

REPORT NO.: 214D-MGA-99-18

V3026

NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TESTING
PASSENGER CARS

TOYOTA MOTOR CORPORATION

1999 TOYOTA RAV4 SUV

NHTSA NO: MX5103

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: January 28, 1999

Report Date: February 4, 1999

FINAL REPORT

Prepared For:

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
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ROOM 5313, NPS-10
400 SEVENTH STREET, SW
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Prepared By: Chad Gadberry
Chad Gadberry, Project Engineer

Approved By: Dave Kosloske
Dave Kosloske, Program Manager

Approval Date: 2-10-99

Technicians:

- Al Chalmers
- Wayne Dahlke
- Jan Elde
- Chris Kulis
- Erik Nelson
- Chris Novak
- Paul Schlimmer
- Kyle Shelton
- Todd Stevenson
- John Wistert

Secretary: Carol Beck

FINAL REPORT ACCEPTED BY (OCWS):

Accepted By: Han Sun Chan (COTR)

Acceptance Date: 03/18/99

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16. Abstract A 90° Moving Deformable Barrier NCAP side impact was conducted on the subject 1999 Toyota RAV4 SUV to obtain new car assessment and research data indicant of FMVSS No. 214D performance. The test was conducted at MGA Research Corporation in Burlington, Wisconsin, on January 28, 1999. The impact velocity of the Moving Deformable Barrier (MDB) was 61.2 kph, and the ambient temperature at the struck side (driver's) of the target vehicle at the time of impact was 20 °C. The target vehicle post test maximum crush was 339 mm at level 2. The test vehicle's performance follows: <table border="1"> <thead> <tr> <th></th> <th><u>DRIVER</u></th> <th><u>PASS.</u></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib (LUR) Accel., g</td> <td>51</td> <td>42</td> </tr> <tr> <td>Left Lower Rib (LLR) Accel., g</td> <td>61</td> <td>53</td> </tr> <tr> <td>Lower Spine (T₁₂) Accel., g</td> <td>51</td> <td>52</td> </tr> <tr> <td>Thoracic Trauma Index (TTI)</td> <td>56</td> <td>53</td> </tr> <tr> <td>Pelvis (PEV) Accel., g</td> <td>72</td> <td>46</td> </tr> </tbody> </table> The doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.					<u>DRIVER</u>	<u>PASS.</u>	Left Upper Rib (LUR) Accel., g	51	42	Left Lower Rib (LLR) Accel., g	61	53	Lower Spine (T ₁₂) Accel., g	51	52	Thoracic Trauma Index (TTI)	56	53	Pelvis (PEV) Accel., g	72	46
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17. Key Words New Car Assessment Program (NCAP) FMVSS No. 214D Side Impact Dummy (SID) Occupant Side Impact Protection		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																			
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SECTION 1
PURPOSE AND TEST PROCEDURE

This side impact test is part of the FY99 NCAP Side Impact Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-97-D-22001. The purpose of this test was to evaluate side impact protection of a 1999 Toyota RAV4 SUV.

This side impact test was conducted in accordance with the New Car Assessment Program Side Impact Testing Procedure dated October 1996.

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

SECTION 2

SUMMARY OF SIDE IMPACT TEST

A 1999 Toyota RAV4 SUV was impacted on the left or driver's 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 38.0 mph (61.2 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 January 28, 1999. Pre- and post-test photographs of the test vehicle, the MDB and the side impact dummies (SIDs) are included in Appendix A.

Two Side Impact Dummies (SIDs) were placed in the driver and left rear designated seating positions according to instructions specified in the New Car Assessment Program Side Impact Laboratory Test Procedure which is dated October 1996. The side impact event was documented by nine high speed cameras. Camera locations and other pertinent camera information can be found in this report.

The SIDs were instrumented with the following accelerometers.

1. Left Upper Rib (LUR) uniaxial accelerometer (Y-direction)
2. Left Lower Rib (LLR) uniaxial accelerometer (Y-direction)
3. Lower Thoracic Spine (T₁₂) uniaxial accelerometer (Y-direction)
4. Pelvic (PEV) section uniaxial accelerometer (Y-direction)
5. Head Center of Gravity triaxial accelerometers (X, Y, and Z-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 test:

Injury Criteria	Front SID	Rear SID
TTI (g)	56	53
Pelvis (g)	72	46

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

DATA SHEET NO. 1

GENERAL VEHICLE TEST PARAMETER DATATEST VEHICLE INFORMATION:Year/Make/Model/Body Style: 1999/Toyota/RAV4/SUVVehicle NHTSA No.: MX5103 VIN: JT3HP10V6X7122271Vehicle Body Color: Red Build Date: 11/98Engine Data: 4 Cylinders; CID; 2.0 Liter; ccPlacement Longitudinal; X LateralTransmission: 4 Speed; Manual; X Automatic; X OverdriveFinal Drive: Rear Wheel Drive; Frt. Wheel Drive; X Four Wheel DriveOdometer Reading 57 milesOptions: X A/C; X Pwr. Steering; X Pwr. Brakes; X Pwr. Windows; X Cruise Control; X Tilt Wheel; X Power Door Locks;DATA FROM TIRE PLACARD:Tire Pressure (at capacity): 28 Psi FRONT26 Psi REARRecommended Tire Size: P215/70R16Tires on Test Vehicle: P215/70R16 Manufacturer: Bridgestone

Vehicle Capacity Data:

Number of Occupants: 2 Front; 3 Rear; 3rd Seat, 5 TotalType of Front Seats: X Bucket; Bench; Split BenchType of Front Seat Back: Fixed; X Adjustable with X LeverVehicle Maximum Capacity Loading = 341.6 kg (A)No. of Occupants x 68.04 kg. = 340.2 kg (B)Cargo Capacity (A-B) = 1.4 kg

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)WEIGHT OF TEST VEHICLE WITH MAXIMUM FLUIDS:Right Front = 403.7 kgRight Rear = 285.8 kgLeft Front = 398.7 kgLeft Rear = 270.8 kgTOTAL FRONT = 802.4 kgTOTAL REAR = 556.6 kg% of Total Vehicle Weight = 59.0 %; % of Total Weight = 41.0 %TOTAL WEIGHT = 1359.0 kg

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)Year/Make/Model/Body Style: 1999/Toyota/RAV4/SUVVehicle NHTSA No.: MX5103 Test Date: January 28, 1999CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Test Vehicle Delivered Weight with Maximum Fluids	=	<u>1359.0</u> kg
Cargo Carrying Capacity of Test Vehicle	=	<u>1.4</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>1521.8</u> kg

ACTUAL WEIGHT OF TEST VEHICLE WITH 2 DUMMIES AND CARGO (Fully Loaded):

Right Front	=	<u>404.6</u> kg	Right Rear	=	<u>325.7</u> kg
Left Front	=	<u>451.8</u> kg	Left Rear	=	<u>339.7</u> kg
TOTAL FRONT	=	<u>856.4</u> kg	TOTAL REAR	=	<u>665.4</u> kg
% of Total Weight	=	<u>56.3</u> %	% of Total Weight	=	<u>43.7</u> %
TOTAL WEIGHT	=	<u>1521.8</u> kg			

TEST VEHICLE ATTITUDE:

CURB WEIGHT ATTITUDE:

Right Front 809 mm Left Front 820 mm Right Rear 837 mm Left Rear 834 mm

FULLY LOADED WEIGHT ATTITUDE:

Right Front 798 mm Left Front 803 mm Right Rear 818 mm Left Rear 805 mm

TEST ATTITUDE:

Right Front 803 mm Left Front 808 mm Right Rear 823 mm Left Rear 809 mm

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Test Vehicle Wheelbase: 2405 mm

C.G. = 1076 mm rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

Right Side = 3454 mm

Centerline = 3883 mm

Left Side = 3454 mm

GENERAL VEHICLE TEST PARAMETER DATA (Cont'd)

Year/Make/Model/Body Style: 1999/Toyota/RAV4/SUV

Vehicle NHTSA No.: MX5103 Test Date: January 28, 1999

FRONT SEAT CUSHION PLACEMENT:

Total Length of Adjustment Travel: 225 mm

Test Position: 9th detent rearward of 16

FRONT SEAT BACK ADJUSTMENT POSITION:

Seat Back Angle = 23°

SECOND POSITION SEAT:

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

Seat Back Adjustment Position: 23°

ADJUSTABLE STEERING COLUMN POSITION: Mid position

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

AMOUNT OF STODDARD SOLVENT IN FUEL TANK:

Fuel system usable capacity = 15.3 gallons

Test Volume: 14.2 gallons 93 % of capacity

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

Wheelbase: = 2405 mm

Impact Point is 305 mm rearward of front axle centerline

DATA SHEET NO. 2
TEST VEHICLE SUMMARY OF RESULTS

Year/Make/Model/Body Style: 1999/Toyota/RAV4/SUV

Vehicle NHTSA No.: MX5103 Test Date: January 28, 1999

Overall Length = 3883 mm; Overall Width = 1685 mm

TEST WEIGHT:

Right Front = 405.1 kg

Right Rear = 337.0 kg

Left Front = 431.8 kg

Left Rear = 340.6 kg

TOTAL FRONT = 836.9 kg

TOTAL REAR = 677.6 kg

% of Total Weight = 55.3 %

% of Total Weight = 44.7 %

TOTAL VEHICLE WEIGHT = 1514.5 kg

Wheelbase = 2405 mm

Longitudinal C.G. from Center of Front Axle = 1076 mm

Impact Angle with Respect to Impactor = 90° degrees

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1 (365 mm above ground) = 272 mm

2. LEVEL 2 (720 mm above ground) = 339 mm

3. LEVEL 3 (743 mm above ground) = 327 mm

4. LEVEL 4 (1032 mm above ground) = 203 mm

5. LEVEL 5 (1558 mm above ground) = 45 mm

Maximum Post-Test Intrusion = 339 mm

OCCUPANTS:

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

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

Number of Vehicle Data Channels:		=	<u>25</u>
Number of Cameras:	Onboard Vehicle	=	<u>3</u>
	Offboard Vehicle	=	<u>4</u>
	Deformable Barrier	=	<u>2</u>
	TOTAL	=	<u>9</u>

DATA SHEET NO. 3

MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTSYear/Make/Model/Body Style: 1999/Toyota/RAV4/SUVVehicle NHTSA No.: MX5103 Test Date: January 28, 1999POSITION OF IMPACT (MDB) ON MONORAIL:Crabbed 27° to leftMDB 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>1098 mm</u>
C.G. Location From Center Line	=	<u>-15 mm</u>
C.G. Location Above Ground Level	=	<u>485 mm</u>

MDB WEIGHT:

Left Front	=	<u>457.7 kg</u>	Left Rear	=	<u>235.1 kg</u>
Right Front	=	<u>328.1 kg</u>	Right Rear	=	<u>342.6 kg</u>
TOTAL FRONT	=	<u>785.8 kg</u>	TOTAL REAR	=	<u>577.7 kg</u>
TOTAL MDB WEIGHT = <u>1363.5 kg</u>					

Impact Angle (MDB C/L to Target Vehicle C/L) = 90° degreesImpact Speed = Primary: 38.0 mph (61.2 kph) Secondary: 38.2 mph (61.5 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>178</u> mm |
| 2. | Row B Mid Stack (686 mm) | = | <u>107</u> mm |
| 3. | Row C Top of Bumper (533 mm) | = | <u>130</u> mm |
| 4. | Row D Center of Bumper (432 mm) | = | <u>185</u> mm |

INSTRUMENTATION:

Number of MDB Data Channels = 7

DATA SHEET NO. 4
POST-TEST OBSERVATIONS

Year/Make/Model/Body Style: 1999/Toyota/RAV4/SUV

Vehicle NHTSA No.: MX5103 Test Date: January 28, 1999

VISIBLE DUMMY CONTACT POINTS:

	<u>LEFT FRONT SID</u>	<u>LEFT REAR SID</u>
Head	<u>Headrest/seatbelt</u>	<u>Side header/headrest/</u> <u>C-post/side window divider</u>
Arm	<u>Rear of door/armrest</u>	<u>Mid-rear of door</u>
Pelvis	<u>Rear of door below armrest</u>	<u>Mid-door below armrest</u>
Left Knee	<u>Mid-door below armrest</u>	<u>Mid-front of door below</u> <u>armrest</u>
Right Knee	<u>Left knee</u>	<u>Left knee</u>

DOOR OPENING:

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

MDB DISTANCE FROM TARGET IMPACT POINT:

Horizontal: 2 mm forward

Vertical: 8 mm high

ARM REST LOCATIONS:

Front: 105 mm from below window

Rear: 102 mm from below window

POST-TEST OBSERVATIONS (Cont'd)SEAT CRUSH:

Front Seat Back:	5 mm	Front Seat Cushion:	12 mm
Left Rear Seat Back:	20 mm	Rear Seat Cushion:	66 mm

GLAZING DAMAGE:

Windshield cracked; both left side windows broke

PILLAR PERFORMANCE:

No failure noted

SILL SEPARATION:

None noted

OTHER NOTABLE IMPACT EFFECTS:

MDB impacted front of left rear wheel

AIRBAG DEPLOYMENT STATUS:

	<u>DRIVER</u>	<u>PASSENGER</u>
Frontal	<u>No</u>	<u>No</u>
Side	<u>N/A</u>	<u>N/A</u>

SECTION 4
OCCUPANT AND VEHICLE INFORMATION

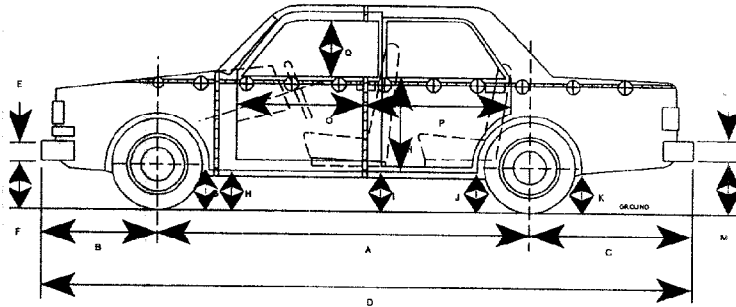
DATA SHEET NO. 5
SIDE IMPACT DUMMY (SID) INSTRUMENTATION DATA

Year/Make/Model/Body Style: 1999/Toyota/RAV4/SUV
Vehicle NHTSA No.: MX5103 Test Date: January 28, 1999

	Driver SID ID # 269				Left Passenger SID ID # 270			
	Pos. Direct.		Neg. Direct		Pos. Direct.		Neg. Direct	
	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)	Max (g)	Time (msec)
RIB ACCELERATIONS								
Left Upper Rib (LUR) Y	51.5	28	-5.4	34	42.1	58	-13.7	93
Left Lower Rib (LLR) Y	60.7	27	-14.9	32	53.1	42	-13.4	92
SPINE ACCELERATIONS								
Lower Lateral Y	50.8	32	-9.8	66	52.0	48	-29.0	69
PELVIS ACCELERATIONS								
Lateral Y	72.3	39	-8.3	55	46.1	41	-12.9	82

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

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



LEFT SIDE VIEW

D = Length at Centerline

R = Right Side Length

S = Left Side Length

T = Width at B Post

E & L = Bumper Thickness

J1 = To Pinch Weld

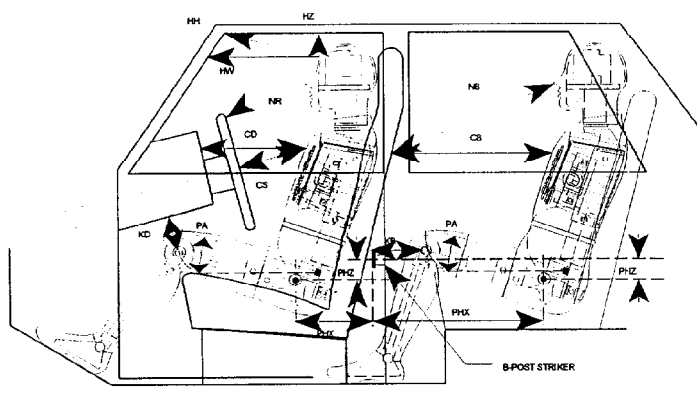
J2 = To Sill

ALL MEASUREMENTS IN (mm)

	PRE-TEST	POST-TEST	Δ CHANGE
A	2405	2290	115
B	710	620	90
C	768	864	96
D	3883	3774	109
E	*	*	*
F	*	*	*
G	292	290	2
H	288	285	3
I	285	298	13
J1/J2	281/280	301/292	20/12
K	415	430	15
L	*	*	*
M	*	*	*
N	735	665	70
O	594	587	7
P	1061	995	66
Q	516	525	9
R	3454	3460	6
S	3454	3372	82
T	1685	1398	287

* Front and rear bumpers removed from test vehicle.

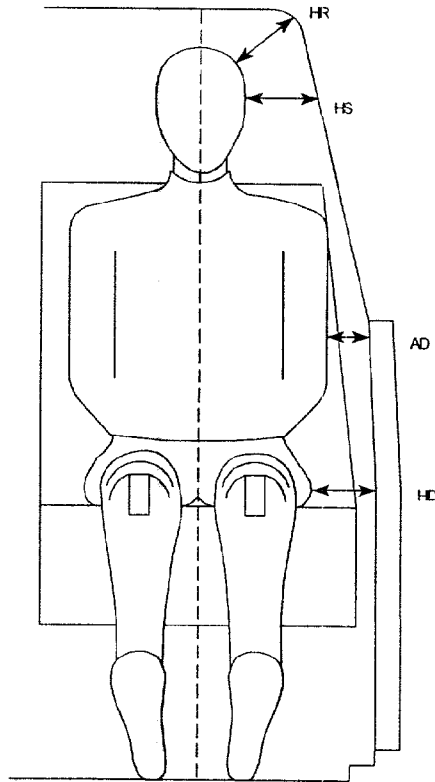
DATA SHEET NO. 7

SIDE IMPACT DUMMY (SID) LONGITUDINAL CLEARANCE DIMENSIONSYear/Make/Model/Body Style: 1999/Toyota/RAV4/SUVNHTSA NO.: MX5103 Test Date: January 28, 1999NOTE: All dimensions are in mm with tolerance of ± 3 mm

	DRIVER SID ID # 269		LEFT REAR PASSENGER SID ID # 270
HH	421	HZ	205
HW	588	NB	507
HZ	200	CB	425
NR	468	KBL (KBA)	161 (0.0°)
CD	530	KBR (KBA)	199 (0.0°)
CS	336	PA°	23.6°
KDL(KDA°)	136 (0.0°)	PHX	178
KDR(KDA°)	147 (0.0°)	PHZ	219
PA°	24.8°		
PHX	145		
PHZ	43		

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 DIMENSIONSYear/Make/Model/Body Style: 1999/Toyota/RAV4/SUVNHTSA NO.: MX5103 Test Date: January 28, 1999

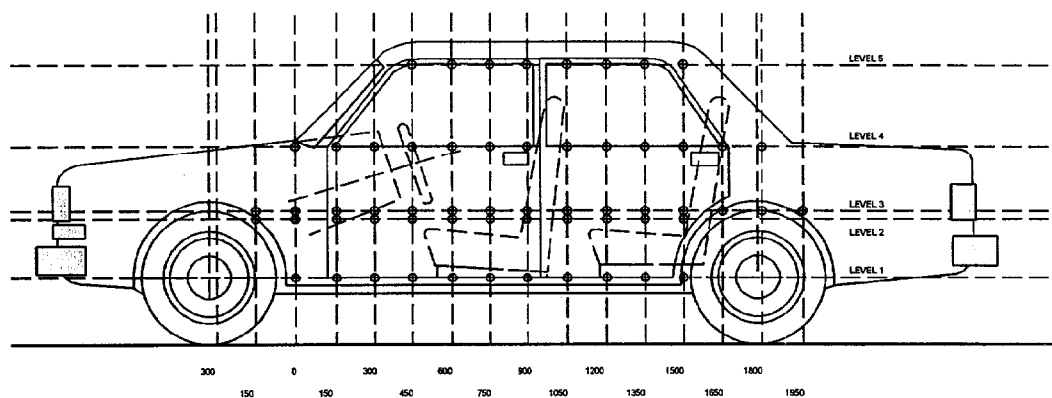
NOTE: All dimensions are in mm

	DRIVER SID ID # 269	LEFT REAR PASSENGER SID ID # 270
HR	190	240
HS	267	330
AD	78	128
HD	181	204

DATA SHEET NO. 9
VEHICLE SIDE MEASUREMENTS

Year/Make/Model/Body Style: 1999/Toyota/RAV4/SUV

NHTSA NO.: MX5103 Test Date: January 28, 1999



LEFT SIDE VIEW

NOTE: All measurements are in millimeters (mm)

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

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

MEASUREMENTS ALONG THE VERTICAL 750 mm. LINE SHOWN ABOVE

Level 1 @ Axle Centerline Height

(or Sill Top Height)

= 365 mm

Level 2 @ Occupant H-Point

= 720 mm

Level 3 @ Mid Door

= 743 mm

Level 4 @ Window Sill

= 1032 mm

Level 5 @ Window Top

= 1558 mm

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

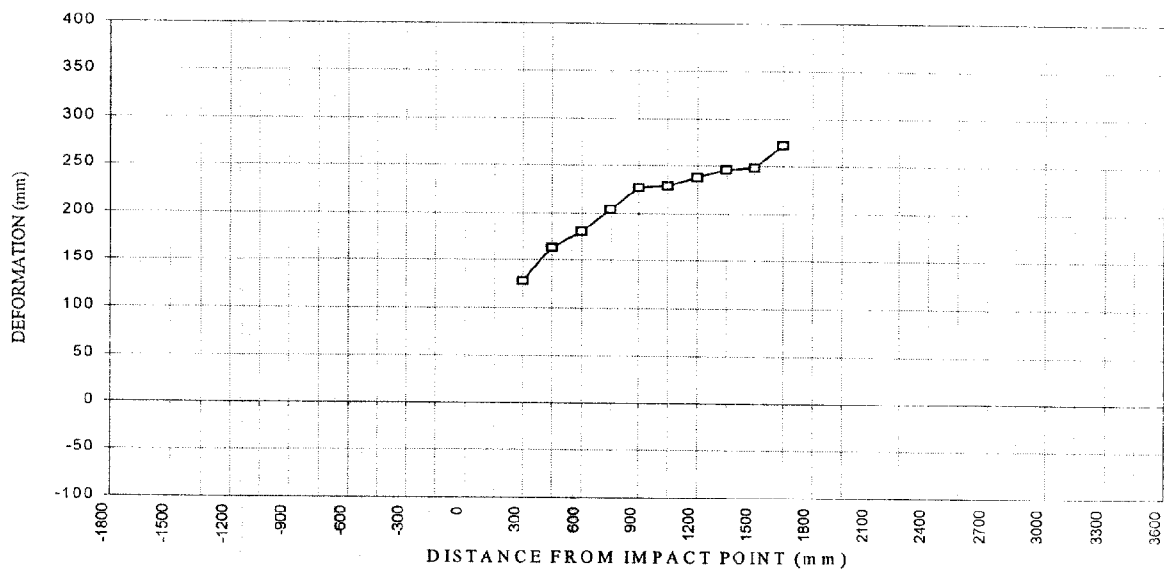
Longitudinal Distance (mm)	Level 1 - Axle Centerline		
	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1800			
-1650			
-1500			
-1350			
-1200			
-1050			
-900			
-750			
-600			
-450			
-300			
-150			
0 (impact point)			
150			
300	762	890	128
450	766	930	164
600	766	947	181
750	764	968	204
900	762	989	227
1050	761	990	229
1200	763	1001	238
1350	762	1008	246
1500	760	1008	248
1650	752	1024	272
1800			

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

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

	Level 1 - Axle Centerline		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
1950			
2100			
2250			
2400			
2550			
2700			
2850			
3000			
3150			
3300			
3450			
3600			

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

VEHICLE EXTERIOR STATIC CRUSH

LEVEL 1 - AXLE CENTERLINE

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

	Level 2 - Occupant H-Point		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1800			
-1650			
-1500			
-1350			
-1200			
-1050			
-900			
-750			
-600			
-450			
-300			
-150			
0 (impact point)			
150	668	829	161
300	665	890	225
450	666	932	266
600	667	944	277
750	665	956	291
900	666	962	296
1050	665	968	303
1200	667	1006	339
1350	667	983	316
1500	664	969	305
1650	664	952	288
1800	661	927	266

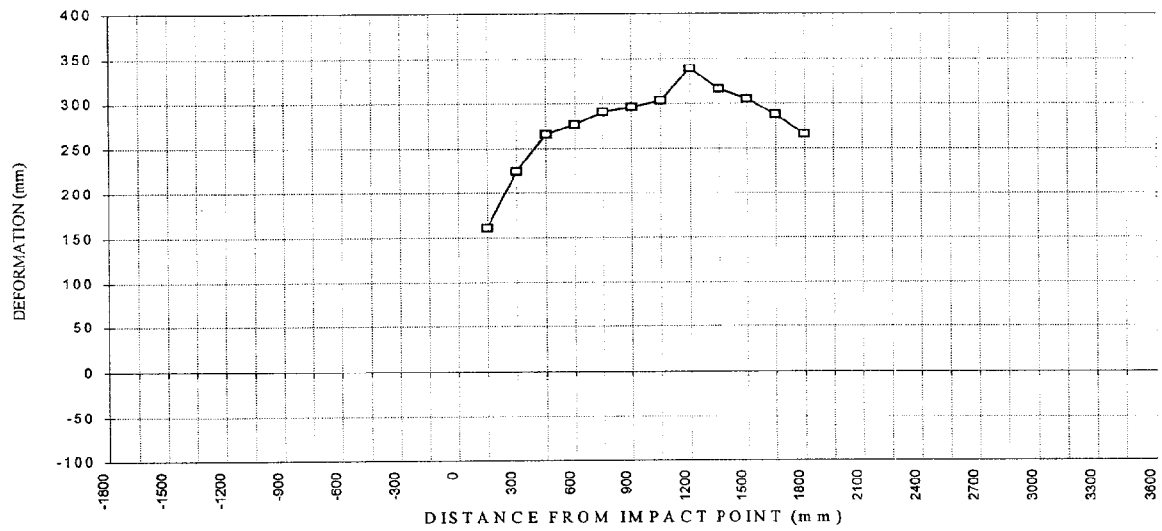
Reference plane is parallel to test vehicle longitudinal centerline.
Given dimensions = Reference plane to car body

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

	Level 2 - Occupant H-Point		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
1950			
2100			
2250			
2400			
2550			
2700			
2850			
3000			
3150			
3300			
3450			
3600			

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

VEHICLE EXTERIOR STATIC CRUSH



LEVEL 2 - OCCUPANT H-POINT

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

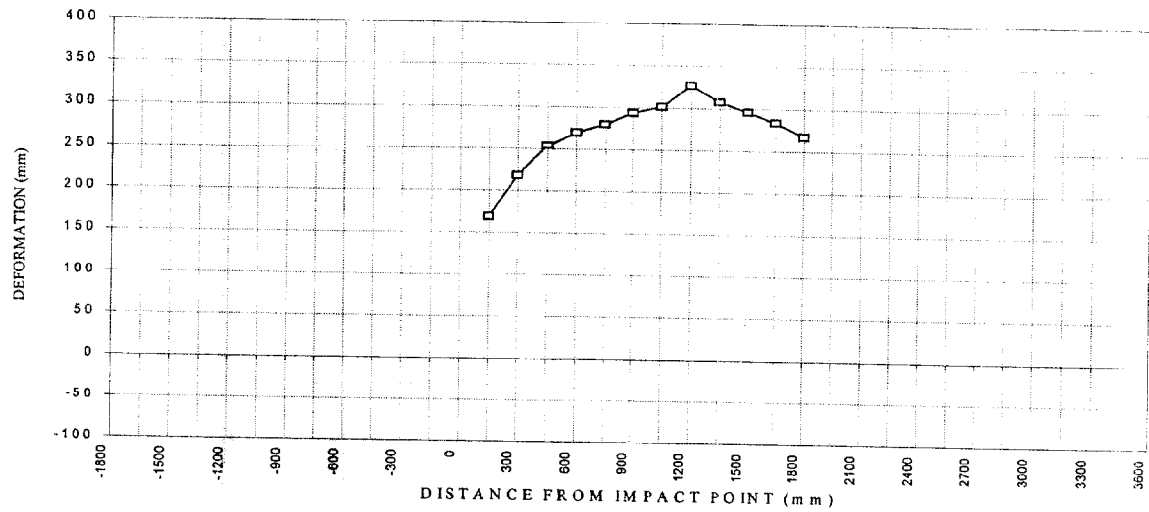
	Level 3 - Mid-Door		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1800			
-1650			
-1500			
-1350			
-1200			
-1050			
-900			
-750			
-600			
-450			
-300			
-150			
0 (impact point)			
150	660	829	169
300	661	879	218
450	660	914	254
600	660	930	270
750	660	940	280
900	660	954	294
1050	660	962	302
1200	660	987	327
1350	659	967	308
1500	659	955	296
1650	656	940	284
1800	652	920	268

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

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

	Level 3 - Mid-Door		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
1950			
2100			
2250			
2400			
2550			
2700			
2850			
3000			
3150			
3300			
3450			
3600			

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

VEHICLE EXTERIOR STATIC CRUSH

LEVEL 3 - MID-DOOR

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

	Level 4 - Window Sill		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1800			
-1650			
-1500			
-1350			
-1200			
-1050			
-900			
-750			
-600	785	786	1
-450	764	773	9
-300	753	772	19
-150	744	776	32
0 (impact point)	740	789	49
150	740	801	61
300	740	815	75
450	740	821	81
600	742	834	92
750	742	854	112
900	742	874	132
1050	741	896	155
1200	741	924	183
1350	742	945	203
1500	739	905	166
1650	733	860	127
1800	728	816	88

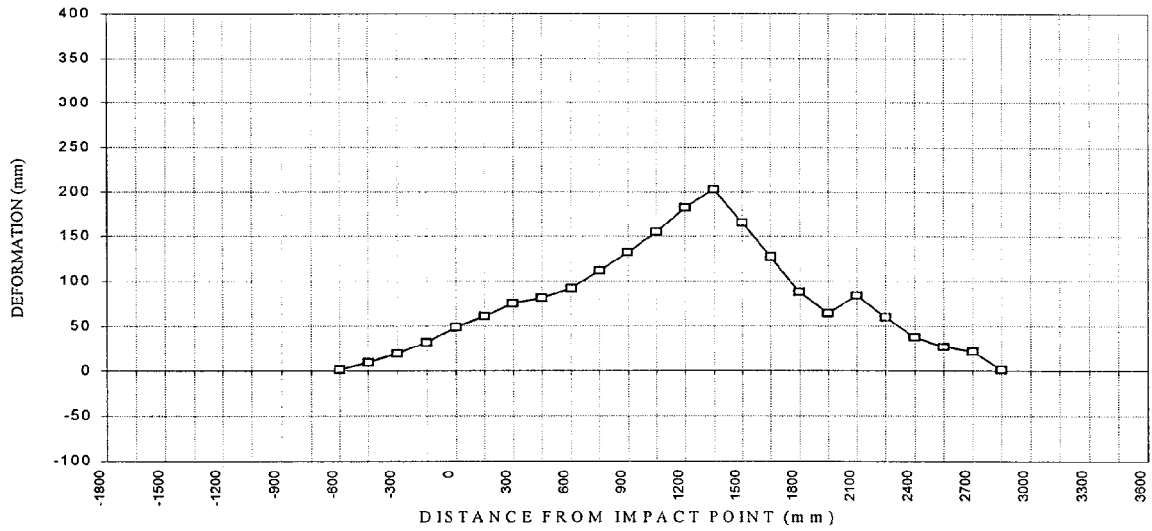
Reference plane is parallel to test vehicle longitudinal centerline.
Given dimensions = Reference plane to car body

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

	Level 4 - Window Sill		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
1950	722	786	64
2100	721	805	84
2250	722	782	60
2400	724	762	38
2550	731	758	27
2700	738	759	21
2850	774	775	1
3000			
3150			
3300			
3450			
3600			

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

VEHICLE EXTERIOR STATIC CRUSH



LEVEL 4 - WINDOW SILL

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

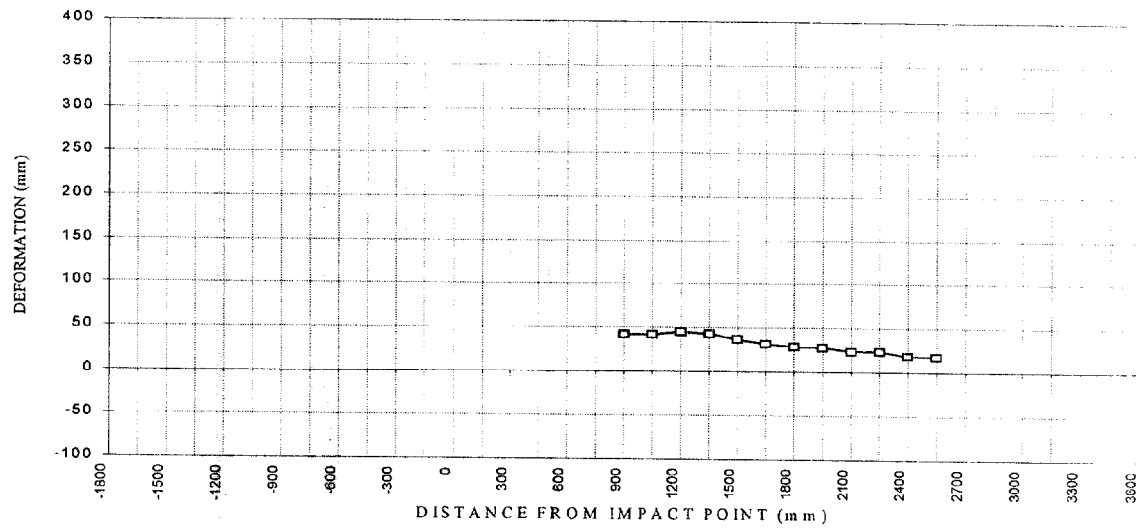
	Level 5 - Window Top		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
-1800			
-1650			
-1500			
-1350			
-1200			
-1050			
-900			
-750			
-600			
-450			
-300			
-150			
0 (impact point)			
150			
300			
450			
600			
750			
900	948	990	42
1050	948	990	42
1200	947	992	45
1350	946	989	43
1500	945	982	37
1650	944	976	32
1800	943	972	29

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

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH PROFILES

	Level 5 - Window Top		
Longitudinal Distance (mm)	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
1950	943	971	28
2100	944	968	24
2250	944	968	24
2400	946	965	19
2550	952	970	18
2700			
2850			
3000			
3150			
3300			
3450			
3600			

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

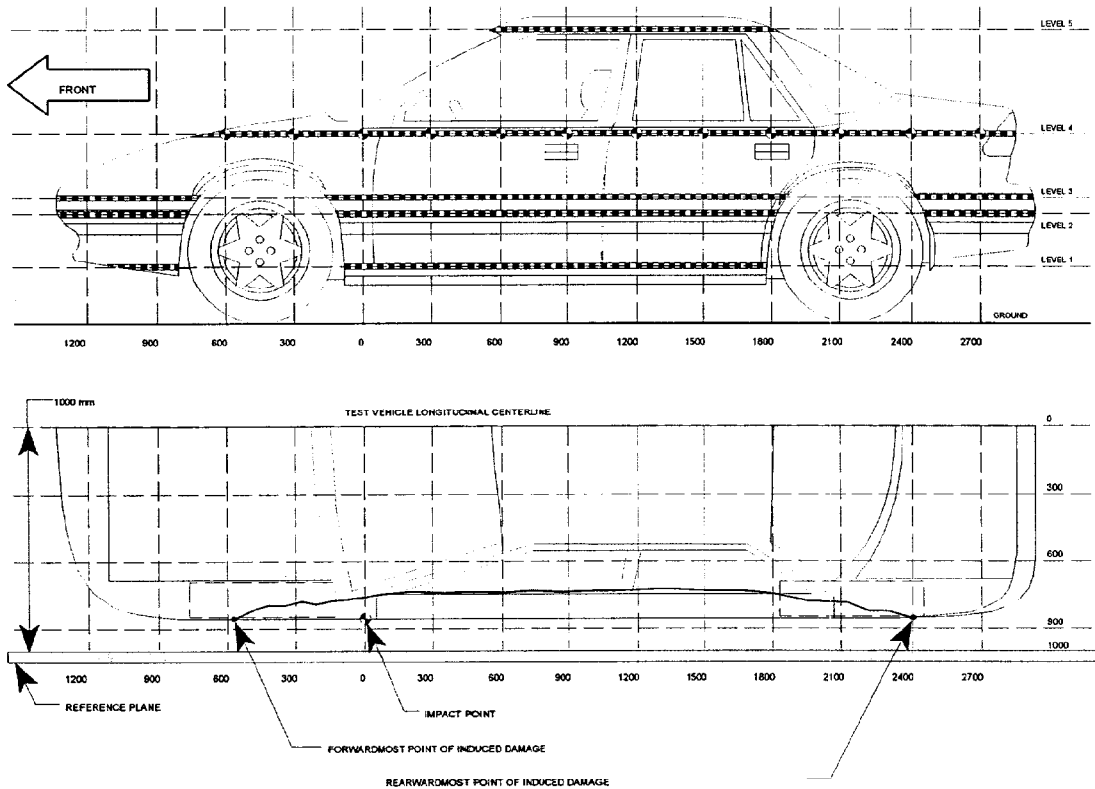
VEHICLE EXTERIOR STATIC CRUSH

LEVEL 5 - WINDOW TOP

DATA SHEET NO. 11
VEHICLE DAMAGE PROFILE DISTANCES

Year/Make/Model/Body Style: 1999/Toyota/RAV4/SUV

NHTSA NO.: MX5103 Test Date: January 28, 1999



NOTE: All measurements are in millimeters (mm)

DPD MEASUREMENTS	POST-TEST (mm)	PRE-TEST (mm)	STATIC CRUSH (mm)
1. (LF = <u>-600</u> mm)	786	785	1
2. 92 mm	798	740	58
3. 750 mm	768	764	204
4. 1433 mm	1008	761	247
5. 1271 mm	795	721	74
6. (LR = <u>2850</u> mm)	775	774	1

DATA SHEET NO. 12
EXTERIOR STATIC CRUSH FOR SIDE IMPACTOR

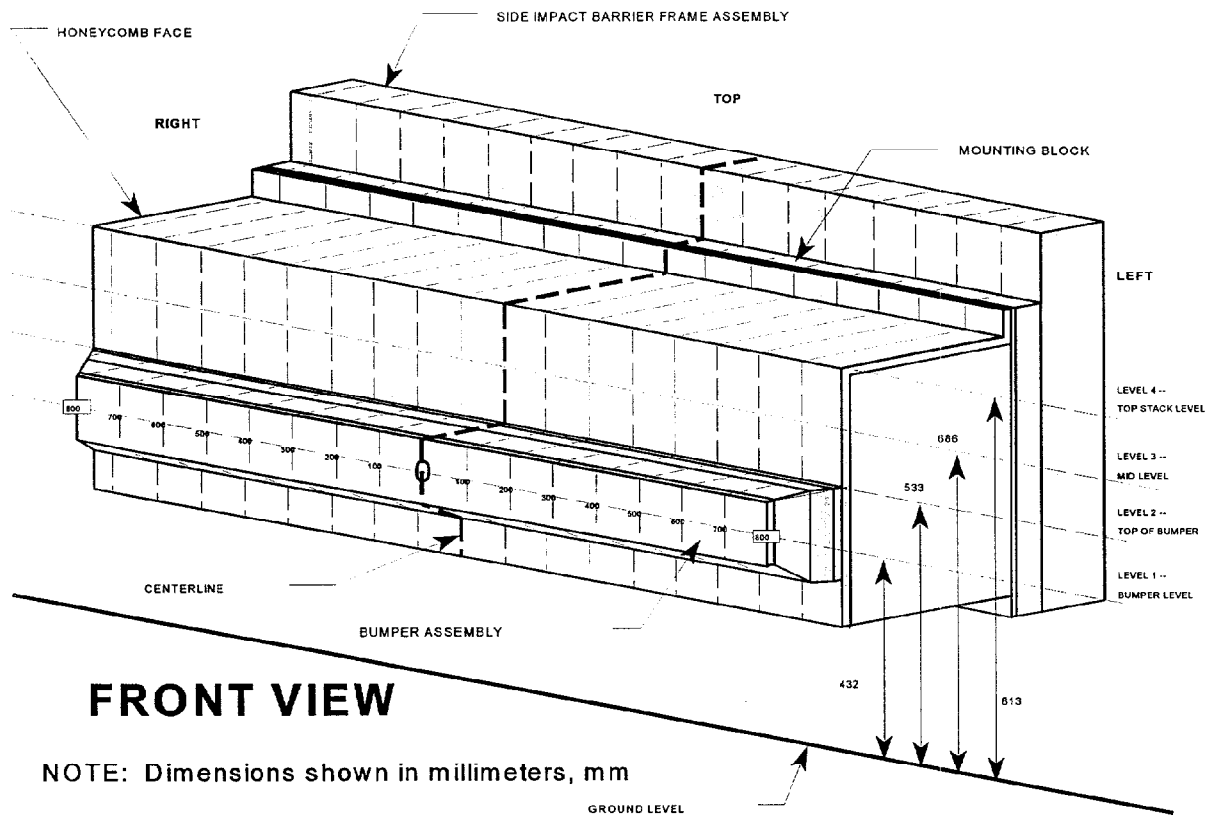
Year/Make/Model/Body Style: 1999/Toyota/RAV4/SUV

Vehicle NHTSA No.: MX5103 Test Date: January 28, 1999

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	70	42	17	16	23	29	38	43	51	57	64	68	80	105	135	158	178
Mid Level Level 3	686 mm	58	20	13	3	4	4	10	6	5	7	12	21	24	33	48	75	107
Top Bumper Level 2	533 mm	24	25	28	29	29	32	36	39	44	51	58	67	73	82	95	109	130
Mid Bumper Level 1	432 mm	32	33	36	41	45	48	53	59	66	73	82	90	100	115	141	169	185

See next page for Barrier Face Graphic

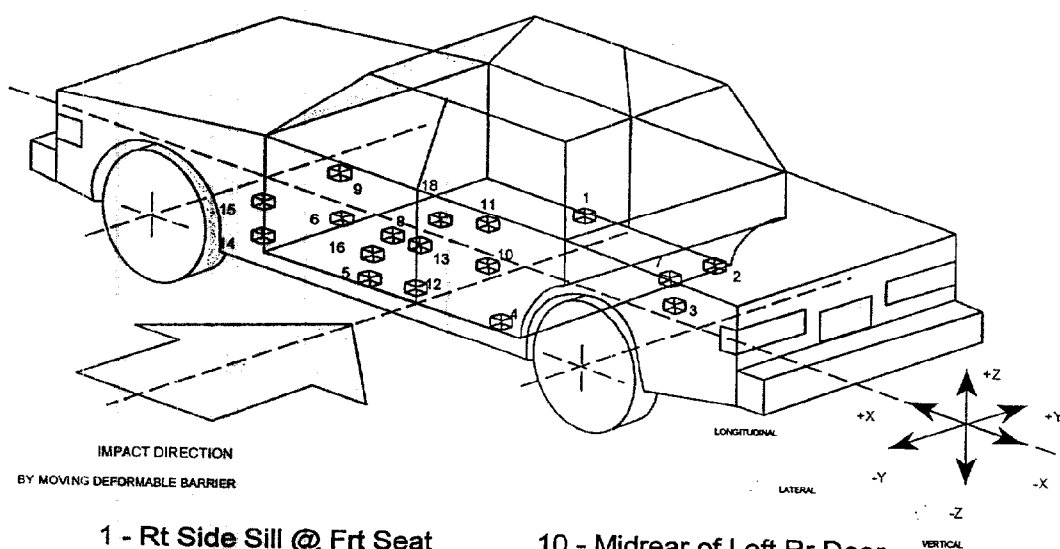
DATA SHEET NO. 12 (Cont'd)



DATA SHEET 13
TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Year/Make/Model/Body Style: 1999/Toyota/RAV4/SUV

Vehicle NHTSA No.: MX5103 Test Date: January 28, 1999



- 1 - Rt Side Sill @ Frt Seat
- 2 - Rt Side Sill @ Rr Seat
- 3 - Rr Floorpan Above Axle
- 4 - Left Side Sill @ Rr Seat
- 5 - Left Side Sill @ Frt Seat
- 6 - Left Frt Door on Centerline
- 7 - Rt Rr Occ Compartment
- 8 - Midrear of Left Frt Door
- 9 - Left Frt Door Up C/Line

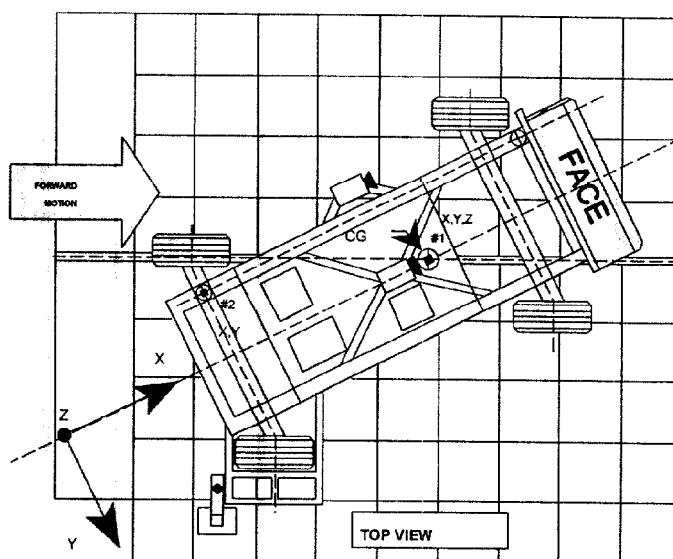
- 10 - Midrear of Left Rr Door
- 11 - Left Rr Door Up C/Line
- 12 - Left Lwr B-Post
- 13 - Left Middle B-Post
- 14 - Left Lwr A-Post
- 15 - Left Middle A-Post
- 16 - Frt Seat Track
- 18 - Vehicle C.G.

DATA SHEET NO. 13
TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY
Year/Make/Model/Body Style: 1999/Toyota/RAV4/SUV
Vehicle NHTSA No.: MX5103 Test Date: January 28, 1999

Accel. No.	Description	Coordinates (mm)*			Long. (X) Maximums (g's)		Lat. (Y) Maximums (g's)		Vert. (Z) Maximums (g's)		Resultant (g's)
		X	Y	Z	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	
1	Rt. Side Sill @ Front Seat	2120	620	354	7.4	-9.0	26.9	-5.3	4.8	-9.5	28.1
2	Rt. Side Sill @ Rear Seat	1340	620	350	7.1	-7.9	27.9	-4.3	7.6	-7.5	28.2
3	Rr. Floorpan Above Axle	905	0	555	14.7	-18.3	31.8	-3.0	13.6	-11.1	33.9
4	Left Side Sill @ Rr. Seat	1337	-626	342	---	---	208.9**	-30.7**	---	---	---
5	Left Side Sill @ Frt. Seat	2123	-626	343	---	---	104.2	-25.8	---	---	---
6	Left Front Door Centerline	2233	-710	850	---	---	195.4	-128.9	---	---	---
7	Right Rear Occupant Compartment	1406	324	440	---	---	27.4	-3.7	---	---	---
8	Mid Rear of Left Front Door	1957	-720	713	---	---	136.7	-108.8	---	---	---
9	Left Front Door Upper Centerline	2205	-707	1002	---	---	162.3	-105.1	---	---	---
10	Left Rear Door Mid Rear	1203	-724	835	---	---	198.8	-67.1	---	---	---
11	Left Rear Door Upper Centerline	1416	-705	1010	---	---	133.0	-135.5	---	---	---
12	Left Lower B-Post	1748	-625	438	---	---	227.0	-77.7	---	---	---
13	Left Mid B-Post	1718	-662	1014	---	---	127.3	-67.8	---	---	---
14	Left Lower A-Post	2701	-700	597	---	---	81.7	-35.7	---	---	---
15	Left Mid A-Post	2670	-758	-970	---	---	33.8	-2.7	---	---	---
16	Driver Seat Track	1873	-606	452	---	---	227.5	-49.7	---	---	---
18	Vehicle CG	2186	0	495	14.7	-17.0	41.1	-11.4	18.3	-14.8	44.5

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

DATA SHEET NO. 14

MOVING DEFORMABLE BARRIER (MDB) ACCELEROMETER LOCATIONS AND DATA SUMMARYYear/Make/Model/Body Style: 1999/Toyota/RAV4/SUVVehicle NHTSA No.: MX5103 Test Date: January 28, 1999

Accel. No.	Description	Coordinates (mm)*			(+) Positive		(-) Negative	
		X	Y	Z	Max. (g)	Time (msec)	Max. (g)	Time (msec)
1	MDB Center of Gravity	-1092	0	483				
	Longitudinal (X)	---	---	---	6.6	135	-18.7	34
	Lateral (Y)	---	---	---	**	**	**	**
	Vertical (Z)	---	---	---	27.8***	46***	-28.0***	20***
	Resultant (R)	---	---	---	**	**	---	---
2	Rear Frame Member	-2501	-625	622				
	Longitudinal (X)	---	---	---	1.8	185	-21.8	38
	Lateral (Y)	---	---	---	6.8	41	-1.1	184

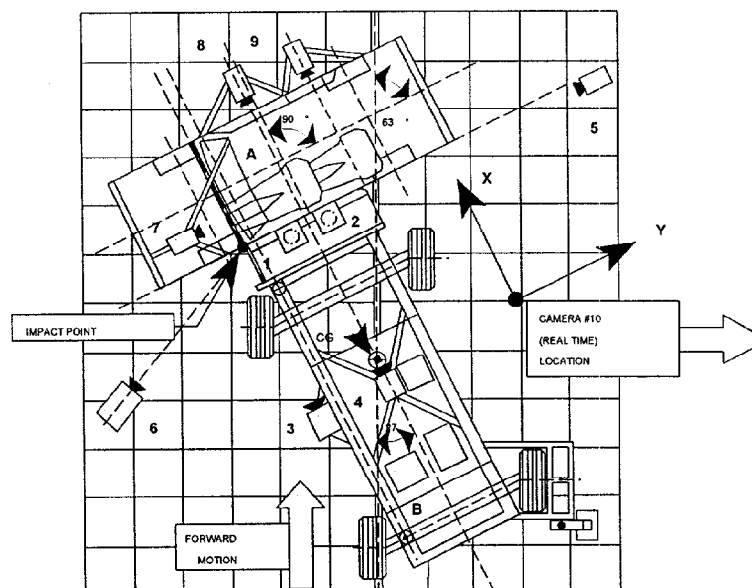
*Reference: X - Front Axle (+ Forward)
 Y - Vehicle Centerline (+ To right)
 Z - Ground Level (+ Up)

** No valid data collected
 *** Data is questionable

DATA SHEET NO. 15
HIGH SPEED CAMERA LOCATIONS AND DATA

Year/Make/Model/Body Style: 1999/Toyota/RAV4/SUV

Vehicle NHTSA No.: MX5103 Test Date: January 28, 1999



Camera No.	View	Coordinates (mm)*			Lens (mm)	Film Speed (fps)
		X	Y	Z		
	Real Time					
1	Top Overall	-100	1270	5000	8	976
2	Top Impact	-170	50	5000	13	952
3	Cart Pointer				35	1010
4	Cart Overall				13	1020
5	Right Impact	-480	10540		25	926
6	Left Impact	-310	-2830		13	1010
7	Onboard Hood				13	1015
8	Onboard Driver				8	1075
9	Onboard Passenger				8	1005

* Reference: (from point of impact)

+X = Forward

+Y = To Right

+Z = Upward

DATA SHEET 16
FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

Vehicle Year/Make/Model/Body Style: 1999/Toyota/RAV4/SUV

Vehicle NHTSA No.: MX5103 Test Date: January 28, 1999

TEST REQUIREMENTS:

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

TEST VEHICLE IMPACT TYPE: X Side Impact MDB 38.0 mph (61.2 kph)

FUEL SPILLAGE MEASUREMENT:

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

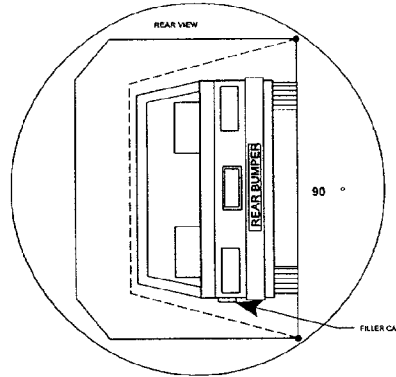
FUEL SPILLAGE LOCATION(S): None

DATA SHEET 16
FMVSS 301 STATIC ROLLOVER TEST DATA

Vehicle Year/Make/Model/Body Style: 1999/Toyota/RAV4/SUV

Vehicle NHTSA No.: MX5103 Test Date: January 28, 1999

TEST PHASE: 0° - 90°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 43 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 43 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

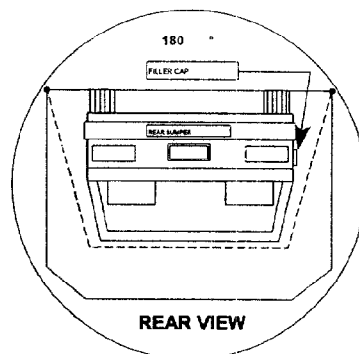
FUEL SPILLAGE LOCATIONS(S): None

DATA SHEET 16
FMVSS 301 STATIC ROLLOVER TEST DATA (Cont'd)

Vehicle Year/Make/Model/Body Style: 1999/Toyota/RAV4/SUV

Vehicle NHTSA No.: MX5103 Test Date: January 28, 1999

TEST PHASE: 90° - 180°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 17 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 17 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

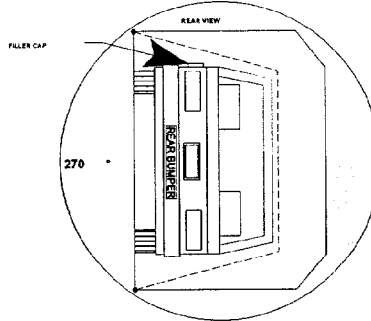
FUEL SPILLAGE LOCATIONS(S): None

DATA SHEET 16
FMVSS 301 STATIC ROLLOVER TEST DATA (Cont'd)

Vehicle Year/Make/Model/Body Style: 1999/Toyota/RAV4/SUV

Vehicle NHTSA No.: MX5103 Test Date: January 28, 1999

TEST PHASE: 180° - 270°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 21 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 21 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

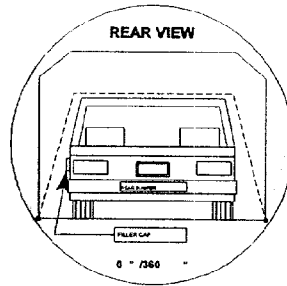
FUEL SPILLAGE LOCATIONS(S): None

DATA SHEET 16
FMVSS 301 STATIC ROLLOVER TEST DATA

Vehicle Year/Make/Model/Body Style: 1999/Toyota/RAV4/SUV

Vehicle NHTSA No.: MX5103 Test Date: January 28, 1999

TEST PHASE: 270° - 360°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 51 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 51 seconds

Next Whole Minute Interval = 8 minutes

FUEL SPILLAGE MEASUREMENT:

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

FUEL SPILLAGE LOCATIONS(S): None

APPENDIX A - PHOTOGRAPHS

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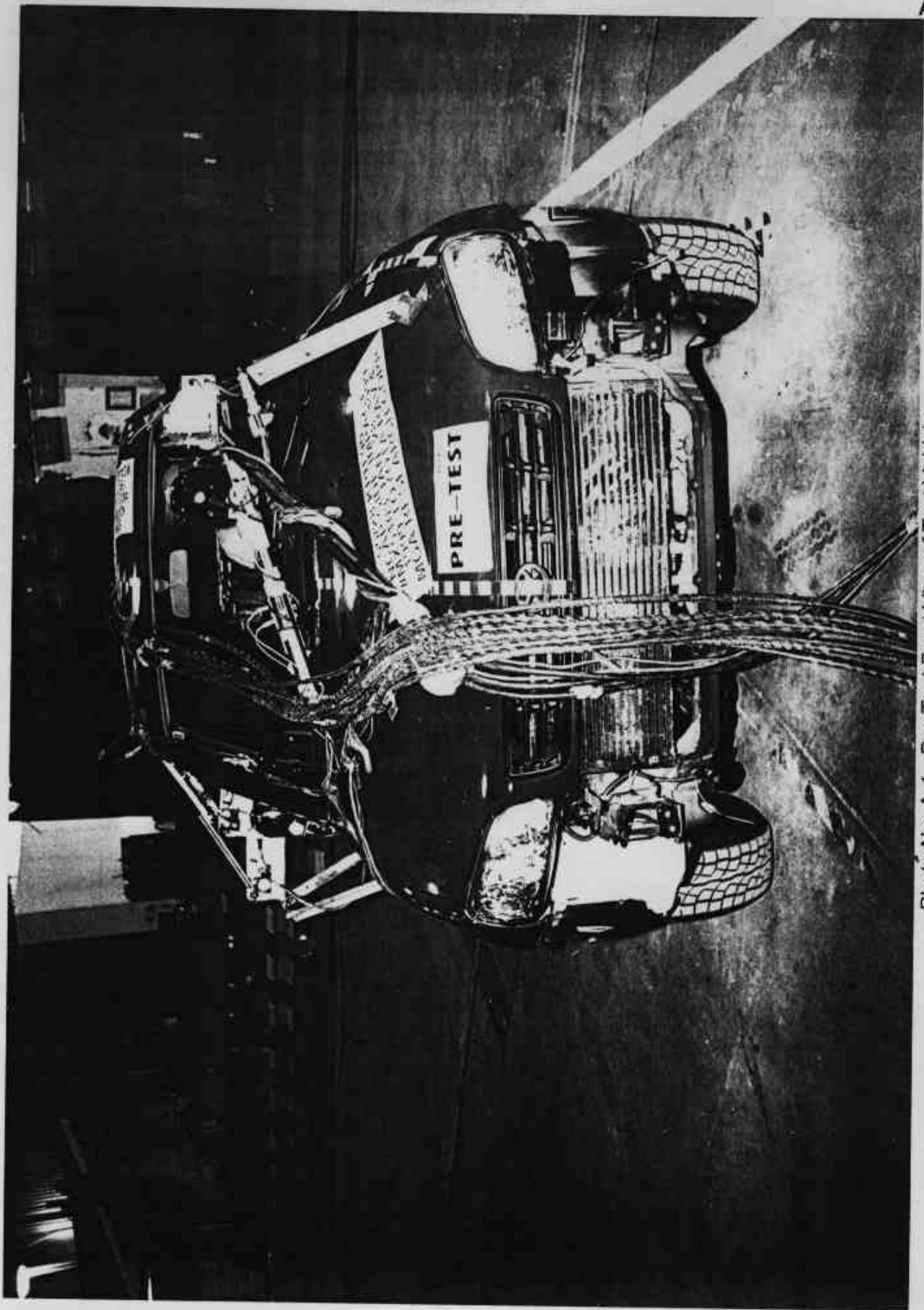


Photo No. A-1 - Pre-Test Front View of Test Vehicle

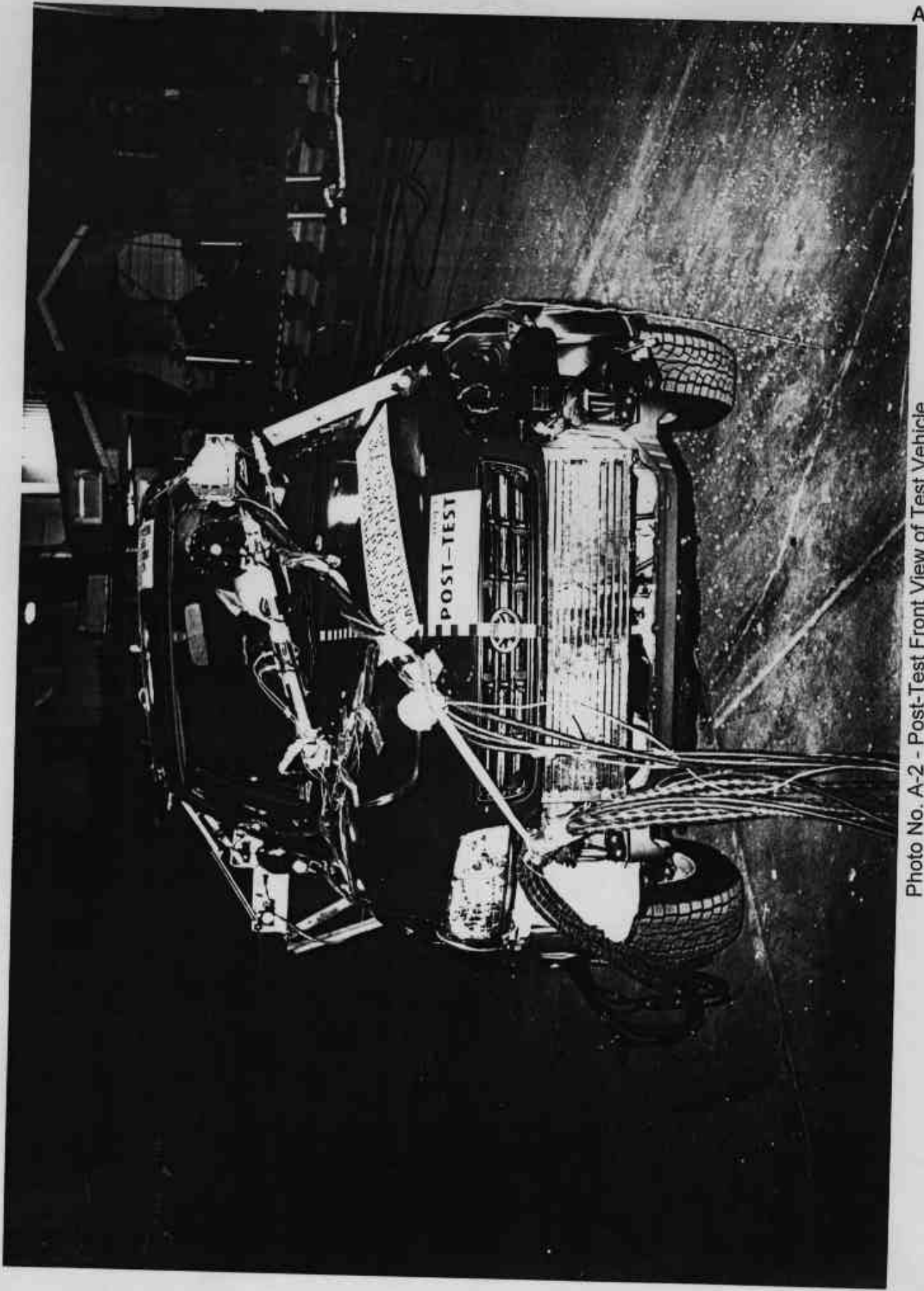


Photo No. A-2 - Post-Test Front View of Test Vehicle



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



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

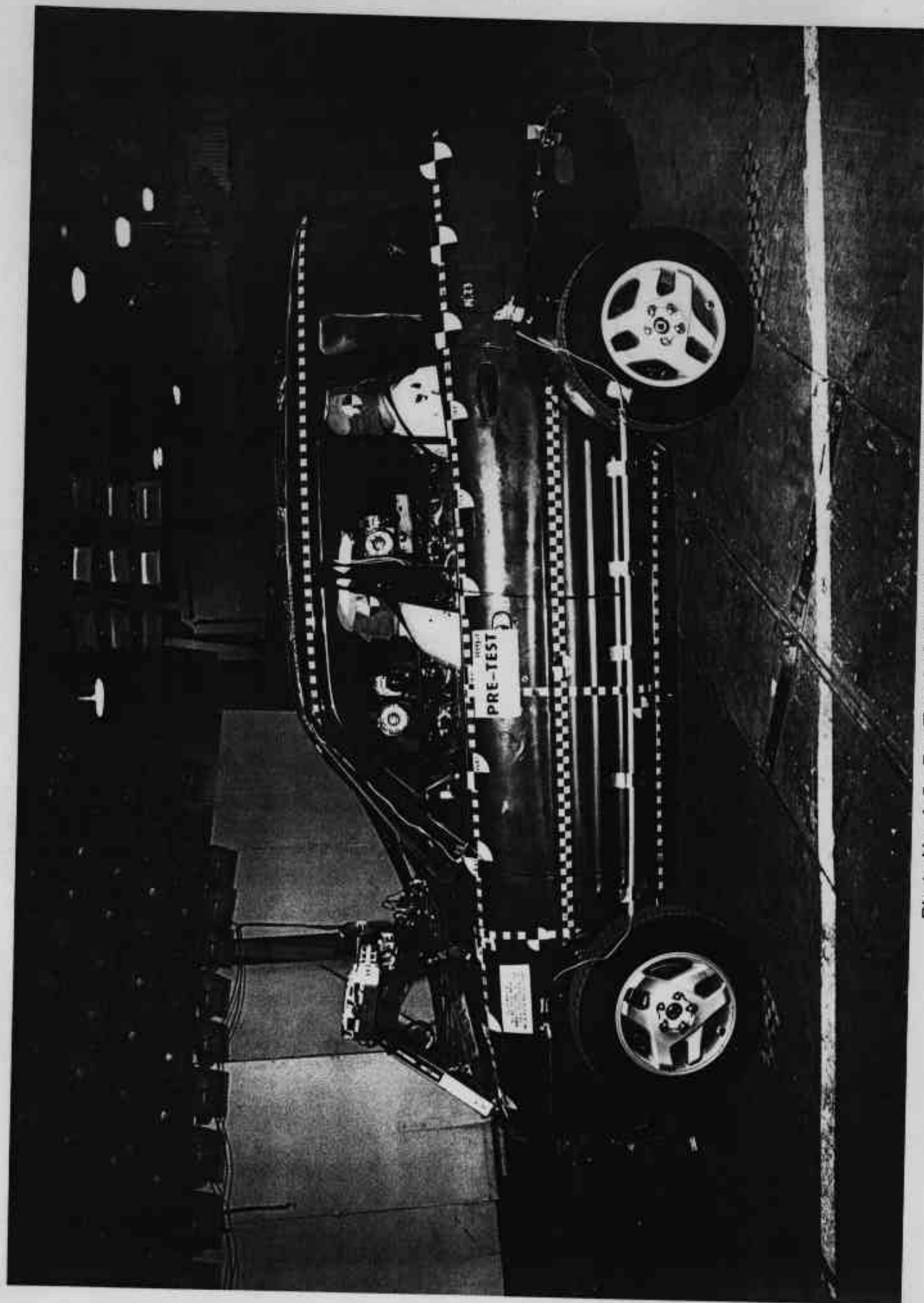


Photo No. A-5 - Pre-Test Left Side View of Test Vehicle

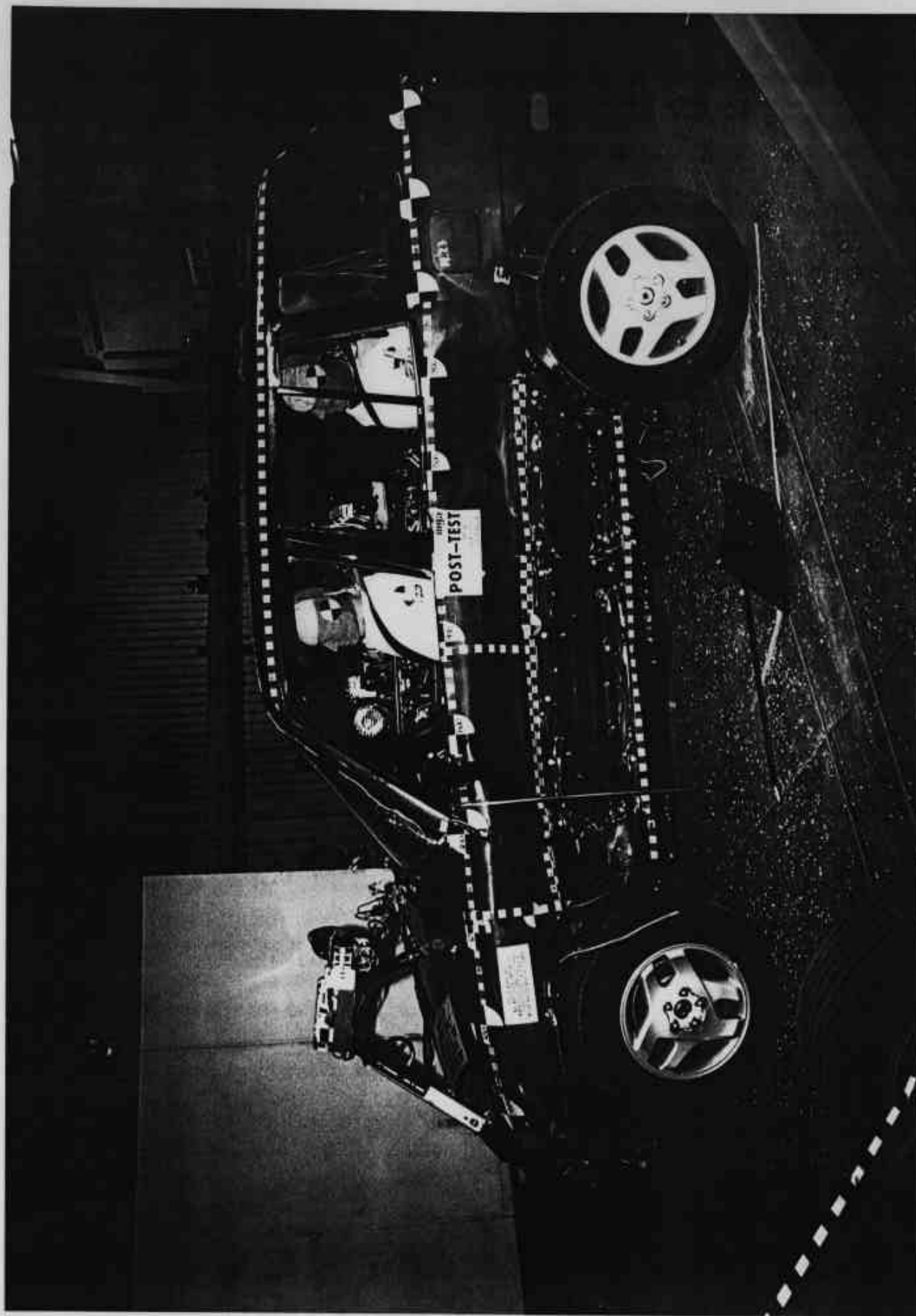


Photo No. A-6 - Post-Test Left Side View of Test Vehicle

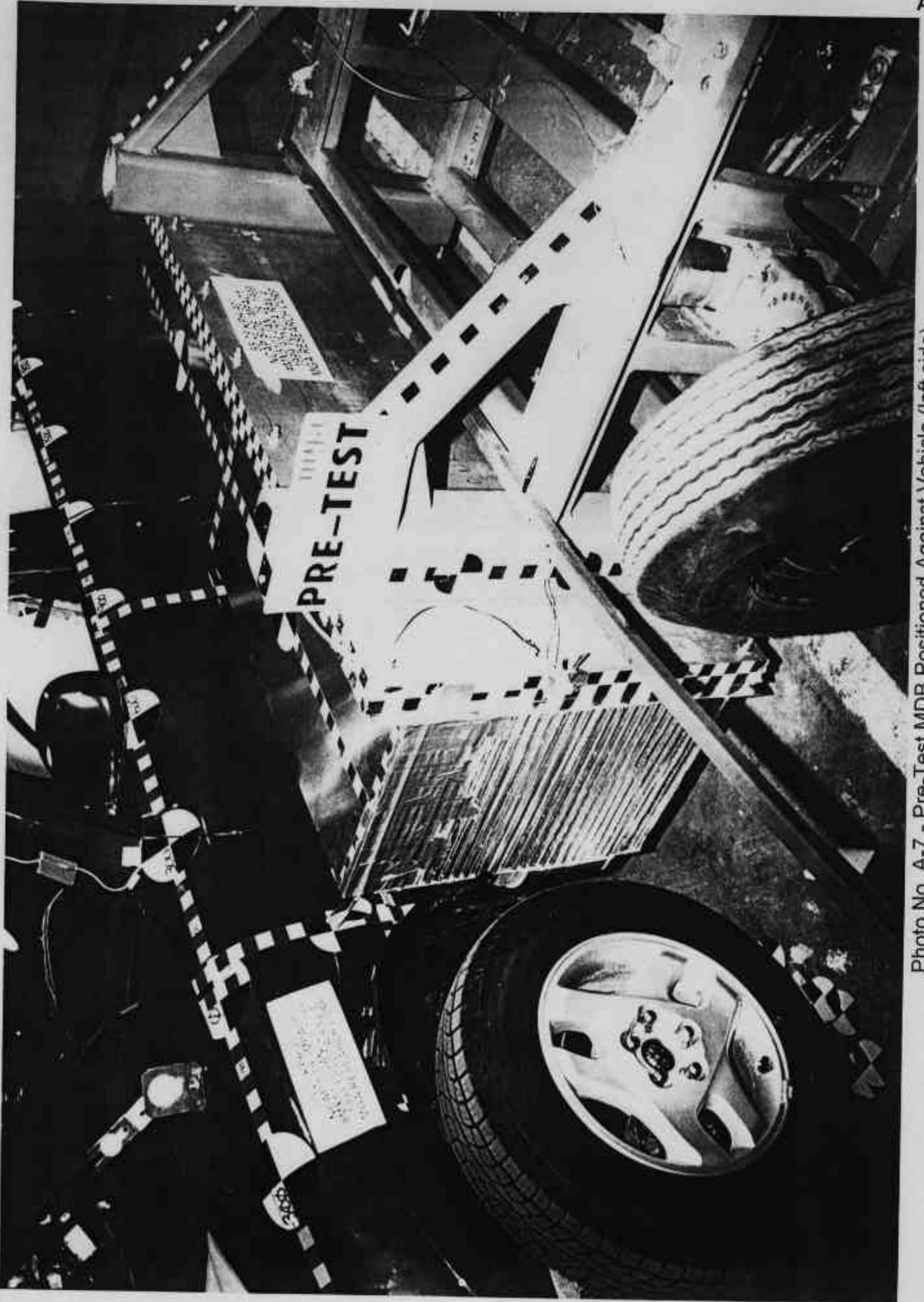


Photo No. A-7 - Pre-Test MDB Positioned Against Vehicle (left side)

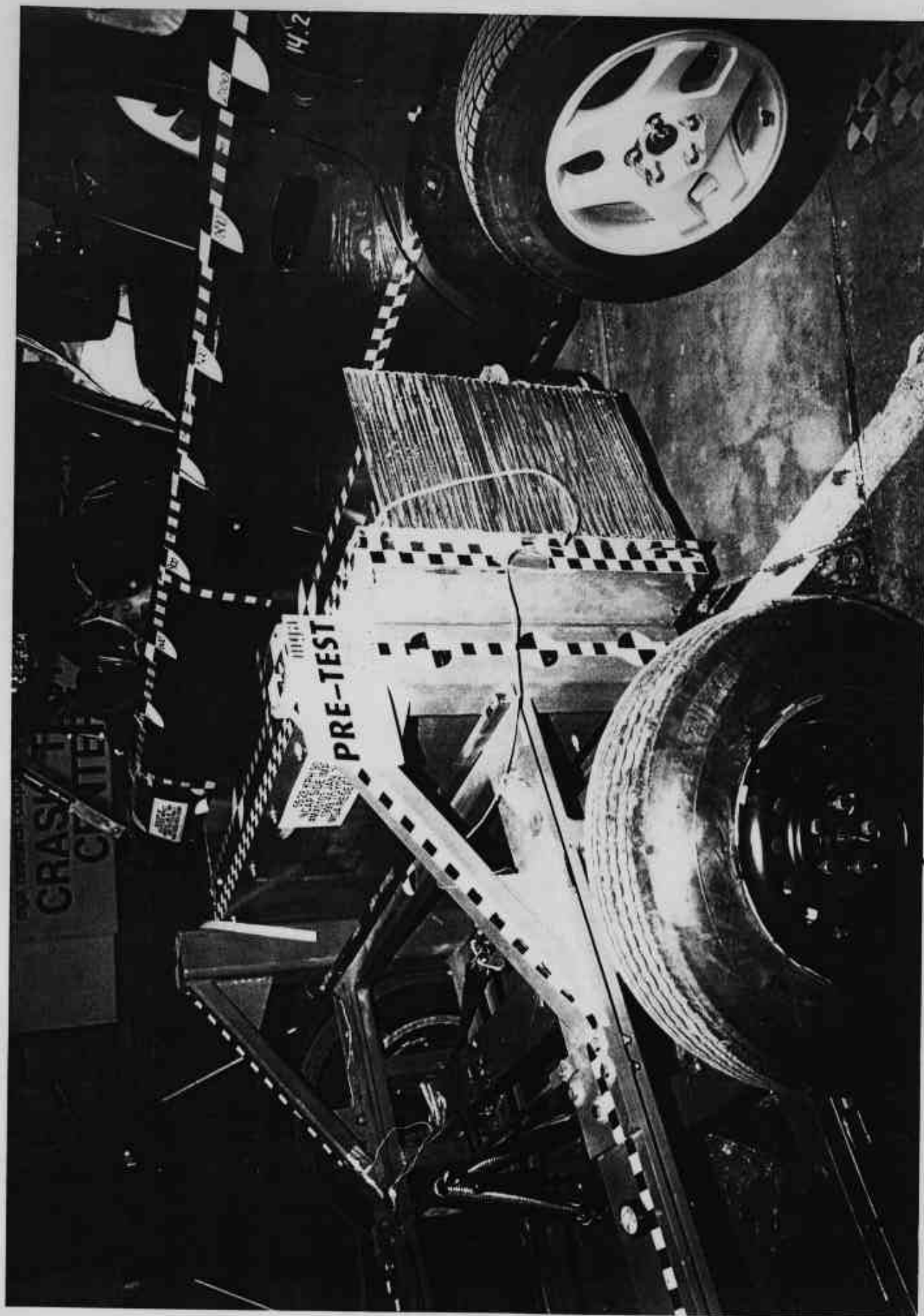


Photo No. A-8 - Pre-Test MDB Positioned Against Vehicle (right side)

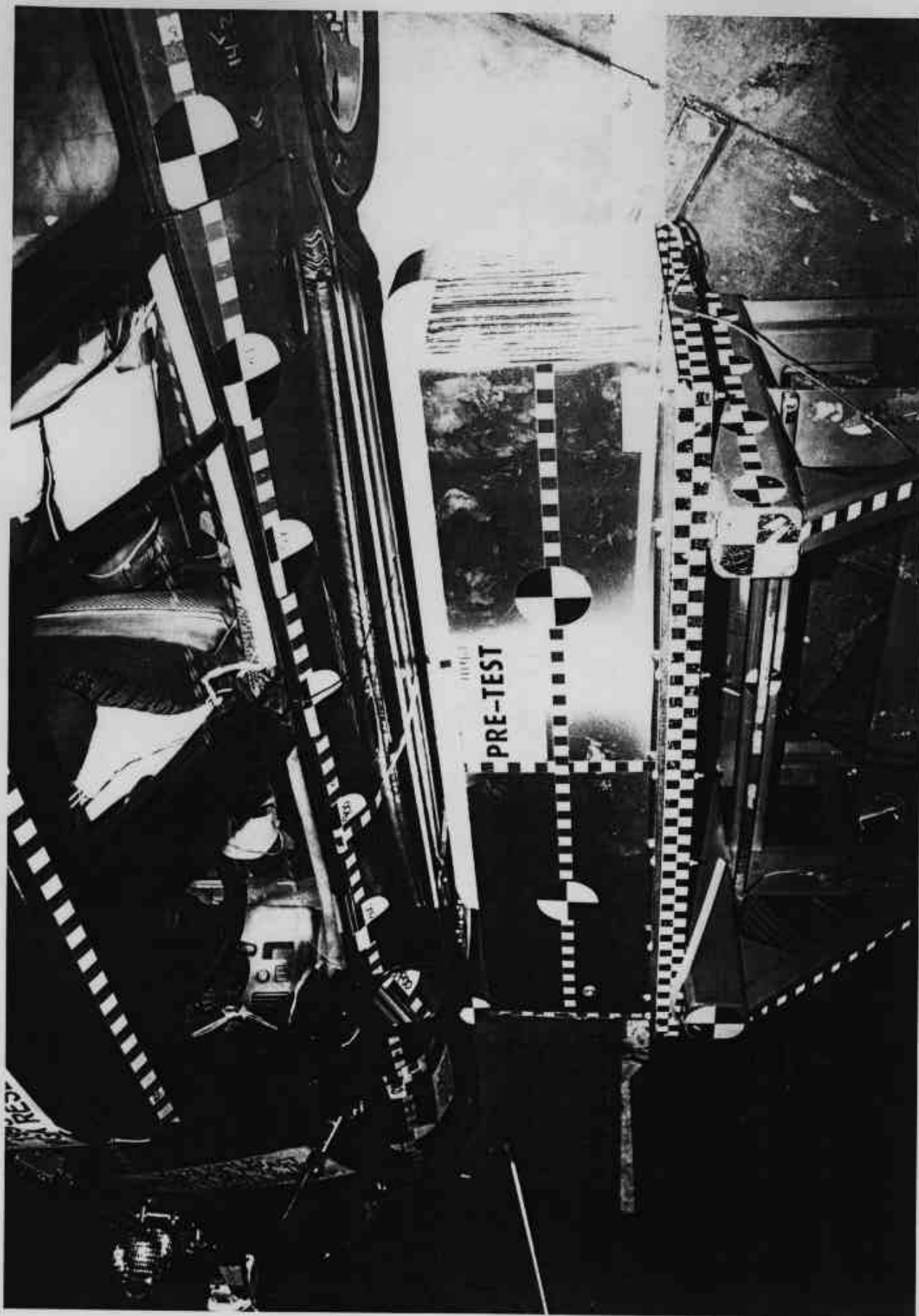


Photo No. A-9 - Pre-Test MDB Positioned Against Vehicle Overhead View

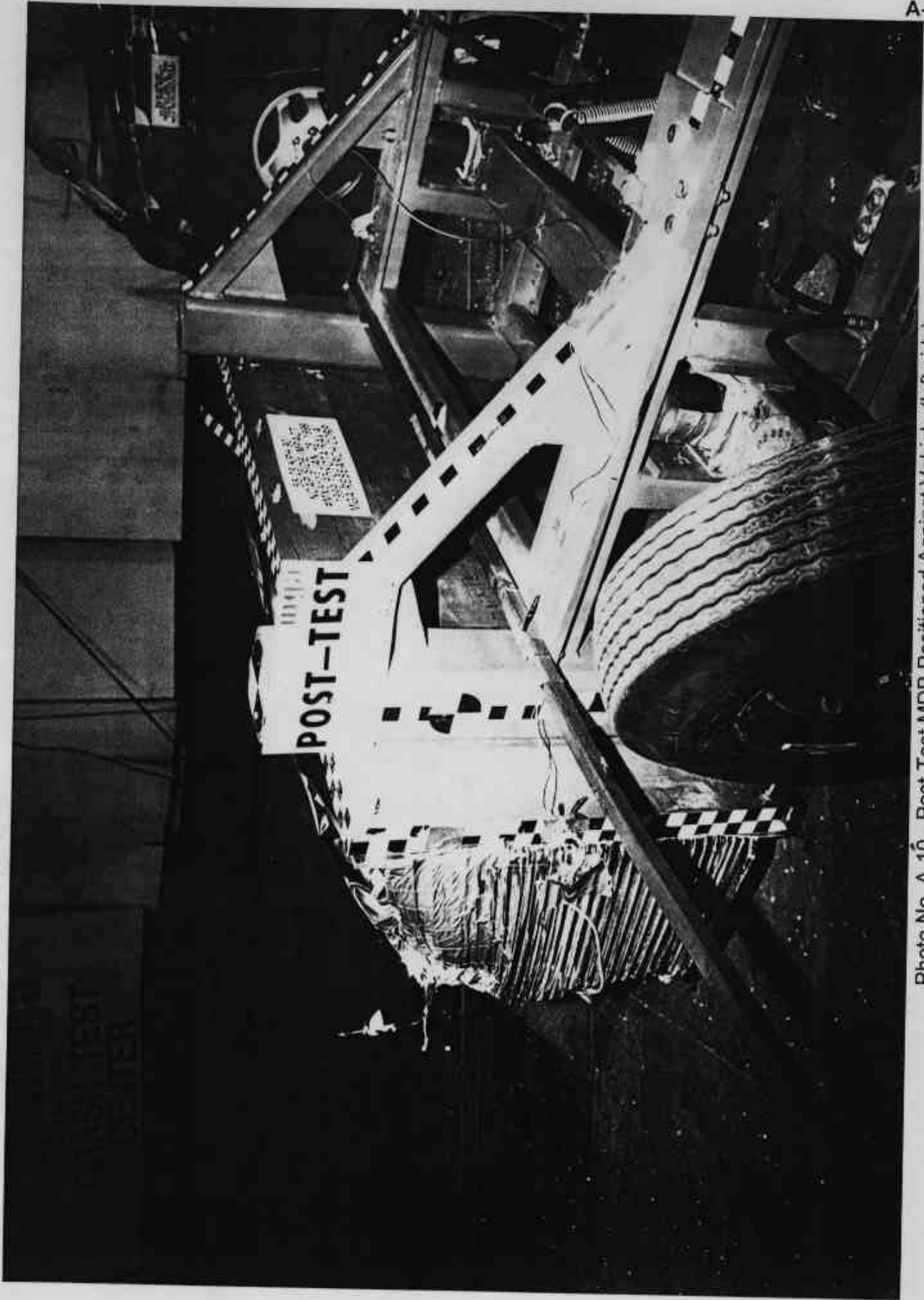


Photo No. A-10 - Post-Test MDB Positioned Against Vehicle (left side)

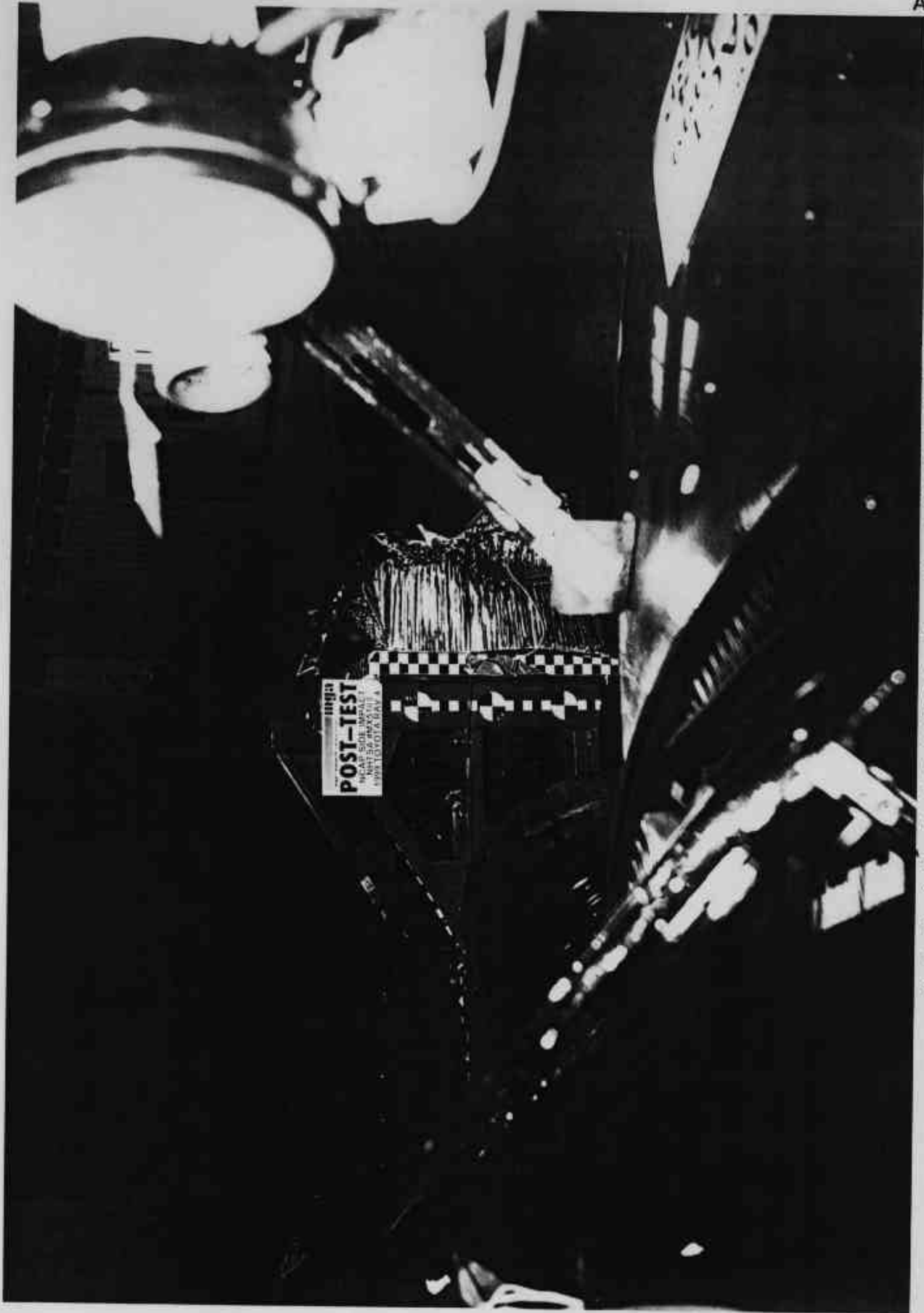


Photo No. A-11 - Post-Test MDB Positioned Against Vehicle (right side)



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

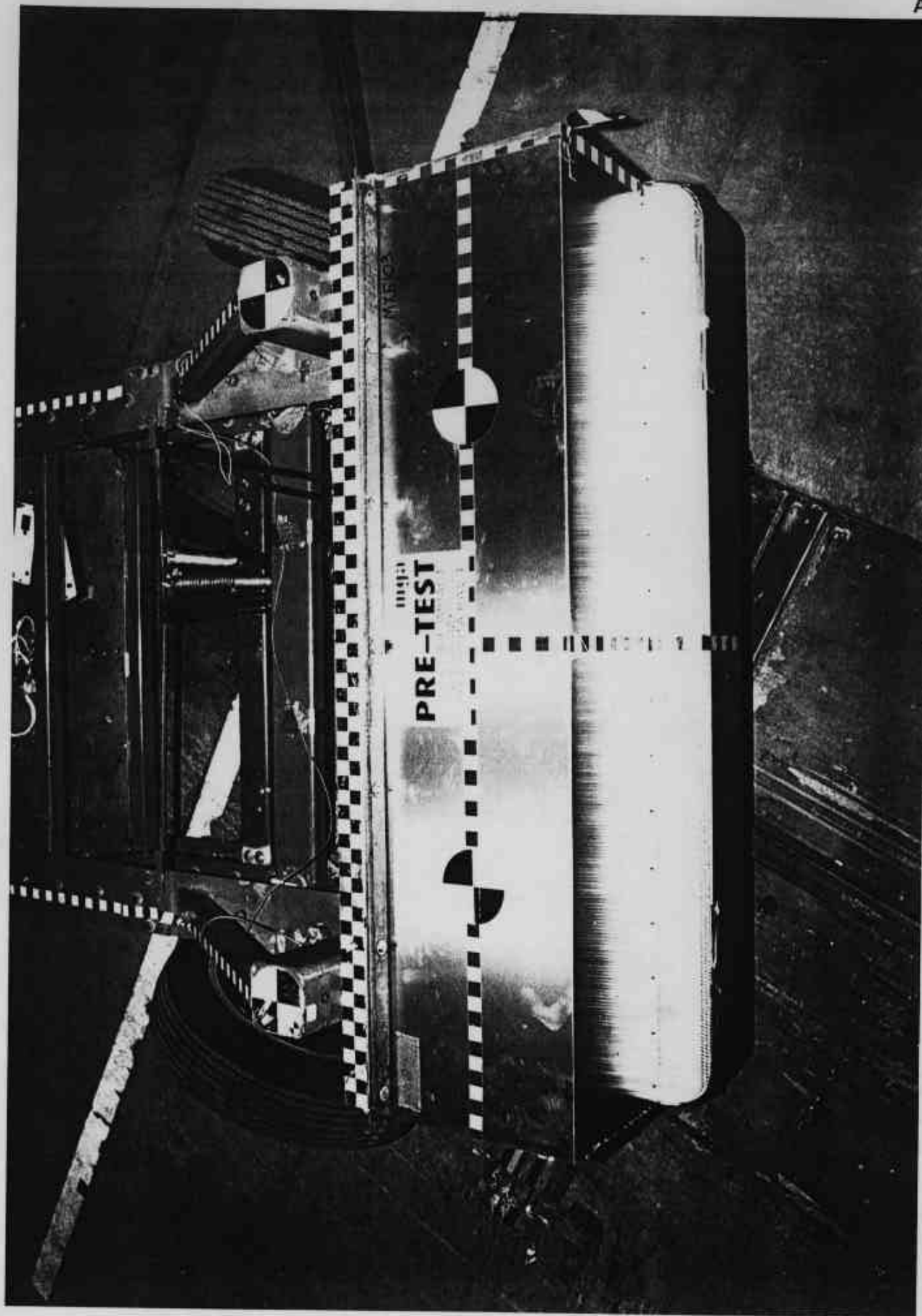


Photo No. A-13 - Pre-Test MDB Top View

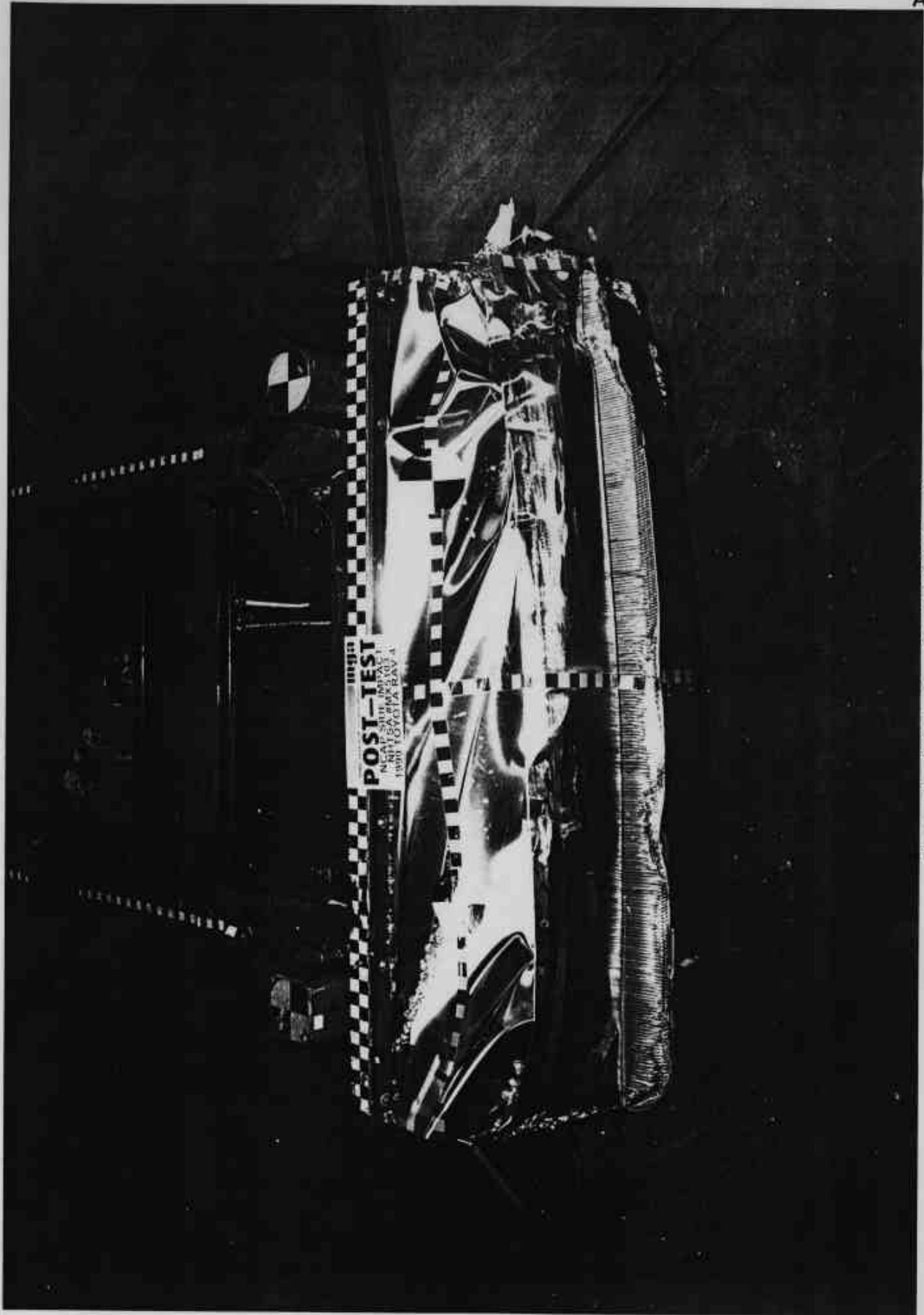


Photo No. A-14 - Post-Test MDB Top View

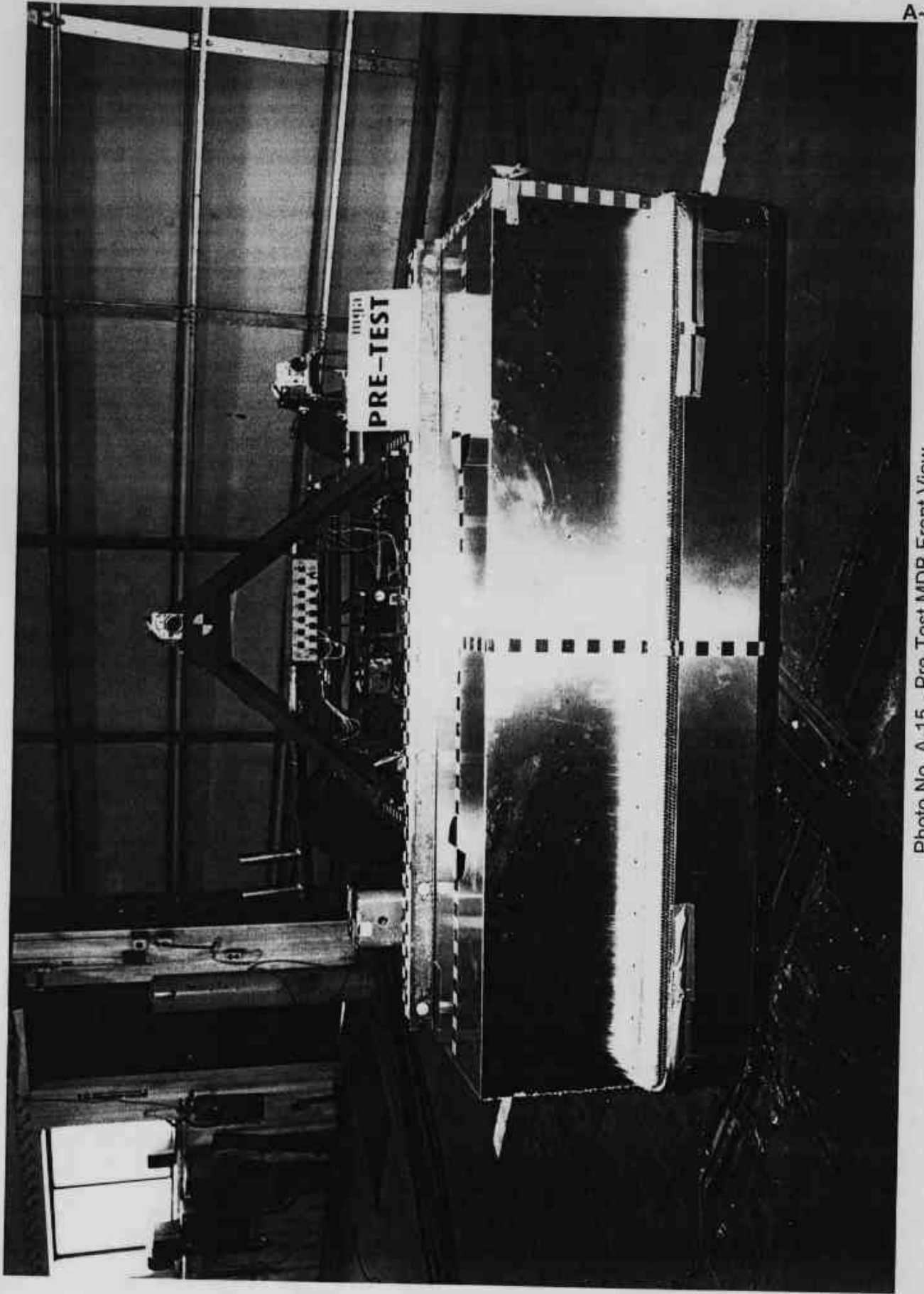


Photo No. A-15 - Pre-Test MDB Front View

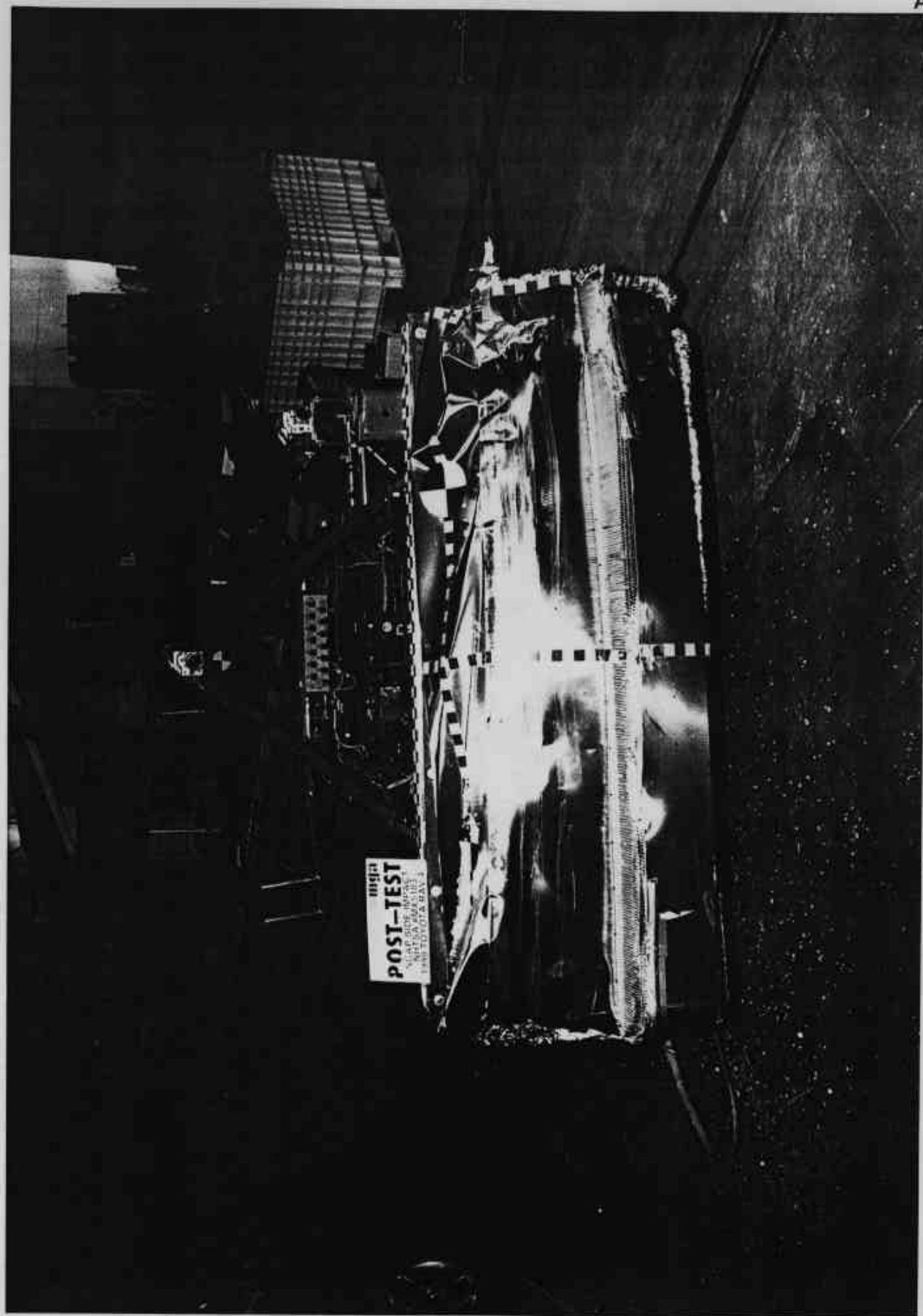


Photo No. A-16 - Post-Test MDB Front View

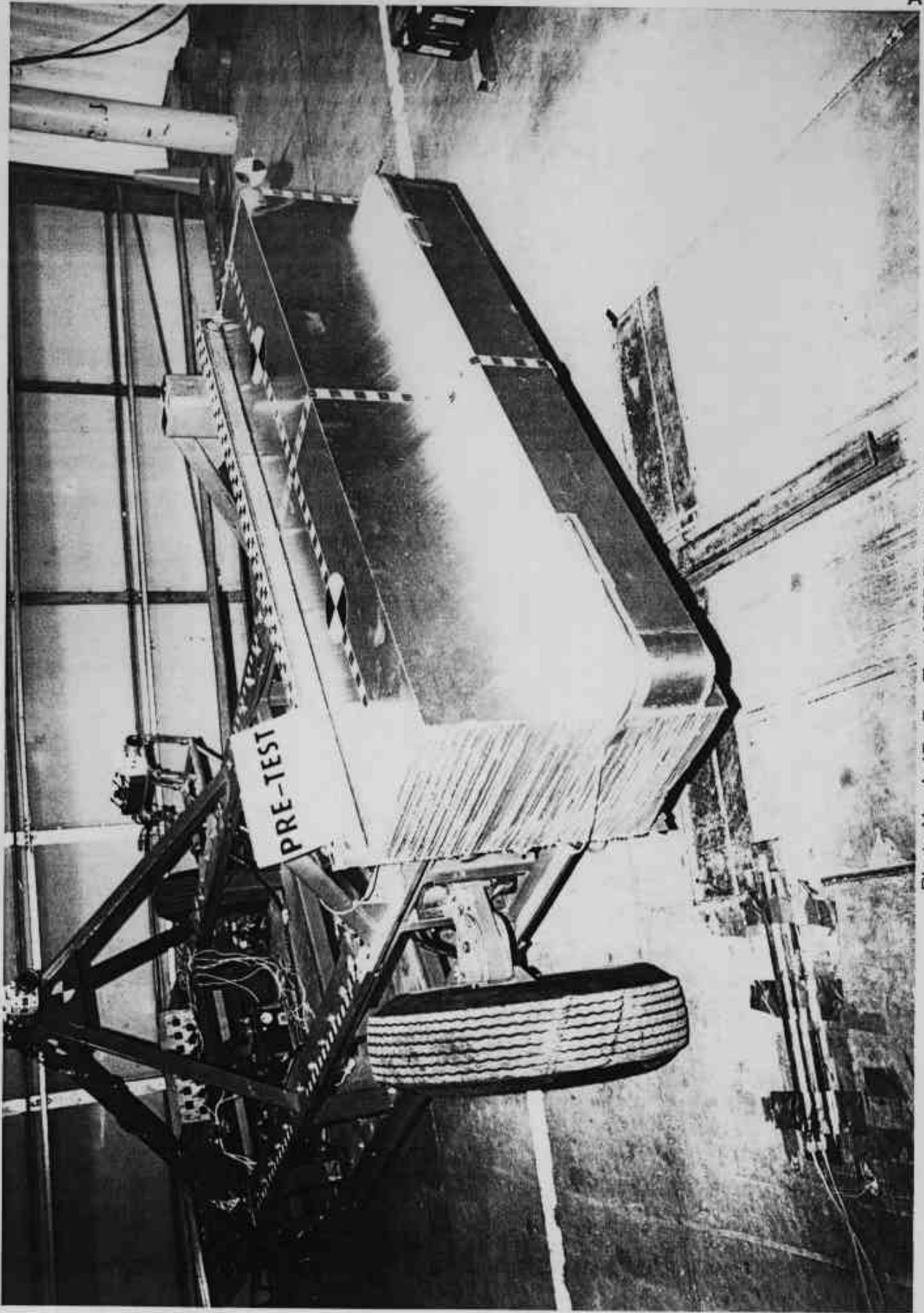


Photo No. A-17 - Pre-Test MDB Right Side View



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



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

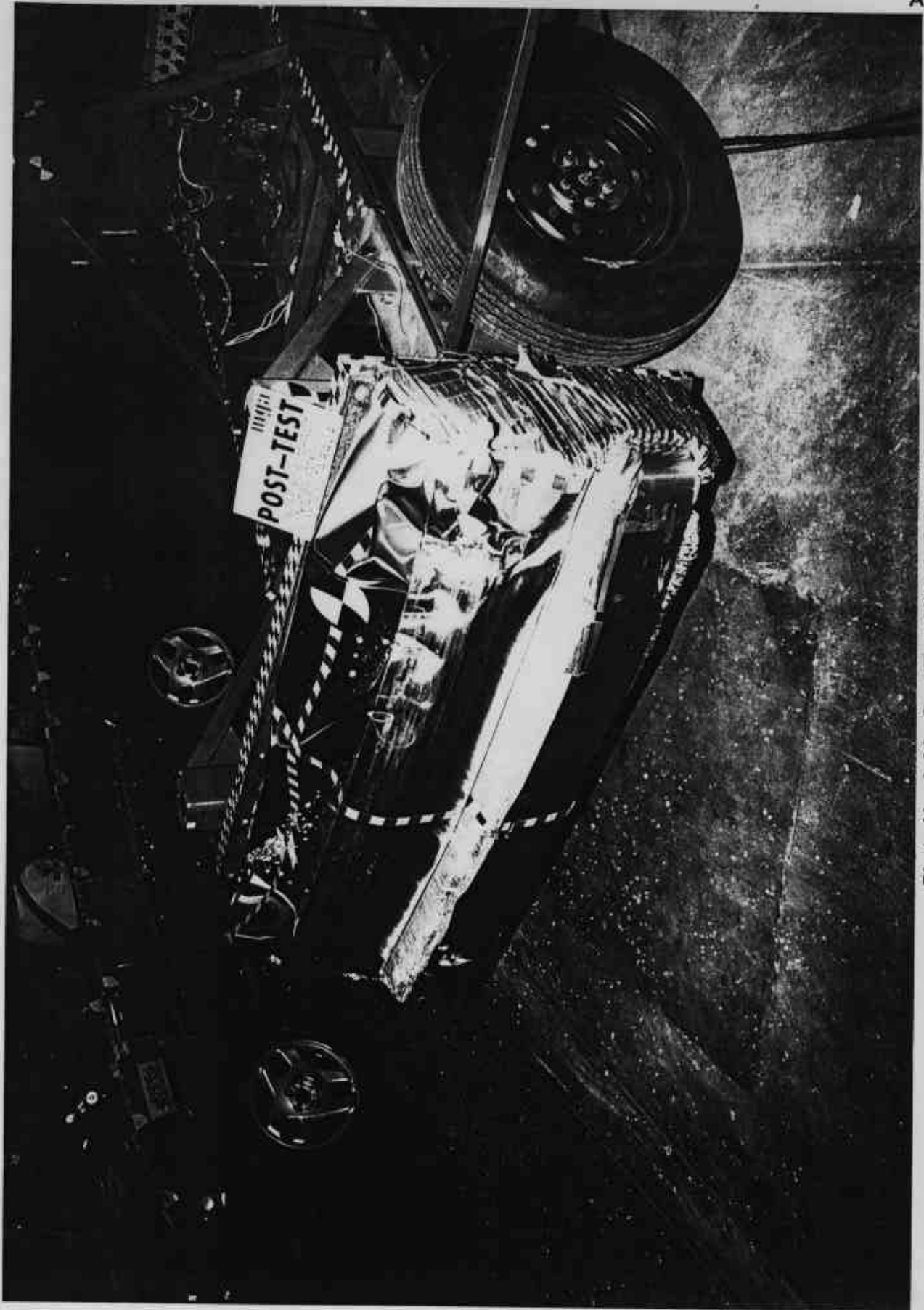


Photo No. A-20 - Post-Test MDB Left Side View

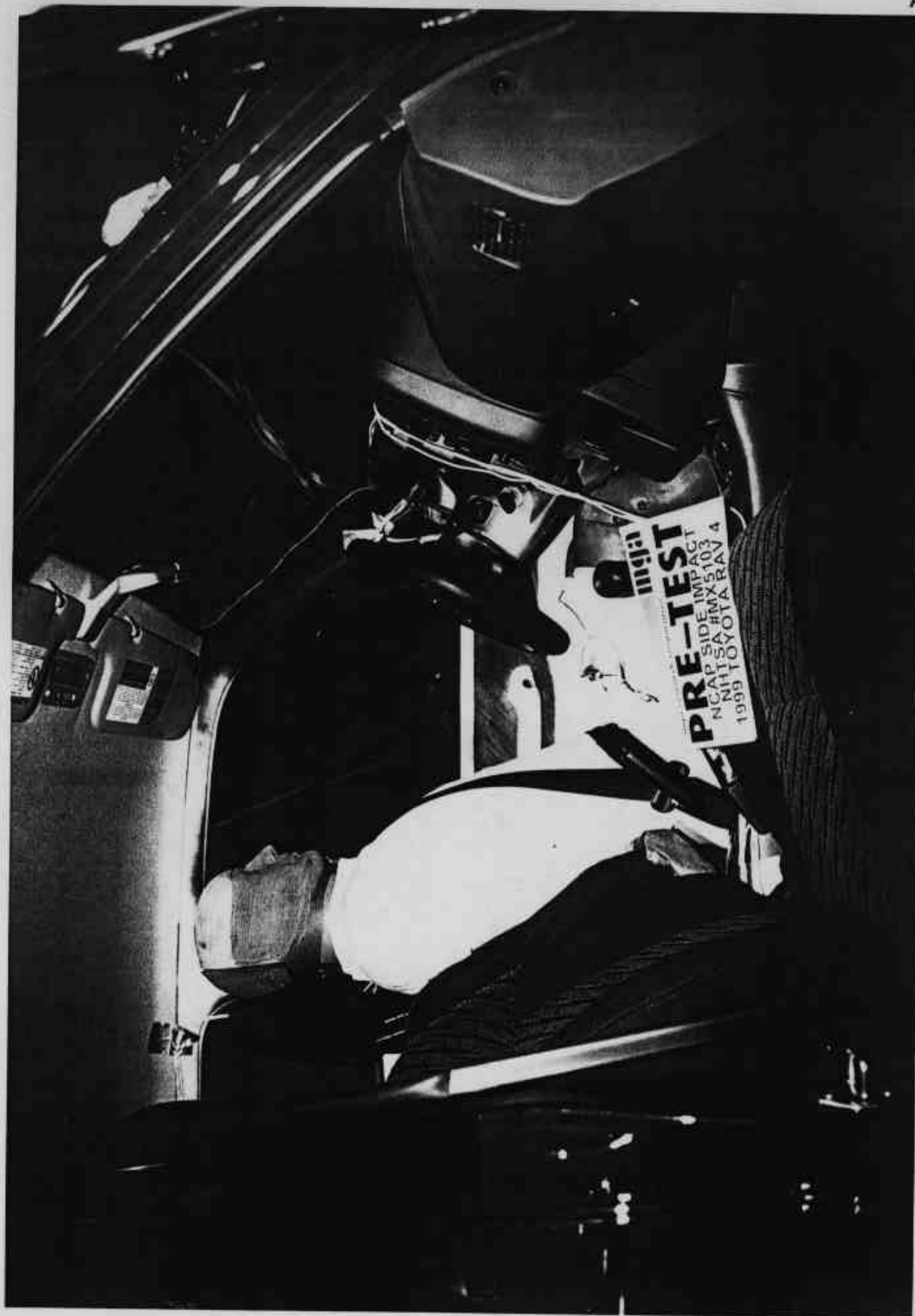


Photo No. A-21 - Pre-Test Driver Dummy Right Side View

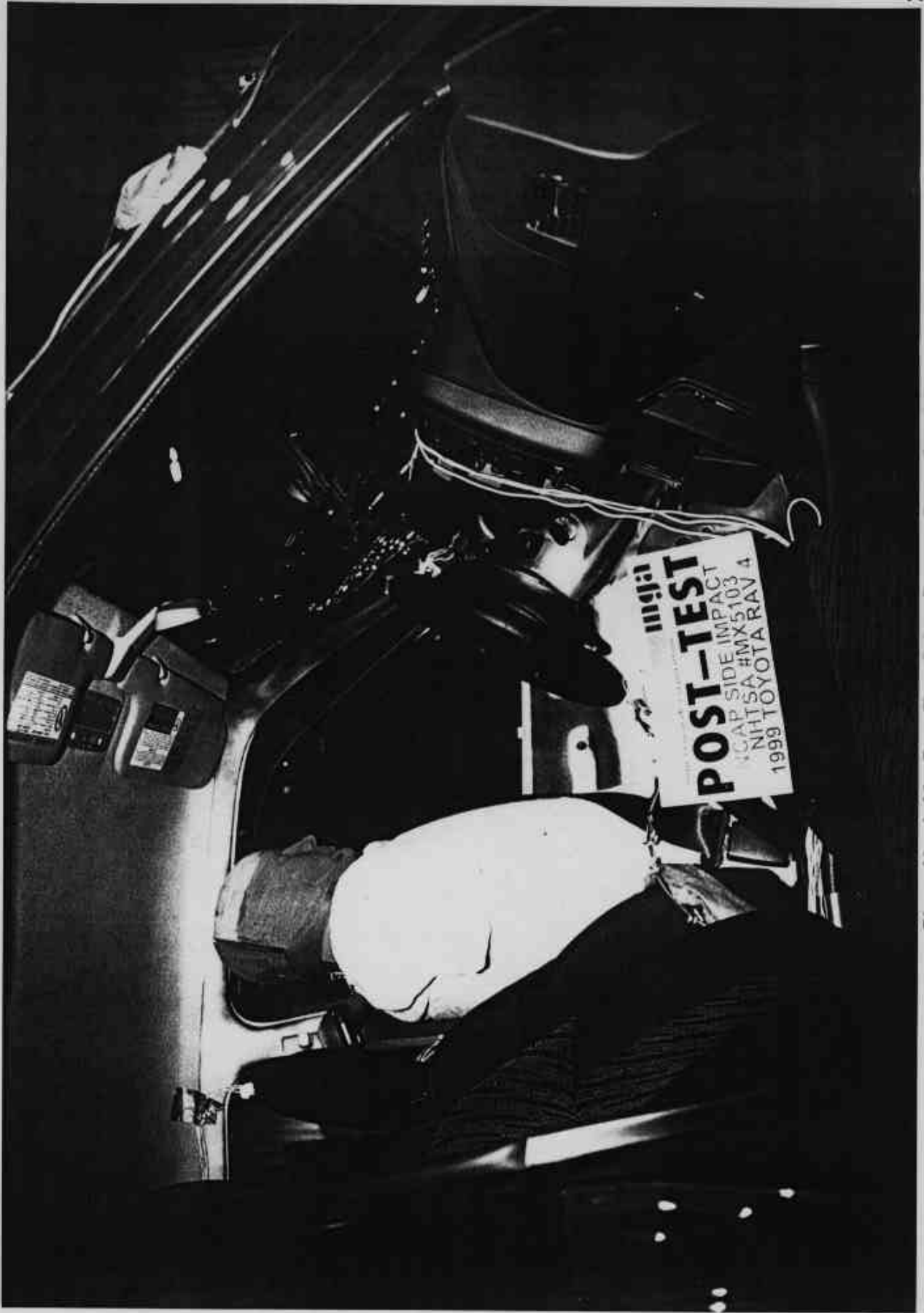


Photo No. A-22 - Post-Test Driver Dummy Right Side View

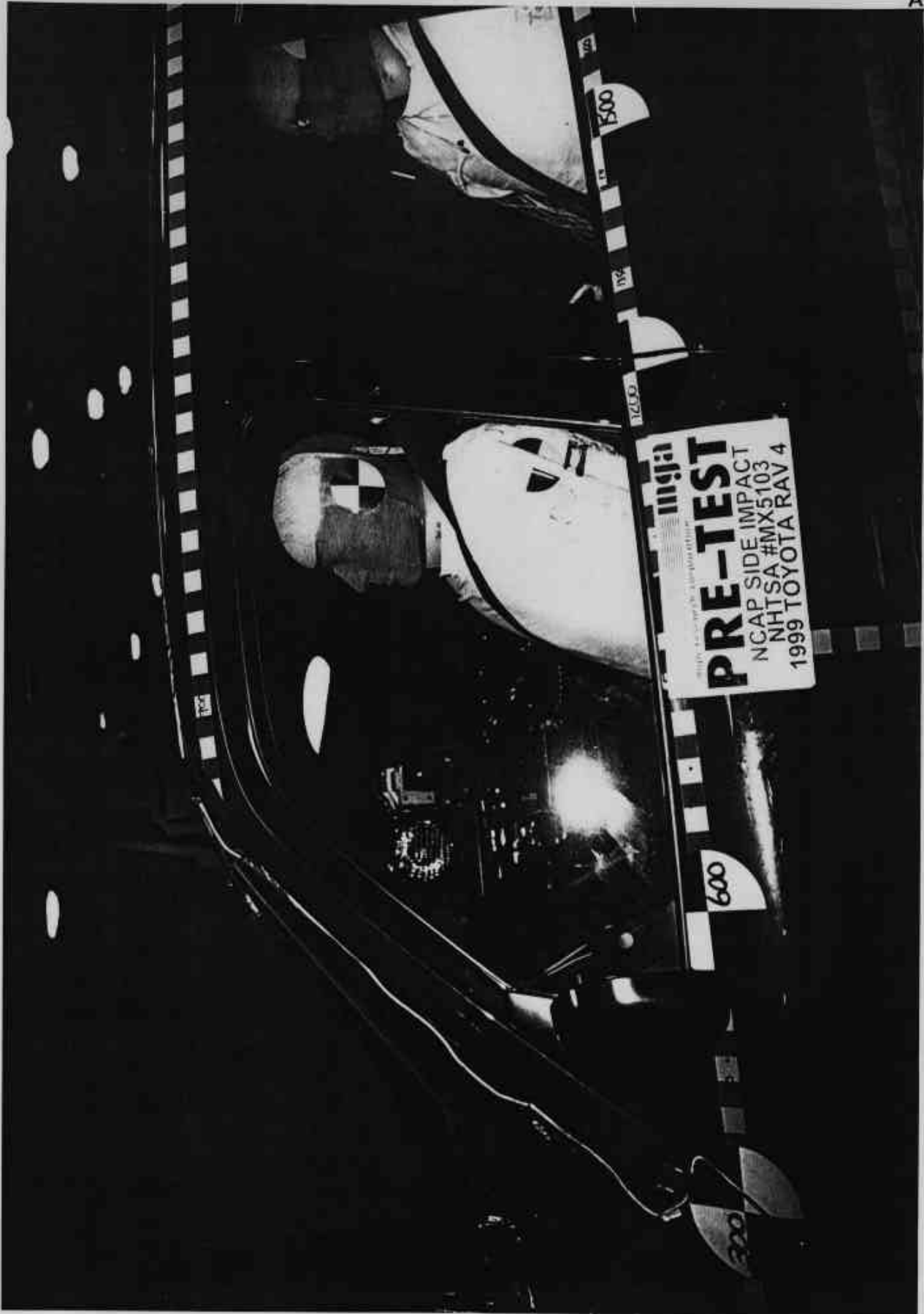


Photo No. A-23 - Pre-Test Driver Dummy Left Side View



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

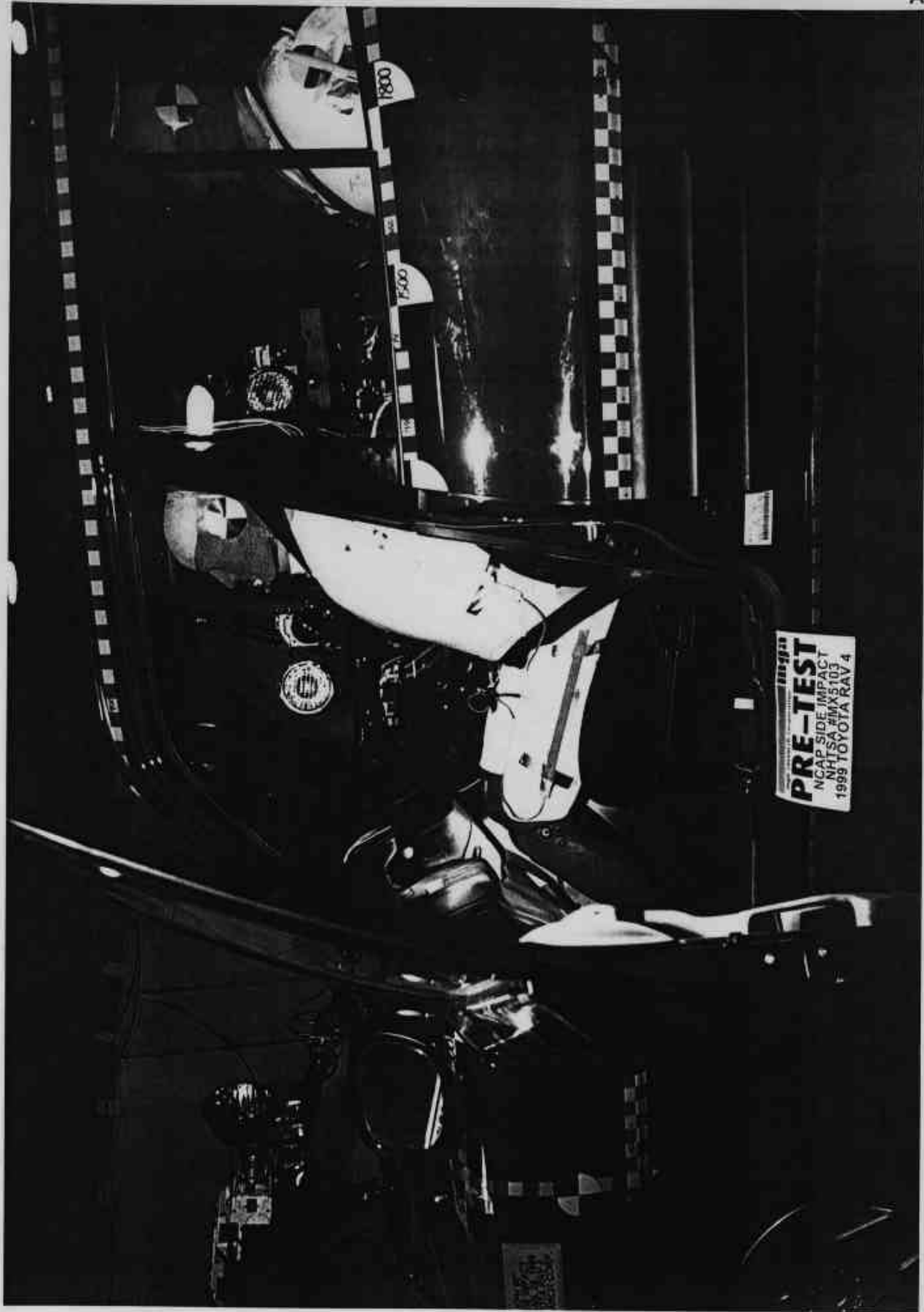


Photo No. A-25 - Pre-Test Driver Dummy Left Side View (Door Open)



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

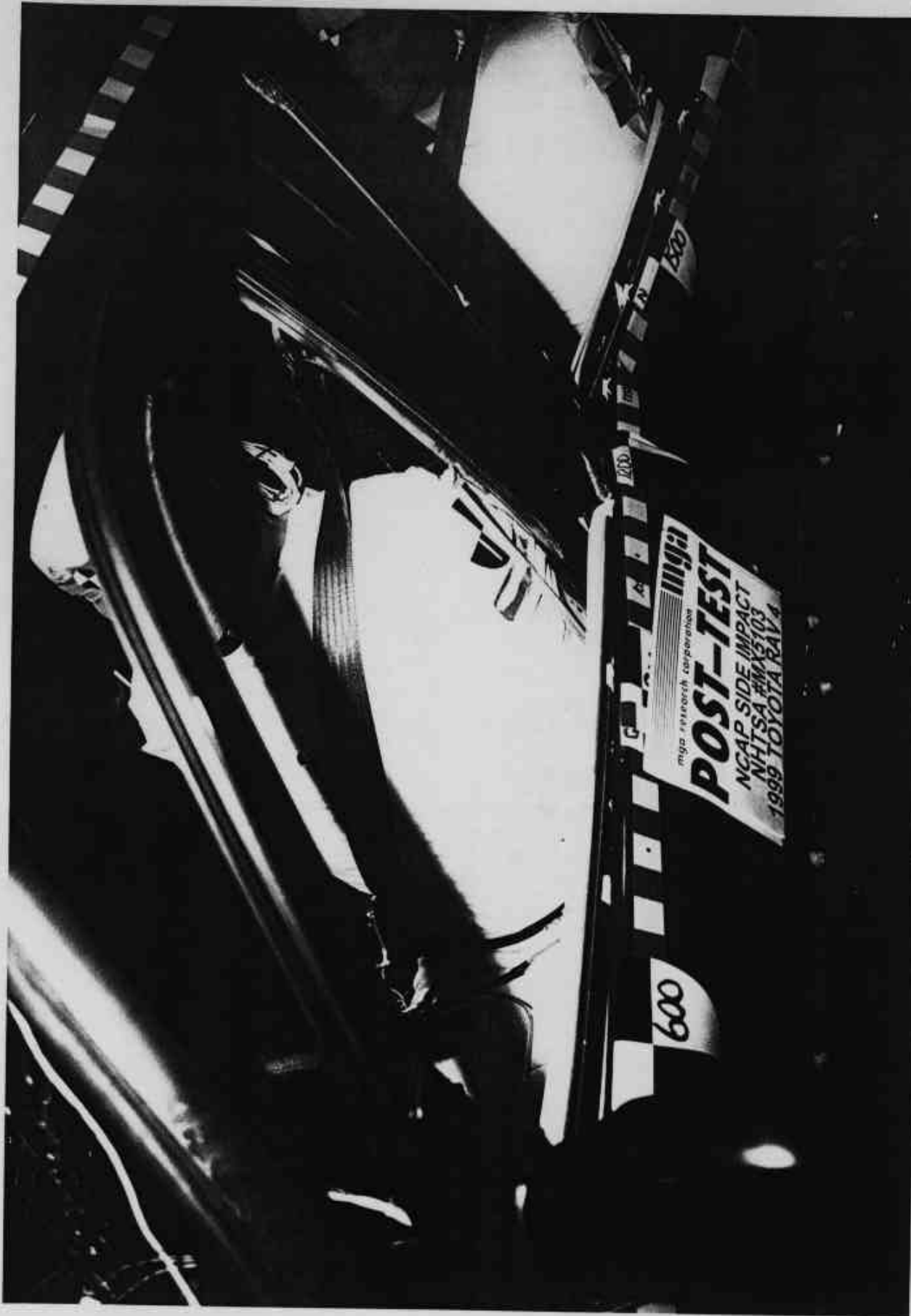


Photo No. A-27 - Post-Test Driver Dummy Shoulder and Door Top View

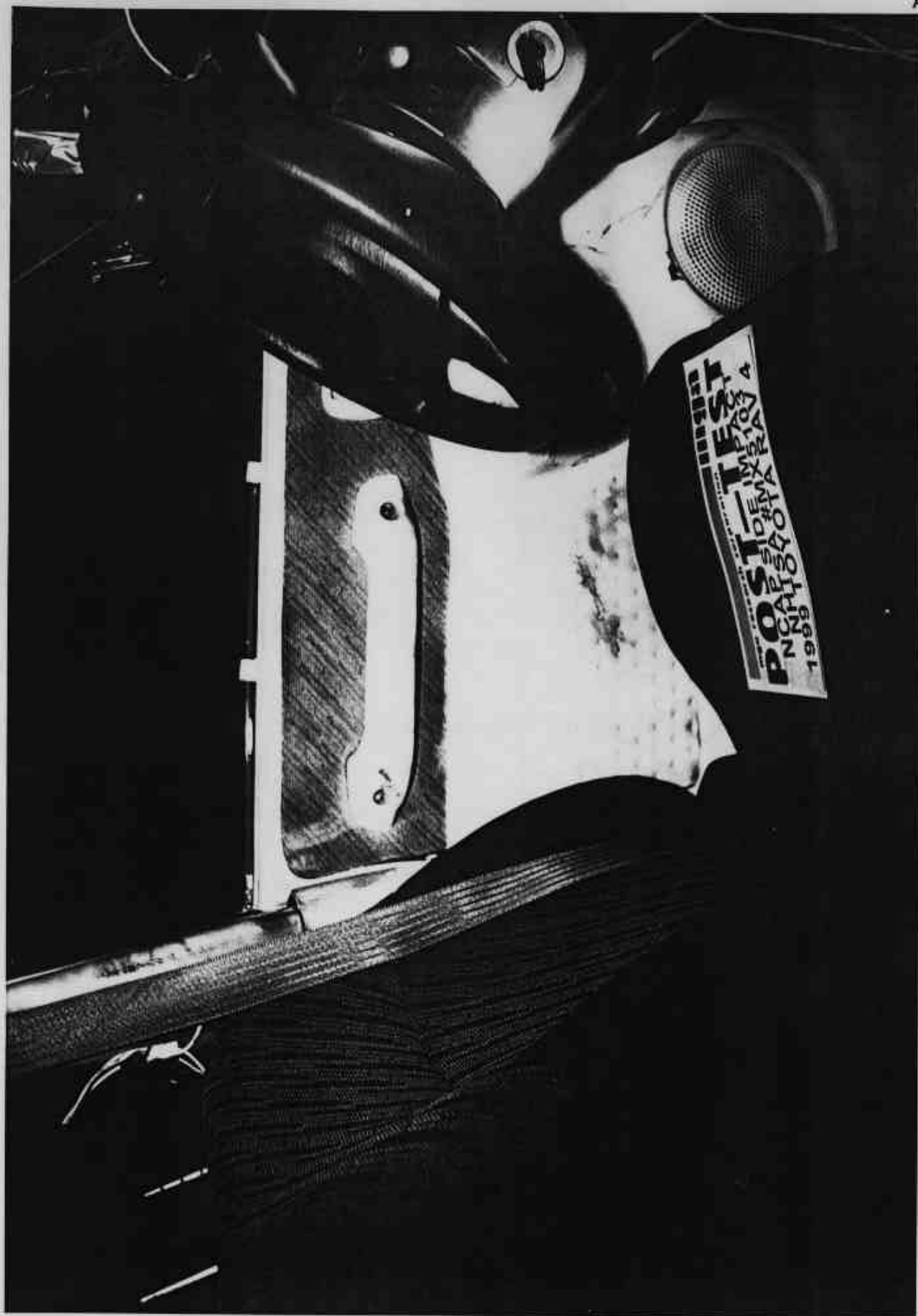


Photo No. A-28 - Post-Test Driver Dummy Contact



Photo No. A-29 - Post-Test Driver Dummy Head Contact

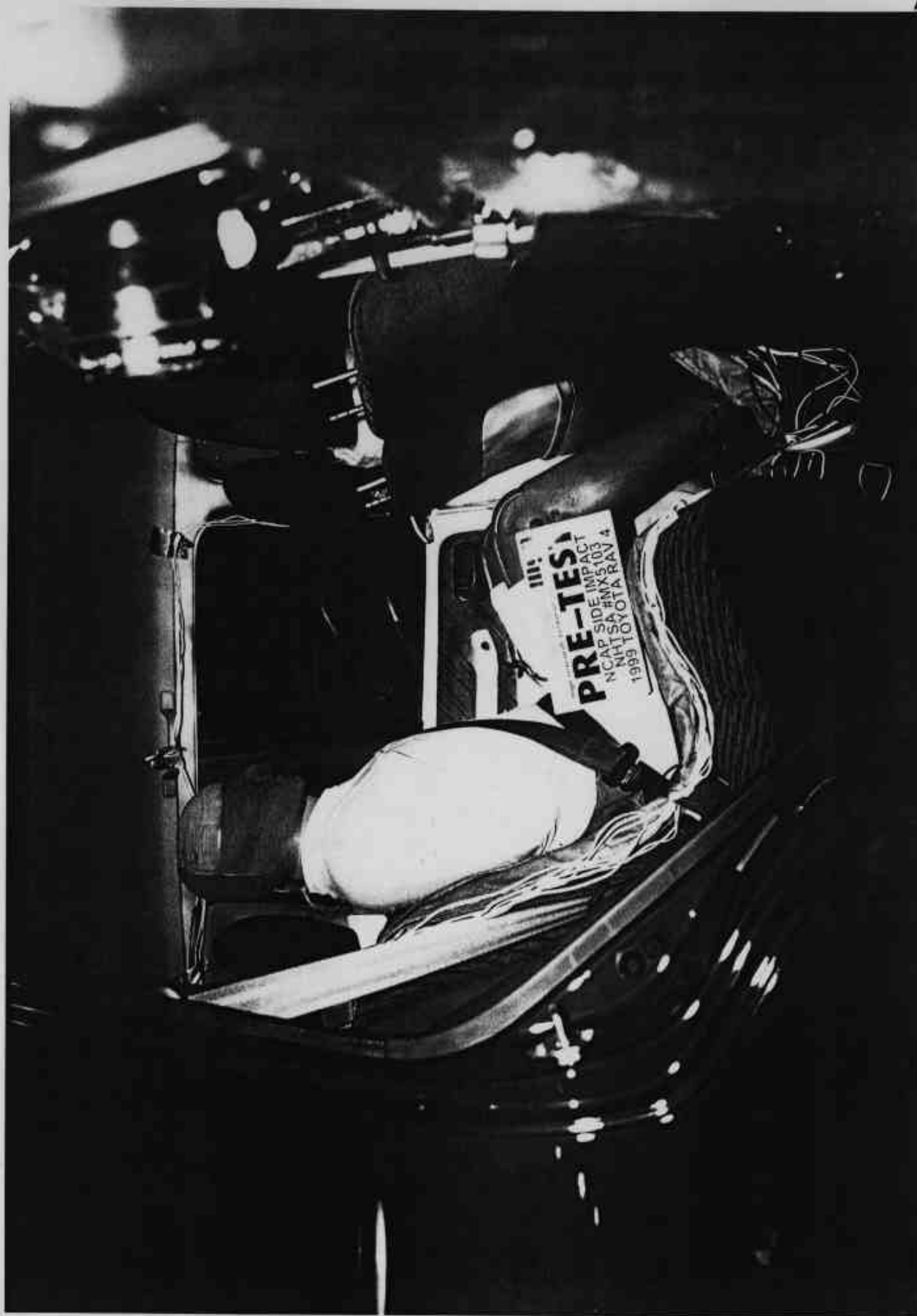


Photo No. A-30 - Pre-Test Passenger Dummy Right Side View



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

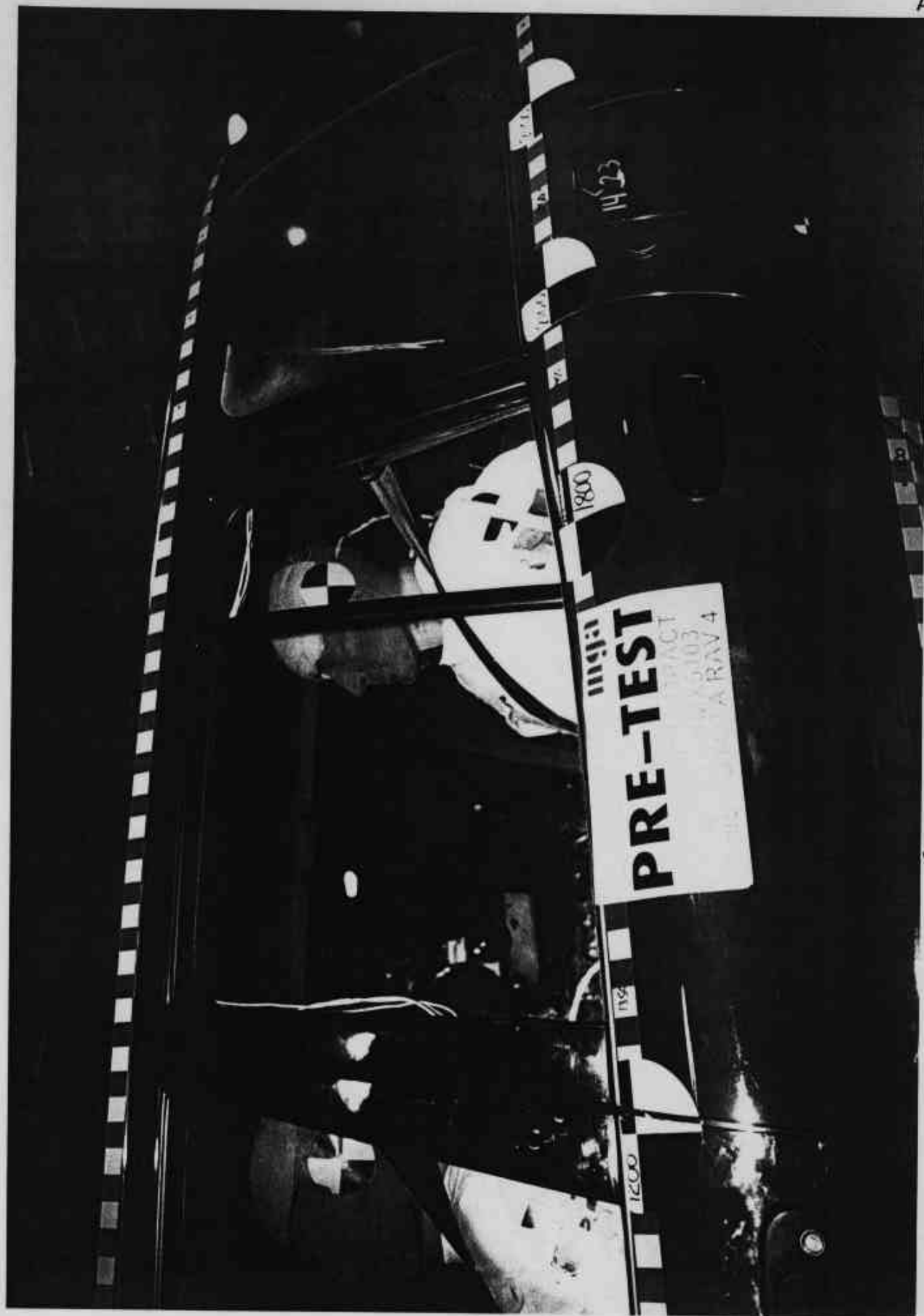


Photo No. A-32 - Pre-Test Passenger Dummy Left Side View



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

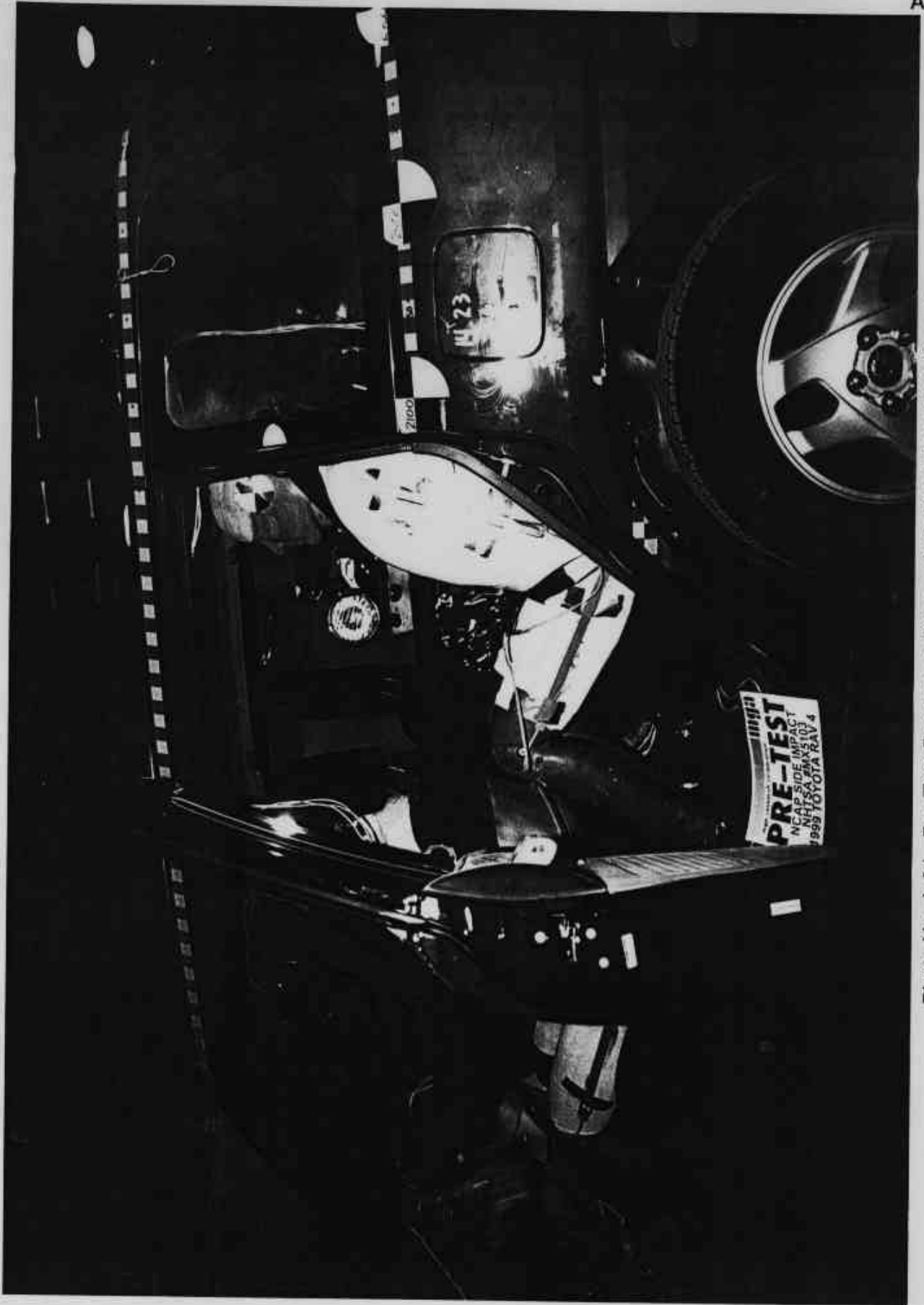


Photo No. A-34 - Pre-Test Passenger Dummy Left Side View (Door Open)



Photo No. A-35 - Pre-Test Passenger Dummy Shoulder and Door Top View

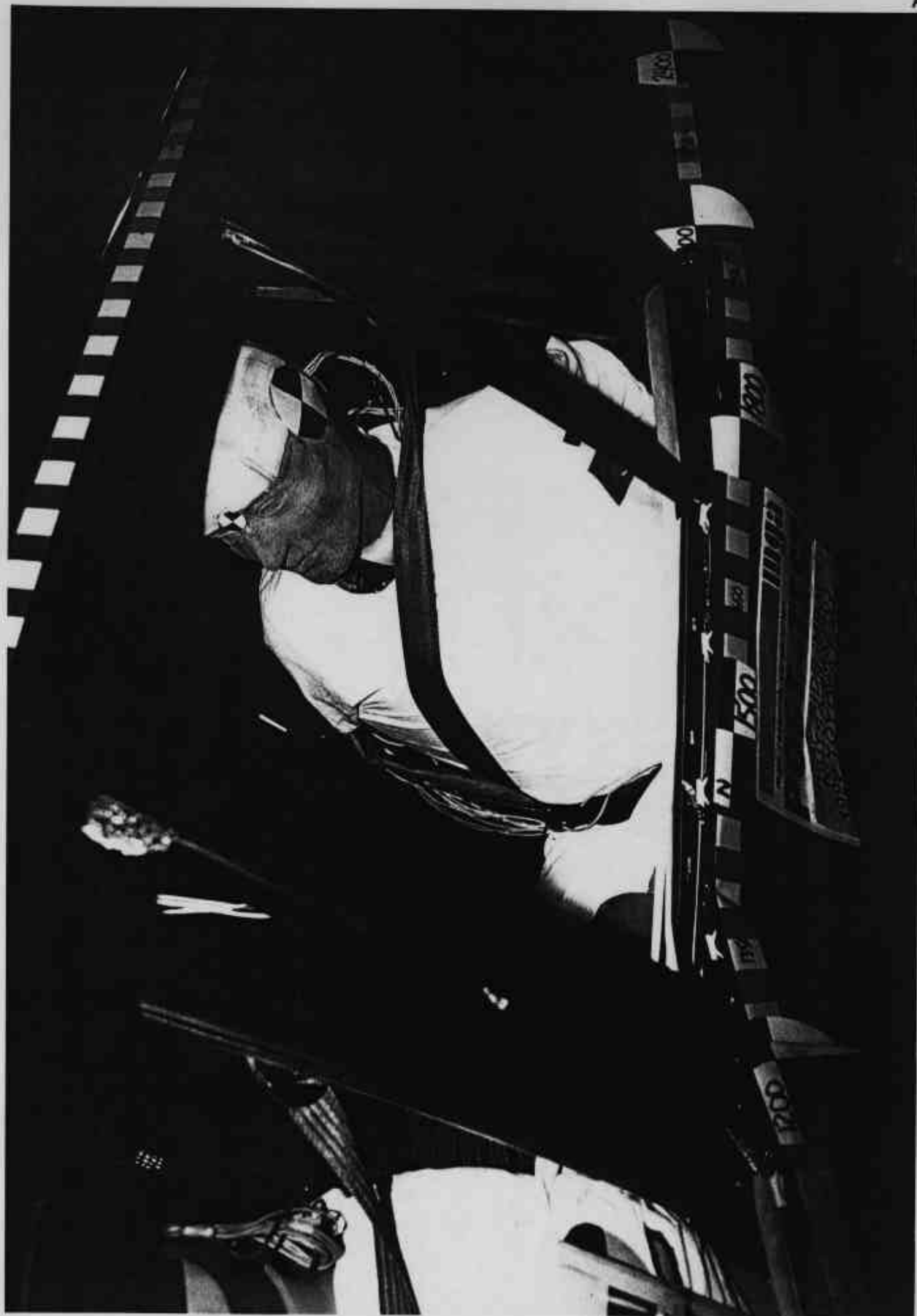


Photo No. A-36 - Post-Test Passenger Dummy Shoulder and Door Top View



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



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

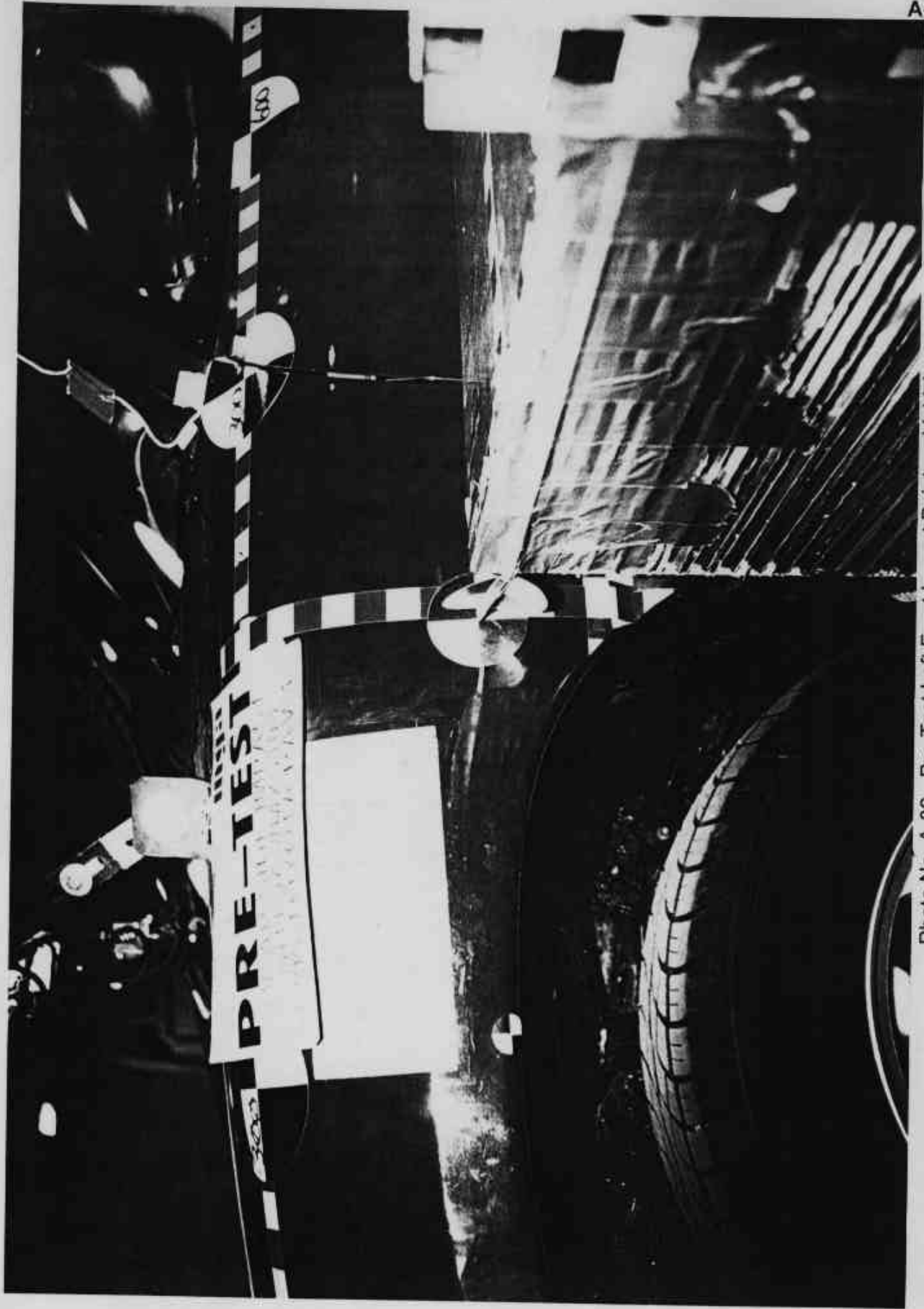


Photo No. A-39 - Pre-Test Left Front Impact Point on Vehicle

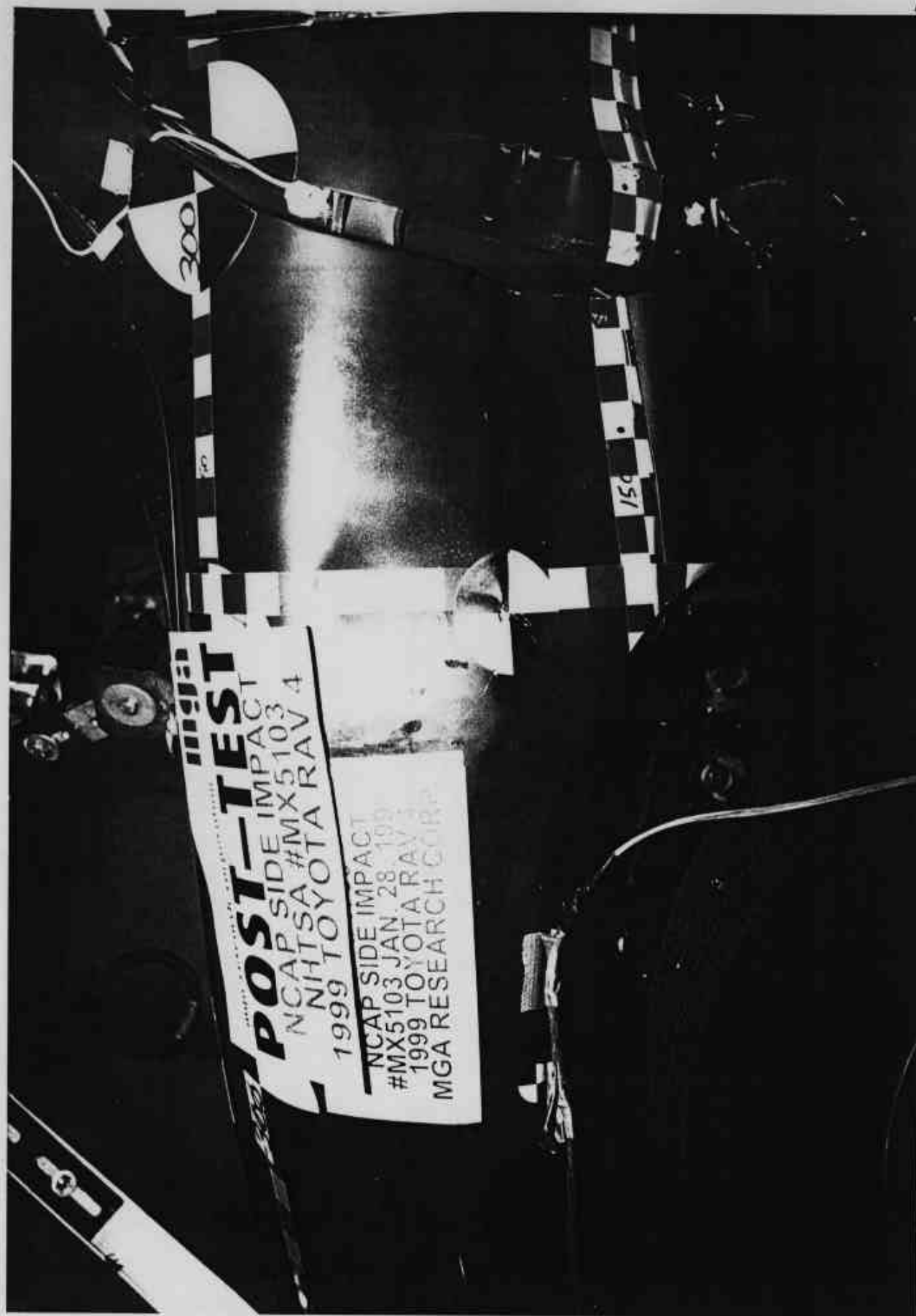


Photo No. A-40 - Post-Test Left Front Impact Point on Vehicle

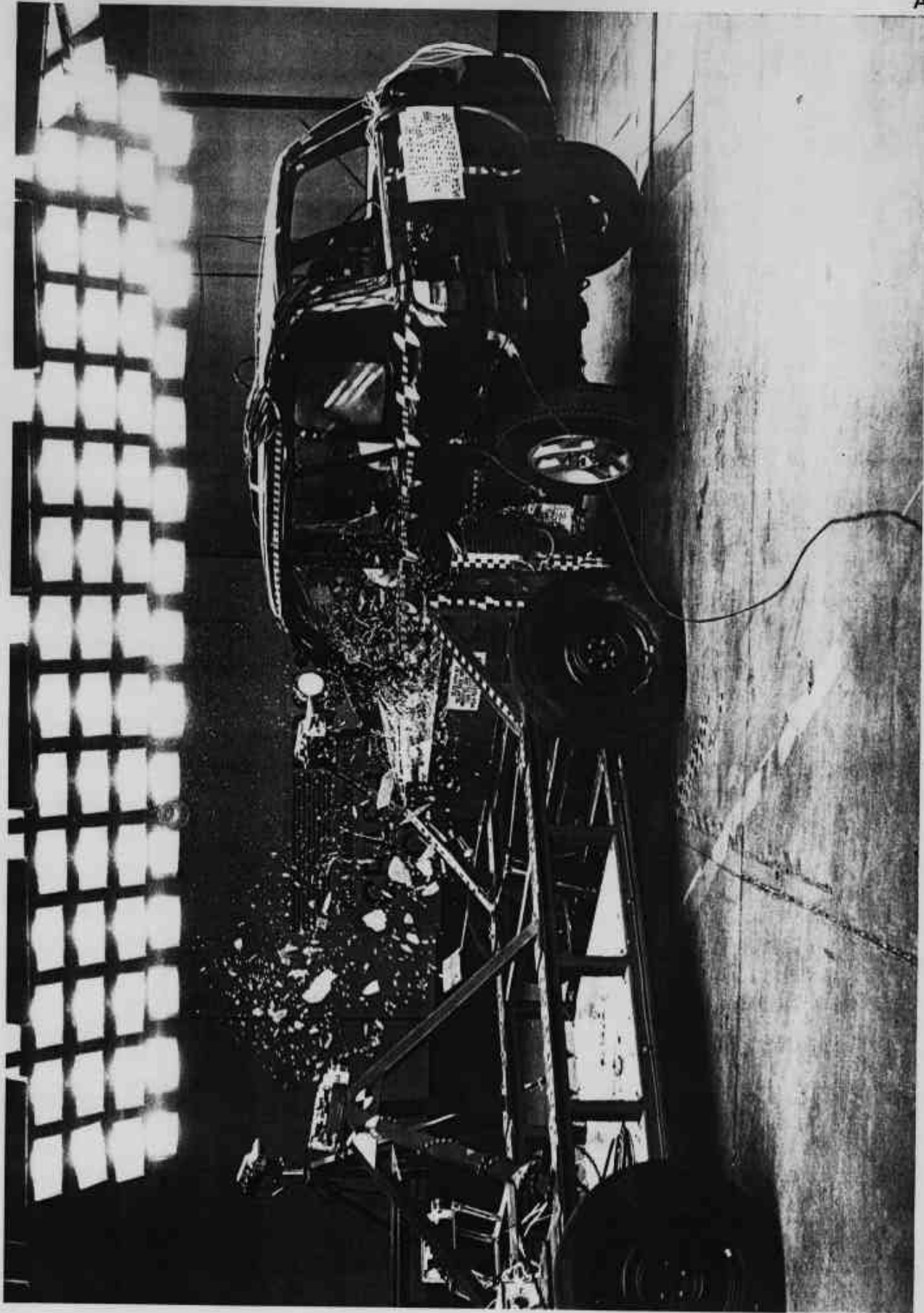


Photo No. A-41 - Impact

* MFD BY TOYOTA MOTOR CORPORATION DATE 11/98
GVWR (LBS) 3948
GAWR (LBS) FRT 2006 WITH 215/70R16 RIMS AT 28 PSI COLD
16X6J TIRES
RR 2183 WITH 215/70R16 RIMS AT 26 PSI COLD
16X6J TIRES
THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL
AND MOTOR VEHICLE SAFETY AND THEFT PREVENTION
STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE
SHOWN ABOVE JT3HP10V6X712271 MPV



Photo No. A-42 - Vehicle Certification Label and Tire Placard

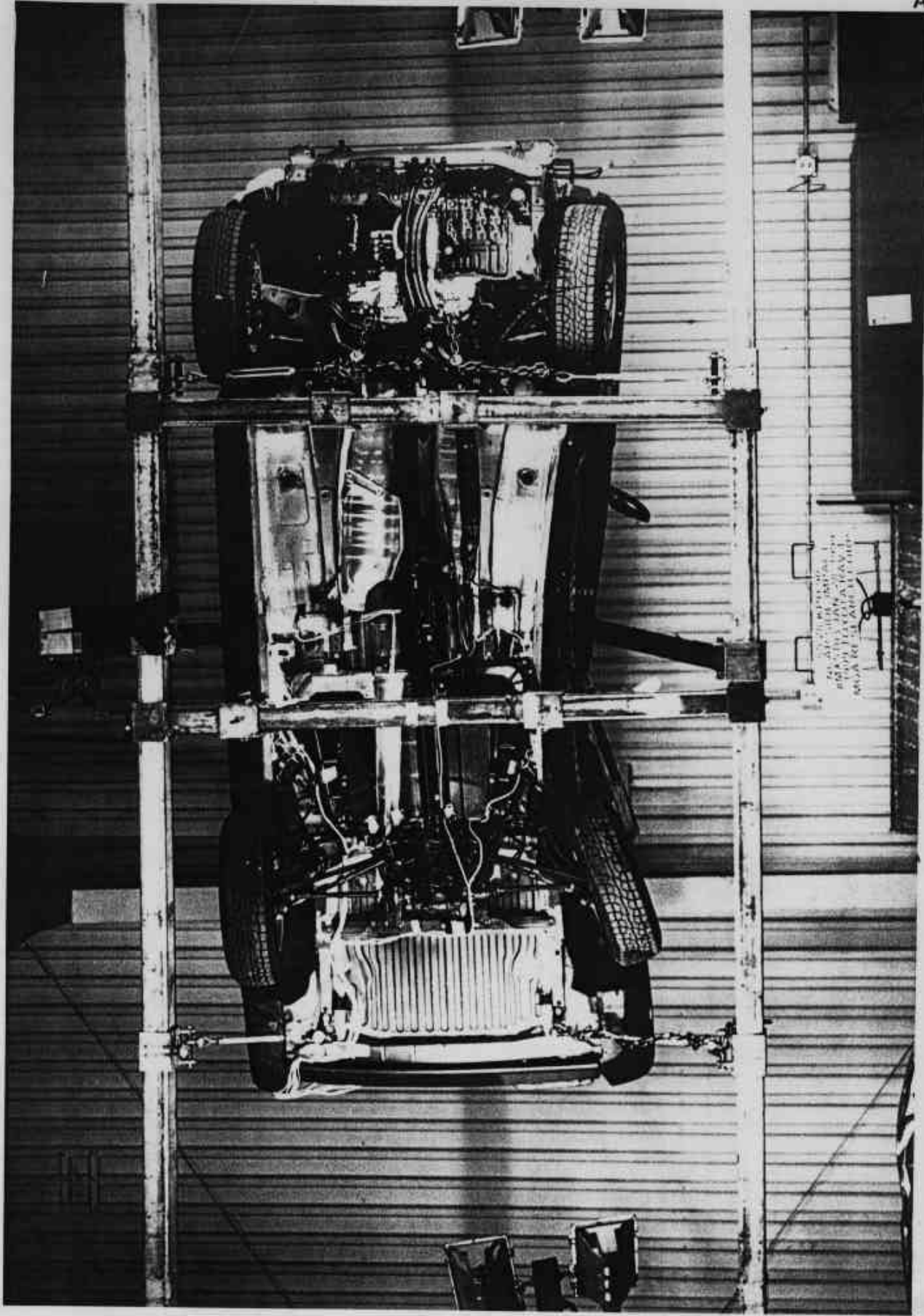


Photo No. A-43 - Rollover 90°

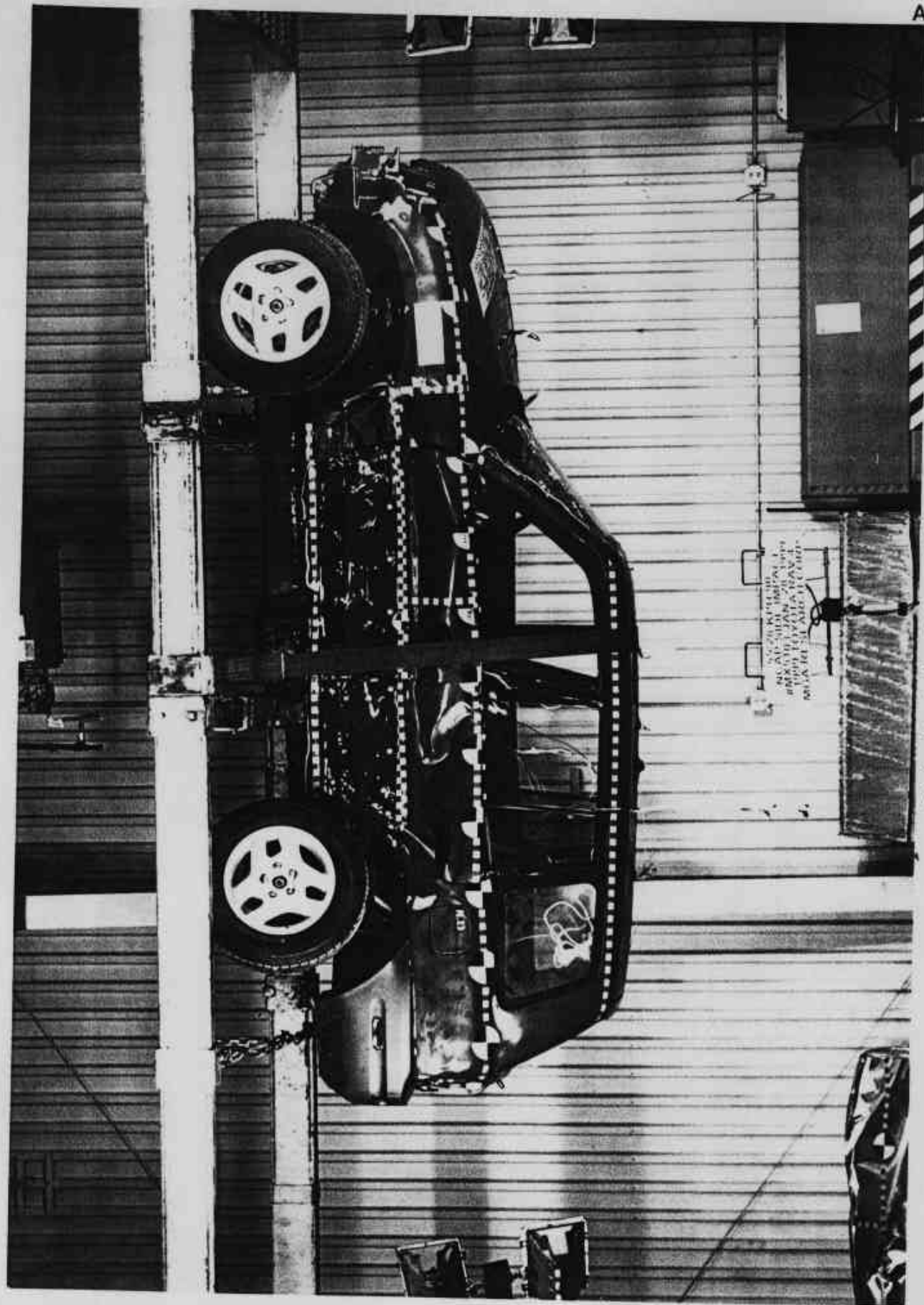


Photo No. A-44 - Rollover 180°

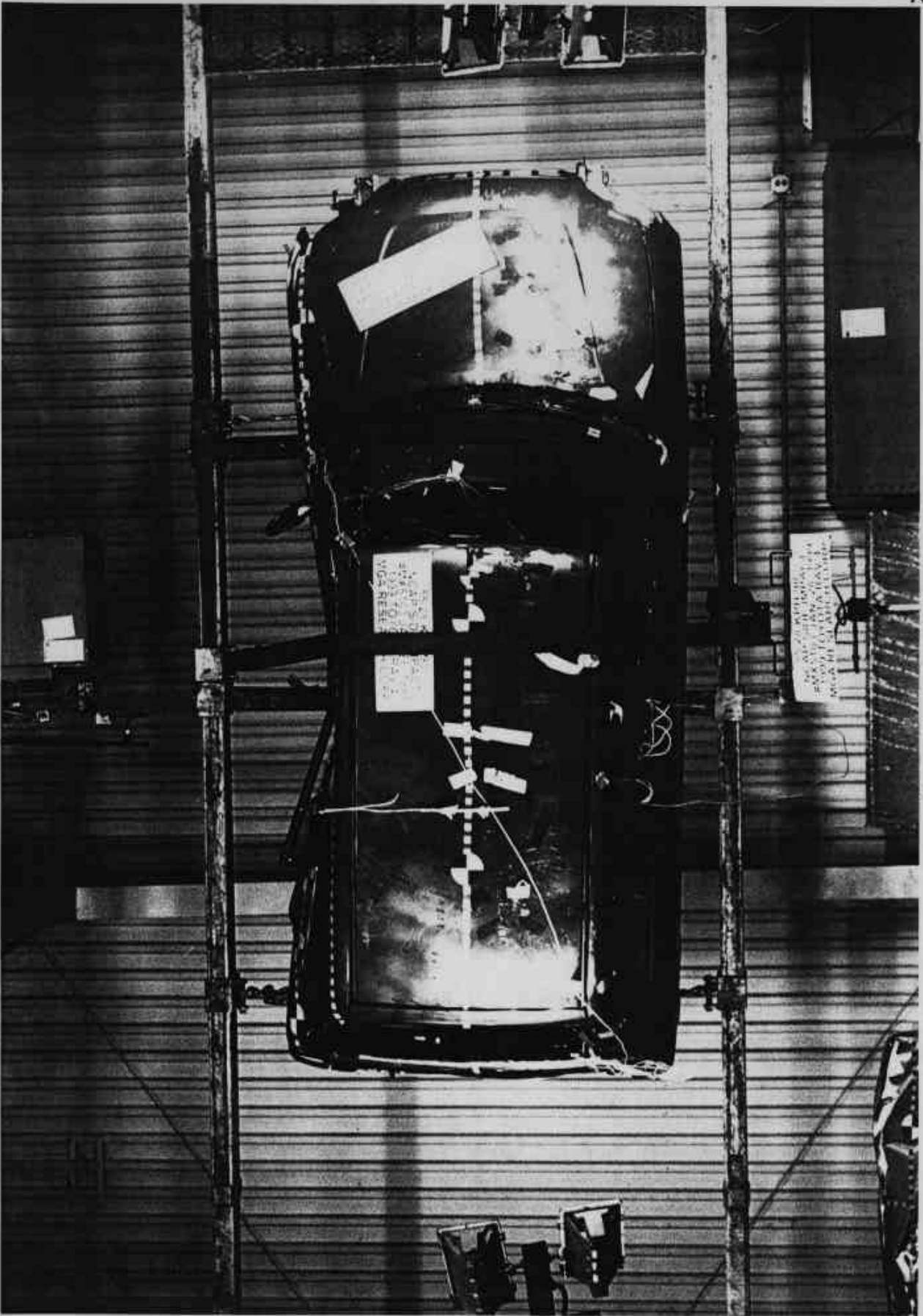


Photo No. A-45 - Rollover 270°

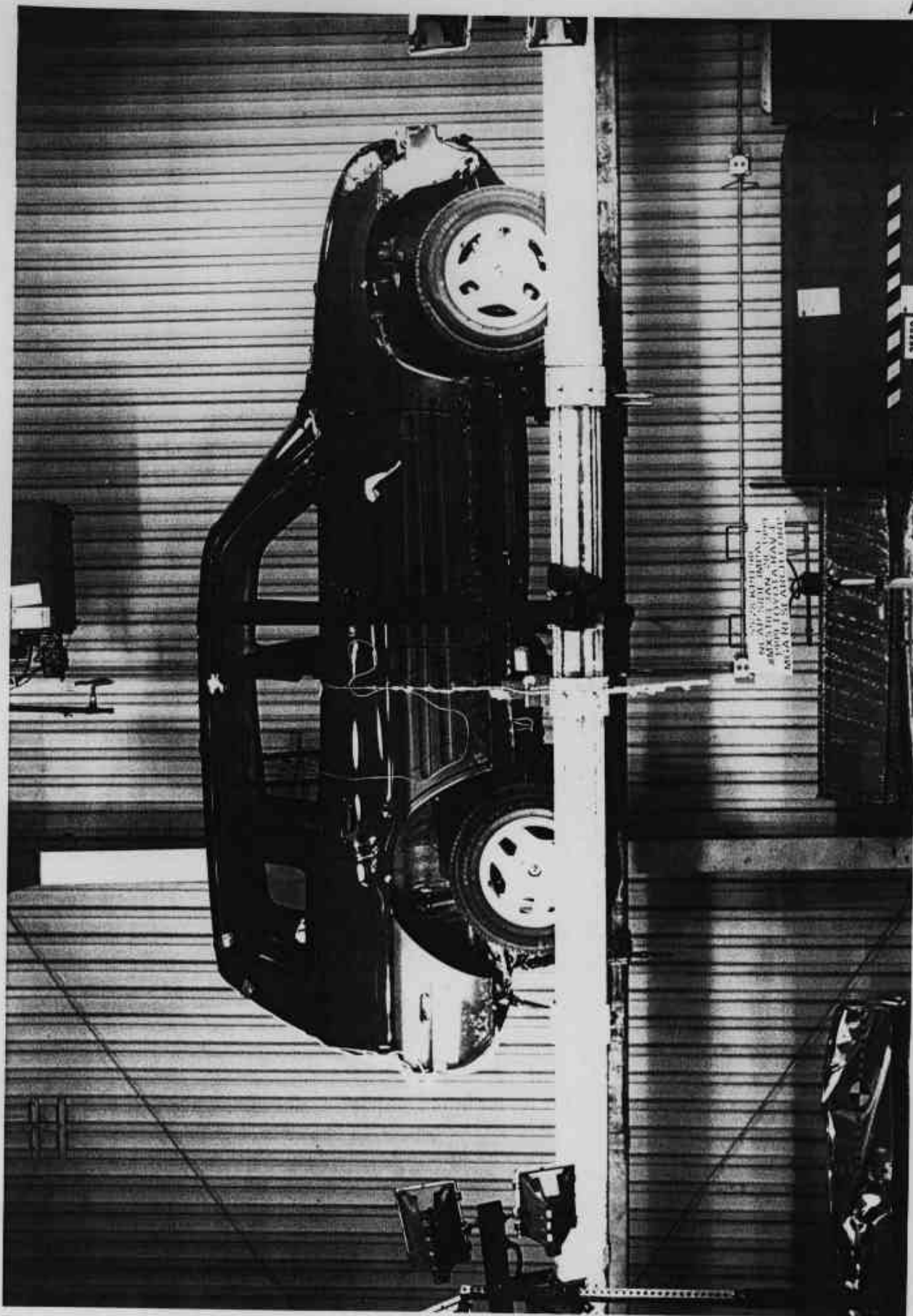


Photo No. A-46 - Rollover 360°

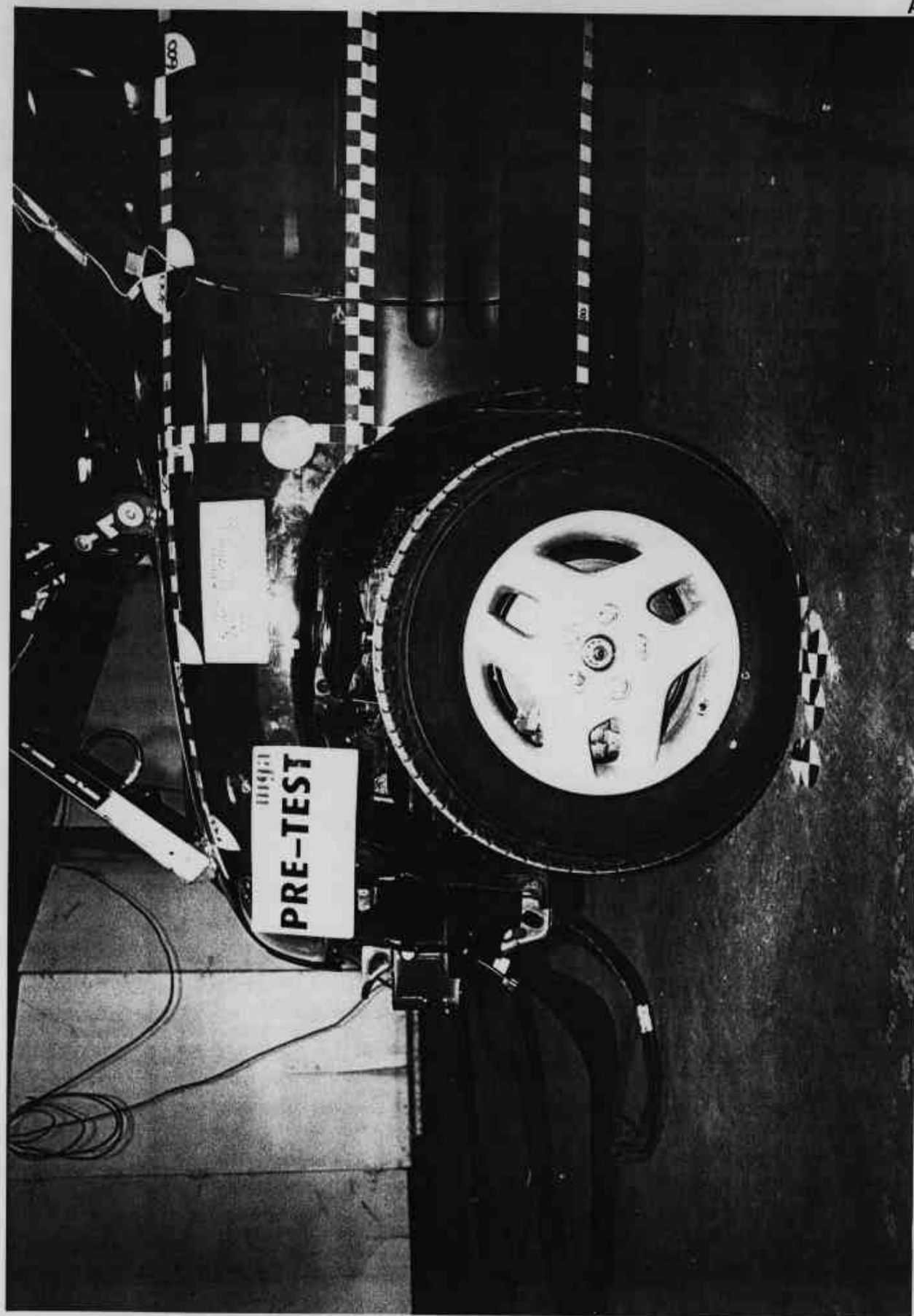


Photo No. A-47 - Left Front Attitude Point

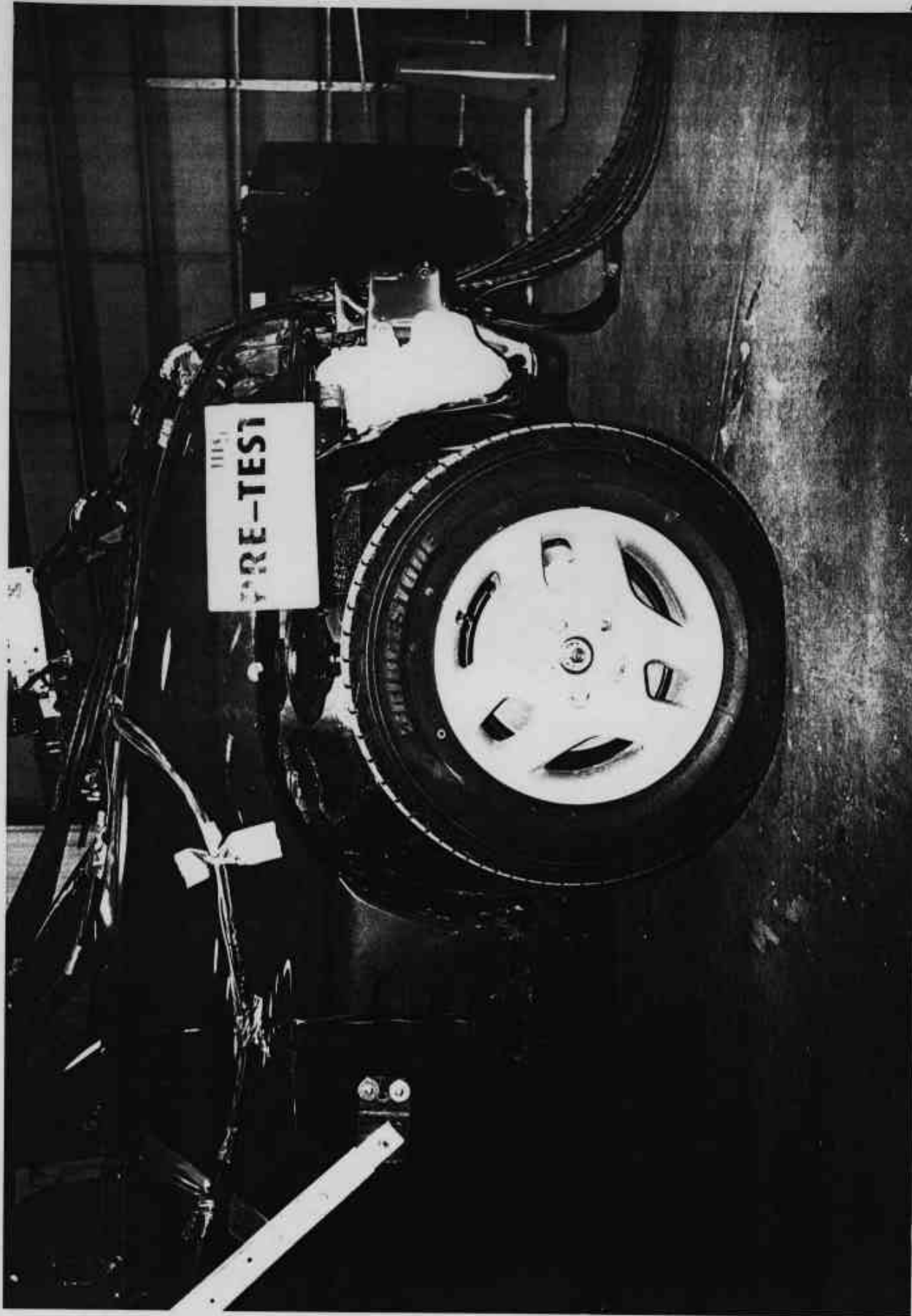


Photo No. A-48 - Right Front Attitude Point

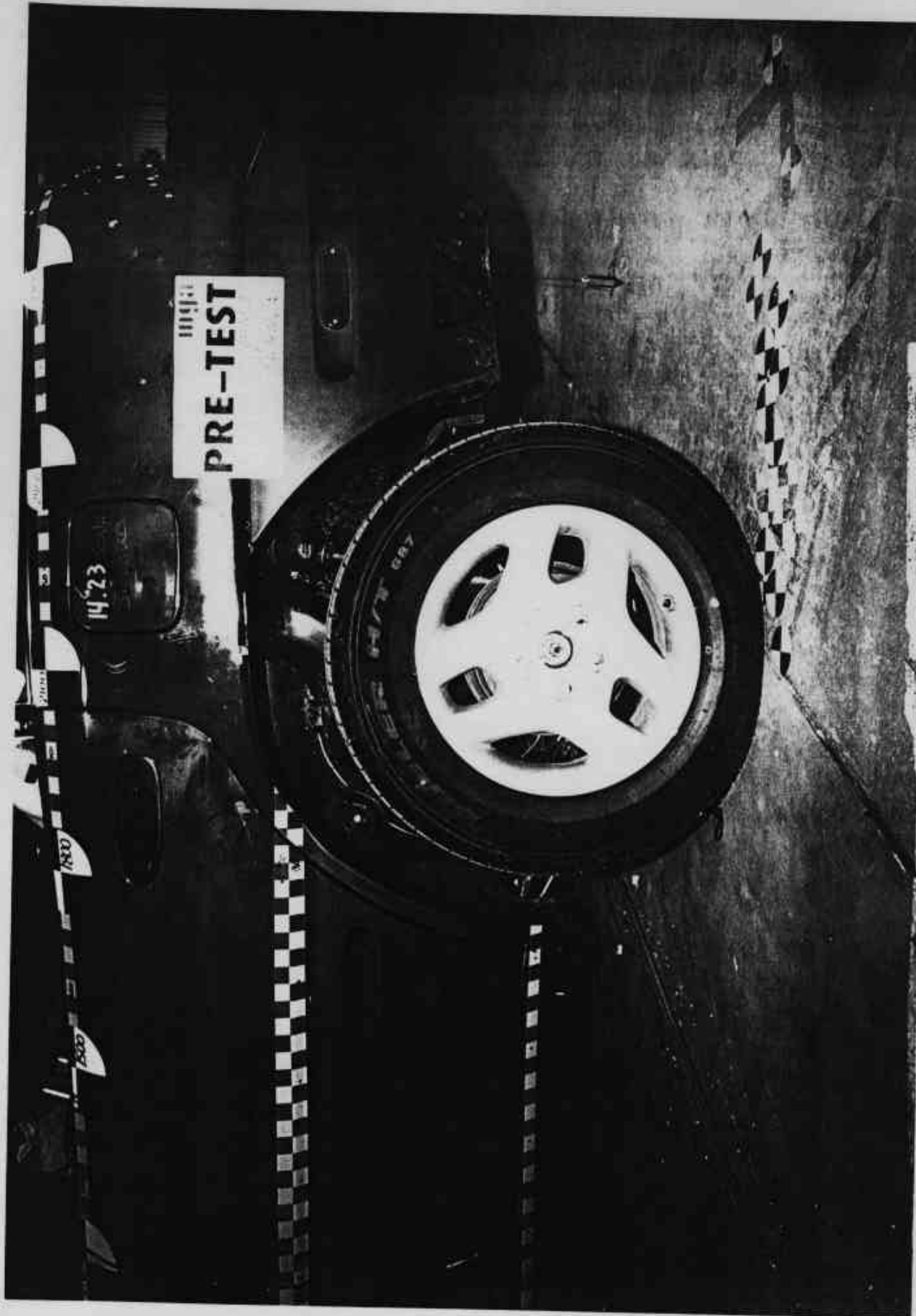


Photo No. A-49 - Left Rear Attitude Point



Photo No. A-50 - Right Rear Attitude Point

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* Data is questionable

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* No valid data collected

** Data is questionable

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TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

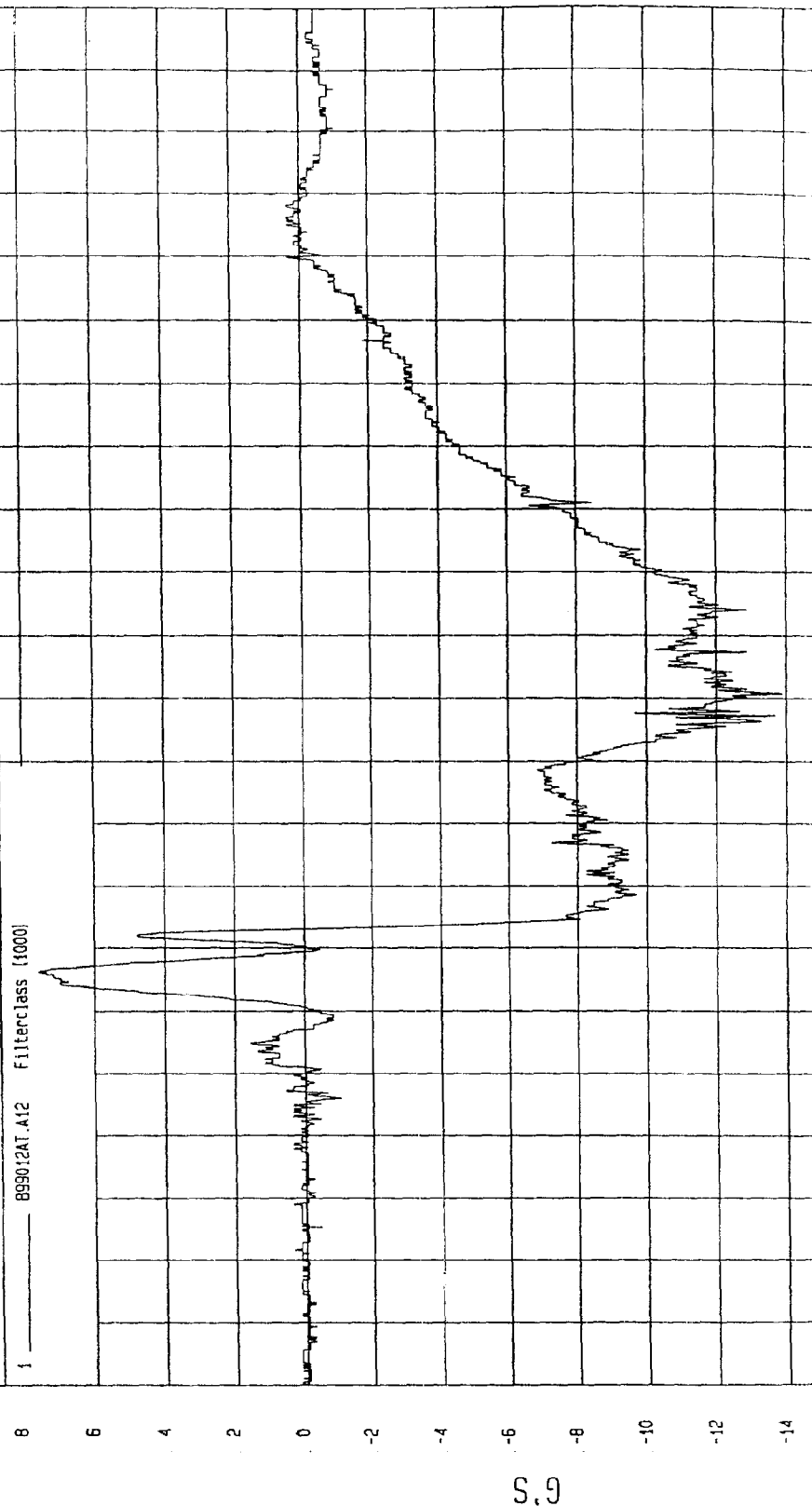
Speed: 38 MPH 61.2 KPH

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = 7.55 G'S at 46 msec

Minimum = -13.87 G'S at 91 msec

DRIVER HEAD X ACCELERATION

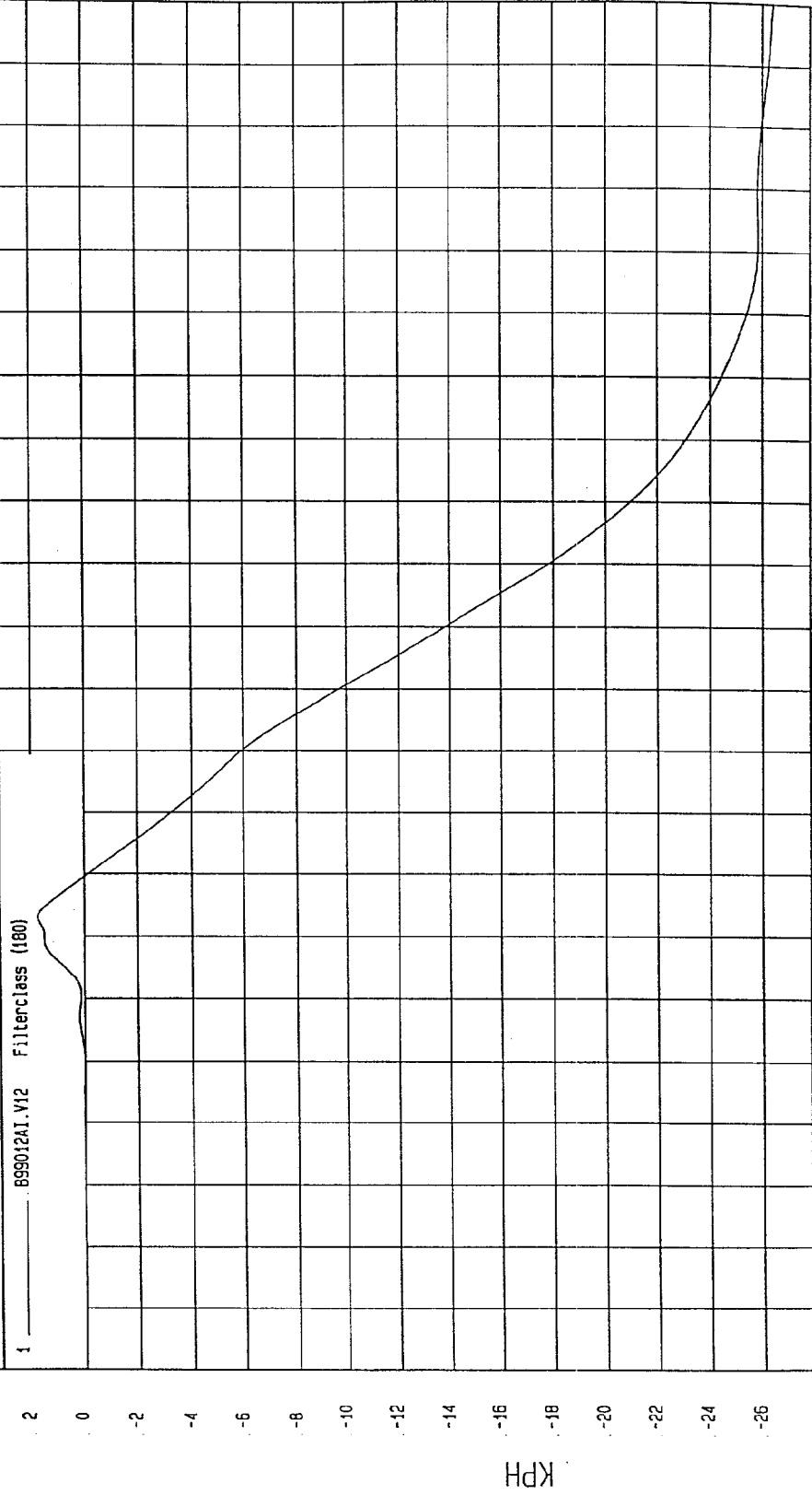


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -26.39 KPH at 200 msec Maximum = 1.76 KPH at 53 msec

DRIVER HEAD X VELOCITY



TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

Speed: 38 MPH 61.2 KPH

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = 34.36 G'S at 107 msec

Minimum = -20.21 G'S at 50 msec

DRIVER HEAD Y ACCELERATION

1 ——— B99012AT A13 Filterclass (1000)

30
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10
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-10
-20

G'S

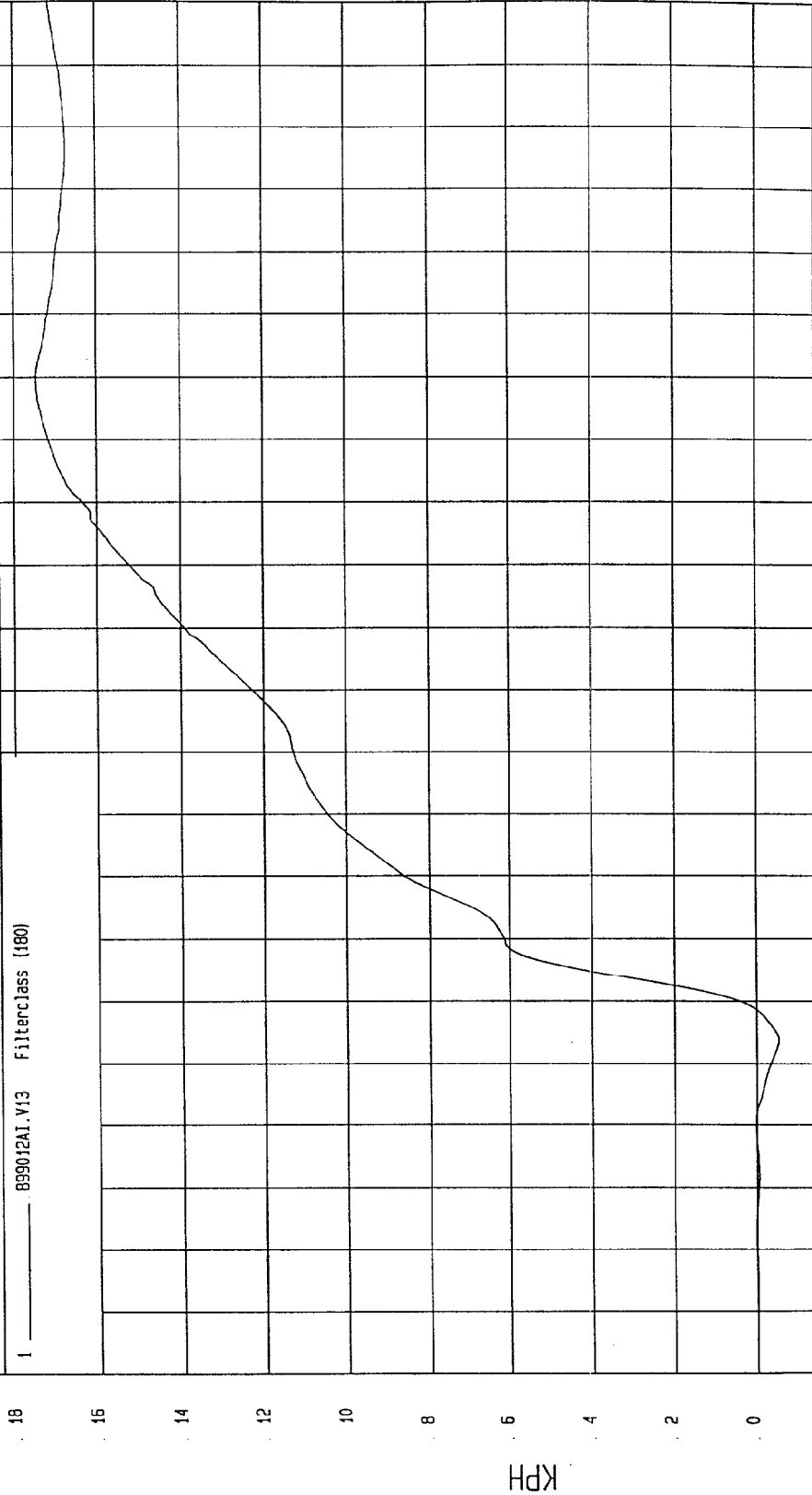
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TIME (SECONDS)

MCA Research
01-30-1999 16.45

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999
COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH
Minimum = -.53 KPH at 34 msec Maximum = 17.47 KPH at 140 msec

DRIVER HEAD Y VELOCITY



TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

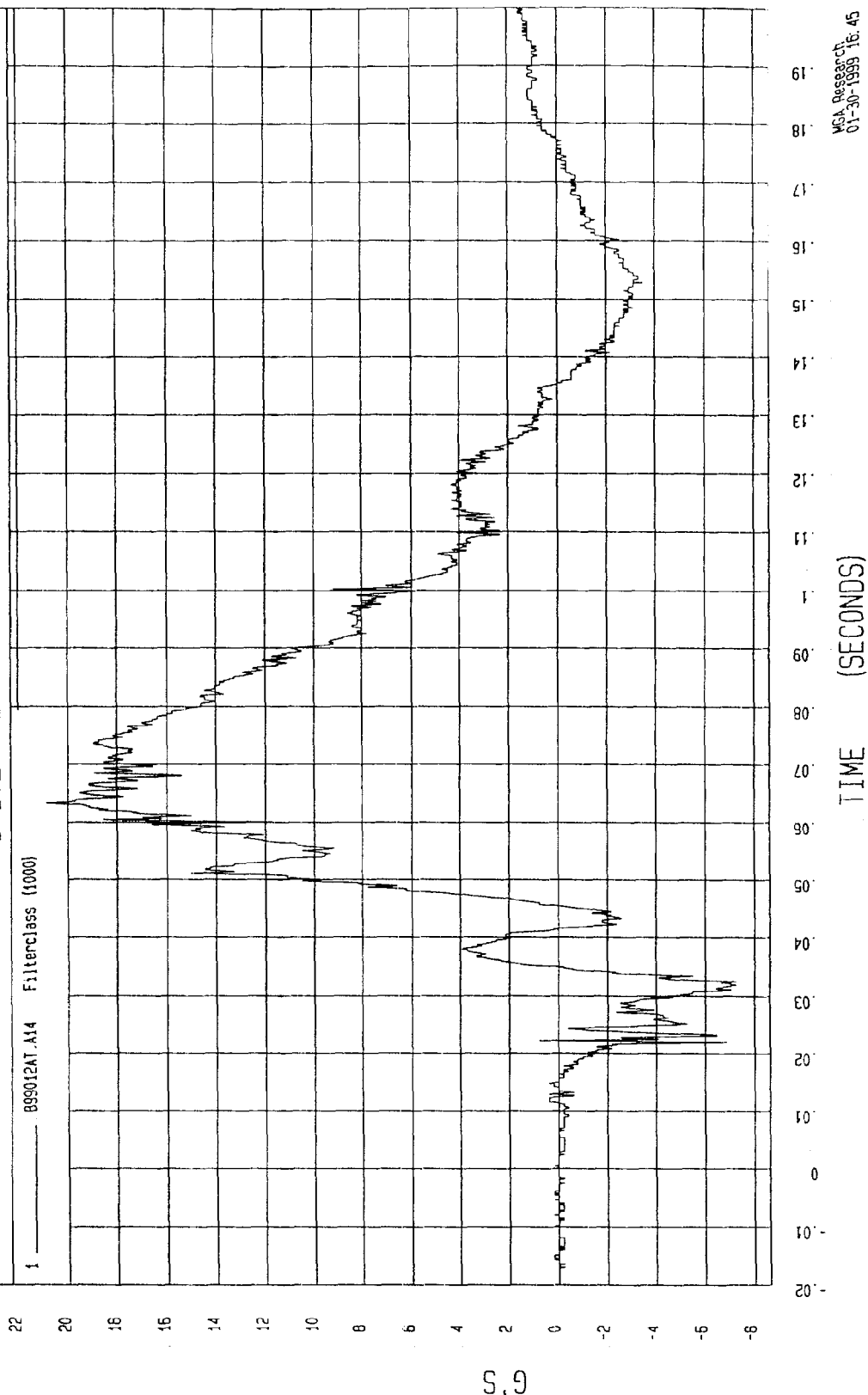
SPEED: 38 MPH 61.2 KPH

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = 20.88 G'S at 63 msec

Minimum = -7.23 G'S at 32 msec

DRIVER HEAD Z ACCELERATION



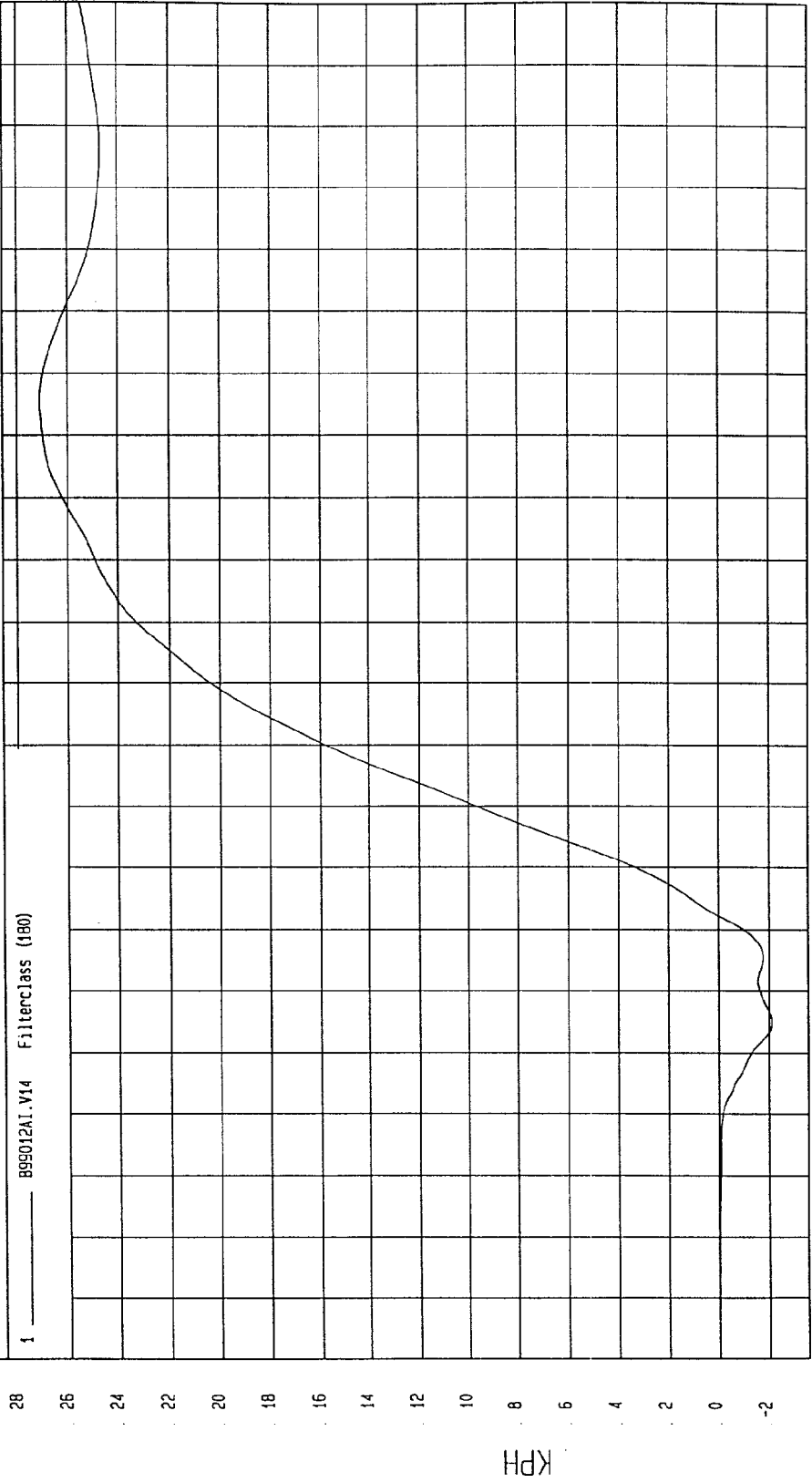
MCA Research
01-30-1999 16:45

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -2.11 KPH at 35 msec Maximum = 27.09 KPH at 136 msec

DRIVER HEAD Z VELOCITY



NCA Research
01-30-1999 16:49

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

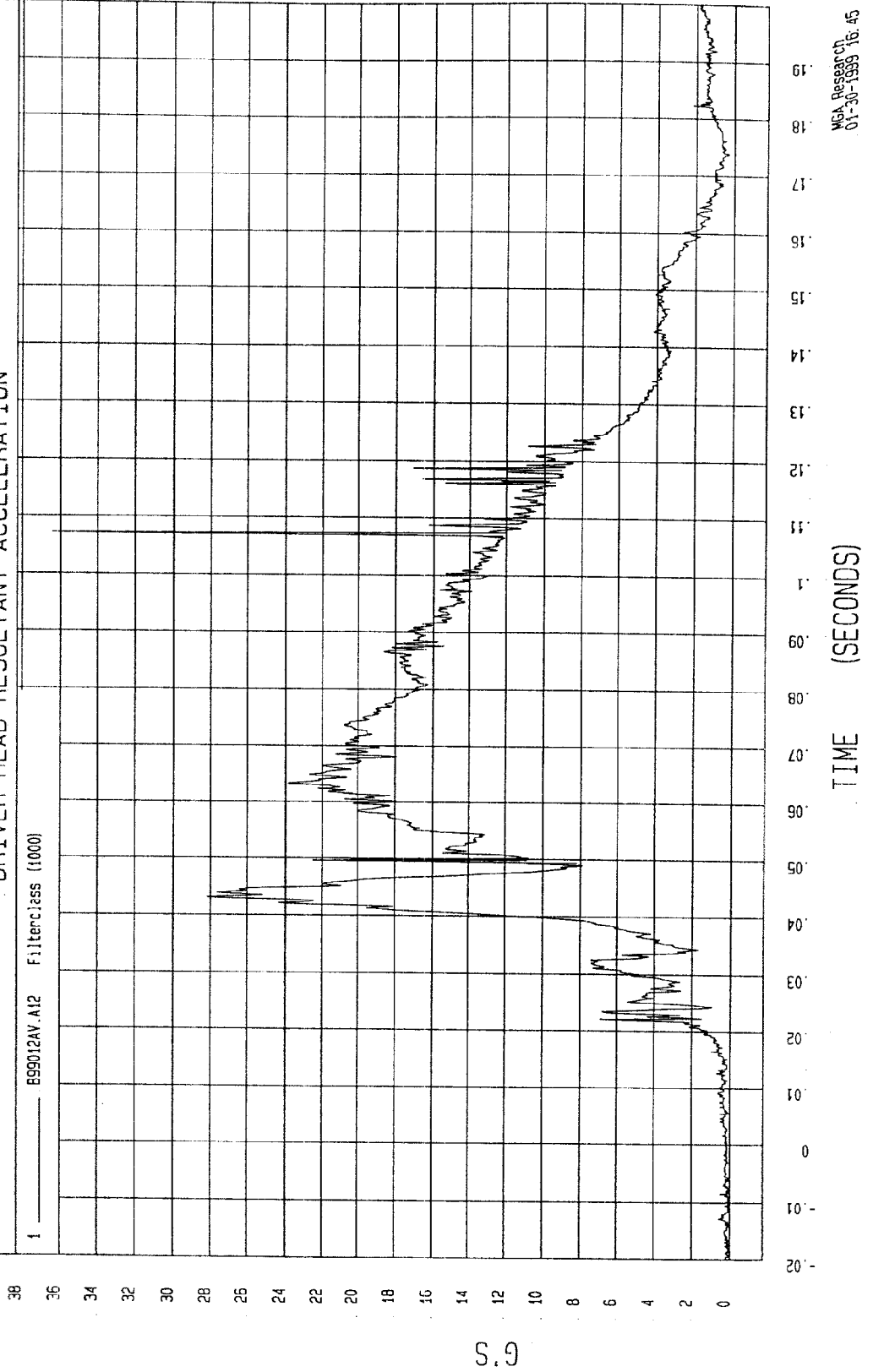
Speed: 38 MPH 61.2 KPH

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = 36.43 G'S at 107 msec

Minimum = 7.49E-02 G'S at -19 msec

DRIVER HEAD RESULTANT ACCELERATION

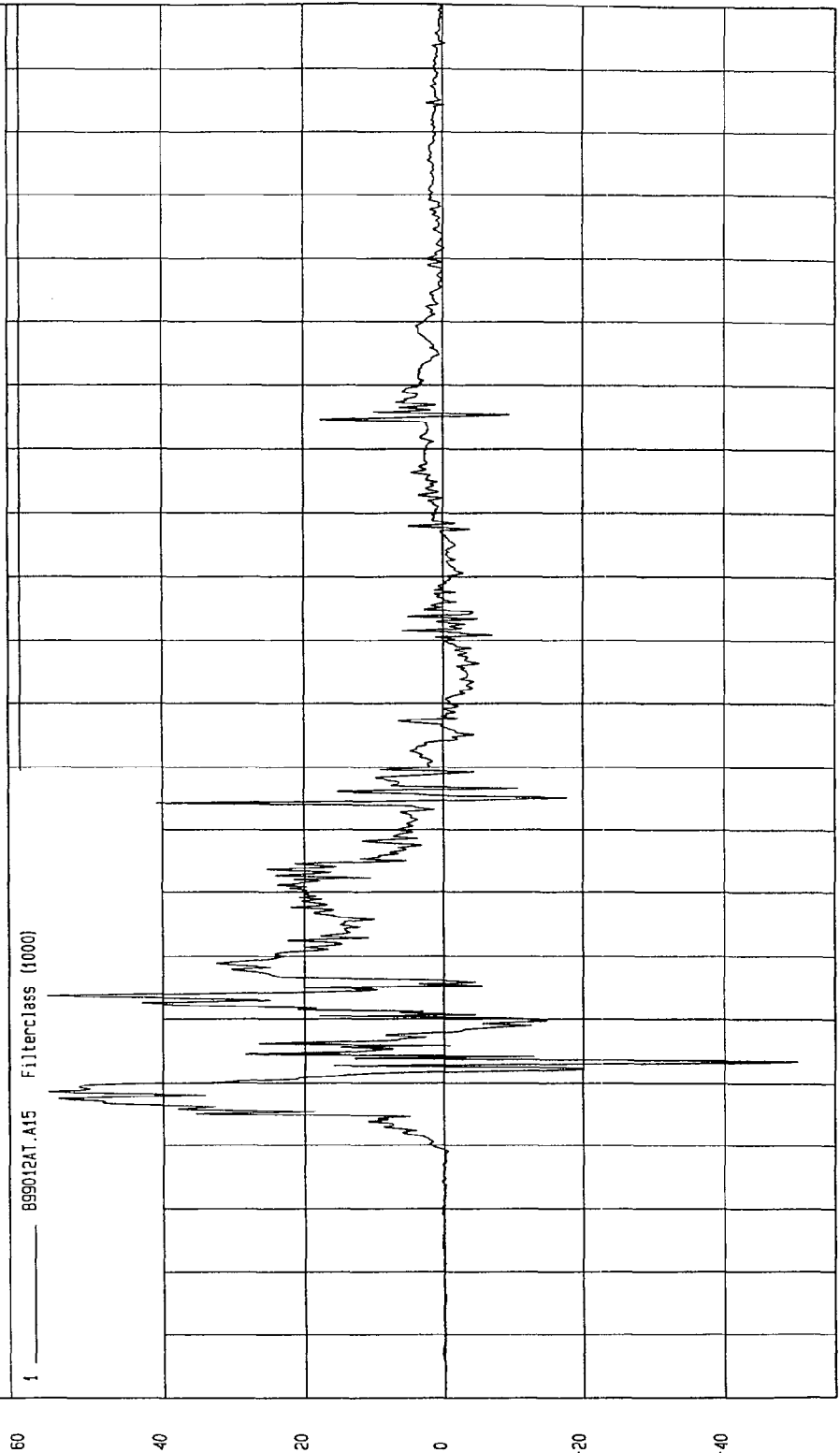


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -50.3 G'S at 33 msec Maximum = 56.29 G'S at 44 msec

DRIVER UPPER RIB Y ACCELERATION



TIME (SECONDS)

MSA Research
01-30-1999 16:47

G.S

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

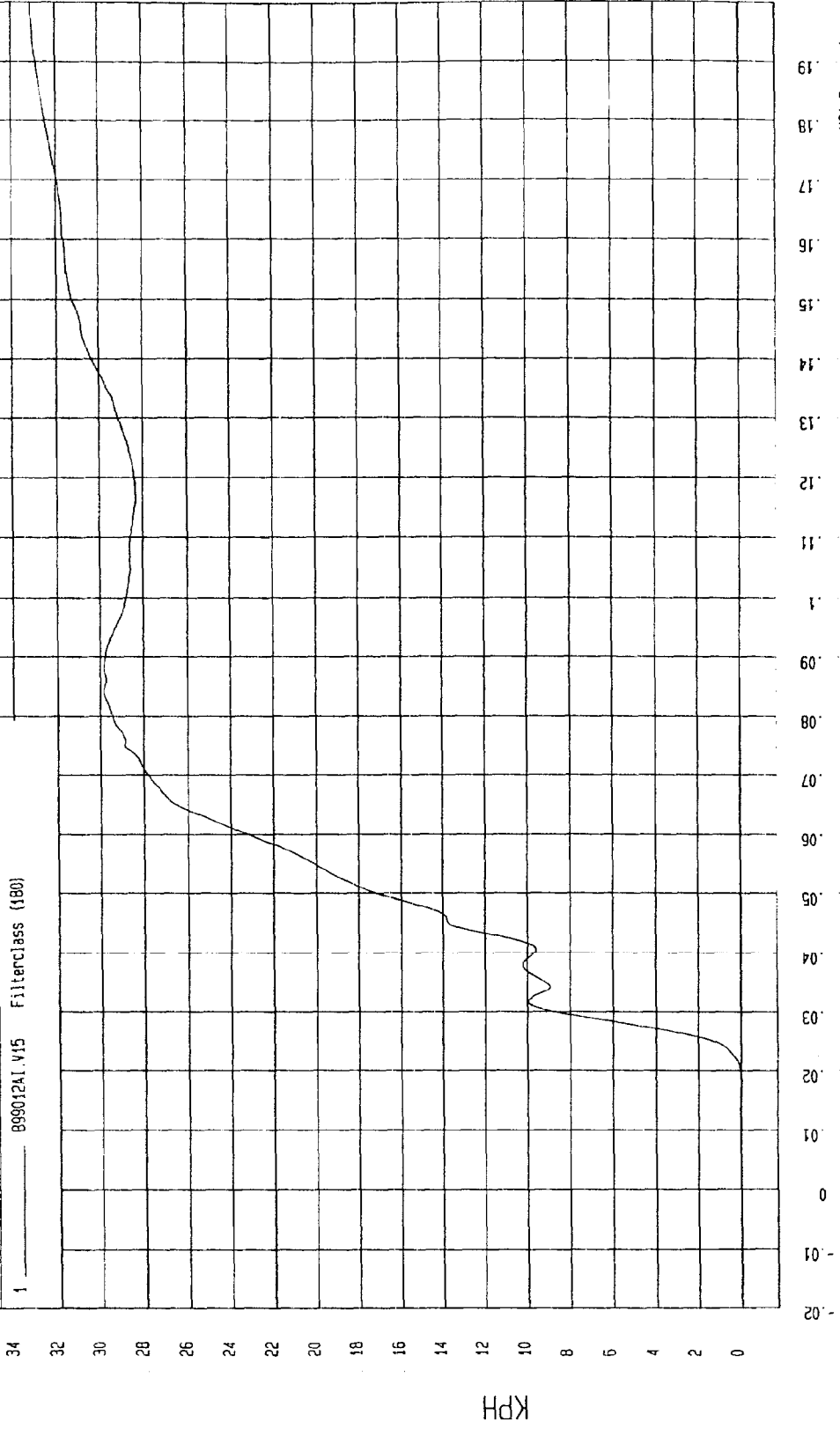
SPEED: 38 MPH 61.2 KPH

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

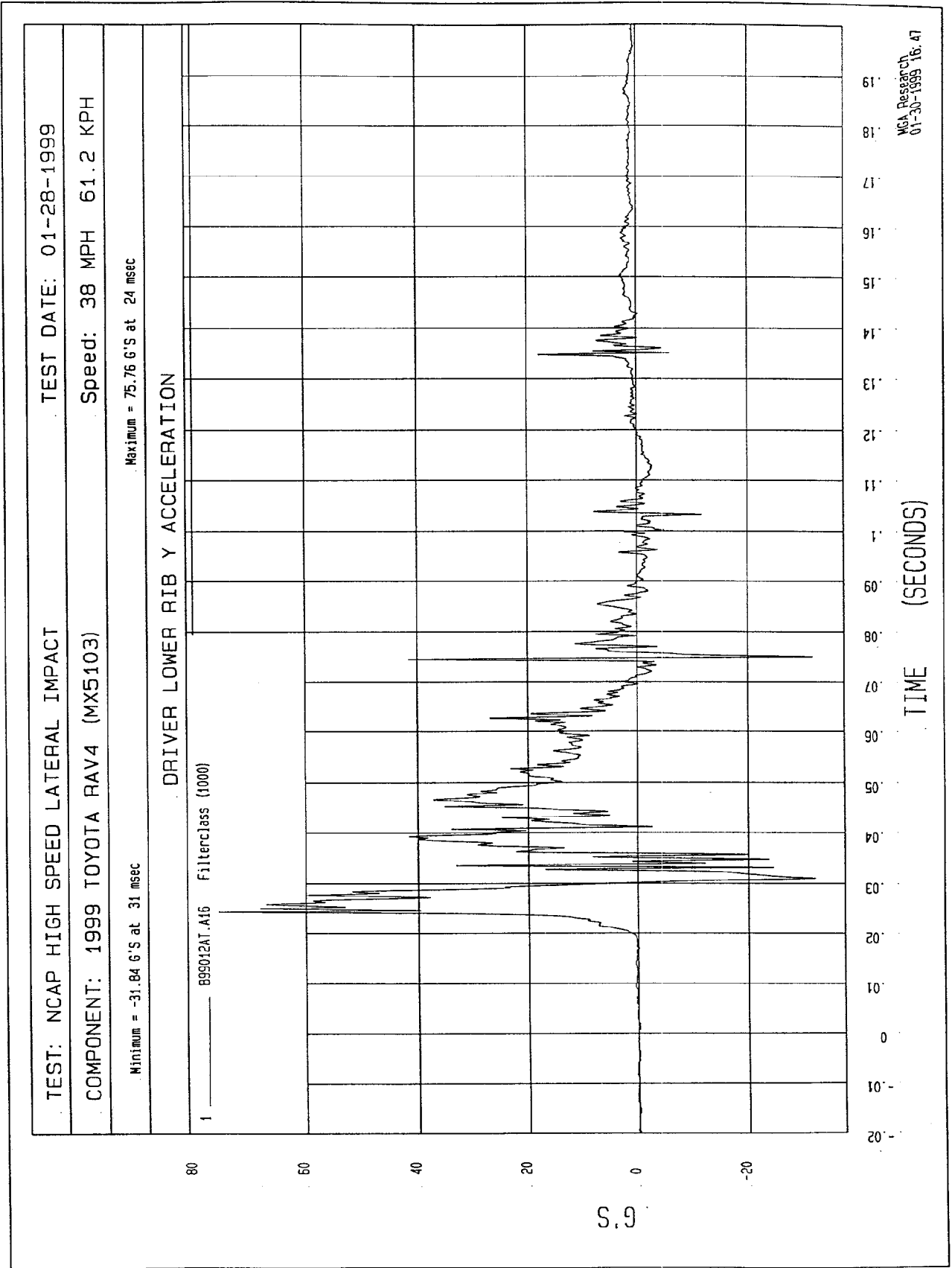
Minimum = -1.31E-02 KPH at 2 msec

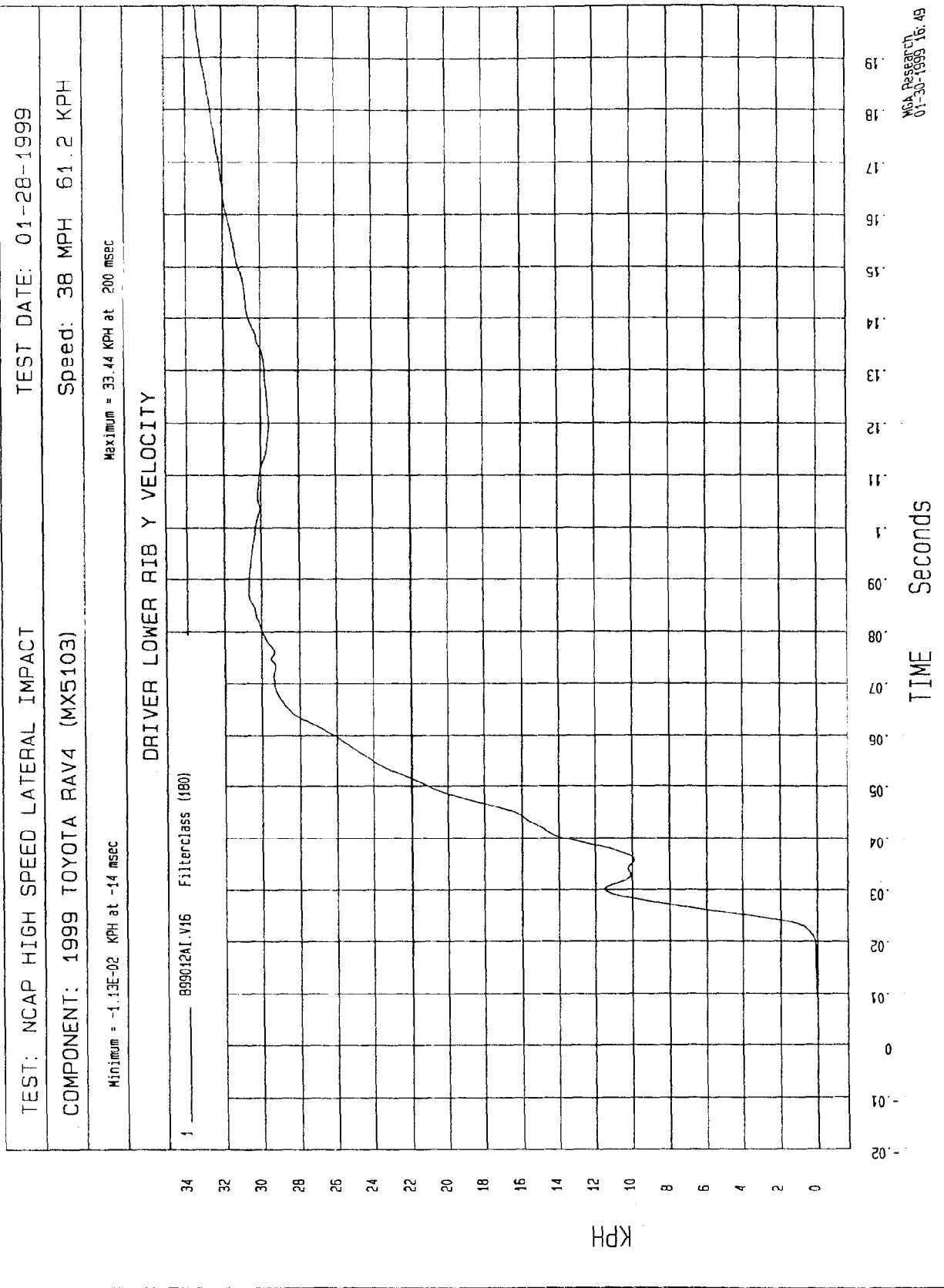
Maximum = 33.12 KPH at 200 msec

DRIVER UPPER RIB Y VELOCITY

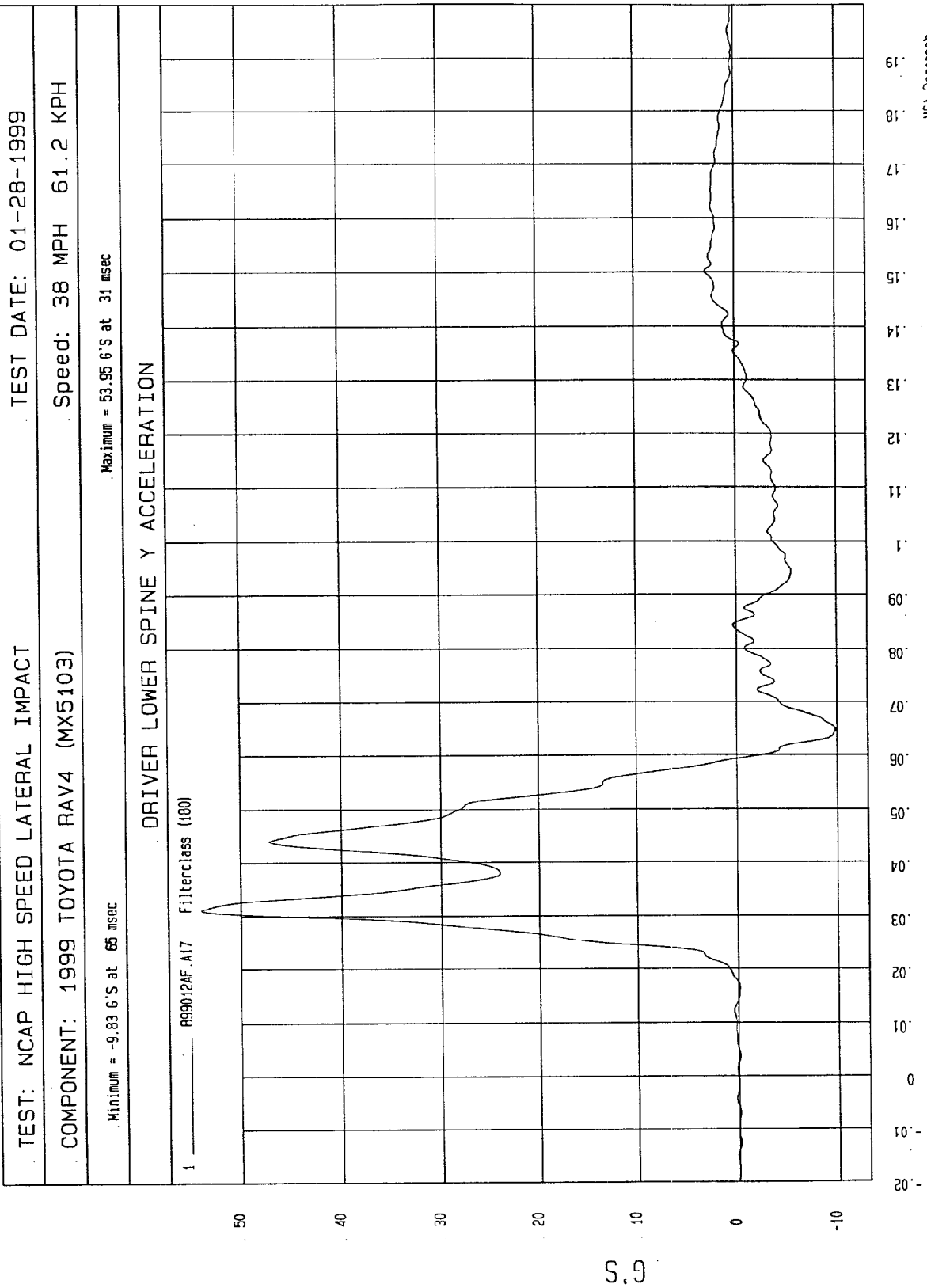


MGA Research
01-30-1999 16:49



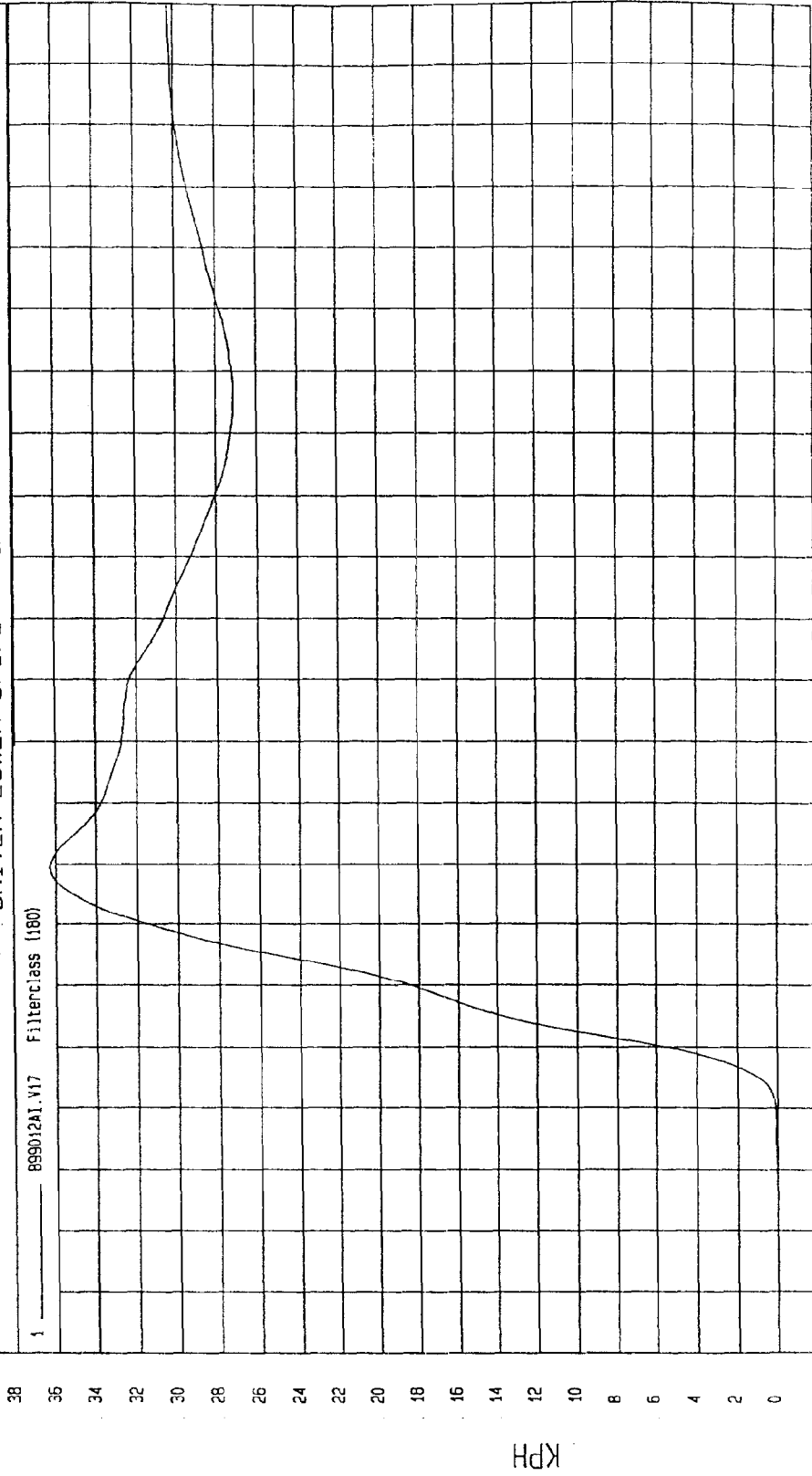


MGA Research
01-30-1999 16:49



TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999
COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH
Minimum = -1.06E-02 KPH at -6 msec Maximum = 36.28 KPH at 59 msec

DRIVER LOWER SPINE Y VELOCITY



TIME Seconds

MSA Research
01-30-1999 16:49

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

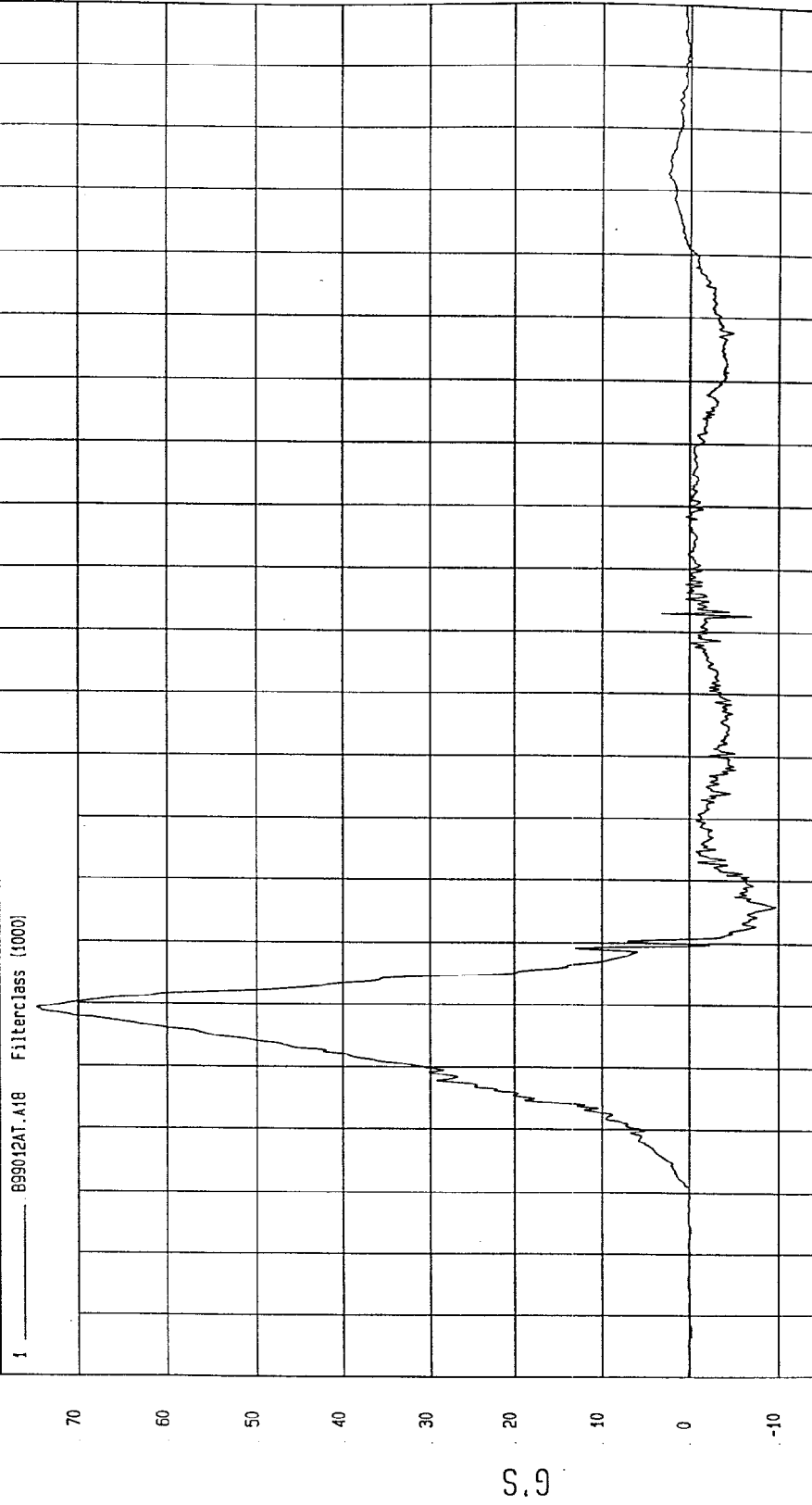
Speed: 38 MPH 61.2 KPH

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = 74.69 G'S at 39 msec

Minimum = -9.68 G'S at 56 msec

DRIVER PELVIS Y ACCELERATION



TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

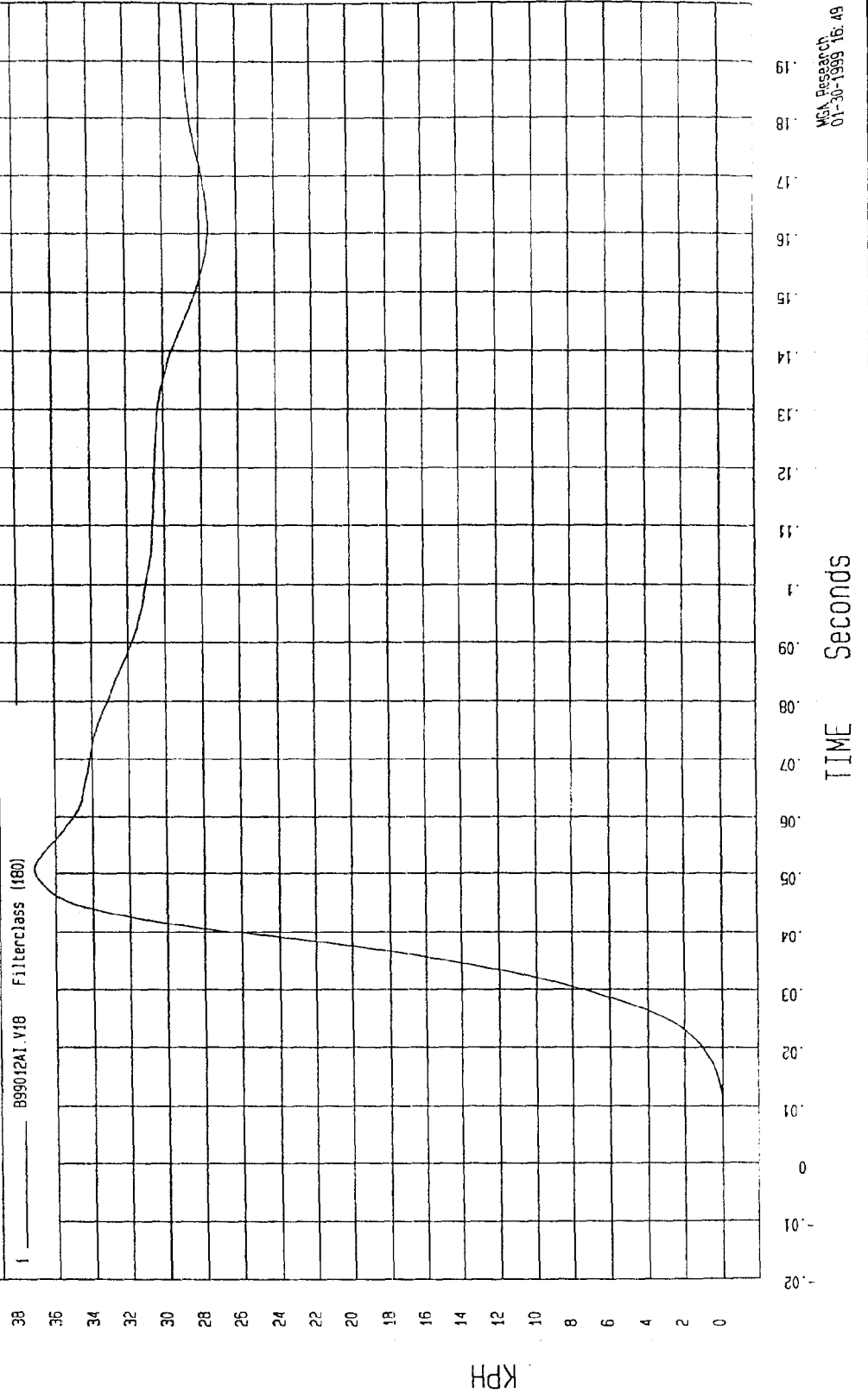
SPEED: 38 MPH 61.2 KPH

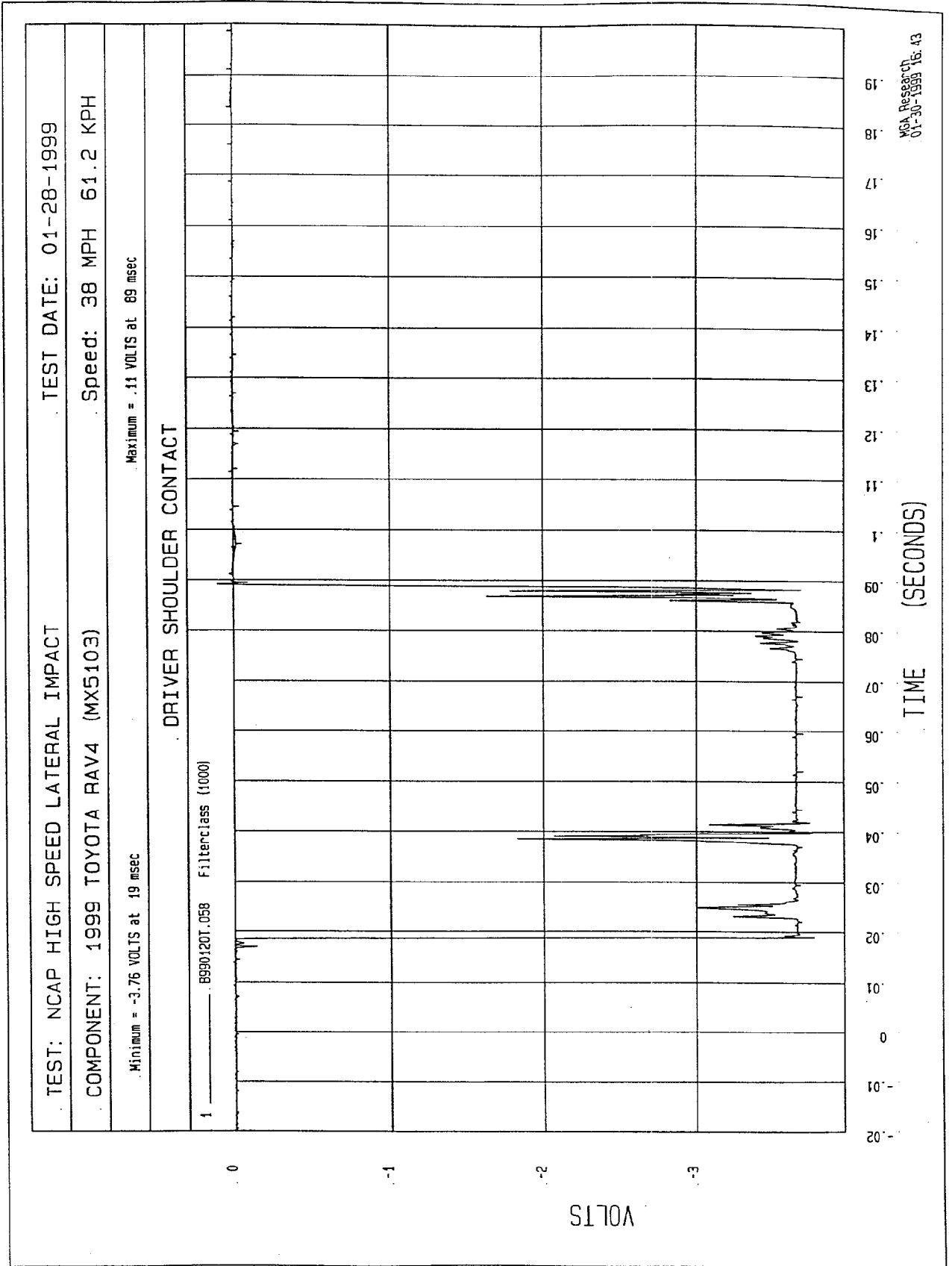
COMPONENT: 1999 TOYOTA PAV4 (MX5103)

Maximum = 37.14 KPH at 51 msec

Minimum = -5.41E-03 KPH at -6 msec

DRIVER PELVIS Y VELOCITY





TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

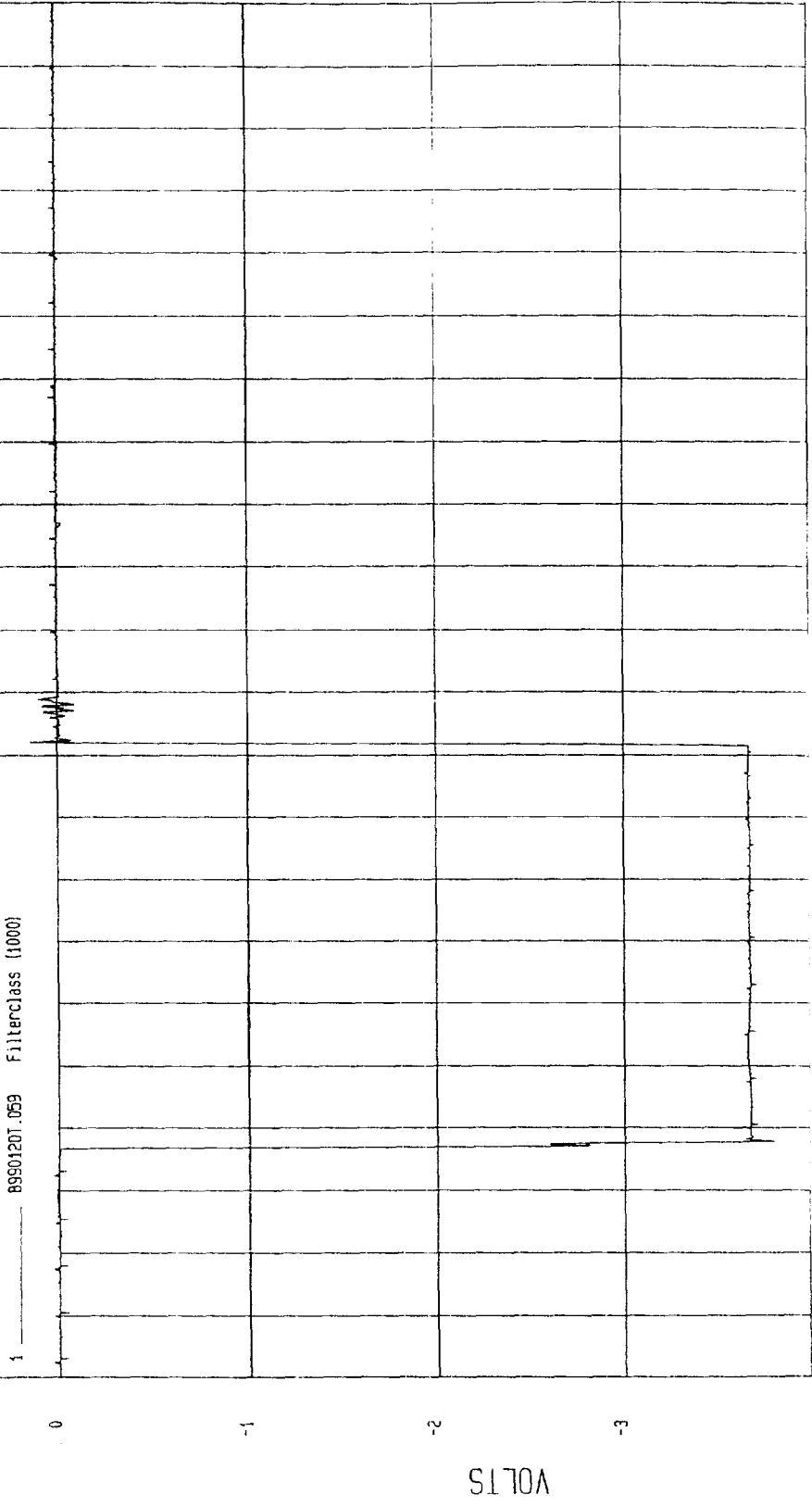
Speed: 38 MPH 61.2 KPH

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = .14 VOLTS at 82 msec

Minimum = -3.79 VOLTS at 18 msec

DRIVER PELVIS CONTACT

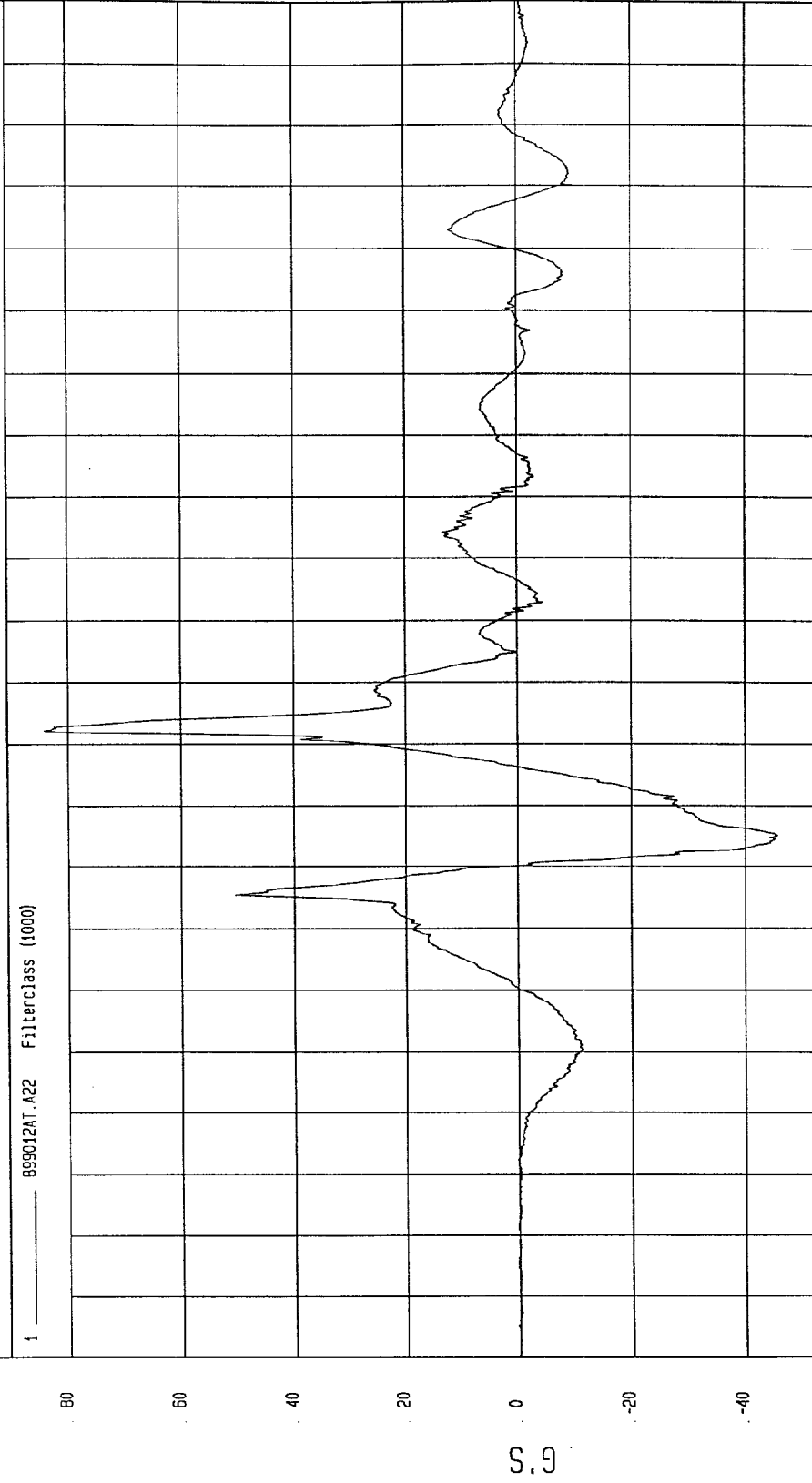


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -45.66 G'S at 65 msec Maximum = 84.17 G'S at 82 msec

REAR PASSENGER HEAD X ACCELERATION



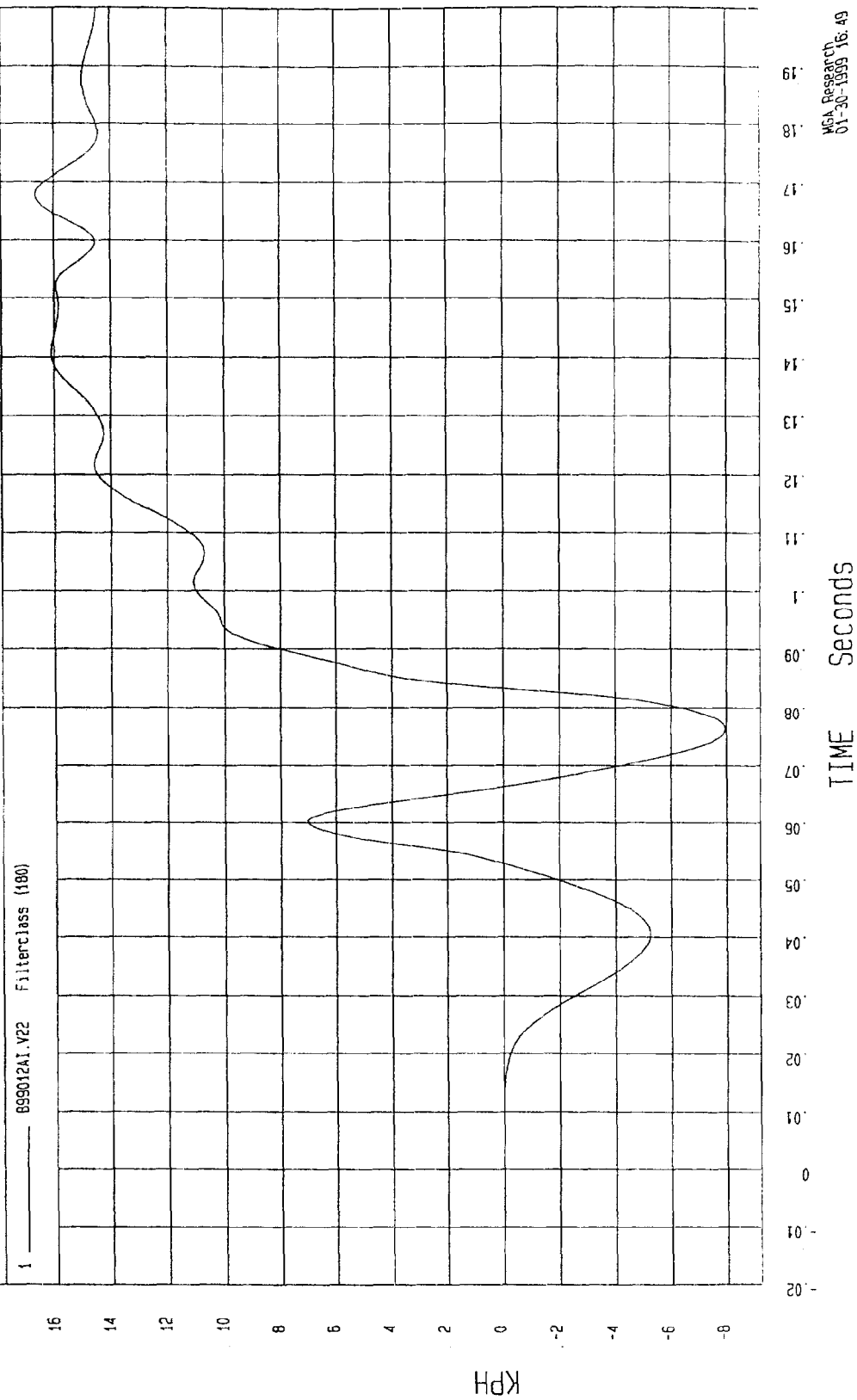
MCA Research
01-30-1999 16:45

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -7.96 KPH at 76 msec Maximum = 16.63 KPH at 168 msec

REAR PASSENGER HEAD X VELOCITY



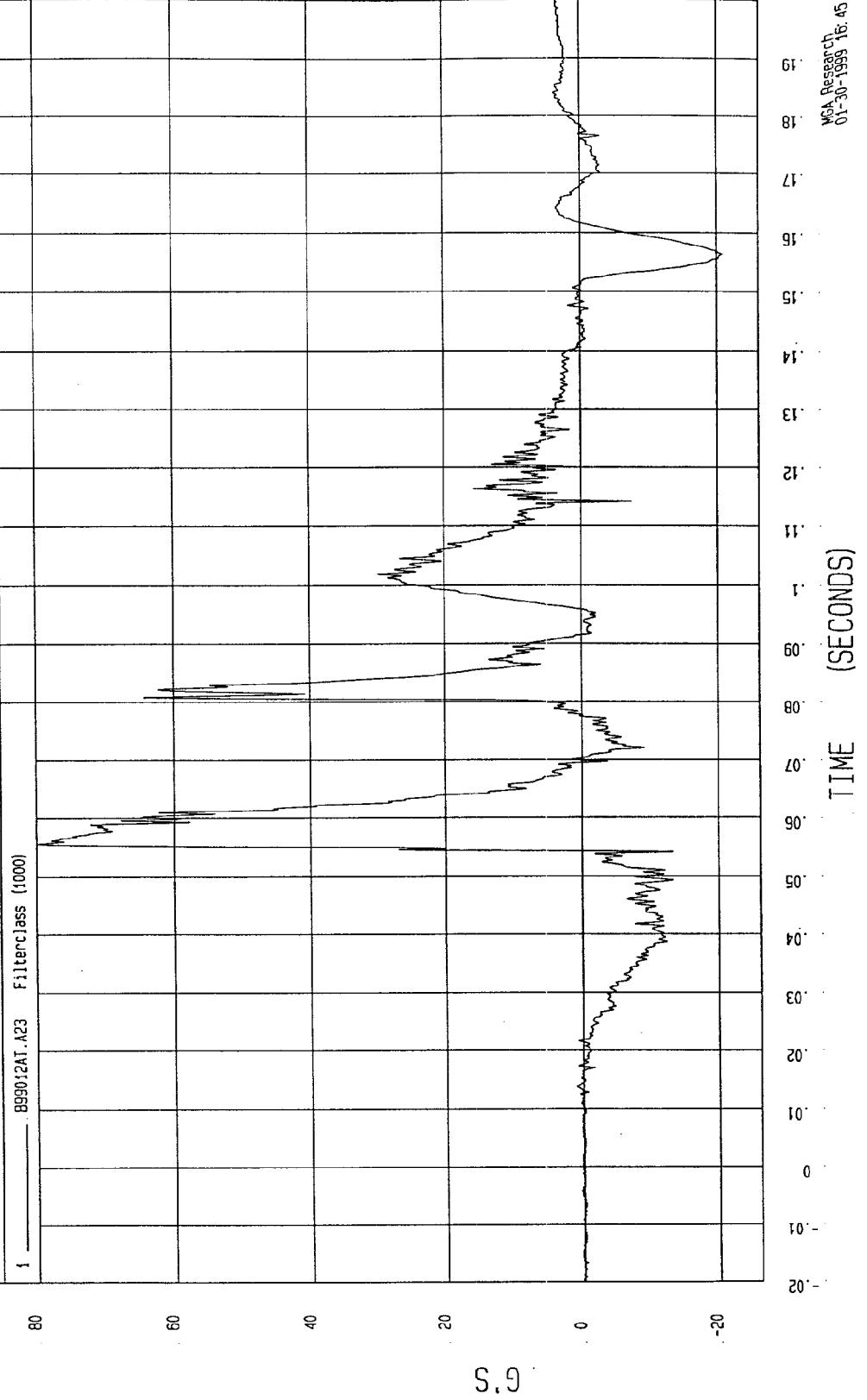
MGA Research
01-30-1999 16:49

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -20.92 G'S at 156 msec Maximum = 80.08 G'S at 156 msec

REAR PASSENGER HEAD Y ACCELERATION

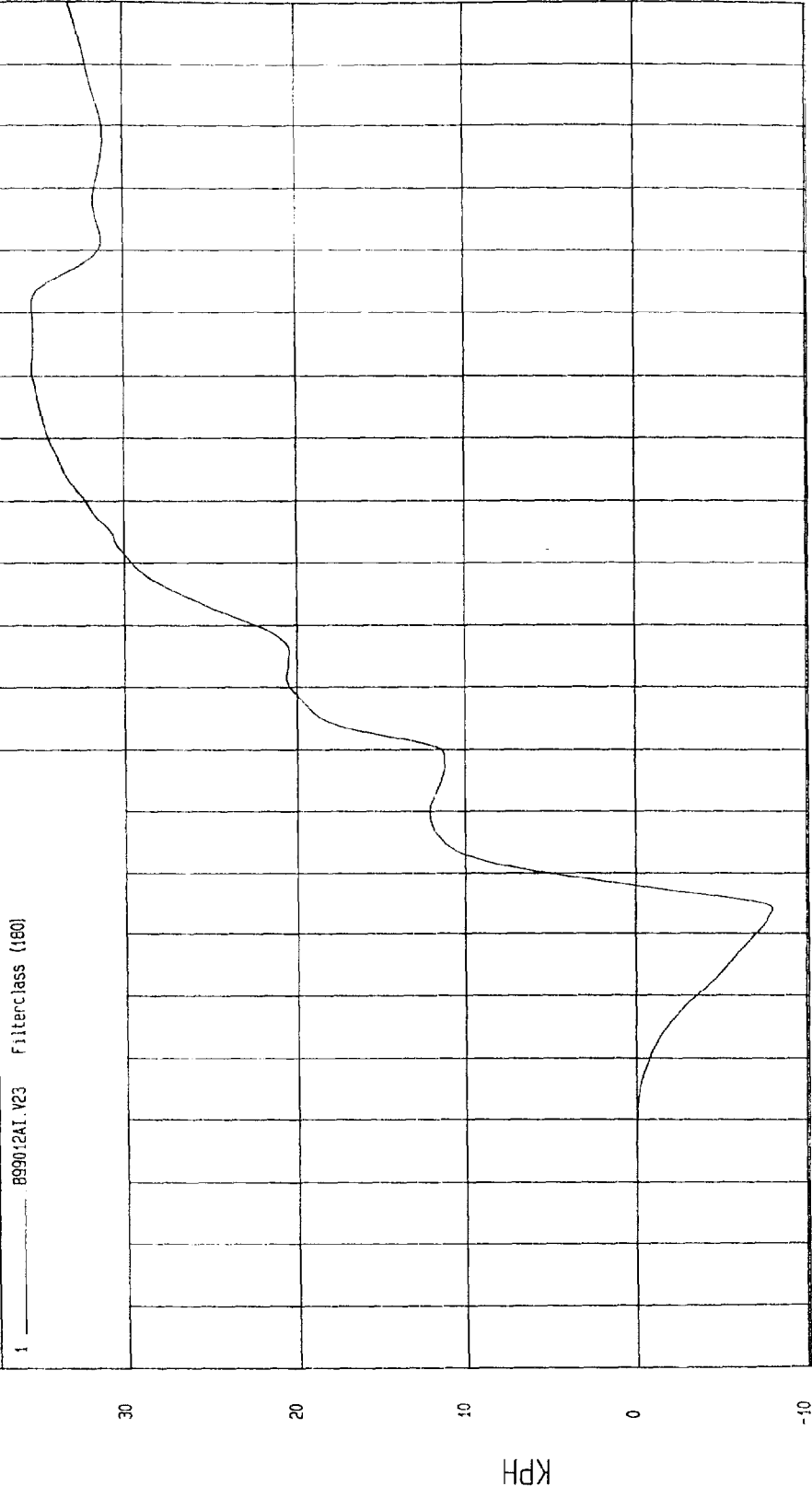


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -7.97 KPH at 54 msec Maximum = 35.35 KPH at 141 msec

REAR PASSENGER HEAD Y VELOCITY



TIME Seconds

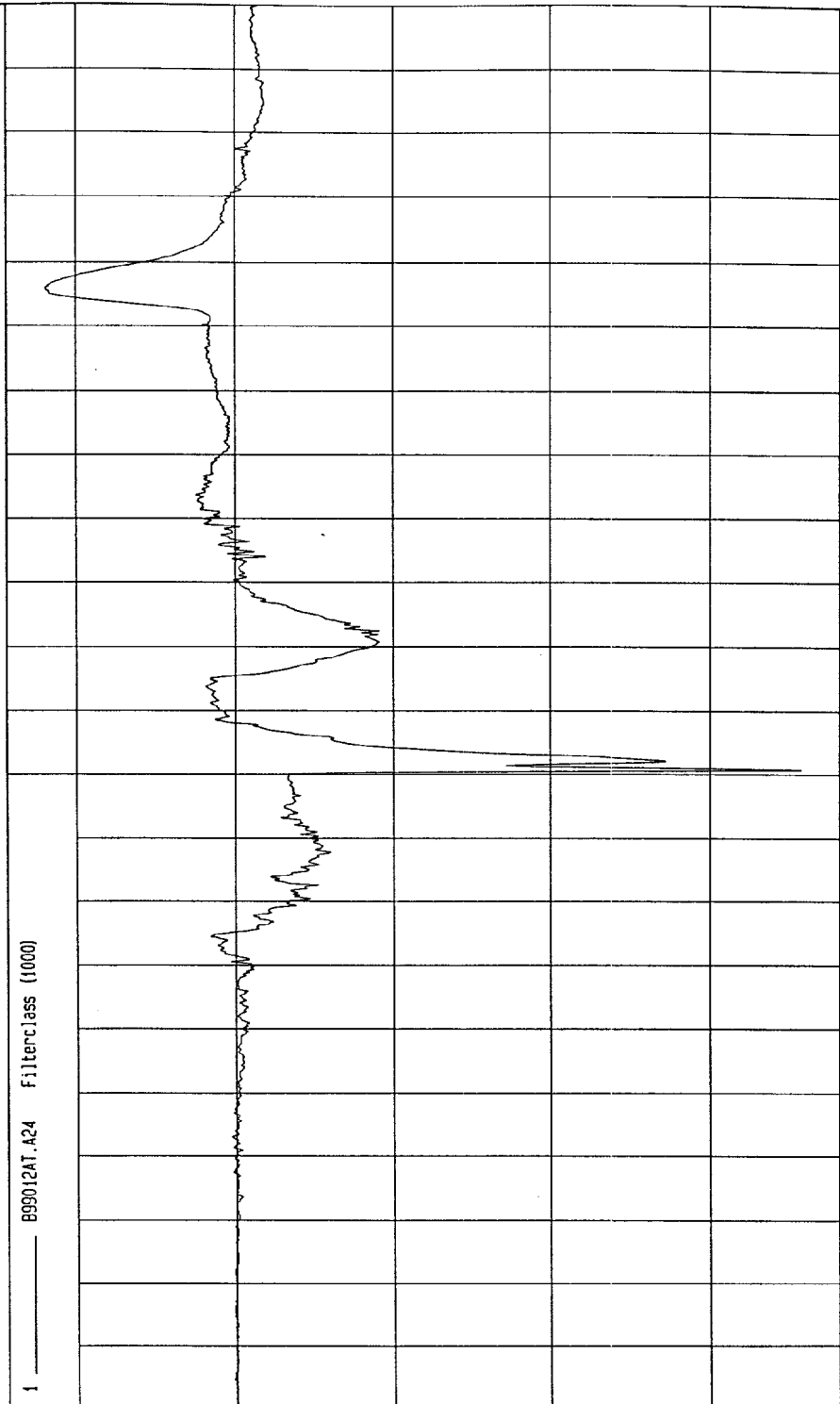
MCA Research
01-30-1999 15:49

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -71.54 G'S at 81 msec Maximum = 23.8 G'S at 156 msec

REAR PASSENGER HEAD Z ACCELERATION



MOA Research
01-30-1999 16:45

TIME (SECONDS)

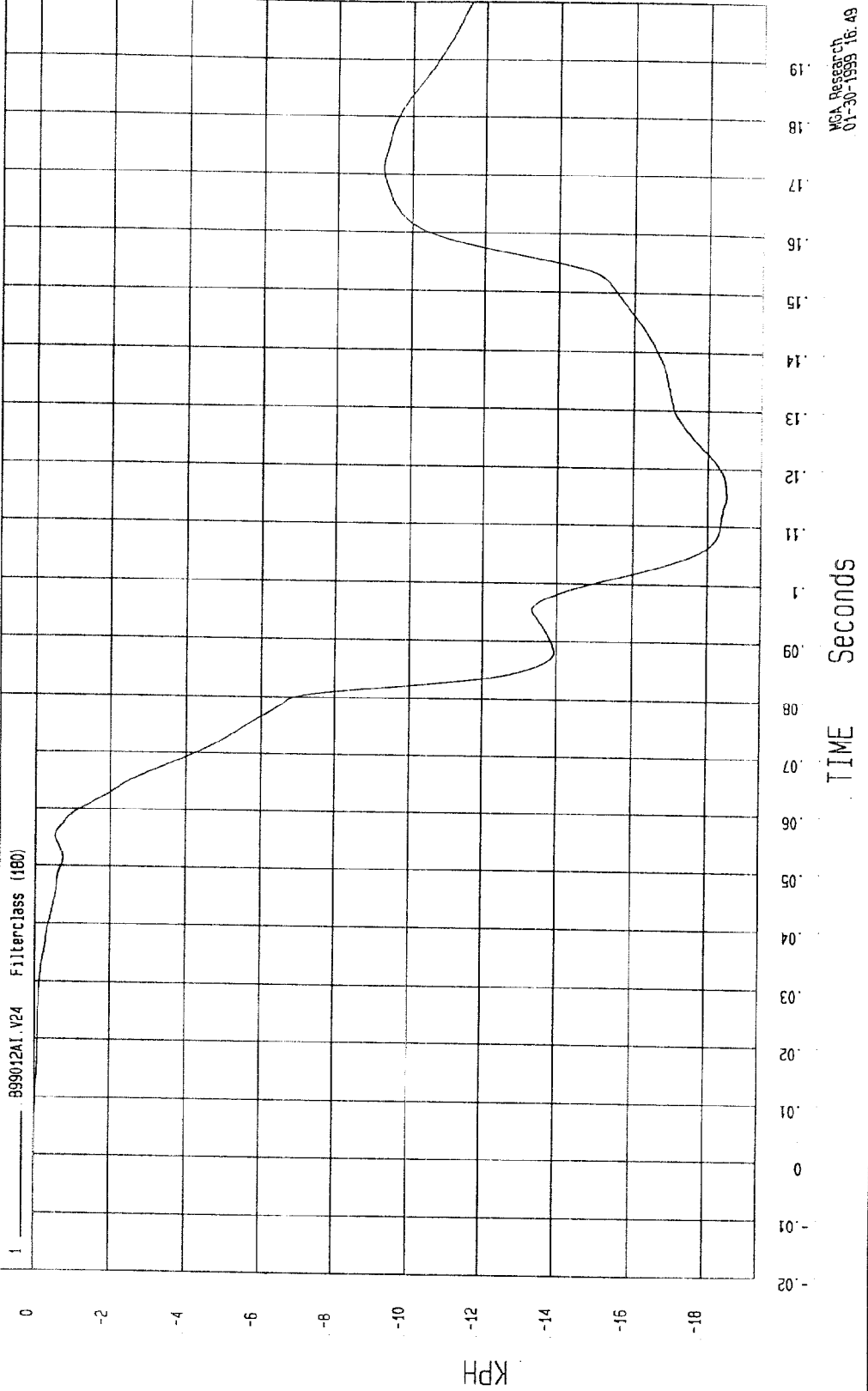
G

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -18.5 KPH at 115 msec Maximum = 9.18E-03 KPH at -14 msec

REAR PASSENGER HEAD Z VELOCITY

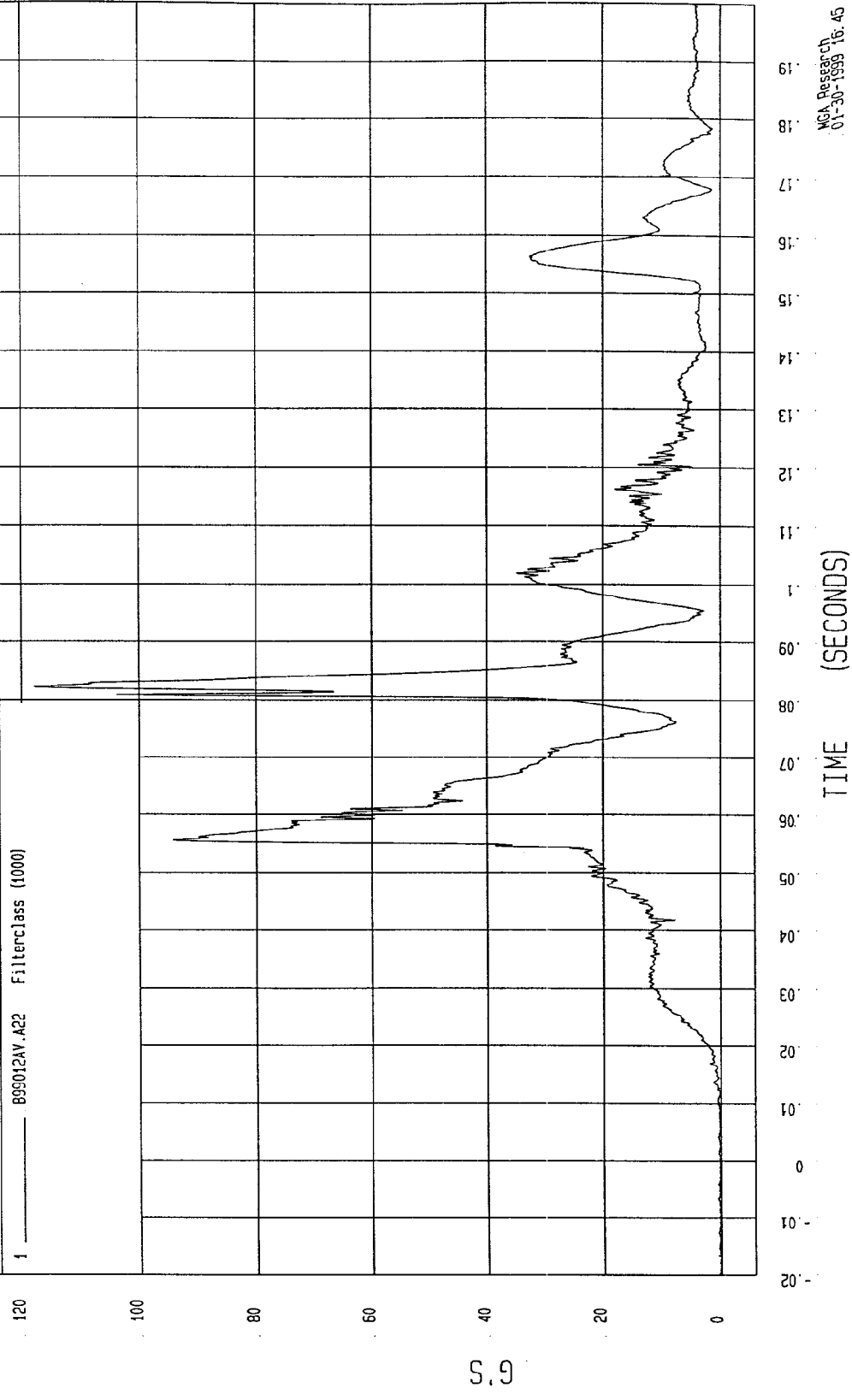


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = 5.95E-02 G'S at -19 msec Maximum = 117.86 G'S at 82 msec

REAR PASSENGER HEAD RESULTANT ACCELERATION



NGA Research
01-30-1999 16:45

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

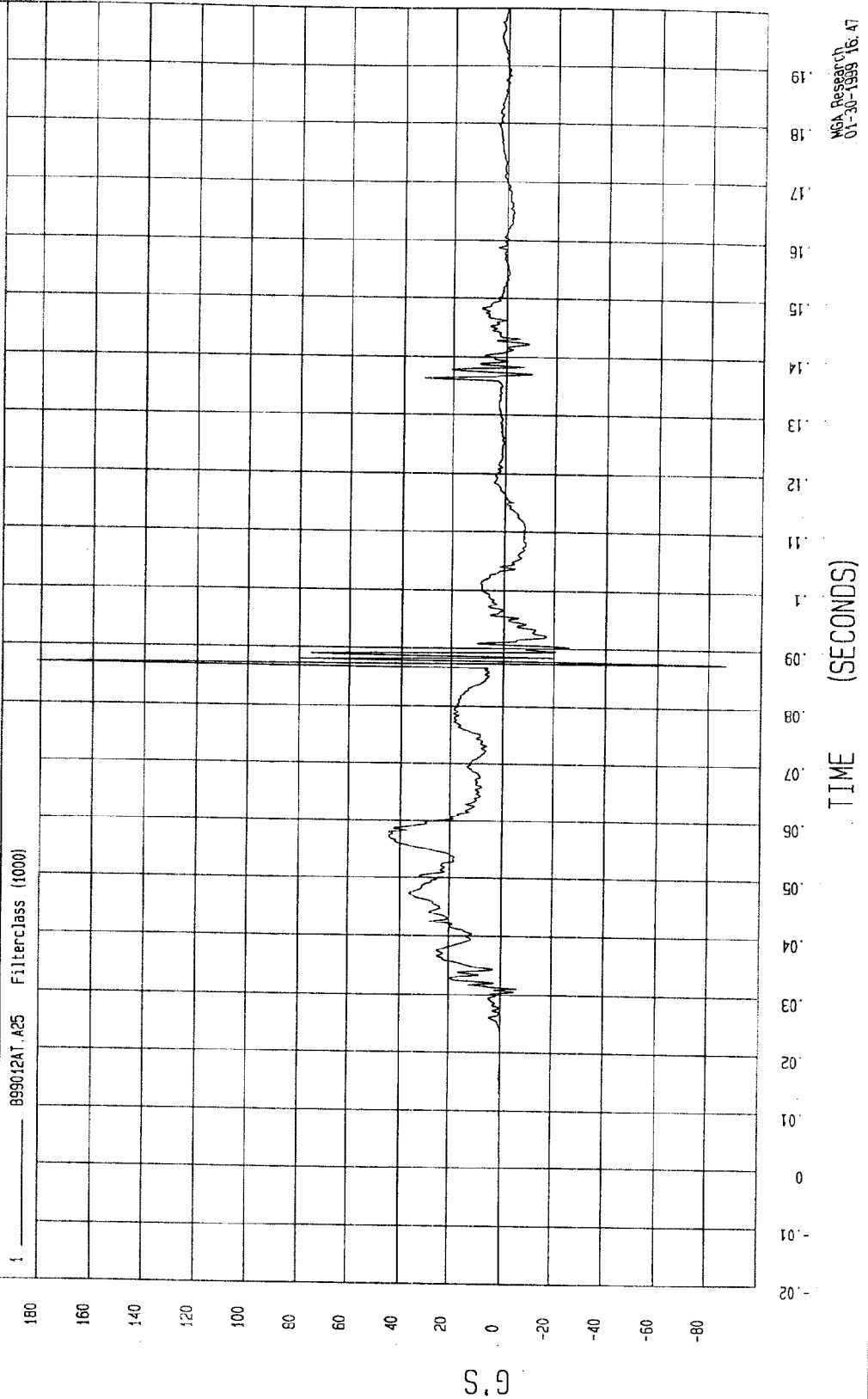
COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Speed: 38 MPH 61.2 KPH

Minimum = -86.46 G'S at 88 msec

Maximum = 181.25 G'S at 87 msec

REAR PASSENGER UPPER RIB Y ACCELERATION

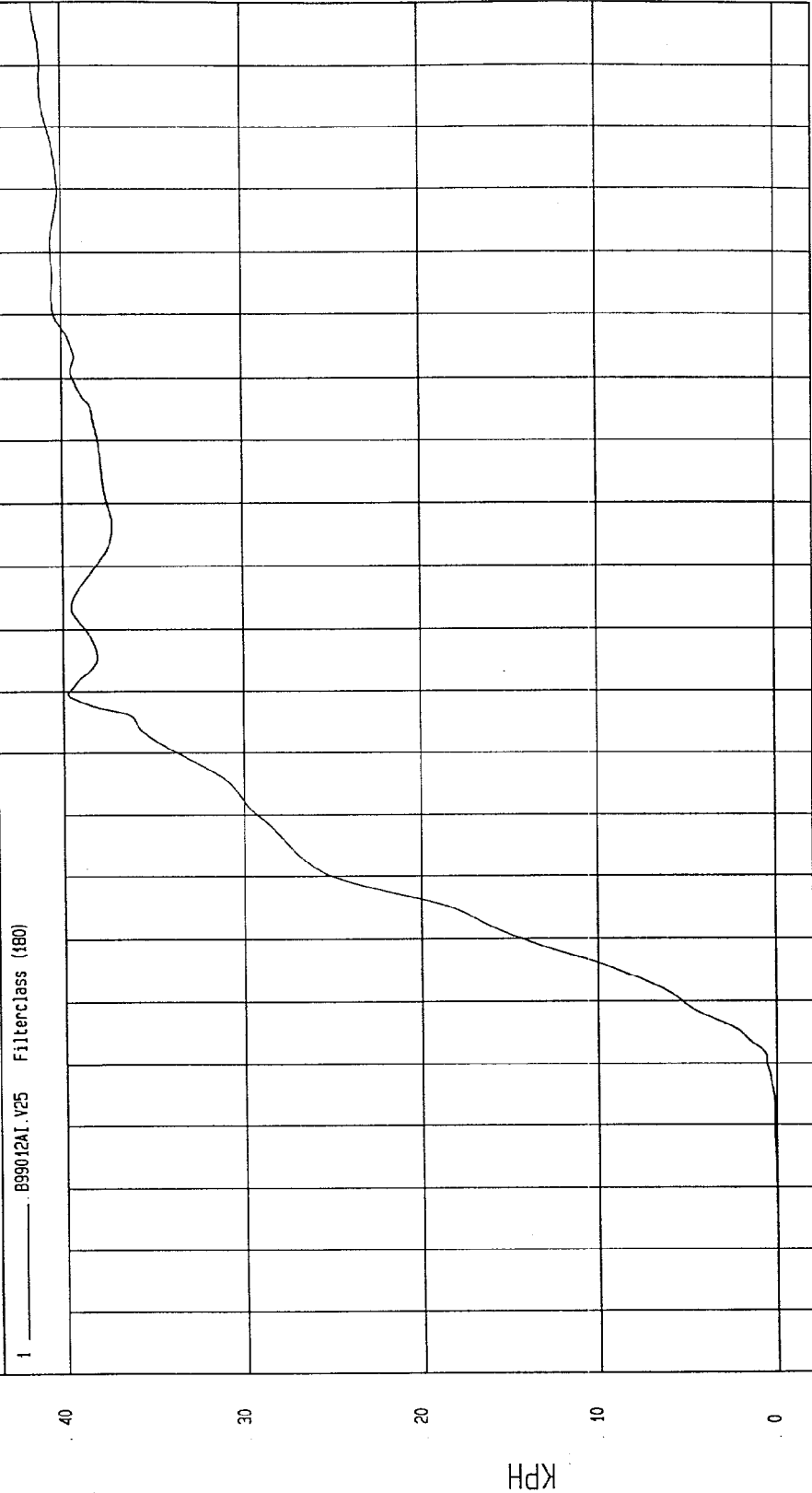


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -3.46E-04 KPH at -14 msec Maximum = 41.59 KPH at 200 msec

REAR PASSENGER UPPER RIB Y VELOCITY



WGA Research
01-30-1999 16:49

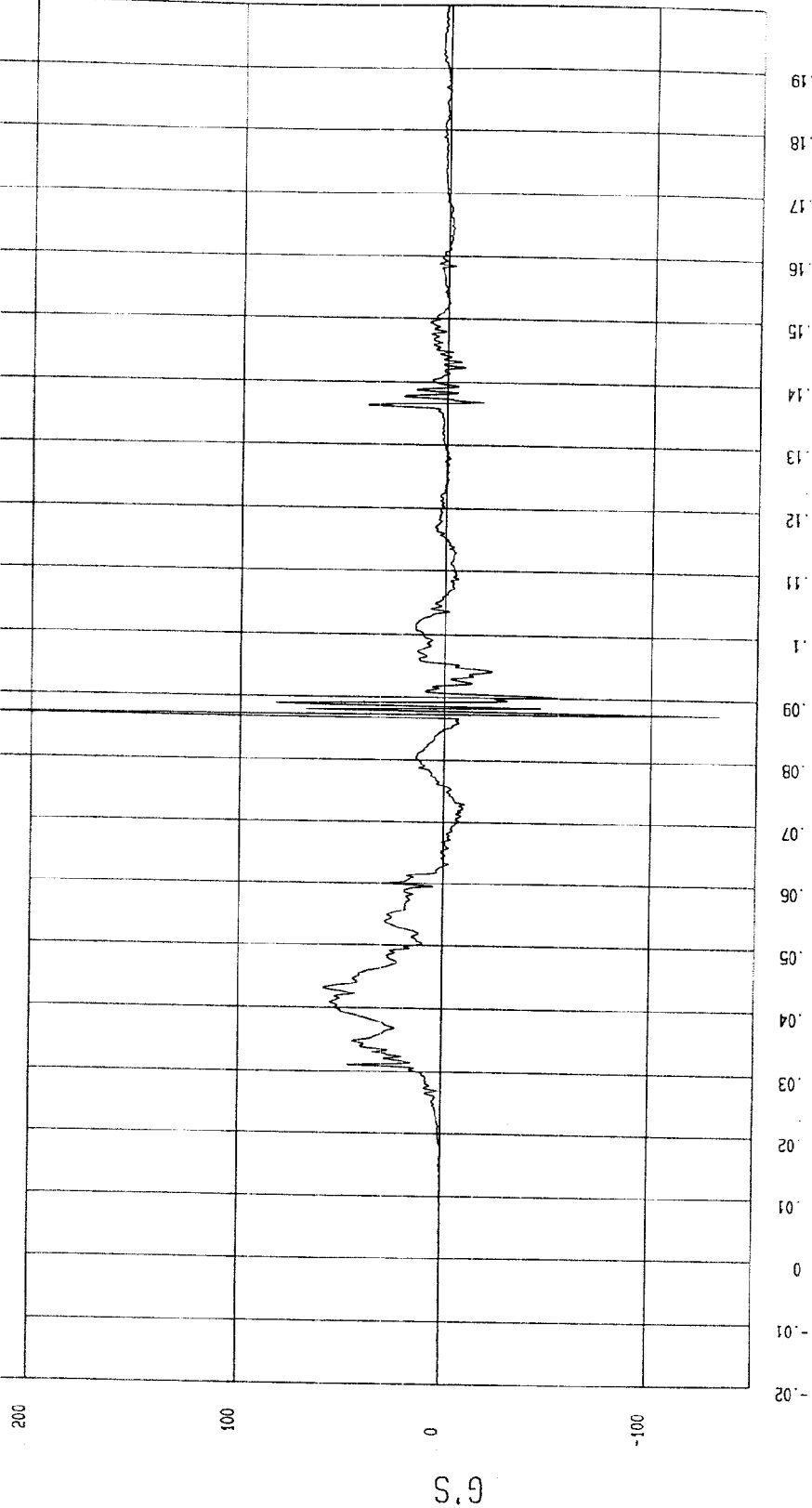
TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

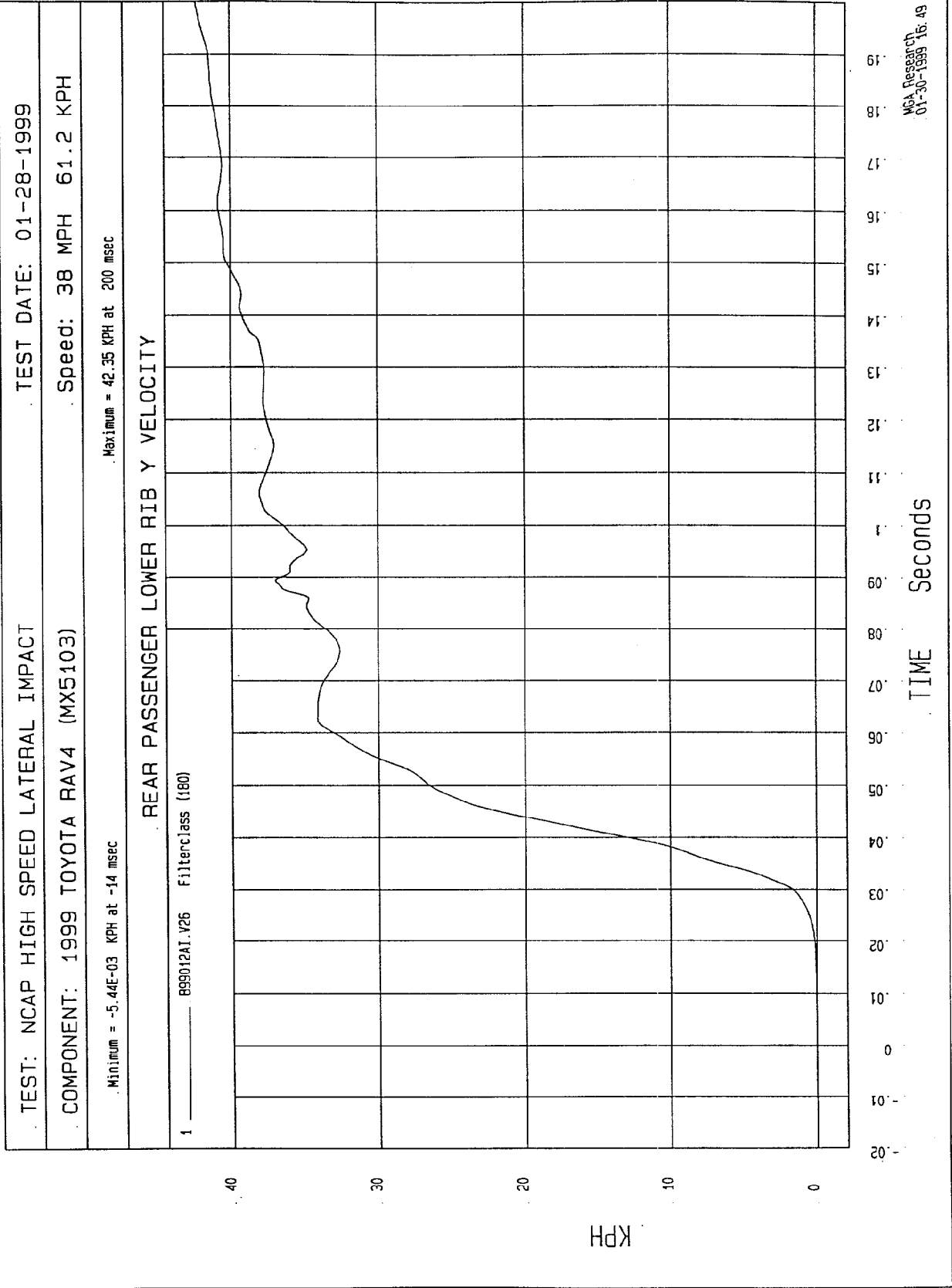
Minimum = -132.19 G'S at 88 msec Maximum = 227.3 G'S at 87 msec

REAR PASSENGER LOWER RIB Y ACCELERATION

1 B99012AT.A26 Filterclass (1000)



MGA Research
01-30-1999 15:47



TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

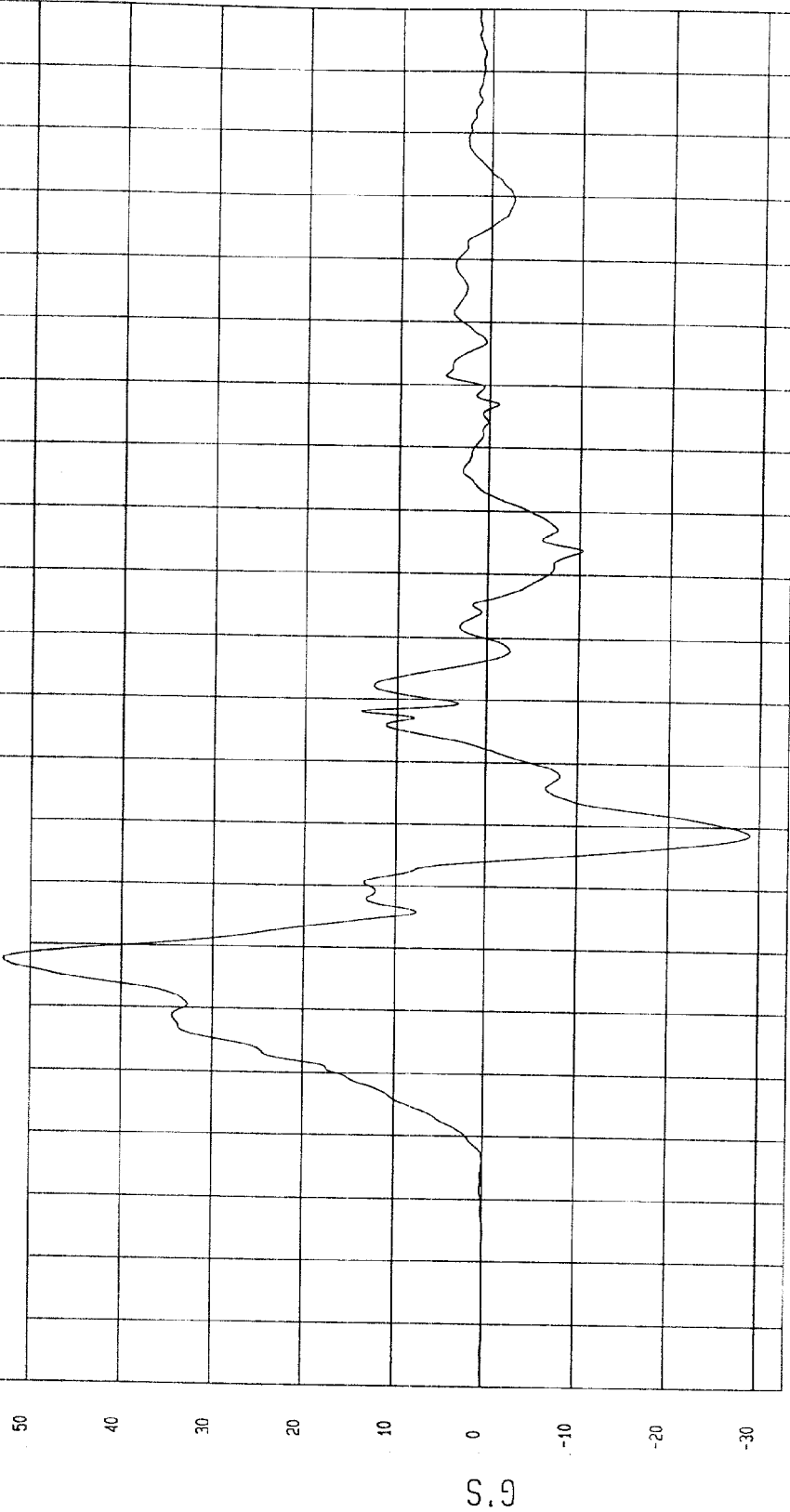
Speed: 38 MPH 61.2 KPH

Minimum = -29 G'S at 69 msec

Maximum = 52.91 G'S at 48 msec

REAR PASSENGER LOWER SPINE Y ACCELERATION

1 ——— B990124F.A27 Filterclass (180)



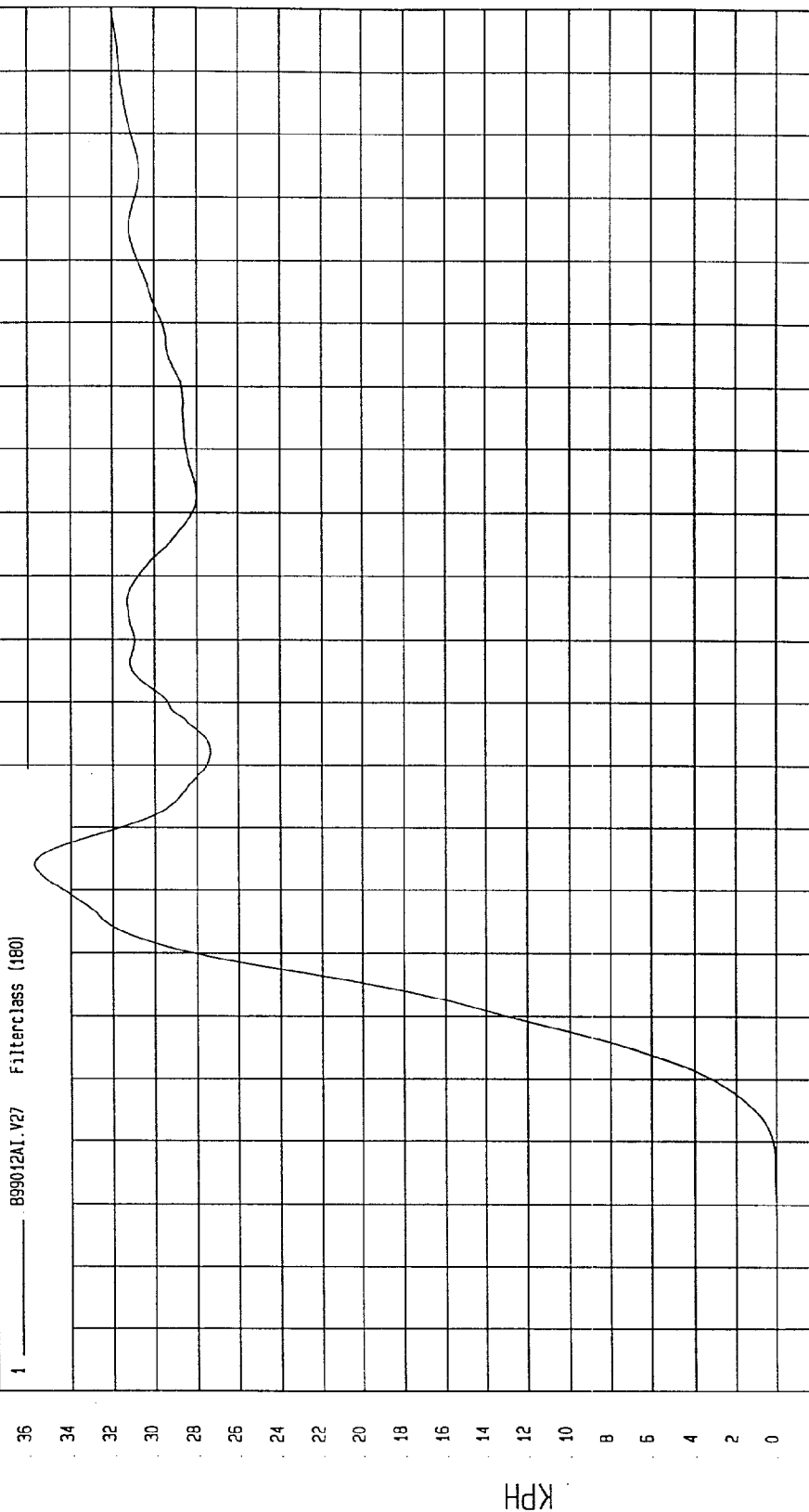
TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

SPEED: 38 MPH 61.2 KPH

Minimum = 0 KPH at -20 msec

REAR PASSENGER LOWER SPINE Y VELOCITY

1 B99012AL.V27 Filterclass (180)



MSA Research
01-30-1999 16.49

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

Speed: 38 MPH 61.2 KPH

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = 47.34 G'S at 41 msec

Minimum = -13.49 G'S at 81 msec

REAR PASSENGER PELVIS Y ACCELERATION

1 ——— B99012AT.A28 Filterclass (1000)

50

40

30

20

10

0

-10

G'S

19

18

17

16

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

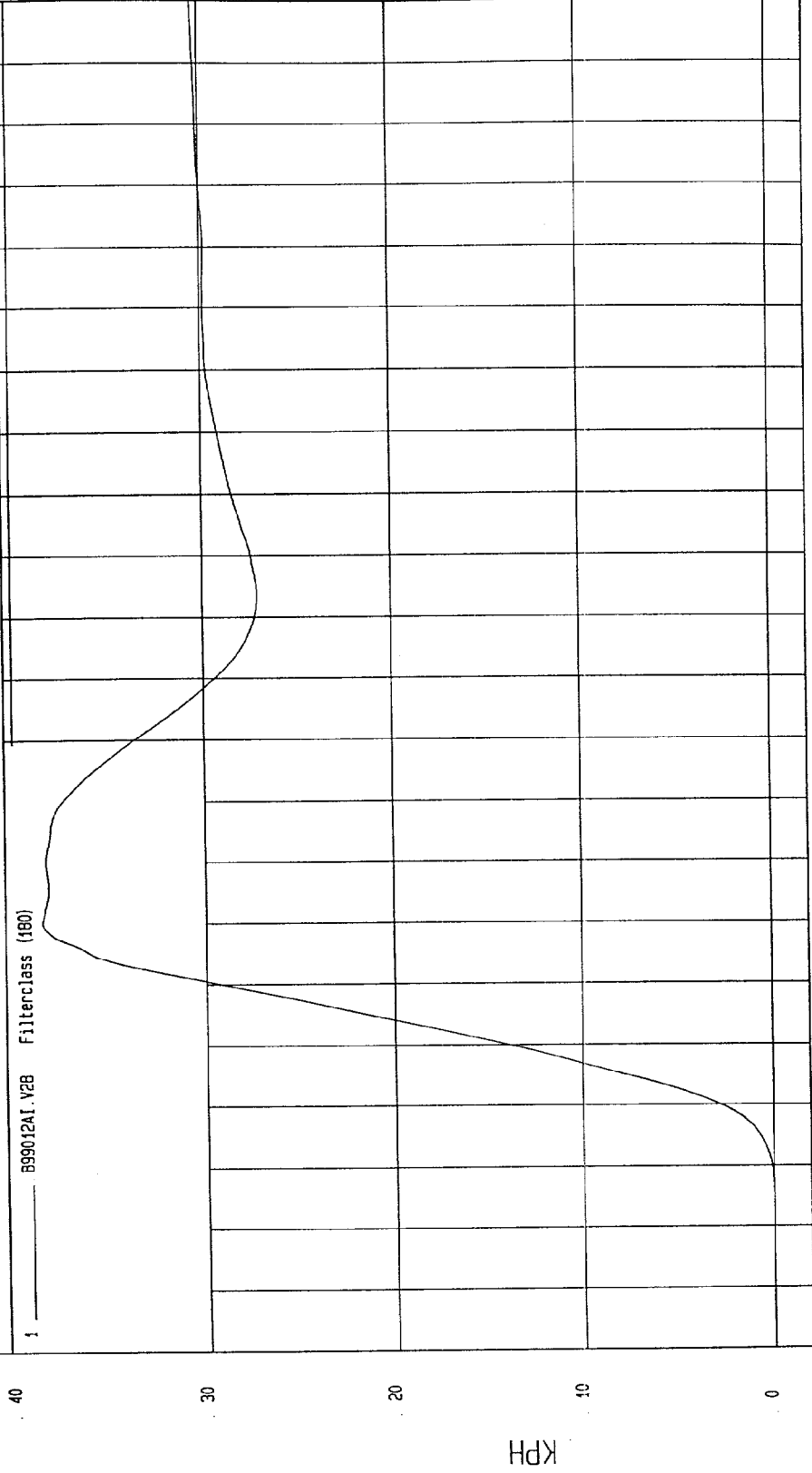
-02

TIME (SECONDS)

WGA Research
01-30-1999 16: 47

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999
COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH
Minimum = -7.09E-03 KPH at -6 msec Maximum = 38.51 KPH at 50 msec

REAR PASSENGER PELVIS Y VELOCITY



TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

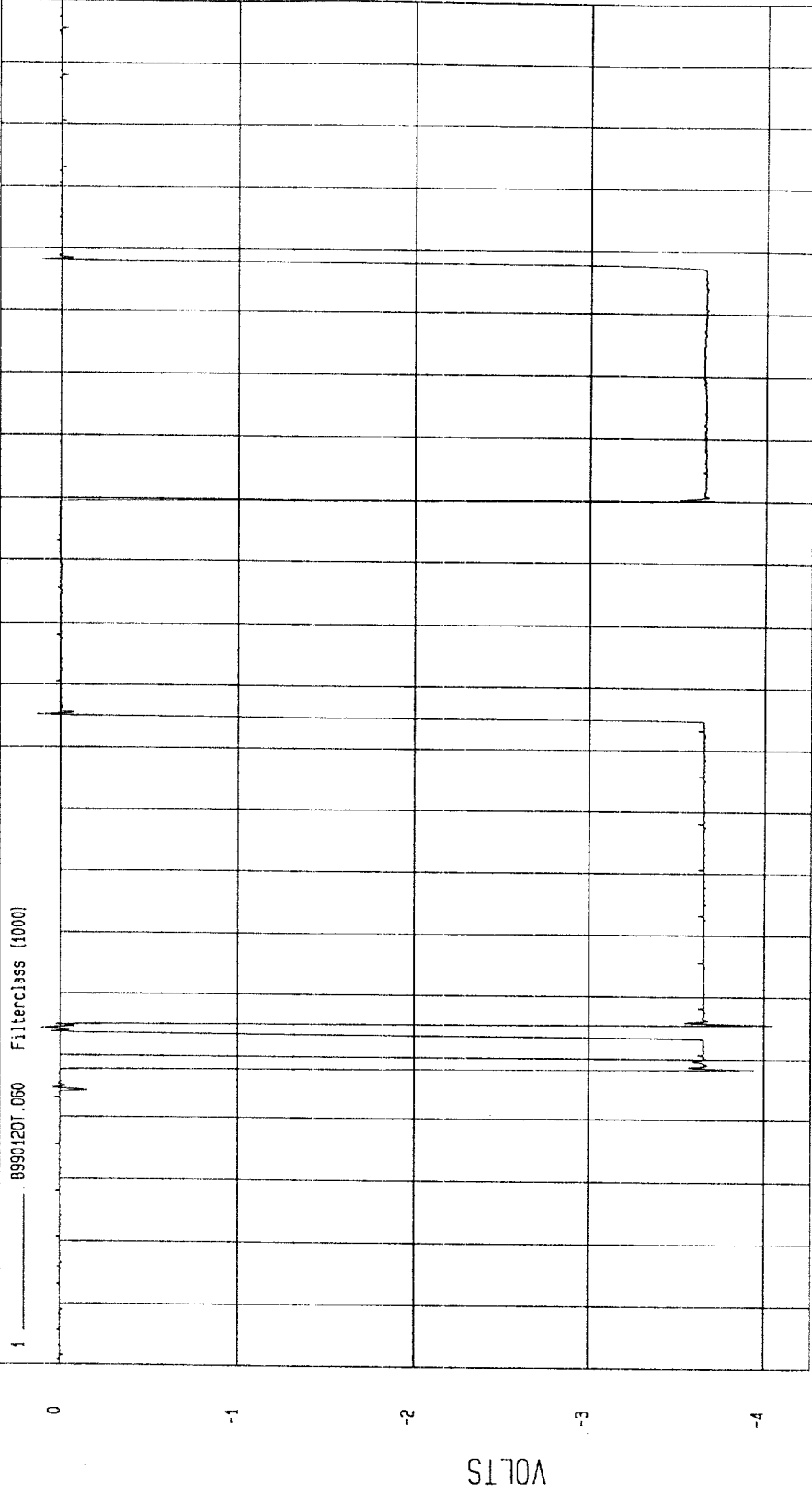
Speed: 38 MPH 61.2 KPH

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

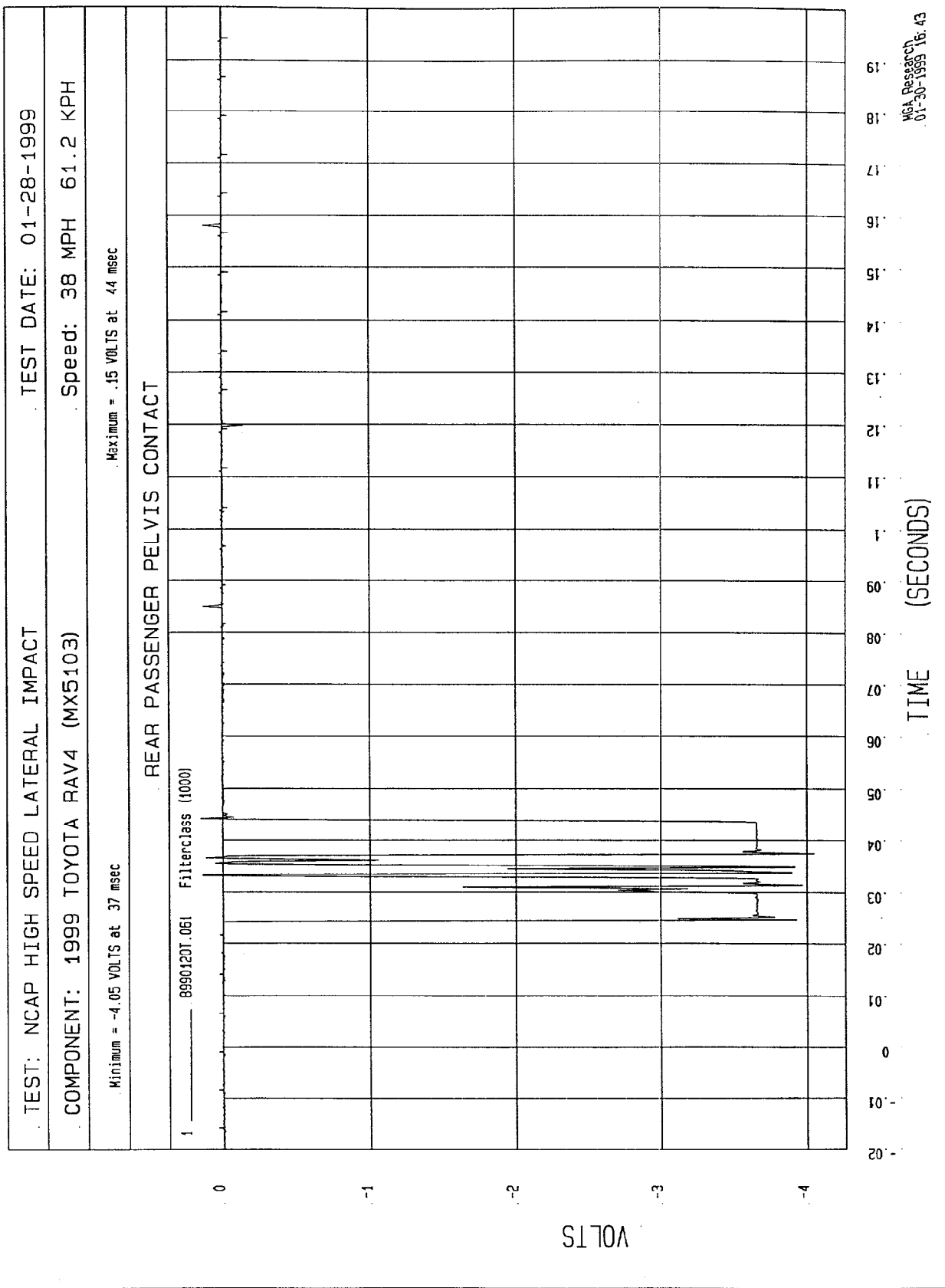
Maximum = .13 VOLTS at 85 msec

Minimum = -4.05 VOLTS at 36 msec

REAR PASSENGER SHOULDER CONTACT



MCA Research
01-30-1999 16:43



TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

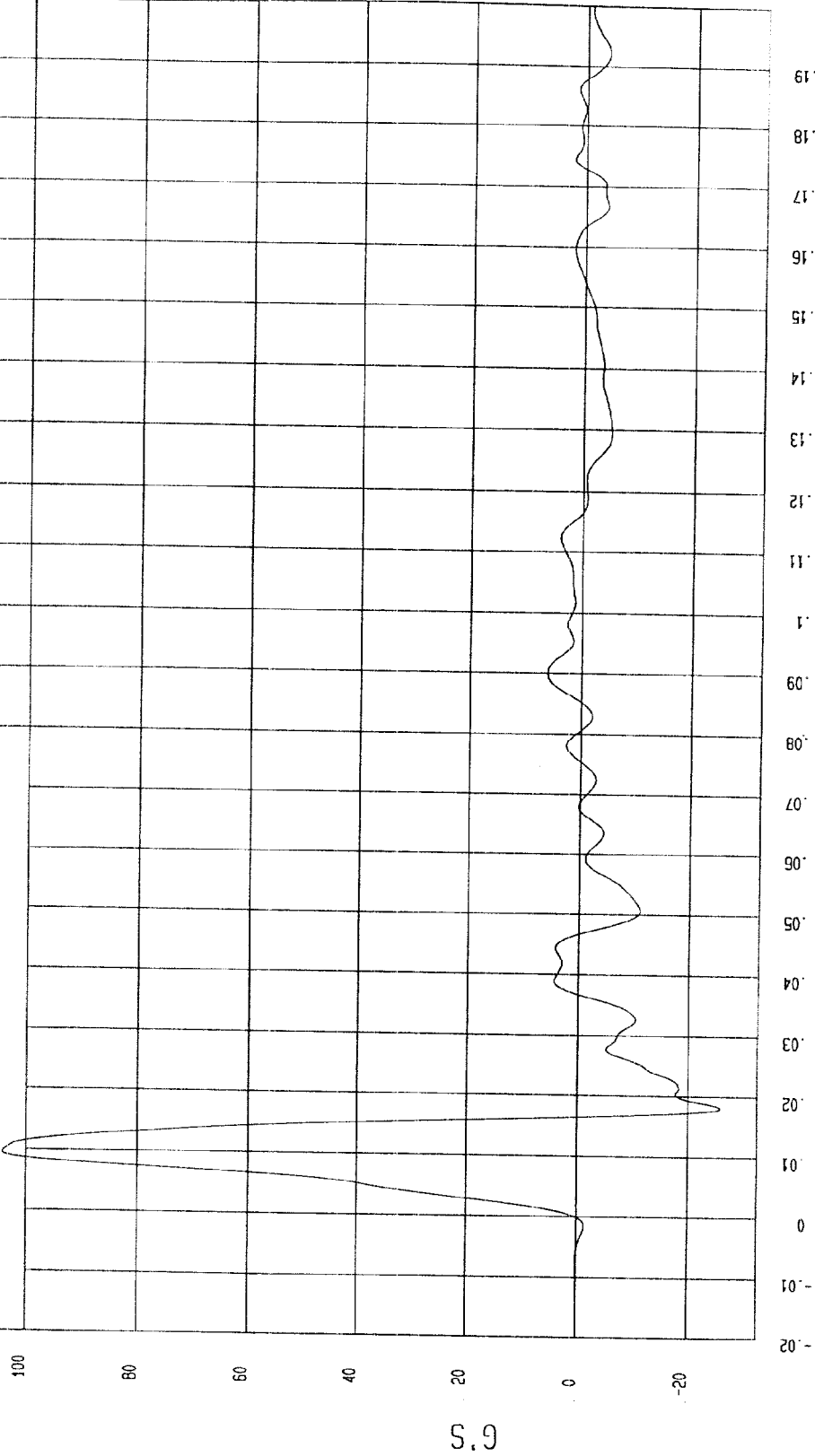
Speed: 38 MPH 61.2 KPH

Minimum = -25.76 G'S at 18 msec

Maximum = 104.2 G'S at 10 msec

LEFT SIDE SILL AT FRONT SEAT Y ACCELERATION

1 B99012AF.A38 Filterclass (60)



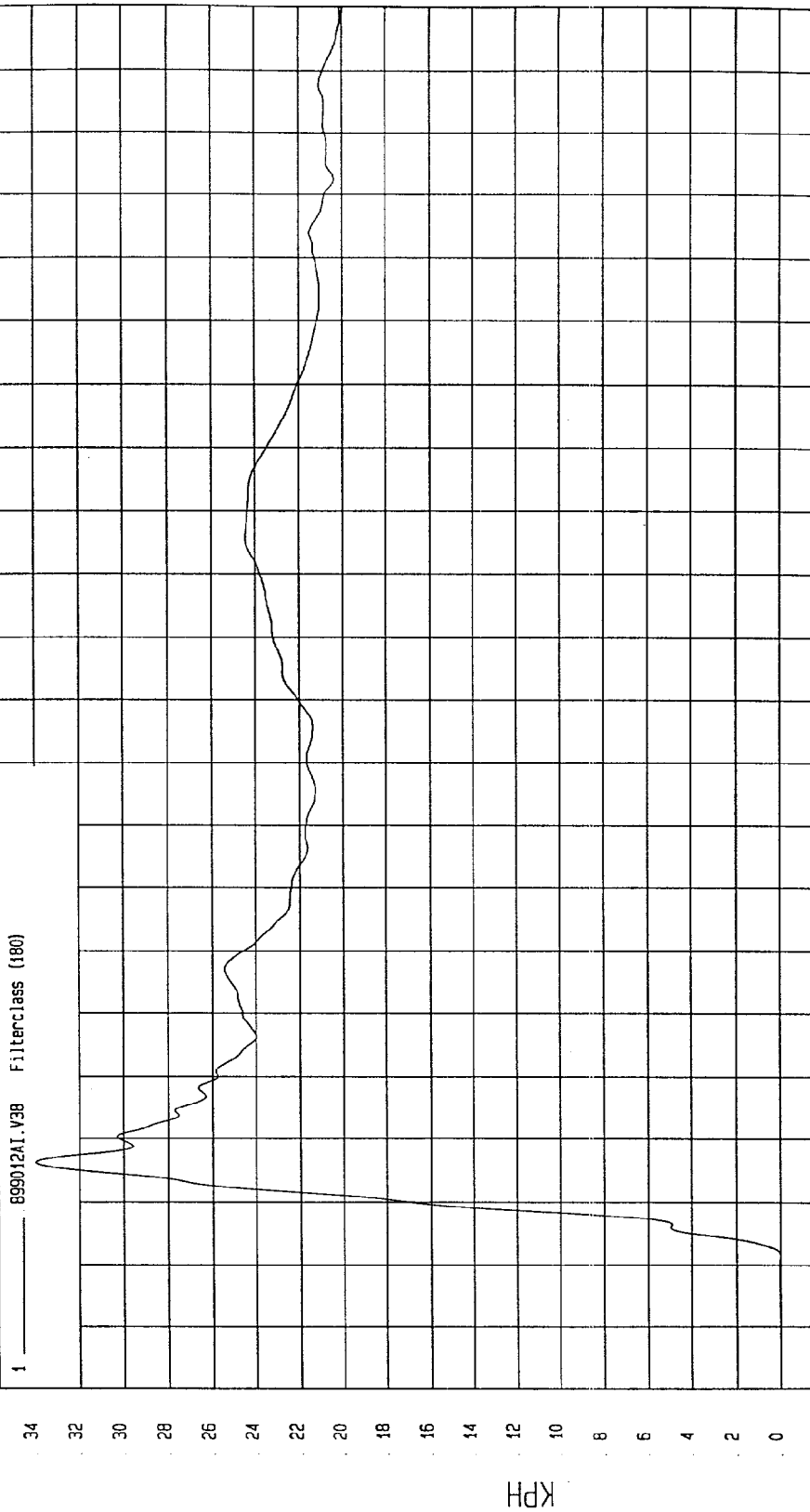
WCA Research
01-30-1999 16:53

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -7.06E-04 KPH at 2 msec Maximum = 33.98 KPH at 16 msec

LEFT SIDE SILL AT FRONT SEAT Y VELOCITY



TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

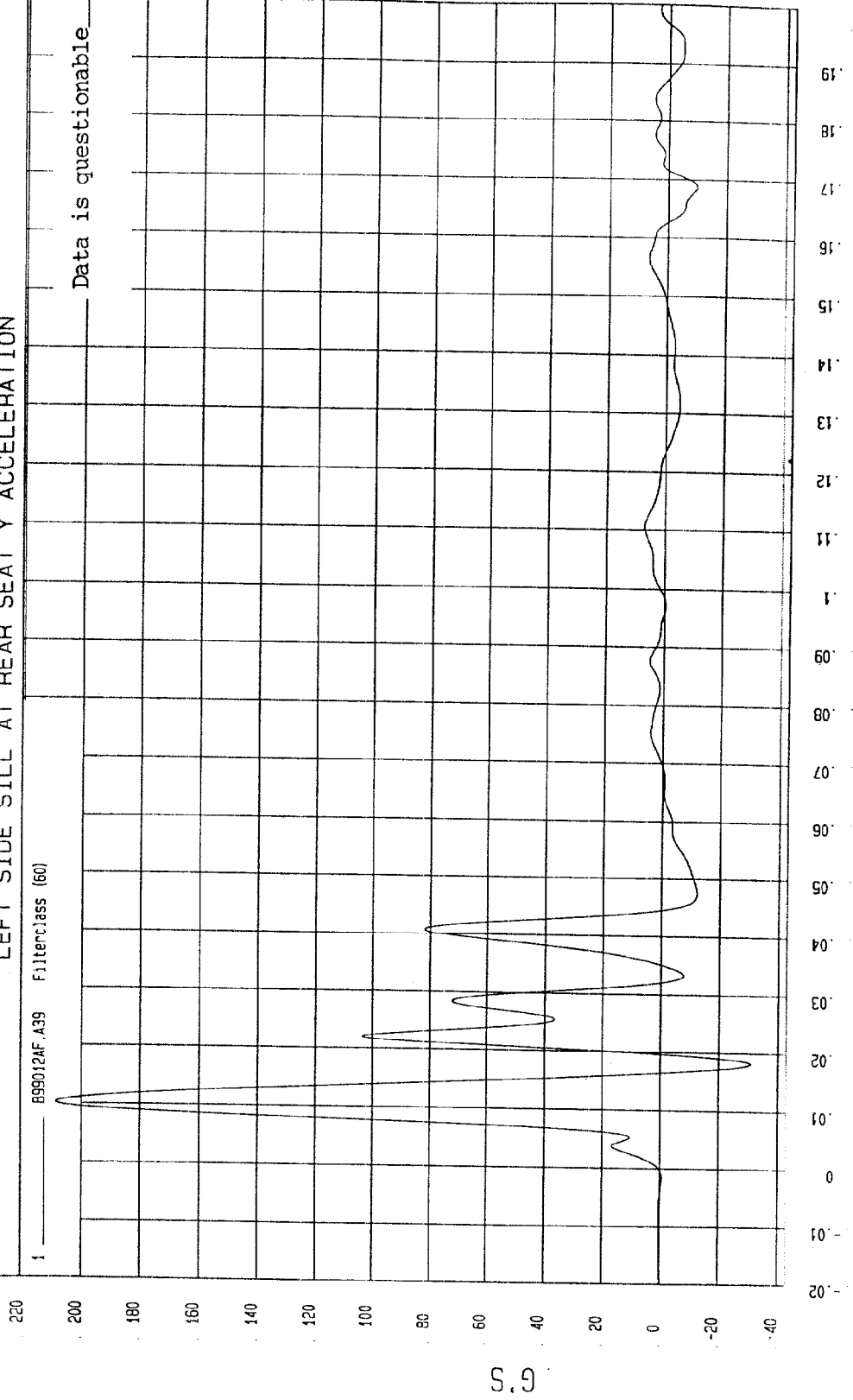
SPEED: 38 MPH 61.2 KPH

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Minimum = -30.74 G'S at 18 msec

Maximum = 208.86 G'S at 10 msec

LEFT SIDE SILL AT REAR SEAT Y ACCELERATION



TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

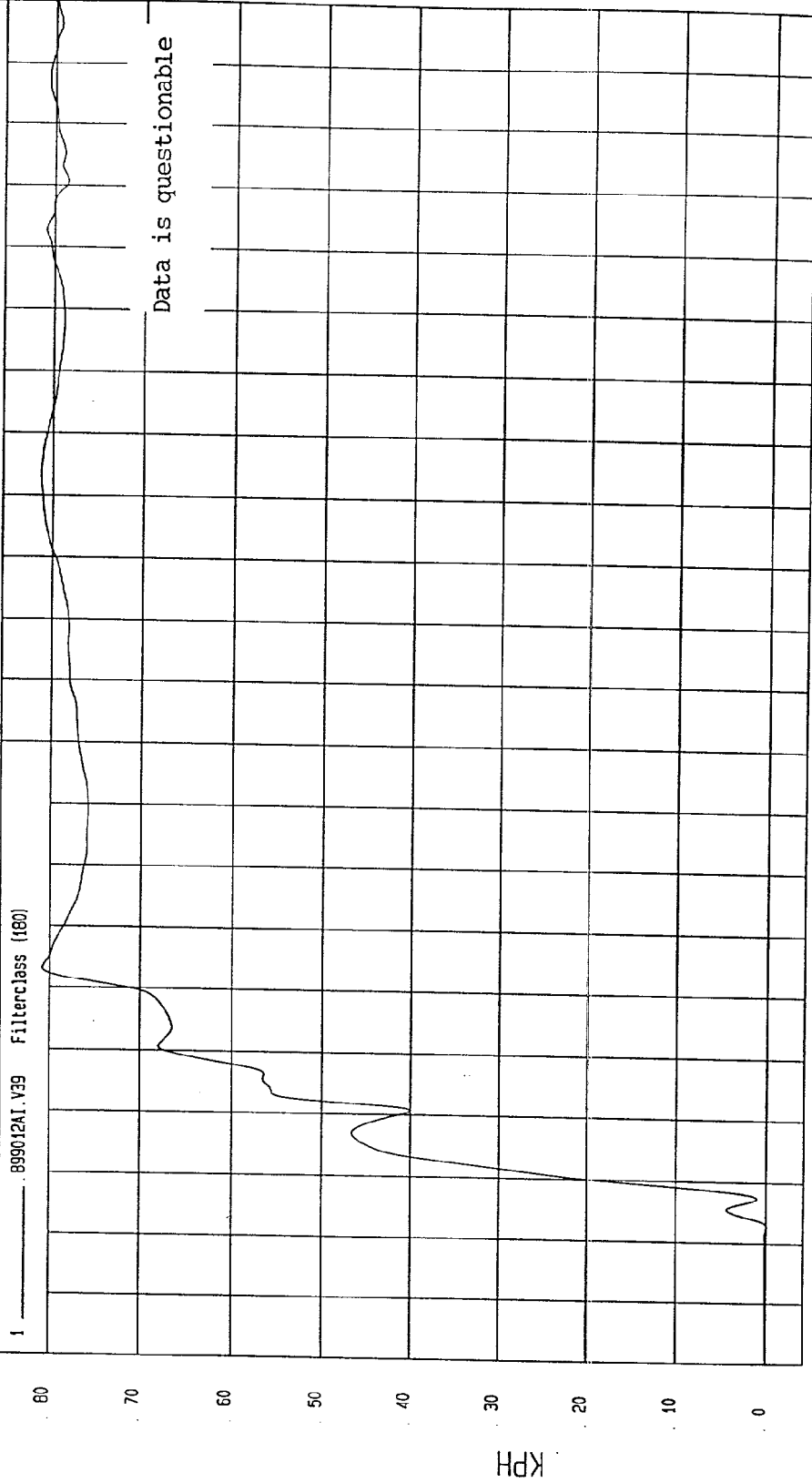
Speed: 38 MPH 61.2 KPH

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Minimum = -11 KPH at 3 msec

Maximum = 81.25 KPH at 124 msec

LEFT SIDE SILL AT REAR SEAT Y VELOCITY



TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

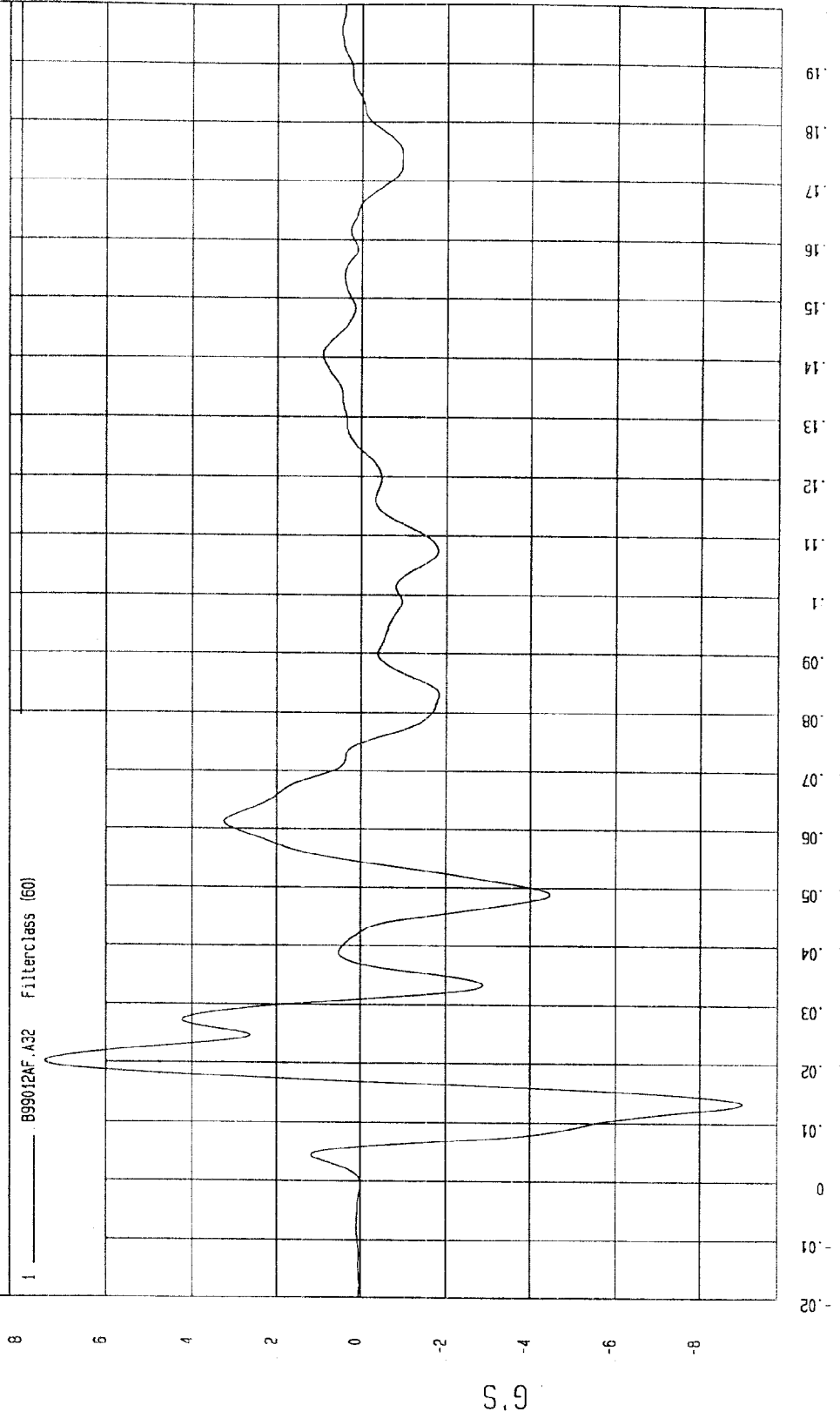
Speed: 38 MPH 61.2 KPH

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = 7.43 G'S at 20 msec

Minimum = -8.97 G'S at 13 msec

RIGHT SIDE SILL AT FRONT SEAT X ACCELERATION



MOA Research
01-30-1999 16:54

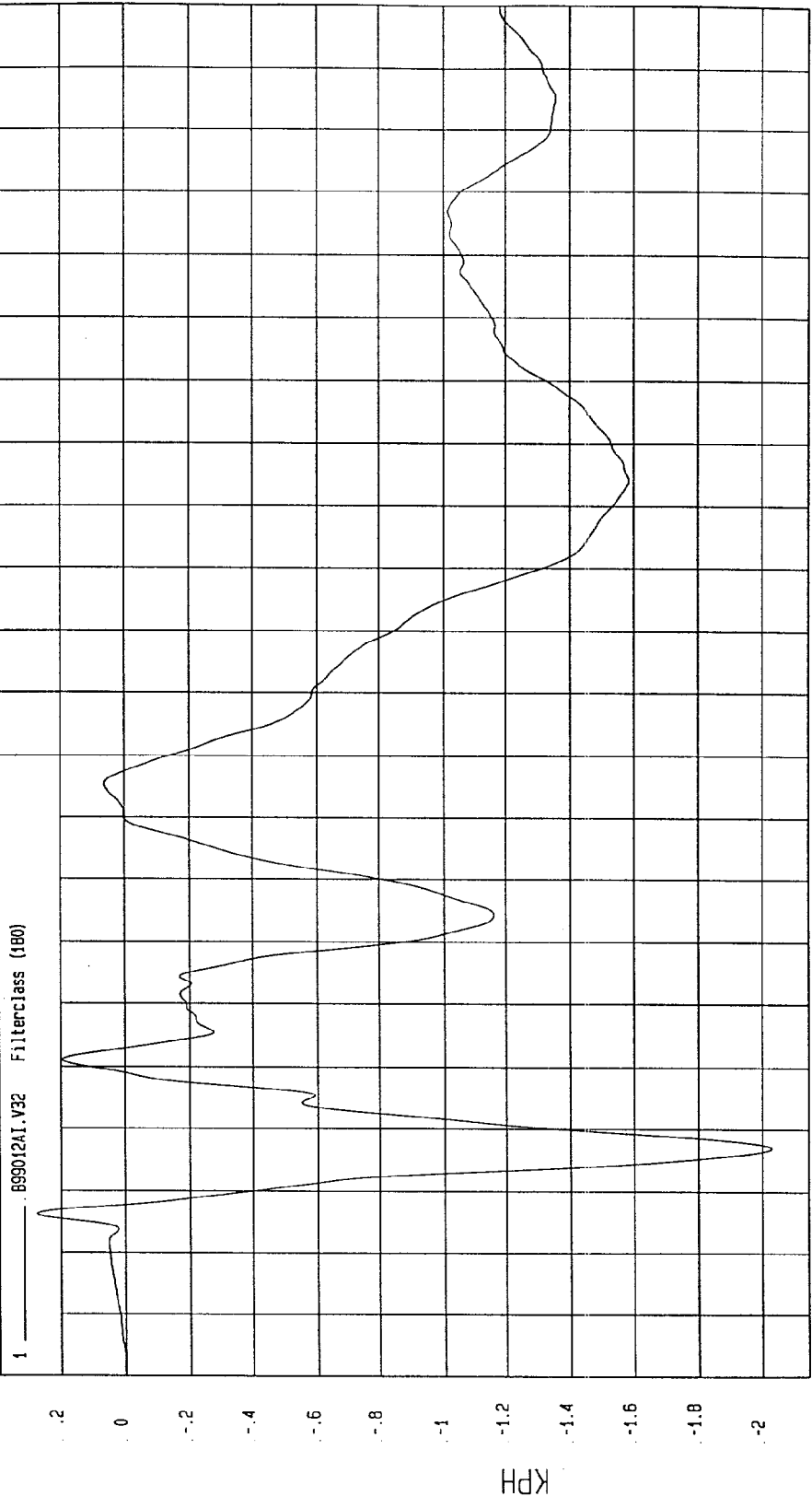
TIME (SECONDS)

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -2.03 KPH at 17 msec Maximum = .28 KPH at 6 msec

RIGHT SIDE SILL AT FRONT SEAT X VELOCITY



TIME Seconds

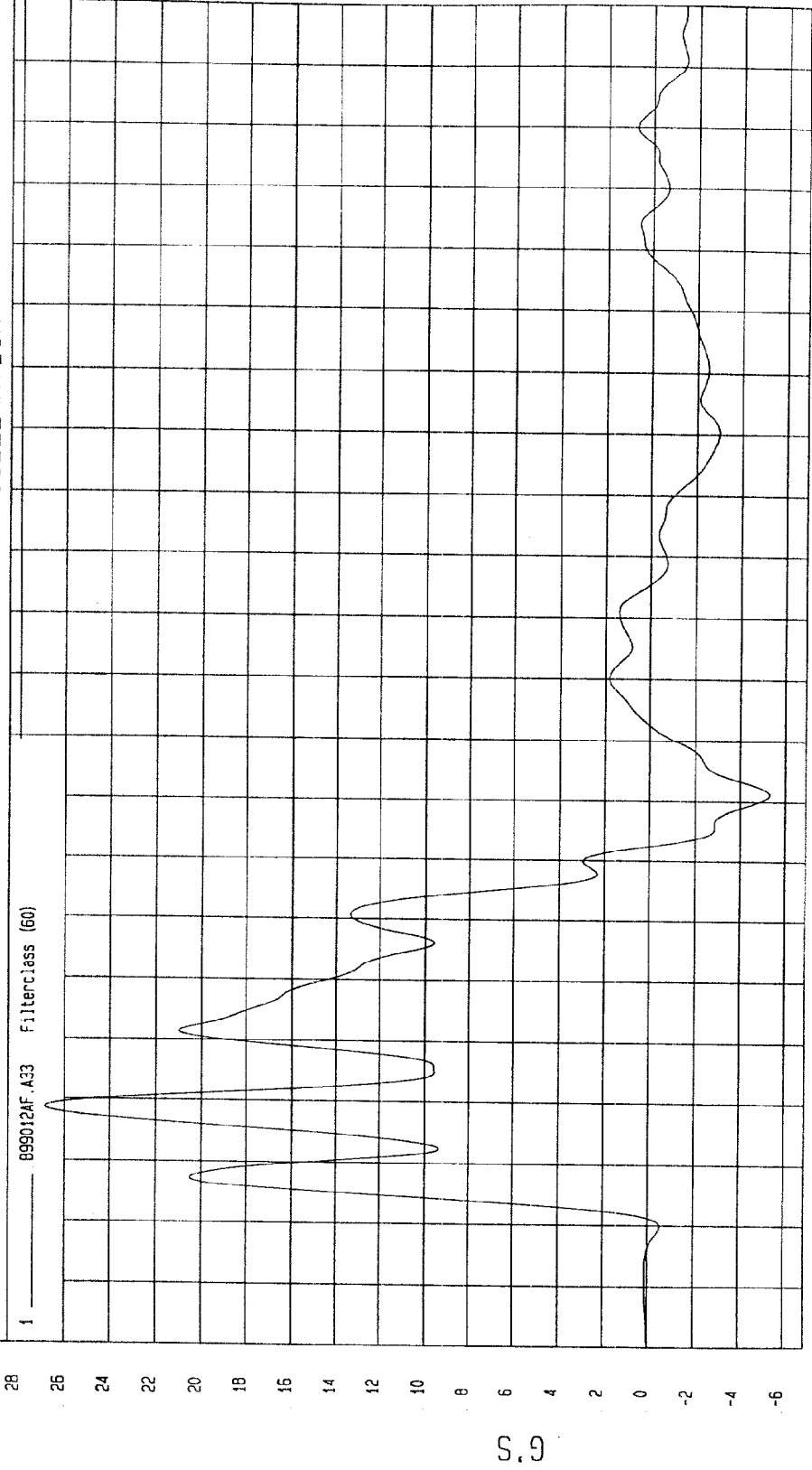
NSA Research
01-30-1999 17:00

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -5.3 G'S at 71 msec Maximum = 26.86 G'S at 19 msec

RIGHT SIDE SILL AT FRONT SEAT Y ACCELERATION

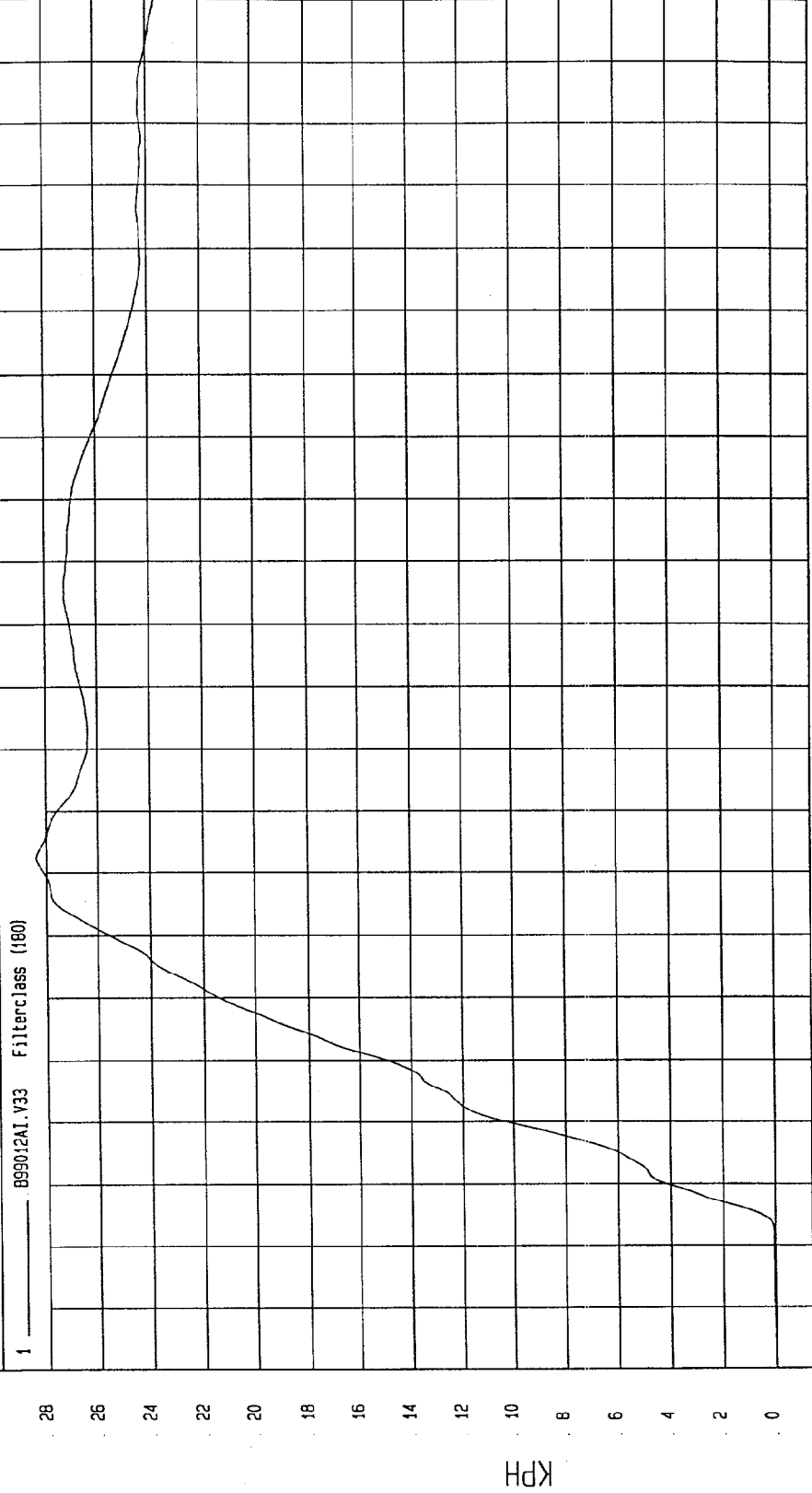


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = 0 KPH at -20 msec Maximum = 28.38 KPH at 62 msec

RIGHT SIDE SILL AT FRONT SEAT Y VELOCITY



NCA Research
01-30-1999 17:00

TIME Seconds

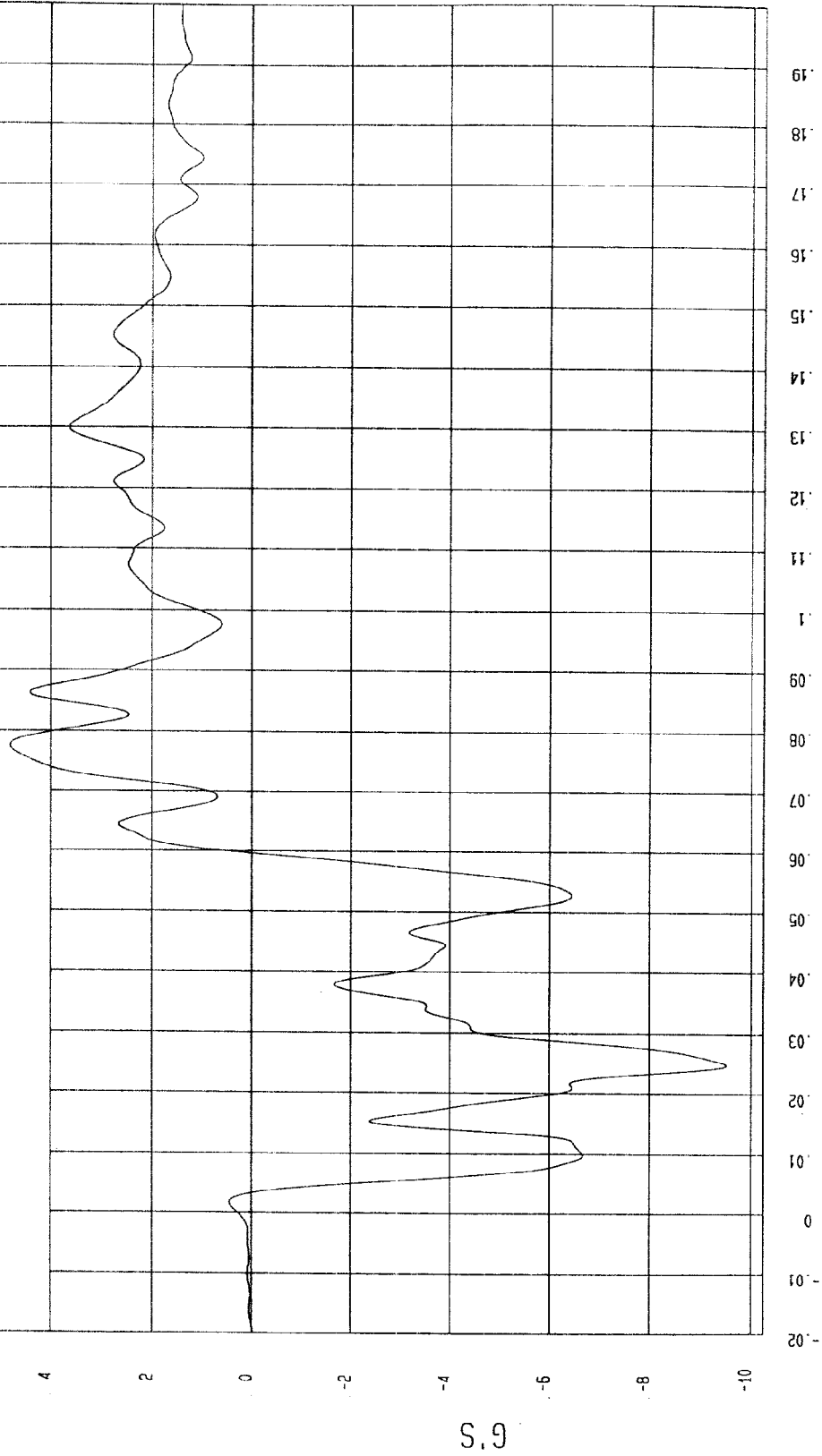
TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -9.53 G'S at 25 msec Maximum = 4.81 G'S at 70 msec

RIGHT SIDE SILL AT FRONT SEAT Z ACCELERATION

1 ——— B99012AF.A34 Filterclass (60)



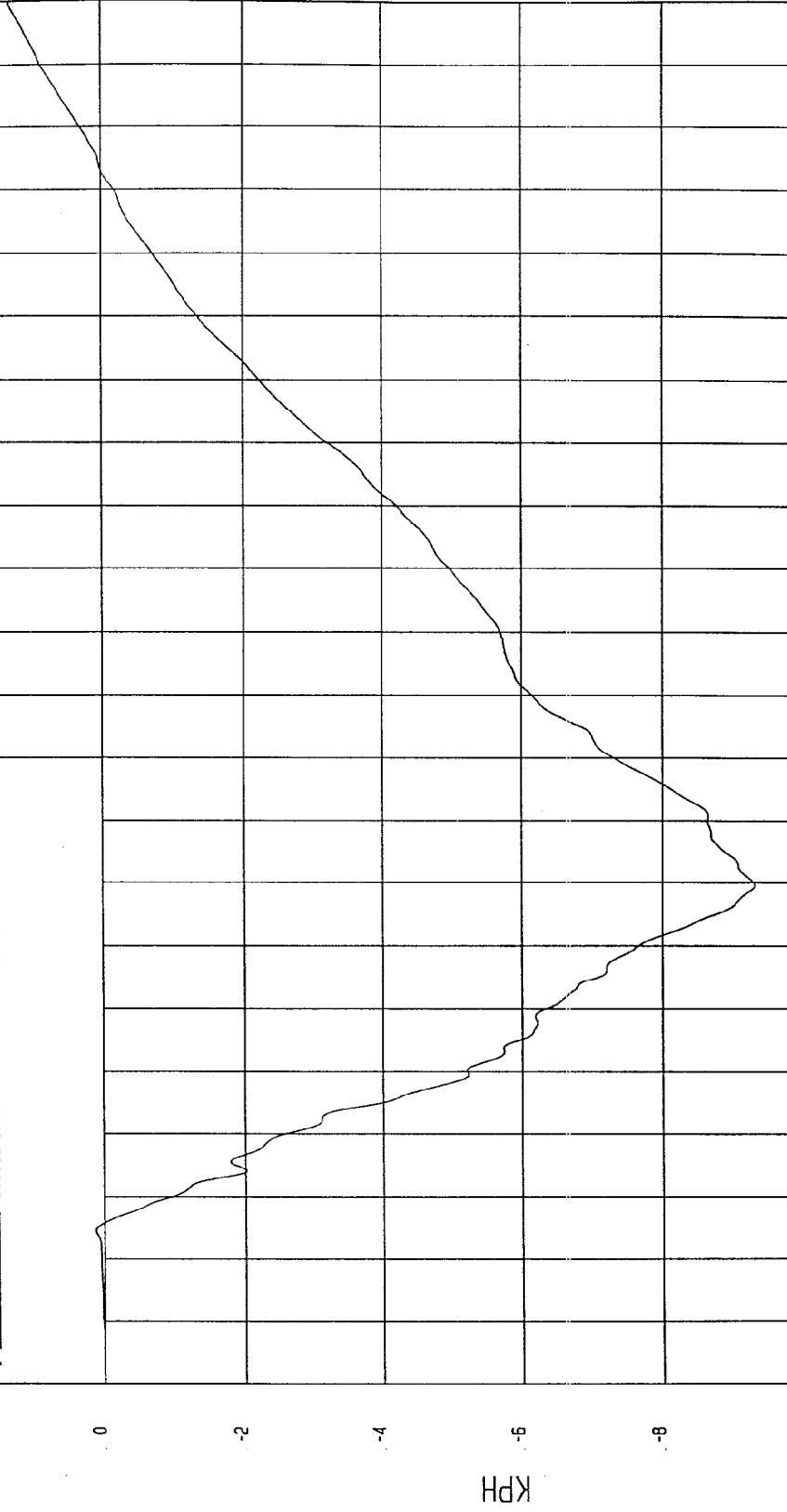
TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -9.31 KPH at 60 msec Maximum = 1.31 KPH at 200 msec

RIGHT SIDE SILL AT FRONT SEAT Z VELOCITY

1 ——— B99012A1.V34 Filterclass (180)



TIME Seconds

NCA Research
01-30-1999 11:00

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

Speed: 38 MPH 61.2 KPH

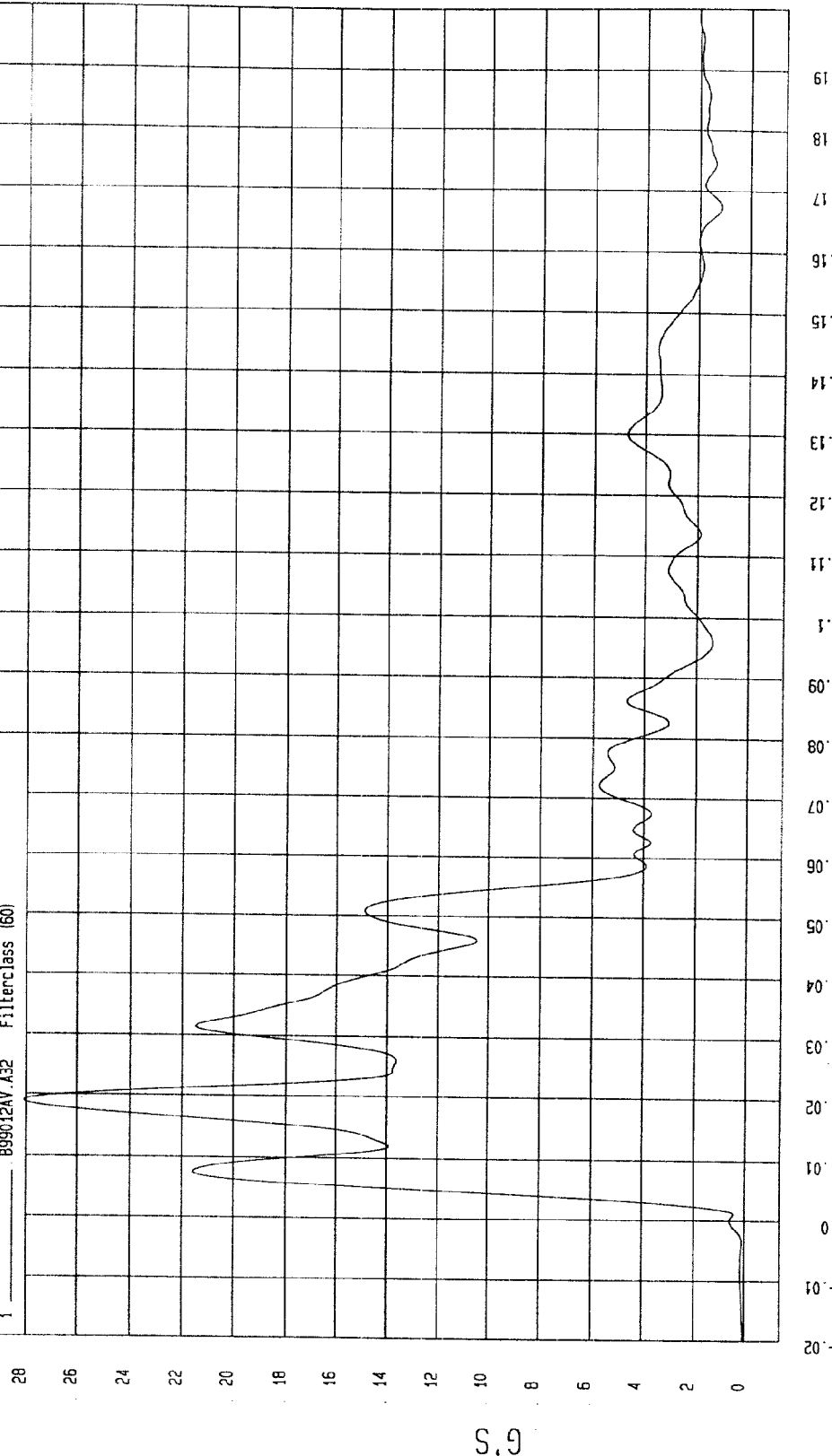
COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = 28.07 G'S at 19 msec

Minimum = 5.22E-02 G'S at -19 msec

RIGHT SIDE SILL AT FRONT SEAT RESULTANT ACCELERATION

1 ——— B99012AV A32 Filterclass (60)



WGL Research
01-30-1999 16:54

TIME (SECONDS)

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

Speed: 38 MPH 61.2 KPH

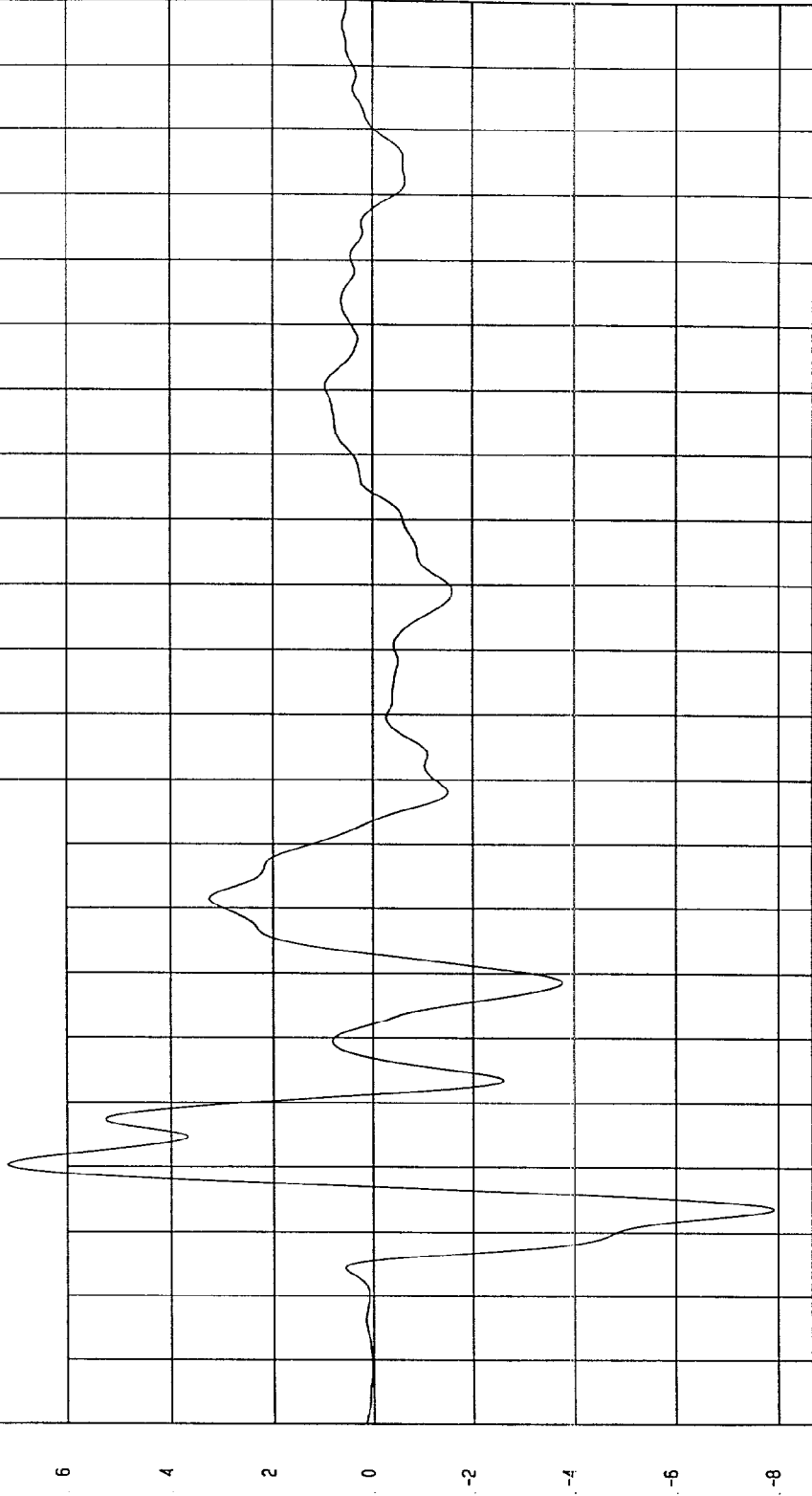
COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = 7.17 G's at 20 msec

Minimum = -7.91 G's at 14 msec

RIGHT SIDE SILL AT REAR SEAT X ACCELERATION

1 B99012AF.A35 Filterclass (60)



MGA Research
01-30-1999 16:54

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

SPEED: 38 MPH 61.2 KPH

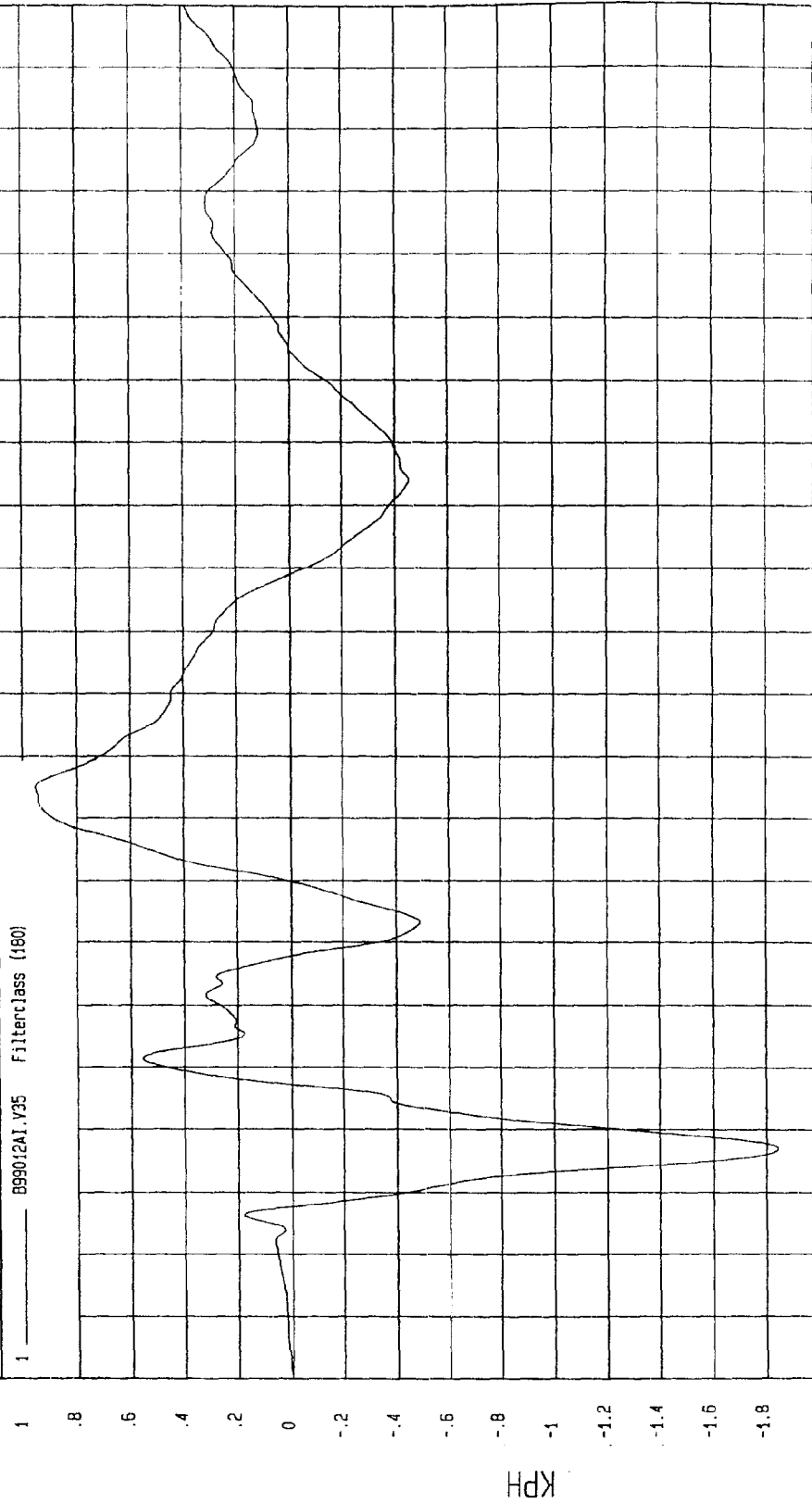
COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = .95 KPH at 75 msec

Minimum = -1.84 KPH at 17 msec

RIGHT SIDE SILL AT REAR SEAT X VELOCITY

1 ——— B99012A1.V35 Filterclass (160)



TIME Seconds

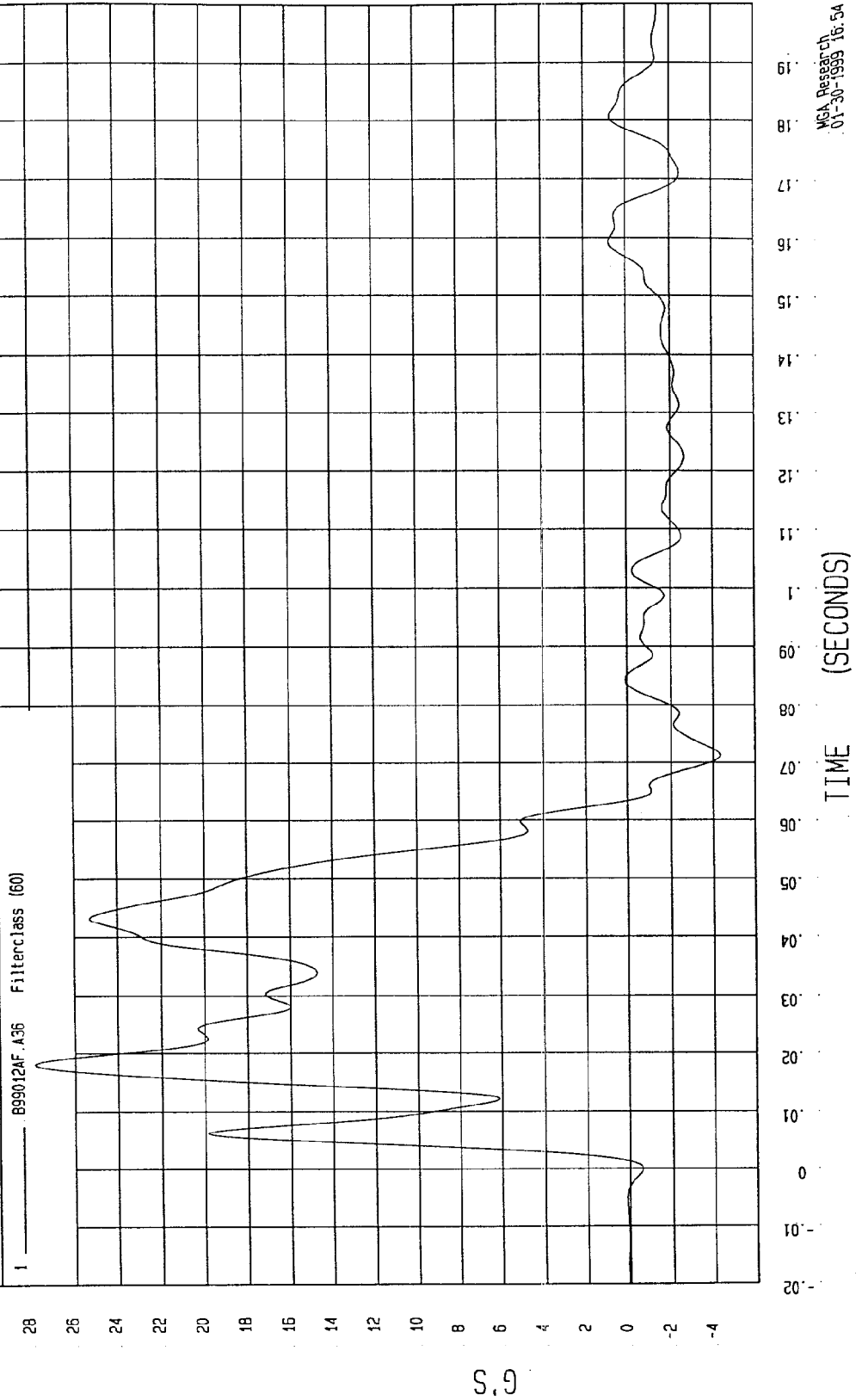
MECA Research
01-30-1999 17:00

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -4.34 G'S at 71 msec Maximum = 27.85 G'S at 18 msec

RIGHT SIDE SILL AT REAR SEAT Y ACCELERATION



TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

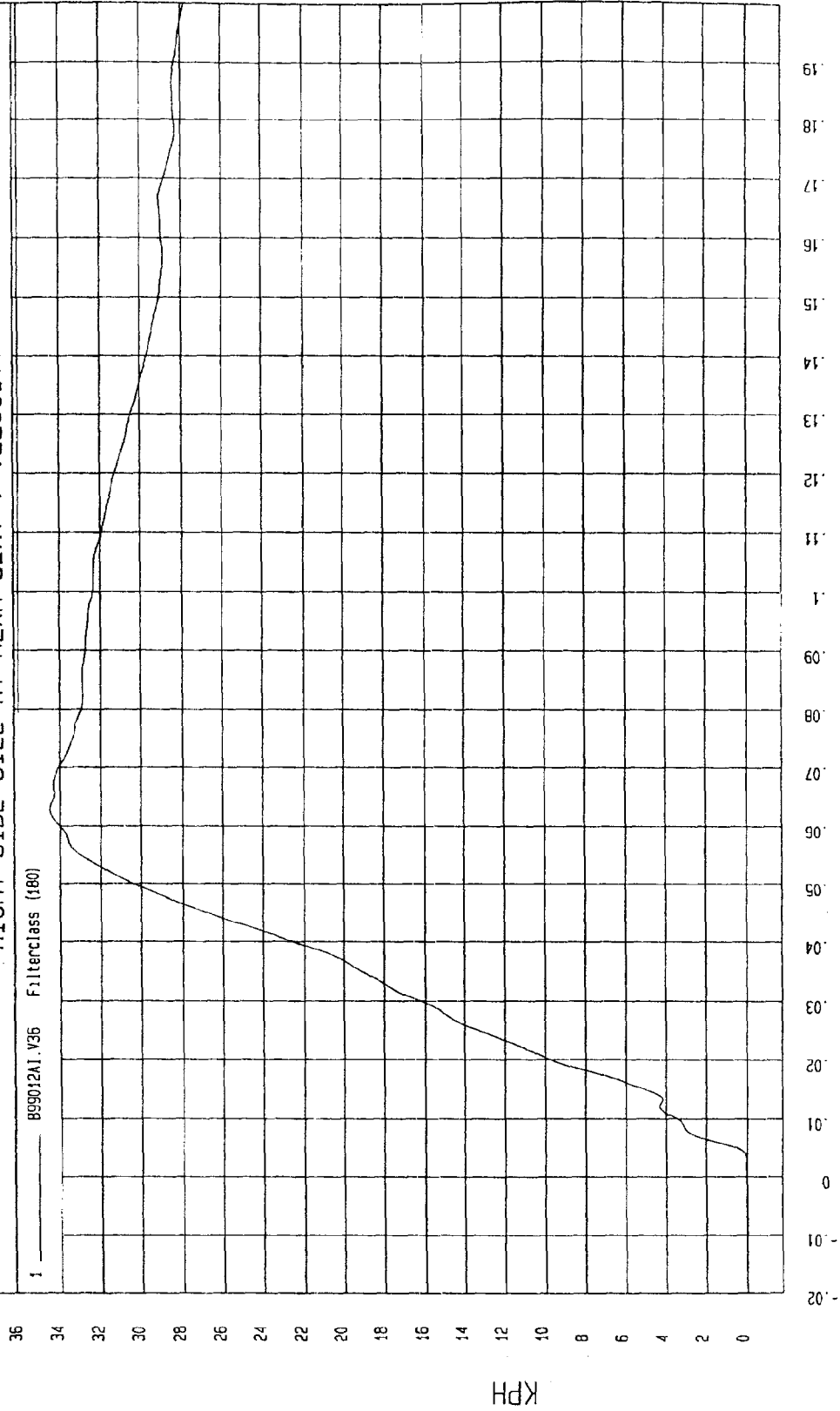
SPEED: 38 MPH 61.2 KPH

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

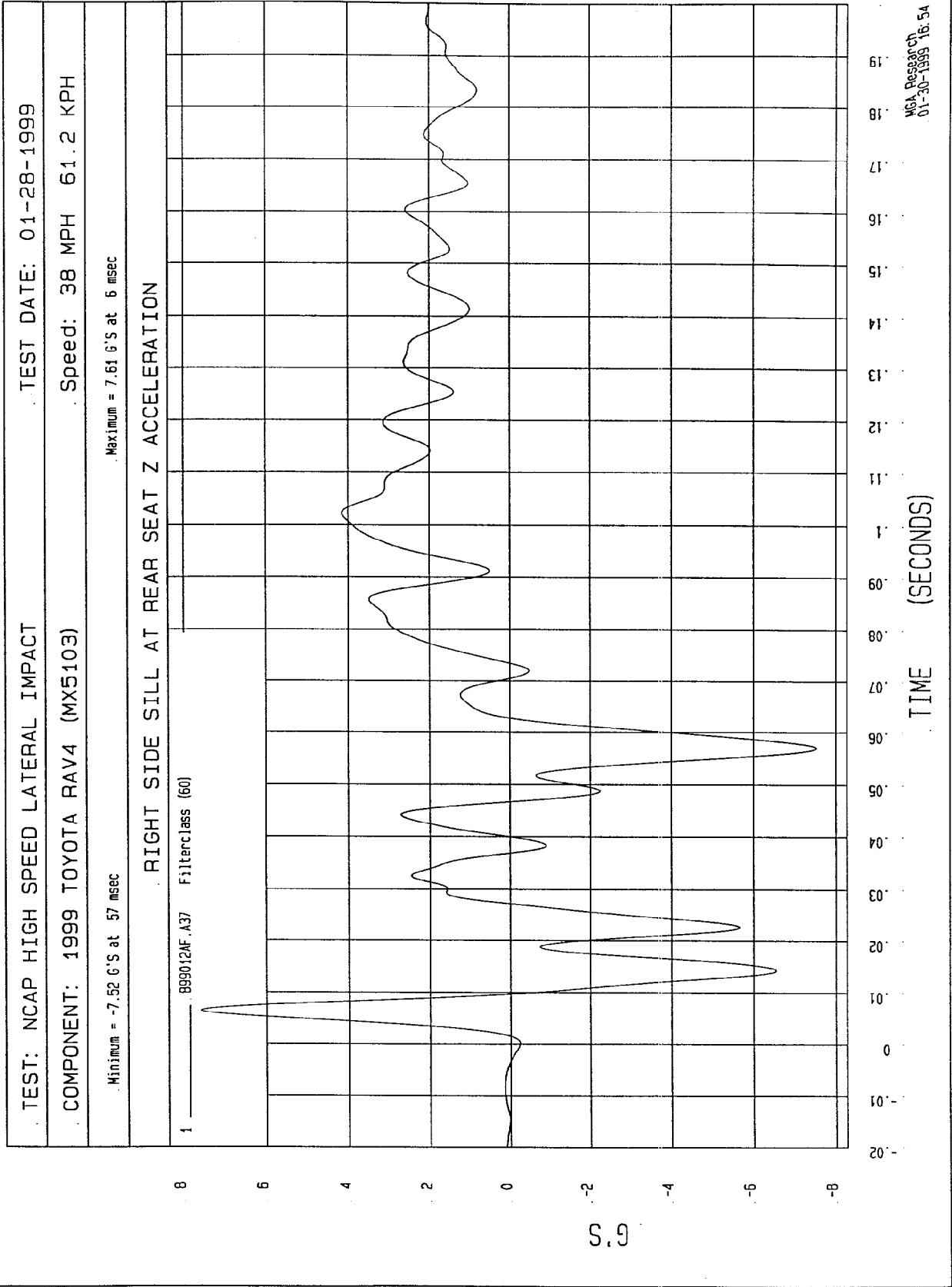
Maximum = 34.49 KPH at 63 msec

Minimum = 0 KPH at -20 msec

RIGHT SIDE SILL AT REAR SEAT Y VELOCITY



WCA Research
01-30-1999 17:00



TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Speed: 38 MPH 61.2 KPH

Minimum = -1.94 KPH at 62 msec

Maximum = 7.61 KPH at 200 msec

RIGHT SIDE SILL AT REAR SEAT Z VELOCITY

1 ——— B99012A1.V37 Filterclass (180)

8

6

4

2

KPH

0

-2

-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

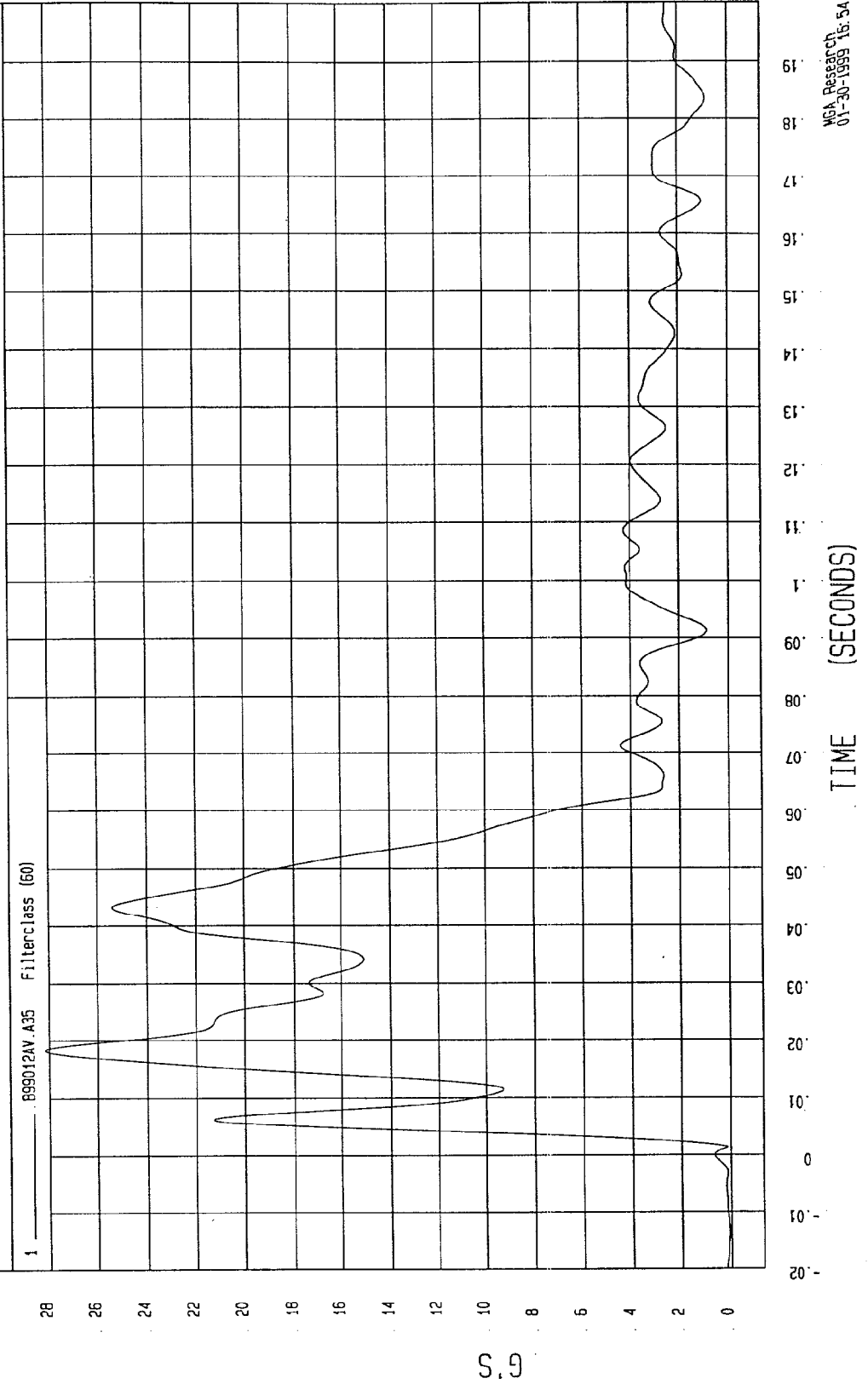
MCA Research
01-30-1999 17:00

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = 7.15E-02 G'S at -14 msec Maximum = 28.16 G'S at 18 msec

RIGHT SIDE SILL AT REAR SEAT RESULTANT ACCELERATION



TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

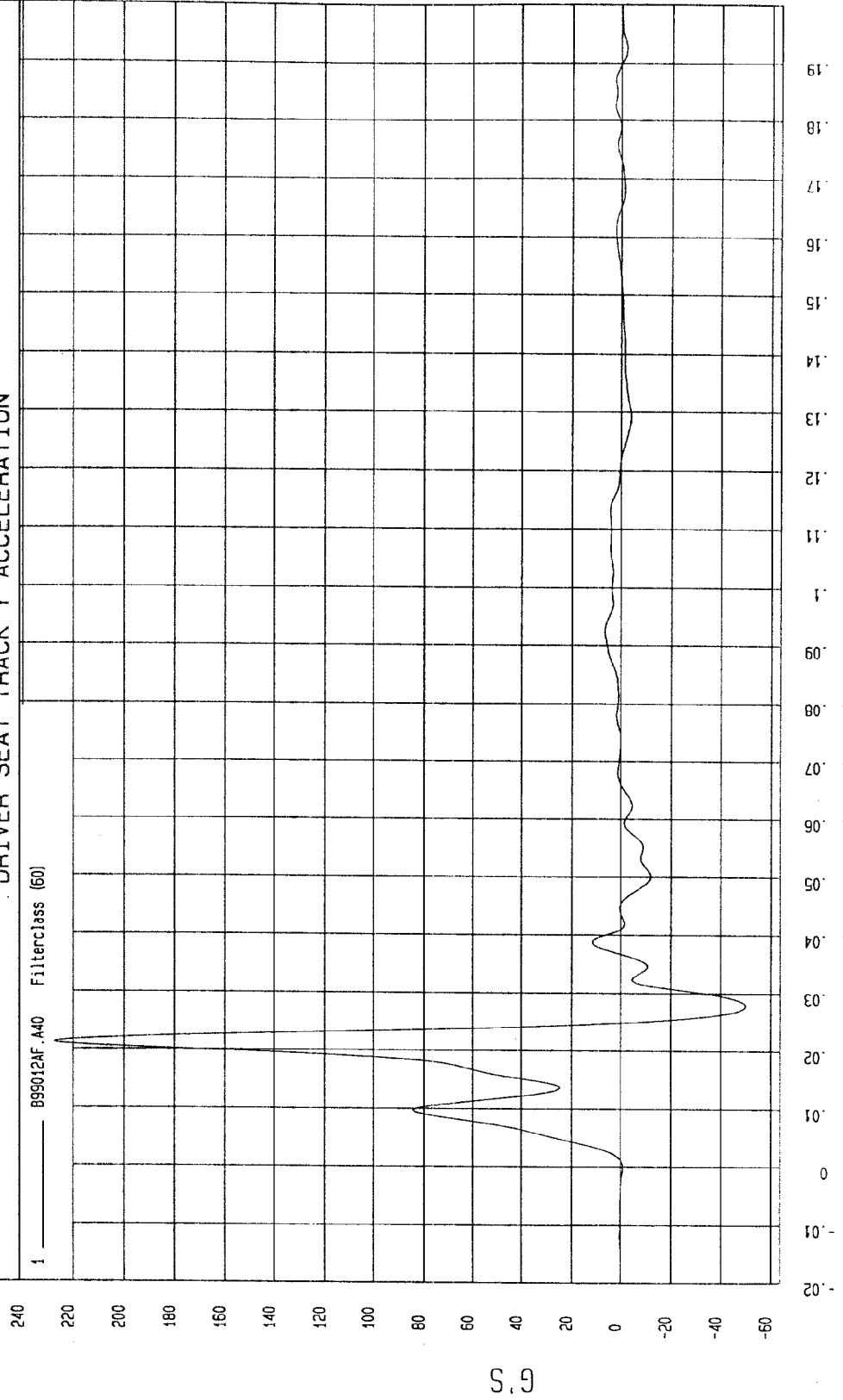
Speed: 38 MPH 61.2 KPH

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = 227.47 G'S at 21 msec

Minimum = -49.67 G'S at 28 msec

DRIVER SEAT TRACK Y ACCELERATION



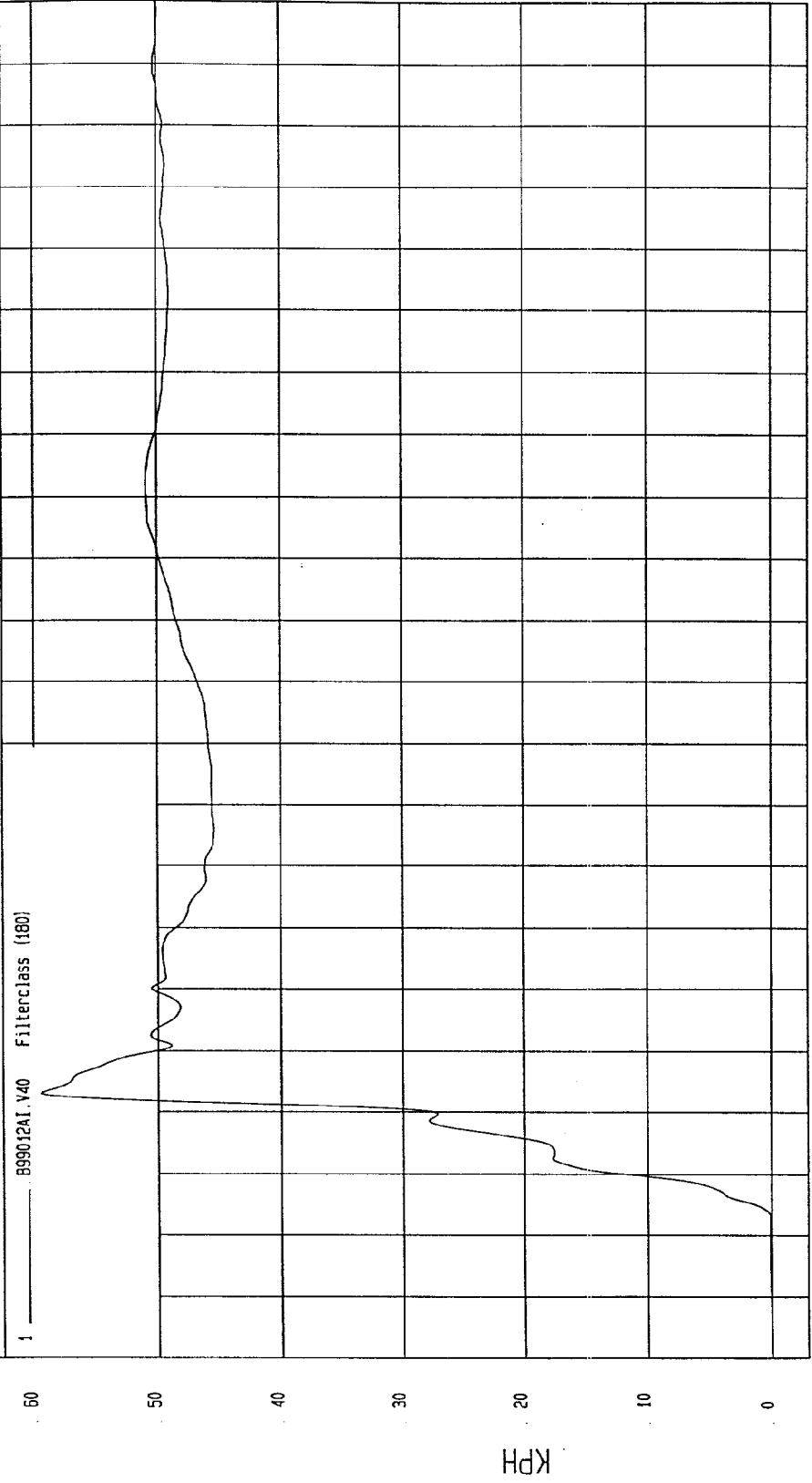
MSA Research
01-30-1999 16:54

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = 0 KPH at -20 msec Maximum = 59.49 KPH at 23 msec

DRIVER SEAT TRACK Y VELOCITY



TIME Seconds

61.2
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
-1
-2

MCA Research
01-30-1999 17:00

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

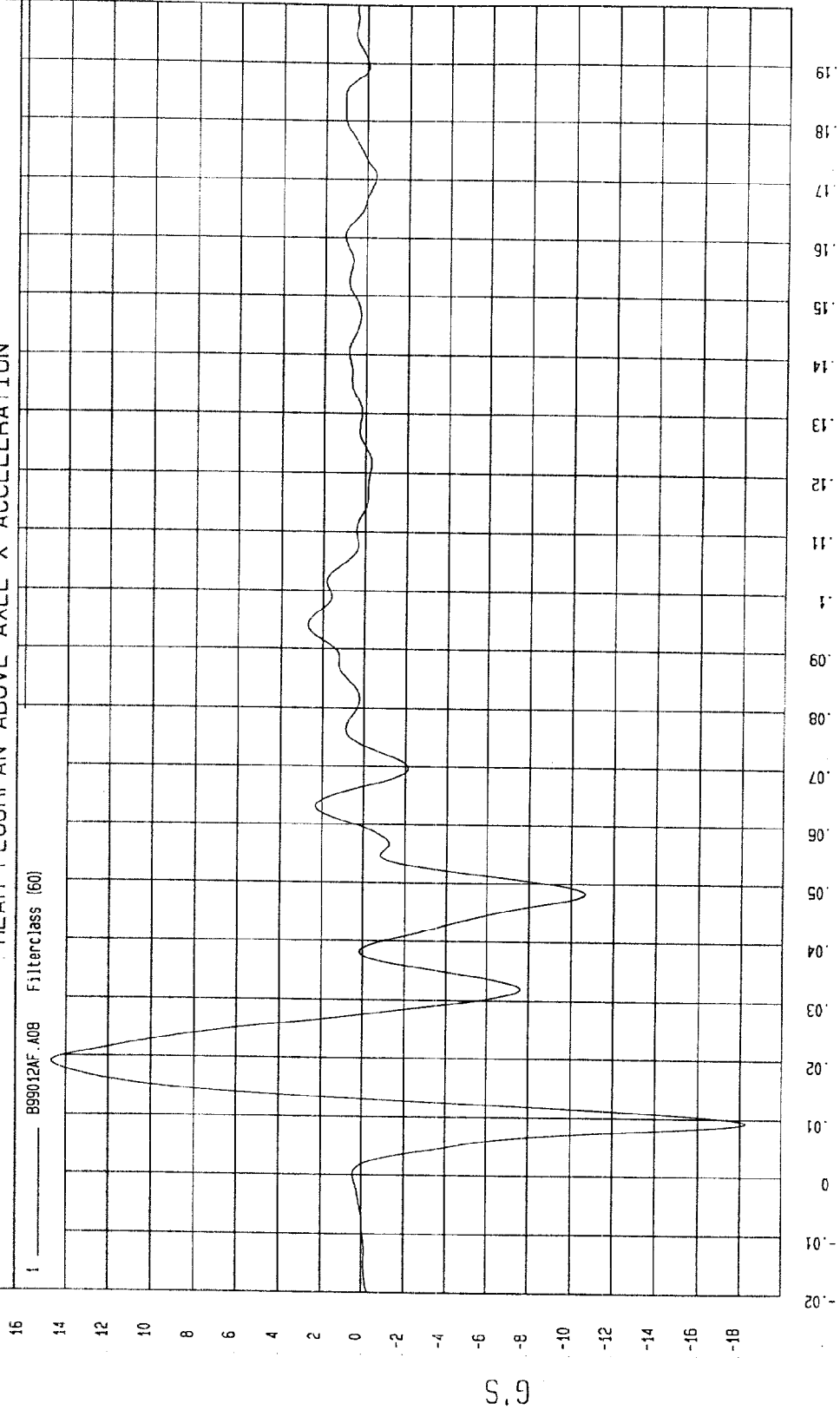
Speed: 38 MPH 61.2 KPH

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = 14.71 G'S at 19 msec

Minimum = -18.26 G'S at 9 msec

REAR FLOORPAN ABOVE AXLE X ACCELERATION



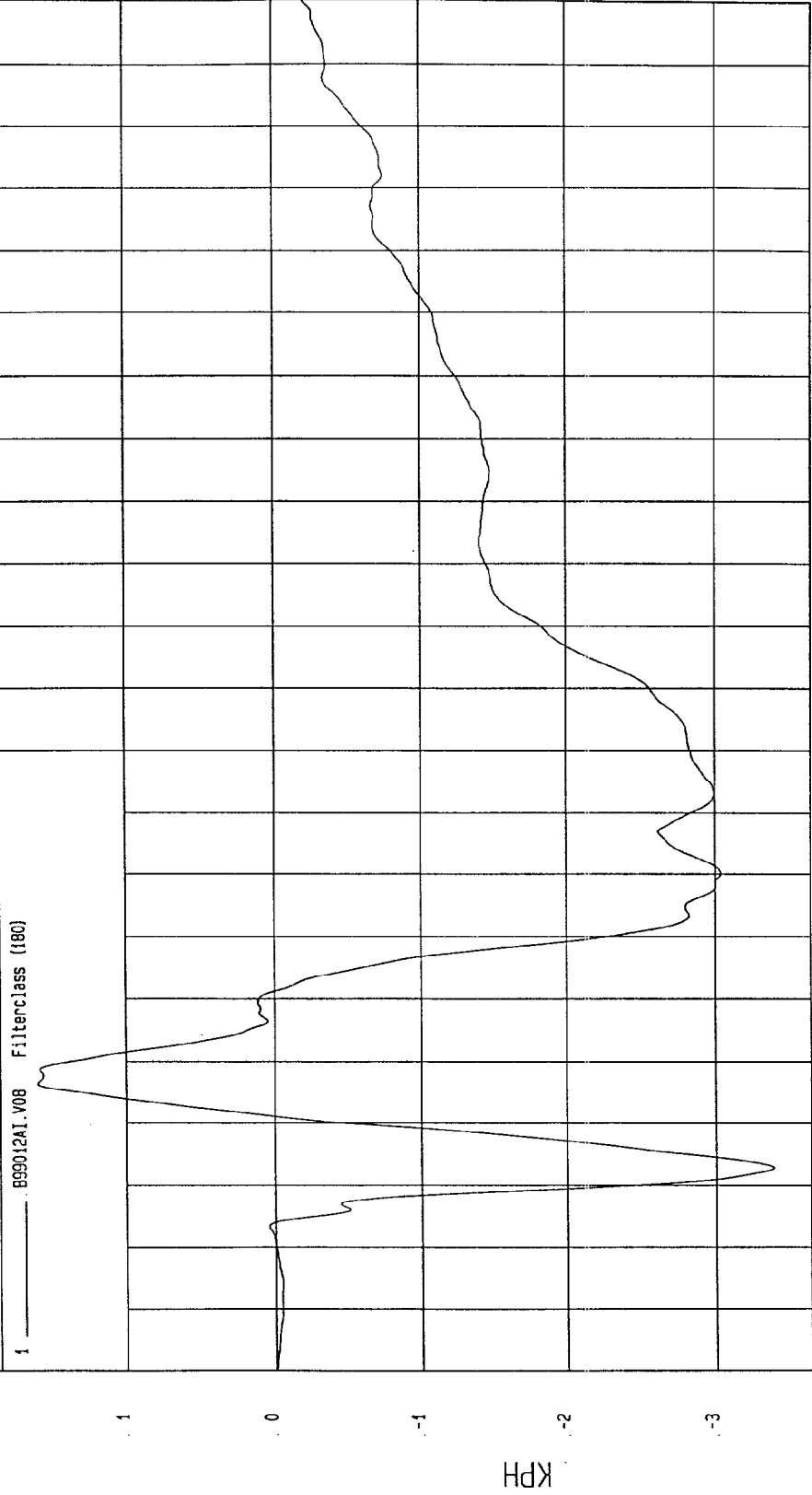
MOA Research
01-30-1999 16:54

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -3.39 KPH at 13 msec Maximum = 1.59 KPH at 26 msec

REAR FLOORPAN ABOVE AXLE X VELOCITY



TIME Seconds

NSA Research
01-30-1999 17:00

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

Speed: 38 MPH 61.2 KPH

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

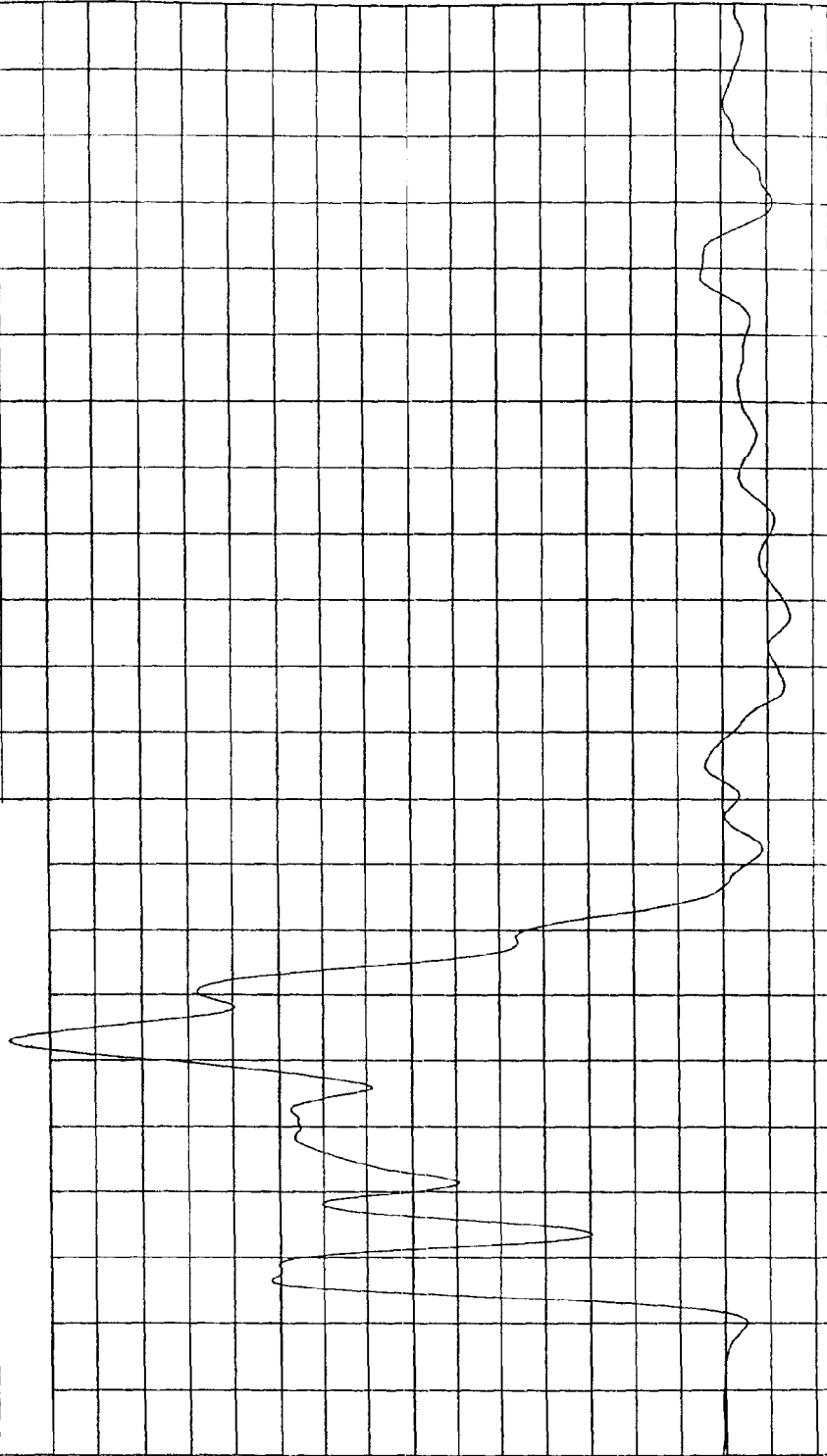
Maximum = 31.77 G'S at 43 msec

Minimum = -2.98 G'S at 108 msec

REAR FLOORPAN ABOVE AXLE Y ACCELERATION

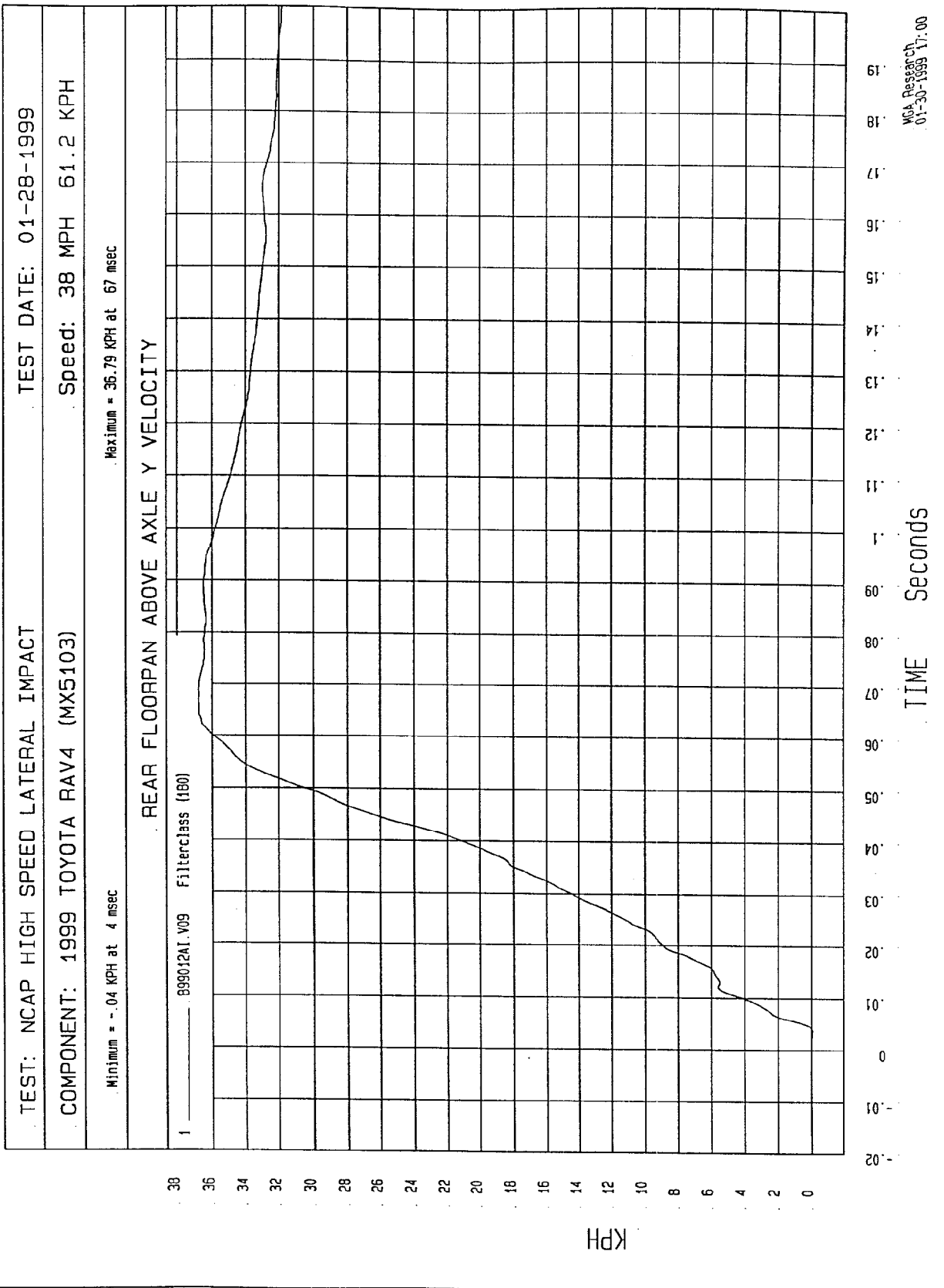
1 899012AF.A03 Filterclass (60)

32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
-2
-4



TIME (SECONDS)

MCA Research
01-30-1999 16:54

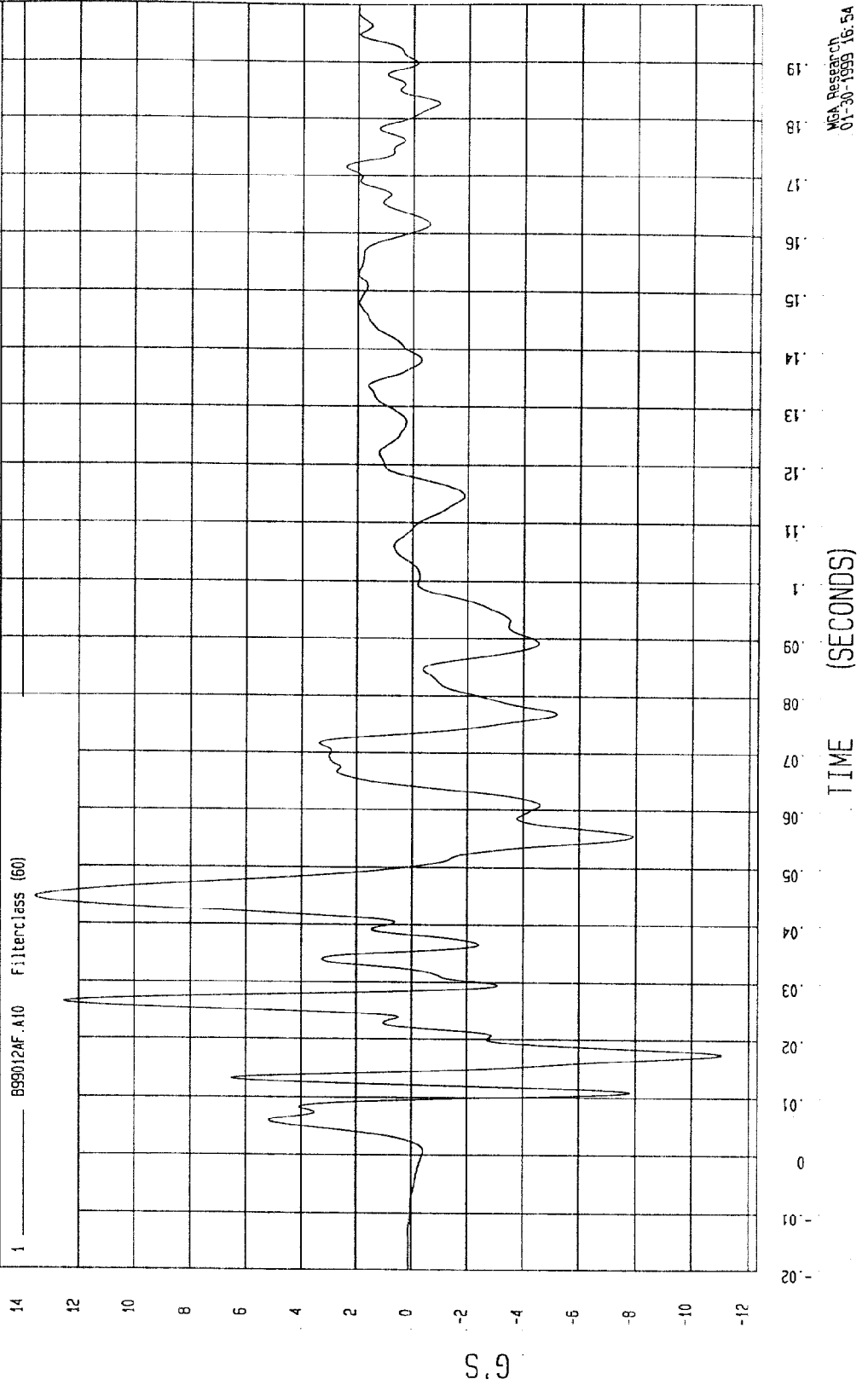


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -11.07 G'S at 18 msec Maximum = 13.55 G'S at 45 msec

REAR FLOORPAN ABOVE AXLE Z ACCELERATION

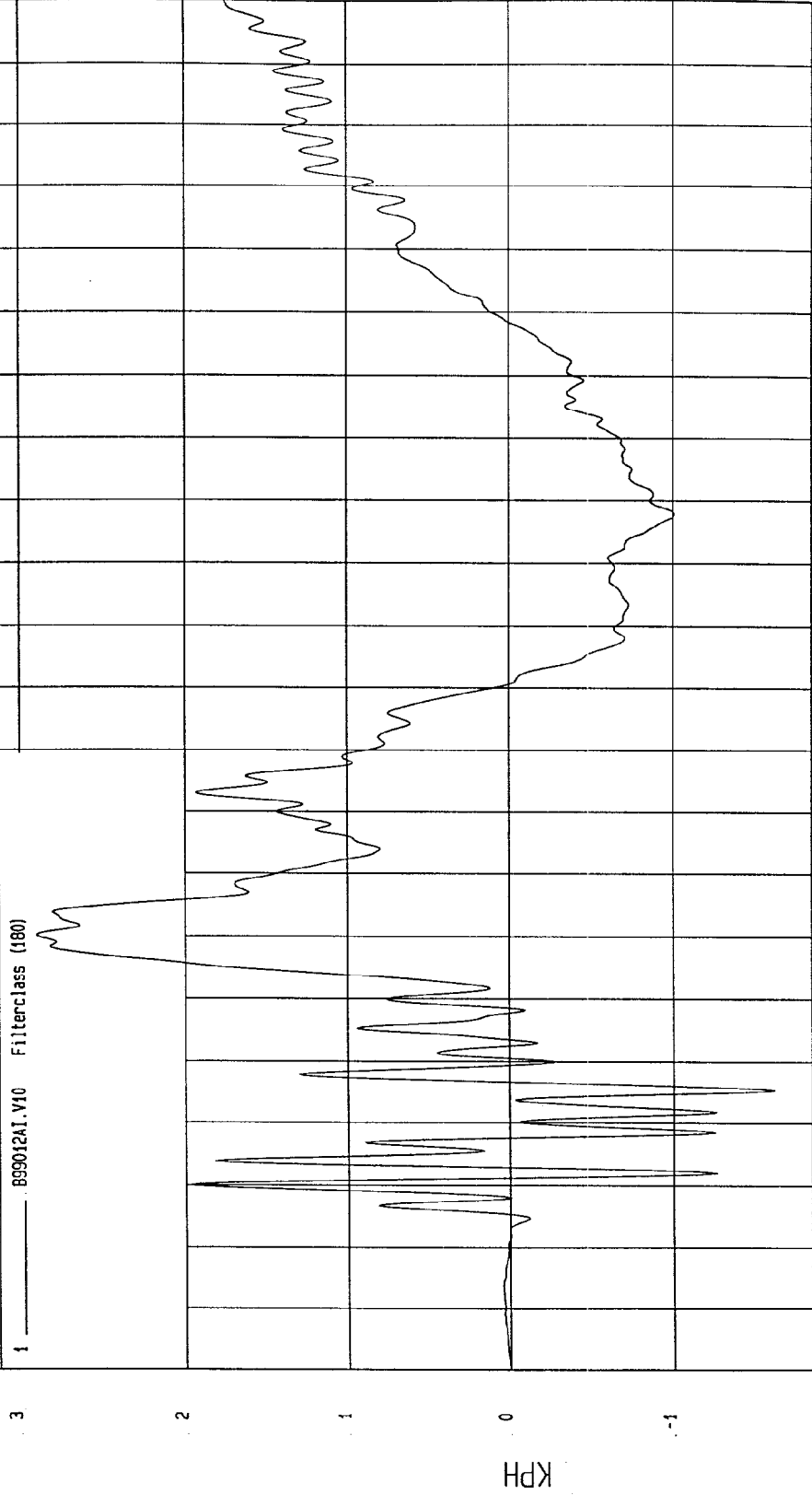


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -1.62 KPH at 25 msec Maximum = 2.9 KPH at 50 msec

REAR FLOORPAN ABOVE AXLE Z VELOCITY

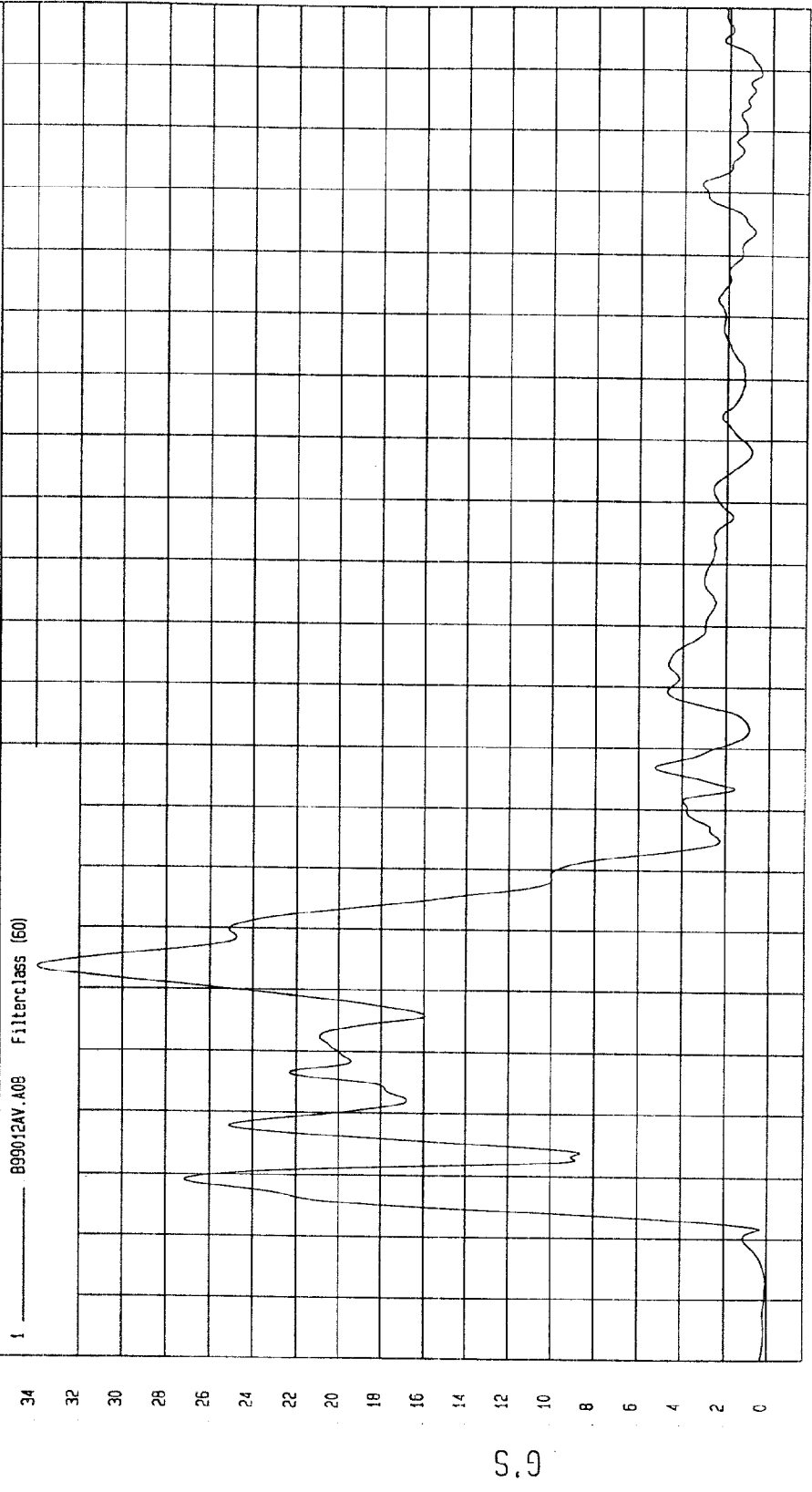


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = 4.36E-02 G'S at -7 msec Maximum = 33.92 G'S at 44 msec

REAR FLOORPAN ABOVE AXLE RESULTANT ACCELERATION



MOA Research
01-30-1999 16:54

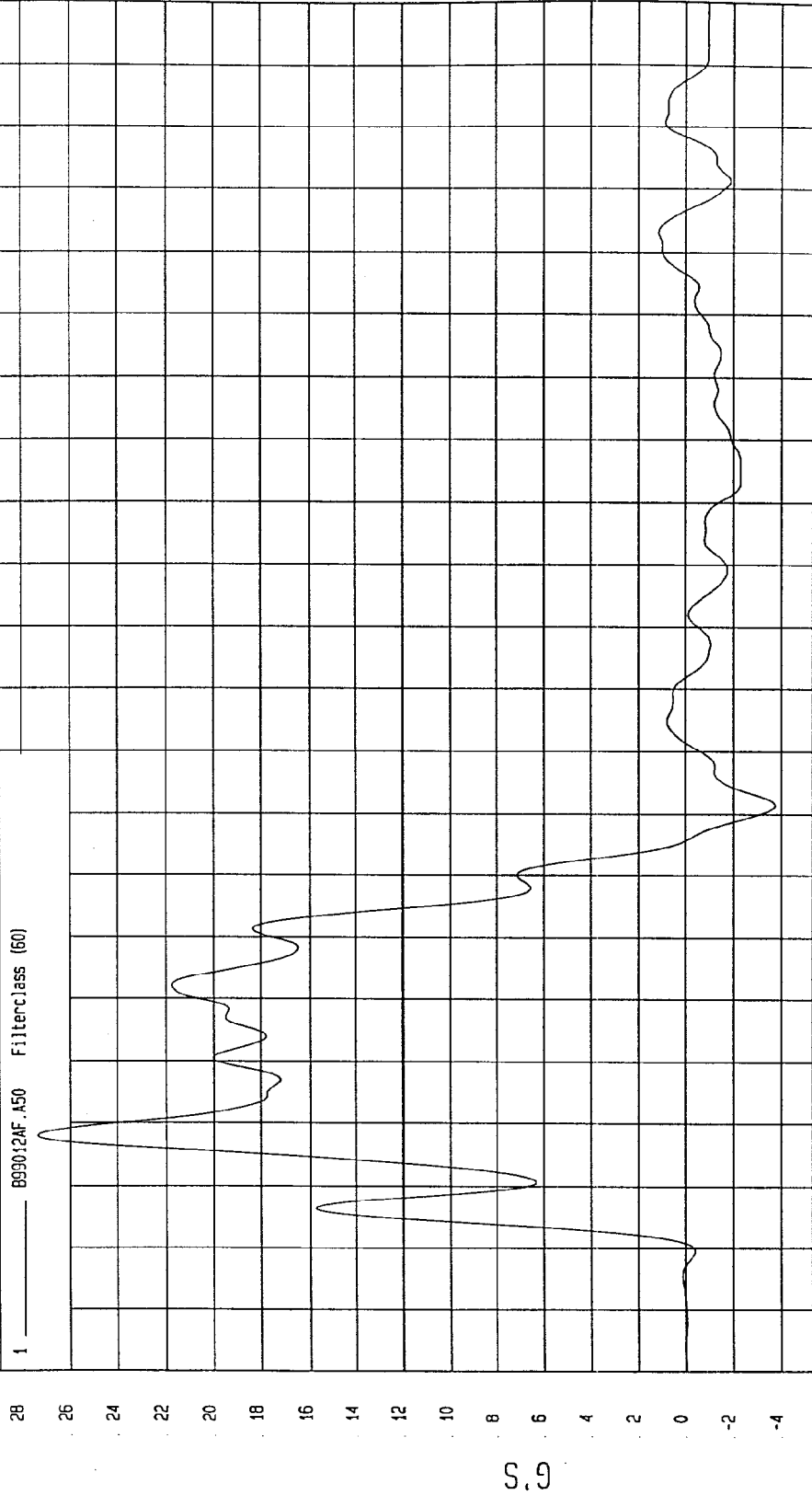
TIME (SECONDS)

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -3.74 G'S at 71 msec Maximum = 27.36 G'S at 18 msec

RIGHT REAR OCCUPANT COMPARTMENT Y ACCELERATION



NEA Research
01-30-1999 16:54

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

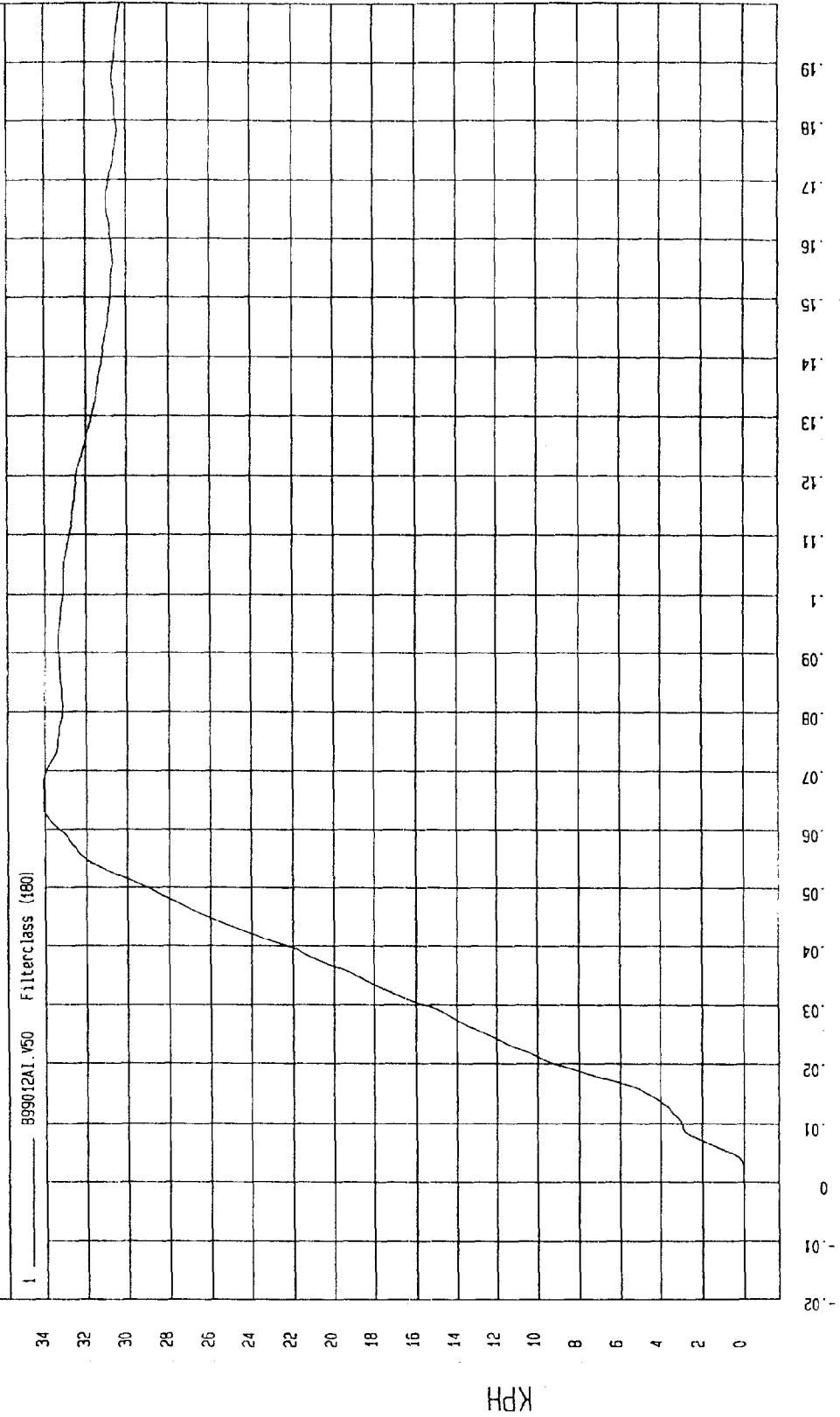
Speed: 38 MPH 51.2 KPH

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = 34.08 KPH at 64 msec

Minimum = -0.13E-03 KPH at -6 msec

RIGHT REAR OCCUPANT COMPARTMENT Y VELOCITY



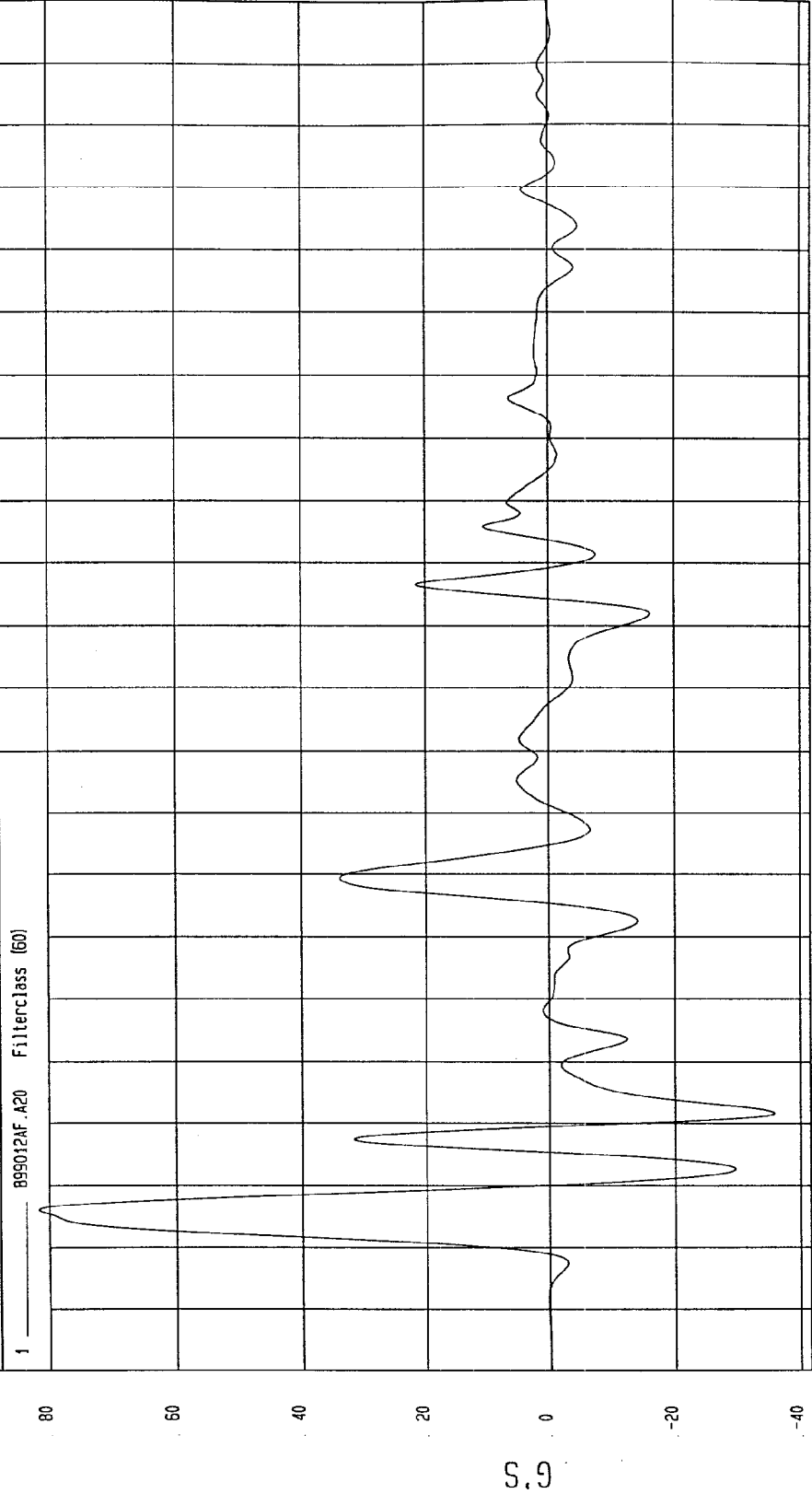
MCA Research
01-30-1999 17:01

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -35.74 G'S at 22 msec Maximum = 81.7 G'S at 6 msec

LEFT LOWER A-POST Y ACCELERATION



TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

Speed: 38 MPH 61.2 KPH

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = 19.49 KPH at 20 msec

Minimum = -1.11 KPH at 1 msec

LEFT LOWER A-POST Y VELOCITY



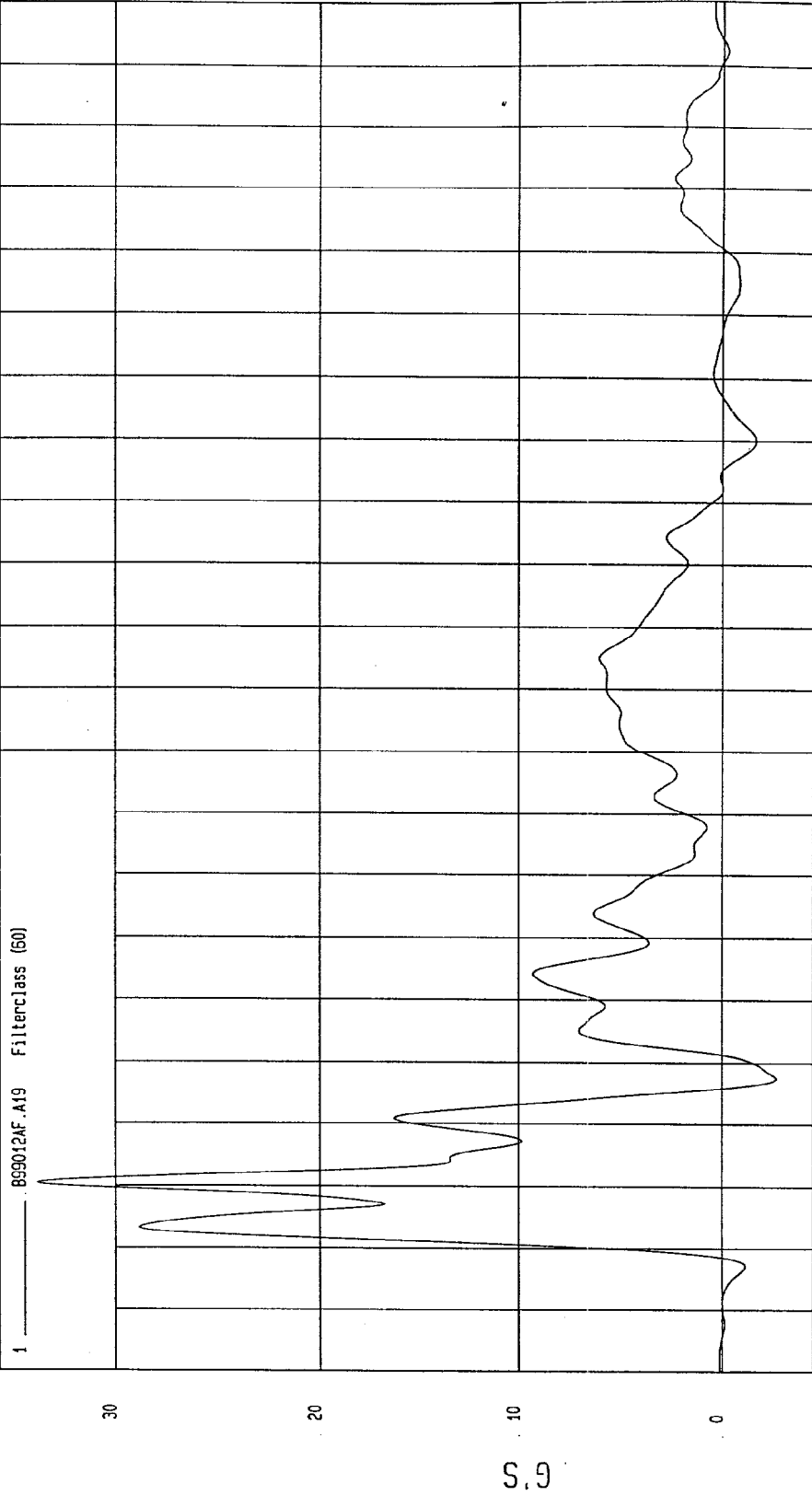
MCA Research
01-30-1999 17:01

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -2.68 G's at 28 msec Maximum = 33.79 G's at 10 msec

LEFT MID A-POST Y ACCELERATION



TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

SPEED: 38 MPH 61.2 KPH

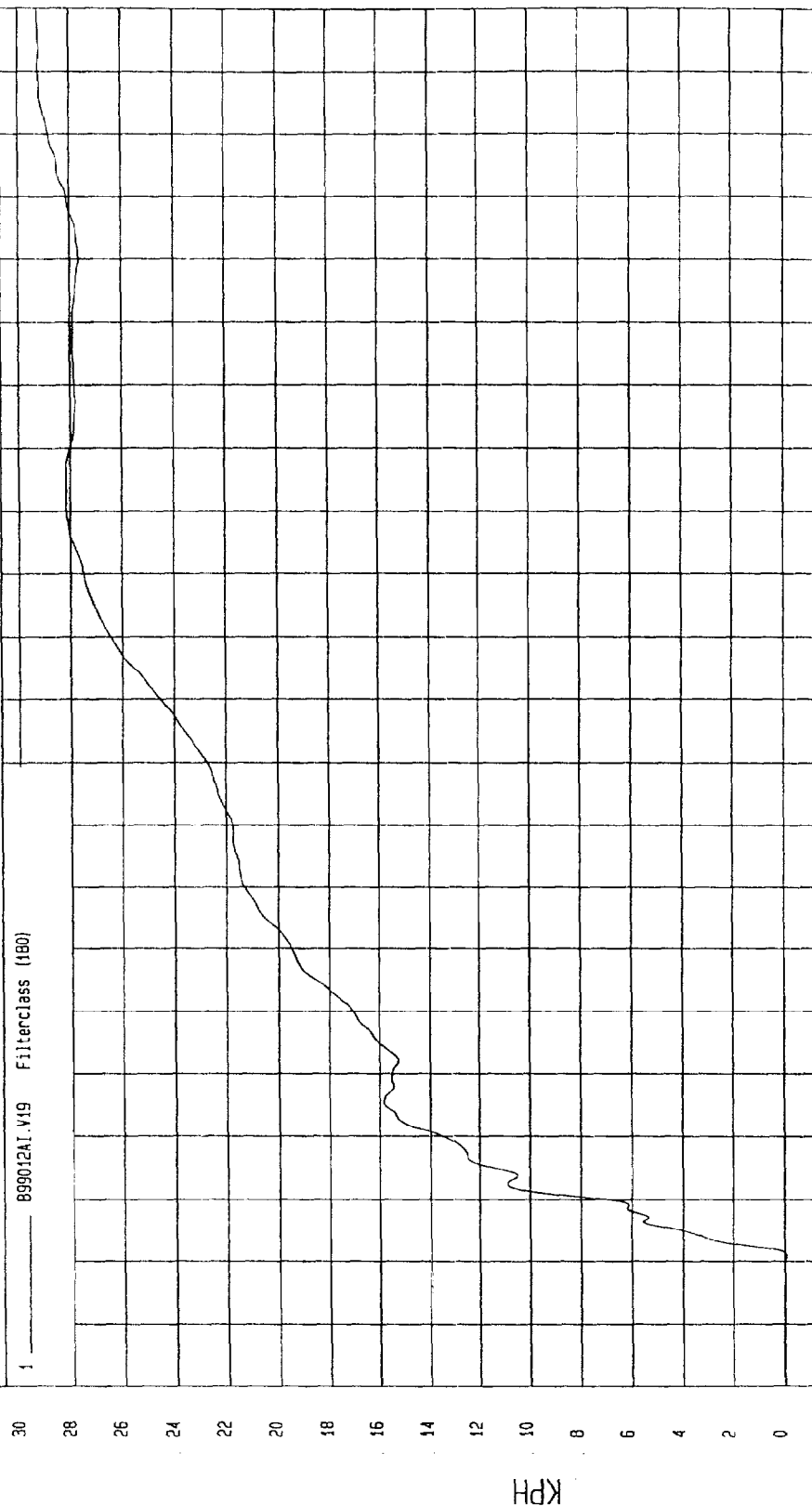
COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = 29.25 KPH at 200 msec

Minimum = -5.93E-02 KPH at 1 msec

LEFT MID A-POST Y VELOCITY

1 899012A1.V19 Filterclass (180)



MCA Research
01-30-1999 17.01

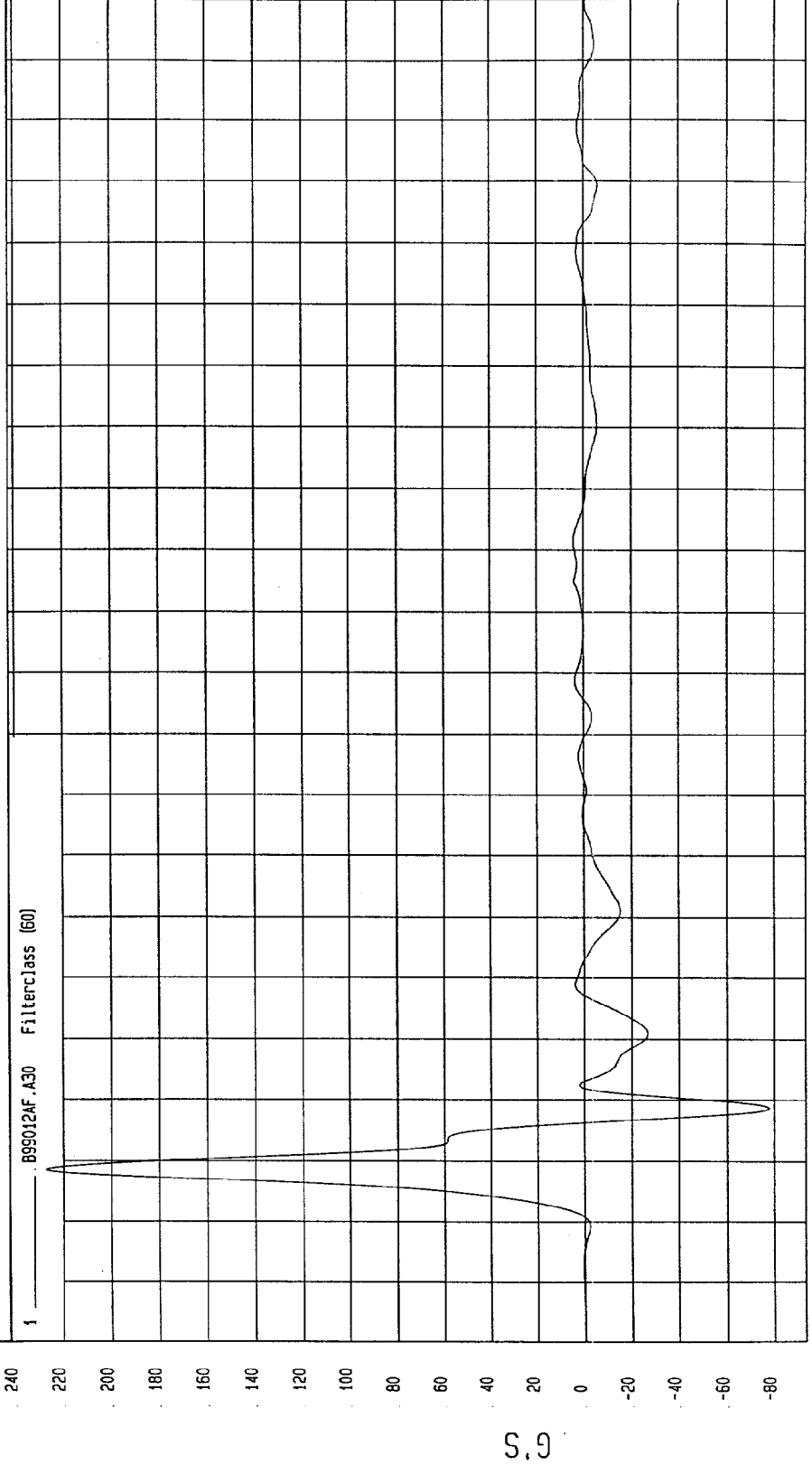
TIME Seconds

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -77.7 G'S at .19 msec Maximum = 226.99 G'S at 9 msec

LEFT LOWER B-POST Y ACCELERATION

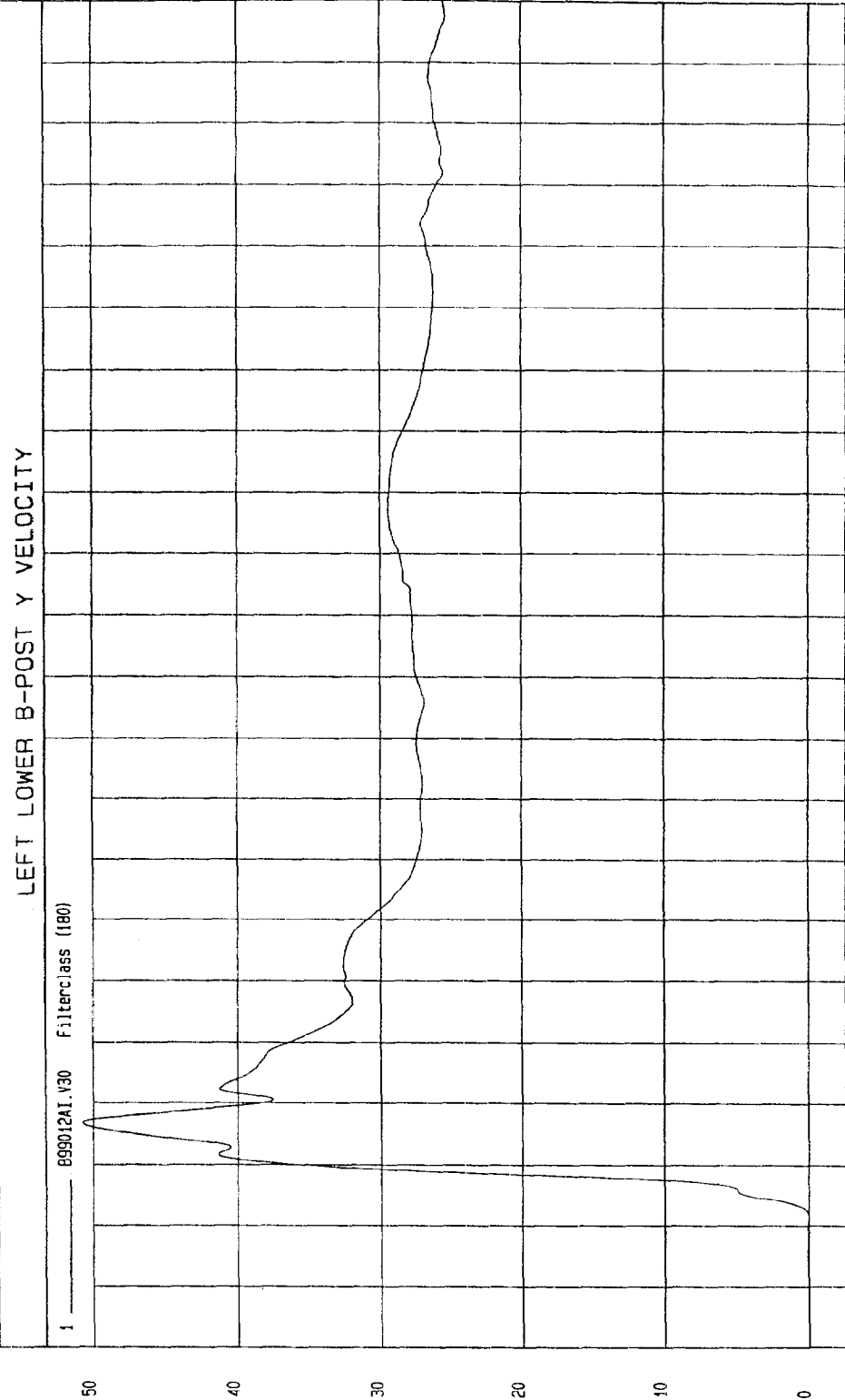


MSA Research
01-30-1999 16:55

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -2.70E-02 KPH at 2 msec Maximum = 50.73 KPH at 17 msec



TIME Seconds

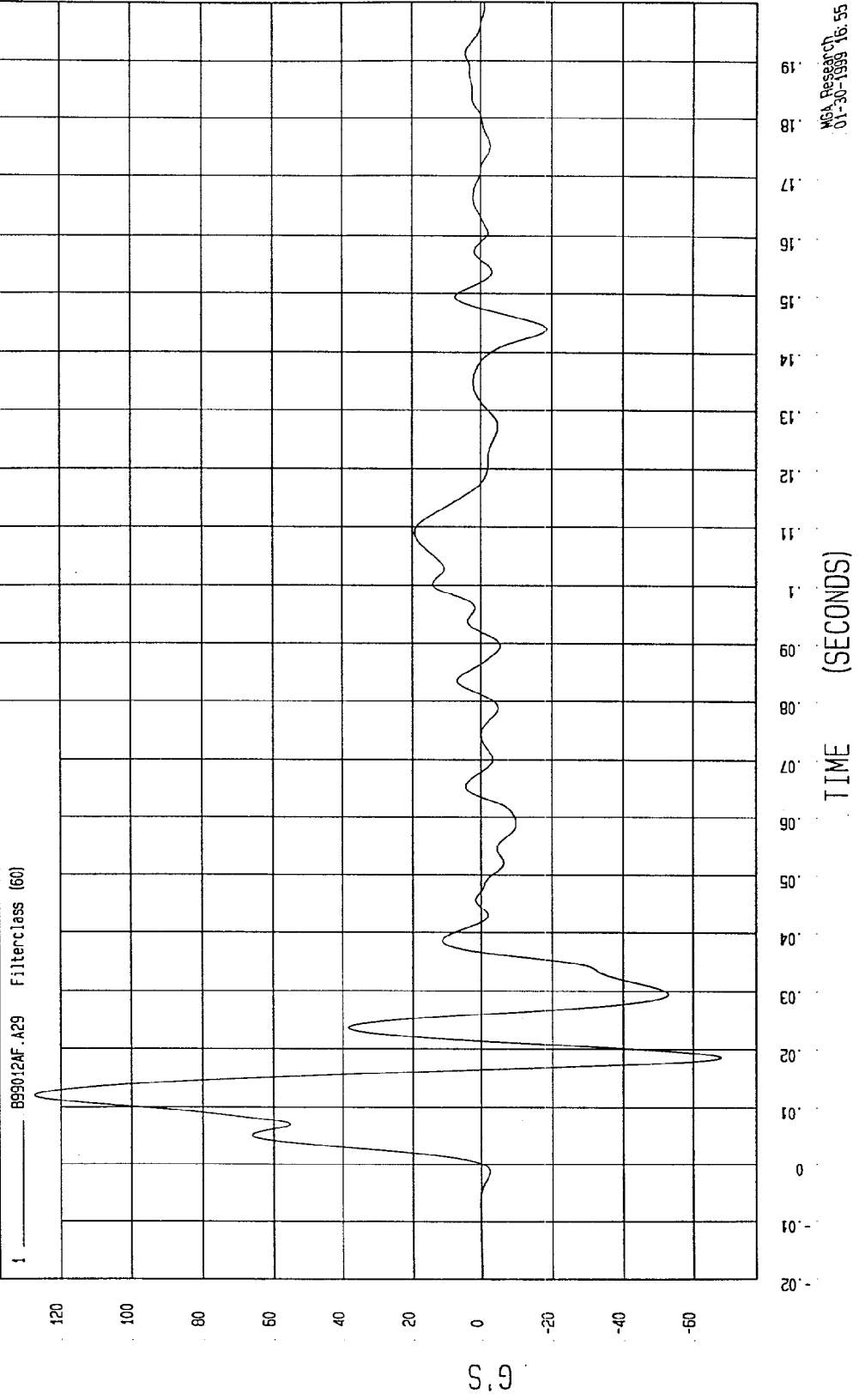
WCA Research
01-30-1999 17:01

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -67.83 G'S at .19 msec Maximum = 127.26 G'S at 12 msec

LEFT MID B-POST Y ACCELERATION



TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

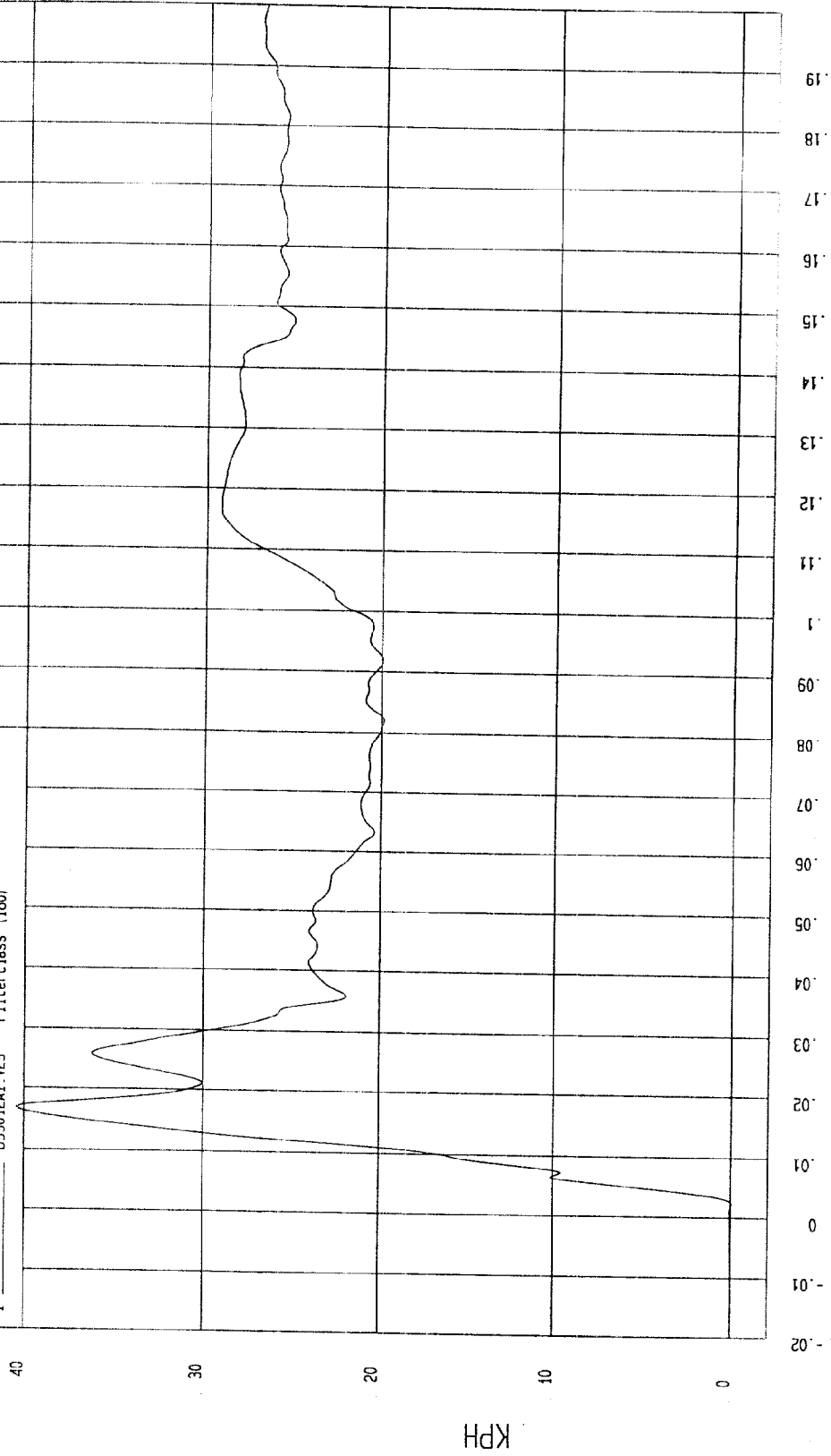
Speed: 38 MPH 61.2 KPH

Minimum = -4.54E-02 KPH at 2 msec

Maximum = 40.42 KPH at 17 msec

LEFT MID B-POST Y VELOCITY

1 B99012AI.V29 Filterclass (180)



MCA Research
01-30-1999 17:01

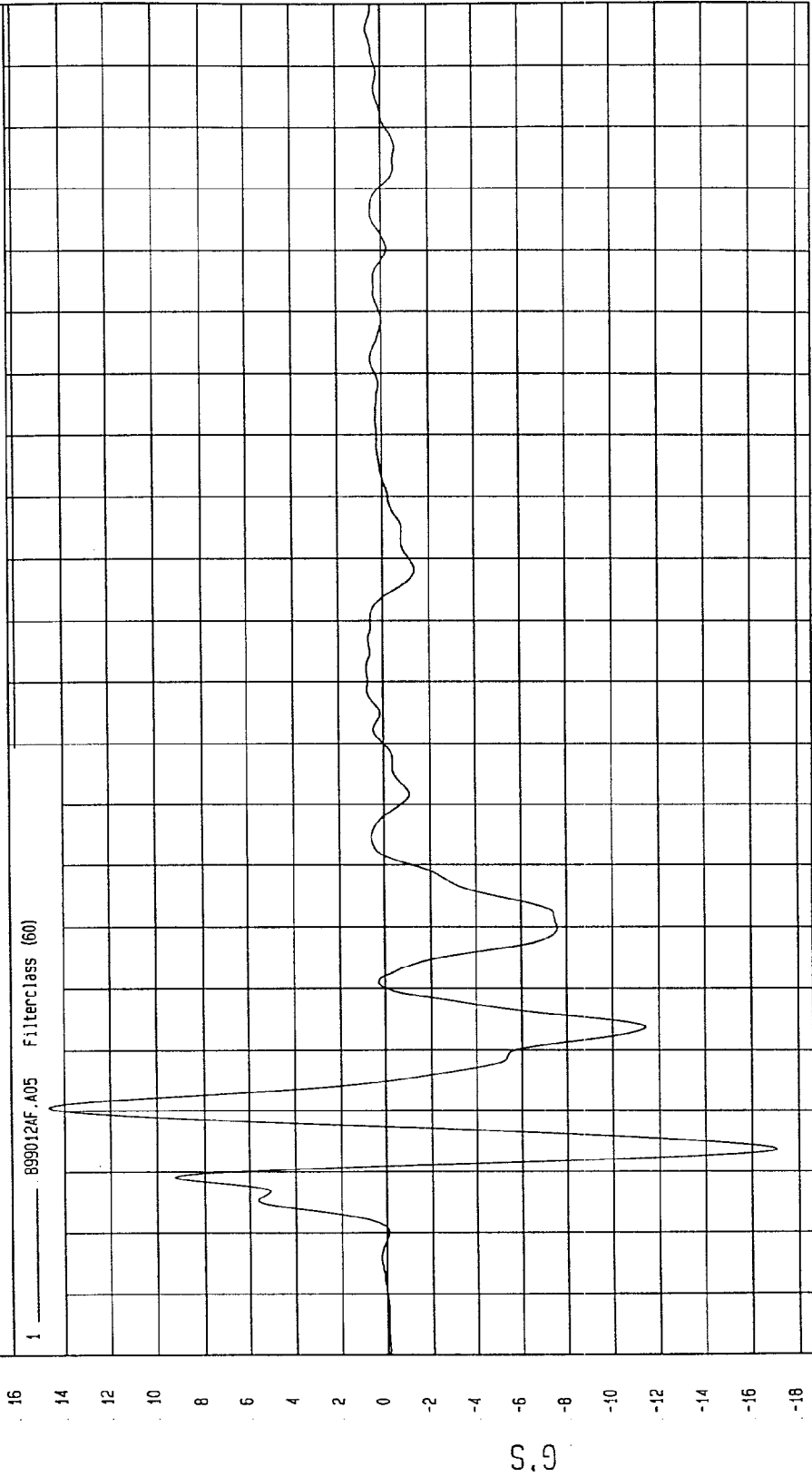
TIME Seconds

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -17.04 G'S at 14 msec Maximum = 14.66 G'S at 20 msec

VEHICLE CG X ACCELERATION



TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

Speed: 38 MPH 61.2 KPH

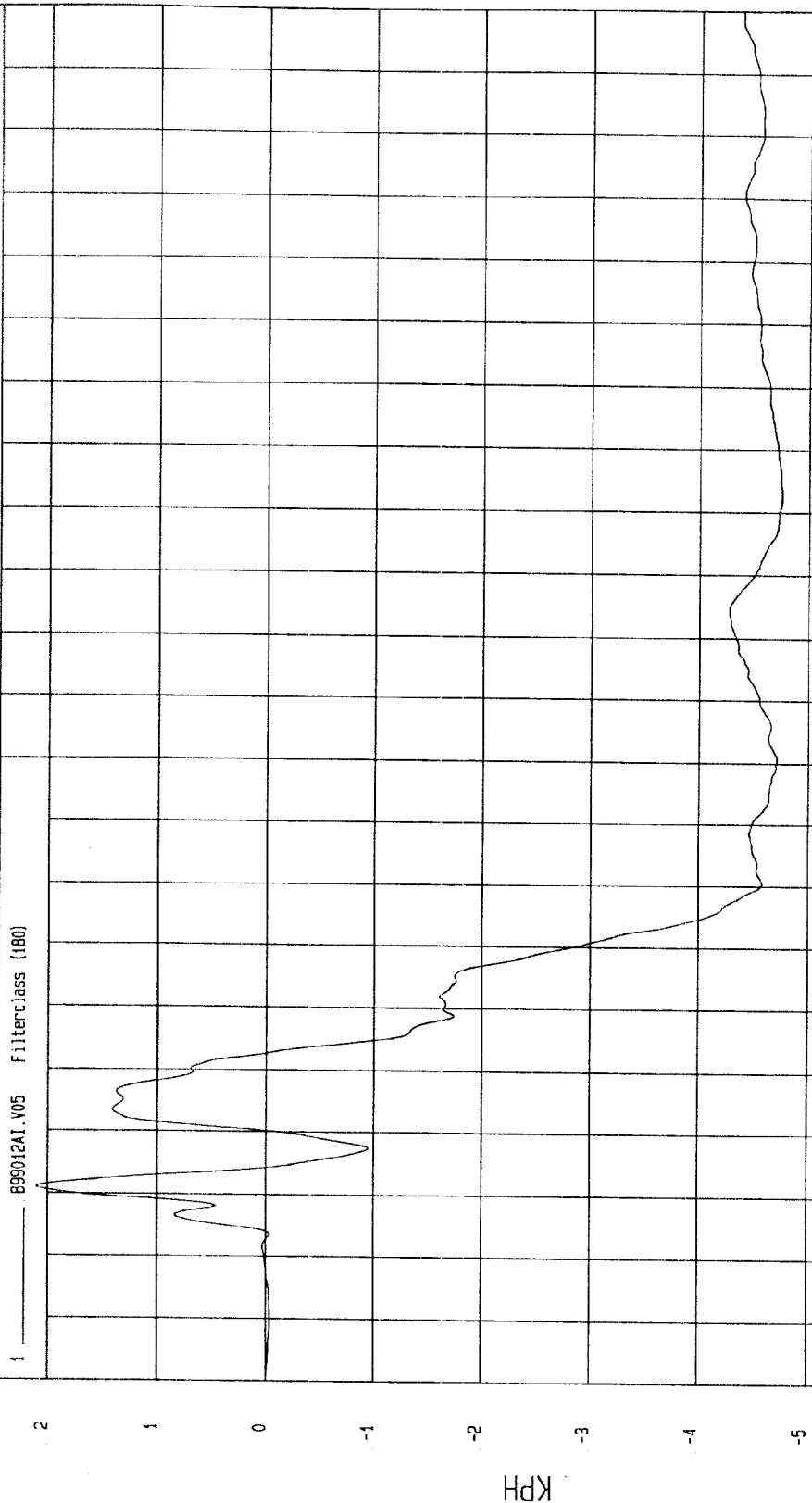
COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = 2.11 KPH at 11 msec

Minimum = -4.75 KPH at 122 msec

VEHICLE CG X VELOCITY

1 ——— B99012A1.V05 Filterclass (180)

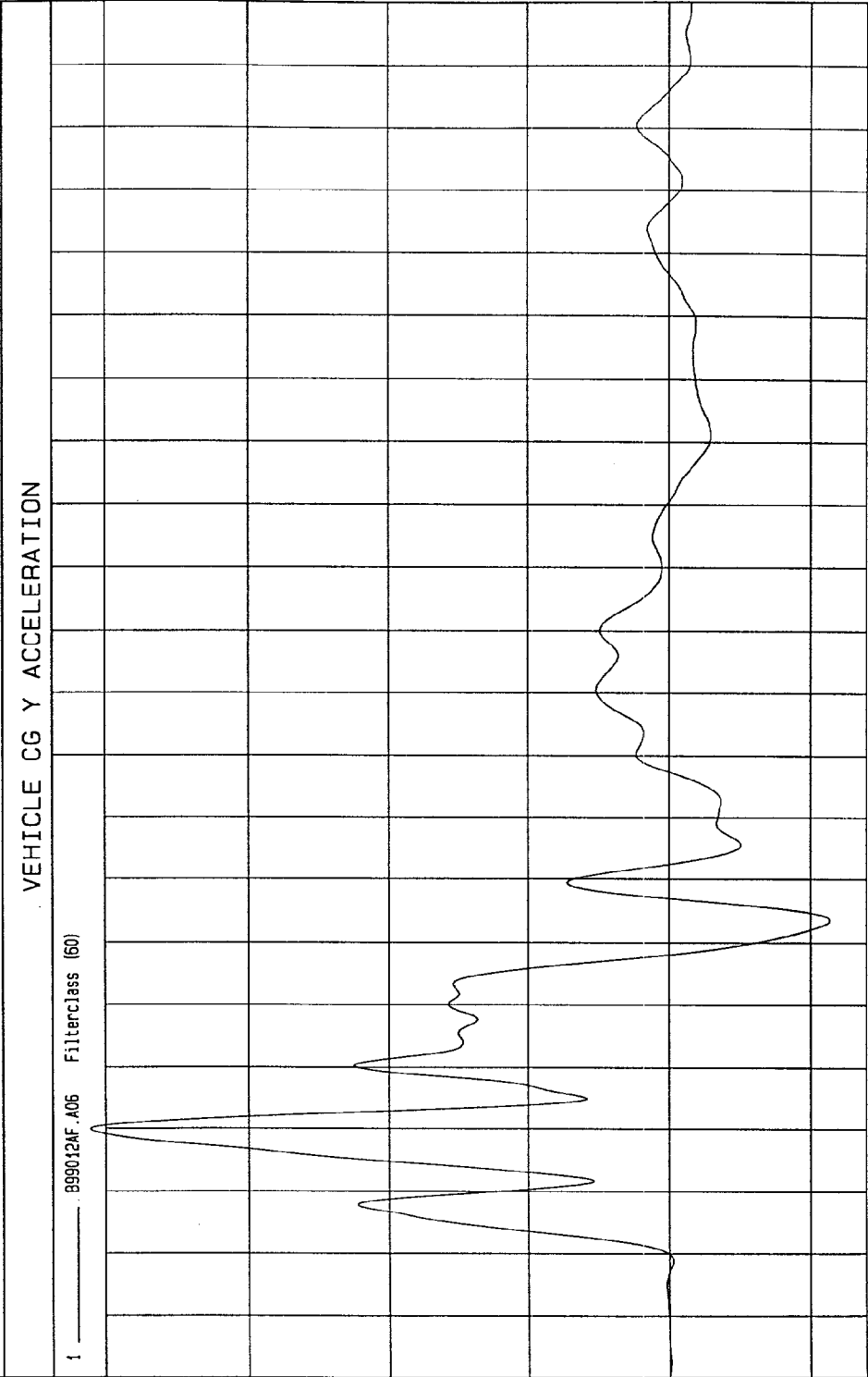


MGA Research
01-30-1999 17:01

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -11.41 G'S at 54 msec Maximum = 41.08 G'S at 20 msec



TIME (SECONDS)

MSA Research
01-30-1999 16:55

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

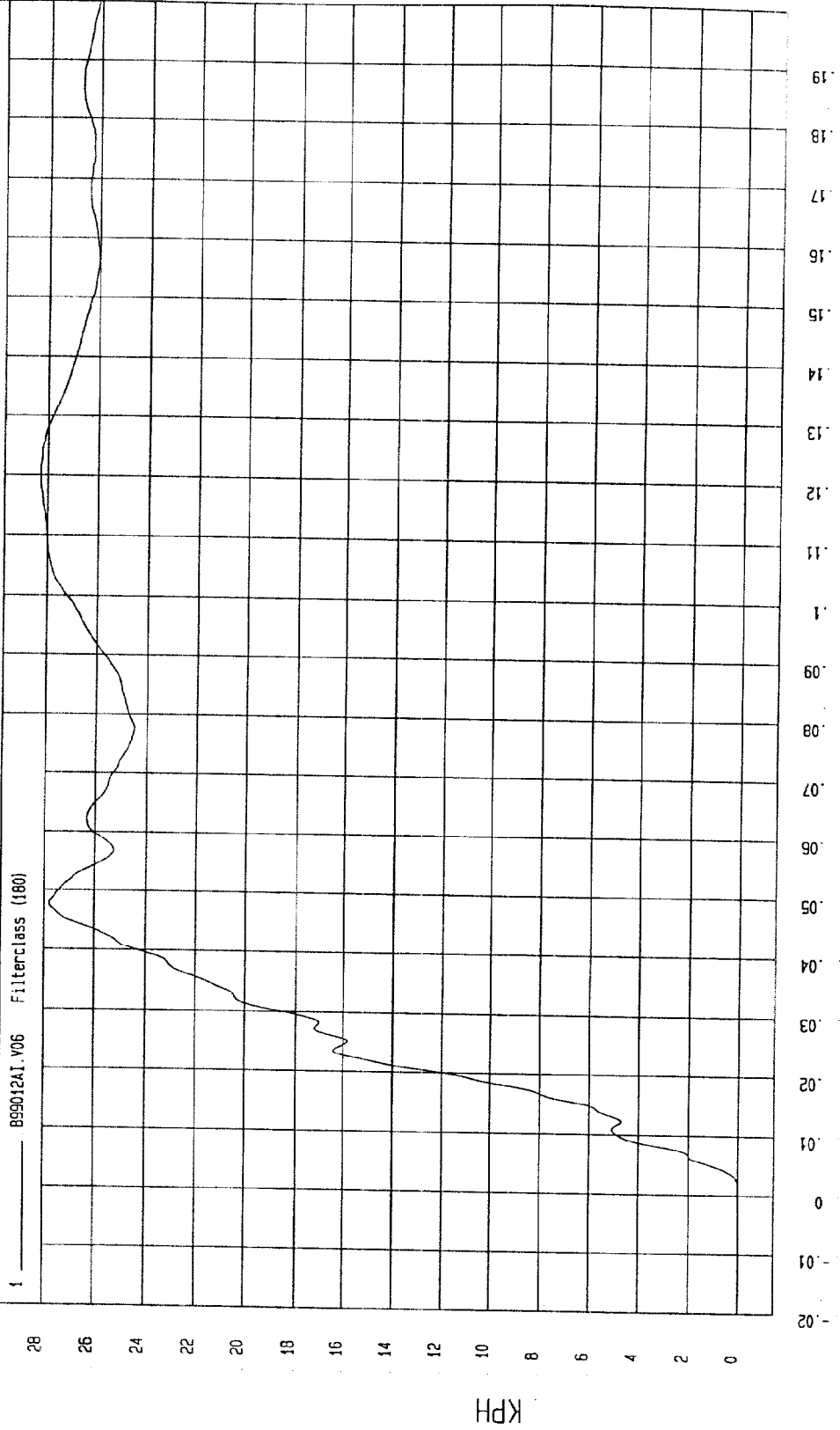
Speed: 38 MPH 61.2 KPH

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Minimum = -3.09E-02 KPH at -11 msec

Maximum = 28.3 KPH at 121 msec

VEHICLE CG Y VELOCITY



WEA Research
01-30-1999 17:01

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

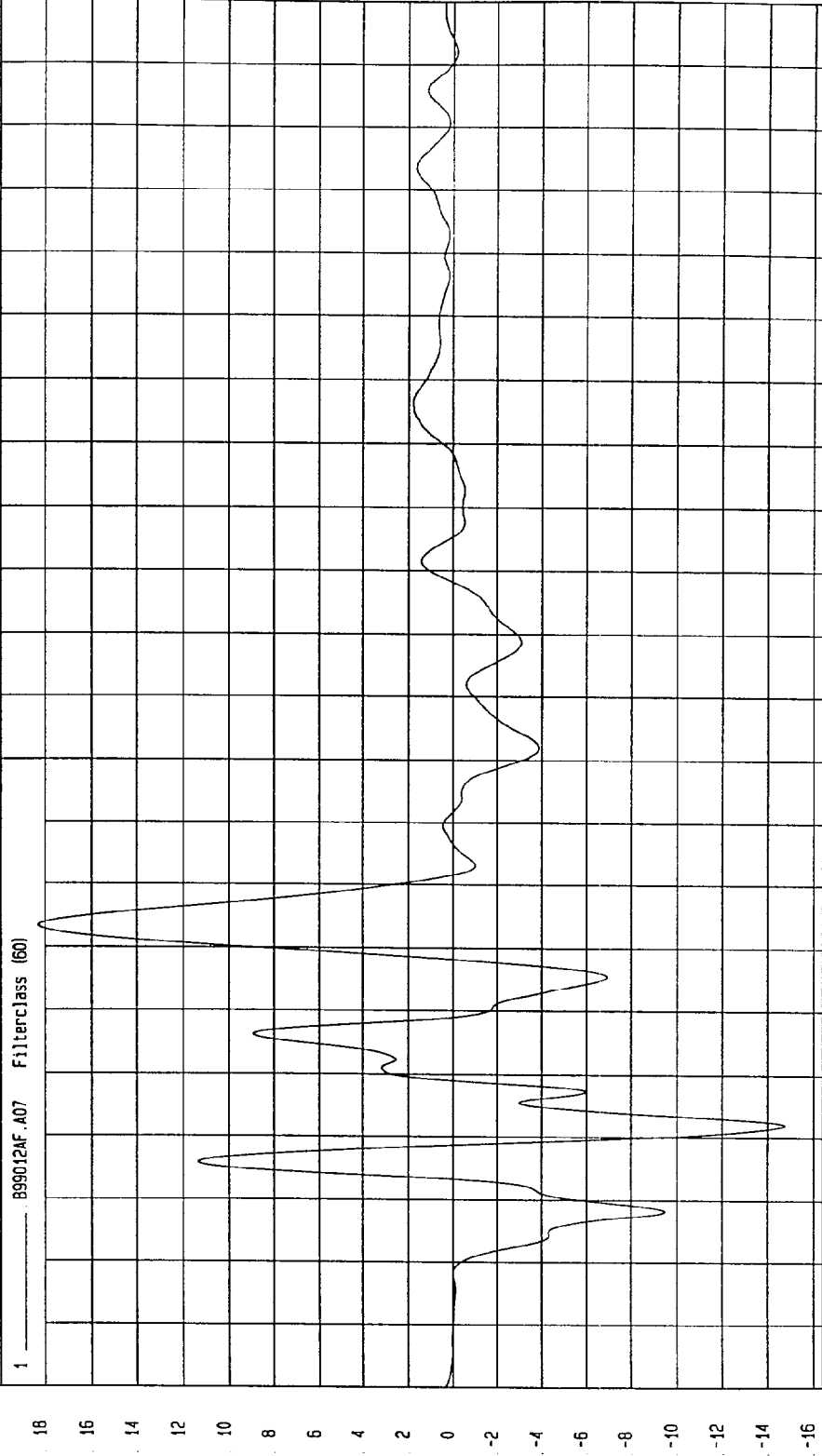
Speed: 38 MPH 61.2 KPH

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = 18.3 G's at 53 msec

Minimum = -14.76 G's at 22 msec

VEHICLE CG Z ACCELERATION



WCA Research
01-30-1999 16:55

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

Speed: 38 MPH 61.2 KPH

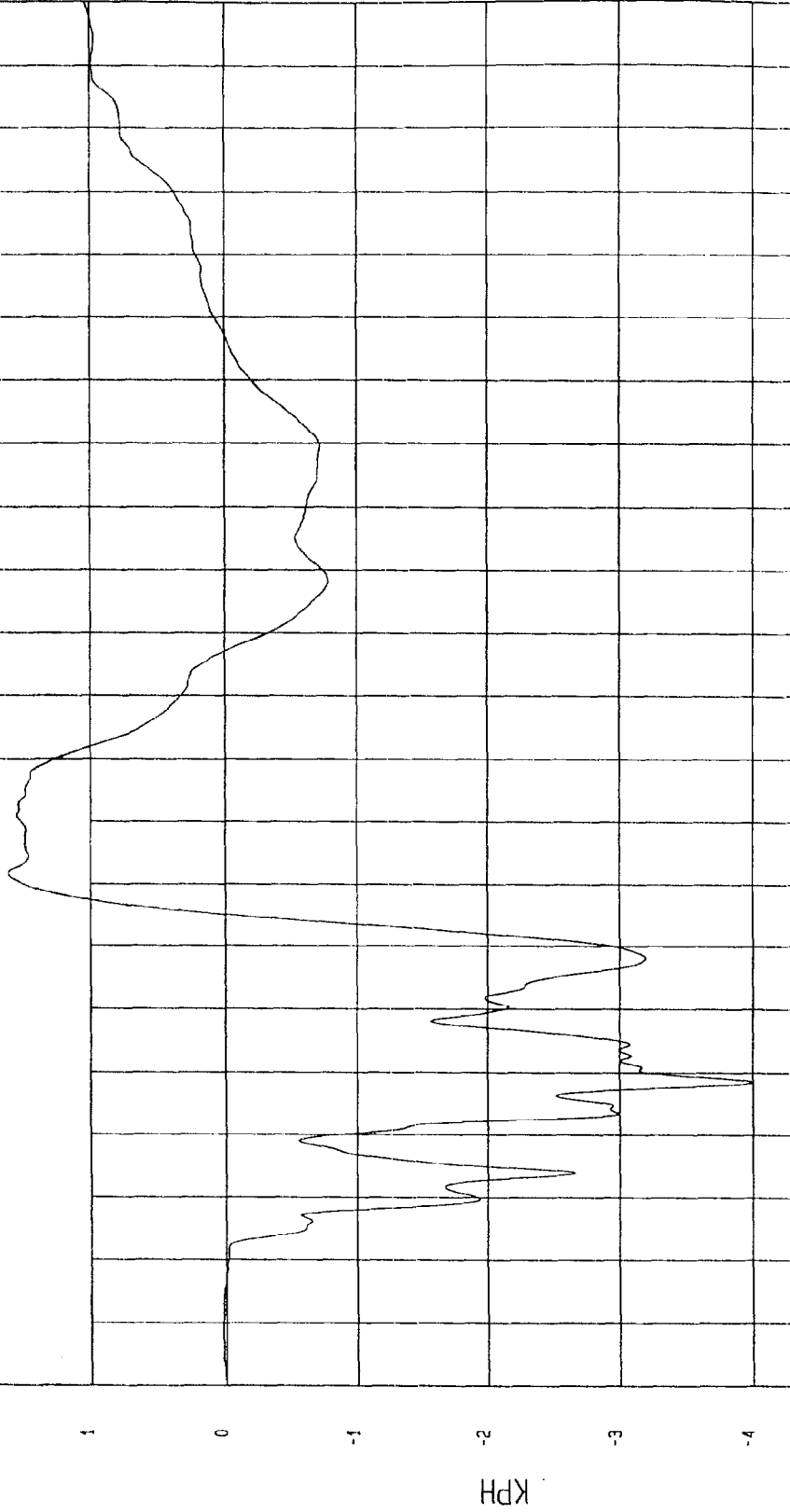
COMPONENT: 1999 TOYOTA RAV4 (MX5103)

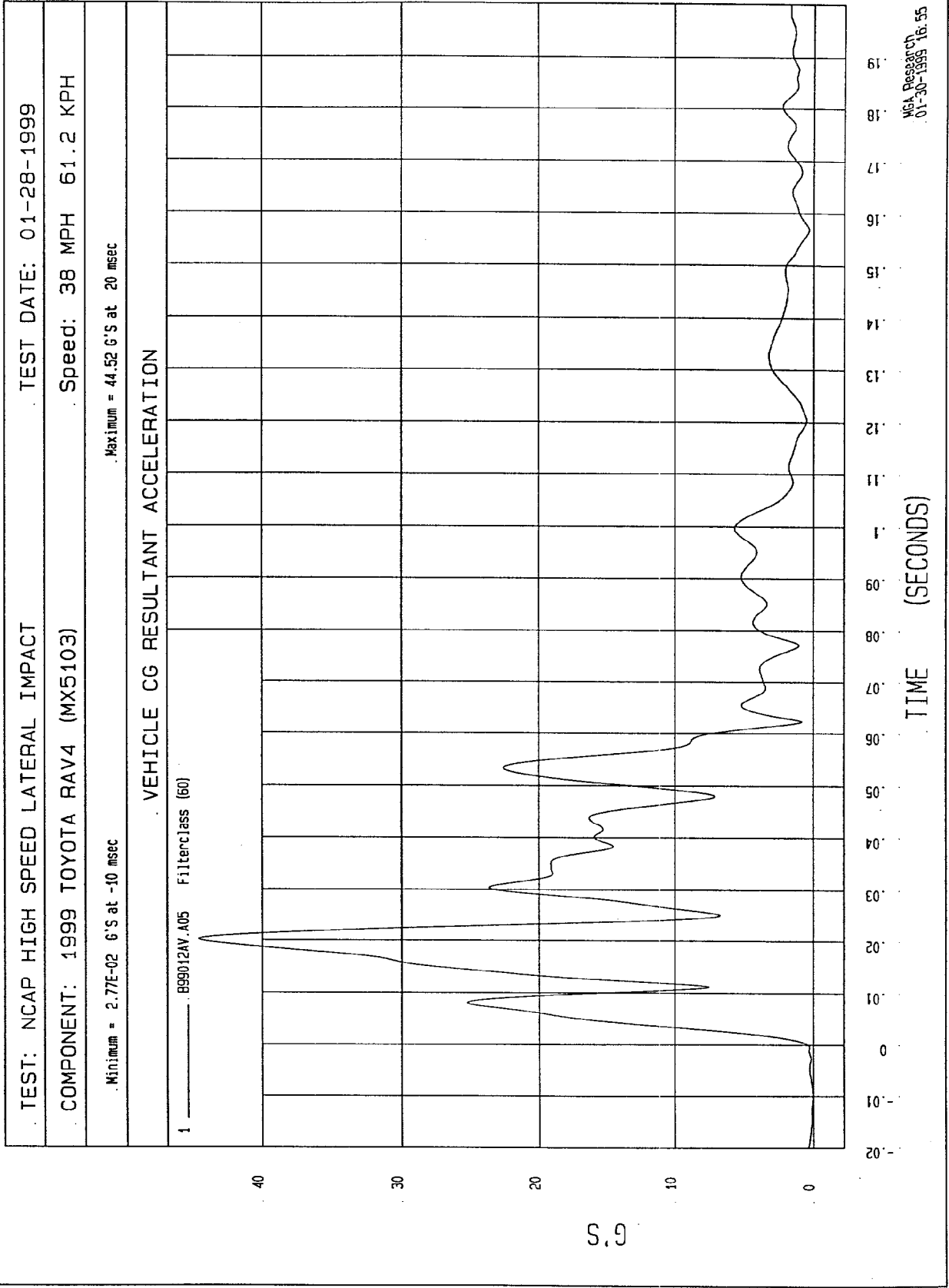
Maximum = 1.62 KPH at 62 msec

Minimum = -4.01 KPH at 28 msec

VEHICLE CG Z VELOCITY

1 — B99012A1.V07 Filterclass (180)





TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

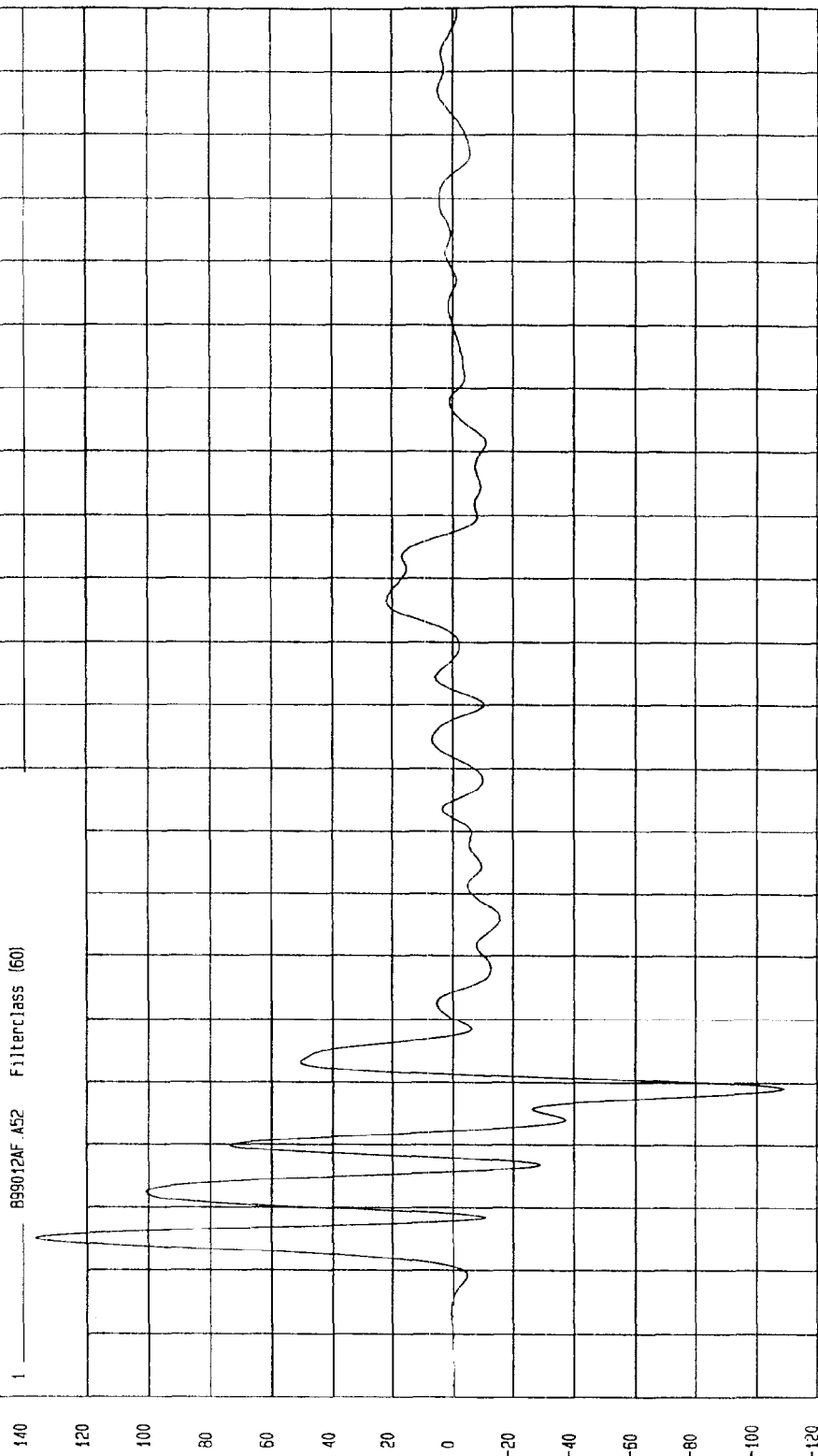
Speed: 38 MPH 61.2 KPH

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = 136.7 G'S at 5 msec

Minimum = -108.6 G'S at 29 msec

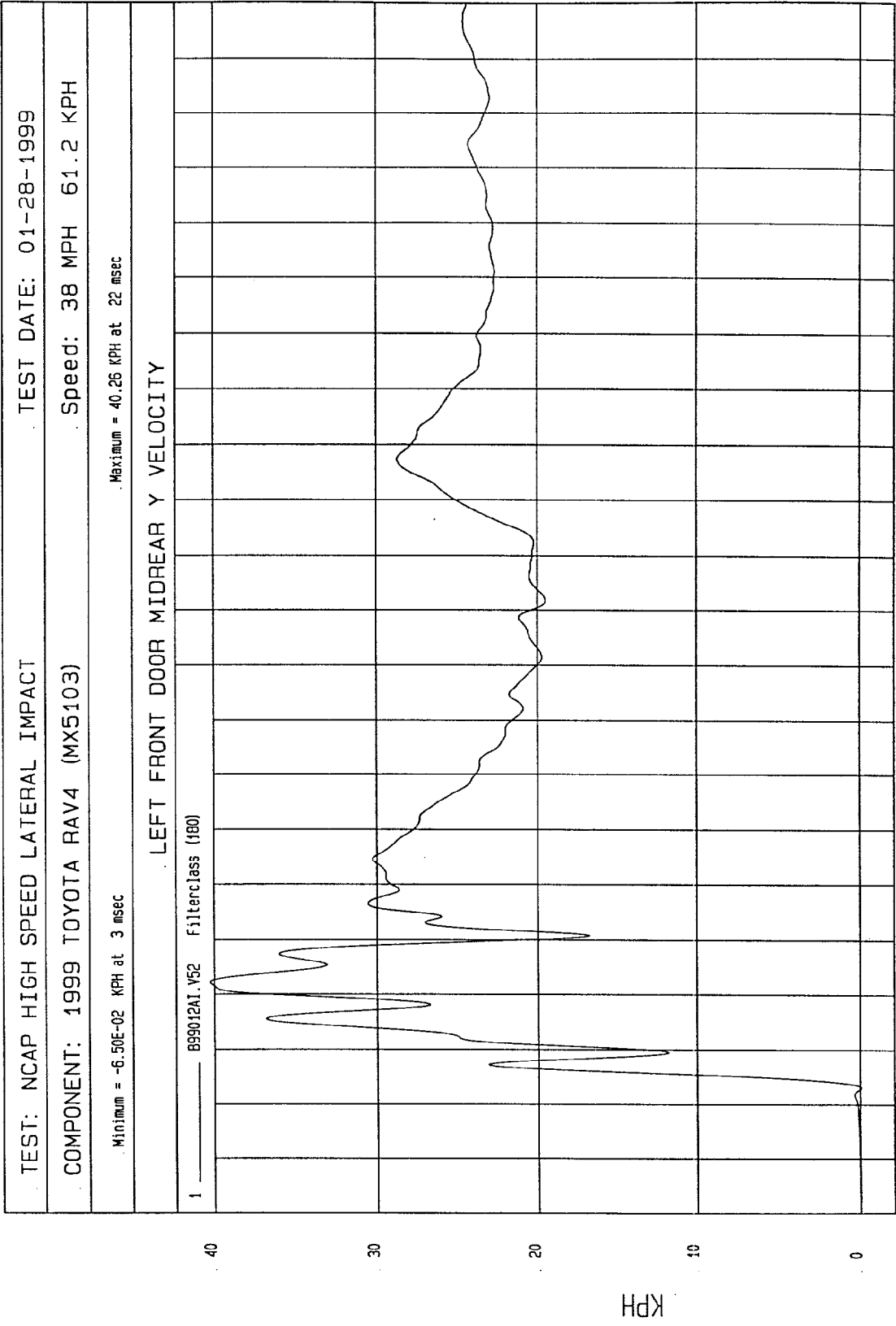
LEFT FRONT DOOR MIDREAR Y ACCELERATION



MCA Research
01-30-1999 16:55

TIME (SECONDS)

G.S



MGA Research
01-30-1999 17:01

TIME Seconds

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

SPEED: 38 MPH 61.2 KPH

Maximum = 195.37 G'S at 12 msec

TEST: NCAP HIGH SPEED LATERAL IMPACT

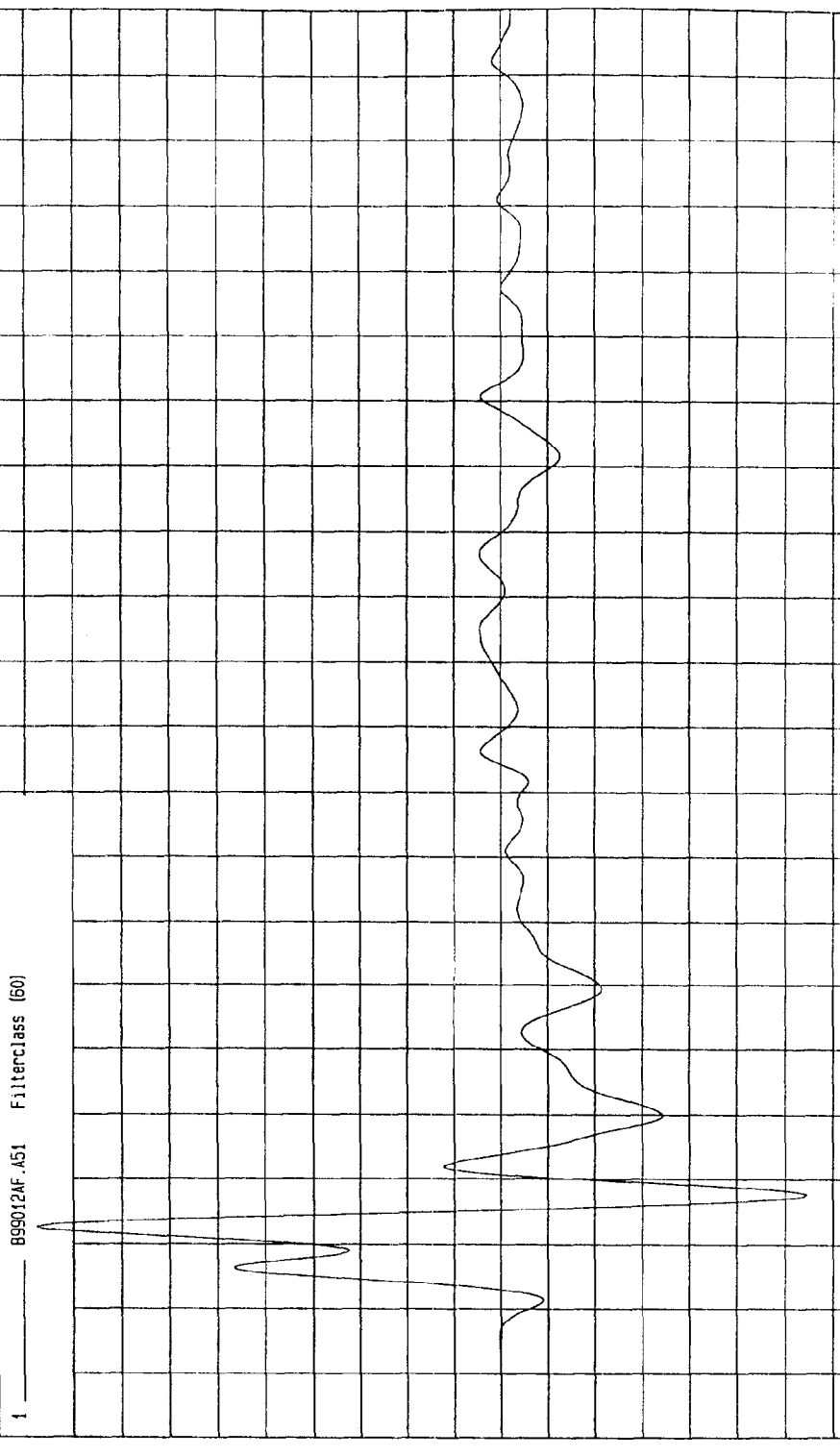
COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Minimum = -128.9 G'S at 18 msec

LEFT FRONT DOOR CENTERLINE Y ACCELERATION

1 B99012AF.A51 Filterclass (50)

G.S



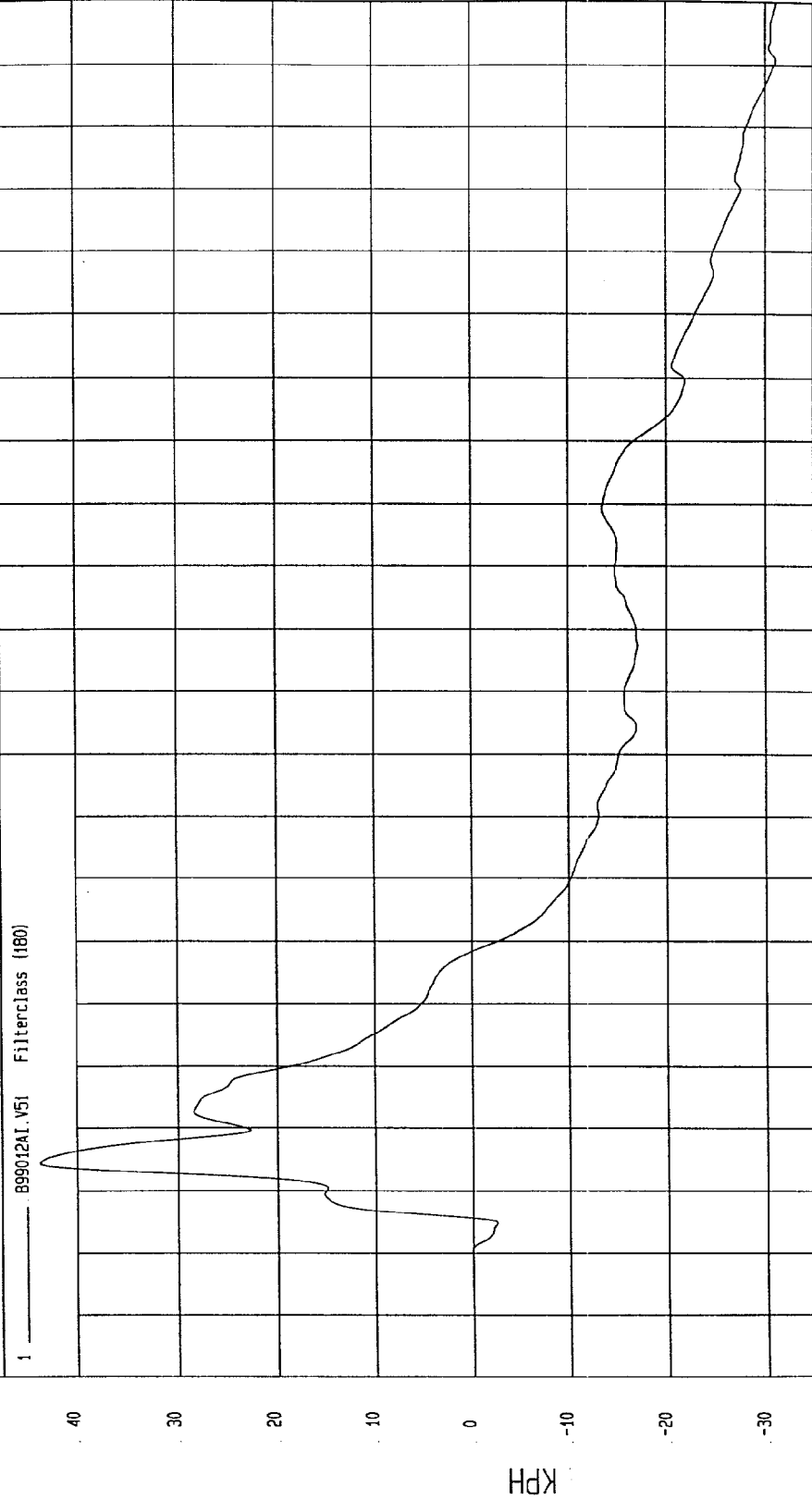
WCA Research
01-30-1999 16:55

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -31.1 KPH at 200 msec Maximum = 43.77 KPH at 14 msec

LEFT FRONT DOOR CENTERLINE Y VELOCITY



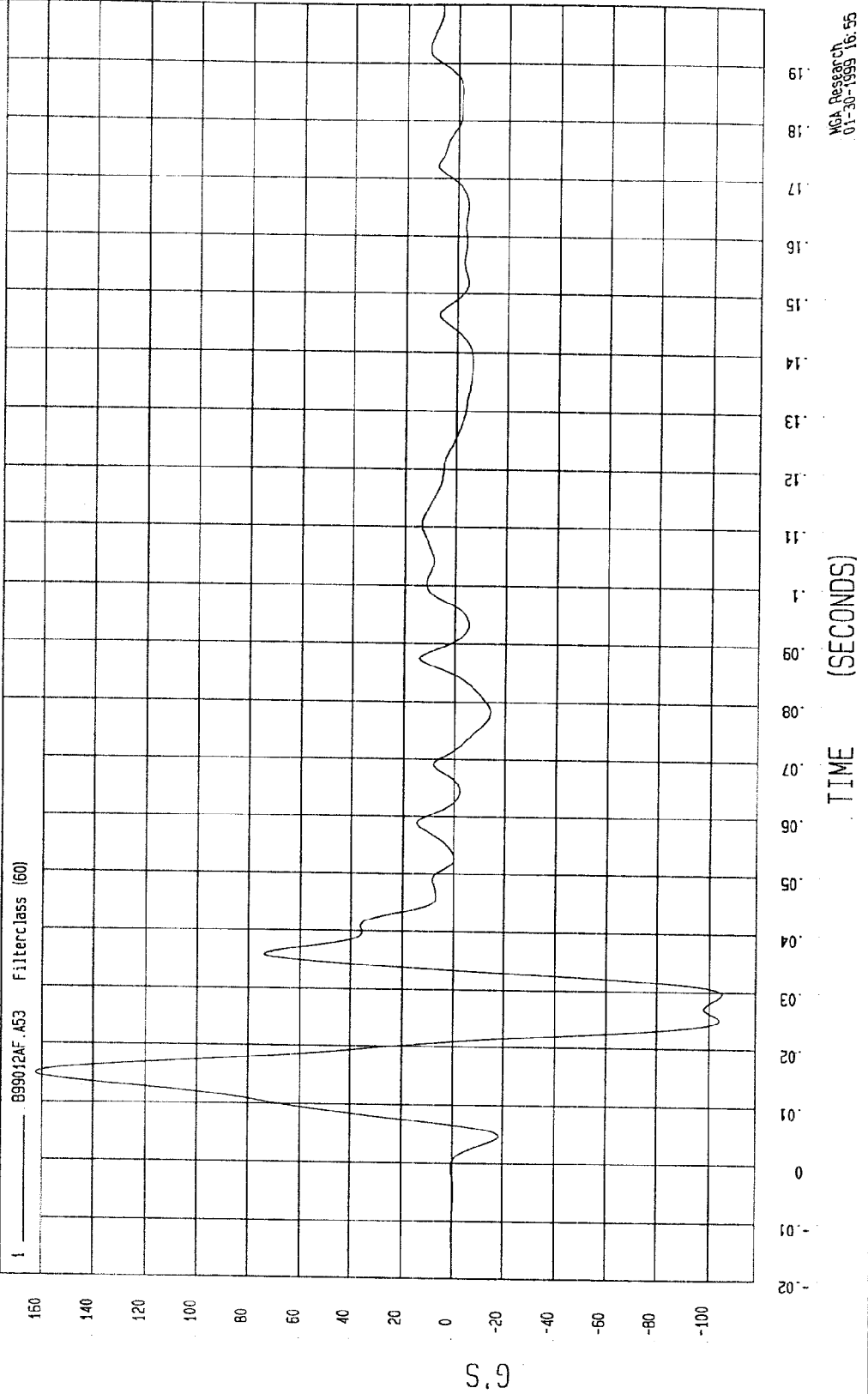
MGA Research
01-30-1999 17:01

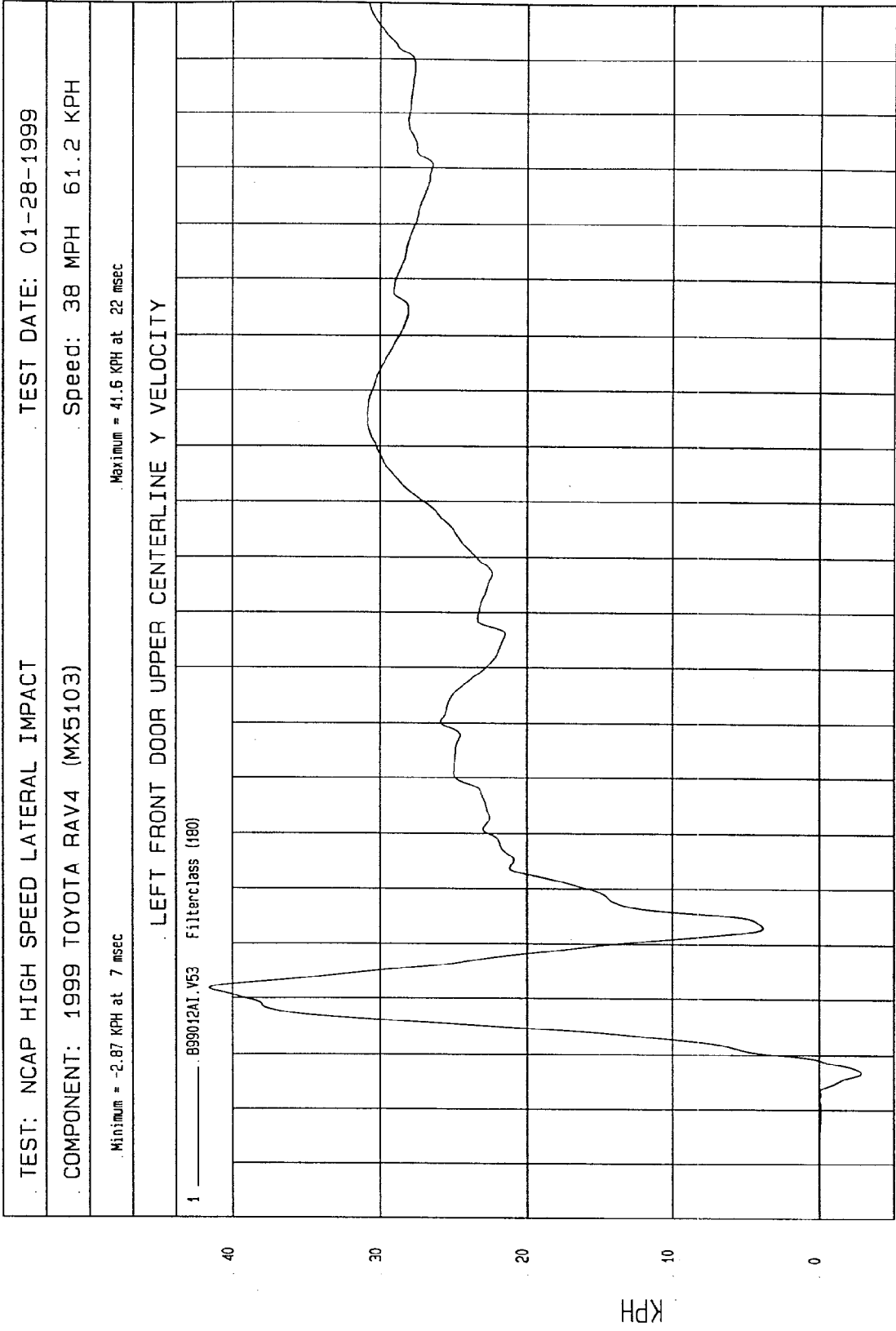
TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -105.08 G'S at 30 msec Maximum = 162.34 G'S at 15 msec

LEFT FRONT DOOR UPPER CENTERLINE Y ACCELERATION





TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

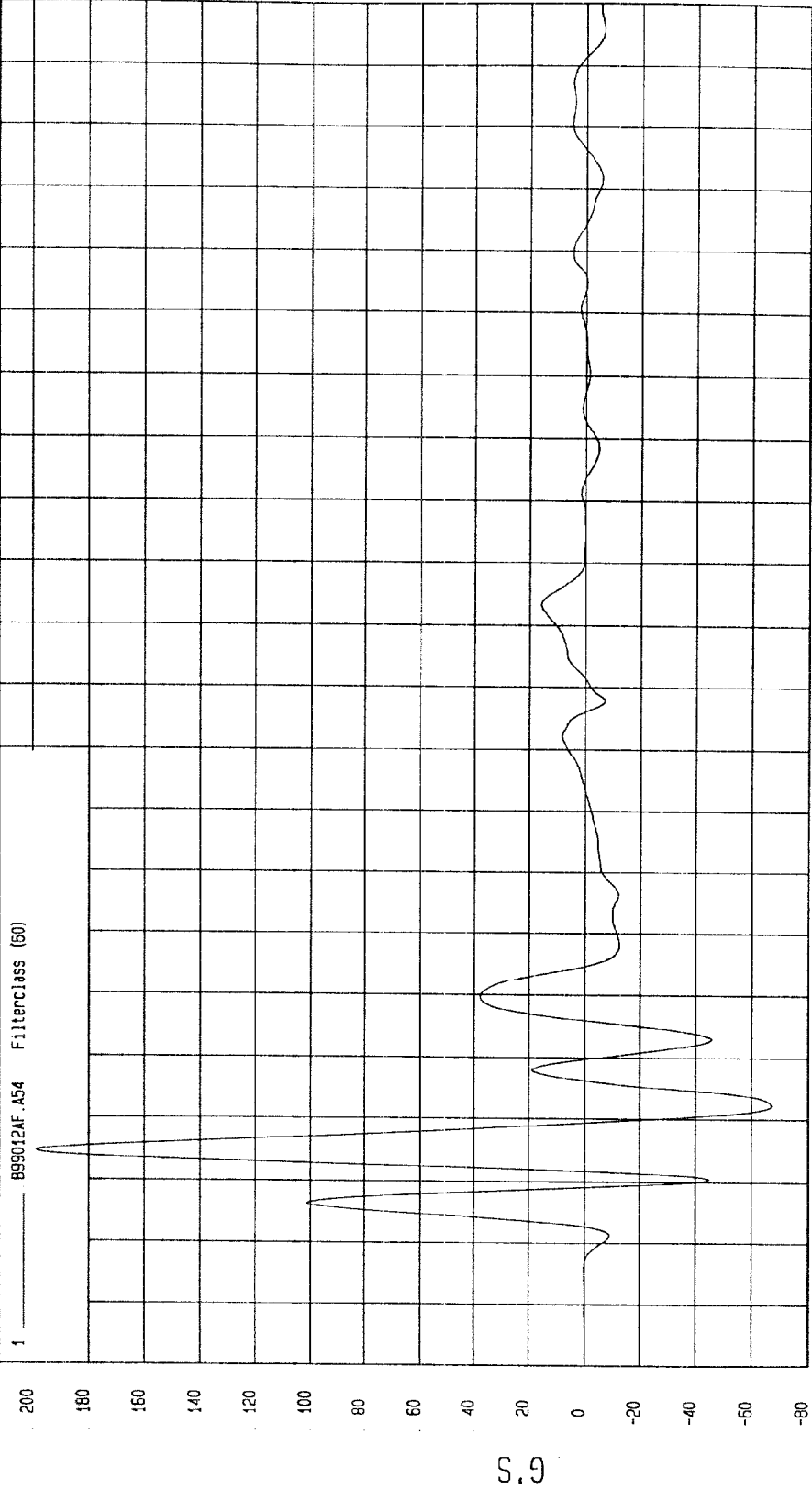
Speed: 38 MPH 61.2 KPH

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

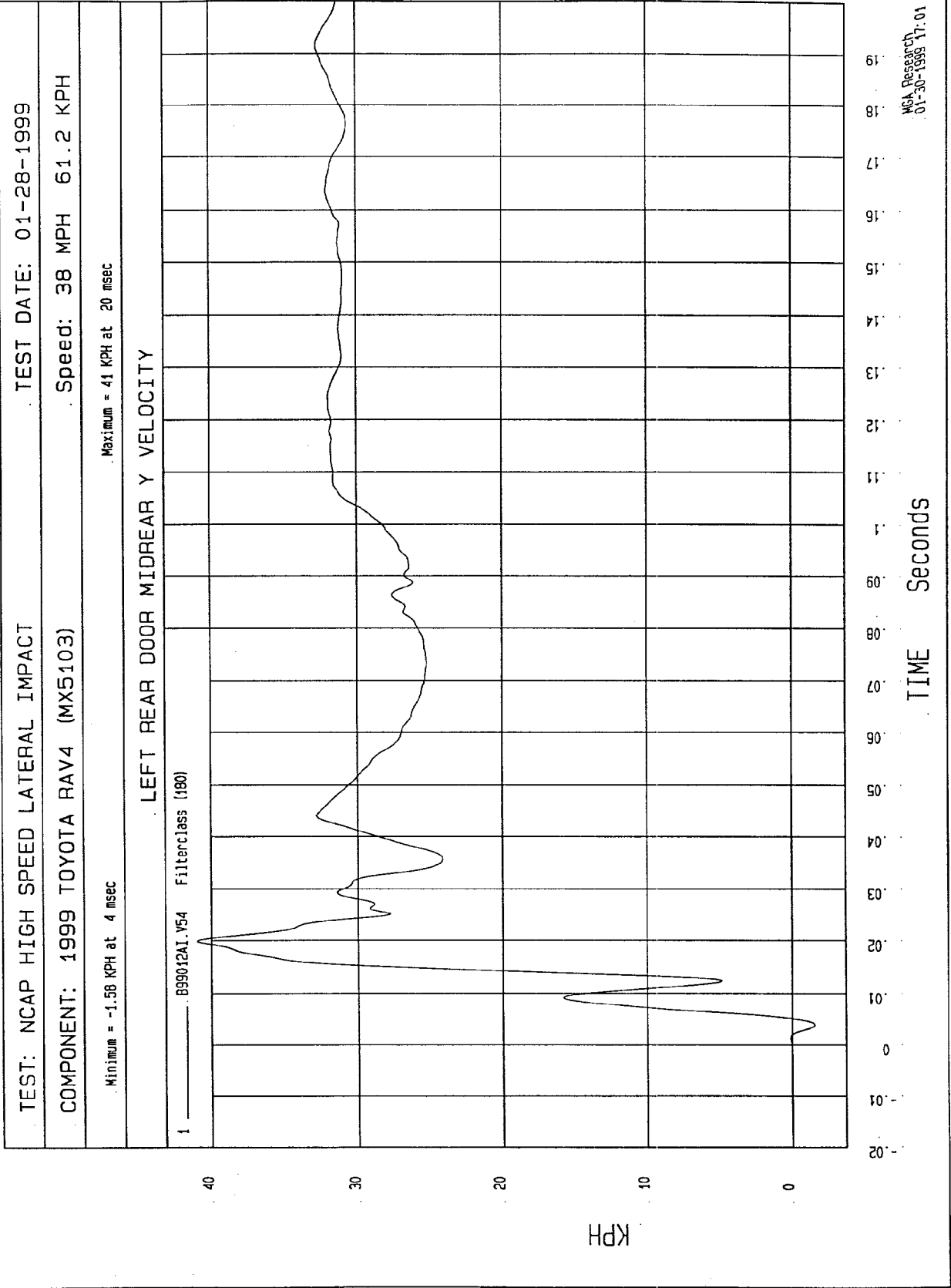
Maximum = 198.76 G'S at 15 msec

Minimum = -67.09 G'S at 22 msec

LEFT REAR DOOR MIDREAR Y ACCELERATION



MCA Research
01-30-1999 16:55

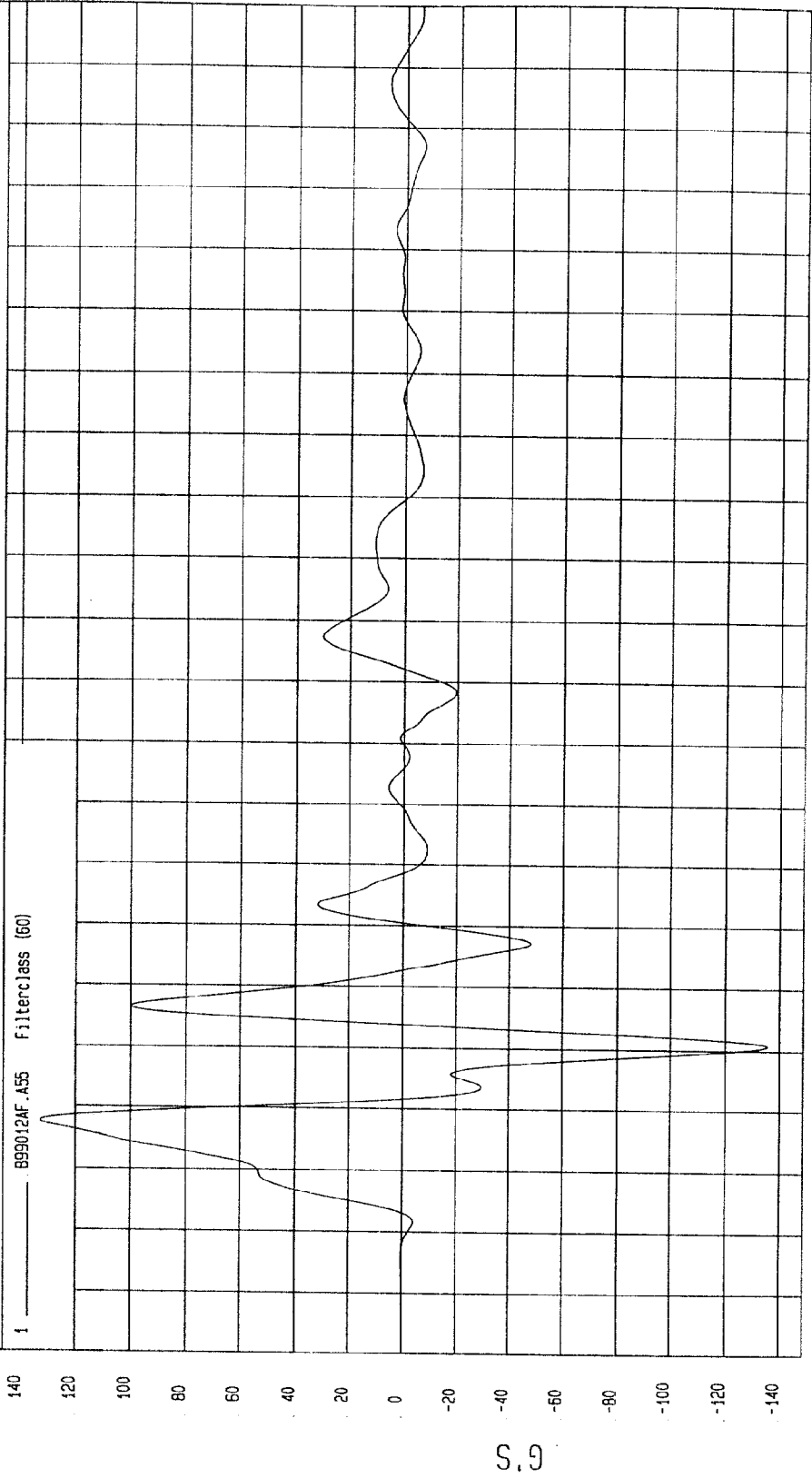


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -135.45 G'S at 31 msec Maximum = 133.01 G'S at 18 msec

LEFT REAR DOOR UPPER CENTERLINE Y ACCELERATION



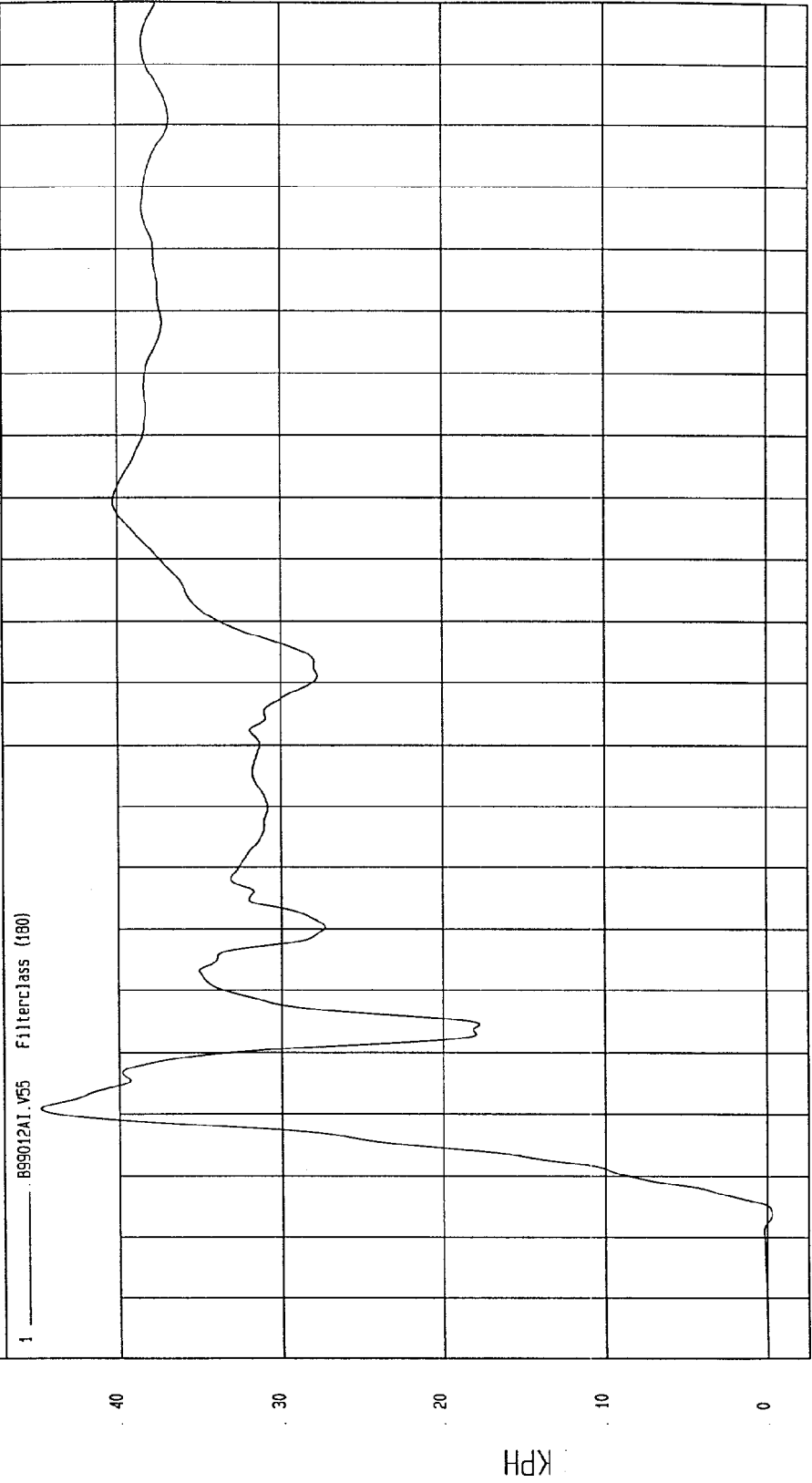
MOA Research
01-30-1999 16:55

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -29 KPH at 4 msec Maximum = 44.81 KPH at 21 msec

LEFT REAR DOOR UPPER CENTERLINE Y VELOCITY



TIME Seconds

19
18
17
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-1
-2

WCA Research
01-30-1999 17:01

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

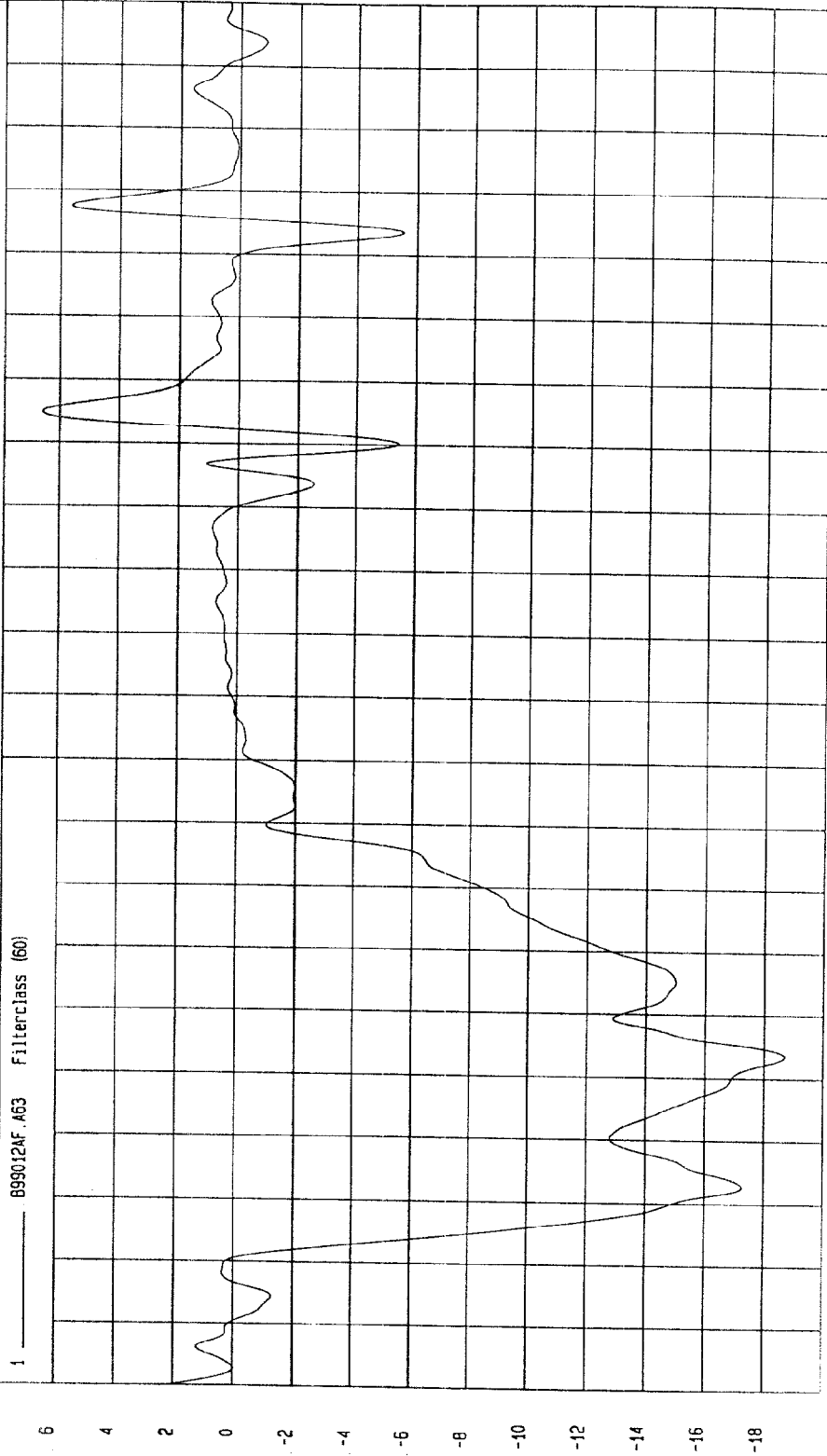
Speed: 38 MPH 61.2 KPH

Minimum = -18.7 G'S at 34 msec

Maximum = 6.57 G'S at 135 msec

MOVING BARRIER CG X ACCELERATION

1 ——— B990124F.A53 Filterclass (60)

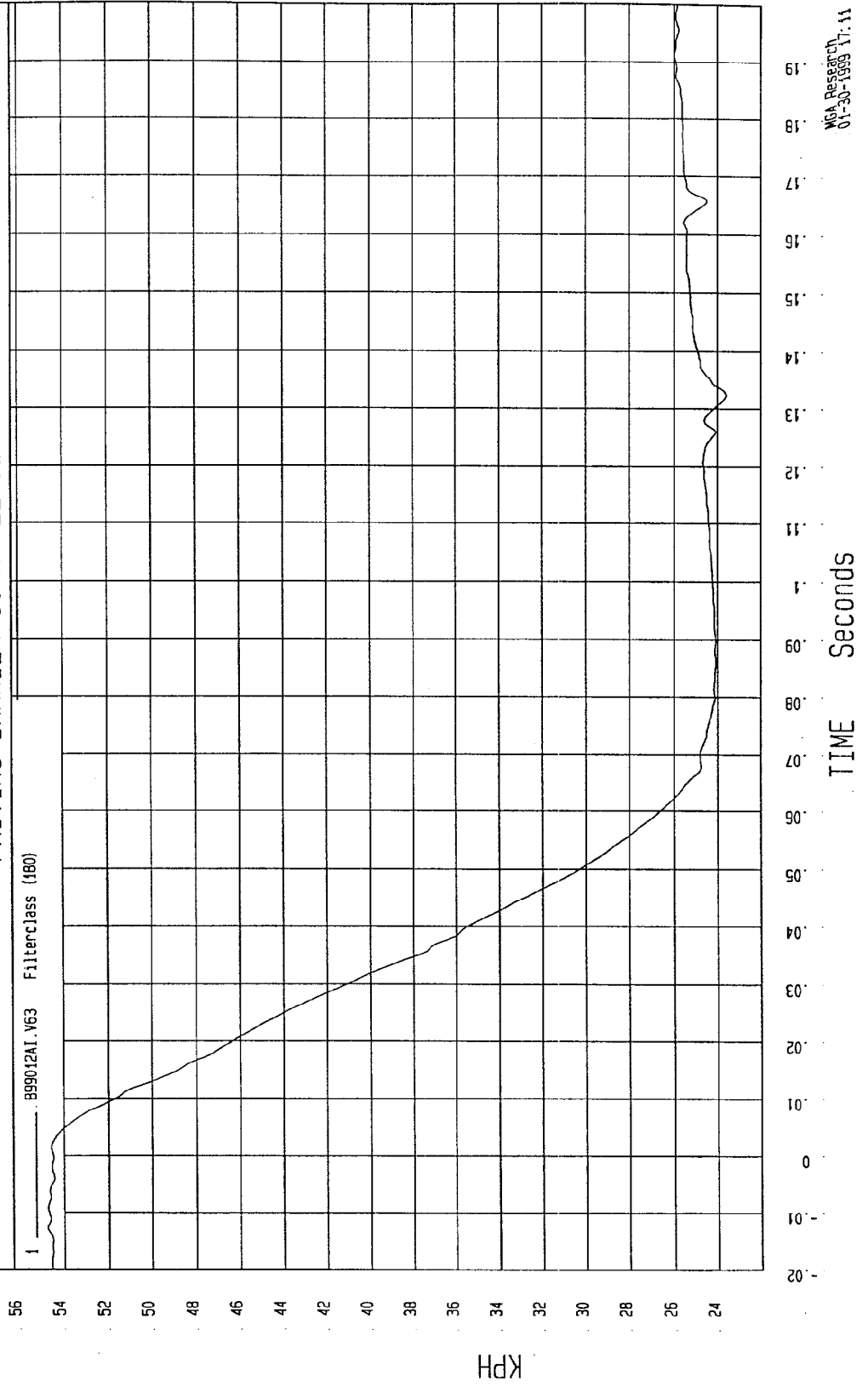


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

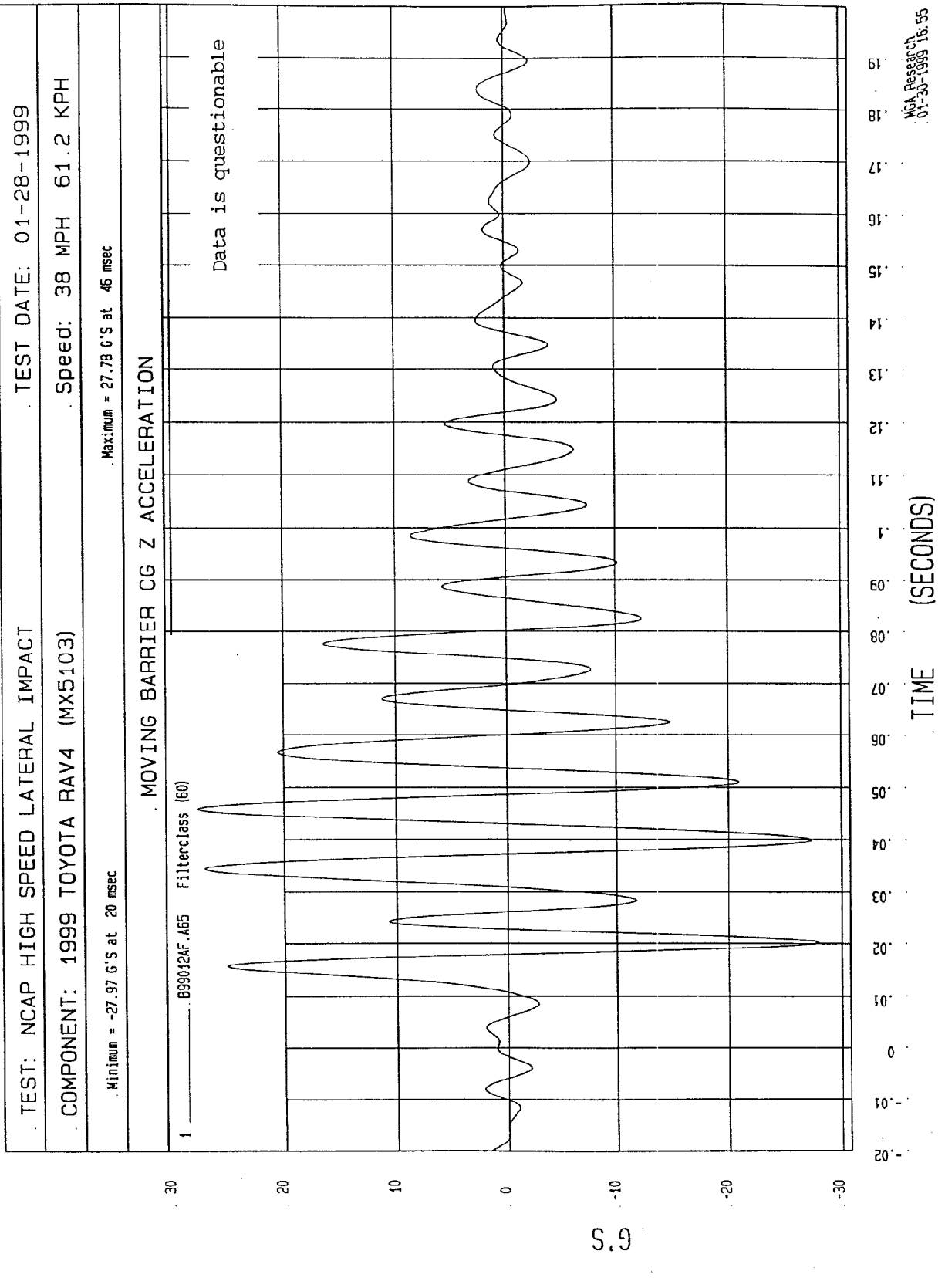
Minimum = 23.6 KPH at 132 msec Maximum = 54.73 KPH at -13 msec

MOVING BARRIER CG X VELOCITY



MOVING BARRIER CENTER OF GRAVITY Y ACCELERATION VS. TIME

NO VALID DATA COLLECTED



TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

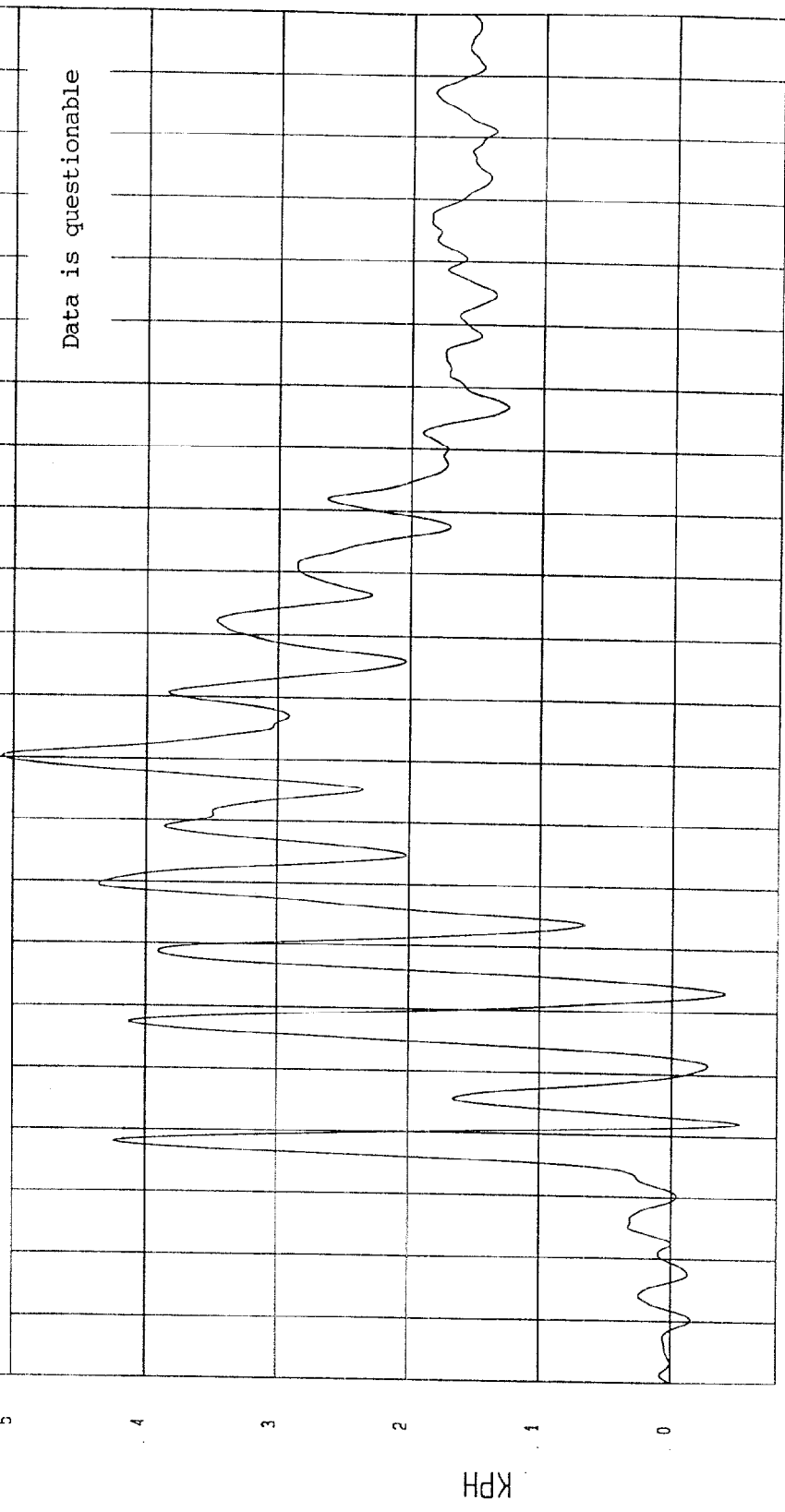
Speed: 38 MPH 61.2 KPH

Minimum = -.51 KPH at 22 msec

Maximum = 5.08 KPH at 80 msec

MOVING BARRIER CG Z VELOCITY

1 ——— 899012A1.V65 Filterclass (180)



TIME Seconds

WCA Research
01-30-1999 17:01

MOVING BARRIER CENTER OF GRAVITY RESULTANT ACCELERATION VS. TIME

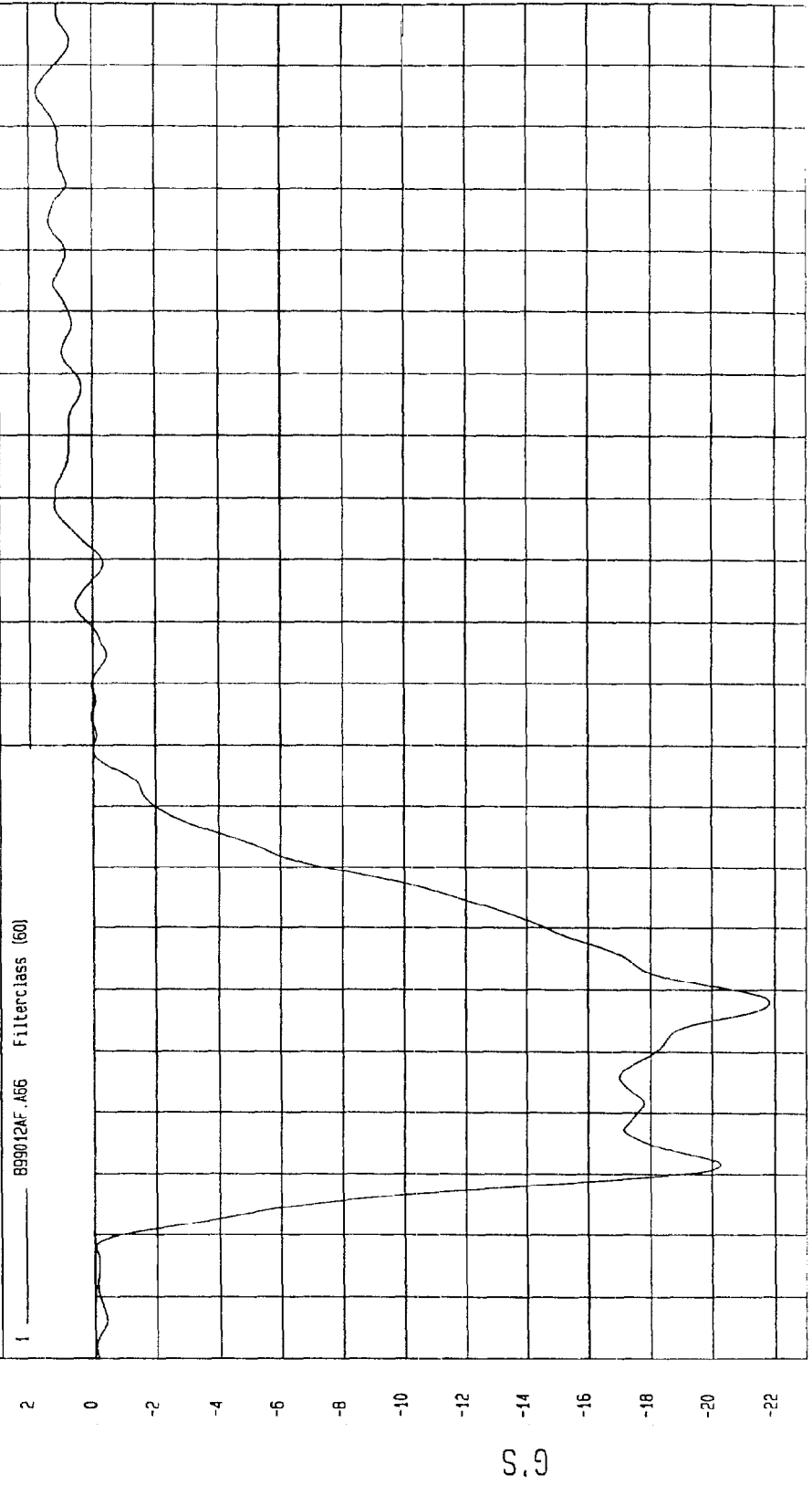
NO VALID DATA COLLECTED

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -21.84 G'S at 38 msec Maximum = 1.77 G'S at 185 msec

MOVING BARRIER REAR AXLE X ACCELERATION



TIME (SECONDS)

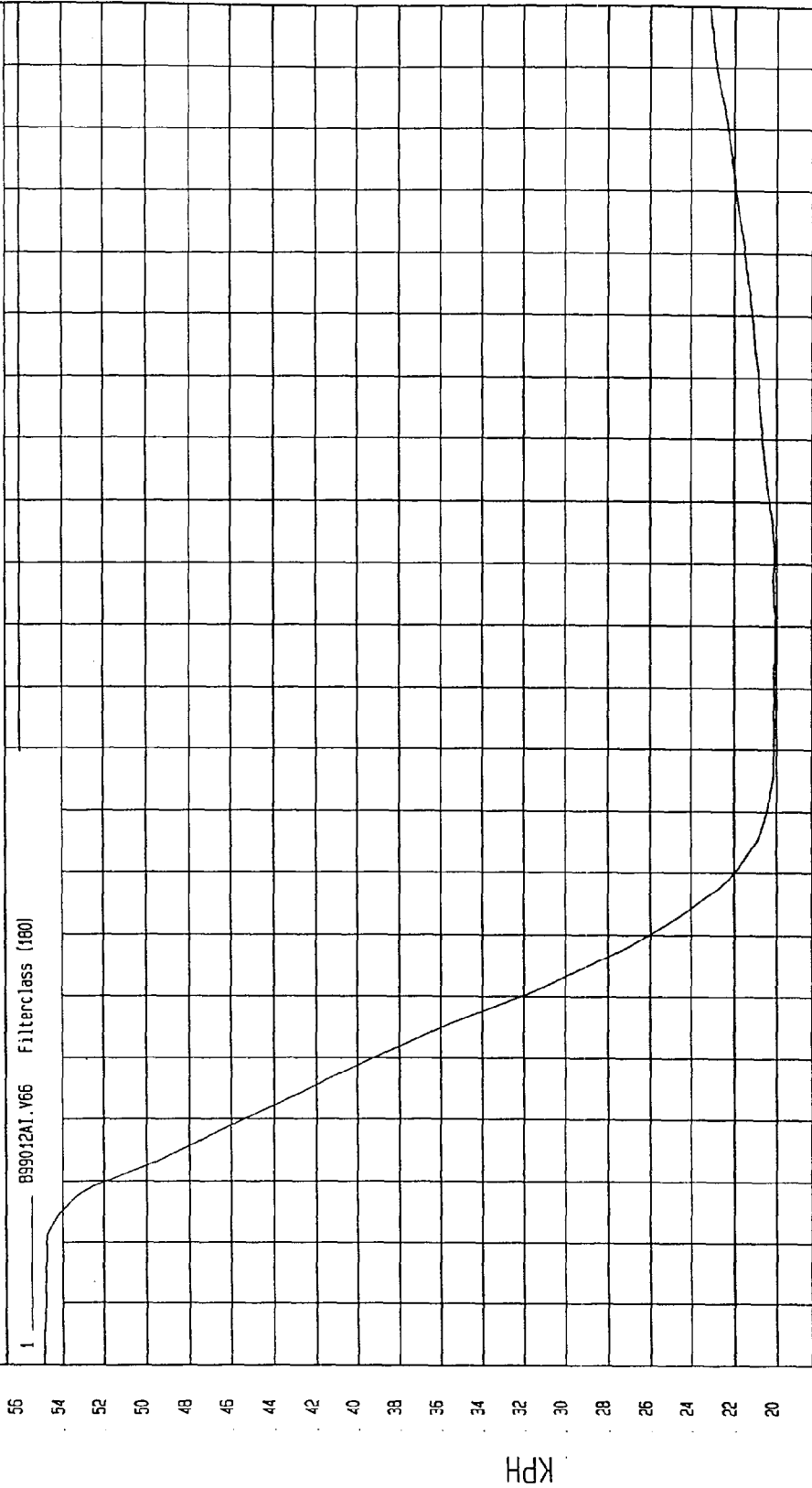
MECA Research
01-30-1999 16:55

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = 20.06 KPH at 99 msec Maximum = 54.9 KPH at -20 msec

MOVING BARRIER REAR AXLE X VELOCITY



TIME Seconds

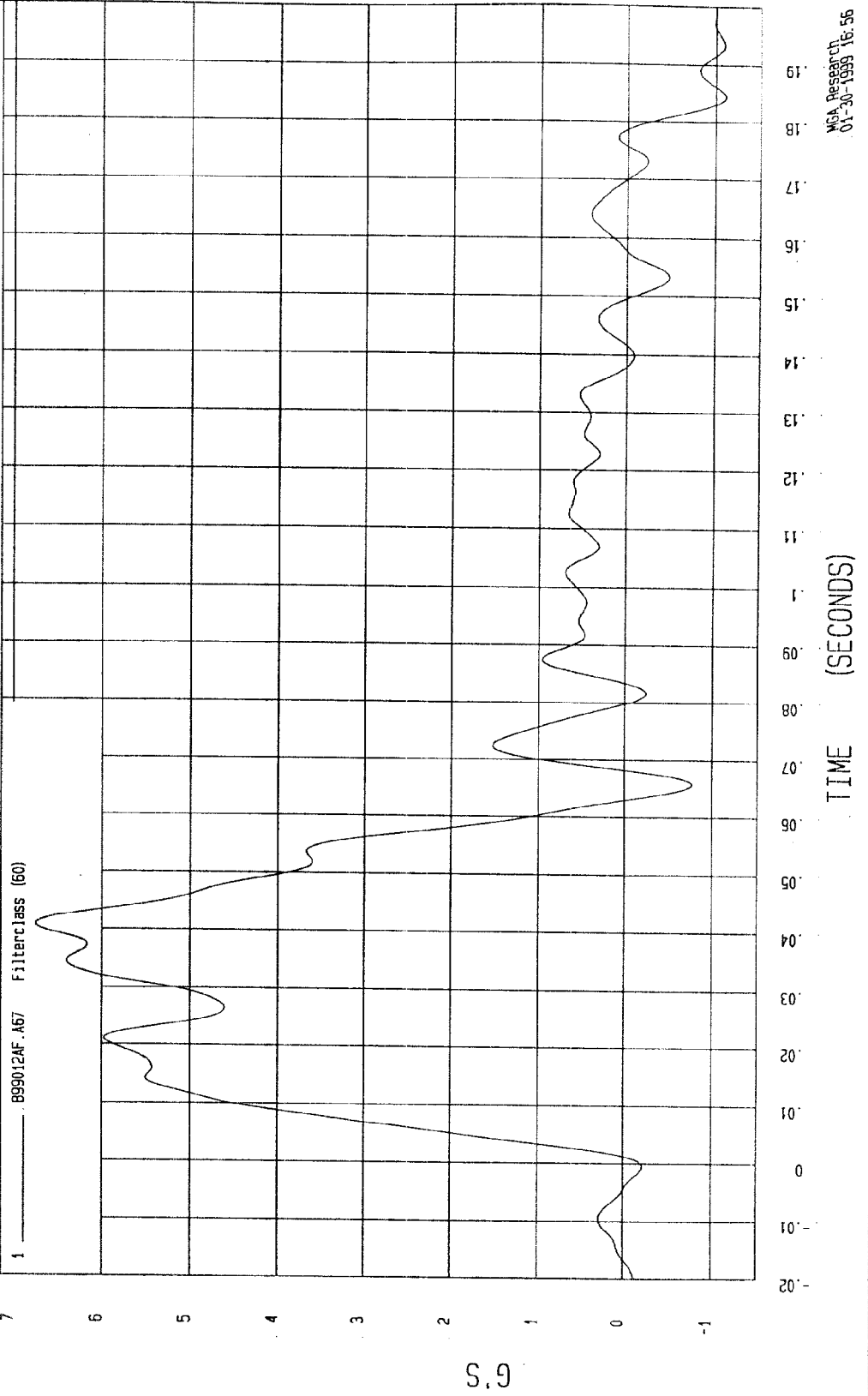
WCA Research
01-30-1999 17:11

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -1.11 G'S at 184 msec Maximum = 6.75 G'S at 41 msec

MOVING BARRIER REAR AXLE Y ACCELERATION

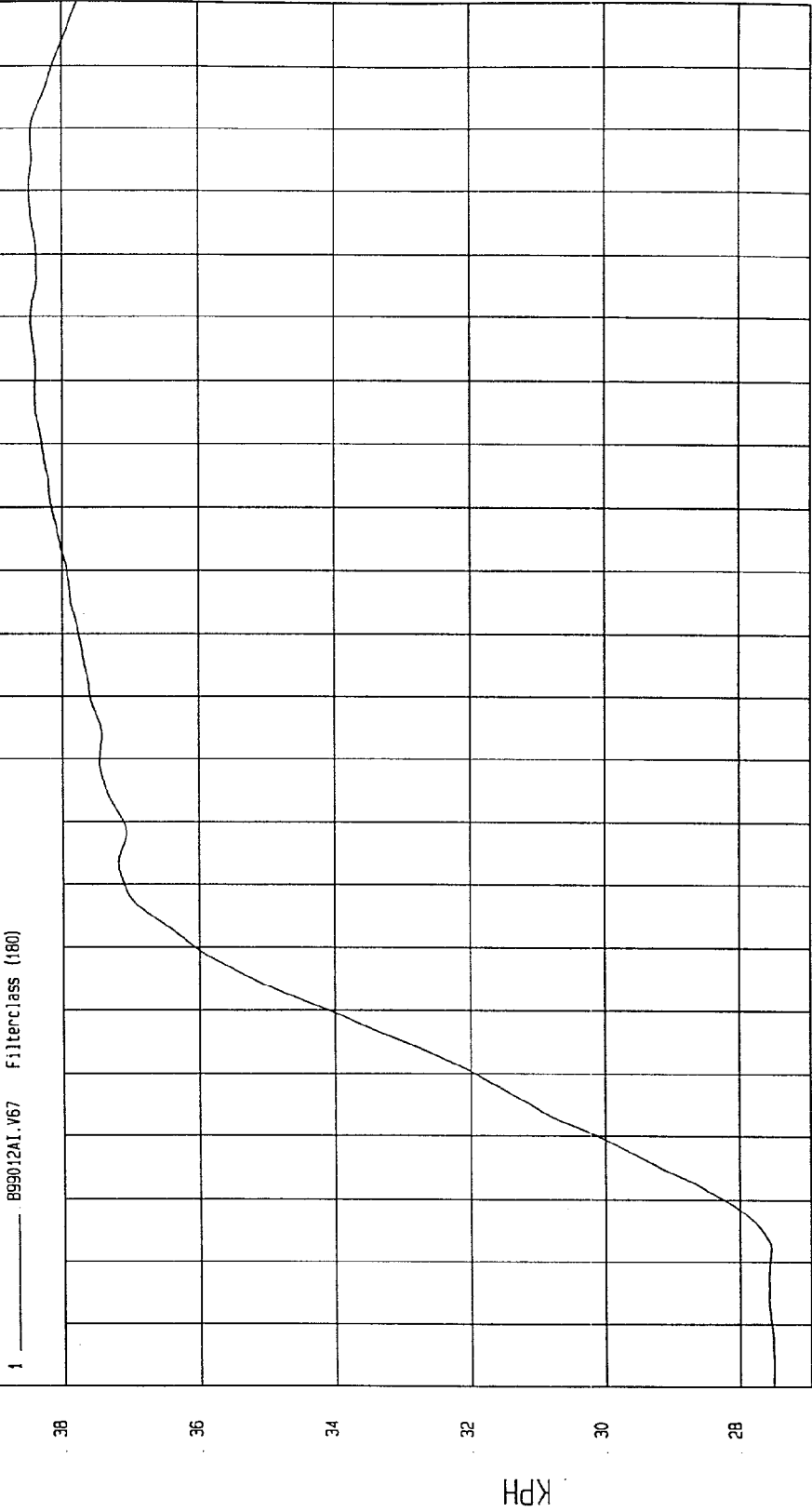


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = 27.49 KPH at -17 msec Maximum = 38.47 KPH at 169 msec

MOVING BARRIER REAR AXLE Y VELOCITY



TIME Seconds

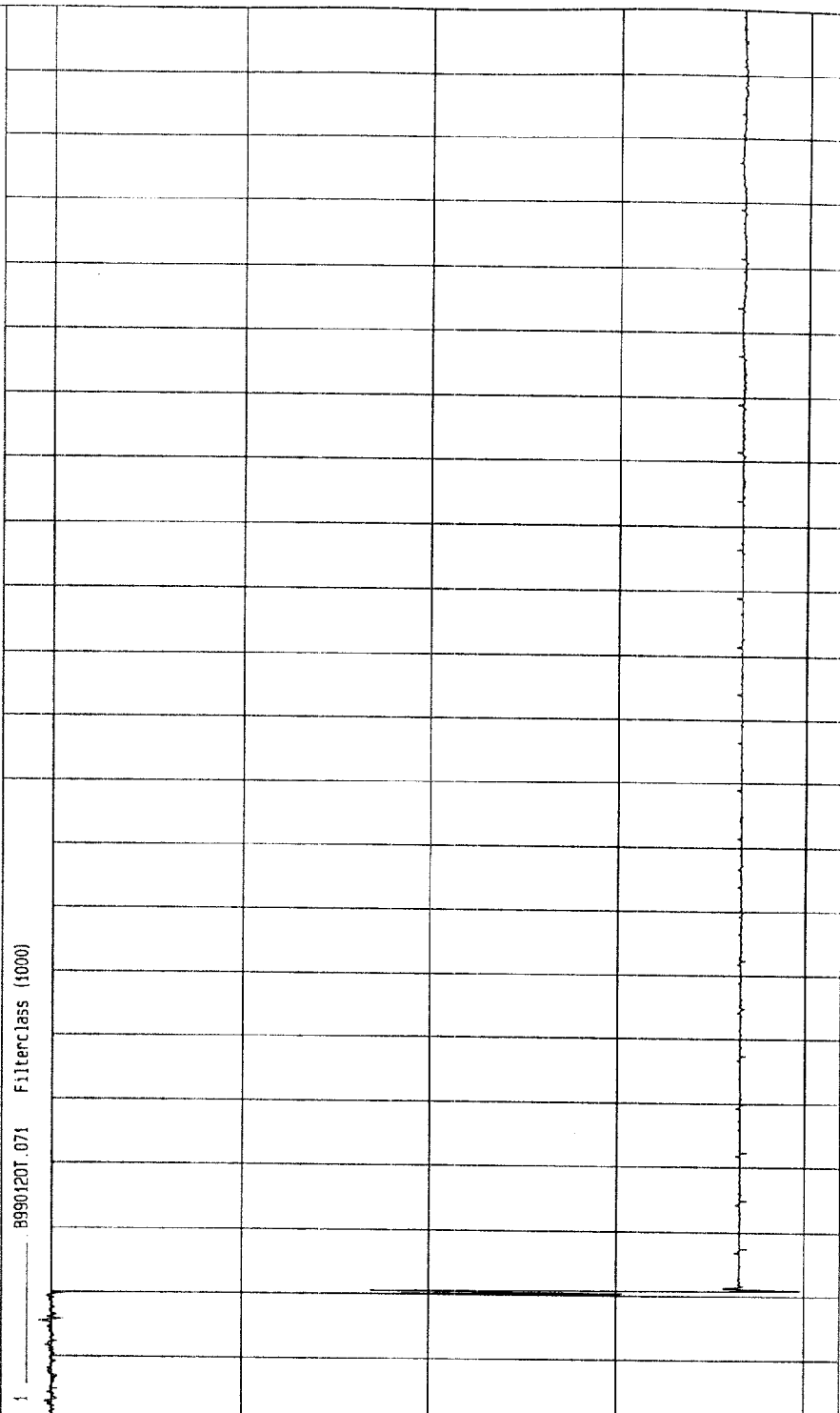
MECA Research
01-30-1999 17:11

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -3.98 VOLTS at 1 msec Maximum = .06 VOLTS at -5 msec

LEFT BARRIER CONTACT



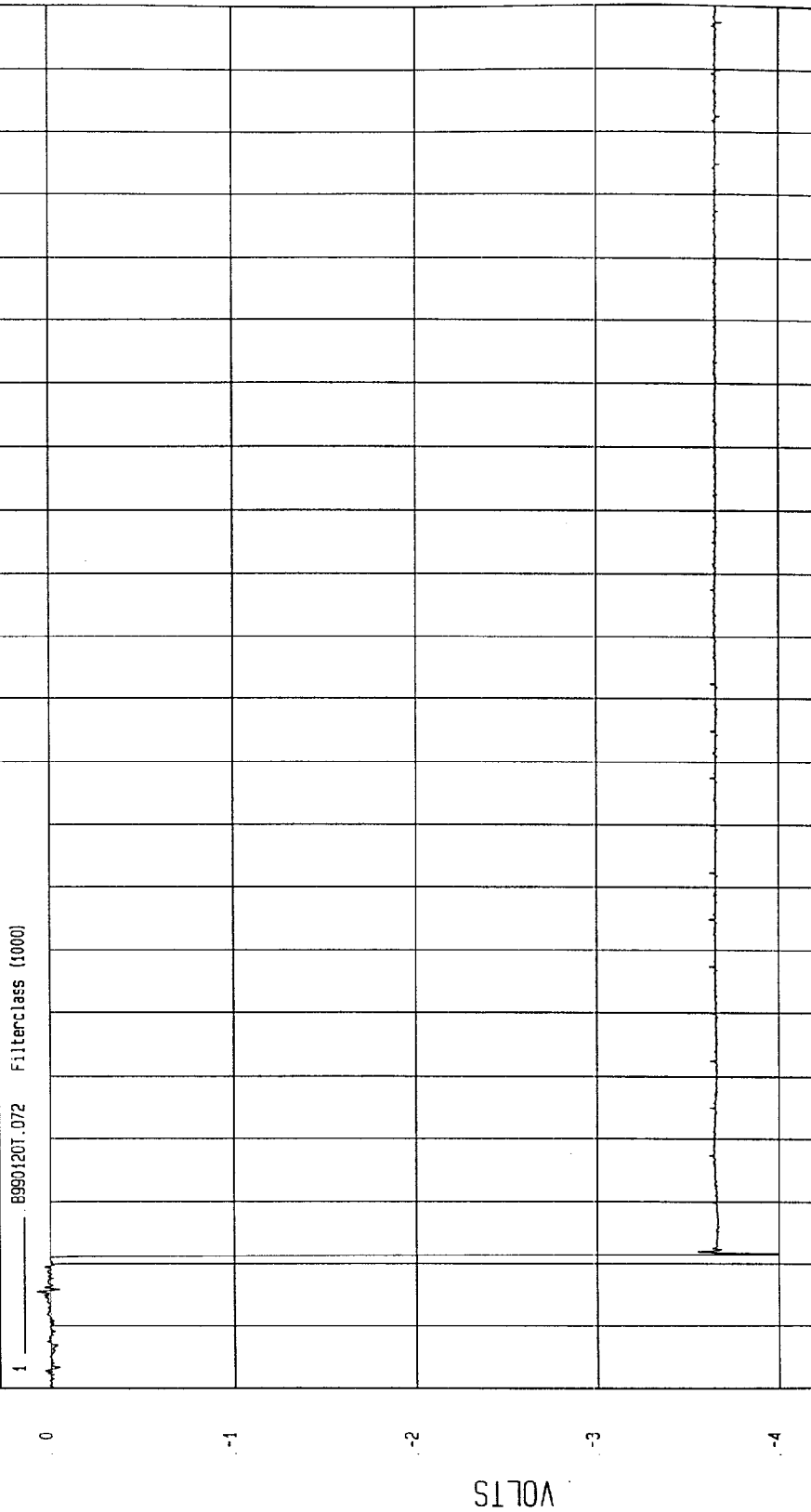
MGA Research
01-30-1999 16:56

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -4 VOLTS at 2 msec Maximum = 7.52E-02 VOLTS at -5 msec

RIGHT BARRIER CONTACT



1 8990120T.072 Filterclass (1000)

TIME (SECONDS)

WCA Research
01-30-1999 16:56

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

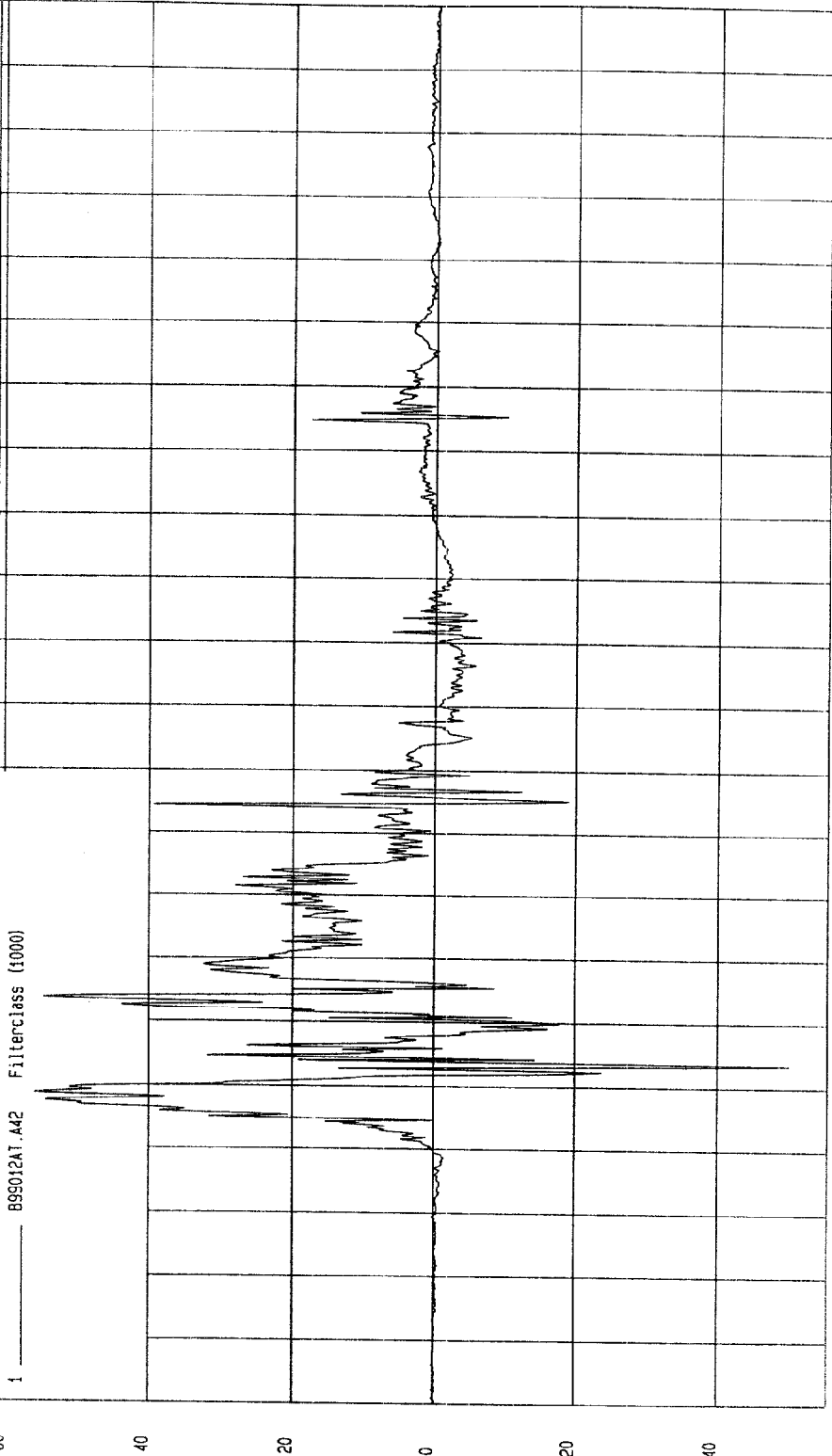
Speed: 38 MPH 61.2 KPH

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = 55.74 G'S at 29 msec

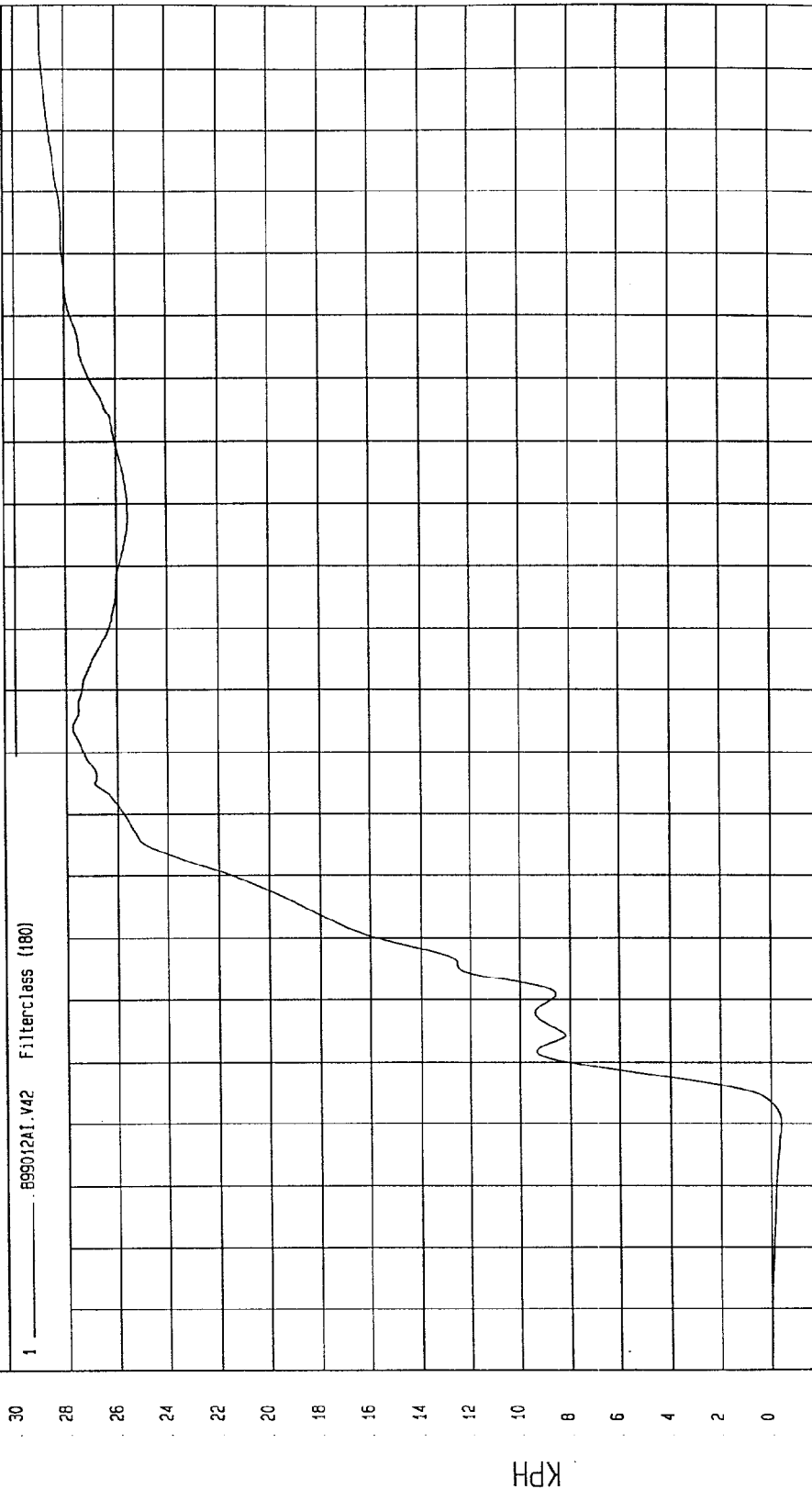
Minimum = -50.08 G'S at 34 msec

DRIVER UPPER RIB Y REDUNDANT ACCELERATION



TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999
COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH
Minimum = -41 KPH at 20 msec Maximum = 28.95 KPH at 200 msec

DRIVER UPPER RIB Y REDUNDANT VELOCITY

MCA Research
01-30-1999 16:49

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

Speed: 38 MPH 61.2 KPH

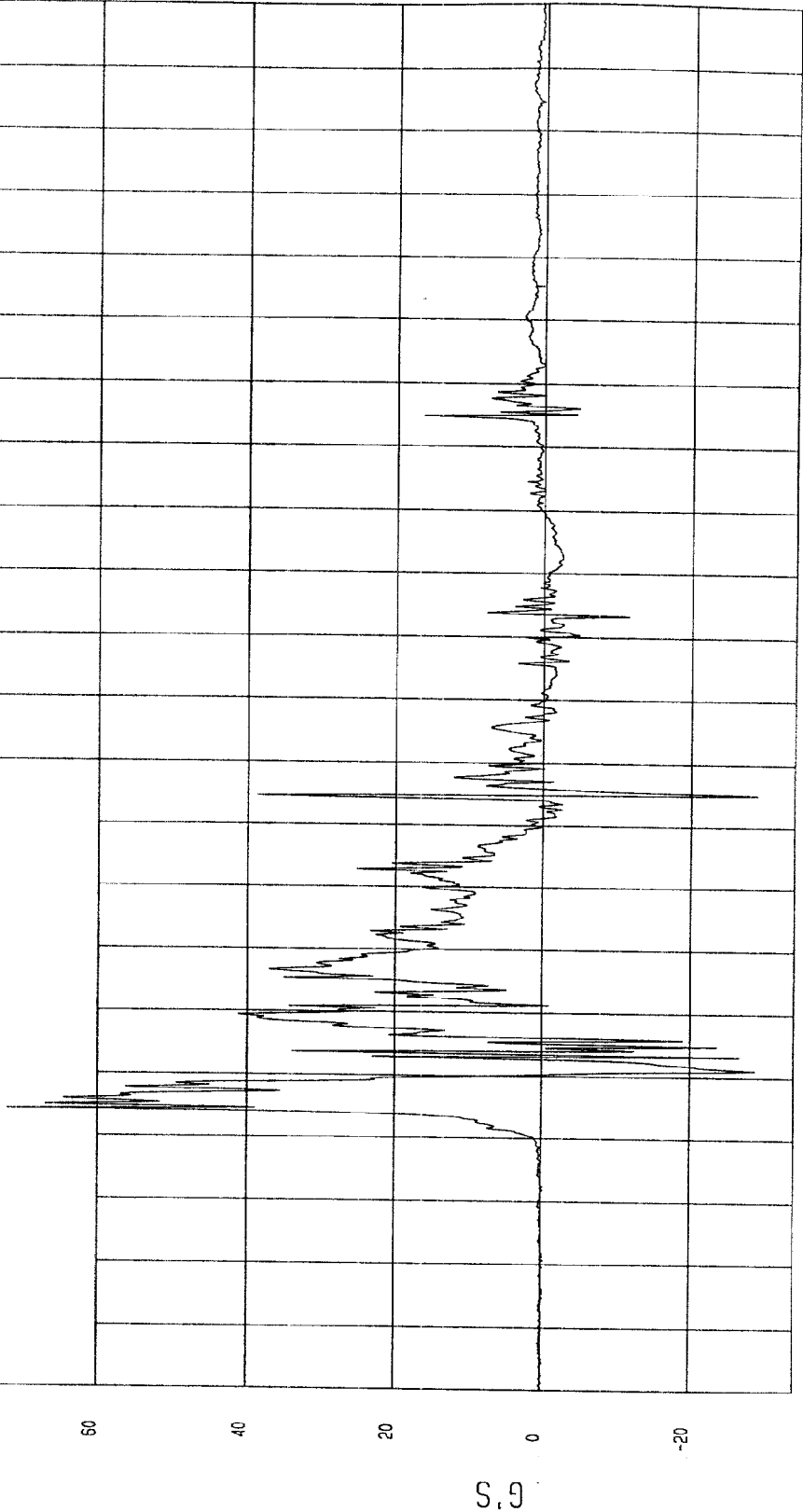
COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = 72.11 G'S at 24 msec

Minimum = -28.79 G'S at 75 msec

DRIVER LOWER RIB Y REDUNDANT ACCELERATION

1 — 899012AT A43 Filterclass (1000)



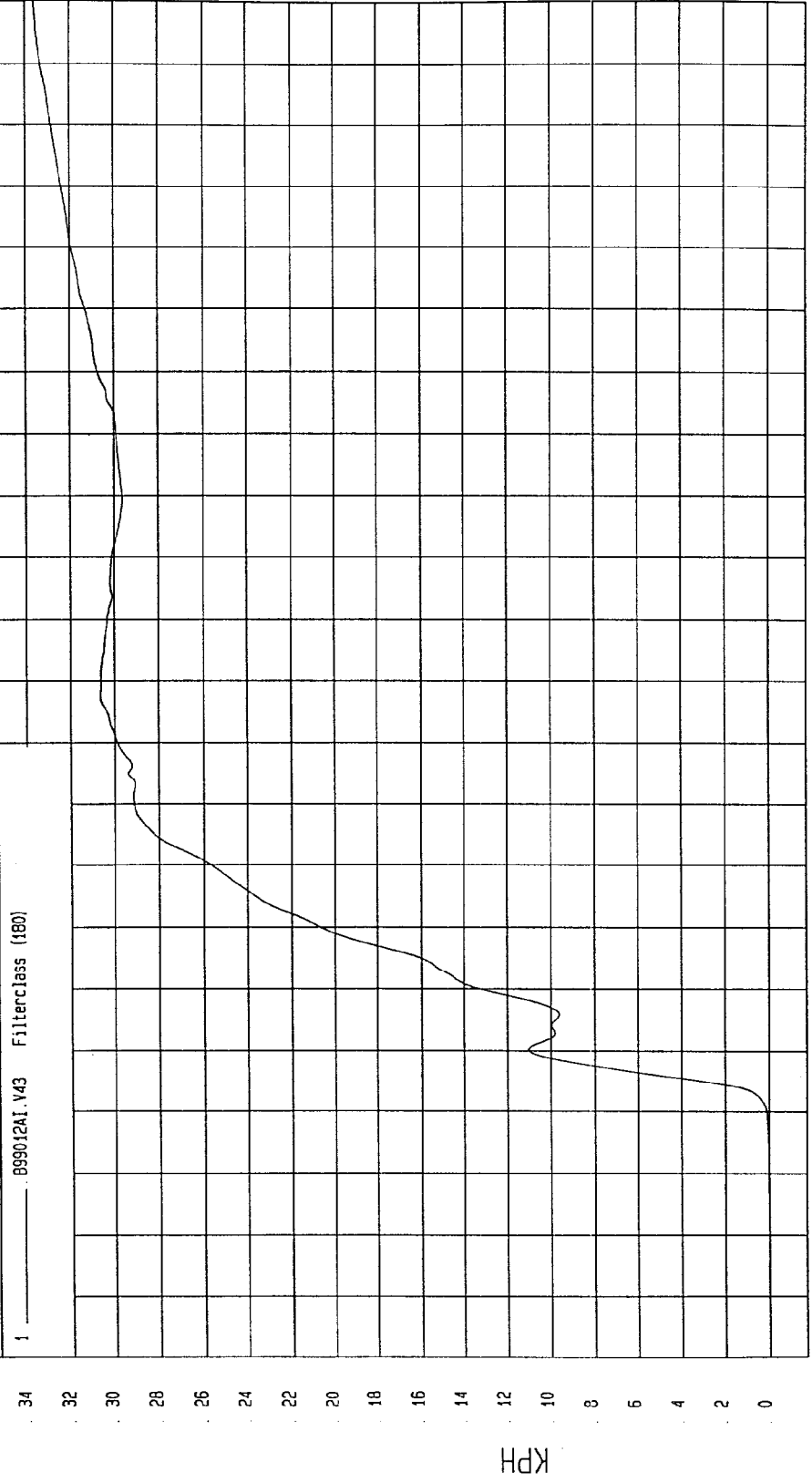
MSA Research
01-30-1999 16: 47

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -6.66E-03 KPH at -14 msec Maximum = 33.61 KPH at 200 msec

DRIVER LOWER RIB Y REDUNDANT VELOCITY



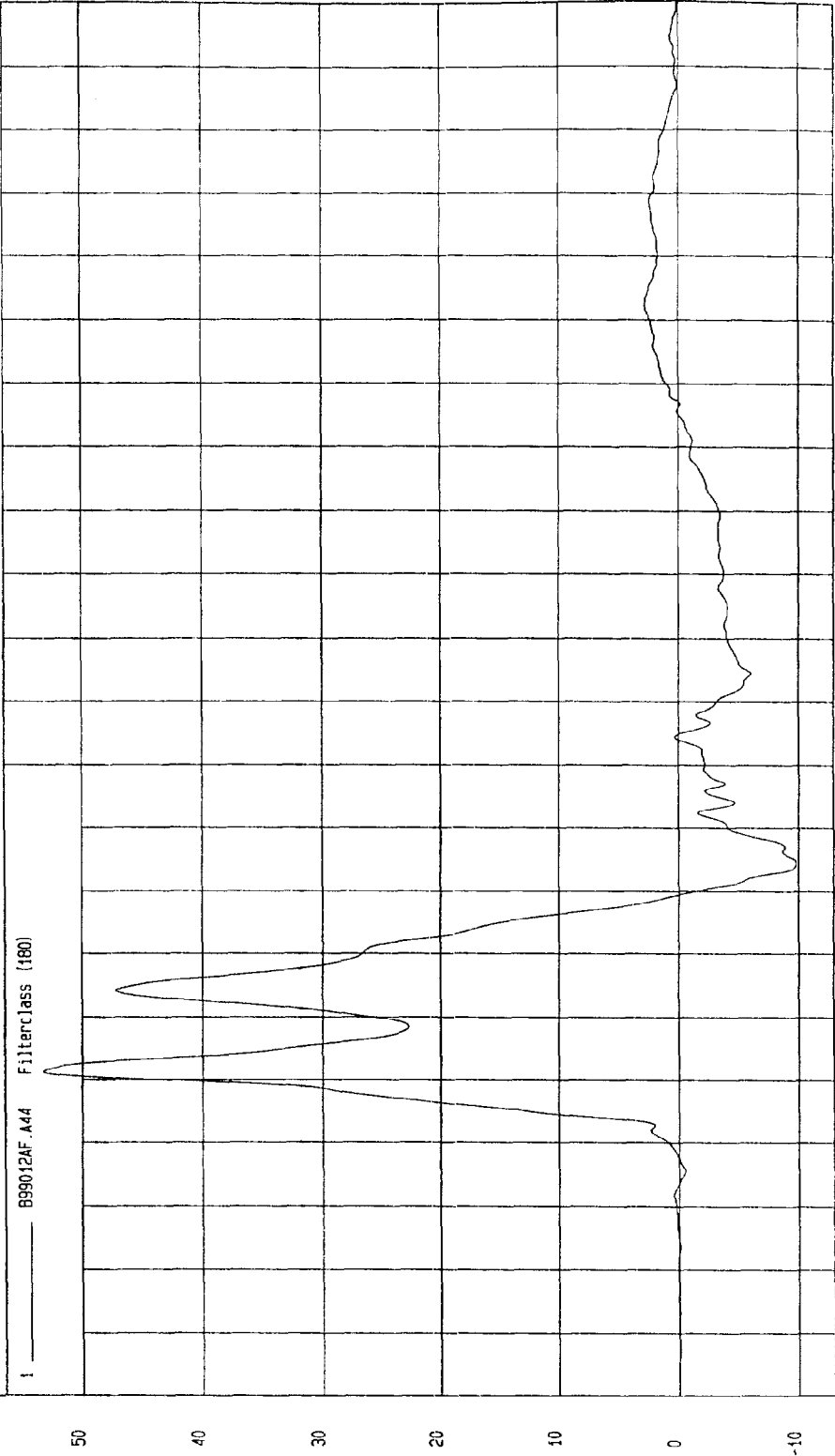
WCA Research
01-30-1999 16:49

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -9.76 G'S at 64 msec Maximum = 53.26 G'S at 31 msec

DRIVER LOWER SPINE Y REDUNDANT ACCELERATION



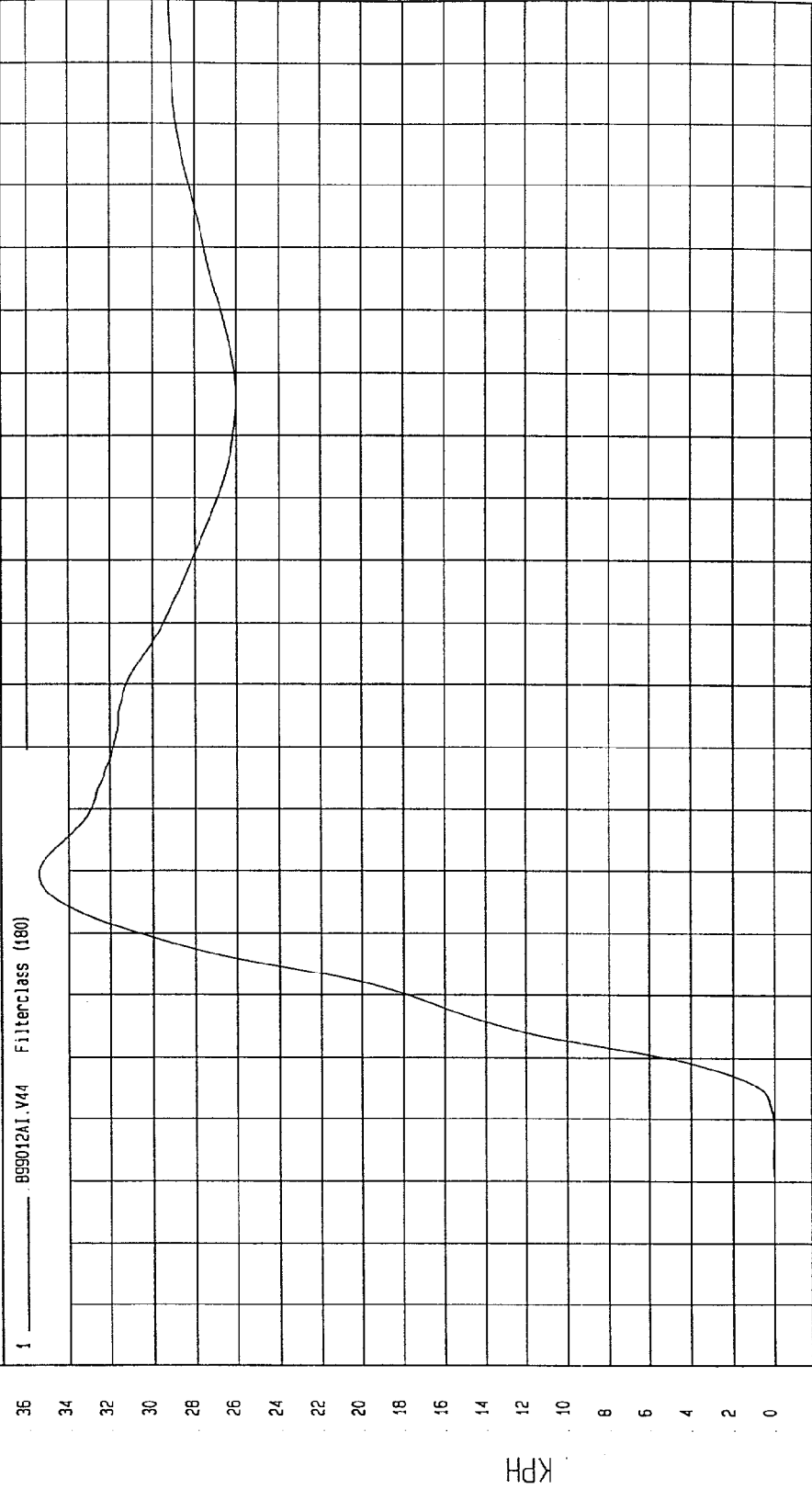
MGA Research
01-30-1999 16:47

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -0.32E-03 KPH at -6 msec Maximum = 35.43 KPH at 60 msec

DRIVER LOWER SPINE Y REDUNDANT VELOCITY

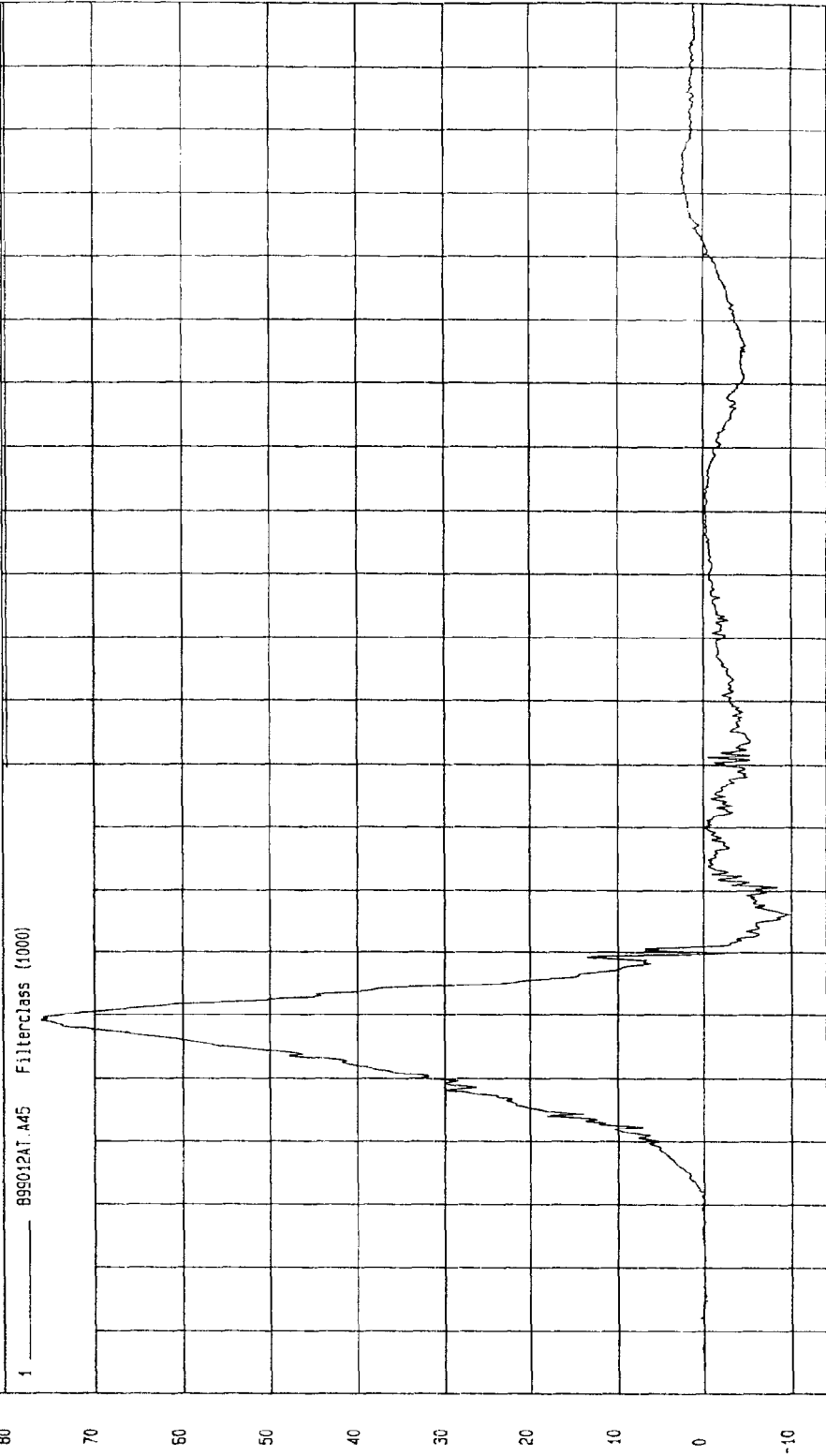


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -9.81 G'S at 56 msec Maximum = 76.13 G'S at 39 msec

DRIVER PELVIS Y REDUNDANT ACCELERATION



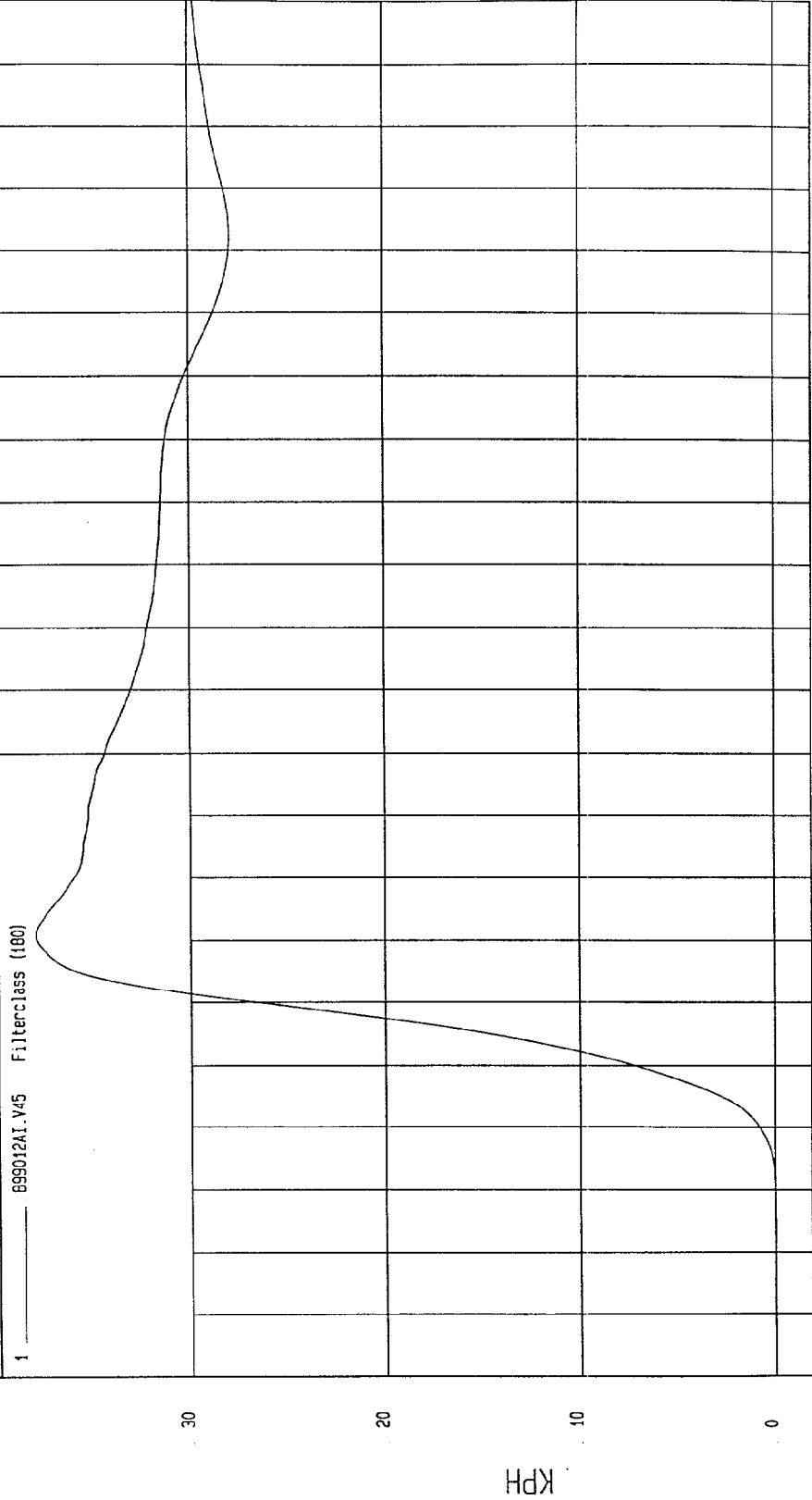
WCA Research
01-30-1999 16:47

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -2.39E-02 KPH at 4 msec Maximum = 37.86 KPH at 51 msec

DRIVER PELVIS Y REDUNDANT VELOCITY



TIME Seconds

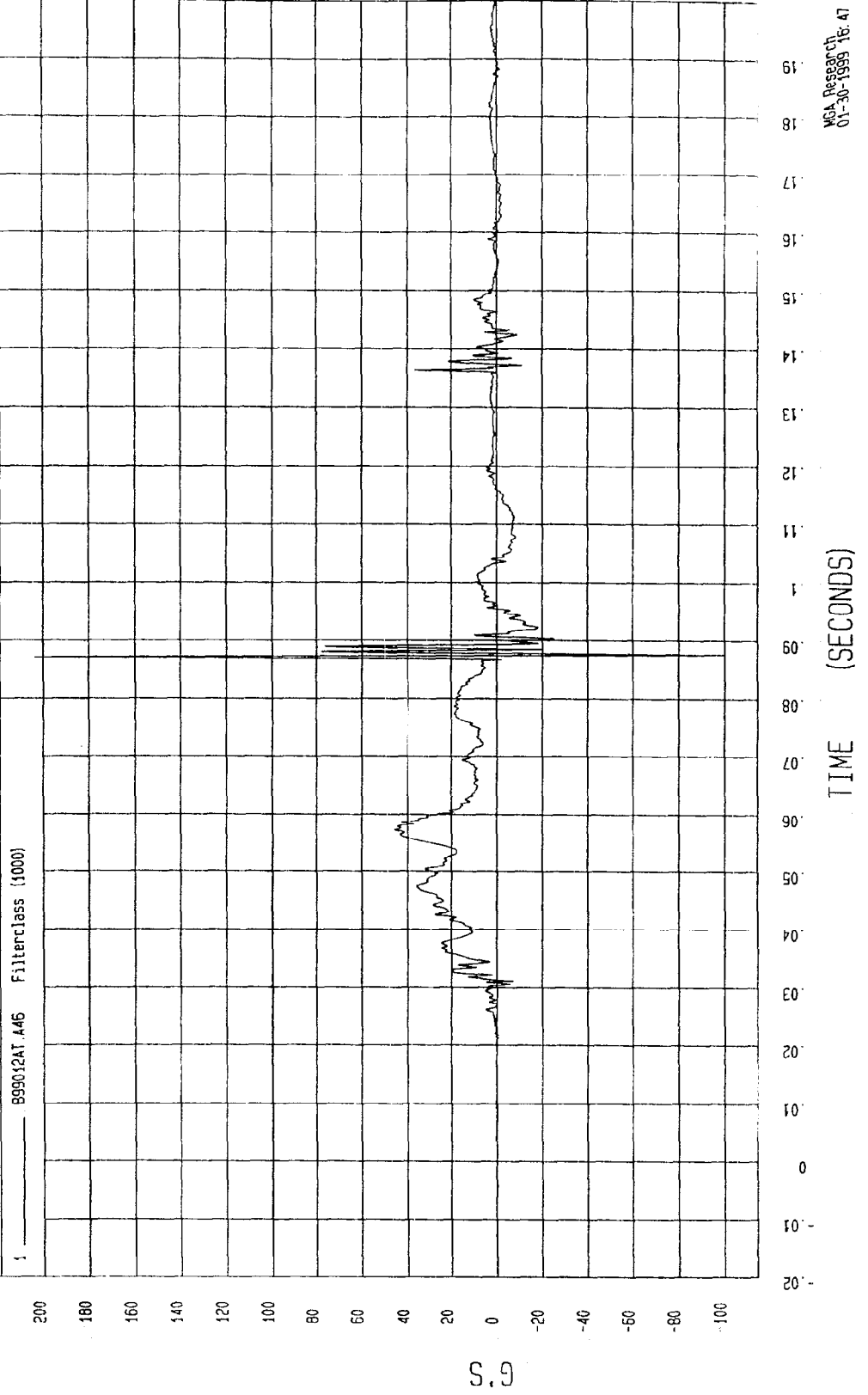
61.2
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0

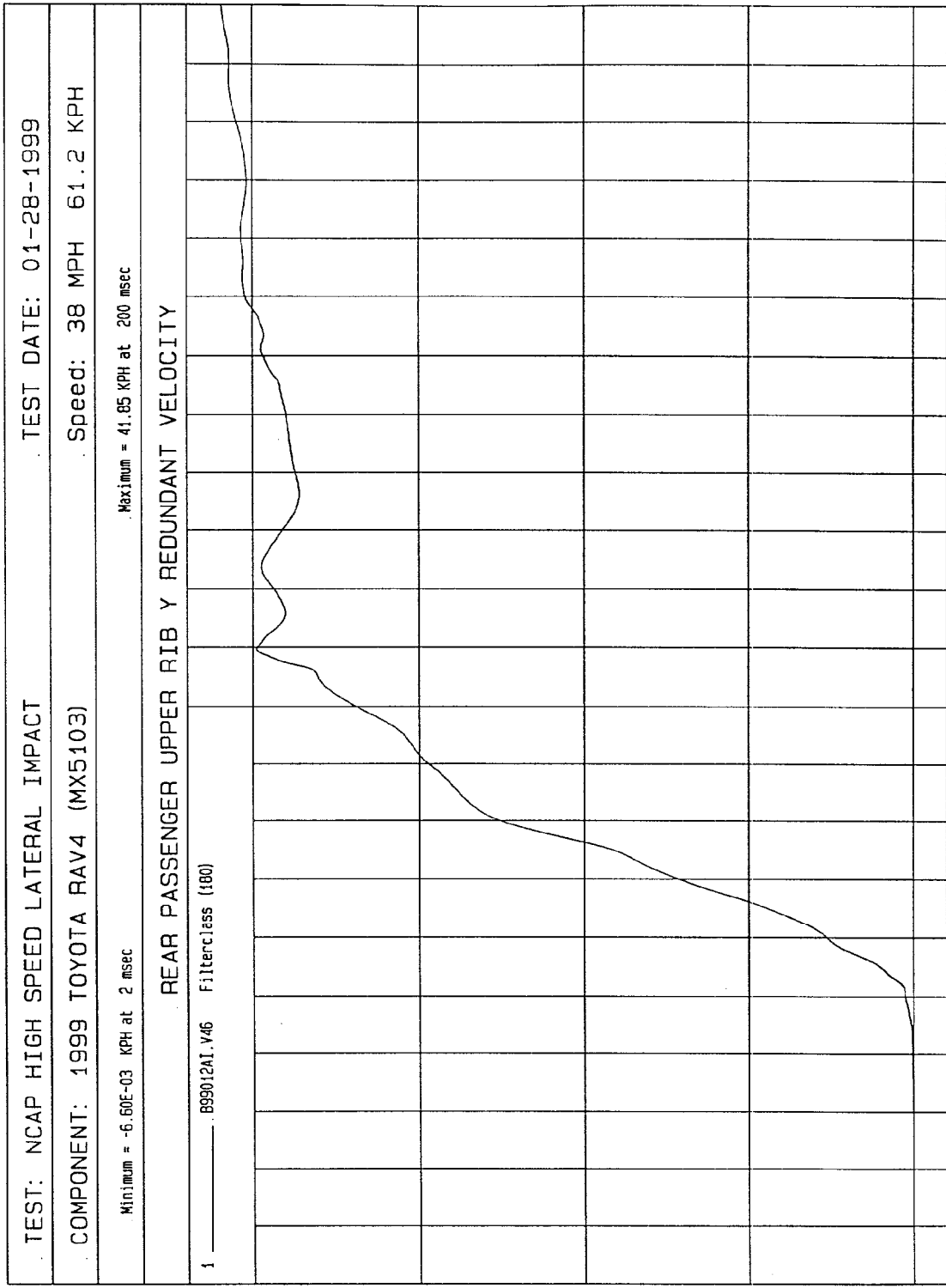
NGA Research
01-30-1999 16:49

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999
COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -99.5 G'S at 88 msec Maximum = 203.89 G'S at 87 msec

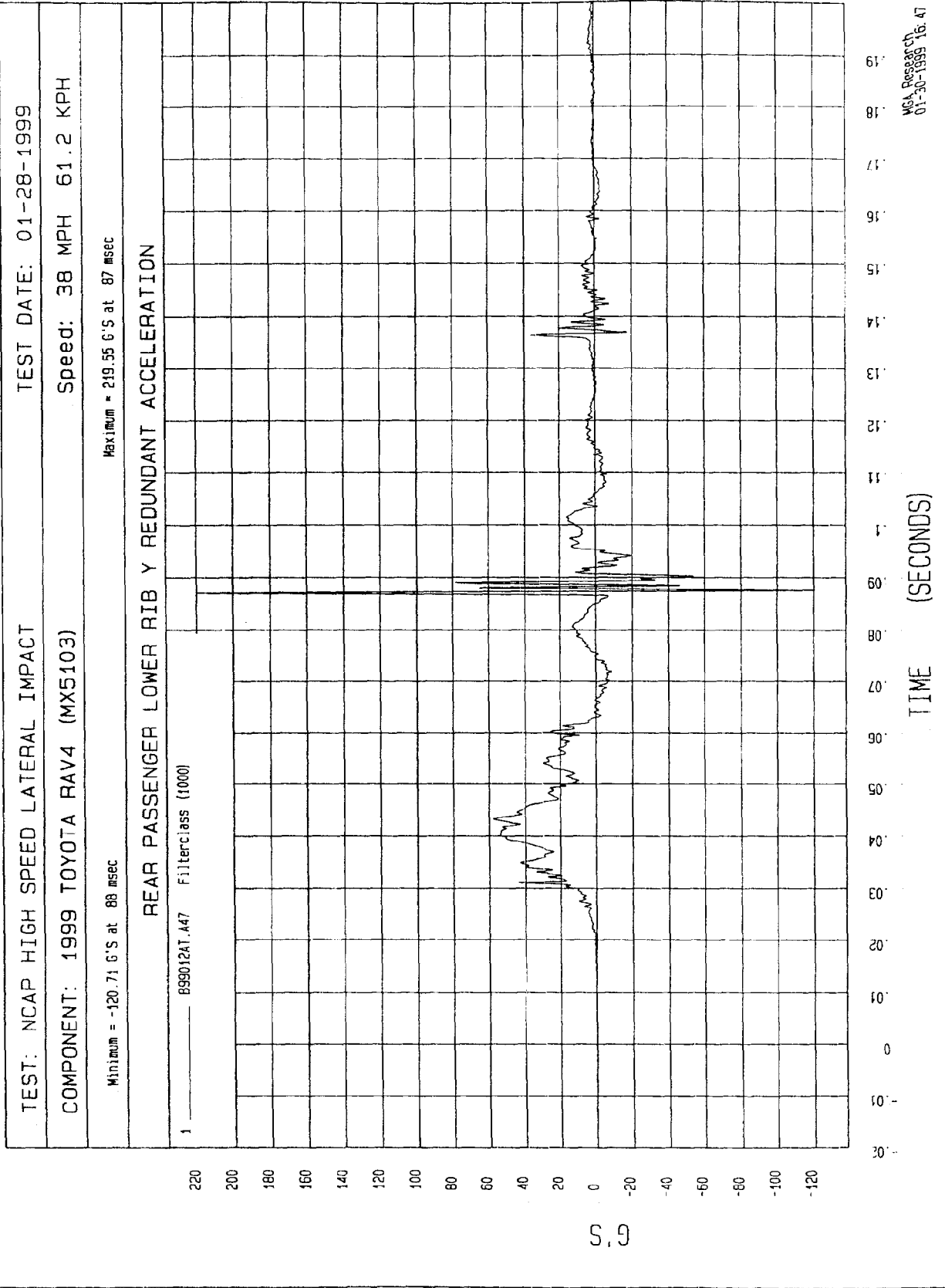
REAR PASSENGER UPPER RIB Y REDUNDANT ACCELERATION





MECA Research
01-30-1999 16:49

TIME Seconds

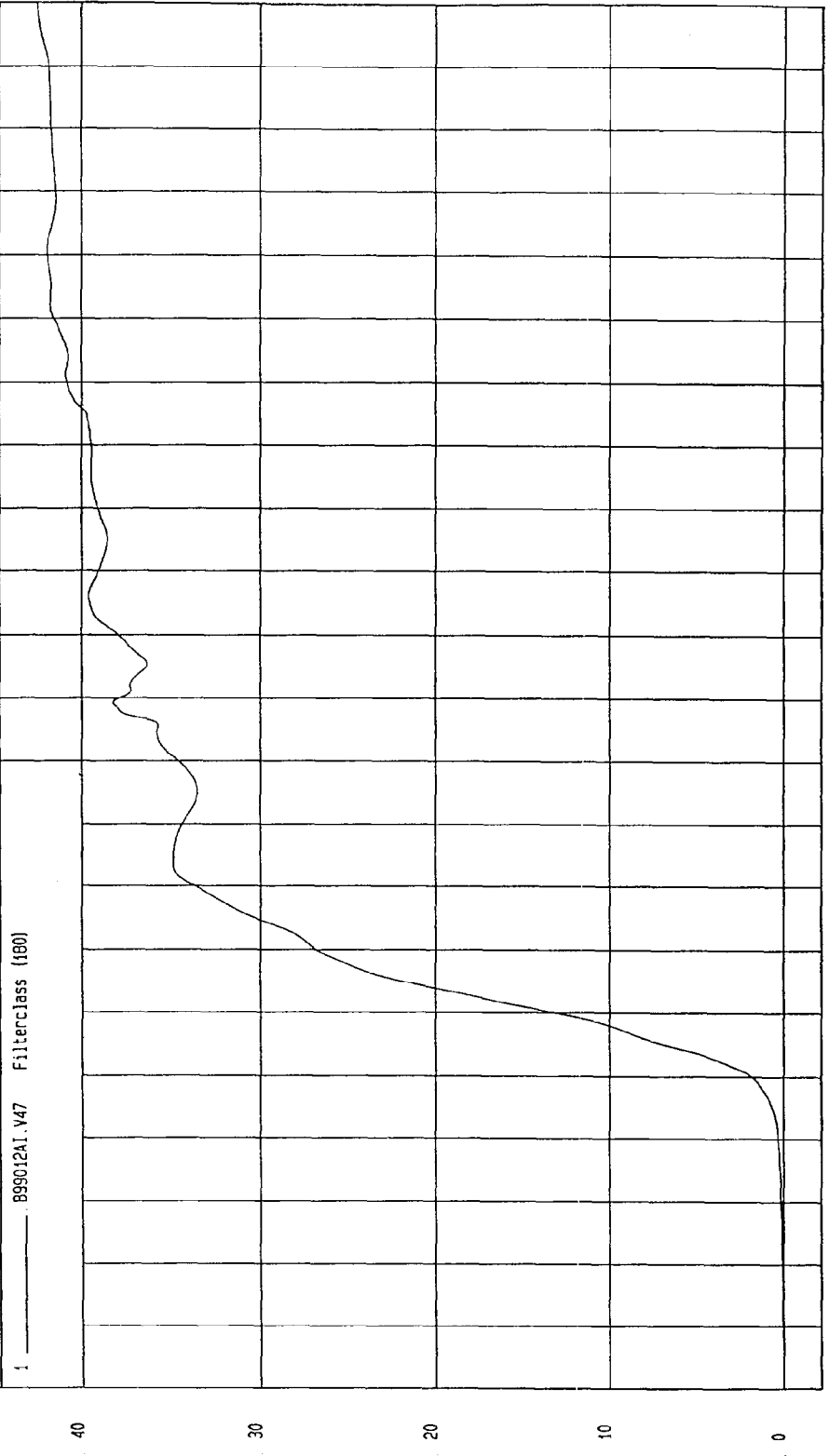


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

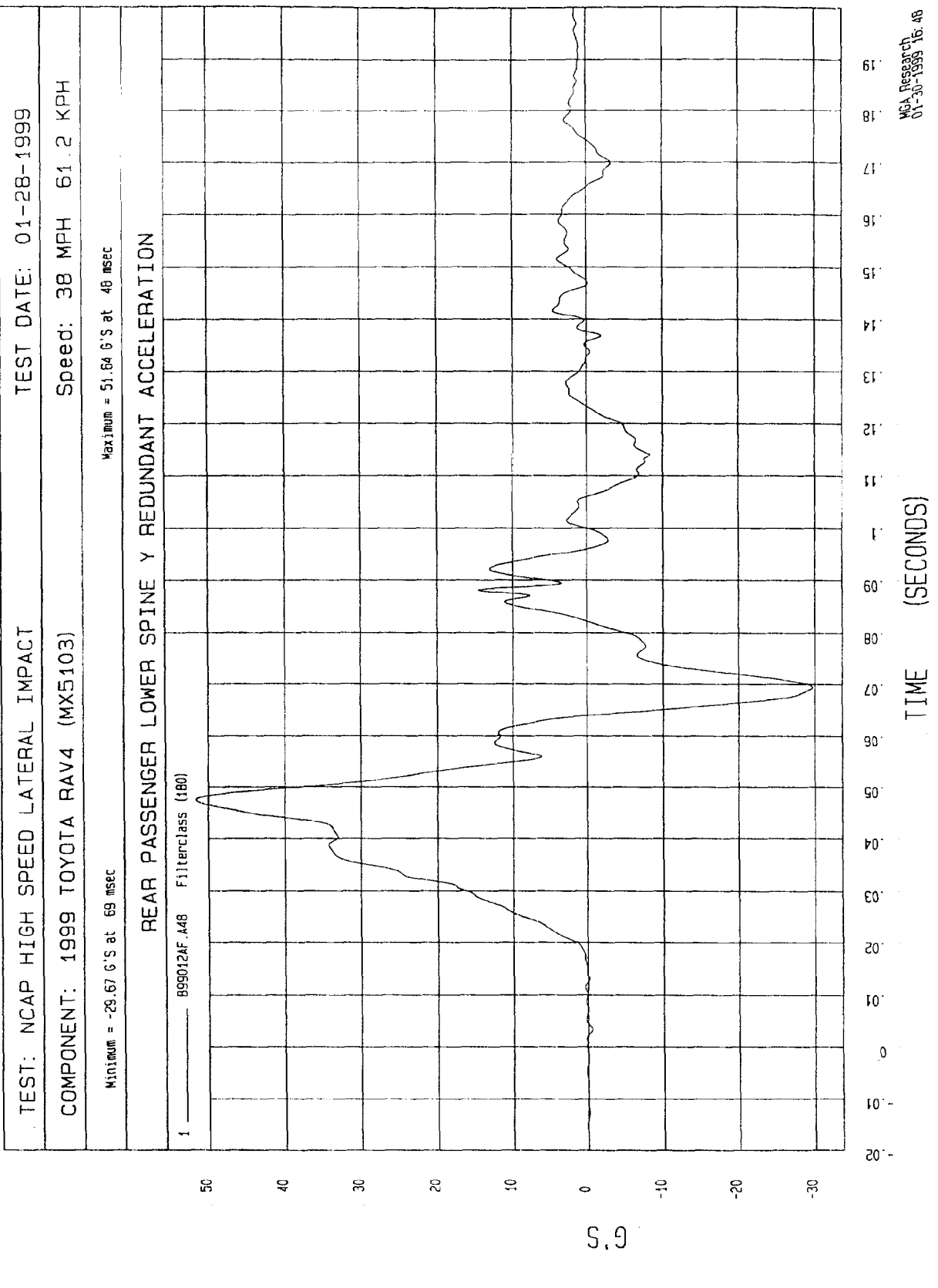
COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -2.59E-04 KPH at -19 msec Maximum = 42.52 KPH at 200 msec

REAR PASSENGER LOWER RIB Y REDUNDANT VELOCITY



MCA Research
01-30-1999 16:49

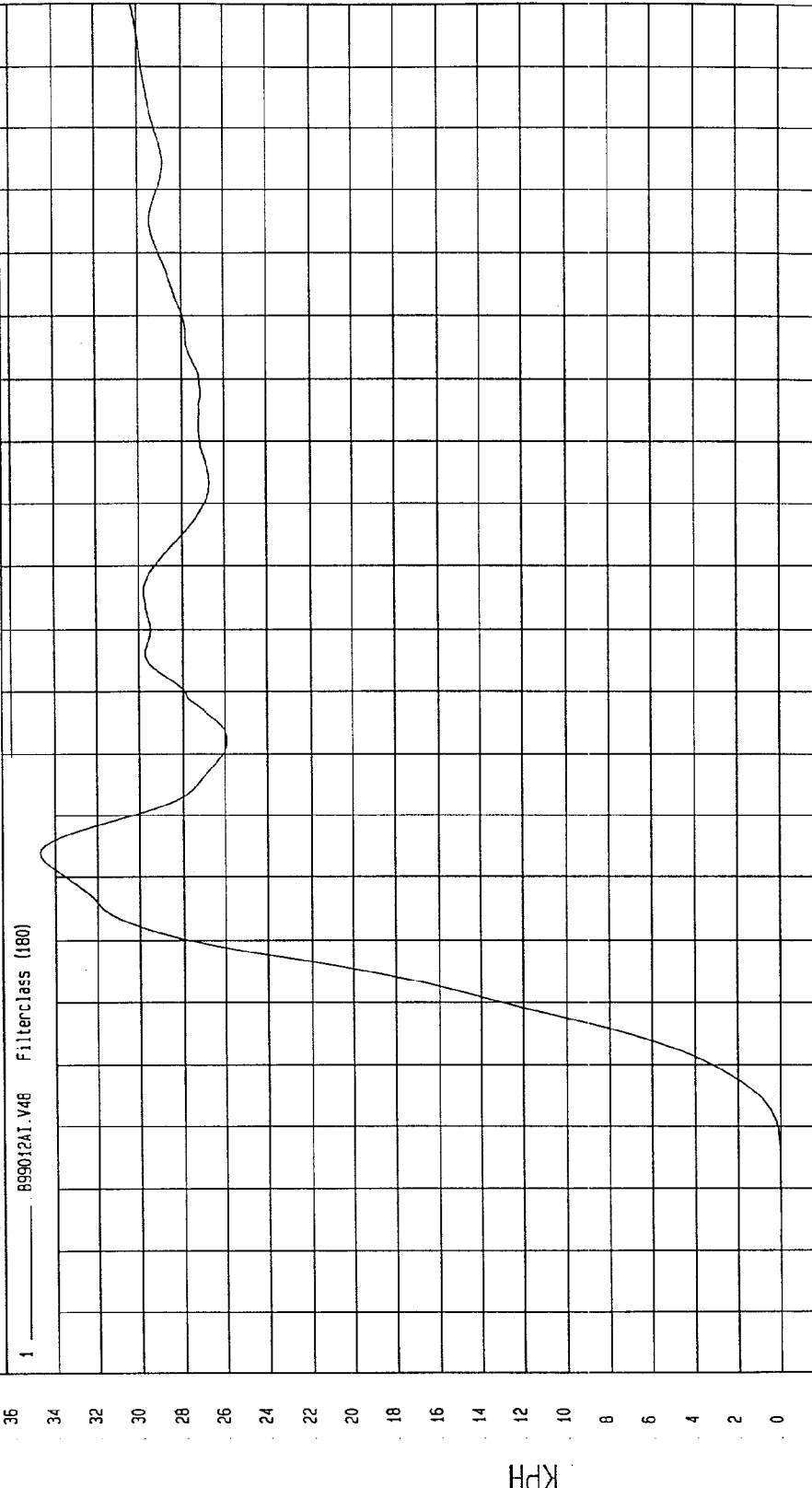


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -7.51E-03 KPH at 4 msec Maximum = 34.69 KPH at 64 msec

REAR PASSENGER LOWER SPINE Y REDUNDANT VELOCITY



WCA Research
01-30-1999 16:49

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

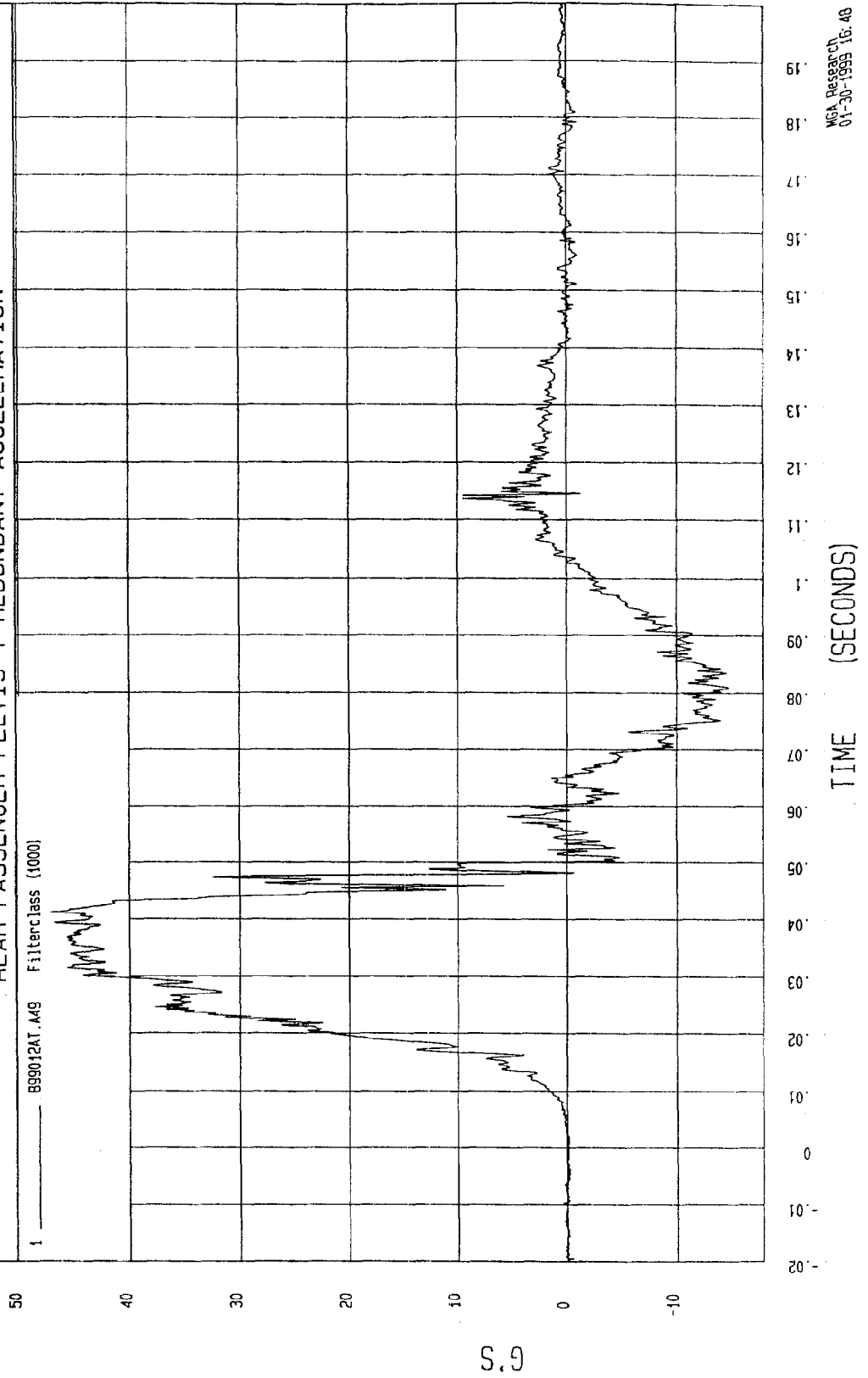
Speed: 38 MPH 61.2 KPH

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = 47.14 G'S at 41 msec

Minimum = -14.79 G'S at 81 msec

REAR PASSENGER PELVIS Y REDUNDANT ACCELERATION

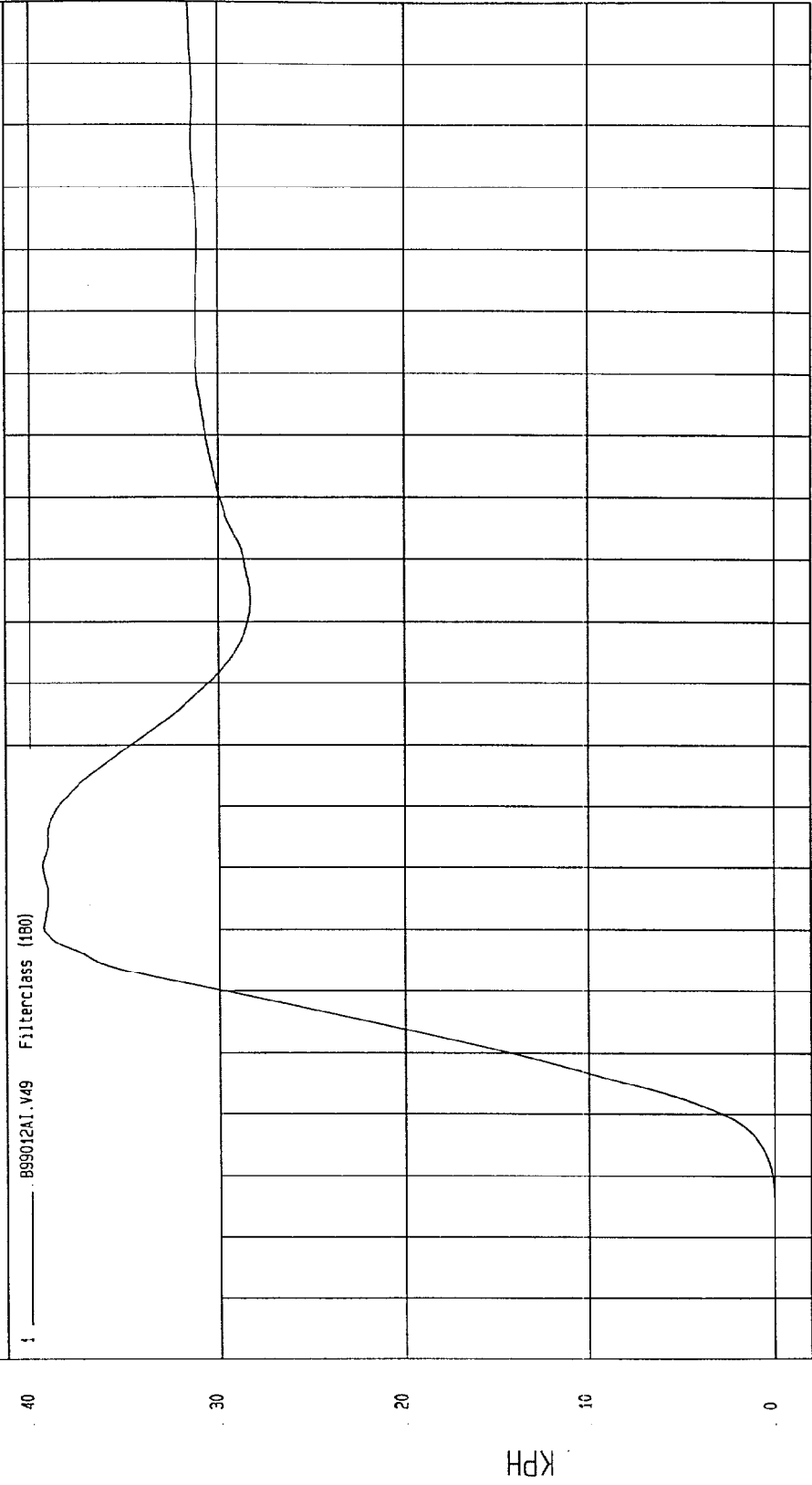


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -5.76E-03 KPH at 2 msec Maximum = 39.34 KPH at 60 msec

REAR PASSENGER PELVIS Y REDUNDANT VELOCITY



WCA Research
01-30-1999 15:49

TIME Seconds

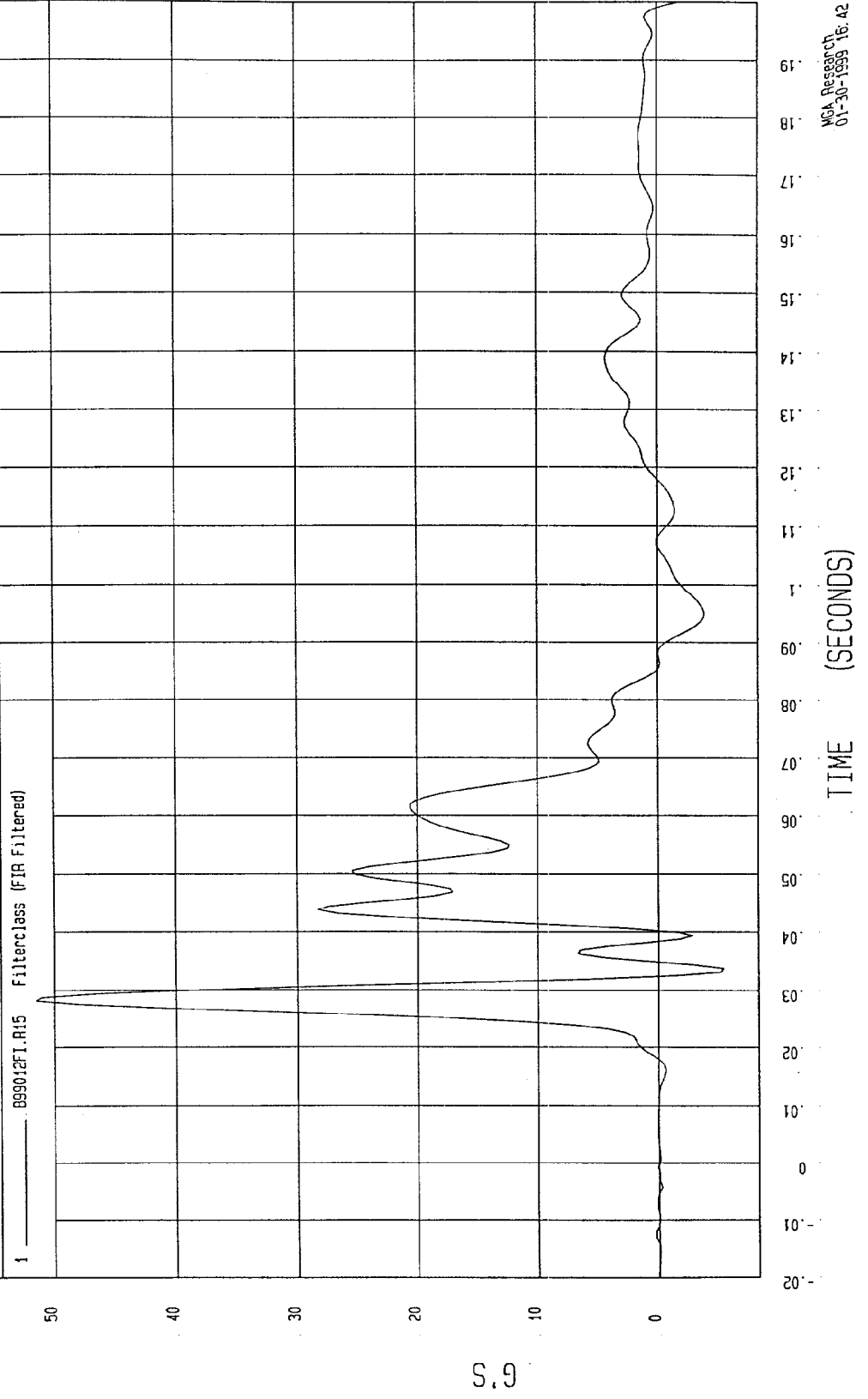
FINITE IMPULSE RESPONSE (FIR) FILTERED DATA

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -5.36 G'S at 34 msec Maximum = 51.47 G'S at 28 msec

DRIVER UPPER RIB Y ACCELERATION



TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

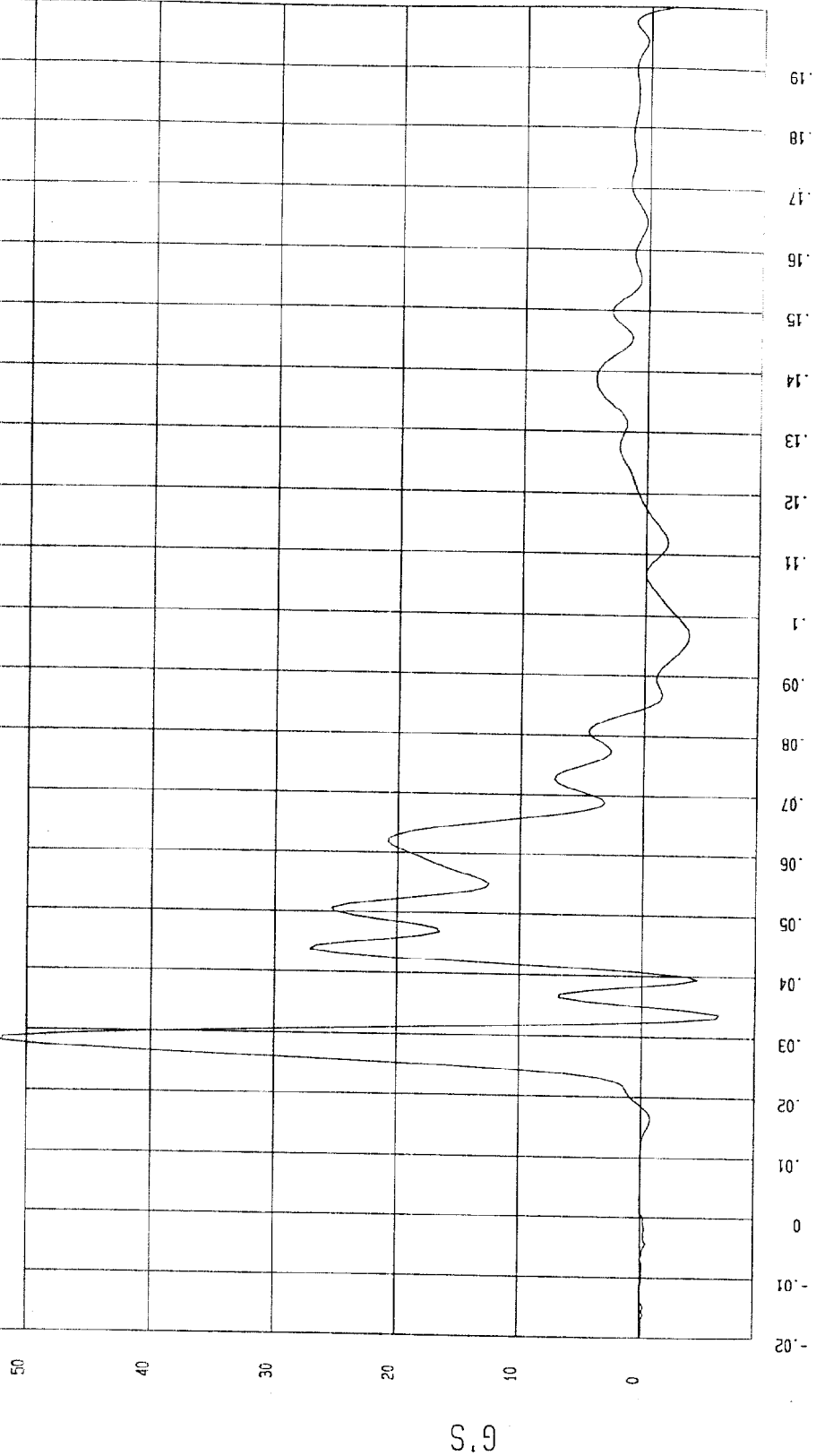
Speed: 38 MPH 61.2 KPH

Minimum = -6.26 G'S at 34 msec

Maximum = 52.09 G'S at 28 msec

DRIVER UPPER RIB Y REDUNDANT ACCELERATION

1 899012FI.R42 Filterclass (FIR Filtered)



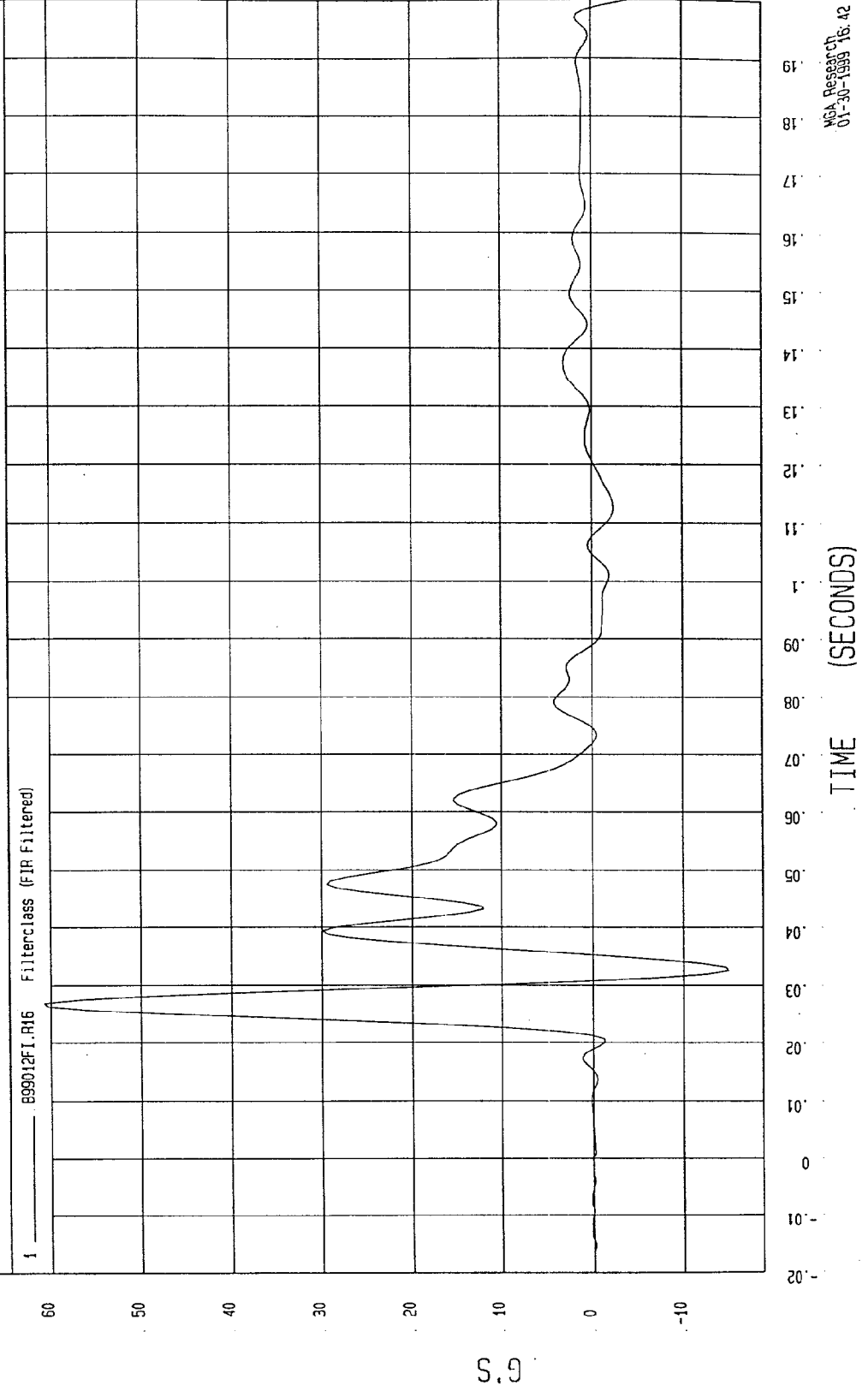
MCA Research
01-28-1999 14:46

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -14.9 G'S at 32 msec Maximum = 60.71 G'S at 27 msec

DRIVER LOWER RIB Y ACCELERATION



TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

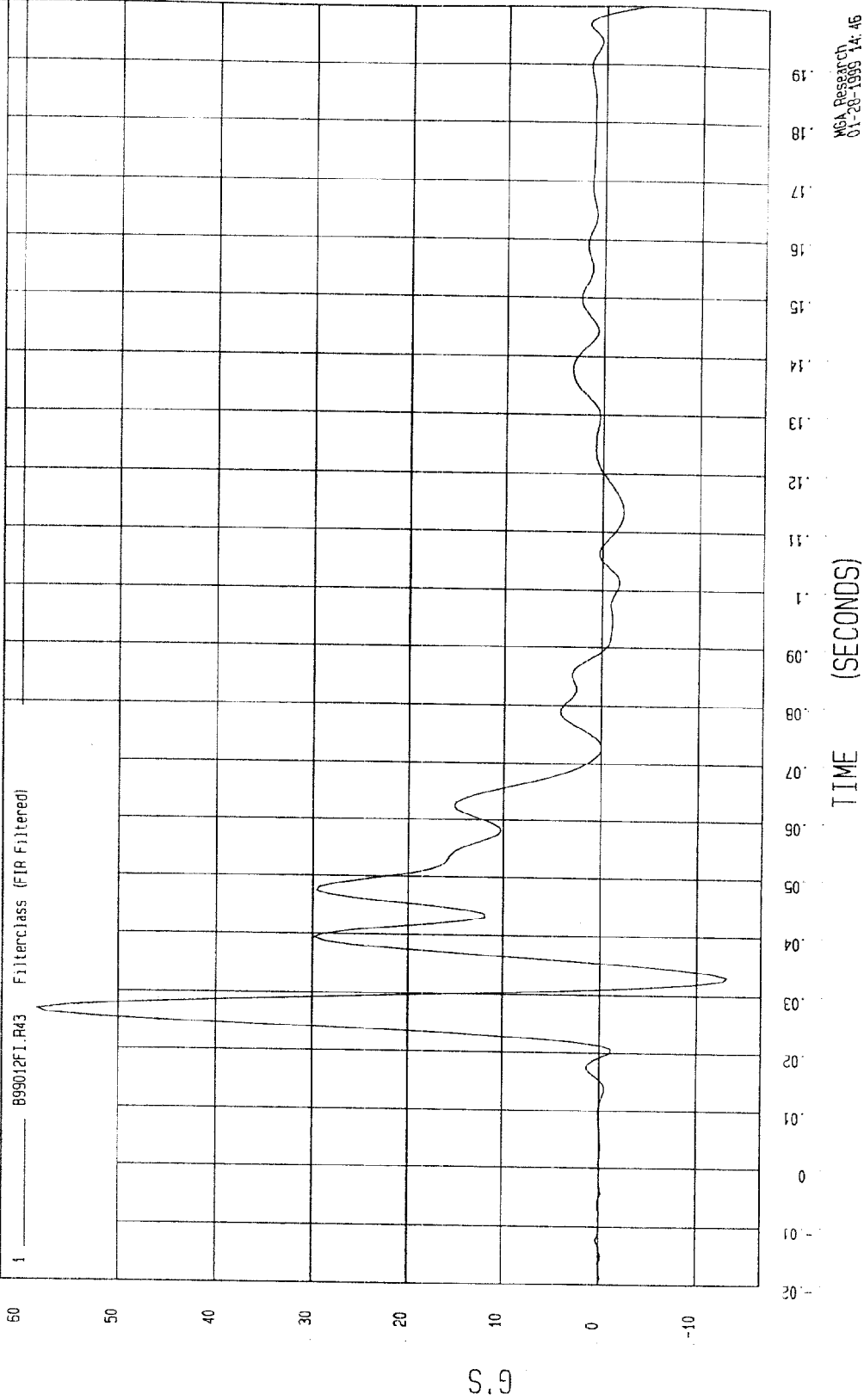
Speed: 38 MPH 61.2 KPH

COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = 58.37 G'S at 27 msec

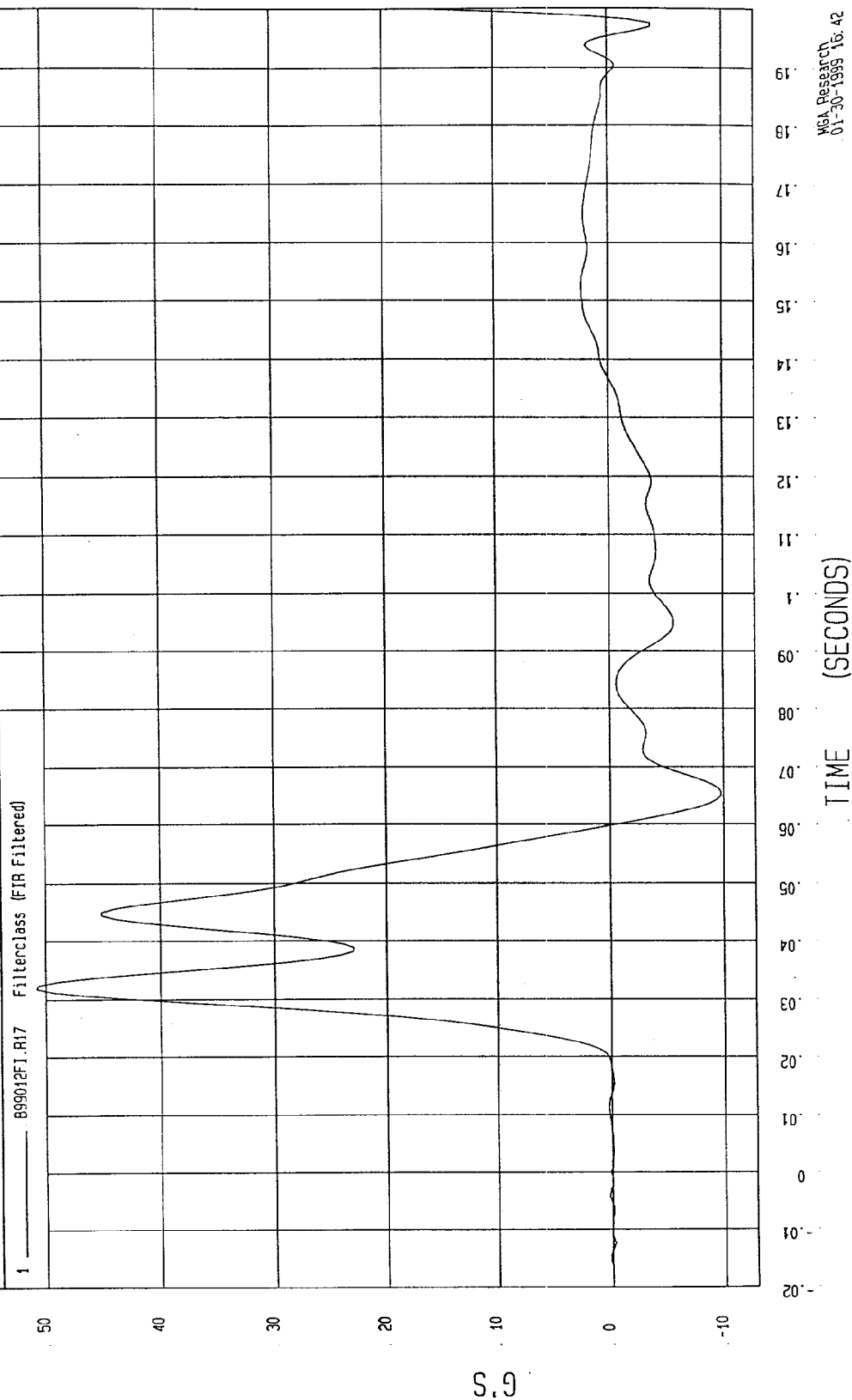
Minimum = -13.11 G'S at 33 msec

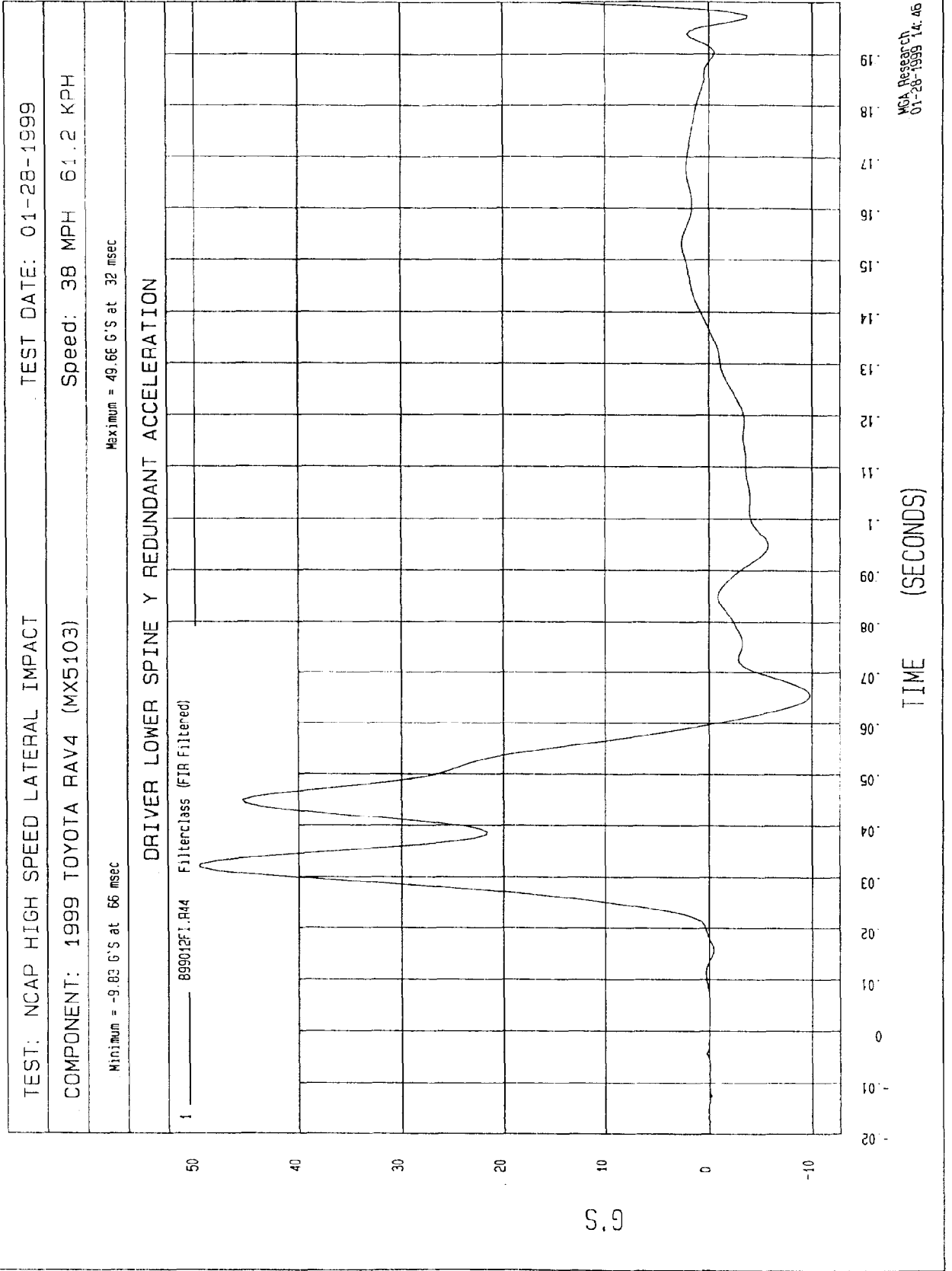
DRIVER LOWER RIB Y REDUNDANT ACCELERATION



TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999
COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH
Minimum = -9.8 G'S at 66 msec Maximum = 50.84 G'S at 32 msec

DRIVER LOWER SPINE Y ACCELERATION



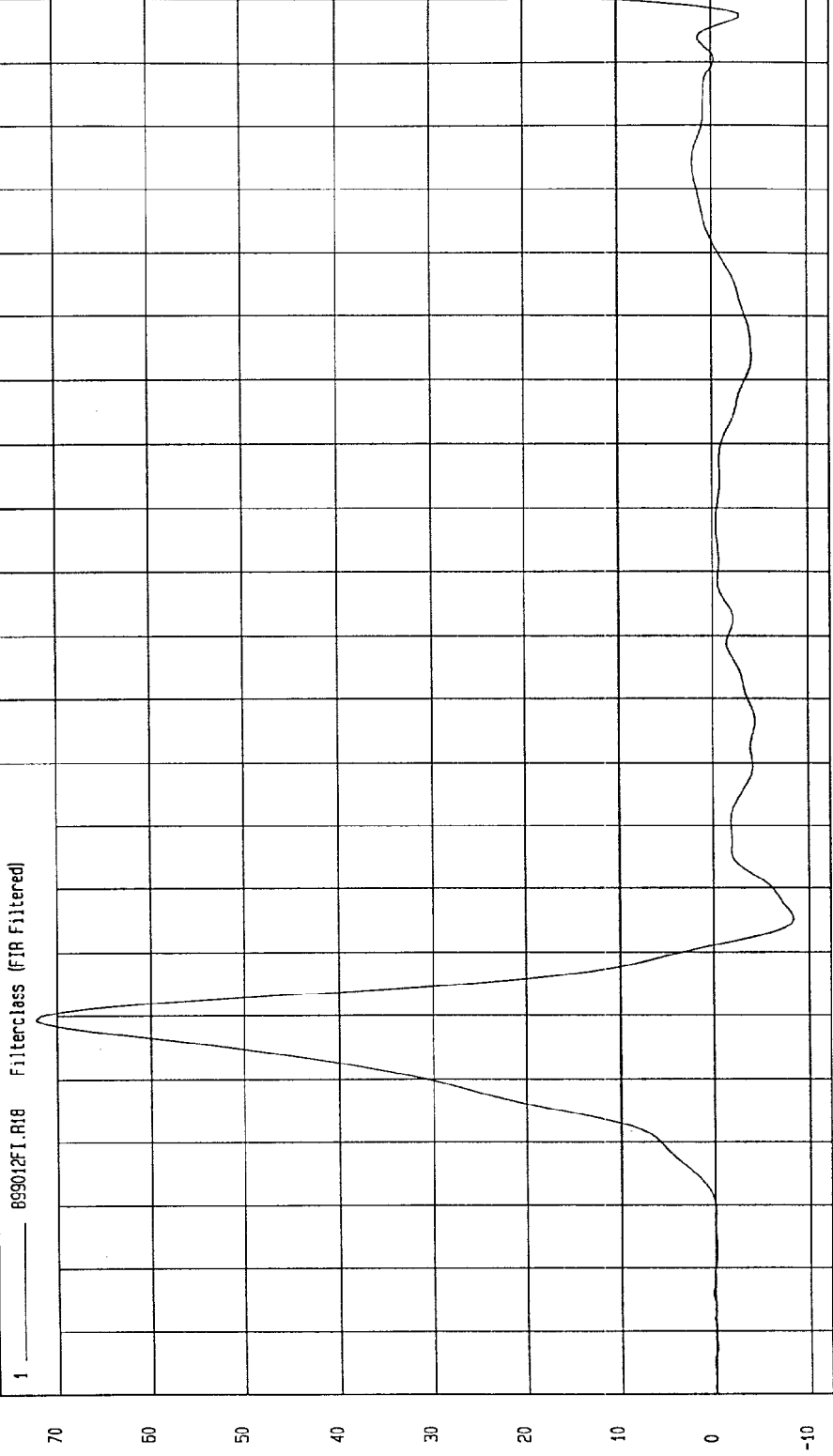


TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -8.3 G'S at 55 msec Maximum = 72.28 G'S at 39 msec

DRIVER PELVIS Y ACCELERATION



TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

Speed: 38 MPH 61.2 KPH

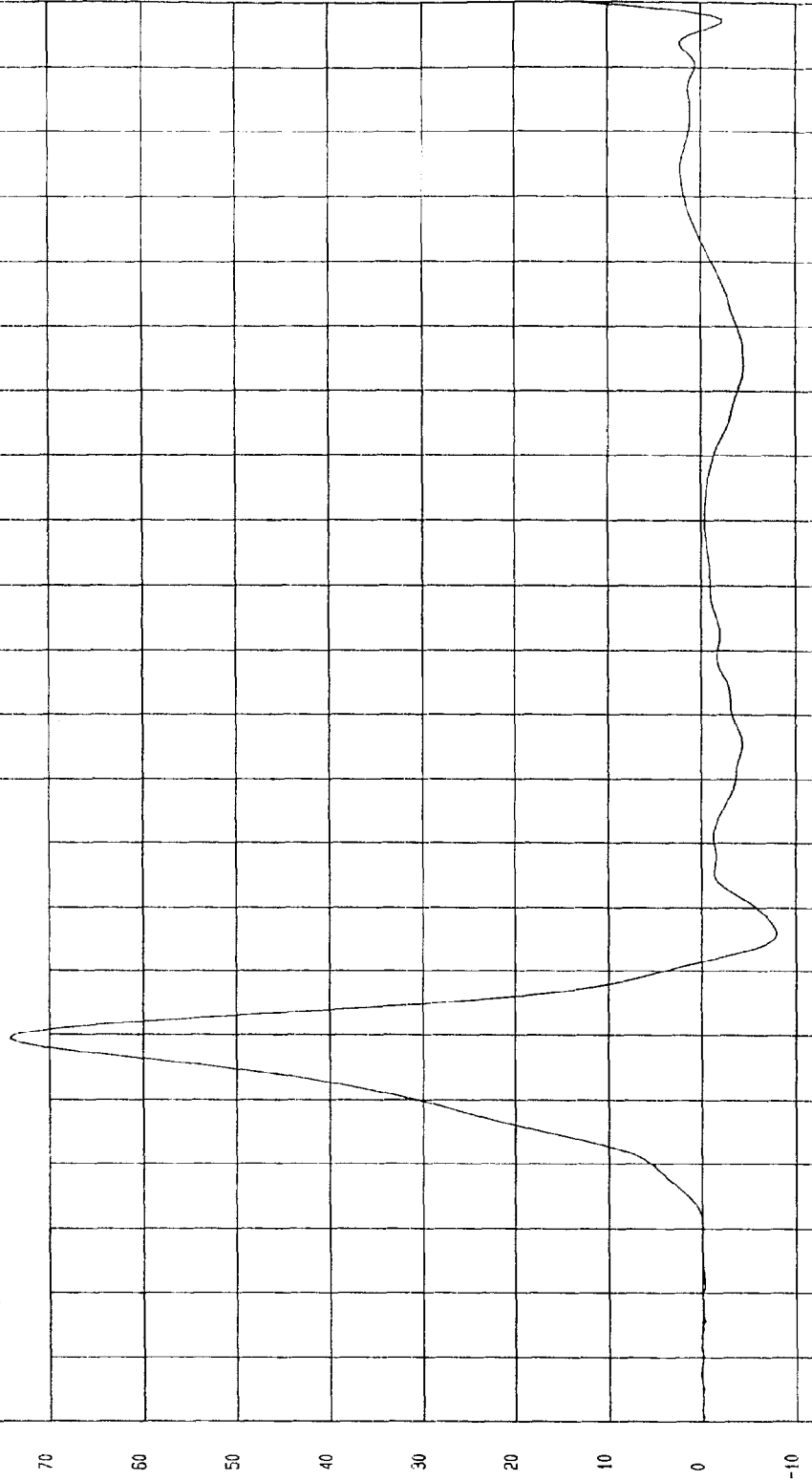
COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = 74.17 G'S at .39 msec

Minimum = -7.92 G'S at .56 msec

DRIVER PELVIS Y REDUNDANT ACCELERATION

1 899012FI.R45 Filterclass (FIR Filtered)



MCA Research
01-28-1999 14:46

TIME (SECONDS)

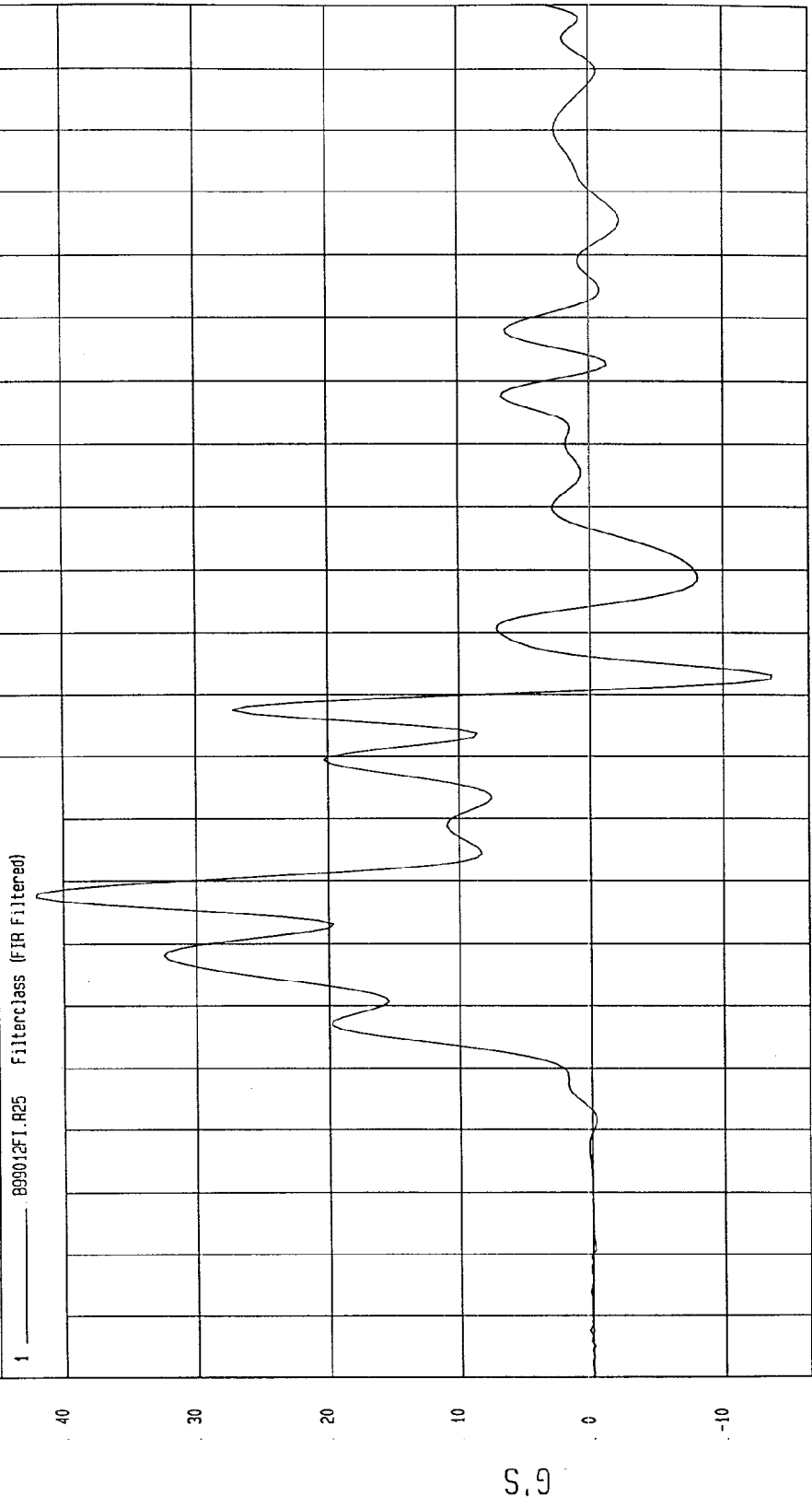
G.S

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -13.69 G'S at 93 msec Maximum = 42.08 G'S at 58 msec

REAR PASSENGER UPPER RIB Y ACCELERATION



MCA Research
01-30-1999 16:43

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

Speed: 38 MPH 61.2 KPH

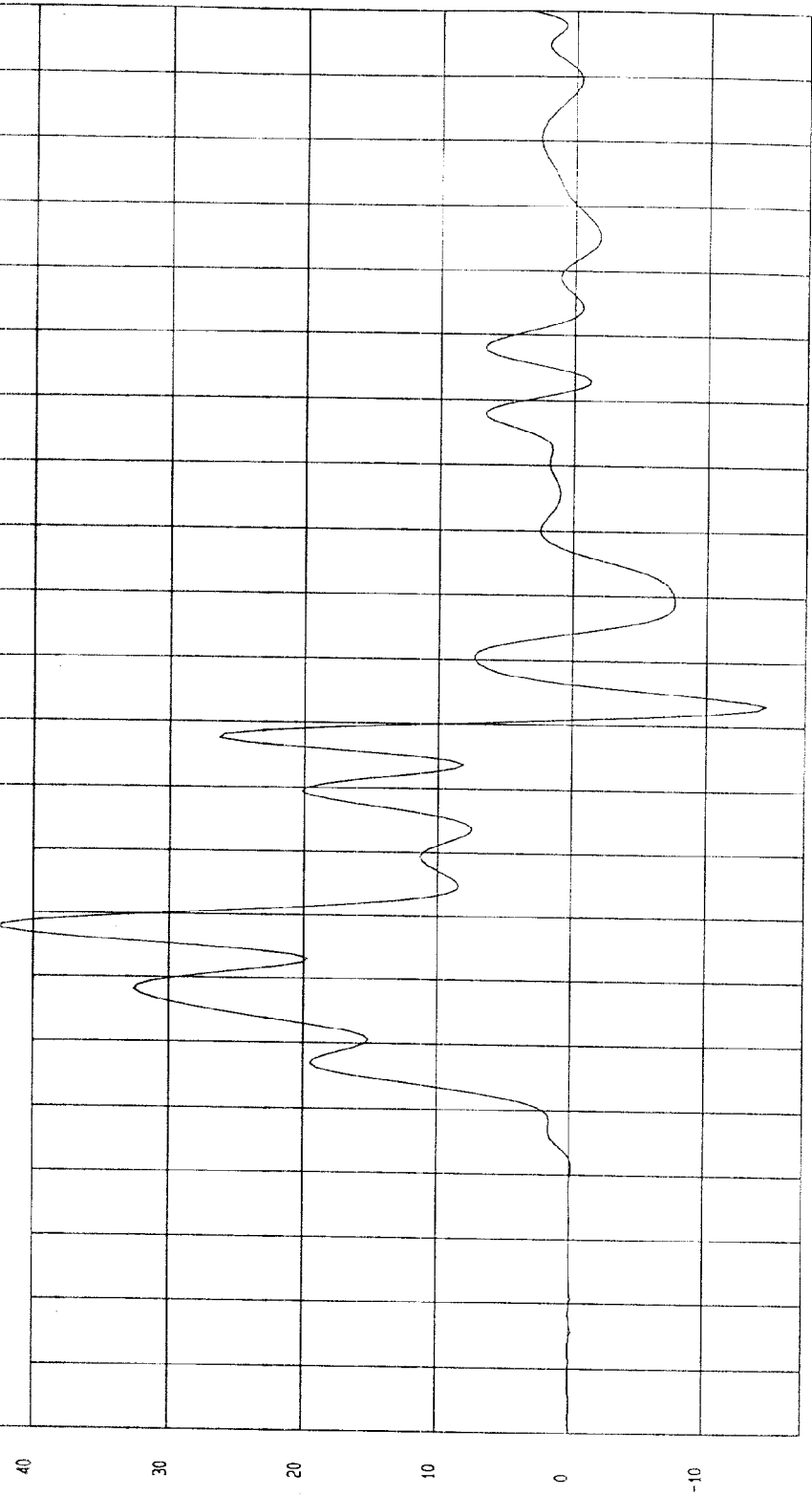
COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = 42.28 G'S at 58 msec

Minimum = -14.44 G'S at 93 msec

REAR PASSENGER UPPER RIB Y REDUNDANT ACCELERATION

1 B99042FI.R46 FilterClass (FIR Filtered)



MGA Research
01-28-1999 14: 46

TIME (SECONDS)

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

Speed: 38 MPH 61.2 KPH

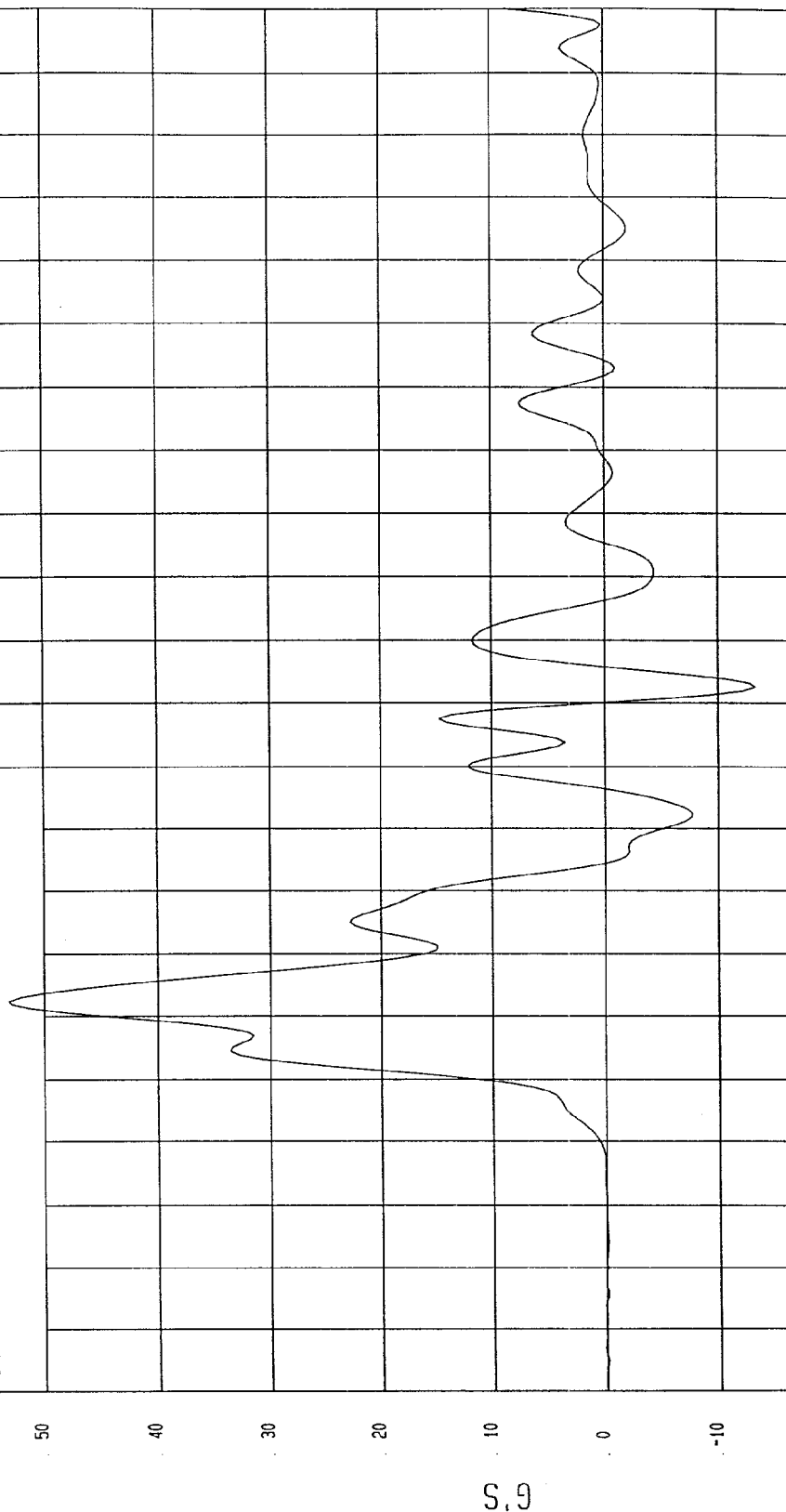
COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = 53.1 G's at 42 msec

Minimum = -13.37 G's at 92 msec

REAR PASSENGER LOWER RIB Y ACCELERATION

1 899012FI.R26 Filterclass (FIR Filtered)



WCA Research
01-30-1999 16.43

TIME (SECONDS)

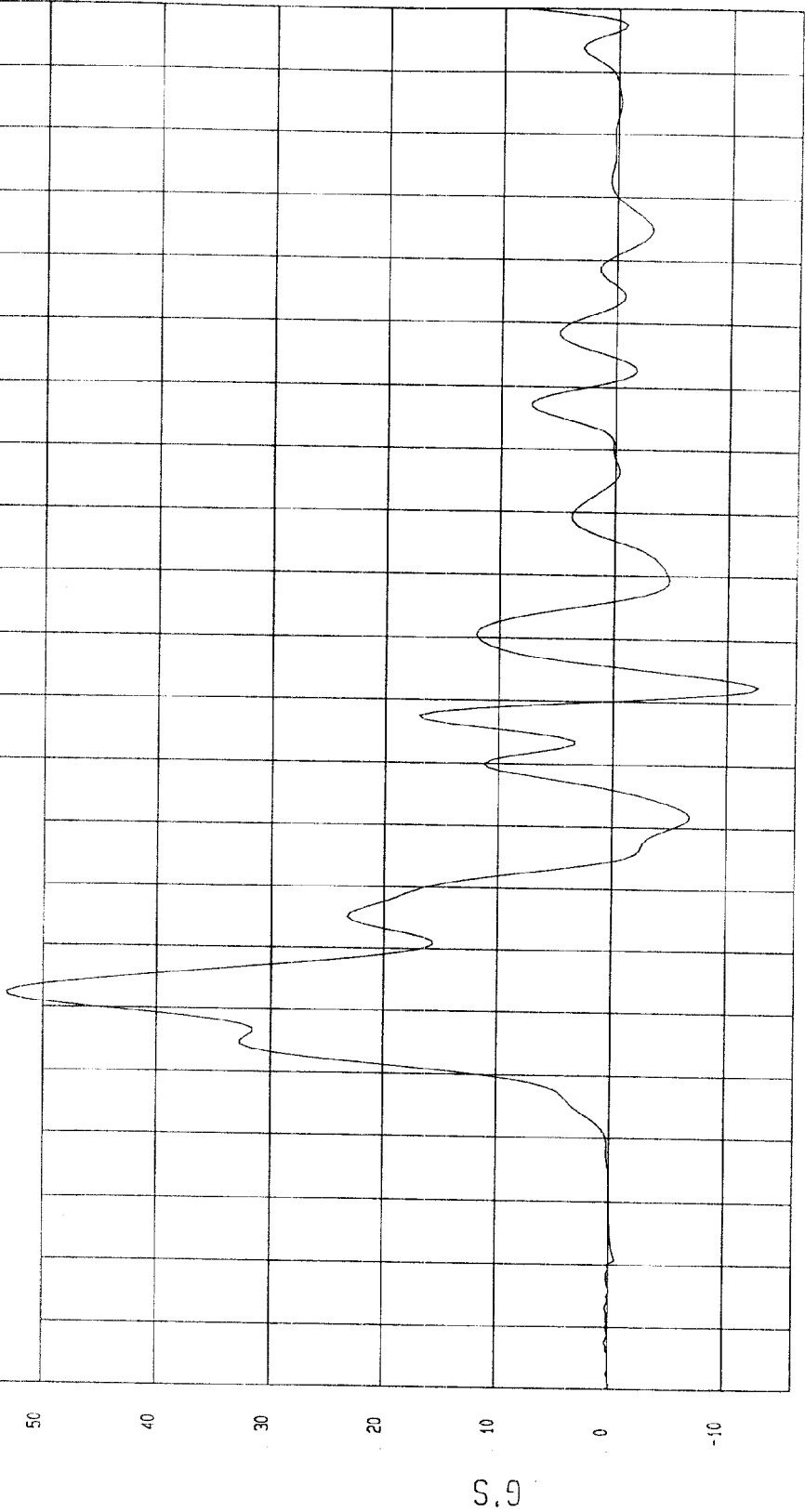
TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -12.72 G'S at 92 msec Maximum = 53.24 G'S at 42 msec

REAR PASSENGER LOWER RIB Y REDUNDANT ACCELERATION

1 899012FI.R47 Filterclass (FIR Filtered)



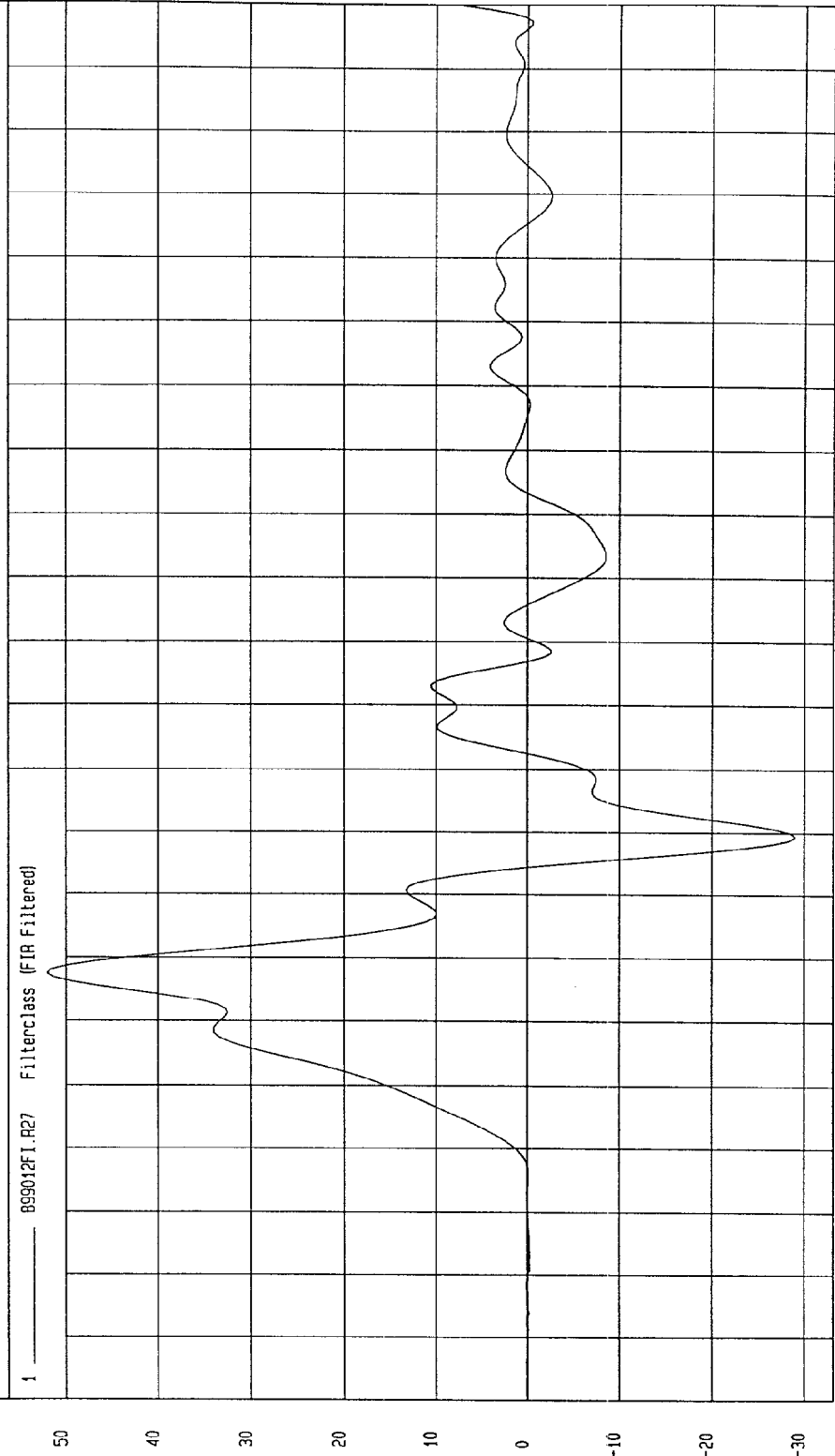
WCA Research
01-28-1999 14.46

TEST: NCAP HIGH SPEED LATERAL IMPACT TEST DATE: 01-28-1999

COMPONENT: 1999 TOYOTA RAV4 (MX5103) Speed: 38 MPH 61.2 KPH

Minimum = -29.03 G'S at 69 msec Maximum = 52.04 G'S at 48 msec

REAR PASSENGER LOWER SPINE Y ACCELERATION



TIME (SECONDS)

WCA Research
01-30-1999 16:43

G.S

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

Speed: 38 MPH 61.2 KPH

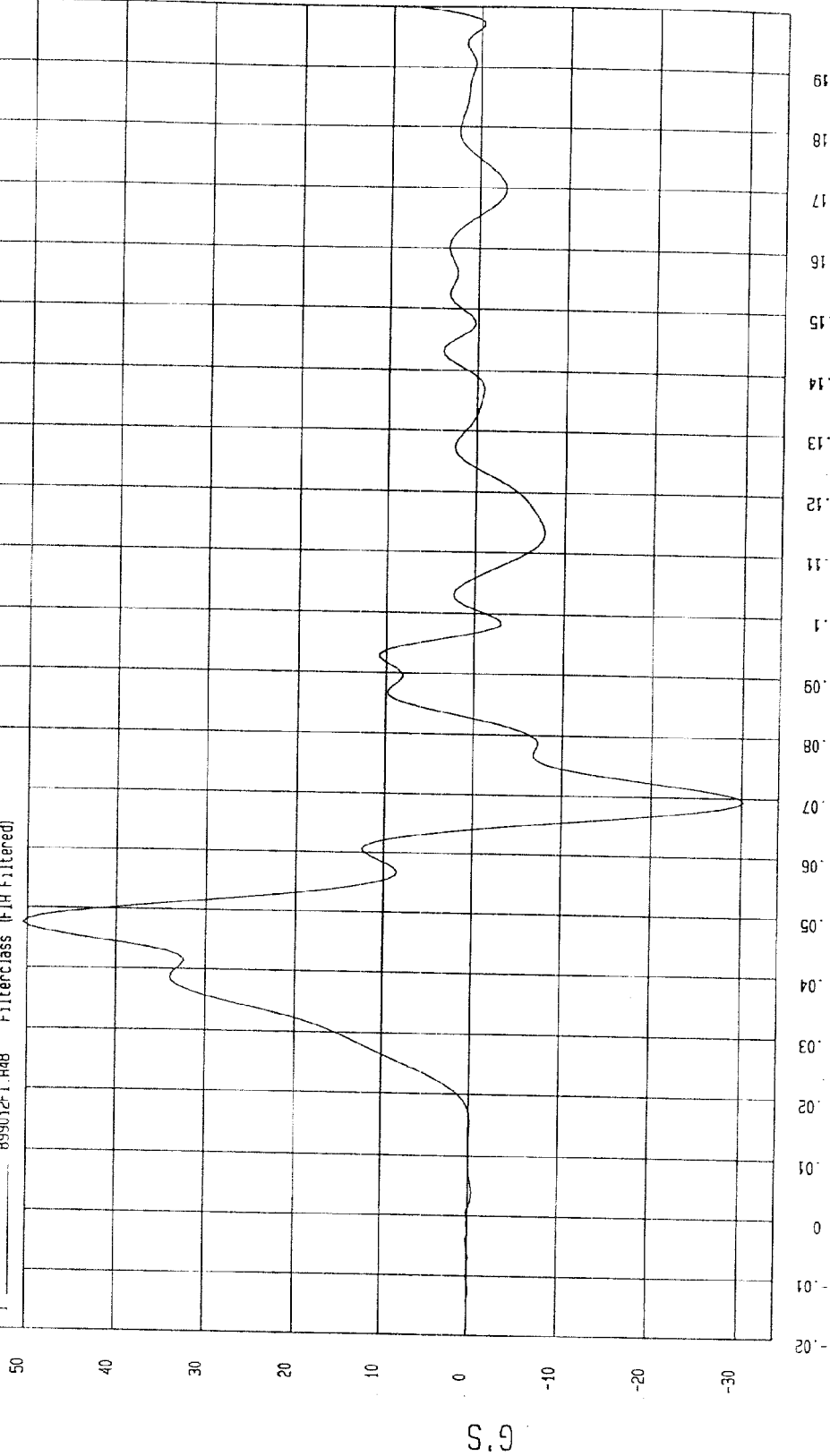
COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = 50.51 G'S at 48 msec

Minimum = -30.2 G'S at 69 msec

REAR PASSENGER LOWER SPINE Y REDUNDANT ACCELERATION

899012F1.R48 FilterClass (FIR Filtered)



MCA Research
01-28-1999 14:46

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

Speed: 38 MPH 61.2 KPH

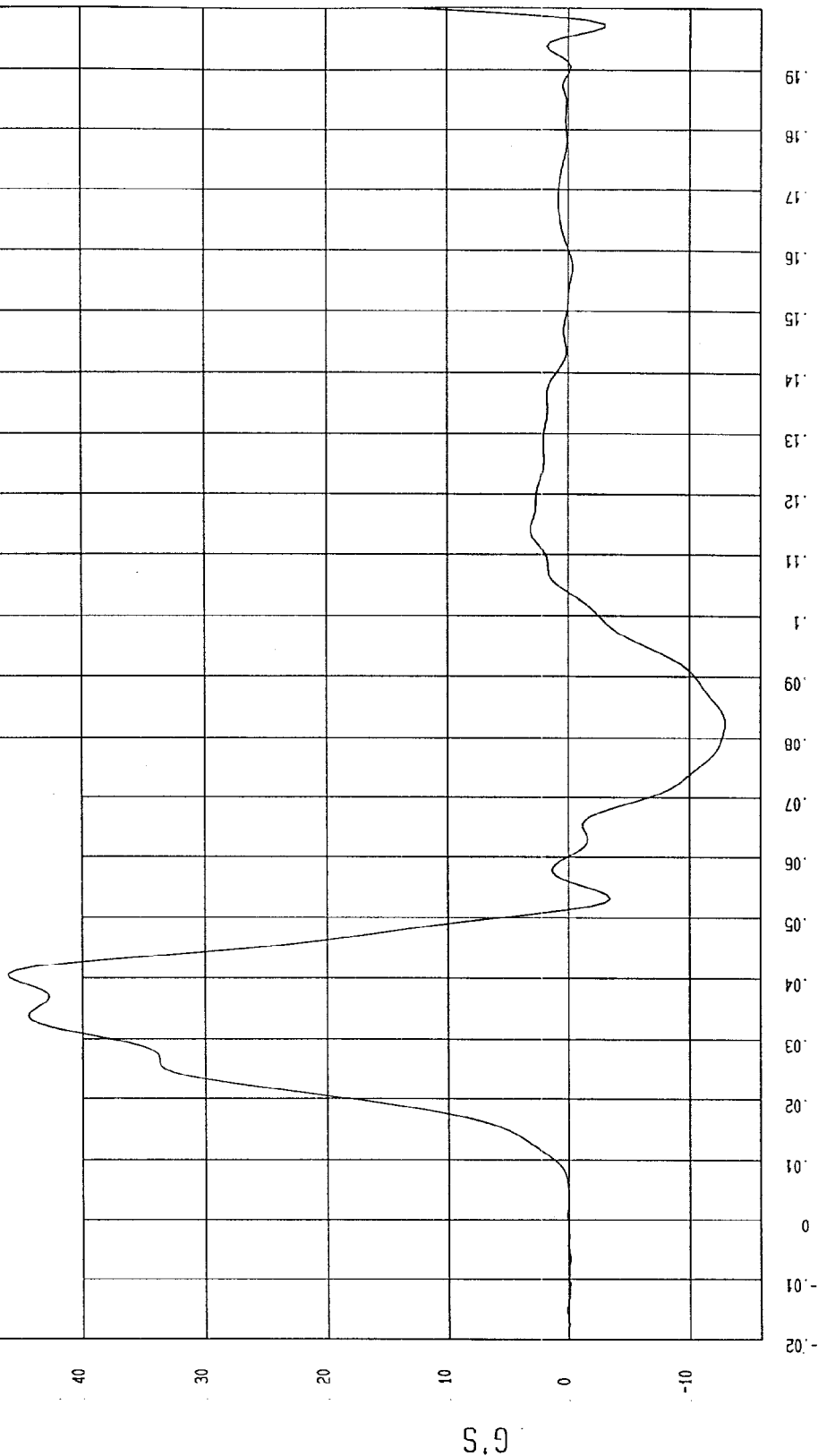
COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = 46.11 G'S at 41 msec

Minimum = -12.93 G'S at 62 msec

REAR PASSENGER PELVIS Y ACCELERATION

1 099012F1.R28 Filterclass (FIR Filtered)



MGA Research
01-30-1999 16:43

TEST: NCAP HIGH SPEED LATERAL IMPACT

TEST DATE: 01-28-1999

Speed: 38 MPH 61.2 KPH

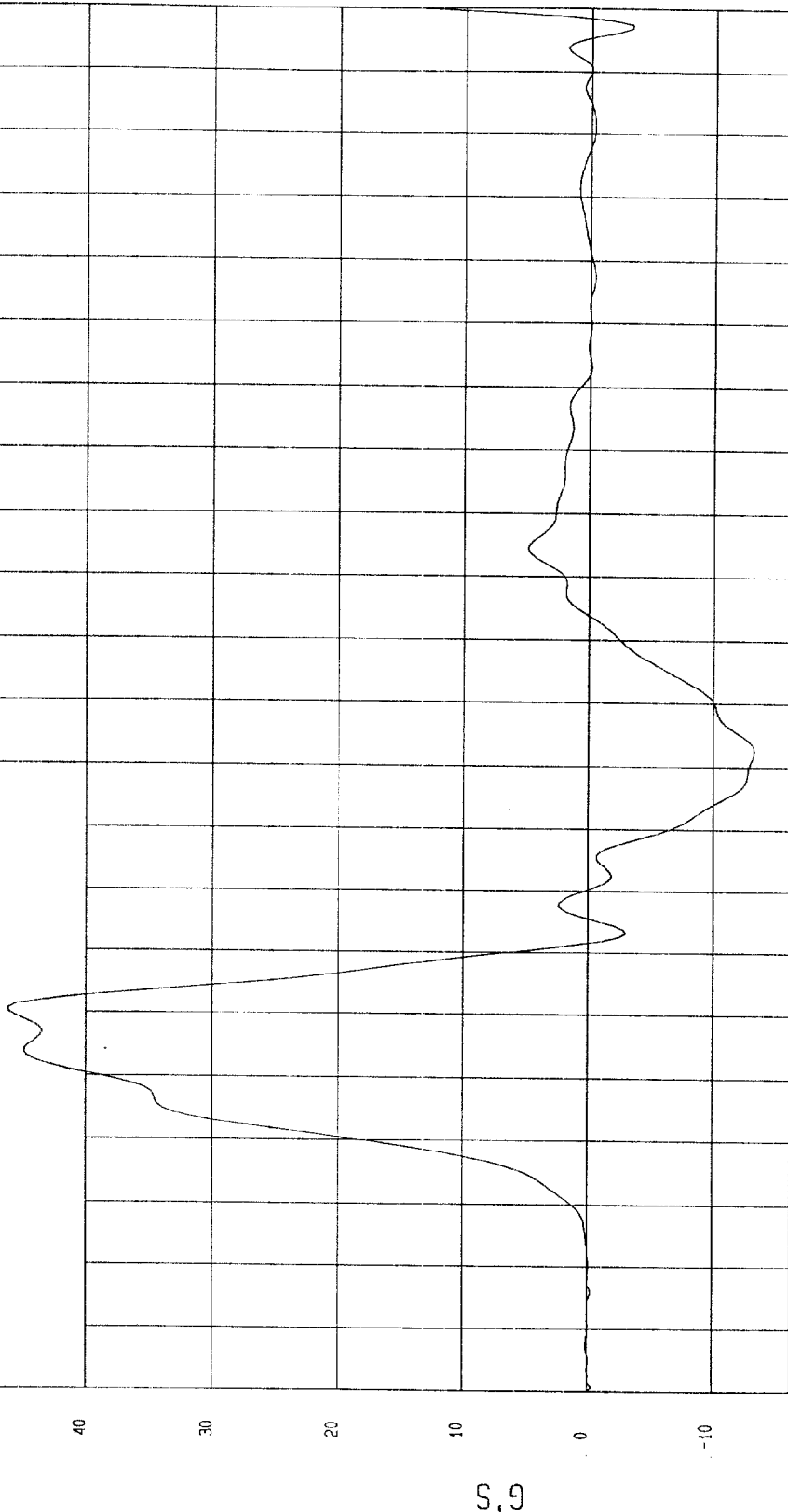
COMPONENT: 1999 TOYOTA RAV4 (MX5103)

Maximum = 46.24 G'S at 41 msec

Minimum = -13.16 G'S at 82 msec

REAR PASSENGER PELVIS Y REDUNDANT ACCELERATION

1 ——— B99012F1.R49 Filterclass (FIR Filtered)



MGA Research
01-28-1999 15:03

APPENDIX C
SID CONFIGURATION AND PERFORMANCE VERIFICATION

PRE-TEST CERTIFICATION DATA

C-1

Driver Dummy Serial Number: 269

Calibration Test Results Summary

C-2

Driver Dummy Serial Number: 269

Pre-Test Calibration

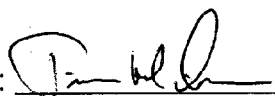
External Dimensions:	The dummy passed all external dimension requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion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

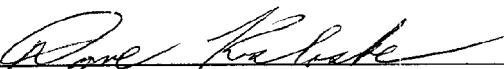
SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA C-3

DUMMY SERIAL NUMBER: 269

DATE OF VERIFICATION: January 27, 1999

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height (mm)	889 - 909	895
RH - Rib Height (mm)	501 - 521	508
HP - Hip Pivot Height (mm)	99 ref.	99
RD - Rib From Back Line (mm)	229 - 241	232
KV - Knee Pivot From Back Line (mm)	511 - 526	523
SW - Knee Pivot to Floor (mm)	490 - 505	501
HW - Hip Width (mm)	356 - 391	382

MEASUREMENTS BY: 

APPROVED BY: 

THORAX IMPACT TEST

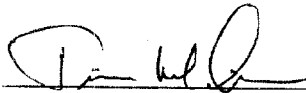
SIDE IMPACT DUMMY (SID)

DATE: January 27, 1999DUMMY SERIAL NUMBER: 269TEST NUMBER: D99302

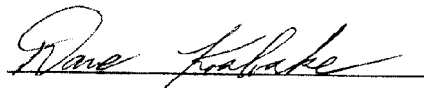
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	26%
PROBE SPEED (m/s)	4.27 - 4.33	4.28
UPPER RIB (g's)	37 - 46 g's	43
LOWER RIB (g's)	37 - 46 g's	43
LOWER SPINE (g's)	15 - 22 g's	20

TEST MEETS SPECIFICATIONS

TECHNICIAN



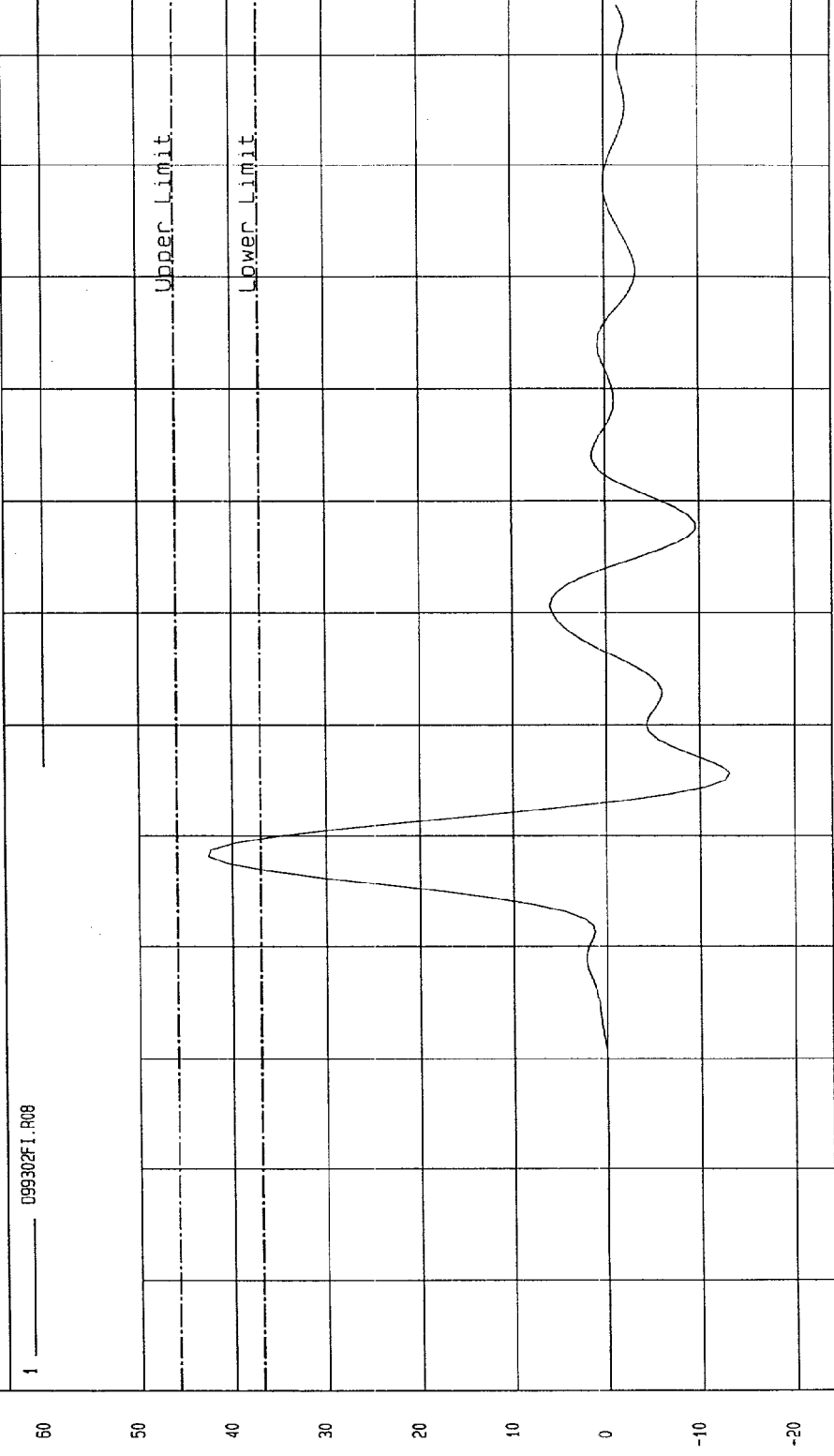
APPROVED BY



TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 01-27-1999 - 17:06
COMPONENT: DUMMY # 269 Velocity: 14.036 FT/SEC 4.28 M/SEC

Minimum = -13.08 G'S at 55.6 msec Maximum = 42.60 G'S at 48.1 msec

UPPER RIB ACCELERATION



TIME (SECONDS)

MGA Research
01-28-1999 08:57

TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 01-27-1999 - 17:06

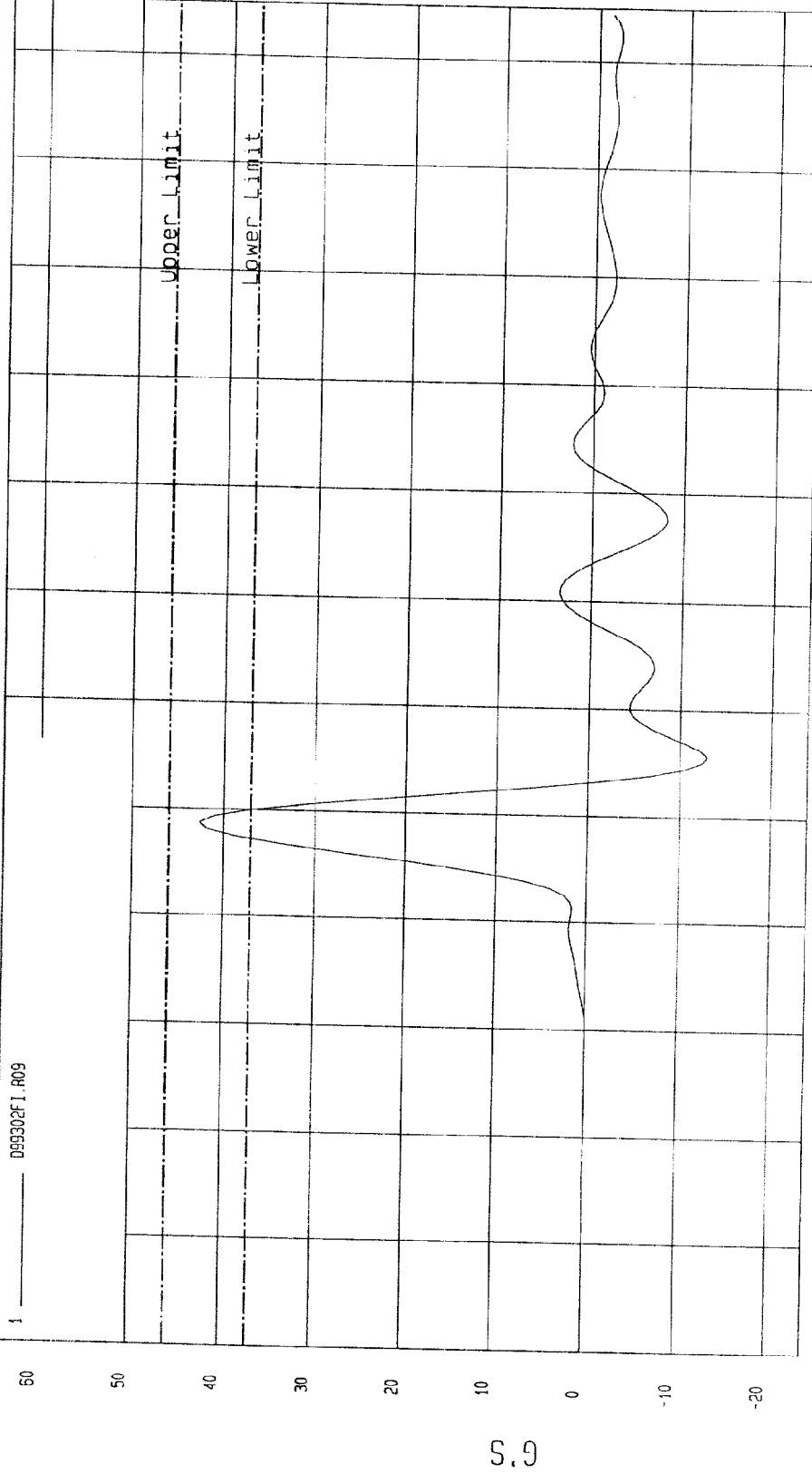
COMPONENT: DUMMY # 269 Velocity: 14.036 FT/SEC 4.28 M/SEC

Minimum = -12.88 G'S at 55.6 msec

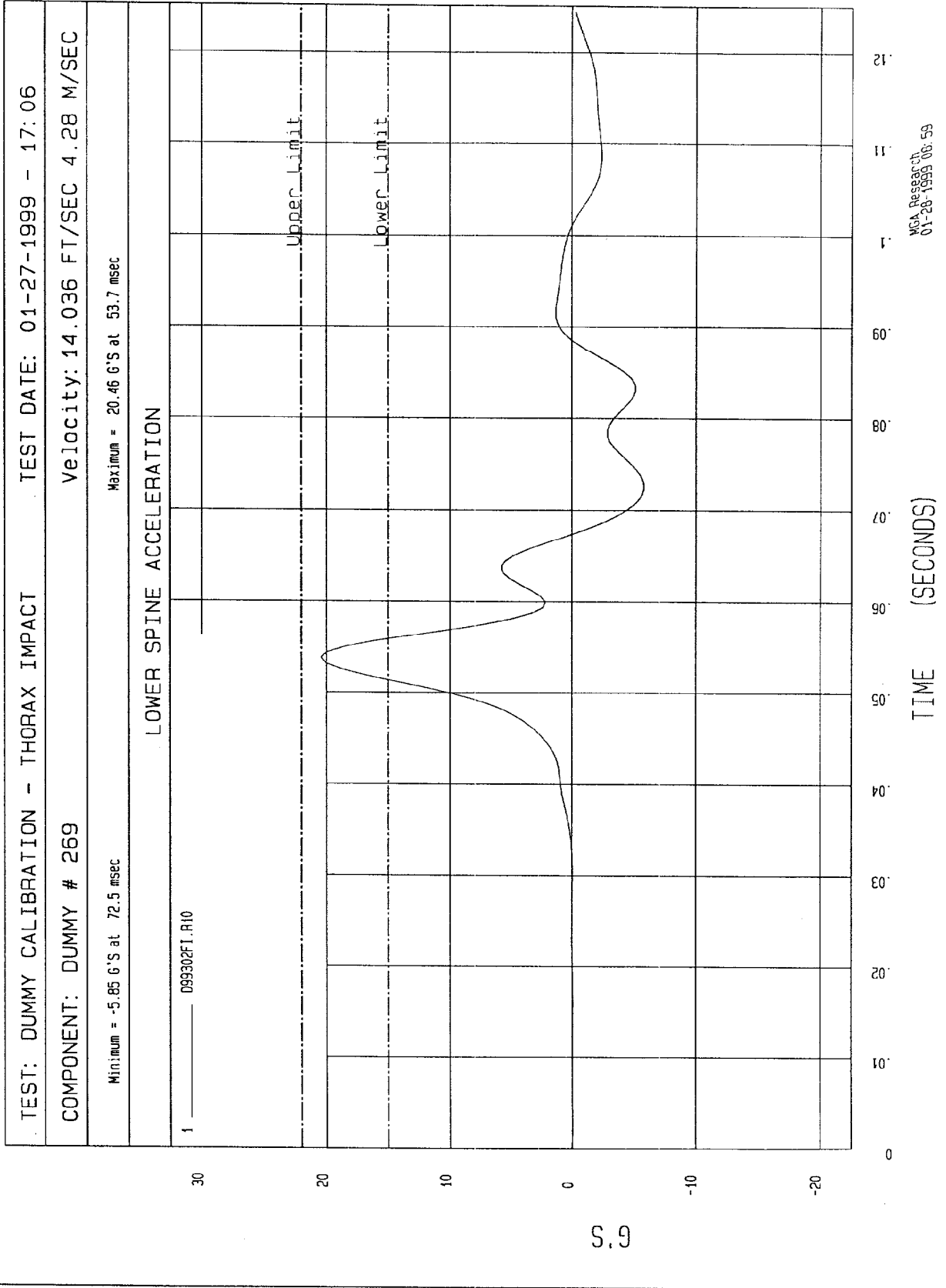
Maximum = 42.68 G'S at 48.7 msec

LOWER RIB ACCELERATION

1 ——— D99302F1 R09



MCA Research
01-28-1999 08:58



PELVIS IMPACT TEST

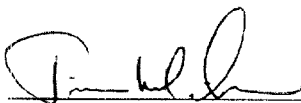
SIDE IMPACT DUMMY (SID)

DATE: January 27, 1999DUMMY SERIAL NUMBER: 269TEST NUMBER: D99303

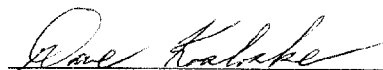
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	26%
PROBE SPEED (m/s)	4.27 - 4.33	4.27
PELVIS ACCELERATION (g's)	40 - 60	46

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY



TEST: DUMMY CALIBRATION - PELVIS IMPACT TEST DATE: 01-27-1999 - 17:17

COMPONENT: DUMMY # 269 Velocity: 14.023 FT/SEC 4.27 M/SEC

Minimum = -10.27 G'S at 58.7 msec Maximum = 46.42 G'S at 46.8 msec

PELVIS ACCELERATION

1 ——— 099303FI.R11

80

60

40

20

0

-20

G.S

Upper Limit

Lower Limit

12

11

10

09

08

07

06

05

04

03

02

01

0

WCA Research
01-28-1999 09:00

TIME (SECONDS)

ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

DATE: January 27, 1999DUMMY SERIAL NUMBER: 269TEST NUMBER: D99304

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	26%
FORCE @ 12.7 mm	104 - 162	153
FORCE @ 19.0 mm	163 - 222	210
FORCE @ 25.4 mm	222 - 280	270
FORCE @ 33 mm	325 - 391	366

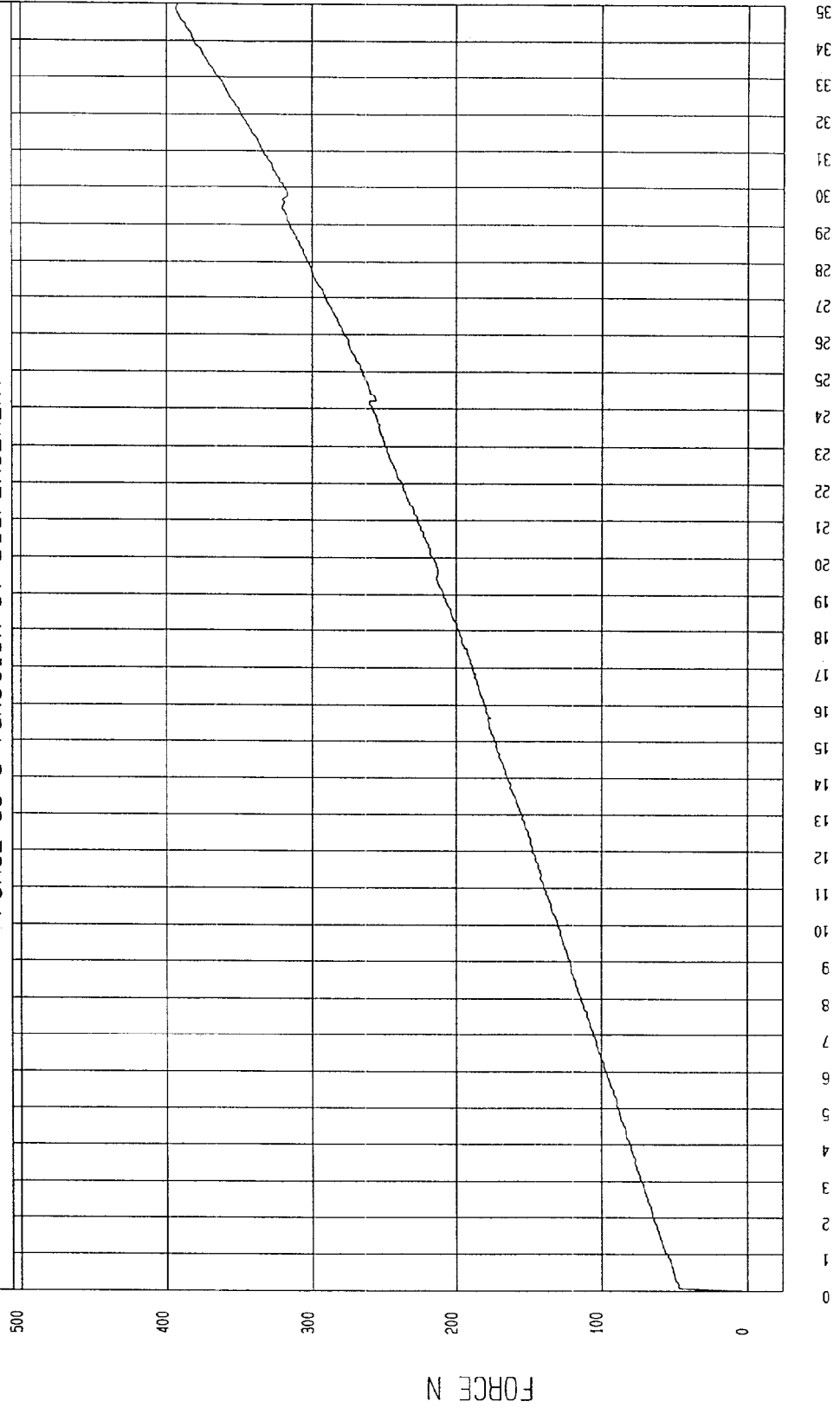
TEST MEETS SPECIFICATIONS

TECHNICIAN Jim KellyAPPROVED BY Gene Kaloske

TEST: DUMMY CALIBRATION - ABDOMEN COMPRESSION TEST DATE: 01-27-1999 - 16:26:21

COMPONENT: DUMMY # 269

FORCE as a function of DISPLACEMENT



WCA Research
01-26-1999 10:58

DISPLACEMENT mm

LUMBAR FLEXION TEST

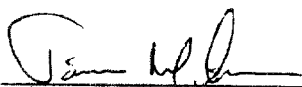
SIDE IMPACT DUMMY (SID)

DATE: January 27, 1999DUMMY SERIAL NUMBER: 269TEST NUMBER: D99305

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	28%
FORCE @ 0°	0 - 26.7	0
FORCE @ 20°	97.9 - 151.2	123.9
FORCE @ 30°	151.2 - 204.6	184.1
FORCE @ 40°	204.6 - 258.0	228.3
RETURN ANGLE	12° maximum	6°

TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY



TEST: DUMMY CALIBRATION - LUMBAR FLEXION TEST DATE: 01-27-1999 - 15:03:35

COMPONENT: DUMMY # 269

FORCE as a function of DISPLACEMENT

FORCE N

240
220
200
180
160
140
120
100
80
60
40
20
0
-20
-40

40

30

20

10

0

DISPLACEMENT DEG

MCA Research
01-28-1999 10:59240
220
200
180
160
140
120
100
80
60
40
20
0
-20
-40

PRE-TEST CERTIFICATION DATA

C-14

Passenger Dummy Serial Number: 270

Calibration Test Results Summary

Passenger Dummy Serial Number: 270

Pre-Test Calibration

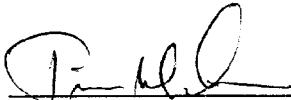
External Dimensions:	The dummy passed all external dimension requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion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

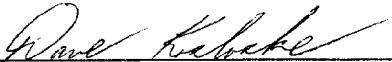
SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA C-16

DUMMY SERIAL NUMBER: 270

DATE OF VERIFICATION: January 27, 1999

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height (mm)	889 - 909	894
RH - Rib Height (mm)	501 - 521	514
HP - Hip Pivot Height (mm)	99 ref.	99
RD - Rib From Back Line (mm)	229 - 241	238
KV - Knee Pivot From Back Line (mm)	511 - 526	519
SW - Knee Pivot to Floor (mm)	490 - 505	494
HW - Hip Width (mm)	356 - 391	371

MEASUREMENTS BY: 

APPROVED BY: 

THORAX IMPACT TEST

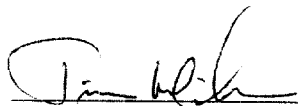
SIDE IMPACT DUMMY (SID)

DATE: January 27, 1999DUMMY SERIAL NUMBER: 270TEST NUMBER: D99312

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	26%
PROBE SPEED (m/s)	4.27 - 4.33	4.30
UPPER RIB (g's)	37 - 46 g's	41
LOWER RIB (g's)	37 - 46 g's	38
LOWER SPINE (g's)	15 - 22 g's	20

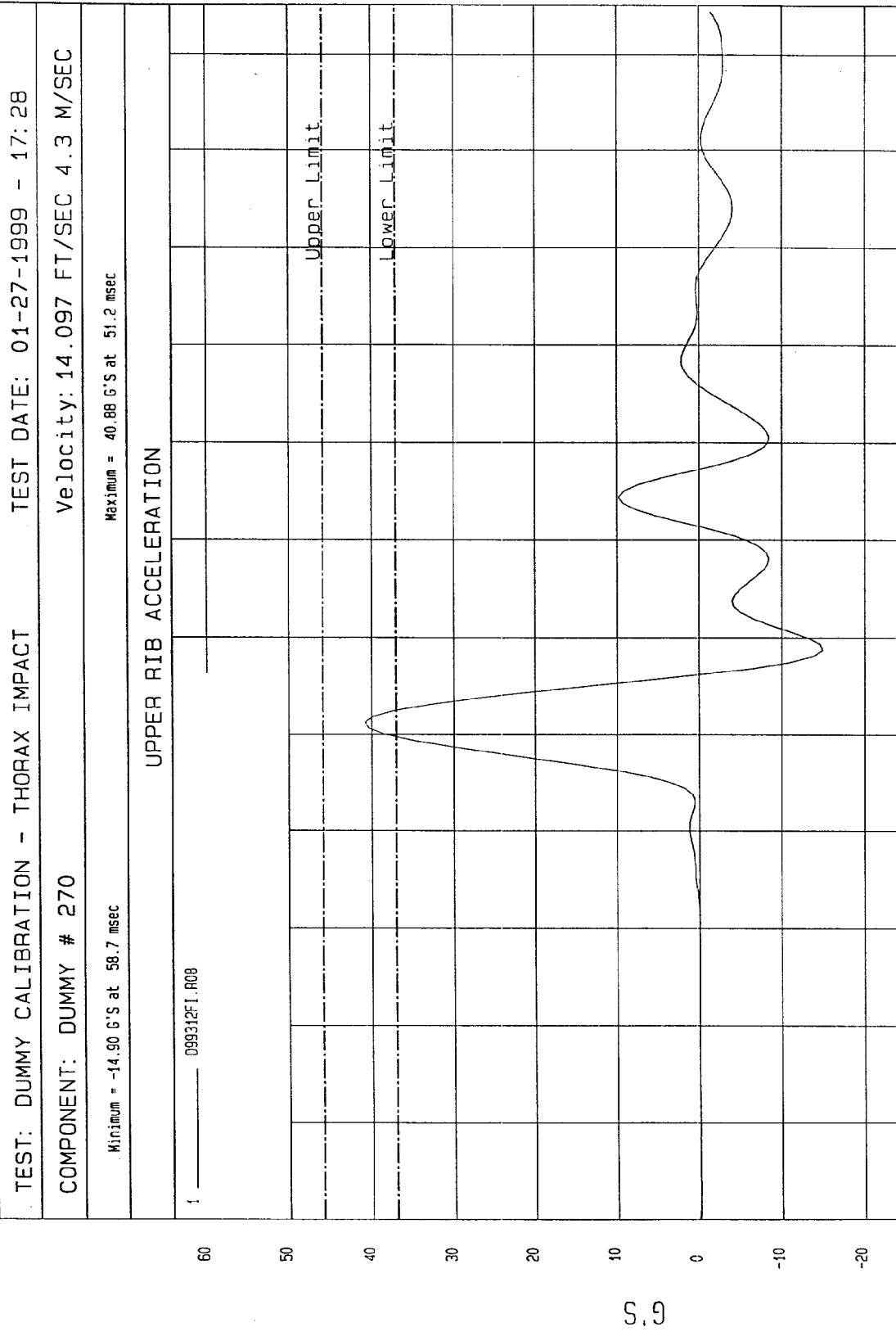
TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY



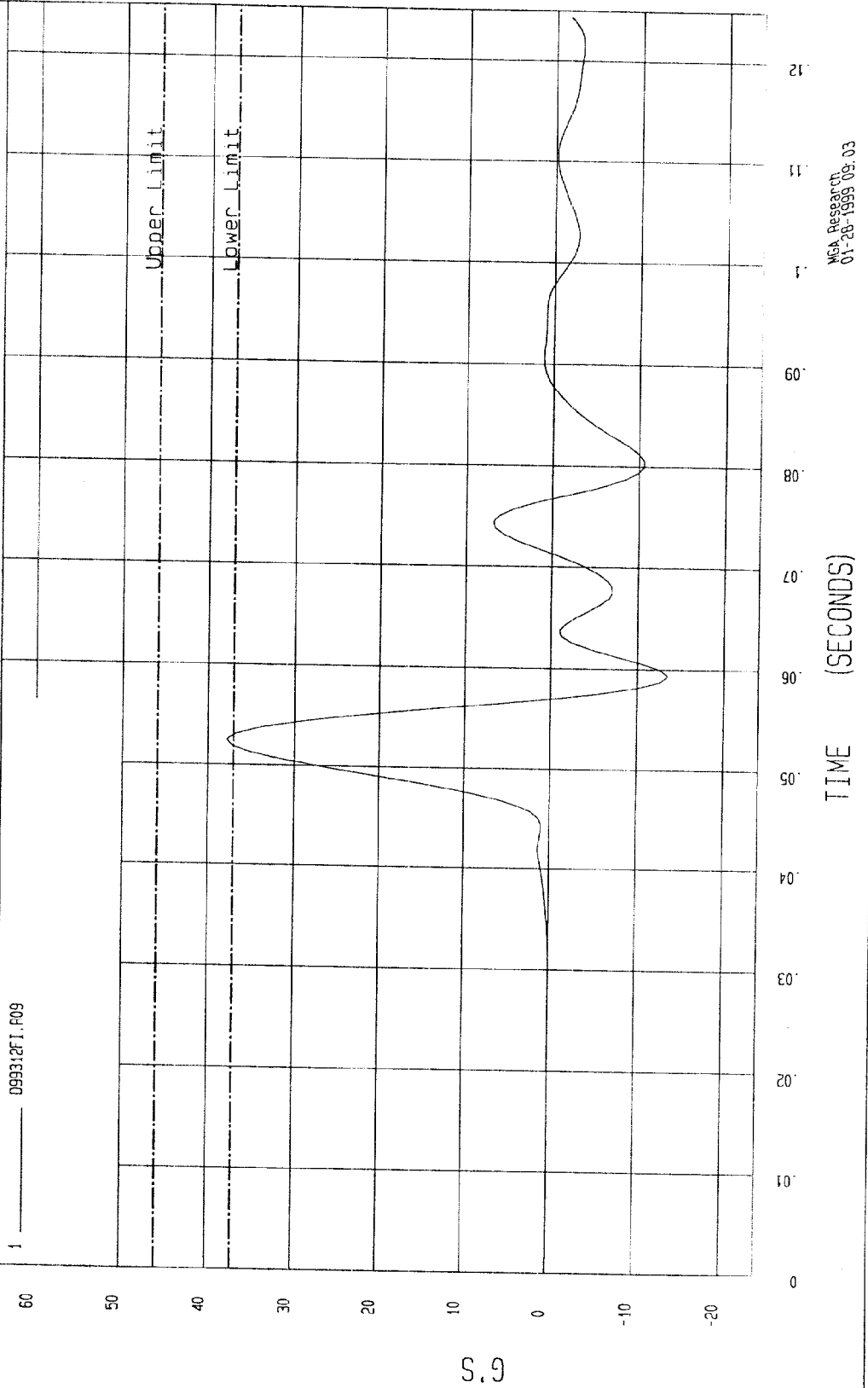


MCA Research
01-28-1999 09:03

TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 01-27-1999 - 17:29:59
COMPONENT: DUMMY # 270 Velocity: 14.097 FT/SEC 4.3 M/SEC

Minimum = -13.44 G'S at 59.3 msec Maximum = 37.79 G'S at 52.5 msec

LOWER RIB ACCELERATION

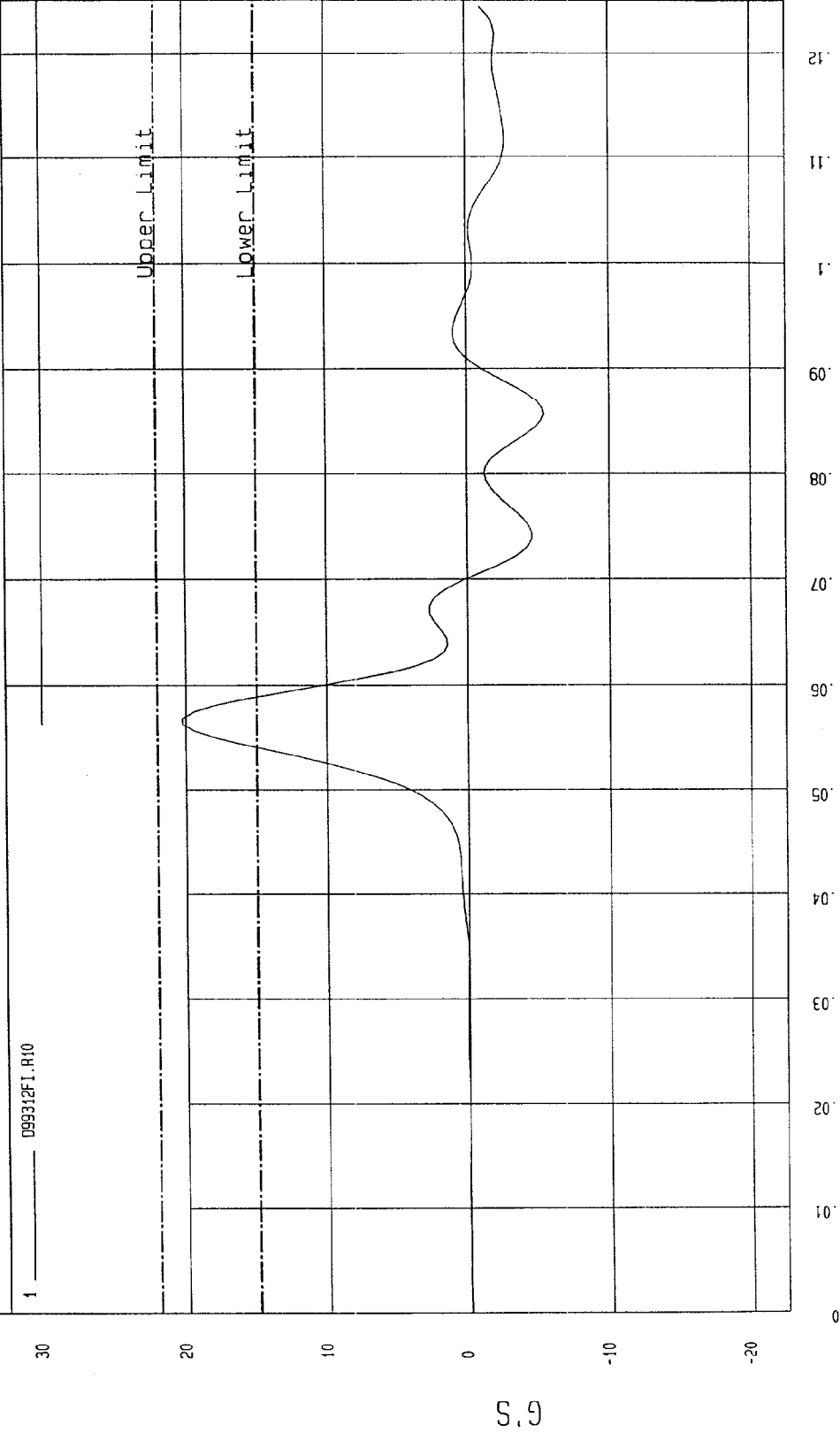


TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 01-27-1999 - 17:28

COMPONENT: DUMMY # 270 Velocity: 14.097 FT/SEC 4.3 M/SEC

Minimum = -5.41 G'S at 85.6 msec Maximum = 20.23 G'S at 56.8 msec

LOWER SPINE ACCELERATION



PELVIS IMPACT TEST

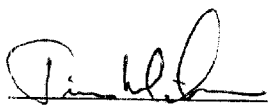
SIDE IMPACT DUMMY (SID)

DATE: January 27, 1999DUMMY SERIAL NUMBER: 270TEST NUMBER: D99313

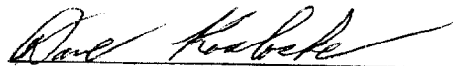
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	26%
PROBE SPEED (m/s)	4.27 - 4.33	4.30
PELVIS ACCELERATION (g's)	40 - 60	44

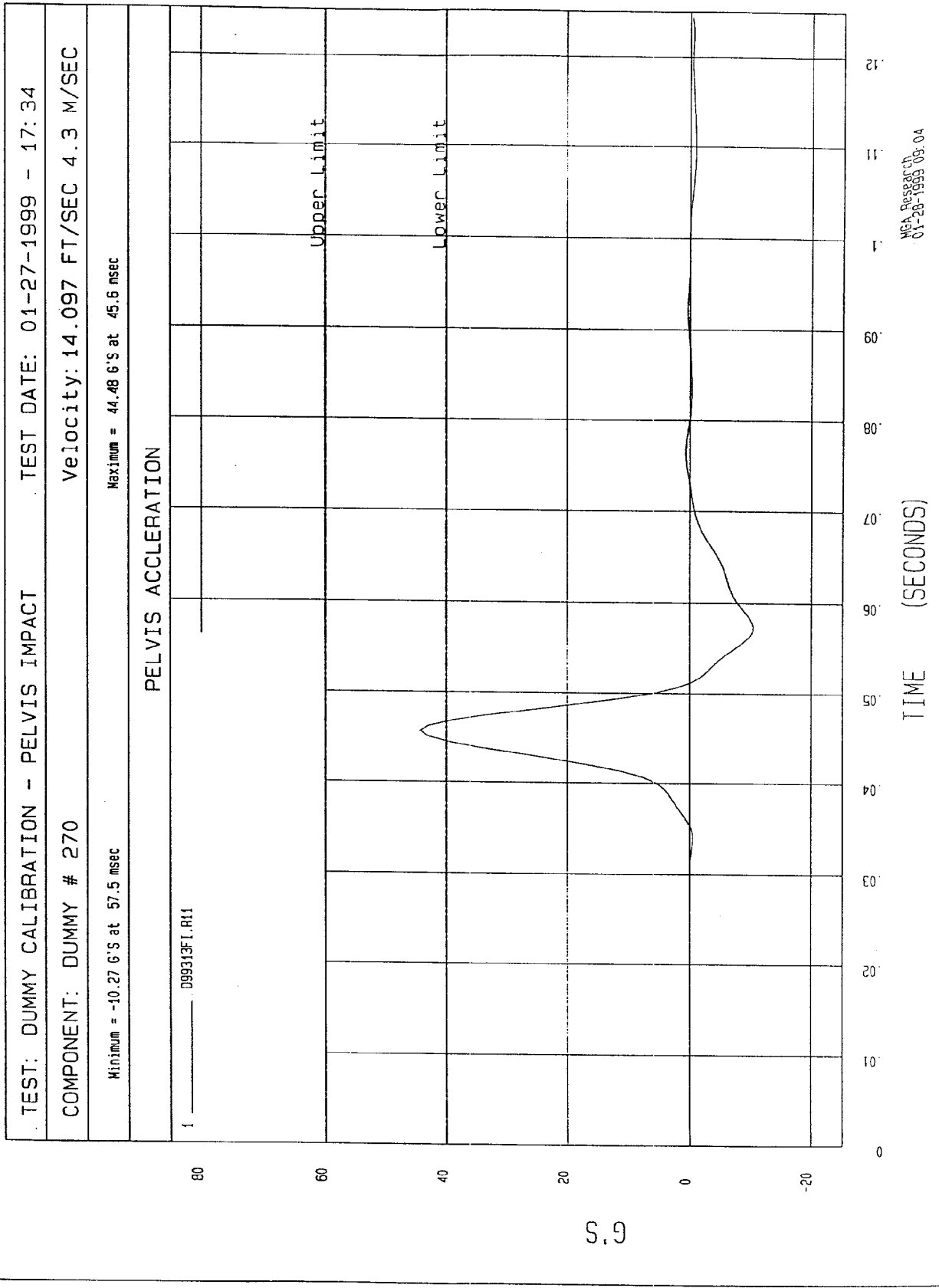
TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY





ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

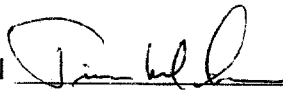
SIDE IMPACT DUMMY (SID)

DATE: January 27, 1999DUMMY SERIAL NUMBER: 270 TEST NUMBER: D99314

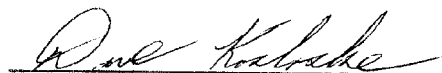
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	26%
FORCE @ 12.7 mm	104 - 162	145
FORCE @ 19.0 mm	163 - 222	202
FORCE @ 25.4 mm	222 - 280	273
FORCE @ 33 mm	325 - 391	381

TEST MEETS SPECIFICATIONS

TECHNICIAN



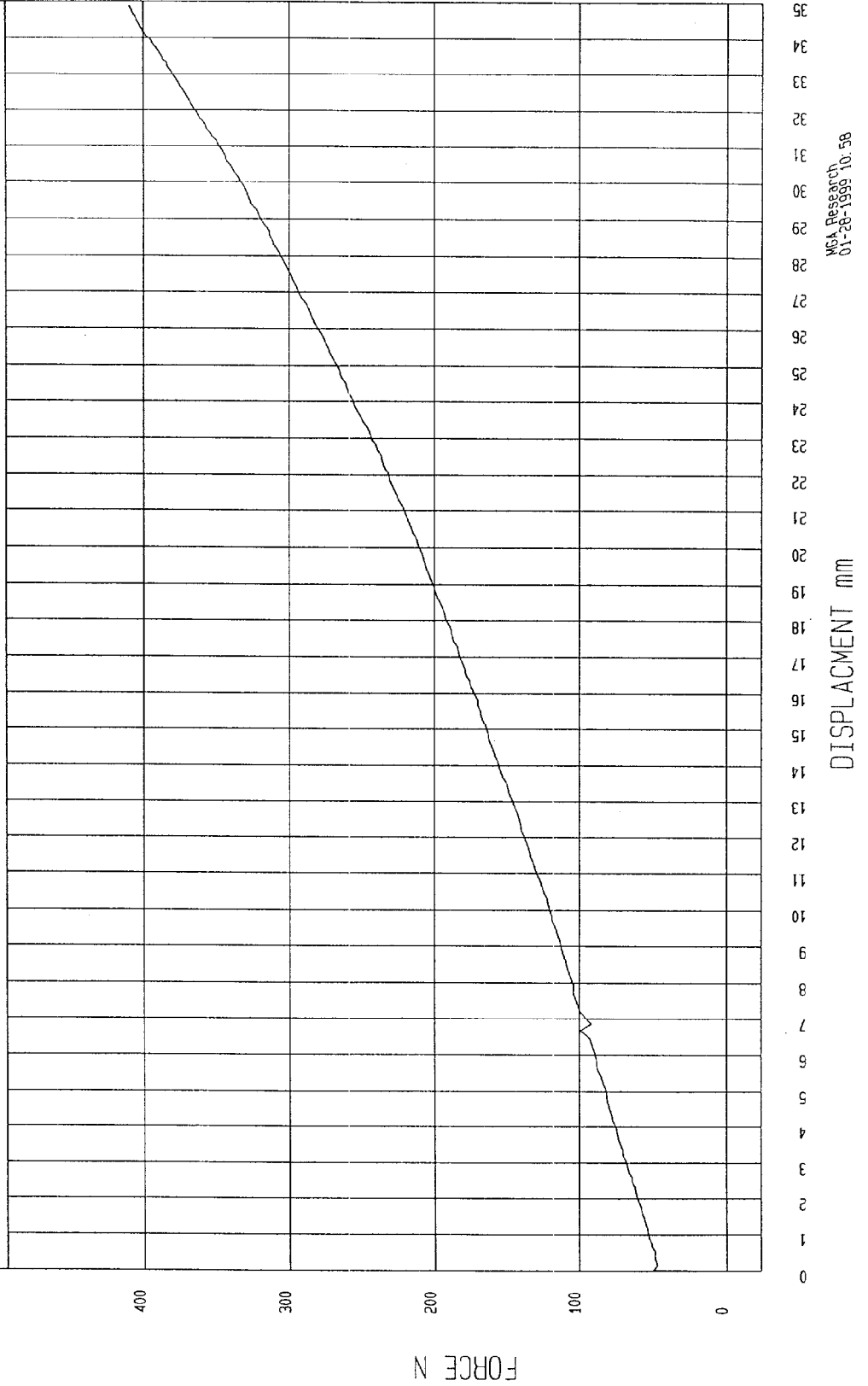
APPROVED BY



TEST: DUMMY CALIBRATION - ABDOMEN COMPRESSION TEST DATE: 01-27-1999 - 16:30:22

COMPONENT: DUMMY # 270

FORCE as a function of DISPLACEMENT



MSA Research
01-28-1999 10:58

MGA RESEARCH CORPORATION

LUMBAR FLEXION TEST

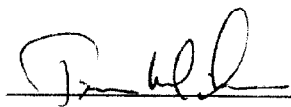
SIDE IMPACT DUMMY (SID)

DATE: January 27, 1999DUMMY SERIAL NUMBER: 270TEST NUMBER: D99315

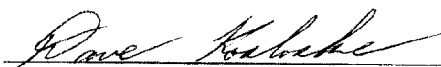
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	26%
FORCE @ 0°	0 - 26.7	0
FORCE @ 20°	97.9 - 151.2	104.9
FORCE @ 30°	151.2 - 204.6	157.1
FORCE @ 40°	204.6 - 258.0	205.2
RETURN ANGLE	12° maximum	1°

TEST MEETS SPECIFICATIONS

TECHNICIAN



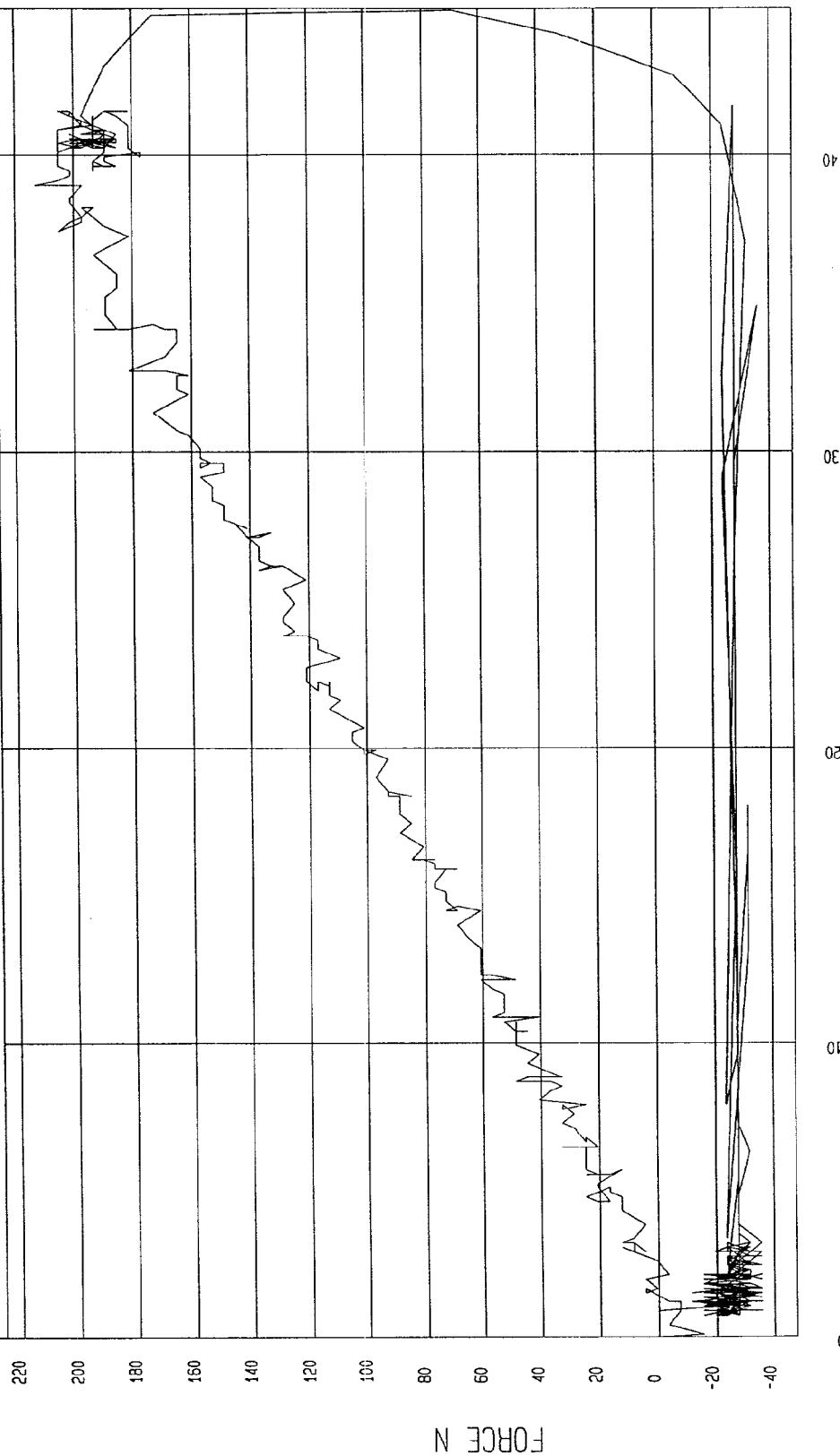
APPROVED BY



TEST: DUMMY CALIBRATION - LUMBAR FLEXION TEST DATE: 01-27-1999 - 15:15:43

COMPONENT: DUMMY # 270

FORCE as a function of TORSO ROTATION



NCA Research
01-28-1999 10:59

POST-TEST CERTIFICATION DATA

C-27

Driver Dummy Serial Number: 269

Driver Dummy Serial Number: 269

Post-Test Calibration

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

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA ^{C-29}

DUMMY SERIAL NUMBER: 269

DATE OF VERIFICATION: February 9, 1999

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height (mm)	889 - 909	895
RH - Rib Height (mm)	501 - 521	508
HP - Hip Pivot Height (mm)	99 ref.	99
RD - Rib From Back Line (mm)	229 - 241	232
KV - Knee Pivot From Back Line (mm)	511 - 526	523
SW - Knee Pivot to Floor (mm)	490 - 505	501
HW - Hip Width (mm)	356 - 391	382

MEASUREMENTS BY: Jim W. L.

APPROVED BY: Rene Kelske

THORAX IMPACT TEST

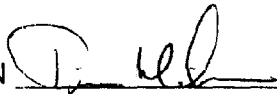
SIDE IMPACT DUMMY (SID)

DATE: January 8, 1999DUMMY SERIAL NUMBER: 269TEST NUMBER: D99392

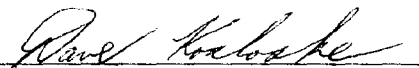
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	31%
PROBE SPEED (m/s)	4.27 - 4.33	4.28
UPPER RIB (g's)	37 - 46 g's	45
LOWER RIB (g's)	37 - 46 g's	43
LOWER SPINE (g's)	15 - 22 g's	20

TEST MEETS SPECIFICATIONS

TECHNICIAN



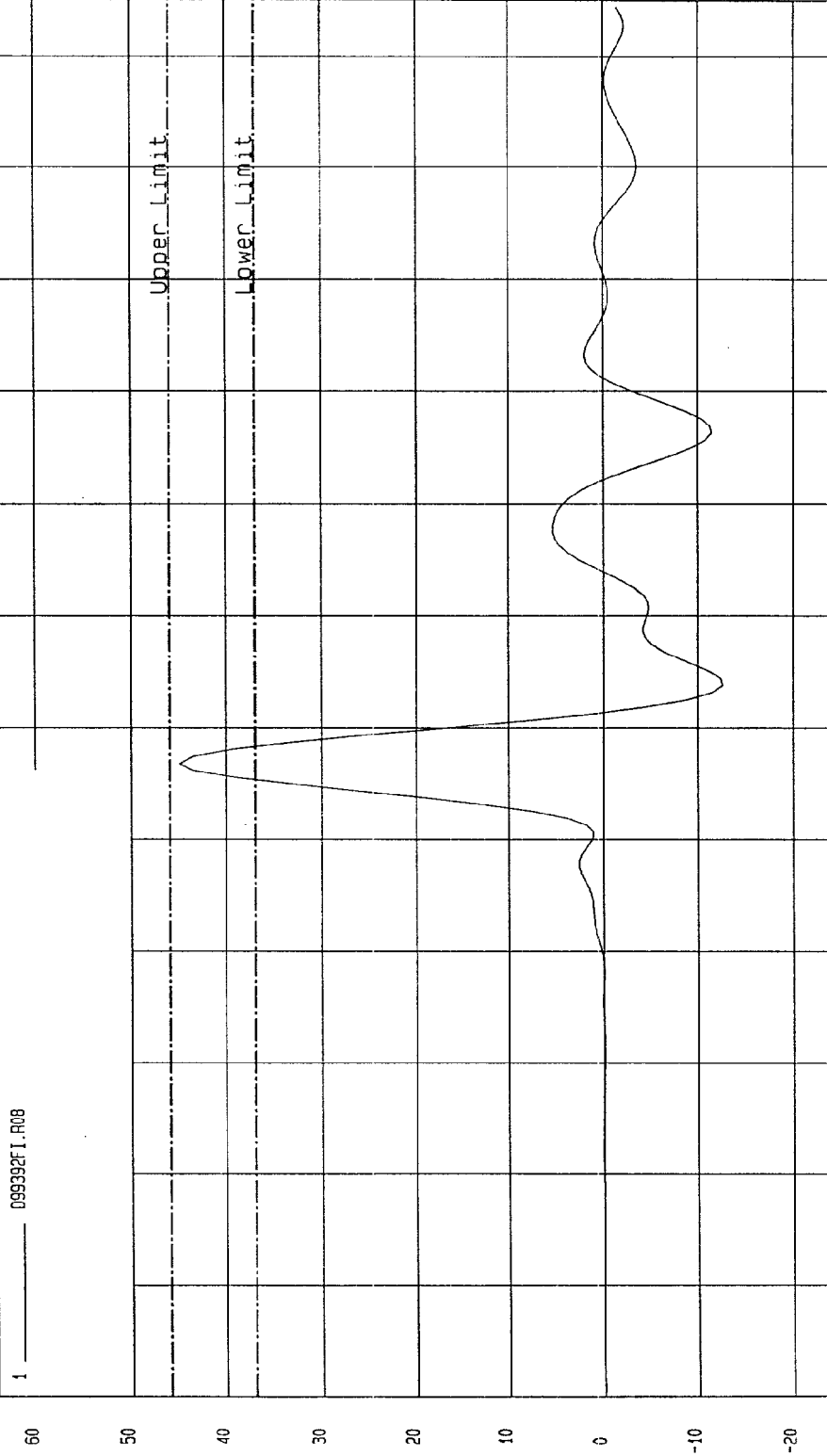
APPROVED BY



TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 02-08-1999 - 14:07
 COMPONENT: DUMMY # 269 Velocity: 14.05 FT/SEC 4.28 M/SEC

Minimum = -12.52 G'S at 63.7 msec
 Maximum = 44.95 G'S at 56.8 msec

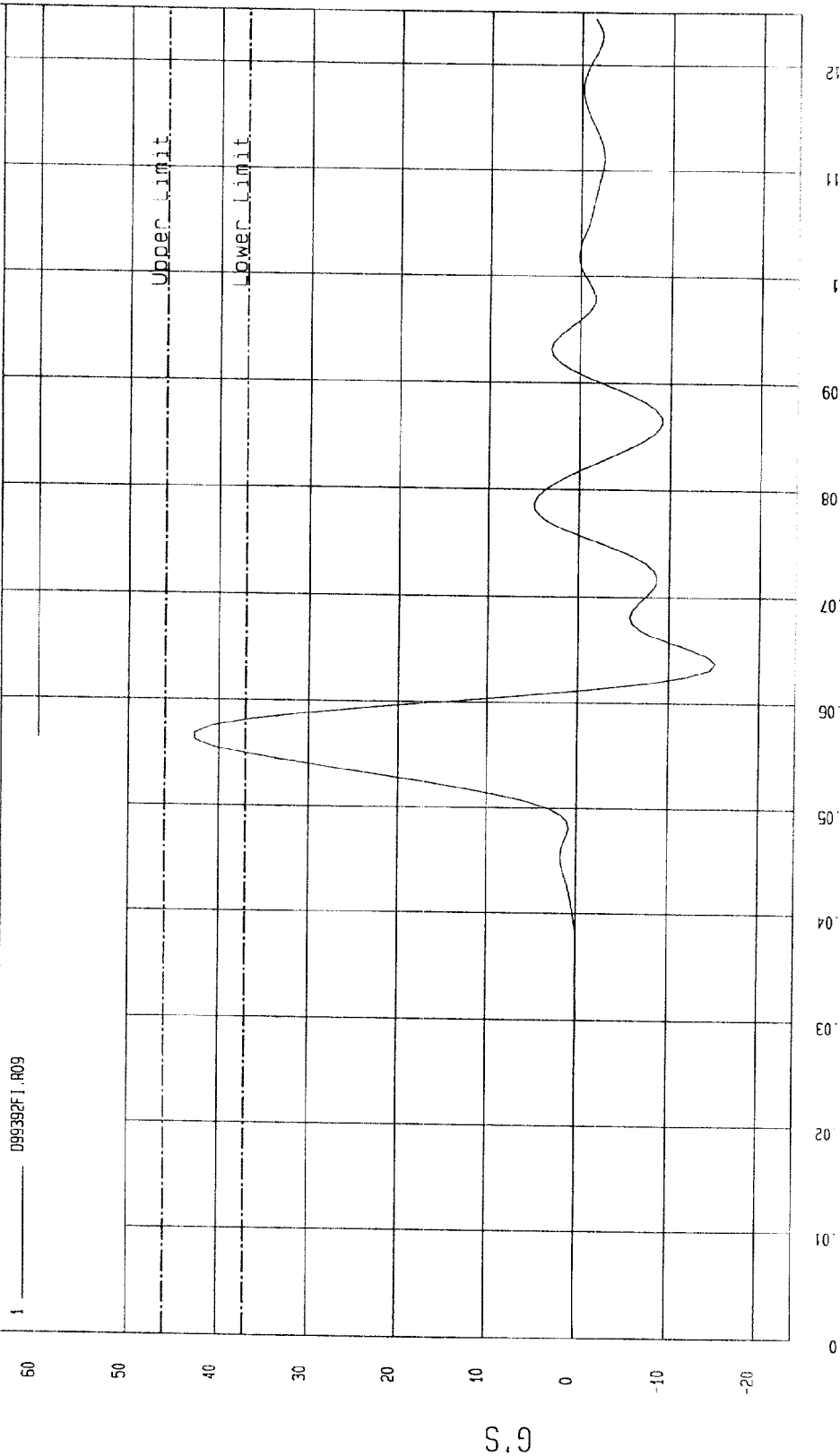
UPPER RIB ACCELERATION



TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 02-08-1999 - 14:07
COMPONENT: DUMMY # 269 Velocity: 14.05 FT/SEC 4.28 M/SEC

Minimum = -15.12 G'S at 63.7 msec Maximum = 42.73 G'S at 56.8 msec

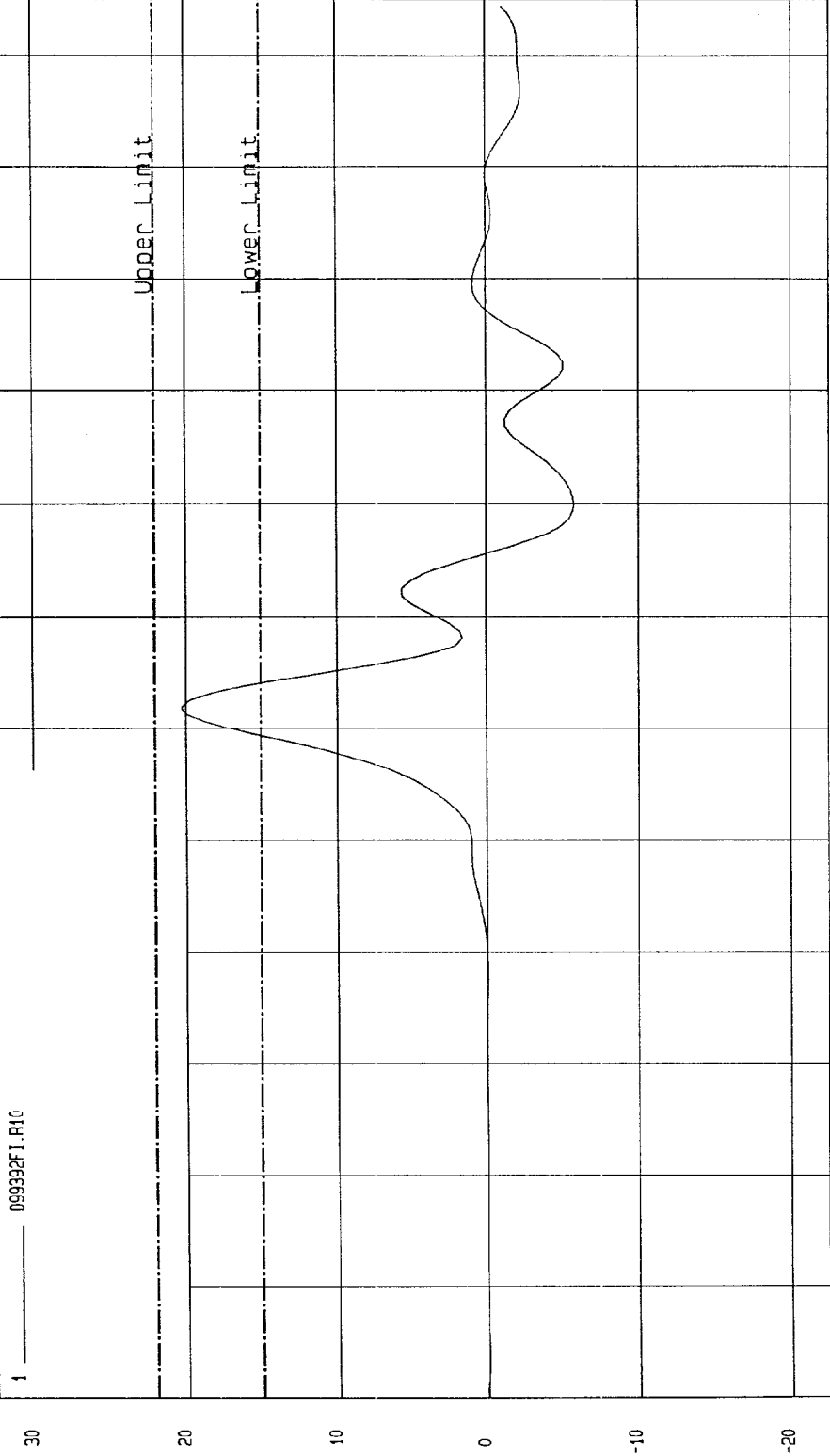
LOWER RIB ACCELERATION



WCA Research
02-08-1999 14:17

TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 02-08-1999 - 14:07
COMPONENT: DUMMY # 269 Velocity: 14.05 FT/SEC 4.28 M/SEC
Minimum = -5.81 G'S at 80 msec Maximum = 20.32 G'S at 61.8 msec

LOWER SPINE ACCELERATION



TIME (SECONDS)

NSA Research
02-08-1999 14:18

S.G

PELVIS IMPACT TEST

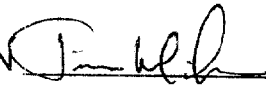
SIDE IMPACT DUMMY (SID)

DATE: February 8, 1999DUMMY SERIAL NUMBER: 269TEST NUMBER: D99393

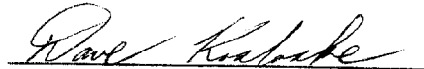
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	31%
PROBE SPEED (m/s)	4.27 - 4.33	4.27
PELVIS ACCELERATION (g's)	40 - 60	42

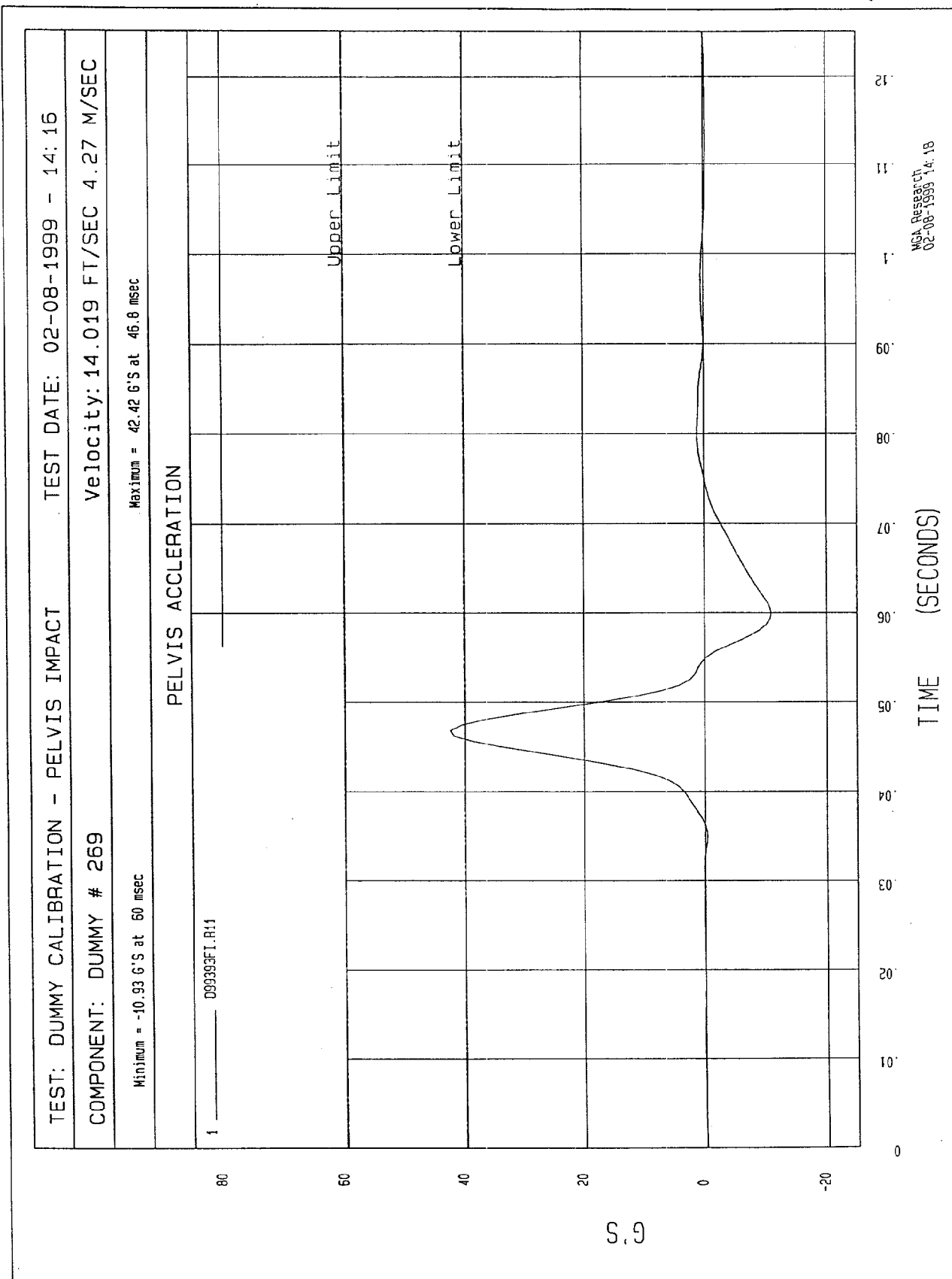
TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY





ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

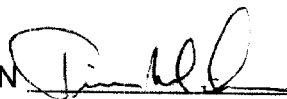
SIDE IMPACT DUMMY (SID)

DATE: February 9, 1999DUMMY SERIAL NUMBER: 269TEST NUMBER: D99394

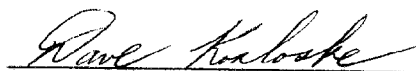
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	30%
FORCE @ 12.7 mm	104 - 162	155
FORCE @ 19.0 mm	163 - 222	216
FORCE @ 25.4 mm	222 - 280	278
FORCE @ 33 mm	325 - 391	383

TEST MEETS SPECIFICATIONS

TECHNICIAN



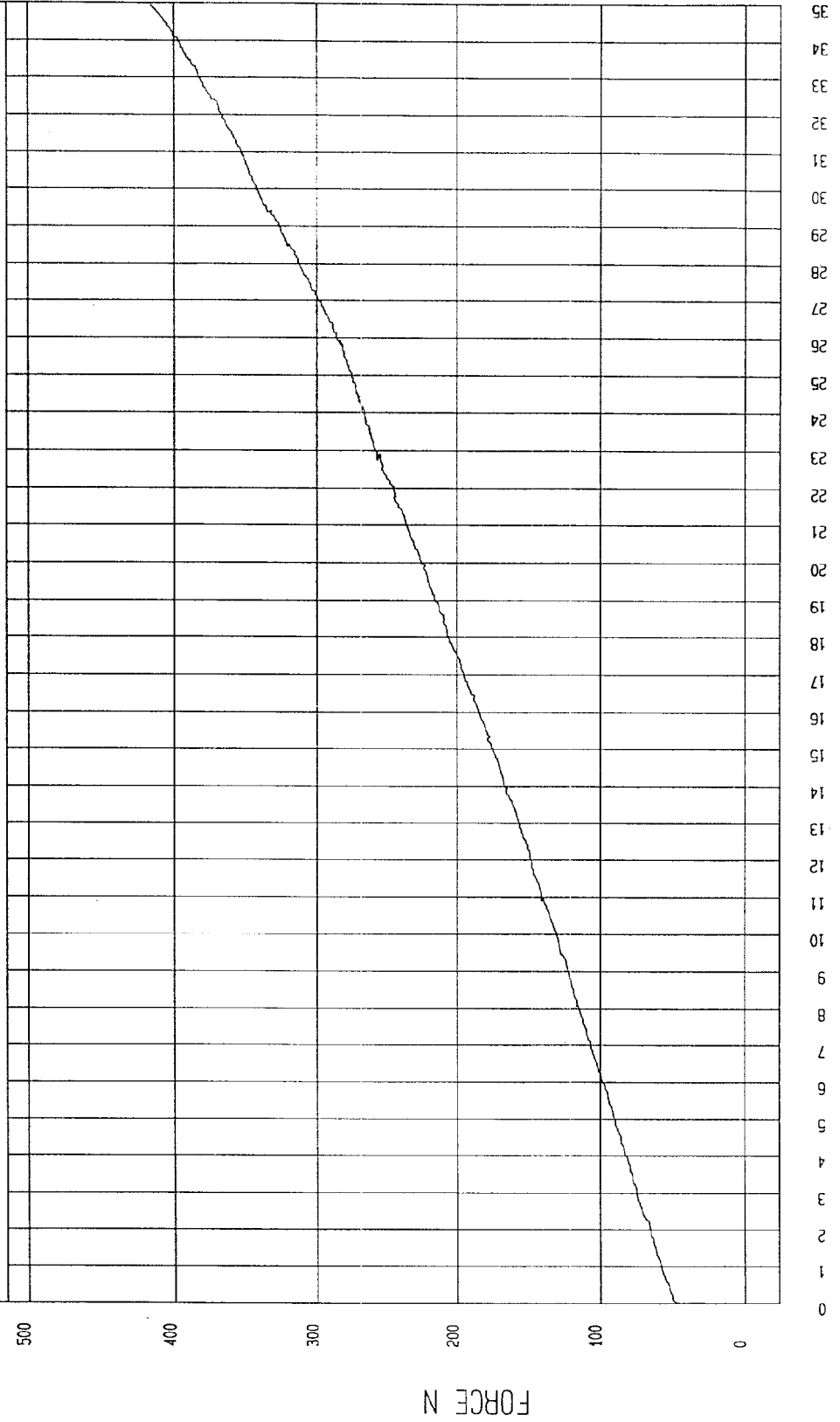
APPROVED BY



TEST: DUMMY CALIBRATION - ABDOMEN COMPRESSION TEST DATE: 02-09-1999 - 10:37:17

COMPONENT: DUMMY # 269

FORCE as a function of DISPLACEMENT



WCA Research
02-09-1999 10:38

DISPLACEMENT mm

LUMBAR FLEXION TEST

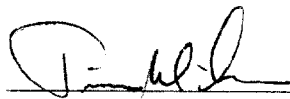
SIDE IMPACT DUMMY (SID)

DATE: February 9, 1999DUMMY SERIAL NUMBER: 269TEST NUMBER: D99395

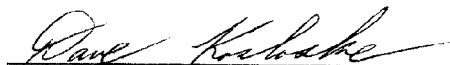
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	30%
FORCE @ 0°	0 - 26.7	0
FORCE @ 20°	97.9 - 151.2	123.8
FORCE @ 30°	151.2 - 204.6	171.9
FORCE @ 40°	204.6 - 258.0	220.1
RETURN ANGLE	12° maximum	5°

TEST MEETS SPECIFICATIONS

TECHNICIAN



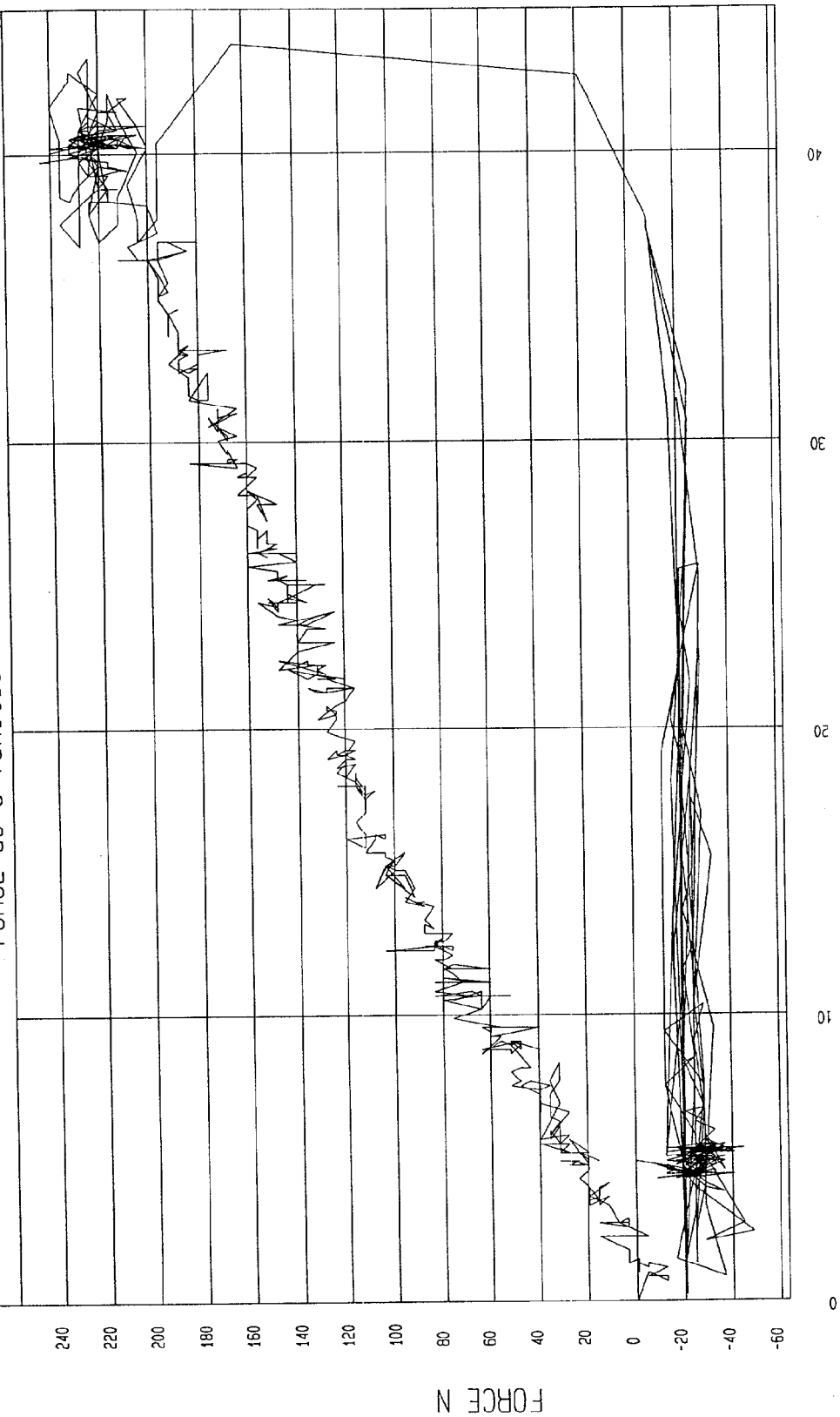
APPROVED BY



TEST: DUMMY CALIBRATION - LUMBAR FLEXION TEST DATE: 02-09-1999 - 09:38:09

COMPONENT: DUMMY # 269

FORCE as a function of TORSO ROTATION



MSA Research
02-09-1999 11:01

POST-TEST CERTIFICATION DATA

C-40

Passenger Dummy Serial Number: 270

Passenger Dummy Serial Number: 270

Post-Test Calibration

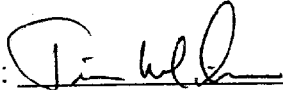
External Dimensions:	The dummy passed all external dimension requirements.
Thorax Impact Test:	The thorax passed all impact test requirements.
Pelvic Impact Test:	The pelvis passed all impact test requirements.
Abdominal Compression Test:	The abdomen passed all compression test requirements.
Lumbar Flexion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

SIDE IMPACT DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA ^{C-42}

DUMMY SERIAL NUMBER: 270

DATE OF VERIFICATION: February 9, 1999

DESCRIPTION	SPECIFICATION	TEST RESULTS
SH - Seated Height (mm)	889 - 909	894
RH - Rib Height (mm)	501 - 521	514
HP - Hip Pivot Height (mm)	99 ref.	99
RD - Rib From Back Line (mm)	229 - 241	238
KV - Knee Pivot From Back Line (mm)	511 - 526	519
SW - Knee Pivot to Floor (mm)	490 - 505	494
HW - Hip Width (mm)	356 - 391	371

MEASUREMENTS BY: 

APPROVED BY: 

THORAX IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: February 9, 1999DUMMY SERIAL NUMBER: 270TEST NUMBER: D99402

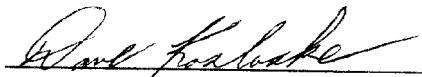
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	30%
PROBE SPEED (m/s)	4.27 - 4.33	4.27
UPPER RIB (g's)	37 - 46 g's	44
LOWER RIB (g's)	37 - 46 g's	42
LOWER SPINE (g's)	15 - 22 g's	22

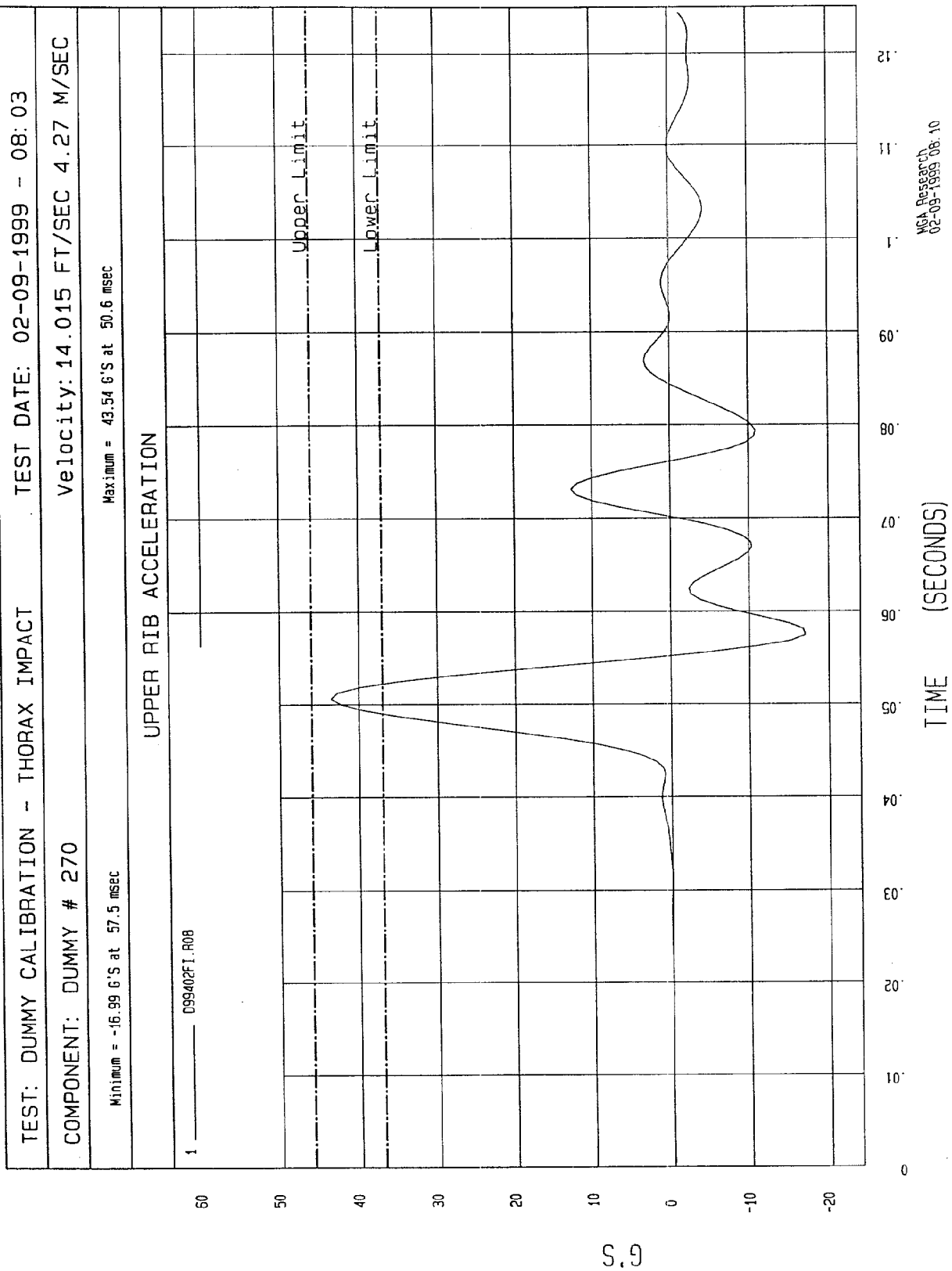
TEST MEETS SPECIFICATIONS

TECHNICIAN



APPROVED BY



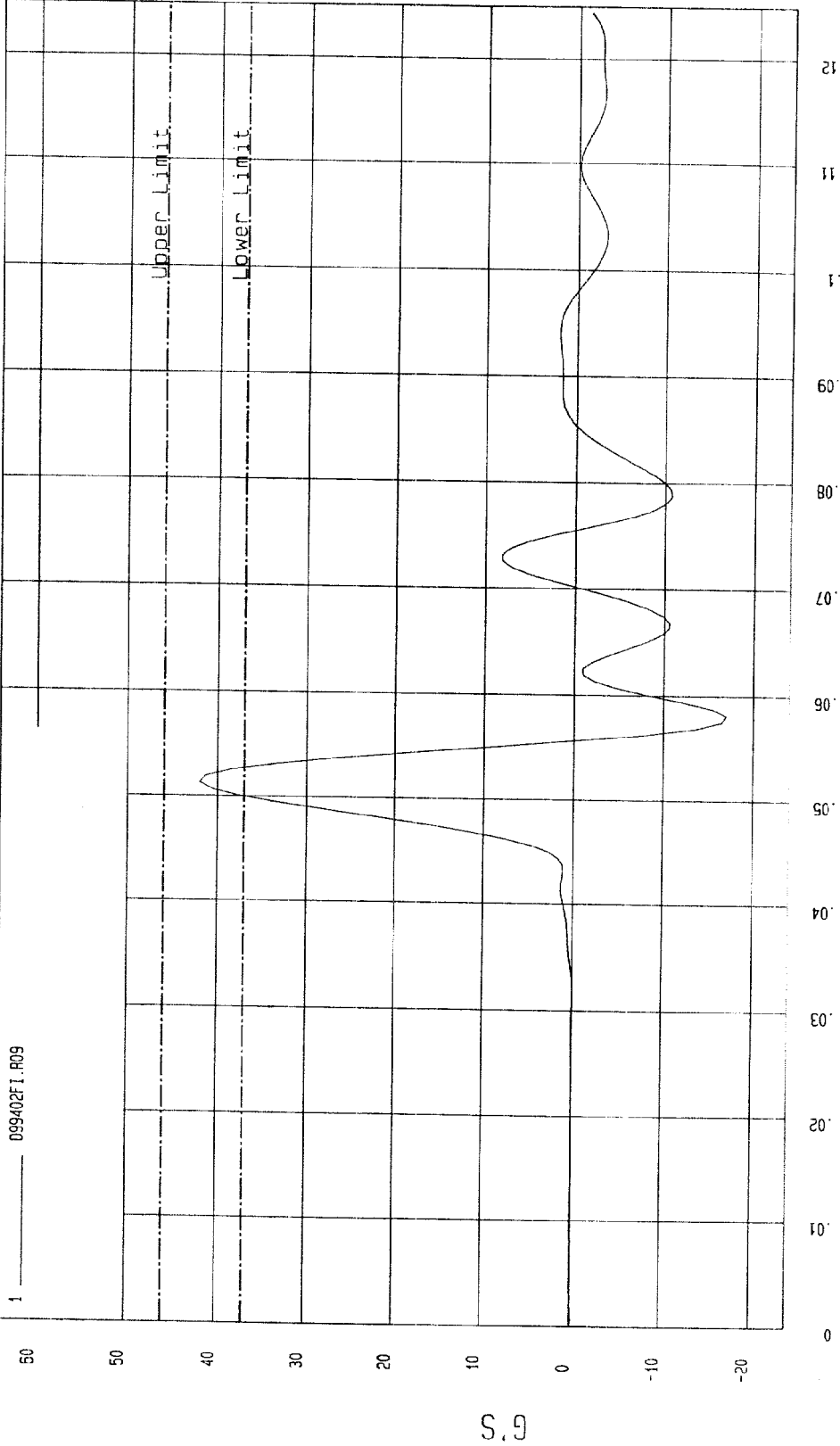


TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 02-09-1999 - 08:03

COMPONENT: DUMMY # 270 Velocity: 14.015 FT/SEC 4.27 M/SEC

Minimum = -16.86 G'S at 58.1 msec Maximum = 42.03 G'S at 51.2 msec

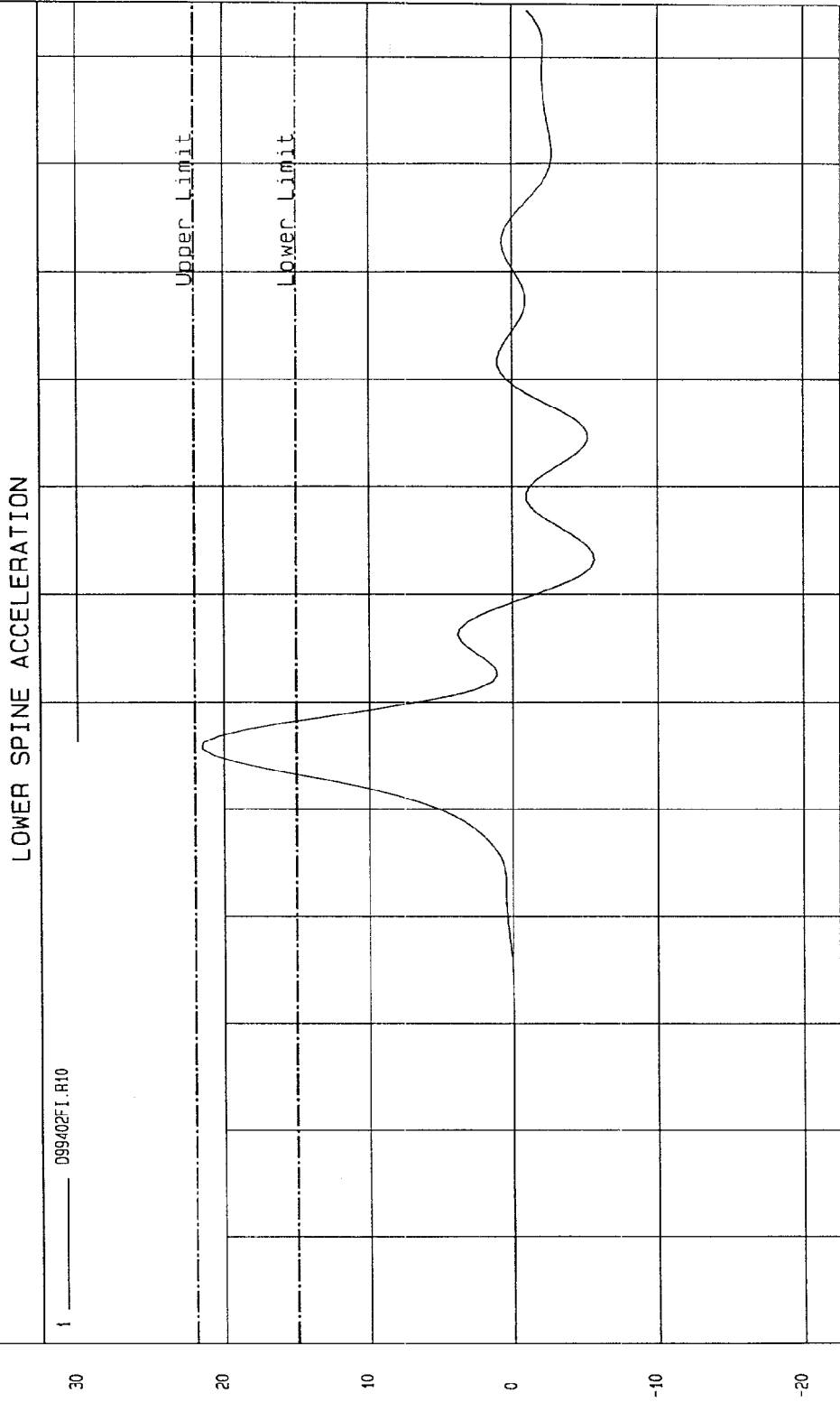
LOWER RIB ACCELERATION



WGA Research
02-09-1999 08:11

TEST: DUMMY CALIBRATION - THORAX IMPACT TEST DATE: 02-09-1999 - 08:03
COMPONENT: DUMMY # 270 Velocity: 14.015 FT/SEC 4.27 M/SEC

Minimum = -5.68 G'S at 73.1 msec Maximum = 21.52 G'S at 55.6 msec



WCA Research
02-09-1999 08:11

PELVIS IMPACT TEST

SIDE IMPACT DUMMY (SID)

DATE: February 9, 1999DUMMY SERIAL NUMBER: 270TEST NUMBER: D99403

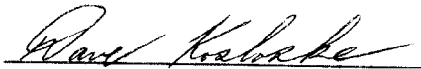
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	30%
PROBE SPEED (m/s)	4.27 - 4.33	4.28
PELVIS ACCELERATION (g's)	40 - 60	40

TEST MEETS SPECIFICATIONS

TECHNICIAN



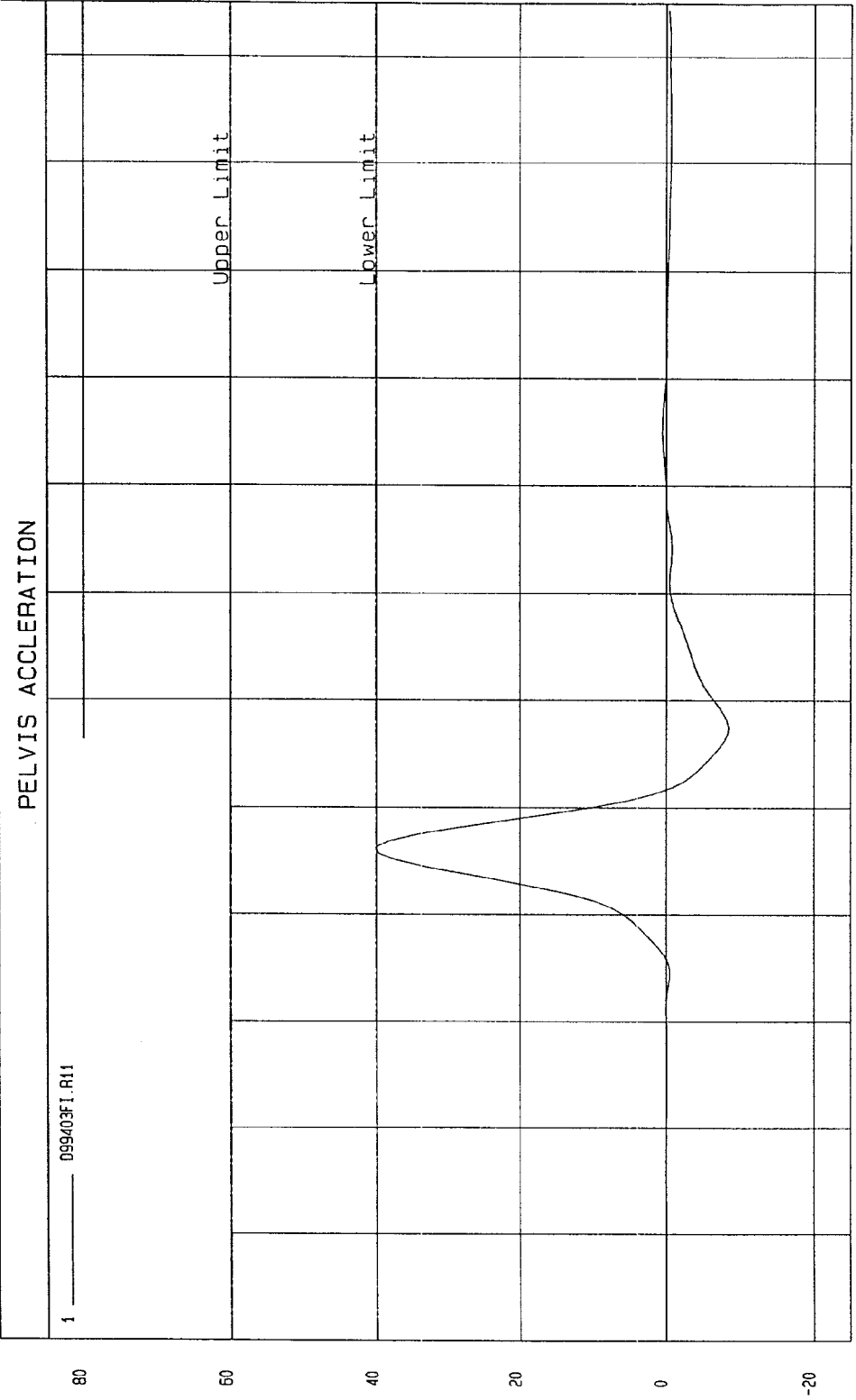
APPROVED BY



TEST: DUMMY CALIBRATION - PELVIS IMPACT TEST DATE: 02-09-1999 - 08:10

COMPONENT: DUMMY # 270 Velocity: 14.058 FT/SEC 4.28 M/SEC

Minimum = -3.42 G'S at 57.5 msec Maximum = 40.10 G'S at 46.2 msec



NSA Research
02-09-1999 08:11

ABDOMINAL COMPRESSION TEST
(PRELOAD = 10 LBS)

SIDE IMPACT DUMMY (SID)

DATE: February 9, 1999DUMMY SERIAL NUMBER: 270 TEST NUMBER: D99404

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	30%
FORCE @ 12.7 mm	104 - 162	138
FORCE @ 19.0 mm	163 - 222	193
FORCE @ 25.4 mm	222 - 280	250
FORCE @ 33 mm	325 - 391	339

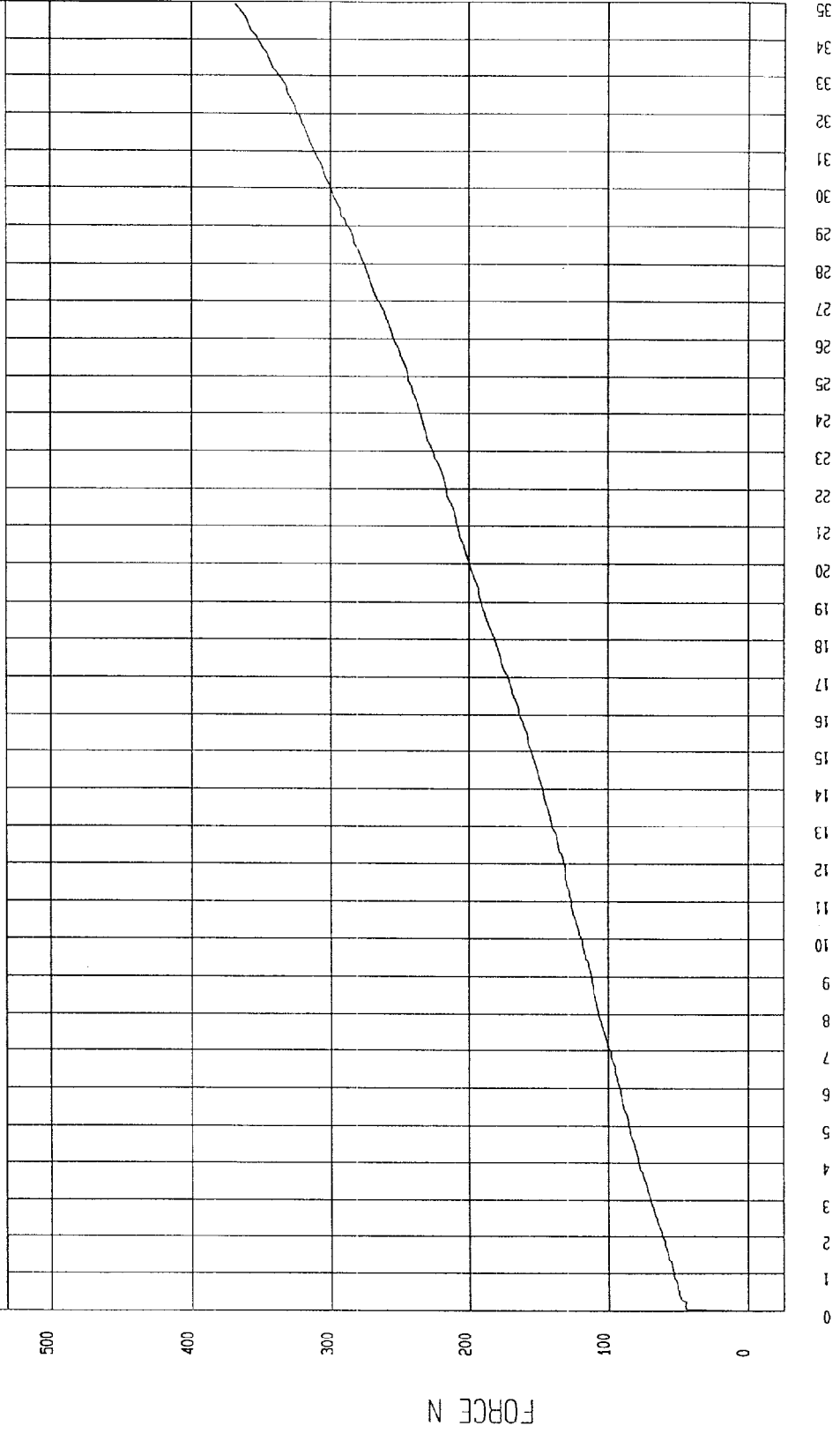
TEST MEETS SPECIFICATIONS

TECHNICIAN Jim W. L.APPROVED BY Rene Korbake

TEST: DUMMY CALIBRATION - ABDOMEN COMPRESSION TEST DATE: 02-09-1999 - 10:35:39

COMPONENT: DUMMY # 270

FORCE as a function of DISPLACEMENT



MCA Research
02-09-1999 10:39

LUMBAR FLEXION TEST

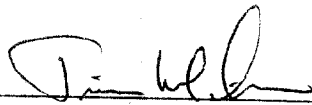
SIDE IMPACT DUMMY (SID)

DATE: February 9, 1999DUMMY SERIAL NUMBER: 270TEST NUMBER: D99405

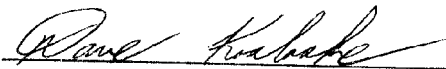
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE (°C)	18.9 - 25.5	21.0°
RELATIVE HUMIDITY (%)	10 - 70	30%
FORCE @ 0°	0 - 26.7	0
FORCE @ 20°	97.9 - 151.2	131.5
FORCE @ 30°	151.2 - 204.6	171.6
FORCE @ 40°	204.6 - 258.0	219.8
RETURN ANGLE	12° maximum	2°

TEST MEETS SPECIFICATIONS

TECHNICIAN



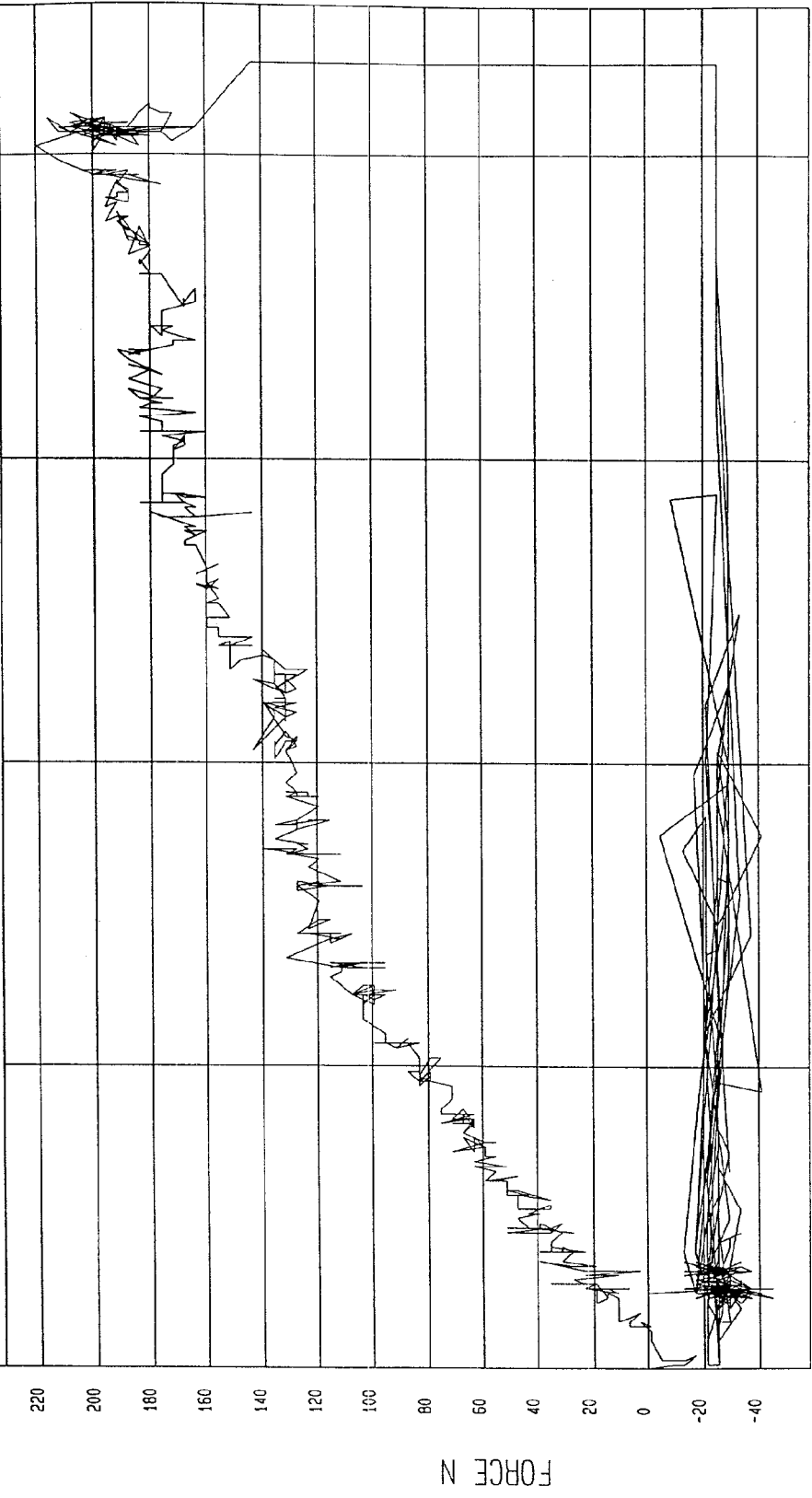
APPROVED BY



TEST: DUMMY CALIBRATION - LUMBAR FLEXION TEST DATE: 02-09-1999 - 09:30:56

COMPONENT: DUMMY # 270

FORCE as a function of TORSO ROTATION



POST-TEST DRIVER DUMMY INSPECTION CHECKLIST

C-53

Type: Side Impact Dummy

Serial Number: 269

Inspected By: Tim Michnay

Date: February 9, 1999

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

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

POST-TEST PASSENGER DUMMY INSPECTION CHECKLIST

C-54

Type: Side Impact Dummy

Serial Number: 270

Inspected By: Tim Michnay

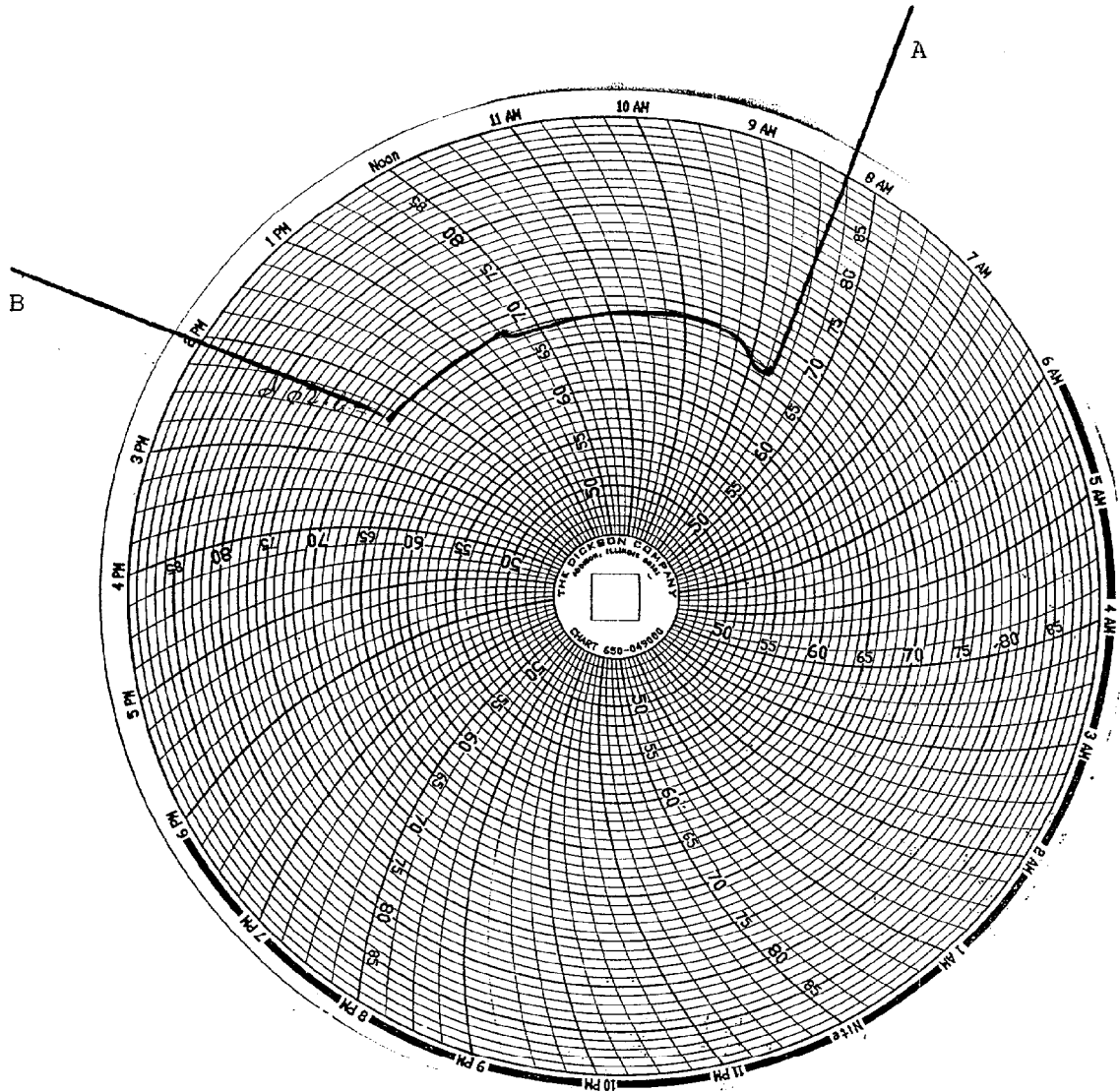
Date: February 9, 1999

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

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

VEHICLE AND DUMMY TEMPERATURE

C-55



A = dummies installed in vehicle
B = test conducted

APPENDIX D
TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

DUMMY AND VEHICLE CALIBRATION DATA
INSTRUMENTS FOR DRIVER DUMMY NO. 269

	DRIVER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	ALFJ7	Endevco	October 20, 1998
Lower Rib Y	APYN0	Endevco	October 20, 1998
Lower Spine Y	ANAP1	Endevco	October 20, 1998
Pelvis Y	AP0G2	Endevco	October 20, 1998
Upper Rib Redundant Y	ALDD6	Endevco	October 20, 1998
Lower Rib Redundant Y	APYN3	Endevco	October 20, 1998
Lower Spine Redundant Y	ANAT6	Endevco	October 20, 1998
Pelvis Redundant Y	AP136	Endevco	October 20, 1998
Head Center of Gravity X	J13990	Endevco	September 27, 1998
Head Center of Gravity Y	J13631	Endevco	September 27, 1998
Head Center of Gravity Z	J13930	Endevco	September 27, 1998

DUMMY AND VEHICLE CALIBRATION DATA
INSTRUMENTS FOR PASSENGER DUMMY NO. 270

	LEFT REAR PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Rib Y	AP2D8	Endevco	October 20, 1998
Lower Rib Y	AP170	Endevco	October 14, 1998
Lower Spine Y	AGTP7	Endevco	October 20, 1998
Pelvis Y	ANBP7	Endevco	October 20, 1998
Upper Rib Redundant Y	AP2A4	Endevco	October 20, 1998
Lower Rib Redundant Y	AP2G9	Endevco	October 14, 1998
Lower Spine Redundant Y	AGT04	Endevco	October 20, 1998
Pelvis Redundant Y	AP1C6	Endevco	October 20, 1998
Head Center of Gravity X	AP170	Endevco	October 20, 1998
Head Center of Gravity Y	ALFP1	Endevco	October 20, 1998
Head Center of Gravity Z	AHTY4	Endevco	October 20, 1998

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Moving Barrier CG X	K19-A11	Entran	August 27, 1998
Moving Barrier CG Y	K19-A15	Entran	August 27, 1998
Moving Barrier CG Z	K11-J17	Entran	August 28, 1998
Moving Barrier Rear Axle X	H02-J02	Entran	December 15, 1998
Moving Barrier Rear Axle Y	J04-F16	Entran	December 15, 1998
Left Mid A-Post Y	I14-D16	Entran	December 21, 1998
Left Lower A-Post Y	F12-G09	Entran	December 21, 1998
Left Mid B-Post Y	J10-E14	Entran	December 21, 1998
Left Lower B-Post Y	G01-J10	Entran	December 15, 1998
Rear Floorpan Above Axle X	F11-G08	Entran	December 21, 1998
Rear Floorpan Above Axle Y	I25-J05	Entran	September 24, 1998
Rear Floorpan Above Axle Z	E10-F03	Entran	December 21, 1998
Driver Seat Track Y	J23-E07	Entran	December 8, 1998
Right Side Sill at Front Seat X	I26-D09	Entran	December 15, 1998
Right Side Sill at Front Seat Y	F12-G05	Entran	December 15, 1998
Right Side Sill at Front Seat Z	I25-J14	Entran	December 8, 1998
Right Side Sill at Rear Seat X	J13-D19	Entran	December 21, 1998
Right Side Sill at Rear Seat Y	J06-D19	Entran	December 21, 1998
Right Side Sill at Rear Seat Z	E13-D18	Entran	December 21, 1998

VEHICLE INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO	MANUFACTURER	CALIBRATION DATE
Left Side Sill at Front Seat Y	A09-G09	Entran	December 15, 1998
Left Side Sill at Rear Seat Y	K16-X10	Entran	August 27, 1998
Right Rear Occupant Compartment Y	H02-J15	Entran	December 21, 1998
Vehicle CG X	G01-J19	Entran	August 27, 1998
Vehicle CG Y	F20-G11	Entran	August 28, 1998
Vehicle CG Z	K11-J07	Entran	August 28, 1998
Left Front Door on Centerline	G13-B14	Entran	September 16, 1998
Midrear of Left Front Door	F20-G12	Entran	September 16, 1998
Left Front Door Upper Centerline	I25-J08	Entran	December 21, 1998
Midrear of Left Rear Door	G01-J11	Entran	December 21, 1998
Left Rear Door Upper Centerline	J23-E06	Entran	December 15, 1998

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