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REPORT NO.: 214-MGA-98-03  
SAFETY COMPLIANCE TESTING FOR FMVSS NO. 214  
"SIDE IMPACT PROTECTION -  
PASSENGER CARS"

GENERAL MOTORS CORPORATION  
1998 OLDSMOBILE INTRIGUE 4 DOOR  
NHTSA NO: CW0102

MGA PROVING GROUNDS  
5000 WARREN ROAD  
BURLINGTON, WI 53105



Test Date: September 15, 1997

Report Date: September 25, 1997

FINAL REPORT

Prepared For:

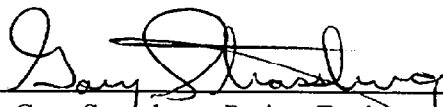
U.S. DEPARTMENT OF TRANSPORTATION  
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION  
ENFORCEMENT  
OFFICE OF VEHICLE SAFETY COMPLIANCE  
400 SEVENTH STREET, SW  
ROOM 6115 (NEF-30)  
WASHINGTON, D.C. 20590

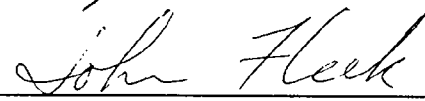
TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. 214-MGA-98-03		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 1998 Oldsmobile Intrigue 4 Door NHTSA No. CW0102				5. Report Date September 25, 1997																			
				6. Performing Organization Code MGA																			
7. Author(s) Gary Strassburg, Project Engineer				8. Performing Organization Report No. MGA-DOT-214-03																			
9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105				10. Work Unit No.																			
				11. Contract or Grant No. DTNH22-97-C-11033																			
12. Sponsoring Agency Name and Address  U.S. Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Compliance 400 Seventh St., S.W., Room 6115 Washington, D.C. 20590				13. Type of Report and Period Covered Final Test Report September 15, to September 25, 1997																			
				14. Sponsoring Agency Code NSA-30																			
15. Supplementary Notes																							
16. Abstract A 48/24 kph 90° Left Side Impact (Moving Deformable Barrier) Compliance Test was conducted on the subject 1998 Oldsmobile Intrigue 4 Door 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 September 15, 1997.  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 23.3°C. The target vehicle post test maximum crush was 378 mm at level 2. The test vehicle's performance follows:																							
<table border="0" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;"></th> <th style="width: 20%; text-align: center;"><u>DRIVER.</u></th> <th style="width: 20%; text-align: center;"><u>LEFT REAR PASS.</u></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib (RUR) Accel., g</td> <td style="text-align: center;">58</td> <td style="text-align: center;">77</td> </tr> <tr> <td>Left Lower Rib (RLR) Accel., g</td> <td style="text-align: center;">52</td> <td style="text-align: center;">75</td> </tr> <tr> <td>Lower Spine (T<sub>12</sub>) Accel., g</td> <td style="text-align: center;">69</td> <td style="text-align: center;">65</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td style="text-align: center;">64</td> <td style="text-align: center;">71</td> </tr> <tr> <td>Pelvis (PEV) Accel., g</td> <td style="text-align: center;">67</td> <td style="text-align: center;">59</td> </tr> </tbody> </table>							<u>DRIVER.</u>	<u>LEFT REAR PASS.</u>	Left Upper Rib (RUR) Accel., g	58	77	Left Lower Rib (RLR) Accel., g	52	75	Lower Spine (T <sub>12</sub> ) Accel., g	69	65	Thoracic Trauma Index (TTI)	64	71	Pelvis (PEV) Accel., g	67	59
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The doors on the struck side of the vehicle did not separate from the body at the hinges or latch and the opposite doors did not open during the side impact event.																							
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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Prepared By:   
Gary Strassburg, Project Engineer

Approved By:   
John Fleck, Facility Director

Approval Date: 10-3-'97

FINAL REPORT ACCEPTED BY (OVSC):

Accepted By:   
Contract Technical Manager

Acceptance Date: 06/30/97

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SECTION 1  
PURPOSE AND TEST PROCEDURE

This side impact test is part of the FY 98 FMVSS 214 Side Impact Protection Compliance Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-97-C-11033. The purpose of this test was to evaluate side impact protection of a 1998 Oldsmobile Intrigue 4 Door.

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 1998 Oldsmobile Intrigue 4 Door was impacted on the left side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 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 September 15, 1997. Pre- and post-test photographs of the test vehicle, the MDB and the side impact dummies (SIDs) are included in Appendix A.

Two Side Impact Dummies (SIDs) were placed in the left front and left rear designated seating positions according to instructions specified in the OVSC Side Impact Laboratory Test Procedure which is dated 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. Left Upper Rib (LUR) uniaxial accelerometer (Y-direction)
2. Left Lower Rib (LLR) uniaxial accelerometer (Y-direction)
3. Lower Thoracic Spine (T<sub>12</sub>) uniaxial accelerometer (Y-direction)
4. Pelvic (PEV) section uniaxial accelerometer (Y-direction)

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

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

Injury Criteria	Front SID	Rear SID
TTI (g)	64	71
Pelvis (g)	67	59

TEST NOTES

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

Left Front Door on Centerline

Midrear of Left Front Door

Left Front Door Upper Centerline

Midrear of Left Rear Door

Left Rear Door Upper Centerline

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: 1998/Oldsmobile/Intrigue/4 Door  
Vehicle NHTSA No.: CW0102 VIN: 1G3WH52K1WF303292  
Vehicle Body Color: Black Build Date: 6/97  
Engine Data: 6 Cylinders;    CID; 3.8 Liter;    cc  
Placement    Longitudinal;   X Lateral  
Transmission: 4 speed;    Manual;   X Automatic;    Overdrive  
Final Drive:    Rear Wheel Drive;   X Frt. Wheel Drive;    Four Wheel Drive  
  
Odometer Reading 23 miles  
Options:   X A/C;   X Pwr. Steering;   X Pwr. Brakes;   X Pwr. Windows;  
  X Cruise Control;   X Tilt Wheel;   X Power Door Locks;   X Traction Control

DATA FROM TIRE PLACARD:

Tire Pressure (at capacity): 30 Psi FRONT  
30 Psi REAR  
Recommended Tire Size: P225/60R16  
Tires on Test Vehicle: P225/60R16 Manufacturer: Goodyear

Vehicle Capacity Data:

Number of Occupants: 2 Front; 3 Rear;    3rd Seat 5 Total  
Type of Front Seats:   X Bucket;    Bench;    Split Bench  
Type of Front Seat Back:    Fixed;   X Adjustable with   X Lever    Knob    Power  
Vehicle Maximum Capacity Loading = 416.0 kg (A)  
No. of Occupants x 68.04 kg. = 340.2 kg (B)  
Cargo Capacity (A-B) = 75.8 kg

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

WEIGHT OF TEST VEHICLE WITH MAXIMUM FLUIDS:(AS DELIVERED)

Right Front = 505.3 kg

Right Rear = 288.5 kg

Left Front = 499.4 kg

Left Rear = 281.7 kg

TOTAL FRONT = 1004.7 kg

TOTAL REAR = 570.2 kg

% of Total Vehicle Weight = 63.8 %;

% of Total Weight = 36.2 %

TOTAL WEIGHT = 1574.9 kg

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Year/Make/Model/Body Style: 1998/Oldsmobile/Intrigue/4 Door

Vehicle NHTSA No.: CW0102 Test Date: September 15, 1997

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Test Vehicle Delivered Weight with Maximum Fluids	= <u>1574.9</u> kg
Cargo Carrying Capacity of Test Vehicle	= <u>75.8</u> kg
Weight of 2 Side Impact Dummies (2 x <u>80.7</u> kg.)	= <u>161.4</u> kg
TEST VEHICLE TARGET WEIGHT	= <u>1812.1</u> kg

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

Right Front	= <u>509.4</u> kg	Right Rear	= <u>362.0</u> kg
Left Front	= <u>553.4</u> kg	Left Rear	= <u>386.9</u> kg
TOTAL FRONT	= <u>1062.8</u> kg	TOTAL REAR	= <u>748.9</u> kg
% of Total Weight	= <u>58.7</u> %	% of Total Weight	= <u>61.3</u> %
TOTAL TEST WEIGHT	= <u>1811.7</u> kg		

TEST VEHICLE ATTITUDE:

CURB WEIGHT ATTITUDE:

Right Front 710 mm Left Front 713 mm Right Rear 720 mm Left Rear 721 mm

FULLY LOADED WEIGHT ATTITUDE:

Right Front 706 mm Left Front 699 mm Right Rear 689 mm Left Rear 680 mm

TEST ATTITUDE:

Right Front 697 mm Left Front 703 mm Right Rear 687 mm Left Rear 681 mm

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Test Vehicle Wheelbase: 2775 mm

C.G. As Tested = 1128 mm rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

Right Side = 4570 mm

Centerline = 4949 mm

Left Side = 4570 mm

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Year/Make/Model/Body Style: 1998/Oldsmobile/Intrigue/4 Door

Vehicle NHTSA No.: CW0102 Test Date: September 15, 1997

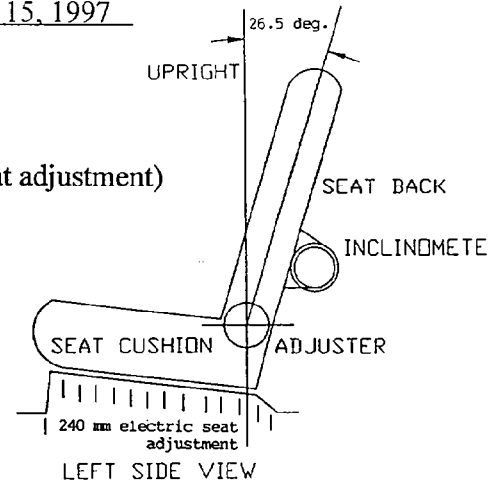
FRONT SEAT CUSHION PLACEMENT:

Total Length of Adjustment Travel: 240 mm (electric seat adjustment)

Test Position: set 120 mm rearward from full forward

FRONT SEAT BACK ADJUSTMENT POSITION:

Seat Back Angle = 26.5°



REAR POSITION SEAT:

Total Length of Fore/Aft Adjustment Travel: Non-Adjustable

Seat Back Adjustment Position: Non-Adjustable

ADJUSTABLE STEERING COLUMN POSITION: Mid

WINDOW POSITIONS: Left Front Closed Left Rear Closed

Right Front Open Right Rear Open

AMOUNT OF STODDARD SOLVENT IN FUEL TANK:

Fuel system usable capacity = 68 liters

Test Volume: 62.8 liters 92.4 % of capacity

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

Wheelbase: = 2775 mm

Impact Point is 448 mm rearward of front axle centerline

DATA SHEET NO. 2  
TEST VEHICLE SUMMARY OF RESULTS

Year/Make/Model/Body Style: 1998/Oldsmobile/Intrigue/4 Door  
Vehicle NHTSA No.: CW0102 Test Date: September 15, 1997  
Overall Length = 4949 mm; Overall Width = 1814 mm

TEST WEIGHT:

Right Front = 517.6 kg      Right Rear = 362.4 kg  
Left Front = 553.8 kg      Left Rear = 371.5 kg  
TOTAL FRONT = 1071.4 kg    TOTAL REAR = 733.9 kg  
% of Total Weight = 59.3 %    % of Total Weight = 60.7 %  
TOTAL VEHICLE WEIGHT = 1805.3 kg  
Wheelbase = 2775 mm  
Longitudinal C.G. from Center of Front Axle = 1128 mm  
Impact Angle with Respect to Impactor = 90° degrees

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1\* ( 267 mm above ground) = 238 mm
  2. LEVEL 2 ( 479 mm above ground) = 378 mm
  3. LEVEL 3 ( 574 mm above ground) = 338 mm
  4. LEVEL 4 ( 907 mm above ground) = 256 mm
  5. LEVEL 5 ( 1360 mm above ground) = 92 mm
- Maximum Post-Test Intrusion = 378 mm

OCCUPANTS:

	<u>Left Front Passenger</u>	<u>Left Rear Passenger</u>
Type of Dummy	<u>SID</u>	<u>SID</u>
Restraints Used	<u>type II belt</u> <u>with frontal airbag</u>	<u>type II belt</u>

TEST VEHICLE SUMMARY OF RESULTS (Cont'd)

INSTRUMENTATION:

Number of Vehicle Data Channels: = 20

Number of Cameras: Onboard Vehicle = 3

Offboard Vehicle = 4

Deformable Barrier = 2

TOTAL = 9

DATA SHEET NO. 3

MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS

Year/Make/Model/Body Style: 1998/Oldsmobile/Intrigue/4 Door

Vehicle NHTSA No.: CW0102 Test Date: September 15, 1997

POSITION OF IMPACT (MDB) ON MONORAIL:

Crabbed 27° to left

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>1105 mm</u>
C.G. Location From Center Line	= <u>-12 mm</u>
C.G. Location Above Ground Level	= <u>484 mm</u>

MDB WEIGHT:

Left Front	= <u>440.1 kg</u>	Left Rear	= <u>246.6 kg</u>
Right Front	= <u>338.2 kg</u>	Right Rear	= <u>331.9 kg</u>
TOTAL FRONT	= <u>778.3 kg</u>	TOTAL REAR	= <u>578.5 kg</u>
TOTAL MDB WEIGHT = <u>1356.8 kg</u>			

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

Impact Speed = Primary: 32.91 mph (53.0 kph) Secondary: 32.98 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>146</u> | mm |
| 2. | Row B Mid Stack (686 mm)        | = | <u>79</u>  | mm |
| 3. | Row C Top of Bumper (533 mm)    | = | <u>65</u>  | mm |
| 4. | Row D Center of Bumper (432 mm) | = | <u>89</u>  | mm |

INSTRUMENTATION:

Number of MDB Data Channels = 5

DATA SHEET NO. 4  
POST-TEST OBSERVATIONS

Year/Make/Model/Body Style: 1998/Oldsmobile/Intrigue/4 Door

Vehicle NHTSA No.: CW0102 Test Date: September 15, 1997

VISIBLE DUMMY CONTACT POINTS:

	<u>LEFT FRONT SID</u>	<u>LEFT REAR SID</u>
Head	<u>to door &amp; headrest</u>	<u>to C Post, &amp; header</u>
Arm	<u>to B-Post &amp; door</u>	<u>to door panel</u>
Pelvis	<u>to door</u>	<u>to door panel</u>
Left Knee	<u>to door</u>	<u>to door panel</u>
Right Knee	<u>to left knee</u>	<u>to left knee</u>

DOOR OPENING:

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

MDB DISTANCE FROM TARGET IMPACT POINT:

Horizontal: 4 mm forward      Vertical: 2 mm high

ARM REST LOCATIONS:

Front: 244 mm from bottom of window

Rear: 276 mm from bottom of window

POST-TEST OBSERVATIONS (Cont'd)

SEAT CRUSH:

Front Seat Back: 124 mm Front Seat Cushion: 95 mm

Left Rear Seat Back: 168 mm Rear Seat Cushion: 164 mm

GLAZING DAMAGE:

Windshield cracked, left side window broken

PILLAR PERFORMANCE:

No separation noted

SILL SEPARATION:

None noted

OTHER NOTABLE IMPACT EFFECTS:

Airbags did not deploy

SECTION 4  
OCCUPANT AND VEHICLE INFORMATION

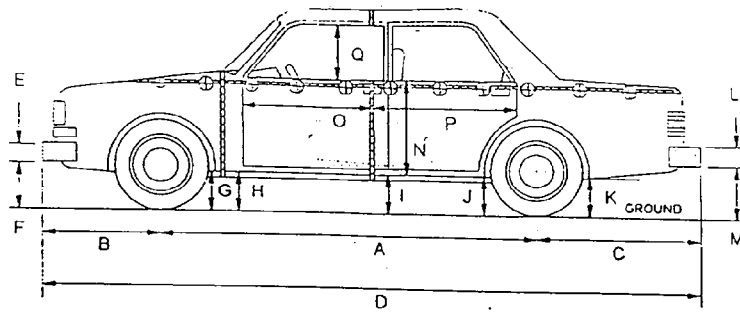
DATA SHEET NO. 5  
 SIDE IMPACT DUMMY (SID) INSTRUMENTATION DATA

Year/Make/Model/Body Style: 1998/Oldsmobile/Intrigue/4 Door  
 Vehicle NHTSA No.: CW0102 Test Date: September 15, 1997

	Front SID ID #048			Rear SID ID #049		
	Pos. Direct.		Neg. Direct	Pos. Direct.		Neg. Direct
	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)
<b>RIB ACCELERATIONS</b>						
Left Upper Rib (LUR) Y	57.9	41	-27.4	82	77.2	46
Left Lower Rib (LLR) Y	52.2	39	-16.8	81	74.7	46
<b>SPINE ACCELERATIONS</b>						
Lower Lateral Y	69.1	35	-18.1	100	64.9	49
<b>PELVIS ACCELERATIONS</b>						
Lateral Y	67.0	37	-18.0	89	58.5	39

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

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



LEFT SIDE VIEW

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

J1 = To Pinch Weld  
J2 = To Sill

ALL MEASUREMENTS IN (mm)

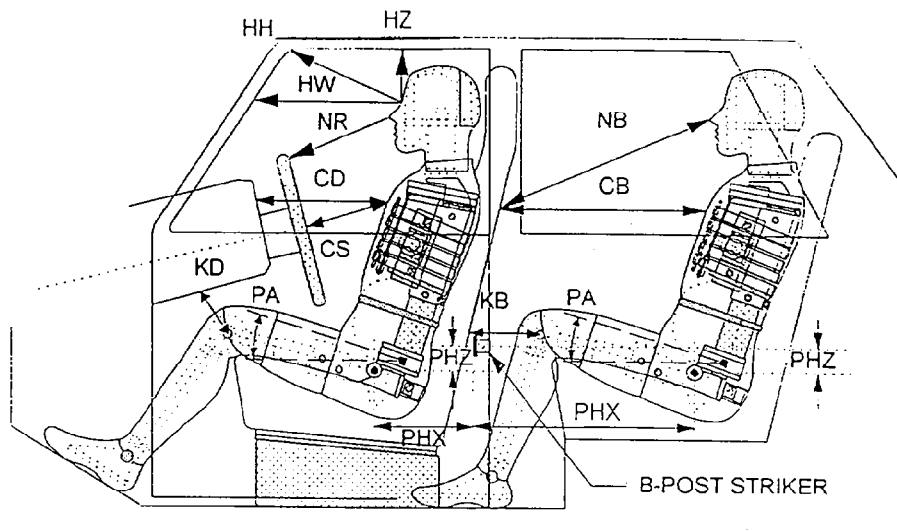
	PRE-TEST	POST-TEST	Δ CHANGE
A	2775	2732	43
B	1066	1063	3
C	1108	1105	3
D	4949	4900	49
E	195	196	-1
F	338	369	-31
G	179	182	-3
H	174	194	-20
I	172	183	-11
J1/J2	163/159	164/166	-1/-7
K	238	254	-16
L	190	187	3
M	416	435	-19
N	673	649	24
O	823	794	29
P	1184	1100	84
Q	461	450	11
R	4570	4568	2
S	4570	4515	55
T	1814	1476	338

DATA SHEET NO. 7

SIDE IMPACT DUMMY (SID) LONGITUDINAL CLEARANCE DIMENSIONS

Year/Make/Model/Body Style: 1998/Oldsmobile/Intrigue/4 Door

NHTSA NO.: CW0102 Test Date: September 15, 1997



NOTE: All dimensions are in mm with tolerance of  $\pm 3$  mm

	FRONT PASSENGER ID #048	REAR PASSENGER SID ID #049	
HH	406	HZ	142
HW	665	NB	575
HZ	173	CB	480
NR	462	KBL (KBA)	180 (8.0°)
CD	565	KBR (KBA)	180 (8.8°)
KDL(KDA°)	210 (0°)	PA°	24.6°
KDR(KDA°)	240 (0°)	PHX*	280
PA°	24.3°	PHZ*	304
PHX	156		
PHZ	98		

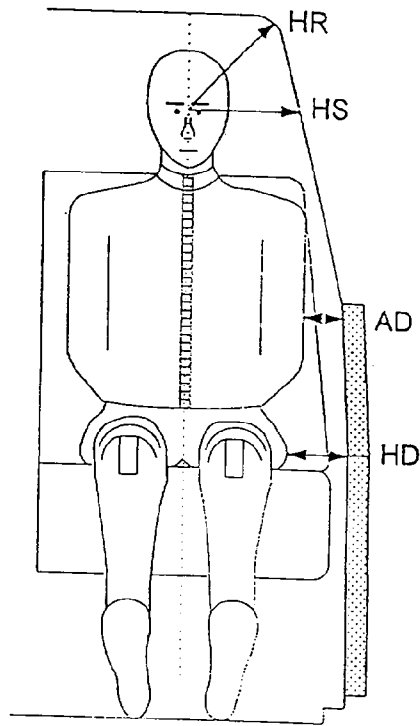
NOTE: 2-door vehicle shown. Rear dummy PHX & PHZ measurements for 4-door vehicle would use the C-post striker as reference point.

\* Measured from rear striker

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

Year/Make/Model/Body Style: 1998/Oldsmobile/Intrigue/4 Door

NHTSA NO.: CW0102 Test Date: September 15, 1997



NOTE: All dimensions are in mm

	FRONT PASSENGER ID #048	REAR PASSENGER ID #049
HR	204	197
HS	322	328
AD	129	124
HD	168	164

DATA SHEET NO. 9  
DUMMY POSITIONING - DRIVER

Driver H-Point

HP to Floor Z = 138

HP to Hinge X = 844

HP to Sill Y = 187

HP to Striker X = 327

HP to Dash X = 576

HP to Header Z = 764

Driver Dummy Position

HP to Floor Z = 134

HP to Hinge X = 846

HP to Sill Y = 191

HP to Striker X = 331

HP to Dash X = 575

HP to Header Z = 766

Pelvis Angle = 24.3°

H-Point Machine

Left Knee = 125°

Right Knee = 125°

Left Foot = 91°

Right Foot = 94°

Left Leg = 205°

Right Leg = 145°

Hip Angle = 99°

Back Angle = 26°

DATA SHEET NO. 9 (Cont'd)  
DUMMY POSITIONING - LEFT REAR PASSENGER

Driver H-Point

HP to Floor Z = 168  
HP to Hinge X = 675  
HP to Sill Y = 205  
HP to Striker X = 526  
HP to Dash X = 608  
HP to Header Z = 749

Driver Dummy Position

HP to Floor Z = 154  
HP to Hinge X = 782  
HP to Sill Y = 210  
HP to Striker X = 530  
HP to Dash X = 611  
HP to Header Z = 762  
Pelvis Angle = 24.6°

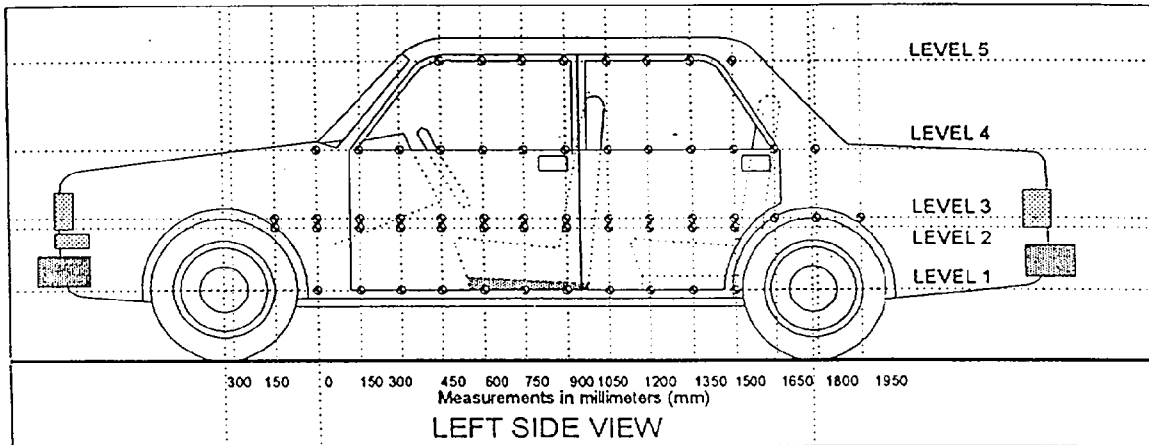
H-Point Machine

Left Knee = 117°  
Right Knee = 117°  
Left Foot = 130°  
Right Foot = 130°  
Left Leg = 90°  
Right Leg = 90°  
Hip Angle = 102°  
Back Angle = 28°

DATA SHEET NO. 10  
VEHICLE SIDE MEASUREMENTS

Year/Make/Model/Body Style: 1998/Oldsmobile/Intrigue/4 Door

NHTSA NO.: CW0102 Test Date: September 15, 1997



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

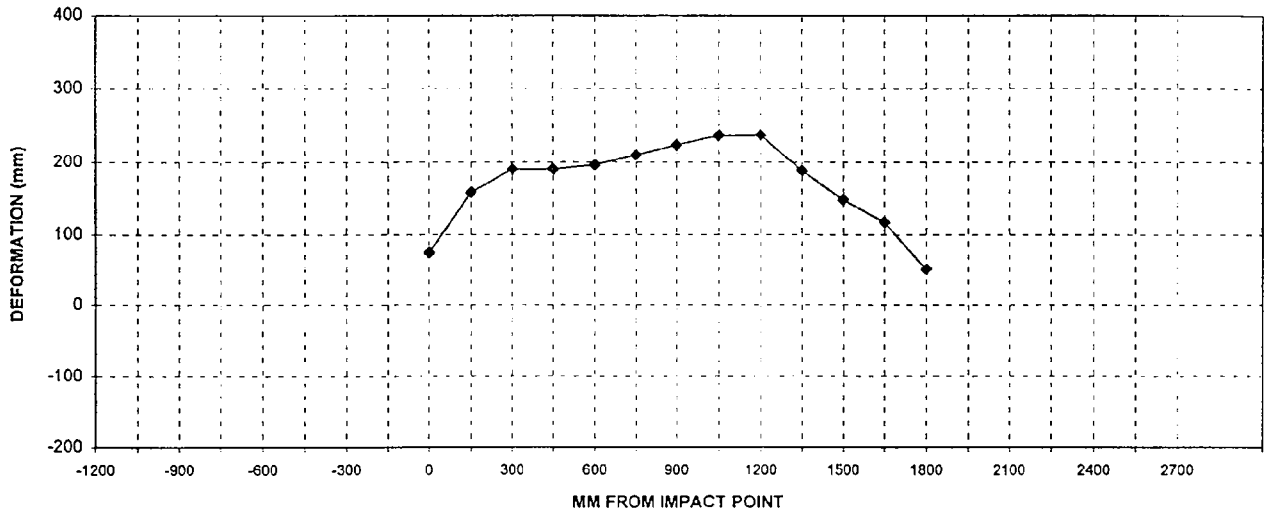
Level 1 @ Axle Centerline Height	
(or Sill Top Height)	= <u>267</u> mm
Level 2 @ Occupant H-Point	= <u>479</u> mm
Level 3 @ Mid Door	= <u>574</u> mm
Level 4 @ Window Sill	= <u>907</u> mm
Level 5 @ Window Top	= <u>1360</u> mm

DATA SHEET NO. 11  
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)	725	800	75
150	728	886	158
300	728	918	190
450	732	922	190
600	736	932	196
750	734	944	210
900	732	956	224
1050	730	967	237
1200	727	965	238
1350	724	912	188
1500	724	872	148
1650	723	840	117
1800	722	773	51
1950			
2100			
2250			
2400			
2550			
2700			
2850			

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

VEHICLE EXTERIOR STATIC CRUSH (Cont'd)



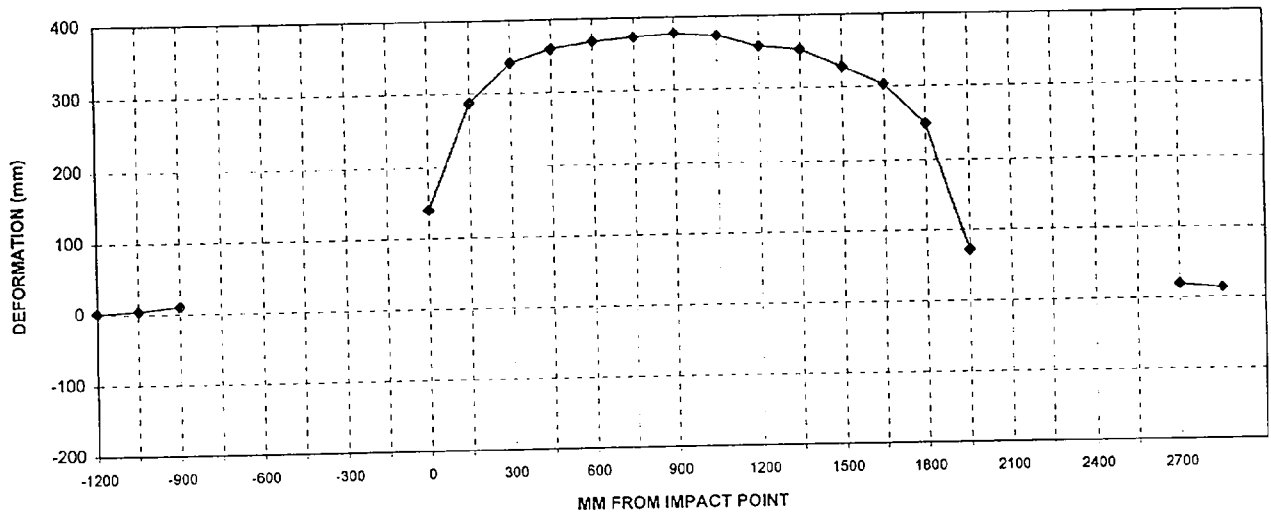
LEVEL 1 - AXLE CENTERLINE

DATA SHEET NO. 11 (Cont'd)  
VEHICLE EXTERIOR CRUSH PROFILES

Longitudinal Distance (mm)	Level 2 - Occupant H Point		
	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1200	752	758	1
-1050	704	708	4
-900	675	685	10
-750			
-600			
-450			
-300			
-150			
0 (impact point)	652	793	141
150	654	941	287
300	656	997	341
450	657	1016	359
600	657	1025	368
750	657	1030	373
900	657	1035	378
1050	657	1031	374
1200	658	1015	357
1350	660	1012	352
1500	660	988	328
1650	659	962	303
1800	656	905	249
1950	650	722	72
2100			
2250			
2400			
2550			
2700	649	669	20
2850	677	691	14

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

VEHICLE EXTERIOR STATIC CRUSH (Cont'd)



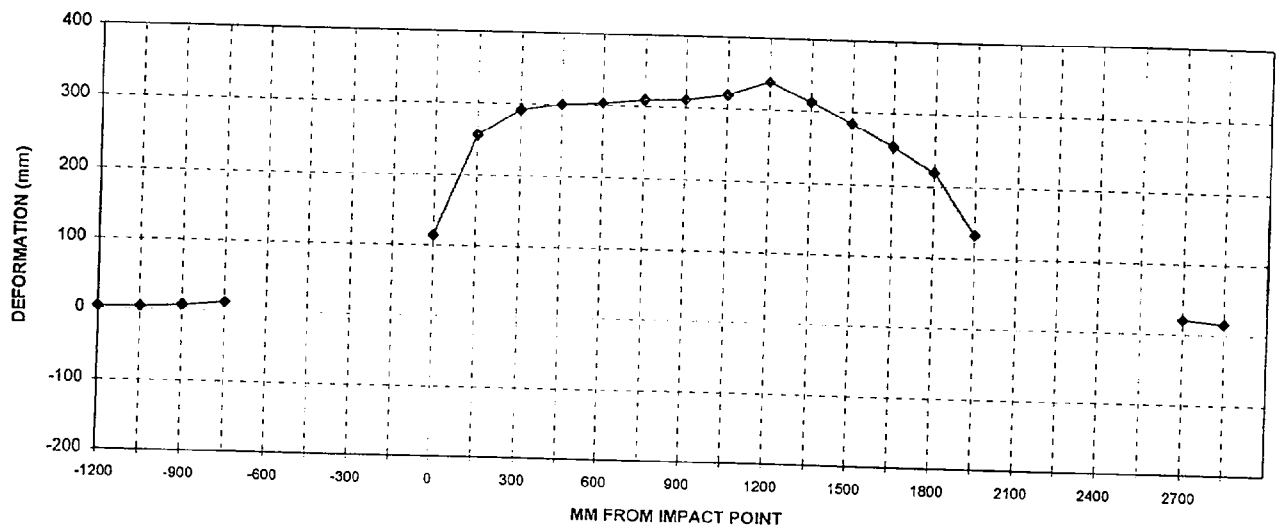
LEVEL 2 - OCCUPANT H-POINT

DATA SHEET NO. 11 (Cont'd)  
VEHICLE EXTERIOR CRUSH PROFILES

Longitudinal Distance (mm)	Level 3 - Mid Door		
	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1200	738	741	3
-1050	693	697	4
-900	662	669	7
-750	640	652	12
-600			
-450			
-300			
-150			
0 (impact point)	644	758	114
150	648	904	256
300	651	942	291
450	652	952	300
600	653	956	303
750	653	962	309
900	653	964	311
1050	654	973	319
1200	654	992	338
1350	654	966	312
1500	653	937	284
1650	649	903	254
1800	642	862	220
1950	638	771	133
2100			
2250			
2400			
2550			
2700	642	662	20
2850	667	682	15

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

VEHICLE EXTERIOR STATIC CRUSH (Cont'd)



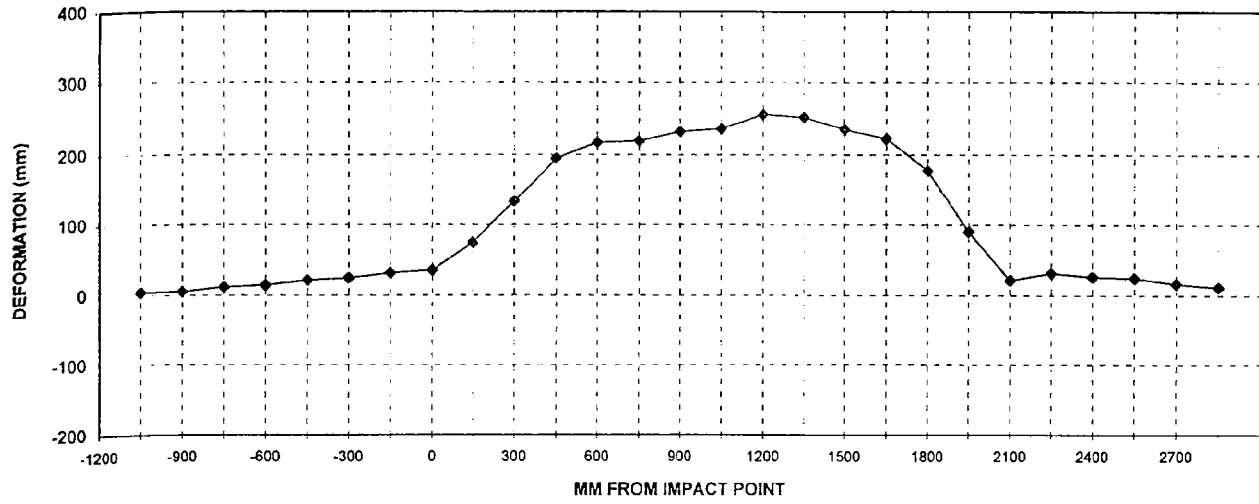
LEVEL 3 - MID DOOR

DATA SHEET NO. 11 (Cont'd)  
VEHICLE EXTERIOR CRUSH PROFILES

Longitudinal Distance (mm)	Level 4 - Window Sill		
	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1200			
-1050	802	806	4
-900	778	783	5
-750	754	765	11
-600	741	755	14
-450	731	752	21
-300	729	753	24
-150	723	754	31
0 (impact point)	720	755	35
150	718	792	74
300	716	849	133
450	713	908	195
600	713	930	217
750	712	931	219
900	712	935	223
1050	711	947	236
1200	710	966	256
1350	710	962	252
1500	712	947	235
1650	712	934	222
1800	712	890	178
1950	712	802	90
2100	716	737	21
2250	720	751	31
2400	726	752	26
2550	730	754	24
2700	743	759	16
2850	755	766	11

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

VEHICLE EXTERIOR STATIC CRUSH (Cont'd)



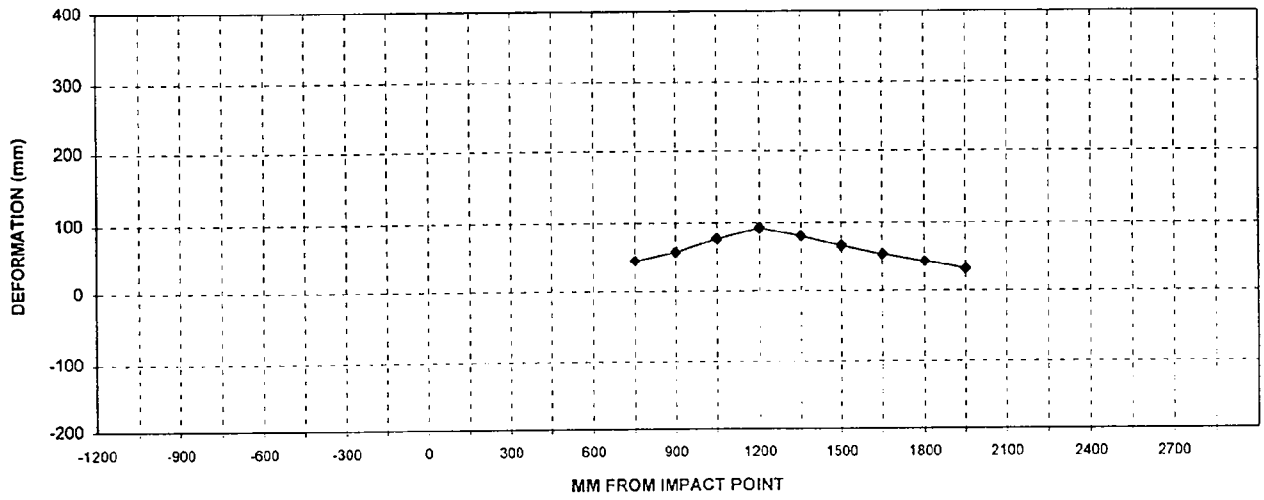
LEVEL 4 - WINDOW SILL

DATA SHEET NO. 11 (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	991	1036	45
900	987	1045	58
1050	986	1063	77
1200	985	1077	92
1350	987	1068	81
1500	987	1054	67
1650	987	1041	54
1800	990	1033	43
1950	997	1029	32
2100			
2250			
2400			
2550			
2700			
2850			

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

VEHICLE EXTERIOR STATIC CRUSH (Cont'd)

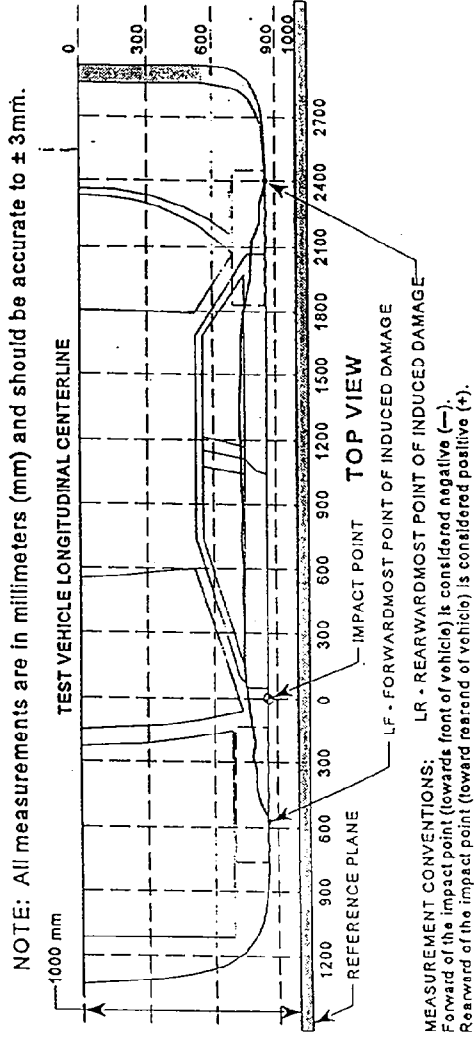


LEVEL 5 - WINDOW TOP

DATA SHEET NO. 12  
VEHICLE DAMAGE PROFILE DISTANCES

Year/Make/Model/Body Style: 1998/Oldsmobile/Intrigue/4 Door

NHTSA NO.: CW0102 Test Date: September 15, 1997



DPD MEASUREMENTS	POST-TEST (mm)	PRE-TEST (mm)	STATIC CRUSH (mm)
1. (LF = -1350 mm)	818	818	0
2. -480 mm	747	736	11
3. 410 mm	1010	657	353
4. 1260 mm	922	659	263
5. 2250 mm	748	723	25
6. (LR = 3150 mm)	738	738	0

DATA SHEET NO. 13

EXTERIOR STATIC CRUSH FOR SIDE IMPACTOR

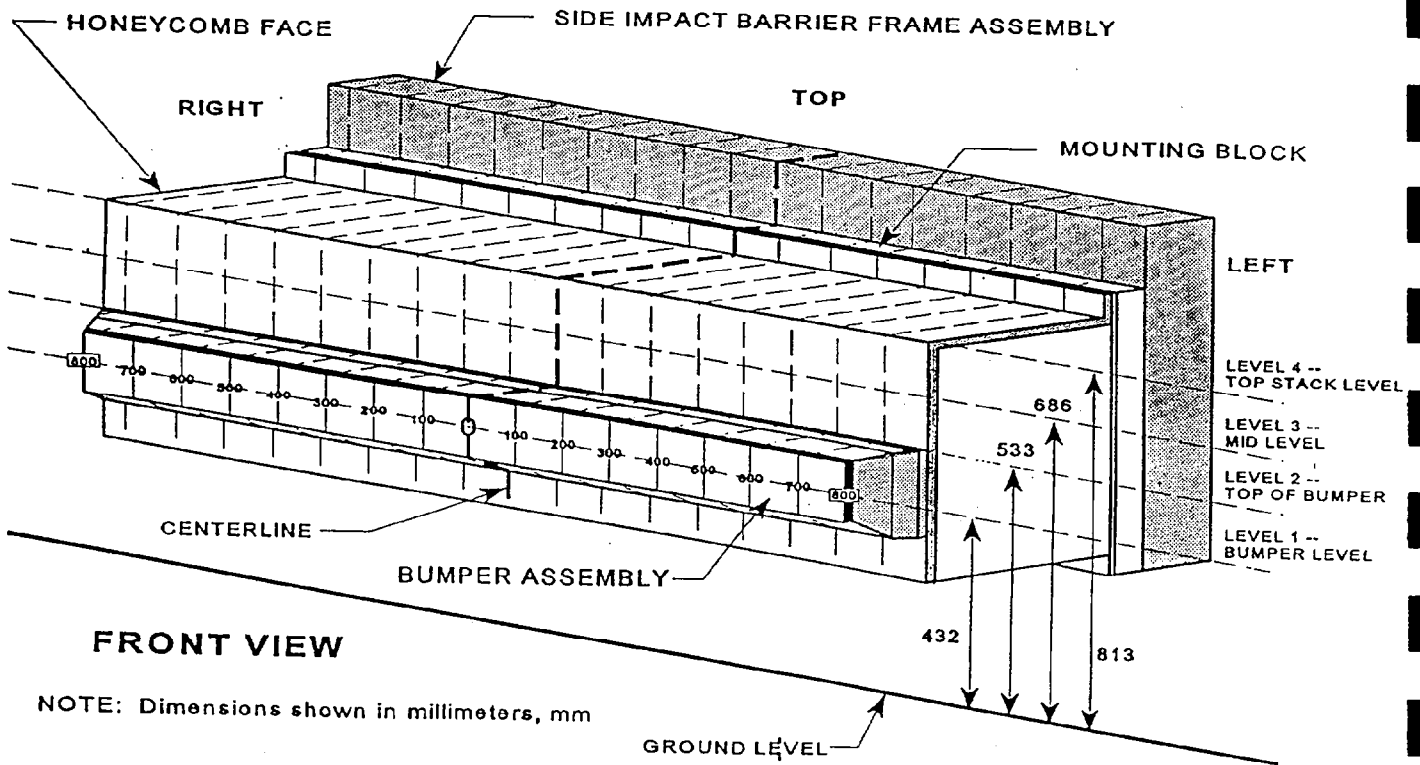
Year/Make/Model/Body Style: 1998/Oldsobile/Intrigue/4 Door

Vehicle NHTSA No.: CW0102 Test Date: September 15, 1997

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	61	15	3	1	1	0	2	3	3	3	3	3	5	6	7	51	99	146
Mid Level Level 3	686 mm	53	20	1	0	0	0	0	1	0	0	0	0	1	1	1	3	32	79
Top Bumper Level 2	533 mm	65	40	27	19	10	2	2	5	3	4	4	6	5	7	9	18	33	
Mid Bumper Level 1	432 mm	89	74	55	35	22	21	12	9	11	12	12	12	14	14	22	40	66	

See next page for Barrier Face Graphic

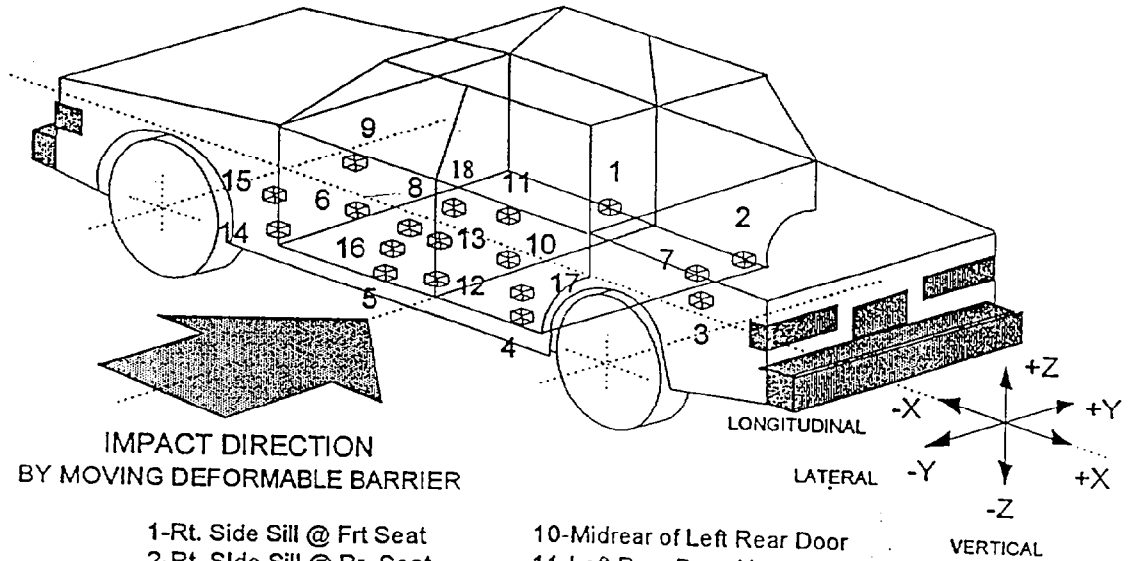
DATA SHEET NO. 13 (Cont'd)



DATA SHEET 14  
TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1998/Oldsmobile/Intrigue/4 Door

Vehicle NHTSA No.: CW0102 Test Date: September 15, 1997



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

DATA SHEET NO. 14 (Cont'd)

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1998/Oldsmobile/Intrigue/4 Door  
 Vehicle NHTSA No.: CW0102 Test Date: September 15, 1997

Acce I. No.	Description	Coordinates (mm)*			Long. (X) Maximums (g's)		Lat. (Y) Maximums (g's)		Vert. (Z) Maximums (g's)		Resultant (g's)
		X	Y	Z	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	
1	Right Side Sill @ Front Seat	2350	727	206	5.1	-1.8	17.2	-3.8	2.9	-5.4	17.4
2	Right Side Sill @ Rear Seat	1531	720	210	3.7	-3.6	18.3	-9.0	6.0	-5.1	18.4
3	Rear Floorpan Above Axle	1146	0	532	4.4	-6.7	15.4	-2.1	4.2	-5.7	16.5
4	Left Side Sill @ Rear Seat	1529	-727	207	---	---	45.8	-20.5	---	---	---
5	Left Side Sill @ Front Seat	2280	-720	212	---	---	107.1	-29.1	---	---	---
7	Right Rear Occupant Compartment	1963	390	337	---	---	15.7	-4.1	---	---	---
12	Left Mid B-Post	2229	-700	1075			130.0	-46.9			
13	Left Lower B-Post	2274	-717	800			**	**			
14	Left Lower A-Post	3282	-655	347			89.9	-22.1			
15	Left Mid A-Post	3330	-788	898			20.5	-1.1			
16	Driver Seat Track	2403	-605	275			50.3	-16.1			
18	Vehicle CG	2773	10	400	*	*	*	*	*	*	*

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

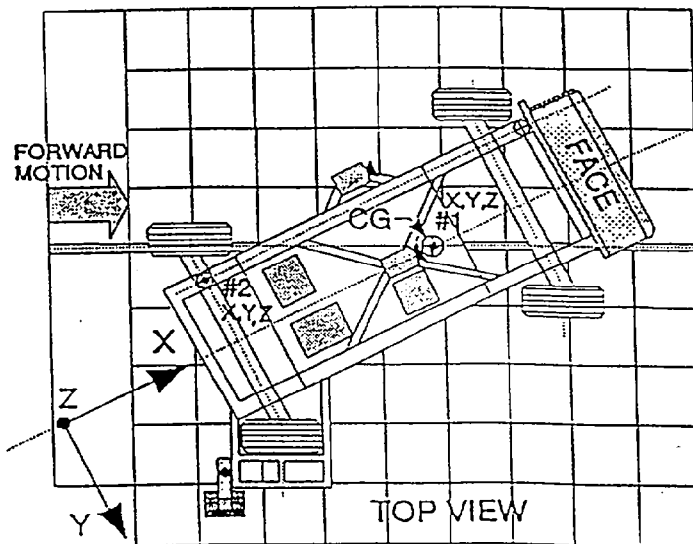
\* Data not valid after 20 msec.  
 \*\* Data not valid after 30 msec.

DATA SHEET NO. 15

MOVING DEFORMABLE BARRIER (MDB) ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1998/Oldsmobile/Intrigue/4 Door

Vehicle NHTSA No.: CW0102 Test Date: September 15, 1997

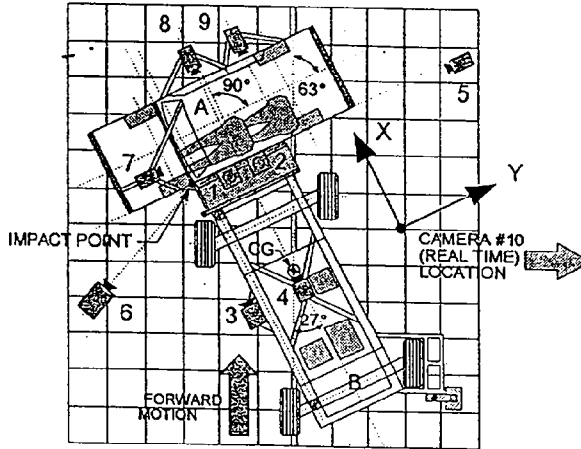


Accel. No.	Description	Coordinates (mm)*			(+ Positive)		(- Negative)	
		X	Y	Z	Max. (g)	Time (msec)	Max. (g)	Time (msec)
1	MDB Center of Gravity	1105	-12	484				
	Longitudinal (X)	---	---	---	1.2	158	-15.4	37
	Lateral (Y)	---	---	---	4.2	60	-6.3	34
	Vertical (Z)	---	---	---	8.0	61	-12.2	27
	Resultant (R)	---	---	---	18.6	27	---	---
2	Rear Frame Member	-2591	-625	622				
	Longitudinal (X)	---	---	---	1.8	165	-18.9	36
	Lateral (Y)	---	---	---	3.3	28	-1.6	72

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

DATA SHEET NO. 16  
HIGH SPEED CAMERA LOCATIONS AND DATA

Year/Make/Model/Body Style: 1998/Oldsmobile/Intrigue/4 Door  
 Vehicle NHTSA No.: CW0102 Test Date: September 15, 1997



Camera No.	View	Coordinates (mm)*			Angle	Lens (mm)	Film Speed (fps)
		X	Y	Z			
	Real Time					13	24
6	Left Impact	-550	-2560	1640		13	1000
7	Onboard Hood					13	1005
8	Onboard Front Occupant					8	913
9	Onboard Rear Occupant					8	1053
5	Right Impact	-260	10580	1650		25	1020
2	Top Overall	30	1350	5000		8	1047
1	Top Impact	-280	0	5000		13	1036
4	Cart Overall					13	909
3	Cart Impact					35	1010

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

DATA SHEET 17  
FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

Vehicle Year/Make/Model/Body Style: 1998/Oldsmobile/Intrigue/4 Door

Vehicle NHTSA No.: CW0102 Test Date: September 15, 1997

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 Left 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

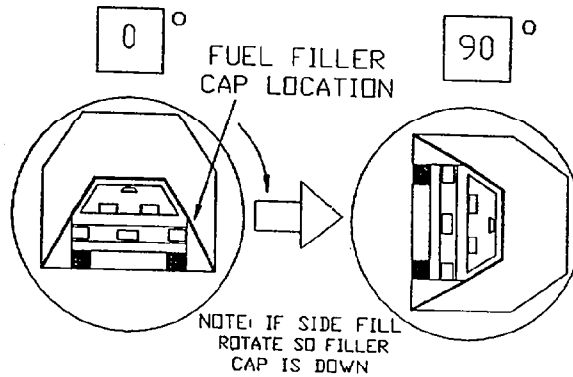
DATA SHEET 17

FMVSS 301 STATIC ROLLOVER TEST DATA

Vehicle Year/Make/Model/Body Style: 1998/Oldsmobile/Intrigue/4 Door

Vehicle NHTSA No.: CW0102 Test Date: September 15, 1997

TEST PHASE: 0° - 90°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 54 seconds  
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 54 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

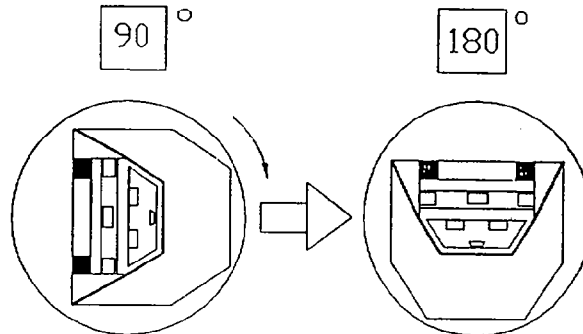
DATA SHEET 17

FMVSS 301 STATIC ROLLOVER TEST DATA (Cont'd)

Vehicle Year/Make/Model/Body Style: 1998/Oldsmobile/Intrigue/4 Door

Vehicle NHTSA No.: CW0102 Test Date: September 15, 1997

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

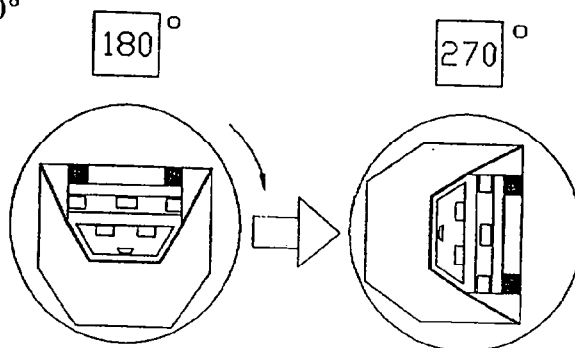
DATA SHEET 17

FMVSS 301 STATIC ROLLOVER TEST DATA (Cont'd)

Vehicle Year/Make/Model/Body Style: 1998/Oldsmobile/Intrigue/4 Door

Vehicle NHTSA No.: CW0102 Test Date: September 15, 1997

TEST PHASE: 180° - 270°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 16 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 16 seconds

Next Whole Minute Interval = 8 minutes

FUEL SPILLAGE MEASUREMENT:

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

FUEL SPILLAGE LOCATIONS(S): None

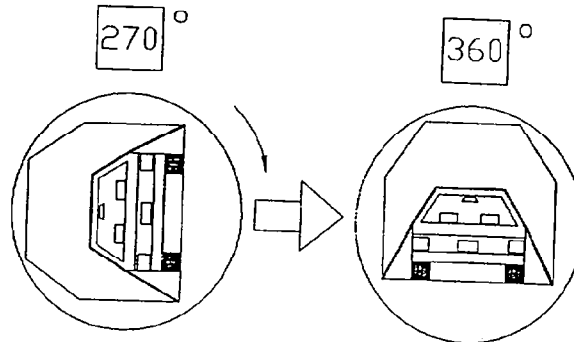
DATA SHEET 17

FMVSS 301 STATIC ROLLOVER TEST DATA

Vehicle Year/Make/Model/Body Style: 1998/Oldsmobile/Intrigue/4 Door

Vehicle NHTSA No.: CW0102 Test Date: September 15, 1997

TEST PHASE: 270° - 360°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 39 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 39 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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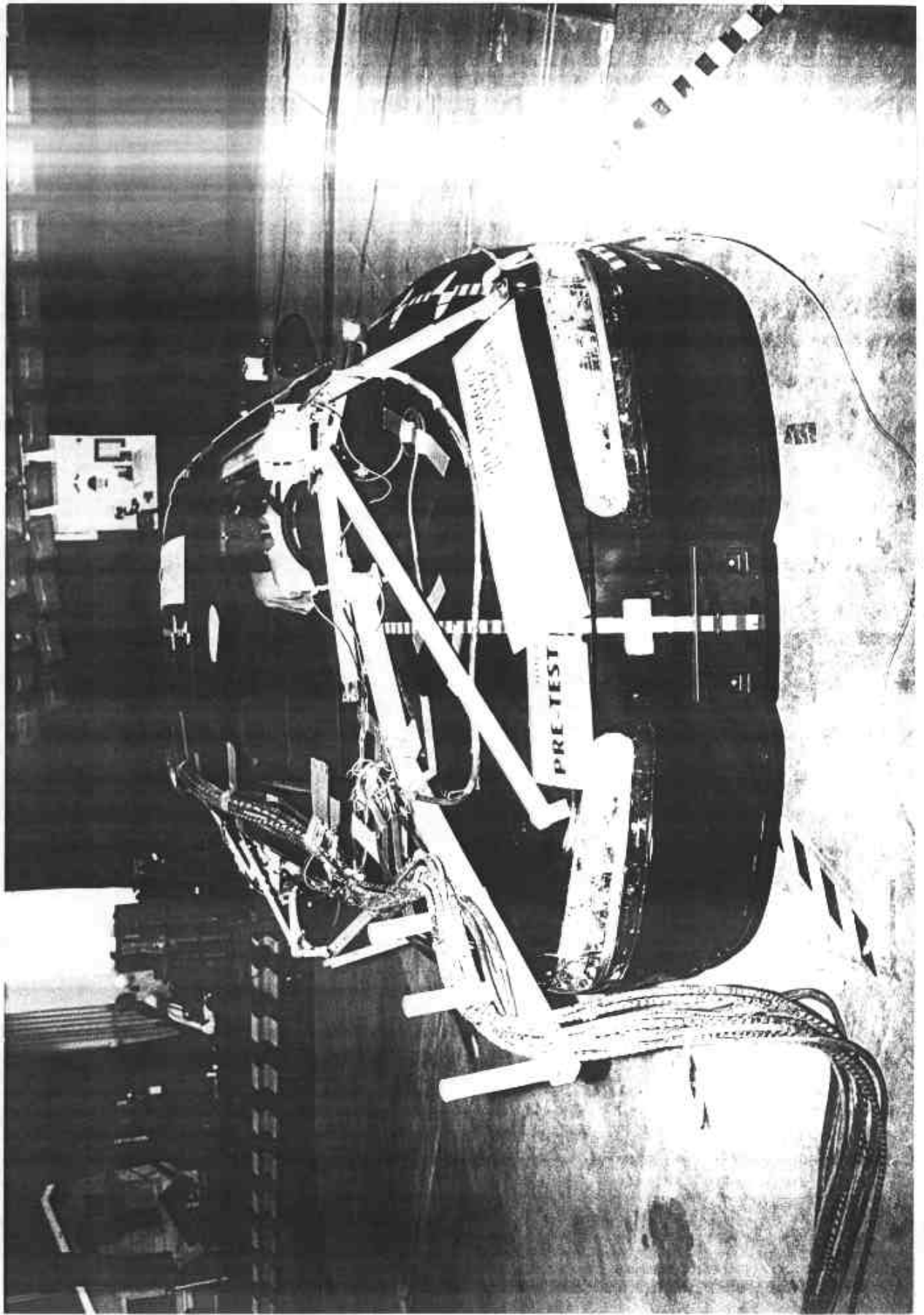


Photo No. A-1 - Pre-Test Front View of Test Vehicle

A-1

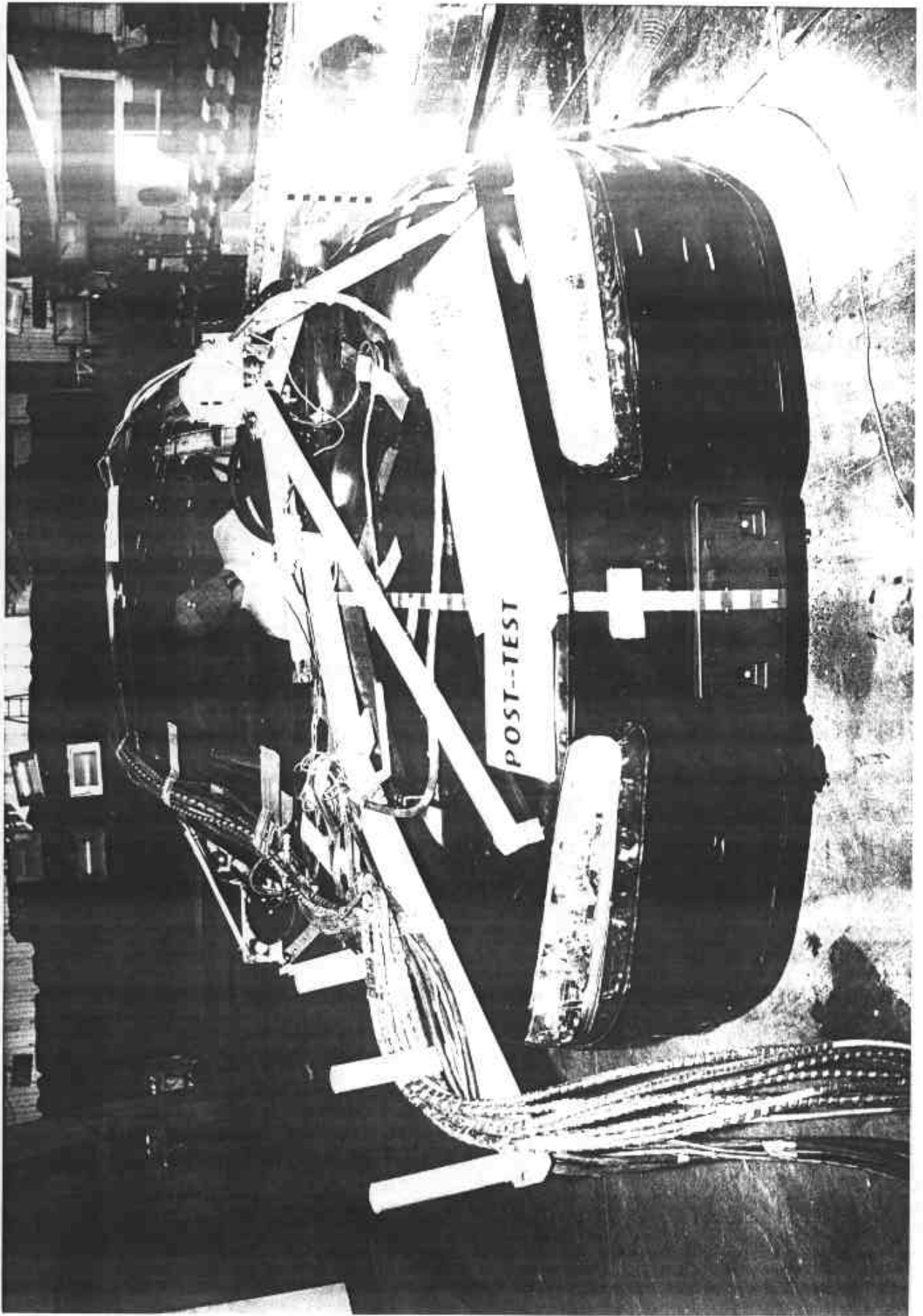


Photo No. A-2 - Post-Test Front View of Test Vehicle

A-2

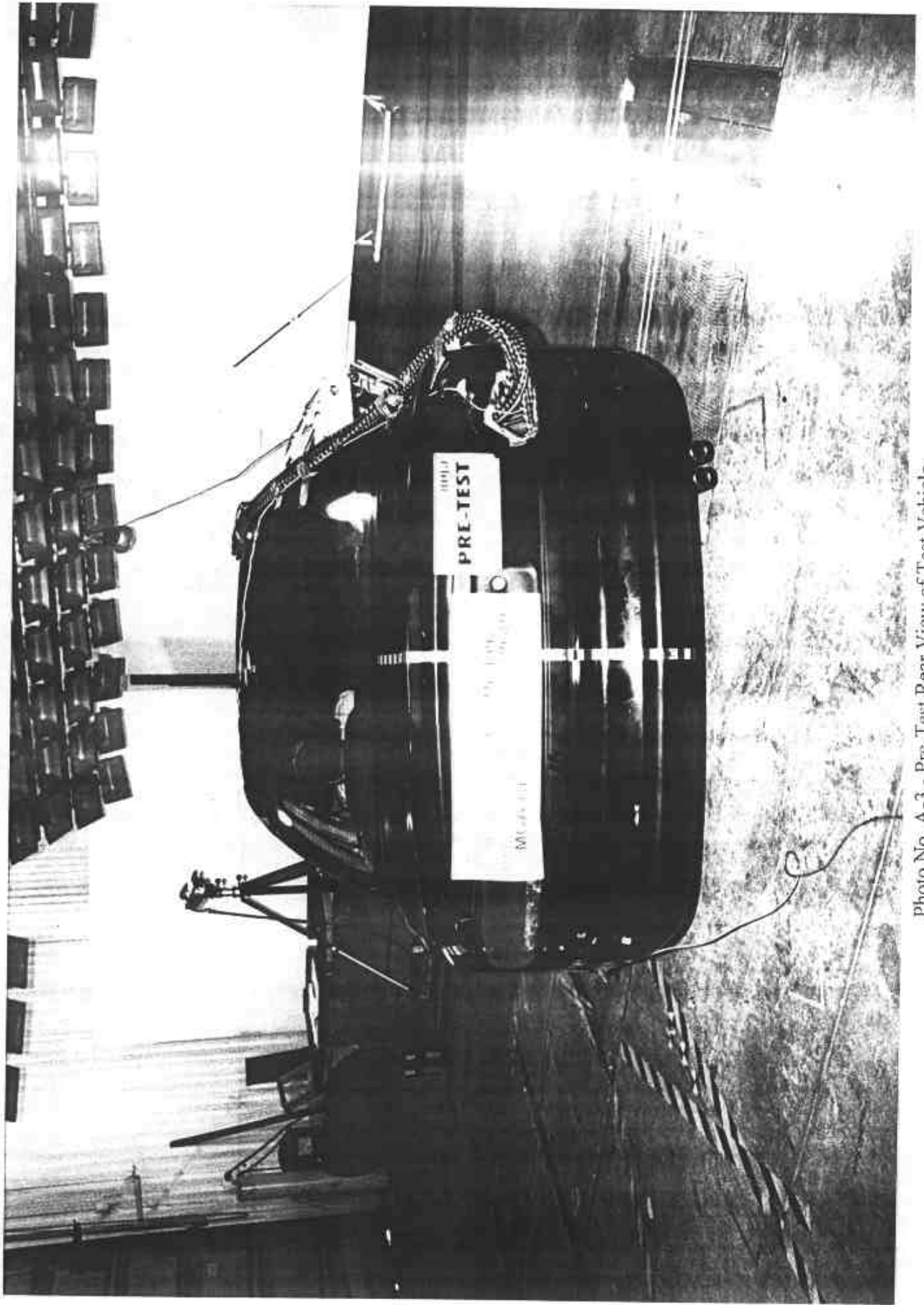


Photo No. A-3 - Pre-Test Rear View of Test Vehicle

A-3

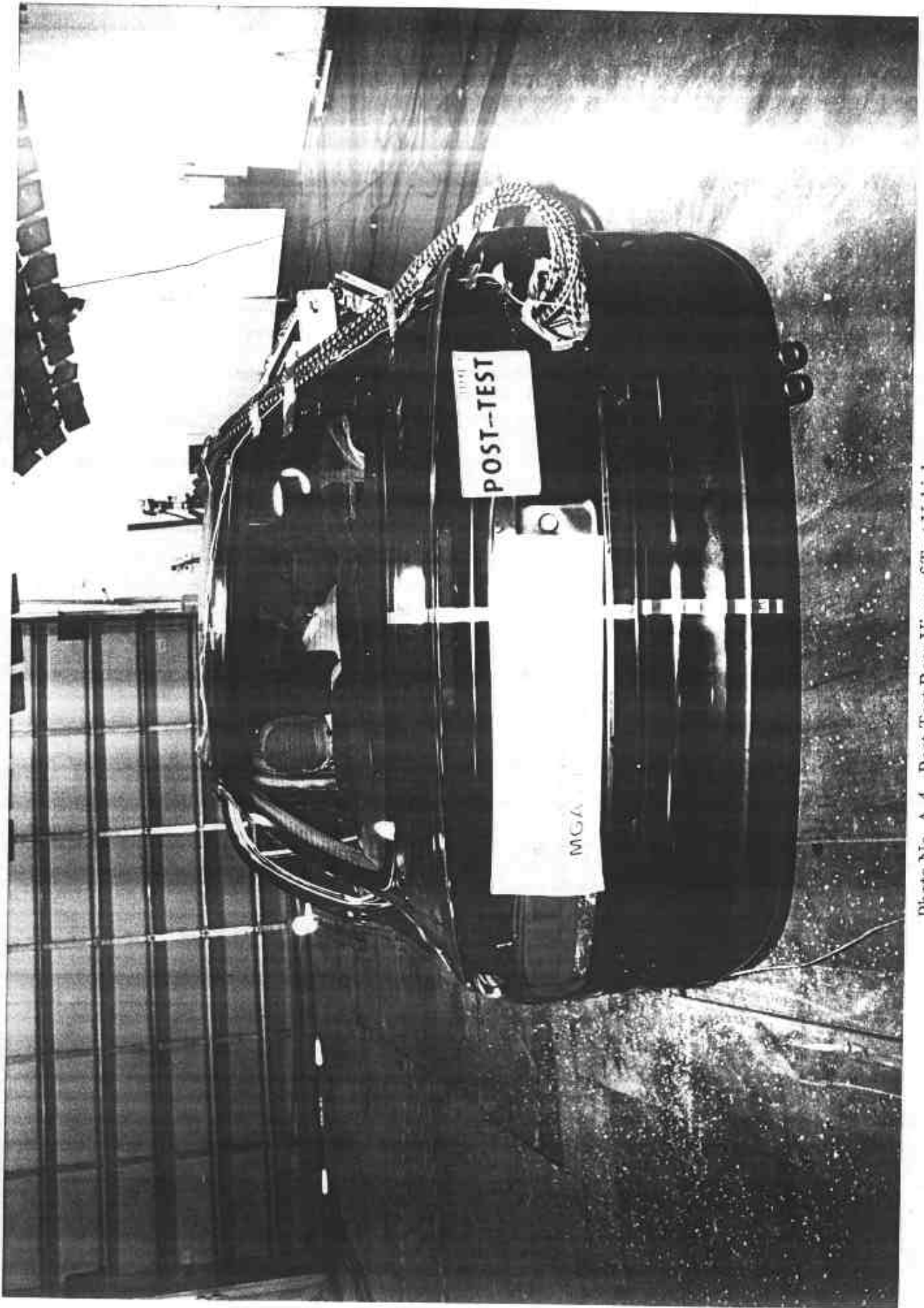


Photo No. A-4 - Post-Test Rear View of Test Vehicle

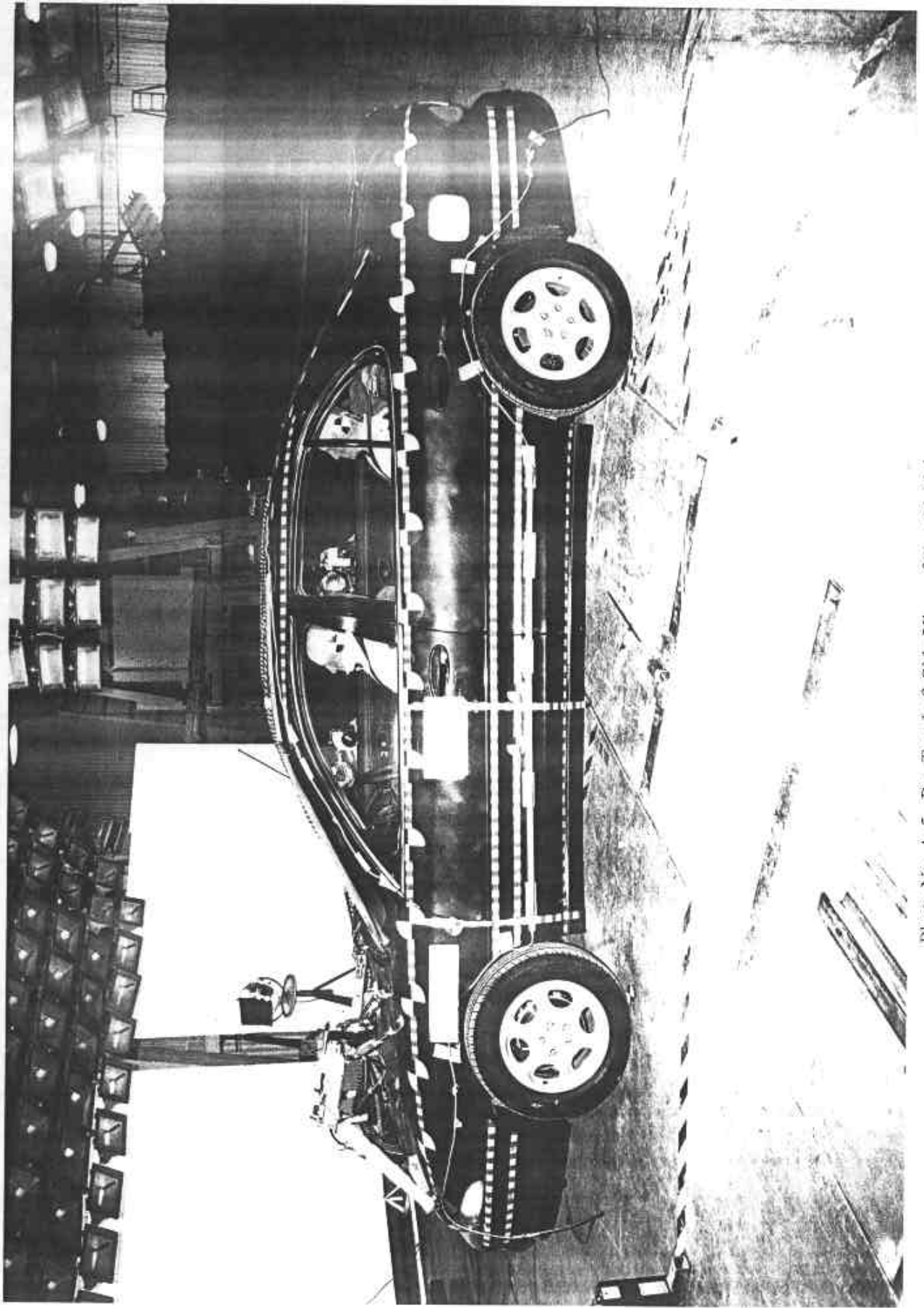


Photo No. A-5 - Pre-Test Left Side View of Test Vehicle

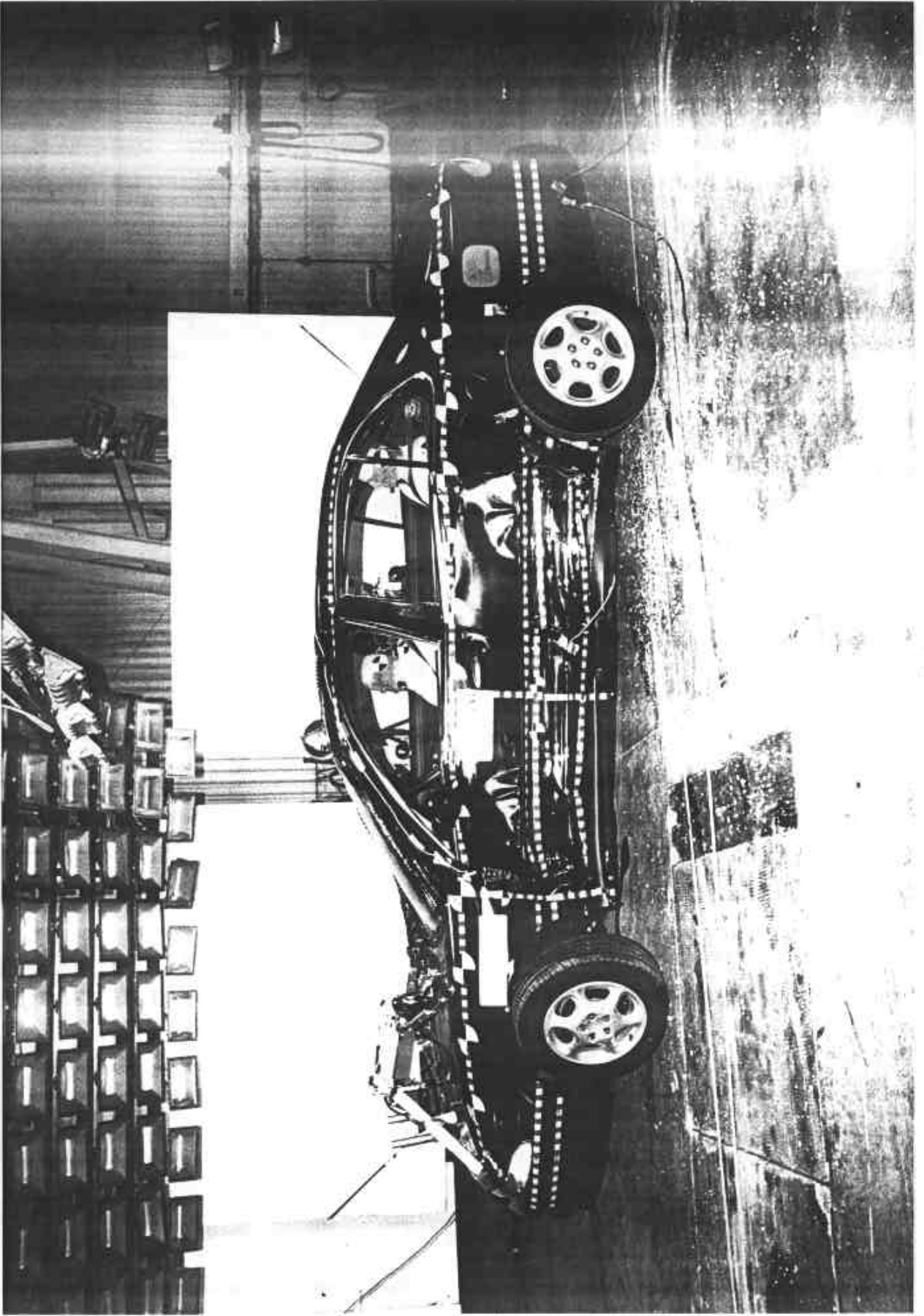


Photo No. A-6 - Post-Test Left Side View of Test Vehicle



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

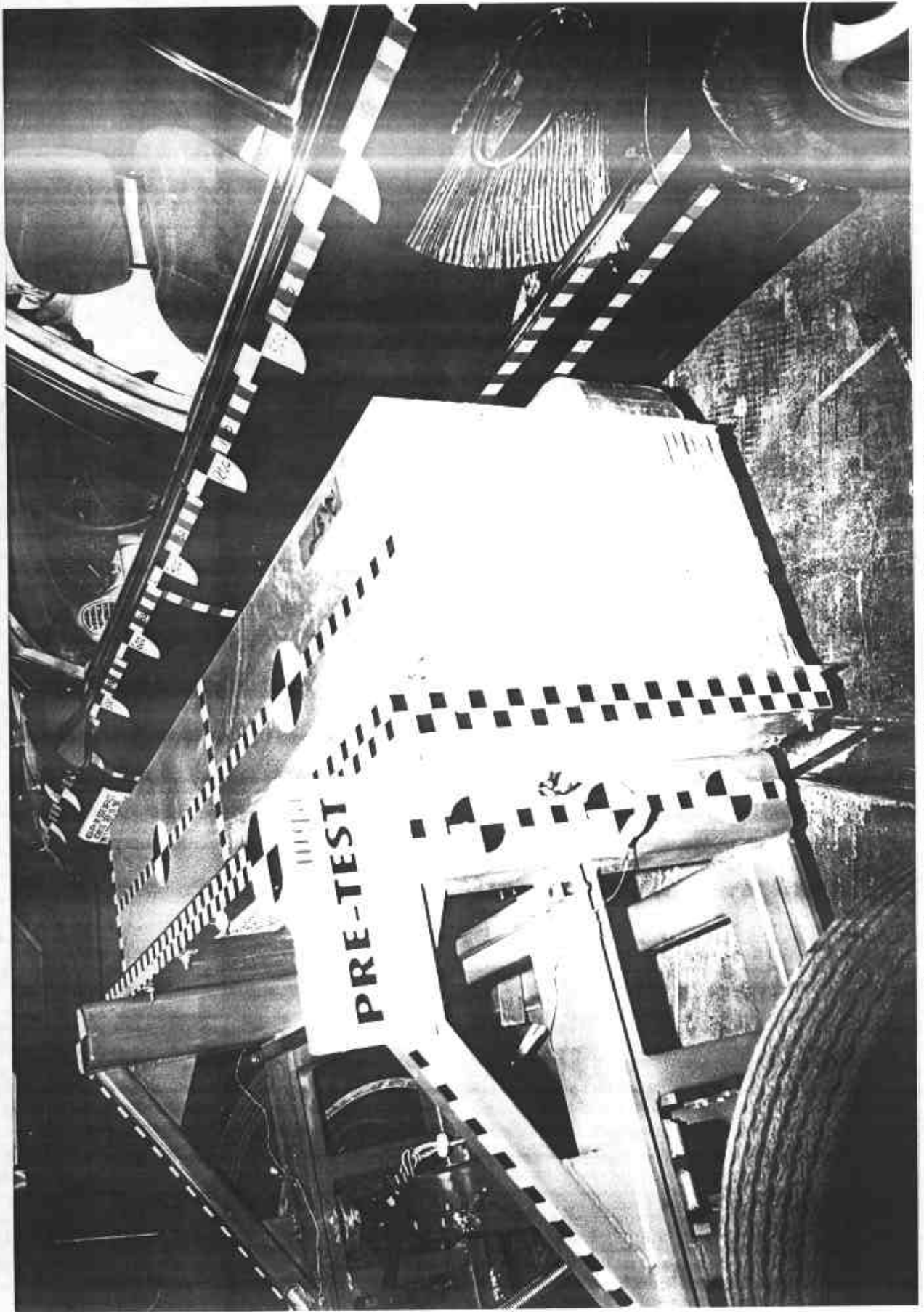


Photo No. A-8 - Pre-Test MDB Positioned Against Vehicle (right side)

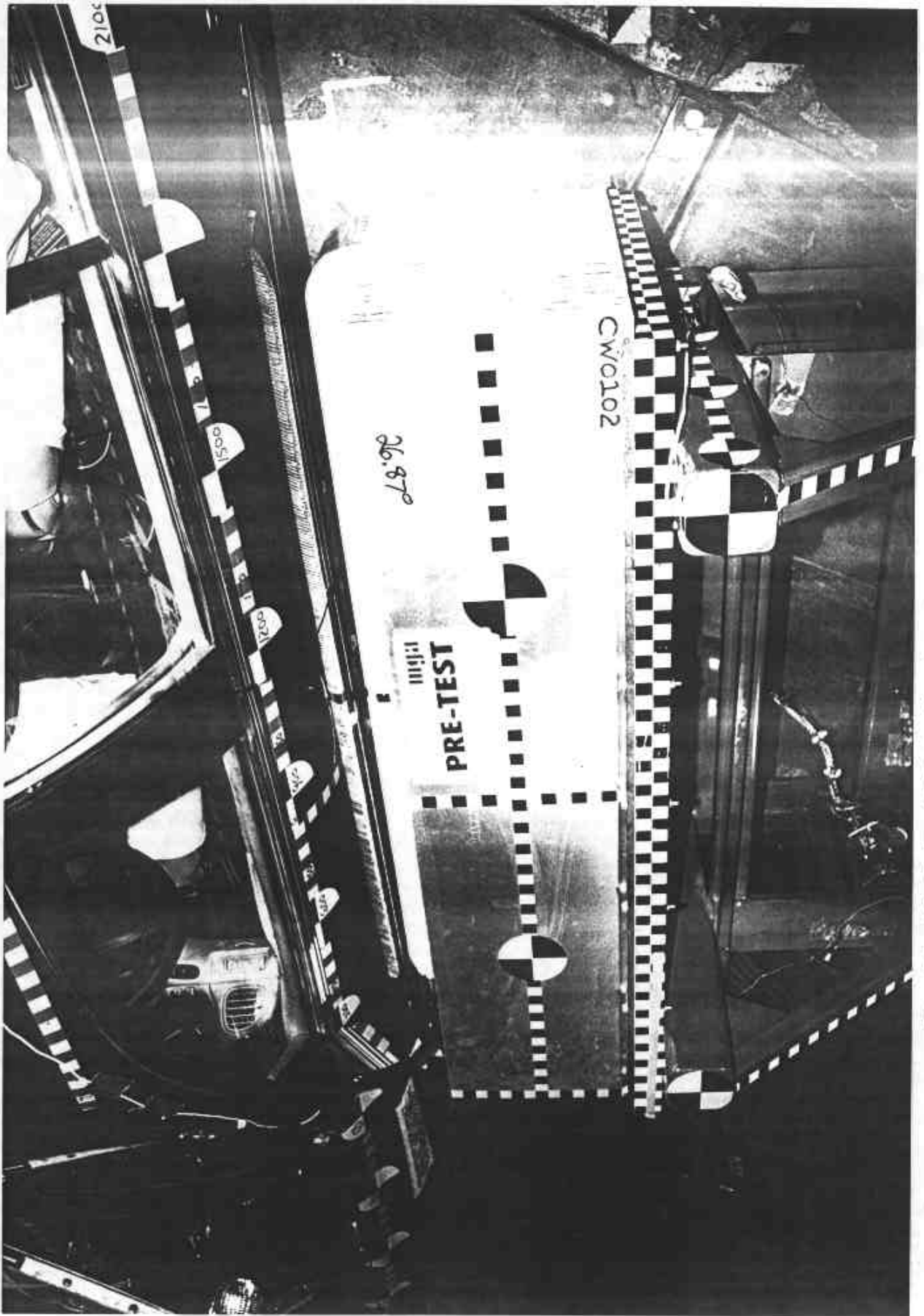


Photo No. A-9 - Pre-Test MDB Positioned Against Vehicle Overhead View

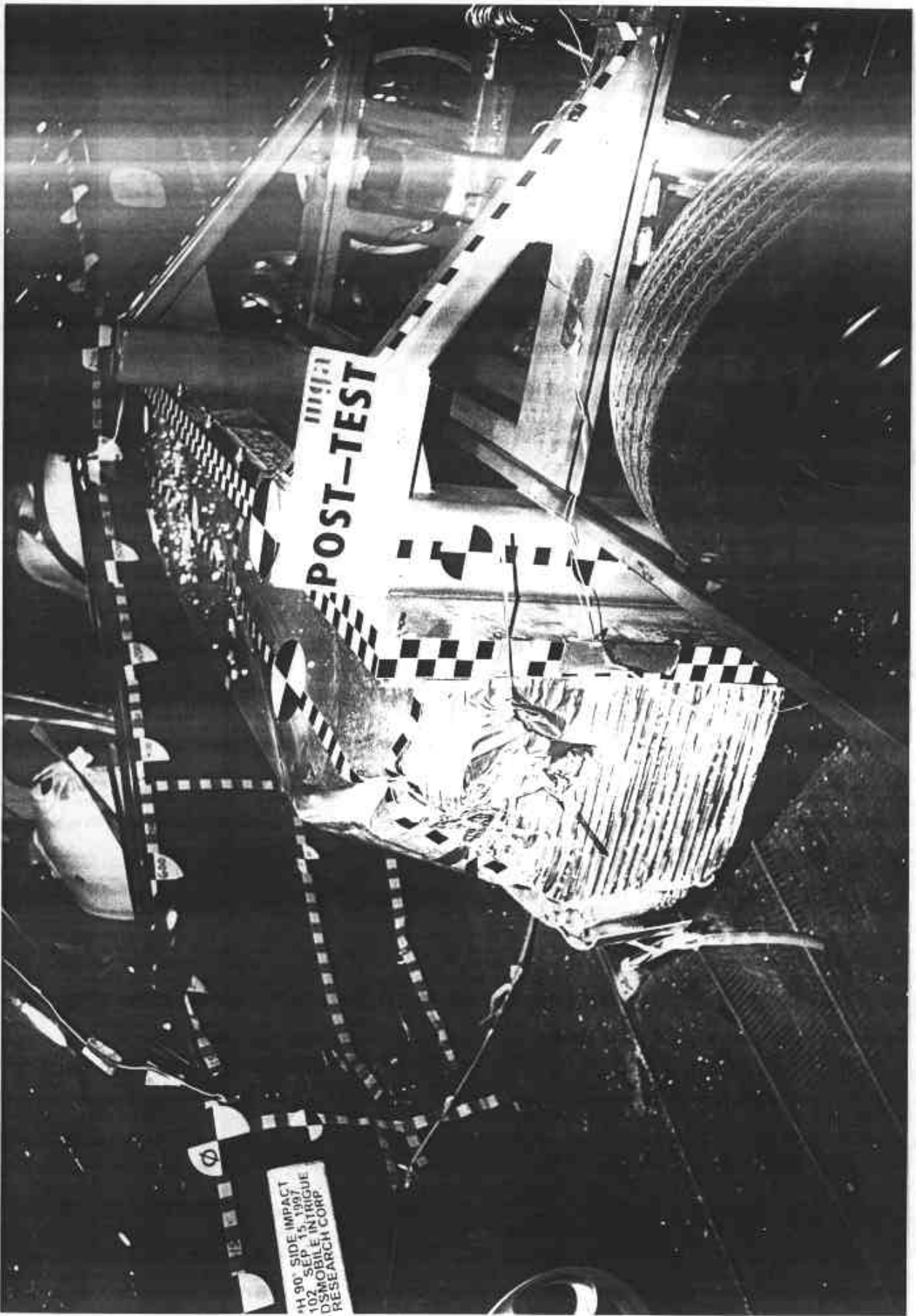


Photo No. A-10 - Post-Test MDB Positioned Against Vehicle (left side)

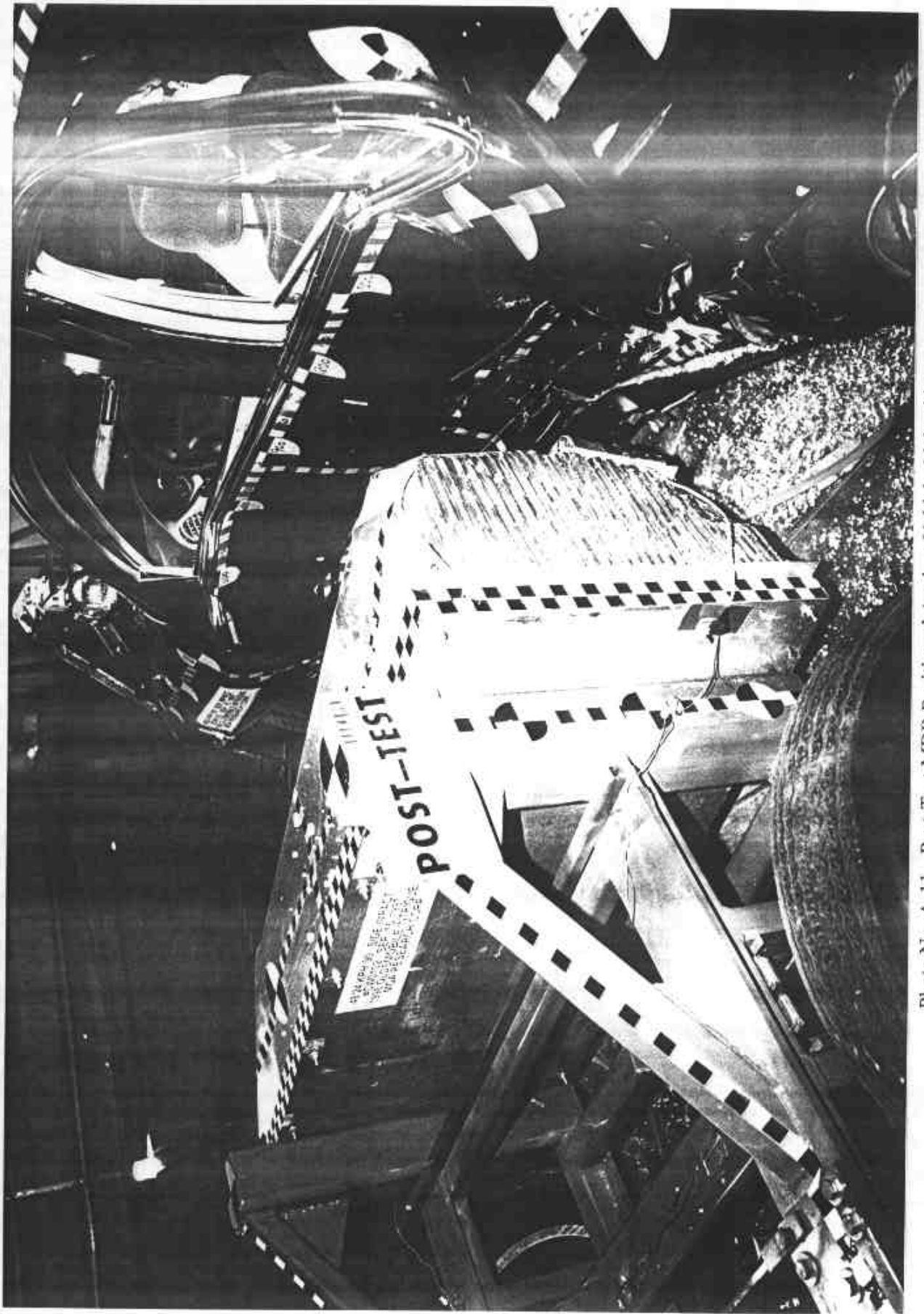


Photo No. A-11 - Post-Test MDB Positioned Against Vehicle (right side)

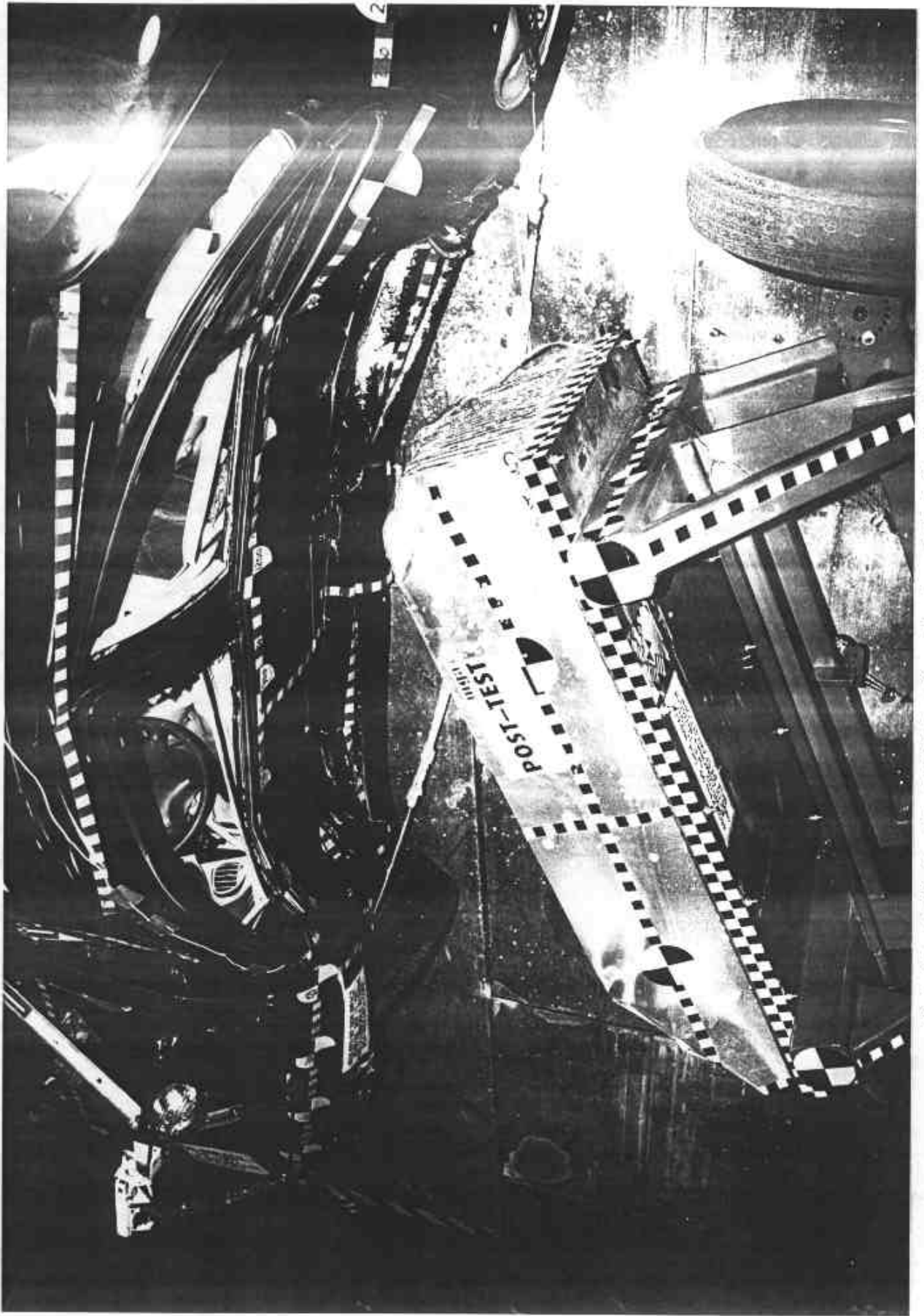


Photo No. A-12 - Post-Test MDB Positioned Against Vehicle Overhead View

A-12

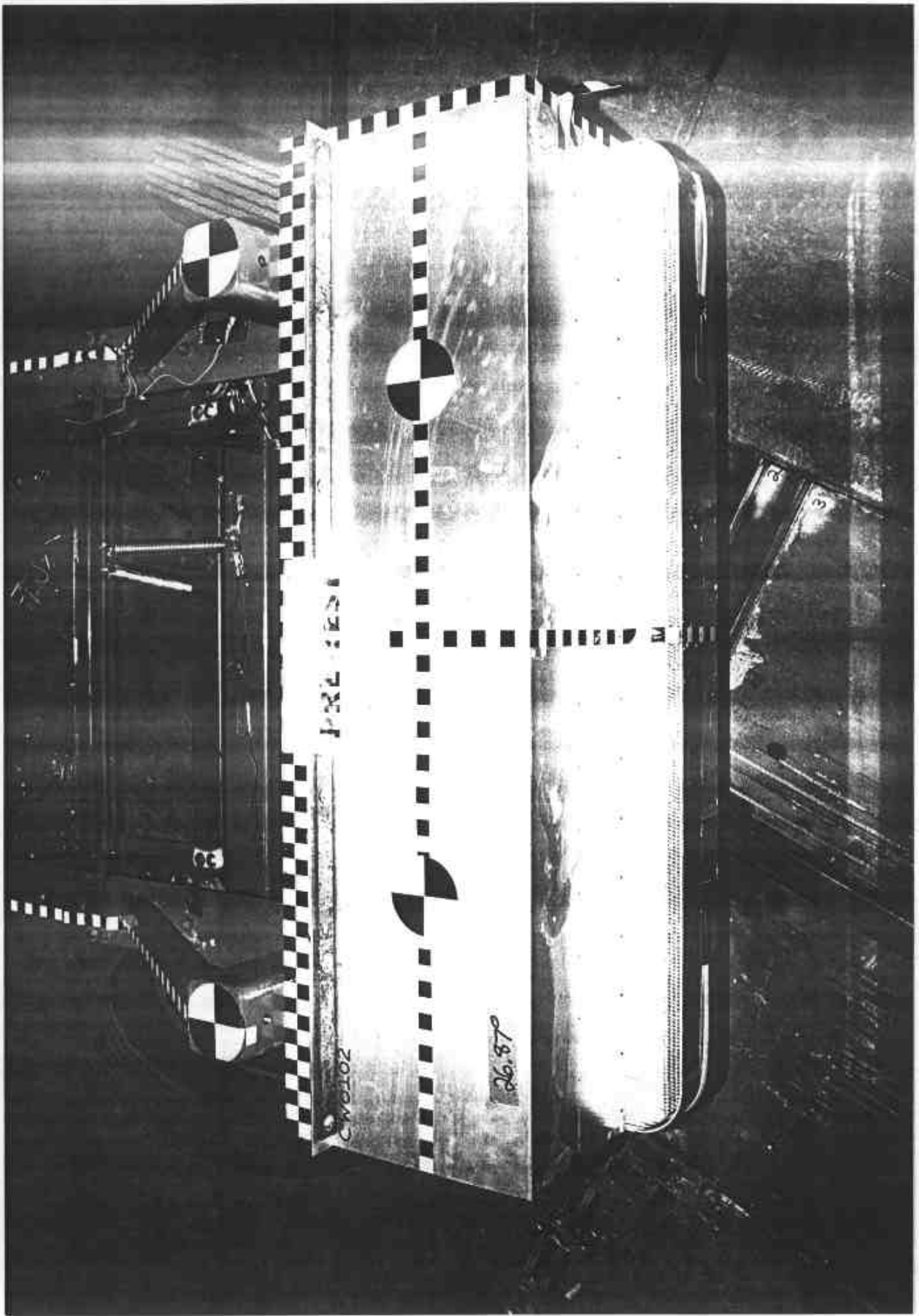


Photo No. A-13 - Pre-Test MDB Top View

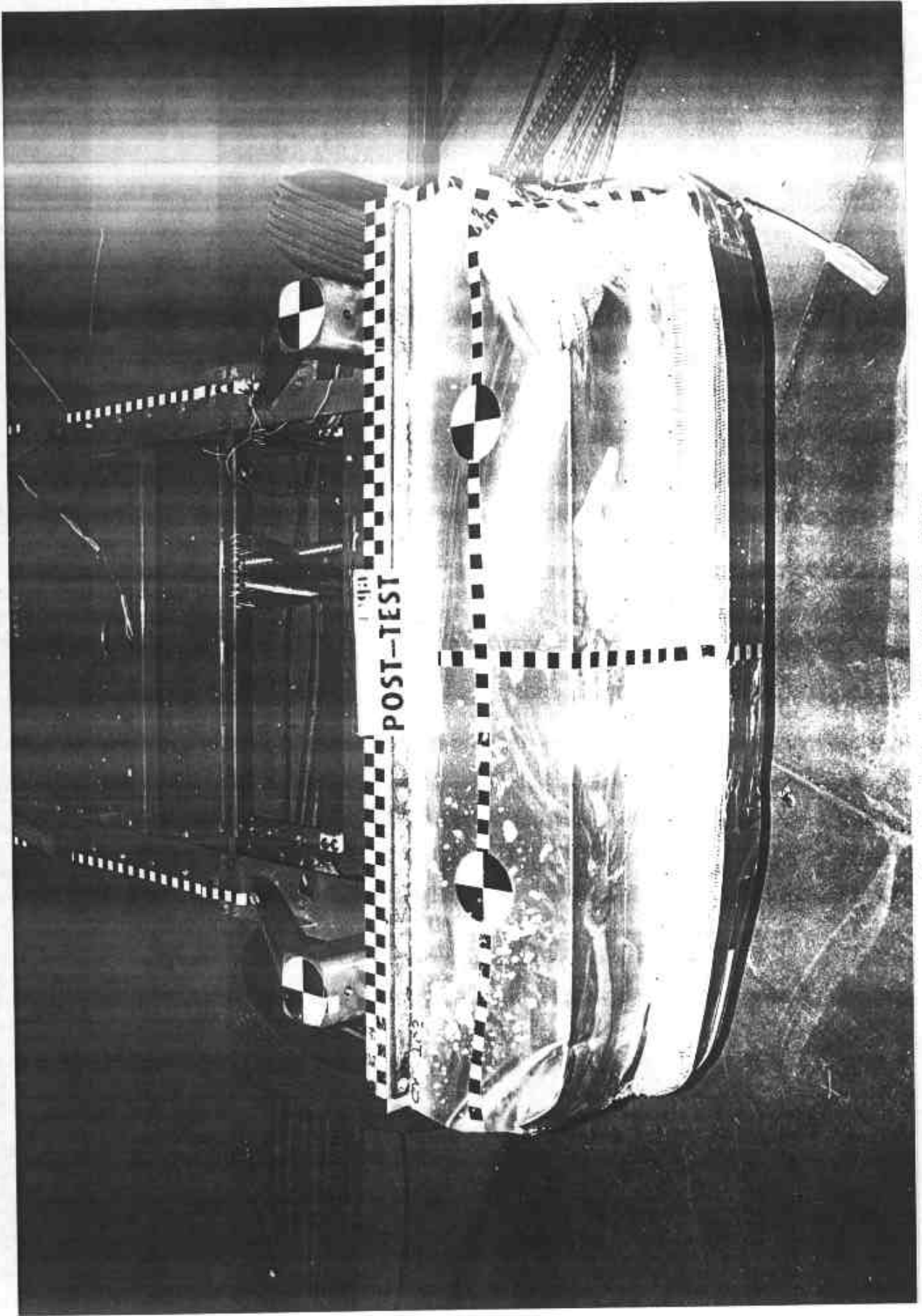
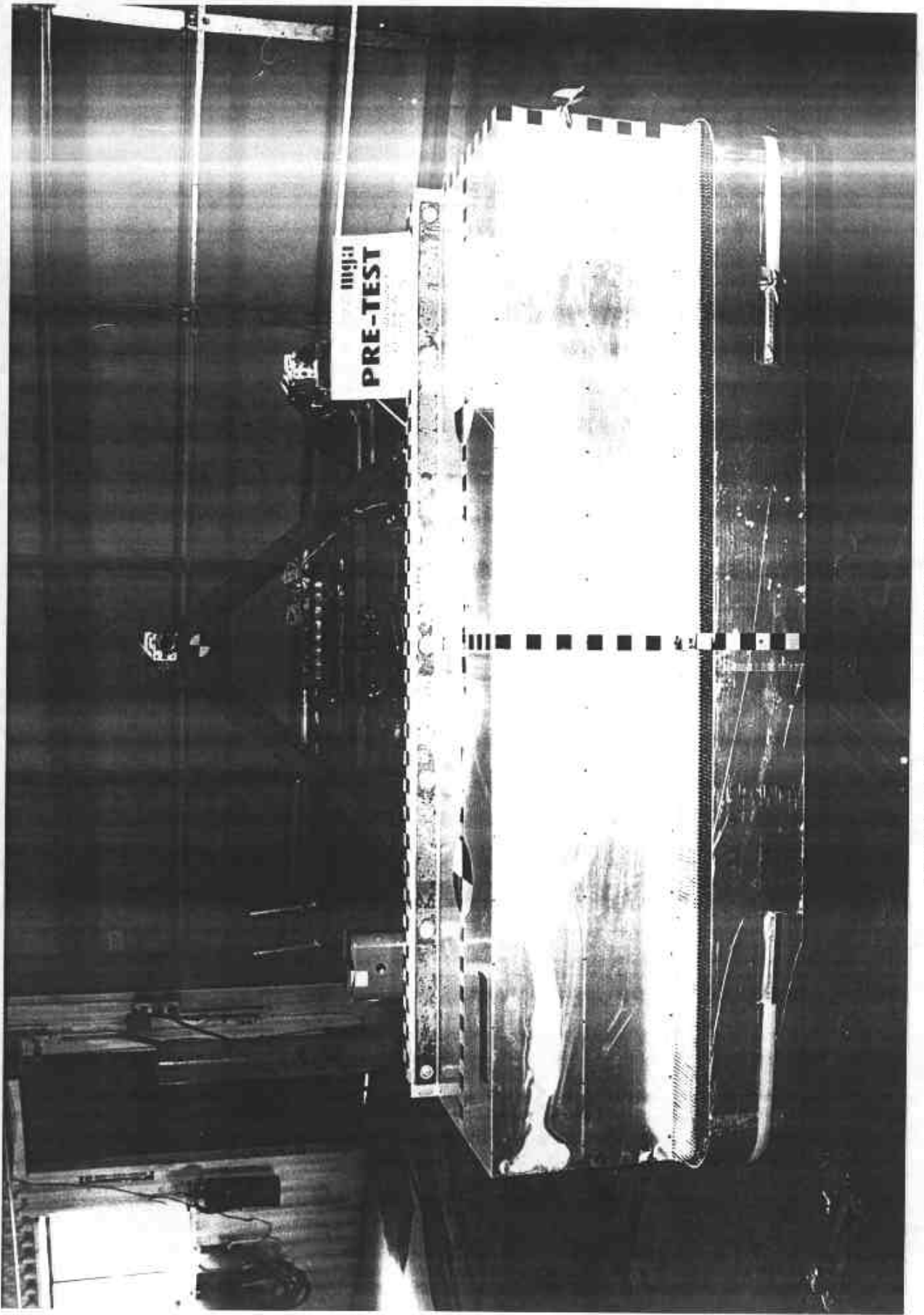


Photo No. A-14 - Post-Test MDB Top View



A-15

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

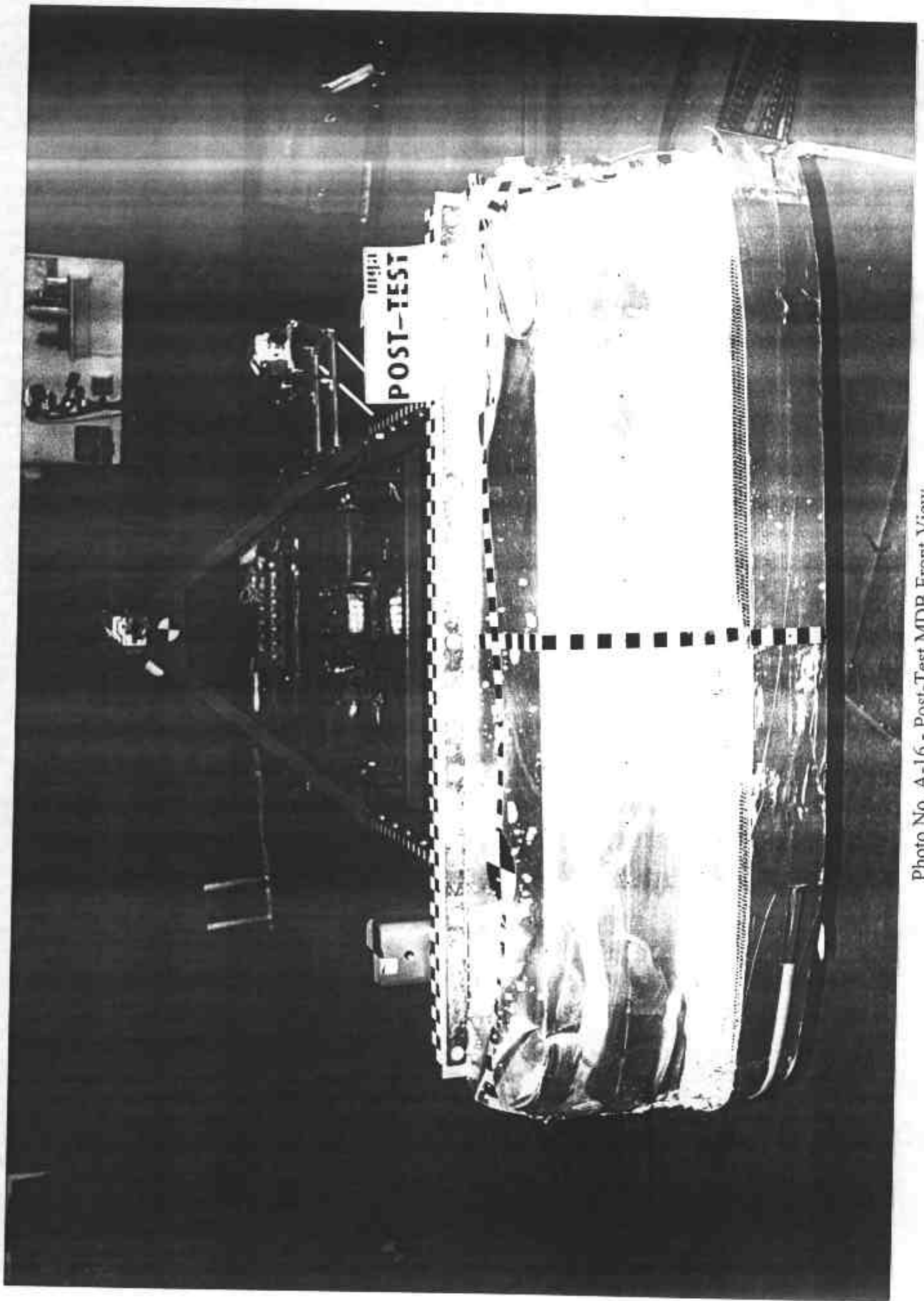


Photo No. A-16 - Post-Test MDB Front View

A-16

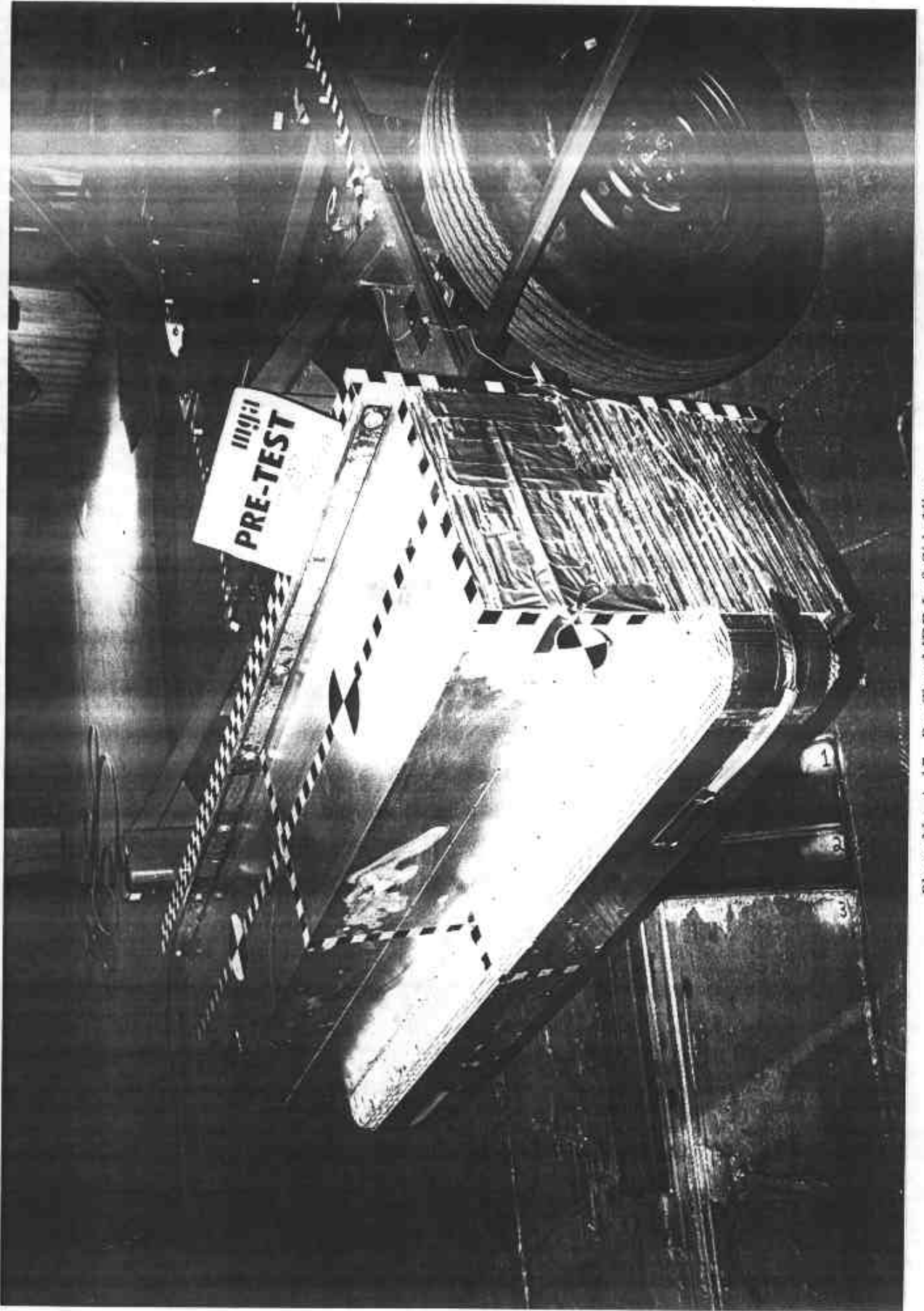


Photo No. A-17 - Pre-Test MDB Left Side View

A-17

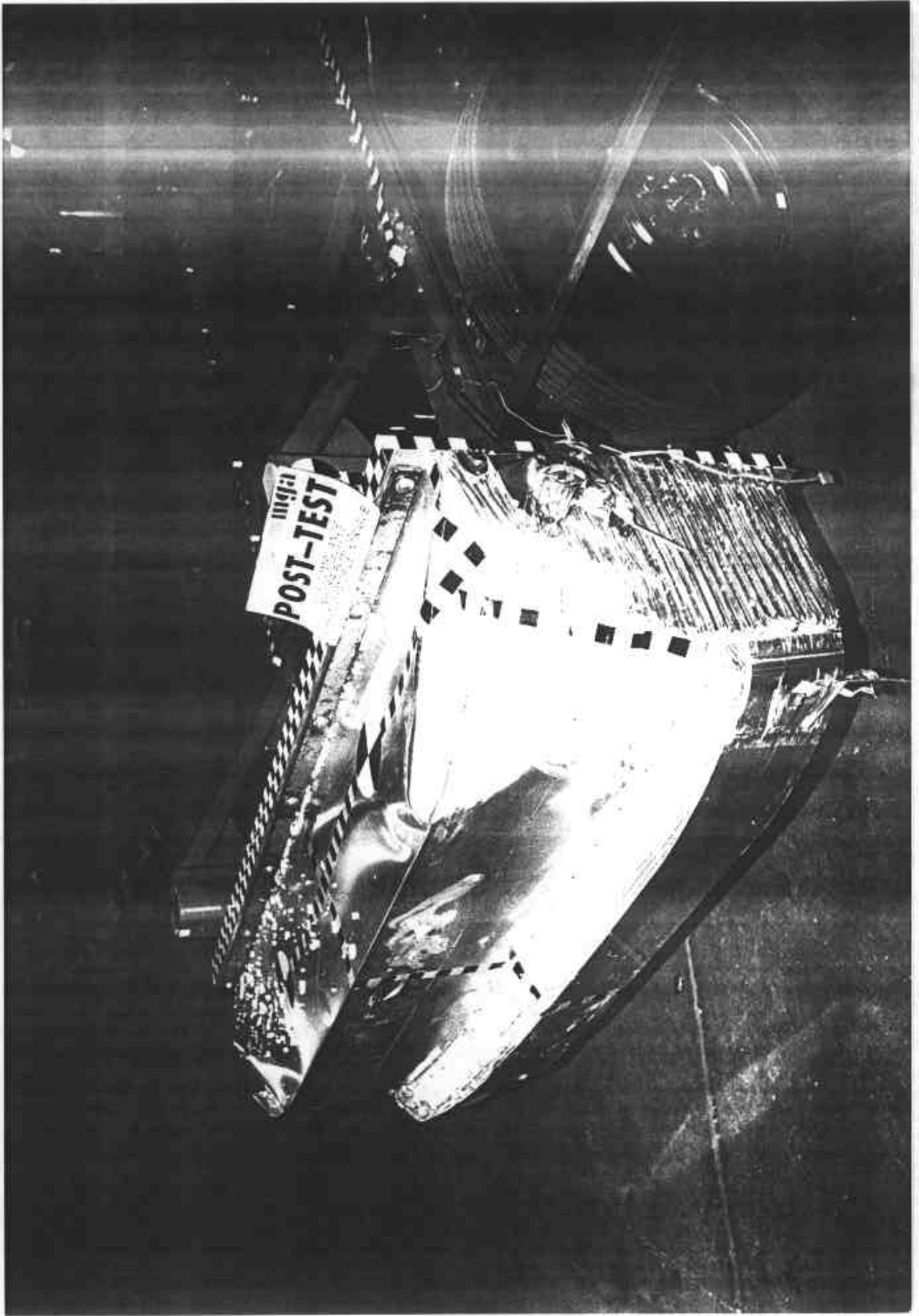


Photo No. A-18 - Post-Test MDB Left Side View

A-18

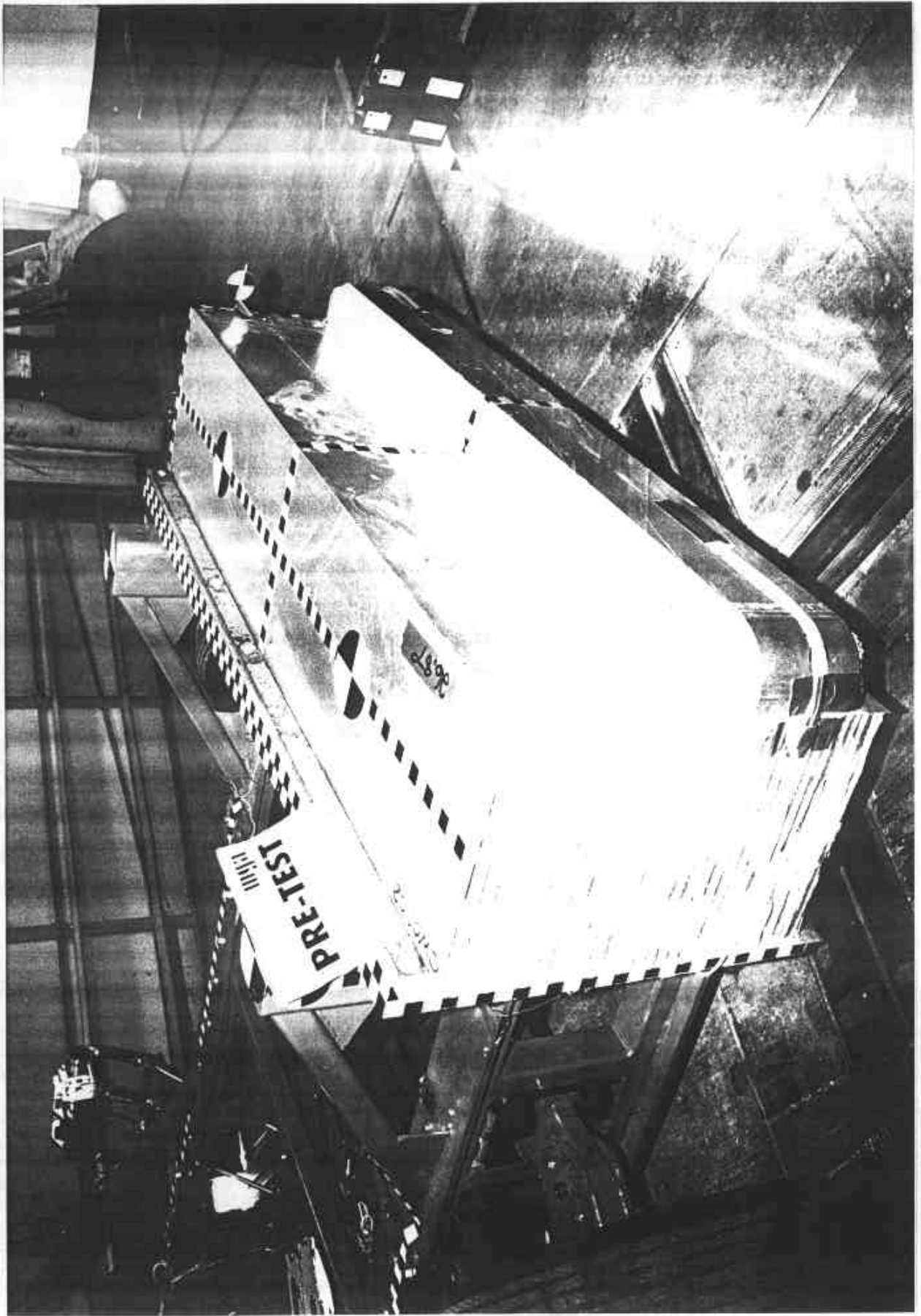


Photo No. A-19 - Pre-Test MDB Right Side View

A-19

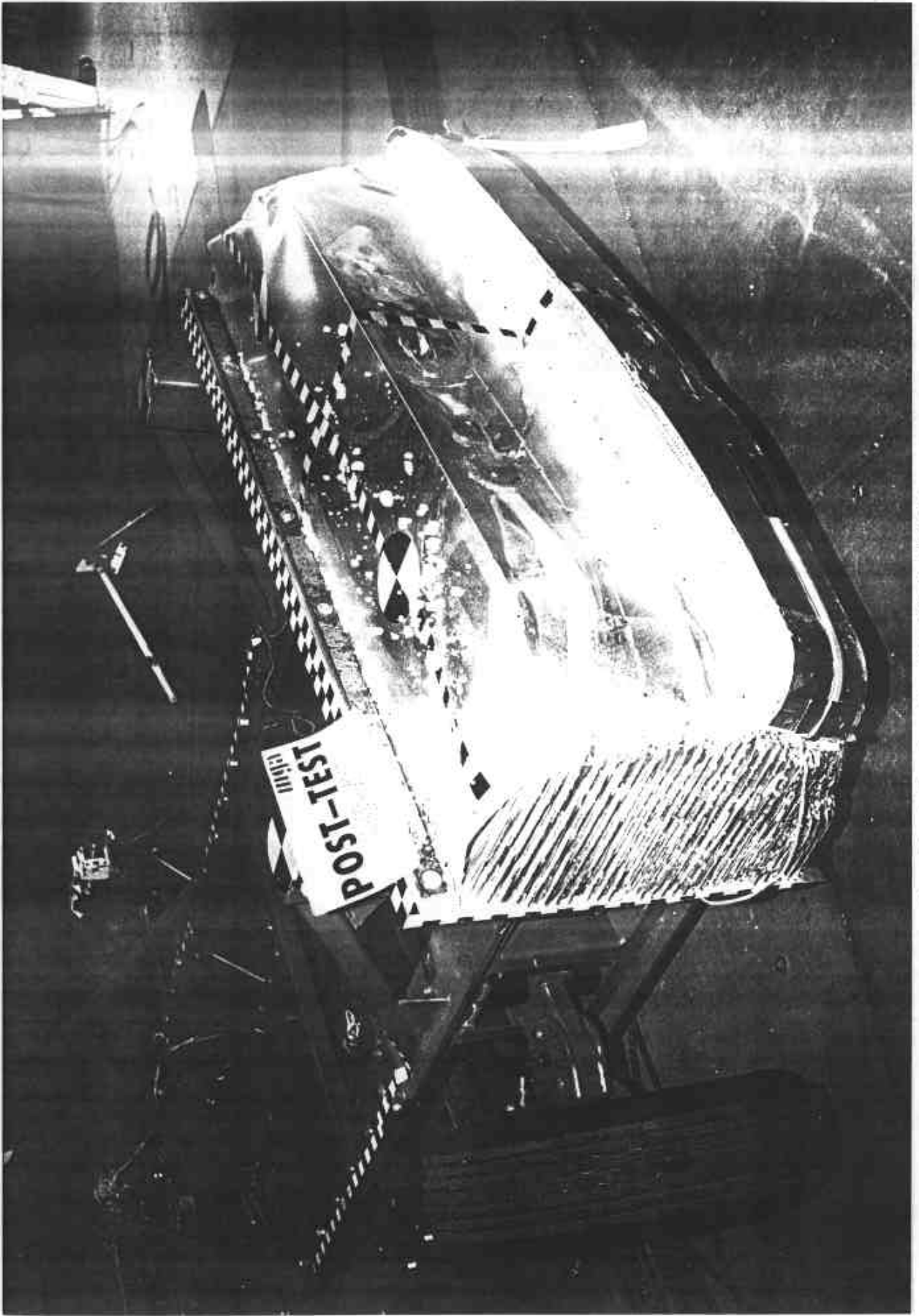


Photo No. A-20 - Post-Test MDB Right Side View

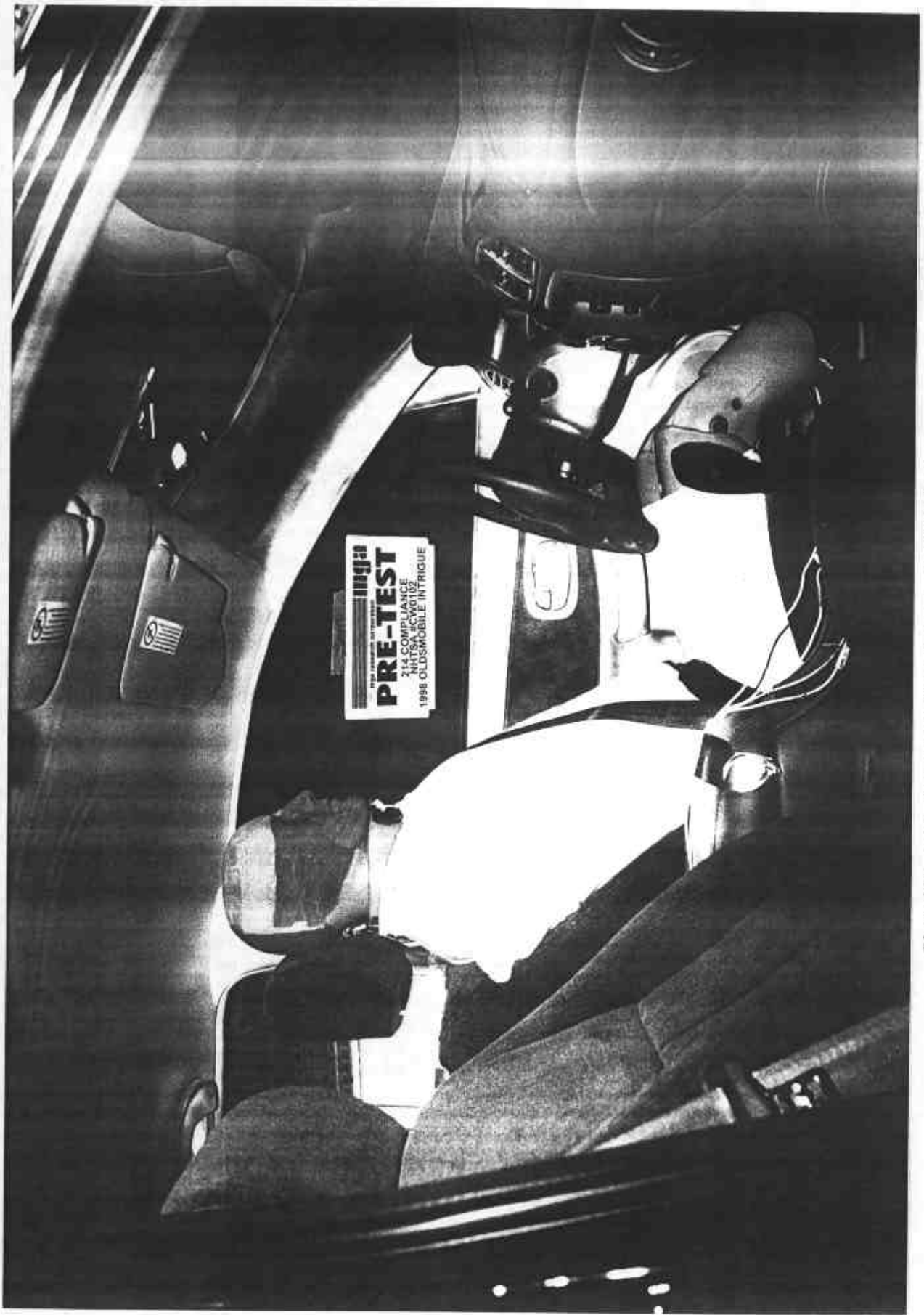


Photo No. A-21 - Pre-Test Driver Dummy Right Side View

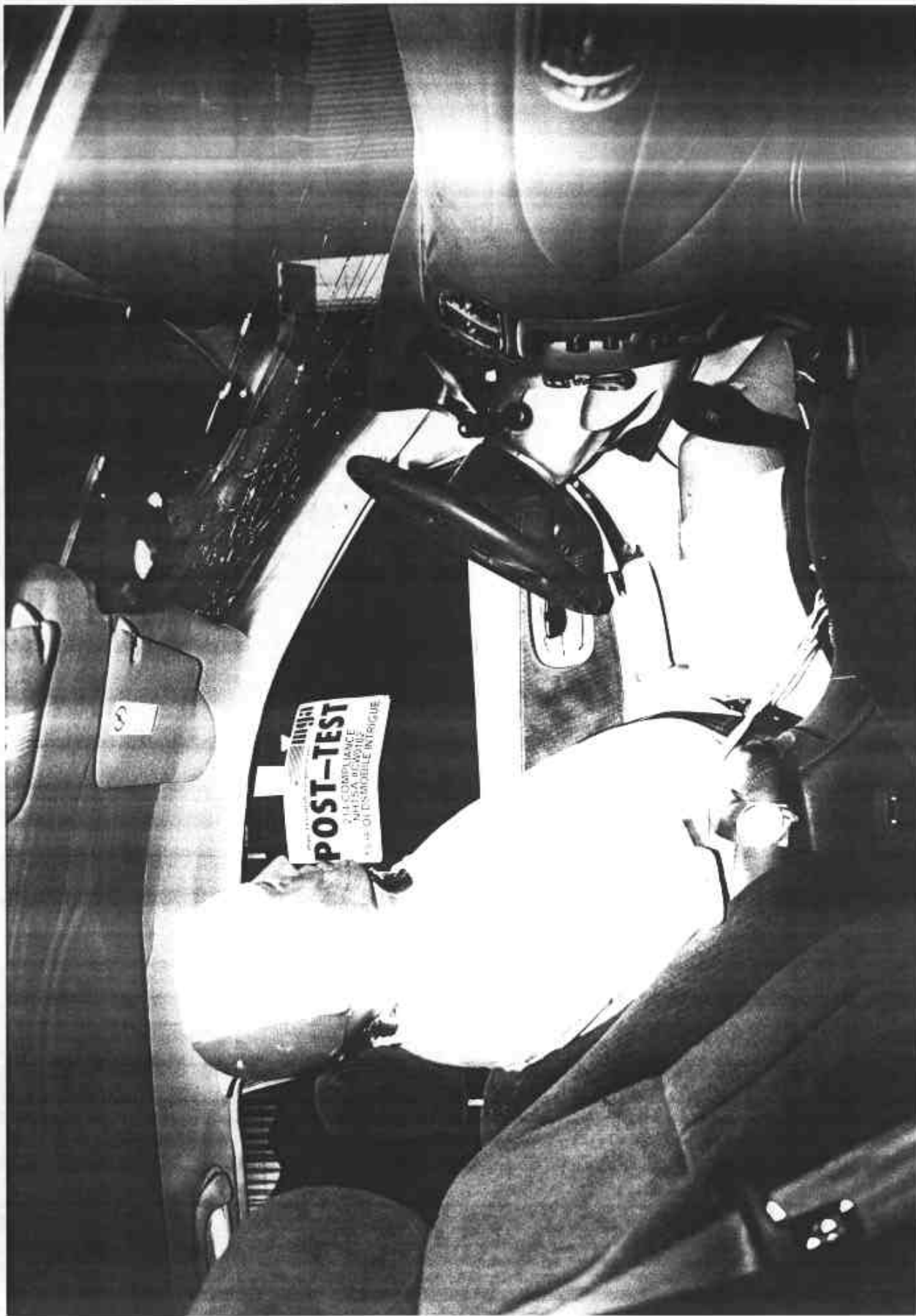


Photo No. A-22 - Post-Test Driver Dummy Right Side View

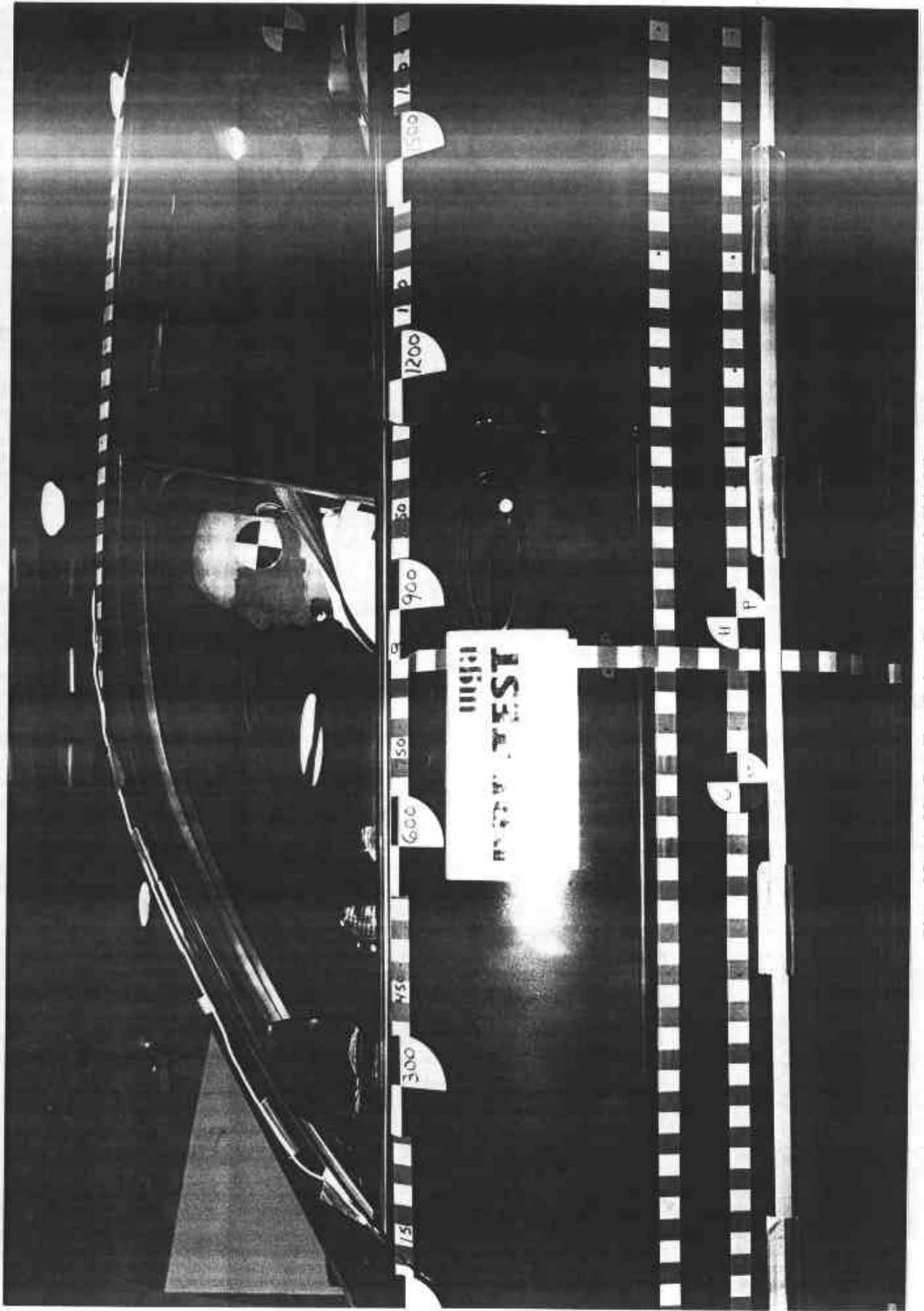


Photo No. A-23 - Pre-Test Driver Dummy Left Side View

A-23

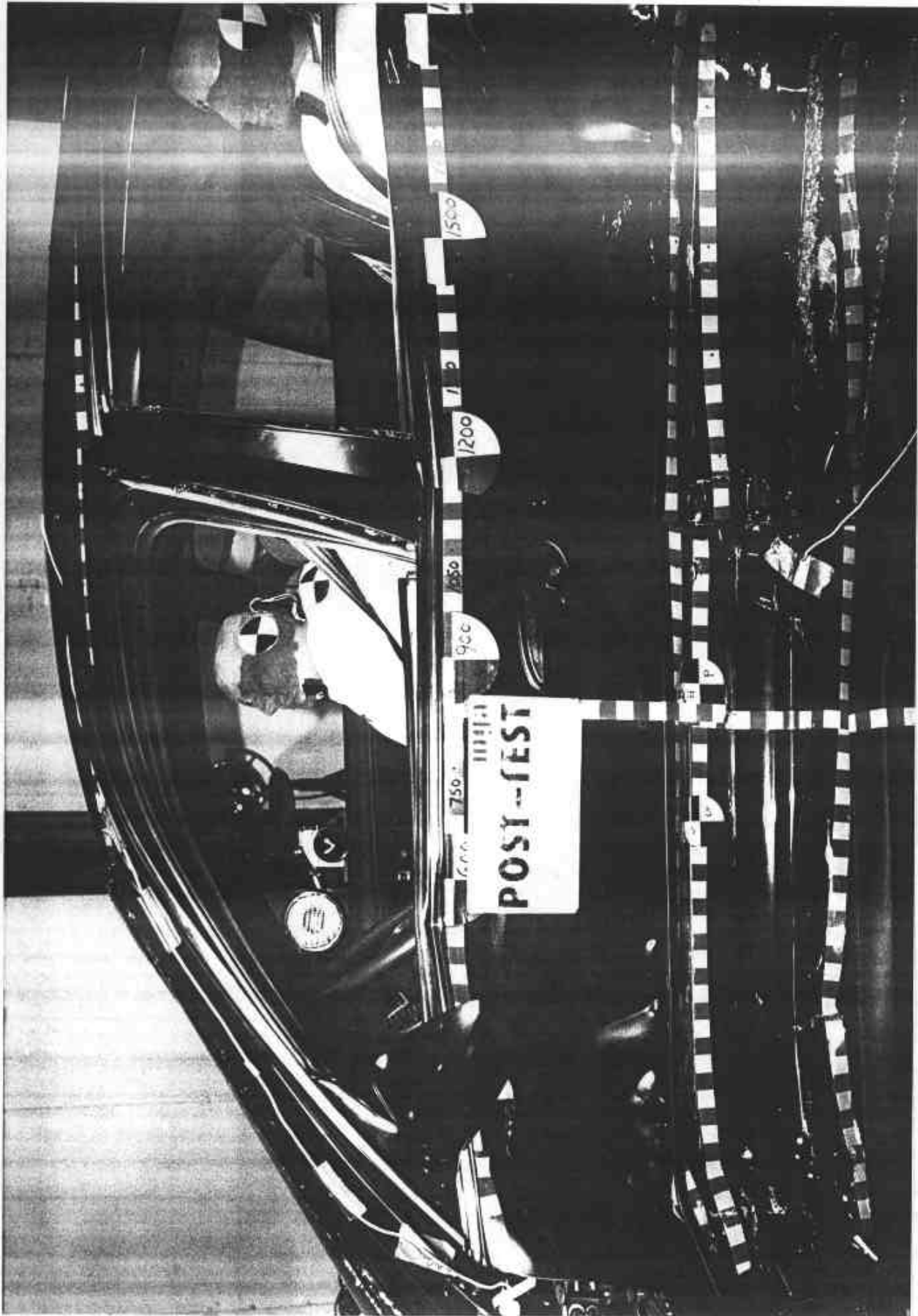


Photo No. A-24 - Post-Test Driver Dummy Left Side View

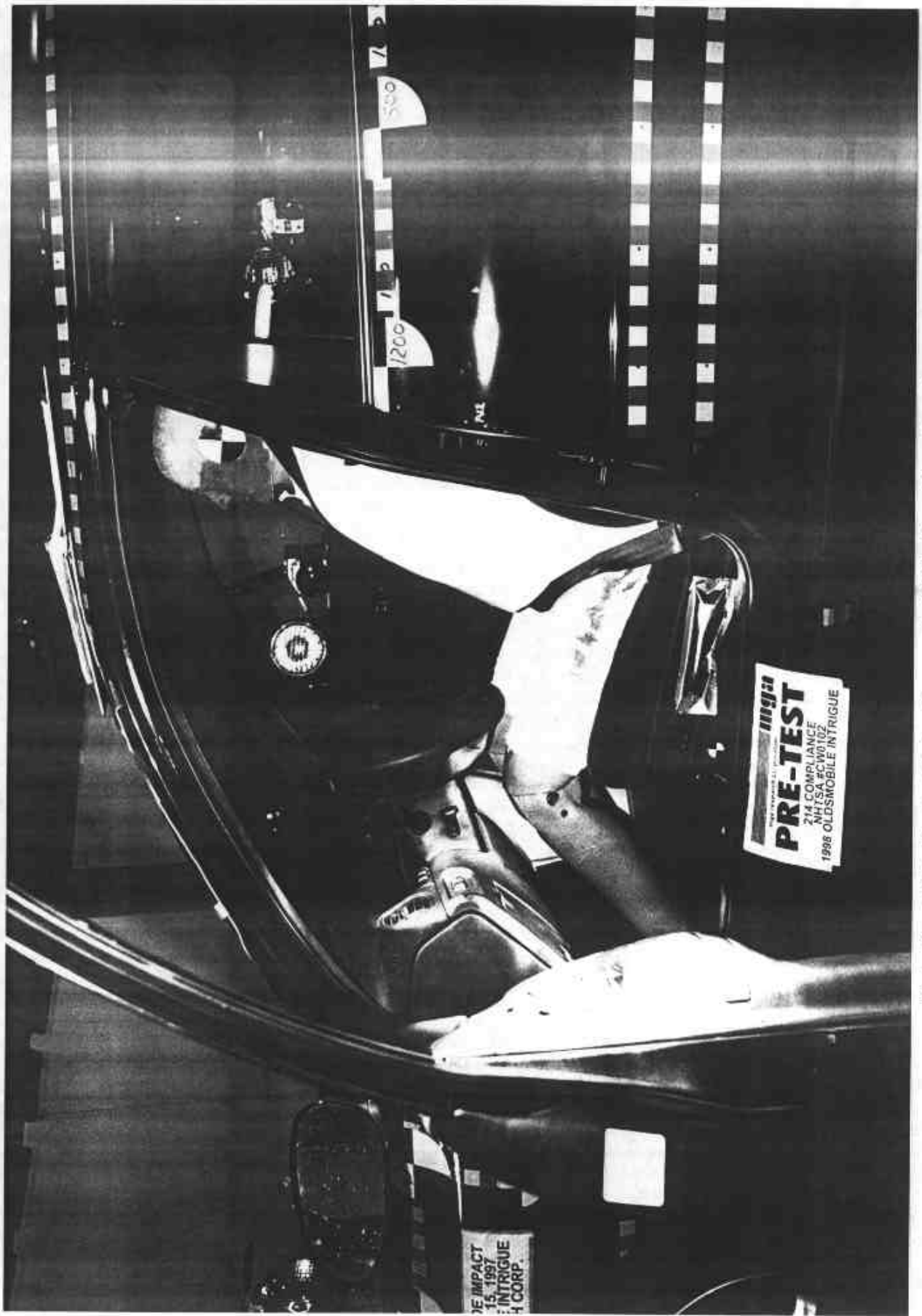


Photo No. A-25 - Pre-Test Driver Dummy Left Side View (Door Open)



A-26

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



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



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

A-28

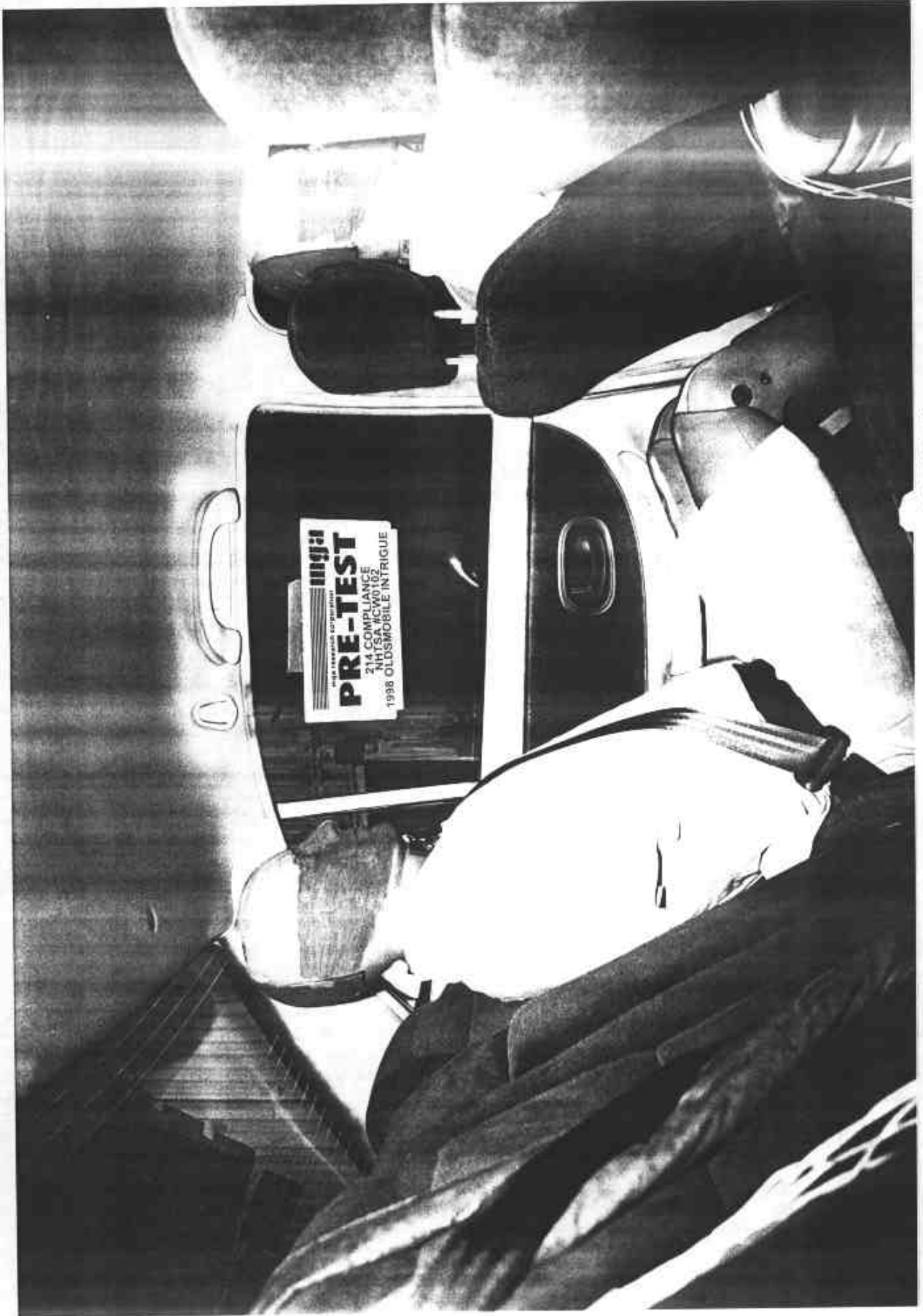


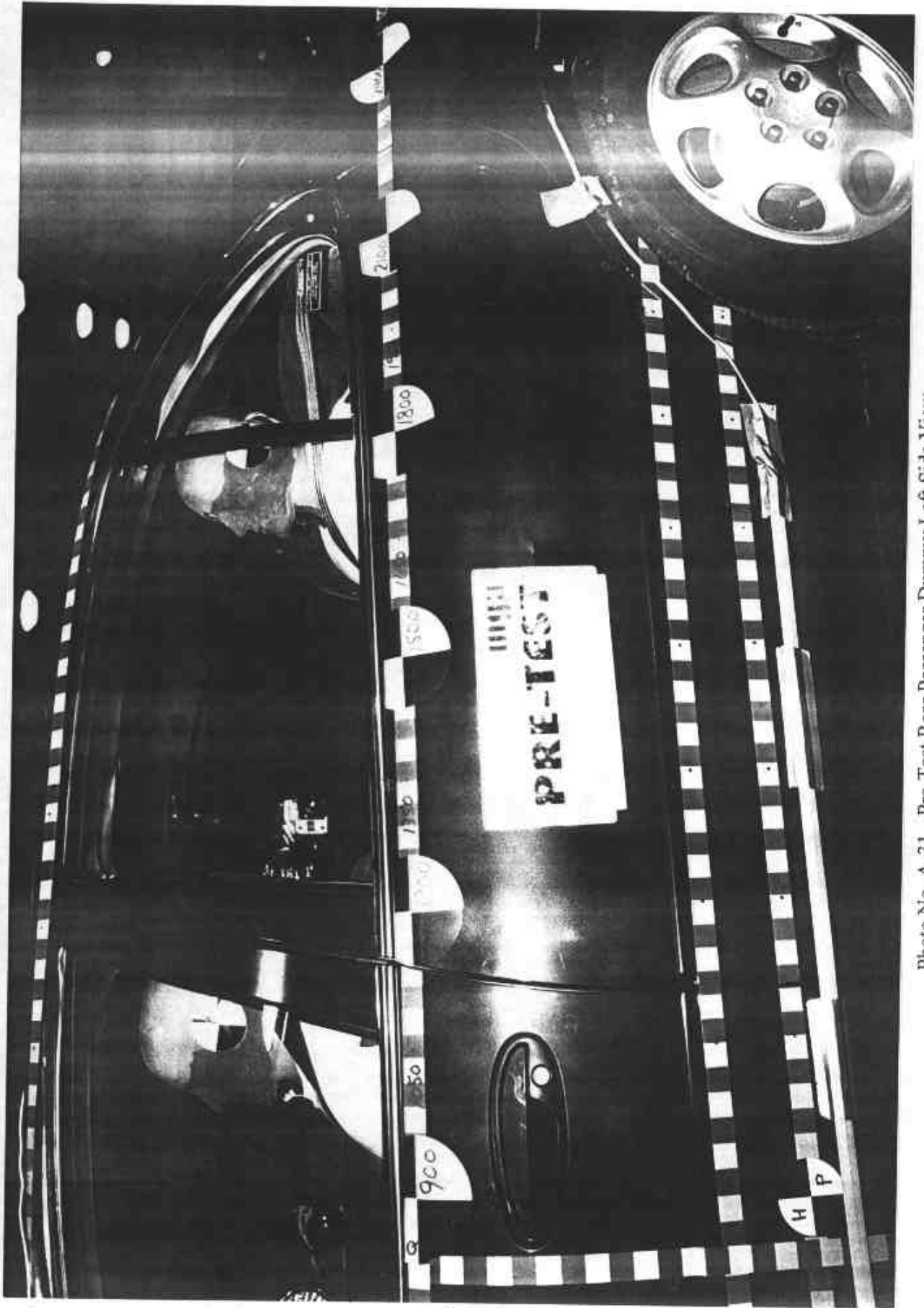
Photo No. A-29 - Pre-Test Rear Passenger Dummy Right Side View

A-29



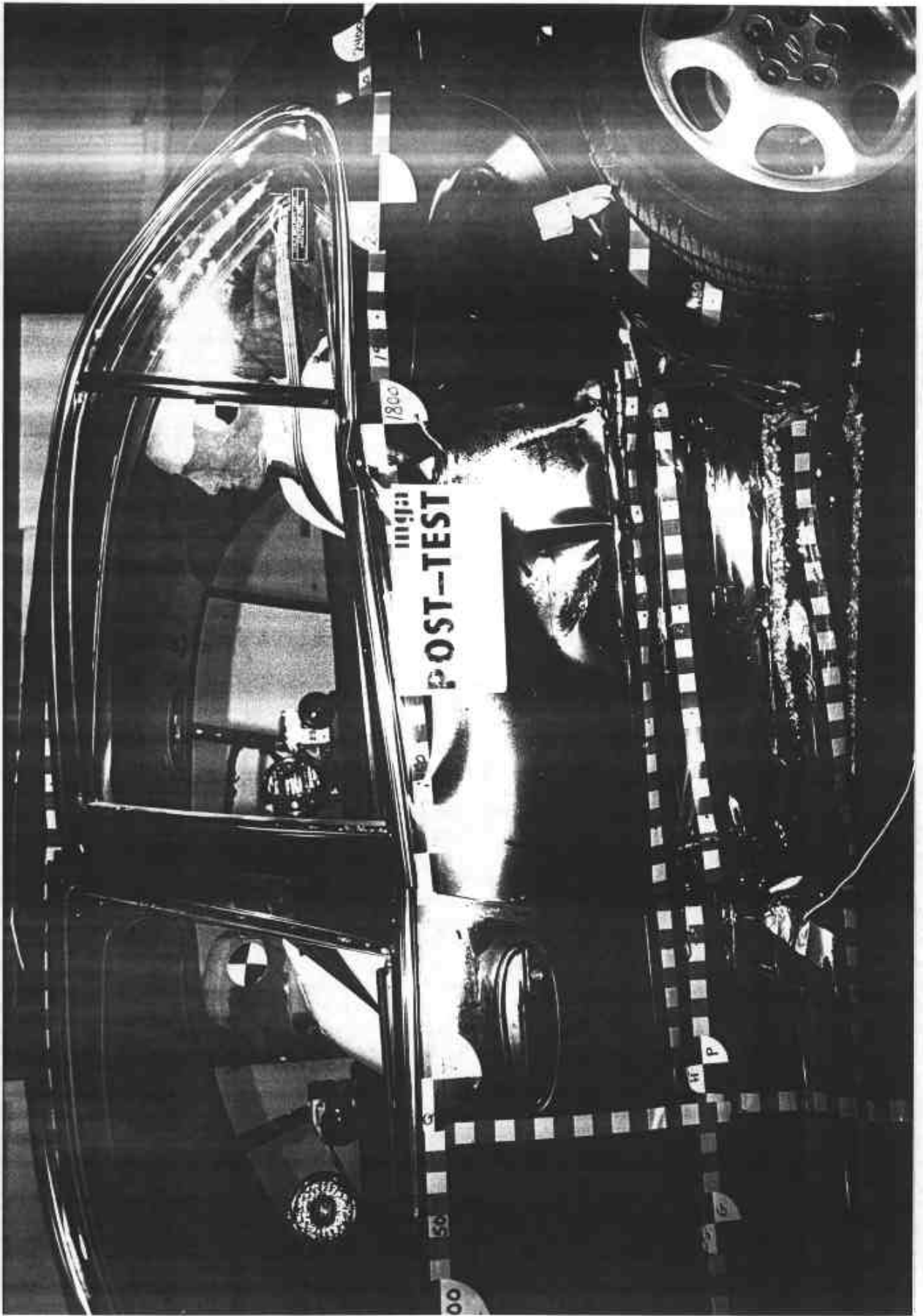
Photo No. A-30 - Post-Test Rear Passenger Dummy Right Side View

A-30



A-31

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



A-32

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



A-33

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



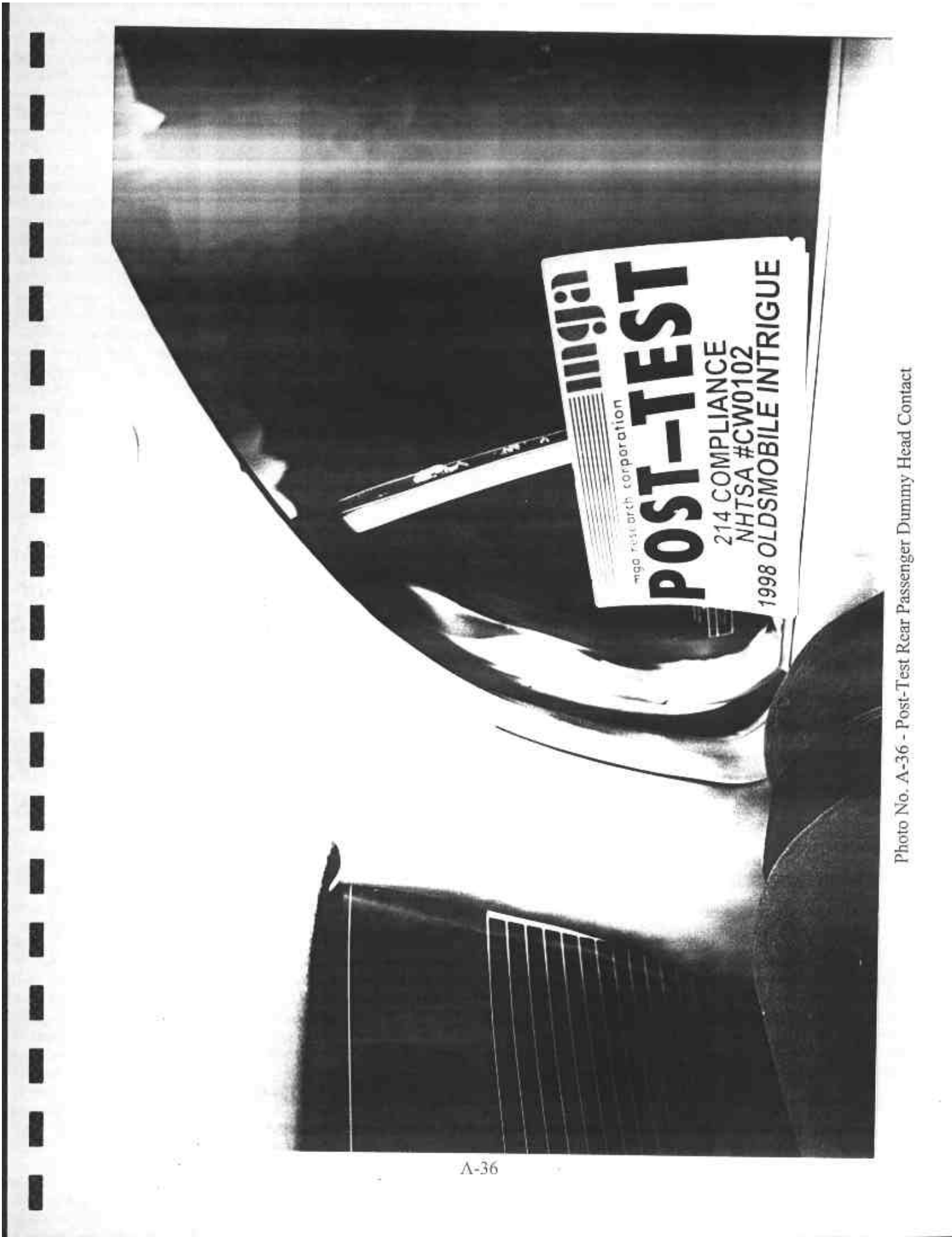
A-34

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



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

A-35



A-36

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



48/24 KPH 90° SIDE IMPACT  
REV W/0102 SEP 15 1997  
MITSUBISHI INTRIGUE

**PRE-TEST**  
MITSUBISHI INTRIGUE

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



A-38

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

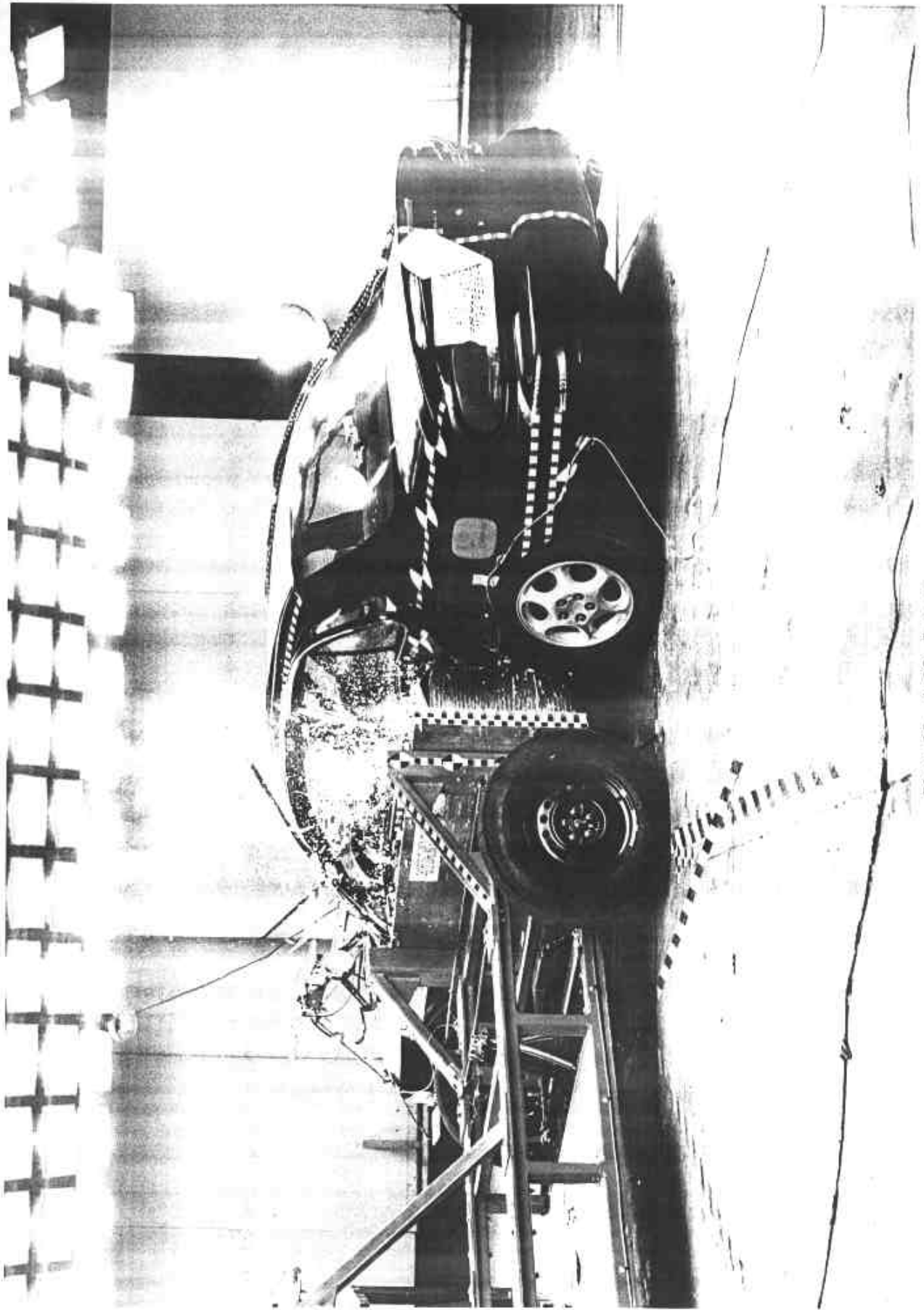


Photo No. A-39 - Impact

A-39

	MFD BY GENERAL MOTORS CORP				GAWR RR
DATE	GVWR	GAWR FRT			2015 LB
05/97	4436 LB	2421 LB			314 KG
	2012 KG	1098 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

1G3WH52K1WF303292 TYPE PASS CAR

GEN

Photo No. A-40 - Vehicle Certification Label



TIRE - LOADING INFORMATION

OCCUPANTS		VEHICLE CAP. WT.		
FRT.	RR.	TOTAL	KG	LBS
2	0	3	5	416
				917

MAX. LOADING @ GVWR SAME AS VEHICLE CAPACITY WEIGHT  
1G3WH52K1WF303292

MODEL: WH59 WAN

TIRE SIZE SPEED RTG COLD TIRE PRESSURE

FRT P225/60R16 S 210KPA(30PSI)

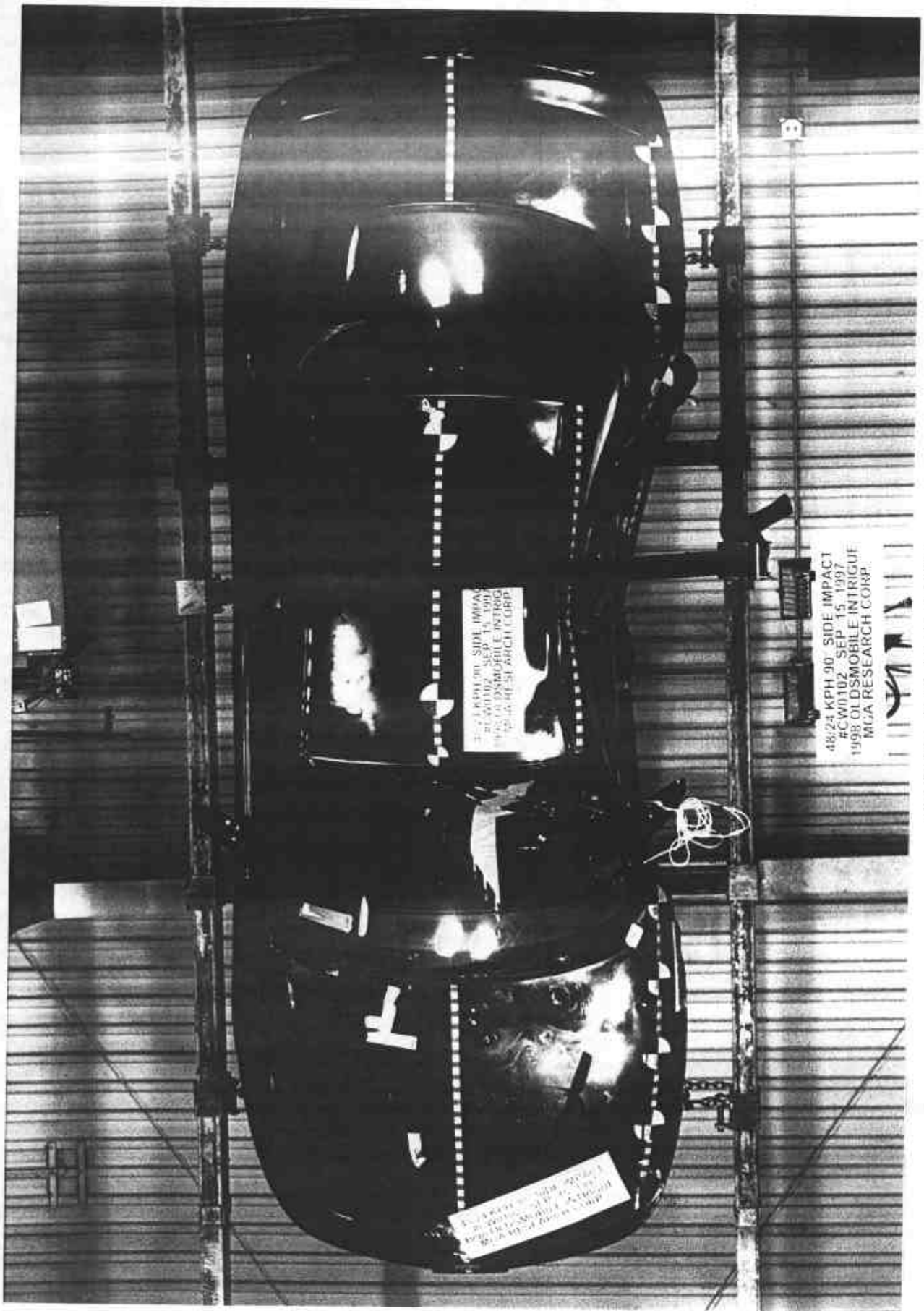
RR P225/60R16 S 210KPA(30PSI)

SPA T125/70D15 M 420KPA(60PSI)

IF TIRES ARE HOT, ADD 28KPA(4LBS)

SEE OWNER'S MANUAL FOR MORE INFORMATION

GEN<sup>®</sup>GM



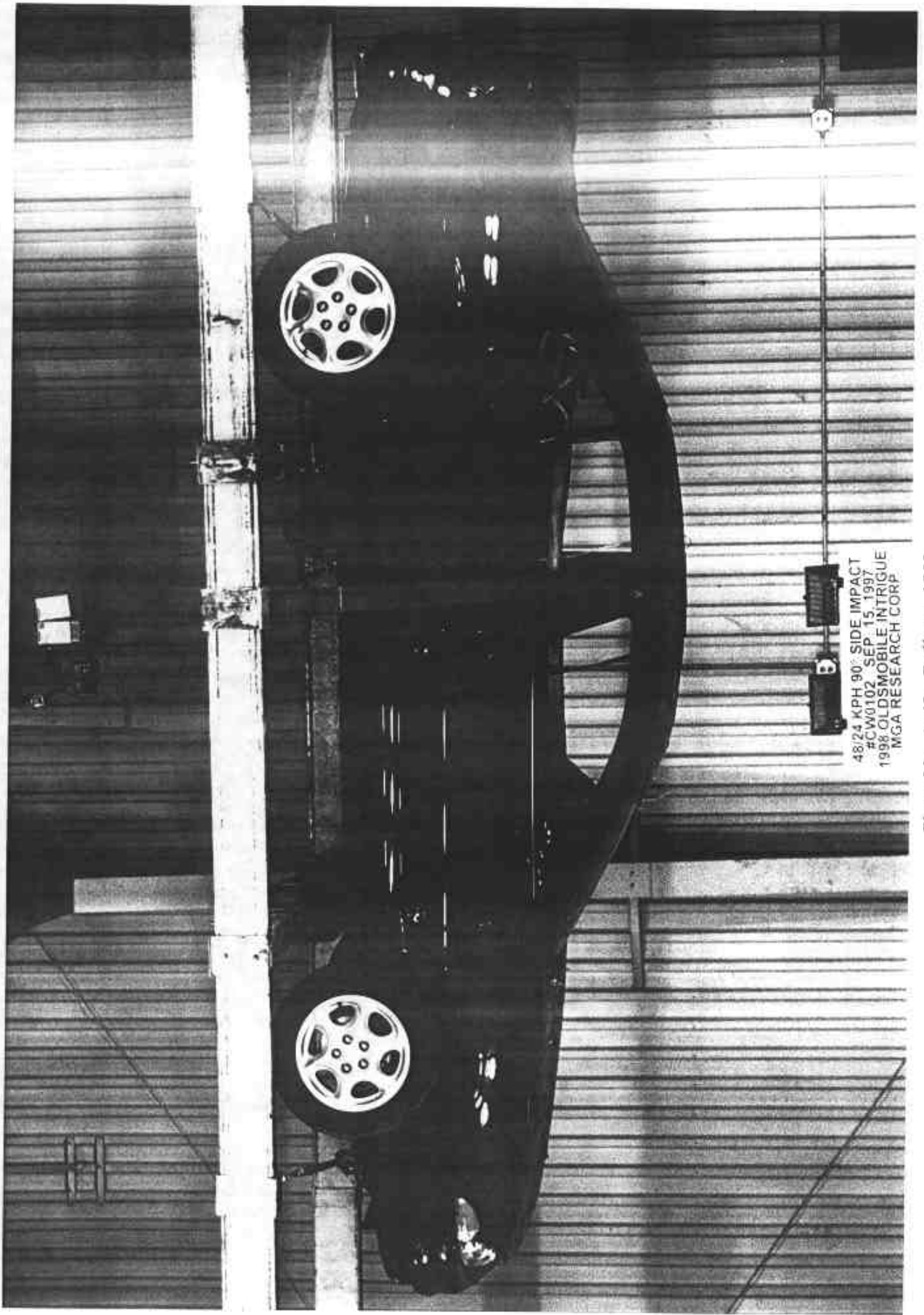
48/24 KPH 90° SIDE IMPACT  
#CW0102 SEP 15 1997  
1998 OLDSMOBILE INTRIGUE  
MCA RESEARCH CORP.

48/24 KPH 90° SIDE IMPACT  
#CW0102 SEP 15 1997  
1998 OLDSMOBILE INTRIGUE  
MCA RESEARCH CORP.

48/24 KPH 90° SIDE IMPACT  
#CW0102 SEP 15 1997  
1998 OLDSMOBILE INTRIGUE  
MCA RESEARCH CORP.



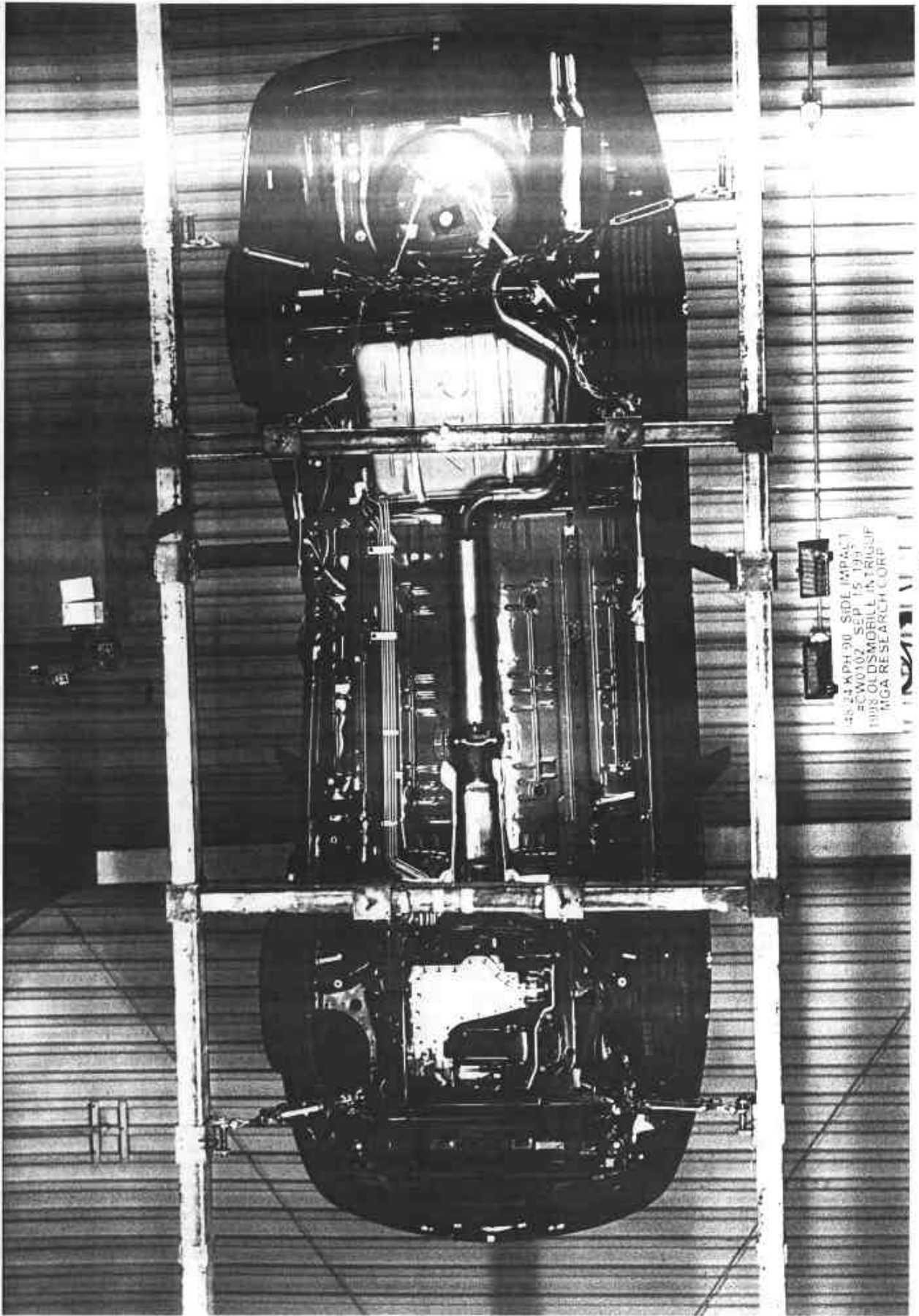
Photo No. A-42 - Rollover 90°



48/24 KPH 90° SIDE IMPACT  
#CW0102 SEP 15, 1997  
1998 OLDSMOBILE INTRIGUE  
MGA RESEARCH CORP

Photo No. A-43 - Rollover 180°

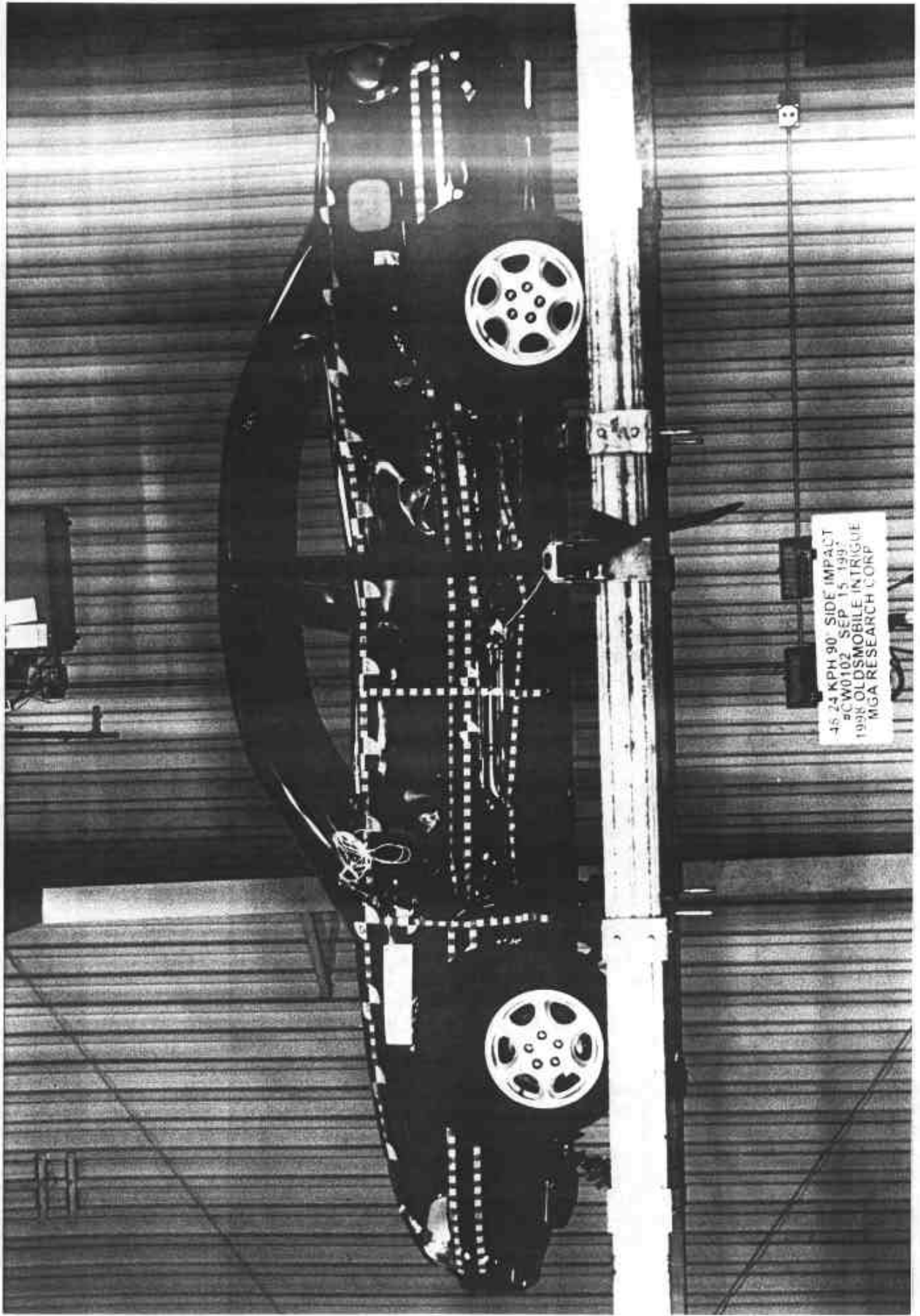
A-43



48-24 MPH 90 SIDE IMPACT  
#CW0102 SEP 15 1997  
1998 OLDSMOBILE INTRIGUE  
MGA RESEARCH CORP

A-44

Photo No. A-44 - Rollover 270°



A-45

Photo No. A-45 - Rollover 360°



Photo No. A-46 - Left Front Attitude Point

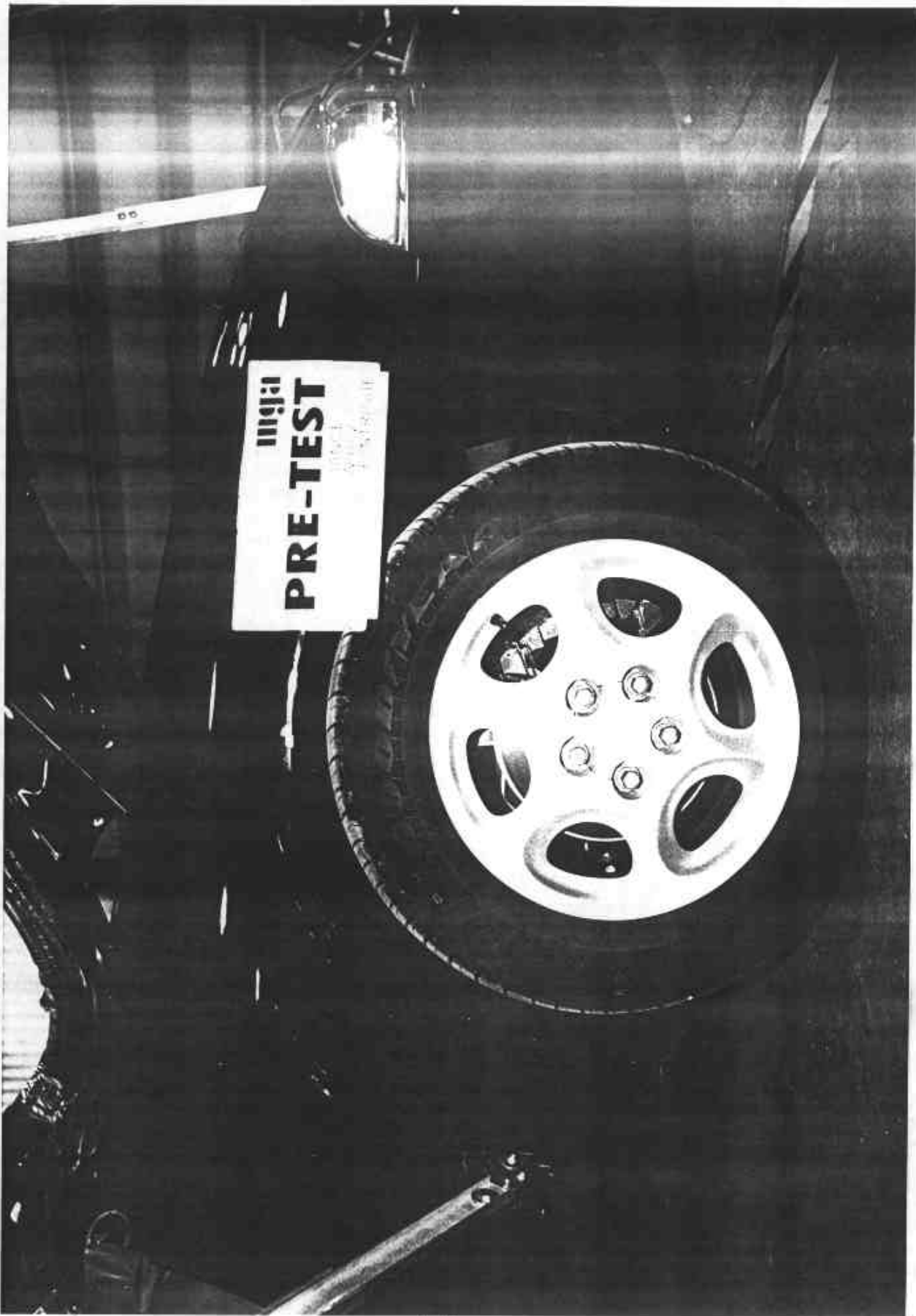


Photo No. A-47 - Right Front Attitude Point

A-47



Photo No. A-48 - Left Rear Attitude Point

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Photo No. A-49 - Right Rear Attitude Point

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\* Data is not valid after 30 msec.

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\*\* Data not valid after approximately 20 msec.

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TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

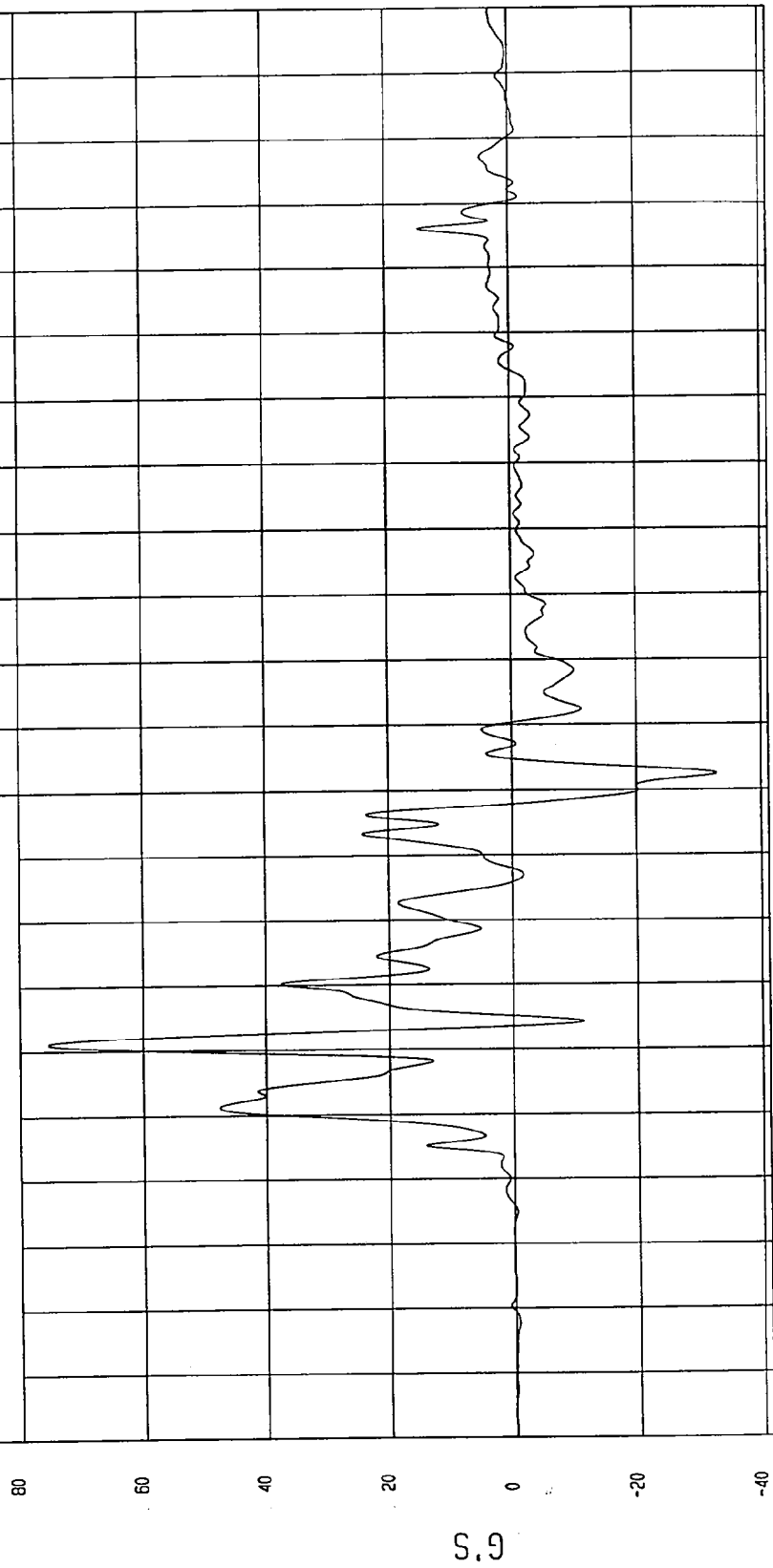
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 75.51 G'S at 41 msec

Minimum = -32.98 G'S at 82 msec

DRIVER UPPER RIB Y ACCELERATION

1 B97106AF.A15 Filter:less (180)



MGA Research  
09-25-1997 12:21

TIME (SECONDS)

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

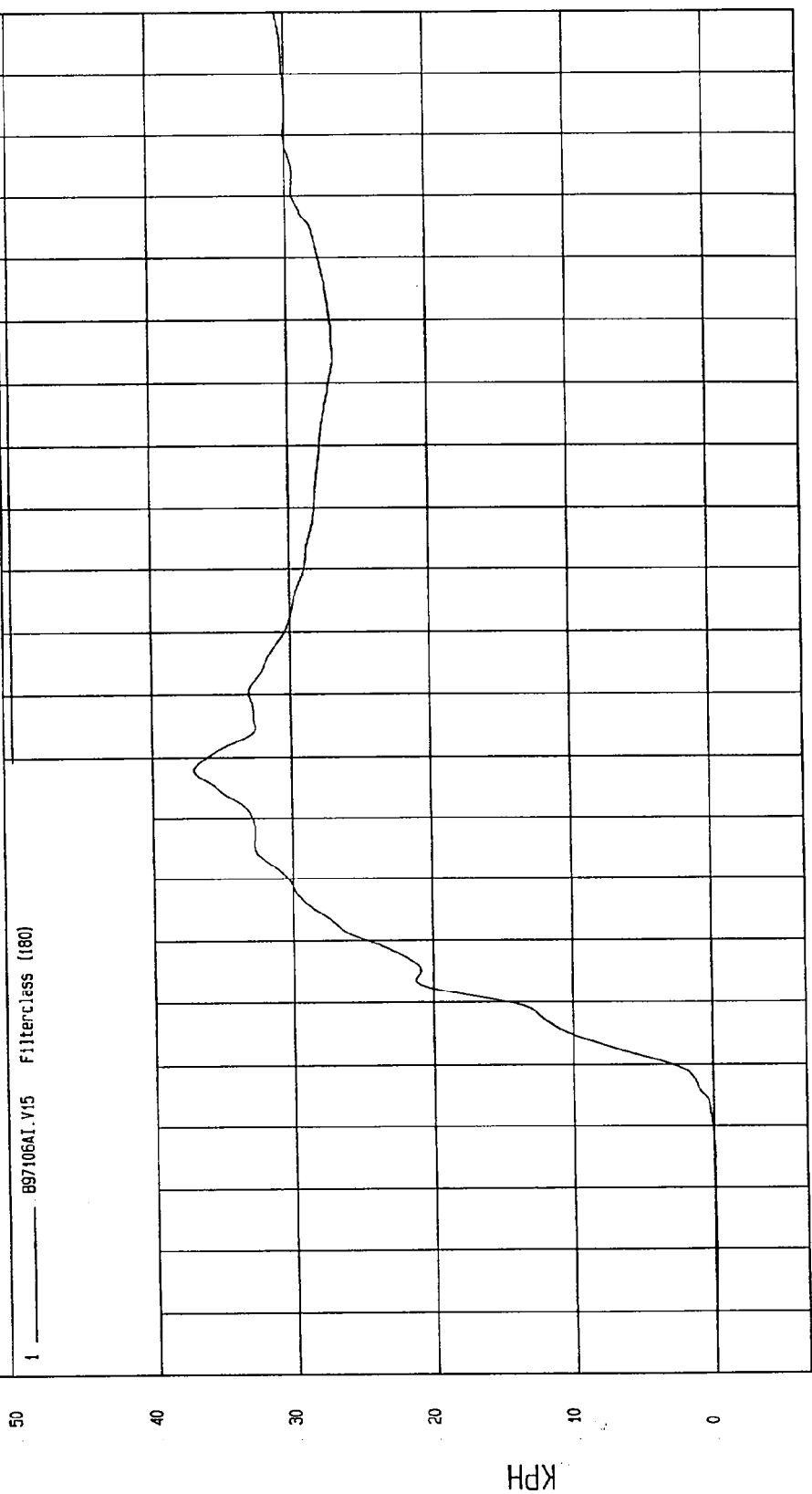
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 37.05 KPH at 78 msec

Minimum = -1.11 KPH at -1 msec

DRIVER UPPER RIB Y VELOCITY

897106A1.V15 Filterclass (180)



TIME Seconds

NSA REPORT  
09-26-1997 10:18

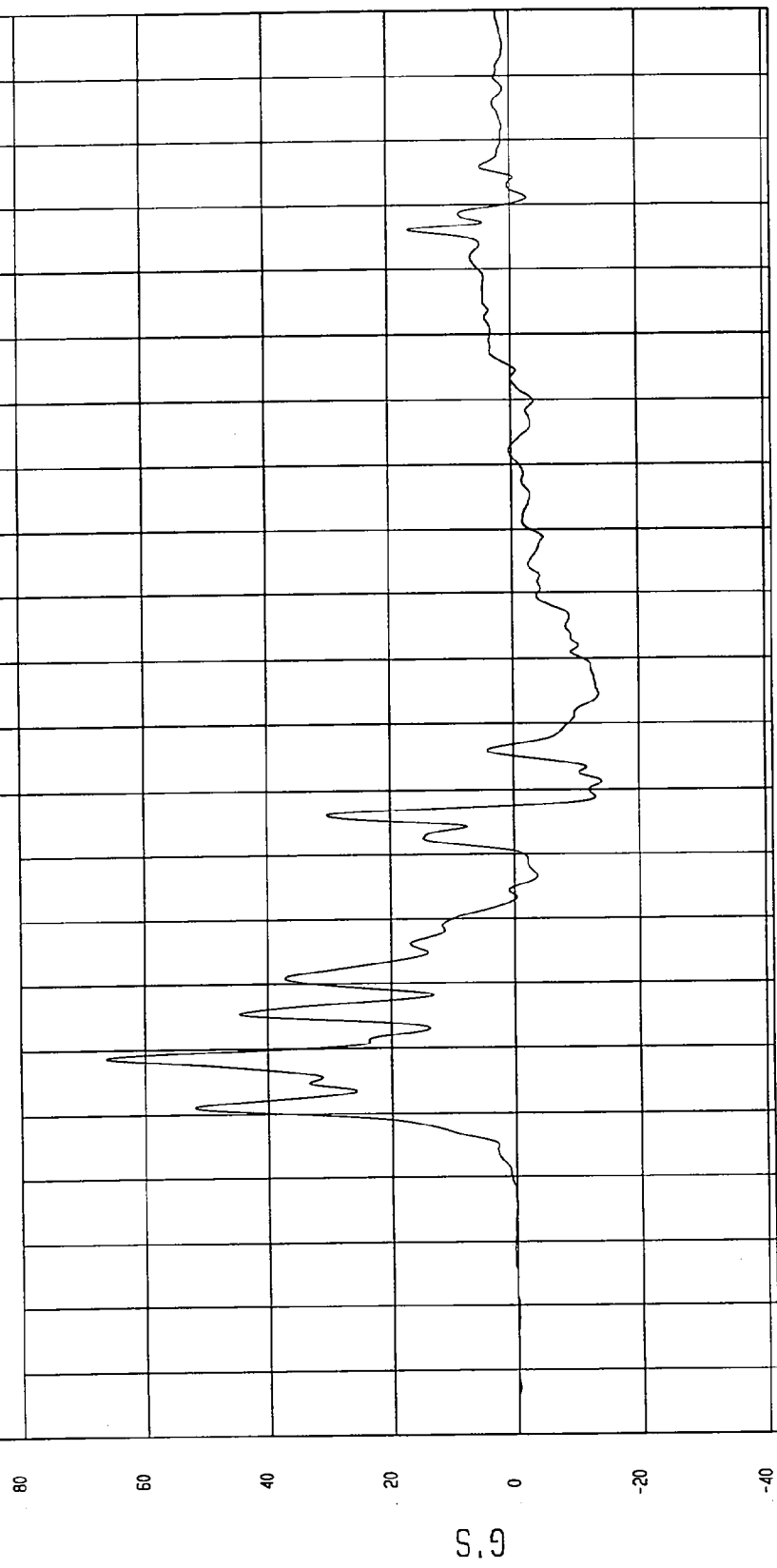
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -14.15 G'S at 81 msec Maximum = 66.29 G'S at 39 msec

DRIVER LOWER RIB Y ACCELERATION

1 B97106AF.A16 Filterclass (180)



MSA Research  
09-25-1997 12:22

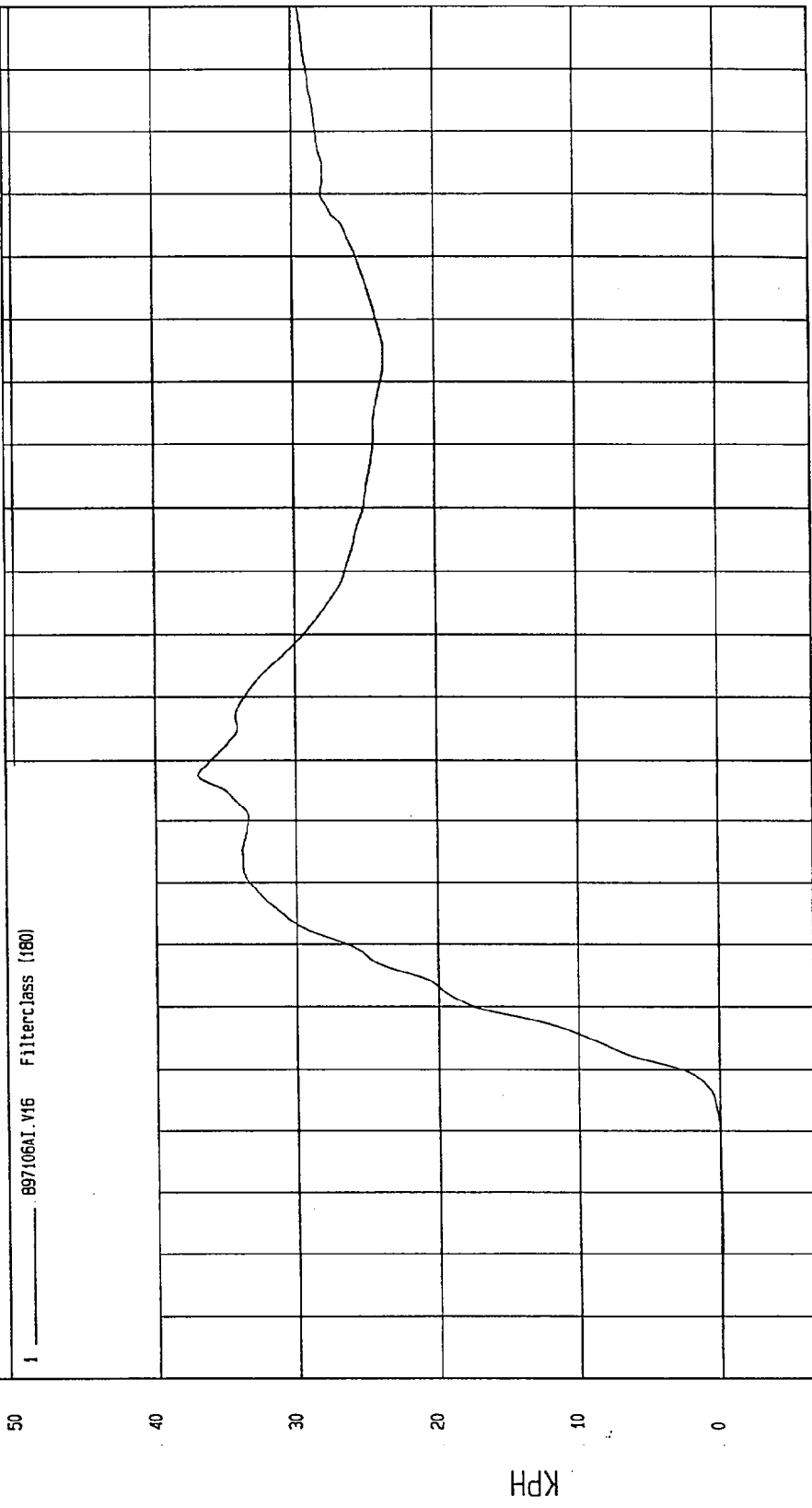
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -.10 KPH at 5 msec  
Maximum = 37.01 KPH at 78 msec

DRIVER LOWER RIB Y VELOCITY

1 . . . . . 897106AT.V16 Filterclass (160)



TIME Seconds  
M&A Research  
09-26-1997 10:18

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

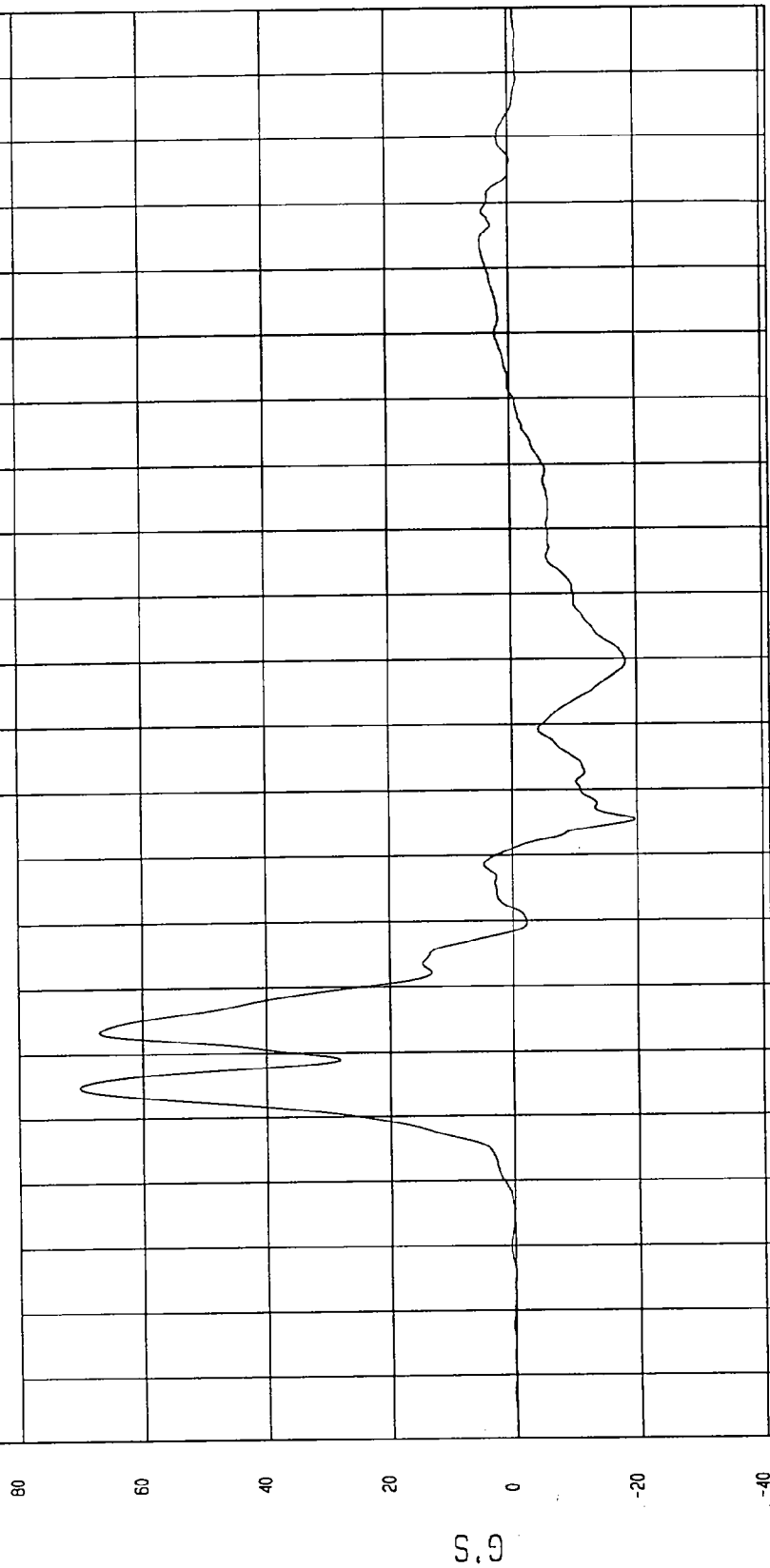
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 70.26 G'S at 35 msec

Minimum = -19.65 G'S at 75 msec

DRIVER LOWER SPINE Y ACCELERATION

897106AF.A17 FilterClass (180)



NCA Research  
09-25-1997 12:22

TIME (SECONDS)

G.S

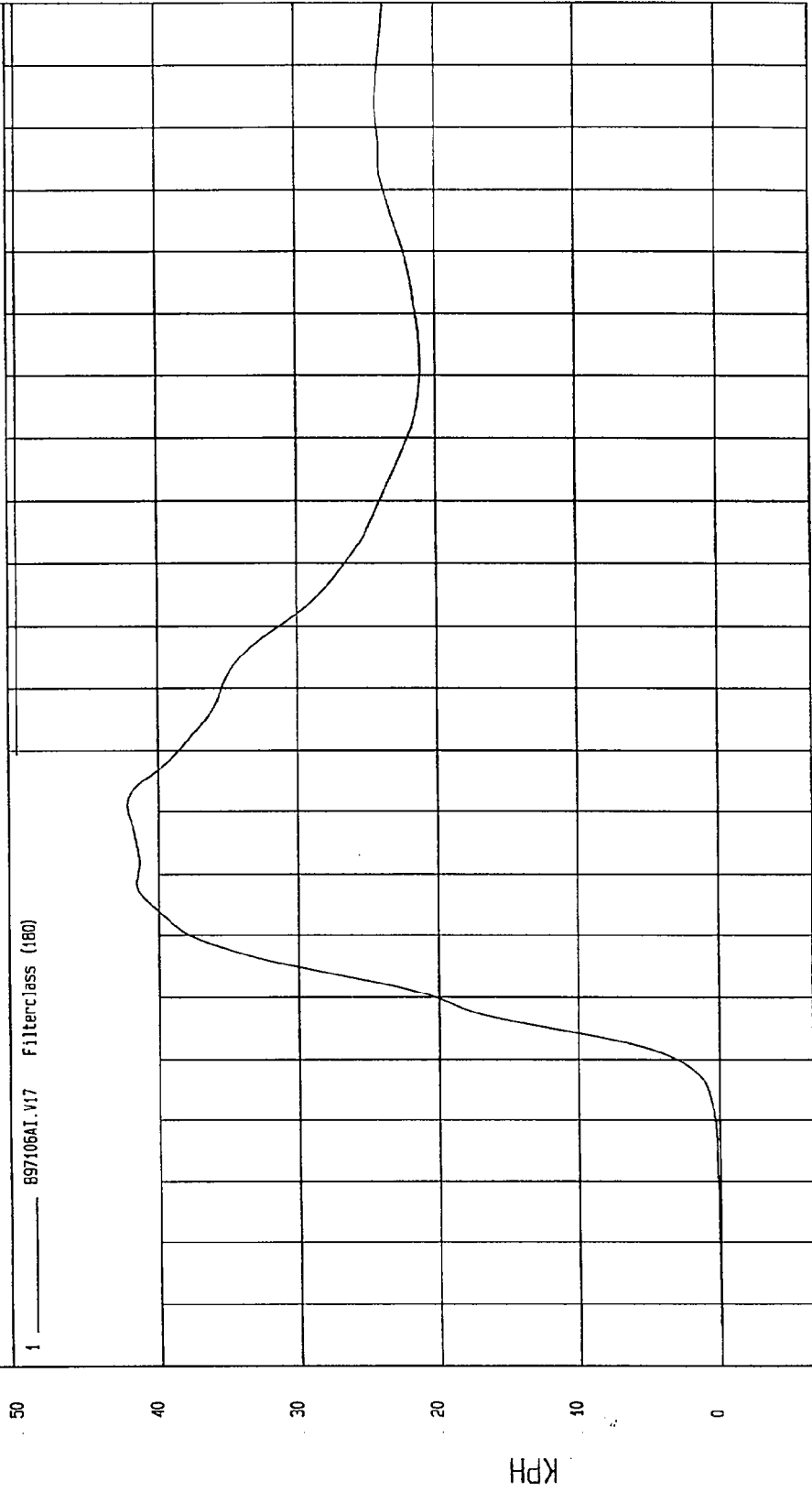
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -5.35E-04 KPH at -20 msec  
Maximum = 42.17 KPH at 71 msec

DRAIVER LOWER SPINE Y VELOCITY

1 897106AI.V17 Filterclass (180)



TIME Seconds  
NCA Research  
09-26-1997 10:18

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

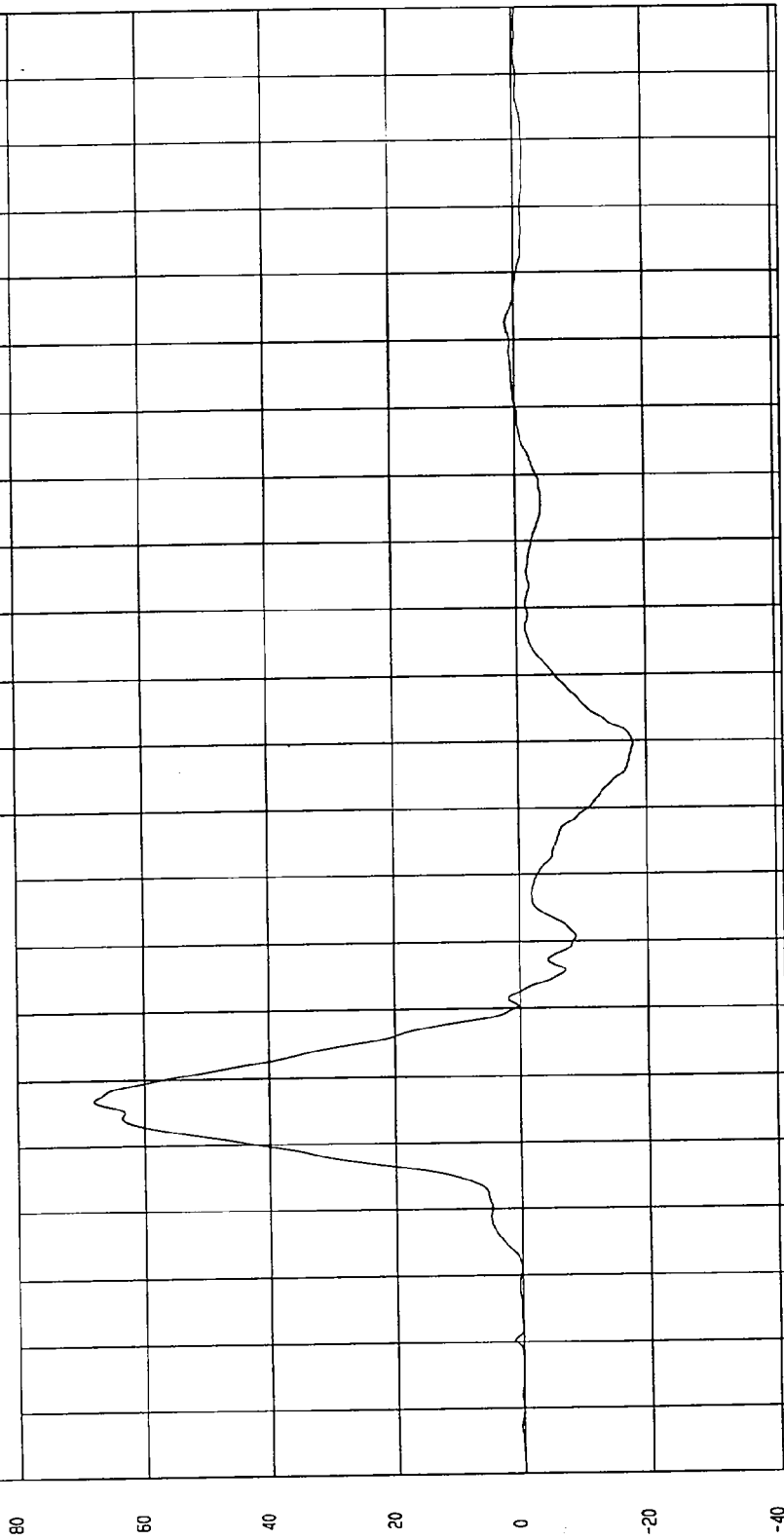
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Maximum = 67.84 G'S at 37 msec

Minimum = -17.88 G'S at 90 msec

DRIVER PELVIS Y ACCELERATION

1 B97106AF.A18 FilterClass (180)



MSA Research  
09-25-1997 12:22

TIME (SECONDS)

G.S

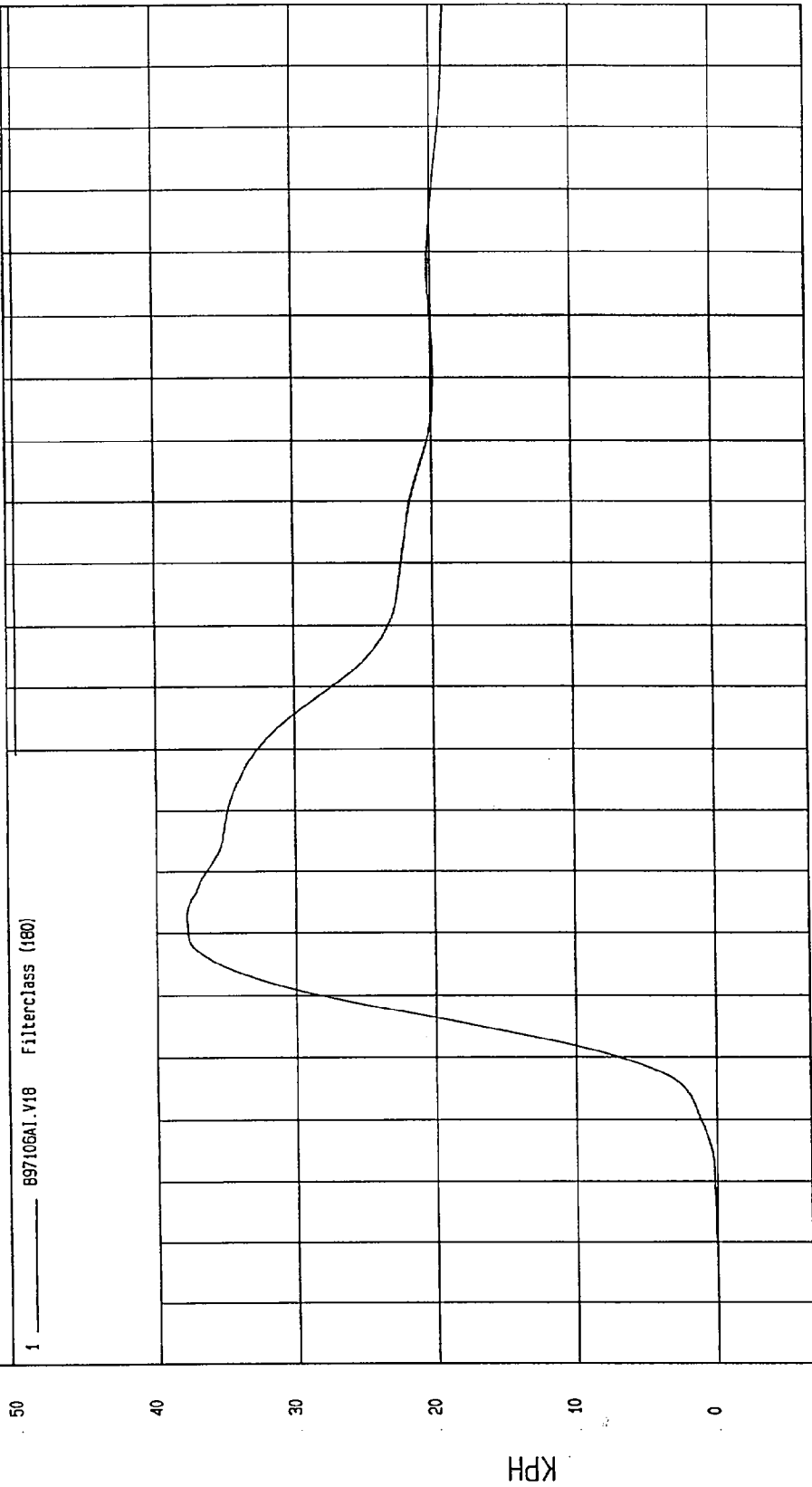
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -6.68E-03 KPH at -17 msec Maximum = 37.85 KPH at 52 msec

DRIVER PELVIS Y VELOCITY

1 897106A1.V18 Filterclass (180)



MCA Research  
09-25-1997 10:18

TIME Seconds

KPH

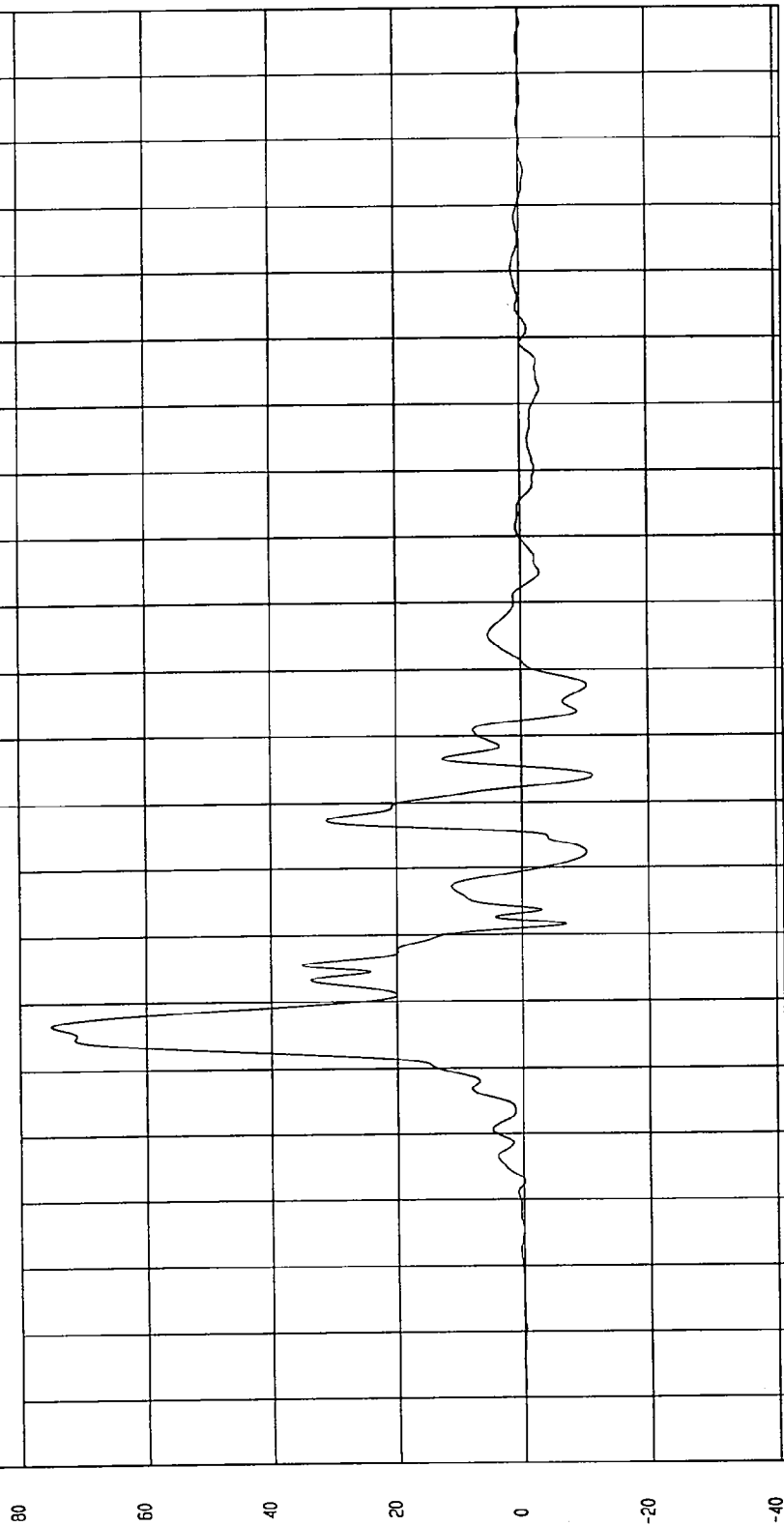
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -11.31 G'S at 84 msec  
Maximum = 74.88 G'S at 47 msec

REAR PASSENGER UPPER RIB Y ACCELERATION

Filterclass (180)



NCA Research  
09-25-1997 12:22

TIME (SECONDS)

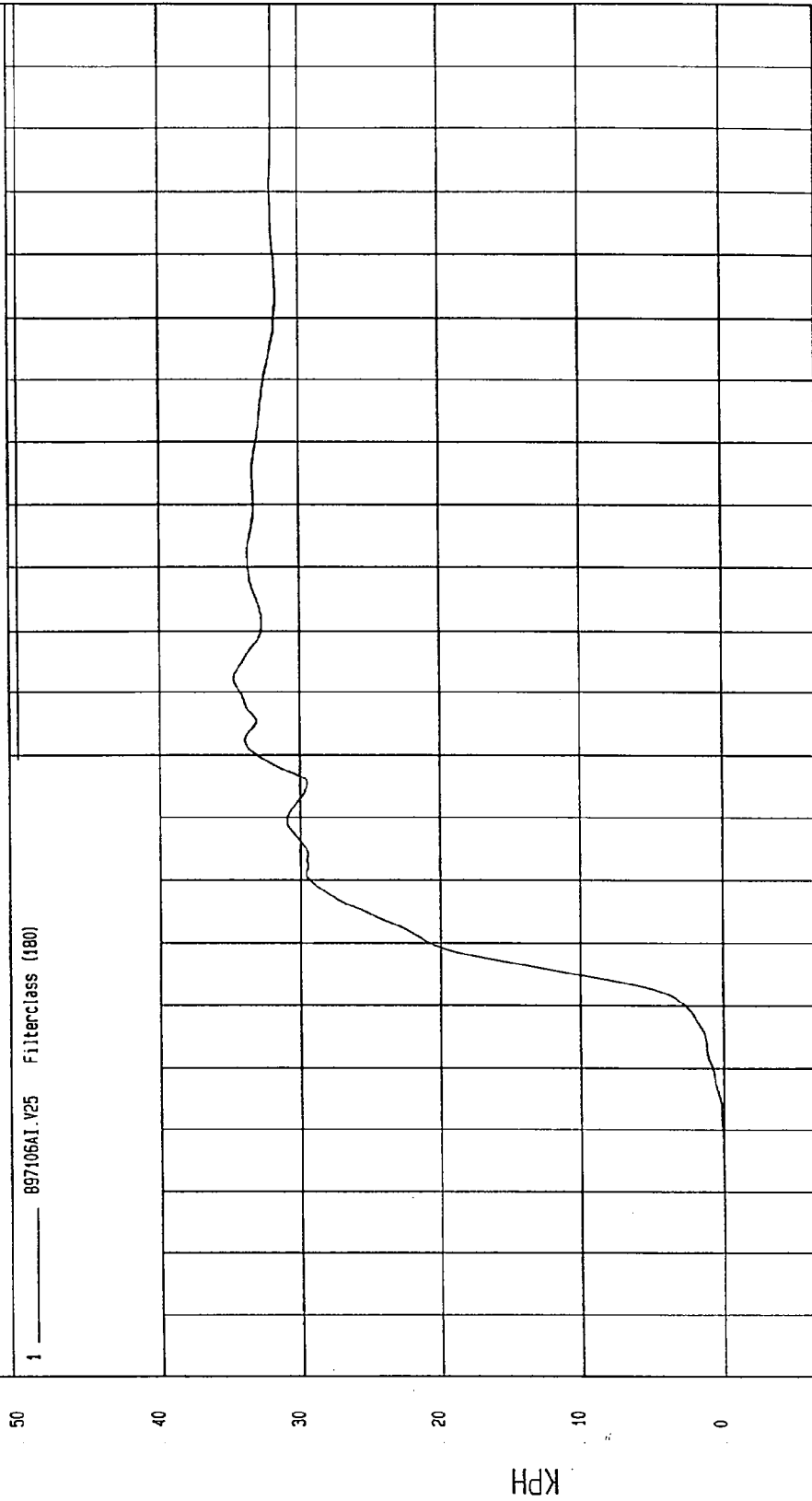
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -4.22E-02 KPH at 5 msec  
Maximum = 34.67 KPH at 92 msec

REAR PASSENGER UPPER RIB Y VELOCITY

1 897106A1.V25 Filterclass (180)



TIME Seconds  
MCA Research  
09-26-1997 10:18

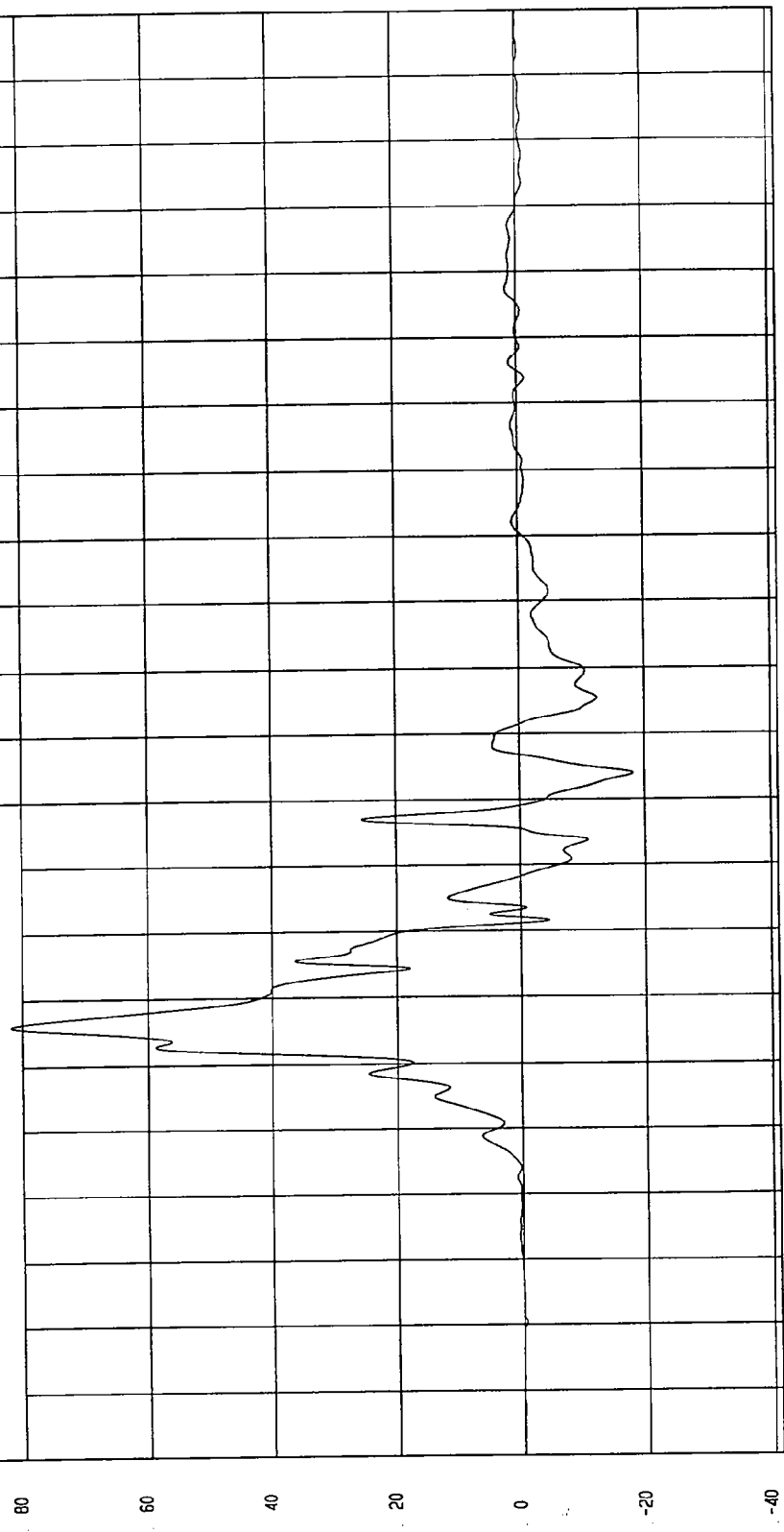
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -18.17 G'S at 84 msec  
Maximum = 81.91 G'S at 46 msec

REAR PASSENGER LOWER RIB Y ACCELERATION

1 \_\_\_\_\_ B97105AF.A26 Filter: class (180)



MCA Research  
09-25-1997 12:22

TIME (SECONDS)

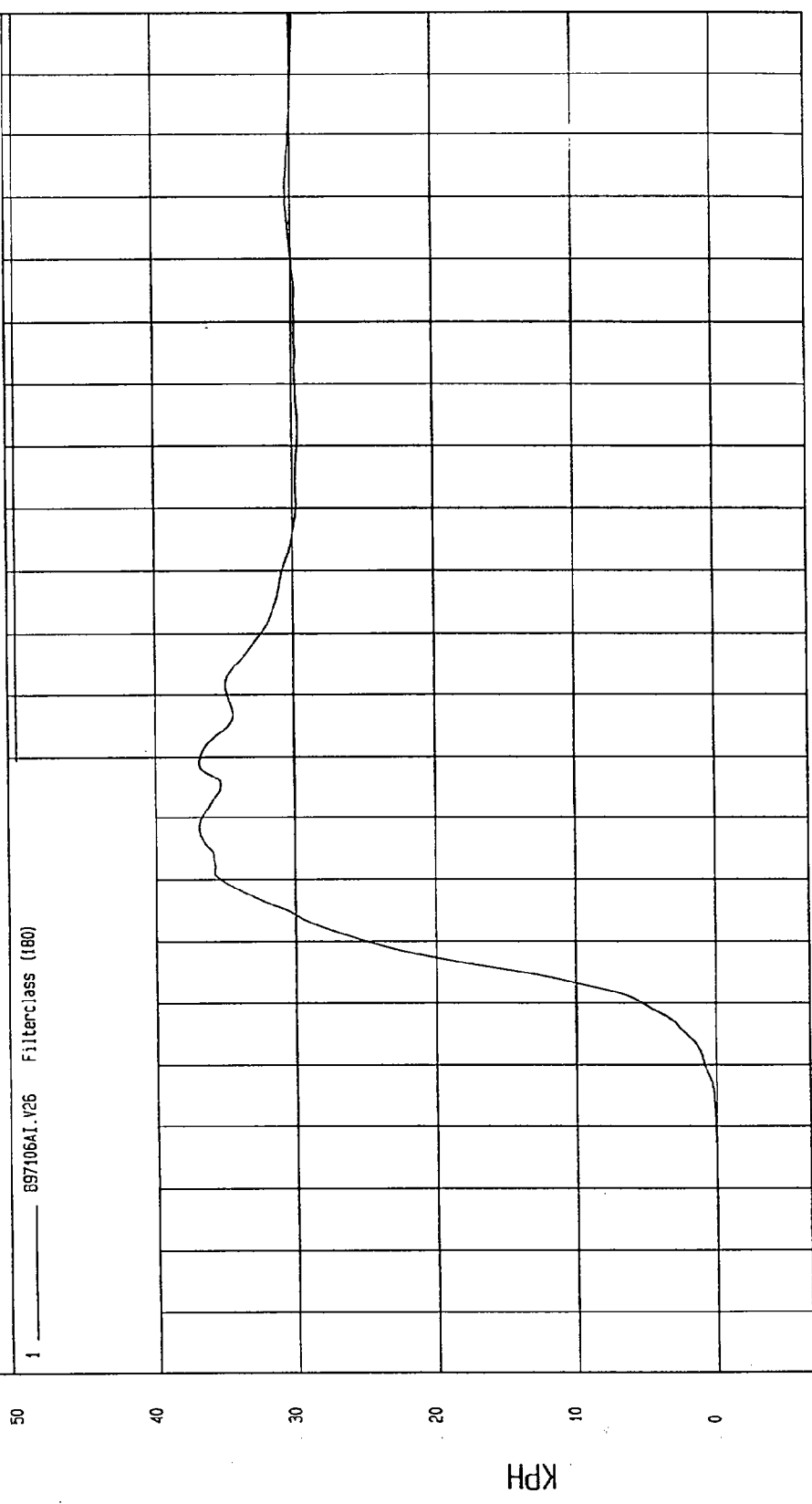
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -4.06E-02 KPH at 6 msec  
Maximum = 36.92 KPH at 68 msec

REAR PASSENGER LOWER RIB Y VELOCITY

1 — 897106AI.V26 Filterclass (180)



MCA Research  
09-26-1997 10:18

TIME Seconds

KPH

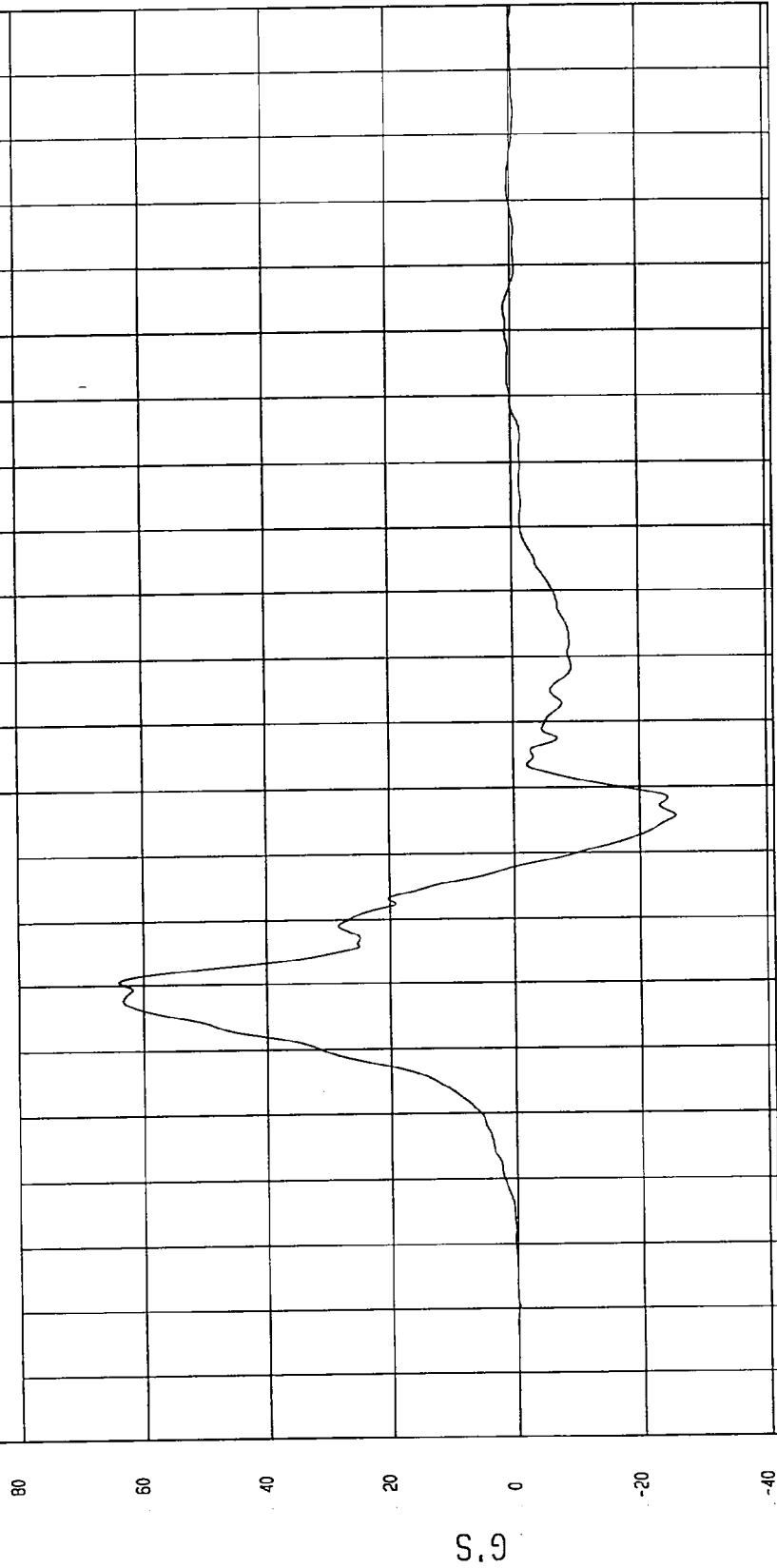
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -25.72 G'S at 76 msec  
Maximum = 63.91 G'S at 50 msec

REAR PASSENGER LOWER SPINE Y ACCELERATION

1 897106AF.A27 Filterclass (180)



MCA Research  
09-25-1997 12:22

TIME (SECONDS)

G.S

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

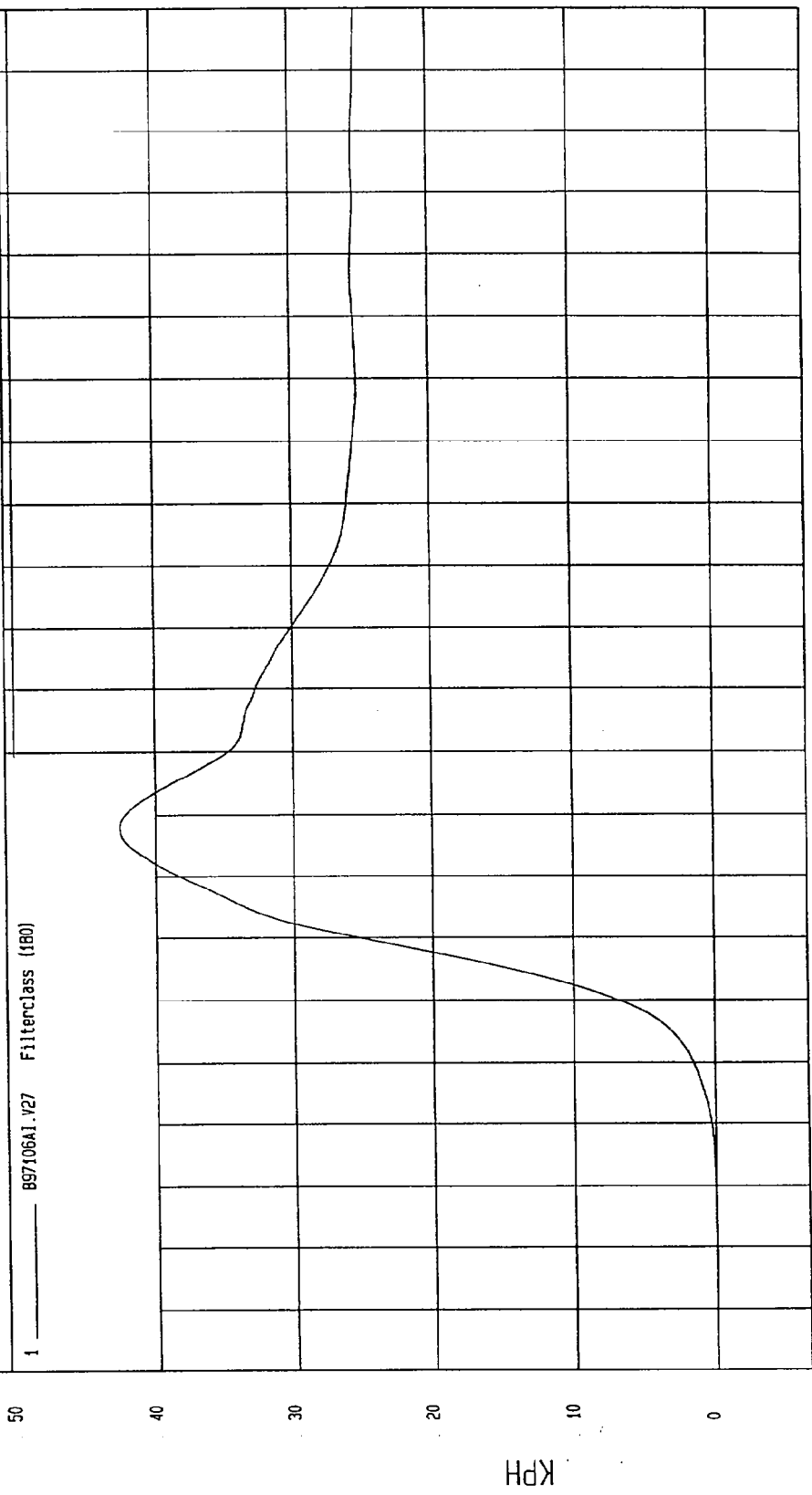
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 42.51 KPH at 68 msec

Minimum = -6.40E-04 KPH at -10 msec

REAR PASSENGER LOWER SPINE Y VELOCITY

1 897106A1.V27 FilterClass (180)



MCA Research  
09-25-1997 10:19

TIME Seconds

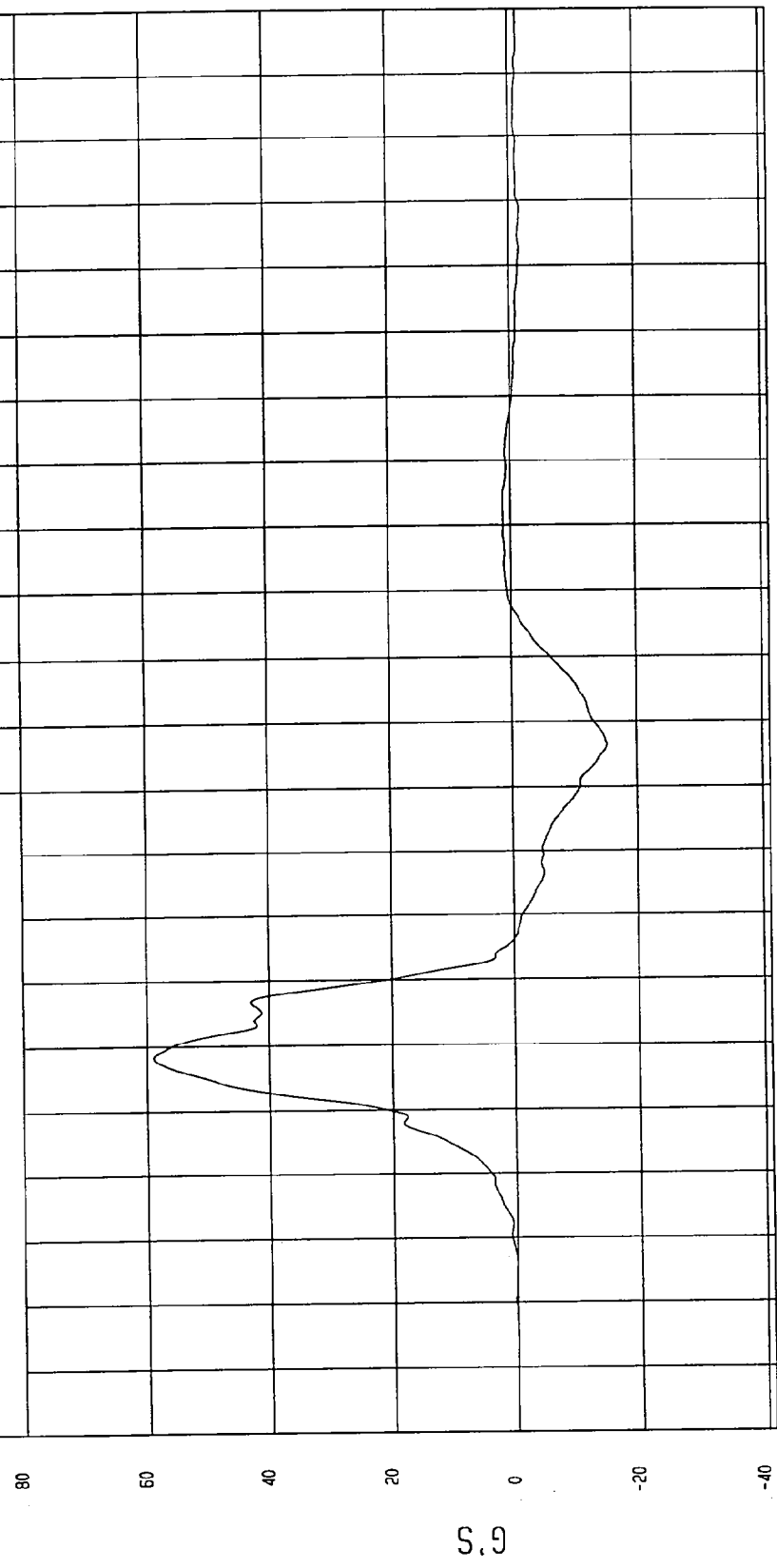
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -15.01 G'S at 86 msec Maximum = 58.92 G'S at 38 msec

REAR PASSENGER PELVIS Y ACCELERATION

1 B97106AF.A28 Filterclass (160)



MGA Research  
09-26-1997 10:13

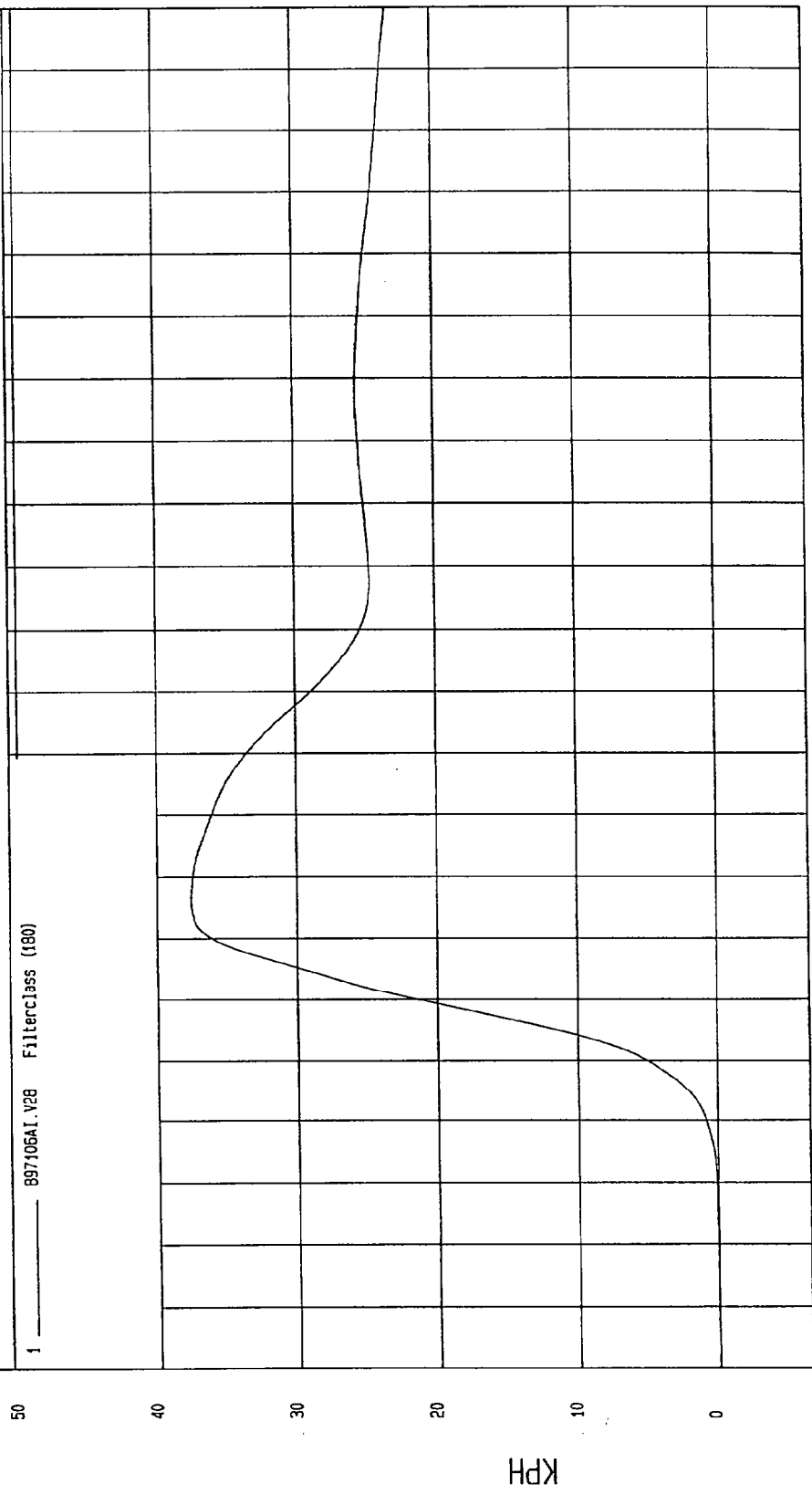
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -1.42E-04 KPH at -19 msec Maximum = 37.56 KPH at 56 msec

REAR PASSENGER PELVIS Y VELOCITY

1 897106A1.V28 Filterclass (180)



TIME Seconds

MCA Research  
09-26-1997 10.19

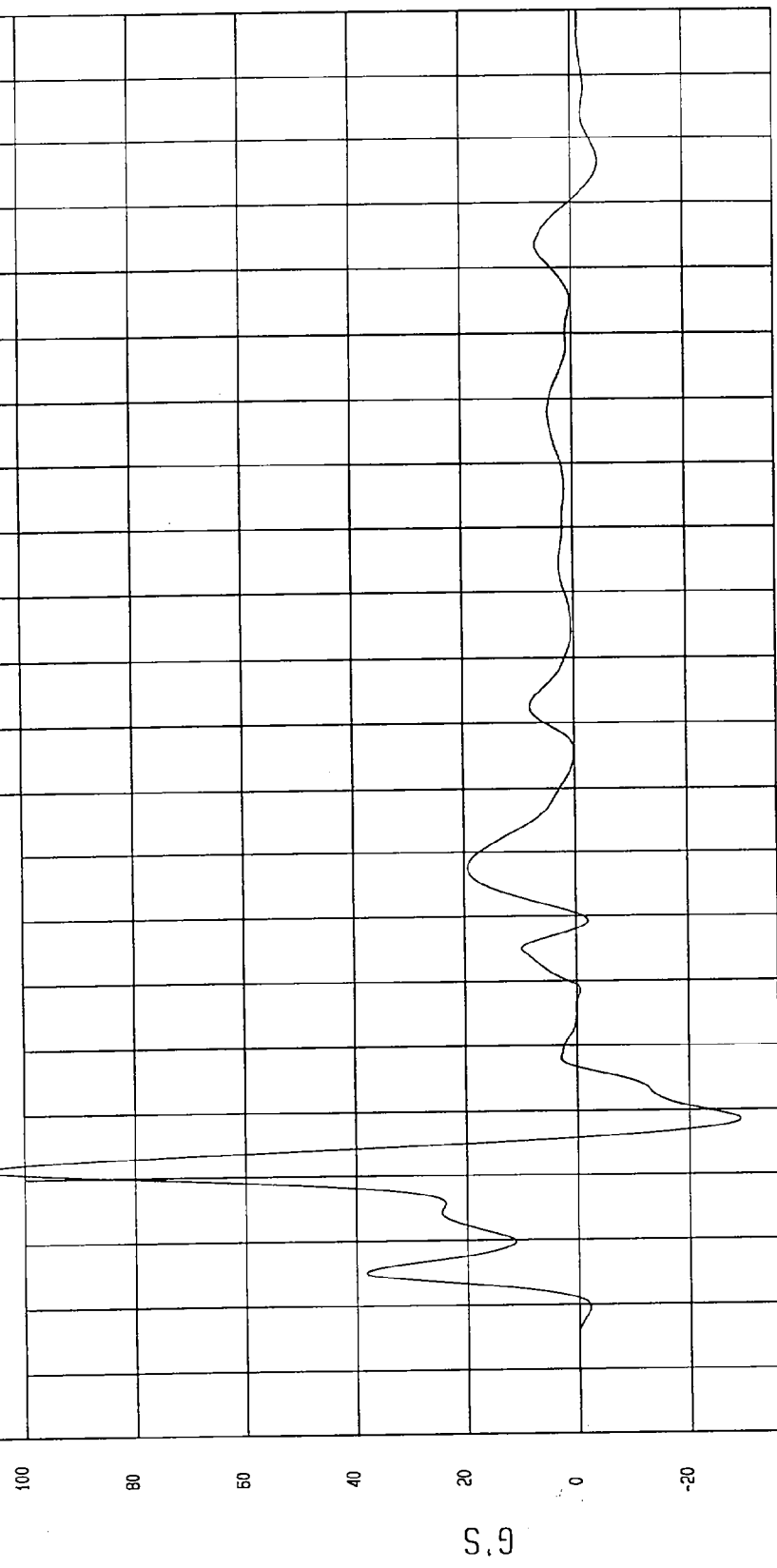
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -29.08 G'S at 28 msec  
Maximum = 107.13 G'S at 21 msec

LEFT SIDE SILL AT FRONT SEAT Y ACCELERATION

1 ——— B97105AF.A38 Filterclass (60)



MCA Research  
09-25-1997 12.15

TIME (SECONDS)

G'S

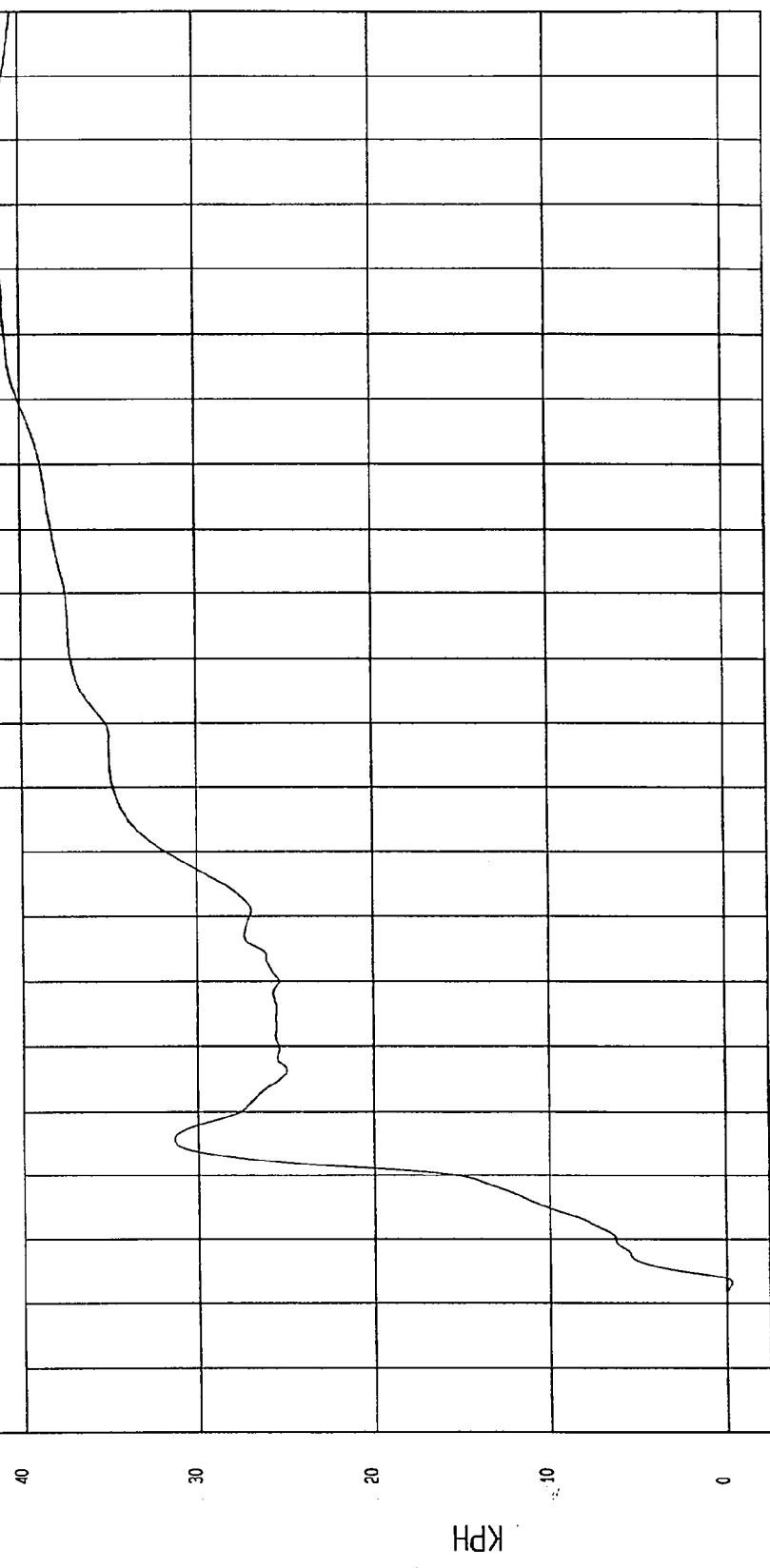
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -.33 KPH at 3 msec  
Maximum = 42.94 KPH at 170 msec

LEFT SIDE SILL AT FRONT SEAT Y VELOCITY

1 ——— 897106AI.V38 Filterclass (180)



MSA Research  
09-25-1997 12:15

TIME Seconds

KPH

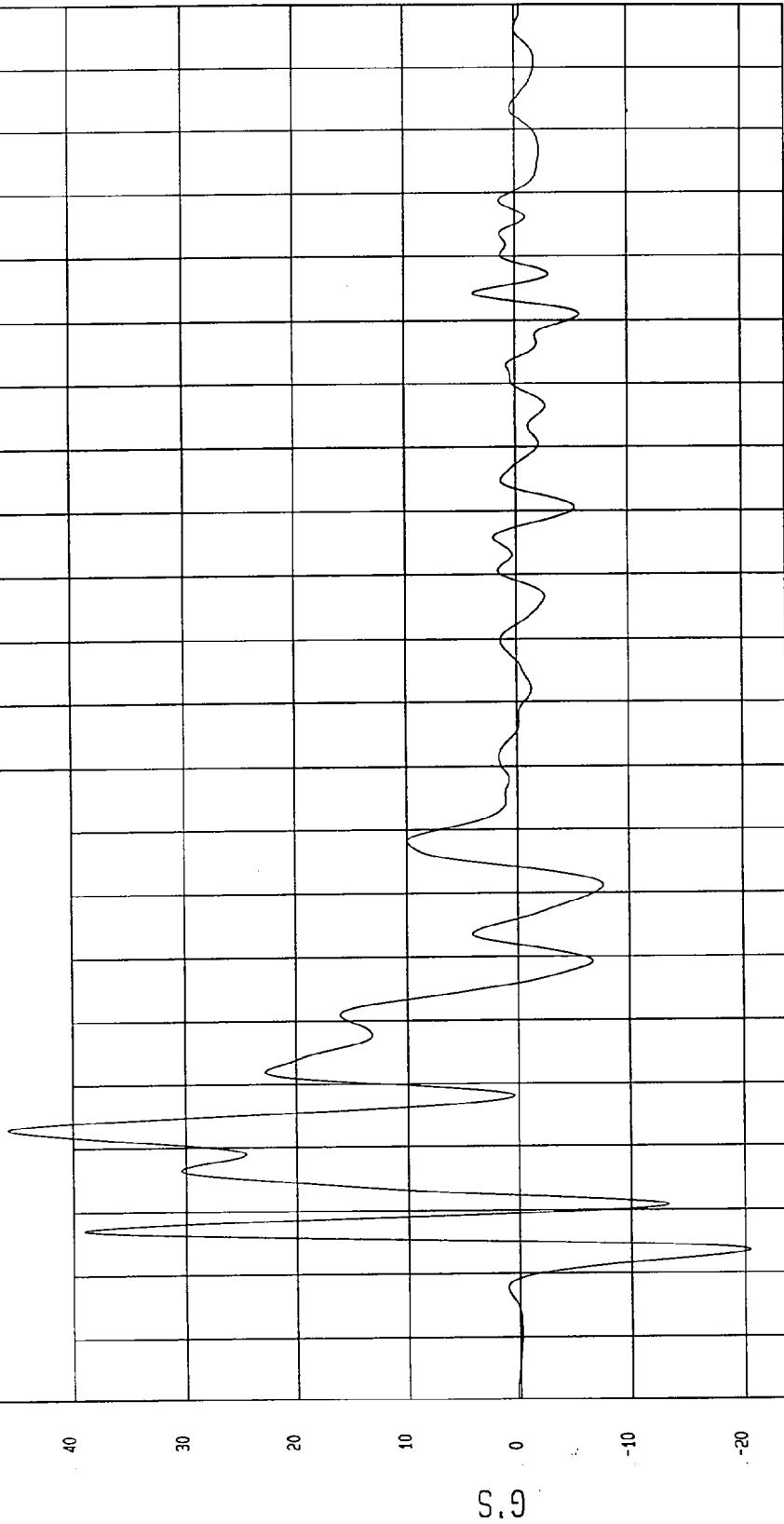
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -20.45 G'S at 4 msec  
Maximum = 45.75 G'S at 23 msec

LEFT SIDE SILL AT REAR SEAT Y ACCELERATION

1 897106AF A39 Filterclass (60)



MSA Research  
09-25-1997 15:44

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

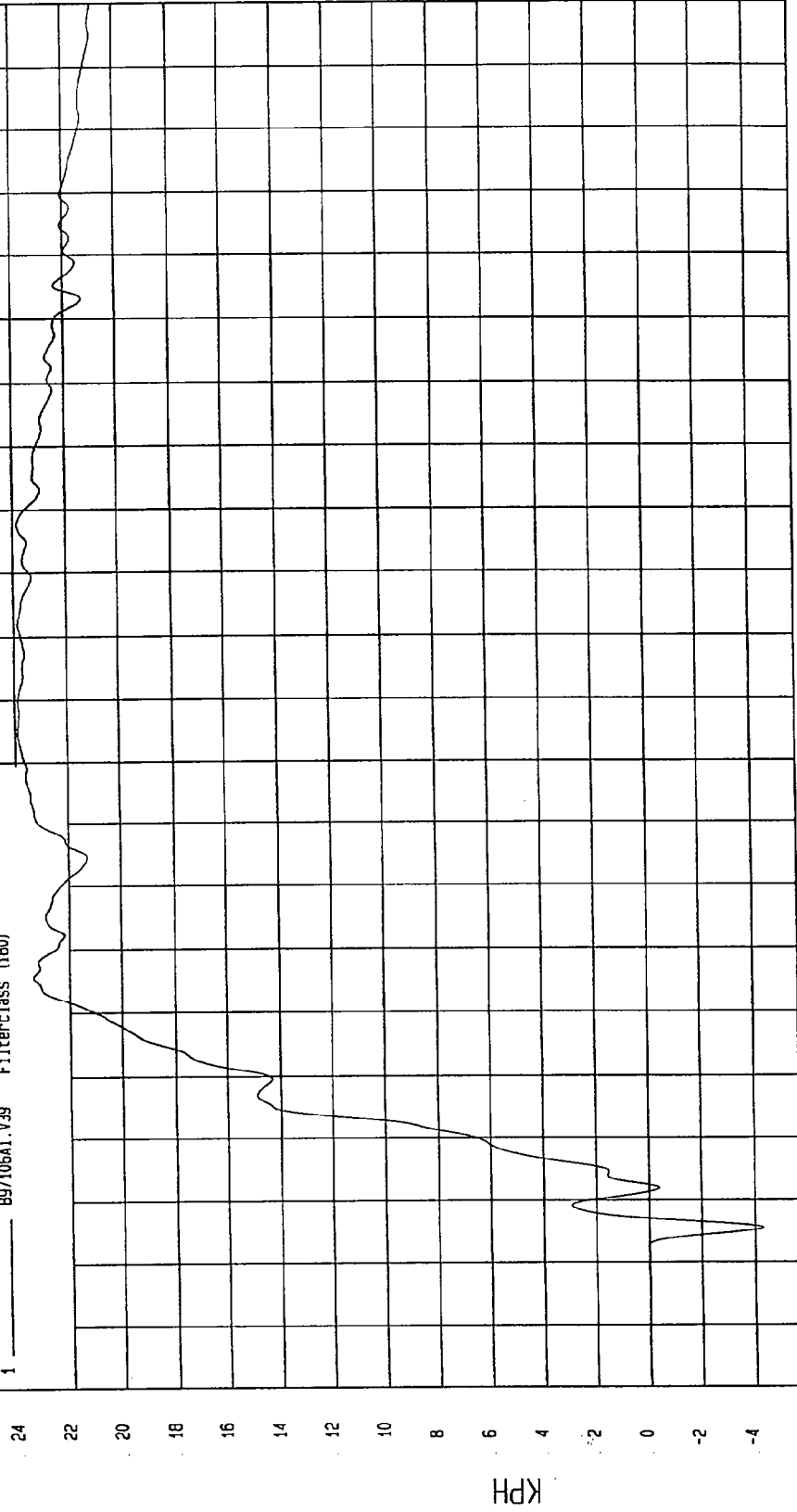
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 23.90 KPH at 85 msec

Minimum = -4.31 KPH at 6 msec

LEFT SIDE SILL AT REAR SEAT Y VELOCITY

1 897106A1.V39 Filterclass (f80)



MGA Research  
09-25-1997 15:44

TIME Seconds

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

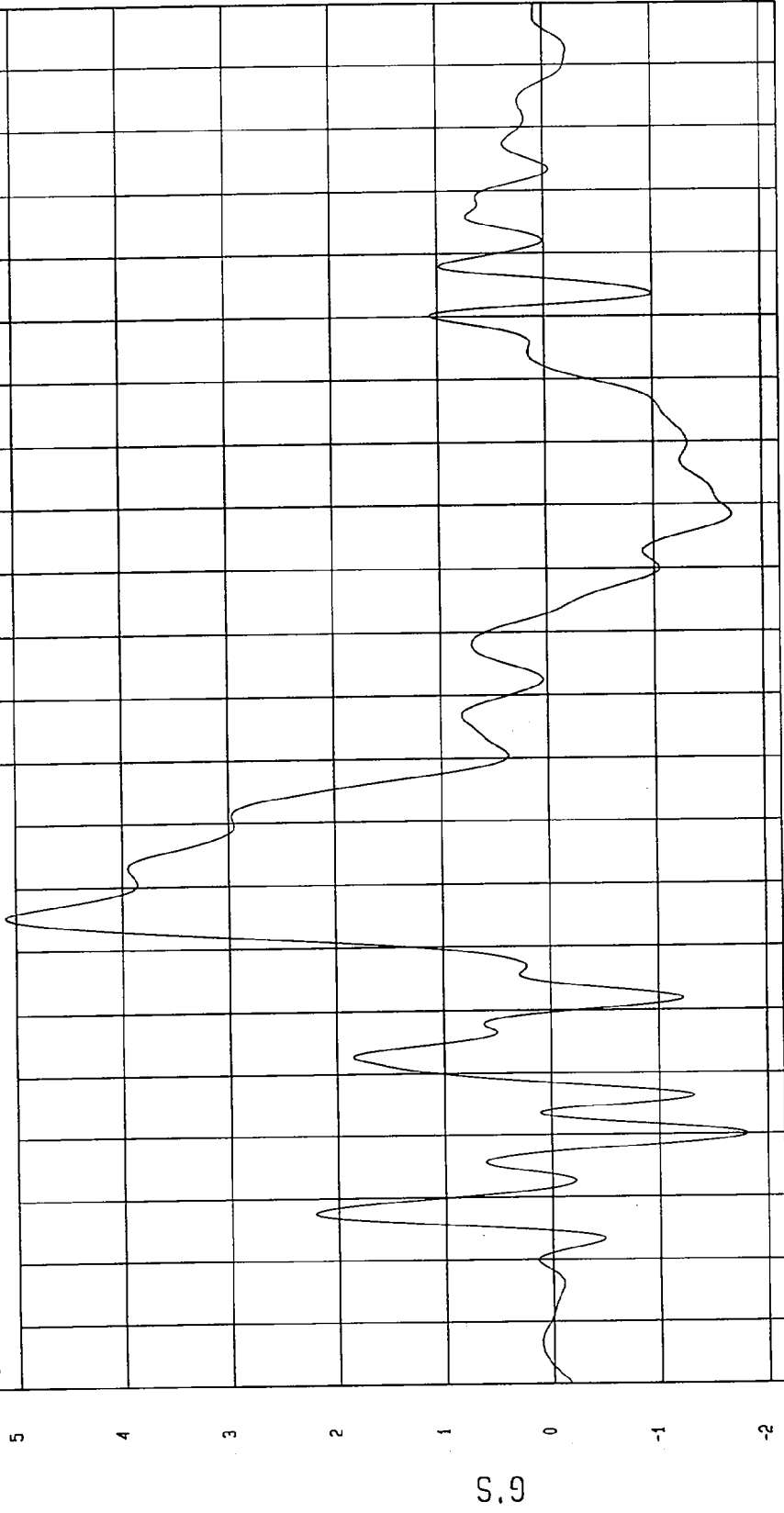
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 5.09 G'S at 55 msec

Minimum = -1.80 G'S at 20 msec

RIGHT SIDE SILL AT FRONT SEAT X ACCELERATION

1 897106AF.A32 Filterclass (60)



MGA Research  
09-25-1997 12:16

TIME (SECONDS)

G.S

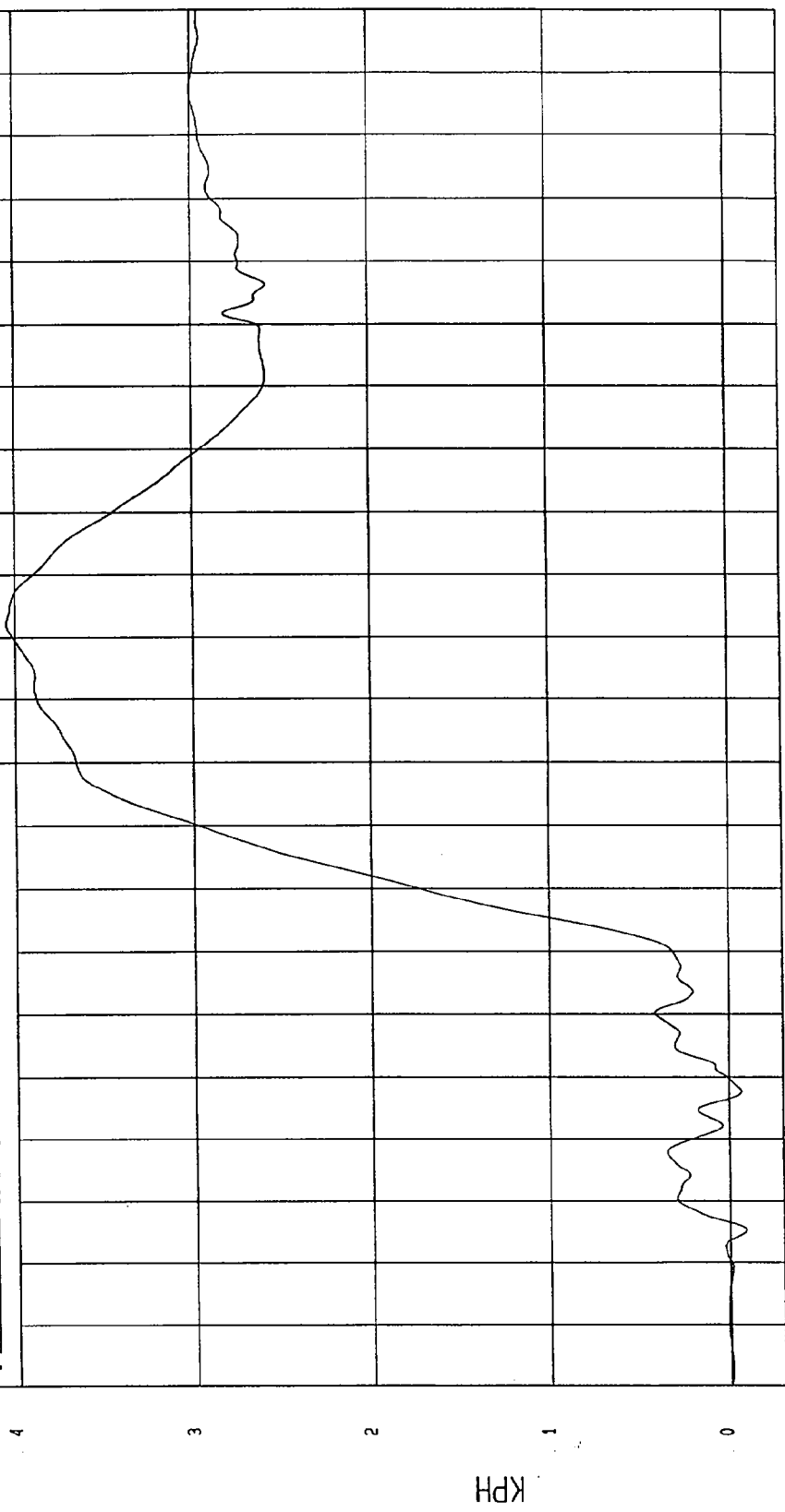
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -8.94E-02 KPH at 5 msec  
Maximum = 4.04 KPH at 102 msec

RIGHT SIDE SILL AT FRONT SEAT X VELOCITY

1 897106A1.V32 Filterclass (180)



TIME Seconds  
NSA Research  
09-23-1997 12:16

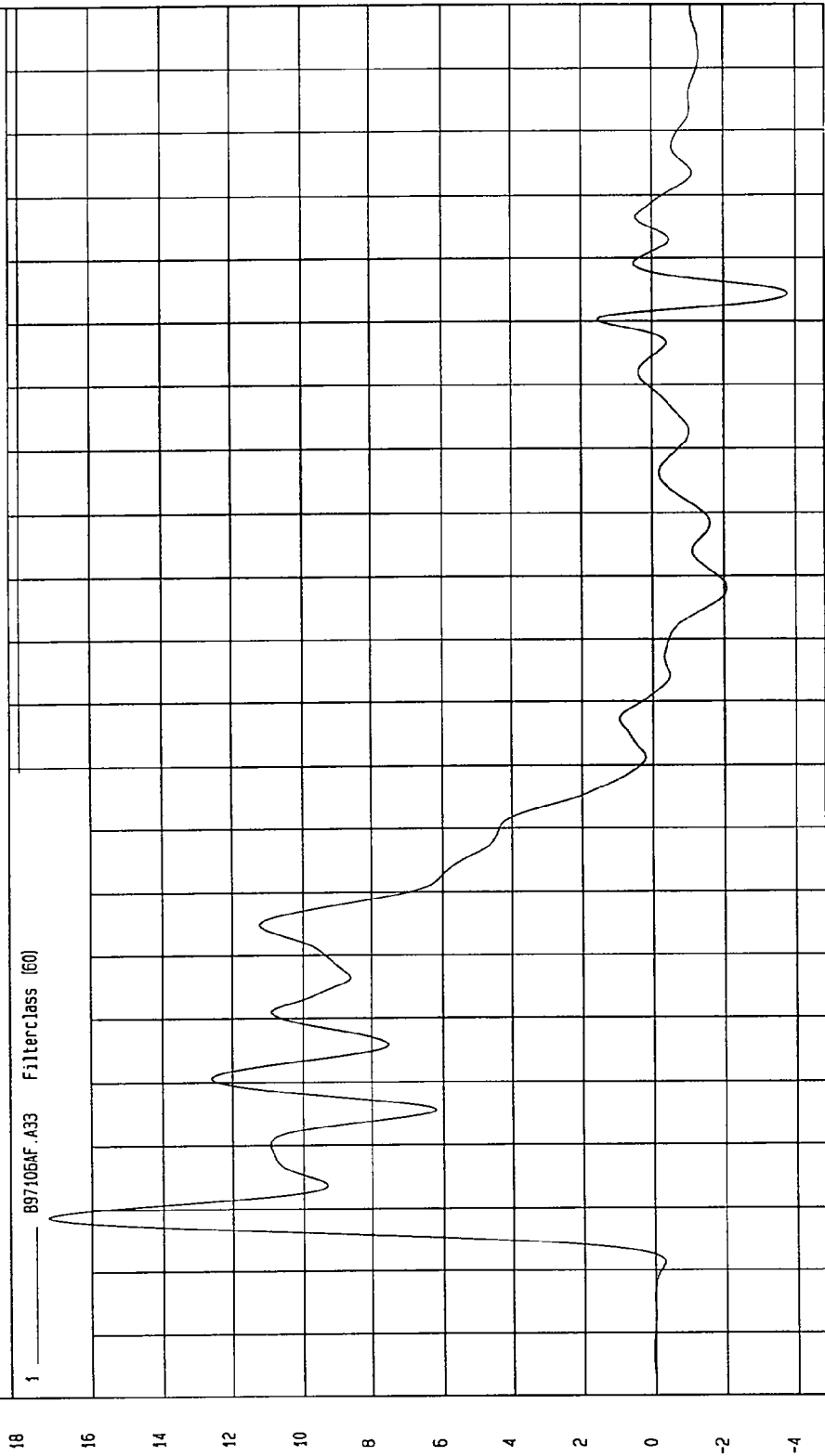
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -3.76 G'S at 154 msec  
Maximum = 17.21 G'S at 9 msec

RIGHT SIDE SILL AT FRONT SEAT Y ACCELERATION

1 897105AF.A33 Filterclass (60)



MGA Research  
09-25-1997 12.16

TIME (SECONDS)

G'S

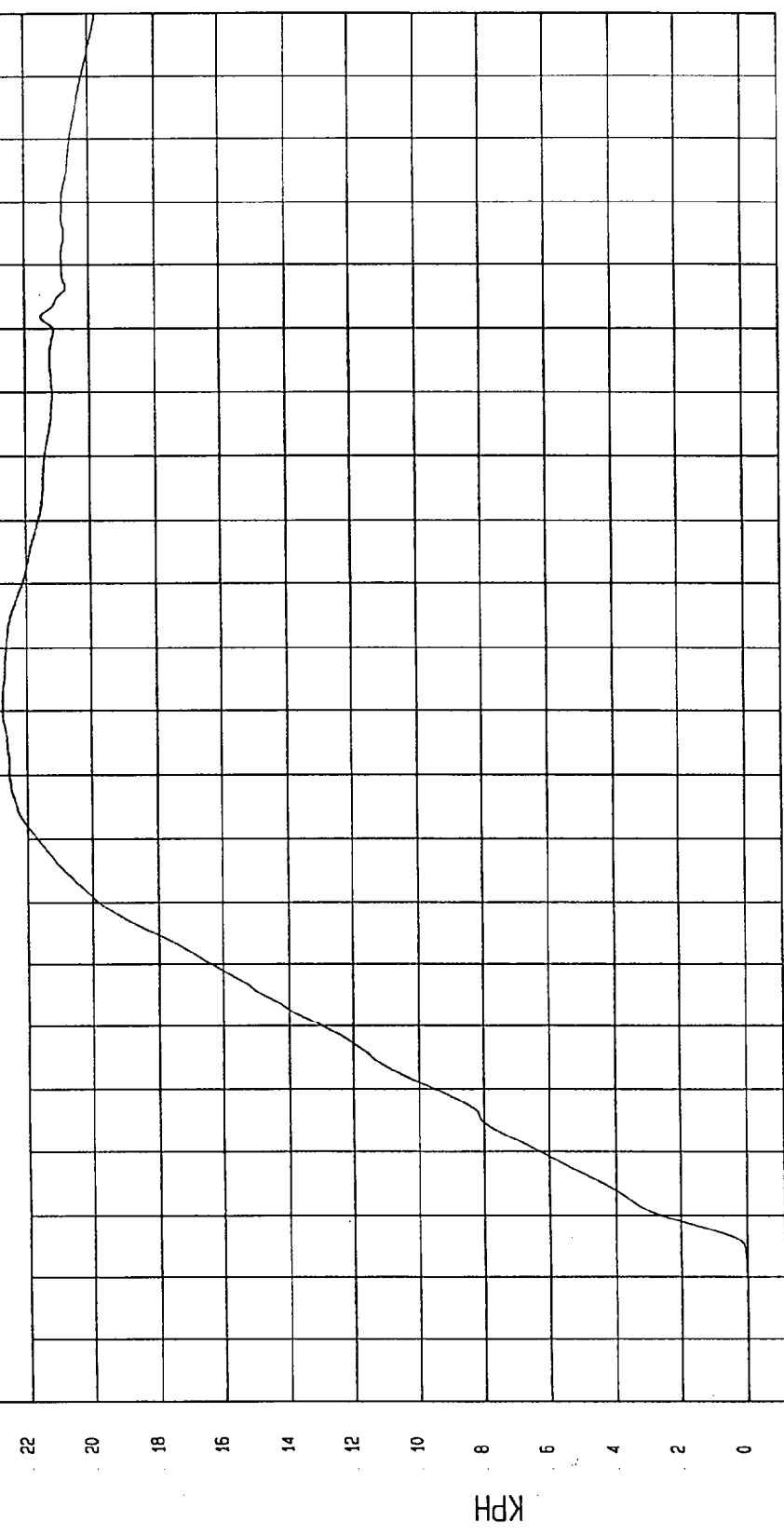
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -3.74E-03 KPH at -17 msec  
Maximum = 22.73 KPH at 92 msec

RIGHT SIDE SILL AT FRONT SEAT Y VELOCITY

1 \_\_\_\_\_ 897106A1.V33 Filterclass (180)



MOA Research  
09-25-1997 12:16

TIME Seconds

TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -5.39 G'S at 12 msec

Maximum = 2.89 G'S at 87 msec

RIGHT SIDE SILL AT FRONT SEAT Z ACCELERATION

1 897106AF.A34 Filterclass (60)

3

2

1

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-1

-2

-3

-4

-5

G.S

19

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01

0

-01

-02

TIME (SECONDS)

MCA Research  
09-25-1997 12:16

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

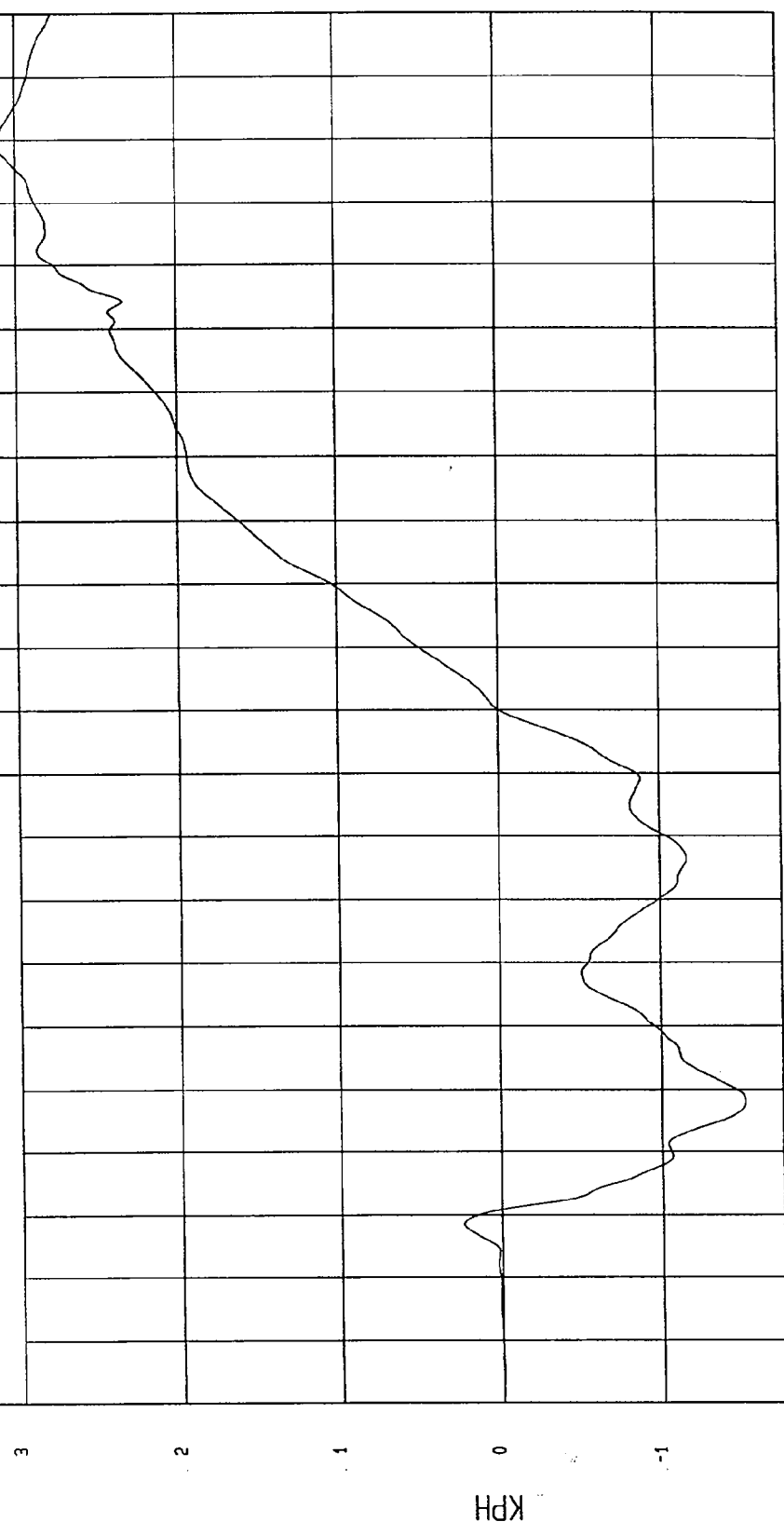
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Maximum = 3.10 KPH at 179 msec

Minimum = -1.51 KPH at 28 msec

RIGHT SIDE SILL AT FRONT SEAT Z VELOCITY

1 \_\_\_\_\_ B97105A1.V34 Filterclass (180)



MGA, Pleasanton, CA  
09-25-1997 12:16

TIME Seconds

KPH

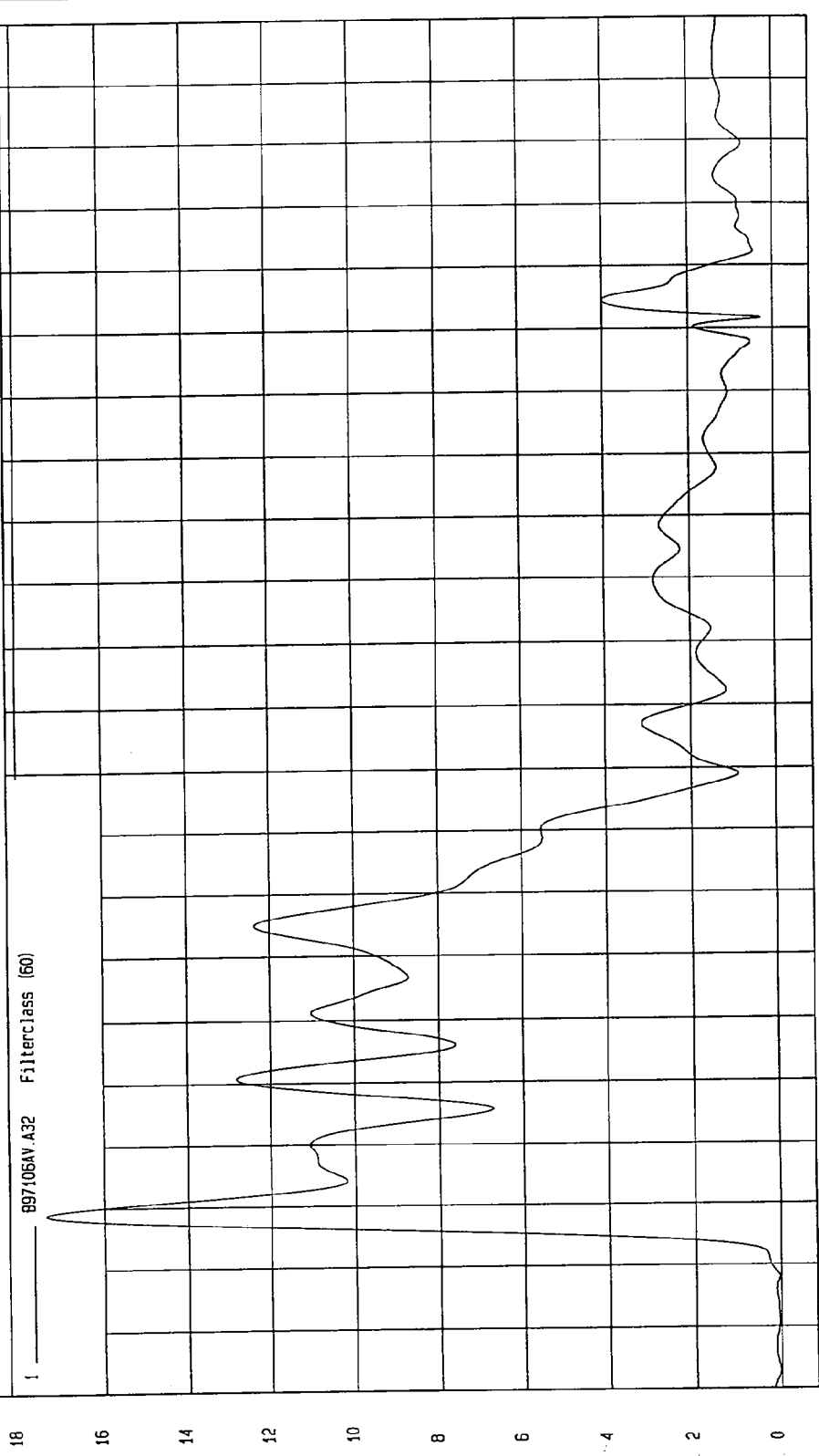
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = 2.73E-02 G'S at -17 msec Maximum = 17.35 G'S at 9 msec

RIGHT SIDE SILL AT FRONT SEAT RESULTANT ACCELERATION

897106AV.A32 FilterClass (60)



MCA Research  
09-25-1997 12:27

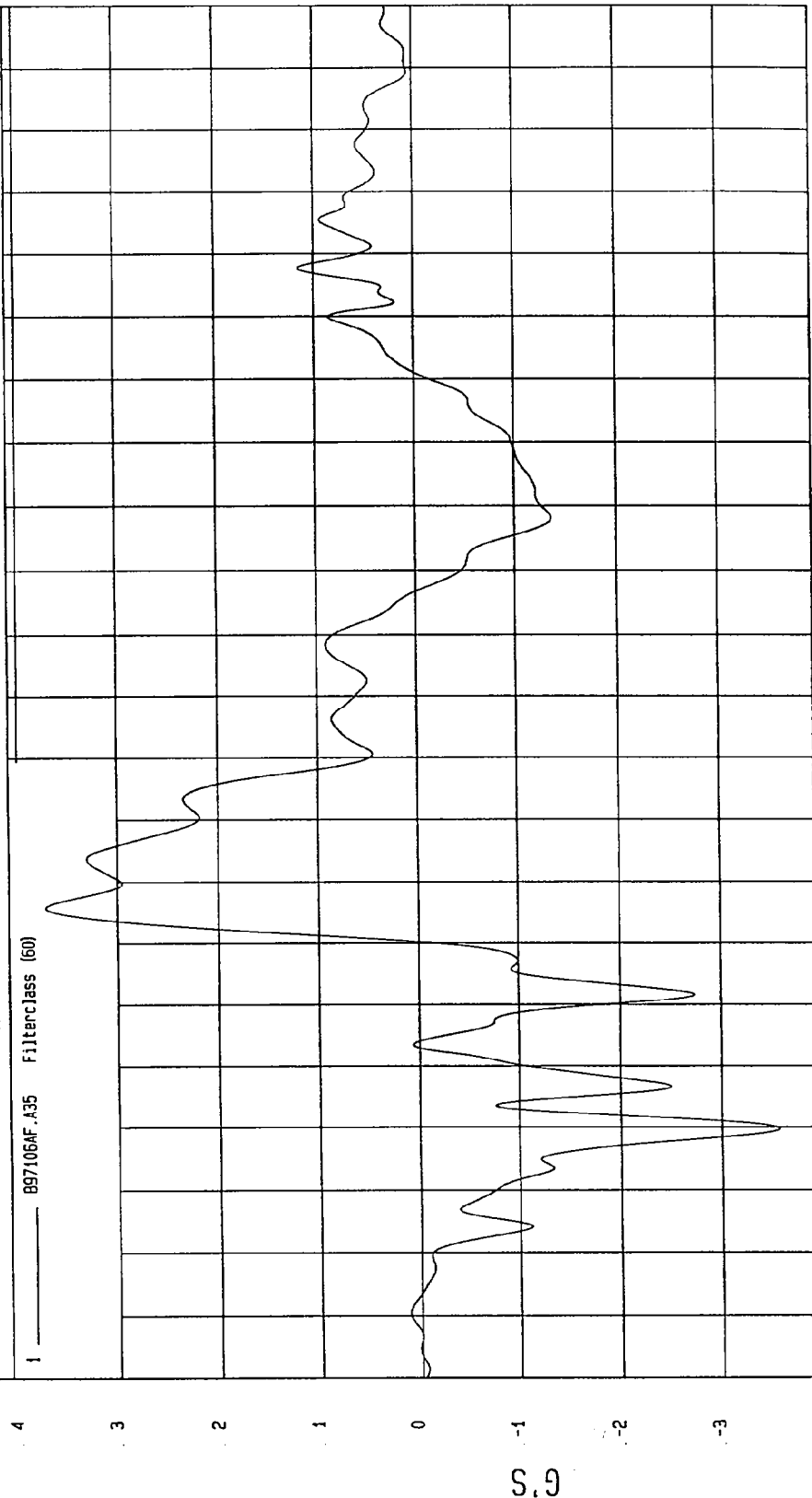
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -3.56 G'S at 20 msec  
Maximum = 3.72 G'S at 56 msec

RIGHT SIDE SILL AT REAR SEAT X ACCELERATION

1 \_\_\_\_\_ 897106AF.A35 Filterclass (60)



MGA Research  
09-25-1997 12.16

TIME (SECONDS)

G'S

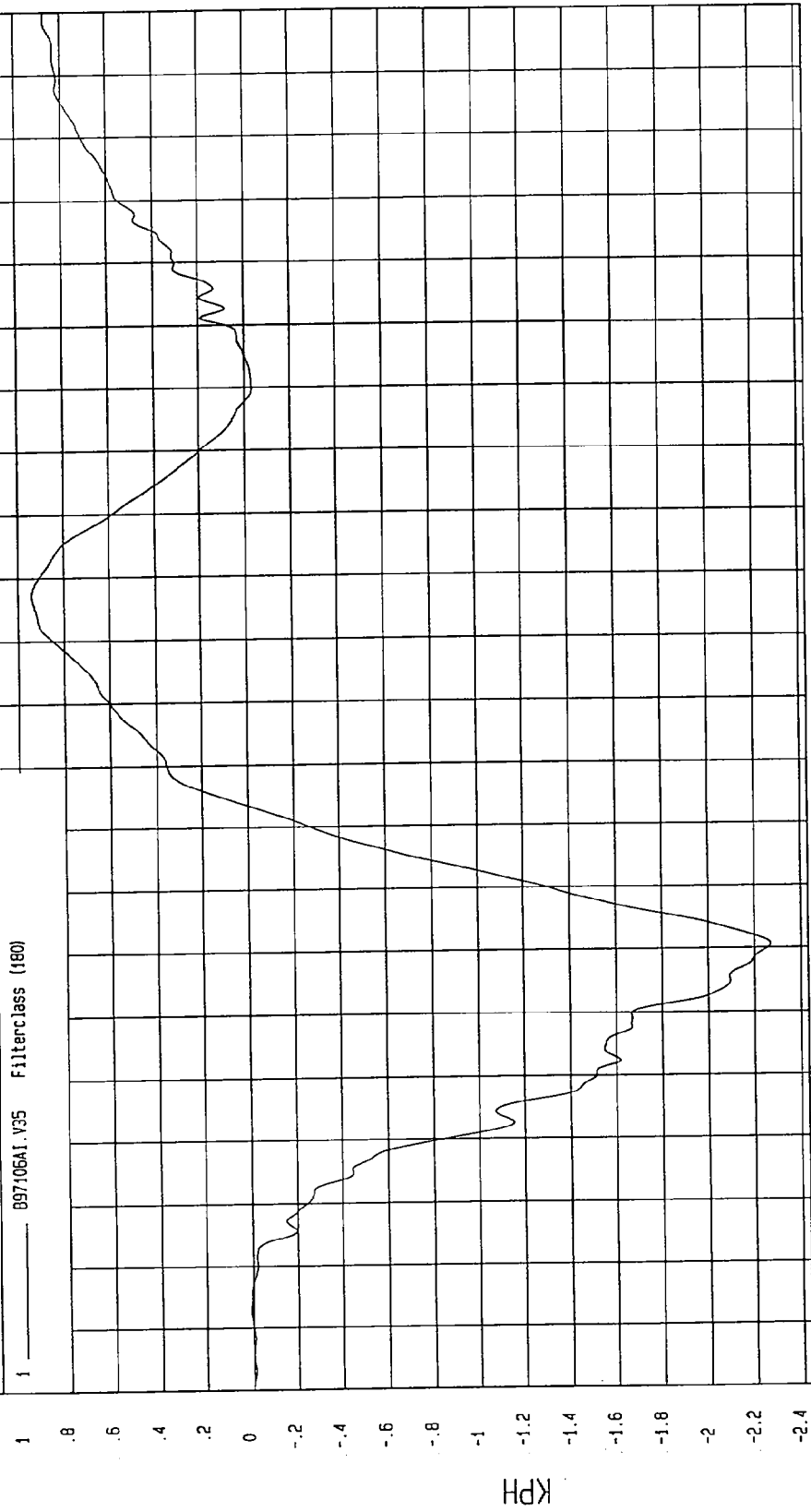
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -2.27 KPH at 51 msec Maximum = .94 KPH at 107 msec

RIGHT SIDE SILL AT REAR SEAT X VELOCITY

1 097106A1.V35 Filterclass (180)

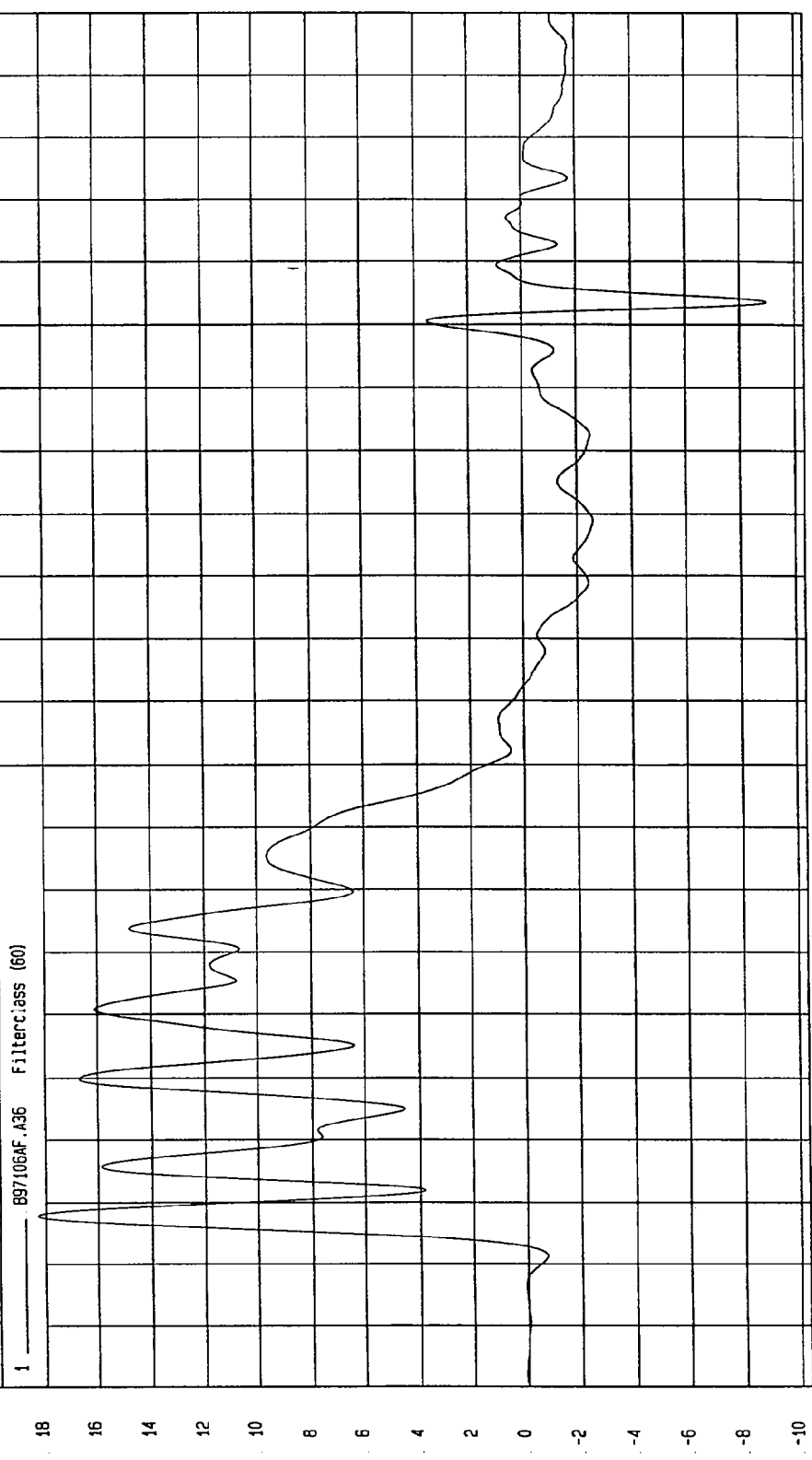


TIME Seconds  
MCA Research  
09-25-1997 12:16

TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997  
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -8.96 G'S at 154 msec Maximum = 16.29 G'S at 8 msec

RIGHT SIDE SILL AT REAR SEAT Y ACCELERATION



NSA Research  
09-25-1997 12:17

TIME (SECONDS)

G.S

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

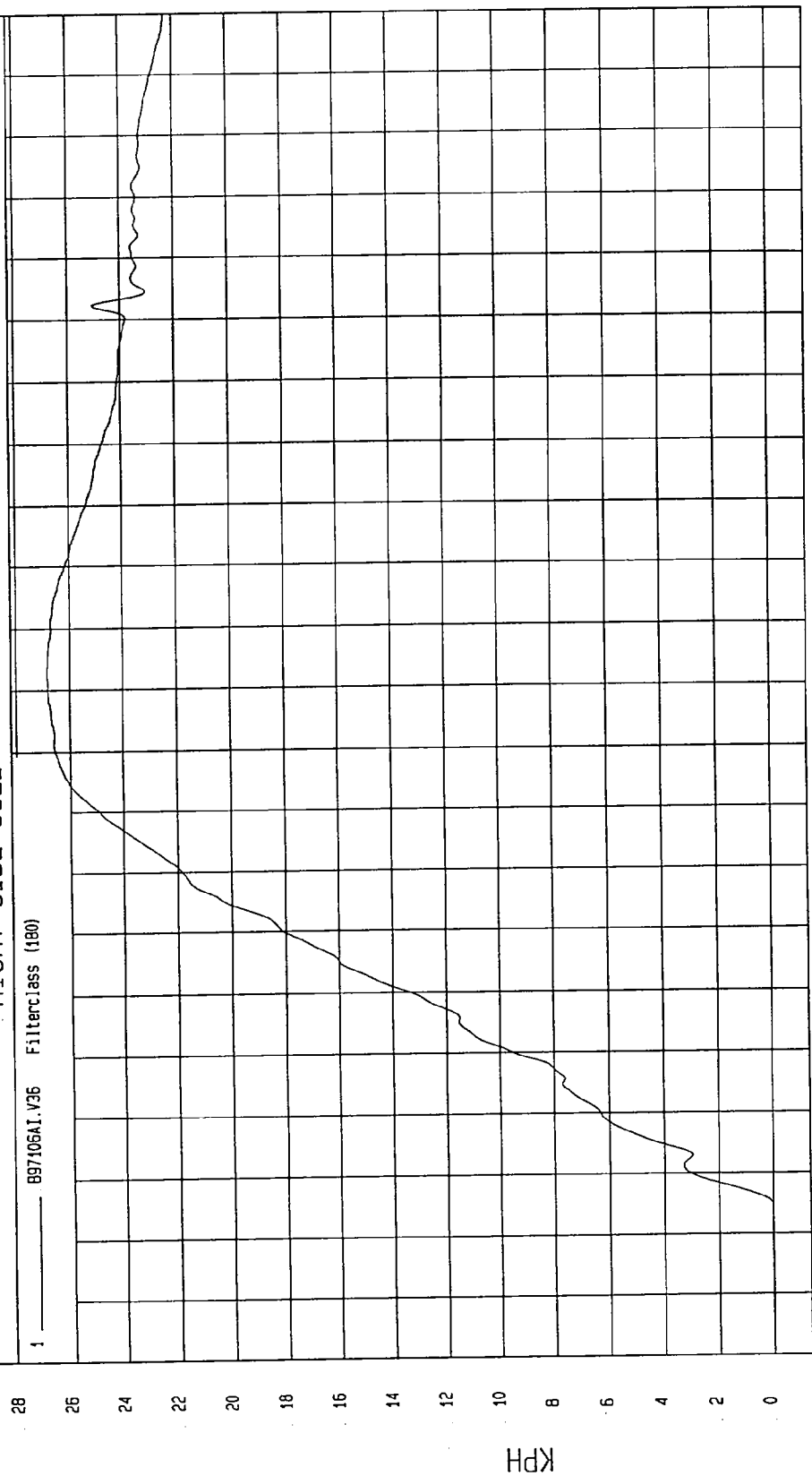
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 26.85 KPH at 93 msec

Minimum = -4.18E-03 KPH at 4 msec

RIGHT SIDE SILL AT REAR SEAT Y VELOCITY

1 897106A1.V36 Filterclass (180)



MCA Research  
09-25-1997 12:17

TIME Seconds

KPH

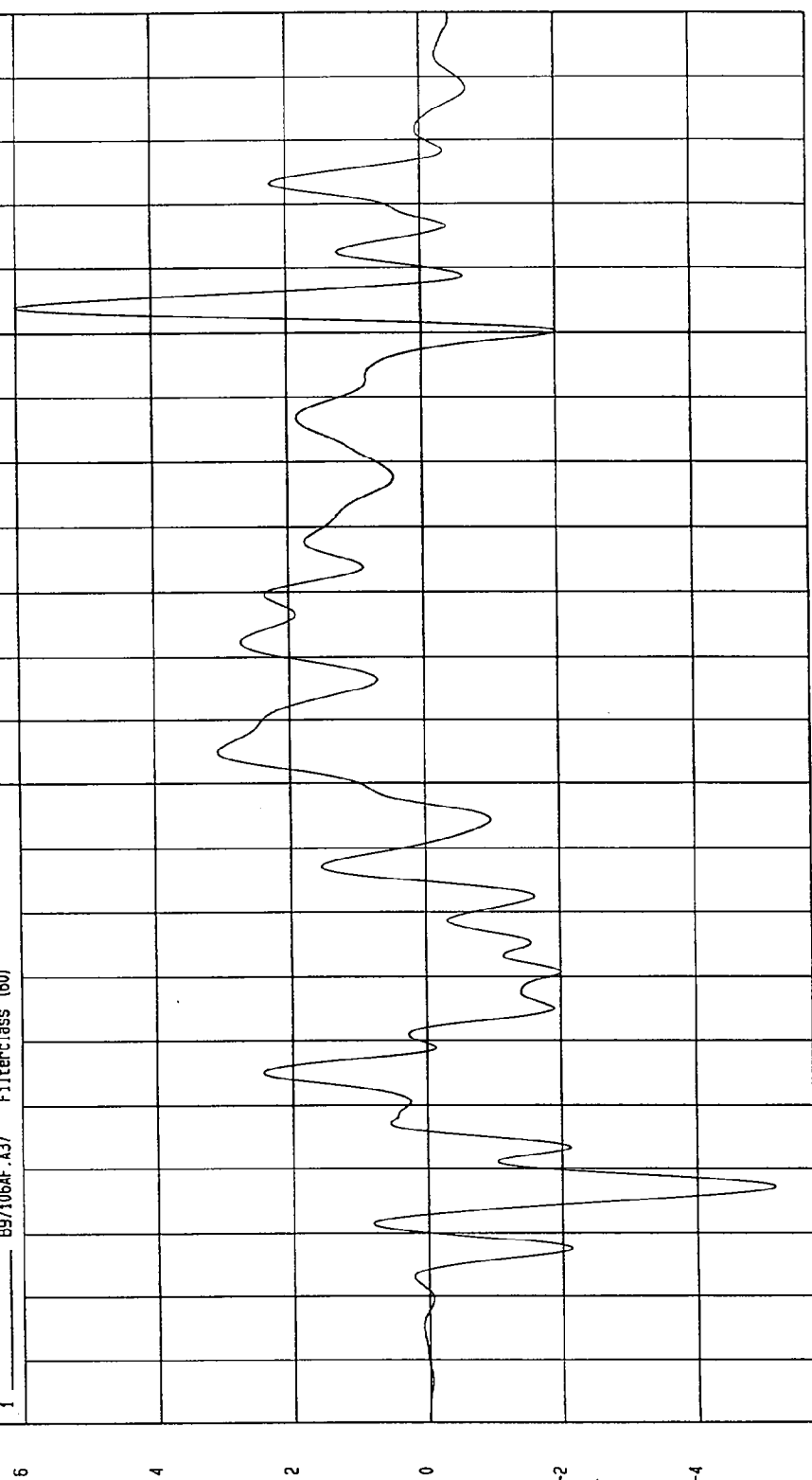
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -5.14 G'S at .17 msec  
Maximum = 6.01 G'S at 154 msec

RIGHT SIDE SILL AT REAR SEAT Z ACCELERATION

1 B97106AF.A37 Filterclass (60)



MECA Research  
09-25-1997 12:17

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

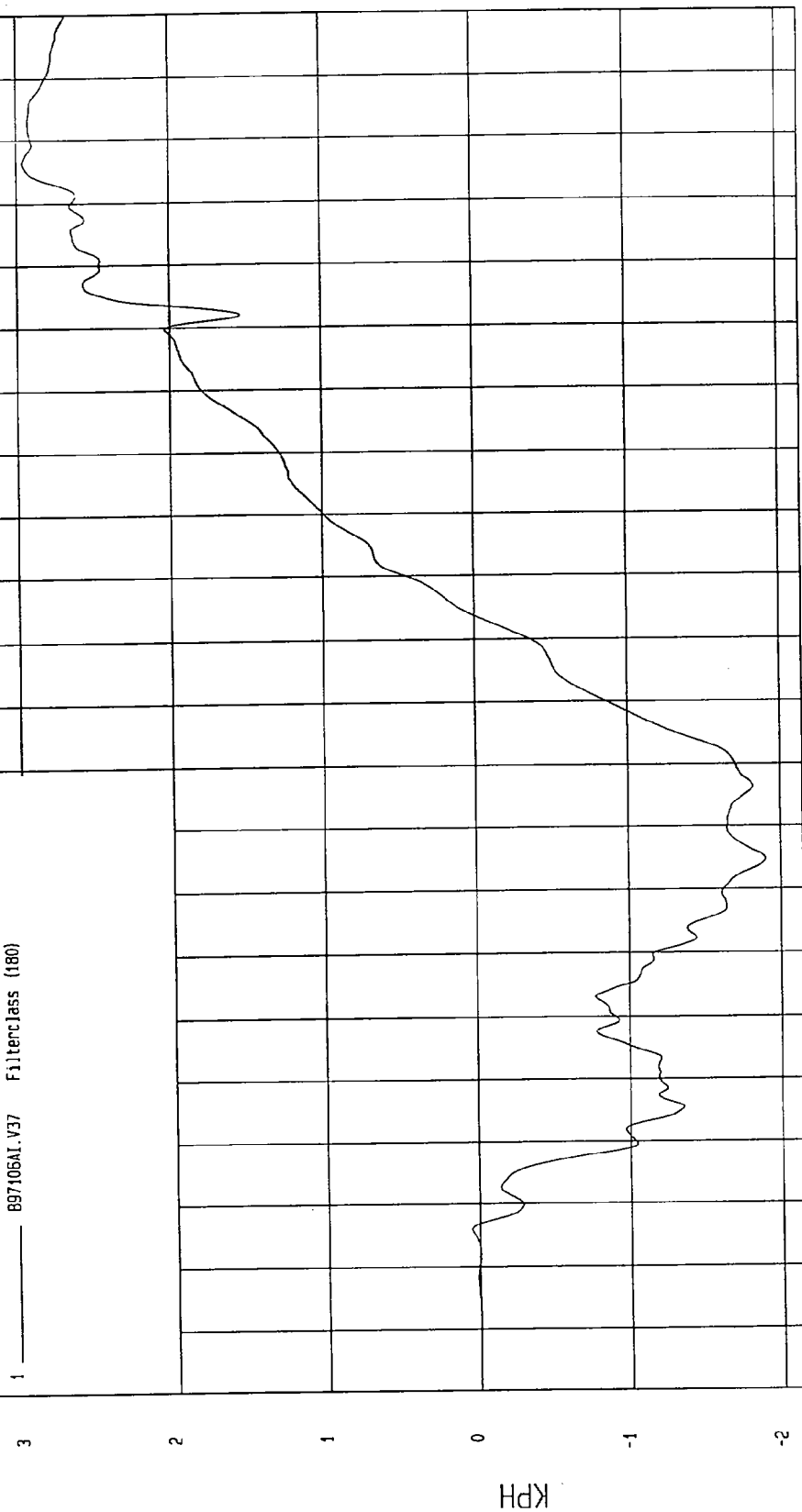
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 2.96 KPH at 176 msec

Minimum = -1.90 KPH at 65 msec

RIGHT SIDE SILL AT REAR SEAT Z VELOCITY

1 \_\_\_\_\_ B97106A1.V37 FilterClass (180)



MCA Research  
09-25-1997 12.17

TIME Seconds

KPH

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

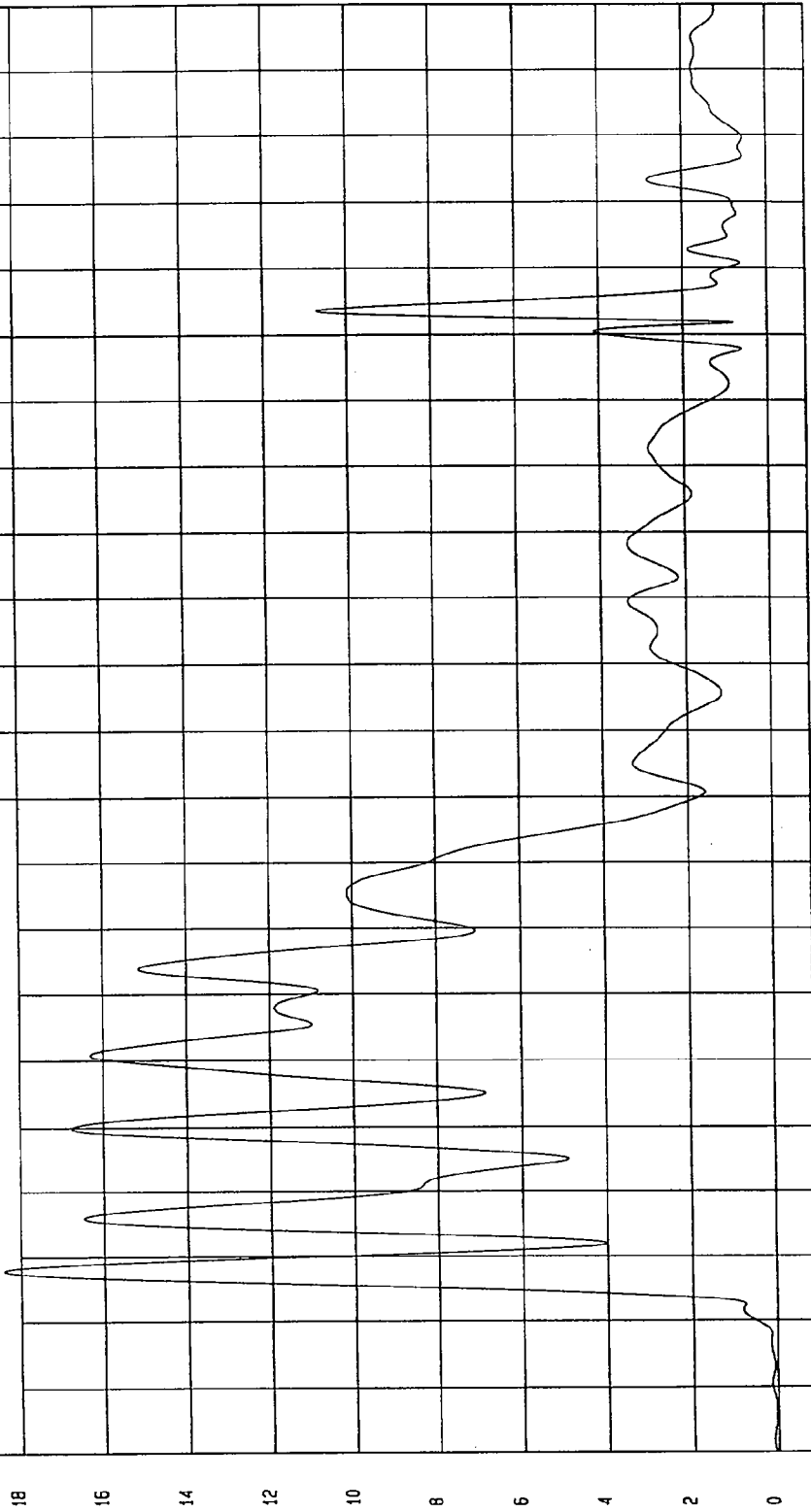
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 18.41 G'S at 8 msec

Minimum = 3.39E-02 G'S at -15 msec

RIGHT SIDE SILL AT REAR SEAT RESULTANT ACCELERATION

1 B97106AV.A35 Filterclass (60)



MGA Research  
09-25-1997 12:27

TIME (SECONDS)

G.S

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

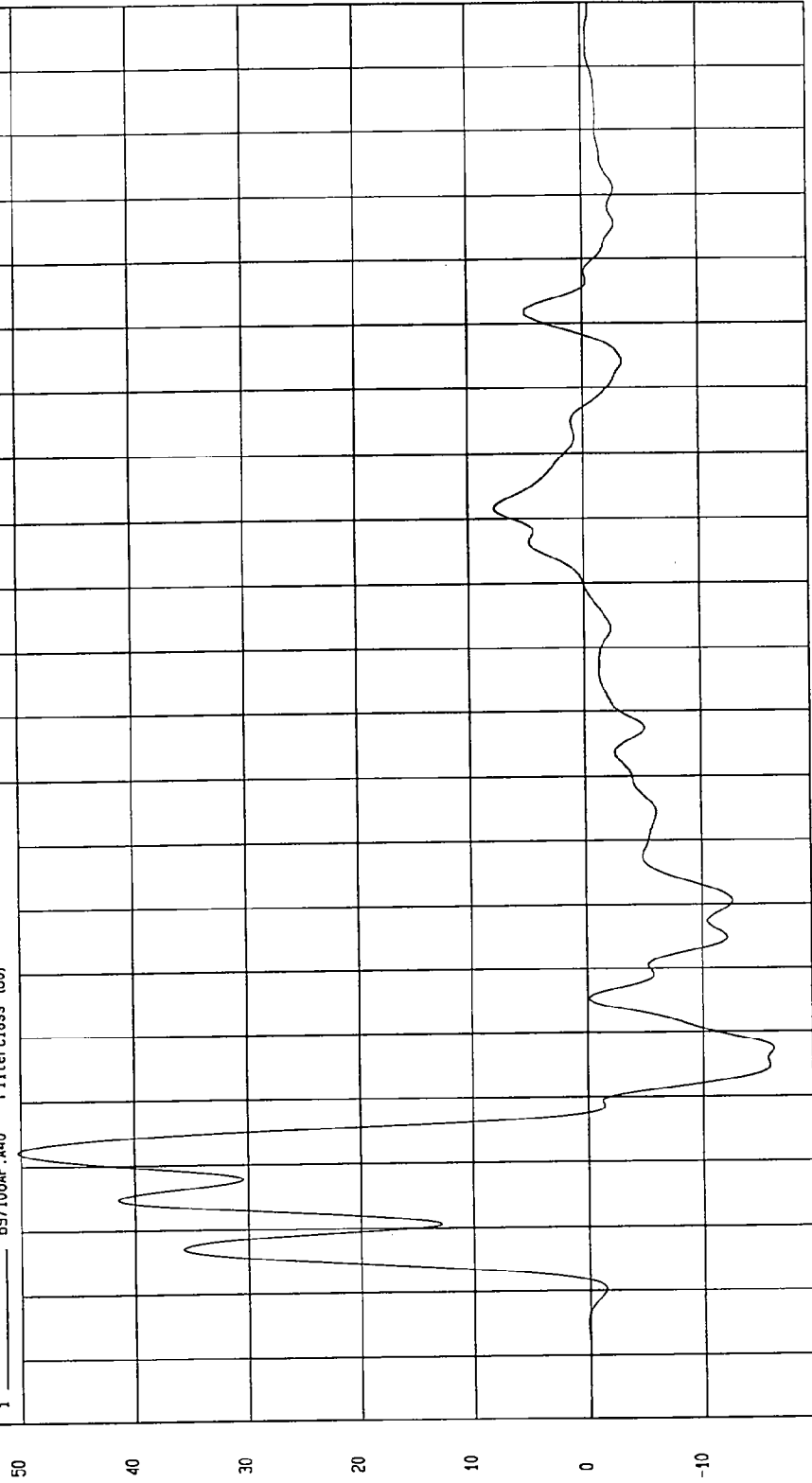
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 50.28 G'S at 22 msec

Minimum = -16.10 G'S at 37 msec

DRIVER SEAT TRACK Y ACCELERATION

1 897106AF.A40 Filterclass (50)



MCA Research  
09-25-1997 12:17

TIME (SECONDS)

G.S

TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

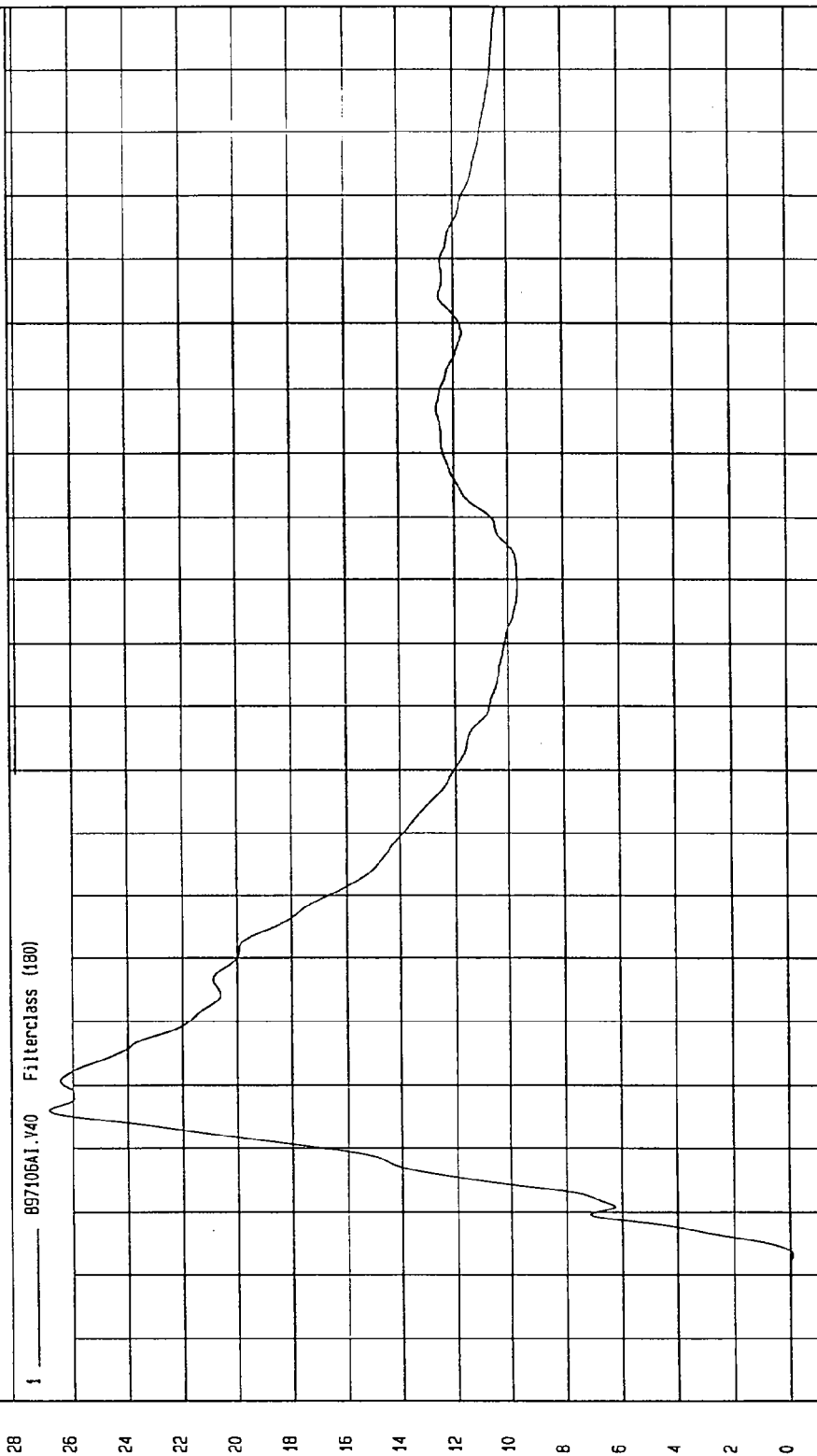
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -8.31E-02 KPH at 3 msec

Maximum = 26.85 KPH at 26 msec

DRIVER SEAT TRACK Y VELOCITY

1 897106A1.Y40 Filterclass (180)



MSA Research  
09-23-1997 12:17

TIME Seconds

KPH

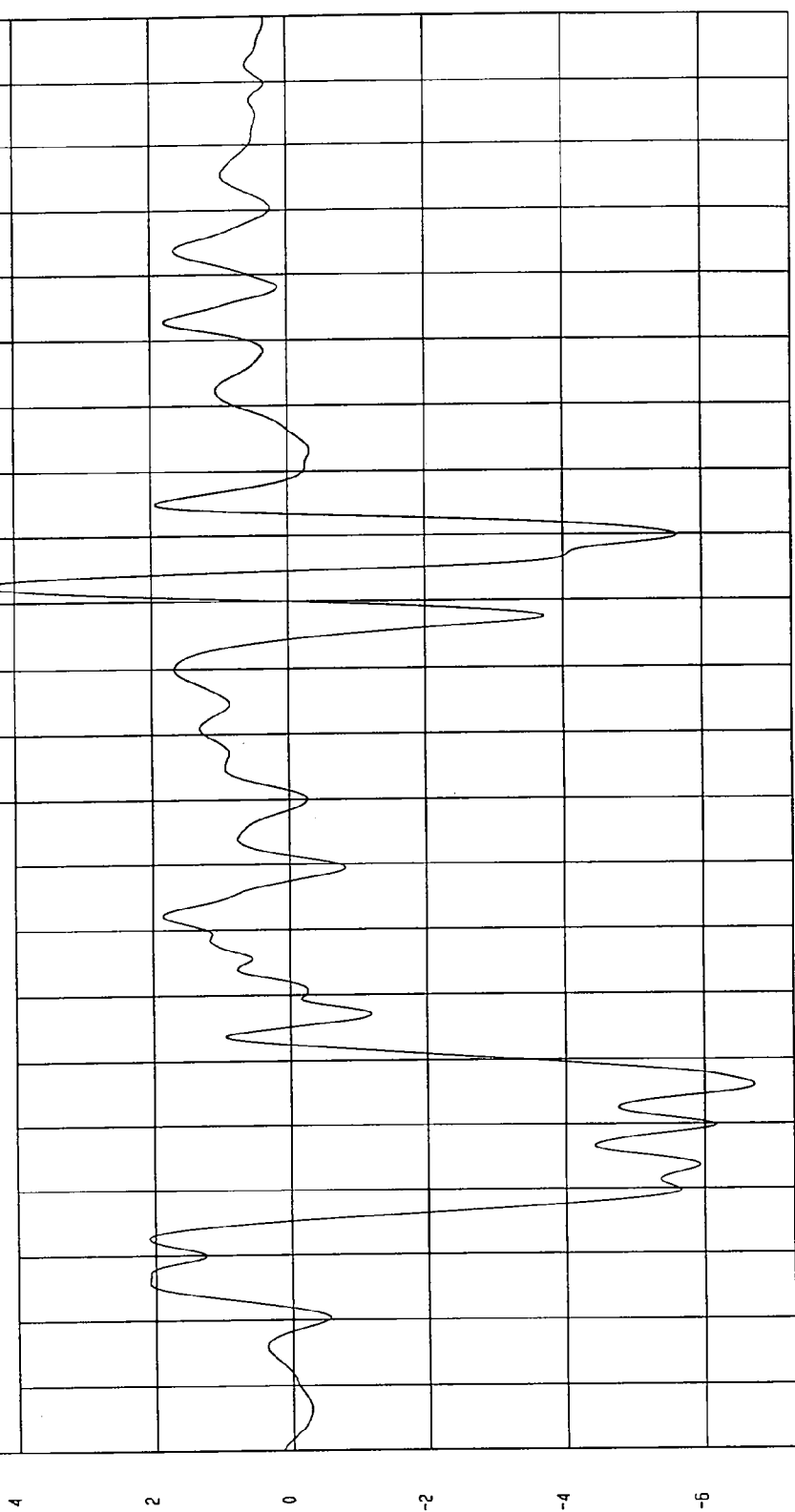
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -6.72 G'S at 36 msec  
Maximum = 4.42 G'S at 113 msec

REAR FLOORPAN ABOVE AXLE X ACCELERATION

1 B97106AF.A08 Filterclass (60)



MECA Research  
09-25-1997 12:17

TIME (SECONDS)

G.S

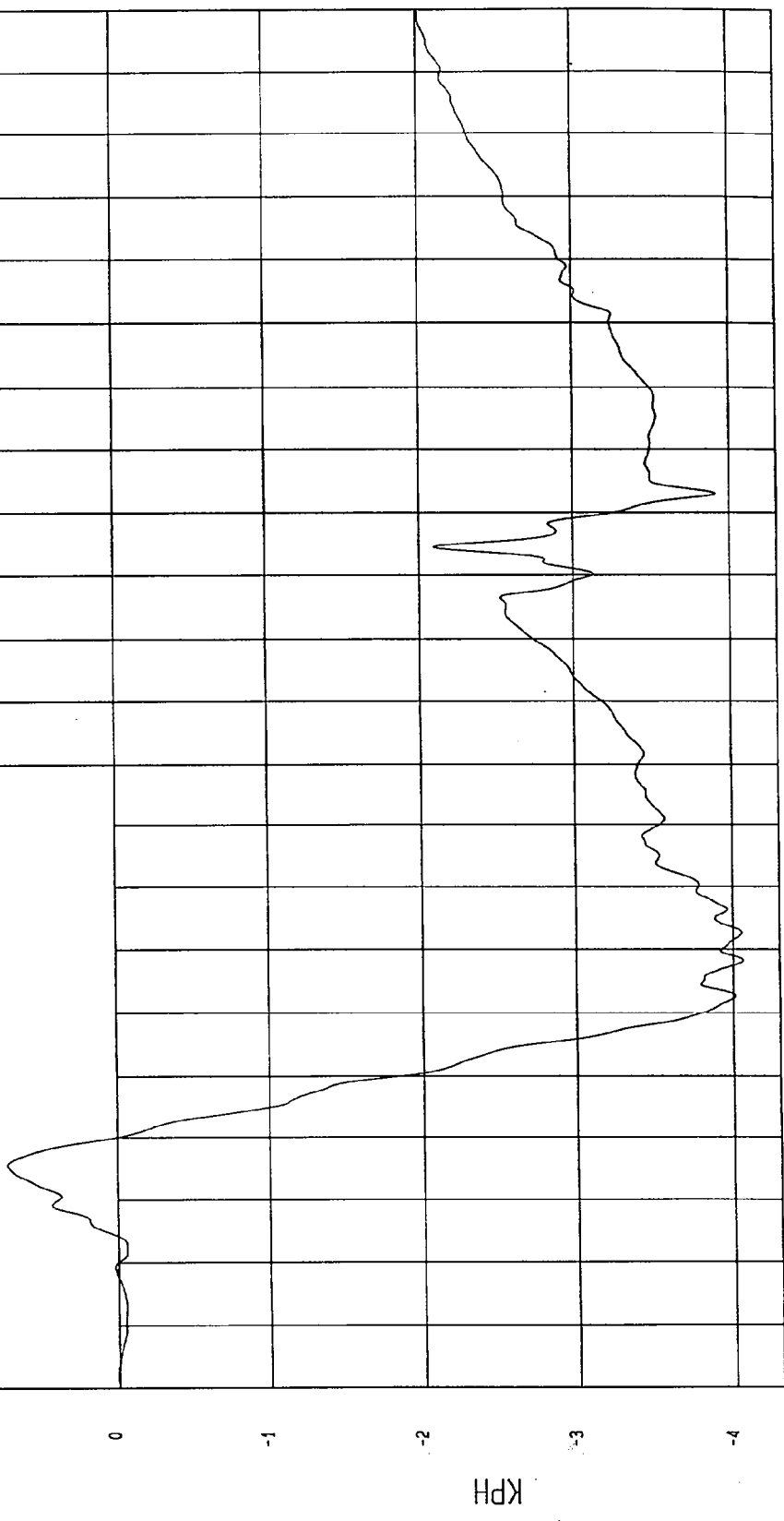
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -4.06 KPH at 48 msec Maximum = .71 KPH at 16 msec

REAR FLOORPAN ABOVE AXLE X VELOCITY

1 \_\_\_\_\_ 897106A1.V08 Filterclass (180)



TIME Seconds  
MGA Research  
09-25-1997 12.17

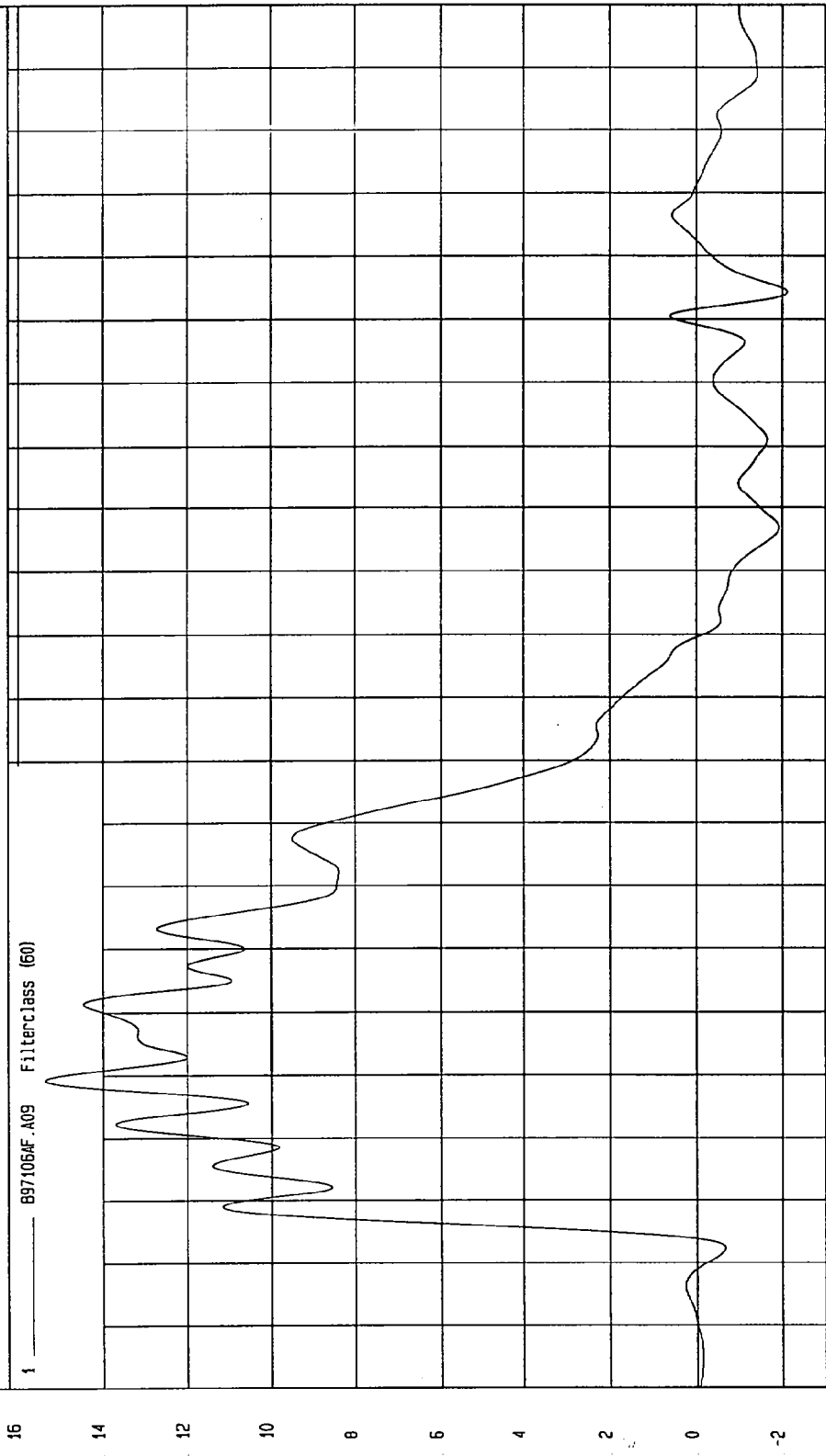
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -2.11 G'S at 154 msec Maximum = 15.36 G'S at 29 msec

REAR FLOORPAN ABOVE AXLE Y ACCELERATION

1 897105AF.A09 Filterclass (60)



MCA Research  
09-25-1997 12:18

TIME (SECONDS)

G.S

TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

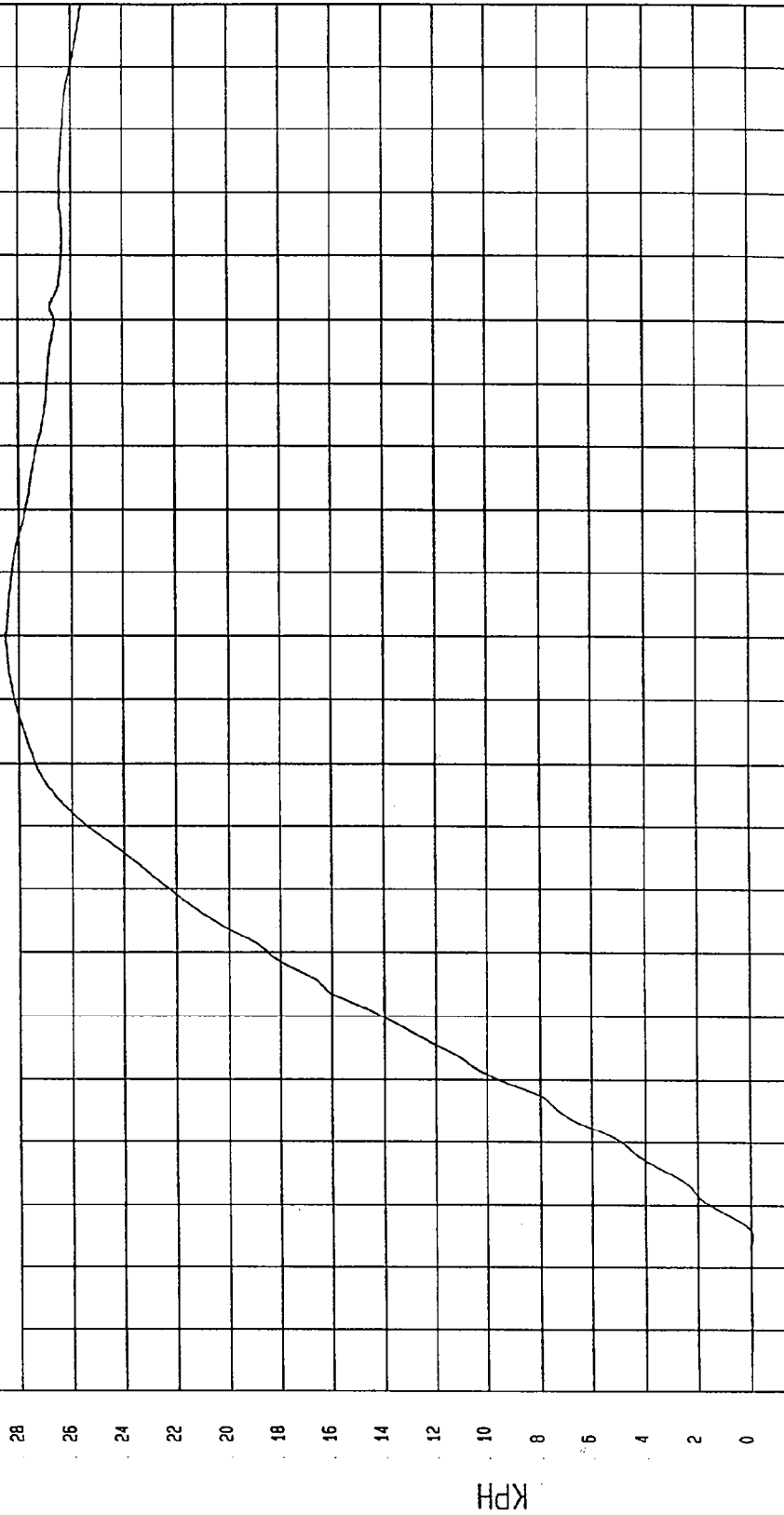
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -8.55E-02 KPH at 5 msec

Maximum = 28.49 KPH at 100 msec

REAR FLOORPAN ABOVE AXLE Y VELOCITY

1 .897106A1.V09 Filterclass (180)



MOA Research  
09-25-1997 12:18

TIME Seconds

KPH

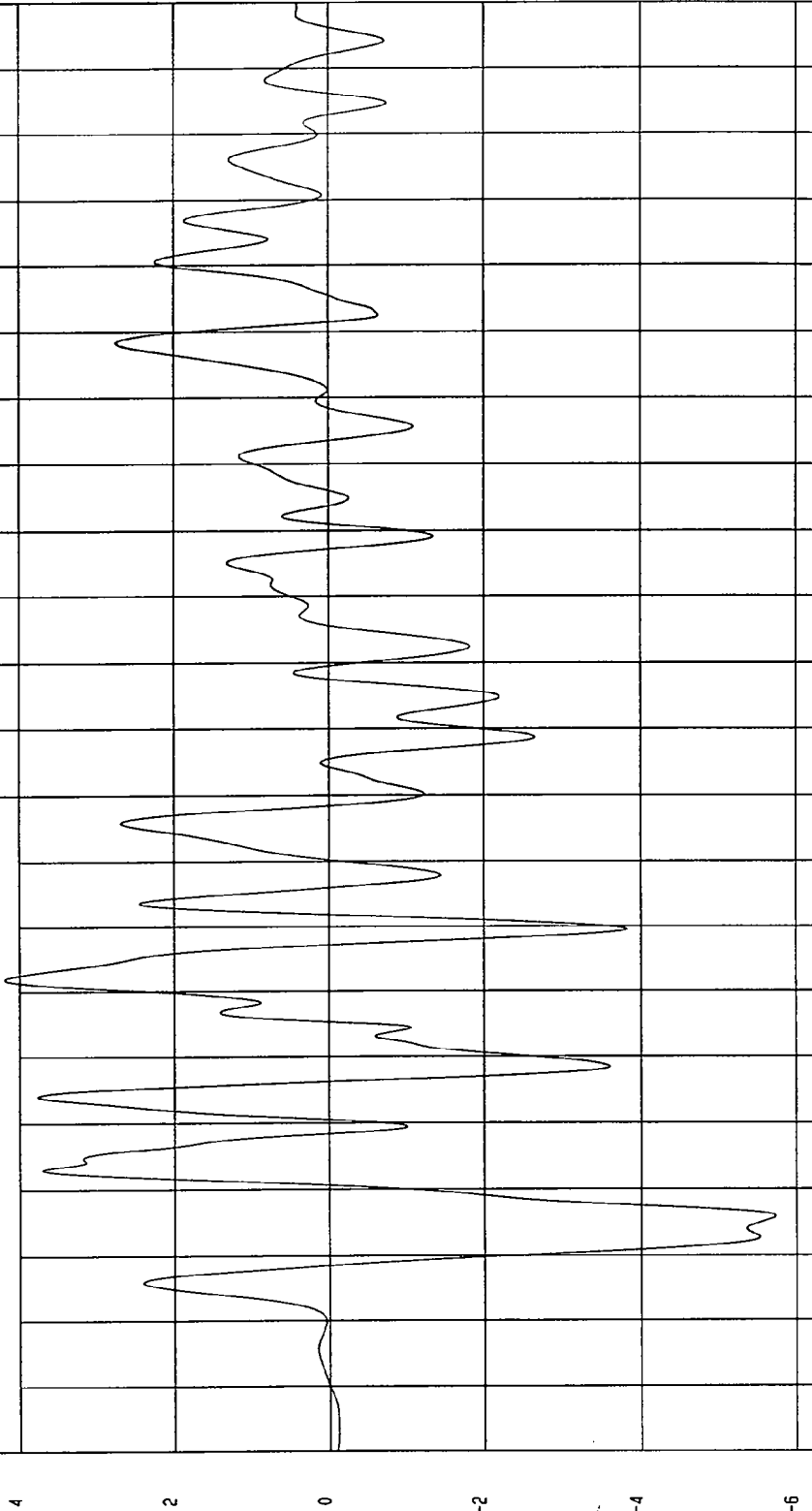
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -5.73 G'S at 16 msec  
Maximum = 4.19 G'S at 52 msec

REAR FLOORPAN ABOVE AXLE Z ACCELERATION

1 ——— 097106AF.A10 Filterclass (60)



G.S

NGA Research  
09-25-1997 12.18

TIME (SECONDS)

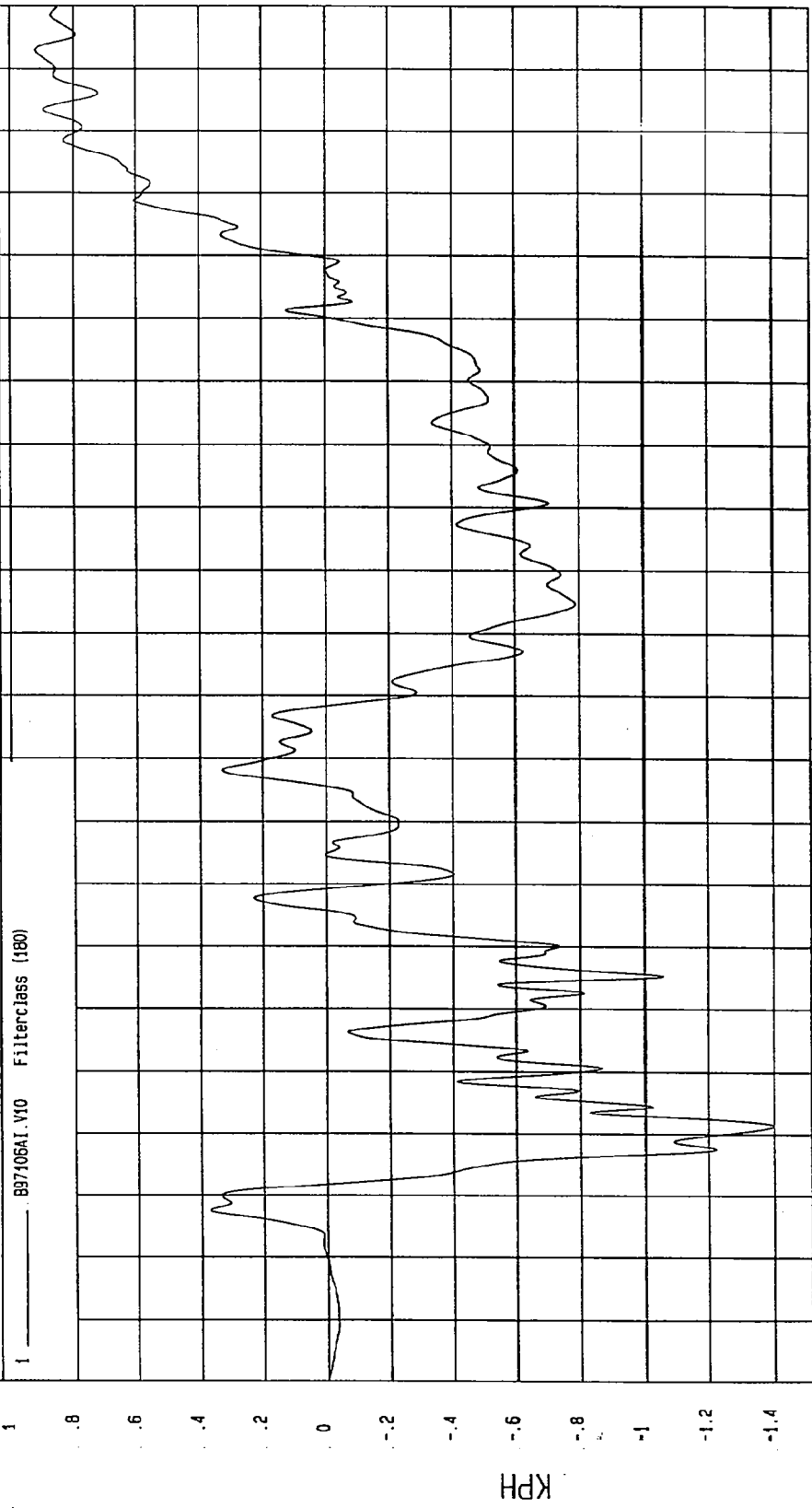
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -1.40 KPH at 21 msec Maximum = .91 KPH at 193 msec

REAR FLOORPAN ABOVE AXLE Z VELOCITY

1 ——— BB7106AI.V10 Filterclass (180)



MCA Research  
09-25-1997 12:18

TIME Seconds

KPH

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 16.54 G'S at 29 msec

Minimum = 5.24E-02 G'S at -9 msec

REAR FLOORPAN ABOVE AXLE RESULTANT ACCELERATION

1 B97106AV.A08 FilterClass (60)



MCA Research  
09-25-1997 12:27

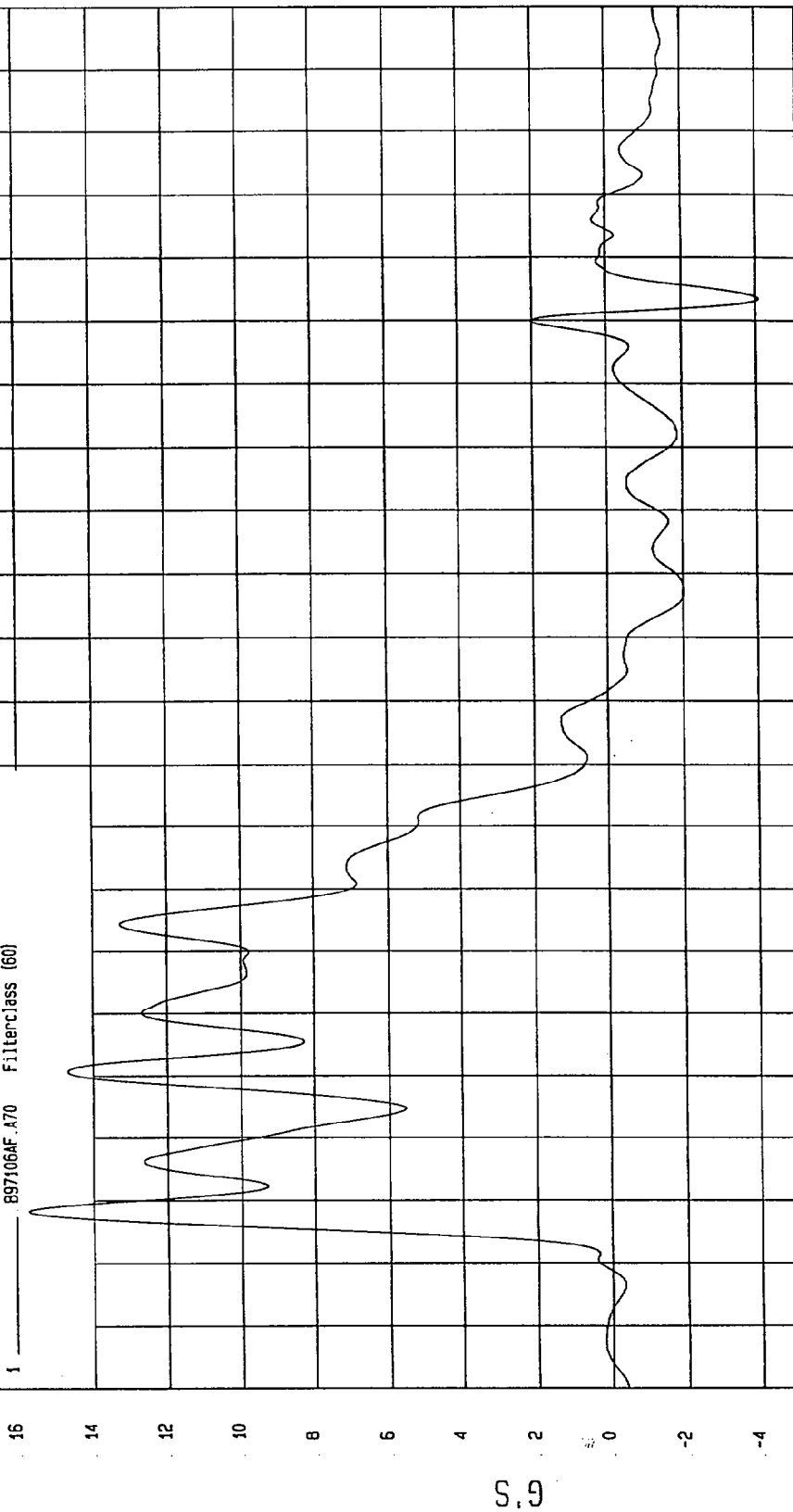
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -4.07 G's at 153 msec

RIGHT REAR OCCUPANT COMPARTMENT Y ACCELERATION

1 897106AF A70 Filterclass (60)



MGA Research  
09-25-1997 12:18

TIME (SECONDS)

G.S

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

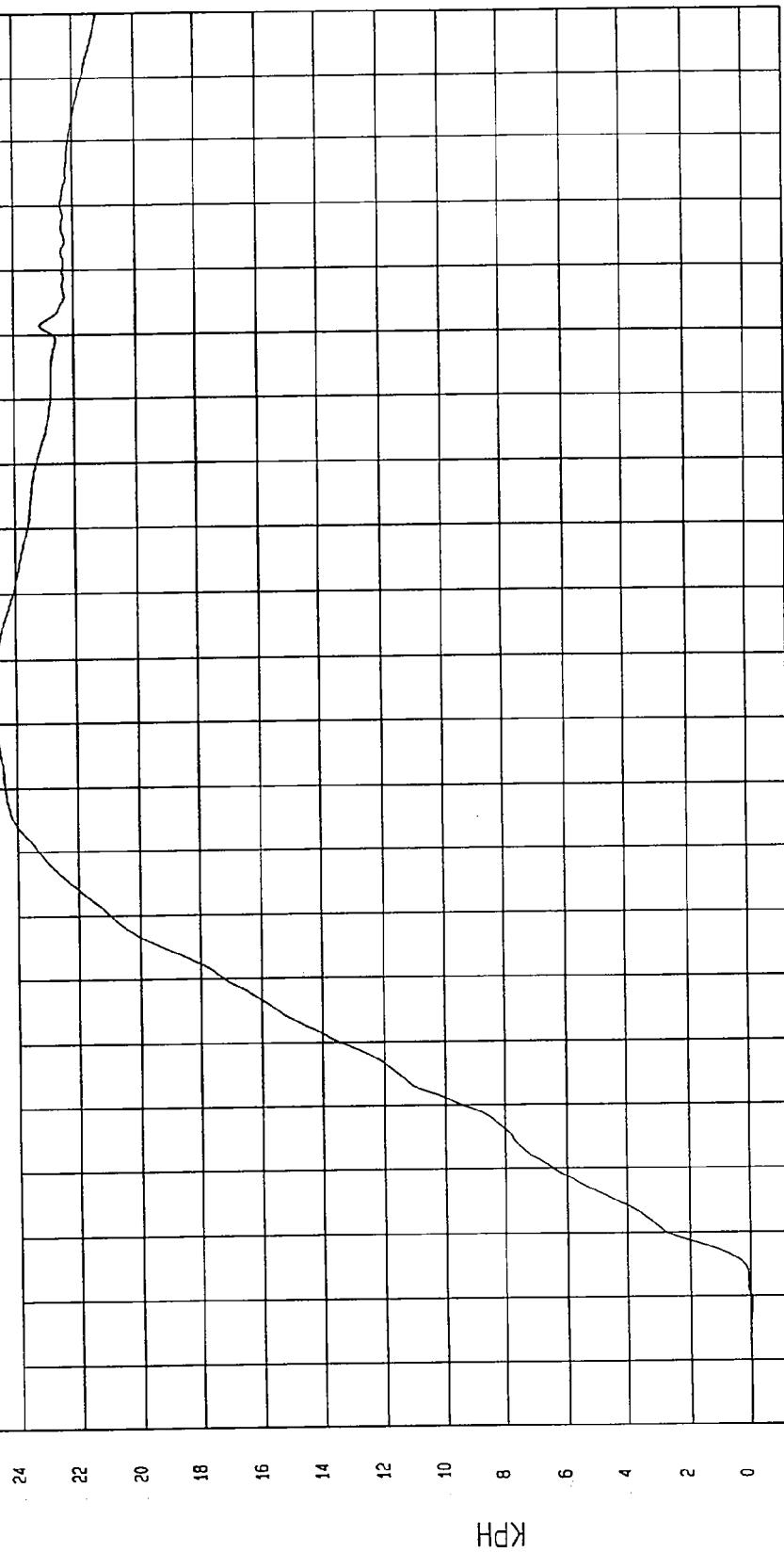
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -5.88E-02 KPH at -1 msec

Maximum = 24.75 KPH at 93 msec

RIGHT REAR OCCUPANT COMPARTMENT Y VELOCITY

1 B97106A1.V70 Filterclass (180)



NGA Research  
09-25-1997 12:18

TIME Seconds

KPH

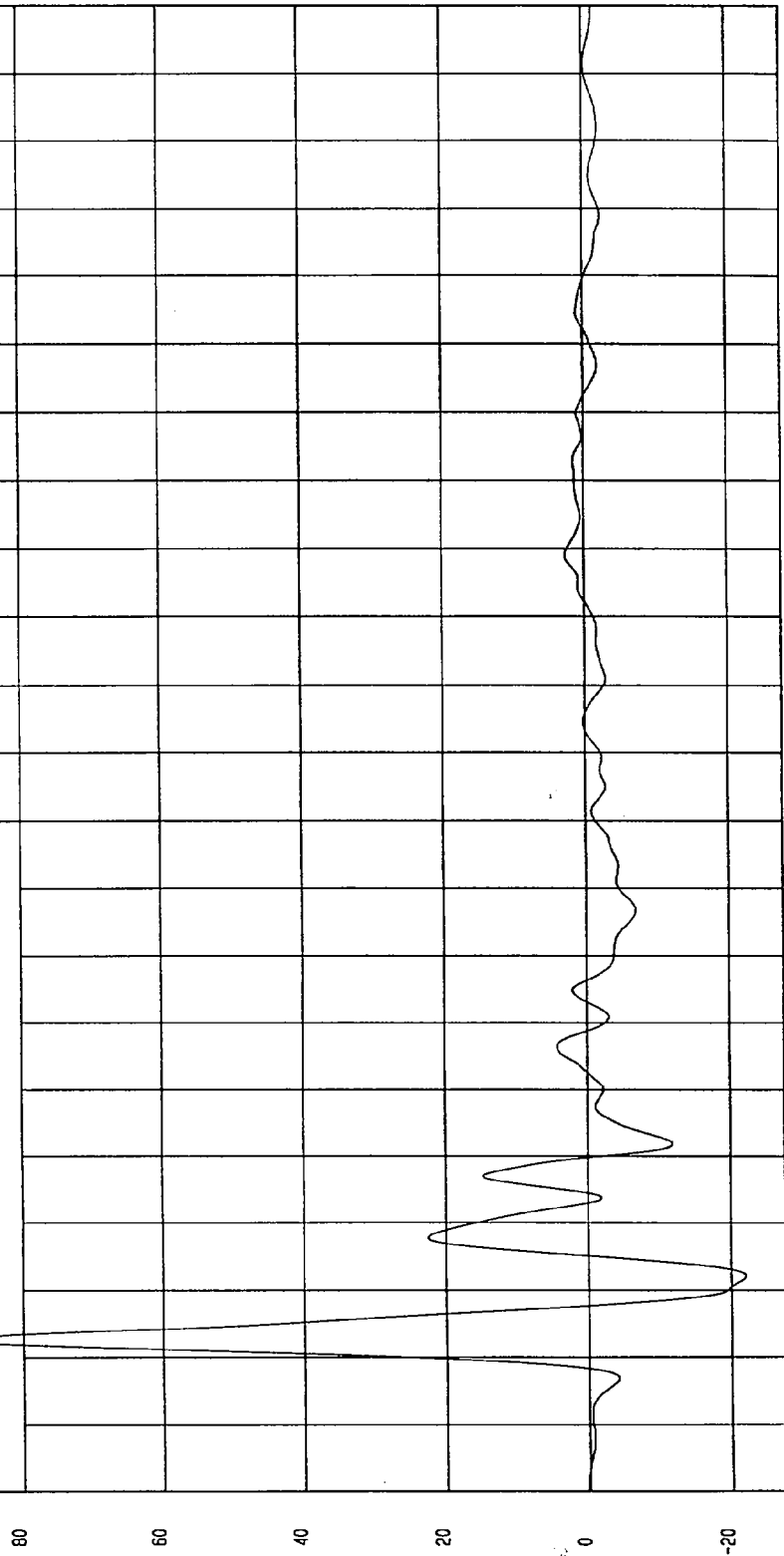
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -22.05 G'S at 12 msec  
Maximum = 89.90 G'S at 3 msec

LEFT LOWER A-POST Y ACCELERATION

1 897106AF.A20 Filterclass (60)



NSA Research  
09-25-1997 12:18

TIME (SECONDS)

G'S

TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -.52 KPH at 1 msec Maximum = 16.04 KPH at 30 msec

LEFT LOWER A-POST Y VELOCITY

1 B97106A1.V20 Filterclass (180)



TIME Seconds

NBA Research  
09-25-1997 12:18

TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

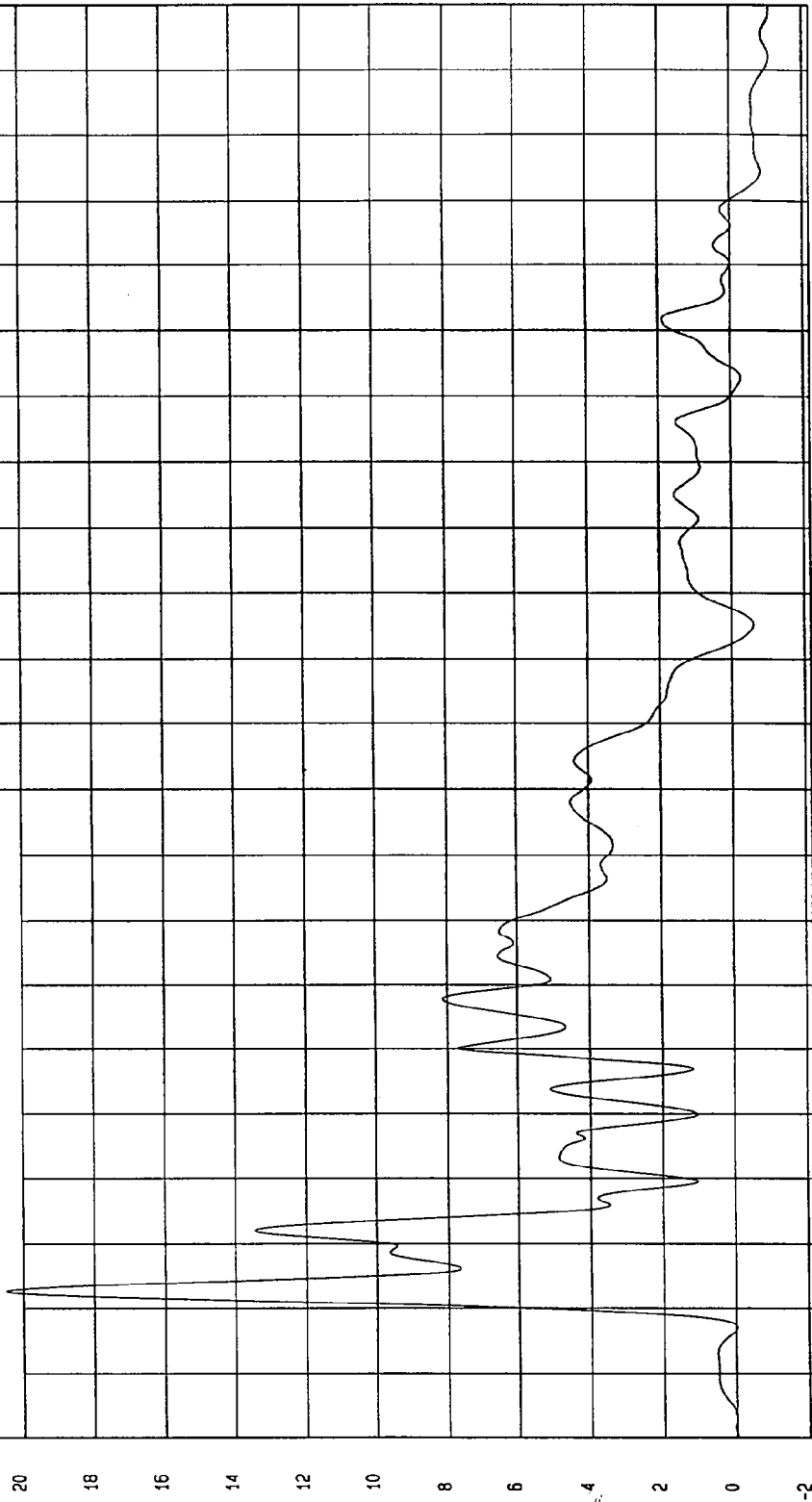
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -1.09 G'S at 192 msec

Maximum = 20.49 G'S at 3 msec

LEFT MID A-POST Y ACCELERATION

1 .897106AF.A19 Filterclass (60)



MGA Research  
09-25-1997 12:19

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

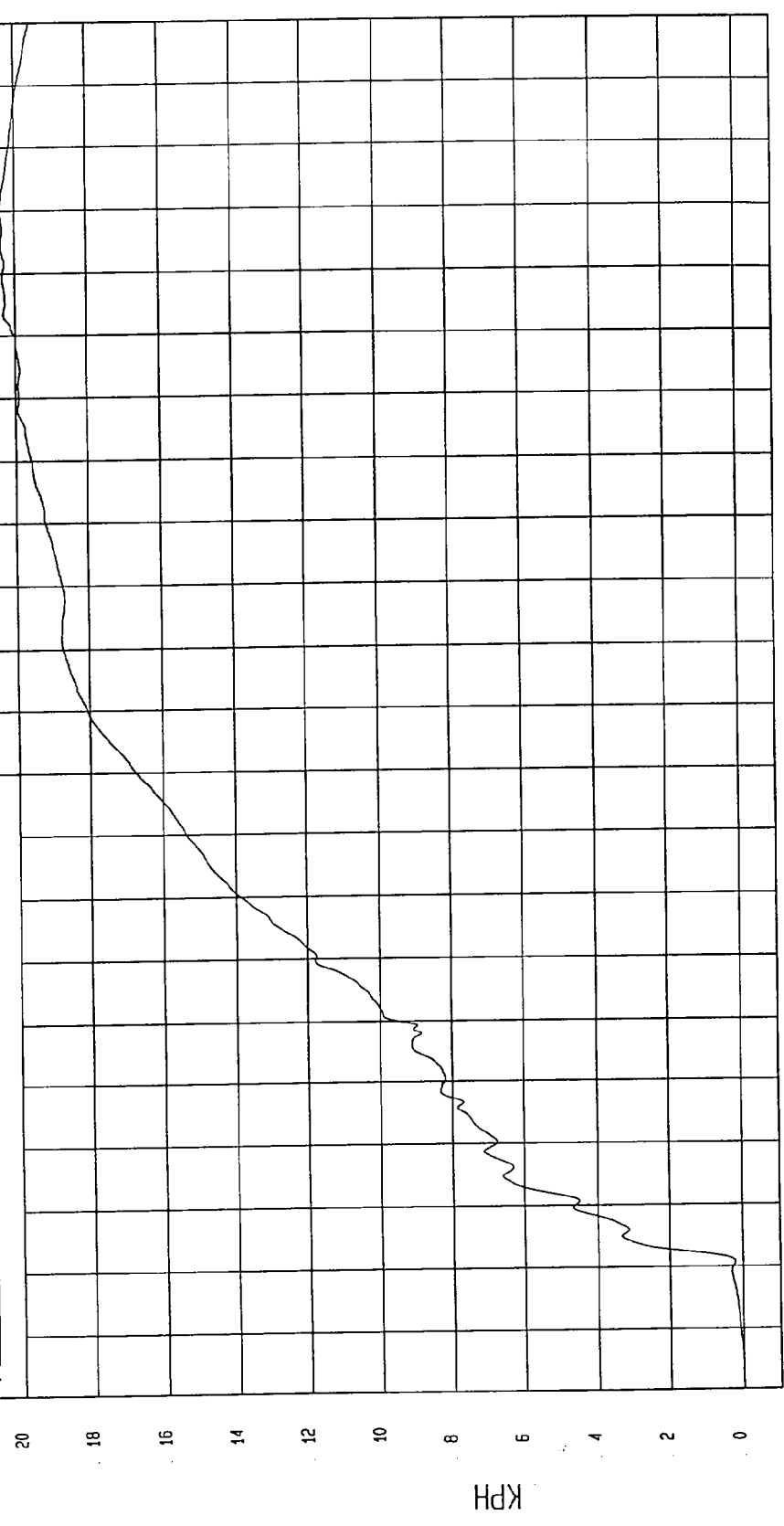
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 20.40 KPH at 170 msec

Minimum = -1.04E-04 KPH at -20 msec

LEFT MID A-POST Y VELOCITY

897106A1.V19 Filterclass (f80)



TIME Seconds

MSA Research  
09-25-1997 12:19

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 167.69 G'S at 6 msec

Minimum = -14.73 G'S at 18 msec

LEFT LOWER B-POST Y ACCELERATION

1 897106AT.A30 Filterclass (60)

200  
180  
160  
140  
120  
100  
80  
60  
40  
20  
0  
-20  
-40

Data not valid after  
approx. 30 msec.

G.S

0.02 0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1 0.11 0.12 0.13 0.14 0.15 0.16 0.17 0.18 0.19

TIME (SECONDS)

MGA Research  
09-26-1997 10:25

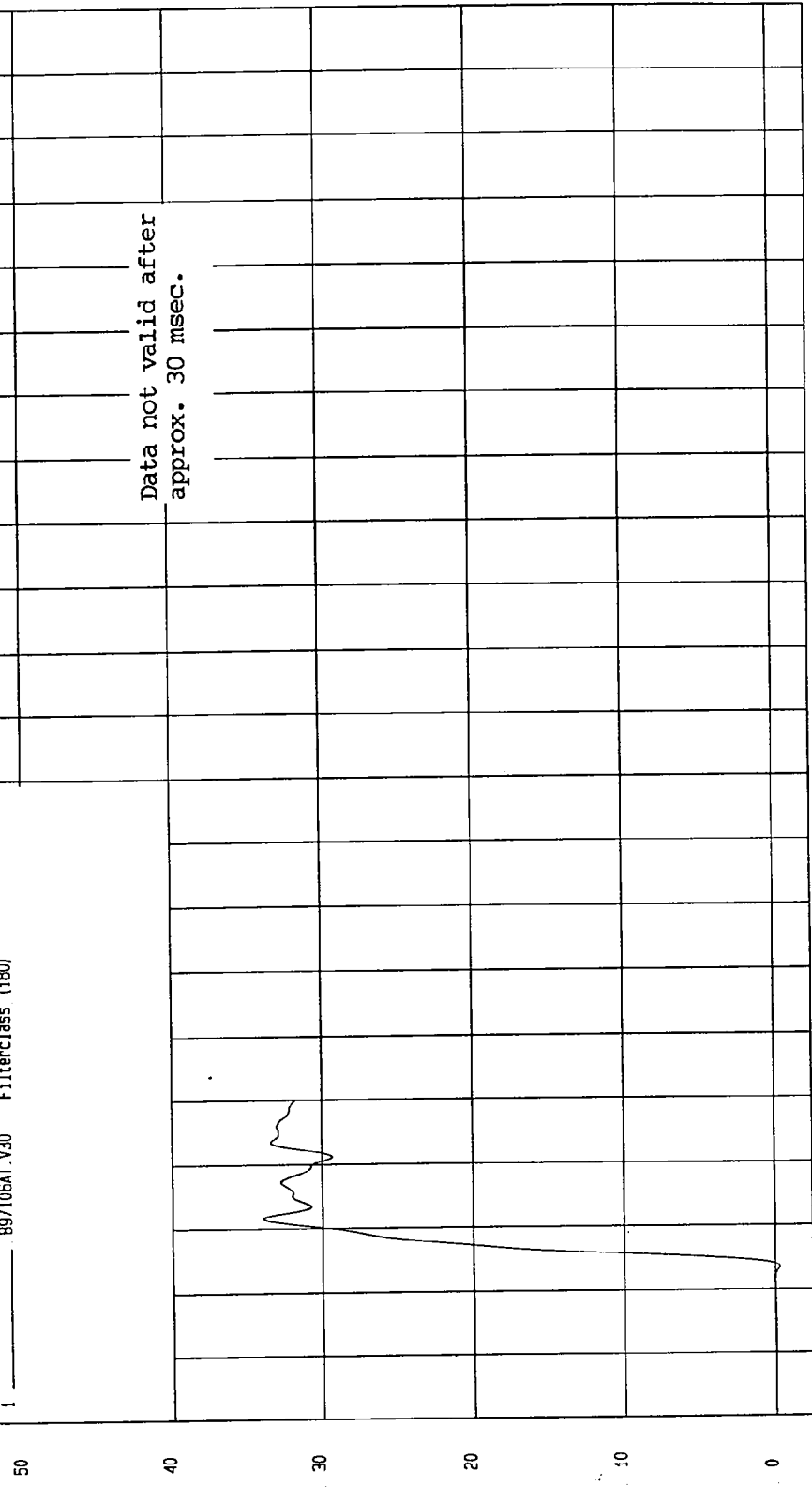
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -27 KPH at 4 msec Maximum = 33.92 KPH at 12 msec

LEFT LOWER B-POST Y VELOCITY

1 897106A1.V30 Filterclass (180)



Data not valid after approx. 30 msec.

MGA Research  
09-26-1997 10:25

TIME Seconds

KPH

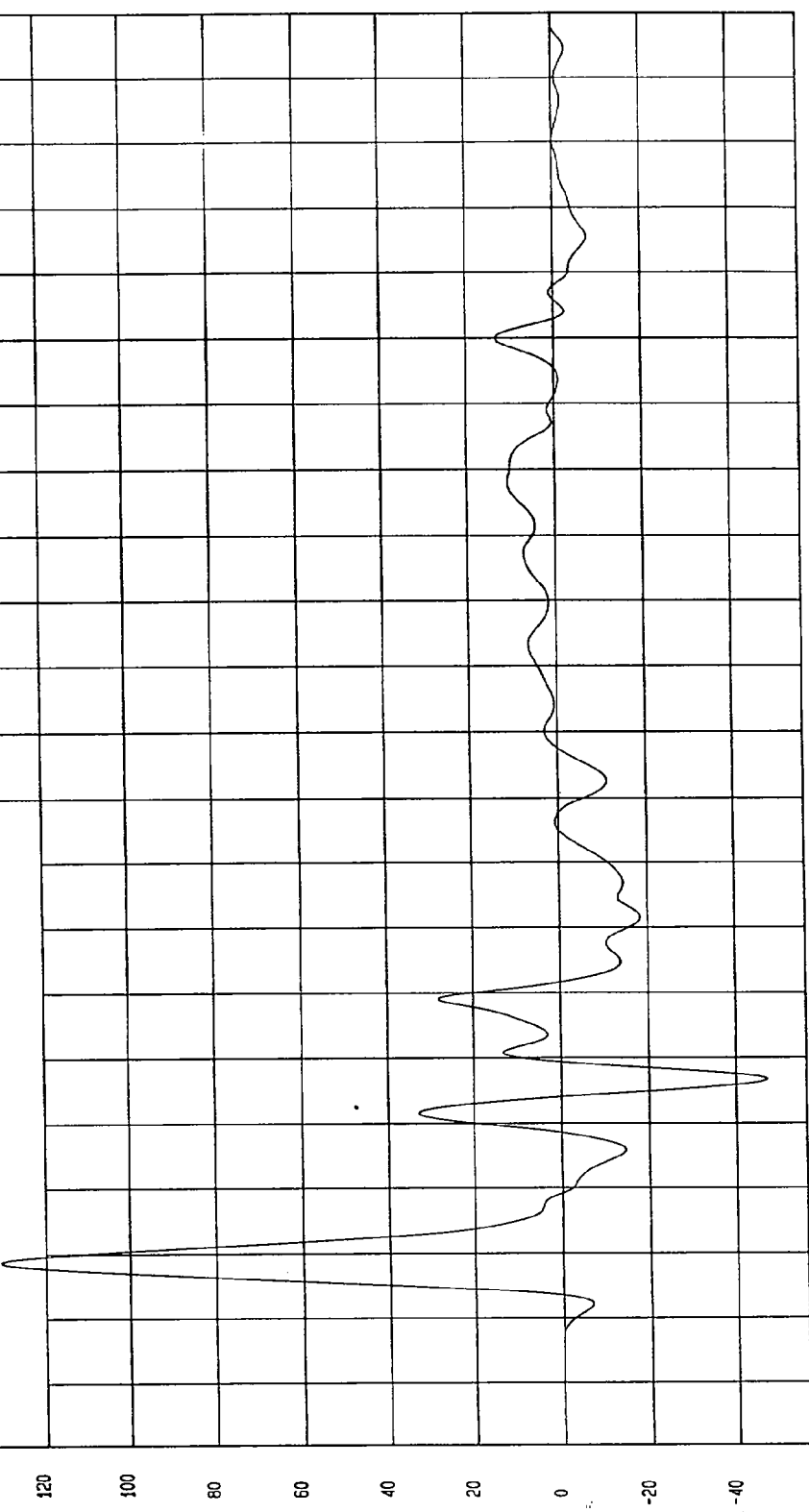
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -46.88 G'S at 37 msec Maximum = 130.02 G'S at 9 msec

LEFT MID B-POST Y ACCELERATION

1 897105AF.A29 FilterClass (60)



TIME (SECONDS)

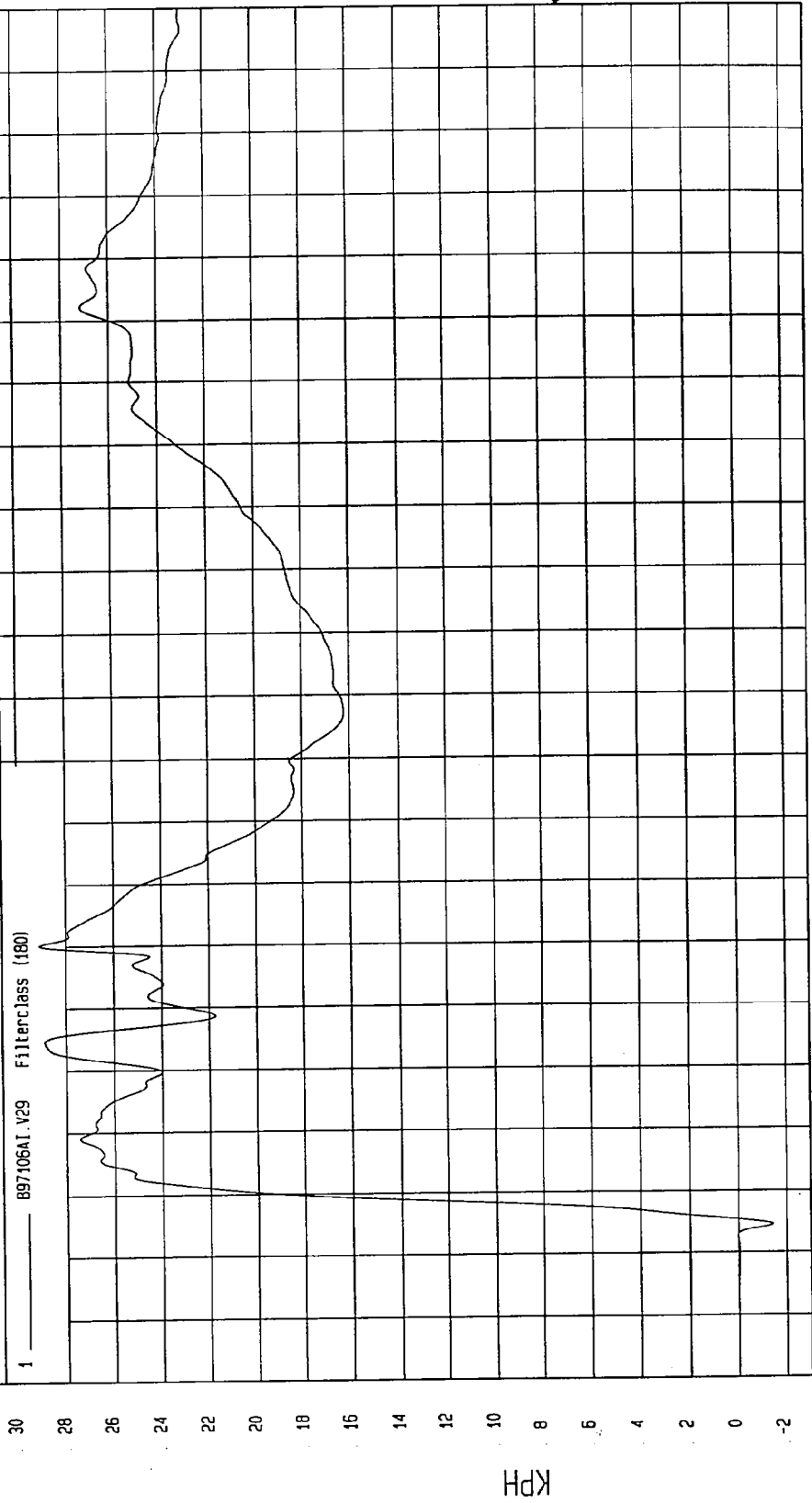
MEV Research  
09-25-1997 12:19

TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -1.43 KPH at 5 msec  
Maximum = 29.09 KPH at 50 msec

LEFT MID B-POST Y VELOCITY



MGA Research  
09-25-1997 12:19

TIME Seconds

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

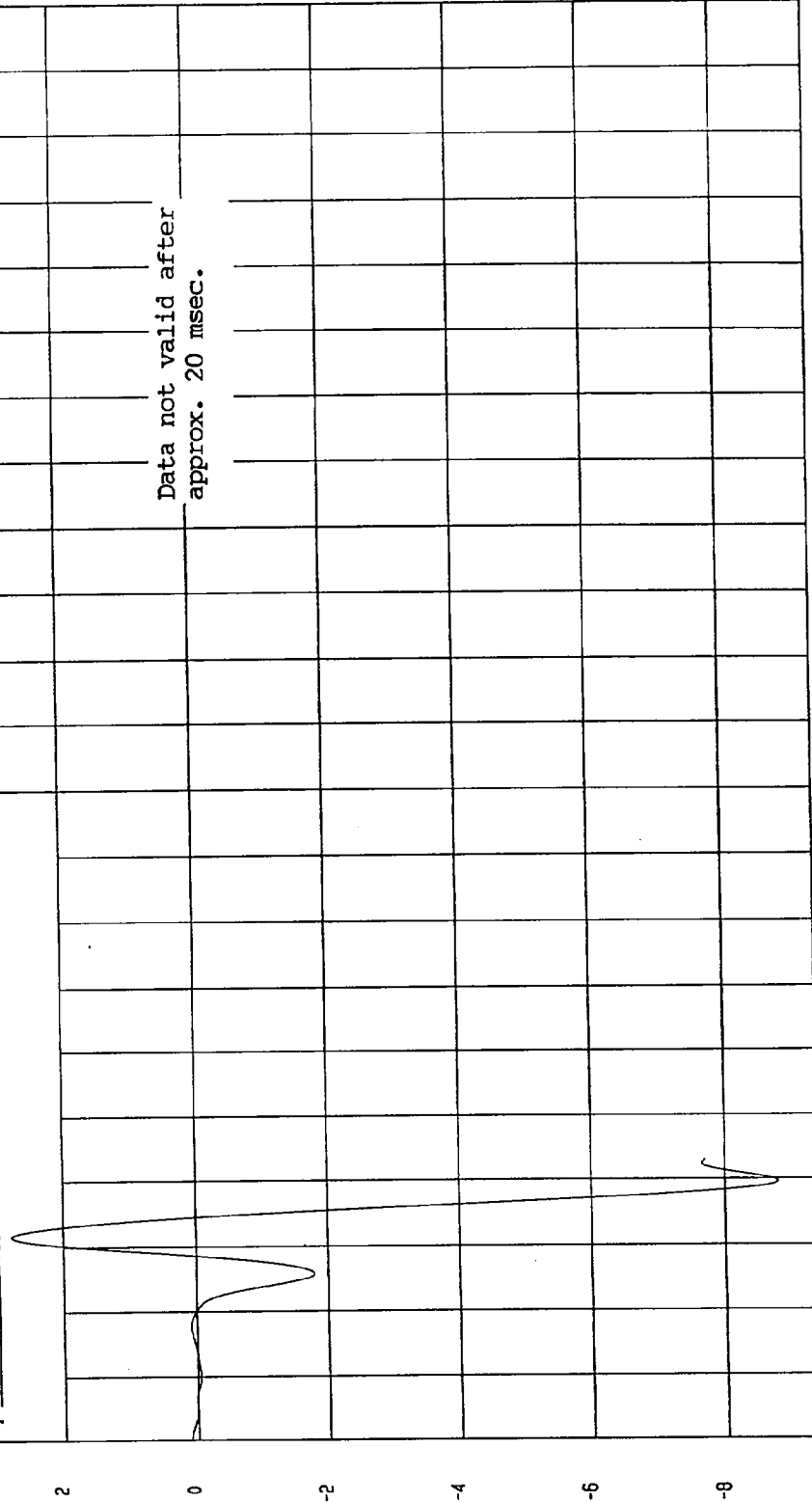
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 2.78 G'S at 12 msec

Minimum = -8.80 G'S at 20 msec

VEHICLE CG X ACCELERATION

1 897106AF.A58 Filterclass (60)



TIME (SECONDS)

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

NGA Research  
09-26-1997 10:32

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

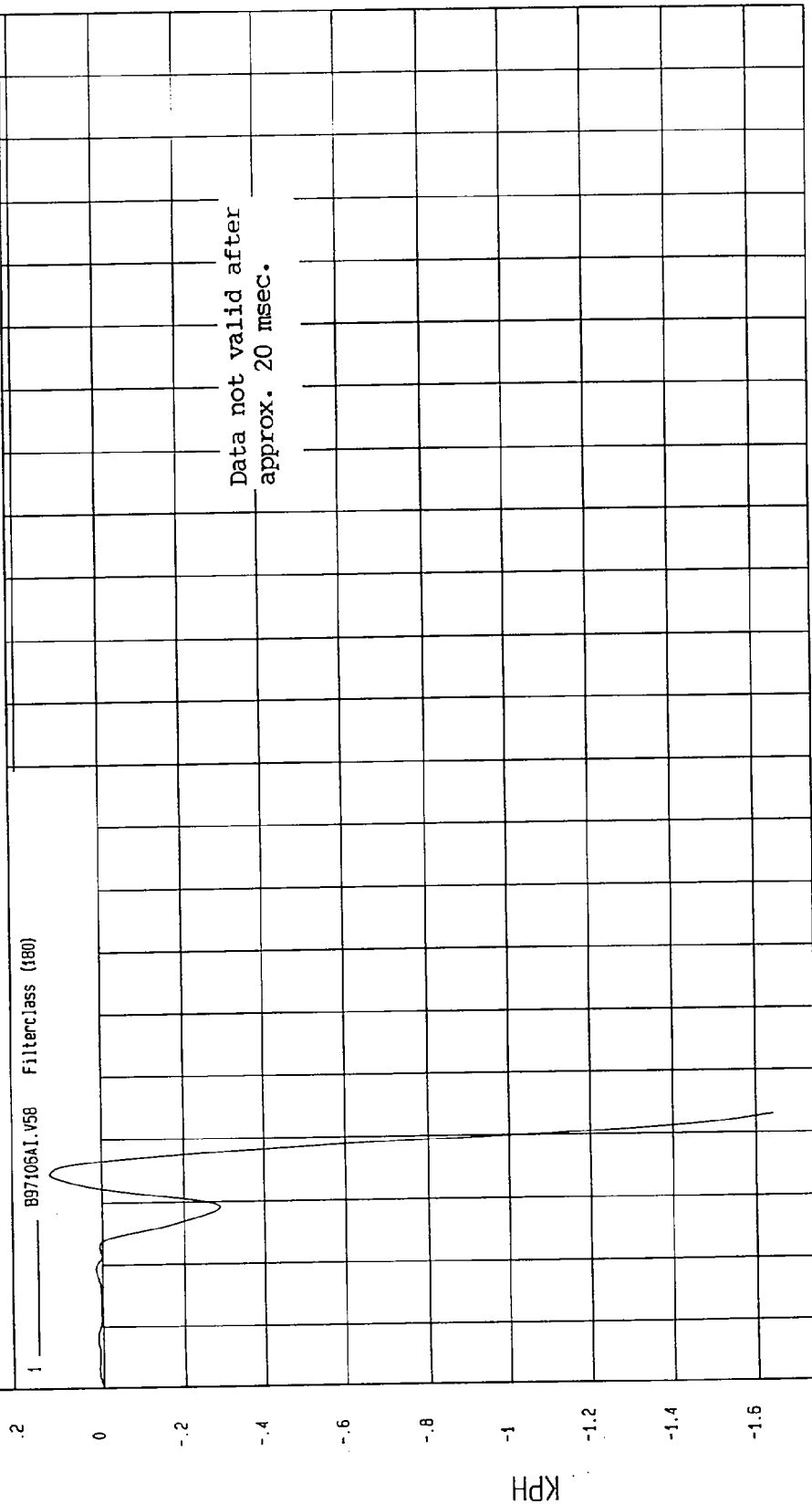
Speed: 32.9 MPH 52.9 KPH

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = .12 KPH at 15 msec

Minimum = -1.65 KPH at 23 msec

VEHICLE CG X VELOCITY



MECA Research  
09-26-1997 10:32

TIME Seconds

KPH

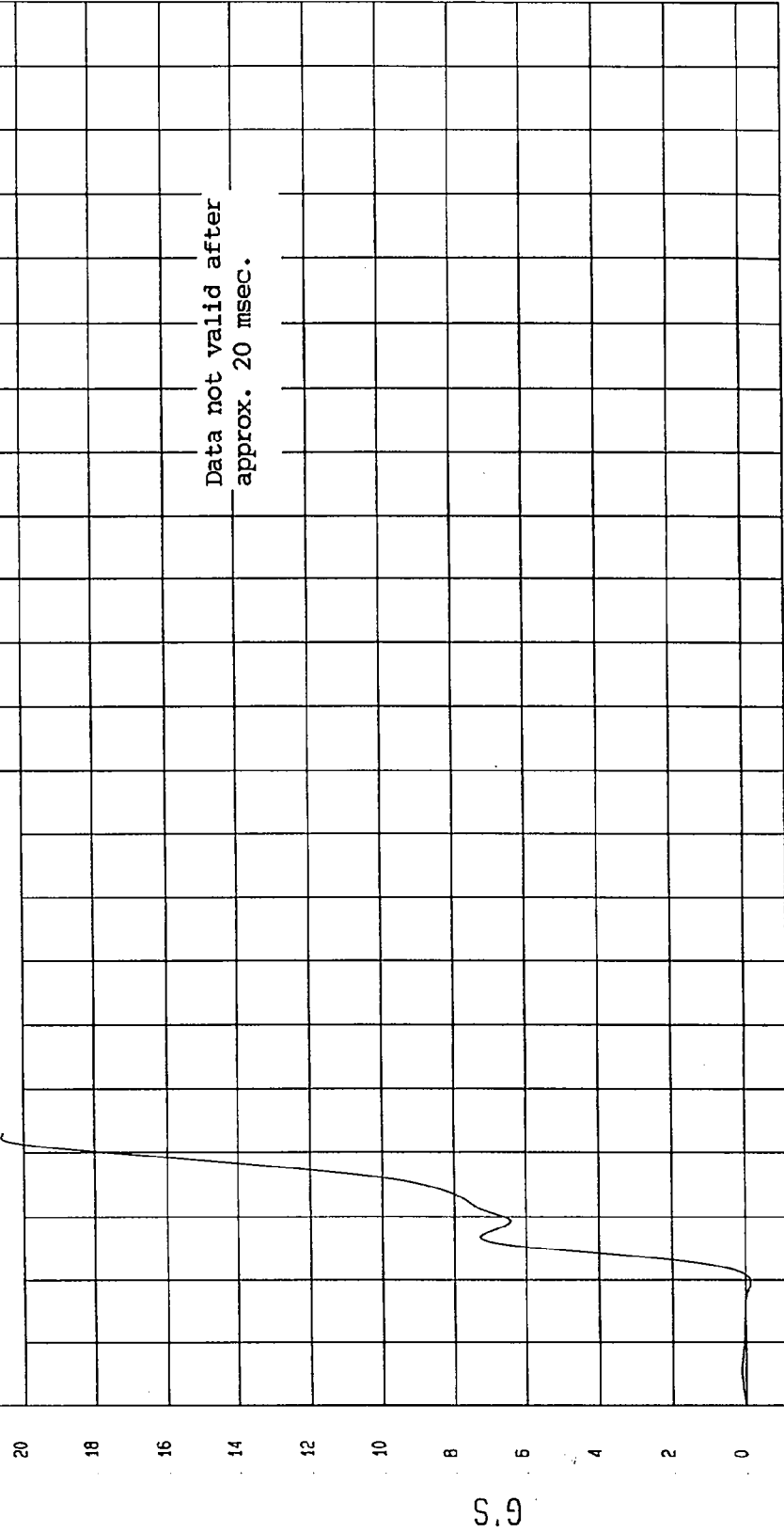
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -.13 G'S at 0 msec  
Maximum = 20.61 G'S at 22 msec

VEHICLE CG Y ACCELERATION

1 ——— 897106AF.A59 Filterclass (60)



MGA Research  
09-26-1997 10:32

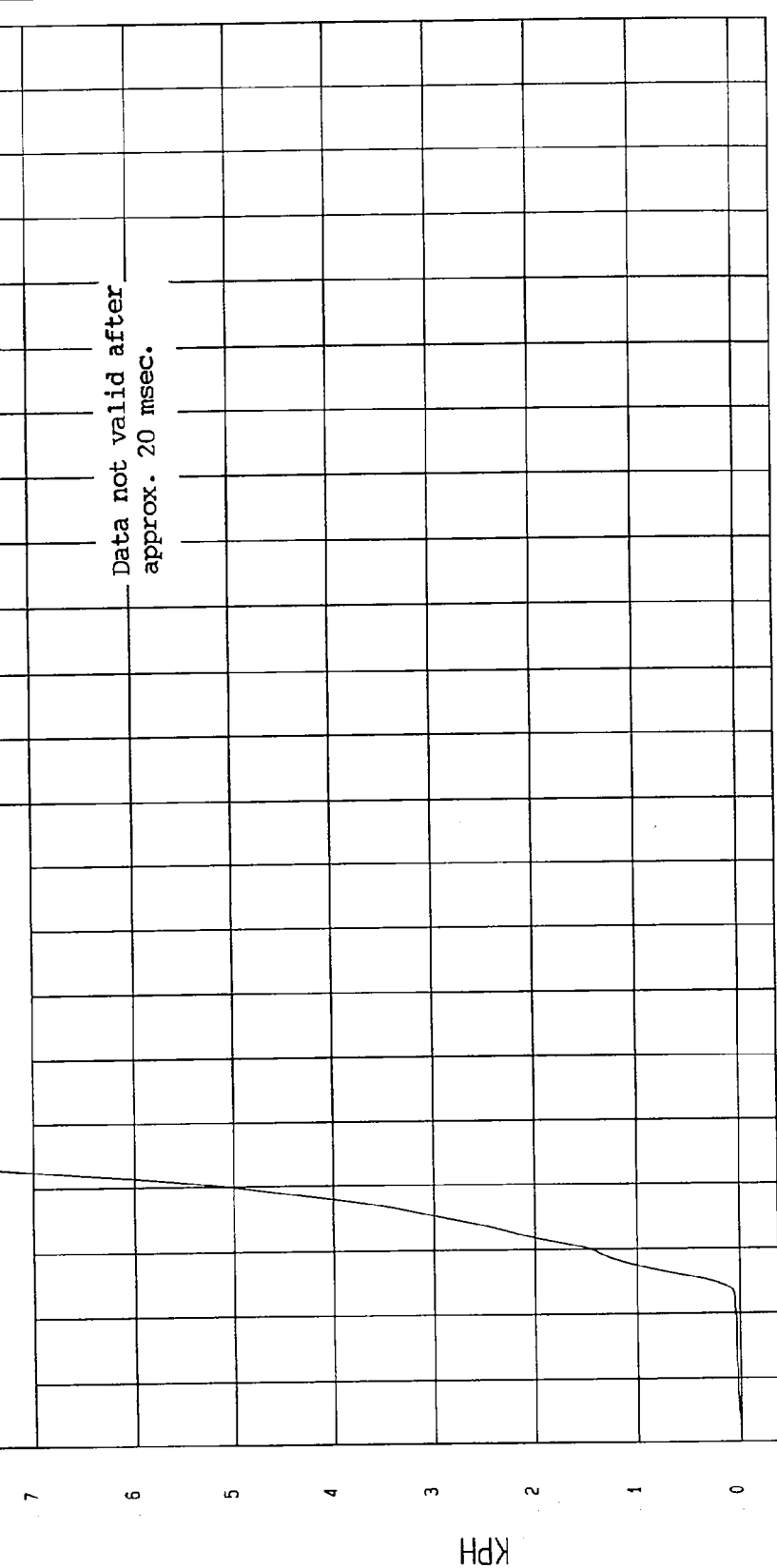
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -2.21E-05 KPH at -20 msec  
Maximum = 7.53 KPH at 23 msec

VEHICLE CG Y VELOCITY

1 ——— B97106A1.V59 Filterclass (180)



Data not valid after approx. 20 msec.

TIME Seconds  
MCA Research  
09-28-1997 10:32

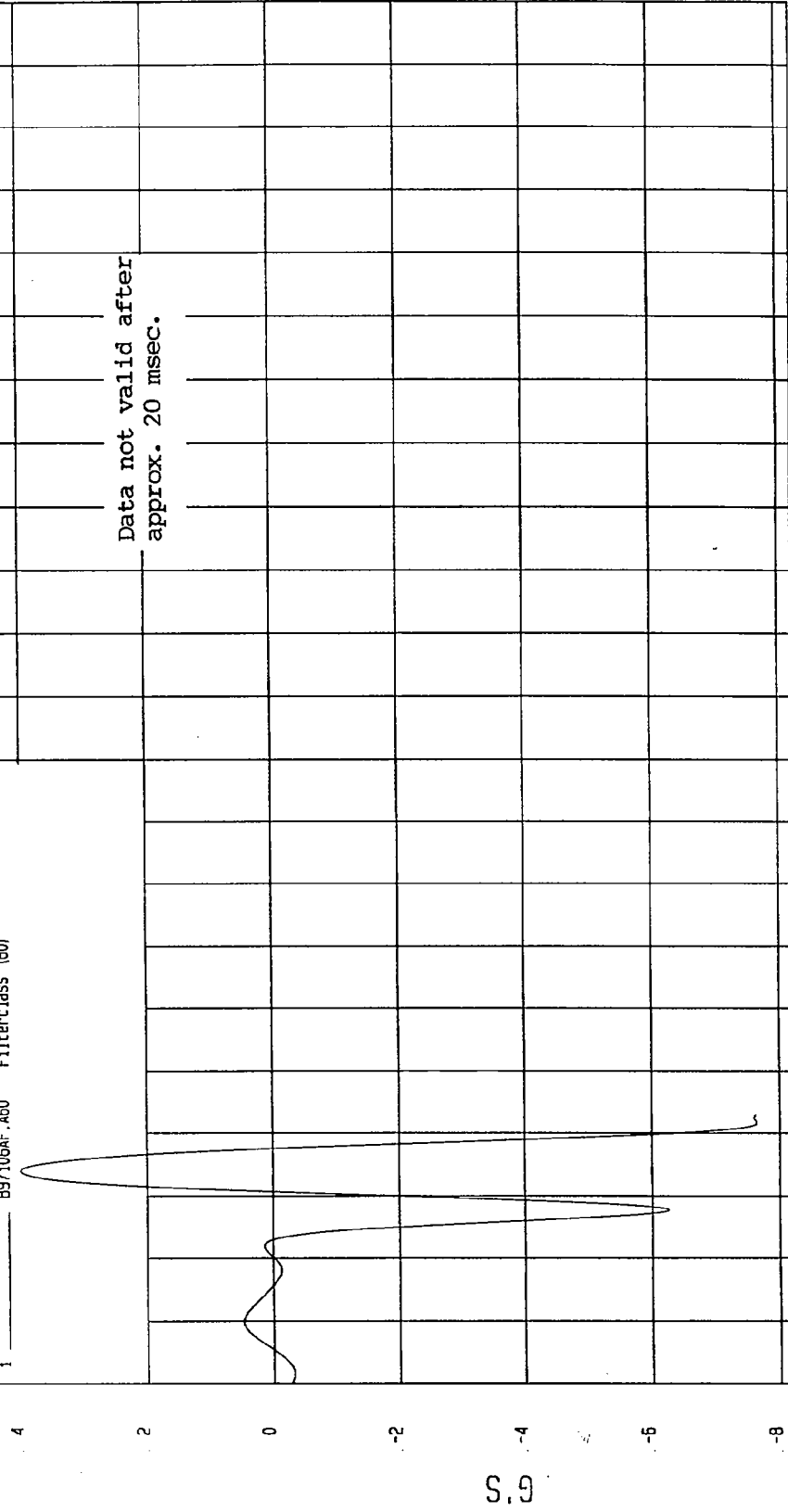
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -7.64 G'S at 22 msec  
Maximum = 4.00 G'S at 14 msec

VEHICLE CG Z ACCELERATION

1 ——— B97106AF .460 Filterclass (60)



TIME (SECONDS)

MGA Research  
09-26-1997 10:32

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

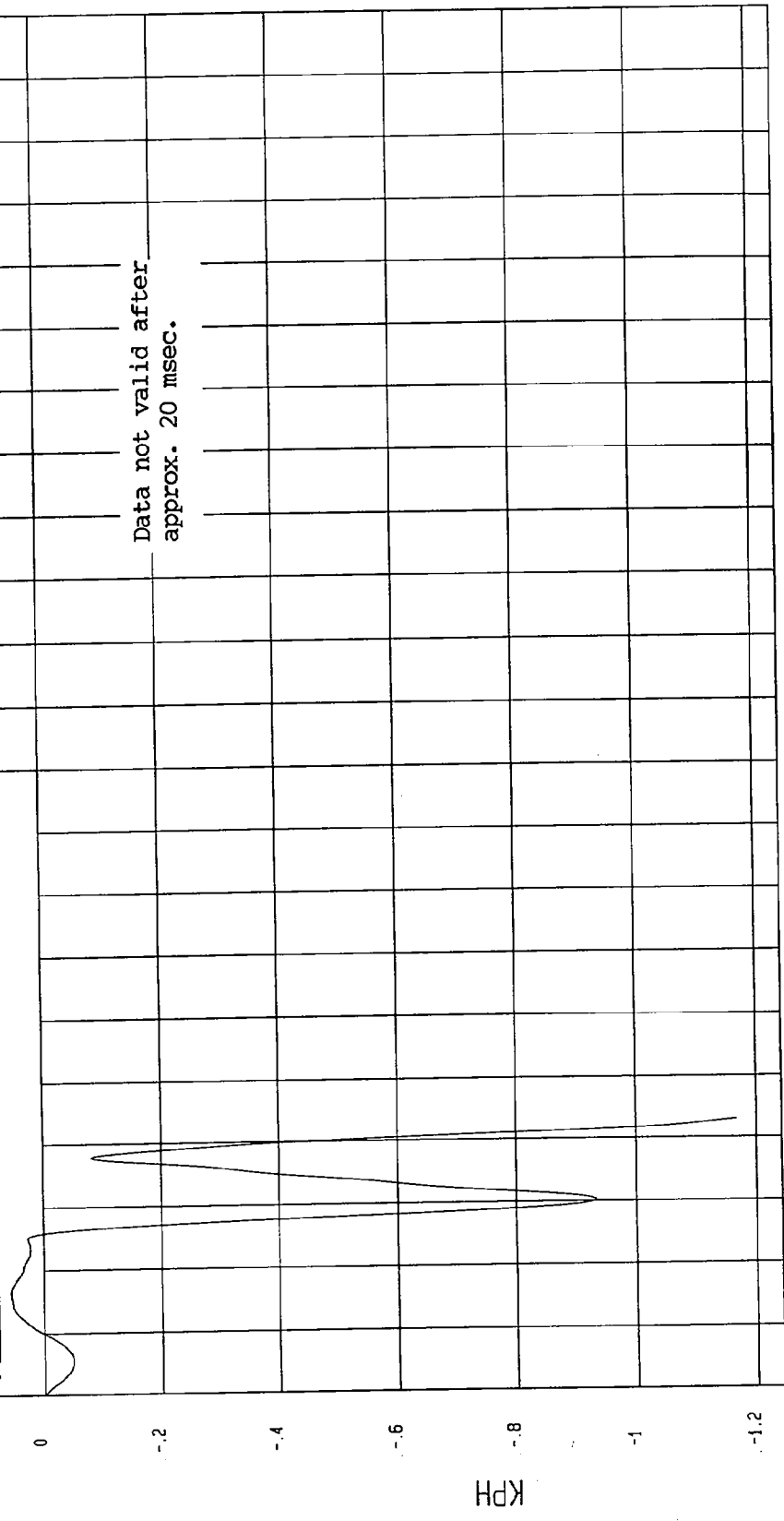
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 5.43E-02 KPH at -4 msec

Minimum = -1.18 KPH at 23 msec

VEHICLE CG Z VELOCITY

1 B97105A1.V60 Filterclass (480)



Data not valid after approx. 20 msec.

MOA Report  
09-26-1997 10:32

TIME Seconds

KPH

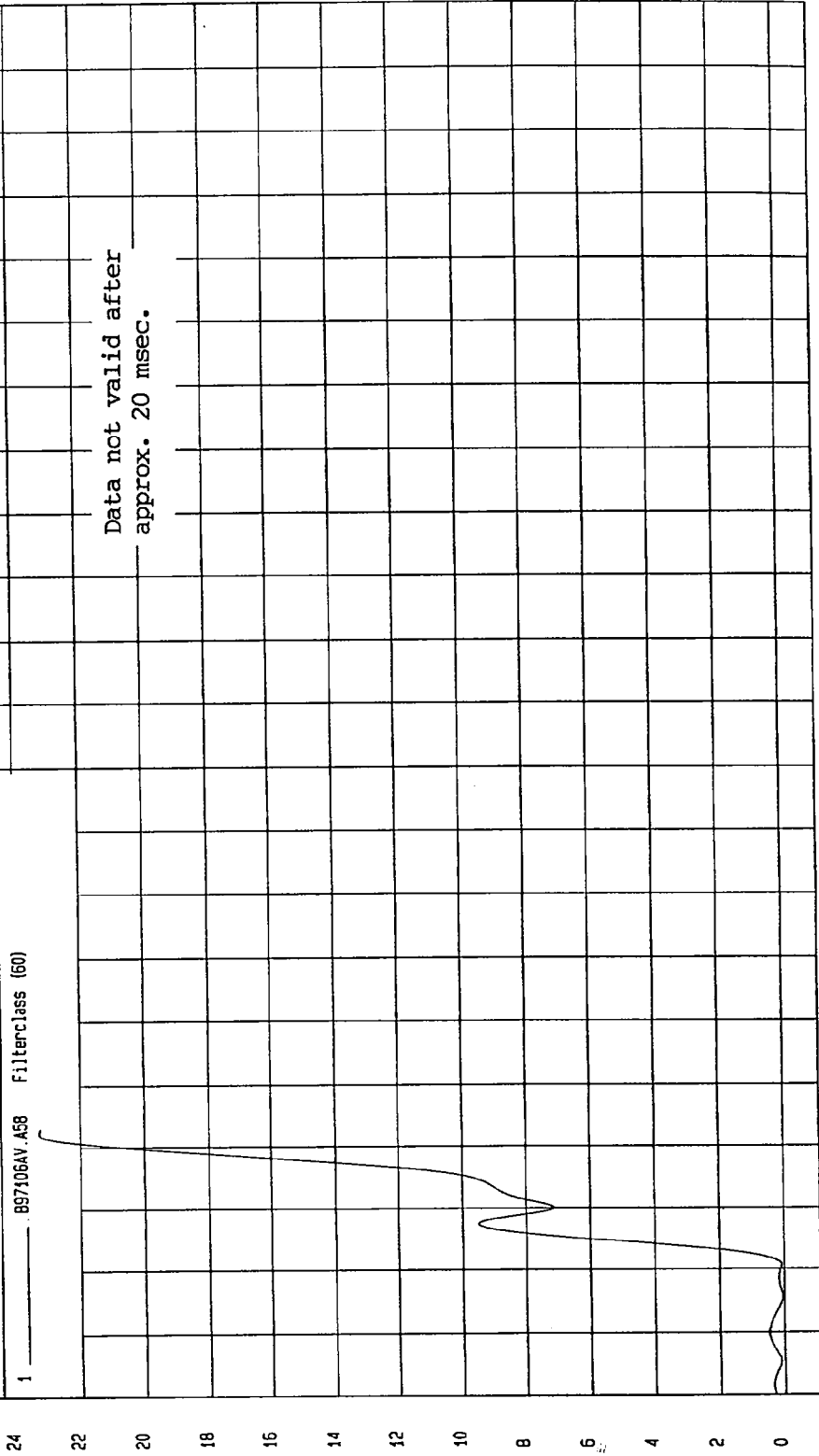
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = .05 G'S at -4 msec  
Maximum = 23.27 G'S at 22 msec

VEHICLE CG RESULTANT ACCELERATION

1 897106AV.A58 Filterclass (60)



MCA Research  
09-26-1997 10:32

TIME (SECONDS)

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

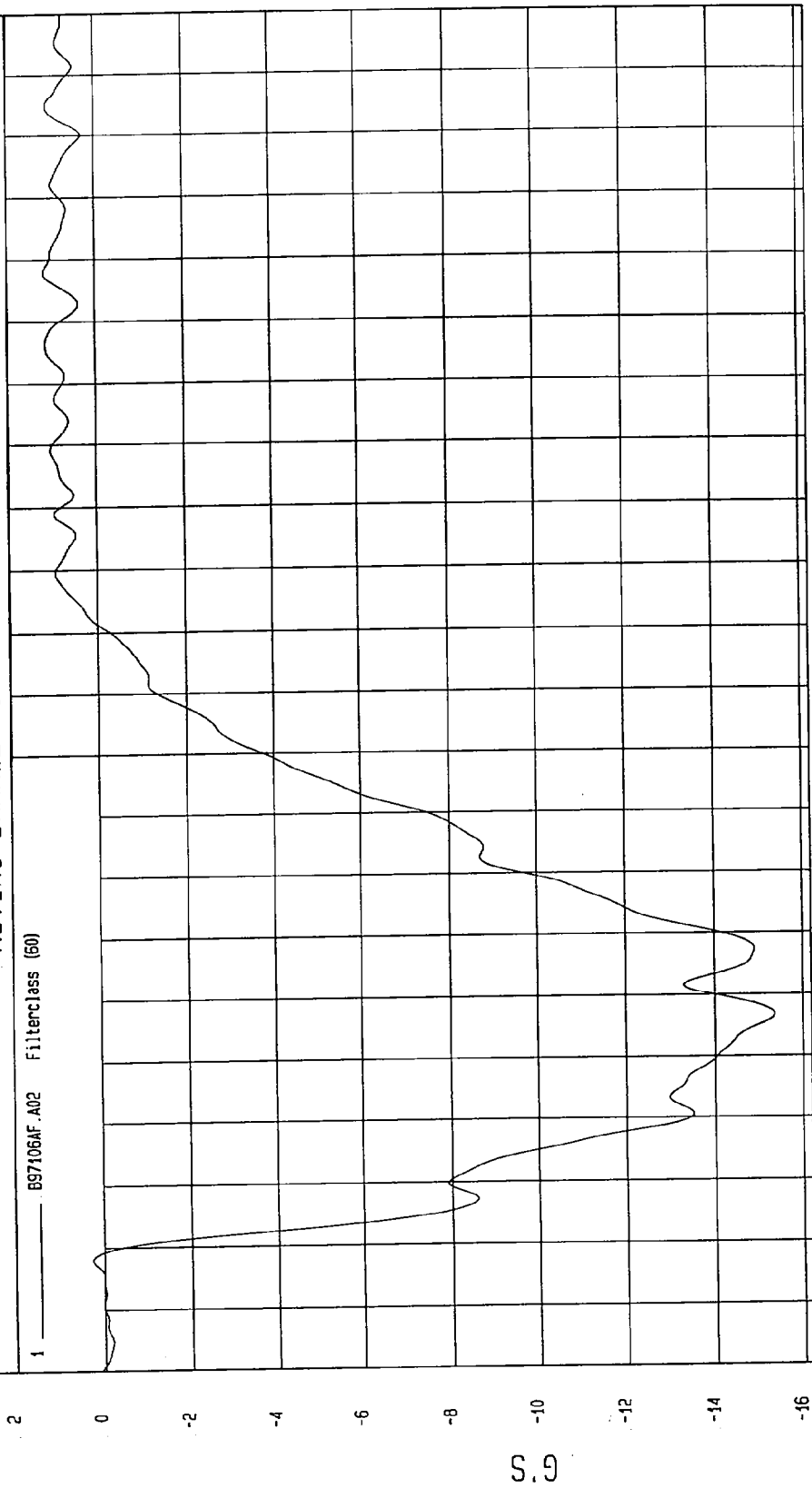
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 1.18 G'S at 158 msec

Minimum = -15.36 G'S at 37 msec

MOVING BARRIER CG X ACCELERATION

1 ——— B97106AF.A02 Filterclass (50)



NSA Research  
09-25-1997 12:20

TIME (SECONDS)

G.S.

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 47.20 KPH at -19 msec

Minimum = 16.07 KPH at 101 msec

MOVING BARRIER CG X VELOCITY

1 897106A1.V02 Filterclass (180)

48

46

44

42

40

38

36

34

32

30

28

26

24

22

20

18

16

KPH

19

18

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16

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03

02

01

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-01

-02

MGA Research  
09-25-1997 12:20

TIME Seconds

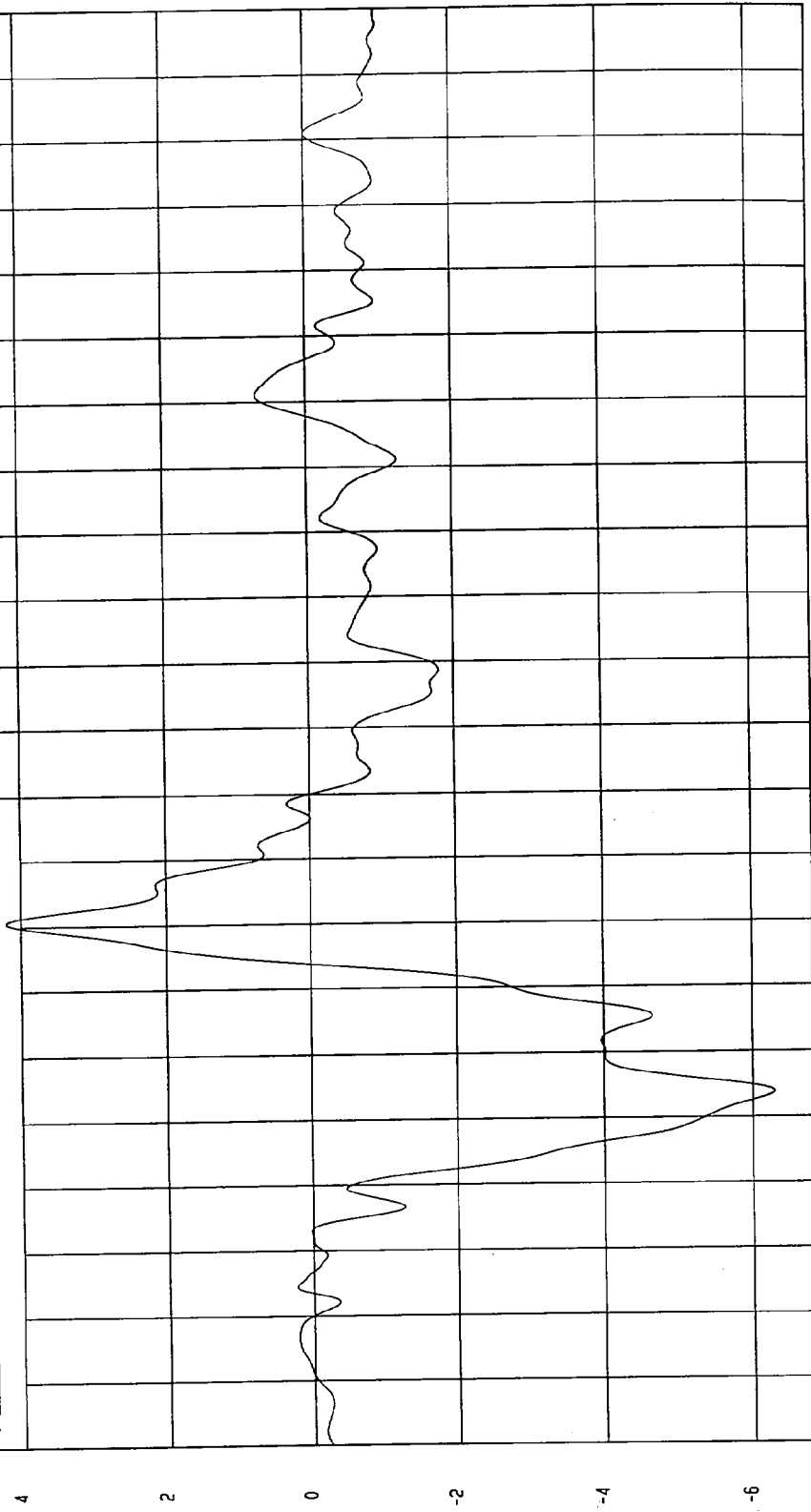
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -6.30 G'S at 34 msec  
Maximum = 4.19 G'S at 60 msec

MOVING BARRIER CG Y ACCELERATION

1 ——— 897106AF.A03 Filterclass (60)



MGA Research  
09-25-1997 12:20

TIME (SECONDS)

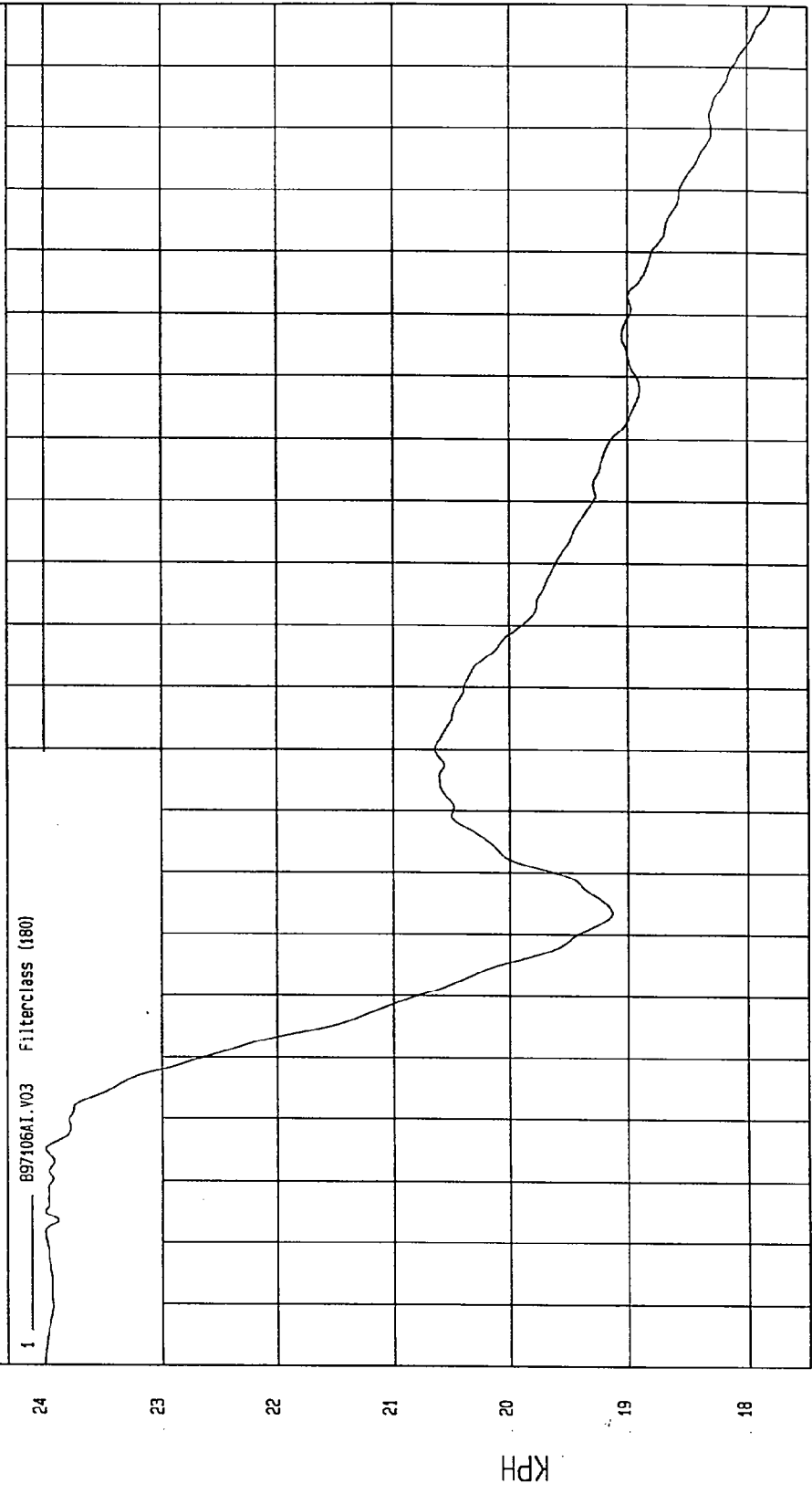
G.S

TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = 17.80 KPH at 200 msec  
Maximum = 24 KPH at -20 msec

MOVING BARRIER CG Y VELOCITY



MCA Research  
09-25-1997 12:20

TIME Seconds

TEST: FMVSS 214 LEFT SIDE IMPACT

TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

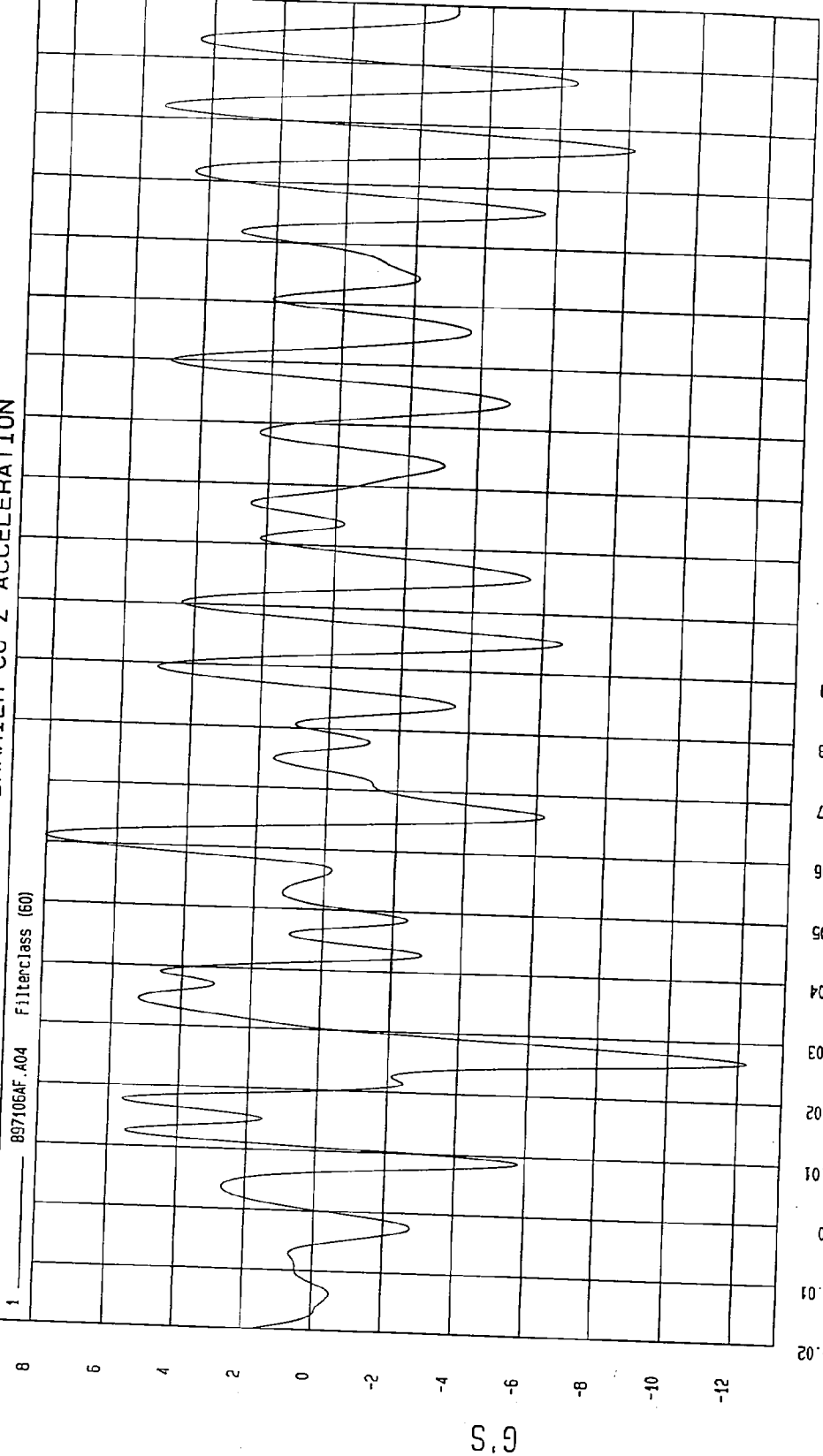
Speed: 32.9 MPH 52.9 KPH

Minimum = -12.24 G'S at 27 msec

Maximum = 8.02 G'S at 61 msec

MOVING BARRIER CG Z ACCELERATION

1 897106AF.A04 Filterclass (60)



TIME (SECONDS)

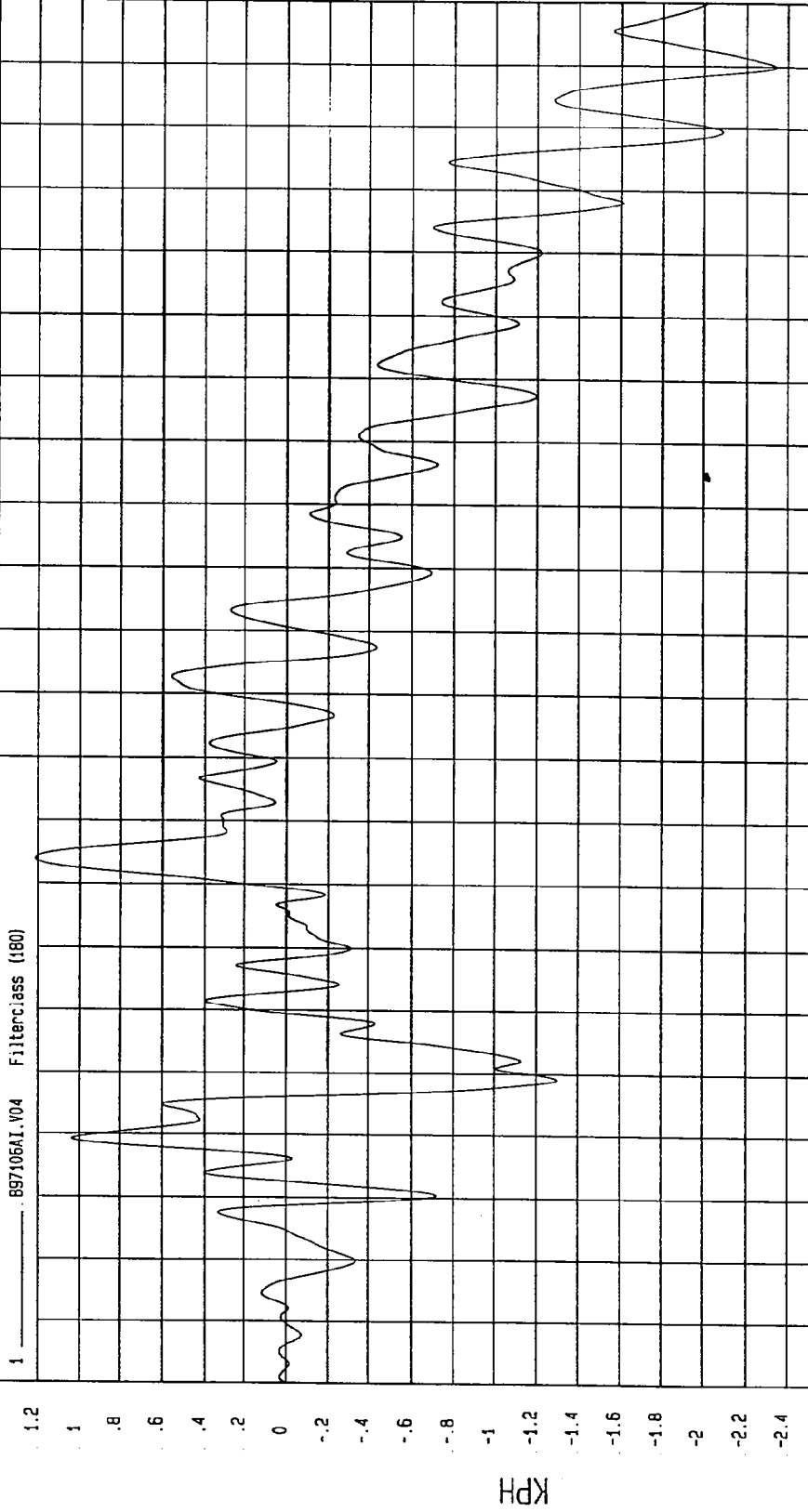
MCA Research  
09-25-1997 12:20

TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -2.34 KPH at .190 msec  
Maximum = 1.21 KPH at 64 msec

MOVING BARRIER CG Z VELOCITY



MCA Research  
09-25-1997 12:21

TIME Seconds

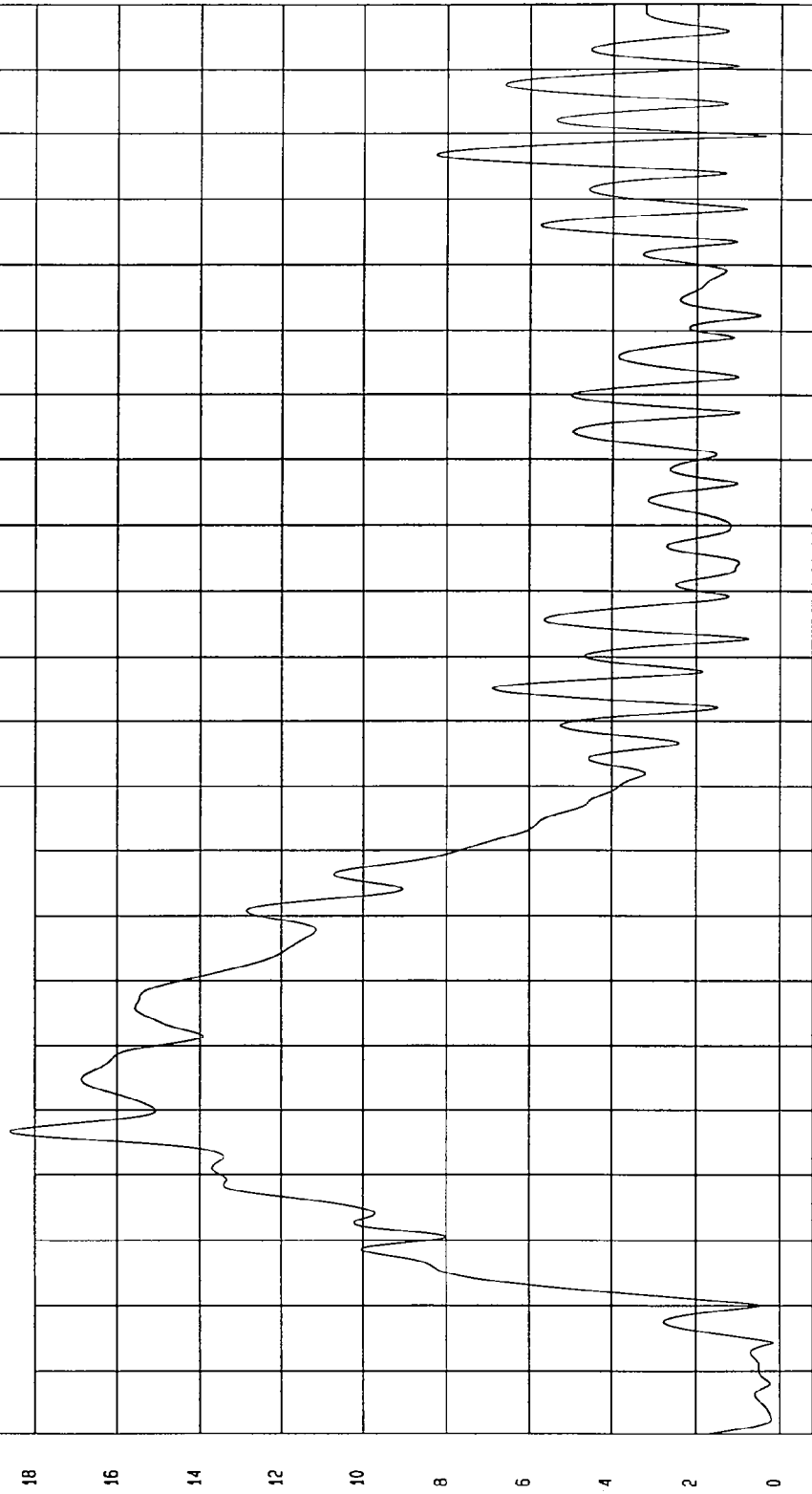
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = .15 G'S at -6 msec Maximum = 18.61 G'S at 27 msec

MOVING BARRIER CG RESULTANT ACCELERATION

1 ——— 897106AV.A02 Filterclass (60)



TIME (SECONDS)

MGA Research  
09-25-1997 12:28

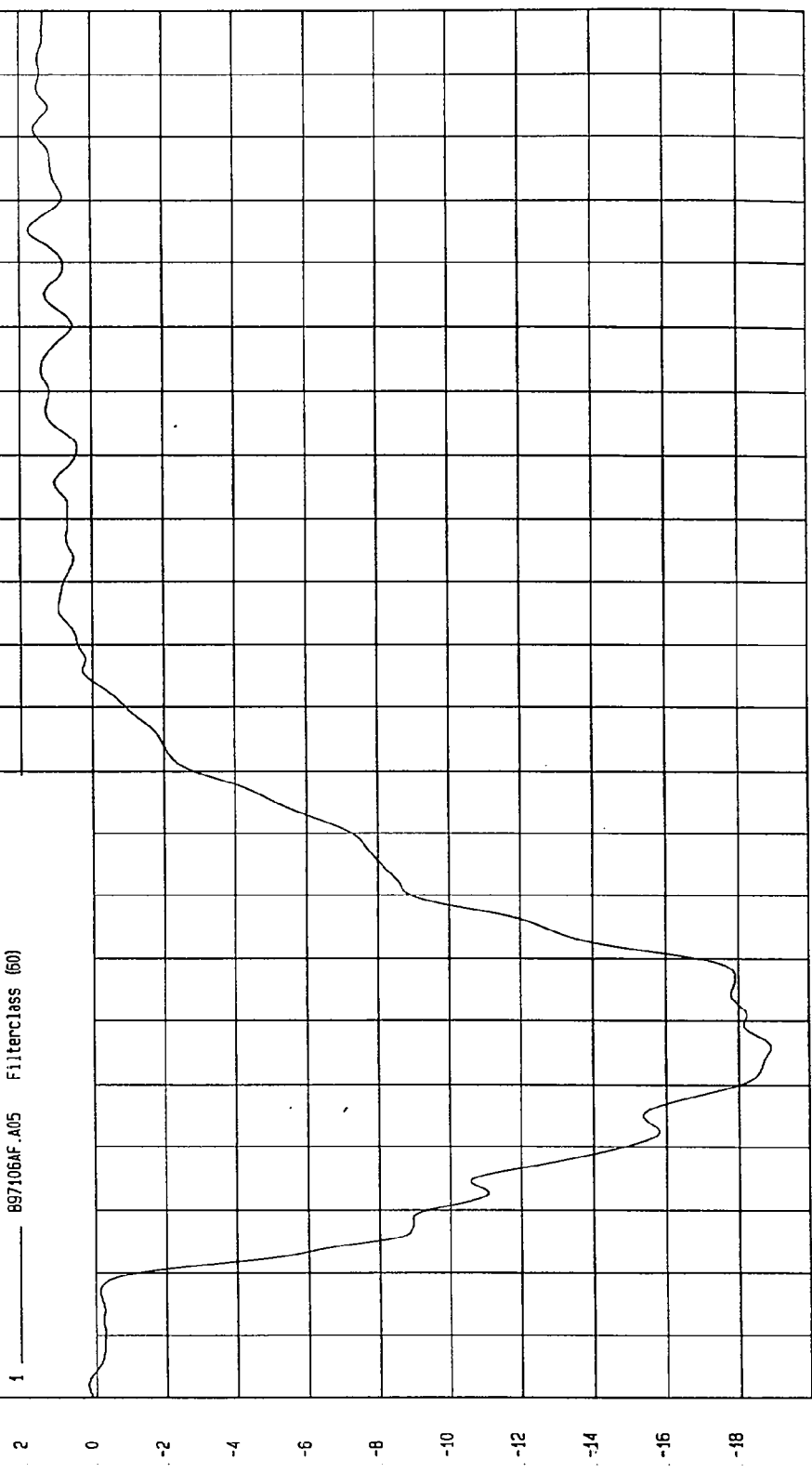
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -18.90 G'S at .36 msec Maximum = 1.76 G'S at 165 msec

MOVING BARRIER REAR AXLE X ACCELERATION

1 897106AF.A05 FilterClass (50)



TIME (SECONDS)

MSA Research  
09-25-1997 12:21

S.G

TEST: FMVSS 214 LEFT SIDE IMPACT

TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

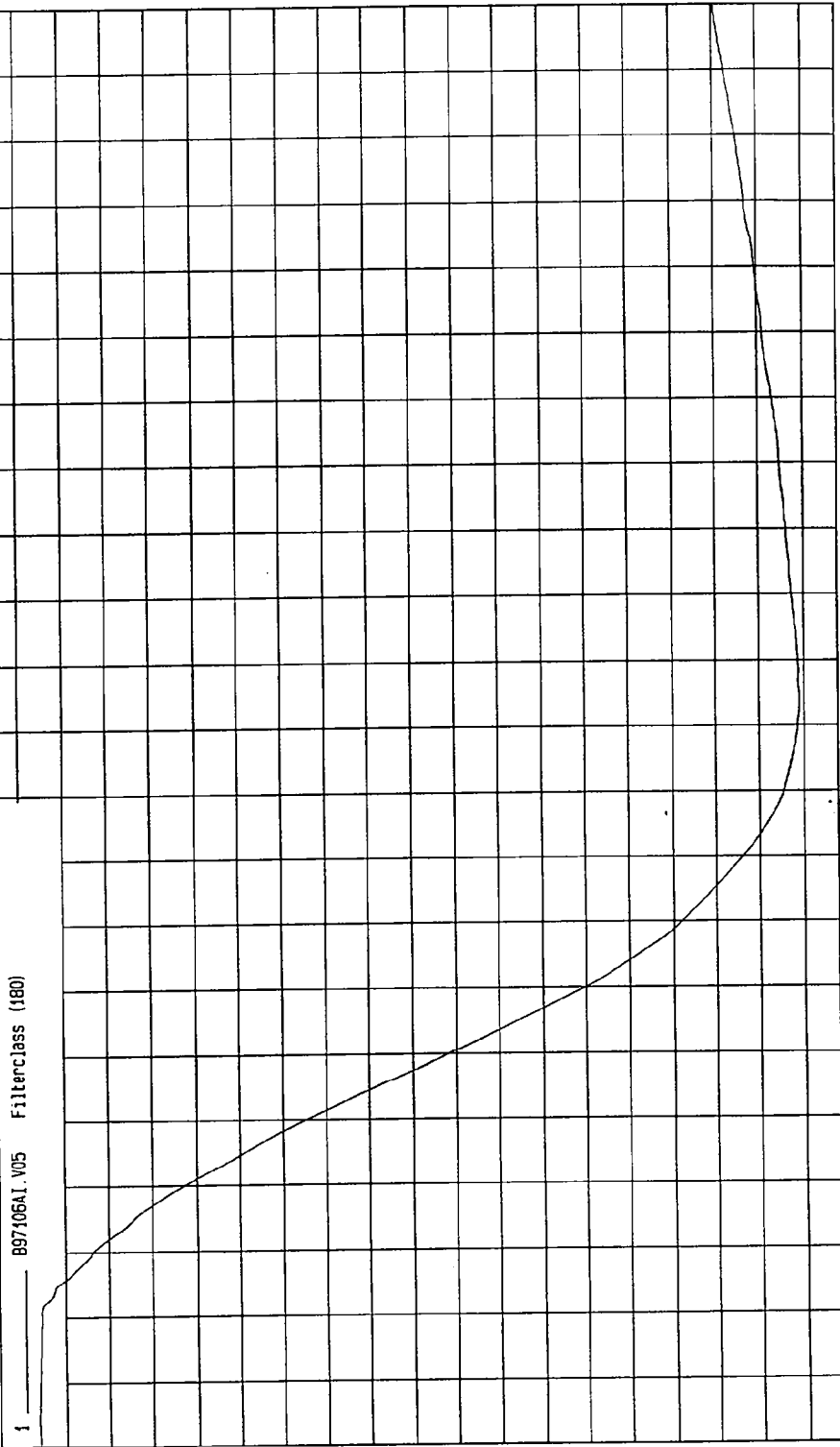
Minimum = 12.20 KPH at 94 msec

Maximum = 47.23 KPH at -16 msec

MOVING BARRIER REAR AXLE X VELOCITY

1 B97106A1.V05 Filterclass (180)

48  
46  
44  
42  
40  
38  
36  
34  
32  
30  
28  
26  
24  
22  
20  
18  
16  
14  
12



TIME Seconds

NSA Research  
09-25-1997 12:21

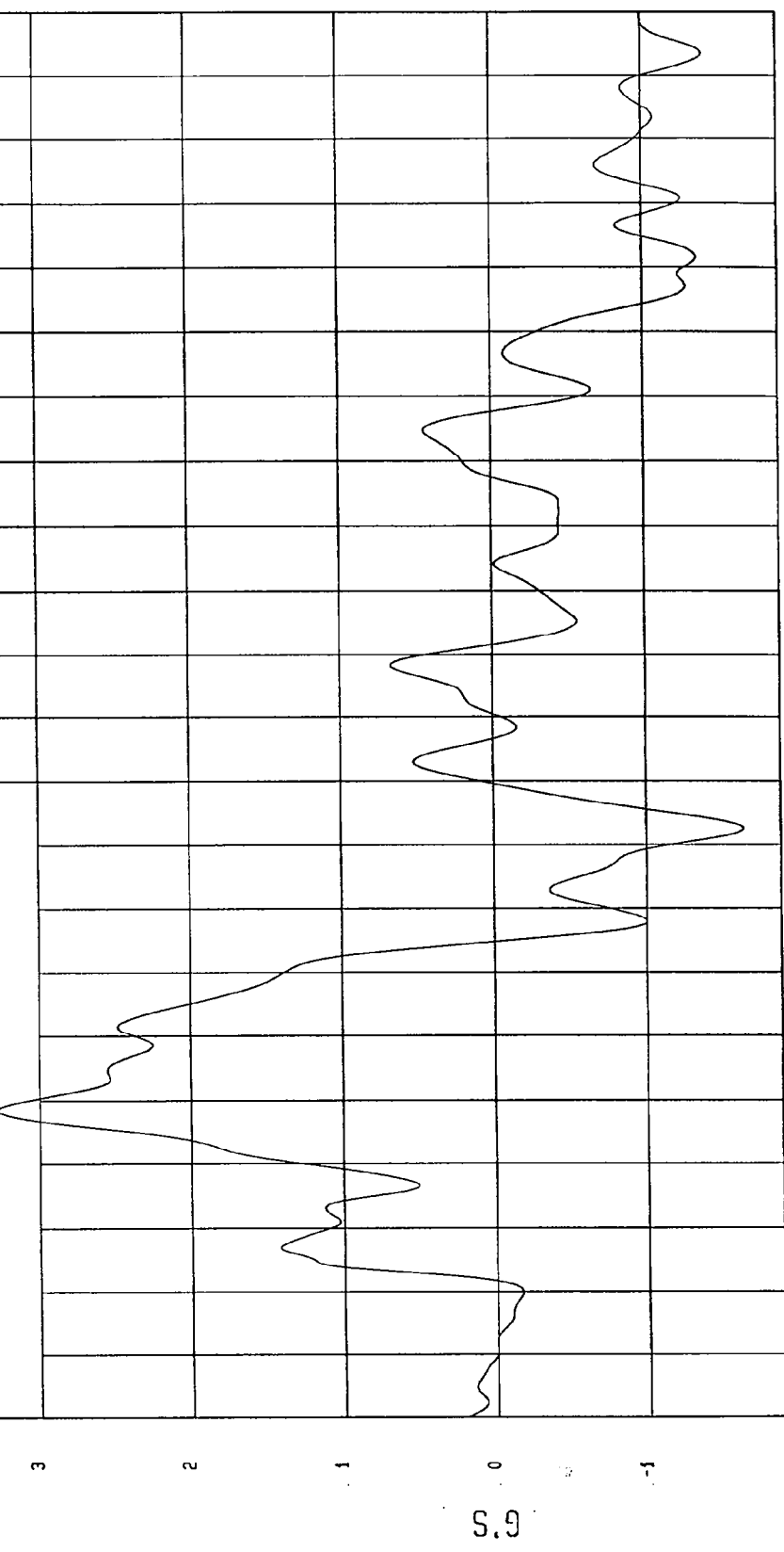
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -1.62 G'S at 72 msec  
Maximum = 3.28 G'S at 28 msec

MOVING BARRIER REAR AXLE Y ACCELERATION

1 \_\_\_\_\_ B97106AF.A06 Filterclass (60)



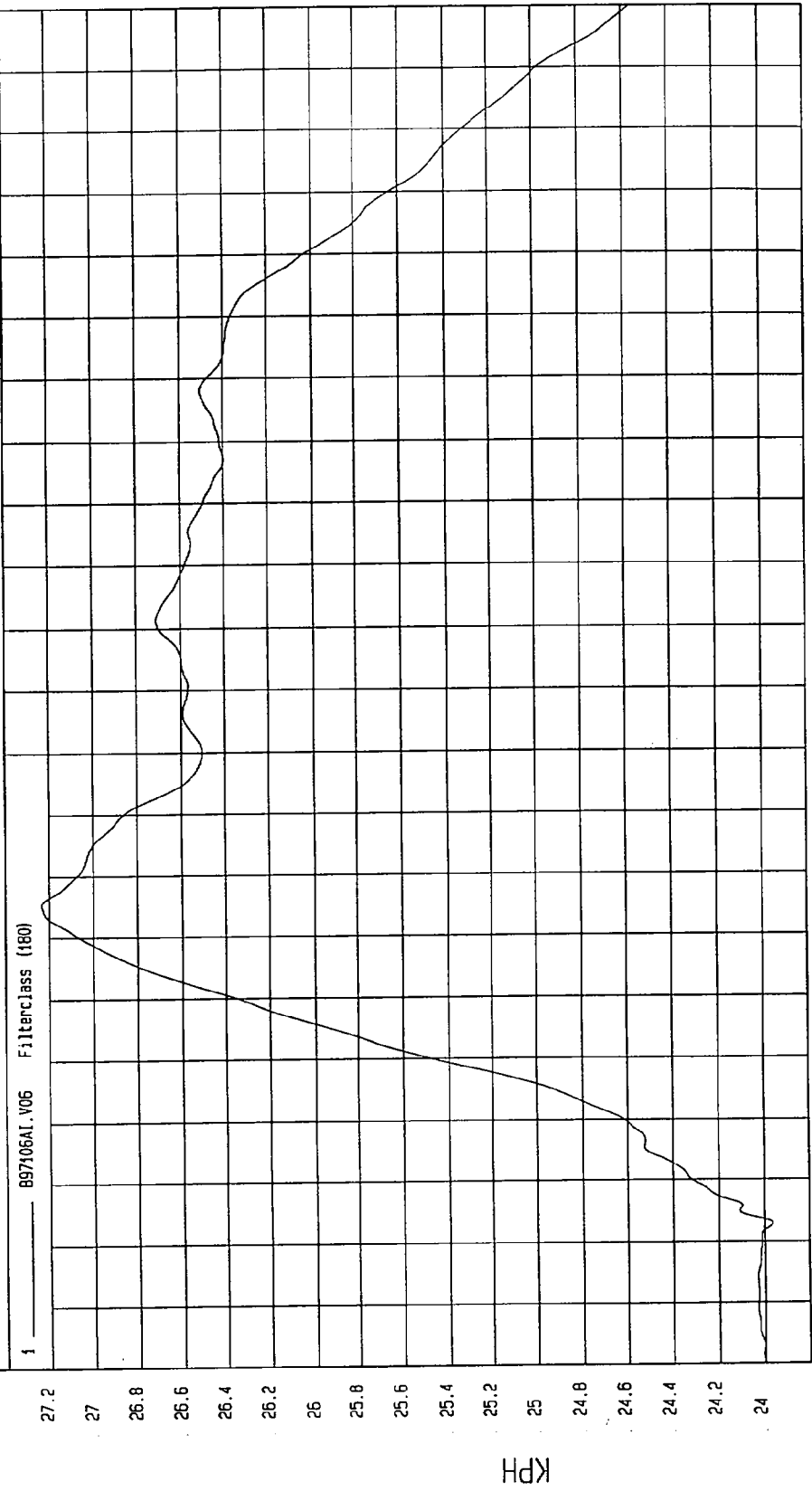
MEA Research  
09-25-1997 12:21

TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = 23.96 KPH at 3 msec Maximum = 27.23 KPH at 55 msec

MOVING BARRIER REAR AXLE Y VELOCITY



MCA Research  
09-25-1997 12:21

TIME Seconds

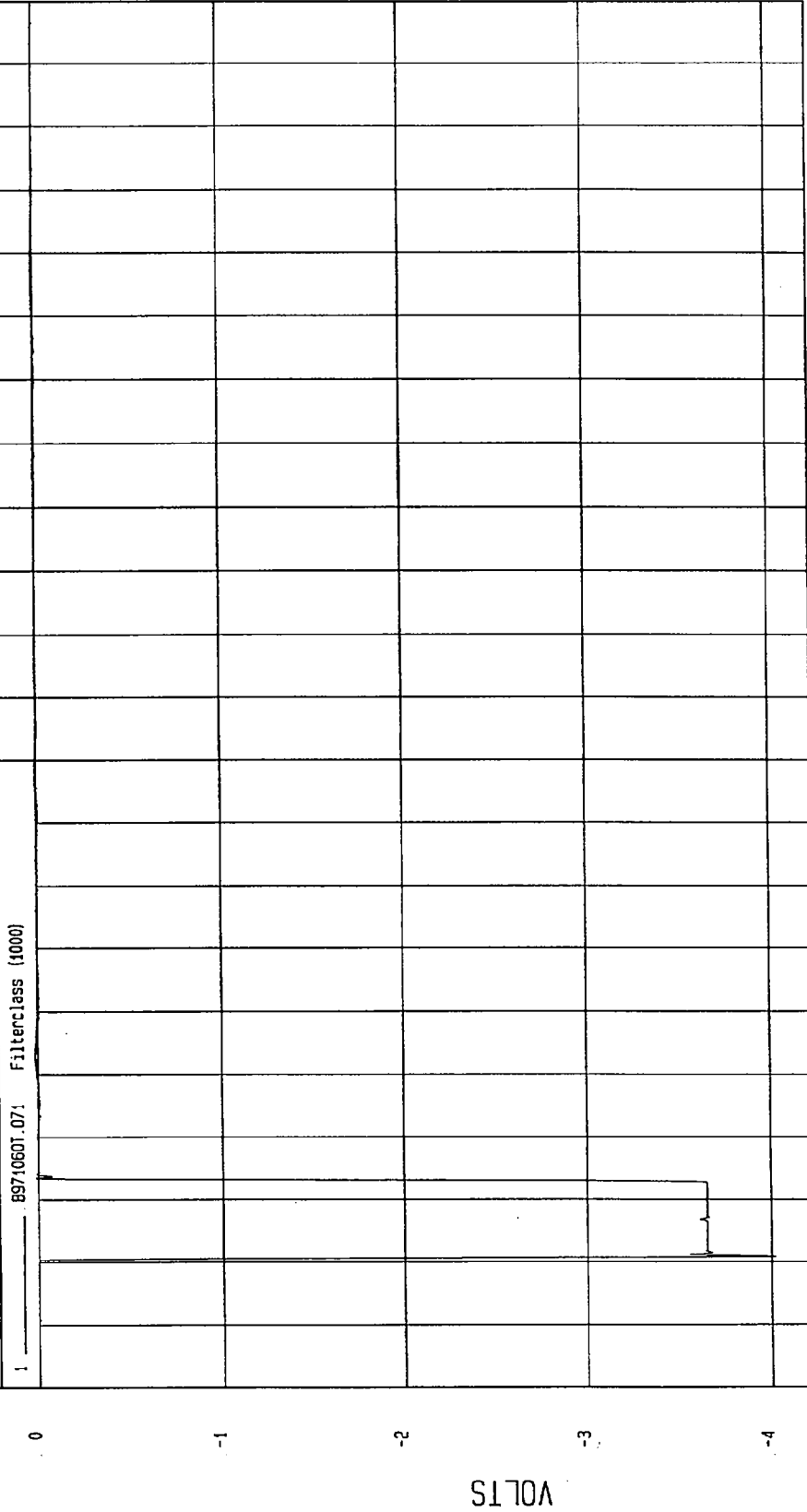
KPH

TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -4.02 VOLTS at 1 msec Maximum = 1.53E-02 VOLTS at 13 msec

LEFT BARRIER CONTACT



MCA Research  
09-25-1997 12:21

TIME (SECONDS)

VOLTS

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

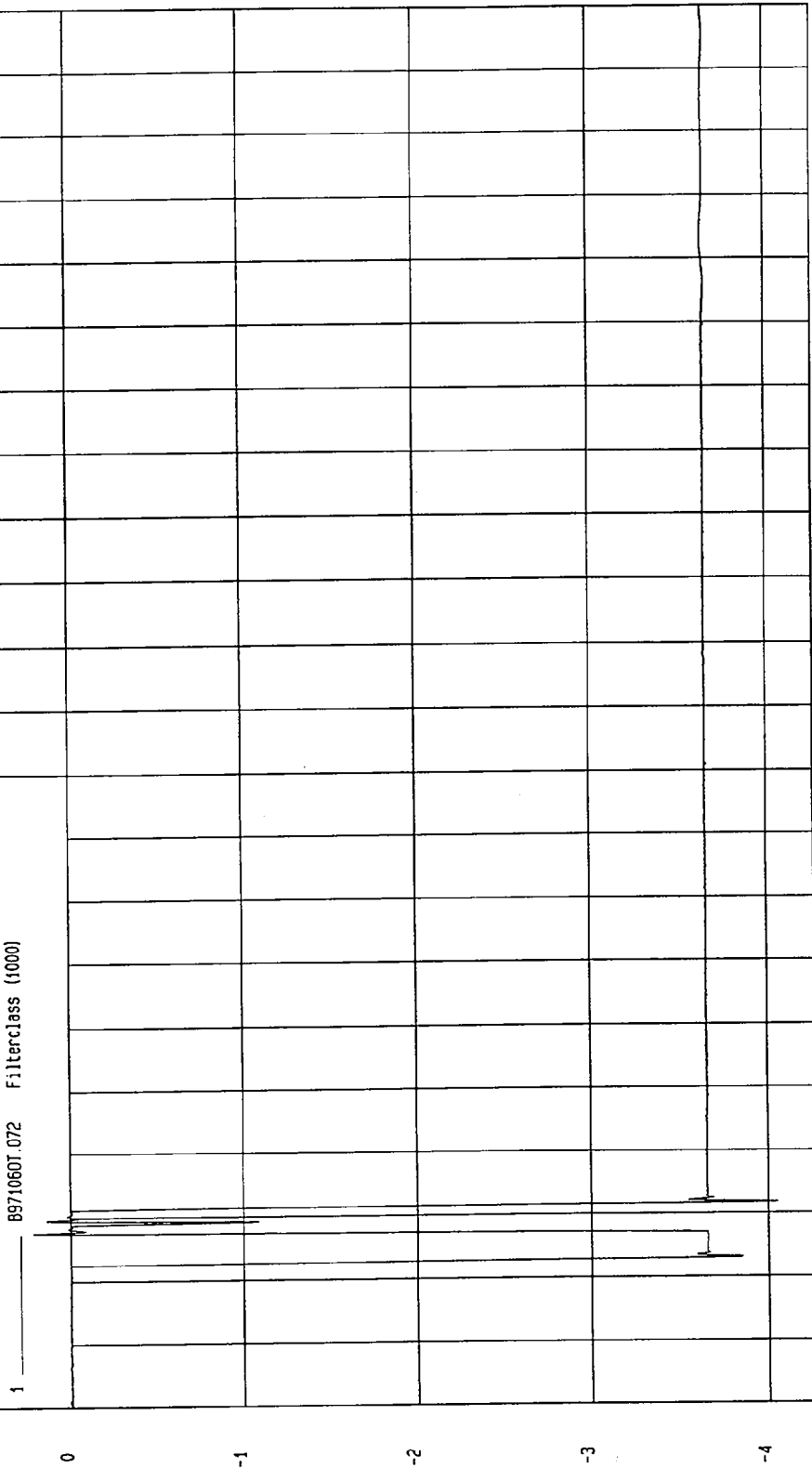
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = .21 VOLTS at 8 msec

Minimum = -4.05 VOLTS at 12 msec

RIGHT BARRIER CONTACT

1 8971060T.072 Filterclass (1000)



NCA Research  
09-25-1997 12:21

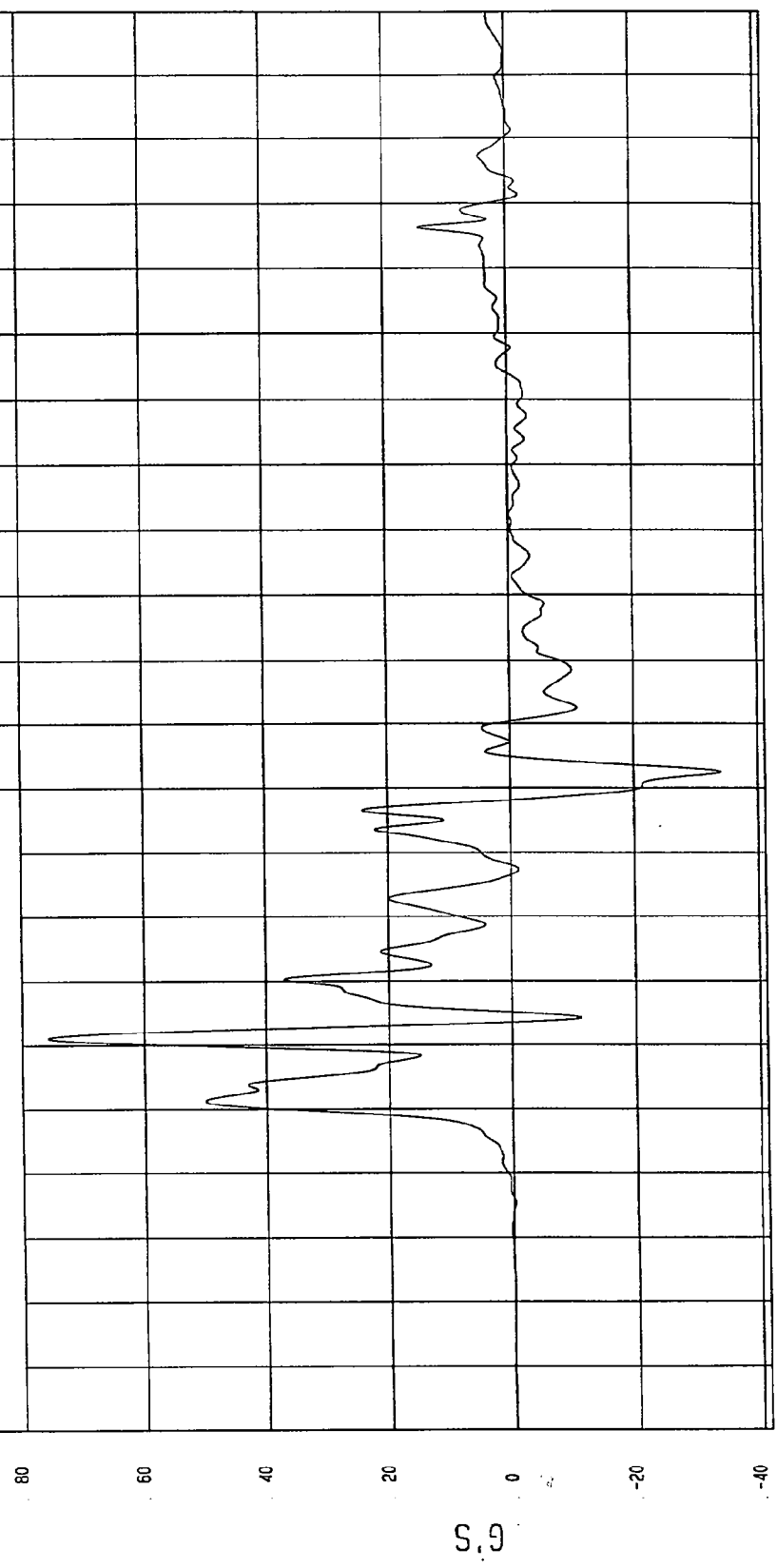
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -34.05 G'S at 82 msec Maximum = 75.70 G'S at 41 msec

DRIVER UPPER RIB Y REDUNDANT ACCELERATION

1 897106AF.A61 FilterClass (180)



WCA Research  
09-25-1997 12:23

TIME (SECONDS)

G'S

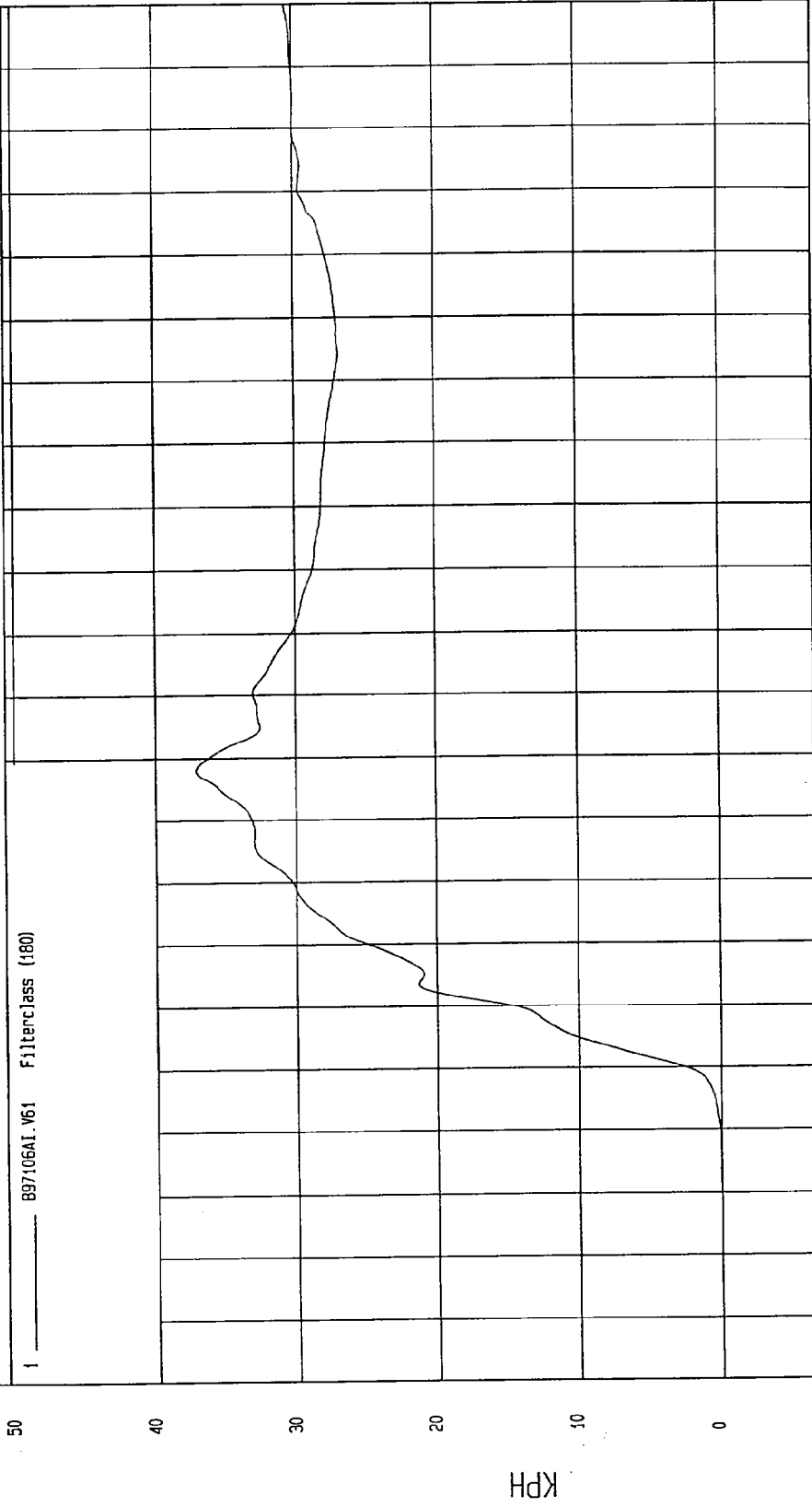
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -1.5jE-02 KPH at 5 msec  
Maximum = 37.11 KPH at 78 msec

DRIVER UPPER RIB Y REDUNDANT VELOCITY

1 ----- 897106A1.V61 Filterclass (180)



MGA Research  
09-26-1997 10:19

TIME Seconds

KPH

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

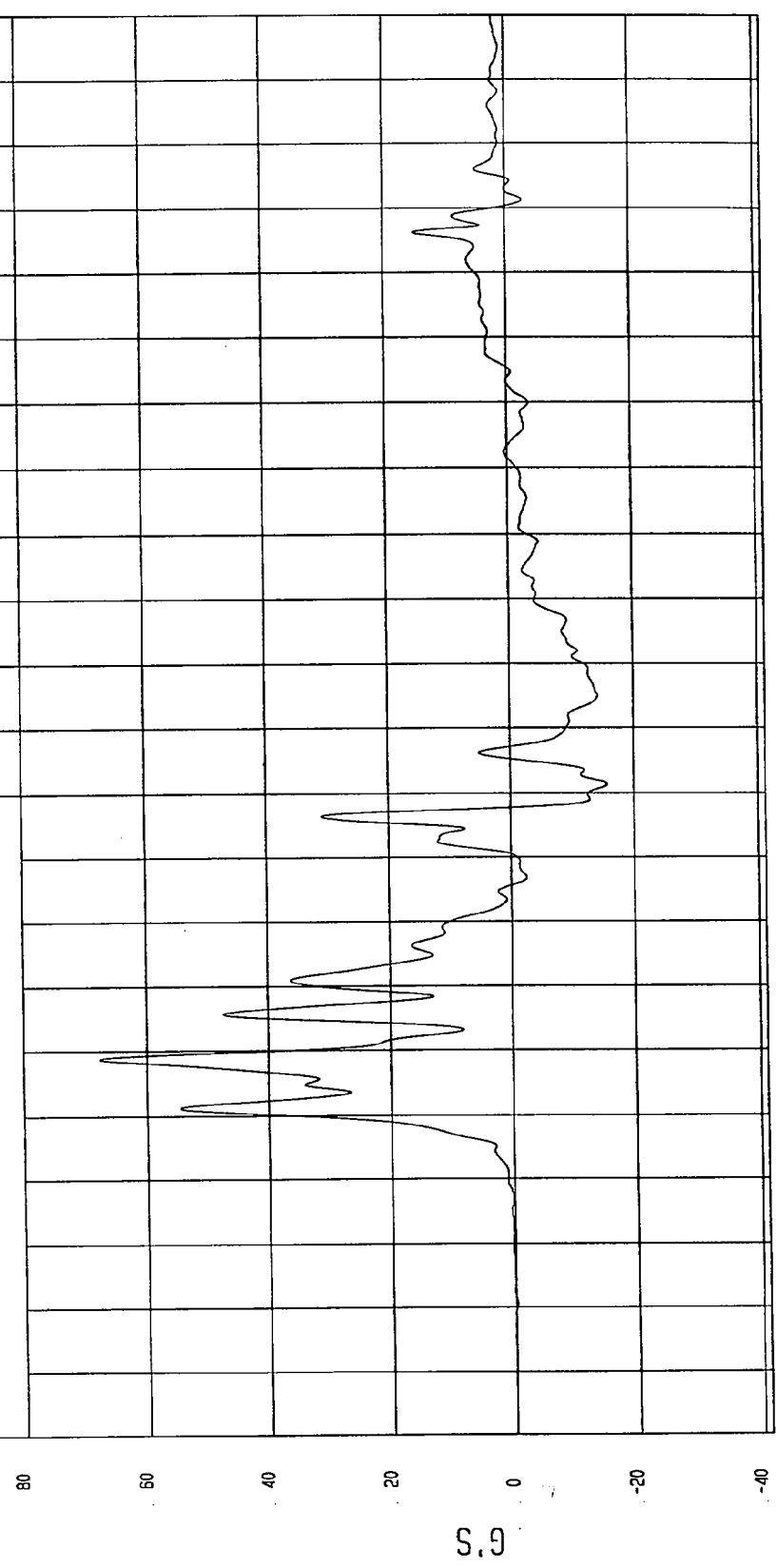
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 67.52 G'S at 39 msec

Minimum = -15.77 G'S at 81 msec

DRIVER LOWER RIB Y REDUNDANT ACCELERATION

1 \_\_\_\_\_ 897106AF.A62 Filterclass (180)



NCA Research  
09-25-1997 12:23

TIME (SECONDS)

G'S

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

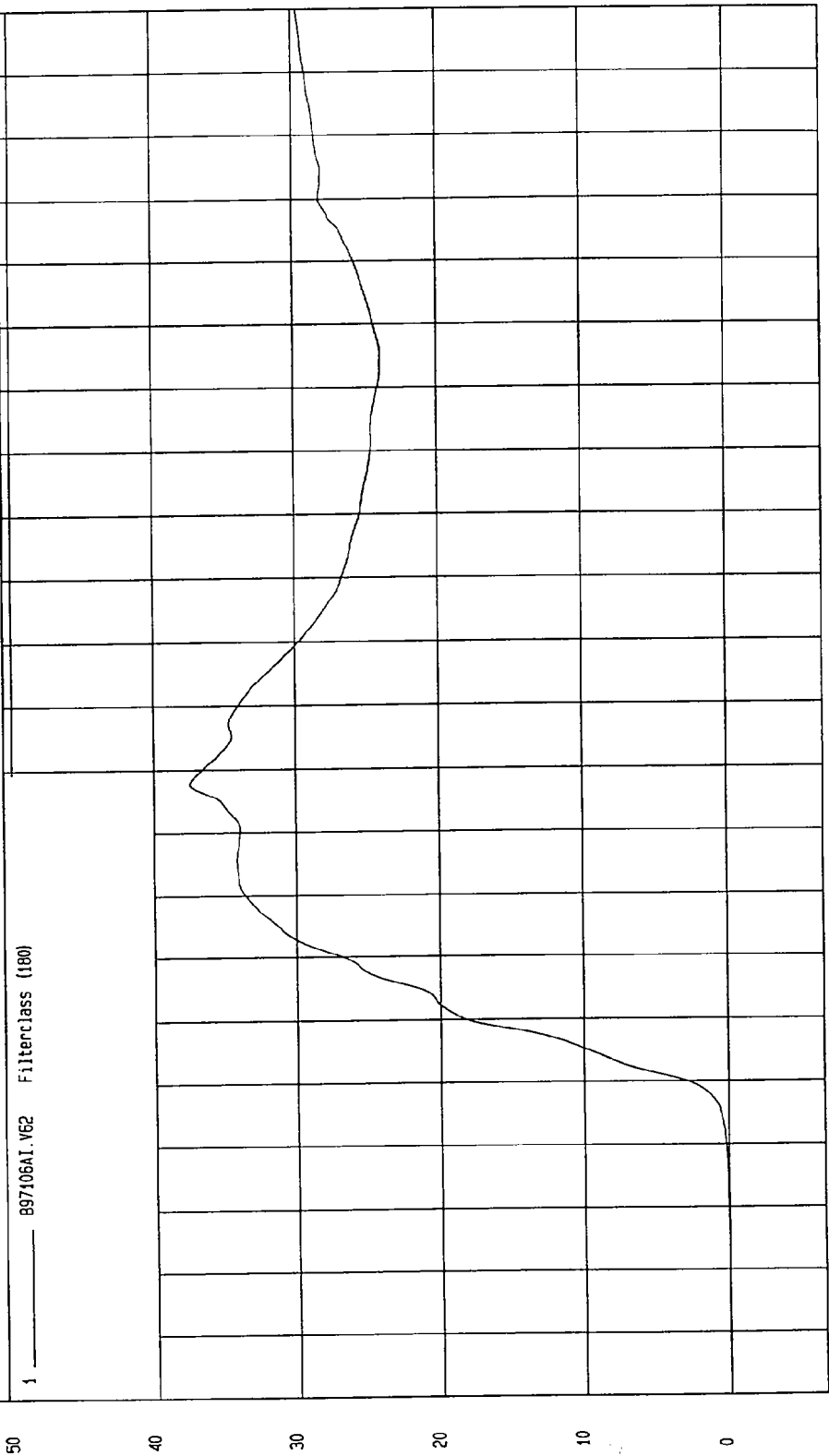
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 37.45 KPH at 78 msec

Minimum = 0 KPH at -20 msec

DRIVER LOWER RIB Y REDUNDANT VELOCITY

1 \_\_\_\_\_ 897106AI.V62 FilterClass (180)



MCA Research  
09-25-1997 10:19

TIME Seconds

KPH

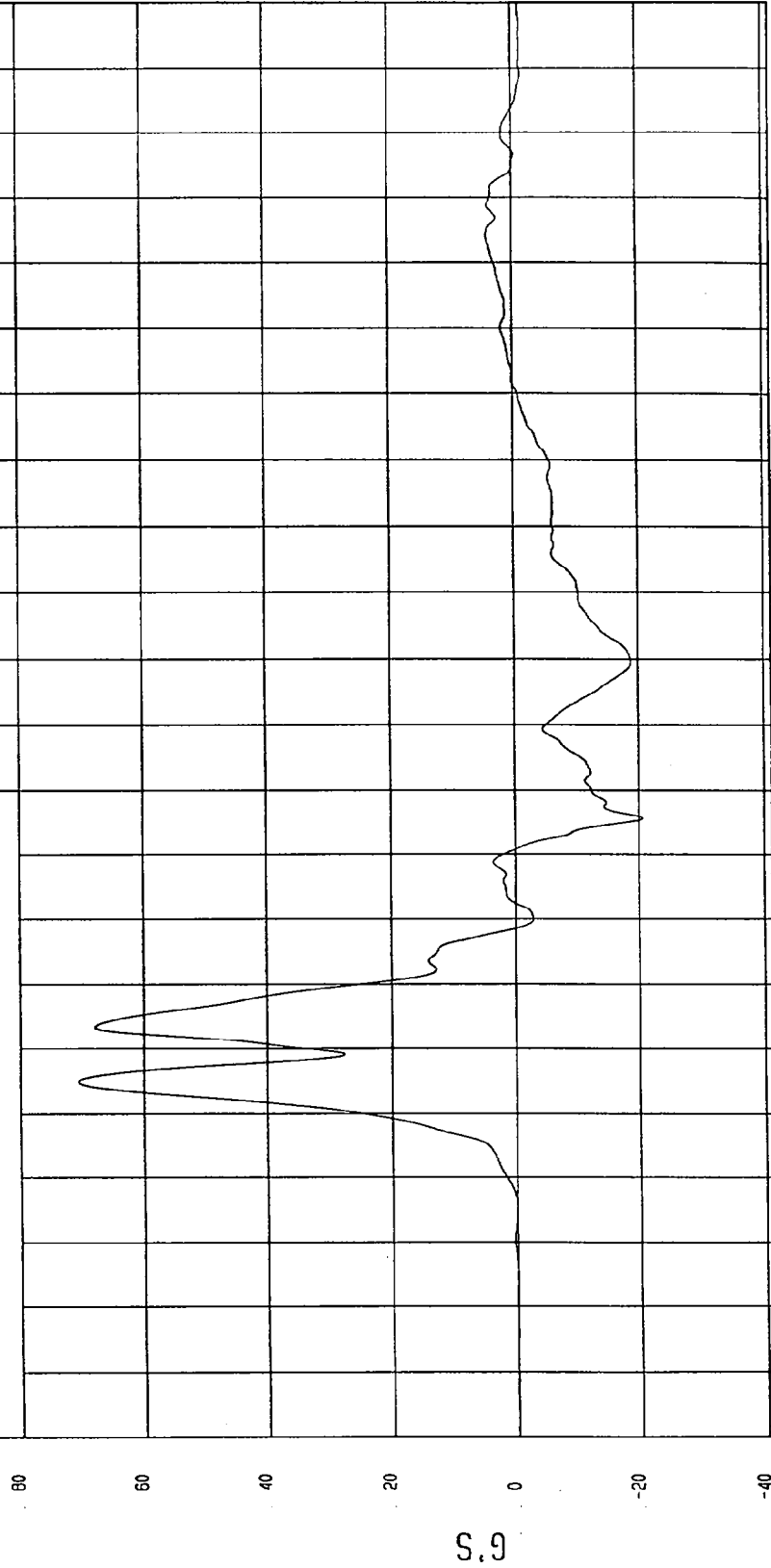
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -20.61 G'S at 76 msec Maximum = 70.50 G'S at 35 msec

DRIVER LOWER SPINE Y REDUNDANT ACCELERATION

1 897105AF.AG3 Filterclass (180)



MCA Research  
09-25-1997 12:23

TIME (SECONDS)

G.S

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

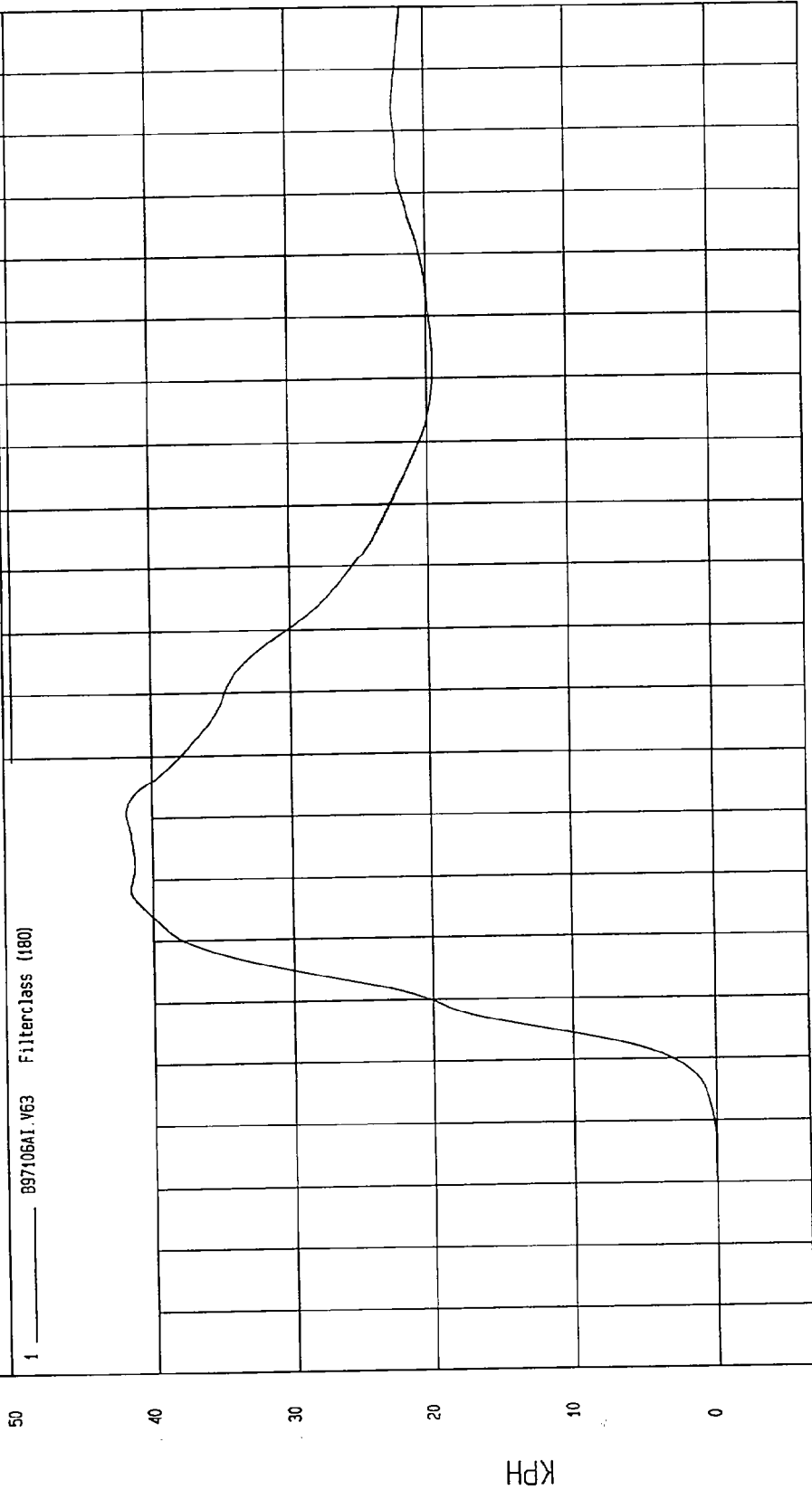
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 41.77 KPH at 71 msec

Minimum = 0 KPH at -20 msec

DRIVER LOWER SPINE Y REDUNDANT VELOCITY

1 ——— 897106AI.V63 Filterclass (180)



MOA Research  
09-26-1997 10:19

TIME Seconds

KPH

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

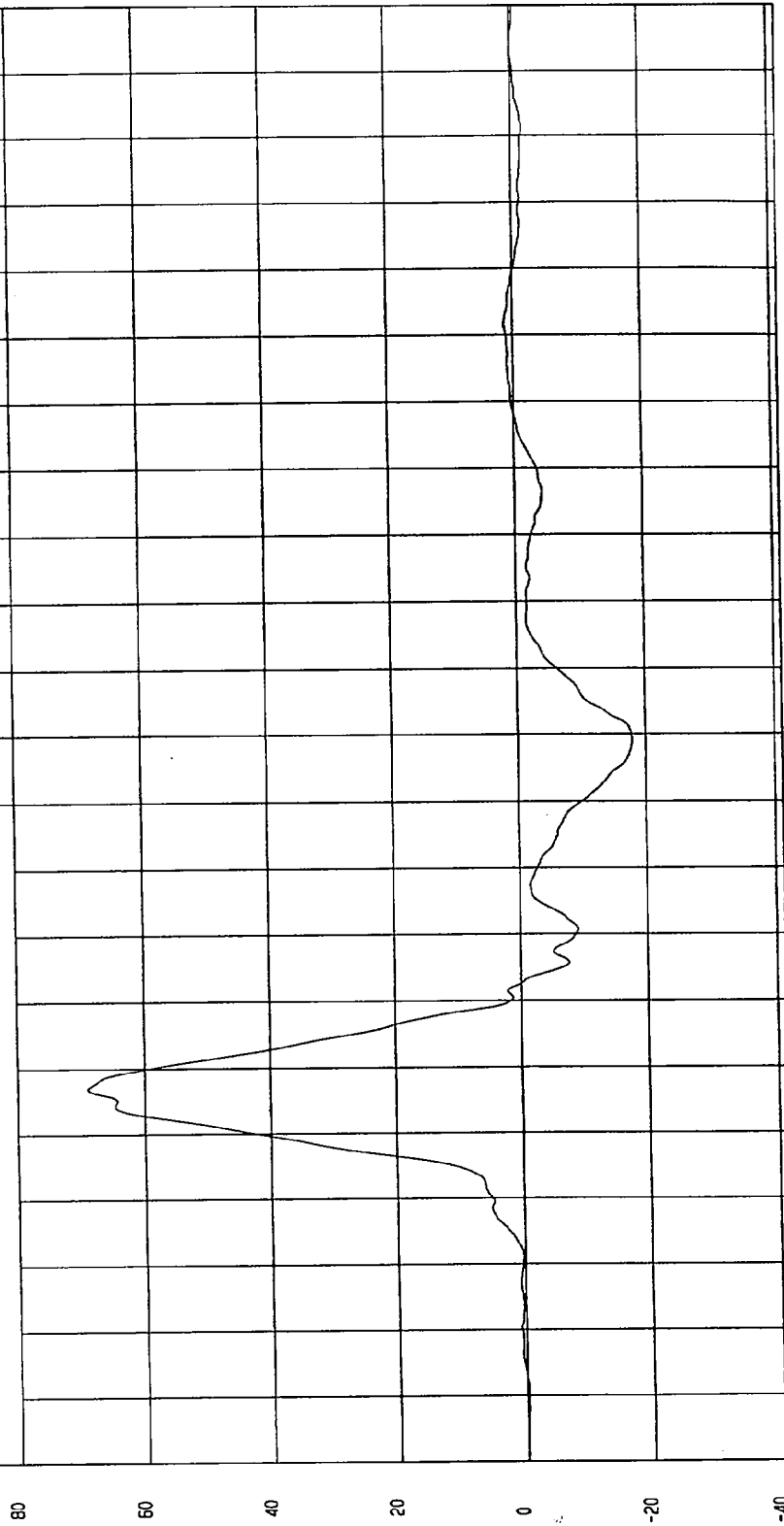
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 68.94 G'S at 37 msec

Minimum = -17.94 G'S at 89 msec

DRIVER PELVIS Y REDUNDANT ACCELERATION

1 \_\_\_\_\_ B97106AF.A65 Filterclass (180)



MCA Research  
09-25-1997 12:24

TIME (SECONDS)

G.S.

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

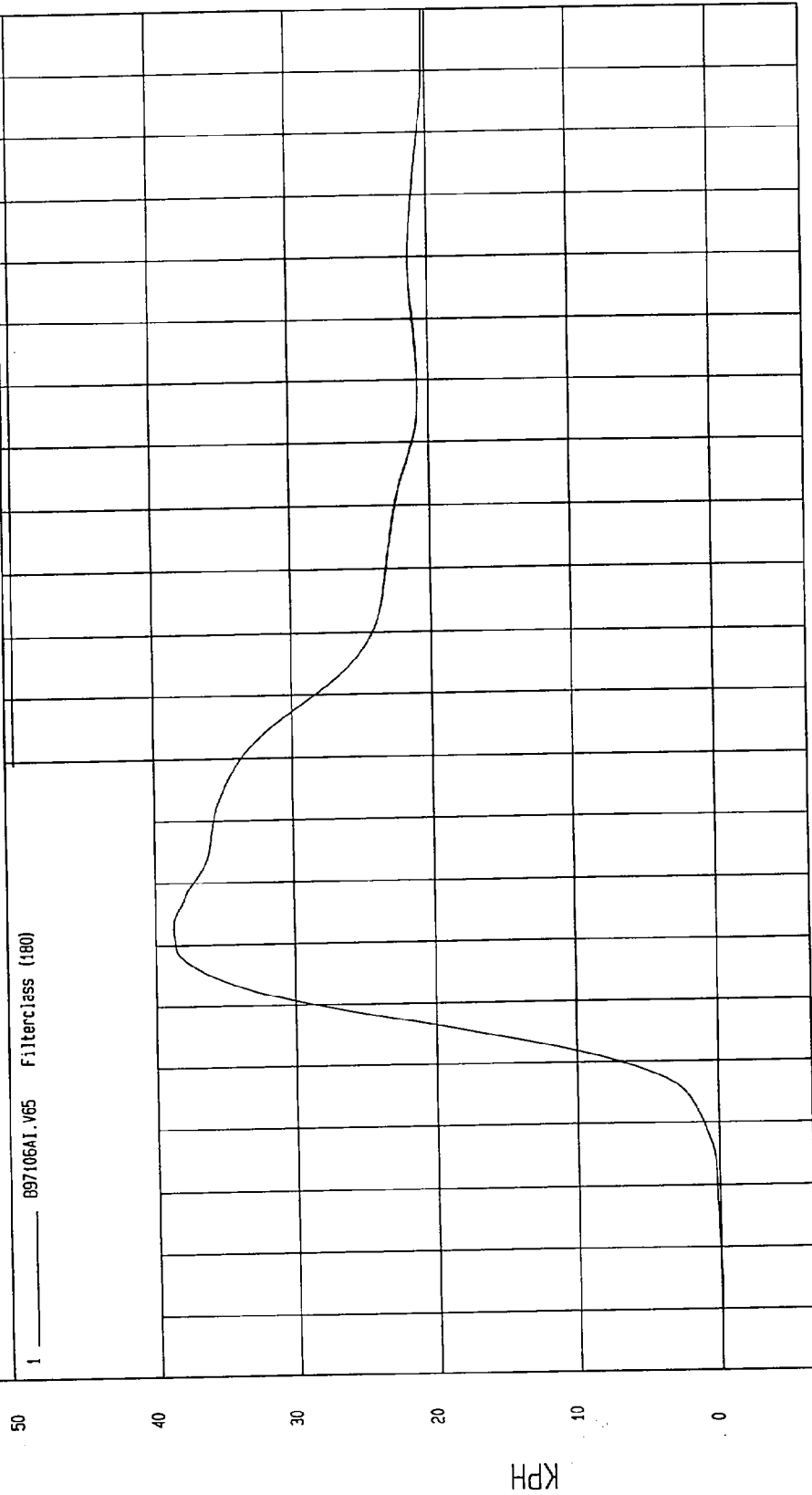
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 38.73 KPH at 53 msec

Minimum = -6.96E-02 KPH at -7 msec

DRIVER PELVIS Y REDUNDANT VELOCITY

1 097106A1.V65 Filterclass (180)



MCA Research  
09-28-1997 10:43

TIME Seconds

KPH

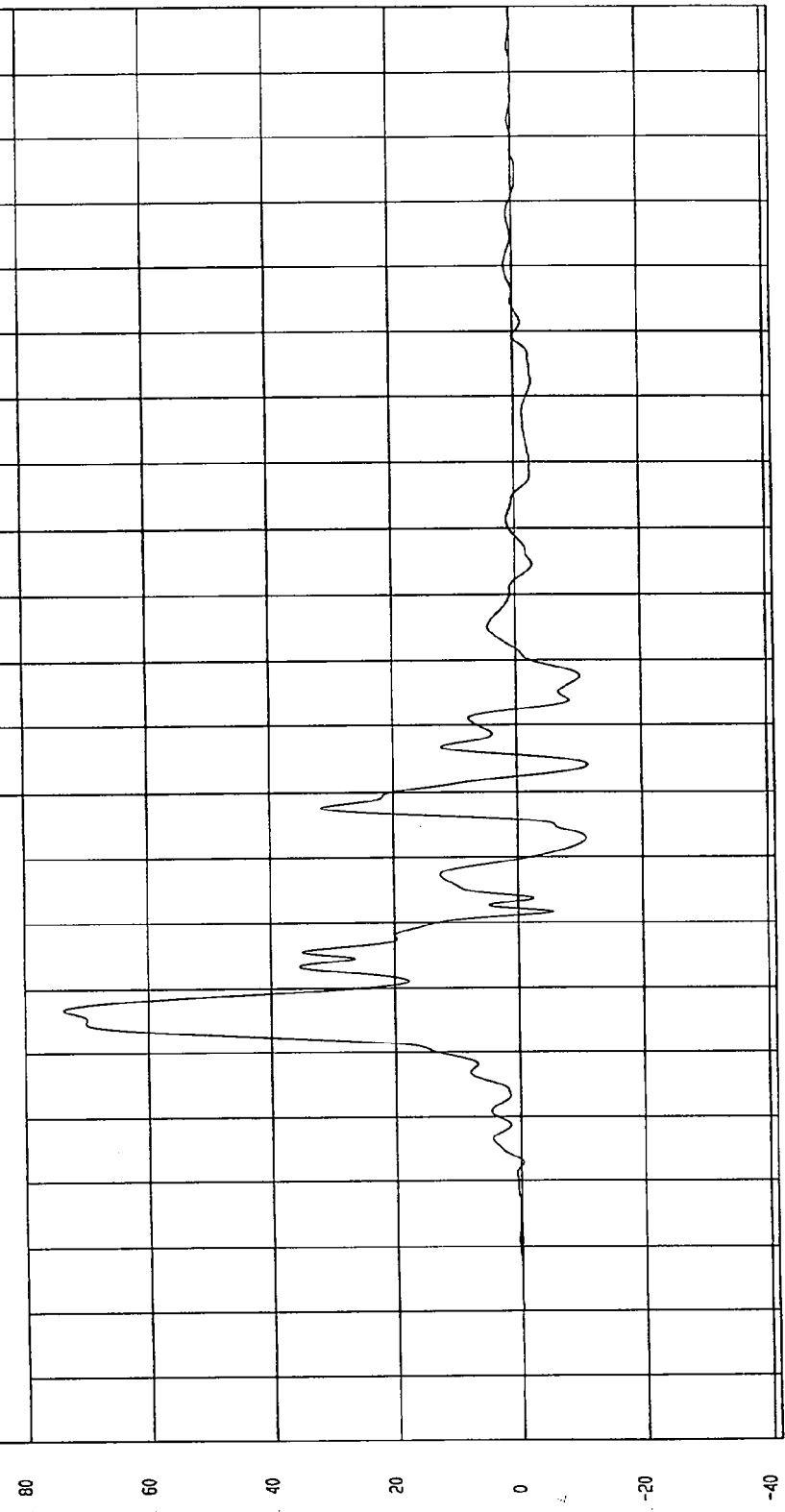
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -11.29 G'S at 84 msec  
Maximum = 73.74 G'S at 47 msec

REAR PASSENGER UPPER RIB Y REDUNDANT ACCELERATION

1 897105AF.A65 Filterclass (180)



NCA Research  
09-25-1997 12:24

TIME (SECONDS)

G.S

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

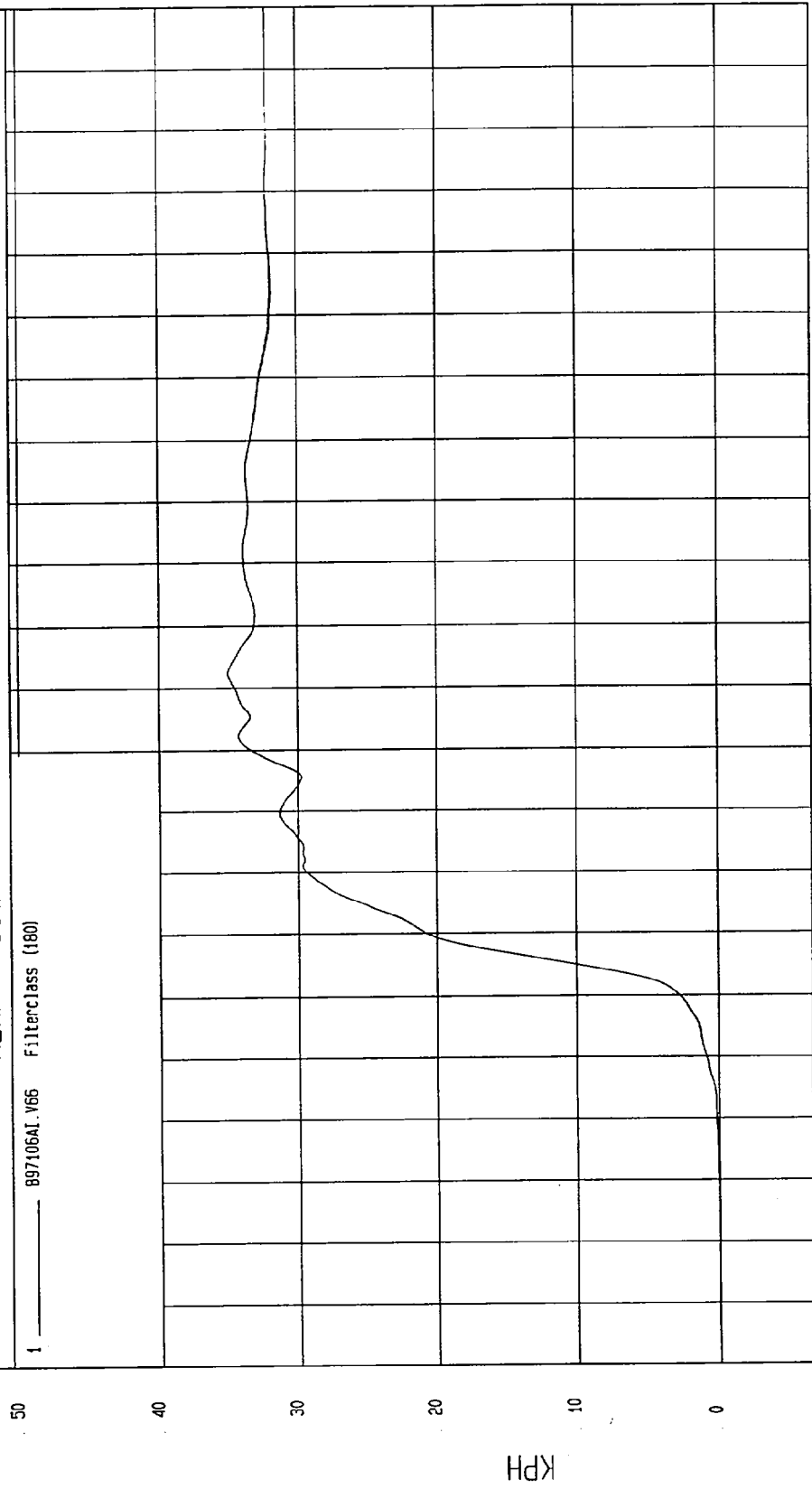
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 34.94 KPH at 92 msec

Minimum = 0 KPH at -20 msec

REAR PASSENGER UPPER RIB Y REDUNDANT VELOCITY

1 897106AI.V66 Filterclass (160)



MCA Research  
09-26-1997 10:19

TIME Seconds

KPH

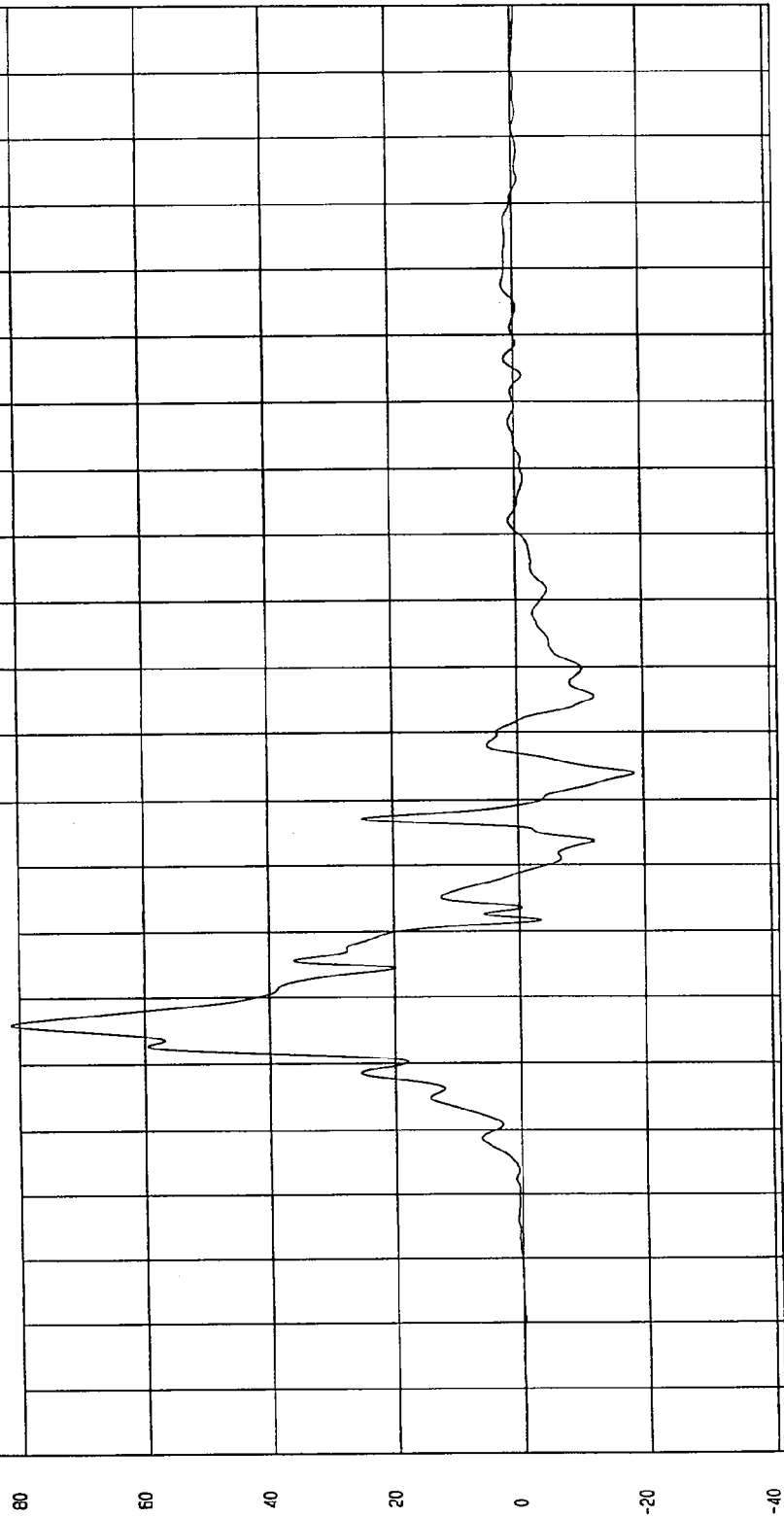
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -18.53 G'S at 84 msec  
Maximum = 81.28 G'S at 46 msec

REAR PASSENGER LOWER RIB Y REDUNDANT ACCELERATION

1 \_\_\_\_\_ 897106AF .A67 Filterclass (180)



MEV Research  
09-15-1997 12:24

TIME (SECONDS)

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

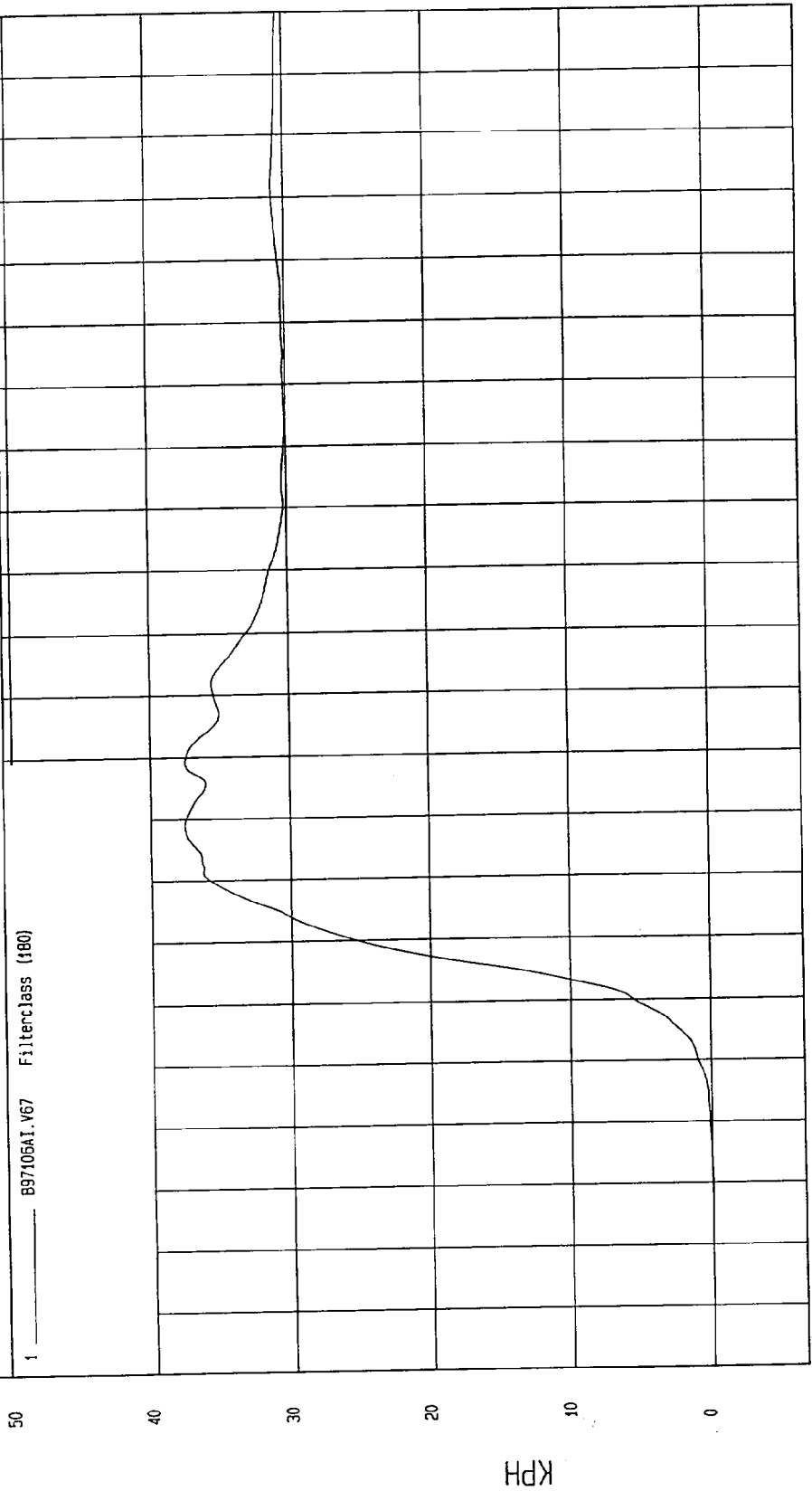
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 37.57 KPH at 69 msec

Minimum = -5.82E-02 KPH at 3 msec

REAR PASSENGER LOWER RIB Y REDUNDANT VELOCITY

1 ——— B97105AI.V67 Filterclass (f80)



VCA Research  
09-26-1997 10:19

TIME Seconds

KPH

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

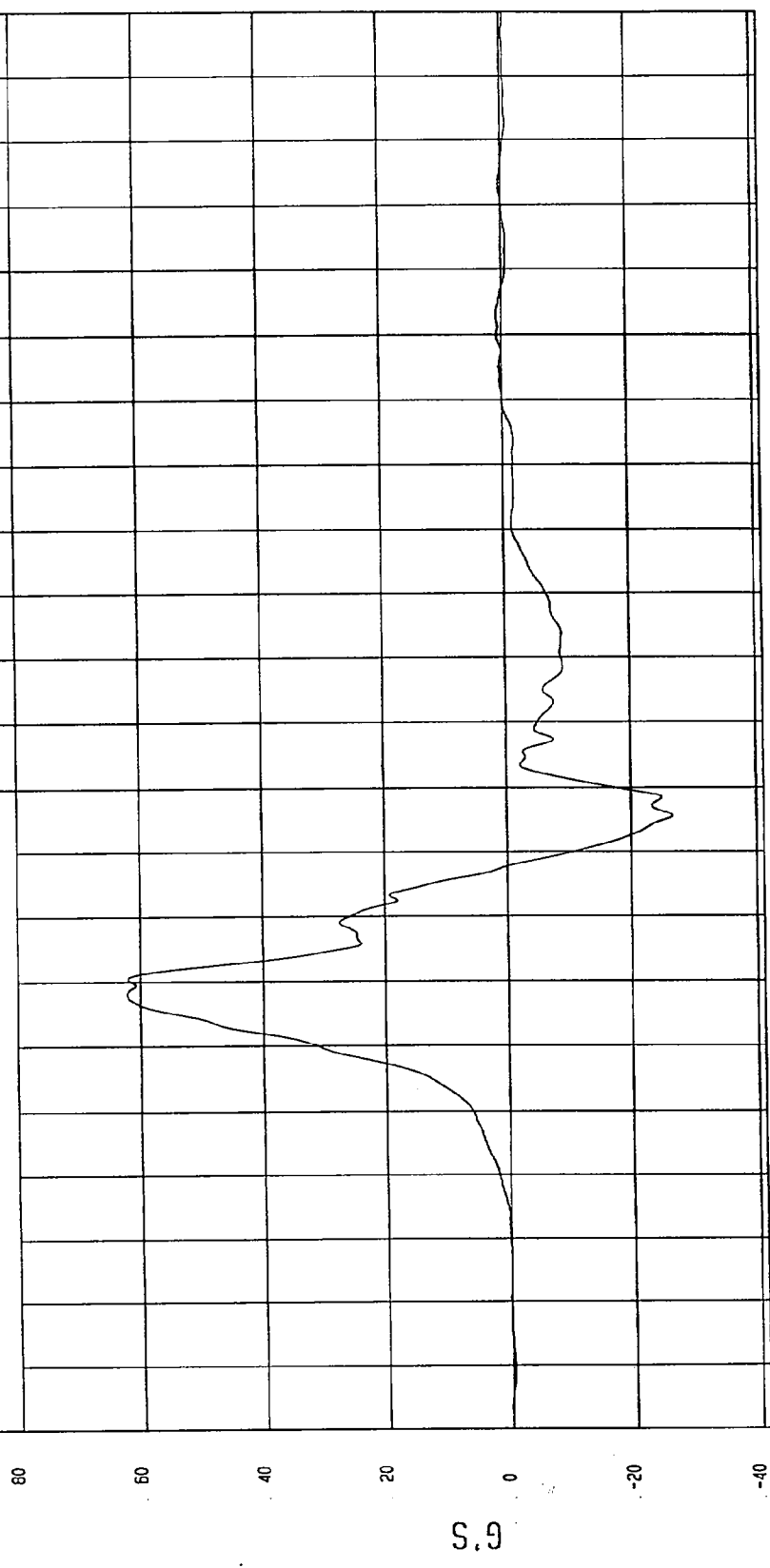
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 62.19 G'S at 48 msec

Minimum = -26.77 G'S at 76 msec

REAR PASSENGER LOWER SPINE Y REDUNDANT ACCELERATION

1 \_\_\_\_\_ B97105AF.468 Filterclass (180)



MGA Research  
09-25-1997 12:24

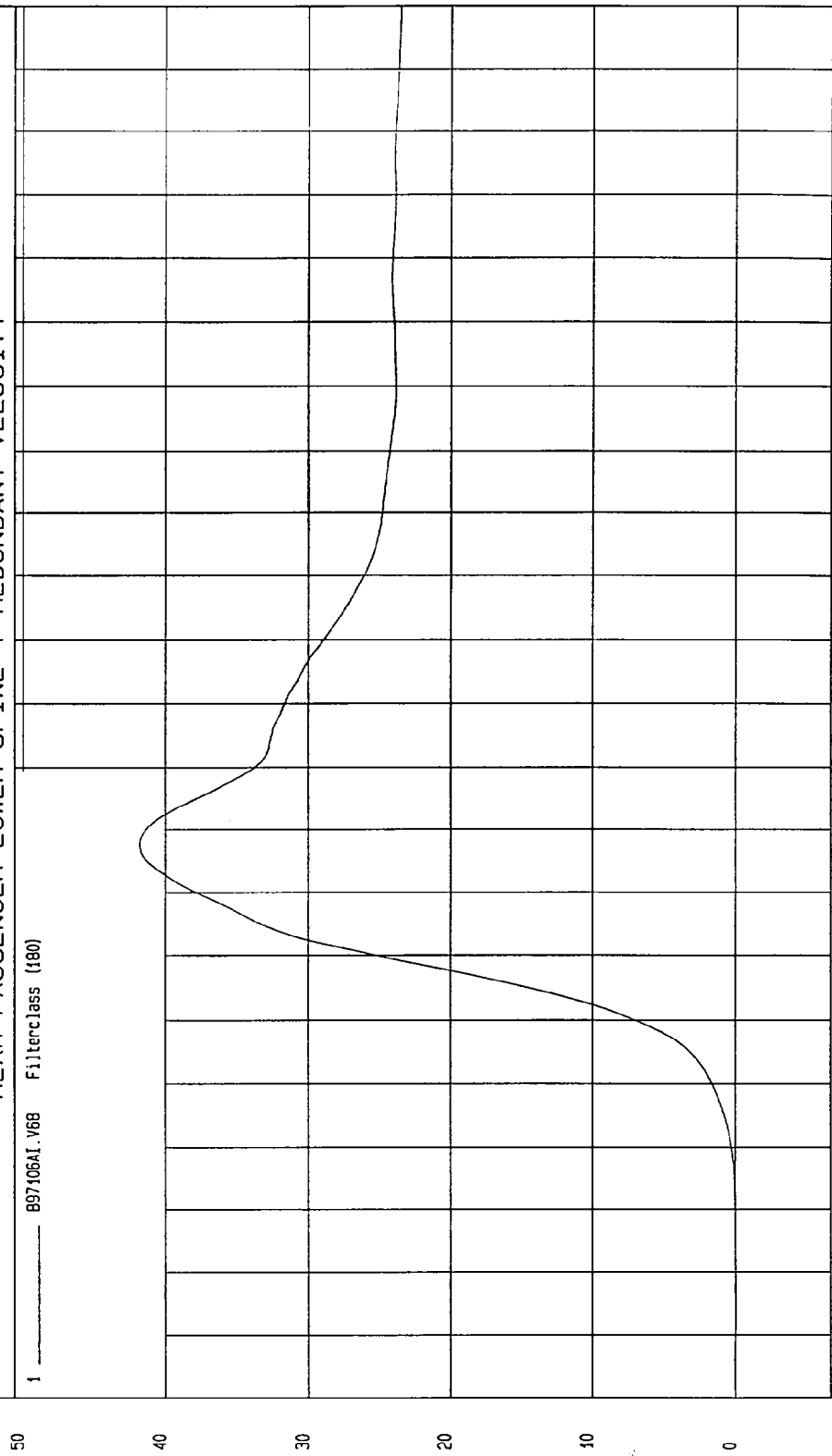
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -4.50E-02 KPH at -5 msec  
Maximum = 41.81 KPH at 68 msec

REAR PASSENGER LOWER SPINE Y REDUNDANT VELOCITY

1 897106A1.V68 Filterclass (180)



MSA Research  
09-26-1997 10:19

TIME Seconds

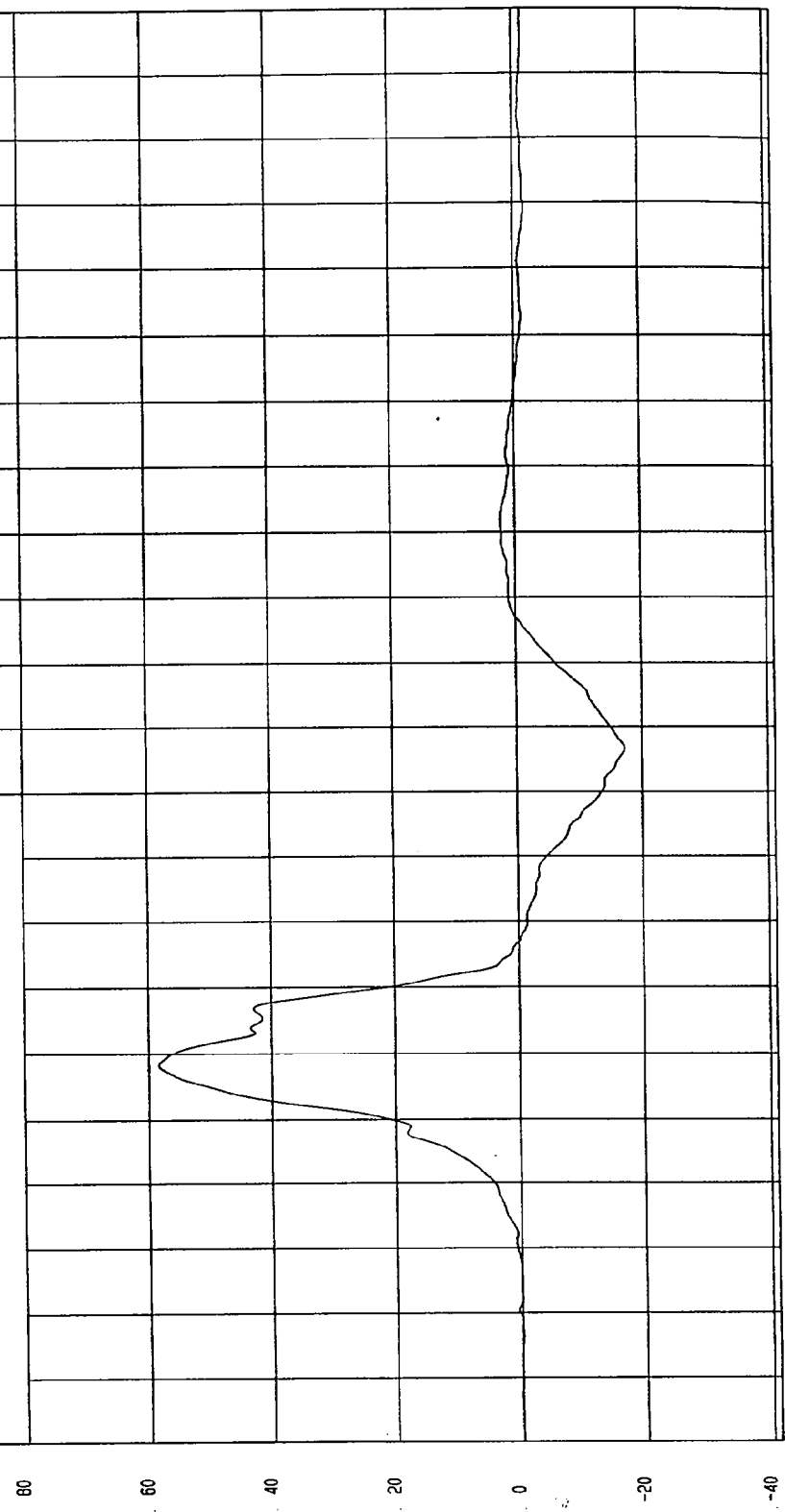
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -17.16 G'S at 87 msec  
Maximum = 58.31 G'S at 38 msec

REAR PASSENGER PELVIS Y REDUNDANT ACCELERATION

1 ——— 897106AF.A59 Filterclass (180)



MECA Research  
09-25-1997 12:24

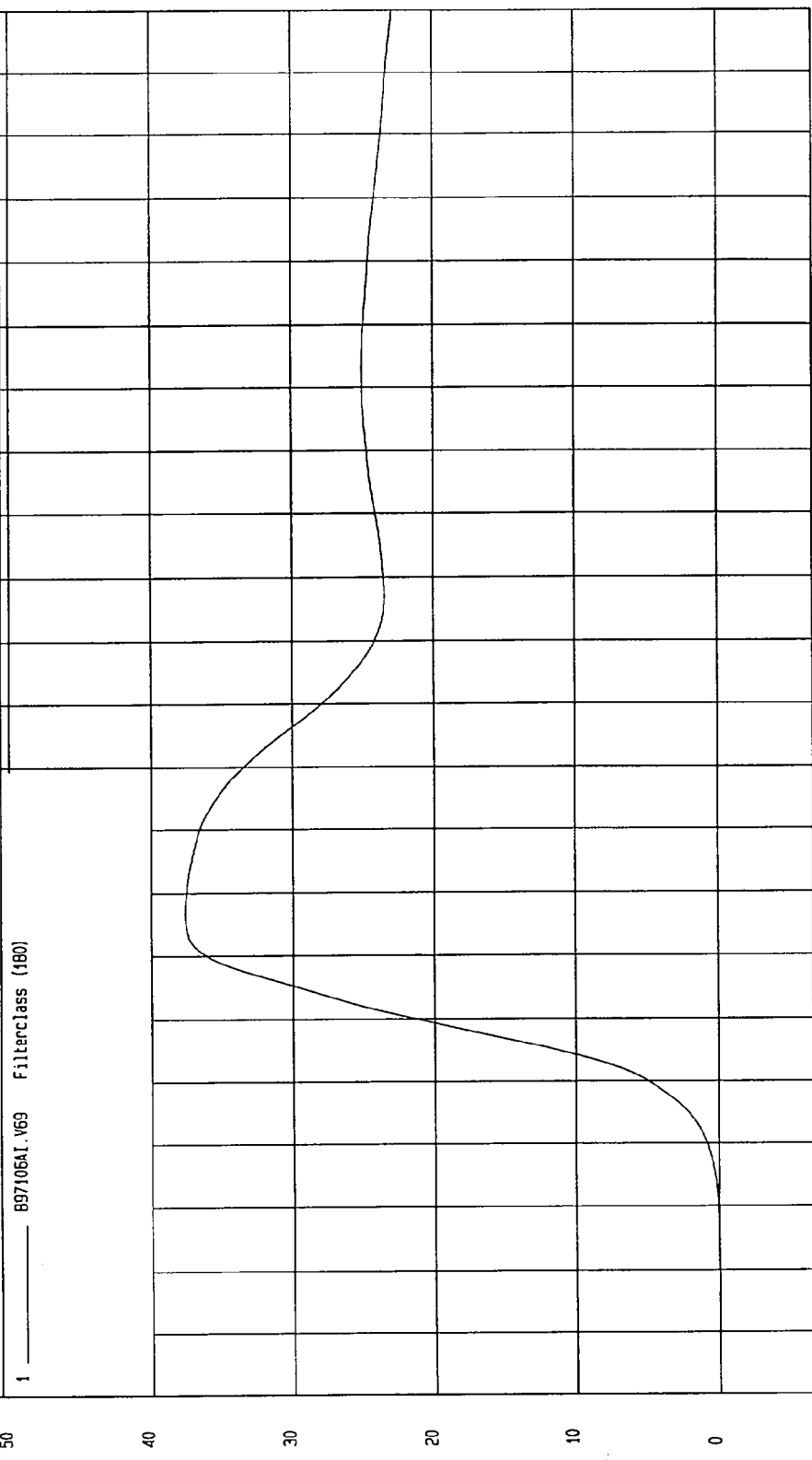
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -2.04E-03 KPH at -18 msec  
Maximum = 37.59 KPH at 57 msec

REAR PASSENGER PELVIS Y REDUNDANT VELOCITY

1 897106A1.V69 Filterclass (180)



McA Research  
09-26-1997 10:19

TIME Seconds

FINITE IMPULSE RESPONSE (FIR) FILTERED DATA

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

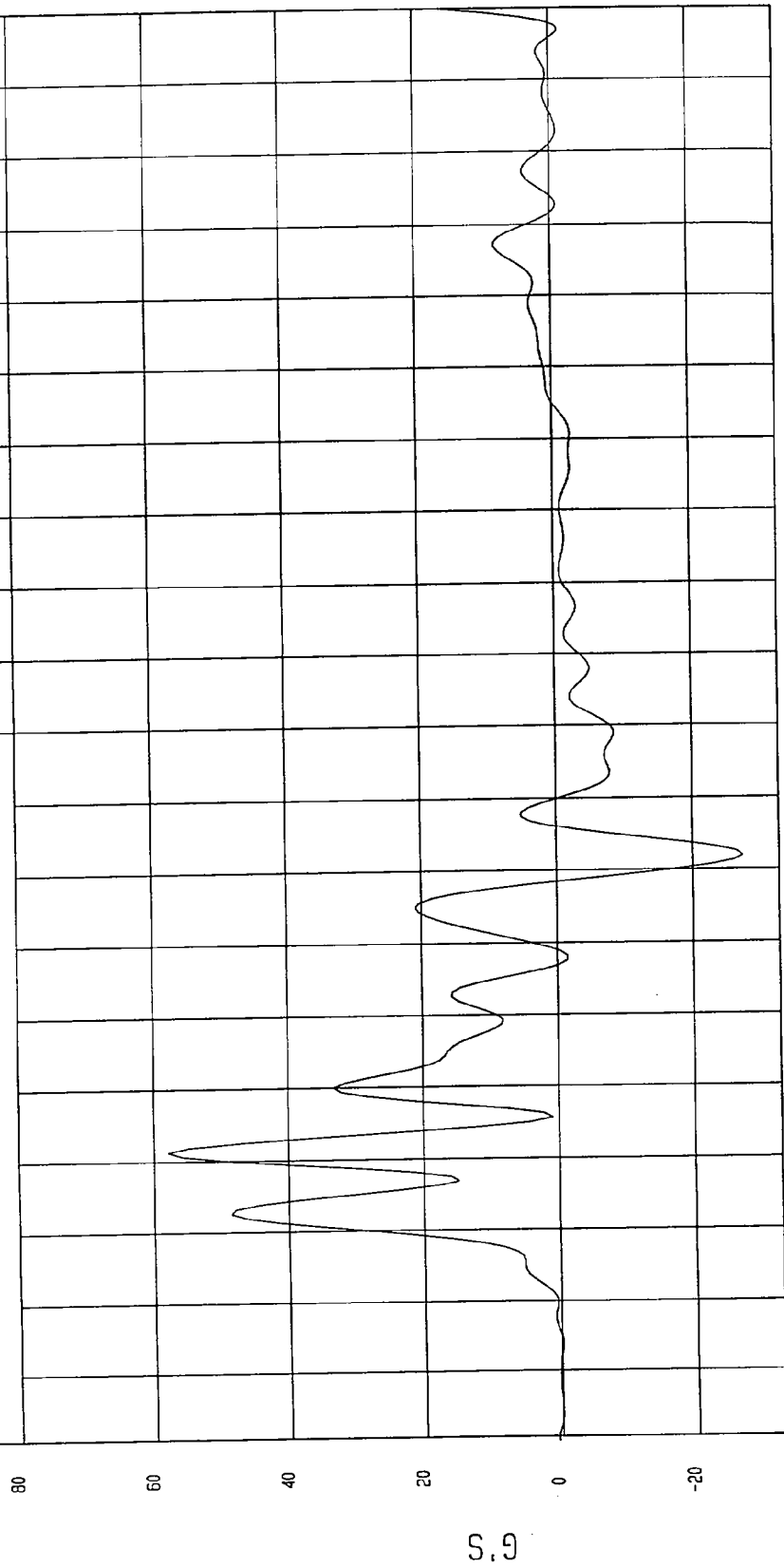
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 57.91 G'S at 41 msec

Minimum = -27.35 G'S at 82 msec

DRIVER UPPER RIB Y ACCELERATION

1 897106FI.R15 Filterclass (FIR Filtered)



MSA Research  
09-26-1997 09:27

TIME (SECONDS)

G.S

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

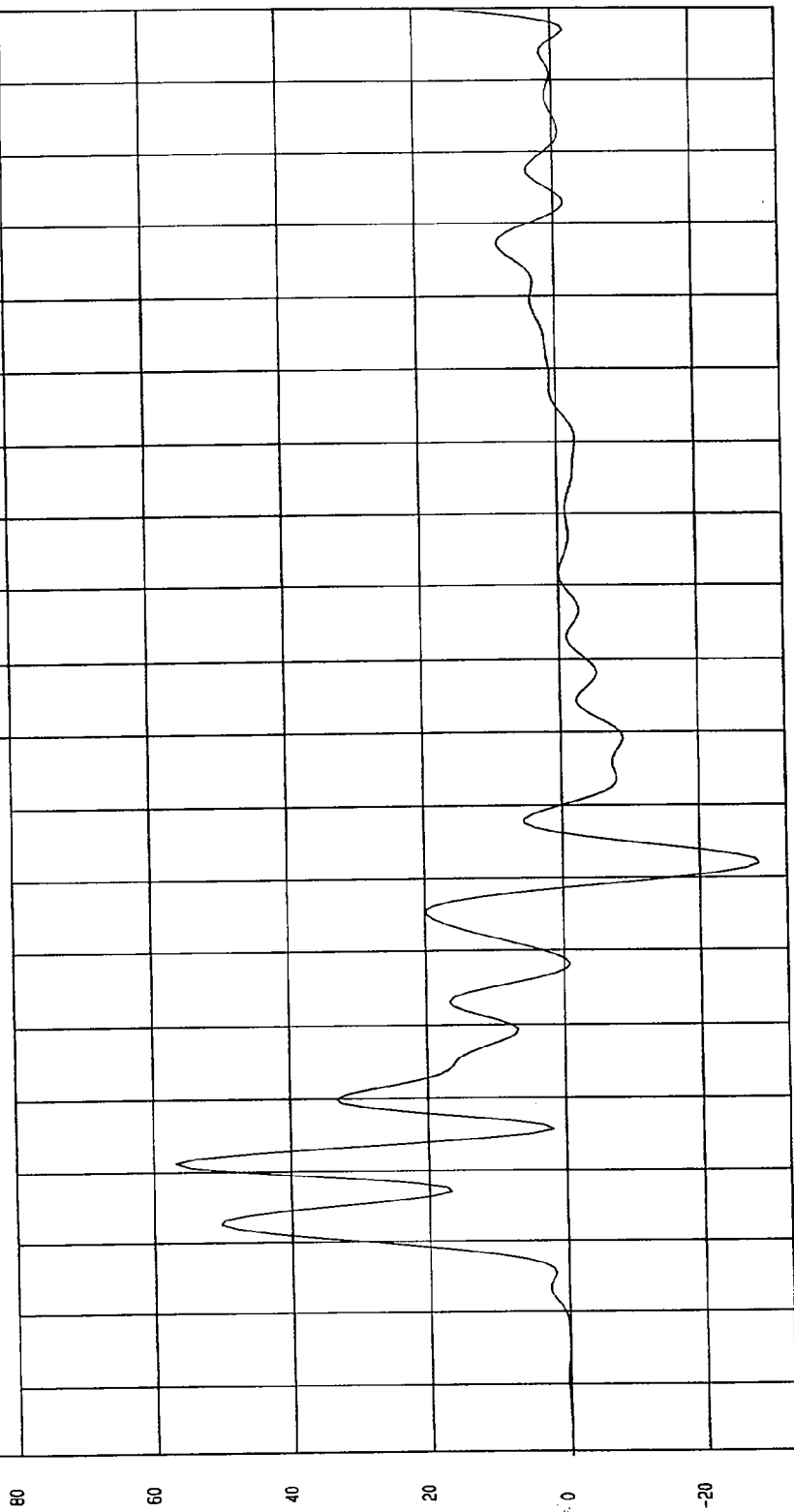
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 56.77 G'S at 41 msec

Minimum = -28.68 G'S at 82 msec

DRIVER UPPER RIB Y REDUNDANT ACCELERATION

1 897106FI.R61 Filterclass (FIR Filtered)



MGA Research  
09-26-1997 09: 27

TIME (SECONDS)

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

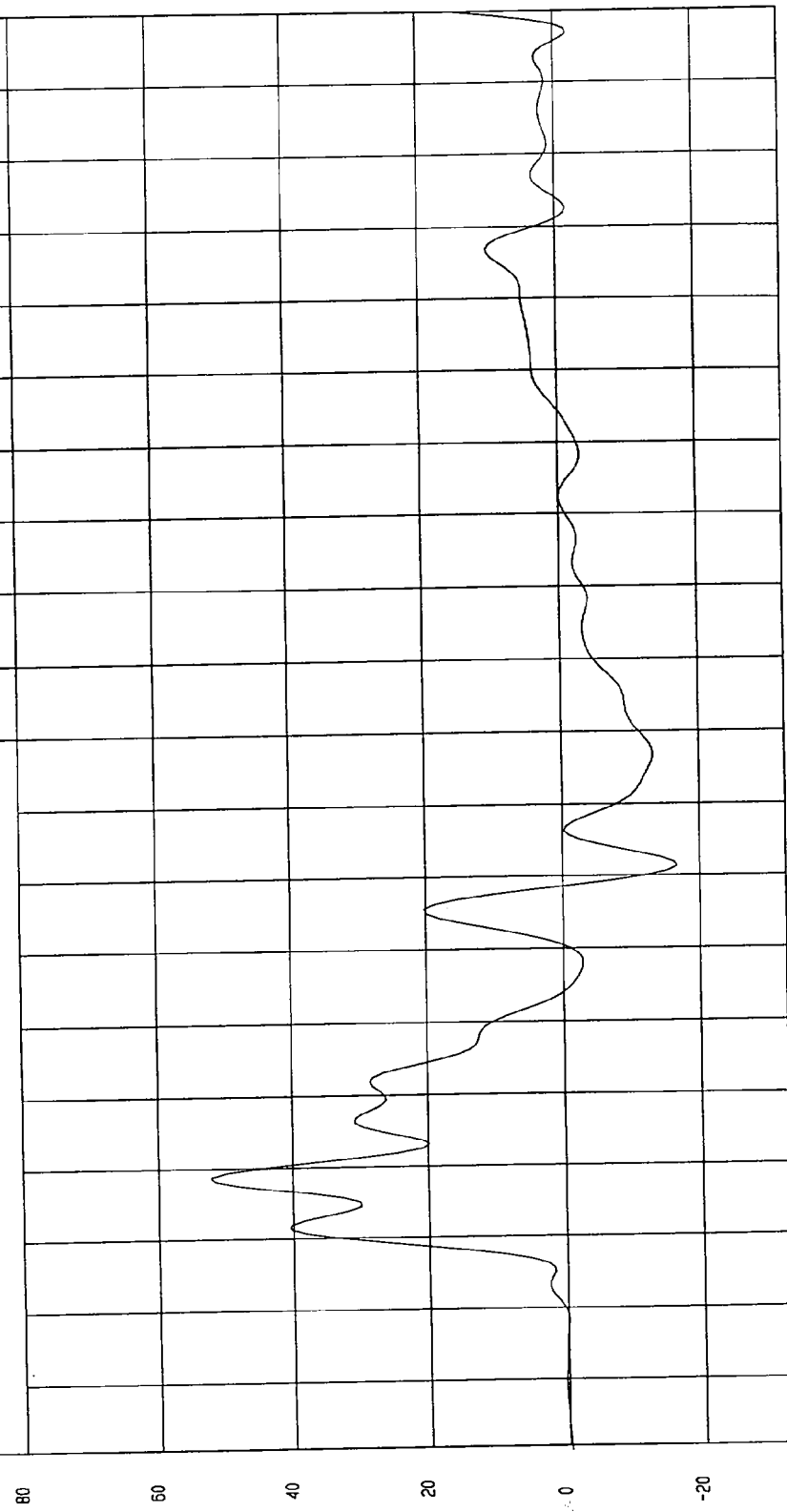
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 52.20 G'S at 39 msec

Minimum = -16.75 G'S at 81 msec

DRIVER LOWER RIB Y ACCELERATION

1 897106FI.R16 FilterClass (FIR Filtered)



MCA Research  
09-26-1997 09: 27

TIME (SECONDS)

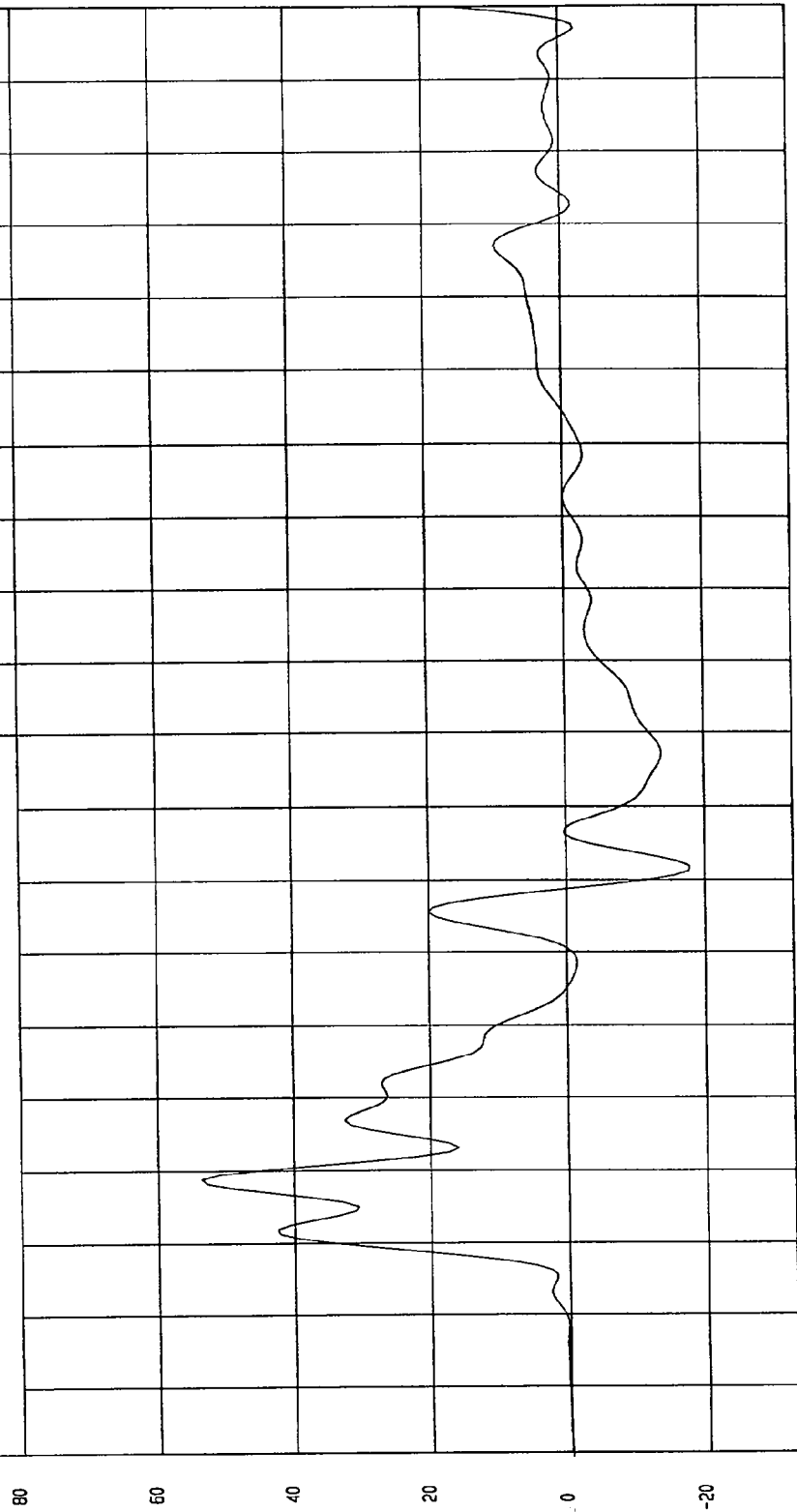
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -17.81 G'S at 82 msec  
Maximum = 53.66 G'S at 39 msec

DRIVER LOWER RIB Y REDUNDANT ACCELERATION

1 897106FT.R62 Filterclass (FIR Filtered)



MOA Research  
09-26-1997 09: 27

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

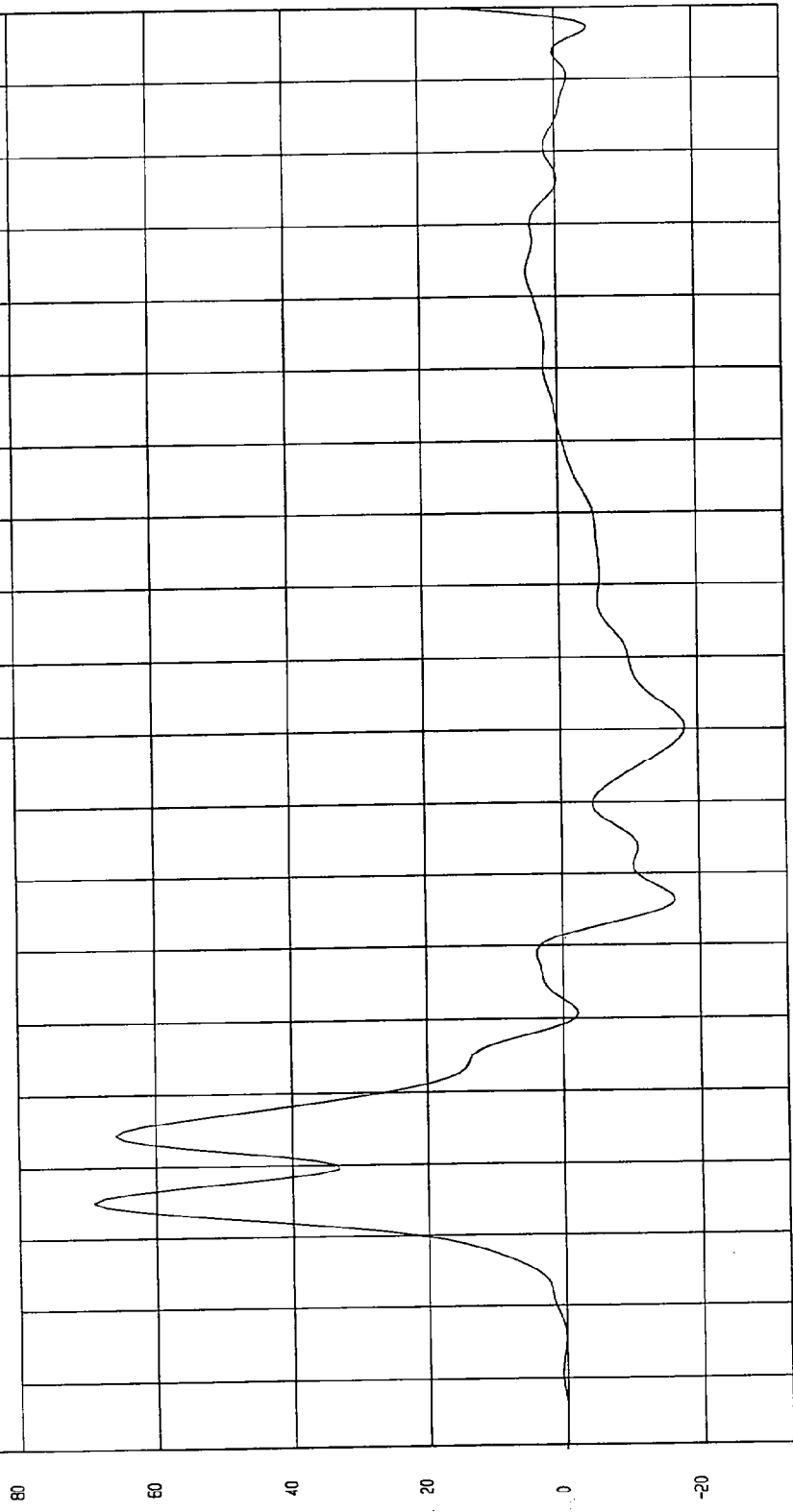
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 69.09 G'S at 35 msec

Minimum = -18.05 G'S at 100 msec

DRIVER LOWER SPINE Y ACCELERATION

1 \_\_\_\_\_ 897106FI.R17 Filterclass (FIR Filtered)



TIME (SECONDS)

MSA Research  
09-26-1997 09:27

G.S

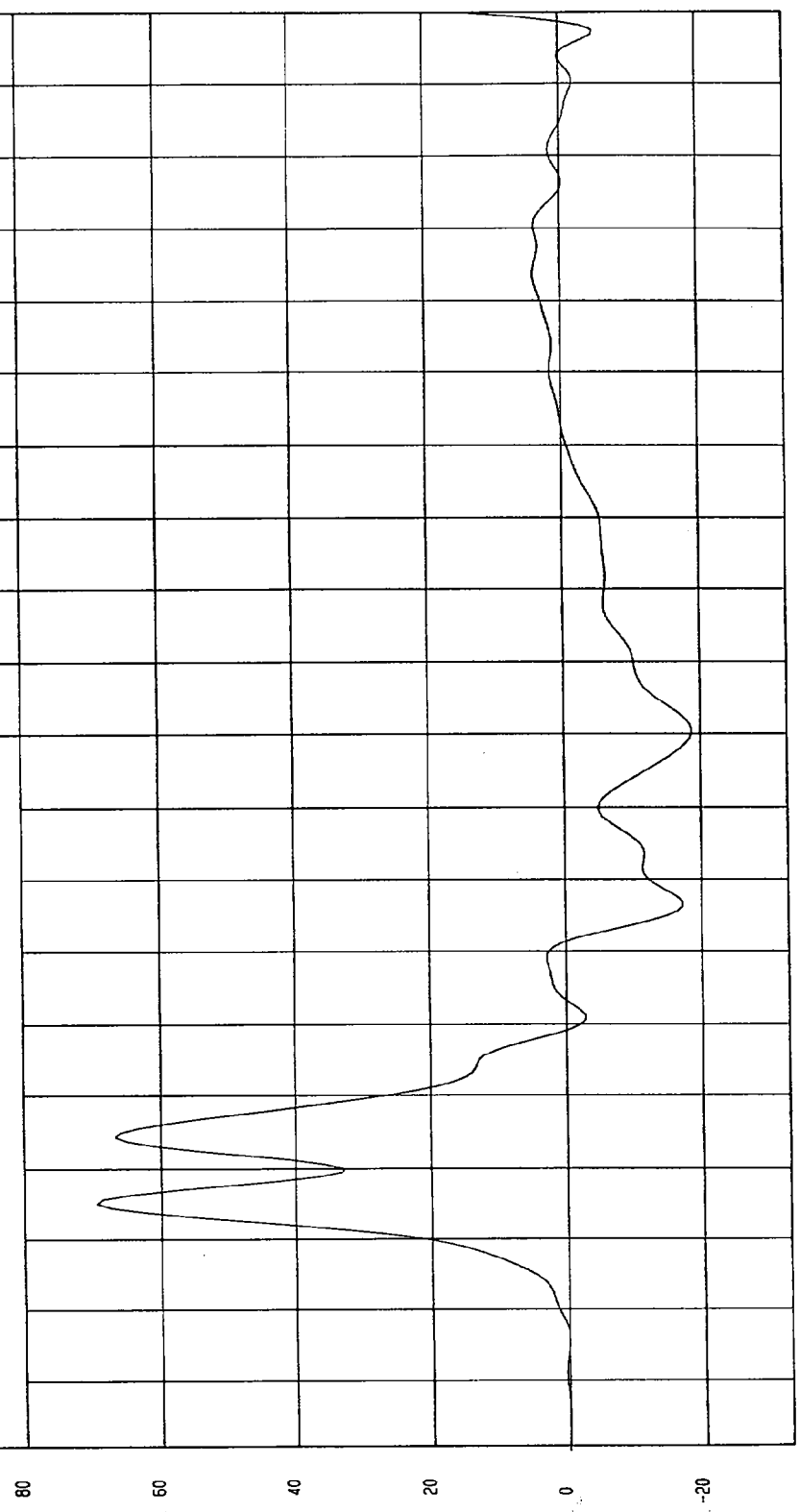
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -18.72 G'S at 101 msec  
Maximum = 69.39 G'S at 35 msec

DRIVER LOWER SPINE Y REDUNDANT ACCELERATION

1 ——— 897106F1.H63 Filterclass (FIR Filtered)



MCA Research  
09-26-1997 09: 27

TIME (SECONDS)

G.S

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

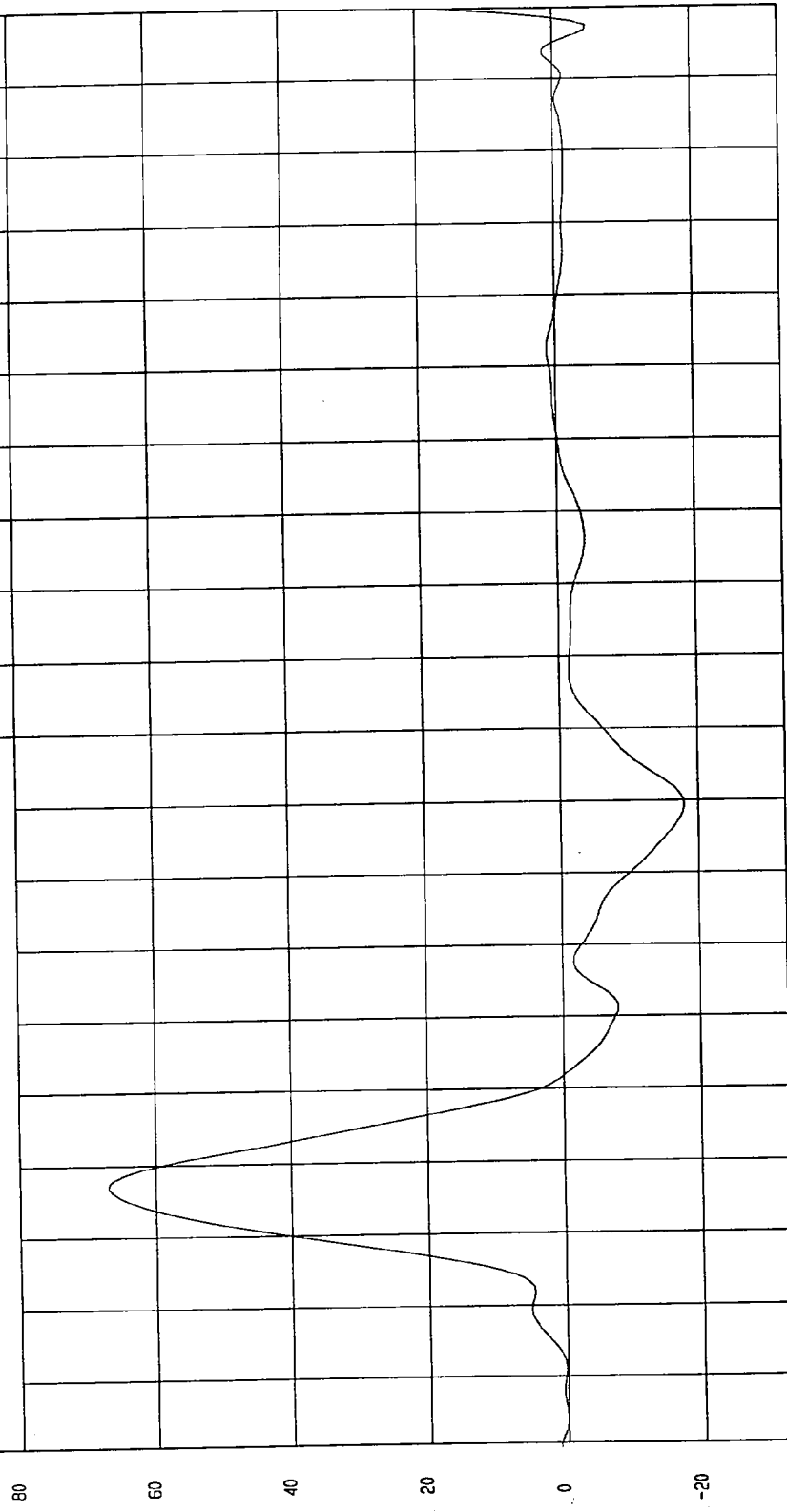
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Maximum = 57.02 G'S at 37 msec

Minimum = -17.99 G'S at 89 msec

DRIVER PELVIS Y ACCELERATION

1 B97406F1.R18 Filterclass (FIR Filtered)



MCA Research  
09-26-1997 09:52

TIME (SECONDS)

G.S

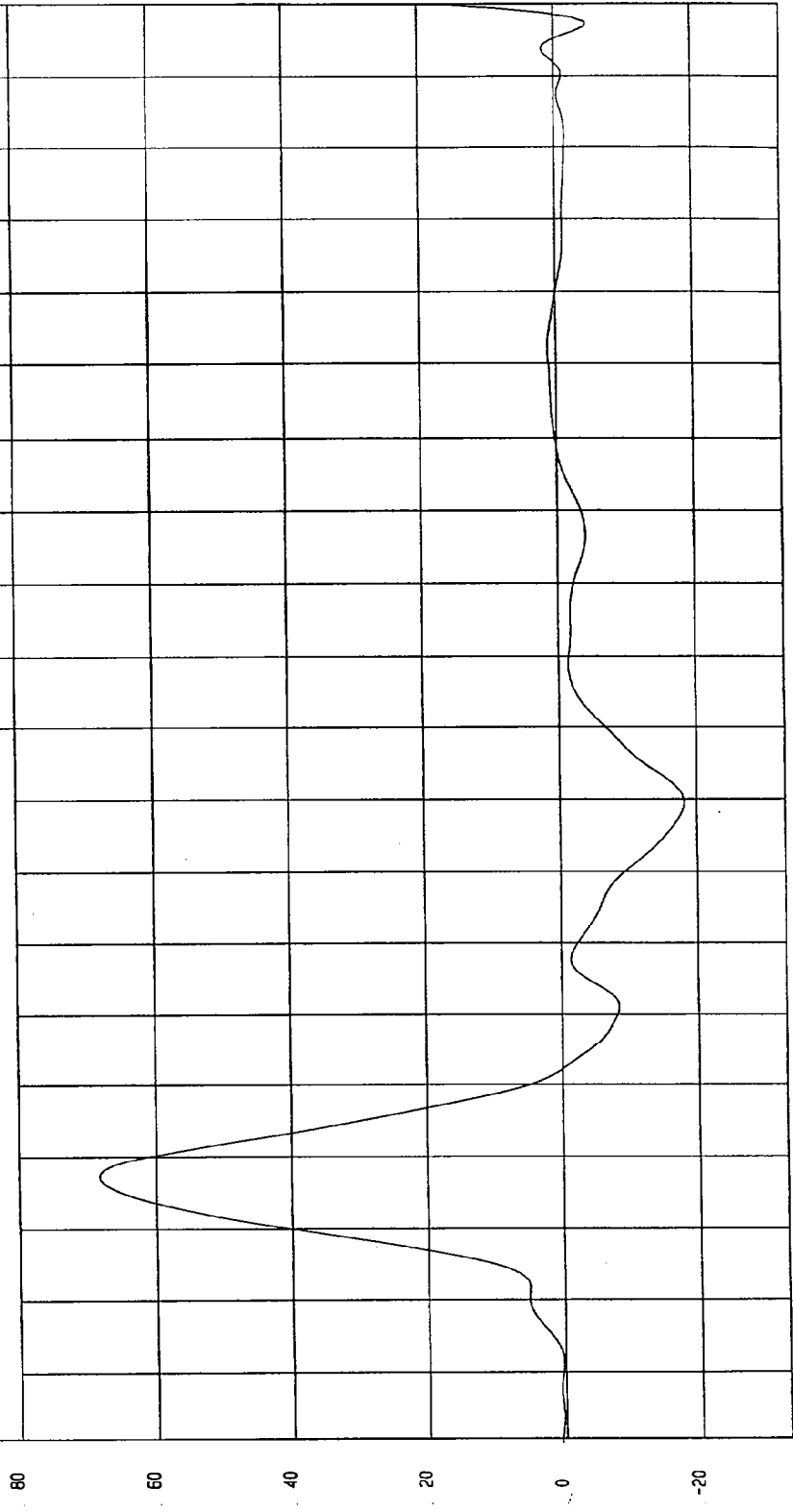
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -18.13 G'S at 89 msec Maximum = 68.13 G'S at 38 msec

DRIVER PELVIS Y REDUNDANT ACCELERATION

1 897106F1.H65 Filterclass (FIR Filtered)



TIME (SECONDS)

NCA Research  
09-26-1997 09:52

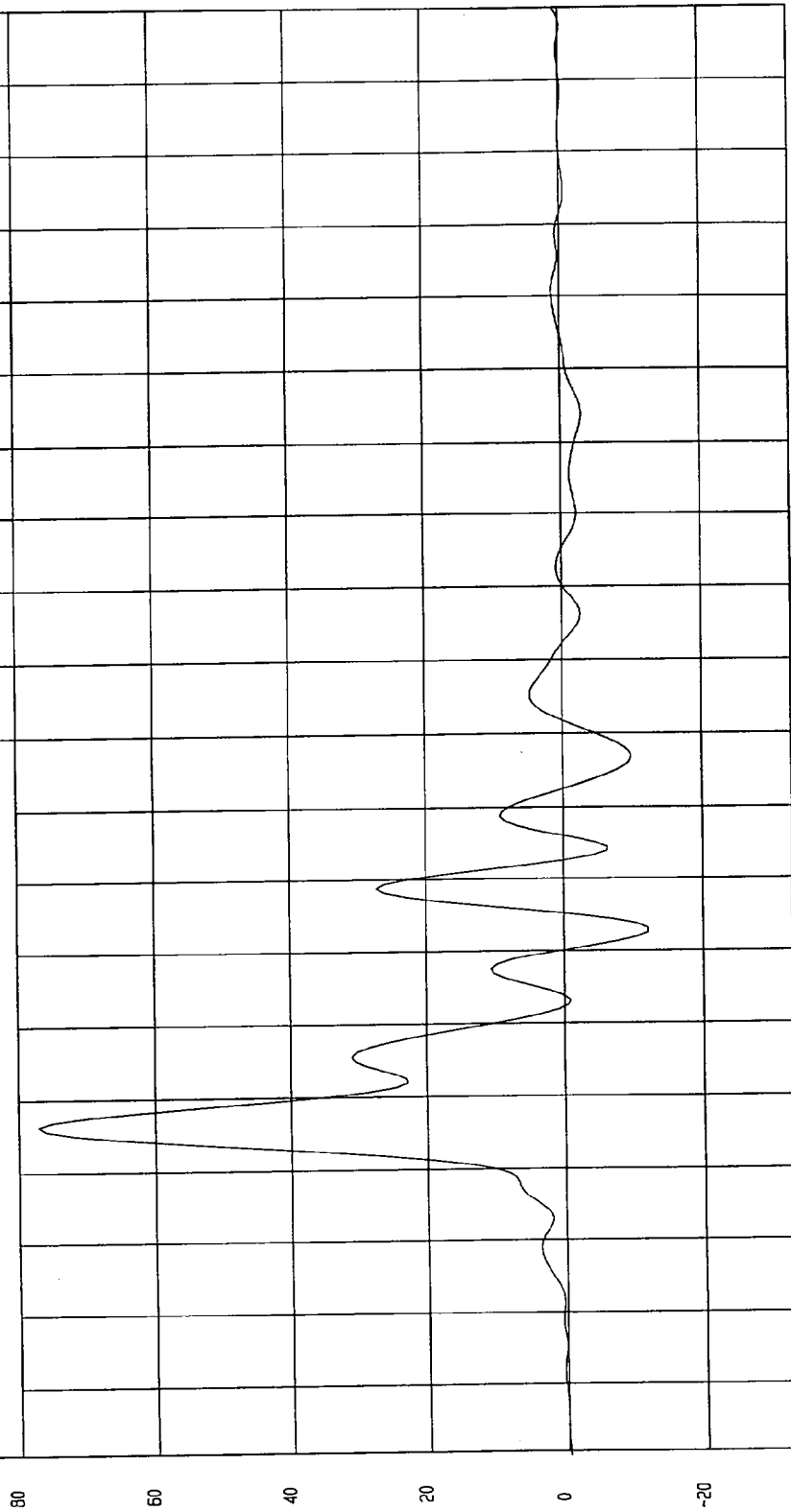
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -12.03 G'S at 73 msec  
Maximum = 77.21 G'S at 46 msec

REAR PASSENGER UPPER RIB Y ACCELERATION

1 887106FI.R25 Filterclass (FIR Filtered)



MCA Research  
09-26-1997 09:52

TIME (SECONDS)

G.S

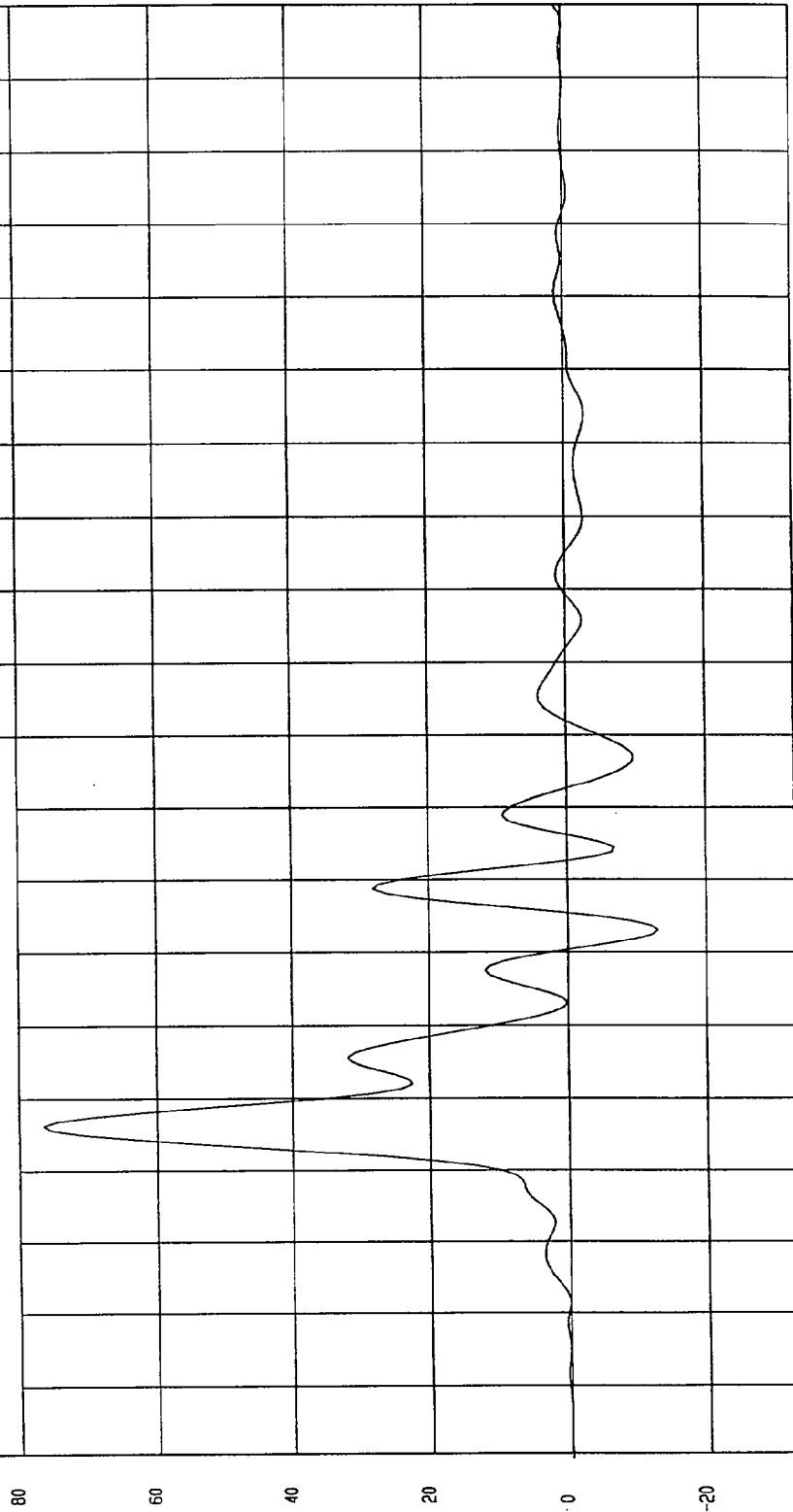
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -13.03 G's at 73 msec  
Maximum = 76.49 G's at 46 msec

REAR PASSENGER UPPER RIB Y REDUNDANT ACCELERATION

1 \_\_\_\_\_ 897106FI.R66 Filterclass (FIR Filtered)



TIME (SECONDS)

M&A Research  
09-26-1997 09:53

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

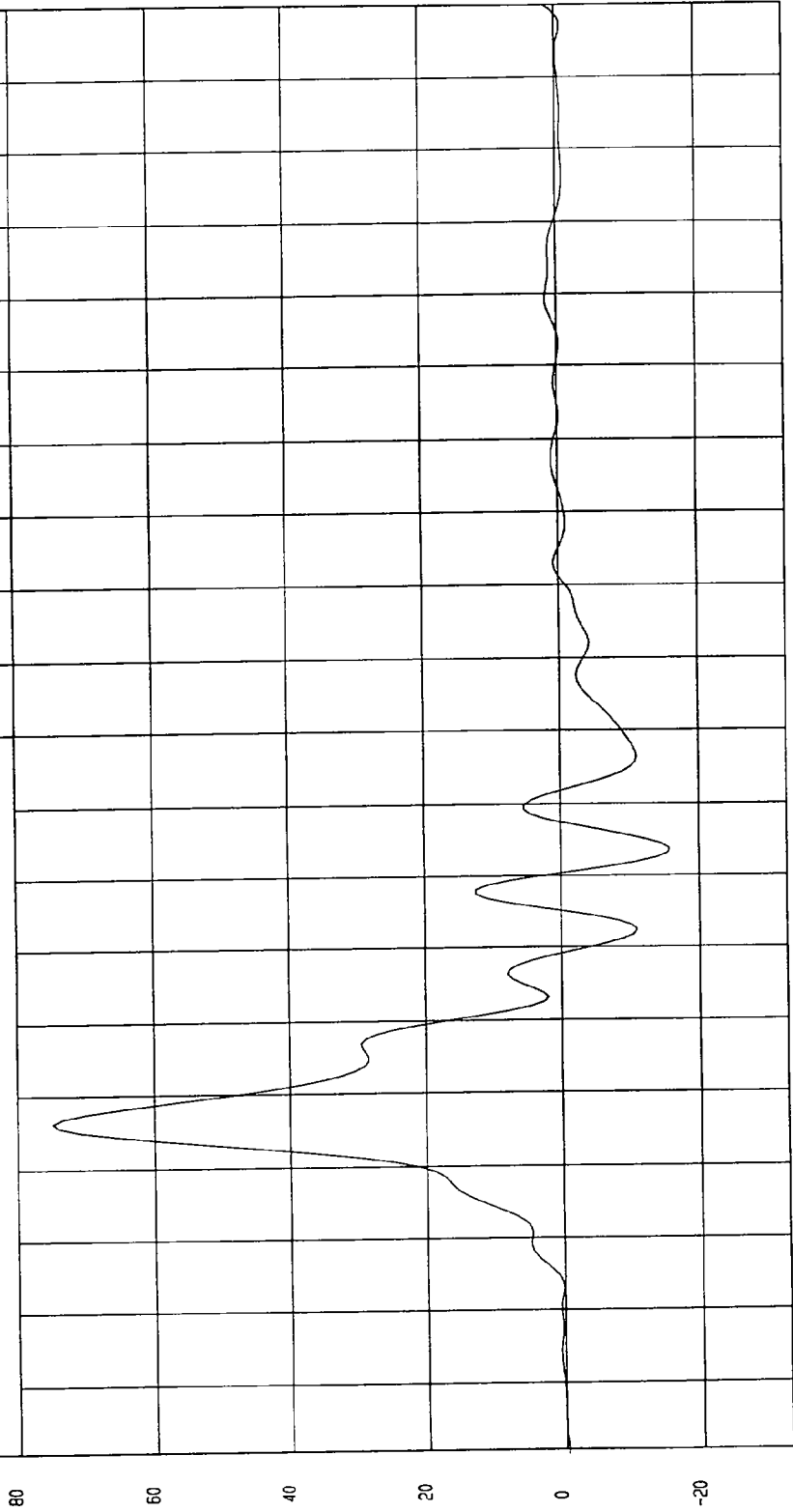
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 74.67 G'S at 46 msec

Minimum = -15.79 G'S at 84 msec

REAR PASSENGER LOWER RIB Y ACCELERATION

1 897106FI.R26 Filterclass (FIR Filtered)



MGA Research  
09-26-1997 09:53

TIME (SECONDS)

G.S

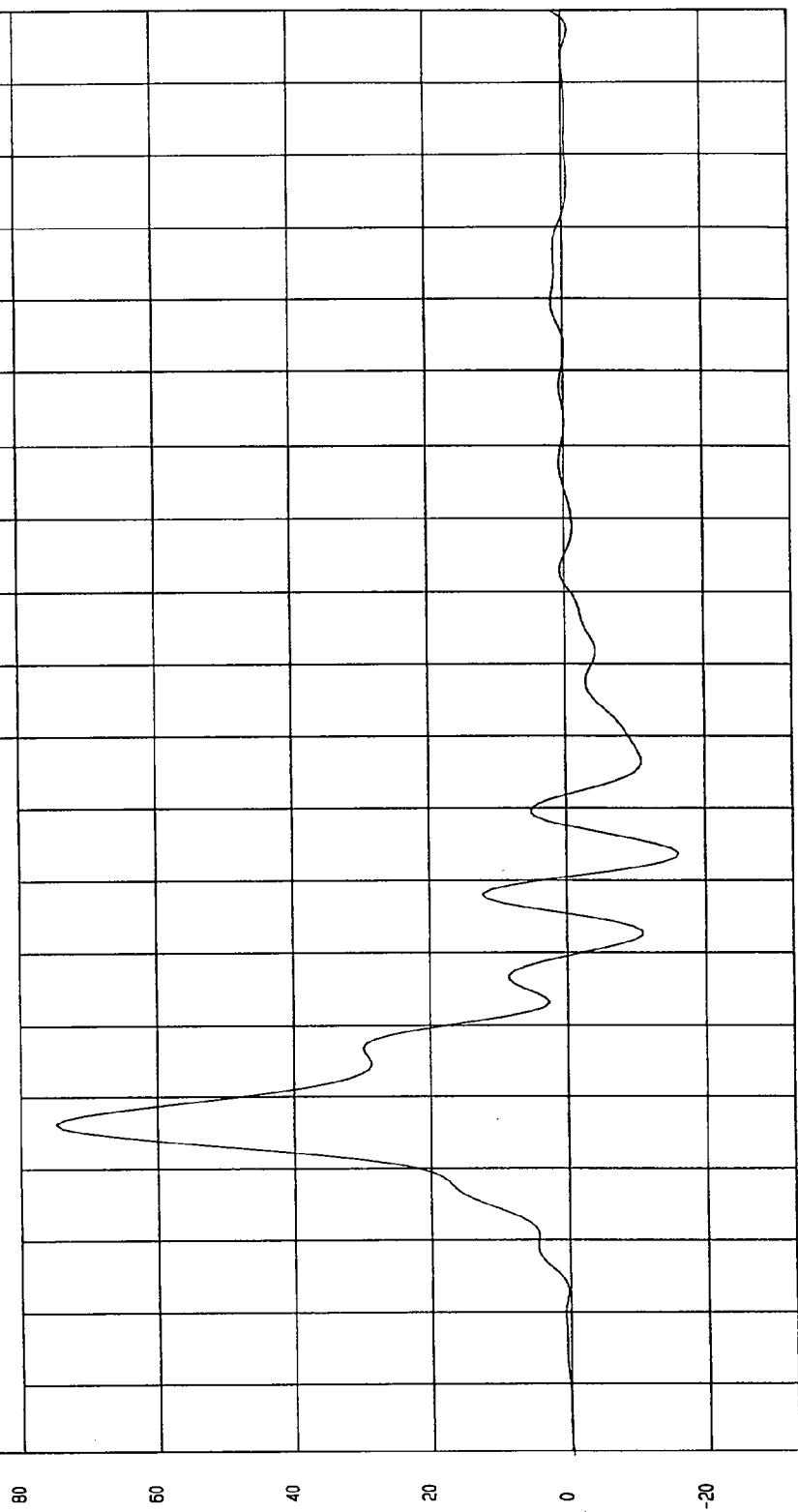
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -16.21 G'S at 84 msec  
Maximum = 74.85 G'S at 46 msec

REAR PASSENGER LOWER RIB Y REDUNDANT ACCELERATION

1 897106F1.067 Filterclass (FIR Filtered)



NSA Research  
09-26-1997 09:53

TIME (SECONDS)

G.S

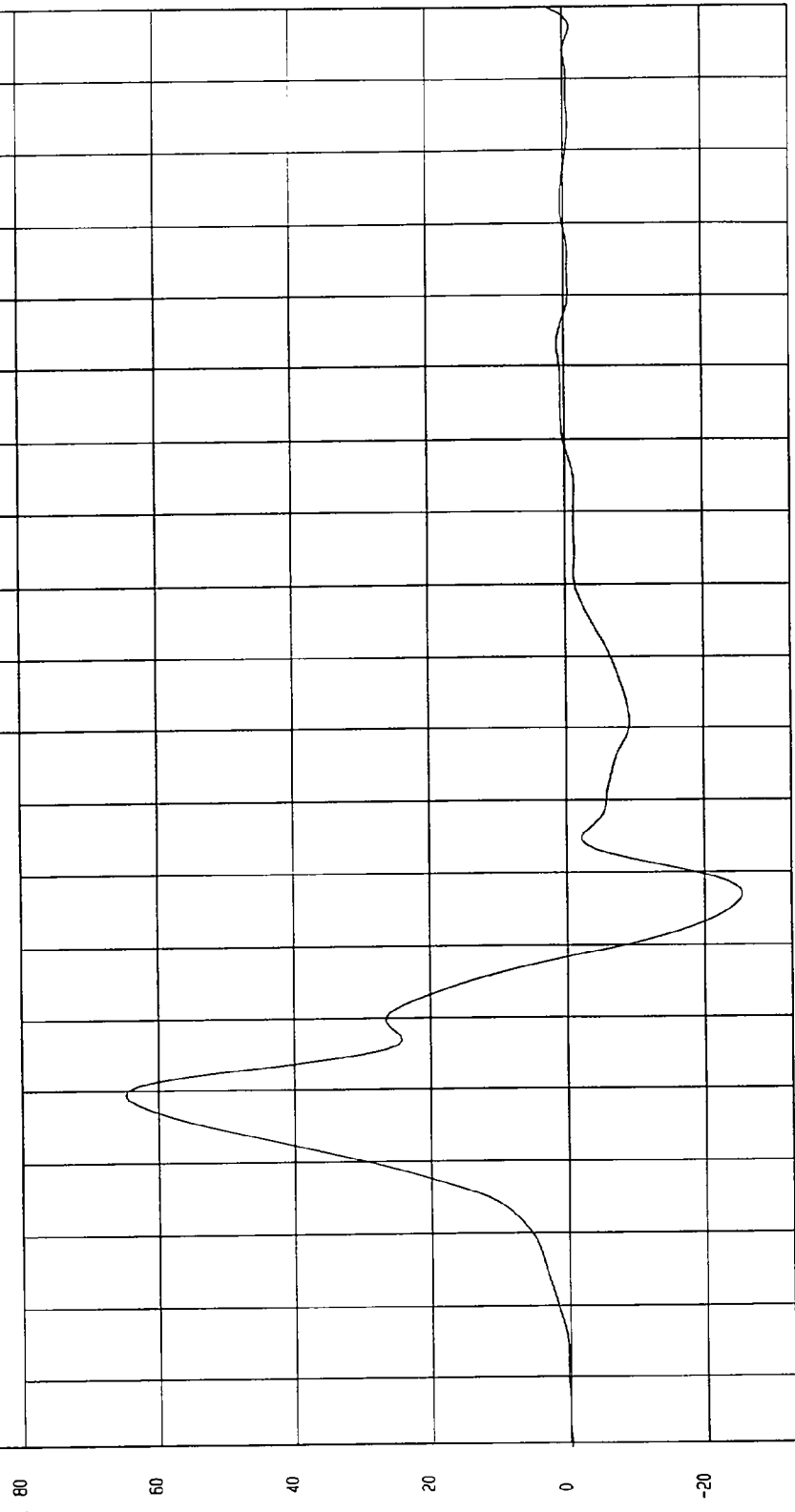
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -25.39 G'S at 77 msec Maximum = 64.89 G'S at 49 msec

REAR PASSENGER LOWER SPINE Y ACCELERATION

1 897106F1.R27 Filterclass (FIR Filtered)



MCA Research  
09-26-1997 09:53

TIME (SECONDS)

G.S

TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

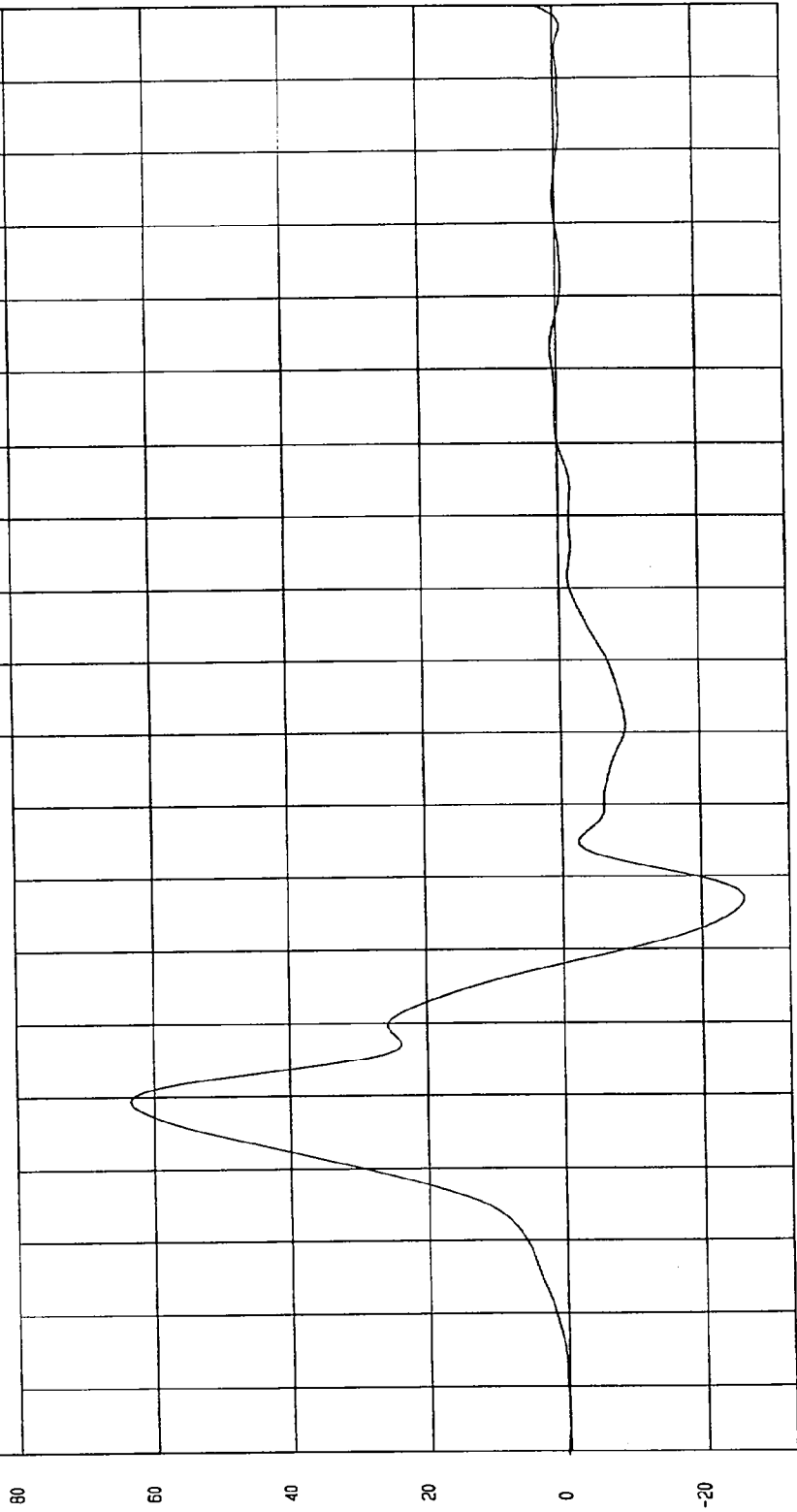
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Maximum = 63.62 G'S at 49 msec

Minimum = -26.00 G'S at 77 msec

REAR PASSENGER LOWER SPINE Y REDUNDANT ACCELERATION

1 897106F1.R68 Filterclass (FIR Filtered)



WCA Research  
09-26-1997 09:53

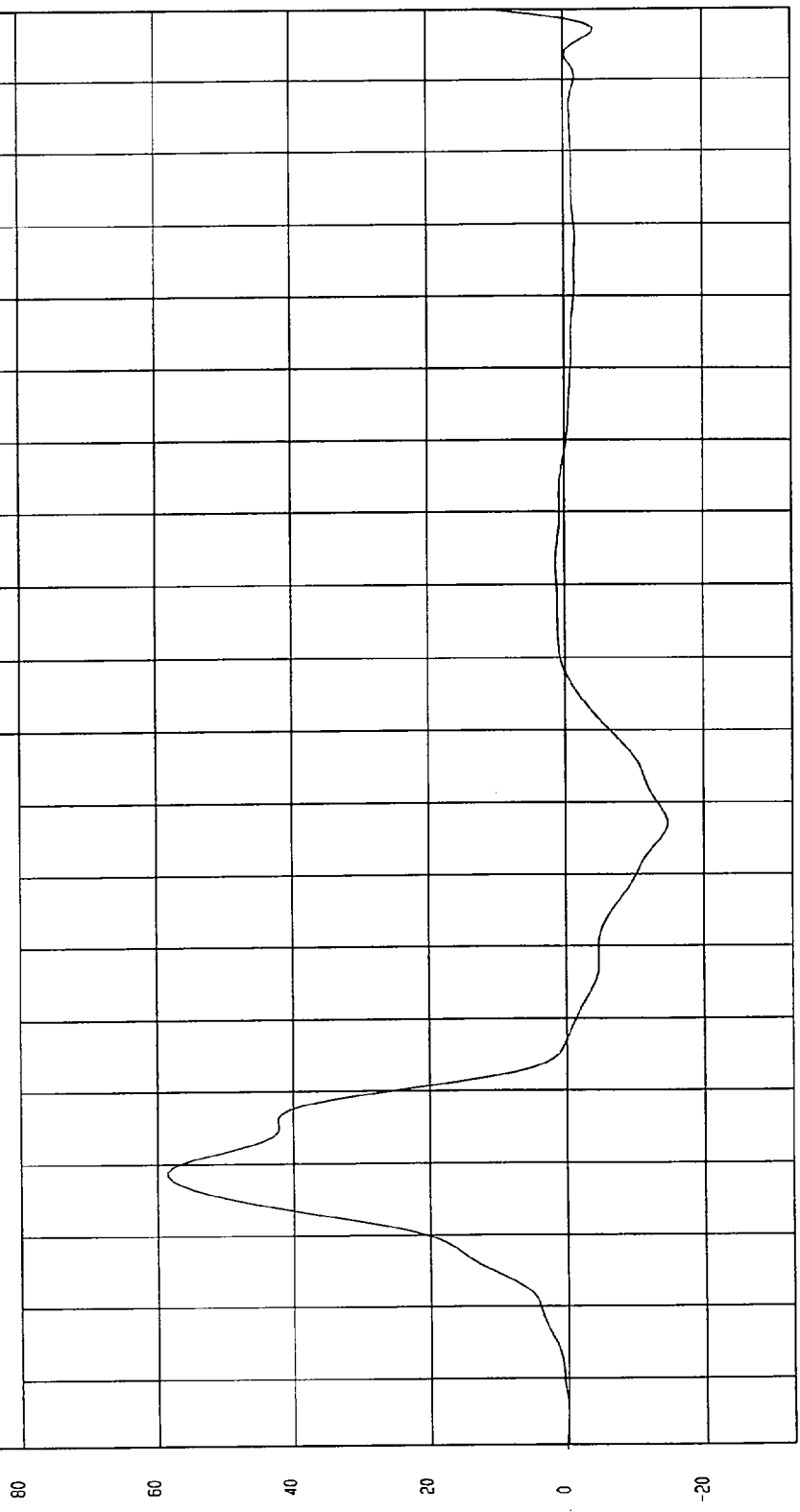
TEST: FMVSS 214 LEFT SIDE IMPACT TEST DATE: 09-15-1997

COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102) Speed: 32.9 MPH 52.9 KPH

Minimum = -14.83 G'S at 87 msec  
Maximum = 58.51 G'S at 39 msec

REAR PASSENGER PELVIS Y ACCELERATION

1 ———— B97106FI.R28 Filterclass (FIR Filtered)



MCA Research  
09-26-1997 10:09

TIME (SECONDS)

G.S

TEST DATE: 09-15-1997

TEST: FMVSS 214 LEFT SIDE IMPACT

Speed: 32.9 MPH 52.9 KPH

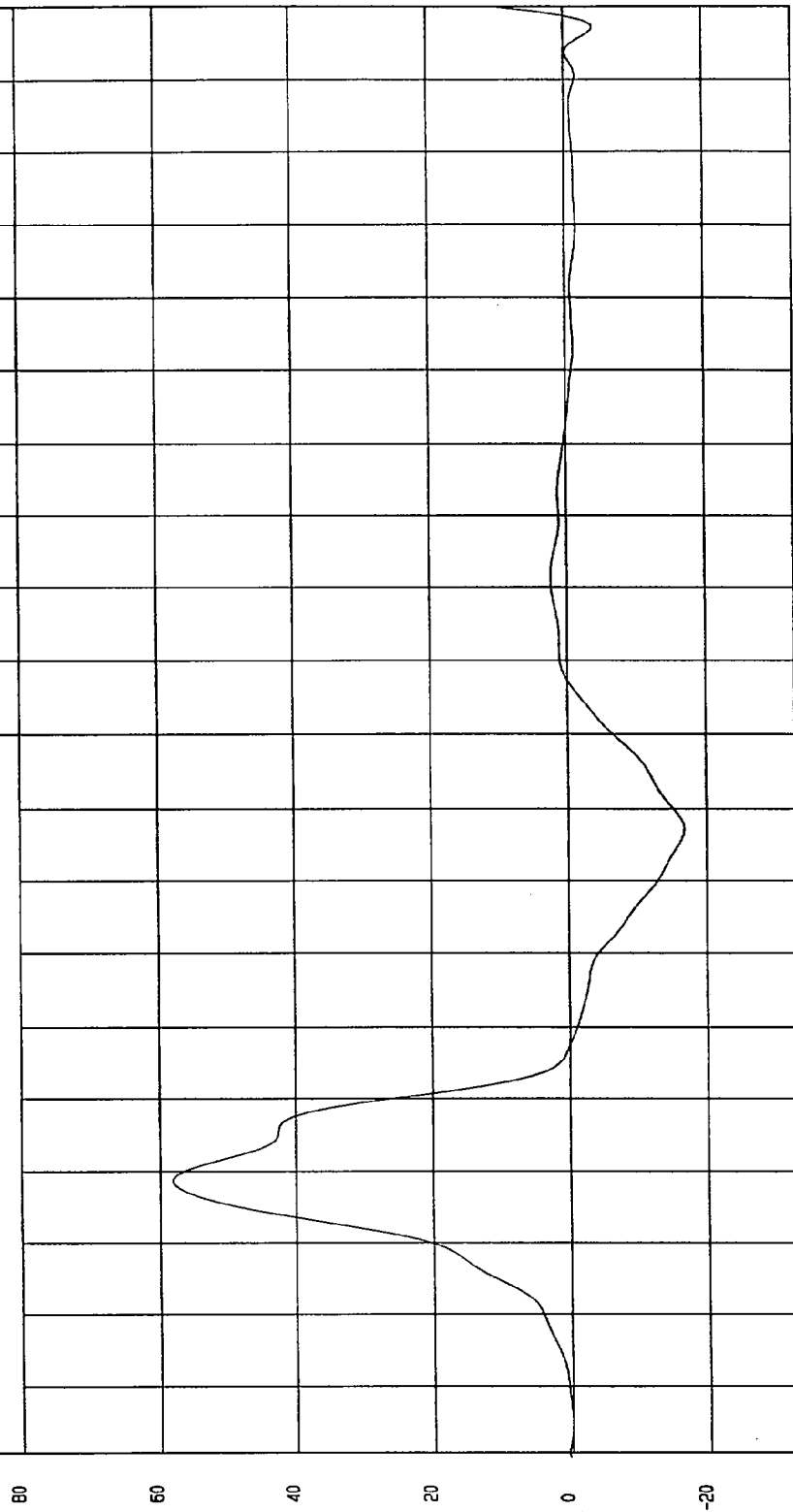
COMPONENT: 1998 OLDSMOBILE INTRIGUE (CW0102)

Maximum = 58.16 G'S at 39 msec

Minimum = -16.78 G'S at 87 msec

REAR PASSENGER PELVIS Y REDUNDANT ACCELERATION

1 \_\_\_\_\_ B97106F1.R69 Filterclass (FIR Filtered)



TIME (SECONDS)

MCA Research  
09-26-1997 09:53

APPENDIX C  
SID CONFIGURATION AND PERFORMANCE VERIFICATION

REPORT NO. MGA-98-DC03

DUMMY PERFORMANCE CALIBRATIONS

FMVSS 214 - SIDE IMPACT TEST

GENERAL MOTORS CORPORATION  
1998 OLDSMOBILE INTRIGUE 4 DOOR  
NHTSA NO. CW0102

MGA PROVING GROUNDS  
5000 WARREN ROAD  
BURLINGTON, WI 53105



Test Date: September 15, 1997

Report Date: September 25, 1997

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: 049	PRE-TEST CERTIFICATION DATA	2-1
DUMMY S/N: 048	POST-TEST CERTIFICATION DATA	3-1
DUMMY S/N: 049	POST-TEST CERTIFICATION DATA	4-1
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DUMMY S/N: 049	POST-TEST INSPECTION CHECKLIST	6-1
	VEHICLE AND DUMMY TEMPERATURE	7-1

PRE-TEST CERTIFICATION DATA

Front Dummy Serial Number: 048

Calibration Test Results Summary

Dummy Serial Number: 048

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.: 048

DATE OF VERIFICATION: September 5, 1997

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.3
RH - Rib Height	19.75" - 20.50"	19.90
HP - Hip Pivot Height	3.9" ref.	3.9
RD - Rib From Back Line	9.0" to 9.5"	9.2
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"	14.8

MEASUREMENTS BY: 

APPROVED BY: 

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

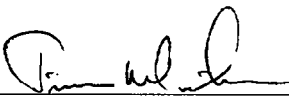
DATE: September 5, 1997

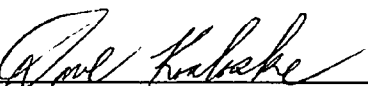
DUMMY NUMBER: 048

TEST NUMBER: D971432

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	40%
PROBE SPEED	14.0 - 14.2 fps	14.2
UPPER RIB	37 - 46 g's	40
LOWER RIB	37 - 46 g's	39
LOWER SPINE	15 - 22 g's	20

TEST MEETS SPECIFICATIONS

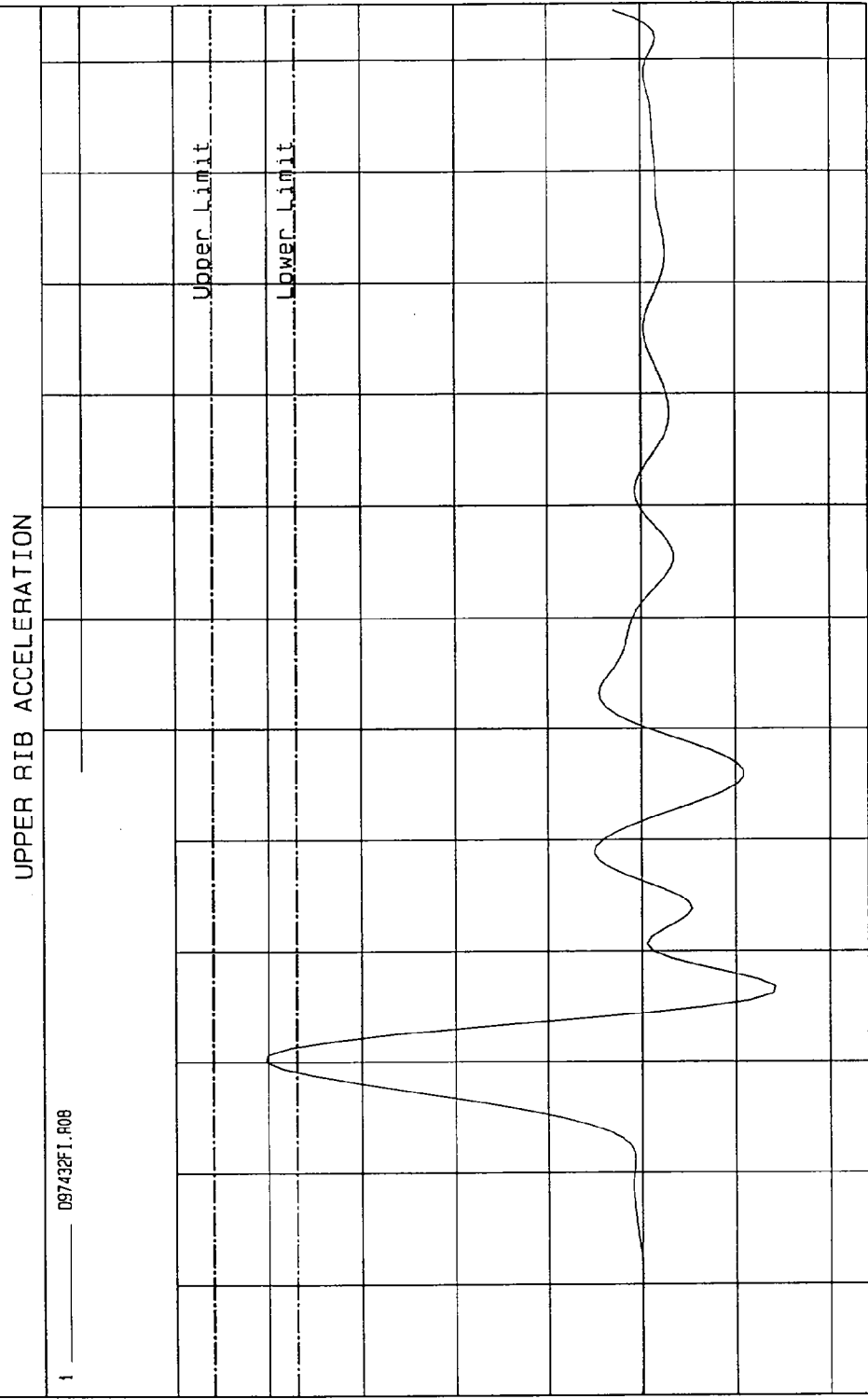
TECHNICIAN 

APPROVED BY 

TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 09-05-1997 - 10:49

COMPONENT: DUMMY # 04B Velocity: 14.156 FT/SEC 4.31 M/SEC

Minimum = -14.15 G'S at 36.8 msec Maximum = 40.25 G'S at 30 msec



TIME (SECONDS)

MOA Research  
09-05-1997 10:57

S.G

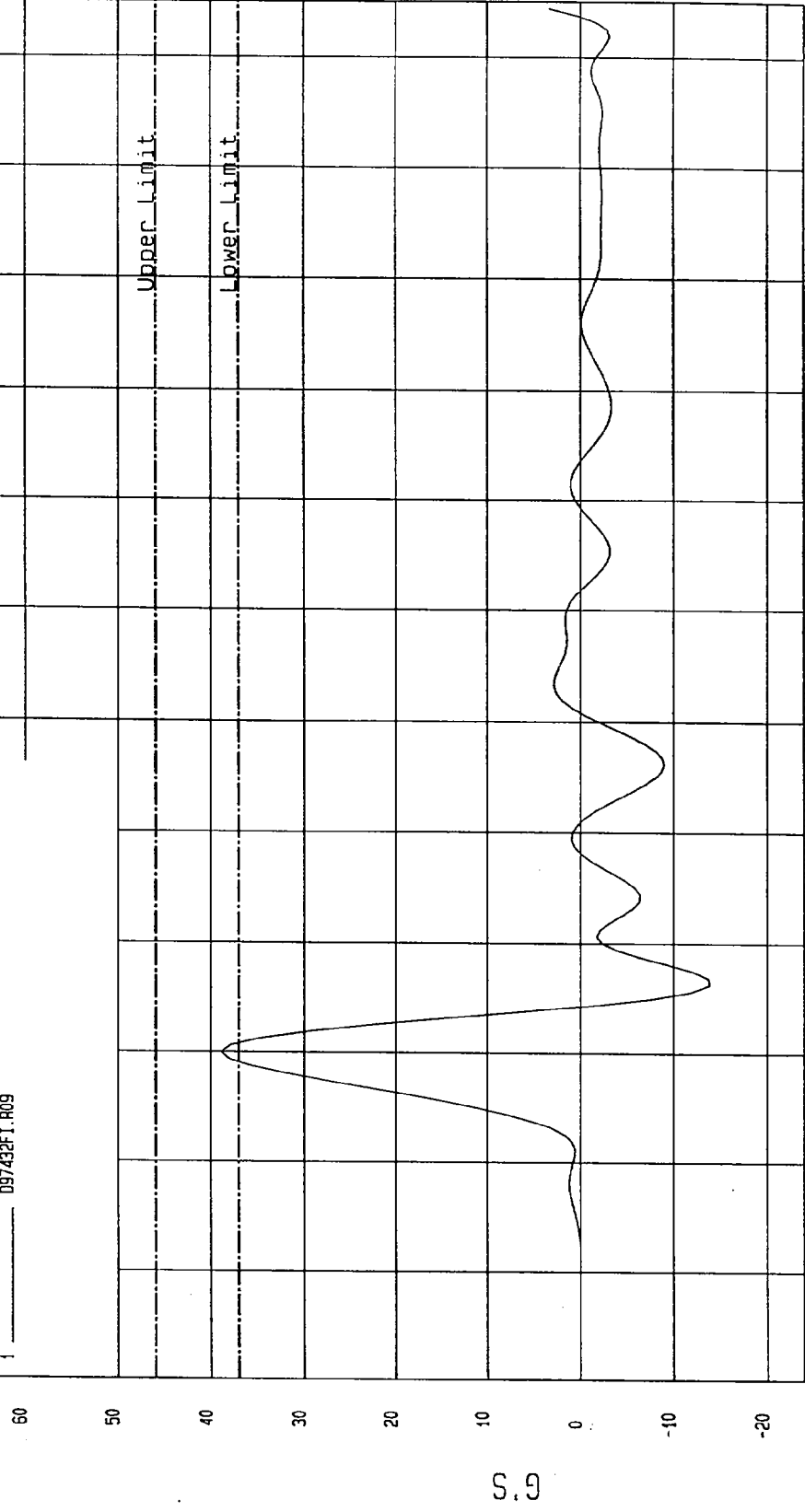
TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 09-05-1997 - 10:49

COMPONENT: DUMMY # 048 Velocity: 14.156 FT/SEC 4.31 M/SEC

Minimum = -13.83 G'S at 36.2 msec Maximum = 38.90 G'S at 30 msec

LOWER RIB ACCELERATION

1 \_\_\_\_\_ DS7432F1.R09



MSA Research  
09-05-1997 10:57

TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 09-05-1997 - 10: 49

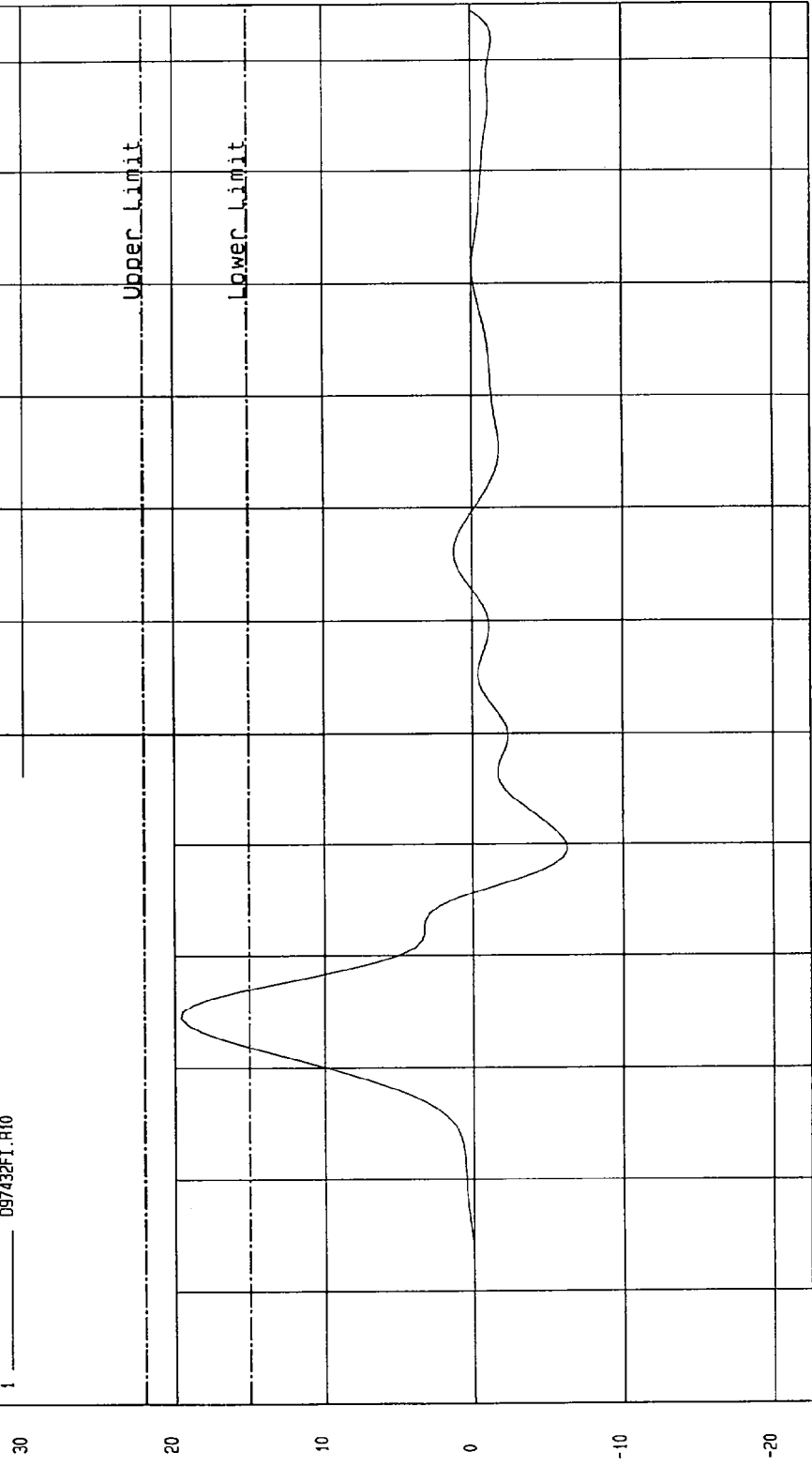
COMPONENT: DUMMY # 048 Velocity: 14.156 FT/SEC 4.31 M/SEC

Minimum = -6.25 G'S at 49.3 msec

Maximum = 19.56 G'S at 34.3 msec

LOWER SPINE ACCELERATION

1 097432FI.R10



TIME (SECONDS)

NSA Research  
09-05-1997 10: 56

G.S

MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: September 5, 1997

DUMMY NUMBER: 048

TEST NUMBER: D971433

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

TEST MEETS SPECIFICATIONS

TECHNICIAN Jim Wilson

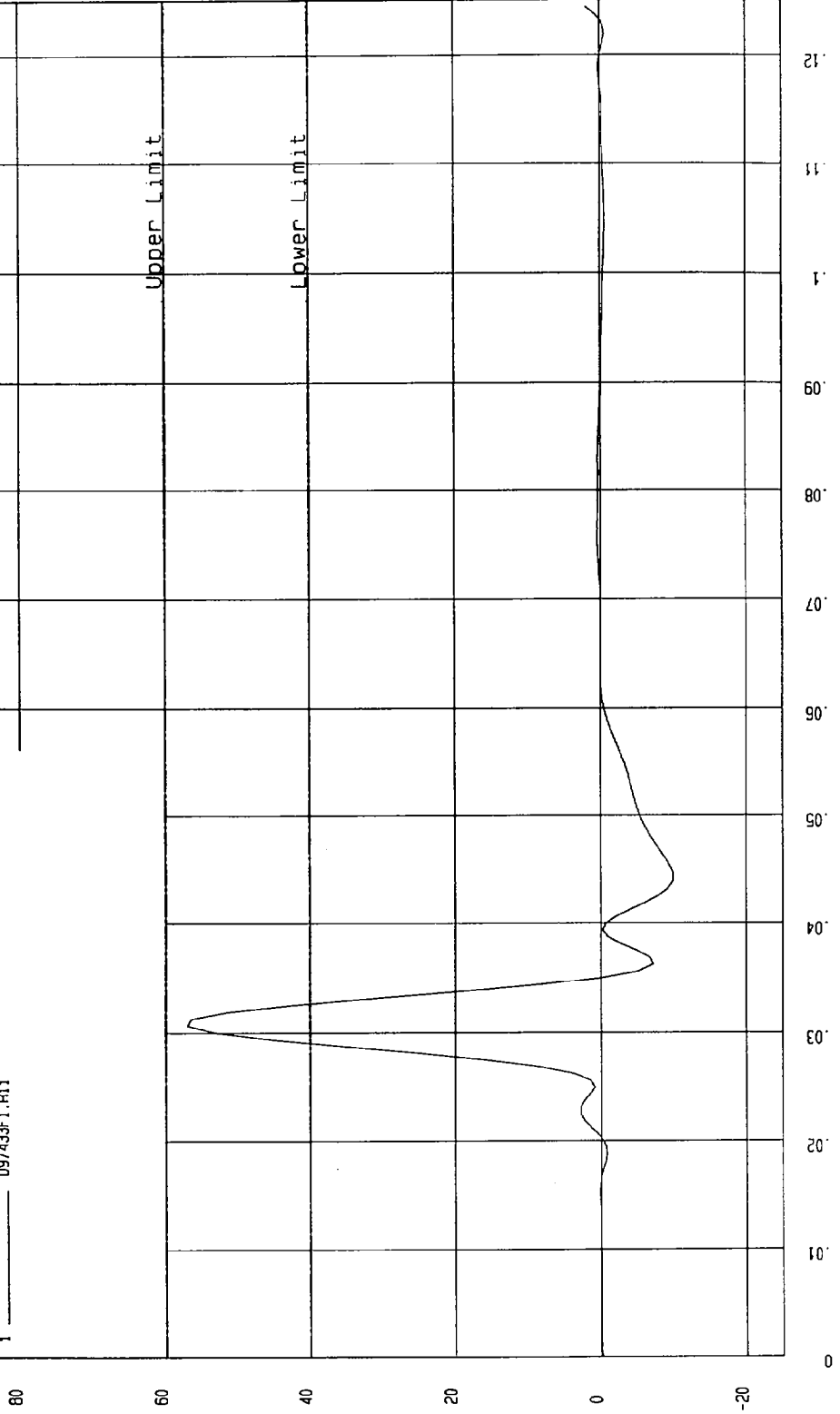
APPROVED BY Paul Koslowski

TEST: DUMMY CALIBRATION - PELVIS IMPACT TEST DATE: 09-05-1997 - 10:56  
COMPONENT: DUMMY # 048 Velocity: 14.04 FT/SEC 4.28 M/SEC

Minimum = -9.99 G's at 44.3 msec Maximum = 56.94 G's at 30.6 msec

PELVIS ACCELERATION

1 097433F1.R11



MGA Research Co.  
09-05-1997 10:58

G.S.

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

DATE: September 5, 1997

DUMMY NUMBER: 048

TEST NUMBER: D971434

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	40%
FORCE @ 0.5 in	23.3 - 36.5 lbs	31.1
FORCE @ 0.75 in	36.7 - 49.8 lbs	43.0
FORCE @ 1.0 in	50 - 63 lbs	57
FORCE @ 1.3 in	73 - 88 lbs	77

TEST MEETS SPECIFICATIONS

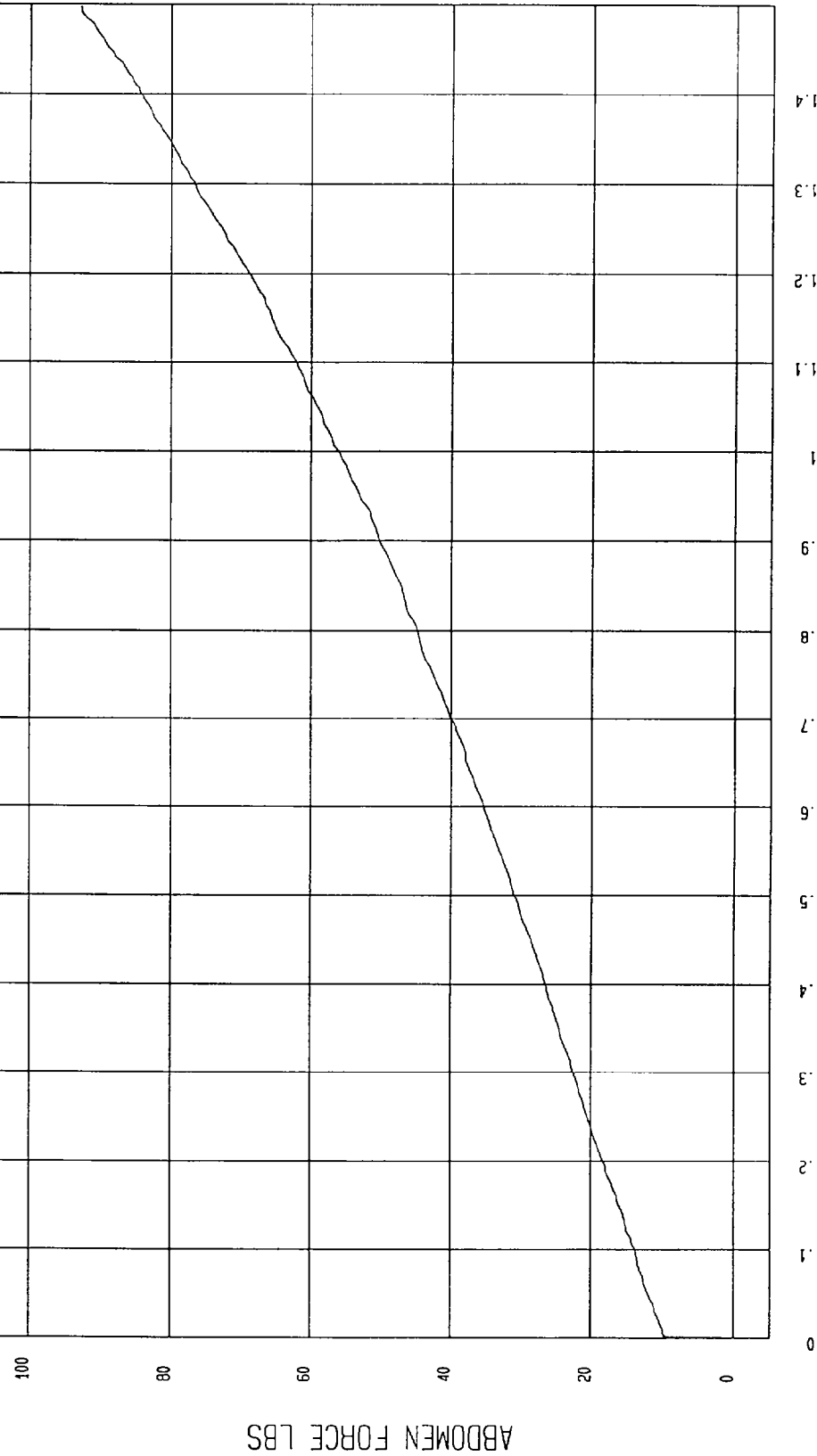
TECHNICIAN 

APPROVED BY 

TEST: DUMMY CALIBRATION - ABDOMEN COMPRESSION TEST DATE: 09-05-1997 - 09: 56

COMPONENT: DUMMY # 04B

ABDOMEN FORCE as a function of ABDOMEN DISPLACEMENT



NGA Research  
09-05-1997 10: 04

ABDOMEN DISPLACEMENT INCHES

ABDOMEN FORCE LBS

MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: September 5, 1997

DUMMY NUMBER: 048

TEST NUMBER: D971435

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	38%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	25
FORCE @ 30°	34 - 46 lbs	42
FORCE @ 40°	46 - 58 lbs	53
RETURN ANGLE	12° maximum	4°

TEST MEETS SPECIFICATIONS

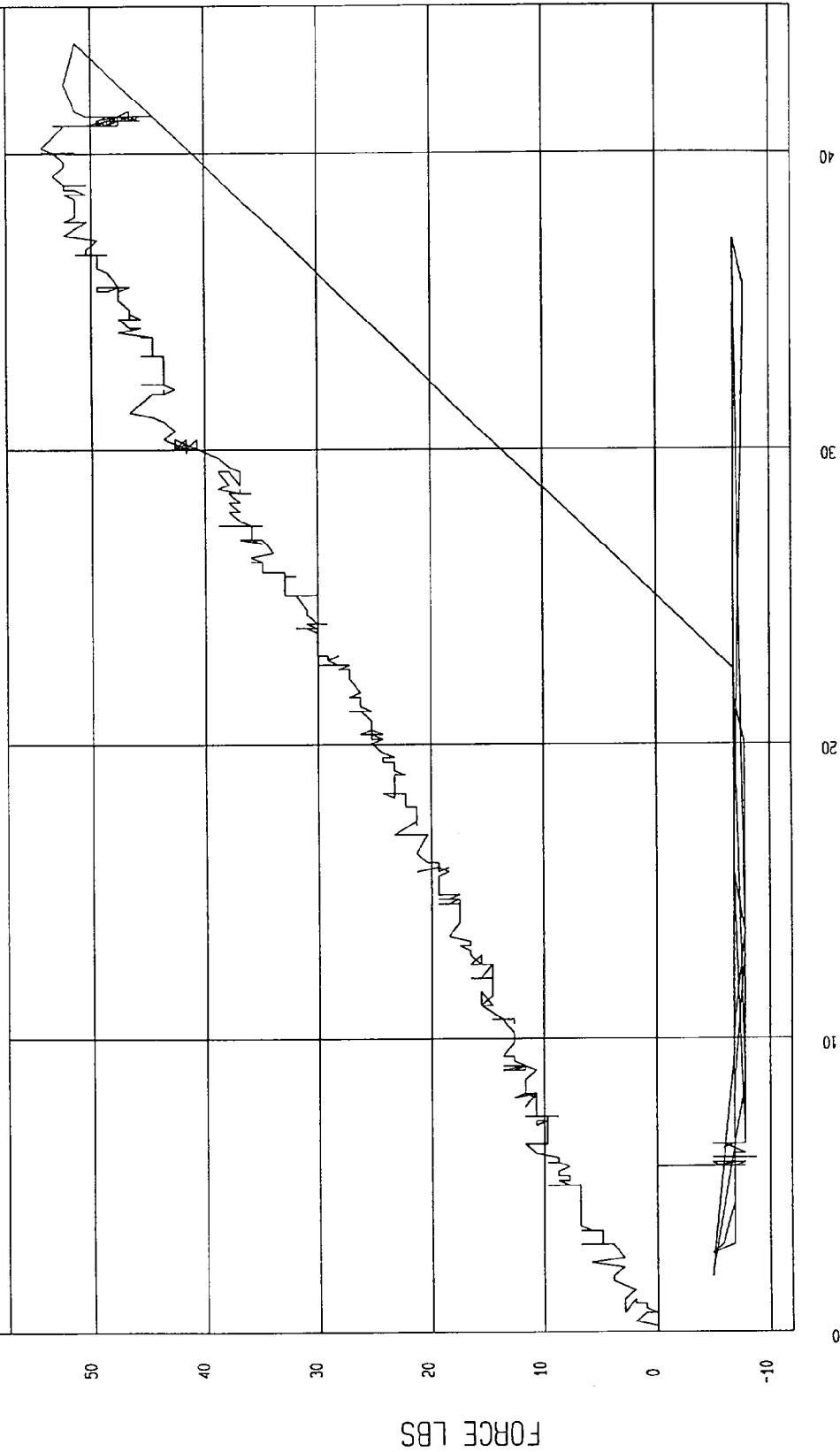
TECHNICIAN *Tom [Signature]*

APPROVED BY *Rene [Signature]*

TEST: DUMMY CALIBRATION - LUMBAR FLEXION TEST DATE: 09-05-1997 - 08:40

COMPONENT: DUMMY # 04B

FORCE as a function of TORSO ROTATION



NGA Research  
09-05-1997 08:59

TORSO ROTATION DEGREES

PRE-TEST CERTIFICATION DATA

Rear Dummy Serial Number: 049

Calibration Test Results Summary

Passenger Serial Number: 049

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.: 049

DATE OF VERIFICATION: September 5, 1997

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.2
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"	20.5
SW - Knee Pivot to Floor	19.3" - 19.9"	19.5
HW - Hip Width	14.0" - 15.4"	14.7

MEASUREMENTS BY: 

APPROVED BY: 

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: September 5, 1997

DUMMY NUMBER: 049

TEST NUMBER: D971442

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	40%
PROBE SPEED	14.0 - 14.2 fps	14.2
UPPER RIB	37 - 46 g's	38
LOWER RIB	37 - 46 g's	40
LOWER SPINE	15 - 22 g's	21

TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 09-05-1997 - 11:20

COMPONENT: DUMMY # 049 Velocity: 14.162 FT/SEC 4.32 M/SEC

Minimum = -10.77 G'S at 62.5 msec

Maximum = 37.92 G'S at 35.6 msec

UPPER RIB ACCELERATION

1 097442F1.R08

60  
50  
40  
30  
20  
10  
0  
-10  
-20

Upper Limit  
Lower Limit

G.S

TIME (SECONDS) 0 .01 .02 .03 .04 .05 .06 .07 .08 .09 .1 .11 .12

WCA Research  
09-05-1997 11:27

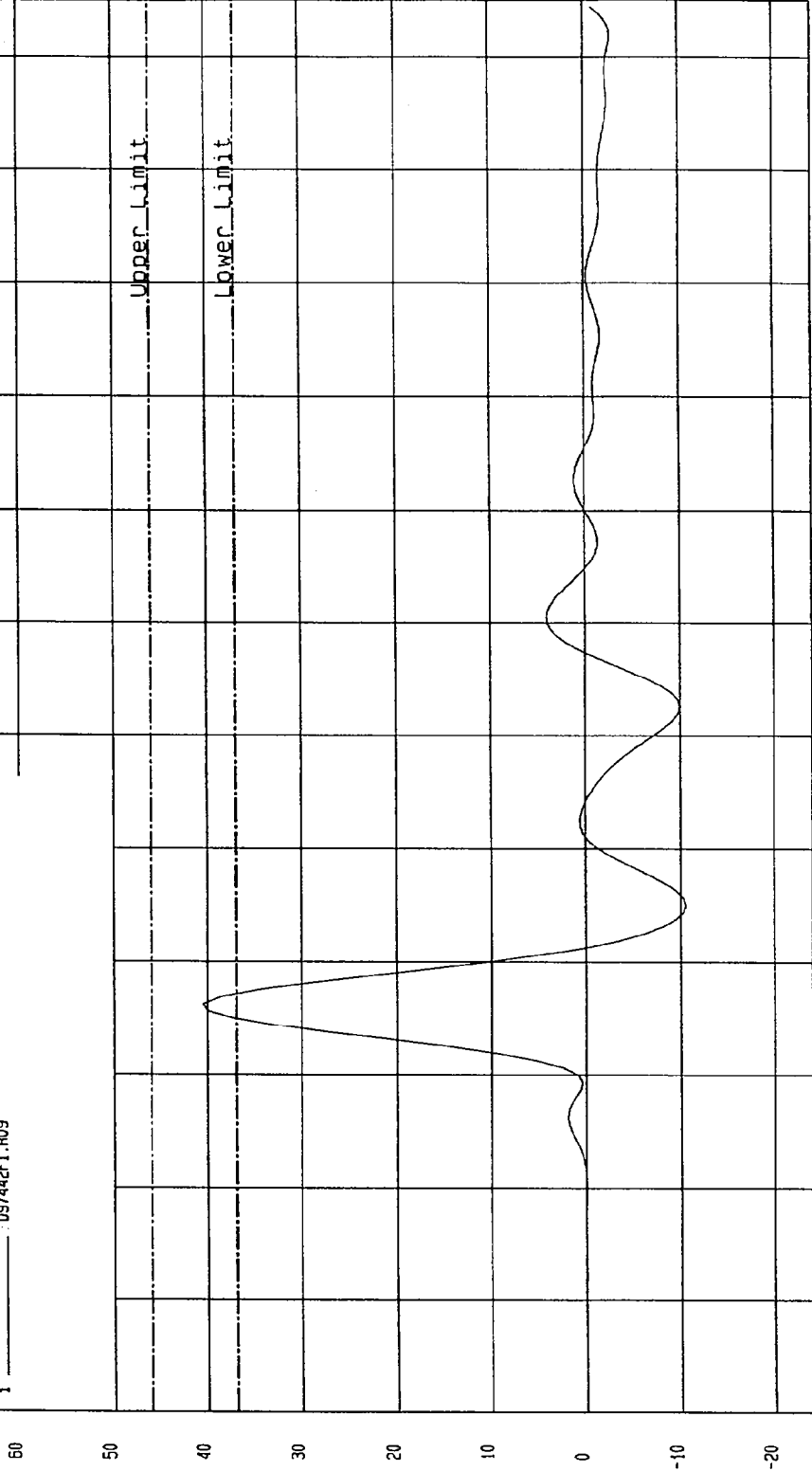
TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 09-05-1997 - 11:20

COMPONENT: DUMMY # 049 Velocity: 14.162 FT/SEC 4.32 M/SEC

Minimum = -10.53 G'S at 45 msec Maximum = 40.43 G'S at 36.2 msec

LOWER RIB ACCELERATION

1 097442F1.R09



MSA Research  
09-05-1997 11:28

TIME (SECONDS)

G.S.

TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 09-05-1997 - 11:20

COMPONENT: DUMMY # 049 Velocity: 14.162 FT/SEC 4.32 M/SEC

Minimum = -4.03 G'S at 58.7 msec

Maximum = 20.61 G'S at 40.6 msec

LOWER SPINE ACCELERATION

1 ——— 097442FI.R10

30  
20  
10  
0  
-10  
-20

Upper Limit  
Lower Limit

G.S

0 10 20 30 40 50 60 70 80 90 100 110 120

TIME (SECONDS)

MGA Research  
09-05-1997 11:28

MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

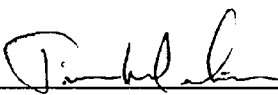
DATE: September 5, 1997

DUMMY NUMBER: 049

TEST NUMBER: D971443

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	40%
PROBE SPEED	14.0 - 14.2 f/s	14.1
PELVIS ACCELERATION	40 - 60 g's	50

TEST MEETS SPECIFICATIONS

TECHNICIAN 

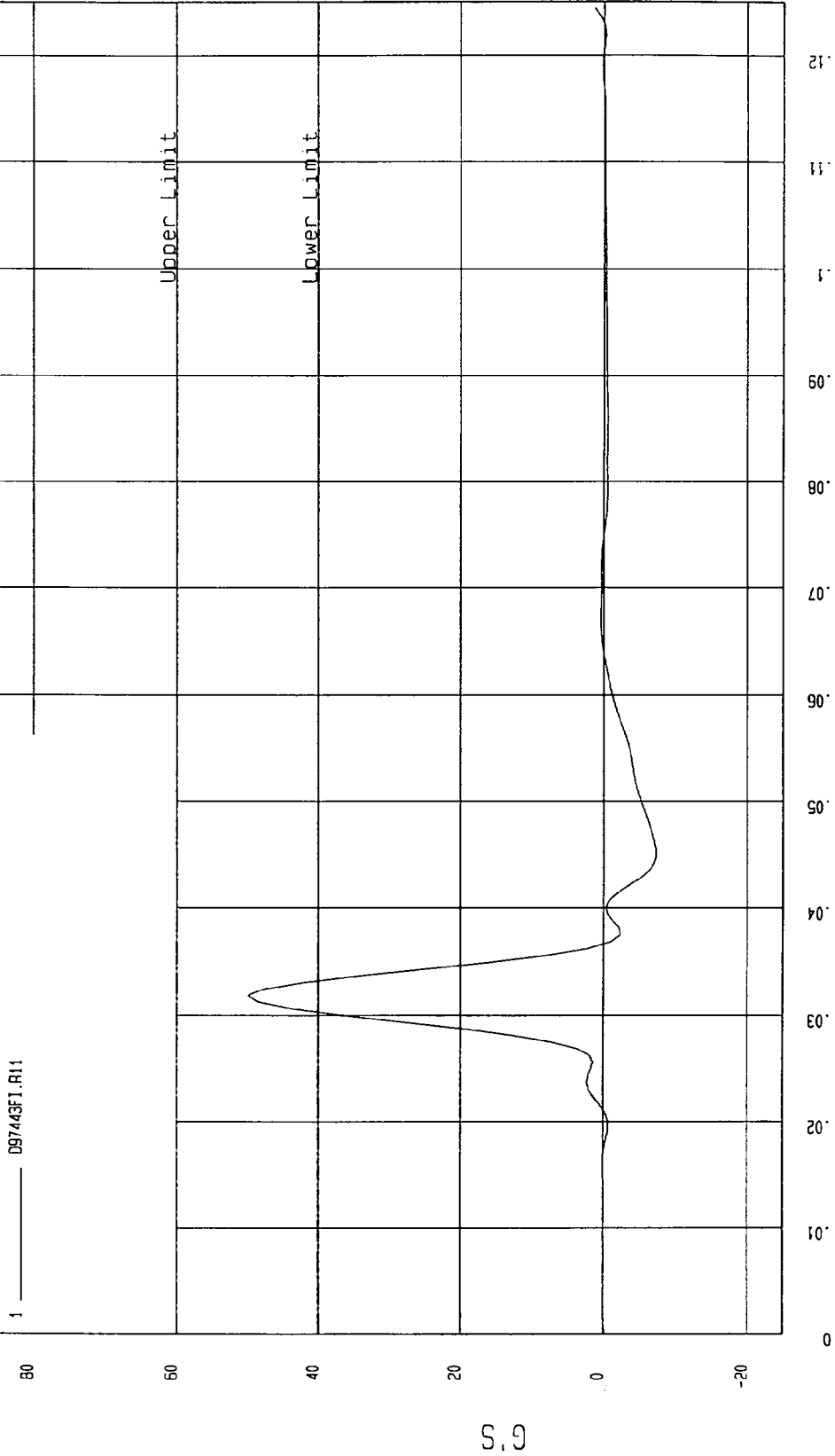
APPROVED BY 

TEST: DUMMY CALIBRATION - PELVIS IMPACT TEST DATE: 09-05-1997 - 11:26:58  
COMPONENT: DUMMY # 049 Velocity: 14.072 FT/SEC 4.29 M/SEC

Minimum = -7.43 G'S at 45 msec Maximum = 49.90 G'S at 31.8 msec

PELVIS ACCELERATION

1 ——— D97443F1.R11



MGA Research  
09-05-1997 11:28

MGA RESEARCH CORPORATION

ABDOMINAL COMPRESSION TEST  
(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

DATE: September 5, 1997

DUMMY NUMBER: 049

TEST NUMBER: D971444

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	40%
FORCE @ 0.5 in	23.3 - 36.5 lbs	30.1
FORCE @ 0.75 in	36.7 - 49.8 lbs	40.9
FORCE @ 1.0 in	50 - 63 lbs	55
FORCE @ 1.3 in	73 - 88 lbs	75

TEST MEETS SPECIFICATIONS

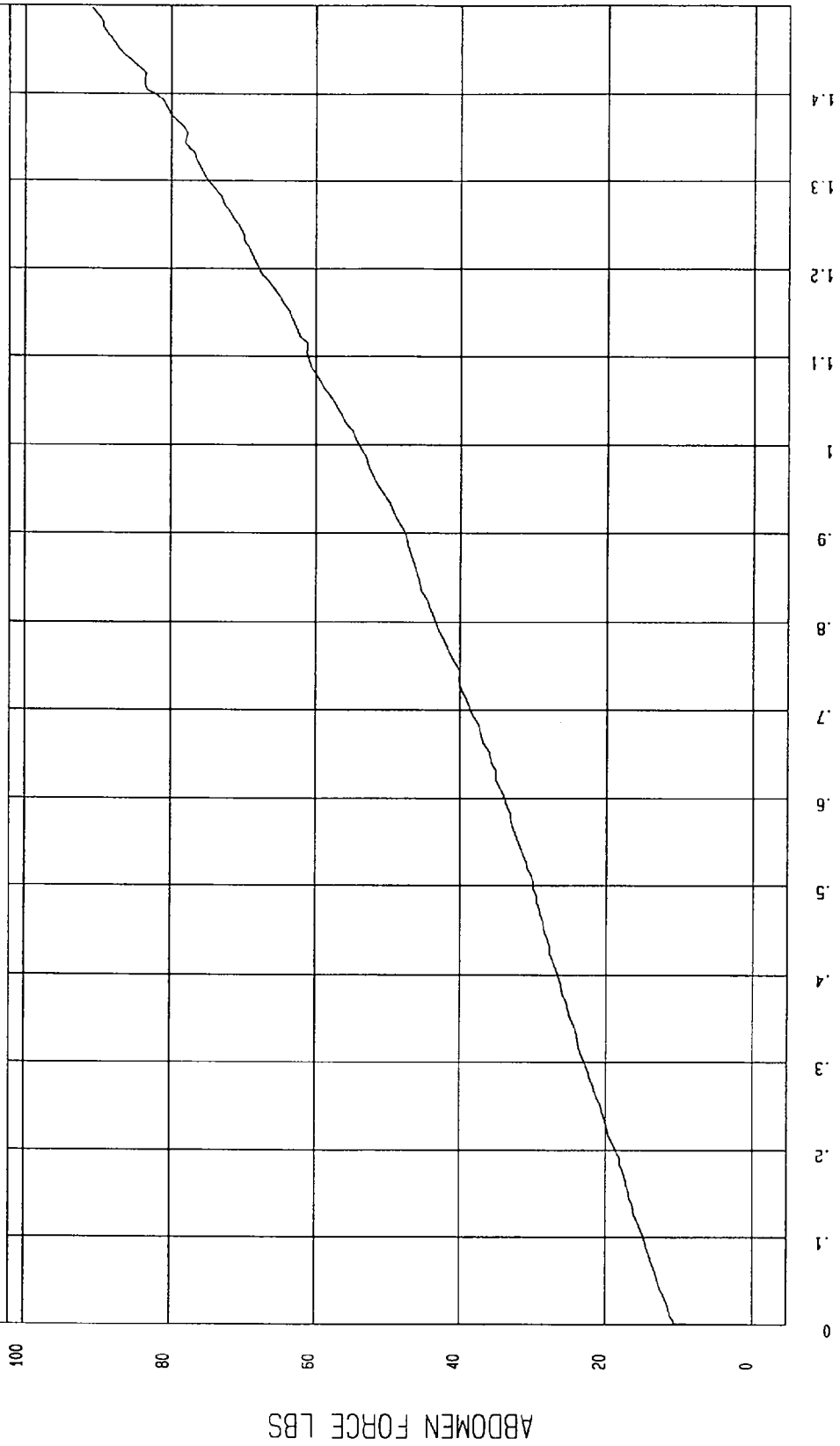
TECHNICIAN 

APPROVED BY 

TEST: DUMMY CALIBRATION - ABDOMEN COMPRESSION TEST DATE: 09-05-1997 - 10:00

COMPONENT: DUMMY # 049

ABDOMEN FORCE as a function of ABDOMEN DISPLACEMENT



MGA Research  
09-05-1997 10:04

MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: September 5, 1997

DUMMY NUMBER: 049

TEST NUMBER: D971445

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	38%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	22
FORCE @ 30°	34 - 46 lbs	35
FORCE @ 40°	46 - 58 lbs	48
RETURN ANGLE	12° maximum	4°

TEST MEETS SPECIFICATIONS

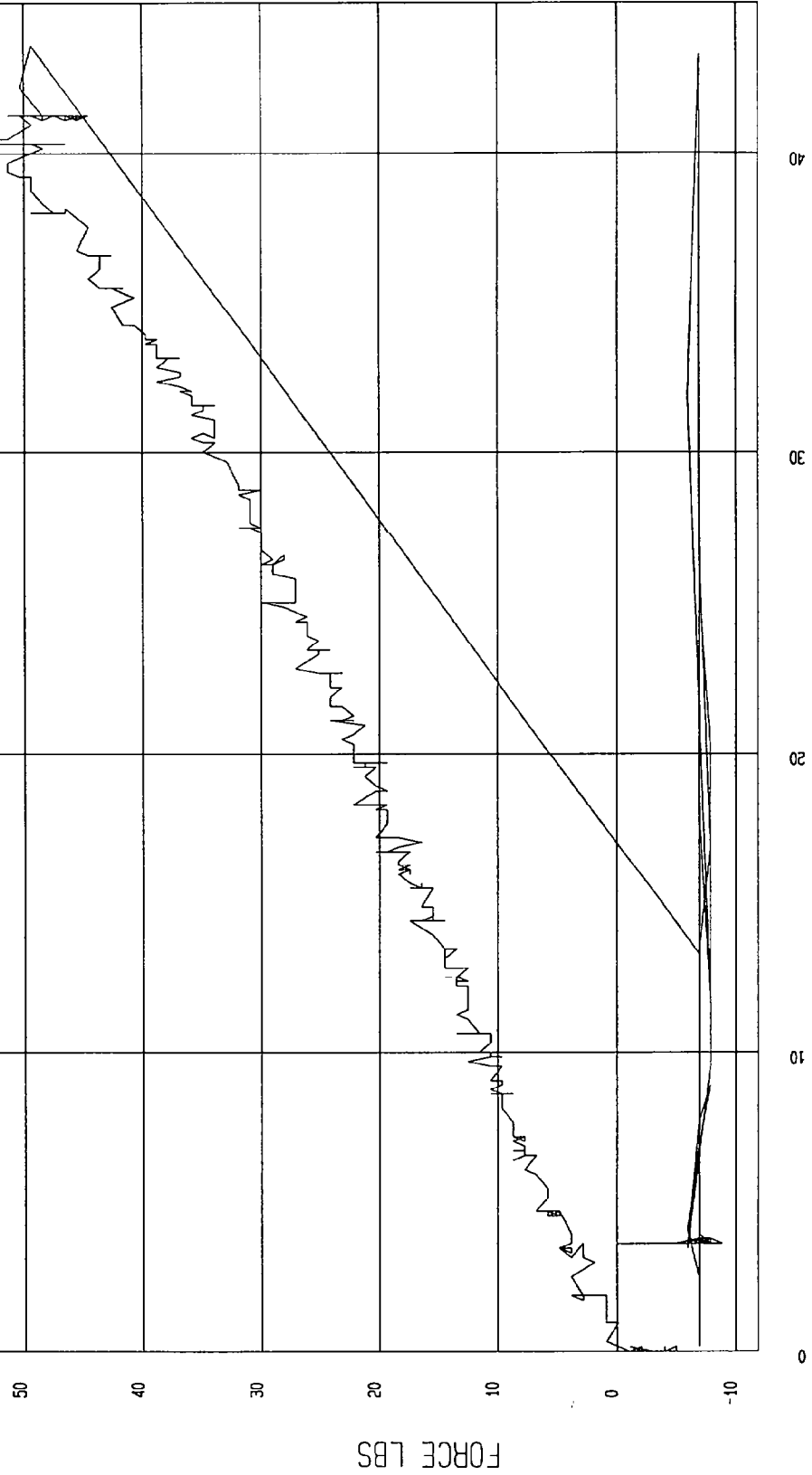
TECHNICIAN Jim H. [Signature]

APPROVED BY [Signature]

TEST: DUMMY CALIBRATION - LUMBAR FLEXION TEST DATE: 09-05-1997 - 08:52

COMPONENT: DUMMY # 049

FORCE as a function of TORSO ROTATION



MGA Research  
09-05-1997 08:59

POST-TEST CERTIFICATION DATA

Front Dummy Serial Number: 048

Calibration Test Results Summary

Dummy Serial Number: 048

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.: 048

DATE OF VERIFICATION: September 18, 1997

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.3
RH - Rib Height	19.75" - 20.50"	19.90
HP - Hip Pivot Height	3.9" ref.	3.9
RD - Rib From Back Line	9.0" to 9.5"	9.2
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"	14.8

MEASUREMENTS BY: Jim W. Lee

APPROVED BY: Paul Kaskaske

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: September 18, 1997

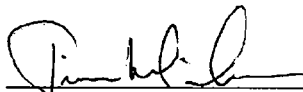
DUMMY NUMBER: 048

TEST NUMBER: D971572

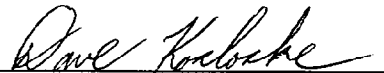
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	40%
PROBE SPEED	14.0 - 14.2 fps	14.1
UPPER RIB	37 - 46 g's	39
LOWER RIB	37 - 46 g's	37
LOWER SPINE	15 - 22 g's	20

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY



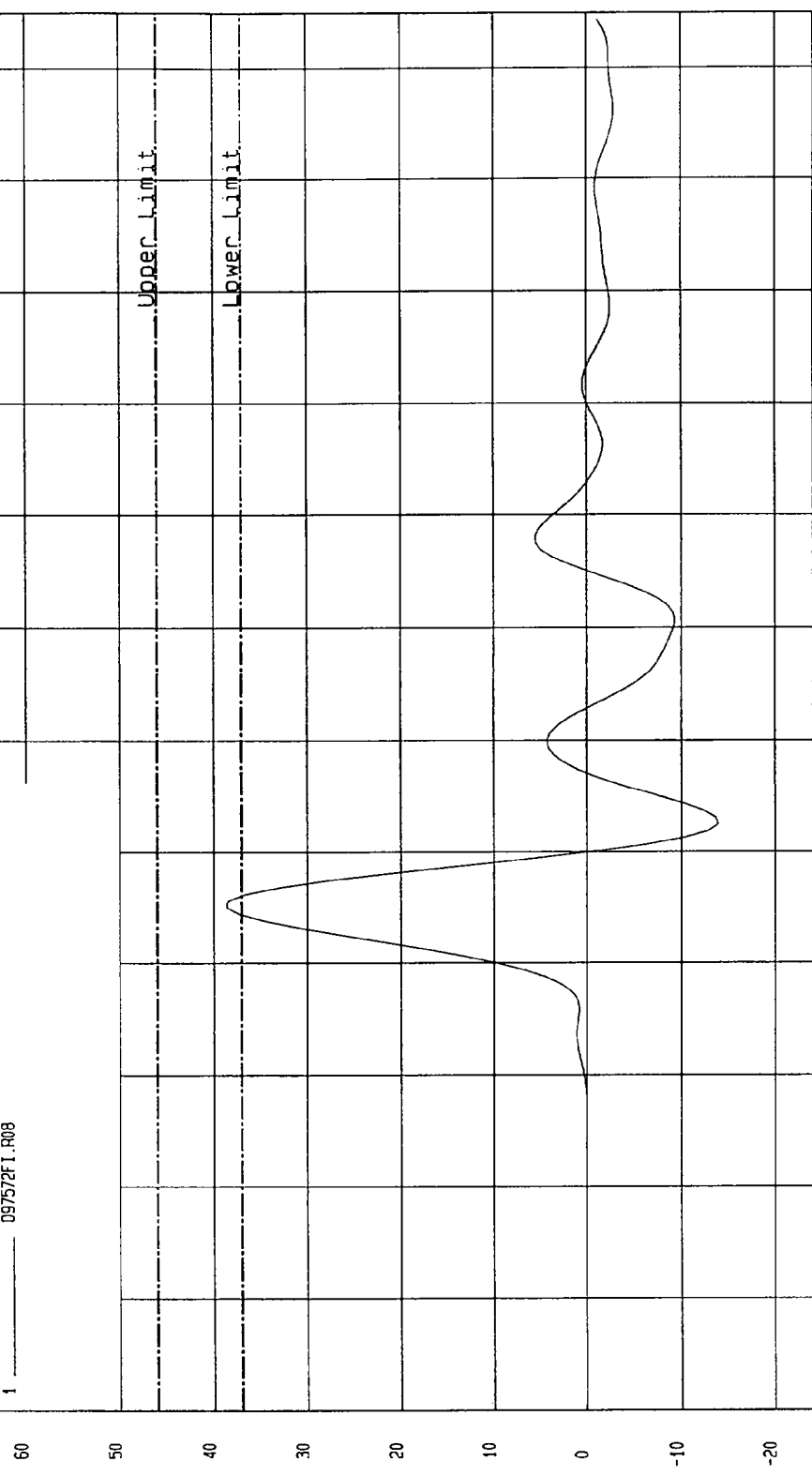
TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 09-18-1997 - 14:19

COMPONENT: DUMMY # 048 Velocity: 14.14467 FT/SEC 4.31 M/SEC

Minimum = -13.92 G'S at 52.5 msec  
Maximum = 38.66 G'S at 45 msec

UPPER RIB ACCELERATION

1 097572F1.R08



NSA Research  
09-18-1997 14:35

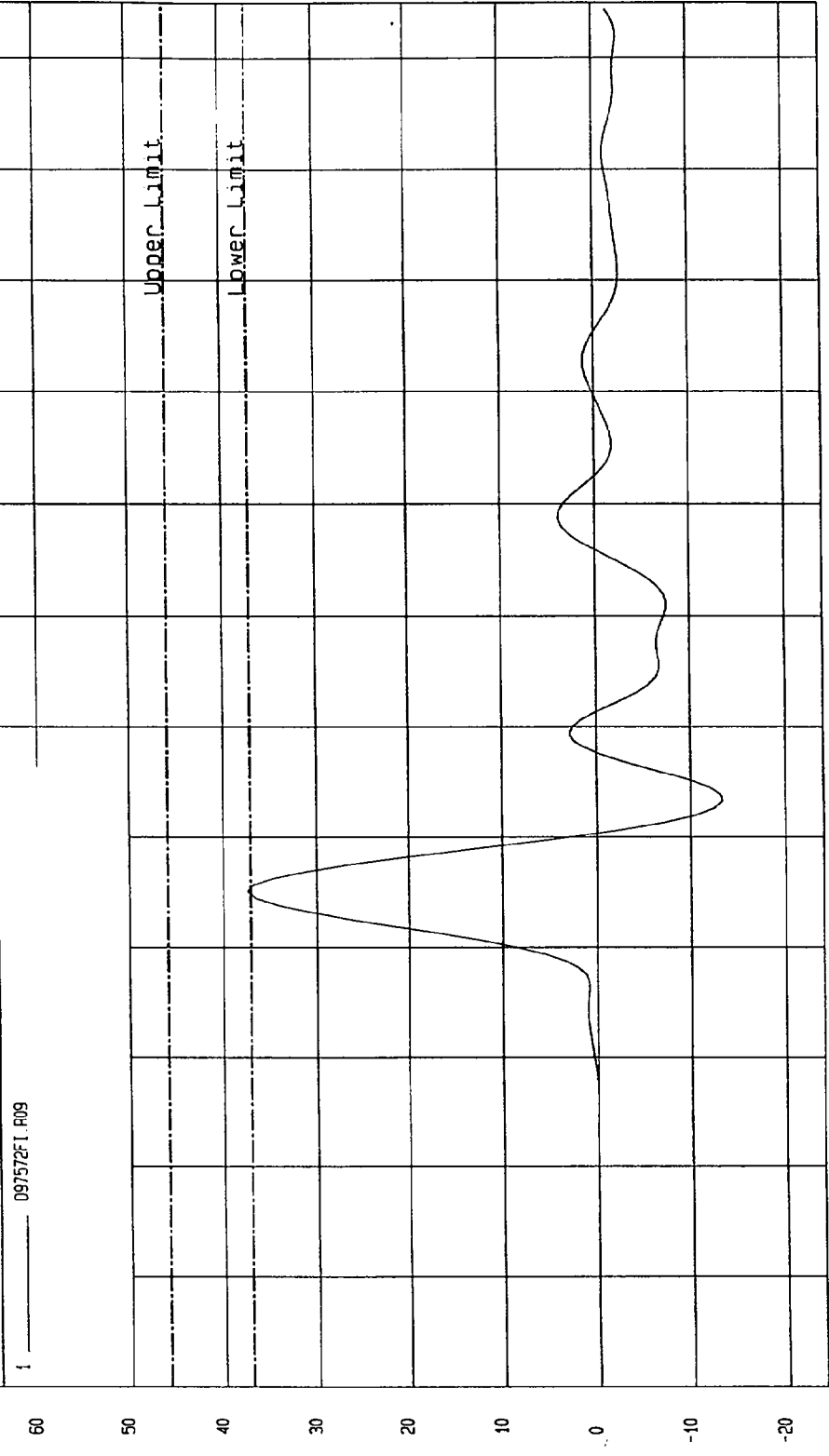
TIME (SECONDS)

G.S

TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 09-18-1997 - 14:21:00  
COMPONENT: DUMMY # 048 Velocity: 14.14467 FT/SEC 4.31 M/SEC

Minimum = -13.39 G'S at 53.1 msec Maximum = 37.32 G'S at 45 msec

LOWER RIB ACCELERATION



TIME (SECONDS)

NSA Research  
09-18-1997 14:36

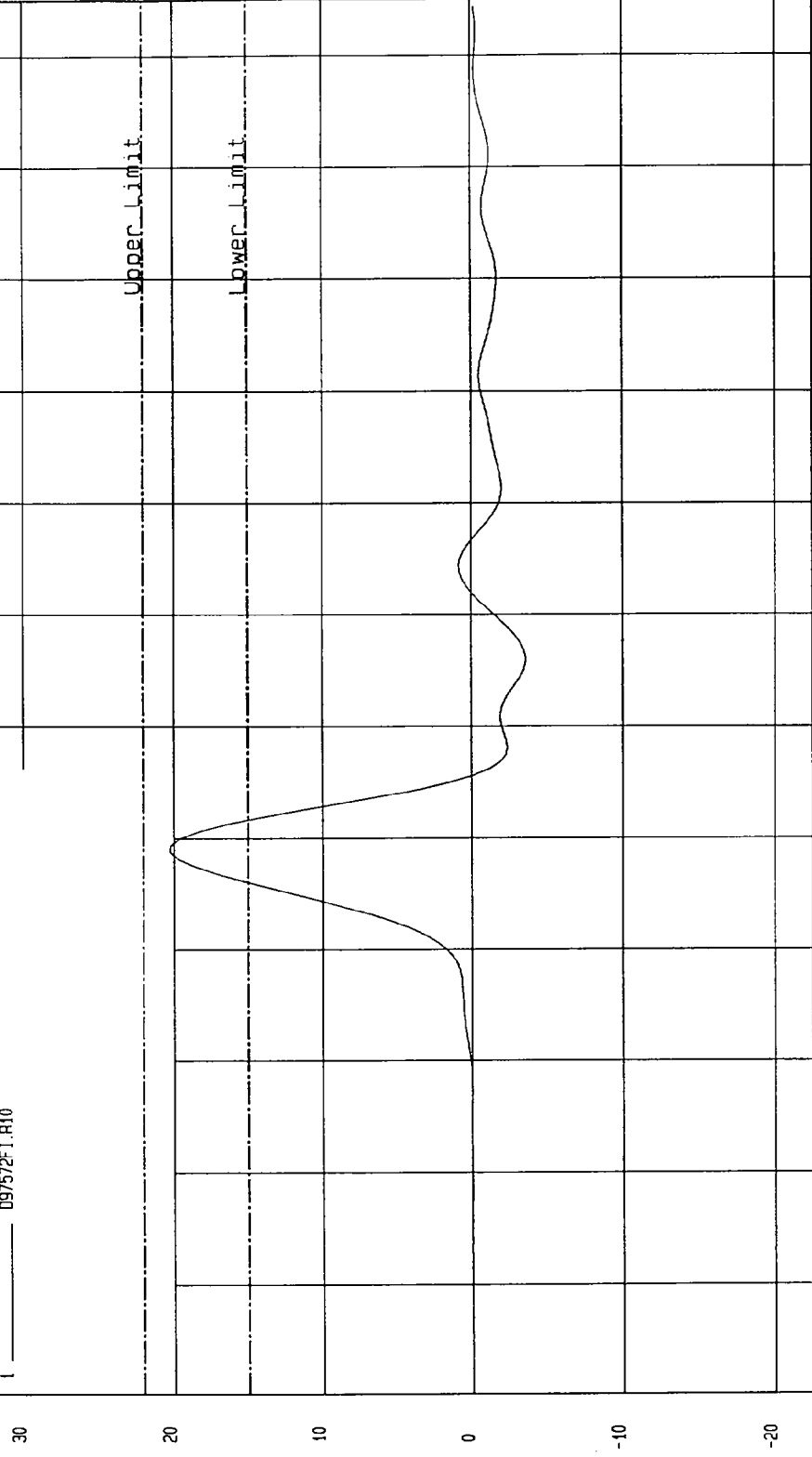
TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 09-18-1997 - 14:19  
COMPONENT: DUMMY # 048 Velocity: 14.14467 FT/SEC 4.31 M/SEC

Minimum = -3.60 G'S at 66.2 msec

Maximum = 20.24 G'S at 48.7 msec

LOWER SPINE ACCELERATION

09757271.R10



MSA Research  
09-18-1997 14:36

MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: September 18, 1997

DUMMY NUMBER: 048

TEST NUMBER: D971573

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	40%
PROBE SPEED	14.0 - 14.2 f/s	14.0
PELVIS ACCELERATION	40 - 60 g's	50

TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

TEST: DUMMY CALIBRATION - PELVIS IMPACT TEST DATE: 09-18-1997 - 14:35

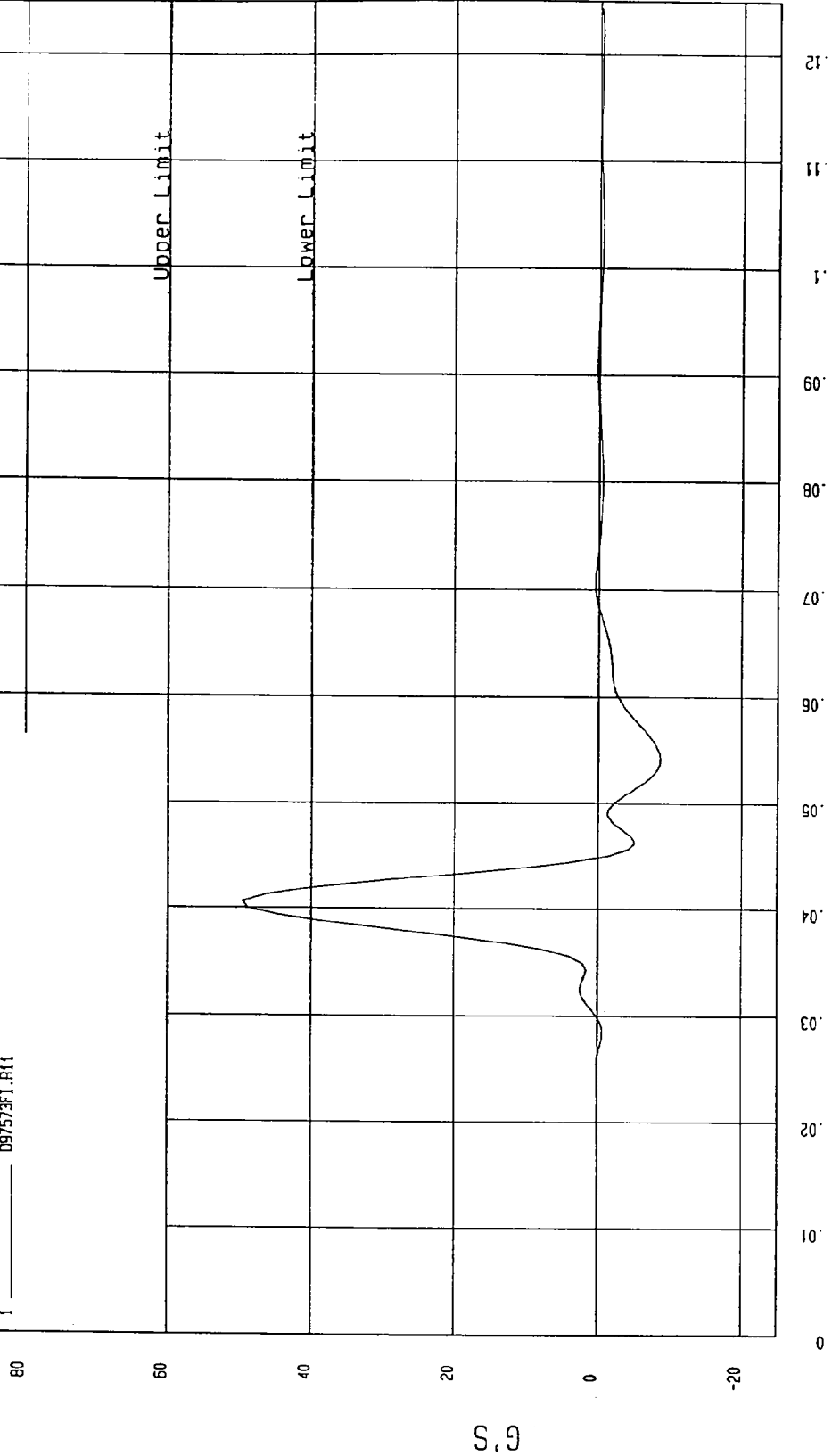
COMPONENT: DUMMY # 04B Velocity: 14.006 FT/SEC 4.27 M/SEC

Minimum = -8.75 G'S at 54.3 msec

Maximum = 49.60 G'S at 40.6 msec

PELVIS ACCELERATION

1 \_\_\_\_\_ D97573FT.R11



NSA Research  
09-18-1997 14:35

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

DATE: September 18, 1997

DUMMY NUMBER: 048

TEST NUMBER: D971574

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	44%
FORCE @ 0.5 in	23.3 - 36.5 lbs	32.2
FORCE @ 0.75 in	36.7 - 49.8 lbs	44.1
FORCE @ 1.0 in	50 - 63 lbs	58
FORCE @ 1.3 in	73 - 88 lbs	80

TEST MEETS SPECIFICATIONS

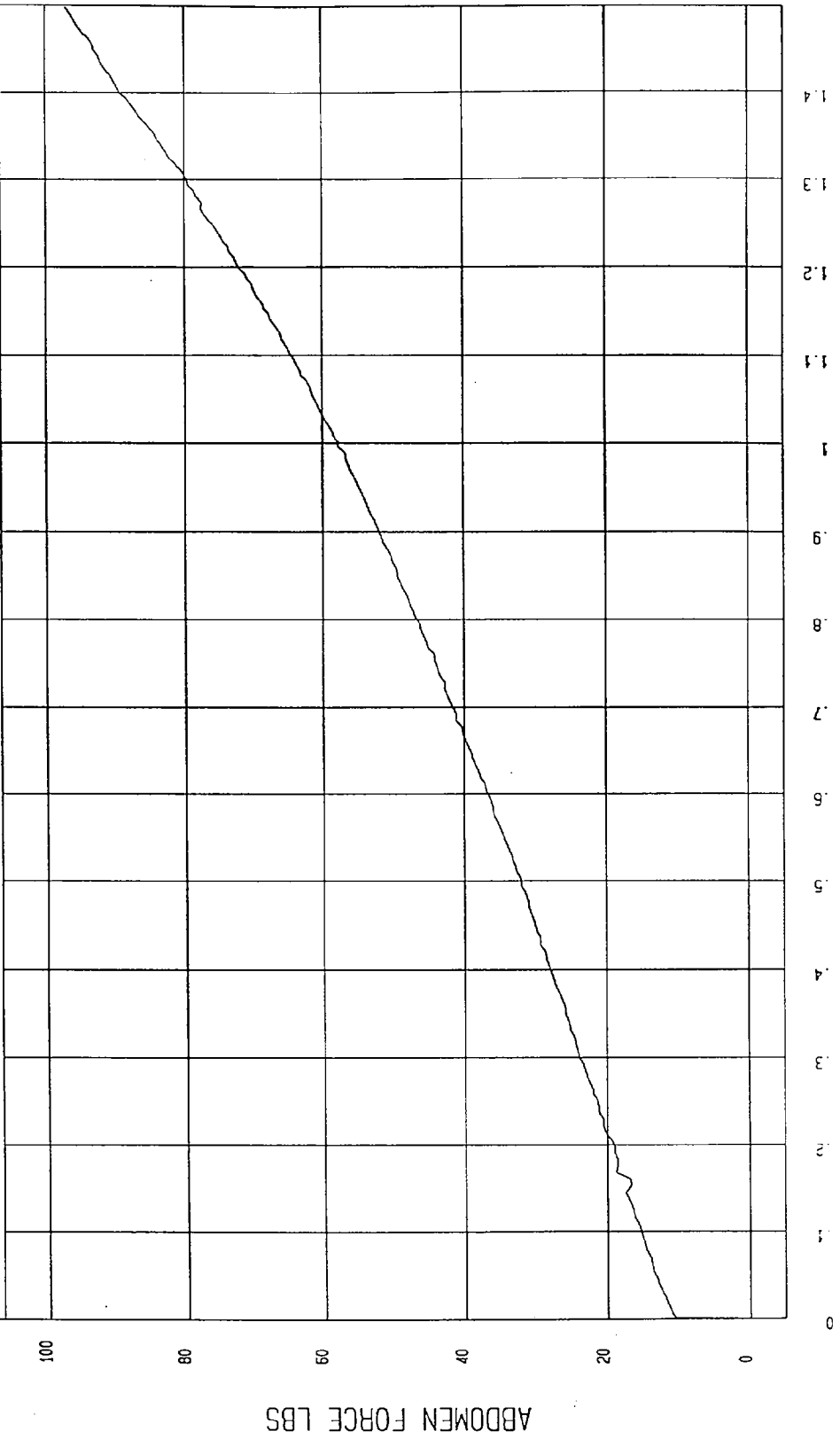
TECHNICIAN 

APPROVED BY 

TEST: DUMMY CALIBRATION - ABDOMEN COMPRESSION TEST DATE: 09-18-1997 - 12:35

COMPONENT: DUMMY # 048

ABDOMEN FORCE as a function of ABDOMEN DISPLACEMENT



MGA Research  
09-18-1997 12:39

ABDOMEN DISPLACEMENT INCHES

ABDOMEN FORCE LBS

MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: September 18, 1997

DUMMY NUMBER: 048

TEST NUMBER: D971575

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	44%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	24
FORCE @ 30°	34 - 46 lbs	36
FORCE @ 40°	46 - 58 lbs	50
RETURN ANGLE	12° maximum	5°

TEST MEETS SPECIFICATIONS

TECHNICIAN Jim [Signature]

APPROVED BY [Signature]

TEST: DUMMY CALIBRATION - LUMBAR FLEXION TEST DATE: 09-18-1997 - 12:02

COMPONENT: DUMMY # 048

FORCE as a function of TORSO ROTATION

50  
40  
30  
20  
10  
0  
-10

FORCE LBS

40  
30  
20  
10  
0  
-10

TORSO ROTATION DEGREES

MGA Research  
09-18-1997 12:20

POST-TEST CERTIFICATION DATA

Rear Dummy Serial Number: 049

Calibration Test Results Summary

Dummy Serial Number: 049

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.: 049

DATE OF VERIFICATION: September 18, 1997

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.2
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"	20.5
SW - Knee Pivot to Floor	19.3" - 19.9"	19.5
HW - Hip Width	14.0" - 15.4"	14.7

MEASUREMENTS BY: 

APPROVED BY: 

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: September 18, 1997

DUMMY NUMBER: 048

TEST NUMBER: D971582

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	40%
PROBE SPEED	14.0 - 14.2 fps	14.1
UPPER RIB	37 - 46 g's	41
LOWER RIB	37 - 46 g's	42
LOWER SPINE	15 - 22 g's	22

TEST MEETS SPECIFICATIONS

TECHNICIAN Jim W. L.

APPROVED BY Rene Korbach

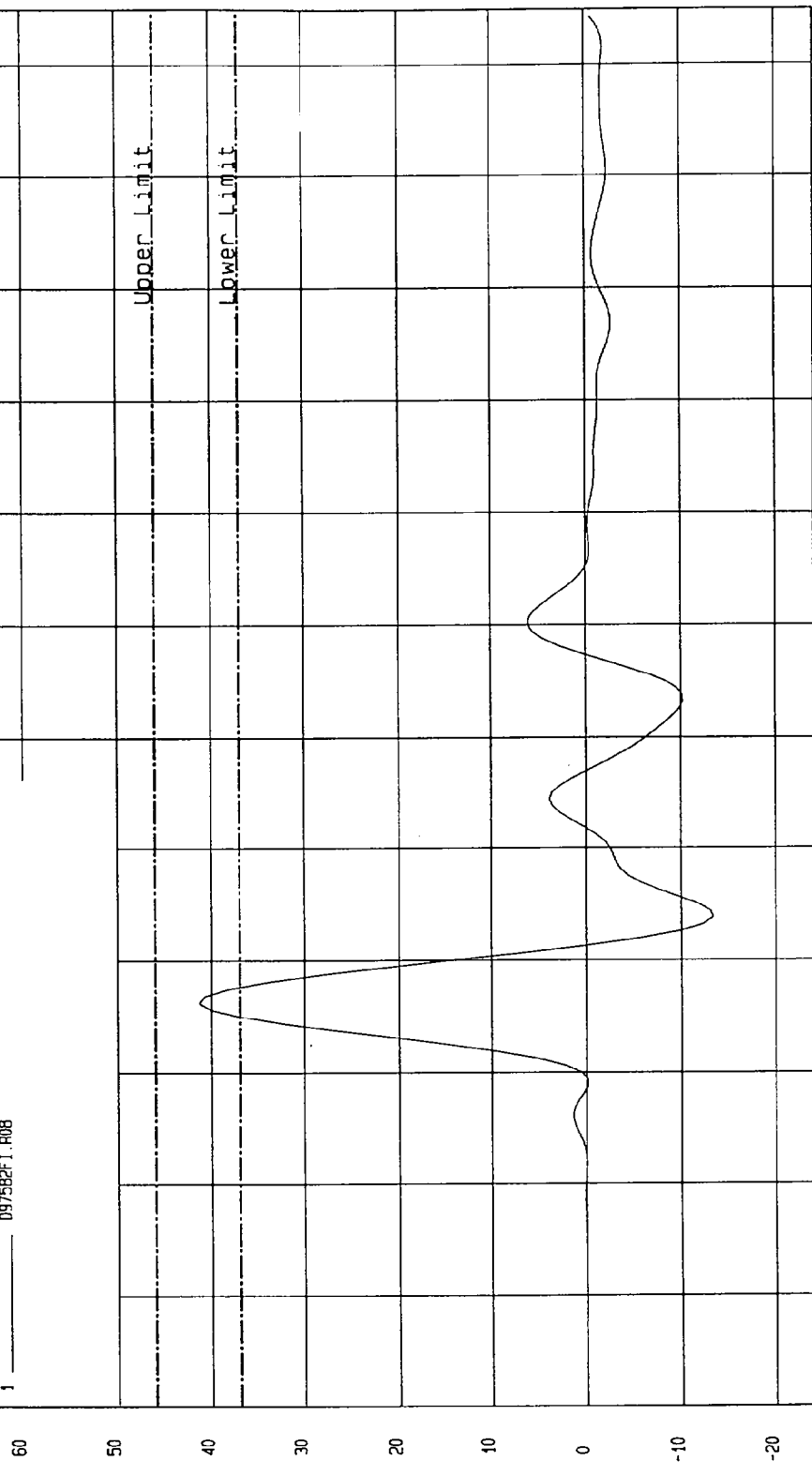
TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 09-18-1997 - 14:54

COMPONENT: DUMMY # 049 Velocity: 14.089 FT/SEC 4.29 M/SEC

Minimum = -13.37 G'S at 43.7 msec Maximum = 41.33 G'S at 36.2 msec

UPPER RIB ACCELERATION

1 097582F1.R08



TIME (SECONDS)

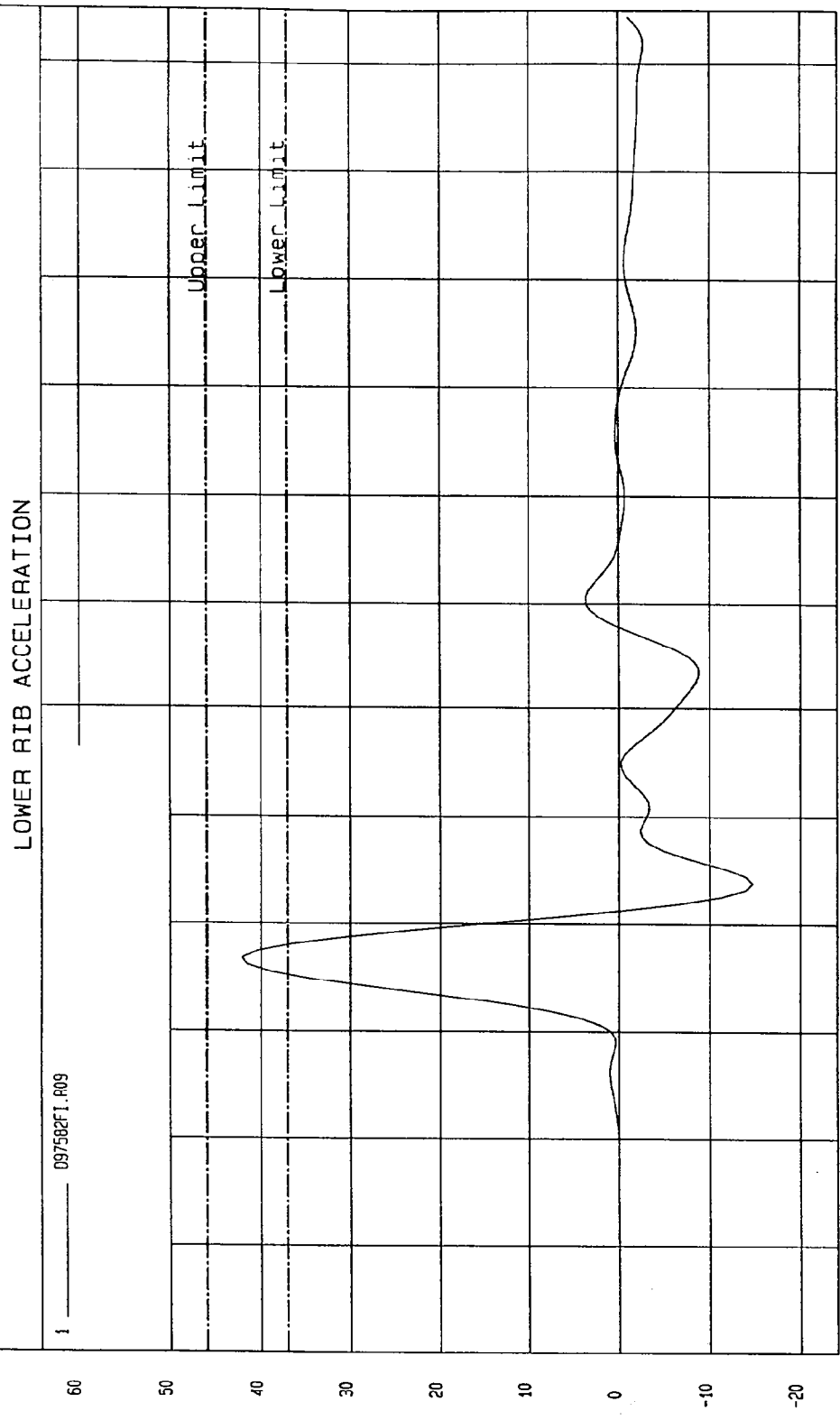
MSA Report CT  
09-18-1997 15:16

S.9

TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 09-18-1997 - 14:54

COMPONENT: DUMMY # 049 Velocity: 14.089 FT/SEC 4.29 M/SEC

Minimum = -14.81 G'S at 43.7 msec Maximum = 42.14 G'S at 36.8 msec



TIME (SECONDS)

NCA Research  
09-18-1997 15:17

TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 09-18-1997 - 14:55:59

COMPONENT: DUMMY # 049 Velocity: 14.089 FT/SEC 4.29 M/SEC

Minimum = -4.79 G'S at 58.1 msec

Maximum = 21.80 G'S at 40.6 msec

LOWER SPINE ACCELERATION

097582F1.R10

30  
20  
10  
0  
-10  
-20

Upper Limit

Lower Limit

G.S

0 0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.10 0.11 0.12

TIME (SECONDS)

MCA Research  
09-18-1997 15:17

MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: September 18, 1997

DUMMY NUMBER: 049

TEST NUMBER: D971583

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	40%
PROBE SPEED	14.0 - 14.2 f/s	14.1
PELVIS ACCELERATION	40 - 60 g's	45

TEST MEETS SPECIFICATIONS

TECHNICIAN 

APPROVED BY 

TEST: DUMMY CALIBRATION - PELVIS IMPACT TEST DATE: 09-18-1997 - 15:19:39

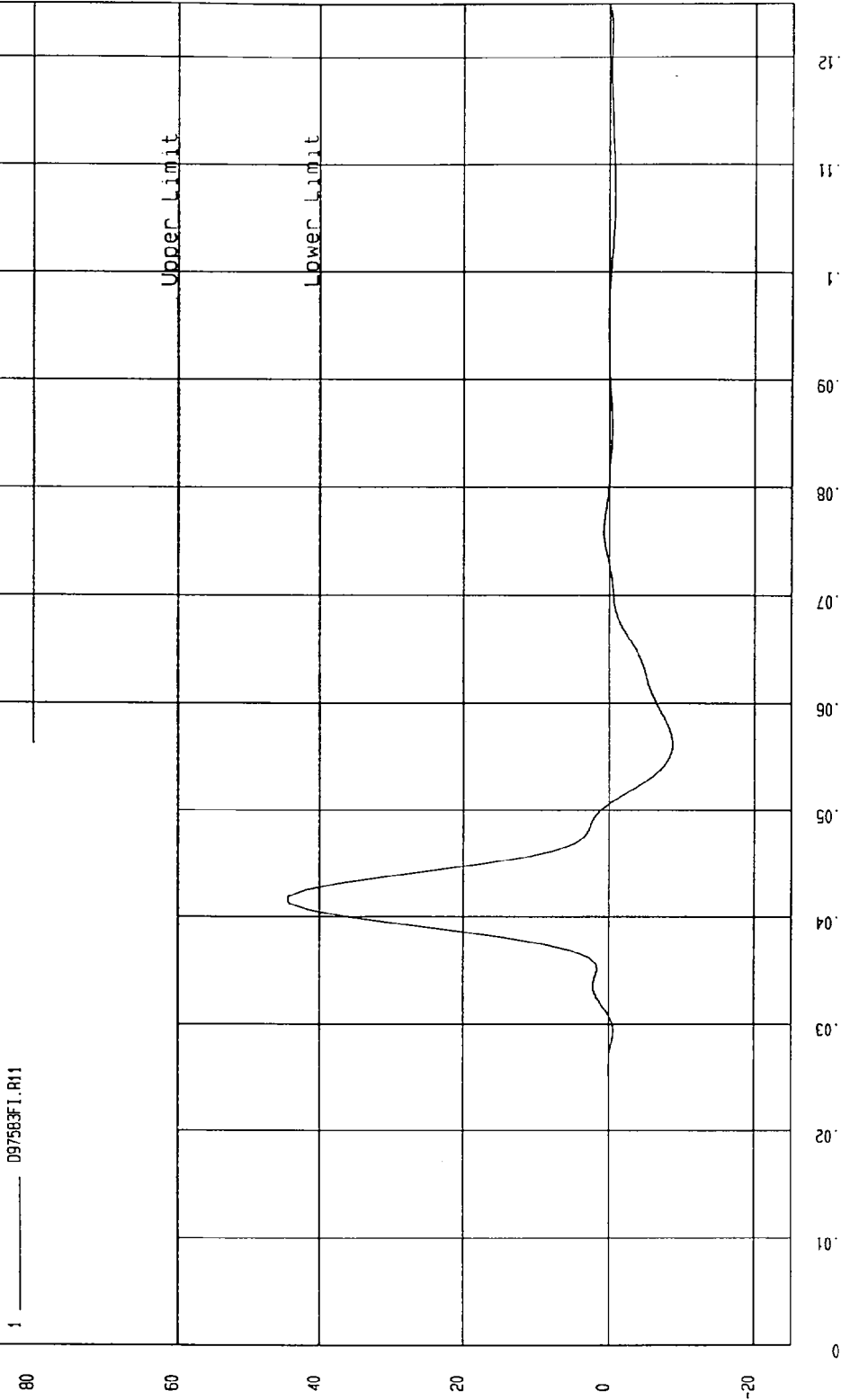
COMPONENT: DUMMY # 049 Velocity: 14.103 FT/SEC 4.3 M/SEC

Minimum = -8.69 G'S at 55.2 msec

Maximum = 44.63 G'S at 41.8 msec

PELVIS ACCELERATION

1 ——— 097583FT.RM1



NSA Research  
09-18-1997 15:20

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

DATE: September 18, 1997

DUMMY NUMBER: 049

TEST NUMBER: D971584

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	44%
FORCE @ 0.5 in	23.3 - 36.5 lbs	30.5
FORCE @ 0.75 in	36.7 - 49.8 lbs	42.3
FORCE @ 1.0 in	50 - 63 lbs	56
FORCE @ 1.3 in	73 - 88 lbs	75

TEST MEETS SPECIFICATIONS

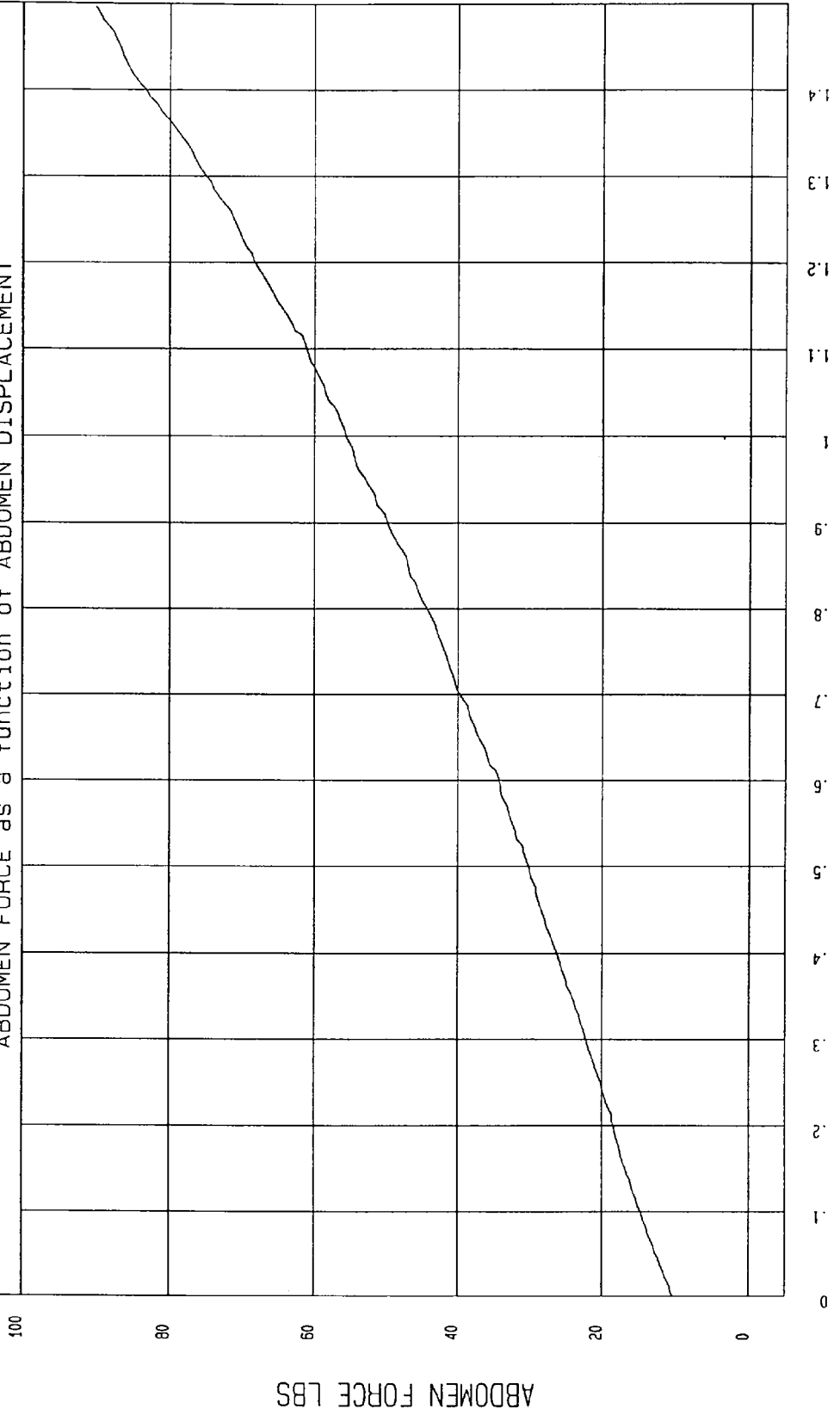
TECHNICIAN *Jim Wilk*

APPROVED BY *Gene Korbak*

TEST: DUMMY CALIBRATION - ABDOMEN COMPRESSION TEST DATE: 09-18-1997 - 12:38

COMPONENT: DUMMY # 049

ABDOMEN FORCE as a function of ABDOMEN DISPLACEMENT



MGA Research  
09-18-1997 12:39

ABDOMEN DISPLACEMENT INCHES

ABDOMEN FORCE LBS

MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: September 18, 1997

DUMMY NUMBER: 049

TEST NUMBER: D971585

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	44%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	24
FORCE @ 30°	34 - 46 lbs	38
FORCE @ 40°	46 - 58 lbs	58
RETURN ANGLE	12° maximum	2°

TEST MEETS SPECIFICATIONS

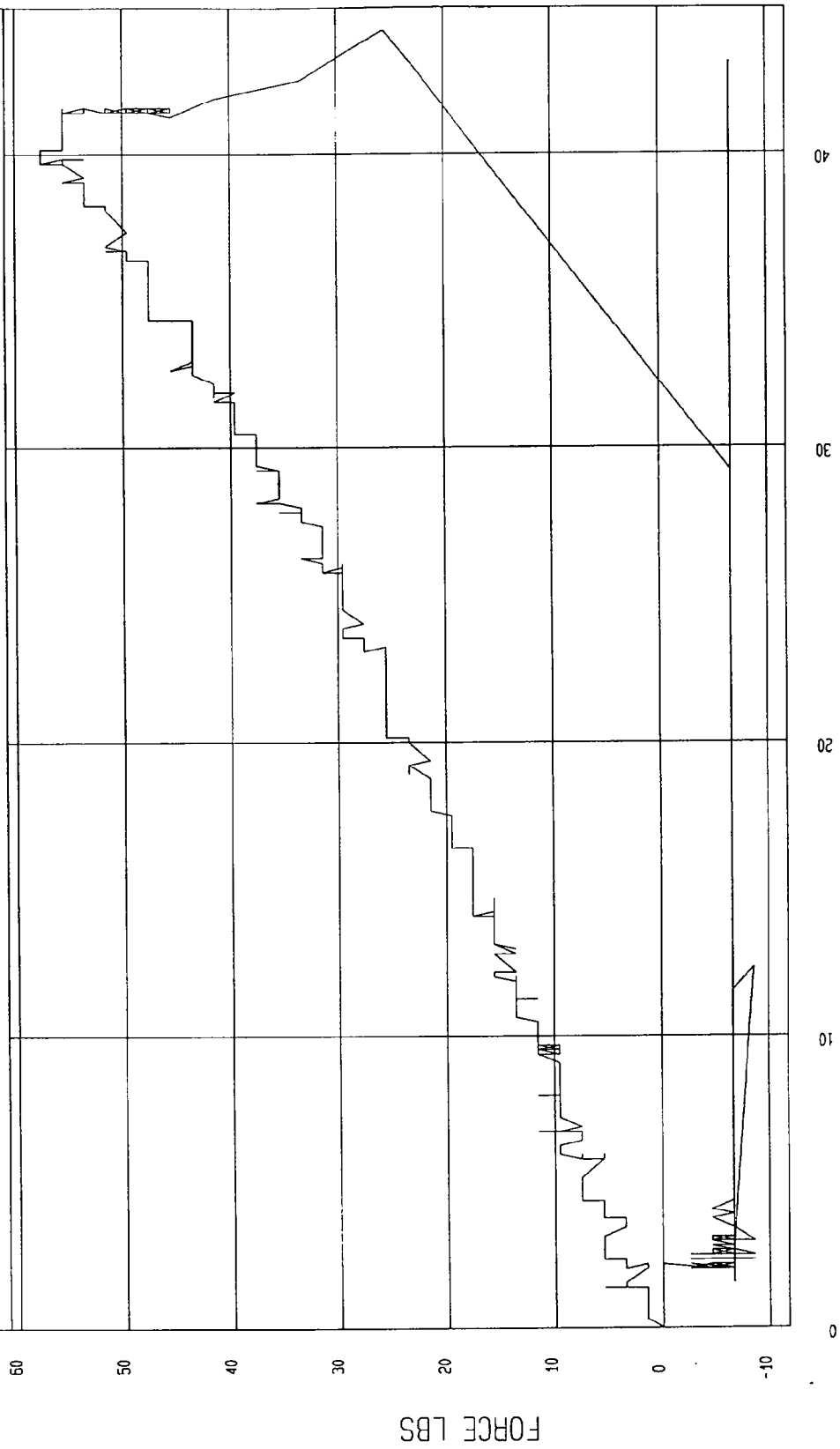
TECHNICIAN 

APPROVED BY 

TEST: DUMMY CALIBRATION - LUMBAR FLEXION TEST DATE: 09-18-1997 - 12:18

COMPONENT: DUMMY # 049

FORCE as a function of TORSO ROTATION



MGA Research  
09-18-1997 12:20

POST-TEST DRIVER DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Serial Number: 048

Inspected By: Tim Michnay

Date: September 18, 1997

<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: 049

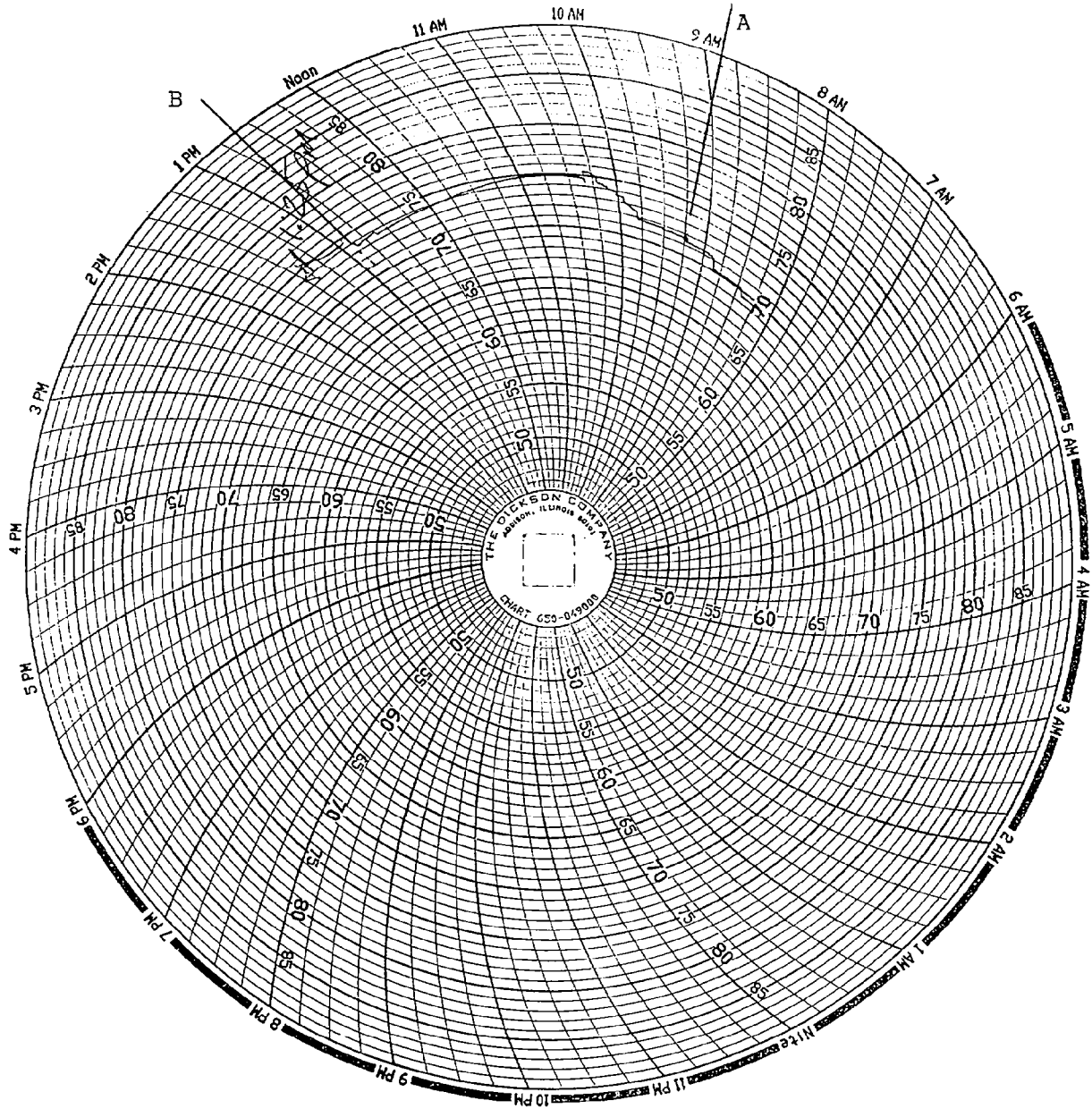
Inspected By: Tim Michnay

Date: September 18, 1997

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

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

# VEHICLE AND DUMMY TEMPERATURE



A = Dummies installed in vehicle  
B = Test conducted

APPENDIX D  
TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

DUMMY AND VEHICLE CALIBRATION DATA  
 INSTRUMENTS FOR DRIVER DUMMY NO. 048

	DRIVER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	AN8L6	Endevco	August 18, 1997
Lower Rib Y	J12465	Endevco	August 18, 1997
Lower Spine Y	J12450	Endevco	August 18, 1997
Pelvis Y	AGTP7	Endevco	August 18, 1997
Upper Rib Redundant Y	AN8L6	Endevco	August 18, 1997
Lower Rib Redundant Y	J12465	Endevco	August 18, 1997
Lower Spine Redundant Y	J12461	Endevco	August 18, 1997
Pelvis Redundant Y	AGT04	Endevco	August 18, 1997

INSTRUMENTS FOR LEFT REAR PASSENGER DUMMY NO. 049

LEFT REAR PASSENGER			
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	AHRP6	Endevco	August 18, 1997
Lower Rib Y	J11630	Endevco	August 18, 1997
Lower Spine Y	AHT20	Endevco	August 18, 1997
Pelvis Y	AJ417	Endevco	August 18, 1997
Upper Rib Redundant Y	AJ412	Endevco	August 18, 1997
Lower Rib Redundant Y	J11166	Endevco	August 18, 1997
Lower Spine Redundant Y	AH0N9	Endevco	August 18, 1997
Pelvis Redundant Y	AGP20	Endevco	August 18, 1997

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE AND MDB ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Moving Barrier CG X	J04-F10	Entran	August 7, 1997
Moving Barrier CG Y	F11-G04	Entran	August 7, 1997
Moving Barrier CG Z	J04-F12	Entran	August 7, 1997
Moving Barrier Rear Axle X	G13-B07	Entran	August 6, 1997
Moving Barrier Rear Axle Y	L14-D04	Entran	August 4, 1997
Left Mid A-Post Y	J06-D22	Entran	June 12, 1997
Left Lower A-Post Y	F12-G02	Entran	July 11, 1997
Left Lower B-Post Y	H02-J04	Entran	August 7, 1997
Rear Floorpan Above Axle X	A10-G08	Entran	July 7, 1997
Rear Floorpan Above Axle Y	E10-F19	Entran	July 11, 1997
Rear Floorpan Above Axle Z	J23-E10	Entran	July 11, 1997
Driver Seat Track Y	F11-G01	Entran	July 11, 1997
Right Side Sill at Front Seat X	G01-J10	Entran	August 7, 1997
Right Side Sill at Front Seat Y	J10-E03	Entran	August 4, 1997
Right Side Sill at Front Seat Z	L18-E18	Entran	June 12, 1997
Right Side Sill at Rear Seat X	I25-J20	Entran	August 7, 1997
Right Side Sill at Rear Seat Y	J04-F13	Entran	August 7, 1997
Right Side Sill at Rear Seat Z	J04-F16	Entran	August 7, 1997
Right Side Sill at Front Seat Y	J06-D16	Entran	August 1, 1997

VEHICLE INSTRUMENT CALIBRATION

VEHICLE AND MDB ACCELEROMETERS			
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Left Side Sill at Rear Seat Y	E13-D02	Entran	August 4, 1997
Rear Occupant Compartment Y	C25-A22	Entran	August 1, 1997
Vehicle CG X	B28-B03	Entran	August 1, 1997
Vehicle CG Y	J10-E06	Entran	August 1, 1997
Vehicle CG Z	J23-E06	Entran	August 1, 1997

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