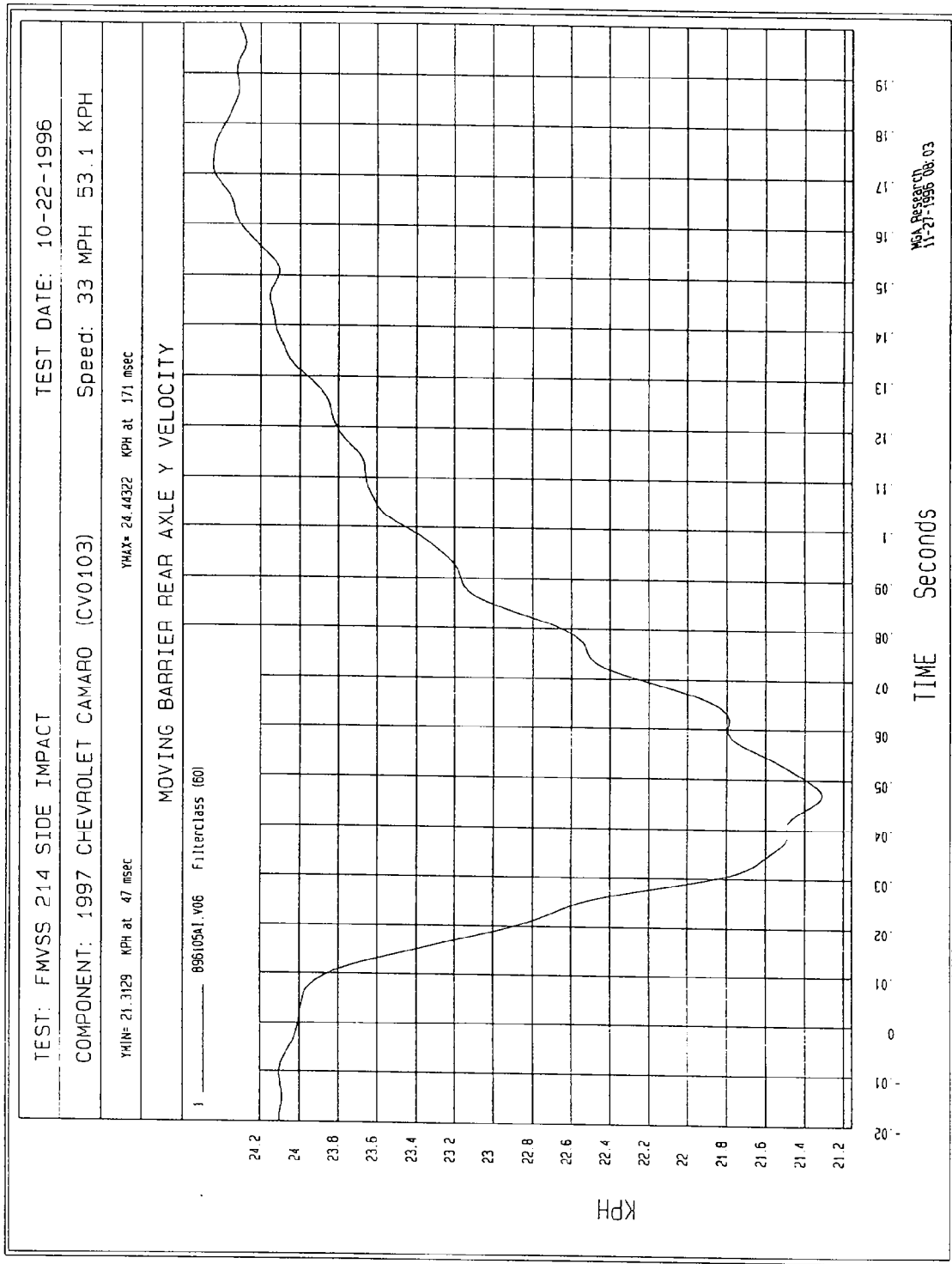


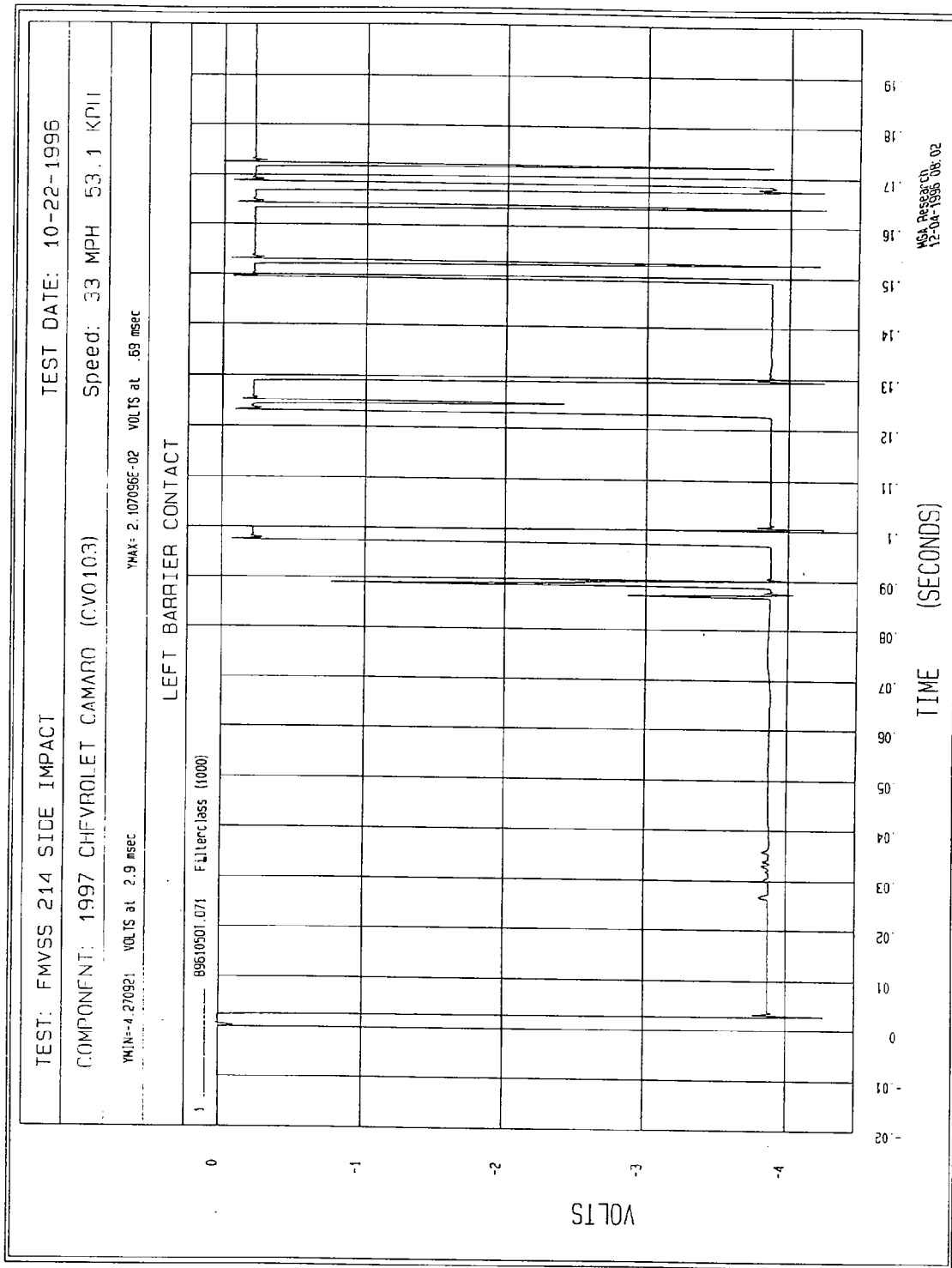


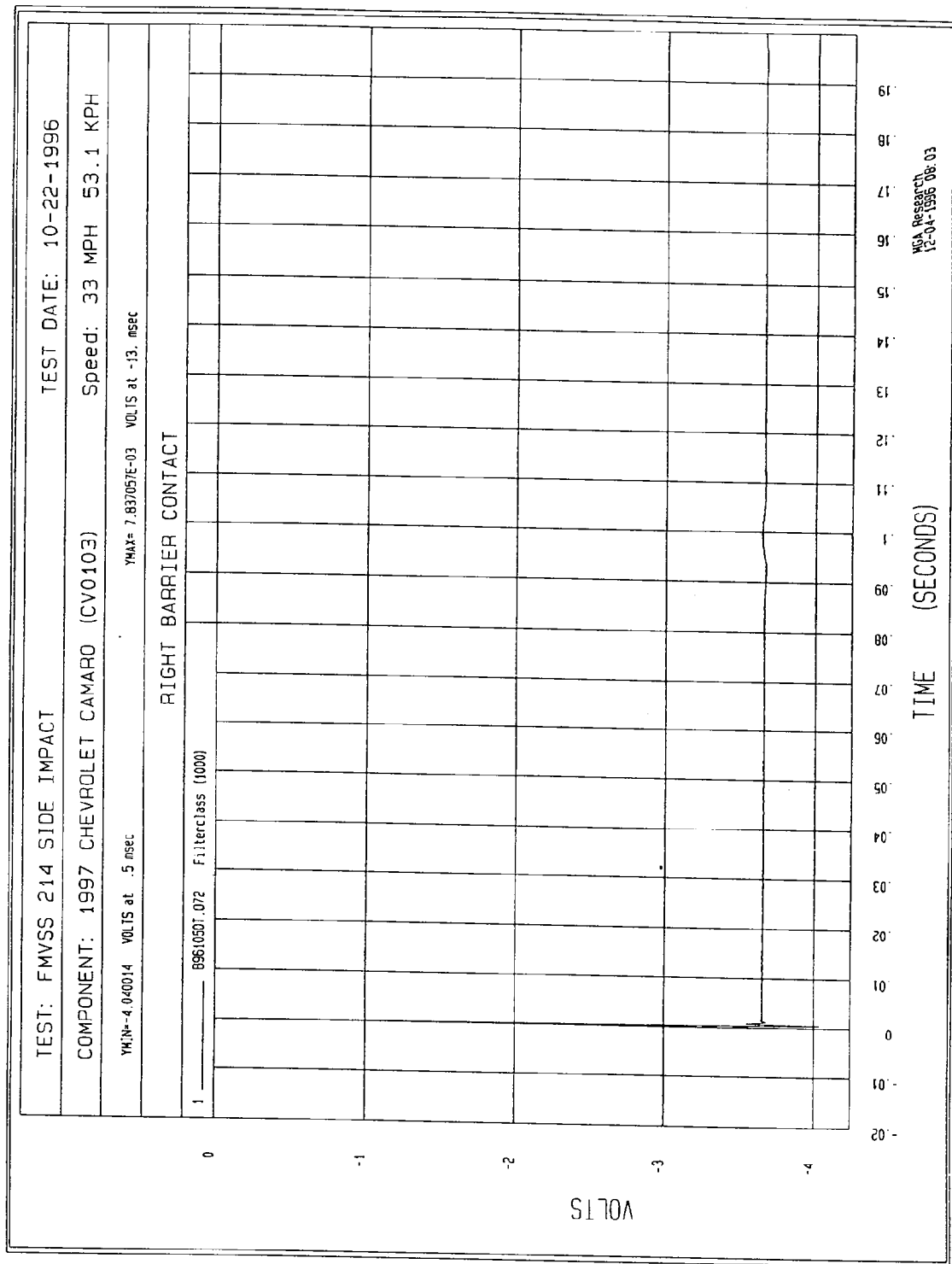


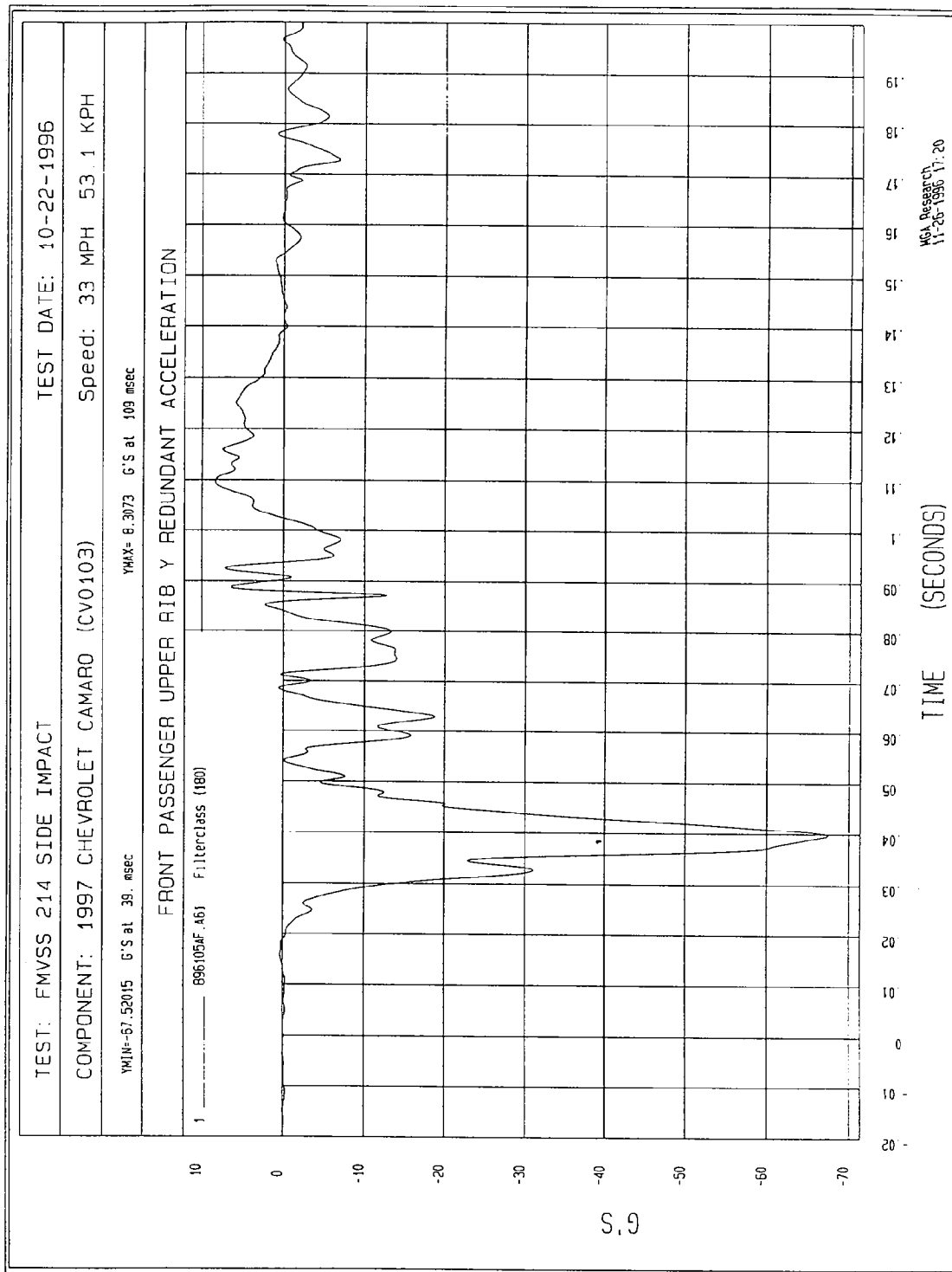


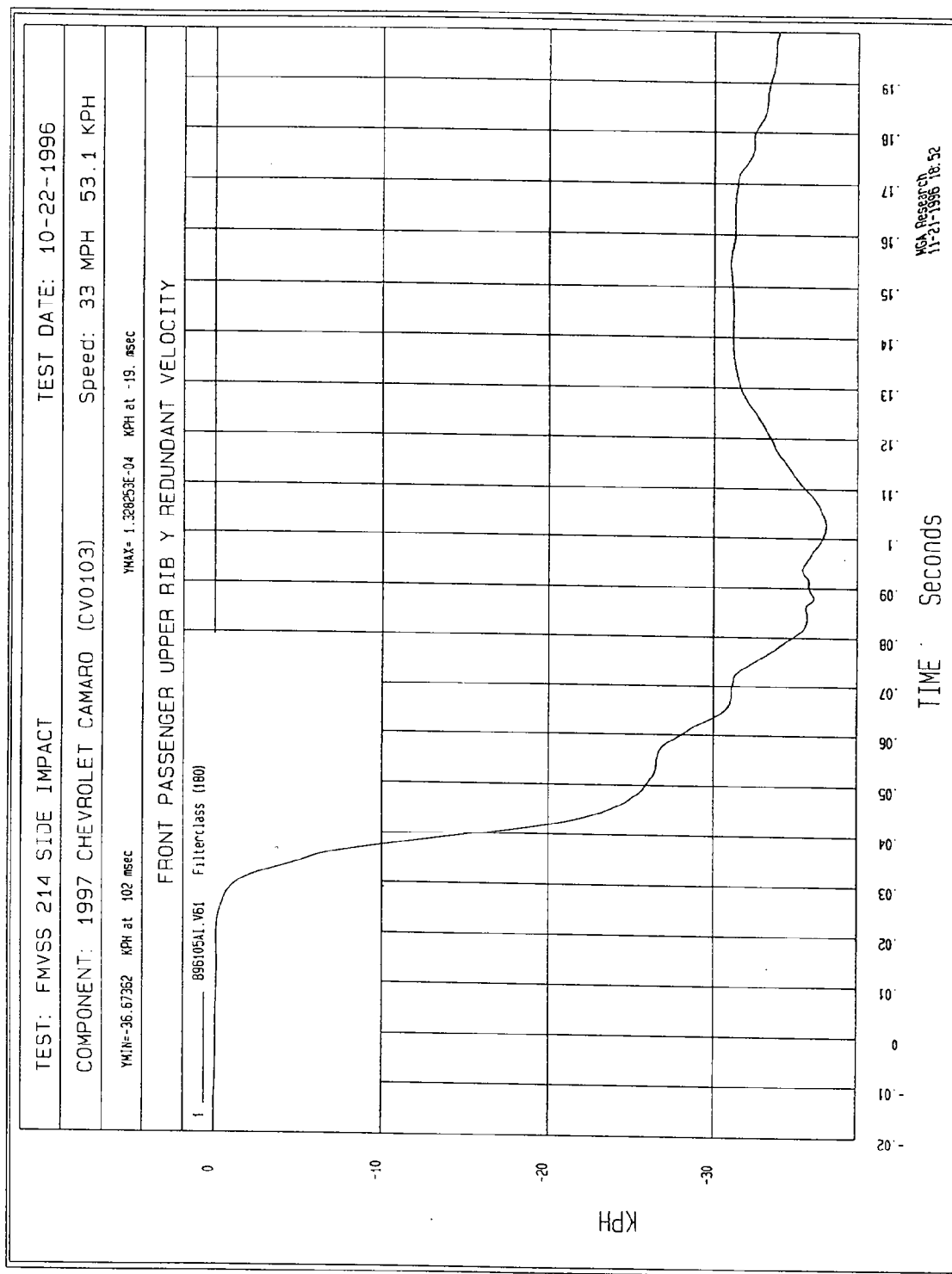


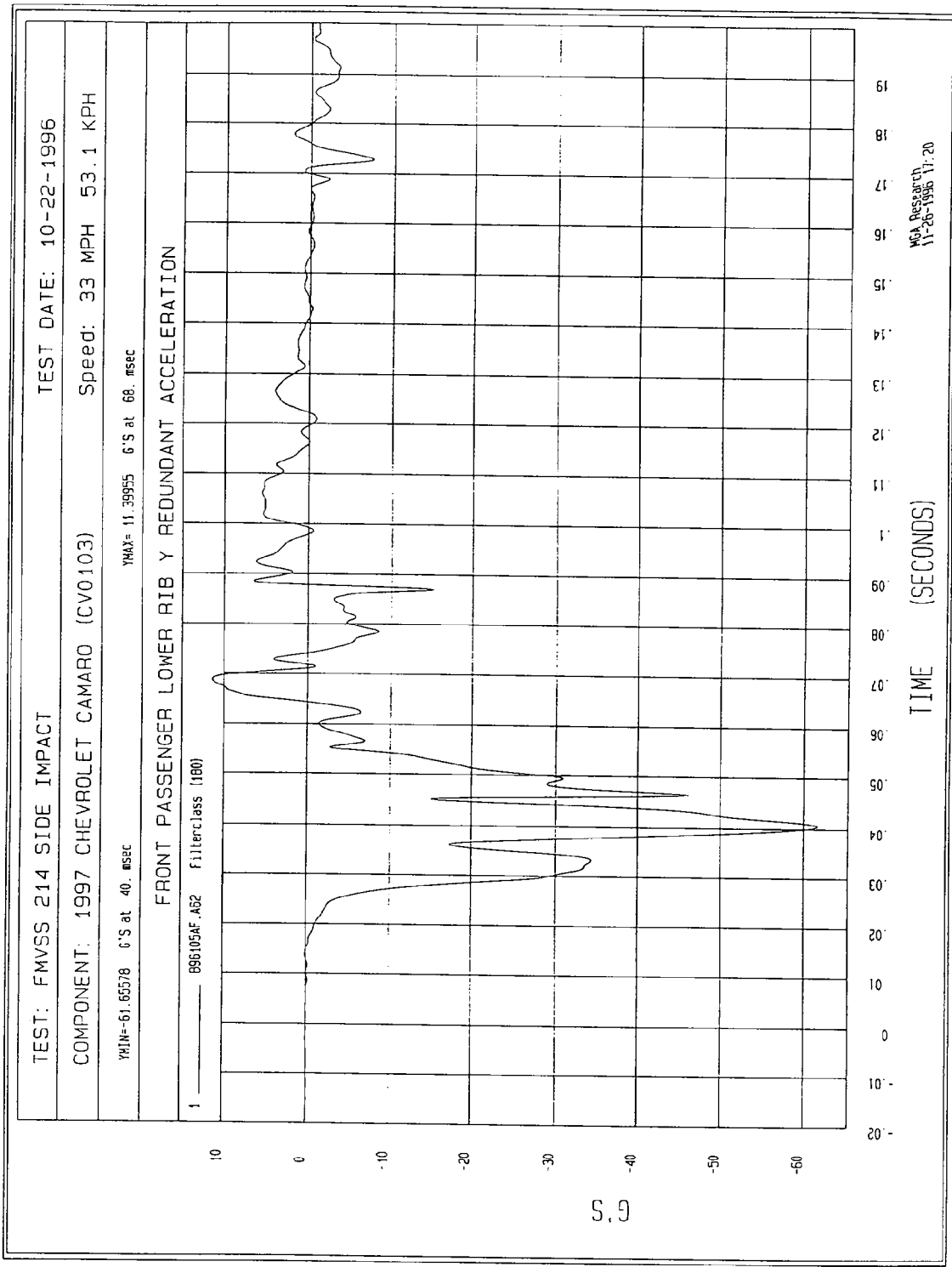


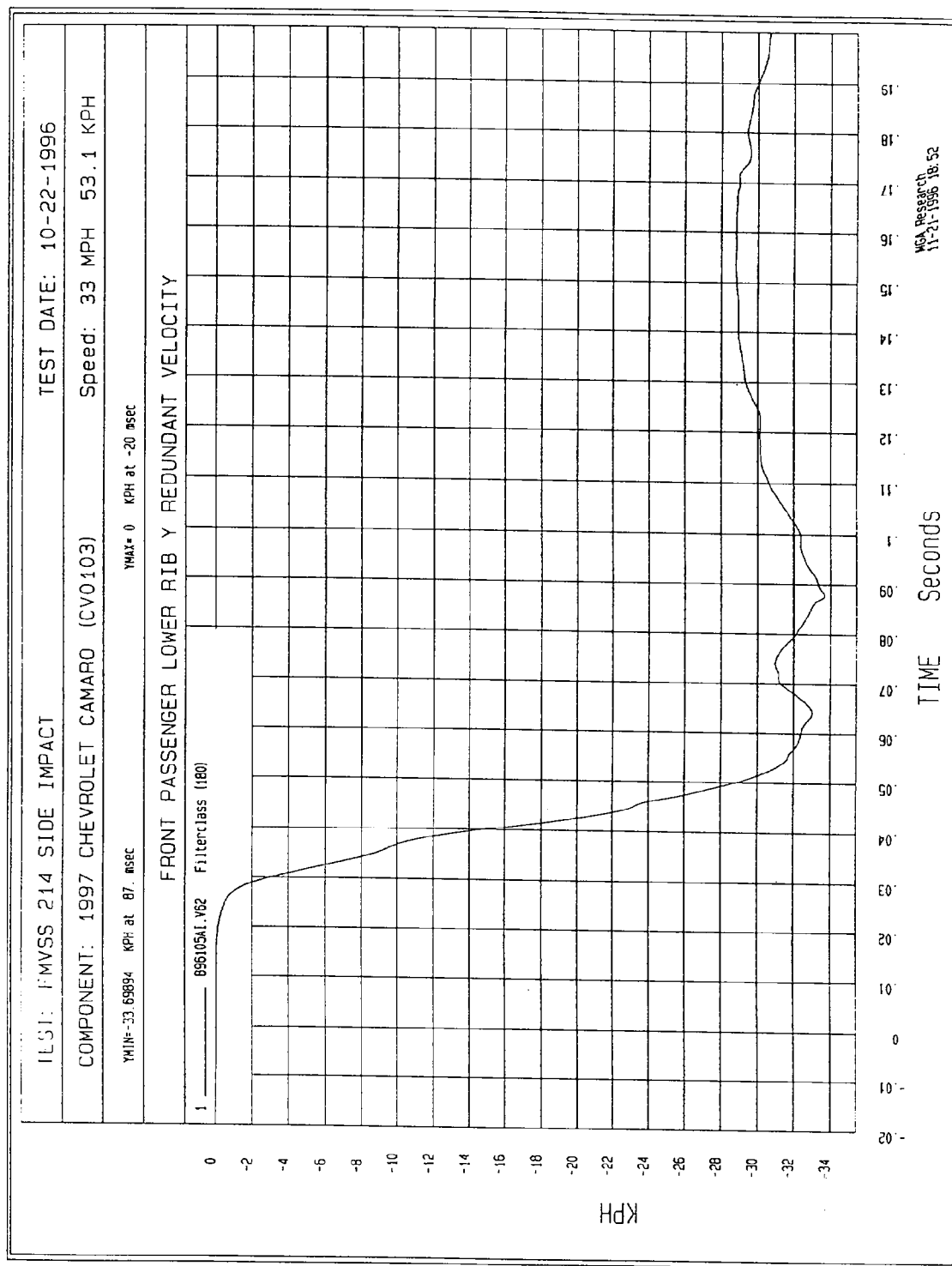


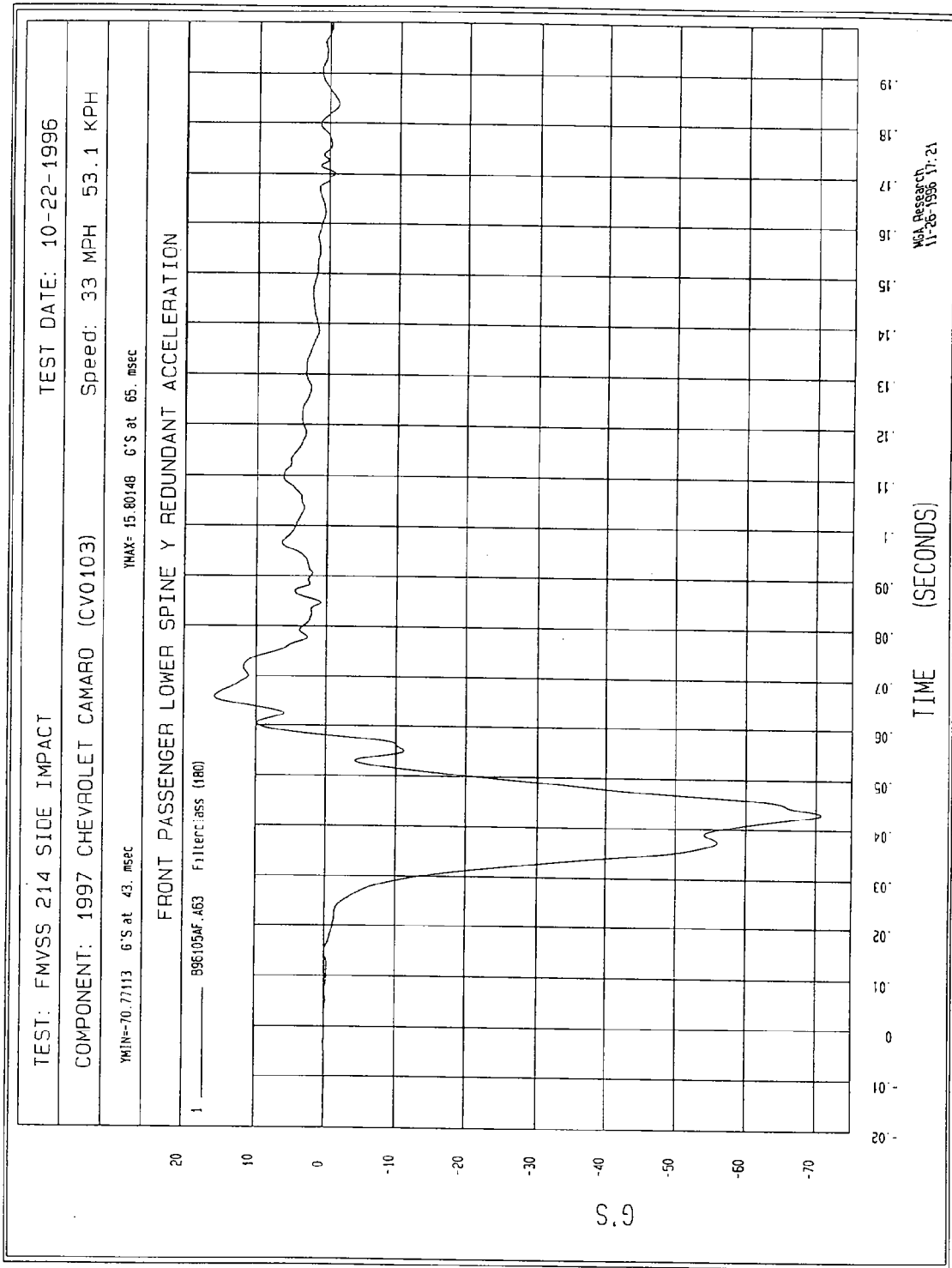


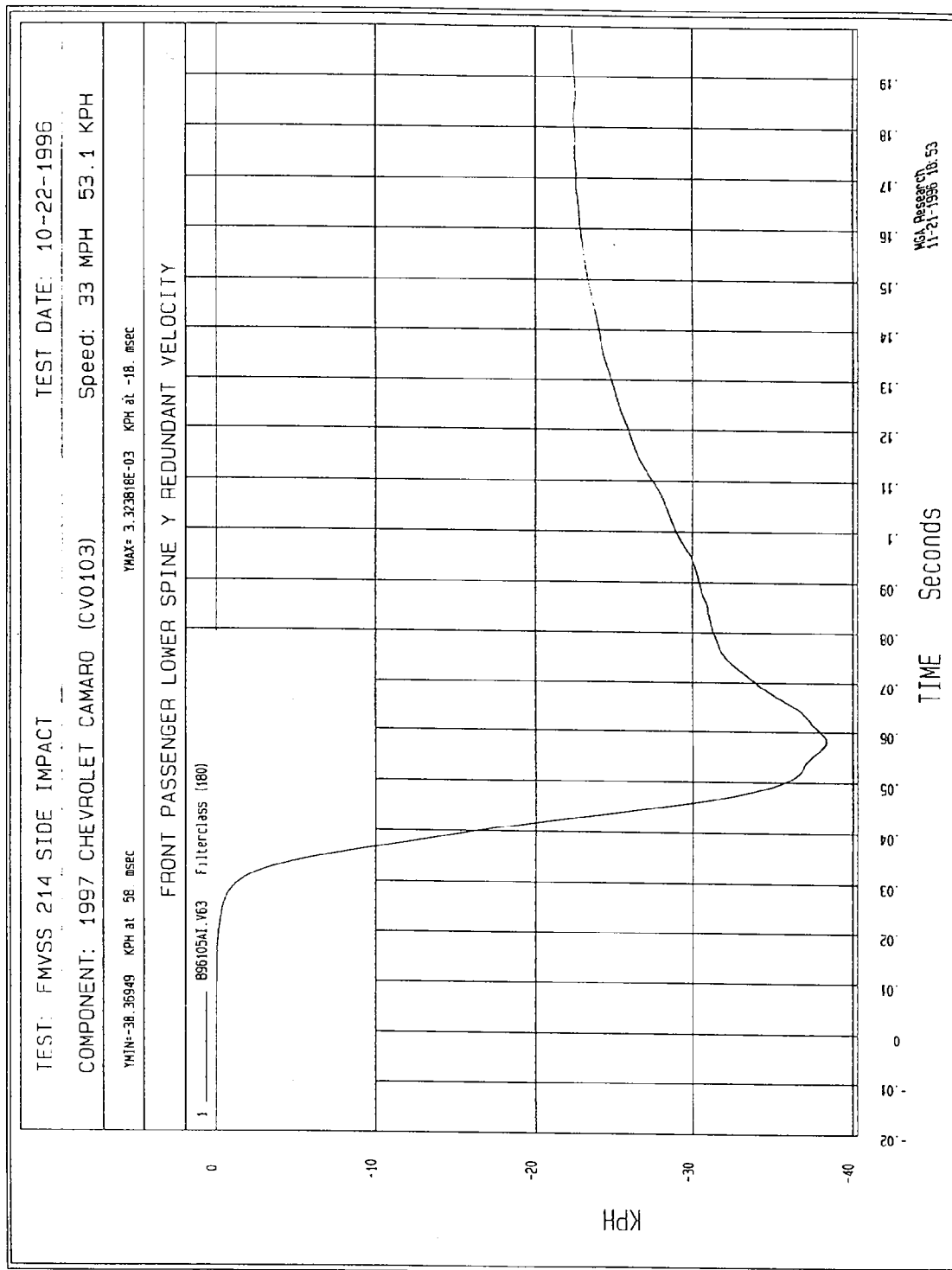


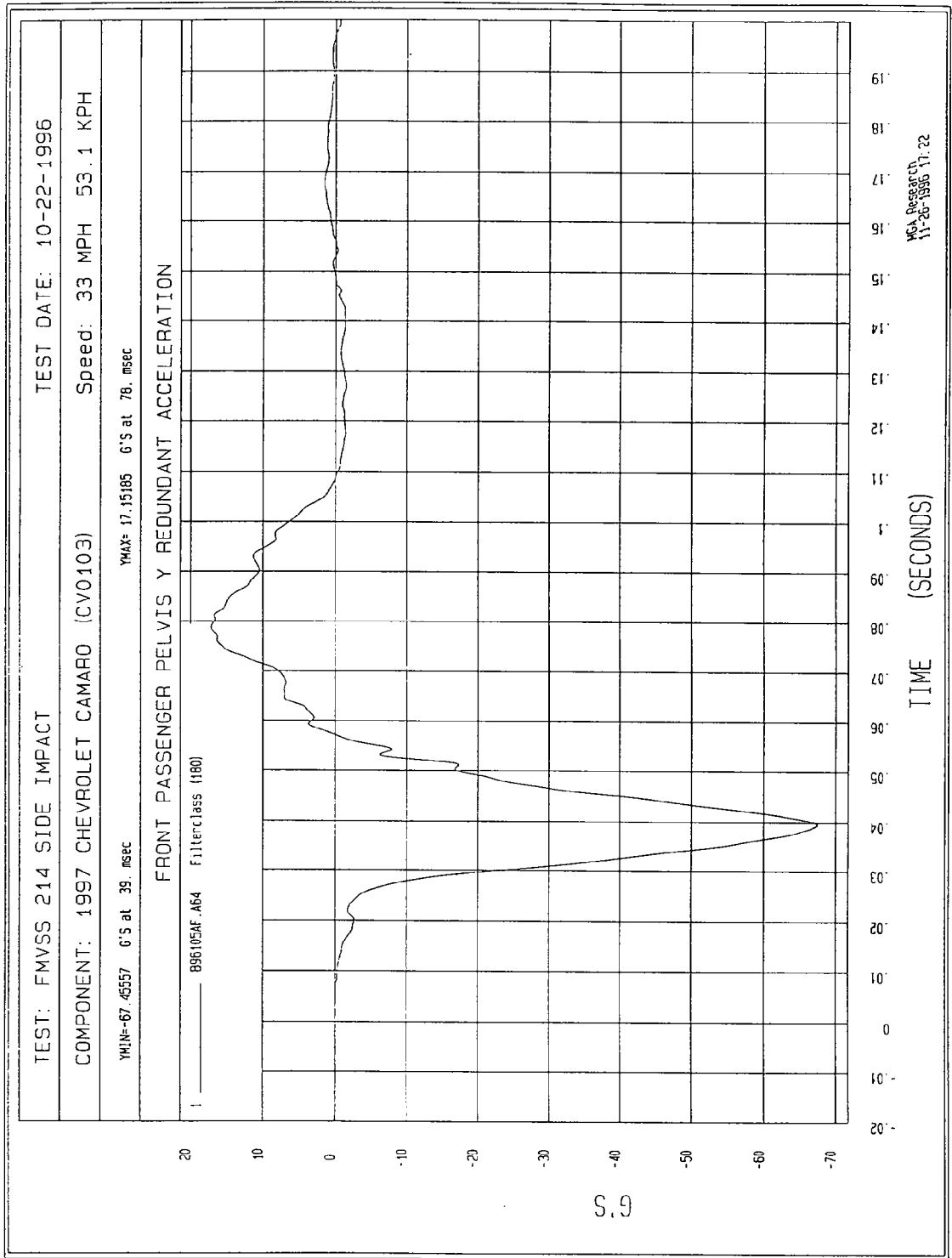


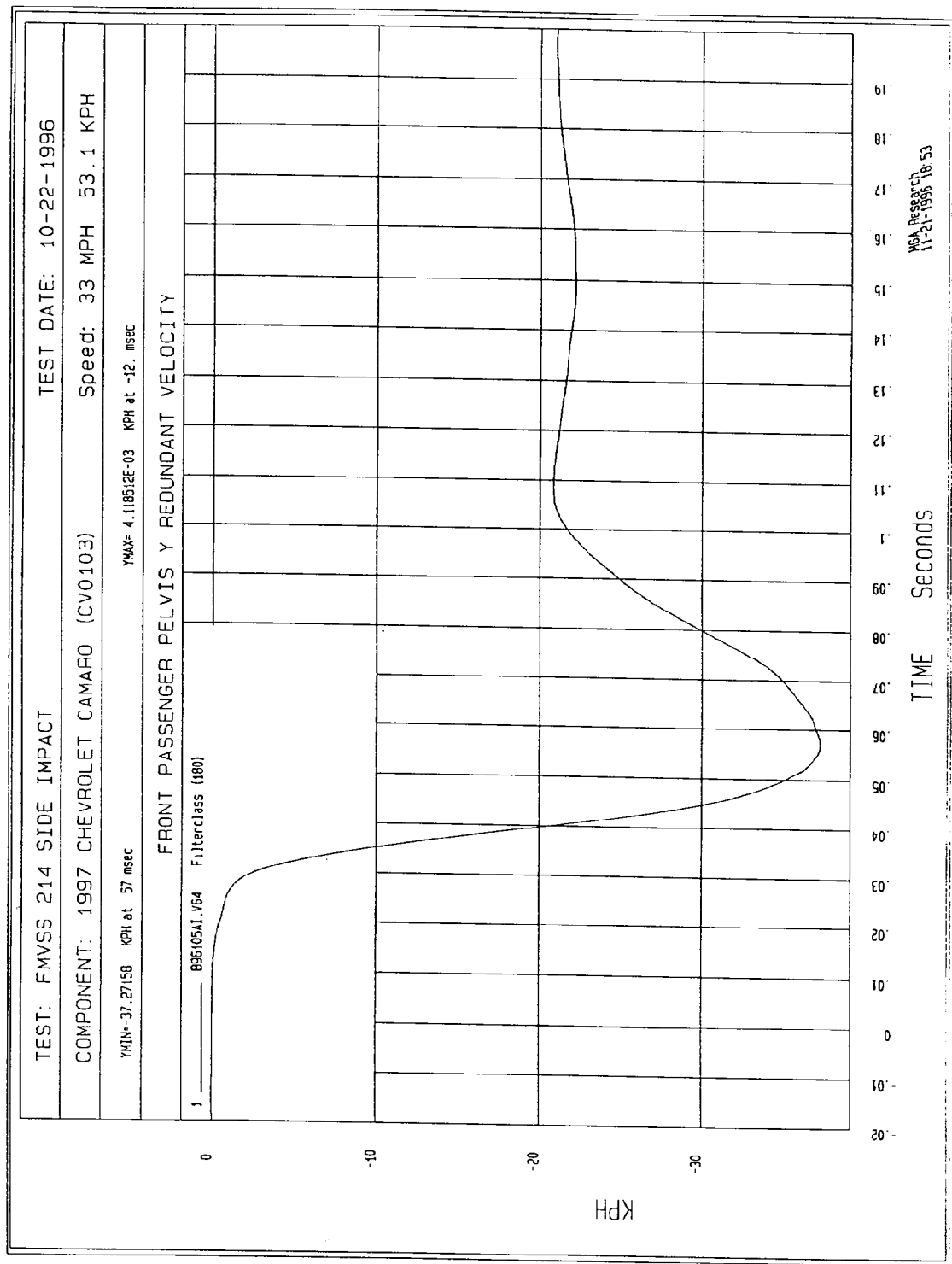


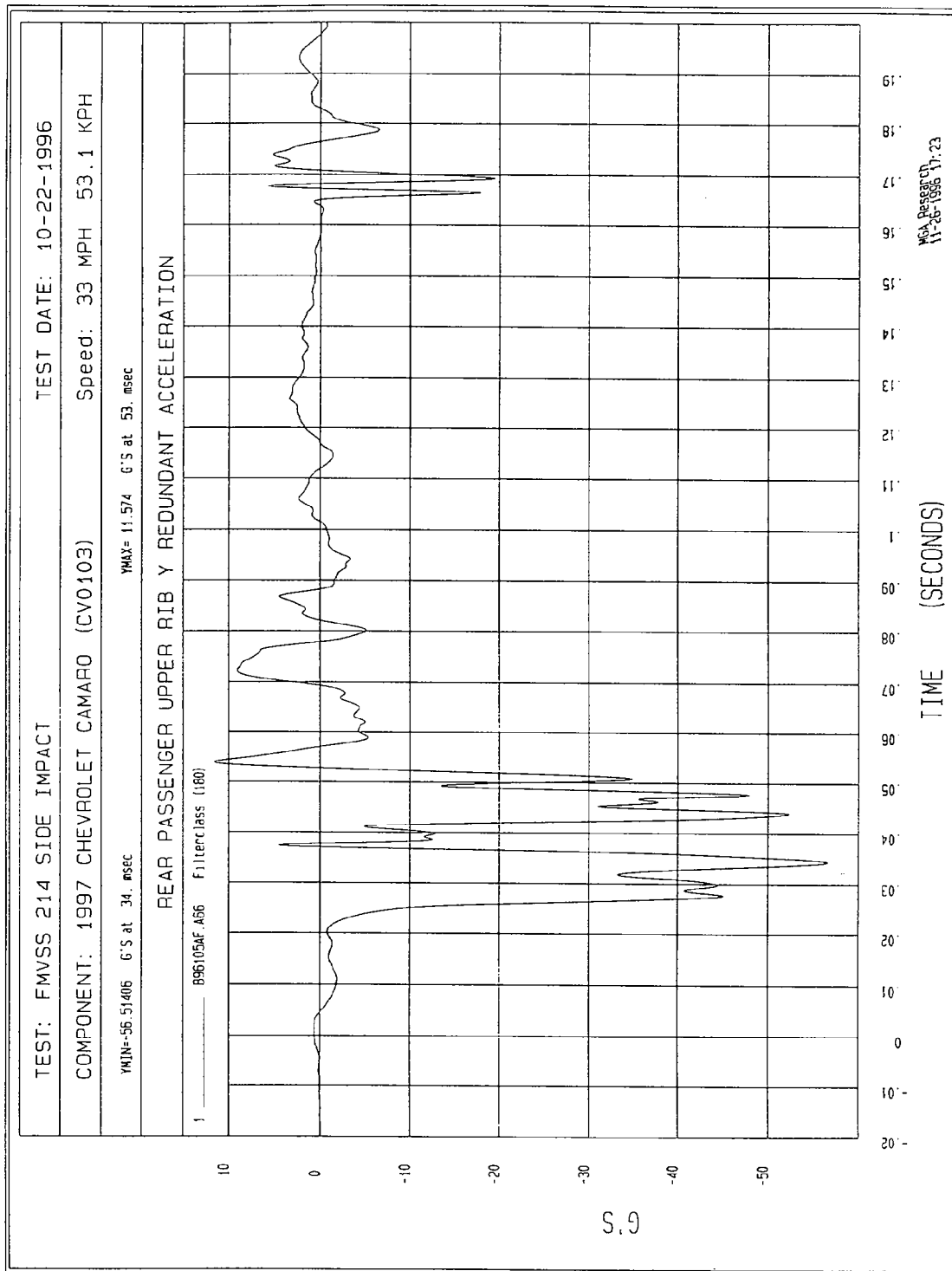


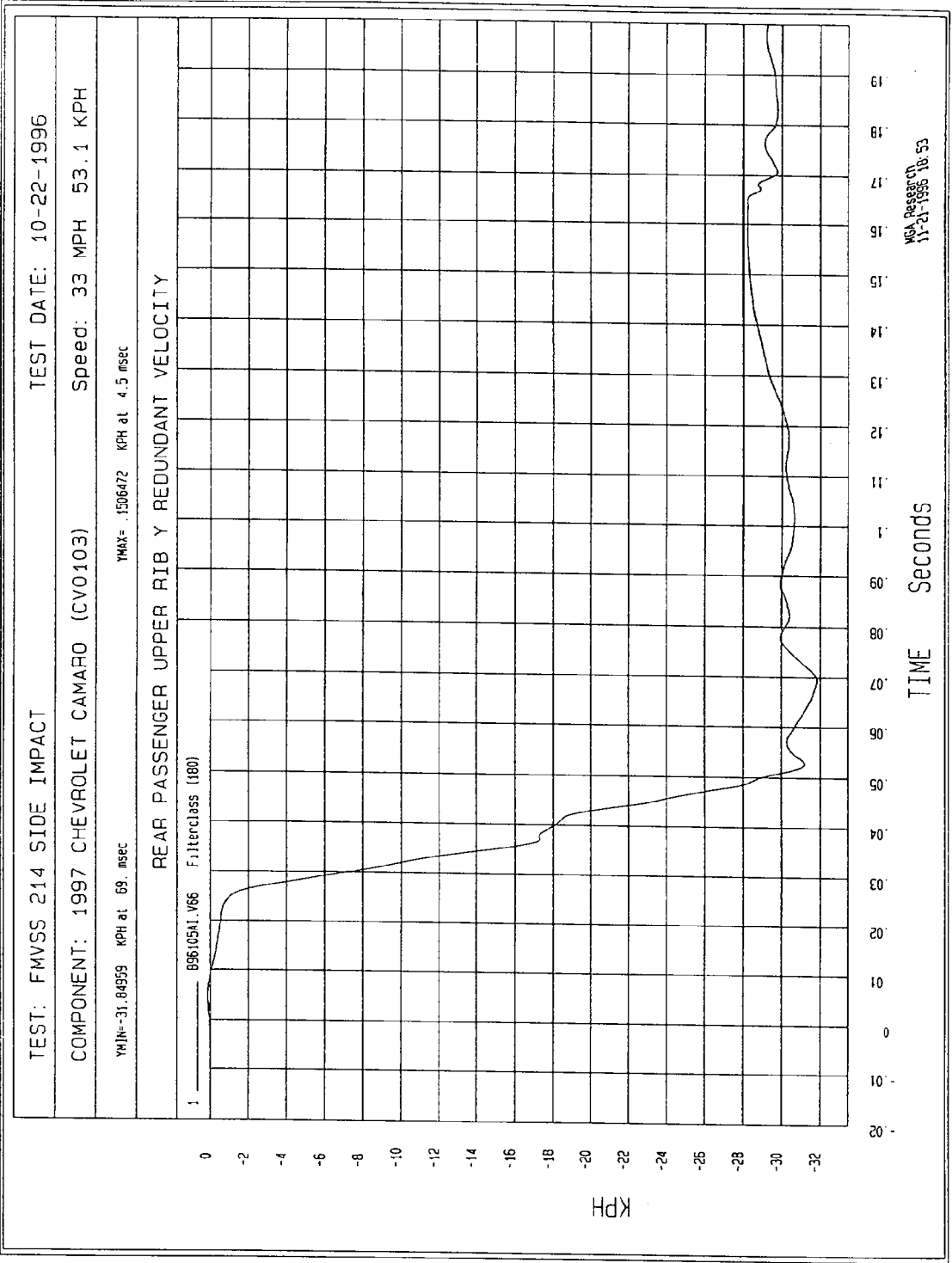


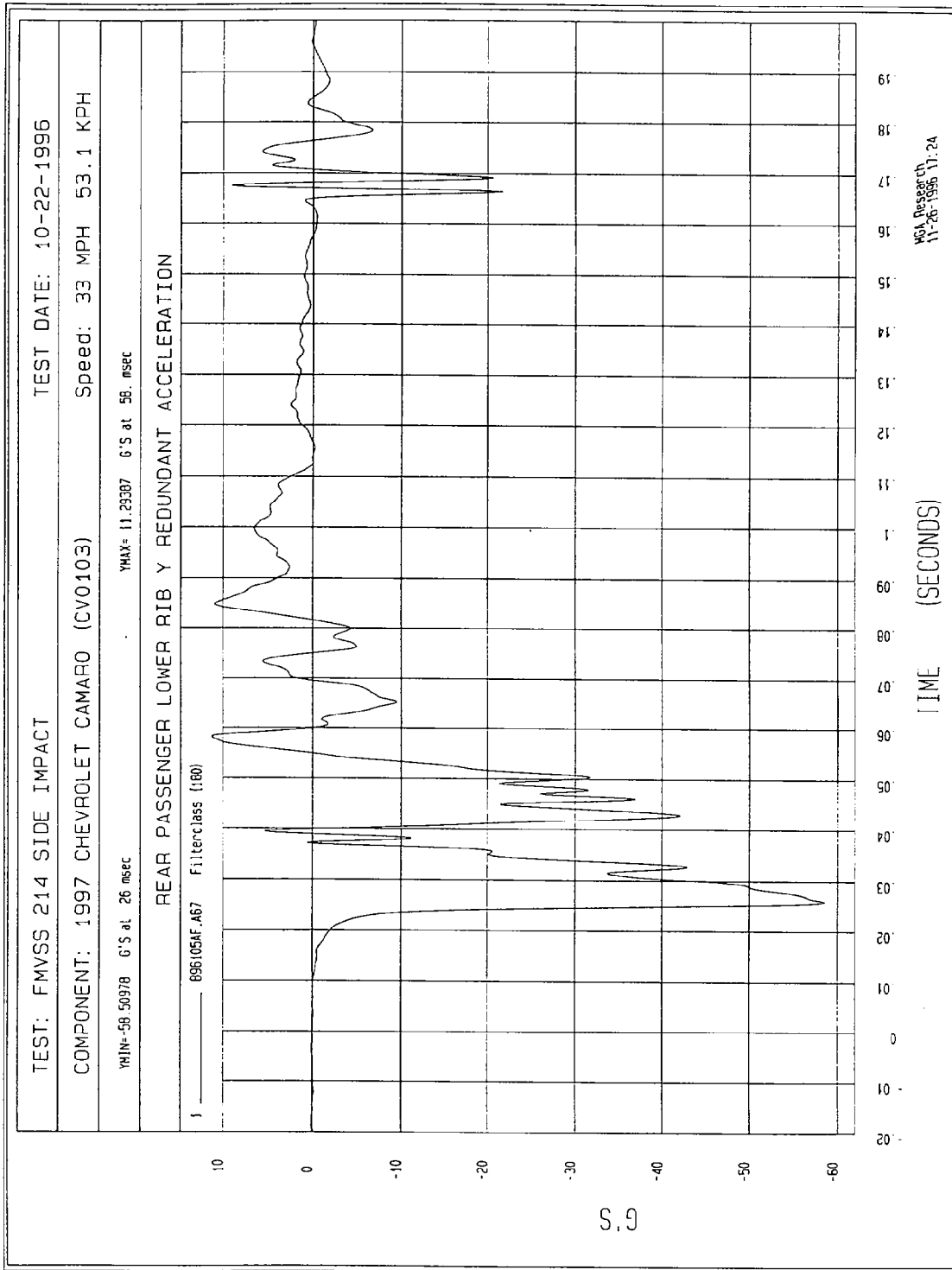


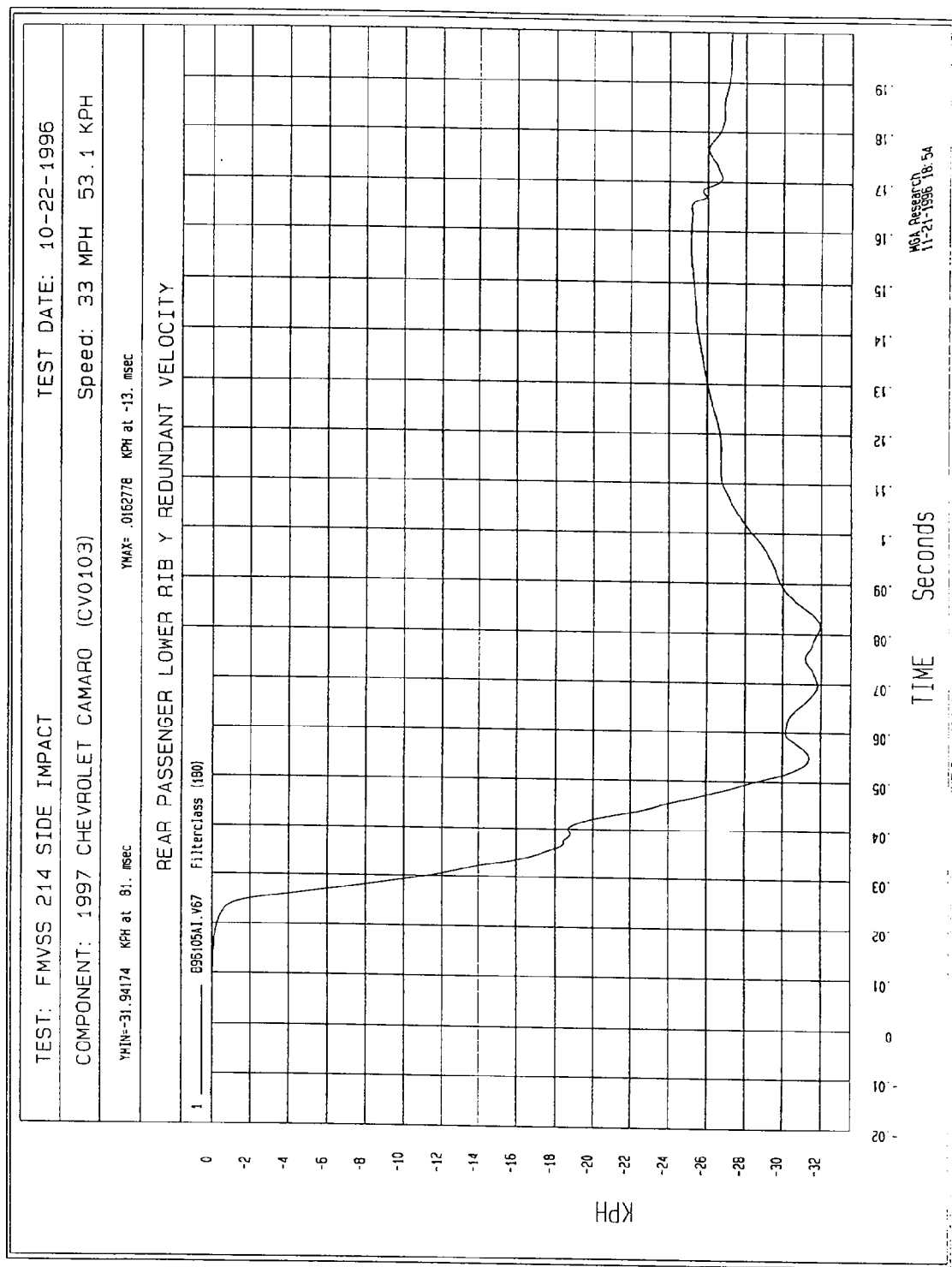


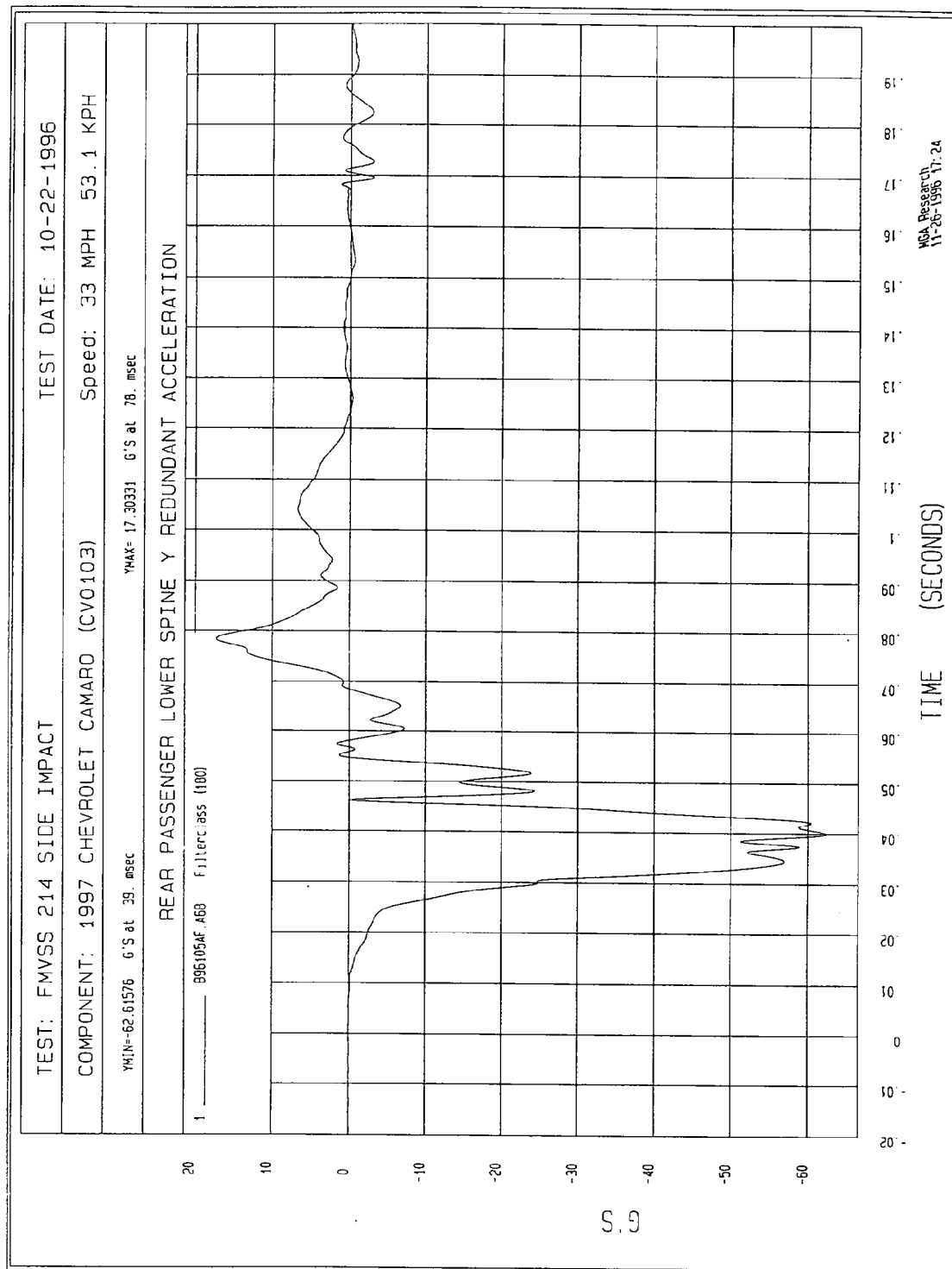


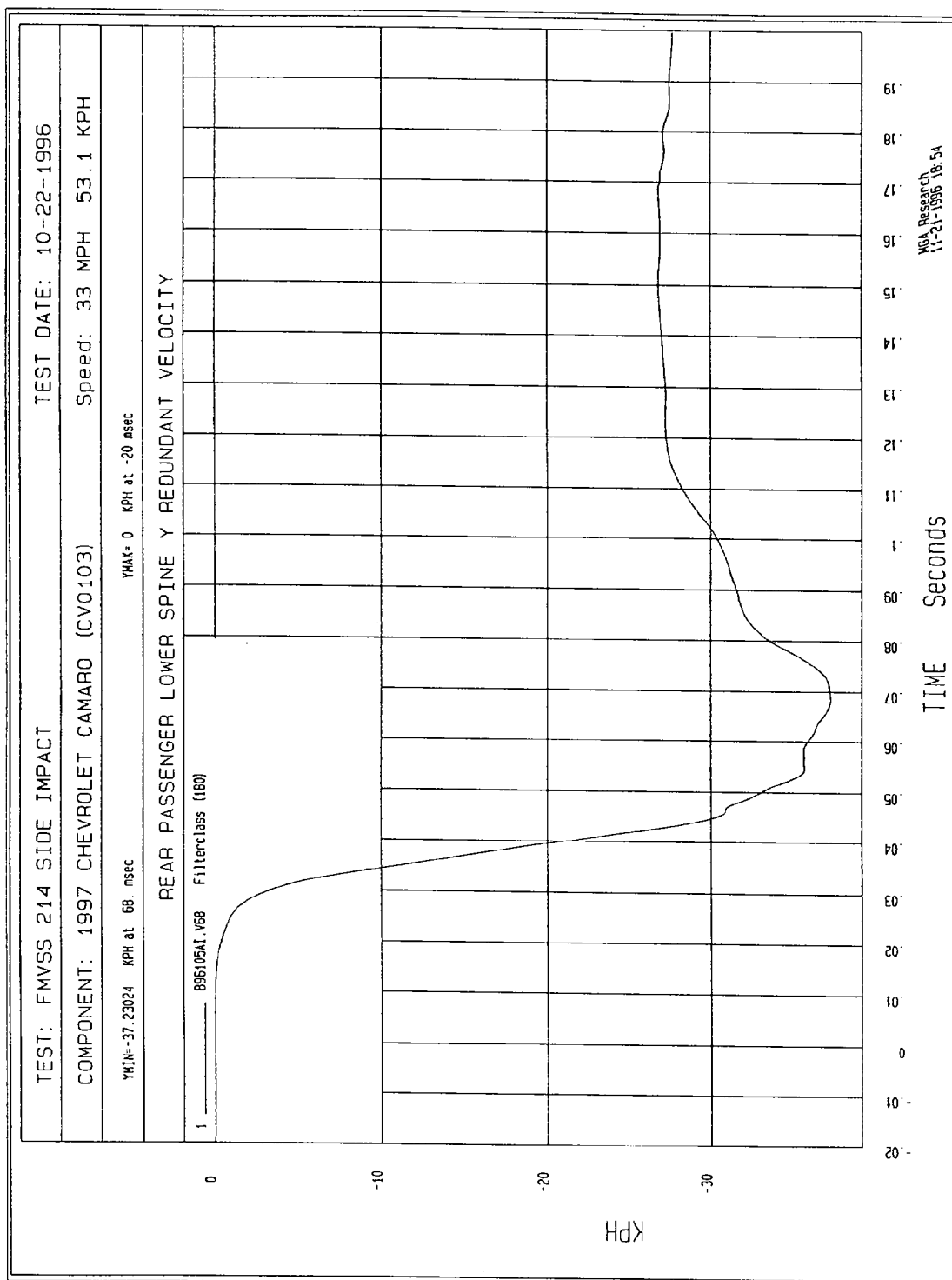


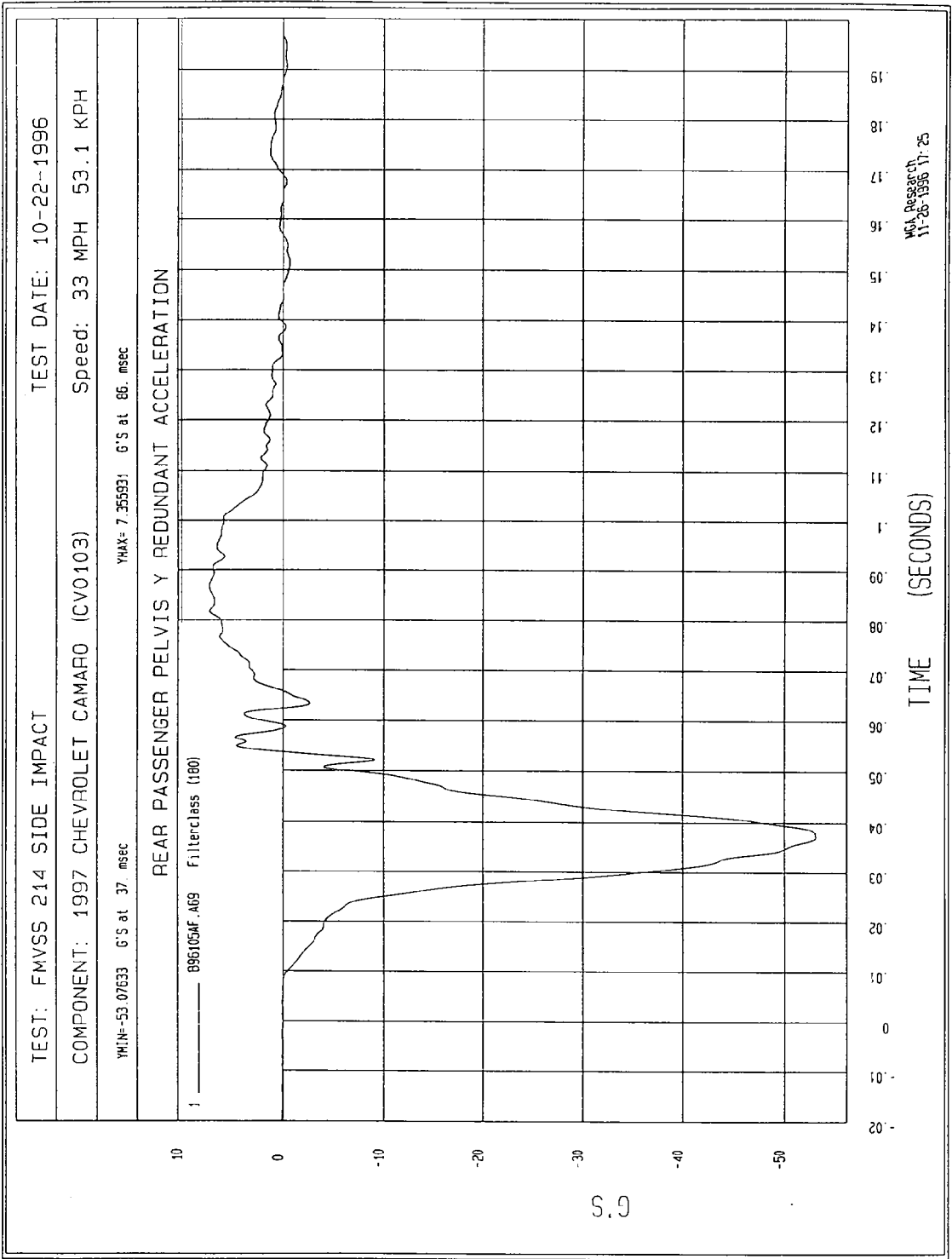


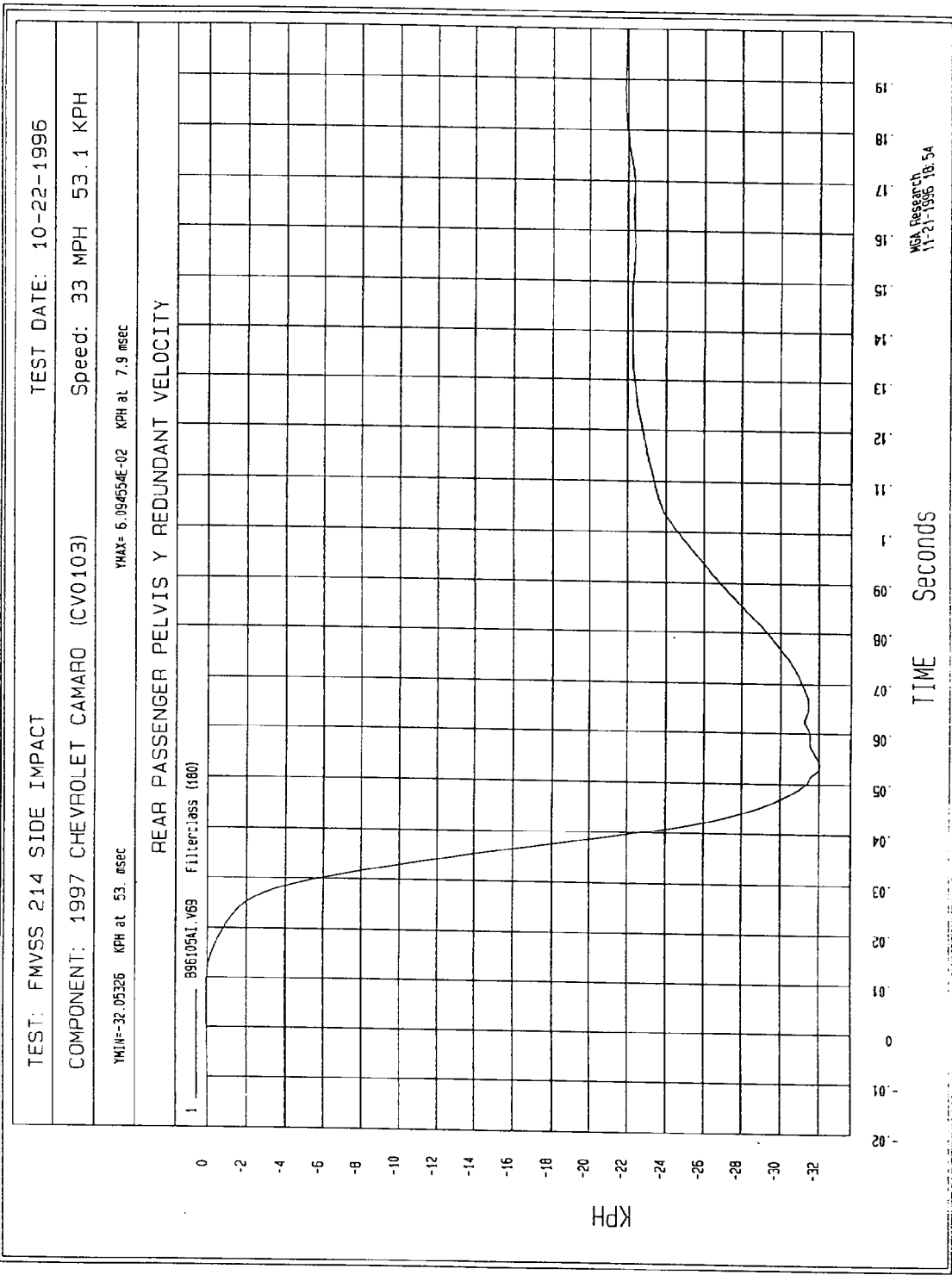




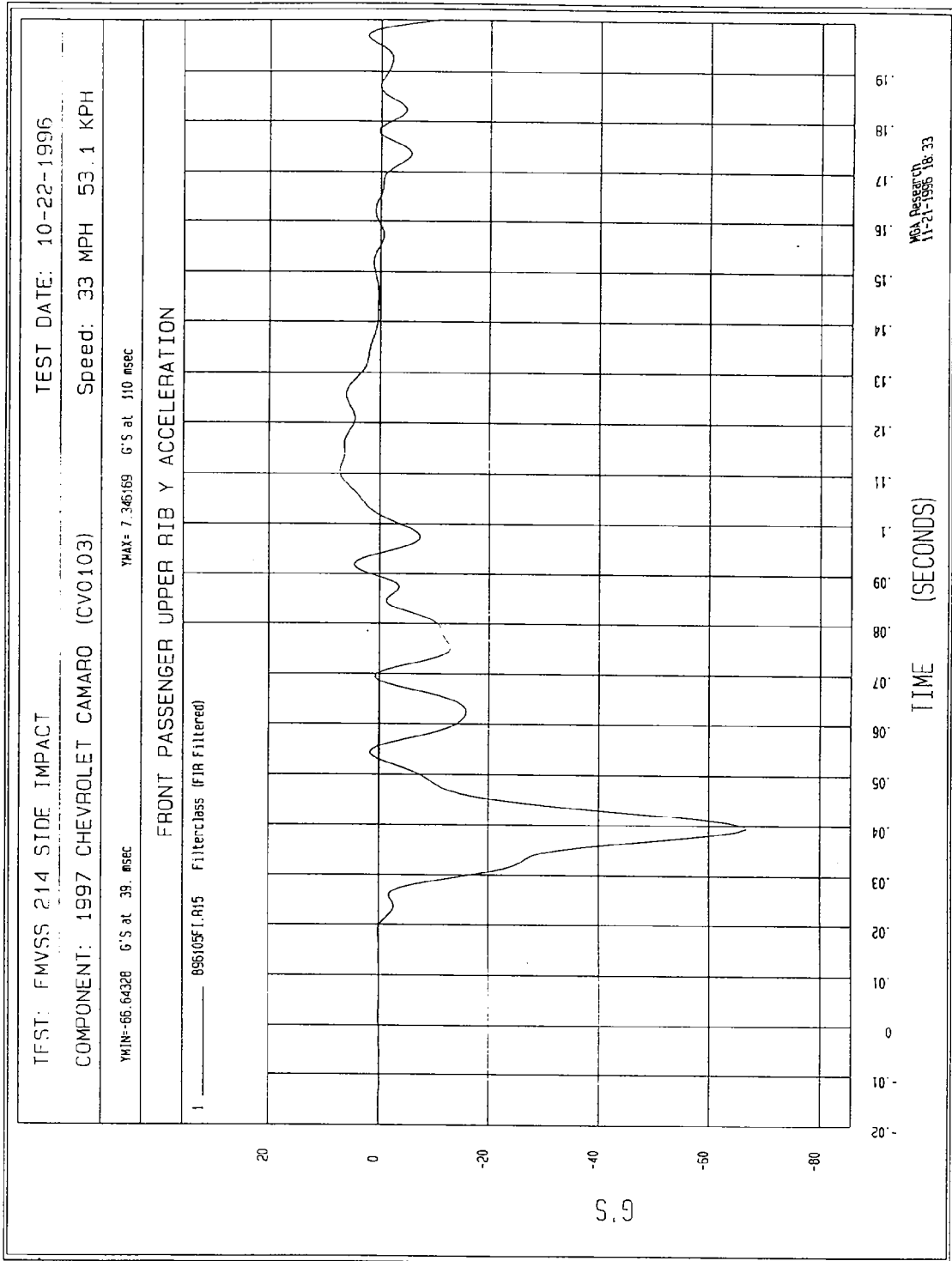


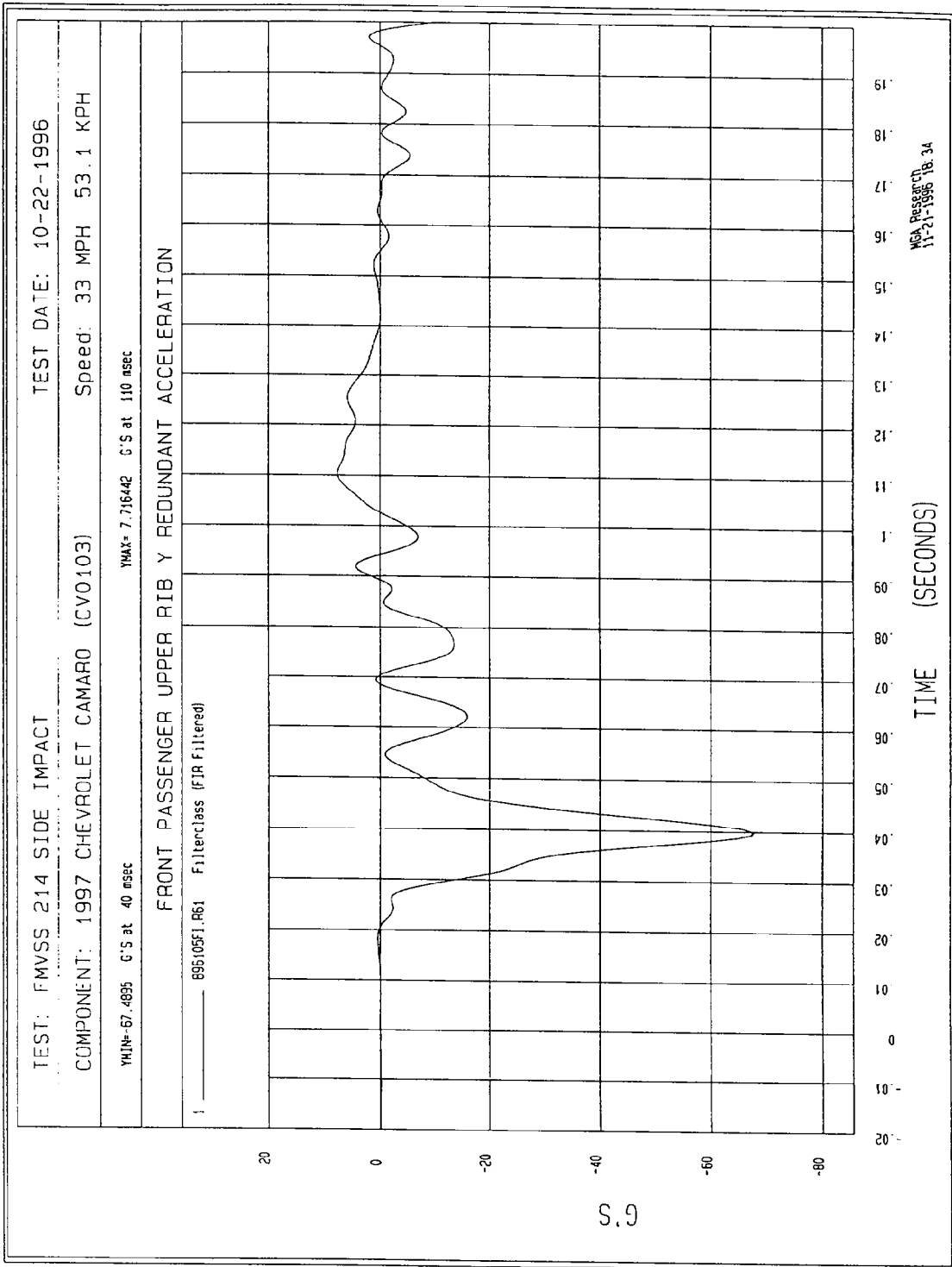


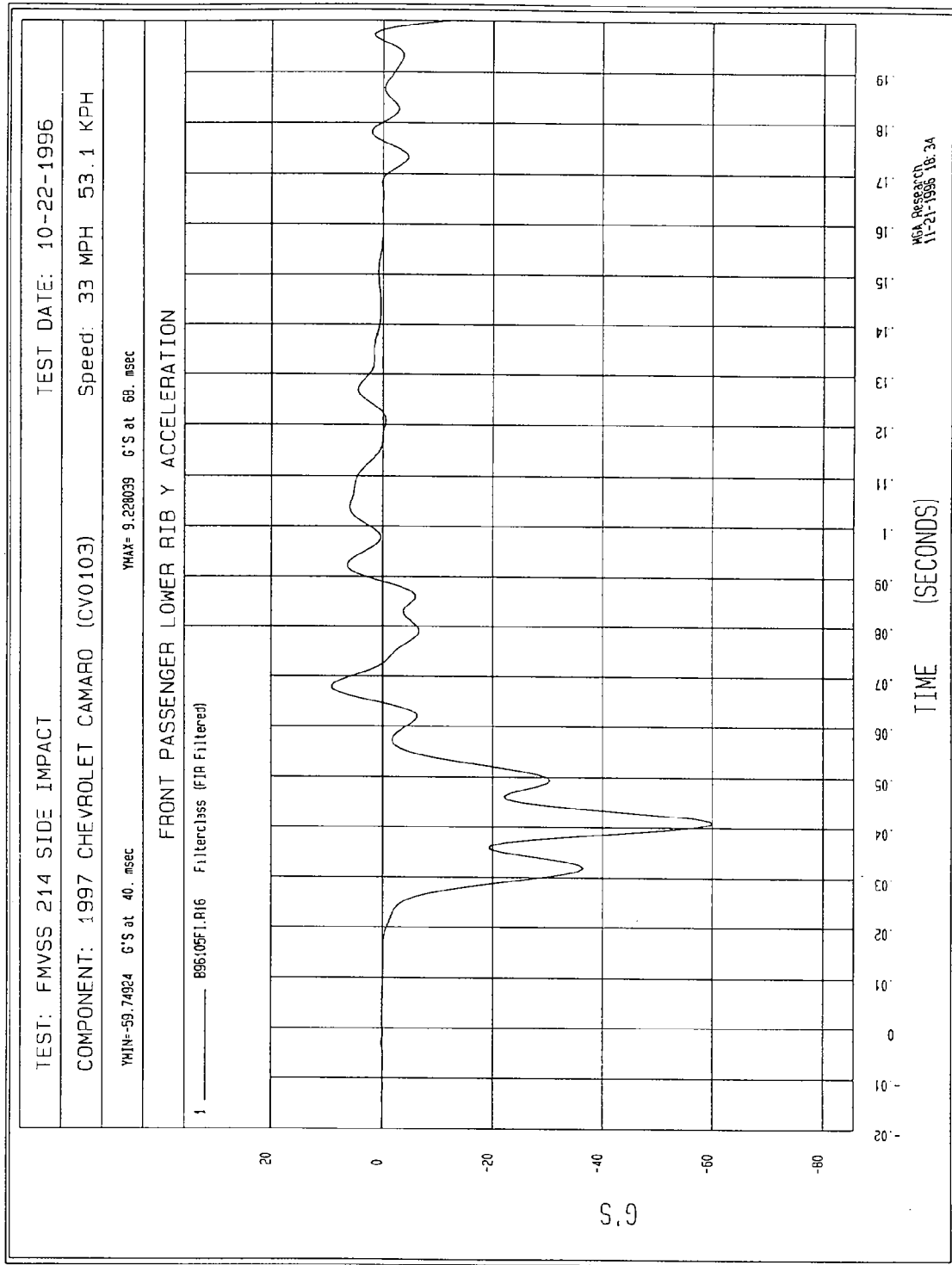


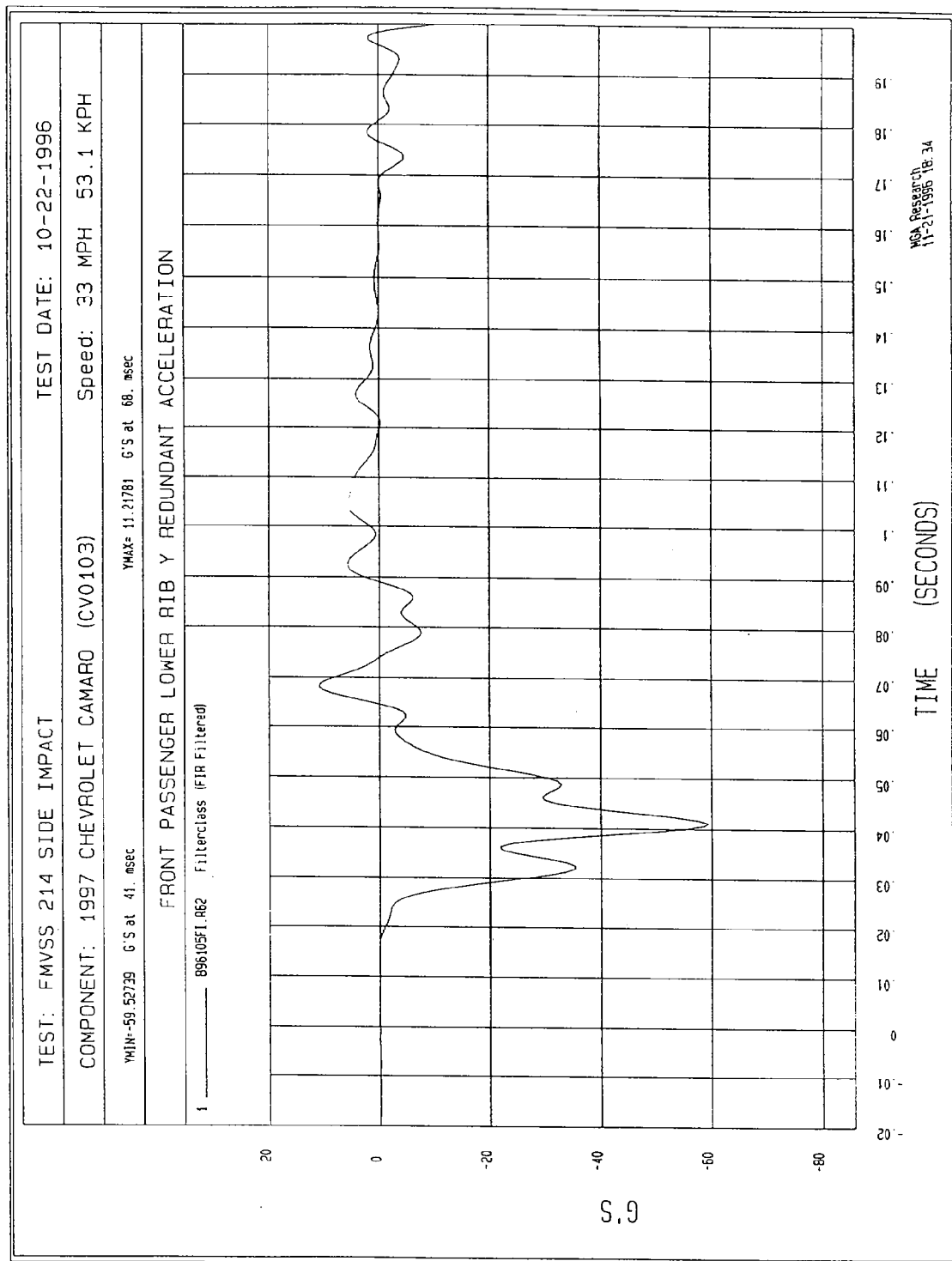


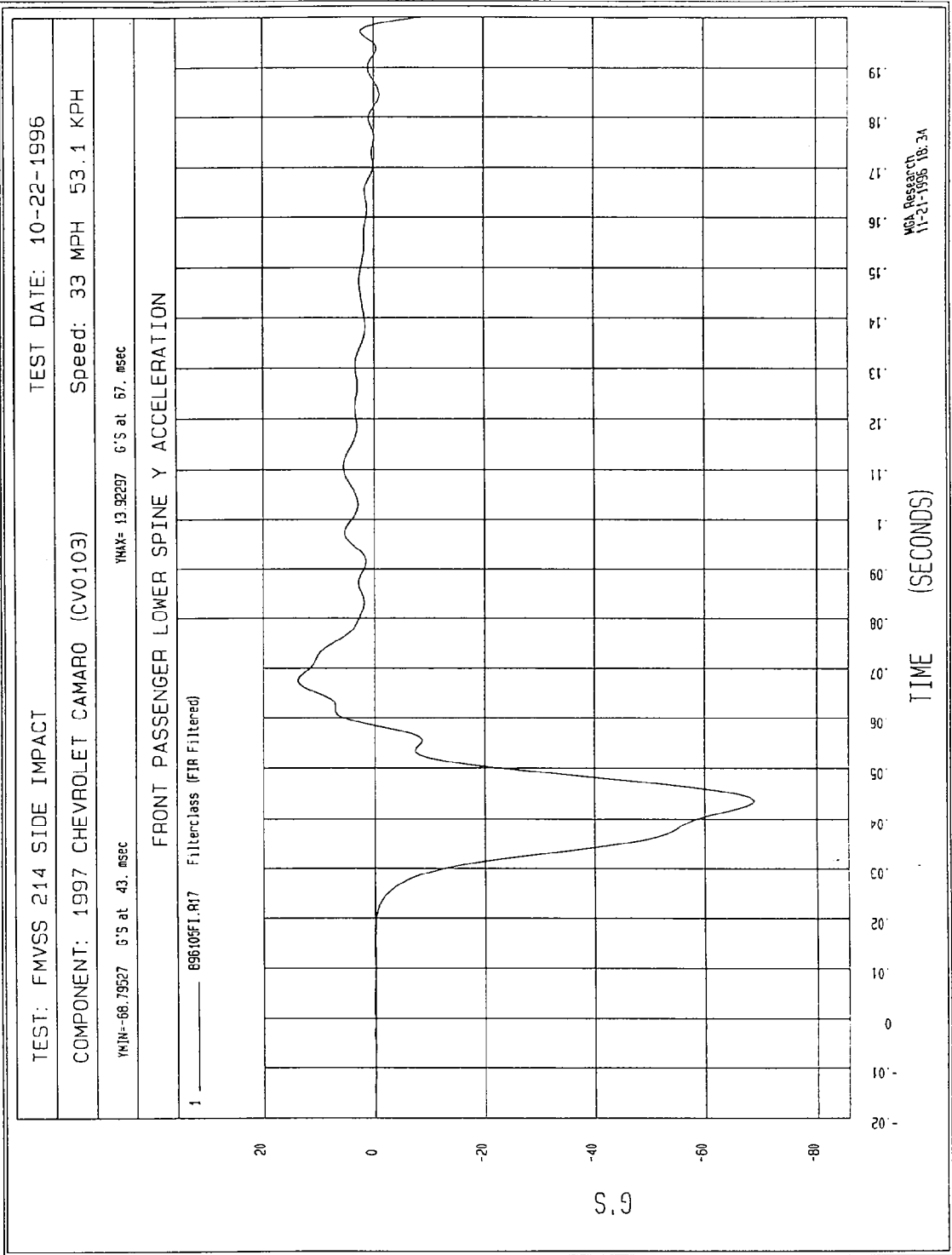
FINITE IMPULSE RESPONSE (FIR) FILTERED DATA

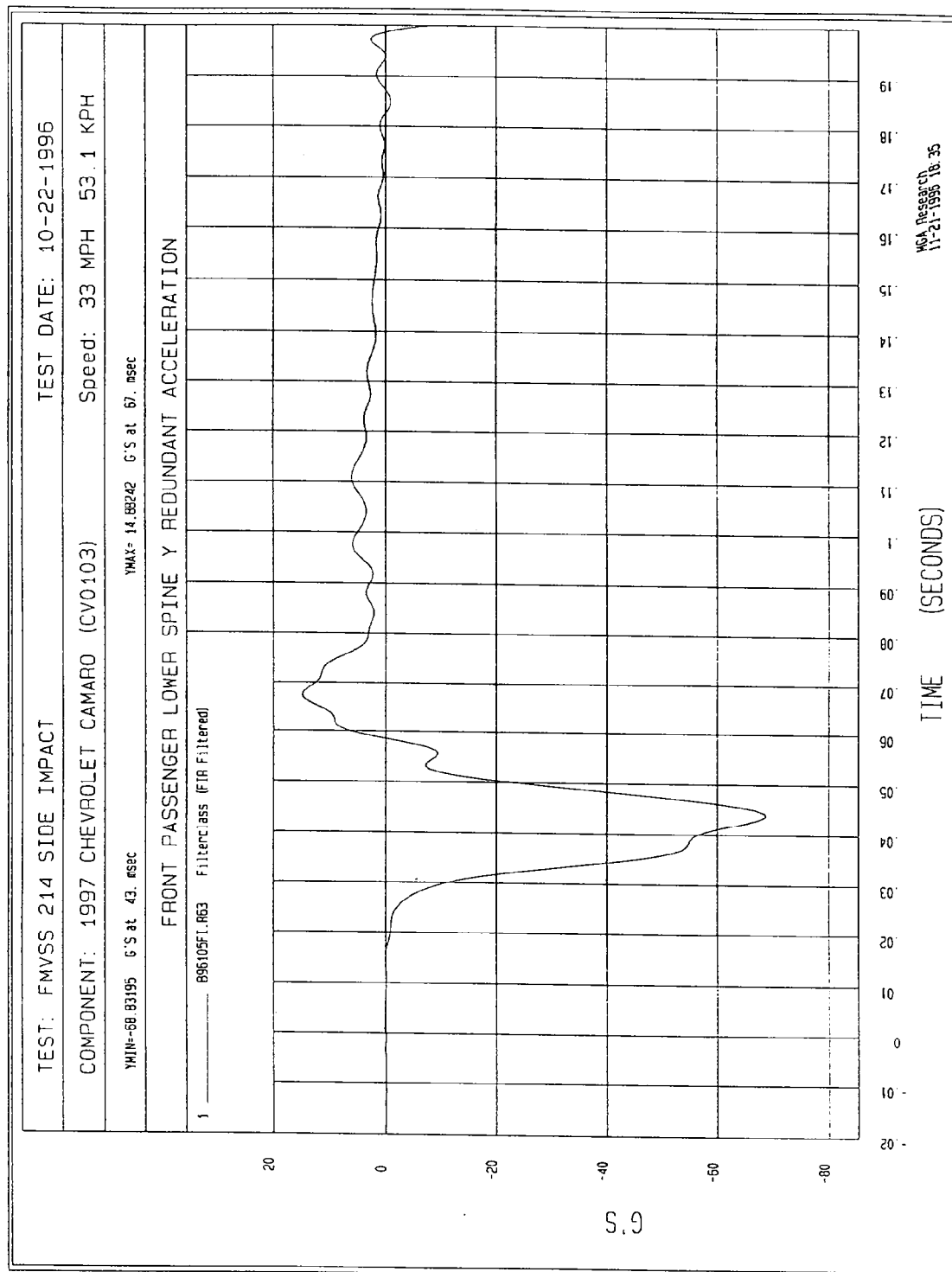




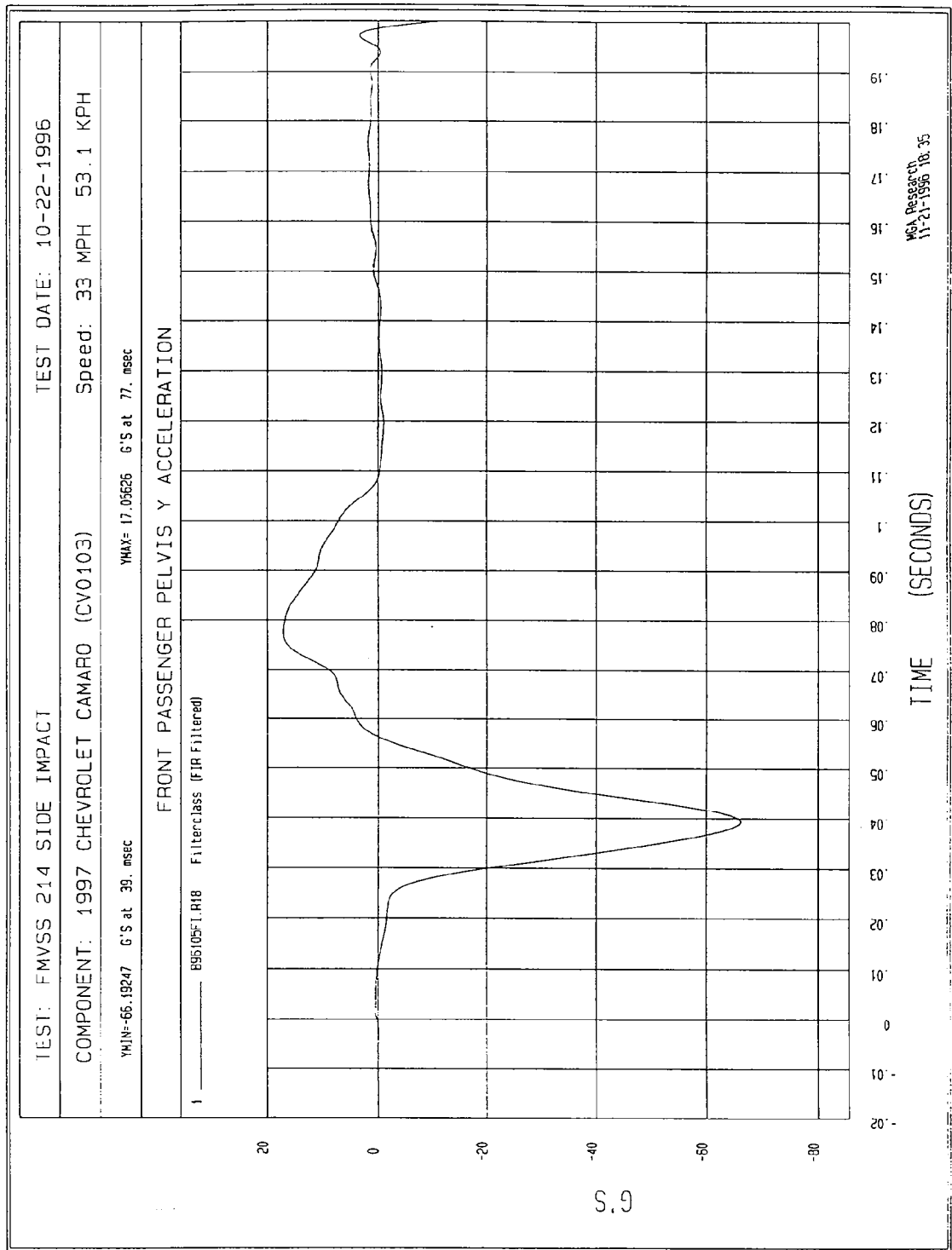


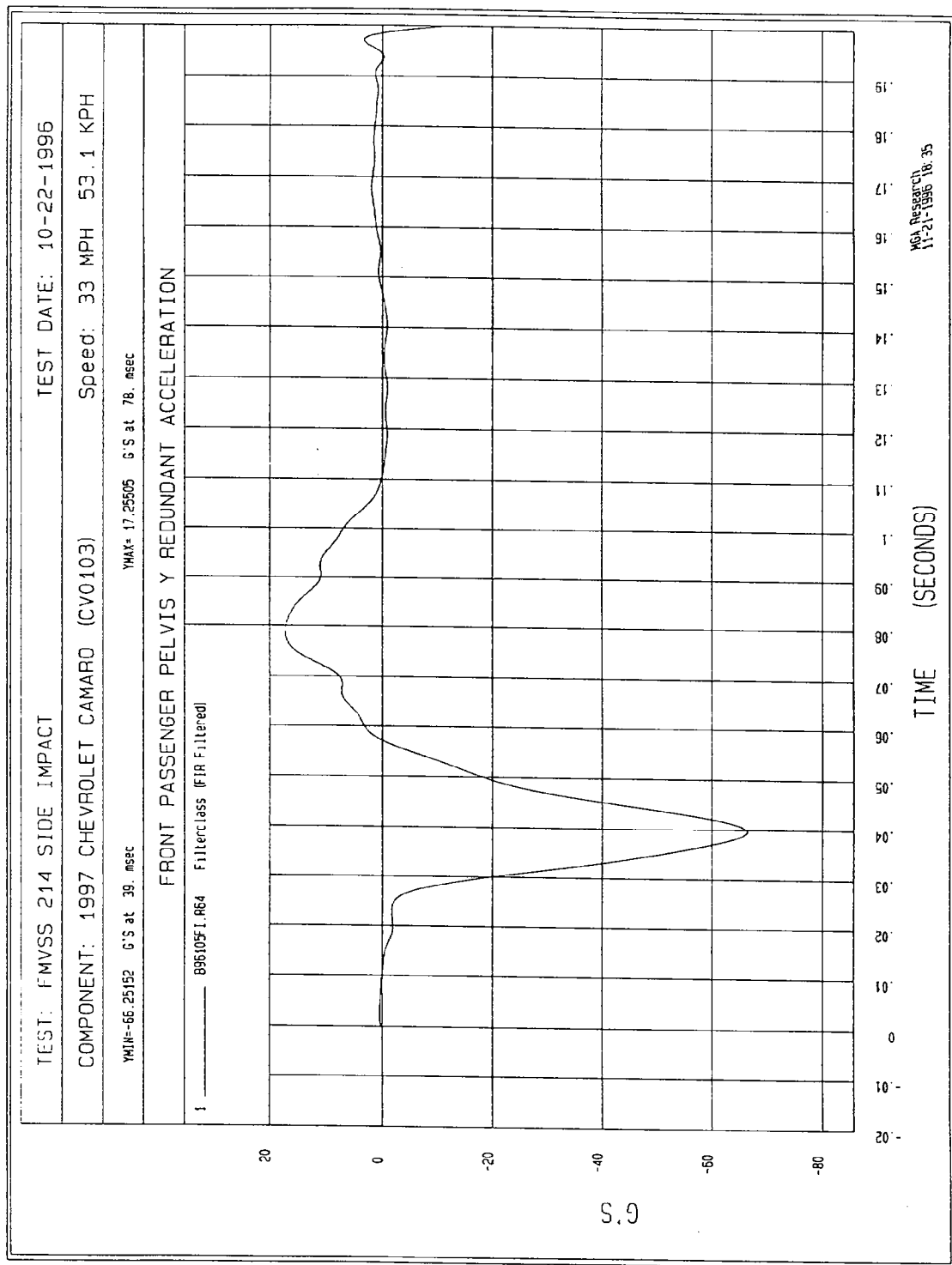


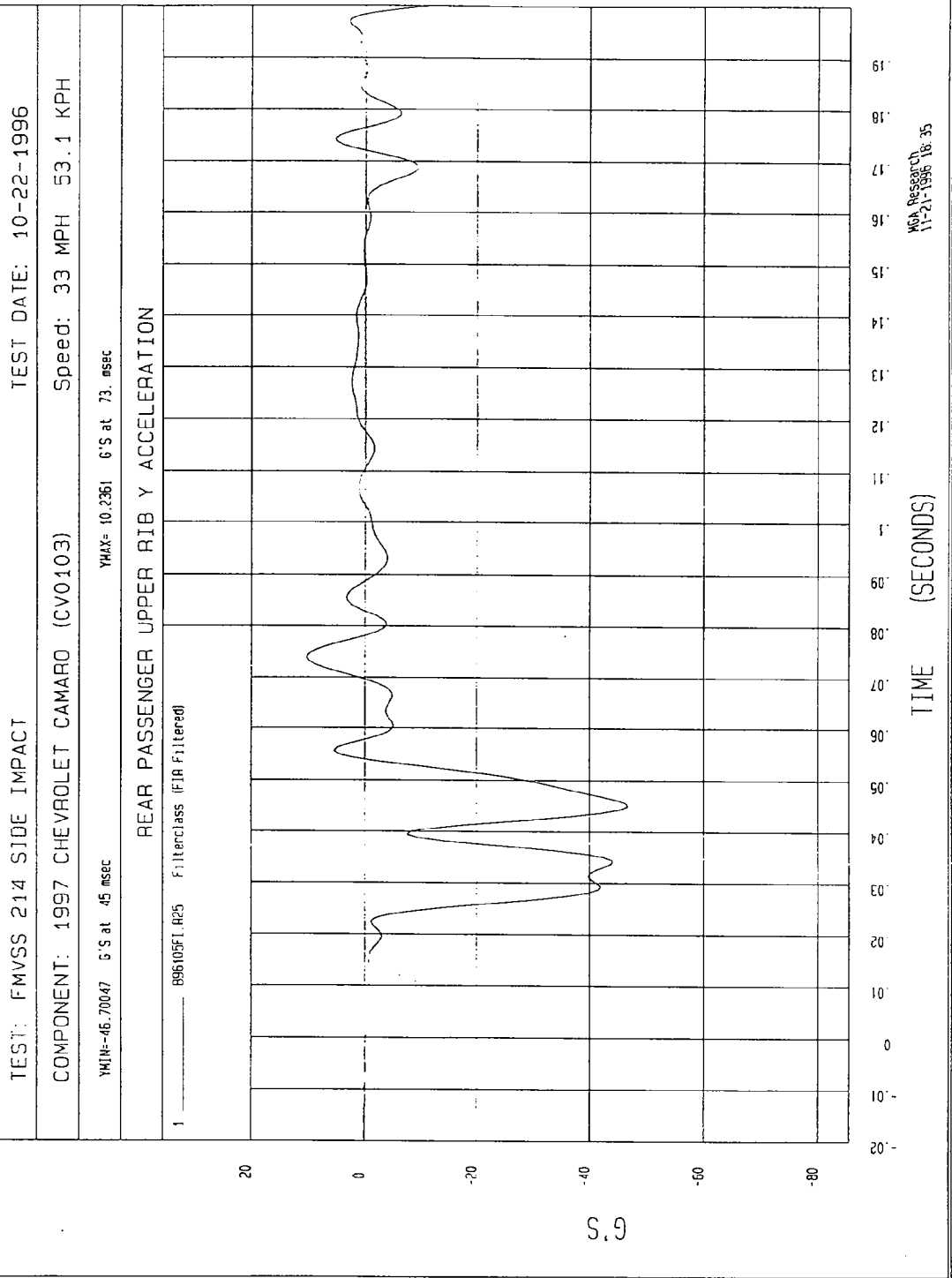


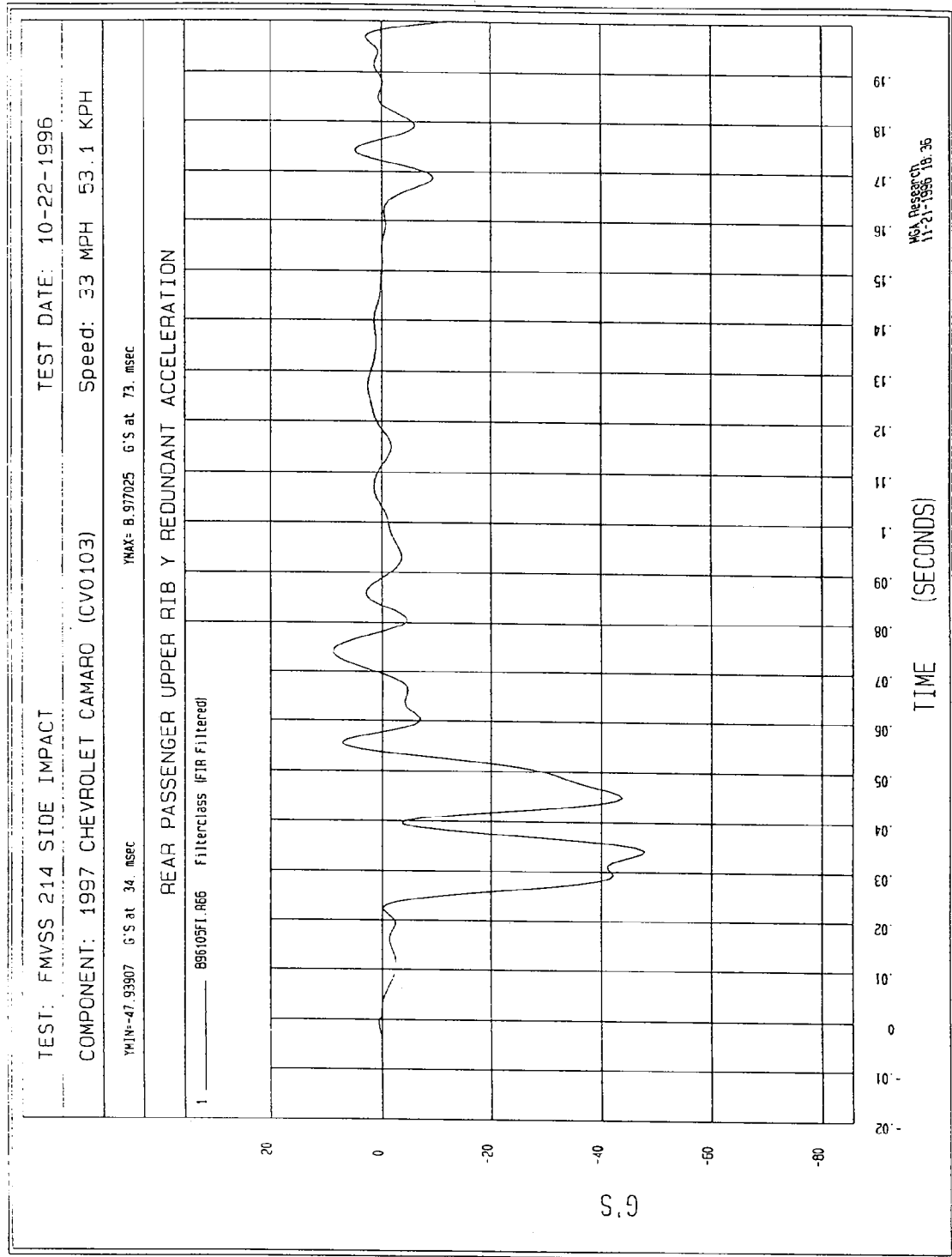


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11-21-1996 18:35









TEST: FMVSS 214 SIDE IMPACT

TEST DATE: 10-22-1996

COMPONENT: 1997 CHEVROLET CAMARO (CV0103)

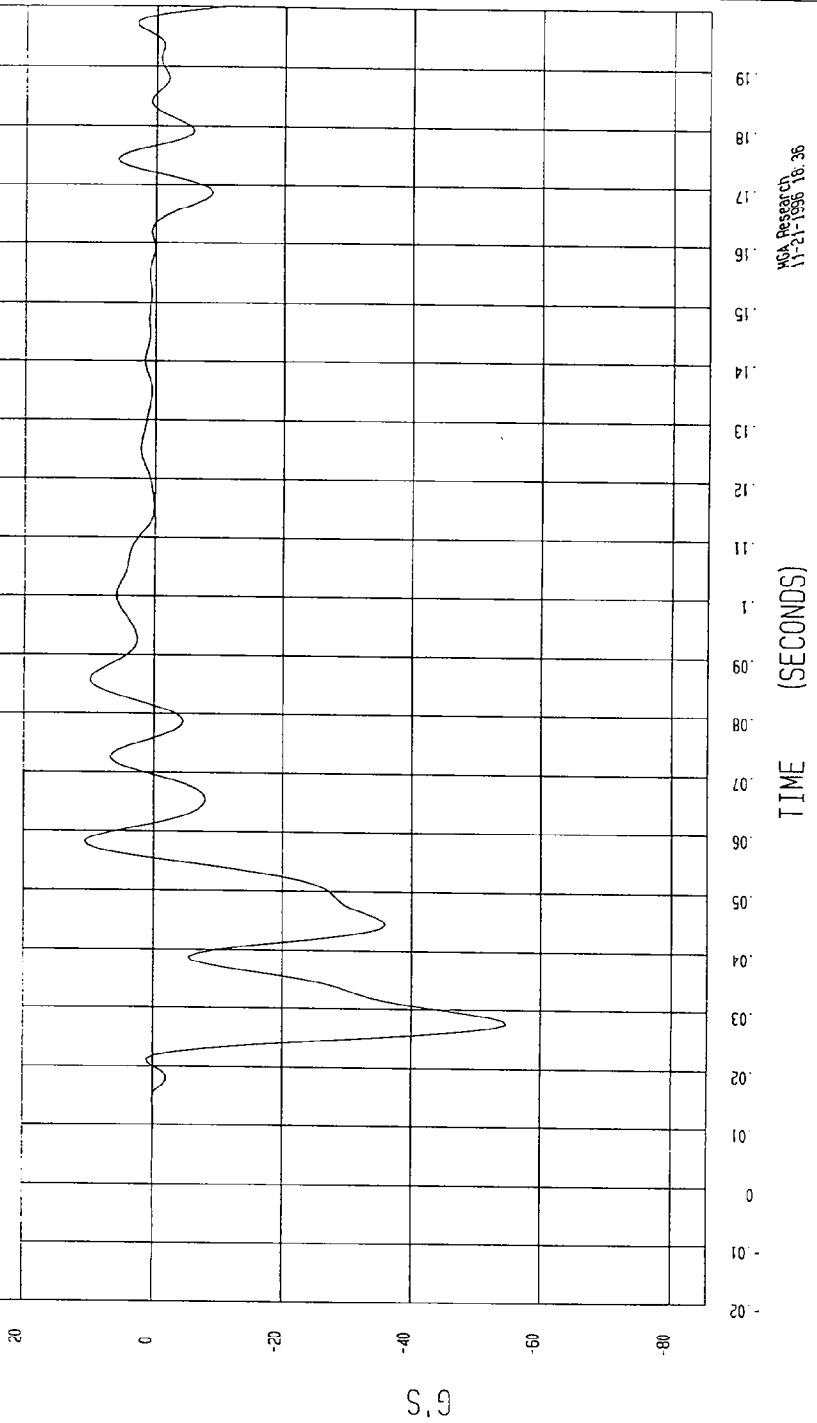
Speed: 33 MPH 53.1 KPH

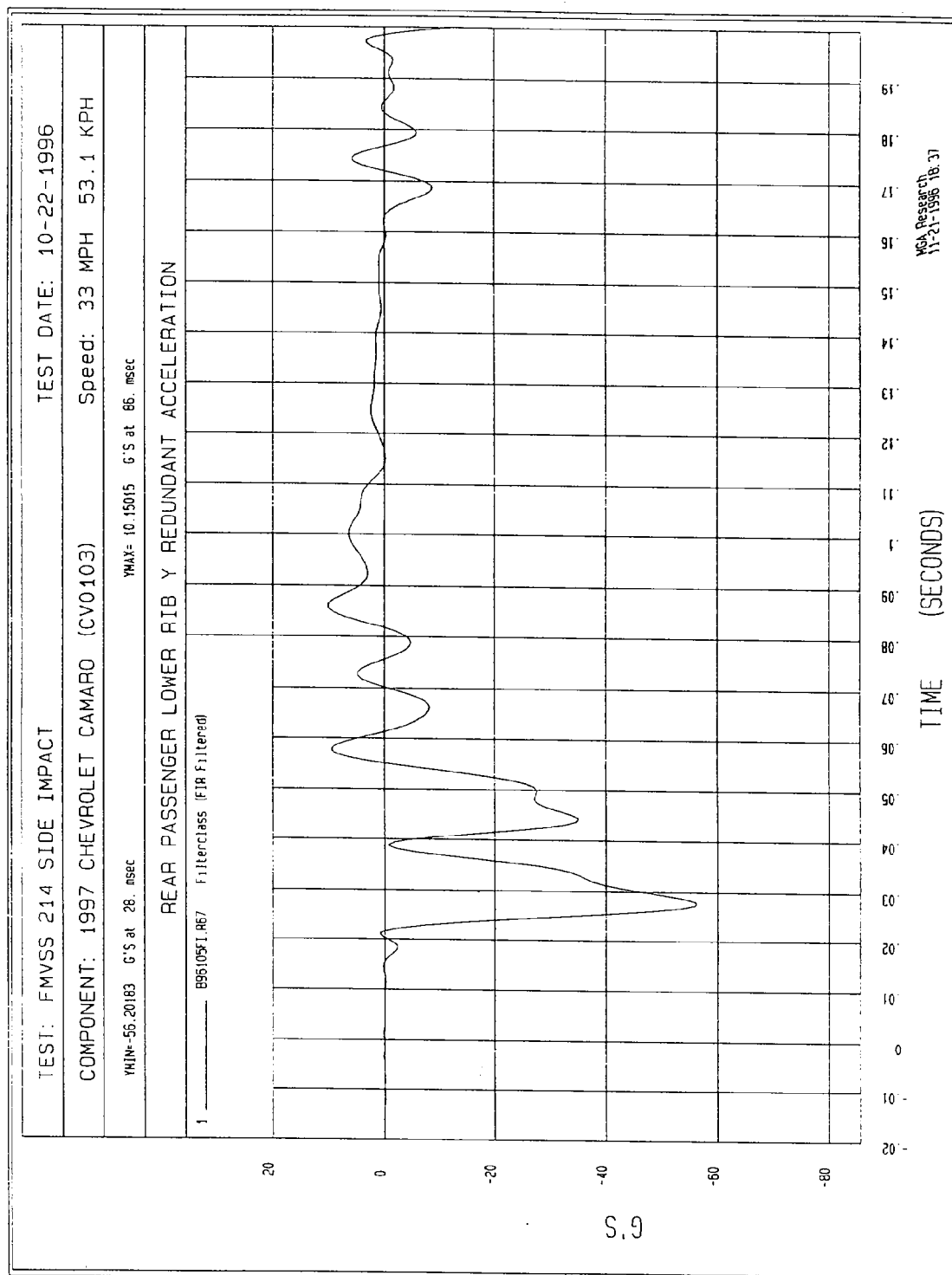
YHIN-54.74/79 G'S at 27. msec

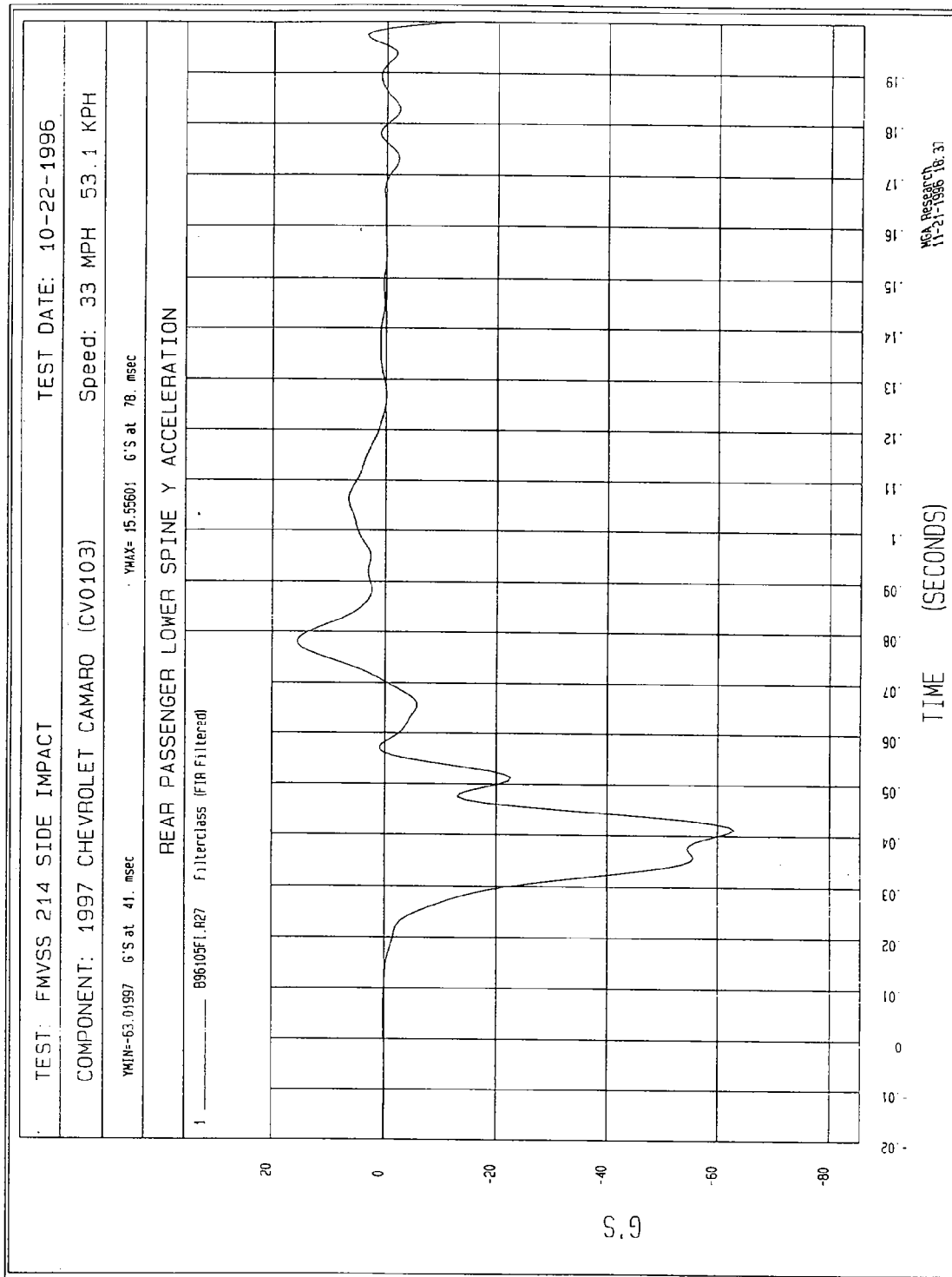
YMAX= 10.66037 G'S at 58. msec

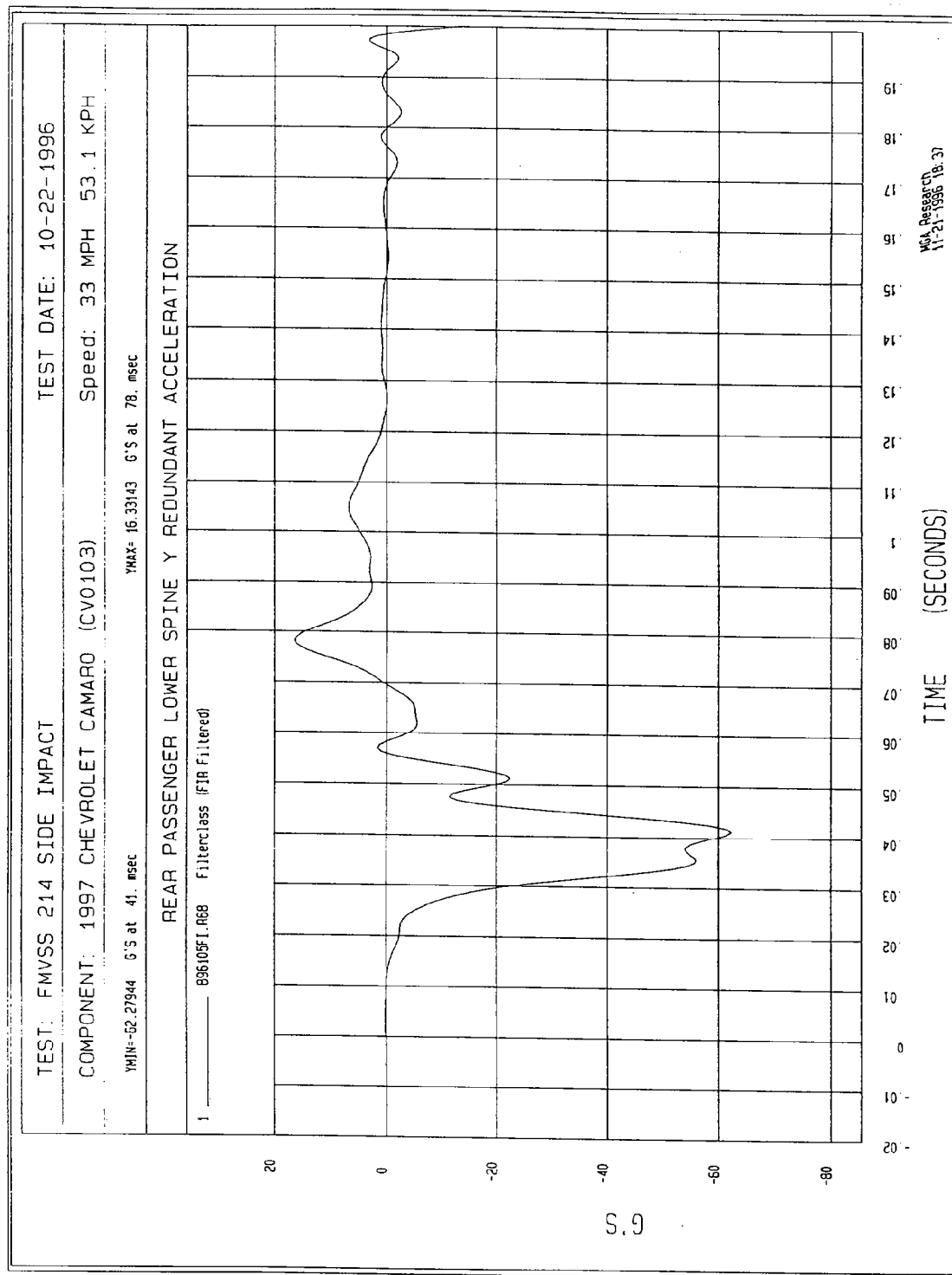
REAR PASSENGER LOWER RIB Y ACCELERATION

1 ——— 896105F1.R26 Filterclass (FIR Filtered)









TEST: FMVSS 214 SIDE IMPACT

TEST DATE: 10-22-1996

COMPONENT: 1997 CHEVROLET CAMARO (CV0103)

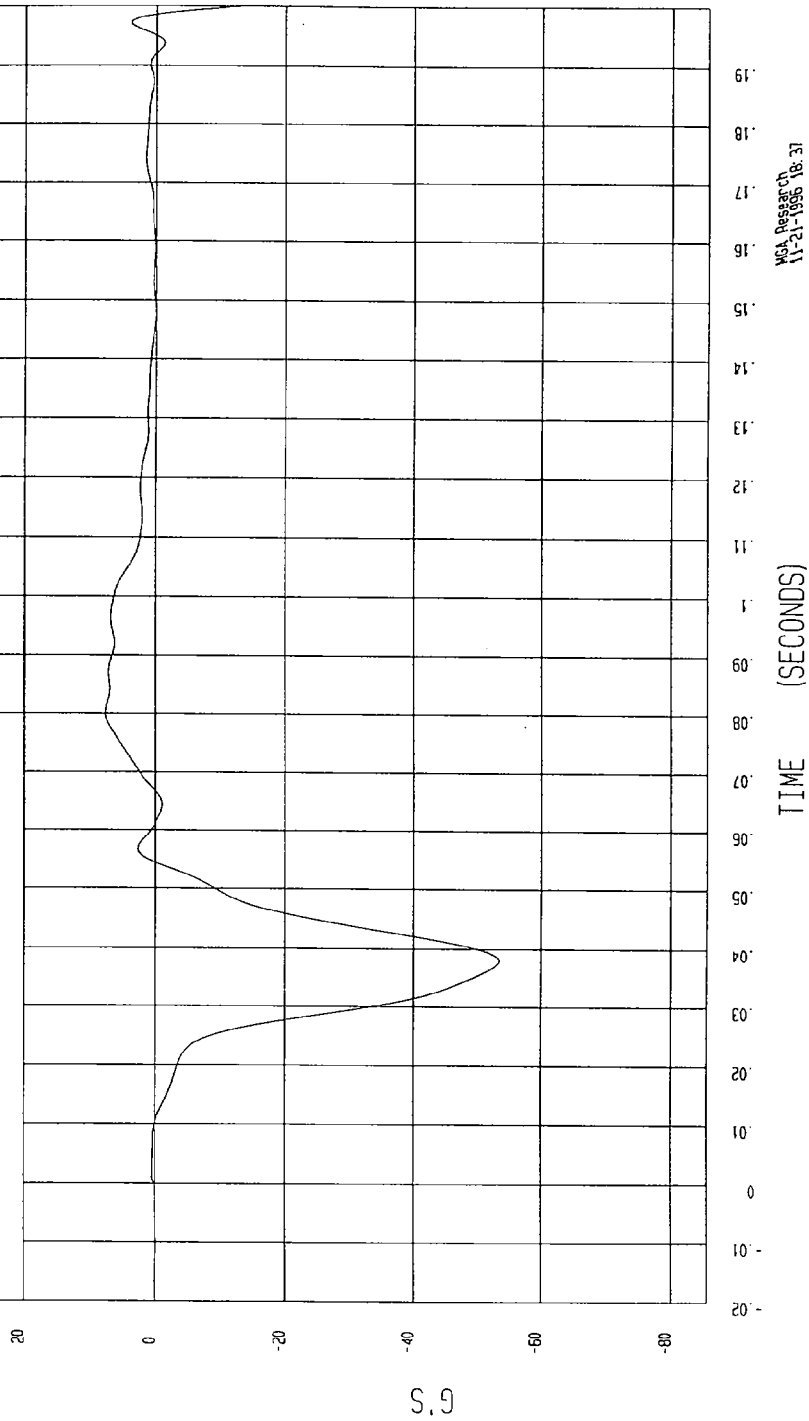
Speed: 33 MPH 53.1 KPH

YMIN=-53.58159 G'S at 30. msec

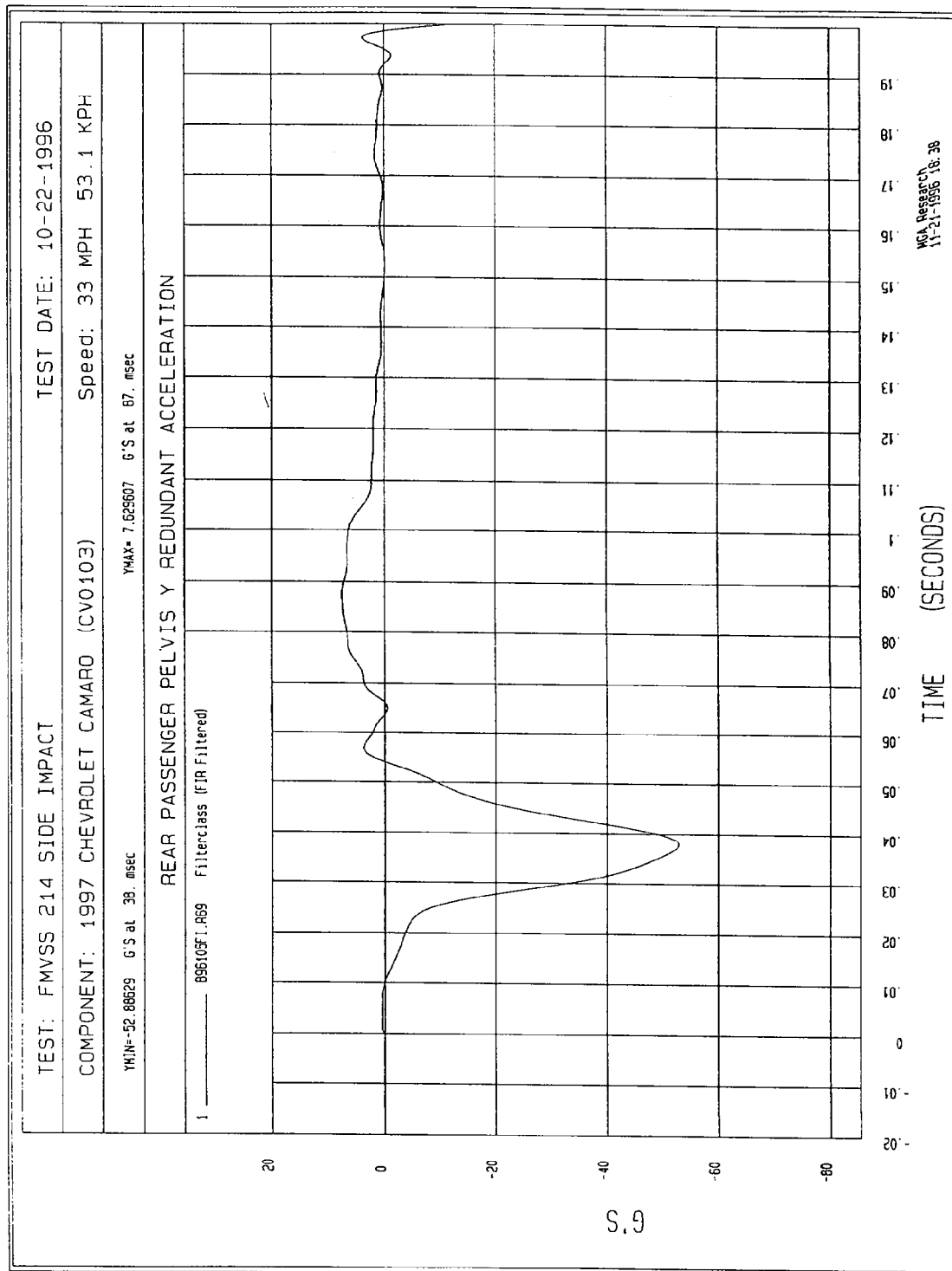
YMAX= 7.821757 G'S at 80 msec

REAR PASSENGER PELVIS Y ACCELERATION

1 — B96105F1.R28 FilterClass (FIR Filtered)



MSA Research
11-21-1996 18:37



APPENDIX C
SID CONFIGURATION AND PERFORMANCE VERIFICATION

REPORT NO. MGA-96-DC05

DUMMY PERFORMANCE CALIBRATIONS

FMVSS 214 - SIDE IMPACT TEST

GENERAL MOTORS CORPORATION
1997 CHEVROLET CAMARO CONVERTIBLE
NHTSA NO. CV0103

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: October 22, 1996

Report Date: November 27, 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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DUMMY S/N: 269	PRE-TEST CERTIFICATION DATA	2-1
DUMMY S/N: 272	POST-TEST CERTIFICATION DATA	3-1
DUMMY S/N: 269	POST-TEST CERTIFICATION DATA	4-1
DUMMY S/N: 272	POST-TEST INSPECTION CHECKLIST	5-1
DUMMY S/N: 269	POST-TEST INSPECTION CHECKLIST	6-1
	VEHICLE AND DUMMY TEMPERATURE	7-1

PRE-TEST CERTIFICATION DATA

Front Dummy Serial Number: 272

Calibration Test Results Summary

Dummy Serial Number: 272

Pre-Test Calibration

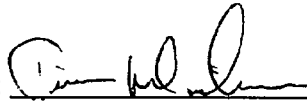
External Dimensions:	The dummy passed all external dimension requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion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

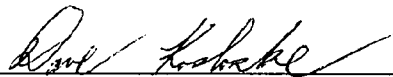
SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 272

DATE OF VERIFICATION: October 21, 1996

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.2
RH - Rib Height	19.75" - 20.50"	20.20
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"	20.7
SW - Knee Pivot to Floor	19.3" - 19.9"	19.6
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 21, 1996

DUMMY NUMBER: 272

TEST NUMBER: D961572

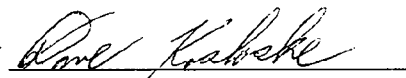
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	32%
PROBE SPEED	13.8 - 14.2 fps	14.0
UPPER RIB	37 - 46 g's	41
LOWER RIB	37 - 46 g's	41
LOWER SPINE	15 - 22 g's	21

TEST MEETS SPECIFICATIONS

TECHNICIAN

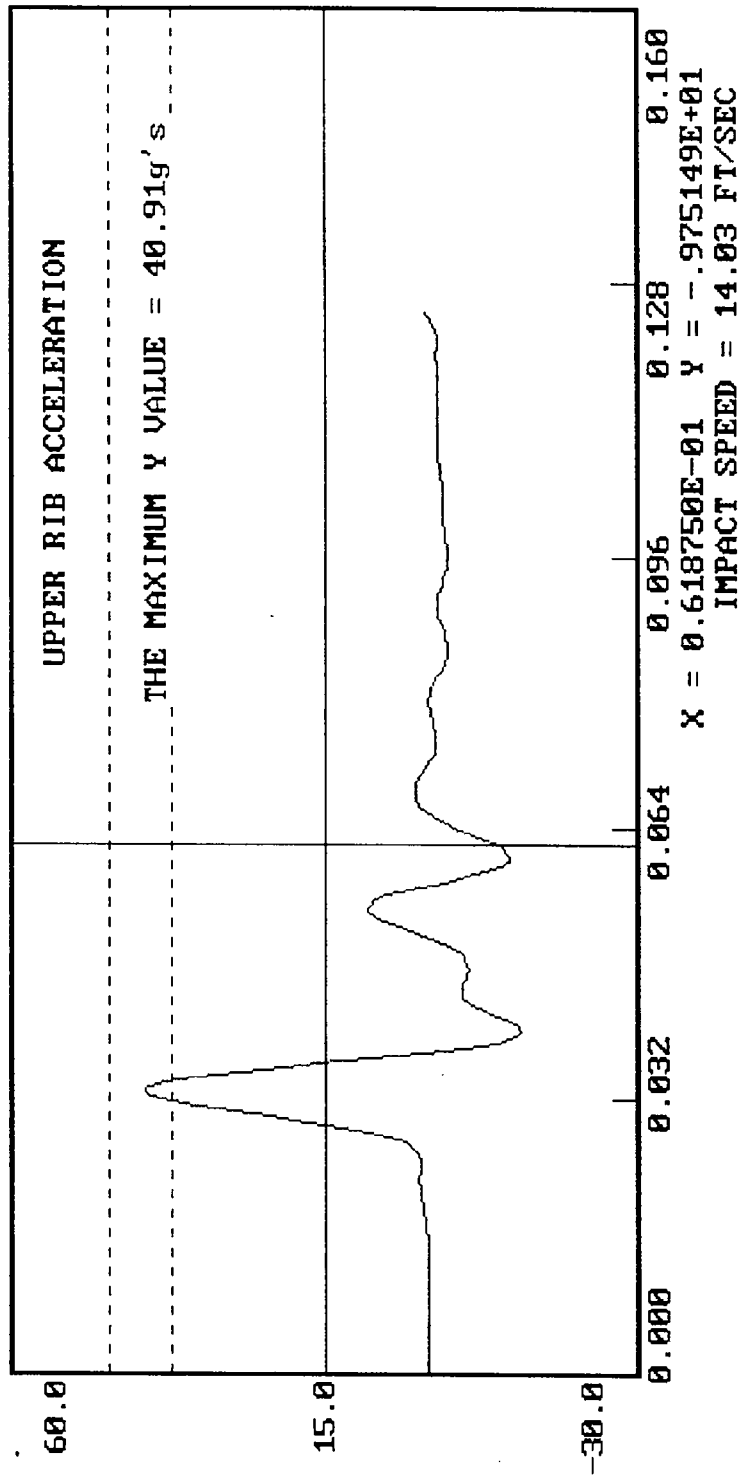


APPROVED BY

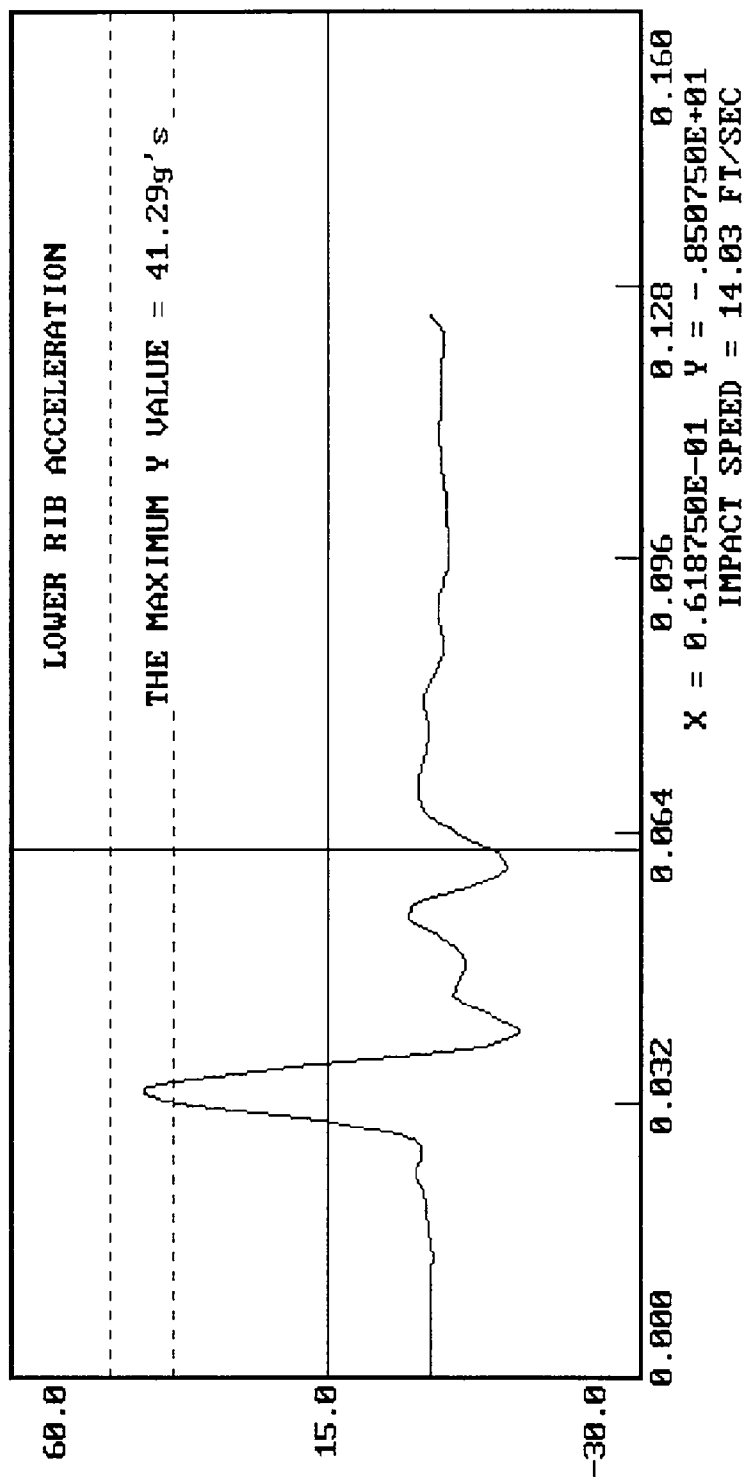


10-21-1996 15:18

DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 272 RIGHT IMPACT
ACCELERATION (G'S) VS. TIME ((SECONDS))

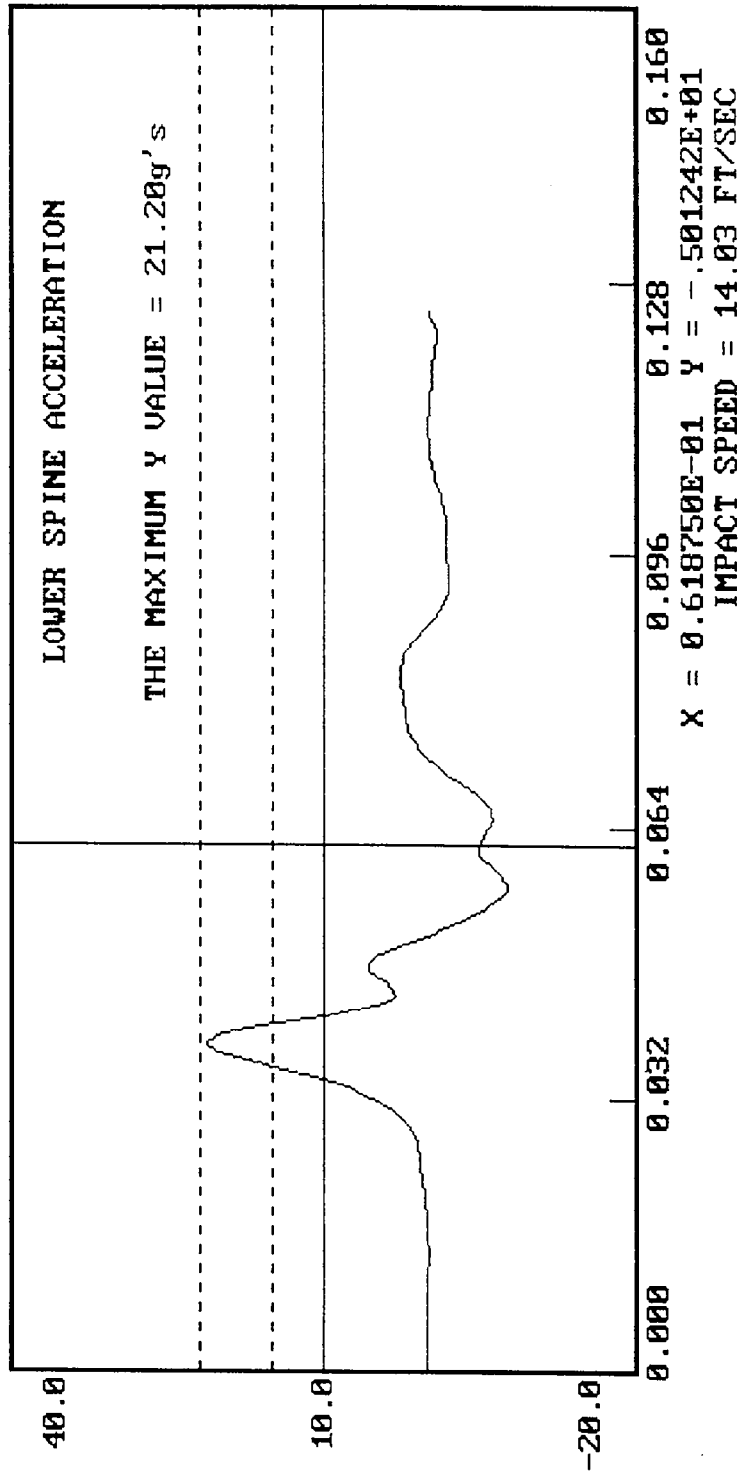


DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 272 RIGHT IMPACT
 10-21-1996 15:18
 ACCELERATION (G'S) VS. TIME ((SECONDS))



10-21-1996 15:18

DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 272 RIGHT IMPACT
ACCELERATION (G'S) VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: October 21, 1996

DUMMY NUMBER: 272

TEST NUMBER: D961573

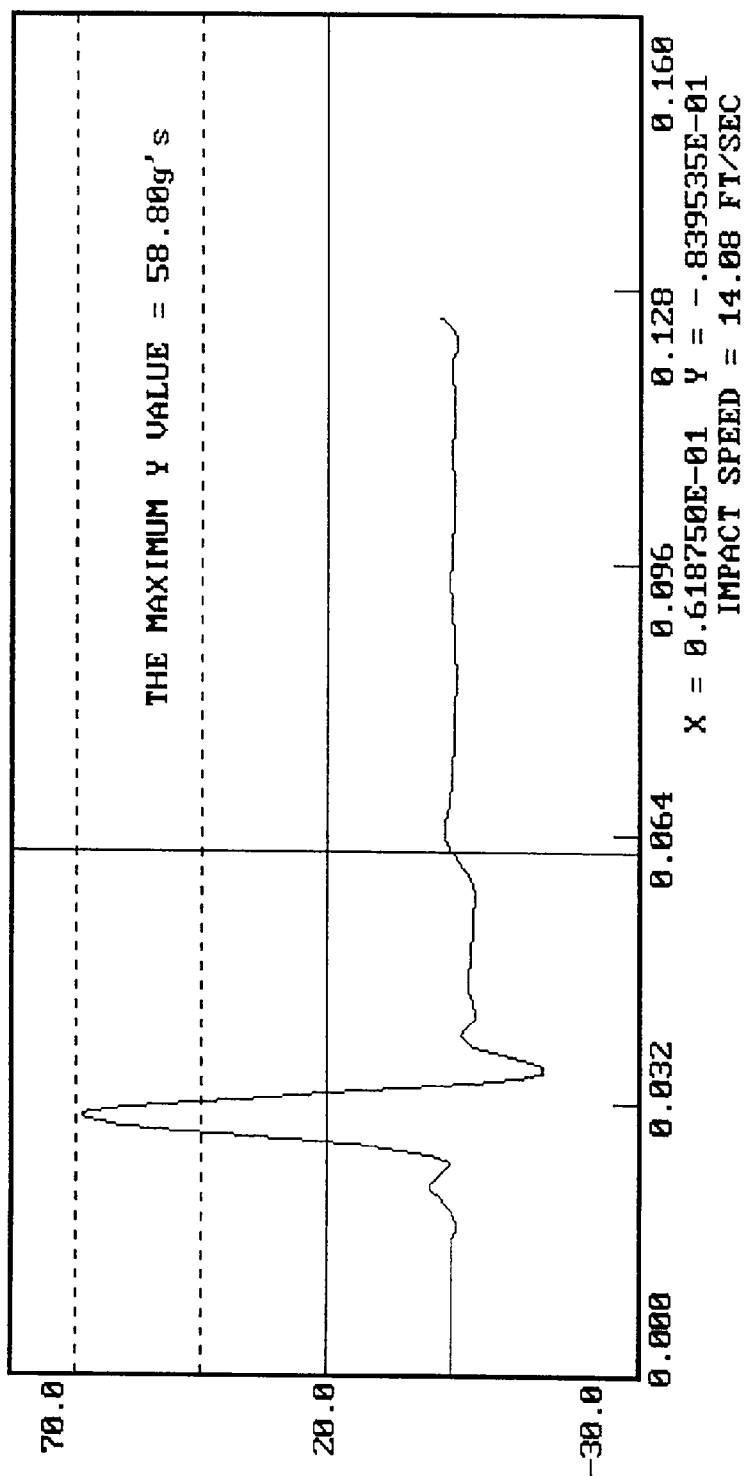
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	32%
PROBE SPEED	13.8 - 14.2 f/s	14.1
PELVIS ACCELERATION	40 - 60 g's	59

TEST MEETS SPECIFICATIONS

TECHNICIAN Jim W. Quinn

APPROVED BY Paul K. Kishner

DUMMY CALIBRATION - PELVIS IMPACT
 DUMMY # 272 RIGHT IMPACT
 10-21-1996 15:26
 ACCELERATION (G'S) VS. TIME ((SECONDS))



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

DATE: October 18, 1996

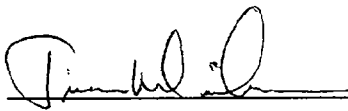
DUMMY NUMBER: 272

TEST NUMBER: D96574

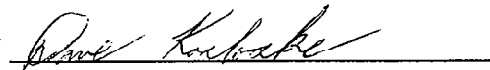
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	35%
FORCE @ 0.5 in	23.3 - 36.5 lbs	31.8
FORCE @ 0.75 in	36.7 - 49.8 lbs	44.4
FORCE @ 1.0 in	50 - 63 lbs	60
FORCE @ 1.3 in	73 - 88 lbs	82

TEST MEETS SPECIFICATIONS

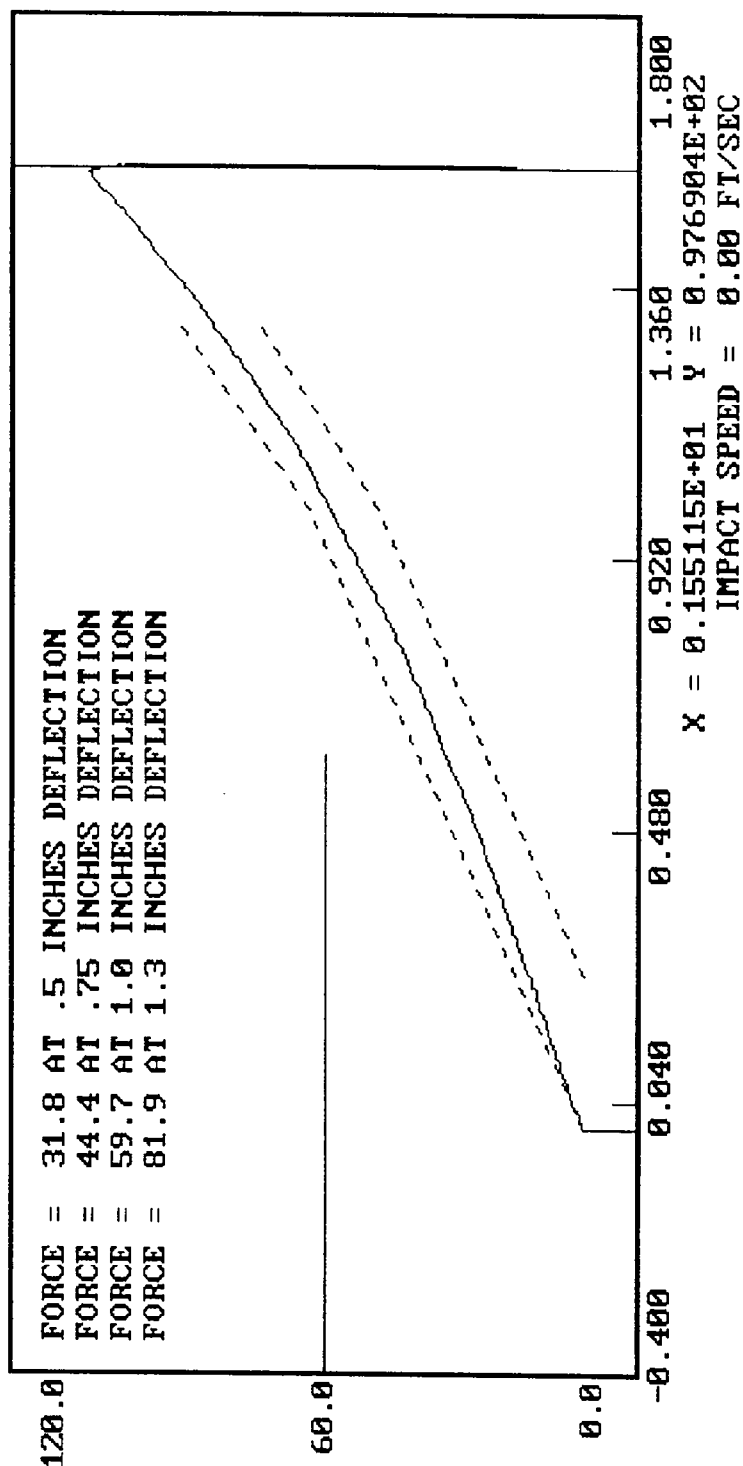
TECHNICIAN



APPROVED BY



DUMMY CALIBRATION - ABDOMEN COMPRESSION
 DUMMY # 272
 10-18-1996 07:45
 ABDOMEN FORCE (LBS) VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

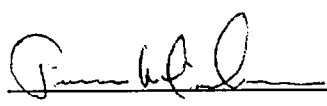
DATE: October 18, 1996

DUMMY NUMBER: 272

TEST NUMBER: D96575

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	27
FORCE @ 30°	34 - 46 lbs	38
FORCE @ 40°	46 - 58 lbs	49
RETURN ANGLE	12° maximum	2°

TEST MEETS SPECIFICATIONS

TECHNICIAN 

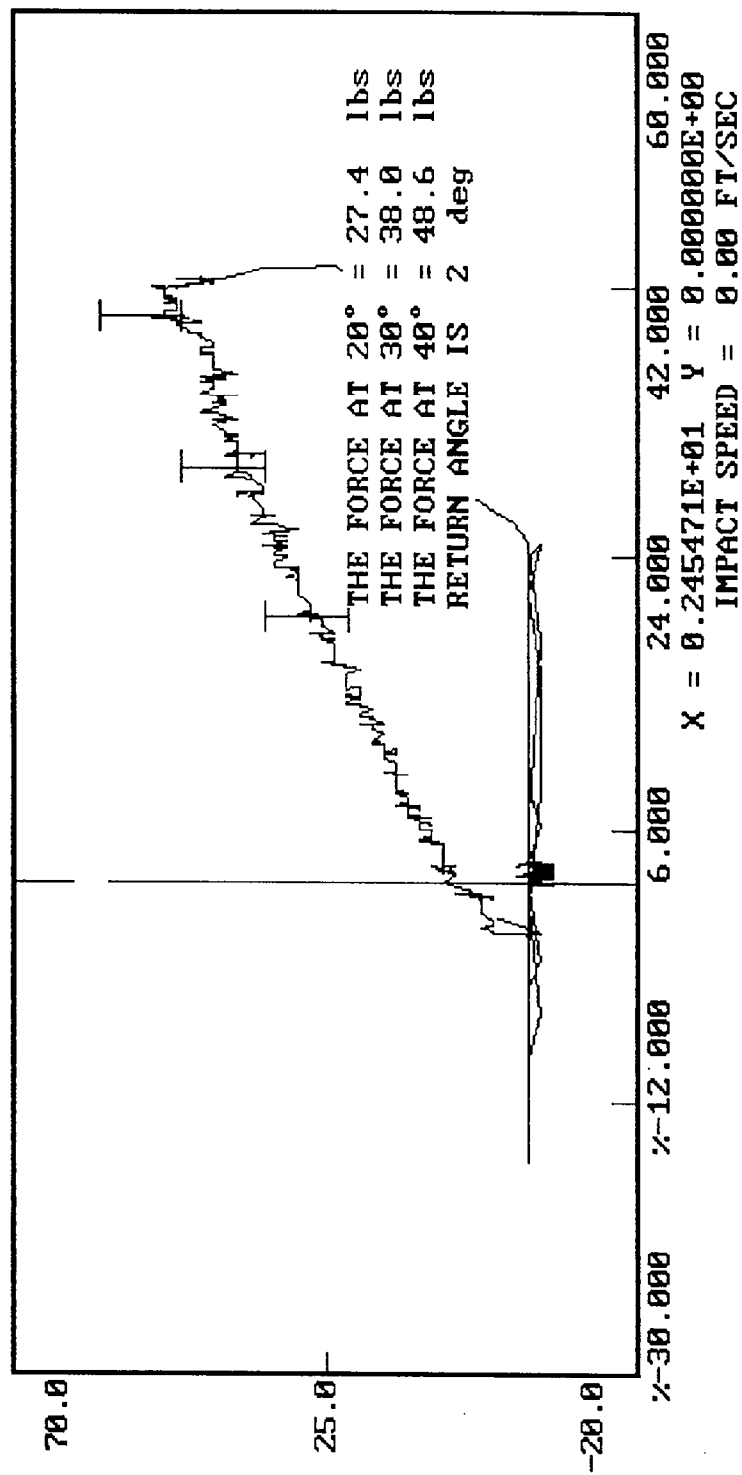
APPROVED BY 

DUMMY CALIBRATION - LUMBAR FLEXION

DUMMY # 272

FORCE (LBS) VS. TORSO ROTATION (DEGREES)

10-18-1996 08:41



PRE-TEST CERTIFICATION DATA

Rear Dummy Serial Number: 269

Calibration Test Results Summary

Passenger Serial Number: 269

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.: 269

DATE OF VERIFICATION: October 21, 1996

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.1
RH - Rib Height	19.75" - 20.50"	20.00
HP - Hip Pivot Height	3.9" ref.	3.9
RD - Rib From Back Line	9.0" to 9.5"	9.3
KV - Knee Pivot From Back Line	20.1" - 20.7"	20.4
SW - Knee Pivot to Floor	19.3" - 19.9"	19.4
HW - Hip Width	14.0" - 15.4"	15.1

MEASUREMENTS BY: Jim Walsh

APPROVED BY: Dave Korbake

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

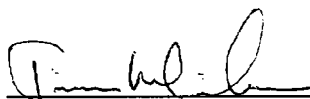
DATE: October 21, 1996

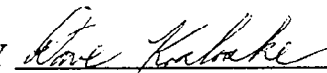
DUMMY NUMBER: 269

TEST NUMBER: D96542

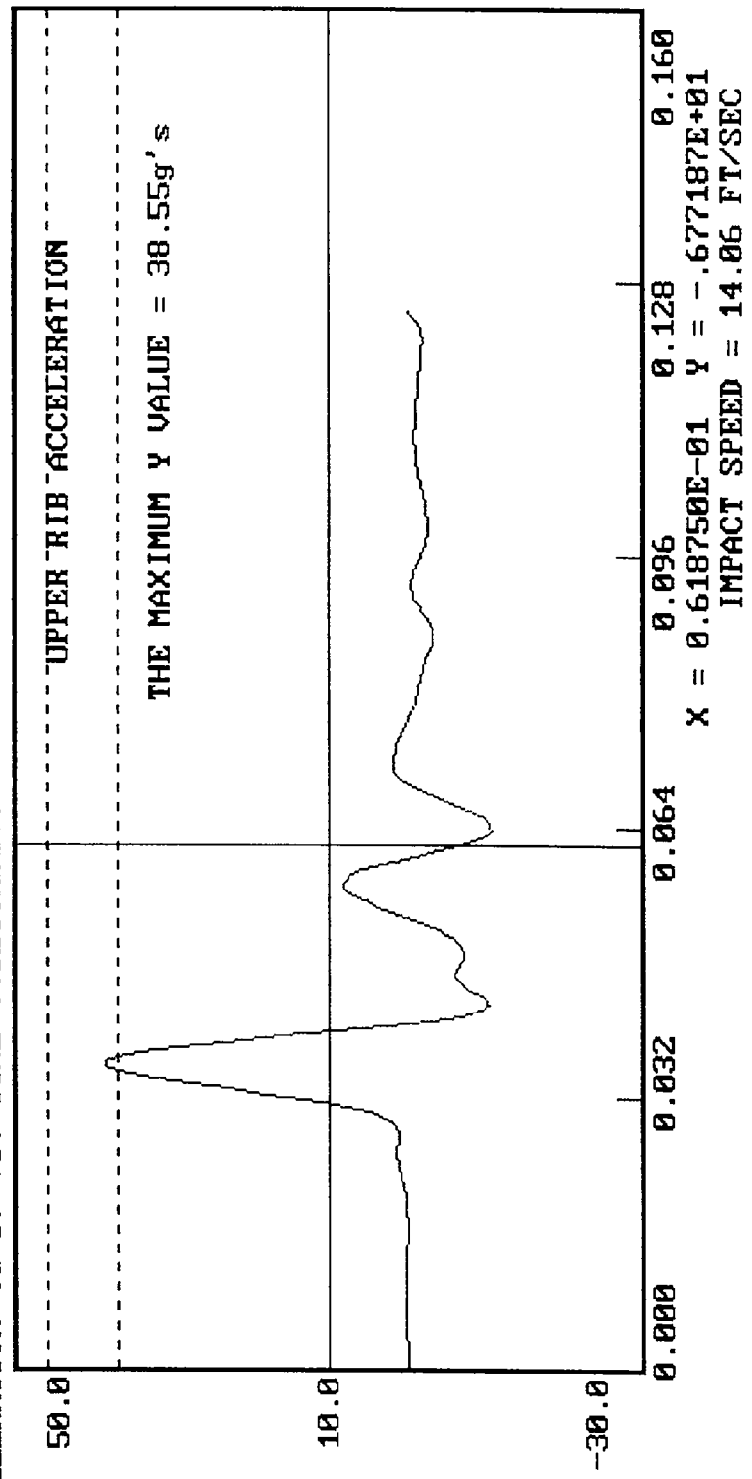
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	32%
PROBE SPEED	13.8 - 14.2 fps	14.1
UPPER RIB	37 - 46 g's	39
LOWER RIB	37 - 46 g's	40
LOWER SPINE	15 - 22 g's	20

TEST MEETS SPECIFICATIONS

TECHNICIAN 

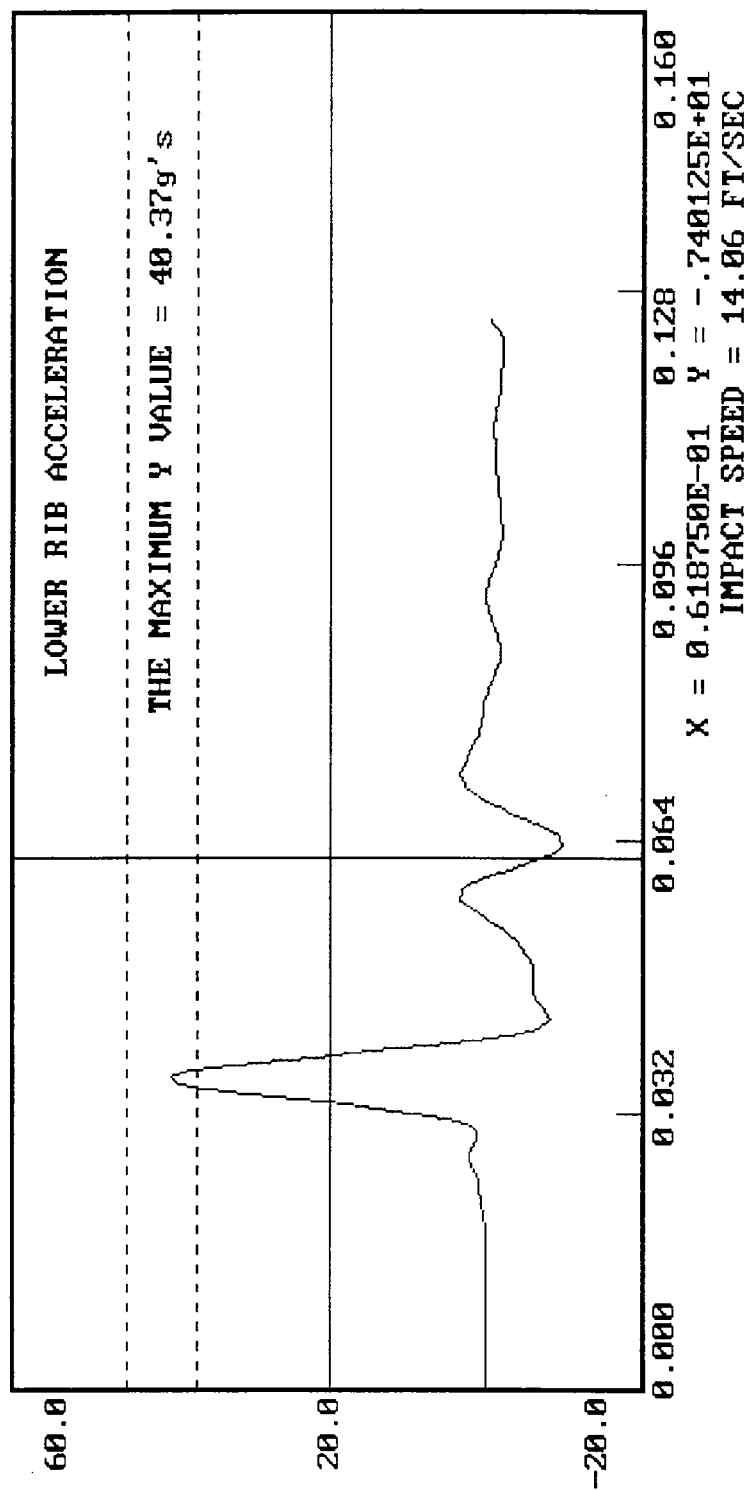
APPROVED BY 

DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 269 RIGHT IMPACT
 10-21-1996 14:50
 ACCELERATION (G'S) VS. TIME ((SECONDS))



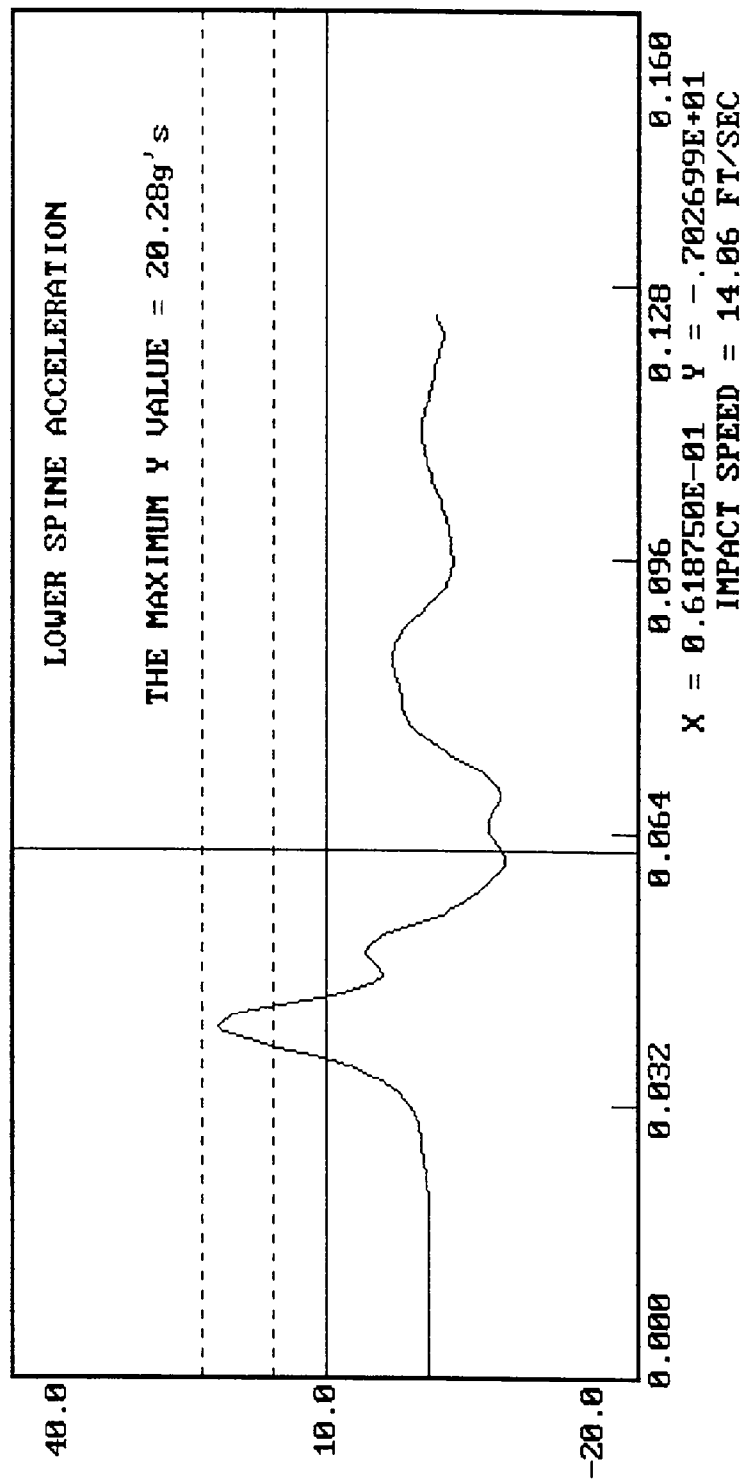
10-21-1996 14:50

DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 269 RIGHT IMPACT
ACCELERATION (G'S) VS. TIME ((SECONDS))



10-21-1996 14:50

DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 269 RIGHT IMPACT
ACCELERATION (G'S) VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: October 21, 1996

DUMMY NUMBER: 269

TEST NUMBER: D96543

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	32%
PROBE SPEED	13.8 - 14.2 f/s	14.0
PELVIS ACCELERATION	40 - 60 g's	51

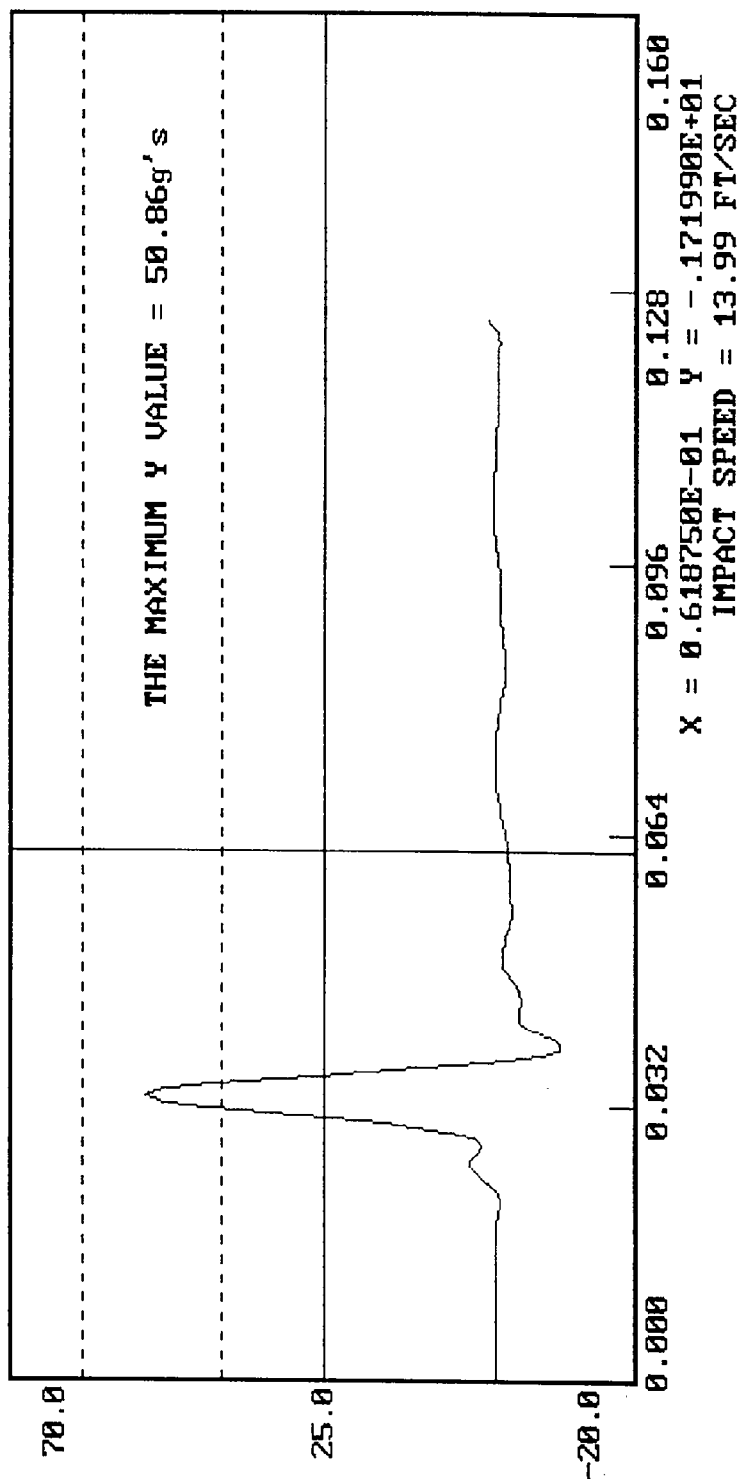
TEST MEETS SPECIFICATIONS

TECHNICIAN Jim Wilsh

APPROVED BY Steve Kelschke

10-21-1996 14:58

DUMMY CALIBRATION - PELVIS IMPACT
DUMMY # 269 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

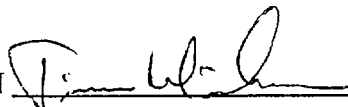
DUMMY NUMBER: 269

TEST NUMBER: D961544

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	35%
FORCE @ 0.5 in	23.3 - 36.5 lbs	29.9
FORCE @ 0.75 in	36.7 - 49.8 lbs	42.7
FORCE @ 1.0 in	50 - 63 lbs	57
FORCE @ 1.3 in	73 - 88 lbs	77

TEST MEETS SPECIFICATIONS

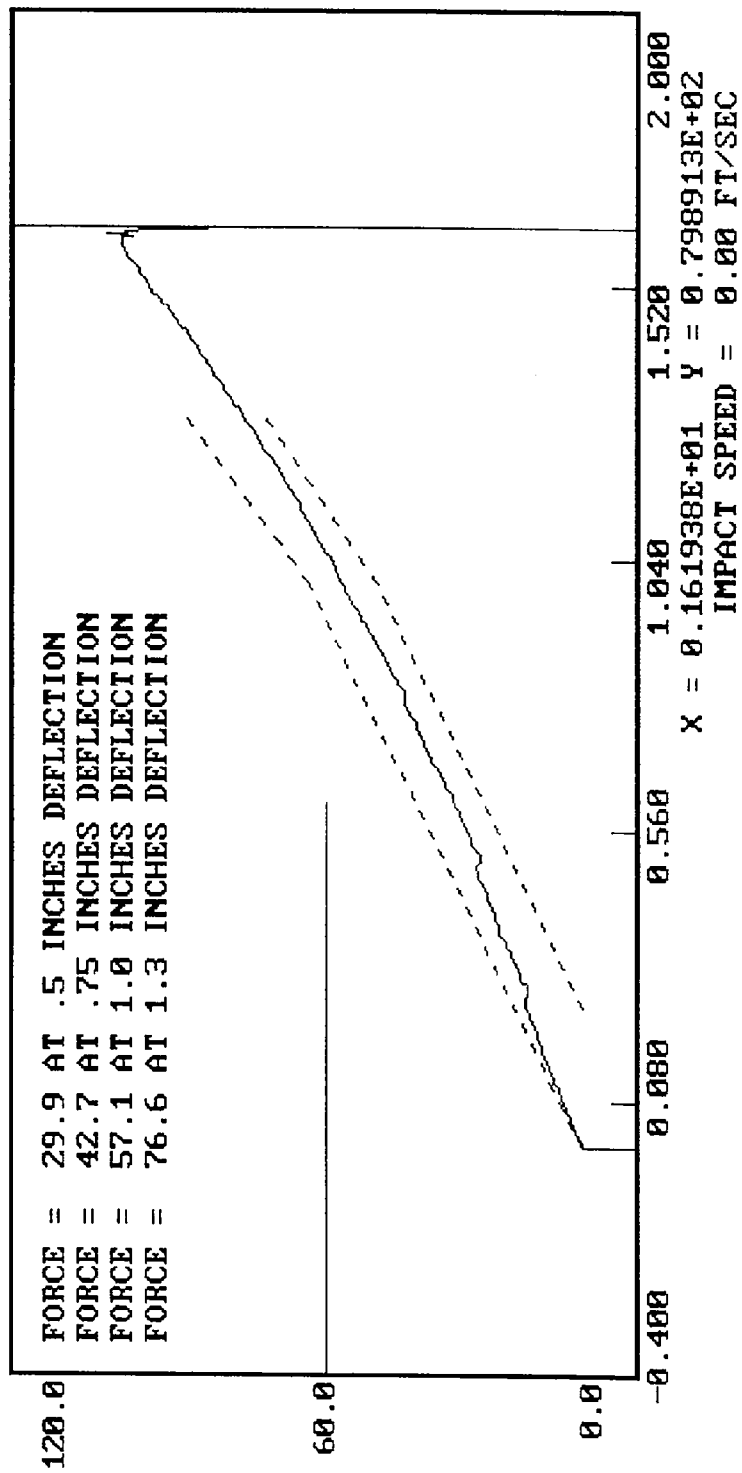
TECHNICIAN



APPROVED BY



DUMMY CALIBRATION - ABDOMEN COMPRESSION
 DUMMY # 269
 10-18-1996 07:52
 ABDOMEN FORCE (LBS) VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: October 21, 1996

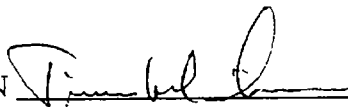
DUMMY NUMBER: 269

TEST NUMBER: D961545

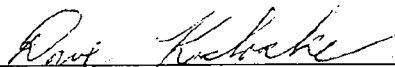
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	35%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	30
FORCE @ 30°	34 - 46 lbs	41
FORCE @ 40°	46 - 58 lbs	48
RETURN ANGLE	12° maximum	2°

TEST MEETS SPECIFICATIONS

TECHNICIAN

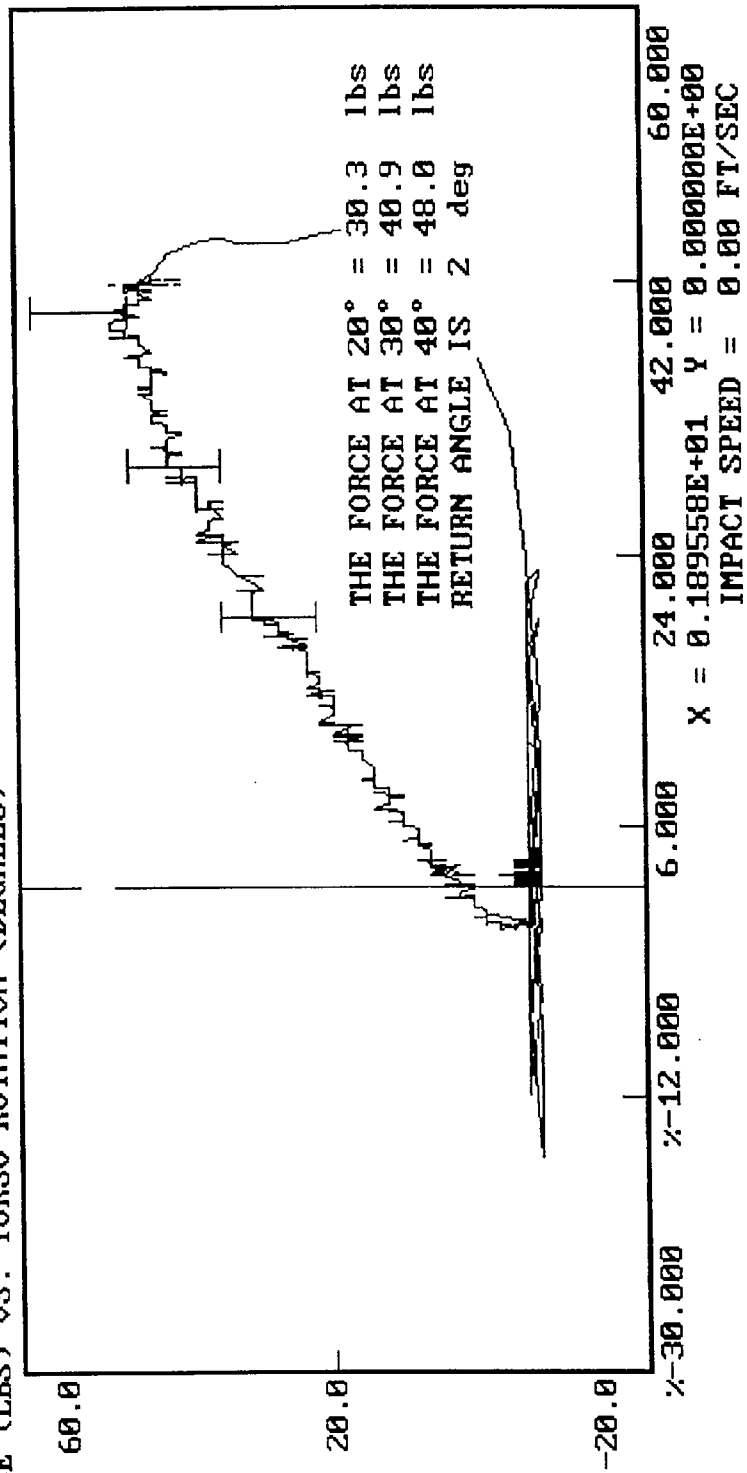


APPROVED BY



10-21-1996 12:02

DUMMY CALIBRATION - LUMBAR FLEXION
DUMMY # 269
FORCE (LBS) VS. TORSO ROTATION (DEGREES)



POST-TEST CERTIFICATION DATA

Front Dummy Serial Number: 272

Calibration Test Results Summary

Dummy Serial Number: 272

Post-Test Calibration

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

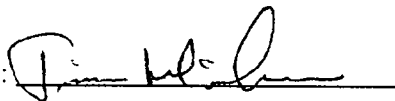
SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 272

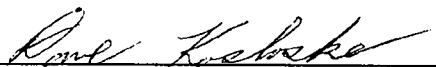
DATE OF VERIFICATION: November 7, 1996

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.2
RH - Rib Height	19.75" - 20.50"	20.20
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"	20.7
SW - Knee Pivot to Floor	19.3" - 19.9"	19.6
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: 272

TEST NUMBER: D961612

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	30%
PROBE SPEED	13.8 - 14.2 fps	14.0
UPPER RIB	37 - 46 g's	41
LOWER RIB	37 - 46 g's	39
LOWER SPINE	15 - 22 g's	19

TEST MEETS SPECIFICATIONS

TECHNICIAN

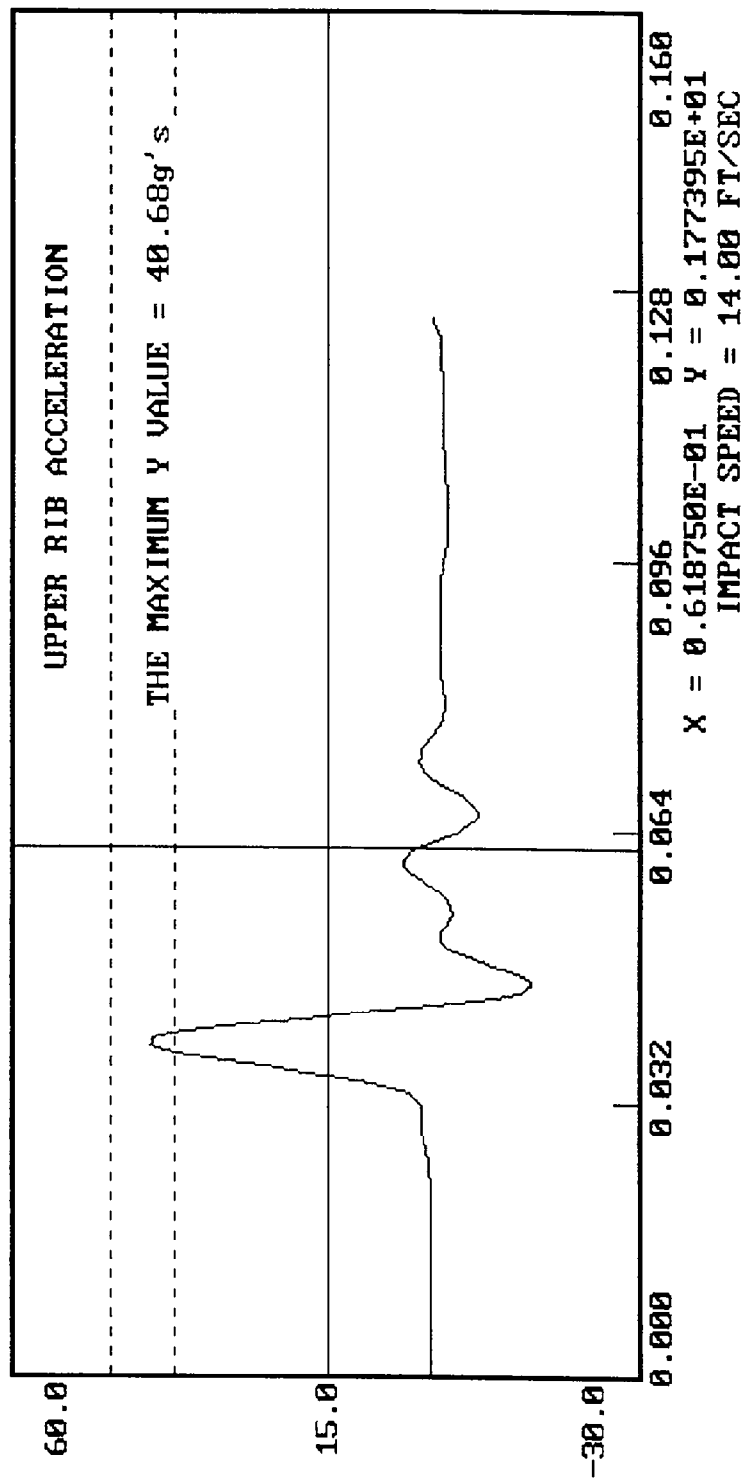
Jim Wilkins

APPROVED BY

Steve Korbach

11-07-1996 15:28

DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 272
ACCELERATION (G'S) VS. TIME ((SECONDS))

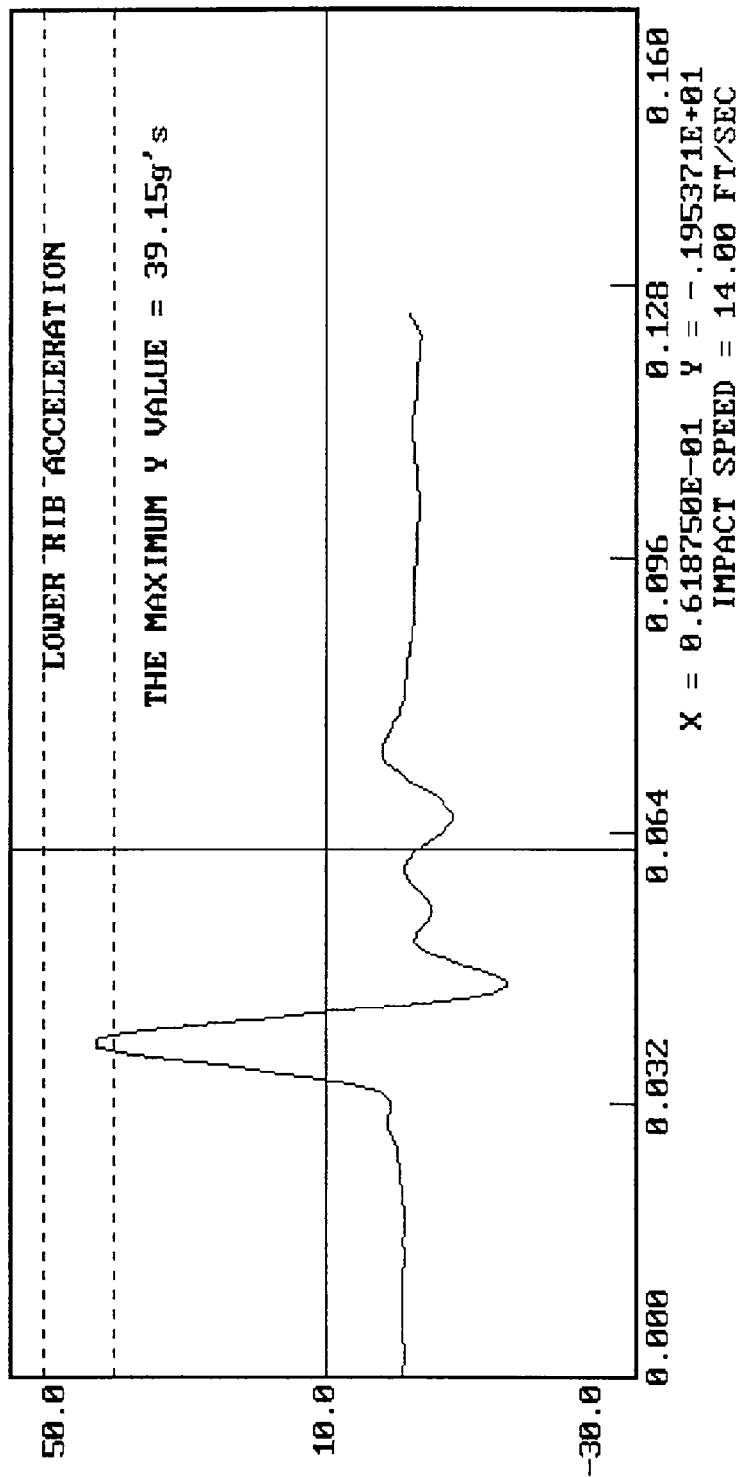


11-07-1996 15:29

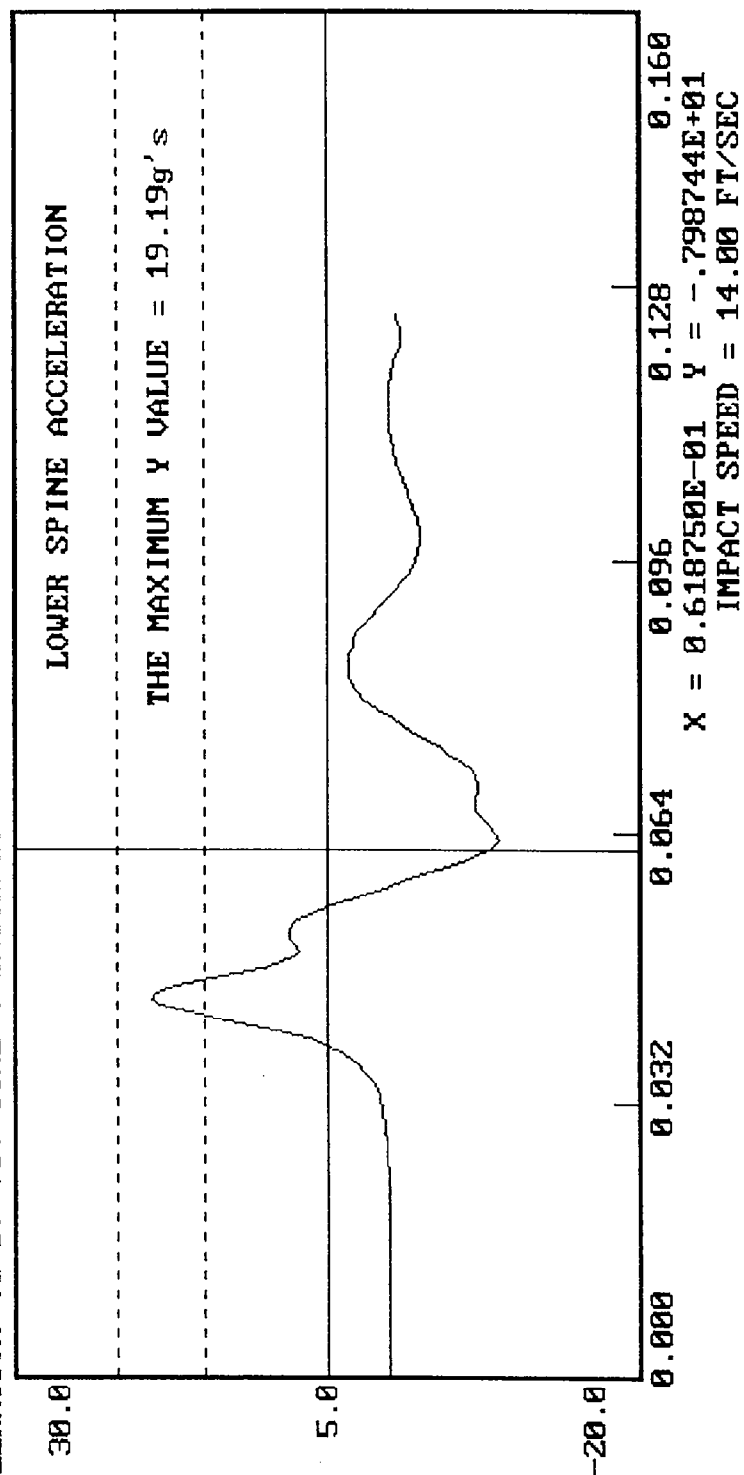
DUMMY CALIBRATION - THORAX IMPACT

DUMMY # 272

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



DUMMY CALIBRATION - THORAX IMPACT
 DUMMY # 272
 11-07-1996 15:29
 ACCELERATION (G'S) VS. TIME ((SECONDS))



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

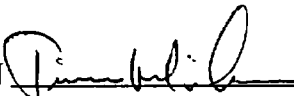
DATE: November 7, 1996

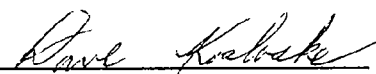
DUMMY NUMBER: 272

TEST NUMBER: D961613

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	30%
PROBE SPEED	13.8 - 14.2 f/s	14.0
PELVIS ACCELERATION	40 - 60 g's	54

TEST MEETS SPECIFICATIONS

TECHNICIAN 

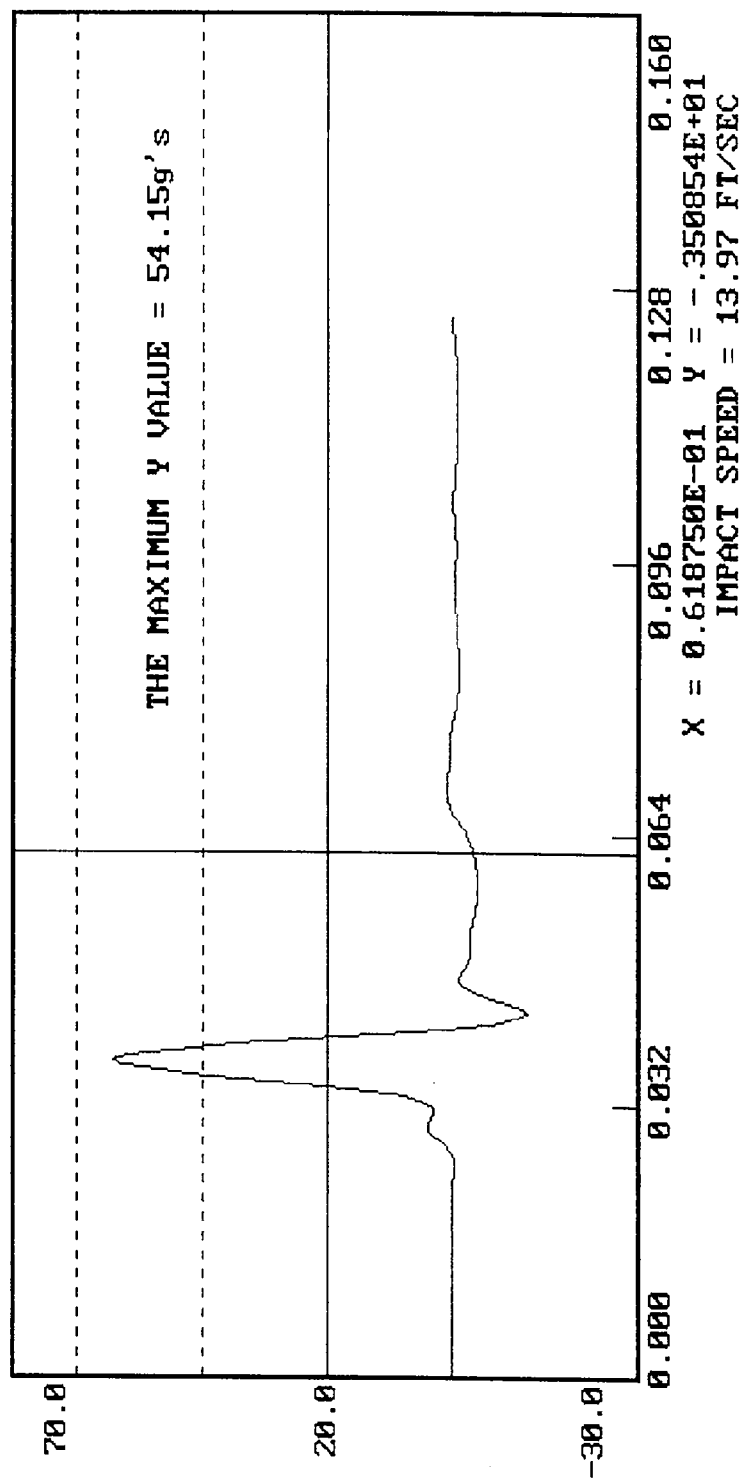
APPROVED BY 

11-07-1996 15:40

DUMMY CALIBRATION - PELVIS IMPACT

DUMMY # 272

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



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

DATE: October 31, 1996

DUMMY NUMBER: 272

TEST NUMBER: D961614

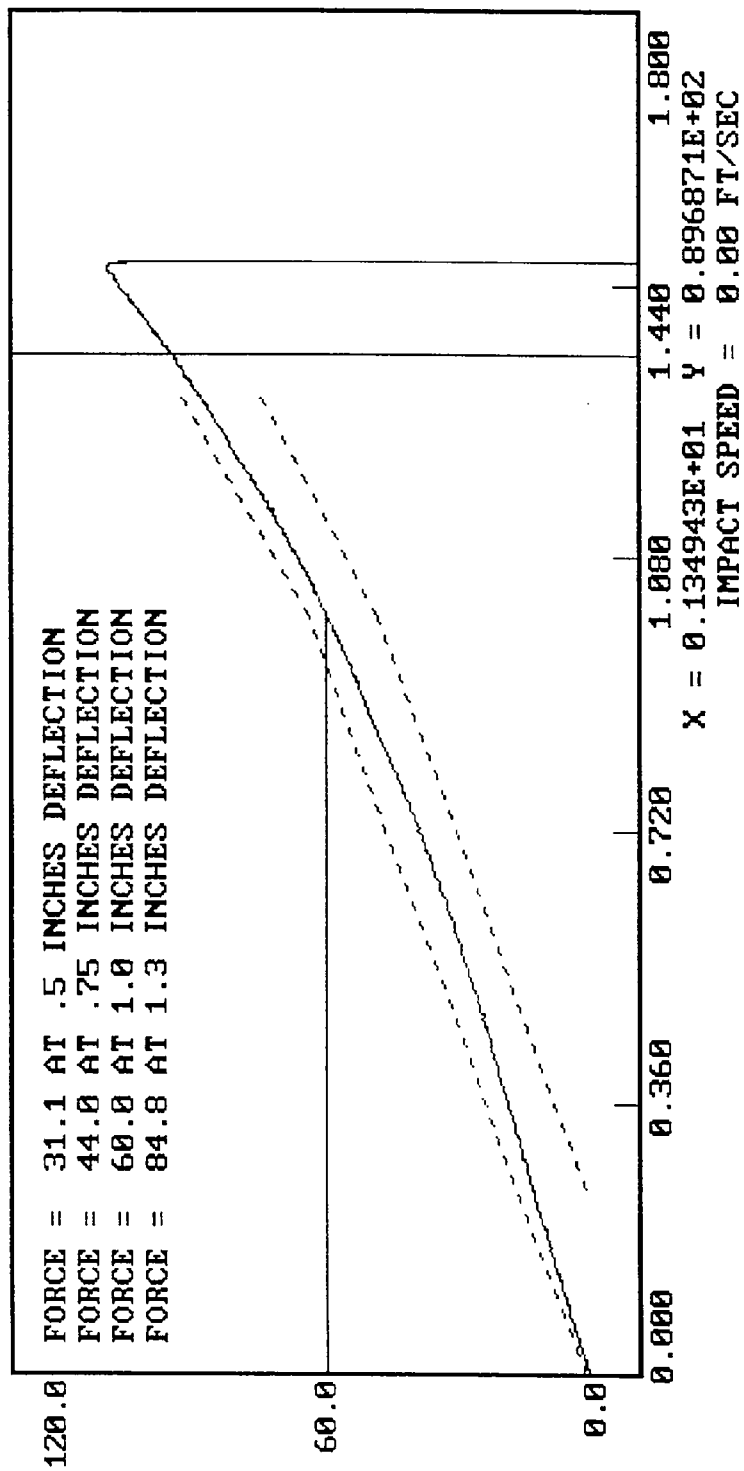
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	18%
FORCE @ 0.5 in	23.3 - 36.5 lbs	31.1
FORCE @ 0.75 in	36.7 - 49.8 lbs	44.0
FORCE @ 1.0 in	50 - 63 lbs	60
FORCE @ 1.3 in	73 - 88 lbs	85

TEST MEETS SPECIFICATIONS

TECHNICIAN Tim Mahan

APPROVED BY Steve Kabeke

DUMMY CALIBRATION - ABDOMEN COMPRESSION
 DUMMY # 272
 10-31-1996 15:54
 ABDOMEN FORCE (LBS) VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: October 31, 1996

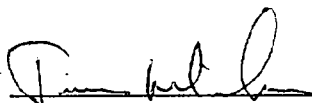
DUMMY NUMBER: 272

TEST NUMBER: D961615

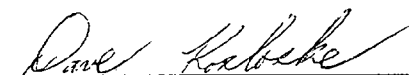
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	18%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	26
FORCE @ 30°	34 - 46 lbs	38
FORCE @ 40°	46 - 58 lbs	49
RETURN ANGLE	12° maximum	7°

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY

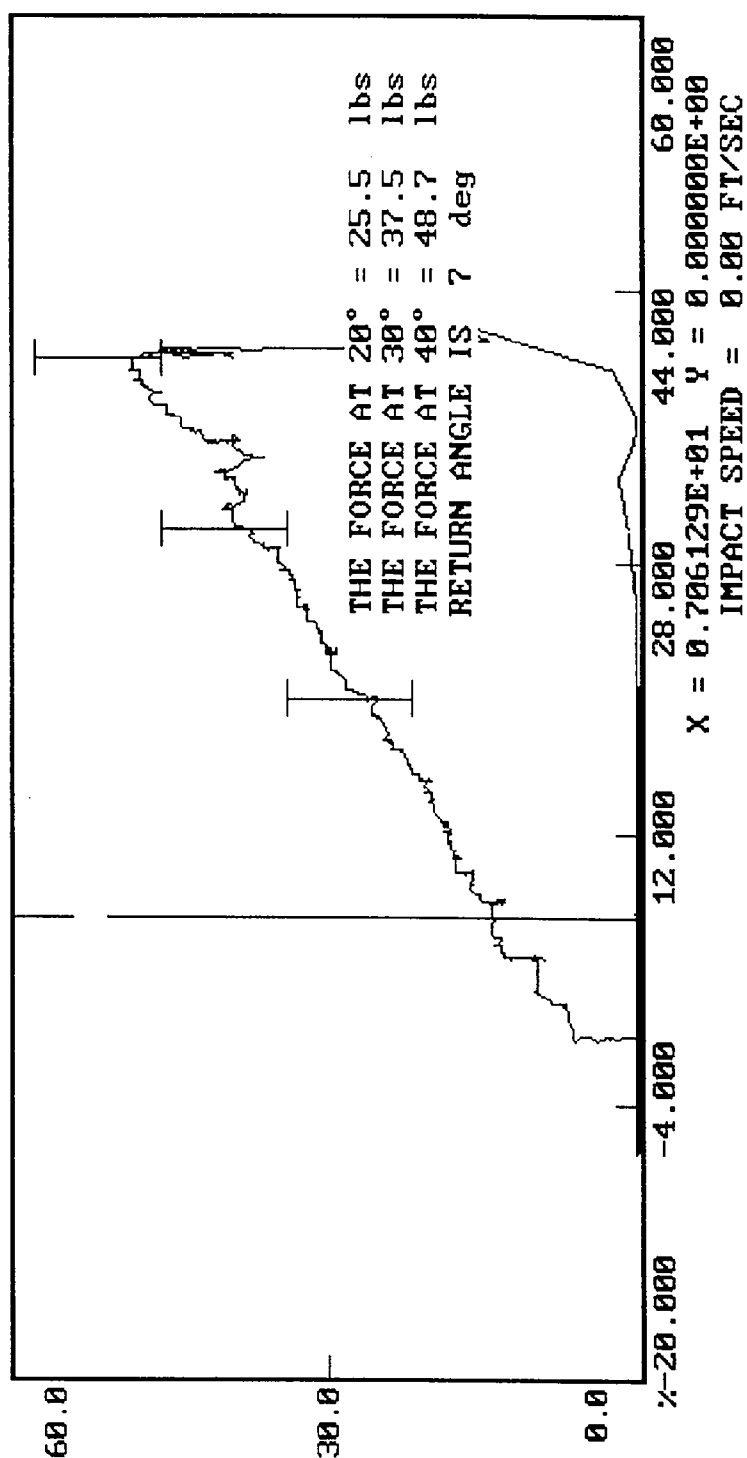


10-31-1996 12:42

DUMMY CALIBRATION - LUMBAR FLEXION

DUMMY # 272

FORCE (LBS) VS. TORSO ROTATION (DEGREES)



POST-TEST CERTIFICATION DATA

Rear Dummy Serial Number: 269

Calibration Test Results Summary

Dummy Serial Number: 269

Post-Test Calibration

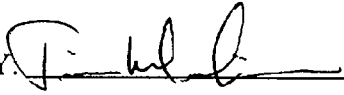
External Dimensions:	The dummy passed all external dimension requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion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

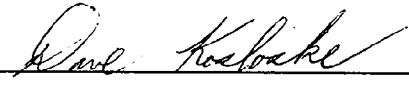
SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 269

DATE OF VERIFICATION: November 07, 1996

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.1
RH - Rib Height	19.75" - 20.50"	20.00
HP - Hip Pivot Height	3.9" ref.	3.9
RD - Rib From Back Line	9.0" to 9.5"	9.3
KV - Knee Pivot From Back Line	20.1" - 20.7"	20.4
SW - Knee Pivot to Floor	19.3" - 19.9"	19.4
HW - Hip Width	14.0" - 15.4"	15.1

MEASUREMENTS BY: 

APPROVED BY: 

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: November 07, 1996

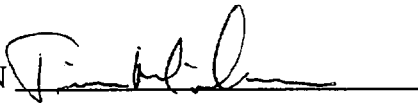
DUMMY NUMBER: 269

TEST NUMBER: D961582

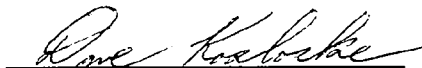
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	30%
PROBE SPEED	13.8 - 14.2 fps	14.0
UPPER RIB	37 - 46 g's	45
LOWER RIB	37 - 46 g's	39
LOWER SPINE	15 - 22 g's	22

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY

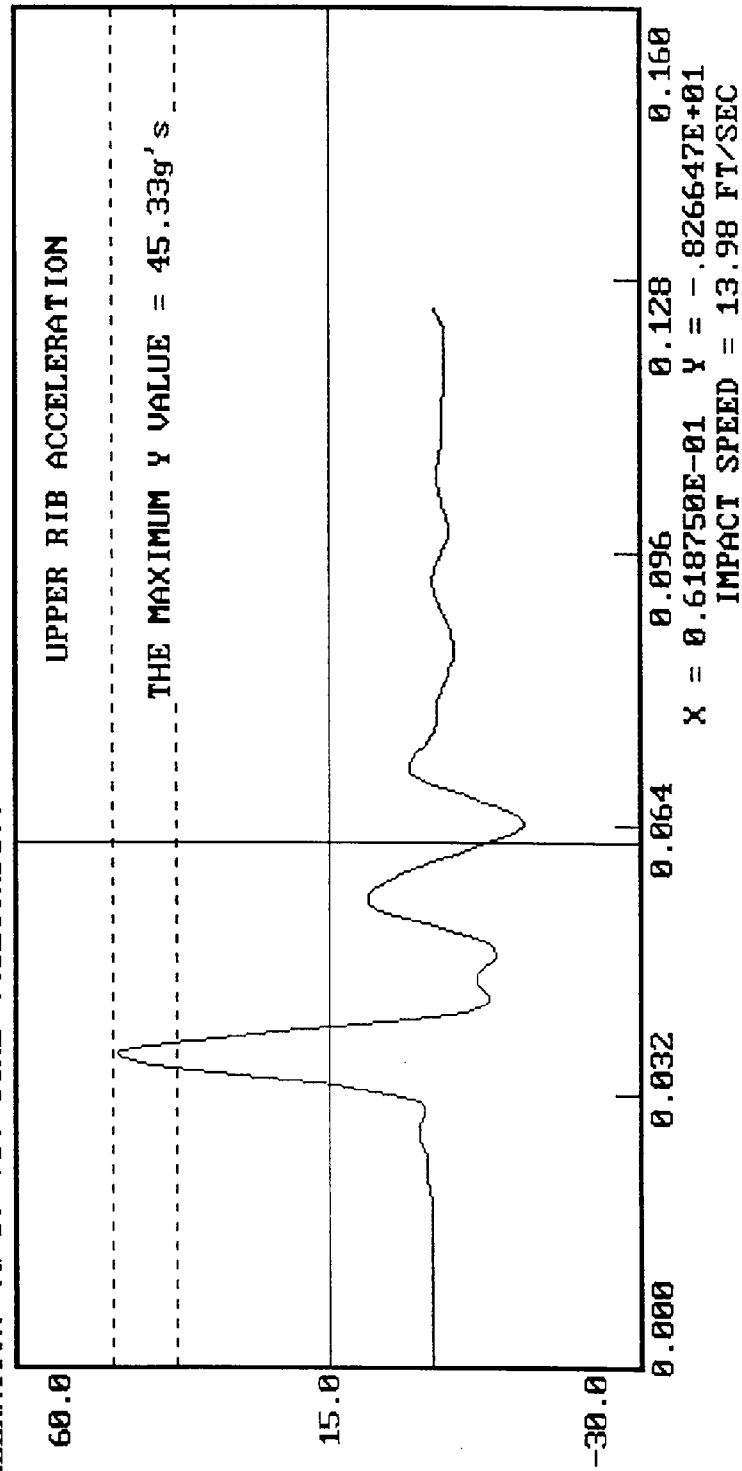


11-07-1996 15:04

DUMMY CALIBRATION - THORAX IMPACT

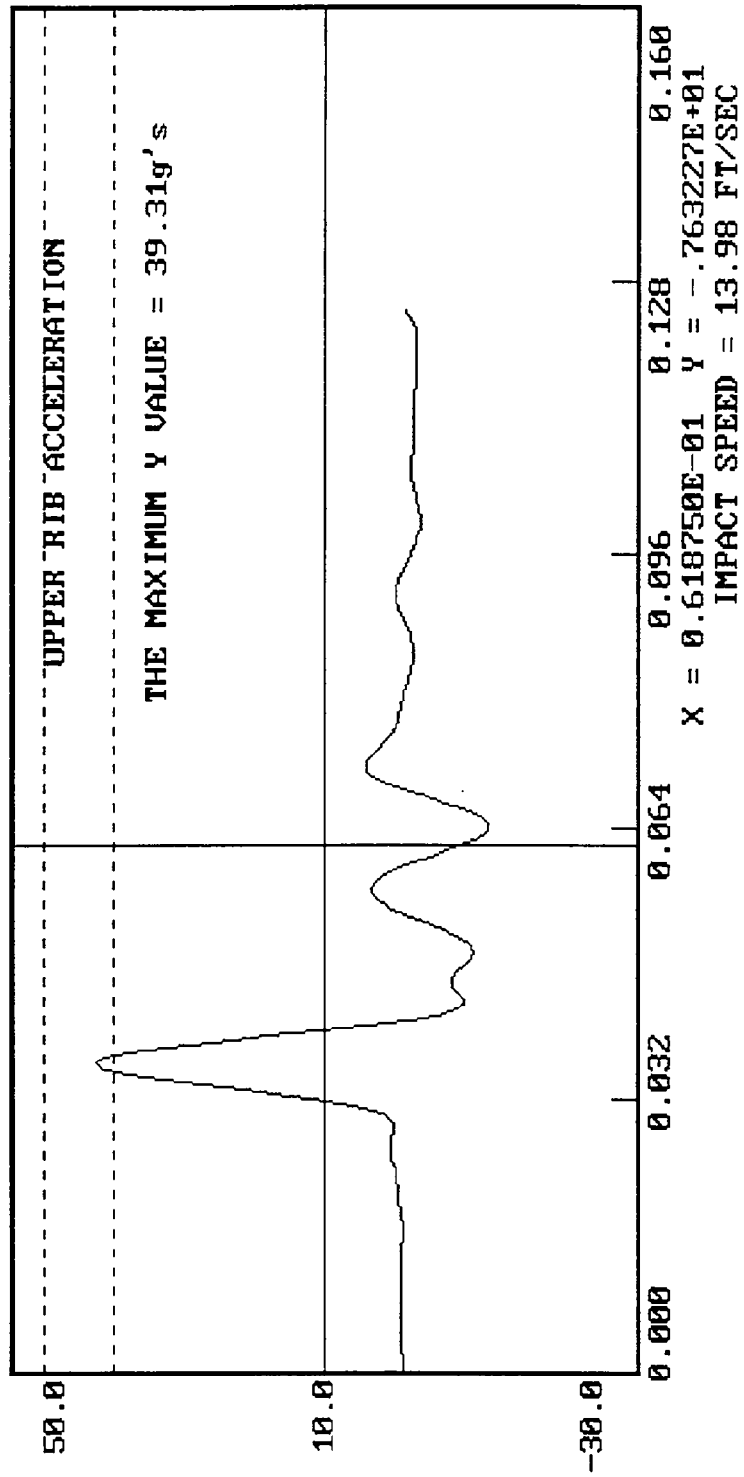
DUMMY # 269

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



11-07-1996 15:04

DUMMY CALIBRATION - THORAX IMPACT
DUMMY # 269
ACCELERATION (G'S) VS. TIME ((SECONDS))

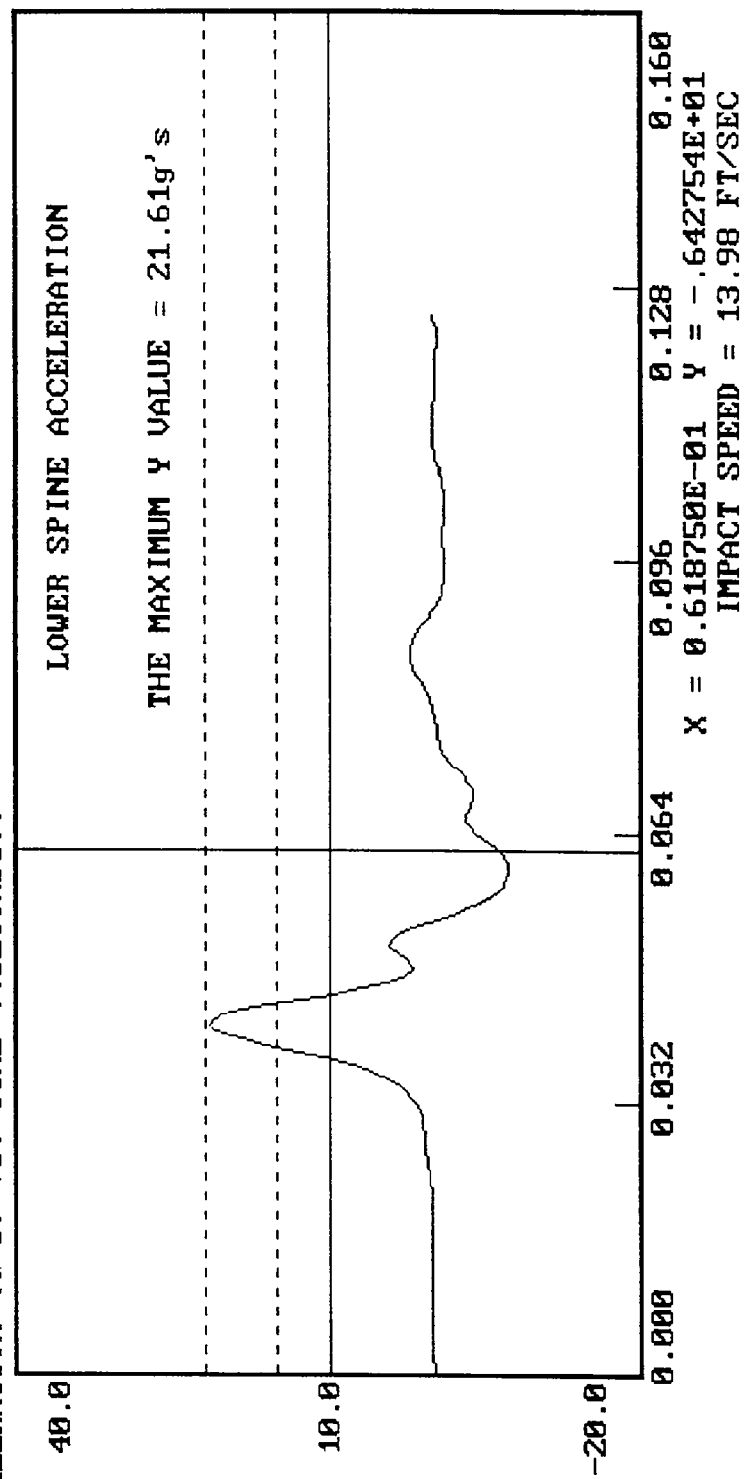


11-07-1996 15:04

DUMMY CALIBRATION - THORAX IMPACT

DUMMY # 269

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



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: November 07, 1996

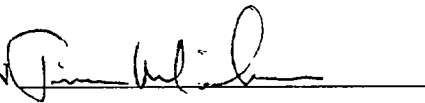
DUMMY NUMBER: 269

TEST NUMBER: D961583

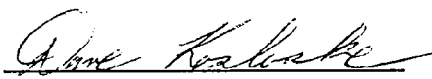
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	30%
PROBE SPEED	13.8 - 14.2 f/s	13.9
PELVIS ACCELERATION	40 - 60 g's	51

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY

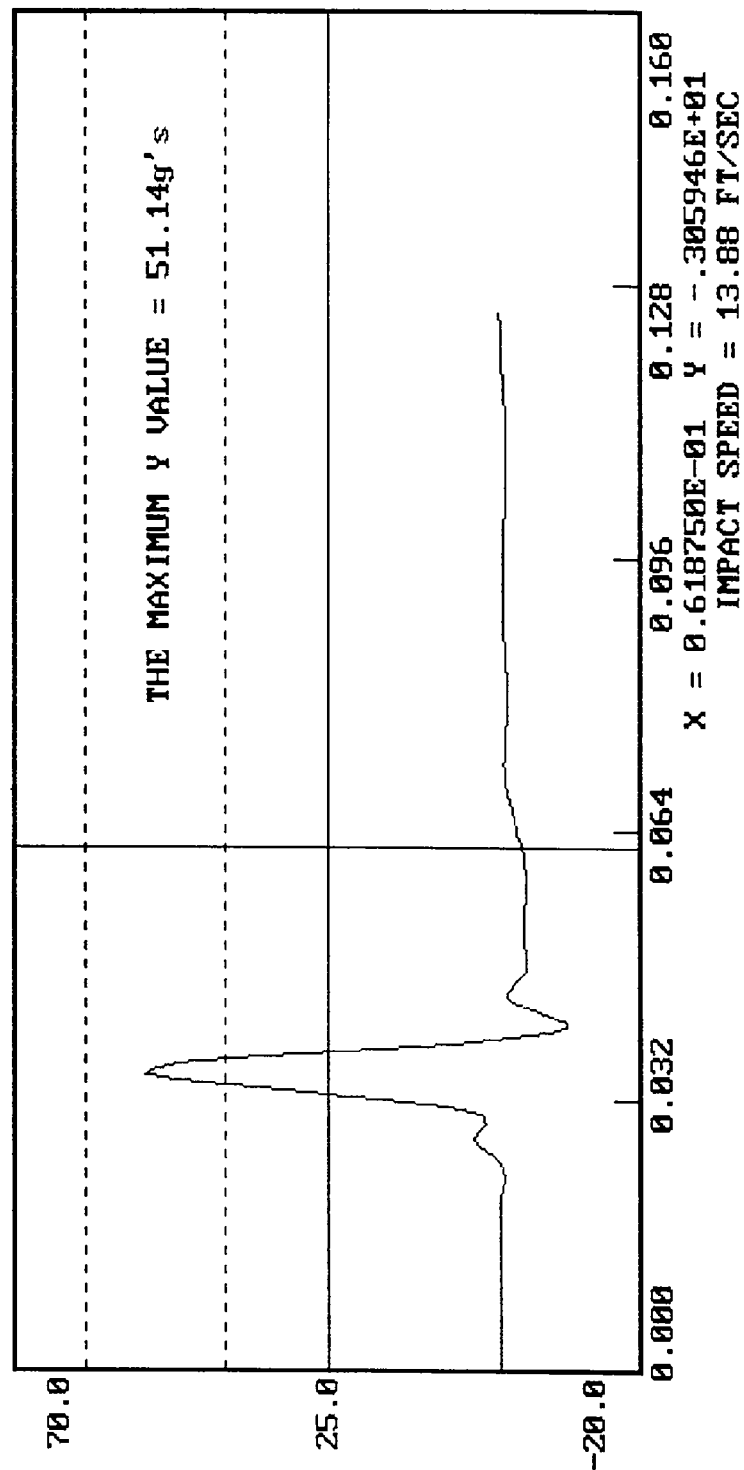


11-07-1996 15:11

DUMMY CALIBRATION - PELVIS IMPACT

DUMMY # 269

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



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

DATE: October 31, 1996

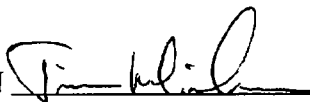
DUMMY NUMBER: 269

TEST NUMBER: D961584

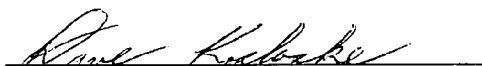
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	18%
FORCE @ 0.5 in	23.3 - 36.5 lbs	34.3
FORCE @ 0.75 in	36.7 - 49.8 lbs	48.1
FORCE @ 1.0 in	50 - 63 lbs	62
FORCE @ 1.3 in	73 - 88 lbs	84

TEST MEETS SPECIFICATIONS

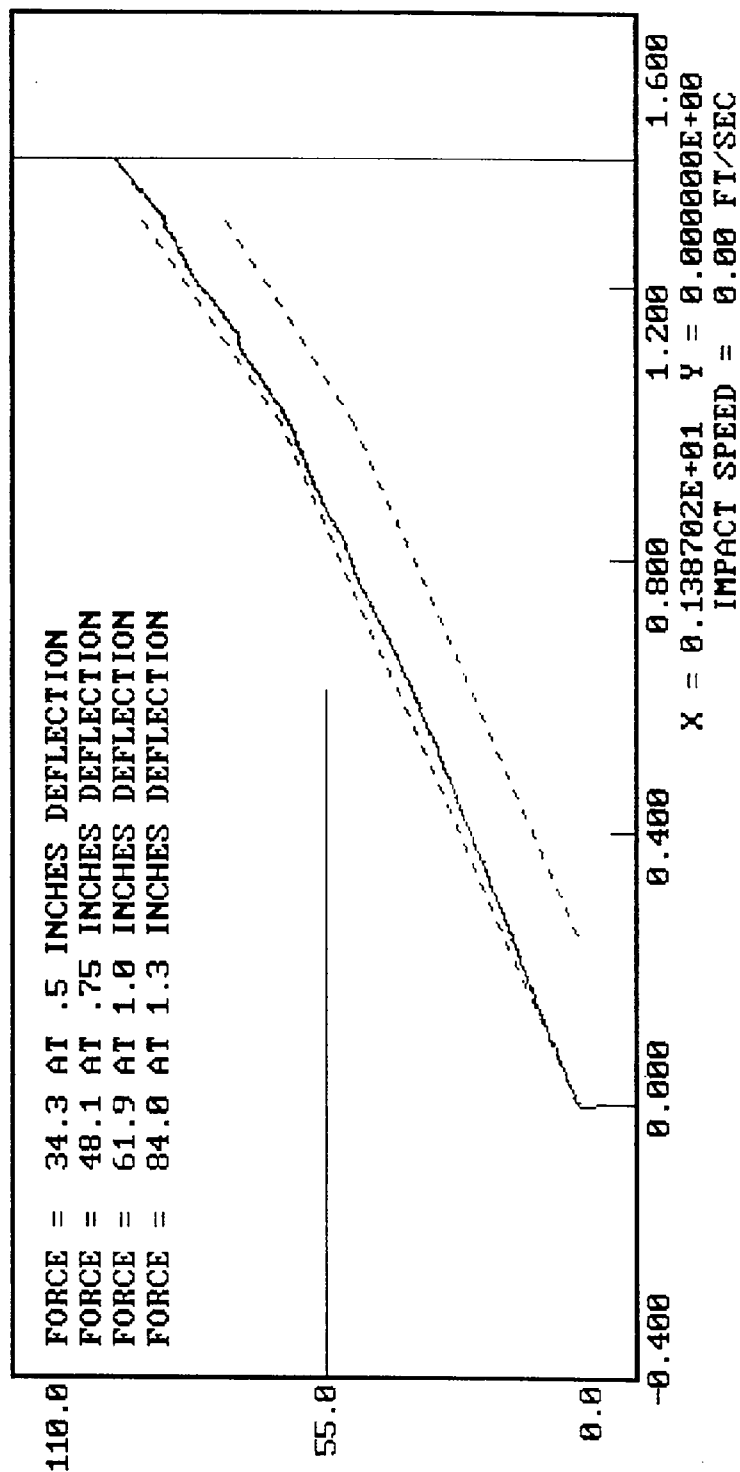
TECHNICIAN



APPROVED BY



DUMMY CALIBRATION - ABDOMEN COMPRESSION
 DUMMY # 269
 10-31-1996 15:00
 ABDOMEN FORCE (LBS) VS. ABDOMEN DISPLACEMENT (INCHES)



MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: October 31, 1996

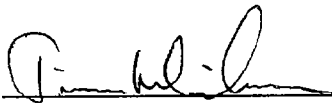
DUMMY NUMBER: 269

TEST NUMBER: D961585

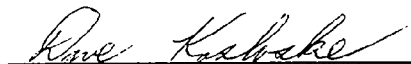
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	18%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	32
FORCE @ 30°	34 - 46 lbs	44
FORCE @ 40°	46 - 58 lbs	47
RETURN ANGLE	12° maximum	6°

TEST MEETS SPECIFICATIONS

TECHNICIAN

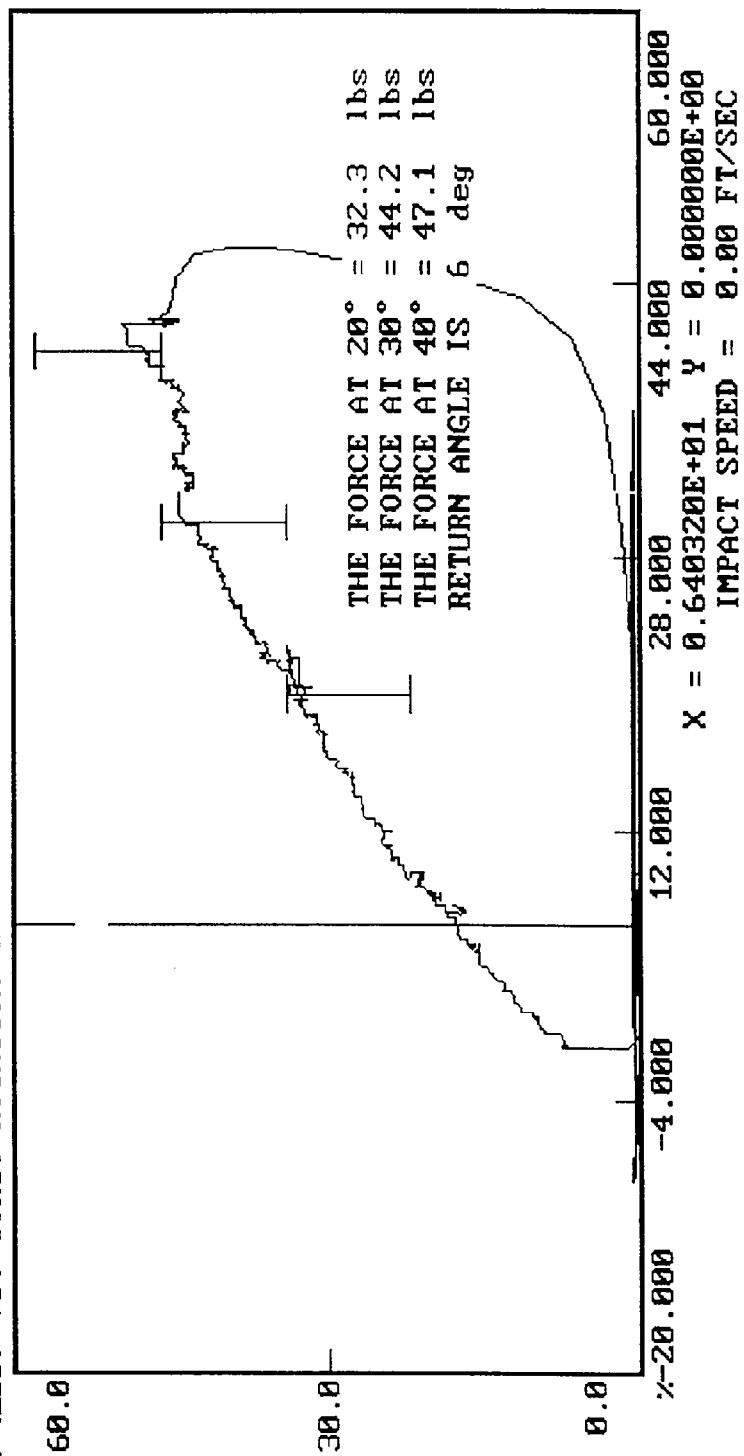


APPROVED BY



10-31-1996 12:28

DUMMY CALIBRATION - LUMBAR FLEXION
DUMMY # 269
FORCE (LBS) VS. TORSO ROTATION (DEGREES)



POST-TEST DRIVER DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Serial Number: 272

Inspected By: Tim Michnay

Date: October 31, 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: 269

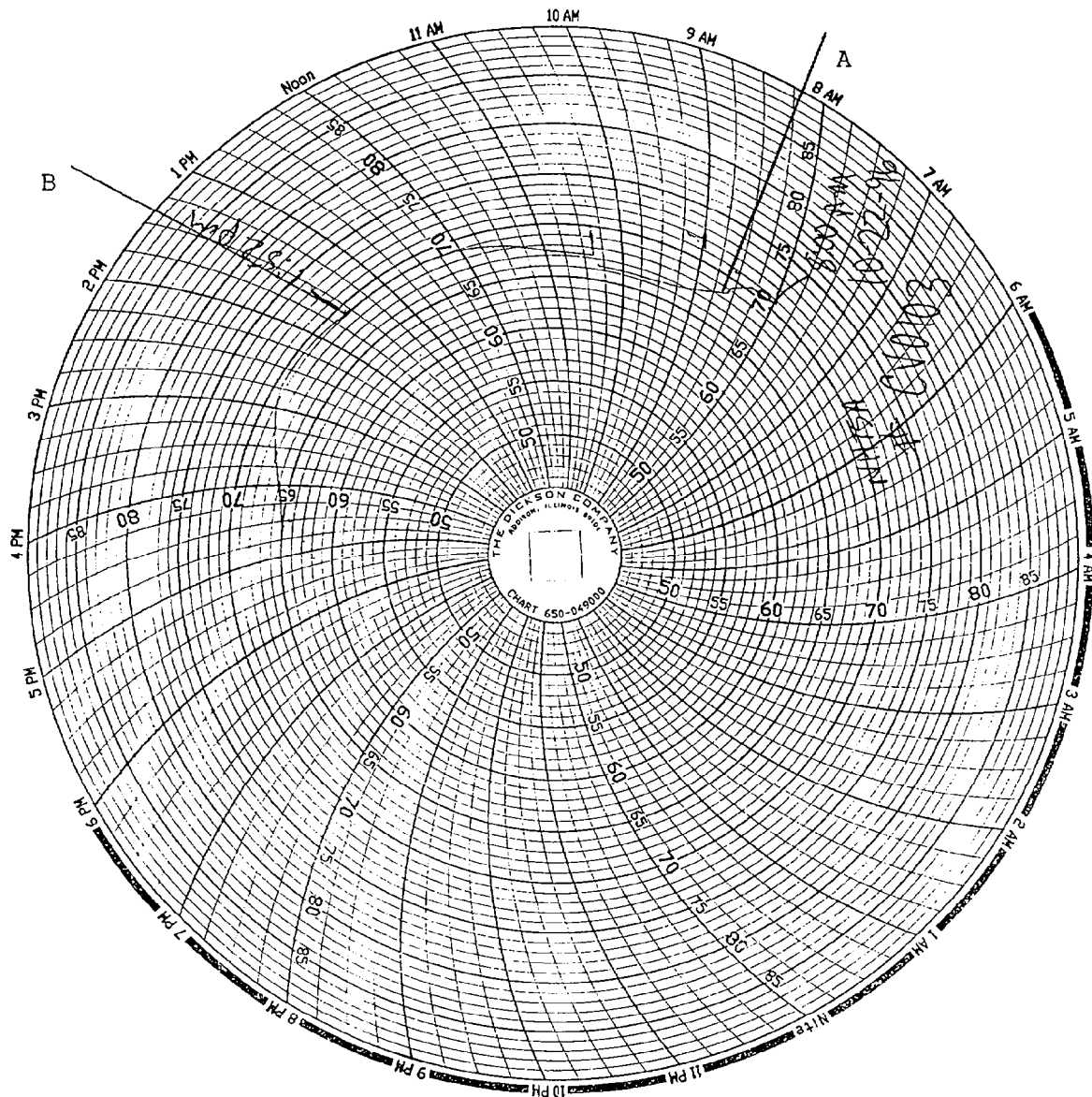
Inspected By: Tim Michnay

Date: October 31, 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. 272

	RIGHT FRONT PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	ALFJ7	Endevco	July 12, 1996
Lower Rib Y	APYN0	Endevco	June 06, 1996
Lower Spine Y	AP062	Endevco	July 12, 1996
Pelvis Y	APY15	Endevco	September 16, 1996
Upper Rib Redundant Y	ALDD6	Endevco	July 12, 1996
Lower Rib Redundant Y	APYN3	Endevco	June 07, 1996
Lower Spine Redundant Y	AP138	Endevco	July 12, 1996
Pelvis Redundant Y	APY16	Endevco	September 16, 1996

INSTRUMENTS FOR RIGHT REAR PASSENGER DUMMY NO. 269

	RIGHT REAR PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	AGTM2	Endevco	September 10, 1996
Lower Rib Y	ALEC1	Endevco	September 16, 1996
Lower Spine Y	AH1G2	Endevco	September 11, 1996
Pelvis Y	ALCN6	Endevco	September 10, 1996
Upper Rib Redundant Y	ABTB5	Endevco	September 10, 1996
Lower Rib Redundant Y	J10411	Endevco	September 16, 1996
Lower Spine Redundant Y	AM751	Endevco	September 11, 1996
Pelvis Redundant Y	AKAF3	Endevco	September 11, 1996

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE AND MDB ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Moving Barrier CG X	D05-R01	Entran	June 03, 1996
Moving Barrier CG Y	D06-A09	Entran	June 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	J23-E04	Entran	June 11, 1996
Right Lower A-Post Y	B14-R16	Entran	July 11, 1996
Right Lower B-Post Y	J23-E09	Entran	July 03, 1996
Rear Floorpan Above Axle X	E13-D07	Entran	July 10, 1996
Rear Floorpan Above Axle Y	C05-Z10	Entran	July 11, 1996
Rear Floorpan Above Axle Z	B02-G16	Entran	June 04, 1996
Right Front Passenger Seat Track Y	J23-E09	Entran	July 03, 1996
Left Side Sill at Front Seat X	D05-R21	Entran	June 04, 1996
Left Side Sill at Front Seat Y	D05-R20	Entran	June 04, 1996
Left Side Sill at Front Seat Z	D05-R19	Entran	June 04, 1996
Left Side Sill at Rear Seat X	B14-R14	Entran	July 11, 1996
Left Side Sill at Rear Seat Y	A09-G04	Entran	July 03, 1996
Left Side Sill at Rear Seat Z	C18-G11	Entran	July 10, 1996
Right Side Sill at Front Seat Y	C27-B05	Entran	October 02, 1996

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE AND MDB ACCELEROMETERS		
	SERIAL NO	MANUFACTURER	CALIBRATION DATE
Right Side Sill at Rear Seat Y	J06-D23	Entran	July 03, 1996
Left Rear Occupant Compartment Y	C06-G04	Entran	October 02, 1996
Vehicle CG X	A09-G06	Entran	July 11, 1996
Vehicle CG Y	L18-E10	Entran	May 10, 1996
Vehicle CG Z	L15-G03	Entran	October 02, 1996

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