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REPORT NO.: 214-MGA-97-21
SAFETY COMPLIANCE TESTING FOR
FMVSS 214 "SIDE IMPACT PROTECTION -
PASSENGER CARS"

FUJI HEAVY INDUSTRIES
1997 SUBARU IMPREZA OUTBACK
NHTSA NO: CV5501

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: June 24, 1997

Report Date: July 9, 1997

FINAL REPORT

Prepared For:

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
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		6. Performing Organization Code MGA																			
7. Author(s) Hans Hauschild, Project Engineer		8. Performing Organization Report No. MGA-DOT-214-21																			
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15. Supplementary Notes																					
16. Abstract A 48/24 kph 90° Impact (Moving Deformable Barrier) Compliance Test was conducted on the subject 1997 Subaru Impreza Outback 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 June 24, 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°C. The target vehicle post test maximum crush was 337 mm at level 2. The test vehicle's performance follows: <table border="0"> <thead> <tr> <th></th><th><u>RIGHT FRONT PASS.</u></th><th><u>RIGHT REAR PASS.</u></th></tr> </thead> <tbody> <tr> <td>Right Upper Rib (RUR) Accel., g</td><td>69</td><td>48</td></tr> <tr> <td>Right Lower Rib (RLR) Accel., g</td><td>55</td><td>51</td></tr> <tr> <td>Lower Spine (T₁₂) Accel., g</td><td>80</td><td>64</td></tr> <tr> <td>Thoracic Trauma Index (TTI)</td><td>75</td><td>58</td></tr> <tr> <td>Pelvis (PEV) Accel., g</td><td>60</td><td>56</td></tr> </tbody> </table> The door on the struck side of the vehicle did not separate from the body at the hinges or latch and the opposite door did not open during the side impact event.					<u>RIGHT FRONT PASS.</u>	<u>RIGHT REAR PASS.</u>	Right Upper Rib (RUR) Accel., g	69	48	Right Lower Rib (RLR) Accel., g	55	51	Lower Spine (T ₁₂) Accel., g	80	64	Thoracic Trauma Index (TTI)	75	58	Pelvis (PEV) Accel., g	60	56
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17. Key Words Compliance Testing Side Impact Protection FMVSS 214 Side Impact Dummy (SID)		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Adm. Technical Ref. Division, Room 5108 (NAD-52) 400 Seventh Street, S.W. Washington, D.C. 20590 Telephone No. 202-366-4946 Attn: Robert Hornickle																			
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Approval Date: 8-20-97

FINAL REPORT ACCEPTED BY (OVSC):

Accepted By: John M. Byns
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Acceptance Date: 8/27/97

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SECTION 1
PURPOSE AND TEST PROCEDURE

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

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

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

SECTION 2

SUMMARY OF SIDE IMPACT TEST

A 1997 Subaru Impreza Outback was impacted on the right side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 32.87 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 June 24, 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 right front and rear right designated seating positions according to instructions specified in the OVSC Side Impact Laboratory Test Procedure which is dated September 1, 1995. The side impact event was documented by nine high speed cameras. Camera locations and other pertinent camera information can be found in this report.

The SIDs were instrumented with the following accelerometers.

1. Right Upper Rib (RUR) uniaxial accelerometer (Y-direction)
2. Right Lower Rib (RLR) uniaxial accelerometer (Y-direction)
3. Lower Thoracic Spine (T₁₂) uniaxial accelerometer (Y-direction)
4. Pelvic (PEV) section uniaxial accelerometer (Y-direction)

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

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

Injury Criteria	Front SID	Rear SID
TTI (g)	75	58
Pelvis (g)	60	56

TEST NOTES

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

Right Front Door on Centerline
Midrear of Right Front Door
Right Front Door Upper Centerline
Midrear of Right Rear Door
Right Rear Door Upper Centerline
Rear Seat Track

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

DATA SHEET NO. 1
GENERAL VEHICLE TEST PARAMETER DATA

TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 1997/Subaru/Impreza/Outback
Vehicle NHTSA No.: CV5501 VIN: JF1GF4859VG803253
Vehicle Body Color: Blue Build Date: 8/96
Engine Data: 4 Cylinders; CID; 2.2 Liter; cc
Placement ☒ Longitudinal; ☐ Lateral
Transmission: 5 speed; ☒ Manual; ☐ Automatic; ☒ Overdrive
Final Drive: ☐ Rear Wheel Drive; ☐ Frt. Wheel Drive; ☒ Four Wheel Drive

Odometer Reading 90 miles
Options: ☒ A/C; ☒ Pwr. Steering; ☒ Pwr. Brakes; ☒ Pwr. Windows;
☐ Cruise Control; ☒ Tilt Wheel; ☒ Power Door Locks;

DATA FROM TIRE PLACARD:

Tire Pressure (at capacity): 32 Psi FRONT
29 Psi REAR
Recommended Tire Size: P205/60R15
Tires on Test Vehicle: P205/60R15 Manufacturer: B.F. Goodrich

Vehicle Capacity Data:

Number of Occupants: 2 Front; 3 Rear; 3rd Seat 5 Total
Type of Front Seats: ☒ Bucket; ☐ Bench; ☐ Split Bench
Type of Front Seat Back: ☐ Fixed; ☒ Adjustable with ☒ Lever
Vehicle Maximum Capacity Loading = 408.1 kg (A)
No. of Occupants x 68.04 kg. = 340.2 kg (B)
Cargo Capacity (A-B) = 67.9 kg

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

WEIGHT OF TEST VEHICLE WITH MAXIMUM FLUIDS:

Right Front	=	<u>359.2</u>	kg	Right Rear	=	<u>282.1</u>	kg
Left Front	=	<u>368.2</u>	kg	Left Rear	=	<u>288.4</u>	kg
TOTAL FRONT	=	<u>727.4</u>	kg	TOTAL REAR	=	<u>570.5</u>	kg
% of Total Vehicle Weight	=	<u>56.0</u>	%;	% of Total Weight	=	<u>44.0</u>	%
TOTAL WEIGHT	=	<u>1297.9</u>	kg				

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Year/Make/Model/Body Style: 1997/Subaru/Impreza/Outback

Vehicle NHTSA No.: CV5501 Test Date: June 24, 1997

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Test Vehicle Delivered Weight with Maximum Fluids	= <u>1297.9</u> kg
Cargo Carrying Capacity of Test Vehicle	= <u>68.0</u> kg
Weight of 2 Side Impact Dummies (2 x <u>80.7</u> kg.)	= <u>161.4</u> kg
TEST VEHICLE TARGET WEIGHT	= <u>1527.3</u> kg

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

Right Front	= <u>412.2</u> kg	Right Rear	= <u>384.5</u> kg
Left Front	= <u>375.9</u> kg	Left Rear	= <u>354.6</u> kg
TOTAL FRONT	= <u>788.1</u> kg	TOTAL REAR	= <u>739.1</u> kg
% of Total Weight	= <u>51.6</u> %	% of Total Weight	= <u>48.4</u> %
TOTAL TEST WEIGHT	= <u>1527.2</u> kg		

TEST VEHICLE ATTITUDE:

CURB WEIGHT ATTITUDE:

Right Front 690 mm Left Front 680 mm Right Rear 675 mm Left Rear 675 mm

FULLY LOADED WEIGHT ATTITUDE:

Right Front 673 mm Left Front 677 mm Right Rear 637 mm Left Rear 648 mm

TEST ATTITUDE:

Right Front 677 mm Left Front 675 mm Right Rear 641 mm Left Rear 648 mm

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Test Vehicle Wheelbase: 2522 mm

C.G. As Tested = 1195 mm rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

Right Side = 4118 mm

Centerline = 4287 mm

Left Side = 4118 mm

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Year/Make/Model/Body Style: 1997/Subaru/Impreza/Outback

Vehicle NHTSA No.: CV5501 Test Date: June 24, 1997

FRONT SEAT CUSHION PLACEMENT:

Total Length of Adjustment Travel: 217 mm

Test Position: 9th position rearward out of 17 total

FRONT SEAT BACK ADJUSTMENT POSITION:

Seat Back Angle = 5th locking position from upright as 1

REAR POSITION SEAT:

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

Seat Back Adjustment Position: N/A

ADJUSTABLE STEERING COLUMN POSITION: Mid position

WINDOW POSITIONS: Left Front down Left Rear down

Right Front up Right Rear up

AMOUNT OF STODDARD SOLVENT IN FUEL TANK:

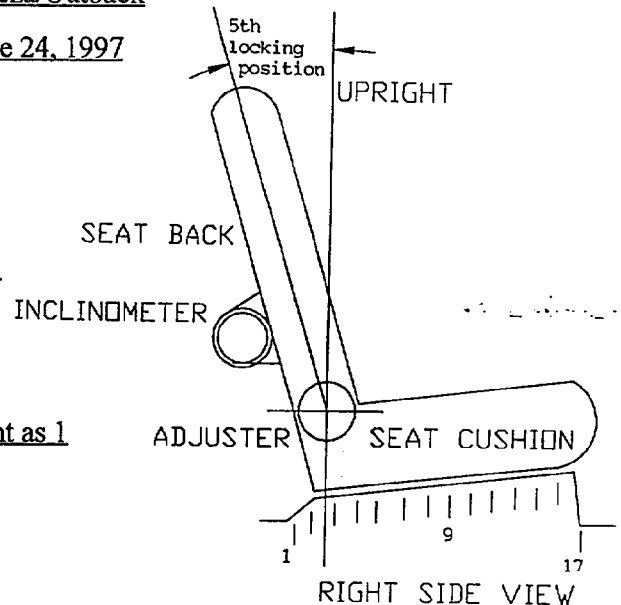
Fuel system usable capacity = 60.2 liters

Test Volume: 55.3 liters 92 % of capacity

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

Wheelbase: = 2522 mm

Impact Point is 321 mm rearward of front axle centerline



DATA SHEET NO. 2
TEST VEHICLE SUMMARY OF RESULTS

Year/Make/Model/Body Style: 1997/Subaru/Impreza/Outback

Vehicle NHTSA No.: CV5501 Test Date: June 24, 1997

Overall Length = 1765 mm; Overall Width = 1705 mm

TEST WEIGHT:

Right Front = 418.1 kg Right Rear = 367.8 kg

Left Front = 382.3 kg Left Rear = 352.8 kg

TOTAL FRONT = 800.4 kg TOTAL REAR = 720.6 kg

% of Total Weight = 52.6 % % of Total Weight = 47.4 %

TOTAL VEHICLE WEIGHT = 1521.0 kg

Wheelbase = 2522 mm

Longitudinal C.G. from Center of Front Axle = 1195 mm

Impact Angle with Respect to Impactor = 90° degrees

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1 (241 mm above ground) = 165 mm

2. LEVEL 2 (464 mm above ground) = 337 mm

3. LEVEL 3 (599 mm above ground) = 285 mm

4. LEVEL 4 (874 mm above ground) = 243 mm

5. LEVEL 5 (1302 mm above ground) = 71 mm

Maximum Post-Test Intrusion = 337 mm

OCCUPANTS:

Right Front Passenger

Right Rear Passenger

Type of Dummy

SID

SID

Restraints Used

type II belt

type II belt

with frontal airbag

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: 1997/Subaru/Impreza/Outback

Vehicle NHTSA No.: CV5501 Test Date: June 24, 1997

POSITION OF IMPACT (MDB) ON MONORAIL:

Crabbed 27° to right

MDB DETAILS:

Overall Width of Framework Carriage	= <u>1252 mm</u>
Overall Length of MDB (incl. honeycomb impact face)	= <u>4115 mm</u>
Wheelbase of Framework Carriage	= <u>2591 mm</u>
Tread of Framework Carriage (Front & Rear)	= <u>1880 mm</u>
C.G. Location Rearward of Front Axle	= <u>1100 mm</u>
C.G. Location From Center Line	= <u>15 mm</u>
C.G. Location Above Ground Level	= <u>480 mm</u>

MDB WEIGHT:

Left Front	= <u>448.1 kg</u>	Left Rear	= <u>336.2 kg</u>
Right Front	= <u>222.8 kg</u>	Right Rear	= <u>356.4 kg</u>
TOTAL FRONT	= <u>670.9 kg</u>	TOTAL REAR	= <u>692.6 kg</u>
TOTAL MDB WEIGHT = <u>1363.5 kg</u>			

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

Impact Speed = Primary: 32.87 mph (52.9 kph) Secondary: 32.93 mph (53.0 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>142</u> mm |
| 2. | Row B Mid Stack (686 mm) | = <u>119</u> mm |
| 3. | Row C Top of Bumper (533 mm) | = <u>70</u> mm |
| 4. | Row D Center of Bumper (432 mm) | = <u>135</u> mm |

INSTRUMENTATION:

Number of MDB Data Channels = 7

DATA SHEET NO. 4
POST-TEST OBSERVATIONS

Year/Make/Model/Body Style: 1997/Subaru/Impreza/Outback

Vehicle NHTSA No.: CV5501 Test Date: June 24, 1997

VISIBLE DUMMY CONTACT POINTS:

	<u>RIGHT FRONT SID</u>	<u>RIGHT REAR SID</u>
Head	<u>back of head to D-ring, face to</u> <u>airbag and seat belt</u>	<u>Top of head to C Pillar</u>
Arm	<u>to door trim</u>	<u>to rear of door</u>
Pelvis	<u>to door trim</u>	<u>to arm rest</u>
Left Knee	<u>to right knee</u>	<u>to right knee</u>
Right Knee	<u>to mid door panel</u>	<u>to mid door panel</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: 5 mm rearward Vertical: 1 mm low

ARM REST LOCATIONS:

Front: 238 mm from bottom of window
Rear: 254 mm from bottom of window

POST-TEST OBSERVATIONS (Cont'd)

SEAT CRUSH:

Front Seat Back: 24 mm Front Seat Cushion: 21 mm

Left Rear Seat Back: 28 mm Rear Seat Cushion: 46 mm

GLAZING DAMAGE:

Windshield cracked, right front and right rear door glass broke

PILLAR PERFORMANCE:

None

SILL SEPARATION:

None

OTHER NOTABLE IMPACT EFFECTS:

Both frontal airbags deployed

SECTION 4
OCCUPANT AND VEHICLE INFORMATION

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

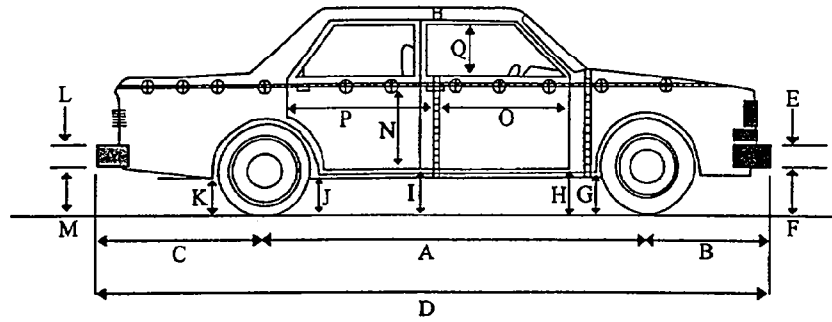
Year/Make/Model/Body Style: 1997/Subaru/Impreza/Outback

Vehicle NHTSA No.: CV5501 Test Date: June 24, 1997

	Front SID ID #272				Rear SID ID #271			
	Pos. Direct.		Neg. Direct		Pos. Direct.		Neg. Direct	
	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)
RIB ACCELERATIONS								
Right Upper Rib (RUR) Y	13.3	92	-69.0	29	5.5	97	-48.0	42
Right Lower Rib (RLR) Y	11.6	91	-55.3	29	7.8	99	-51.4	41
SPINE ACCELERATIONS								
Lower Lateral Y	18.9	69	-80.1	32	30.5	73	-64.2	54
PELVIS ACCELERATIONS								
Lateral Y	10.6	94	-60.0	36	9.8	97	-55.7	51

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

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



D = Length at Centerline

R = Right Side Length

S = Left Side Length

T = Width at B Post

E & L = Bumper Thickness

J1 = To Pinch Weld

J2 = To Sill

ALL MEASUREMENTS IN (mm)

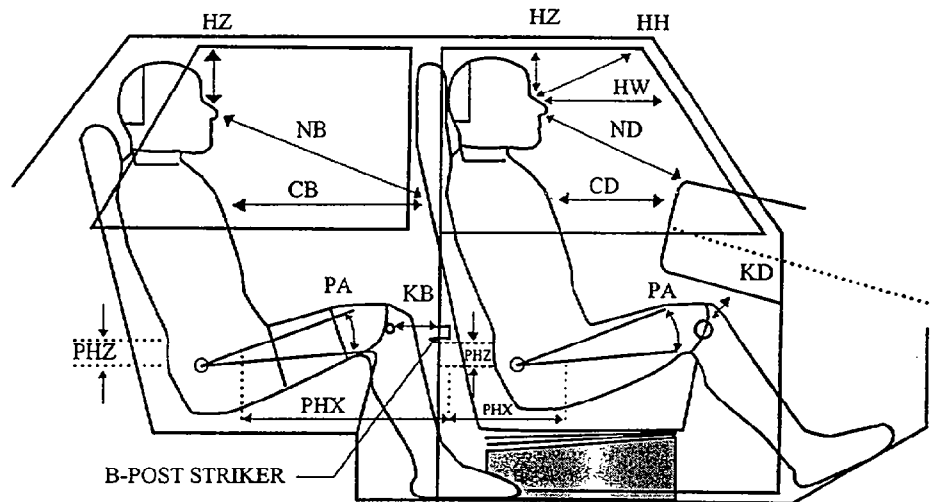
	PRE-TEST	POST-TEST	Δ CHANGE
A	2522	2484	38
B	886	886	0
C	950	928	22
D	4358	4298	60
E	137	137	0
F	419	450	-31
G	180	246	-66
H	179	253	-74
I	163	224	-61
J1/J2	164/168	186/180	-22/-12
K	258	273	-15
L	263	263	0
M	297	285	12
N	668	575	93
O	705	695	10
P	1127	1049	78
Q	417	428	-11
R	4118	4050	68
S	4118	4120	-2
T	1705	1455	250

DATA SHEET NO. 7

SIDE IMPACT DUMMY (SID) LONGITUDINAL CLEARANCE DIMENSIONS

Year/Make/Model/Body Style: 1997/Subaru/Impreza/Outback

NHTSA NO.: CV5501 Test Date: June 24, 1997



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

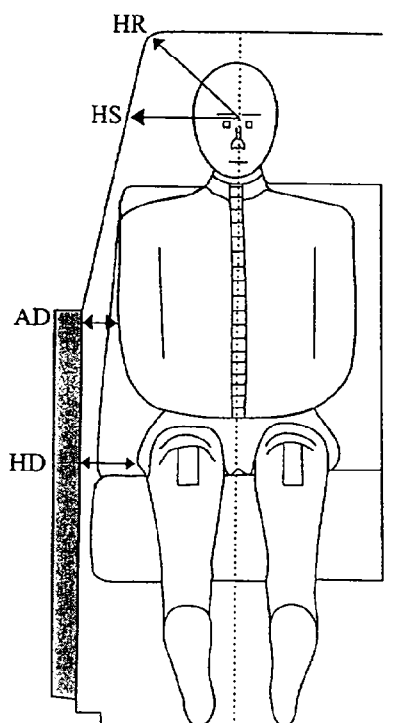
	FRONT PASSENGER ID #272		REAR PASSENGER SID ID #271
HH	374	HZ	155
HW	589	NB	559
HZ	175	CB	442
ND	737	KBL (KBA)	157 (0°)
CD	628	KBR (KBA)	152 (0°)
KDL(KDA°)	204 (21.4°)	PA°	24.1°
KDR(KDA°)	215 (16.3°)	PHX	311
PA°	23.7°	PHZ	277
PHX	140		
PHZ	121		

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

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

Year/Make/Model/Body Style: 1997/Subaru/Impreza/Outback

NHTSA NO.: CV5501 Test Date: June 24, 1997



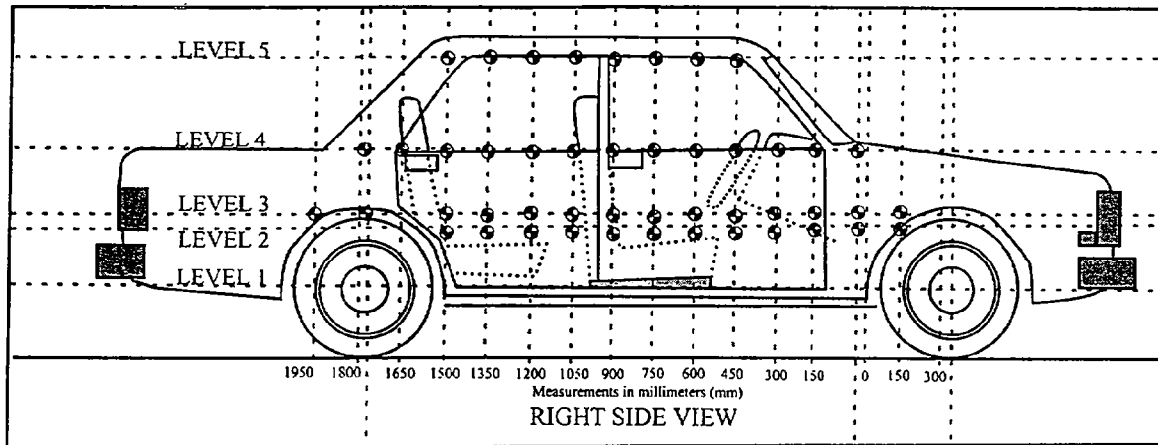
NOTE: All dimensions are in mm

	FRONT PASSENGER ID #272	REAR PASSENGER ID #271
HR	214	197
HS	258	237
AD	82	98
HD	166	173

DATA SHEET NO. 9
VEHICLE SIDE MEASUREMENTS

Year/Make/Model/Body Style: 1997/Subaru/Impreza/Outback

NHTSA NO.: CV5501 Test Date: June 24, 1997



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

MEASUREMENTS ALONG THE VERTICAL 750 mm. LINE SHOWN ABOVE

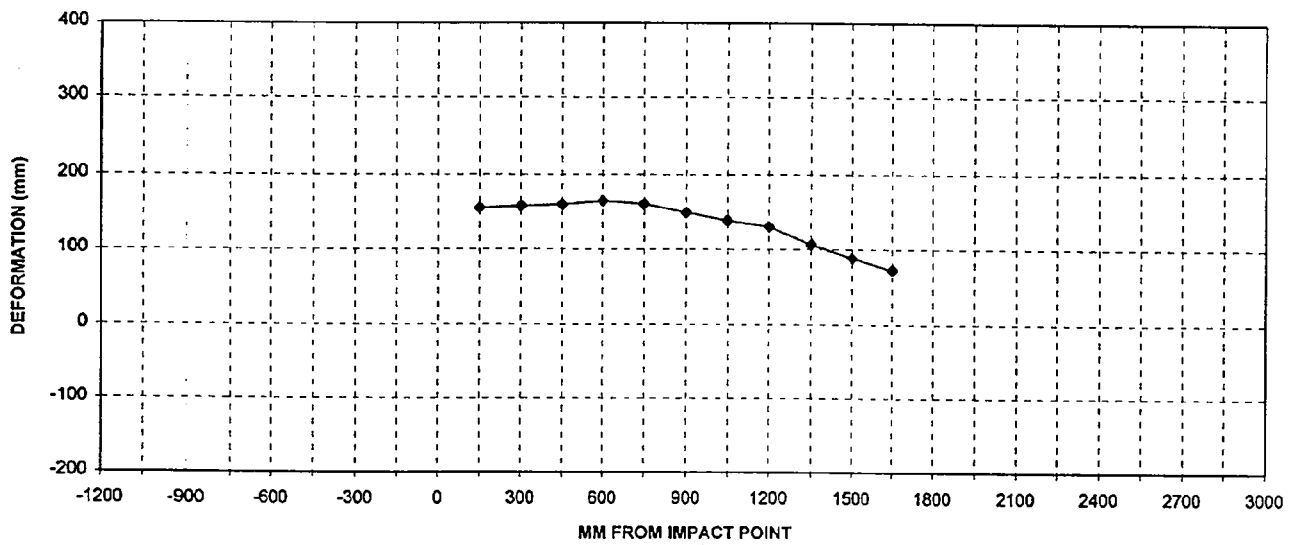
Level 1 @ Axle Centerline Height (or Sill Top Height)	= <u>241</u> mm
Level 2 @ Occupant H-Point	= <u>464</u> mm
Level 3 @ Mid Door	= <u>599</u> mm
Level 4 @ Window Sill	= <u>874</u> mm
Level 5 @ Window Top	= <u>1302</u> mm

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

Longitudinal Distance (mm)	Level 1 - Axle Centerline		
	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1200			
-1050			
-900			
-750			
-600			
-450			
-300			
-150			
0 (impact point)			
150	721	876	155
300	725	883	158
450	726	886	160
600	726	890	164
750	725	890	165
900	725	886	161
1050	724	873	149
1200	724	862	138
1350	724	854	130
1500	724	830	106
1650	724	812	88
1800	723	795	72
1950			
2100			
2250			
2400			
2550			
2700			
2850			
3000			

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

VEHICLE EXTERIOR STATIC CRUSH (Cont'd)



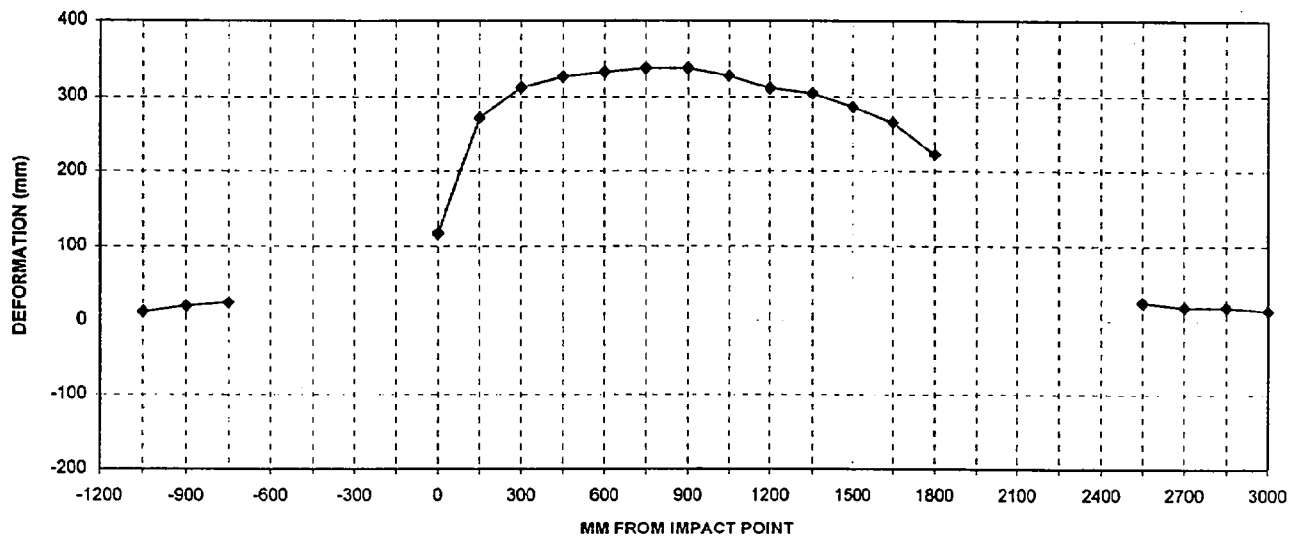
LEVEL 1 - AXLE CENTERLINE

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

	Level 2 - Occupant H Point		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1200			
-1050	753	764	11
-900	709	728	19
-750	680	703	23
-600			
-450			
-300			
-150			
0 (impact point)	665	782	117
150	672	944	272
300	673	985	312
450	674	1000	326
600	675	1007	332
750	675	1012	337
900	675	1012	337
1050	675	1002	327
1200	675	986	311
1350	675	979	304
1500	675	961	286
1650	675	941	266
1800	675	898	223
1950			
2100			
2250			
2400			
2550	681	704	23
2700	699	716	17
2850	722	739	17
3000	767	780	13

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

VEHICLE EXTERIOR STATIC CRUSH (Cont'd)



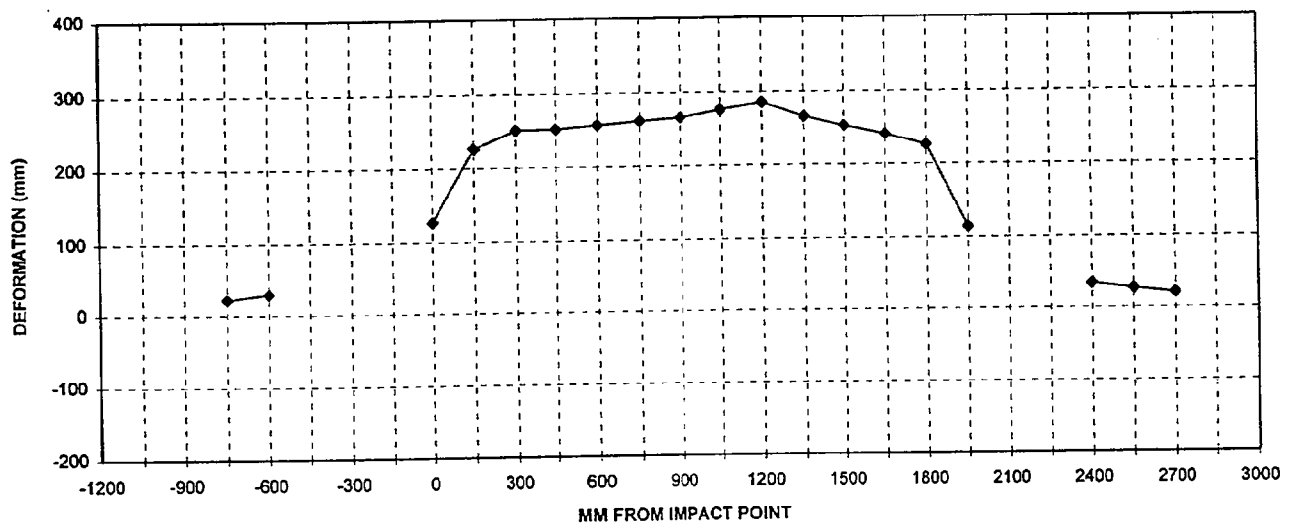
LEVEL 2 - OCCUPANT H-POINT

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

Longitudinal Distance (mm)	Level 3 - Mid Door		
	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1200			
-1050			
-900			
-750	690	712	22
-600	660	689	29
-450			
-300			
-150			
0 (impact point)	656	783	127
150	660	886	226
300	663	914	251
450	665	917	252
600	665	922	257
750	667	929	262
900	668	934	266
1050	668	944	276
1200	670	955	285
1350	669	935	266
1500	669	922	253
1650	669	910	241
1800	669	895	226
1950	668	782	114
2100			
2250			
2400	665	698	33
2550	688	714	26
2700	706	726	20
2850			
3000			

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

VEHICLE EXTERIOR STATIC CRUSH (Cont'd)



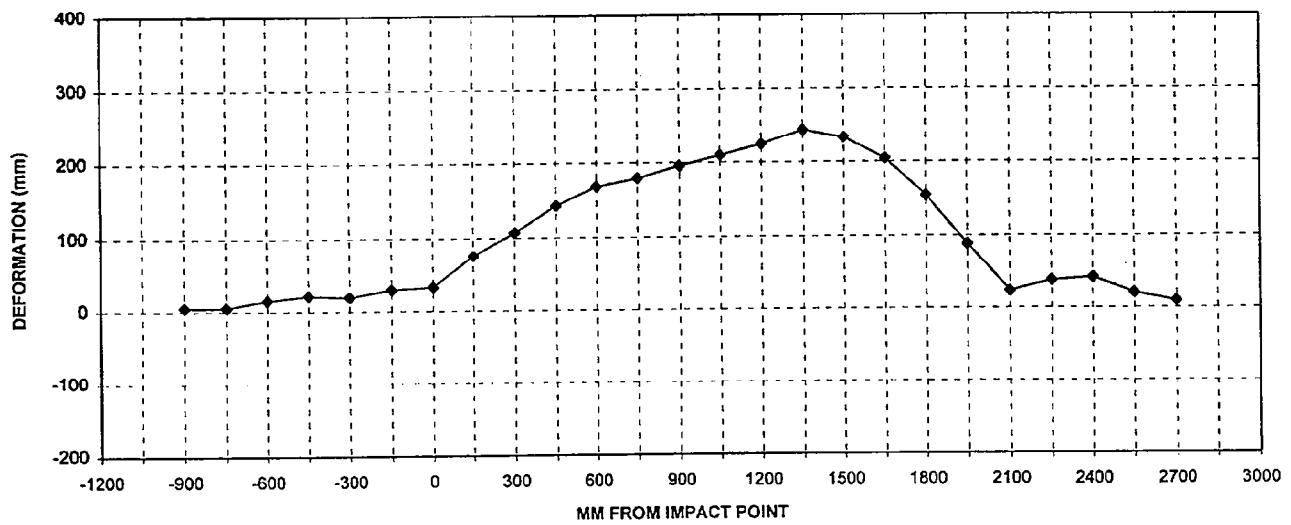
LEVEL 3 - MID DOOR

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

Longitudinal Distance (mm)	Level 4 - Window Sill		
	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1200			
-1050			
-900	808	813	5
-750	793	798	5
-600	774	789	15
-450	761	782	21
-300	755	774	19
-150	743	772	29
0 (impact point)	741	773	32
150	727	802	75
300	731	838	107
450	740	883	143
600	742	910	168
750	740	919	179
900	740	935	195
1050	741	950	209
1200	741	965	224
1350	745	988	243
1500	748	981	233
1650	750	954	204
1800	751	905	154
1950	752	840	88
2100	756	779	23
2250	763	800	37
2400	772	813	41
2550	791	811	20
2700	814	823	9
2850			
3000			

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

VEHICLE EXTERIOR STATIC CRUSH (Cont'd)



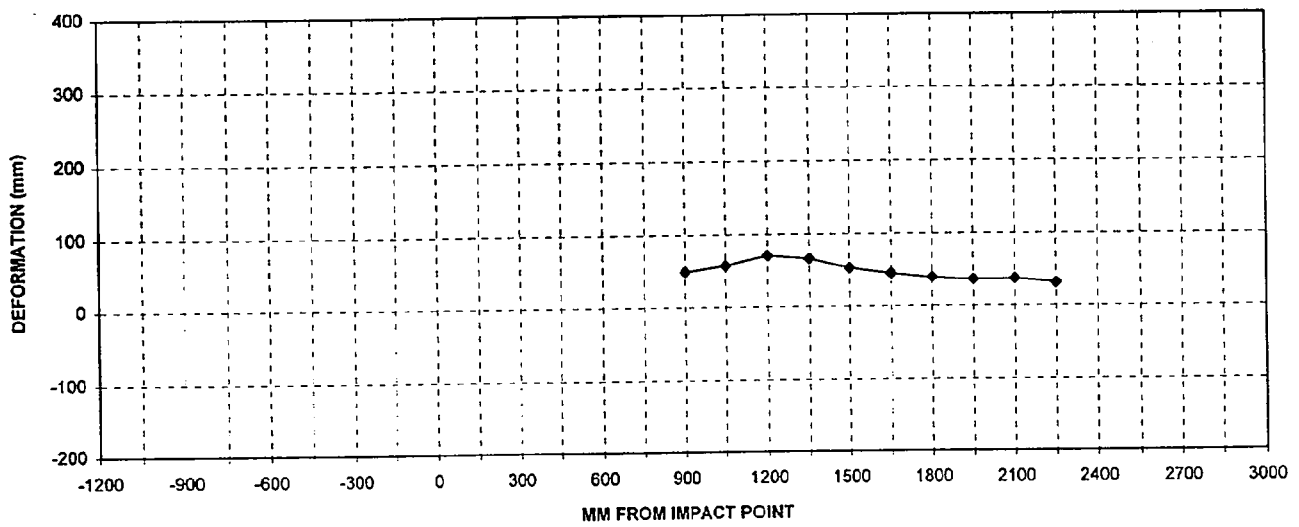
LEVEL 4 - WINDOW SILL

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

Longitudinal Distance (mm)	Level 5 - Window Top		
	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1200			
-1050			
-900			
-750			
-600			
-450			
-300			
-150			
0 (impact point)			
150			
300			
450			
600			
750			
900	951	1000	49
1050	960	1017	57
1200	971	1042	71
1350	975	1040	66
1500	981	1034	53
1650	985	1030	45
1800	987	1026	39
1950	992	1028	36
2100	994	1031	37
2250	1006	1037	31
2400			
2550			
2700			
2850			
3000			

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

VEHICLE EXTERIOR STATIC CRUSH (Cont'd)



LEVEL 5 - WINDOW TOP

DATA SHEET NO. 11
 VEHICLE DAMAGE PROFILE DISTANCES
 Year/Make/Model/Body Style: 1997/Subaru/Impreza/Outback
 NHTSA NO.: CV5501 Test Date: June 24, 1997

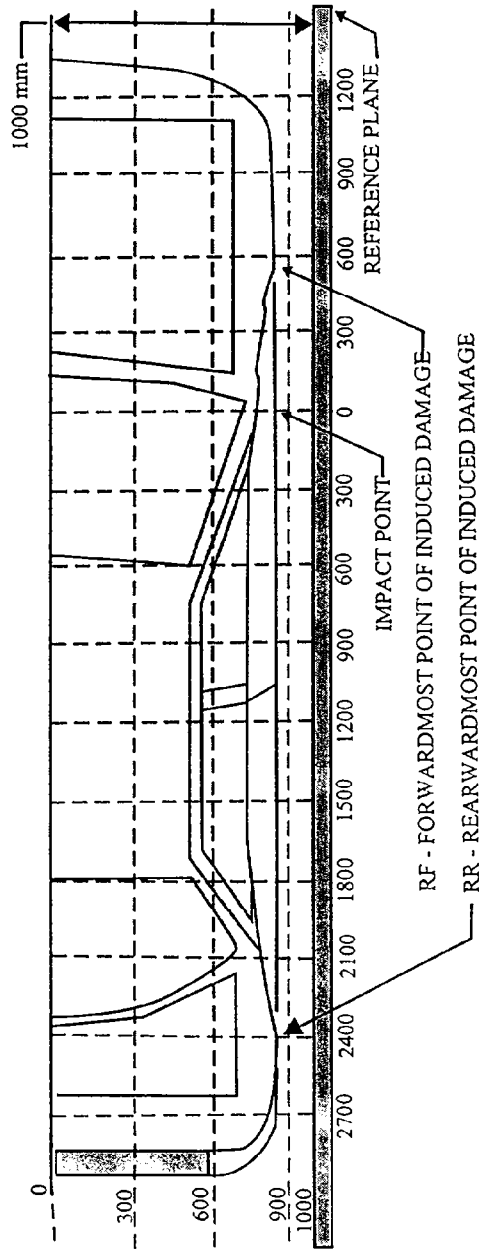


Figure is not representative of the actual test configuration

DPD MEASUREMENTS	POST-TEST (mm)	PRE-TEST (mm)	STATIC CRUSH (mm)
1. (RF = <u>750</u> mm)	798	798	0
2. <u>75</u> mm	764	734	30
3. <u>600</u> mm	1007	675	332
4. <u>1270</u> mm	992	675	317
5. <u>2010</u> mm	811	754	57
6. (RR = <u>2700</u> mm)	823	823	0

DATA SHEET NO. 12

EXTERIOR STATIC CRUSH FOR SIDE IMPACTOR

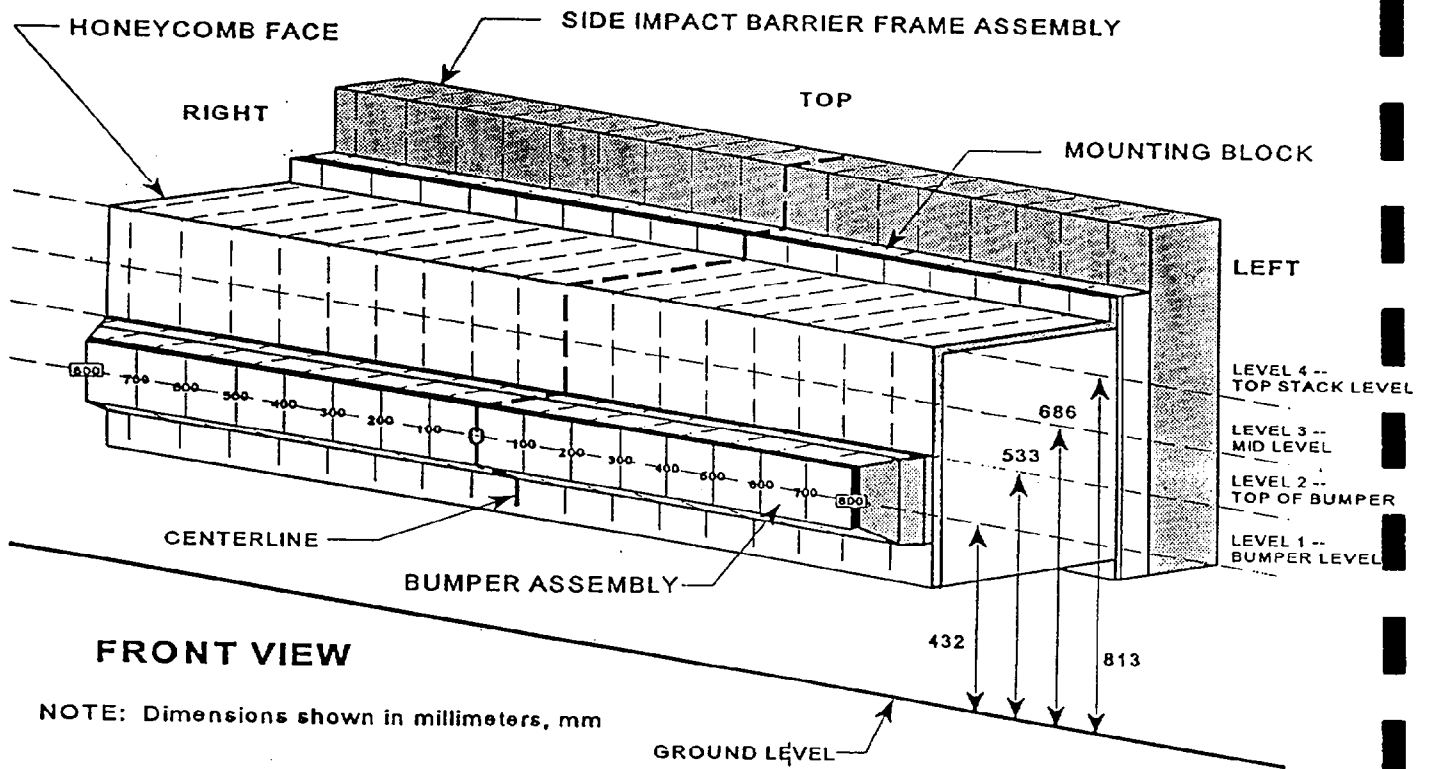
Year/Make/Model/Body Style: 1997/Subaru/Impreza/Outback

Vehicle NHTSA No.: CV5501 Test Date: June 24, 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	52	0	0	1	3	5	7	9	10	13	16	21	25	49	79	112	142
Mid Level Level 3	686 mm	32	10	3	1	1	2	8	8	5	3	5	7	9	12	29	65	119
Top Bumper Level 2	533 mm	70	63	50	40	34	29	23	17	16	16	16	17	19	21	24	31	43
Mid Bumper Level 1	432 mm	135	130	123	106	90	90	76	65	53	47	43	41	39	39	43	61	69

See next page for Barrier Face Graphic

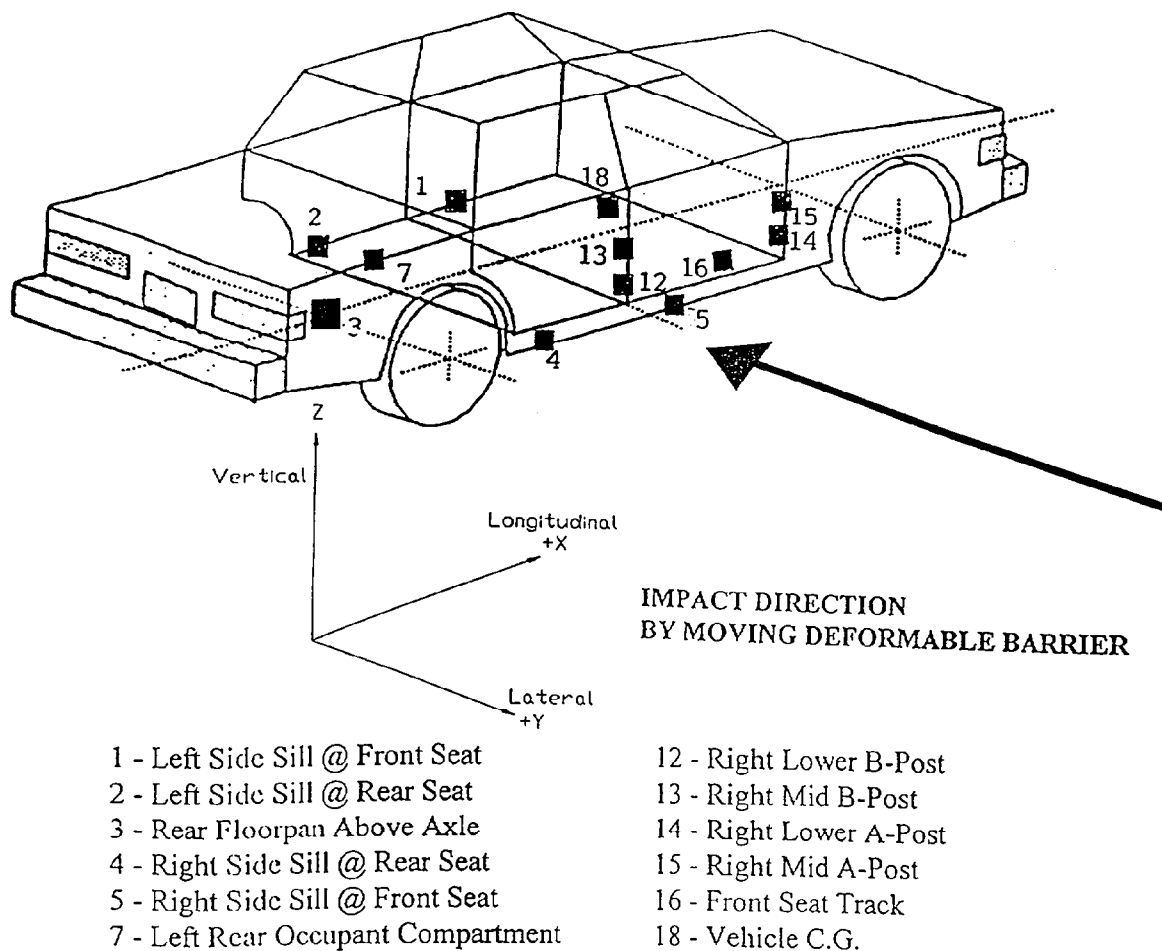
DATA SHEET NO. 12 (Cont'd)



DATA SHEET 13
TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1997/Subaru/Impreza/Outback

Vehicle NHTSA No.: CV5501 Test Date: June 24, 1997



DATA SHEET NO. 13

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1997/Subaru/Impreza/Outback

Vehicle NHTSA No.: CV5501 Test Date: June 24, 1997

Accel. No.	Description	Coordinates (mm)*			Long. (X) Maximums (g's)		Lat. (Y) Maximums (g's)		Vert. (Z) Maximums (g's)		Resultant (g's)
		X	Y	Z	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	
1	Left Side Sill @ Front Seat	2517	-628	222	2.1	-5.6	1.4	-20.9	4.7	-9.5	21.5
2	Left Side Sill @ Rear Seat	1837	-652	255	2.3	-6.8	2.3	-23.7	6.4	-4.1	24.3
3	Rr. Floorpan Above Axle	910	15	497	2.6	-6.1	1.8	-20.9	5.1	-4.1	21.2
4	Right Side Sill @ Rr. Seat	1620	705	178	---	---	20.0	-47.2	---	---	---
5	Right Side Sill @ Frt. Seat	2419	708	175	---	---	15.7	-34.0	---	---	---
7	Left Rear Occupant Compartment	1762	-355	220	---	---	2.3	-22.8	---	---	---
12	Right Lower B-Post	2011	695	321	---	---	22.5**	-114.6**	---	---	---
13	Right Mid B-Post	1934	689	840	---	---	44.6	-106.0	---	---	---
14	Right Lower A-Post	3028	632	342	---	---	50.2	-68.7	---	---	---
15	Right Mid A-Post	2999	658	540	---	---	39.4	-92.1	---	---	---
16	Right Front Passenger Seat Track	2112	576	245	---	---	26.3	-52.7	---	---	---
18	Vehicle CG	2409	22	448	12.5	-15.2	4.9	-30.5	15.0	-8.0	30.8

*Reference: X - Rear Bumper (+ Forward)

Y - Vehicle Centerline (+ To right)

Z - Ground Level (+ Up)

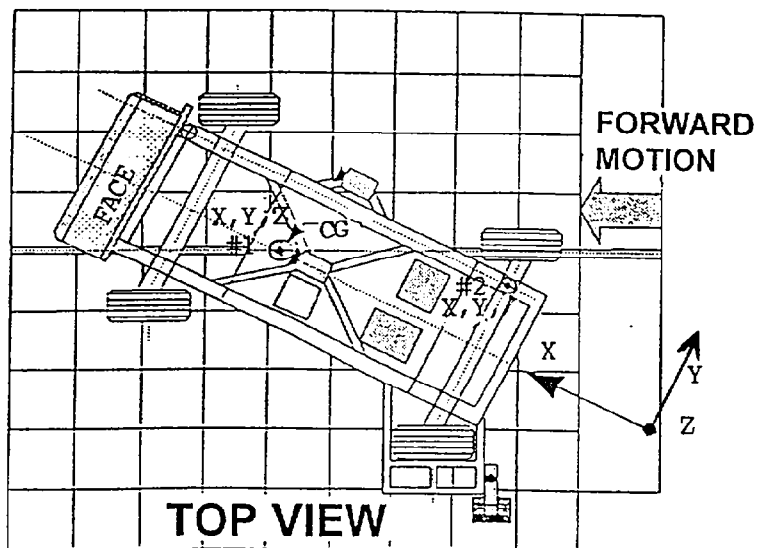
** Data valid until approximately 17 msec.

DATA SHEET NO. 14

MOVING DEFORMABLE BARRIER (MDB) ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1997/Subaru/Impreza/Outback

Vehicle NHTSA No.: CV5501 Test Date: June 24, 1997



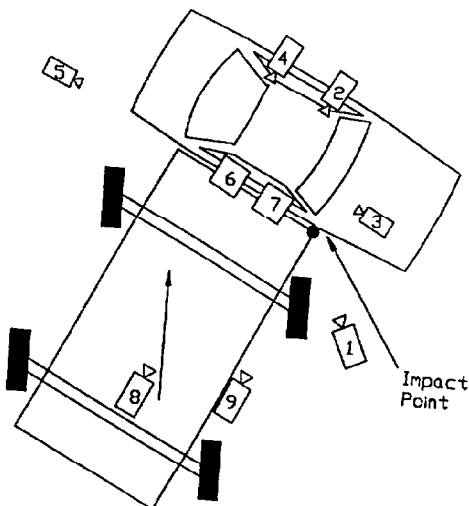
Accel. No.	Description	Coordinates (mm)*			(+) Positive		(-) Negative	
		X	Y	Z	Max. (g)	Time (msec)	Max. (g)	Time (msec)
1	MDB Center of Gravity	-1092	0	483				
	Longitudinal (X)	---	---	---	1.2	105	-15.6	37
	Lateral (Y)	---	---	---	6.9	42	-1.1	169
	Vertical (Z)	---	---	---	5.1	18	-13.5	23
	Resultant (R)	---	---	---	19.5	23	---	---
2	Rear Frame Member	-2591	625	622				
	Longitudinal (X)	---	---	---	1.6	91	-18.6	42
	Lateral (Y)	---	---	---	1.8	60	-2.8	28

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

DATA SHEET NO. 15
HIGH SPEED CAMERA LOCATIONS AND DATA

Year/Make/Model/Body Style: 1997/Subaru/Impreza/Outback

Vehicle NHTSA No.: CV5501 Test Date: June 24, 1997



Camera No.	View	Coordinates (mm)*			Angle	Lens (mm)	Film Speed (fps)
		X	Y	Z			
	Real Time					13	24
1	Right Impact	-610	1950	1640	90°	13	976
2	Onboard Hood					13	760
3	Onboard Front Occupant					8	758
4	Onboard Rear Occupant					8	939
5	Left Impact	10	-10400	1680	90°	25	1010
6	Top Overall	0	0	5000	90°	8	966
7	Top Impact	-270	0	5000	90°	13	985
8	Cart Wide					13	1015
9	Cart Impact					35	1015
10	Left Impact Close-up	-450	-10300	760		35	810

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

DATA SHEET 16
FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

Vehicle Year/Make/Model/Body Style: 1997/Subaru/Impreza/Outback

Vehicle NHTSA No.: CV5501 Test Date: June 24, 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 Right Side Impact MDB 32.87 mph (52.9 kph)

FUEL SPILLAGE MEASUREMENT:

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

FUEL SPILLAGE LOCATION(S): None

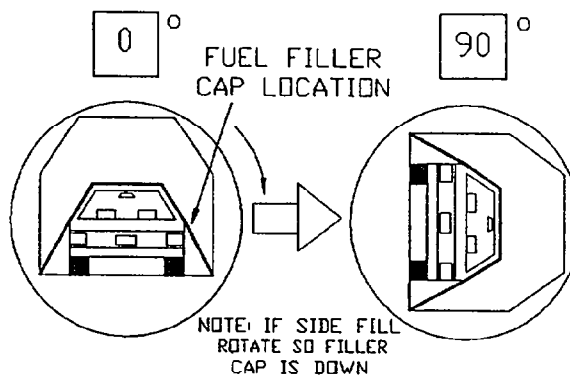
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA

Vehicle Year/Make/Model/Body Style: 1997/Subaru/Impreza/Outback

Vehicle NHTSA No.: CV5501 Test Date: June 24, 1997

TEST PHASE: 0° - 90°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 42 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 42 seconds

Next Whole Minute Interval = 8 minutes

FUEL SPILLAGE MEASUREMENT:

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

FUEL SPILLAGE LOCATIONS(S): None

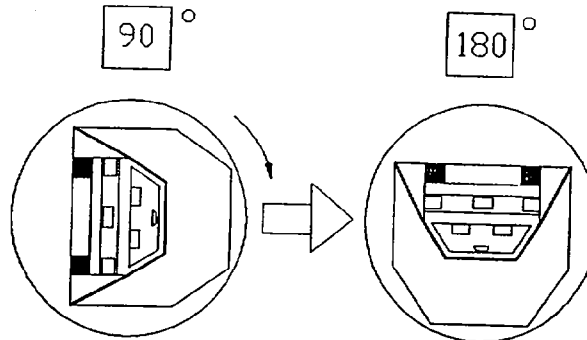
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA (Cont'd)

Vehicle Year/Make/Model/Body Style: 1997/Subaru/Impreza/Outback

Vehicle NHTSA No.: CV5501 Test Date: June 24, 1997

TEST PHASE: 90° - 180°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 22 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 22 seconds

Next Whole Minute Interval = 8 minutes

FUEL SPILLAGE MEASUREMENT:

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

FUEL SPILLAGE LOCATIONS(S): None

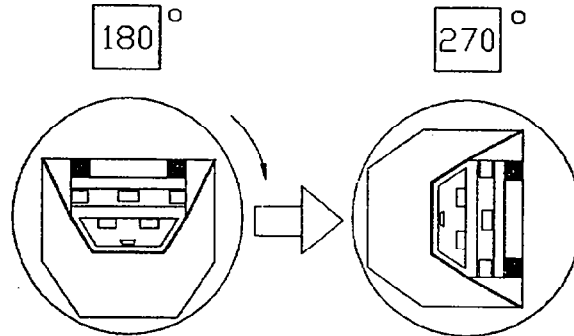
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA (Cont'd)

Vehicle Year/Make/Model/Body Style: 1997/Subaru/Impreza/Outback

Vehicle NHTSA No.: CV5501 Test Date: June 24, 1997

TEST PHASE: 180° - 270°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 25 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 25 seconds

Next Whole Minute Interval = 8 minutes

FUEL SPILLAGE MEASUREMENT:

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

FUEL SPILLAGE LOCATIONS(S): None

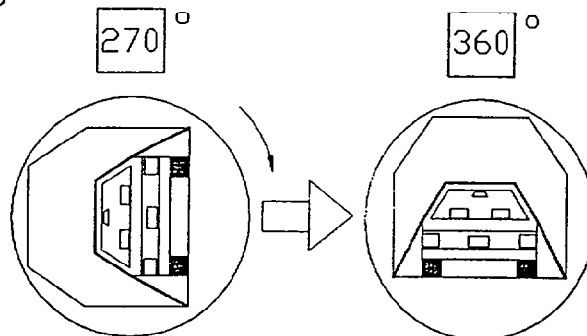
DATA SHEET 16

FMVSS 301 STATIC ROLLOVER TEST DATA

Vehicle Year/Make/Model/Body Style: 1997/Subaru/Impreza/Outback

Vehicle NHTSA No.: CV5501 Test Date: June 24, 1997

TEST PHASE: 270° - 360°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 49 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 49 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

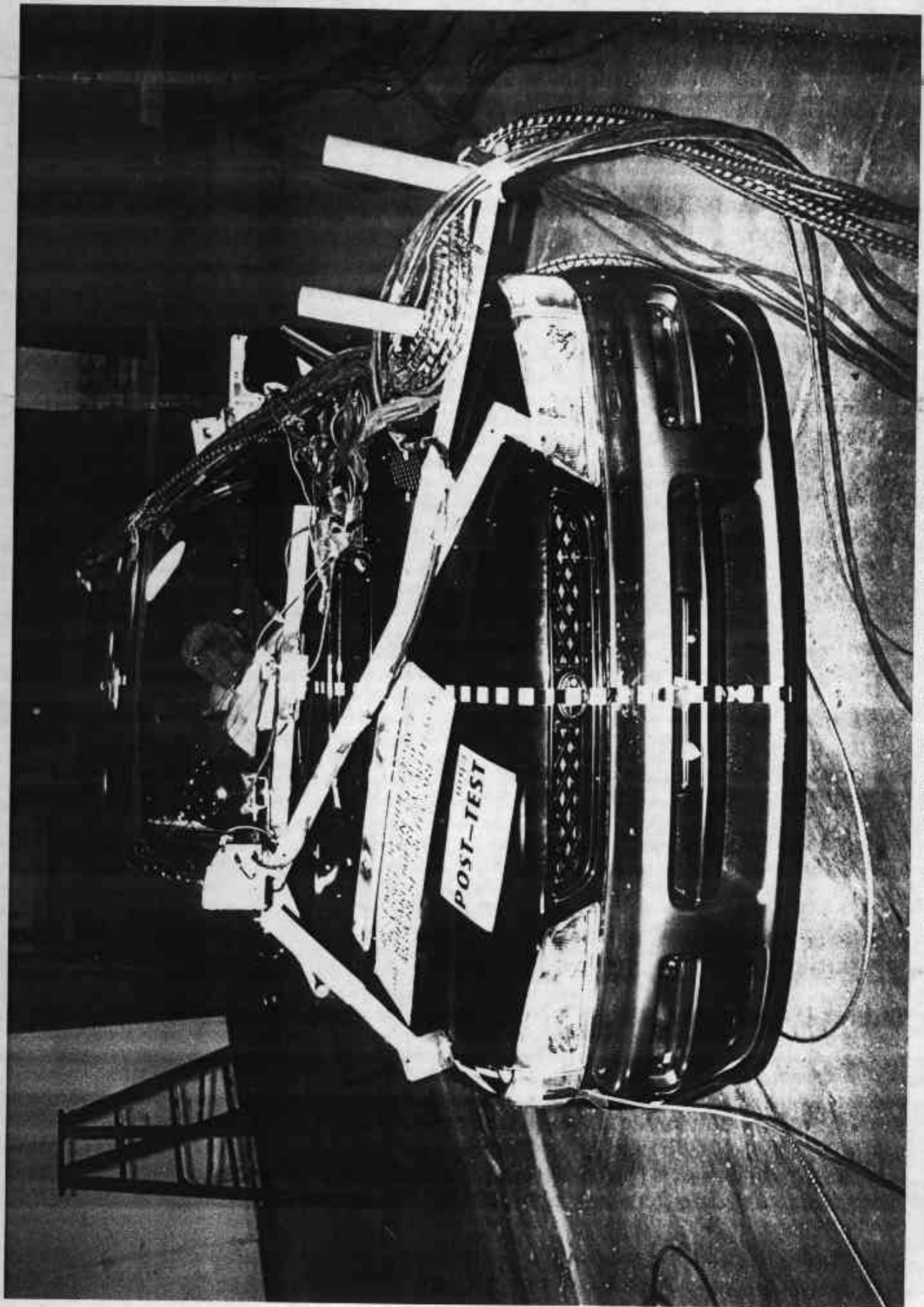


Photo No. A-2 - Post-Test Front View of Test Vehicle

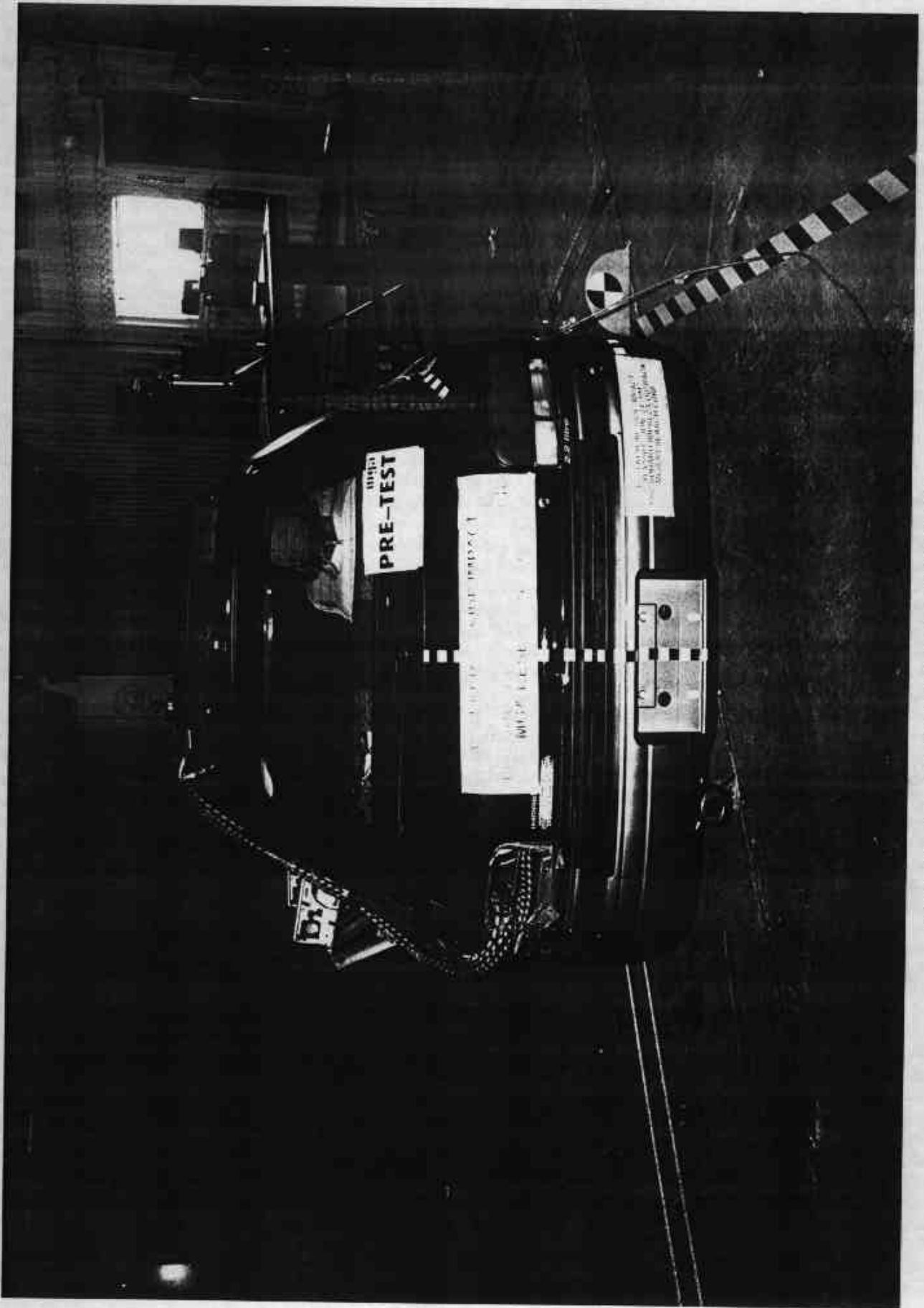


Photo No. A-3 - Pre-Test Rear View of Test Vehicle

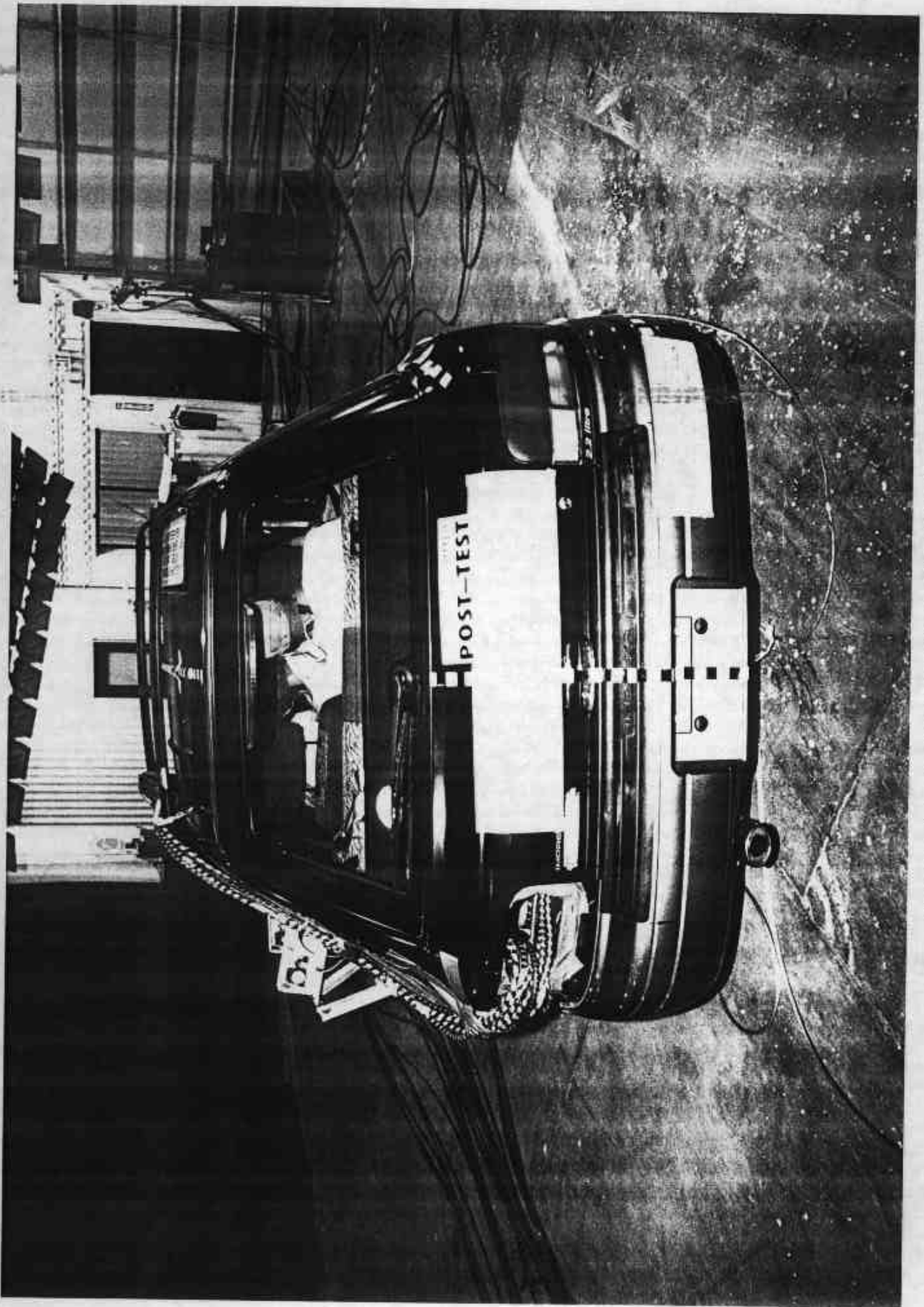


Photo No. A-4 - Post-Test Rear View of Test Vehicle

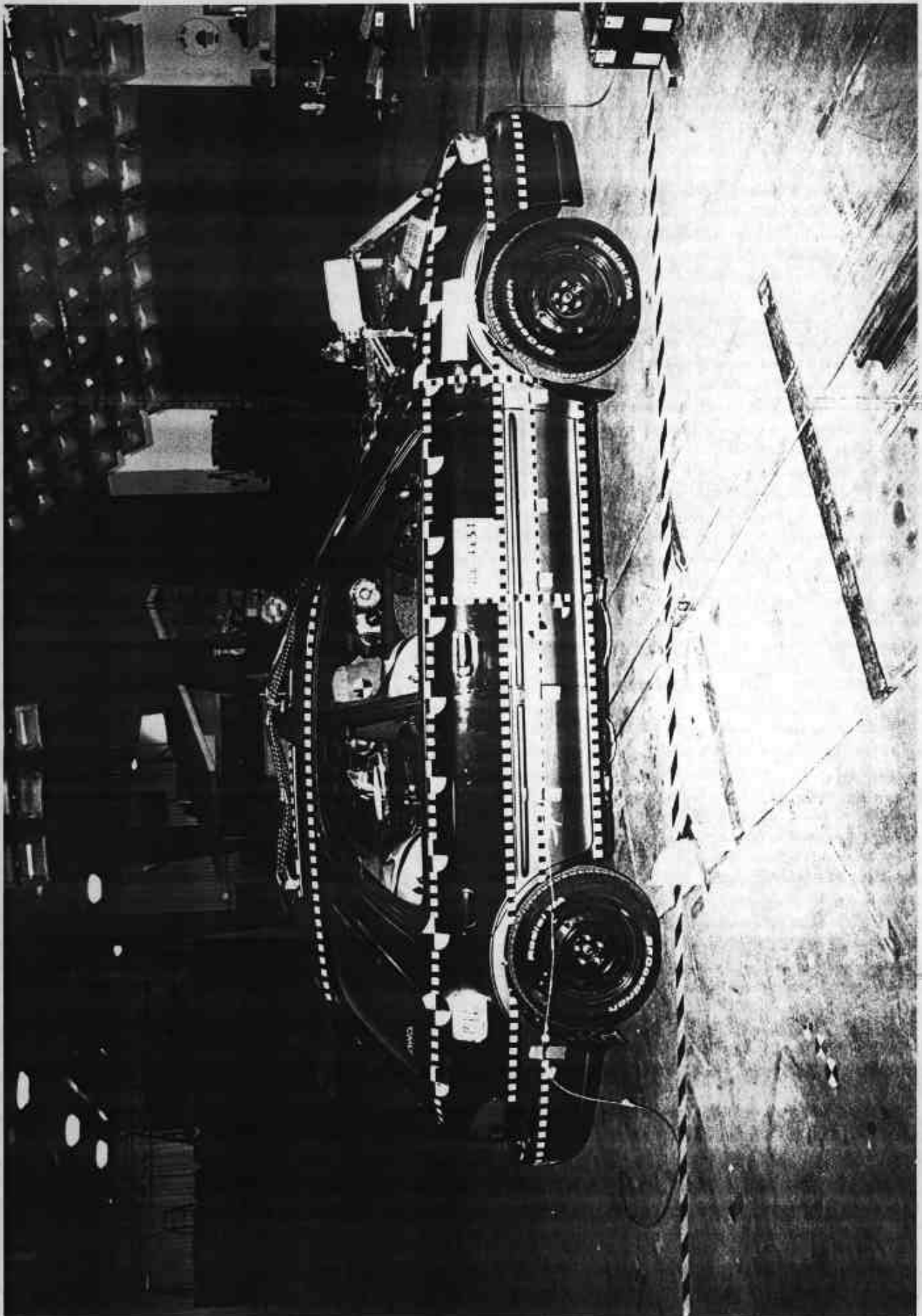


Photo No. A-5 - Pre-Test Right Side View of Test Vehicle

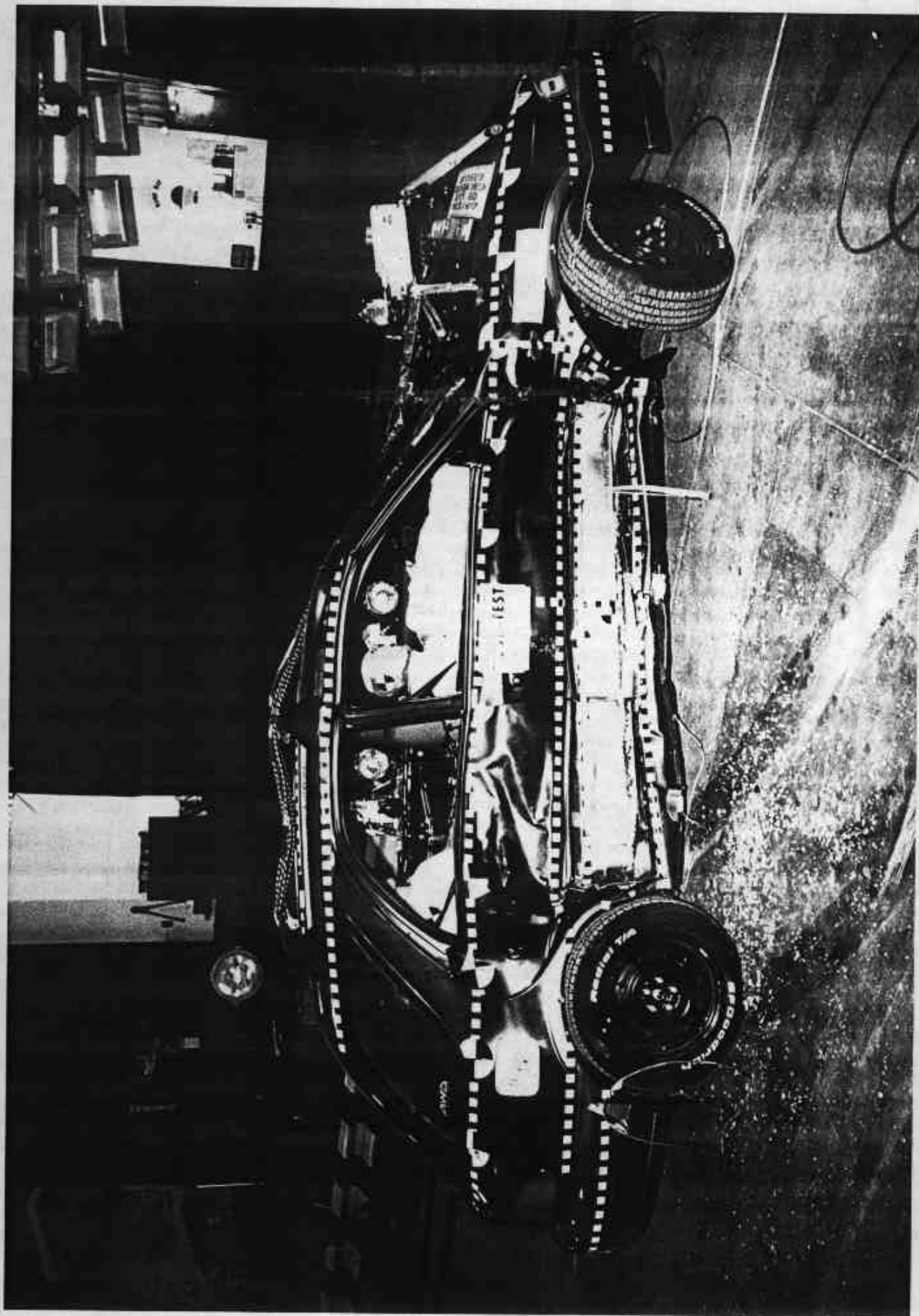


Photo No. A-6 - Post-Test Right Side View of Test Vehicle

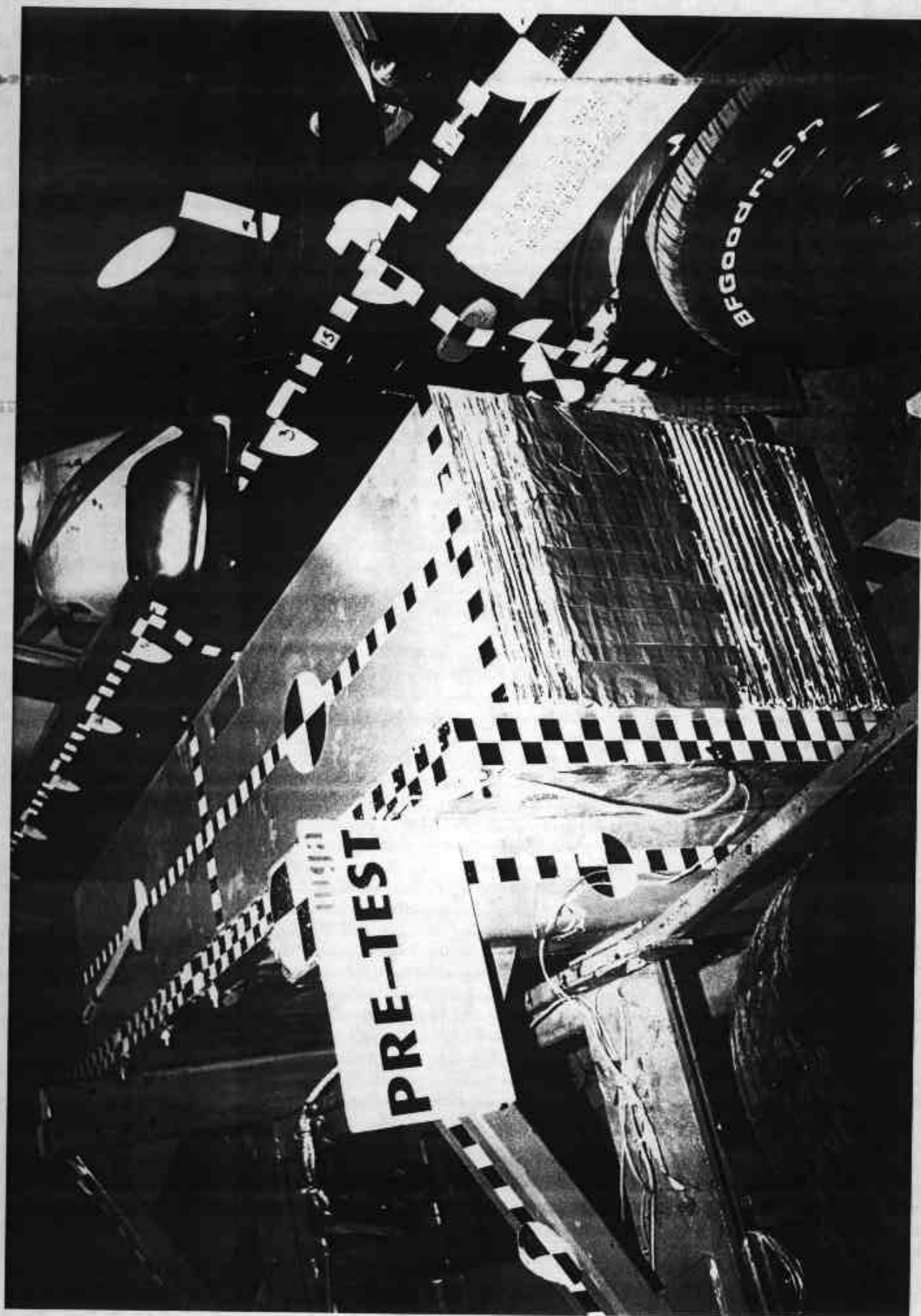


Photo No. A-7 - Pre-Test MDB Positioned Against Vehicle (right side)

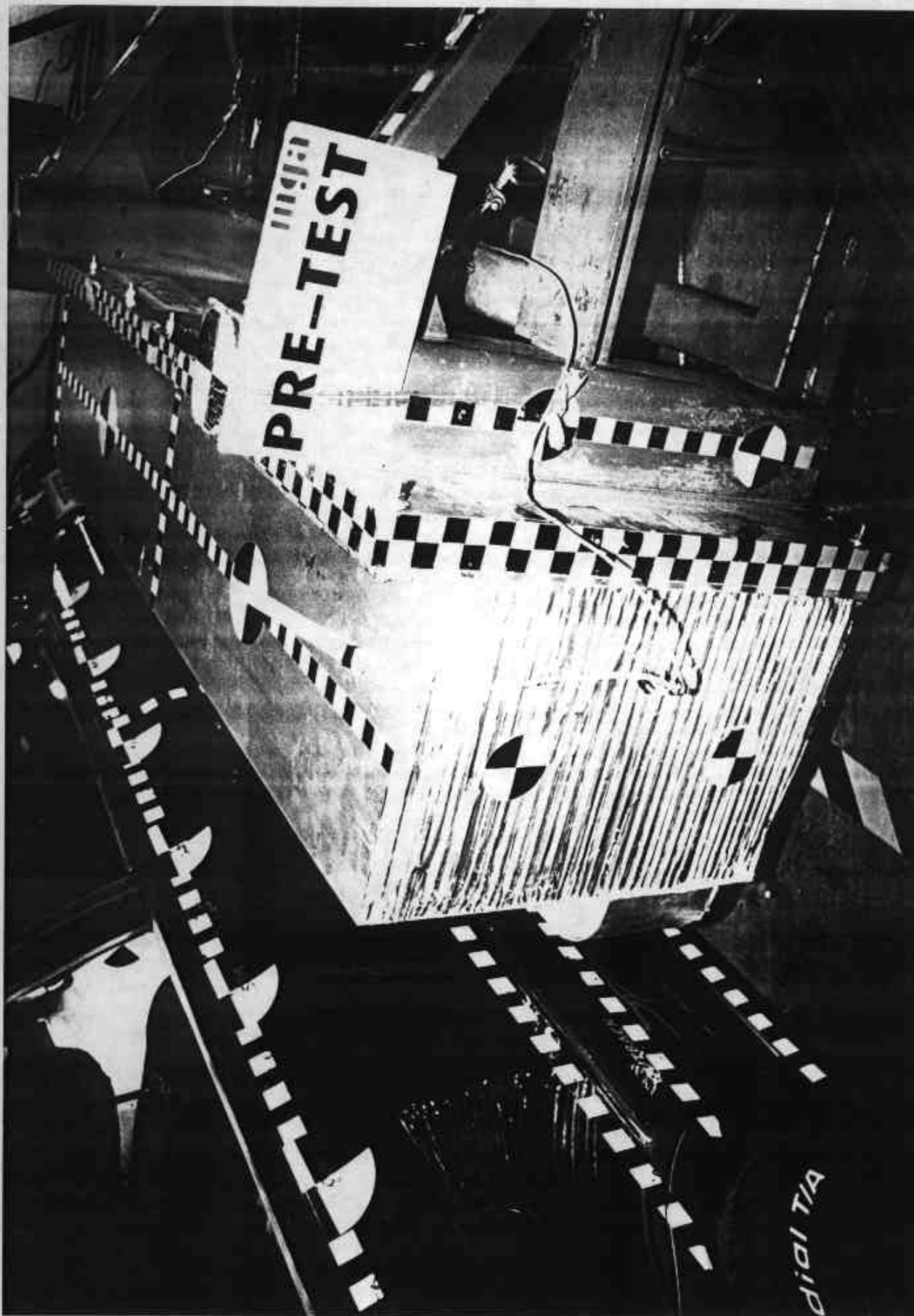


Photo No. A-8 - Pre-Test MDB Positioned Against Vehicle (left side)

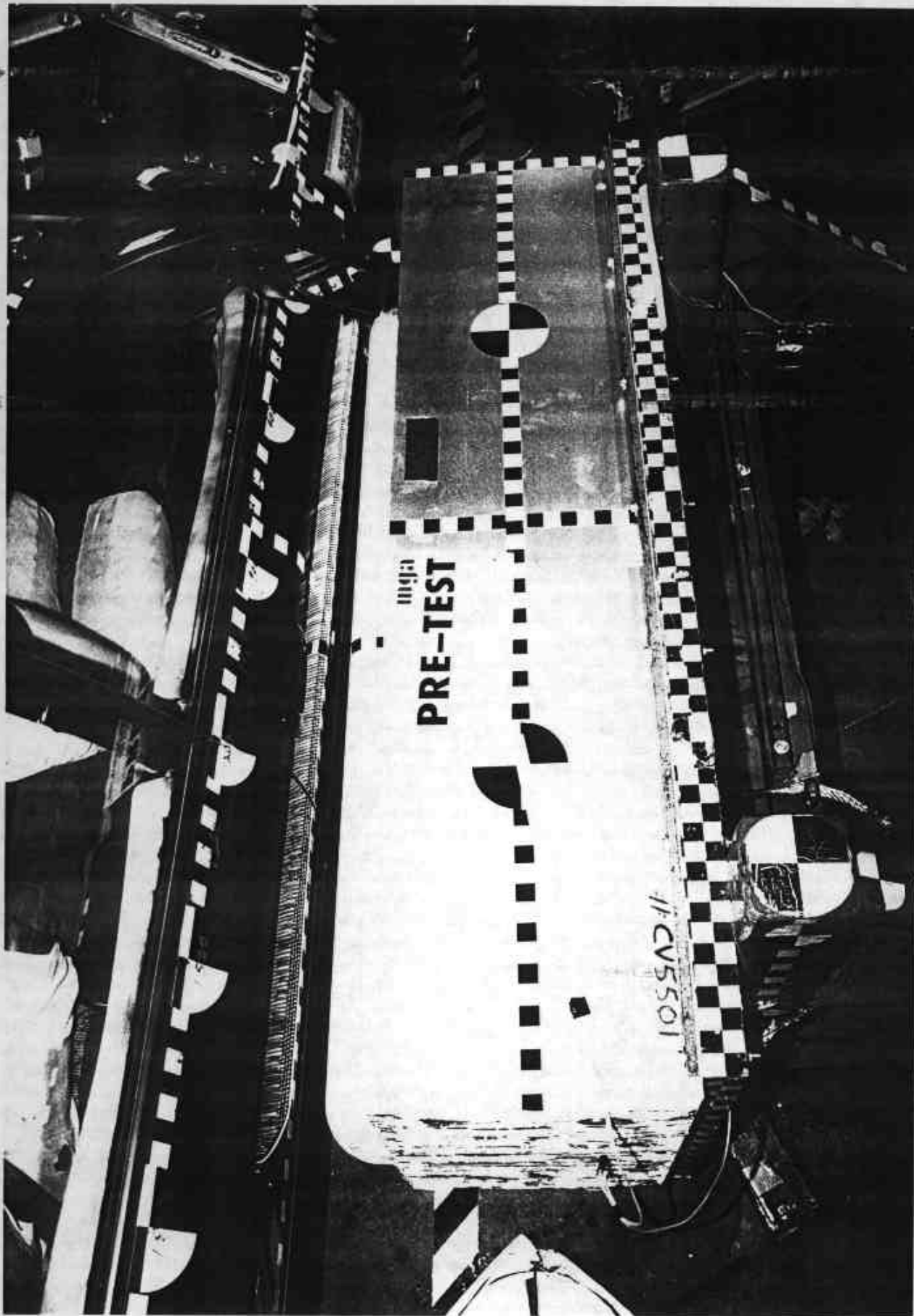


Photo No. A-9 - Pre-Test MDB Positioned Against Vehicle Overhead View

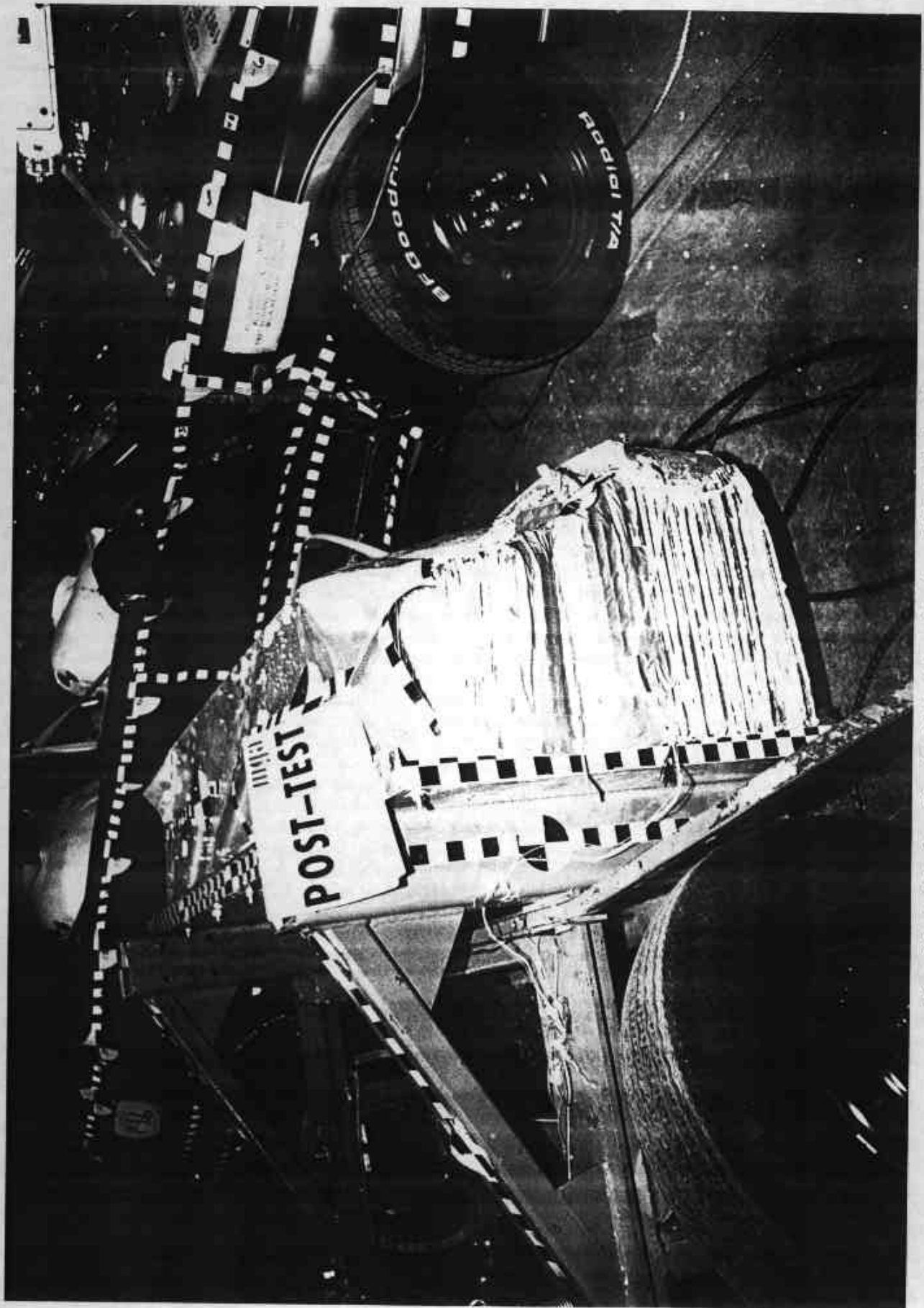


Photo No. A-10 - Post-Test MDB Positioned Against Vehicle (right side)

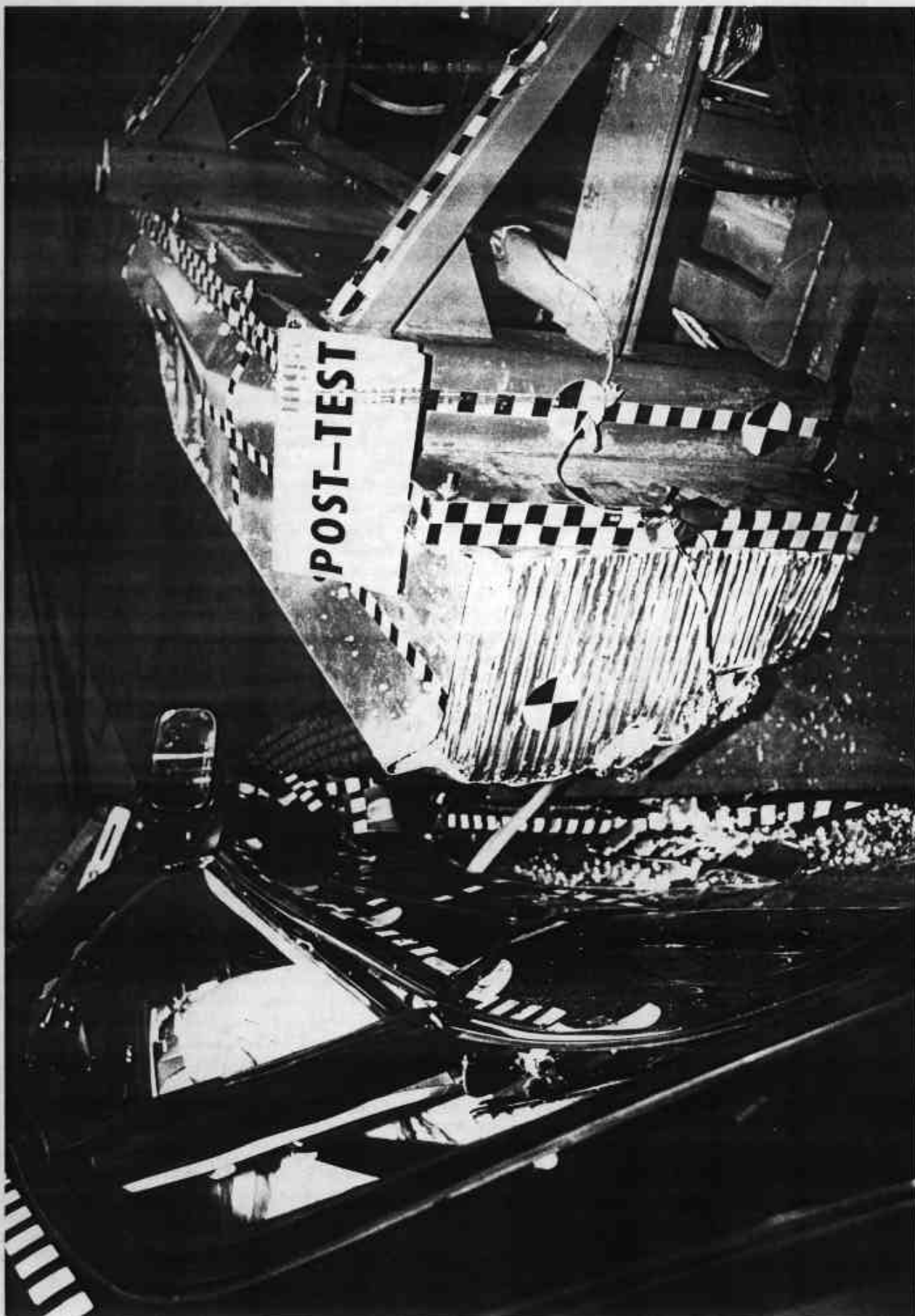


Photo No. A-11 - Post-Test MDB Positioned Against Vehicle (left side)

A-11.

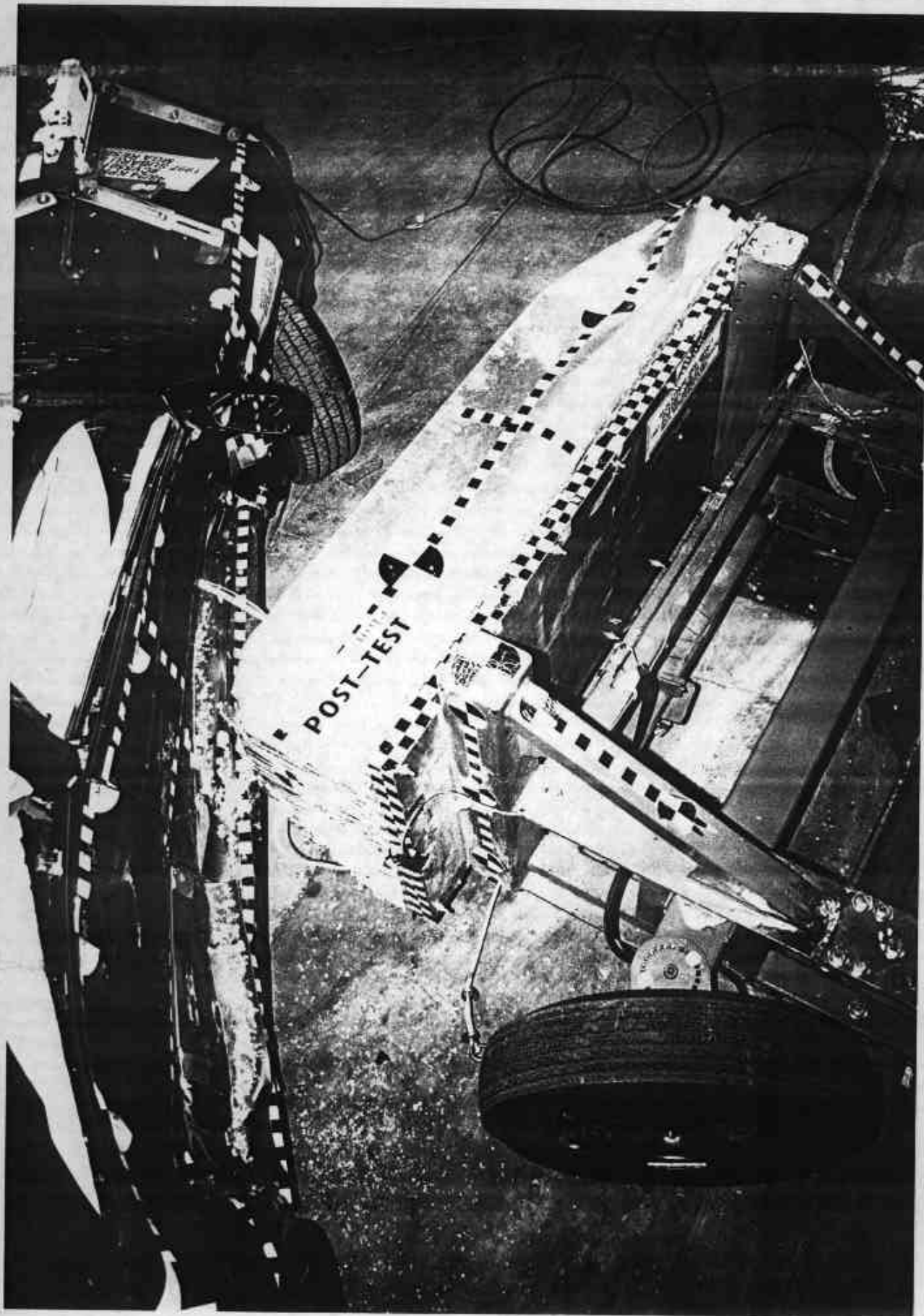


Photo No. A-12 - Post-Test MDB Positioned Against Vehicle Overhead View

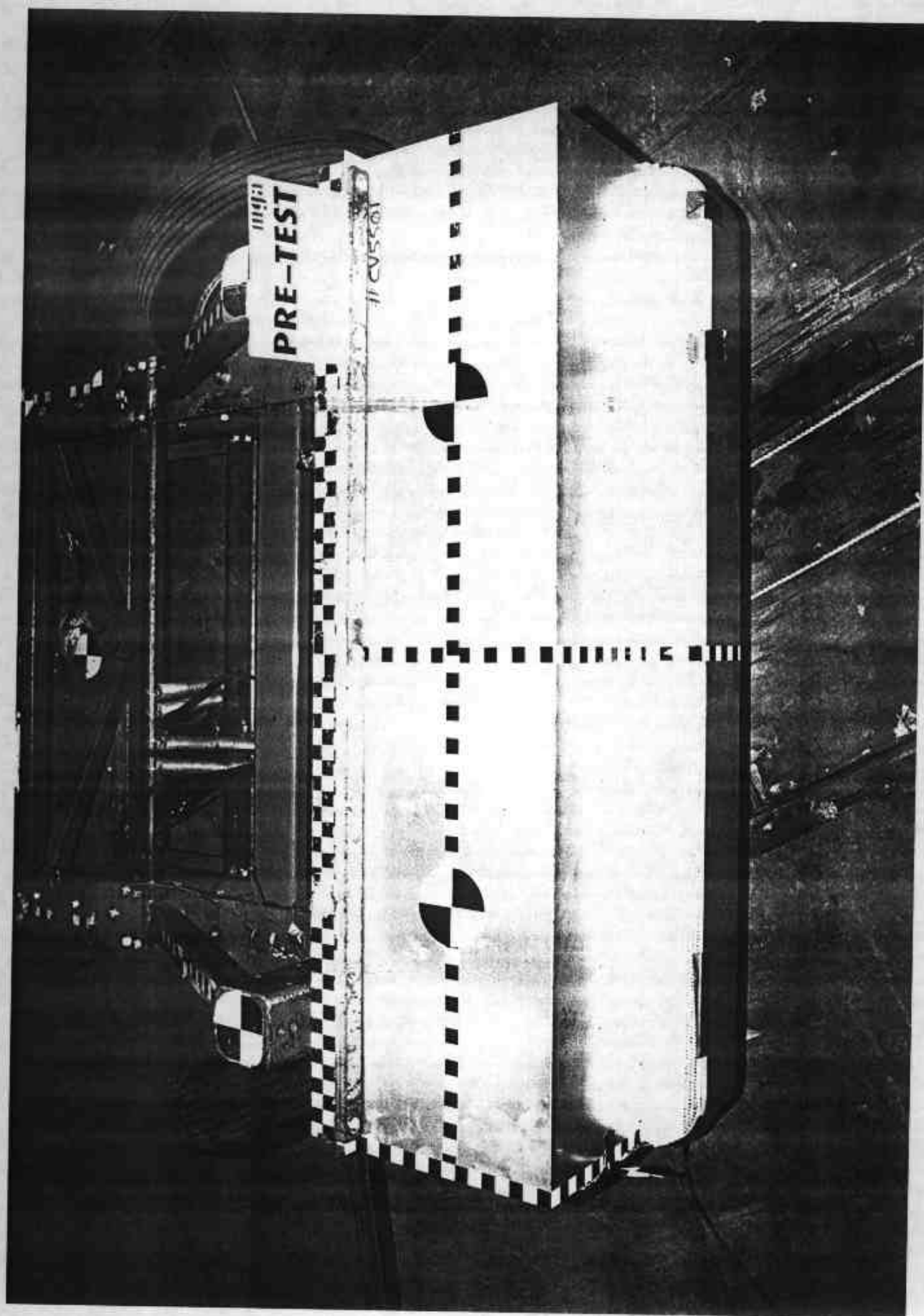


Photo No. A-13 - Pre-Test MDB Top View

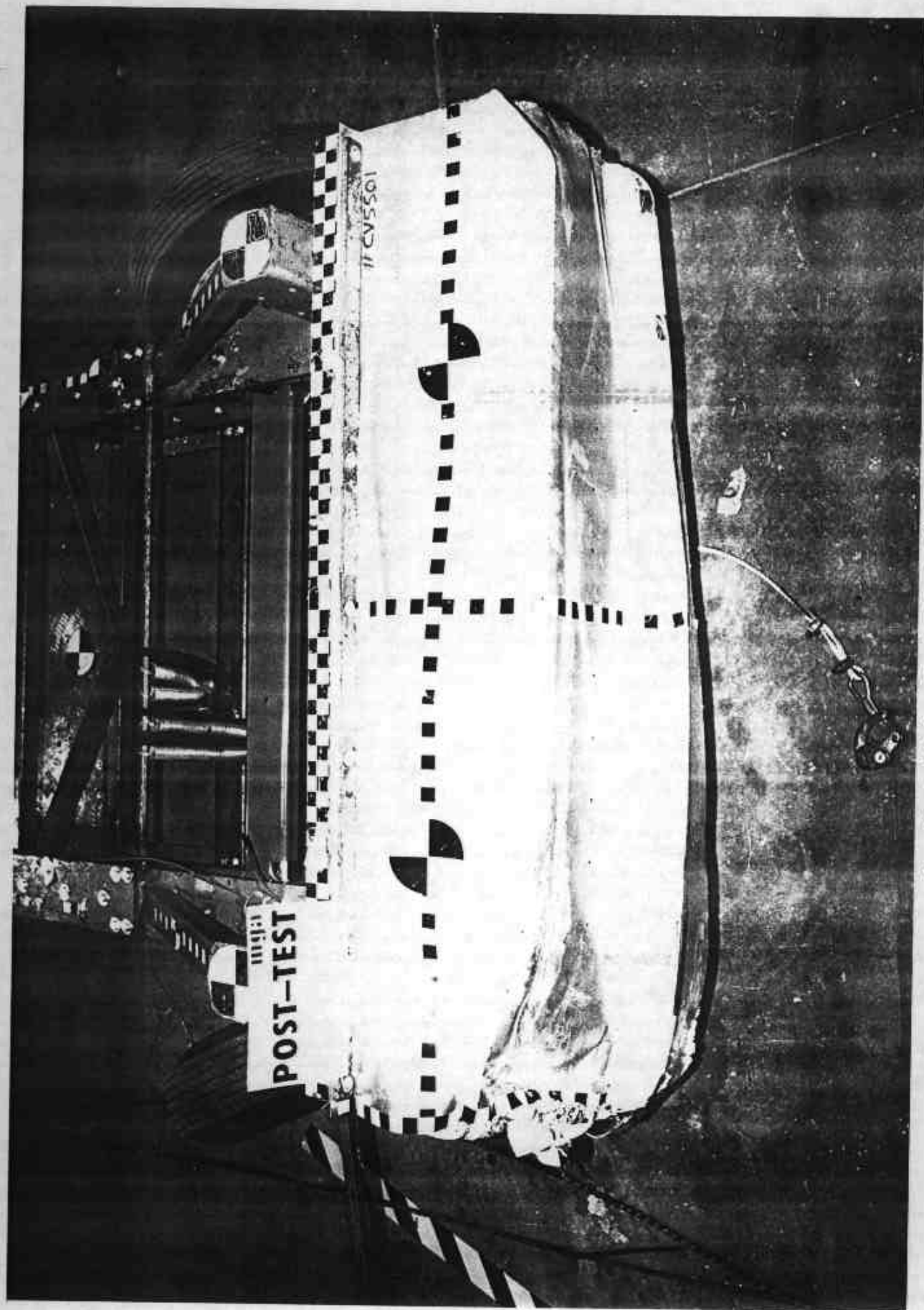


Photo No. A-14 - Post-Test MDB Top View

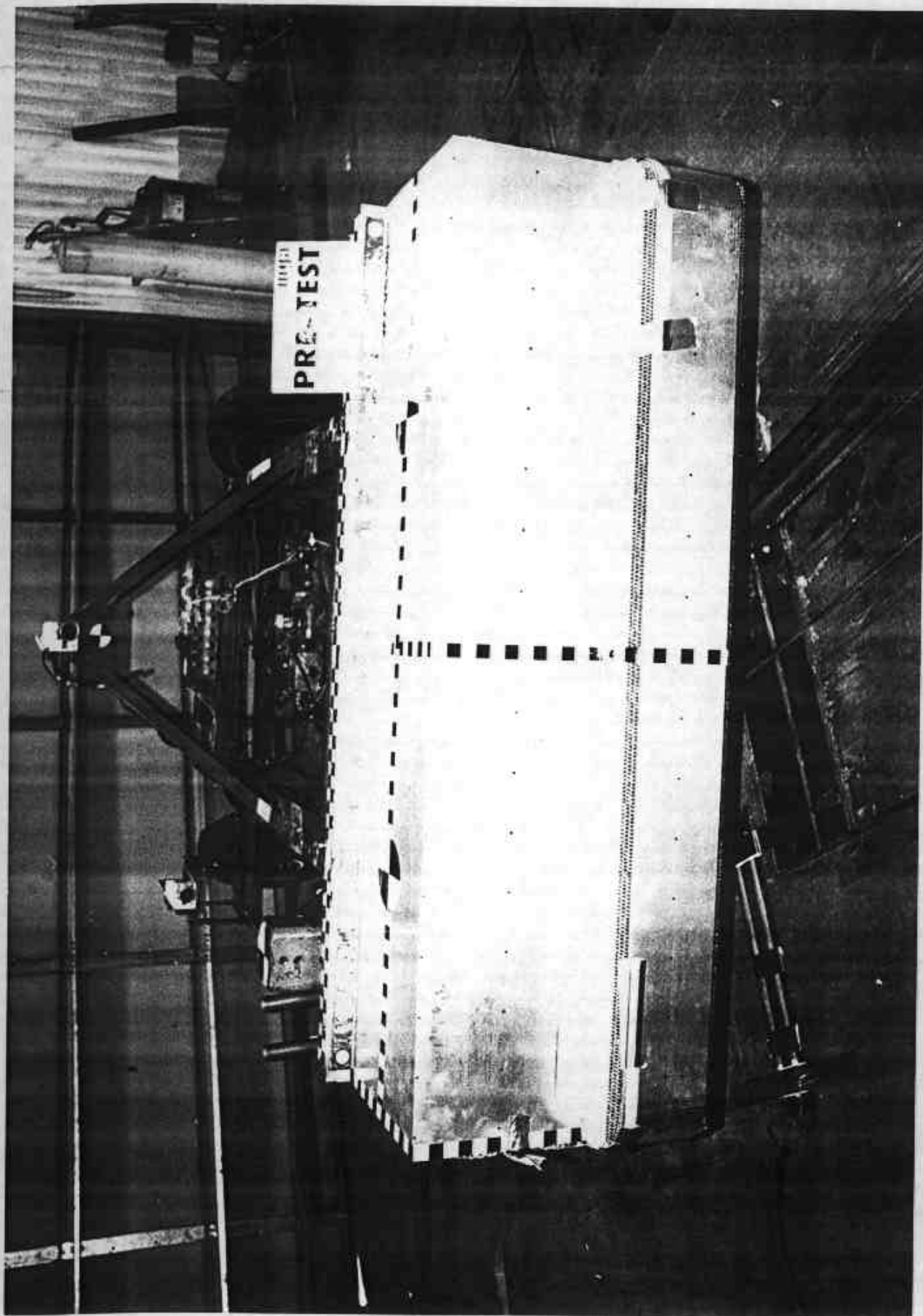


Photo No. A-15 - Pre-Test MDB Front View

A-15

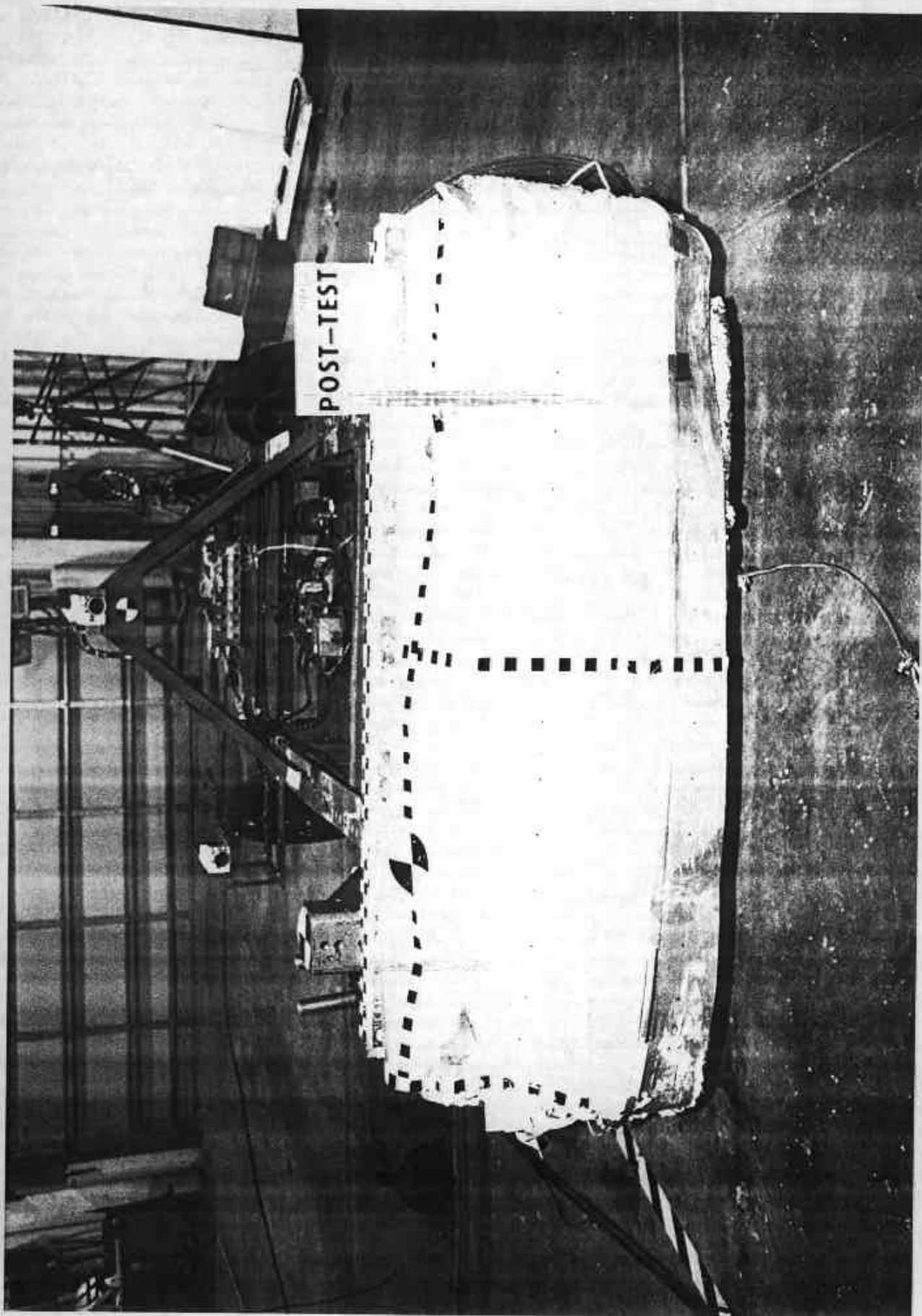


Photo No. A-16 - Post-Test MDB Front View

A-16

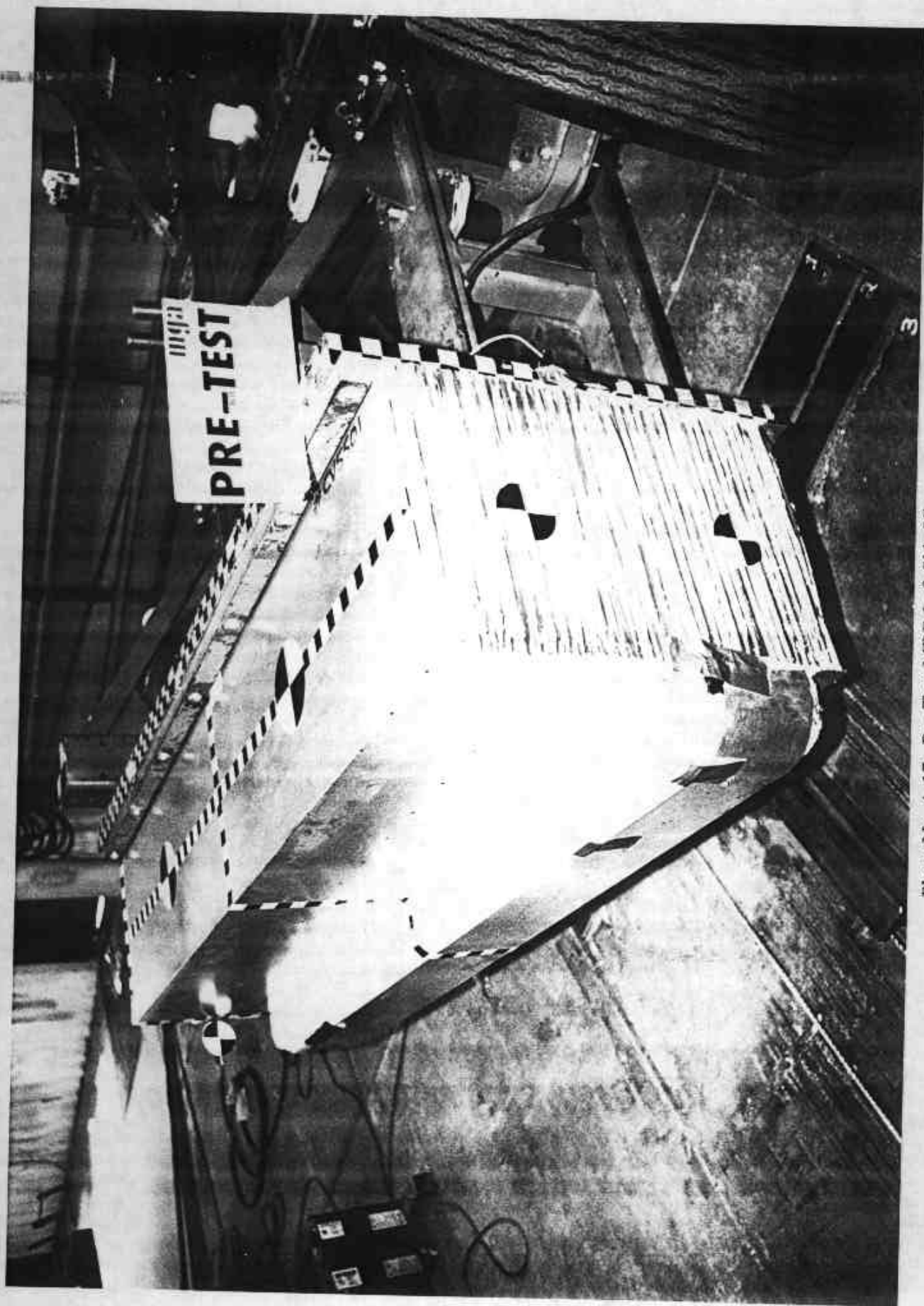


Photo No. A-17 - Pre-Test MDB Left Side View

A-17

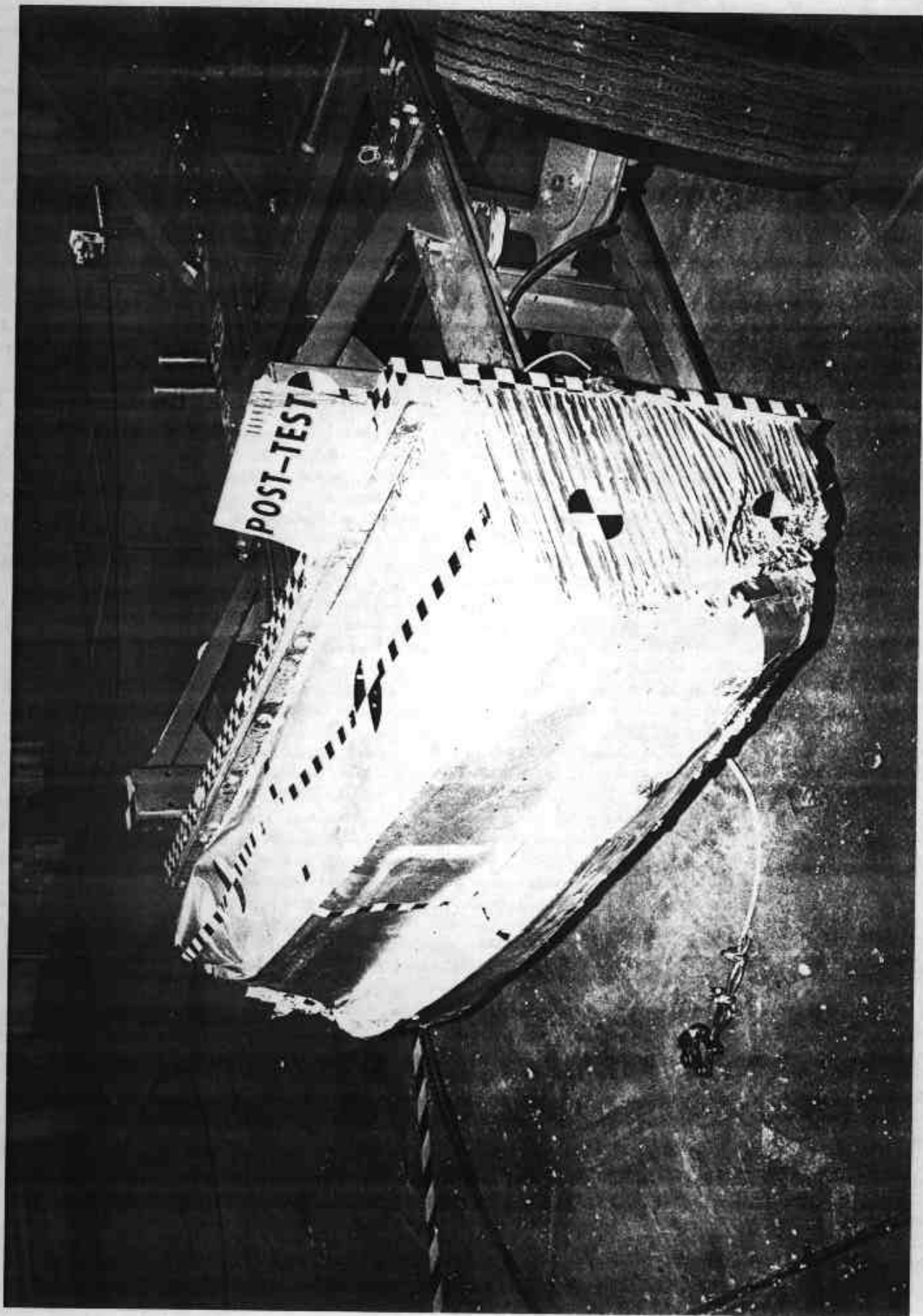


Photo No. A-18 - Post-Test MDB Left Side View

A-18

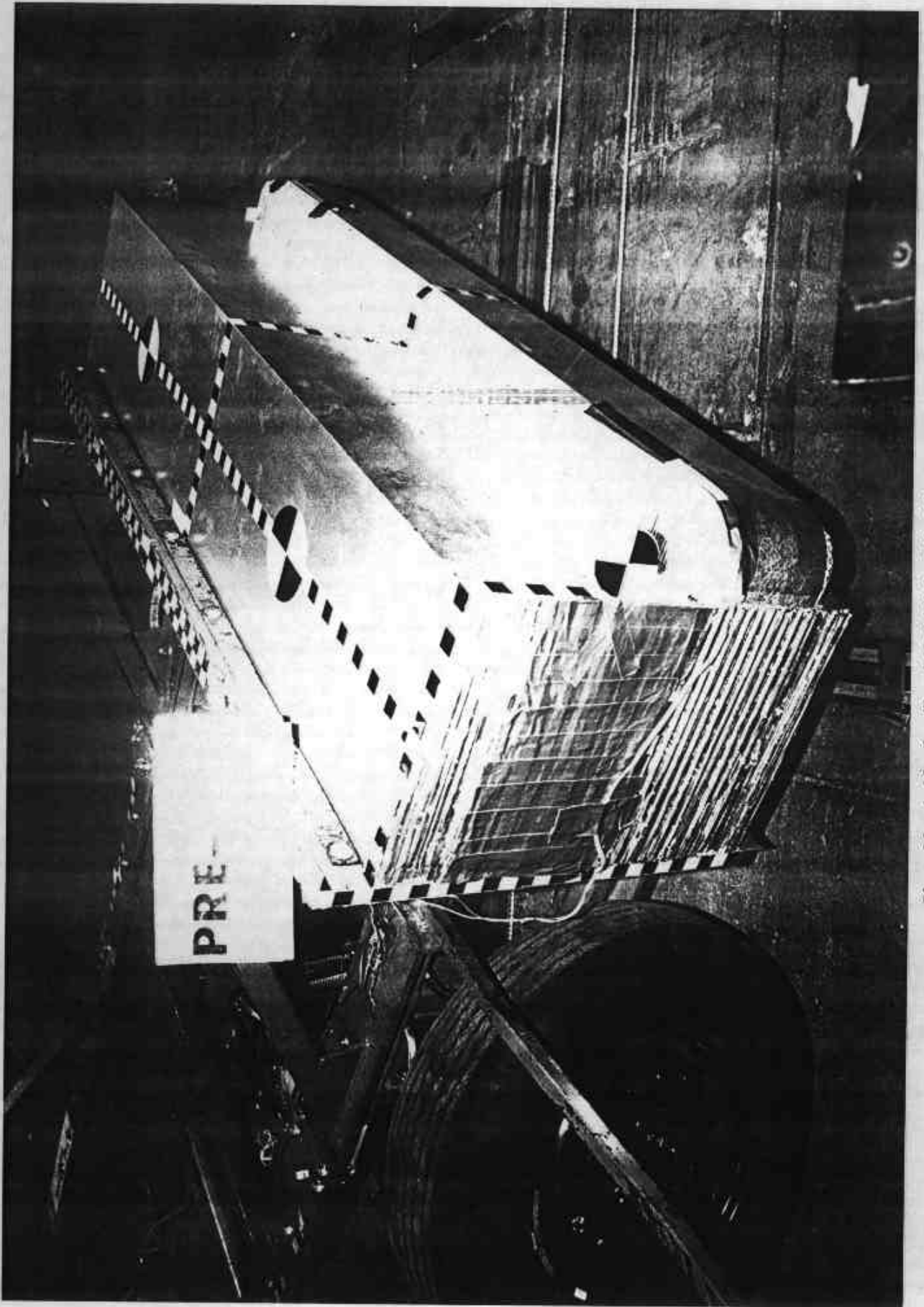


Photo No. A-19 - Pre-Test MDB Right Side View

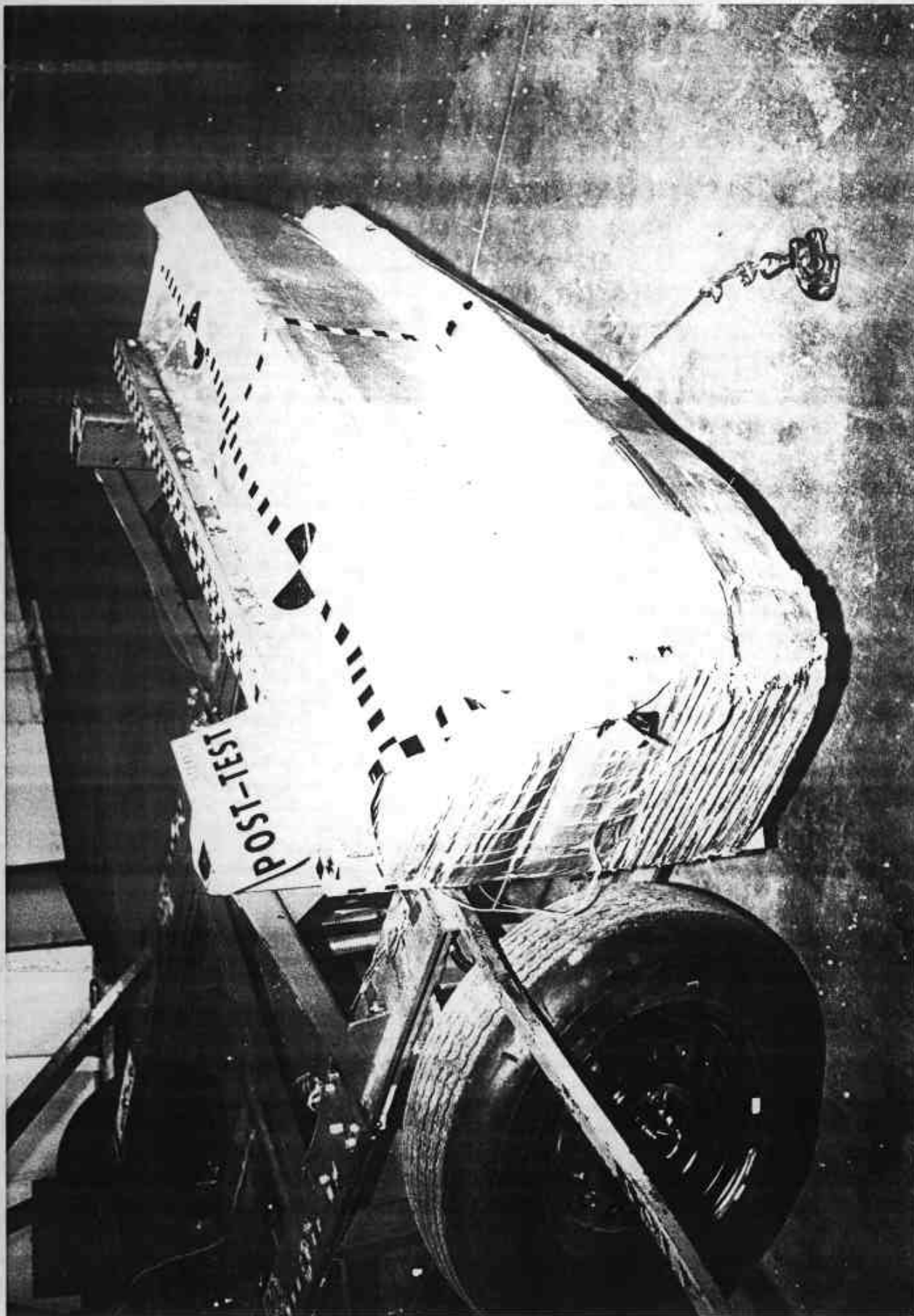


Photo No. A-20 - Post-Test MDB Right Side View

A-20



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



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

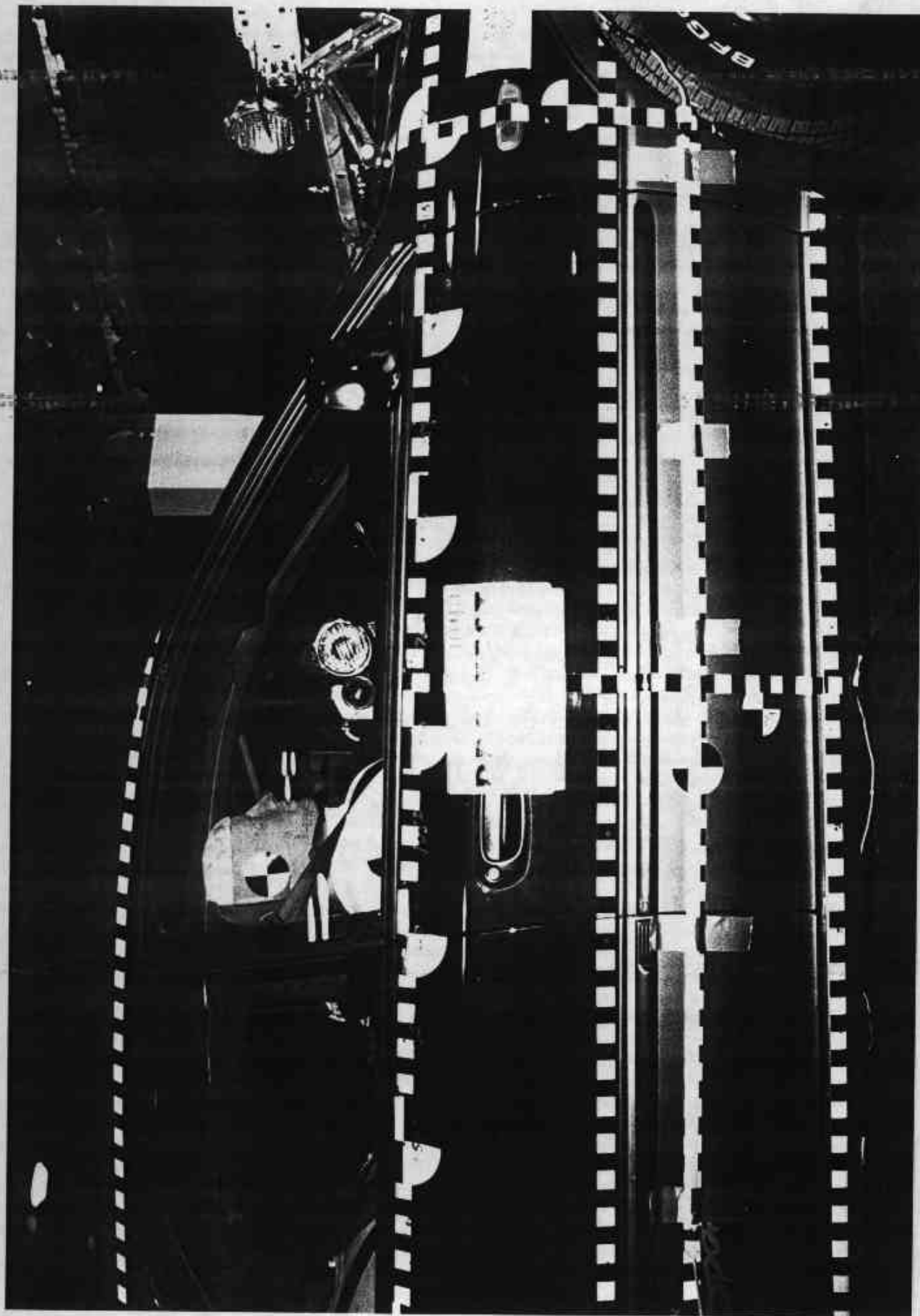


Photo No. A-23 - Pre-Test Front Passenger Dummy Right Side View

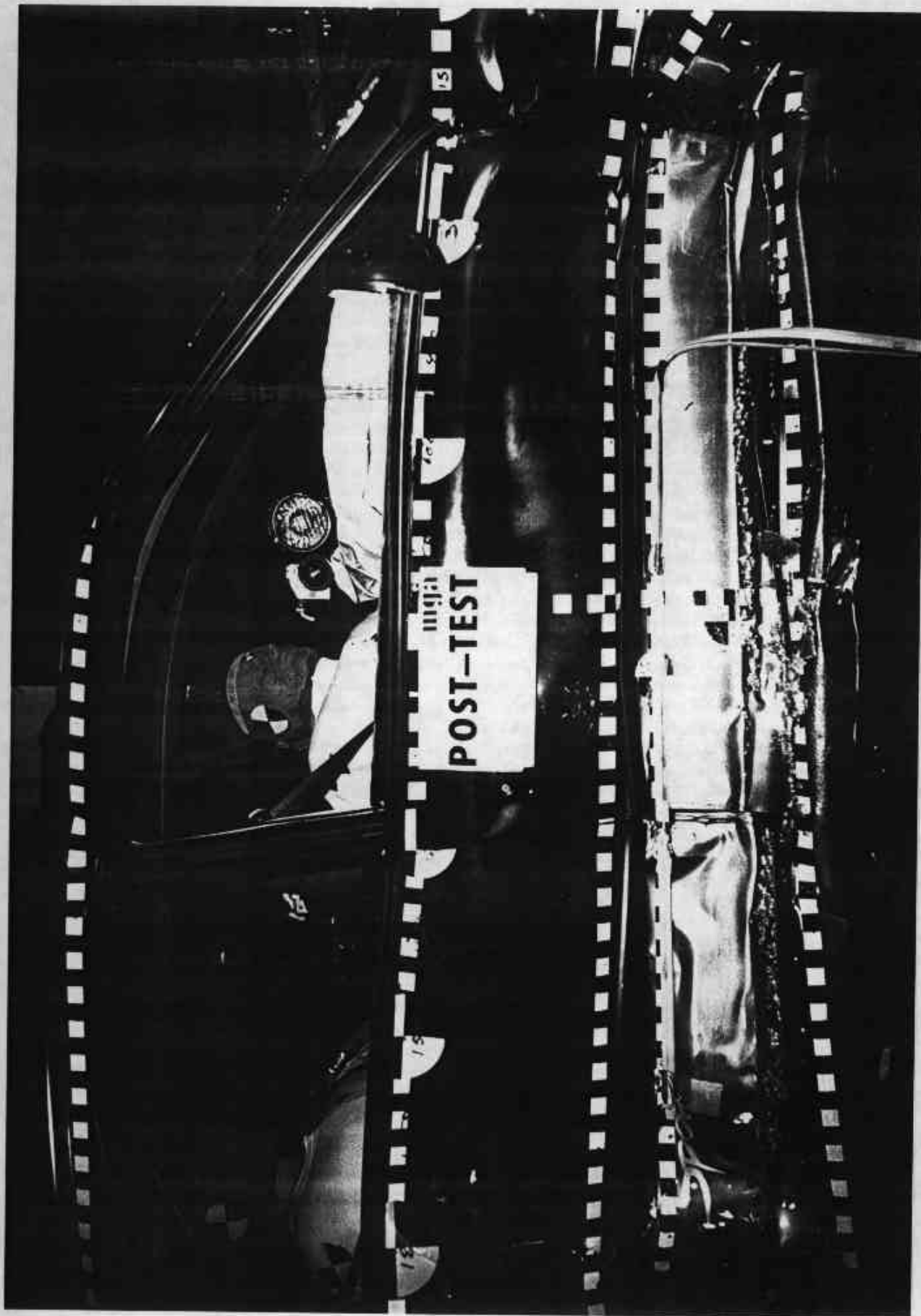


Photo No. A-24 - Post-Test Front Passenger Dummy Right Side View

A-24



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



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



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



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



POST-TEST

214 COMPLIANCE
NHTSA #CV5501
1997 SUBARU IMPREZA OUTBACK

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



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

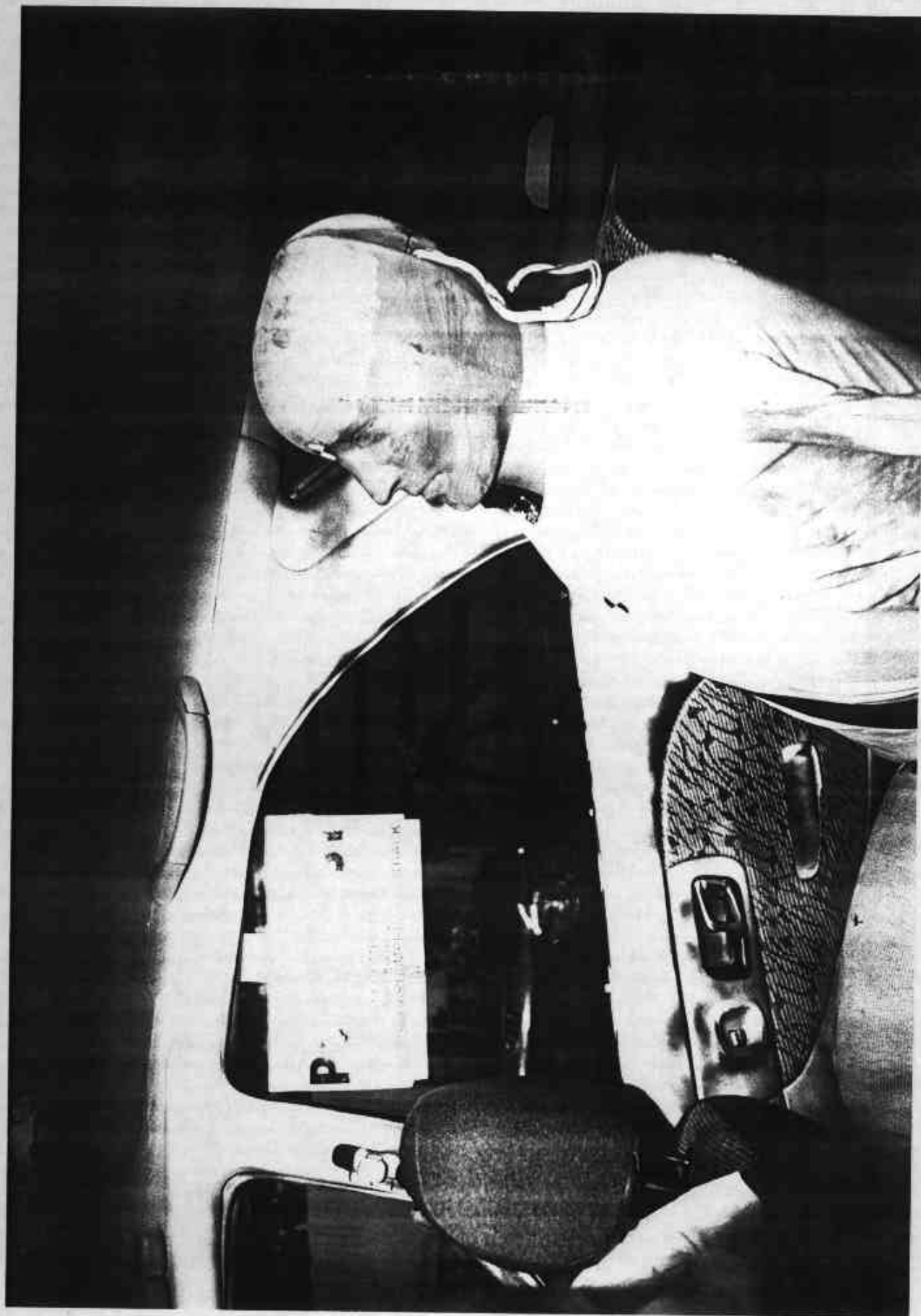


Photo No. A-31 - Post-Test Rear Passenger Dummy Left Side View

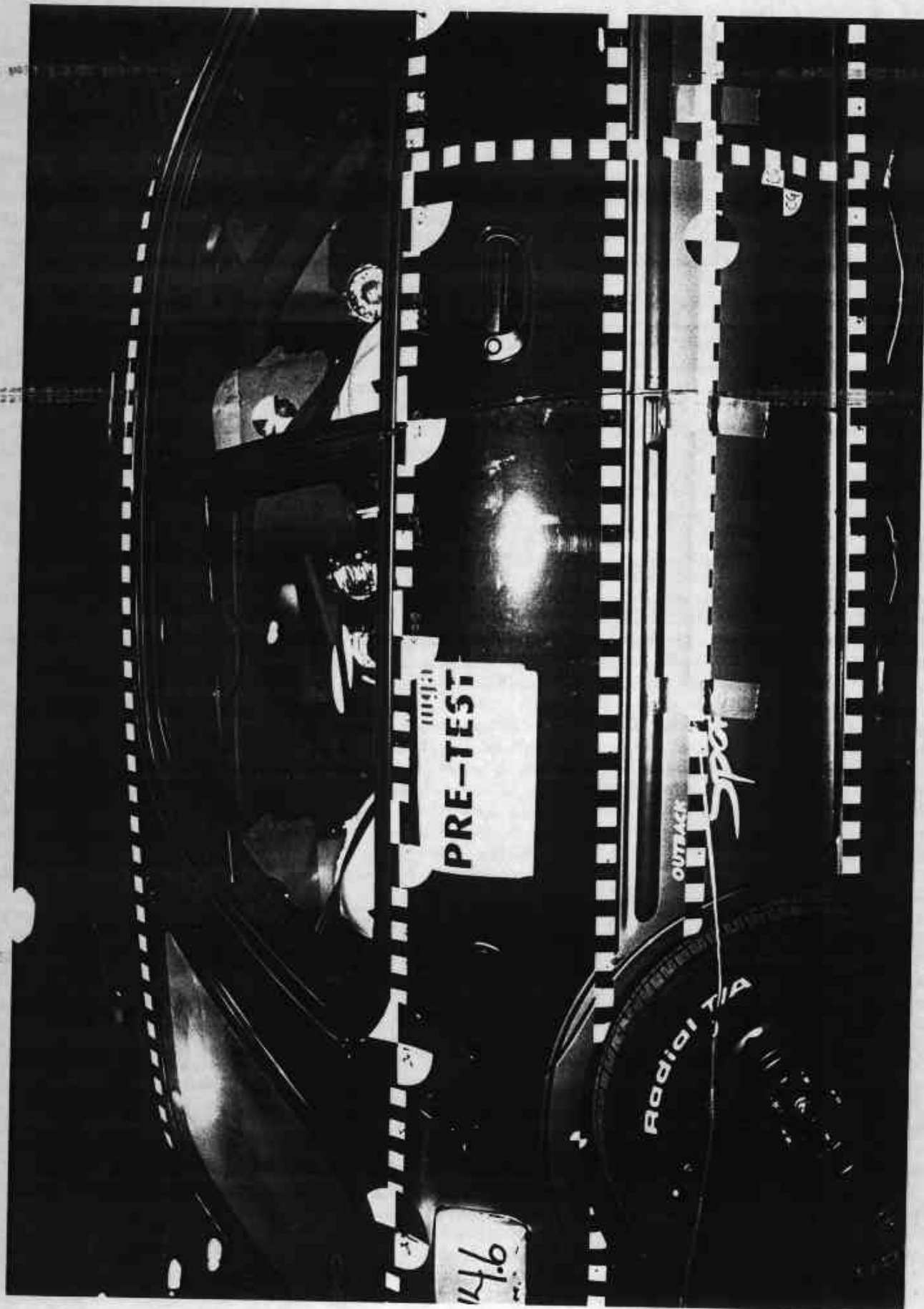


Photo No. A-32 - Pre-Test Rear Passenger Dummy Right Side View

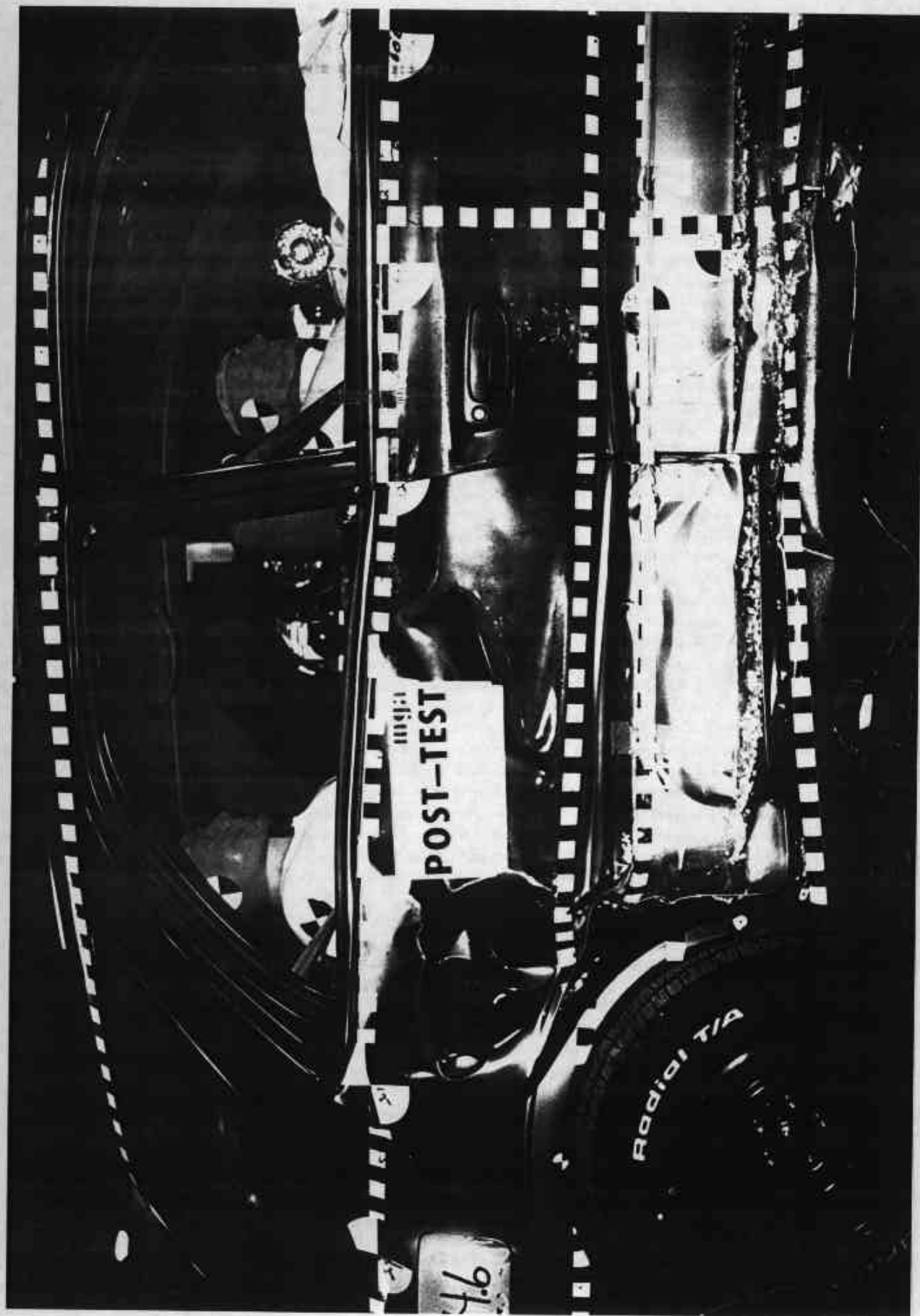


Photo No. A-33 - Post-Test Rear Passenger Dummy Right Side View

A-33

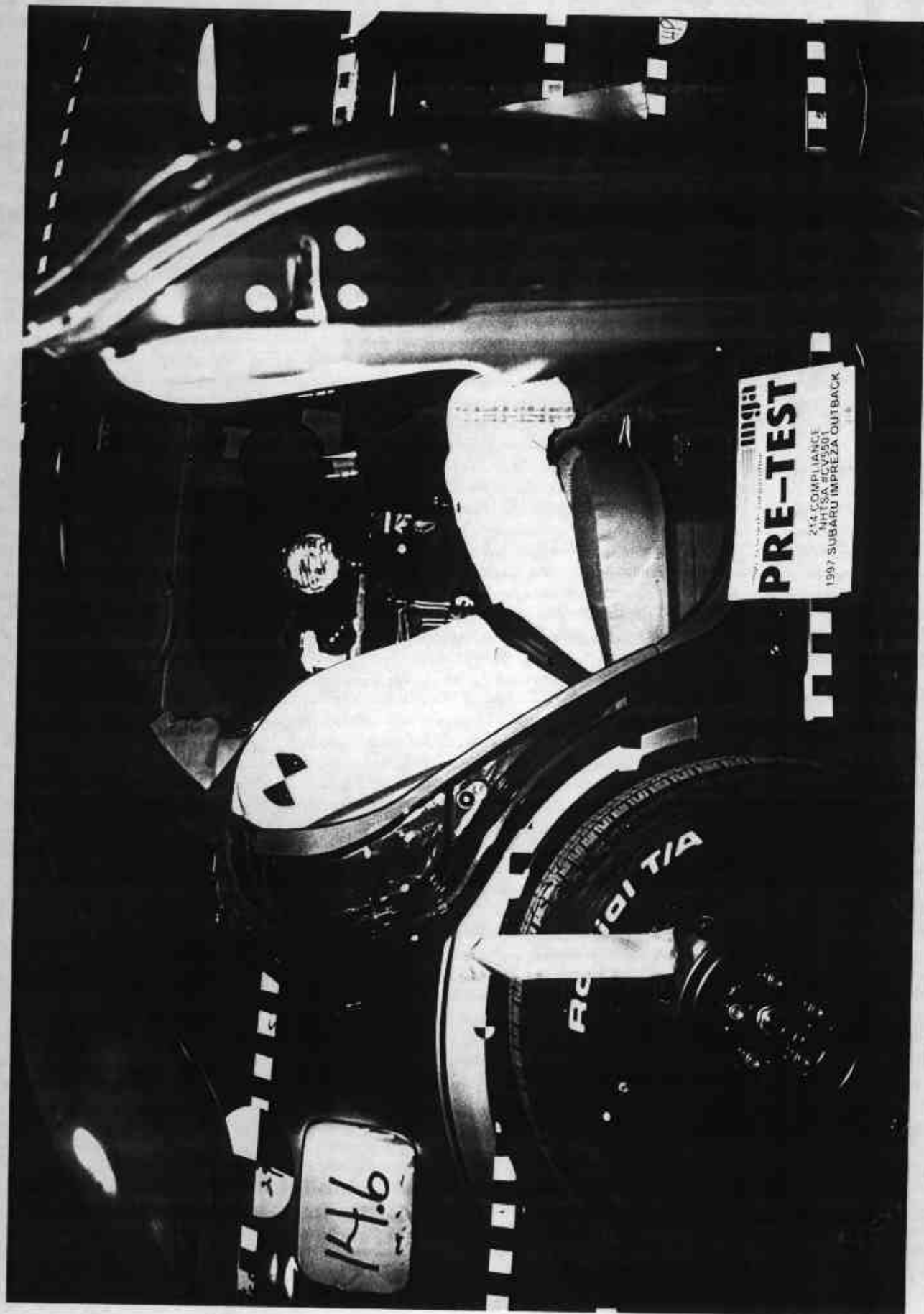


Photo No. A-34 - Pre-Test Rear Passenger Dummy Right Side View (Door Open)



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

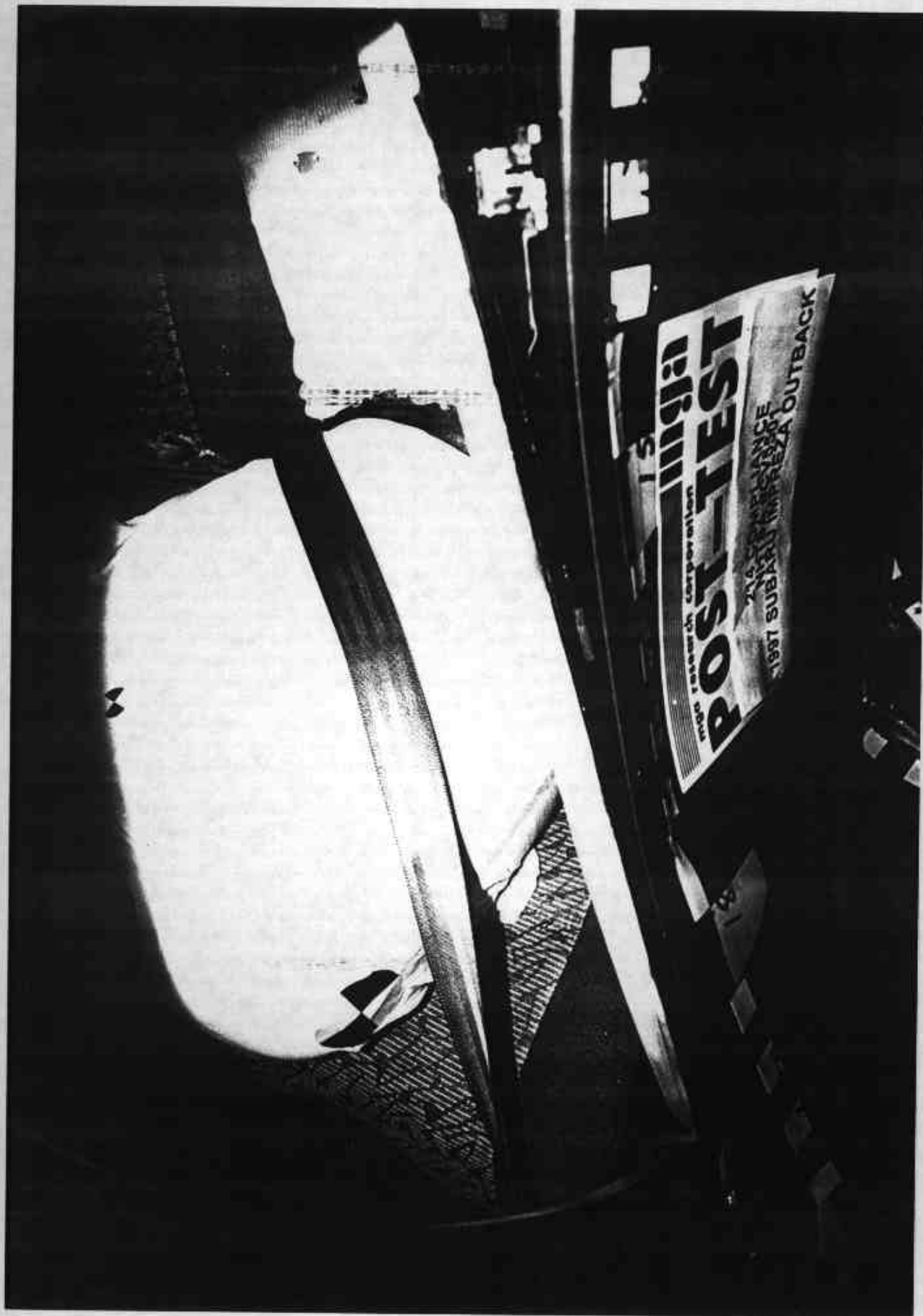


Photo No. A-36 - Post-Test Rear Passenger Dummy Shoulder View

A-36

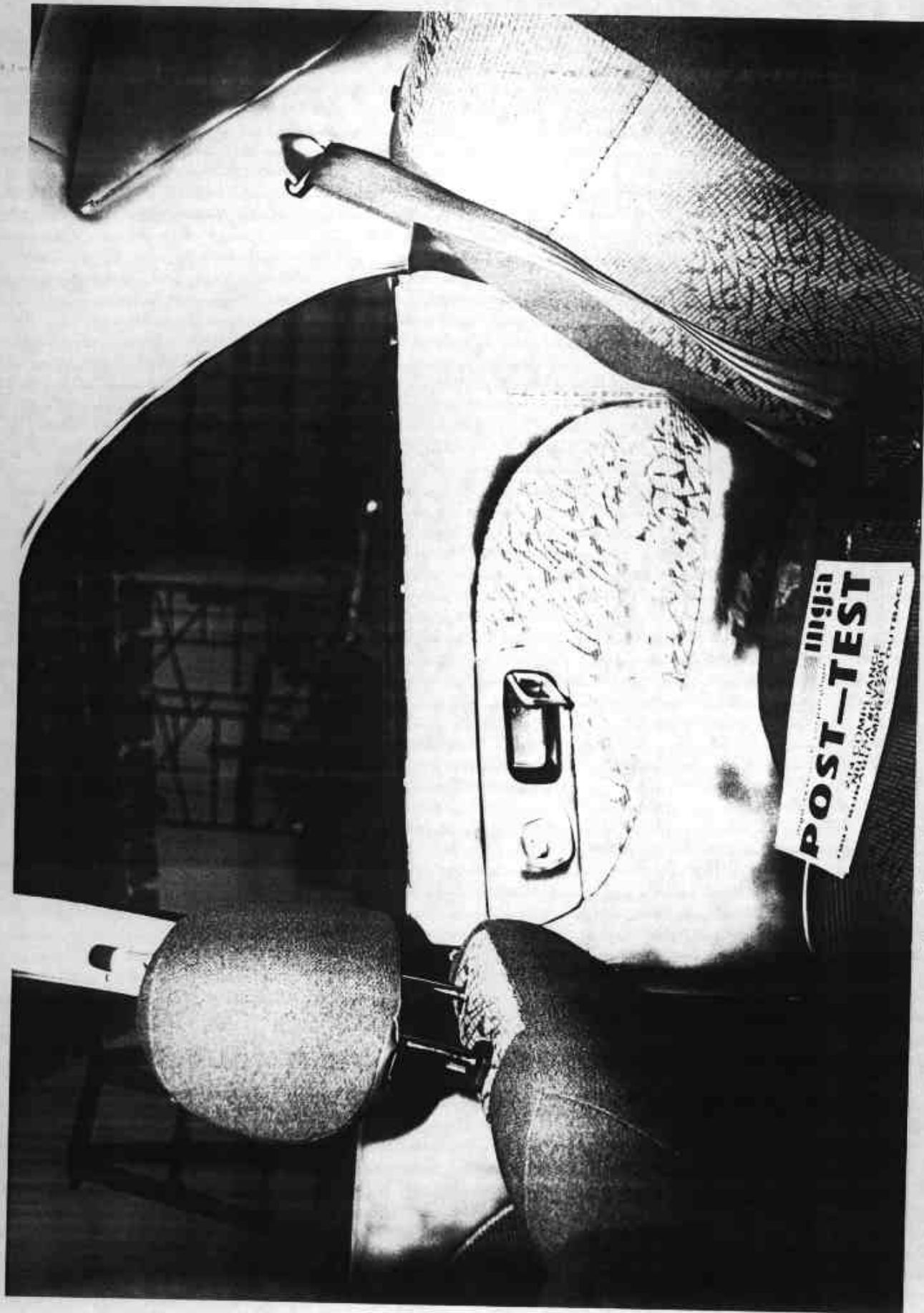


Photo No. A-37 - Post-Test Rear Passenger Dummy Contact



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

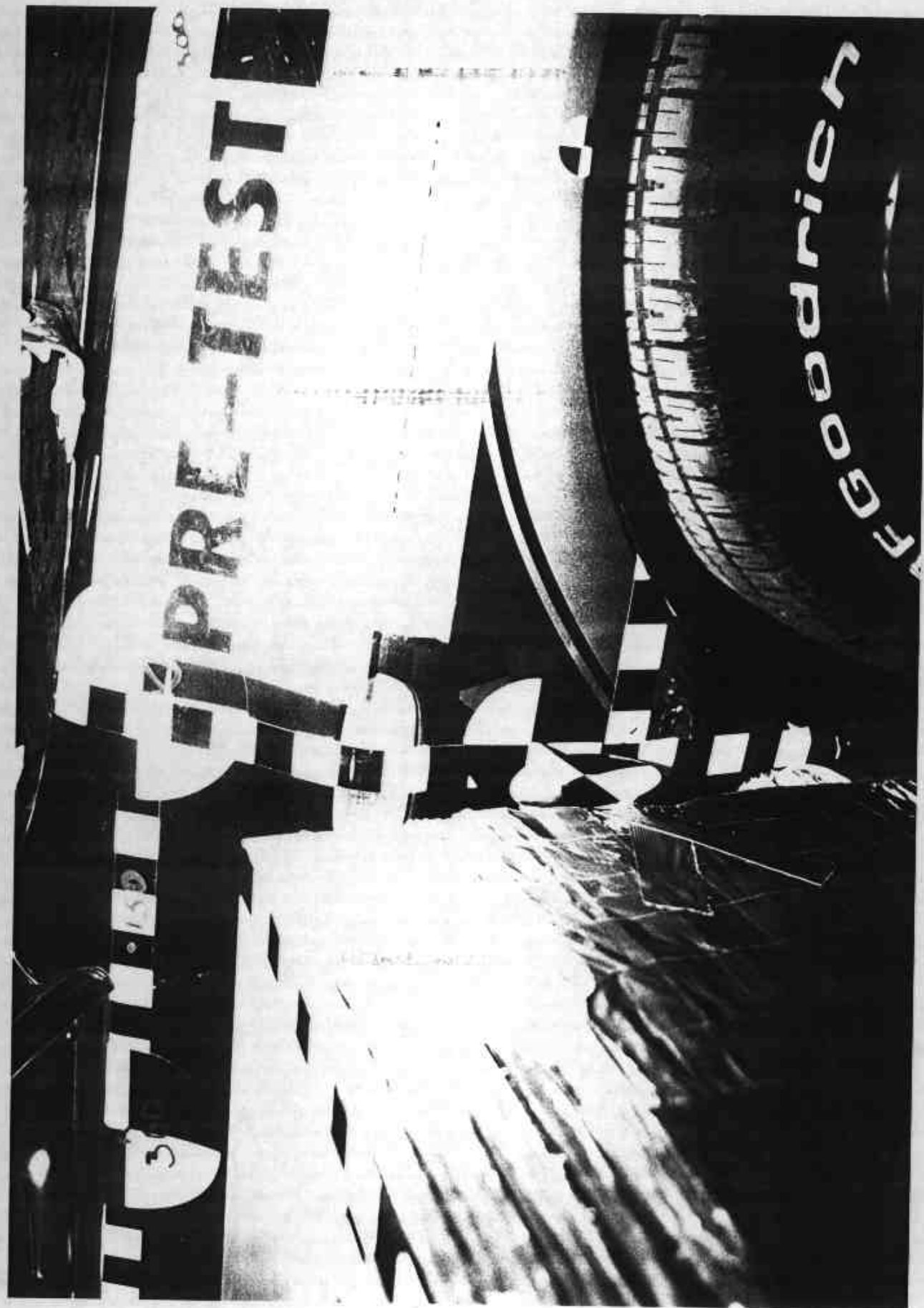
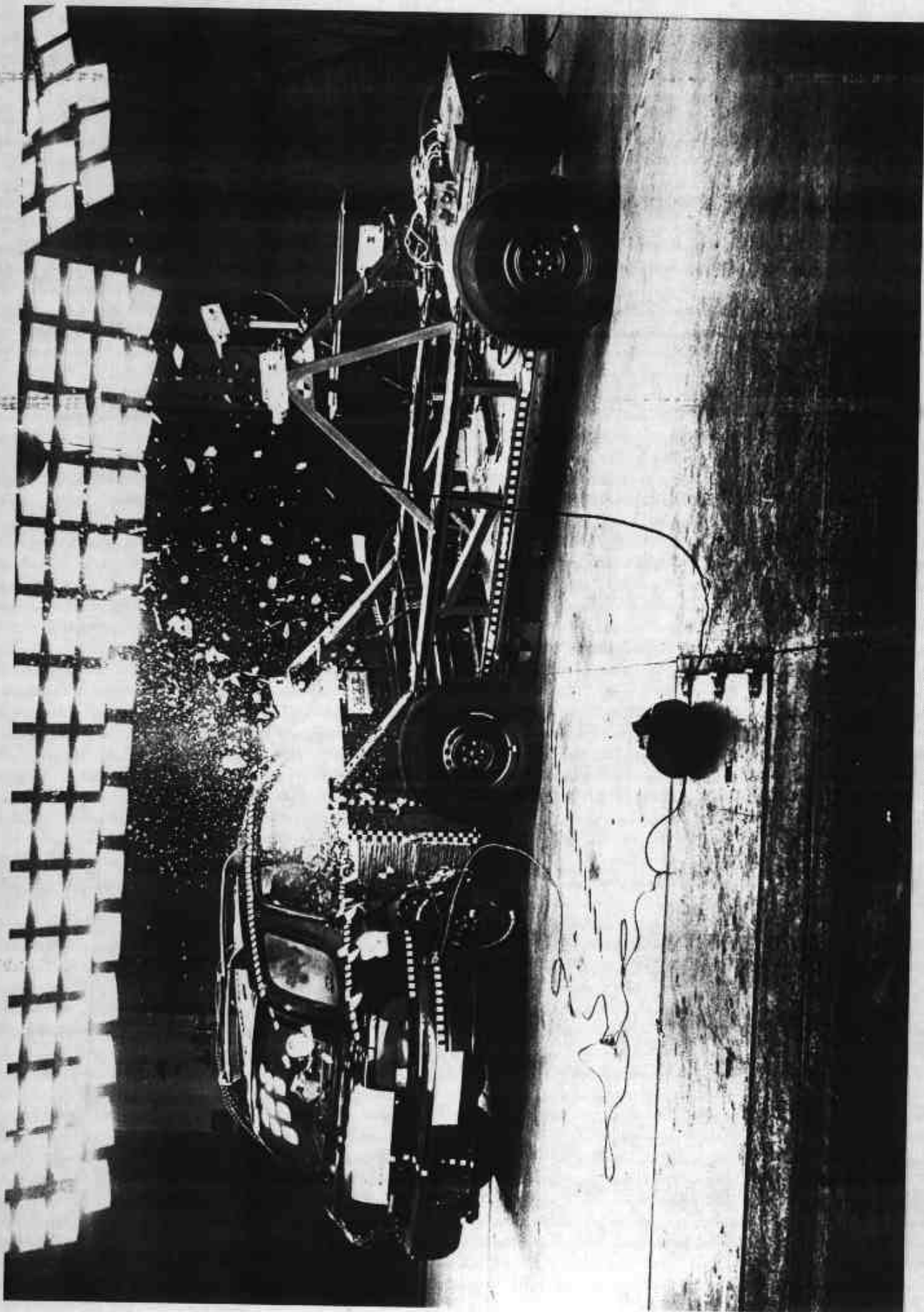


Photo No. A-39 - Pre-Test Right Front Impact Point on Vehicle



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



A-41

Photo No. A-41 - Impact

MFD BY FUJI HEAVY IND. LTD. JAPAN
MFD IN 08/95

GVWR: 3950LB(1792KG)
GAWR: FRONT-1950LB(885KG)
REAR-2000LB(907KG)

THIS VEHICLE CONFORMS TO ALL APPLICABLE
FEDERAL MOTOR VEHICLE SAFETY STANDARDS
THEFT PREVENTION STANDARDS IN EFFECT
ON THE DATE OF MANUFACTURE SHOWN ABOVE

VIN JF1GF4859V6803253

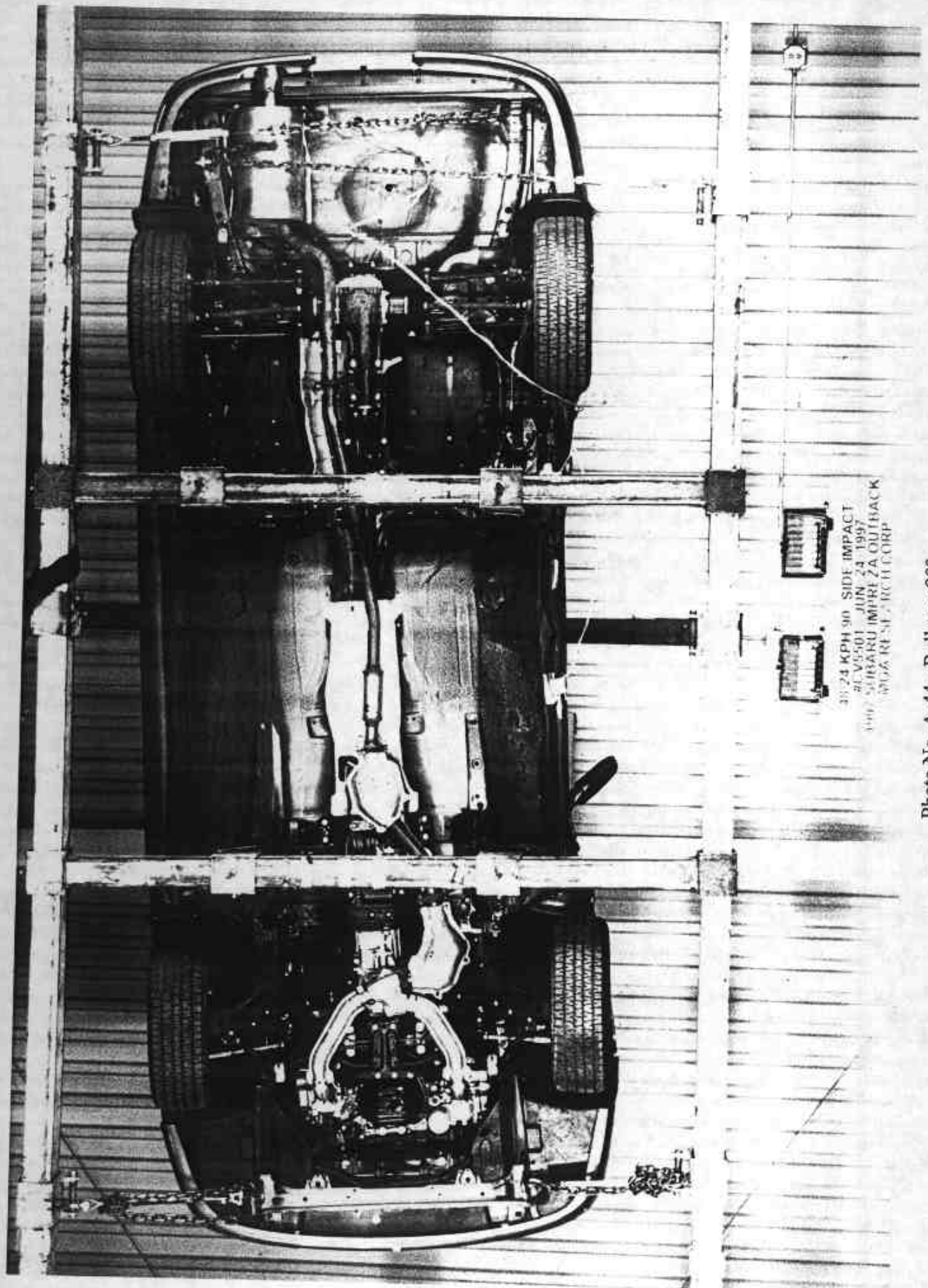
(FK)

PASSENGER CAR

Photo No. A-42 - Vehicle Certification Label



Photo No. A-43 - Tire Placard



35-24 KPH 90 SIDE IMPACT
#CV5501 JUN 24 1997
SHIBAKU IMPREZA OUTBACK
WDA REN-REI CORP

A-44

Photo No. A-44 - Rollover 90°

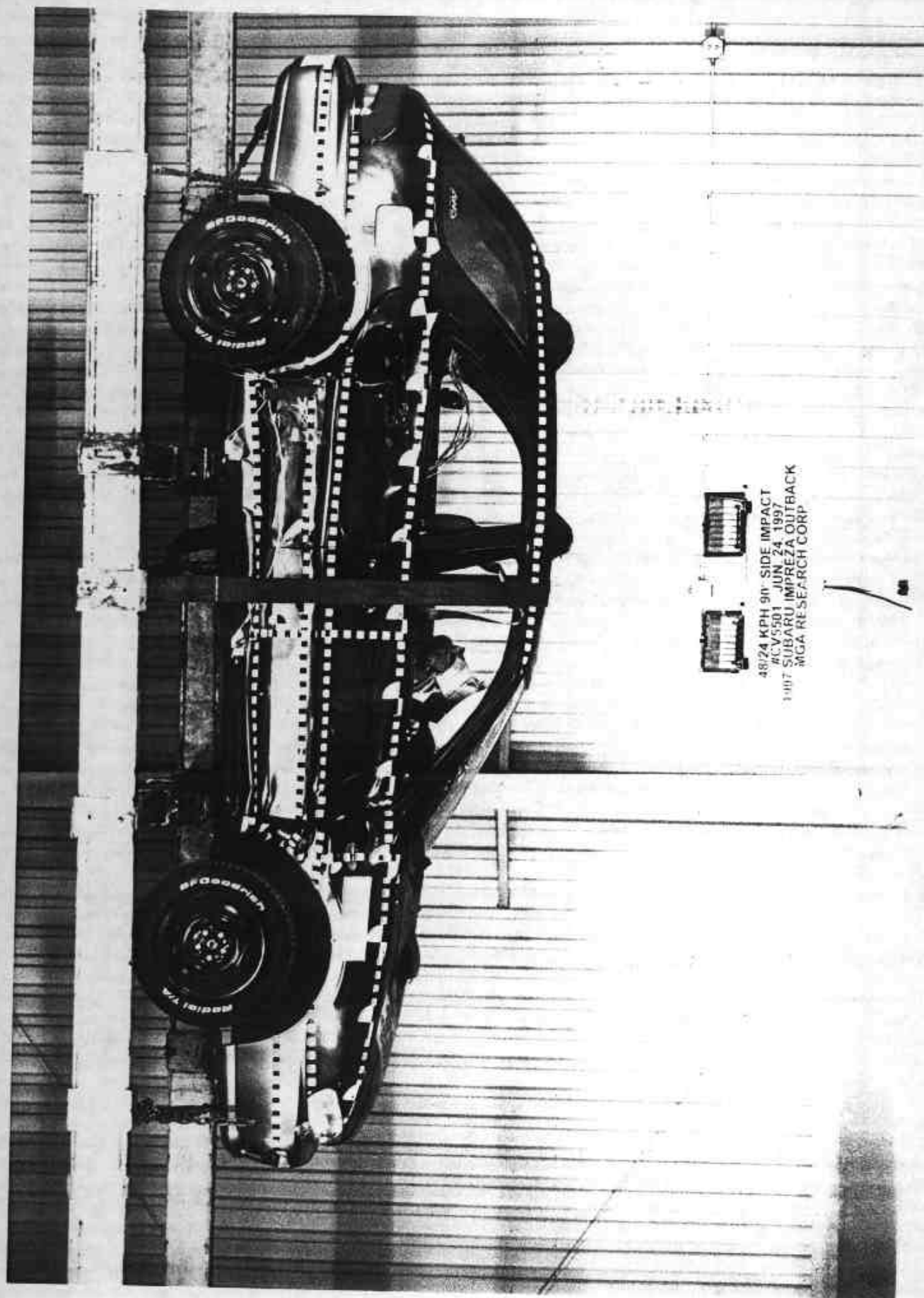
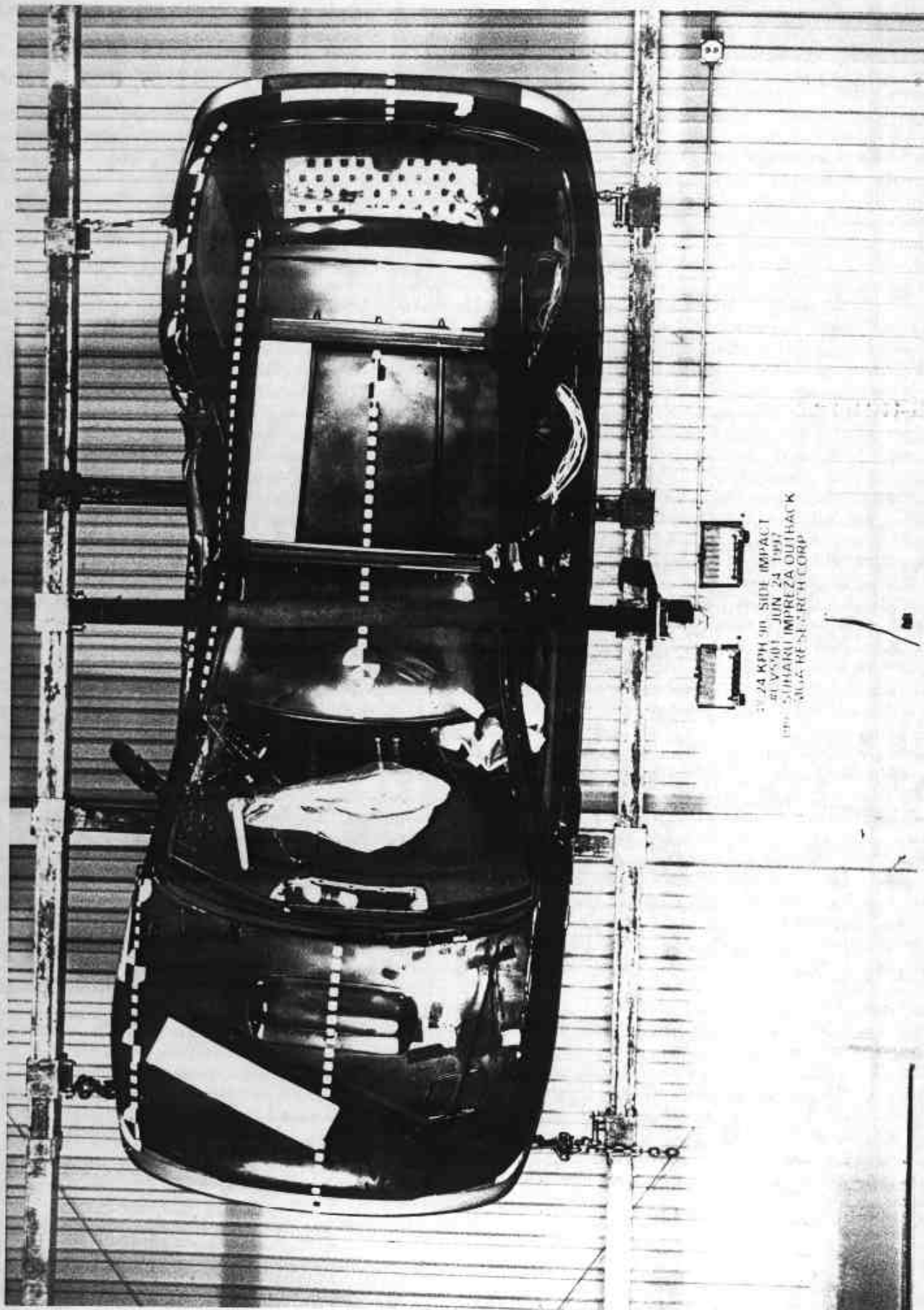
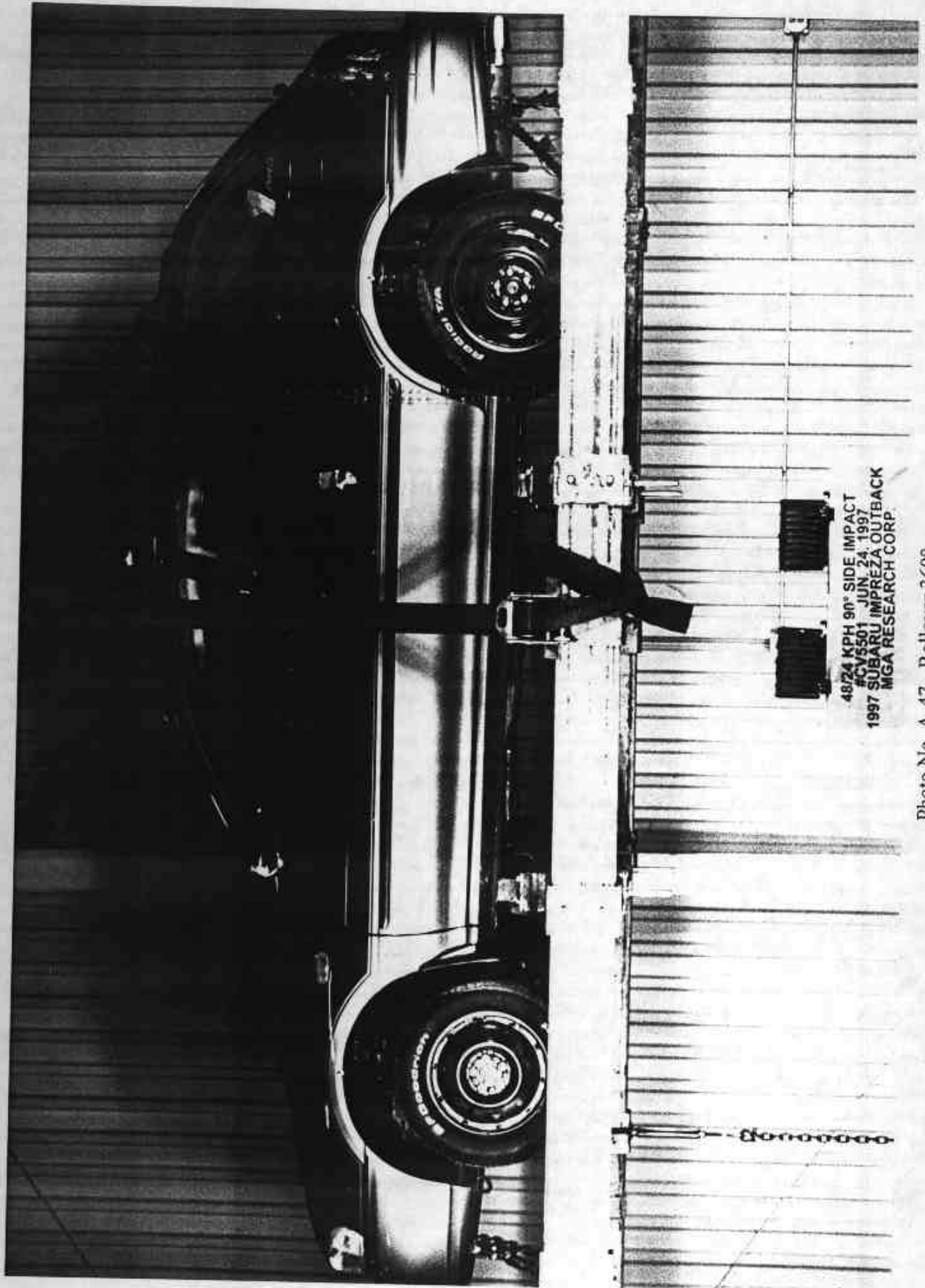


Photo No. A-45 - Rollover 180°



24 KPH 90° SIDE IMPACT
43 V5501 JUN 24 1997
SUHARI IMPREZA OUTBACK
MGA RESEARCH CORP

Photo No. A-46 - Rollover 270°



48/24 KPH 90° SIDE IMPACT
#CV5501 JUN 24, 1997
1997 SUBARU IMPREZA OUTBACK
MGA RESEARCH CORP.

Photo No. A-47 - Rollover 360°



Photo No. A-48 - Right Front Attitude Point

A-48

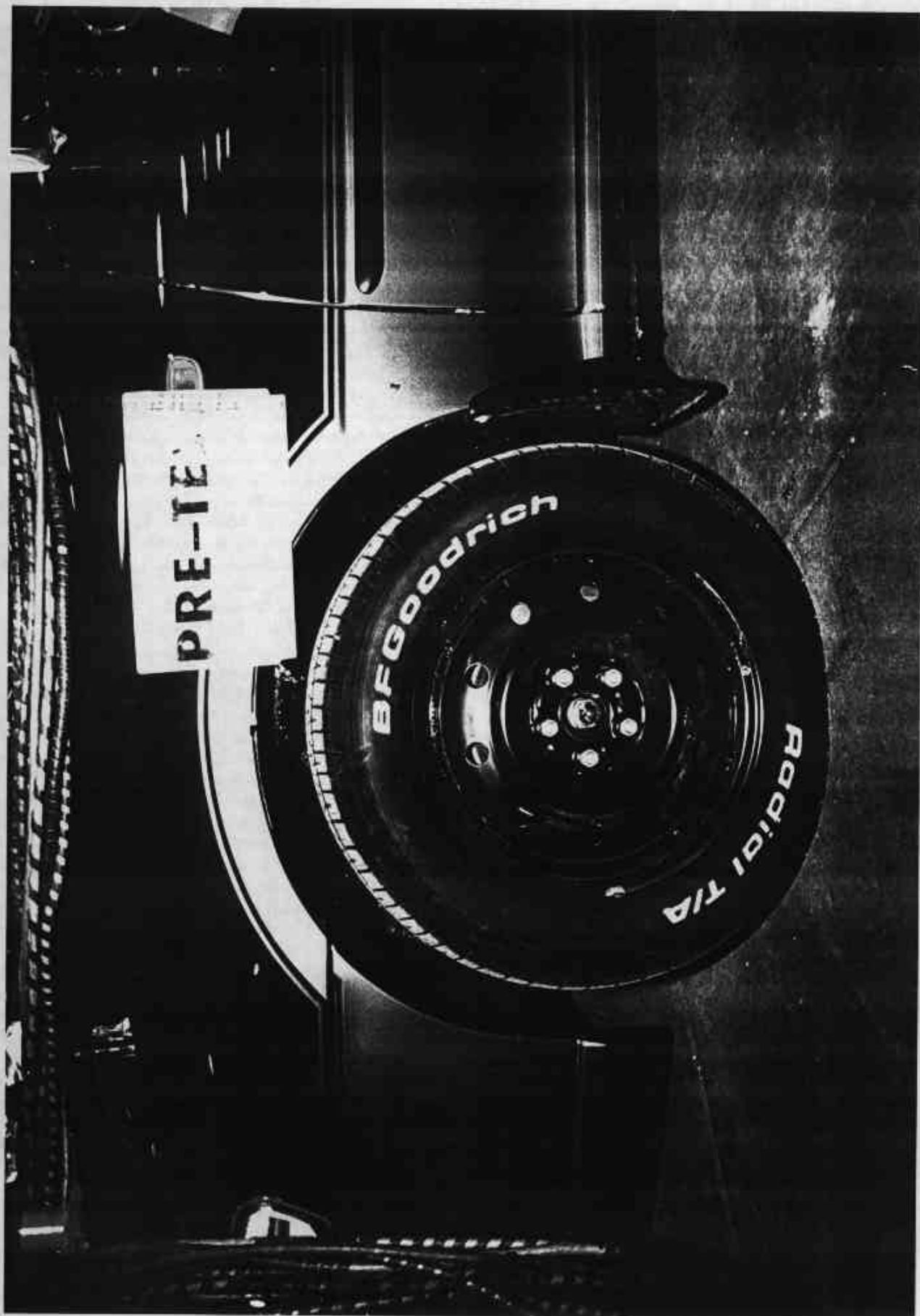


Photo No. A-49 - Left Front Attitude Point

A-49

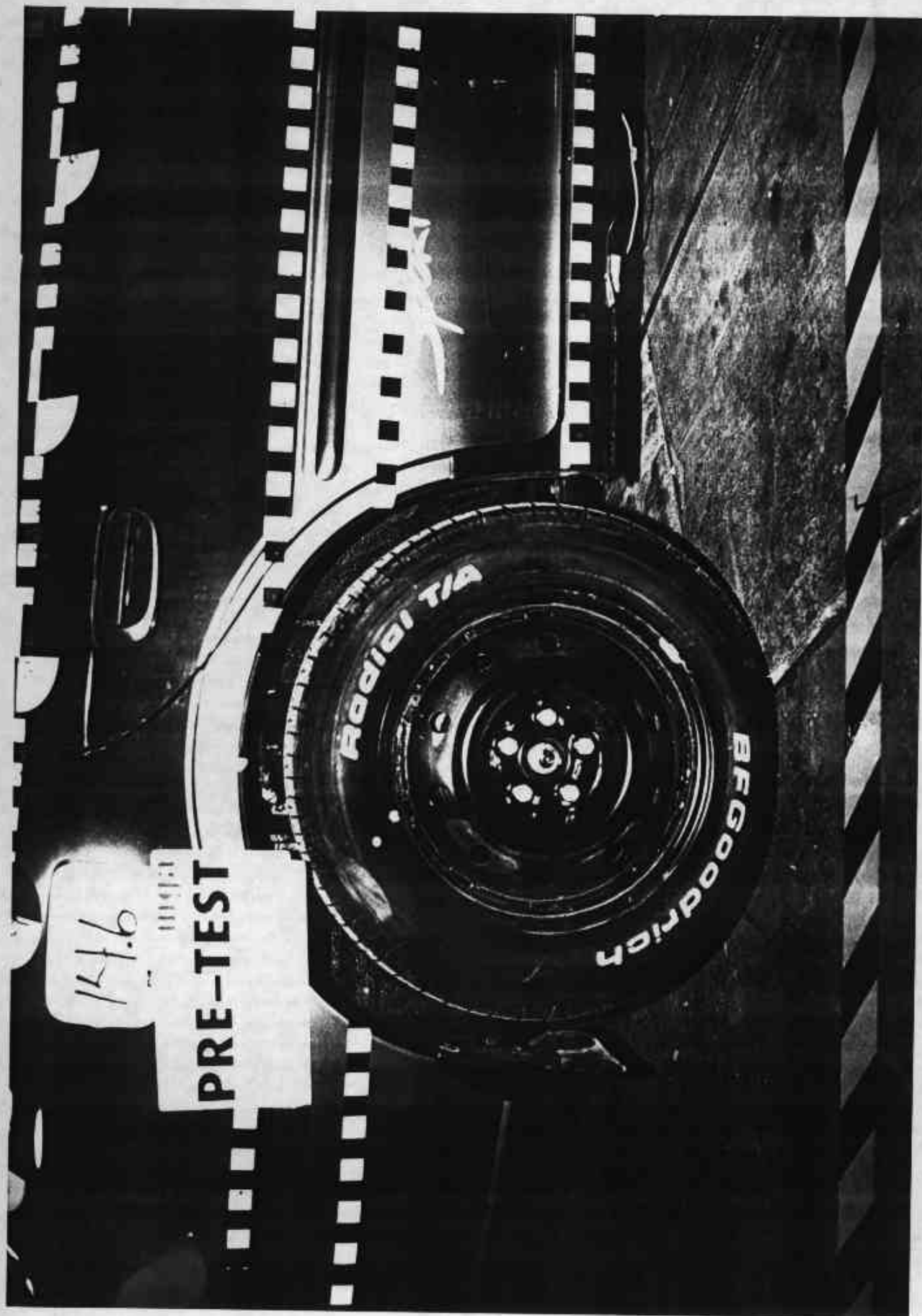


Photo No. A-50 - Right Rear Attitude Point

A-50



Photo No. A-51 - Left Rear Attitude Point

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FIR Filter

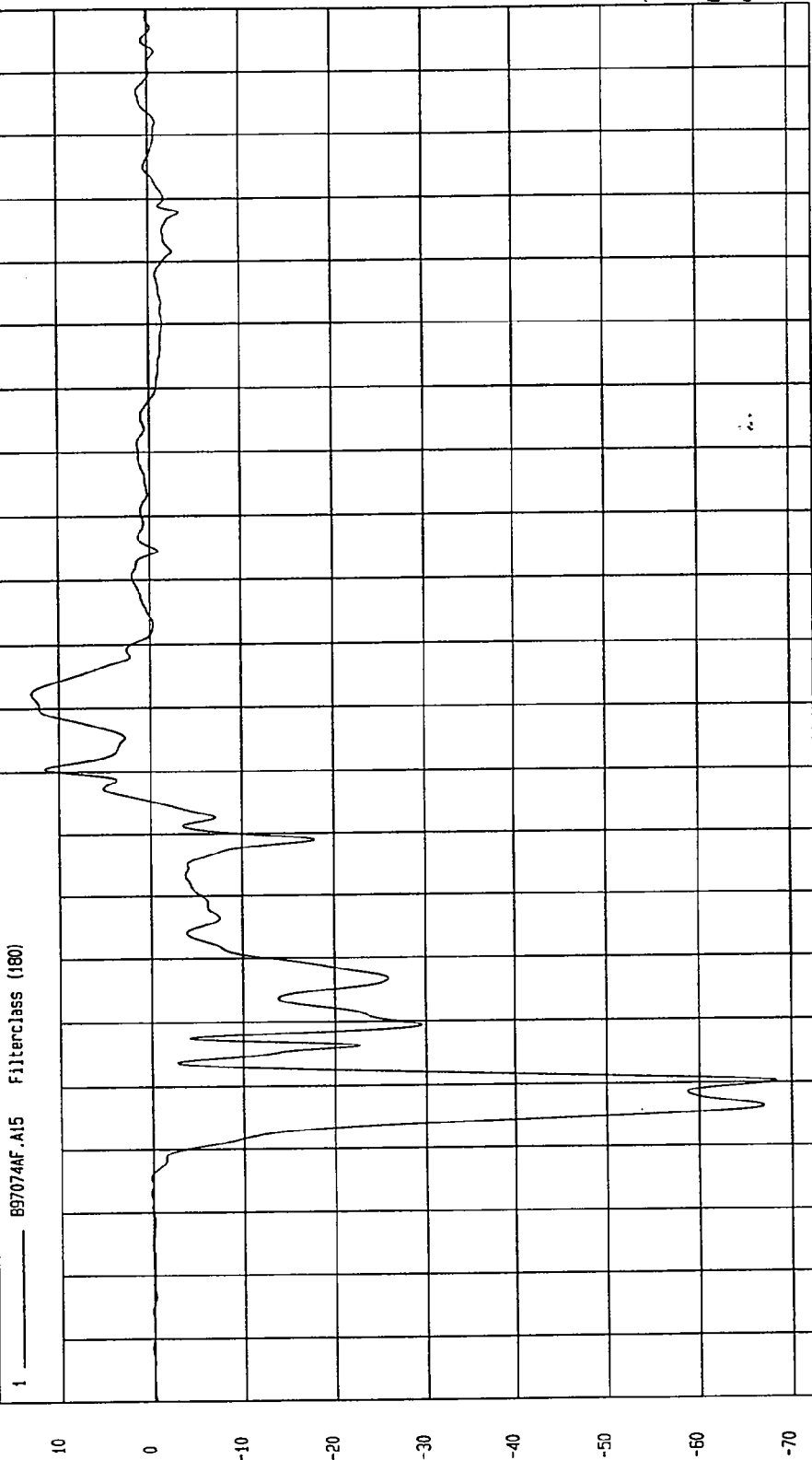
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TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -68.40 G'S at 30 msec Maximum = 13.02 G'S at 92 msec

FRONT PASSENGER UPPER RIB Y ACCELERATION



TIME (SECONDS)

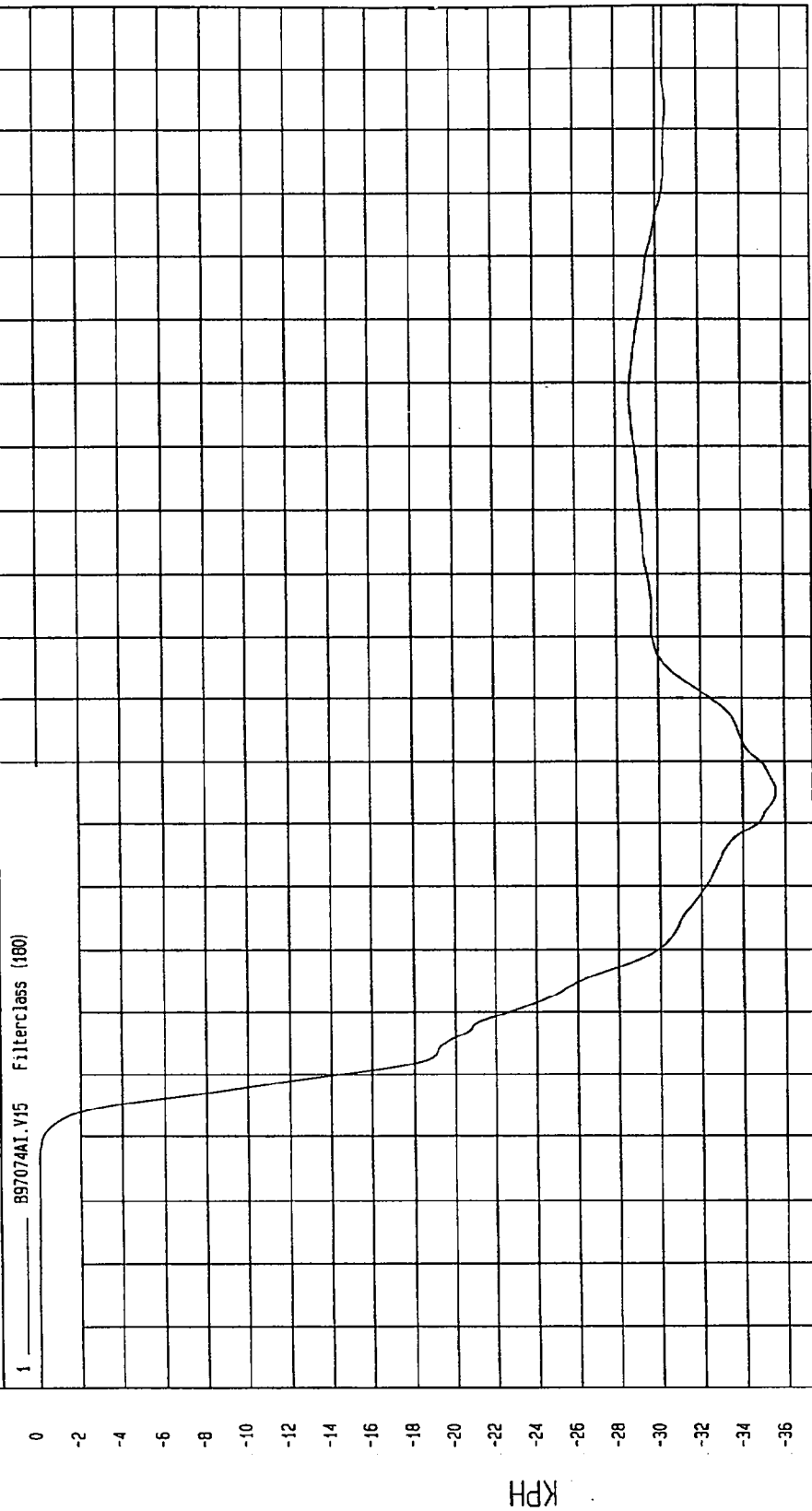
MSA Research
06-22-1997 16:31

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -35.56 KPH at 75 msec Maximum = 0 KPH at -20 msec

FRONT PASSENGER UPPER RIB Y VELOCITY



TIME Seconds

NCA Research
06-22-1997 18:23

TEST: FMVSS 214 RIGHT SIDE IMPACT

TEST DATE: 06-24-1997

SPEED: 32.87 MPH 52.9 KPH

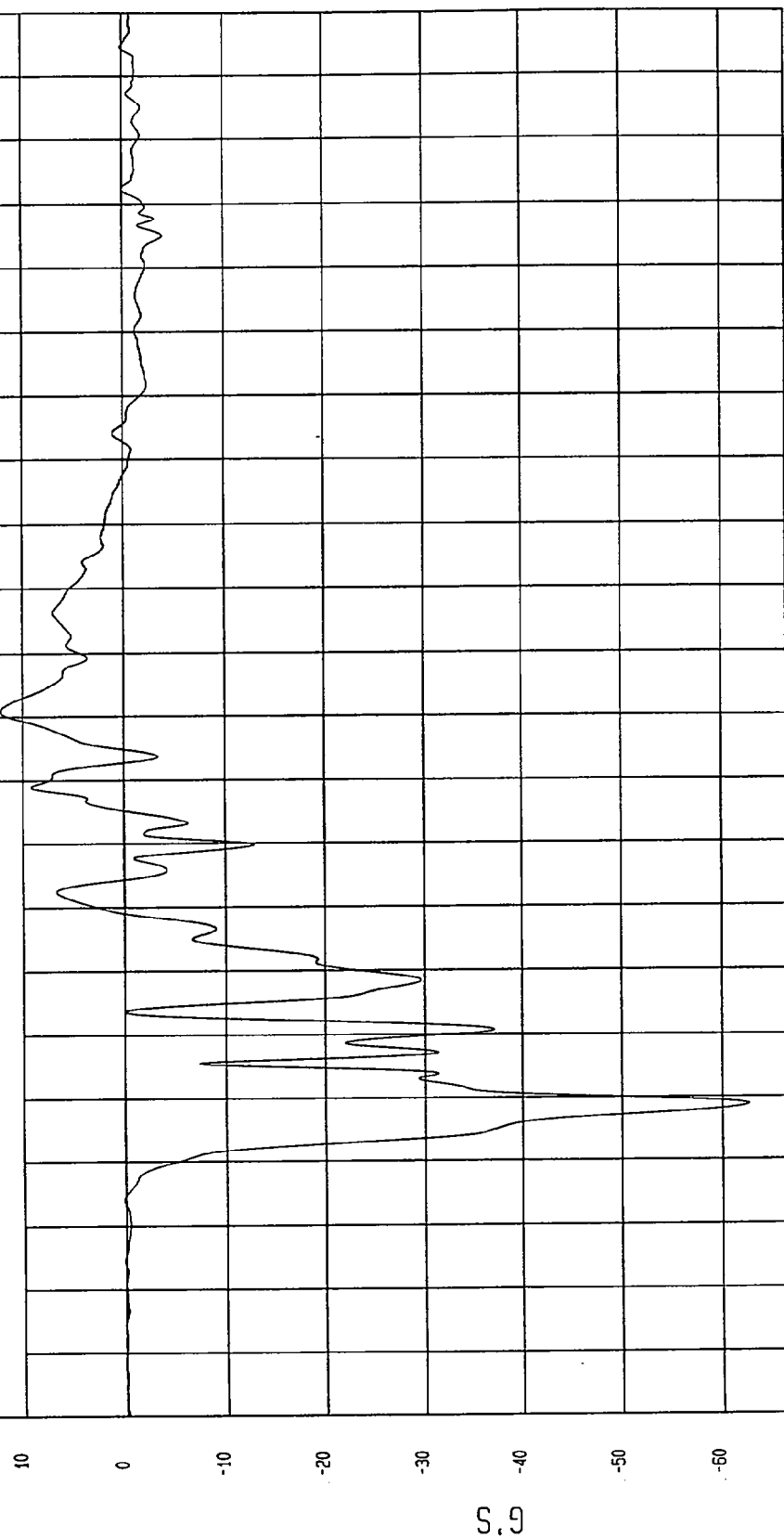
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR

Maximum = 12.17 G's at 91 msec

Minimum = -62.62 G's at 29 msec

FRONT PASSENGER LOWER RIB Y ACCELERATION

1 B97074AF.A16 Filterclass (180)



NGA Research
06-22-1997 18:31

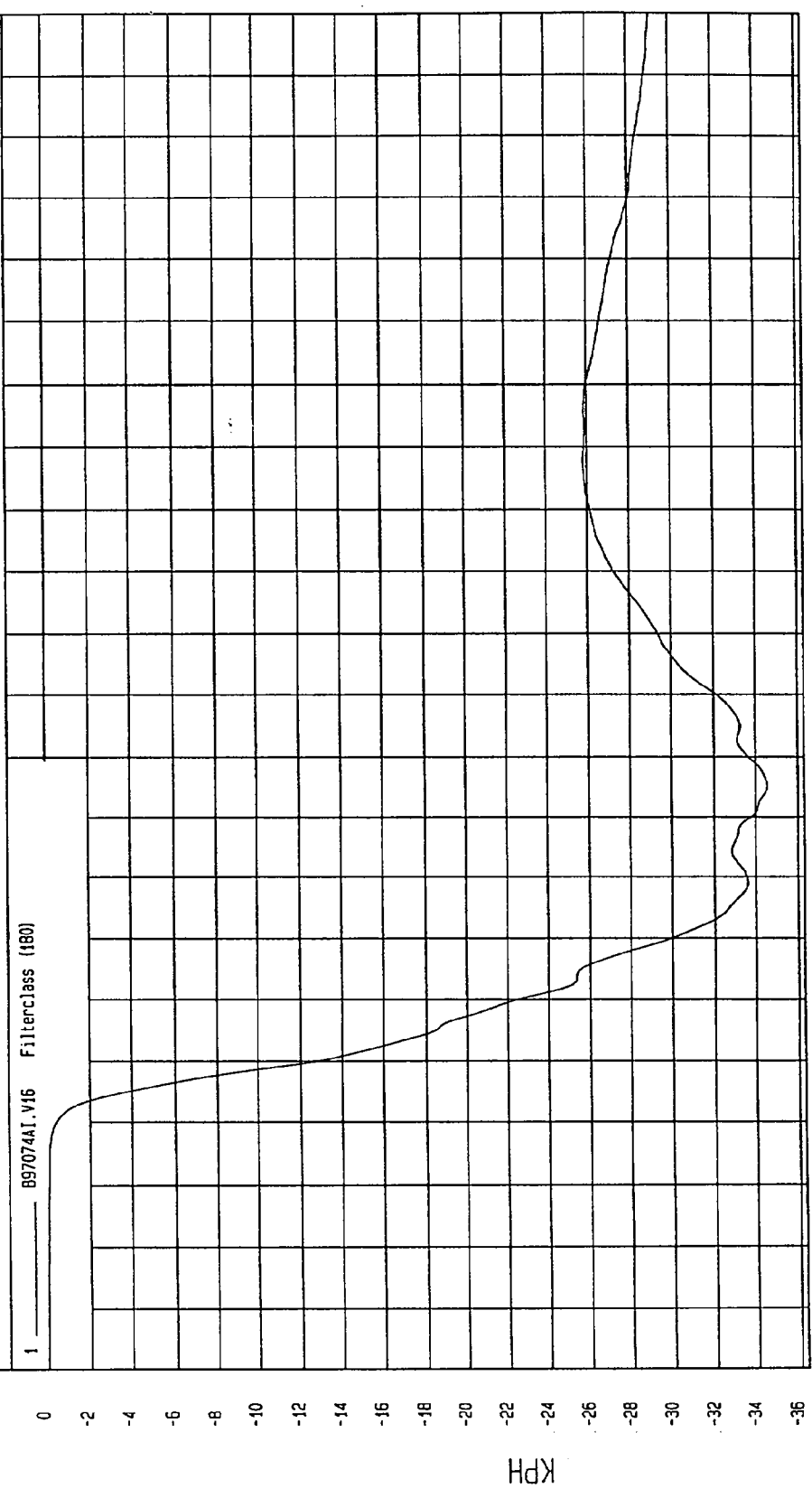
TIME (SECONDS)

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -34.56 KPH at 75 msec Maximum = 0 KPH at -20 msec

FRONT PASSENGER LOWER RIB Y VELOCITY



TIME Seconds

NCA Research
06-22-1997 18:23

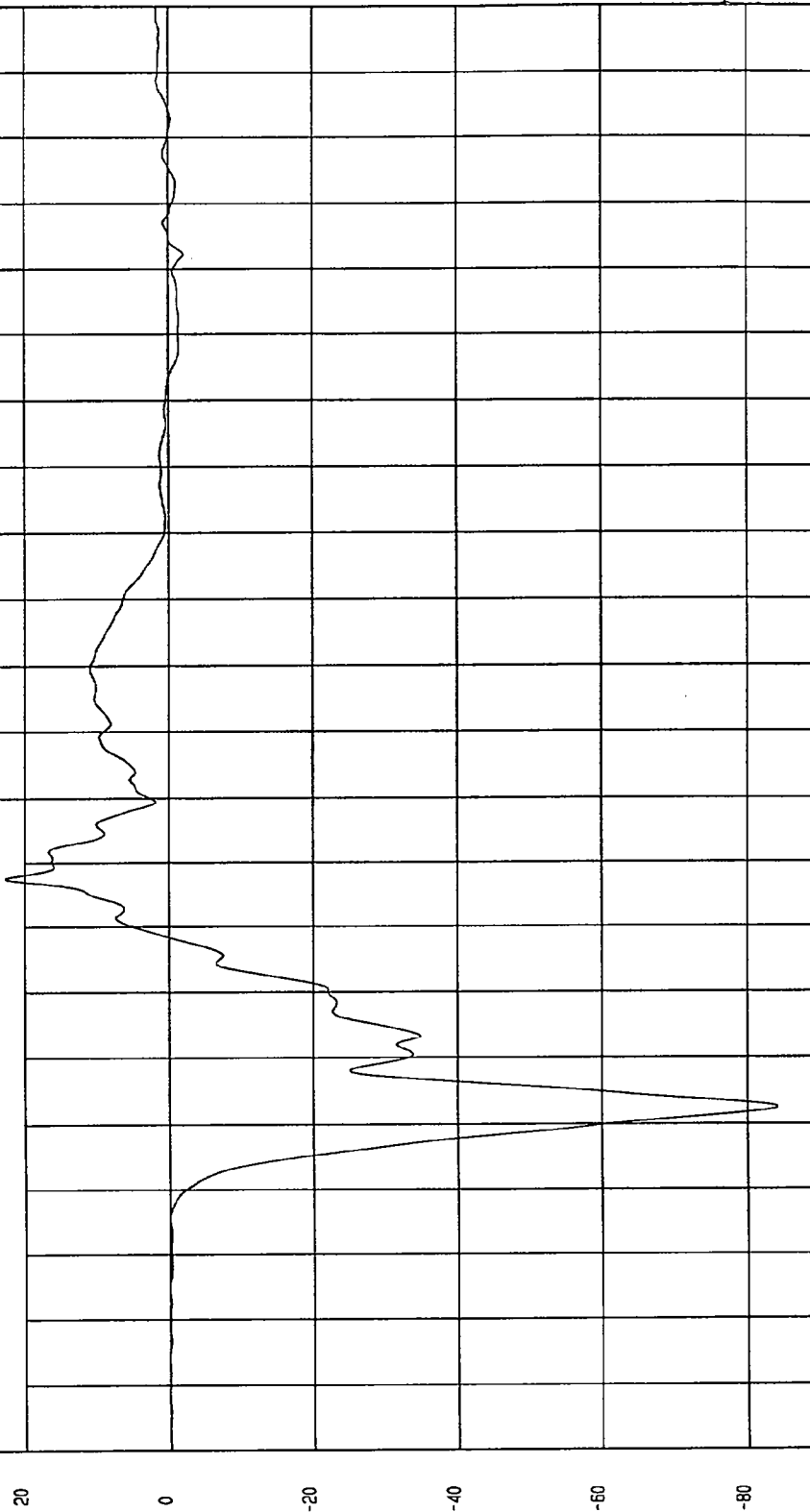
TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -84.12 G'S at 32 msec Maximum = 22.65 G'S at 68 msec

FRONT PASSENGER LOWER SPINE Y ACCELERATION

1 ——— B97074AF.A17 Filterclass (100)



TIME (SECONDS)

MOA Research
06-22-1997 16:31

TEST DATE: 06-24-1997

TEST: FMVSS 214 RIGHT SIDE IMPACT

Speed: 32.87 MPH 52.9 KPH

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR

Maximum = 0 KPH at -20 msec

Minimum = -40.68 KPH at 58 msec

FRONT PASSENGER LOWER SPINE Y VELOCITY

1 897074A1.V17 Filterclass (180)

0

-10

-20

-30

-40

KPH

.19

.18

.17

.16

.15

.14

.13

.12

.11

.1

.09

.08

.07

.06

.05

.04

.03

.02

.01

0

-.01

-.02

MOA Research
06-22-1997 18:23

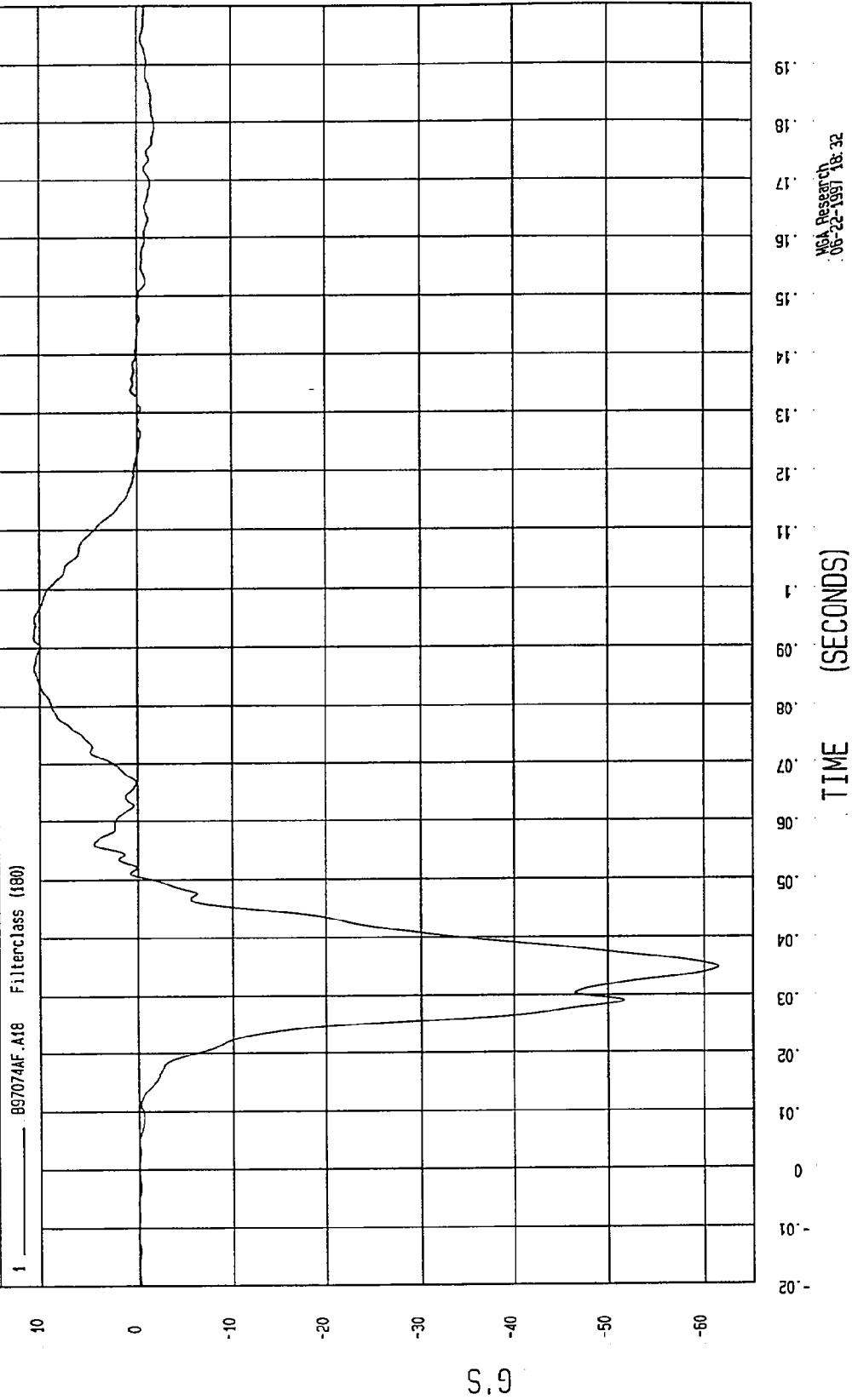
TIME Seconds

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -61.53 G'S at 35 msec Maximum = 10.63 G'S at 92 msec

FRONT PASSENGER PELVIS Y ACCELERATION

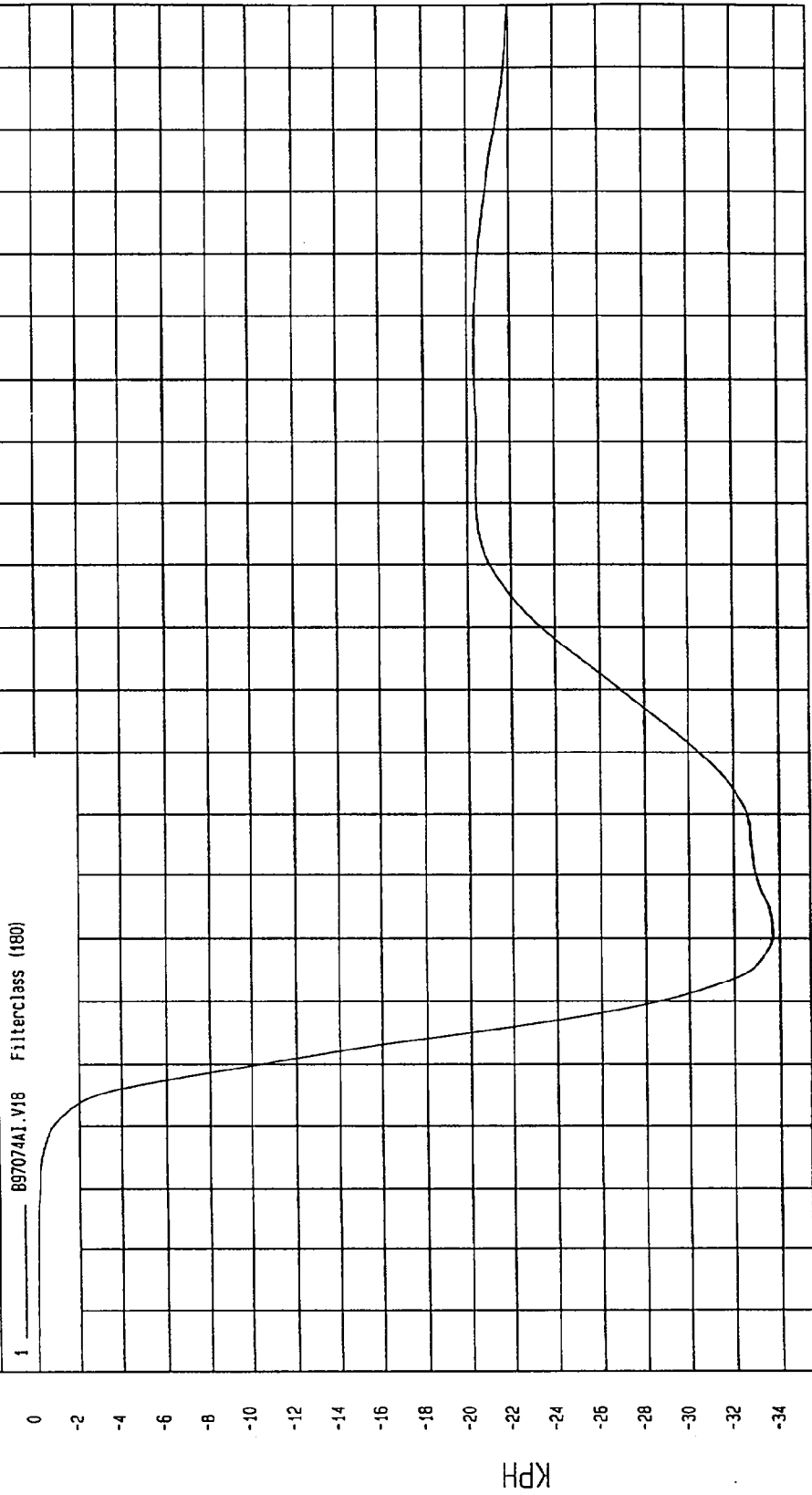


TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -33.68 KPH at 50 msec Maximum = 0 KPH at -20 msec

FRONT PASSENGER PELVIS Y VELOCITY



TIME Seconds

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

MGA Research
06-22-1997 18:24

TEST: FMVSS 214 RIGHT SIDE IMPACT

TEST DATE: 06-24-1997

Speed: 32.87 MPH 52.9 KPH

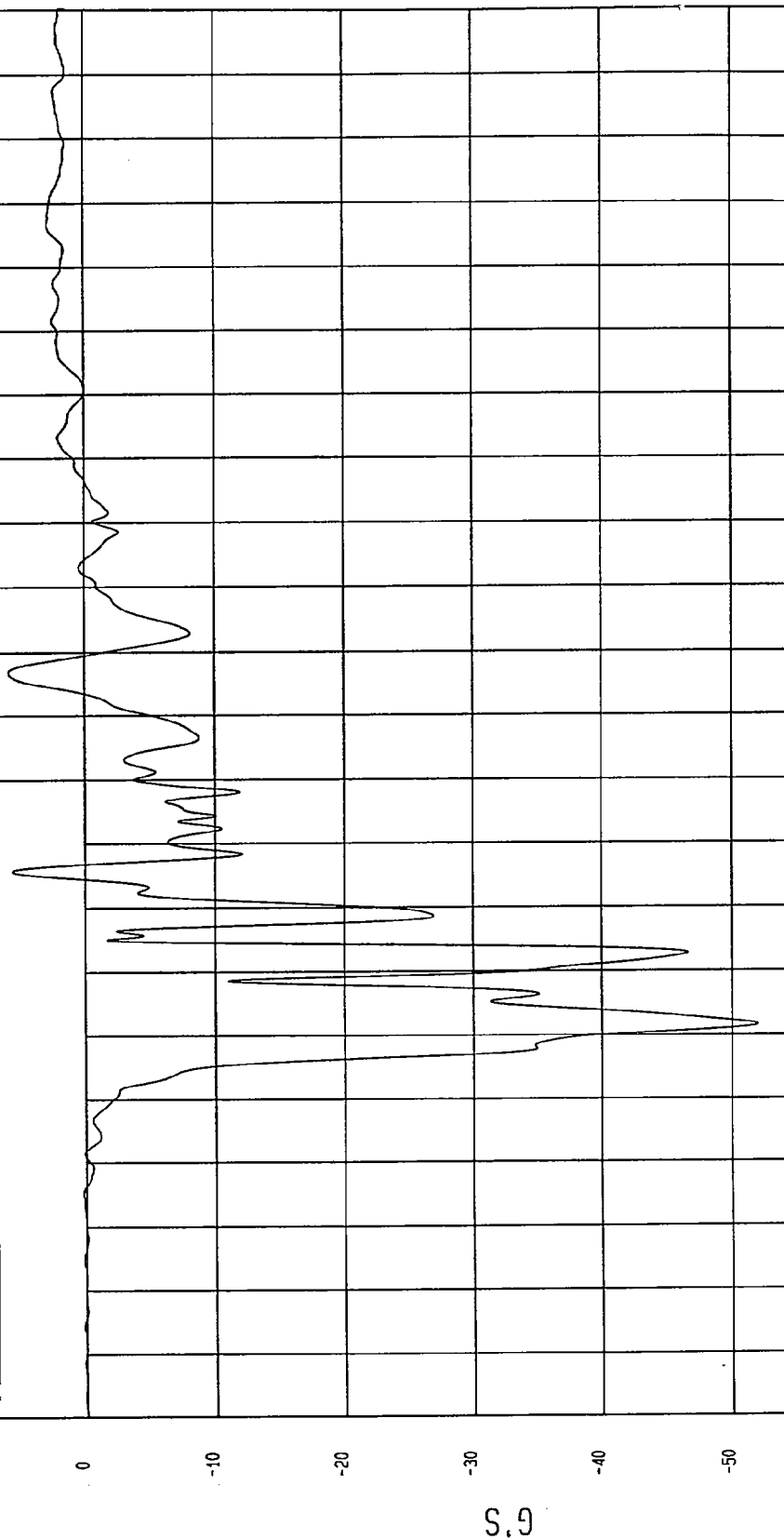
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR

Maximum = 5.72 G'S at 97 msec

Minimum = -51.99 G'S at 42 msec

REAR PASSENGER UPPER RIB Y ACCELERATION

1 _____ B97074AF.A25 Filterclass (480)



MSA Research
06-22-1997 18:32

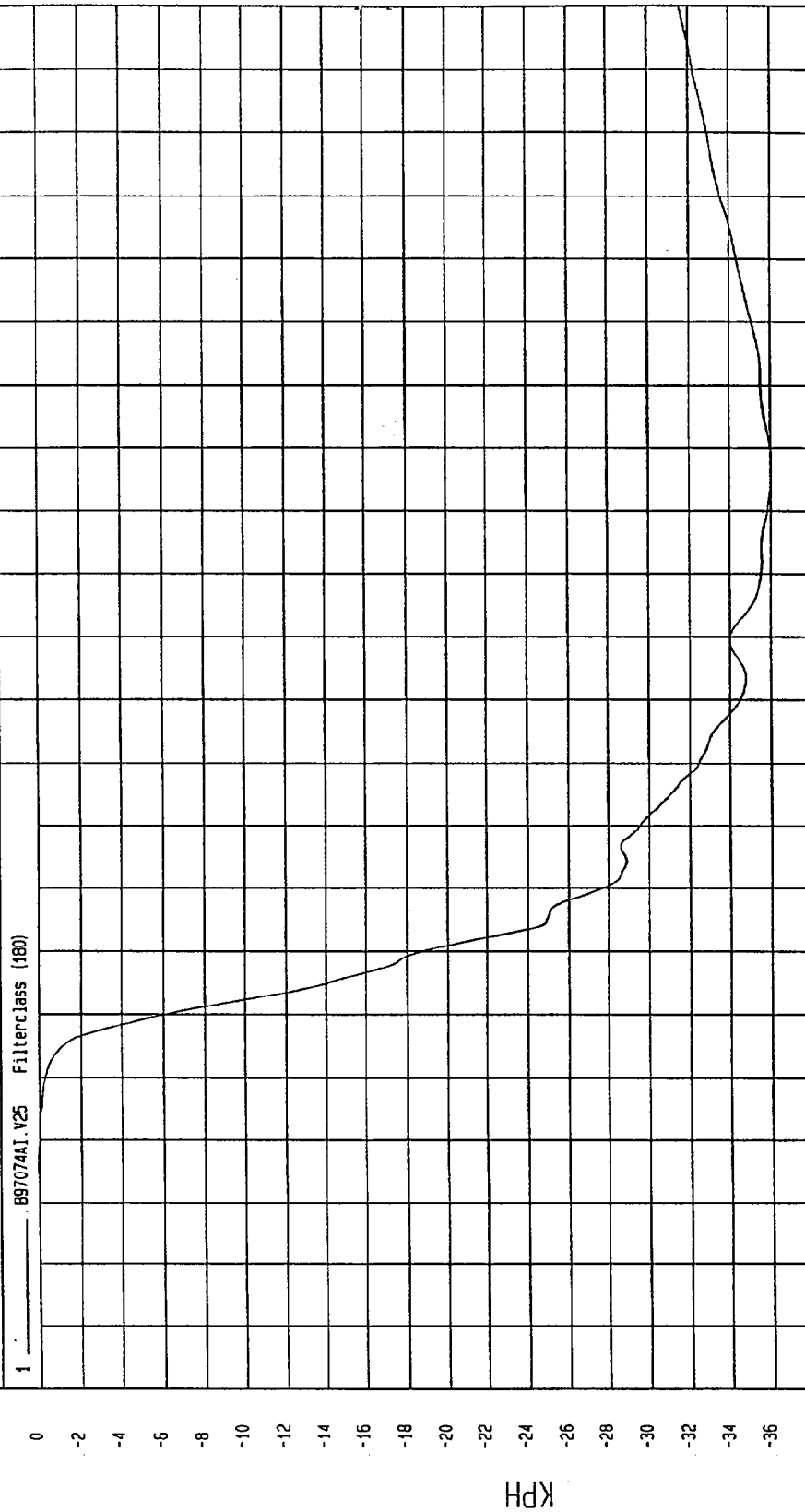
TIME (SECONDS)

G'S

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -36.04 KPH at 127 msec Maximum = .05 KPH at 16 msec

REAR PASSENGER UPPER RIB Y VELOCITY



TIME Seconds

VEA Research
06-22-1997 18:24

TEST DATE: 06-24-1997

TEST: FMVSS 214 RIGHT SIDE IMPACT

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Maximum = 8.84 G'S at 79 msec

Minimum = -56.00 G'S at 41 msec

REAR PASSENGER LOWER RIB Y ACCELERATION

1 ——— B97074AF.A26 Filterclass (180)

10

0

-10

-20

-30

-40

-50

G

.19

.18

.17

.16

.15

.14

.13

.12

.11

.1

.09

.08

.07

.06

.05

.04

.03

.02

.01

0

-.01

-.02

TIME (SECONDS)

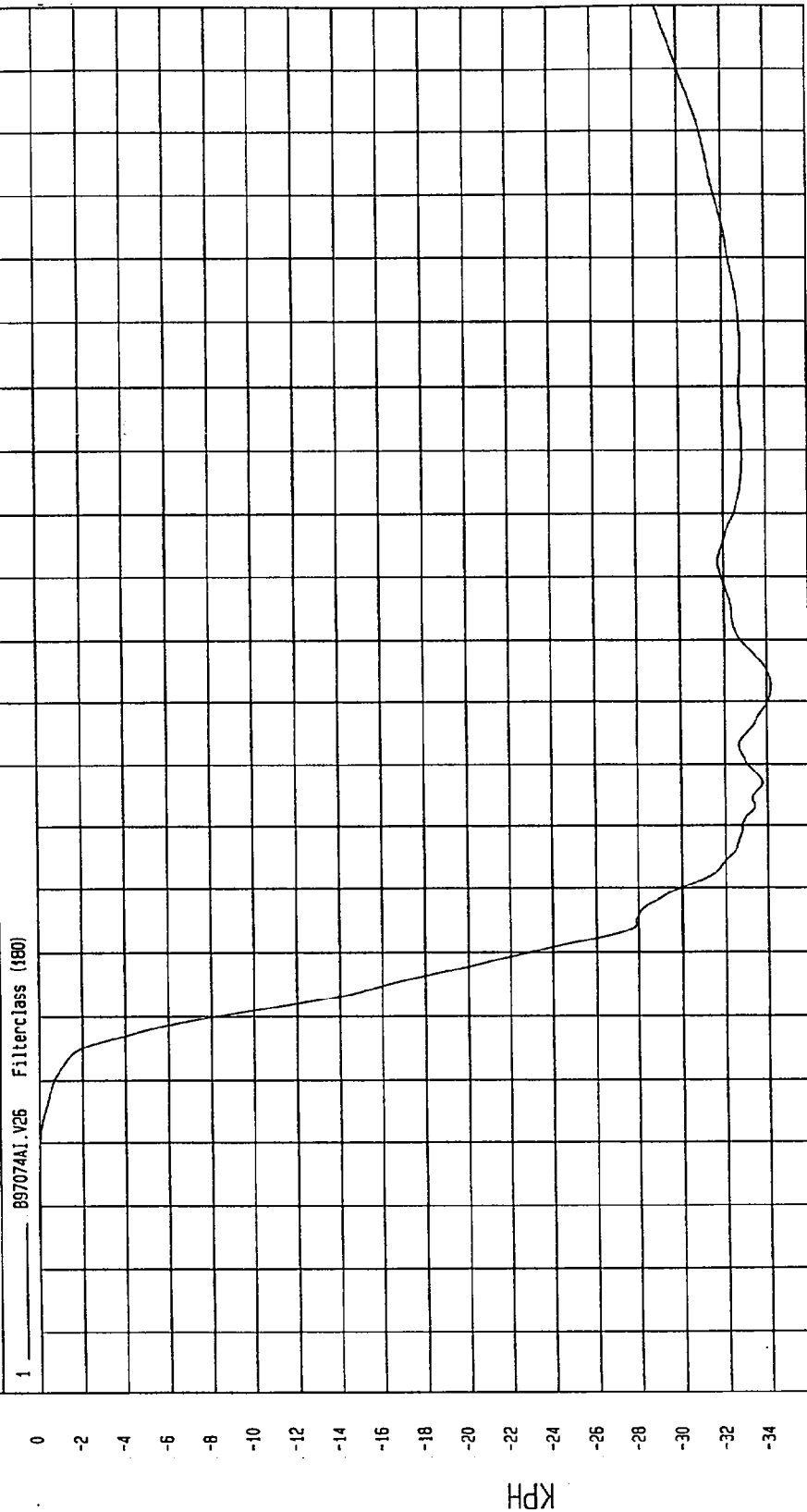
NSA Research
06-22-1997 18:32

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -34.19 KPH at 92 msec Maximum = 6.61f-02 KPH at 7 msec

REAR PASSENGER LOWER RIB Y VELOCITY



TIME Seconds

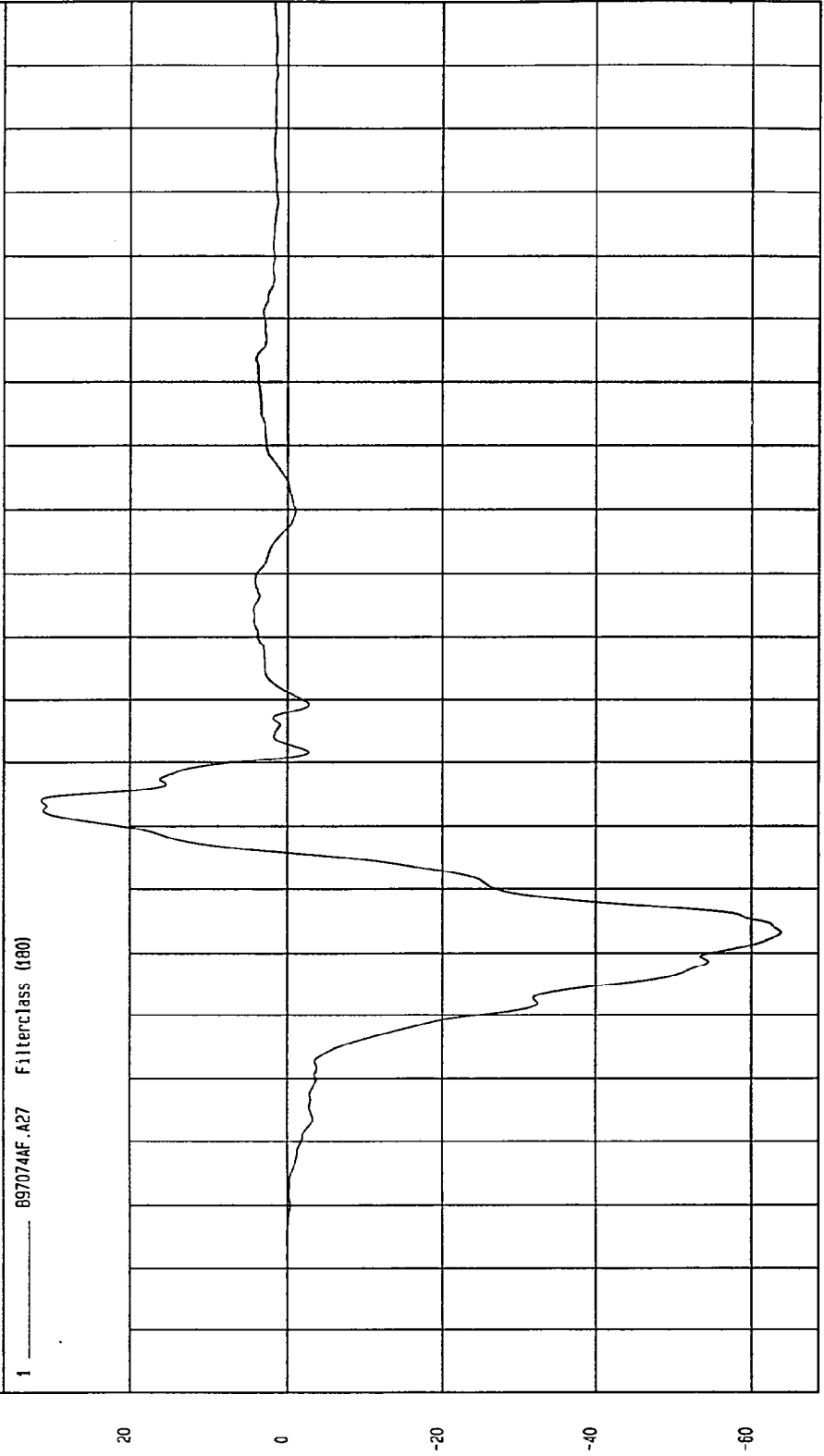
MCA Research
06-22-1997 18:24

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -63.67 G'S at 53 msec Maximum = 31.40 G'S at 74 msec

REAR PASSENGER LOWER SPINE Y ACCELERATION



TIME (SECONDS)

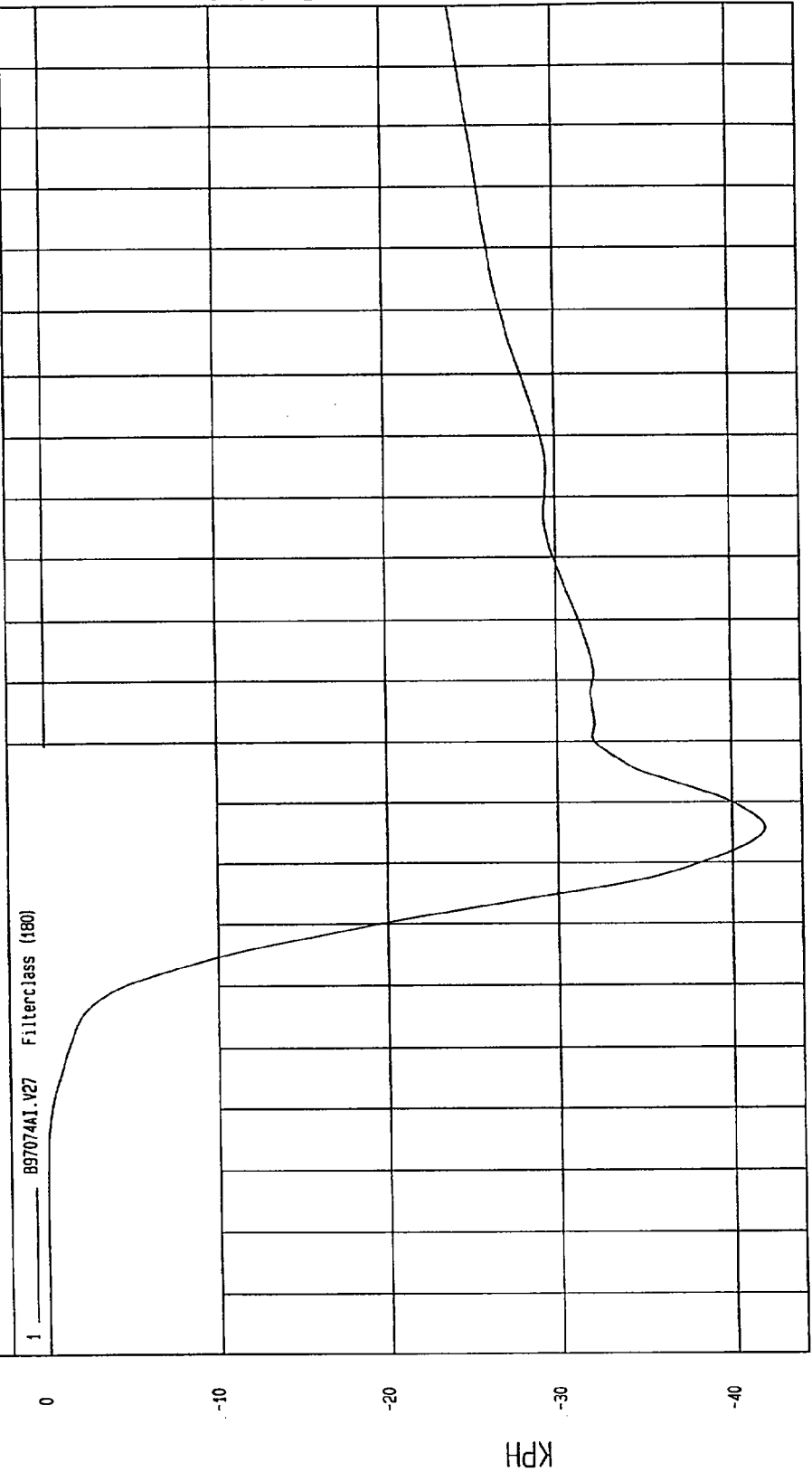
06-22-1997 16:32

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -41.68 KPH at 66 msec Maximum = 2.04E-03 KPH at 6 msec

REAR PASSENGER LOWER SPINE Y VELOCITY



TIME Seconds

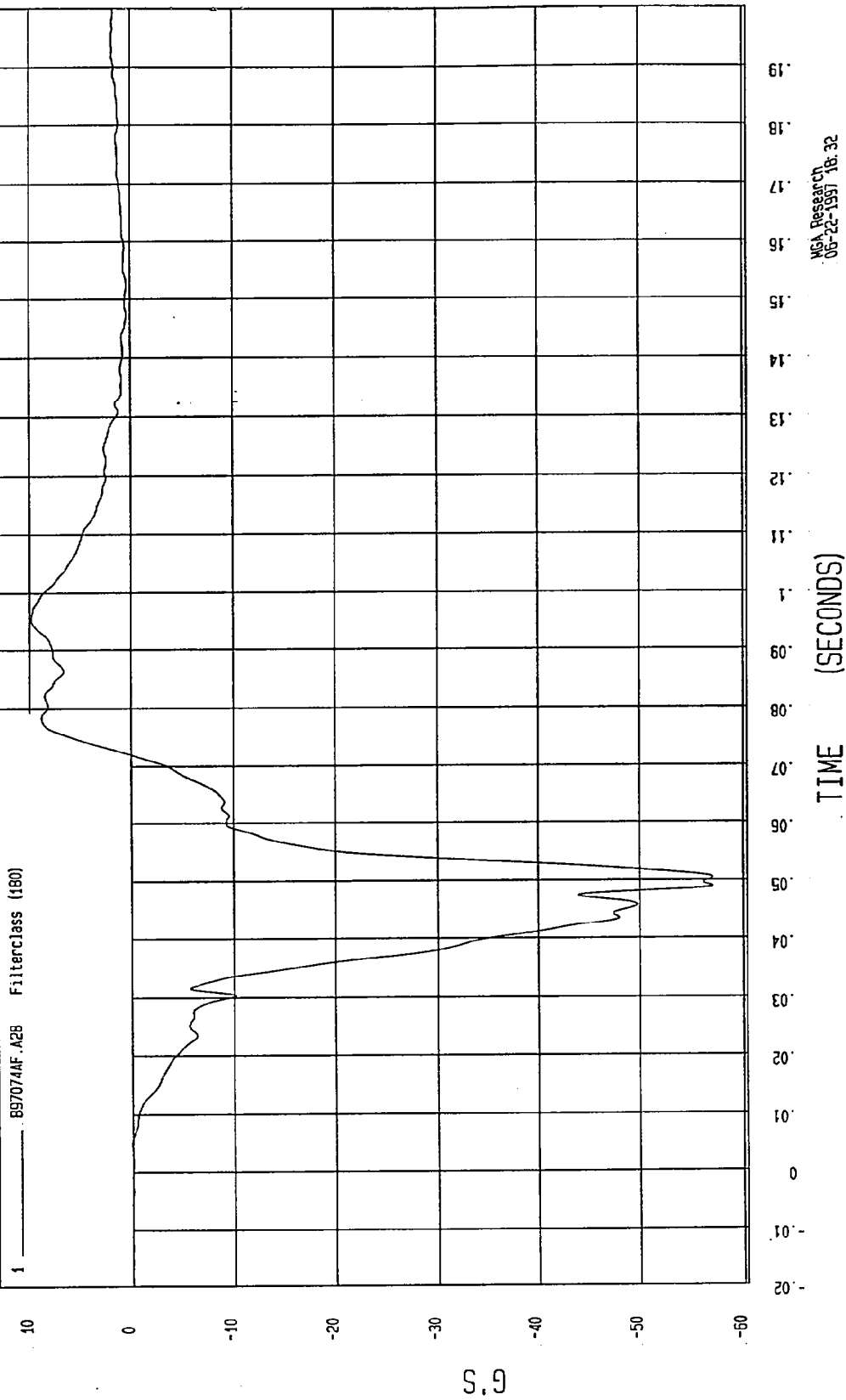
NCA Research
06-22-1997 16:24

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -57.01 G'S at 49 msec Maximum = 9.82 G'S at 95 msec

REAR PASSENGER PELVIS Y ACCELERATION



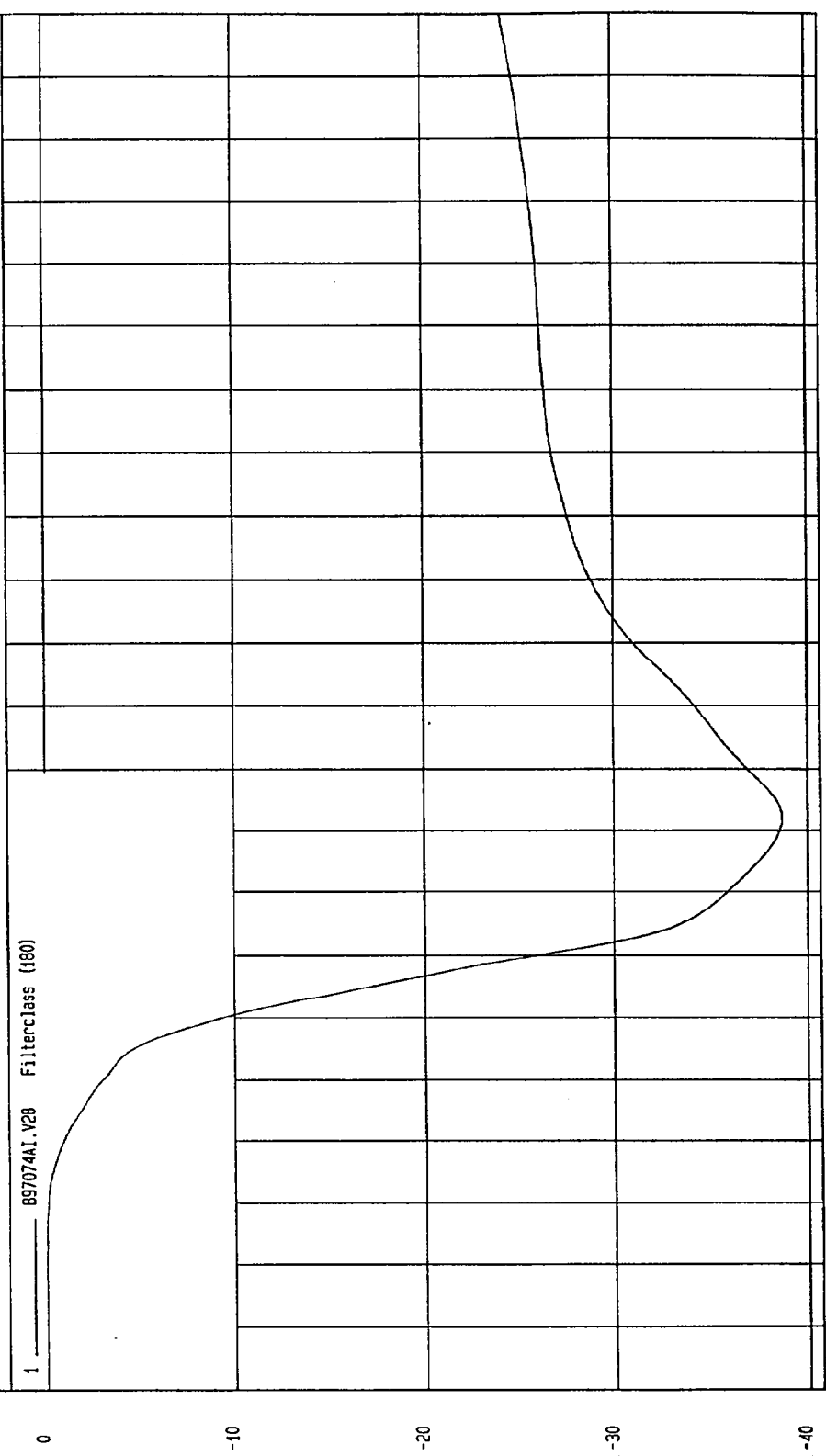
NSA Research
06-22-1997 18:32

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

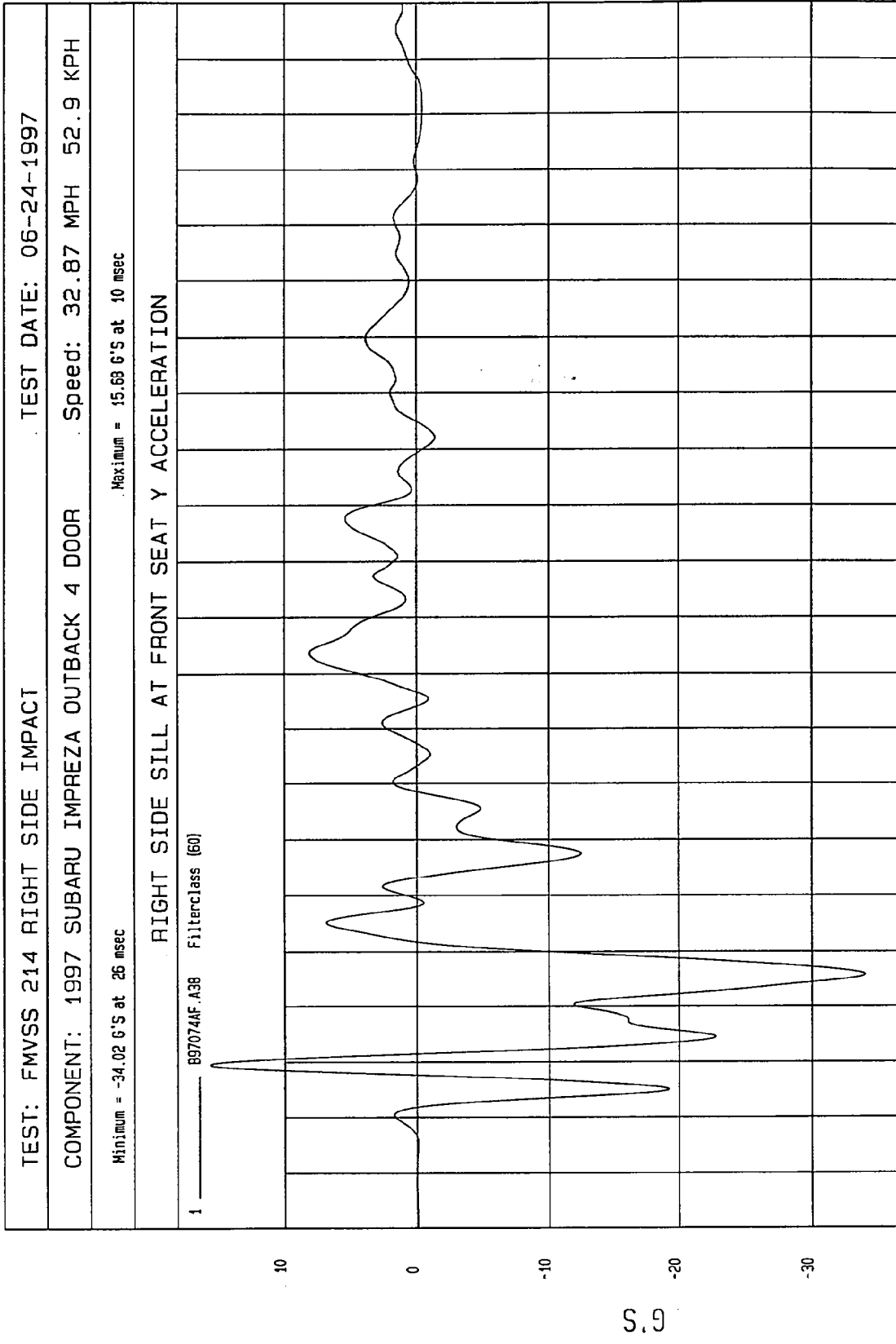
Minimum = -38.72 KPH at 72 msec Maximum = 8.63E-03 KPH at -5 msec

REAR PASSENGER PELVIS Y VELOCITY



TIME Seconds

NGA Research
06-22-1997 16:24



MCA Research
06-22-1997 18:25

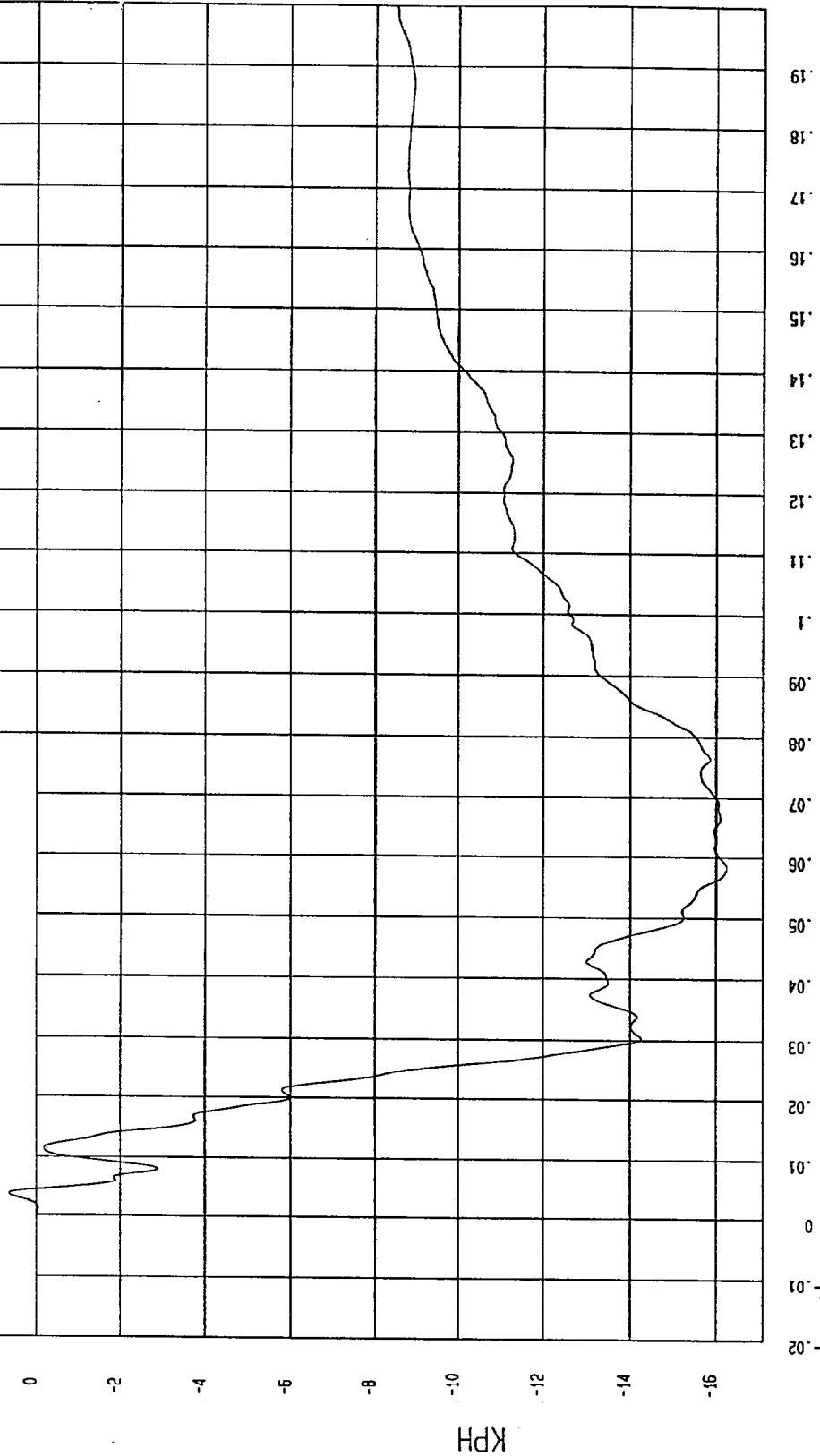
TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -16.24 KPH at 58 msec Maximum = .63 KPH at 4 msec

RIGHT SIDE SILL AT FRONT SEAT Y VELOCITY

1 997074A1.V3B Filterclass (180)



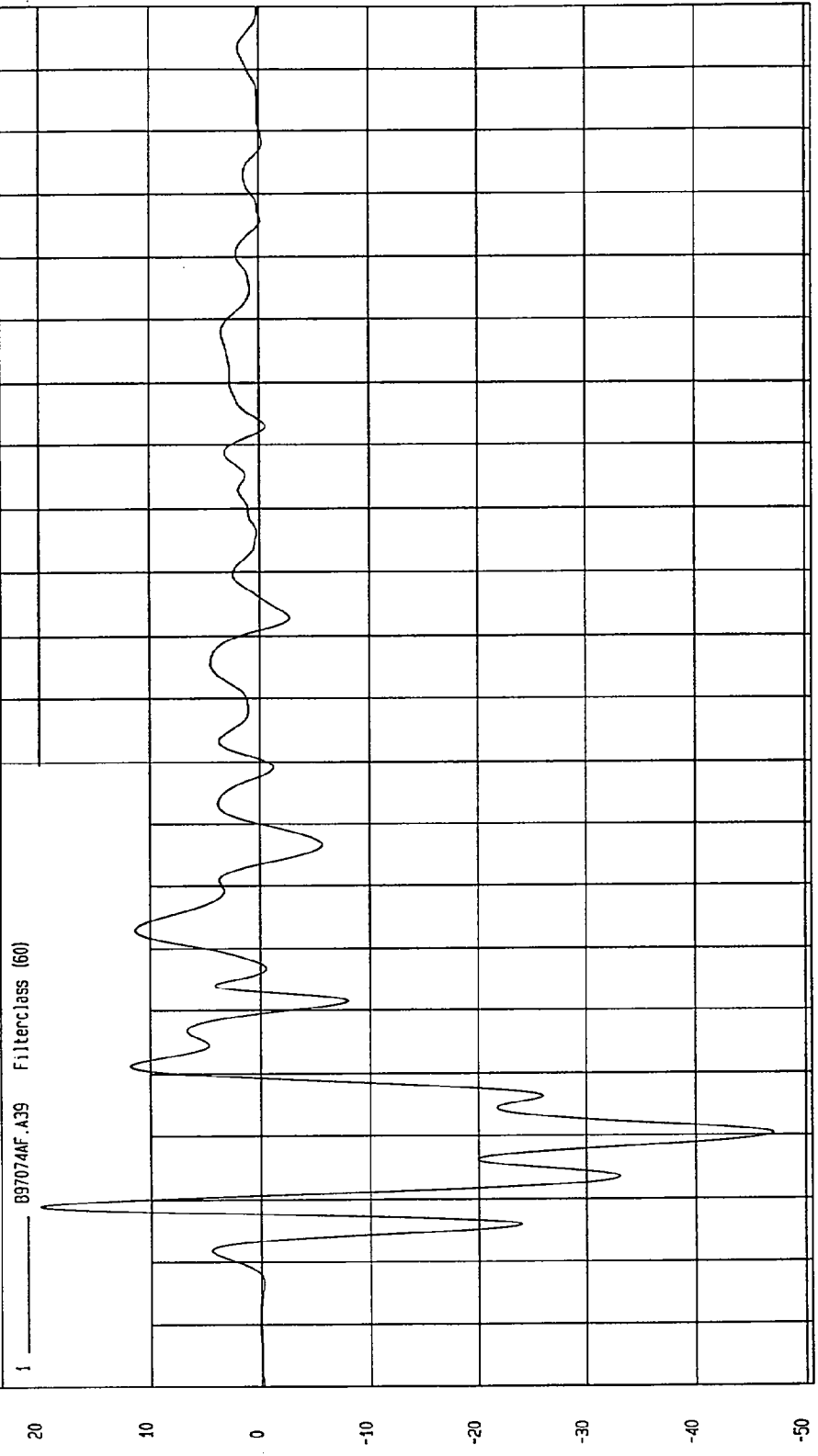
MGA Research
06-22-1997 18:25

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -47.19 G's at 20 msec Maximum = 19.95 G's at 9 msec

RIGHT SIDE SILL AT REAR SEAT Y ACCELERATION



TIME (SECONDS)

0.19
0.18
0.17
0.16
0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0
-0.01
-0.02

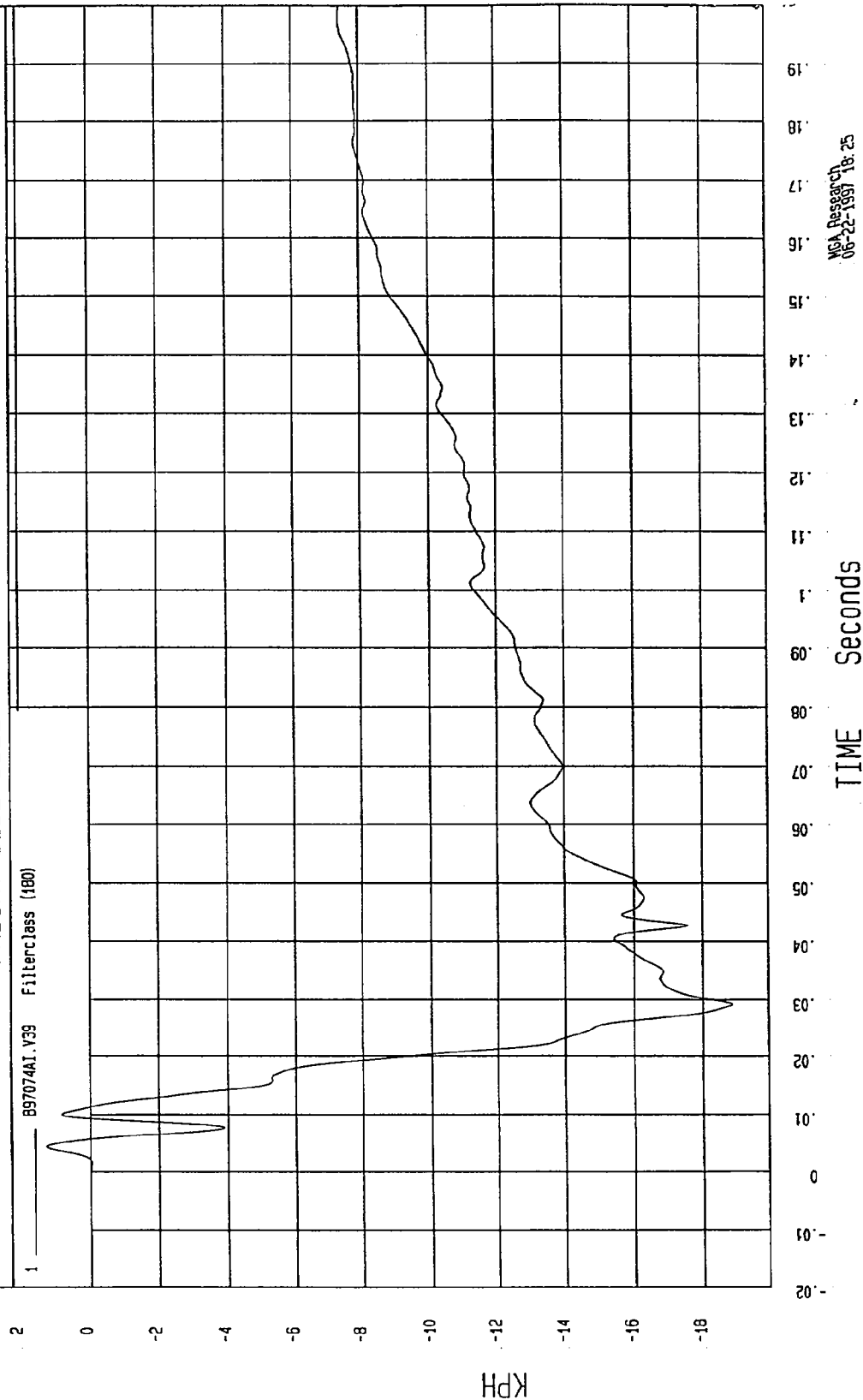
NSA Research
06-22-1997 18:25

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -18.85 KPH at 29 msec Maximum = 1.23 KPH at 4 msec

RIGHT SIDE SILL AT REAR SEAT Y VELOCITY



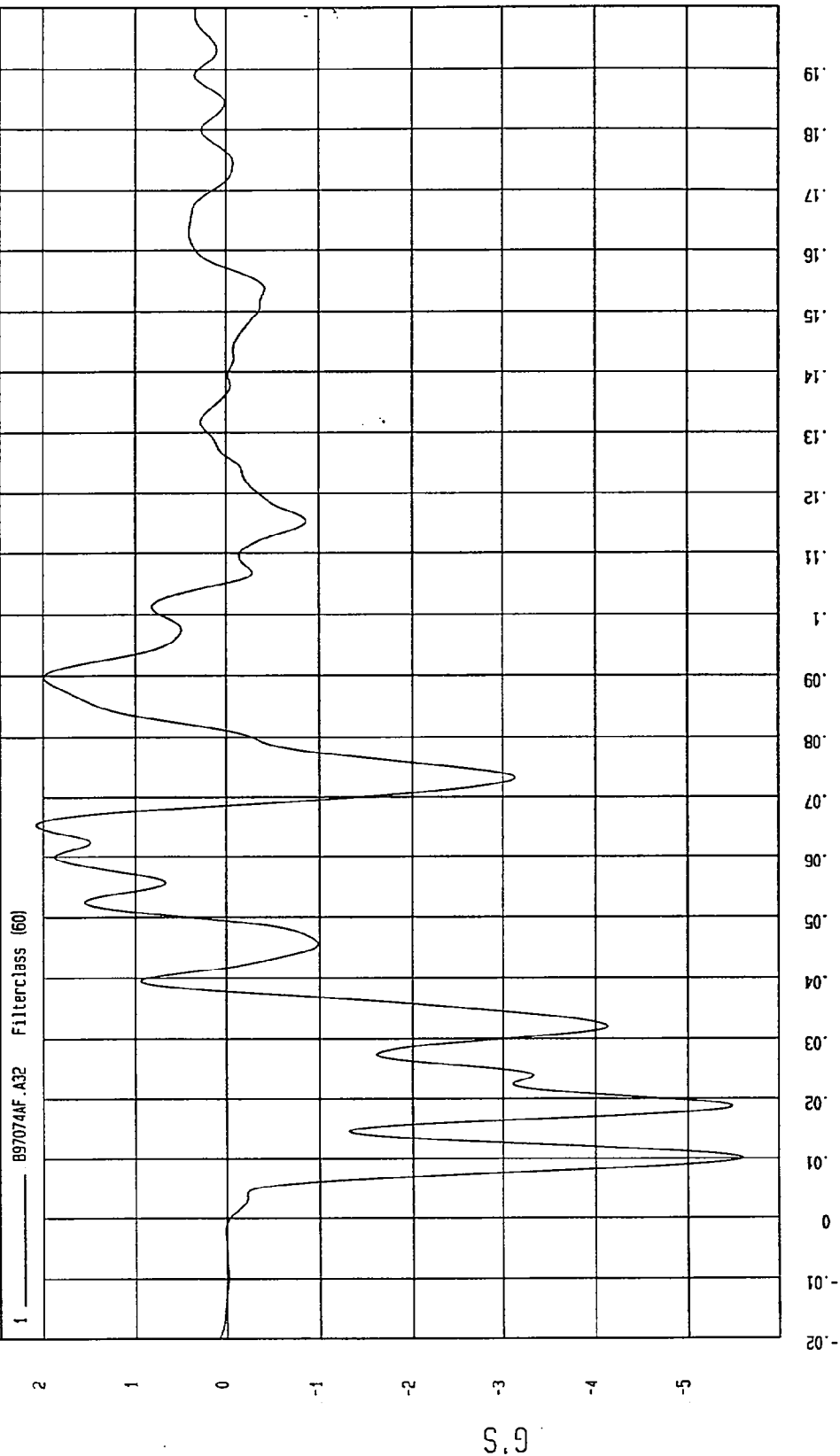
MCA Research
06-22-1997 18:25

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -5.60 G'S at 10 msec
Maximum = 2.07 G'S at 65 msec

LEFT SIDE SILL AT FRONT SEAT X ACCELERATION

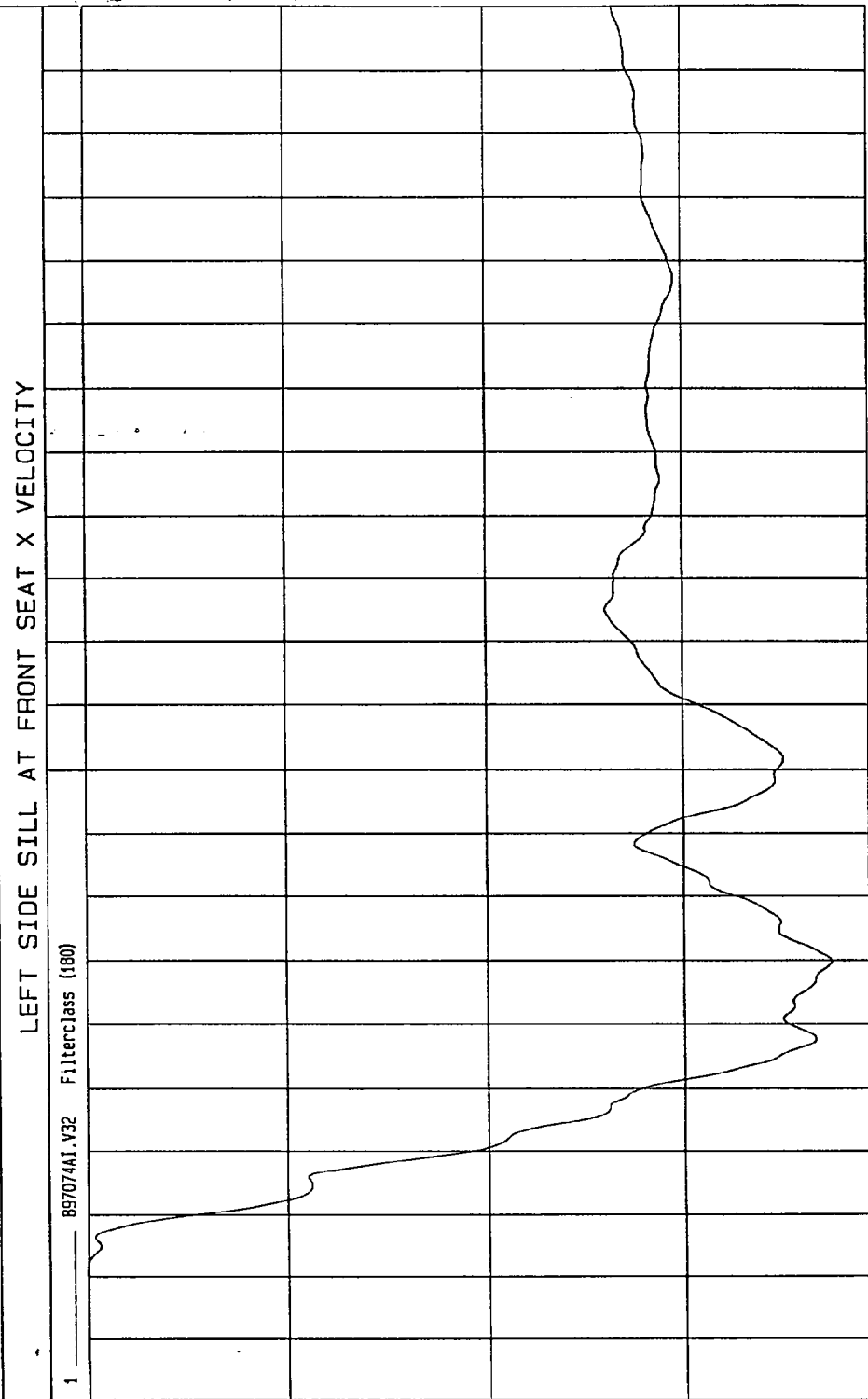


MGA Research
06-22-1997 18:26

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -3.73 KPH at 50 msec Maximum = 6.71E-03 KPH at -12 msec

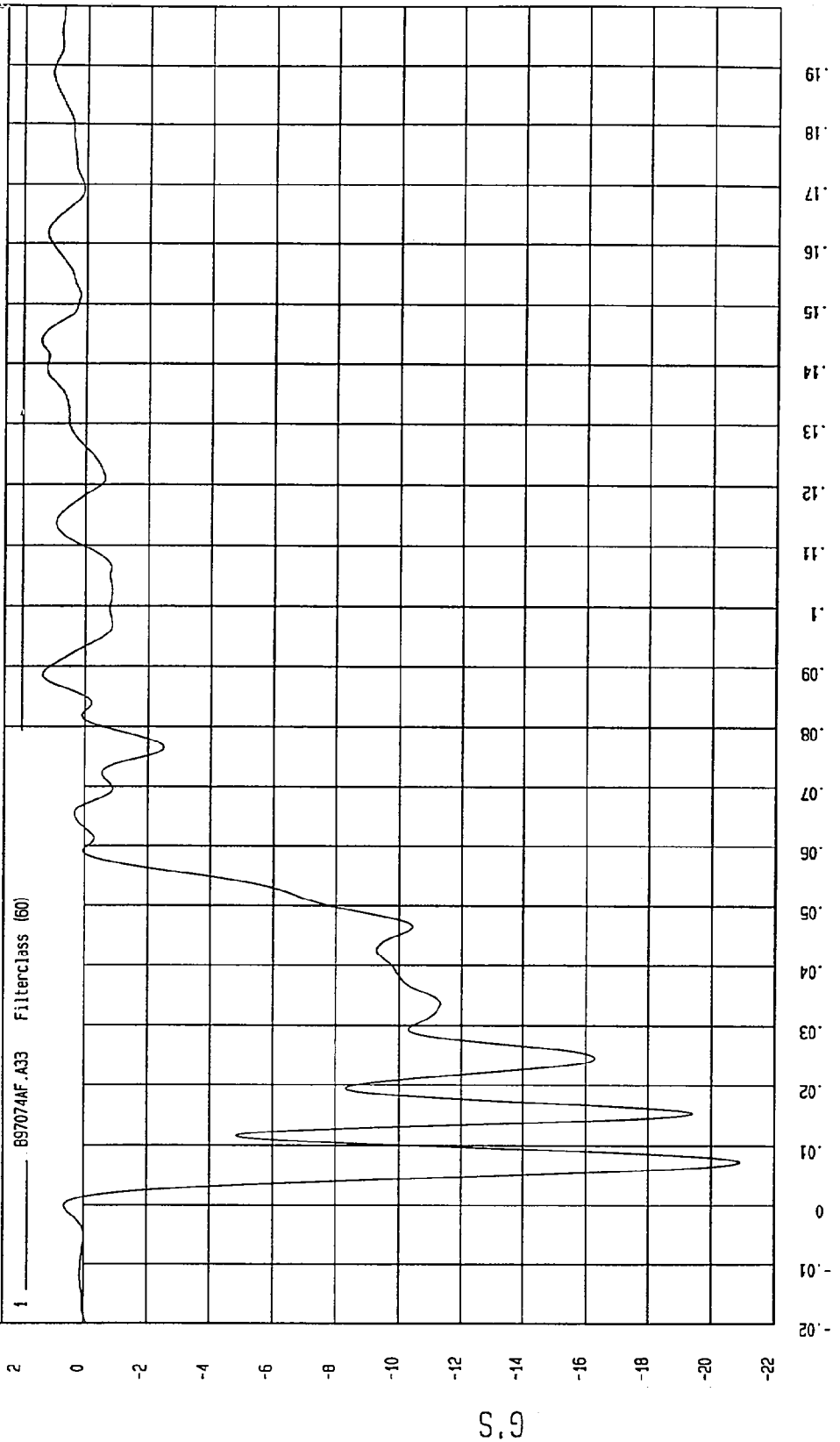


TIME Seconds

NGA Research
06-22-1997 18:26

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH
Minimum = -20.89 G'S at 7 msec Maximum = 1.43 G'S at 144 msec

LEFT SIDE SILL AT FRONT SEAT Y ACCELERATION



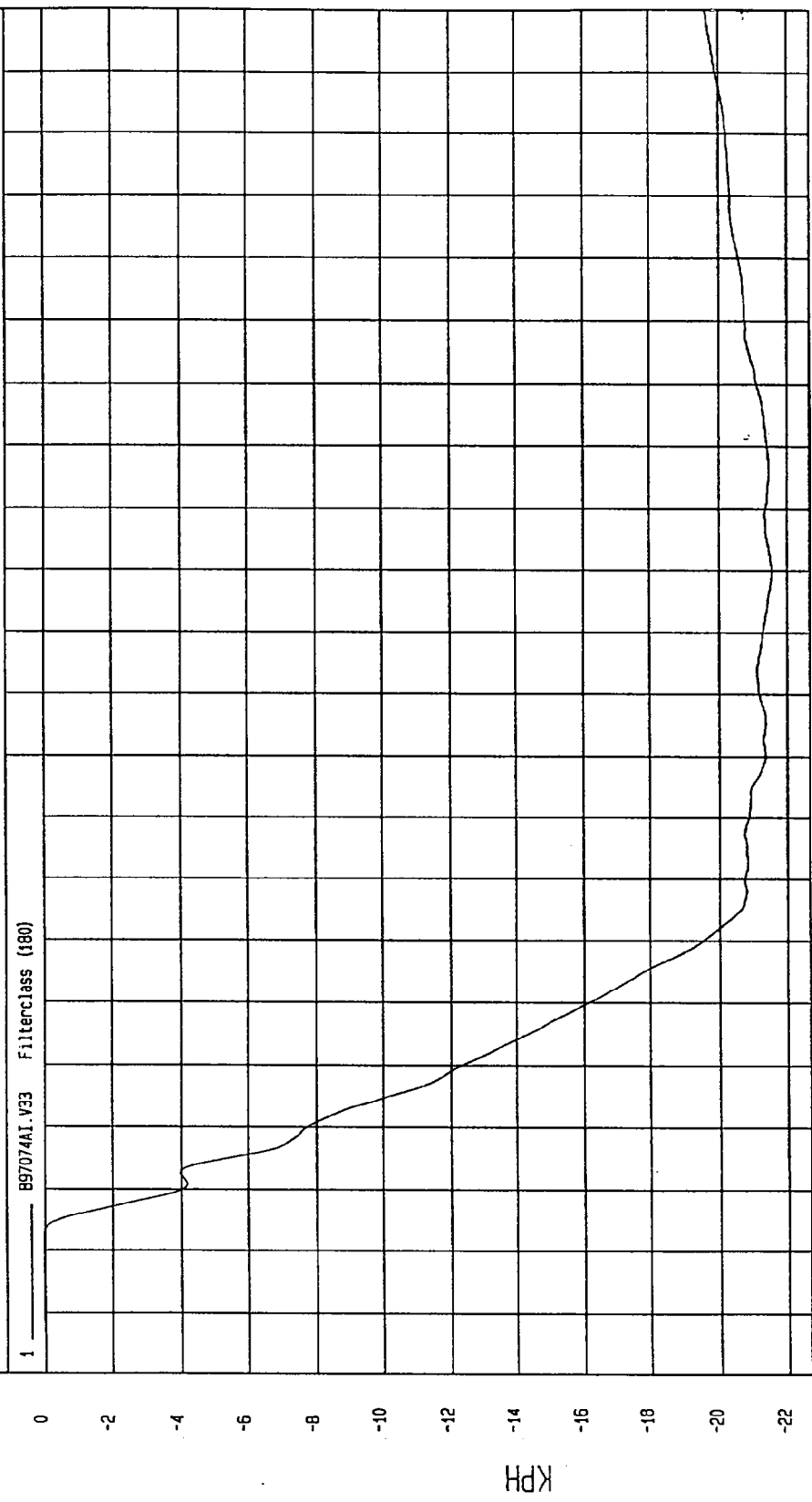
WCA Research
06-22-1997 18:26

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -21.55 KPH at 110 msec Maximum = 4.72E-02 KPH at 0 msec

LEFT SIDE SILL AT FRONT SEAT Y VELOCITY



MOA Research
06-22-1997 16:28

TIME Seconds

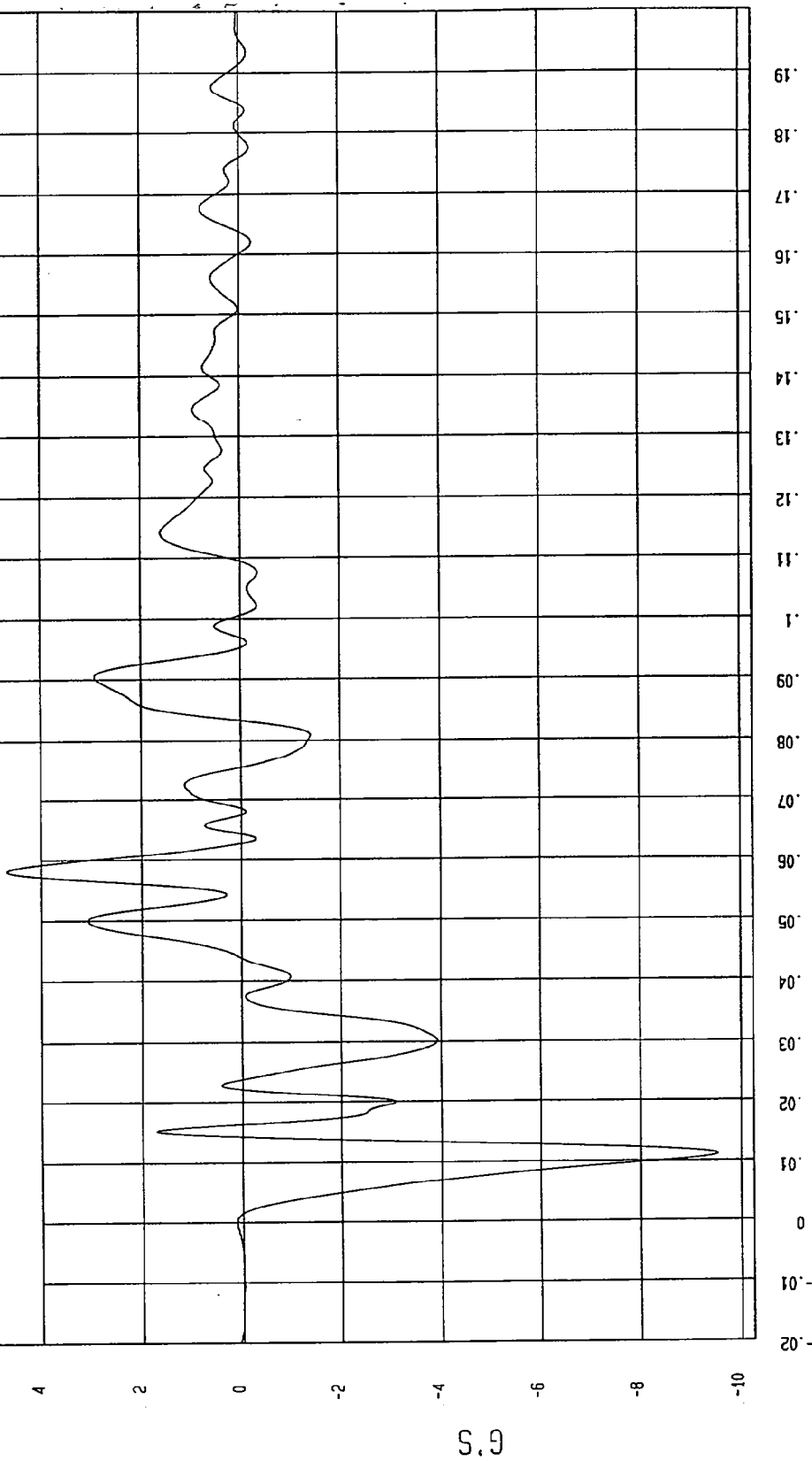
TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -9.52 G'S at 11 msec Maximum = 4.66 G'S at 58 msec

LEFT SIDE SILL AT FRONT SEAT Z ACCELERATION

1 ——— B97074AF.A34 Filterclass (60)



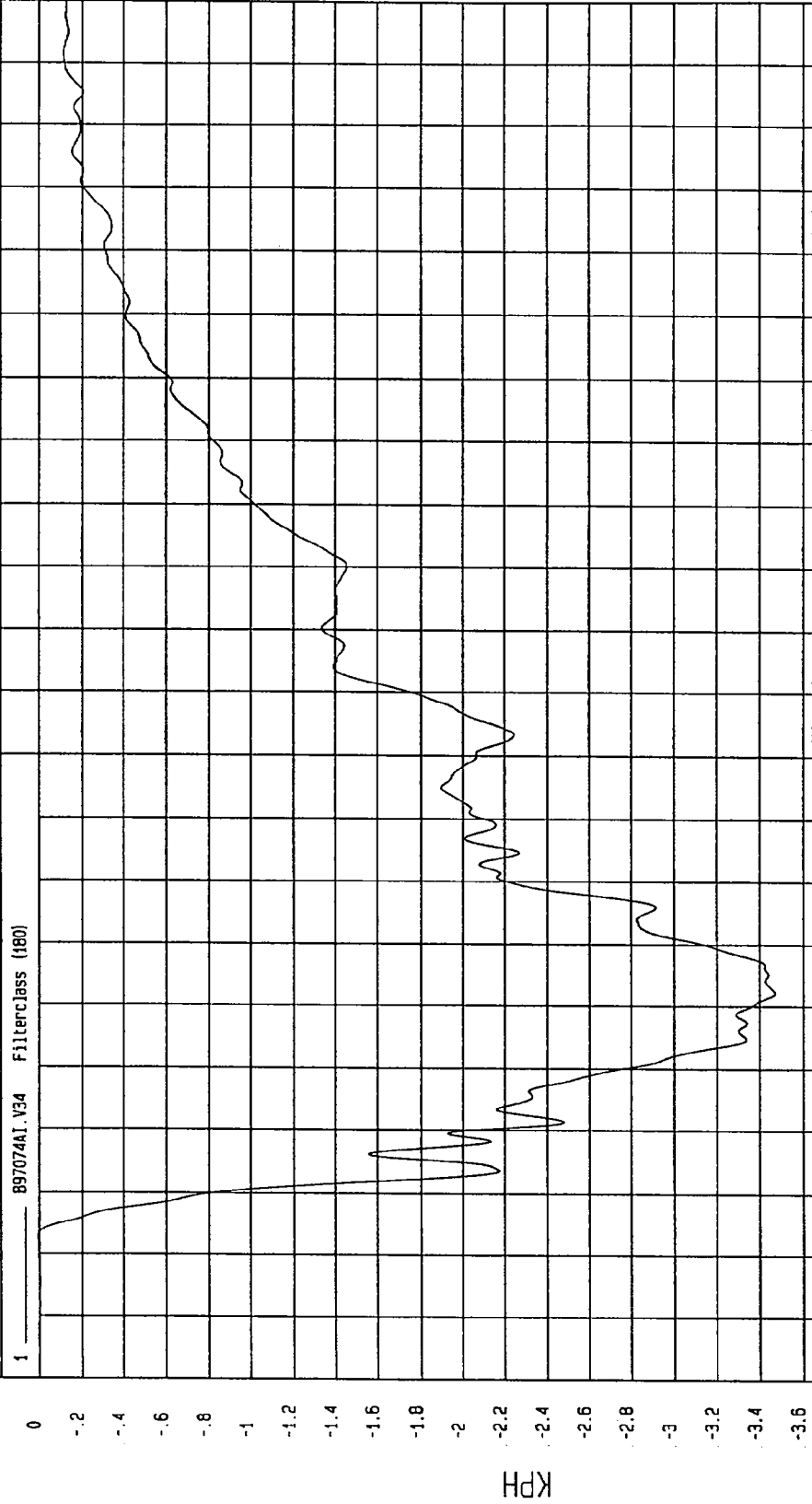
NSA Research
06-22-1997 18:26

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -3.47 KPH at 42 msec Maximum = 5.50E-03 KPH at 3 msec

LEFT SIDE SILL AT FRONT SEAT Z VELOCITY



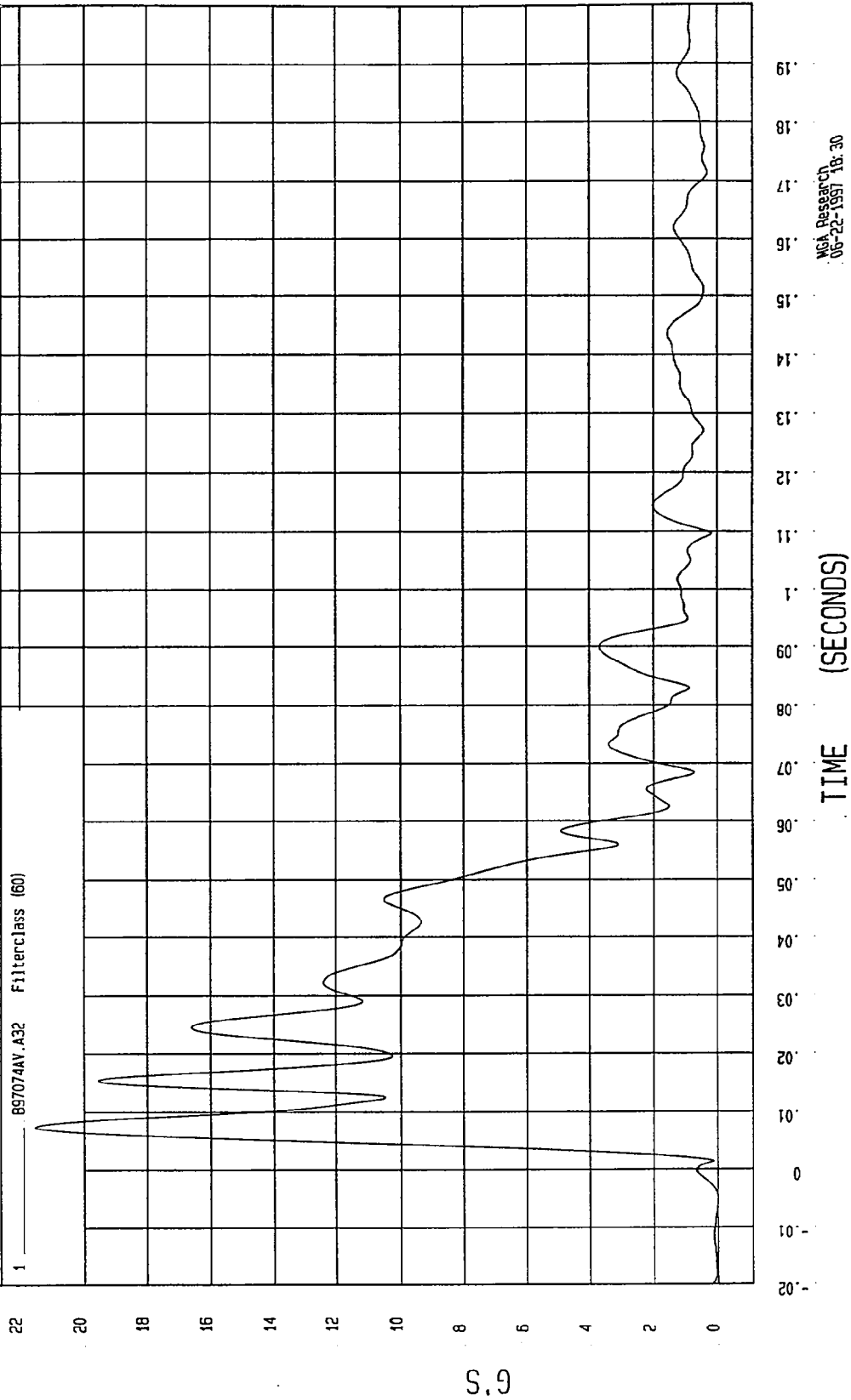
TIME Seconds
MEA Research
06-22-1997 18:26

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = 1.48E-03 G'S at -5 msec Maximum = 21.53 G'S at 7 msec

LEFT SIDE SILL AT FRONT SEAT RESULTANT ACCELERATION



TEST: FMVSS 214 RIGHT SIDE IMPACT

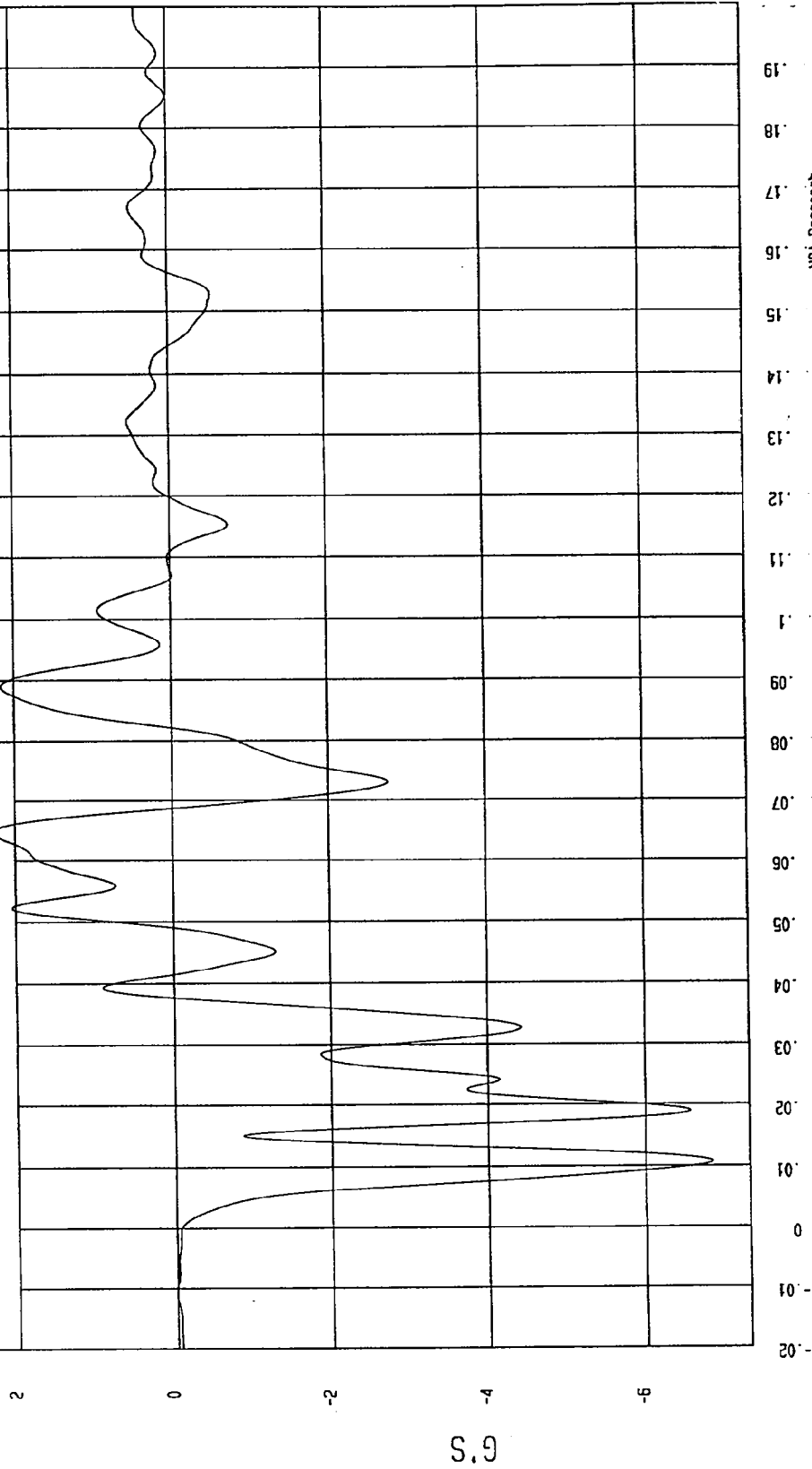
TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -6.82 G'S at 11 msec Maximum = 2.28 G'S at 65 msec

LEFT SIDE SILL AT REAR SEAT X ACCELERATION

1 — 897074AF.A35 Filterclass (60)



W&A Research
06-22-1997 18:26

TIME (SECONDS)

TEST: FMVSS 214 RIGHT SIDE IMPACT

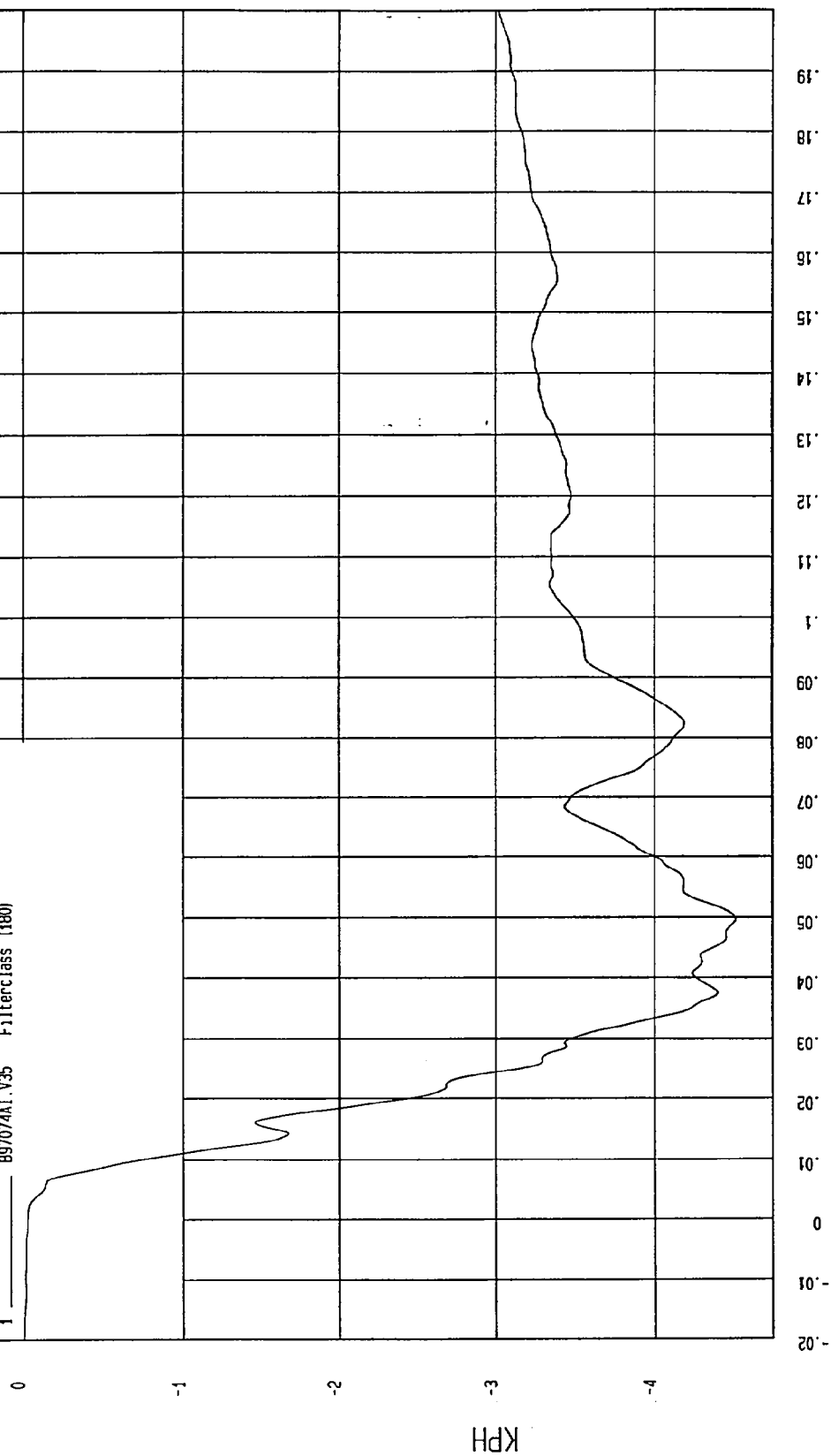
TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -4.50 KPH at 50 msec Maximum = 0 KPH at -20 msec

LEFT SIDE SILL AT REAR SEAT X VELOCITY

1 897074A1.V35 Filterclass (180)



MOA Research
06-22-1997 18:26

TEST: FMVSS 214 RIGHT SIDE IMPACT

TEST DATE: 06-24-1997

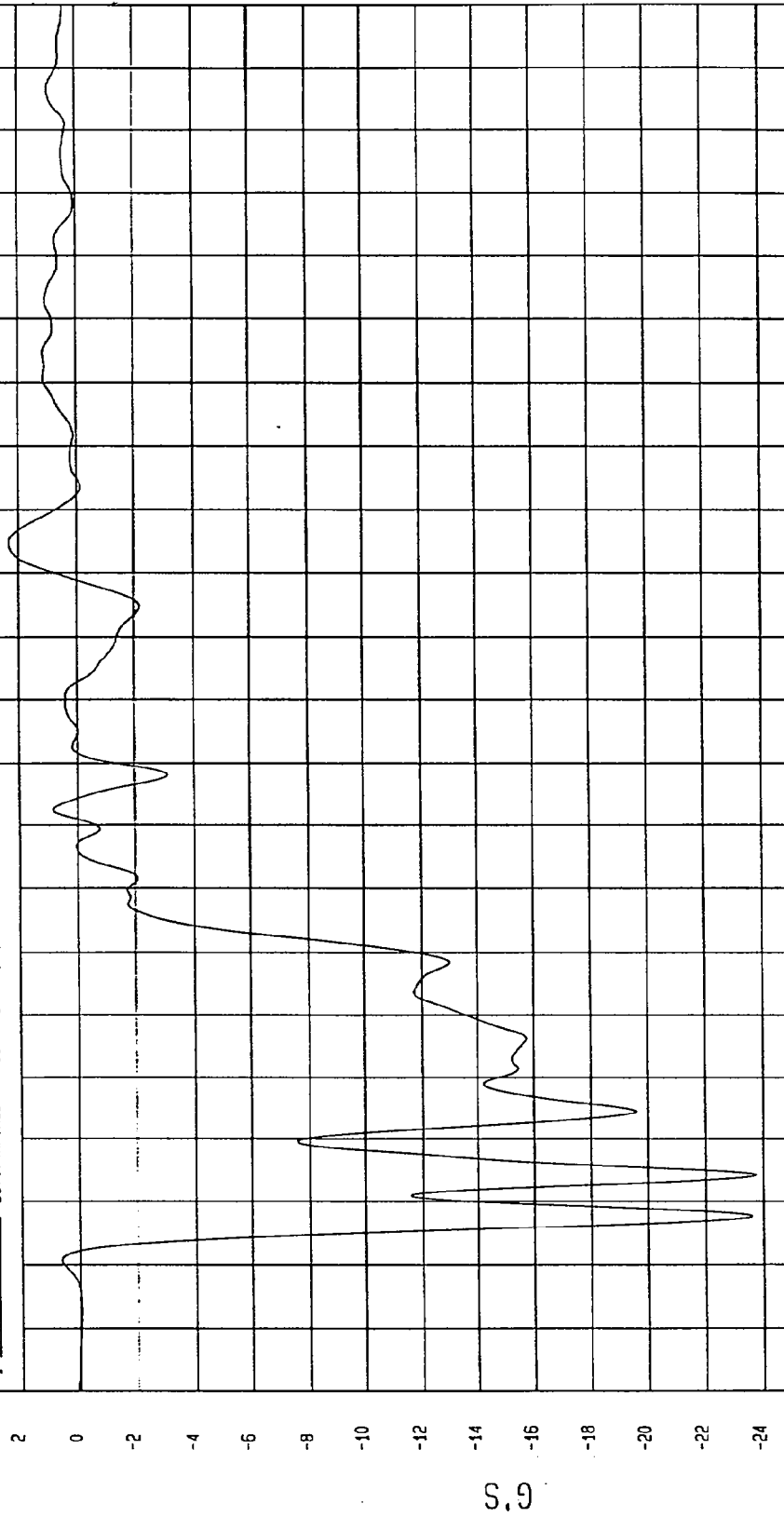
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -23.73 G'S at 14 msec

Maximum = 2.32 G'S at 115 msec

LEFT SIDE SILL AT REAR SEAT Y ACCELERATION

1 ——— B97074AF.A36 FilterClass (60)



TIME (SECONDS)

MCA Research
06-22-1997 16:26

TEST: FMVSS 214 RIGHT SIDE IMPACT

TEST DATE: 06-24-1997

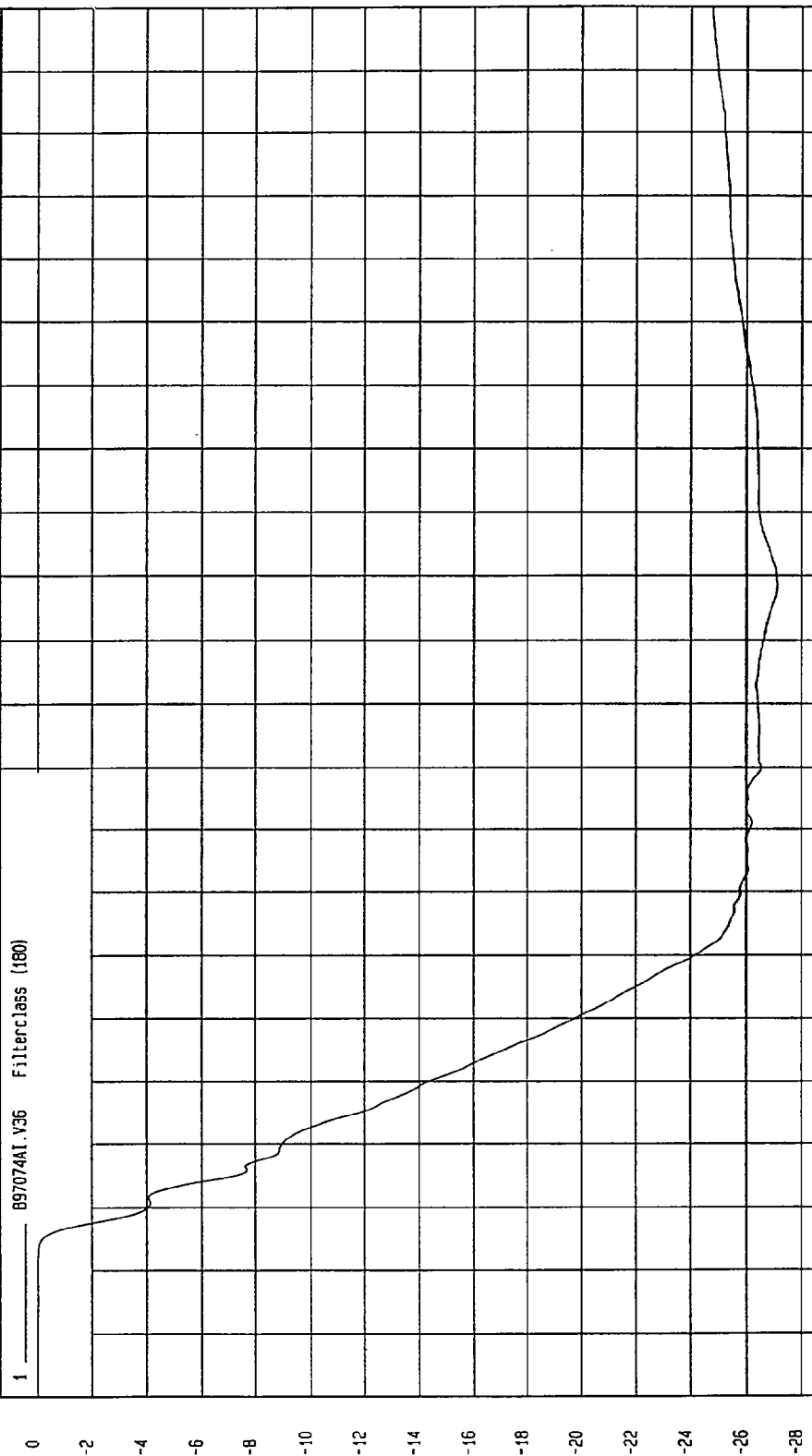
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -27.10 KPH at 108 msec

Maximum = 9.08E-03 KPH at -12 msec

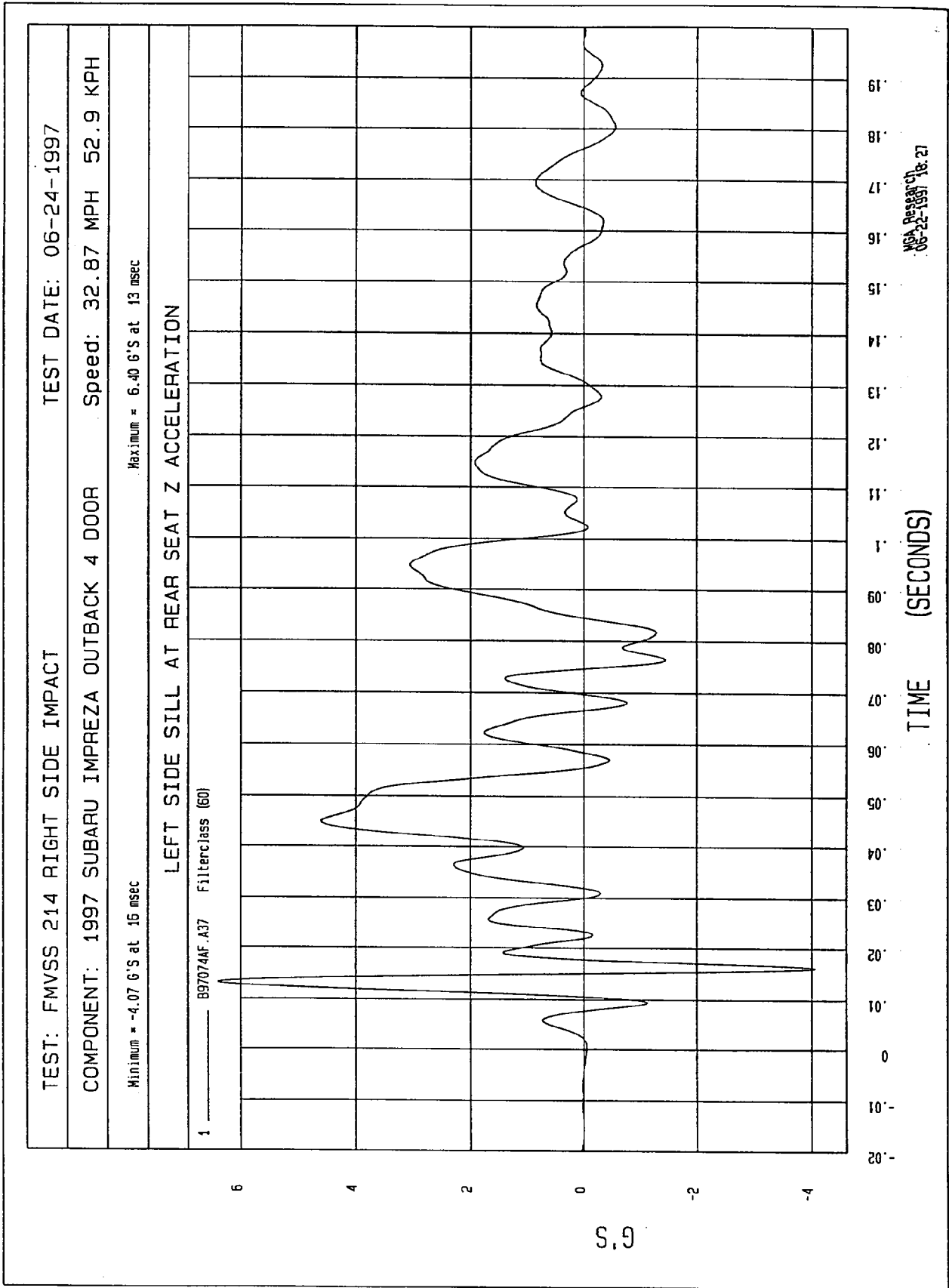
LEFT SIDE SILL AT REAR SEAT Y VELOCITY

1 — 897074AI.V36 Filterclass (180)



NSI Research
06-22-1997 16:27

TIME Seconds



TEST: FMVSS 214 RIGHT SIDE IMPACT

TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -17 KPH at 17 msec Maximum = 5.59 KPH at 176 msec

LEFT SIDE SILL AT REAR SEAT Z VELOCITY

1 _____ BS7074AI.V37 FilterClass (180)

5

4

3

2

1

0

KPH

-0.02

-0.01

0

0.01

0.02

0.03

0.04

0.05

0.06

0.07

0.08

0.09

0.1

0.11

0.12

0.13

0.14

0.15

0.16

0.17

0.18

0.19

TIME Seconds

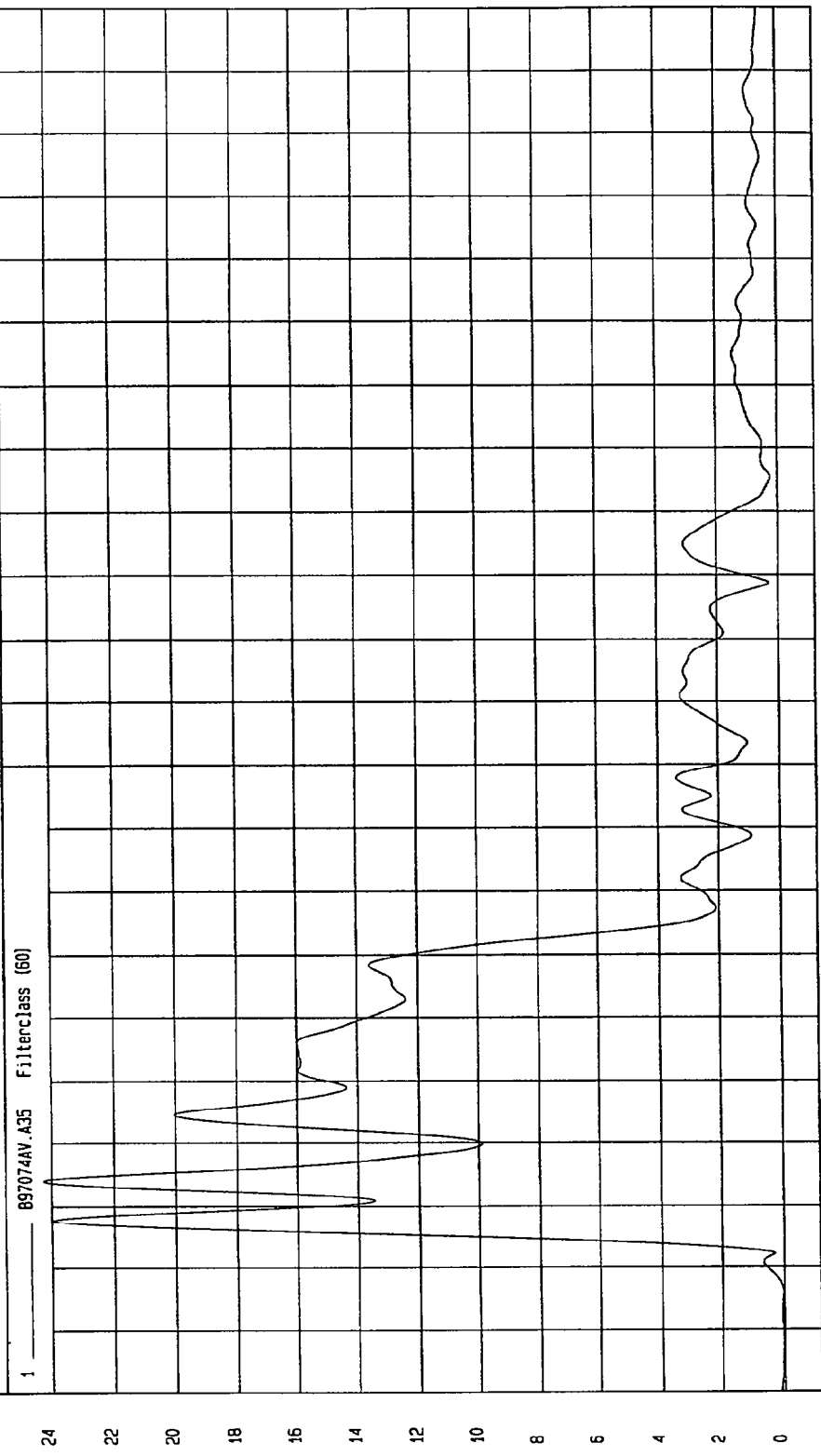
MOA Research
06-22-1997 18:27

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = 2.40E-02 G's at -12 msec Maximum = 24.25 G's at 14 msec

LEFT SIDE SILL AT REAR SEAT RESULTANT ACCELERATION



TIME (SECONDS)

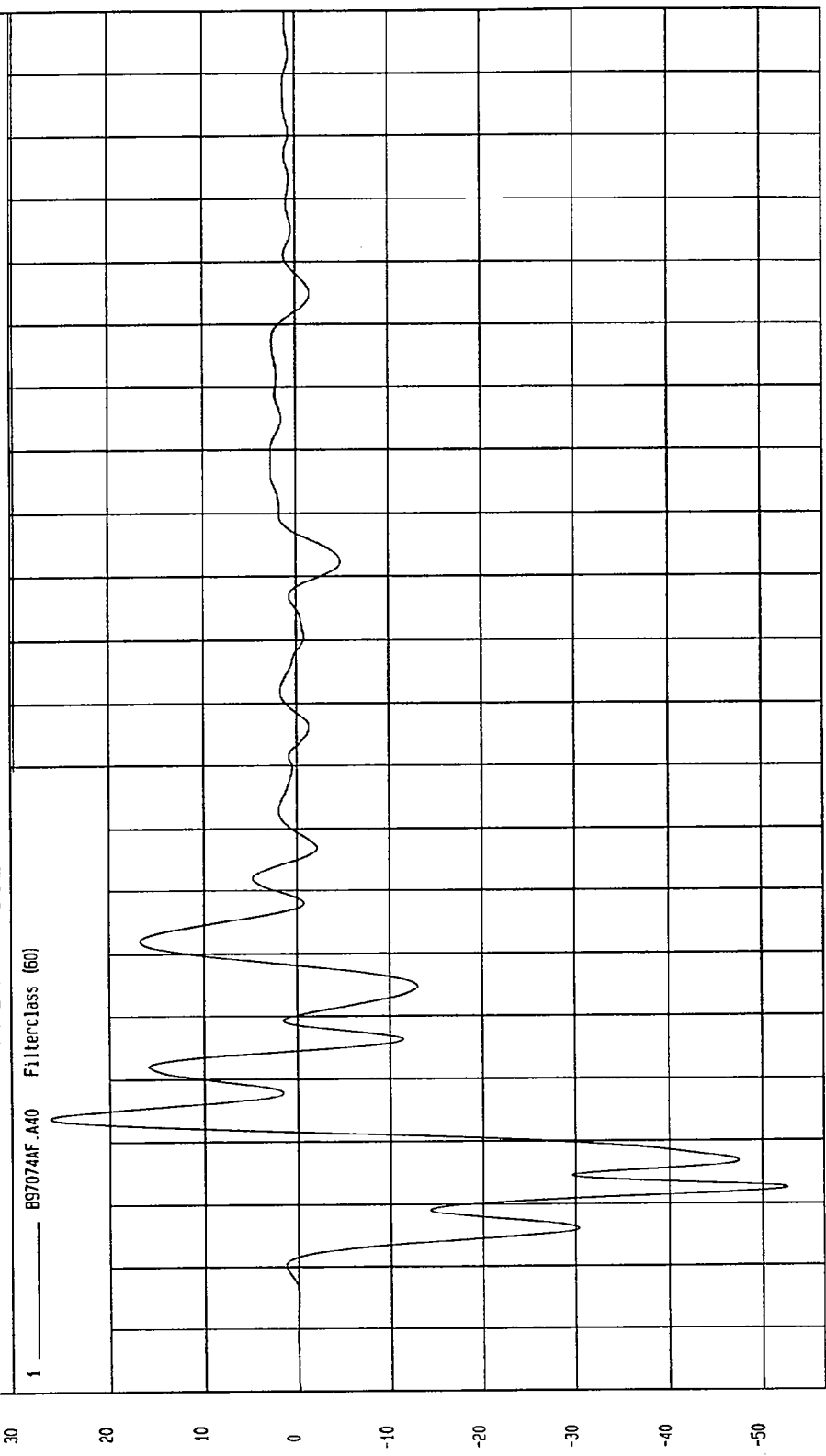
NGA Research
06-22-1997 18-31

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -52.66 G'S at 12 msec Maximum = 26.34 G'S at 24 msec

FRONT PASSENGER SEAT TRACK Y ACCELERATION



TIME (SECONDS)

0.19
0.18
0.17
0.16
0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
-0.01
-0.02

WCA Research
06-22-1997 18:27

TEST: FMVSS 214 RIGHT SIDE IMPACT

TEST DATE: 06-24-1997

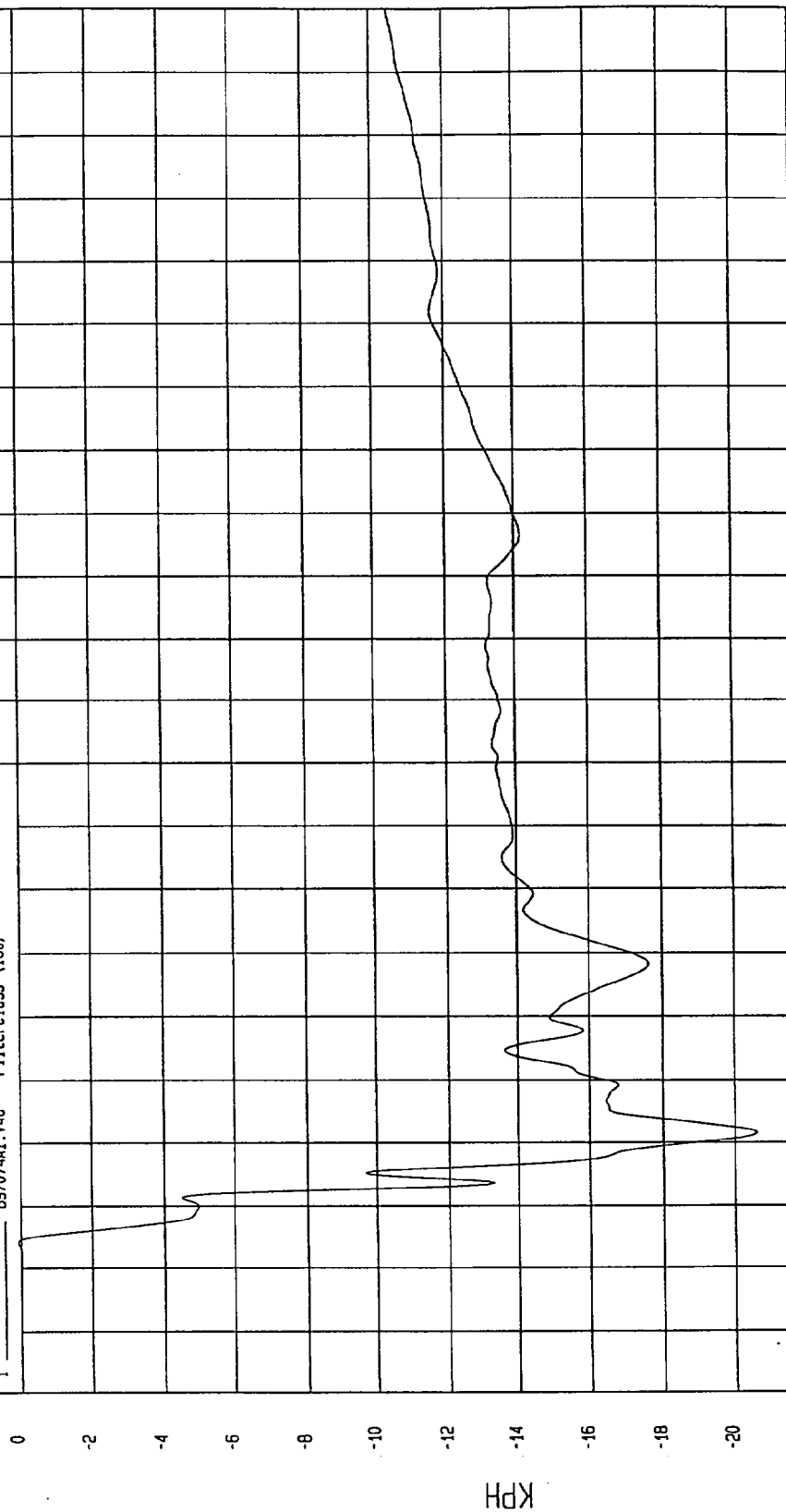
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -20.57 KPH at 22 msec

Maximum = 8.54E-02 KPH at 4 msec

FRONT PASSENGER SEAT TRACK Y VELOCITY

1 _____ B97074A1.V40 Filterclass (180)

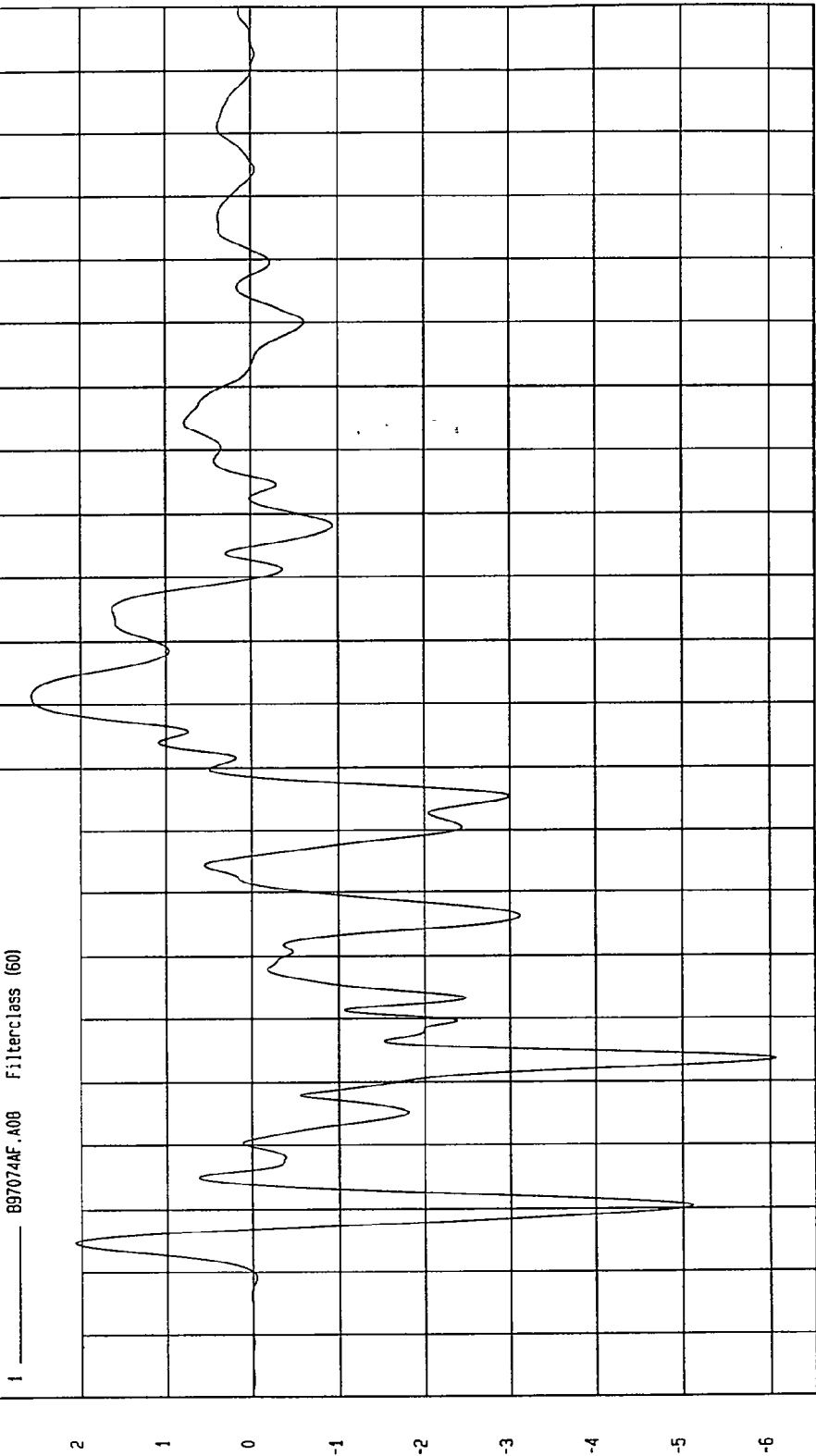


WCA Research
06-22-1997 18:27

TIME Seconds

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH
Minimum = -6.05 G'S at 34 msec Maximum = 2.55 G'S at 92 msec

REAR FLOORPAN ABOVE AXLE X ACCELERATION



TIME (SECONDS)

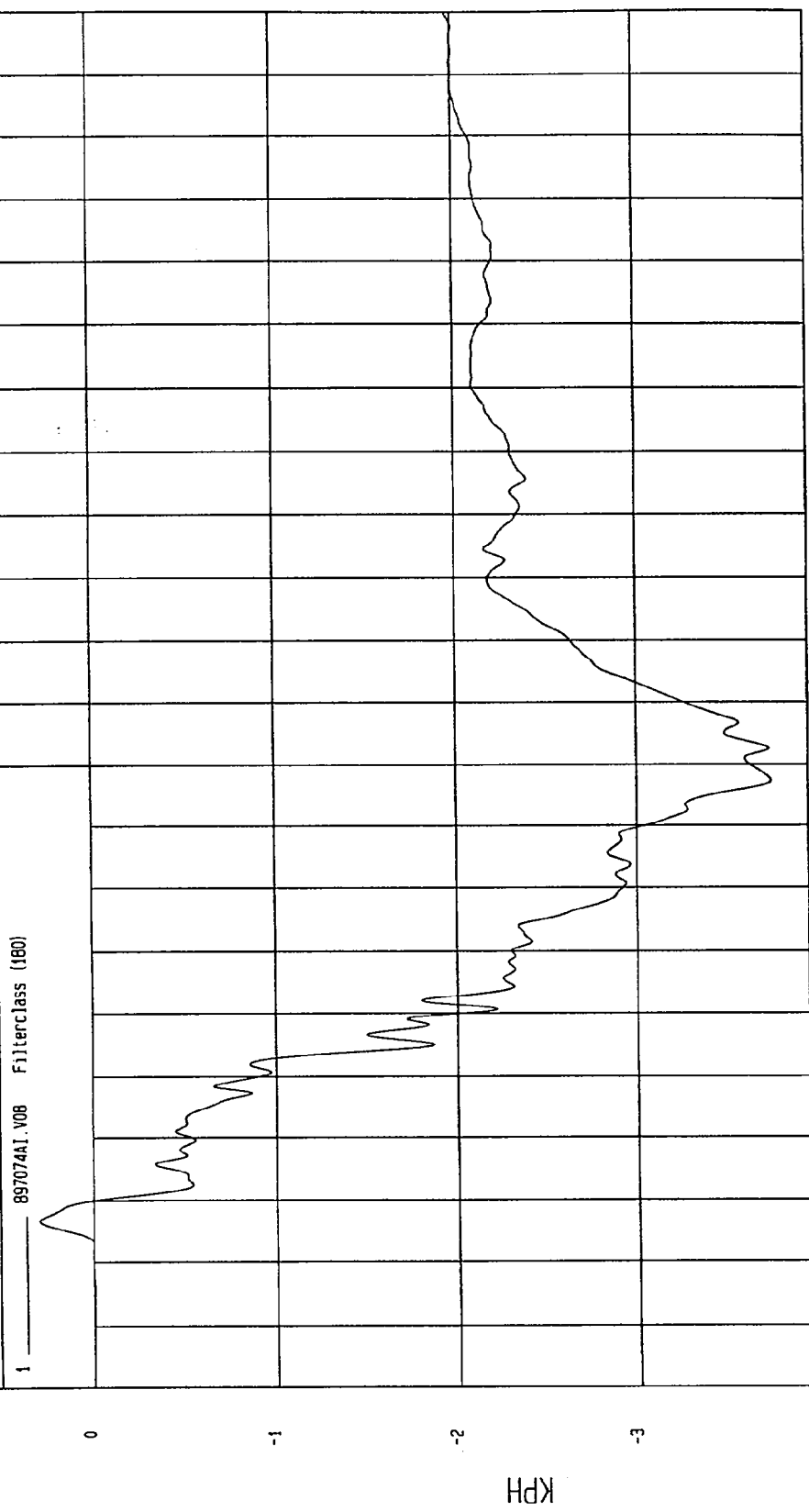
NSA Research
06-22-1997 18:27

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -3.73 KPH at 77 msec Maximum = .29 KPH at 7 msec

REAR FLOORPAN ABOVE AXLE X VELOCITY



TIME Seconds

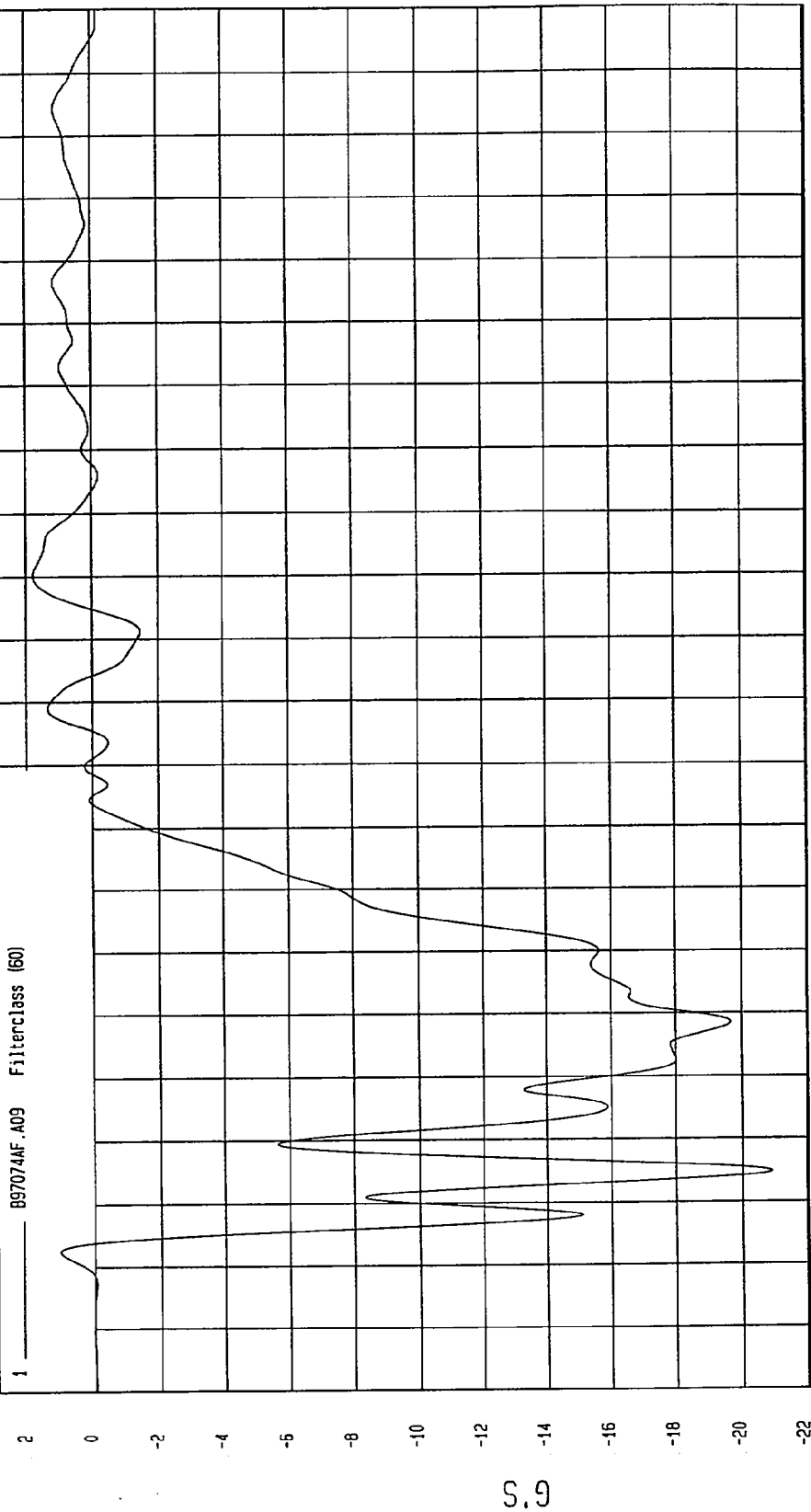
NCA Research
06-22-1997 18:27

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -20.91 G'S at 15 msec Maximum = 1.78 G'S at 110 msec

REAR FLOORPAN ABOVE AXLE Y ACCELERATION



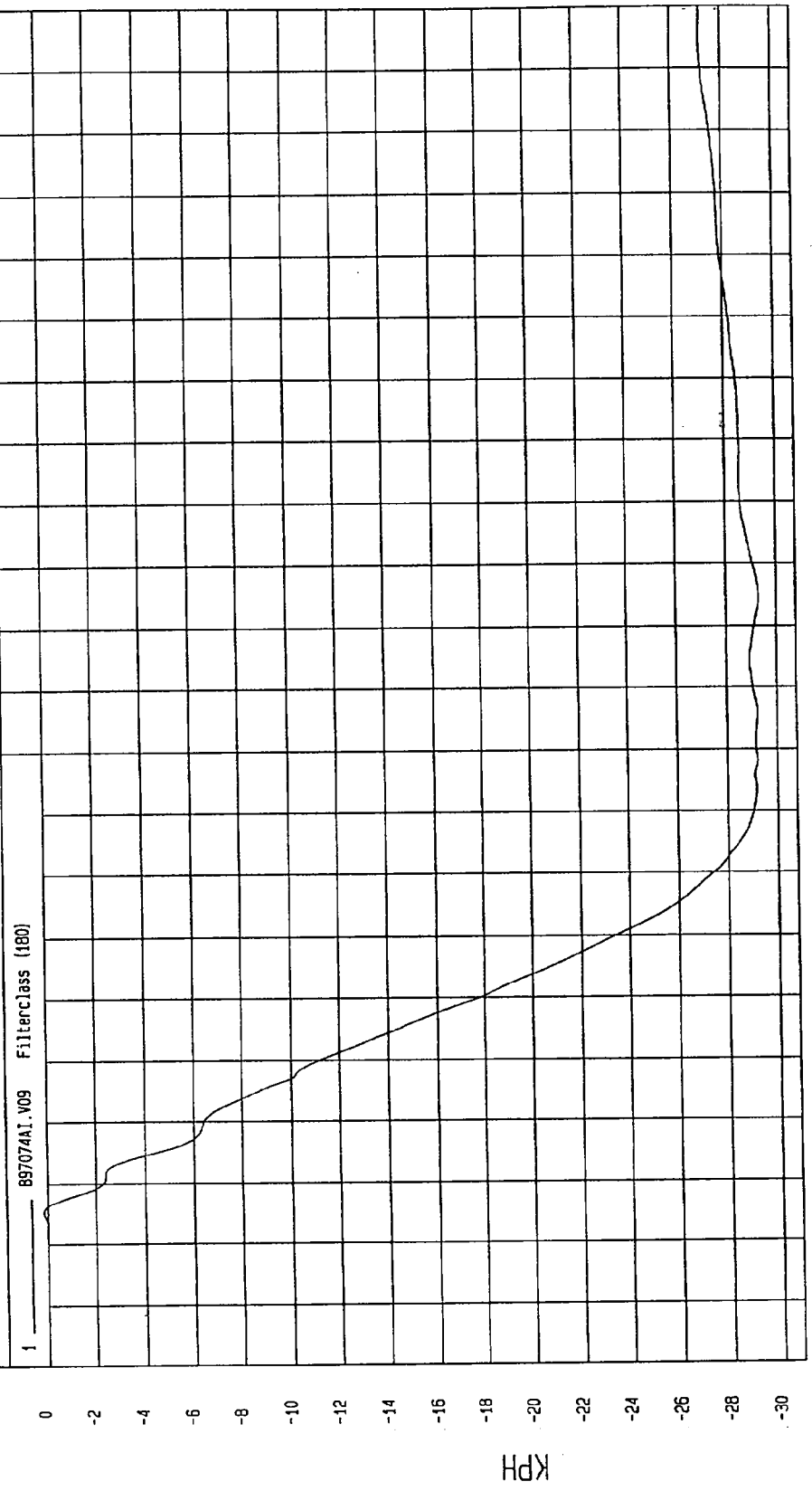
NSA Research
06-22-1997 18:27

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -29.30 KPH at 104 msec Maximum = .15 KPH at 5 msec

REAR FLOORPAN ABOVE AXLE Y VELOCITY



TIME Seconds

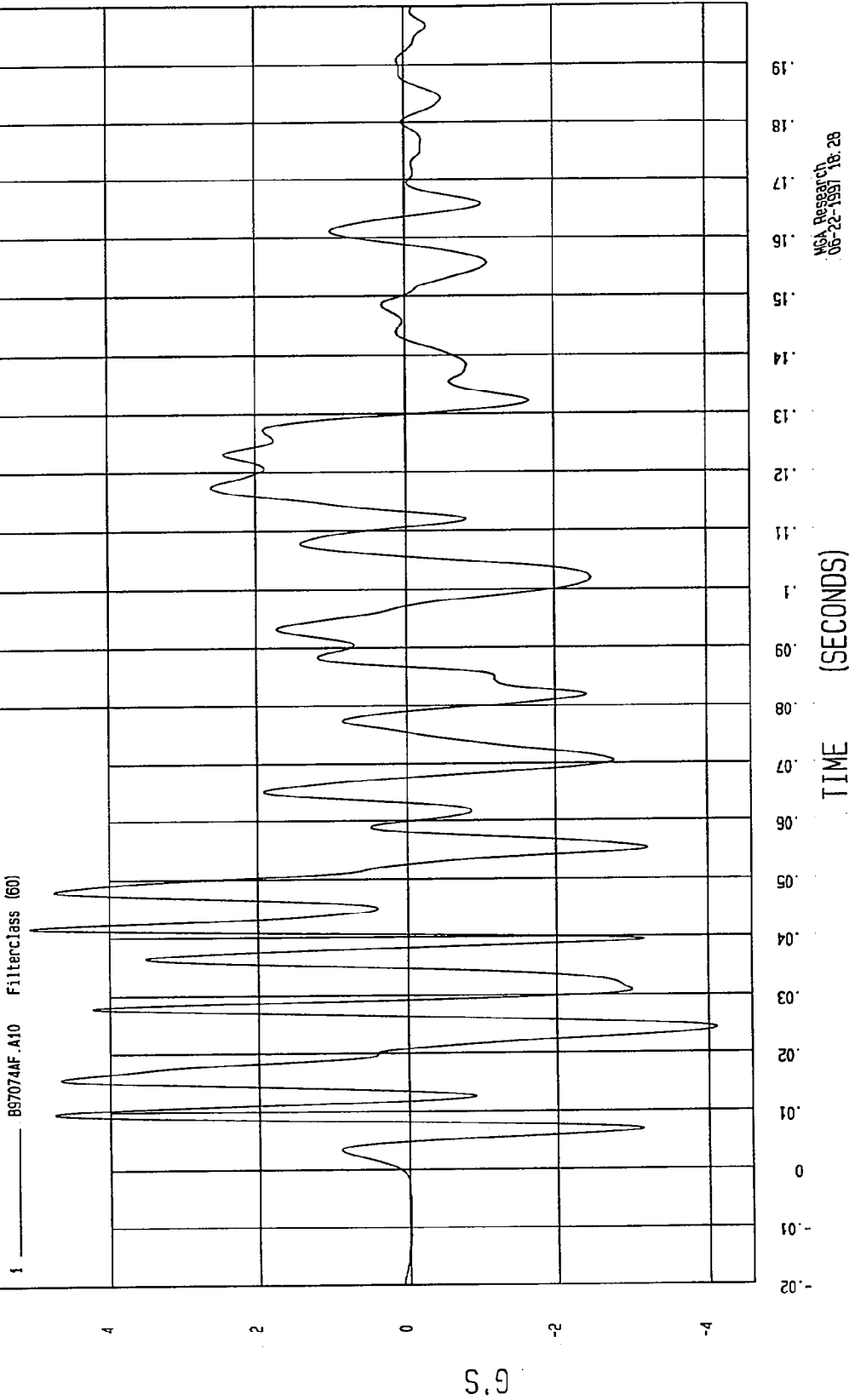
NSA Research
06-22-1997 18:27

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -4.11 G'S at 24 msec Maximum = 5.07 G'S at 42 msec

REAR FLOORPAN ABOVE AXLE Z ACCELERATION

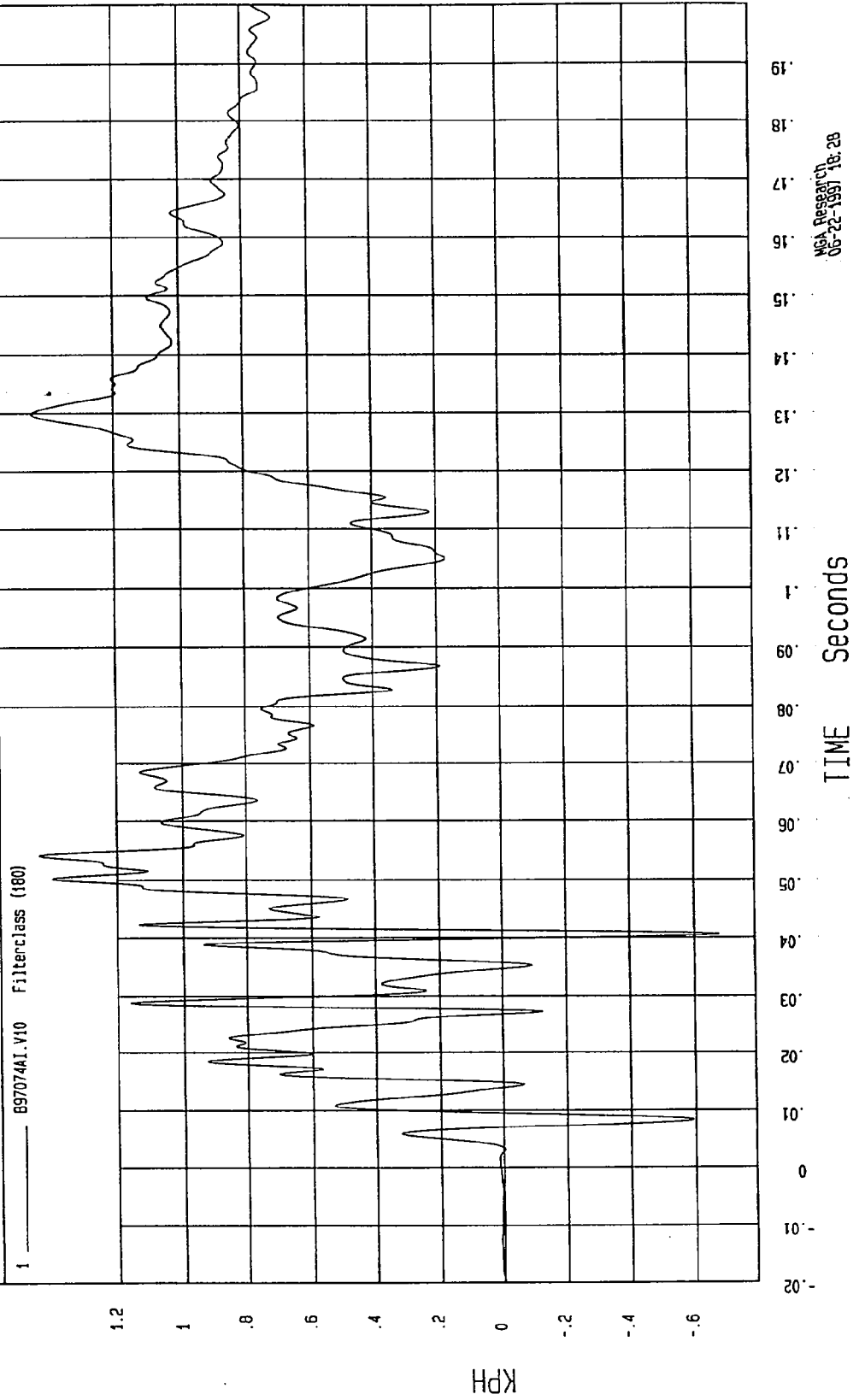


TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -.67 KPH at 41 msec Maximum = 1.45 KPH at 130 msec

REAR FLOORPAN ABOVE AXLE Z VELOCITY

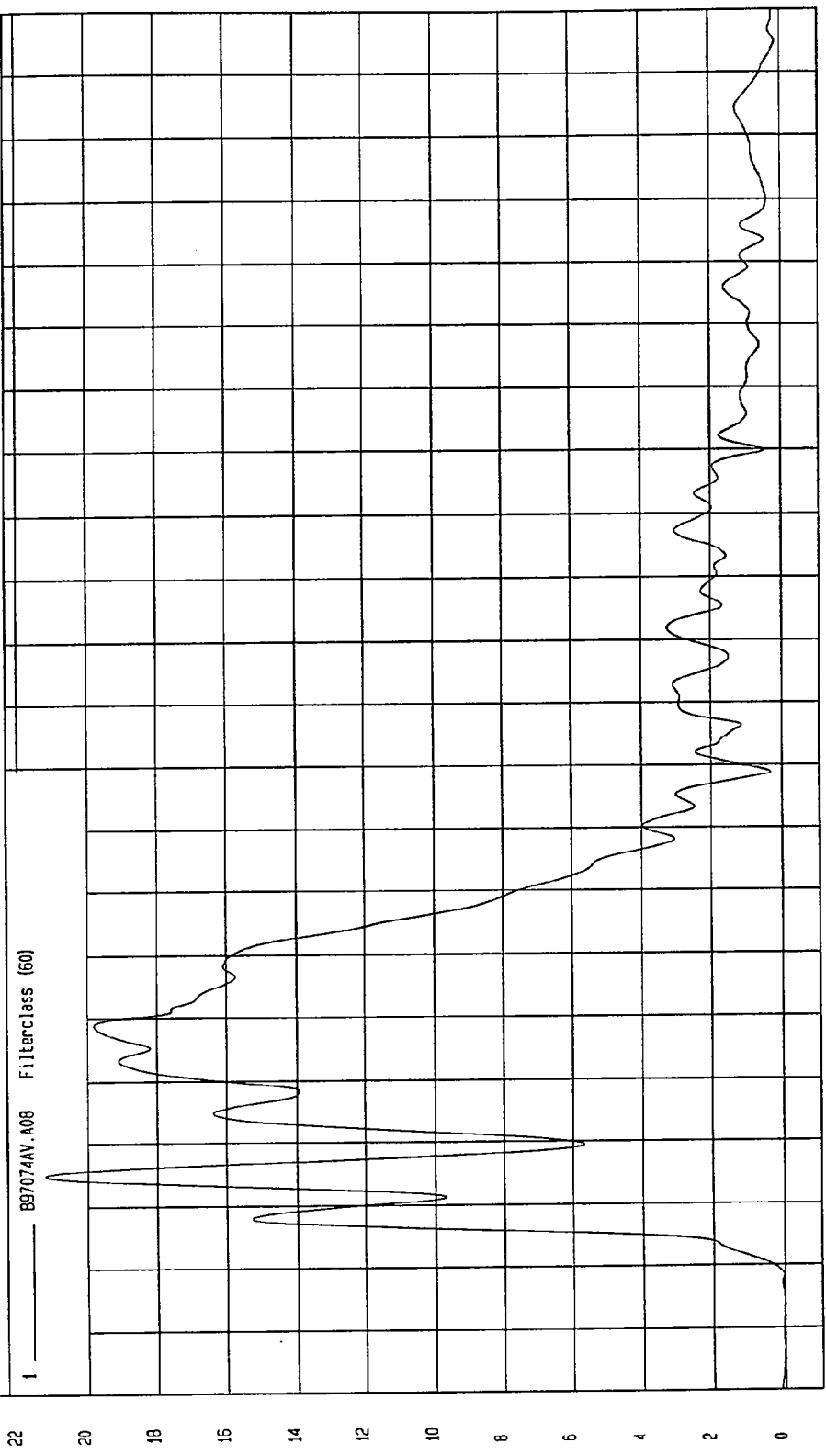


TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = 9.46E-03 G'S at -13 msec Maximum = 21.24 G'S at 15 msec

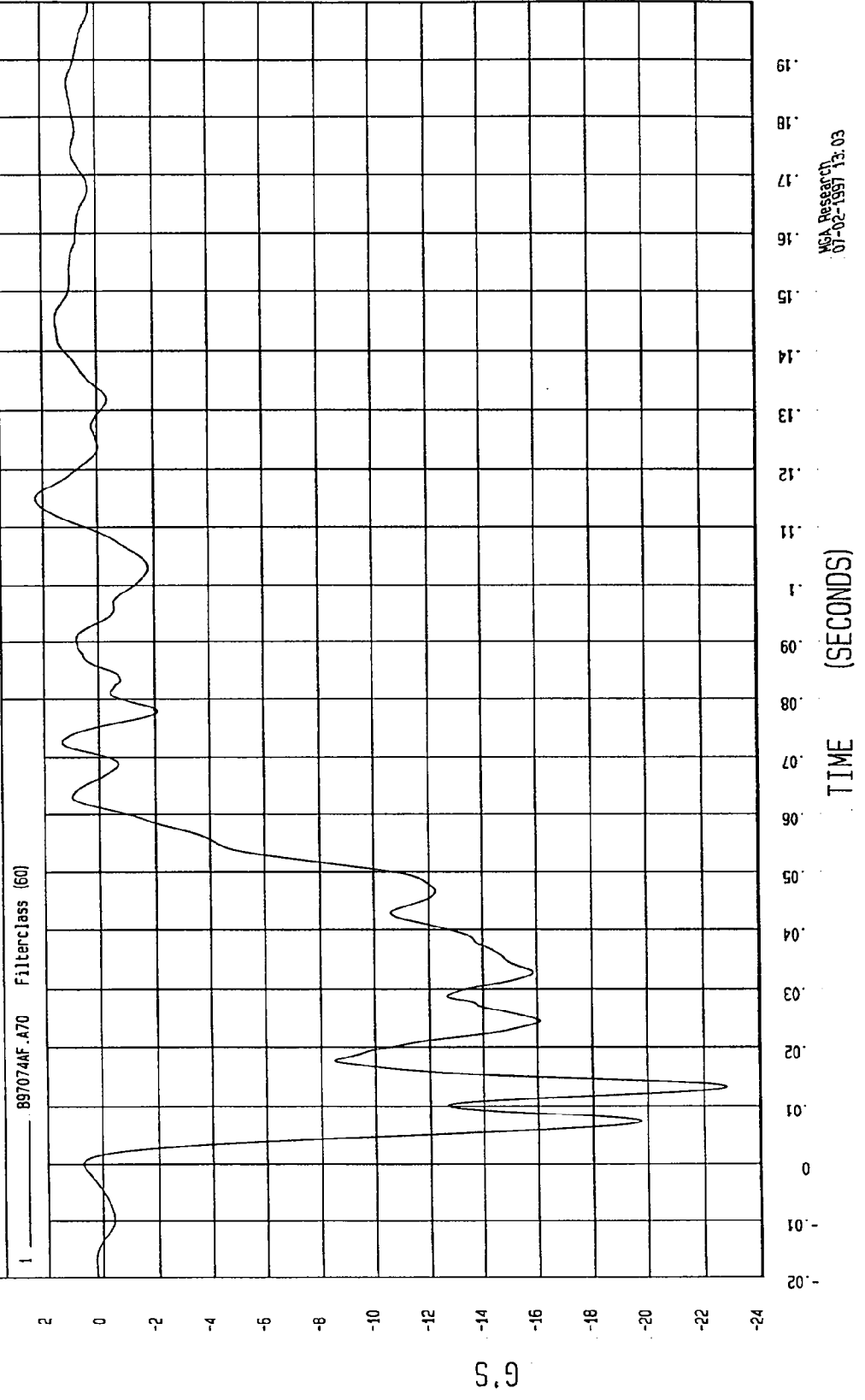
REAR FLOORPAN ABOVE AXLE RESULTANT ACCELERATION



MOA Research
06-22-1997 18:31

TEST: FMVSS 214 RIGHT SIDE IMPACT	TEST DATE: 06-24-1997
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR	Speed: 32.87 MPH 52.9 KPH
Minimum = -22.79 G'S at 13 msec	Maximum = 2.27 G'S at 115 msec

RIGHT REAR OCCUPANT COMPARTMENT Y ACCELERATION

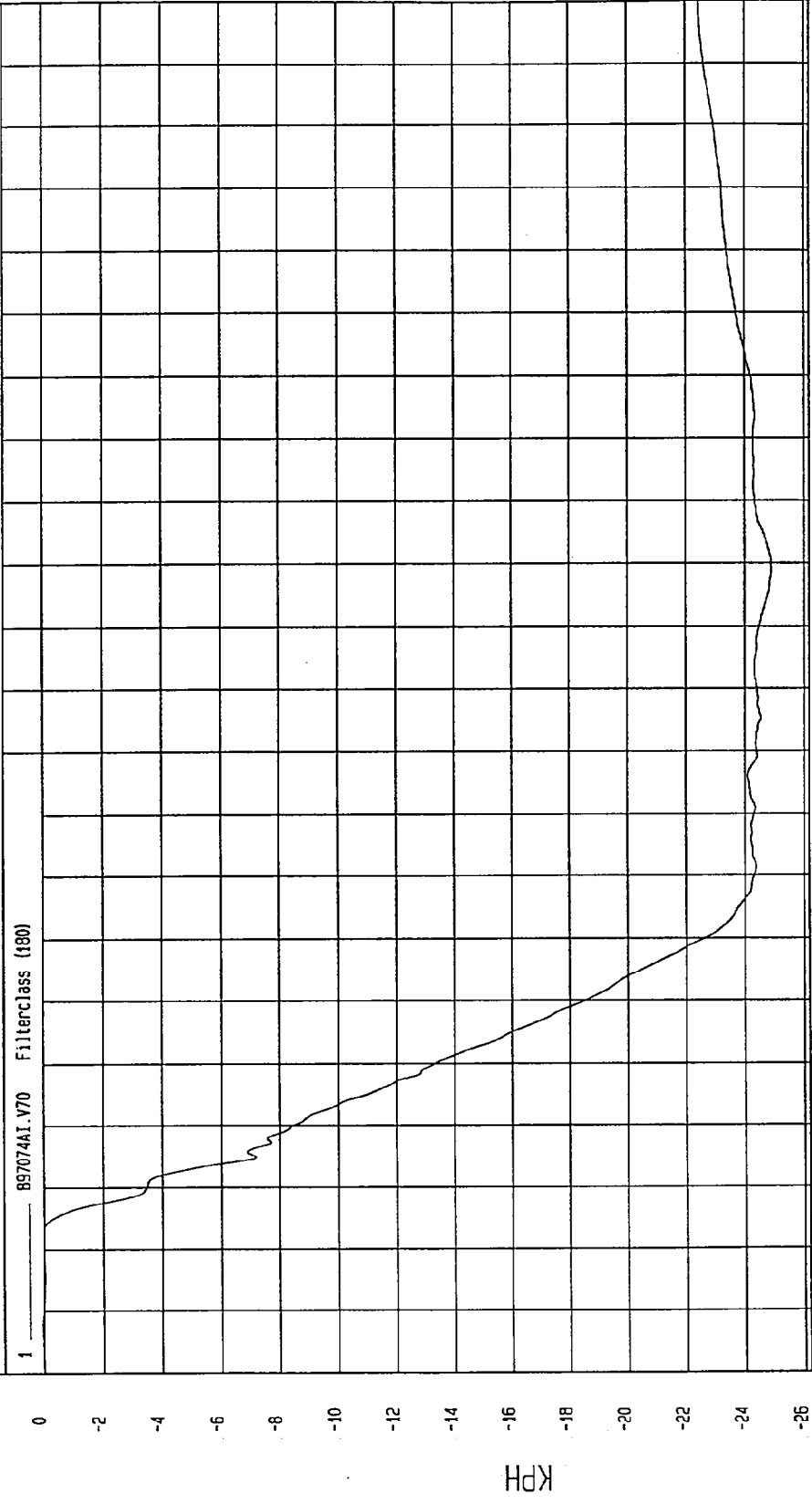


TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -24.91 KPH at 109 msec Maximum = 4.94E-02 KPH at -13 msec

RIGHT REAR PASSENGER COMPARTMENT Y VELOCITY



TIME Seconds

WCA Research
07-02-1997 13:03

TEST: FMVSS 214 RIGHT SIDE IMPACT

TEST DATE: 06-24-1997

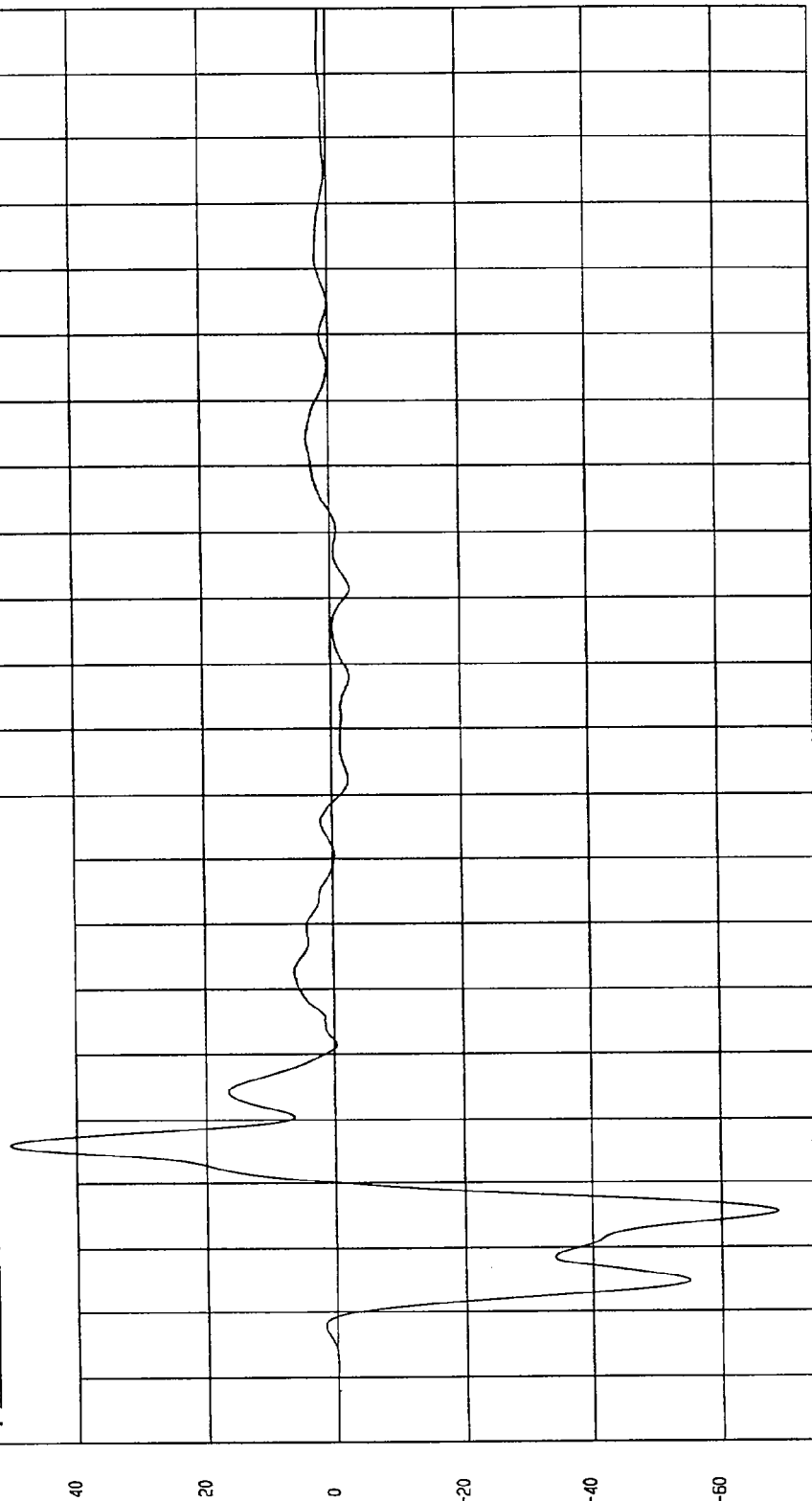
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -68.72 G's at 15 msec

Maximum = 50.24 G's at 26 msec

RIGHT LOWER A-POST Y ACCELERATION

1 ——— B97074AF.A20 Filterclass (60)



TIME (SECONDS)

MGA Research
06-22-1997 18:28

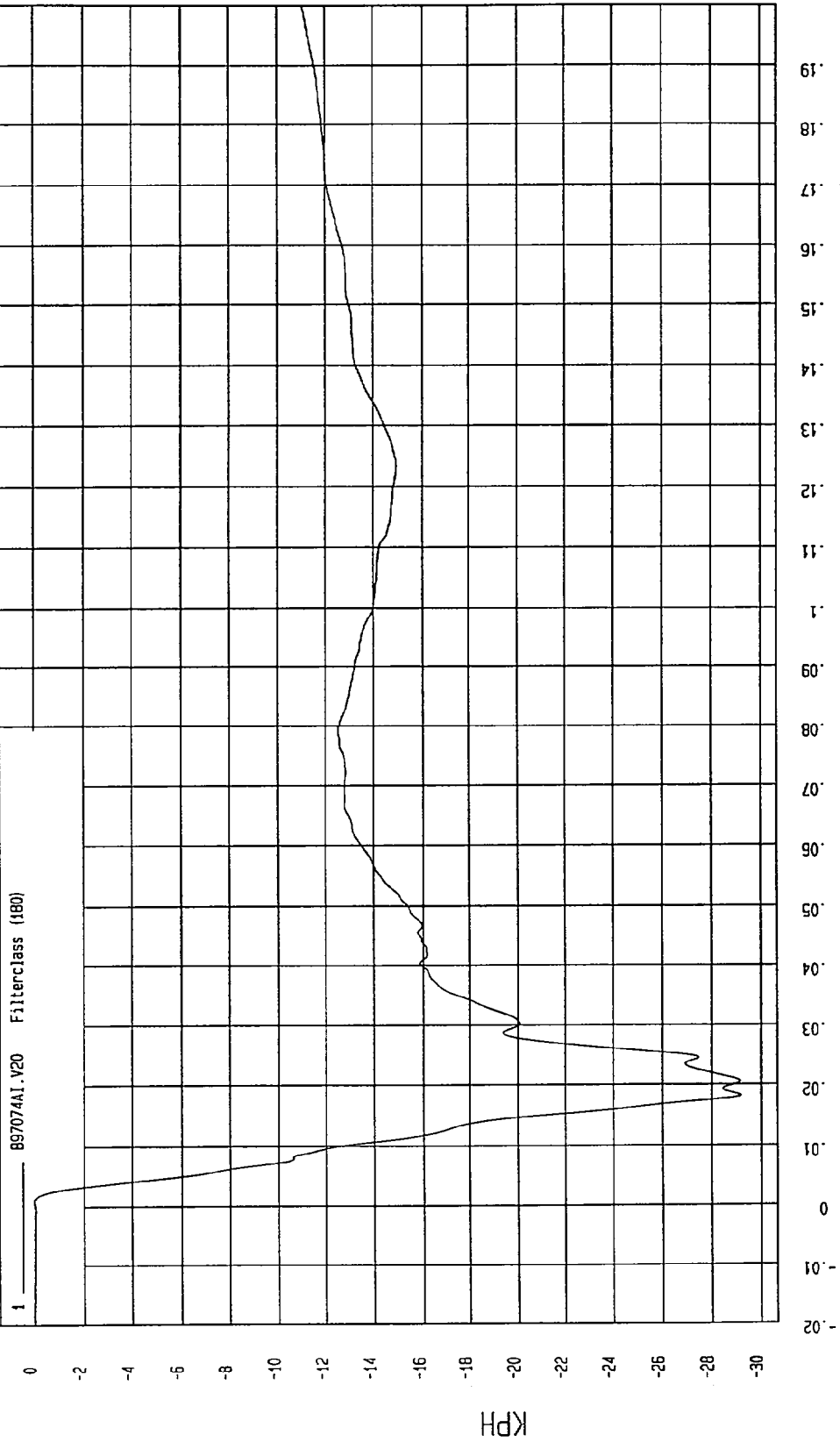
G's

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -29.18 KPH at 19 msec Maximum = 2.61E-03 KPH at 1 msec

RIGHT LOWER A-POST Y VELOCITY



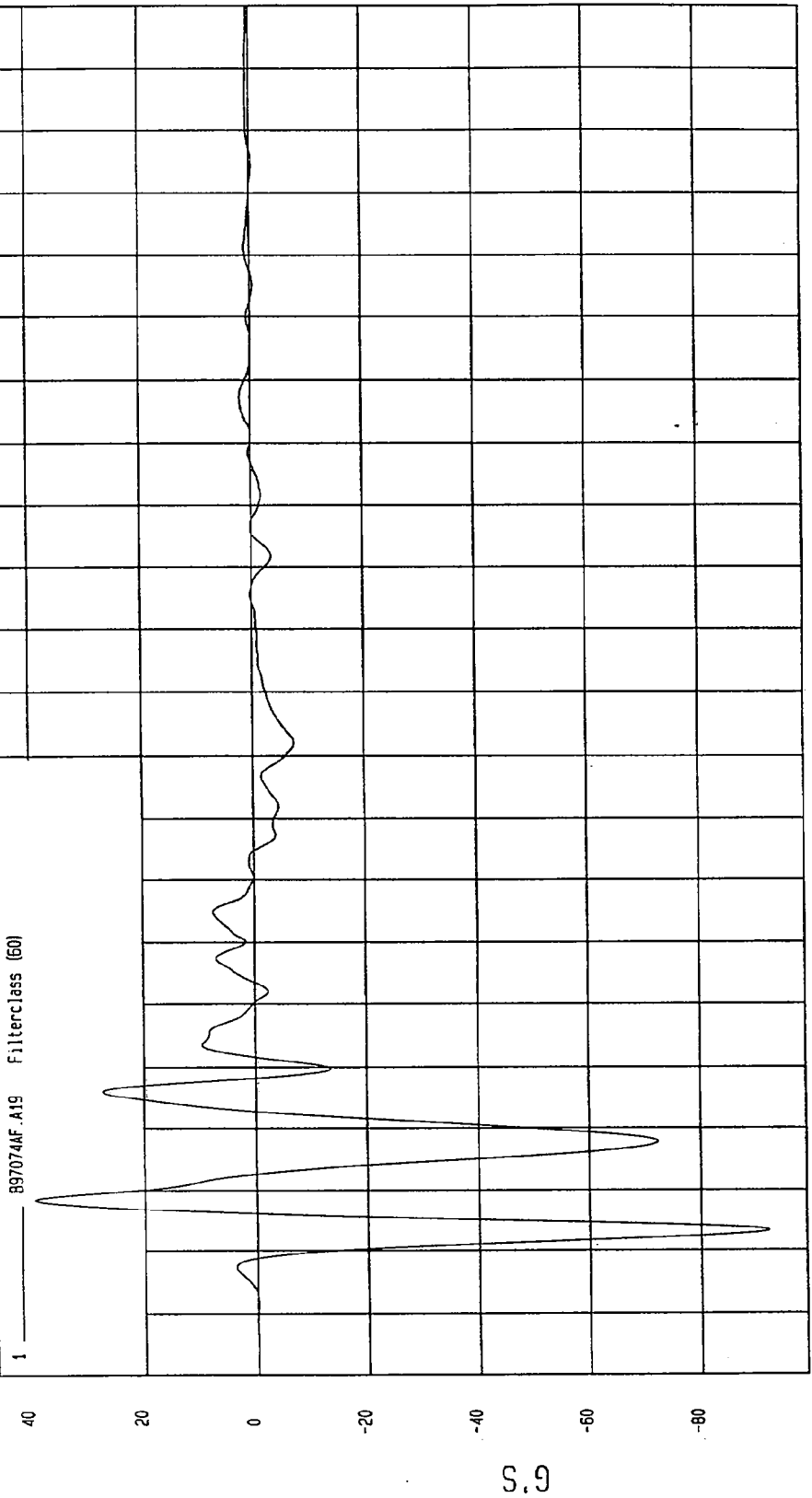
WCA Research
06-22-1997 18:28

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -32.14 G's at 3 msec Maximum = 39.40 G's at 8 msec

RIGHT MID A-POST Y ACCELERATION



NSA Research
06-22-1997 18:28

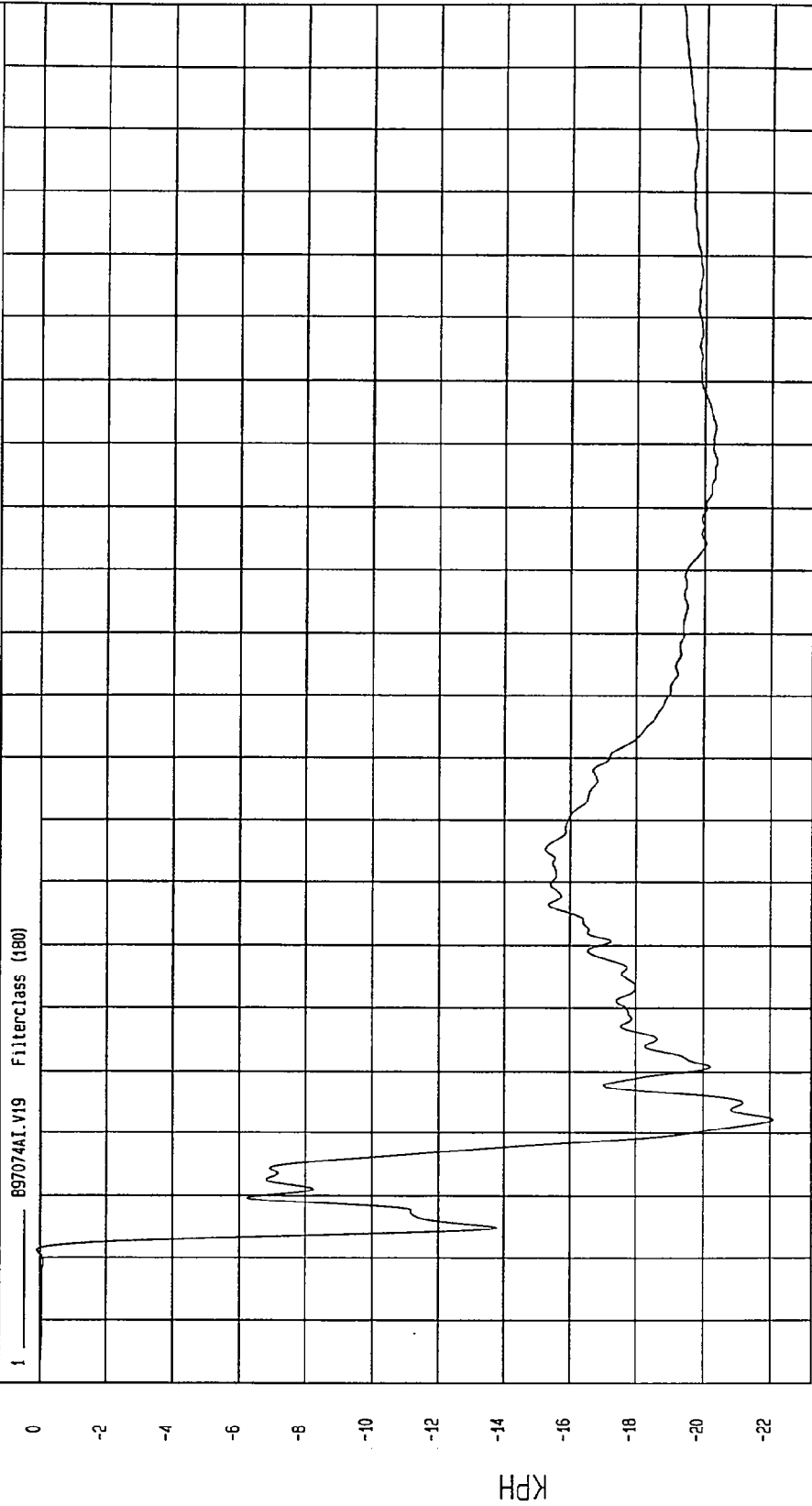
TEST: FMVSS 214 RIGHT SIDE IMPACT

TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -22.09 KPH at 22 msec Maximum = 9.09E-02 KPH at 1 msec

RIGHT MID A-POST Y VELOCITY



TIME Seconds

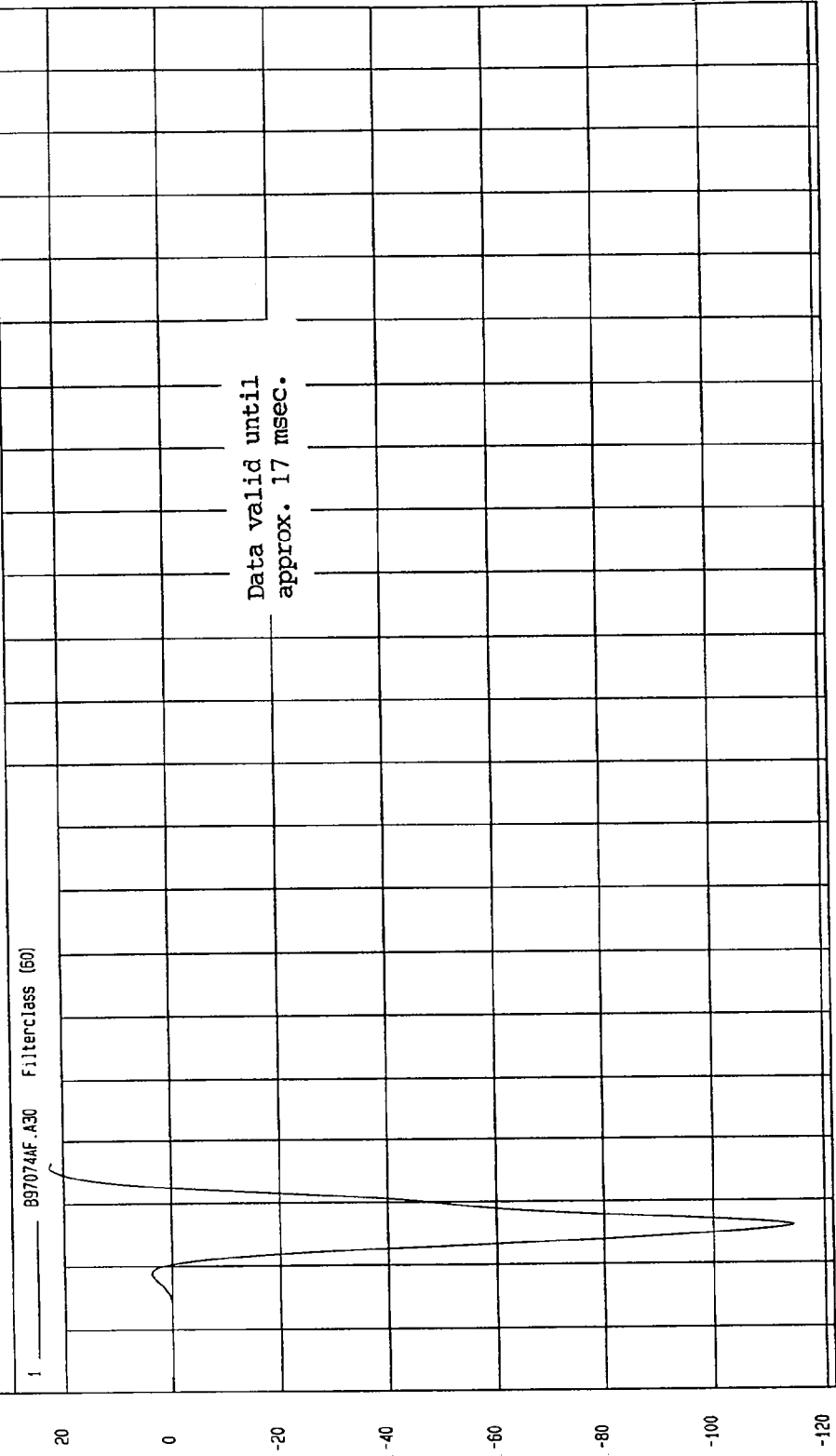
NCA Research
06-22-1997 10:28

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -114.62 G'S at 6 msec Maximum = 22.52 G'S at 16 msec

RIGHT LOWER B-POST Y ACCELERATION



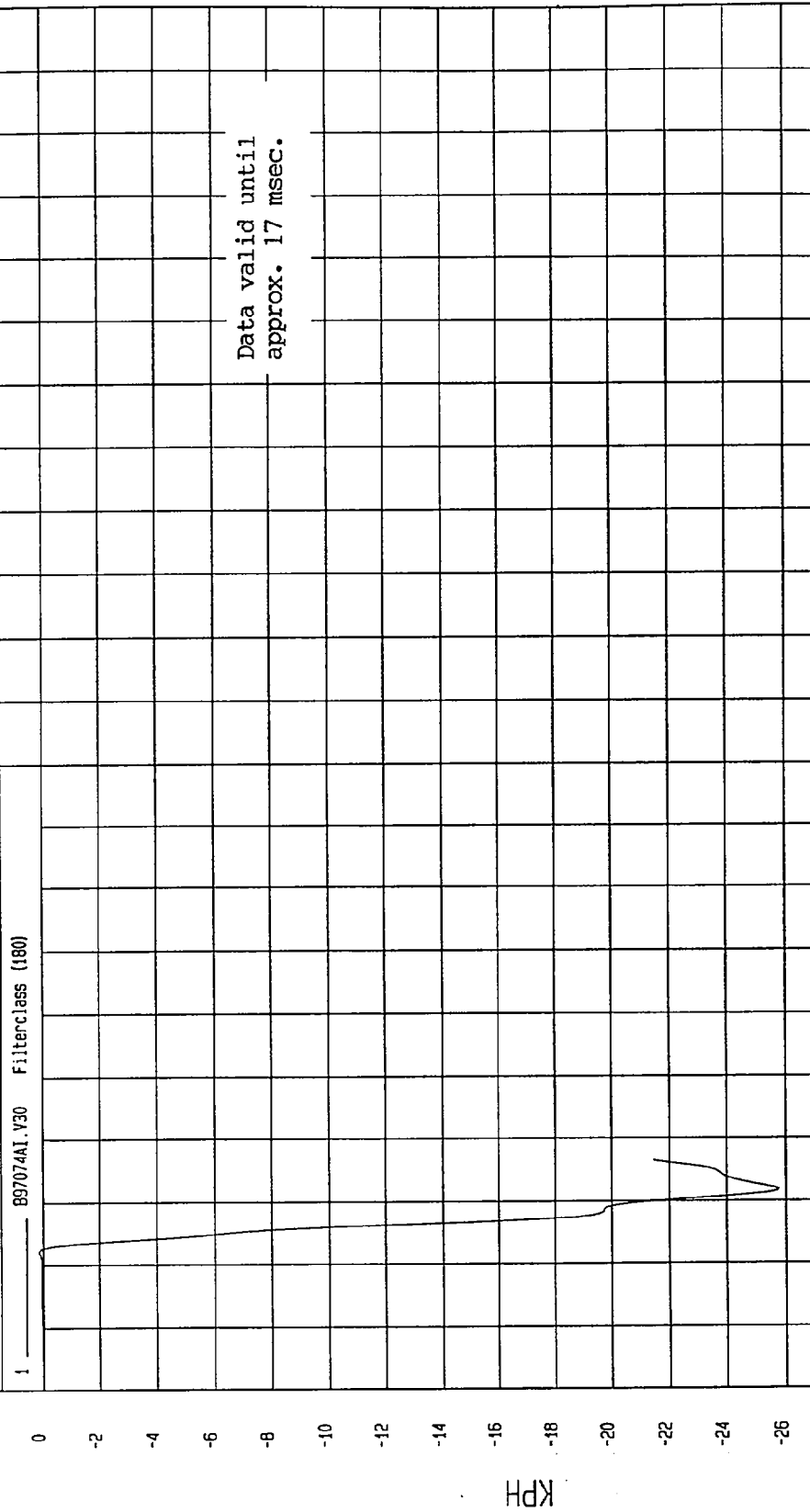
TIME (SECONDS)

NSA Research
07-01-1997 16:02

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -25.75 KPH at 12 msec Maximum = .14 KPH at 2 msec

RIGHT LOWER B-POST Y VELOCITY



TIME Seconds

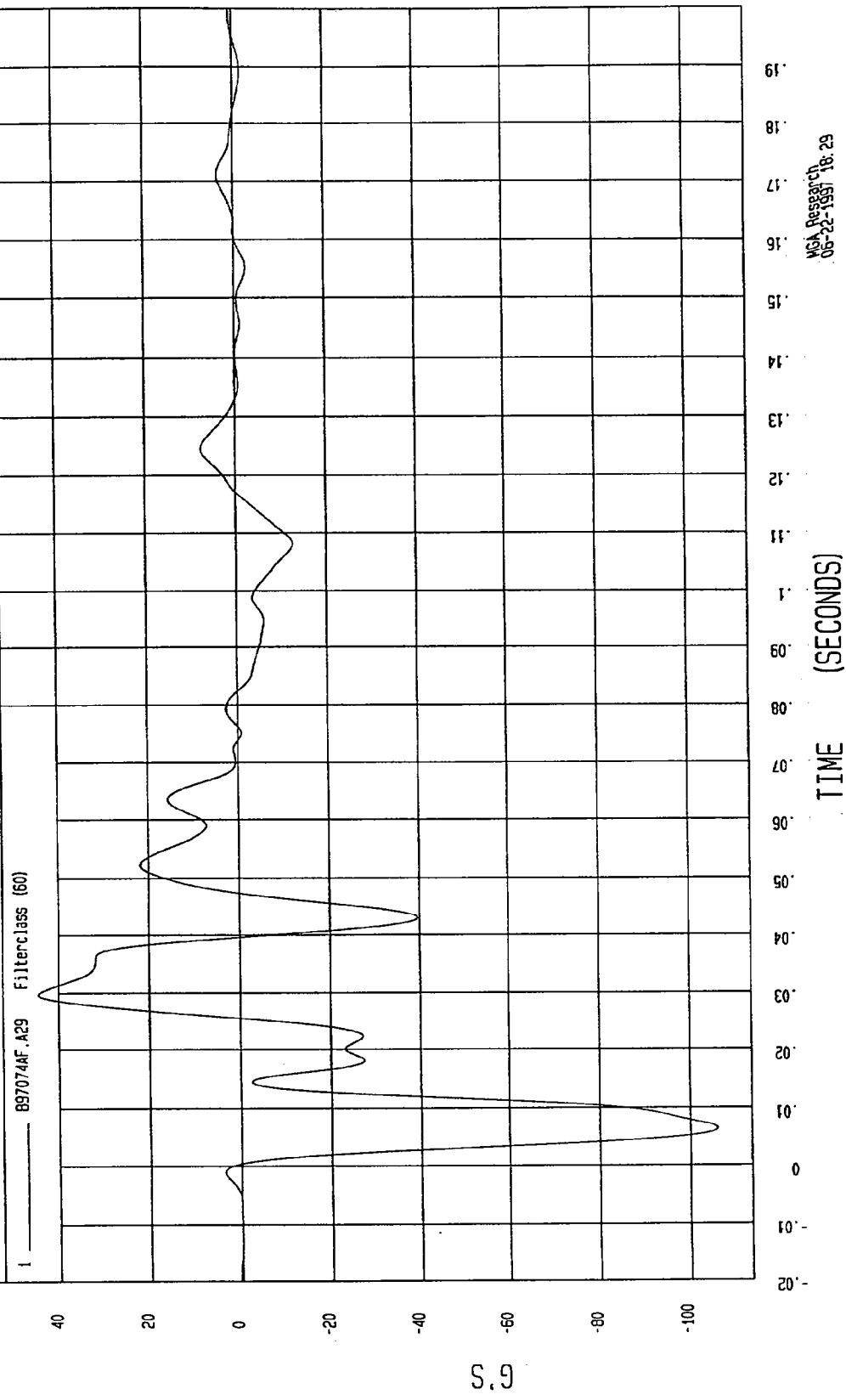
MGA Research
07-01-1997 16:02

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -105.97 G'S at 6 msec Maximum = 44.57 G'S at 30 msec

RIGHT MID B-POST Y ACCELERATION



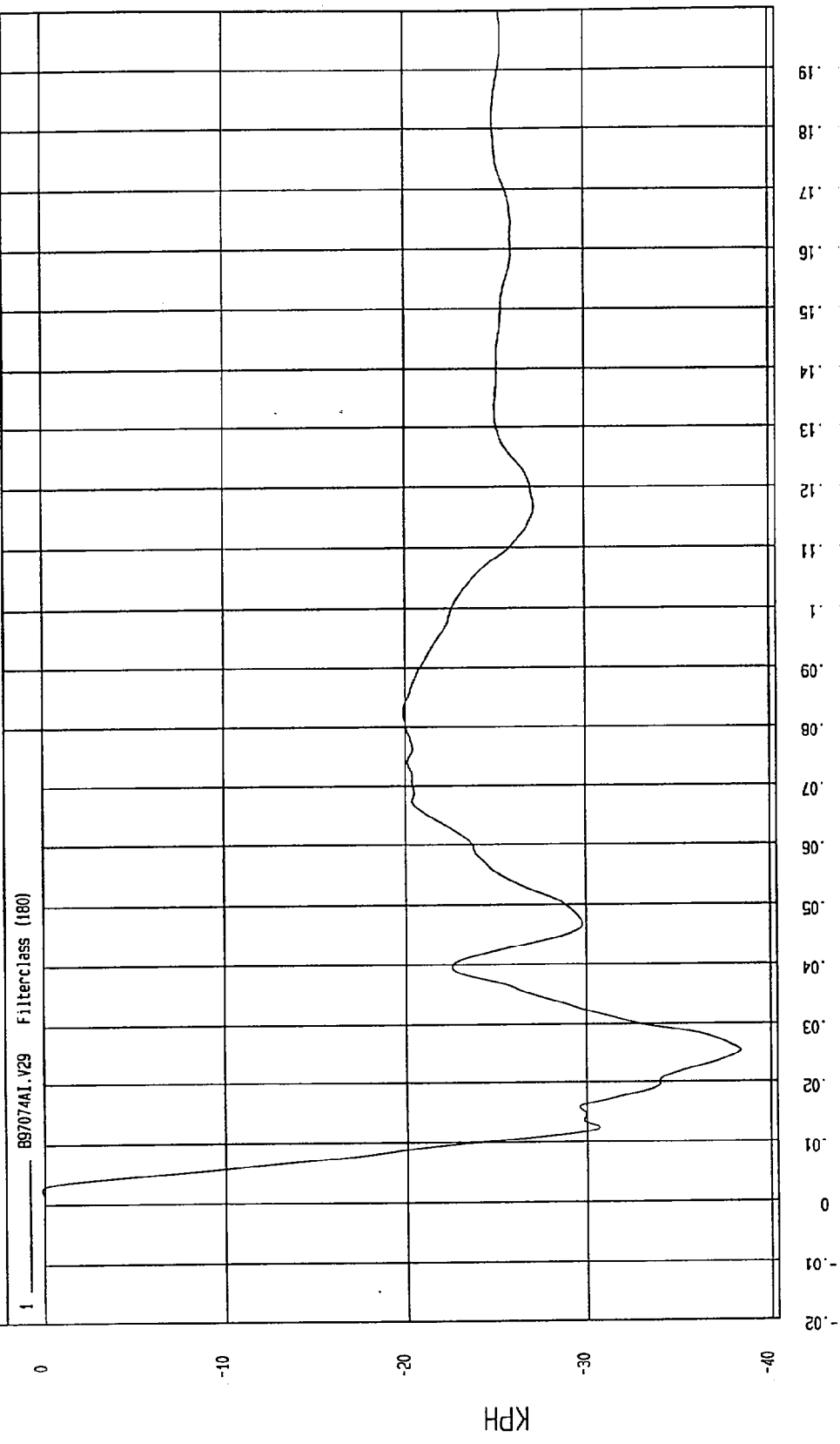
WGA Research
06-22-1997 16:29

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -38.41 KPH at 25 msec Maximum = .13 KPH at 2 msec

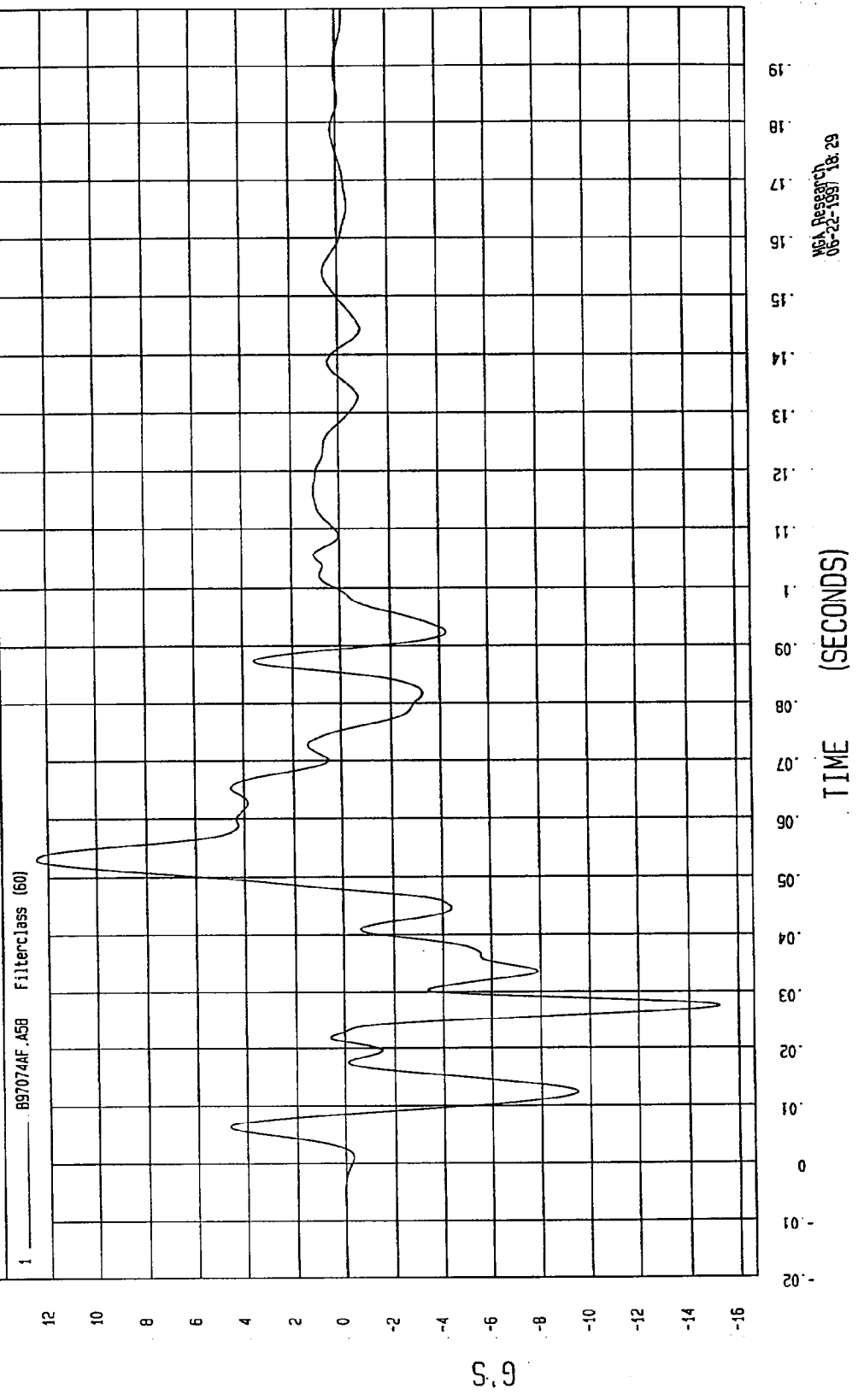
RIGHT MID B-POST Y VELOCITY



MOA Research
06-22-1997 18:29

TEST: FMVSS 214 RIGHT SIDE IMPACT	TEST DATE: 06-24-1997
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR	Speed: 32.87 MPH 52.9 KPH
Minimum = -5.21 G'S at 28 msec	Maximum = 12.47 G'S at 53 msec

VEHICLE CG X ACCELERATION



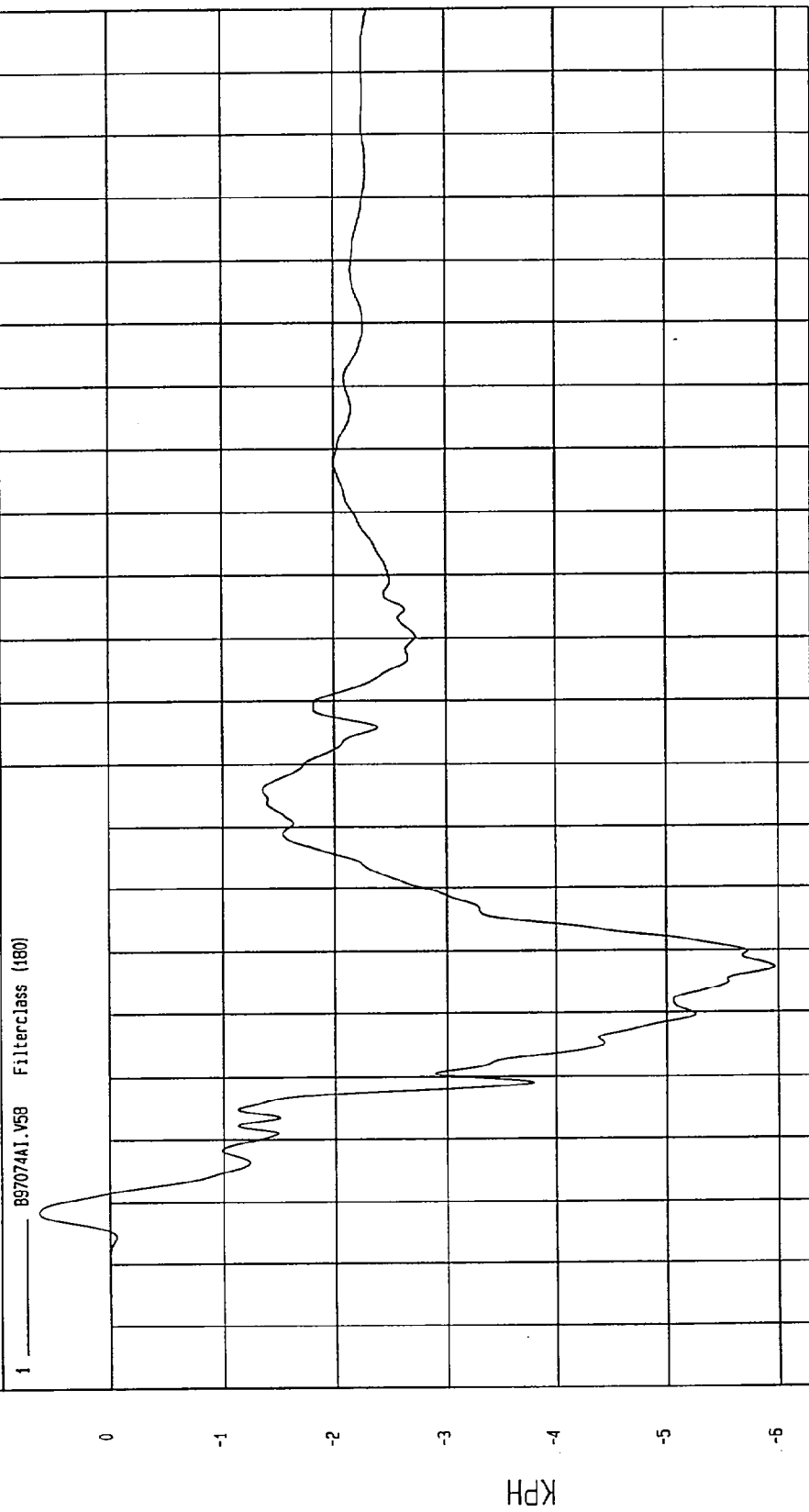
NCA Research
06-22-1997 18:29

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -5.96 KPH at 47 msec Maximum = .60 KPH at 8 msec

VEHICLE CG X VELOCITY



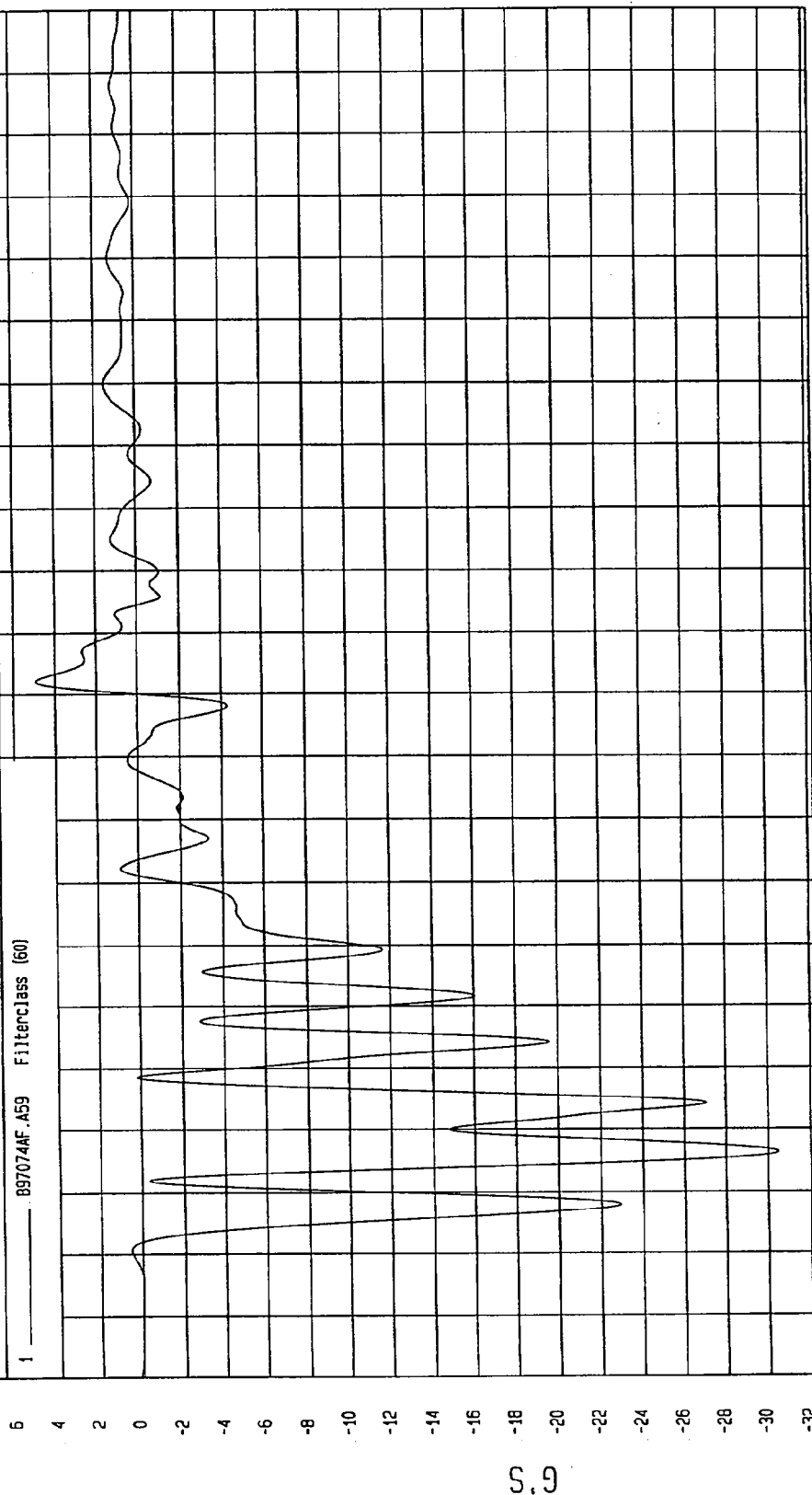
TIME Seconds

0.19
0.18
0.17
0.16
0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
-0.01
-0.02

MCA Research
06-22-1997 18:29

TEST: FMVSS 214 RIGHT SIDE IMPACT	TEST DATE: 06-24-1997
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR	Speed: 32.87 MPH 52.9 KPH
Minimum = -50.49 G'S at 16 msec	Maximum = 4.92 G'S at 92 msec

VEHICLE CG Y ACCELERATION



MCA Research
06-22-1997 16:29

TEST: FMVSS 214 RIGHT SIDE IMPACT

TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -25.01 KPH at 90 msec

Maximum = 1.33E-02 KPH at -7 msec

VEHICLE CG Y VELOCITY

1 B97074A1.V59 Filterclass (100)

KPH

TIME Seconds

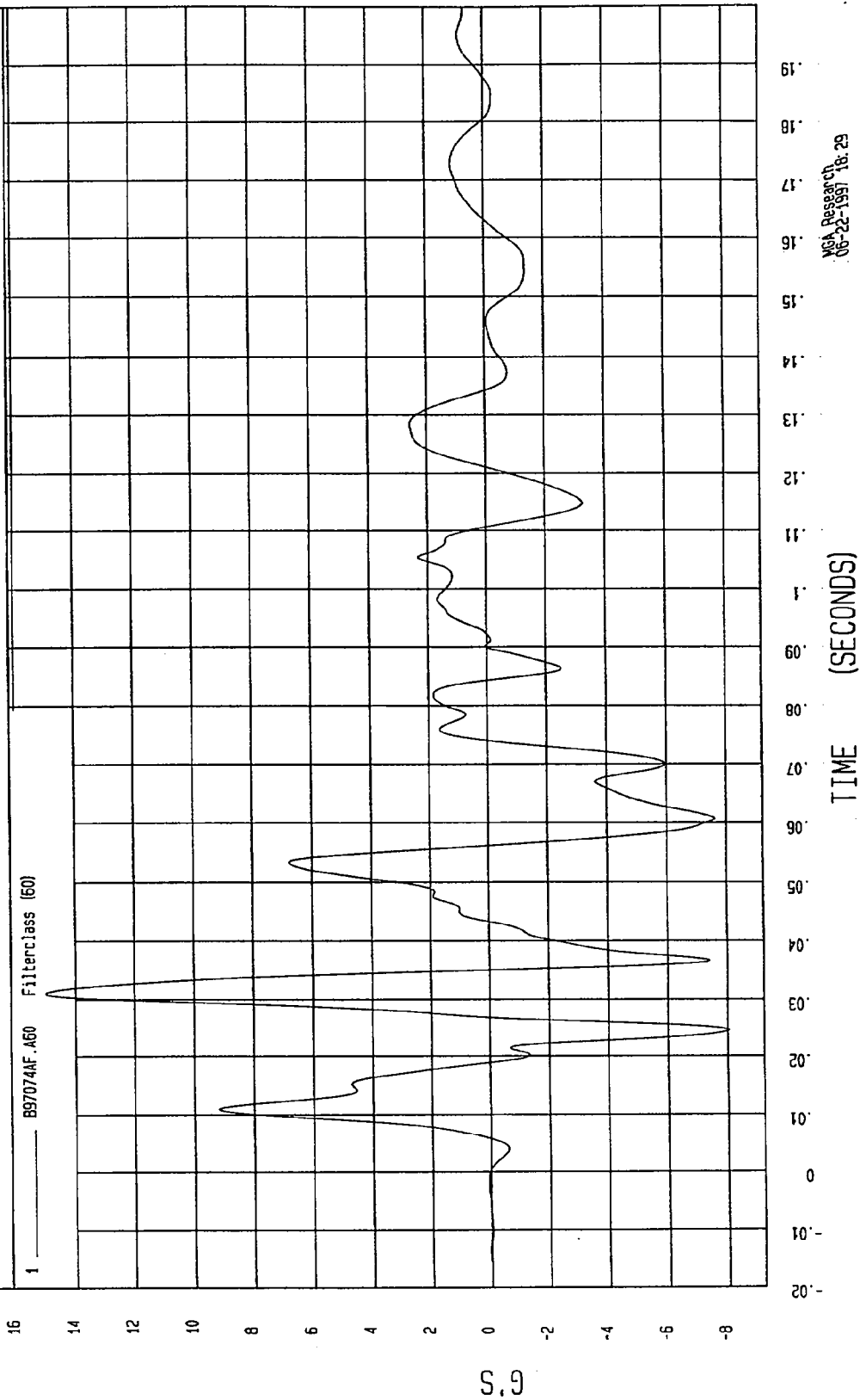
NBA Research
06-22-1997 18:29

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -8.03 G'S at 25 msec Maximum = 15.00 G'S at 31 msec

VEHICLE CG Z ACCELERATION

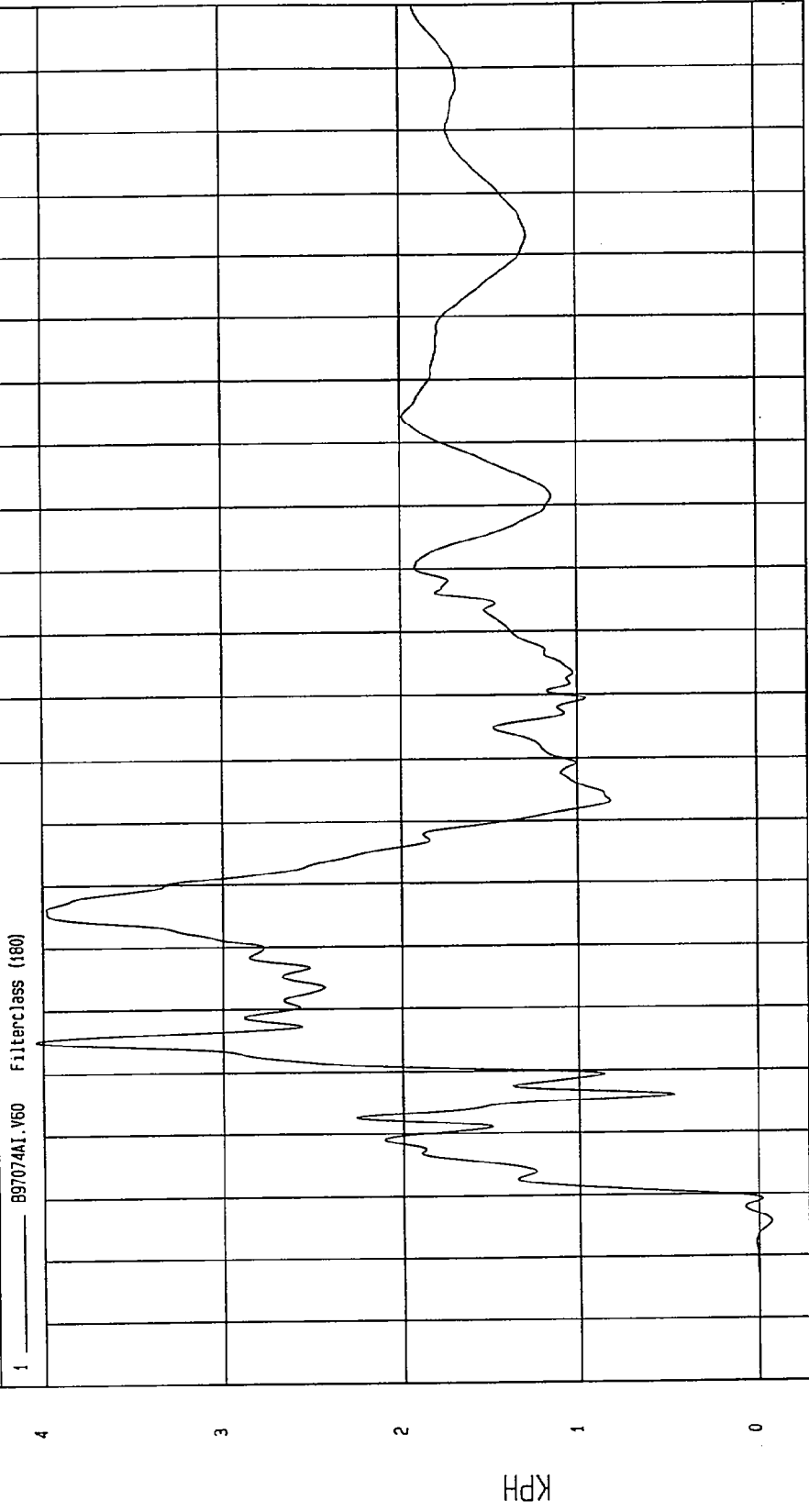


TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -7.08E-02 KPH at 6 msec Maximum = 4.04 KPH at 35 msec

VEHICLE CG Z VELOCITY



TIME Seconds

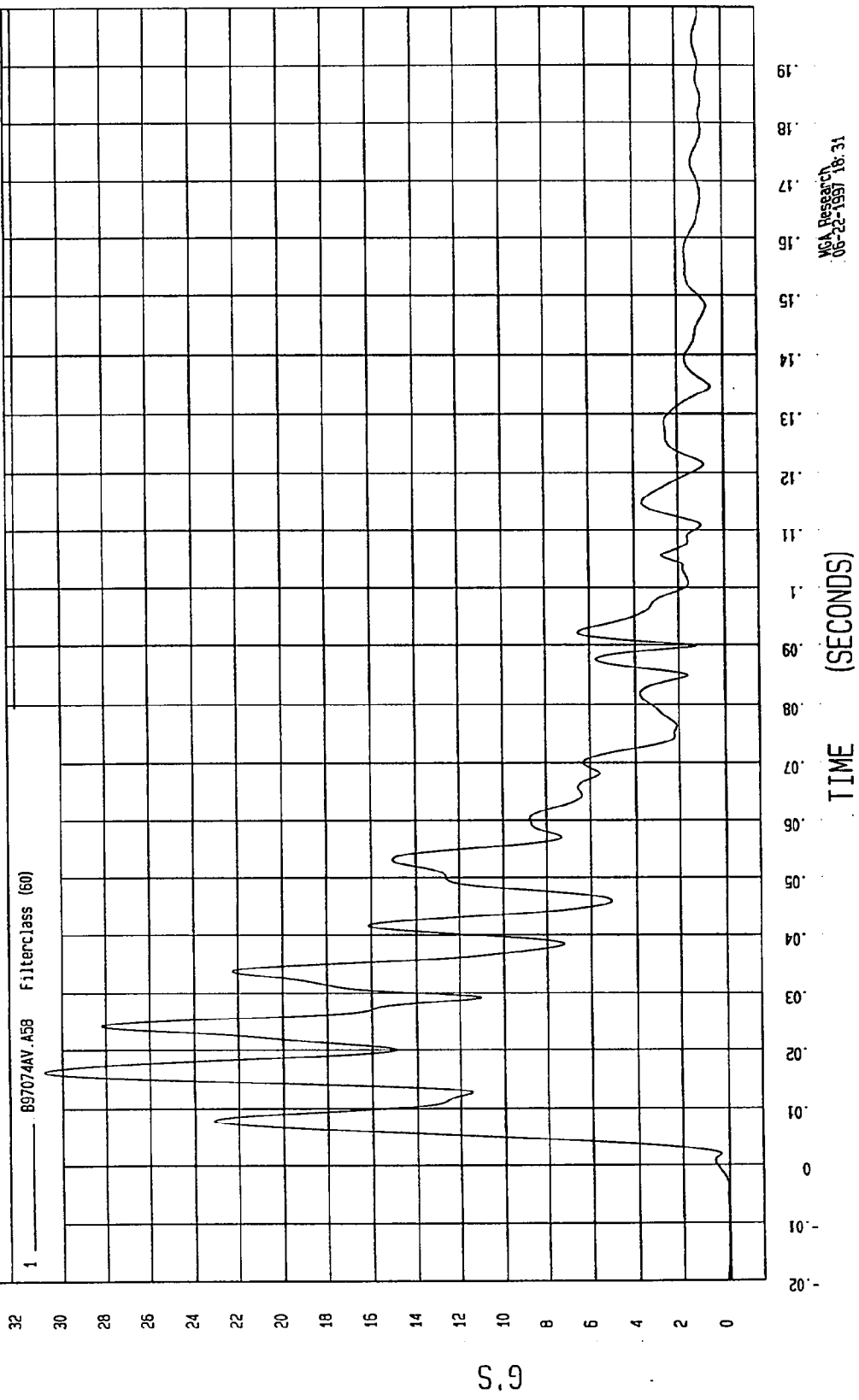
NCA Research
06-22-1997 18:29

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = 1.83E-02 G'S at -12 msec Maximum = 30.80 G'S at 16 msec

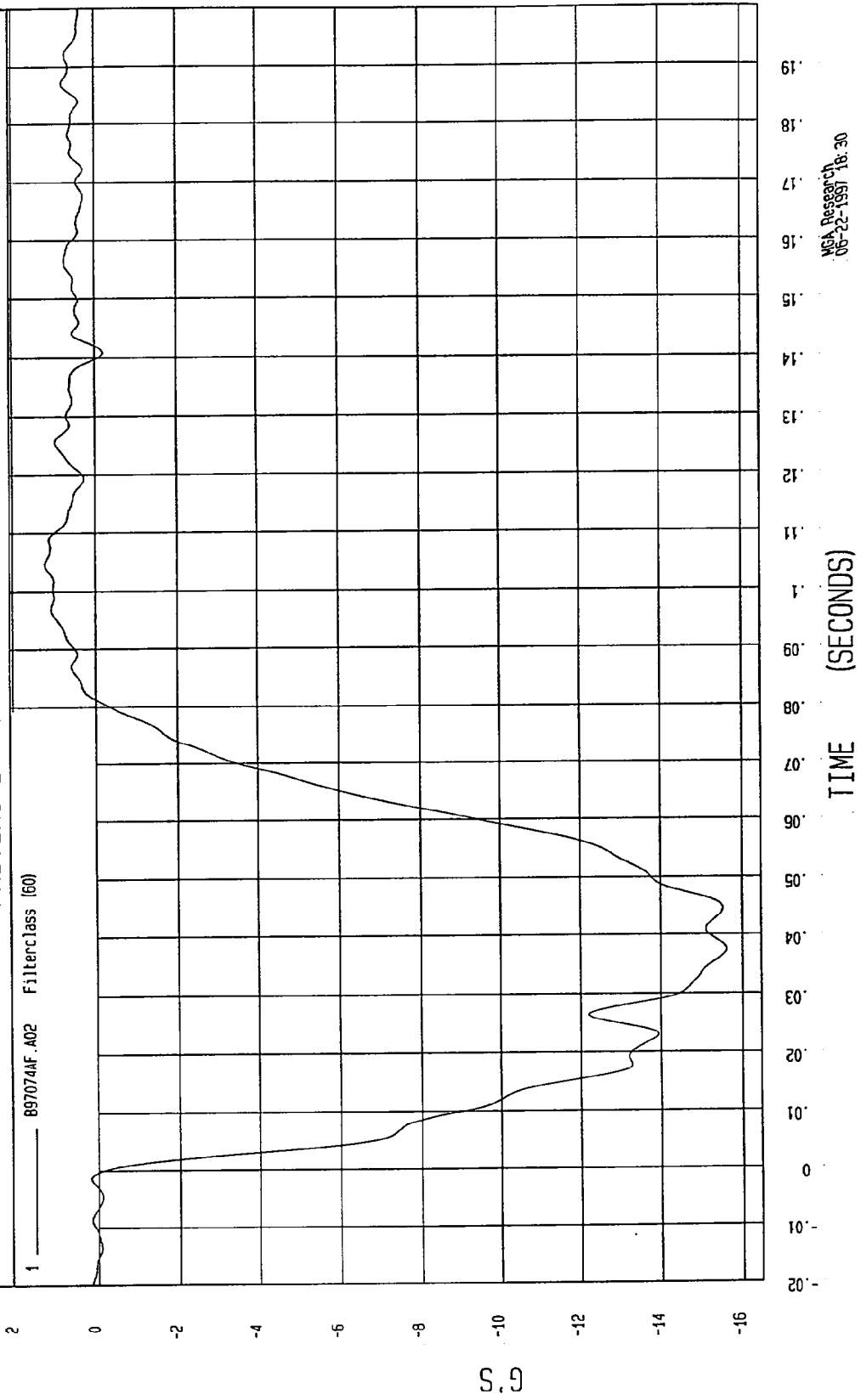
VEHICLE CG RESULTANT ACCELERATION



MCA Research
06-22-1997 18:31

TEST: FMVSS 214 RIGHT SIDE IMPACT	TEST DATE: 06-24-1997
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR	Speed: 32.87 MPH 52.9 KPH
Minimum = -15.61 G'S at 37 msec	Maximum = 1.22 G'S at 105 msec

MOVING BARRIER CG X ACCELERATION



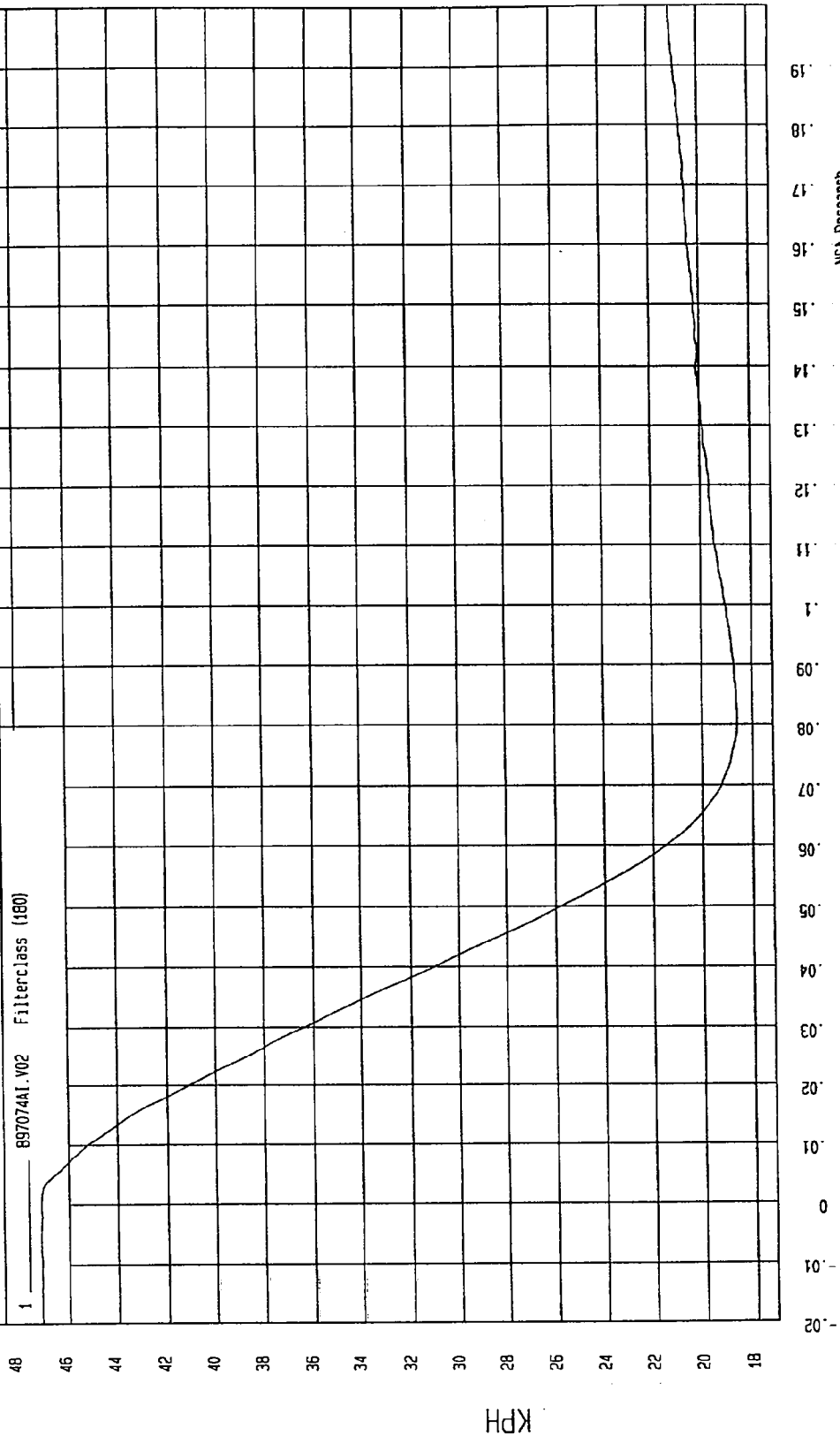
NGA Research
06-22-1997 16:30

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = 19.59 KPH at 81 msec Maximum = 47.13 KPH at -7 msec

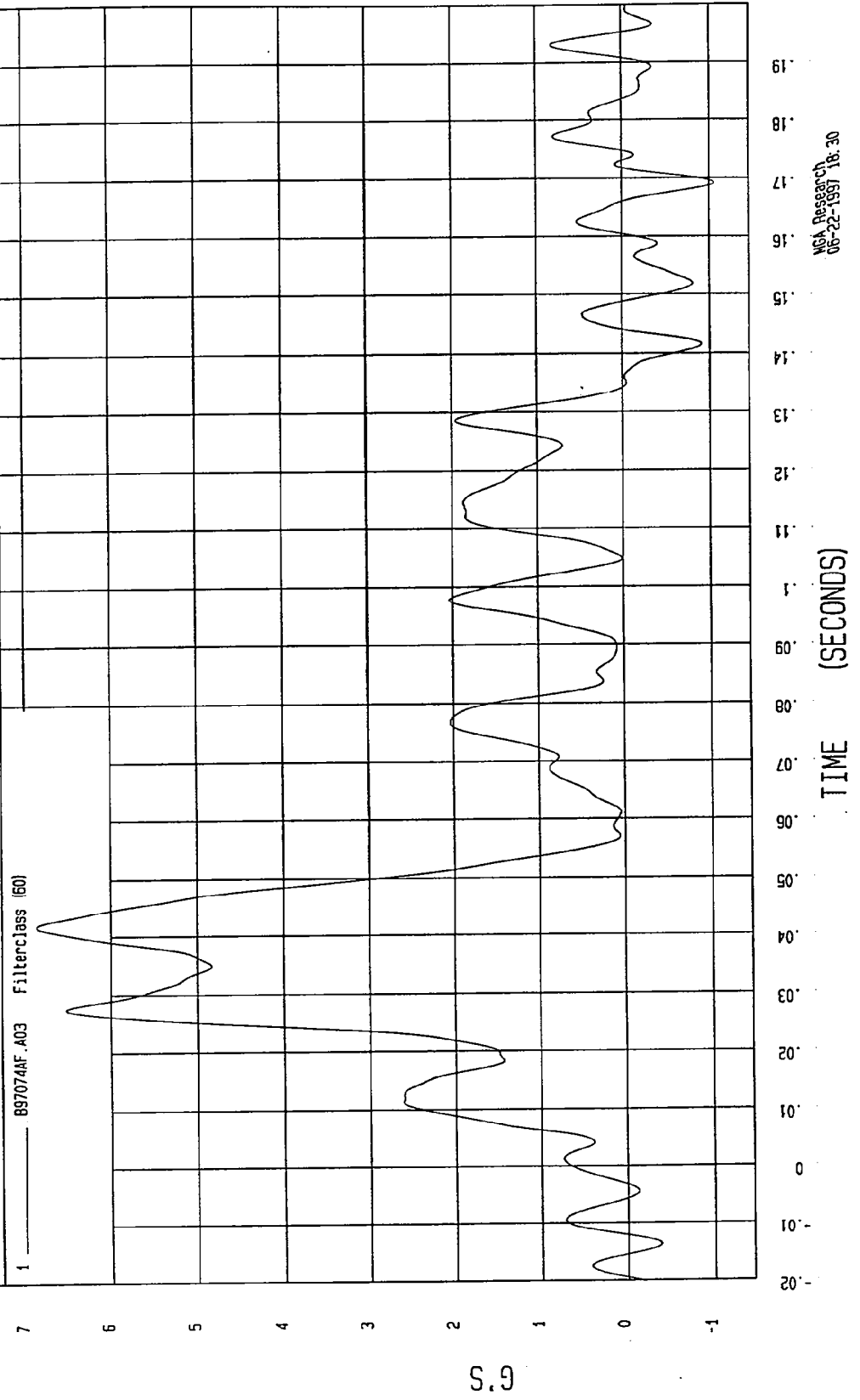
MOVING BARRIER CG X VELOCITY



NGA Research
07-01-1997 15:57

TEST: FMVSS 214 RIGHT SIDE IMPACT	TEST DATE: 06-24-1997
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR	Speed: 32.87 MPH 52.9 KPH
Minimum = -1.05 G'S at 169 msec	Maximum = 6.87 G'S at 42 msec

MOVING BARRIER CG Y ACCELERATION



TEST: FMVSS 214 RIGHT SIDE IMPACT

TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = 23.99 KPH at -12 msec

Maximum = 33.51 KPH at 137 msec

MOVING BARRIER CG Y VELOCITY

1 _____ B97074A1.V03 Filterclass (180)

32

30

28

26

24

KPH

61

58

55

52

49

46

43

40

37

34

31

28

25

22

19

16

13

10

7

4

1

-2

WGA Research
07-01-1997 15:58

TIME Seconds

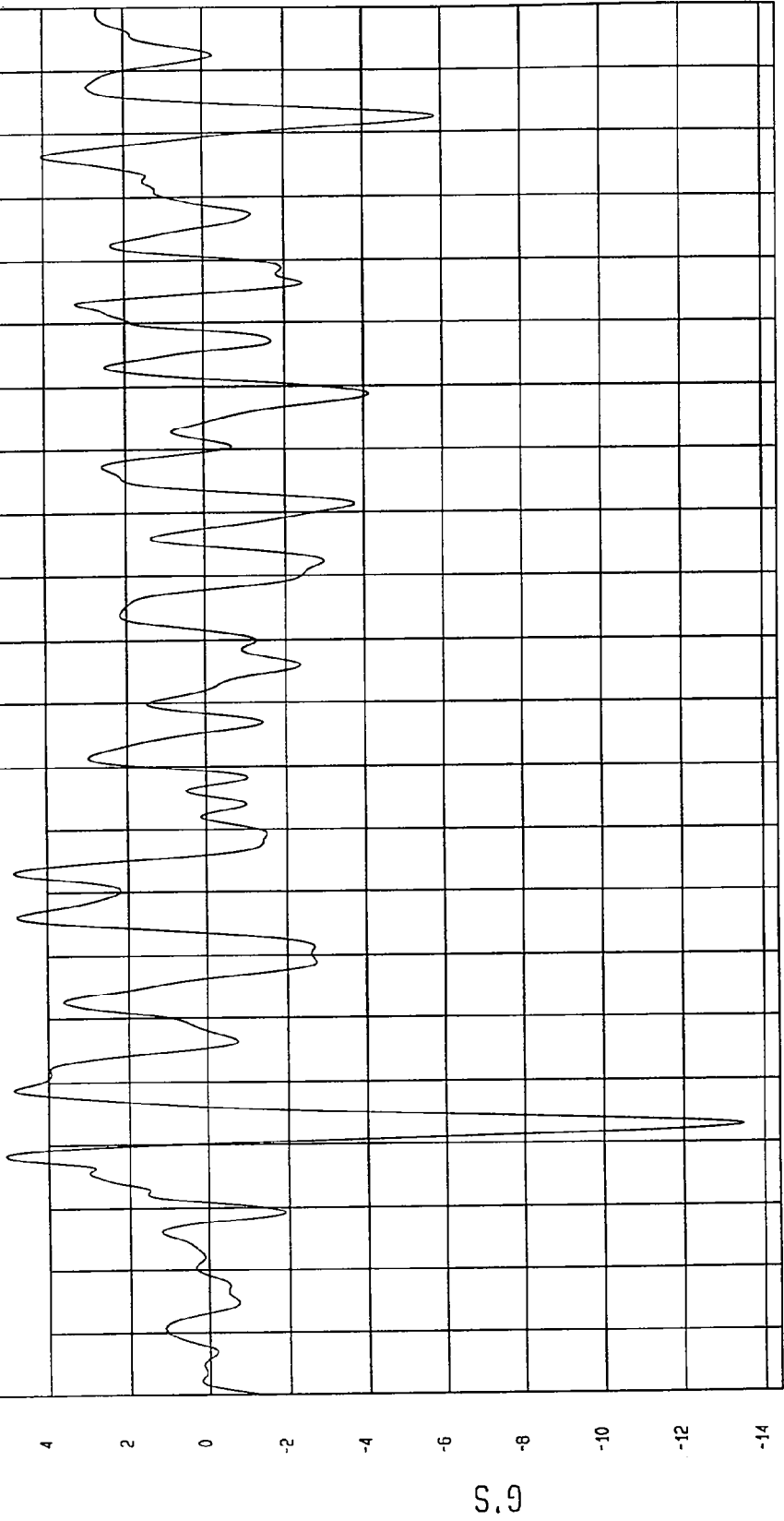
TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -13.46 G'S at 23 msec Maximum = 5.05 G'S at 18 msec

MOVING BARRIER CG Z ACCELERATION

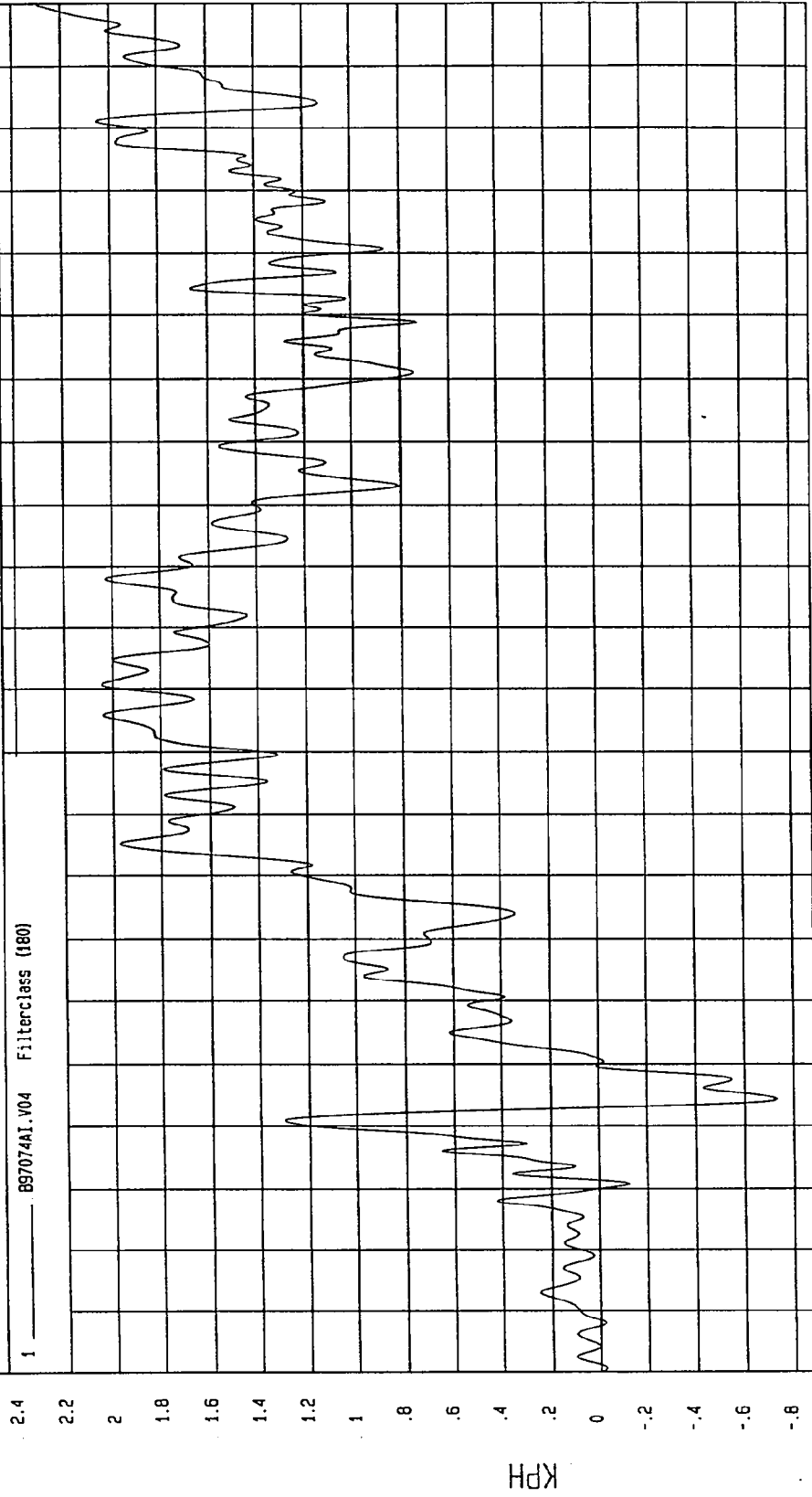
1 897074AF.A04 Filterclass (60)



MCA Research
06-22-1997 18:30

TEST: FMVSS 214 RIGHT SIDE IMPACT	TEST DATE: 06-24-1997
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR	Speed: 32.87 MPH 52.9 KPH
Minimum = -.73 KPH at 24 msec	Maximum = 2.30 KPH at 200 msec

MOVING BARRIER CG Z VELOCITY



TIME Seconds

0.19
0.18
0.17
0.16
0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
-0.01
-0.02

NCI Research
07-01-1997 15:58

TEST: FMVSS 214 RIGHT SIDE IMPACT

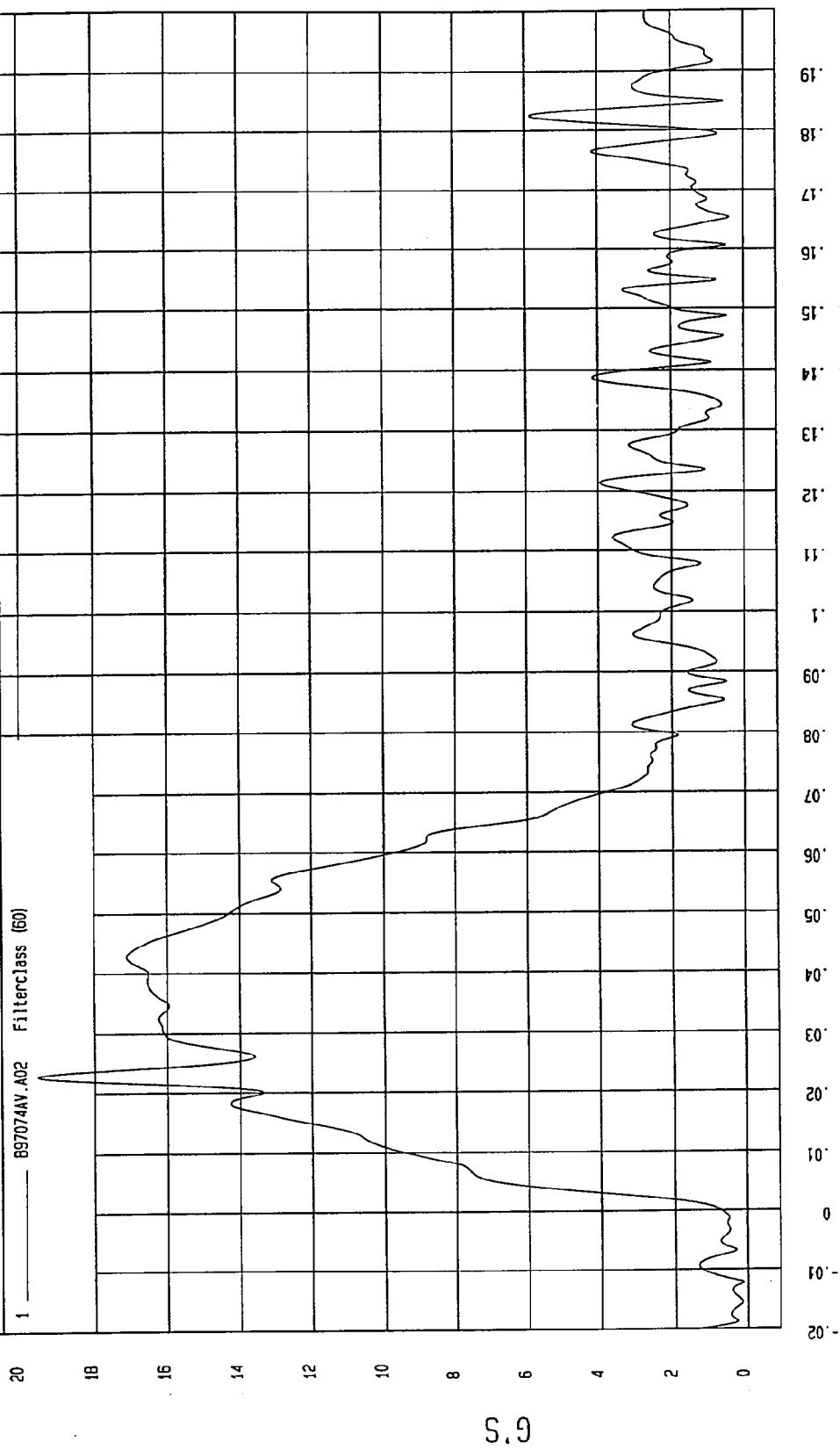
TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = .10 G'S at -12 msec

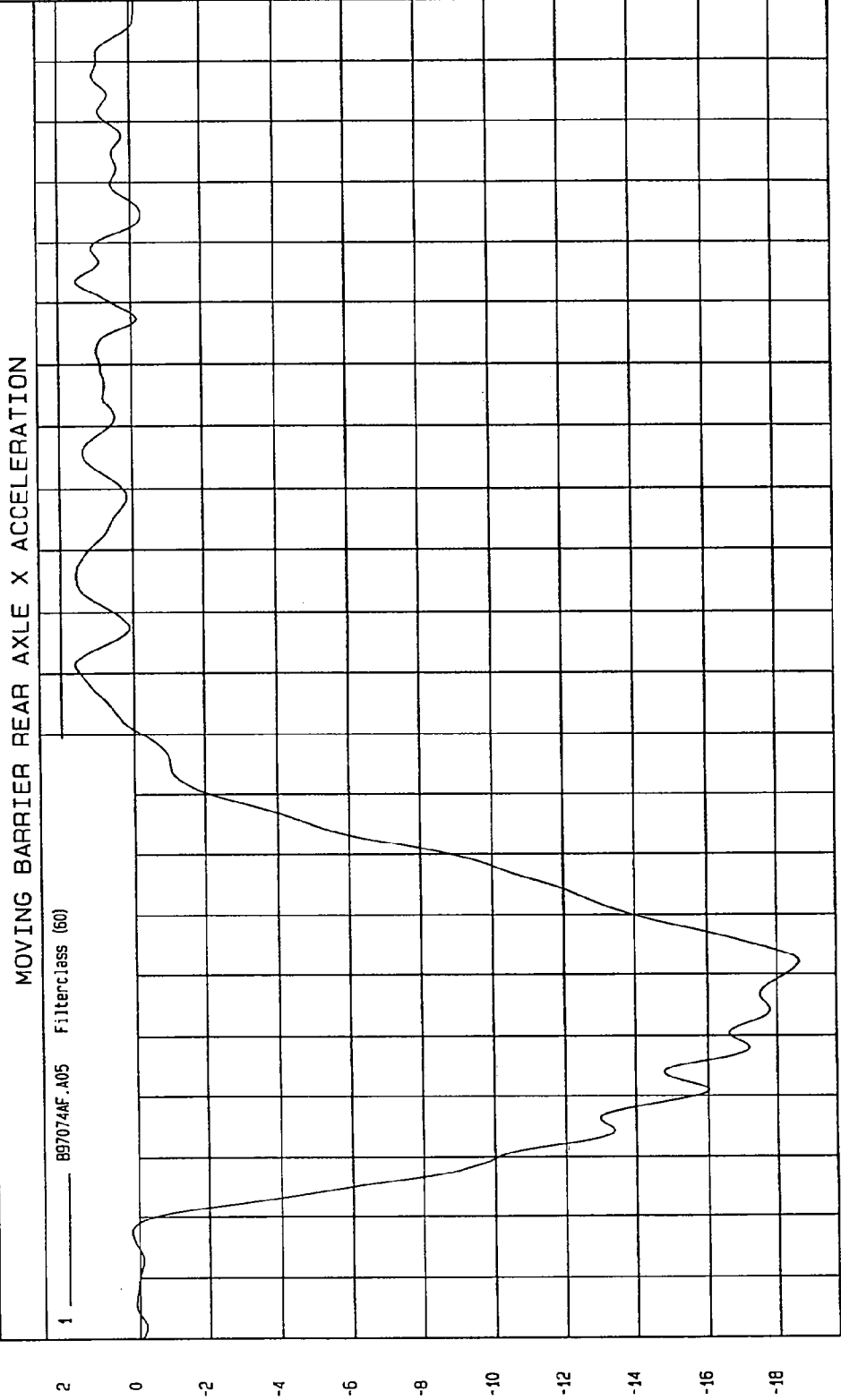
Maximum = 19.52 G'S at 23 msec

MOVING BARRIER CG RESULTANT ACCELERATION



NCA Research
06-22-1997 18:31

TEST: FMVSS 214 RIGHT SIDE IMPACT	TEST DATE: 06-24-1997
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR	Speed: 32.87 MPH 52.9 KPH
Minimum = -18.59 G'S at 42 msec	
Maximum = 1.60 G'S at 91 msec	



TIME (SECONDS)

0.19
0.18
0.17
0.16
0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
-0.01
-0.02

06-22-1997 18:30
NCA Research

G.S

TEST: FMVSS 214 RIGHT SIDE IMPACT

TEST DATE: 06-24-1997

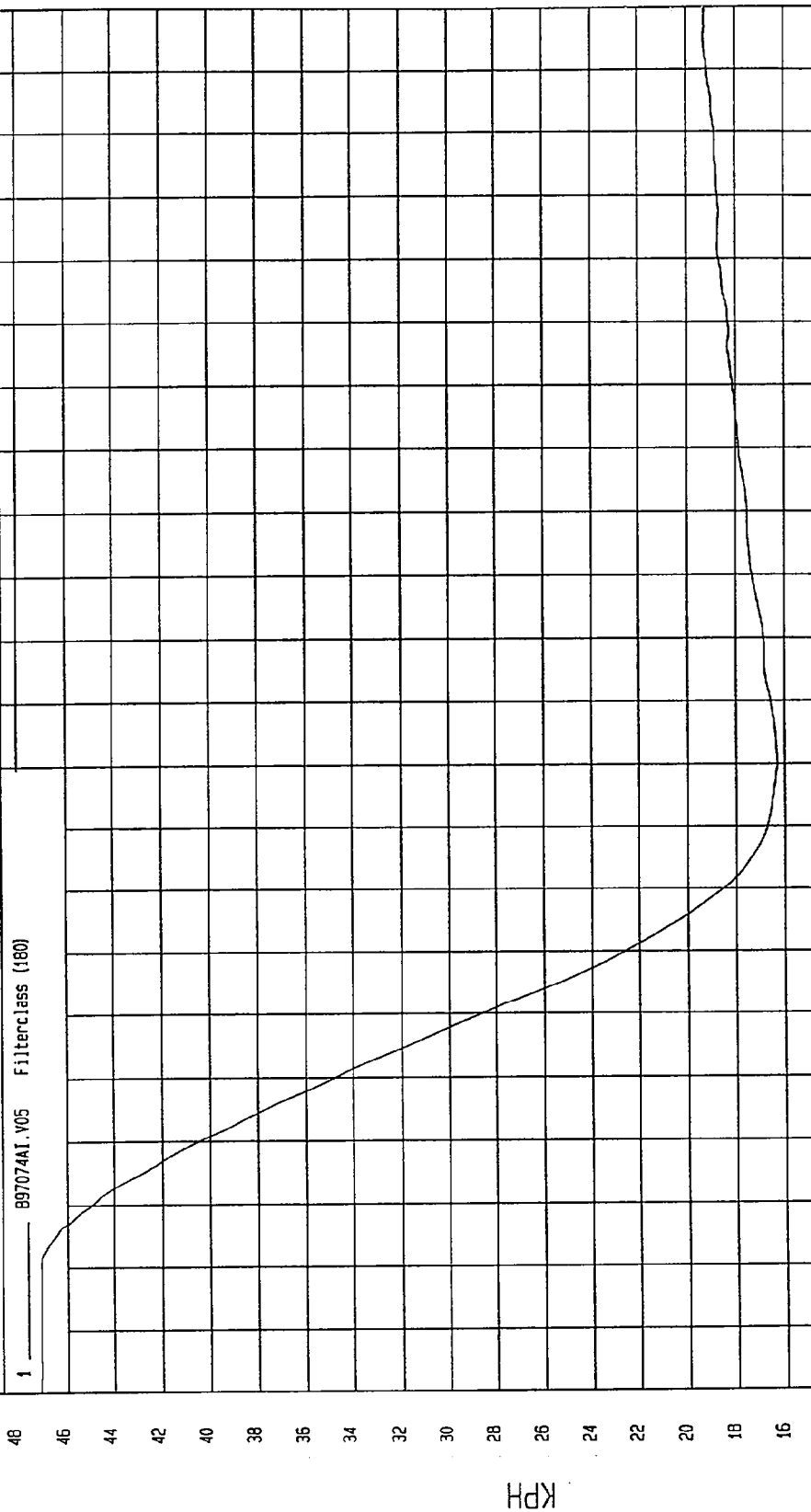
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = 16.31 KPH at 80 msec

Maximum = 47.1 KPH at -20 msec

MOVING BARRIER REAR AXLE X VELOCITY

1 897074A1.V05 Filterclass (180)



WCA Research
07-01-1997 15:58

TIME Seconds

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -2.82 G'S at 28 msec Maximum = 1.78 G'S at 60 msec

MOVING BARRIER REAR AXLE Y ACCELERATION

1 897074AF.A06 Filterclass (60)

2
1
0
-1
-2
-3

G.S

TIME (SECONDS)
0.19
0.18
0.17
0.16
0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
-0.01
-0.02

MCA Research
06-22-1997 18:30

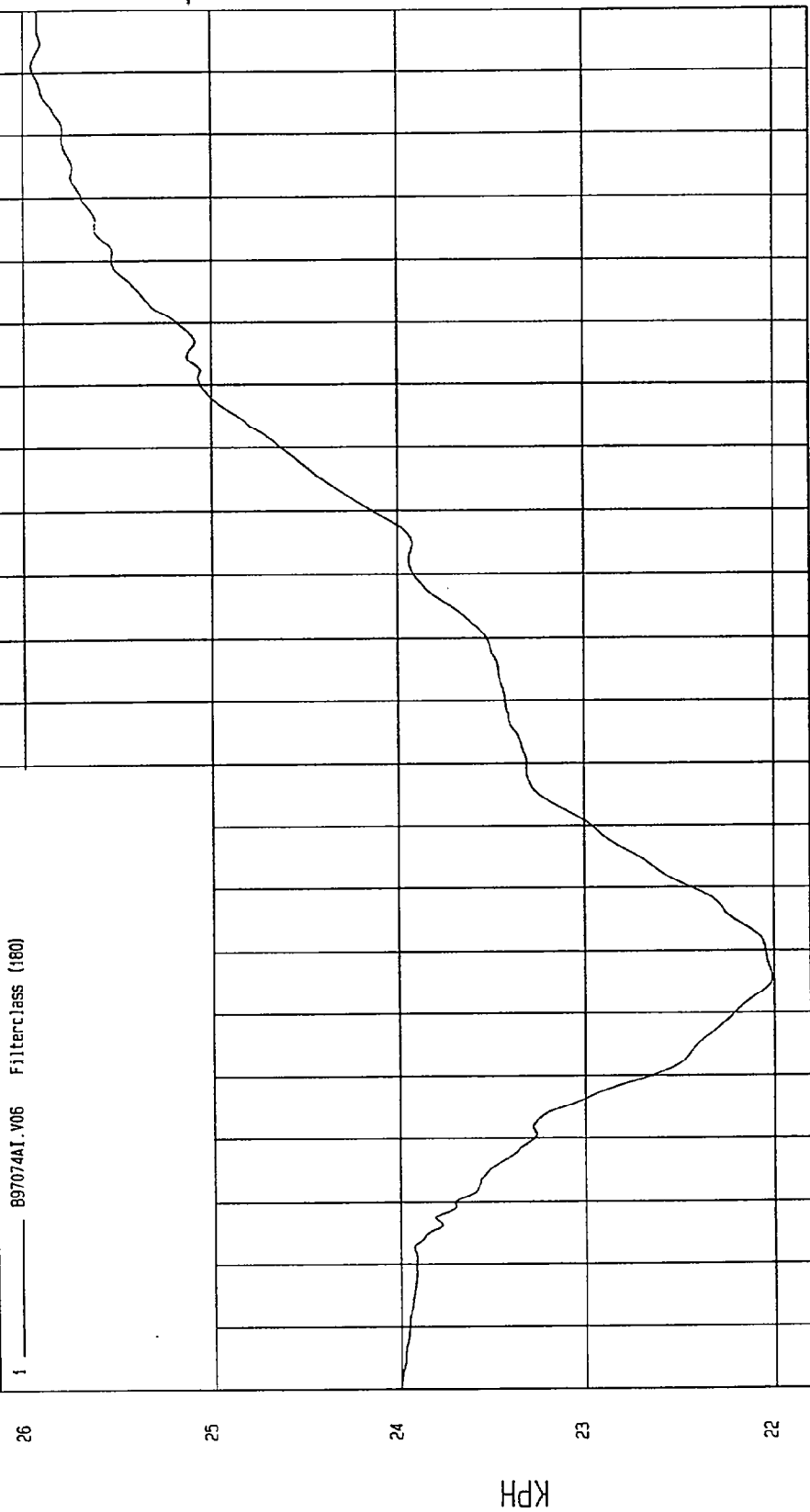
TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = 22.01 KPH at 46 msec Maximum = 25.95 KPH at 191 msec

MOVING BARRIER REAR AXLE Y VELOCITY

1 ——— B97074A1.V06 Filterclass (180)



TIME Seconds

MCA Research
01-01-1997 15:58

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR

Speed: 32.87 MPH 52.9 KPH

Maximum = .21 VOLTS at 118 msec

Minimum = -3.72 VOLTS at 2 msec

LEFT BARRIER CONTACT

1 89707401.071 Filterclass (1000)

0

-1

-2

-3

VOLTS

.19

.18

.17

.16

.15

.14

.13

.12

.11

.1

.09

.08

.07

.06

.05

.04

.03

.02

.01

0

-.01

-.02

M&A Research
06-22-1997 18:30

TIME (SECONDS)

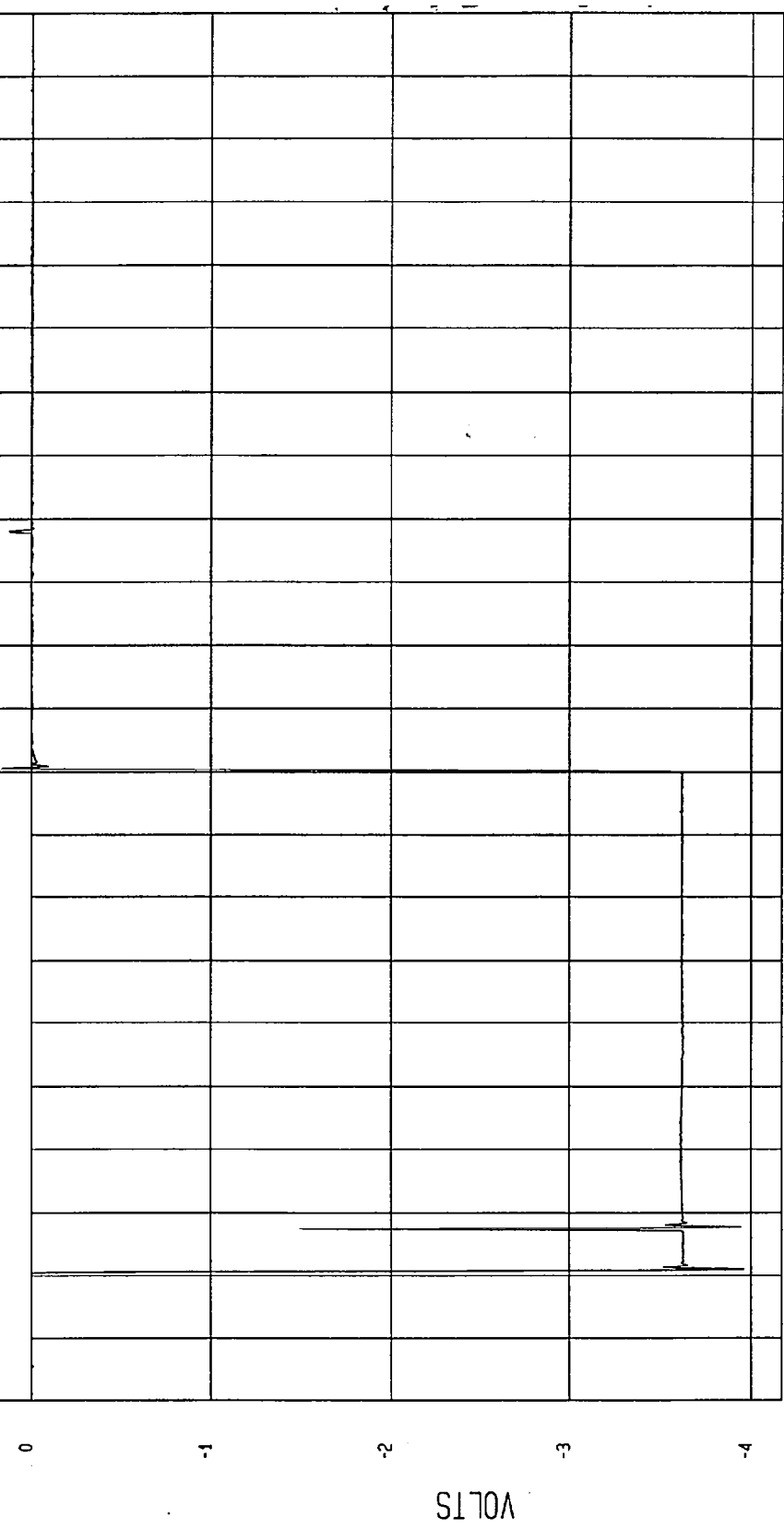
TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -3.95 VOLTS at 1 msec Maximum = .16 VOLTS at 81 msec

RIGHT BARRIER CONTACT

1 ——— B9707401.072 Filterclass (1000)



VCA Research
06-22-1997 16:30

TEST: FMVSS 214 RIGHT SIDE IMPACT

TEST DATE: 06-24-1997

SPEED: 32.87 MPH 52.9 KPH

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR

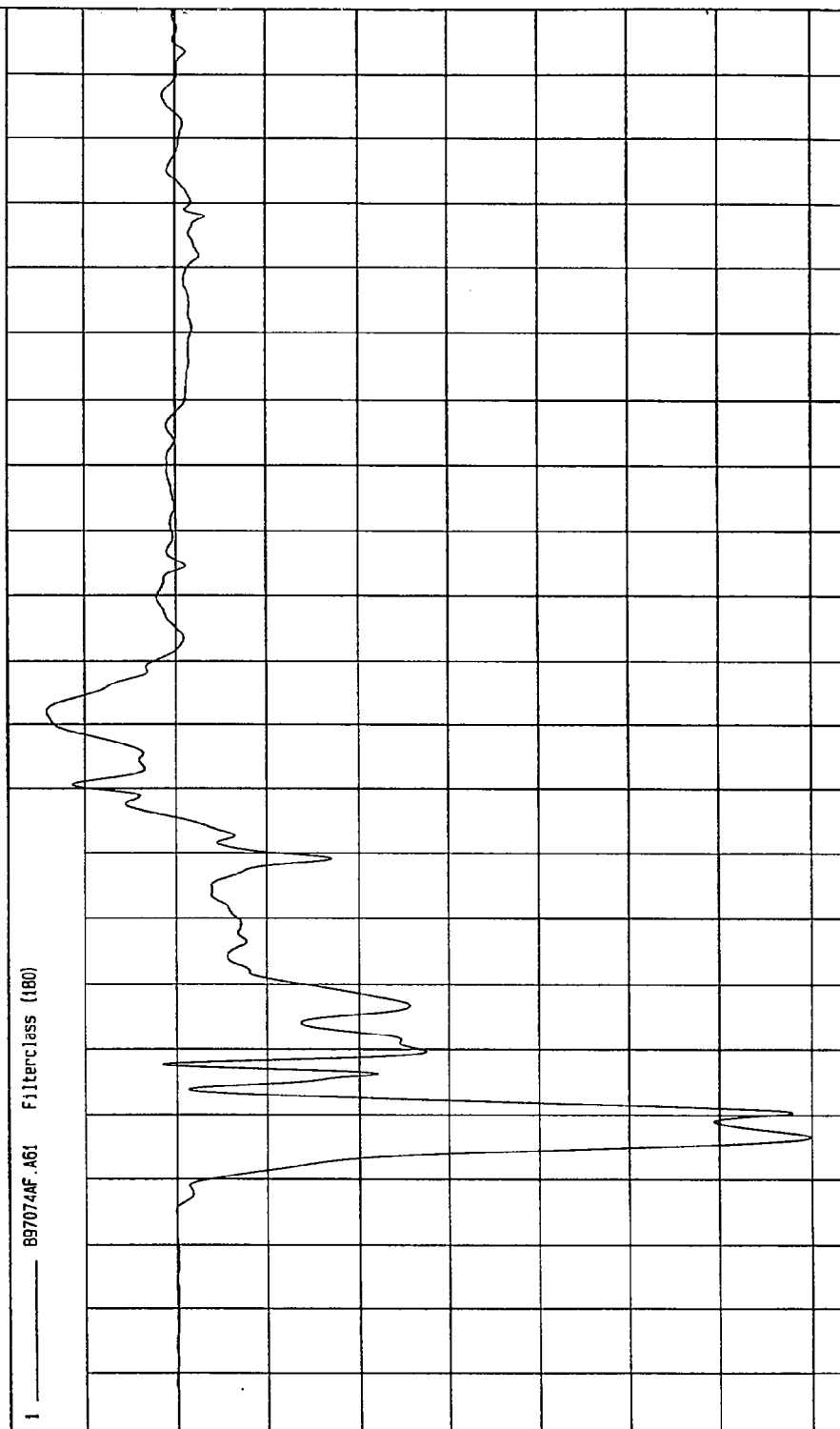
Maximum = 14.25 G'S at 92 msec

Minimum = -69.80 G'S at 27 msec

FRONT PASSENGER UPPER RIB Y REDUNDANT ACCELERATION

1 _____ 897074AF.A61 Filterclass (180)

G



MSA Research
06-22-1997 18:32

TIME (SECONDS)

TEST: FMVSS 214 RIGHT SIDE IMPACT

TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR

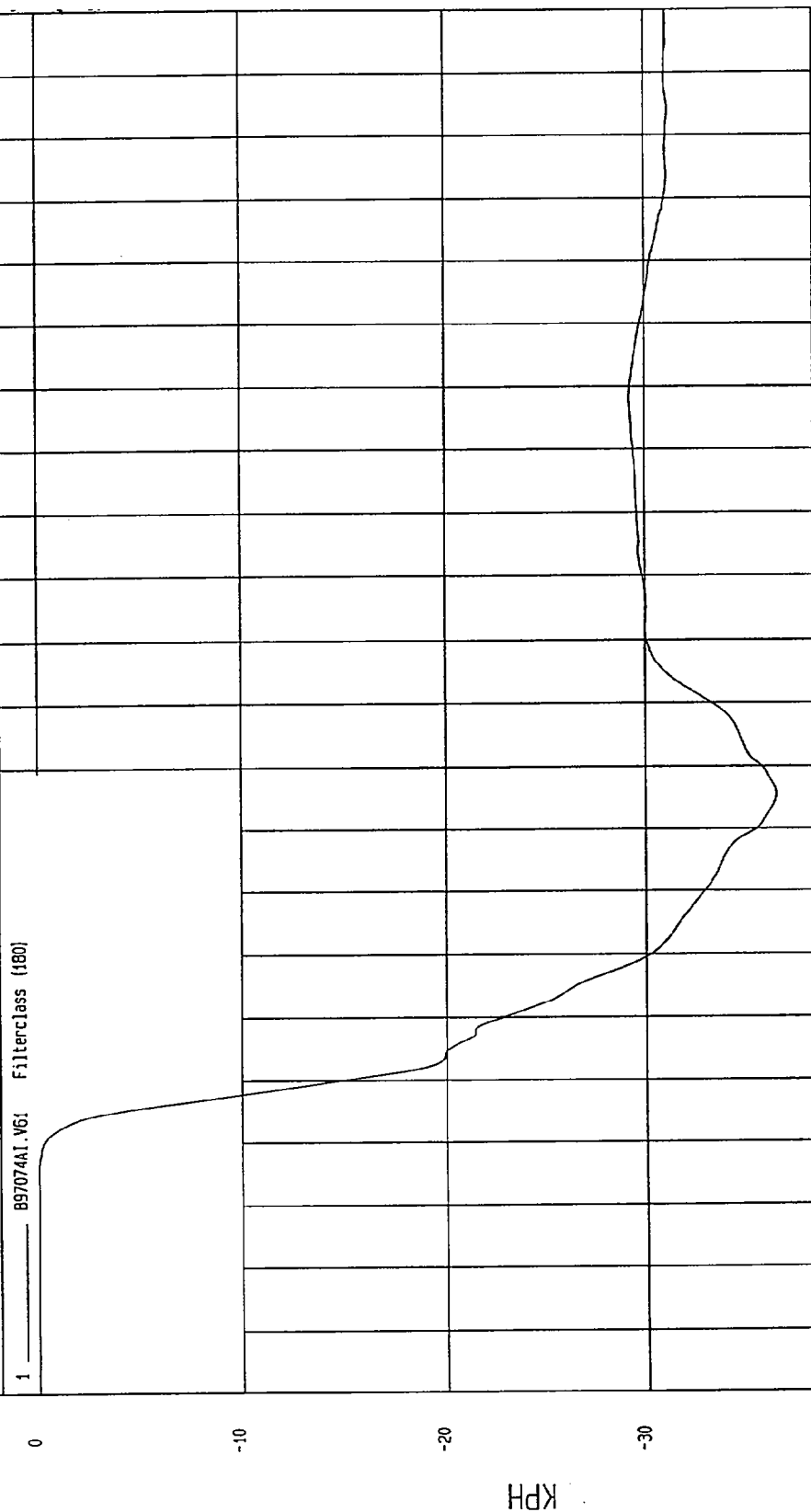
Speed: 32.87 MPH 52.9 KPH

Minimum = -36.36 KPH at 76 msec

Maximum = 0 KPH at -20 msec

FRONT PASSENGER UPPER RIB Y REDUNDANT VELOCITY

1 ——— B97074A1.V61 Filterclass (180)

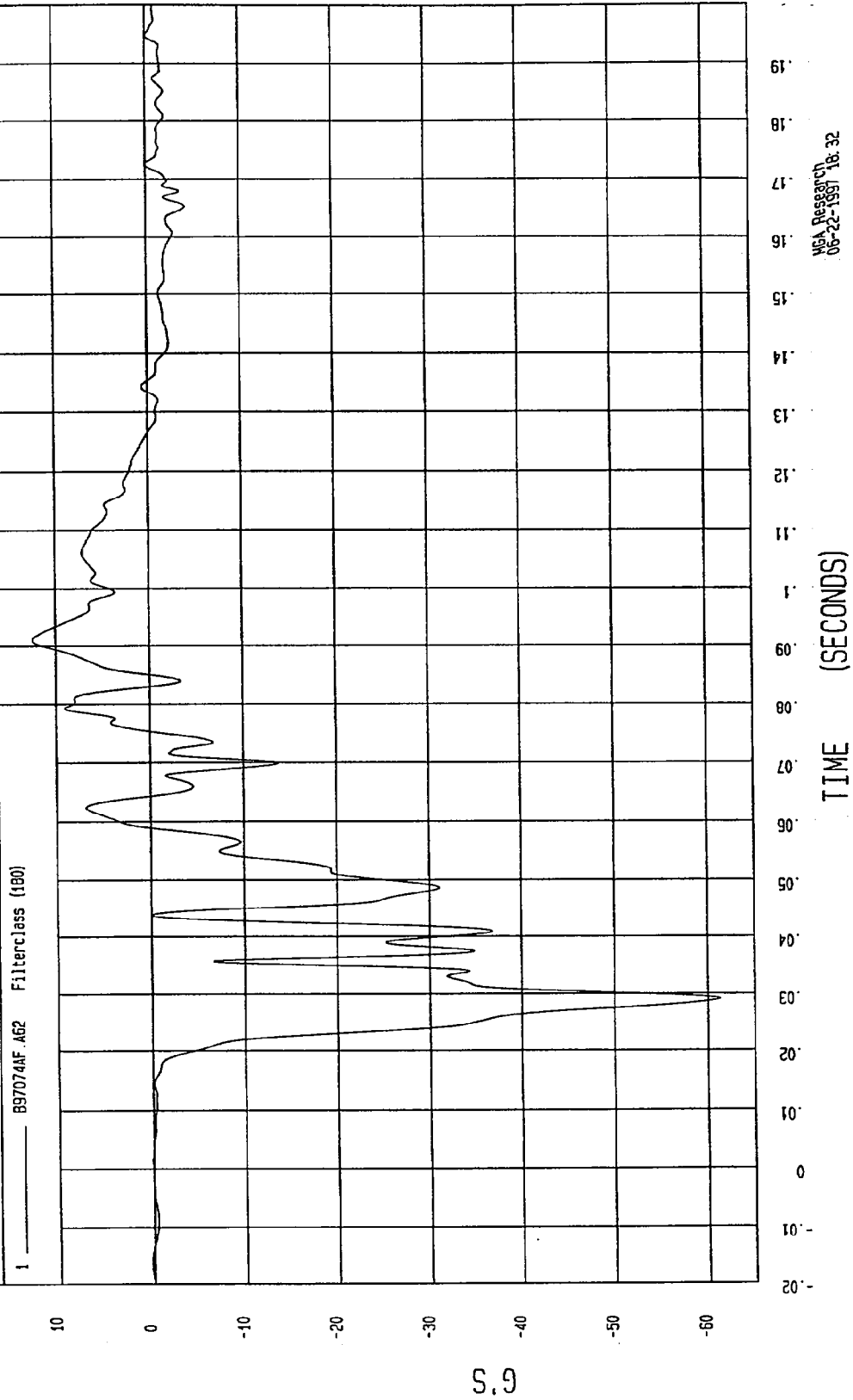


MECA Research
06-22-1997 18:24

TIME Seconds

TEST: FMVSS 214 RIGHT SIDE IMPACT	TEST DATE: 06-24-1997
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR	Speed: 32.87 MPH 52.9 KPH
Minimum = -61.30 G's at 29 msec	
Maximum = 12.38 G's at 91 msec	

FRONT PASSENGER LOWER RIB Y REDUNDANT ACCELERATION

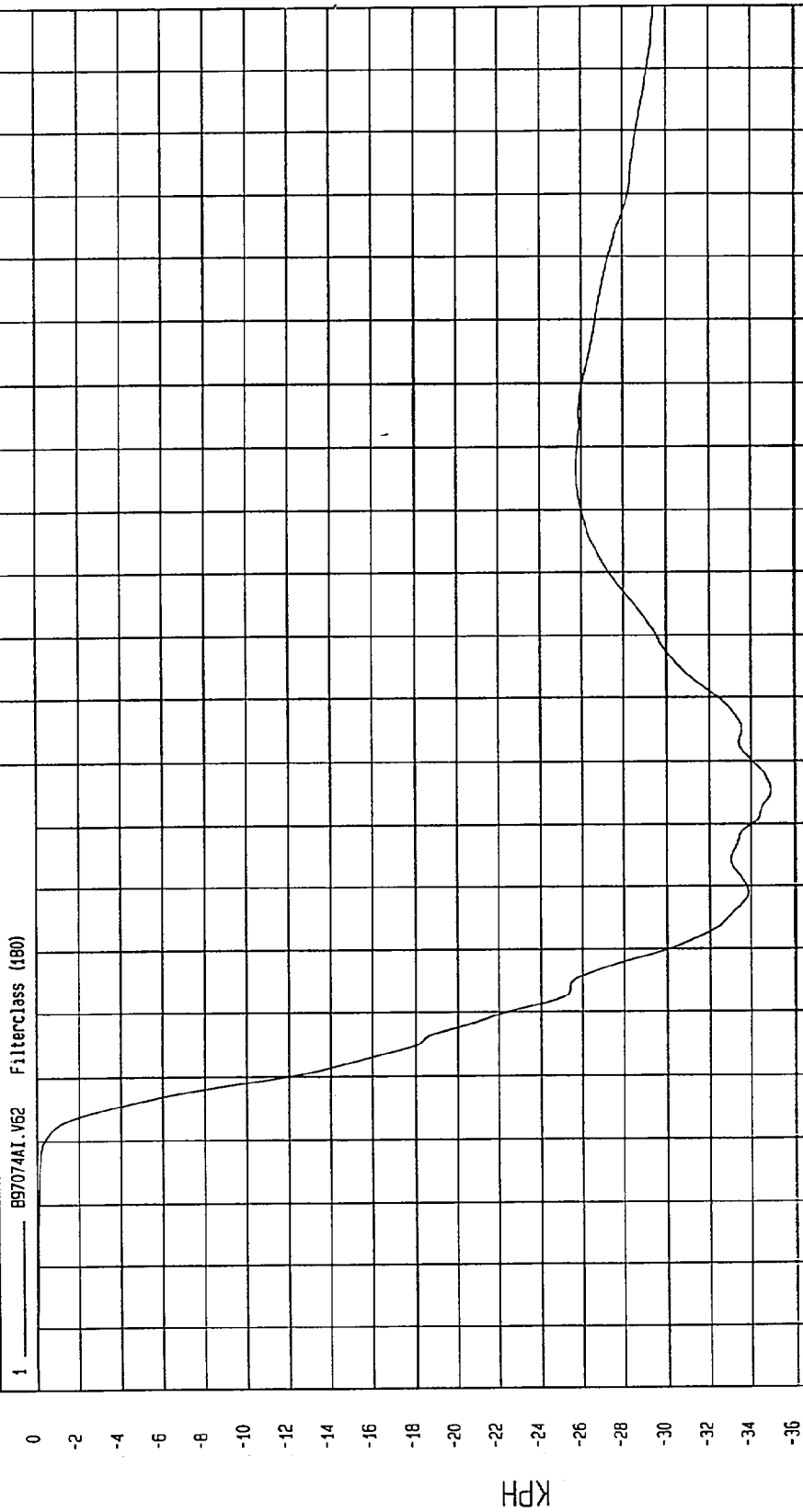


TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -34.93 KPH at 75 msec Maximum = 3.91E-02 KPH at -13 msec

FRONT PASSENGER LOWER RIB Y REDUNDANT VELOCITY



NSA Research
06-22-1997 16:24

TIME Seconds

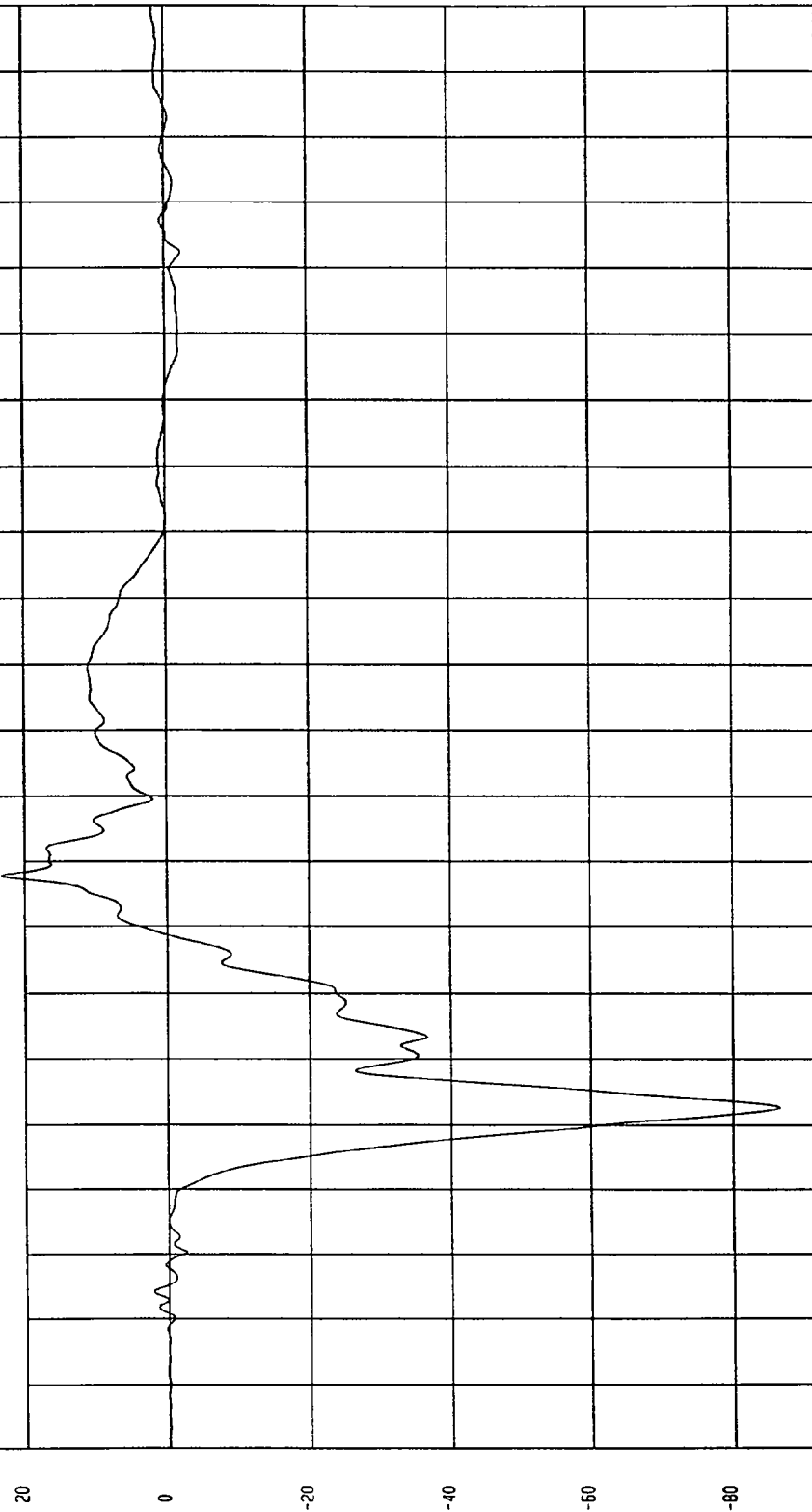
TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -86.36 G'S at 33 msec
Maximum = 23.03 G'S at 68 msec

FRONT PASSENGER LOWER SPINE Y REDUNDANT ACCELERATION

1 ——— 897074NF.A63 Filterclass (180)



TIME (SECONDS)

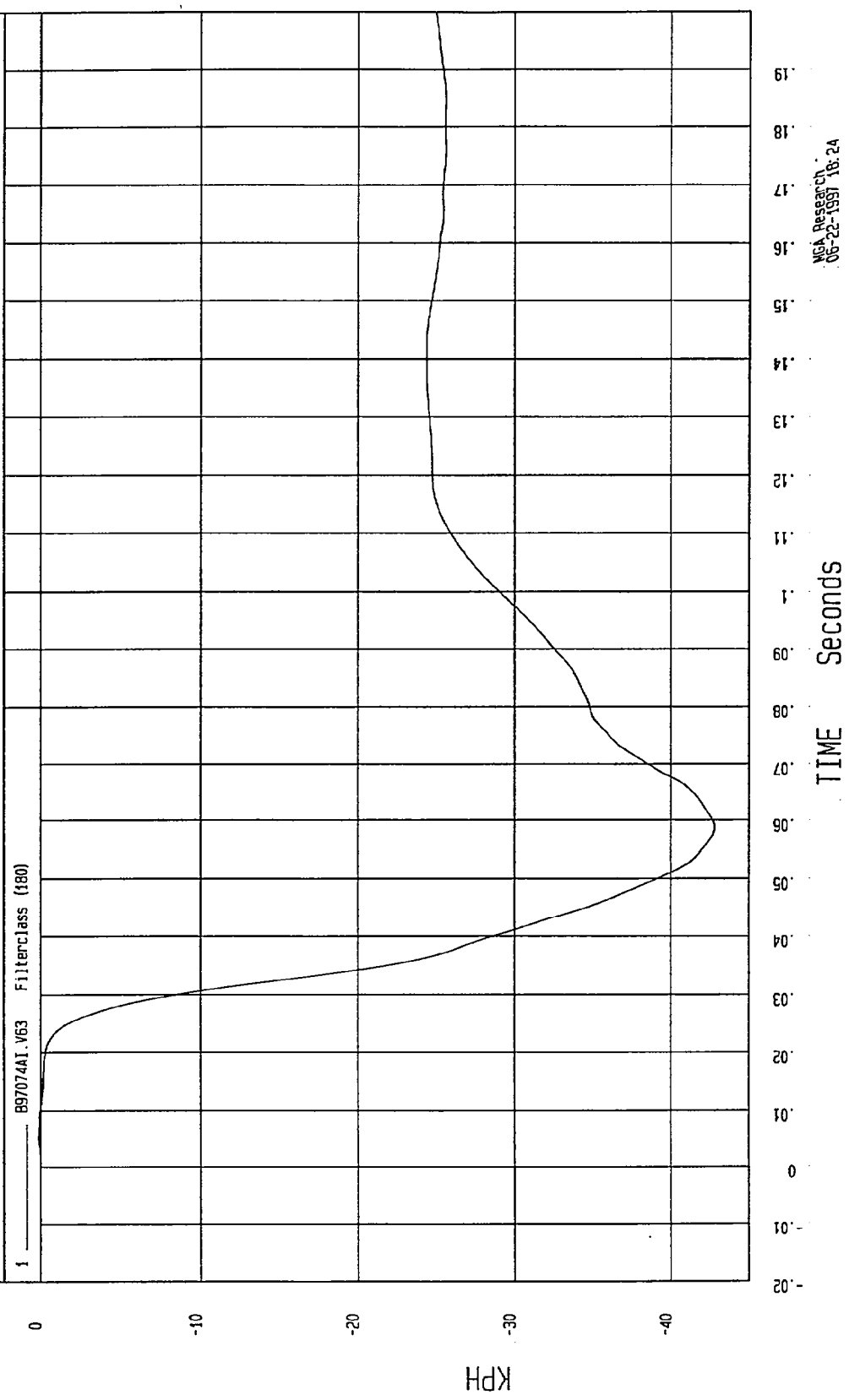
NSA Research
06-22-1997 18:33

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -42.77 KPH at 59 msec Maximum = .13 KPH at 5 msec

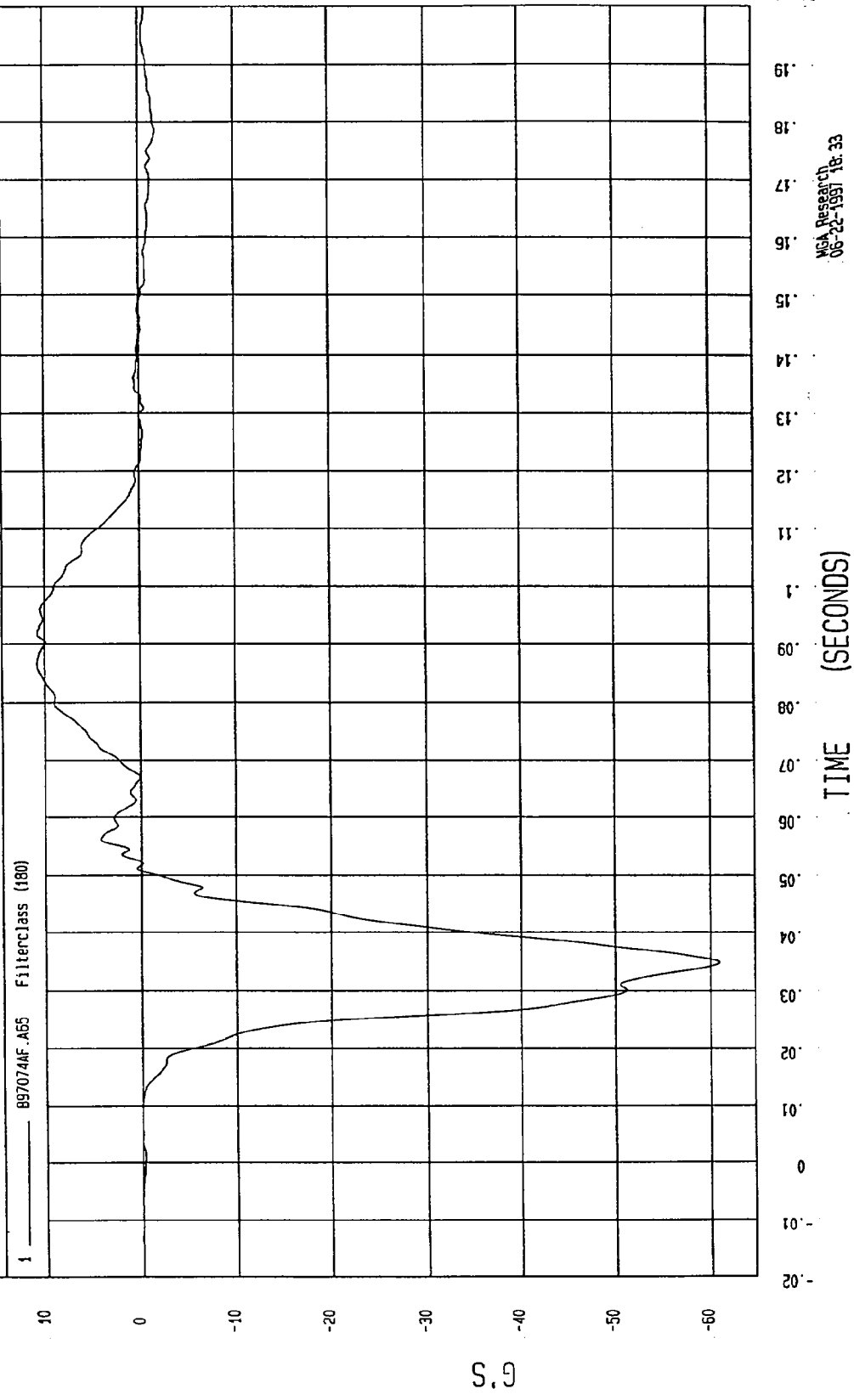
FRONT PASSENGER LOWER SPINE Y REDUNDANT VELOCITY



NCA Research
06-22-1997 16:24

TEST: FMVSS 214 RIGHT SIDE IMPACT	TEST DATE: 06-24-1997
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR	Speed: 32.87 MPH 52.9 KPH
Minimum = -60.91 G'S at 35 msec	Maximum = 10.76 G'S at 86 msec

FRONT PASSENGER PELVIS Y REDUNDANT ACCELERATION



MCA Research
06-22-1997 18:33

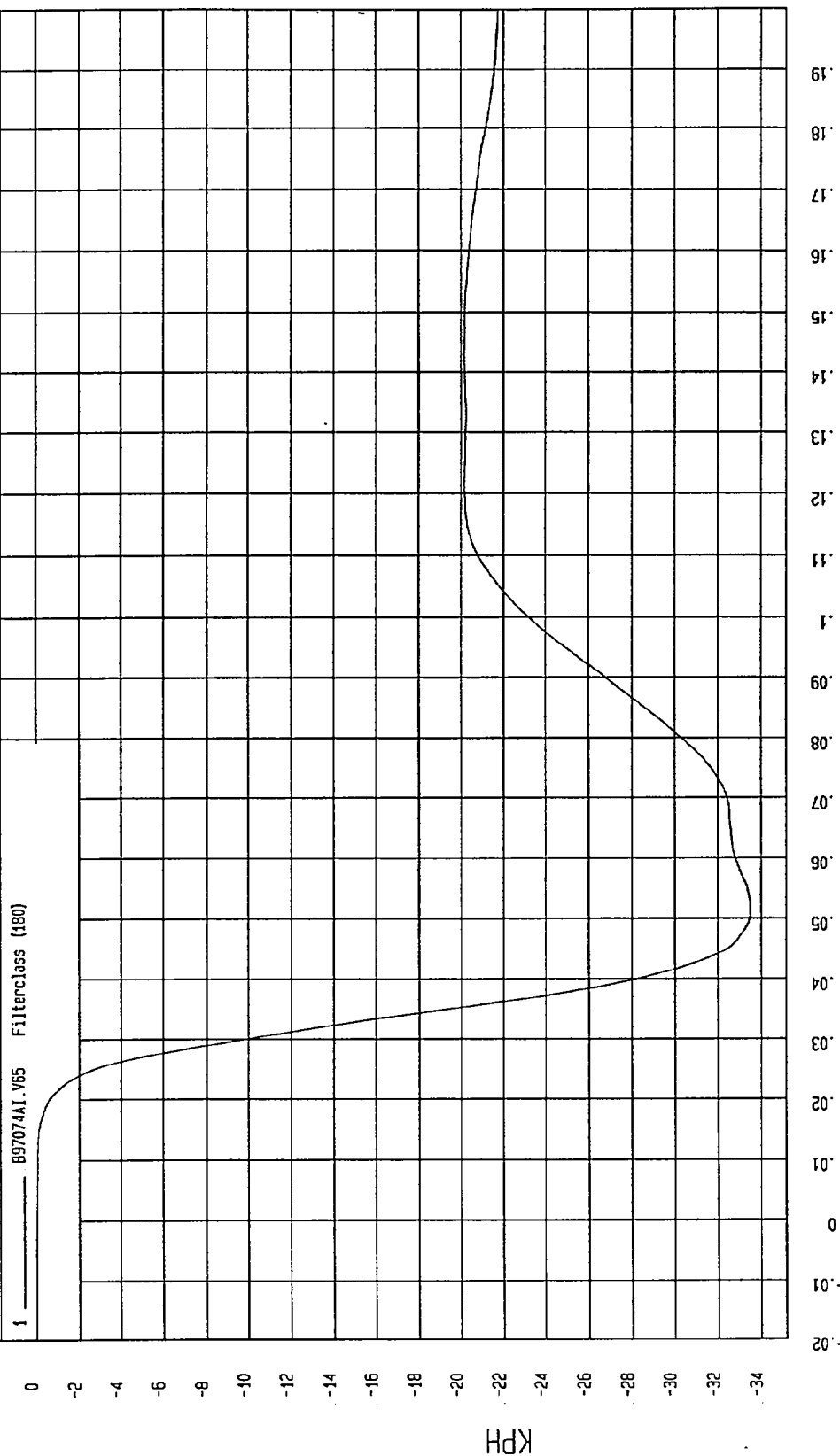
TEST: FMVSS 214 RIGHT SIDE IMPACT

TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -33.48 KPH at 51 msec Maximum = 2.54E-03 KPH at -6 msec

FRONT PASSENGER PELVIS Y REDUNDANT VELOCITY



WCA Research
06-22-1997 18:24

TIME Seconds

TEST: FMVSS 214 RIGHT SIDE IMPACT

TEST DATE: 06-24-1997

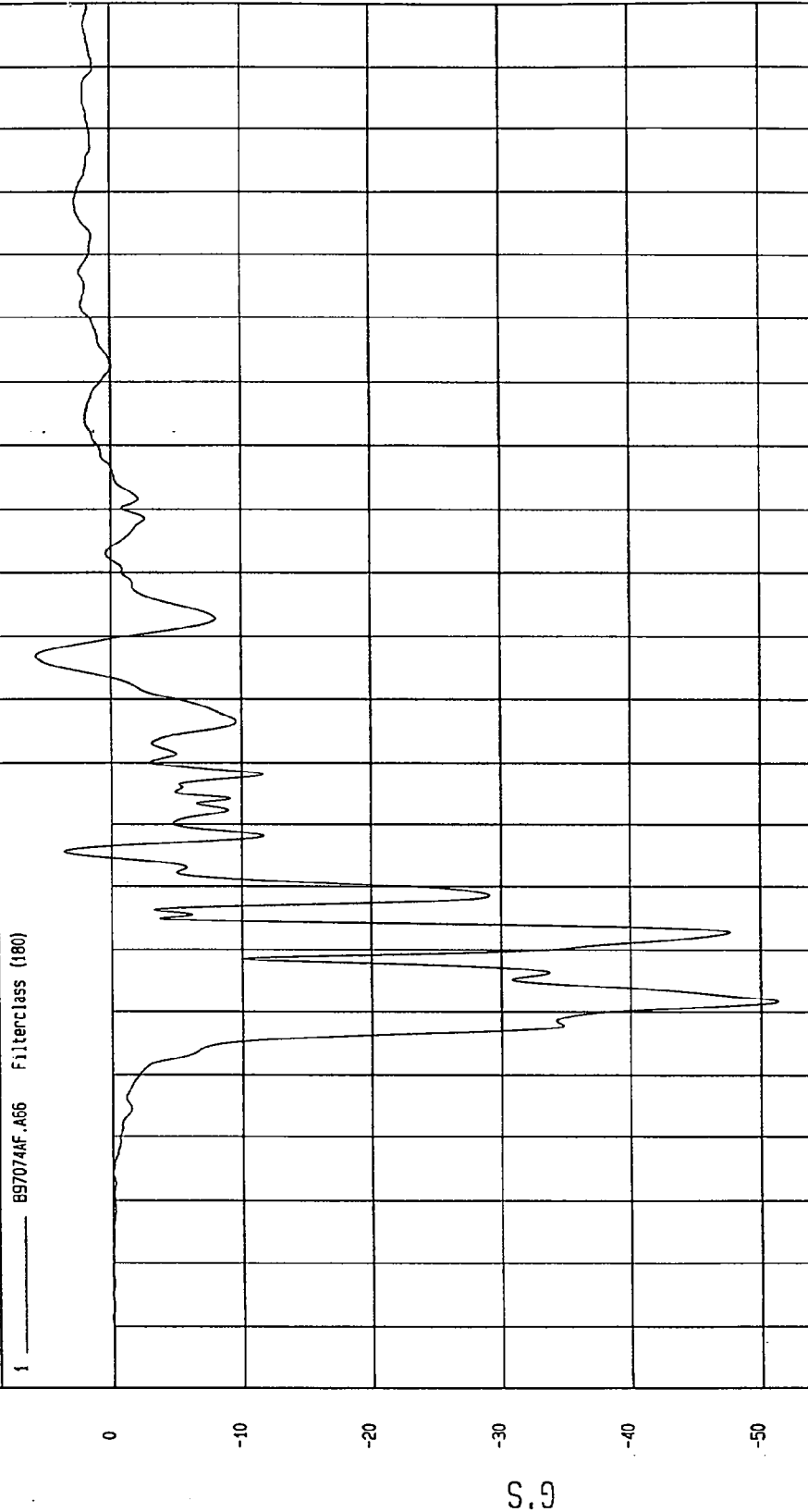
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -51.36 G'S at 42 msec

Maximum = 5.93 G'S at 97 msec

REAR PASSENGER UPPER RIB Y REDUNDANT ACCELERATION

1 B97074AF.A66 Filterclass (180)



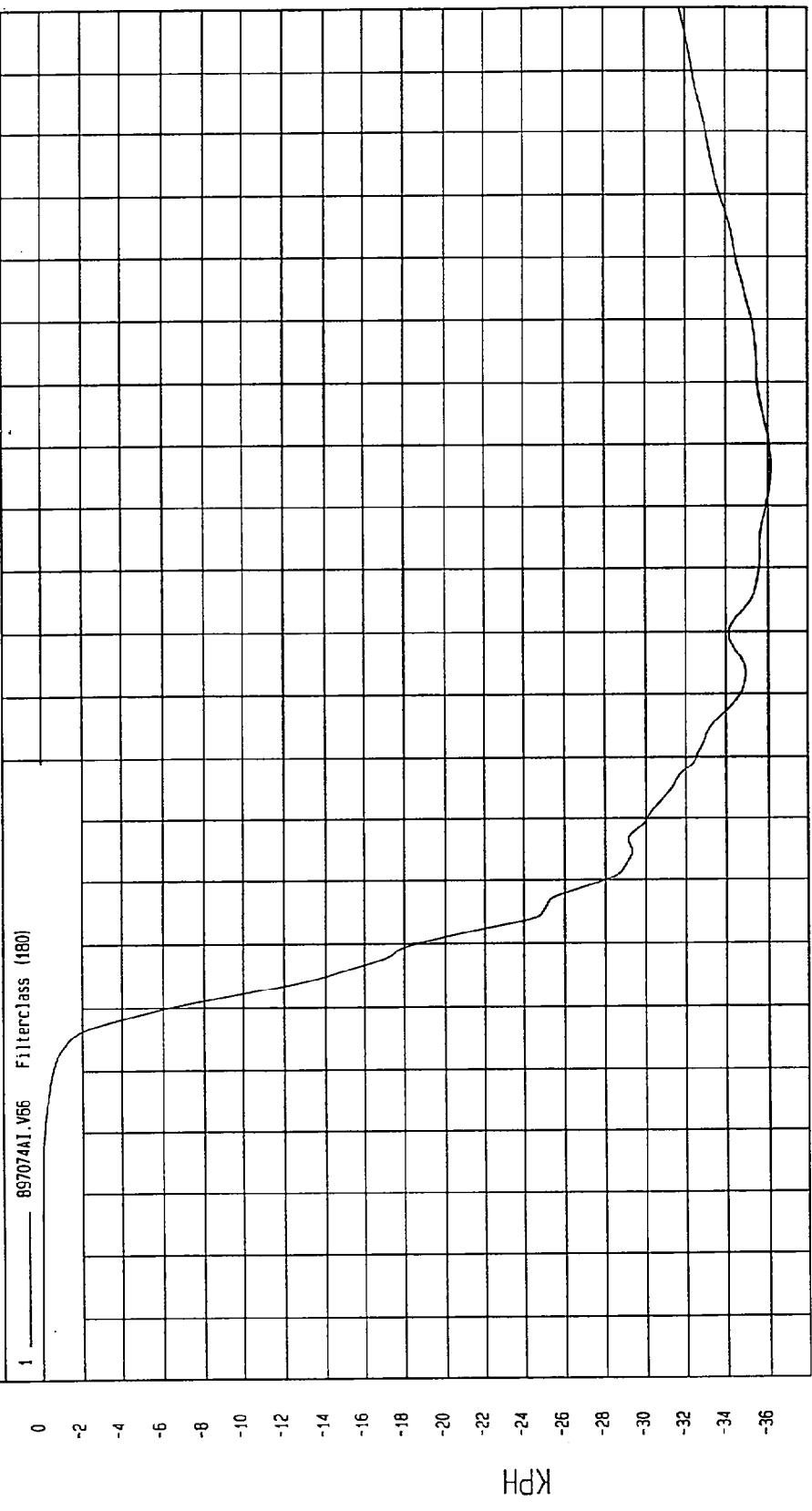
MCA Research
06-22-1997 18:33

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -36.13 KPH at 127 msec Maximum = 0 KPH at -20 msec

REAR PASSENGER UPPER RIB Y REDUNDANT VELOCITY



NSA Research
06-22-1997 18:24

TEST DATE: 06-24-1997

TEST: FMVSS 214 RIGHT SIDE IMPACT

Speed: 32.87 MPH 52.9 KPH

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR

Maximum = 8.71 G'S at 98 msec

Minimum = -54.46 G'S at 41 msec

REAR PASSENGER LOWER RIB Y REDUNDANT ACCELERATION

1 _____ B97074AF.A67 Filterclass (180)

10

0

-10

-20

-30

-40

-50

G

19

18

17

16

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

-02

TIME (SECONDS)

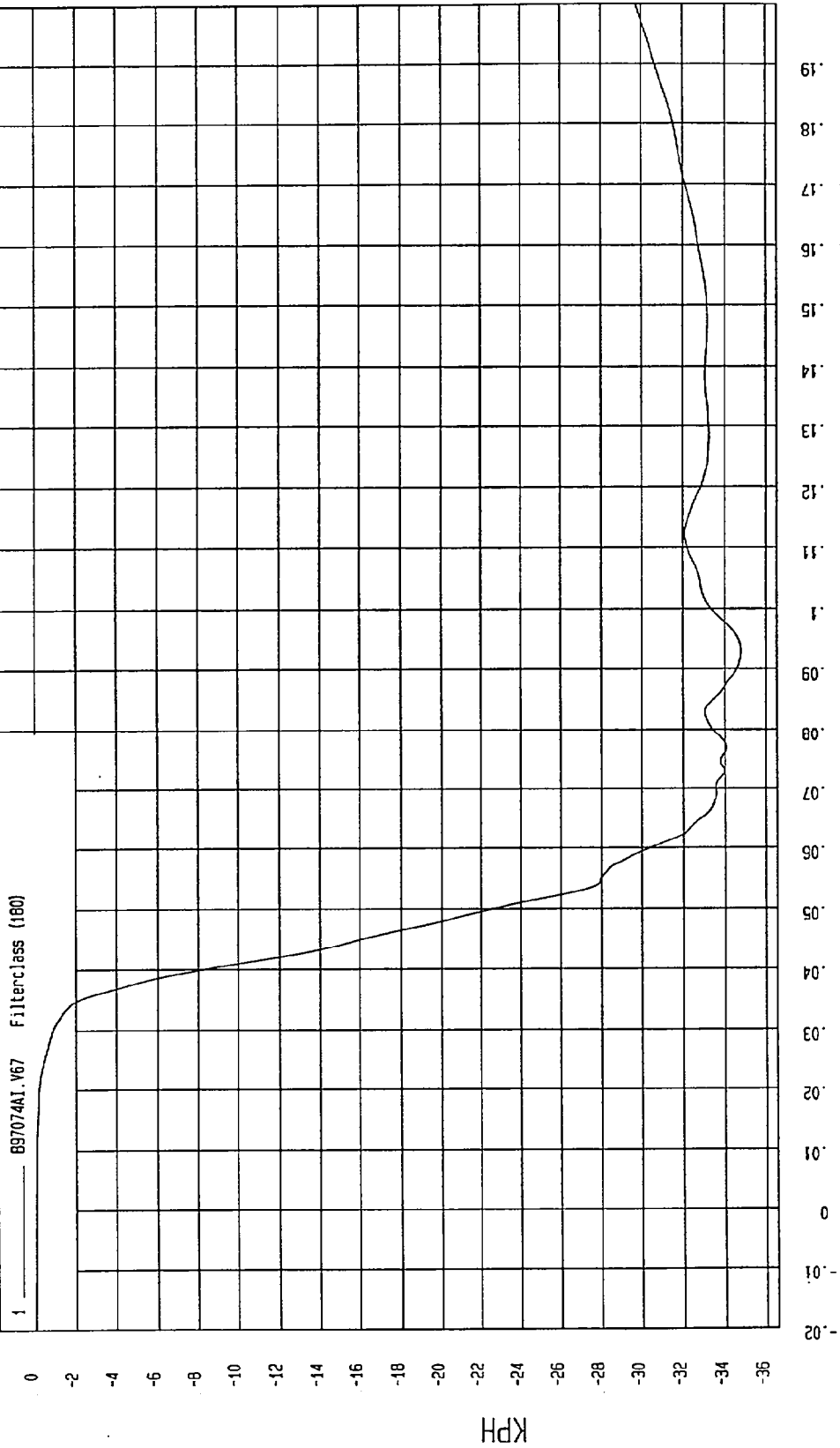
NGA Research
06-22-1997 18:33

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

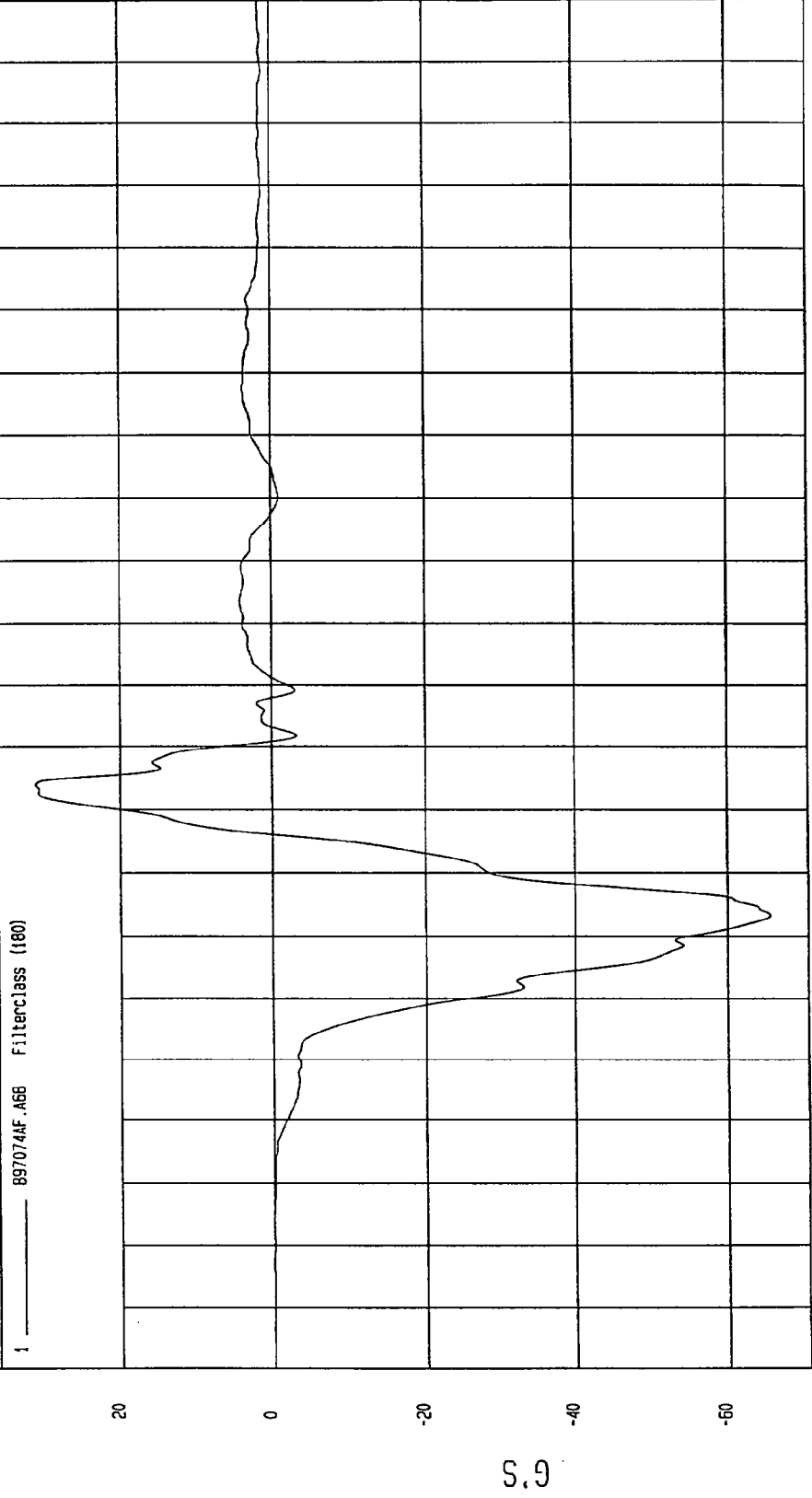
Minimum = -34.77 KPH at 93 msec Maximum = 0 KPH at -20 msec

REAR PASSENGER LOWER RIB Y REDUNDANT VELOCITY



MCA Research
06-22-1997 18:25

TEST: FMVSS 214 RIGHT SIDE IMPACT	TEST DATE: 06-24-1997
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR	Speed: 32.87 MPH 52.9 KPH
Minimum = -65.49 G'S at 53 msec	Maximum = 31.35 G'S at 74 msec
REAR PASSENGER LOWER SPINE Y REDUNDANT ACCELERATION	



TIME (SECONDS)

0.19
0.18
0.17
0.16
0.15
0.14
0.13
0.12
0.11
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
-0.01
-0.02

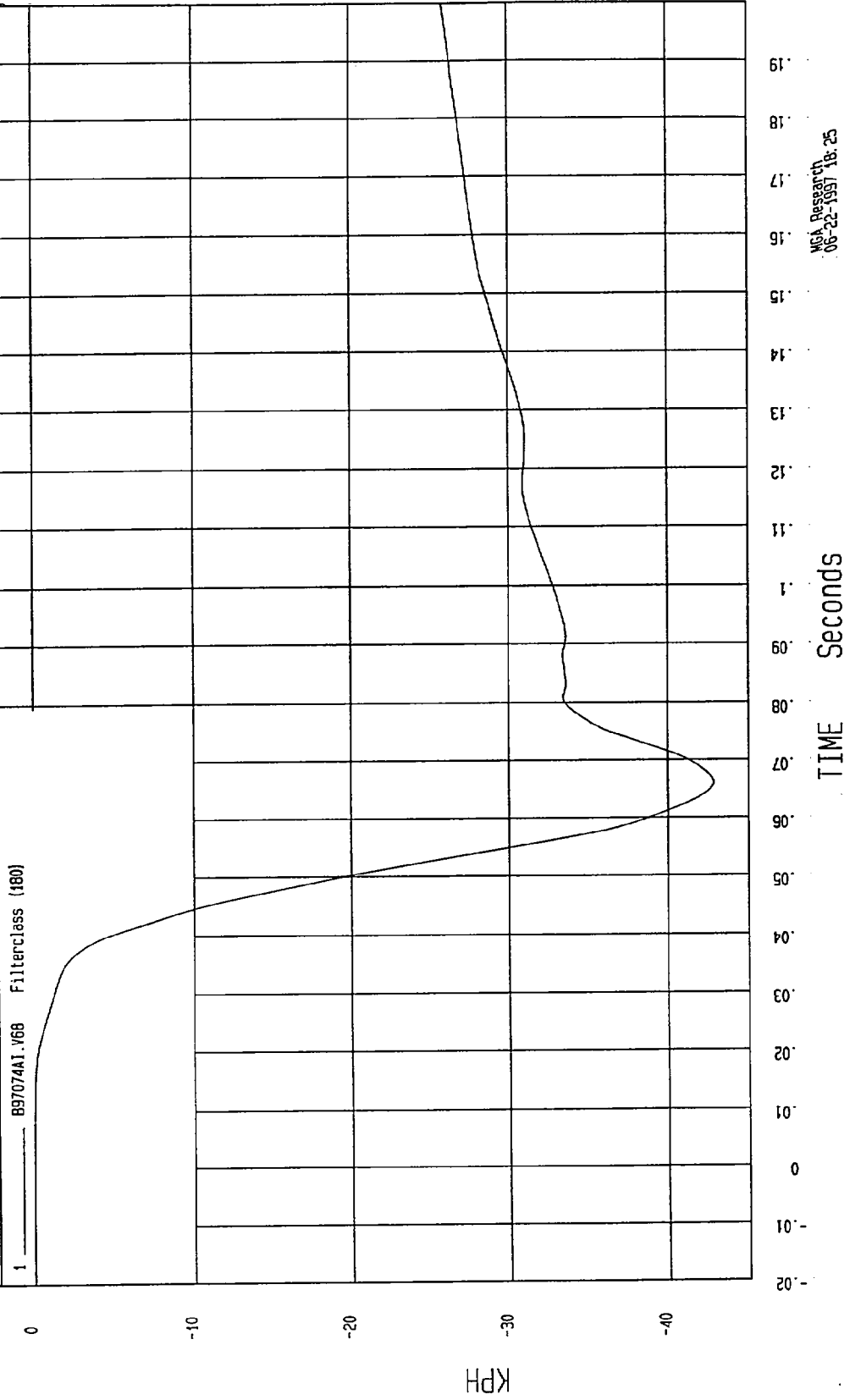
MCA Research
06-22-1997 18:33

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -42.84 KPH at 66 msec Maximum = 2.49E-03 KPH at -12 msec

REAR PASSENGER LOWER SPINE Y REDUNDANT VELOCITY

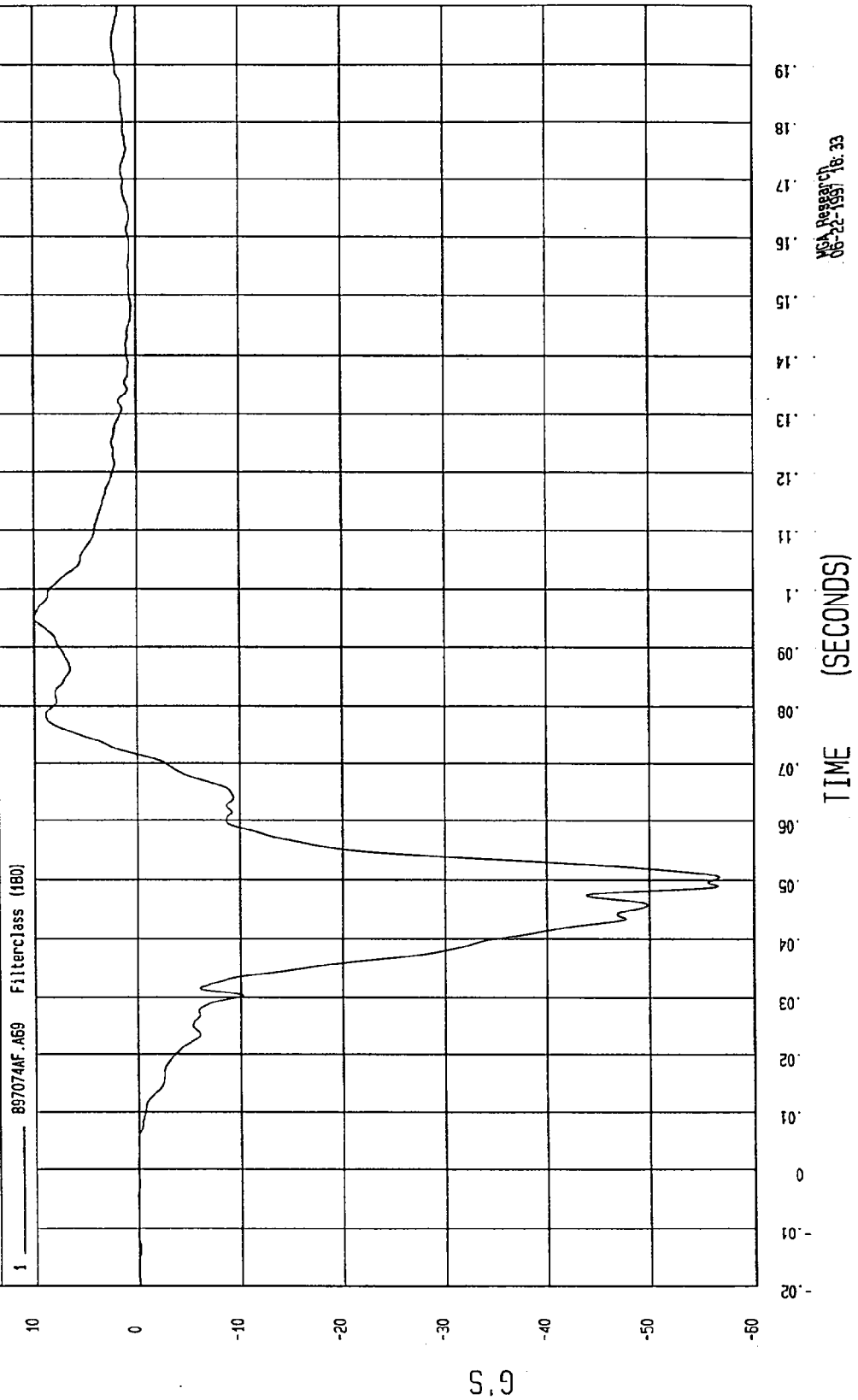


TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -56.68 G's at 50 msec Maximum = 10.07 G's at 95 msec

REAR PASSENGER PELVIS Y REDUNDANT ACCELERATION



TEST: FMVSS 214 RIGHT SIDE IMPACT

TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR

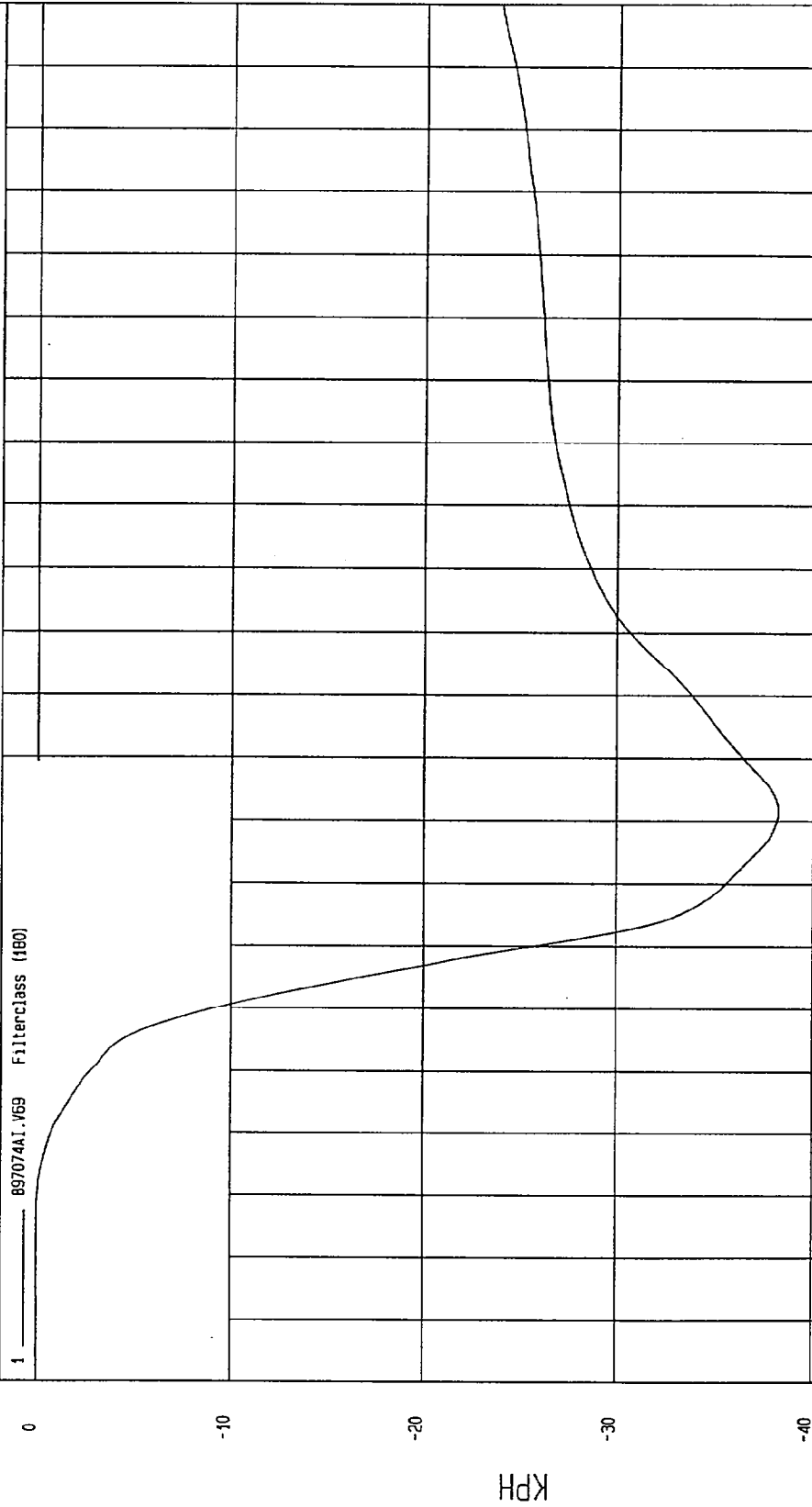
Speed: 32.87 MPH 52.9 KPH

Minimum = -38.23 KPH at 72 msec

Maximum = 1.30E-02 KPH at 2 msec

REAR PASSENGER PELVIS Y REDUNDANT VELOCITY

1 — 897074A1.V69 Filterclass (f80)



MGA Research
06-22-1997 18:25

TIME Seconds

FINITE IMPULSE RESPONSE (FIR) FILTERED DATA

TEST: FMVSS 214 RIGHT SIDE IMPACT

TEST DATE: 06-24-1997

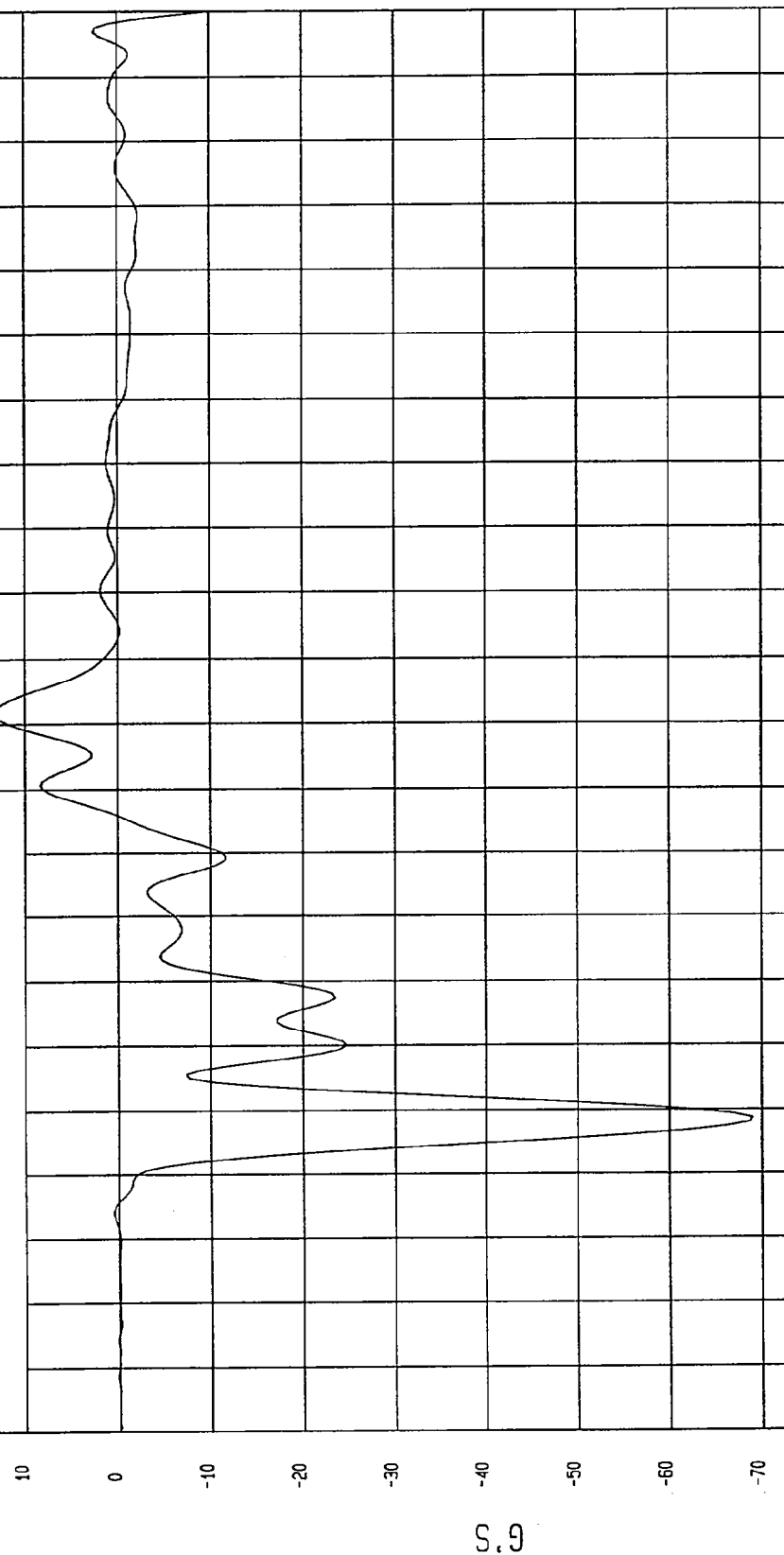
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -68.95 G's at 29 msec

Maximum = 13.29 G's at 92 msec

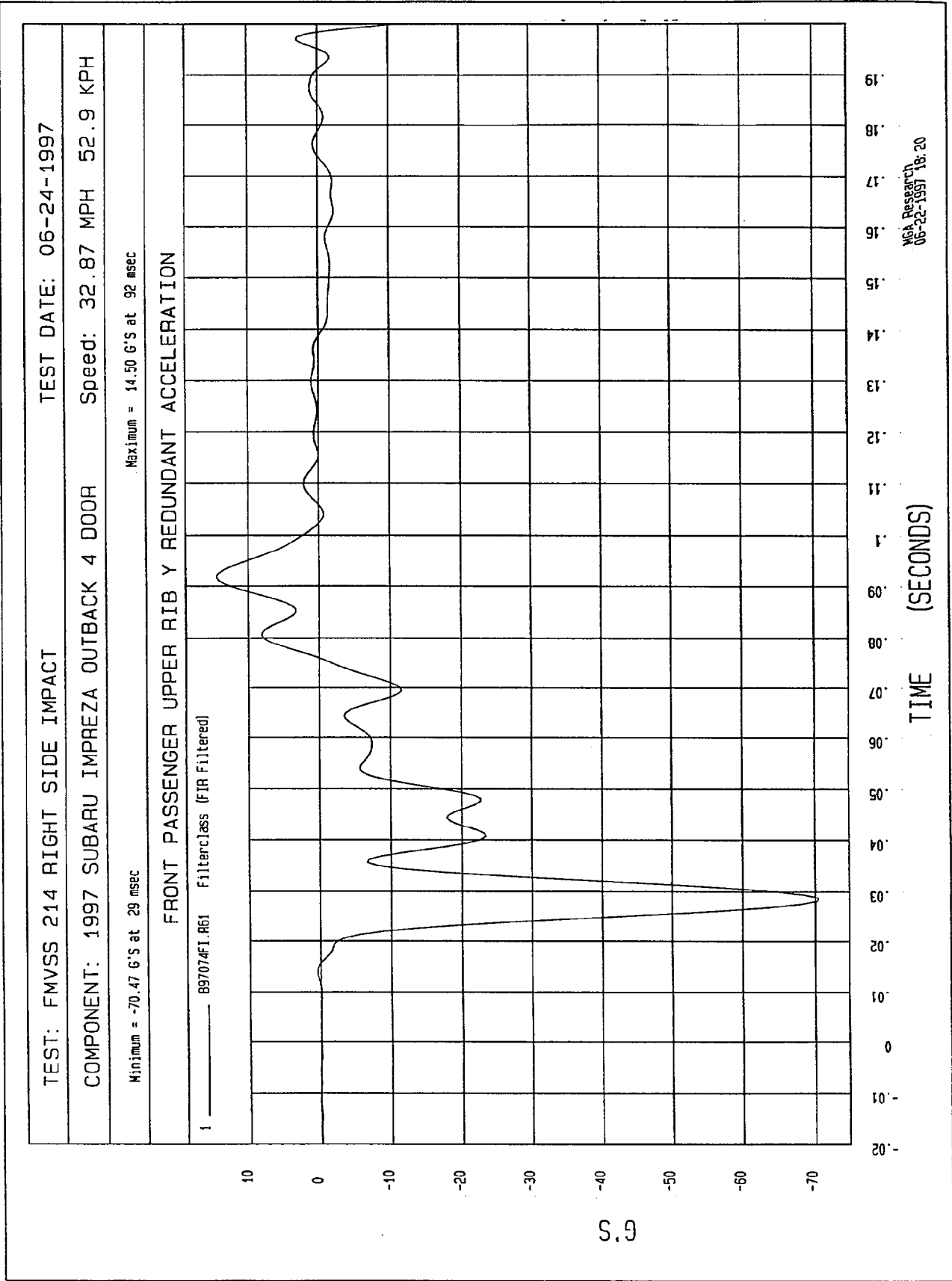
FRONT PASSENGER UPPER RIB Y ACCELERATION

1 097074F1.R15 Filterclass (FIR Filtered)



WCA Research
06-22-1997 18:40

TIME (SECONDS)

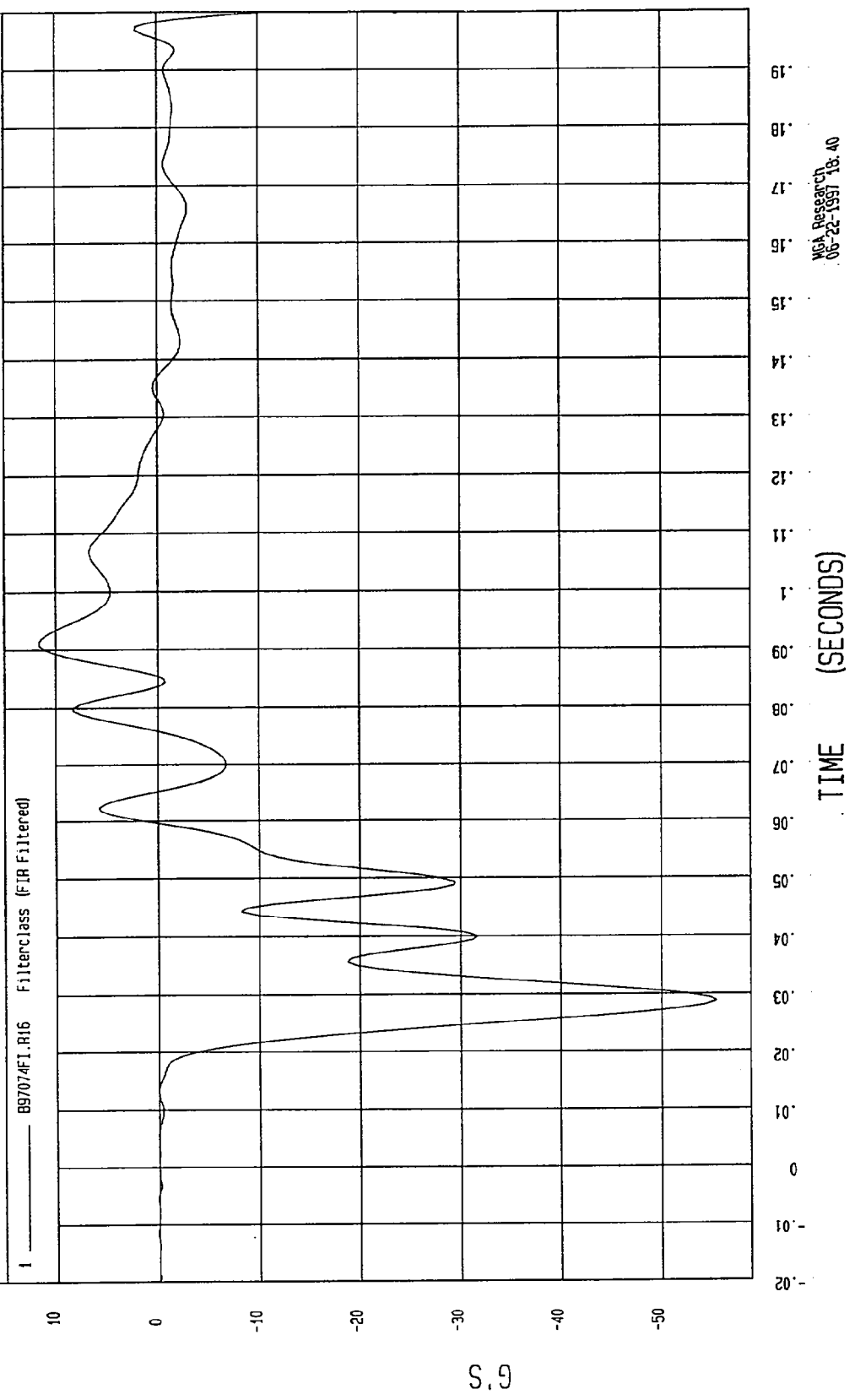


TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -55.32 G'S at 29 msec Maximum = 11.58 G'S at 91 msec

FRONT PASSENGER LOWER RIB Y ACCELERATION



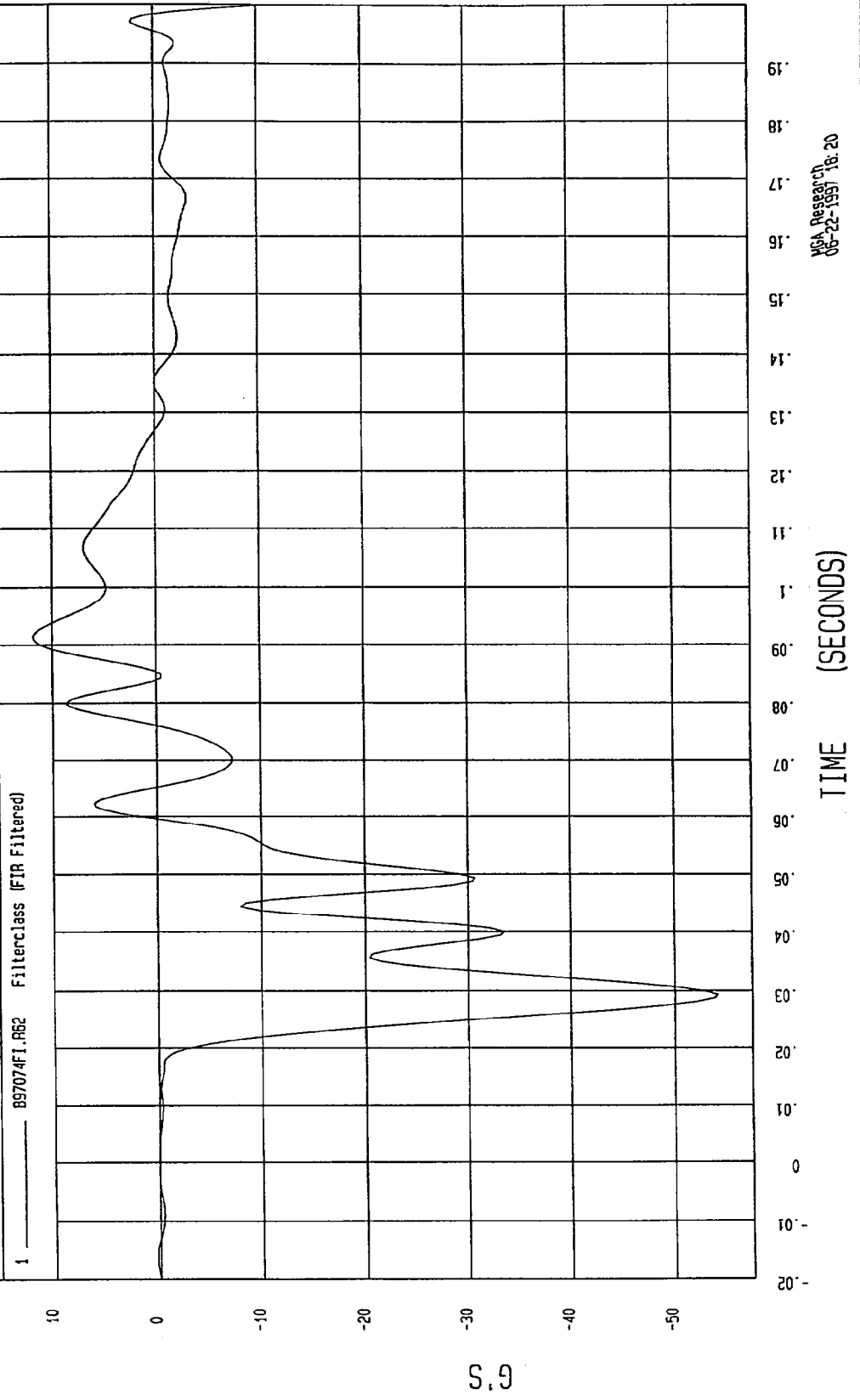
MCA Research
06-22-1997 18:40

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -53.91 G'S at 29 msec Maximum = 11.83 G'S at 91 msec

FRONT PASSENGER LOWER RIB Y REDUNDANT ACCELERATION



TEST: FMVSS 214 RIGHT SIDE IMPACT

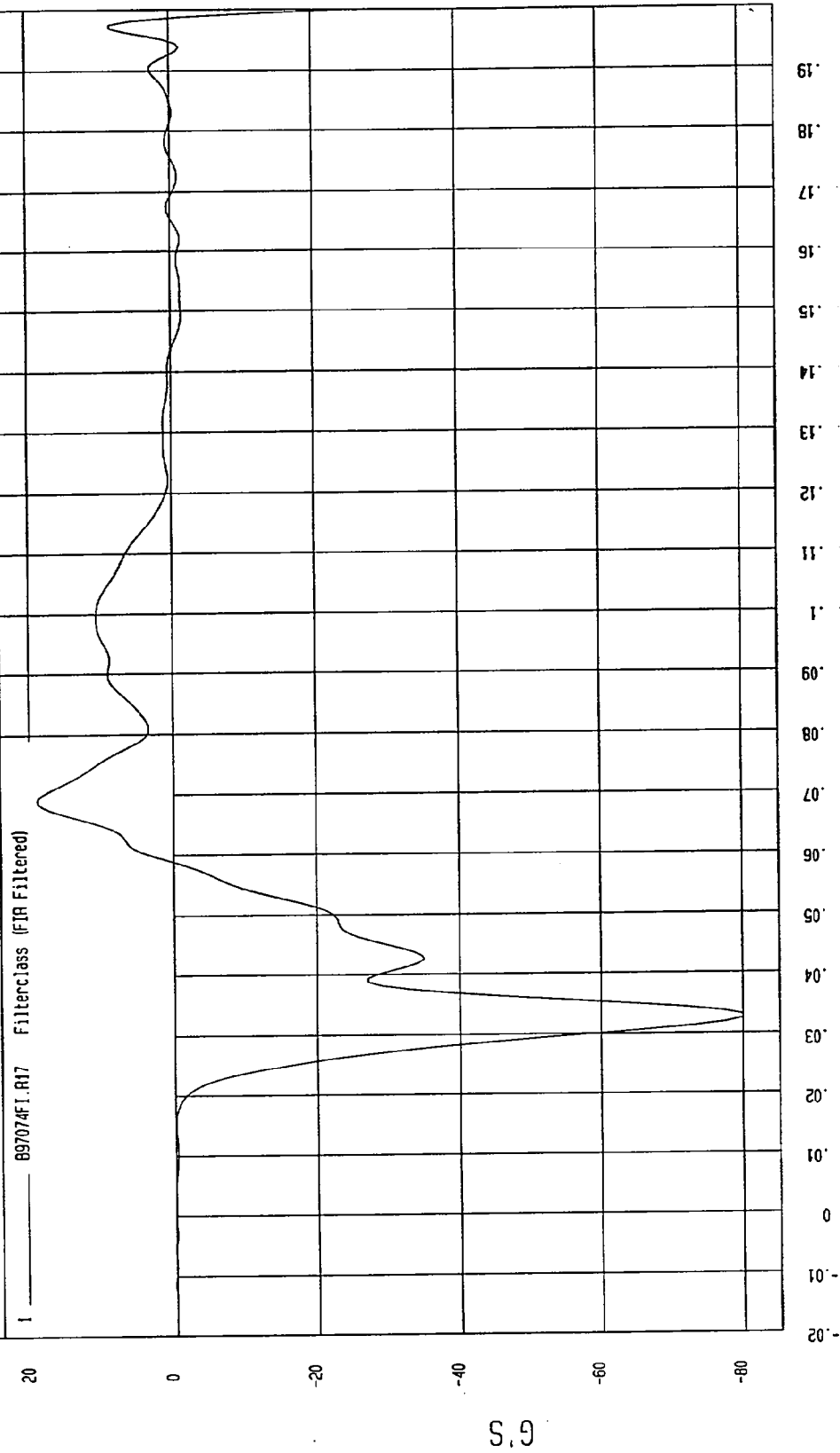
TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -80.07 G'S at 32 msec

Maximum = 18.91 G'S at 69 msec

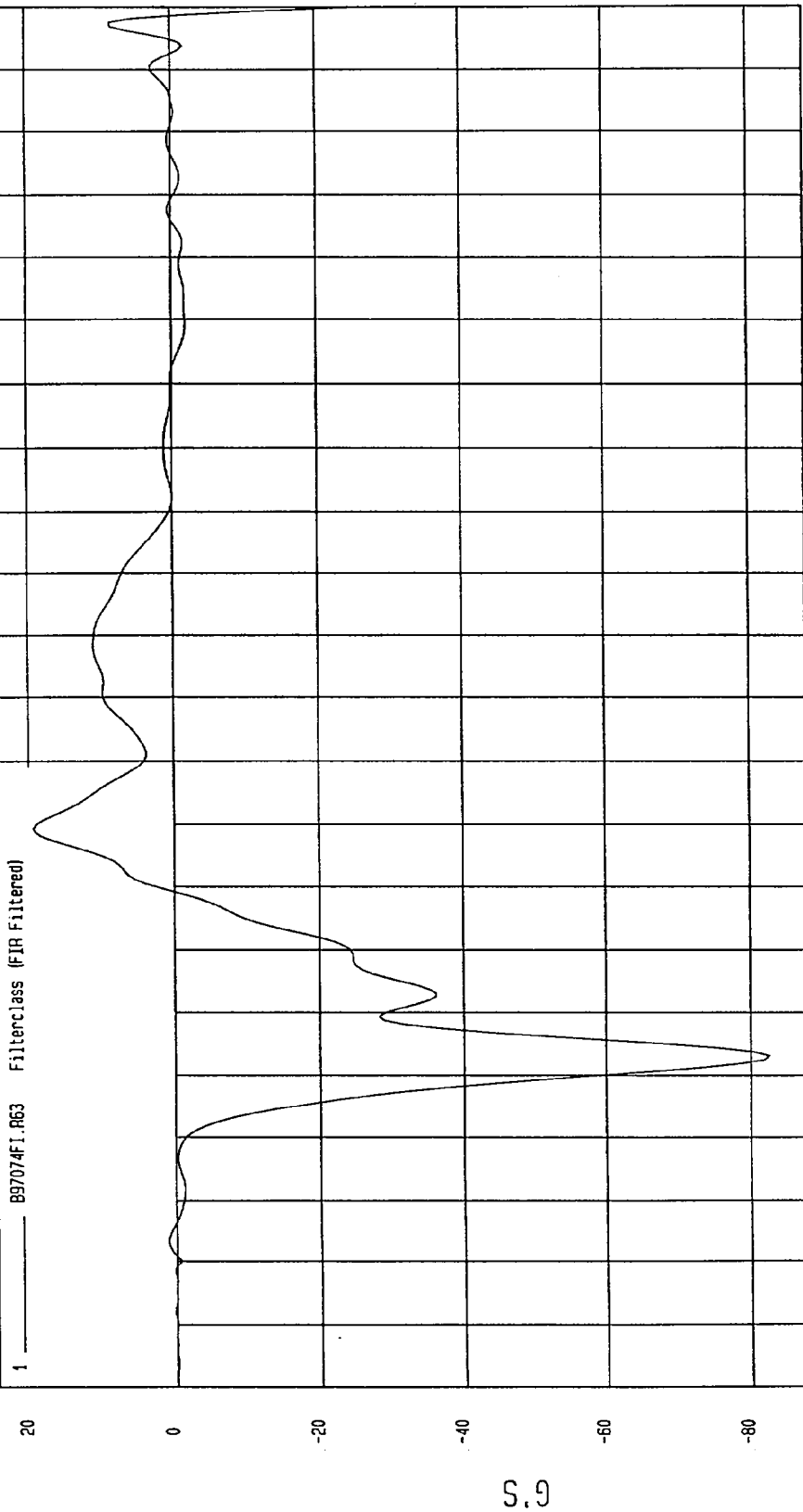
FRONT PASSENGER LOWER SPINE Y ACCELERATION



MCA Research
06-22-1997 18:40

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH
Minimum = -32.55 G'S at 33 msec Maximum = 19.32 G'S at 69 msec

FRONT PASSENGER LOWER SPINE Y REDUNDANT ACCELERATION

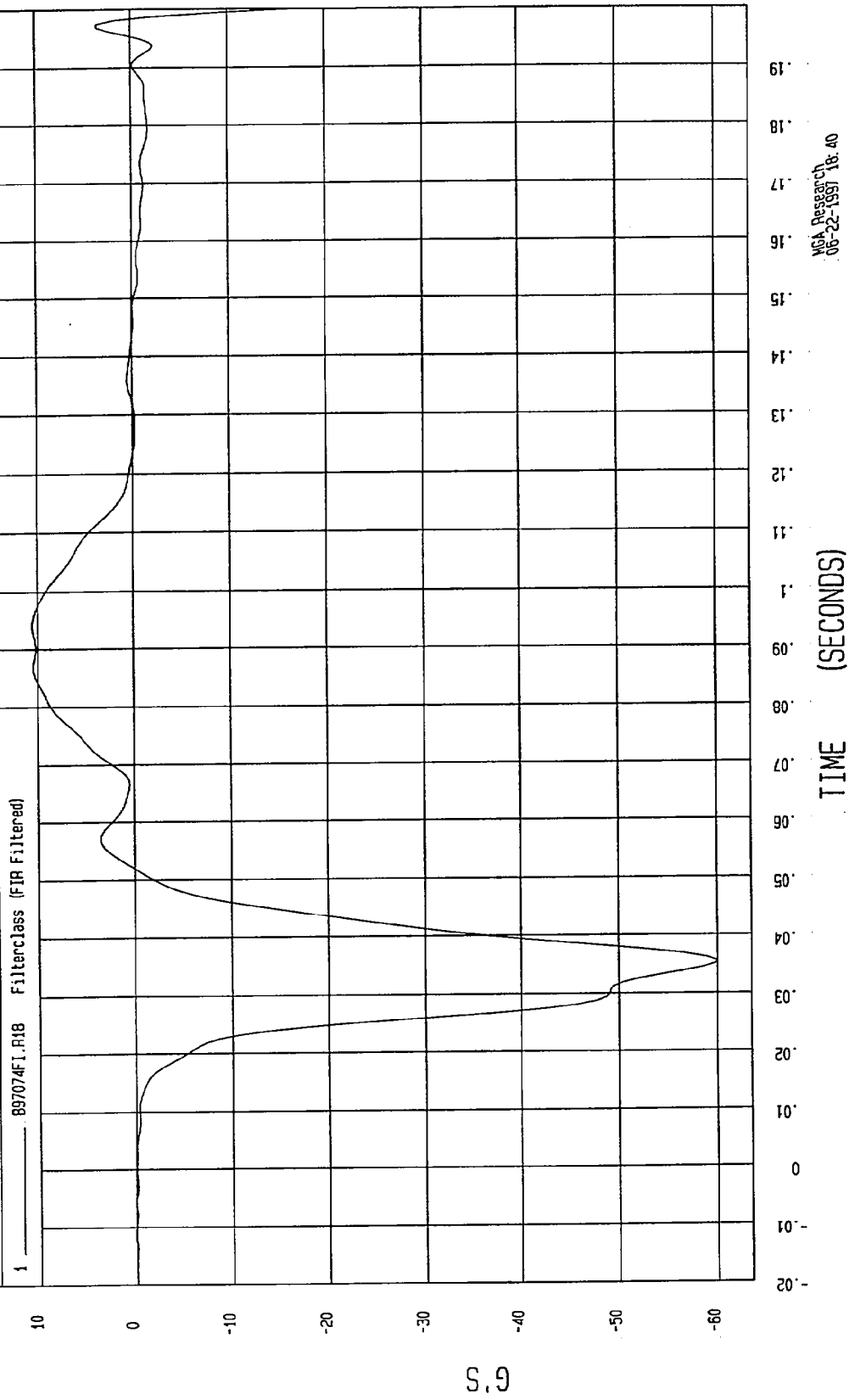


TIME (SECONDS)

NSA Research
06-22-1997 16:20

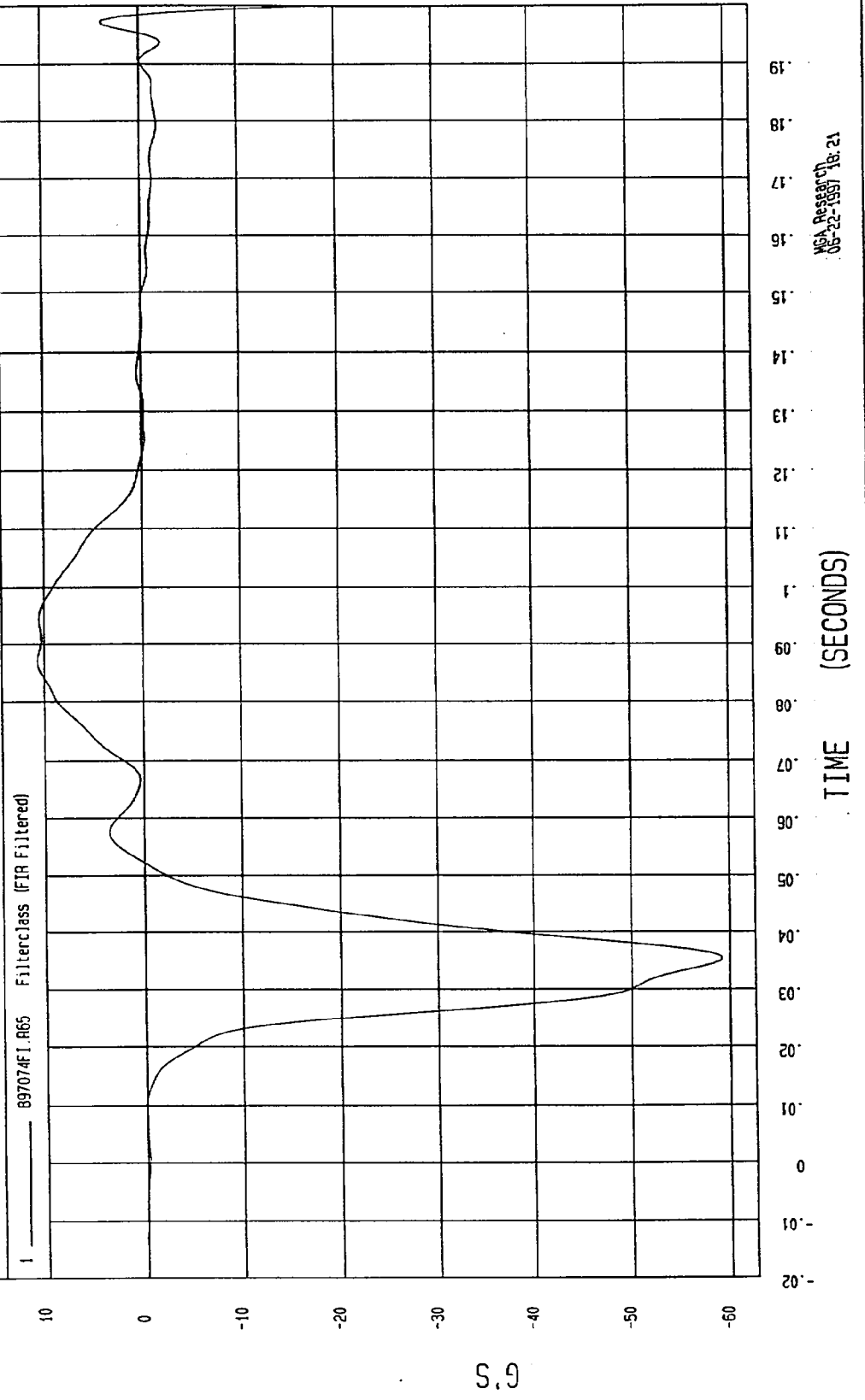
TEST: FMVSS 214 RIGHT SIDE IMPACT	TEST DATE: 06-24-1997
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR	Speed: 32.87 MPH 52.9 KPH
Minimum = -59.99 G'S at 35 msec	Maximum = 10.55 G'S at 94 msec

FRONT PASSENGER PELVIS Y ACCELERATION



TEST: FMVSS 214 RIGHT SIDE IMPACT	TEST DATE: 06-24-1997
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR	Speed: 32.87 MPH 52.9 KPH
Minimum = -59.15 G'S at 36 msec	Maximum = 10.66 G'S at 87 msec

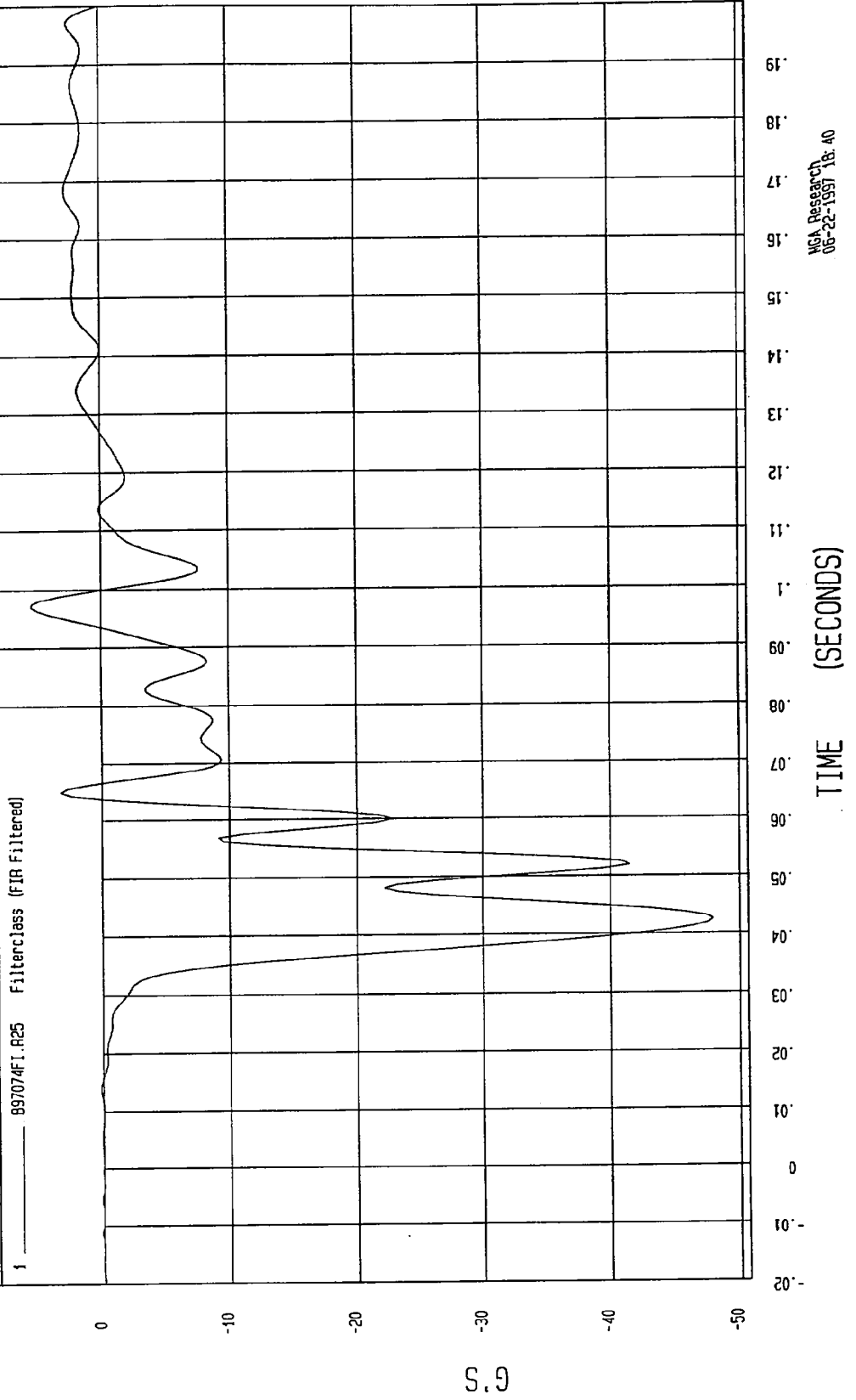
FRONT PASSENGER PELVIS Y REDUNDANT ACCELERATION



NSA Research
06-22-1997 18:21

TEST: FMVSS 214 RIGHT SIDE IMPACT	TEST DATE: 06-24-1997
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR	Speed: 32.87 MPH 52.9 KPH
Minimum = -47.97 G'S at 42 msec	Maximum = 5.46 G'S at 97 msec

REAR PASSENGER UPPER RIB Y ACCELERATION



TEST: FMVSS 214 RIGHT SIDE IMPACT

TEST DATE: 06-24-1997

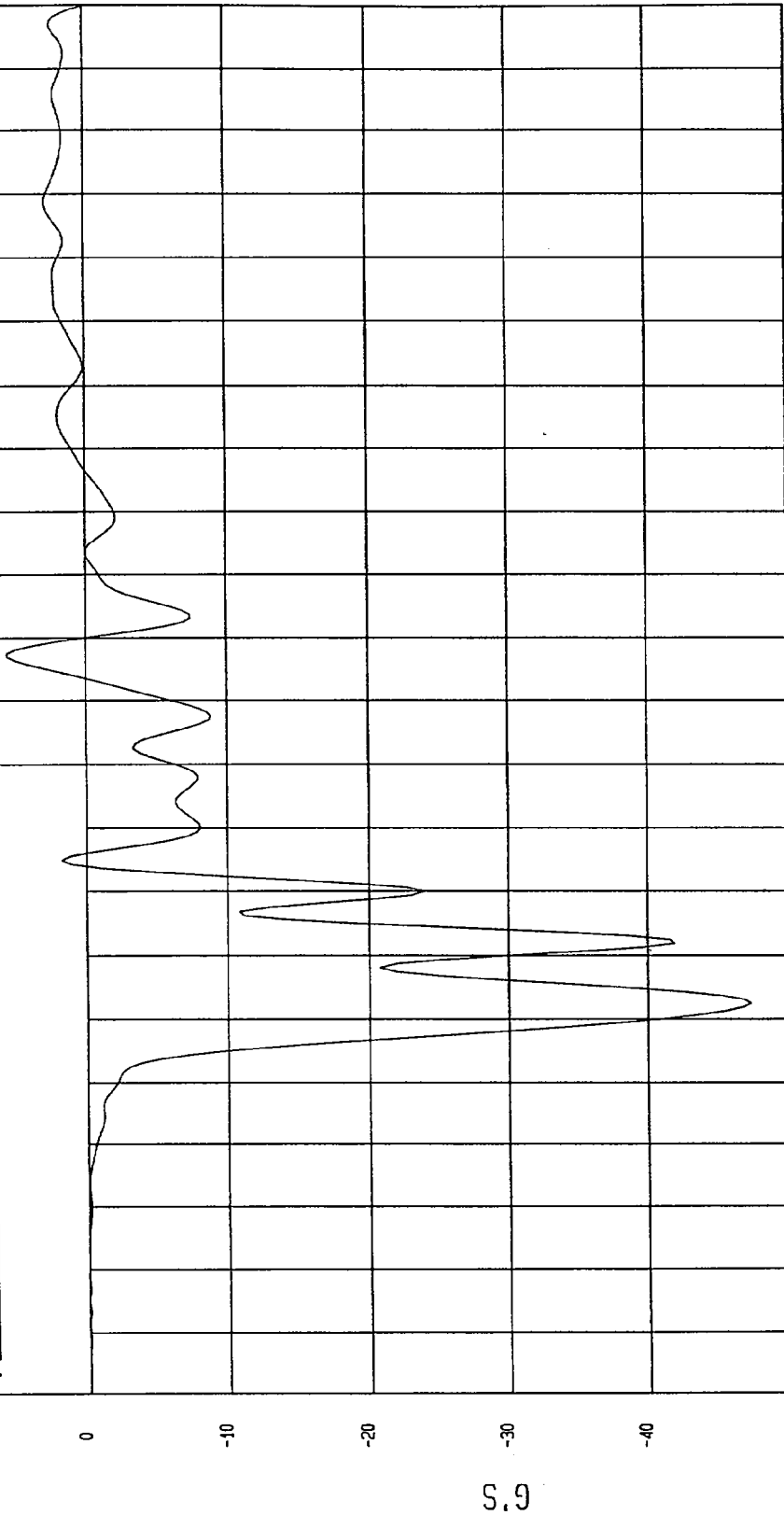
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -47.27 G'S at 42 msec

Maximum = 5.64 G'S at 98 msec

REAR PASSENGER UPPER RIB Y REDUNDANT ACCELERATION

1 ——— B97074F1.R66 Filterclass (FIR Filtered)



NCA Research
06-22-1997 16:21

TIME (SECONDS)

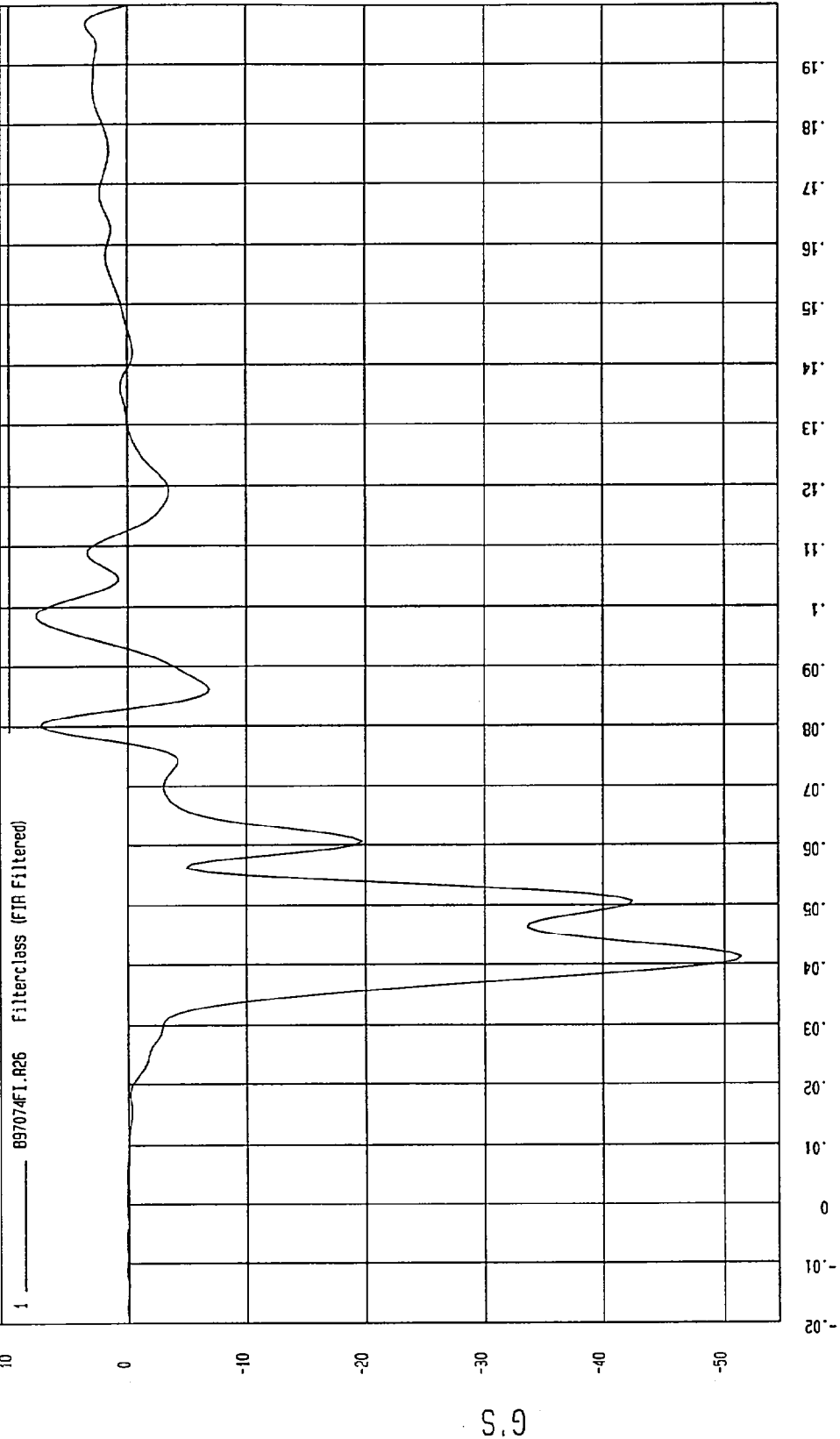
G.S

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -51.42 G'S at 41 msec Maximum = 7.76 G'S at 99 msec

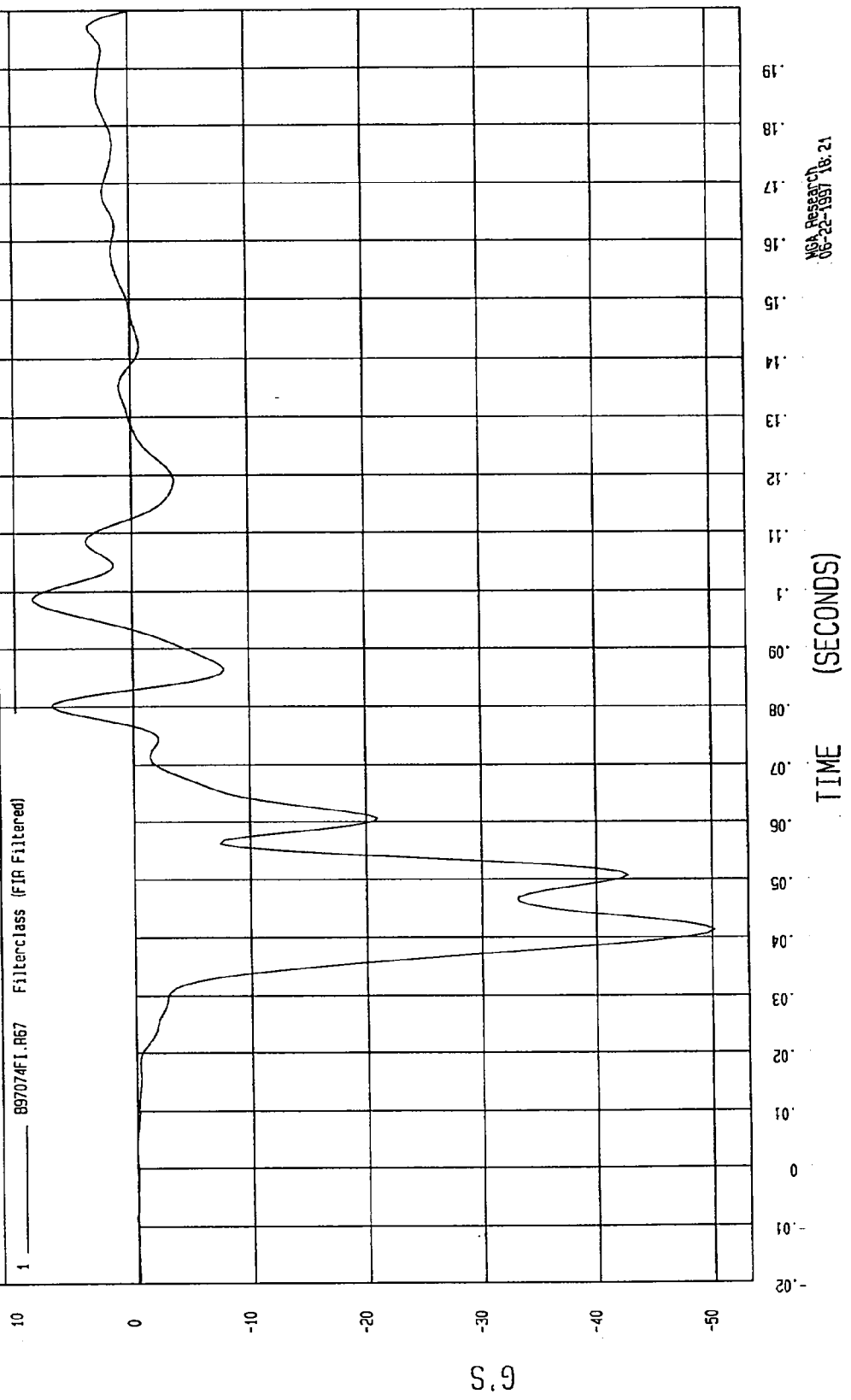
REAR PASSENGER LOWER RIB Y ACCELERATION



NSA Research
06-22-1997 18:40

TEST: FMVSS 214 RIGHT SIDE IMPACT	TEST DATE: 06-24-1997
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR	Speed: 32.87 MPH 52.9 KPH
Minimum = -50.17 G'S at 41 msec	Maximum = 8.48 G'S at 99 msec

REAR PASSENGER LOWER RIB Y REDUNDANT ACCELERATION



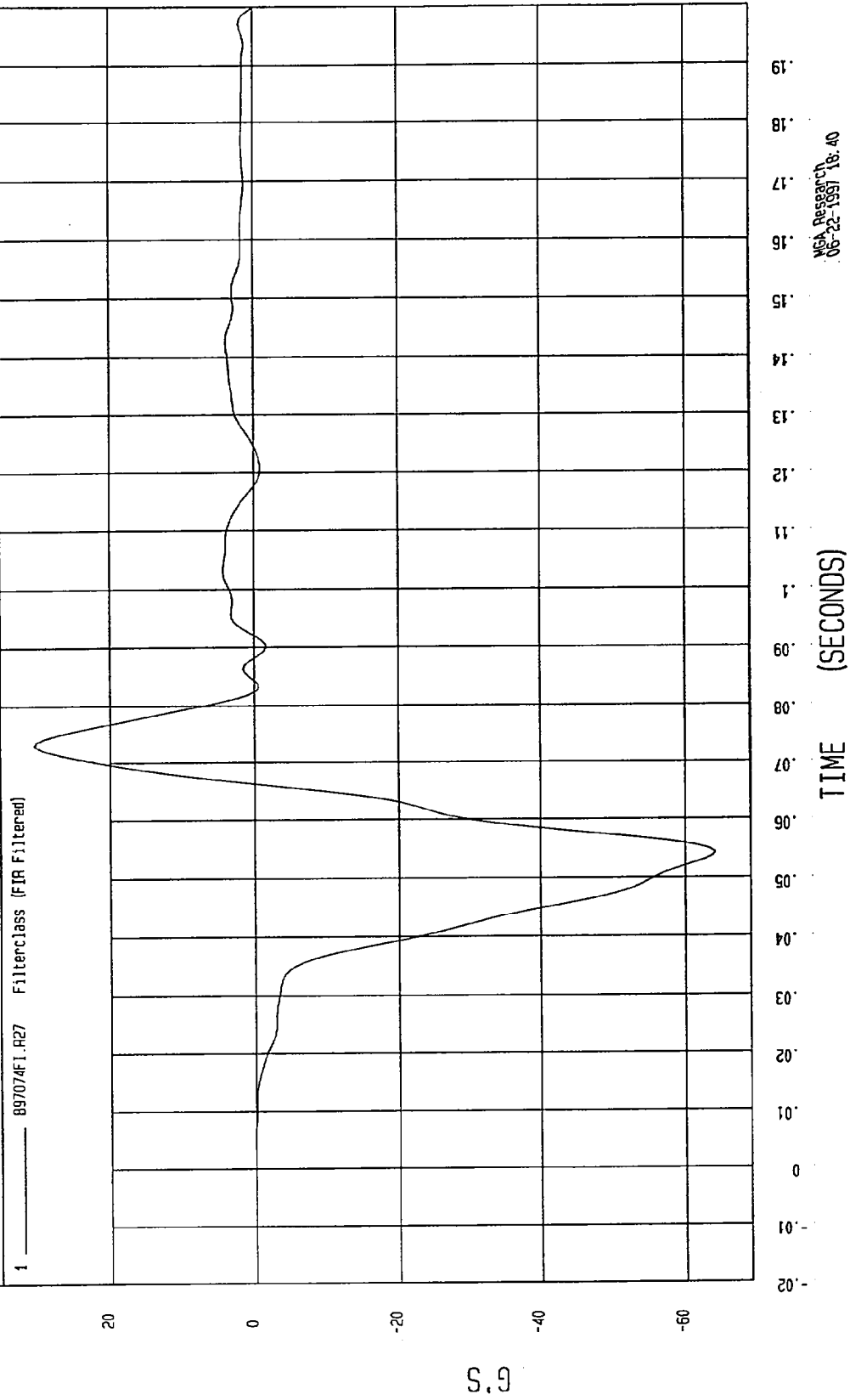
MGA Research
06-22-1997 18:21

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997

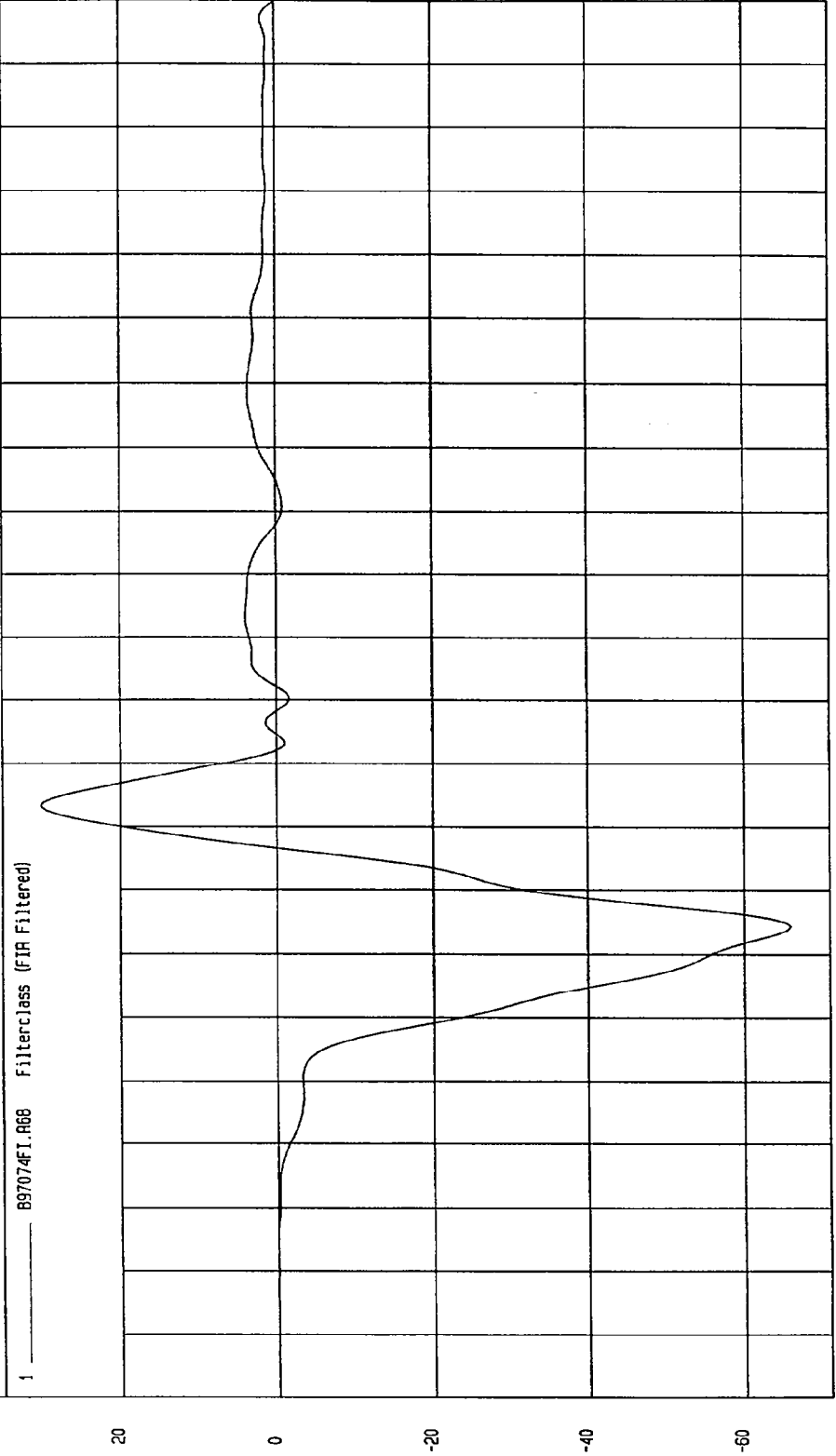
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Minimum = -64.19 G'S at 54 msec Maximum = 30.52 G'S at 73 msec

REAR PASSENGER LOWER SPINE Y ACCELERATION



TEST: FMVSS 214 RIGHT SIDE IMPACT	TEST DATE: 06-24-1997
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR	Speed: 32.87 MPH 52.9 KPH
Minimum = -65.80 G'S at 54 msec	
Maximum = 30.27 G'S at 73 msec	
REAR PASSENGER LOWER SPINE Y REDUNDANT ACCELERATION	

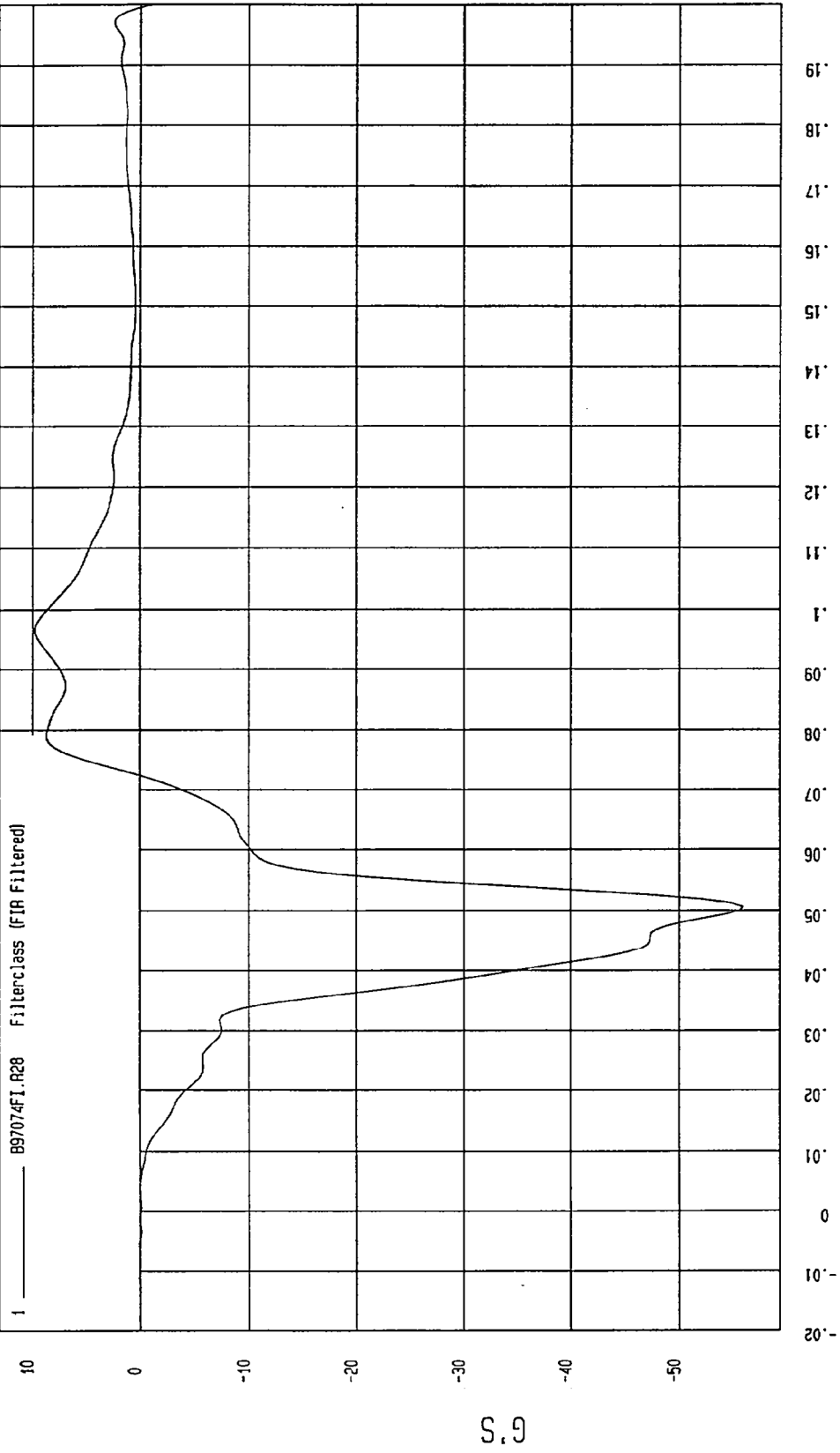


TIME (SECONDS)

NGA Research
06-22-1997 18:21

TEST: FMVSS 214 RIGHT SIDE IMPACT TEST DATE: 06-24-1997
COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH
Minimum = -55.74 G'S at 51 msec Maximum = 9.77 G'S at 97 msec

REAR PASSENGER PELVIS Y ACCELERATION



MGA Research
06-22-1997 18:40

TEST: FMVSS 214 RIGHT SIDE IMPACT

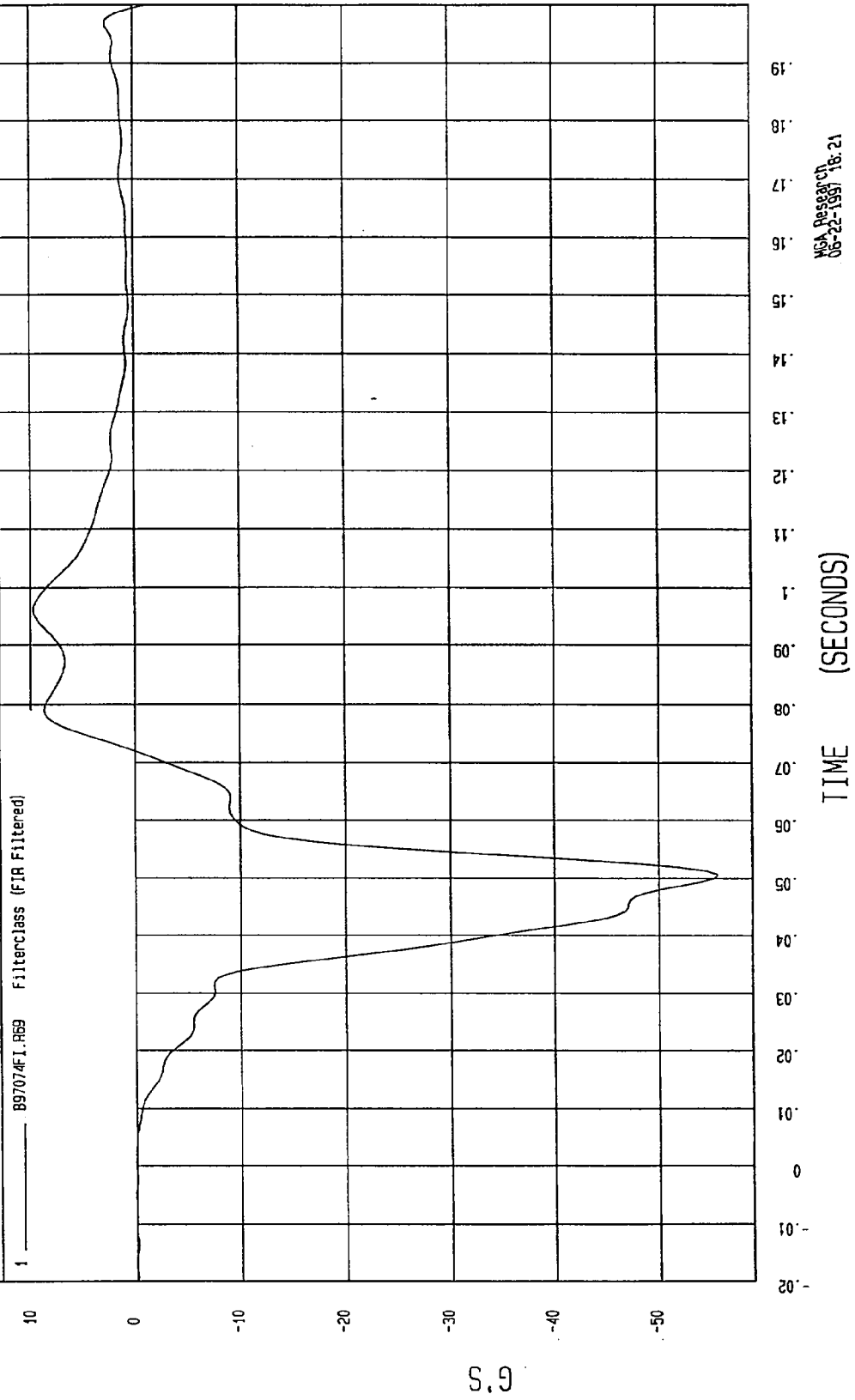
TEST DATE: 06-24-1997

COMPONENT: 1997 SUBARU IMPREZA OUTBACK 4 DOOR Speed: 32.87 MPH 52.9 KPH

Maximum = 9.76 G'S at 96 msec

Minimum = -55.49 G'S at 51 msec

REAR PASSENGER PELVIS Y REDUNDANT ACCELERATION



APPENDIX C
SID CONFIGURATION AND PERFORMANCE VERIFICATION

REPORT NO. MGA-96-DC21

DUMMY PERFORMANCE CALIBRATIONS

FMVSS 214 - SIDE IMPACT TEST

FUJI HEAVY INDUSTRIES LTD.
1997 SUBARU IMPREZA OUTBACK
NHTSA NO. CV5501

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: June 24, 1997

Report Date: July 9, 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: 272	PRE-TEST CERTIFICATION DATA	1-1
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DUMMY S/N: 272	POST-TEST CERTIFICATION DATA	3-1
DUMMY S/N: 271	POST-TEST CERTIFICATION DATA	4-1
DUMMY S/N: 272	POST-TEST INSPECTION CHECKLIST	5-1
DUMMY S/N: 271	POST-TEST INSPECTION CHECKLIST	6-1
	VEHICLE AND DUMMY TEMPERATURE	7-1

PRE-TEST CERTIFICATION DATA

Front Dummy Serial Number: 272

Calibration Test Results Summary

Dummy Serial Number: 272

Pre-Test Calibration

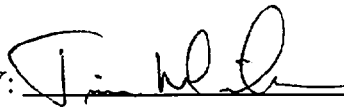
External Dimensions:	The dummy passed all external dimension requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion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

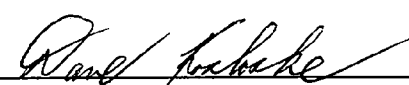
SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 272

DATE OF VERIFICATION: June 16, 1997

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.2
RH - Rib Height	19.75" - 20.50"	20.20
HP - Hip Pivot Height	3.9" ref.	3.9
RD - Rib From Back Line	9.0" to 9.5"	9.4
KV - Knee Pivot From Back Line	20.1" - 20.7"	20.7
SW - Knee Pivot to Floor	19.3" - 19.9"	19.6
HW - Hip Width	14.0" - 15.4"	15.0

MEASUREMENTS BY: 

APPROVED BY: 

MGA RESEARCH CORPORATION
THORACIC SHOCK ABSORBER TEST
SIDE IMPACT DUMMY (SID)

DATE: June 13, 1997

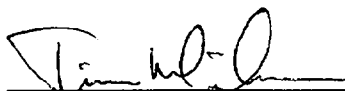
DUMMY NUMBER: 272

TEST NUMBER: D9706678

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		66° - 78° F	70°
RELATIVE HUMIDITY		10 - 70%	40%
VELOCITY 10 ft/s	FORCE (lb.)	188 - 253	190
	DISPLACEMENT (in.)	1.18 - 1.38	1.32
VELOCITY 14 ft/s	FORCE (lb.)	389 - 472	420
	DISPLACEMENT (in.)	1.26 - 1.47	1.43
VELOCITY 20 ft/s	FORCE (lb.)	841 - 1000	962
	DISPLACEMENT (in.)	1.30 - 1.57	1.49

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY



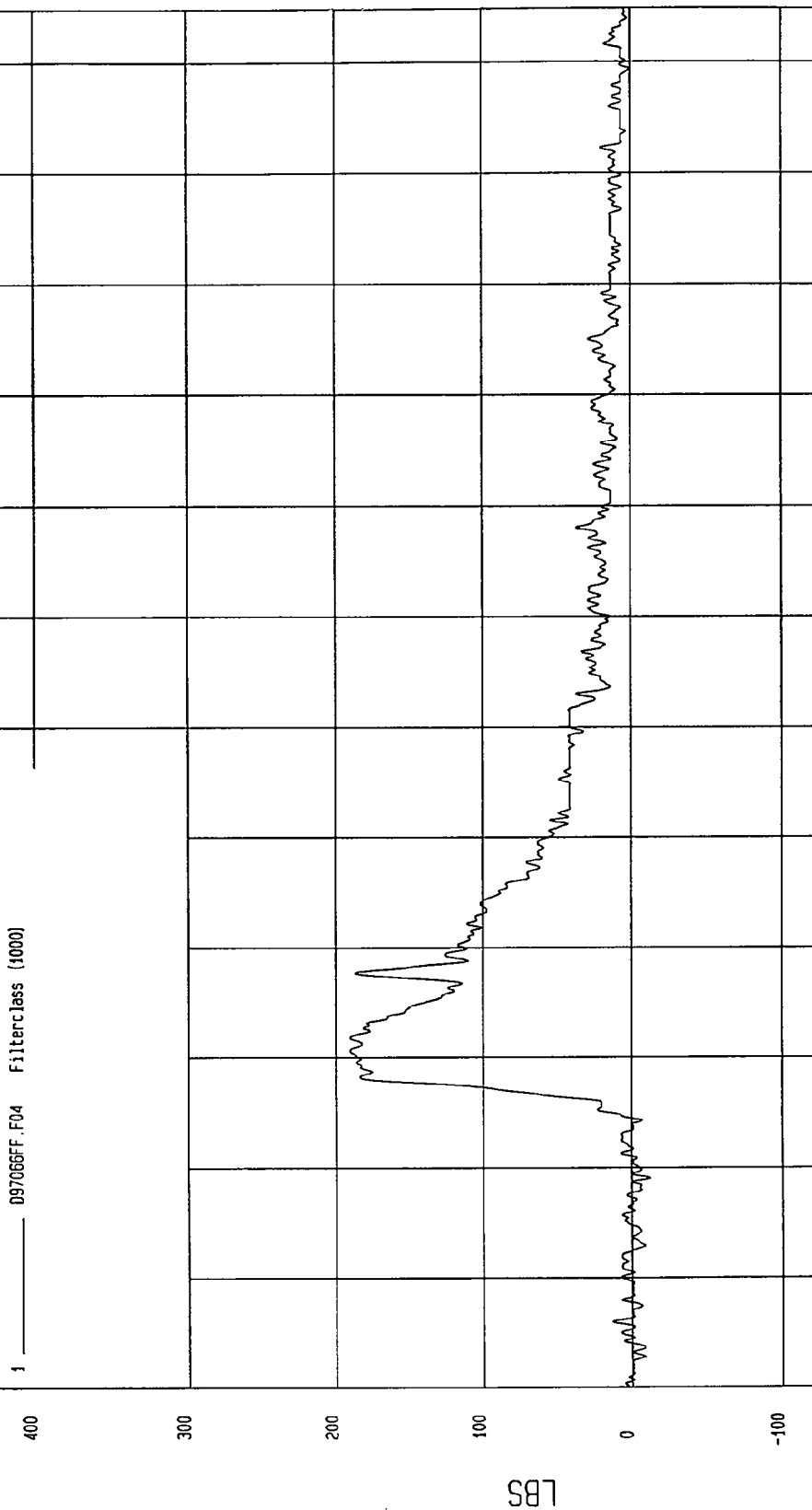
TEST: DUMMY CALIBRATION - DAMPENER BENCH TEST TEST DATE: 06-13-1997 - 14:47

COMPONENT: DUMMY # 272 Velocity: 10 FT/SEC 3.05 M/SEC

Minimum = -12.46 LBS at 19.0 msec Maximum = 190.07 LBS at 30.5 msec

PEAK FORCE

1 ——— 097066FF.F04 Filterclass (1000)



MGA Research
06-13-1997 15:02

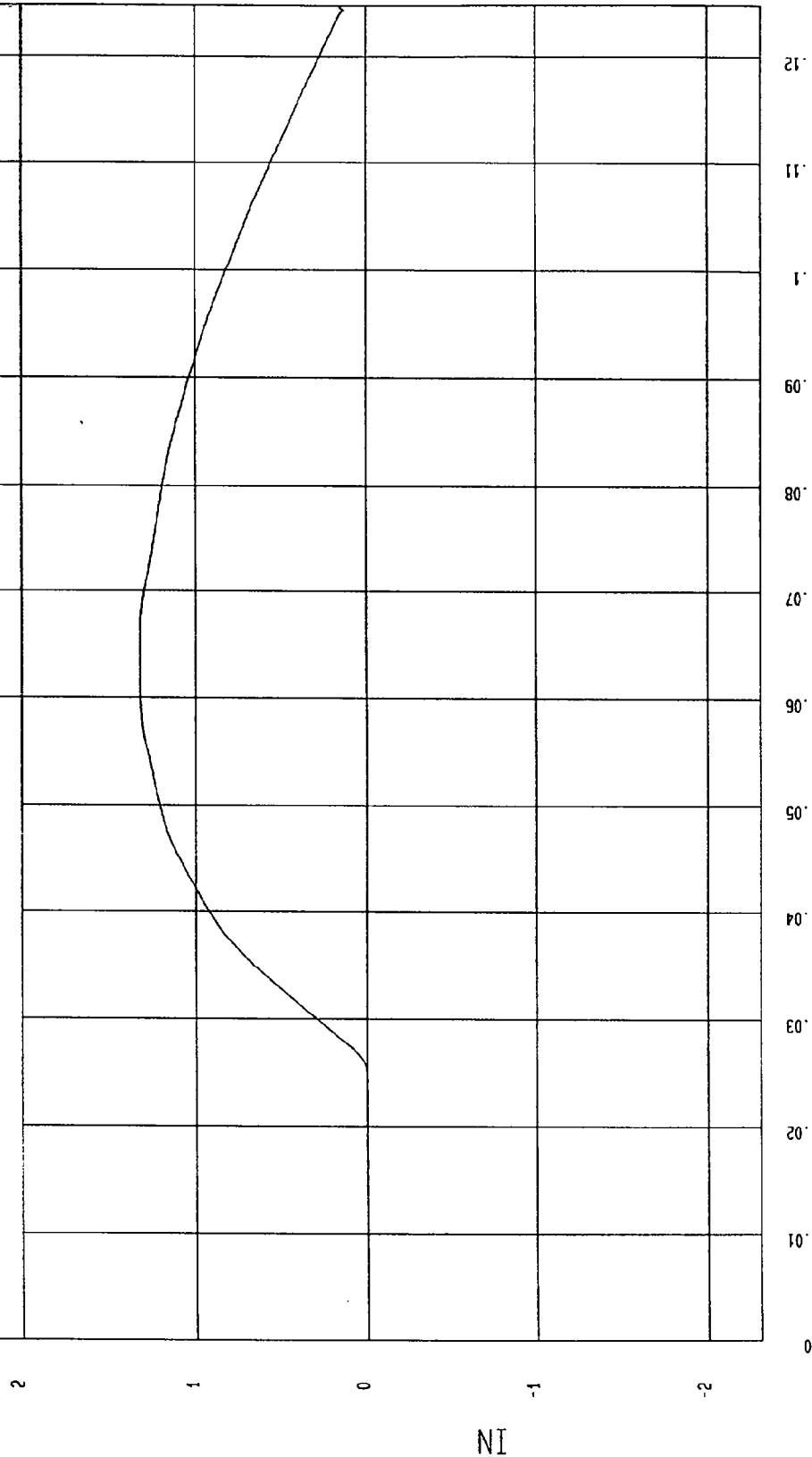
TEST: DUMMY CALIBRATION - DAMPENER BENCH TEST TEST DATE: 06-13-1997 - 14: 47

COMPONENT: DUMMY # 272 Velocity: 10 FT/SEC 3.05 M/SEC

Minimum = -8.70E-04 IN at 3.49 msec Maximum = 1.32 IN at 67.1 msec

PEAK DISPLACEMENT

1 _____ 097066DF.D05 Filterclass (1000)



MCA Research
06-13-1997 15:02

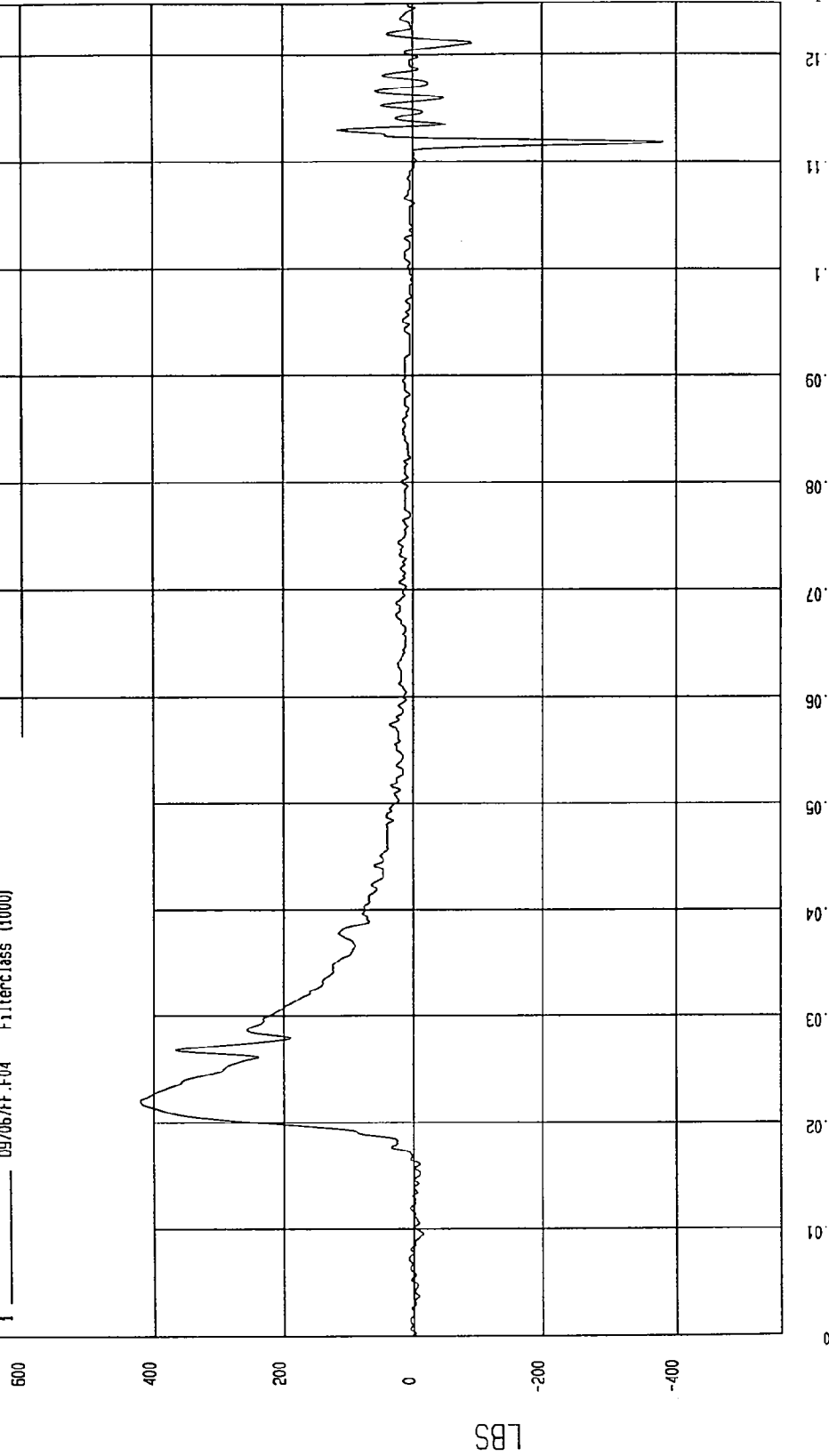
TEST: DUMMY CALIBRATION - DAMPENER BENCH TESTTEST DATE: 06-13-1997 - 14: 49

COMPONENT: DUMMY # 272 Velocity: 14 FT/SEC 4.27 M/SEC

Minimum = -379.81 LBS at 111. msec Maximum = 420.23 LBS at 21.9 msec

PEAK FORCE

1 ——— 097067FF.F04 Filterclass (1000)



NCA Research
06-13-1997 15: 03

TEST: DUMMY CALIBRATION - DAMPENER BENCH TEST TEST DATE: 06-13-1997 - 14: 49

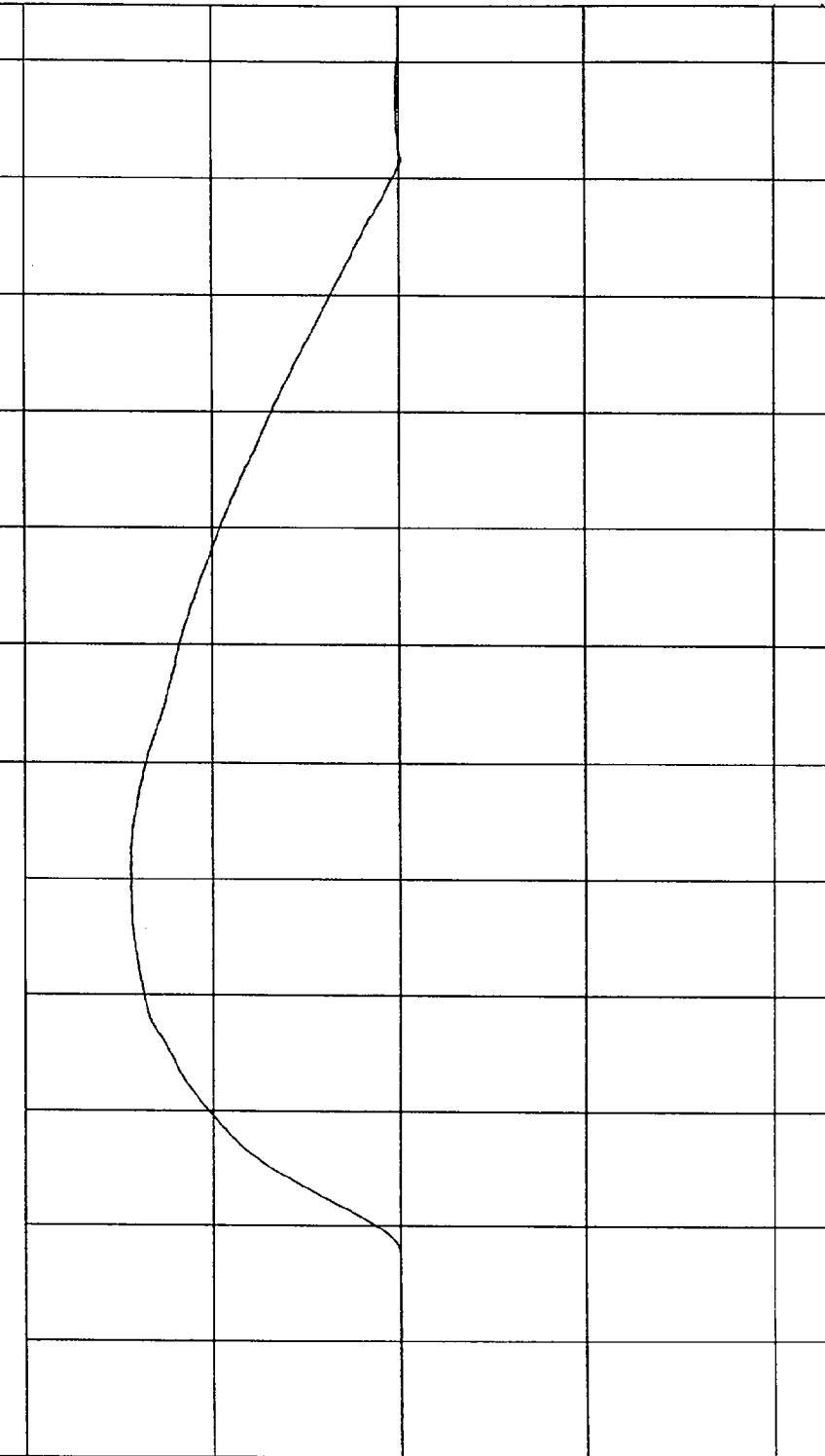
COMPONENT: DUMMY # 272 Velocity: 14 FT/SEC 4.27 M/SEC

Minimum = -1.11E-02 IN at 111. msec Maximum = 1.43 IN at 49.3 msec

PEAK DISPLACEMENT

1 ——— 0970670F.005 Filterclass (1000)

2
1
0
-1
-2



0 20 40 60 80 100 120

MOA Research
06-13-1997 15: 03

TEST: DUMMY CALIBRATION - DAMPENER BENCH TEST TEST DATE: 06-13-1997 - 14:52

COMPONENT: DUMMY # 272 Velocity: 20 FT/SEC 6.1 M/SEC

Minimum = -323.36 LBS at 99.9 msec

Maximum = 961.73 LBS at 15.3 msec

PEAK FORCE

1 097068FF.F04 Filterclass (1000)

1200

1000

800

600

400

200

0

-200

-400

LBS

0

.01

.02

.03

.04

.05

.06

.07

.08

.09

.1

.11

.12

TIME (SECONDS)

NSA Research
06-13-1997 15:00

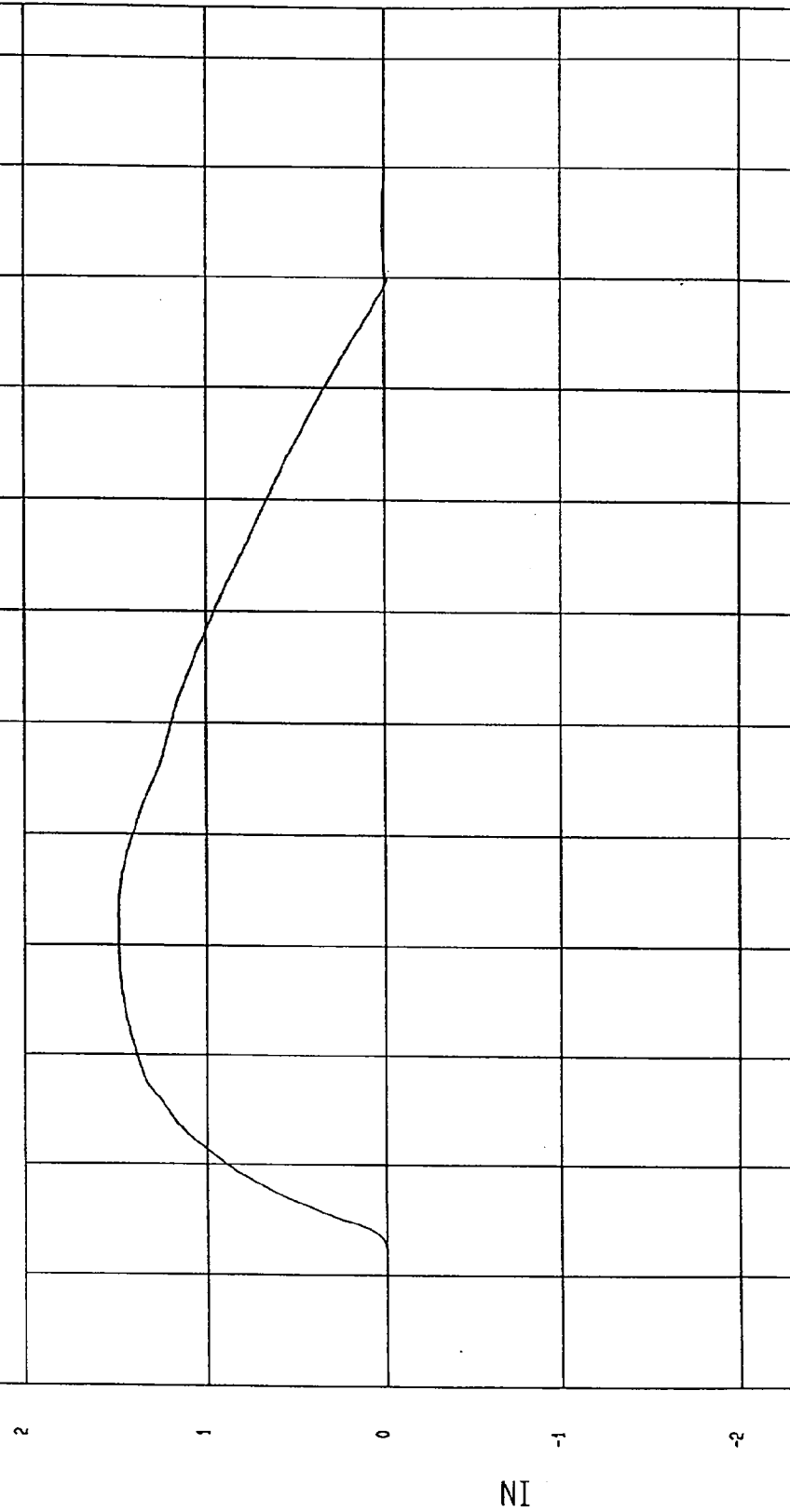
TEST: DUMMY CALIBRATION - DAMPENER BENCH TEST TEST DATE: 06-13-1997 - 14:52

COMPONENT: DUMMY # 272 Velocity: 20 FT/SEC 6.1 M/SEC

Minimum = -1.26E-02 IN at 99.8 msec Maximum = 1.49 IN at 42.6 msec

PEAK DISPLACEMENT

1 ——— 0970680F.D05 Filterclass (1000)



TIME (SECONDS)

WCA Research
06-13-1997 15:00

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: June 24, 1997

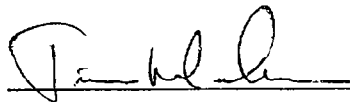
DUMMY NUMBER: 272

TEST NUMBER: D97EN2

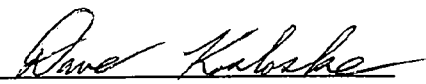
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	60%
PROBE SPEED	13.8 - 14.2 fps	14.1
UPPER RIB	37 - 46 g's	45
LOWER RIB	37 - 46 g's	45
LOWER SPINE	15 - 22 g's	20

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY



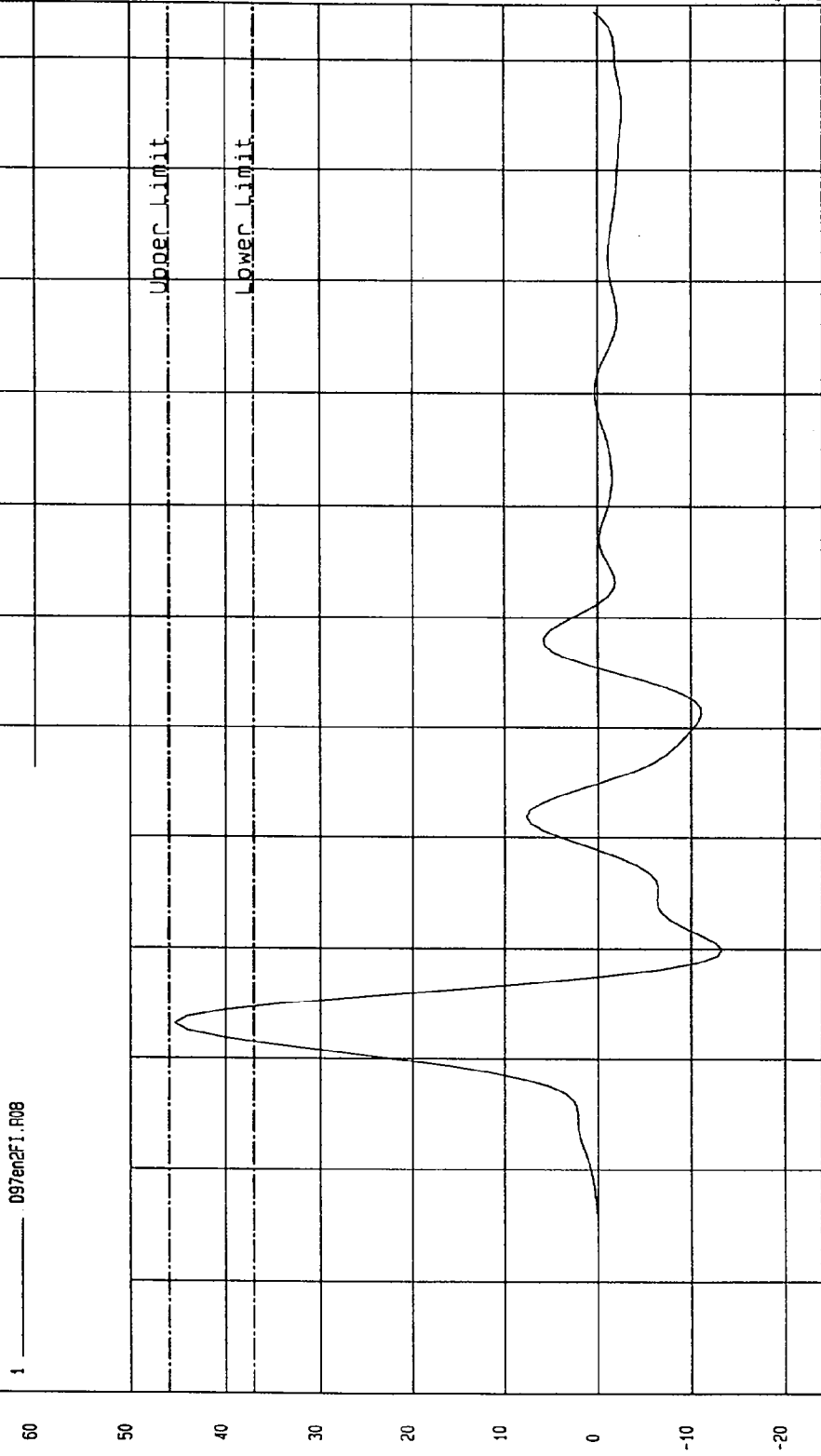
TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 06-24-1997 - 13:40

COMPONENT: DUMMY # 272 Velocity: 14.068 FT/SEC 4.29 M/SEC

Minimum = -13.26 G'S at 40 msec

Maximum = 45.46 G'S at 33.1 msec

UPPER RIB ACCELERATION



TIME (SECONDS)

MCA Research
06-24-1997 13:55

TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 06-24-1997 - 13:40

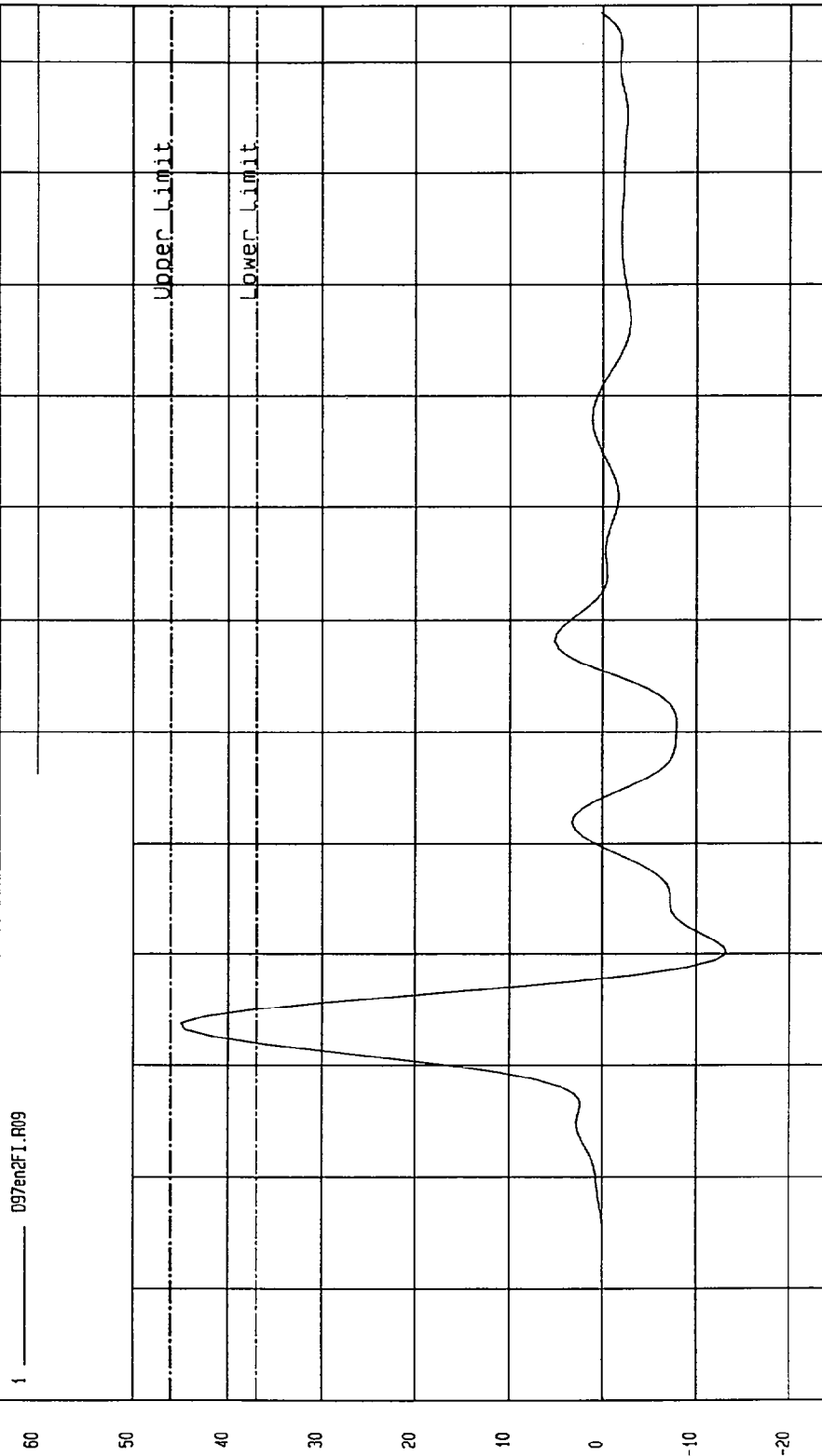
COMPONENT: DUMMY # 272 Velocity: 14.068 FT/SEC 4.29 M/SEC

Minimum = -13.13 G's at 40 msec

Maximum = 44.89 G's at 33.7 msec

LOWER RIB ACCELERATION

1 097en2F1.R09



MCA Research
06-24-1997 13:56

TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 06-24-1997 - 13:40

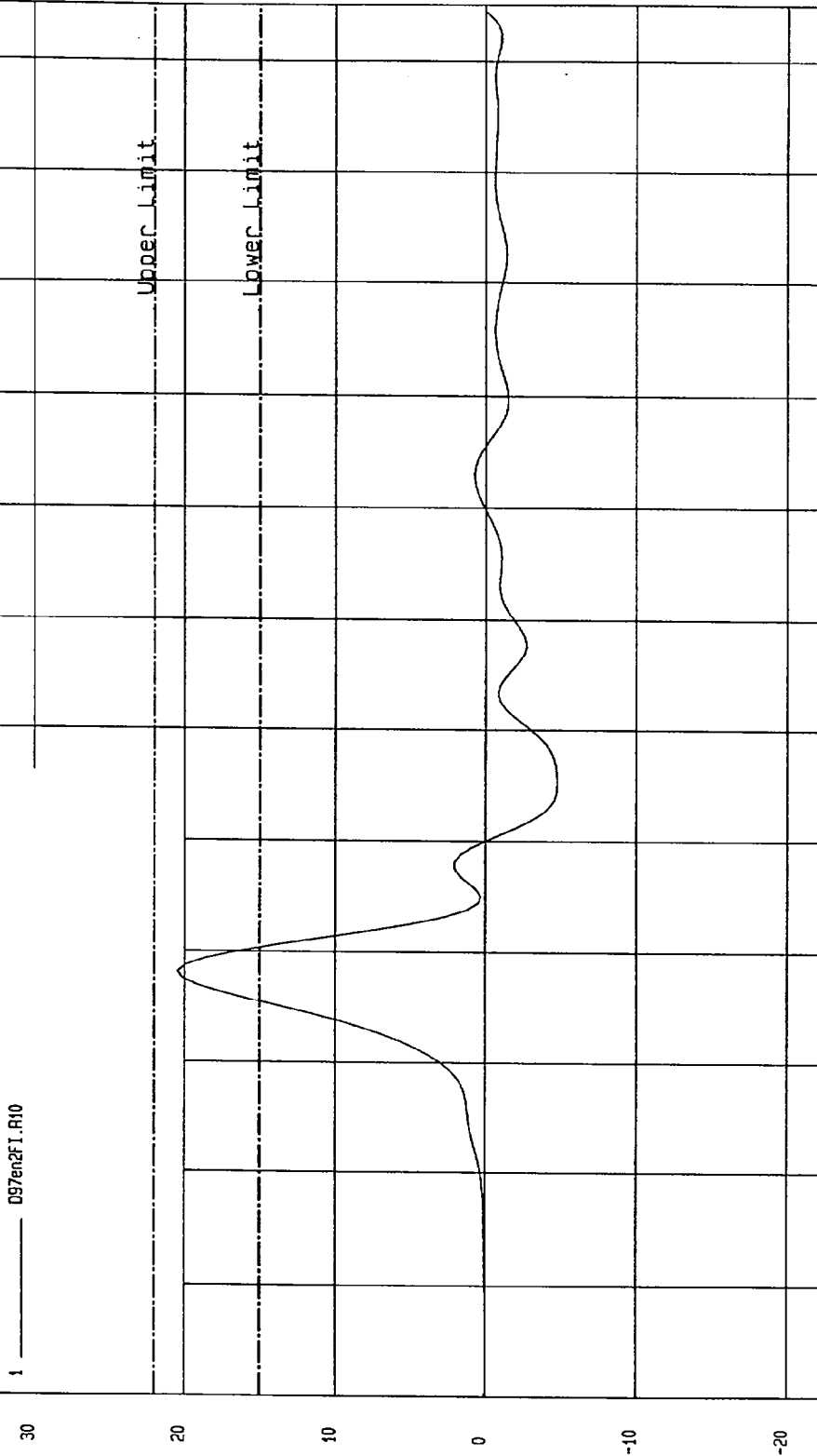
COMPONENT: DUMMY # 272 Velocity: 14.068 FT/SEC 4.29 M/SEC

Minimum = -4.77 G'S at 55 msec

Maximum = 20.47 G'S at 38.1 msec

1 _____ D97en2FI.R10

LOWER SPINE ACCELERATION



12

11

10

9

8

7

6

5

4

3

2

1

0

WCA Research
06-24-1997 13:56

TIME (SECONDS)

MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: June 24, 1997

DUMMY NUMBER: 272

TEST NUMBER: D97E03

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	60%
PROBE SPEED	13.8 - 14.2 f/s	14.1
PELVIS ACCELERATION	40 - 60 g's	58

TEST MEETS SPECIFICATIONS

TECHNICIAN

Jim Helal

APPROVED BY

Paul Kraloske

TEST: DUMMY CALIBRATION - PELVIS IMPACT TEST DATE: 06-24-1997 - 13:50

COMPONENT: DUMMY # 272 Velocity: 14.055 FT/SEC 4.28 M/SEC

Minimum = -12.69 G'S at 41.2 msec

Maximum = 57.54 G'S at 35.6 msec

PELVIS ACCELERATION

1 ——— D97ec3F1.R11

80

60

40

20

0

-20

G'S

Upper Limit

Lower Limit

.12

.11

.1

.09

.08

.07

.06

.05

.04

.03

.02

.01

0

TIME (SECONDS)

MGA Research
06-24-1997 13:58

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

DATE: March 3, 1997

DUMMY NUMBER: 272

TEST NUMBER: D97064

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	20%
FORCE @ 0.5 in	23.3 - 36.5 lbs	31.6
FORCE @ 0.75 in	36.7 - 49.8 lbs	43.2
FORCE @ 1.0 in	50 - 63 lbs	57
FORCE @ 1.3 in	73 - 88 lbs	77

TEST MEETS SPECIFICATIONS

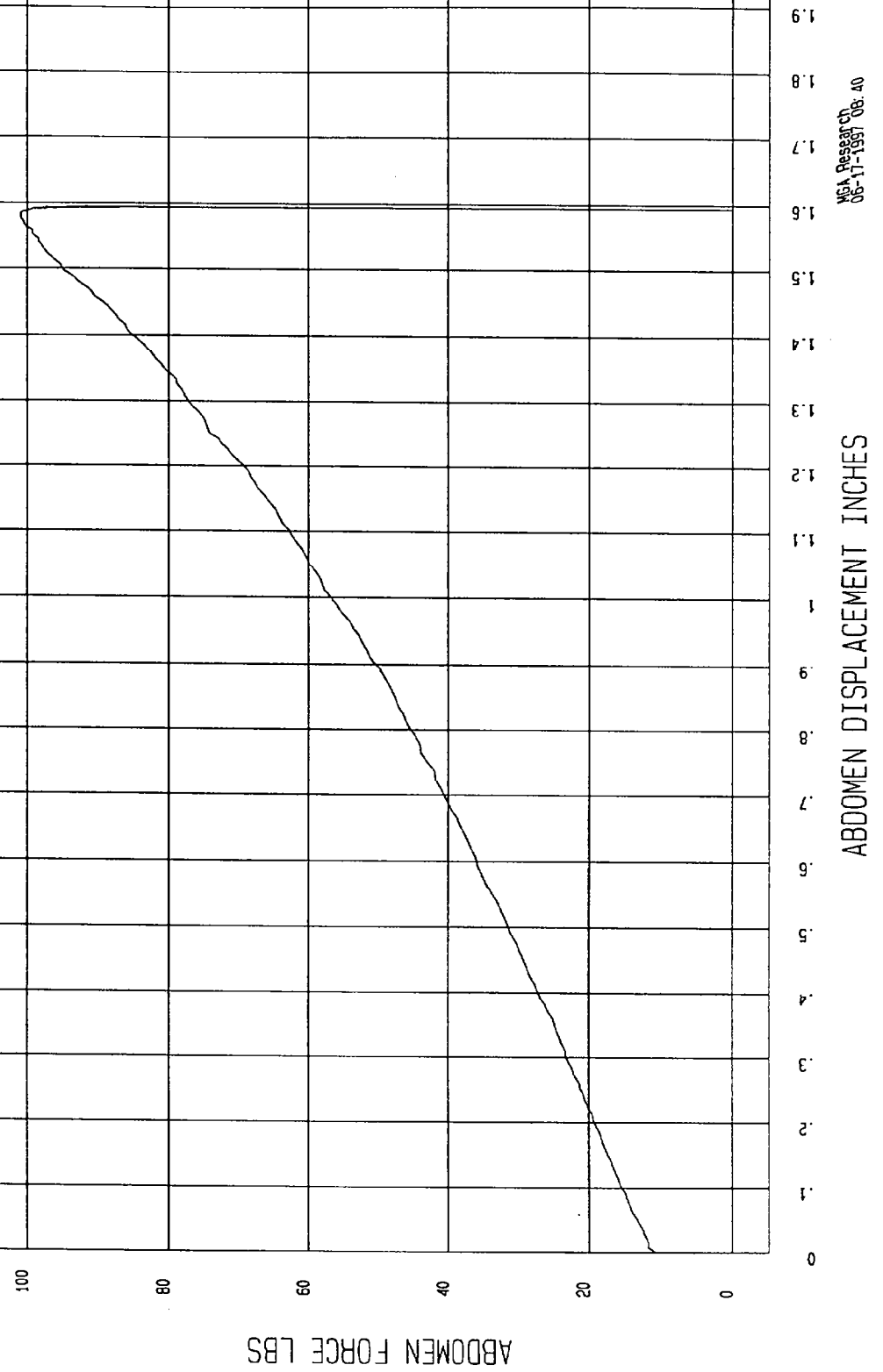
TECHNICIAN Jim M. L.

APPROVED BY Dave Kraloske

TEST: DUMMY CALIBRATION - ABDOMEN COMPRESSION TEST DATE: 03-03-1997 - 11:16

COMPONENT: DUMMY # 272

ABDOMEN FORCE as a function of ABDOMEN DISPLACEMENT



NSA Research
06-17-1997 08:40

MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: February 28, 1997

DUMMY NUMBER: 272

TEST NUMBER: D97065

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	20%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	25
FORCE @ 30°	34 - 46 lbs	41
FORCE @ 40°	46 - 58 lbs	54
RETURN ANGLE	12° maximum	4°

TEST MEETS SPECIFICATIONS

TECHNICIAN

Jim [Signature]

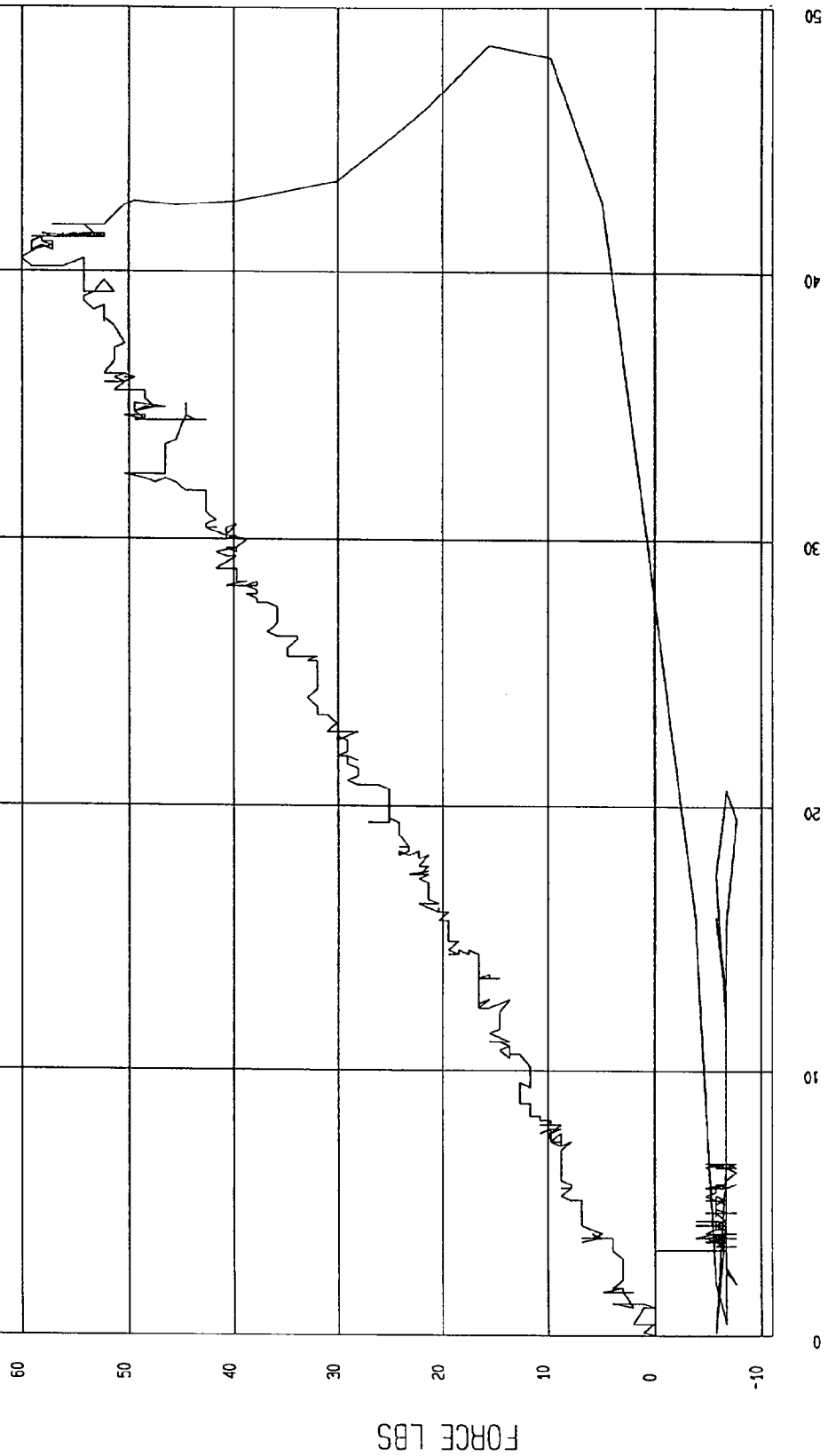
APPROVED BY

Don Kelske

TEST: DUMMY CALIBRATION - LUMBAR FLEXION TEST DATE: 02-28-1997 - 16:25

COMPONENT: DUMMY # 272

FORCE as a function of TORSO ROTATION



NSA Research
06-11-1997 08:47

PRE-TEST CERTIFICATION DATA

Rear Dummy Serial Number: 271

Calibration Test Results Summary

Passenger Serial Number: 271

Pre-Test Calibration

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

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 271

DATE OF VERIFICATION: June 17, 1997

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.6
RH - Rib Height	19.75" - 20.50"	20.40
HP - Hip Pivot Height	3.9" ref.	3.9
RD - Rib From Back Line	9.0" to 9.5"	9.4
KV - Knee Pivot From Back Line	20.1" - 20.7"	20.4
SW - Knee Pivot to Floor	19.3" - 19.9"	19.5
HW - Hip Width	14.0" - 15.4"	15.1

MEASUREMENTS BY: Jim W. C.

APPROVED BY: Paul Kosloski

MGA RESEARCH CORPORATION
THORACIC SHOCK ABSORBER TEST
SIDE IMPACT DUMMY (SID)

DATE: June 13, 1997

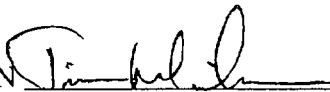
DUMMY NUMBER: 271

TEST NUMBER: D97105678

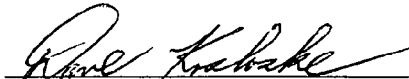
TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		66° - 78° F	70°
RELATIVE HUMIDITY		10 - 70%	40%
VELOCITY 10 ft/s	FORCE (lb.)	188 - 253	204
	DISPLACEMENT (in.)	1.18 - 1.38	1.34
VELOCITY 14 ft/s	FORCE (lb.)	389 - 472	440
	DISPLACEMENT (in.)	1.26 - 1.47	1.44
VELOCITY 20 ft/s	FORCE (lb.)	841 - 1000	995
	DISPLACEMENT (in.)	1.30 - 1.57	1.47

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY



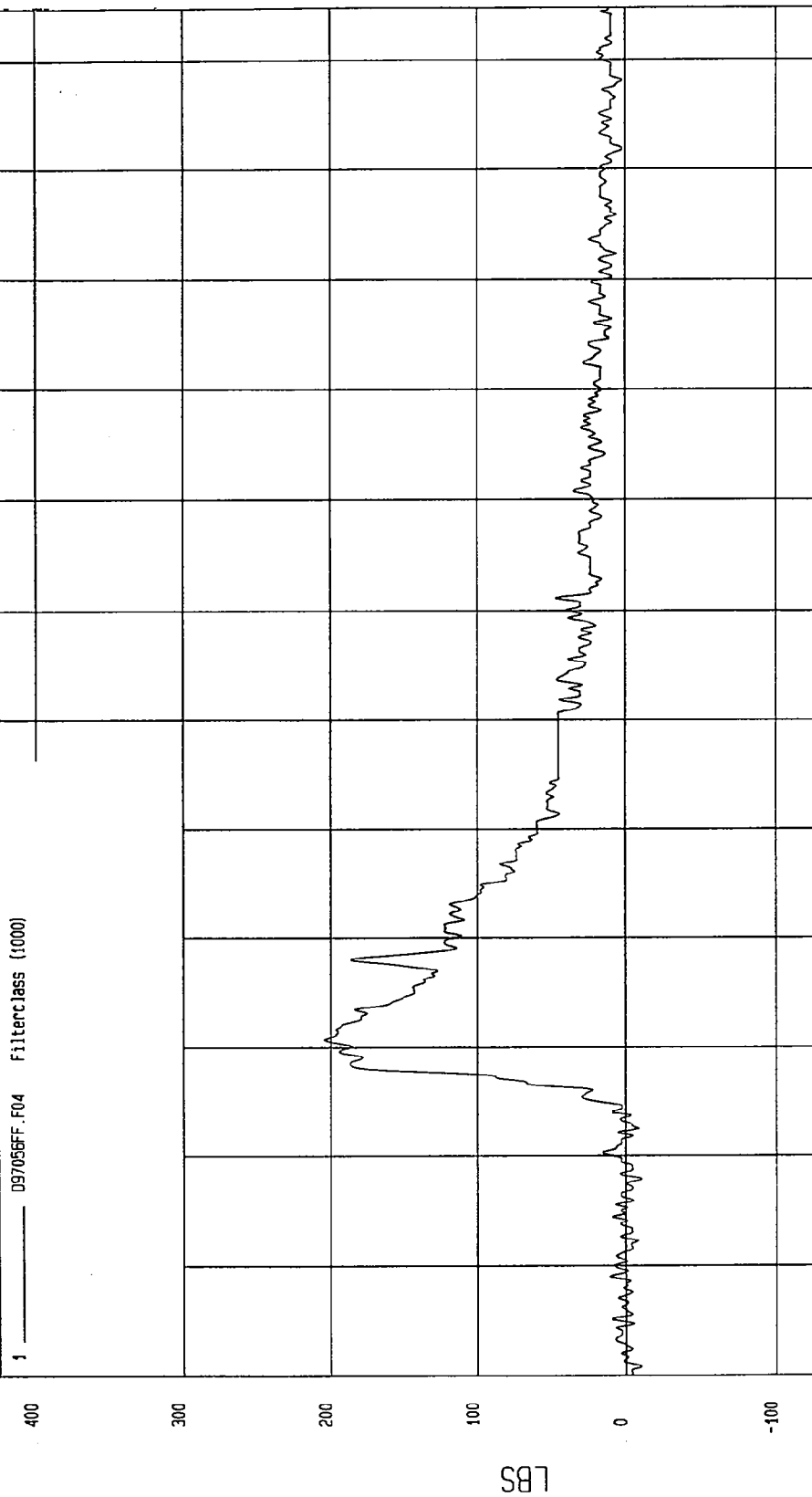
TEST: DUMMY CALIBRATION - DAMPENER BENCH TEST TEST DATE: 06-13-1997 - 14:09:20

COMPONENT: DUMMY # 271 Velocity: 10 FT/SEC 3.05 M/SEC

Minimum = -10.66 LBS at 17.8 msec Maximum = 204.08 LBS at 30.7 msec

PEAK FORCE

1 ——— D97056FF.F04 Filterclass (1000)



MGA Research
06-13-1997 14:35

TEST: DUMMY CALIBRATION - DAMPENER BENCH TEST TEST DATE: 06-13-1997 - 14:07

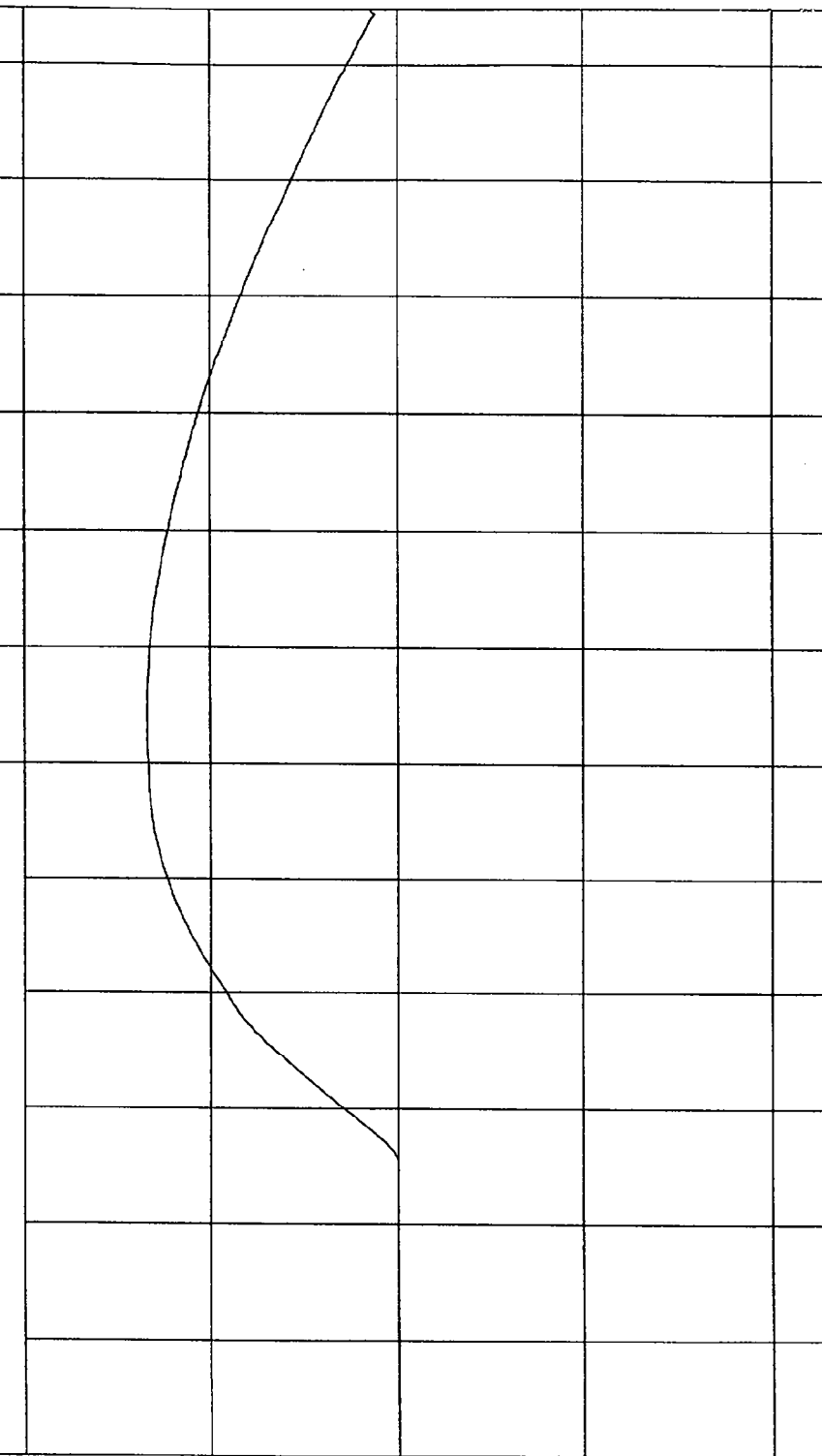
COMPONENT: DUMMY # 271 Velocity: 10 FT/SEC 3.05 M/SEC

Minimum = -7.19E-04 IN at 4.99 msec Maximum = 1.34 IN at 62.6 msec

PEAK DISPLACEMENT

1 ——— 0970560F.005 Filterclass (1000)

2
1
0
-1
-2



0 0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1 0.11 0.12

MCA Research
06-13-1997 14:36

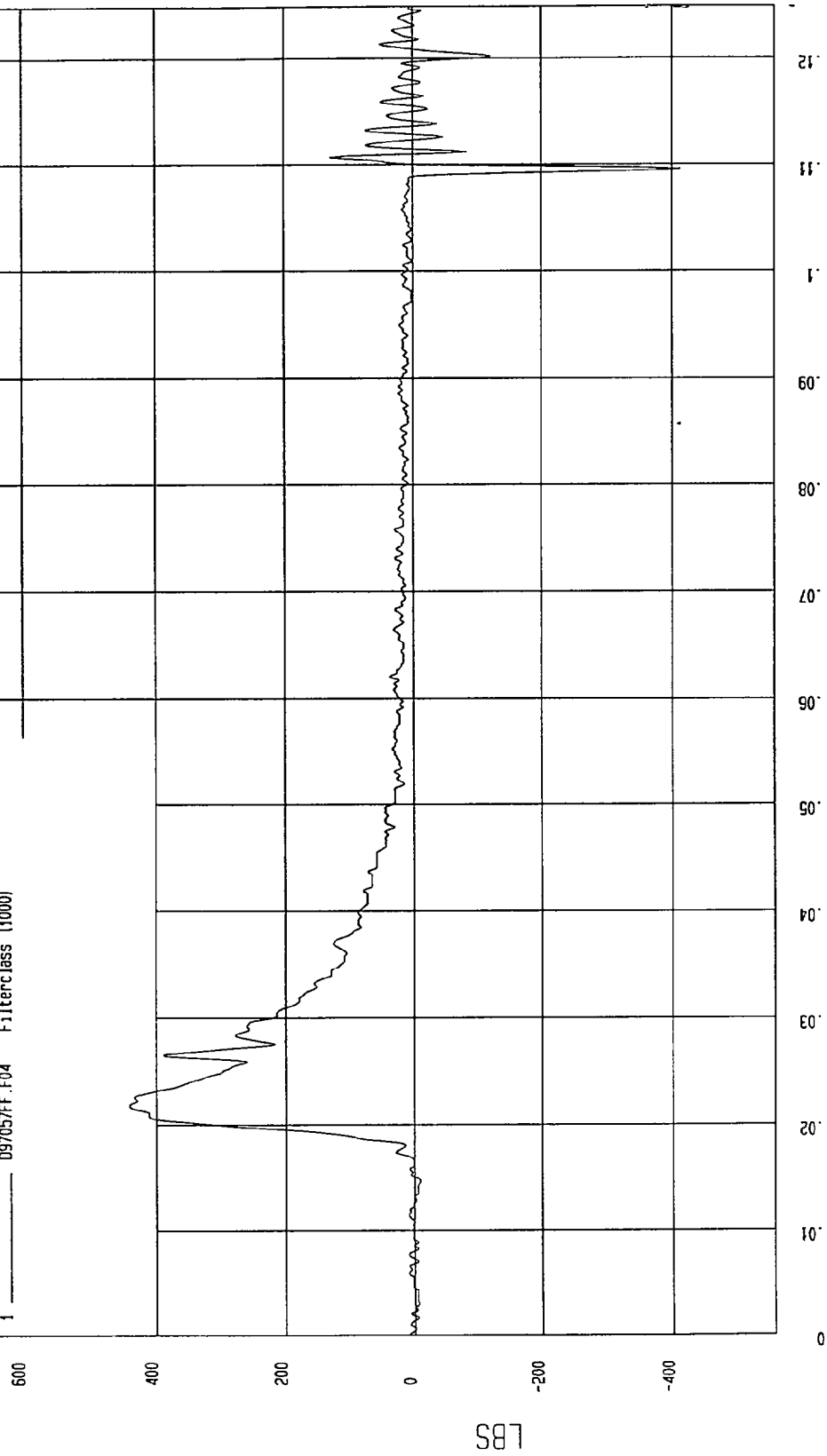
TEST: DUMMY CALIBRATION - DAMPENER BENCH TEST TEST DATE: 06-13-1997 - 14:12

COMPONENT: DUMMY # 271 Velocity: 14 FT/SEC 4.27 M/SEC

Minimum = -412.86 LBS at 109. msec Maximum = 439.78 LBS at 21.8 msec

PEAK FORCE

1 ——— 097057FF.F04 Filterclass (1000)



HGA Research
06-13-1997 14:36

TEST: DUMMY CALIBRATION - DAMPENER BENCH TEST TEST DATE: 06-13-1997 - 14:12

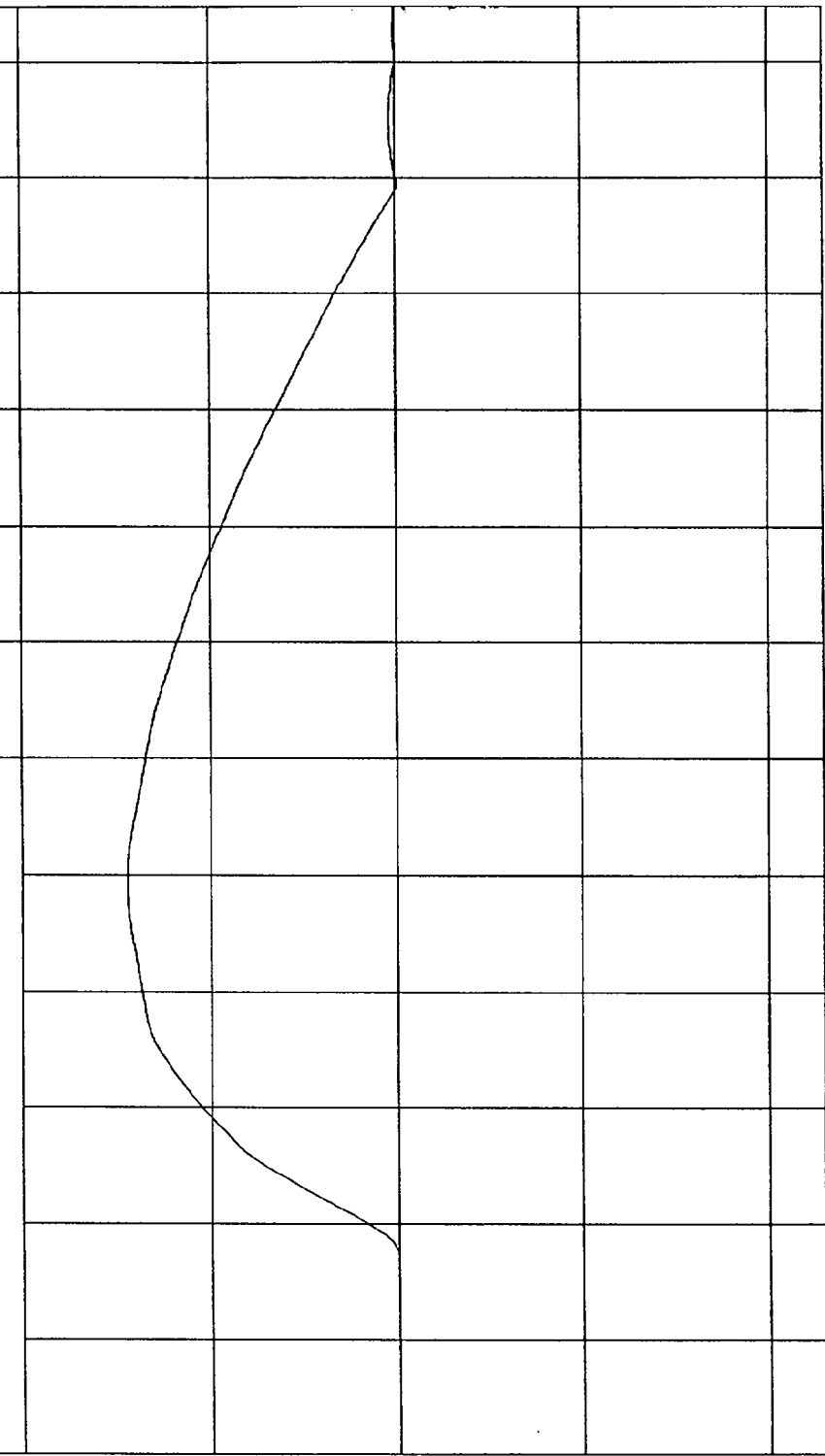
COMPONENT: DUMMY # 271 Velocity: 14 FT/SEC 4.27 M/SEC

Minimum = -1.19E-02 IN at 109. msec Maximum = 1.44 IN at 48.9 msec

PEAK DISPLACEMENT

1 _____ D970570F.005 Filterclass (1000)

2
1
0
-1
-2



12

11

10

09

08

07

06

05

04

03

02

01

0

TIME (SECONDS)

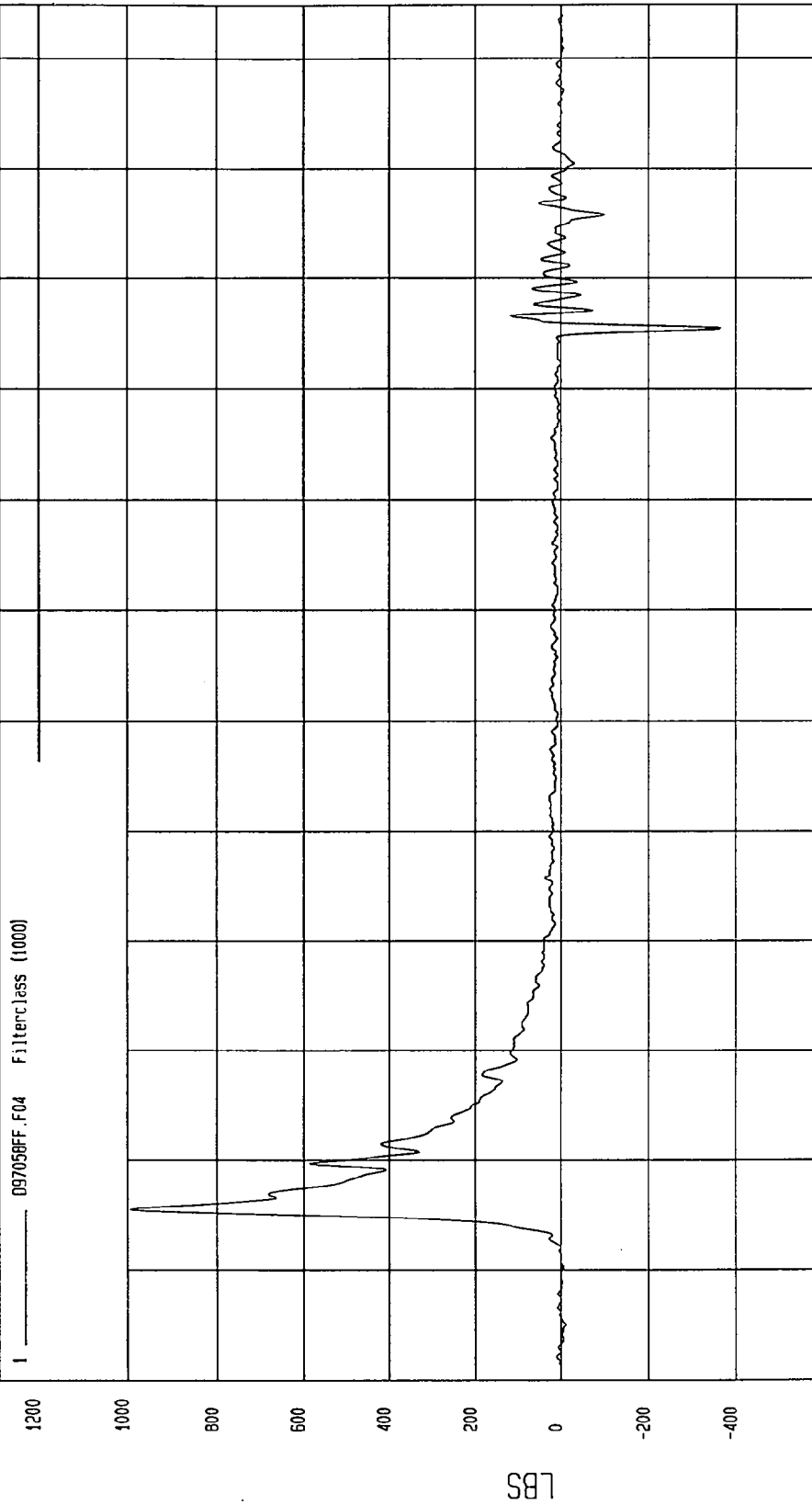
NSA Research
06-13-1997 14:36

TEST: DUMMY CALIBRATION - DAMPENER BENCH TEST TEST DATE: 06-13-1997 - 14:17

COMPONENT: DUMMY # 271 Velocity: 20 FT/SEC 6.1 M/SEC

Minimum = -365.20 LBS at 95.4 msec Maximum = 995.11 LBS at 15.6 msec

PEAK FORCE



TIME (SECONDS)

NSA Research
06-13-1997 14:36

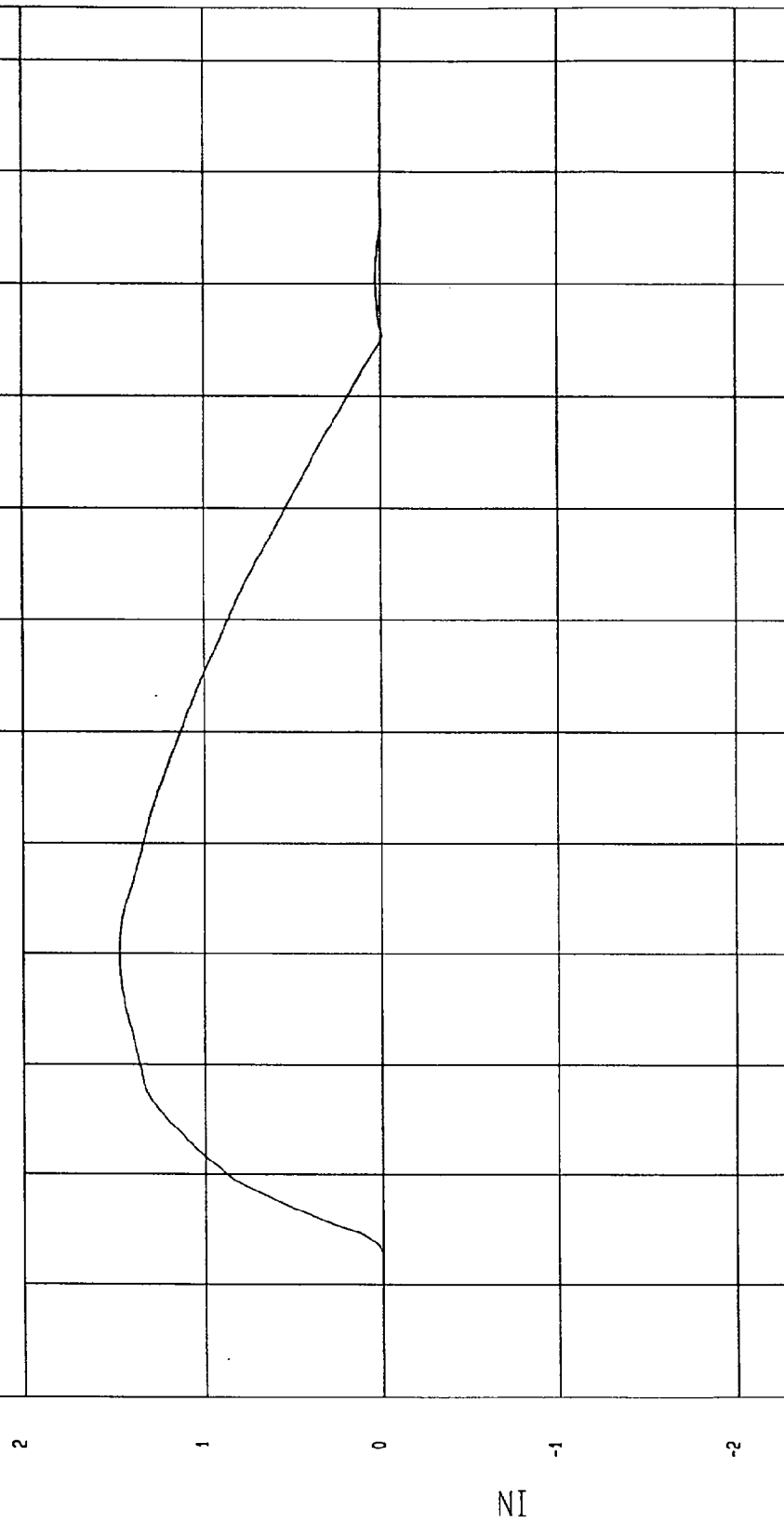
TEST: DUMMY CALIBRATION - DAMPENER BENCH TESTTEST DATE: 06-13-1997 - 14:17

COMPONENT: DUMMY # 271 Velocity: 20 FT/SEC 6.1 M/SEC

Minimum = -9.85E-03 IN at 95.3 msec Maximum = 1.47 IN at 39.6 msec

PEAK DISPLACEMENT

1 — 0970580F.005 Filterclass (1000)



TIME (SECONDS)

MCA Research
06-13-1997 14:37

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: June 24, 1997

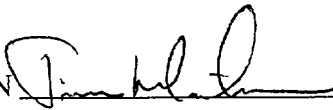
DUMMY NUMBER: 271

TEST NUMBER: D97EM2

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	60%
PROBE SPEED	13.8 - 14.2 fps	14.0
UPPER RIB	37 - 46 g's	44
LOWER RIB	37 - 46 g's	44
LOWER SPINE	15 - 22 g's	21

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY



TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 06-24-1997 - 13:23

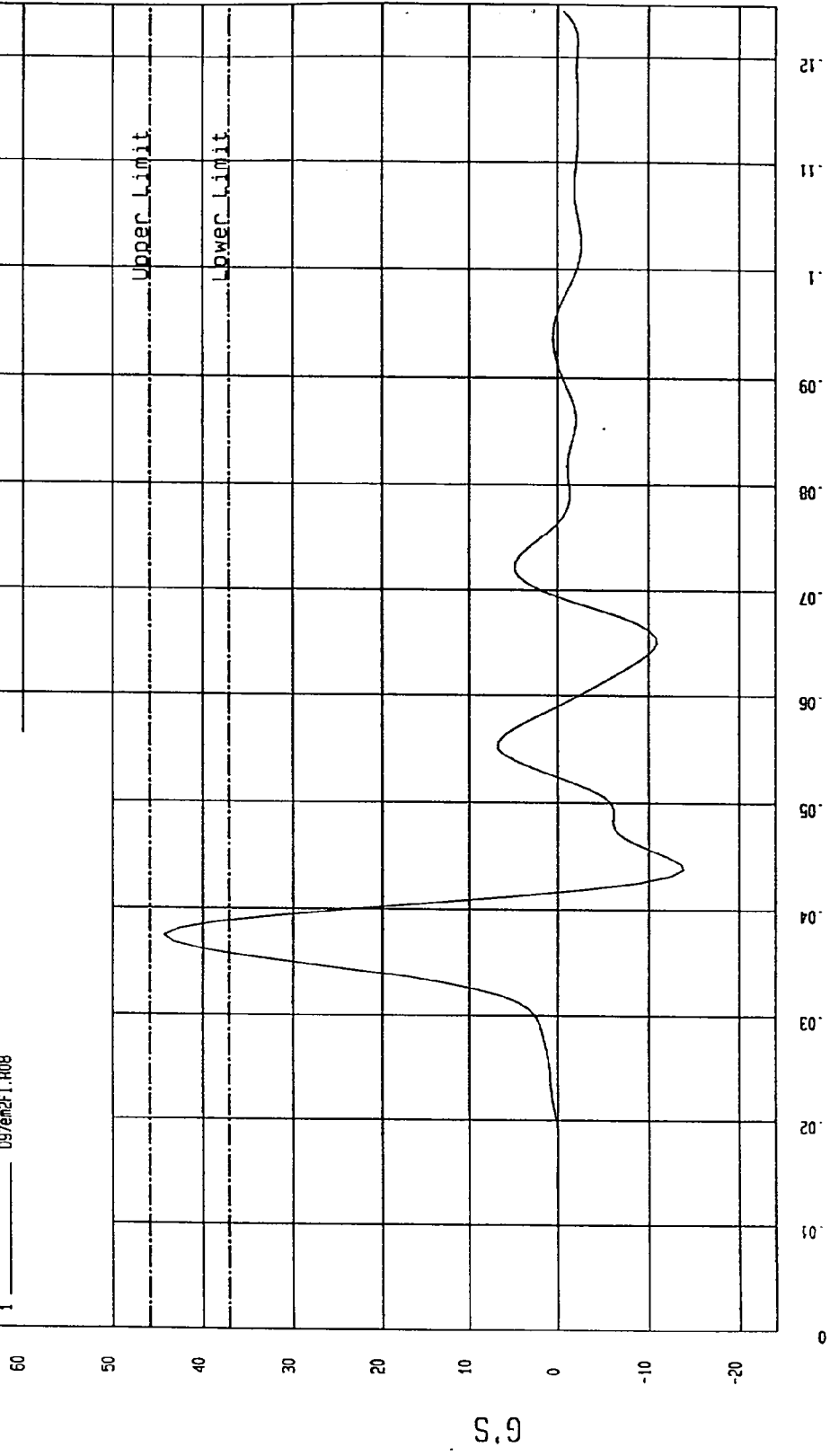
COMPONENT: DUMMY # 271 Velocity: 14.024 FT/SEC 4.27 M/SEC

Minimum = -13.90 G'S at 43.7 msec

Maximum = 44.40 G'S at 37.5 msec

UPPER RIB ACCELERATION

1 097en2FI.R08



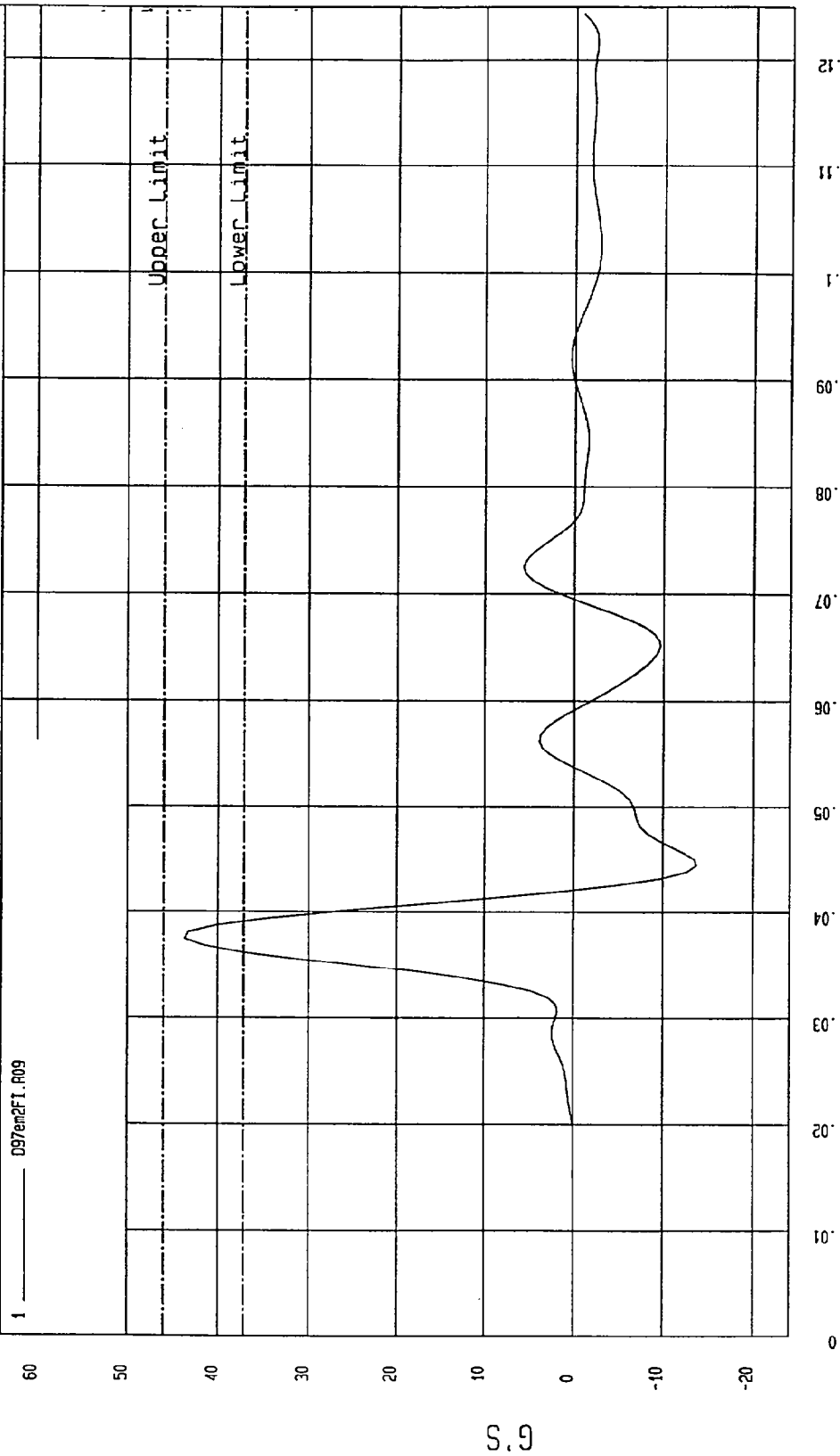
MGA Research
06-24-1997 13:26

TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 06-24-1997 - 13:23

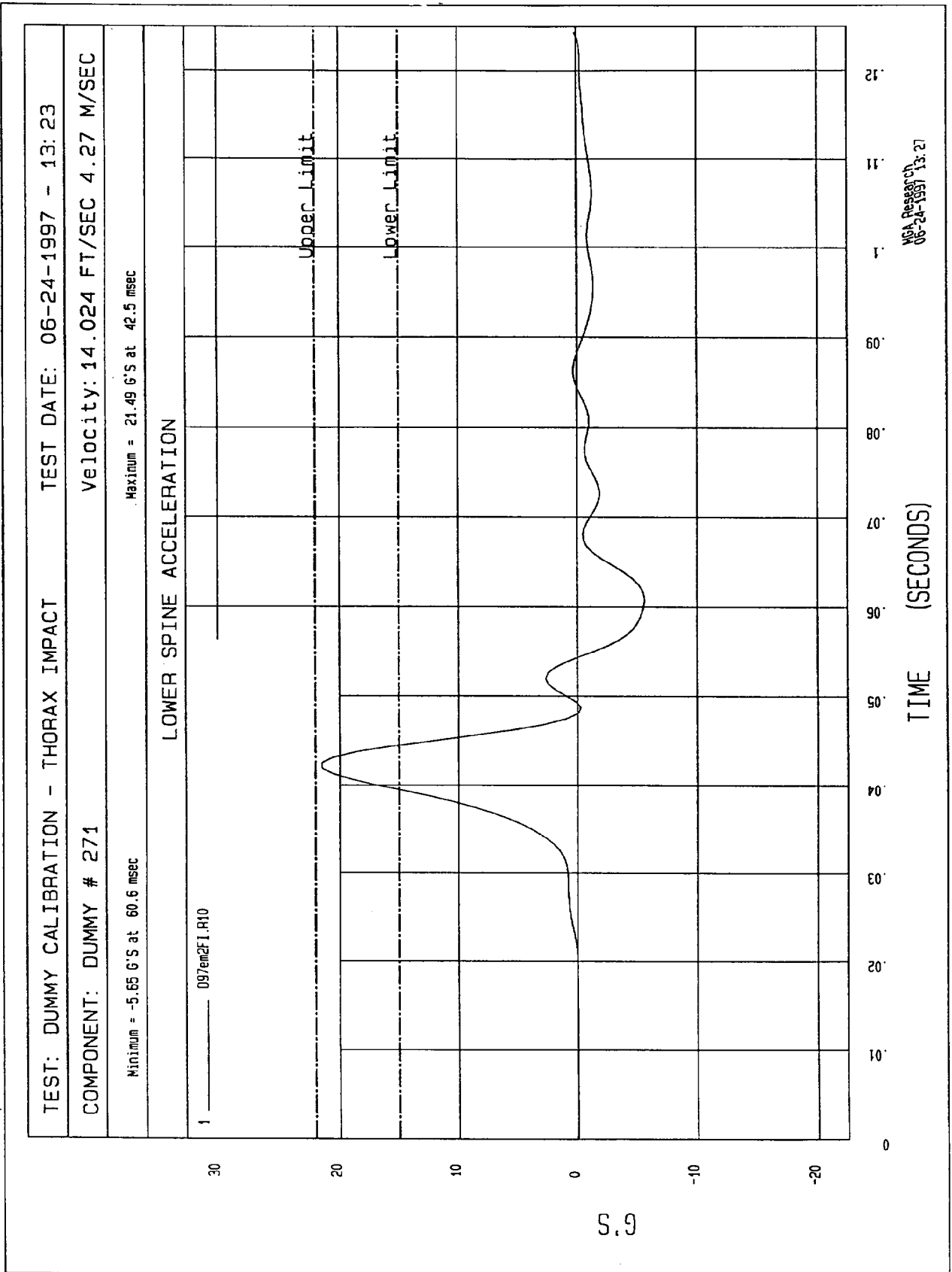
COMPONENT: DUMMY # 271 Velocity: 14.024 FT/SEC 4.27 M/SEC

Minimum = -13.56 G'S at 44.3 msec Maximum = 43.75 G'S at 37.5 msec

LOWER RIB ACCELERATION



HGA Research
06-24-1997 13:27



MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: June 17, 1996

DUMMY NUMBER: 271

TEST NUMBER: D97053

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	32%
PROBE SPEED	13.8 - 14.2 f/s	13.9
PELVIS ACCELERATION	40 - 60 g's	51

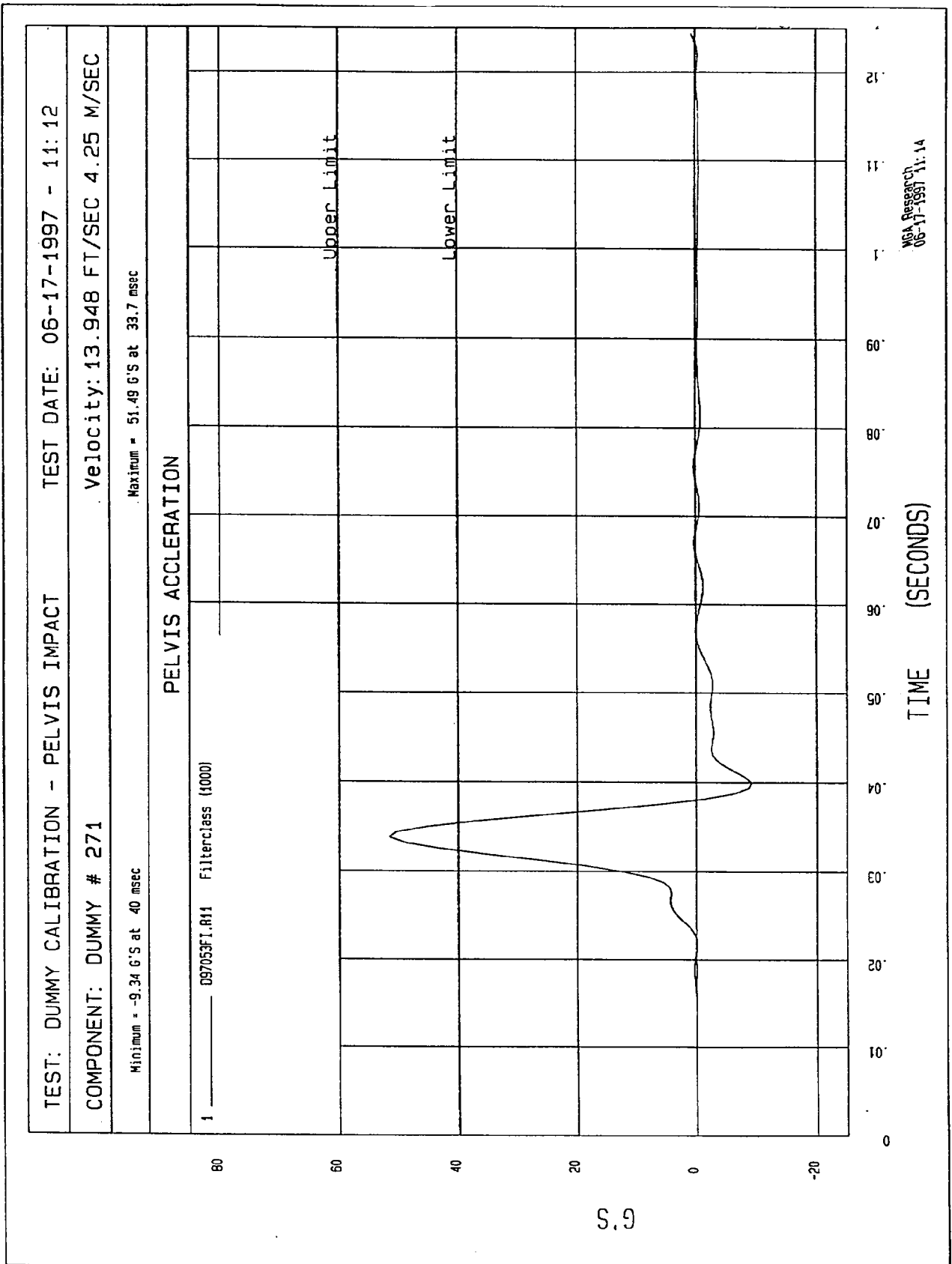
TEST MEETS SPECIFICATIONS

TECHNICIAN

Tim M. D.

APPROVED BY

Paul K. K.



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

DATE: March 3, 1997

DUMMY NUMBER: 271

TEST NUMBER: D97054

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	20%
FORCE @ 0.5 in	23.3 - 36.5 lbs	32.3
FORCE @ 0.75 in	36.7 - 49.8 lbs	43.8
FORCE @ 1.0 in	50 - 63 lbs	57
FORCE @ 1.3 in	73 - 88 lbs	75

TEST MEETS SPECIFICATIONS

TECHNICIAN

Tim W. L.

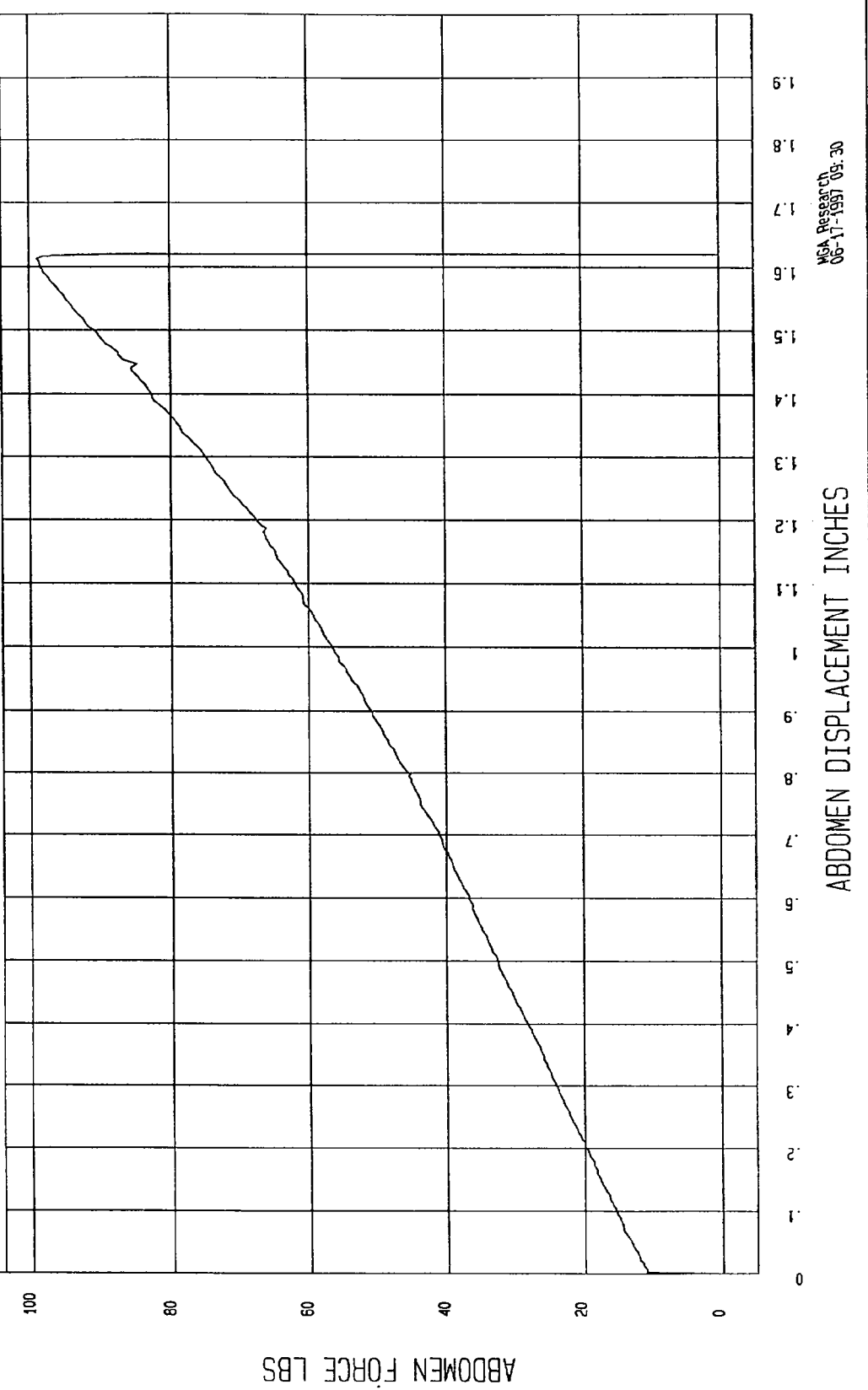
APPROVED BY

Paul K. K.

TEST: DUMMY CALIBRATION - ABDOMEN COMPRESSION TEST DATE: 03-03-1997 - 11:21

COMPONENT: DUMMY # 271

ABDOMEN FORCE as a function of ABDOMEN DISPLACEMENT



NSA Research
06-17-1997 09:30

MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: February 28, 1997

DUMMY NUMBER: 271

TEST NUMBER: D97055

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	20%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	25
FORCE @ 30°	34 - 46 lbs	42
FORCE @ 40°	46 - 58 lbs	52
RETURN ANGLE	12° maximum	5°

TEST MEETS SPECIFICATIONS

TECHNICIAN

Jim W. L.

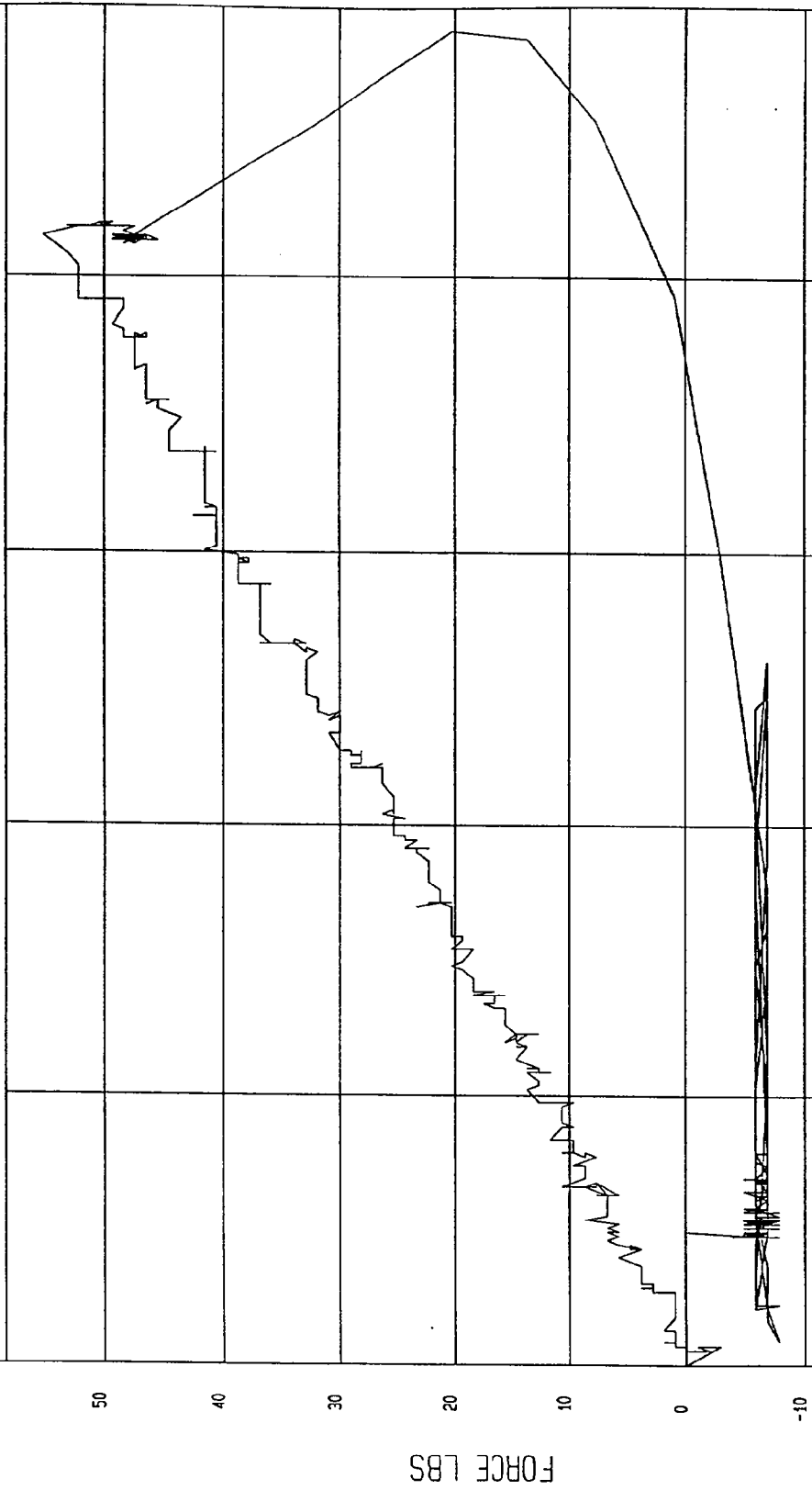
APPROVED BY

Rene Kabeke

TEST: DUMMY CALIBRATION - LUMBAR FLEXION TEST DATE: 02-28-1997 - 16:14

COMPONENT: DUMMY # 271

FORCE as a function of TORSO ROTATION



MSA Research
06-17-1997 09:29

POST-TEST CERTIFICATION DATA

Front Dummy Serial Number: 272

Calibration Test Results Summary

Dummy Serial Number: 272

Post-Test Calibration

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

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 272

DATE OF VERIFICATION: July 22, 1997

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.2
RH - Rib Height	19.75" - 20.50"	20.20
HP - Hip Pivot Height	3.9" ref.	3.9
RD - Rib From Back Line	9.0" to 9.5"	9.4
KV - Knee Pivot From Back Line	20.1" - 20.7"	20.7
SW - Knee Pivot to Floor	19.3" - 19.9"	19.6
HW - Hip Width	14.0" - 15.4"	15.0

MEASUREMENTS BY: J. M. O.

APPROVED BY: Steve Kraboske

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: July 22, 1997

DUMMY NUMBER: 272

TEST NUMBER: D971232

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	52%
PROBE SPEED	13.8 - 14.2 fps	14.0
UPPER RIB	37 - 46 g's	45
LOWER RIB	37 - 46 g's	45
LOWER SPINE	15 - 22 g's	19

TEST MEETS SPECIFICATIONS

TECHNICIAN

Tim M. L.

APPROVED BY

Dave K. K.

TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 07-22-1997 - 09:37

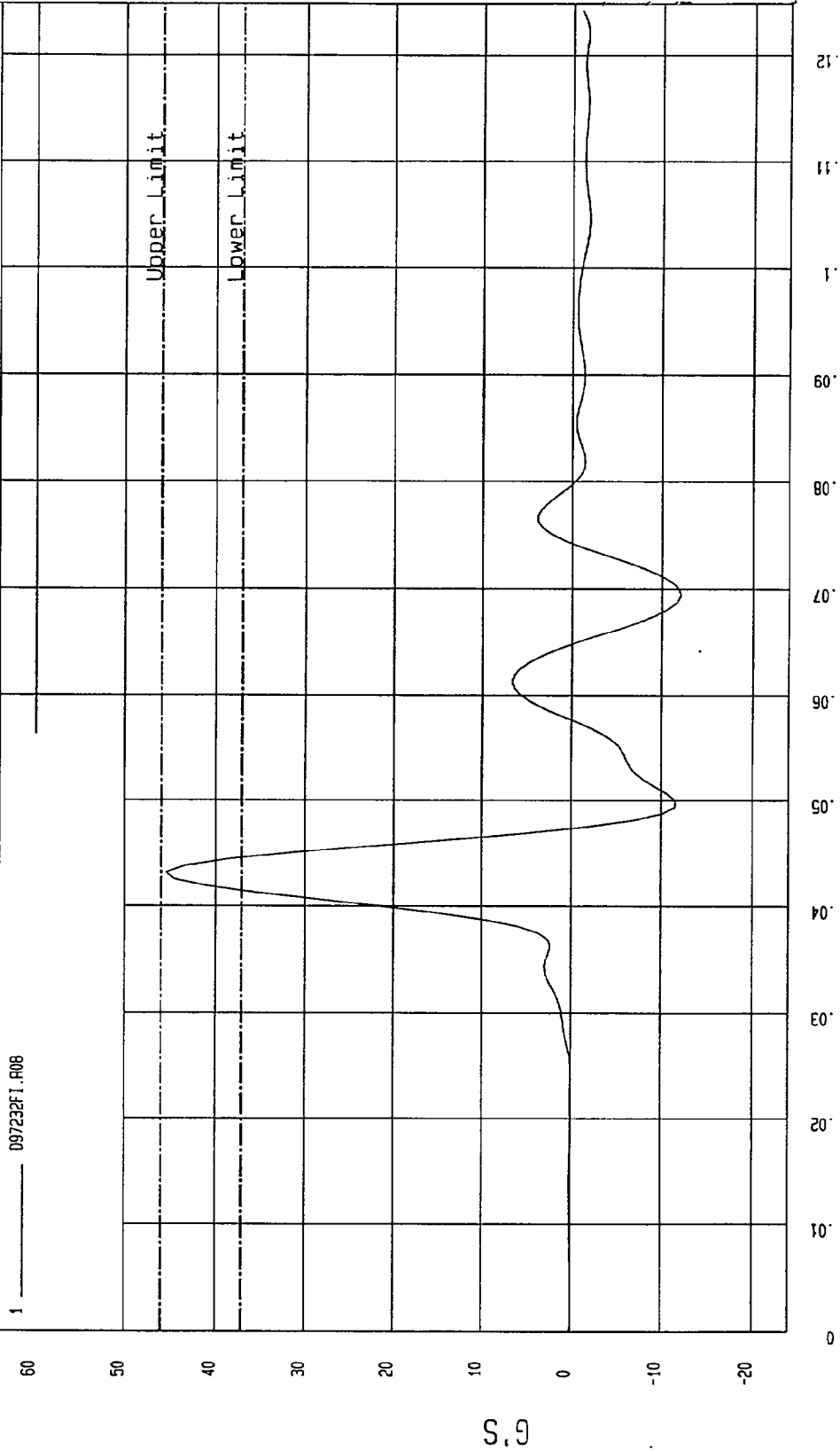
COMPONENT: DUMMY # 272

Velocity: 13.96 FT/SEC 4.26 M/SEC

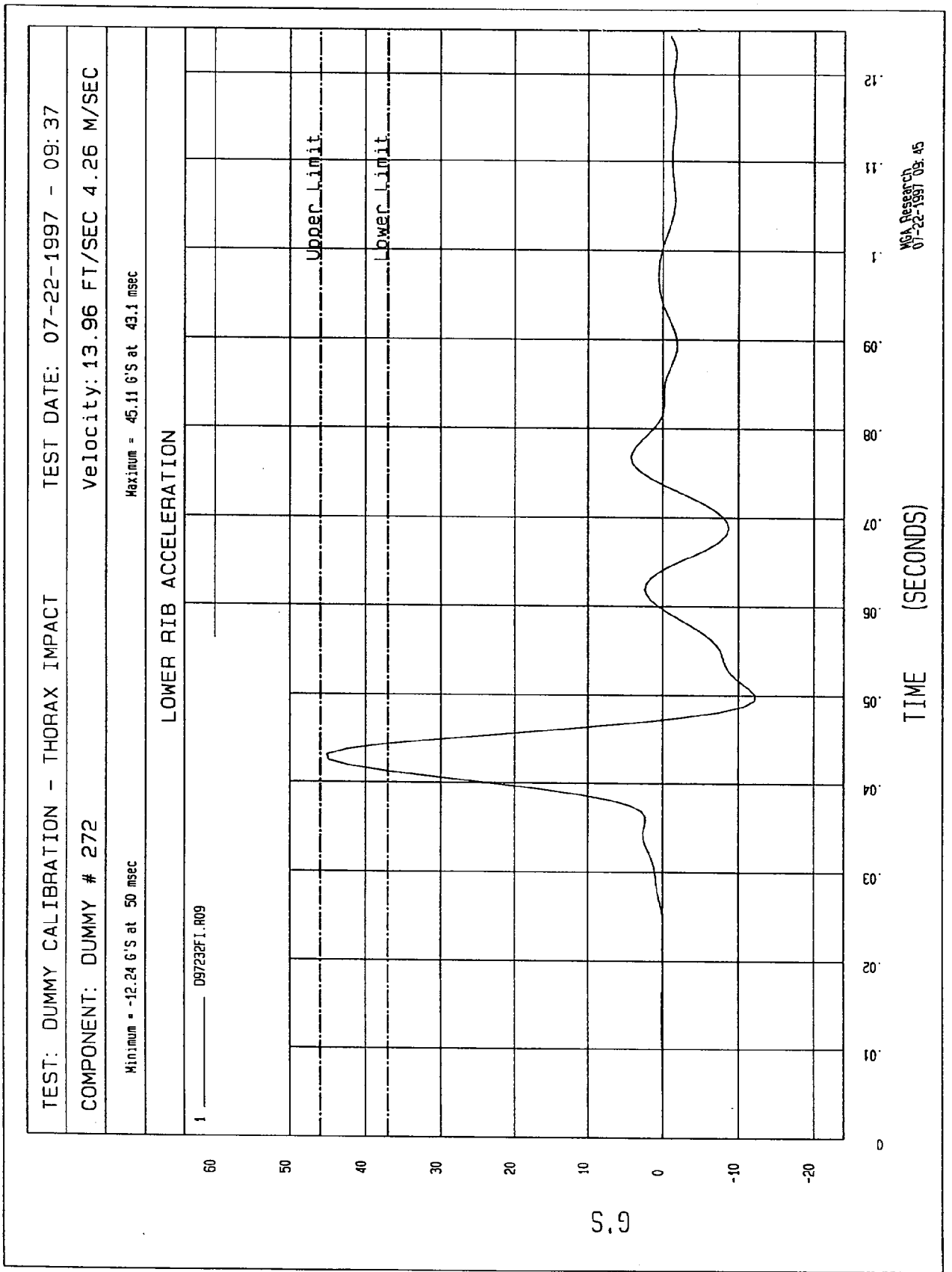
Minimum = -12.10 G'S at 69.3 msec

Maximum = 45.47 G'S at 43.1 msec

UPPER RIB ACCELERATION



NSA Research
07-22-1997 09:45



TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 07-22-1997 - 09: 37

COMPONENT: DUMMY # 272 Velocity: 13.96 FT/SEC 4.26 M/SEC

Minimum = -6.03 G'S at 65 msec Maximum = 19.11 G'S at 47.5 msec

LOWER SPINE ACCELERATION

1 _____ 097232F1.010

30

20

10

0

-10

-20

G.S.

Upper Limit

Lower Limit

.12

.11

.1

.09

.08

.07

.06

.05

.04

.03

.02

.01

0

TIME (SECONDS)

MGA Research
07-22-1997 09: 45

MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: July 22, 1997

DUMMY NUMBER: 272

TEST NUMBER: D971233

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	52%
PROBE SPEED	13.8 - 14.2 f/s	14.0
PELVIS ACCELERATION	40 - 60 g's	55

TEST MEETS SPECIFICATIONS

TECHNICIAN

Jim Wilk

APPROVED BY

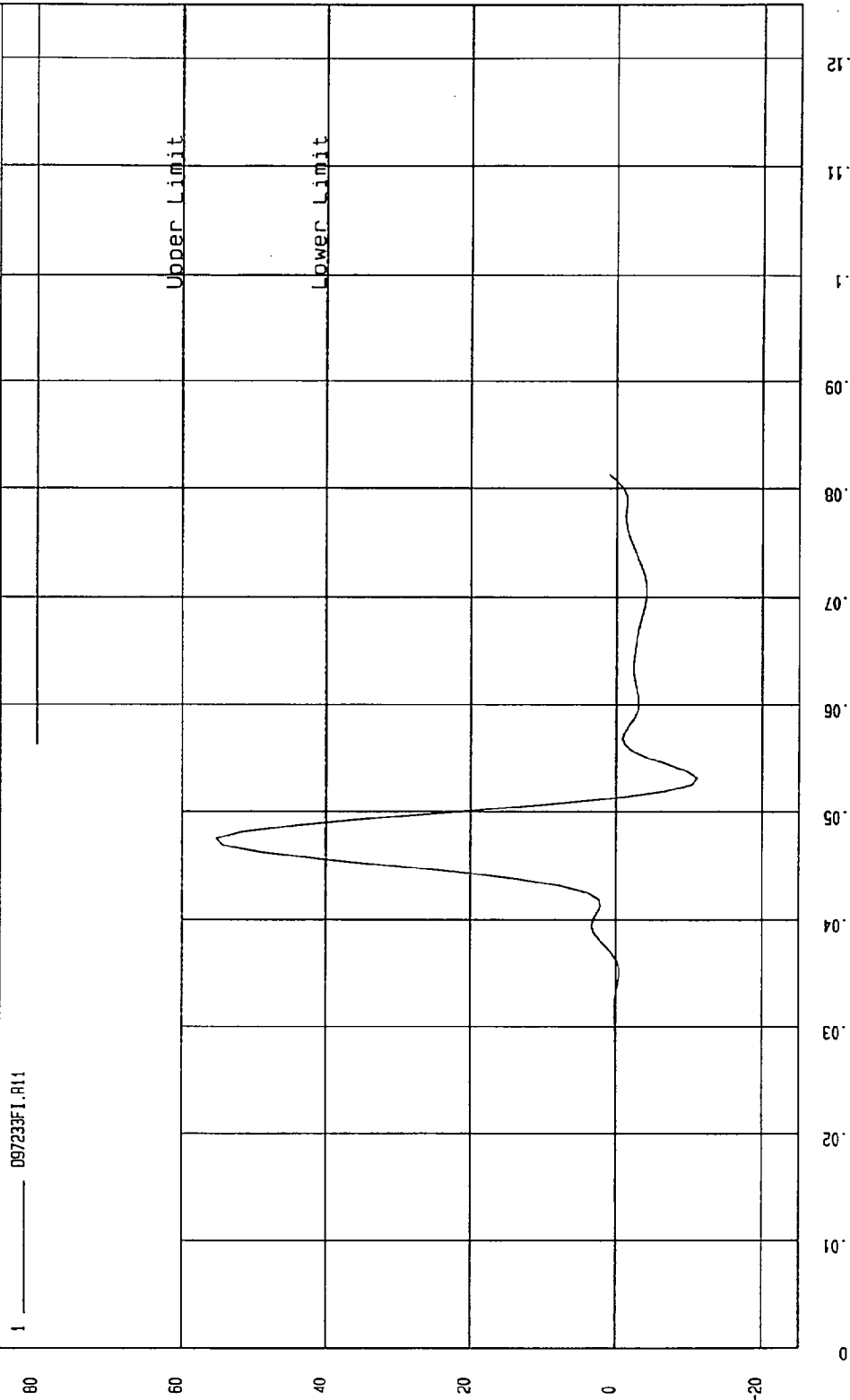
Raul Kalsche

TEST: DUMMY CALIBRATION - PELVIS IMPACT TEST DATE: 07-22-1997 - 09:43:09

COMPONENT: DUMMY # 272 Velocity: 14.013 FT/SEC 4.27 M/SEC

Minimum = -11.16 G'S at 53.1 msec Maximum = 55.16 G'S at 47.5 msec

PELVIS ACCELERATION



NSA Research
07-22-1997 09:45

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

DATE: July 22, 1997

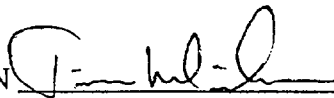
DUMMY NUMBER: 272

TEST NUMBER: D971234

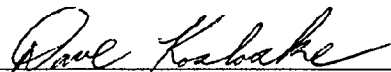
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	52%
FORCE @ 0.5 in	23.3 - 36.5 lbs	32.1
FORCE @ 0.75 in	36.7 - 49.8 lbs	43.5
FORCE @ 1.0 in	50 - 63 lbs	57
FORCE @ 1.3 in	73 - 88 lbs	78

TEST MEETS SPECIFICATIONS

TECHNICIAN



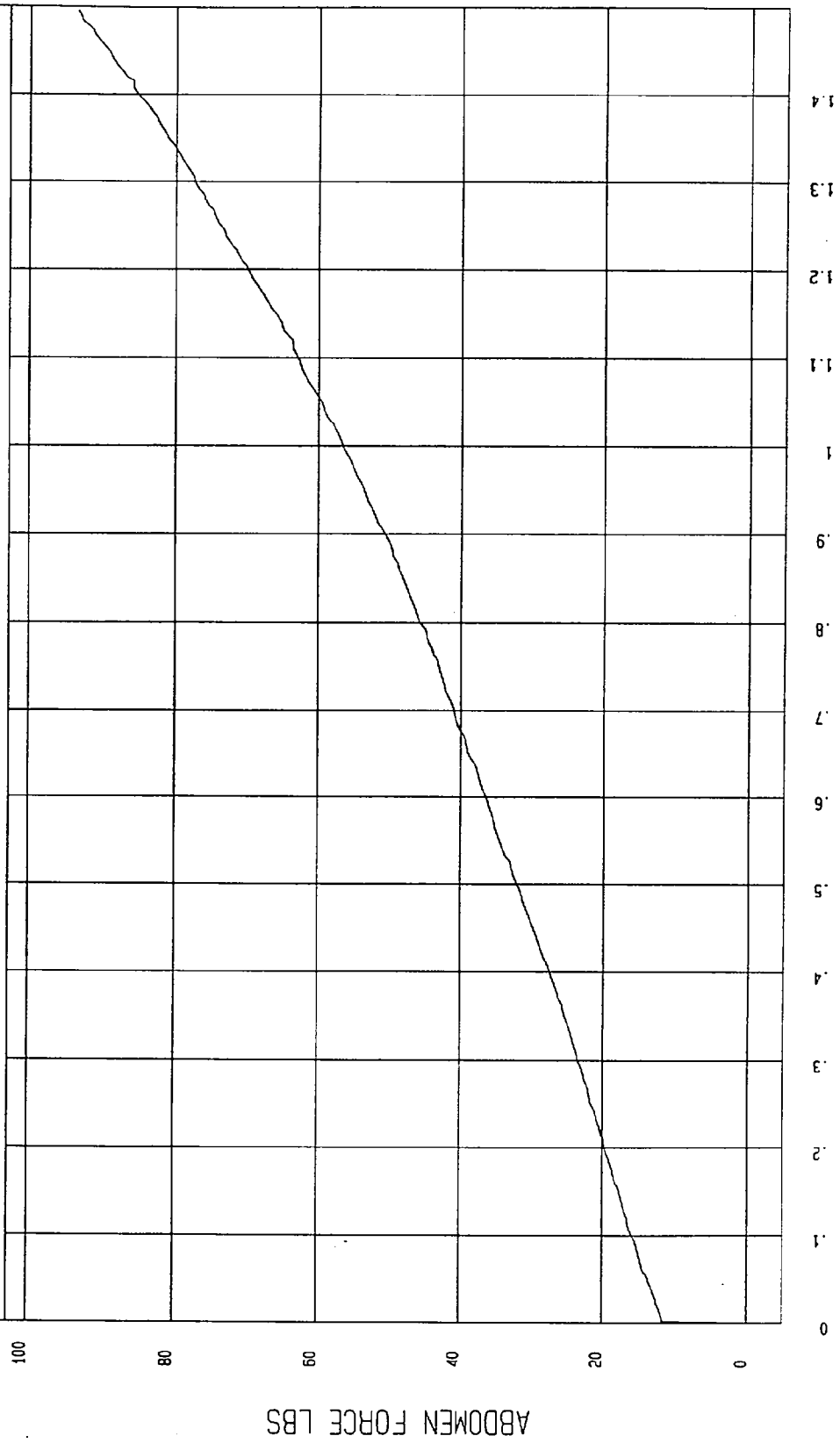
APPROVED BY



TEST: DUMMY CALIBRATION - ABDOMEN COMPRESSION TEST DATE: 07-22-1997 - 13:19

COMPONENT: DUMMY # 272

ABDOMEN FORCE as a function of ABDOMEN DISPLACEMENT



MGA Research
07-22-1997 13:27

ABDOMEN DISPLACEMENT INCHES

ABDOMEN FORCE LBS

MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

DATE: July 22, 1997

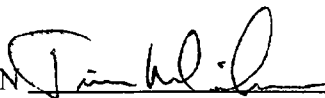
DUMMY NUMBER: 272

TEST NUMBER: D971235

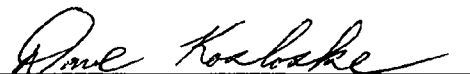
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	52%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	24
FORCE @ 30°	34 - 46 lbs	37
FORCE @ 40°	46 - 58 lbs	54
RETURN ANGLE	12° maximum	6°

TEST MEETS SPECIFICATIONS

TECHNICIAN



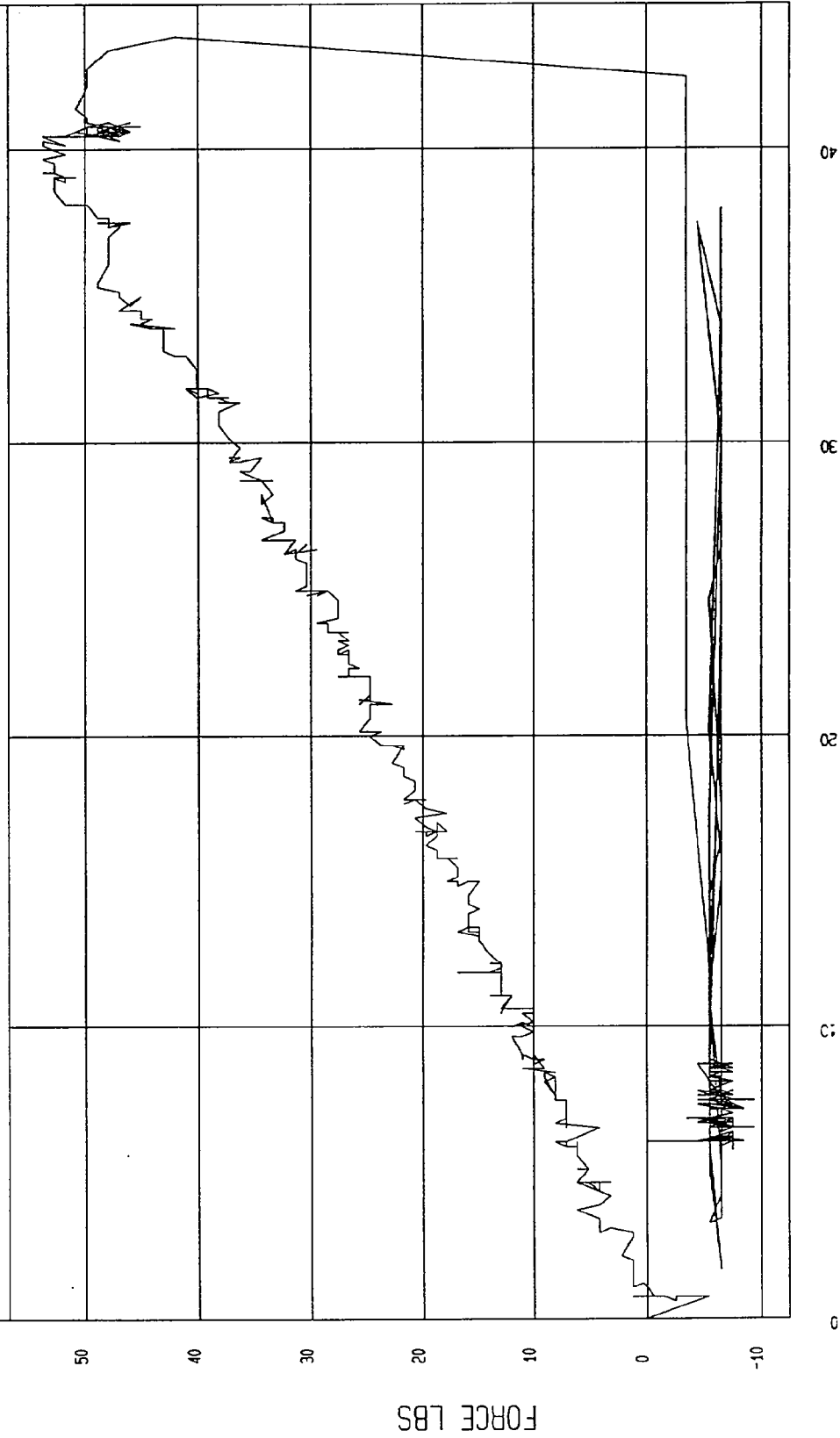
APPROVED BY



TEST: DUMMY CALIBRATION - LUMBAR FLEXION TEST DATE: 07-22-1997 - 13:08

COMPONENT: DUMMY # 272

FORCE as a function of TORSO ROTATION



WGA Research
07-22-1997 13:28

POST-TEST CERTIFICATION DATA

Rear Dummy Serial Number: 271

Calibration Test Results Summary

Dummy Serial Number: 271

Post-Test Calibration

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

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 271

DATE OF VERIFICATION: July 22, 1997

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height	35.0" - 35.8"	35.6
RH - Rib Height	19.75" - 20.50"	20.40
HP - Hip Pivot Height	3.9" ref.	3.9
RD - Rib From Back Line	9.0" to 9.5"	9.4
KV - Knee Pivot From Back Line	20.1" - 20.7"	20.4
SW - Knee Pivot to Floor	19.3" - 19.9"	19.5
HW - Hip Width	14.0" - 15.4"	15.1

MEASUREMENTS BY: Jim Walsh

APPROVED BY: Paul Kosloske

MGA RESEARCH CORPORATION

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: July 22, 1997

DUMMY NUMBER: 271

TEST NUMBER: D971222

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	52%
PROBE SPEED	13.8 - 14.2 fps	14.0
UPPER RIB	37 - 46 g's	43
LOWER RIB	37 - 46 g's	44
LOWER SPINE	15 - 22 g's	22

TEST MEETS SPECIFICATIONS

TECHNICIAN

Jim Hill

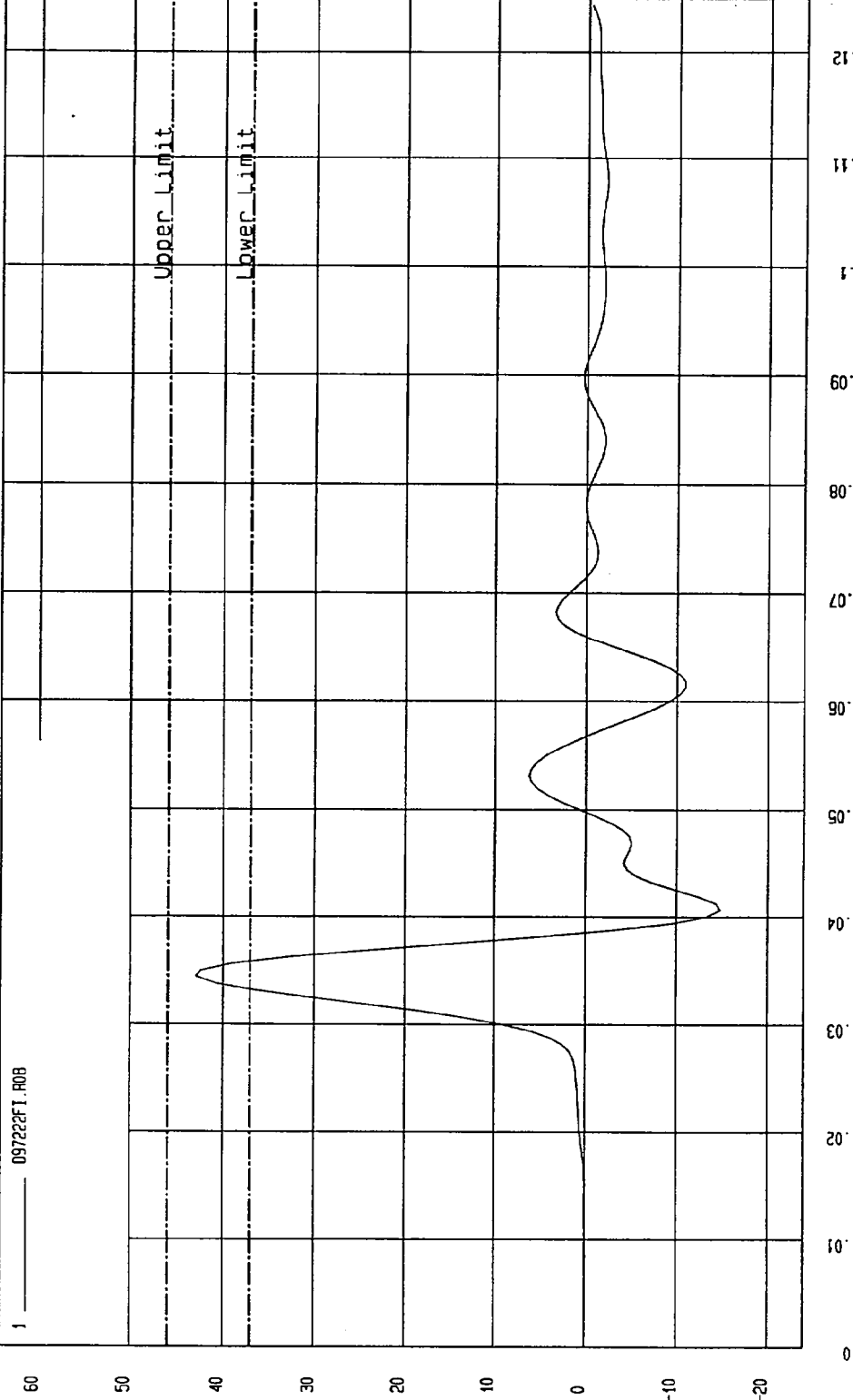
APPROVED BY

Dave Kibake

TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 07-22-1997 - 09:14
COMPONENT: DUMMY # 271 Velocity: 14.013 FT/SEC 4.27 M/SEC

Minimum = -14.81 G'S at 40.6 msec Maximum = 43.00 G'S at 34.3 msec

UPPER RIB ACCELERATION



NSA Research
07-22-1997 09:18

TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 07-22-1997 - 09:14

COMPONENT: DUMMY # 271 Velocity: 14.013 FT/SEC 4.27 M/SEC

Minimum = -15.01 G'S at 41.2 msec

Maximum = 43.92 G'S at 35 msec

LOWER RIB ACCELERATION

1 _____ 097222FT R09

60

50

40

30

20

10

0

-10

-20

G.S

Upper Limit

Lower Limit

.12

.11

.1

.09

.08

.07

.06

.05

.04

.03

.02

.01

0

TIME (SECONDS)

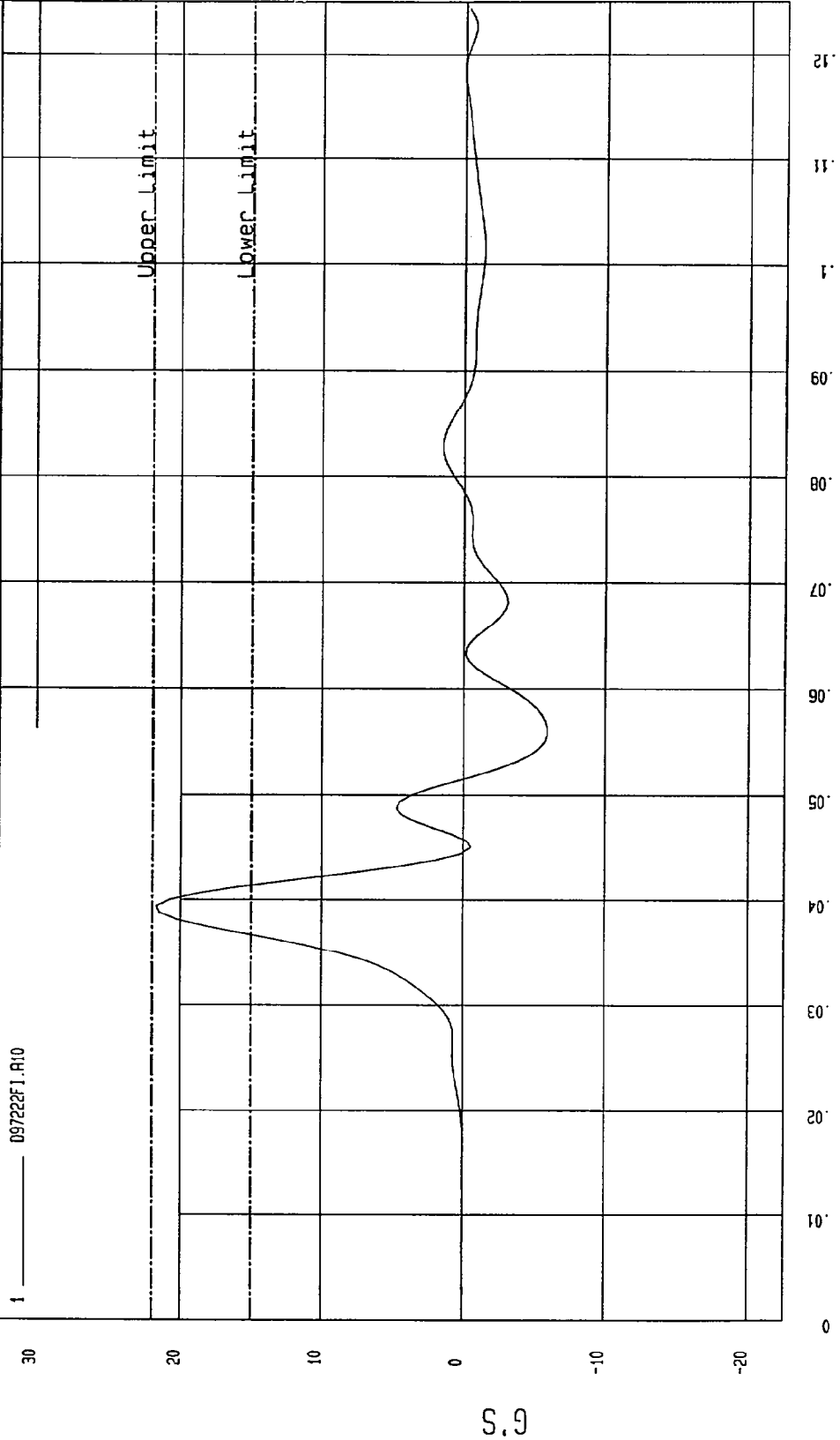
MCA Research
07-22-1997 09:19

TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 07-22-1997 - 9:14

COMPONENT: DUMMY # 271 Velocity: 14.013 FT/SEC 4.27 M/SEC

Minimum = -5.97 G'S at 56.2 msec

Maximum = 21.72 G'S at 39.3 msec



MSA Research
07-22-1997 13:33

MGA RESEARCH CORPORATION

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: July 22, 1997

DUMMY NUMBER: 271

TEST NUMBER: D971223

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	52%
PROBE SPEED	13.8 - 14.2 f/s	14.0
PELVIS ACCELERATION	40 - 60 g's	55

TEST MEETS SPECIFICATIONS

TECHNICIAN Jimmiel D.

APPROVED BY Paul Kozlowski

TEST: DUMMY CALIBRATION - PELVIS IMPACT TEST DATE: 07-22-1997 - 09:21:24

COMPONENT: DUMMY # 271 Velocity: 14.021 FT/SEC 4.27 M/SEC

Minimum = -10.58 G's at 49.3 msec

Maximum = 54.50 G's at 43.7 msec

PELVIS ACCELERATION

1 _____ 097223F1.R11

80

60

40

20

0

-20

G

Upper Limit

Lower Limit

0.12

0.11

0.1

0.09

0.08

0.07

0.06

0.05

0.04

0.03

0.02

0.01

0

TIME (SECONDS)

NSA Research
07-22-1997 09:21

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

DATE: July 22, 1997

DUMMY NUMBER: 271

TEST NUMBER: D971224

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	52%
FORCE @ 0.5 in	23.3 - 36.5 lbs	31.6
FORCE @ 0.75 in	36.7 - 49.8 lbs	43.3
FORCE @ 1.0 in	50 - 63 lbs	56
FORCE @ 1.3 in	73 - 88 lbs	75

TEST MEETS SPECIFICATIONS

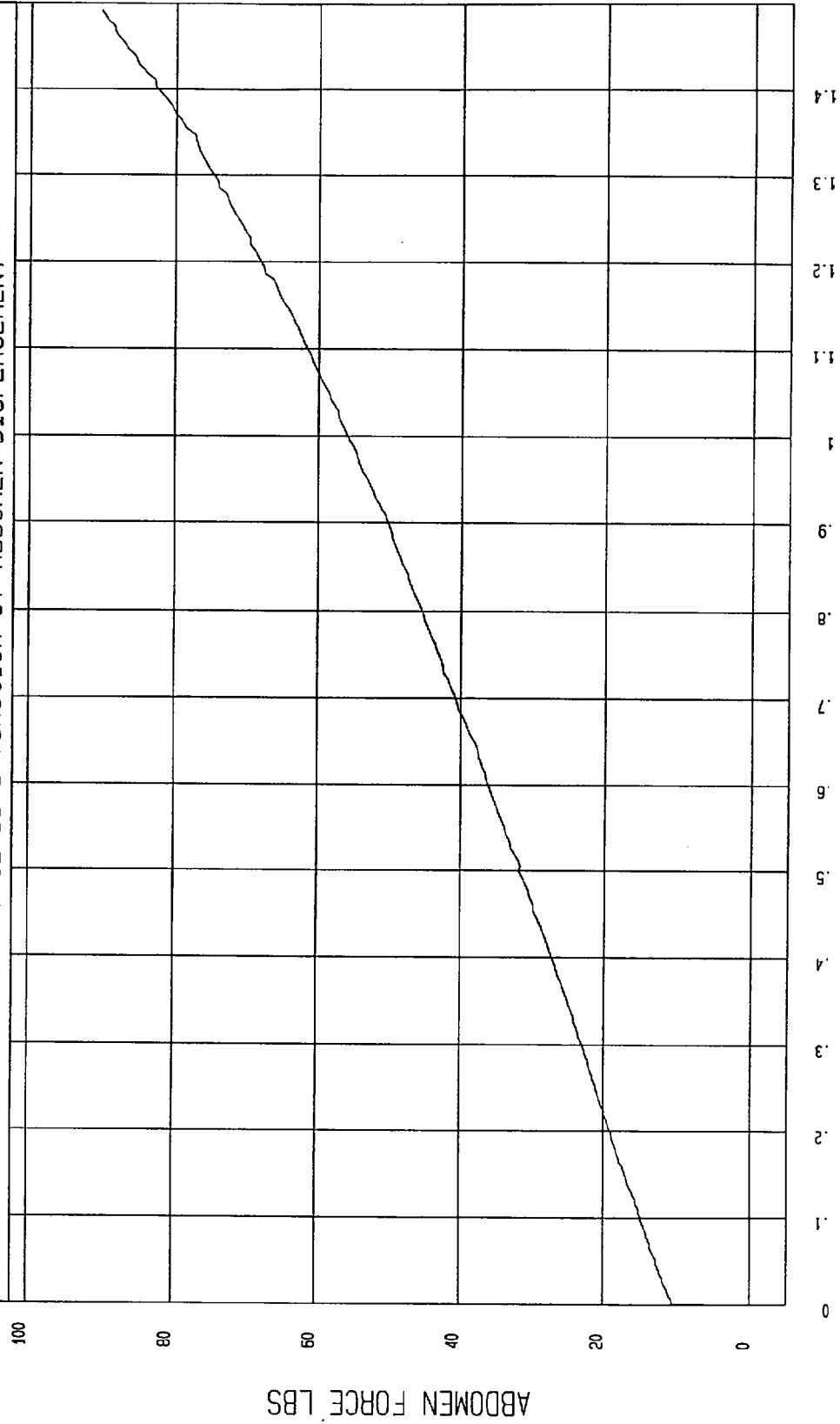
TECHNICIAN Tim W. L.

APPROVED BY Dave Kubecke

TEST: DUMMY CALIBRATION - ABDOMEN COMPRESSION TEST DATE: 07-22-1997 - 13:23

COMPONENT: DUMMY # 271

ABDOMEN FORCE as a function of ABDOMEN DISPLACEMENT



NSA Research
07-22-1997 13:27

MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

SIDE IMPACT DUMMY (SID)

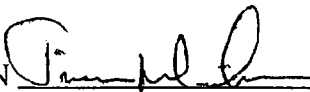
DATE: July 22, 1997

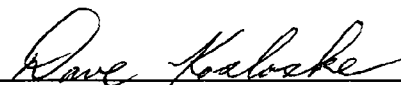
DUMMY NUMBER: 271

TEST NUMBER: D971225

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	66 - 78° F	70°
RELATIVE HUMIDITY	10 - 70%	52%
FORCE @ 0°	0 - 6 lbs	0
FORCE @ 20°	22 - 34 lbs	29
FORCE @ 30°	34 - 46 lbs	39
FORCE @ 40°	46 - 58 lbs	50
RETURN ANGLE	12° maximum	3°

TEST MEETS SPECIFICATIONS

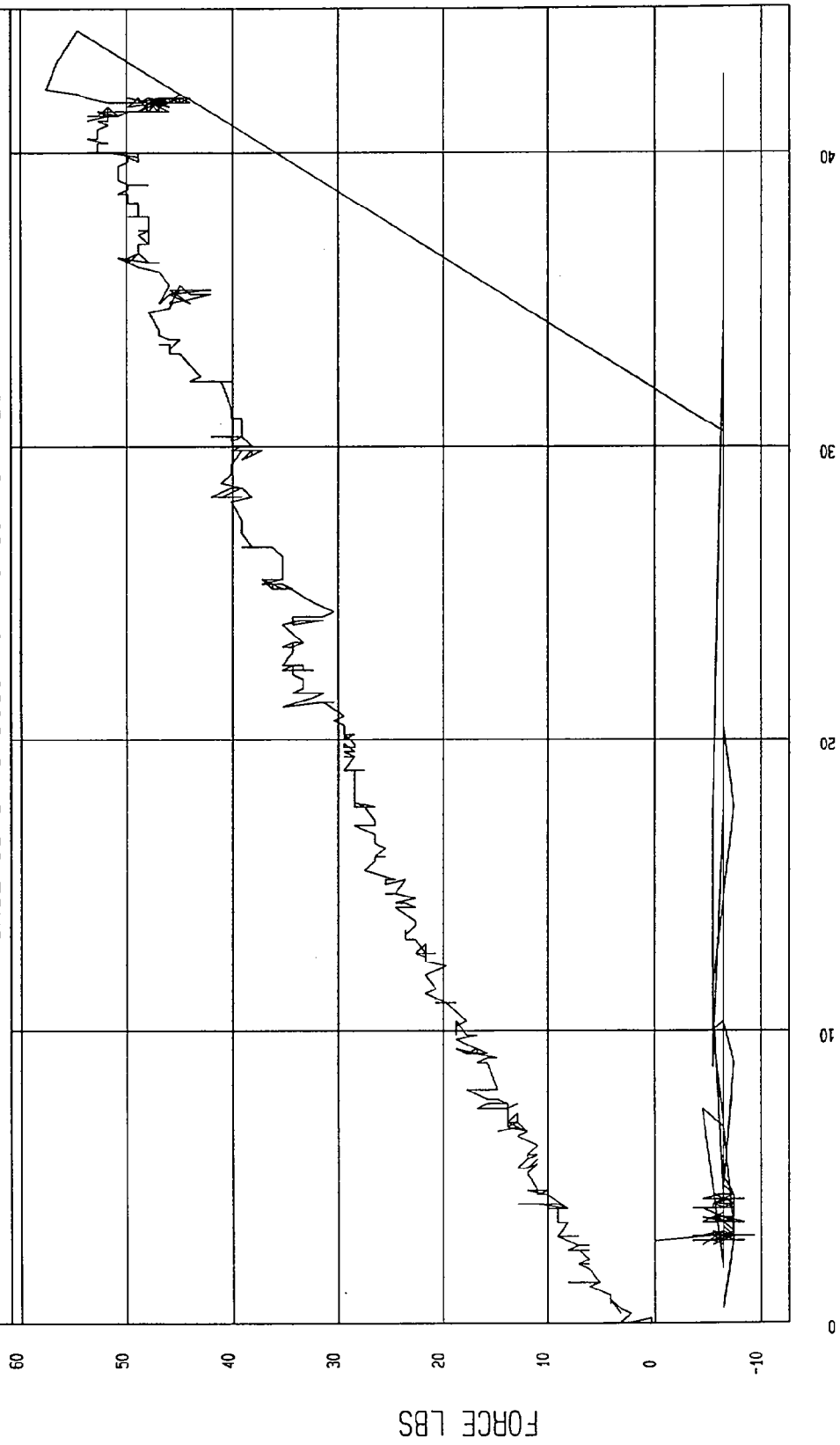
TECHNICIAN 

APPROVED BY 

TEST: DUMMY CALIBRATION - LUMBAR FLEXION TEST DATE: 07-22-1997 - 12:57

COMPONENT: DUMMY # 271

FORCE as a function of TORSO ROTATION



MGA Research
07-22-1997 13:28

POST-TEST DRIVER DUMMY INSPECTION CHECKLIST

Type: Side Impact Dummy

Serial Number: 272

Inspected By: Tim Michnay

Date: July 22, 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: 271

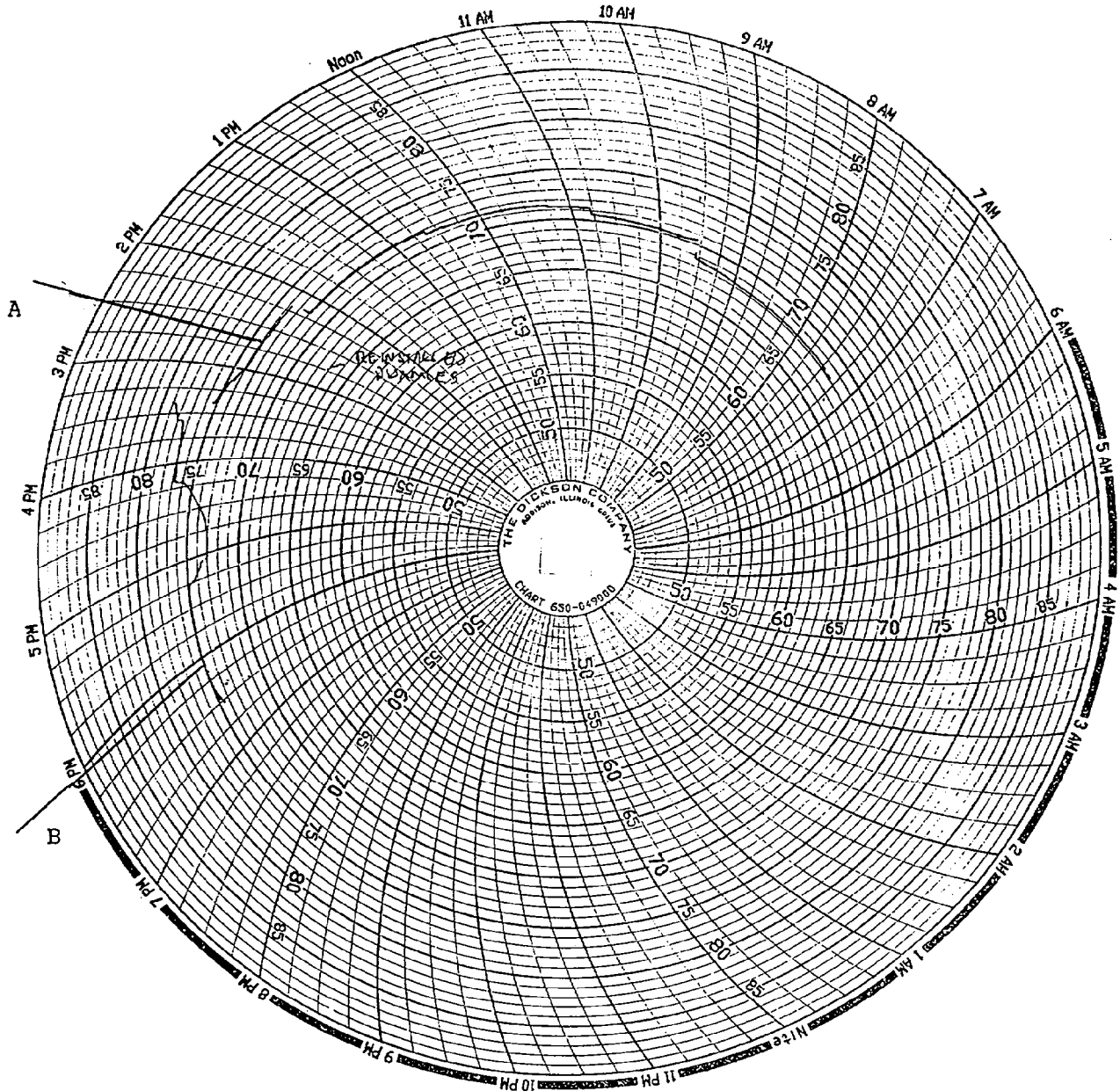
Inspected By: Tim Michnay

Date: July 22, 1996

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

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

VEHICLE AND DUMMY TEMPERATURE



A = Dummies installed in vehicle
B = Test conducted

APPENDIX D
TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

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

	RIGHT FRONT PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	ALFJ7	Endevco	December 9, 1996
Lower Rib Y	APYN0	Endevco	December 9, 1996
Lower Spine Y	AP0G2	Endevco	December 9, 1996
Pelvis Y	APY15	Endevco	December 9, 1996
Upper Rib Redundant Y	ALDD6	Endevco	December 9, 1996
Lower Rib Redundant Y	APYN3	Endevco	December 9, 1996
Lower Spine Redundant Y	AP138	Endevco	December 9, 1996
Pelvis Redundant Y	APY16	Endevco	December 9, 1996

INSTRUMENTS FOR RIGHT REAR PASSENGER DUMMY NO. 271

	RIGHT REAR PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	AP2A4	Endevco	February 26, 1997
Lower Rib Y	AP1B3	Endevco	February 26, 1997
Lower Spine Y	ANAP1	Endevco	February 26, 1997
Pelvis Y	AHTC3	Endevco	February 26, 1997
Upper Rib Redundant Y	AP2D8	Endevco	February 26, 1997
Lower Rib Redundant Y	AP1C6	Endevco	February 26, 1997
Lower Spine Redundant Y	ANAT6	Endevco	February 26, 1997
Pelvis Redundant Y	AGP53	Endevco	February 26, 1997

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE AND MDB ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Moving Barrier CG X	F10-D02	Entran	January 8, 1997
Moving Barrier CG Y	D05-R09	Entran	January 2, 1997
Moving Barrier CG Z	E10-F12	Entran	January 9, 1997
Moving Barrier Rear Axle X	G01-J12	Entran	January 9, 1997
Moving Barrier Rear Axle Y	F12-G10	Entran	January 9, 1997
Right Mid A-Post Y	A10-G08	Entran	June 12, 1997
Right Lower A-Post Y	E24-G06	Entran	June 12, 1997
Right Mid B-Post Y	F12-G02	Entran	January 9, 1997
Right Lower B-Post Y	F11-G01	Entran	January 9, 1997
Rear Floorpan Above Axle X	L14-D07	Entran	January 6, 1997
Rear Floorpan Above Axle Y	F07-A04	Entran	January 7, 1997
Rear Floorpan Above Axle Z	J10-E14	Entran	January 3, 1997
Right Front Passenger Seat Track Y	H07-A20	Entran	June 12, 1997
Left Side Sill at Front Seat X	F11-G02	Entran	January 9, 1997
Left Side Sill at Front Seat Y	B14-R15	Entran	January 3, 1997
Left Side Sill at Front Seat Z	J10-E17	Entran	April 23, 1997
Left Side Sill at Rear Seat X	L14-D14	Entran	January 6, 1997
Left Side Sill at Rear Seat Y	B28-B01	Entran	January 23, 1997
Left Side Sill at Rear Seat Z	E24-G04	Entran	January 3, 1997
Right Side Sill at Front Seat Y	H07-A20	Entran	June 12, 1997

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE AND MDB ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Right Side Sill at Rear Seat Y	MGA095	Entran	June 12, 1997
Right Rear Occupant Compartment Y	D05-R05	Entran	January 7, 1997
Vehicle CG X	L18-E18	Entran	June 12, 1997
Vehicle CG Y	L18-E01	Entran	June 12, 1997
Vehicle CG Z	J23-E01	Entran	June 12, 1997

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