

REPORT NO. NCAP-MGA-99-01

V3003

NEW CAR ASSESSMENT PROGRAM (NCAP)

FRONTAL BARRIER IMPACT TEST

Nissan North America, Inc.
1999 Nissan Altima 4 Door
NHTSA No. MX5200

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: January 13, 1999

Report Date: February 3, 1999

FINAL REPORT

Prepared For:

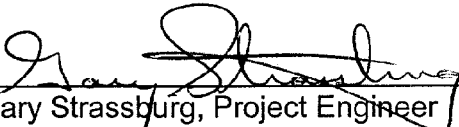
U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
SAFETY PERFORMANCE STANDARDS
OFFICE OF CRASHWORTHINESS STANDARDS
MAIL CODE NPS-10
400 SEVENTH STREET, SW, ROOM 5313
WASHINGTON, D.C. 20590

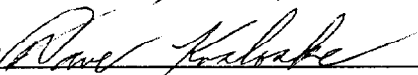
TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. NCAP-MGA-99-01	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle NHTSA New Car Assessment Program (NCAP) Testing of a 1999 Nissan Altima 4 Door NHTSA No.: MX5200		5. Report Date February 3, 1999	
		6. Performing Organization Code MGA	
7. Author(s) Gary Strassburg		8. Performing Organization Report No. MGA-DOT-NCAP-01	
9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105		10. Work Unit No.	
		11. Contract or Grant No. DTNH22-96-D-12010	
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (Mail Code: NPS-10) 400 Seventh St., S.W., Room 5313 Washington, D.C. 20590		13. Type of Report and Period Covered Final Report January 13 - February 15, 1999	
		14. Sponsoring Agency Code	
15. Supplementary Notes			
16. Abstract A 56 kph (35 mph) frontal barrier impact using a rigid barrier was conducted on a 1999 Nissan Altima 4 Door in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure No. TP-NCAP090196 for the determination of vehicle crashworthiness on January 13, 1999. The barrier impact velocity was 56.4 kph (35.06 mph), and the ambient temperature at the time of impact was 21.1°C. The post-test maximum static crush was 616 mm. The test vehicle appeared to comply with the requirements of the following Federal Motor Vehicle Safety Standards: 1. FMVSS 212, "Windshield Mounting" 2. FMVSS 219 (partial), "Windshield Zone Intrusion" 3. FMVSS 301, "Fuel System Integrity" With regard to "Occupant Crash Protection" injury criteria, the driver's HIC was 908 and the 3 msec. Clip (Chest g's) was 51.3 g's. The left and right femur loads for the driver were 1770 and 3328 Newtons, respectively. The passenger's HIC was 834 and the 3 msec Clip was 49.8 g's. The left and right femur maximum loads were 3639 and 2588 Newtons respectively.			
17. Key Words 35 mph Frontal Barrier Impact Test New Car Assessment Program (NCAP) FMVSS 212 Indicant Testing FMVSS 219 (partial) Indicant Testing FMVSS 301 Indicant Testing		18. Distribution Statement Copies of this report are available from: Technical Ref. Division, NHTSA, NASSIF Building, Room 5108 400 Seventh Street, S.W. Washington, D.C. 20590	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 275	22. Price

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

This Final Test Report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-96-D-12010. This document is disseminated under the sponsorship of the U.S. Dept. of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof.

PREPARED BY: 
 Gary Strassburg, Project Engineer
 MGA Research Corporation

APPROVED BY: 
 Dave Kosloske, Project Engineer
 MGA Research Corporation

APPROVAL DATE: 2-22-99

TECHNICIANS:	Al Chalmers	Chris Novak
	Wayne Dahlke	Paul Schlimmer
	Jan Eide	Kyle Shelton
	Chris Kulis	Todd Stevenson
	Tim Michnay	John Wistert
	Erika Miller	

SECRETARY: Donna Janovicz

FINAL REPORT ACCEPTED BY:

 Manager, New Car Assess. Program (NCAP)

 Date of Report Acceptance

 Contracting Officer's Tech. Rep. (COTR)

 Date of Report Acceptance

TABLE OF CONTENTS

<u>SECTION</u>	<u>DESCRIPTION</u>	<u>PAGE NO.</u>
1	Purpose and Summary of NCAP Test	1-1
2	Occupant and Vehicle Information/Data Sheets	2-1
APPENDIX A	Photographs	
APPENDIX B	Vehicle and Dummy Response Data	
APPENDIX C	Dummy Configuration & Performance Verification Data	
APPENDIX D	Test Equipment and Instrumentation Calibration	
APPENDIX E	Vehicle Owner's Occupant Restraint System Instructions	

DATA SHEET LISTING

<u>DATA SHEET NO.</u>	<u>DESCRIPTION</u>	<u>PAGE NO.</u>
1	Crash Test Summary	2-1
2	General Test and Vehicle Parameter Data	2-2
3	Post Impact Data	2-5
4	Test Vehicle Information	2-6
5	Summary of FMVSS 212 Data	2-7
6	Windshield Zone Intrusion FMVSS 219 Data	2-8
7	FMVSS 301 Fuel System Integrity Data	2-9
8	FMVSS 301 Rollover Data	2-10
9	Dummy Injury Criteria Values	2-14
10	Dummy Positioning in Vehicle	2-17
11	Seat Belt Positioning Data	2-20
12	Seat Belt Performance Data	2-21
13	Camera Data	2-22
14	Vehicle Target Locations	2-24
15	Vehicle Accelerometer Location and Data Summary	2-25
16	Post Test Air Bag Data	2-26
17	Test Vehicle Measurements	2-27
18	Accident Investigation Division Data	2-34

SECTION 1

PURPOSE AND SUMMARY OF NCAP TEST

This 35 mph frontal barrier impact test is part of the Composite FY'99 Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-96-D-12010. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 48 kph (30 mph) FMVSS 208/212/219/301-75 requirements.

The 56 kph (35 mph) frontal barrier impact test was conducted in accordance with the National Highway Traffic Safety Administration (NHTSA) Indicant Test Procedure for New Car Assessment Program (NCAP) dated January 1, 1990. Data for FMVSS No. 212, "Windshield Mounting", FMVSS No. 219 (Partial), "Windshield Zone Intrusion", FMVSS No. 301-75, "Fuel System Integrity," as well as occupant performance data are provided herein.

A flat concrete barrier covered with 3/4" plywood was impacted by a 1999 Nissan Altima 4 Door at a velocity of 56.4 kph (35.06 mph). The test was performed at the MGA Proving Grounds and Crash Test Center on January 13, 1999. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

The frontal barrier impact event was documented by one real-time camera and 16 high speed cameras. Camera locations and other pertinent camera information can be found in this report.

Two Part 572E, 50th percentile male anthropomorphic test devices (ATDs) were placed in the driver and right-front passenger seating positions according to dummy placement instructions specified in the Laboratory Indicant Test Procedure.

Both ATDs were instrumented with head and chest primary and redundant triaxial accelerometers, pelvis triaxial accelerometers, a chest displacement transducer, a six axis neck load cell, right/left femur load cells, right/left lower leg sensors, and right/left foot accelerometers. Seat belt load cells were also on the driver and passenger shoulder and lap

belts to measure dummy torso and pelvic section loading. Calibrated ATDs, driver (Serial No. 066), and the right front passenger (Serial No. 065), were used for this test. Certification details, along with instrumentation calibration data, are found in Appendices C and D.

The 107 channels of data were recorded on 10 computers. Appendix B contains the vehicle and dummy response data traces.

The driver's head struck the inflated airbag. The driver HIC was 908 and the maximum chest (CLIP) deceleration over 3 milliseconds was 51.3 g's. The maximum chest compression was 32 mm. The left and right femur loads were 1770 and 3328 Newtons respectively.

The right front passenger's head struck the inflated airbag. The passenger HIC was 834 and maximum chest (CLIP) deceleration over 3 milliseconds was 49.8 g's. The maximum chest compression was 35 mm. The left and right femur loads were 3639 and 2588 Newtons respectively.

SECTION 2
OCCUPANT AND VEHICLE
INFORMATION/DATA SHEETS

DATA SHEET NO. 1
CRASH TEST SUMMARY

Vehicle Yr/Make/Model/Body Style: 1999/Nissan/Altima/4 Door

NHTSA No.: MX5200 VIN.: 1N4DL01D7XC148204

Vehicle Test Weight: 1566 kgs.

Impact Velocity: 56.4 kph

Maximum Static Crush: 616 mm

Vehicle Rebound: 846 mm

DUMMIES:	DRIVER	PASSENGER
Serial Number:	<u>066</u>	<u>065</u>
Restraint System:	<u>Airbag and type II belt</u>	<u>Airbag and type II belt</u>
No. Data Channels:	<u>40</u>	<u>40</u>

Number of Cameras: 1 Real Time
16 High Speed

Door Opening Data: LF yes RF yes LR yes RR yes
(without use of tools)

FRONT SEAT(S) DATA	DRIVER	FRONT PASSENGER
Seat Shift:	<u>2 mm</u> forward;	<u>4 mm</u> forward
Seat Back Movement:	<u>None</u>	<u>None</u>

VISIBLE DUMMY

CONTACT POINTS:	DRIVER	PASSENGER
Head	<u>to airbag</u>	<u>to airbag</u>
Chest	<u>to airbag</u>	<u>to airbag</u>
Left Knee	<u>to dash panel</u>	<u>to dash panel</u>
Right Knee	<u>to dash panel</u>	<u>to dash panel</u>

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

Tire Pressure (at capacity): Front 207 kPa (30 Psi) Rear 200 kPa (29 Psi)

Recommended Tire Size: P195/65R15

Recommended Cold Tire Pressure: Front 207 kPa (30 Psi) Rear 200 kPa (29 Psi)

Tires on Vehicle: P195/65R15 Manufacturer: General

Number of Occupants: 2 Front; 3 Rear; 3rd Seat; 5 TOTAL

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

Type of Front Seat Back: Fixed; X Adj. With; Power; X Lever

Vehicle Capacity Weight (VCW) = 390.1 kg. (A)

No. of Occupants x 68.0 kg. = 340.0 kg. (B)

Rated Cargo Weight (RCW) A-B = 50.1 kg.

GVWR 1809.9 kg. GAWR: Front 976.1 kg.; Rear 845.1 kg.

GENERAL TEST AND VEHICLE PARAMETER DATA (Cont'd)

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (WITH MAXIMUM FLUIDS) = UDW:

Right Front = 419.6 kg Right Rear = 259.5 kg
 Left Front = 432.7 kg Left Rear = 250.4 kg
 TOTAL FRONT WEIGHT = 852.3 kg (62.6 % of Total Vehicle Weight)
 TOTAL REAR WEIGHT = 509.9 kg (37.4 % of Total Vehicle Weight)
 TOTAL UNLOADED DELIVERED WEIGHT (UDW) = 1362.2 kg

CALCULATION FOR TARGET TEST WEIGHT:

UDW = Unloaded Delivered Weight 1362.2 kg
 VCW = Vehicle Capacity Weight 390.1 kg
 DSC = Designated Seating Capacity 5
 RCW = VCW - 68 (DSC) = 50.1 kg*
 Target Test Weight = UDW + RCW + (2 dummies x 78.0 kg/dummy)
 Target Test Weight = 1568.3 kg

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND CARGO:

Right Front = 464.0 kg Right Rear = 317.1 kg
 Left Front = 475.4 kg Left Rear = 309.8 kg
 TOTAL FRONT WEIGHT = 939.4 kg (60.0 % of Total Vehicle Weight)
 TOTAL REAR WEIGHT = 626.9 kg (40.0 % of Total Vehicle Weight)
 TOTAL TEST WEIGHT = 1566.3 kg
 Weight of ballast secured in vehicle trunk area = 0 kg
 Vehicle components removed to meet target weight: Spare tire, jack, rear bumper,
muffler, rear seat, taillights, and trunk interior components.

VEHICLE ATTITUDE (all dimensions in mm):

Delivered Attitude: RF 706 LF 710 RR 692 LR 693
 Test Attitude: RF 691 LF 691 RR 668 LR 667
 Post Test RF 652 LF 733 RR 636 LR 675
 Wheel Base: 2630 mm; C.G. = 1053 mm rearward of front wheel C/L
 Remarks: _____

* light trucks and MPVs RCW is 136 kgs or manufacturer's value, whichever is less

GENERAL TEST AND VEHICLE PARAMETER DATA (Cont'd)

FUEL SYSTEM DATA:Fuel System Capacity From Owner's Manual = 59.8 litersUsable Capacity Figure Furnished by COTR = 59.8 litersTest Volume Range (92 to 94% of Usable Capacity) = 55.0 to 56.2 litersACTUAL TEST VOLUME = 55.2 litersTest Fluid Type: Stoddard Solvent; Spec. Grav. = 0.77Kinematic Viscosity = 1.788 centistrokes; Color = PurpleType of Fuel Pump; Electric X; Mechanical

Does Electric Pump operate with ignition switch "ON" & engine "Off"?

Yes X No

DATA SHEET NO. 3
POST-IMPACT DATA

Vehicle Yr/Make/Model/Body Style: 1999/Nissan/Altima/4 Door
NHTSA No.: MX5200 VIN.: 1N4DL01D7XC148204

Type of Test: 35 mph Frontal Impact Impact Angle: 0°
Date of Test: January 13, 1999 Time of Test: 6:31 p.m.

Ambient Temperature: 21.1 °C (70°F) (Spec. Range = 18.8 to 25.6°C)

Temperature in Occupant Compartment: 21.1° C (70°F)

Windshield Molding Temperature: 21.1° C (70°F)

Required Impact Velocity Range: 55.5 to 57.1 kph

Impact Velocity: primary = 56.4 kph; secondary = 56.6 kph

Distance From Front Bumper to Barrier Face When

Entering Speed Trap: 1300 mm

Exiting Speed Trap: 300 mm

VEHICLE REBOUND AND CRUSH (mm):

Vehicle Length:	Pre-test	= Right	<u>4265</u>	C/L	<u>4460</u>	Left	<u>4276</u>
	Post-test	= Right	<u>3829</u>	C/L	<u>3844</u>	Left	<u>3789</u>
	Crush	= Right	<u>436</u>	C/L	<u>616</u>	Left	<u>487</u>

Distance from front of test vehicle to point of impact (rebound):

Right 777 mm C/L 810 mm Left 950 mm

Average = 846 mm

DATA SHEET NO. 4
TEST VEHICLE INFORMATION

	<u>Front</u>		<u>Rear</u>	
<u>Post-Test Door Opening</u>	<u>Left</u>	<u>Right</u>	<u>Left</u>	<u>Right</u>
(without use of tools)	<u>yes</u>	<u>yes</u>	<u>yes</u>	<u>yes</u>

	<u>Front</u>		<u>Rear</u>	
<u>Seat Movement</u>	<u>Left</u>	<u>Right</u>	<u>Left</u>	<u>Right</u>
Seat Back Movement	<u>none</u>	<u>none</u>	<u>N/A</u>	<u>N/A</u>
Seat Shift (mm)	<u>2 mm forward</u>	<u>4 mm forward</u>	<u>N/A</u>	<u>N/A</u>

Glazing Damage

Backlight/Windshield windshield cracked

Other Notable Impact Effects: both frontal airbags deployed

DATA SHEET 5

FMVSS NO. 212, "WINDSHIELD MOUNTING", DATA SHEET

Details of windshield mounting such as retention method, trim type, etc.:

Windshield set in rubber molding with glue

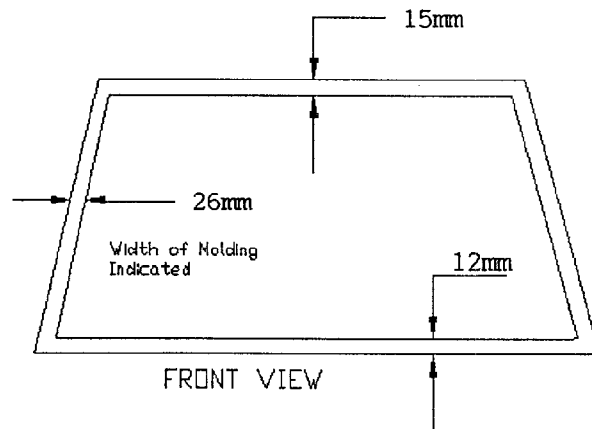
FMVSS 212 Requirements:

The Post-Test periphery retention amount must be at least 75% of the Pre-Test periphery measurement for vehicles NOT equipped with automatic restraints, and 50% for each side of windshield for vehicles equipped with automatic restraint systems for front occupants.

FMVSS 212 TEST DATA:

	WINDSHIELD PERIPHERY		
	PRE-TEST (mm)	POST-TEST (mm)	PERCENT RETENTION
RIGHT SIDE	2116	2116	100%
LEFT SIDE	2116	2116	100%
TOTAL	4232	4232	100%

AREA OF RETENTION FAILURE: None



FAILURE DETAILS:

DATA SHEET 6

FMVSS NO. 219, "WINDSHIELD ZONE INTRUSION", DATA SHEET

PROTECTED ZONE LOWER EDGE REQUIREMENT:

The lower edge of the protected zone is determined by placing a 6.5" dia. rigid sphere weighing 15 pounds in a position such that it simultaneously contacts the inner surface of the windshield and the surface of the instrument panel, including padding, and drawing the locus of points on the inner surface of the windshield contactable by the sphere across the width of the instrument panel. From the outermost contact points, extend the locus line horizontally to the edges of the windshield, and then draw a line on the inner surface of the windshield below and $\frac{1}{2}$ " distant from the locus line. The LOWER EDGE OF THE PROTECTED ZONE is the longitudinal projection onto the outer surface of the windshield of this line.

FMVSS 219 TEST DATA:

A= 1152 mm

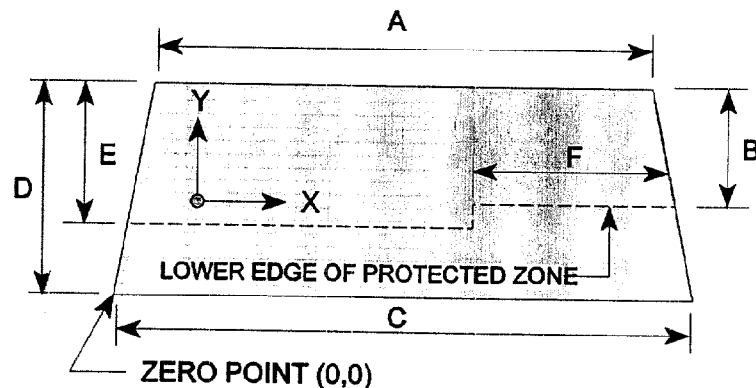
B= 454 mm

C= 1460 mm

D= 800 mm

E= 550 mm

F= 640 mm

DETAILS OF WINDSHIELD GLASS PENETRATION GREATER THAN 1/4":

(Show location of penetration)

DATA SHEET 7

FMVSS NO. 301-75, FUEL SYSTEM INTEGRITY POST IMPACT TEST DATA

FMVSS NO. 301

Test Vehicle NHTSA No.: MX5200 Test Date: January 13, 1999Vehicle Mfr./Make/Model: 1999/Nissan/Altima/4 DoorUsable Capacity of Vehicle's Fuel Tank: 59.8 Liters
(figure furnished by vehicle manufacturer)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.

AMOUNT OF STODDARD SOLVENT ADDED TO VEHICLE'S FUEL TANK:55.2 Liters which is 92.3 % of the stated USABLE CAPACITY.TEST VEHICLE IMPACT TYPE: ☒ Frontal (35 mph)☐ Oblique (30 mph) with ☐ barrier face first
contacting (driver/passenger) side☐ Rear Moving Barrier (30 mph)☐ Side Impact MDB (33.2 mph)FUEL SPILLAGE MEASUREMENT:

1. From impact until vehicle motion ceases
2. For 5 minute period after vehicle motion ceases
3. For next 25 minutes

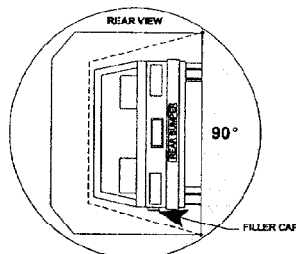
ACTUAL	MAX ALLOWED
0 oz.	1 OZ
0 oz.	5 OZ
0 oz.	1 oz./1 MIN

SOLVENT SPILLAGE DETAILS: None

DATA SHEET 8

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE: 0° - 90°

Vehicle NHTSA No.: MX5200

I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 40 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL

7 minutes 40 seconds

Next whole minute interval

8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 min FROM onset of rotation	6th min.	7th min.	8th min. if reqd.
------------------------------------	----------	----------	-------------------

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
----------	---------	---------	---------

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0
---	---	---	---

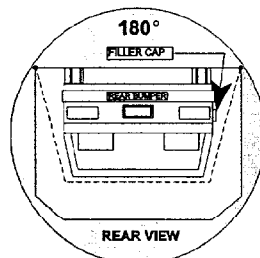
Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATIONS(S): None

DATA SHEET 8
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (Cont'd)

TEST PHASE: 90°- 180°

Vehicle NHTSA No.: MX5200



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 27 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds
TOTAL 7 minutes 27 seconds

Next whole minute interval 8 minutes

II. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 min FROM onset of rotation	6th min.	7th min.	8th min. if reqd.
------------------------------------	----------	----------	-------------------

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
----------	---------	---------	---------

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0
---	---	---	---

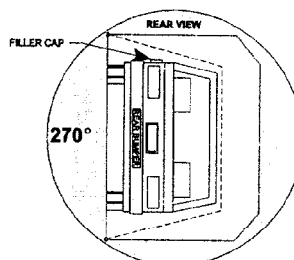
Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATIONS(S): None

DATA SHEET 8

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (Cont'd)

TEST PHASE: 180° - 270°

Vehicle NHTSA No.: MX5200I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:Rollover Fixture 90° Rotation Time 2 minutes 26 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 secondsTOTAL 7 minutes 26 secondsNext whole minute interval 8 minutesII. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 min FROM onset of rotation	6th min.	7th min.	8th min. if reqd.
------------------------------------	----------	----------	-------------------

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
----------	---------	---------	---------

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0
---	---	---	---

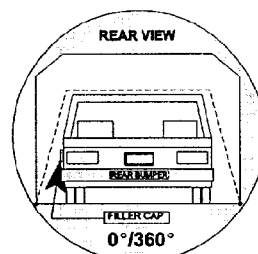
Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATIONS(S): None

DATA SHEET 8

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (Cont'd)

TEST PHASE: 270° - 360°

Vehicle NHTSA No.: MX5200I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:Rollover Fixture 90° Rotation Time 2 minutes 47 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 secondsTOTAL 7 minutes 47 secondsNext whole minute interval 8 minutesII. FMVSS 301 REQUIREMENTS:

(1) Time Period

First 5 min FROM onset of rotation	6th min.	7th min.	8th min. if reqd.
------------------------------------	----------	----------	-------------------

(2) Maximum Allowable Solvent Spillage

5 ounces	1 ounce	1 ounce	1 ounce
----------	---------	---------	---------

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0
---	---	---	---

Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATIONS(S): None

DATA SHEET 9

DUMMY INJURY CRITERIA VALUES DATA SHEET

Vehicle Year/Make/Model/Body Style: 1999/Nissan/Altima/4 DoorVehicle NHTSA No.: MX5200 Test Date: January 13, 1999

DESCRIPTION	UNIT	MAXIMUM VALUE			
		pos.	msec.	neg.	msec.
Pos. 1 Head X	G	8.0	200	-75.3	77
Pos. 1 Head Y	G	3.5	181	-11.8	86
Pos. 1 Head Z	G	29.8	64	-3.6	115
Pos. 1 Head Resultant	G	78.3	76	--	--
Pos. 2 Head X	G	6.7	200	-58.8	87
Pos. 2 Head Y	G	6.5	80	-4.8	41
Pos. 2 Head Z	G	34.7	77	-3.8	40
Pos. 2 Head Resultant	G	67.0	78	--	--
Pos. 1 Chest X	G	4.4	184	-52.8	63
Pos. 1 Chest Y	G	4.6	90	-8.1	53
Pos. 1 Chest Z	G	8.9	49	-9.6	98
Pos. 1 Chest Resultant	G	53.3	63	--	--
Pos. 1 Chest Displacement	mm	31.8	81	--	--
Pos. 2 Chest X	G	4.9	188	-51.5	77
Pos. 2 Chest Y	G	5.5	53	-5.1	94
Pos. 2 Chest Z	G	10.2	79	-5.1	116
Pos. 2 Chest Resultant	G	52.4	77	--	--
Pos. 2 Chest Displacement	mm	34.7	78	--	--
Pos. 1 Left Femur	N	797	53	-1770	62
Pos. 1 Right Femur	N	689	52	-3328	59
Pos. 2 Left Femur	N	557	102	-3639	59
Pos. 2 Right Femur	N	786	53	-2588	61

DATA SHEET 9
DUMMY INJURY CRITERIA VALUES DATA SHEET (Cont'd)

DESCRIPTION	UNIT	MAXIMUM VALUE			
		pos.	msec.	neg.	msec.
Pos. 1 Lap Belt Load	N	6543	62	--	--
Pos. 1 Torso Belt Load	N	6917	75	--	--
Pos. 2 Lap Belt Load	N	593	66	--	--
Pos. 2 Torso Belt Load	N	7268	76	--	--
Pos. 1 Upper Neck Fx	N	463	81	-211	53
Pos. 1 Upper Neck Fy	N	130	175	-224	89
Pos. 1 Upper Neck Fz	N	1899	68	-193	21
Pos. 1 Neck Force Resultant	N	1923	68	--	--
Pos. 1 Upper Neck Mx	N•m	8.6	171	-9.0	119
Pos. 1 Upper Neck My	N•m	35.1	68	-15.3	54
Pos. 1 Upper Neck Mz	N•m	5.7	103	-2.4	155
Pos. 1 Neck Moment Result	N•m	35.5	68	--	--
Pos. 2 Upper Neck Fx	N	76	15	-621	66
Pos. 2 Upper Neck Fy	N	59	41	-139	155
Pos. 2 Upper Neck Fz	N	2117	78	-169	20
Pos. 2 Neck Force Result	N	2133	78	--	--
Pos. 2 Upper Neck Mx	N•m	10.9	86	-6.5	135
Pos. 2 Upper Neck My	N•m	19.0	135	-36.0	65
Pos. 2 Upper Neck Mz	N•m	4.1	124	-6.3	87
Pos. 2 Neck Moment Result	N•m	36.0	65	--	--
Pos. 1 Pelvic (X)	G	*	*	-62.3	59
Pos. 1 Pelvic (Y)	G	7.1	93	-15.9	55
Pos. 1 Pelvic (Z)	G	20.8	70	-5.0	200
Pos. 1 Pelvic Resultant	G	*	*	--	--

* Not Valid After 72 msec.

DATA SHEET 9
DUMMY INJURY CRITERIA VALUES DATA SHEET (Cont'd)

DESCRIPTION	UNIT	MAXIMUM VALUE			
		pos.	msec.	neg.	msec.
Pos. 2 Pelvic (X)	G	3.4	144	-61.8	60
Pos. 2 Pelvic (Y)	G	6.0	51	-5.4	71
Pos. 2 Pelvic (Z)	G	*	*	--	--
Pos. 2 Pelvic Resultant	G	*	*	--	--
Pos. 1 Left Upper Tibia Mx	N•m	79.4	56	-65.8	53
Pos. 1 Left Upper Tibia My	N•m	39.2	55	-188.0	52
Pos. 1 Left Upper Tibia Fz	N	722	54	-111	69
Pos. 1 Left Lower Tibia Mx	N•m	15.1	44	-208.9	54
Pos. 1 Left Lower Tibia My	N•m	75.3	55	-41.4	46
Pos. 1 Left Lower Tibia Fz	N	990	52	-69	176
Pos. 1 Right Upper Tibia Mx	N•m	83.9	46	-53.0	91
Pos. 1 Right Upper Tibia My	N•m	43.8	71	-419.2	45
Pos. 1 Right Upper Tibia Fz	N	2109	45	-53	154
Pos. 1 Right Lower Tibia Mx	N•m	39.2	46	-146.4	48
Pos. 1 Right Lower Tibia My	N•m	47.6	46	-210.2	60
Pos. 1 Right Lower Tibia Fz	N	2839	45	-53	172
Pos. 2 Left Upper Tibia Mx	N•m	86.2	58	-42.1	44
Pos. 2 Left Upper Tibia My	N•m	137.8	58	-187.1	71
Pos. 2 Left Lower Tibia Fz	N	868	47	-81	150
Pos. 2 Left Lower Tibia Mx	N•m	134.8	57	-5.2	34
Pos. 2 Left Lower Tibia My	N•m	299.2	61	-81.5	44
Pos. 2 Left Lower Tibia Fz	N	1097	47	-78	159
Pos. 2 Right Upper Tibia Mx	N•m	62.5	51	-15.0	151
Pos. 2 Right Upper Tibia My	N•m	45.3	152	-132.6	40
Pos. 2 Right Upper Tibia Fz	N	983	38	-51	150
Pos. 2 Right Lower Tibia Mx	N•m	46.7	51	-68.2	57
Pos. 2 Right Lower Tibia My	N•m	149.8	86	-40.5	46
Pos. 2 Right Lower Tibia Fz	N	1154	38	-40	143

* No Valid Data Collected

DATA SHEET 10 DUMMY POSITIONING IN VEHICLE

Vehicle NHTSA No.: MX5200 Vehicle: 1999 Nissan Altima 4 Door

SEAT TYPE:

 Bench
 X Bucket
 Split Bench

ADJUSTER TYPE:

Driver: X Manual
 Power
Passenger: X Manual
 Power

BUCKET SEAT BACK TYPE:

 Fixed
 X Adjustable Reclining
 Fixed
 X Adjustable Reclining

DRIVER SEAT POSITION

11th detent of 20 detents

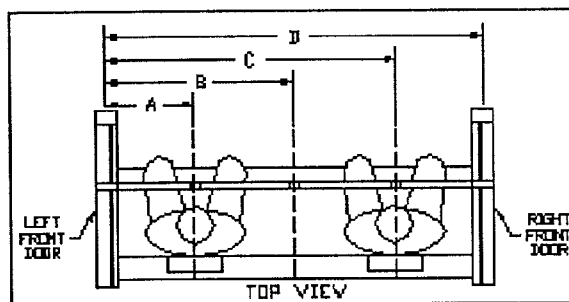
Seat back angle 16.3° (ref. sill)*
Set seven positions back from
the first locking position

PASSENGER SEAT POSITION

11th detent of 20 detents

Seat back angle 16.9° (ref. sill)*
Set seven positions back from
the first locking position

Steering column set to mid position. Steering column angle 24.9°



066 DUMMY ID 065

A = Left Door to Driver Centerline	<u>409</u> mm
B = Left Door to Center Passenger Centerline	<u>764</u> mm
C = Left Door to Right Passenger Centerline	<u>1119</u> mm
D = Left Door to Right Door	<u>1528</u> mm

* Measured at head rest posts

DATA SHEET 10
DUMMY POSITIONING IN VEHICLE (Cont'd)

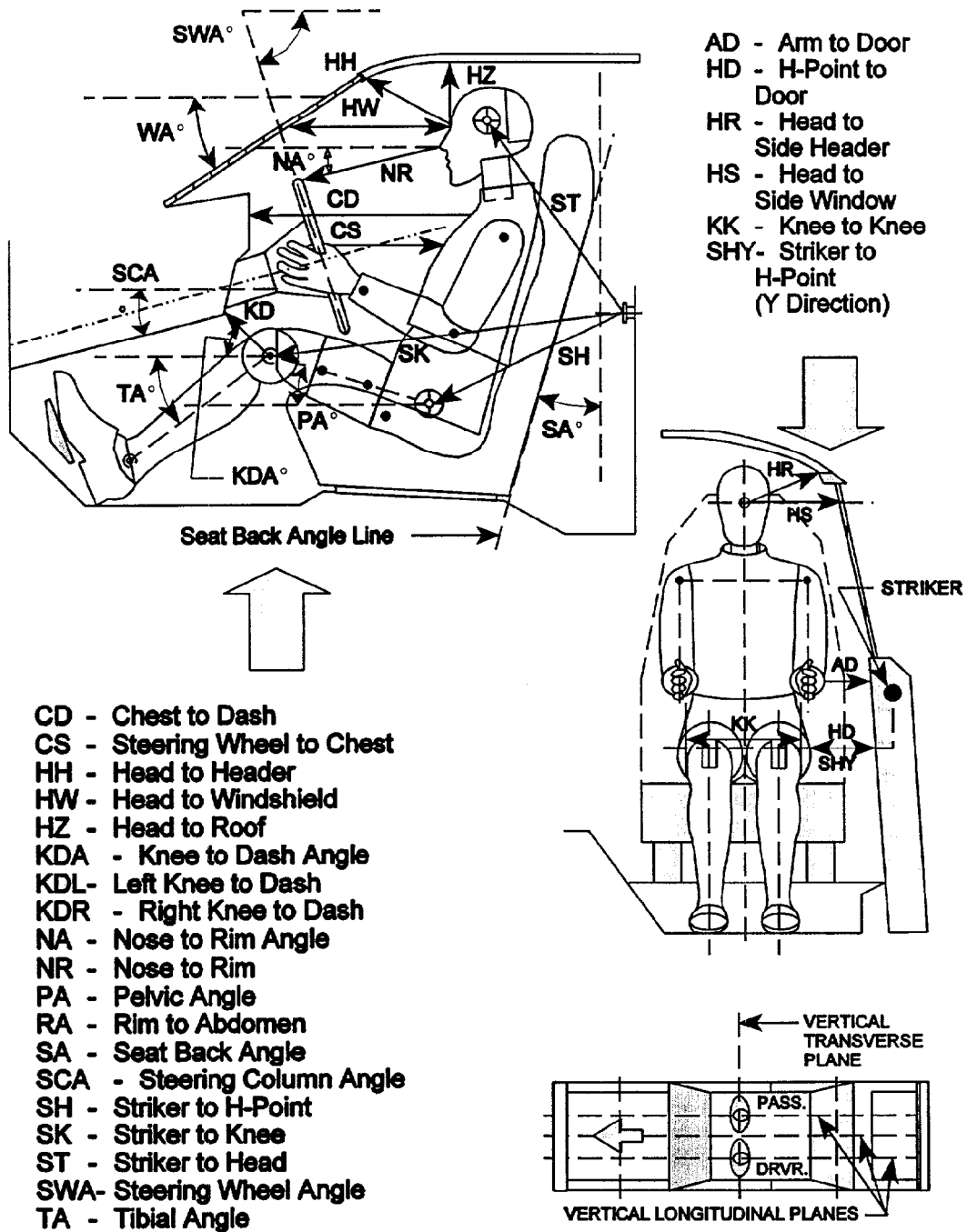
	Units (mm)	
	DRIVER (Serial #066)	PASSENGER (Serial #065)
WA°	29.5°	
SWA°	66°	N/A
SCA°	24.9°	N/A
SA°	16.3° **	16.9° **
HZ	164	149
HH	308	317
HW	560	538
HR	250	248
NR	430 Angle 14.4°	N/A
CD	535	584
CS	344	N/A
RA	217	N/A
KDL	187 Angle (KDA) 24.1°	184
KDR	158	190 Angle 33.1°
PA°	22.6°	23.9°
TA°	37.1°	56.3°
KK	305	253
ST*	529 Angle 5.7°	511 Angle 3.1°
SK*	579 Angle 94.3°	612 Angle 94.1°
SH*	229 Angle 128.2°	242 Angle 120.8°
SHY	255	252
HS	285	278
HD	134	132
AD	109	88

N/A = Not Applicable

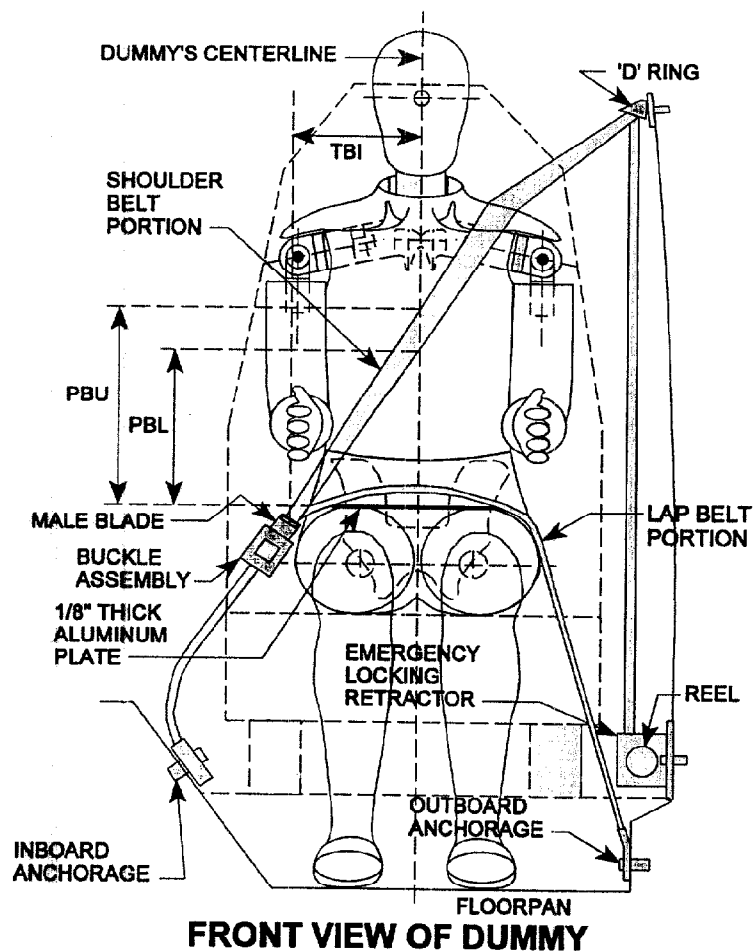
* angle measured with respect to vertical

** measured on headrest posts

FRONT SEAT MEASUREMENTS



DATA SHEET 11 SEAT BELT POSITIONING DATA



(Illustration)

Dimension = mm

	DRIVER DUMMY	PASSENGER DUMMY
PBU -- Top surface of alum. plate to upper edge	350	335
PBL -- Top surface of alum. plate to belt lower edge	272	235

DATA SHEET 12
SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

<u>BELT LENGTH DATA:</u>	<u>Driver</u>	<u>Passenger</u>
Length from trim above retractor reel to "D" ring as measured on dummy.	<u>184 mm</u>	<u>185 mm</u>
Shoulder belt length as measured on Part 572 Dummy.	<u>867 mm</u>	<u>880 mm</u>
Lap belt length as measured on Part 572 Dummy.	<u>798 mm</u>	<u>782 mm</u>
 <u>SHOULDER BELT SPOOL-OFF DATA:</u>		
As determined by film analysis	<u>45 mm</u>	<u>48 mm</u>
As determined mechanically at Retractor	<u>54 mm</u>	<u>72 mm</u>
As determined mechanically at D-Ring	<u>48 mm</u>	<u>54 mm</u>
 <u>BELT STRETCH DATA:</u>		
Measured electronically between shoulder belt load cell and the "D" ring.	<u>Not Recorded</u>	<u>Not Recorded</u>
Measured mechanically	<u>Not Recorded</u>	<u>Not Recorded</u>
 <u>RETRACTOR LOCK-UP TIME:</u>		
As determined by shoulder belt spool-off observed in on-board cameras	<u>40 msec.</u>	<u>34 msec.</u>

DATA SHEET 13
CAMERA LOCATIONS

Veh. NHTSA No.: MX5200 Test Date: January 13, 1999

Vehicle Year/Make/Model/Body Style: 1999/Nissan/Altima/4 Door

CAMERA POSITION NO.	VIEW	CAMERA POSITIONS (mm.)*			ANGLE (deg)	FILM PLANE TO HEAD TARGET (mm)	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Real-Time Left Side View	-	-	-	-	-	18	32
2	Left Front View	1000	-7930	1510	90	7495	25	1005
3	Steering Column Top	2080	-7890	1550	90	7455	25	1020
4	Steering Column Bottom	2070	-7910	1030	90	7475	25	1111
5	Driver Close-up	1450	-10540	1410	90	10105	75	1000
6	Driver Angle	4850	-5350	2050			50	1020
7	Onboard Driver						35	1010
8	Onboard Passenger						35	1005
9	Right Overall	2250	7860	1370	90	7415	13	985
10	Right Passenger Half	1020	7930	1420	90	7485	25	1183
11	Right Close-up	1450	10160	1310	90	9715	75	1093
12	Right Angle	5000	5410	1980			50	1282
13	Windshield	-380	0	2750			13	901
14	Top Driver	100	-450	1625			13	858
15	Top Passenger	100	480	1625			13	926
16	Pit Front	980	0	-3195			13	1020
17	Pit Rear	2620	0	-3195			13	1010

* COORDINATES:

+X = film plane rearward of barrier

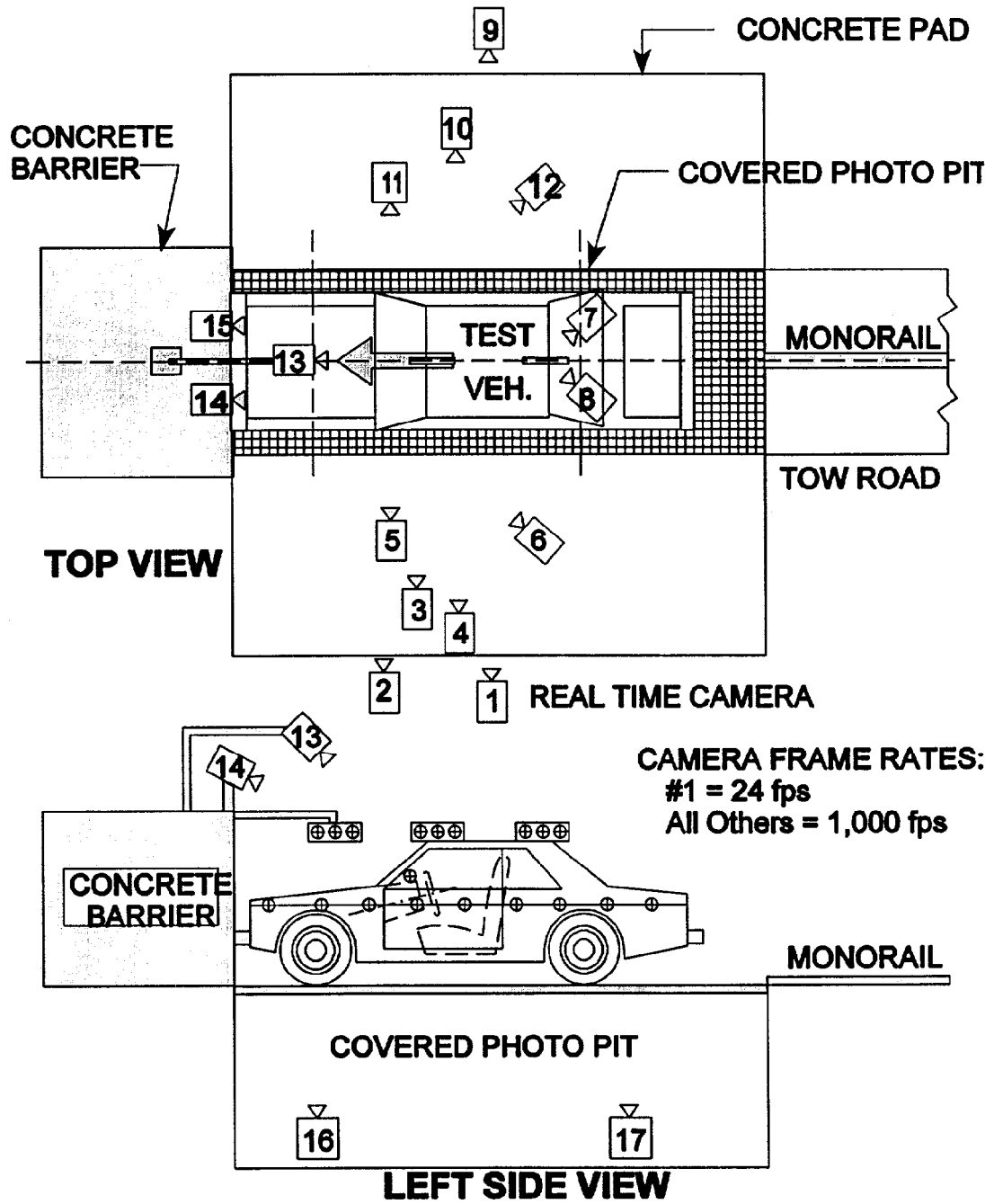
+Y = film plane to right of monorail centerline

+Z = film plane to above ground level

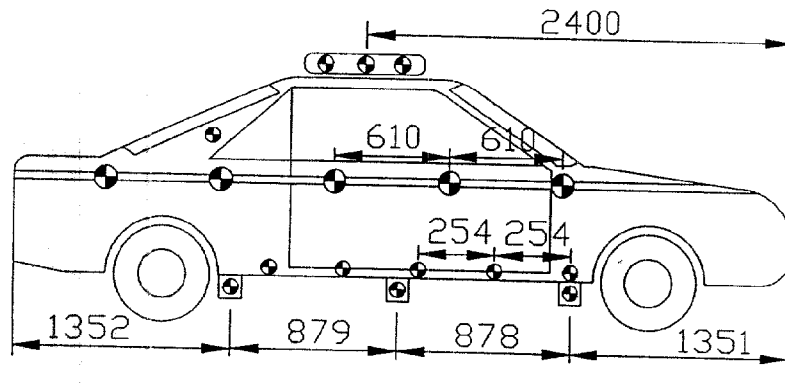
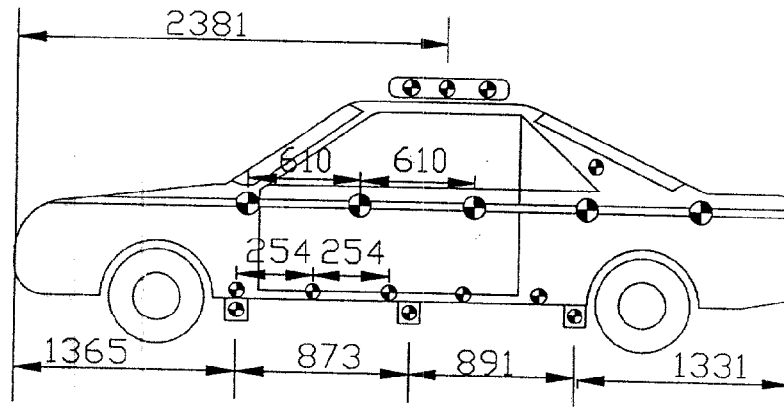
ORIGIN: For X and Y it is the Impact Point. For Z it is the Floor.

CAMERA LOCATIONS (Cont'd)

CAMERA POSITIONS FOR FRONTAL IMPACTS

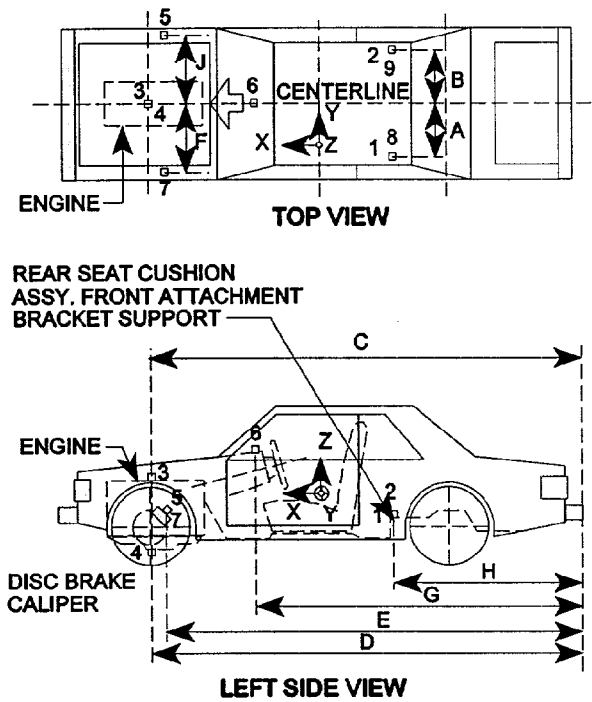


DATA SHEET 14
VEHICLE TARGET LOCATIONS



(DIMENSIONS IN MM)

DATA SHEET 15
VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY



Units: (mm)

Dimension	Length
A	361
B	361
C	3638
D	3595
E	2876
F	671
G	1608
H	275
J	671

ACCEL. NO.	ACCELEROMETER	DIRECTION
1 and 8	Left Rear Seat Crossmember	X
2 and 9	Right Rear Seat Crossmember	X
3	Top of Engine	X
4	Bottom of Engine	X
5	Right Side Brake Caliper	X
6	Instrument Panel	X
7	Left Side Brake Caliper	X

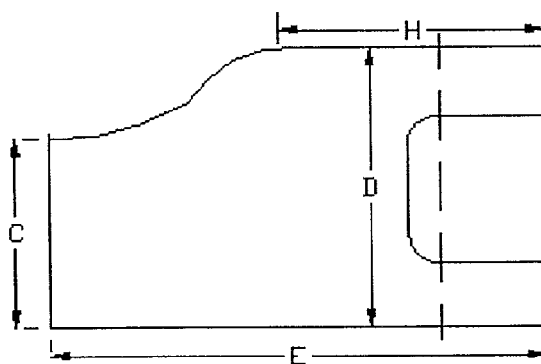
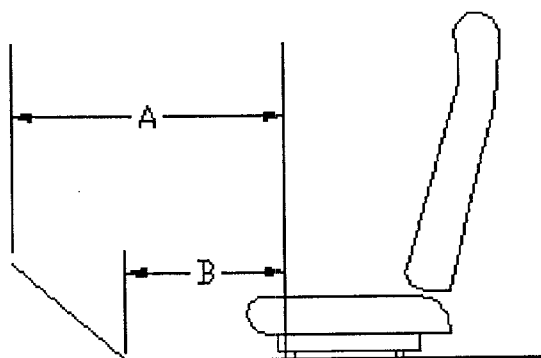
DATA SHEET 16
POST TEST AIRBAG DATA

- A. Number of Vent Holes: Driver 2; Passenger 2
- B. Size of Vent Holes: Driver 19 mm dia; Passenger 44 mm dia;
- C. Total Vent Area; Driver 5.7 cm² Passenger 30.4 cm²
- D. Deflated Airbag Length and Width Dimensions or, if Round, Diameter
Driver; Length____mm, Width____mm, Diameter 584 mm
Passenger; Length 635 mm, Width 406 mm, Diameter ____ mm
- E. Is the Airbag Tethered?
Driver; X Yes; ____ No; If yes, record length of tether 356 mm
Passenger; X Yes; ____ No, If yes, record length of tether 483 mm

DATA SHEET 17
TEST VEHICLE MEASUREMENTS

STATIC FOOTWELL DEFORMATION

Driver's Side



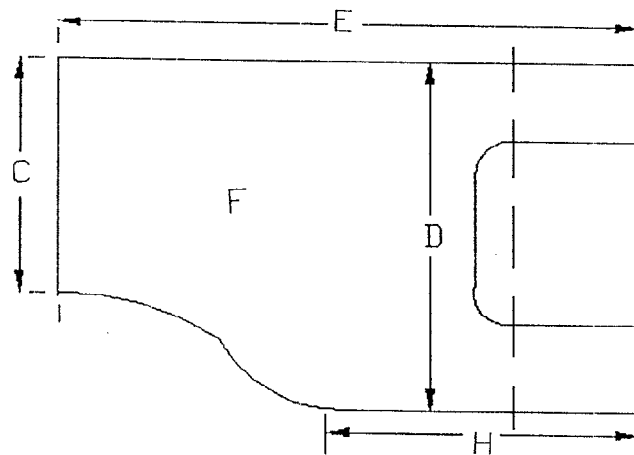
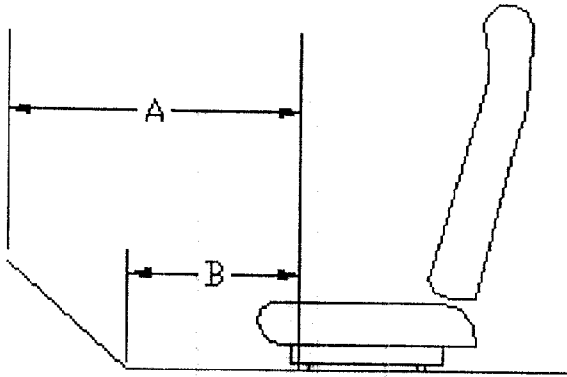
Units = mm

MEASUREMENT	PRE TEST	POST TEST	DIFFERENCE
A	827	615	212
B	595	442	153
C	470	491	-21
D	380	380	0
E	1795	1479	216
H	507	482	25

DATA SHEET 17
TEST VEHICLE MEASUREMENTS (Cont'd)

STATIC FOOTWELL DEFORMATION

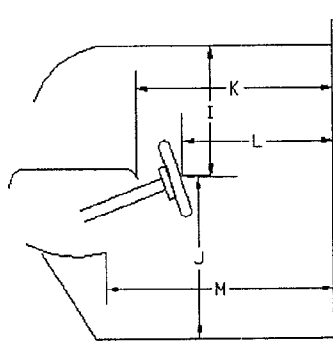
Passenger's Side



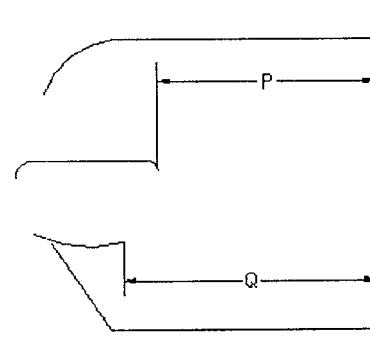
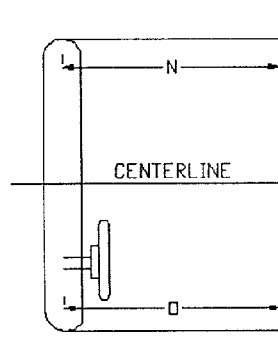
Units = mm

MEASUREMENT	PRE TEST	POST TEST	DIFFERENCE
A	805	572	233
B	525	463	62
C	475	427	48
D	369	365	4
E	1700	1495	205
H	545	297	248

DATA SHEET 17
 TEST VEHICLE MEASUREMENTS (Cont'd)
 STATIC PASSENGER COMPARTMENT INTRUSION



MEASUREMENTS
 FROM C-PILLAR
 BELT ANCHORAGE



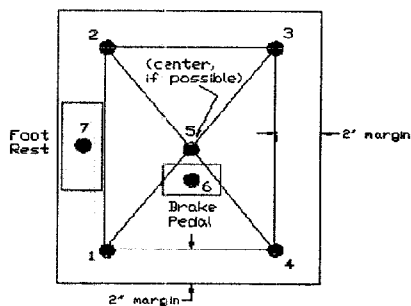
Units = mm

MEASUREMENT	PRE TEST	POST TEST	DIFFERENCE
I	422	334	88
J	658	775	-117
K	1605	1492	113
L	1390	1329	61
M	1525	1461	64
N	1820	1747	73
O	1835	1743	92
P	1580	1547	33
Q	1550	1488	62

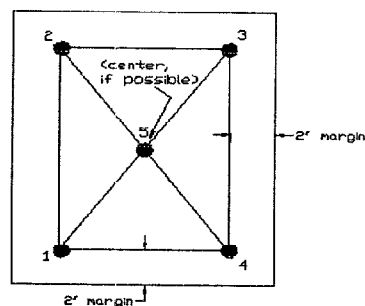
DATA SHEET 17

TEST VEHICLE MEASUREMENTS (Cont'd)

TOE PAN MEASUREMENTS



DRIVER



PASSENGER

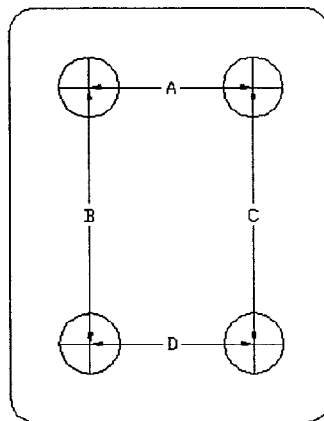
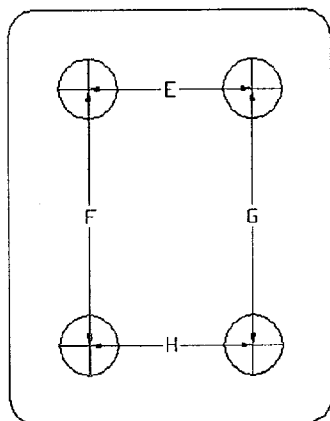
Driver						
Location	X			Z		
	Pre-Test	Post-Test	Def.	Pre-Test	Post-Test	Def.
1	605	488	117	-20	-6	14
2	740	568	172	88	154	66
3	735	531	204	82	120	38
4	609	422	187	-30	4	34
5	681	495	186	32	99	67
6	580	403	177	125	185	60
7	620	543	77	47	63	16
Passenger						
Location	X			Z		
	Pre-Test	Post-Test	Def.	Pre-Test	Post-Test	Def.
1	545	N/A	N/A	-30	N/A	N/A
2	720	522	198	85	168	83
3	730	538	192	87	171	84
4	580	518	62	-19	-14	5
5	670	484	186	50	116	66

DATA SHEET 17
TEST VEHICLE MEASUREMENTS (Cont'd)

UNDERBODY FLOORBOARD DEFORMATION

DRIVER'S SIDE

PASSENGER'S SIDE



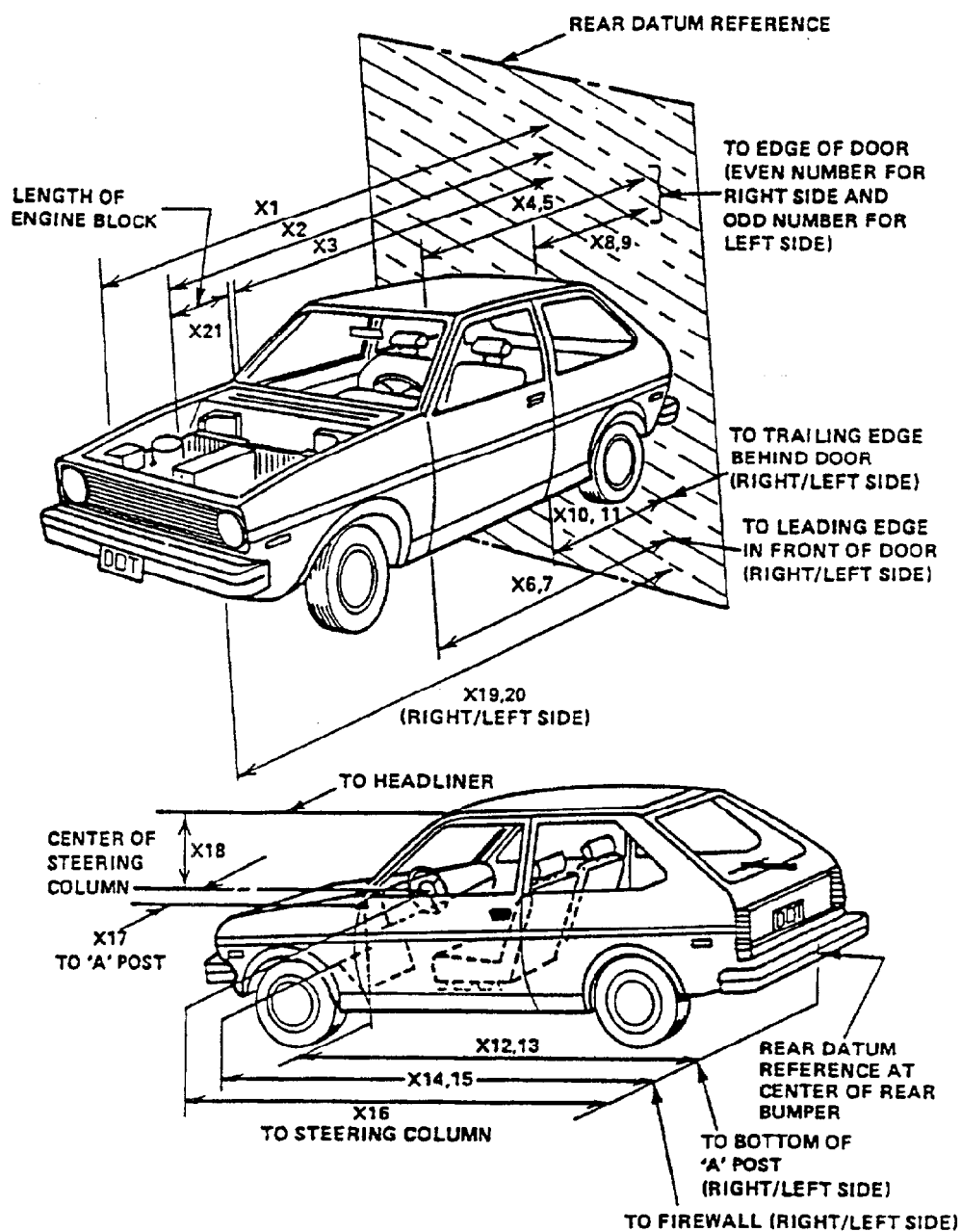
MEASUREMENT	PRE TEST	POST TEST	DIFFERENCE
A	260	250	10
B	218	216	2
C	213	204	9
D	258	253	5
E	231	212	19
F	219	213	6
G	225	224	1
H	231	230	1

DATA SHEET 17
TEST VEHICLE MEASUREMENTS (Cont'd)

No.	MEASUREMENT DESCRIPTION:	Pre-Test (mm)	Post-Test (mm)	Diff. (mm)
X1*	Total Length of Test Vehicle at Centerline	4460	3844	616
X2	Rear Surface of Vehicle to Front of Engine	3772	3496	276
X3	Rear Surface of Vehicle to Firewall	3327	3188	139
X4	Rear Surface to Upr. Leading Edge of Rt. Door	2968	2974	-6
X5	Rear Surface to Upr. Leading Edge of Left Door	2973	2966	7
X6	Rear Surface to Lwr. Leading Edge of Rt. Door	2961	2957	4
X7	Rear Surface to Lwr. Leading Edge of Left Door	2959	2916	43
X8	Rear Surface to Upr. Trailing Edge of Rt. Door	1911	1922	-11
X9	Rear Surface to Upr. Trailing Edge of Left Door	1915	1918	-3
X10	Rear Surface to Lwr. Trailing Edge of Rt. Door	1914	1911	-3
X11	Rear Surface to Lwr. Trailing Edge of Left Door	1916	1911	5
X12	Rear Surface to Bottom of A-Post on Rt. Side	2971	2958	13
X13	Rear Surface to Bottom of A-Post on Left Side	2972	2958	14
X14	Rear Surface to Firewall on Right Side	3257	3228	31
X15	Rear Surface to Firewall on Left Side	3261	3253	8
X16	Rear Surface to Steering Column	2527	2529	-2
X17	Center of Steering Column to A-Post	353	322	31
X18	Center of Steering Column to Headlining	419	334	85
X19*	Rear Surface to Right Side of Front Bumper	4265	3829	436
X20*	Rear Surface to Left Side of Front Bumper	4276	3789	487
X21	Length of Engine Block	520	520	0

* The bumper separated from the vehicle during impact.

DATA SHEET 17 TEST VEHICLE MEASUREMENTS (Cont'd)



DATA SHEET 18
ACCIDENT INVESTIGATION DIVISION DATA
FOR 35 MPH FRONTAL BARRIER IMPACT

Vehicle Make/Model/Body Style: 1999/Nissan/Altima/4 Door

VIN: 1N4DL01D7XC148204

Model Year: 1999 ; Build Date: 10/98 ; Test Date: January 13, 1999

Veh. Size Category: Mid ; TEST WEIGHT: 1566 kg

Veh. Wheelbase: 2630 mm ; Front Overhang: 927 mm ; Overall Width: 1760 mm

ACCELEROMETER DATA:

Location: As per measurements on pages 2-25

Calibration Procedure: As per MGA Calibration Procedure

Linearity: >99.9% ; Integration Algorithm: Trapezoidal

Veh: Impact Speed: 56.4 kph ; Time Of Separation: 173 msec

Velocity Change: 65.5 kph

Collision Deformation Classification (CDC) Code: F (Frontal)

Crush Depth C1 = 487 mm

Dimensions*: C2 = 552 mm

C3 = 596 mm

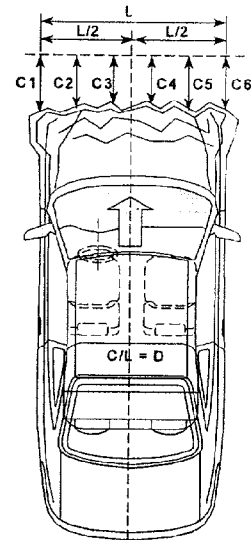
C4 = 604 mm

C5 = 561 mm

C6 = 436 mm

Midpoint Of Damage: D = Vehicle Centerline (Longitudinal)

Length Of Damaged Region: L = 1462 mm



* The bumper separated from the vehicle during impact.

APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

	<u>Page No.</u>
Photo No. A-1 - Pre-Test Front View of Test Vehicle	A-1
Photo No. A-2 - Post-Test Front View of Test Vehicle	A-2
Photo No. A-3 - Pre-Test Rear View of Test Vehicle	A-3
Photo No. A-4 - Post-Test Rear View of Test Vehicle	A-4
Photo No. A-5 - Pre-Test Left Side View of Test Vehicle	A-5
Photo No. A-6 - Post-Test Left Side View of Test Vehicle	A-6
Photo No. A-7 - Pre-Test Left Rear Three-Quarter View of Test Vehicle	A-7
Photo No. A-8 - Post-Test Left Rear Three-Quarter View of Test Vehicle	A-8
Photo No. A-9 - Pre-Test Right Side View of Test Vehicle	A-9
Photo No. A-10 - Post-Test Right Side View of Test Vehicle	A-10
Photo No. A-11 - Pre-Test Right Front Three-Quarter View of Test Vehicle	A-11
Photo No. A-12 - Post-Test Right Front Three-Quarter View of Test Vehicle	A-12
Photo No. A-13 - Pre-Test Fuel Filler Cap View	A-13
Photo No. A-14 - Pre-Test Engine Compartment View	A-14
Photo No. A-15 - Post-Test Engine Compartment View	A-15
Photo No. A-16 - Pre-Test Front Underbody View	A-16
Photo No. A-17 - Post-Test Front Underbody View	A-17
Photo No. A-18 - Pre-Test Rear Underbody View	A-18
Photo No. A-19 - Post-Test Rear Underbody View	A-19
Photo No. A-20 - Pre-Test Windshield View	A-20
Photo No. A-21 - Post-Test Windshield View	A-21
Photo No. A-22 - Pre-Test Driver Dummy Position Left Side View	A-22
Photo No. A-23 - Post-Test Driver Dummy Position Left Side View	A-23
Photo No. A-24 - Pre-Test Driver Dummy Position Left Side View (Door Open)	A-24
Photo No. A-25 - Post-Test Driver Dummy Position Left Side View (Door Open)	A-25
Photo No. A-26 - Pre-Test Driver Seat Position View	A-26
Photo No. A-27 - Post-Test Driver Seat Position View	A-27
Photo No. A-28 - Pre-Test Driver Dummy Knee Position	A-28
Photo No. A-29 - Post-Test Driver Dummy Knee Position	A-29

TABLE OF PHOTOGRAPHS (Cont'd)

	<u>Page No.</u>
Photo No. A-30 - Post-Test Driver Airbag Contact	A-30
Photo No. A-31 - Post-Test Driver Knee Contact View	A-31
Photo No. A-32 - Pre-Test Driver Windshield View	A-32
Photo No. A-33 - Post-Test Driver Windshield View	A-33
Photo No. A-34 - Pre-Test Passenger Dummy Position Right Side View	A-34
Photo No. A-35 - Post-Test Passenger Dummy Position Right Side View	A-35
Photo No. A-36 - Pre-Test Pass. Dummy Position Right Side View (Door Open)	A-36
Photo No. A-37 - Post-Test Pass. Dummy Position Right Side View (Door Open)	A-37
Photo No. A-38 - Pre-Test Passenger Seat Position View	A-38
Photo No. A-39 - Post-Test Passenger Seat Position View	A-39
Photo No. A-40 - Pre-Test Passenger Dummy Knee Position	A-40
Photo No. A-41 - Post-Test Passenger Dummy Knee Position	A-41
Photo No. A-42 - Post-Test Passenger Airbag Contact	A-42
Photo No. A-43 - Post-Test Passenger Knee Contact View	A-43
Photo No. A-44 - Pre-Test Passenger Windshield View	A-44
Photo No. A-45 - Post-Test Passenger Windshield View	A-45
Photo No. A-46 - Vehicle Certification Label	A-46
Photo No. A-47 - Tire Placard	A-47
Photo No. A-48 - Vehicle Impact	A-48
Photo No. A-49 - Rollover 90°	A-49
Photo No. A-50 - Rollover 180°	A-50
Photo No. A-51 - Rollover 270°	A-51
Photo No. A-52 - Rollover 360°	A-52

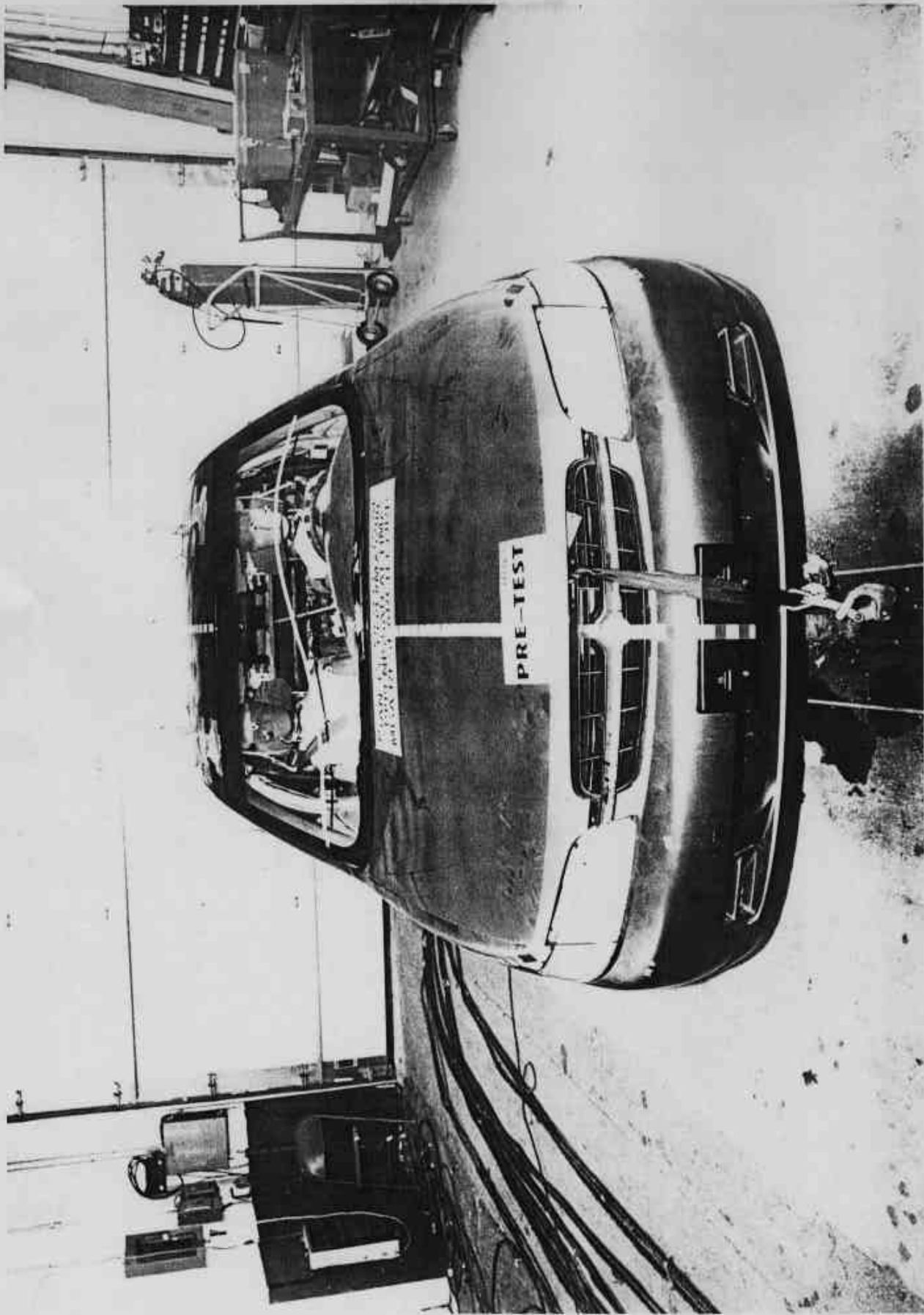


Photo No. A-1 - Pre-Test Front View of Test Vehicle

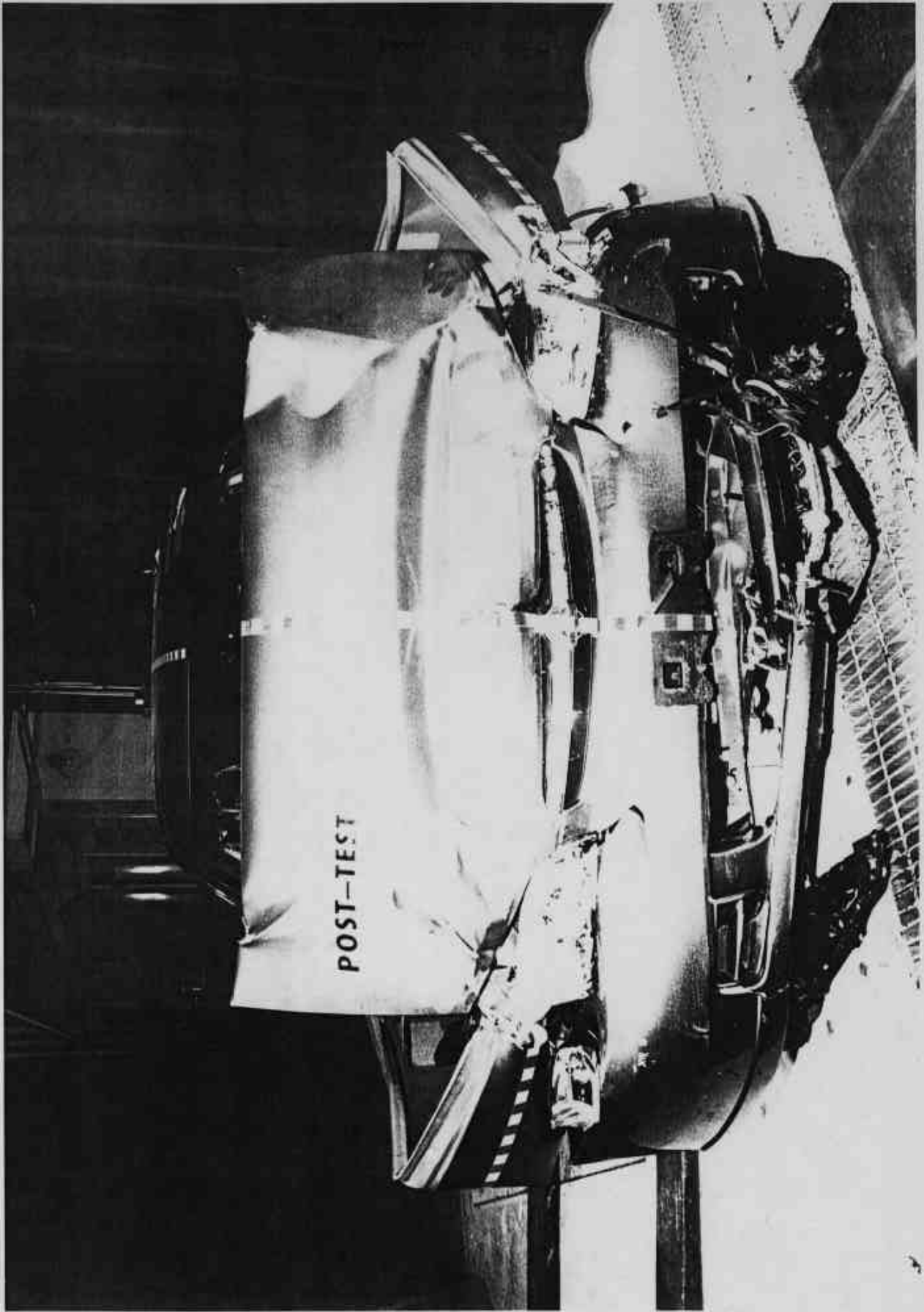


Photo No. A-2 - Post-Test Front View of Test Vehicle

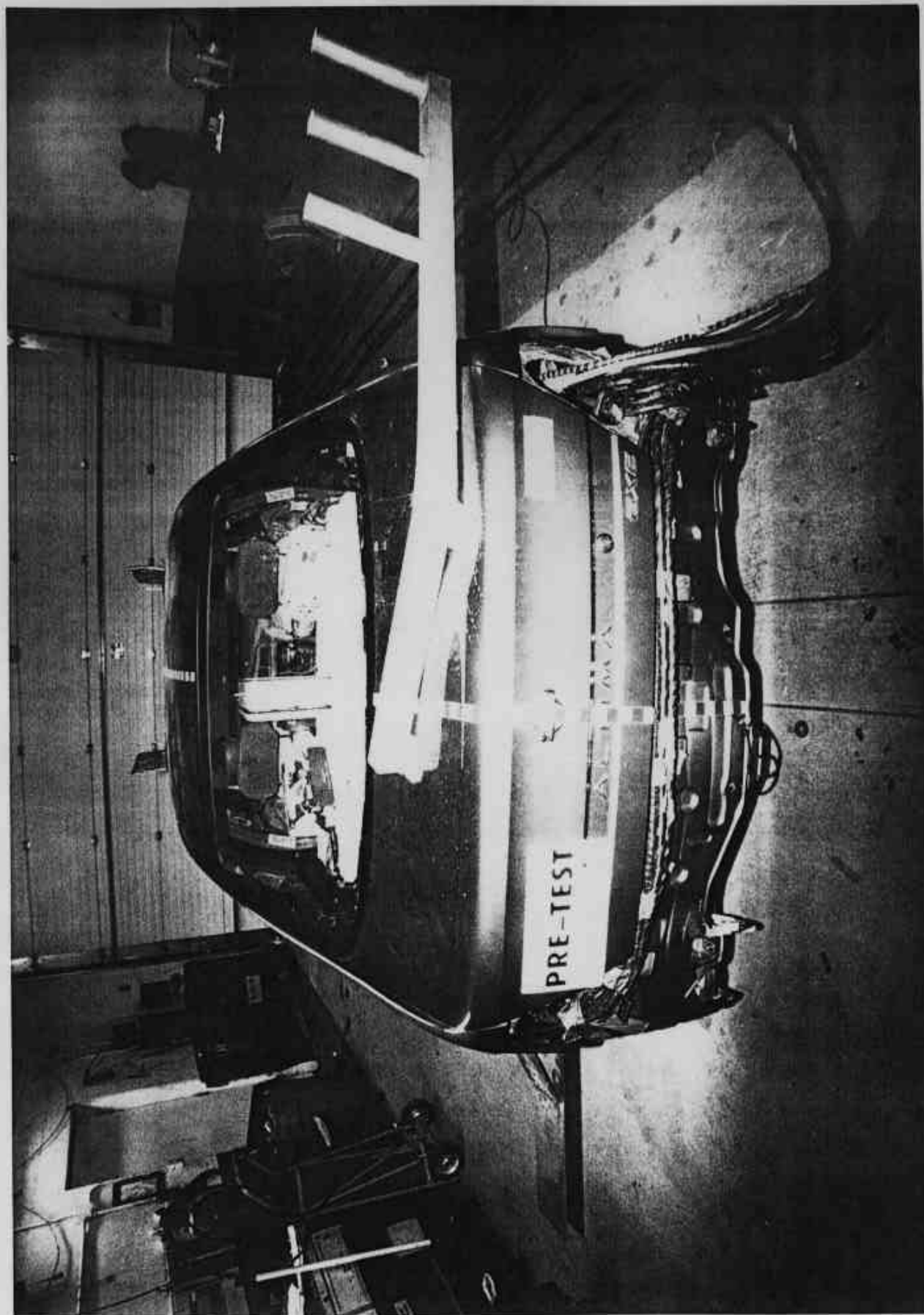


Photo No. A-3 - Pre-Test Rear View of Test Vehicle

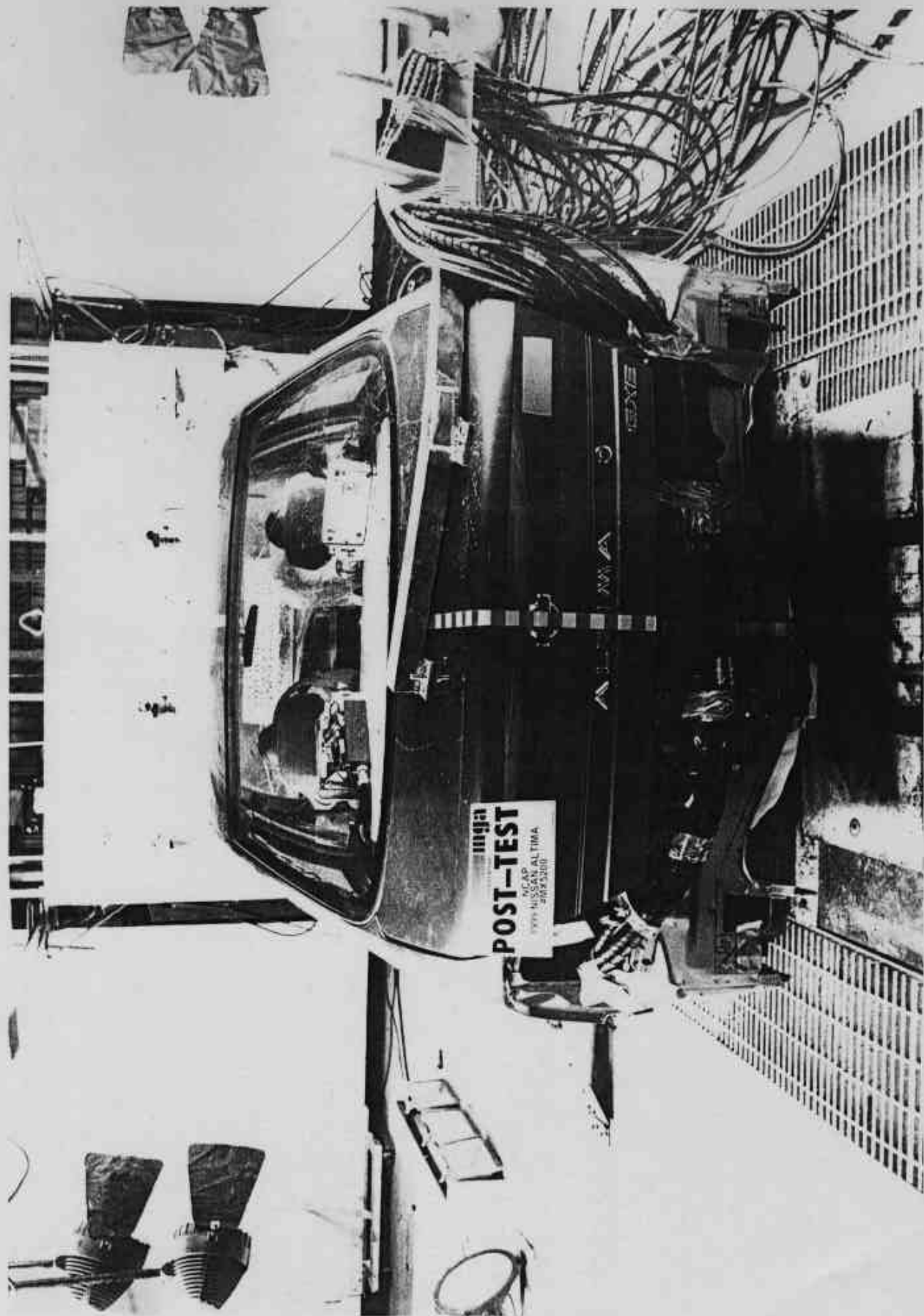


Photo No. A-4 - Post-Test Rear View of Test Vehicle

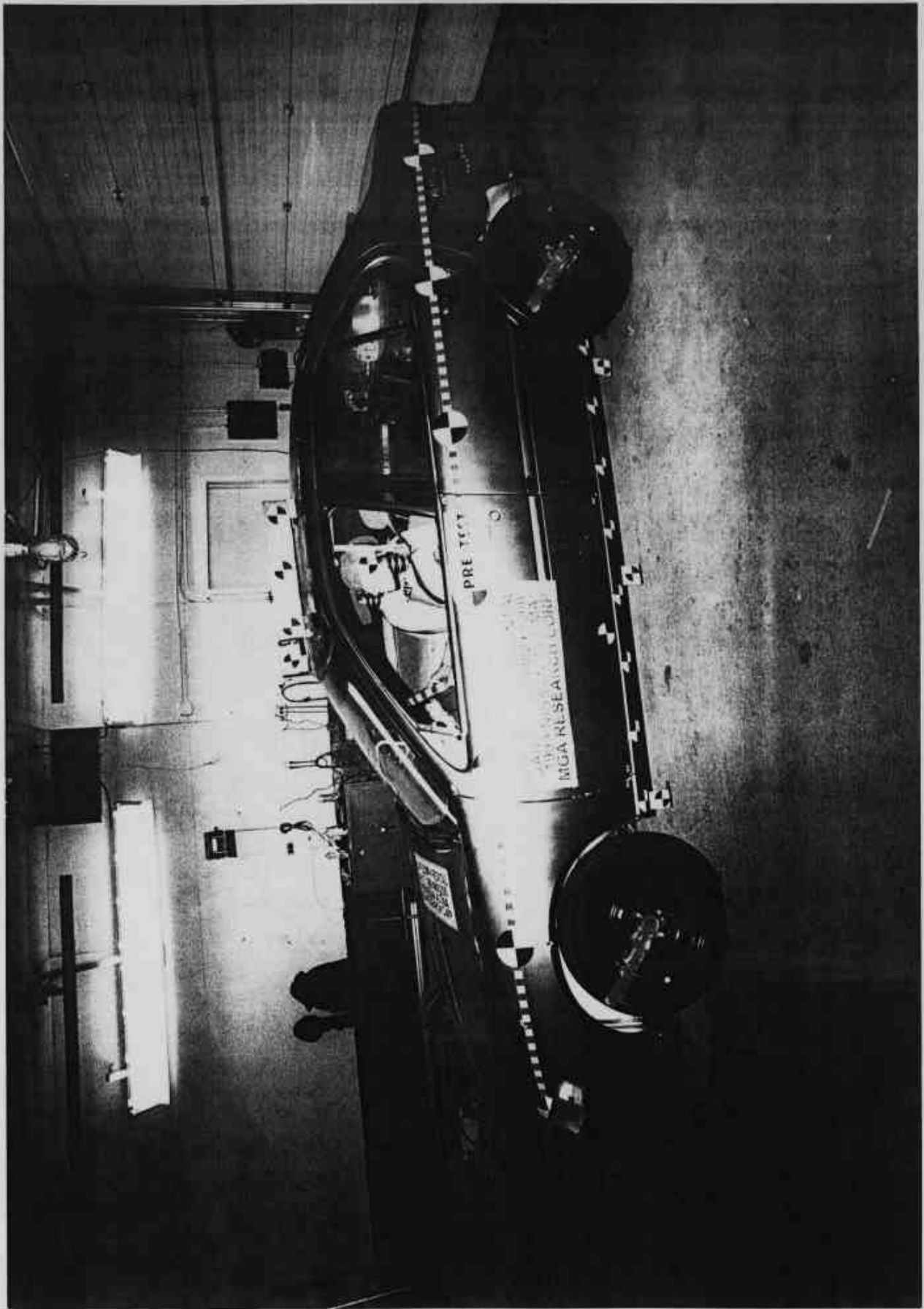


Photo No. A-5 - Pre-Test Left Side View of Test Vehicle

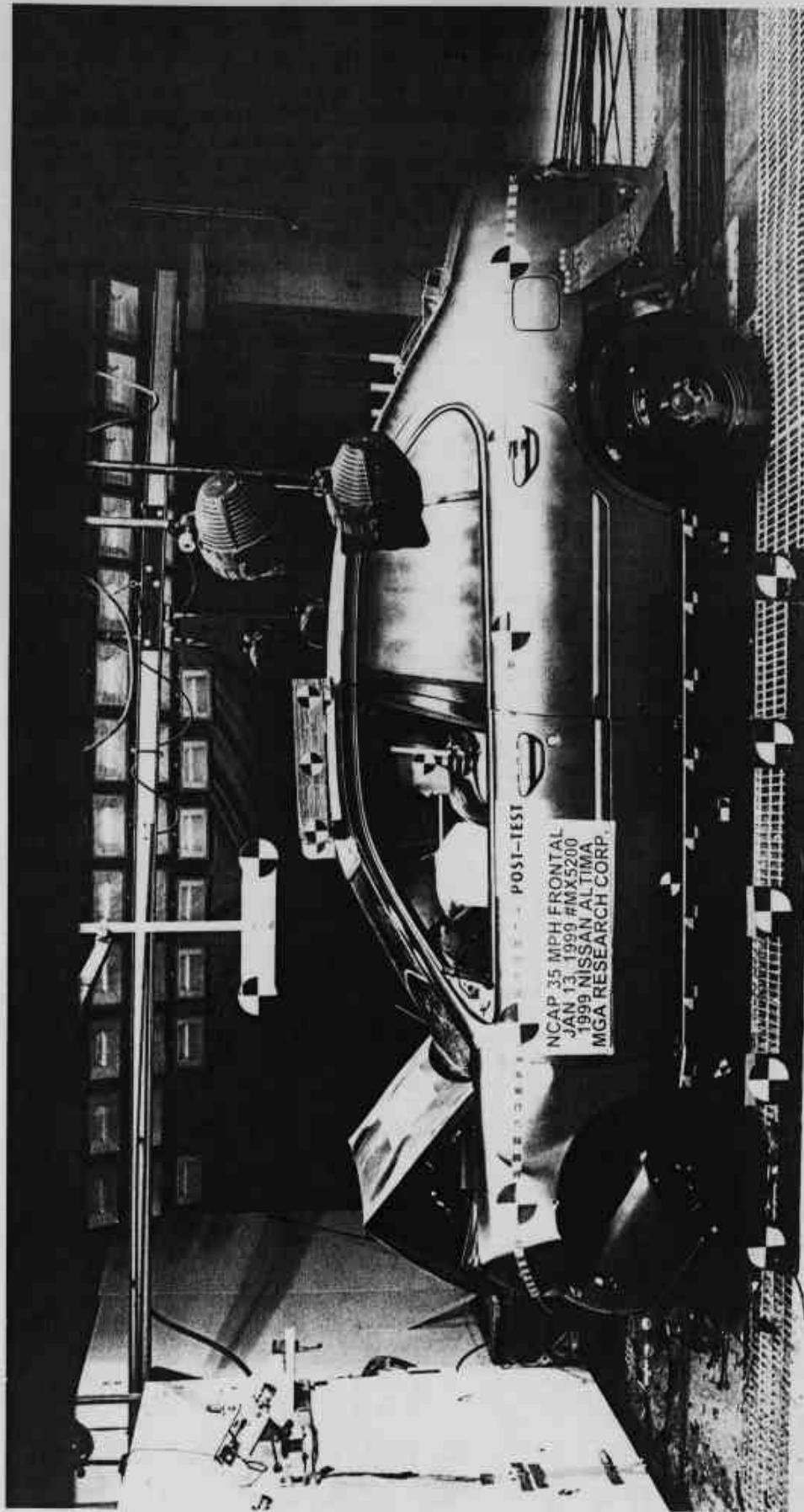


Photo No. A-6 - Post-Test Left Side View of Test Vehicle

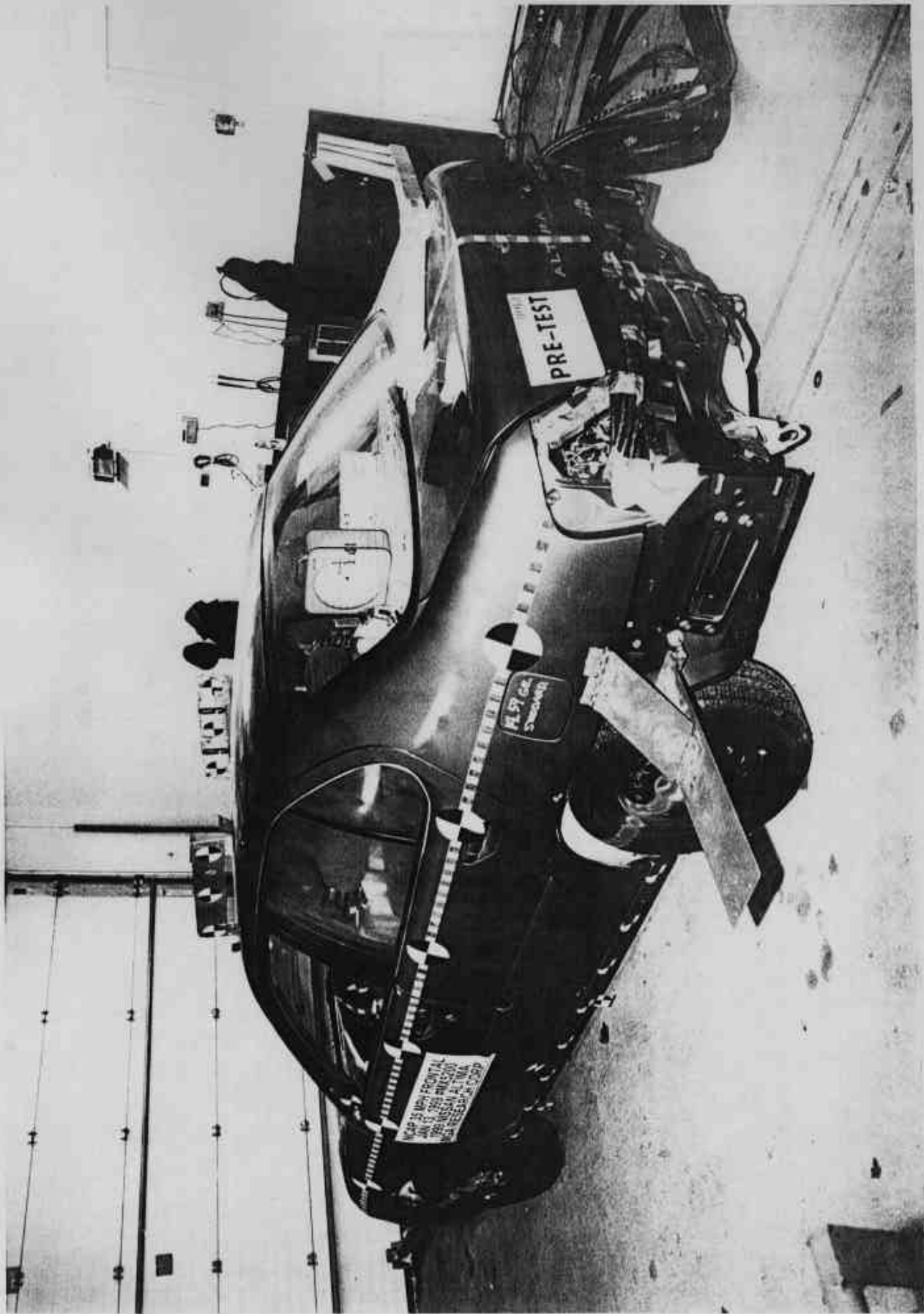


Photo No. A-7 : Pre-Test Left Rear Three-Quarter View of Test Vehicle

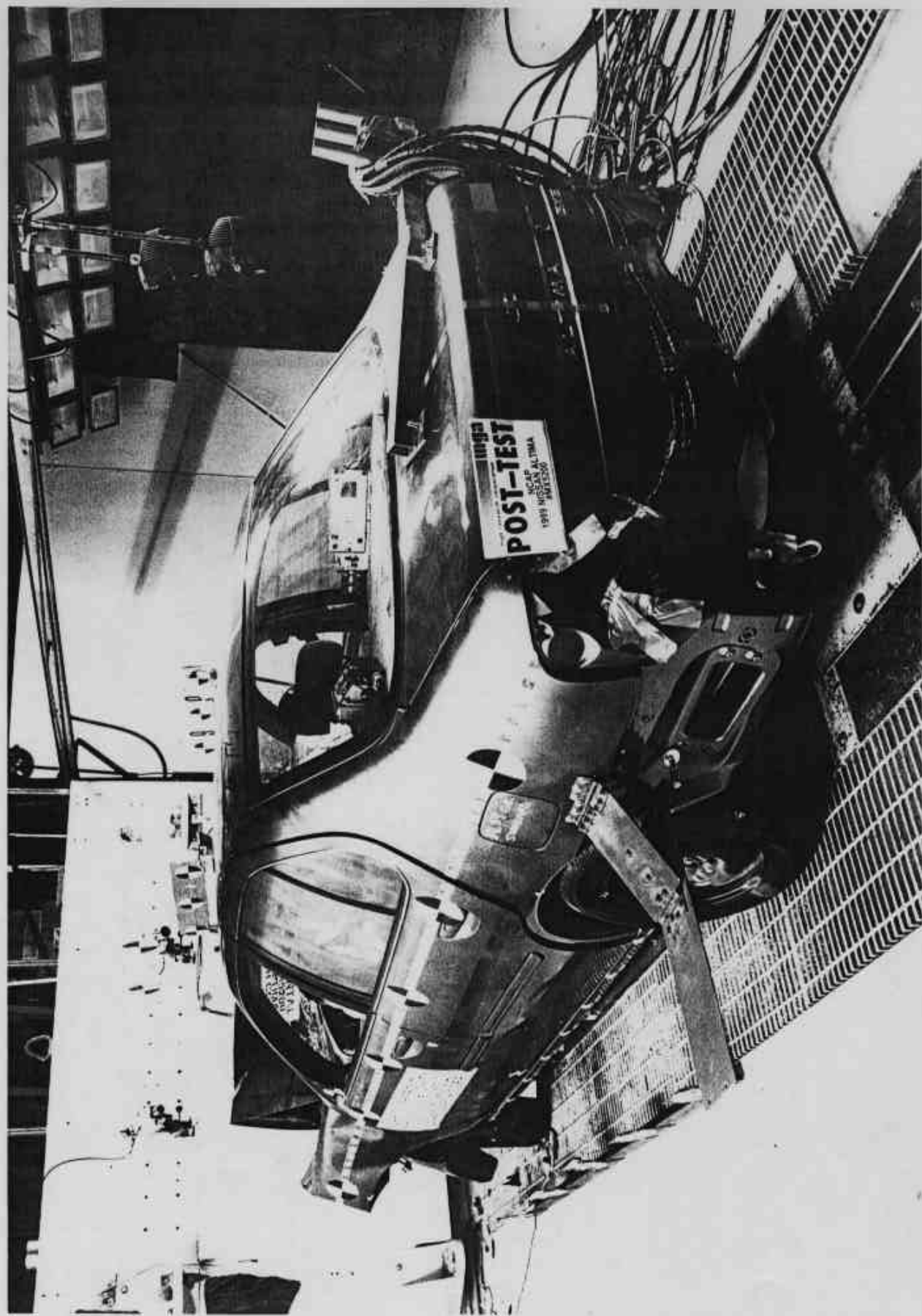


Photo No. A-8 - Post-Test Left Rear Three-Quarter View of Test Vehicle

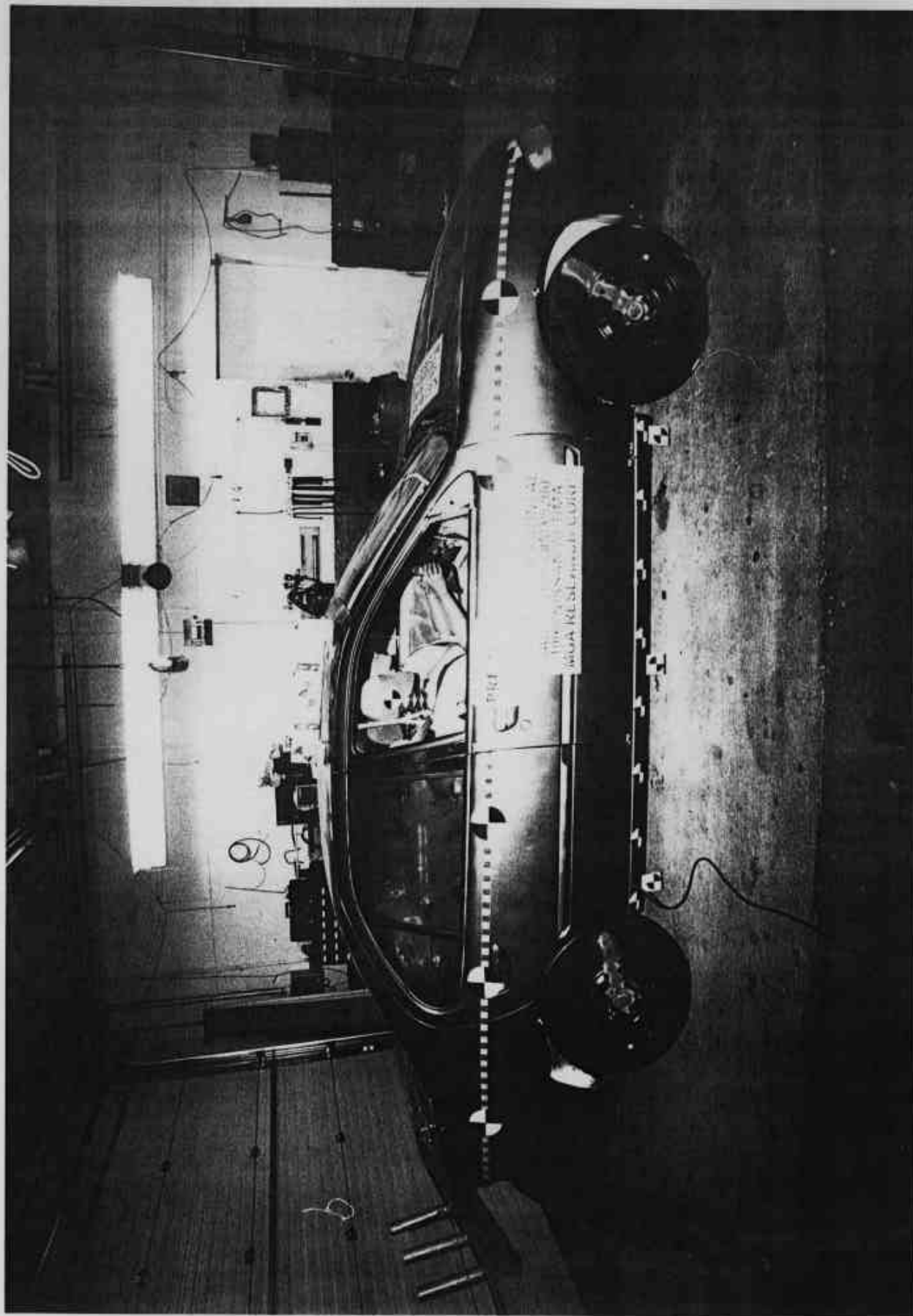
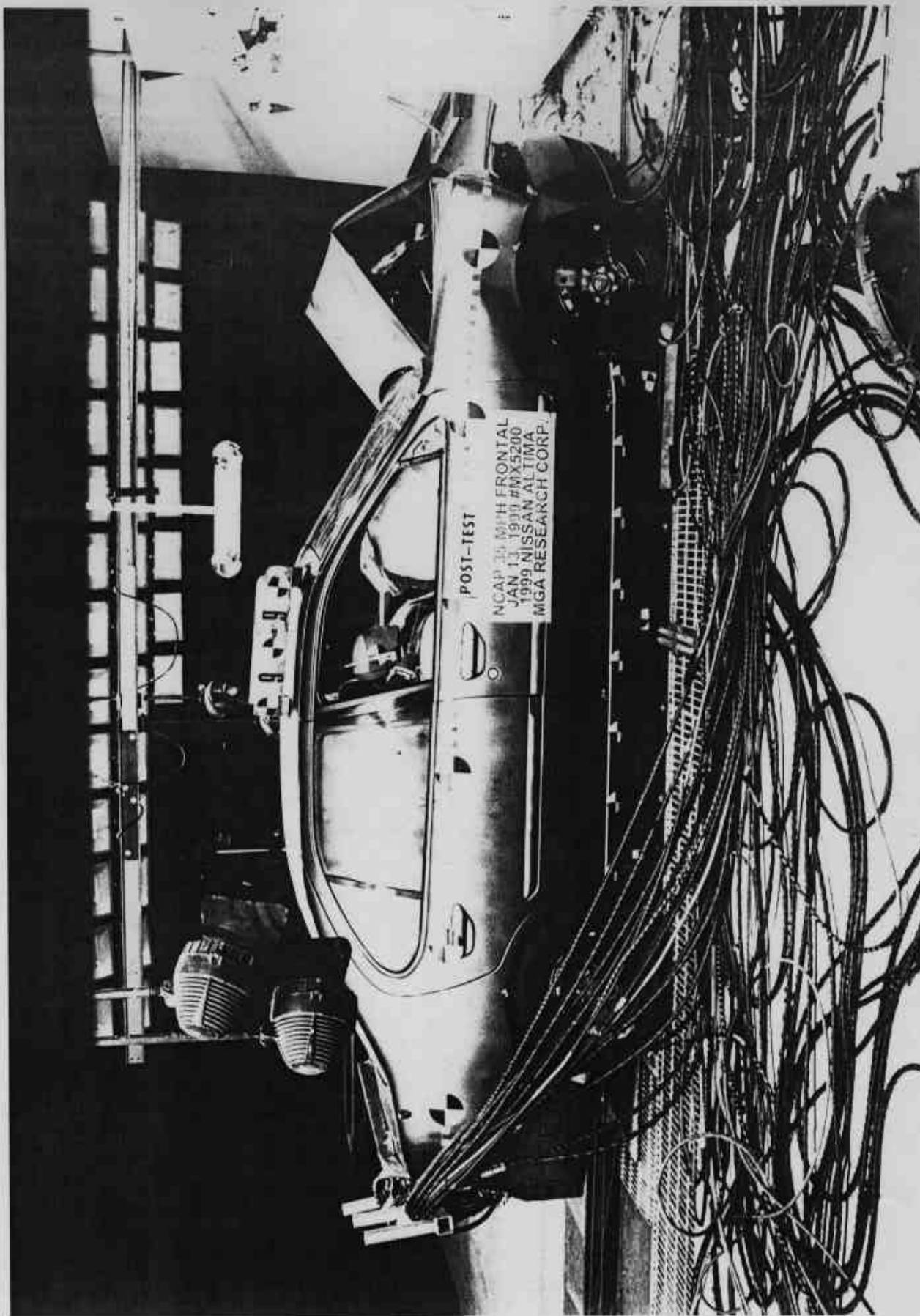


Photo N^o. A-9 - Pre-Test Right Side View of Test Vehicle



A-10

Photo No. A-10 - Post-Test Right Side View of Test Vehicle

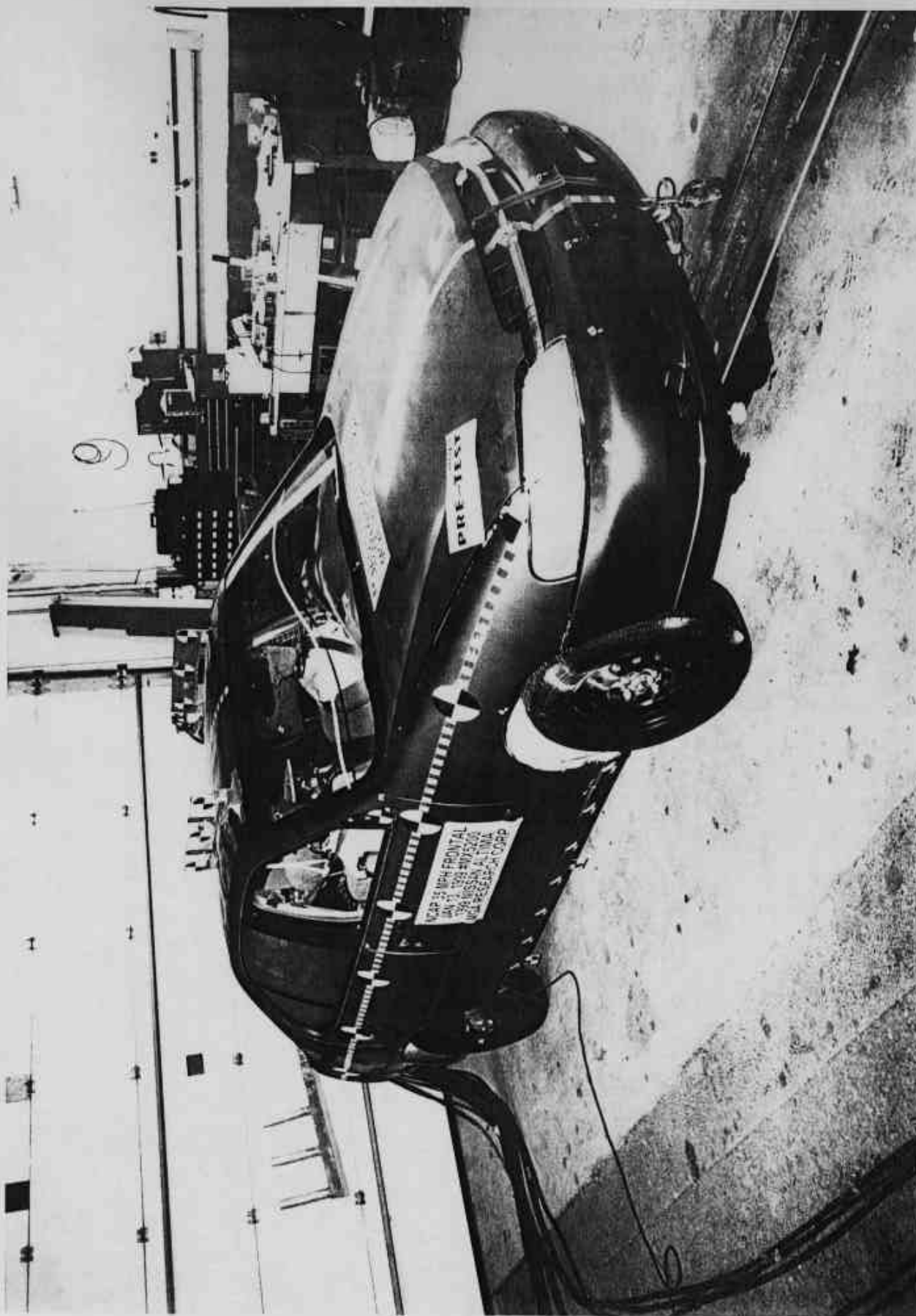


Photo No. A-11 - Pre-Test Right Front Three-Quarter View of Test Vehicle

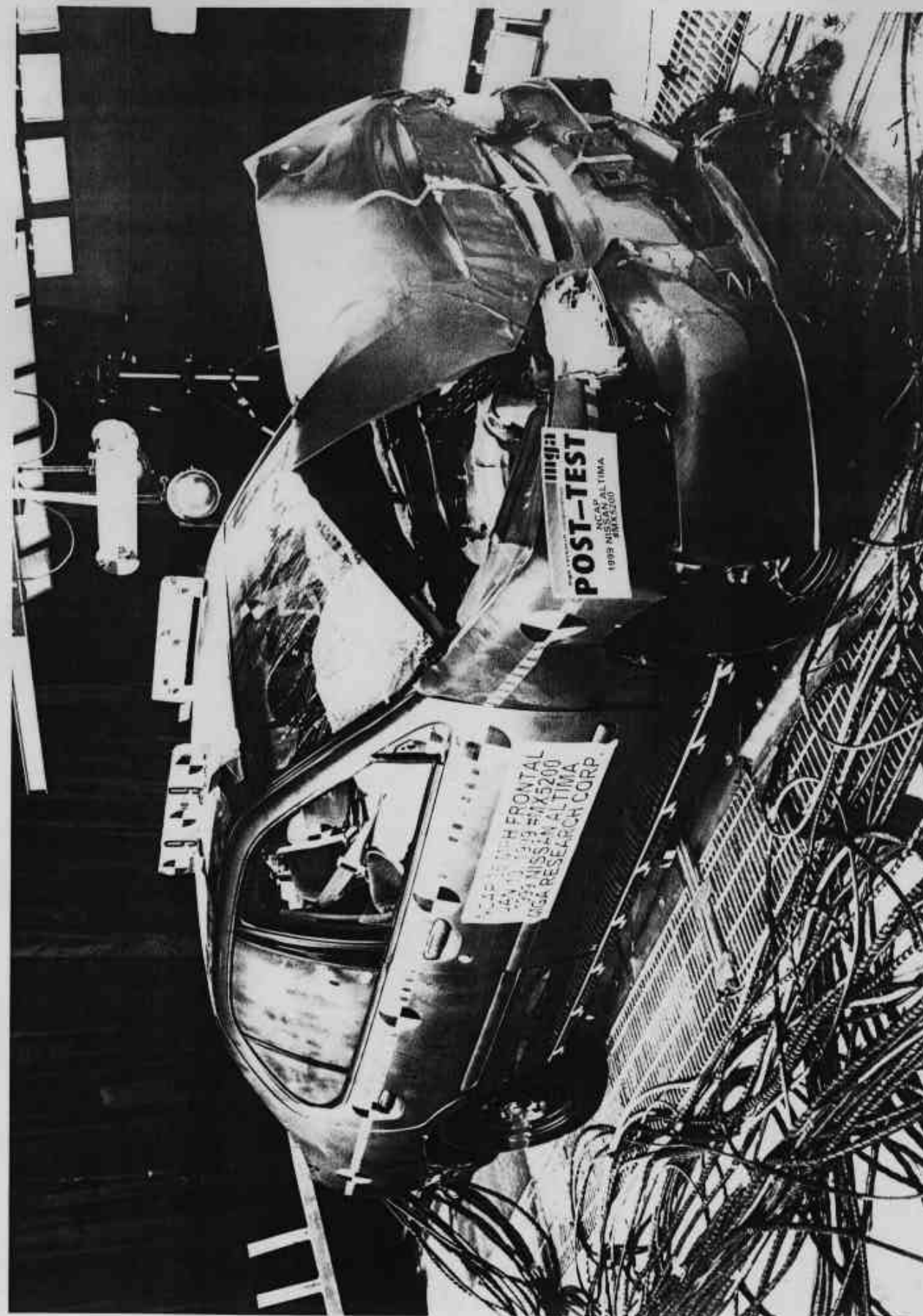


Photo No. A-12 - Post-Test Right Front Three-Quarter View of Test Vehicle

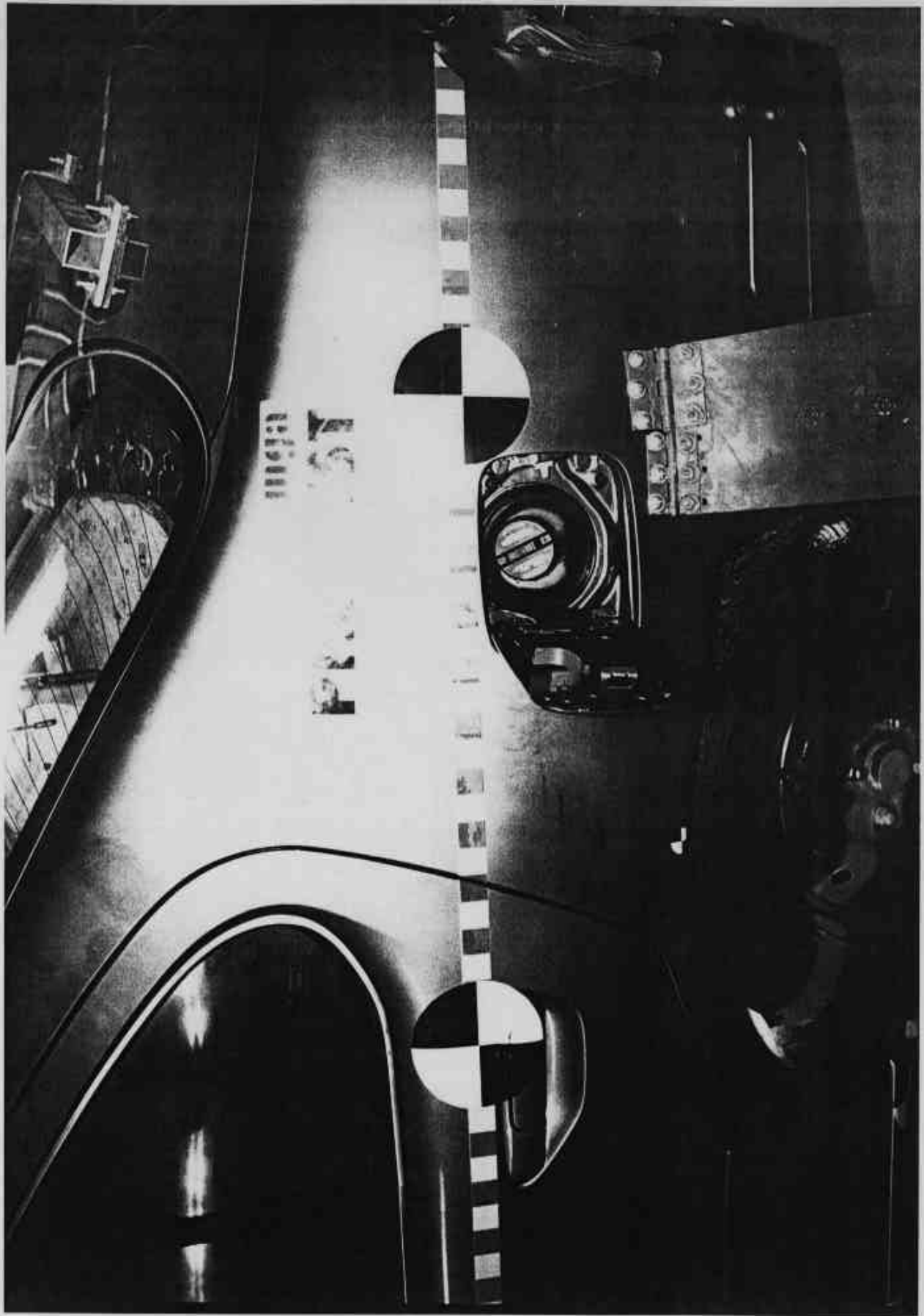
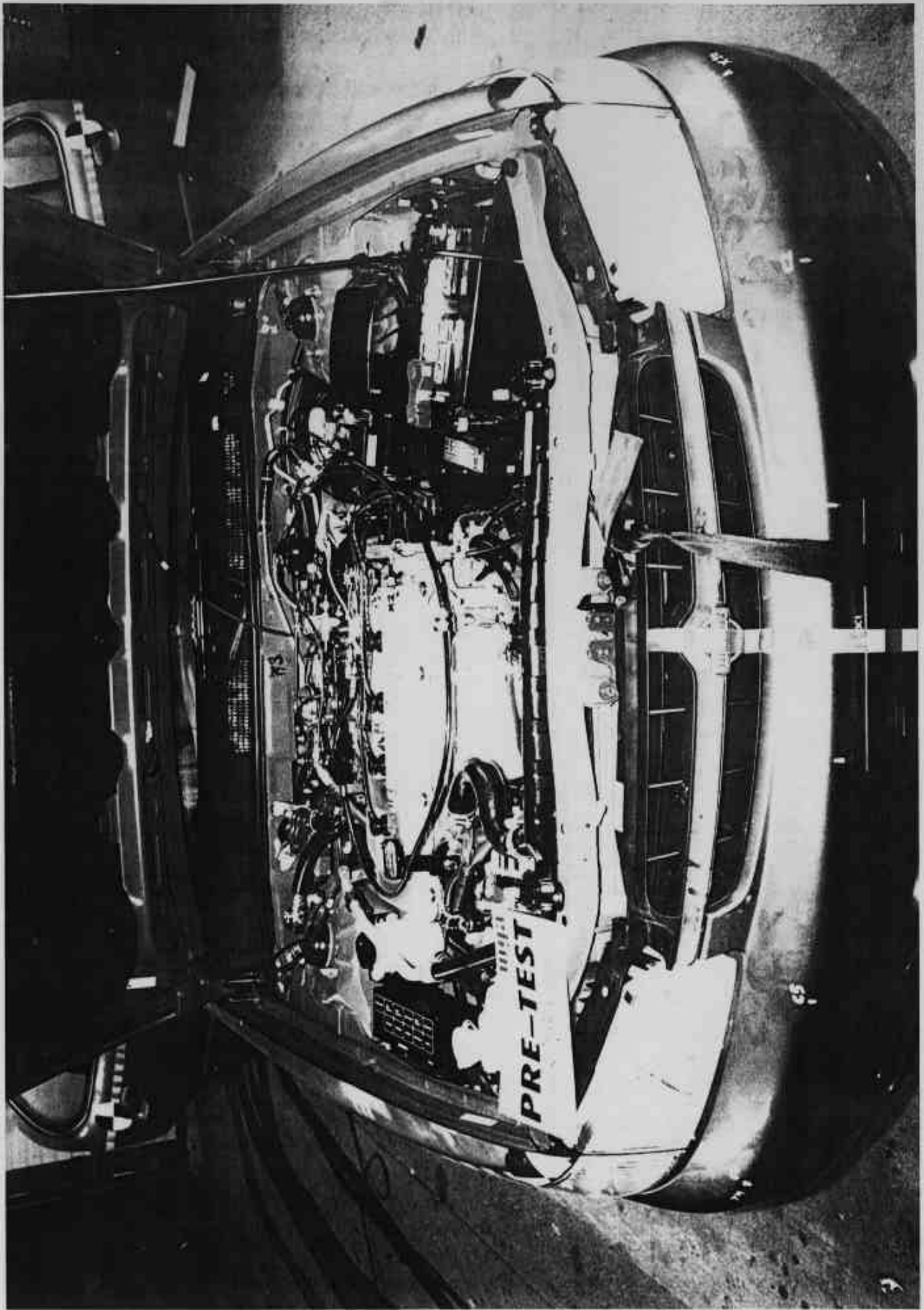


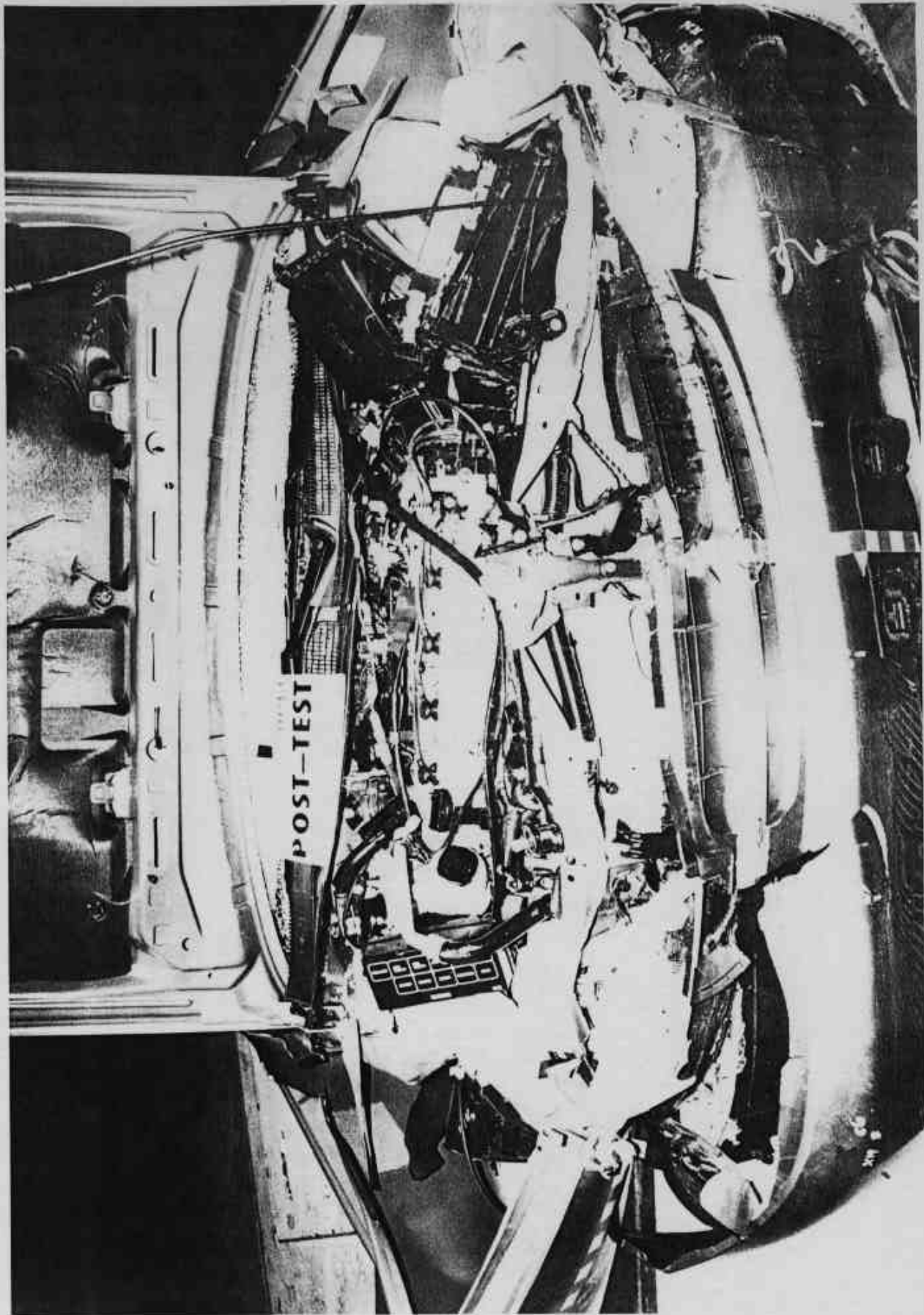
Photo No. A-13 - Pre-Test Fuel Filler Cap View

A-13



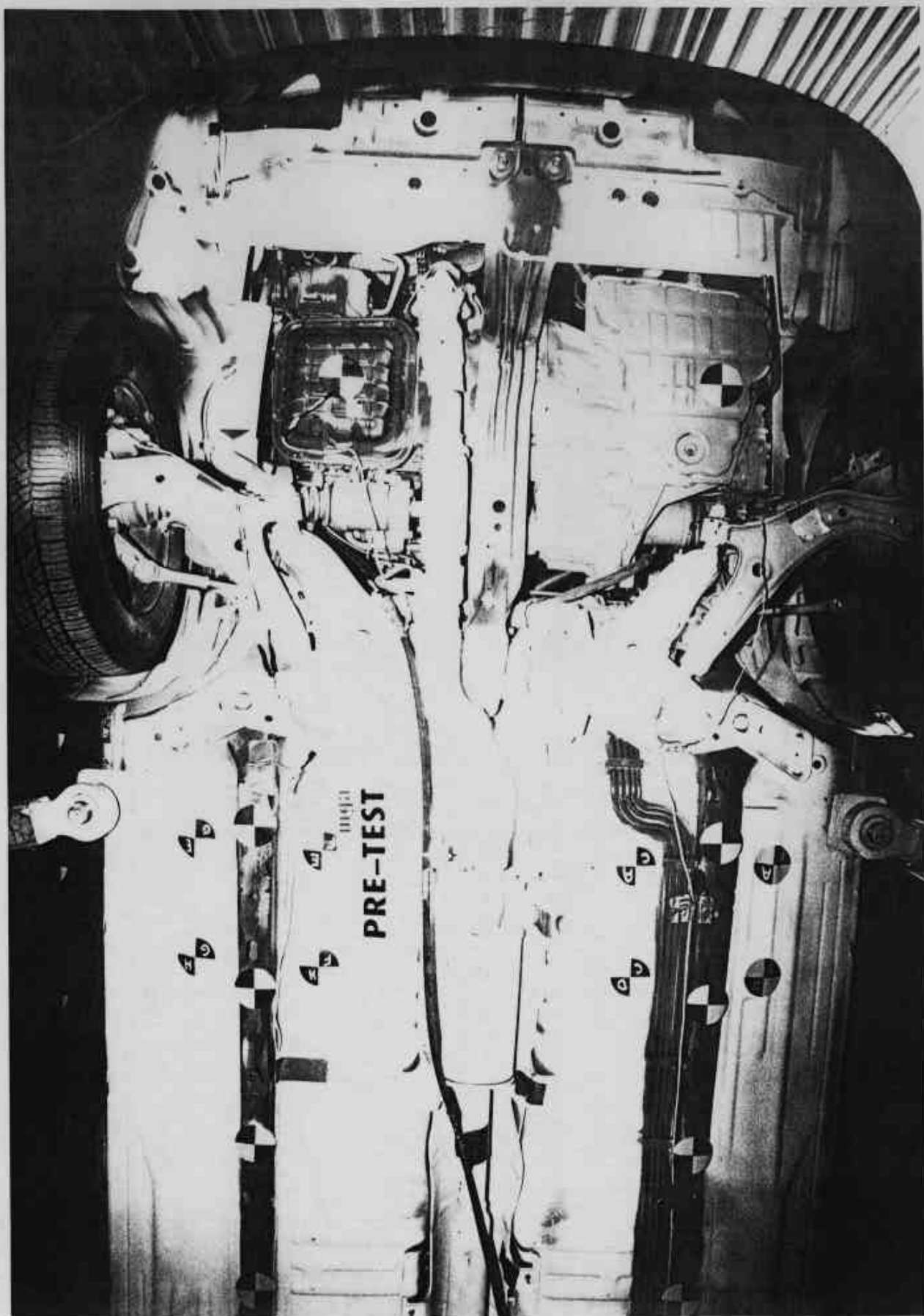
A-14

Photo No. A-14 - Pre-Test Engine Compartment View



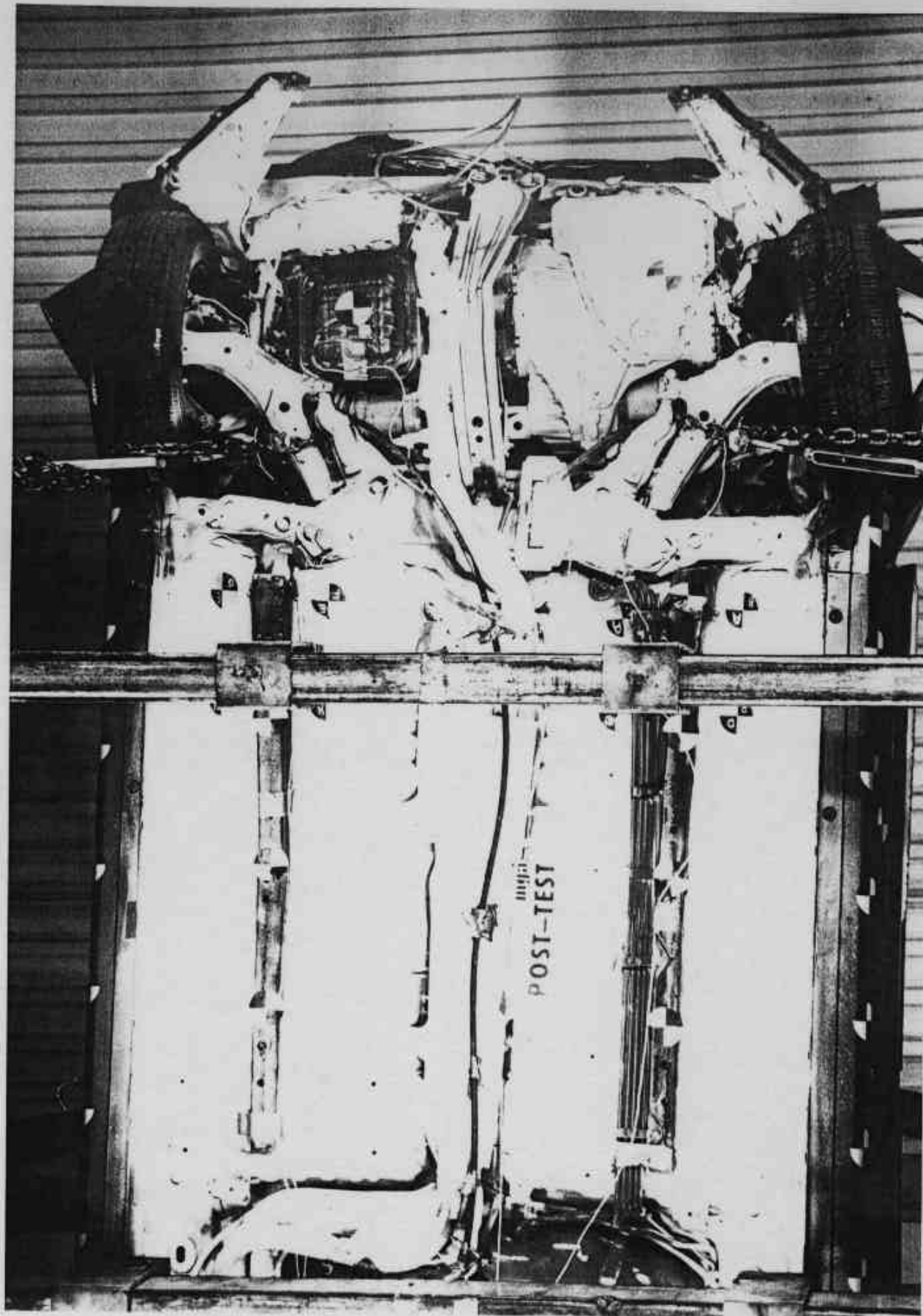
A-15

Photo No. A-15 - Post-Test Engine Compartment View



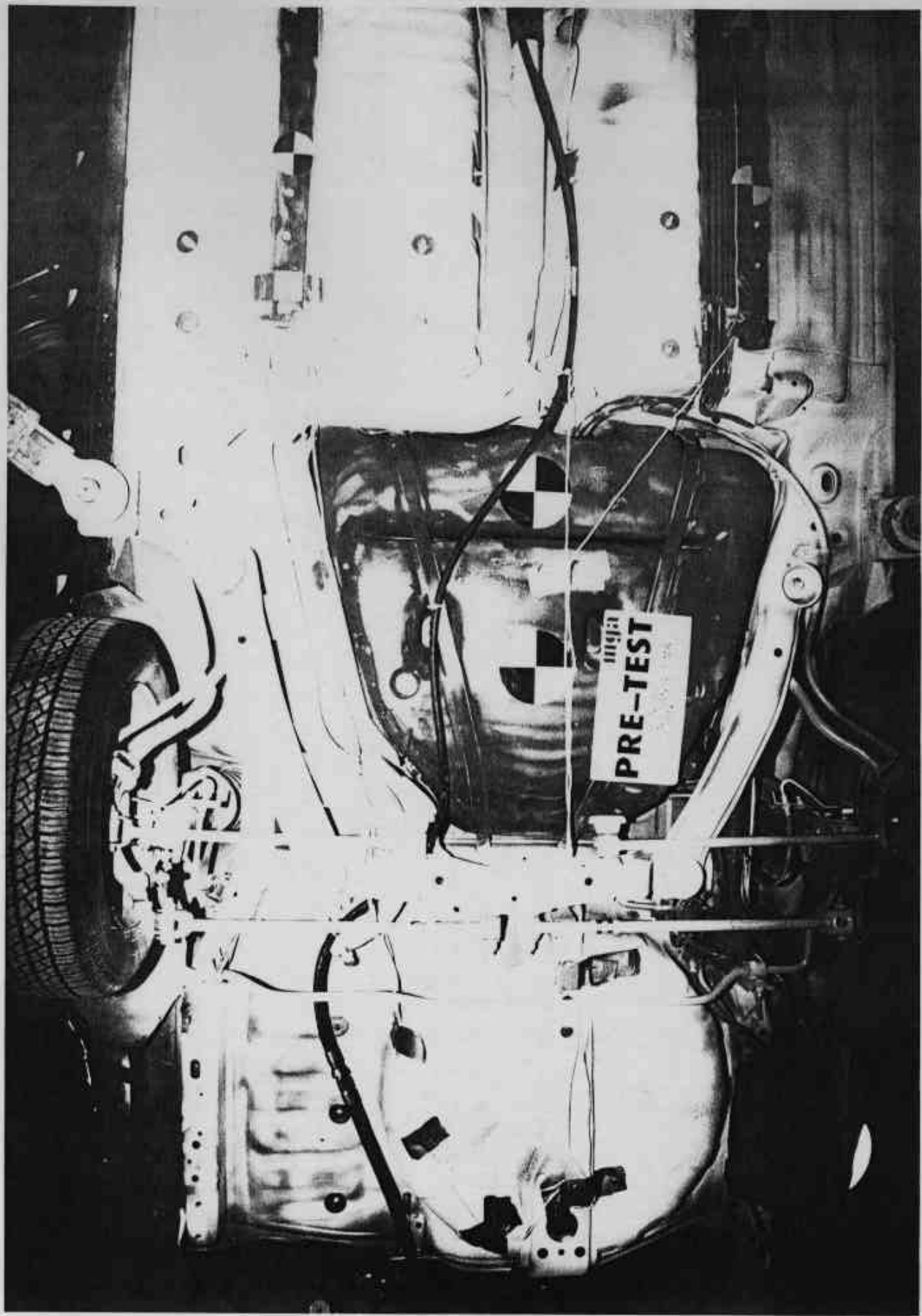
A-16

Photo No. A-16 - Pre-Test Front Underbody View



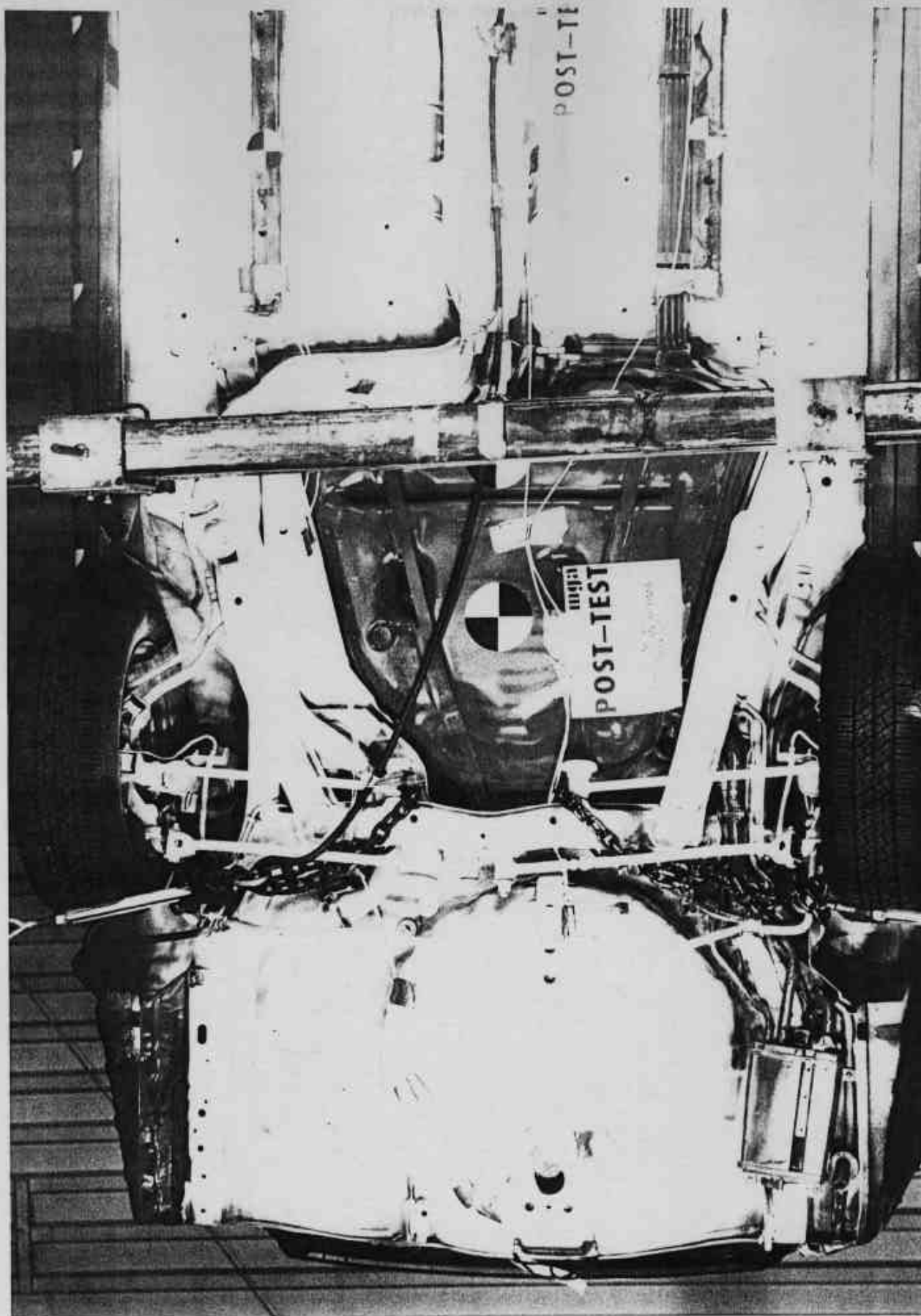
A-17

Photo No. A-17 - Post-Test Front Underbody View



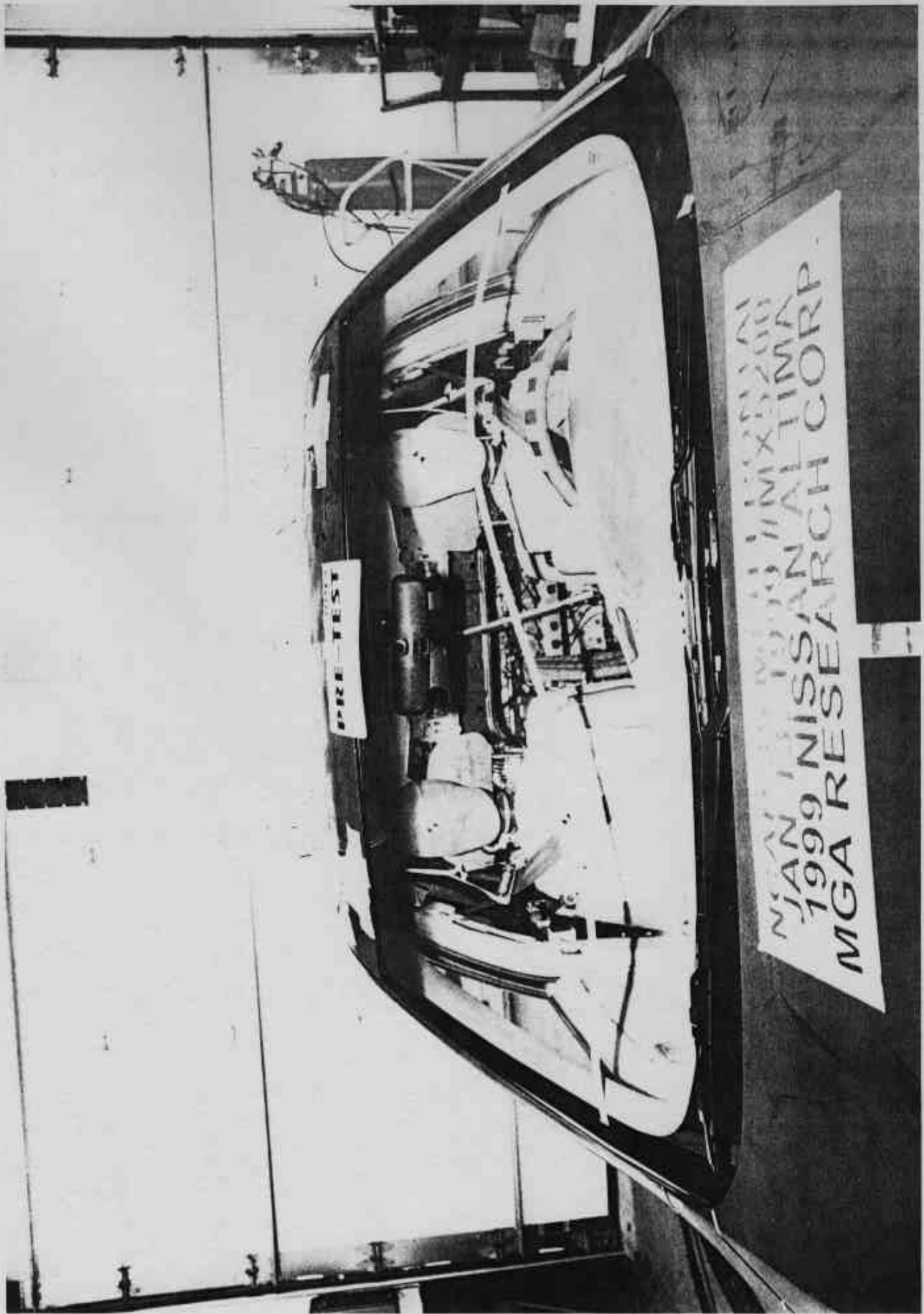
A-18

Photo No. A-18 - Pre-Test Rear Underbody View



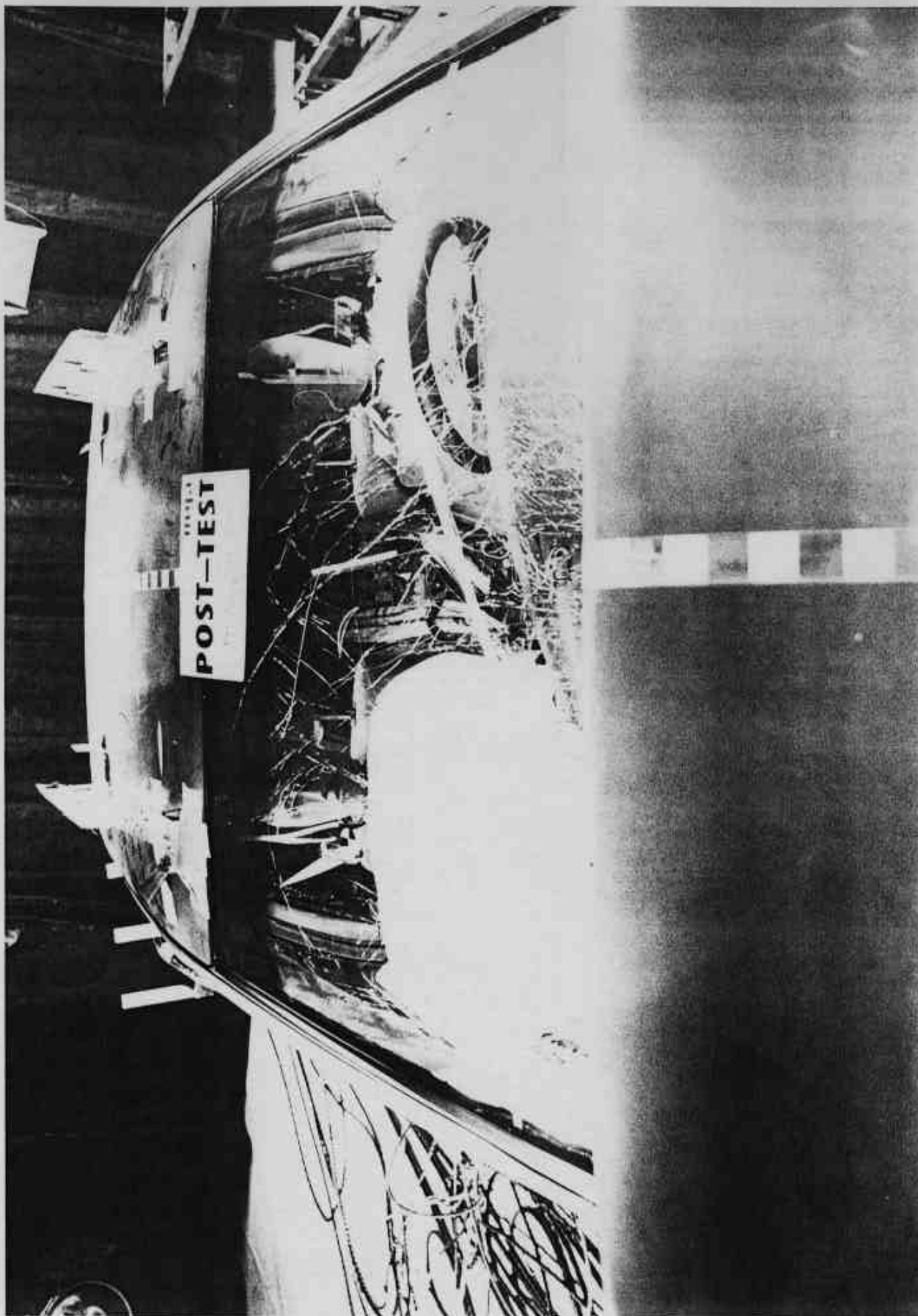
A-19

Photo No. A-19 - Post-Test Rear Underbody View



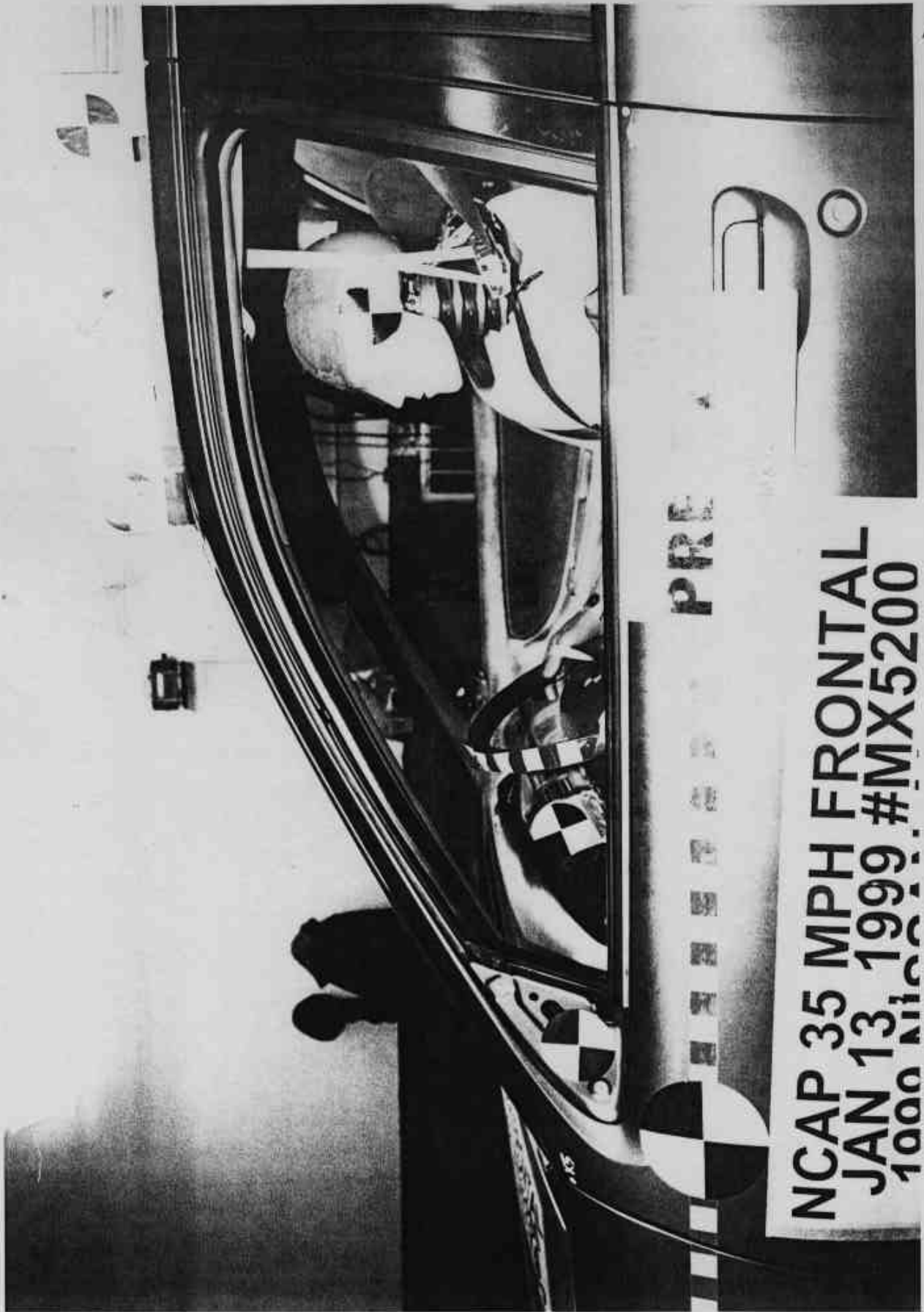
A-20

Photo No. A-20 - Pre-Test Windshield View



A-21

Photo No. A-21 - Post-Test Windshield View



NCAP 35 MPH FRONTAL
JAN 13, 1999 #MX5200
1000 Miles

PRE

Photo No. A-22 - Pre-Test Driver Dummy Position Left Side View

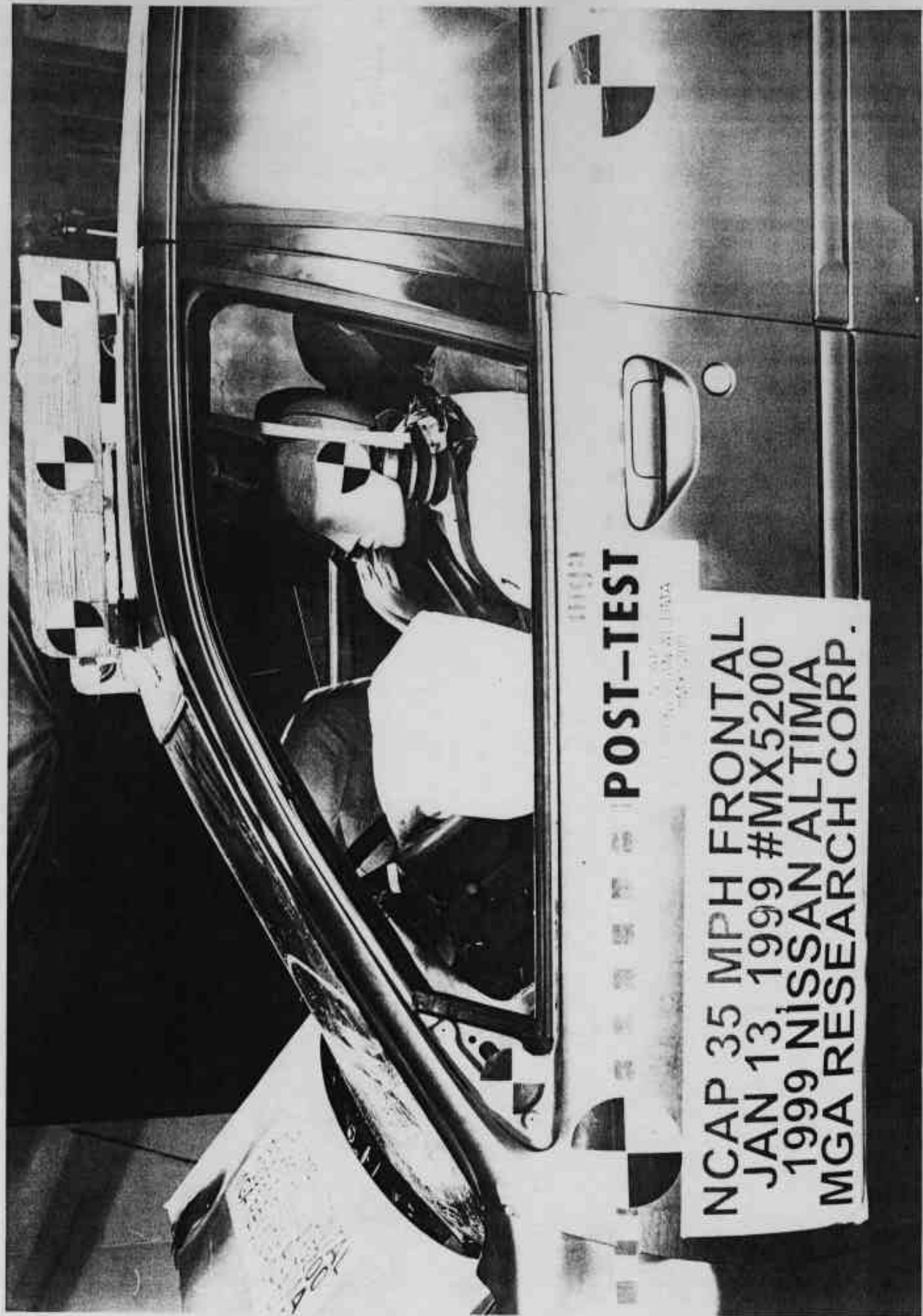
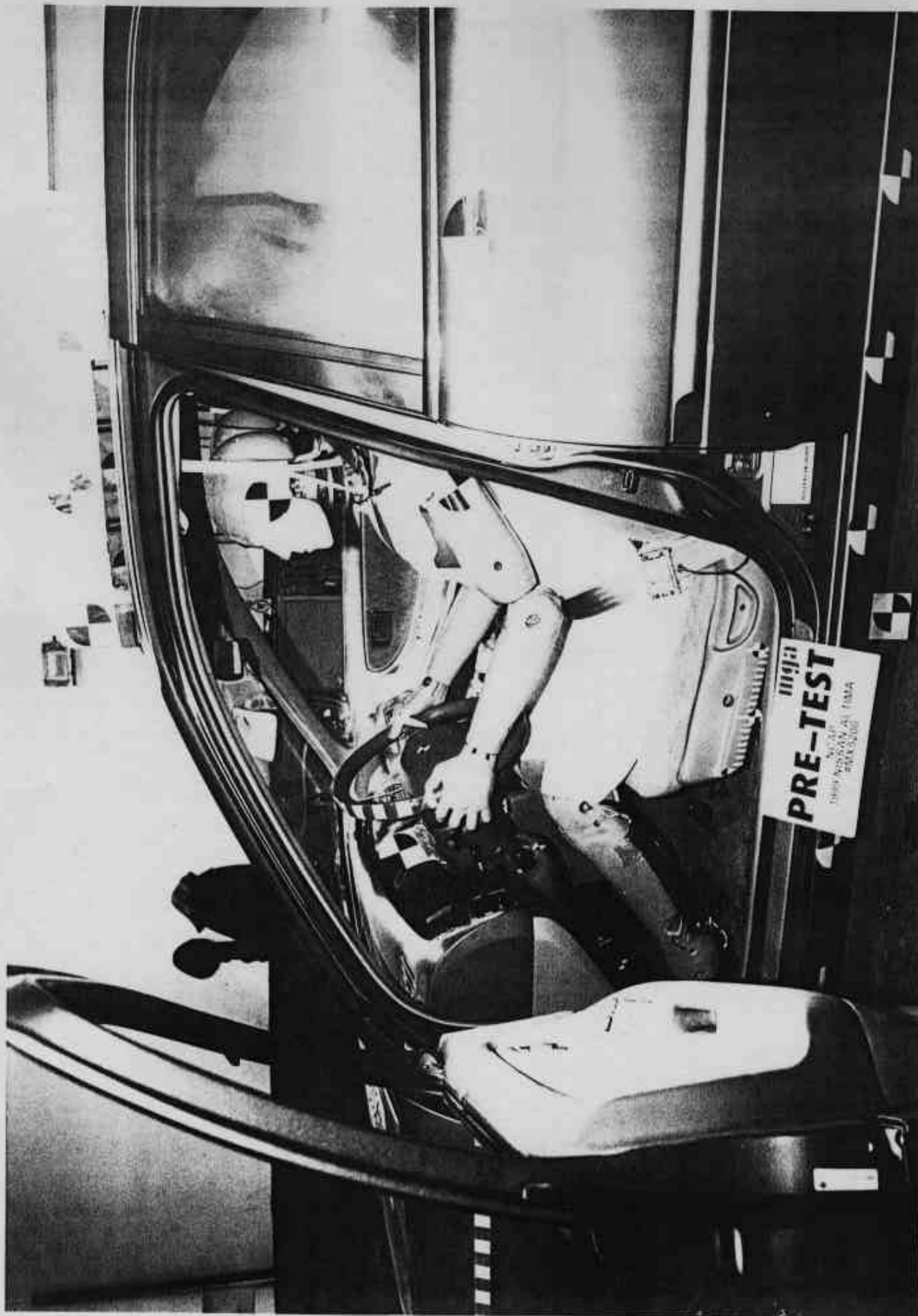


Photo No. A-23 - Post-Test Driver Dummy Position Left Side View



A-24

Photo No. A-24 - Pre-Test Driver Dummy Position Left Side View (Door Open)



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



Photo No. A-26 - Pre-Test Driver Seat Position View



A-27

Photo No. A-27 - Post-Test Driver Seat Position View



A-28

Photo No. A-28 - Pre-Test Driver Dummy Knee Position



A-29

Photo No. A-29 - Post-Test Driver Dummy Knee Position



Photo No. A-30 - Post-Test Driver Airbag Contact



A-31

Photo No. A-31 - Post-Test Driver Knee Contact View

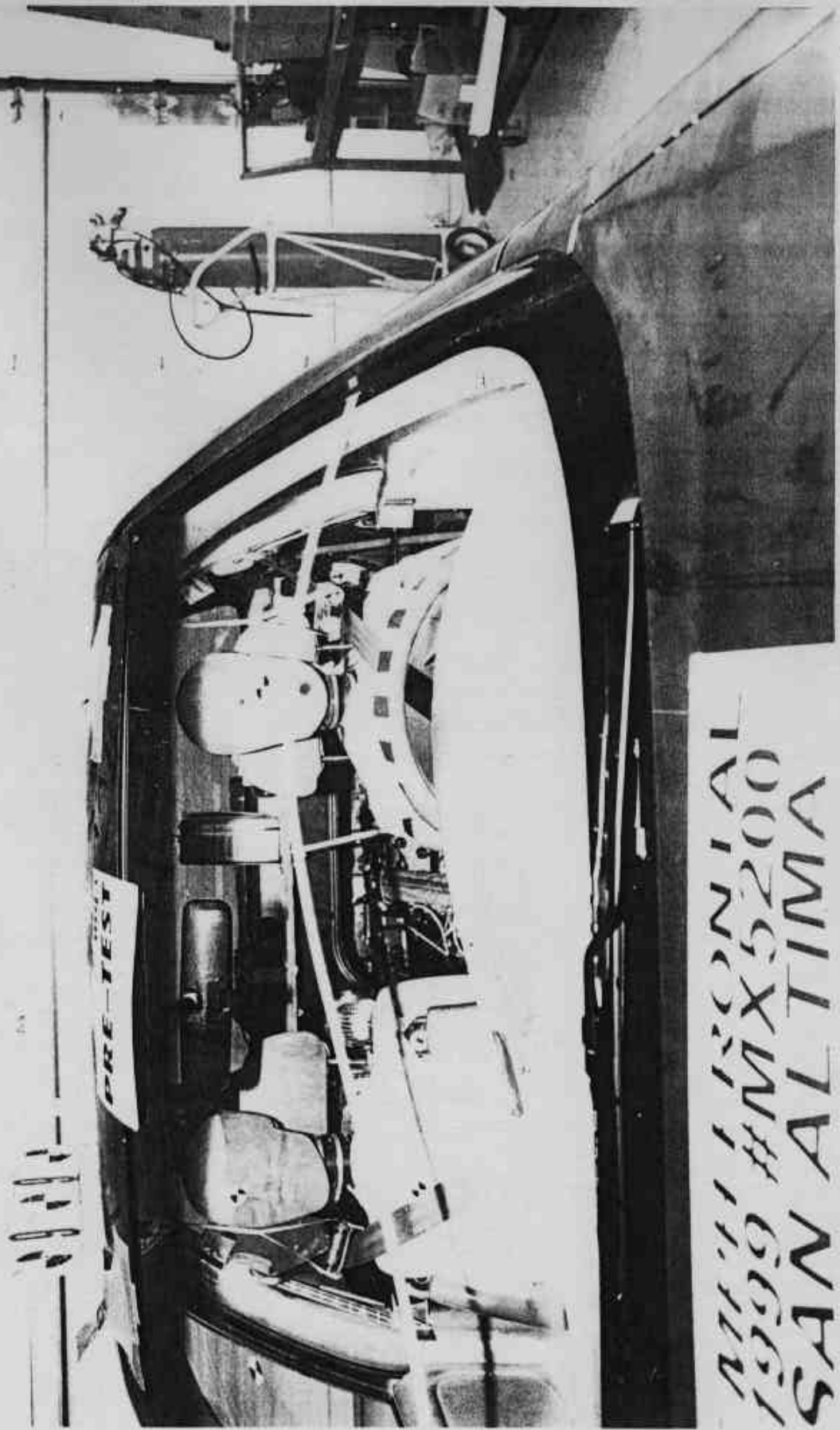


Photo No. A-32 - Pre-Test Driver Windshield View

1999 HONDA CIVIC
1999 #MX5200
SAN ALTIMA



Photo No. A-33 - Post-Test Driver Windshield View

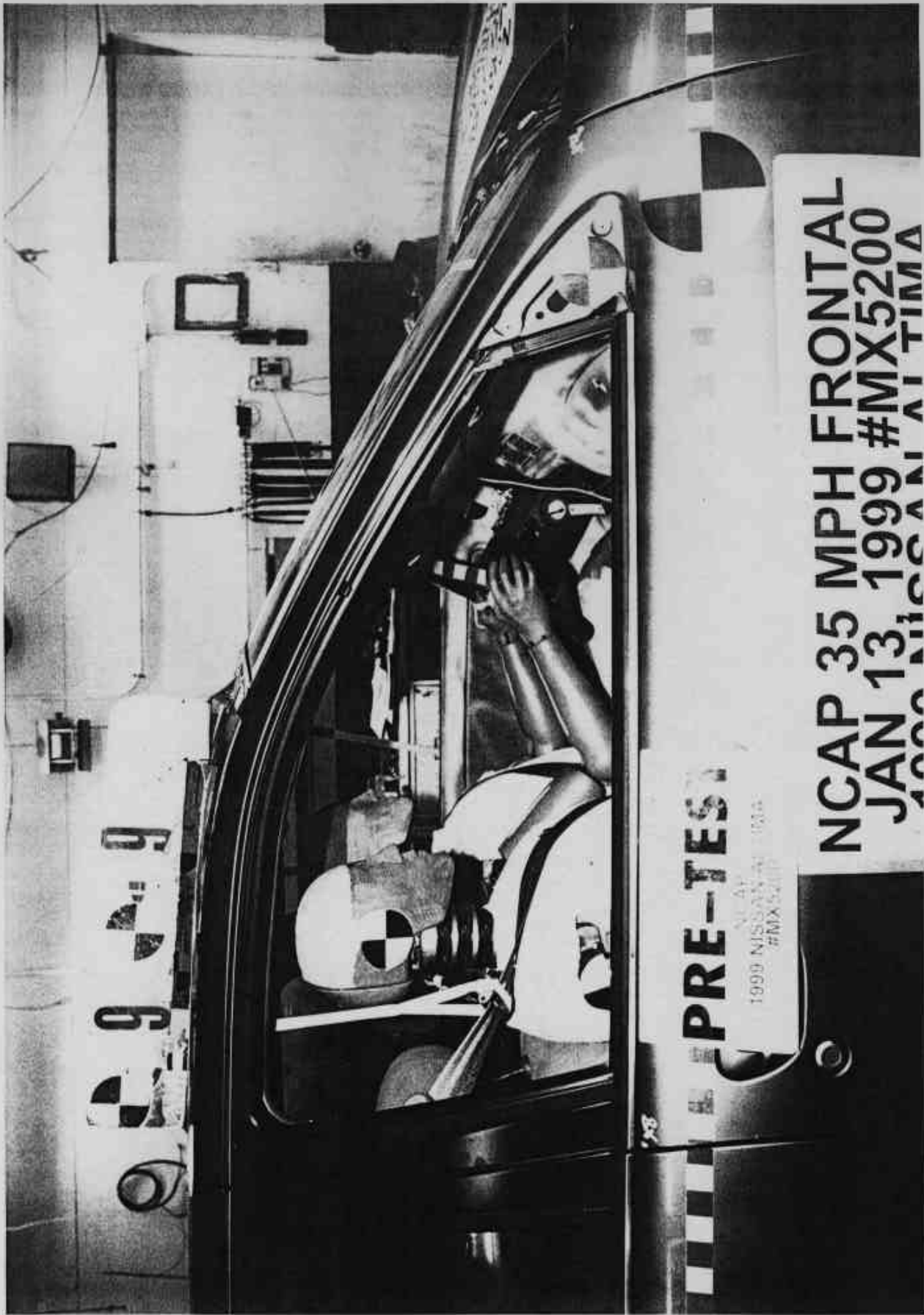


Photo No. A-34 - Pre-Test Passenger Dummy Position Right Side View

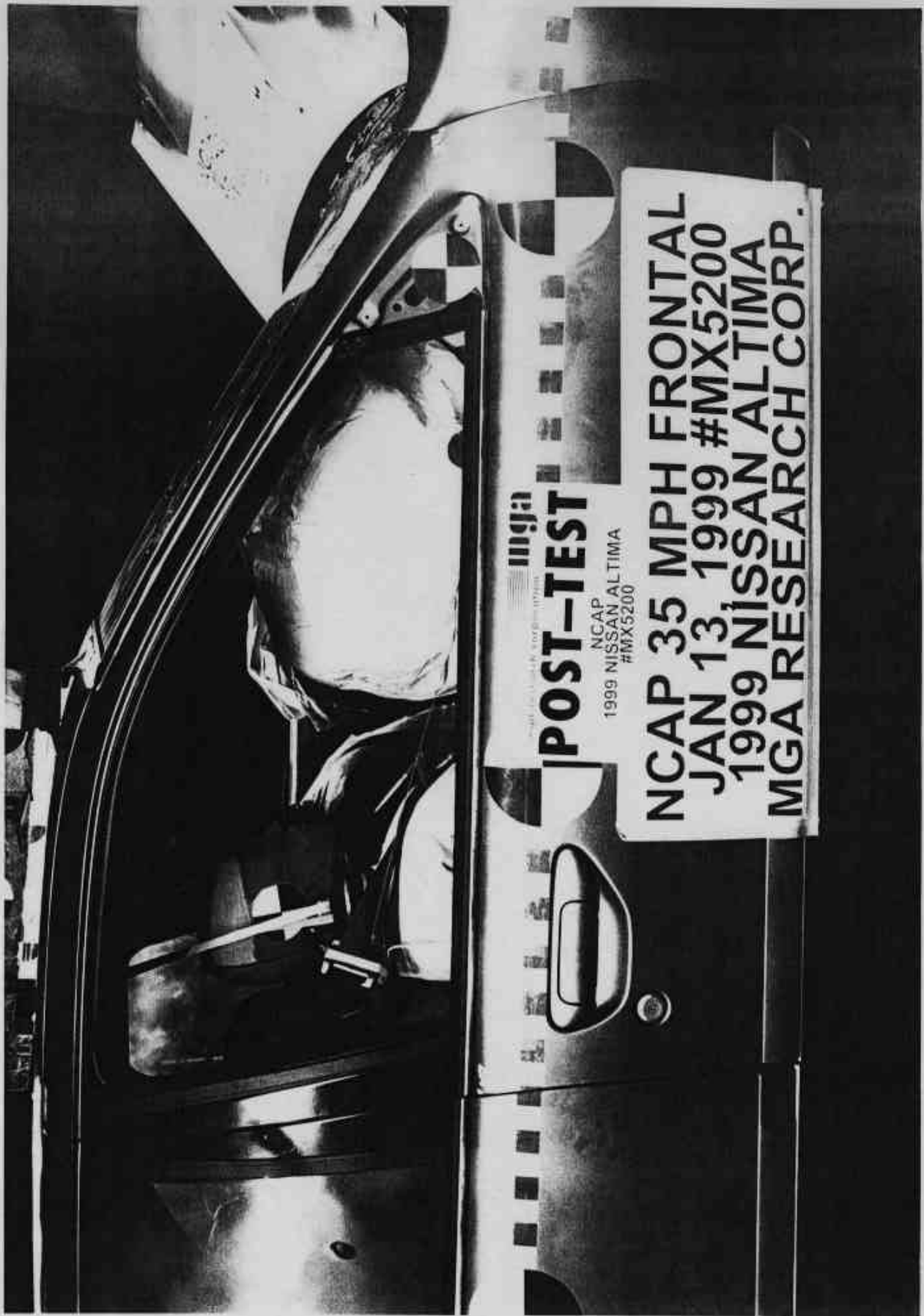
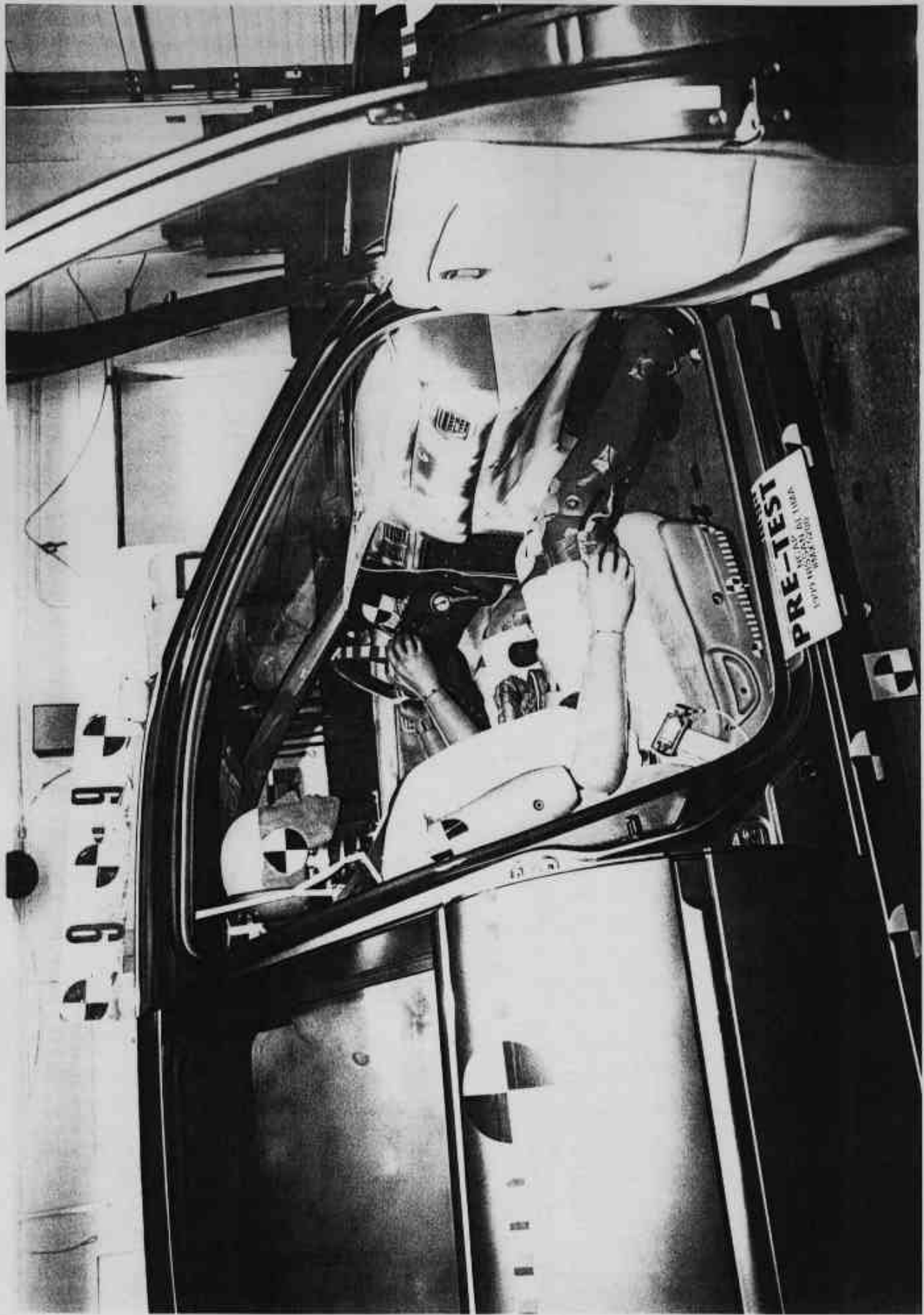


Photo No. A-35 - Post-Test Passenger Dummy Position Right Side View



A-36

Photo No. A-36 - Pre-Test Pass. Dummy Position Right Side View (Door Open)



A-37

Photo No. A-37 - Post-Test Pass. Dummy Position Right Side View (Door Open)



Photo No. A-38 - Pre-Test Passenger Seat Position View



Photo No. A-39 - Post-Test Passenger Seat Position View



A-40

Photo No. A-40 - Pre-Test Passenger Dummy Knee Position



A-41

Photo No. A-41 - Post-Test Passenger Dummy Knee Position



Photo No. A-42 - Post-Test Passenger Airbag Contact



A-43

Photo No. A-43 - Post-Test Passenger Knee Contact View

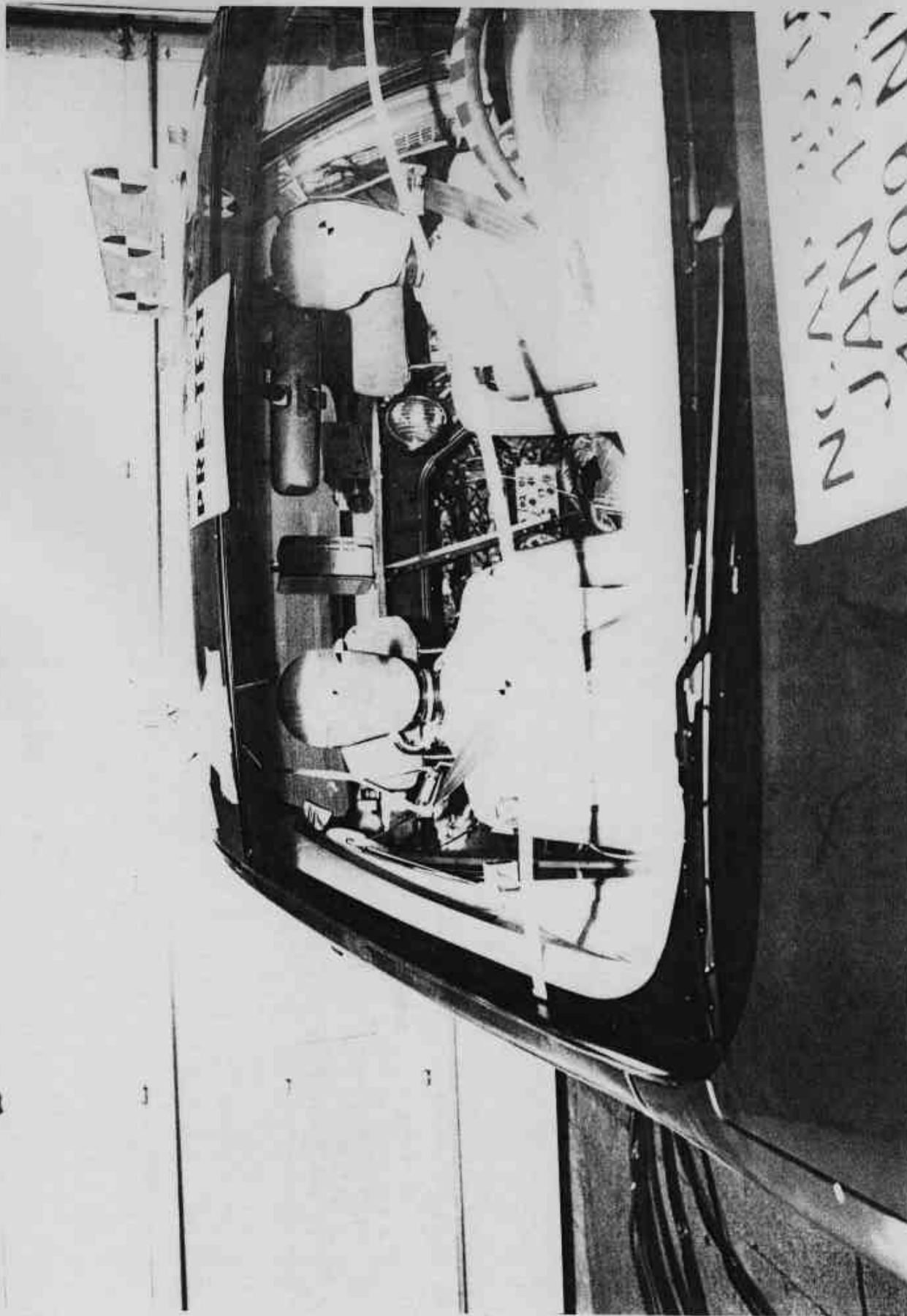


Photo No. A-44 - Pre-Test Passenger Windshield View

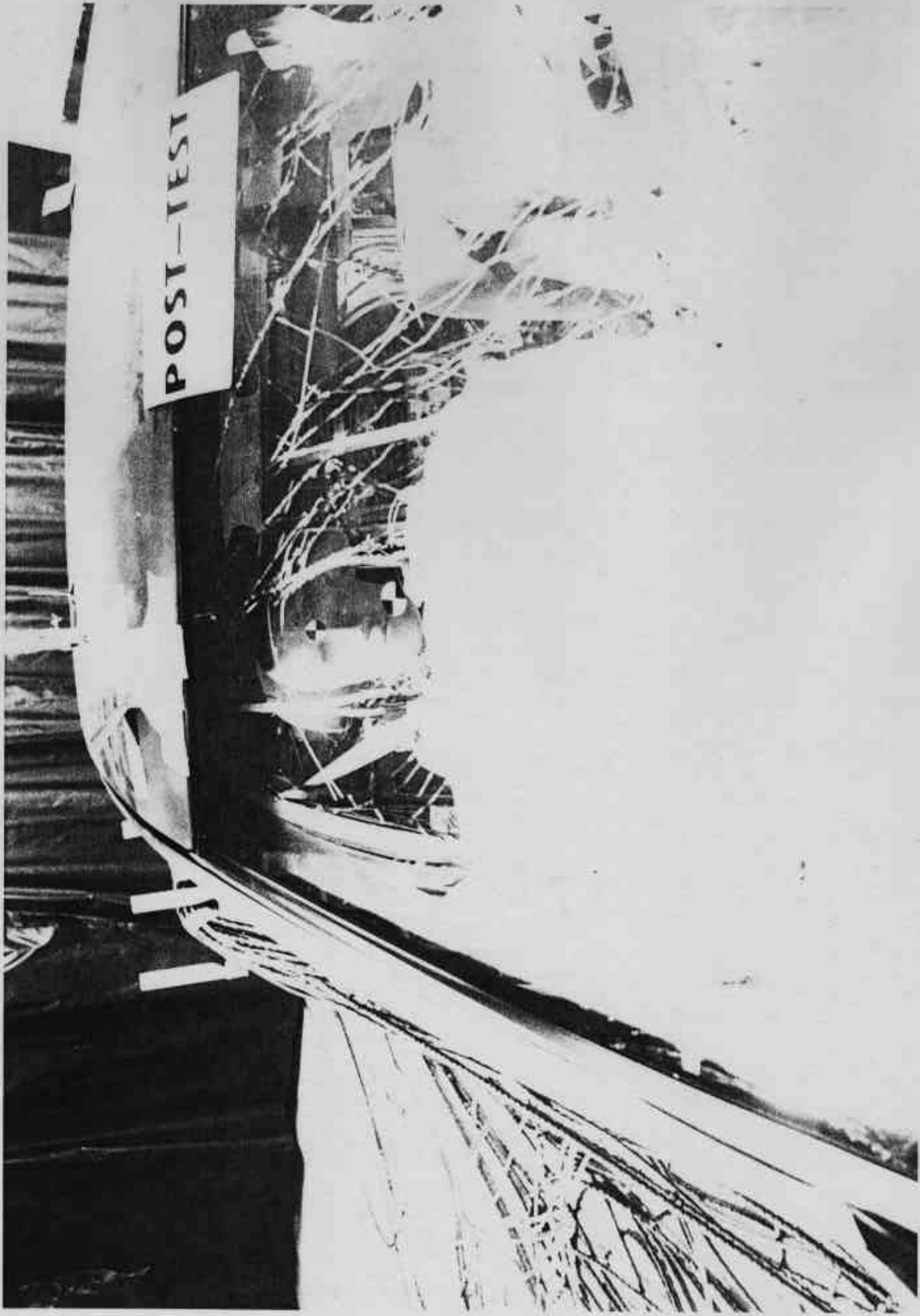


Photo No. A-45 - Post-Test Passenger Windshield View

Photo No. A-46 - Vehicle Certification Label



TIRE SIZE DIMENSIONS	FRONT AVANT	REAR ARRIERE
P195/65R15	210 kPa 30 psi	200 kPa 29 psi

REAR VIEW MIRROR
UTILISATION A L'AVANT
MAX 50 MPH 80 km/h
POUR LES DETAILS SE REFERER
AU MANUEL DU CONDUCTEUR

9E003

Photo No. A-47 - Tire Placard

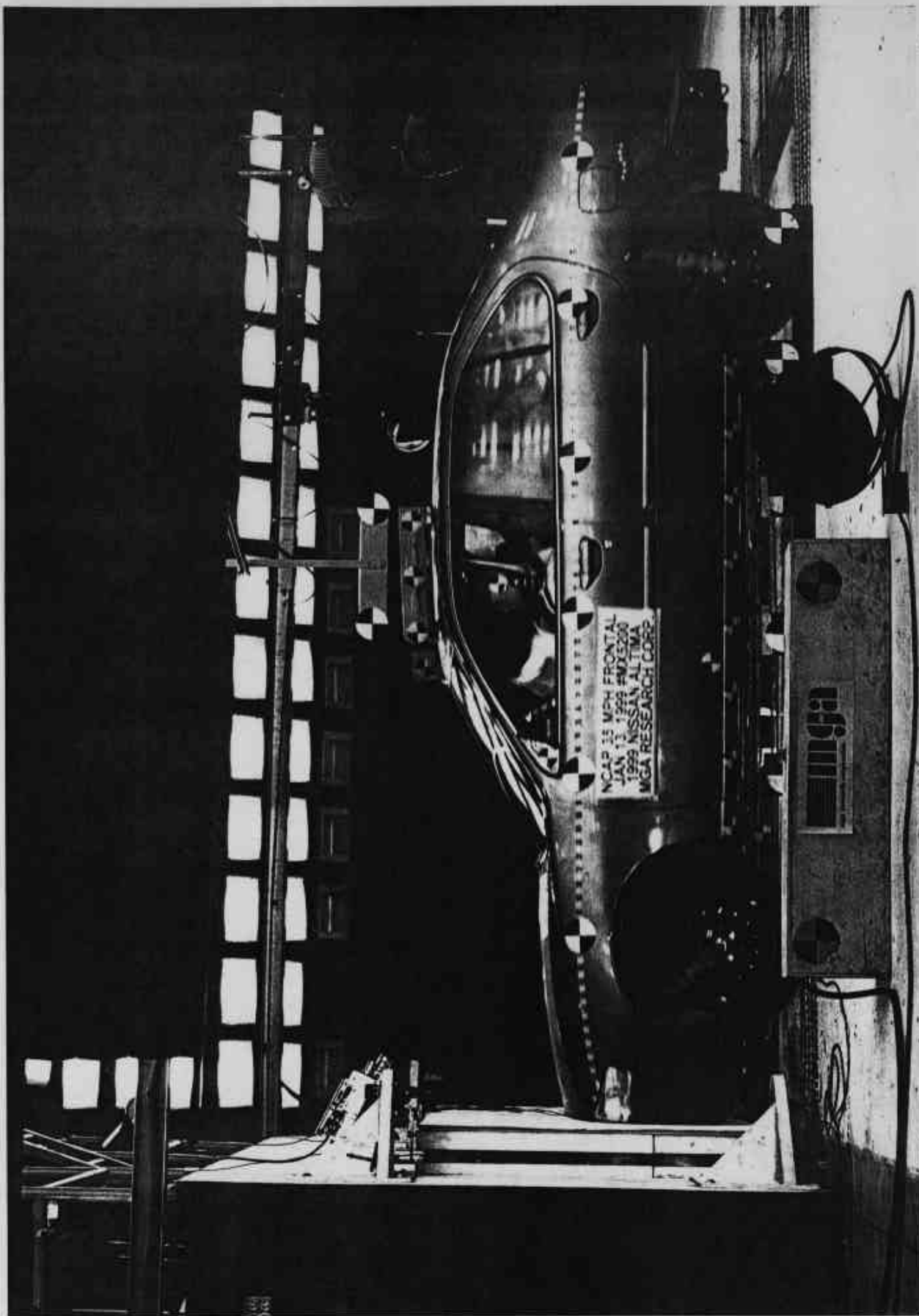
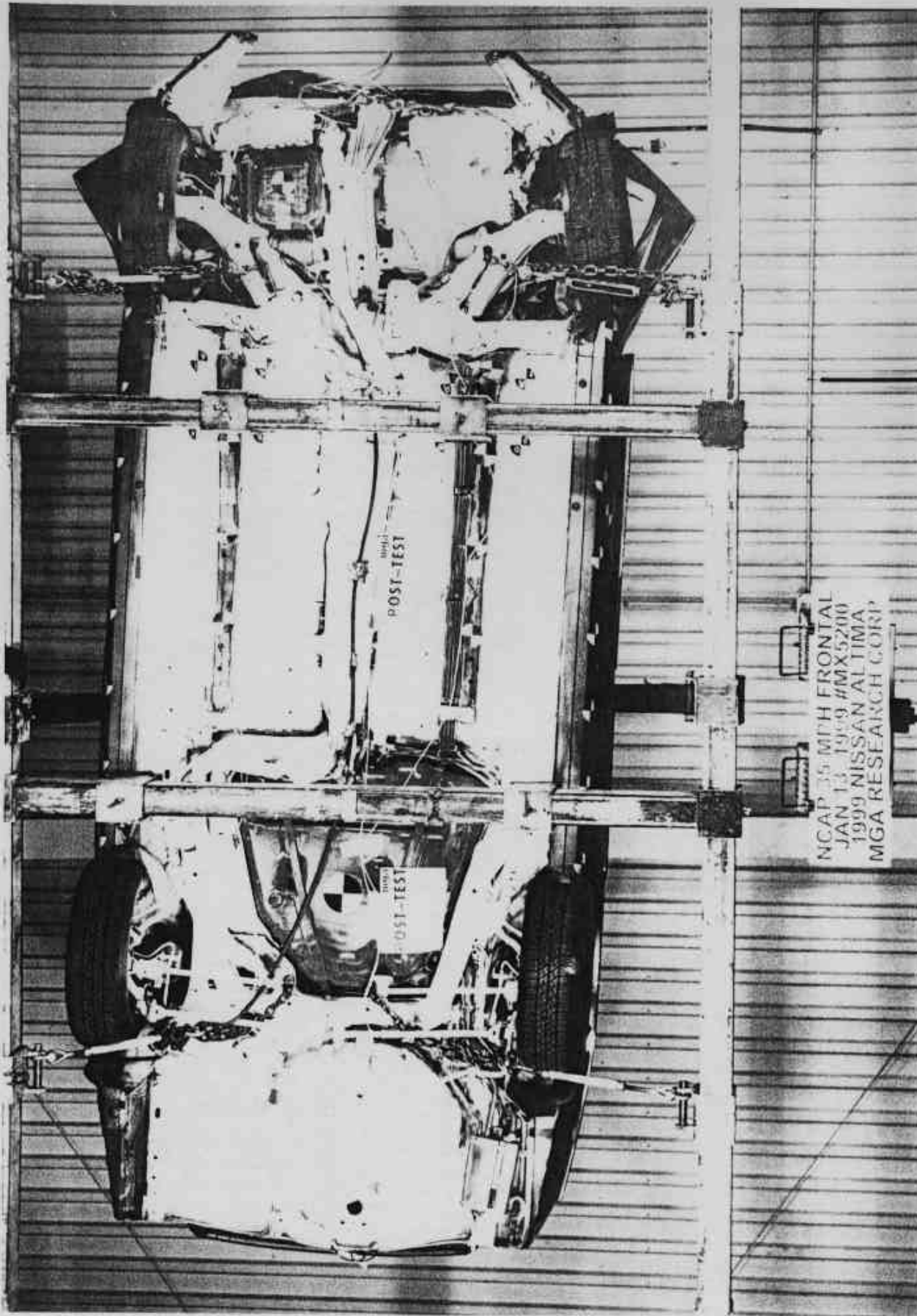


Photo No. A-48 - Vehicle Impact

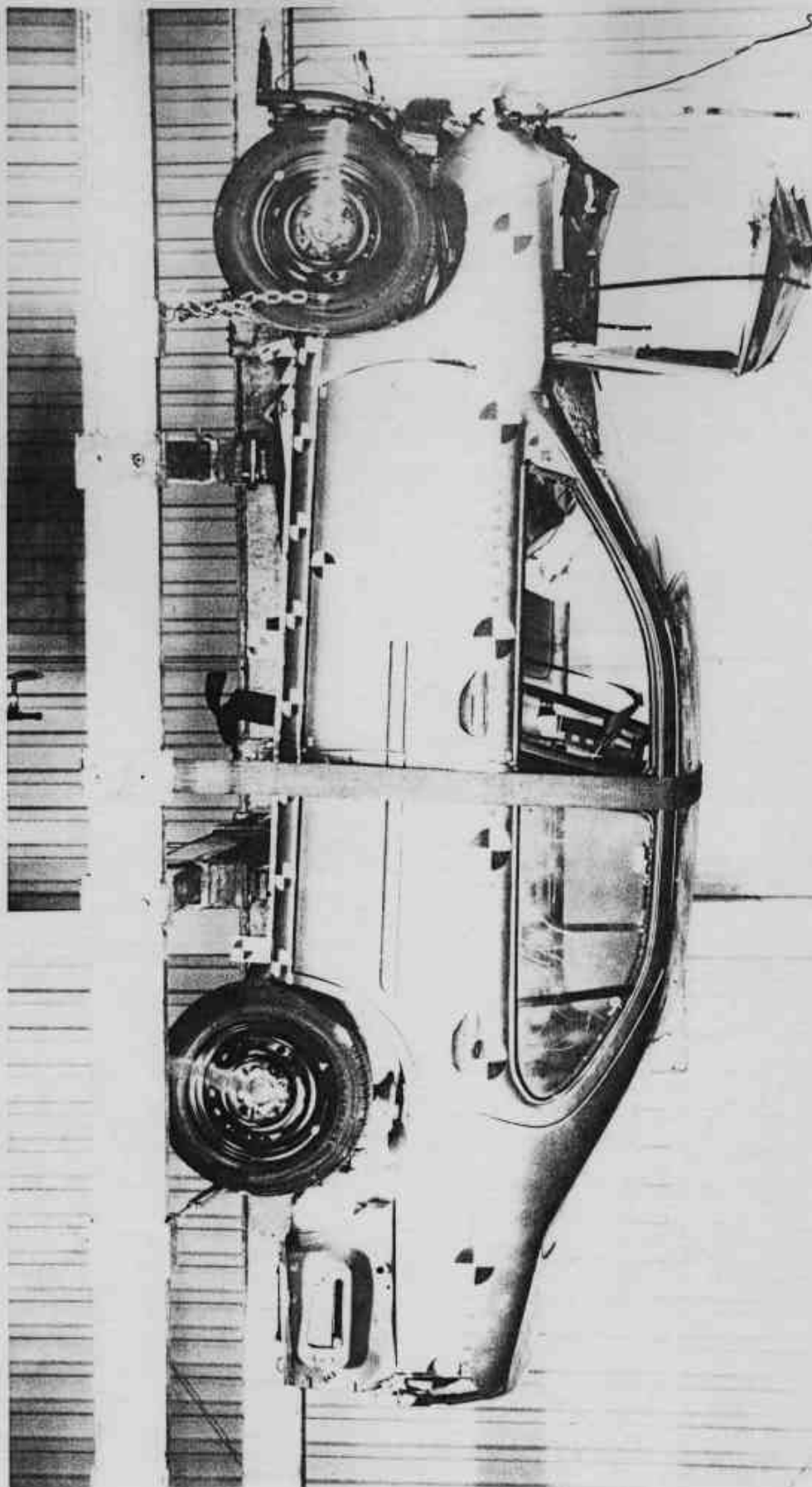


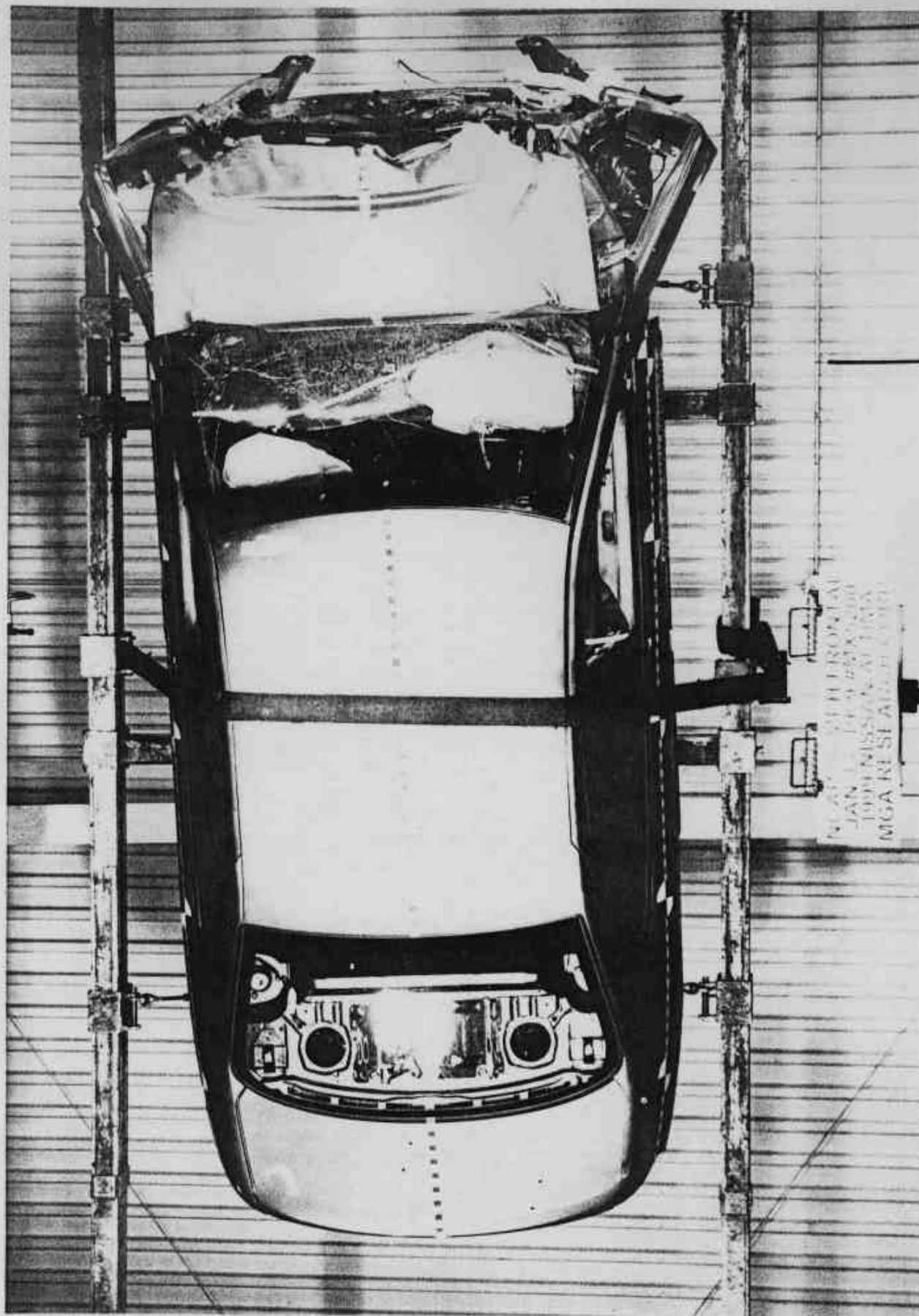
A-49

Photo No. A-49 - Rollover 90°

A-50

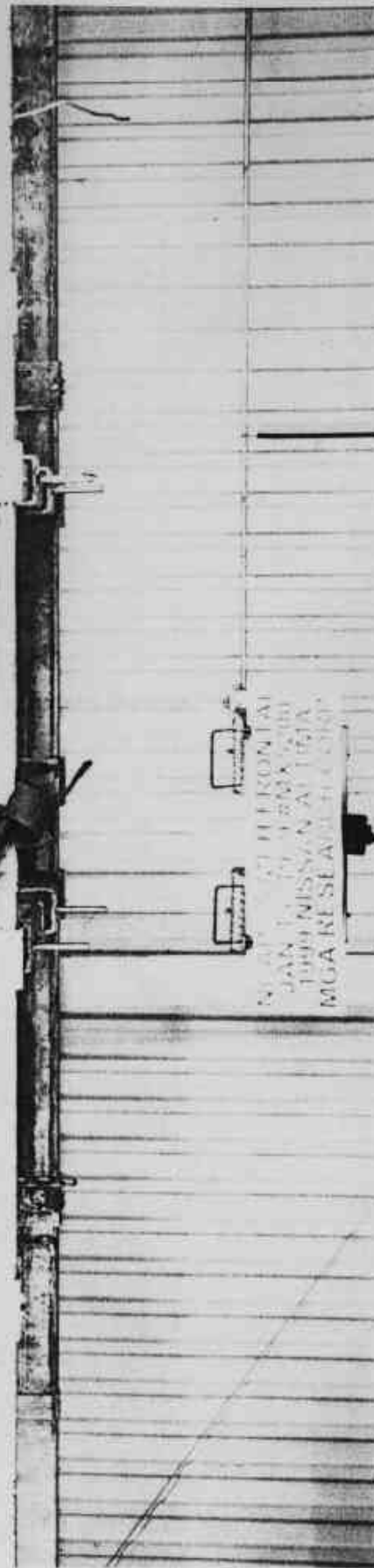
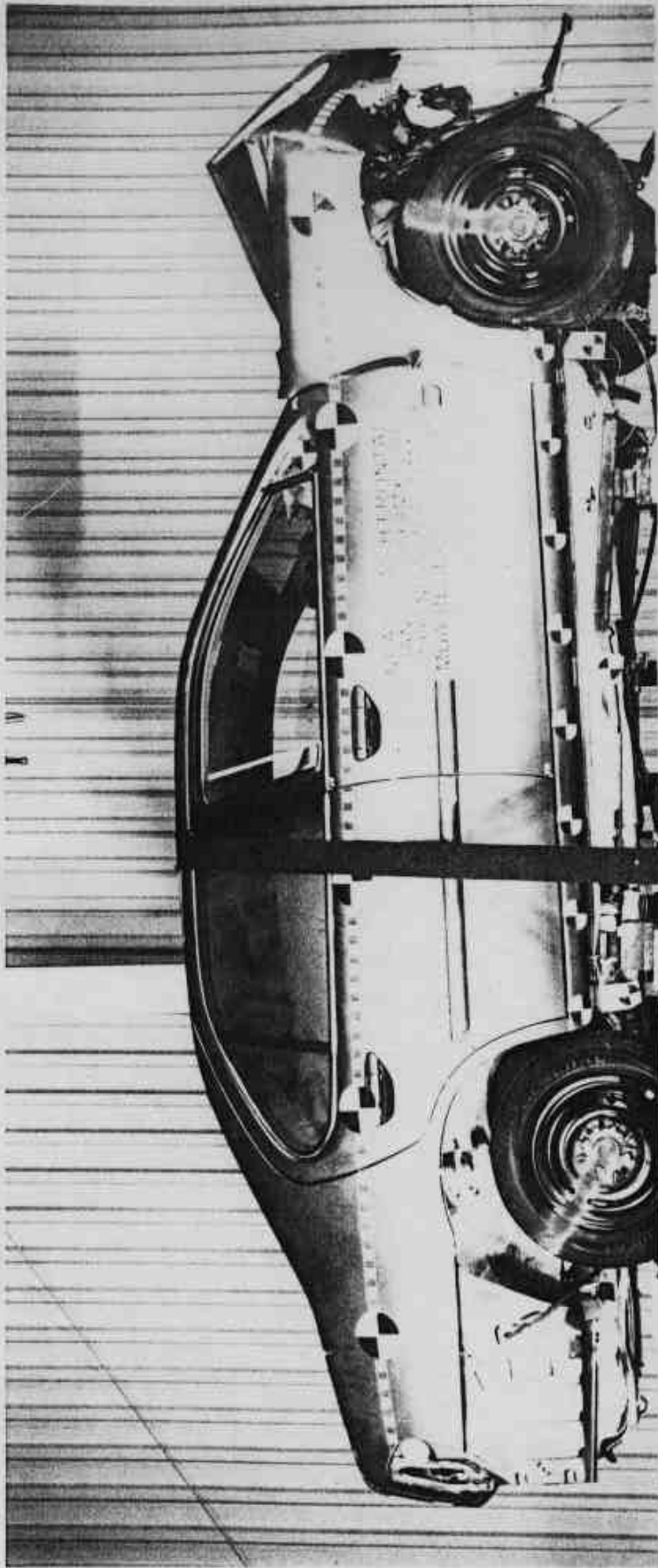
Photo No. A-50 - Rollover 180°





A-51

Photo No. A-51 - Rollover 270°



A-52

Photo No. A-52 - Rollover 360°

APPENDIX B
VEHICLE, LOAD CELL BARRIER AND DUMMY RESPONSE DATA

1999 Nissan Altima 4 Door

VEHICLE DATA FILTER CHANNEL CLASS

Head Accelerations 1000 (1650 Hz)

Chest Accelerations 180 (300 Hz)

Vehicle Accelerations 60 (100 Hz)

Barrier Load Cells 60 (100 Hz)

Femur Load Cells 600 (1000 Hz)

Lap and Torso Belts 60 (100 Hz)

Occupant Data

Page No.

Figure B-1 - Driver Head X Acceleration vs. Time	B-1
Figure B-2 - Driver Head Y Acceleration vs. Time	B-2
Figure B-3 - Driver Head Z Acceleration vs. Time	B-3
Figure B-4 - Driver Head Resultant Acceleration vs. Time	B-4
Figure B-5 - Driver Head X Velocity vs. Time	B-5
Figure B-6 - Driver Head Redundant X Acceleration vs. Time	B-6
Figure B-7 - Driver Head Redundant Y Acceleration vs. Time	B-7
Figure B-8 - Driver Head Redundant Z Acceleration vs. Time	B-8
Figure B-9 - Driver Head Redundant Resultant Acceleration vs. Time	B-9
Figure B-10 - Driver Head Redundant X Velocity vs. Time	B-10
Figure B-11 - Driver Neck Force X vs. Time	B-11
Figure B-12 - Driver Neck Force Y vs. Time	B-12
Figure B-13 - Driver Neck Force Z vs. Time	B-13
Figure B-14 - Driver Neck Force Resultant vs. Time	B-14
Figure B-15 - Driver Neck Moment X vs. Time	B-15
Figure B-16 - Driver Neck Moment Y vs. Time	B-16
Figure B-17 - Driver Neck Moment Z vs. Time	B-17
Figure B-18 - Driver Neck Moment Resultant vs. Time	B-18
Figure B-19 - Driver Chest X Acceleration vs. Time	B-19
Figure B-20 - Driver Chest Y Acceleration vs. Time	B-20
Figure B-21 - Driver Chest Z Acceleration vs. Time	B-21
Figure B-22 - Driver Chest Resultant Acceleration vs. Time	B-22
Figure B-23 - Driver Chest X Velocity vs. Time	B-23
Figure B-24 - Driver Chest Redundant X Acceleration vs. Time	B-24

Occupant Data: (Cont'd)

Page No.

Figure B-25 - Driver Chest Redundant Y Acceleration vs. Time	B-25
Figure B-26 - Driver Chest Redundant Z Acceleration vs. Time	B-26
Figure B-27 - Driver Chest Redundant Resultant Acceleration vs. Time	B-27
Figure B-28 - Driver Chest Redundant X Velocity vs. Time	B-28
Figure B-29 - Driver Chest Compression vs. Time	B-29
Figure B-30 - Driver Pelvis X Acceleration vs. Time*	B-30
Figure B-31 - Driver Pelvis Y Acceleration vs. Time	B-31
Figure B-32 - Driver Pelvis Z Acceleration vs. Time	B-32
Figure B-33 - Driver Pelvis Resultant Acceleration vs. Time*	B-33
Figure B-34 - Driver Pelvis X Velocity vs. Time*	B-34
Figure B-35 - Driver Left Femur Force vs. Time	B-35
Figure B-36 - Driver Right Femur Force vs. Time	B-36
Figure B-37 - Driver Left Upper Tibia Moment X vs. Time	B-37
Figure B-38 - Driver Left Upper Tibia Moment Y vs. Time	B-38
Figure B-39 - Driver Left Upper Tibia Force Z vs. Time	B-39
Figure B-40 - Driver Left Lower Tibia Moment X vs. Time	B-40
Figure B-41 - Driver Left Lower Tibia Moment Y vs. Time	B-41
Figure B-42 - Driver Left Lower Tibia Force Z vs. Time	B-42
Figure B-43 - Driver Right Upper Tibia Moment X vs. Time	B-43
Figure B-44 - Driver Right Upper Tibia Moment Y vs. Time	B-44
Figure B-45 - Driver Right Upper Tibia Force Z vs. Time	B-45
Figure B-46 - Driver Right Lower Tibia Moment X vs. Time	B-46
Figure B-47 - Driver Right Lower Tibia Moment Y vs. Time	B-47
Figure B-48 - Driver Right Lower Tibia Force Z vs. Time	B-48
Figure B-49 - Driver Left Foot Ball Z Acceleration vs. Time	B-49
Figure B-50 - Driver Left Heel X Acceleration vs. Time	B-50
Figure B-51 - Driver Left Heel Z Acceleration vs. Time	B-51
Figure B-52 - Driver Right Foot Ball Z Acceleration vs. Time	B-52
Figure B-53 - Driver Right Heel X Acceleration vs. Time	B-53
Figure B-54 - Driver Right Heel Z Acceleration vs. Time	B-54
Figure B-55 - Driver Shoulder Belt Force vs. Time	B-55
Figure B-56 - Driver Lap Belt Force vs. Time	B-56

* Not Valid After 72 msec.

Occupant Data: (Cont'd)

Page No.

Figure B-57 - Passenger Head X Acceleration vs. Time	B-57
Figure B-58 - Passenger Head Y Acceleration vs. Time	B-58
Figure B-59 - Passenger Head Z Acceleration vs. Time	B-59
Figure B-60 - Passenger Head Resultant Acceleration vs. Time	B-60
Figure B-61 - Passenger Head X Velocity vs. Time	B-61
Figure B-62 - Passenger Head Redundant X Acceleration vs. Time	B-62
Figure B-63 - Passenger Head Redundant Y Acceleration vs. Time	B-63
Figure B-64 - Passenger Head Redundant Z Acceleration vs. Time	B-64
Figure B-65 - Passenger Head Redundant Resultant Acceleration vs. Time	B-65
Figure B-66 - Passenger Head Redundant X Velocity vs. Time	B-66
Figure B-67 - Passenger Neck Force X vs. Time	B-67
Figure B-68 - Passenger Neck Force Y vs. Time	B-68
Figure B-69 - Passenger Neck Force Z vs. Time	B-69
Figure B-70 - Passenger Neck Force Resultant vs. Time	B-70
Figure B-71 - Passenger Neck Moment X vs. Time	B-71
Figure B-72 - Passenger Neck Moment Y vs. Time	B-72
Figure B-73 - Passenger Neck Moment Z vs. Time	B-73
Figure B-74 - Passenger Neck Moment Resultant vs. Time	B-74
Figure B-75 - Passenger Chest X Acceleration vs. Time	B-75
Figure B-76 - Passenger Chest Y Acceleration vs. Time	B-76
Figure B-77 - Passenger Chest Z Acceleration vs. Time	B-77
Figure B-78 - Passenger Chest Resultant Acceleration vs. Time	B-78
Figure B-79 - Passenger Chest X Velocity vs. Time	B-79
Figure B-80 - Passenger Chest Redundant X Acceleration vs. Time	B-80
Figure B-81 - Passenger Chest Redundant Y Acceleration vs. Time*	B-81
Figure B-82 - Passenger Chest Redundant Z Acceleration vs. Time	B-82
Figure B-83 - Passenger Chest Redundant Resultant Acceleration vs. Time*	B-83
Figure B-84 - Passenger Chest Redundant X Velocity vs. Time	B-84
Figure B-85 - Passenger Chest Compression vs. Time	B-85
Figure B-86 - Passenger Pelvis X Acceleration vs. Time	B-86
Figure B-87 - Passenger Pelvis Y Acceleration vs. Time	B-87
Figure B-88 - Passenger Pelvis Z Acceleration vs. Time*	B-88

* No Valid Data Collected

Occupant Data: (Cont'd)Page No.

Figure B-89 - Passenger Pelvis Resultant Acceleration vs. Time*	B-89
Figure B-90 - Passenger Pelvis X Velocity vs. Time	B-90
Figure B-91 - Passenger Left Femur Force vs. Time	B-91
Figure B-92 - Passenger Right Femur Force vs. Time	B-92
Figure B-93 - Passenger Left Upper Tibia Moment X vs. Time	B-93
Figure B-94 - Passenger Left Upper Tibia Moment Y vs. Time	B-94
Figure B-95 - Passenger Left Upper Tibia Force Z vs. Time	B-95
Figure B-96 - Passenger Left Lower Tibia Moment X vs. Time	B-96
Figure B-97 - Passenger Left Lower Tibia Moment Y vs. Time	B-97
Figure B-98 - Passenger Left Lower Tibia Force Z vs. Time	B-98
Figure B-99 - Passenger Right Upper Tibia Moment X vs. Time	B-99
Figure B-100 - Passenger Right Upper Tibia Moment Y vs. Time	B-100
Figure B-101 - Passenger Right Upper Tibia Force Z vs. Time	B-101
Figure B-102 - Passenger Right Lower Tibia Moment X vs. Time	B-102
Figure B-103 - Passenger Right Lower Tibia Moment Y vs. Time	B-103
Figure B-104 - Passenger Right Lower Tibia Force Z vs. Time	B-104
Figure B-105 - Passenger Left Foot Ball Z Acceleration vs. Time	B-105
Figure B-106 - Passenger Left Heel X Acceleration vs. Time	B-106
Figure B-107 - Passenger Left Heel Z Acceleration vs. Time	B-107
Figure B-108 - Passenger Right Foot Ball Z Acceleration vs. Time*	B-108
Figure B-109 - Passenger Right Heel X Acceleration vs. Time	B-109
Figure B-110 - Passenger Right Heel Z Acceleration vs. Time	B-110
Figure B-111 - Passenger Shoulder Belt Force vs. Time	B-111
Figure B-112 - Passenger Lap Belt Force vs. Time	B-112

Vehicle and Barrier Data:

Figure B-113- Left Rear Seat Crossmember X Acceleration vs. Time	B-113
Figure B-114 - Left Rear Seat Crossmember X Velocity vs. Time	B-114
Figure B-115 - Left Rear Seat Crossmember X Displacement vs. Time	B-115
Figure B-116 - Right Rear Seat Crossmember X Acceleration vs. Time	B-116
Figure B-117- Right Rear Seat Crossmember X Velocity vs. Time	B-117
Figure B-118 - Right Rear Seat Crossmember X Displacement vs. Time	B-118

* No Valid Data Collected

Vehicle and Barrier Data:Page No.

Figure B-119 - Top of Engine Block X Acceleration vs. Time	B-119
Figure B-120 - Top of Engine Block X Velocity vs. Time	B-120
Figure B-121 - Top of Engine Block X Displacement vs. Time	B-121
Figure B-122 - Bottom of Engine X Acceleration vs. Time	B-122
Figure B-123 - Bottom of Engine X Velocity vs. Time	B-123
Figure B-124 - Bottom of Engine X Displacement vs. Time	B-124
Figure B-125 - Left Front Brake Caliper X Acceleration vs. Time	B-125
Figure B-126 - Left Front Brake Caliper X Velocity vs. Time	B-126
Figure B-127 - Left Front Brake Caliper X Displacement vs. Time	B-127
Figure B-128 - Right Front Brake Caliper X Acceleration vs. Time	B-128
Figure B-129 - Right Front Brake Caliper X Velocity vs. Time	B-129
Figure B-130 - Right Front Brake Caliper X Displacement vs. Time	B-130
Figure B-131 - Instrument Panel X Acceleration vs. Time	B-131
Figure B-132 - Instrument Panel X Velocity vs. Time	B-132
Figure B-133 - Instrument Panel X Displacement vs. Time	B-133
Figure B-134 - Left Rear Seat Crossmember Redundant X Acceleration vs. Time	B-134
Figure B-135 - Left Rear Seat Crossmember Redundant X Velocity vs. Time	B-135
Figure B-136 - Left Rear Seat Crossmember Redundant X Displacement vs. Time	B-136
Figure B-137 - Right Rear Seat Crossmember Redundant X Acceleration vs. Time	B-137
Figure B-138 - Right Rear Seat Crossmember Redundant X Velocity vs. Time	B-138
Figure B-139 - Right Rear Seat Crossmember Redundant X Displacement vs. Time	B-139
Figure B-140 - Upper Left Barrier Force vs. Time*	B-140
Figure B-141 - Upper Center Barrier Force vs. Time*	B-141
Figure B-142 - Upper Right Barrier Force vs. Time*	B-142
Figure B-143 - Lower Left Barrier Force vs. Time*	B-143
Figure B-144 - Lower Center Barrier Force vs. Time*	B-144
Figure B-145 - Lower Right Barrier Force vs. Time*	B-145

* No Valid Data Collected

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

SPEED: 35.06 MPH 56.4 KPH

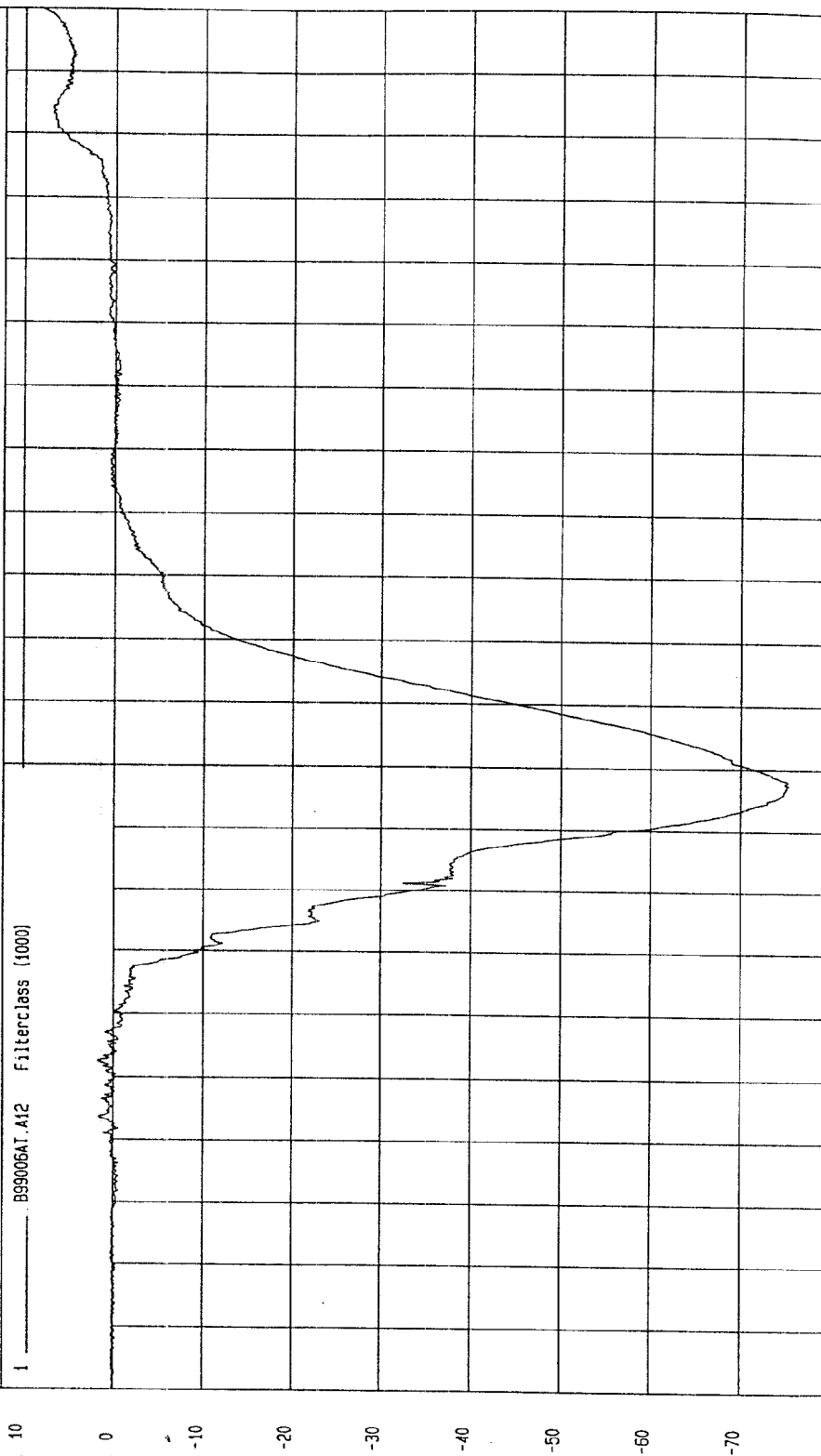
COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = 8.04 G'S at 200 msec

Minimum = -75.3 G'S at 77 msec

DRIVER HEAD X ACCELERATION

1 B99006AT.A12 Filterclass (1000)



MSA Research
01-14-1999 10:04

TIME (SECONDS)

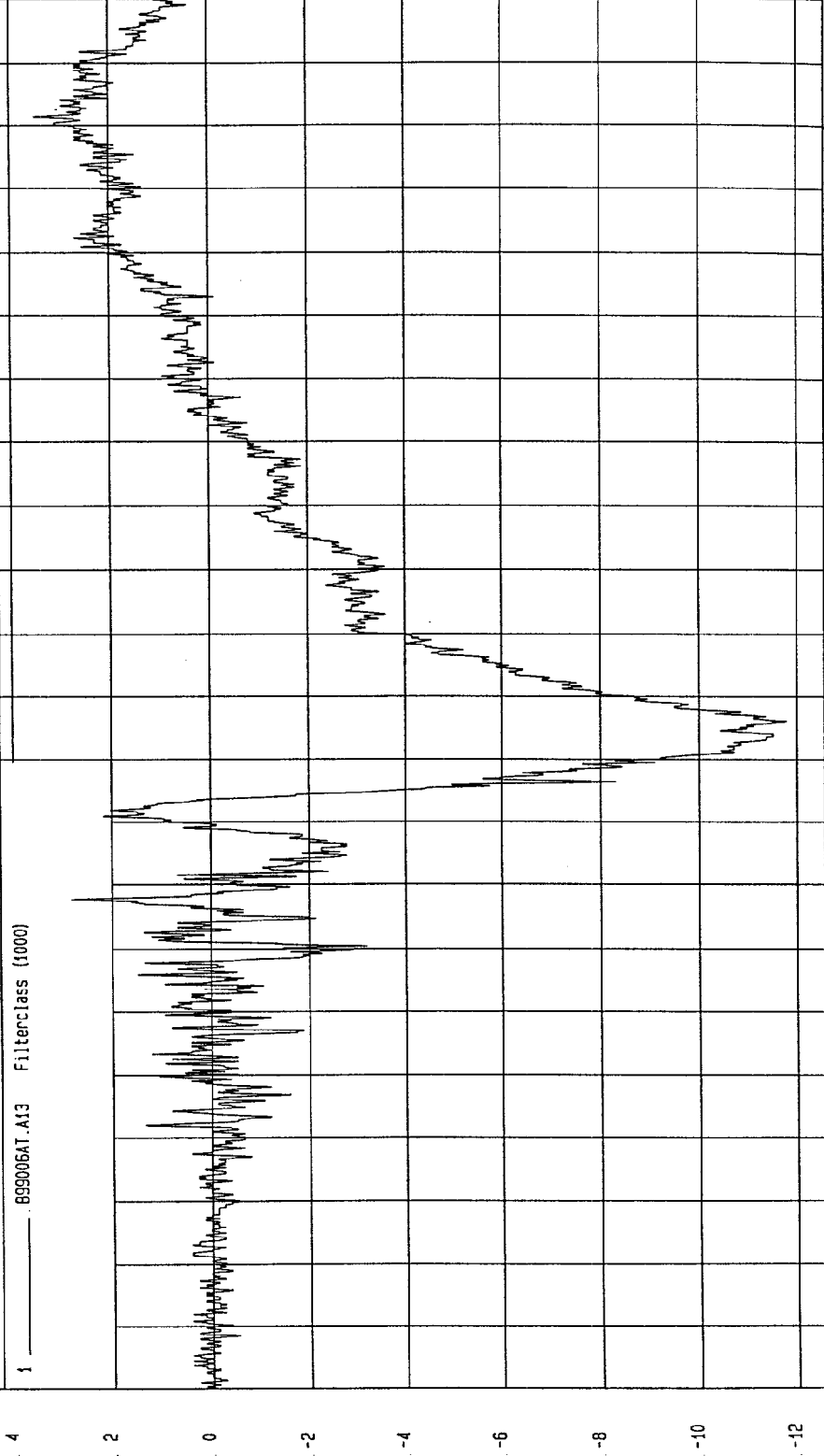
G's

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -11.78 G'S at 86 msec Maximum = 3.5 G'S at 181 msec

DRIVER HEAD Y ACCELERATION



TIME (SECONDS)

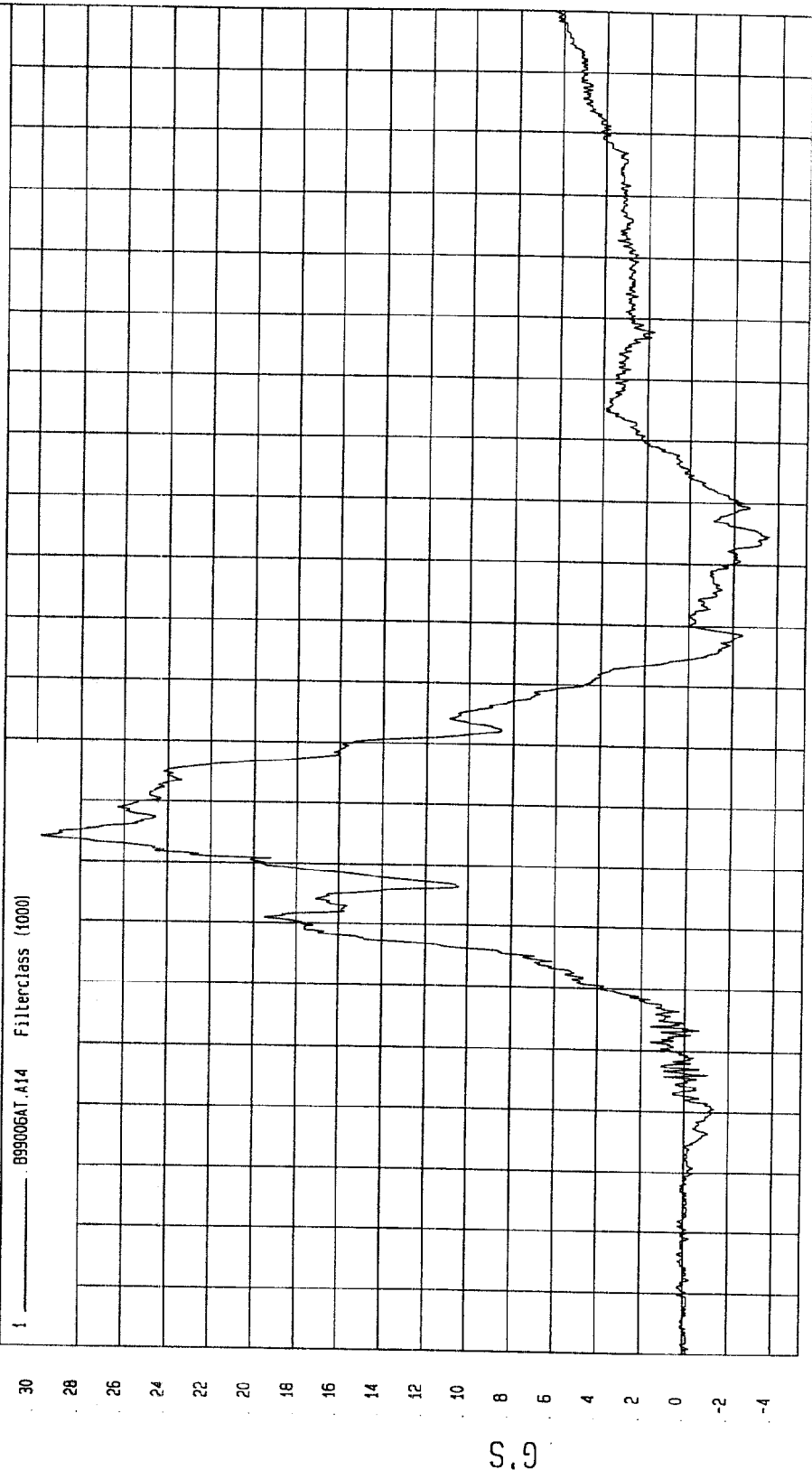
MCA Research
01-22-1999 16:12

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -3.62 G'S at 115 msec
Maximum = 29.78 G'S at 64 msec

DRIVER HEAD Z ACCELERATION



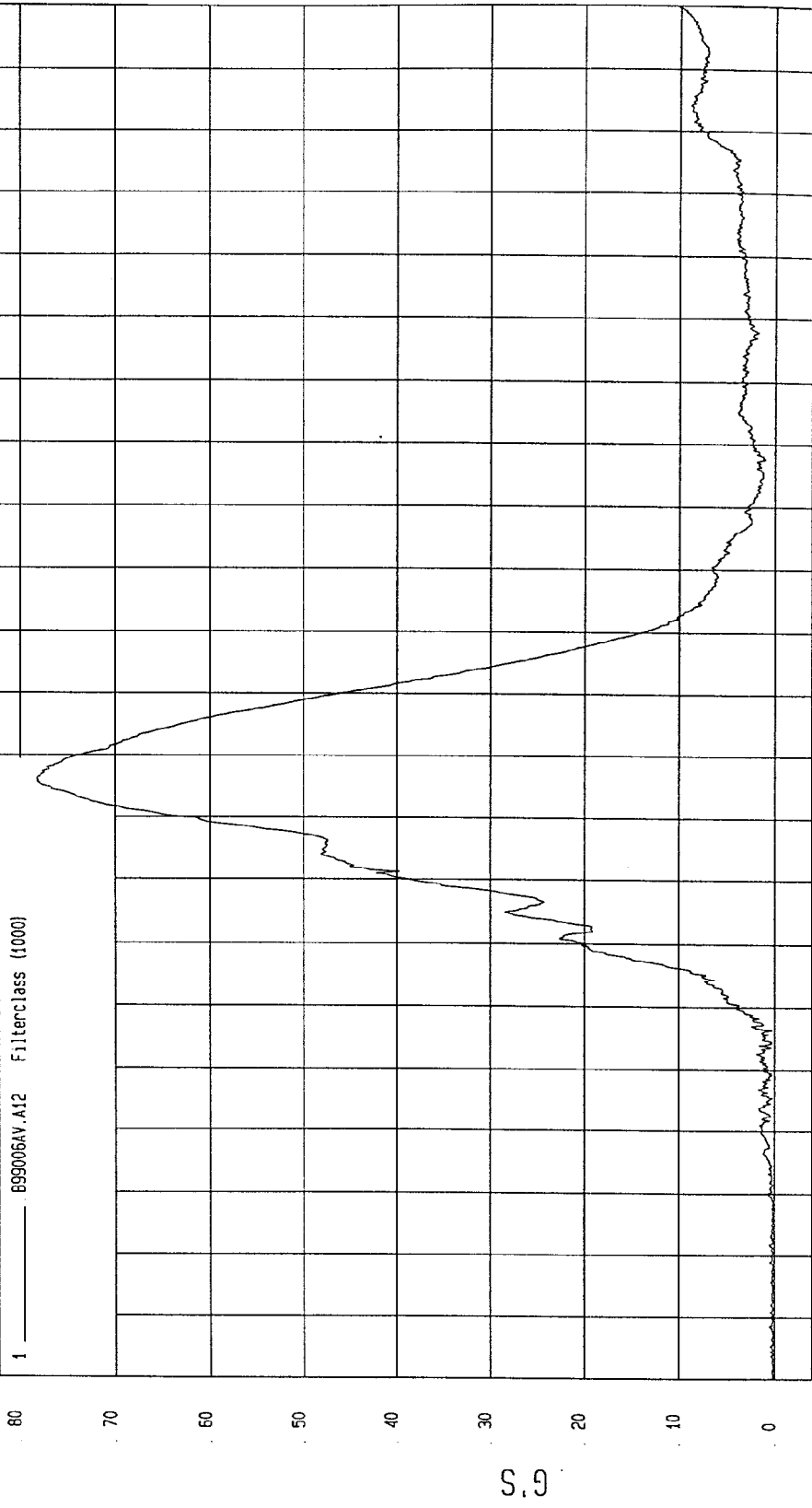
TIME (SECONDS)

MGA Research
01-22-1999 15:12

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999
COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = 1.92E-02 G'S at -16 msec Maximum = 78.27 G'S at 76 msec

DRIVER HEAD RESULTANT ACCELERATION



TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Speed: 35.06 MPH 56.4 KPH

Minimum = -25.65 KPH at 146 msec

Maximum = 56.81 KPH at 37 msec

DRIVER HEAD X VELOCITY

1 899006A1.V12 Filterclass (180)

60

50

40

30

20

10

0

-10

-20

KPH

-02

-01

0

01

02

03

04

05

06

07

08

09

1

11

12

13

14

15

16

17

18

19

TIME Seconds

WCA Research
01-22-1999 16:15

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -74.07 G'S at 77 msec Maximum = 7.93 G'S at 200 msec

DRIVER HEAD REDUNDANT X ACCELERATION



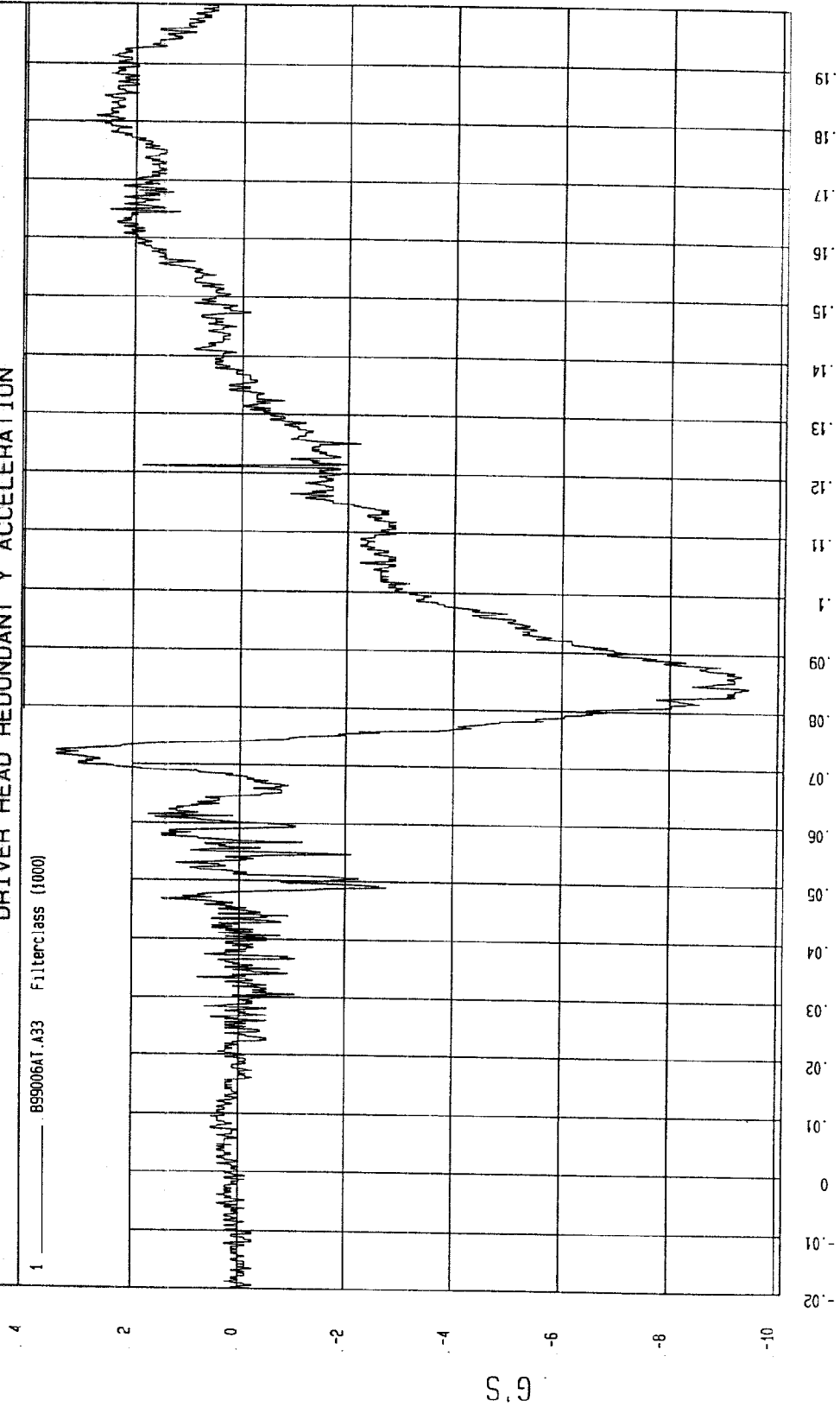
TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -9.47 G'S at 84 msec Maximum = 3.41 G'S at 72 msec

DRIVER HEAD REDUNDANT Y ACCELERATION

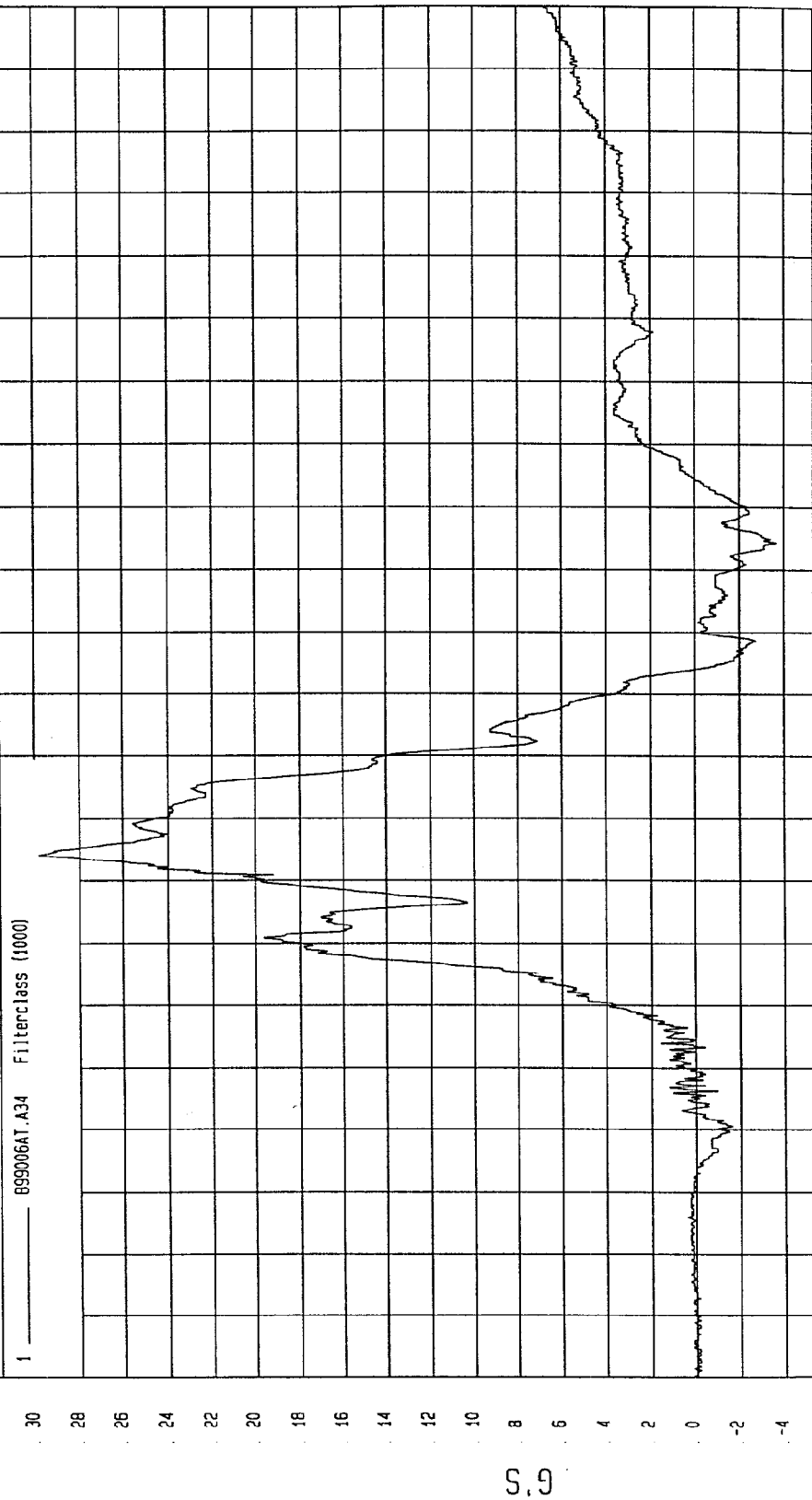
1 ——— B99006AT.A33 Filterclass (1000)



MGA Research
01-22-1999 16.13

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999
 COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH
 Minimum = -3.65 G'S at 114 msec Maximum = 29.84 G'S at 64 msec

DRIVER HEAD REDUNDANT Z ACCELERATION



MSA Research
 01-22-1999 16:13

TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

Speed: 35.06 MPH 56.4 KPH

COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Minimum = 3.74E-02 G'S at -20 msec

Maximum = 76.4 G'S at 77 msec

DRIVER HEAD REDUNDANT RESULTANT ACCELERATION

1 ——— B99006AV.A32 FilterClass (1000)

80

70

60

50

40

30

20

10

0

G.S

-0.02

-0.01

0

.01

.02

.03

.04

.05

.06

.07

.08

.09

1

.11

.12

.13

.14

.15

.16

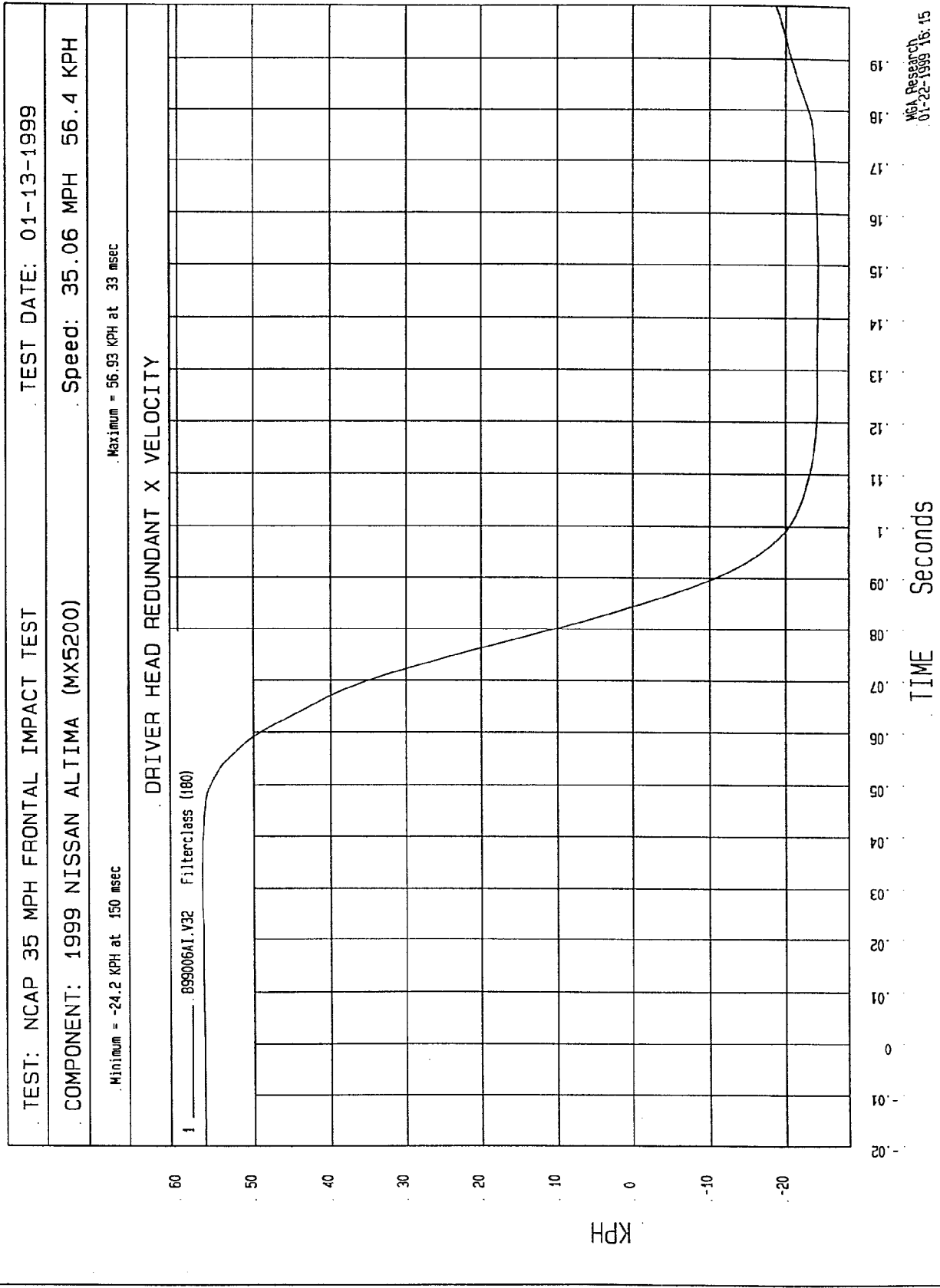
.17

.18

.19

TIME (SECONDS)

MGA Research
01-13-1999 18:59



TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

Speed: 35.06 MPH 56.4 KPH

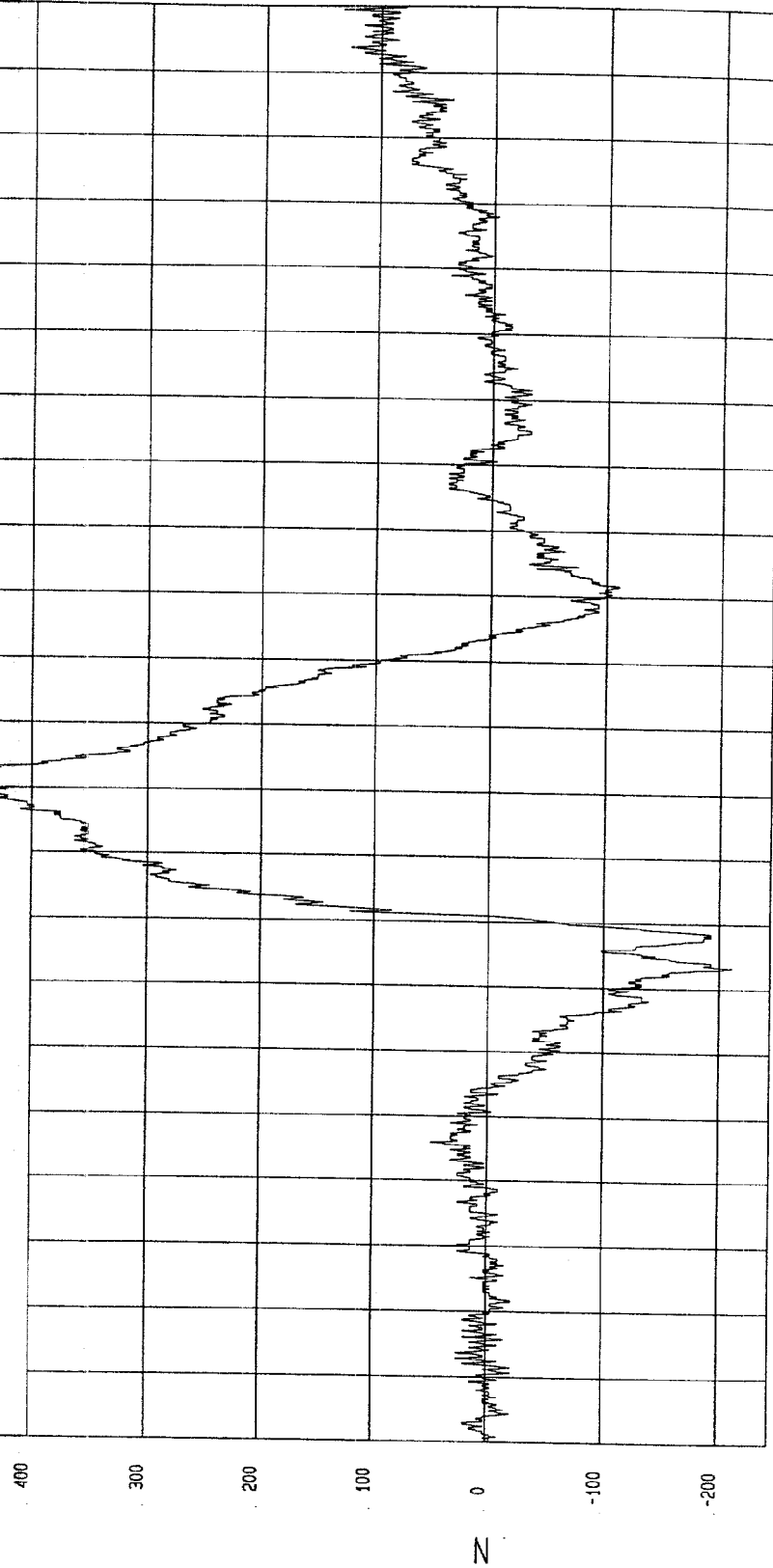
COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Minimum = -210.78 N at 53 msec

Maximum = 463.03 N at 81 msec

DRIVER NECK FORCE X

1 ——— B99006FT.F45 Filterclass (1000)

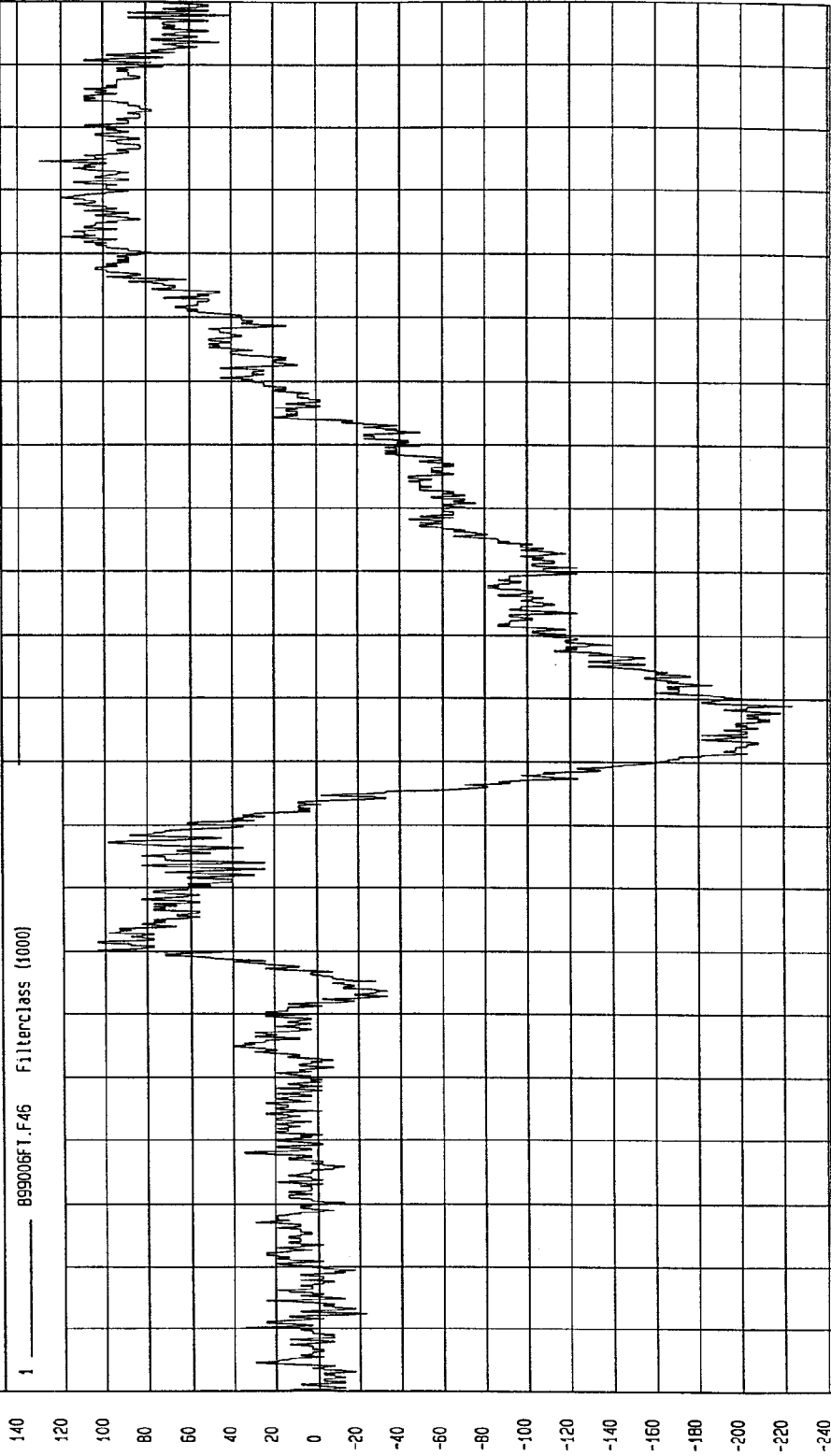


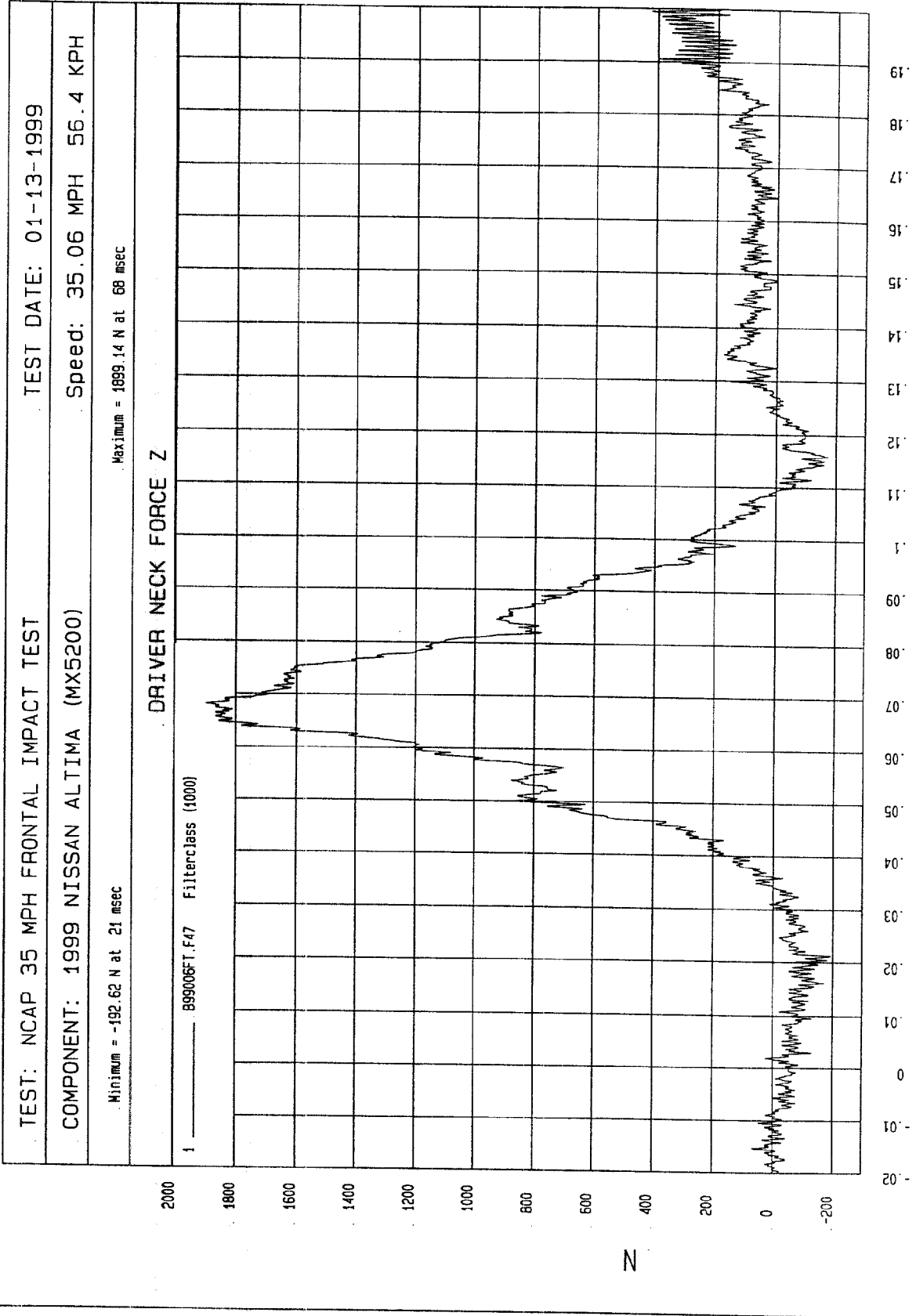
TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -223.7 N at 89 msec Maximum = 130.02 N at 175 msec

DRIVER NECK FORCE Y





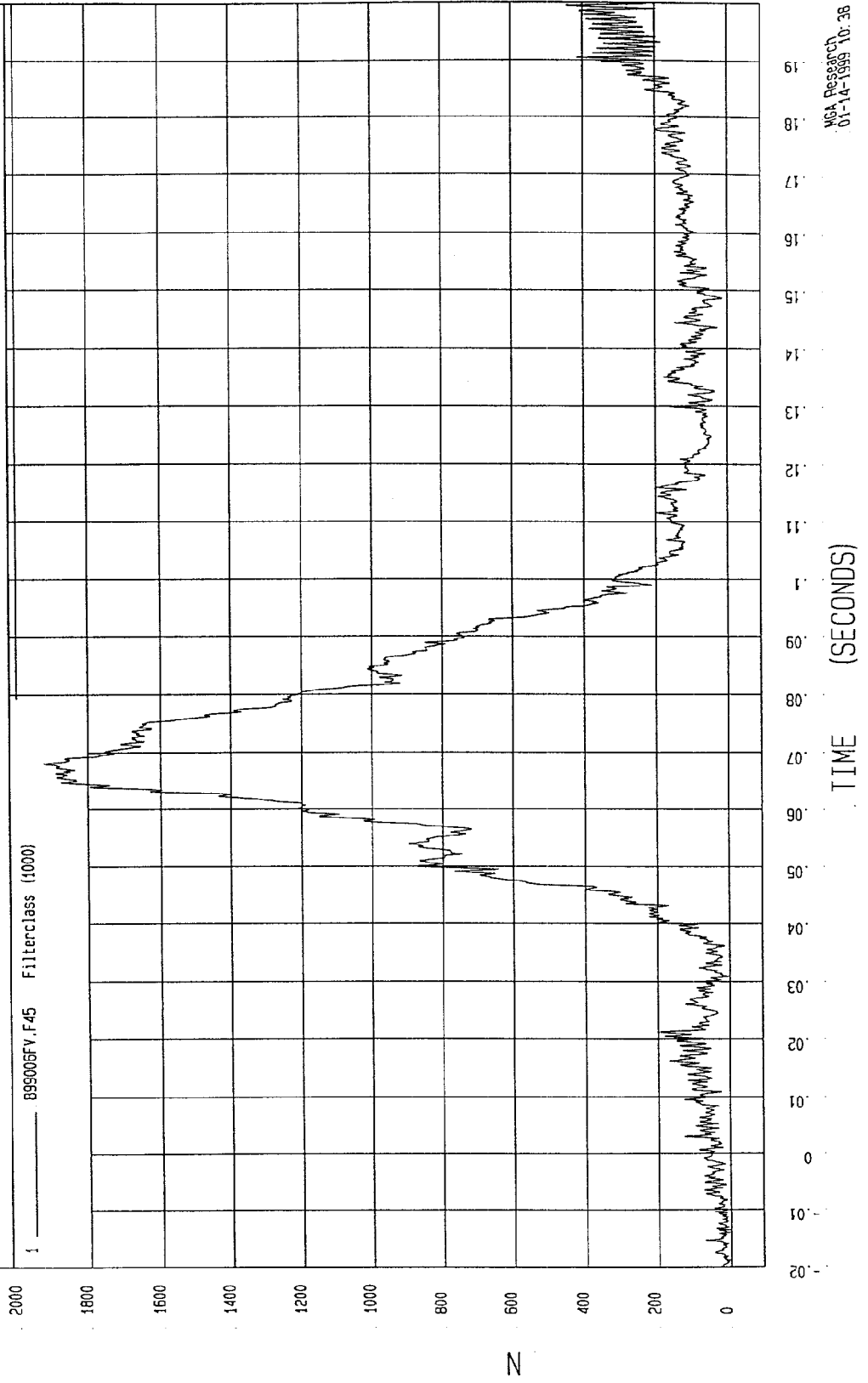
WCA Research
01-22-1999 16:13

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = 3.16 N at -19 msec Maximum = 1923.46 N at 68 msec

DRIVER NECK FORCE RESULTANT



TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

Speed: 35.06 MPH 56.4 KPH

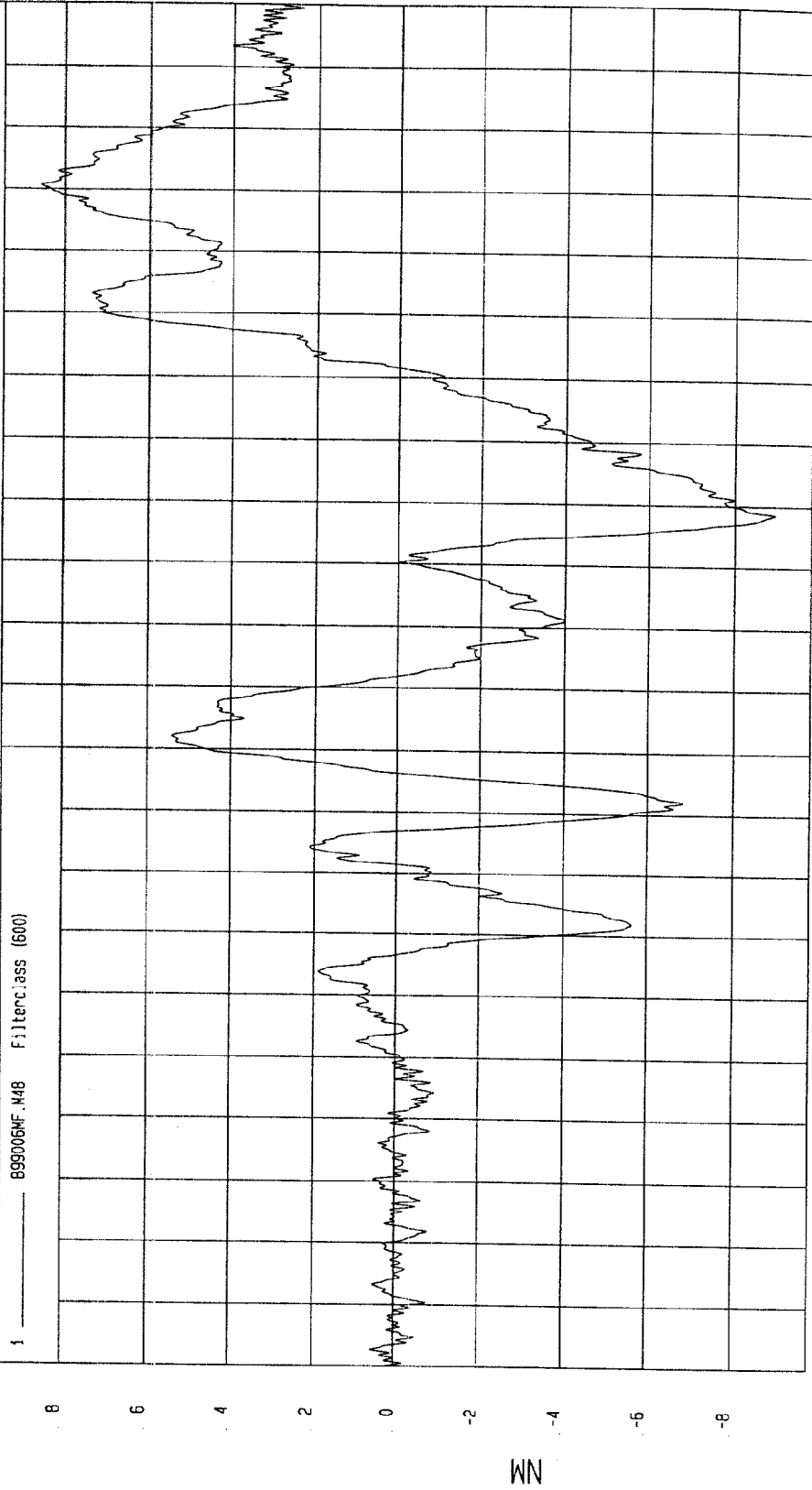
COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = 8.56 NM at 171 msec

Minimum = -8.96 NM at 119 msec

DRIVER NECK MOMENT X

1 ——— B99006WF.M48 Filter: class (600)



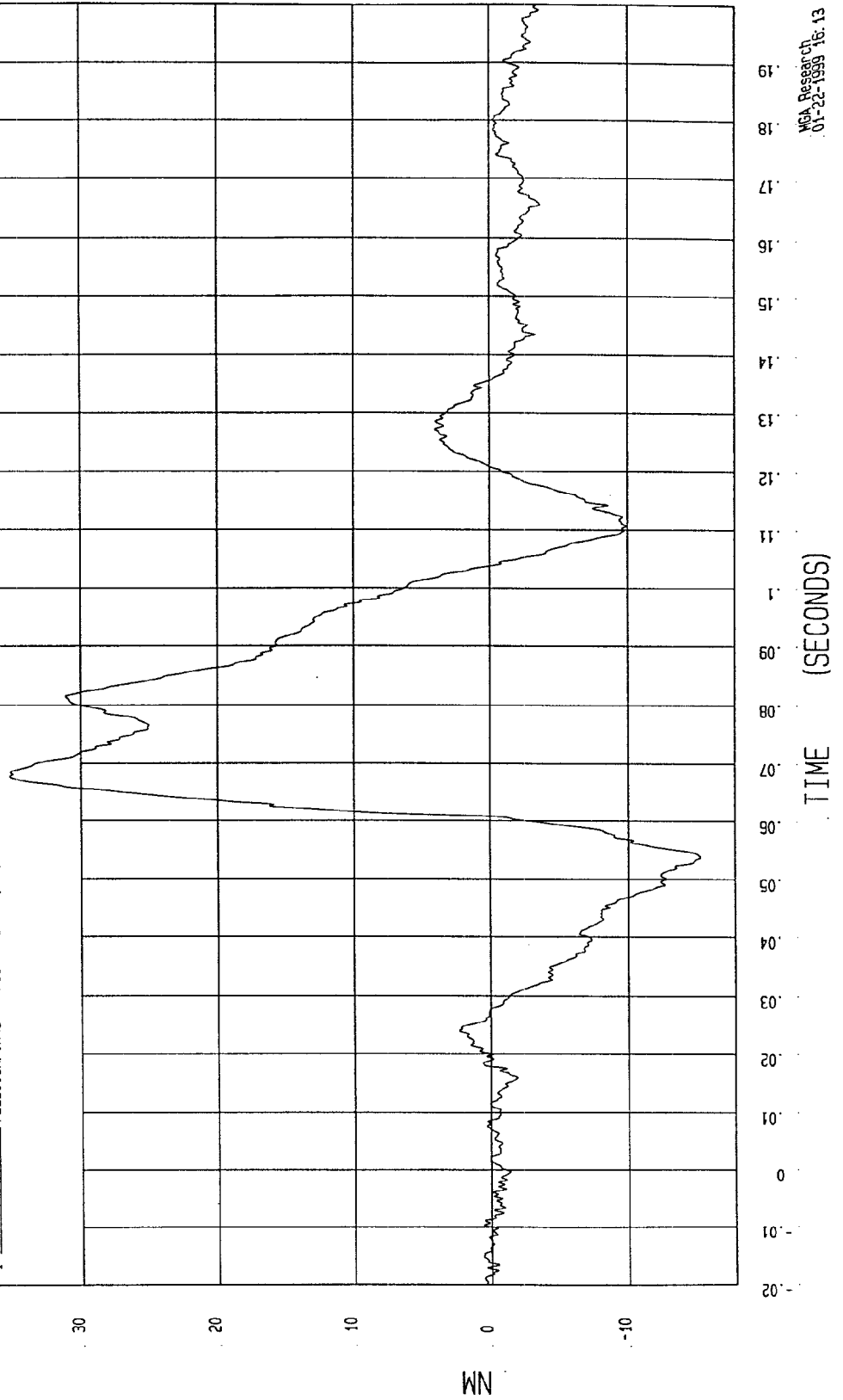
TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -15.31 NM at 54 msec Maximum = 35.13 NM at 68 msec

DRIVER NECK MOMENT Y

1 _____ B99006MF.M49 Filterclass (500)



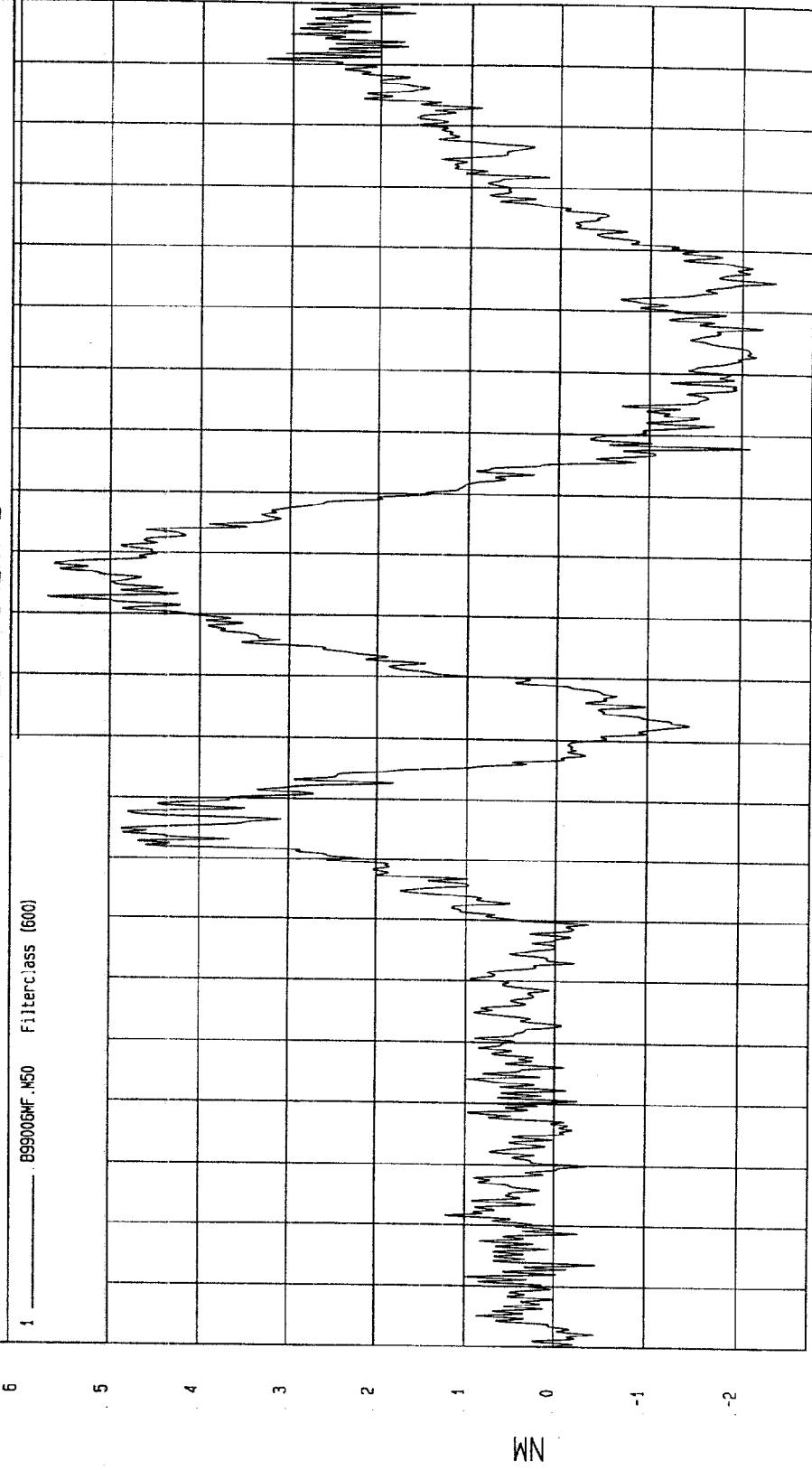
WCA Research
01-22-1999 16:13

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -2.38 NM at 155 msec Maximum = 5.68 NM at 103 msec

DRIVER NECK MOMENT Z



MSA Research
01-22-1999 16:13

TEST: NCAP 35 MPH FRONTAL IMPACT TEST

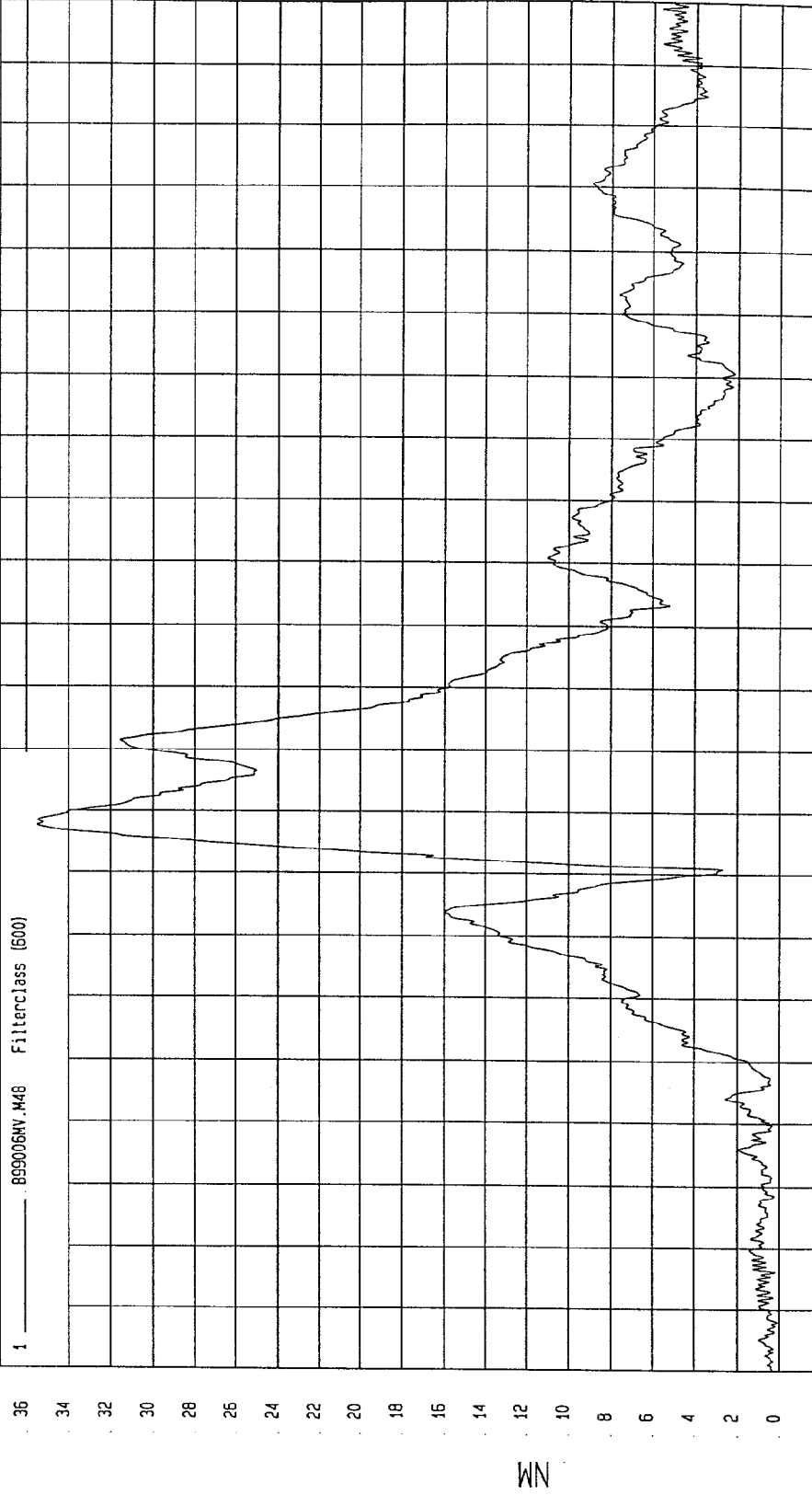
TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = 8.29E-02 NM at -12 msec

Maximum = 35.49 NM at 68 msec

DRIVER NECK MOMENT RESULTANT



WGA Research
01-14-1999 10:38

TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

Speed: 35.06 MPH 56.4 KPH

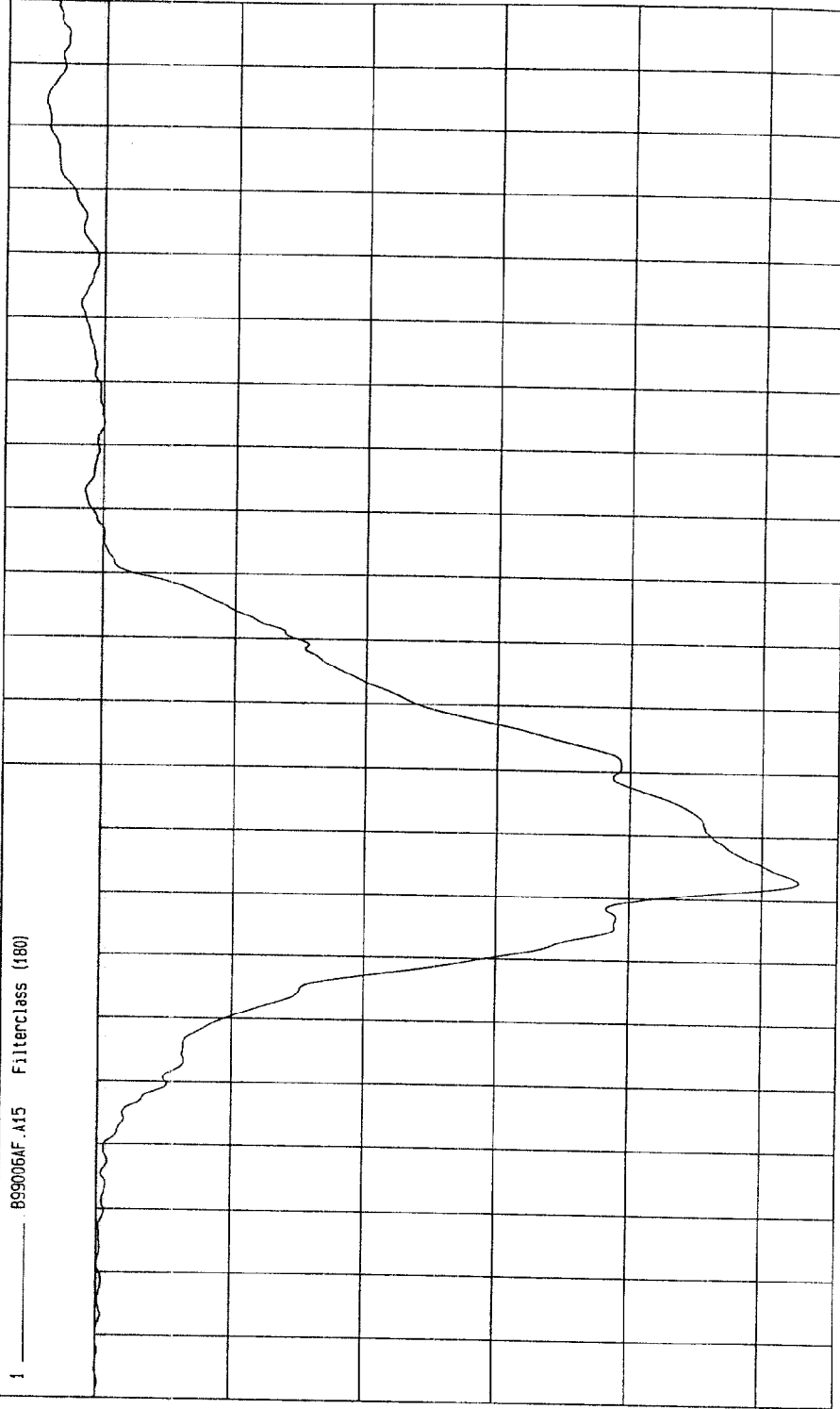
COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = 4.44 G'S at 184 msec

Minimum = -52.78 G'S at 63 msec

DRIVER CHEST X ACCELERATION

1 B99006AF.A15 Filterclass (180)

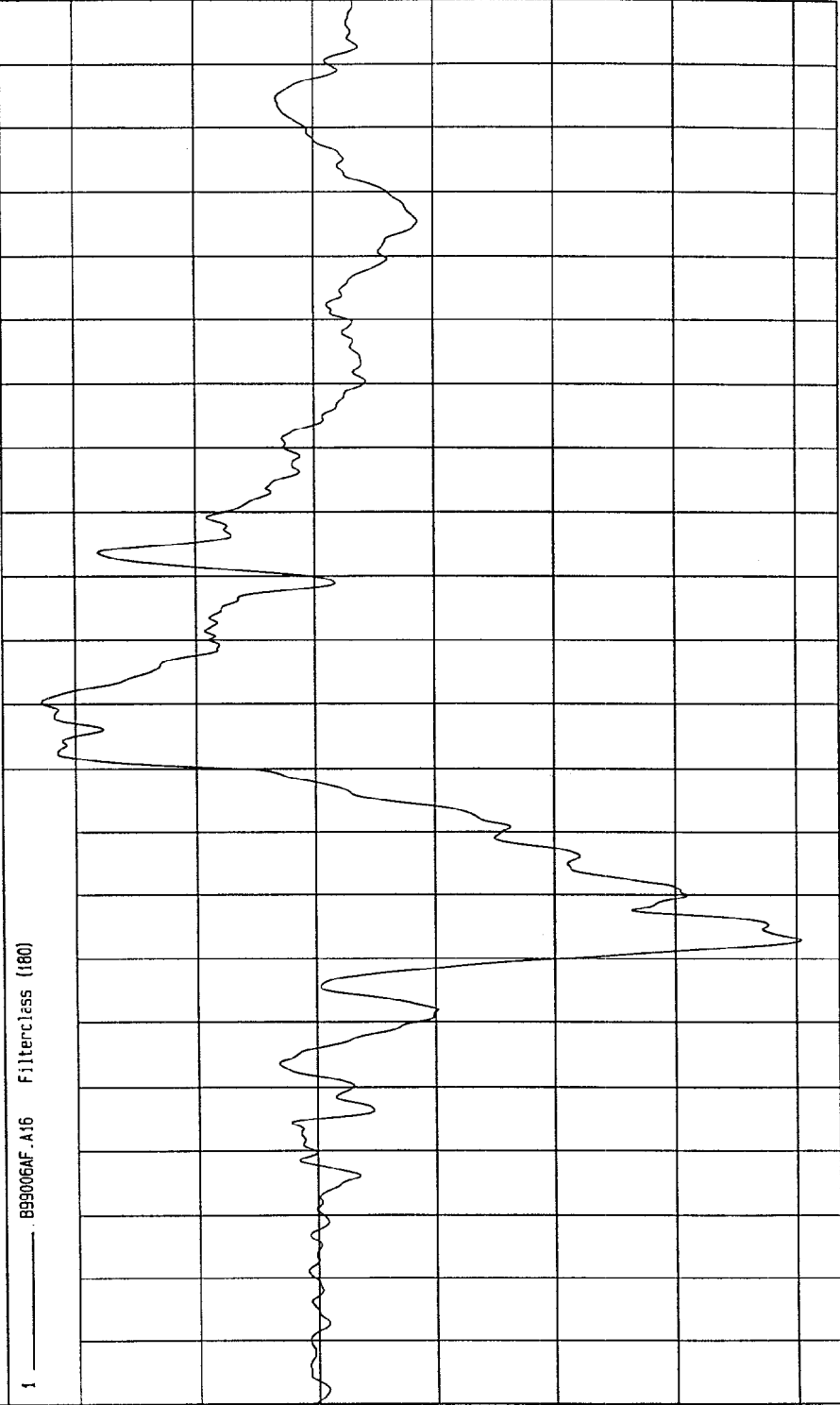


TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -8.08 G'S at 53 msec Maximum = 4.57 G'S at 90 msec

DRIVER CHEST Y ACCELERATION



TIME (SECONDS)

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

MGA Research
01-22-1999 16:12

TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

Speed: 35.06 MPH 56.4 KPH

COMPONENT: 1999 NISSAN ALTIMA (MX5200)

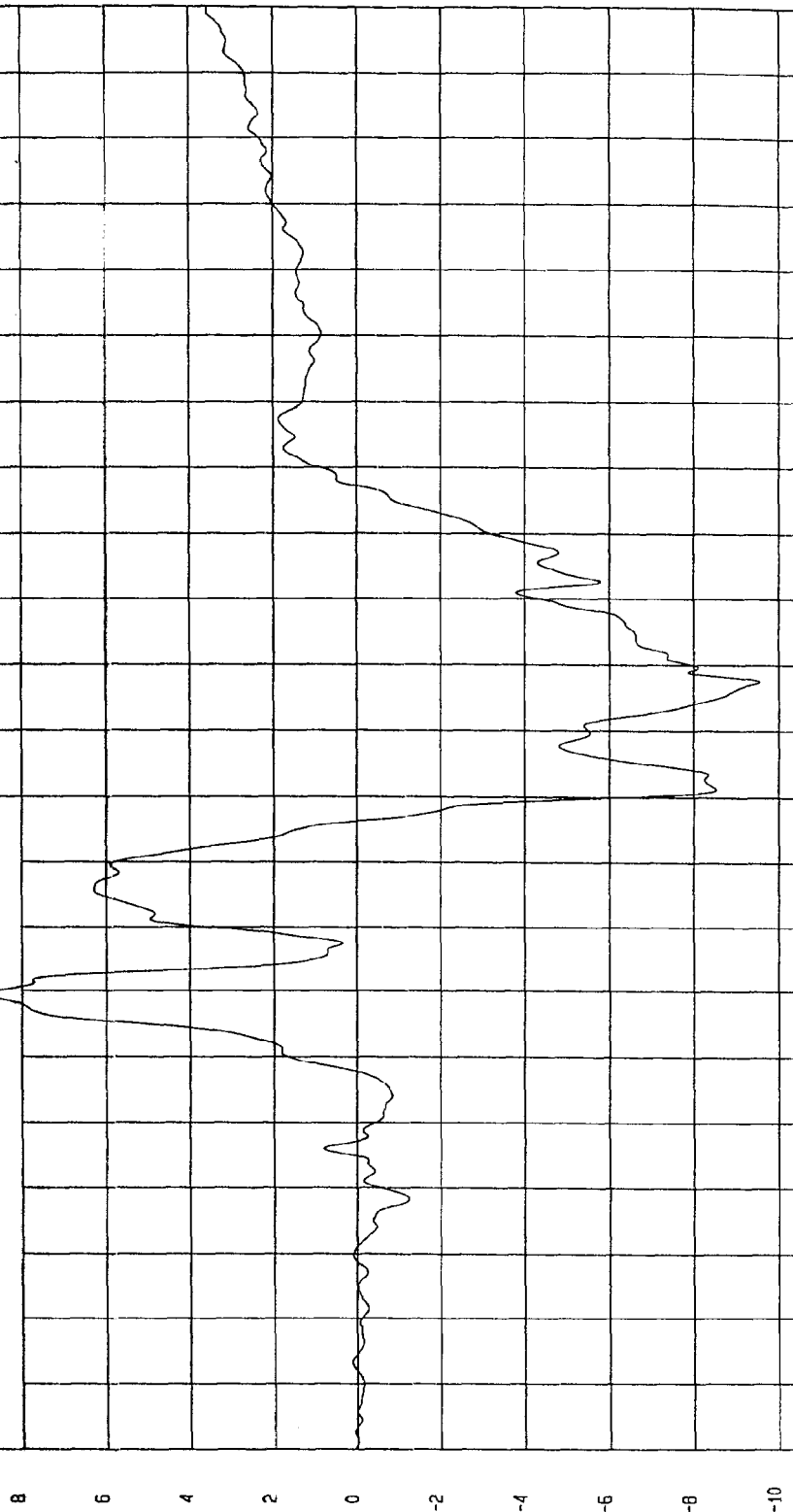
Minimum = -9.56 G'S at 98 msec

Maximum = 8.99 G'S at 49 msec

DRIVER CHEST Z ACCELERATION

1 ——— .899006AF.A17 Filterclass (180)

G.S



MGA Research
01-22-1999 16:12

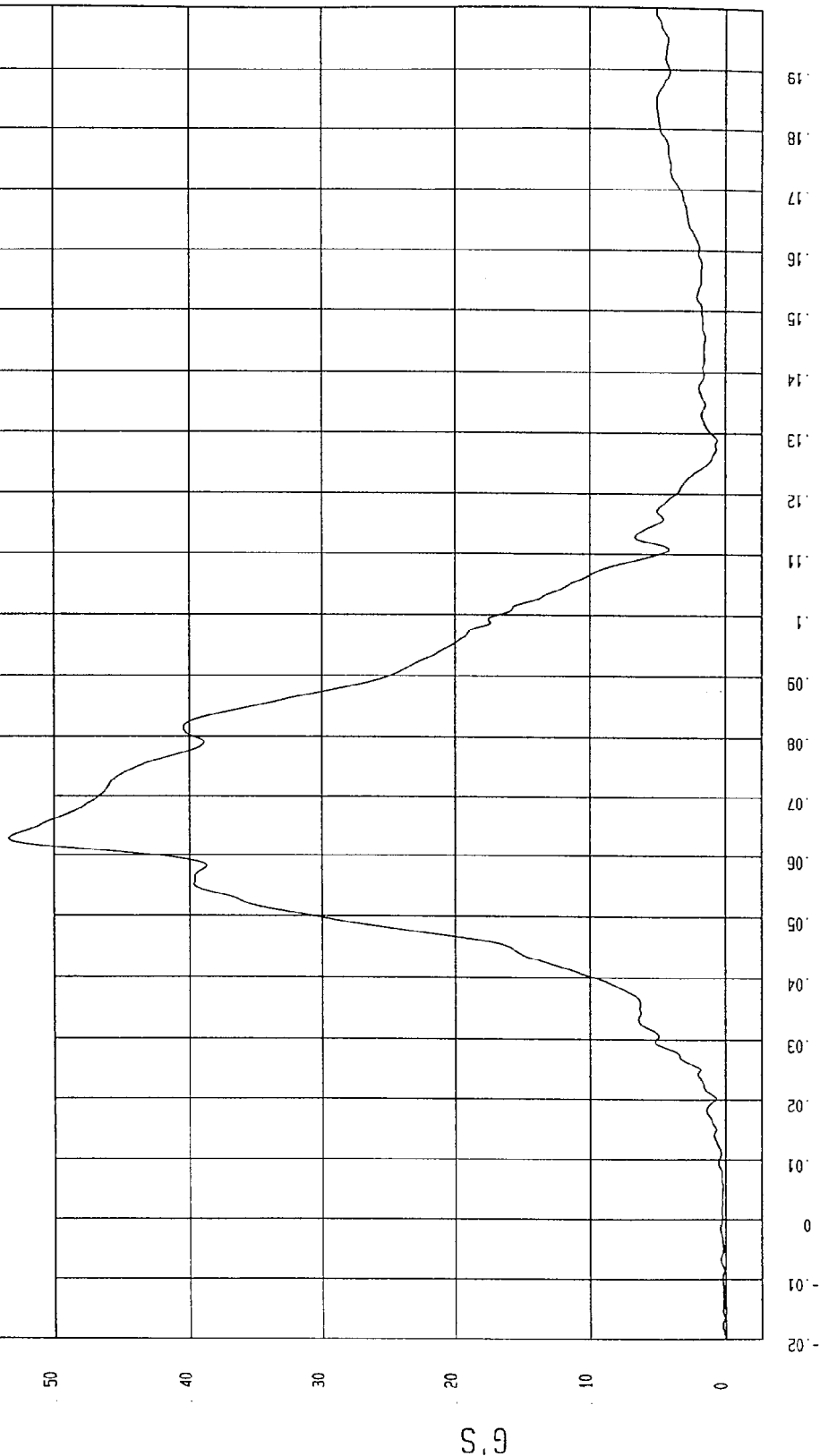
TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = 2.30E-02 G'S at -20 msec
Maximum = 53.26 G'S at 63 msec

DRIVER CHEST RESULTANT ACCELERATION

1 _____ B99006AV A15 Filterclass (180)



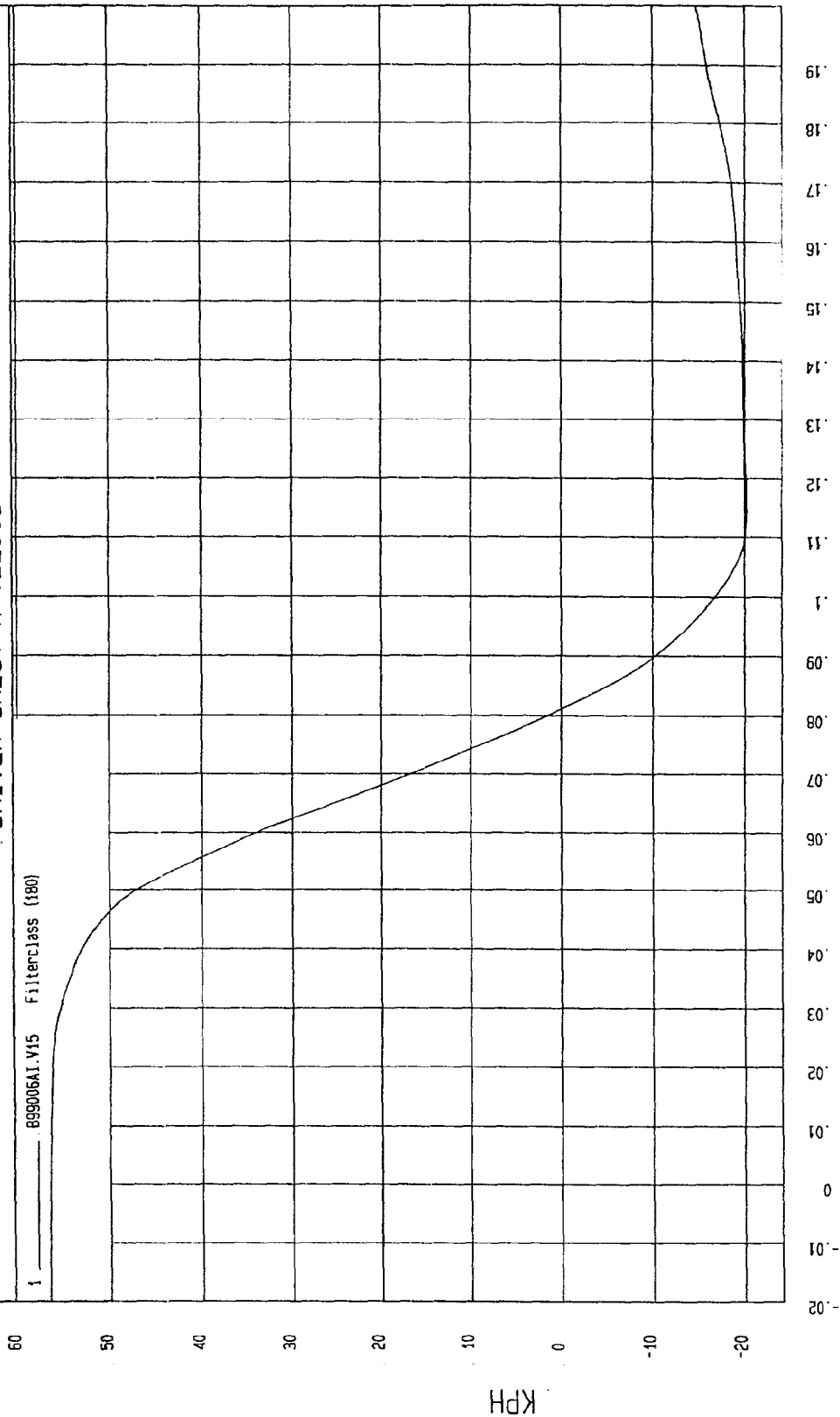
MGA Research
01-14-1999 10:04

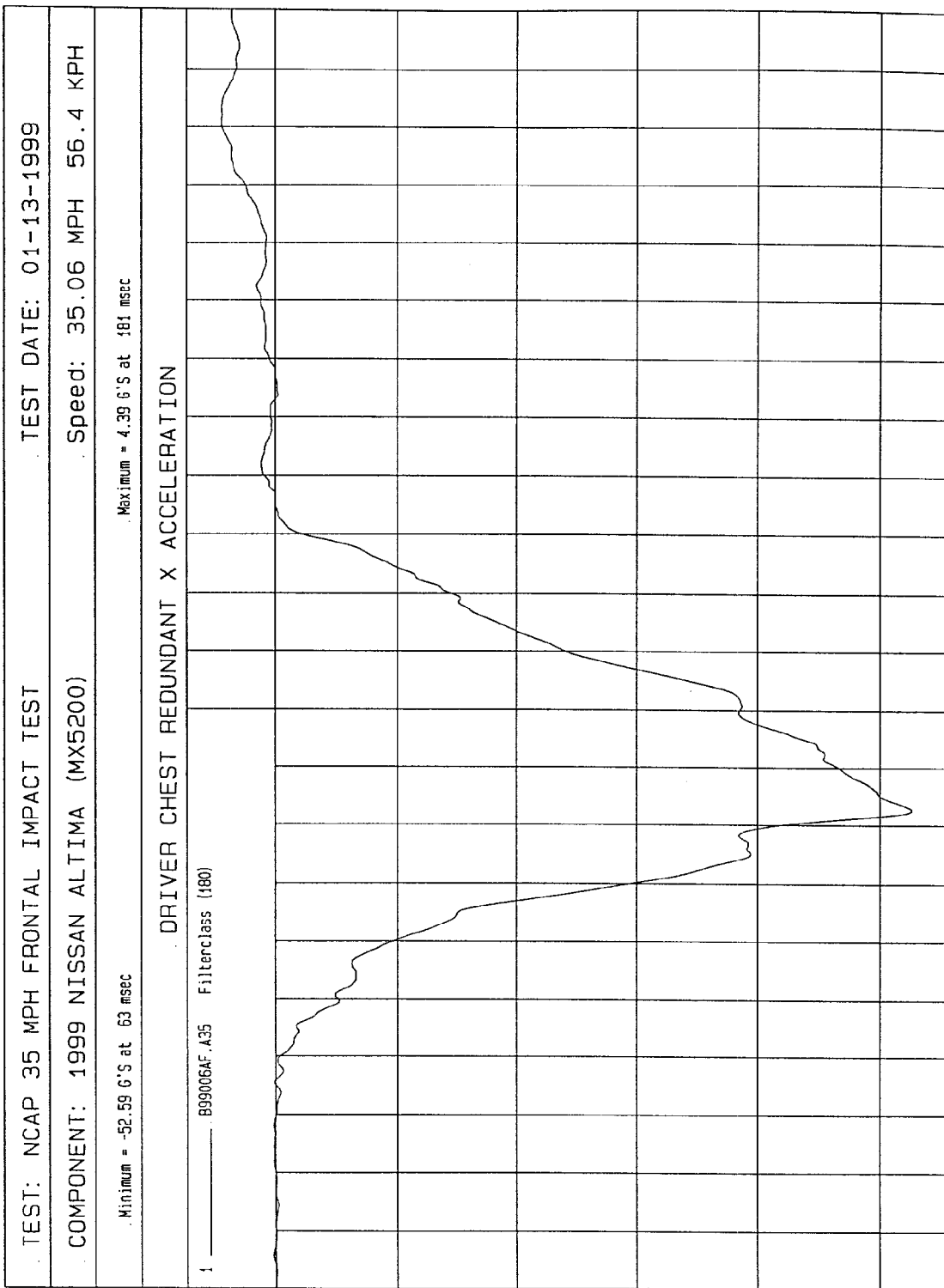
TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -20.22 KPH at 117 msec Maximum = 56.6 KPH at -19 msec

DRIVER CHEST X VELOCITY

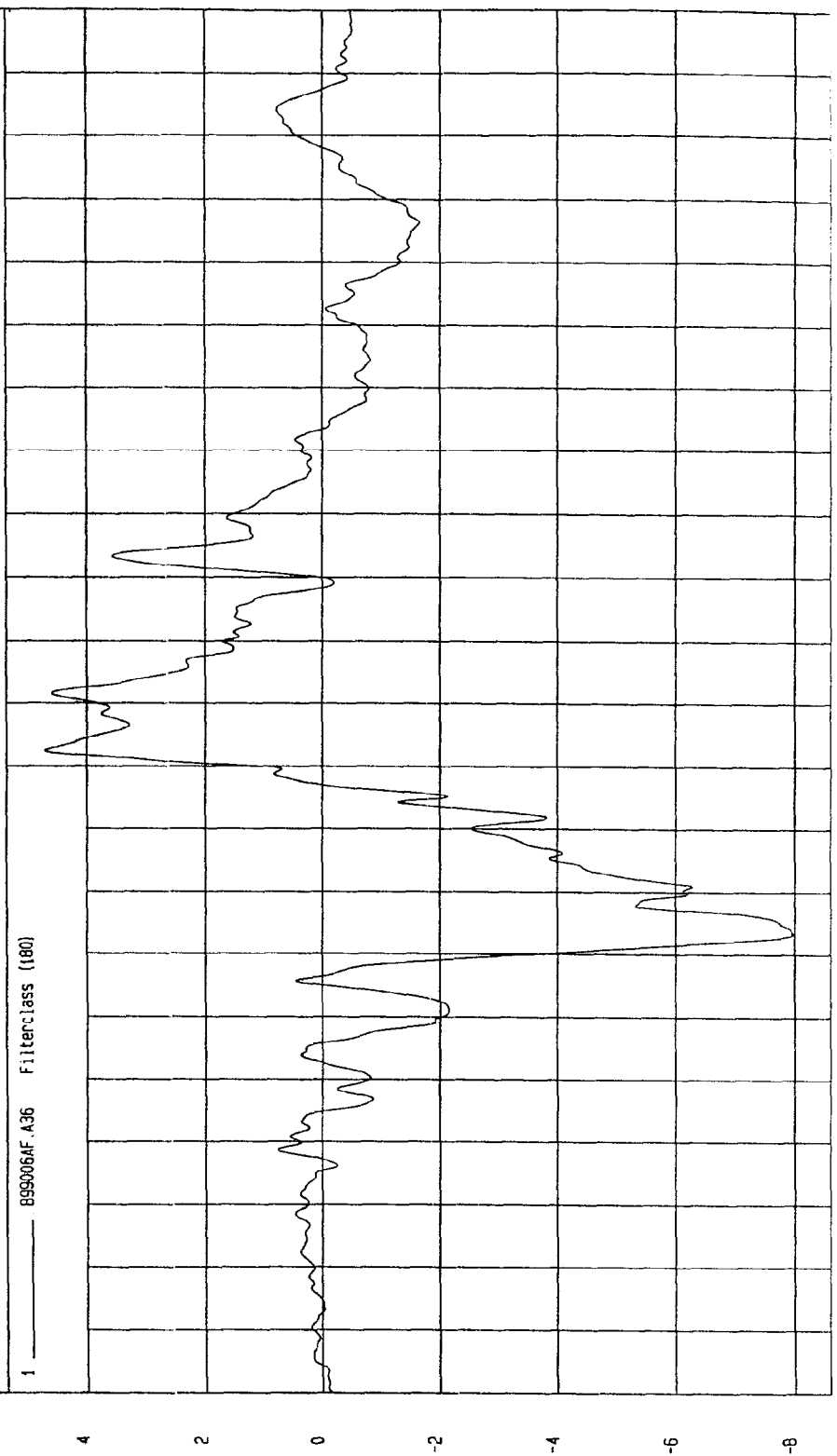




MCA Research
01-13-1999 18:59

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999
COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH
Minimum = -7.96 G'S at 53 msec Maximum = 4.69 G'S at 82 msec

DRIVER CHEST REDUNDANT Y ACCELERATION



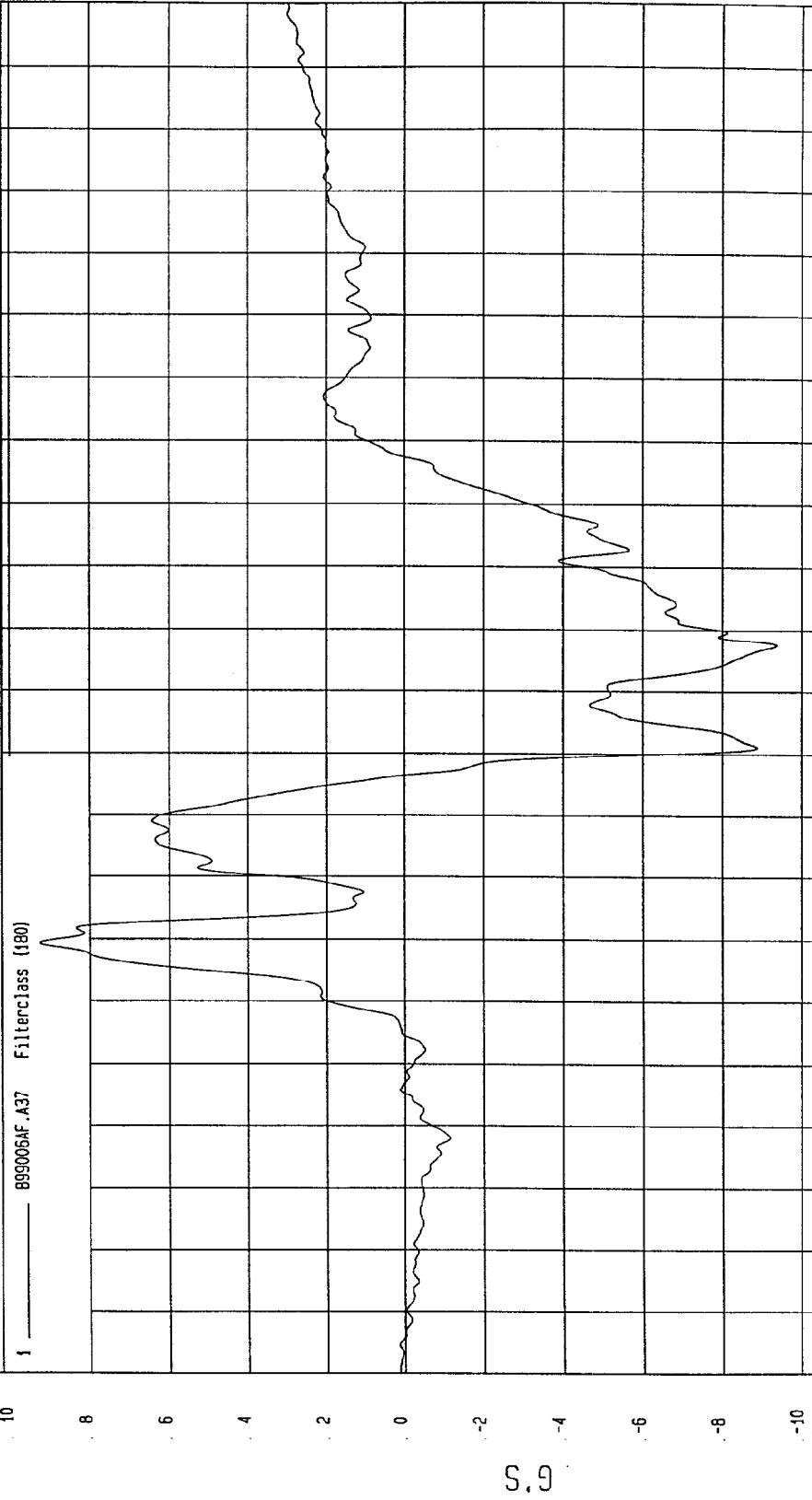
MGA Research
01-22-1999 16.14

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -9.38 G'S at 98 msec Maximum = 9.27 G'S at 49 msec

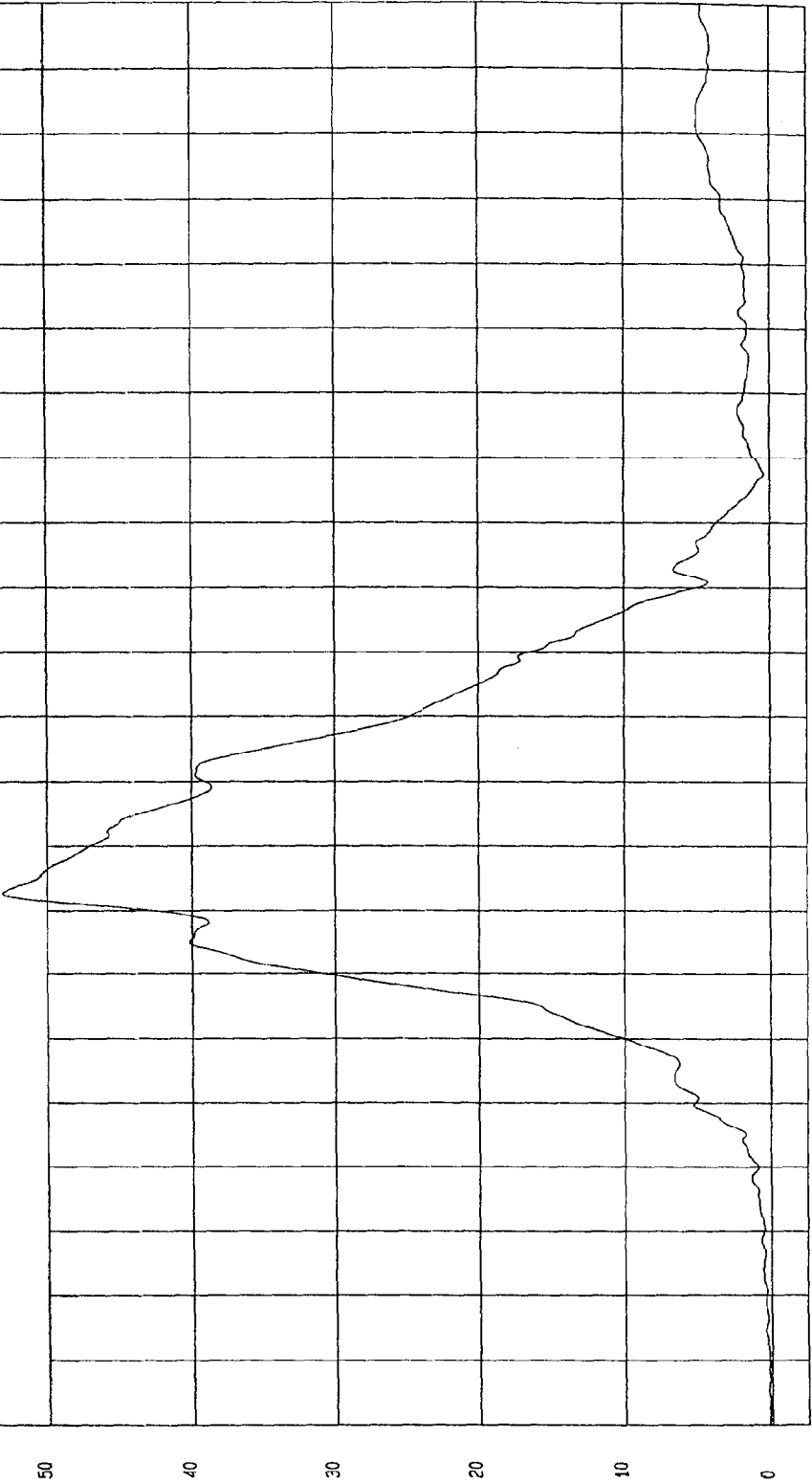
DRIVER CHEST REDUNDANT Z ACCELERATION



TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999
COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH
Minimum = .12 G's at .13 msec Maximum = 53.05 G's at .63 msec

DRIVER CHEST REDUNDANT RESULTANT ACCELERATION

1 _____ B99006AV.A35 Filterclass (180)



MSA Research
01-13-1999 18:59

TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

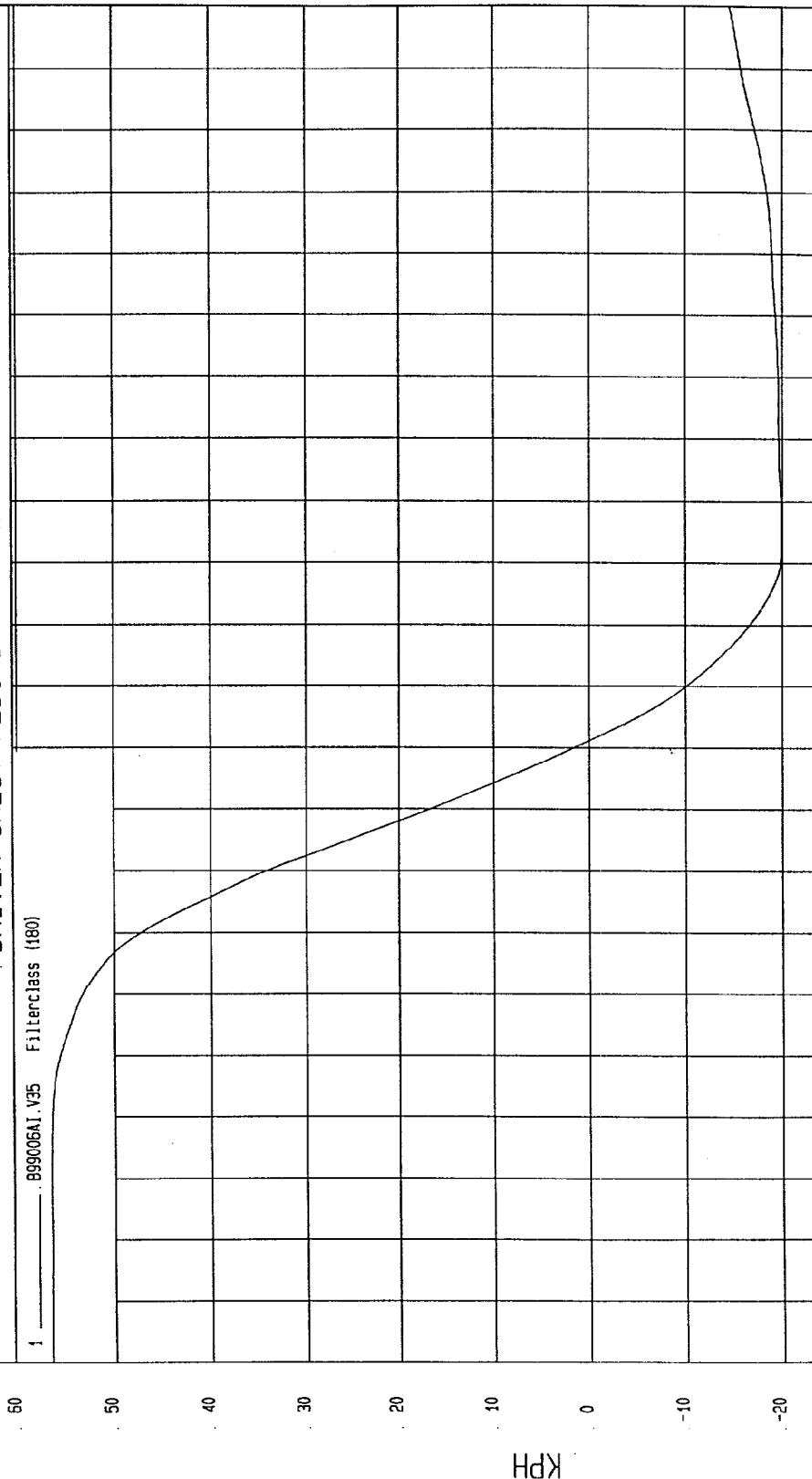
Speed: 35.06 MPH 56.4 KPH

COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = 56.61 KPH at 10 msec

Minimum = -19.96 KPH at 115 msec

DRIVER CHEST REDUNDANT X VELOCITY



NCA Research
01-22-1999 16:15

TIME Seconds

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

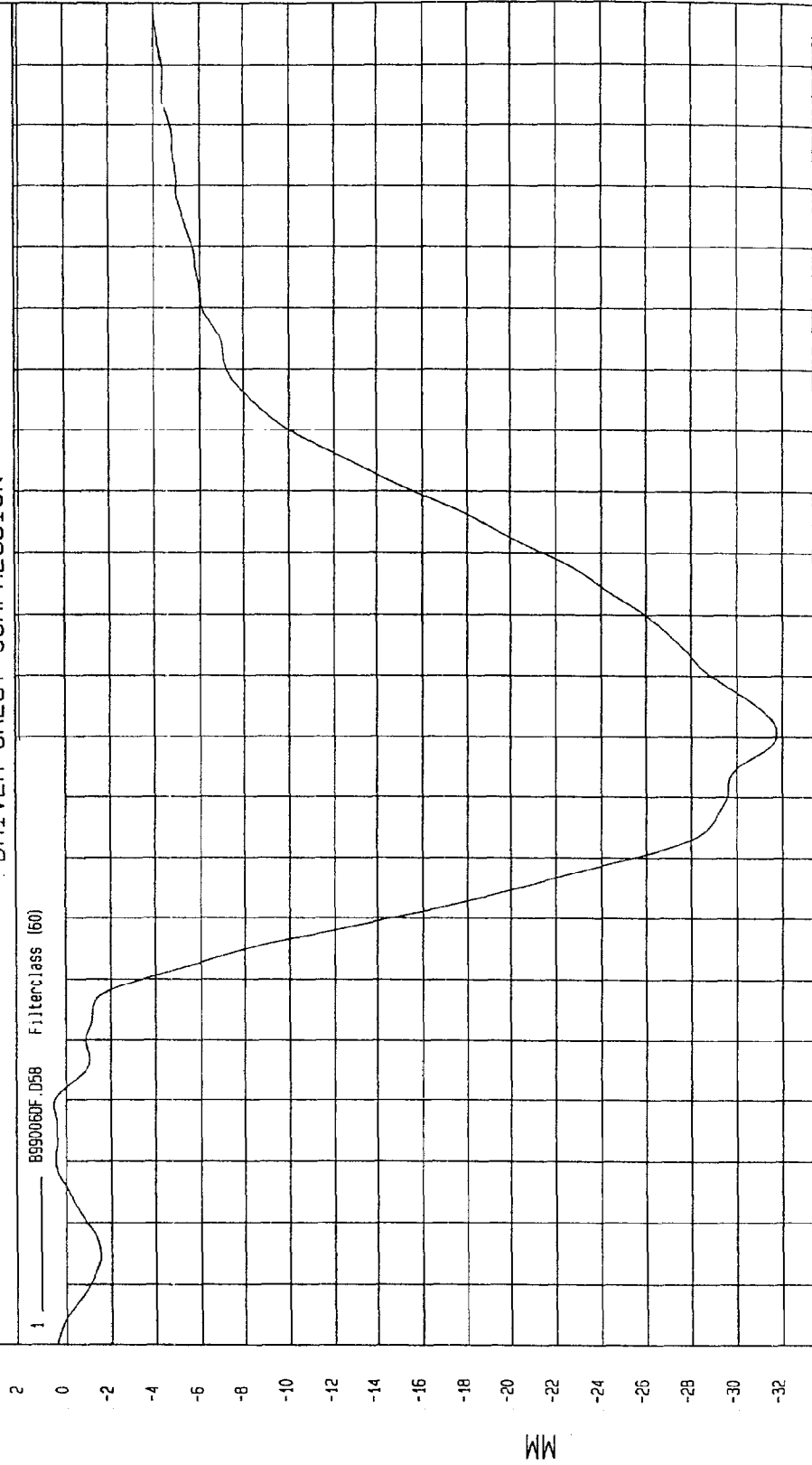
SPEED: 35.06 MPH 56.4 KPH

COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = .56 MM at 19 msec

Minimum = -31.77 MM at 81 msec

DRIVER CHEST COMPRESSION



NCA Research
01-14-1999 10:04

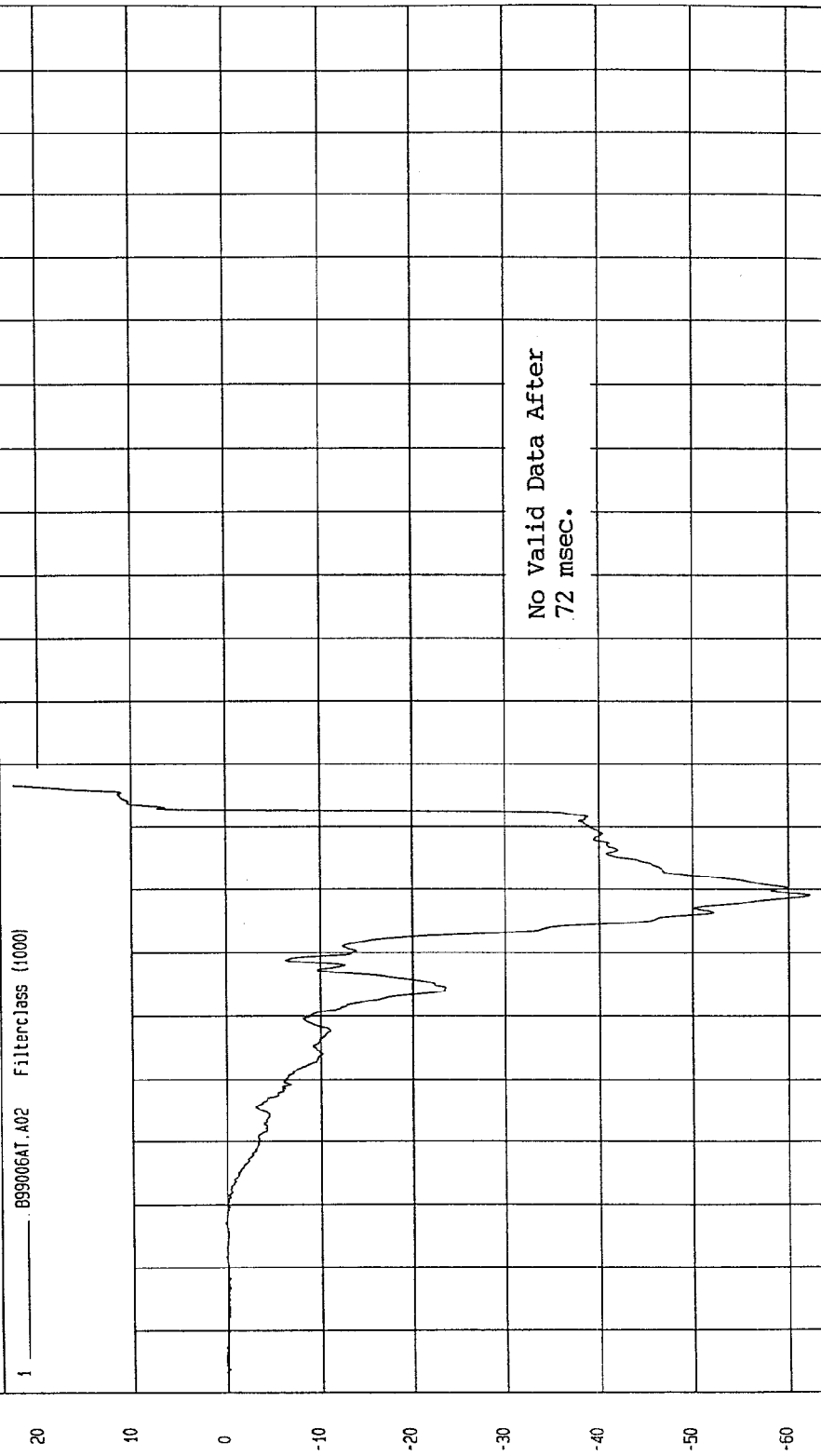
TIME SECONDS

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -62.32 G'S at 59 msec Maximum = 116.15 G'S at 88 msec

DRIVER PELVIS X ACCELERATION



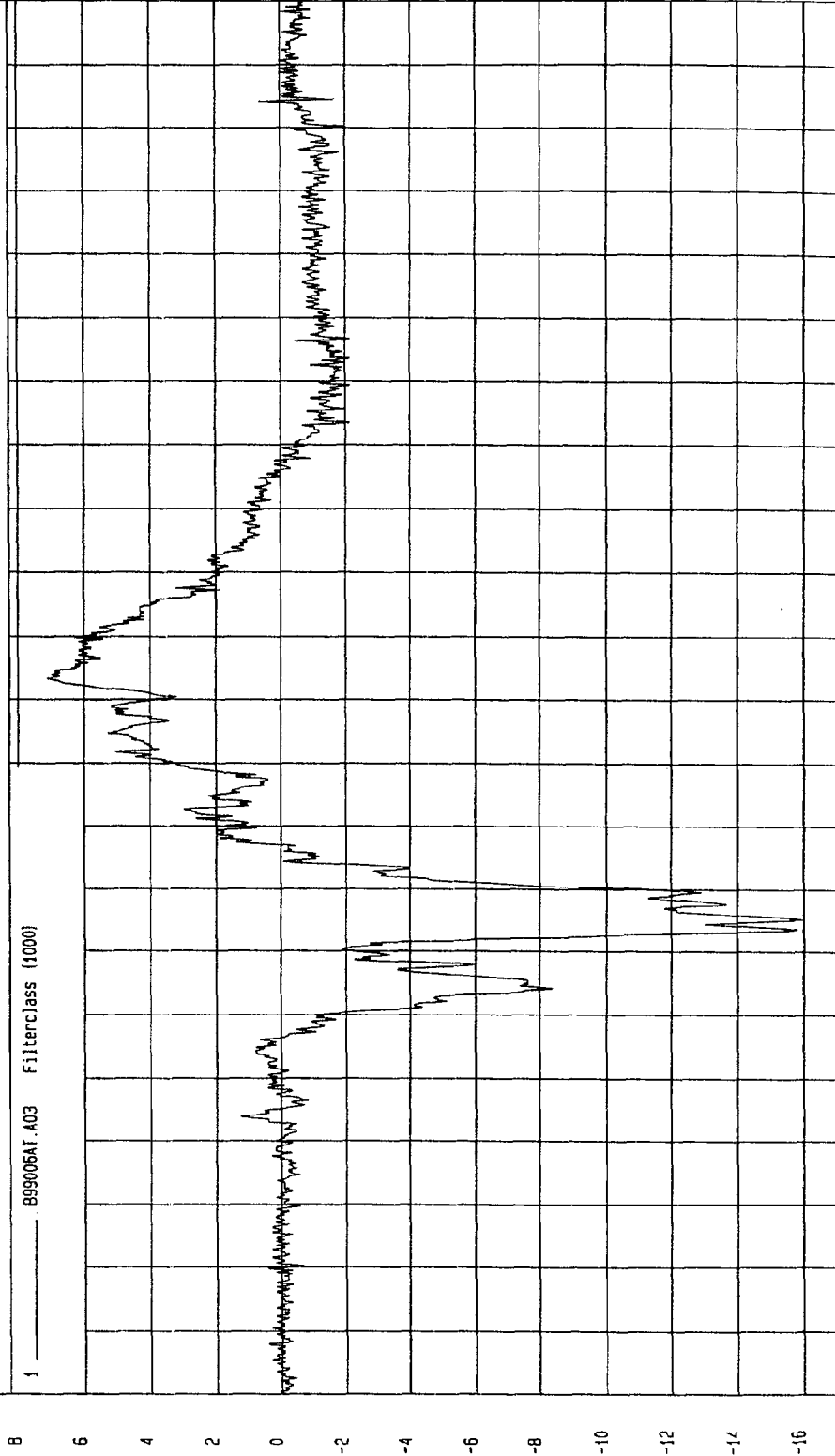
TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.05 MPH 56.4 KPH

Minimum = -15.94 G'S at 55 msec Maximum = 7.12 G'S at 93 msec

DRIVER PELVIS Y ACCELERATION

1 899005AT.A03 Filterclass (1000)

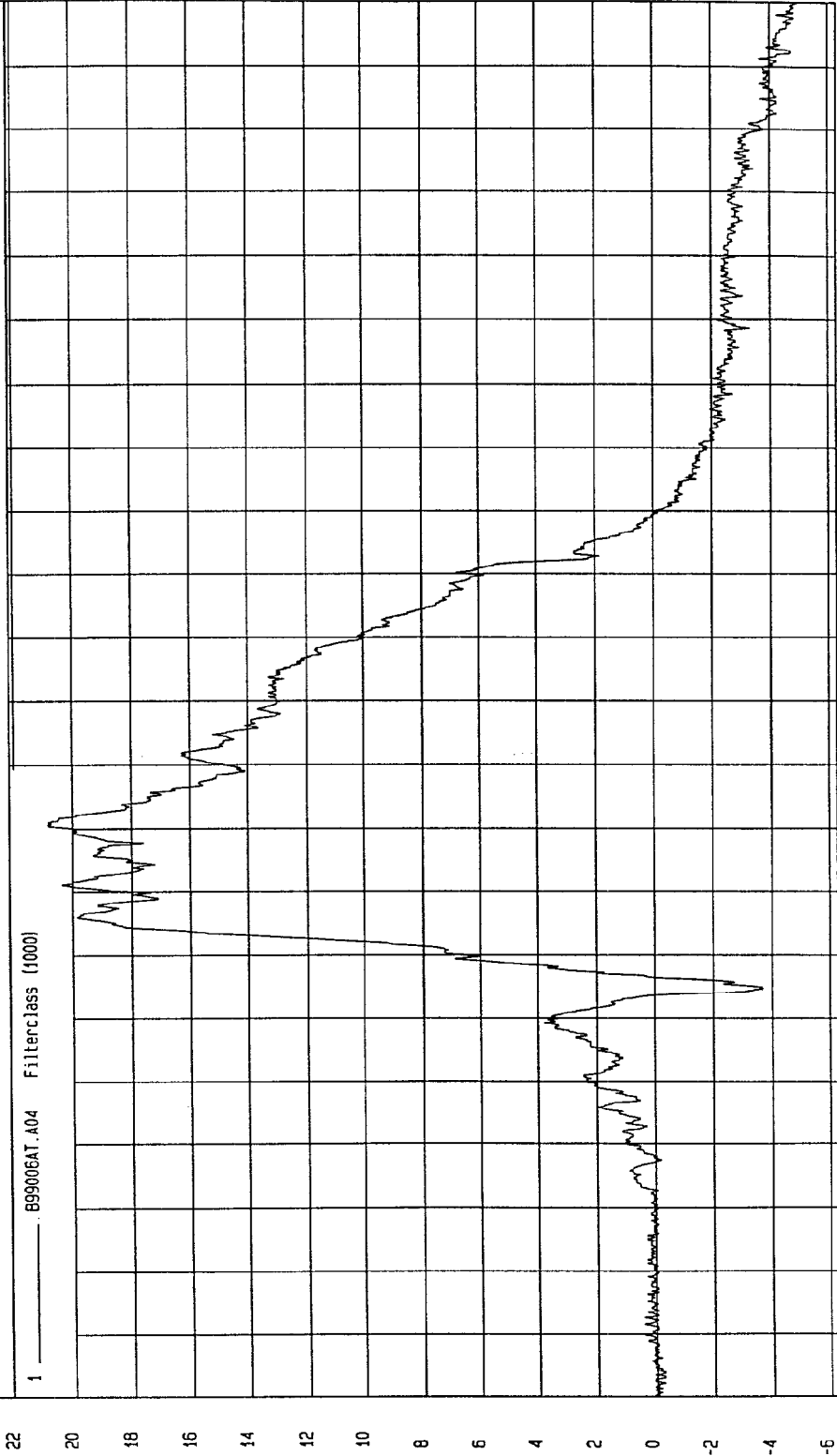


TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -4.98 G'S at 200 msec Maximum = 20.84 G'S at 70 msec

DRIVER PELVIS Z ACCELERATION



TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

Speed: 35.06 MPH 56.4 KPH

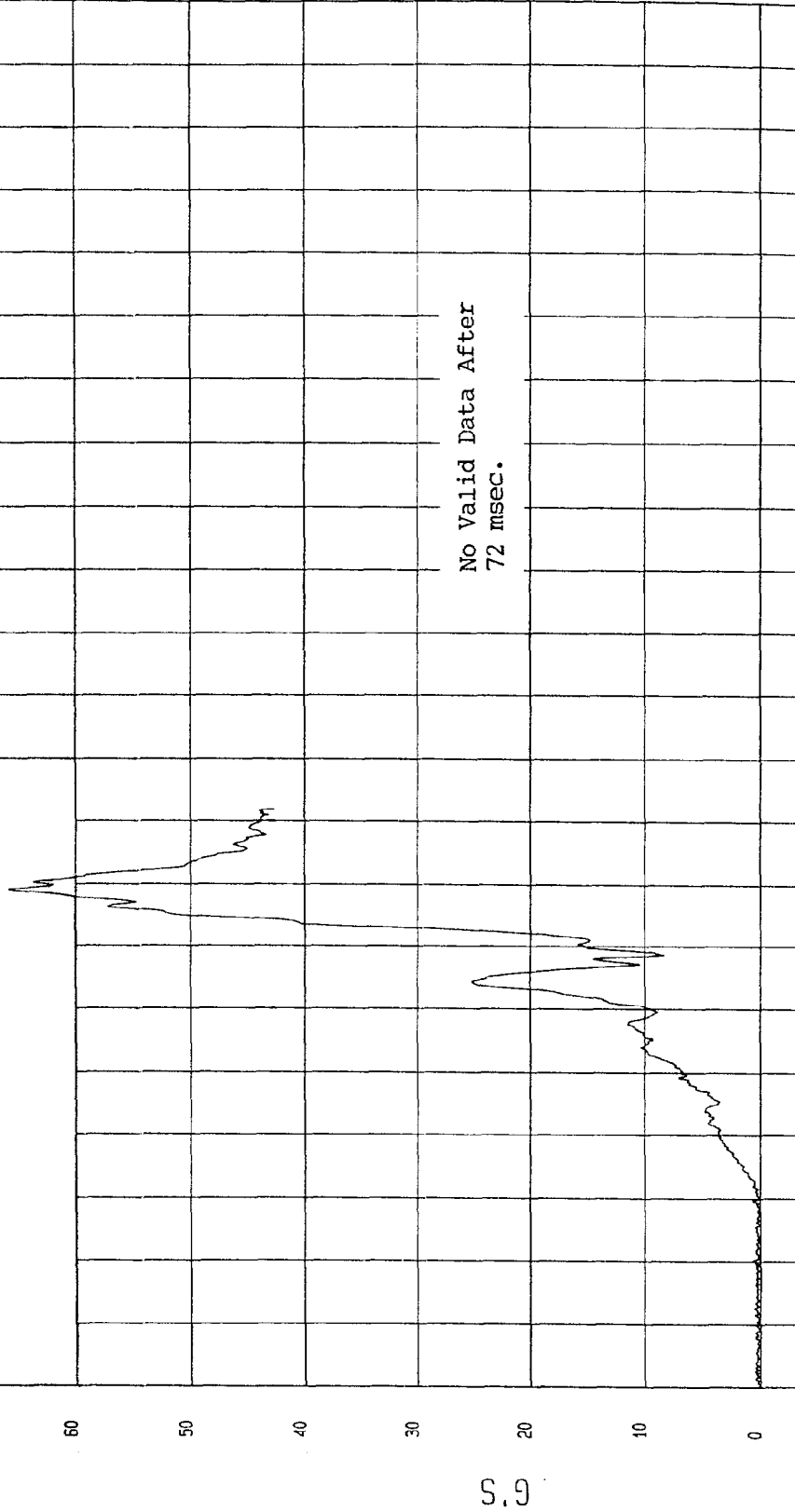
COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = 65.6 G'S at 59 msec

Minimum = 8.27E-02 G'S at -20 msec

DRIVER PELVIS RESULTANT ACCELERATION

1 ——— B99005AT.A02 Filterclass (1000)

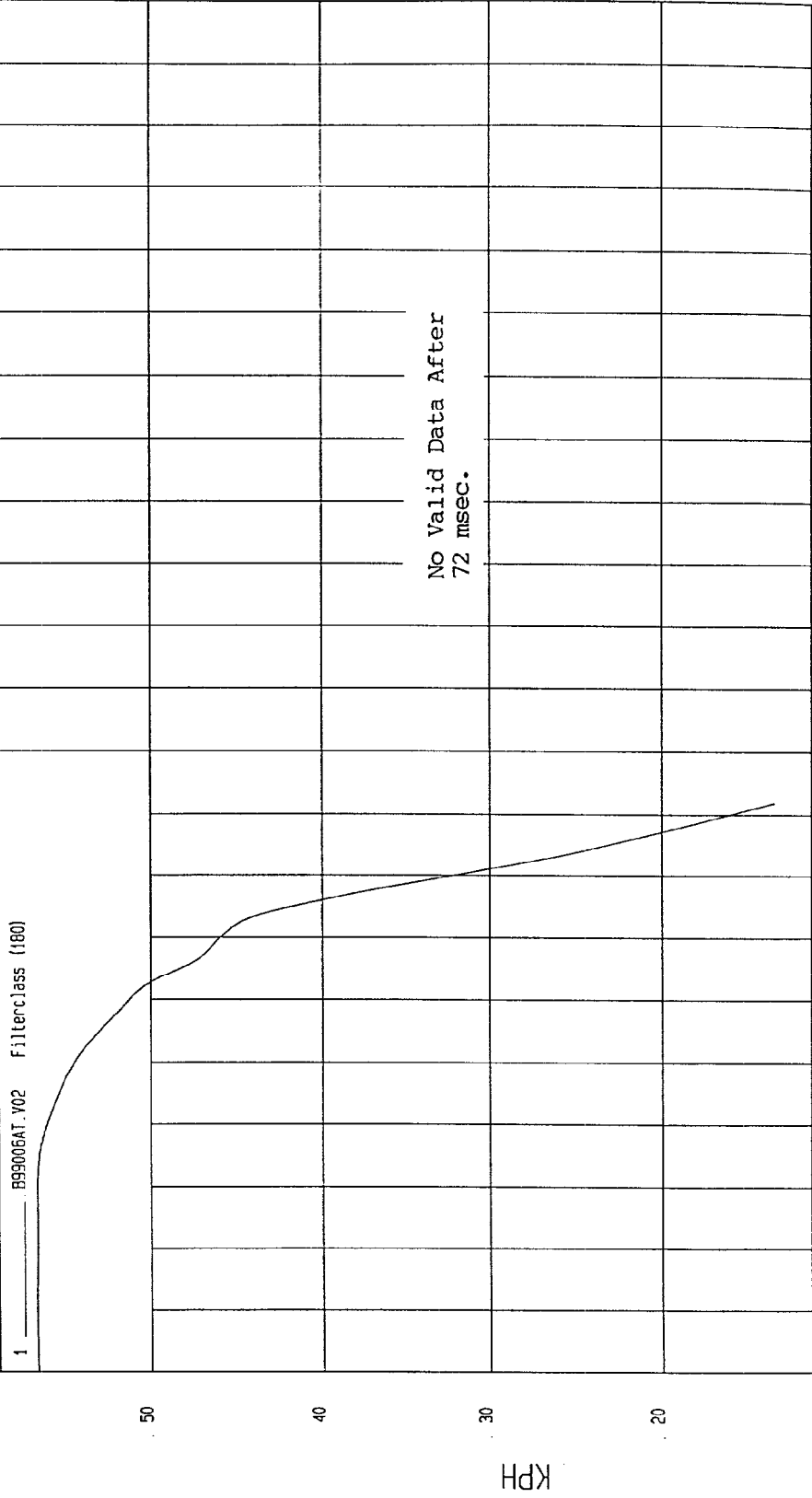


TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = 13.51 KPH at 72 msec Maximum = 56.63 KPH at -11 msec

DRIVER PELVIS X VELOCITY

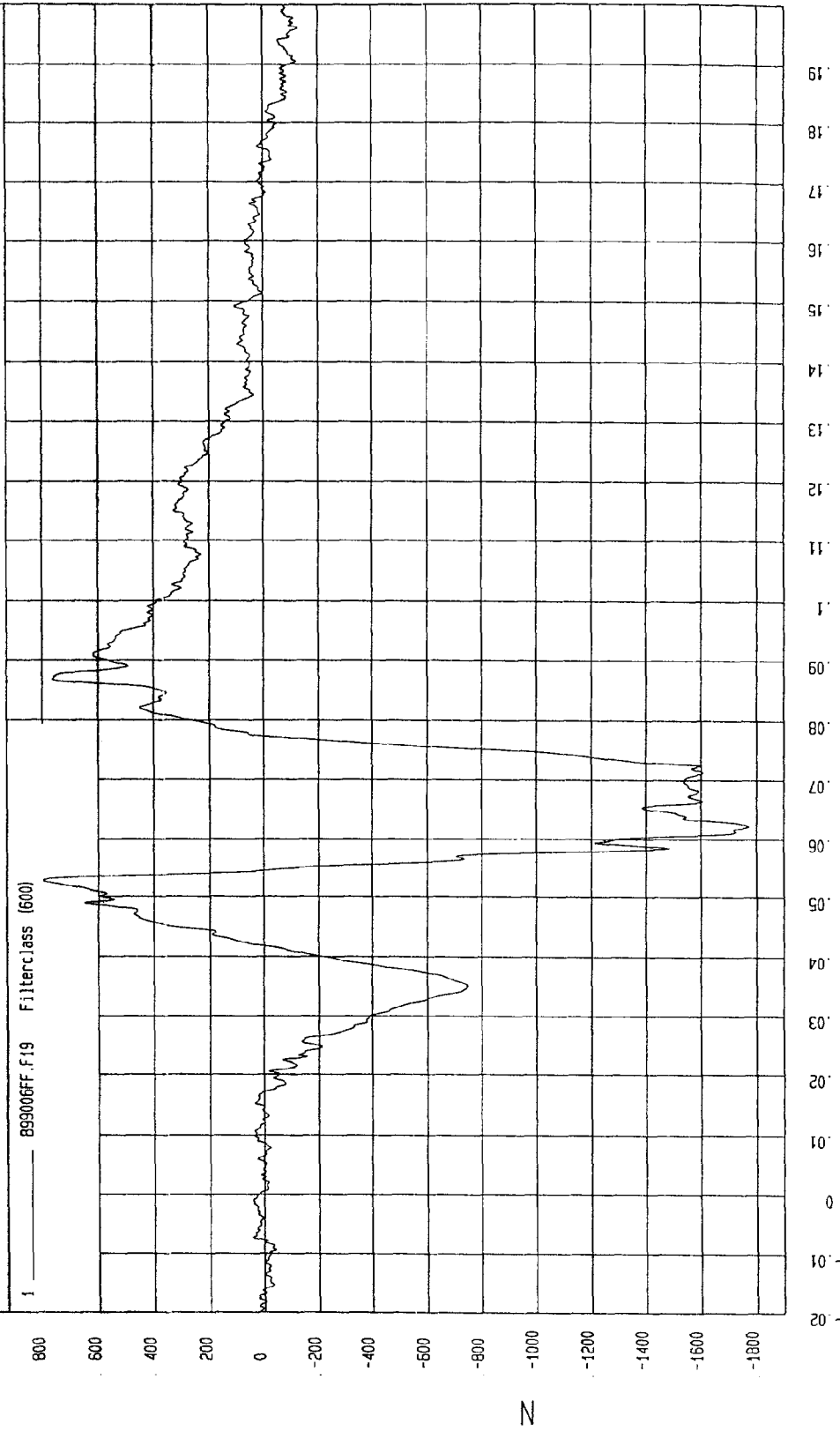


TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -1770.21 N at 62 msec Maximum = 796.96 N at 53 msec

DRIVER LEFT FEMUR FORCE

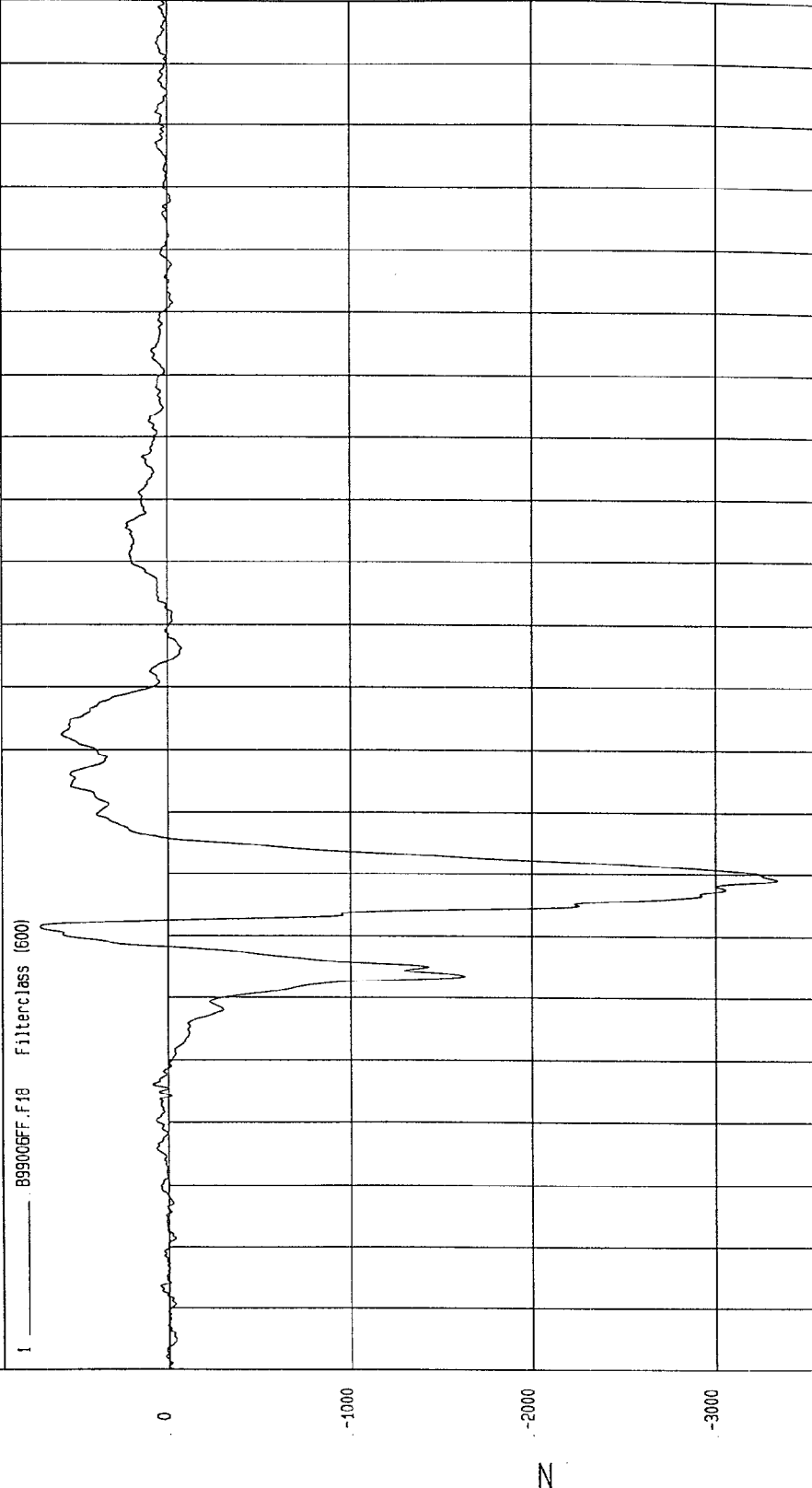


TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -3327.8 N at 59 msec Maximum = 669.20 N at 52 msec

DRIVER RIGHT FEMUR FORCE



TIME (SECONDS)

WCA Research
01-14-1999 10:04

TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

Speed: 35.06 MPH 56.4 KPH

COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Minimum = -65.81 NM at 53 msec

Maximum = 79.37 NM at 56 msec

DRIVER LEFT UPPER TIBIA MOMENT X

1 899005MF.MR0 FilterClass (500)

80

60

40

20

0

NM

-20

-40

-60

-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

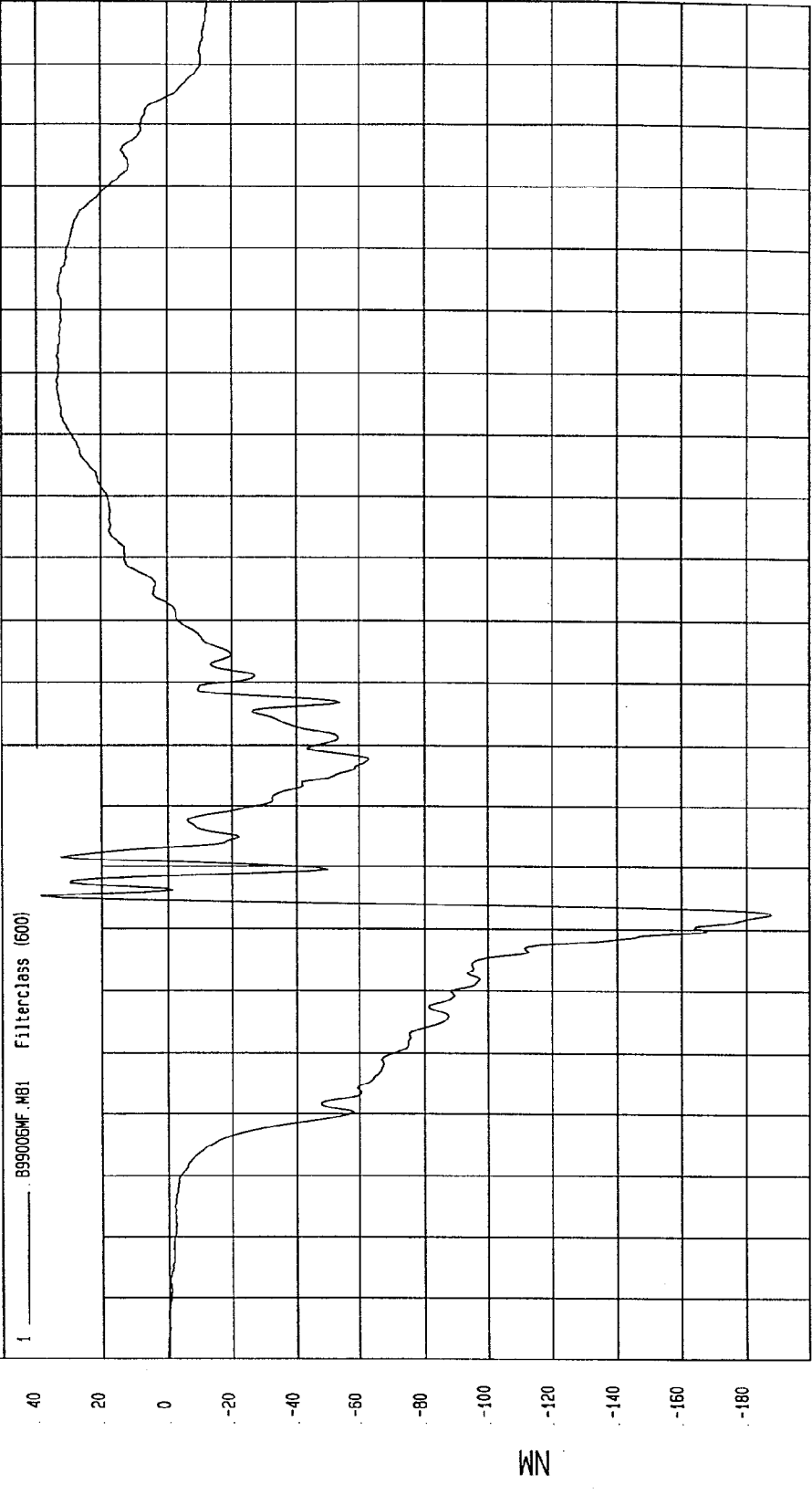
0.19

TIME (SECONDS)

MEA Research
01-22-1999 16:13

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999
COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH
Minimum = -187.97 NM at 52 msec Maximum = 39.2 NM at 55 msec

DRIVER LEFT UPPER TIBIA MOMENT Y



TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

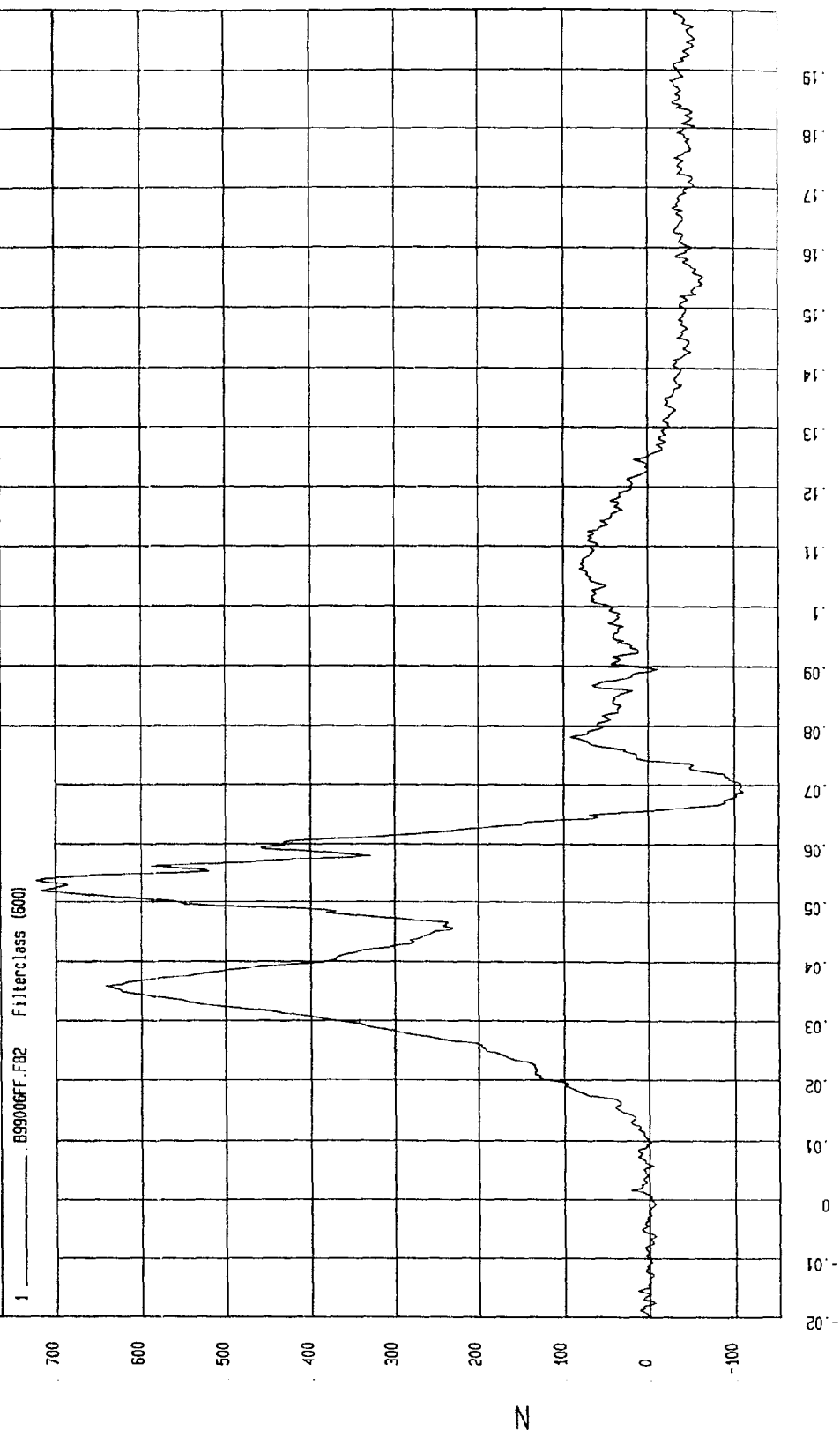
SPEED: 35.06 MPH 56.4 KPH

COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = 722.3 N at 54 msec

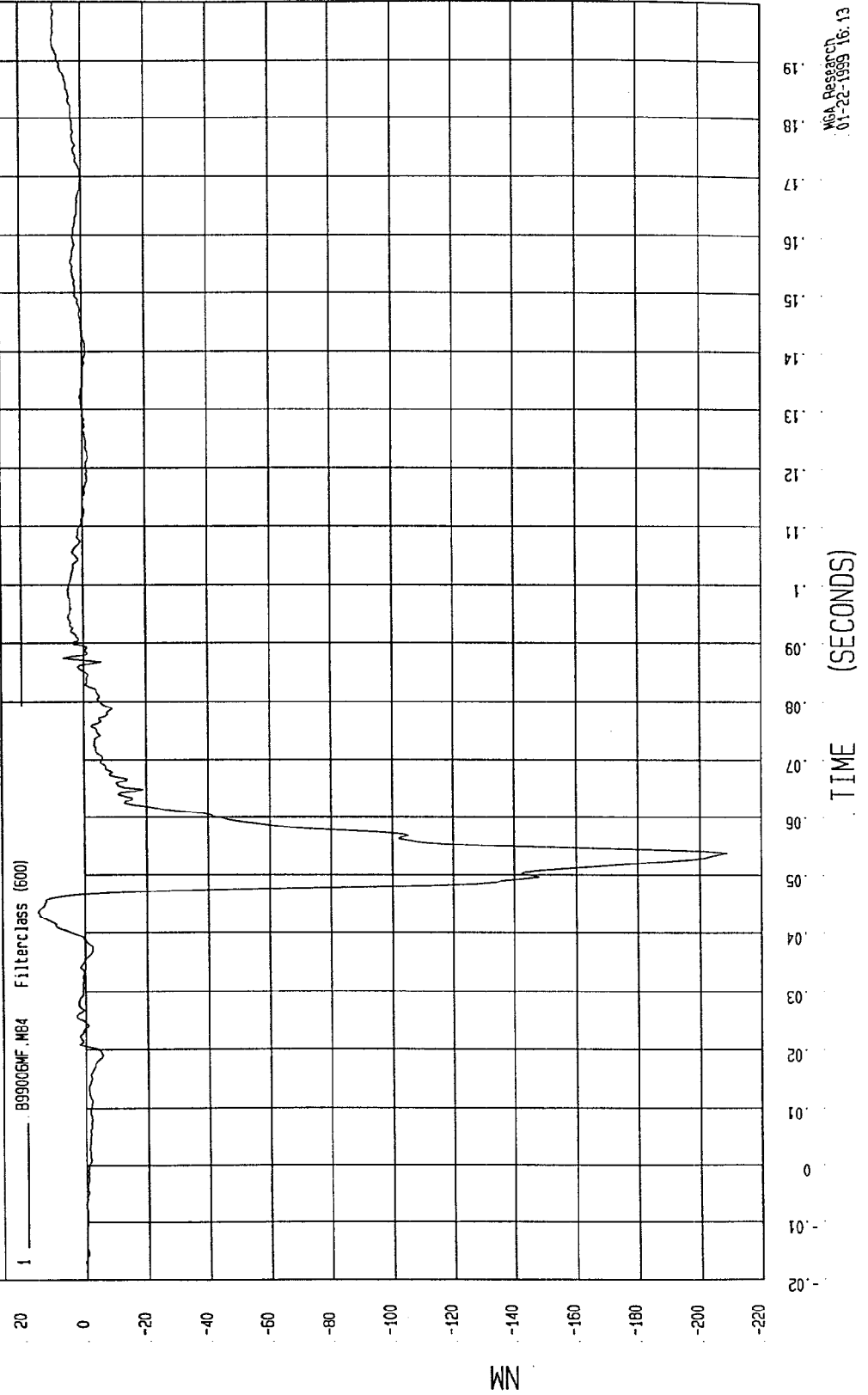
Minimum = -111.27 N at 69 msec

DRIVER LEFT UPPER TIBIA FORCE Z



TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999
COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH
Minimum = -208.88 NM at 54 msec Maximum = 15.13 NM at 44 msec

DRIVER LEFT LOWER TIBIA MOMENT X



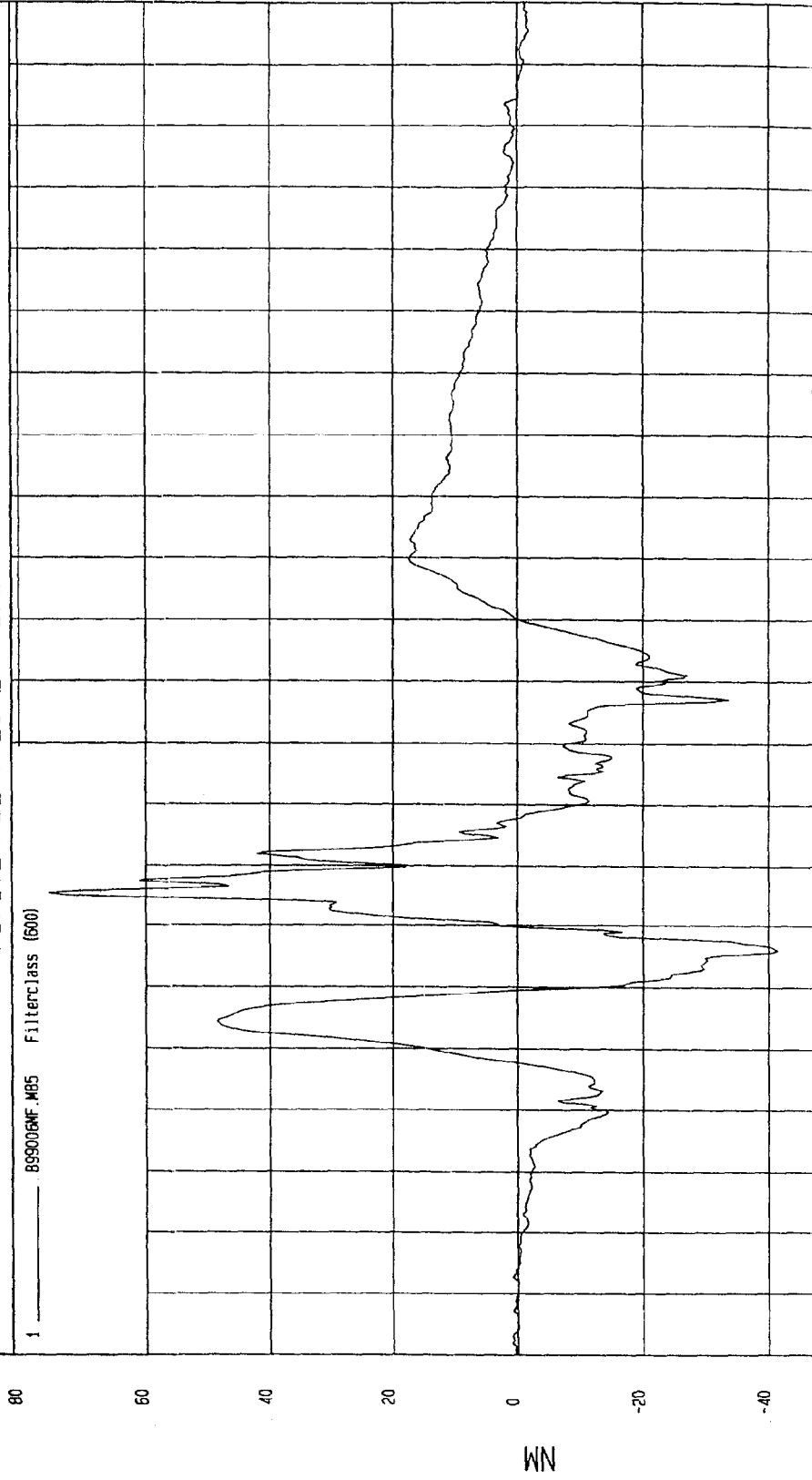
TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

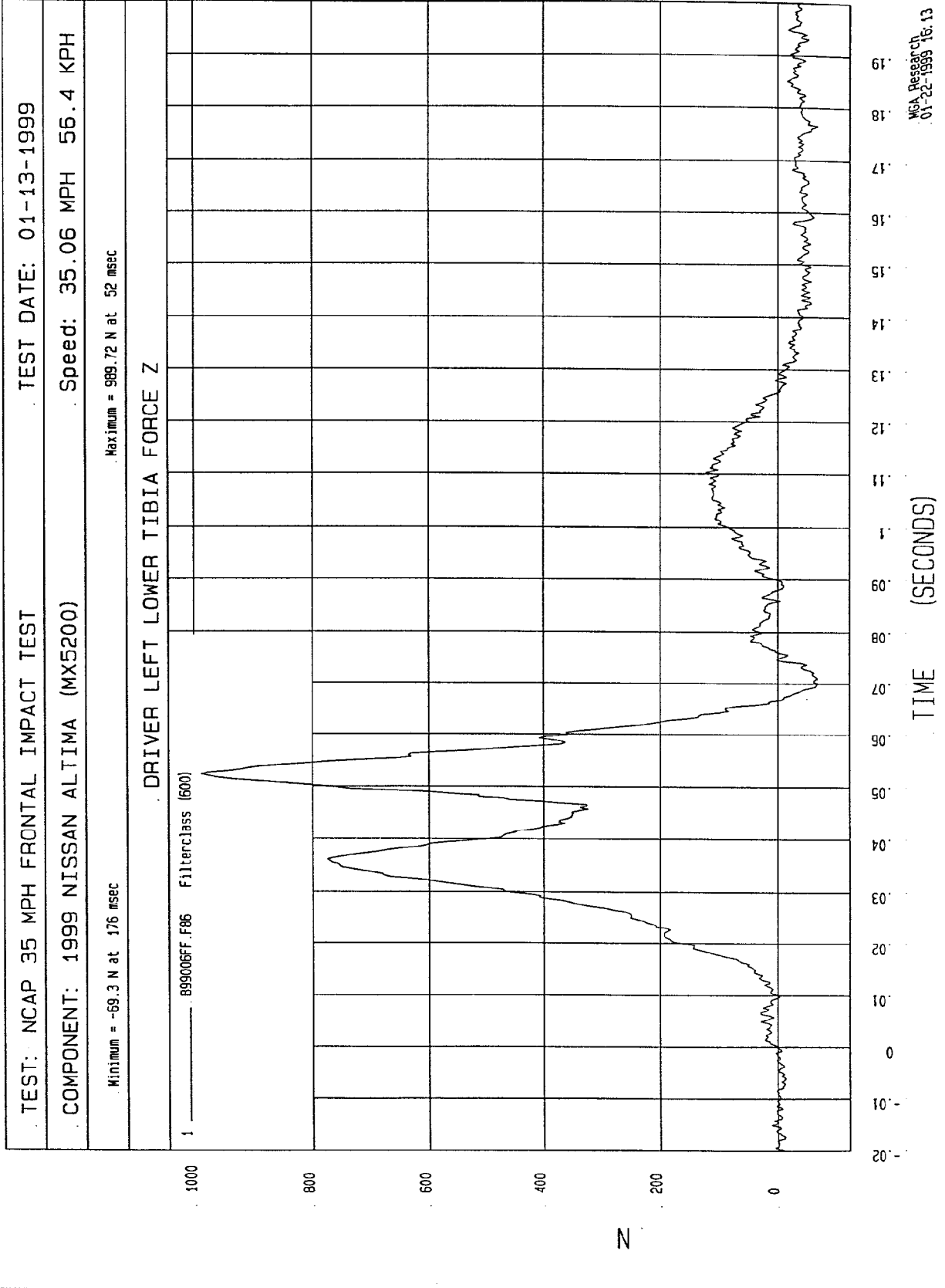
SPEED: 35.06 MPH 56.4 KPH

COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Minimum = -41.4 NM at 46 msec Maximum = 75.33 NM at 55 msec

DRIVER LEFT LOWER TIBIA MOMENT Y





TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

Speed: 35.06 MPH 56.4 KPH

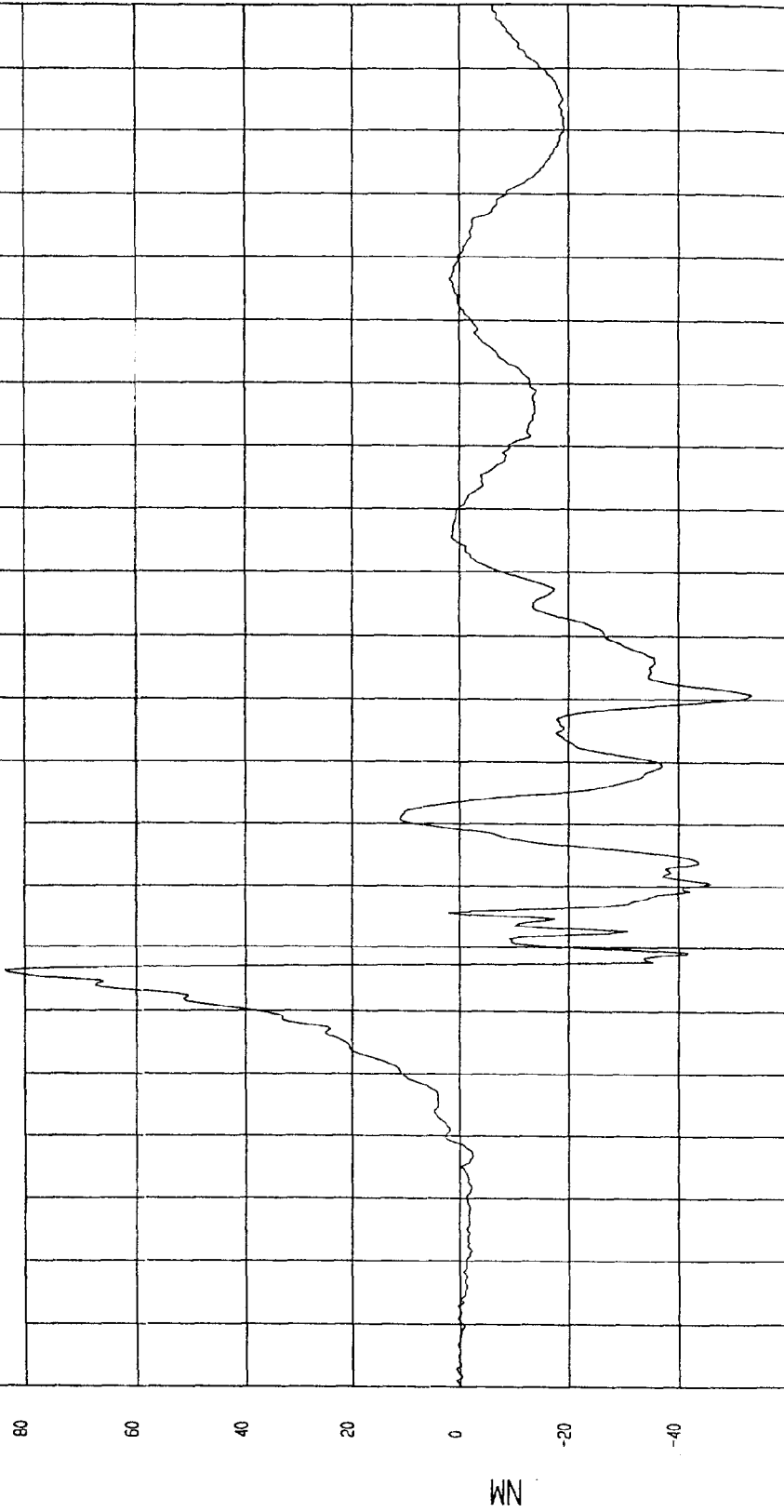
COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = 83.87 NM at 46 msec

Minimum = -53 NM at 91 msec

DRIVER RIGHT UPPER TIBIA MOMENT X

1 B99005MF.M74 Filterclass (600)



WCA Research
01-22-1999 16:13

TIME (SECONDS)

TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

SPEED: 35.06 MPH 56.4 KPH

COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Minimum = -419.2 NM at 45 msec

Maximum = 43.84 NM at 71 msec

DRIVER RIGHT UPPER TIBIA MOMENT Y

1 _____ B99006MF.W75 Filterclass (600)



TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

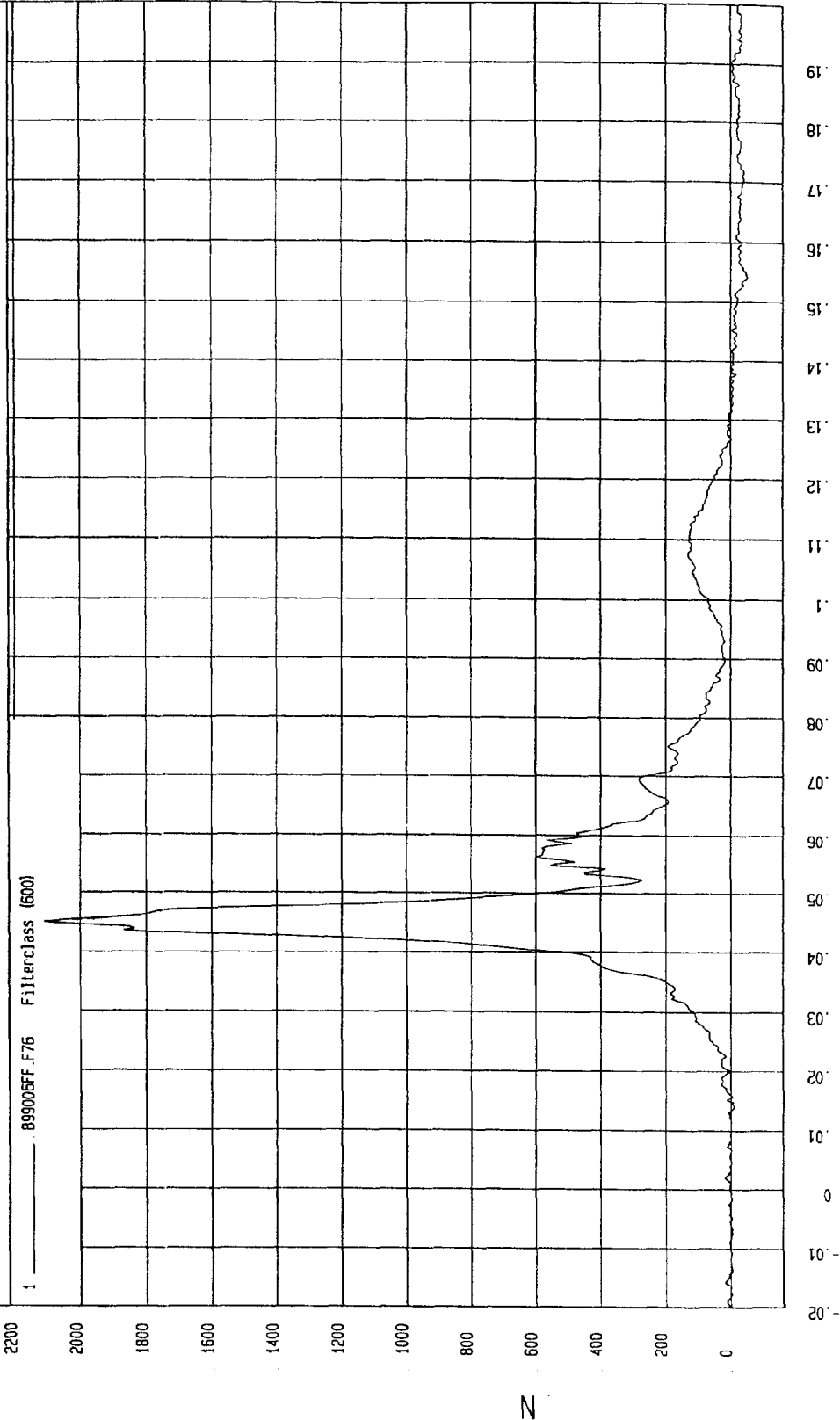
Speed: 35.06 MPH 56.4 KPH

COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = 2108.77 N at 45 msec

Minimum = -53.05 N at 154 msec

DRIVER RIGHT UPPER TIBIA FORCE Z

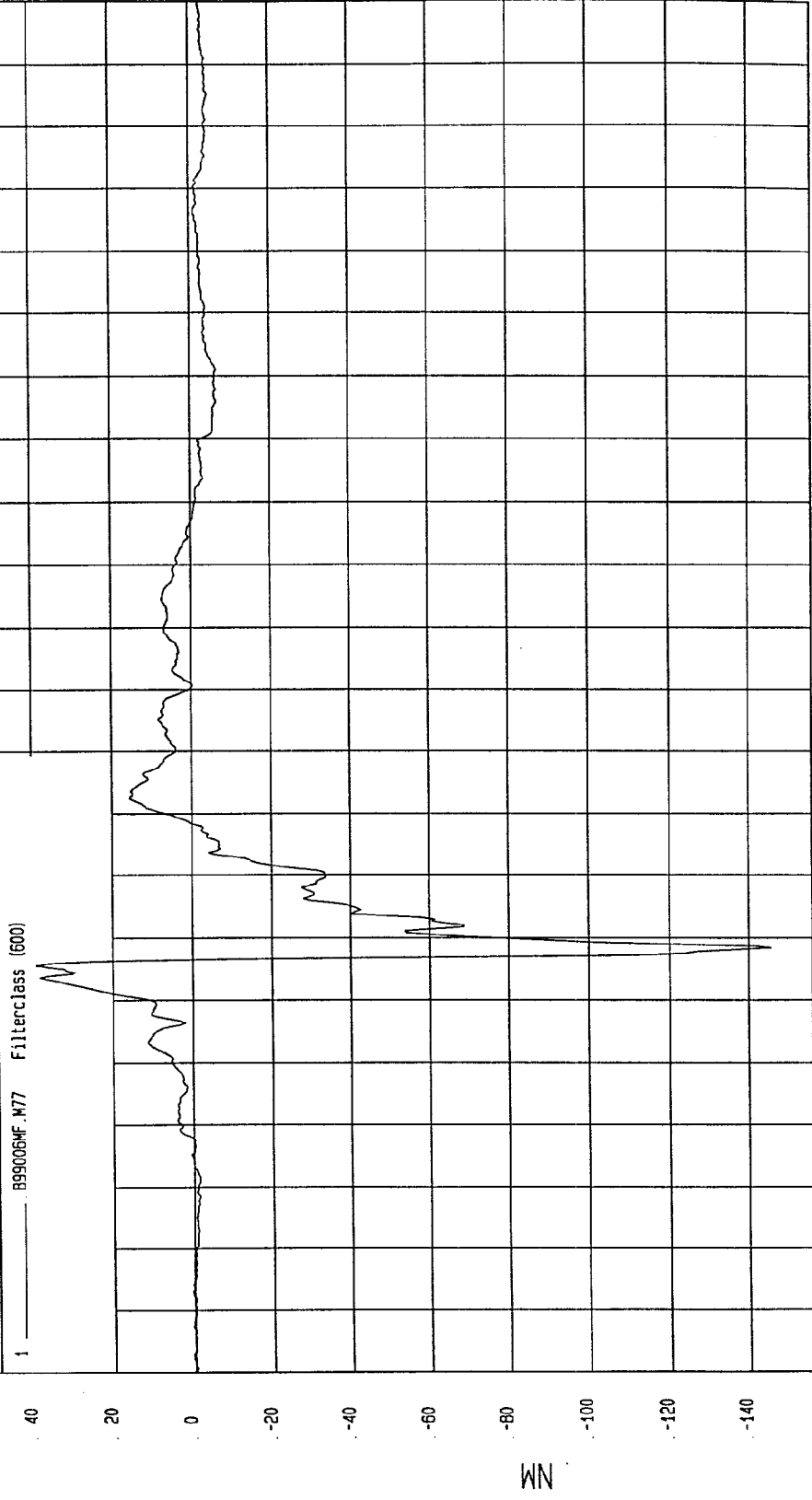


TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -146.37 NM at 48 msec Maximum = 39.2 NM at 46 msec

DRIVER RIGHT LOWER TIBIA MOMENT X



TIME (SECONDS)

NCA Research
01-22-1999 16:13

TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

Speed: 35.06 MPH 56.4 KPH

COMPONENT: 1999 NISSAN ALTIMA (MX5200)

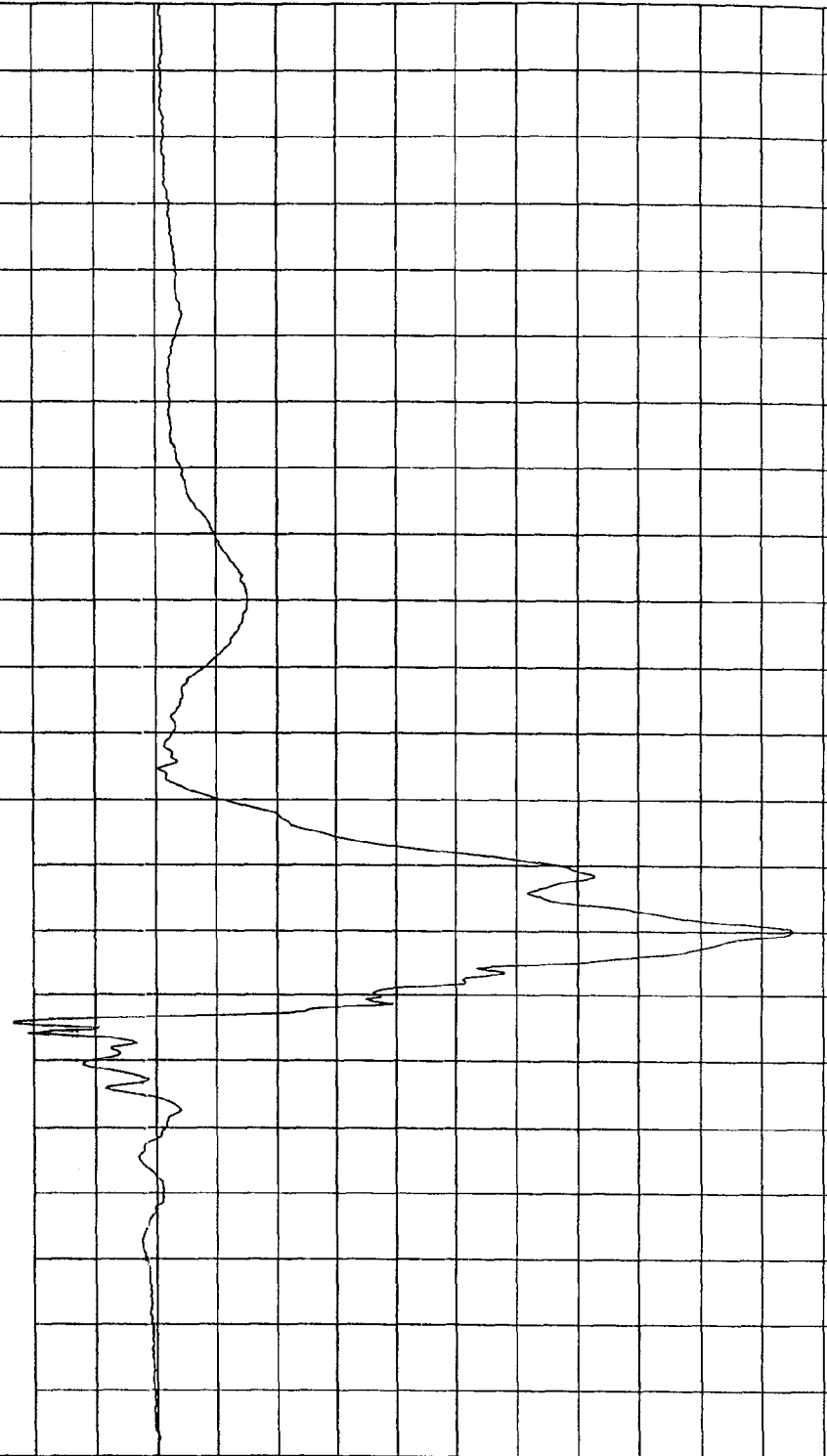
Maximum = 47.64 NM at 46 msec

Minimum = -210.19 NM at 60 msec

DRIVER RIGHT LOWER TIBIA MOMENT Y

1 ——— B9900GMF.M78 Filterclass (500)

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



MCA Research
01-22-1999 16:13

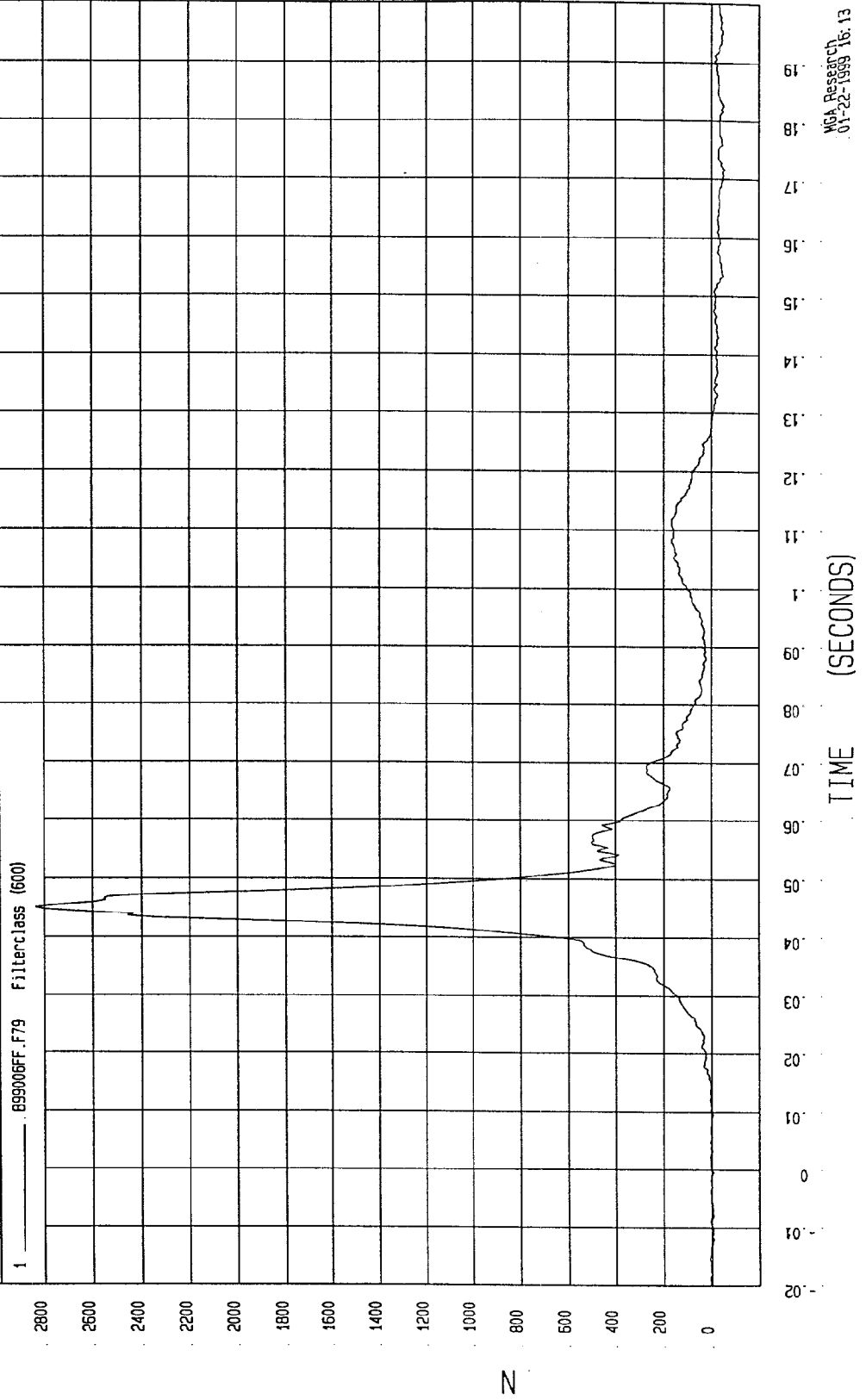
TIME (SECONDS)

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -53.3 N at 172 msec Maximum = 2838.57 N at 45 msec

DRIVER RIGHT LOWER TIBIA FORCE Z



TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 01-13-1999

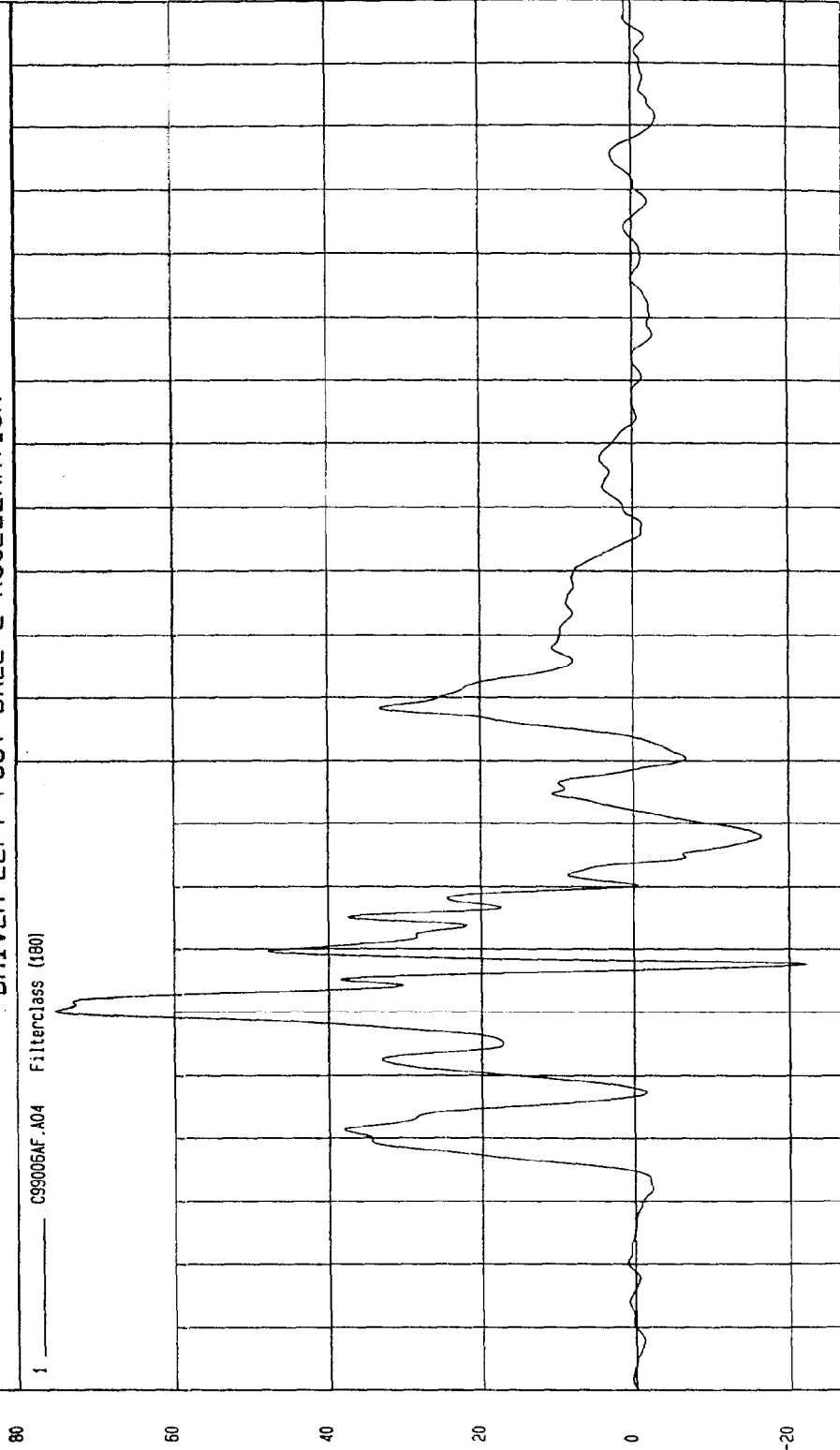
Speed: 35.06 MPH 56.4 KPH

COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = 75.33 G'S at 40 msec

Minimum = -22.13 G'S at 48 msec

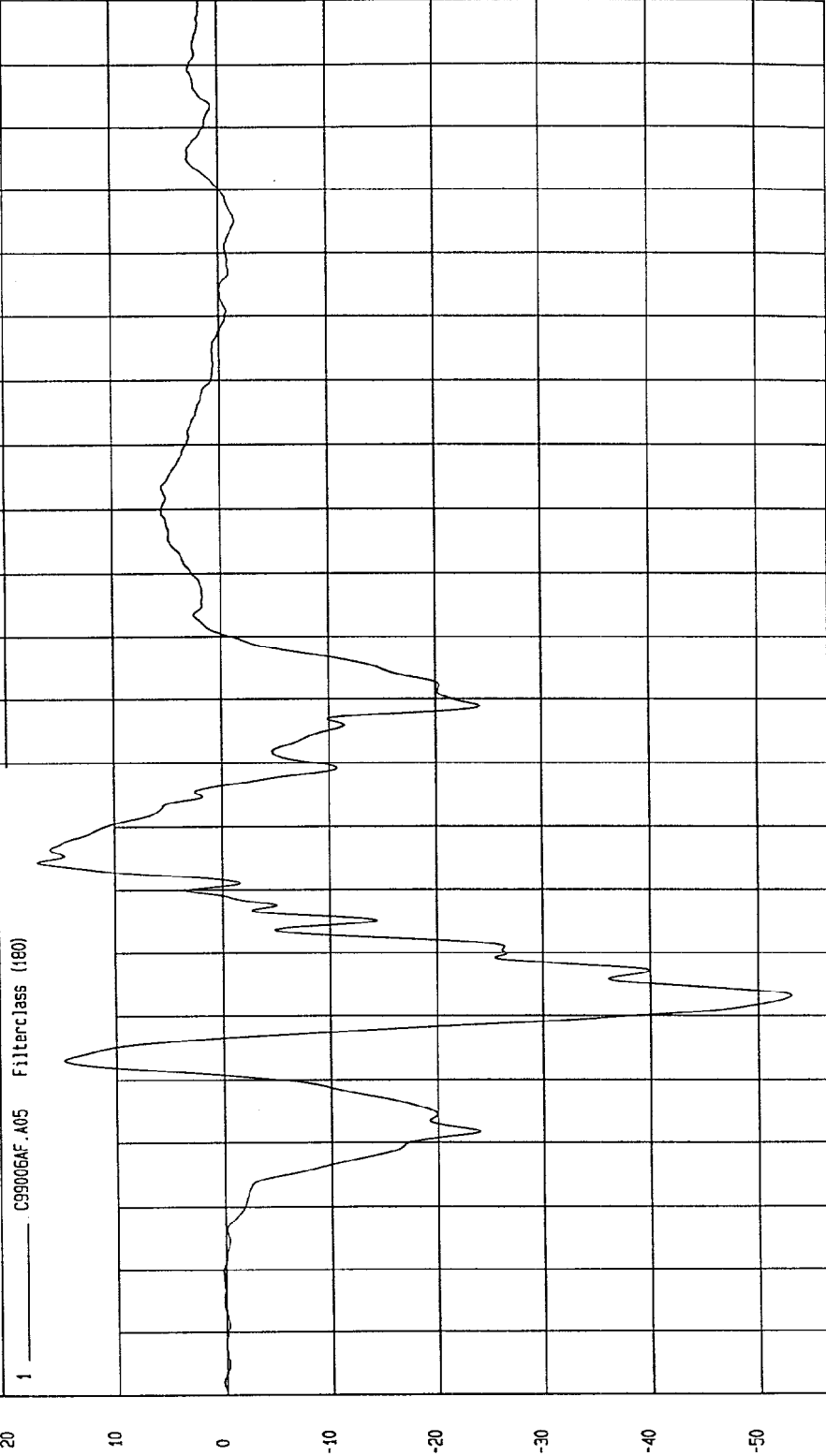
DRIVER LEFT FOOT BALL Z ACCELERATION



MCA Research
01-26-1999 13.07

TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 01-13-1999
COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH
Minimum = -53.04 G's at 43 msec Maximum = 17.29 G's at 64 msec

DRIVER LEFT HEEL X ACCELERATION



WCA Research
01-26-1999 13:07

TIME (seconds)

G's

TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 01-13-1999

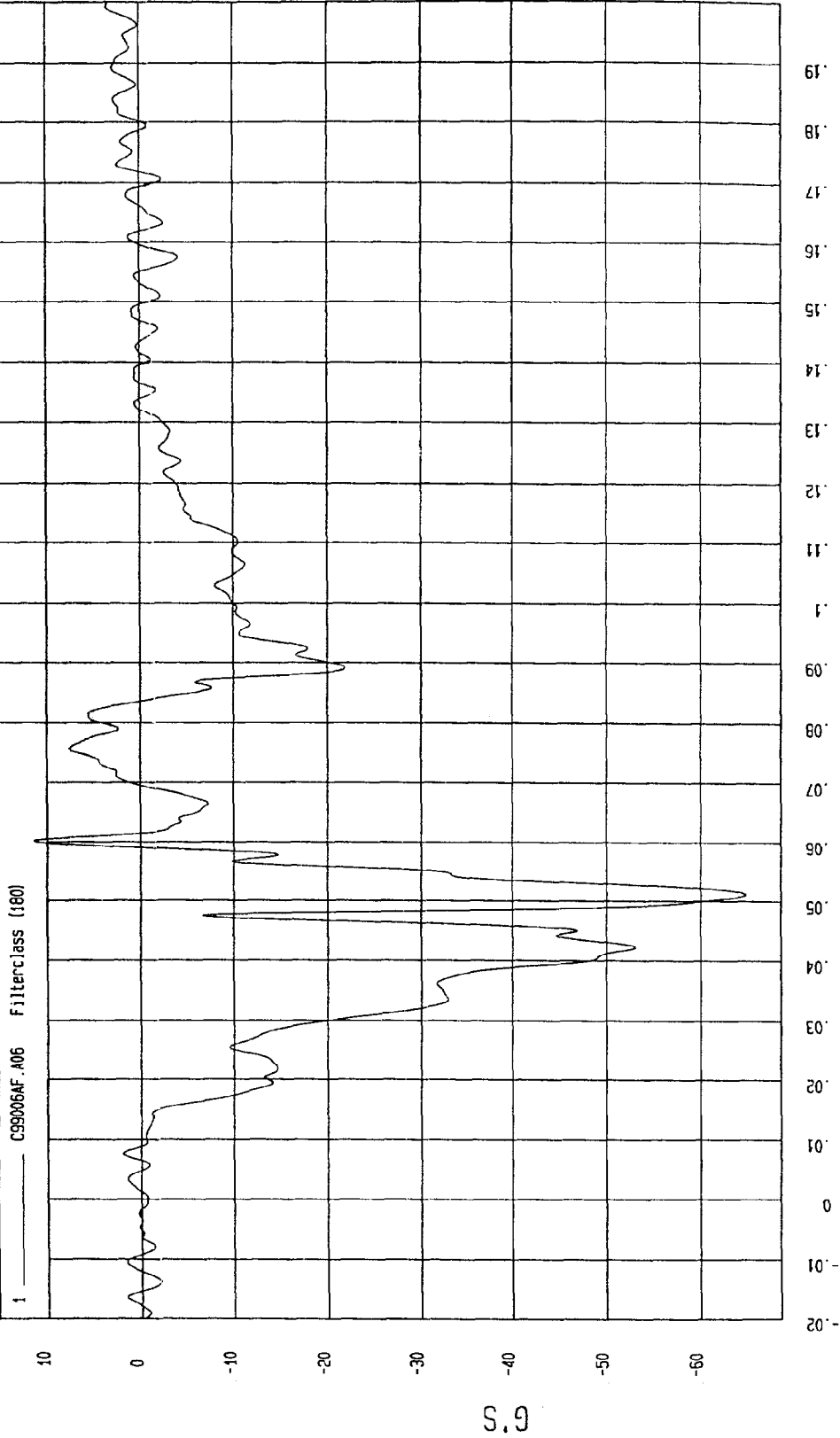
Speed: 35.06 MPH 56.4 KPH

COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = 11.32 G'S at 60 msec

Minimum = -64.77 G'S at 51 msec

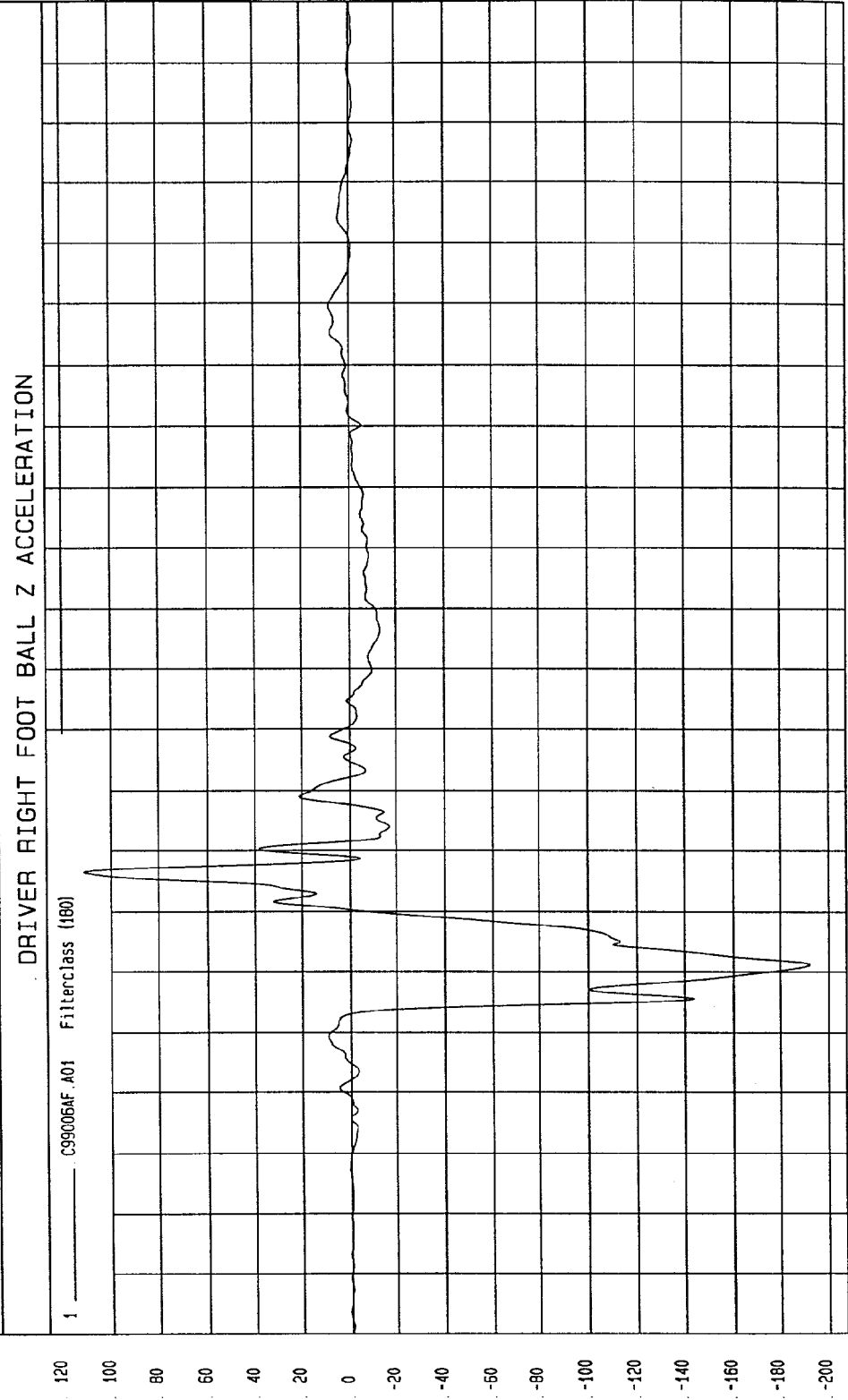
DRIVER LEFT HEEL Z ACCELERATION



TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -192.21 G'S at 41 msec Maximum = 111.16 G'S at 57 msec



TIME (seconds)

NCA Research
01-26-1999 13.07

TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 01-13-1999

Speed: 35.06 MPH 56.4 KPH

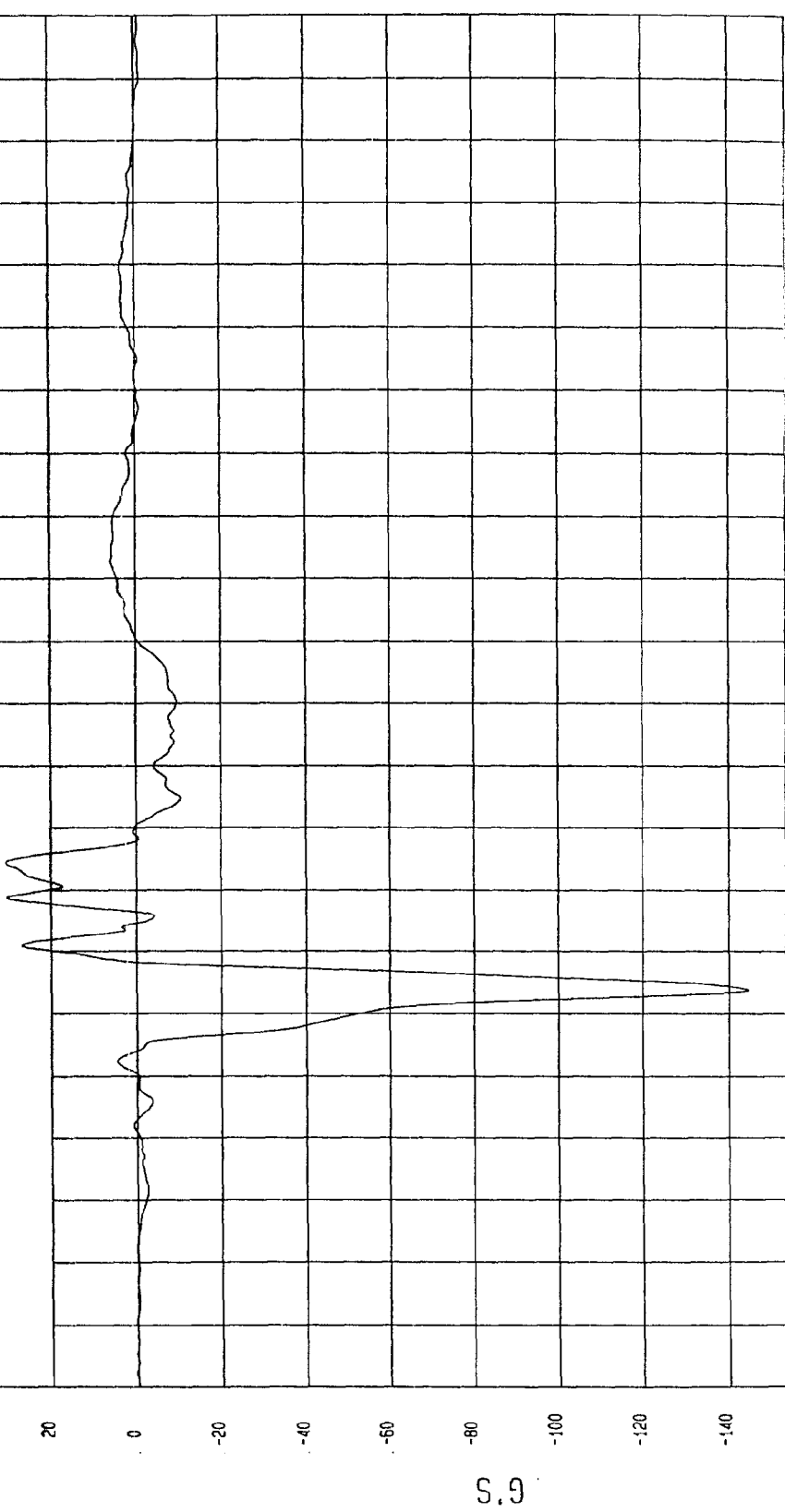
COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = 30.46 G'S at 54 msec

Minimum = -144.54 G'S at 44 msec

DRIVER RIGHT HEEL X ACCELERATION

1 — C95006AF.A02 Filterclass (180)

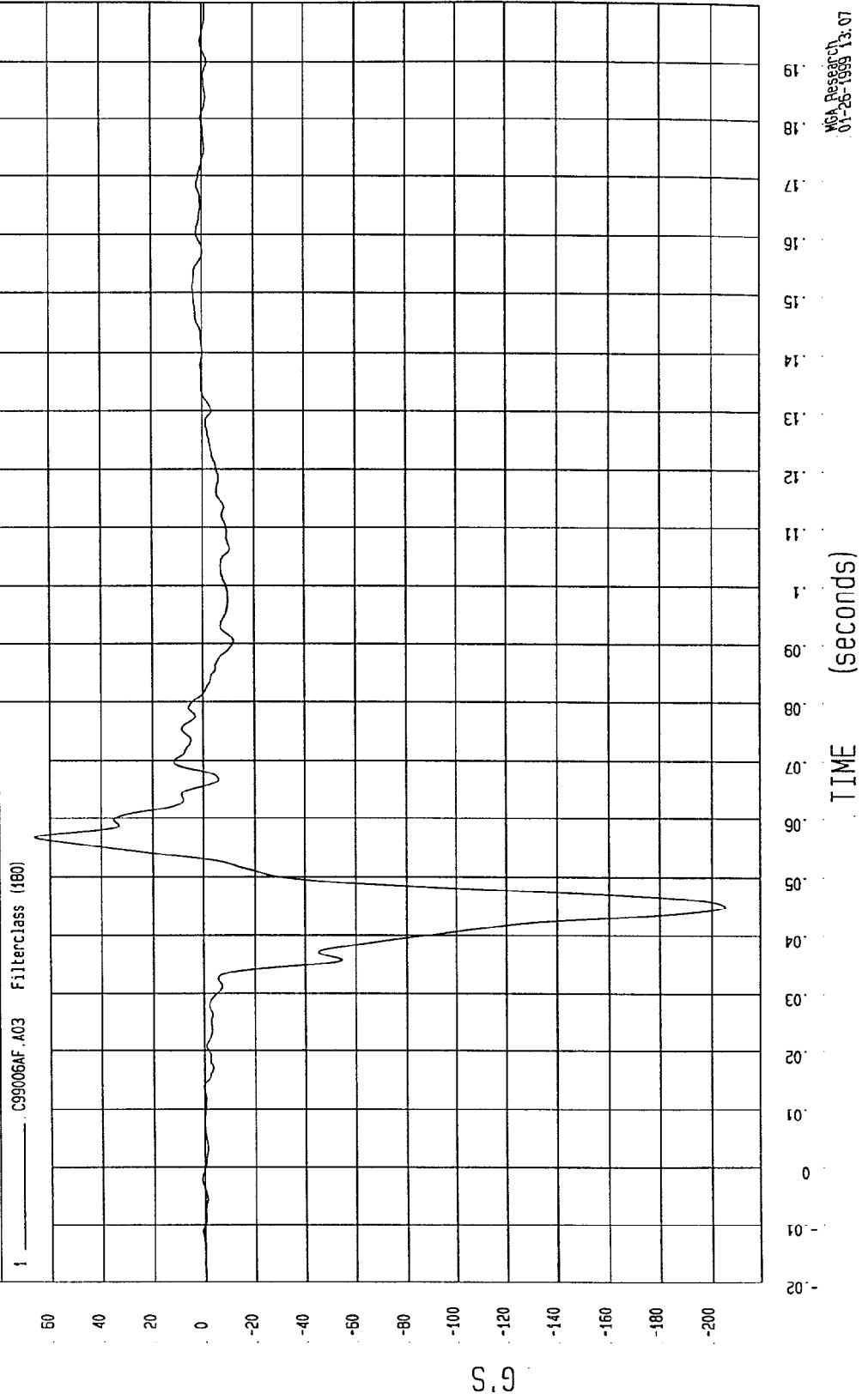


TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -205.35 G's at 45 msec Maximum = 66.04 G's at 57 msec

DRIVER RIGHT HEEL Z ACCELERATION



TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

Speed: 35.06 MPH 56.4 KPH

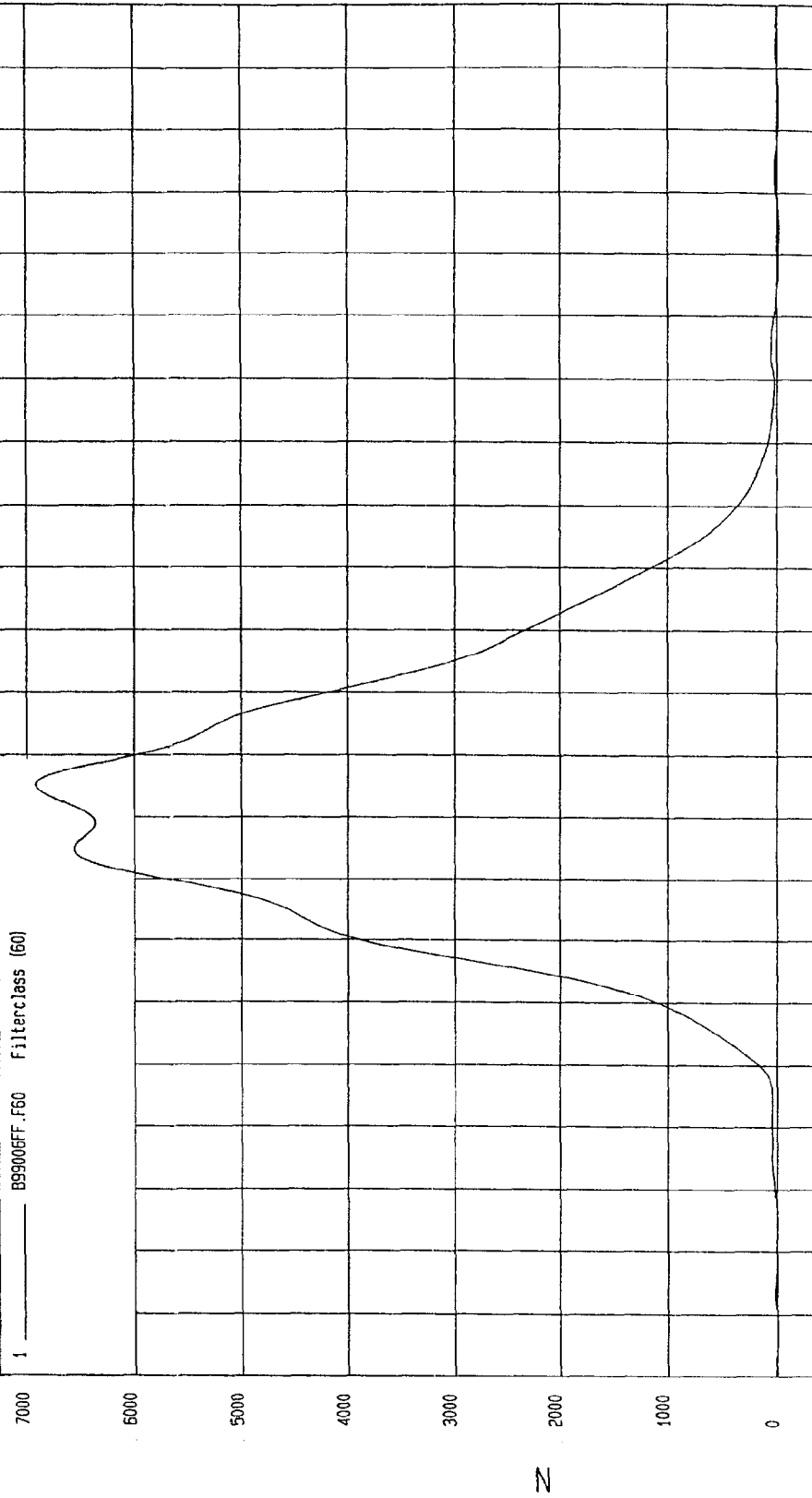
COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = 6916.58 N at 75 msec

Minimum = -17.57 N at 164 msec

DRIVER SHOULDER BELT FORCE

1 ——— B99006FF.F60 Filterclass (60)



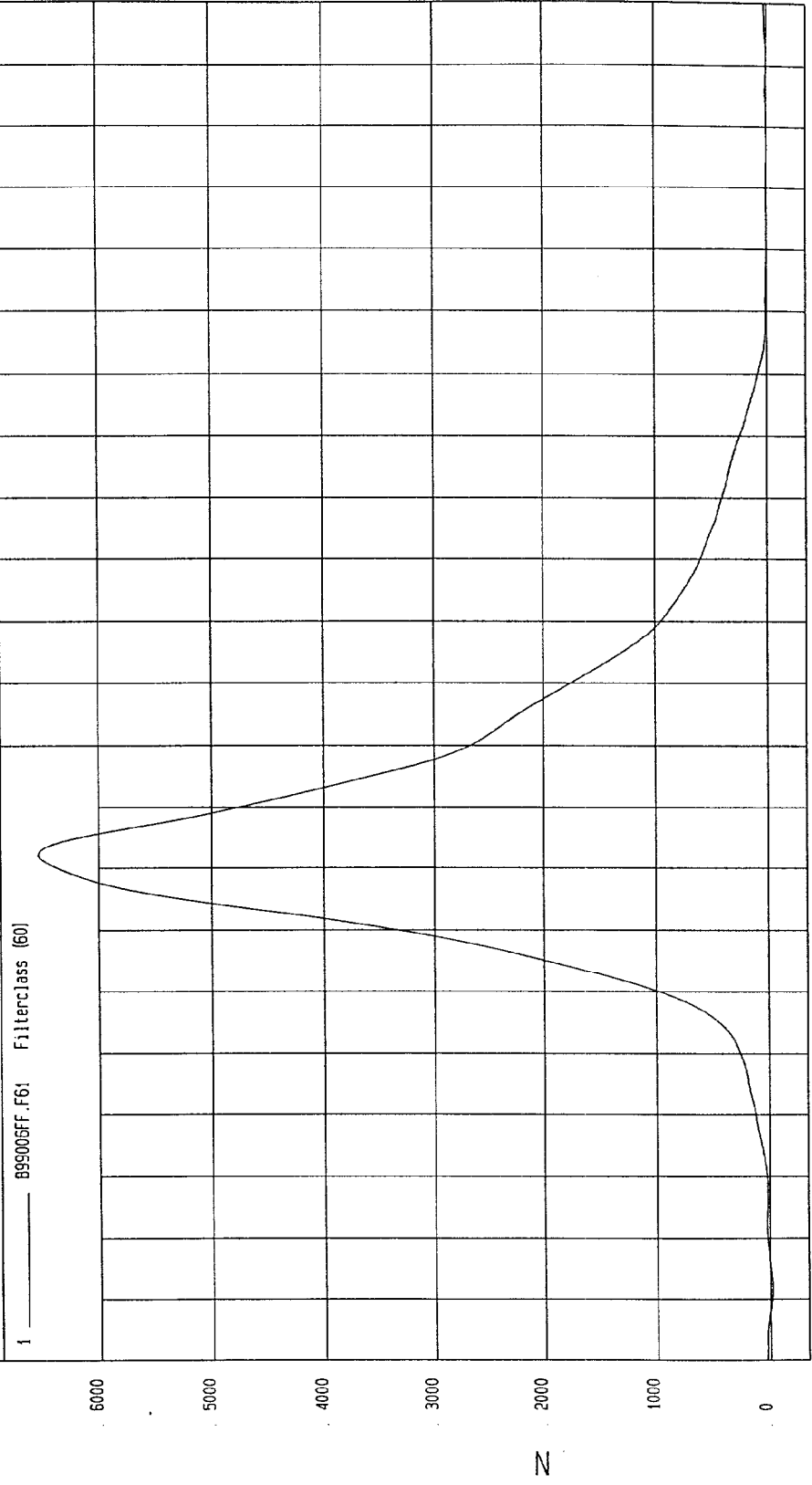
NSA Research
01-14-1999 10:30

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

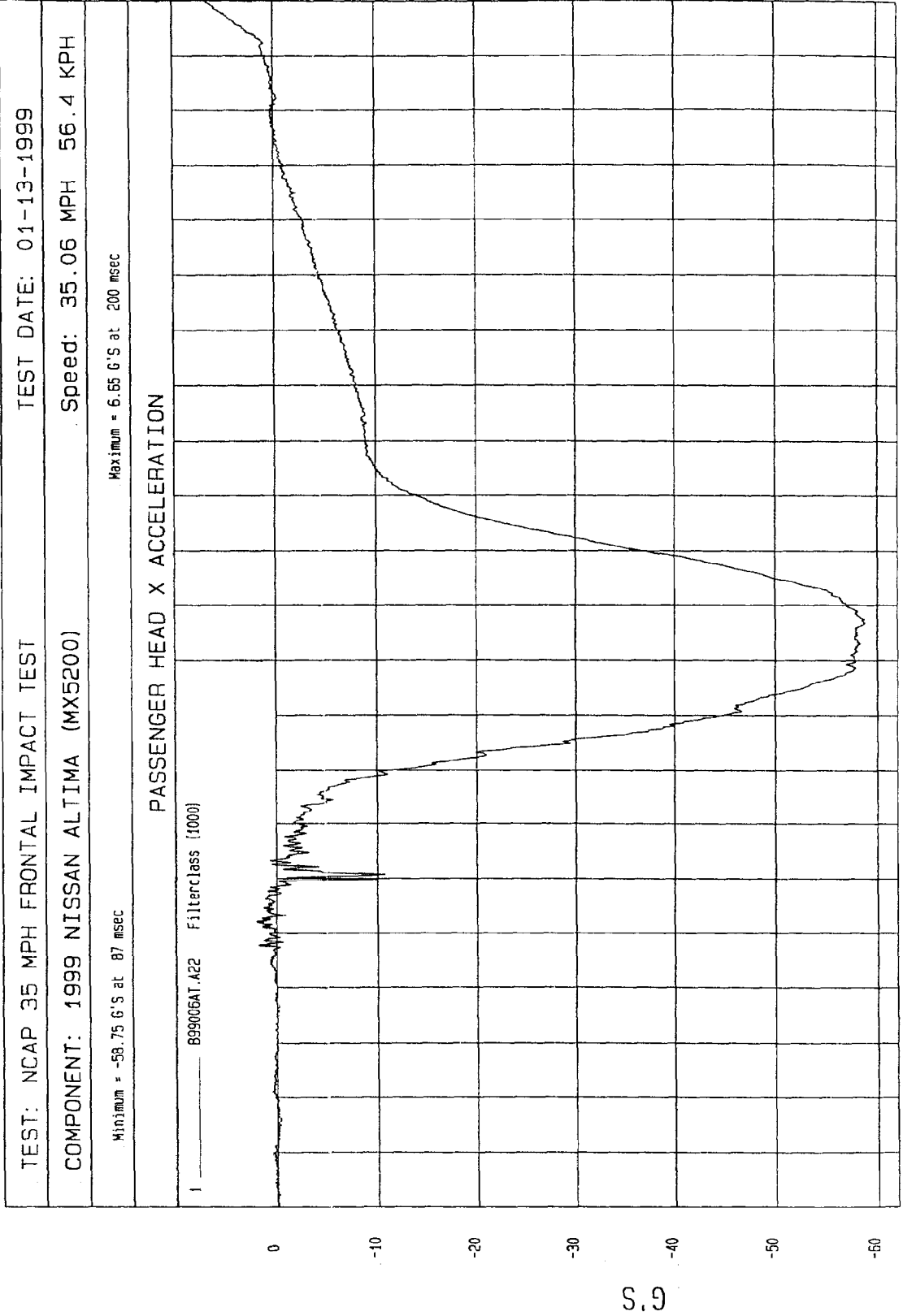
Minimum = -21.33 N at -8 msec Maximum = 6543.13 N at 62 msec

DRIVER LAP BELT FORCE



TIME (SECONDS)

WCA Research
01-14-1999 10:38



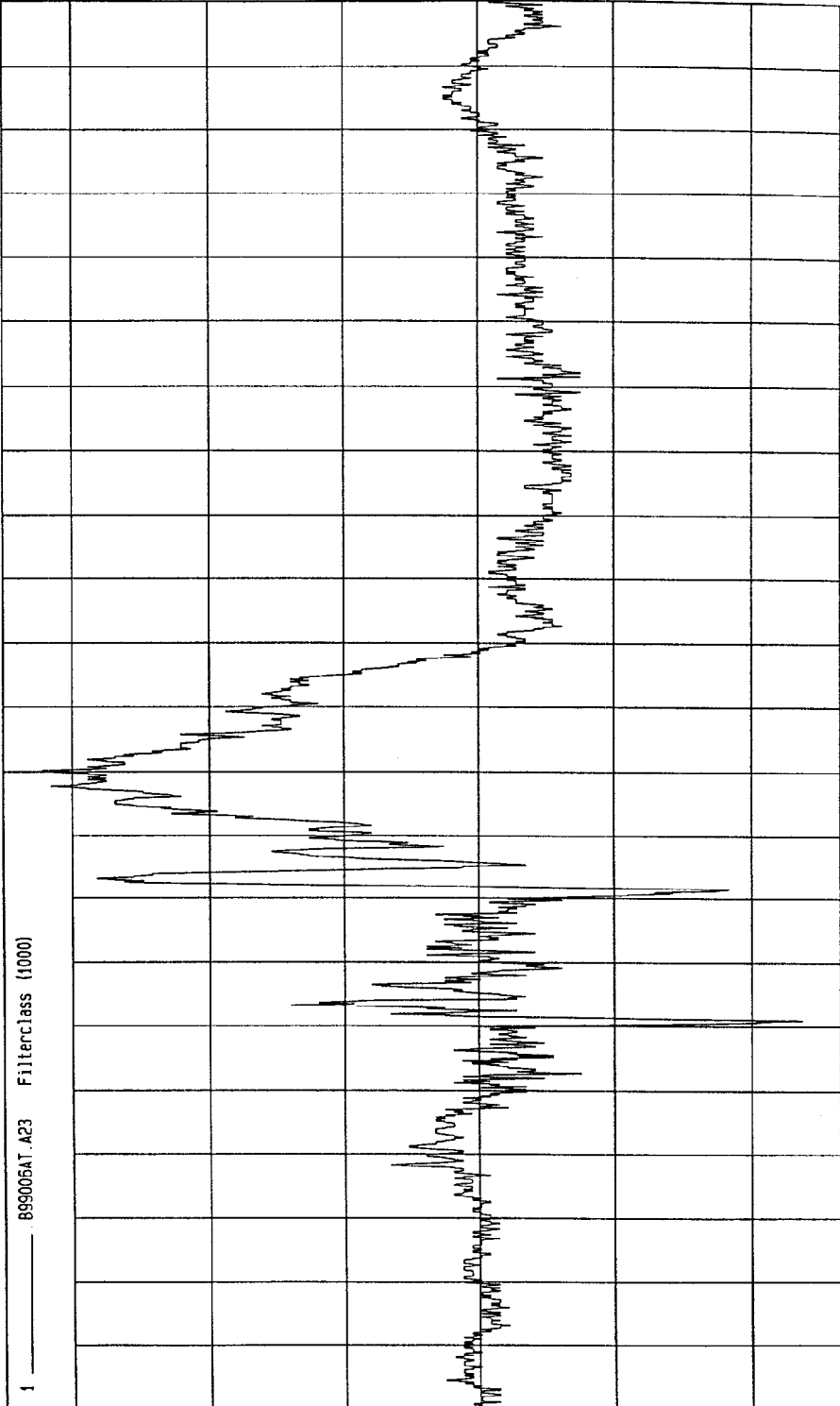
MGA Research
01-14-1999 10:04

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -4.75 G'S at 41 msec Maximum = 6.45 G'S at 80 msec

PASSENGER HEAD Y ACCELERATION



TIME (SECONDS)

NGA Research
01-22-1999 16:14

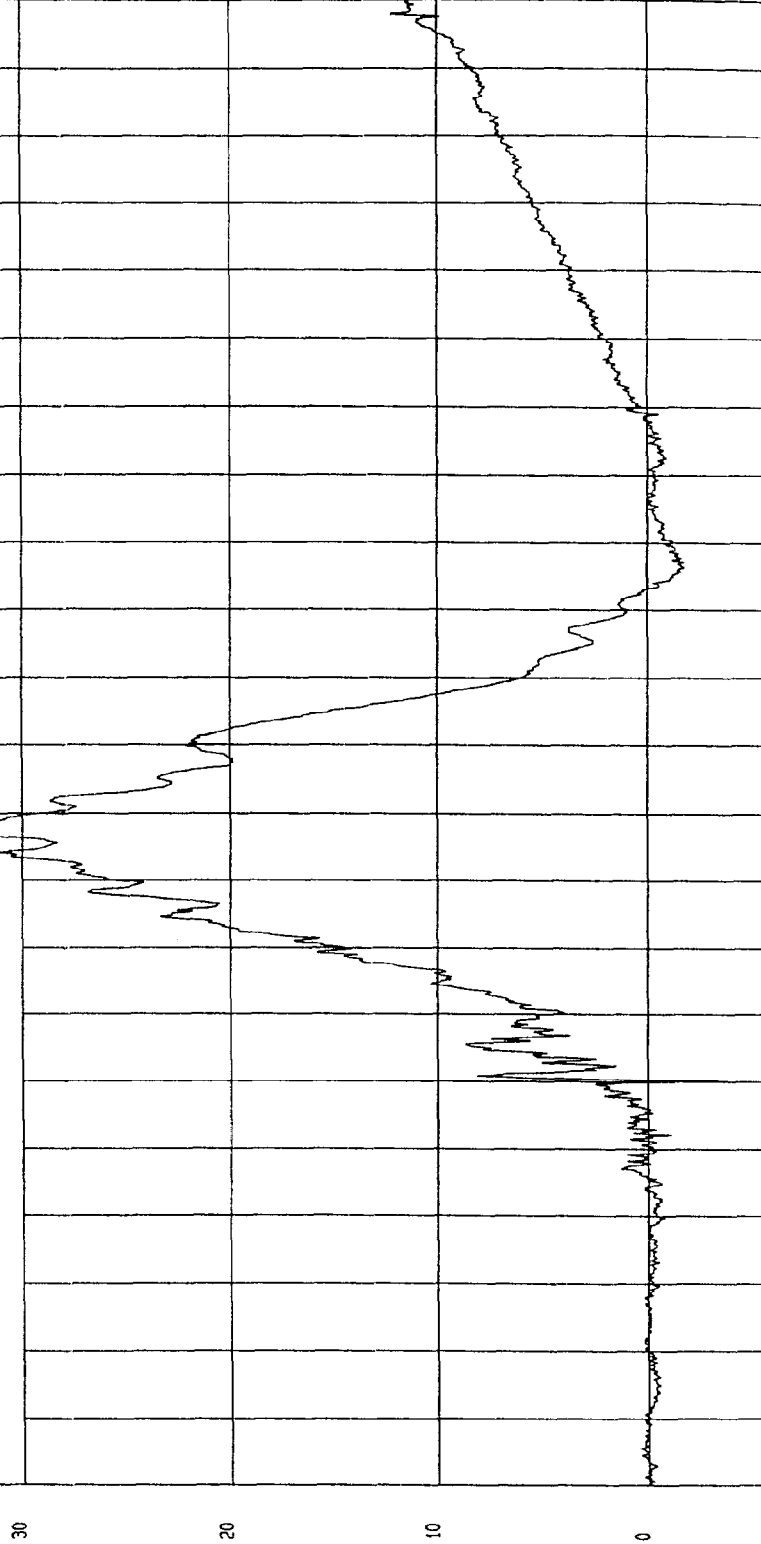
TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -3.76 G'S at 40 msec Maximum = 34.71 G'S at 77 msec

PASSENGER HEAD Z ACCELERATION

1 899006AT.A24 Filterclass (1000)



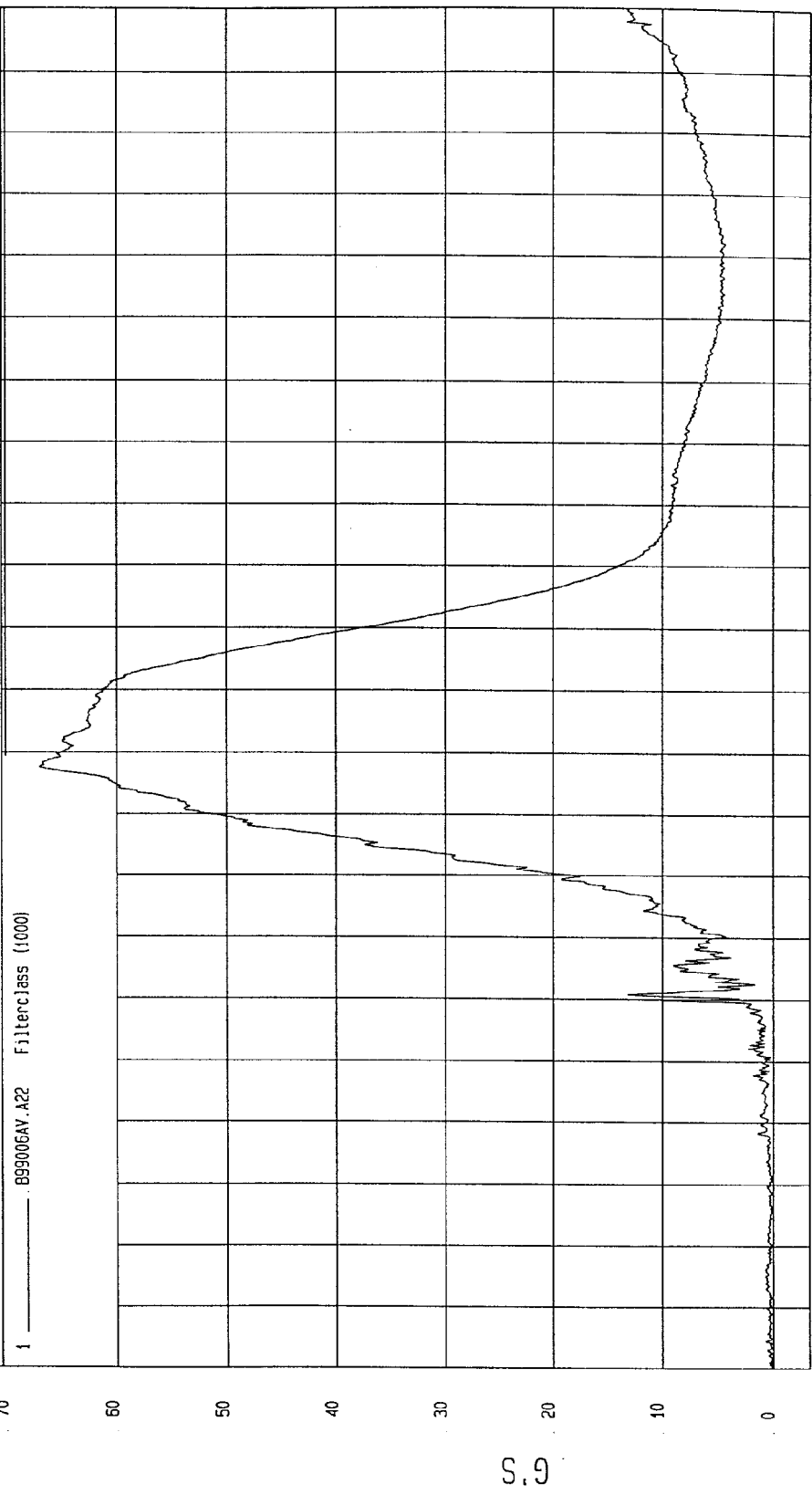
MSA Research
01-22-1999 16:14

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

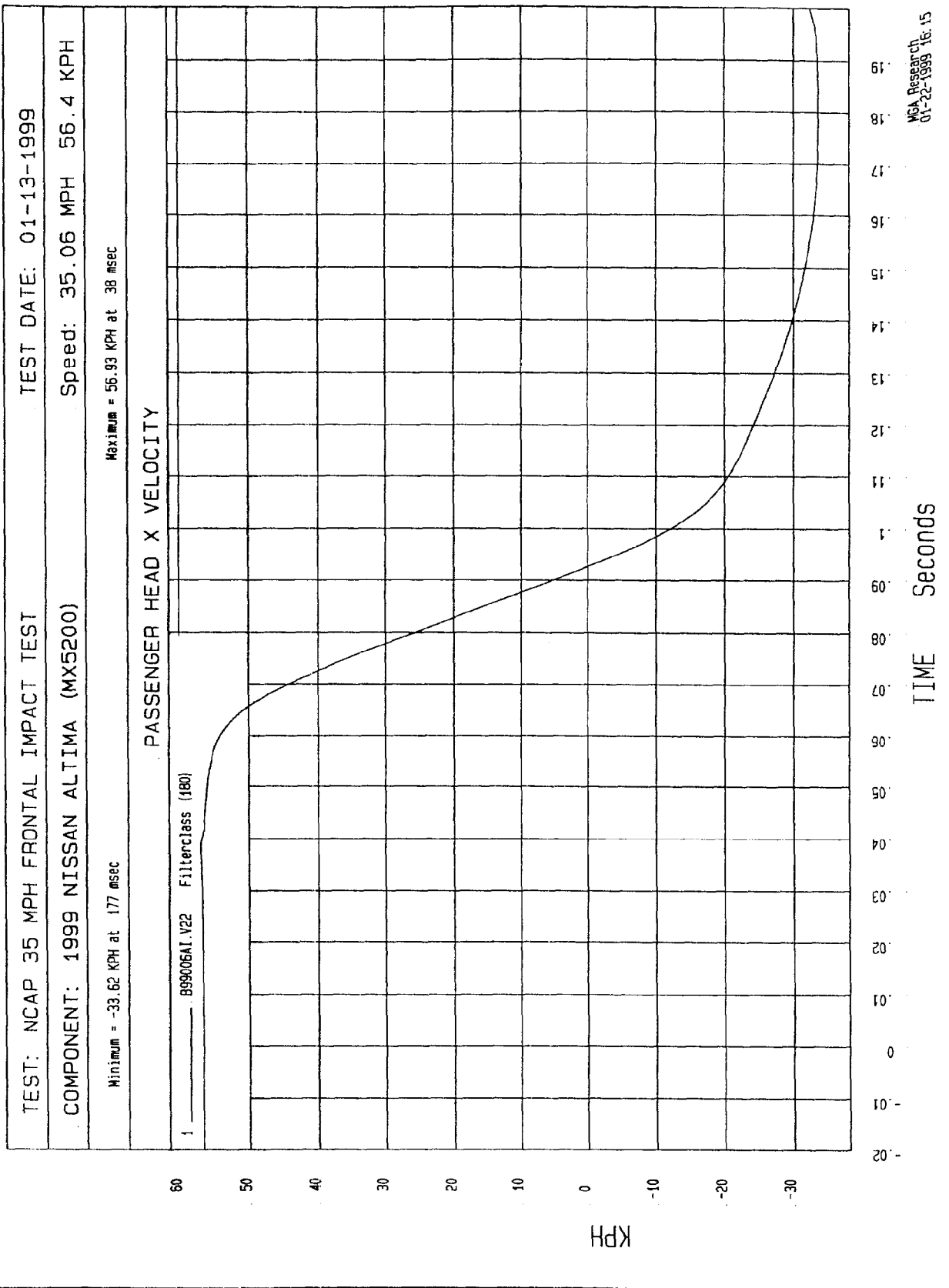
COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

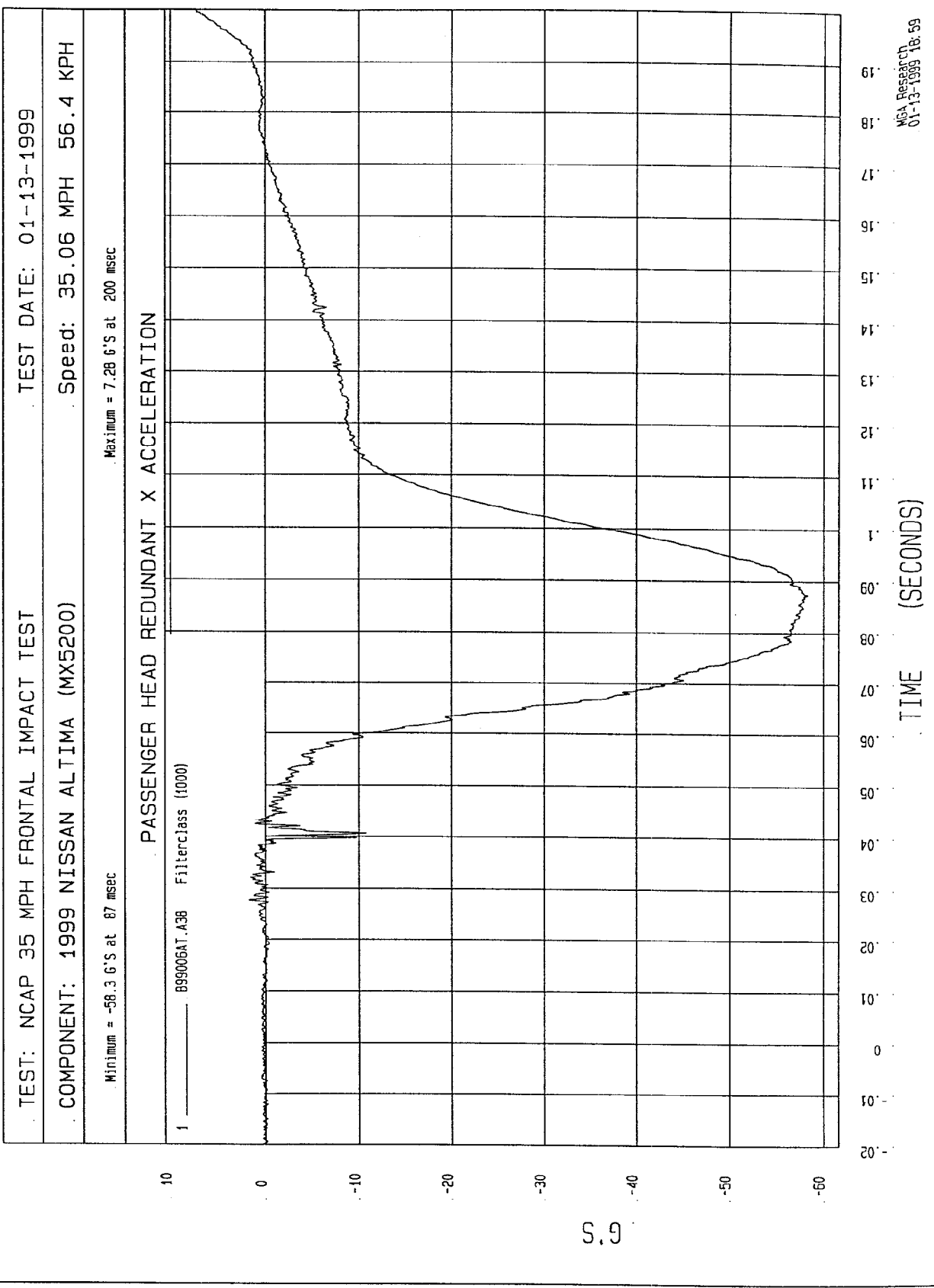
Minimum = 6.43E-02 G'S at -18 msec Maximum = 67.01 G'S at 78 msec

PASSENGER HEAD RESULTANT ACCELERATION



WCA Research
01-14-1999 10:05





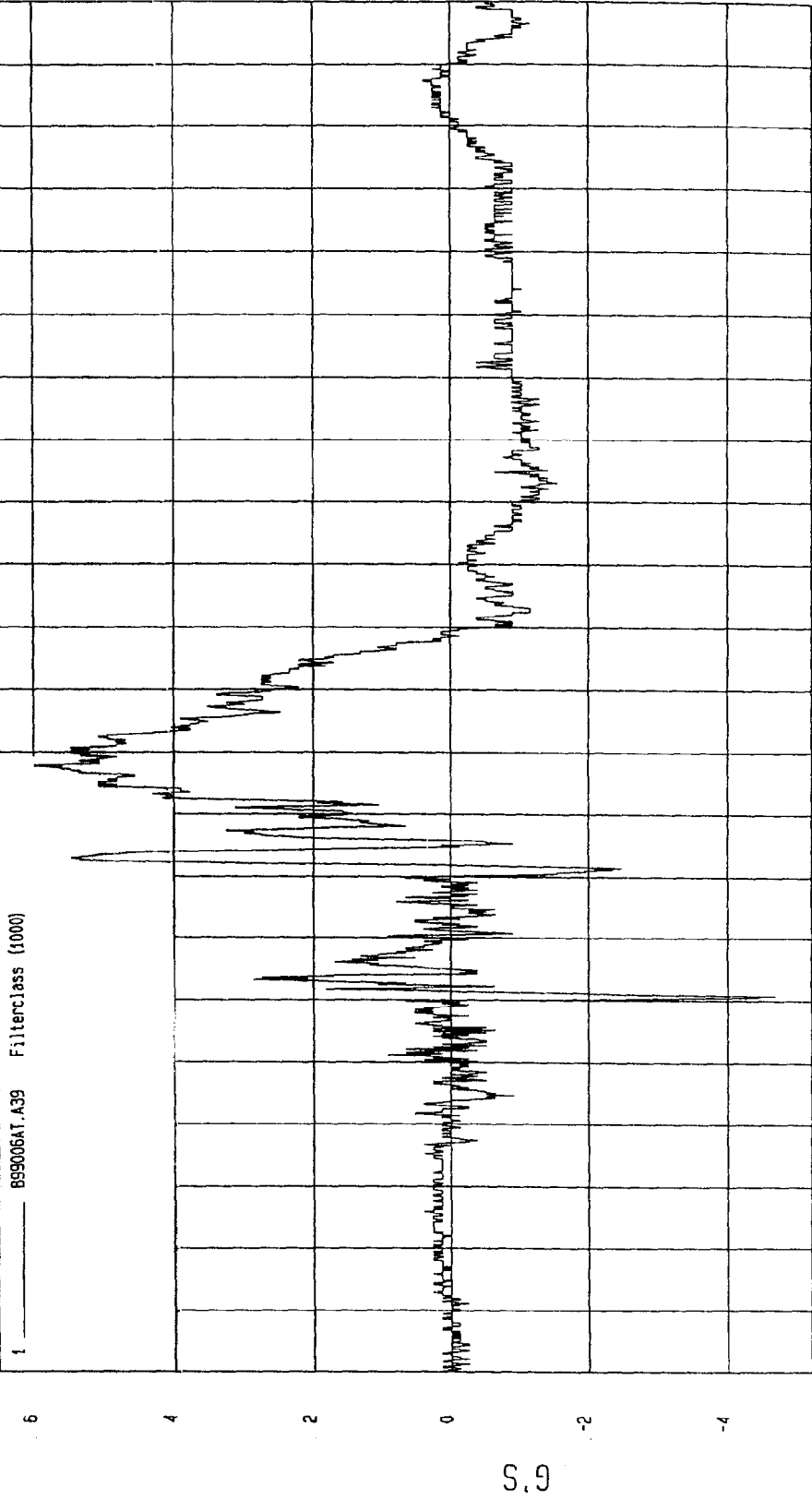
MGA Research
01-13-1999 18:59

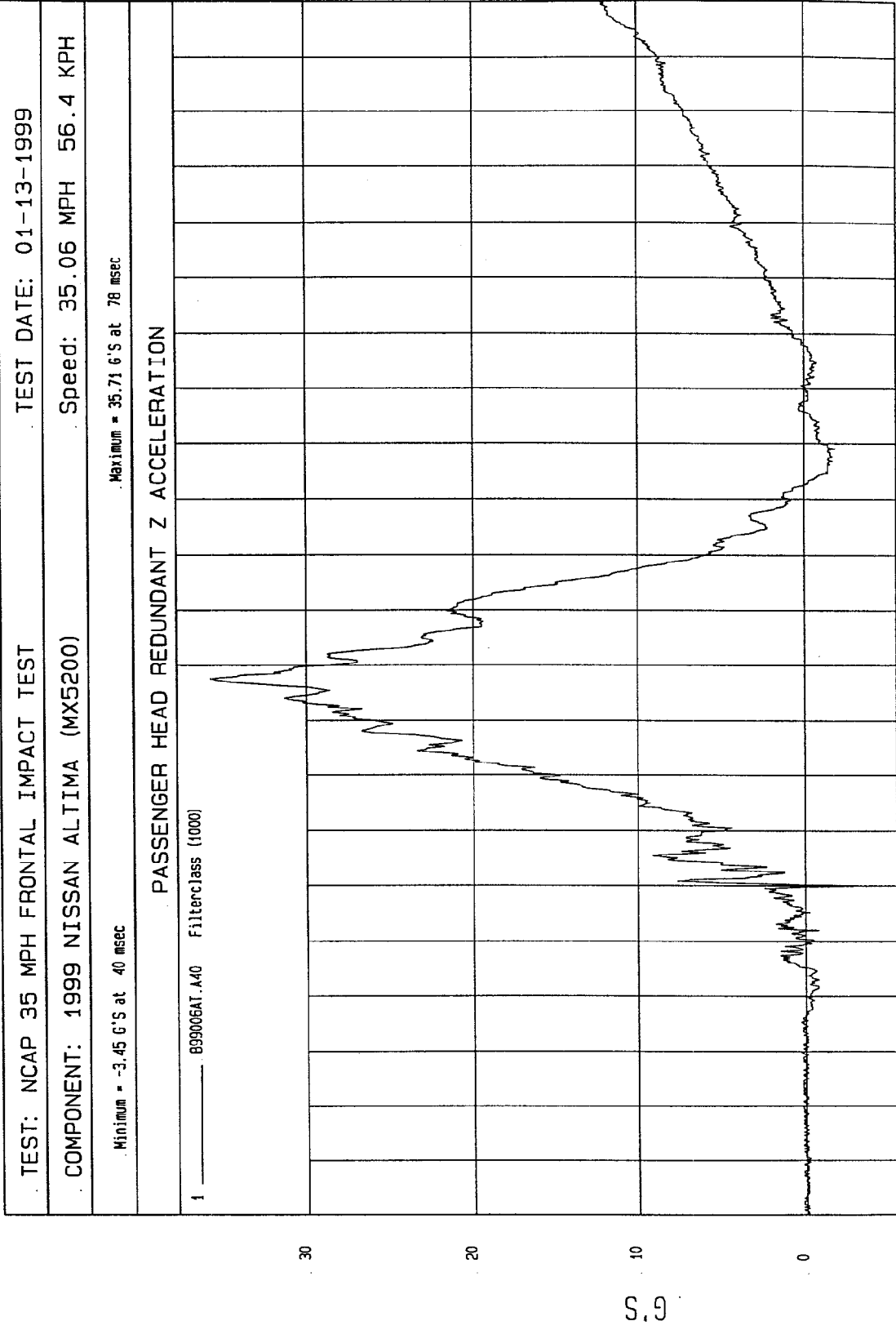
TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -4.68 G'S at 41 msec Maximum = 5.99 G'S at 78 msec

PASSENGER HEAD REDUNDANT Y ACCELERATION





TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

SPEED: 35.06 MPH 56.4 KPH

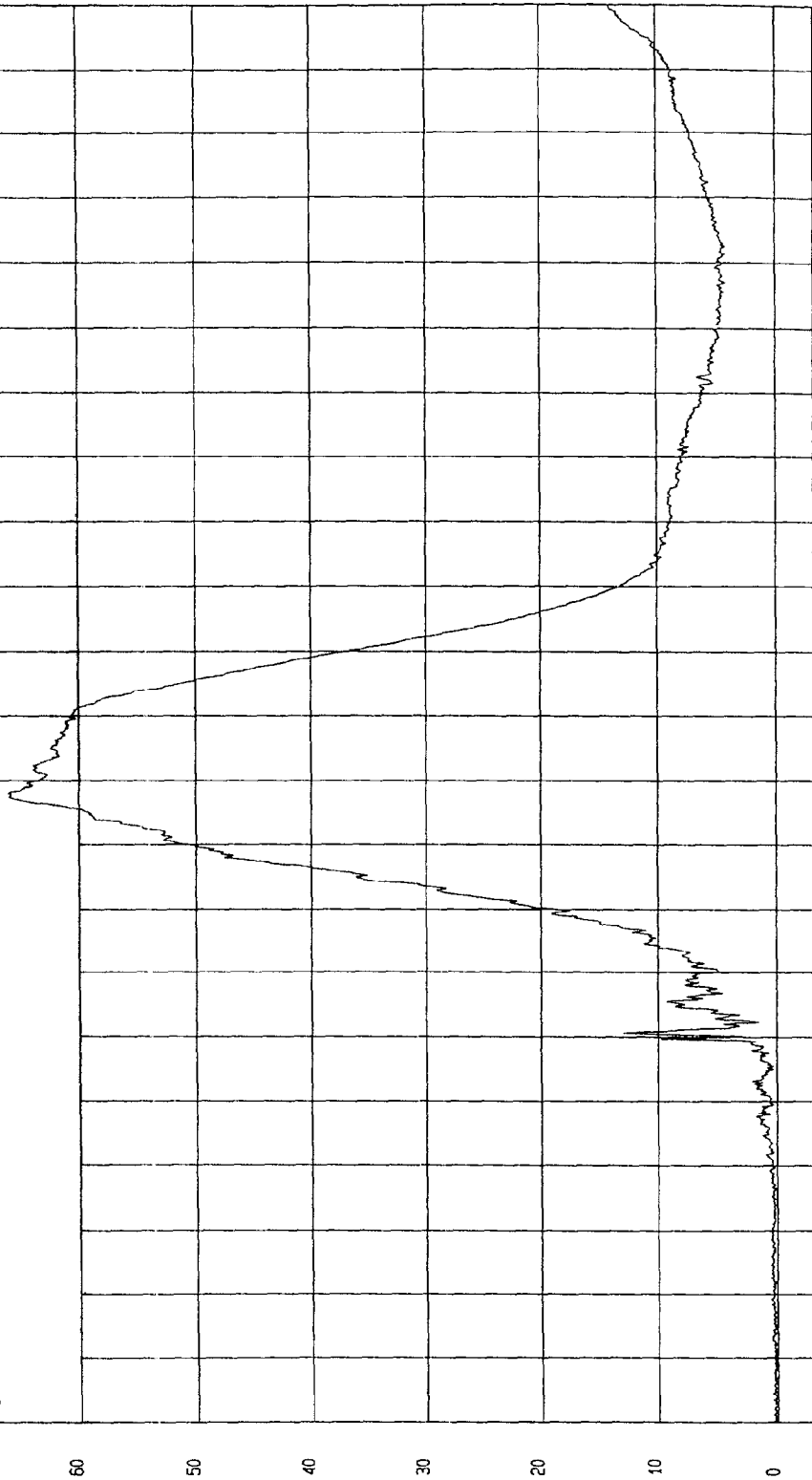
COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = 66.05 G'S at 78 msec

Minimum = 3.54E-02 G'S at -20 msec

PASSENGER HEAD REDUNDANT RESULTANT ACCELERATION

1 ——— B99006AV A38 Filterclass (1000)



MGA Research
01-13-1999 19:00

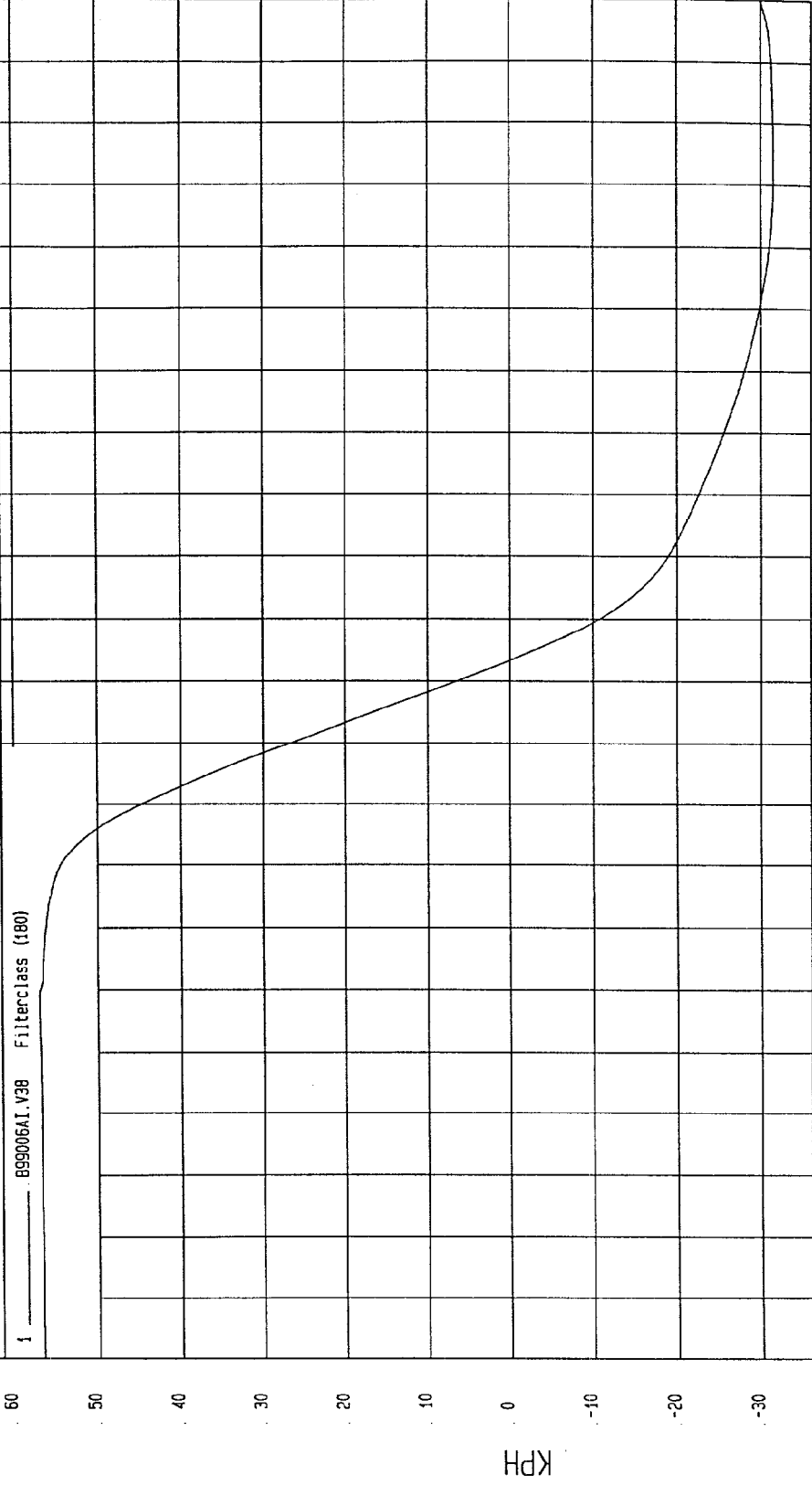
TIME (SECONDS)

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

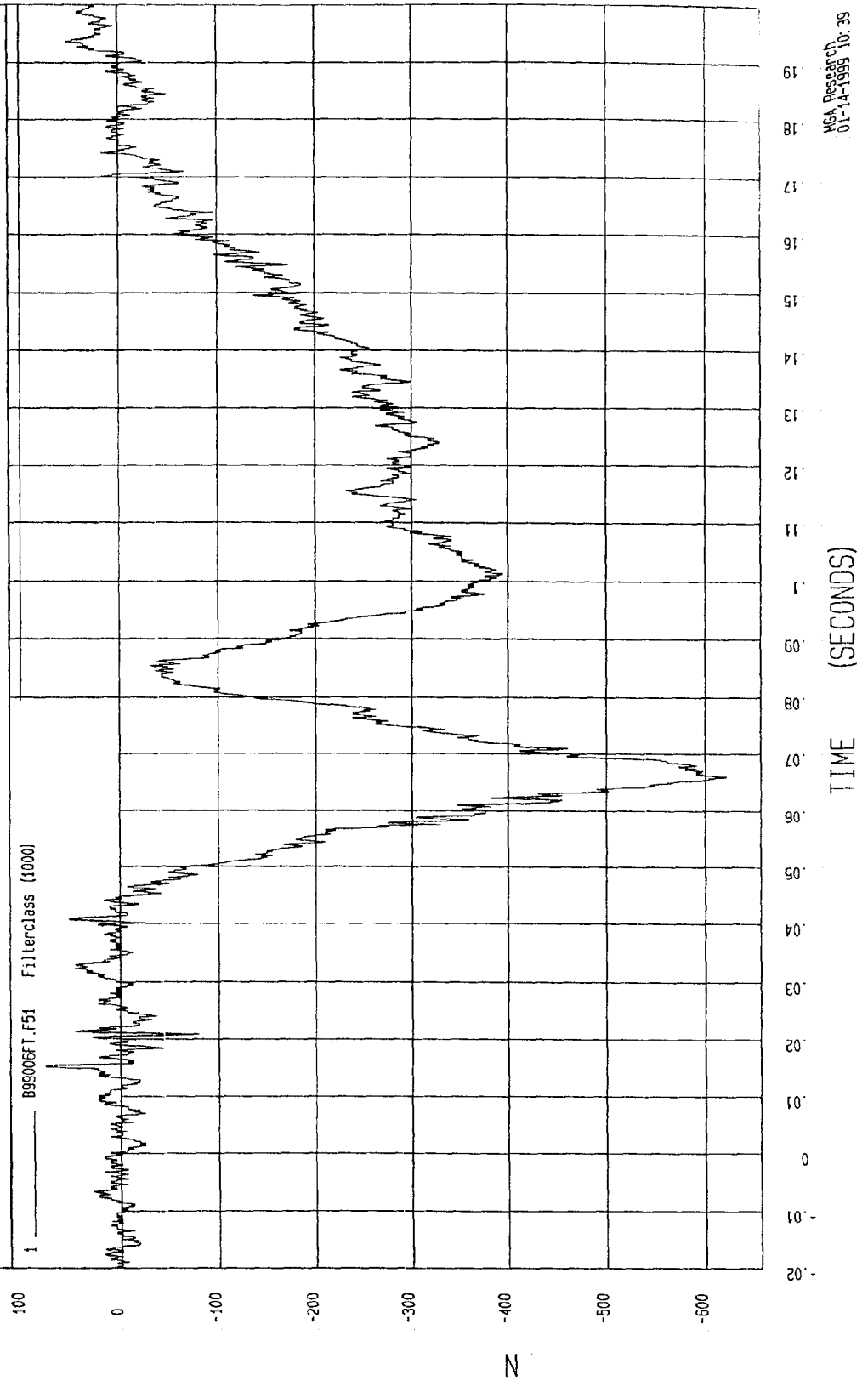
Minimum = -31.55 KPH at 173 msec Maximum = 57 KPH at 38 msec

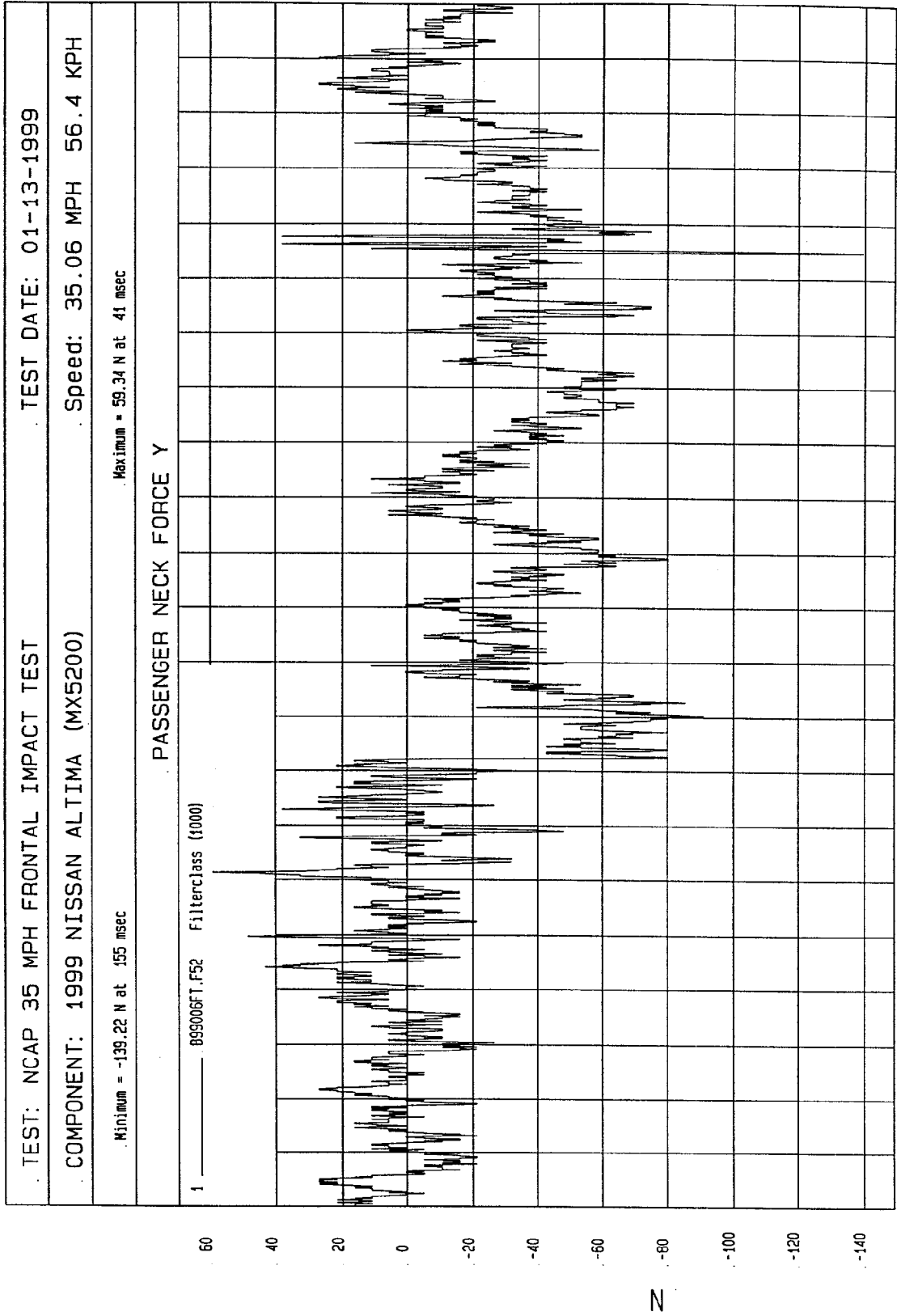
PASSENGER HEAD REDUNDANT X VELOCITY



TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999
COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH
Minimum = -620.78 N at 66 msec Maximum = 76.49 N at 15 msec

PASSENGER NECK FORCE X





TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

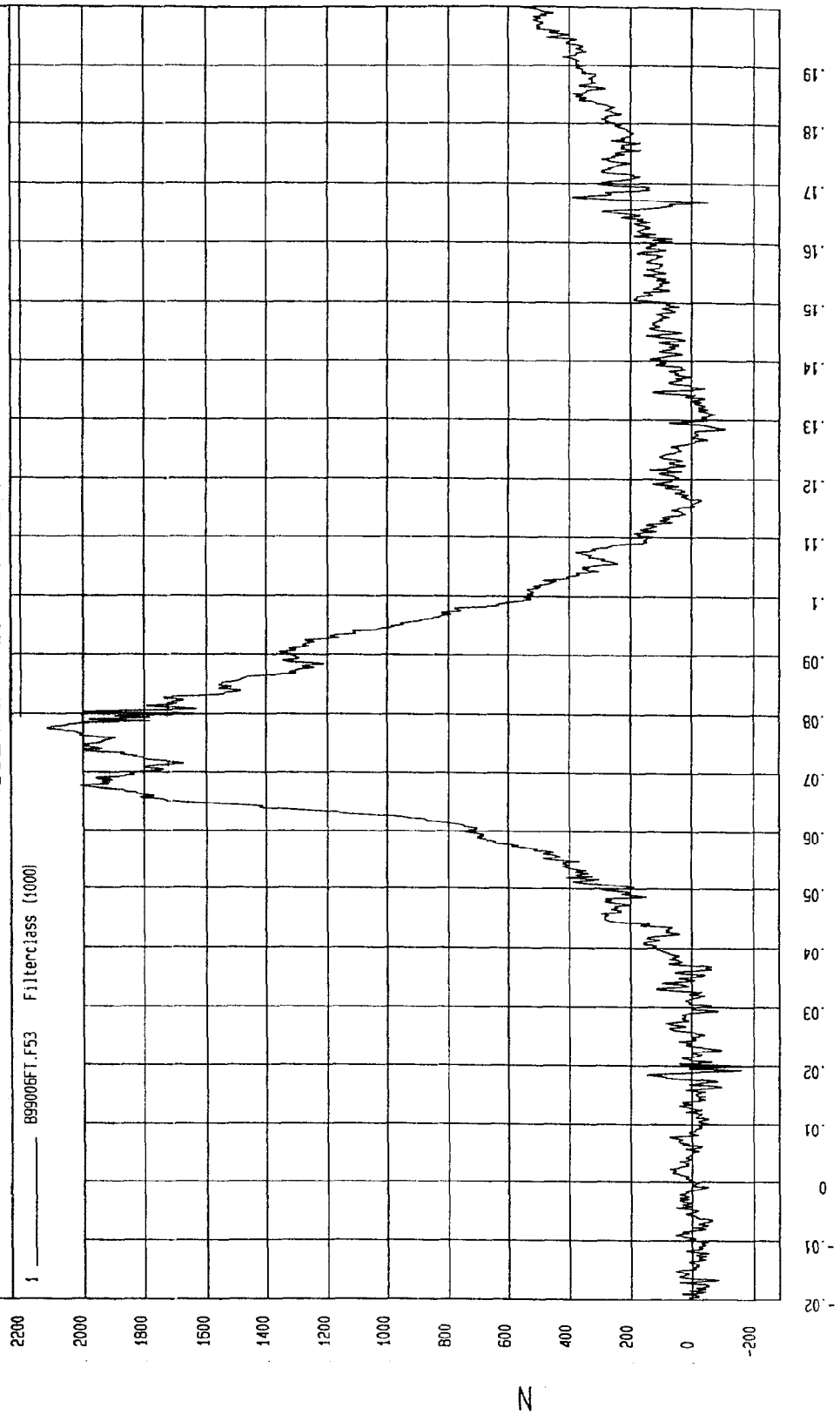
Speed: 35.06 MPH 56.4 KPH

COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = 2137.24 N at 78 msec

Minimum = -168.81 N at 20 msec

PASSENGER NECK FORCE Z



MCA Research
01-22-1999 16:14

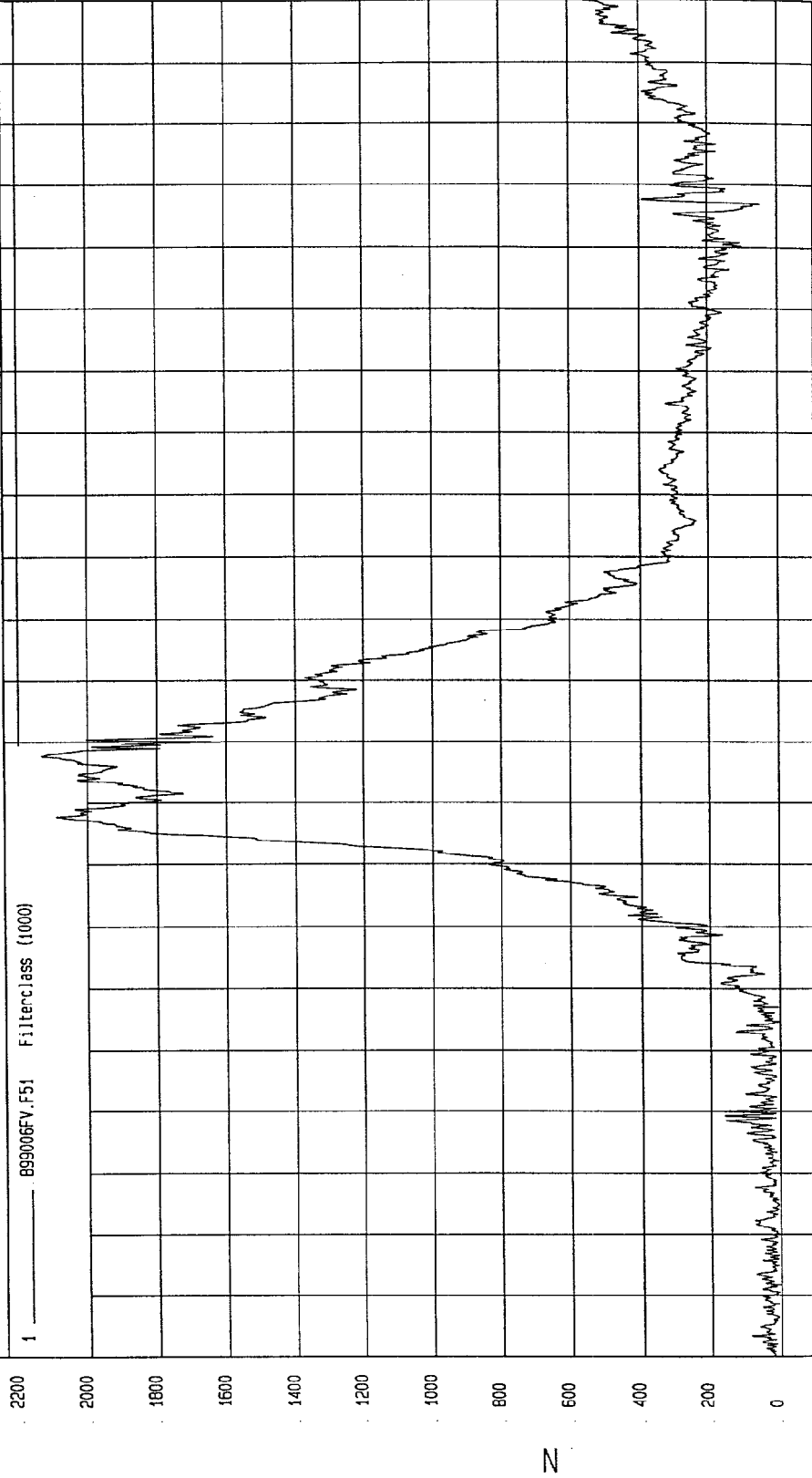
TIME (SECONDS)

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = 1.05 N at -8 msec Maximum = 2132.85 N at 78 msec

PASSENGER NECK FORCE RESULTANT



TIME (SECONDS)

MOA Research
01-14-1999 10:39

TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

Speed: 35.06 MPH 56.4 KPH

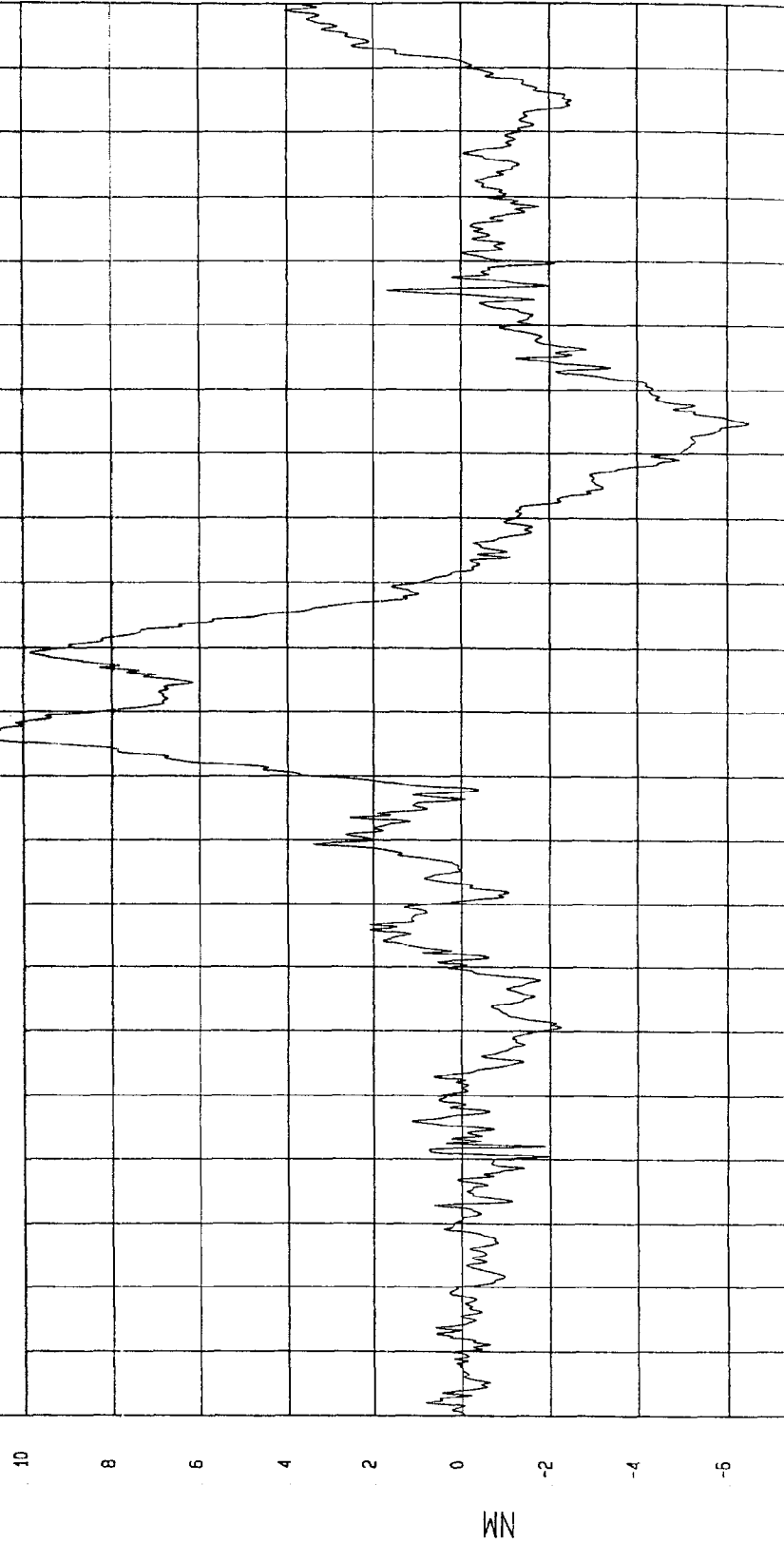
COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = 10.87 NM at 86 msec

Minimum = -6.49 NM at 135 msec

PASSENGER NECK MOMENT X

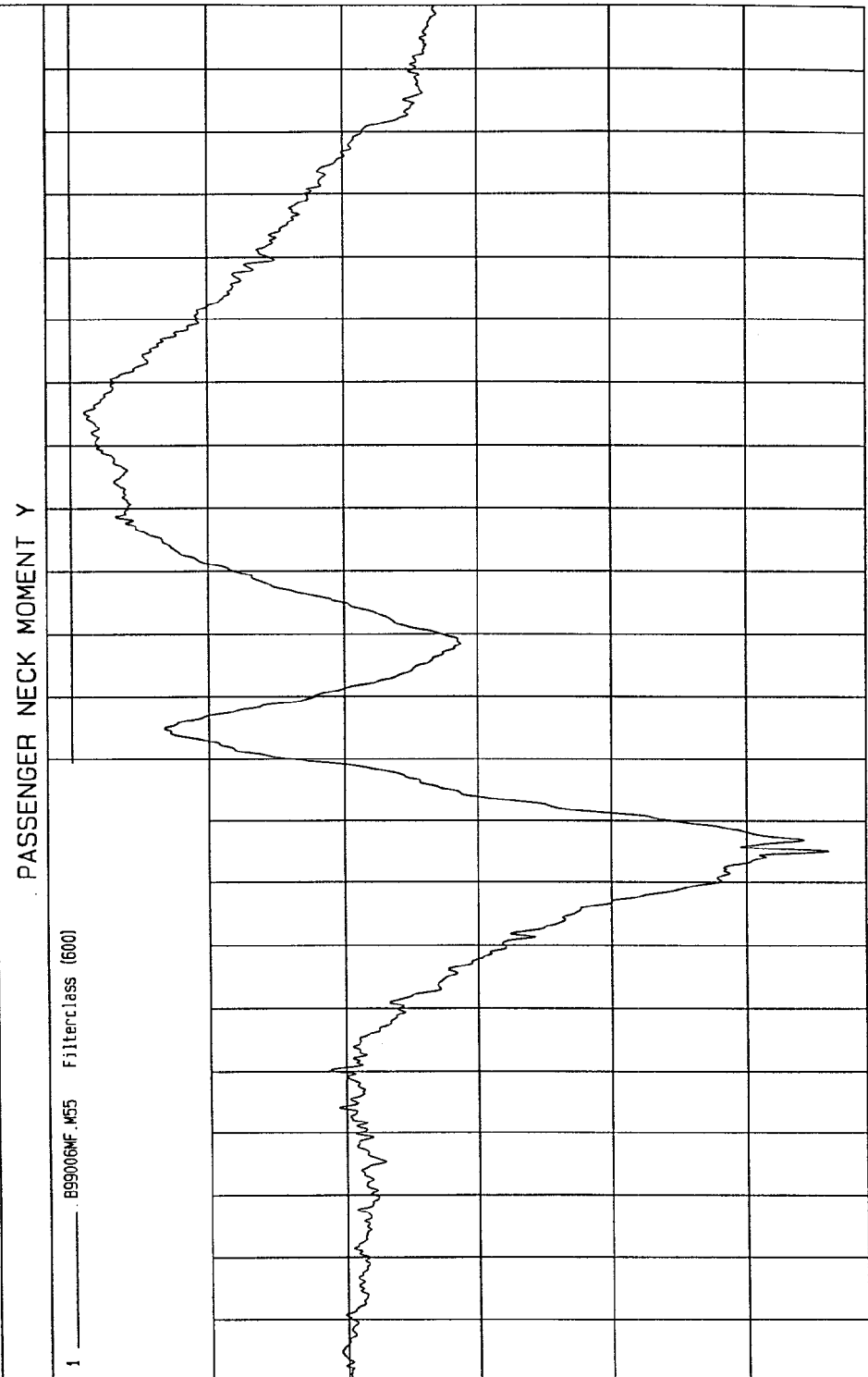
1 _____ B99006MF M54 Filterclass (600)



TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -36.01 NM at 65 msec Maximum = 19.02 NM at 135 msec



TIME (SECONDS)

MGA Research
01-22-1999 16:14

TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200)

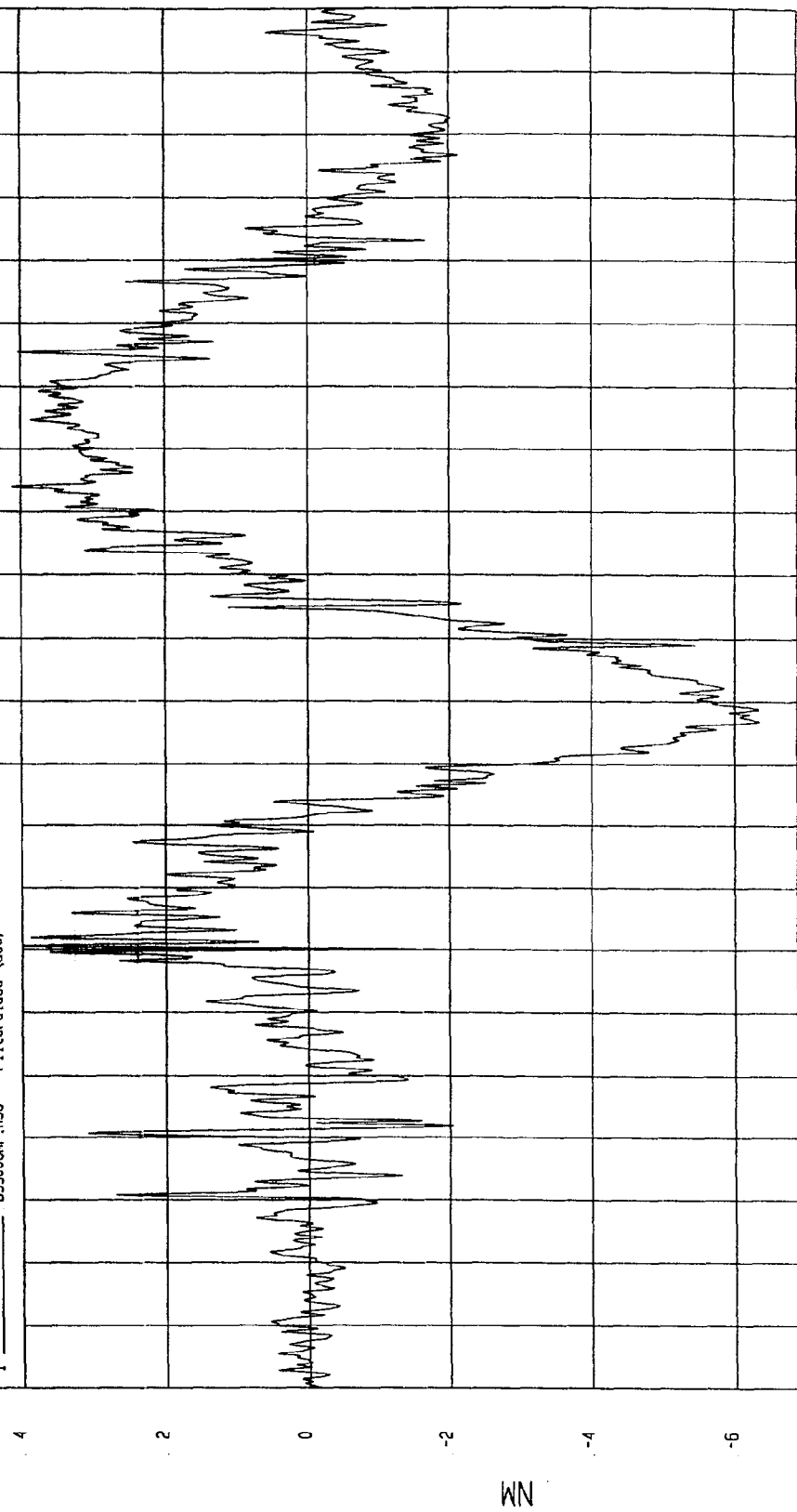
Speed: 35.06 MPH 56.4 KPH

Minimum = -6.34 NM at 87 msec

Maximum = 4.12 NM at 124 msec

PASSENGER NECK MOMENT Z

1 899006NF.M56 Filterclass (500)



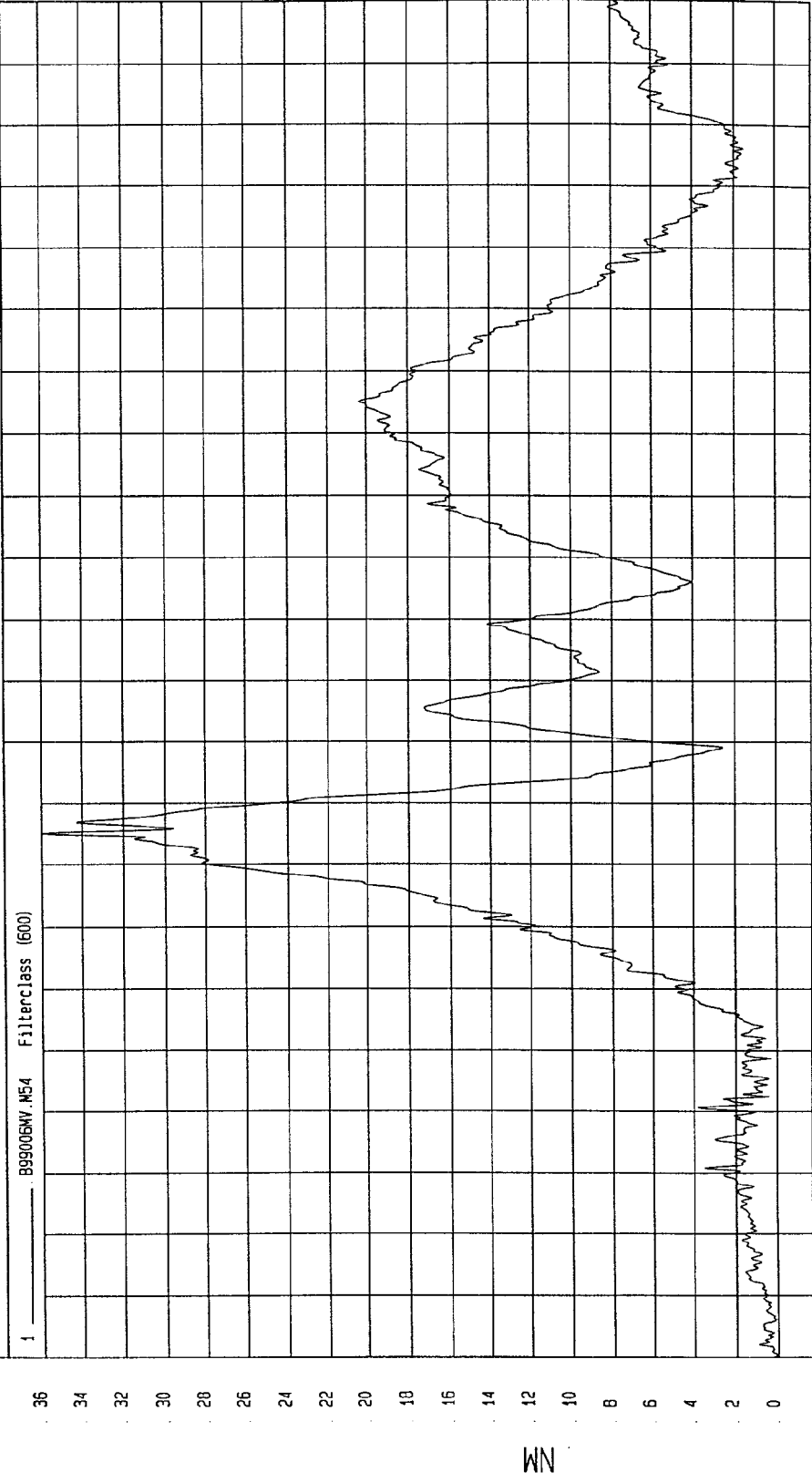
NSA Research
01-22-1999 16:14

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = 4.97E-02 NM at -20 msec Maximum = 36.02 NM at 65 msec

PASSENGER NECK MOMENT RESULTANT



TIME (SECONDS)

MSA Research
01-14-1999 10:40

TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

Speed: 35.06 MPH 56.4 KPH

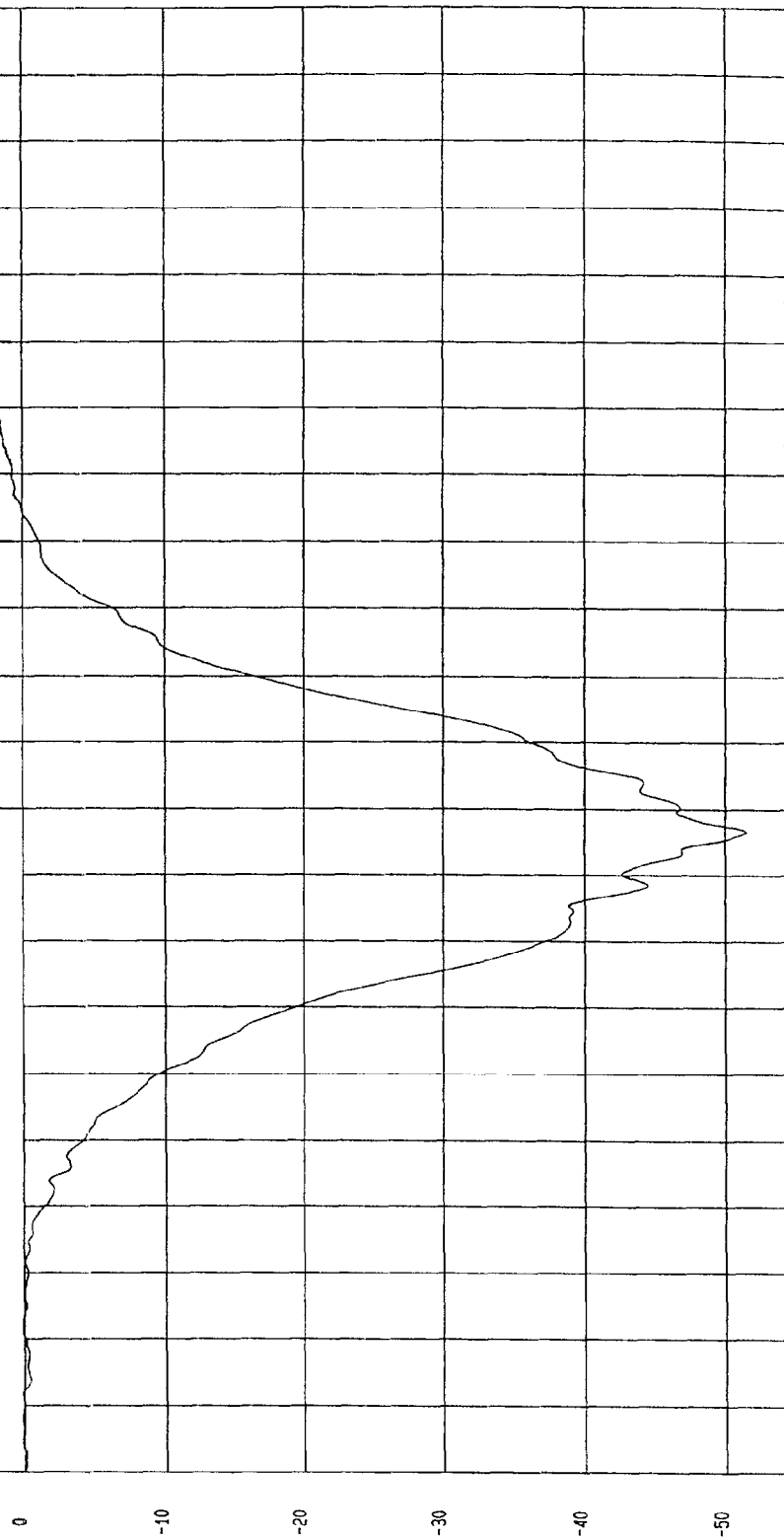
COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Minimum = -51.5 G'S at 77 msec

Maximum = 4.85 G'S at 188 msec

PASSENGER CHEST X ACCELERATION

1 899006AF.A25 Filterclass (180)

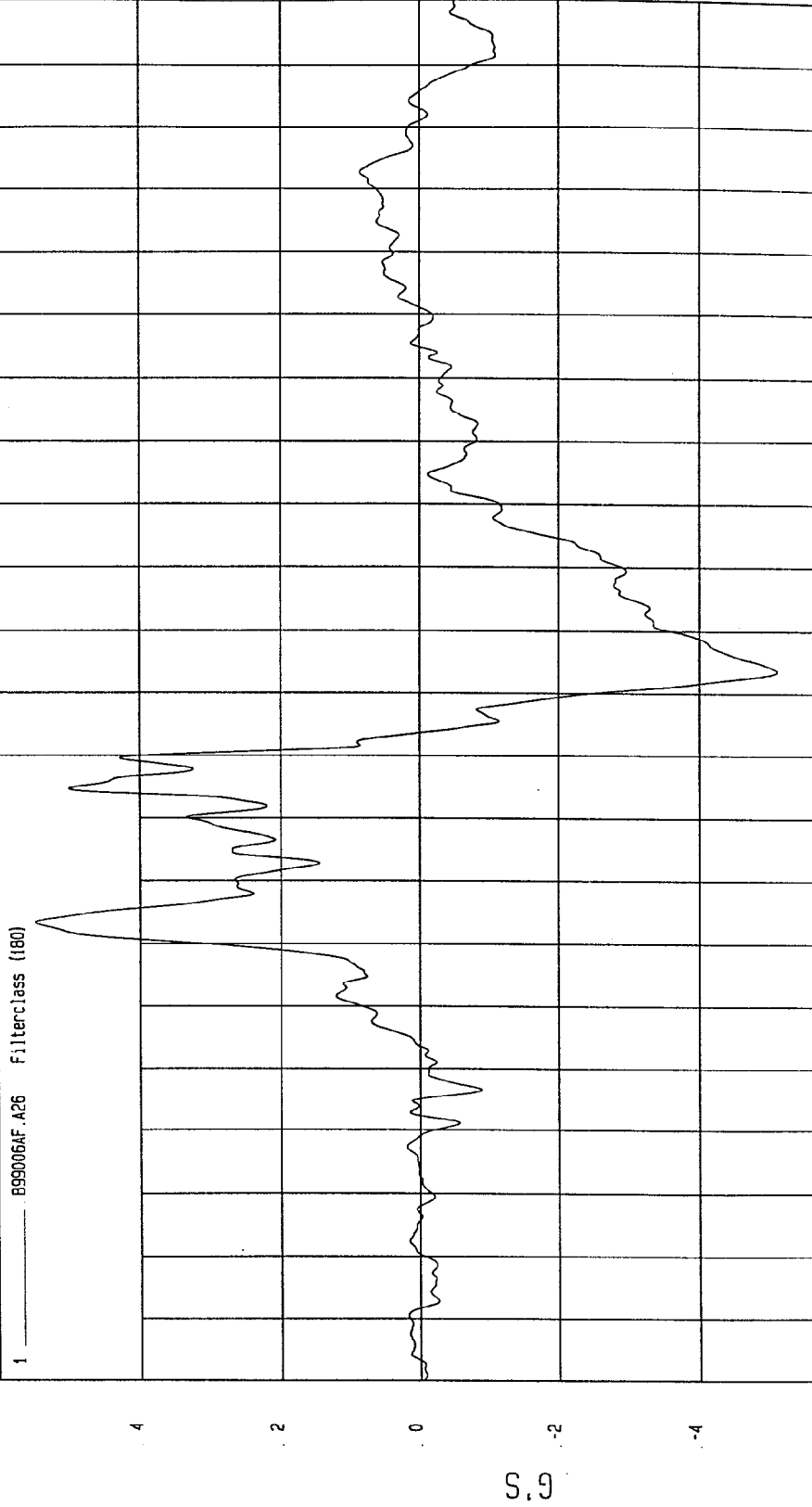


TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -5.11 G'S at 94 msec Maximum = 5.47 G'S at 53 msec

PASSENGER CHEST Y ACCELERATION



TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

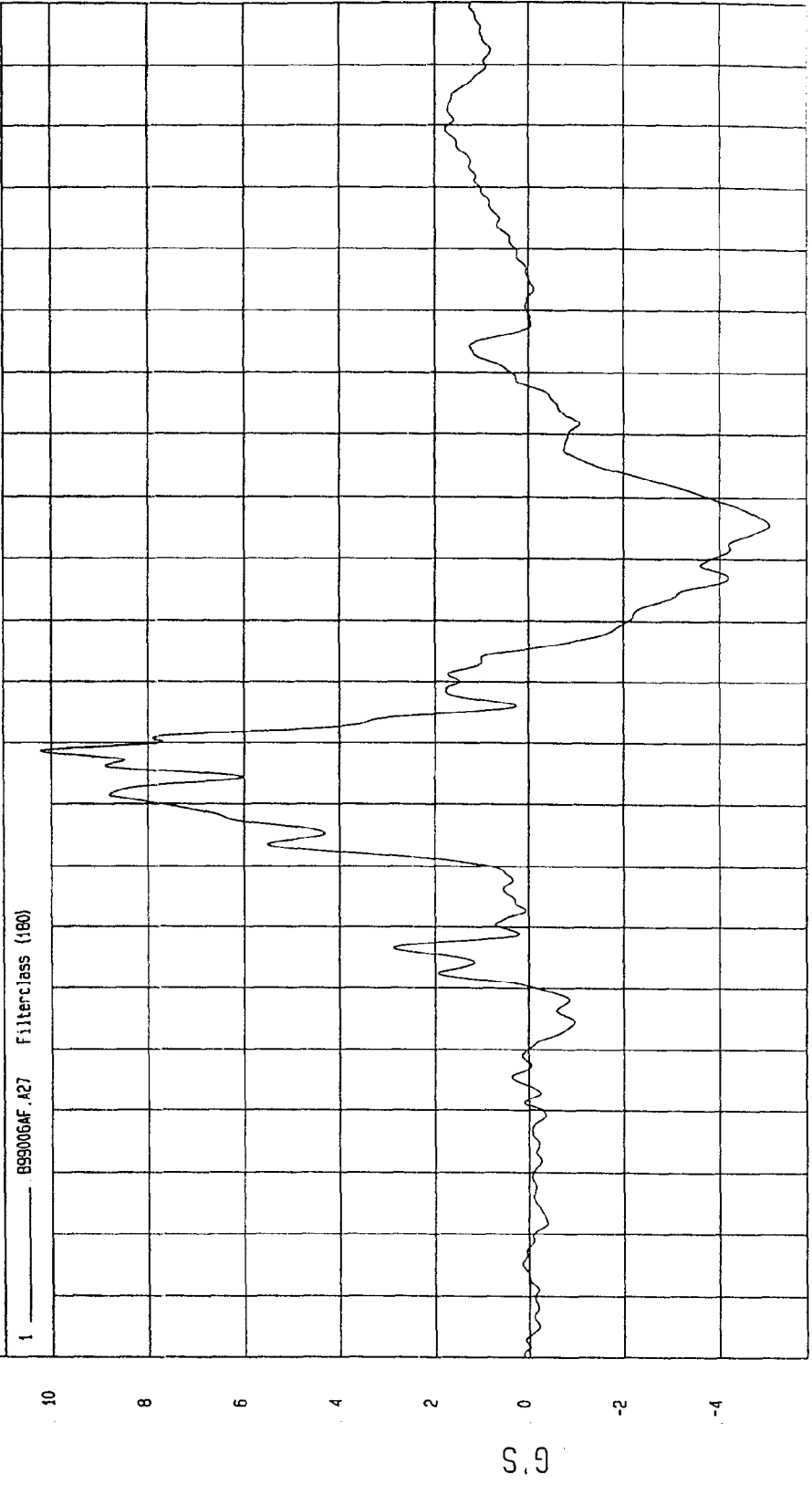
COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Speed: 35.06 MPH 56.4 KPH

Minimum = -5.06 G'S at 116 msec

Maximum = 10.22 G'S at 79 msec

PASSENGER CHEST Z ACCELERATION



TIME (SECONDS)

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

10 8 6 4 2 0 -2 -4

G.S

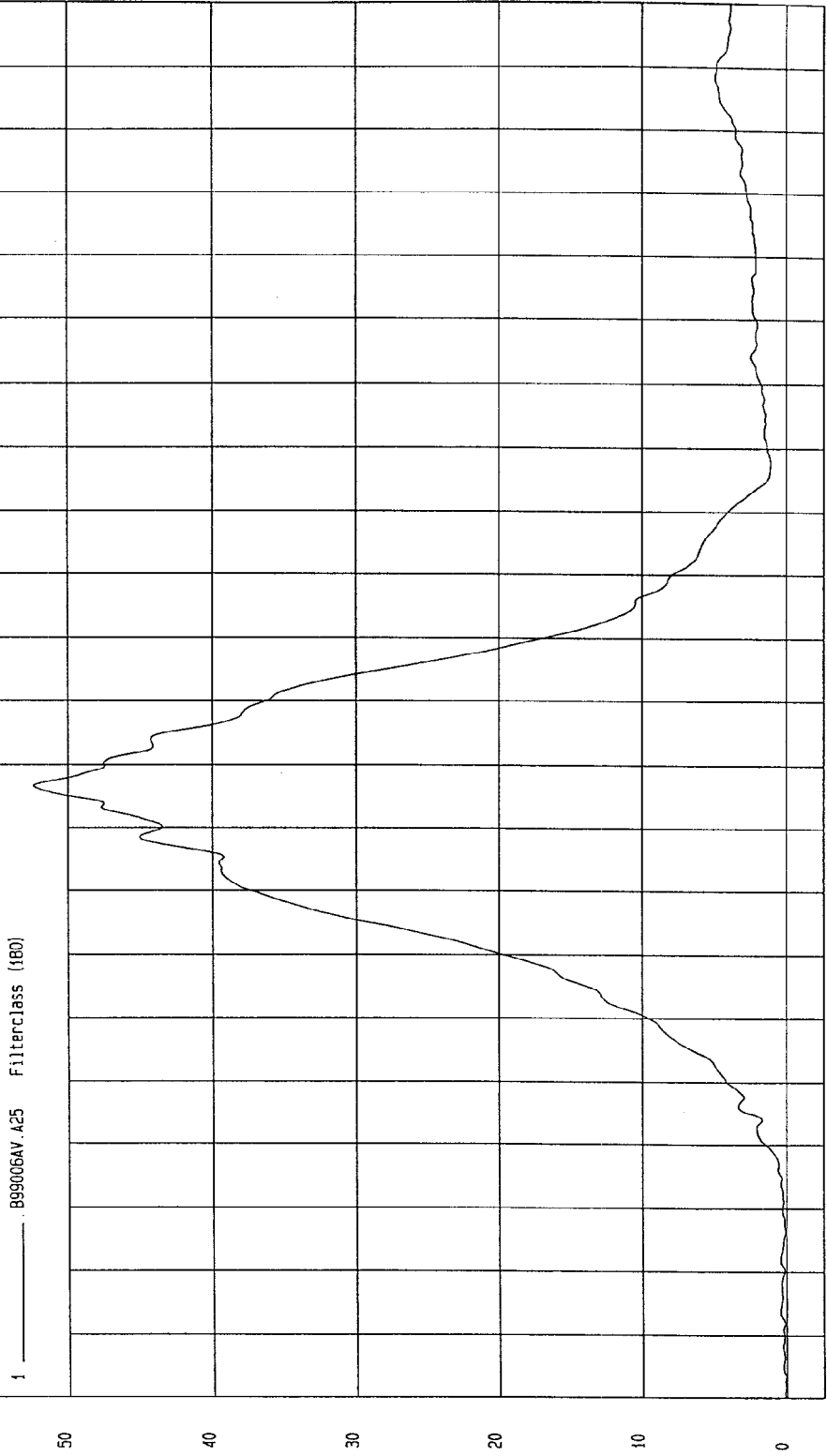
NCA Research
01-22-1999 16:14

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = 3.61E-02 G'S at -17 msec Maximum = 52.39 G'S at 77 msec

PASSENGER CHEST RESULTANT ACCELERATION



WCA Research
01-14-1999 10:05

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

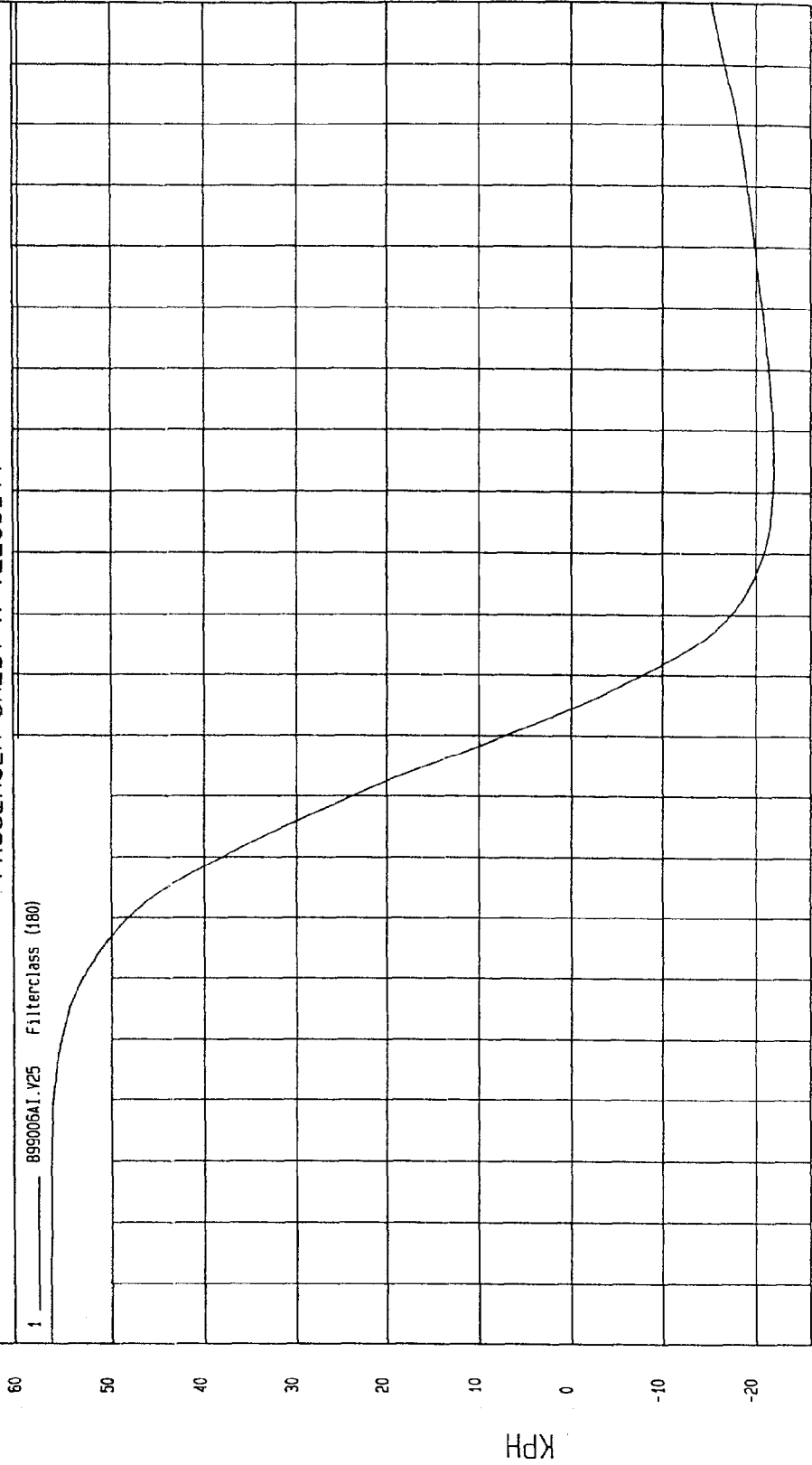
COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -21.9 KPH at 124 msec

Maximum = 56.61 KPH at -8 msec

PASSENGER CHEST X VELOCITY

1 ——— 899006A1.V25 Filterclass (180)



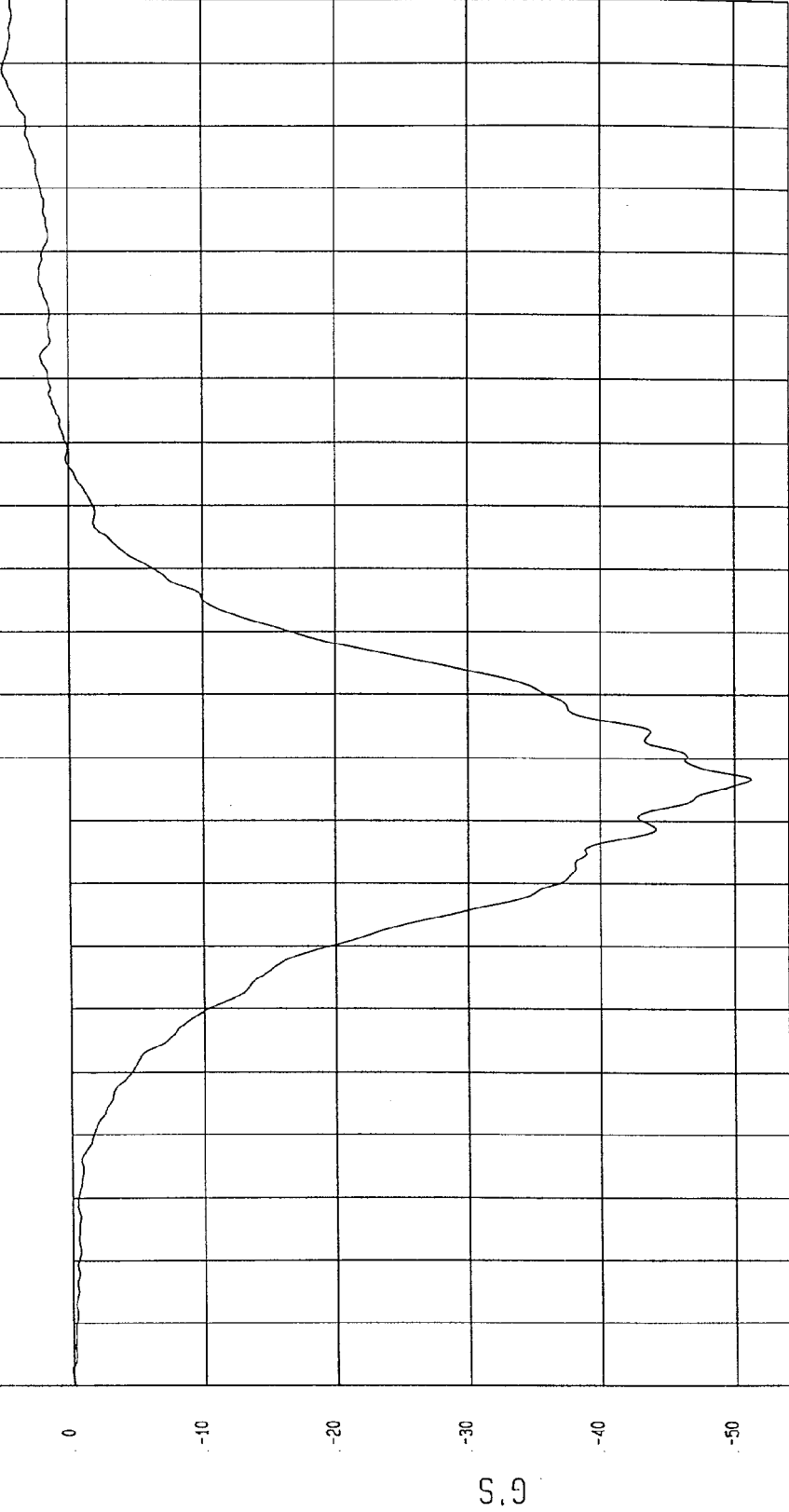
TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -51.28 G'S at 77 msec Maximum = 4.86 G'S at 189 msec

PASSENGER CHEST REDUNDANT X ACCELERATION

1 _____ B99005AF.A42 Filterclass (180)



TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

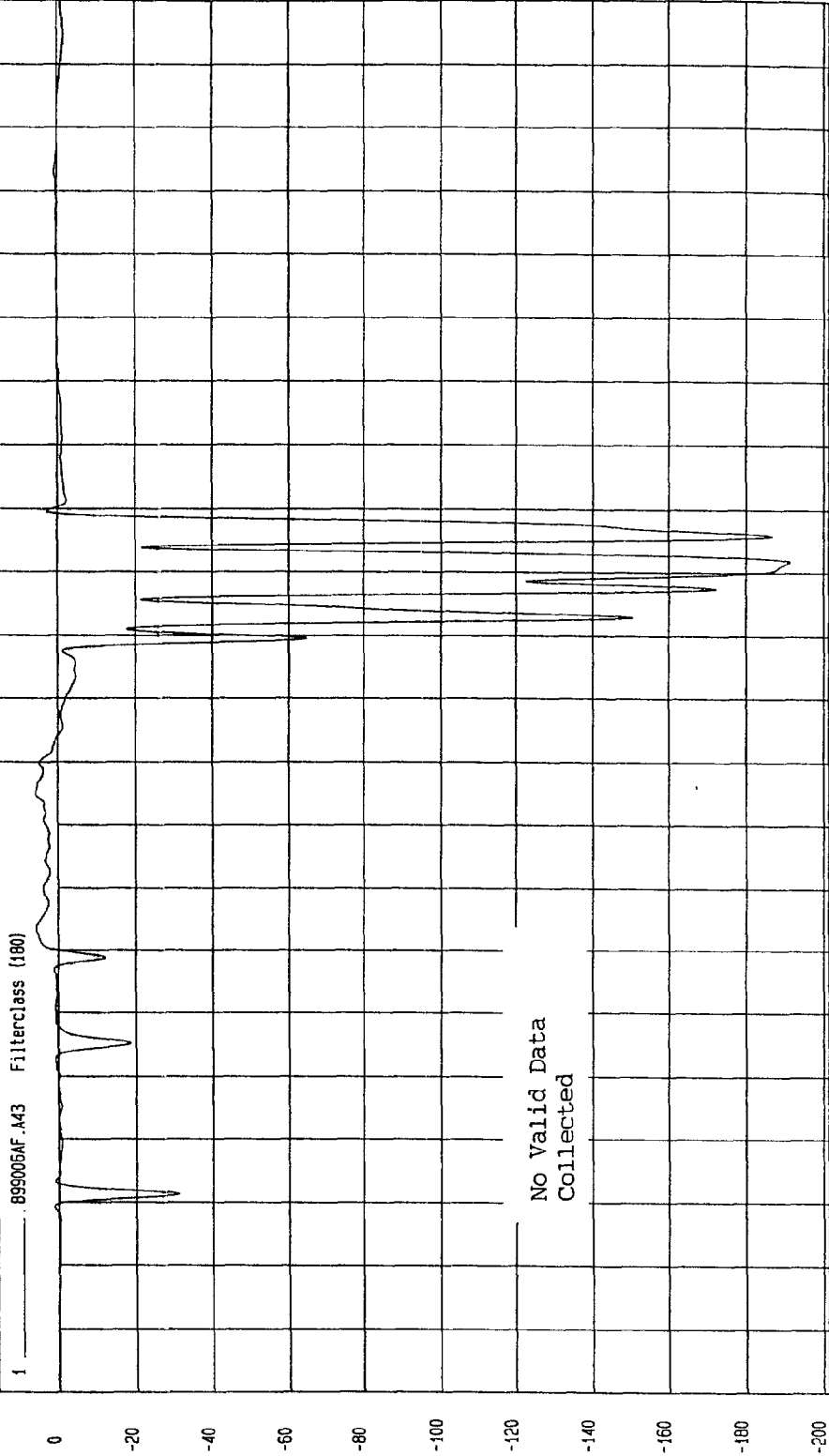
Speed: 35.06 MPH 56.4 KPH

COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = 5.9 G's at 75 msec

Minimum = -191.3 G's at 112 msec

PASSENGER CHEST REDUNDANT Y ACCELERATION



MCA Research
01-22-1999 16:15

TIME (SECONDS)

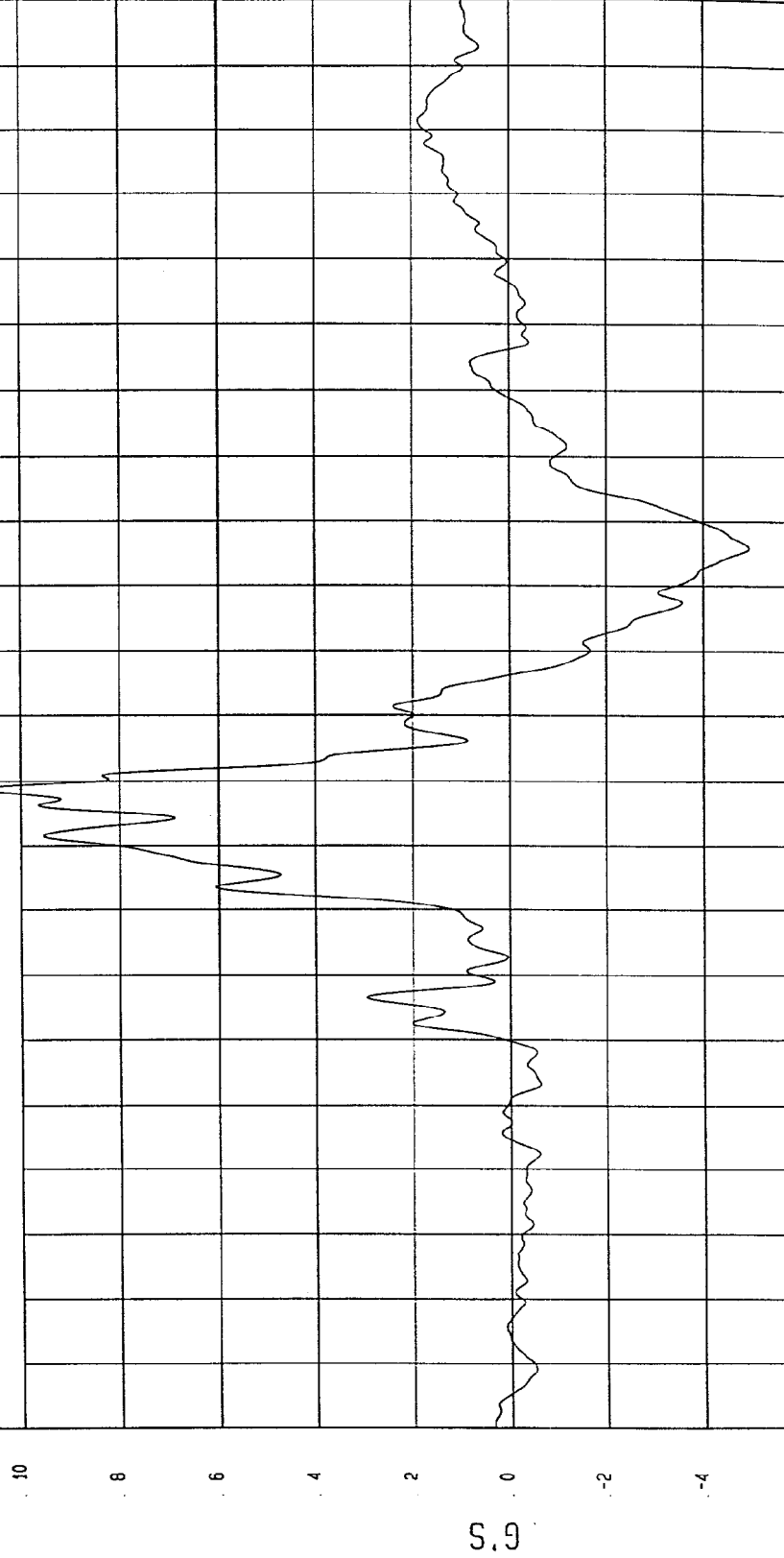
TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -4.93 G'S at 116 msec Maximum = 10.83 G'S at 79 msec

PASSENGER CHEST REDUNDANT Z ACCELERATION

1 _____ B99006AF.A44 Filterclass (180)



TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

Speed: 35.06 MPH 56.4 KPH

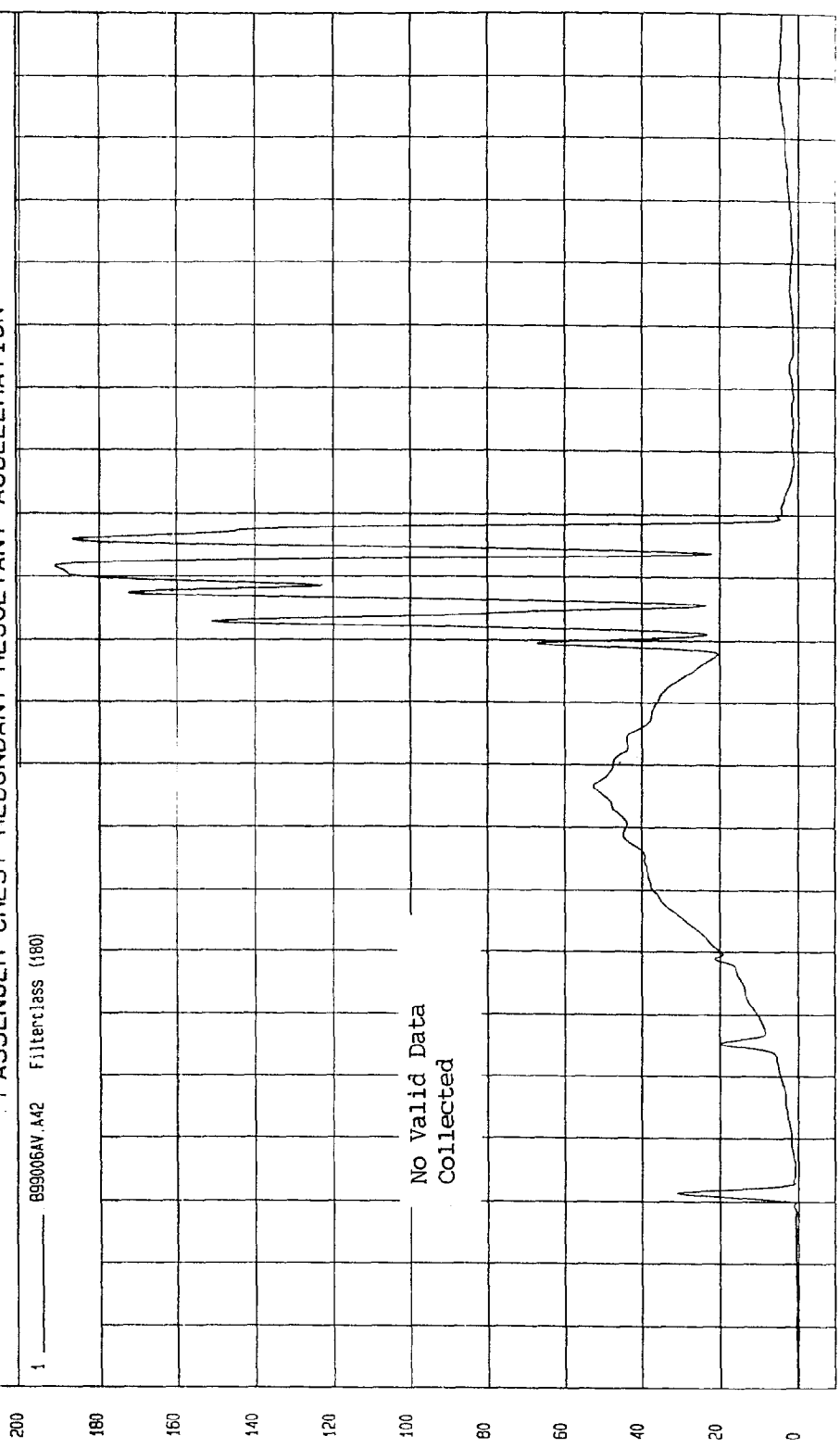
COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = 191.39 G'S at 112 msec

Minimum = .21 G'S at -14 msec

PASSENGER CHEST REDUNDANT RESULTANT ACCELERATION

1 B99006AV.A42 Filterclass (180)

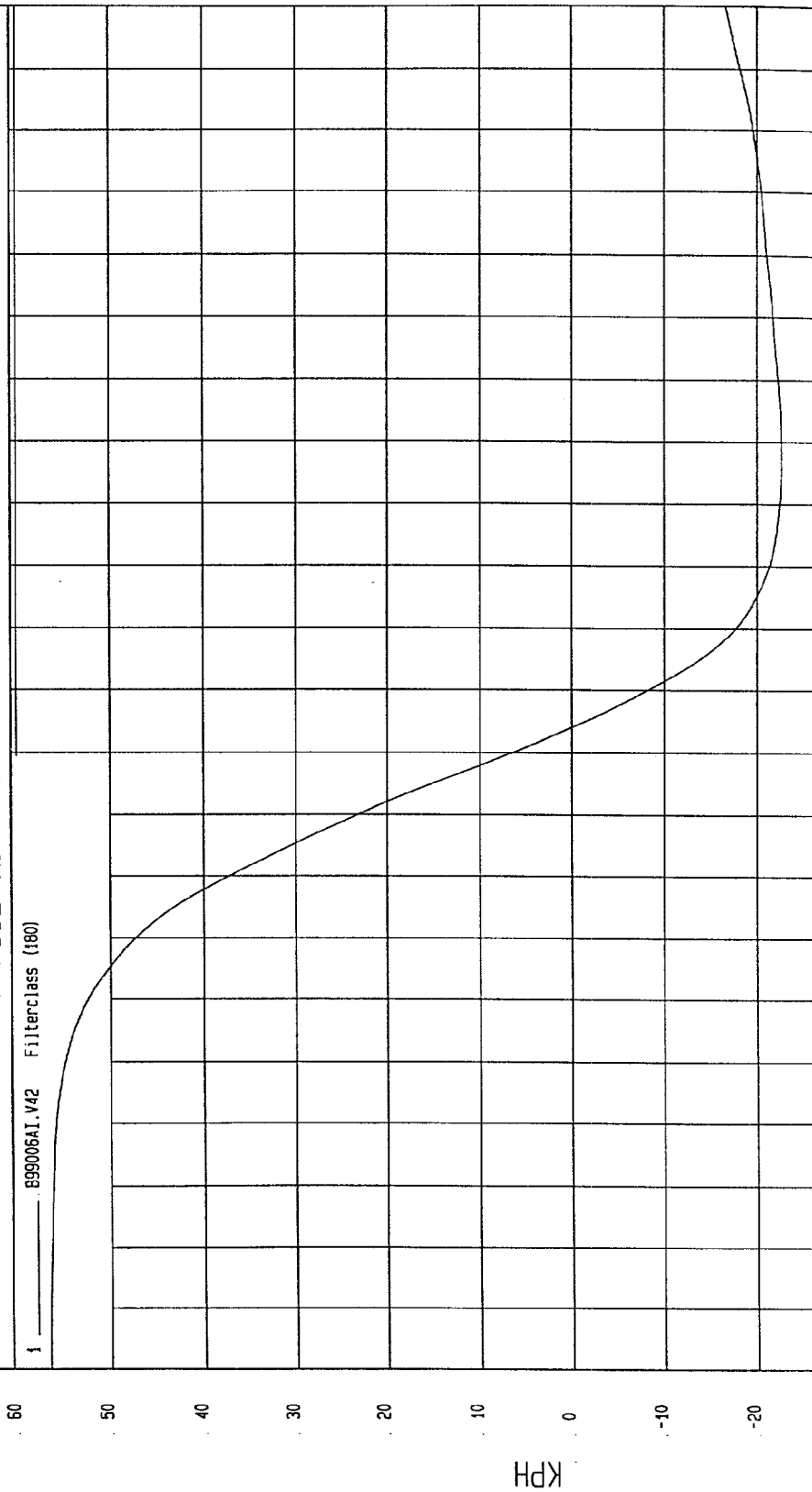


TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -22.68 KPH at 126 msec Maximum = 56.6 KPH at -17 msec

PASSENGER CHEST REDUNDANT X VELOCITY



TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

Speed: 35.06 MPH 56.4 KPH

COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = .14 MM at 11 msec

Minimum = -34.72 MM at 78 msec

PASSENGER CHEST COMPRESSION

1 ——— 8990060F.D59 Filterclass (60)

MM

TIME SECONDS

NGA Research
01-14-1999 10:05

TIME SECONDS

TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200)

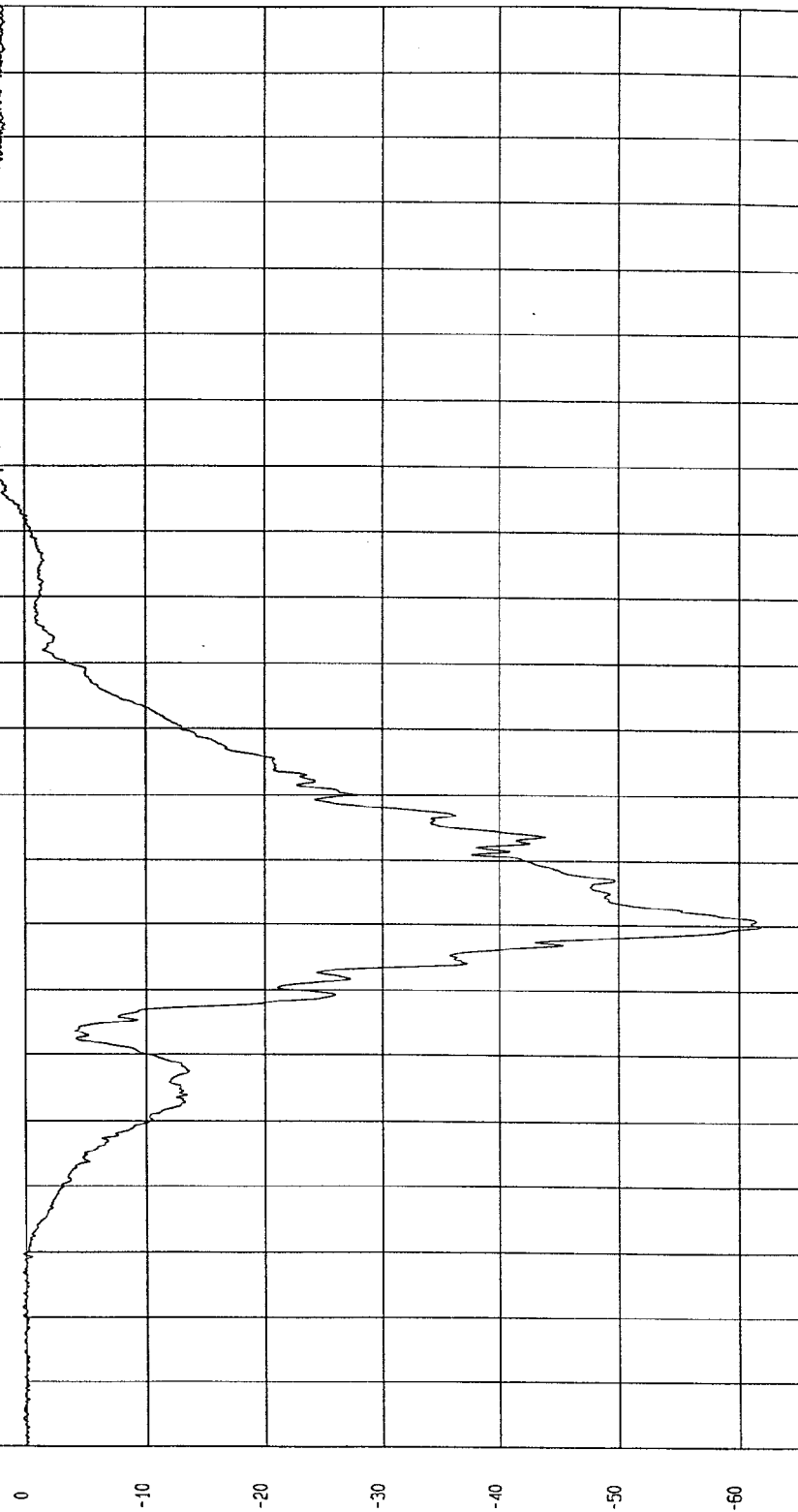
Speed: 35.06 MPH 56.4 KPH

Minimum = -61.83 G'S at 50 msec

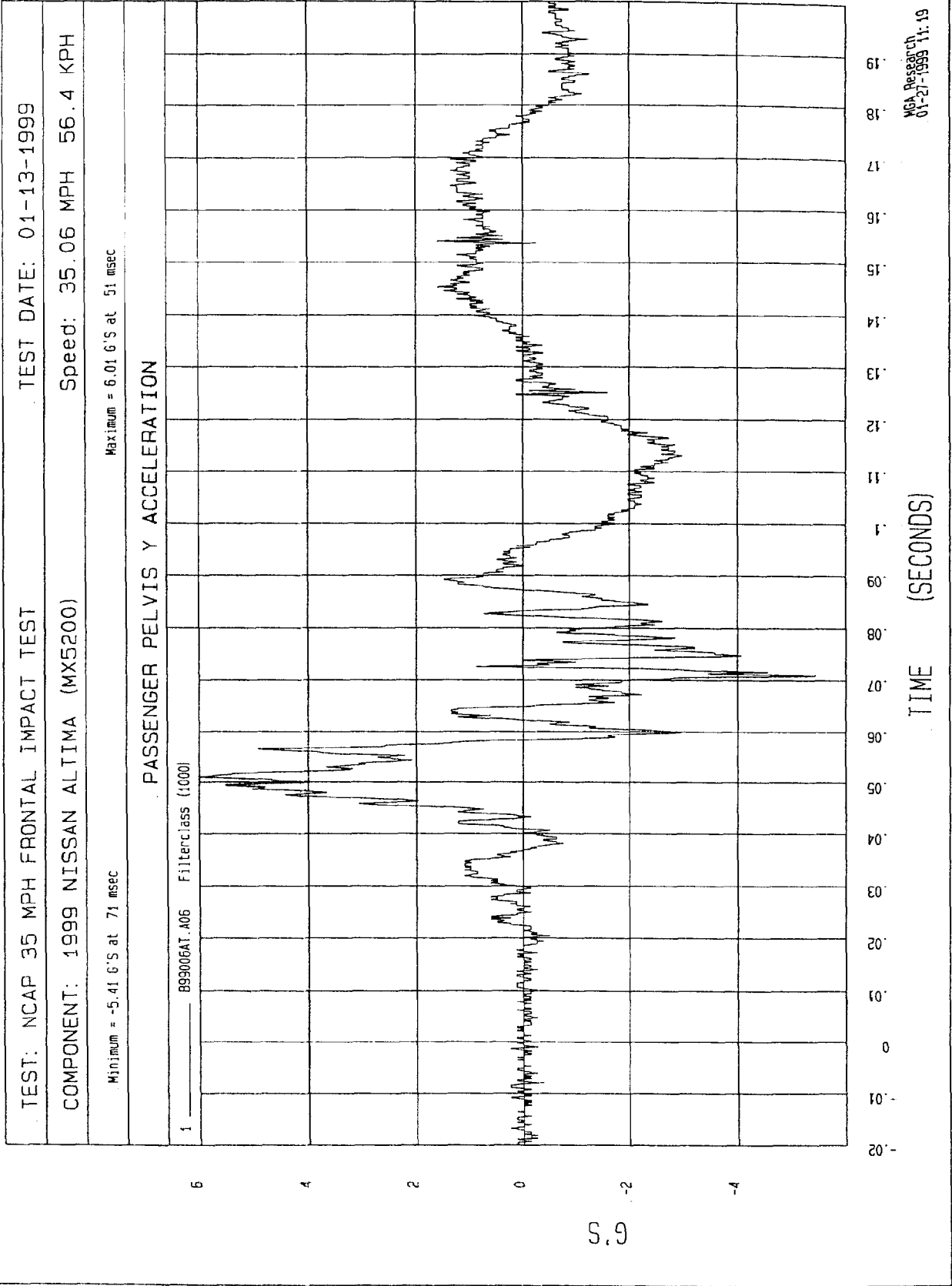
Maximum = 3.35 G'S at 144 msec

PASSENGER PELVIS X ACCELERATION

1 _____ 899005AT.A05 Filterclass (1000)

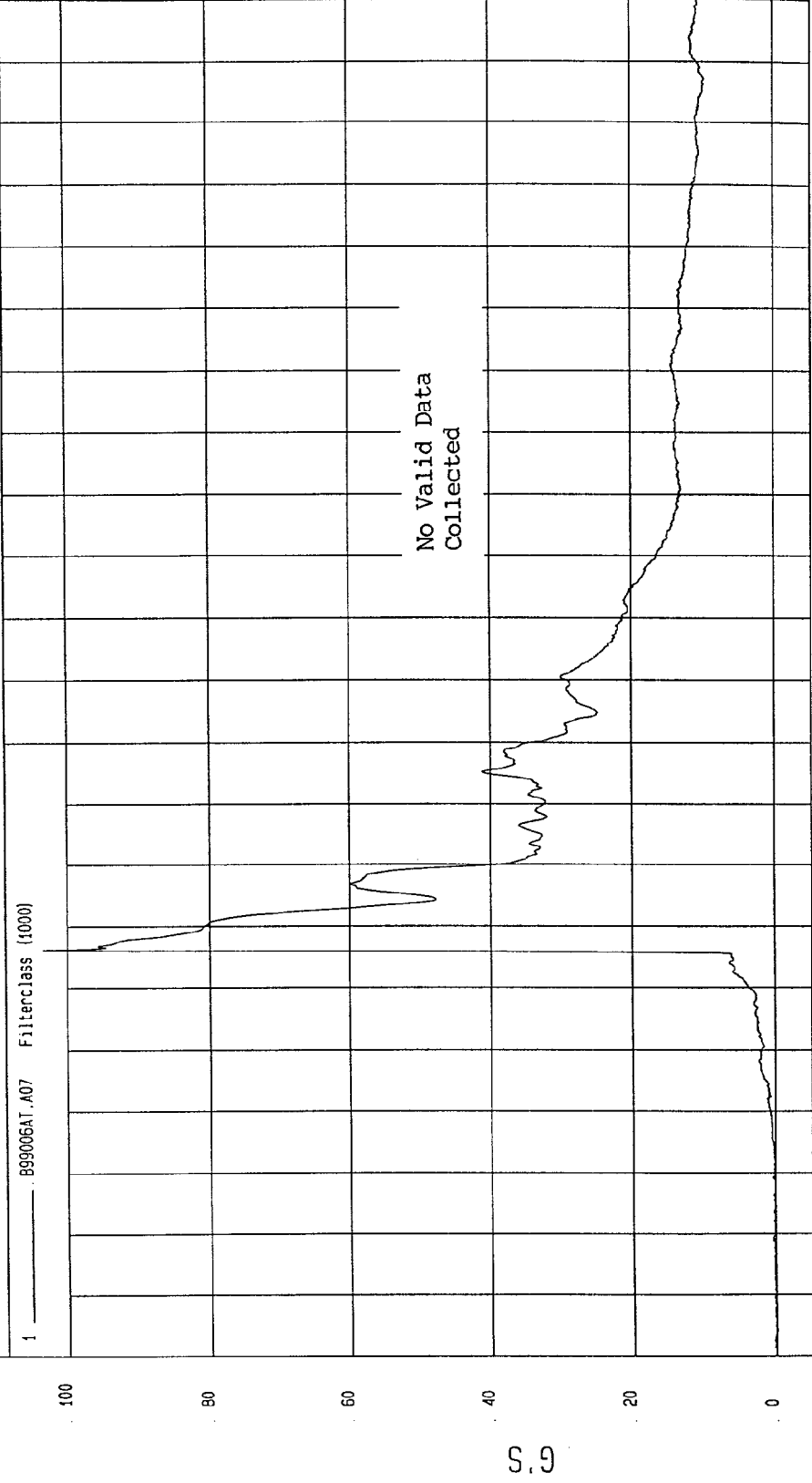
MCA Research
01-14-1999 10:39

TIME (SECONDS)



TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999
COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH
Minimum = -.13 G'S at -16 msec Maximum = 103.4 G'S at 46 msec

PASSENGER PELVIS Z ACCELERATION



TIME (SECONDS)

NGA Research
01-27-1999 11:19

TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

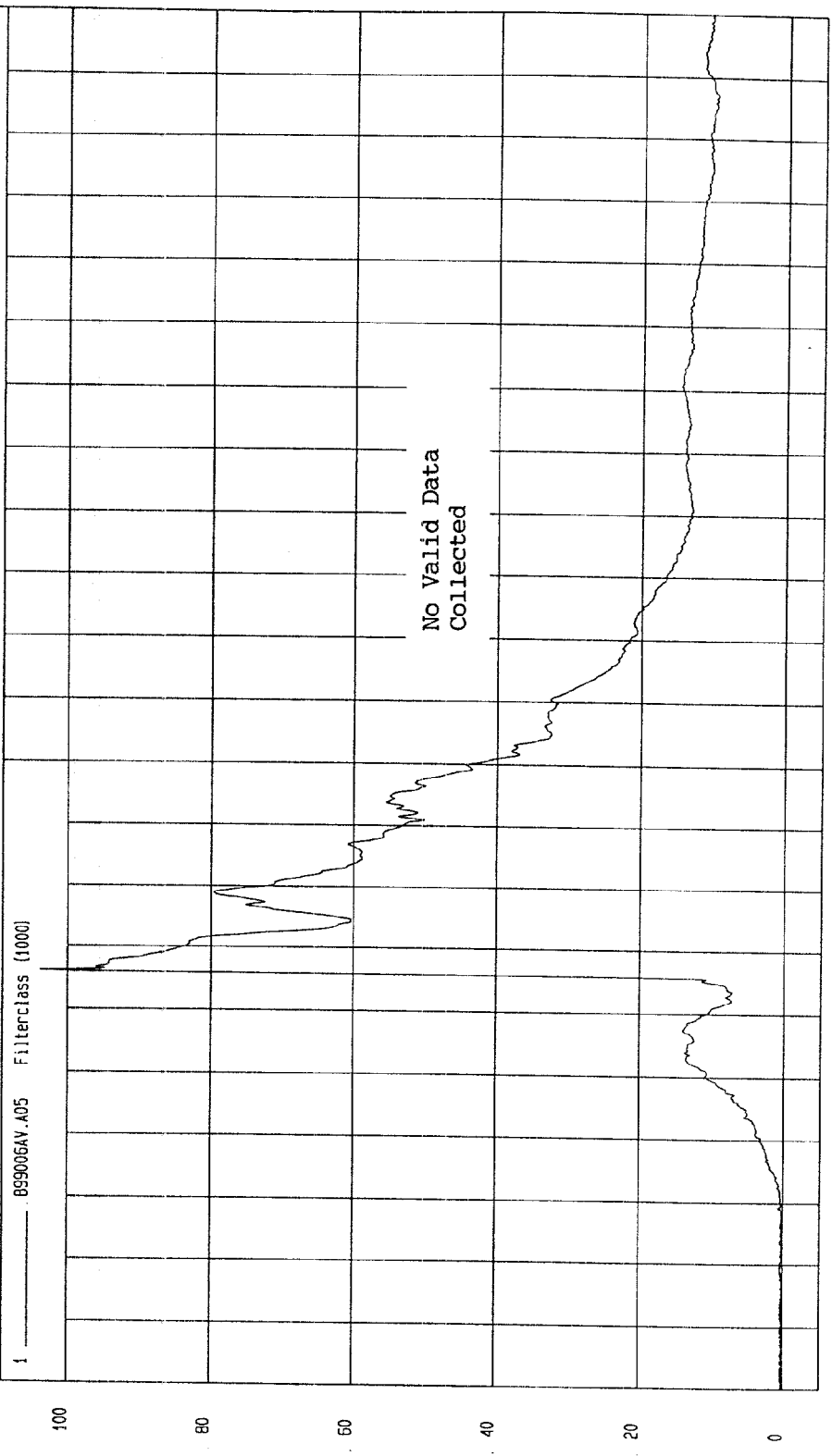
Speed: 35.06 MPH 56.4 KPH

COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = 103.77 G'S at 46 msec

Minimum = 1.50E-02 G'S at -16 msec

PASSENGER PELVIS RESULTANT ACCELERATION



TIME (SECONDS)

MCA Research
01-27-1999 11:19

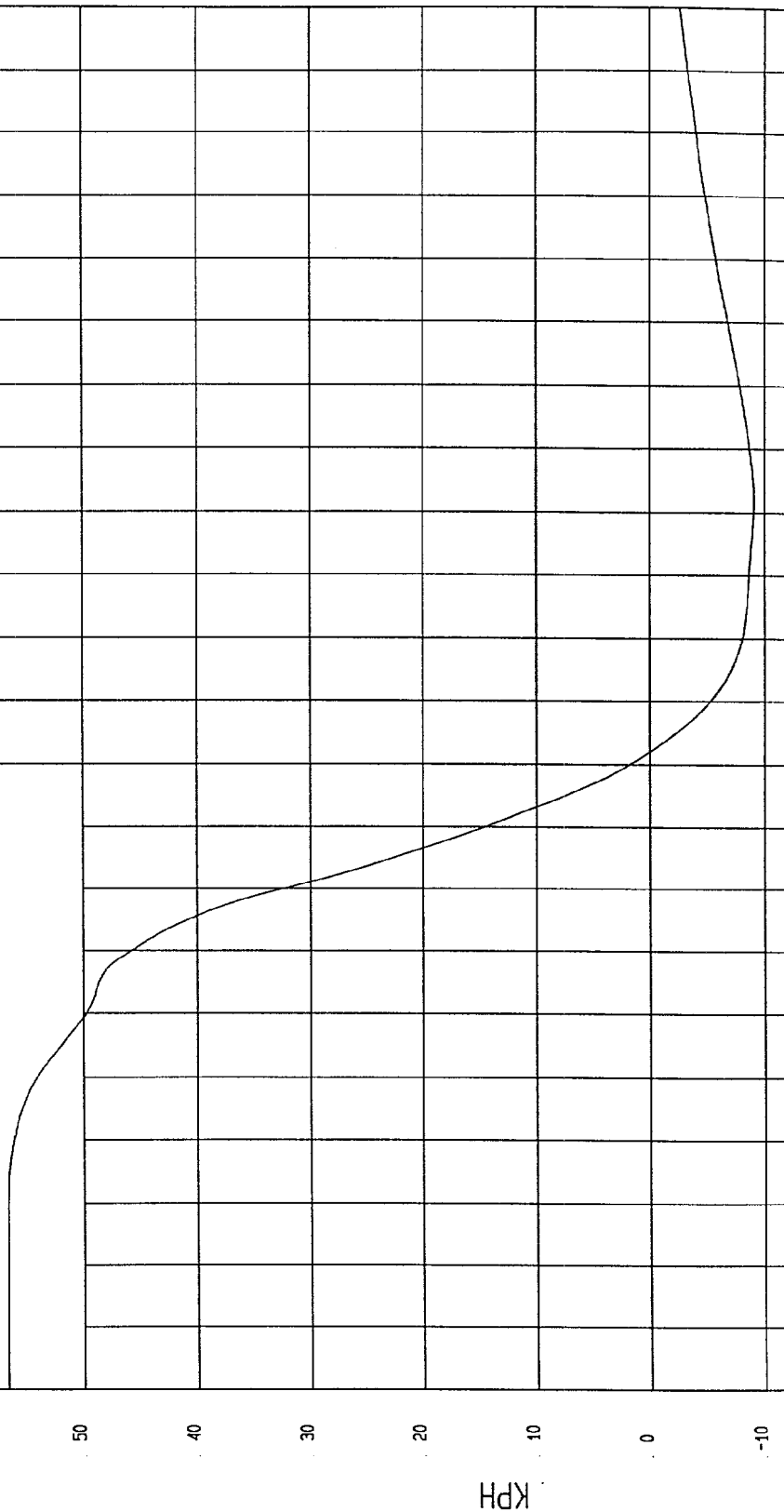
TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

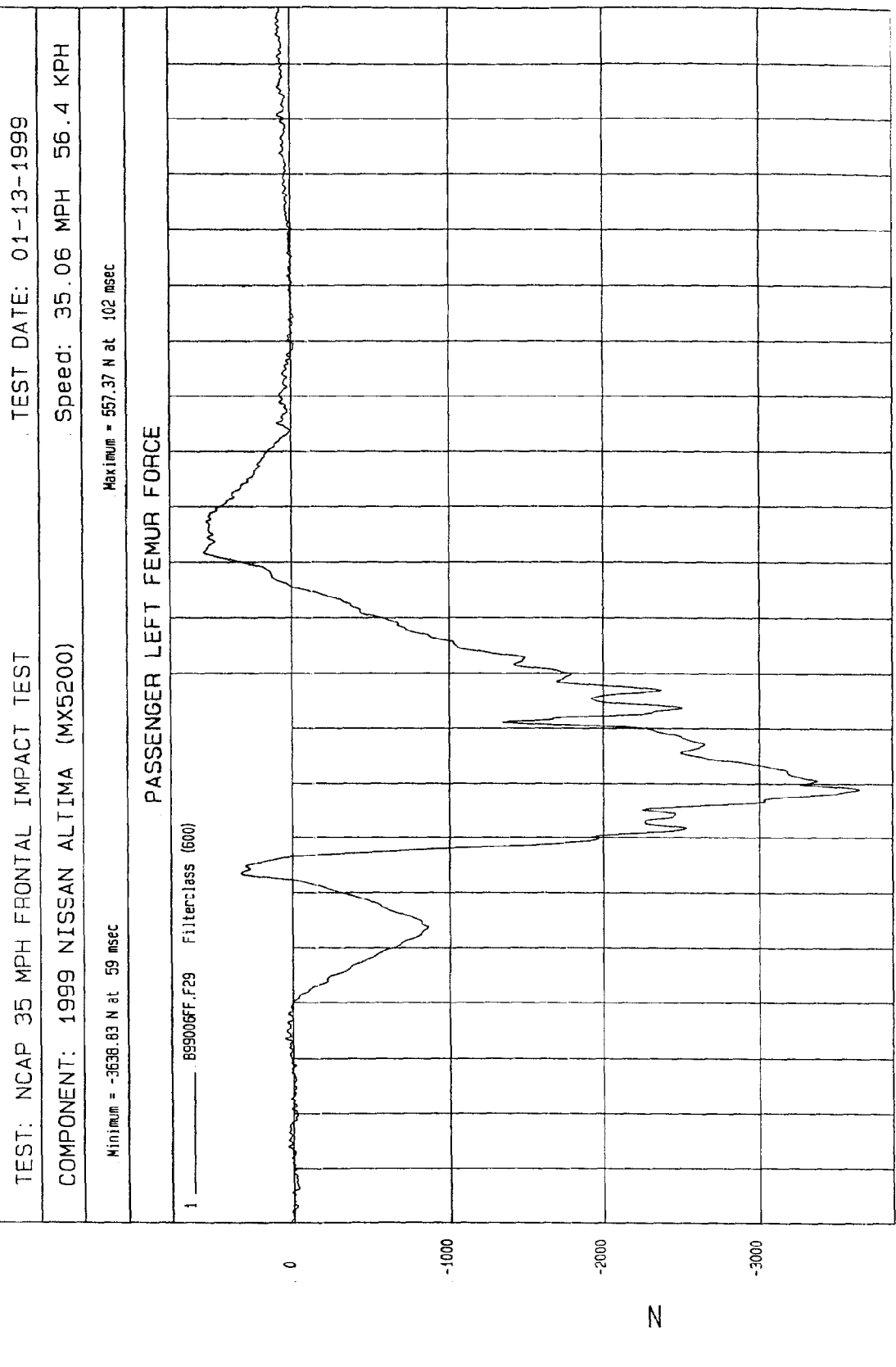
COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -9.05 KPH at .122 msec Maximum = 56.61 KPH at -.12 msec

PASSENGER PELVIS X VELOCITY

1 _____ B99006A1.V05 Filterclass (180)





MCA Research
01-14-1999 10:05

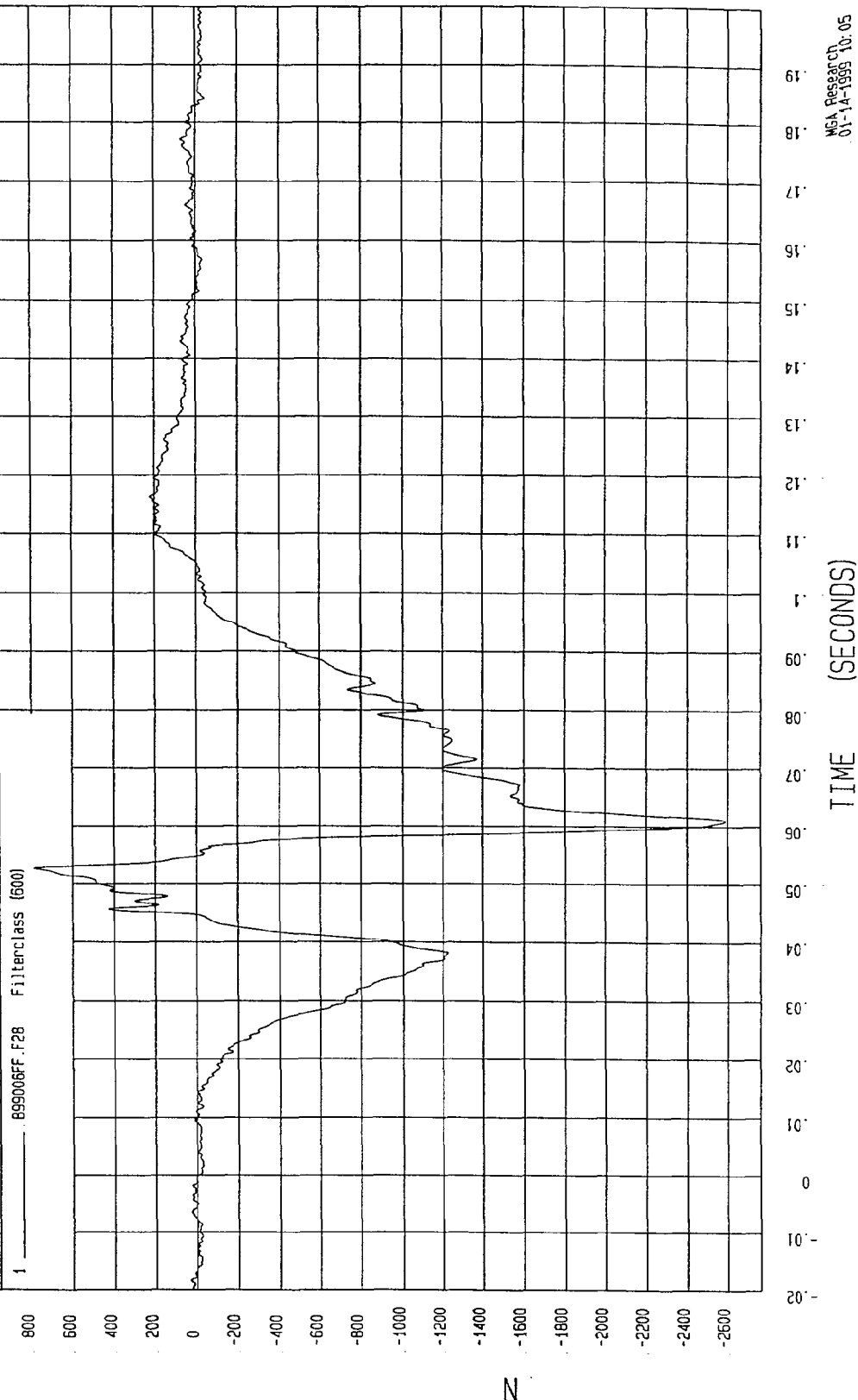
TIME (SECONDS)

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -2587.89 N at 61 msec Maximum = 786.32 N at 53 msec

PASSENGER RIGHT FEMUR FORCE



TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

SPEED: 35.06 MPH 56.4 KPH

COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Minimum = -42.07 NM at 44 msec

Maximum = 86.18 NM at 58 msec

PASSENGER LEFT UPPER TIBIA MOMENT X

1 B99006MF.N94 Filterclass (600)



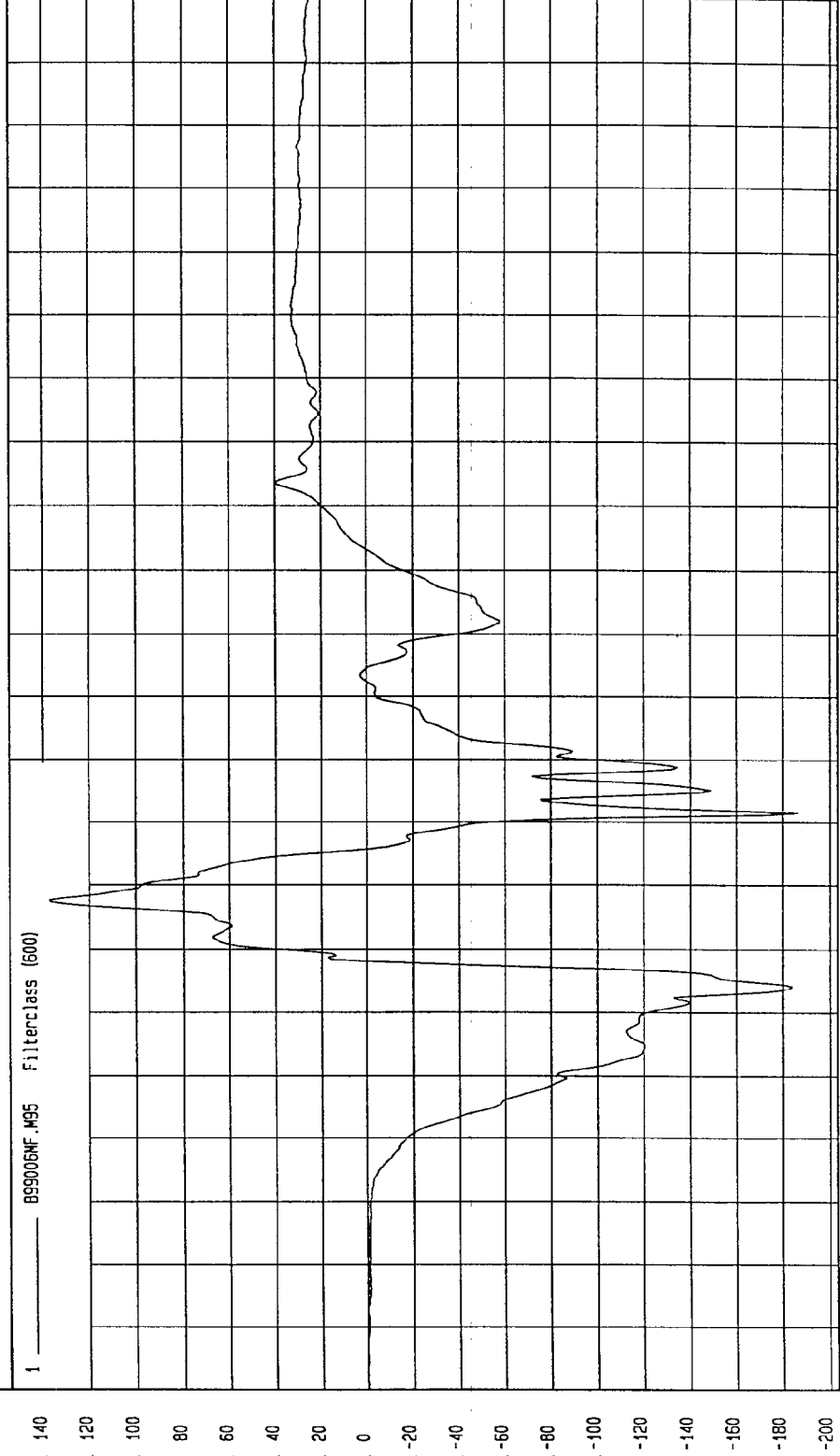
MGA Research
03-10-1999 12:20

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -187.09 NM at 71 msec Maximum = 137.82 NM at 59 msec

PASSENGER LEFT UPPER TIBIA MOMENT Y



MCA Research
03-10-1999 12:20

TIME (SECONDS)

NM

TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

Speed: 35.06 MPH 56.4 KPH

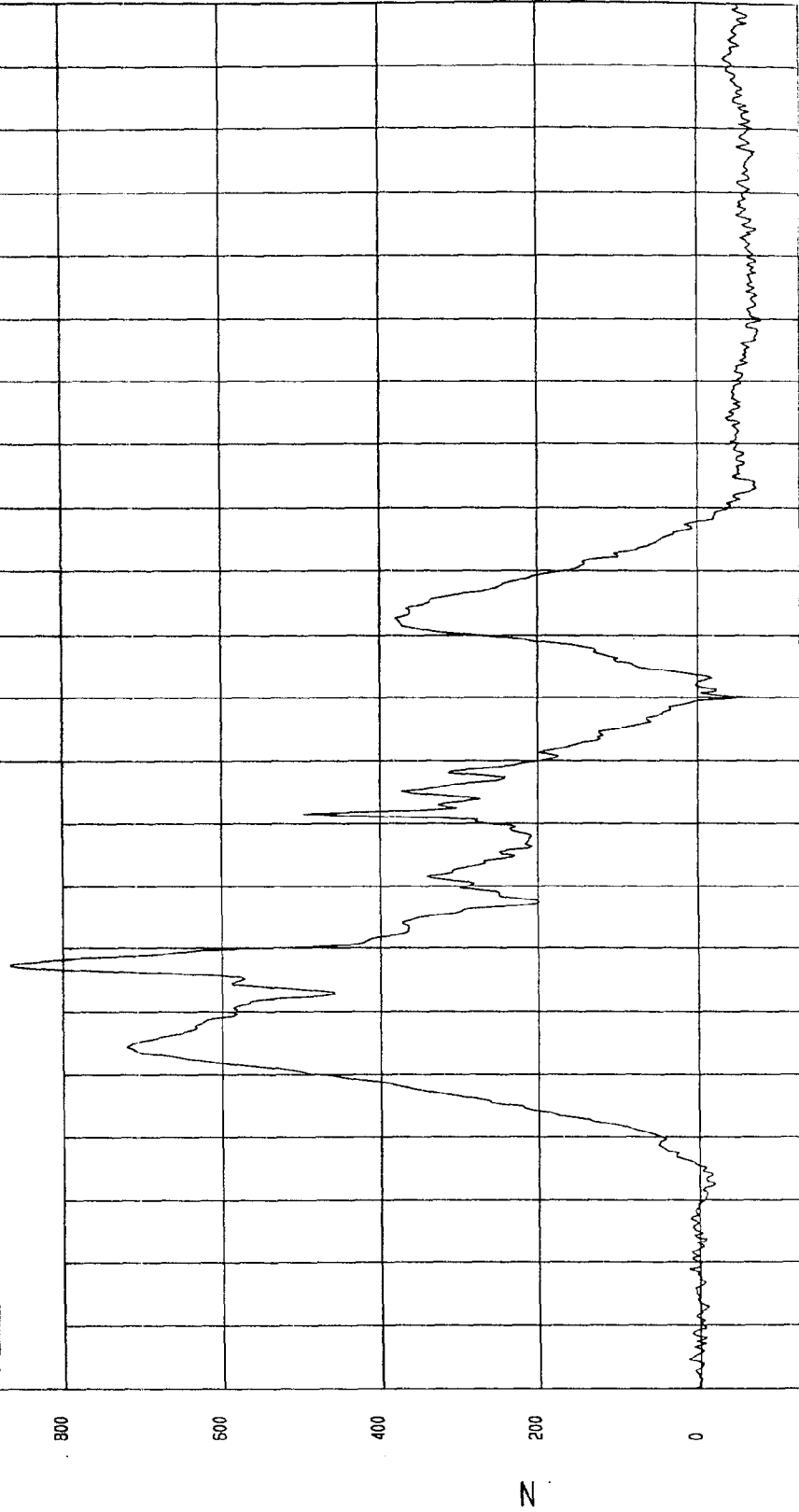
COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = 868.32 N at 47 msec

Minimum = -80.79 N at 150 msec

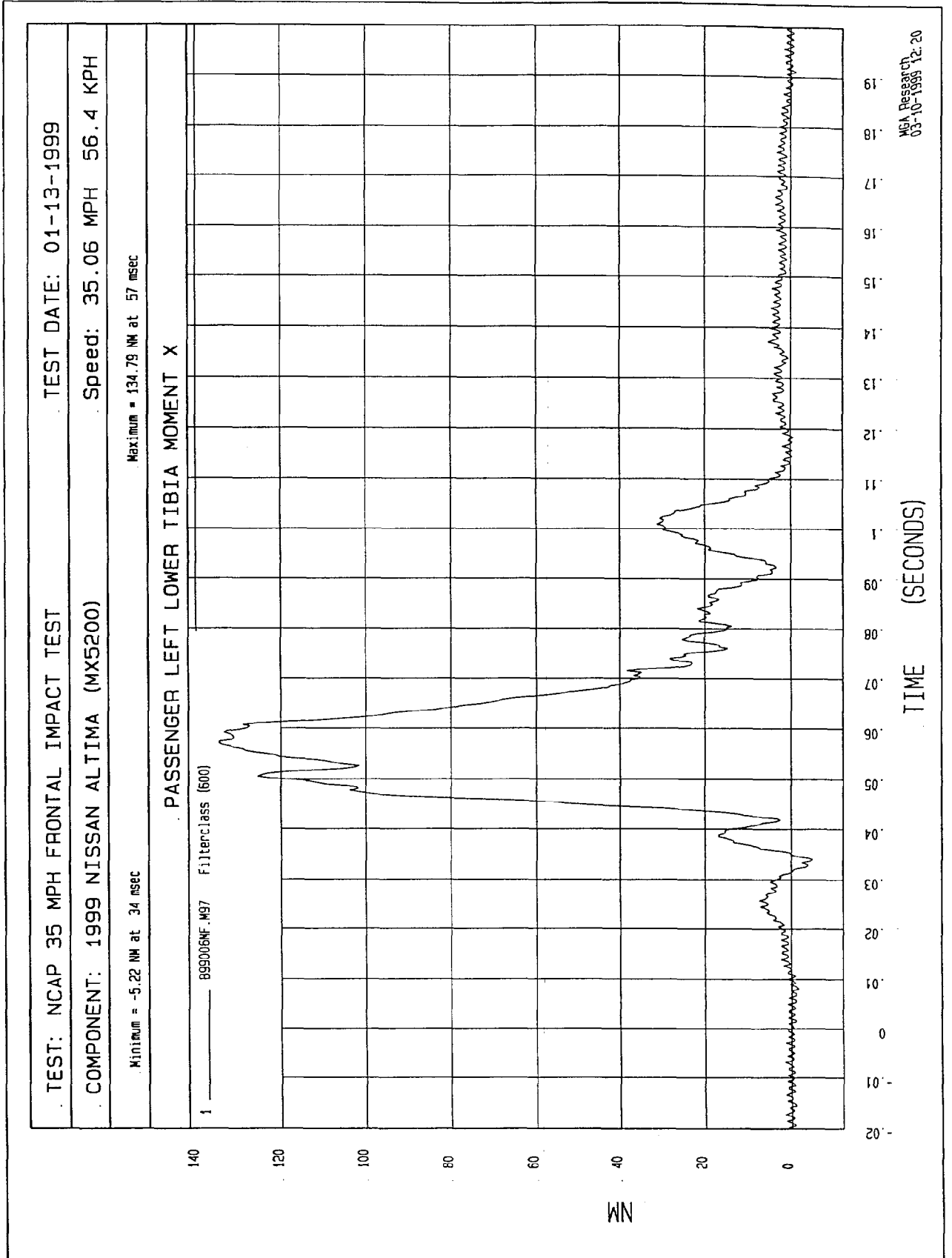
PASSENGER LEFT UPPER TIBIA FORCE Z

1 ——— B99006FF.F96 Filterclass (600)



TIME (SECONDS)

MCA Research
03-10-1999 12:20



TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

SPEED: 35.06 MPH 56.4 KPH

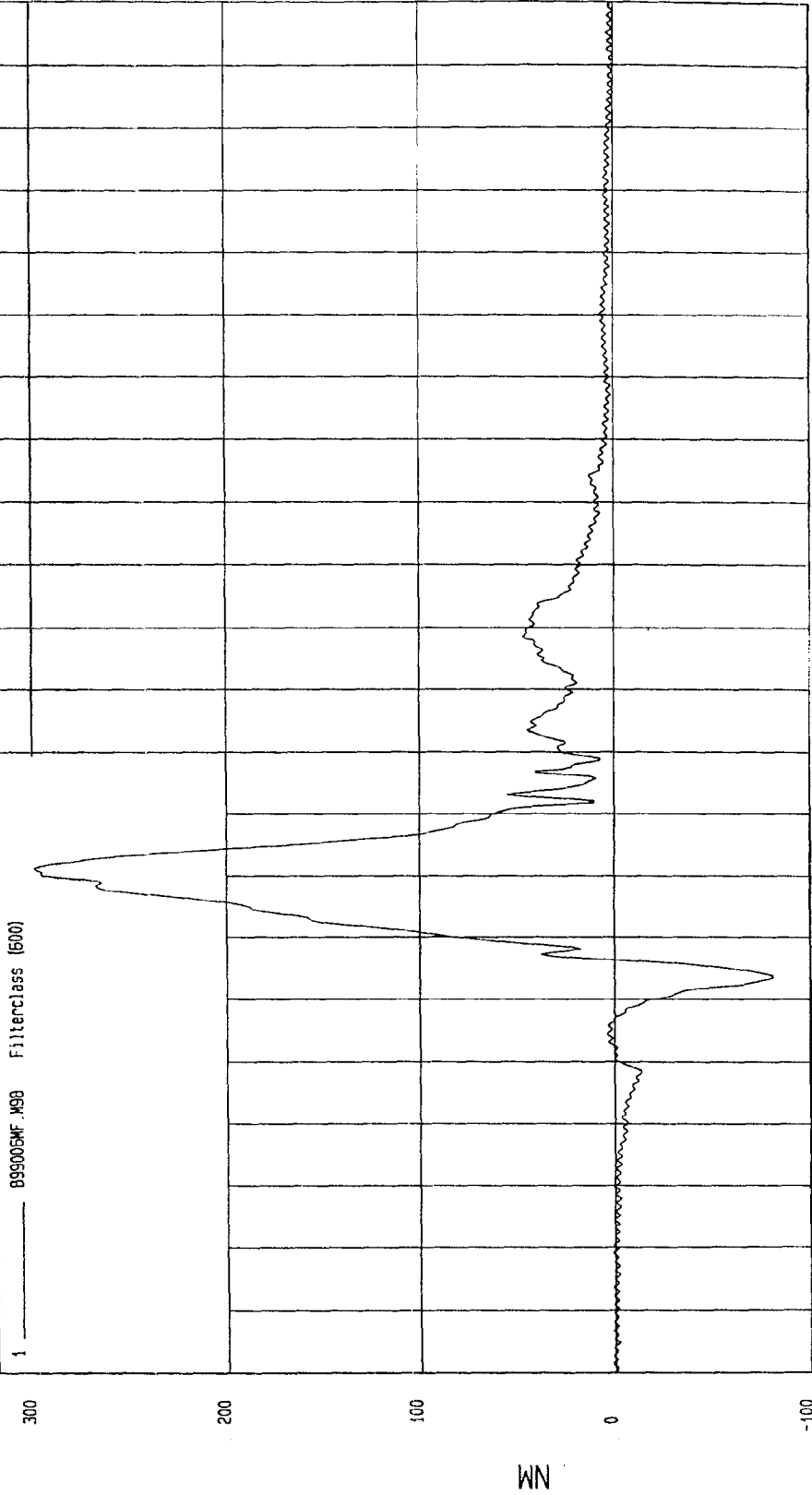
COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = 299.21 NM at 61 msec

Minimum = -81.5 NM at 44 msec

PASSENGER LEFT LOWER TIBIA MOMENT Y

1 895005MF.M98 Filterclass (500)



TIME (SECONDS)

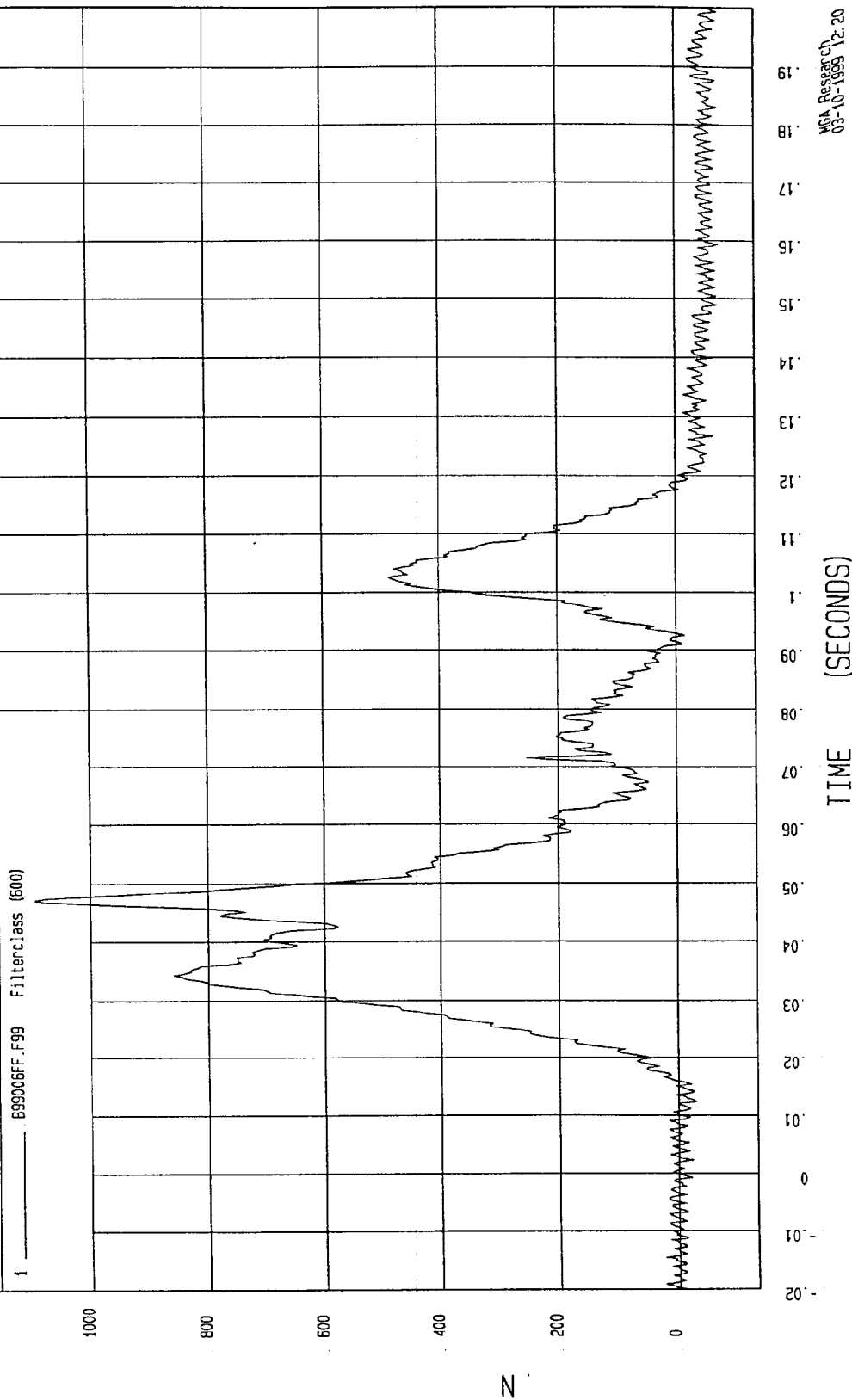
WCA Research
03-10-1999 12:20

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -77.83 N at 159 msec Maximum = 1097.15 N at 47 msec

PASSENGER LEFT LOWER TIBIA FORCE Z



TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

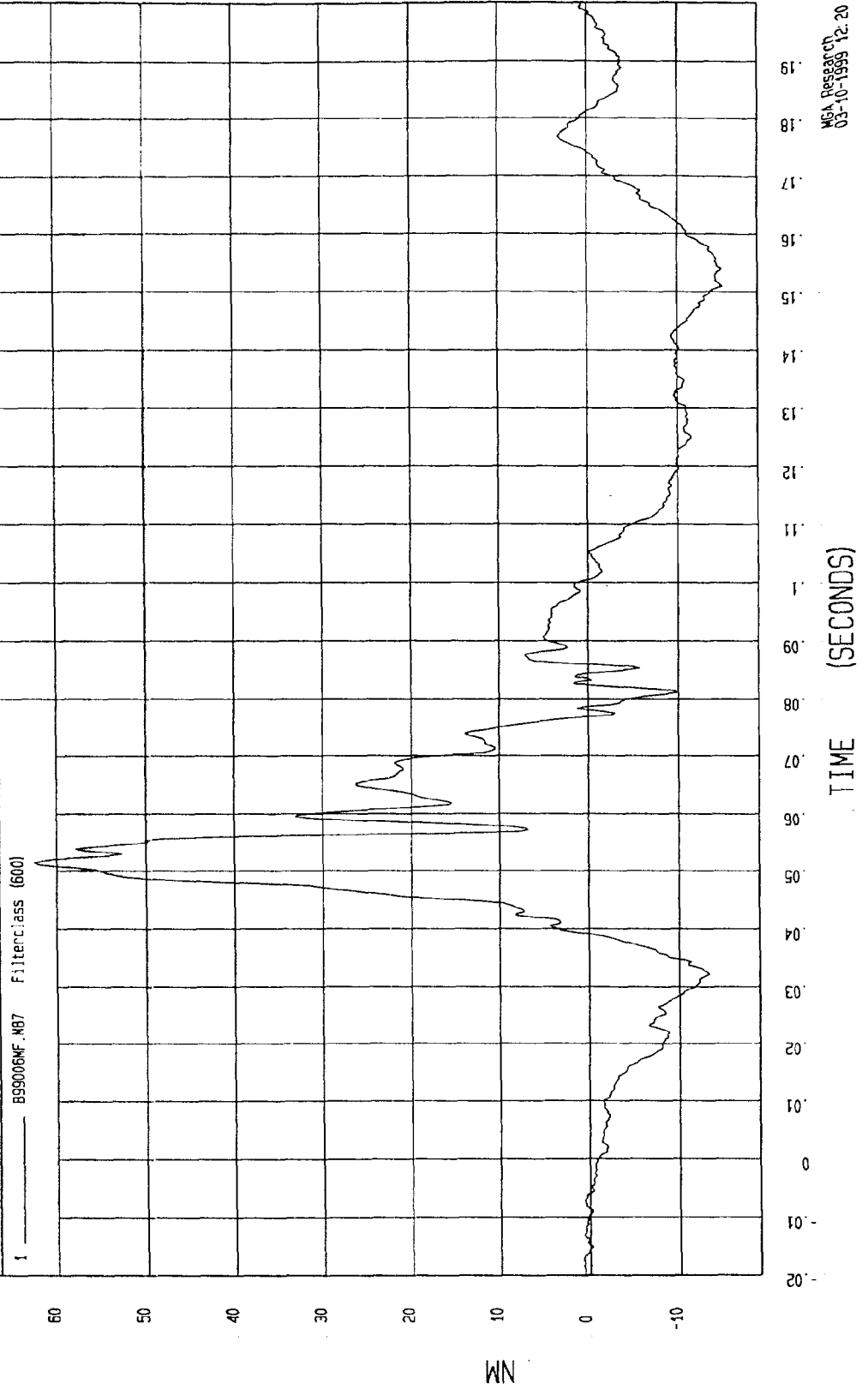
Speed: 35.06 MPH 56.4 KPH

COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = 62.40 NM at 51 msec

Minimum = -15.04 NM at 151 msec

PASSENGER RIGHT UPPER TIBIA MOMENT X

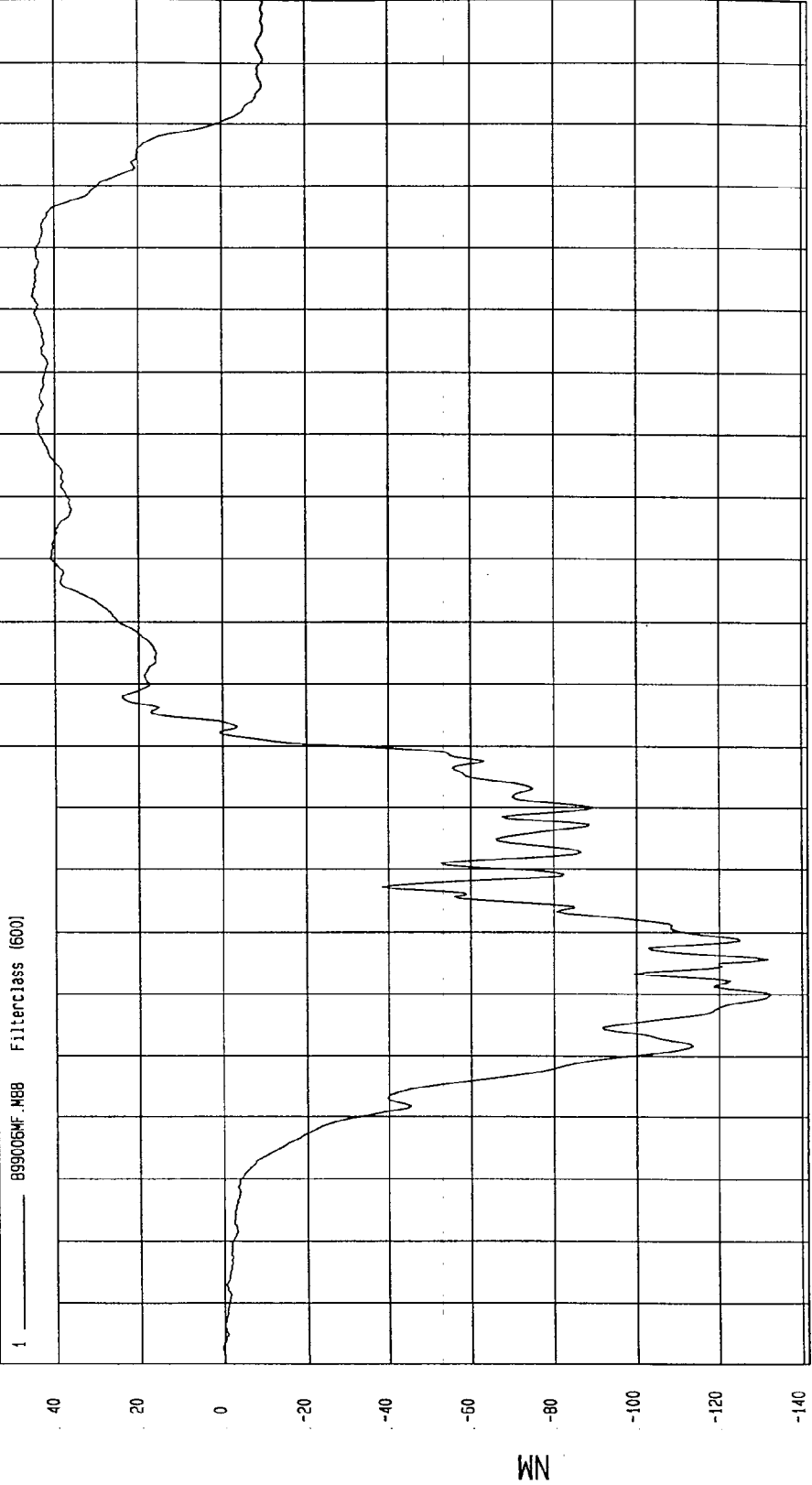


TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -132.55 NM at 40 msec Maximum = 45.33 NM at 152 msec

PASSENGER RIGHT UPPER TIBIA MOMENT Y



TIME (SECONDS)

MCA Research
05-10-1999 12:20

TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

Speed: 35.06 MPH 56.4 KPH

COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = 983.47 N at 38 msec

Minimum = -51.05 N at 150 msec

PASSENGER RIGHT UPPER TIBIA FORCE Z

1 899006FF.FB9 Filterclass (600)

1000

800

600

400

200

0

N

19

18

17

16

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

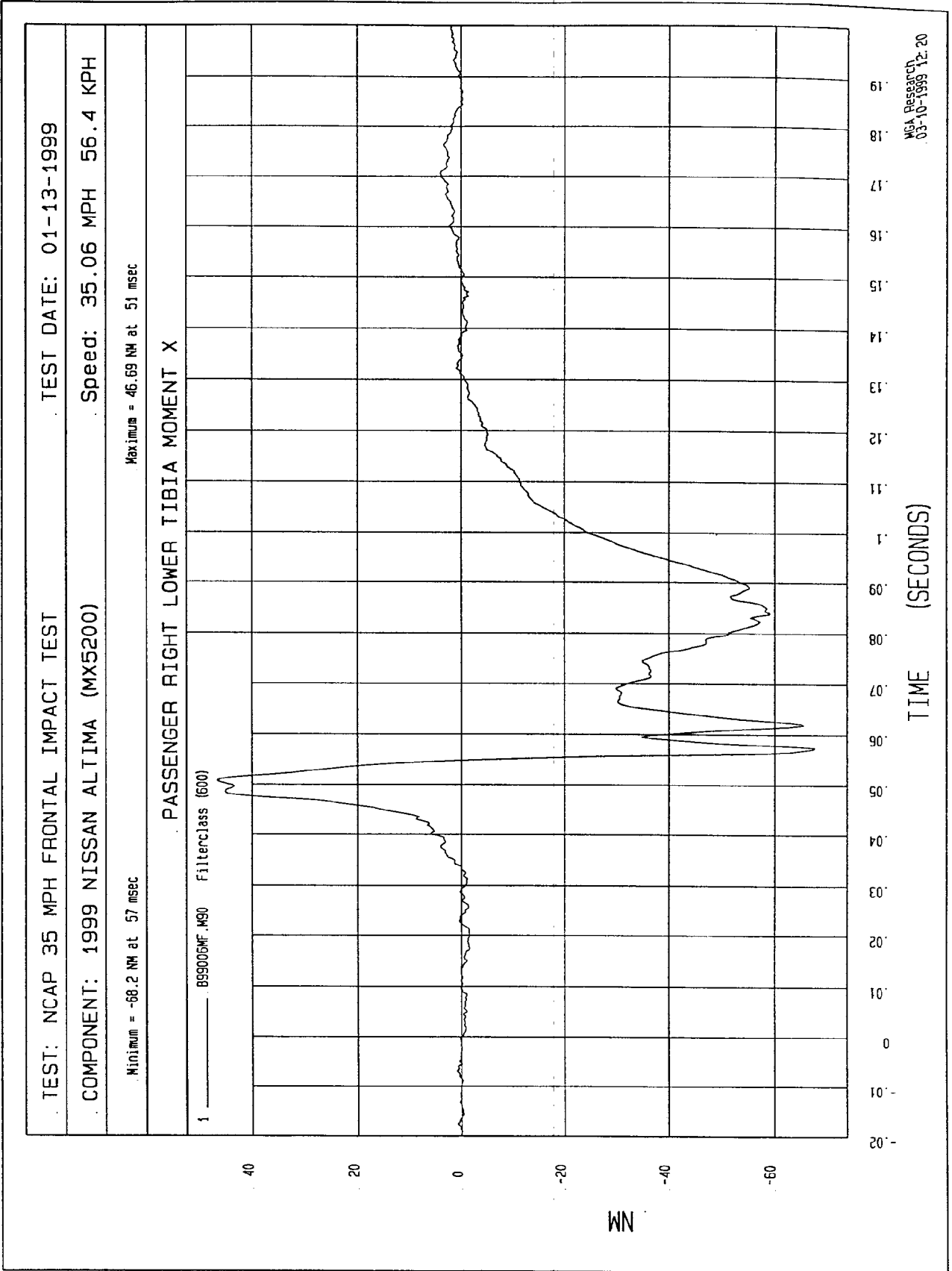
00

-01

-02

TIME (SECONDS)

MCA Research
03-10-1999 12:20



TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

SPEED: 35.06 MPH 56.4 KPH

COMPONENT: 1999 NISSAN ALTIMA (MX5200)

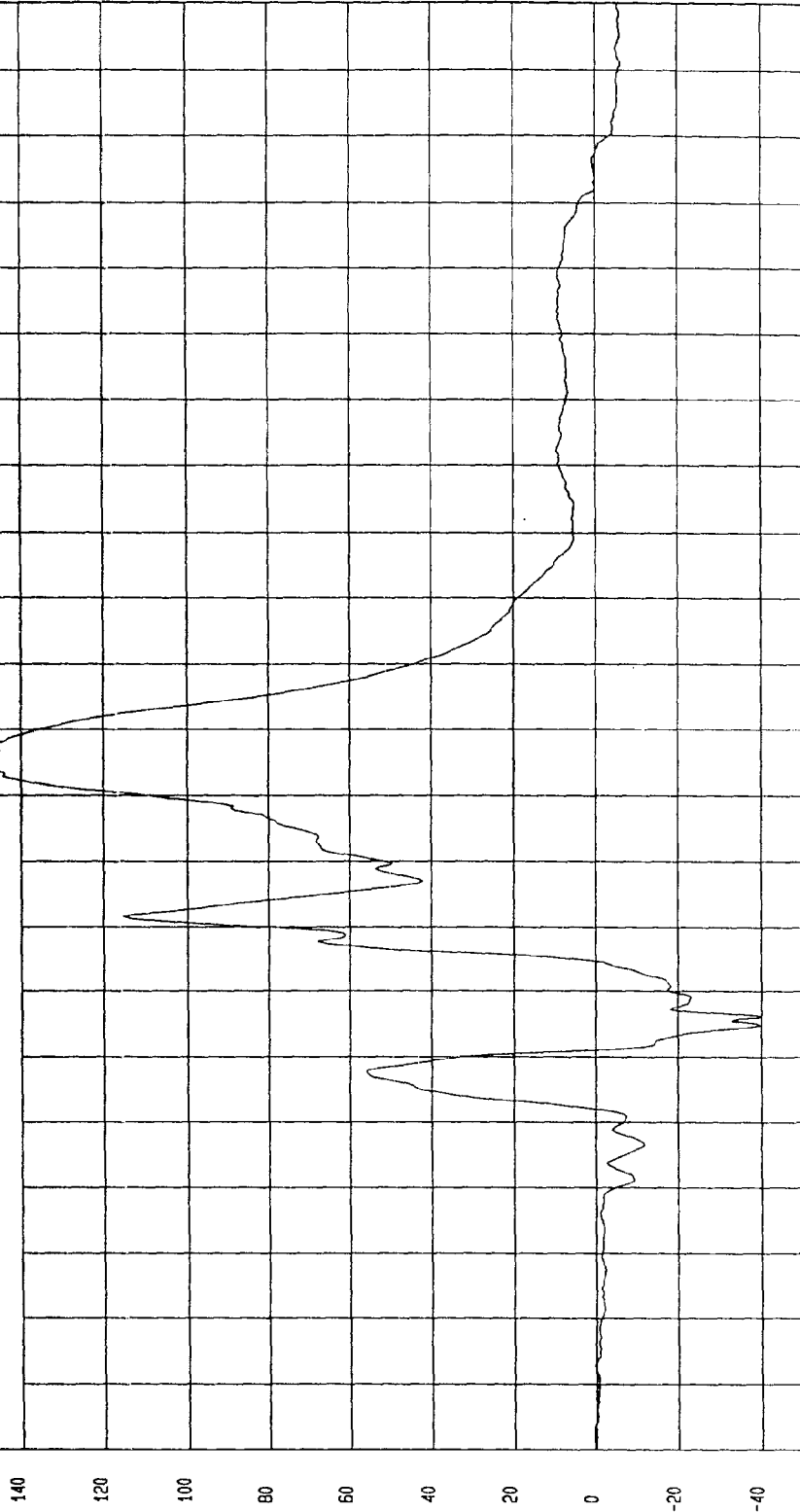
Minimum = -40.53 NM at 46 msec

Maximum = 149.75 NM at 86 msec

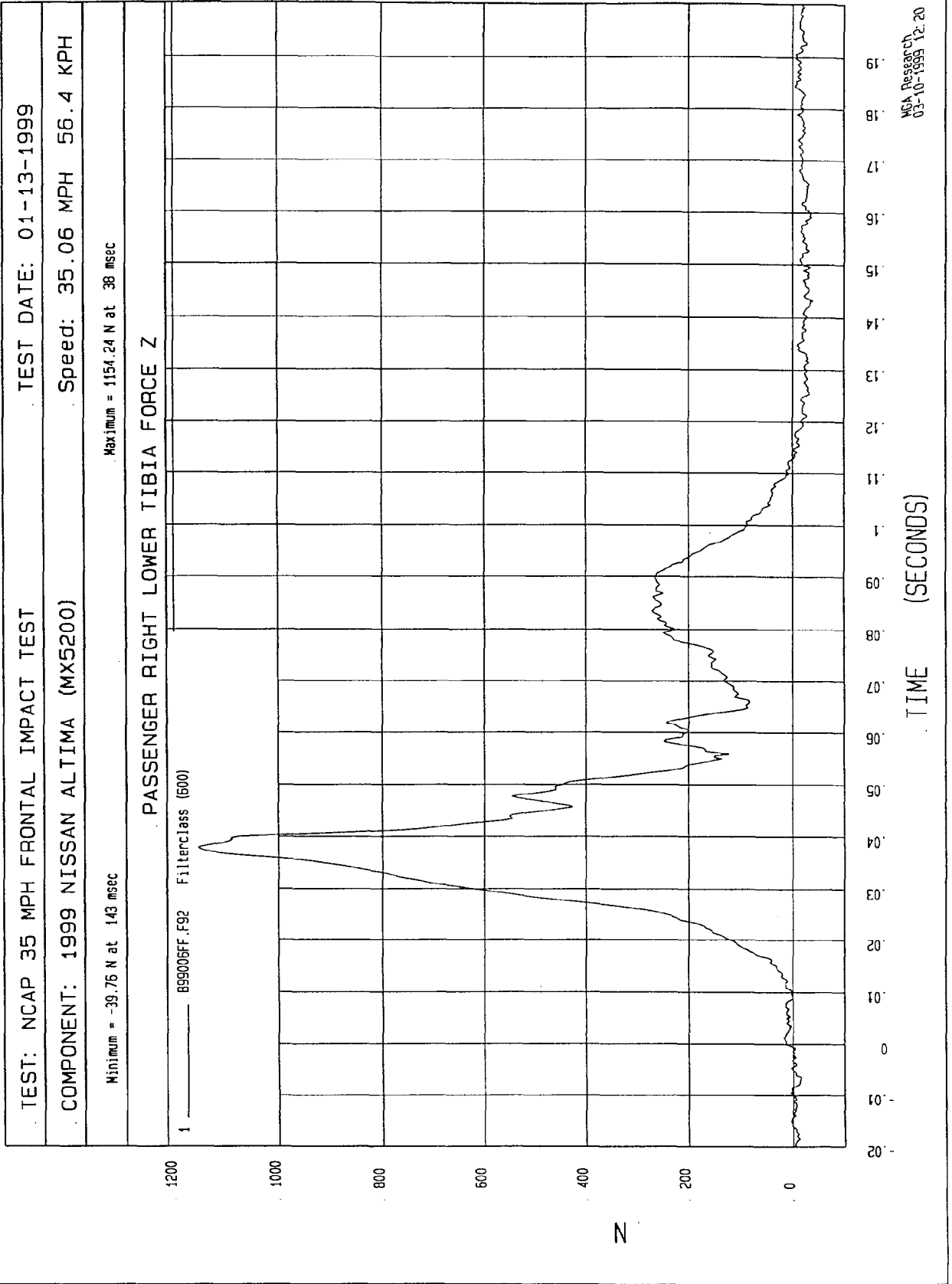
PASSENGER RIGHT LOWER TIBIA MOMENT Y

1 B99006MF.M91 Filterclass (500)

NM



NCA Research
03-10-1999 12:20

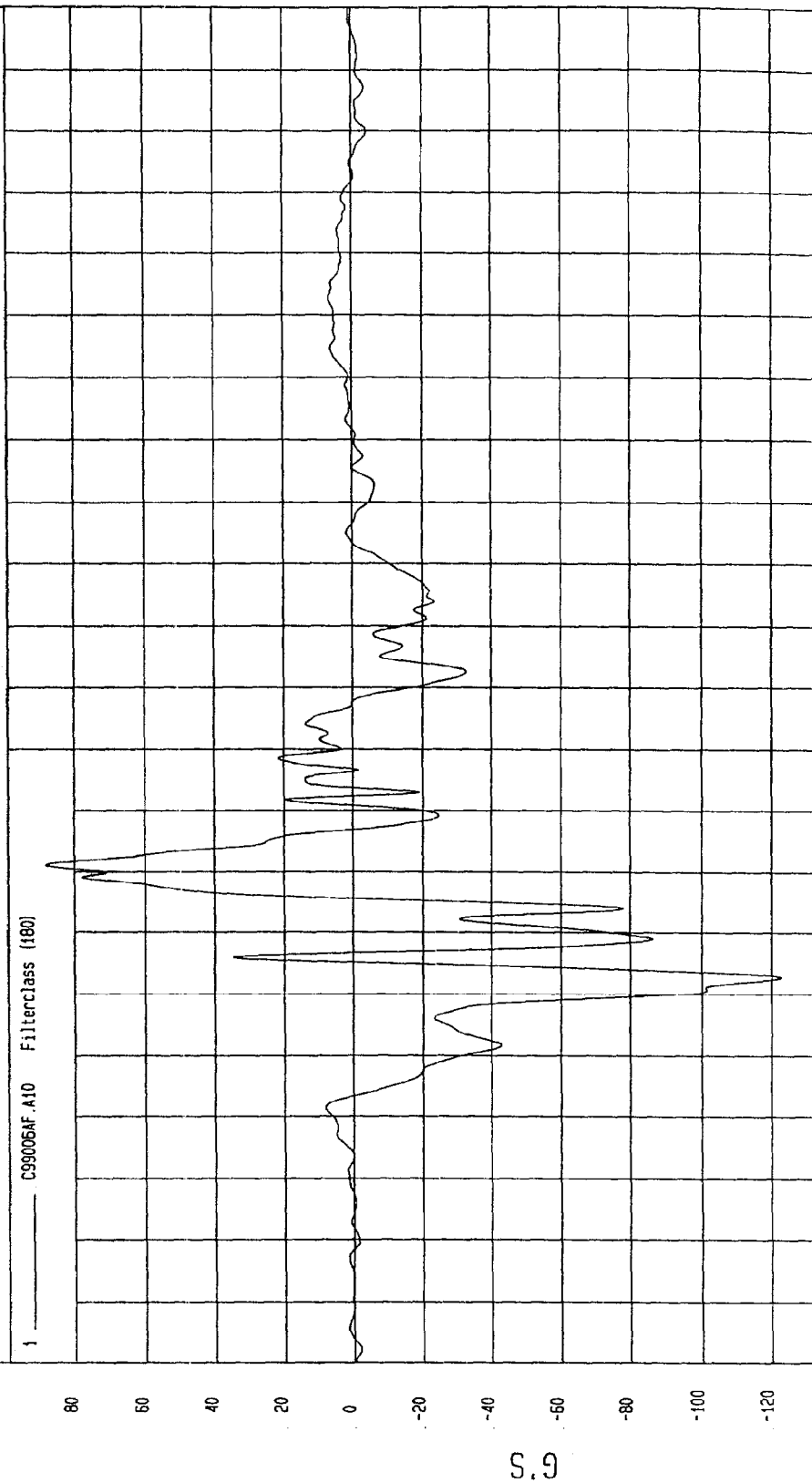


TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -122.65 G's at 43 msec Maximum = 88.15 G's at 61 msec

PASSENGER LEFT FOOT BALL Z ACCELERATION

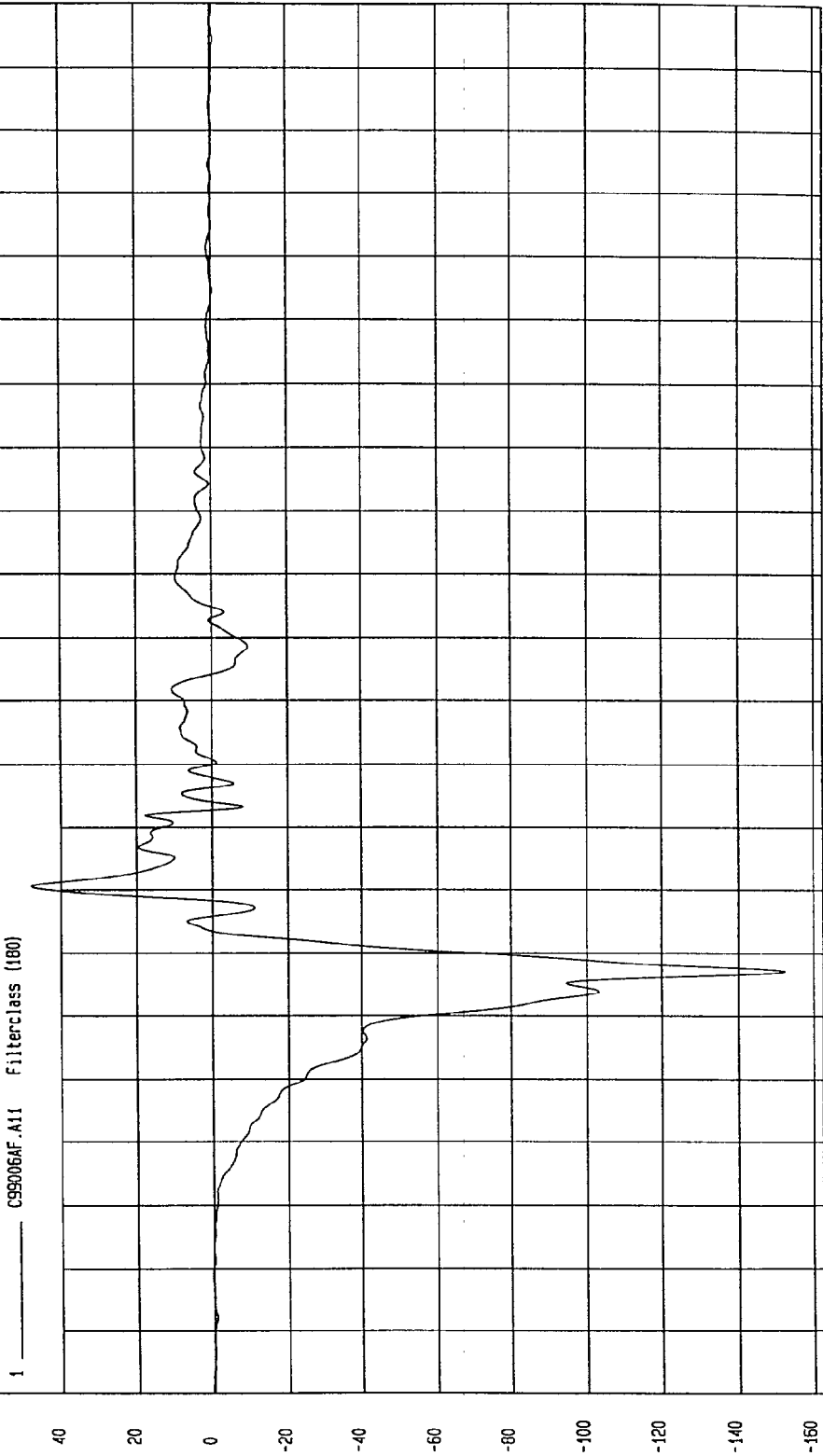


TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -152.41 G'S at 47 msec Maximum = 47.87 G'S at 61 msec

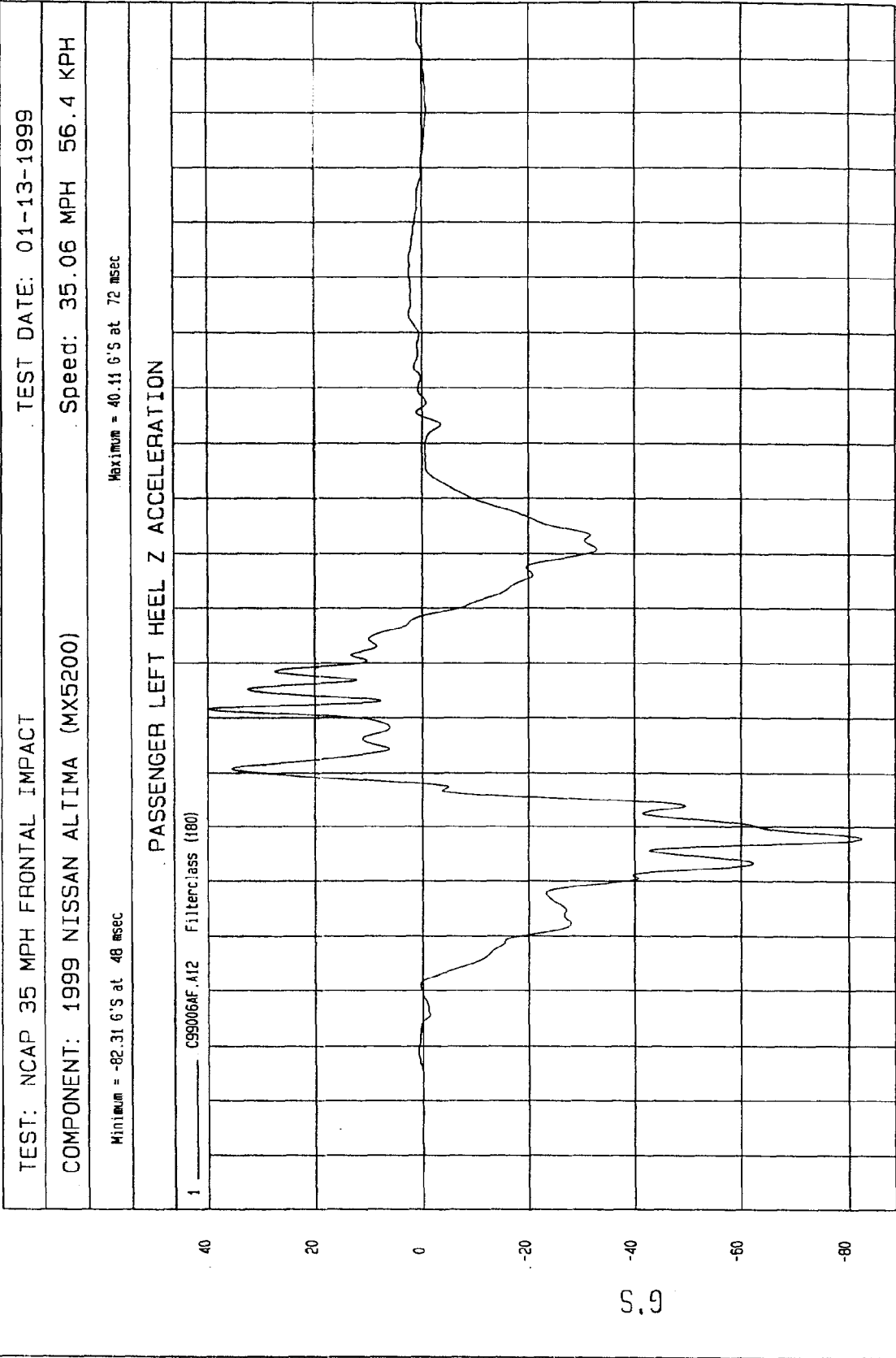
PASSENGER LEFT HEEL X ACCELERATION



NCI Research
01-28-1999 13:08

TIME (seconds)

G.S



PASSENGER RIGHT FOOT BALL Z ACCELERATION VS. TIME

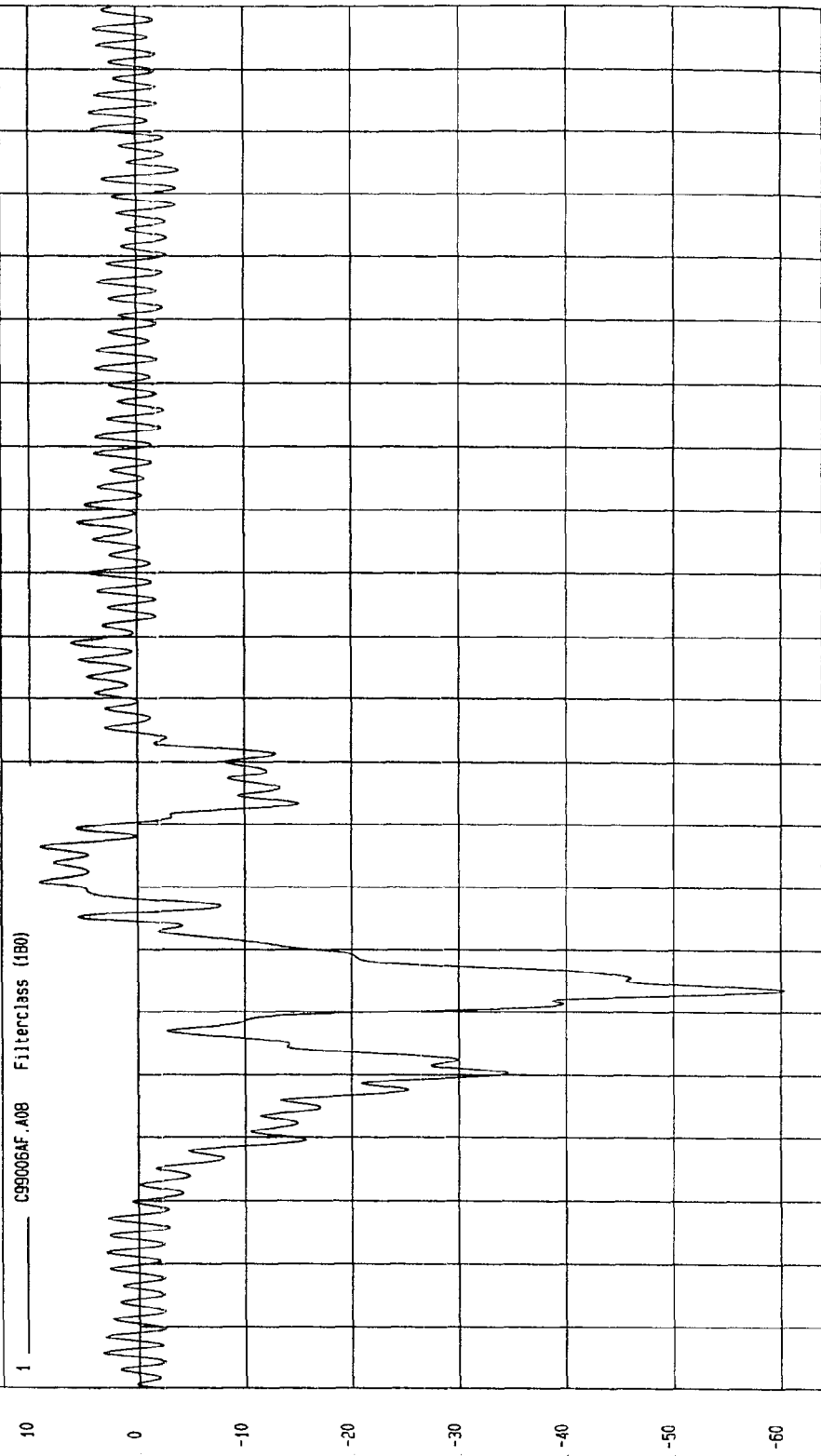
NO VALID DATA COLLECTED

TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 01-13-1999

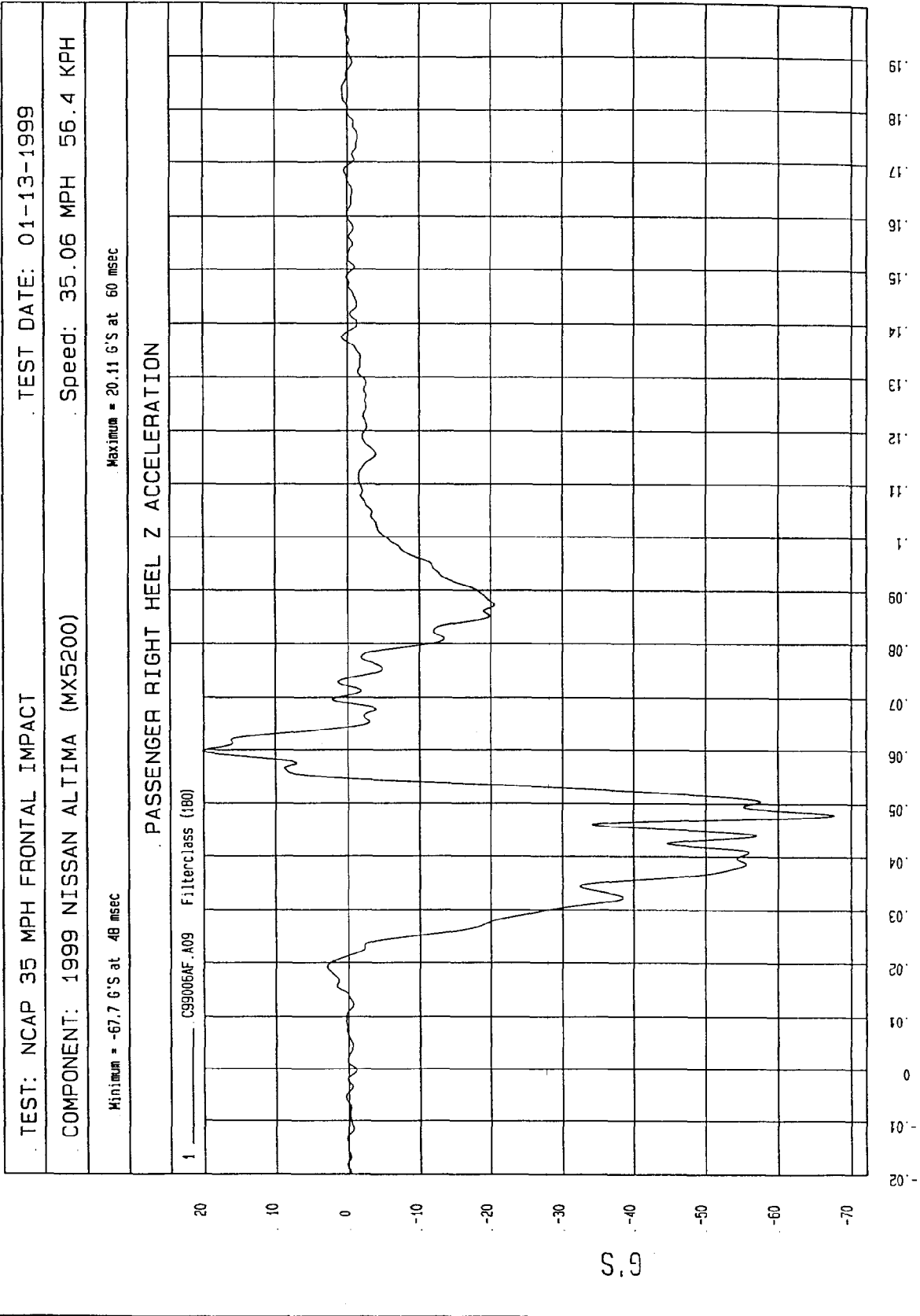
COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -60.34 G'S at 44 msec Maximum = 9.16 G'S at 61 msec

PASSENGER RIGHT HEEL X ACCELERATION



MSA Research
01-26-1999 13:07



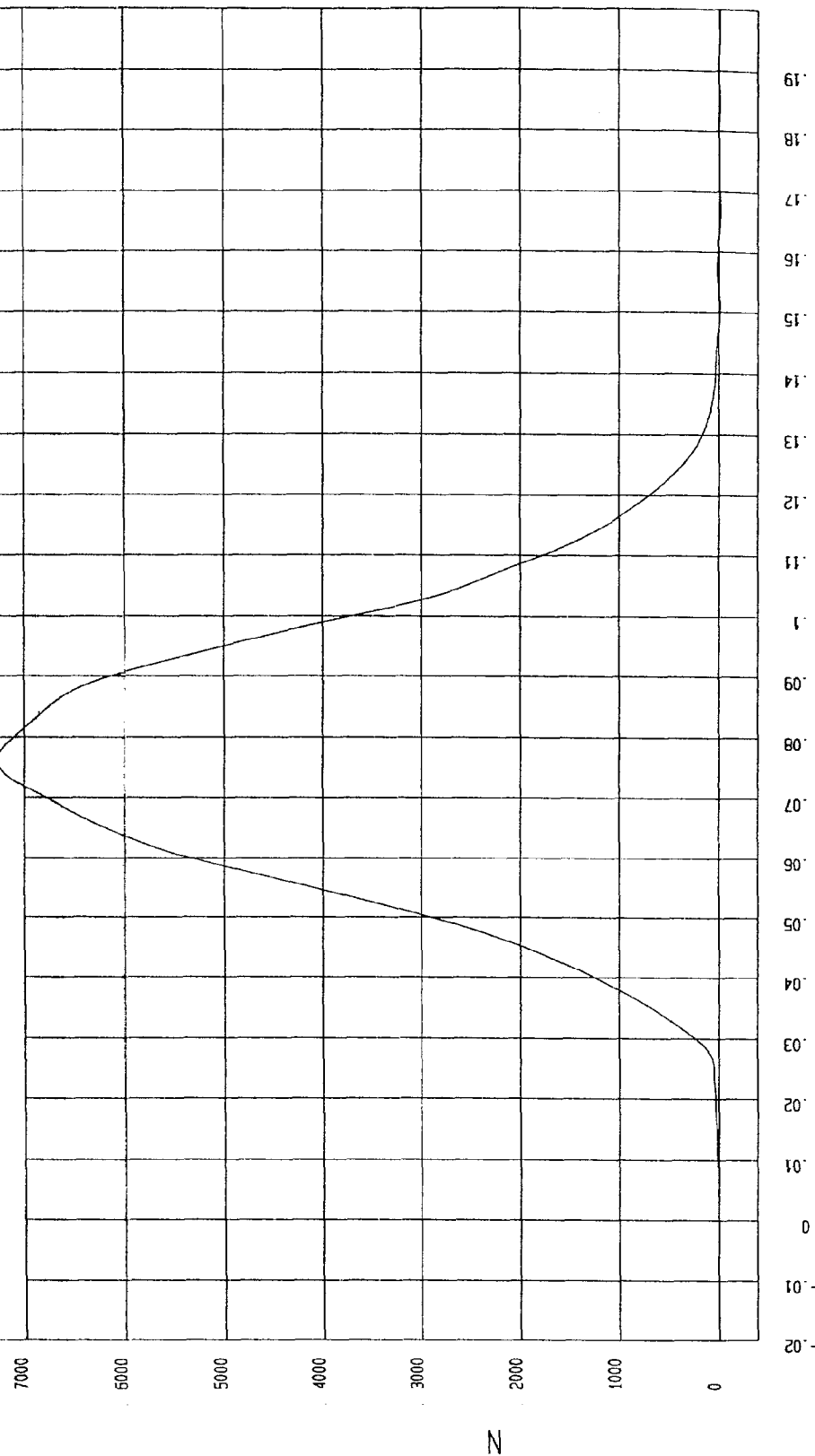
TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -15.99 N at 156 msec Maximum = 7267.61 N at 76 msec

PASSENGER SHOULDER BELT FORCE

1 — 899006FF.F52 Filterclass (60)

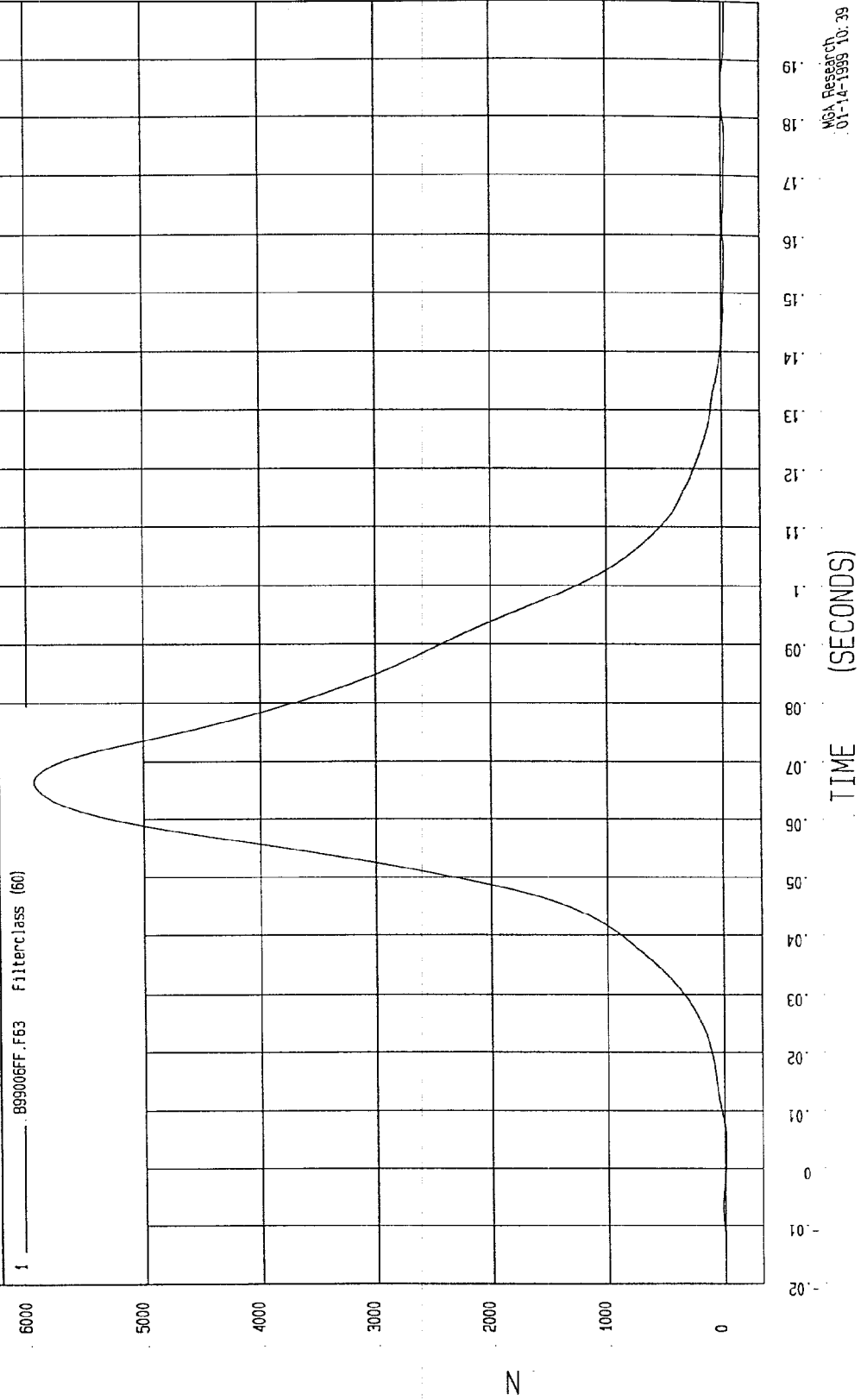


TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -30.5 N at 175 msec Maximum = 5938.09 N at 66 msec

PASSENGER LAP BELT FORCE

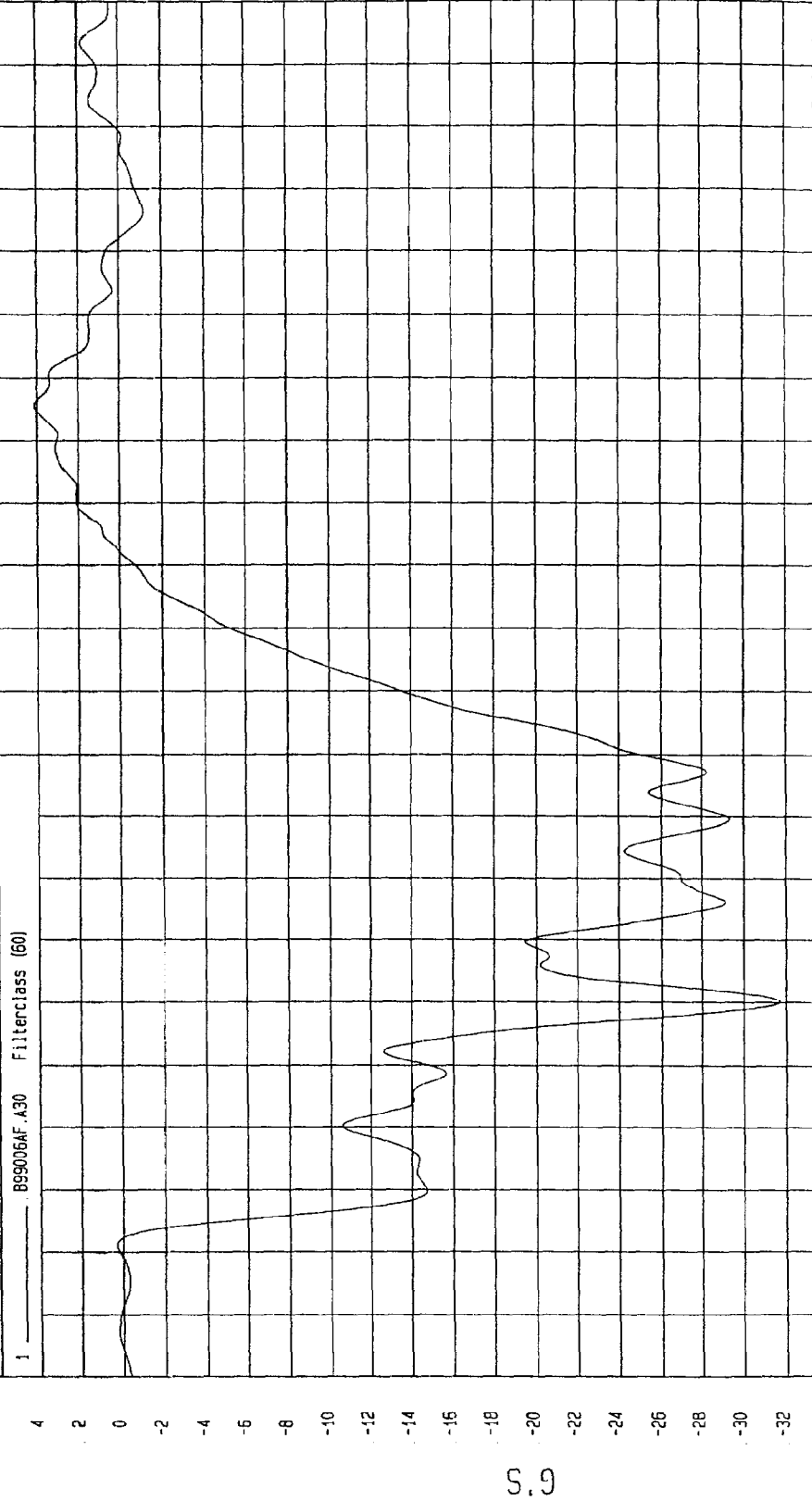


TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

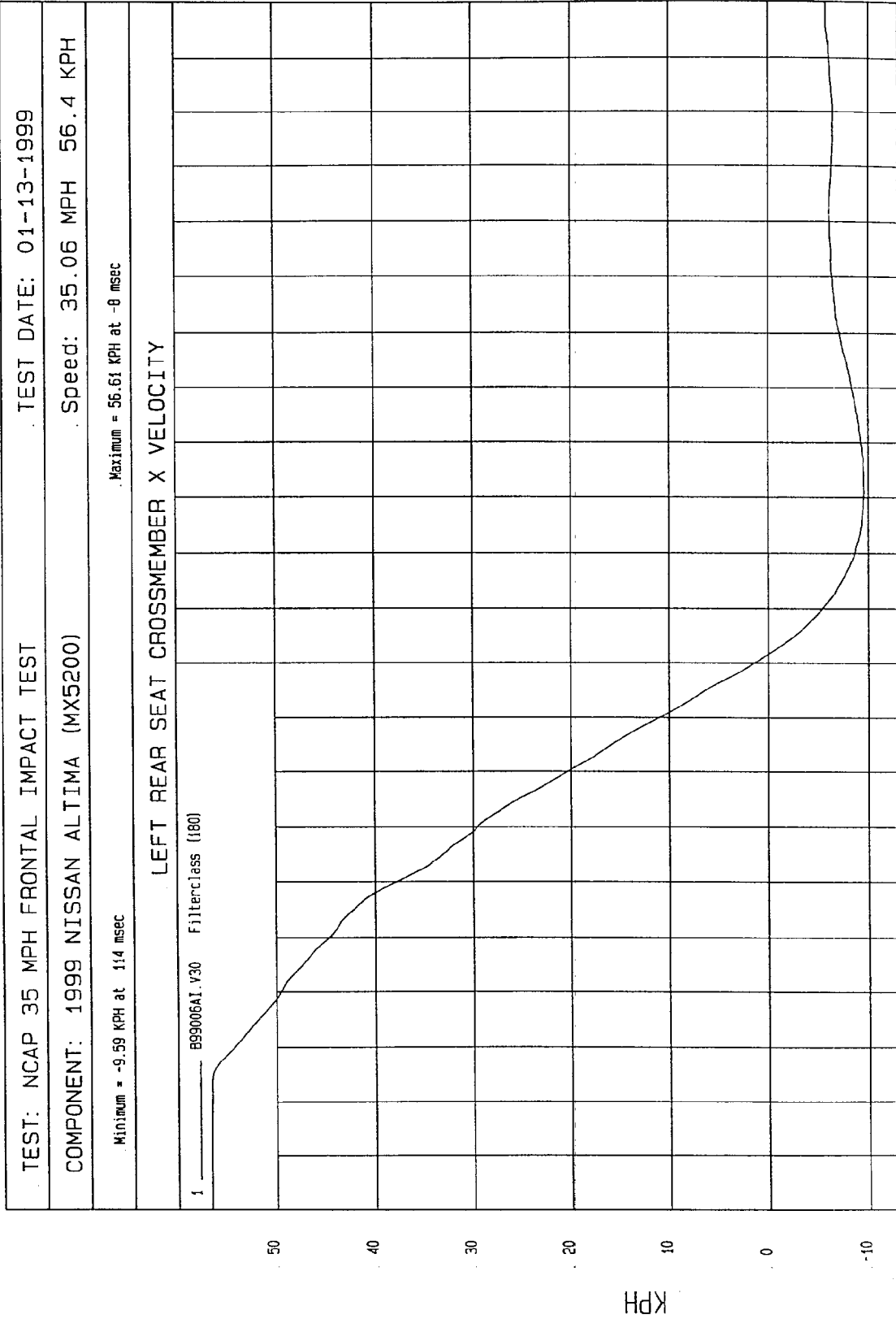
COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -31.69 G'S at 40 msec Maximum = 4.13 G'S at 136 msec

LEFT REAR SEAT CROSSMEMBER X ACCELERATION



MCA Research
01-14-1999 10:41

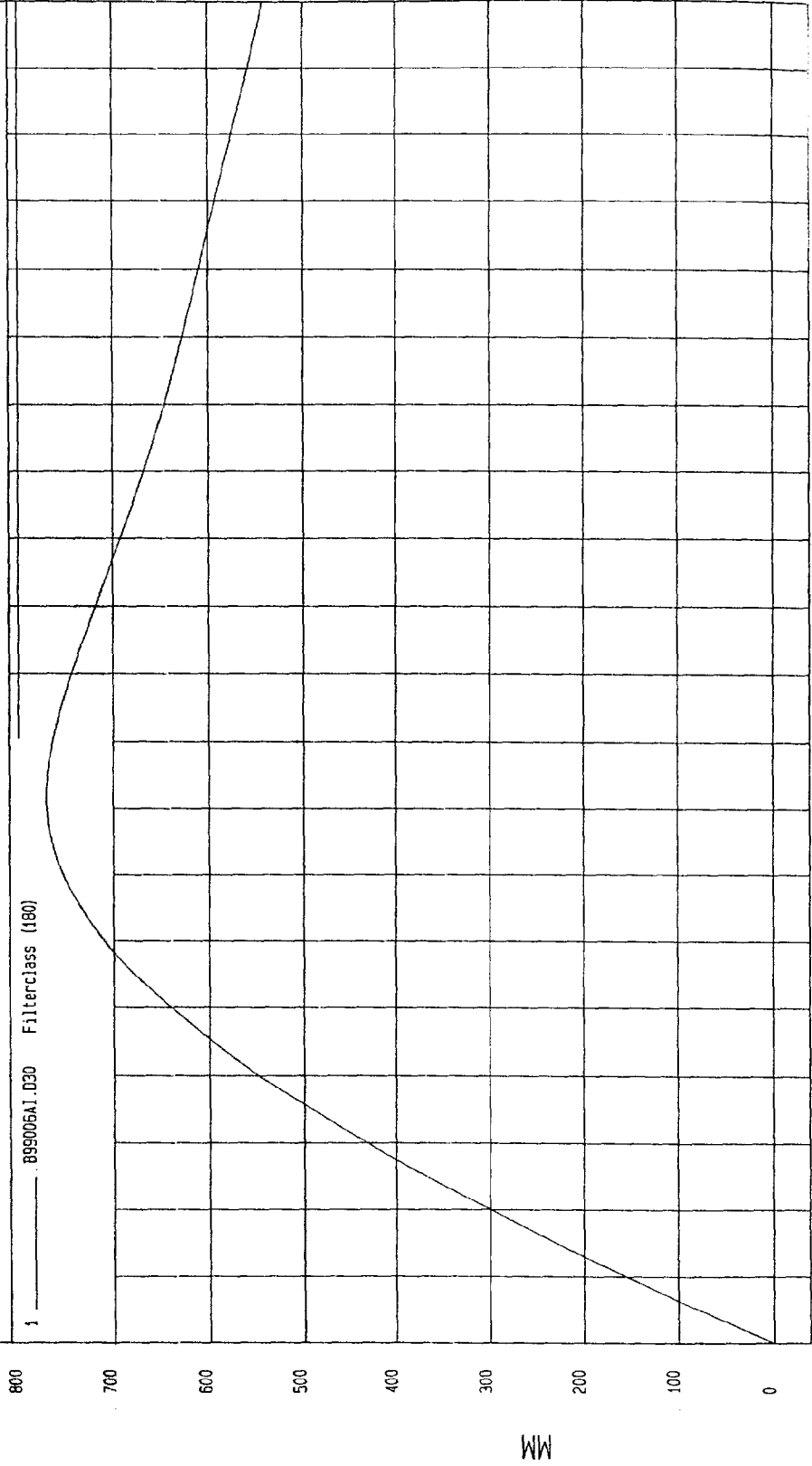


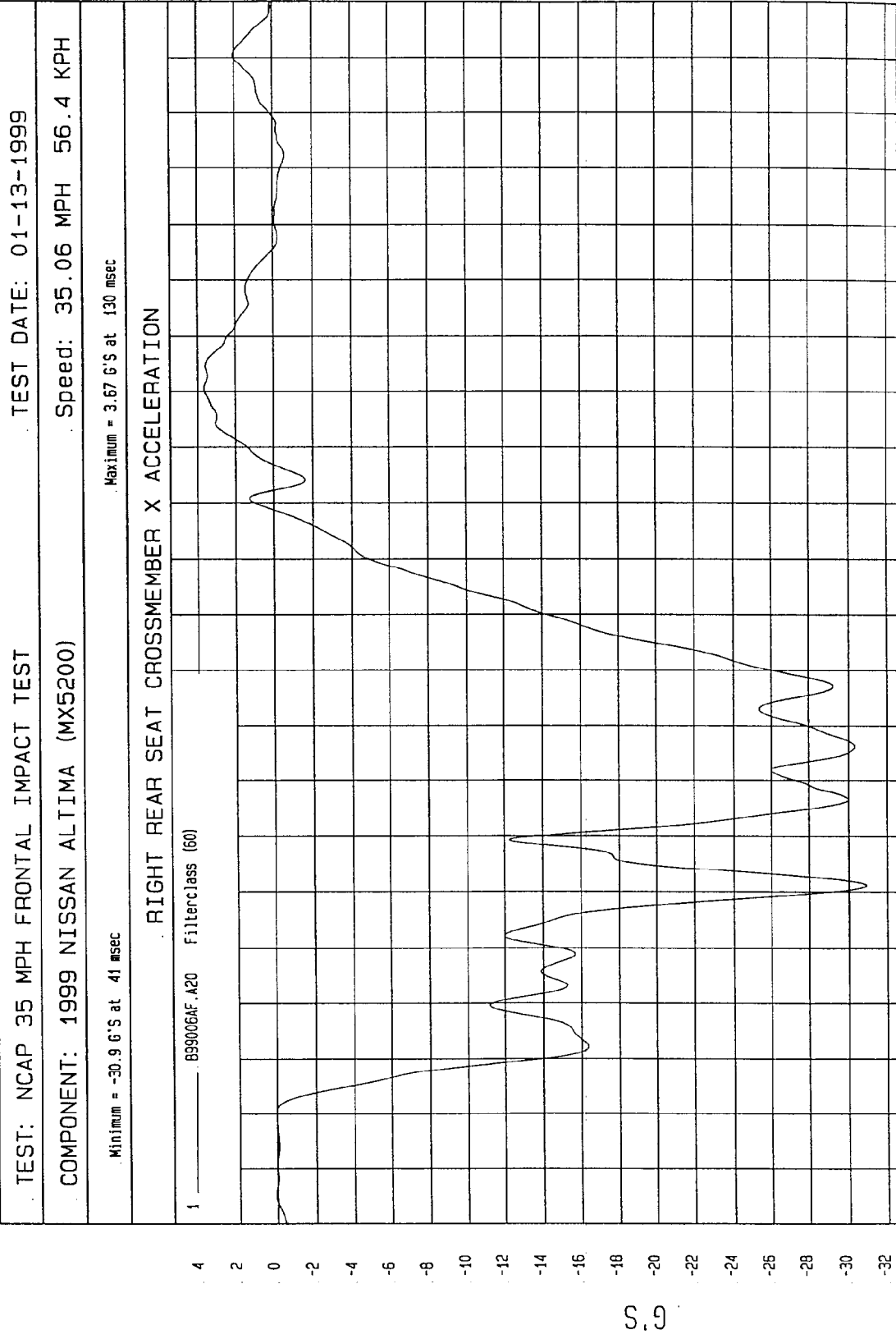
TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = 0 MM at 0 msec Maximum = 771.12 MM at 82 msec

LEFT REAR SEAT CROSSMEMBER X DISPLACEMENT





TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

SPEED: 35.06 MPH 56.4 KPH

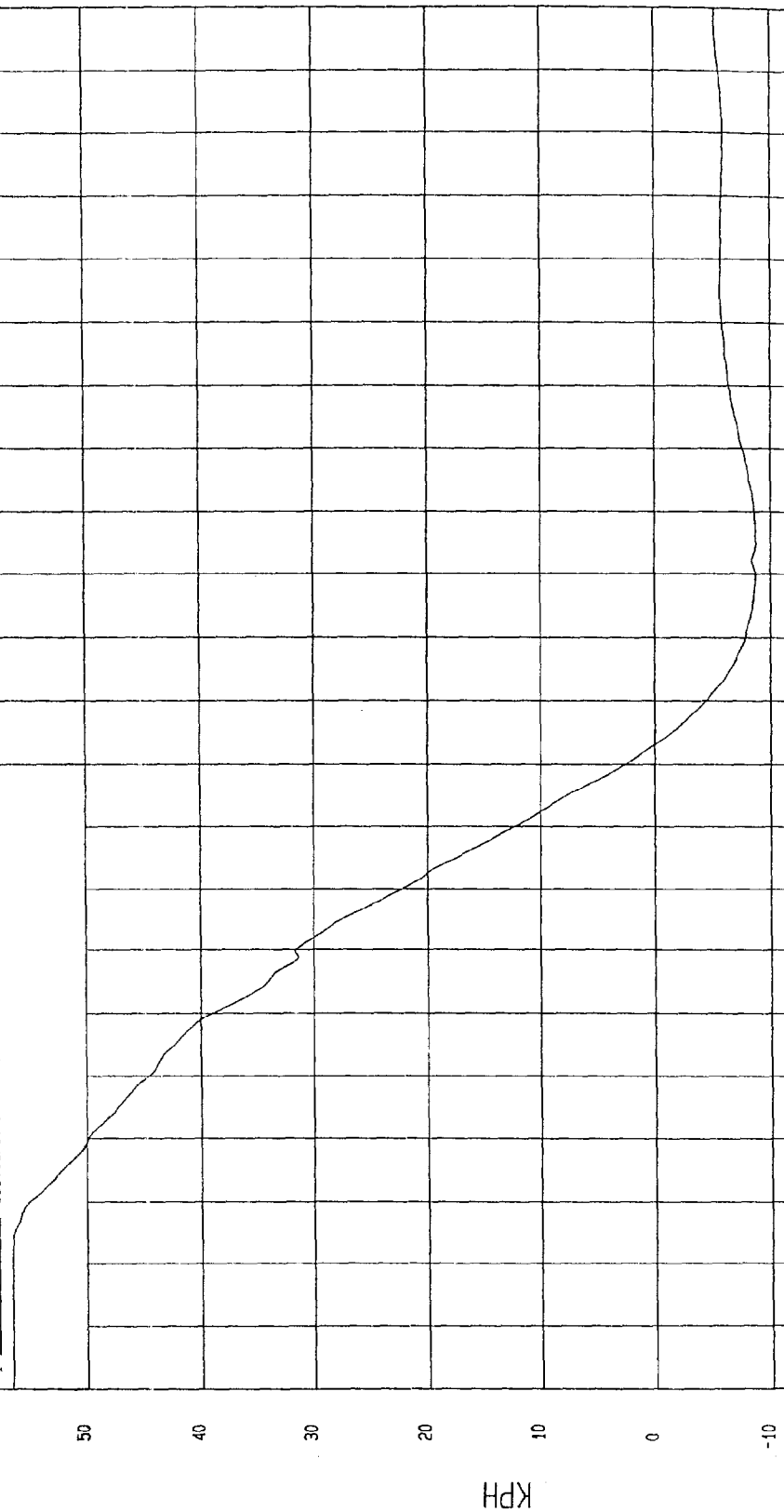
COMPONENT: 1999 NISSAN ALTIMA (MX5200)

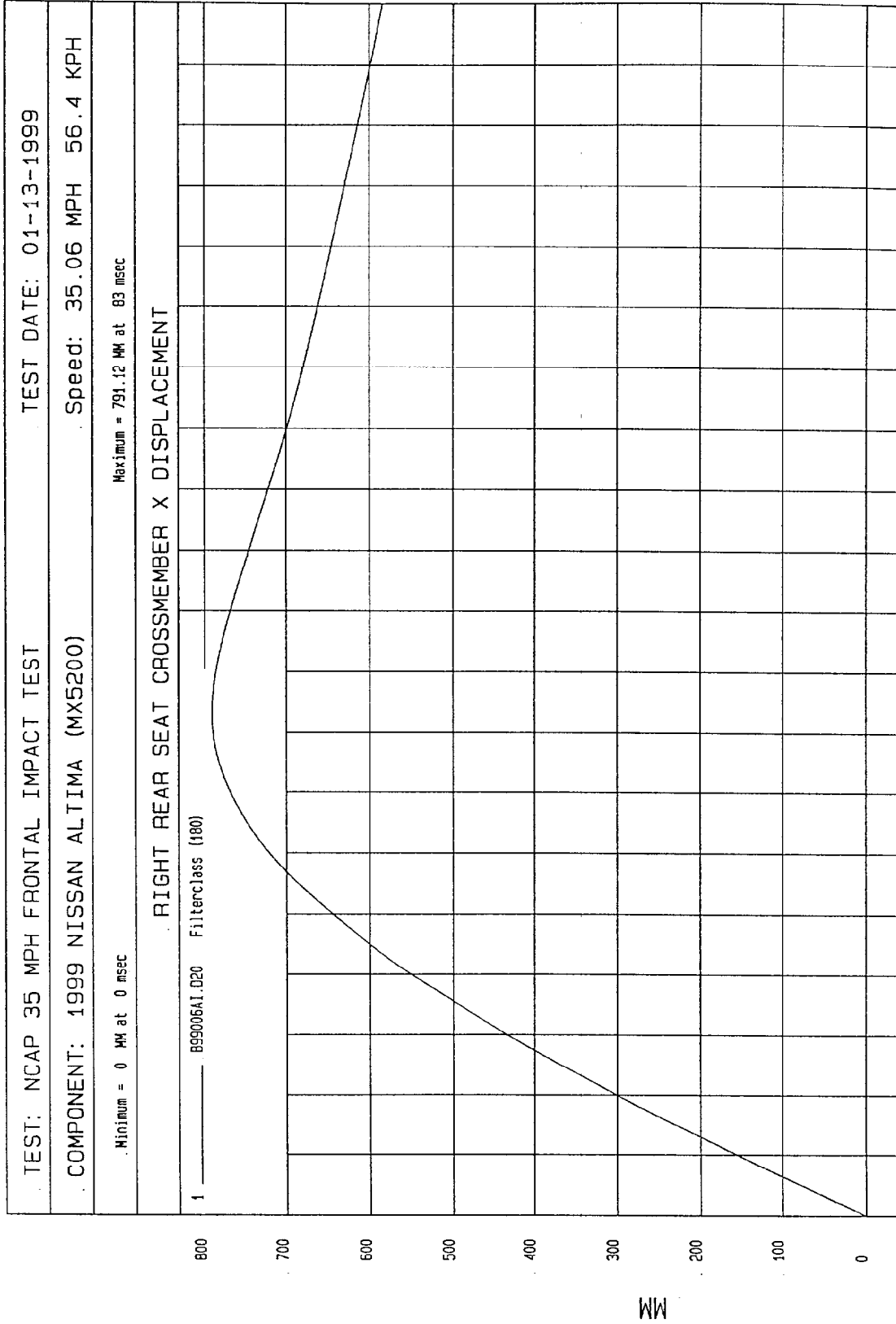
Maximum = 56.6 KPH at -20 msec

Minimum = -8.71 KPH at 115 msec

RIGHT REAR SEAT CROSSMEMBER X VELOCITY

1 — 899006A1.V20 FilterClass (180)





MCA Research
01-28-1999 14:32

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

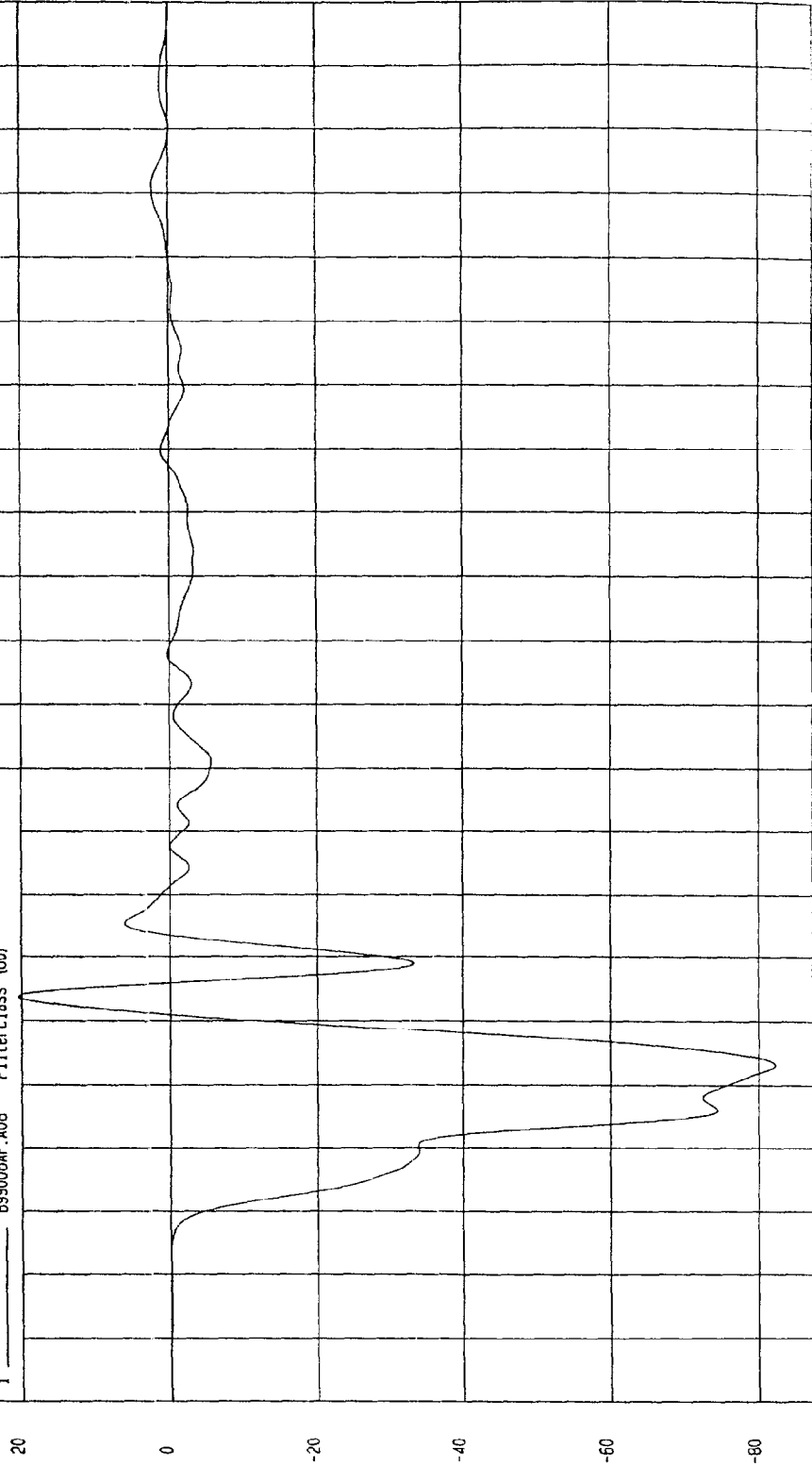
SPEED: 35.06 MPH 56.4 KPH

Maximum = 20.49 G'S at 44 msec

TOP OF ENGINE BLOCK X ACCELERATION

Minimum = -82.33 G'S at 33 msec

1 B99005AF.A08 Filterclass (60)



TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

Speed: 35.06 MPH 56.4 KPH

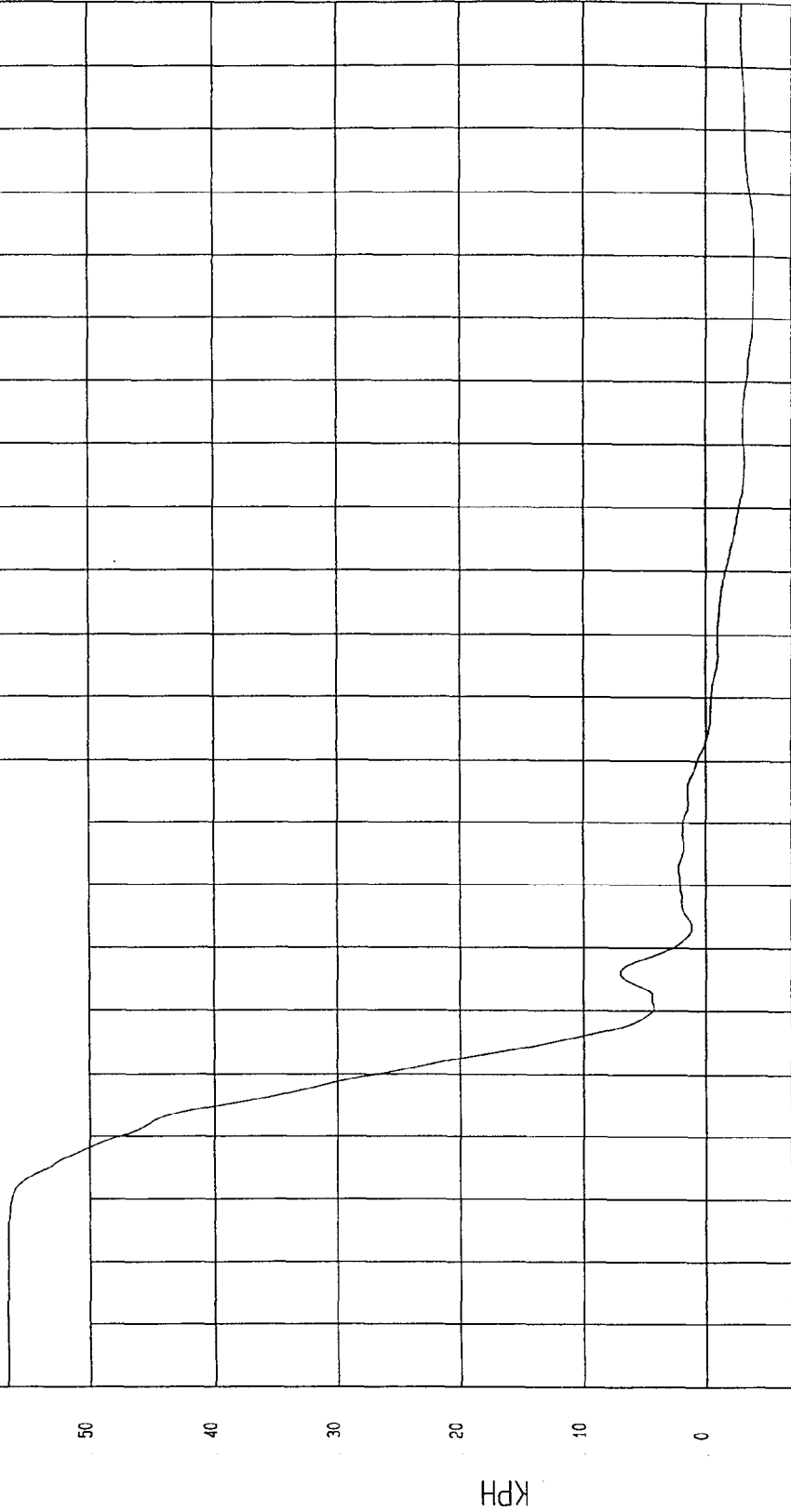
COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = 56.6 KPH at -11 msec

Minimum = -3.9 KPH at 158 msec

TOP OF ENGINE BLOCK X VELOCITY

1 ——— B99005A1.V08 Filterclass (180)



MCA Research
01-14-1999 10:41

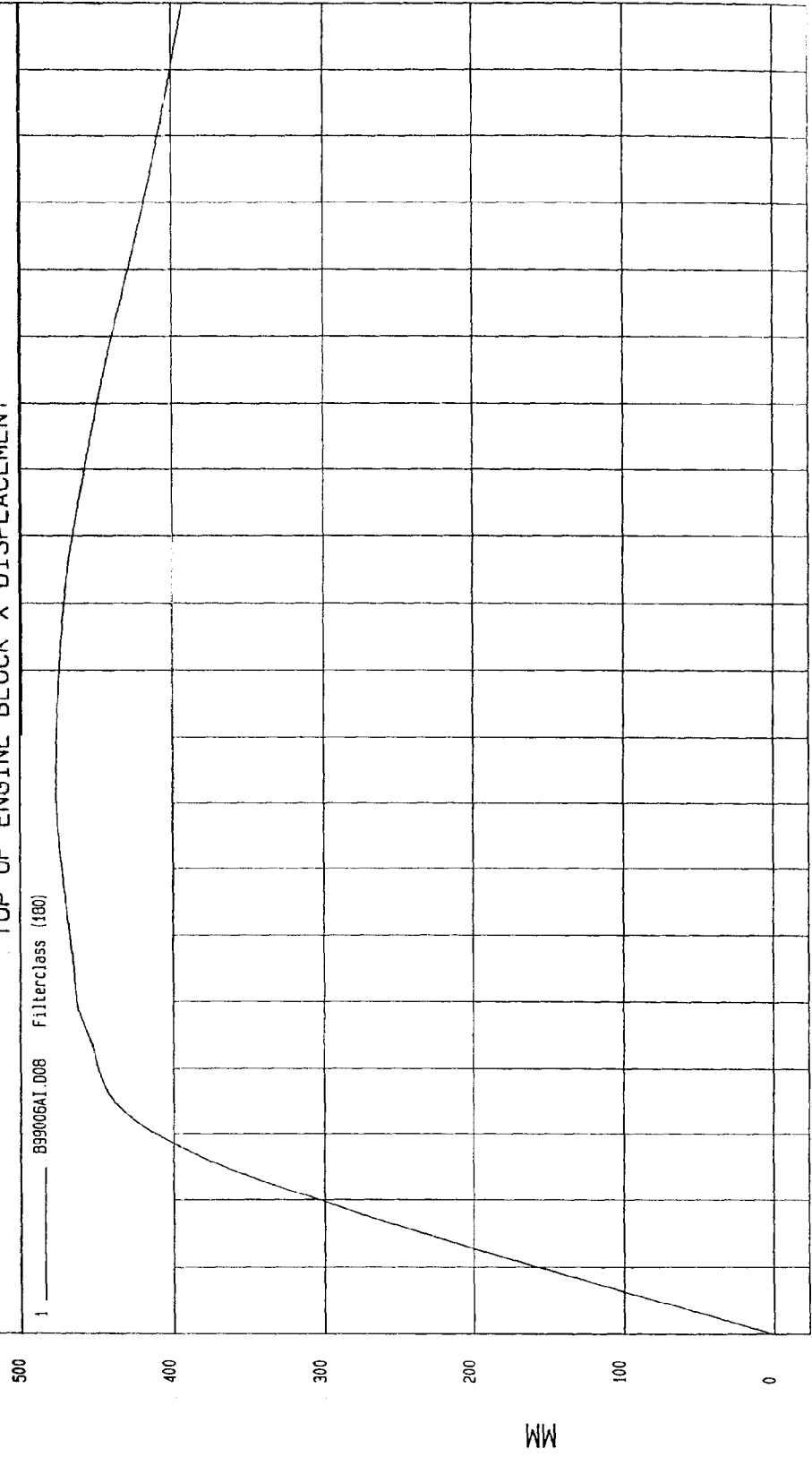
TIME Seconds

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

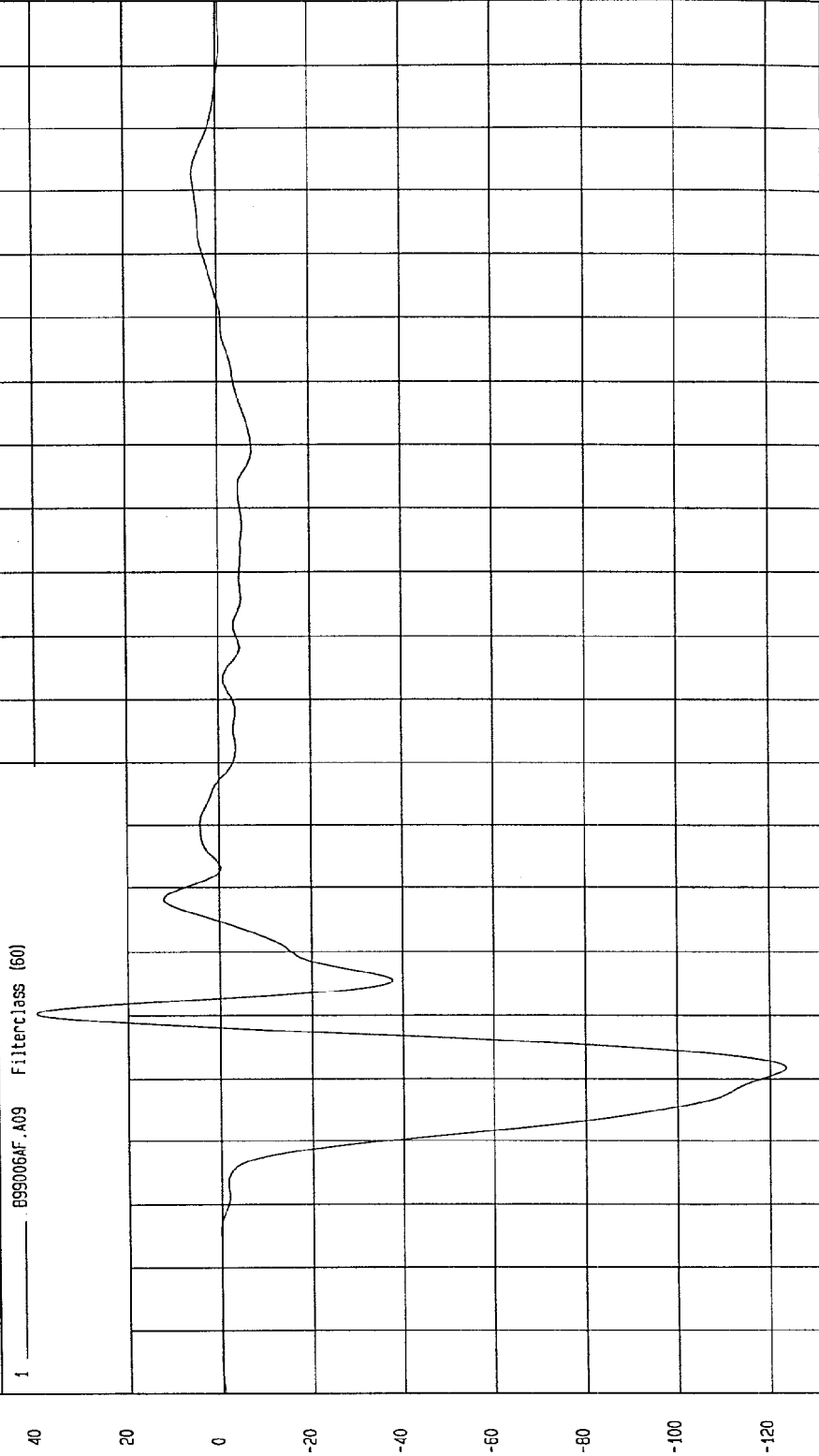
Minimum = 0 MM at 0 msec Maximum = 477.51 MM at 83 msec

TOP OF ENGINE BLOCK X DISPLACEMENT



TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999
COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH
Minimum = -123.64 G'S at 32 msec Maximum = 39.97 G'S at 40 msec

BOTTOM OF ENGINE X ACCELERATION

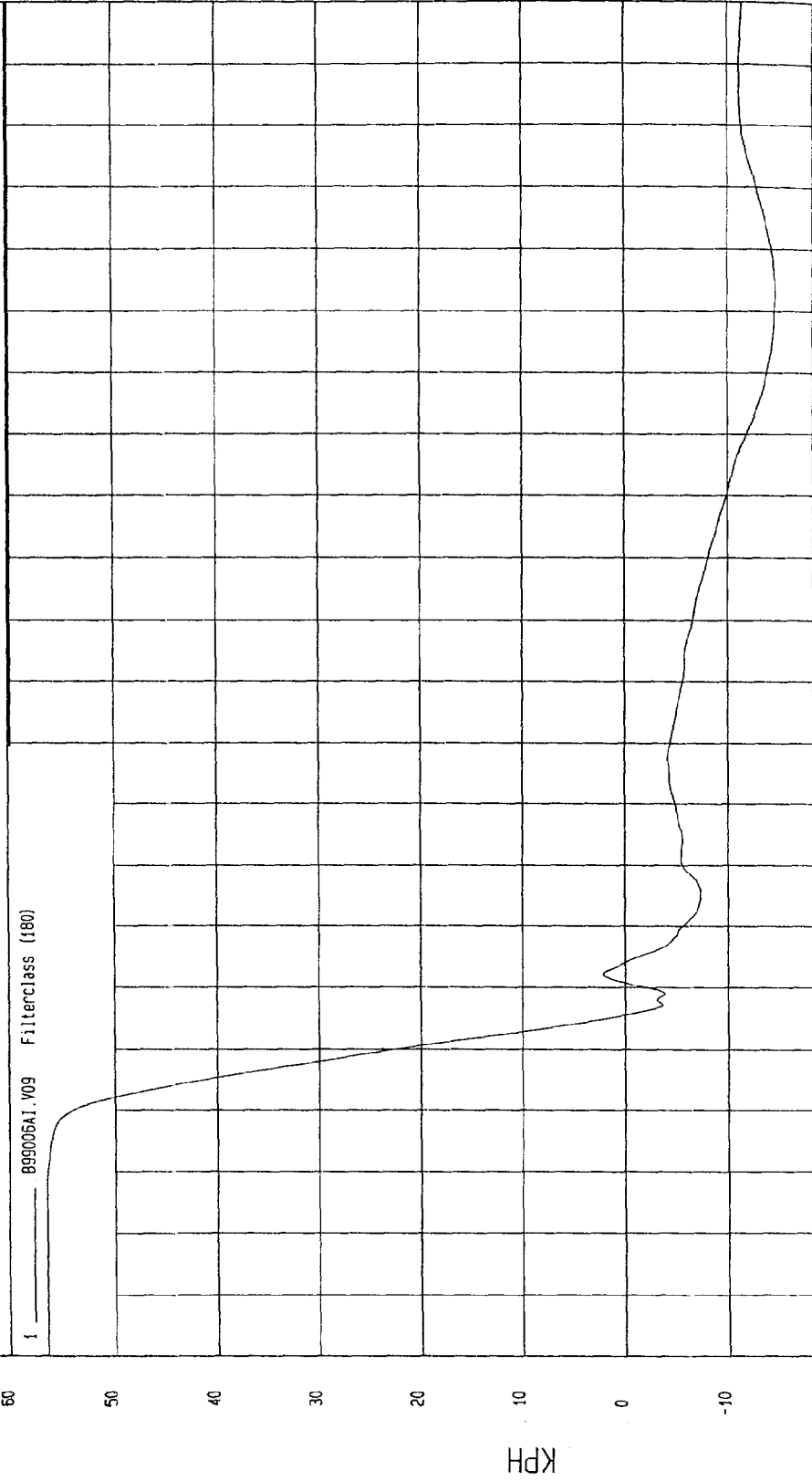


TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -14.65 KPH at 152 msec Maximum = 56.62 KPH at 8 msec

BOTTOM OF ENGINE X VELOCITY

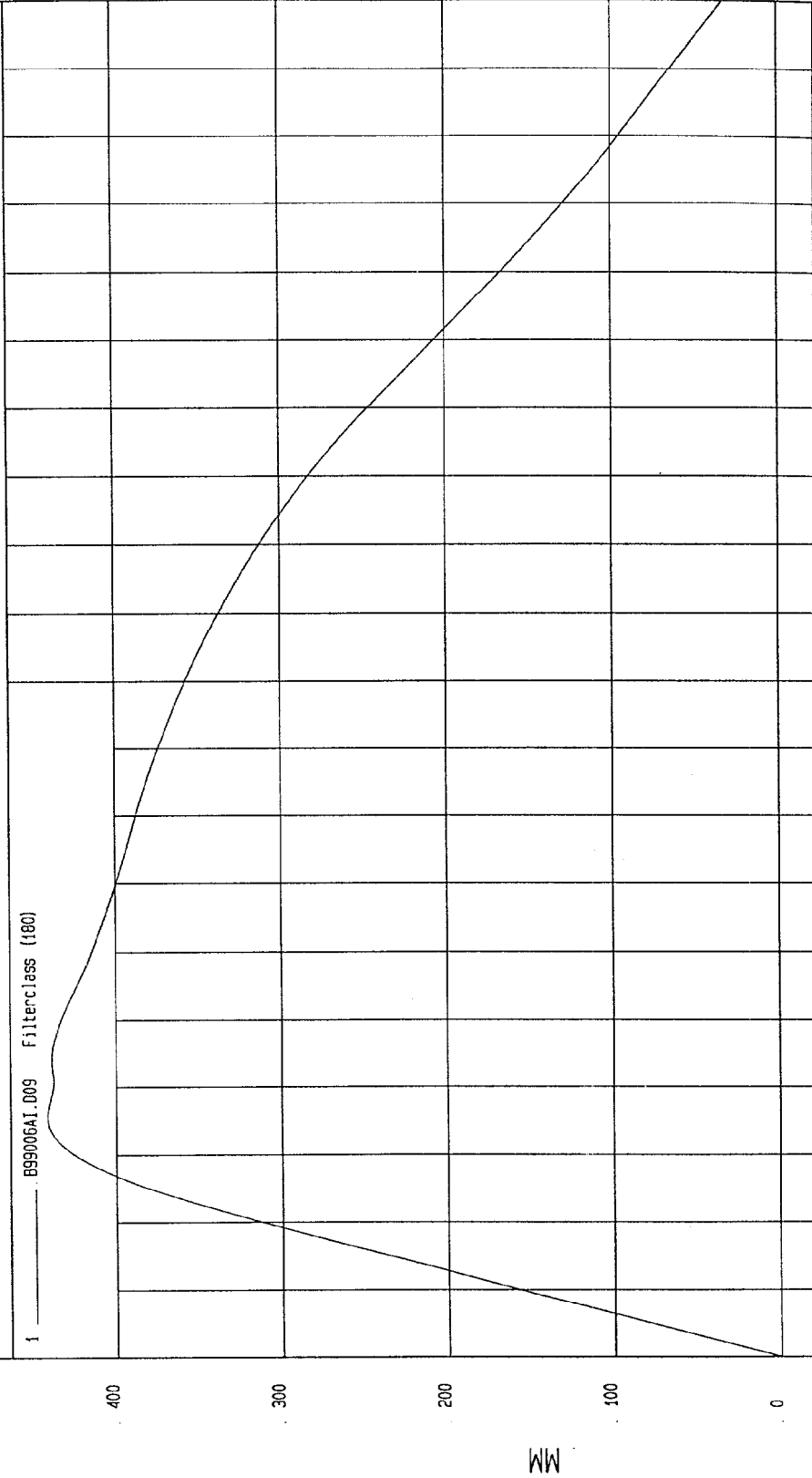


TIME Seconds

WEA Research
01-14-1999 10:41

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999
COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH
Minimum = 0 MM at 0 msec Maximum = 441.1 MM at 36 msec

BOTTOM OF ENGINE X DISPLACEMENT



MCA Research
01-28-1999 14: 32

TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 01-13-1999

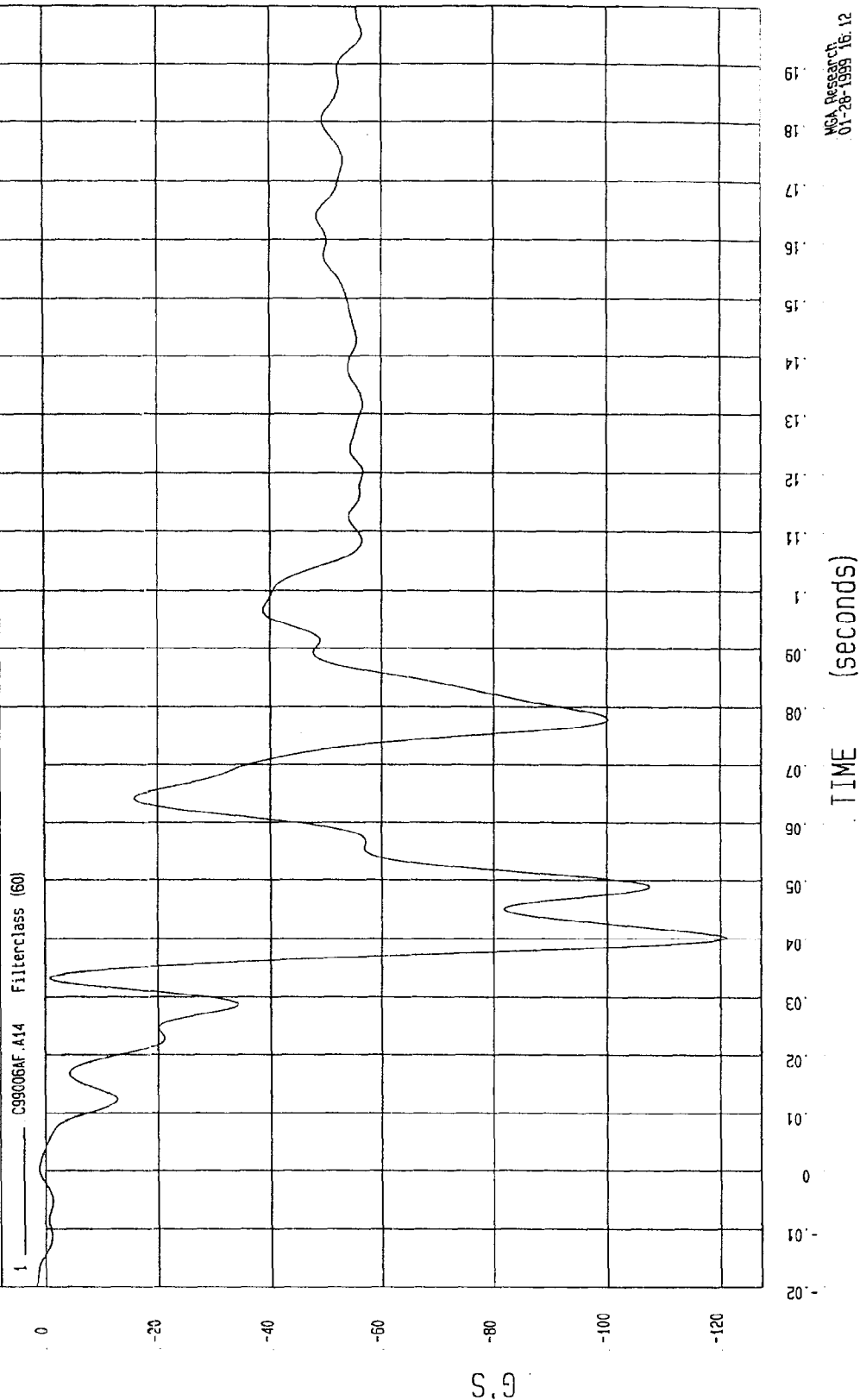
SPEED: 35.06 MPH 56.4 KPH

COMPONENT: 1999 NISSAN ALTIMA (MX5200)

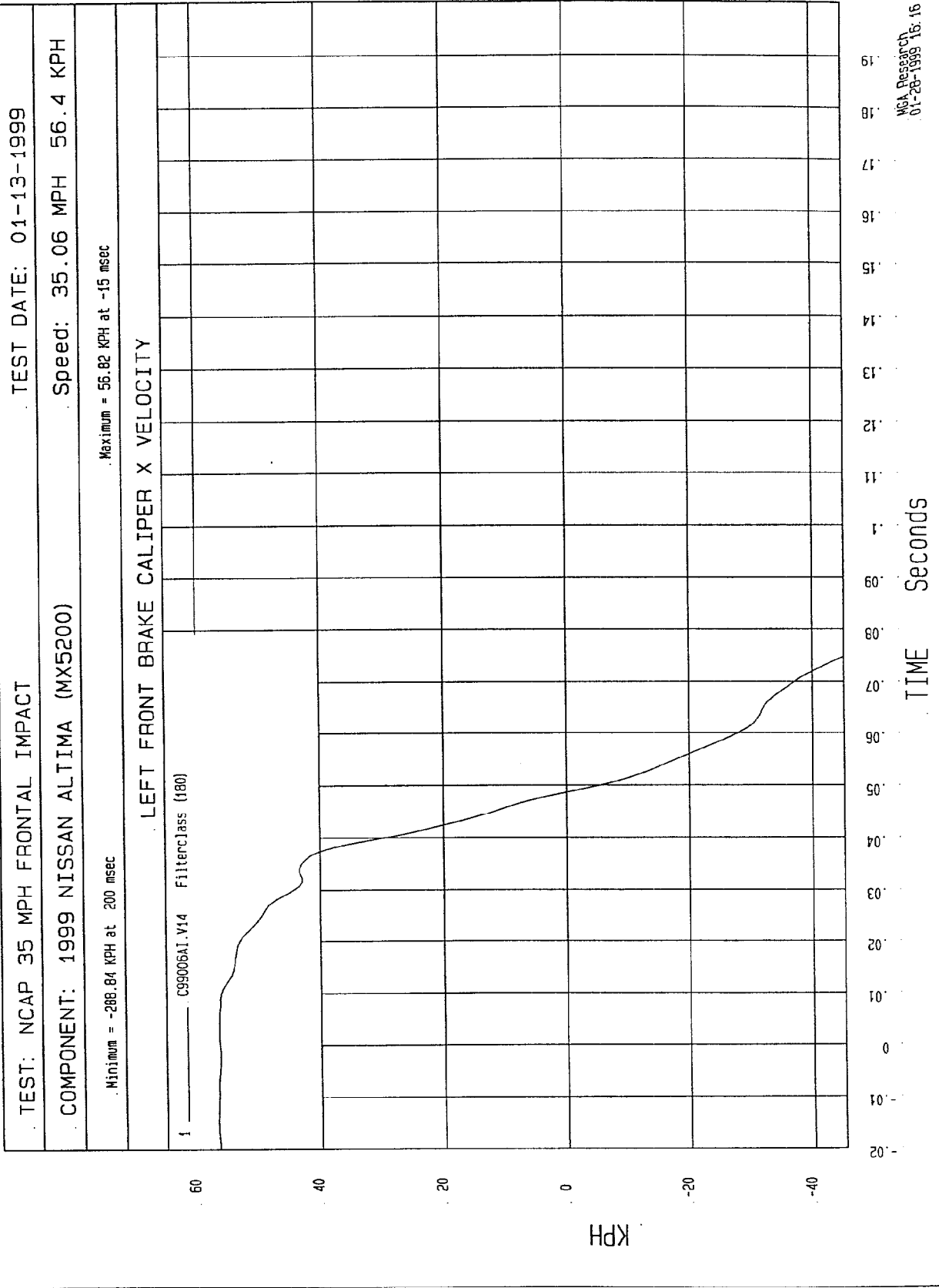
Maximum = 1.72 G'S at -20 msec

Minimum = -121.15 G'S at 40 msec

LEFT FRONT BRAKE CALIPER X ACCELERATION



MCA Research
01-28-1999 16:12



TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 01-13-1999

Speed: 35.06 MPH 56.4 KPH

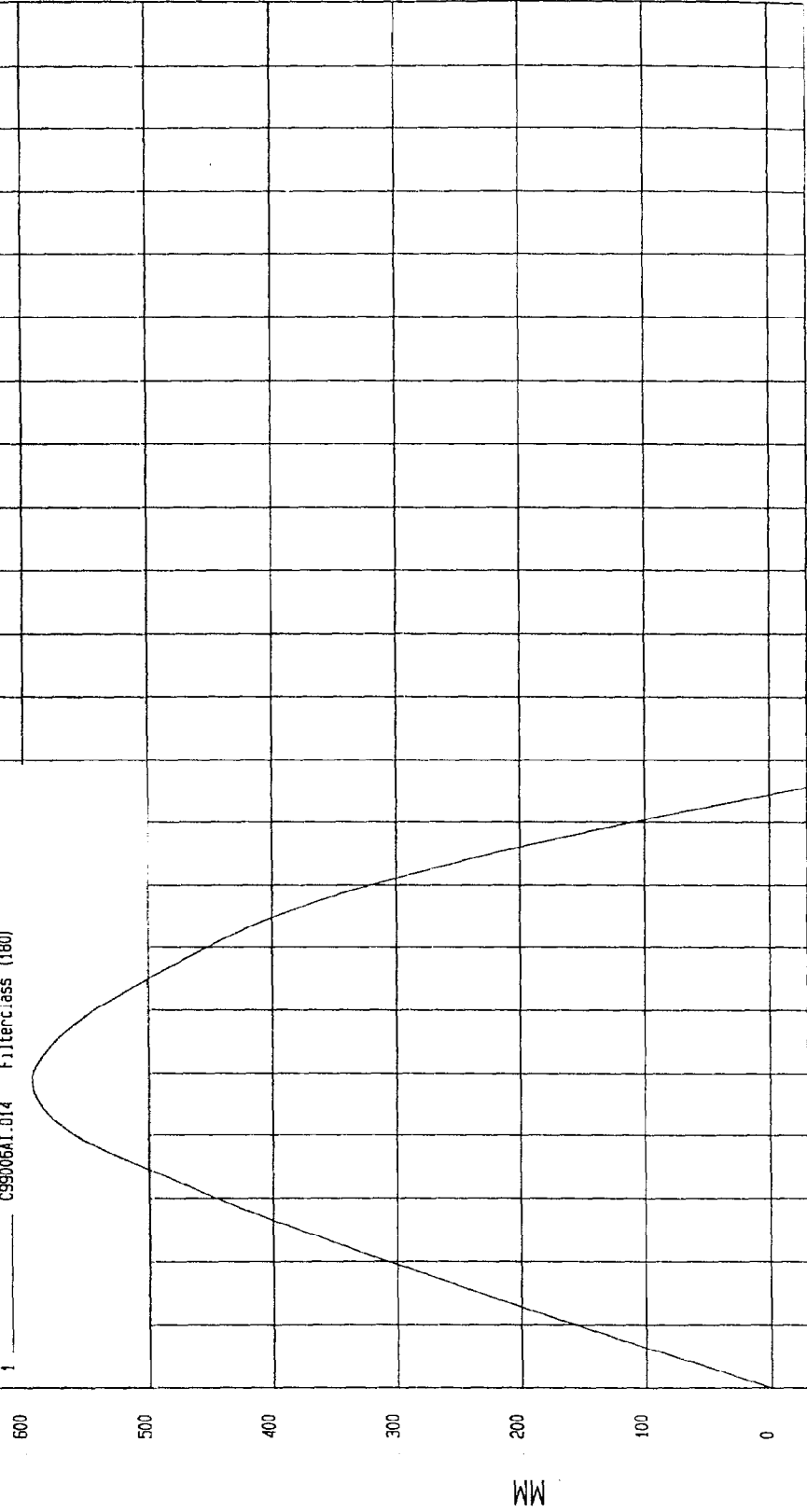
COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = 593.33 MM at 49 msec

Minimum = -5573.13 MM at 200 msec

LEFT FRONT BRAKE CALIPER X DISPLACEMENT

1 C99006A1.014 Filterclass (180)



TIME Seconds

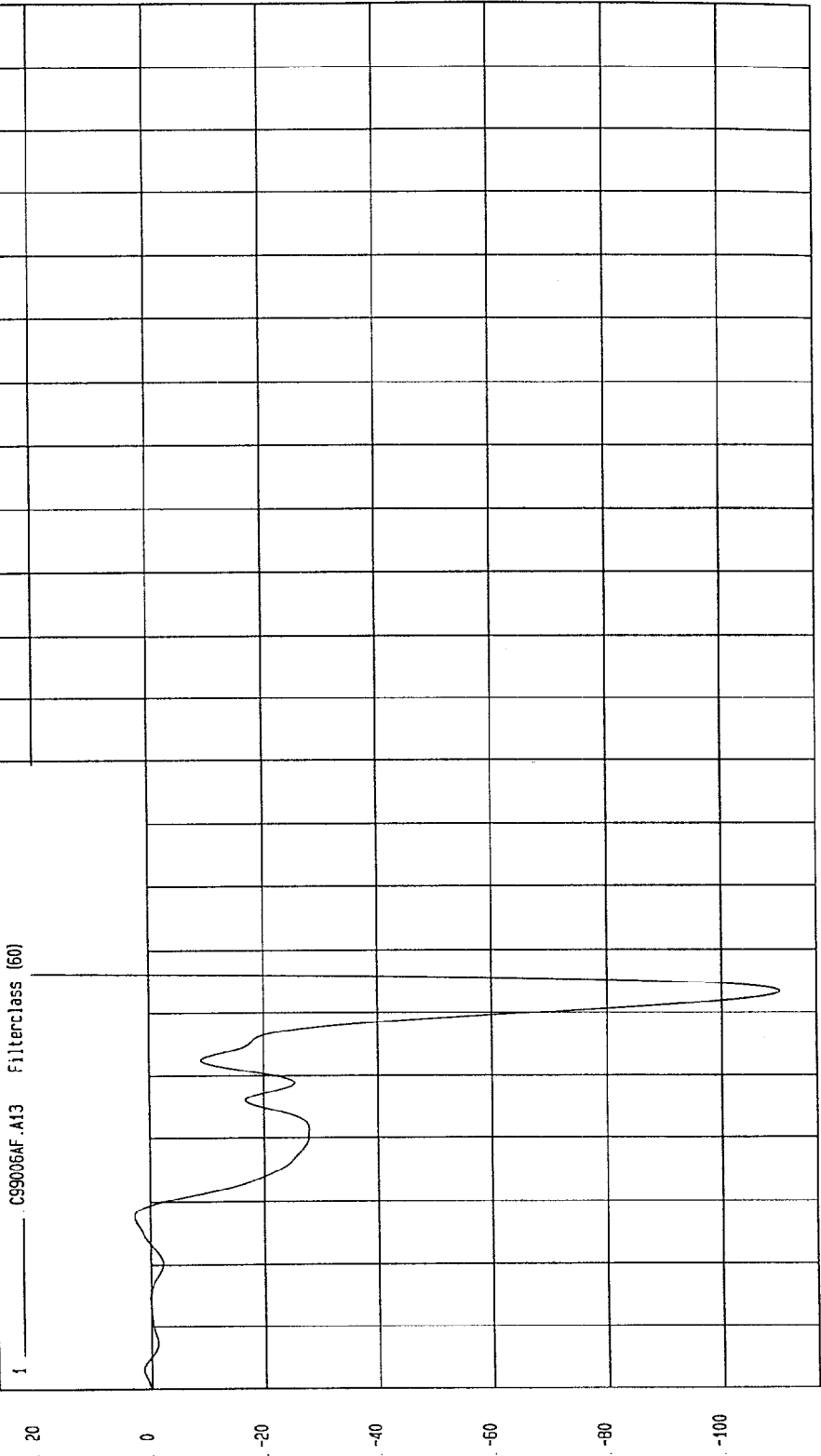
MCA Research
01-28-1999 16:17

TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -110.01 G'S at 43 msec Maximum = 1025.02 G'S at 52 msec

RIGHT FRONT BRAKE CALIPER X ACCELERATION



TIME (seconds)

MGA Research
01-28-1999 16:17

TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 01-13-1999

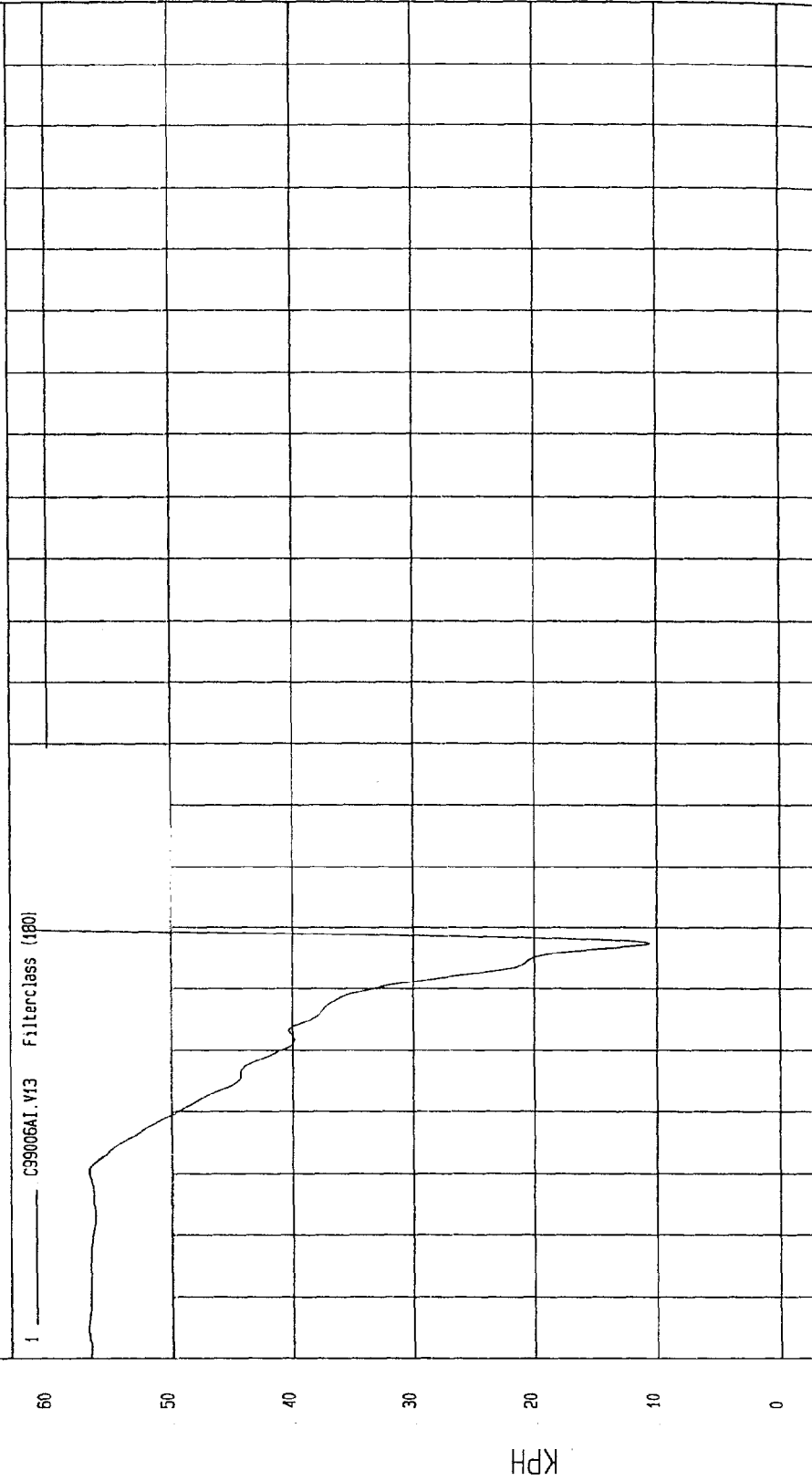
Speed: 35.06 MPH 56.4 KPH

COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = 5308.58 KPH at 200 msec

Minimum = 10.57 KPH at 48 msec

RIGHT FRONT BRAKE CALIPER X VELOCITY



TIME Seconds

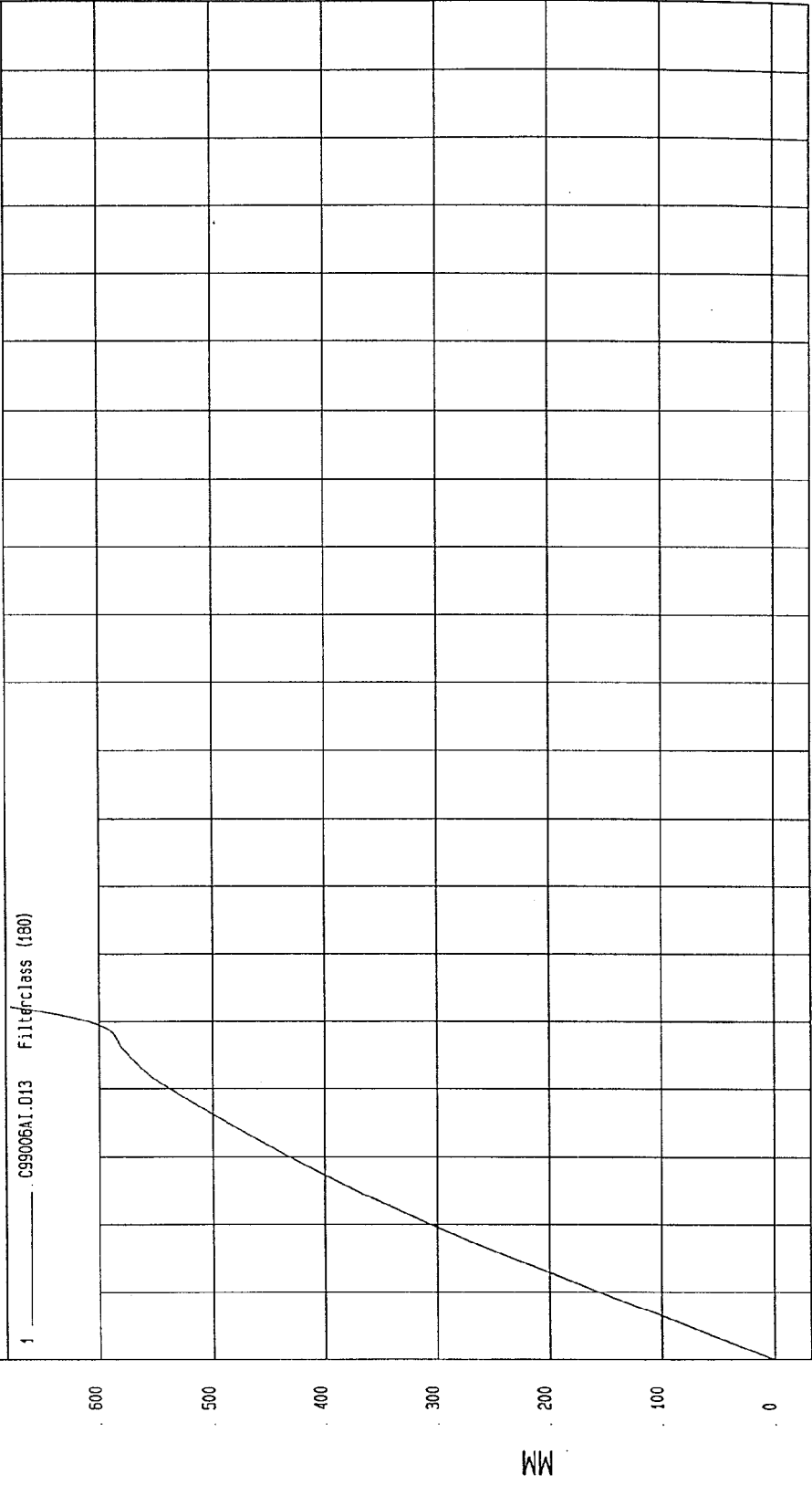
NCA Research
01-28-1999 16:17

TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = 0 MM at 0 msec Maximum = 112715.6 MM at 200 msec

RIGHT FRONT BRAKE CALIPER X DISPLACEMENT

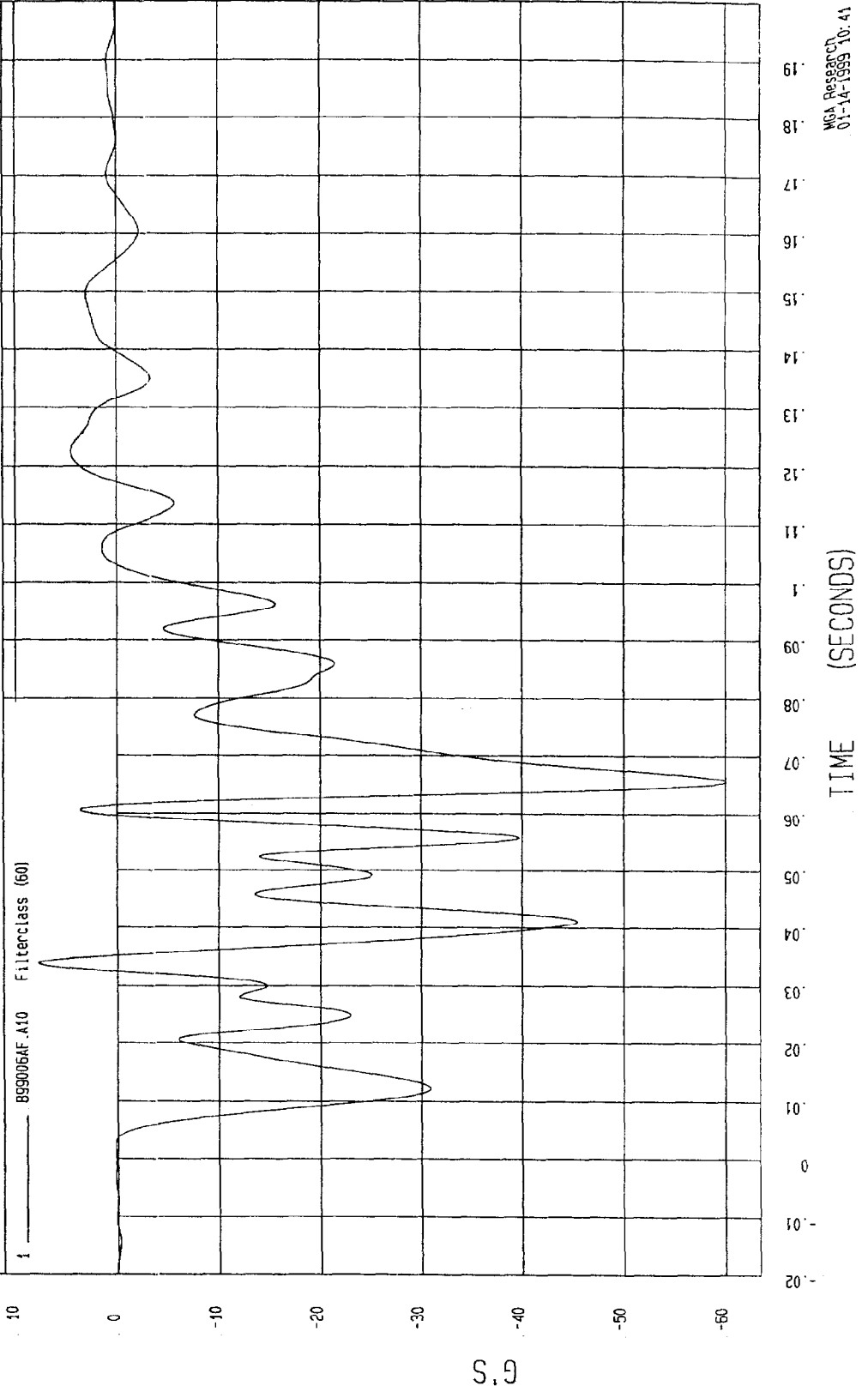


TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

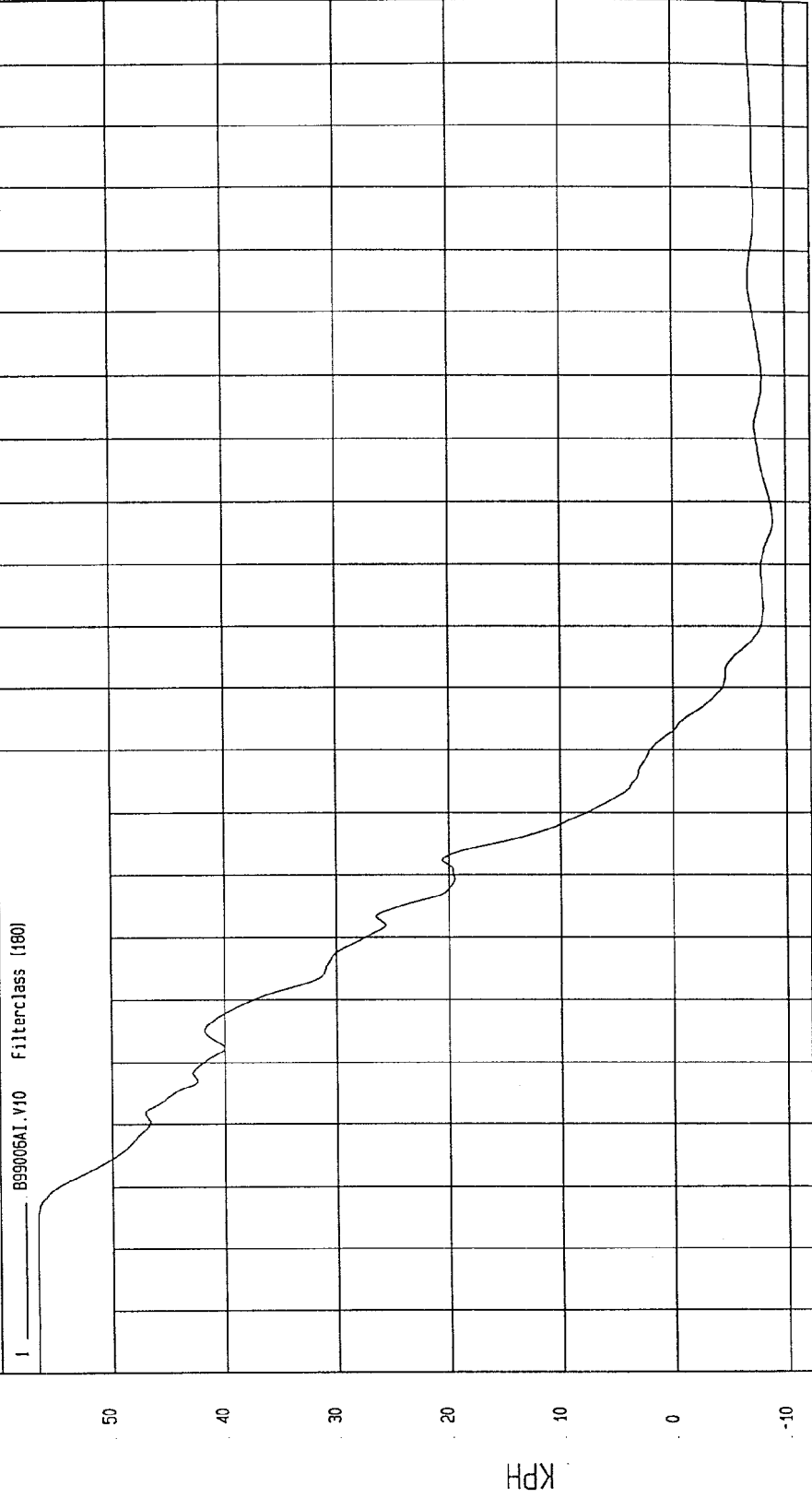
Minimum = -60.06 G'S at 66 msec Maximum = 7.82 G'S at 34 msec

INSTRUMENT PANEL X ACCELERATION



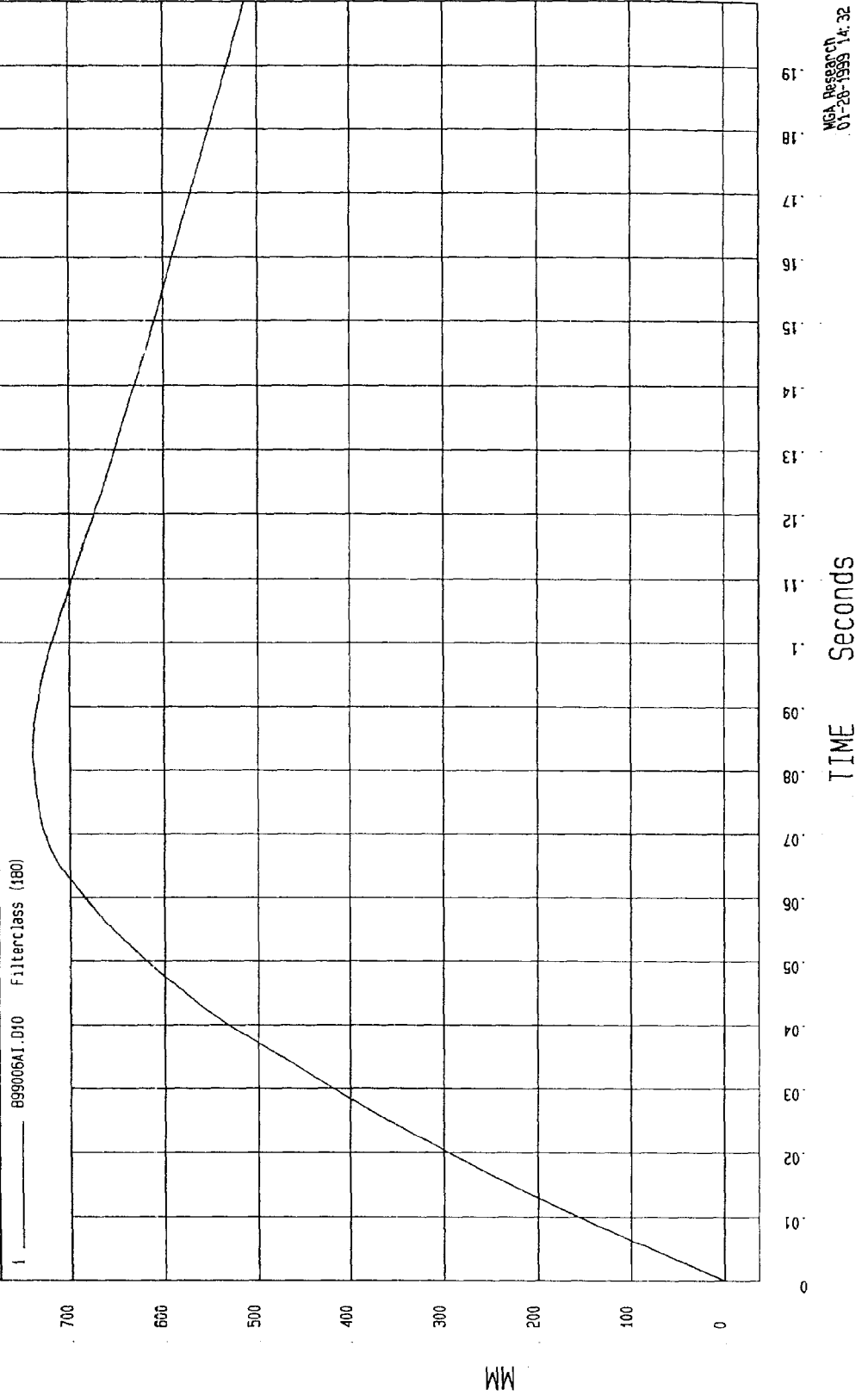
TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999
COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH
Minimum = -8.88 KPH at 117 msec Maximum = 56.61 KPH at 0 msec

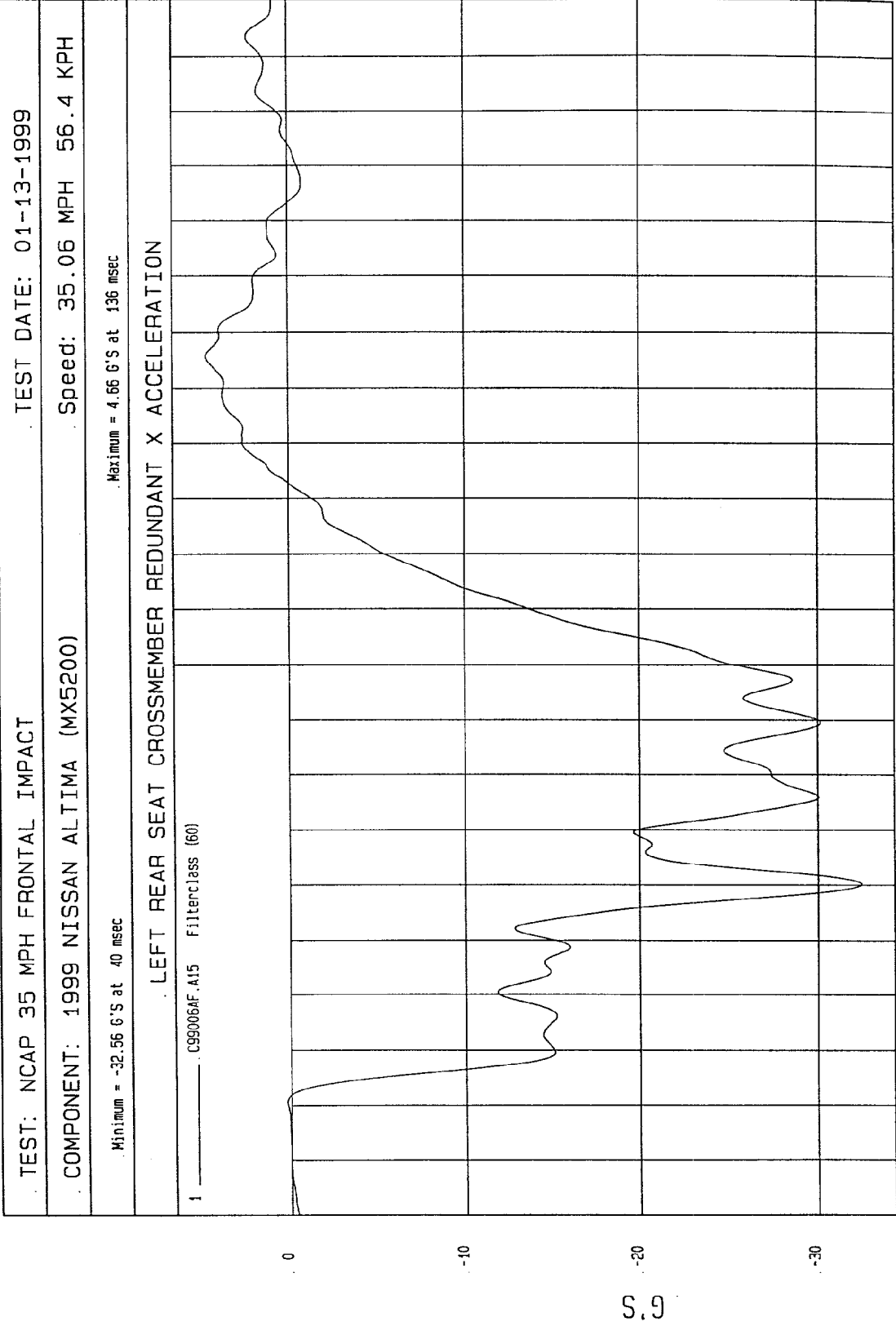
INSTRUMENT PANEL X VELOCITY



TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999
COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH
Minimum = 0 MM at 0 msec Maximum = 739.32 MM at 83 msec

INSTRUMENT PANEL X DISPLACEMENT





TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 01-13-1999

Speed: 35.06 MPH 56.4 KPH

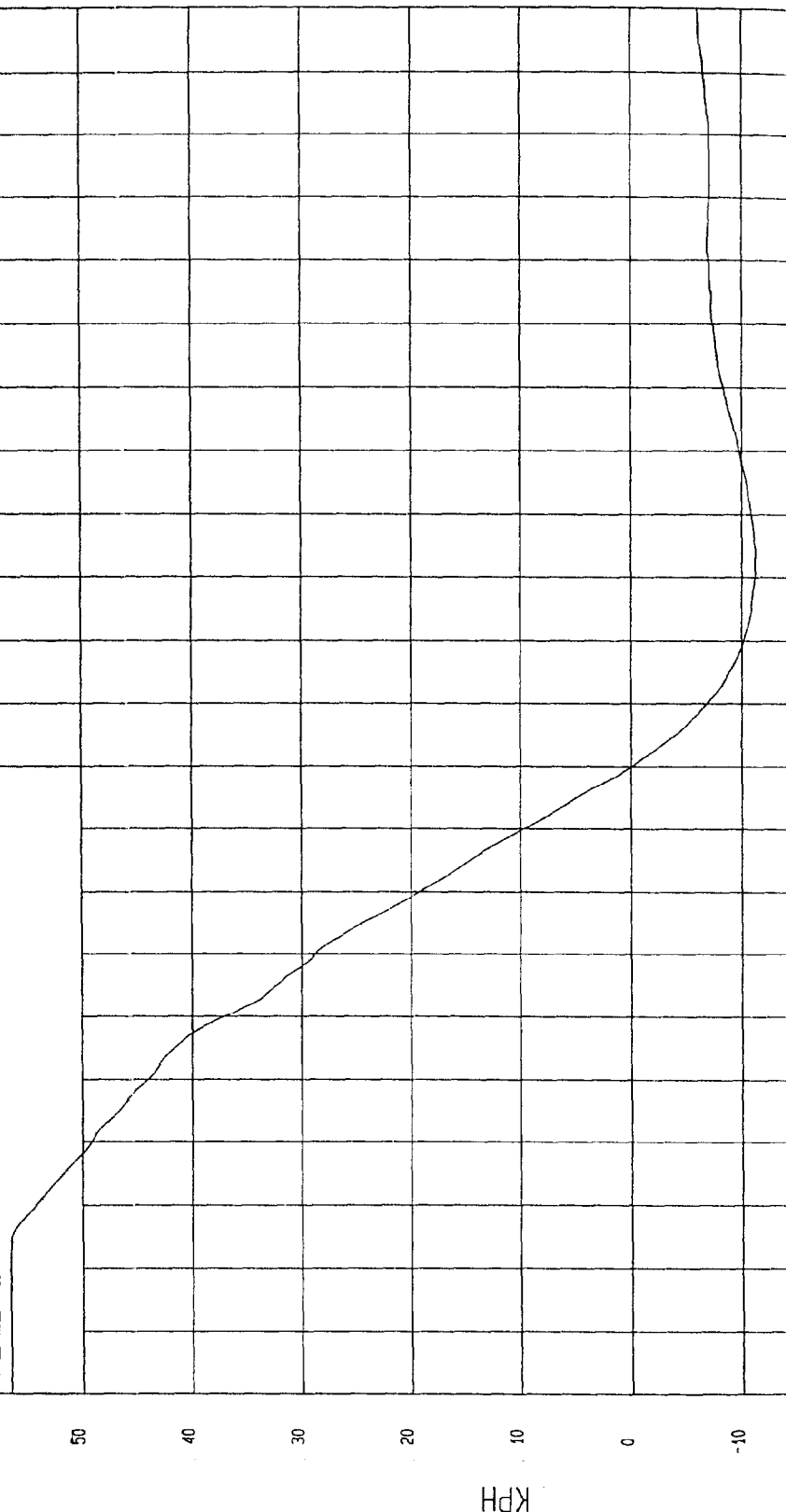
COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = 56.6 KPH at -20 msec

Minimum = -11.27 KPH at 114 msec

LEFT REAR SEAT CROSSMEMBER REDUNDANT X VELOCITY

1 C99006A1.V15 Filterclass (180)



W&A Research
01-26-1999 16:11

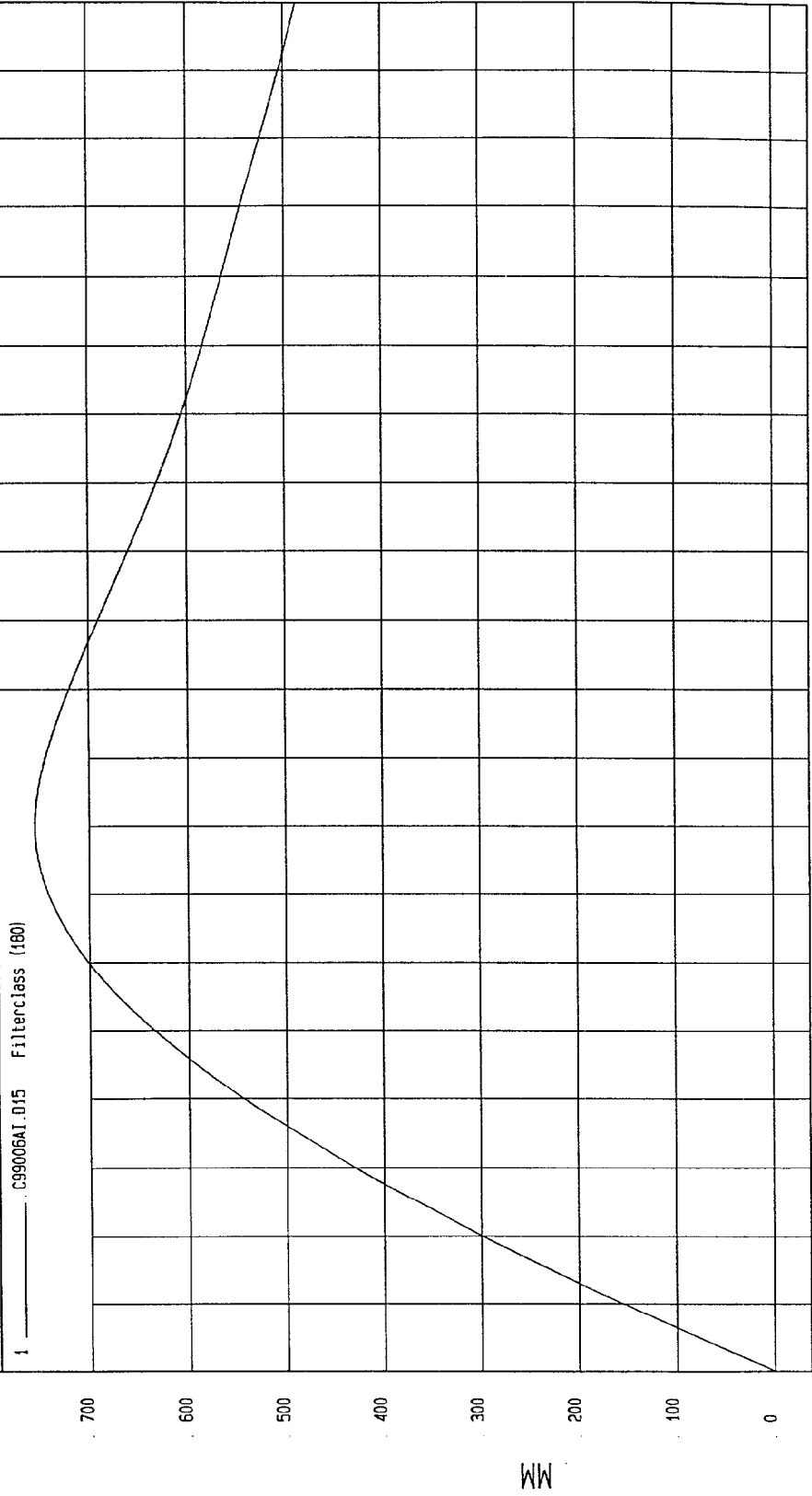
TIME Seconds

TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = 0 MM at 0 msec Maximum = 755.09 MM at 80 msec

LEFT REAR SEAT CROSSMEMBER REDUNDANT X DISPLACEMENT

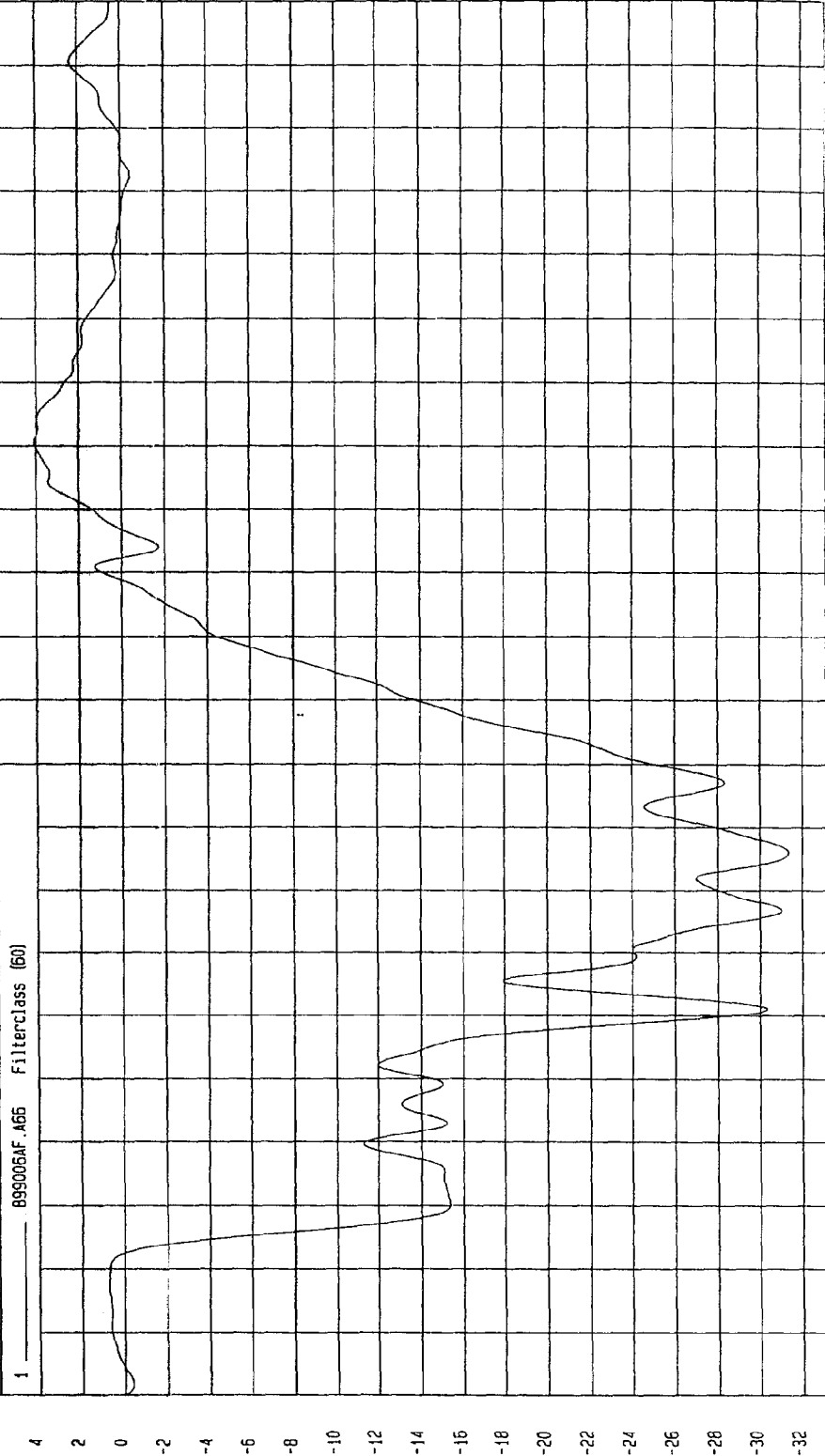


TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -31.35 G's at 66 msec Maximum = 4.16 G's at 131 msec

RIGHT REAR SEAT CROSSMEMBER REDUNDANT X ACCELERATION



TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

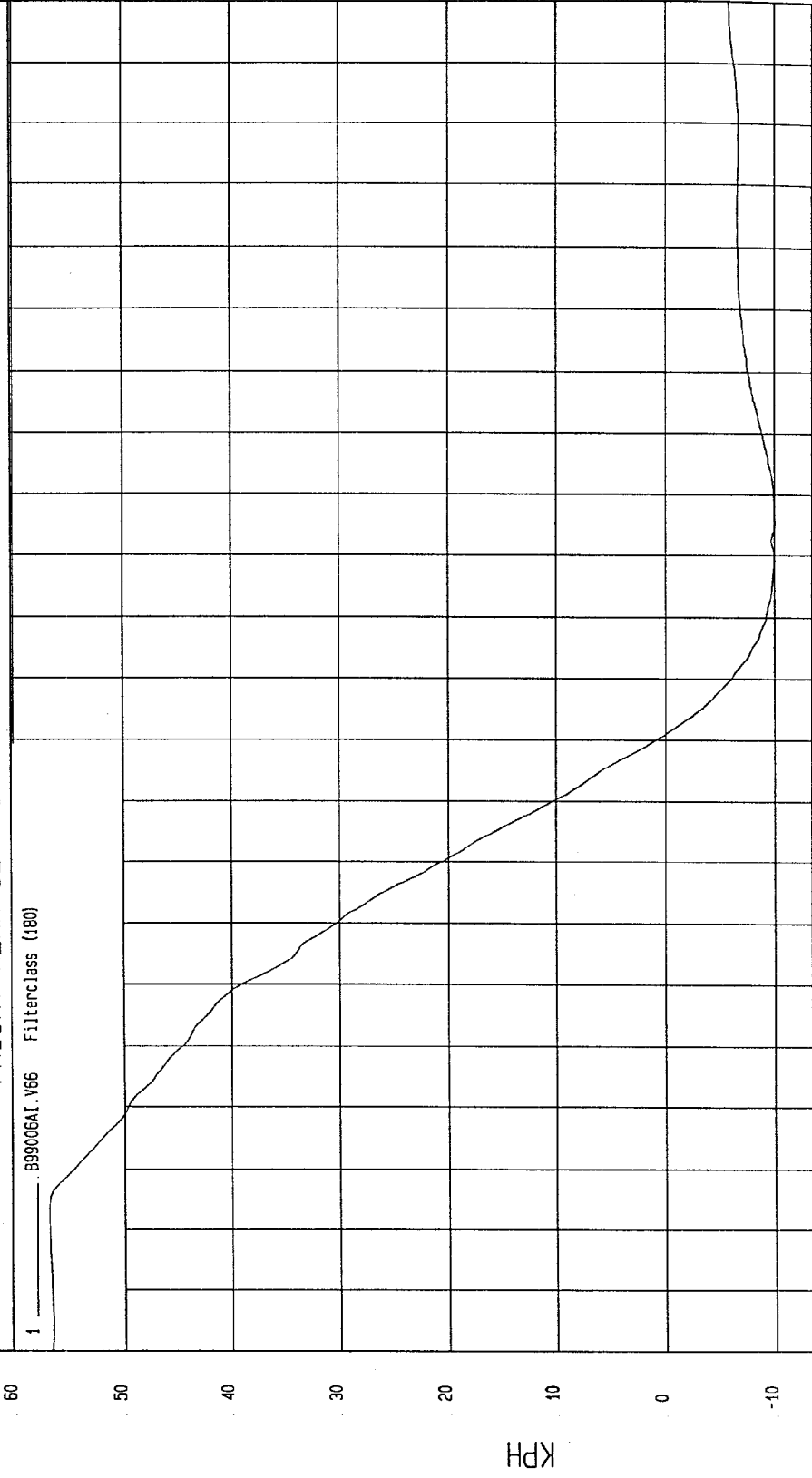
Speed: 35.06 MPH 56.4 KPH

COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = 56.87 KPH at 3 msec

Minimum = -10.04 KPH at 115 msec

RIGHT REAR SEAT CROSSMEMBER REDUNDANT X VELOCITY



TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

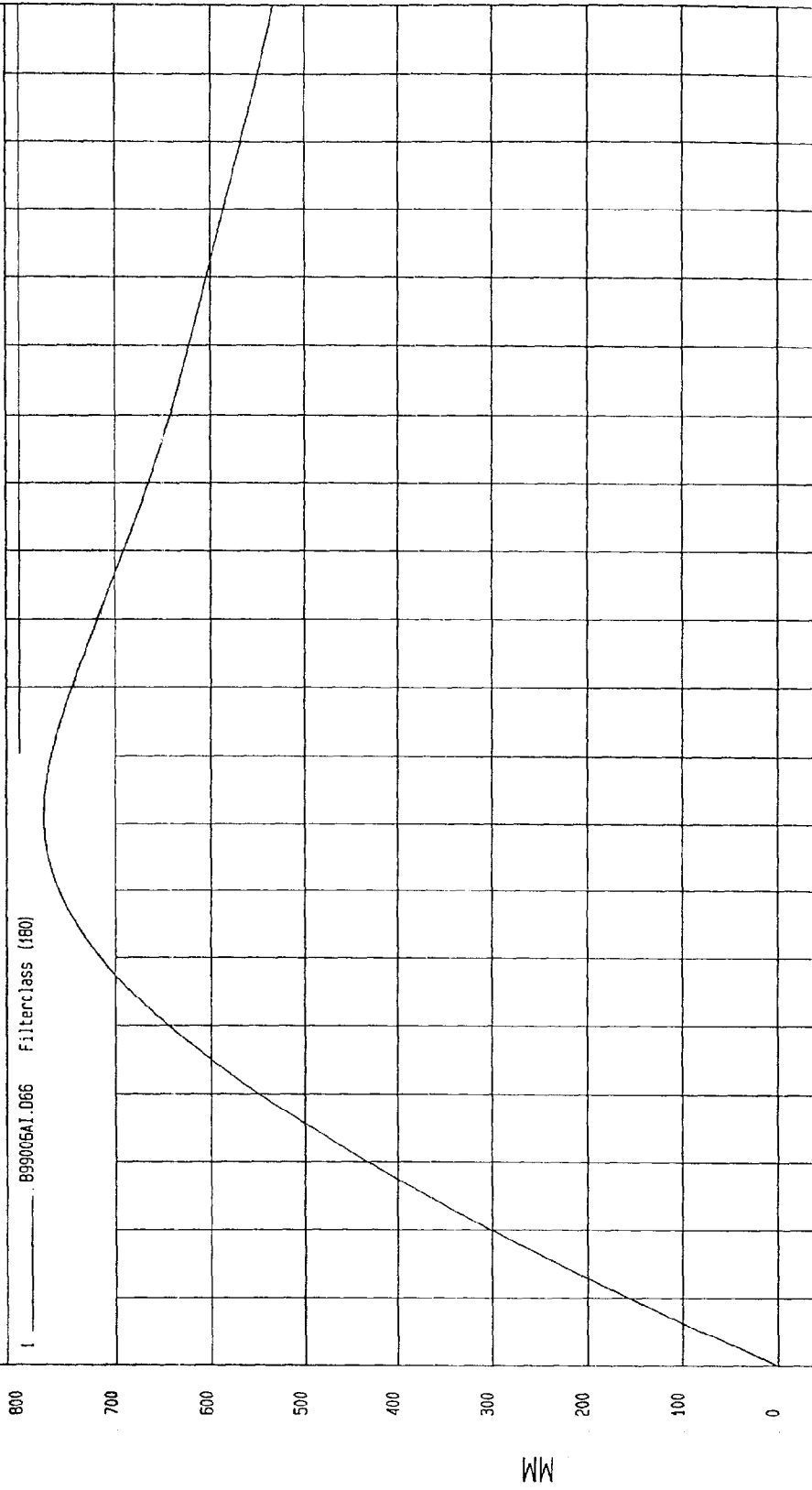
SPEED: 35.06 MPH 56.4 KPH

Maximum = 775.32 MM at 81 msec

RIGHT REAR SEAT CROSSMEMBER REDUNDANT X DISPLACEMENT

Minimum = 0 MM at 0 msec

1 899006A1.D66 Filterclass (180)



TIME Seconds

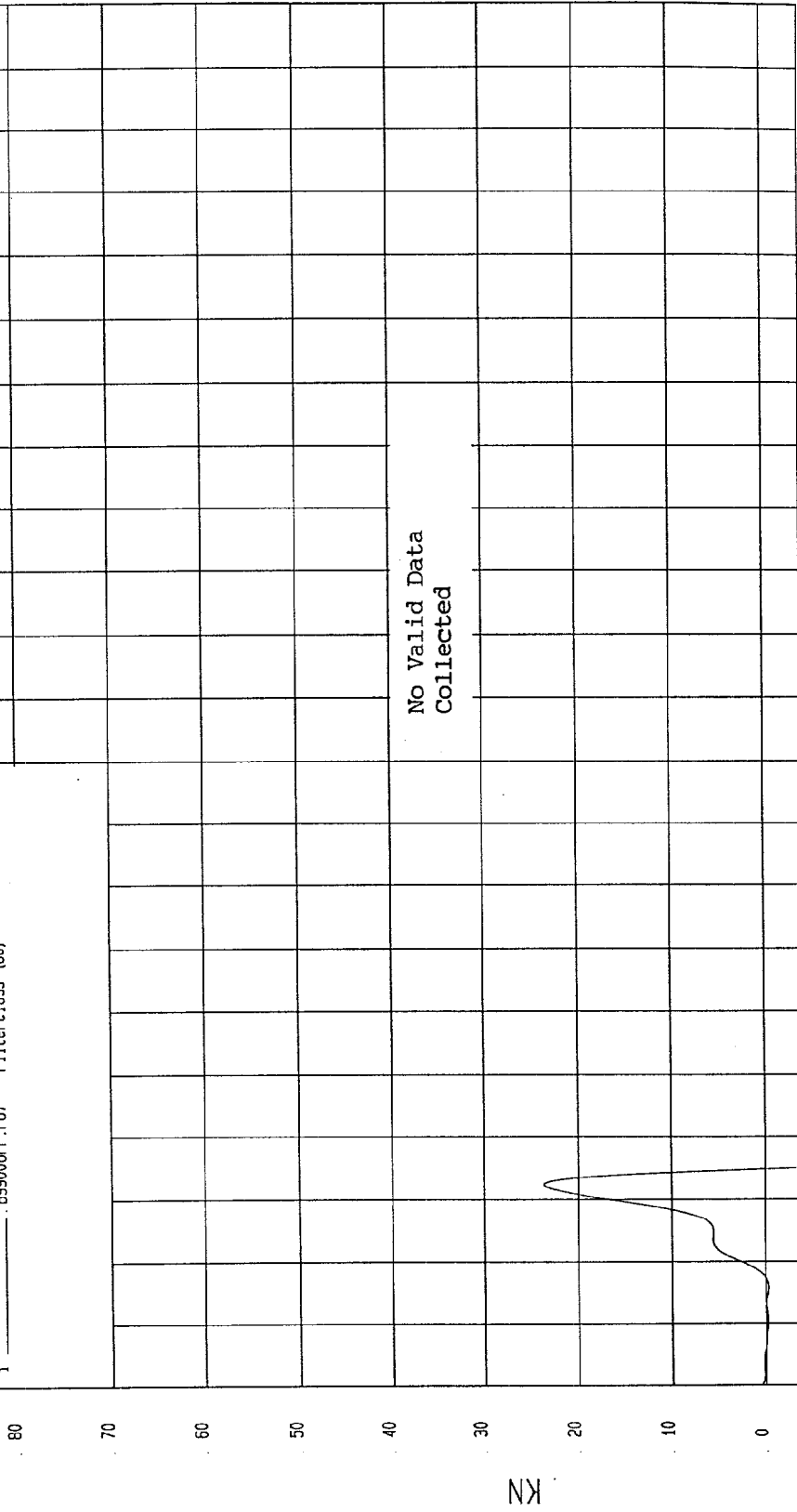
TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -81.69 KN at 20 msec Maximum = 23.68 KN at 12 msec

UPPER LEFT BARRIER FORCE

1 _____ B99006FF.F67 Filterclass (60)



TIME (SECONDS)

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

WCA Research
01-28-1999 16:25

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -37.5 KN at 20 msec Maximum = 28.44 KN at 12 msec

UPPER CENTER BARRIER FORCE

1 899006FF.F68 Filterclass (60)

KN

80
70
60
50
40
30
20
10
0

No Valid Data
Collected

TIME (SECONDS)

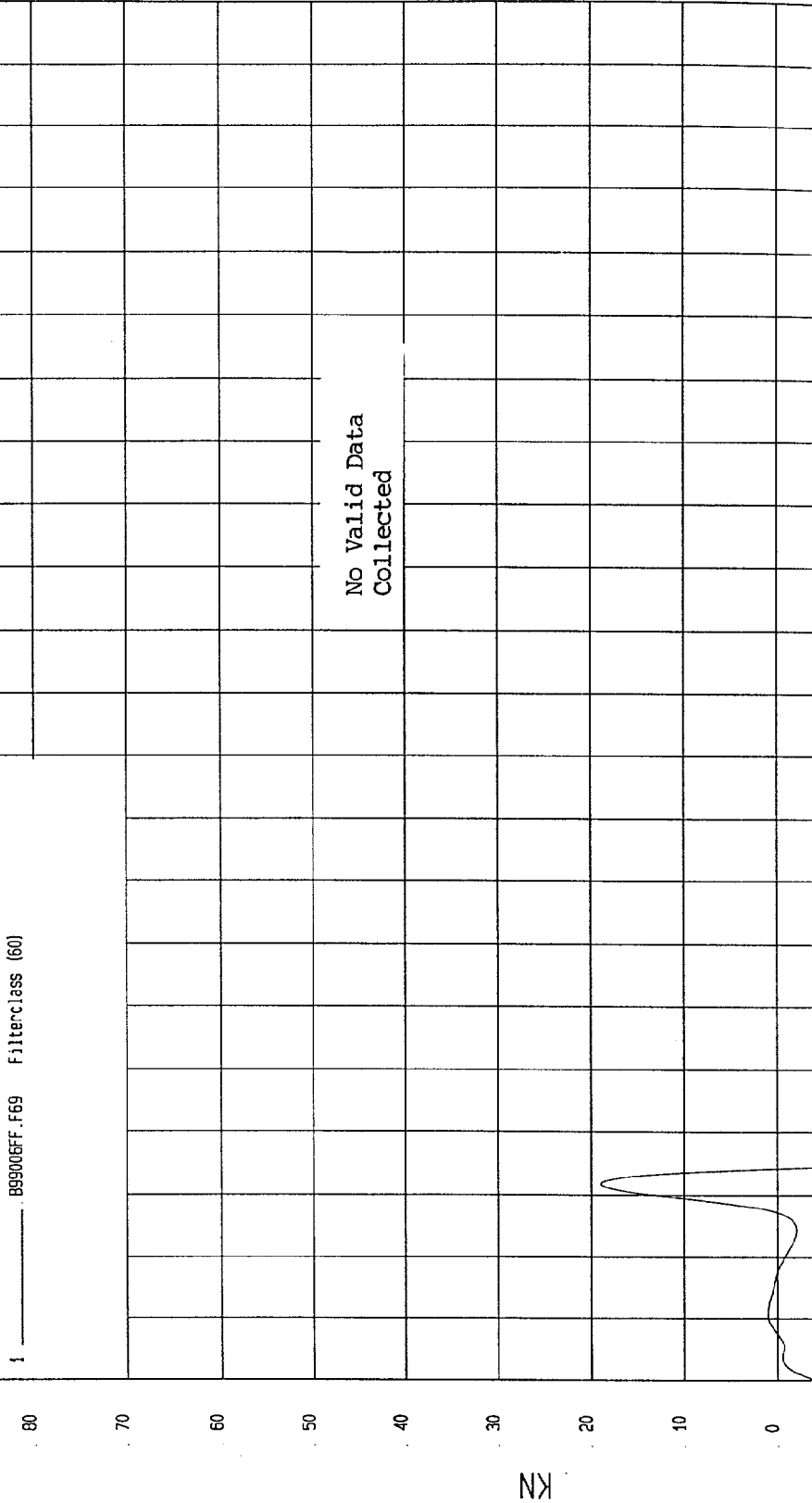
0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1 0.11 0.12 0.13 0.14 0.15 0.16 0.17 0.18 0.19

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -73.59 KN at 20 msec Maximum = 18.95 KN at 12 msec

UPPER RIGHT BARRIER FORCE

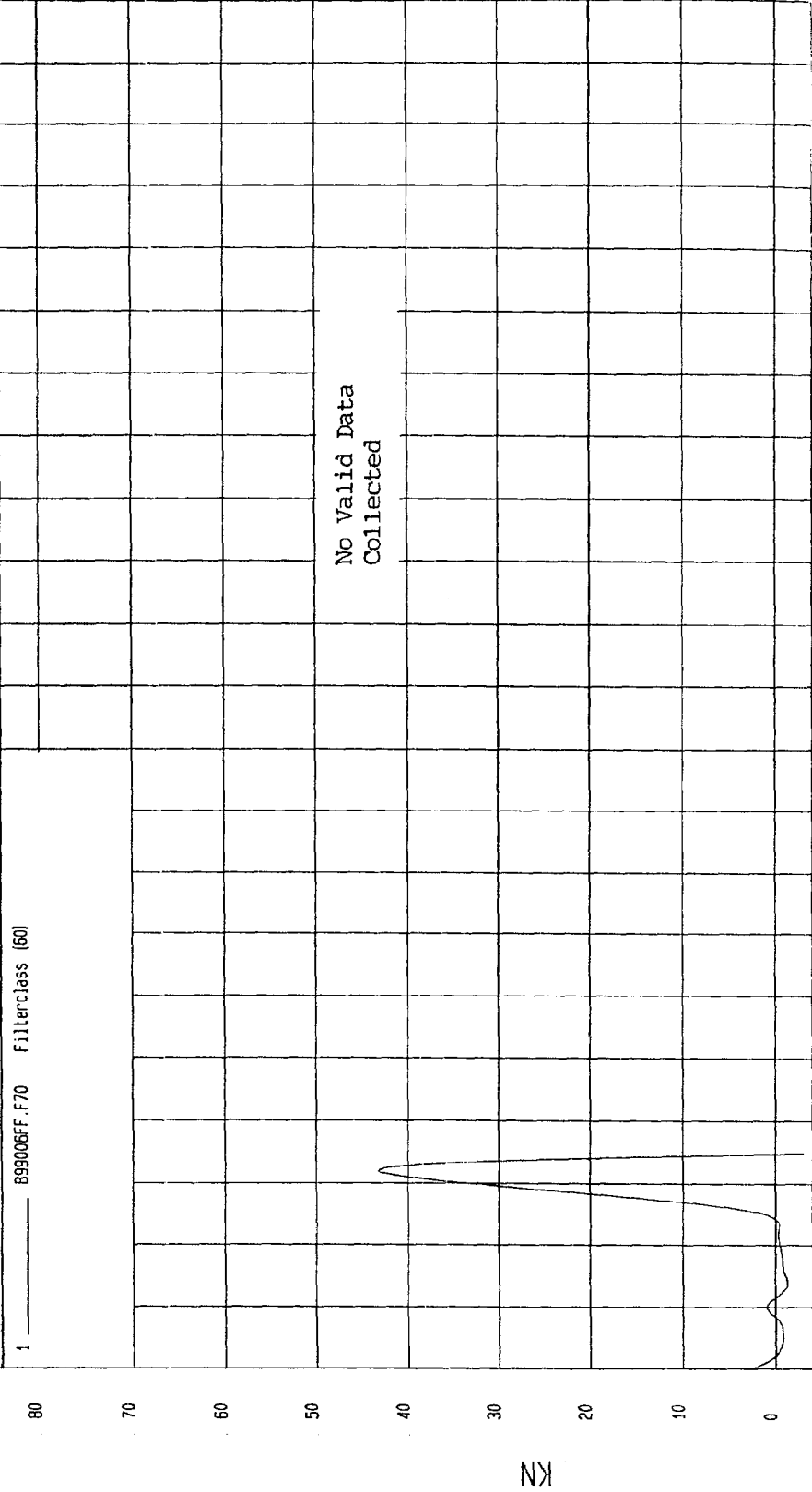


TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -79.01 KN at 19 msec Maximum = 43.24 KN at 12 msec

LOWER LEFT BARRIER FORCE



TIME (SECONDS)

WGL Research
01-28-1999 16:25

TEST: NCAP 35 MPH FRONTAL IMPACT TEST TEST DATE: 01-13-1999

COMPONENT: 1999 NISSAN ALTIMA (MX5200) Speed: 35.06 MPH 56.4 KPH

Minimum = -77.46 KN at 19 msec Maximum = 77.33 KN at 9 msec

LOWER CENTER BARRIER FORCE

1 899006FF.F71 Filterclass (60)

No Valid Data
Collected

KN

TIME (SECONDS)

WCA Research
01-28-1999 16:25

TEST: NCAP 35 MPH FRONTAL IMPACT TEST

TEST DATE: 01-13-1999

Speed: 35.06 MPH 56.4 KPH

COMPONENT: 1999 NISSAN ALTIMA (MX5200)

Maximum = 69.7 KN at 12 msec

Minimum = -49.77 KN at 20 msec

LOWER RIGHT BARRIER FORCE

1 B99006FF.F72 Filterclass (60)

80

70

60

50

40

30

20

10

0

KN

No Valid Data
Collected

19

18

17

16

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

-02

TIME (SECONDS)

NSA Research
01-28-1999 16:25

APPENDIX C
DUMMY CONFIGURATION & PERFORMANCE VERIFICATION DATA

HYBRID III DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 066 DUMMY CALIBRATION BY: Tim Michnay

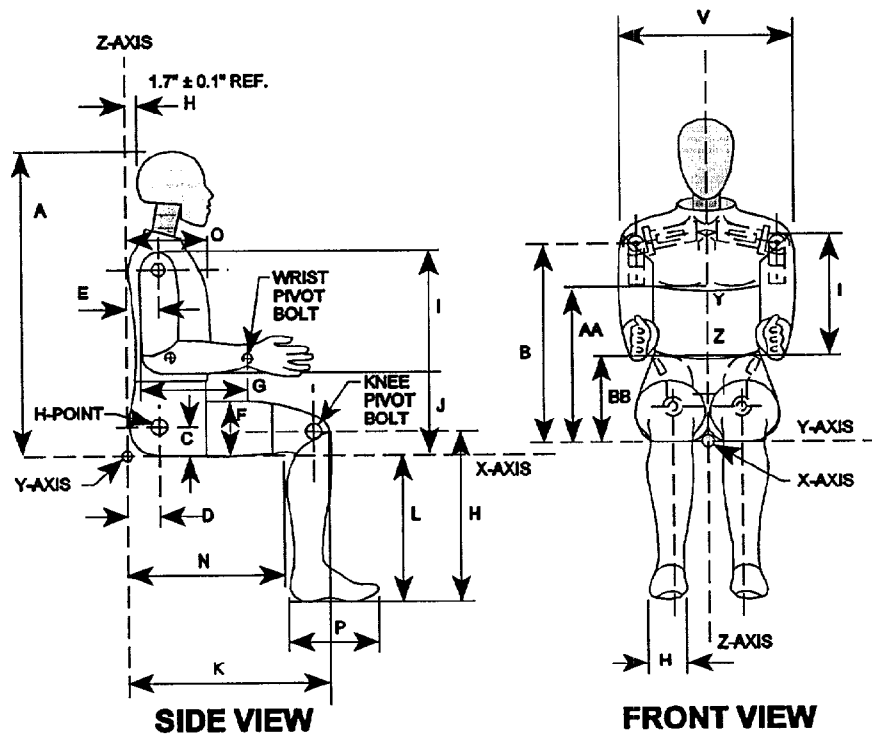
I. CONFIGURATION VERIFICATION DATA

DATE OF VERIFICATION: January 10, 1999

DESCRIPTION	SPECIFICATION (Inches)	ACTUAL MEASUREMENT (inches)
A - Total Sitting Height	34.6 - 35.0	34.8
B - Shoulder Pivot Height	19.9 - 20.5	20.1
C - "H" Point Height	3.3 - 3.5	3.4
D - "H" Point from Seat Back	5.3 - 5.5	5.4
E - Shoulder Pivot From Backline	3.3 - 3.7	3.4
F - Thigh Clearance	5.5 - 6.1	5.9
G - Back of Elbow to Wrist Pivot	11.4 - 12.0	11.7
H - Skull Cap Skin to Backline	1.6 - 1.8	1.7
I - Shoulder Elbow Length	13.0 - 13.6	13.4
J - Elbow Rest Height	7.5 - 8.3	8.1
K - Buttock Knee Length	22.8 - 23.8	23.5
L - Popliteal Height	16.9 - 17.9	17.6
M - Knee Pivot Height	19.1 - 19.9	19.5
N - Buttock Popliteal Length	17.8 - 18.8	18.2
O - Chest Depth at 3rd Rib	8.4 - 9.0	8.8
P - Foot Length	9.9 - 10.5	10.4
V - Shoulder Breadth	16.6 - 17.2	16.9
W - Foot Breadth	3.5 - 4.2	4.0
Y - Chest Circumference	38.2 - 39.4	39.1
Z - Waist Circumference	32.9 - 34.1	33.5

Note: (See next page for external dimensions)

HYBRID III EXTERNAL DIMENSIONS



Note: Figure is referenced to the erect seated position. The curved lumbar does not allow the hybrid III to be positioned in a perfect erect attitude.

HYBRID III DUMMY CALIBRATION DATA SUMMARY SHEET

DUMMY NO.: 066 DUMMY CALIBRATION BY: Tim MichnayVERIFICATION DATE: January 10, 1999VERIFICATION LABORATORY TEMPERATURE (66° - 78°): 70°

1.0 HEAD DROP TEST

	SPECIFICATION	MEASUREMENT
Peak Resultant Acceleration	225 - 275 G	269
Peak Lateral Acceleration	15 G. MAX	-14
Is Acceleration Curve Unimodal	within 10% of peak	Yes

2.0 NECK FLEXION TEST

		SPECIFICATION	MEASUREMENT
Pendulum Speed		22.6 - 23.4 FT/SEC	22.8
Pendulum Deceleration	10 MS	22.50 - 27.50 G	24.00
	20 MS	17.60 - 22.60 G	19.93
	30 MS	12.50 - 18.50 G	14.11
Max. Pendulum G Above 30 MS		29.0 G MAX	14.1
Deceleration - Time Curve Decay Time to 5 G		34 - 42 MS	41
D Plane Rotation	MAX	64 - 78 DEG.	66
	TIME	57 - 64 MS	59
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 MS	120
Moment About Occipital Condyle	MAX.	65 - 80 FT.LBS	67
	TIME	47 - 58 MS	54
Positive Moment - Time Curve Decay Time to Zero		97 - 107 MS	105

HYBRID III DUMMY CALIBRATION DATA SUMMARY SHEET (CONT.)

3.0 NECK EXTENSION TEST

		SPECIFICATION	MEASUREMENT
Pendulum Speed		19.50 - 20.30 F/S	19.87
Pendulum Deceleration	10 MS	17.20 - 21.20 G	18.73
	20 MS	14.00 - 19.00 G	15.15
	30 MS	11.00 - 16.00 G	13.64
Max. Pendulum G Above 30 MS		22 G Max	14
Deceleration - Time Curve Decay Time to 5 G		38 - 46 MS	43
D Plane Rotation	MAX	81 - 106 DEG.	93
	TIME	72 - 82 MS	78
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 MS	160
Moment About Occipital Condyle	MIN.	-59.0/-39.0 FT LBS	-48.0
	TIME	65 - 79 MS	74
Positive Moment - Time Curve Decay Time to Zero		120 - 148 MS	143

4.0 CHEST IMPACT TESTS

	SPECIFICATION	MEASUREMENT
Probe Speed	21.6 to 22.4 F/S	22.1
Peak Deflection	2.50 to 2.86 IN.	2.67
Peak Resistive Force	1160 to 1325 LBS.	1232
Internal Hysteresis	69 to 85%	71%

HYBRID III DUMMY CALIBRATION DATA SUMMARY SHEET (CONT.)

5.0 KNEE IMPACT TESTS

RIGHT KNEE	SPECIFICATION	MEASUREMENT
Probe Speed	6.8 to 7.0 F/S	6.9
Maximum Force	1060 - 1300 LBS.	1082

LEFT KNEE	SPECIFICATION	MEASUREMENT
Probe Speed	6.8 to 7.0 F/S	6.9
Maximum Force	1060 - 1300 LBS.	1073

6.0 HIP JOINT-FEMUR FLEXION TEST

LEFT KNEE	SPECIFICATION	MEASUREMENT	
		LEFT	RIGHT
Relative Humidity	10 - 70%	14%	
Rotation Rate	5-10 DEG/SEC.	Yes	Yes
30 DEGREE MAX. ROTATION	70 FT-LBF	59	45
150 FT-LBF	40-50 DEGREE MAX. ROTATION	42°	43°

HYBRID III DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 065 DUMMY CALIBRATION BY: Tim Michnay

I. CONFIGURATION VERIFICATION DATA

DATE OF VERIFICATION: January 10, 1999

DESCRIPTION	SPECIFICATION (Inches)	ACTUAL MEASUREMENT (inches)
A - Total Sitting Height	34.6 - 35.0	34.7
B - Shoulder Pivot Height	19.9 - 20.5	20.2
C - "H" Point Height	3.3 - 3.5	3.4
D - "H" Point from Seat Back	5.3 - 5.5	5.4
E - Shoulder Pivot From Backline	3.3 - 3.7	3.5
F - Thigh Clearance	5.5 - 6.1	5.8
G - Back of Elbow to Wrist Pivot	11.4 - 12.0	11.6
H - Skull Cap Skin to Backline	1.6 - 1.8	1.7
I - Shoulder Elbow Length	13.0 - 13.6	13.5
J - Elbow Rest Height	7.5 - 8.3	8.0
K - Buttock Knee Length	22.8 - 23.8	23.4
L - Popliteal Height	16.9 - 17.9	17.7
M - Knee Pivot Height	19.1 - 19.9	19.5
N - Buttock Popliteal Length	17.8 - 18.8	18.5
O - Chest Depth at 3rd Rib	8.4 - 9.0	8.9
P - Foot Length	9.9 - 10.5	10.4
V - Shoulder Breadth	16.6 - 17.2	16.8
W - Foot Breadth	3.5 - 4.2	4.0
Y - Chest Circumference	38.2 - 39.4	39.0
Z - Waist Circumference	32.9 - 34.1	33.8

Note: (See page C-2 for external dimensions)

HYBRID III DUMMY CALIBRATION DATA SUMMARY SHEET (CONT.)

DUMMY NO.: 065 DUMMY CALIBRATION BY: Tim Michnay

VERIFICATION DATE: _____

VERIFICATION LABORATORY TEMPERATURE (66° - 78°): 70°

1.0 HEAD DROP TEST

	SPECIFICATION	MEASUREMENT
Peak Resultant Acceleration	225 - 275 G	257
Peak Lateral Acceleration	15 G. MAX	6
Is Acceleration Curve Unimodal	within 10% of peak	Yes

2.0 NECK FLEXION TEST

		SPECIFICATION	MEASUREMENT
Pendulum Speed		22.6 - 23.4 FT/SEC	23.0
Pendulum Deceleration	10 MS	22.50 - 27.50 G	24.93
	20 MS	17.60 - 22.60 G	20.86
	30 MS	12.50 - 18.50 G	14.62
Max. Pendulum G Above 30 MS		29.0 G MAX	14.6
Deceleration - Time Curve Decay Time to 5 G		34 - 42 MS	38
D Plane Rotation	MAX	64 - 78 DEG.	75
	TIME	57 - 64 MS	61
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 MS	119
Moment About Occipital Condyle	MAX.	65 - 80 FT.LBS	66
	TIME	47 - 58 MS	51
Positive Moment - Time Curve Decay Time to Zero		97 - 107 MS	106

HYBRID III DUMMY CALIBRATION DATA SUMMARY SHEET (CONT.)

3.0 NECK EXTENSION TEST

		SPECIFICATION	MEASUREMENT
Pendulum Speed		19.50 - 20.30 F/S	19.79
Pendulum Deceleration	10 MS	17.20 - 21.20 G	20.75
	20 MS	14.00 - 19.00 G	16.34
	30 MS	11.00 - 16.00 G	12.97
Max. Pendulum G Above 30 MS		22 G Max	13
Deceleration - Time Curve Decay Time to 5 G		38 - 46 MS	41
D Plane Rotation	MAX	81 - 106 DEG.	101
	TIME	72 - 82 MS	77
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 MS	159
Moment About Occipital Condyle	MIN.	-59.0/-39.0 FT LBS	-49.3
	TIME	65 - 79 MS	73
Positive Moment - Time Curve Decay Time to Zero		120 - 148 MS	139

4.0 CHEST IMPACT TESTS

	SPECIFICATION	MEASUREMENT
Probe Speed	21.6 to 22.4 F/S	22.1
Peak Deflection	2.50 to 2.86 IN.	2.63
Peak Resistive Force	1160 to 1325 LBS.	1245
Internal Hysteresis	69 to 85%	74%

HYBRID III DUMMY CALIBRATION DATA SUMMARY SHEET (CONT.)

5.0 KNEE IMPACT TESTS

RIGHT KNEE	SPECIFICATION	MEASUREMENT
Probe Speed	6.8 to 7.0 F/S	6.8
Maximum Force	1060 - 1300 LBS.	1069

LEFT KNEE	SPECIFICATION	MEASUREMENT
Probe Speed	6.8 to 7.0 F/S	7.0
Maximum Force	1060 - 1300 LBS.	1065

6.0 HIP JOINT-FEMUR FLEXION TEST

LEFT KNEE	SPECIFICATION	MEASUREMENT	
		LEFT	RIGHT
Relative Humidity	10 - 70%	14%	
Rotation Rate	5-10 DEG/SEC.	Yes	Yes
30 DEGREE ROTATION	70 FT-LBF	69	42
150 FT-LBF	40-50 degree maximum rotation	41°	46°

APPENDIX D
TEST EQUIPMENT & INSTRUMENTATION CALIBRATION

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION
INSTRUMENTS FOR DUMMY NO. 066

	DRIVER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	ACCY6	Endevco	January 7, 1999
Head Y	ACCH1	Endevco	January 7, 1999
Head Z	AAMW5	Endevco	January 7, 1999
Head X Redundant	AJ9D2	Endevco	January 7, 1999
Head Y Redundant	AH1E2	Endevco	January 7, 1999
Head Z Redundant	AJ7K3	Endevco	January 7, 1999
Chest X	ACCY1	Endevco	January 7, 1999
Chest Y	ACCC8	Endevco	January 7, 1999
Chest Z	ACCT7	Endevco	January 7, 1999
Chest X Redundant	AJ9D4	Endevco	January 7, 1999
Chest Y Redundant	AJ9F3	Endevco	January 7, 1999
Chest Z Redundant	AJ9D9	Endevco	January 7, 1999
Right Femur Load Cell	261	Denton	January 11, 1999
Left Femur Load Cell	262	Denton	January 11, 1999
Pelvis X	AJ9H0	Endevco	January 8, 1999
Pelvis Y	ANAN3	Endevco	January 8, 1999
Pelvis Z	ANAN6	Endevco	January 8, 1999

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENTS FOR DUMMY NO. 066

	DRIVER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Neck Load Cell X	443	Denton	October 14, 1998
Neck Load Cell Y	443	Denton	October 14, 1998
Neck Load Cell Z	443	Denton	October 14, 1998
Neck Moment X	443	Denton	October 14, 1998
Neck Moment Y	443	Denton	October 14, 1998
Neck Moment Z	443	Denton	October 14, 1998
Chest Deflection Gauge	66	Servo	January 10, 1999
Lap Belt Load Cell	314	Denton	October 14, 1998
Shoulder Belt Load Cell	313	Denton	October 5, 1998

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION
INSTRUMENTS FOR DUMMY NO. 066

	DRIVER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Right Tibia Moment X	106	Denton	December 3, 1998
Upper Right Tibia Moment Y	106	Denton	December 3, 1998
Upper Right Tibia Force Z	106	Denton	December 3, 1998
Lower Right Tibia Moment X	135	Denton	December 4, 1998
Lower Right Tibia Moment Y	135	Denton	December 4, 1998
Lower Right Tibia Force Z	135	Denton	December 4, 1998
Upper Left Tibia Moment X	109	Denton	December 3, 1998
Upper Left Tibia Moment Y	109	Denton	December 3, 1998
Upper Left Tibia Force Z	109	Denton	December 3, 1998
Lower Left Tibia Moment X	138	Denton	December 5, 1998
Lower Left Tibia Moment Y	138	Denton	December 5, 1998
Lower Left Tibia Force Z	138	Denton	December 5, 1998
Left Foot Ball Z Acceleration	J18925	Endevco	October 20, 1998
Left Heel X Acceleration	AP0T3	Endevco	July 22, 1998
Left Heel Z Acceleration	AP122	Endevco	October 20, 1998
Right Foot Ball Z Acceleration	AGMT2	Endevco	July 22, 1998
Right Heel X Acceleration	AJ837	Endevco	July 22, 1998
Right Heel Z Acceleration	AH0A2	Endevco	July 22, 1998

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENTS FOR DUMMY NO. 065

	PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	AAMN8	Endevco	January 8, 1999
Head Y	ACC61	Endevco	January 8, 1999
Head Z	ACCW9	Endevco	January 8, 1999
Head X Redundant	AJ621	Endevco	January 8, 1999
Head Y Redundant	AJ619	Endevco	January 8, 1999
Head Z Redundant	AHY54	Endevco	January 8, 1999
Chest X	ACC78	Endevco	January 8, 1999
Chest Y	ACCE6	Endevco	January 8, 1999
Chest Z	ACCY3	Endevco	January 8, 1999
Chest X Redundant	AJ7A2	Endevco	January 8, 1999
Chest Y Redundant	AJ819	Endevco	January 8, 1999
Chest Z Redundant	AJ9J7	Endevco	January 8, 1999
Right Femur Load Cell	259	Denton	January 11, 1999
Left Femur Load Cell	260	Denton	January 11, 1999
Pelvis X	J20298	Endevco	January 8, 1999
Pelvis Y	J17709	Endevco	January 8, 1999
Pelvis Z	J20473	Endevco	January 8, 1999

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENTS FOR DUMMY NO. 065

	PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Neck Load Cell X	442	Denton	October 14, 1998
Neck Load Cell Y	442	Denton	October 14, 1998
Neck Load Cell Z	442	Denton	October 14, 1998
Neck Moment X	442	Denton	October 14, 1998
Neck Moment Y	442	Denton	October 14, 1998
Neck Moment Z	442	Denton	October 14, 1998
Chest Deflection Gauge	65	Servo	January 10, 1999
Lap Belt Load Cell	690	Denton	July 14, 1998
Shoulder Belt Load Cell	624	Denton	July 14, 1998

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION
INSTRUMENTS FOR DUMMY NO. 065

	PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Right Tibia Moment X	103	Denton	December 3, 1998
Upper Right Tibia Moment Y	103	Denton	December 3, 1998
Upper Right Tibia Force Z	103	Denton	December 3, 1998
Lower Right Tibia Moment X	133	Denton	December 4, 1998
Lower Right Tibia Moment Y	133	Denton	December 4, 1998
Lower Right Tibia Force Z	133	Denton	December 4, 1998
Upper Left Tibia Moment X	105	Denton	December 3, 1998
Upper Left Tibia Moment Y	105	Denton	December 3, 1998
Upper Left Tibia Force Z	105	Denton	December 3, 1998
Lower Left Tibia Moment X	134	Denton	December 4, 1998
Lower Left Tibia Moment Y	134	Denton	December 4, 1998
Lower Left Tibia Force Z	134	Denton	December 4, 1998
Left Foot Ball Z Acceleration	J11548	Endevco	July 28, 1998
Left Heel X Acceleration	J10866	Endevco	July 28, 1998
Left Heel Z Acceleration	AP2D6	Endevco	July 28, 1998
Right Foot Ball Z Acceleration	J13653	Endevco	July 28, 1998
Right Heel X Acceleration	J13649	Endevco	July 28, 1998
Right Heel Z Acceleration	J13713	Endevco	July 28, 1998

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

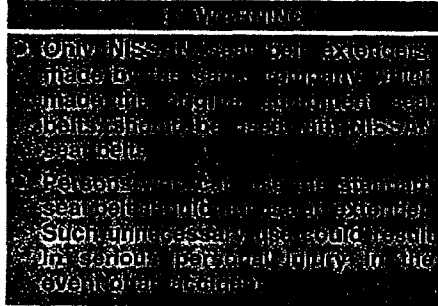
VEHICLE ACCELEROMETERS			
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Left Rear Seat Crossmember X	F07-A16	Entran	December 16, 1998
Right Rear Seat Crossmember X	F12-G06	Entran	December 15, 1998
Top of Engine Block X	K16-X10	Entran	August 27, 1998
Bottom of Engine X	A09-G09	Entran	December 15, 1998
Left Brake Caliper X	I14-D16	Entran	December 21, 1998
Right Brake Caliper X	E25-G07	Entran	December 21, 1998
Instrument Panel X	G01-J10	Entran	December 15, 1998
Redundant Left Rear Seat Crossmember X	F12-G09	Entran	December 21, 1998
Redundant Right Rear Seat Crossmember X	I26-D09	Entran	December 15, 1998

LABORATORY INSTRUMENTS			
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Neck Bending Pendulum Accelerometer	12871	Endevco	January 7, 1999
Neck Bending Head Rotary Potentiometer	018	Spectrol	August 5, 1998
Neck Bending Pendulum Rotary Potentiometer	019	Spectrol	August 5, 1998
Chest Probe Accelerometer	J13780	Endevco	January 7, 1999
Knee Impact Accelerometer	AMHP6	Entran	January 7, 1999

APPENDIX E
VEHICLE OWNER'S OCCUPANT RESTRAINT
SYSTEM INSTRUCTIONS

SEAT BELT EXTENDERS

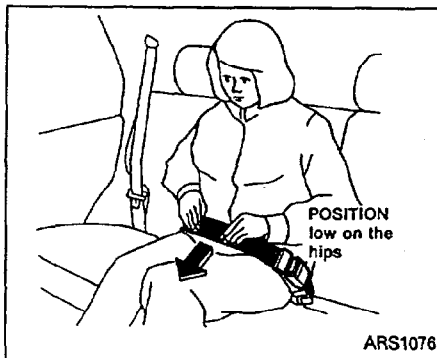
If, because of body size or driving position, it is not possible to properly fit the lap-shoulder belt and fasten it, an extender is available which is compatible with the installed seat belts. The extender adds approximately 8 inches (200 mm) of length and may be used for either the driver or front passenger seating position. See your NISSAN dealer for assistance if an extender is required.



SEAT BELT MAINTENANCE

- To clean the seat belt webbings, apply a mild soap solution or any solution recommended for cleaning upholstery or carpet. Then wipe with a cloth and allow the seat belts to dry in the shade. Do not allow the seat belts to retract until they are completely dry.
- If dirt builds up on the shoulder belt guide of the seat belt anchors, the seat belts may retract slowly. Wipe the shoulder belt guide with a clean, dry cloth.
- Periodically check to see that the seat belt and the metal components, such as buckles, tongues, retractors, flexible wires and anchors, work properly. If loose parts, deterioration, cuts or other damage on the webbing is found, the entire seat belt assembly should be replaced.

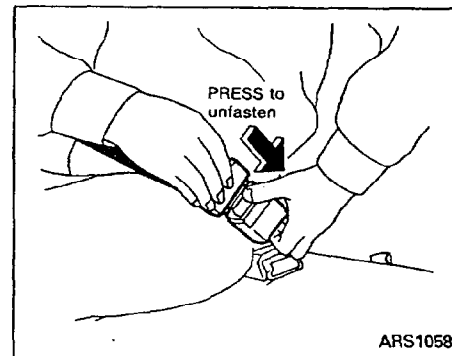
Seats, restraints and supplemental air bag systems 1-23



3. Position the lap belt low and snug on the hips as illustrated.

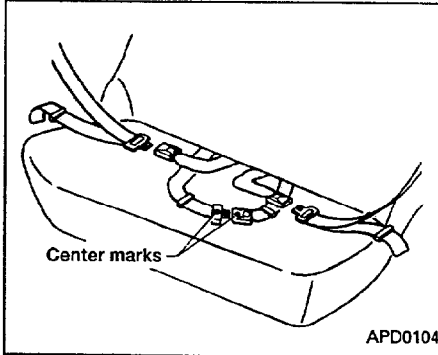


4. Loosen the belt by holding the tongue at a right angle to the belt, then pull on the belt.



Unfastening the belt

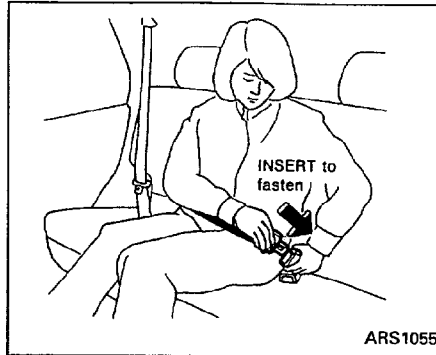
To unfasten the seat belt, press the button on the buckle.



TWO-POINT TYPE WITHOUT RETRACTOR (rear center lap belt)

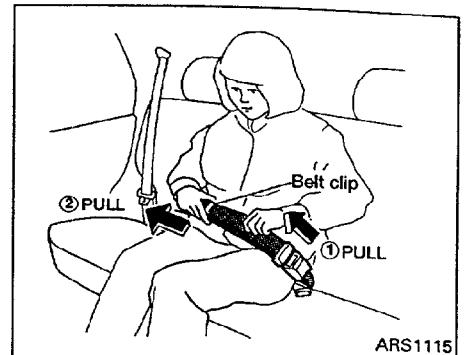
Selecting the correct set of seat belts

The center seat belt buckle and tongue are identified by the word **CENTER**. The center seat belt tongue can be fastened **only** into the center seat belt buckle.



Fastening the seat belts

1. Insert the tongue into the buckle until it clicks. Both the tongue and the buckle are marked **CENTER**.



2. Tighten the belt by pulling the free end of the belt away from the tongue, then pull the belt clip to take up the slack.

Seats, restraints and supplemental air bag systems 1-21

Checking seat belt operation (Three-point type seat belt with retractor)

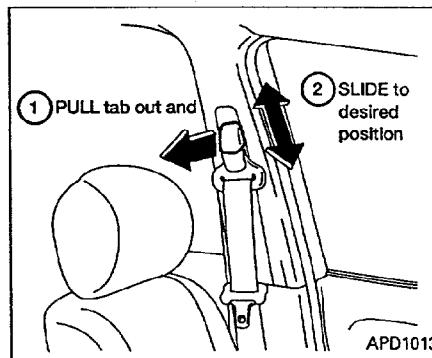
Seat belt retractors are designed to lock seat belt movement using two separate methods:

- 1) When the seat belt is pulled quickly from the retractor.
- 2) When the vehicle slows down rapidly.

To increase your confidence in the seat belts, check their operation as follows.

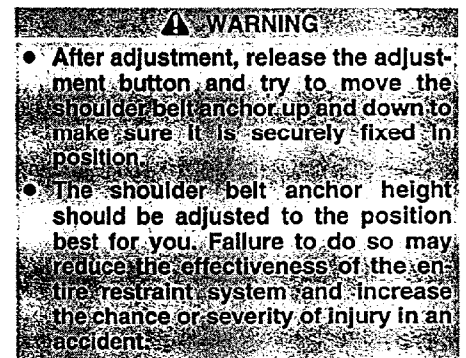
- Grasp the shoulder belt and pull quickly forward. The retractor should lock and restrict further belt movement.

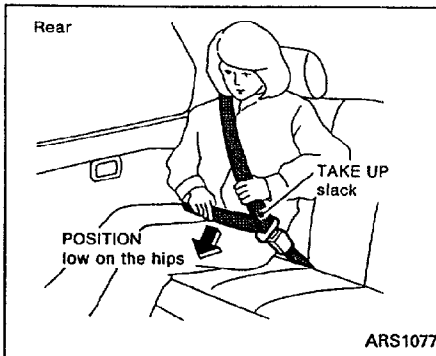
If the retractor does not lock during this check or if you have any questions about belt operation, see an authorized NISSAN dealer.



Shoulder belt height adjustment (For front seats)

The shoulder belt anchor height should be adjusted to the position best for you. (See "Precautions on seat belt usage" earlier in this section.) To adjust, pull out the adjustment button and move the shoulder belt anchor to the desired position, so the belt passes over the center of the shoulder. The belt should be away from your face and neck, but not falling off of your shoulder. Release the adjustment button to lock the shoulder belt anchor into position.





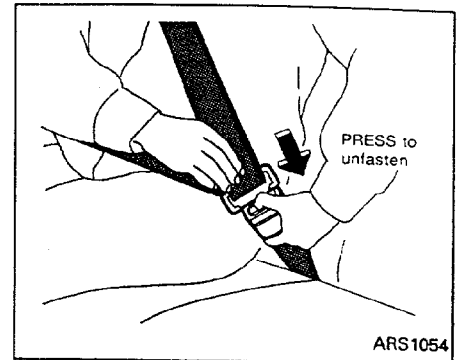
3. Position the lap belt portion low and snug on the hips as shown.
4. Pull the shoulder belt portion toward the retractor to take up extra slack.

The front passenger side seat belt and rear three-point seat belts have a cinching mechanism for child restraint installation. It is referred to as the automatic locking mode.

When automatic locking mode is activated the seat belt cannot be withdrawn further until the seat belt tongue is detached from the buckle and fully retracted. Once re-

tracted, the seat belt is in the emergency locking mode. See "Child Restraints" later in this section for more information.

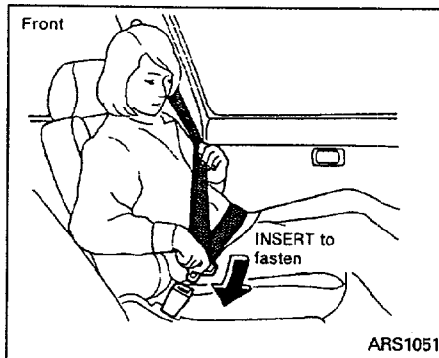
The automatic locking mode should be used only for child restraint installation. During normal seat belt use by a passenger, the locking mode should not be activated. If it is activated it may cause uncomfortable seat belt tension.



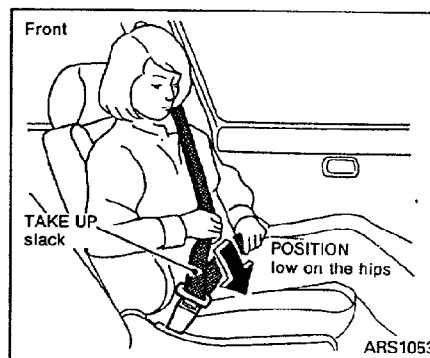
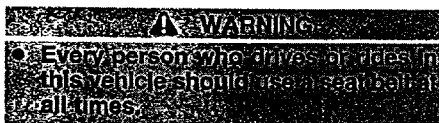
Unfastening the seat belts

To unfasten the seat belt, press the button on the buckle. The seat belt automatically retracts.

Seats, restraints and supplemental air bag systems 1-19

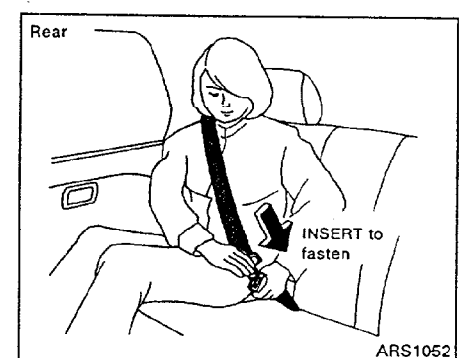


THREE-POINT TYPE WITH RETRACTOR



Do not ride in a moving vehicle when the seatback is reclined. This can be dangerous. The shoulder belt will not be against your body. In an accident, you could be thrown into it and receive neck or other serious injuries. You could also slide under the lap belt and receive serious internal injuries.

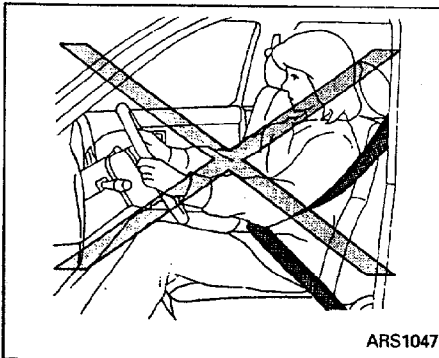
For most effective protection when the vehicle is in motion, the seat should be upright. Always sit well back in the seat and adjust the seat belt properly.



Fastening the seat belt

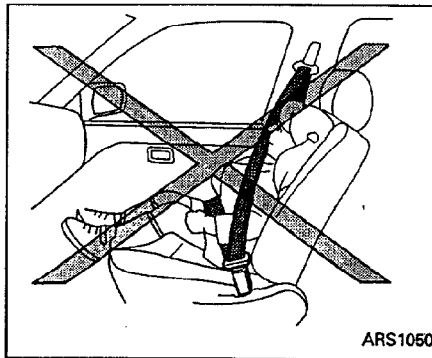
1. Adjust the seat.
2. Slowly pull the seat belt out of the retractor and insert the tongue into the buckle until it clicks.

The retractor is designed to lock during a sudden stop or on impact. A slow pulling motion permits the seat belt to move, and allows you some freedom of movement in the seat.



ARS1047

- Be sure the seat belt tongue is securely fastened to the proper buckle.
- Do not wear the belt inside out or twisted. Doing so may reduce its effectiveness.
- Do not allow more than one person to use the same belt.
- Never carry more people in the vehicle than there are seat belts.



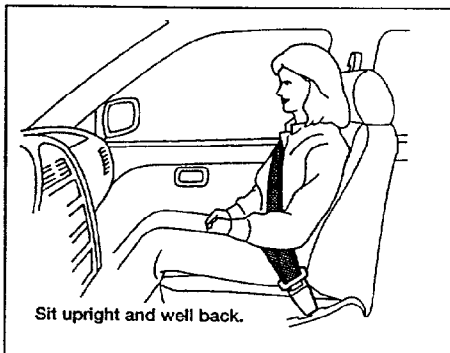
ARS1050

If the seat belt warning light glows continuously while the ignition is turned ON with all doors closed and all seat belts fastened, it may indicate a malfunction in the system. Have the system checked by an authorized NISSAN dealer.

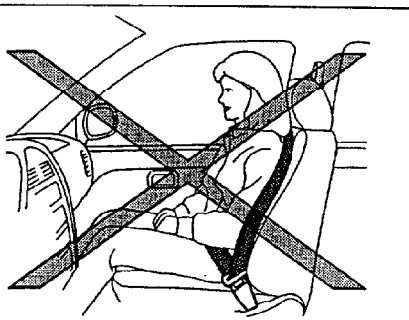
All seat belt assemblies including retractors and attaching hardware should be inspected after any collision by an authorized NISSAN dealer. NISSAN recommends that all seat belt assemblies in use during a collision be replaced unless the collision was minor and the belts show no damage and continue to operate properly. Seat belt assemblies not in use during a collision should also be inspected and replaced if either damage or improper operation is noted.

1-16 Seats, restraints and supplemental air bag systems

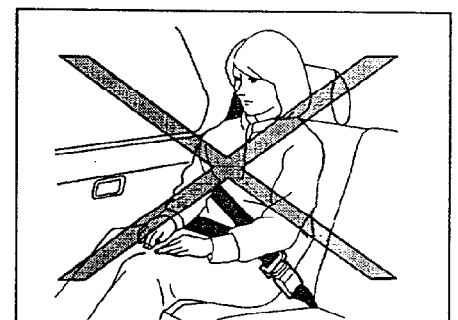
SEAT BELTS



Sit upright and well back.



ARS1134



ARS1049

PRECAUTIONS ON SEAT BELT USAGE

If you are wearing your seat belt properly adjusted, your chances of being injured or killed in an accident and/or the severity of injury may be greatly reduced. NISSAN strongly encourages you and all of your passengers to buckle up every time you drive, even if your seating position includes a supplemental air bag.

Most U.S. states and all Canadian provinces and territories, require that seat belts be worn at all times when a vehicle is being driven.

TV WARNING

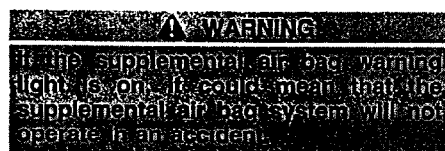
- Every person who drives or rides in this vehicle should use a seat belt at all times. Children should be properly restrained and, if appropriate, in a child restraint.
- The belt should be properly adjusted to a snug fit. Failure to do so may reduce the effectiveness of the entire restraint system and increase the chance or severity of injury in an accident. Serious injury or death can occur if the seat belt is not worn properly.

- Always route the shoulder belt over your shoulder and across your chest. Never run the belt behind your back, under your arm or across your neck. The belt should be away from your face and neck, but not falling off your shoulder.
- Position the lap belt as low and snug as possible **AROUND THE HIPS, NOT THE WAIST**. A lap belt worn too high could increase the risk of internal injuries in an accident.

If any of the following conditions occur, the supplemental air bag needs servicing:

1. The supplemental air bag warning light does not come on and remain on for 7 seconds and then go off as described.
2. The supplemental air bag warning light flashes intermittently or remains on.
3. The supplemental air bag warning light does not come on at all.

Under these conditions, the supplemental restraint system air bag may not operate properly. It must be checked and repaired. Take your vehicle to the nearest authorized NISSAN dealer.



Repair and replacement procedure

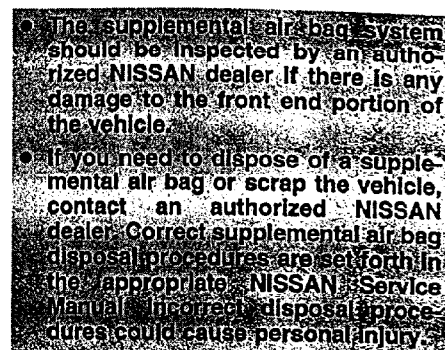
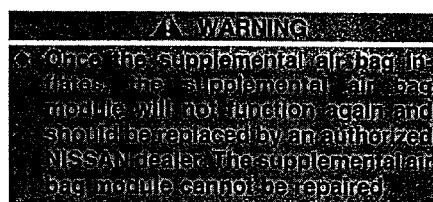
The supplemental air bag modules are designed to inflate on a one-time-only basis. As a reminder, unless it is damaged, the supplemental air bag light remains illumi-

1-14 Seats, restraints and supplemental air bag systems

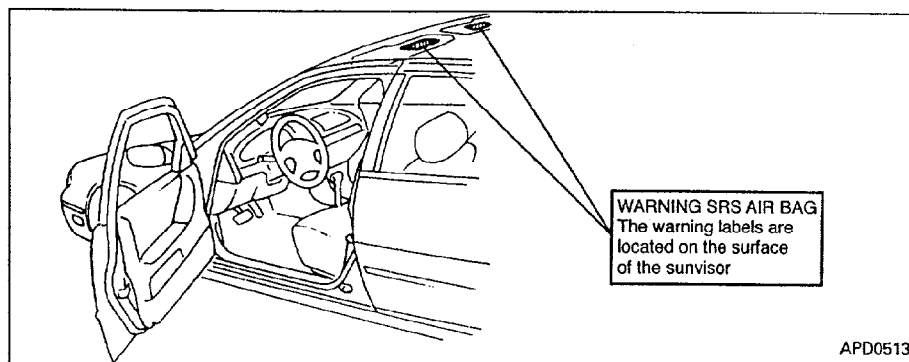
nated after inflation has occurred. Repair and replacement of the supplemental air bag system should be done only by an authorized NISSAN dealer.

To ensure long-term functioning, the supplemental air bag system must be inspected 10 years after the date of manufacture as noted on the certification label located on the driver side front pillar.

When maintenance work is required on the vehicle, the supplemental air bag system and related parts should be pointed out to the person conducting the maintenance. The ignition key should always be in the LOCK position when working under the hood or inside the vehicle.

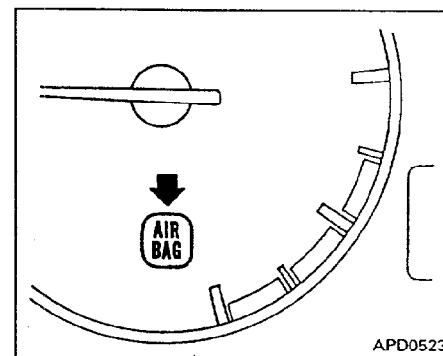


WARNING LABELS



Warning labels about the supplemental air bag system are placed in the vehicle as shown in the illustration.

SUPPLEMENTAL AIR BAG WARNING LIGHT



The supplemental air bag warning light, displaying **AIR BAG** in the instrument panel, monitors the circuits of the supplemental air bag system. The circuits monitored by the supplemental air bag warning light are the diagnosis sensor unit, supplemental air bag modules and all related wiring.

When the ignition key is in the ON or START position, the supplemental air bag warning light illuminates for about 7 seconds and then turns off. This means the system is operational.

⚠ WARNING

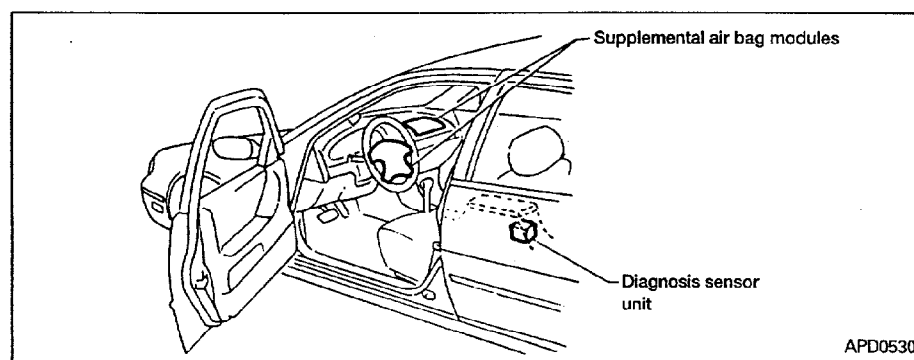
- Do not place any objects on the steering wheel pad or on the instrument panel. Also, do not place any objects between any occupant and the steering wheel or instrument panel. Such objects may become dangerous projectiles and cause injury if the supplemental air bag inflates.
- Right after inflation, several supplemental air bag system components will be hot. Do not touch them; you may severely burn yourself.
- No unauthorized changes should be made to any components or wiring of the supplemental air bag system. This is to prevent accidental inflation of the supplemental air bag or damage to the supplemental air bag system.
- Do not make unauthorized changes to your vehicle's electrical system, suspension system or front end structure. This could affect proper operation of the supplemental air bag system.

- Tampering with the supplemental air bag system may result in serious personal injury. Tampering includes changes to the steering wheel and the instrument panel assembly by placing material over the steering wheel pad and above the dashboard, or by installing additional trim material around the supplemental air bag system.
- Work around and on the supplemental air bag system should be done by an authorized NISSAN dealer. Installation of electrical equipment should also be done by an authorized NISSAN dealer. The yellow SRS wiring should not be modified or disconnected. Unauthorized electrical test equipment and probing devices should not be used on the supplemental air bag system.
- The SRS wiring harnesses are covered with yellow insulation either just before the harness connectors or over the complete harness for easy identification.

When selling your vehicle, we request that you inform the buyer about the supplemental air bag system and guide the buyer to the appropriate sections in this owner's manual.

1-12 Seats, restraints and supplemental air bag systems

SUPPLEMENTAL AIR BAG SYSTEM



The driver supplemental air bag is located in the center of the steering wheel. The front passenger supplemental air bag is mounted in the dashboard above the glove box.

These systems are designed to meet optional certification requirements under U.S. regulations. They are also permitted in Canada. The optional certification allows air bags to be designed to inflate somewhat less forcefully than previously. **However, all of the information, cautions and warnings in this manual still apply and must be followed.**

The supplemental air bag system is de-

signed to inflate in higher severity frontal collisions, although it may inflate if the forces in another type of collision are similar to those of a higher severity frontal impact. It may not inflate in certain frontal collisions. Vehicle damage (or lack of it) is not always an indication of proper supplemental air bag system operation.

When the supplemental air bag inflates, a fairly loud noise may be heard, followed by the release of smoke. This smoke is not harmful and does not indicate a fire, but care should be taken not to unintentionally inhale it, as it may cause irritation and

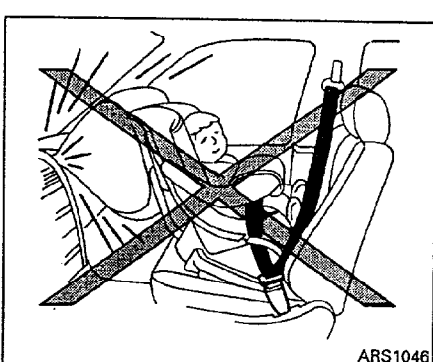
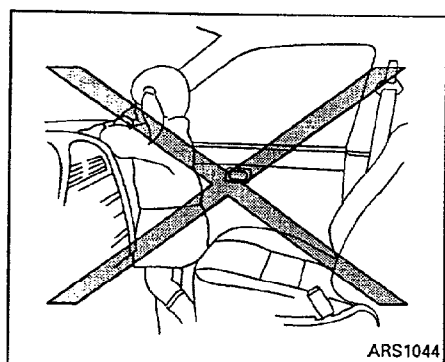
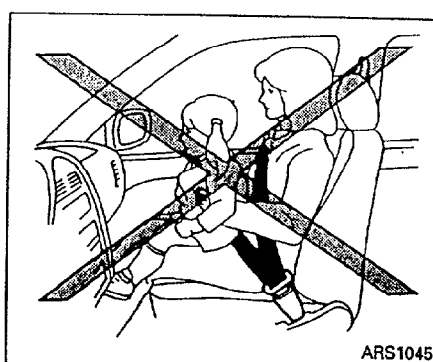
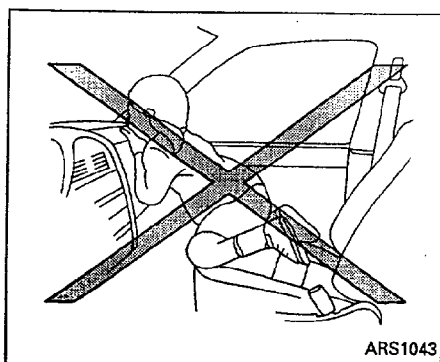
choking. Those with a history of breathing trouble should get fresh air promptly.

The supplemental air bags, along with the use of seat belts, help to cushion the impact force on the face and chest of the occupant. They can help save lives and reduce serious injuries. However, an inflating supplemental air bag may cause facial abrasions or other injuries. Supplemental air bags do not provide restraint to the lower body.

Seat belts should be correctly worn and the driver and passenger seated upright as far as practical away from the steering wheel or instrument panel. Since the supplemental air bags inflate quickly in order to help protect the front occupants, the force of the supplemental air bag inflating can increase the risk of injury if the occupant is too close to or is against the supplemental air bag module during inflation.

The supplemental air bags deflate quickly after a collision.

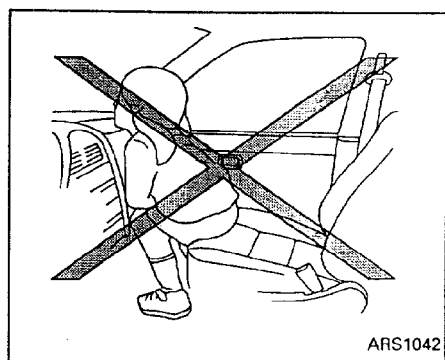
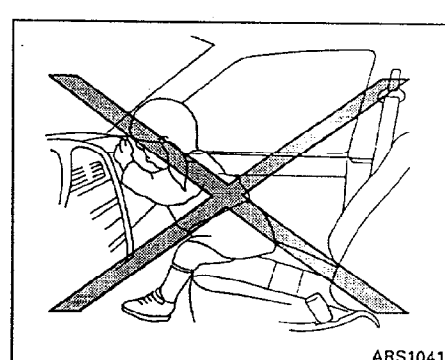
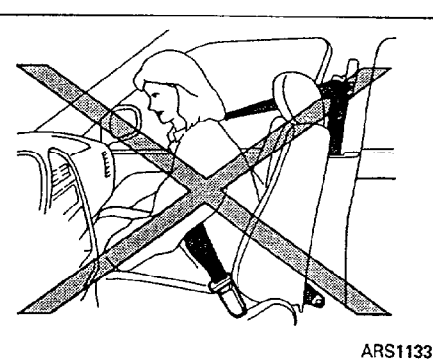
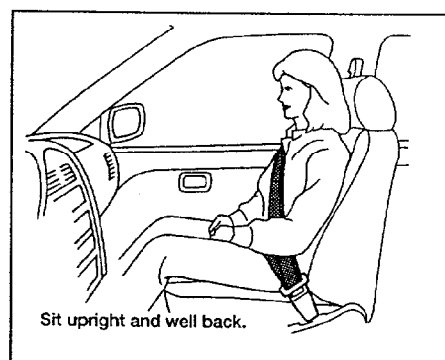
The supplemental air bags operate only when the ignition switch is in the ON or START position.



⚠ WARNING

- Never let children ride unrestrained. Do not attempt to hold them in your lap or arms. Some examples of dangerous riding positions are shown in the previous illustrations.
- Children may be severely injured or killed when the supplemental air bag inflates if they are not properly restrained.
- Never install a rear-facing child restraint in the front seat. An inflating supplemental air bag could seriously injure or kill your child. See "Child Restraints" later in this section for details.

1-10 Seats, restraints and supplemental air bag systems



SUPPLEMENTAL RESTRAINT SYSTEM (AIR BAG SYSTEM)

This Supplemental Restraint System section contains important information concerning the driver and passenger supplemental air bags. The Supplemental Restraint System Air Bag can help reduce impact force to the driver and to the front passenger in certain frontal collisions. The supplemental air bags are designed to **supplement** the crash protection provided by the driver and front passenger seat belts and are **not a substitute** for them. The seat belts should always be correctly worn and the driver and front passenger seated a suitable distance away from the steering wheel and instrument panel. (See "Seat belts" for instructions and precautions on seat belt usage later in this section.)

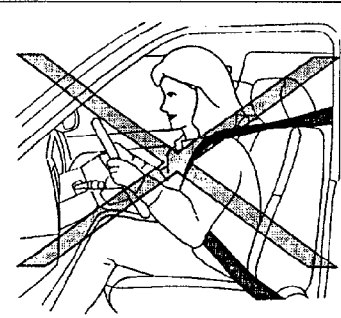
The supplemental air bags operate only when the ignition switch is in the ON or START position.

⚠ WARNING

• The supplemental air bags ordinarily will not inflate in the event of a side impact, rear impact, roll over, or lower severity frontal collision. Always wear your seat belts to help reduce the risk or severity of injury in various kinds of accidents.



• The seat belts and the supplemental air bags are most effective when you are sitting back and upright in the seat. Supplemental air bags inflate with great force. If you are unrestrained, leaning forward, sitting sideways or out of position in any way, you are at greater risk of injury or death in a crash and may also receive serious or fatal injuries from the supplemental air bag if you are up against it when it inflates. Always sit back against the seatback and as far



ARS1132

away as practical from the steering wheel or instrument panel. Always use the seat belts.

• Keep hands on the outside of the steering wheel. Placing them inside the steering wheel rim could increase the risk that they are injured when the supplemental air bag inflates.