

V2744

REPORT NO. MGA-98-N05

NEW CAR ASSESSMENT PROGRAM (NCAP)

FRONTAL BARRIER IMPACT TEST

1998 NISSAN ALTIMA 4 DOOR SEDAN
NHTSA NO. MW5200

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: November 24, 1997

Report Date: January 9, 1998

FINAL REPORT

Prepared For:

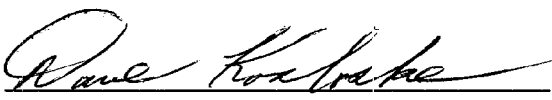
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16. Abstract A 56 kph (35 mph) frontal barrier impact using a rigid barrier was conducted on a 1998 Nissan Altima 4 Door in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure No. TP-NCAP090196 for the determination of vehicle crashworthiness on November 24, 1997. The barrier impact velocity was 56.6 kph (35.2 mph), and the ambient temperature at the time of impact was 22°C. The post-test maximum static crush was 521 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 887 and the 3 msec. Clip (Chest g's) was 51.1 g's. The left and right femur loads for the driver were 2920 and 1317 Newtons, respectively. The passenger's HIC was 1119 and the 3 msec Clip was 55.4 g's. The left and right femur maximum loads were 4245 and 2659 Newtons respectively.					
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SECTION 1
PURPOSE AND SUMMARY OF NCAP TEST

This 35 mph frontal barrier impact test is part of the Composite FY'98 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 rigid barrier was impacted by a 1998 Nissan Altima 4 Door Sedan at a velocity of 56.6 kph (35.2 mph). The test was performed at the MGA Proving Grounds and Crash Test Center on November 24, 1997. 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. 065), and the right front passenger (Serial No. 066), were used for this test. Certification details, along with instrumentation calibration data, are found in Appendix C and D.

The 103 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 887 and the maximum chest (CLIP) deceleration over 3 milliseconds was 51.1 g's. The maximum chest compression was 35 mm. The left and right femur loads were 2920 and 1317 Newtons respectively.

The right front passenger's head struck the inflated airbag. The passenger HIC was 1119 and maximum chest (CLIP) deceleration over 3 milliseconds was 55.4 g's. The maximum chest compression was 36 mm. The left and right femur loads were 4245 and 2659 Newtons respectively.

SECTION 2
OCCUPANT AND VEHICLE
INFORMATION/DATA SHEETS

DATA SHEET NO. 1
CRASH TEST SUMMARY

Vehicle Yr/Make/Model/Body Style: 1998/Nissan/Altima/4 Door

NHTSA No.: MW5200 VIN.: 1N4DL01DXWC102557

Vehicle Test Weight: 1553.5 kgs.

Impact Velocity: 56.6 kph

Maximum Static Crush: 521 mm

Vehicle Rebound: 710 mm

DUMMIES:

DRIVER

PASSENGER

Serial Number: 065

066

Restraint System: Type II belt and
frontal airbag

Type II belt and
frontal airbag

No. Data Channels: 40

40

Number of Cameras: 1 Real Time
16 High Speed

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

FRONT SEAT(S) DATA

DRIVER

FRONT PASSENGER

Seat Shift: 0 mm

0 mm

Seat Back Movement: None

None

VISIBLE DUMMY

CONTACT POINTS:

DRIVER

PASSENGER

Head to airbag

to airbag

Chest to airbag

to airbag

Left Knee to steering column and dash

to glove box

Right Knee to steering column and dash

to glove box

GENERAL TEST AND VEHICLE PARAMETER DATA (Cont'd)

Other: _____

GVWR 1809.8 kg. GAWR: Front 976.1 kg.; Rear 845.0 kg.

GENERAL TEST AND VEHICLE PARAMETER DATA (Cont'd)

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

Right Front = 405.0 kg Right Rear = 269.0 kg
Left Front = 439.1 kg Left Rear = 243.1 kg
TOTAL FRONT WEIGHT = 844.1 kg (62.2 % of Total Vehicle Weight)
TOTAL REAR WEIGHT = 512.1 kg (37.8 % of Total Vehicle Weight)
TOTAL UNLOADED DELIVERED WEIGHT (UDW) = 1356.2 kg

CALCULATION FOR TARGET TEST WEIGHT:

UDW = Unloaded Delivered Weight 1356.2 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 = 1562.3 kg

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND CARGO:

Right Front = 453.1 kg Right Rear = 325.7 kg
Left Front = 471.3 kg Left Rear = 303.4 kg
TOTAL FRONT WEIGHT = 924.4 kg (59.5 % of Total Vehicle Weight)
TOTAL REAR WEIGHT = 629.1 kg (40.5 % of Total Vehicle Weight)
TOTAL TEST WEIGHT = 1553.5 kg
Weight of ballast secured in vehicle trunk area = 0 kg
Vehicle components removed to meet target weight: rear seat, muffler, and rear bumper

VEHICLE ATTITUDE (all dimensions in mm):

Delivered Attitude: RF 693 LF 693 RR 685 LR 691
Test Attitude: RF 677 LF 678 RR 658 LR 664
Post Test RF 689 LF 694 RR 635 LR 654
Wheel Base: 2630 mm; C.G. = 1065 mm rearward of front wheel C/L
Remarks: none

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

GENERAL TEST AND VEHICLE PARAMETER DATA (Cont'd)

Location of Vehicle's C.G. = _____ (if required)

FUEL SYSTEM DATA:

Fuel System Capacity From Owner's Manual = 59.8 liters

Usable Capacity Figure Furnished by COTR = 59.8 liters

Test Volume Range (92 to 94% of Usable Capacity) = 55.0 to 56.2 liters

ACTUAL TEST VOLUME = 55.6 liters

Test Fluid Type: Stoddard Solvent; Spec. Grav. = 0.77

Kinematic Viscosity = 1.788 centistrokes; Color = Purple

Type 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: 1998/Nissan/Altima/4 Door
NHTSA No.: MW5200 VIN.: 1N4DL01DXWC102557

Type of Test: 35 mph Frontal Impact Impact Angle: 0°
Date of Test: November 24, 1997 Time of Test: 3:16 p.m.

Ambient Temperature: 22°C (71°F) (Spec. Range = 18.8 to 25.6°C)
Temperature in Occupant Compartment: 22° C
Windshield Molding Temperature: 22° C
Required Impact Velocity Range: 55.5 to 57.1 kph
Impact Velocity: primary = 56.6 kph; secondary = 56.7 kph
Distance From Front Bumper to Barrier Face When
Entering Speed Trap: 1305 mm
Exiting Speed Trap: 305 mm

VEHICLE REBOUND AND CRUSH (mm):

Vehicle Length:	Pre-test	= Right <u>4282</u>	C/L <u>4484</u>	Left <u>4270</u>
	Post-test	= Right <u>4018</u>	C/L <u>3990</u>	Left <u>3806</u>
	Crush	= Right <u>264</u>	C/L <u>494</u>	Left <u>464</u>

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

R 610 mm C_L 724 mm L 795 mm
Average = 710 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>None</u>	<u>None</u>
Seat Shift (mm)	<u>0 mm</u>		<u>0 mm</u>	

Glazing Damage

Backlight/Windshield Windshield cracked and retention lost starting 155 mm below
the upper right corner and running approximately 470 mm

Other Notable Impact Effects: Both frontal airbags deployed

SECTION 3

SUMMARY OF RESULTS FOR-----

FMVSS 212, "Windshield Mounting"

FMVSS 219 (Partial), "Windshield Zone Intrusion"

FMVSS 301-75, "Fuel System Integrity"

DATA SHEET 5

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

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

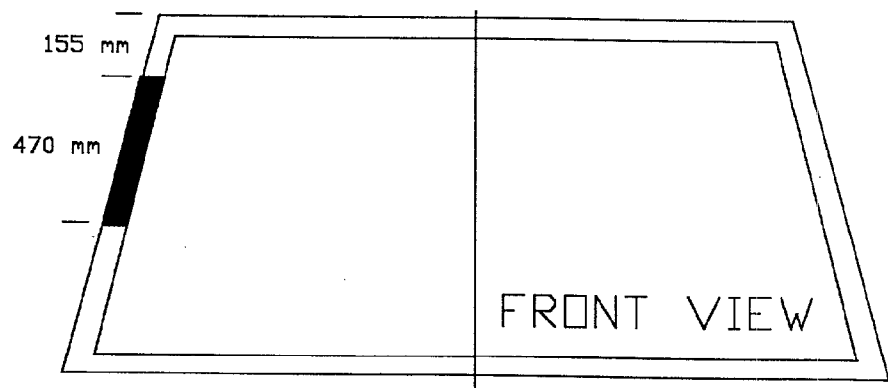
Windshield set in rubber molding with glue

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		PERCENT RETENTION
	PRE-TEST (mm)	POST-TEST (mm)	
RIGHT SIDE	2154	1684	78%
LEFT SIDE	2154	2154	100%
TOTAL	4308	3838	89%

AREA OF RETENTION FAILURE:



FAILURE DETAILS: The shaded area shown above buckled outward away from the A-Pillar

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 ½" 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= 1164 mm

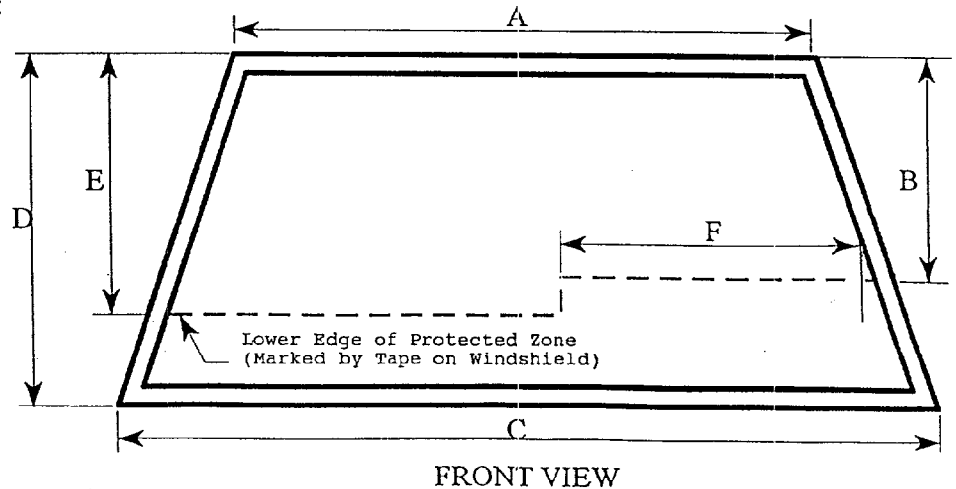
B= 452 mm

C= 1562 mm

D= 790 mm

E= 552 mm

F= 754 mm



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

(Show location of penetration)

NONE

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

TEST VEHICLE NHTSA NO.: MW5200 Test Date: November 24, 1997

Usable Capacity of Vehicle's Fuel Tank: 59.8 Liters
(figure furnished by vehicle manufacturer)

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.

55.6 Liters which is 93.0 % of the stated USABLE CAPACITY.

___ Oblique (30 mph) with ___° barrier face first
contacting (driver/passenger) side

___ Rear Moving Barrier (30 mph)

___ Side Impact MDB (33.2 mph)

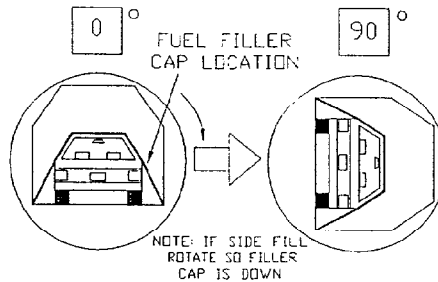
1. From impact until vehicle motion ceases
2. For 5 minute period after vehicle motion ceases
3. For next 25 minutes

SOLVENT SPILLAGE DETAILS: None

DATA SHEET 8
FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE: 0° - 90°

Vehicle NHTSA ID No.: MW5200



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 46 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 46 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
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Note: Record Spillage for whole minute intervals only as determined above.

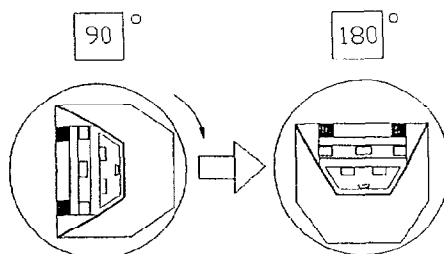
IV. SOLVENT SPILLAGE LOCATIONS(S): None

DATA SHEET 8

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

TEST PHASE: 90° - 180°

Vehicle NHTSA ID No.: MW5200



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 19 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 19 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
---	---	---	---

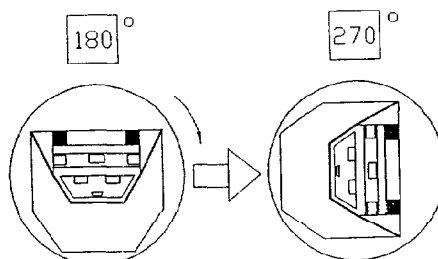
Note: Record Spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATIONS(S): None

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

TEST PHASE: 180° - 270°

Vehicle NHTSA ID No.: MW5200



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 24 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 24 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
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Note: Record Spillage for whole minute intervals only as determined above.

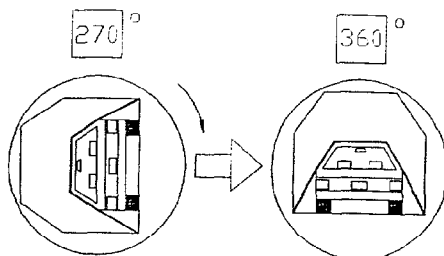
IV. SOLVENT SPILLAGE LOCATIONS(S): None

DATA SHEET 8

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

TEST PHASE: 270° - 360°

Vehicle NHTSA ID No.: MW5200



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 52 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 52 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

SECTION 4
OMI FINAL DATA

Occupant and Vehicle Information

I. OMI DATA

1. Dummy Injury Criteria Data Summary
2. Dummy Positioning Data
3. Seat Belt Positioning Data
4. Seat Belt Performance Assessment Data
5. Camera Locations
6. Vehicle Target Locations

II. OVR DATA

1. Vehicle Accelerometer Data
2. Post-Test Airbag Data
3. Test Vehicle Measurements

III. AID DATA

1. Accident Investigation Damage Data Summary

DATA SHEET 9

DUMMY INJURY CRITERIA VALUES DATA SHEET

Vehicle Year/Make/Model/Body Style: 1998/Nissan/Altima/4 Door

Veh. NHTSA No.: MW5200 Test Date: November 24, 1997

ACCELERATION VALUES: (g's)	DRIVER # <u>065</u>		PASSENGER # <u>066</u>	
	Min.	Max.	Min.	Max.
Head Channel X	-76.8 @ 80 msec.	19.7 @ 199 msec.	-77.2 @ 88 msec.	16.0 @ 196 msec.
Head Channel Y	-11.0 @ 72 msec.	1.9 @ 51 msec.	-17.5 @ 90 msec.	5.0 @ 57 msec.
Head Channel Z	-25.7 @ 66 msec.	3.4 @ 122 msec.	-29.2 @ 77 msec.	4.0 @ 42 msec.
HEAD RESULTANT	77.8 @ 80 msec.		79.8 @ 88 msec.	
Chest Channel X	-51.4 @ 68 msec.	6.6 @ 179 msec.	-56.1 @ 75 msec.	7.8 @ 182 msec.
Chest Channel Y	-3.7 @ 102 msec.	5.2 @ 54 msec.	-6.3 @ 54 msec.	4.4 @ 92 msec.
Chest Channel Z	-10.4 @ 62 msec.	9.9 @ 85 msec.	-9.6 @ 73 msec.	5.5 @ 111 msec.
CLIP	51.1		55.4	
TIME INTERVAL (msec) [3. msec. minimum]	t ₁ = 63.1 t ₂ = 66.2		t ₁ = 74.2 t ₂ = 77.2	

HEAD INJURY CRITERIA (HIC) VALUES:

HIC	887	1119
t ₁ = (msec)	59.4	65.2
t ₂ = (msec)	94.4	101.2
Avg. Accel. t ₁ to t ₂ (g's)	57.8	62.7
t ₂ - t ₁	35.0	36.0

[The maximum time interval
from t₁ to t₂ is 36
milliseconds.]

COMPRESSIVE FEMUR FORCES:

Left Side (N)	-2920 @ 62 msec.	473 @ 50 msec.	-4245 @ 54 msec.	393 @ 119 msec.
Right Side (N)	-1317 @ 43 msec.	599 @ 70 msec.	-2659 @ 64 msec.	605 @ 50 msec.

SEAT BELT FORCES:

Lap Belt (N)	6526 @ 62 msec.	5091 @ 64 msec.
Shoulder Belt (N)	7548 @ 74 msec.	6864 @ 75 msec.

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

HYBRID III NECK, CHEST AND PELVIS DATA SHEET

	DRIVER DUMMY #065		PASSENGER DUMMY #066	
	Min.	Max.	Min.	Max.
Neck Load X (N)	-377 @ 55 msec.	616 @ 83 msec.	-643 @ 65 msec.	201 @ 40 msec.
Neck Load Y (N)	-99 @ 177 msec.	256 @ 83 msec.	-117 @ 94 msec.	91 @ 167 msec.
Neck Load Z (N)	-2049 @ 66 msec.	187 @ 118 msec.	-2559 @ 76 msec.	398 @ 6 msec.
Neck Moment X (Nm)	-4.5 @ 99 msec.	10.9 @ 64 msec.	-7.5 @ 65 msec.	12.9 @ 84 msec.
Neck Moment Y (Nm)	-31.7 @ 72 msec.	26.0 @ 55 msec.	-9.6 @ 84 msec.	38.3 @ 66 msec.
Neck Moment Z (Nm)	-5.6 @ 197 msec.	13.9 @ 88 msec.	-5.8 @ 155 msec.	11.9 @ 95 msec.
Chest Deflection X (mm)	35		36	
Pelvis X Acceleration (g's)	-56.6 @ 62 msec.	3.3 @ 155 msec.	-49.8 @ 66 msec.	3.8 @ 134 msec.
Pelvis Y Acceleration (g's)	-9.1 @ 97 msec.	9.1 @ 59 msec.	-14.6 @ 51 msec.	9.3 @ 72 msec.
Pelvis Z Acceleration (g's)	-24.9 @ 72 msec.	4.5 @ 191 msec.	-21.6 @ 71 msec.	4.7 @ 200 msec.
Pelvis Resultant (g's)	60.3 @ 62 msec.		52.3 @ 66 msec.	

DATA SHEET 10
DUMMY POSITIONING IN VEHICLE

Vehicle NHTSA No.: MW5200 Vehicle: 1998/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 out of 20 detents

Seat back angle 21.2°

7th notch from full up as "0"

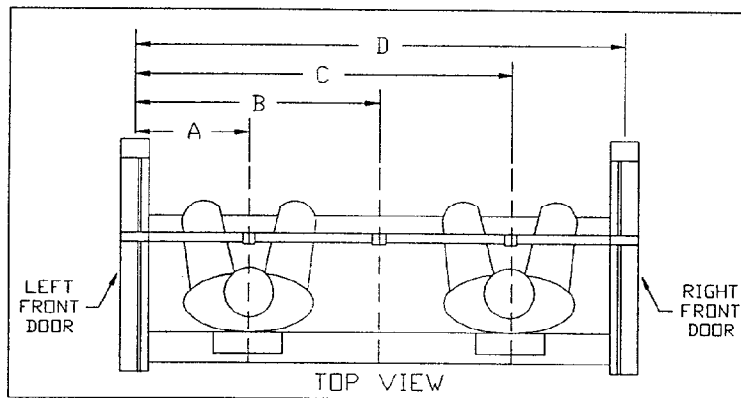
Steering column set to mid position. Steering column angle 24.8°

PASSENGER SEAT POSITION

11th detent of 20 detents

Seat back angle 21.2°

7th notch from full up as "0"



 065 DUMMY ID 066

A = Left Door to Driver Centerline	<u> 415 </u> mm
B = Left Door to Center Passenger Centerline	<u> 764 </u> mm
C = Left Door to Right Passenger Centerline	<u> 1125 </u> mm
D = Left Door to Right Door	<u> 1528 </u> mm

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

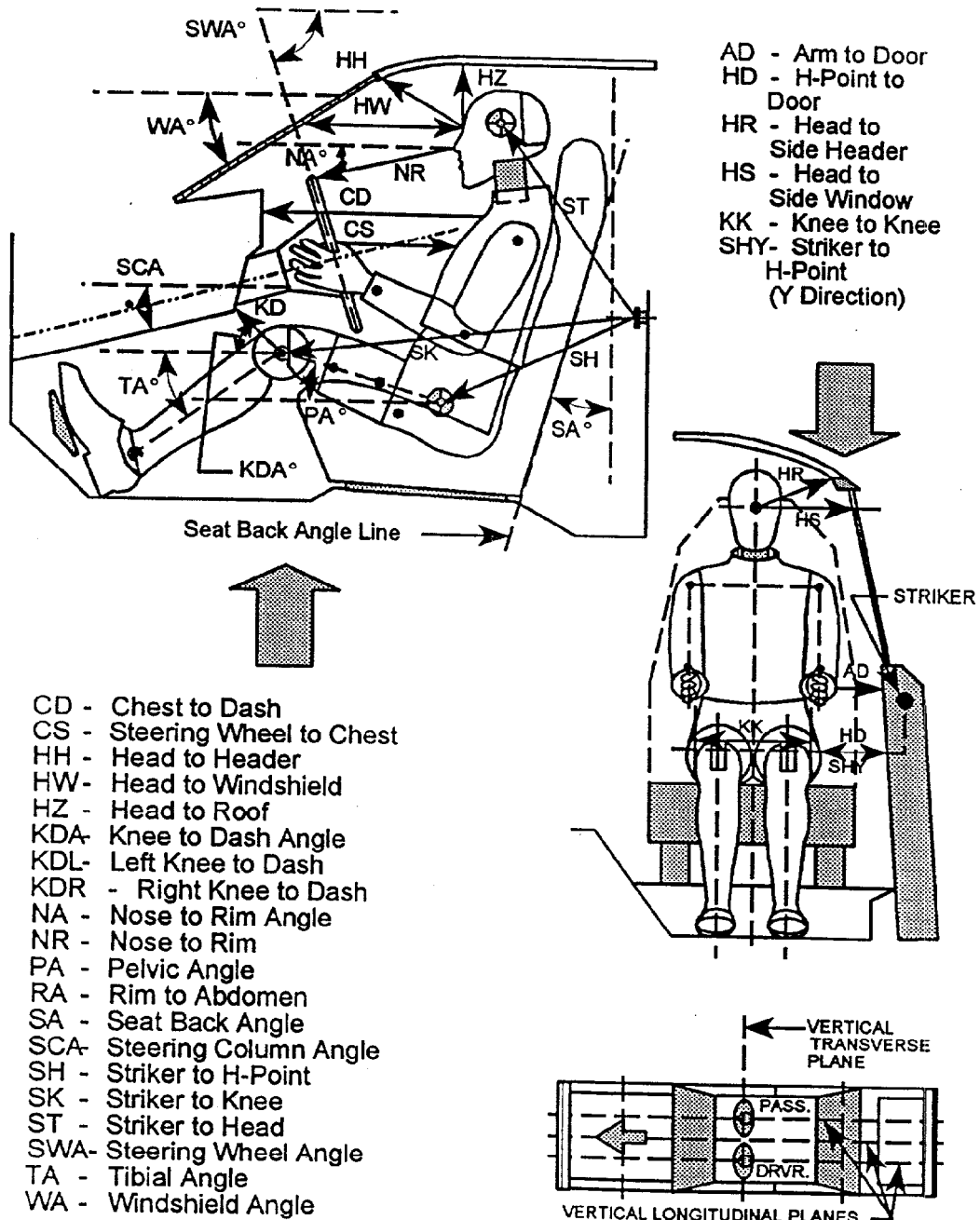
Units (mm)

	DRIVER (Serial #065)	PASSENGER (Serial #066)
WA °	29.8°	
SWA °	24.6°	N/A
SCA °	24.8°	N/A
SA °	21.2°	21.2°
HZ	161	150
HH	311	318
HW	565	578
HR	251	237
NR	431 Angle 13.9°	N/A
CD	538	647
CS	344	N/A
RA	209	N/A
KDL	179 Angle (KDA) 23.9°	182
KDR	172	180 Angle 23.4°
PA °	24.0°	24.2°
TA °	40.3°	33.4°
KK	306	272
ST*	506 Angle 5.0°	534 Angle 6.2°
SK*	569 Angle 91.4°	598 Angle 96.6°
SH*	235 Angle 126.4°	454 Angle 118.4°
SHY	262	258
HS	323	286
HD	137	131
AD	117	110

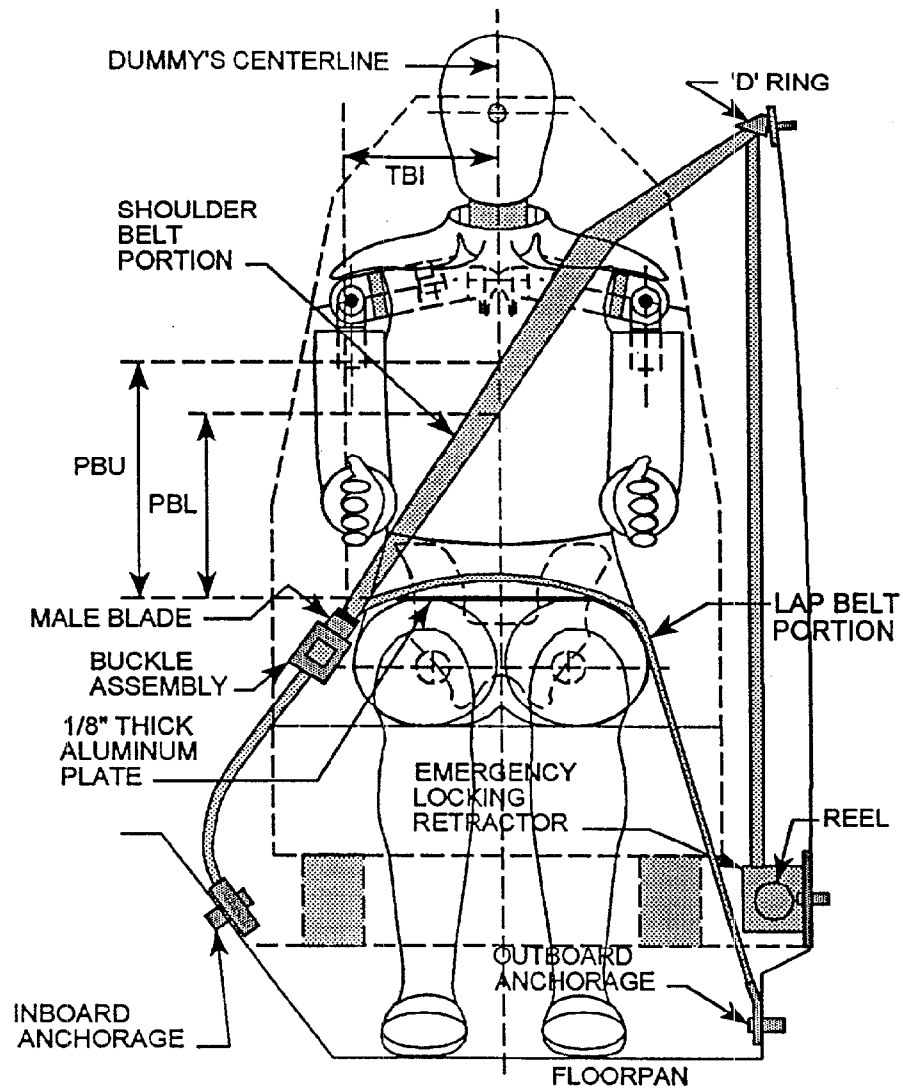
N/A = Not Applicable

* Angles measured from vertical

FRONT SEAT MEASUREMENTS



DATA SHEET 11
SEAT BELT POSITIONING DATA



FRONT VIEW OF DUMMY

(illustration)

Dimension = mm

	DRIVER DUMMY	PASSENGER DUMMY
<u>PBU</u> -- Top surface of alum. plate to upper edge	343	351
<u>PBL</u> -- Top surface of alum. plate to belt lower edge	270	272

DATA SHEET 12
SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

BELT LENGTH DATA:

	<u>Driver</u>	<u>Passenger</u>
Length from trim above retractor reel to "D" ring as measured on dummy.	<u>165 mm</u>	<u>185 mm</u>
Shoulder belt length as measured on Part 572 Dummy.	<u>871 mm</u>	<u>860 mm</u>
Lap belt length as measured on Part 572 Dummy.	<u>790 mm</u>	<u>785 mm</u>

SHOULDER BELT SPOOL-OFF DATA:

As determined by film analysis	<u>41 mm</u>	<u>38 mm</u> at shoulder
As determined mechanically	<u>50 mm</u>	<u>52 mm</u> at shoulder

BELT STRETCH DATA:

Measured electronically between shoulder belt load cell and the "D" ring.	<u>N/A</u>	<u>N/A</u>
Measured mechanically	<u>N/A</u>	<u>N/A</u>

RETRACTOR LOCK-UP TIME:

As determined by shoulder belt spool-off observed in on-board cameras	<u>34 msec.</u>	<u>32 msec.</u>
---	-----------------	-----------------

DATA SHEET 13
CAMERA LOCATIONS

Veh. NHTSA NO.: MW5200; Test Date: November 24, 1997

Veh. Year/Make/Model/Body Style: 1998/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	970	-8210	1560	90	7785	25	813
3	Steering Column Top	2010	-7640	1560	90	7215	25	1005
4	Steering Column Bottom	2000	-7630	1030	90	7205	25	935
5	Driver Close-up	1450	-10280	1460	90	9855	75	1015
6	Driver Angle	4850	-5300	2030			50	990
7	Onboard Driver						35	1010
8	Onboard Passenger						35	1000
9	Right Overall	2120	7190	1370	90	6740	13	971
10	Right Passenger Half	1060	8380	1440	90	7930	25	1000
11	Right Close-up	1700	10170	1390	90	9720	75	1053
12	Right Angle	4760	5530	1950			50	1165
13	Windshield	-380	0	2750			13	1042
14	Top Driver	-100	-450	1760			13	935
15	Top Passenger	-100	460	1760			13	820
16	Pit Front	1170	0	-3165			13	1015
17	Pit Rear	2740	0	-3155			13	1008

* COORDINATES:

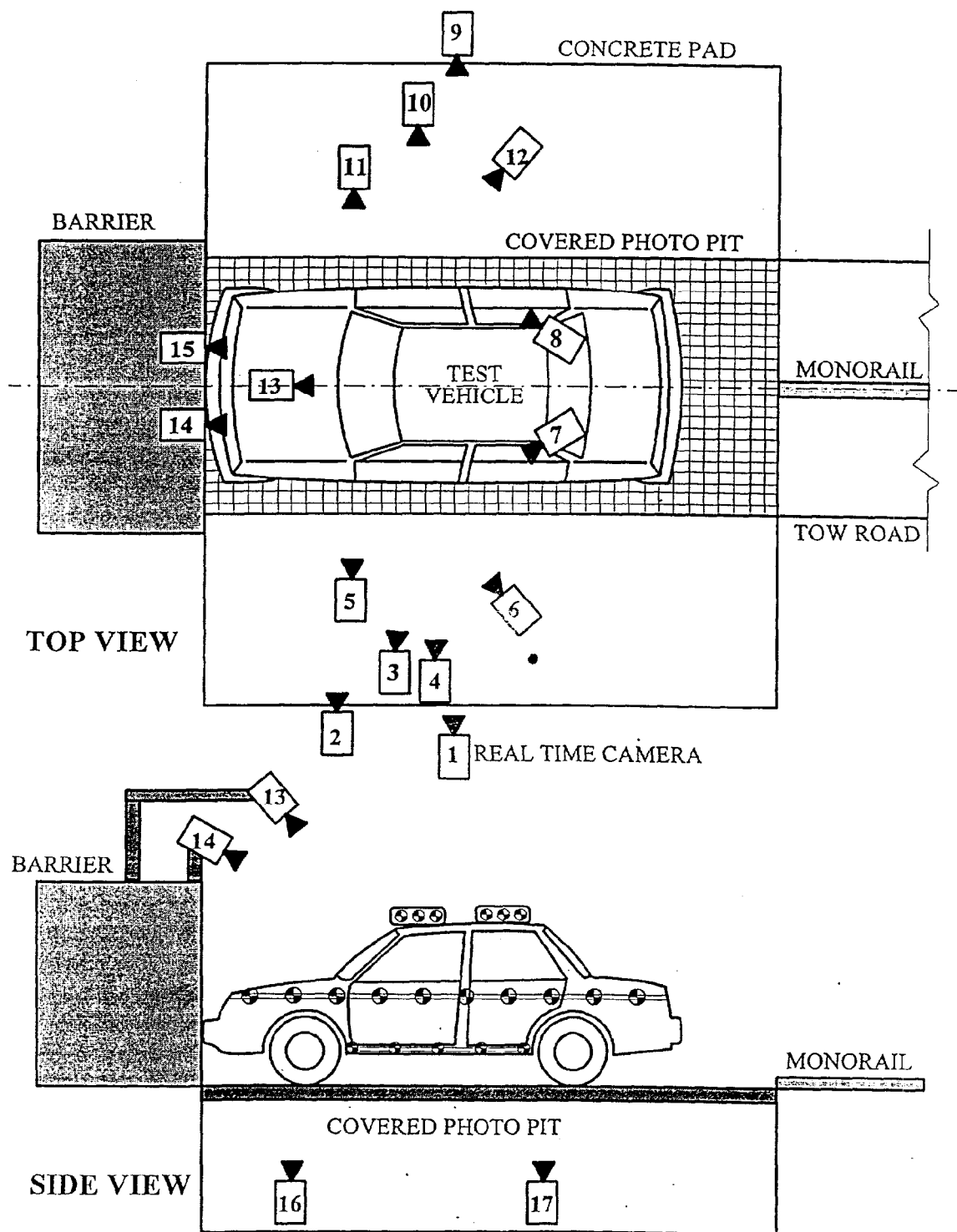
+X = film plane rearward of barrier

+Y = film plane to right of monorail centerline

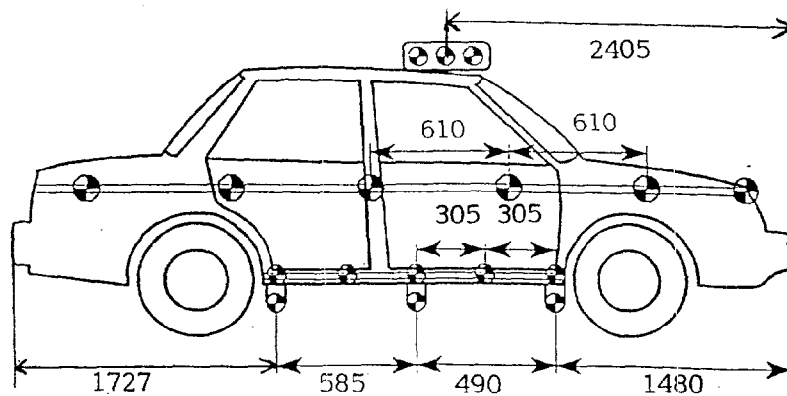
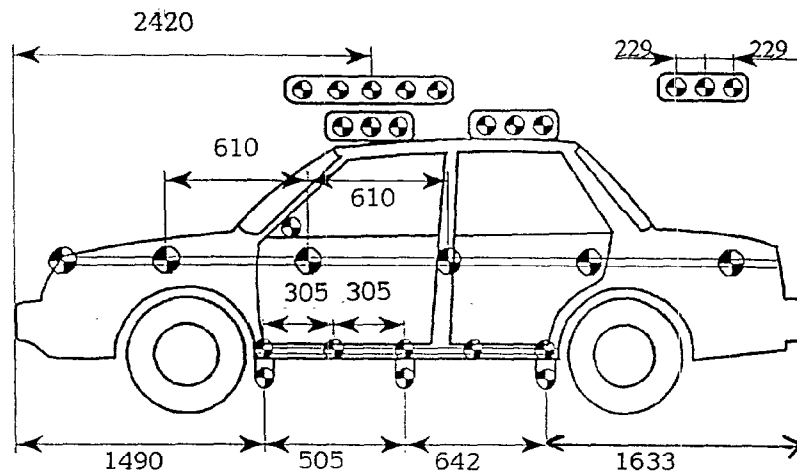
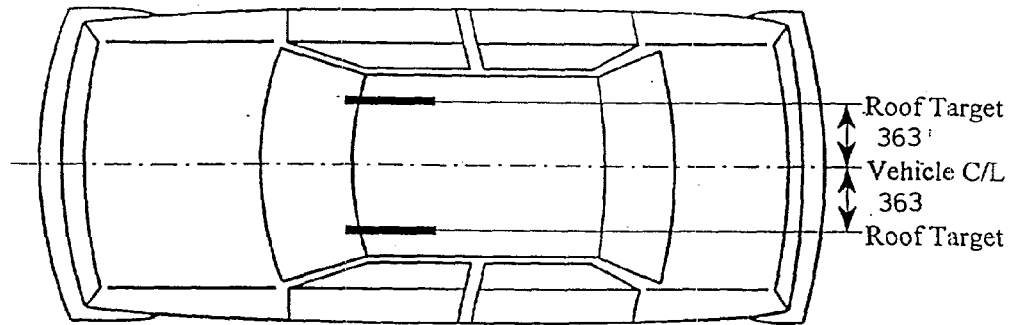
+Z = film plane to above ground level

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

CAMERA LOCATIONS (Cont'd)

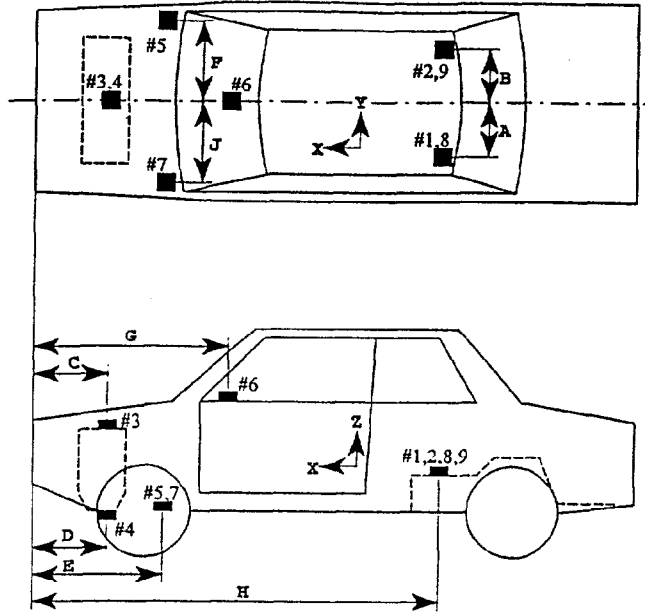


DATA SHEET 14
VEHICLE TARGET LOCATIONS



(DIMENSIONS IN MM)

DATA SHEET 15
VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY



Units: (mm)

Dimension	Length
A	310
B	310
C	716
D	746
E	820
F	672
G	1553
H	2861
J	672

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

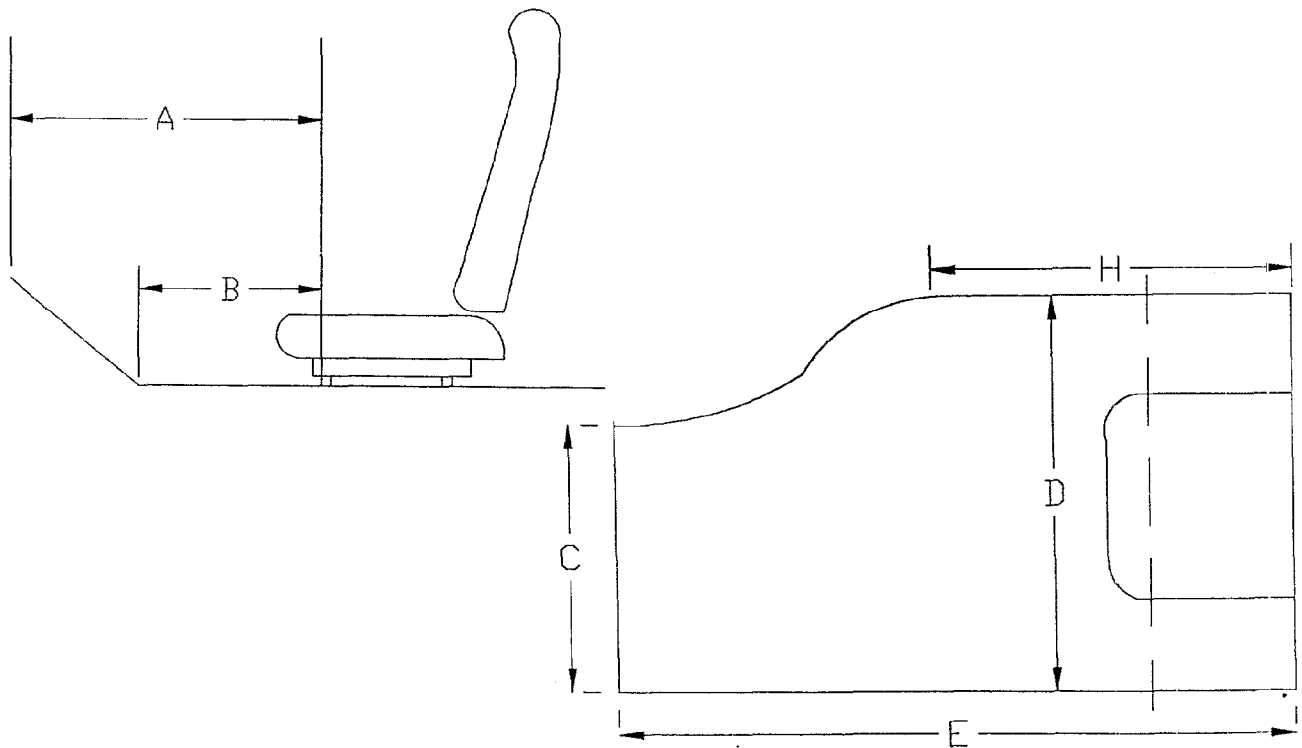
DATA SHEET 16
POST TEST AIRBAG DATA

- A. Number of Vent Holes: Driver 2; Passenger 2
- B. Size of Vent Holes: Driver 25 mm dia.; Passenger 35 mm dia.
- C. Total Vent Area; Driver 39.3 cm² Passenger 77.0 cm²
- D. Deflated Airbag Length and Width Dimensions or, if Round, Diameter
Driver; Length mm, Width mm, Diameter 550 mm
Passenger; Length 500 mm, Width 350 mm, Diameter mm
- E. Is the Airbag Tethered?
Driver; X Yes; No; If yes, record length of tether 300 mm
Passenger; Yes; X No, If yes, record length of tether mm

DATA SHEET 17
TEST VEHICLE MEASUREMENTS

STATIC FOOTWELL DEFORMATION

Driver's Side



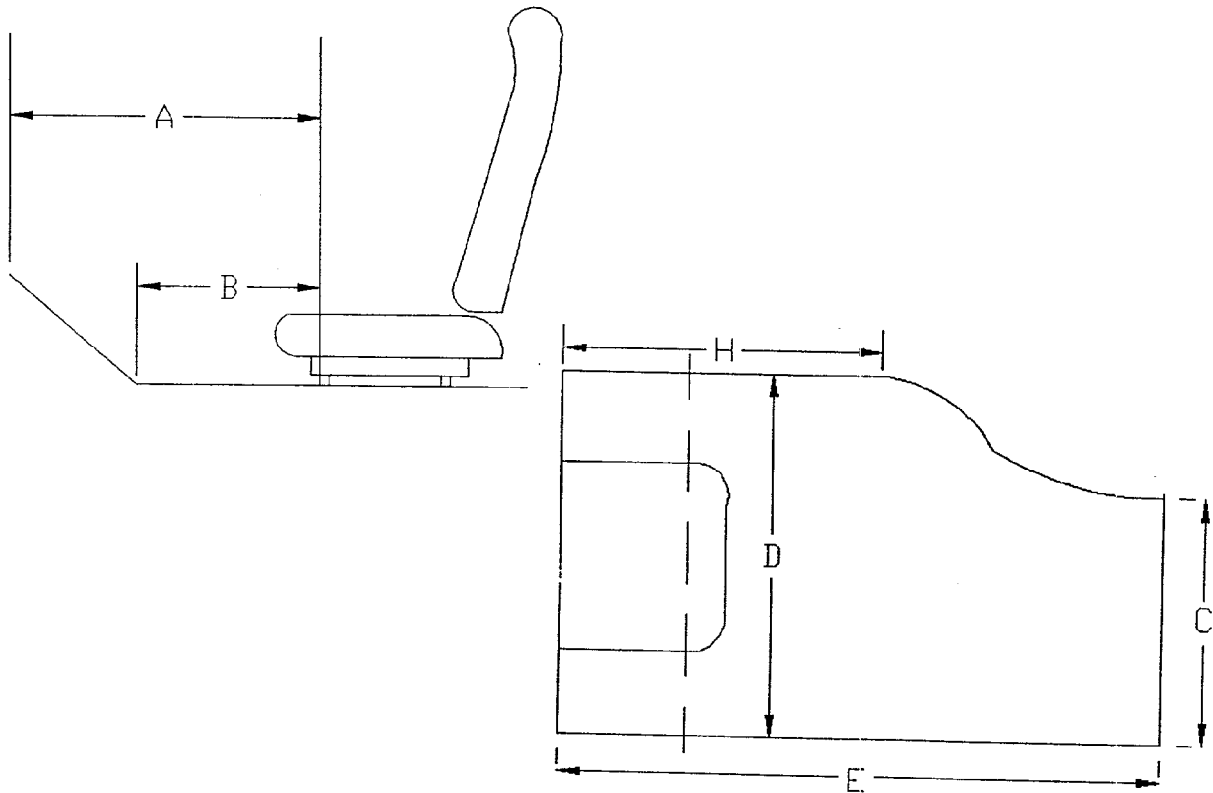
Units = mm

MEASUREMENT	PRE TEST	POST TEST	DIFFERENCE
A	757	580	177
B	615	460	155
C	300	292	8
D	402	403	1
E	1944	1785	159
H	1723	1665	58

DATA SHEET 17
TEST VEHICLE MEASUREMENTS (Cont'd)

STATIC FOOTWELL DEFORMATION

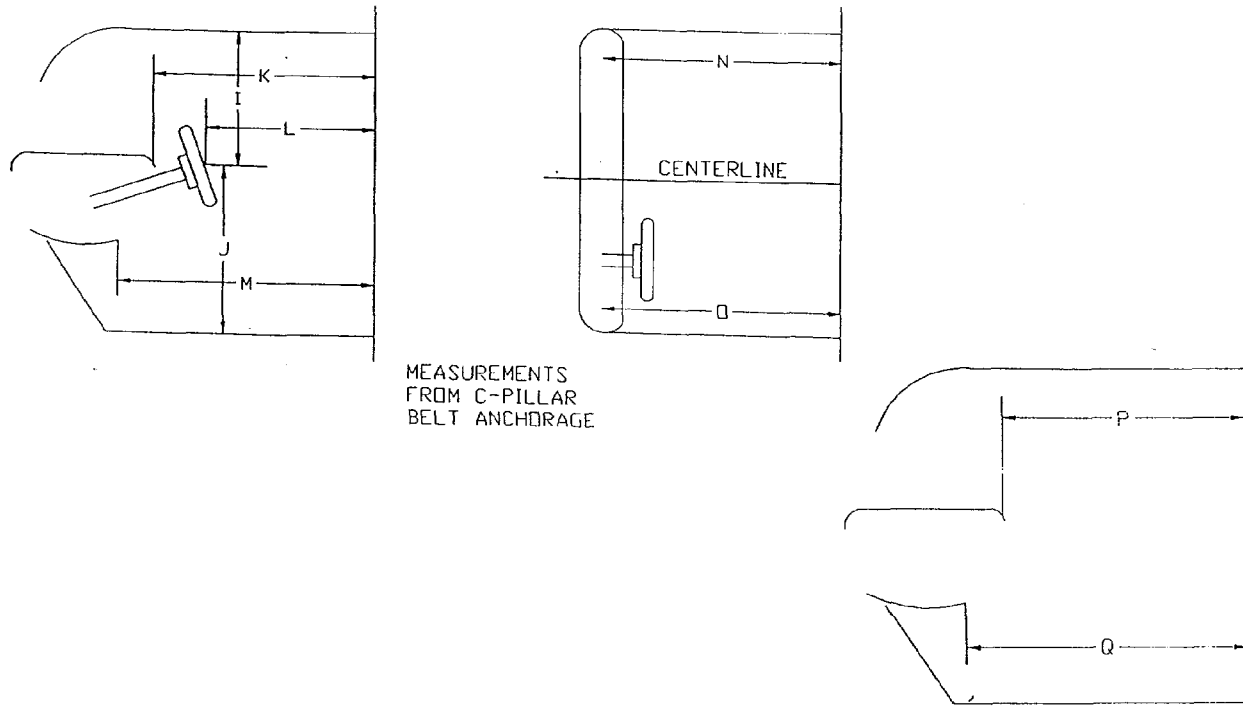
Passenger's Side



Units = mm

MEASUREMENT	PRE TEST	POST TEST	DIFFERENCE
A	813	550	263
B	569	484	85
C	444	380	64
D	473	425	48
E	1835	1783	52
H	1815	1739	76

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



Units = mm

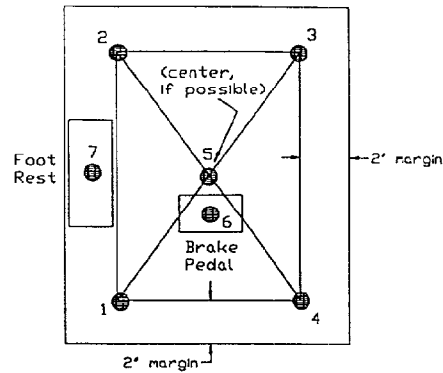
MEASUREMENT	PRE TEST	POST TEST	DIFFERENCE
I	450	352	98
J	628	756	128
K	1518	1512	6
L	1313	1309	4
M	1548	1480	68
N	1838	1811	27
O	1810	1800	10
P	1568	1524	44
Q	1768	*	---

* Knee bolster panel fell off during impact

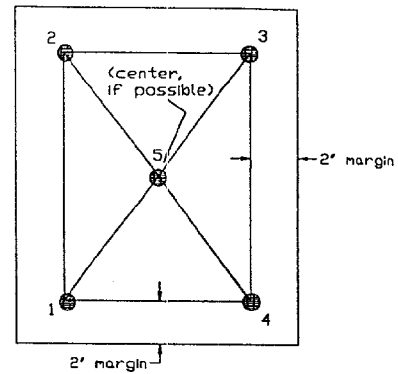
DATA SHEET 17

TEST VEHICLE MEASUREMENTS (Cont'd)

TOE PAN MEASUREMENTS



DRIVER



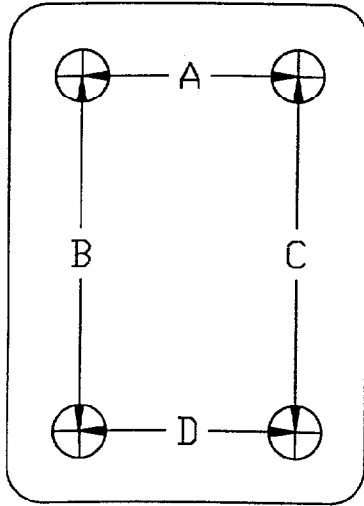
PASSENGER

Driver						
Location	X			Z		
	Pre-Test	Post-Test	Def.	Pre-Test	Post-Test	Def.
1	580	480	100	42	18	24
2	760	571	189	142	226	84
3	736	564	172	181	180	1
4	574	476	98	37	2	35
5	684	524	160	35	122	87
6	568	440	128	124	162	38
7	618	550	68	62	82	20
Passenger						
Location	X			Z		
	Pre-Test	Post-Test	Def.	Pre-Test	Post-Test	Def.
1	561	423	138	19	23	4
2	754	530	224	130	187	57
3	751	567	184	113	197	84
4	580	521	59	36	37	1
5	648	456	192	38	77	39

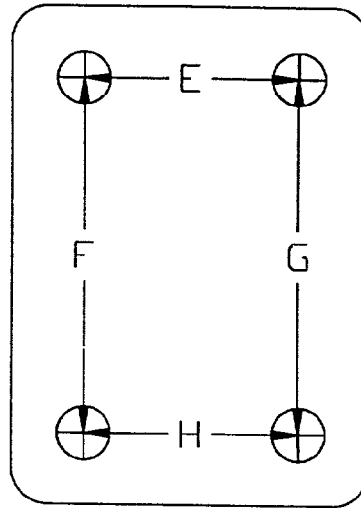
DATA SHEET 17
TEST VEHICLE MEASUREMENTS (Cont'd)

UNDERBODY FLOORBOARD DEFORMATION

DRIVER'S SIDE



PASSENGER'S SIDE



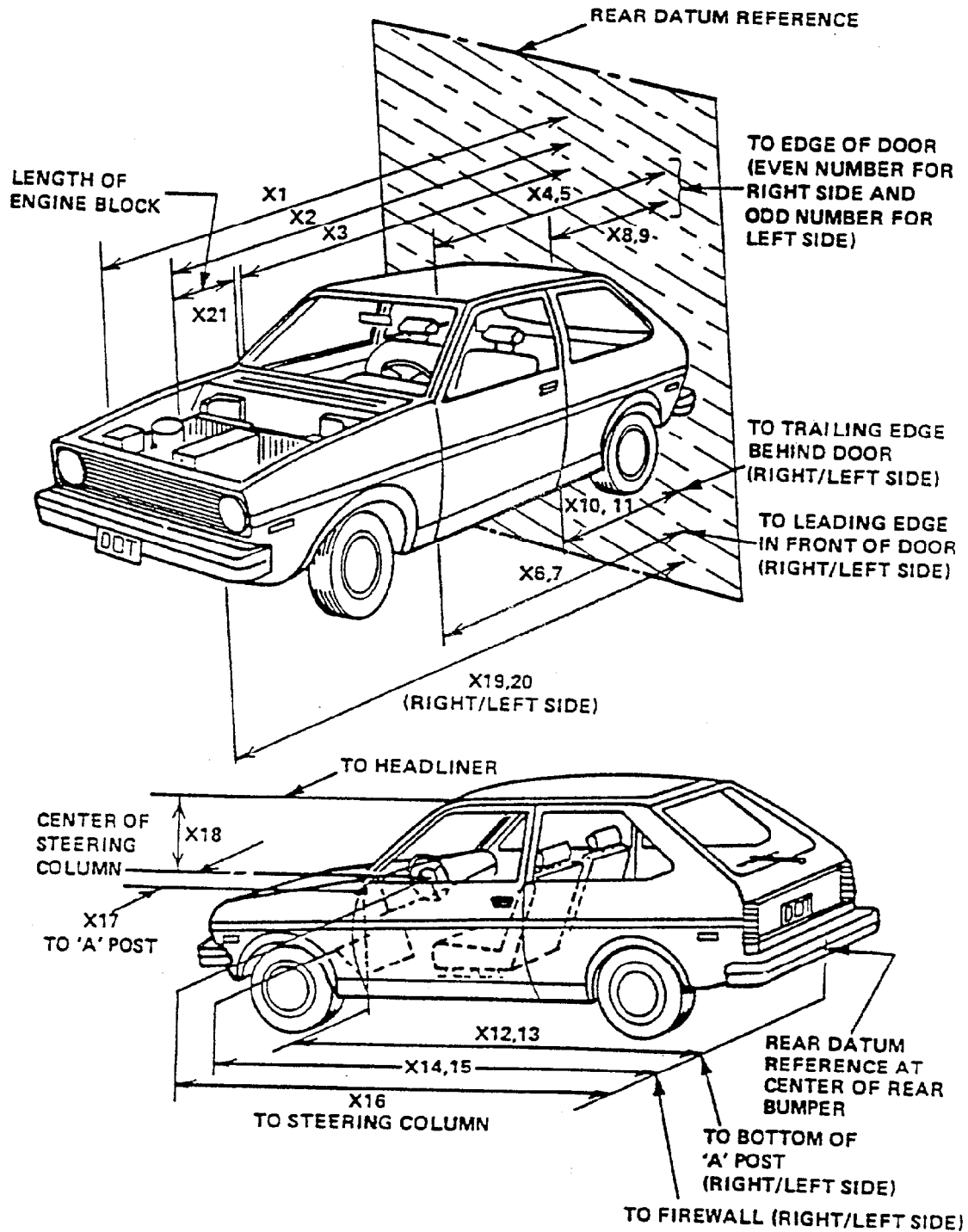
MEASUREMENT	PRE TEST	POST TEST	DIFFERENCE
A	333	342	9
B	313	311	2
C	310	254	56
D	336	333	3
E	303	312	9
F	336	296	40
G	337	338	1
H	292	295	3

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	4484	3990	494
X2	Rear Surface of Vehicle to Front of Engine	3815	3525	290
X3	Rear Surface of Vehicle to Firewall	3363	3190	173
X4	Rear Surface to Upr. Leading Edge of Rt. Door	2988	2998	10
X5	Rear Surface to Upr. Leading Edge of Left Door	2988	2987	1
X6	Rear Surface to Lwr. Leading Edge of Rt. Door	2988	2983	5
X7	Rear Surface to Lwr. Leading Edge of Left Door	2978	2976	2
X8	Rear Surface to Upr. Trailing Edge of Rt. Door	1944	1947	3
X9	Rear Surface to Upr. Trailing Edge of Left Door	1935	1936	1
X10	Rear Surface to Lwr. Trailing Edge of Rt. Door	1941	1934	7
X11	Rear Surface to Lwr. Trailing Edge of Left Door	1934	1925	9
X12	Rear Surface to Bottom of A-Post on Rt. Side	2987	2983	4
X13	Rear Surface to Bottom of A-Post on Left Side	2985	2976	9
X14	Rear Surface to Firewall on Right Side	3272	*	---
X15	Rear Surface to Firewall on Left Side	3272	*	---
X16	Rear Surface to Steering Column	2528	2505	23
X17	Center of Steering Column to A-Post	448	357	91
X18	Center of Steering Column to Headlining	450	352	98
X19	Rear Surface to Right Side of Front Bumper	4282	4018	264
X20	Rear Surface to Left Side of Front Bumper	4270	3806	464
X21	Length of Engine Block	540	540	0

* Measurement point not accessible post-test.

DATA SHEET 17
TEST VEHICLE MEASUREMENTS (Cont'd)



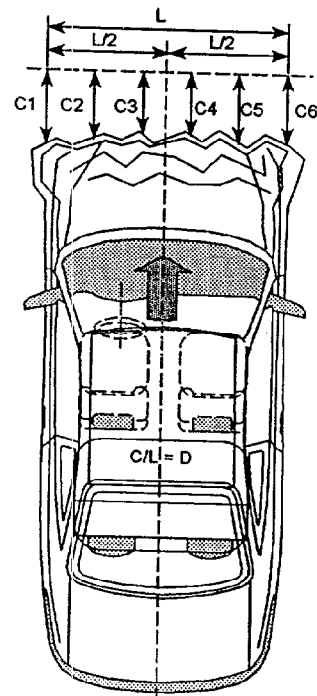
DATA SHEET 18
ACCIDENT INVESTIGATION DIVISION DATA
FOR 35 MPH FRONTAL BARRIER IMPACT

Vehicle Make/Model/Body Style: 1998/Nissan/Altima/4 Door
 Veh. NHTSA NO.: MW5200 ; VIN: 1N4DL01DXWC102557
 Model Year: 1998 ; Build Date: 6-97 ; Test Date: November 24, 1997
 Veh. Size Category: mid-size ; Test Weight: 1553.5 kg
 Veh. Wheelbase: 2630 mm ; Front Overhang: 910 mm ; Overall Width: 1740 mm

ACCELEROMETER DATA:

Location: As per measurements on pages 4-13
 Calibration Procedure: As per MGA Calibration Procedure
 Linearity: >99.9% ; Integration Algorithm: Trapezoidal
 Veh: Impact Speed: 56.6 kph ; Time Of Separation: 192 msec
 Velocity Change: 67.9 kph
 COLLISION DEFORMATION CLASSIFICATION (CDC) CODE: F (Frontal)

CRUSH DEPTH C1 = 464 mm
 DIMENSIONS: C2 = 521 mm
 C3 = 501 mm
 C4 = 471 mm
 C5 = 402 mm
 C6 = 264 mm
 MIDPOINT OF D = Vehicle Centerline
 DAMAGE: (Longitude)
 LENGTH OF
 DAMAGED REGION: L = 1498 mm



APPENDIX A
PHOTOGRAPHS

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Photo No. A-49 - Rollover 270°	A-49
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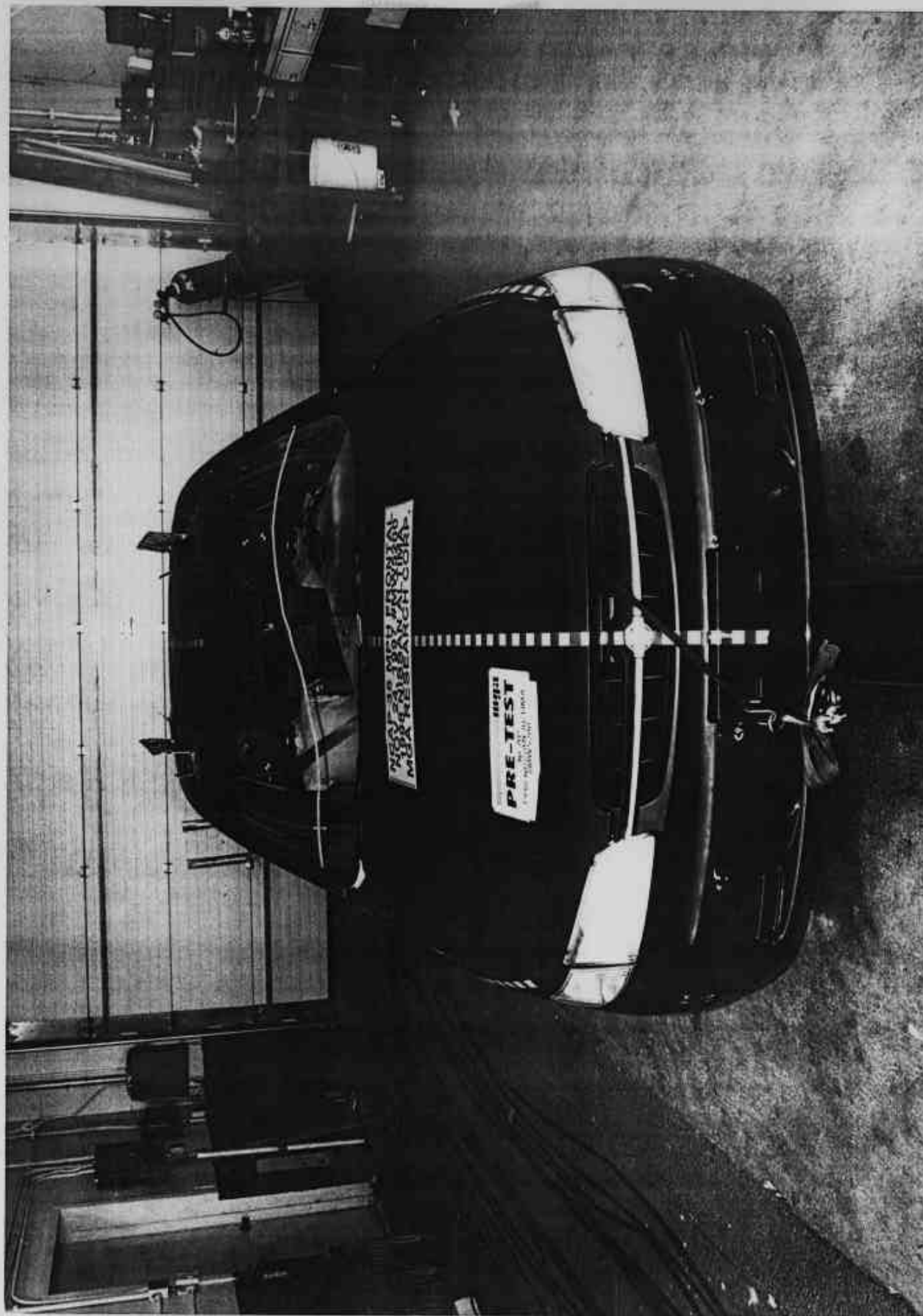


Photo No. A-1 - Pre-Test Front View of Test Vehicle

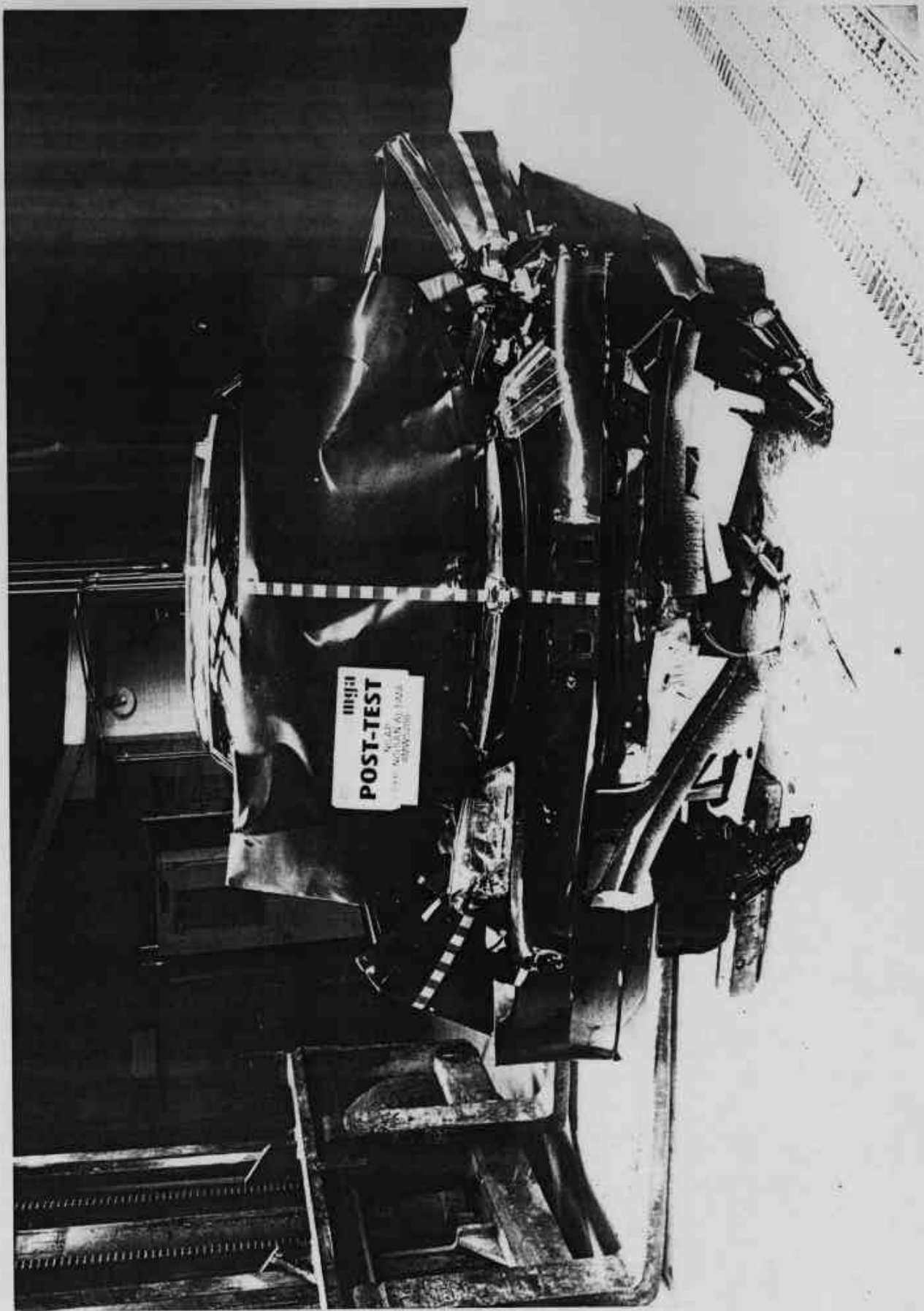


Photo No. A-2 - Post-Test Front View of Test Vehicle

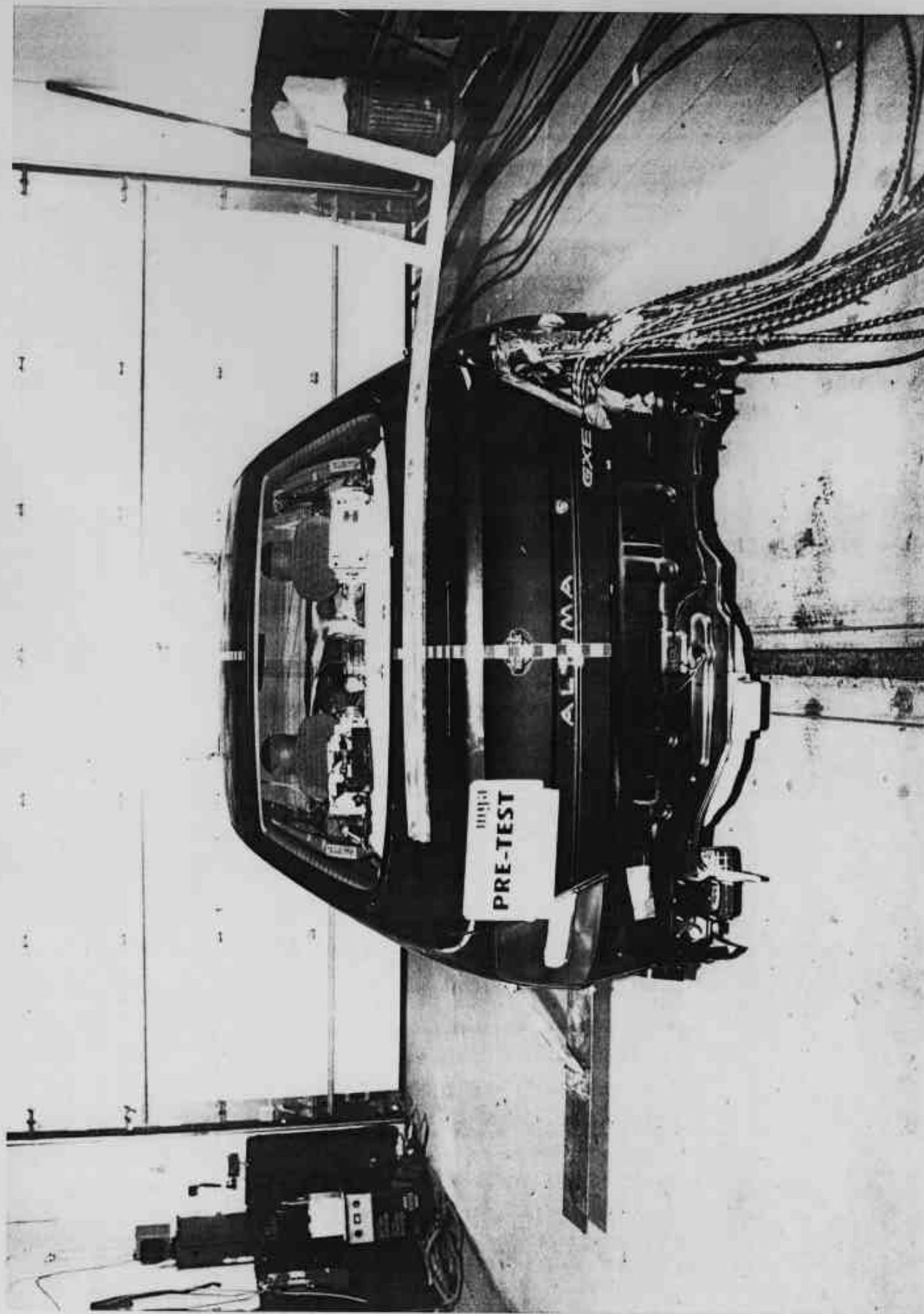


Photo No. A-3 - Pre-Test Rear View of Test Vehicle

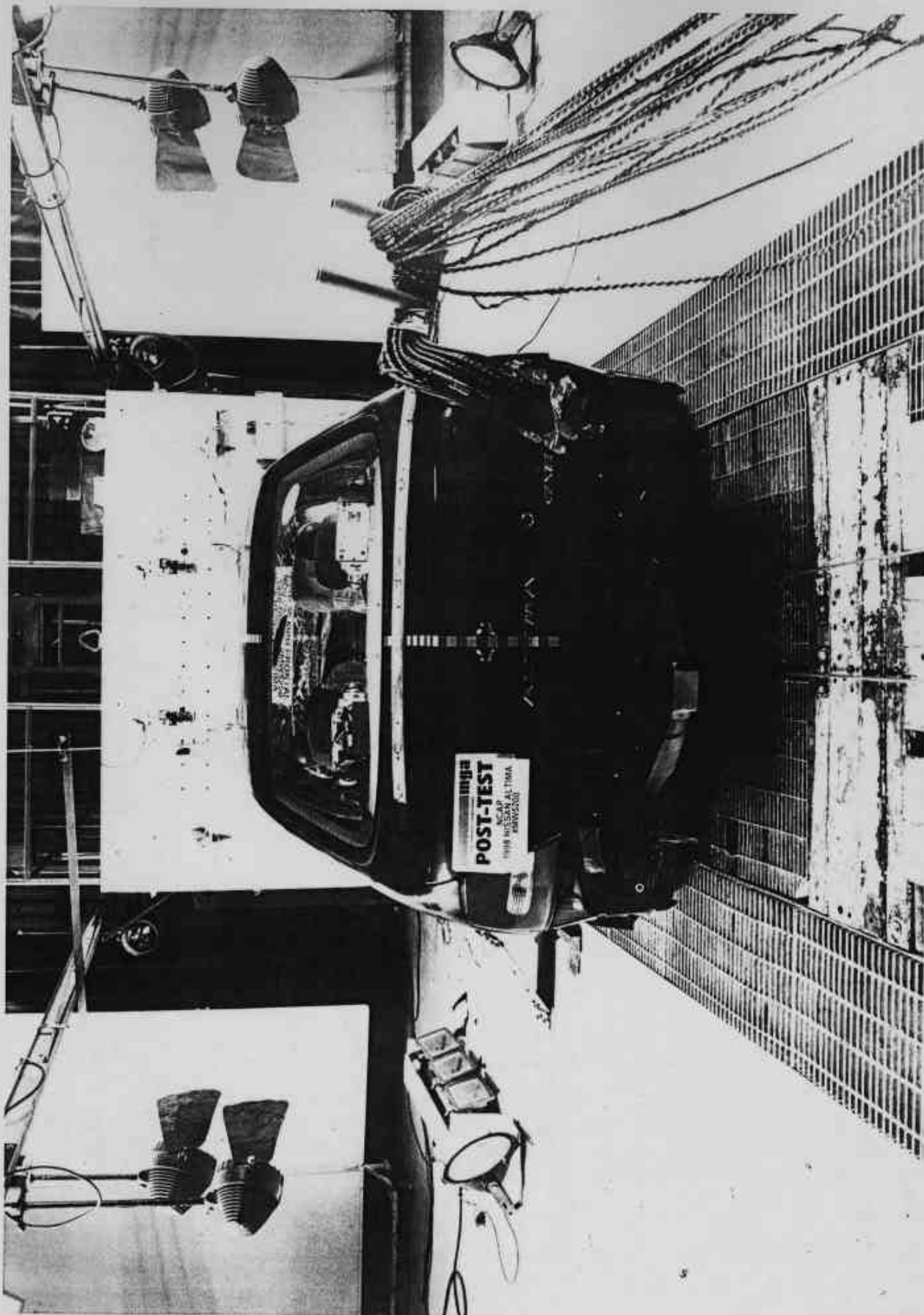


Photo No. A-4 - Post-Test Rear View of Test Vehicle

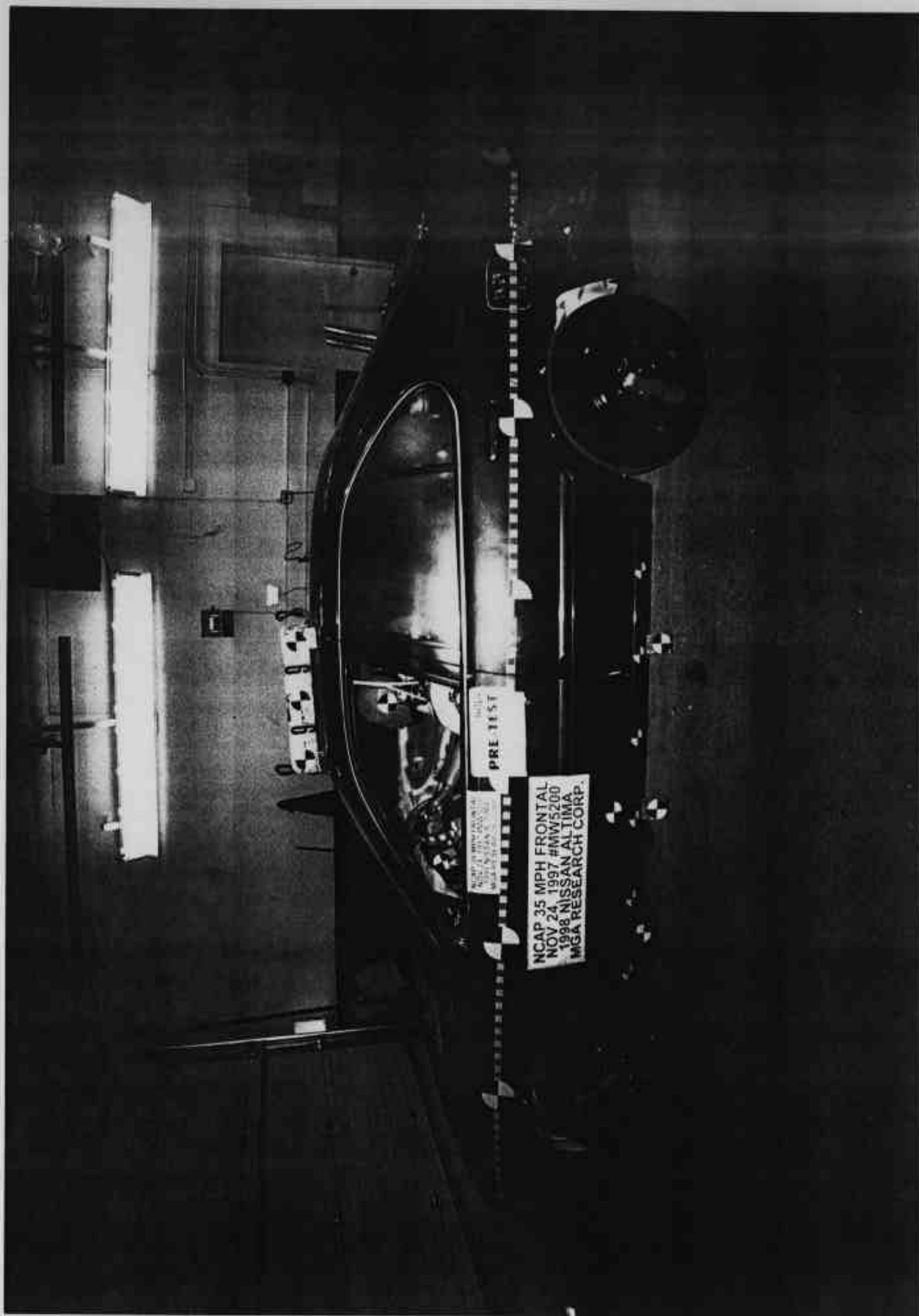


Photo No. A-5 - Pre-Test Left Side View of Test Vehicle

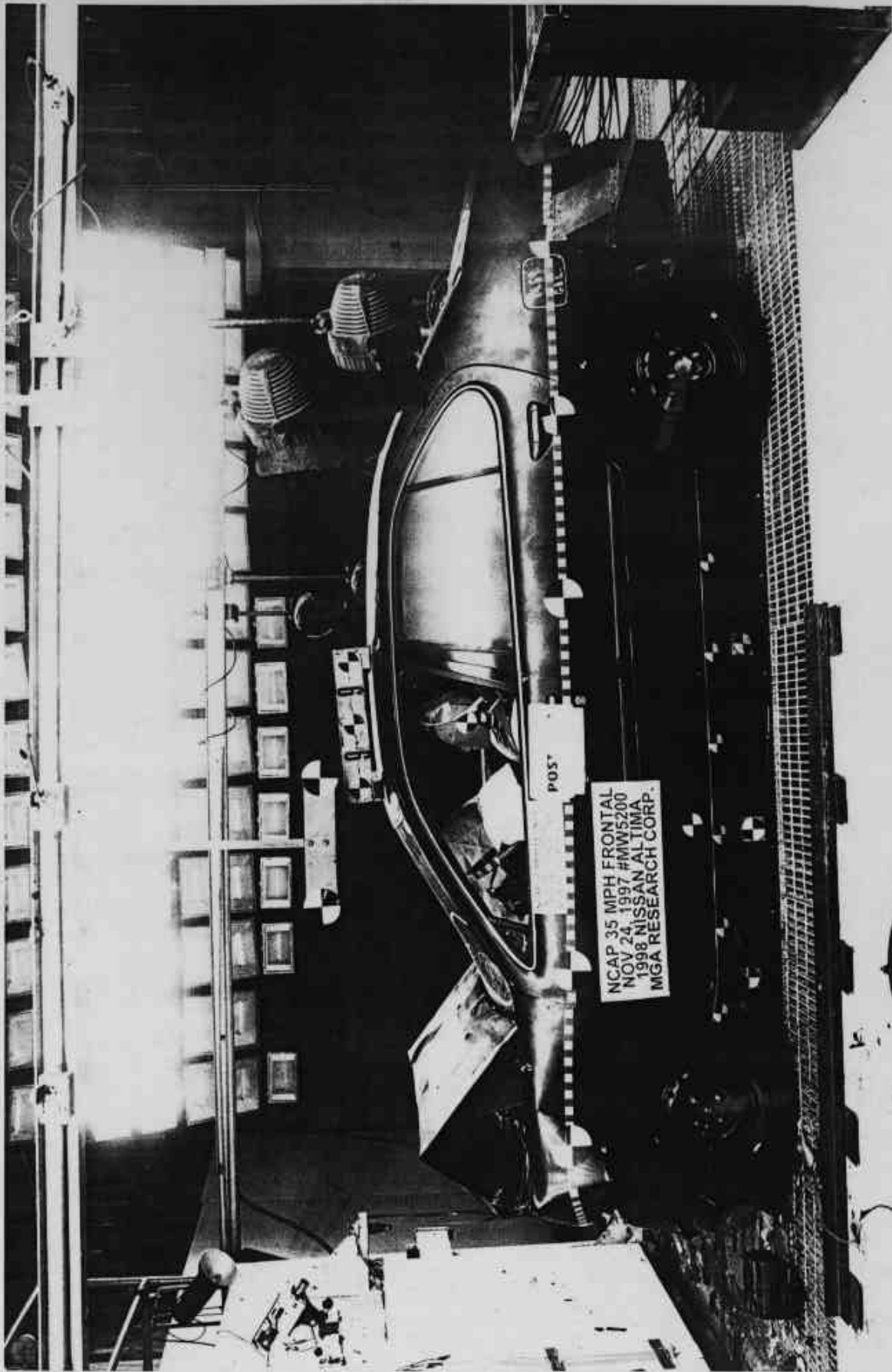


Photo No. A-6 - Post-Test Left Side View of Test Vehicle

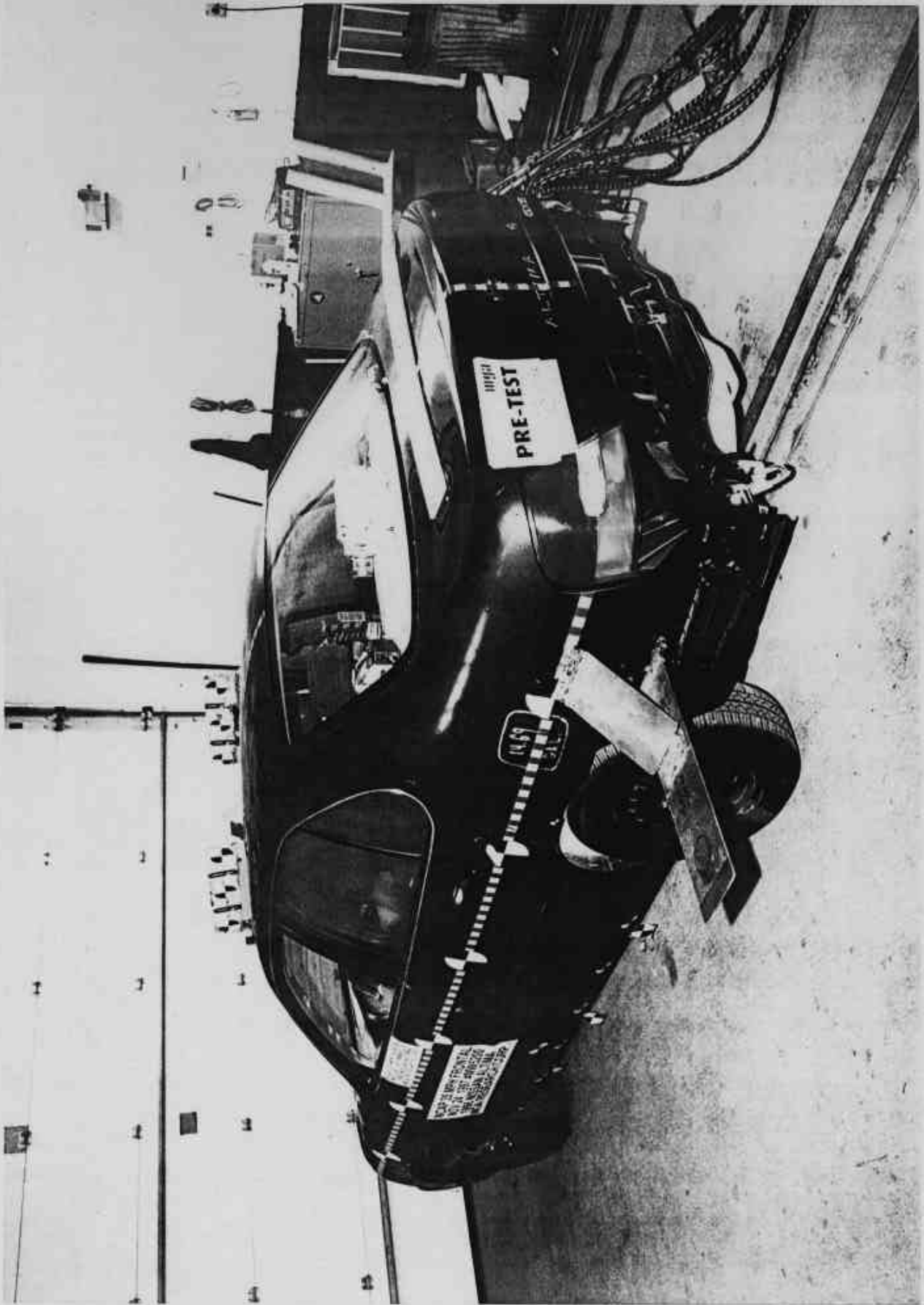
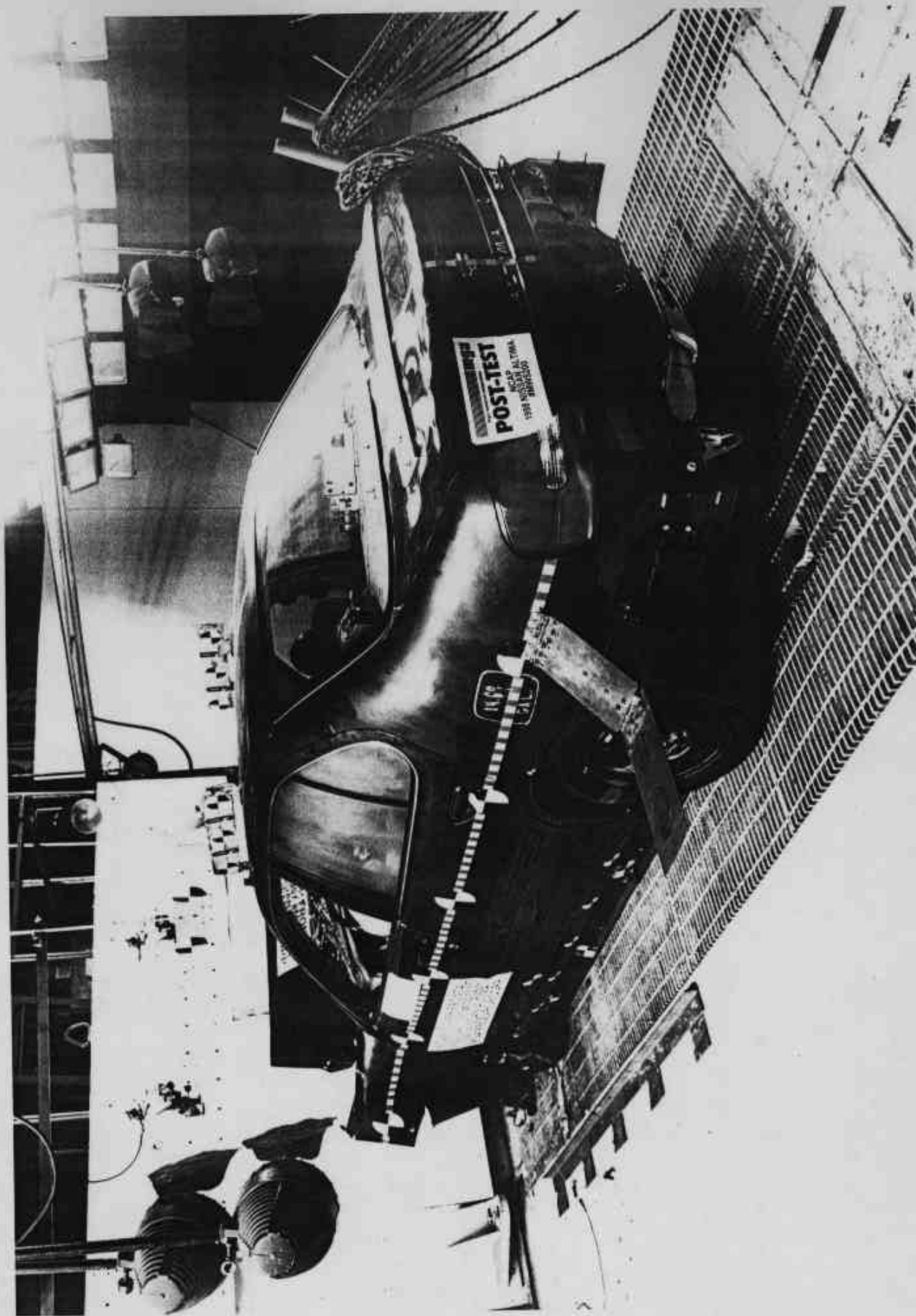


Photo No. A-7 - Pre-Test Left Rear Three-Quarter View of Test Vehicle



A-8

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

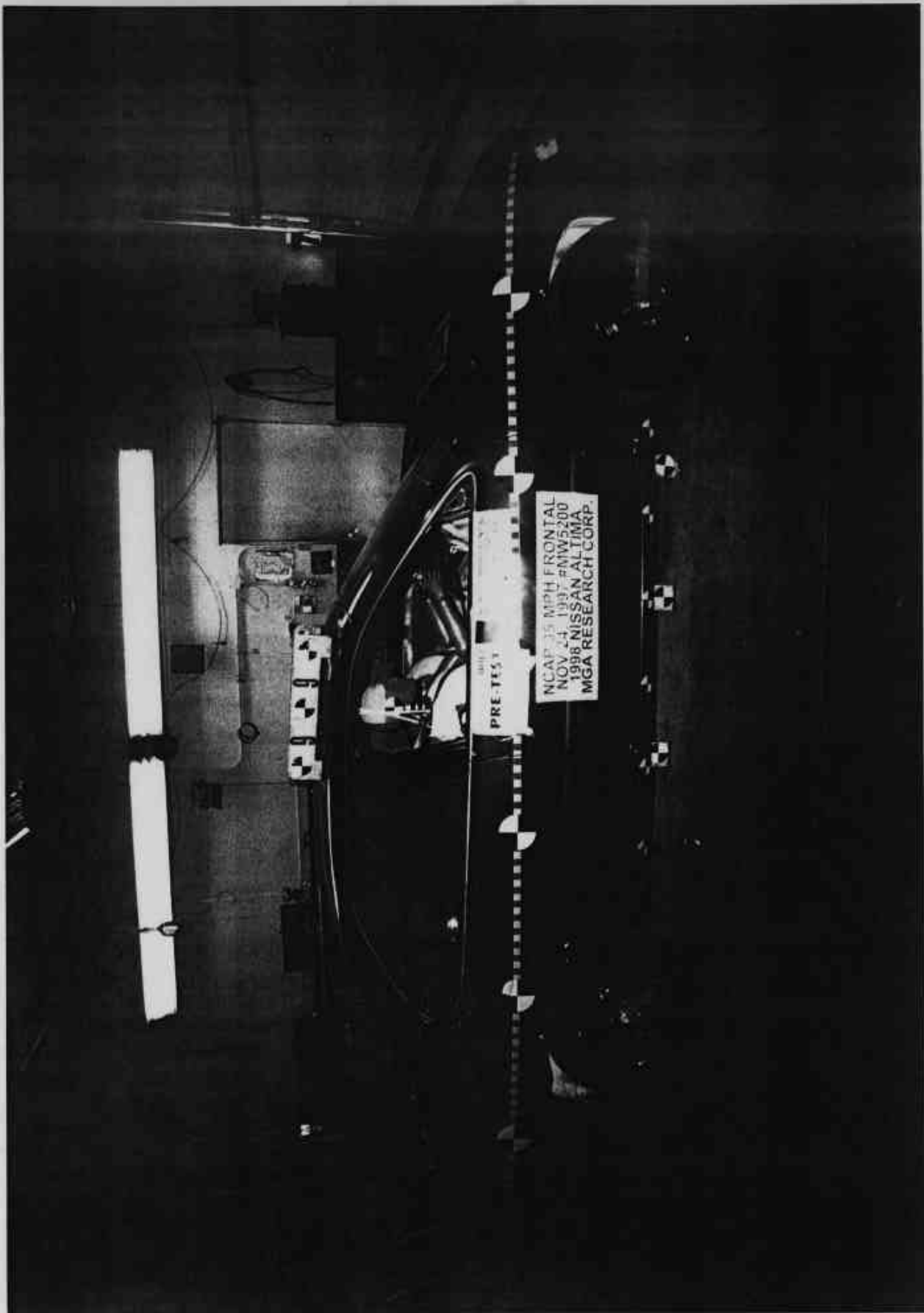


Photo No. A-9 - Pre-Test Right Side View of Test Vehicle

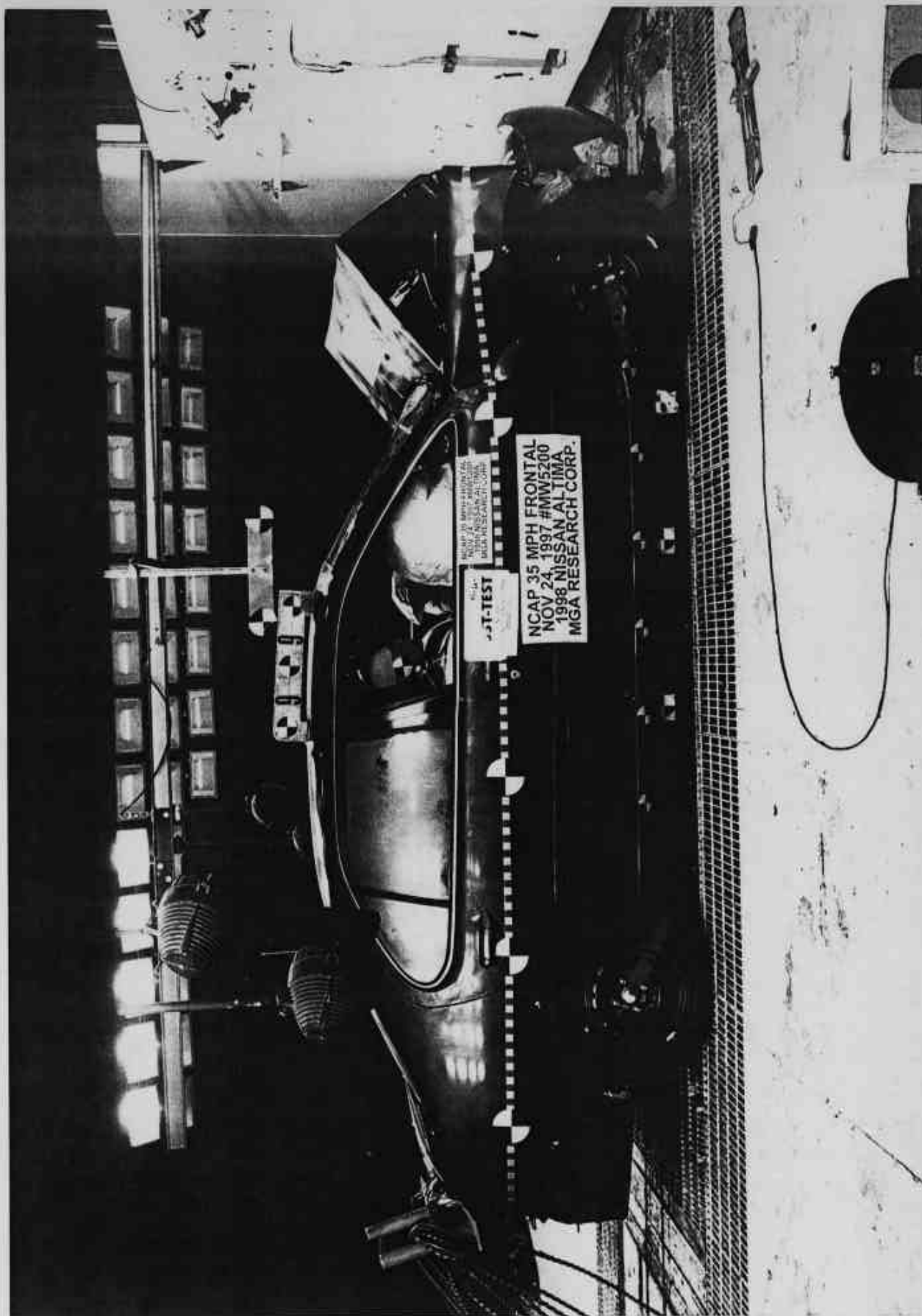


Photo No. A-10 - Post-Test Right Side View of Test Vehicle

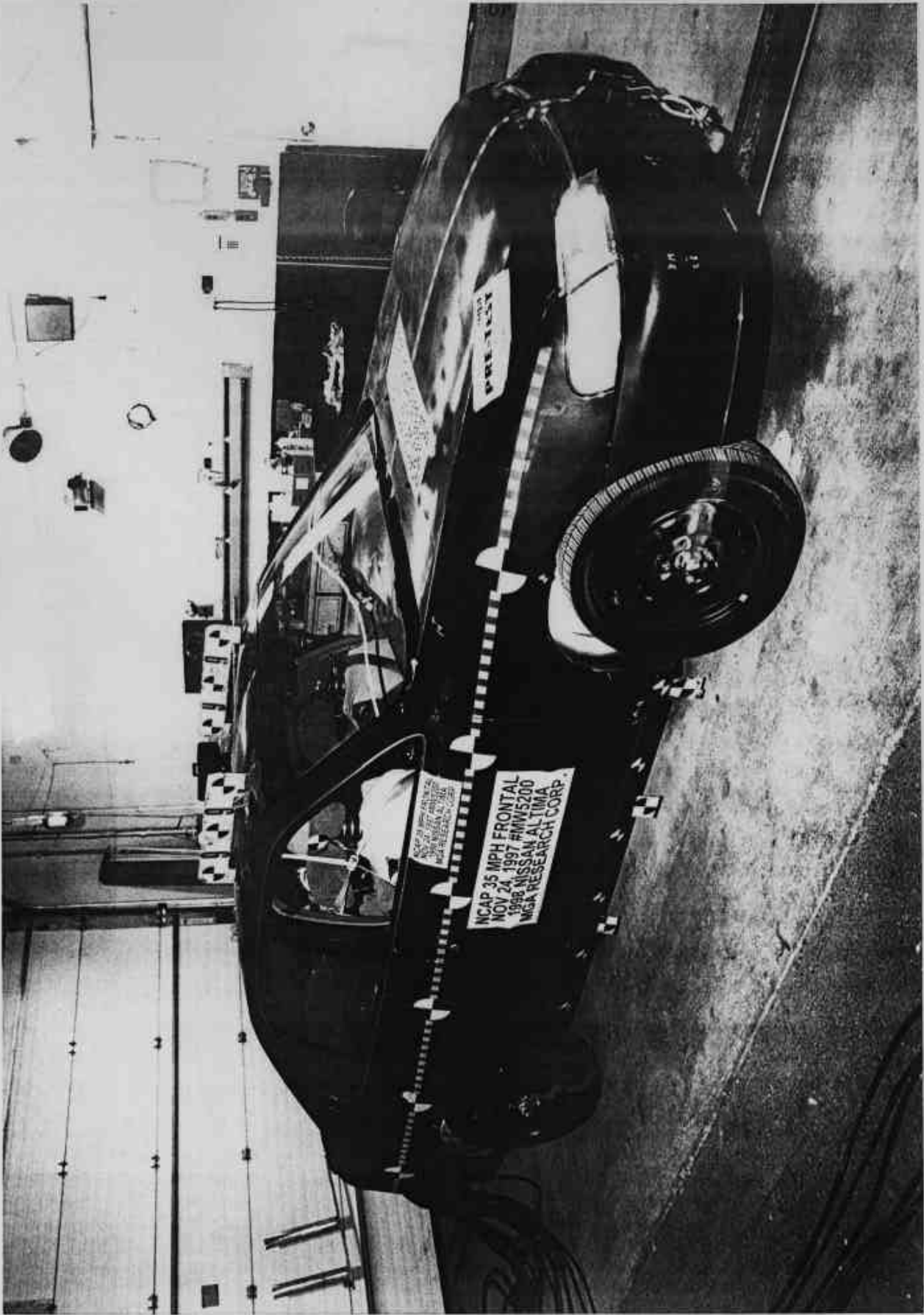
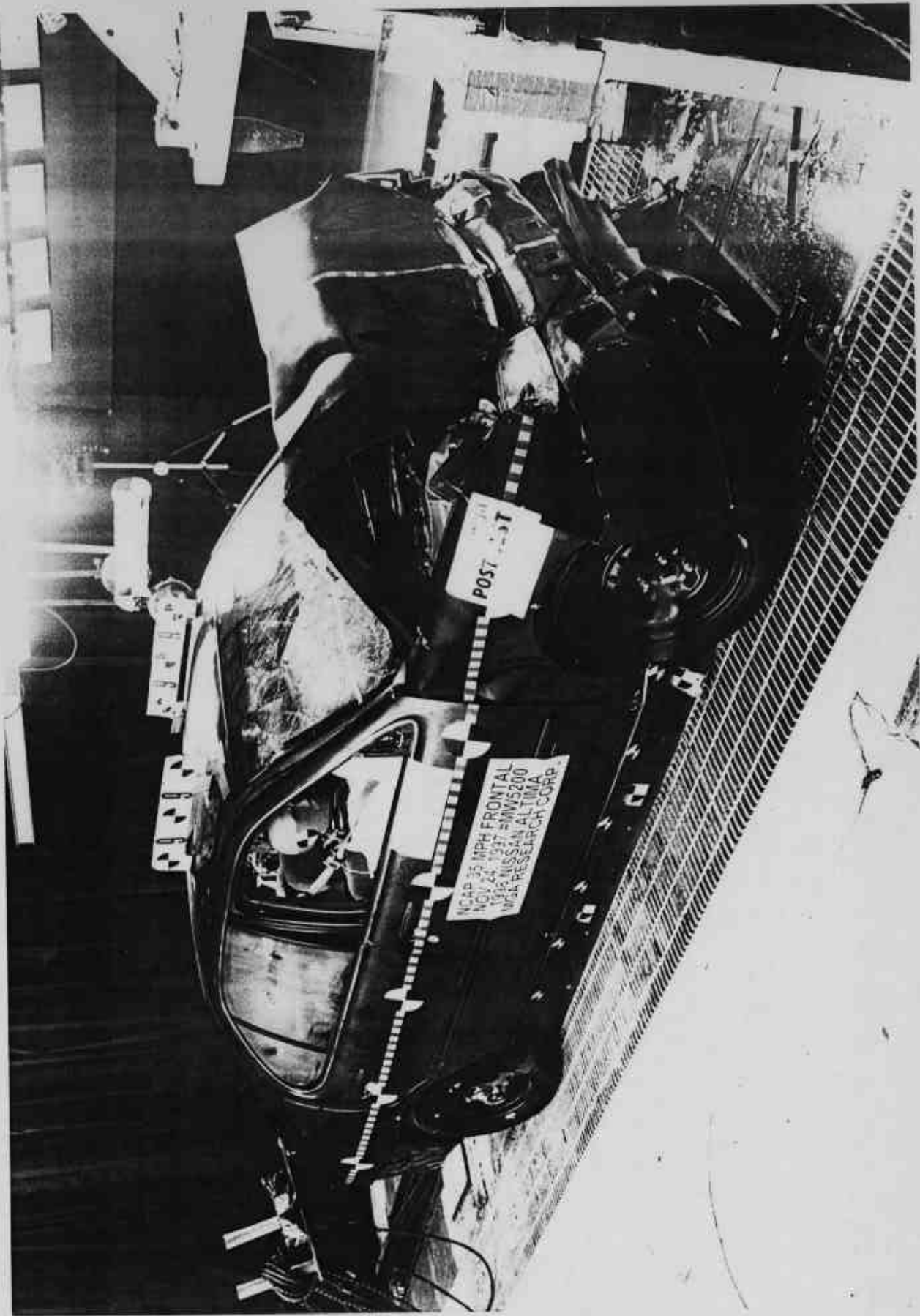


Photo No. A-11 - Pre-Test Right Front Three-Quarter View of Test Vehicle



A-12

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

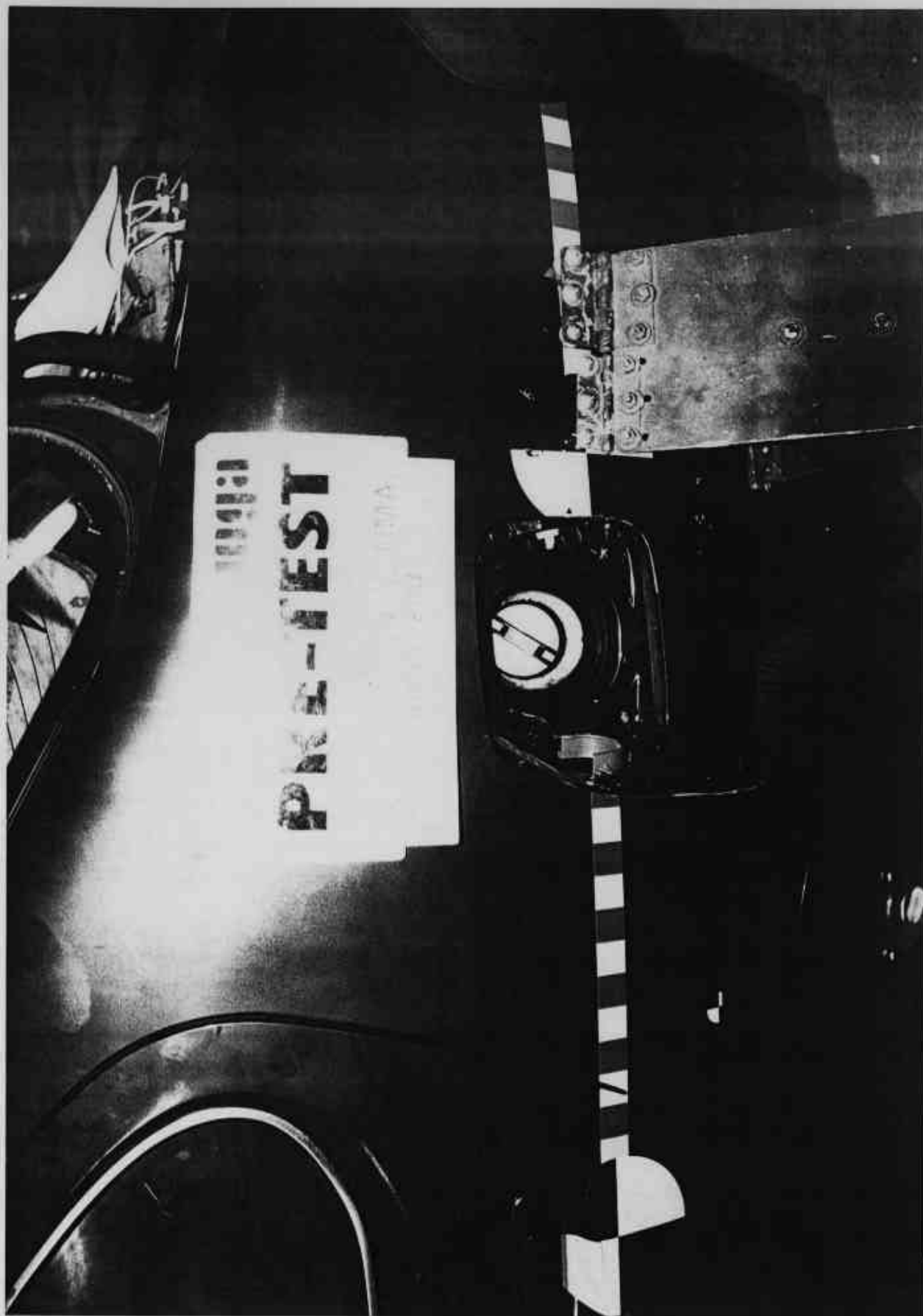


Photo No. A-13 - Pre-Test Fuel Filler Cap View

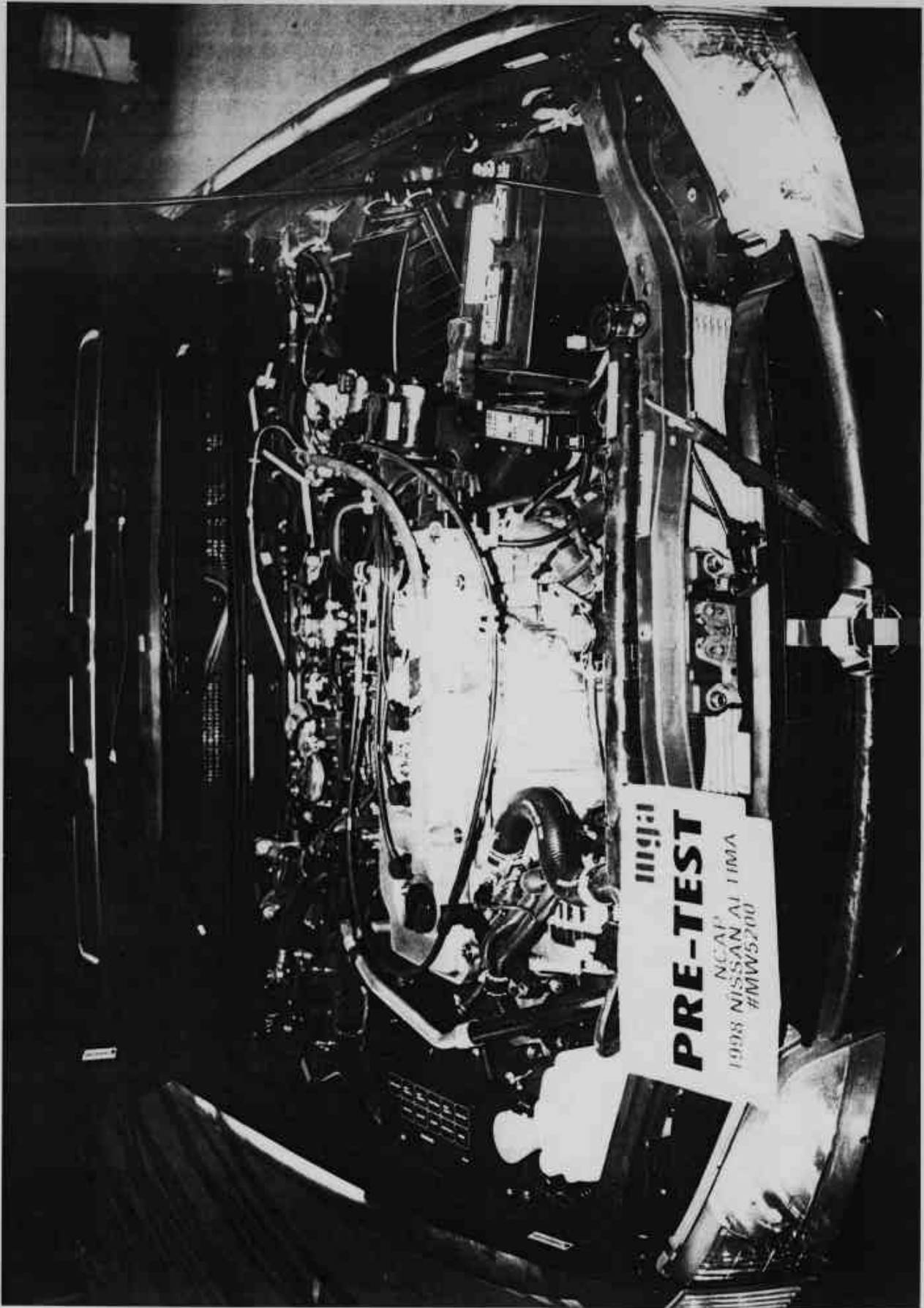


Photo No. A-14 - Pre-Test Engine Compartment View

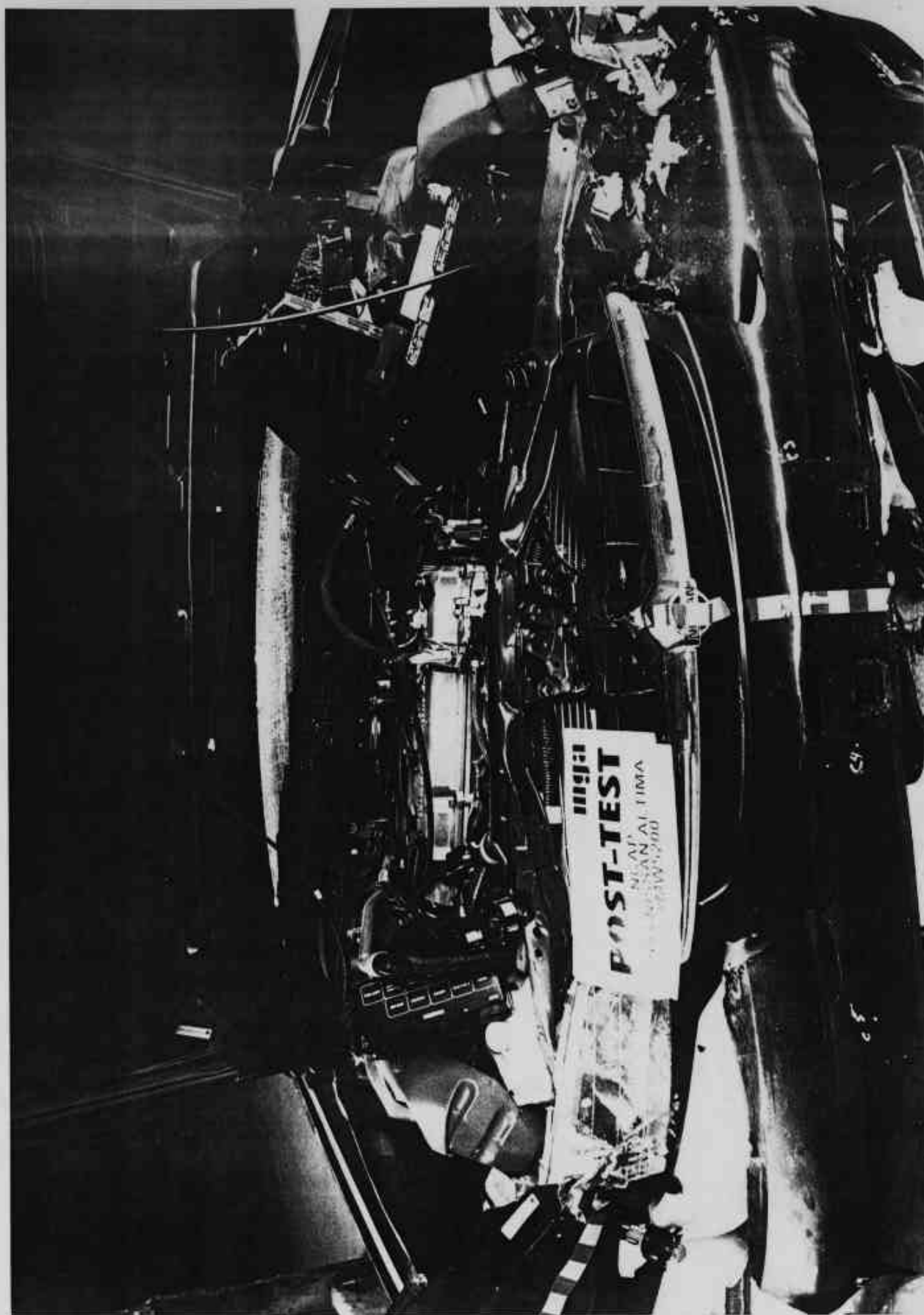


Photo No. A-15 - Post-Test Engine Compartment View

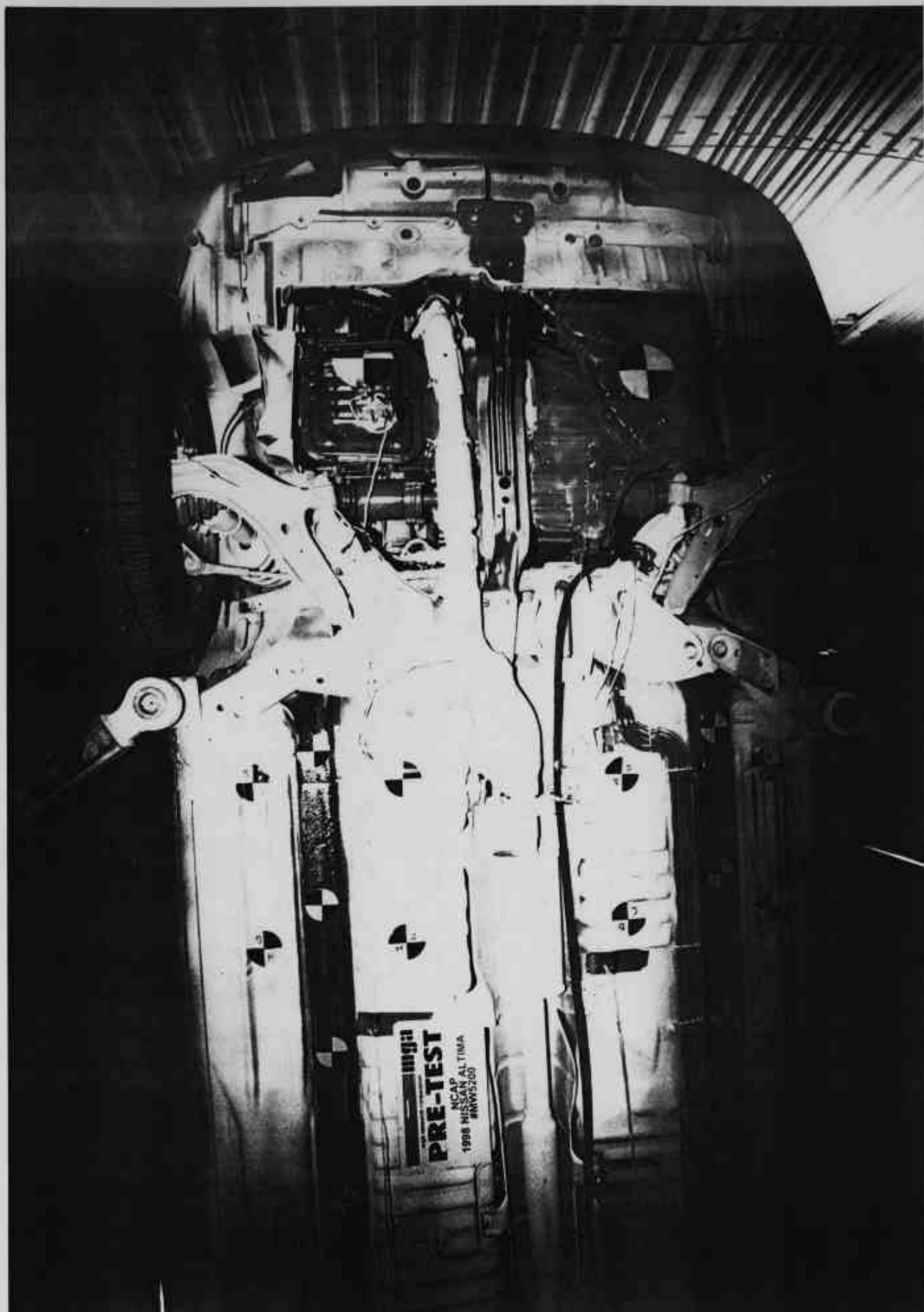


Photo No. A-16 - Pre-Test Front Underbody View

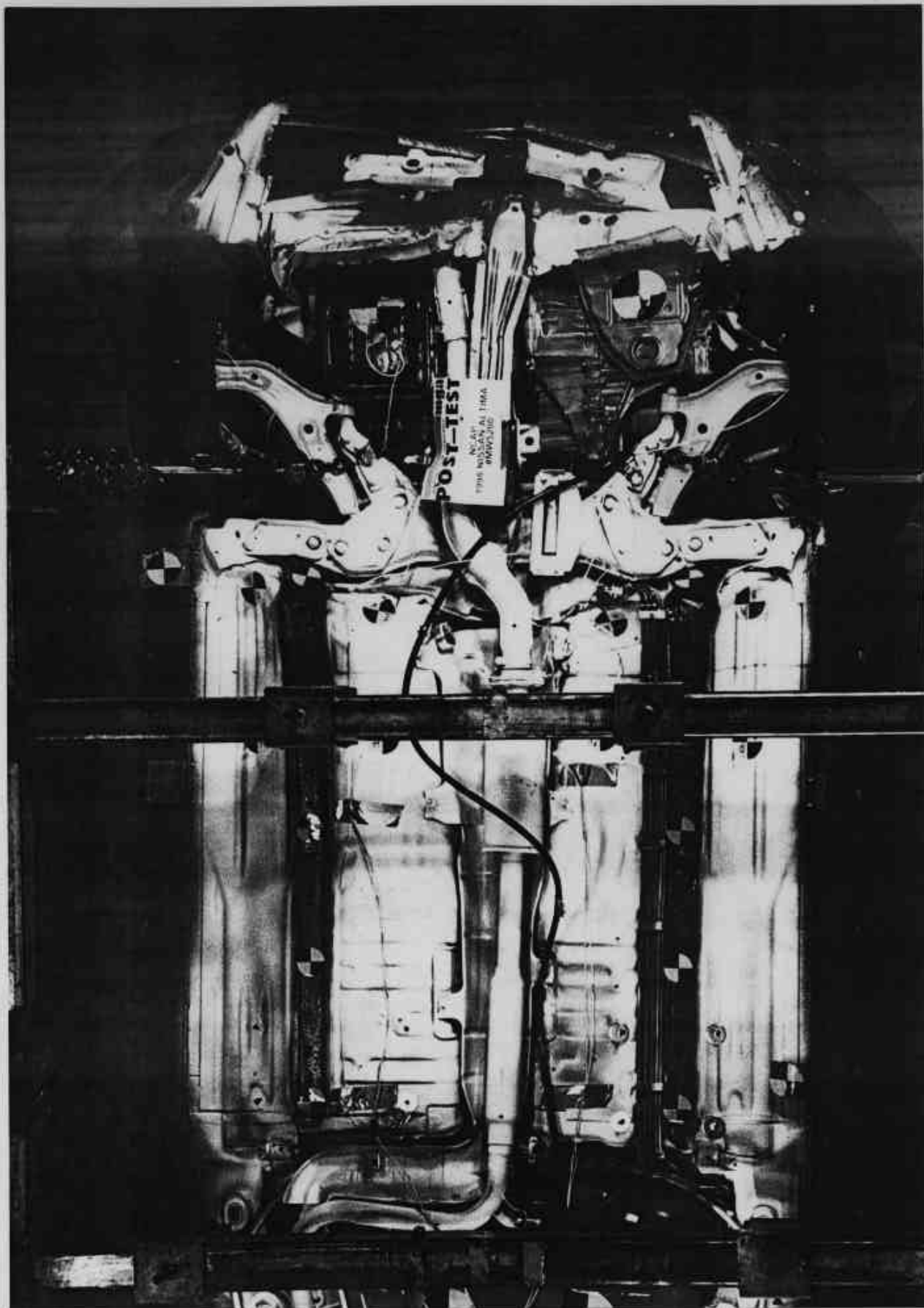


Photo No. A-17 - Post-Test Front Underbody View

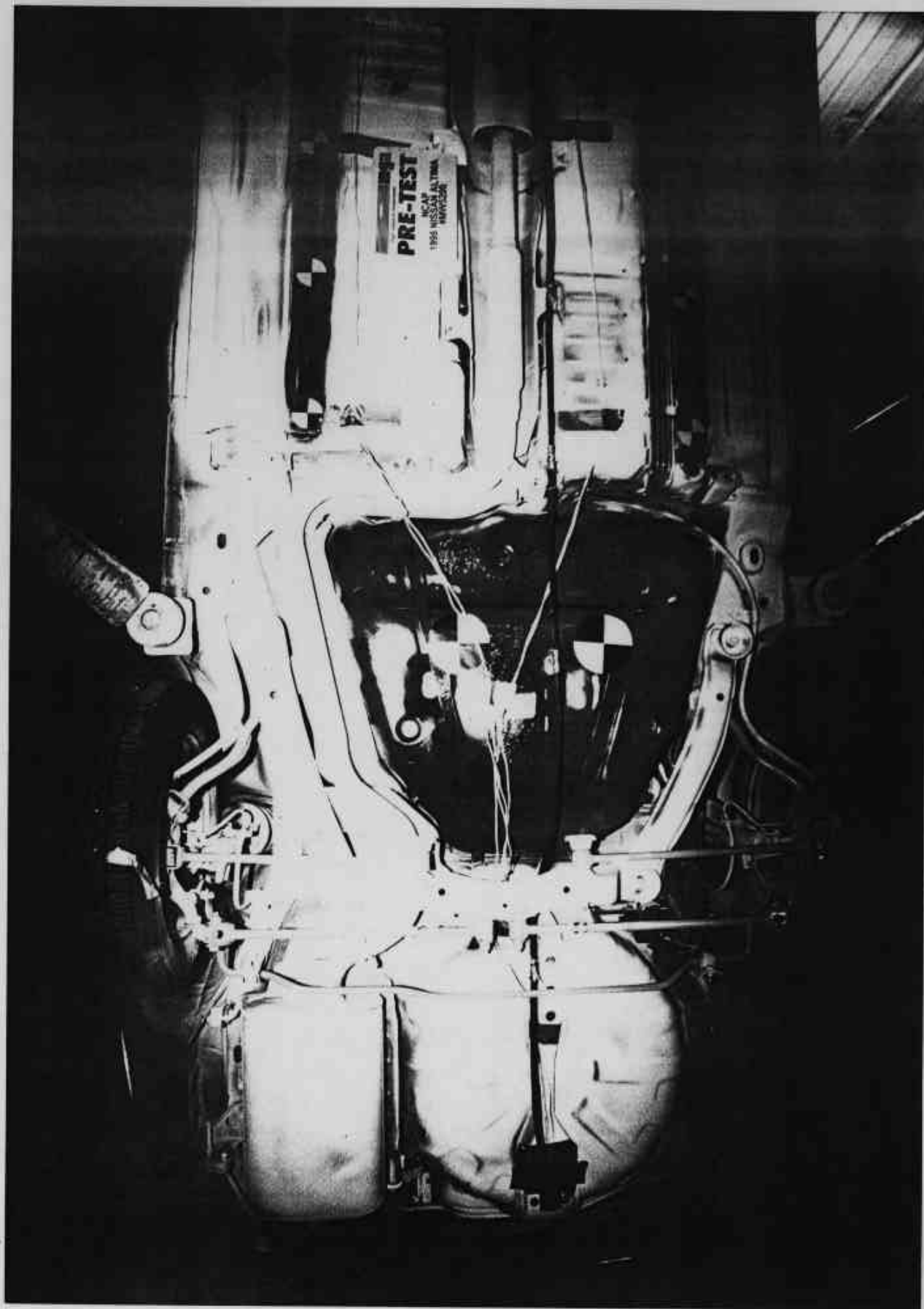


Photo No. A-18 - Pre-Test Rear Underbody View

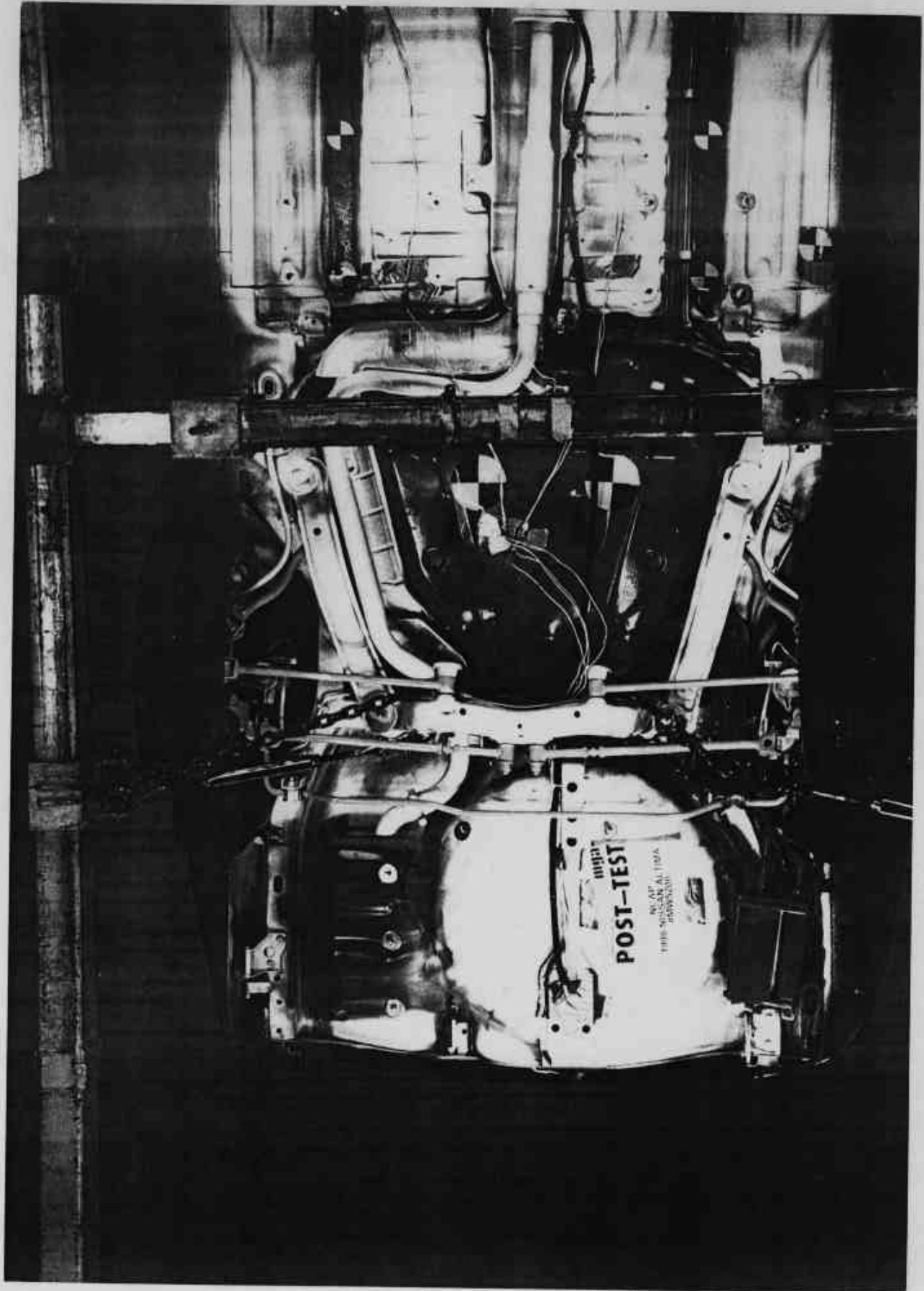
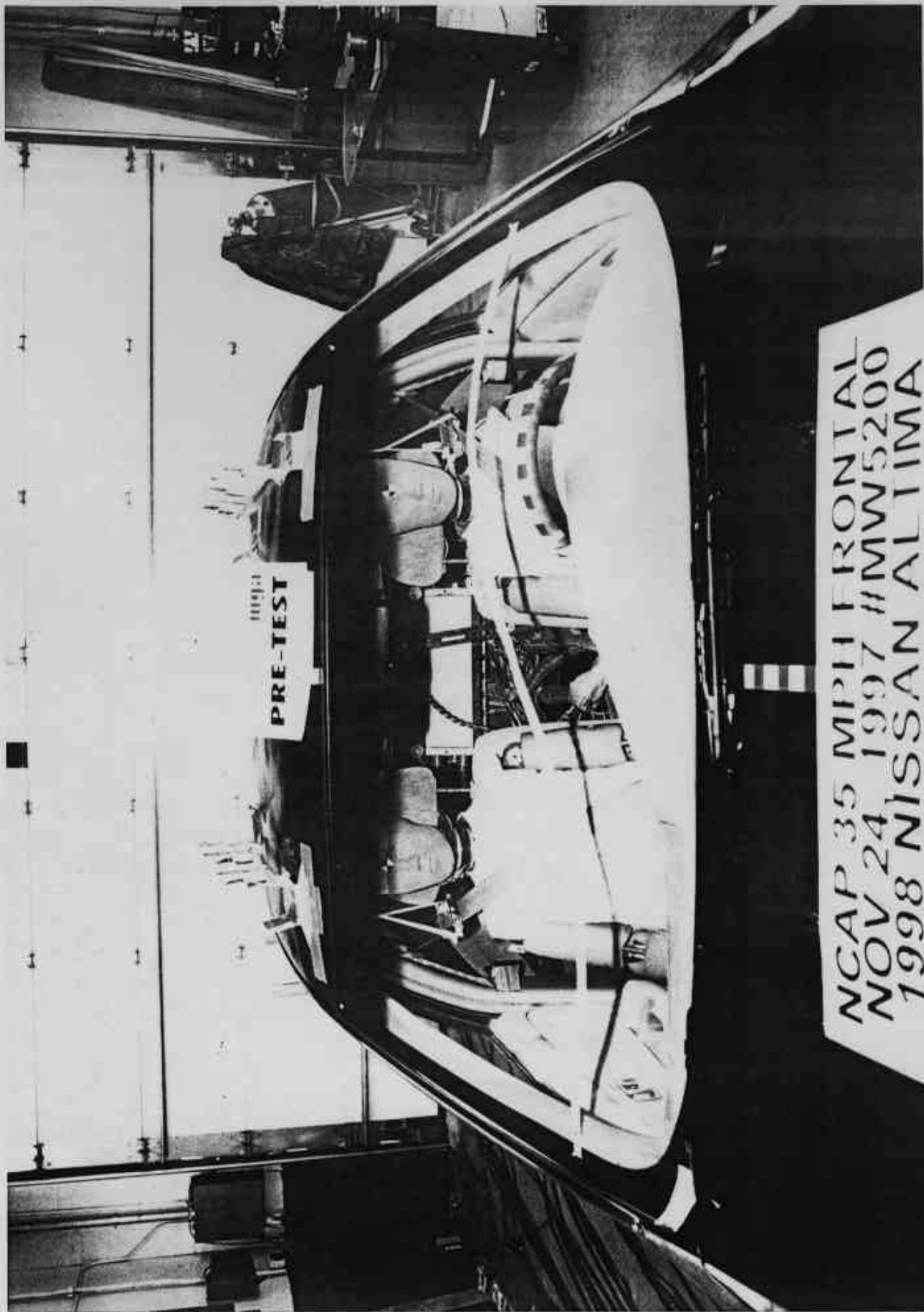


Photo No. A-19 - Post-Test Rear Underbody View



NCAP 35 MPH FRONTAL
NOV 24, 1997 #MW5200
1998 NISSAN ALTIMA

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

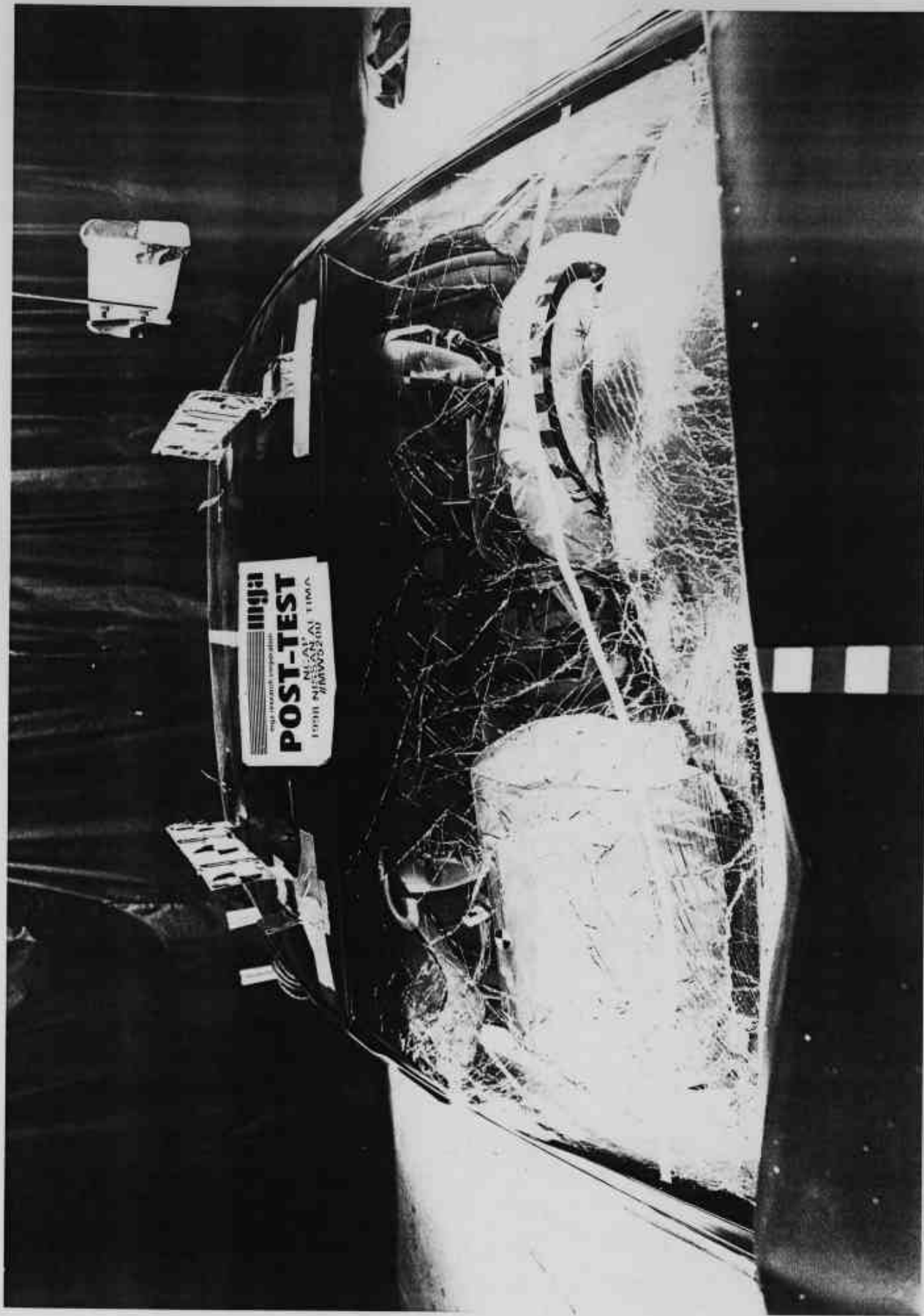


Photo No. A-21 - Post-Test Windshield View

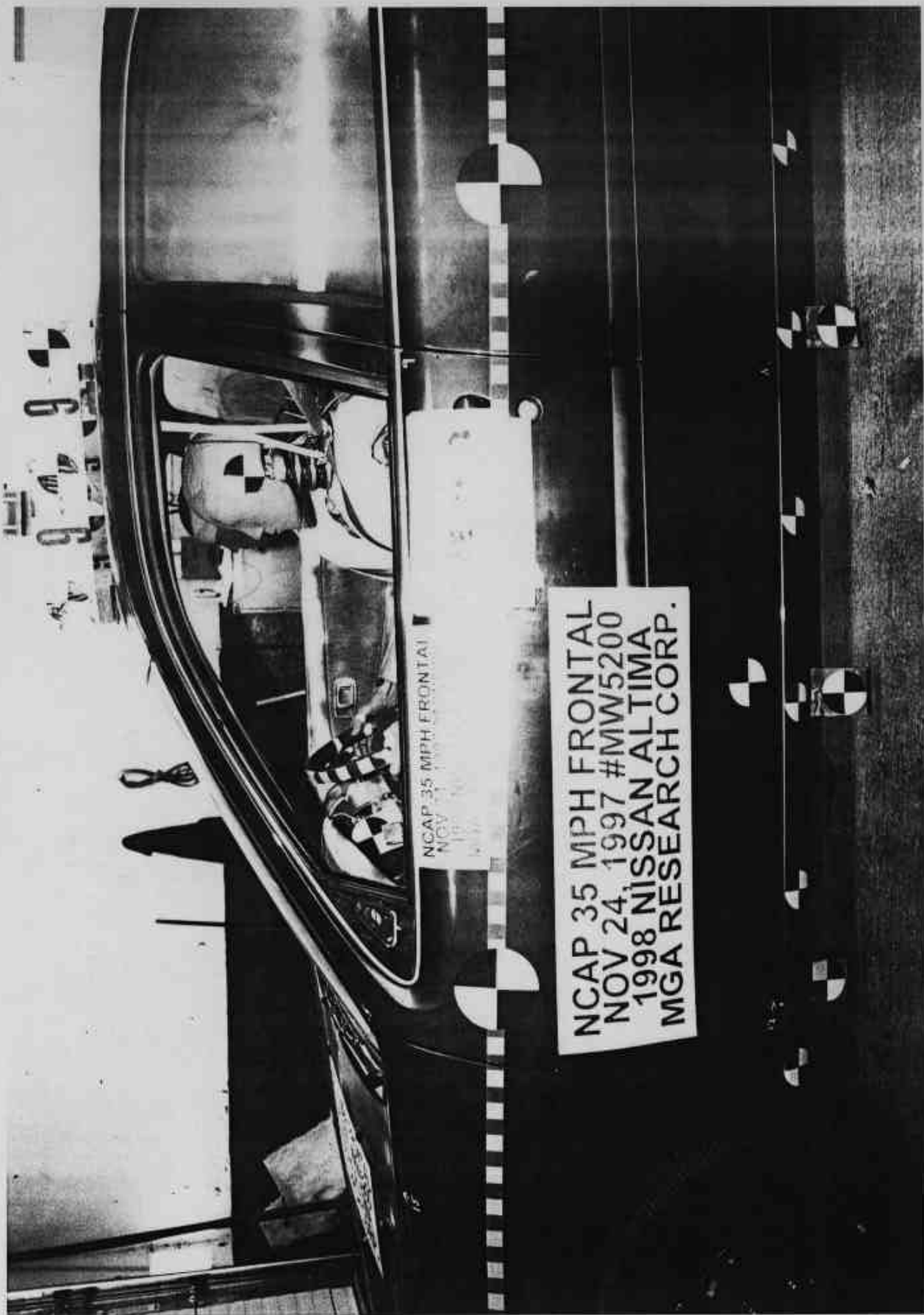


Photo No. A-22 - Pre-Test Driver Dummy Position Left Side View

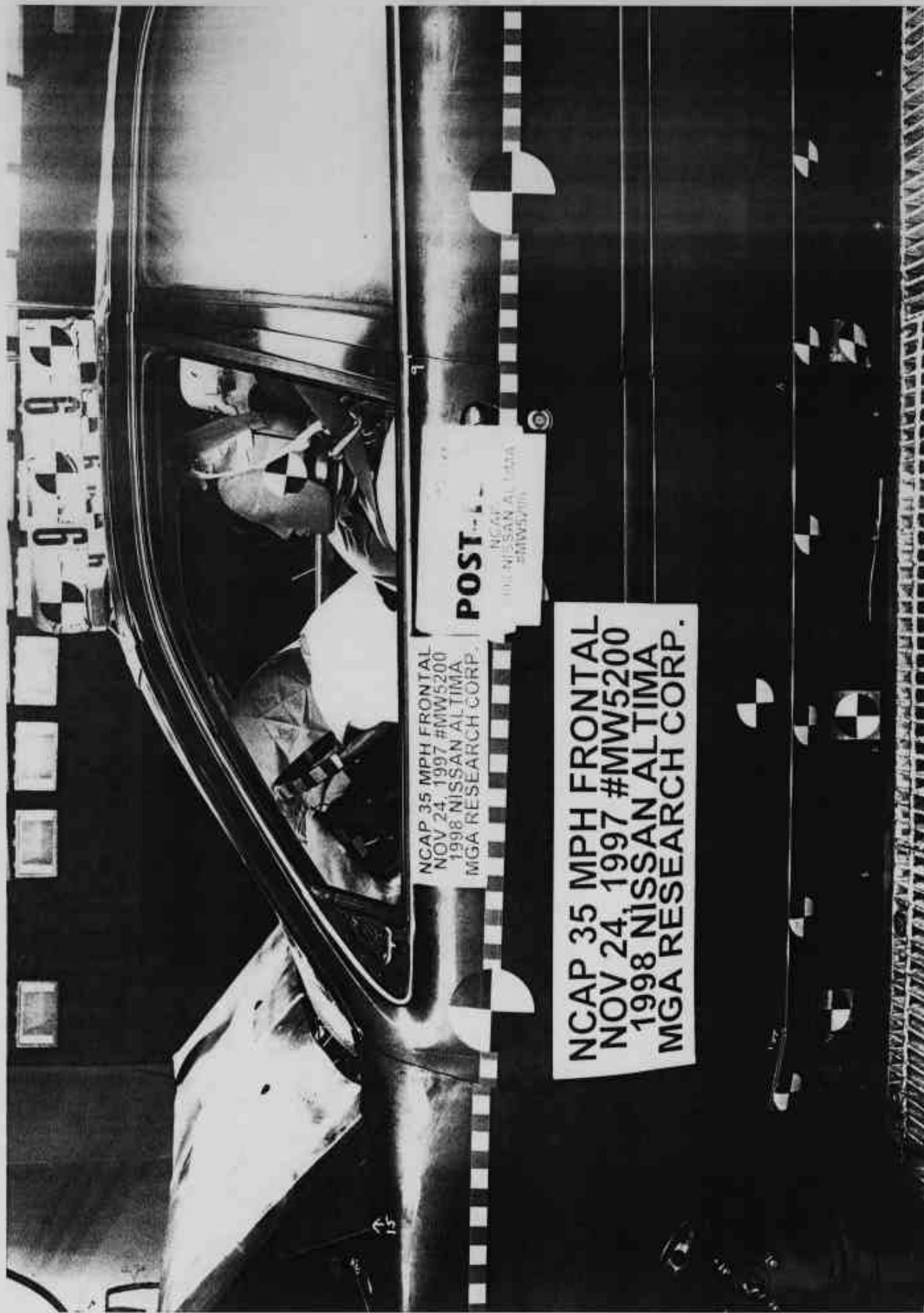


Photo No. A-23 - Post-Test Driver Dummy Position Left Side View

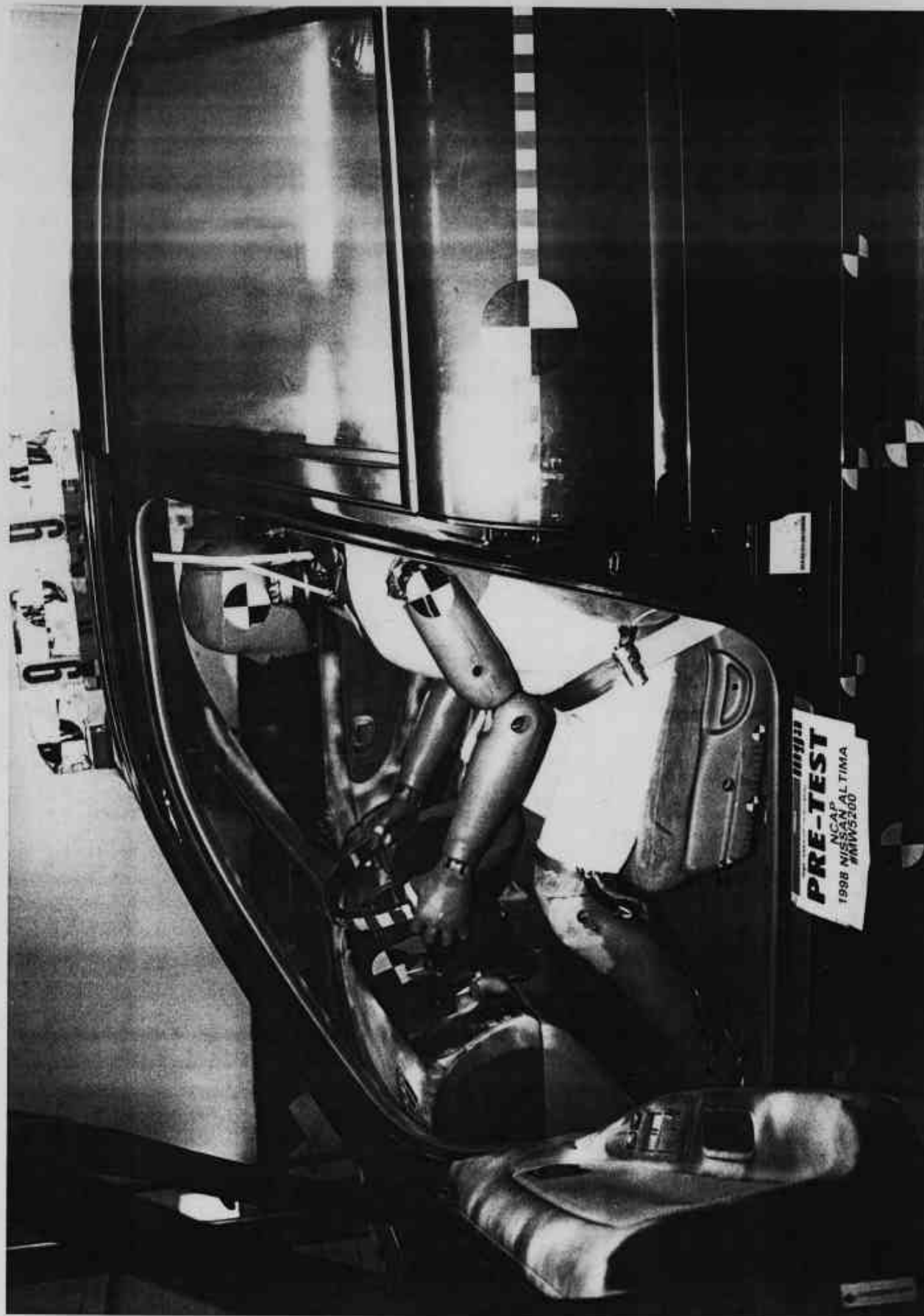


Photo No. A-24 - Pre-Test Driver Dummy Position Left Side View (Door Open)



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



A-26

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



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



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



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



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



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



A-32

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

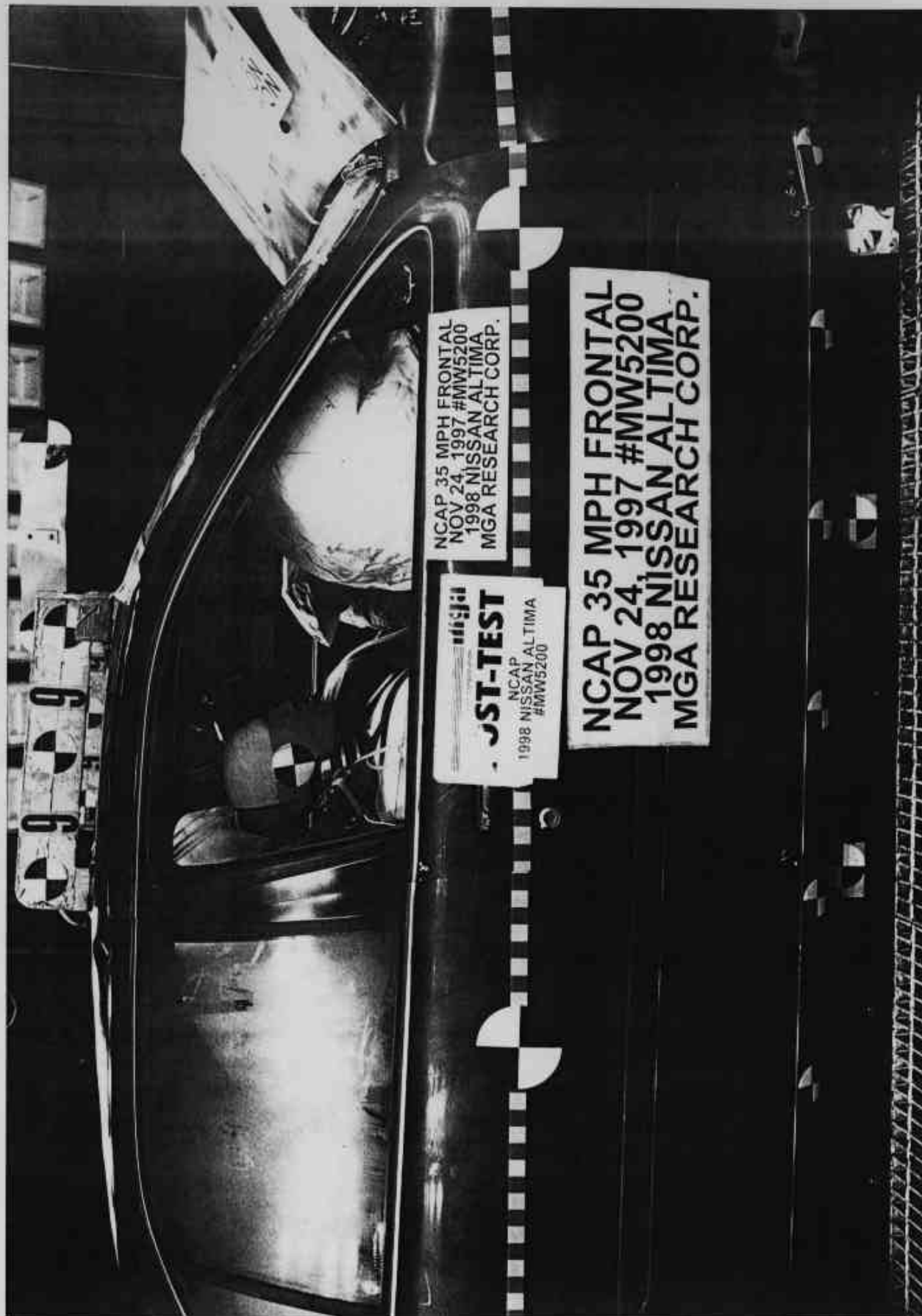
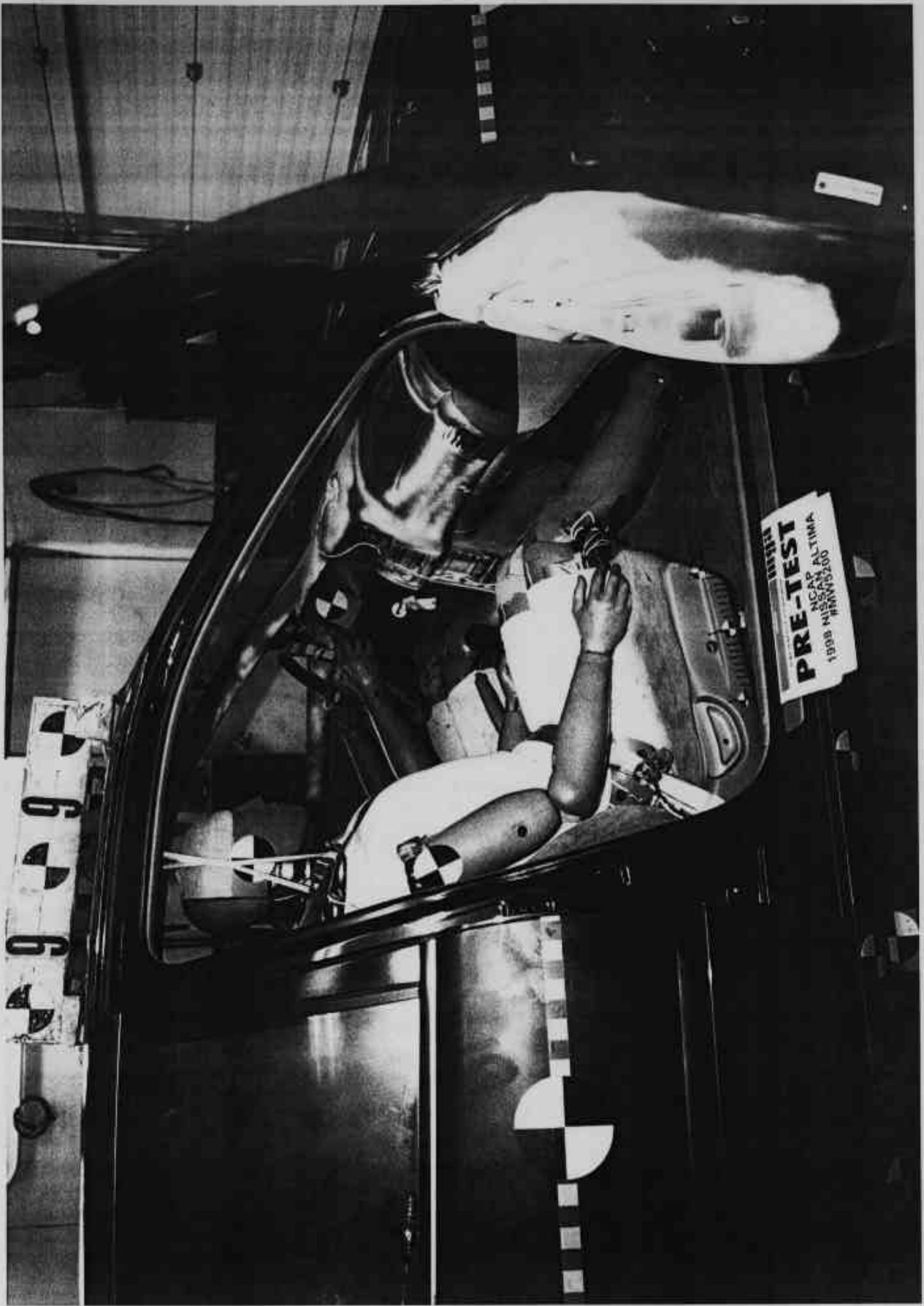


Photo No. A-33 - Post-Test Passenger Dummy Position Right Side View



A-34

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



Photo No. A-35 - Post-Test Passenger Dummy Position Right Side View (Door Open)



Photo No. A-36 - Pre-Test Passenger Seat Position View



Photo No. A-37 - Post-Test Passenger Seat Position View



Photo No. A-38 - Pre-Test Passenger Dummy Knee Position



Photo No. A-39 - Post-Test Passenger Dummy Knee Position



Photo No. A-40 - Post-Test Passenger Airbag Contact



Photo No. A-41 - Post-Test Passenger Knee Contact View

A-41



Photo No. A-42 - Windshield Retention Failure



Photo No. A-43 - Windshield Retention Failure

MANUFACTURED BY NISSAN MOTOR CO., LTD.

DATE 06/97 GVWR 3990 LB
GAWR FR. 2152 LB GAWR RR. 1863 LB

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR
VEHICLE SAFETY, BUMPER AND THEFT PREVENTION STANDARDS
IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.
SEE OWNERS MANUAL FOR ADDITIONAL INFORMATION.

VIN: 1N4DL01DXWC102557 PASSENGER CAR ENGINE
COLOR TRIM TRANS AXLE
FN2 C RE4F04A FN36 449 02000

MODEL: BBGALBA-EUR



1N4DL01DXWC102557

VEHICLE CAPACITY WEIGHT		390kg	SEATING CAPACITY		FRONT 2	TOTAL TOTAL	
POIDS UTILE DU VEHICULE		860 lbs.	NOMBRE DE PLACES		REAR 3	5	
RECOMMENDED COLD TIRE INFLATION PRESSURE.							
PRESSION DE GONFLAGE RECOMMANDEE DES PNEUS FROIDS.							
TIRE SIZE DIMENSIONS		FRONT AVANT	REAR ARRIERE				
P195 65R15		210 kPa	30 psi		200 kPa 29 psi		
SPARE TIRE		ROUE DE SECOURS		kPa		psi	
T125 70D15		420		40			
DO NOT USE IN EXCESS OF 50 MPH 80 km/h SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION UTILISATION AU NE PAS EXCÉDER 80 km/h POUR LES DÉTAILS VOIR LE MANUEL DU CONDUCTEUR							

Photo No. A-45 - Tire Placard

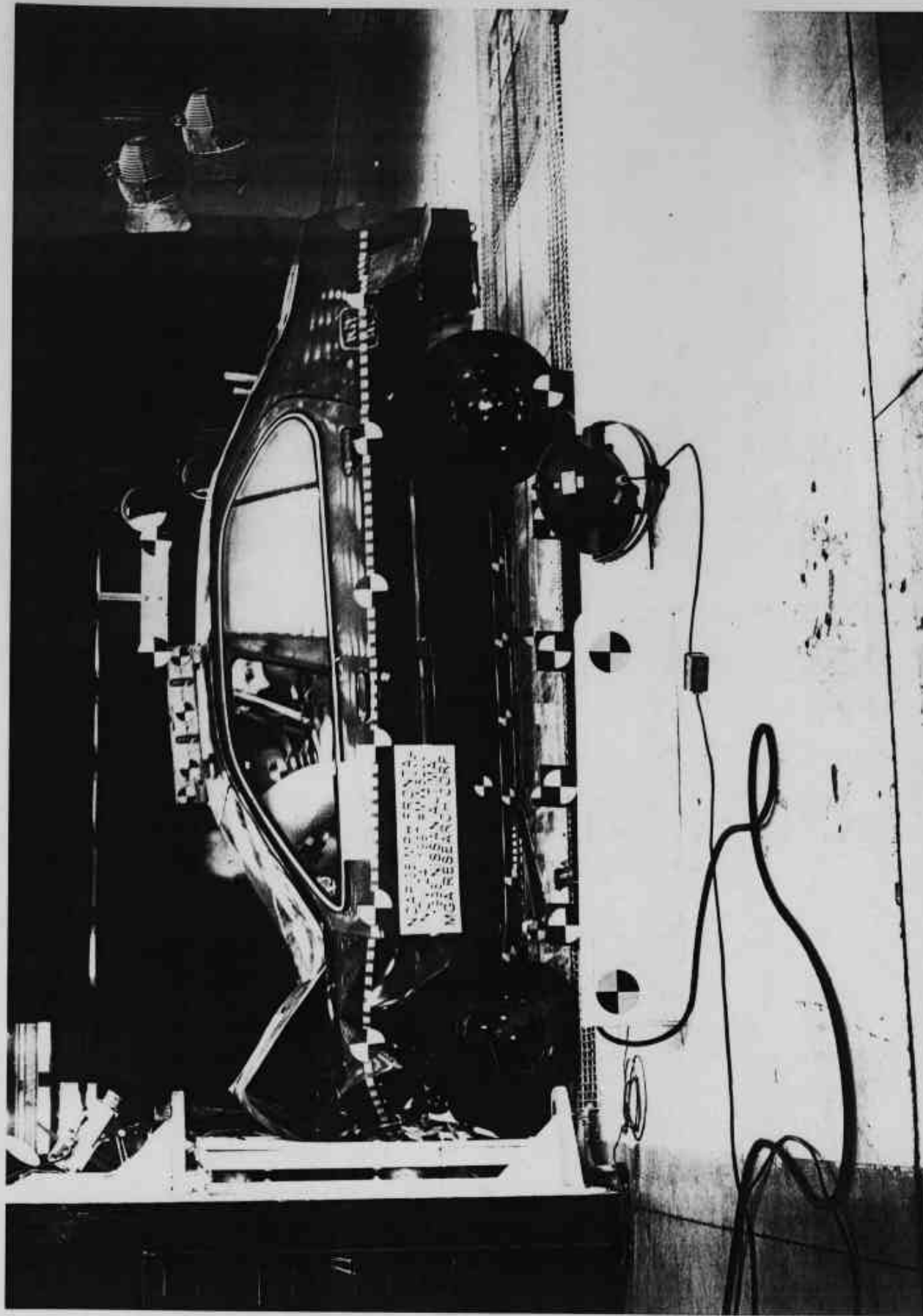


Photo No. A-46 - Vehicle Impact

A-46

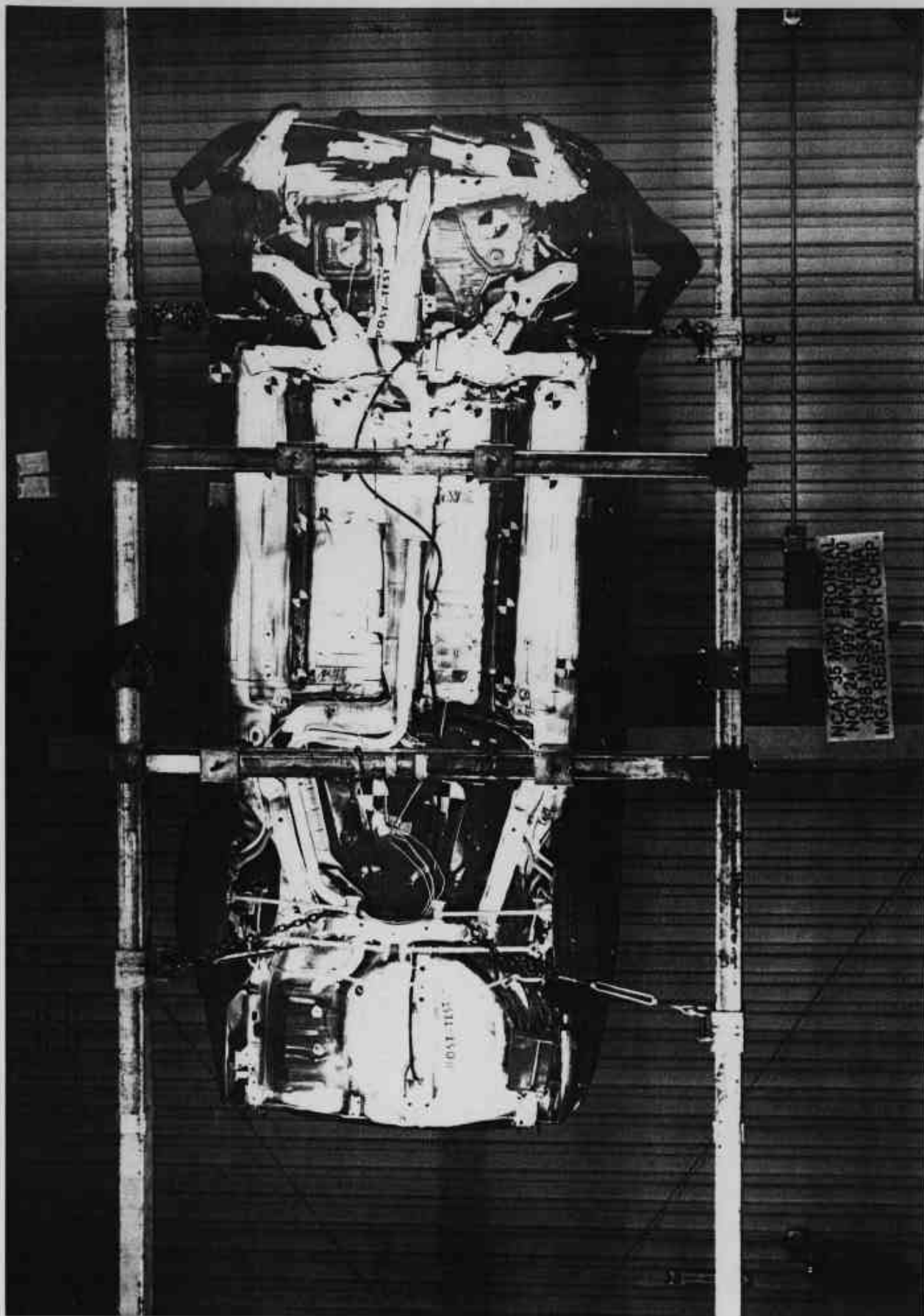


Photo No. A-47 - Rollover 90°

A-47

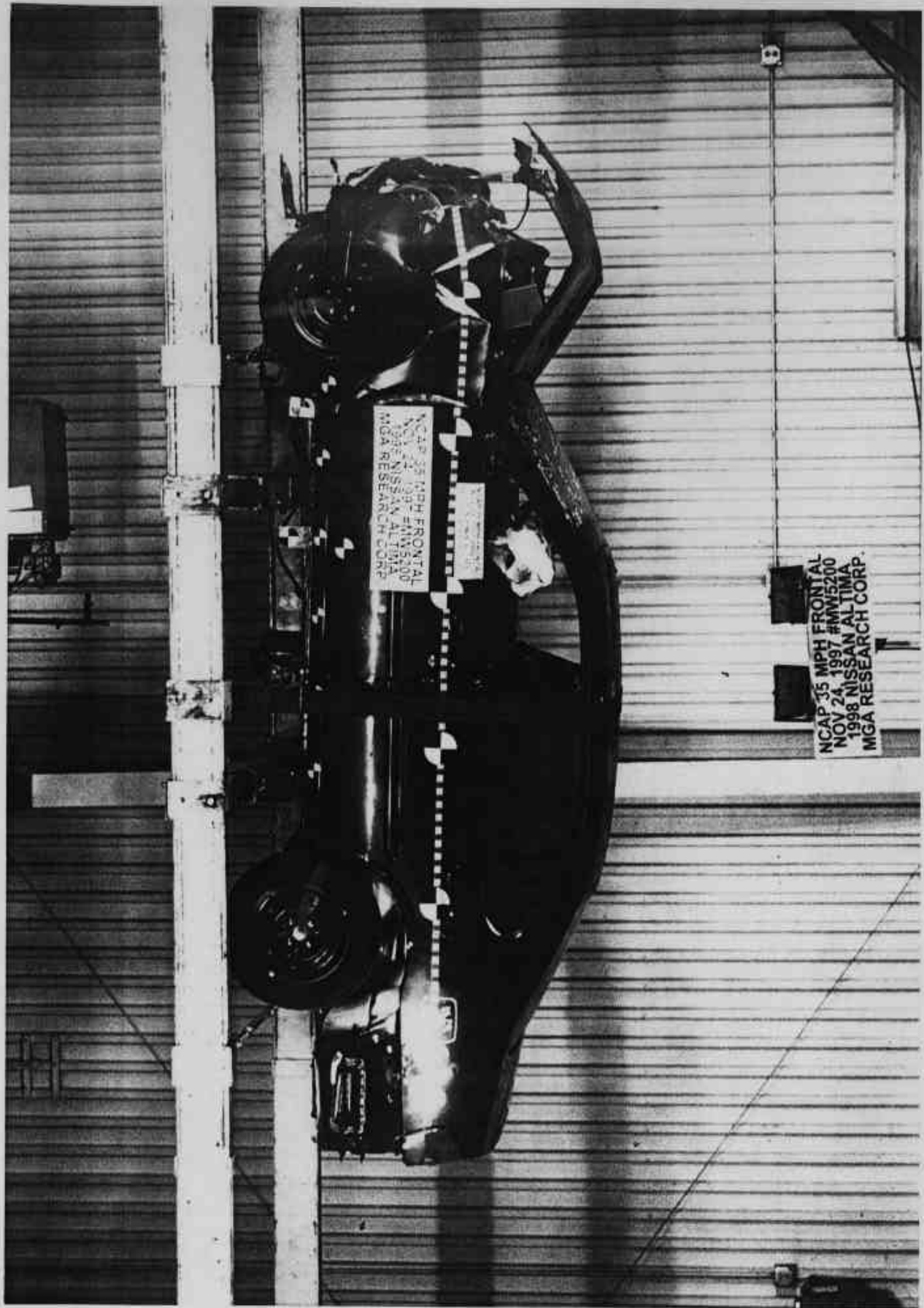
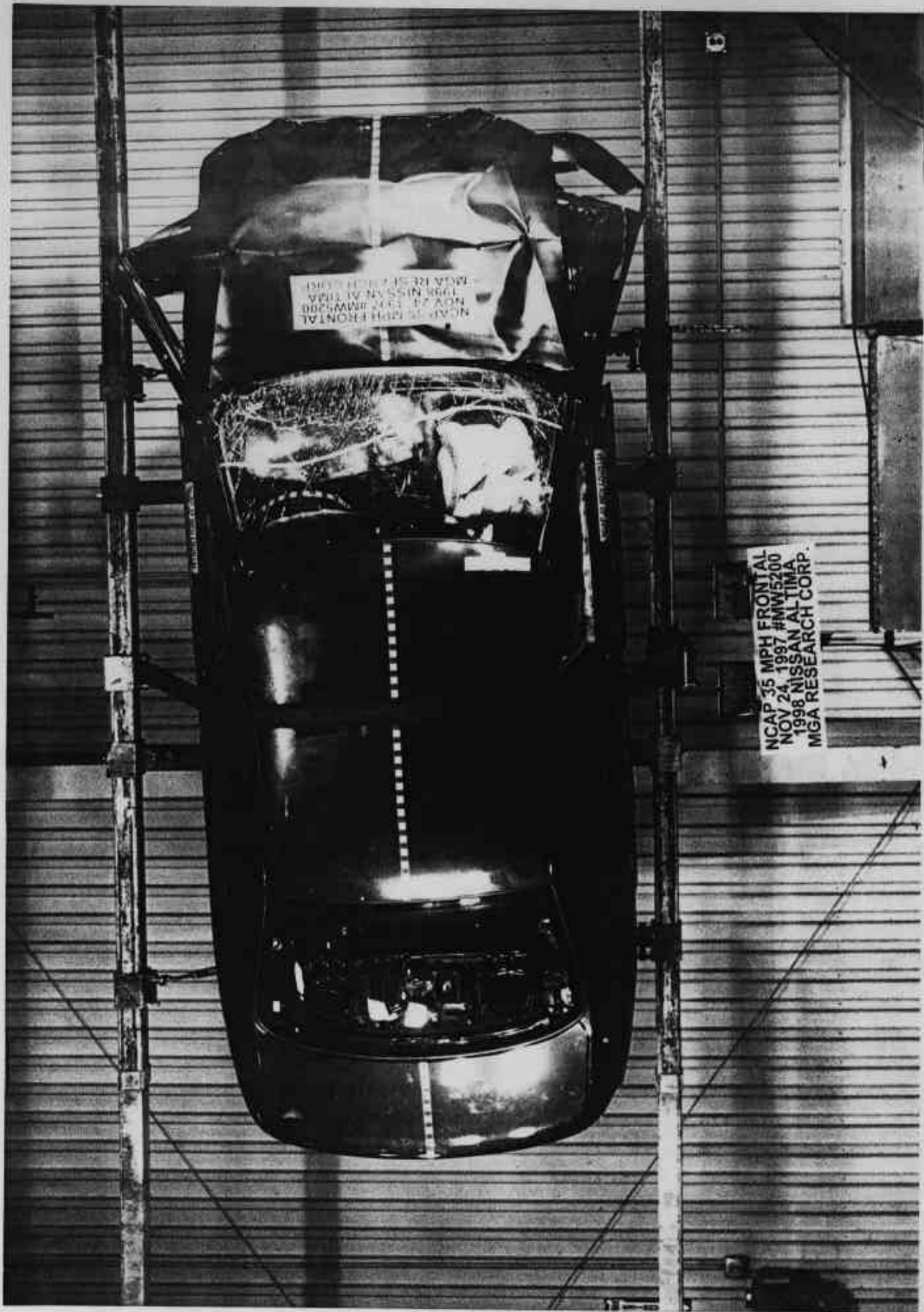
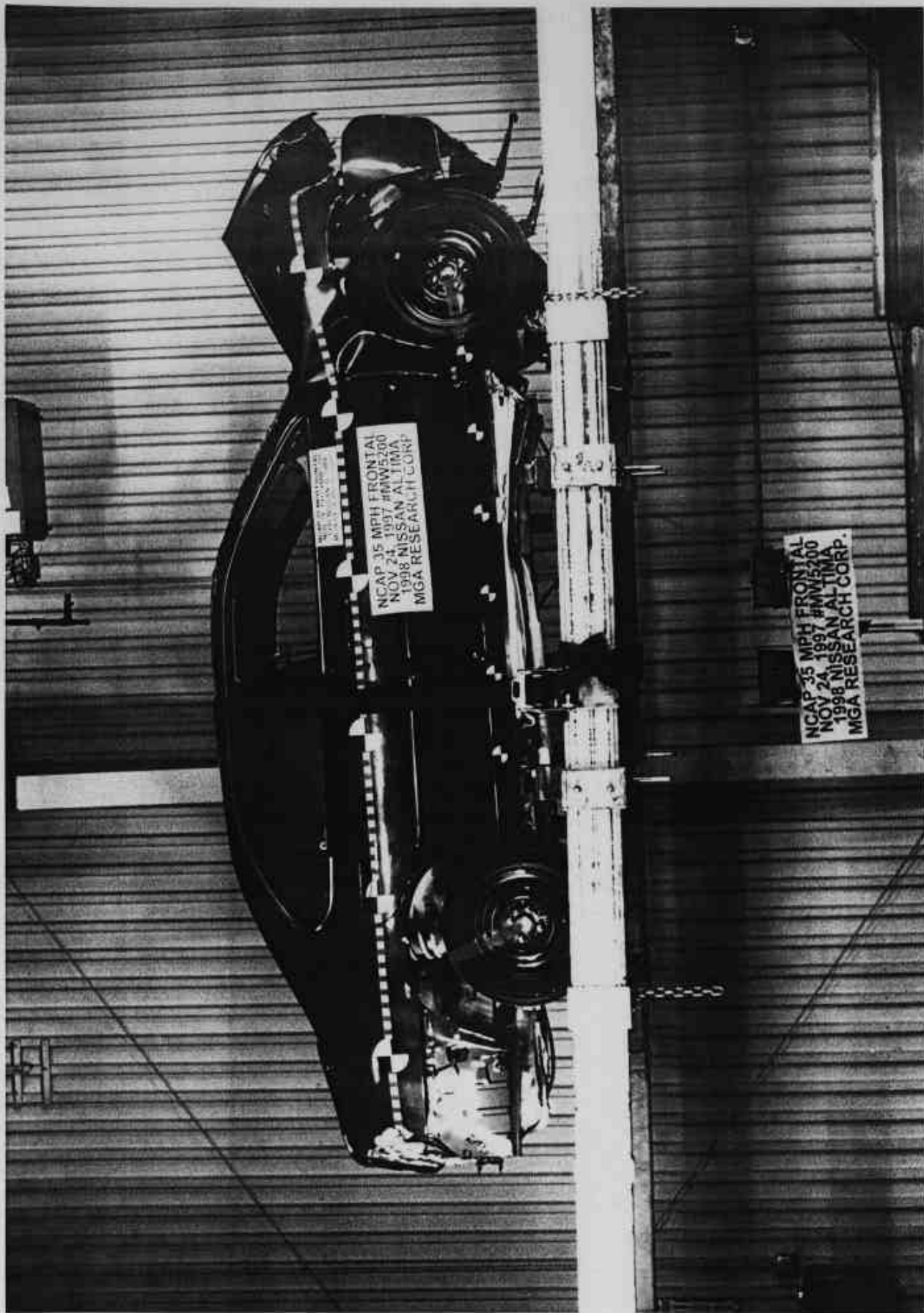


Photo No. A-48 - Rollover 180°



A-49

Photo No. A-49 - Rollover 270°



A-50

Photo No. A-50 - Rollover 360°

APPENDIX B

Vehicle, Load Cell Barrier and Dummy Response Data

1998 Nissan Altima 4 Door

NHTSA NO.: MW5200

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

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* Data not valid after approximately 49 msec.

** Data not valid after approximately 59 msec.

TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 11-24-1997

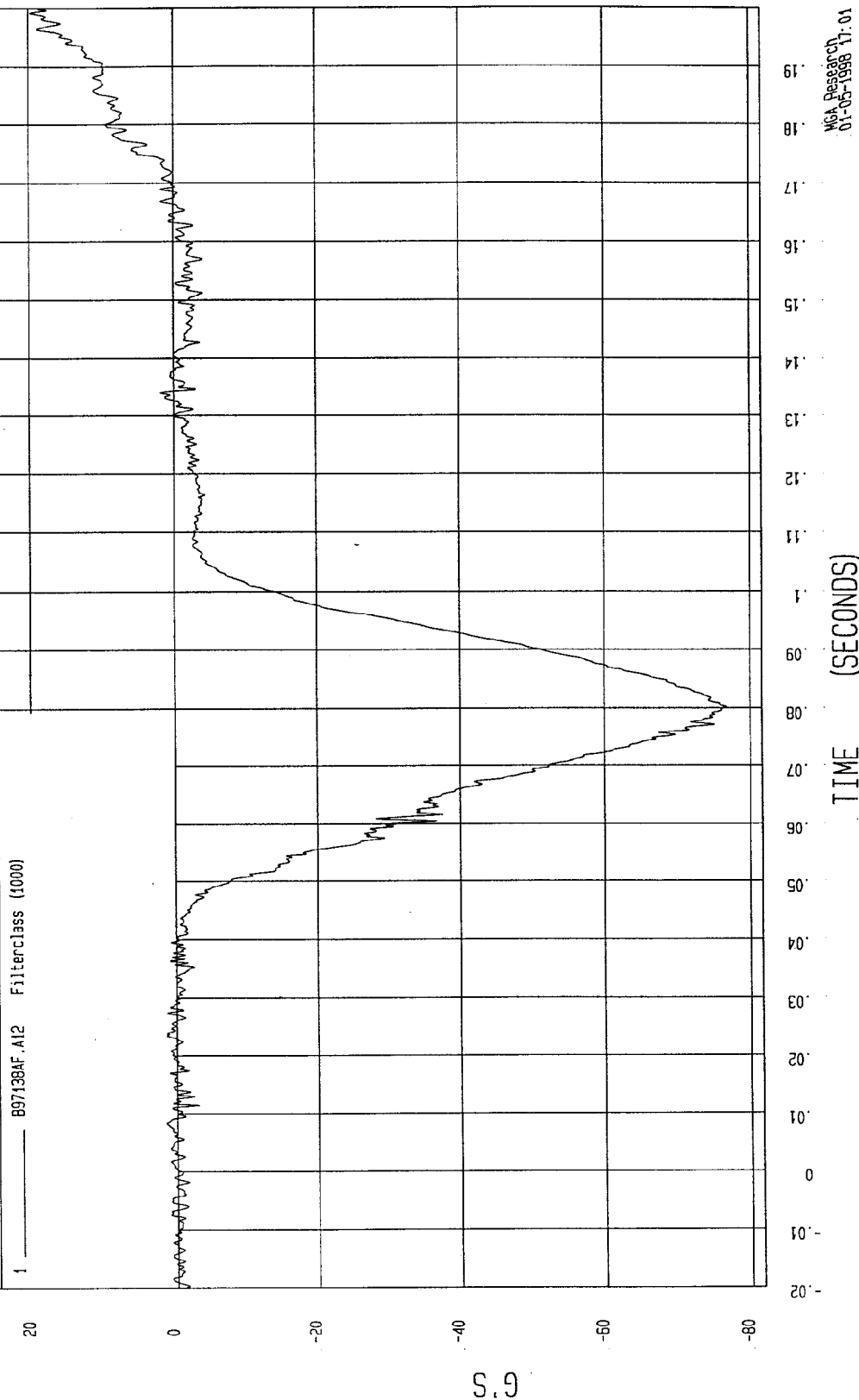
Speed: 35.2 MPH 56.6 KPH

COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Maximum = 19.72 G'S at 199 msec

Minimum = -76.81 G'S at 80 msec

DRIVER HEAD X ACCELERATION



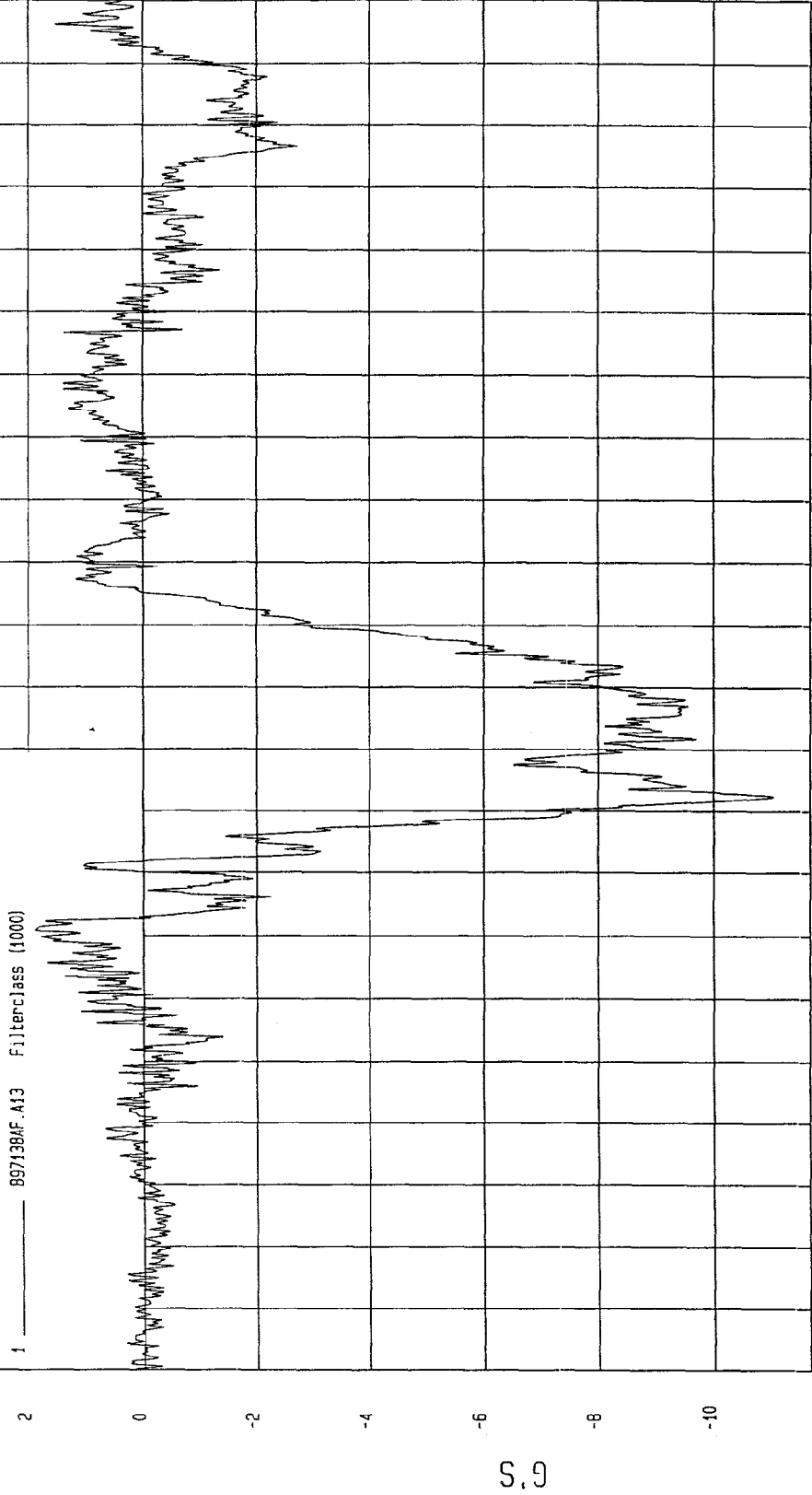
WCA Research
01-05-1998 17:01

TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

Minimum = -11.02 G'S at 72 msec Maximum = 1.89 G'S at 51 msec

DRIVER HEAD Y ACCELERATION



WSA Research
01-05-1998 17:01

TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 11-24-1997

Speed: 35.2 MPH 56.6 KPH

COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Maximum = 3.35 G's at 122 msec

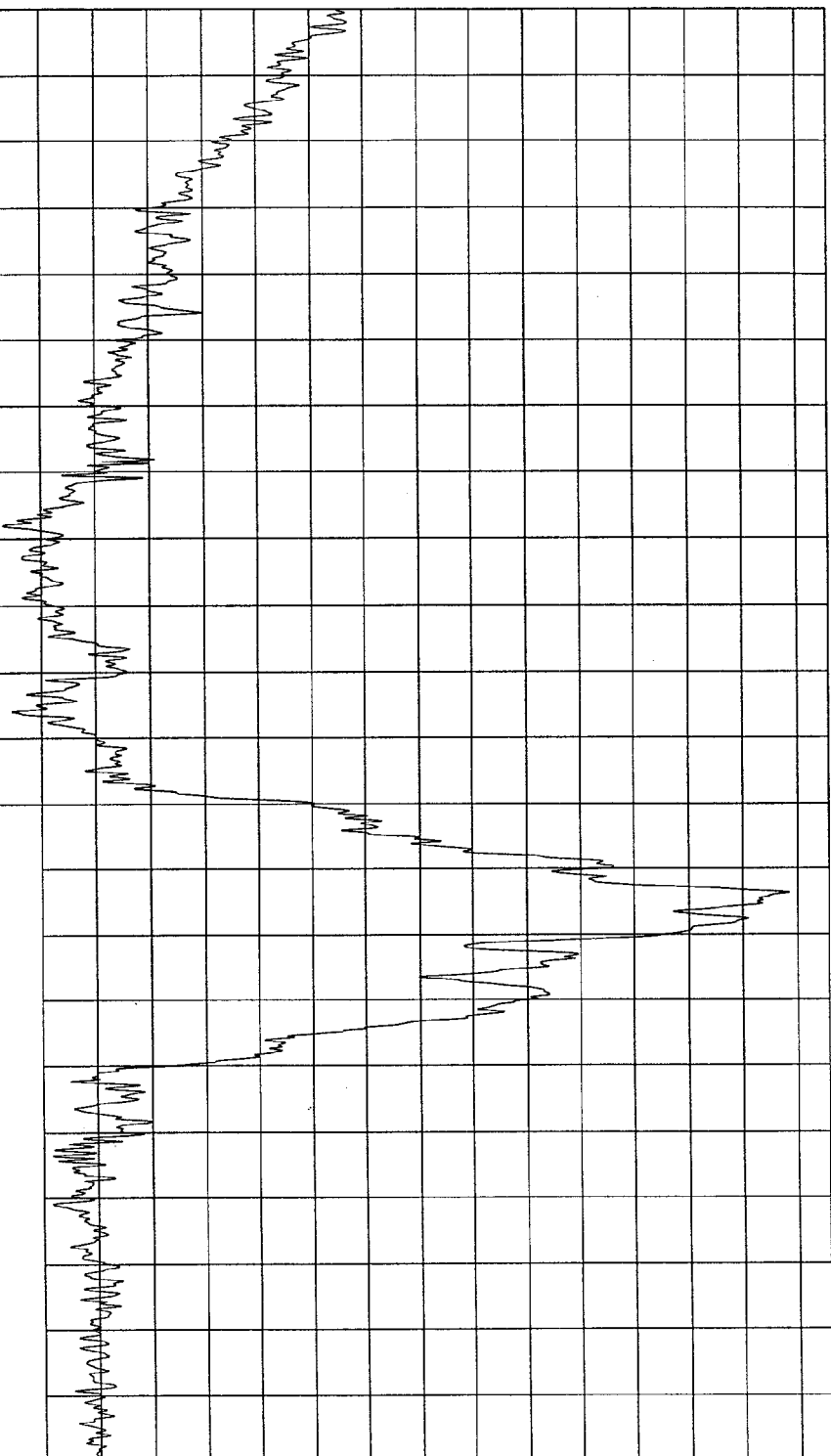
Minimum = -25.68 G's at 66 msec

DRIVER HEAD Z ACCELERATION

1 897139AF.A14 Filterclass (1000)

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

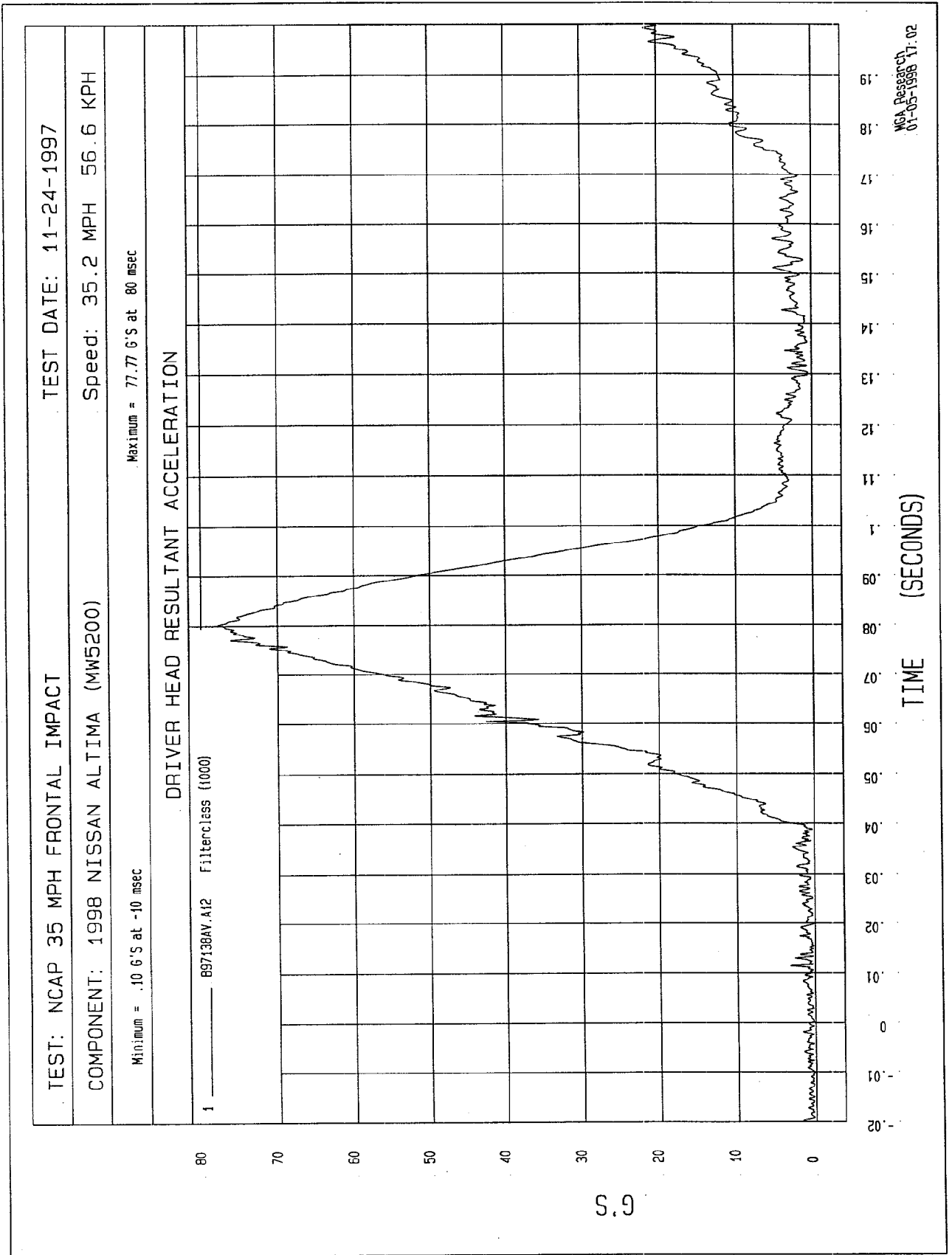
G's



TIME (SECONDS)

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

MCA Research
01-05-1998 17.02



TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 11-24-1997

Speed: 35.2 MPH 56.6 KPH

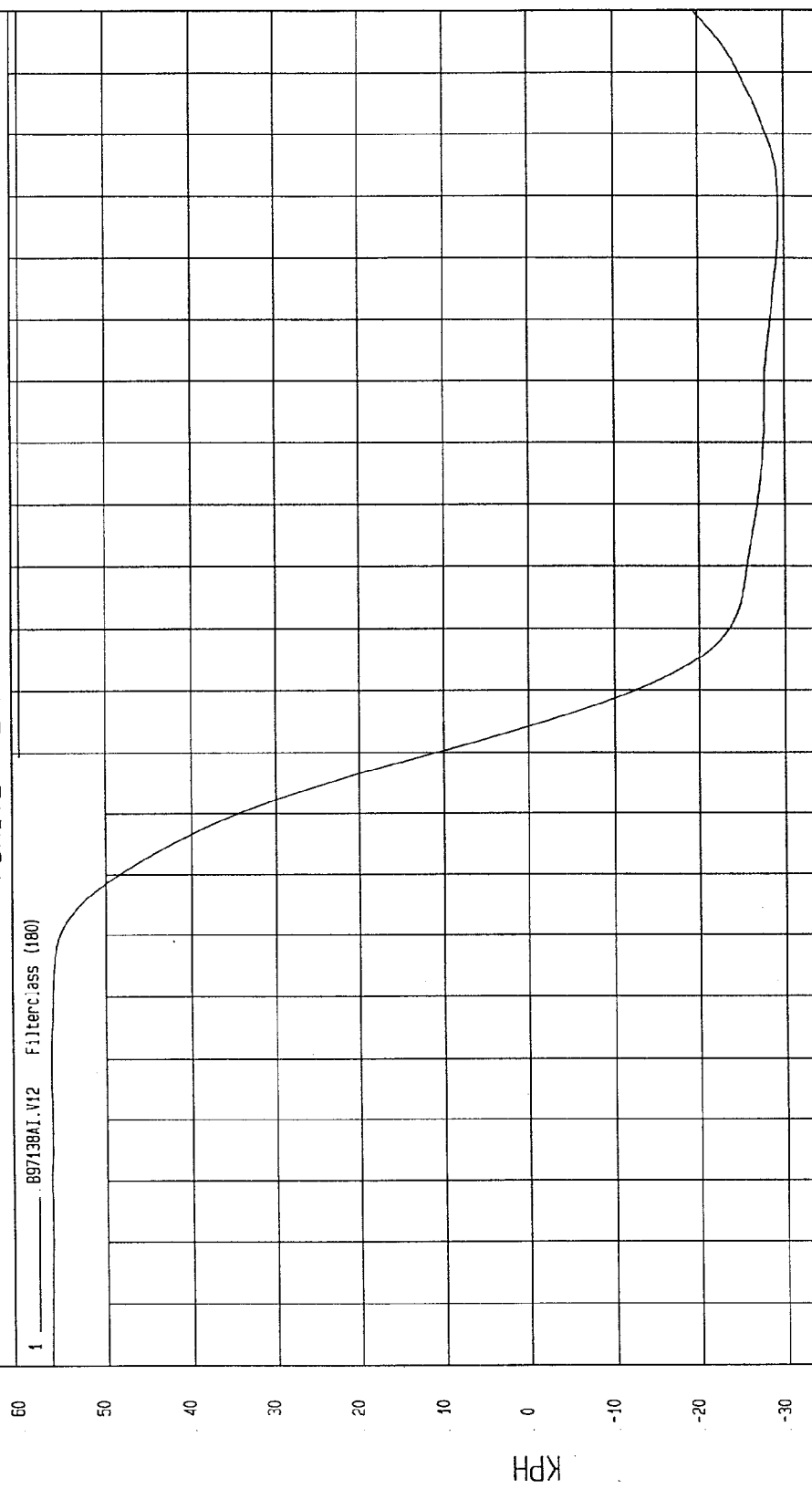
COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Maximum = 56.6 KPH at -20 msec

Minimum = -29.30 KPH at 166 msec

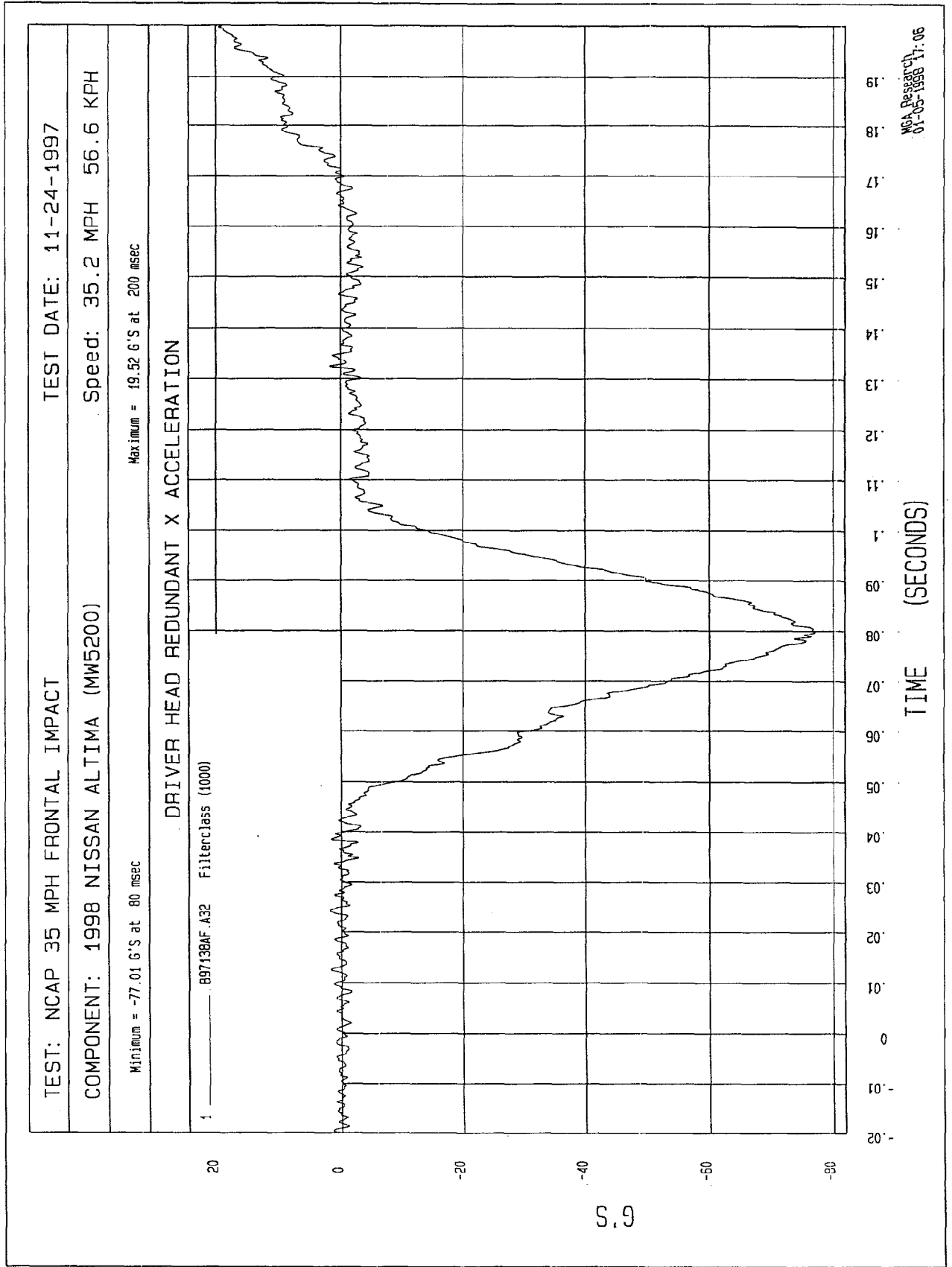
DRIVER HEAD X VELOCITY

1 _____ B97138A1.V12 Filterclass (180)



NCA Research
01-05-1998 11:25

TIME Seconds



TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

SPEED: 35.2 MPH 56.6 KPH

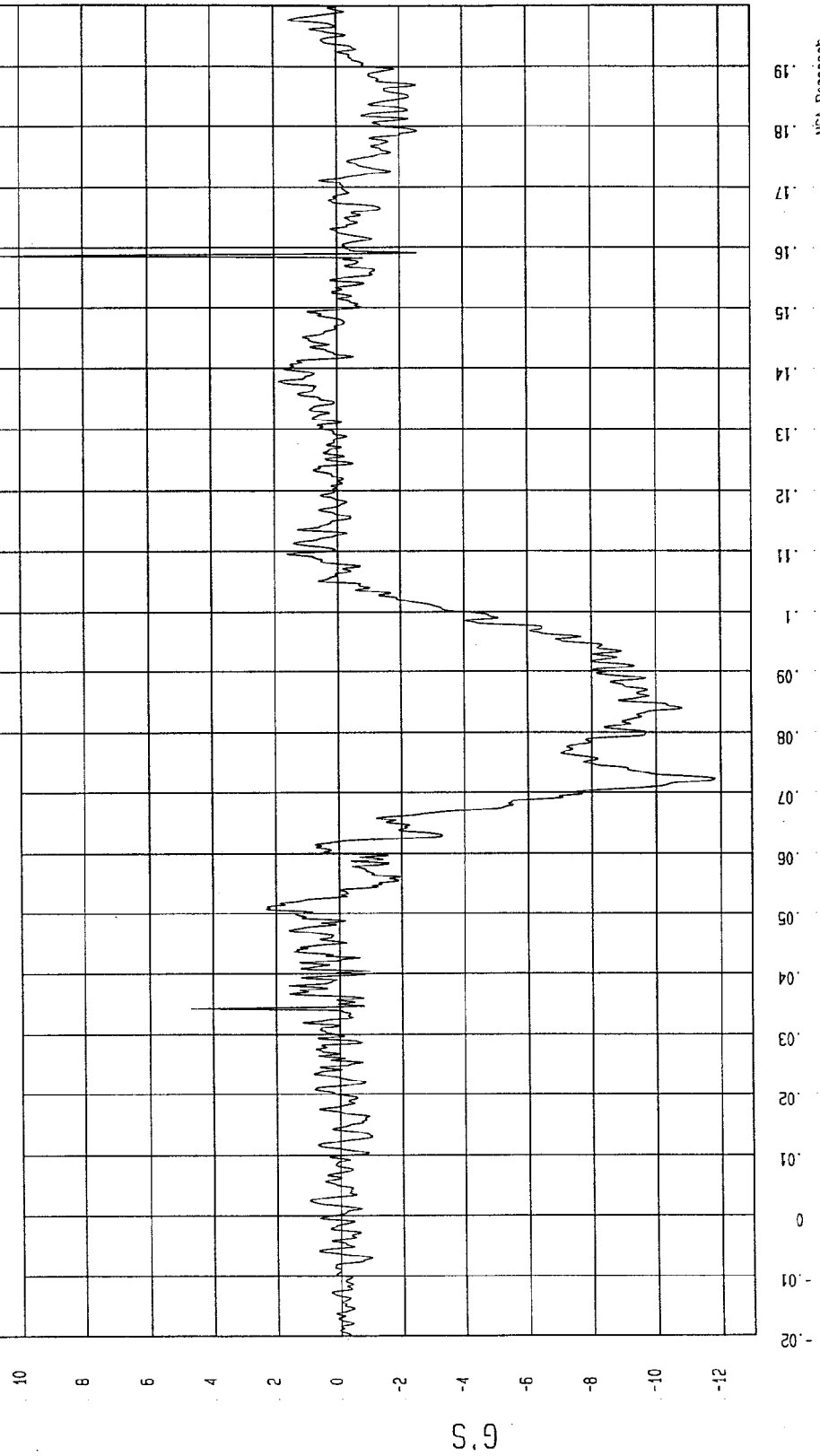
COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Maximum = 10.80 G'S at 159 msec

Minimum = -11.82 G'S at 72 msec

DRIVER HEAD REDUNDANT Y ACCELERATION

1 897138AF.A33 Filter: class (1000)



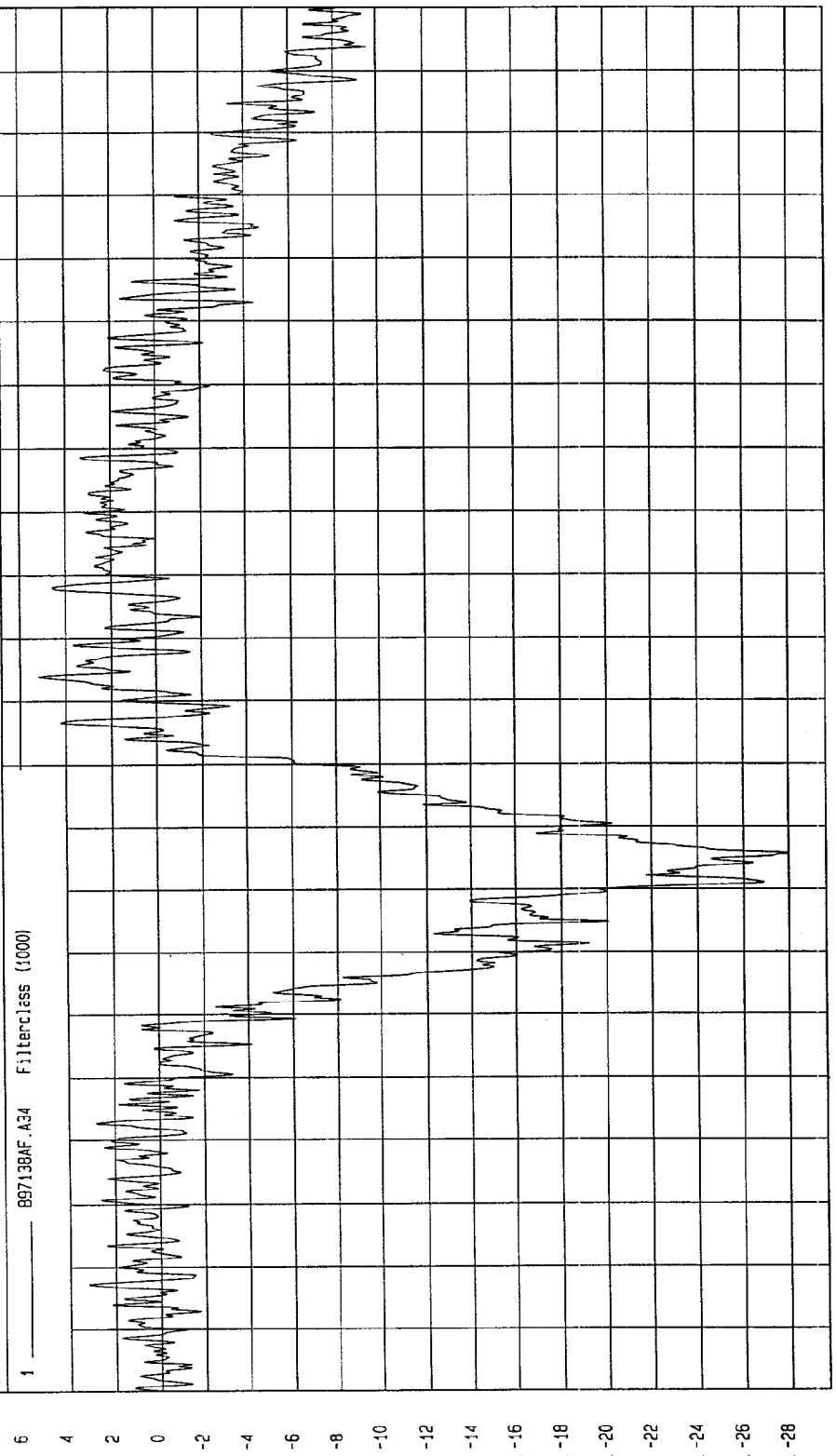
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01-05-1998 17:06

TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

Minimum = -27.97 G'S at 66 msec Maximum = 5.17 G'S at 94 msec

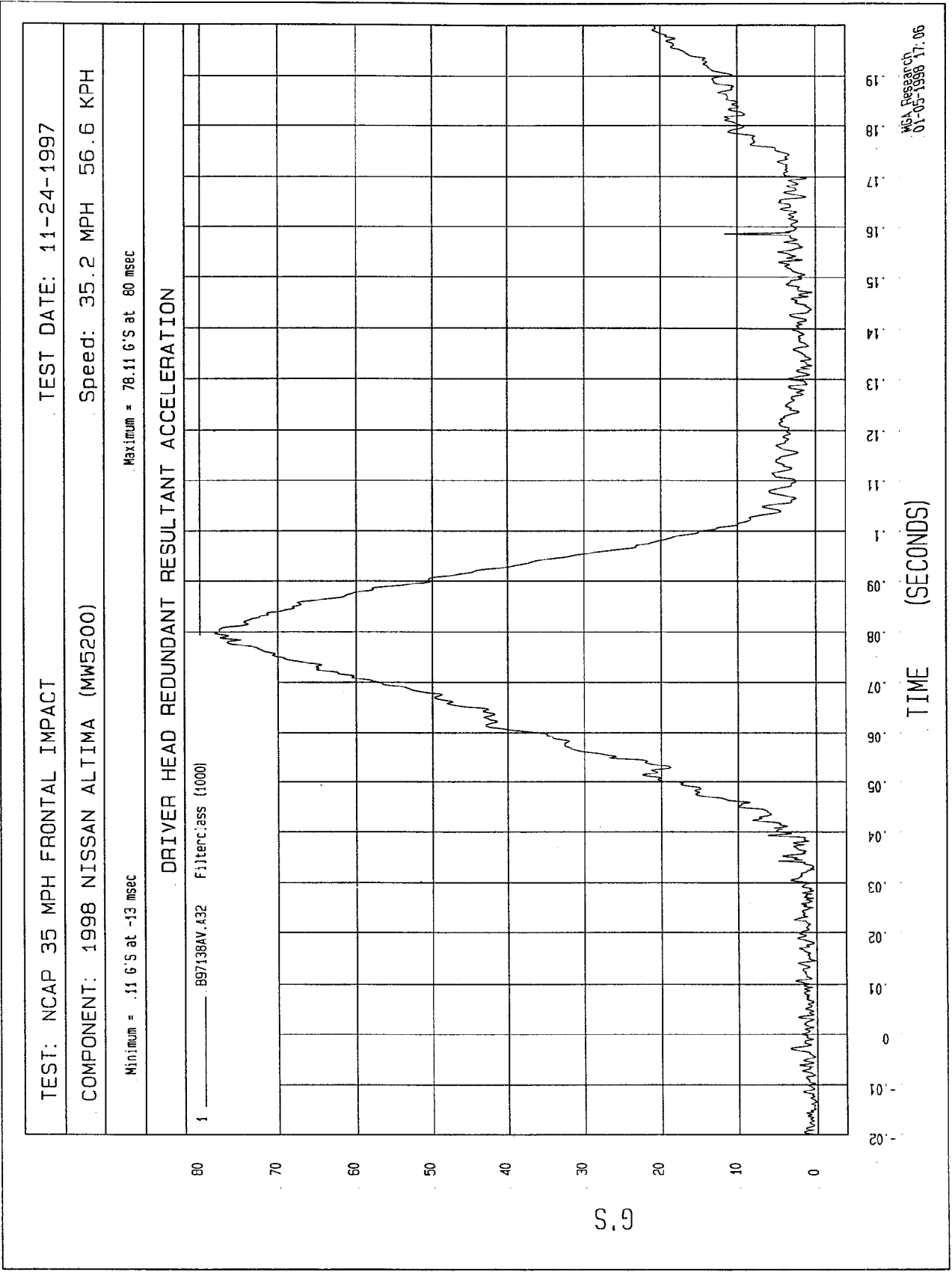
DRIVER HEAD REDUNDANT Z ACCELERATION



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

NCA Research
01-05-1998 17:06

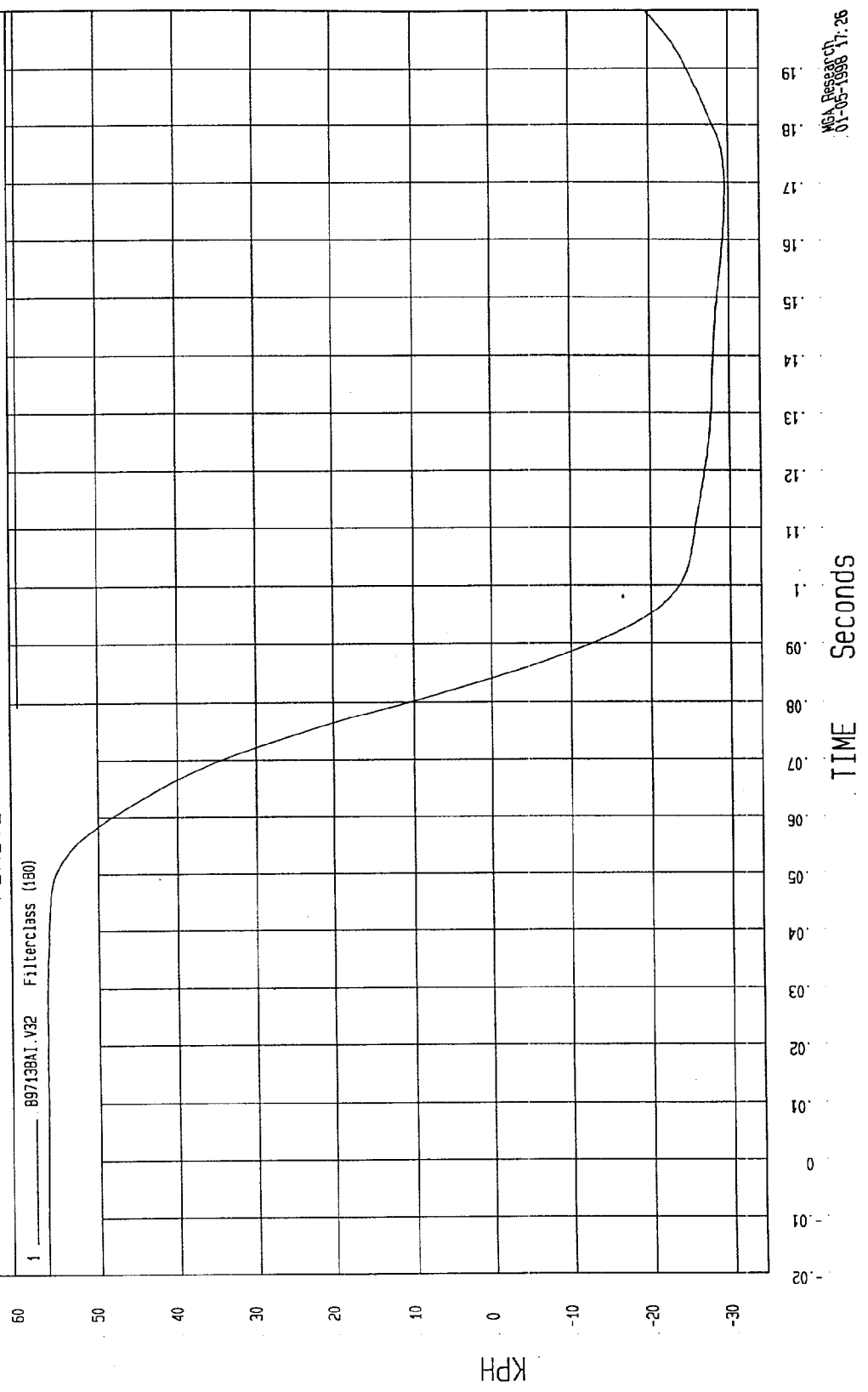


TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

Minimum = -29.48 KPH at 168 msec Maximum = 56.61 KPH at -19 msec

DRIVER HEAD REDUNDANT X VELOCITY



WCA Research
01-05-1998 17:26

TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

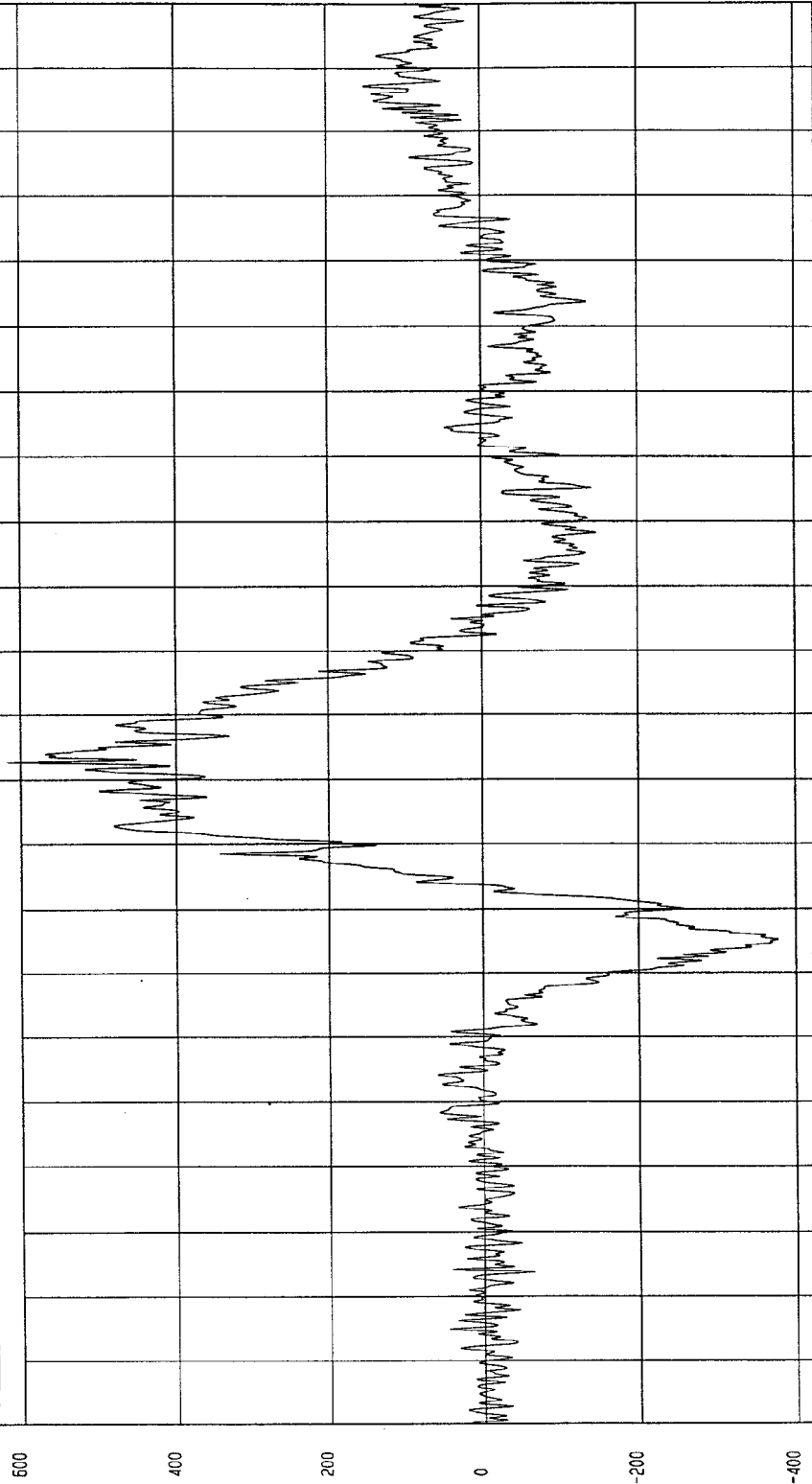
SPEED: 35.2 MPH 56.6 KPH

Maximum = 616.13 N at 83 msec

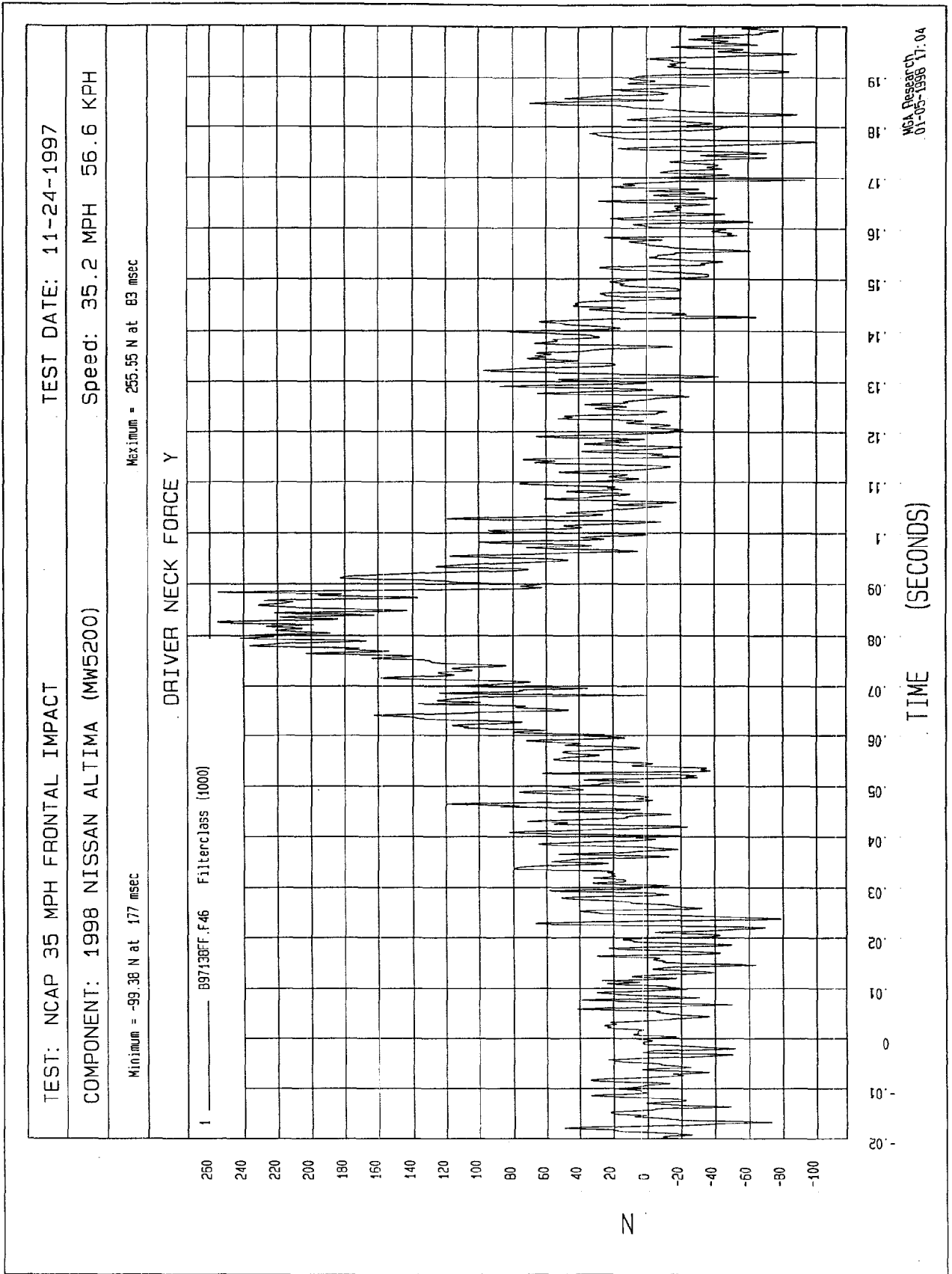
Minimum = -377.05 N at 55 msec

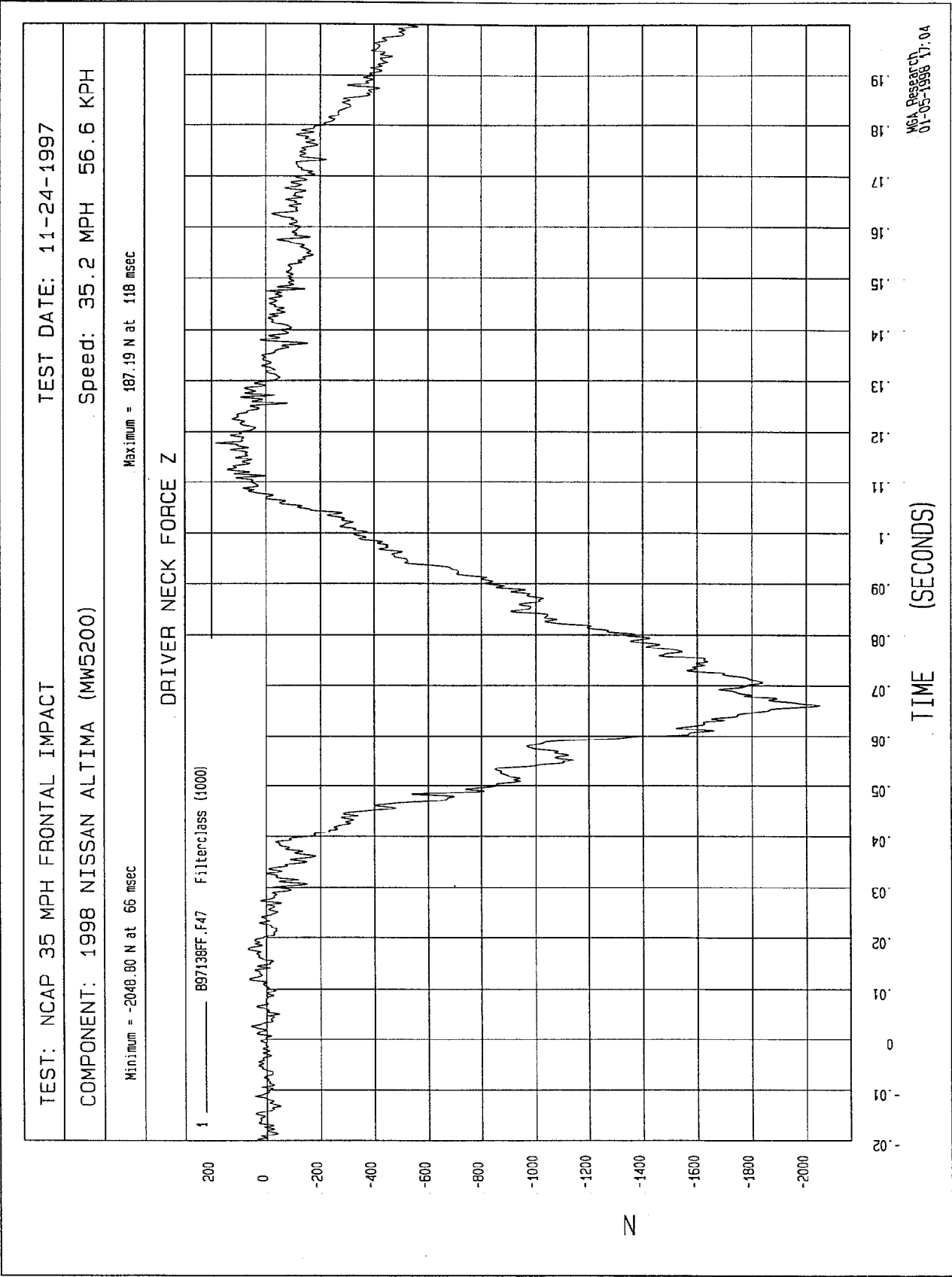
DRIVER NECK FORCE X

1 ——— B97138FF.F45 Filterclass (1000)



NGA Research
01-05-1998 11:04

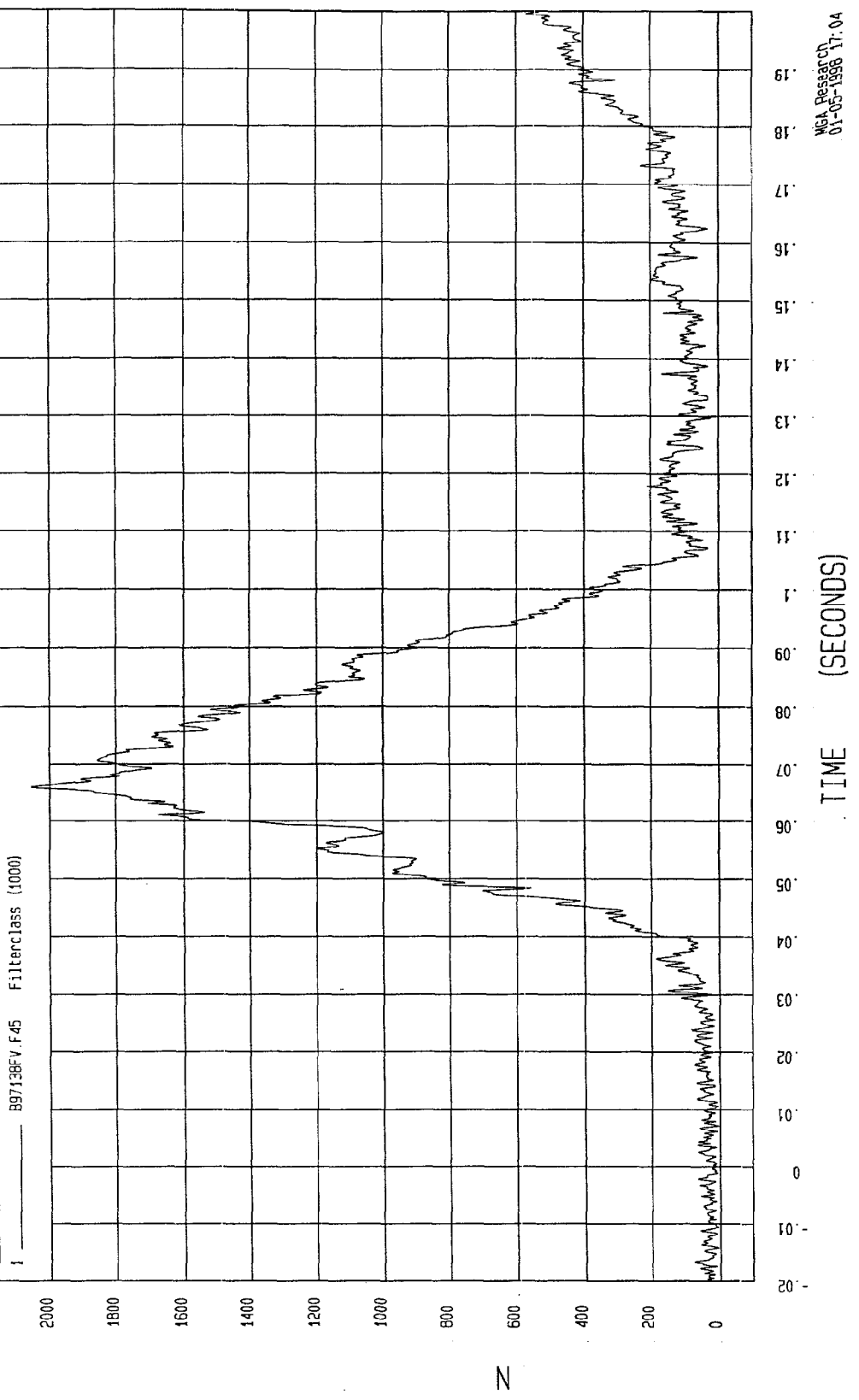




TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997
COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

Minimum = 3.45 N at 7 msec Maximum = 2053.46 N at 66 msec

DRIVER NECK FORCE RESULTANT



TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 11-24-1997

Speed: 35.2 MPH 56.6 KPH

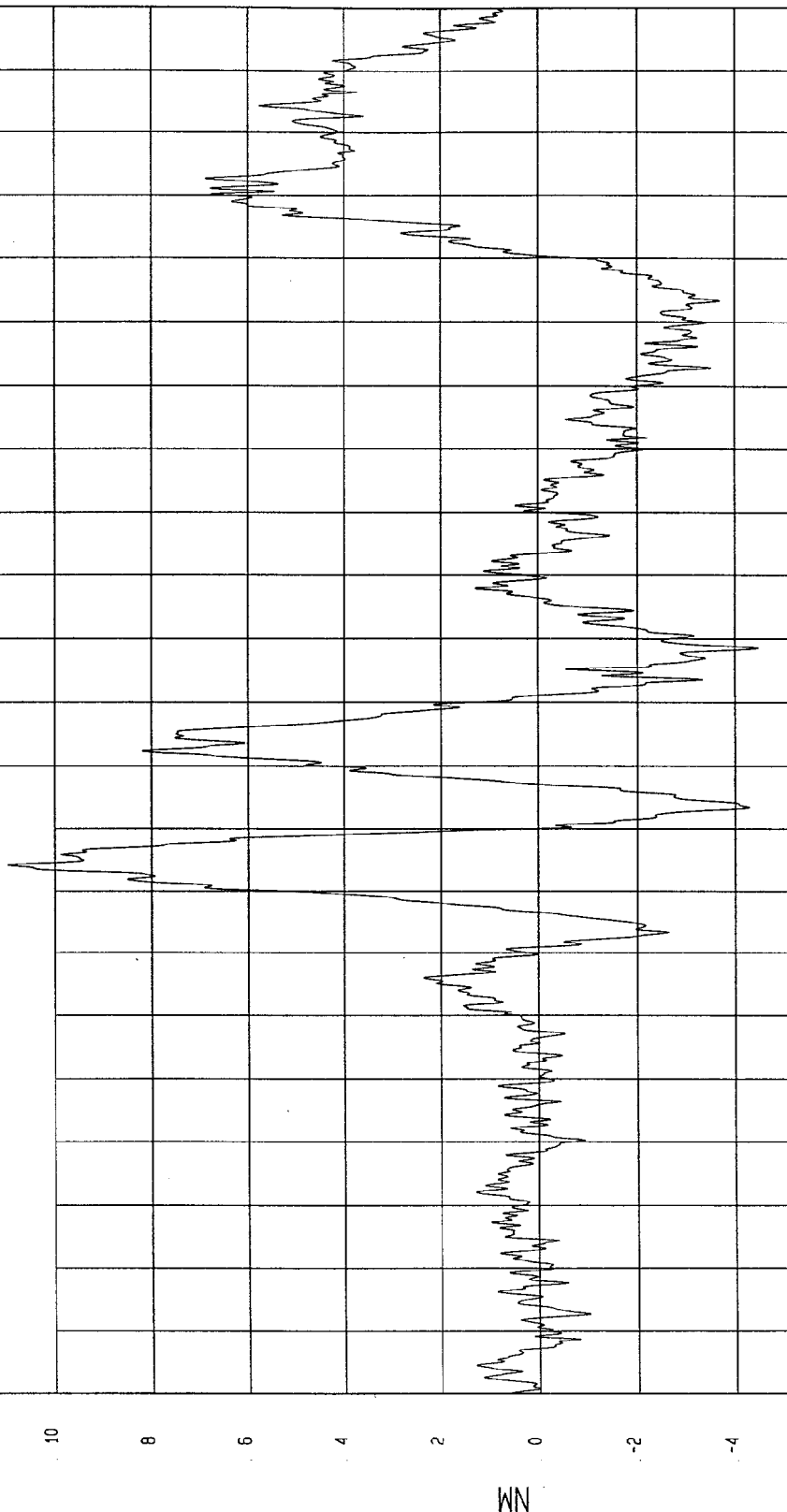
COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Maximum = 10.93 NM at 64 msec

Minimum = -4.45 NM at 99 msec

DRIVER NECK MOMENT X

1 897138NF.M48 Filterclass (600)



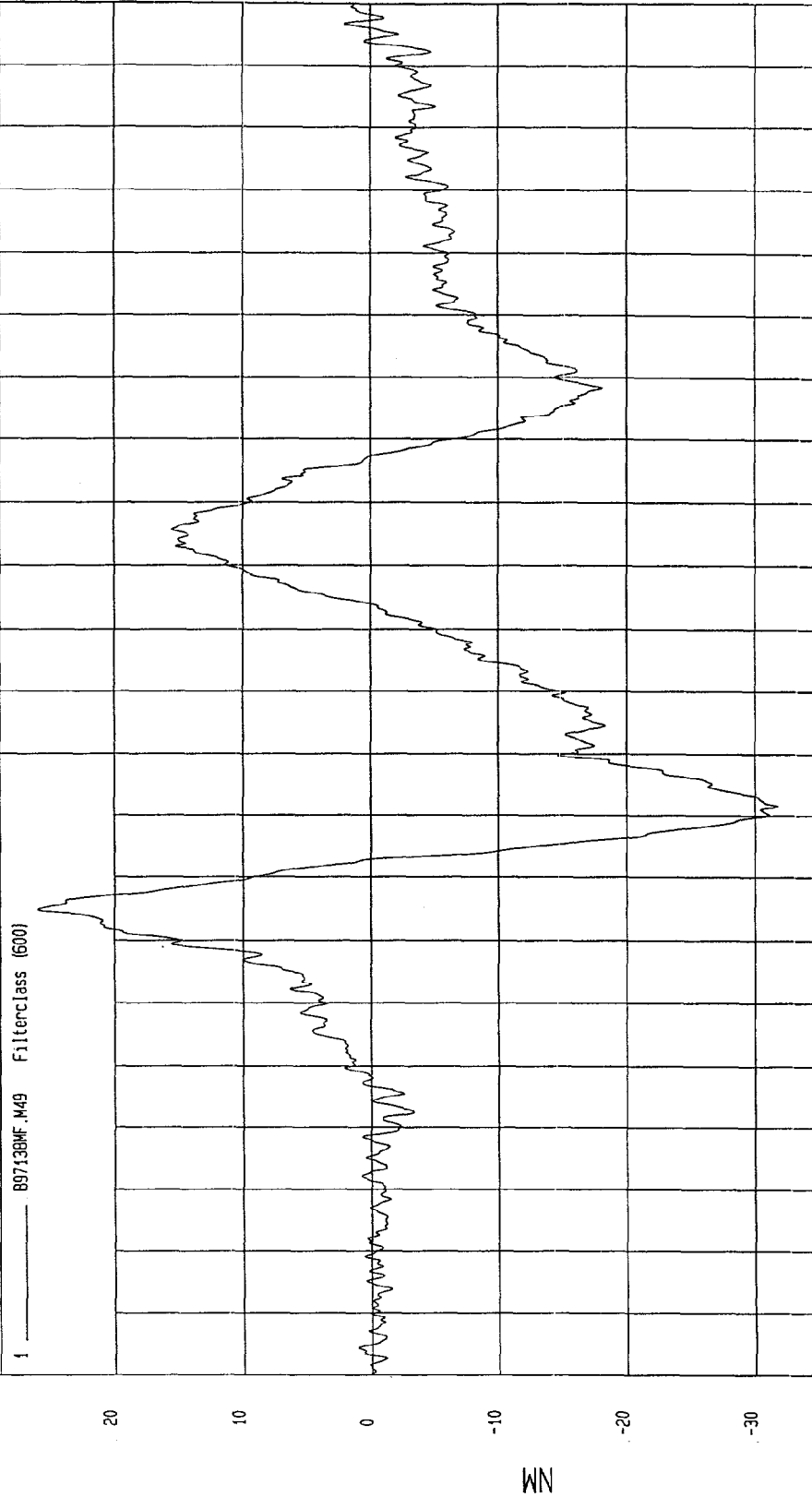
W&A Research
01-05-1998 17:04

TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

Minimum = -31.74 NM at 72 msec Maximum = 26.01 NM at 55 msec

DRIVER NECK MOMENT Y



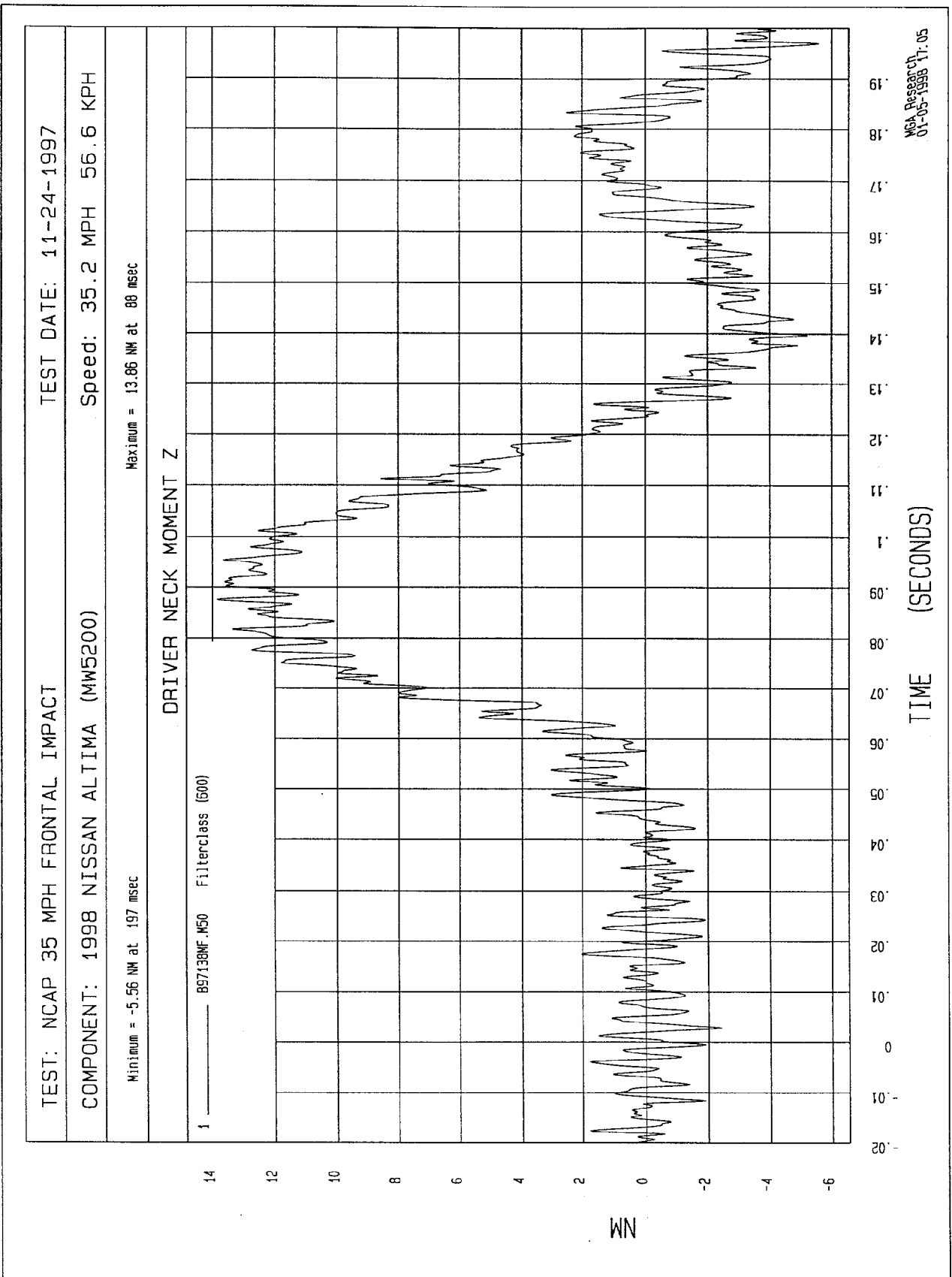
TIME (SECONDS)

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

20 10 0 -10 -20 -30

NM

MCA Research
01-05-1998 17:05

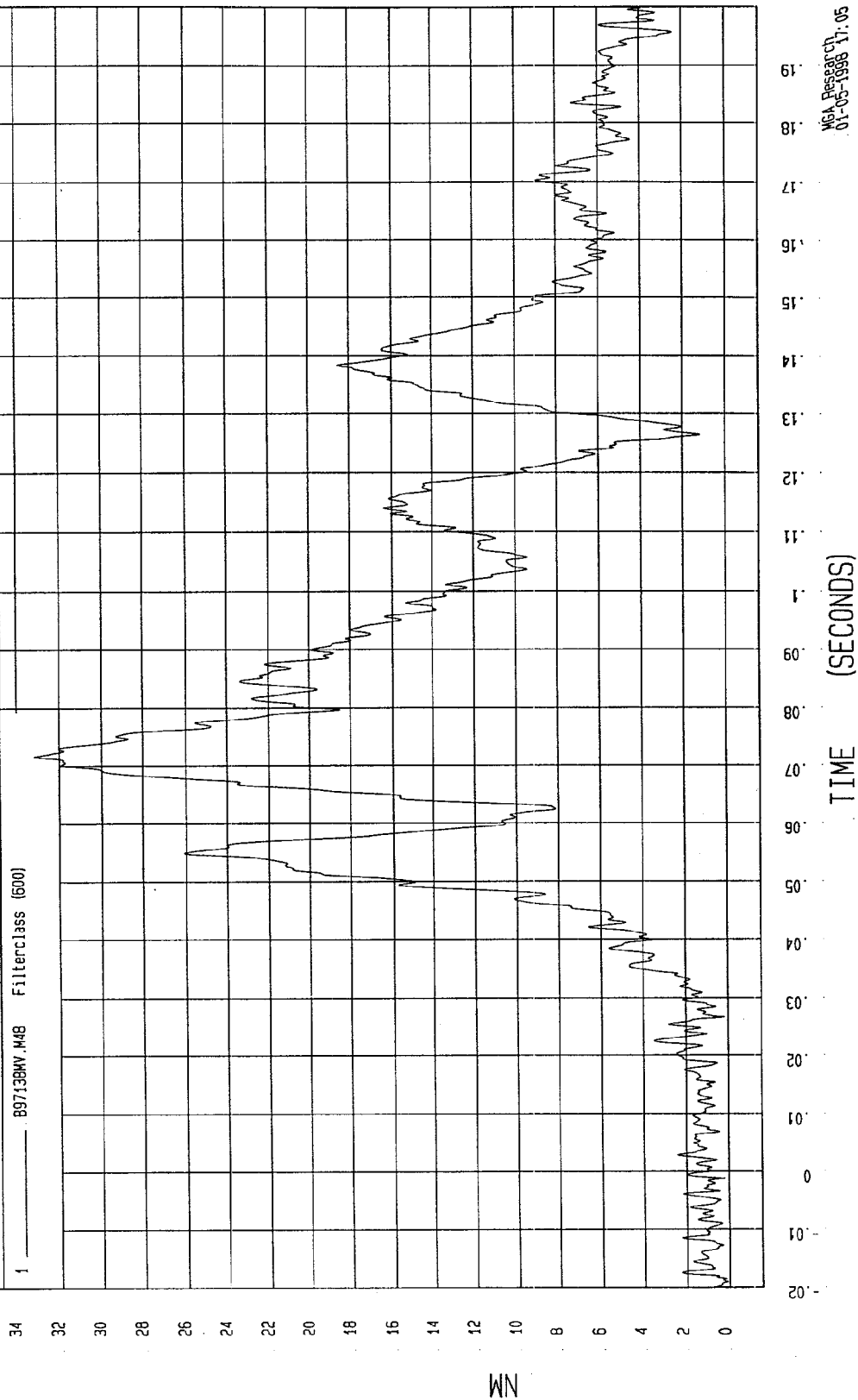


TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

Minimum = 8.00E-02 NM at -19 msec Maximum = 33.14 NM at 72 msec

DRIVER NECK MOMENT RESULTANT



TEST: NCAP 35 MPH FRONTAL IMPACT	TEST DATE: 11-24-1997
COMPONENT: 1998 NISSAN ALTIMA (MW5200)	Speed: 35.2 MPH 56.6 KPH
Minimum = -51.42 G'S at 68 msec	Maximum = 6.60 G'S at 179 msec

DRIVER CHEST X ACCELERATION

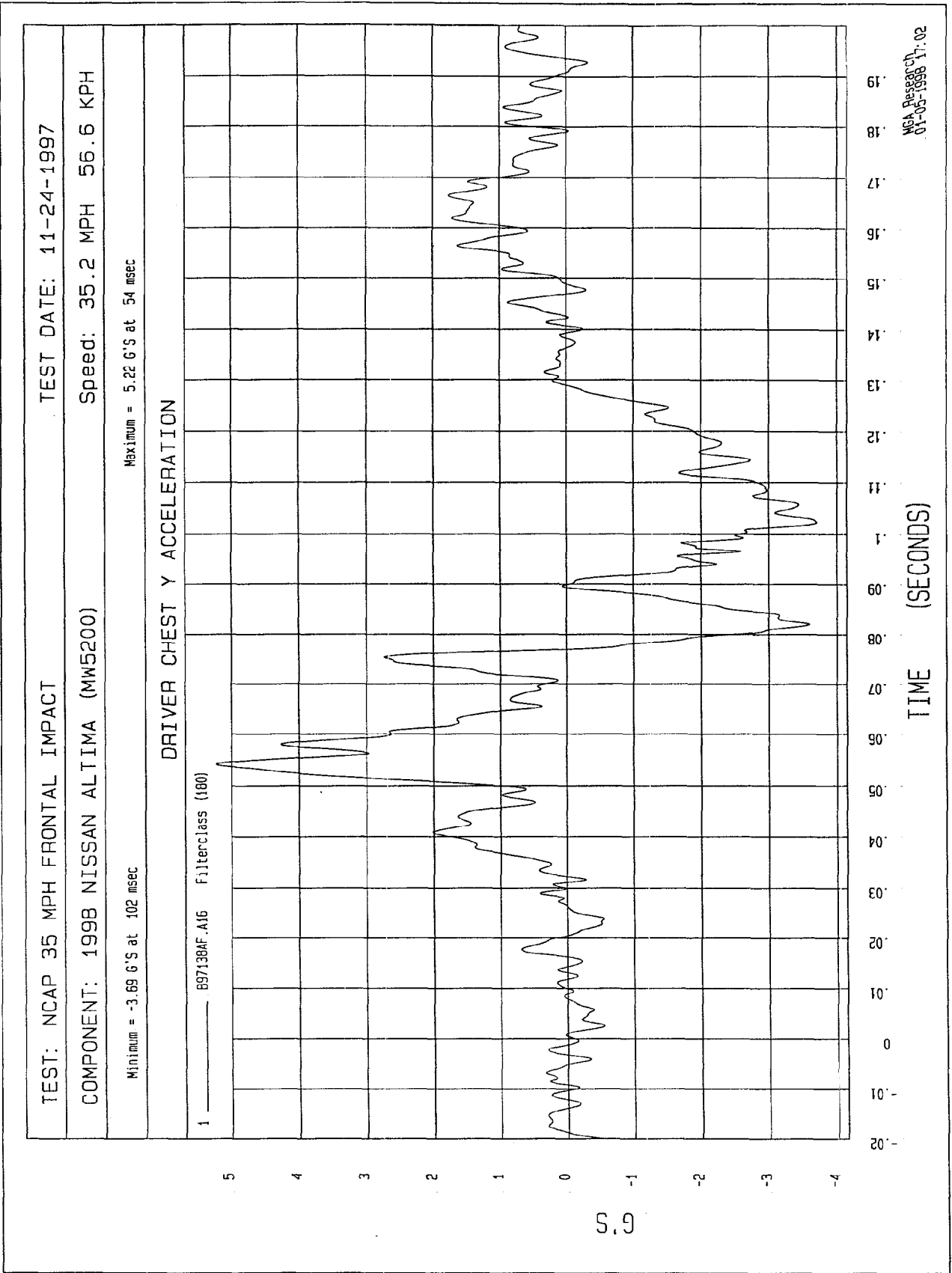
1 ——— B97138AF.A15 Filterclass (180)

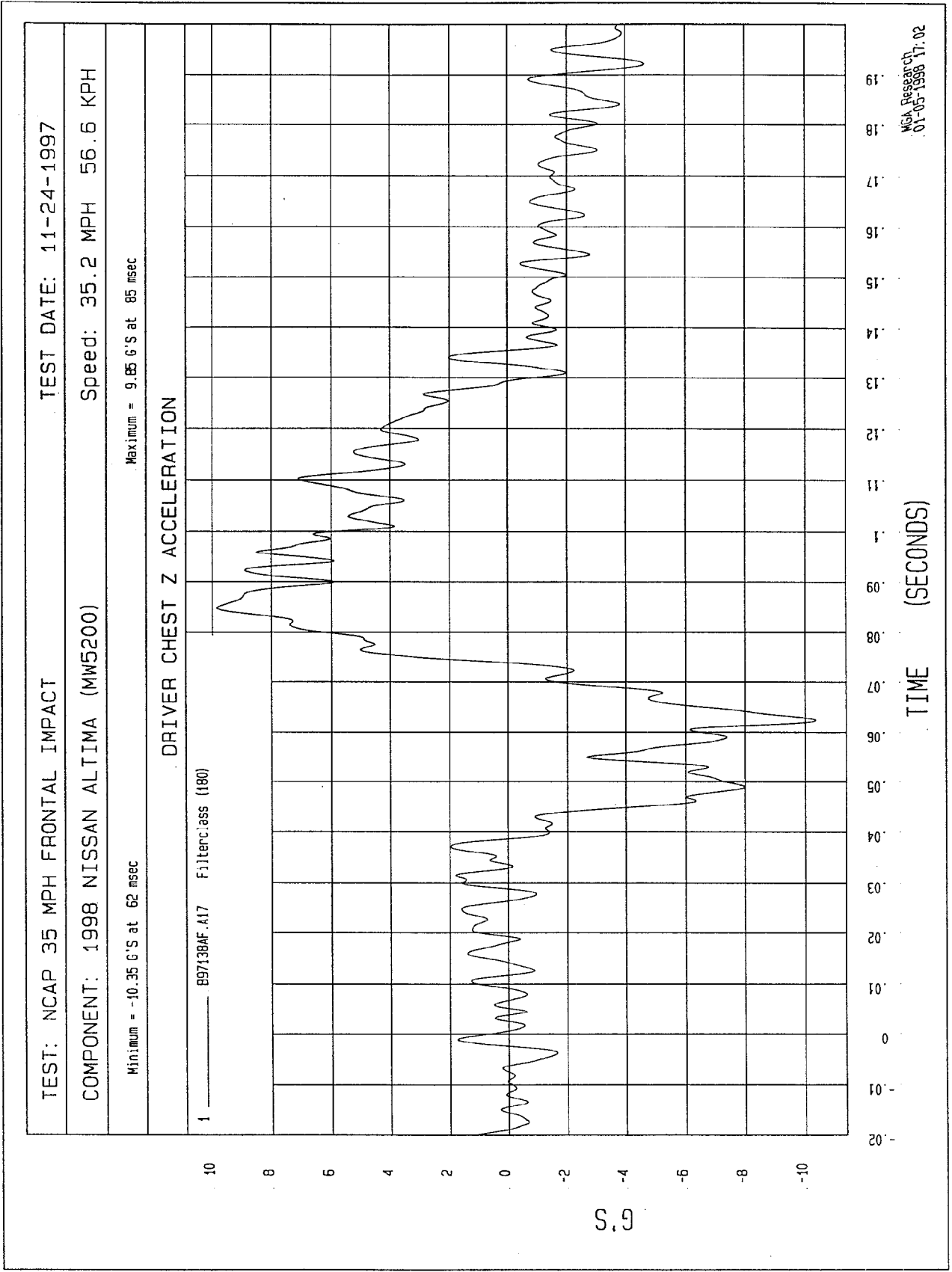


MCA Research
01-05-1998 17.02

TIME (SECONDS)

G.S



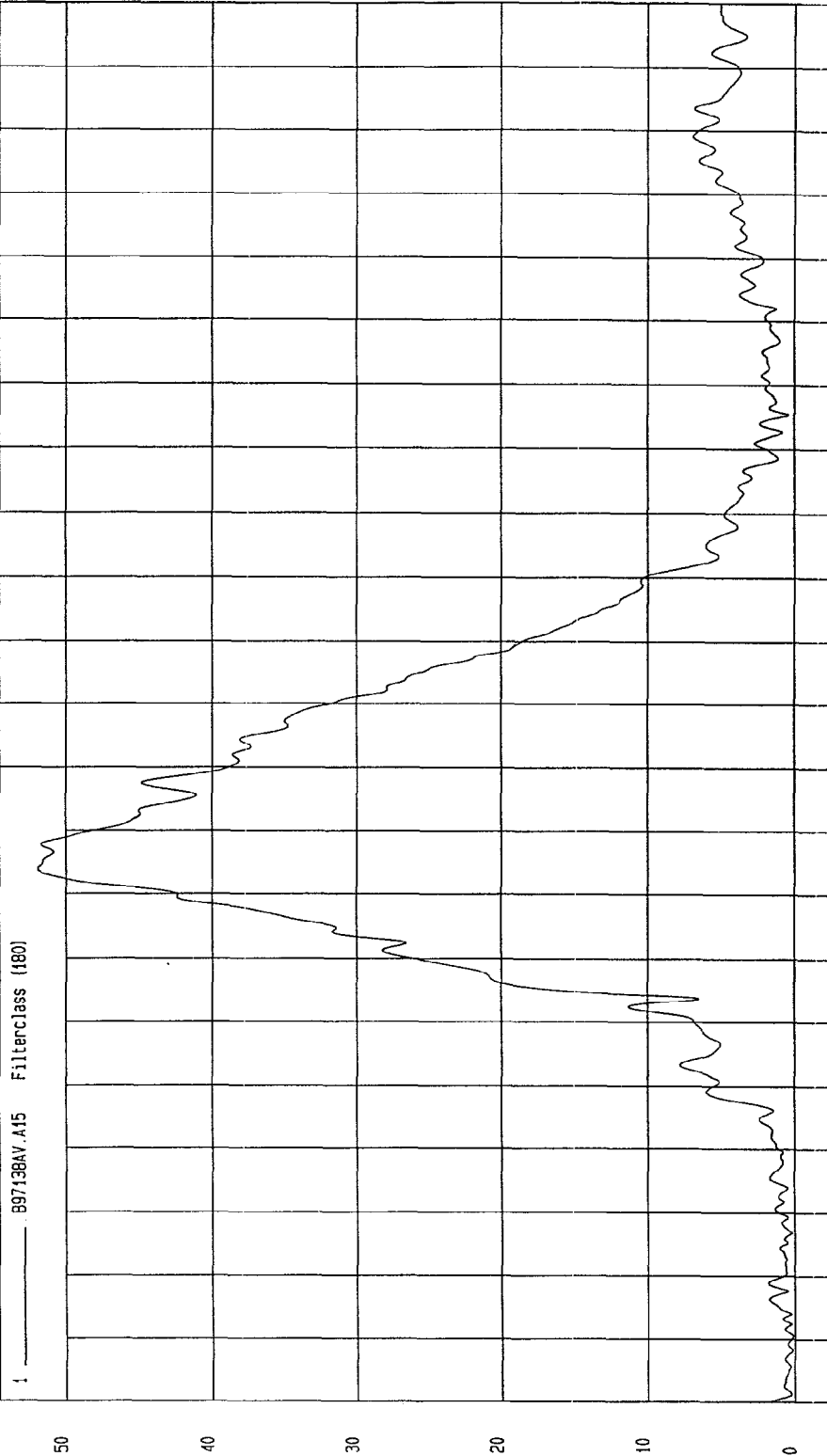


TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

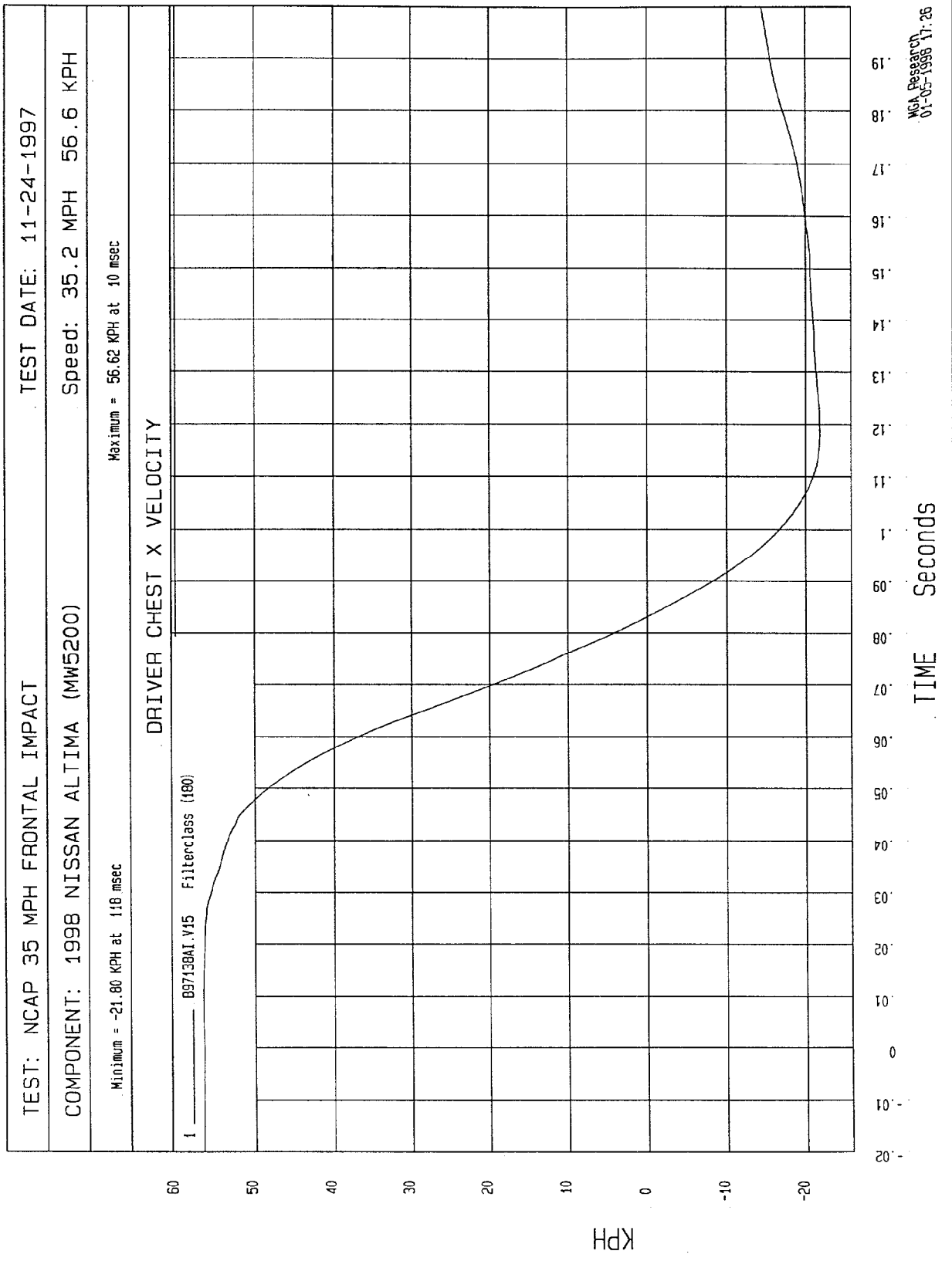
COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

Minimum = .13 G'S at -9 msec Maximum = 51.92 G'S at 64 msec

DRIVER CHEST RESULTANT ACCELERATION



MCA Research
01-05-1998 17:02



TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

SPEED: 35.2 MPH 56.6 KPH

COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Maximum = 5.74 G'S at 180 msec

Minimum = -51.34 G'S at 65 msec

DRIVER CHEST REDUNDANT X ACCELERATION

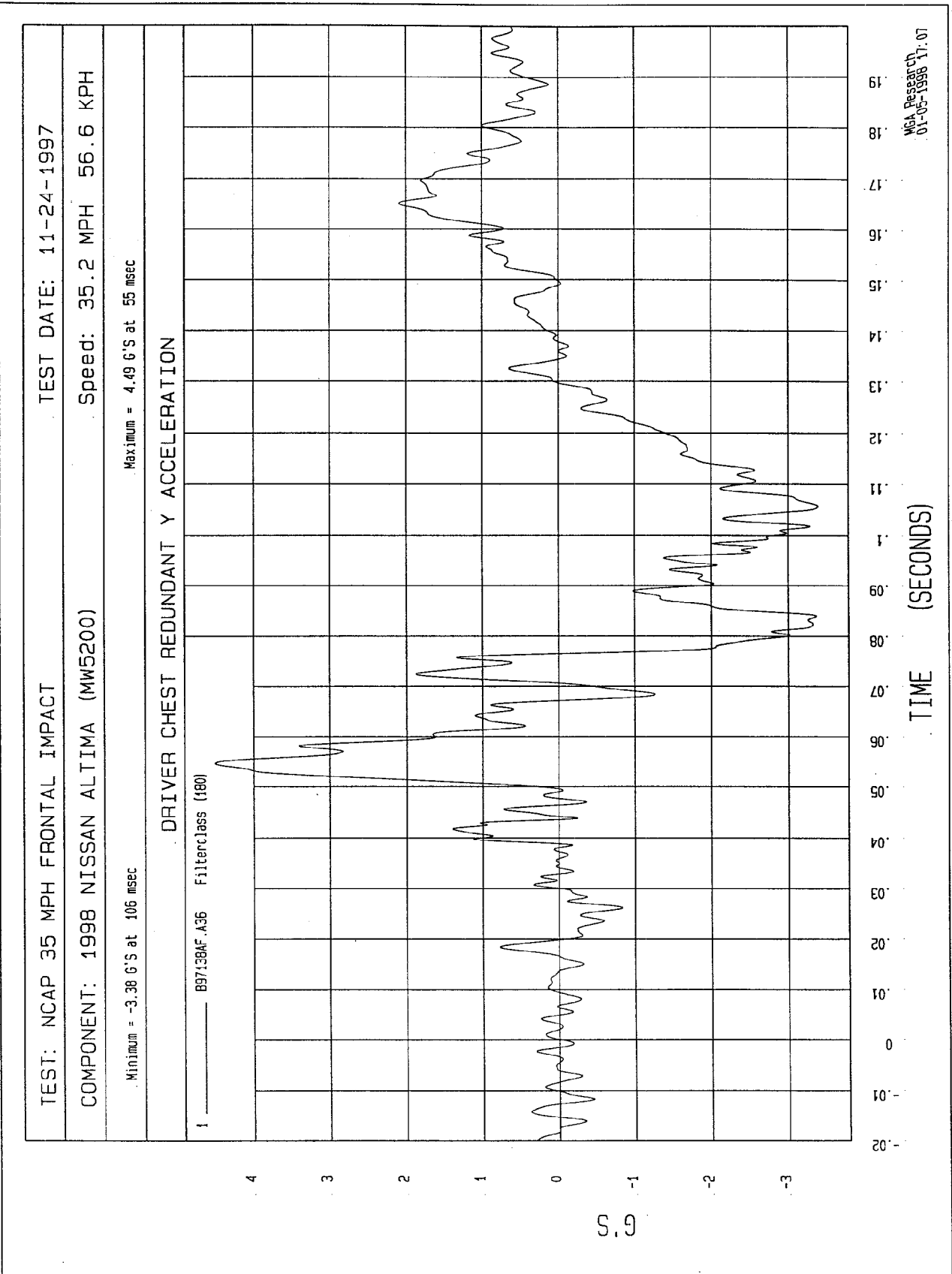
1 — B97138AF.A35 Filterclass (180)



MCA Research
01-05-1998 17:06

TIME (SECONDS)

G.S

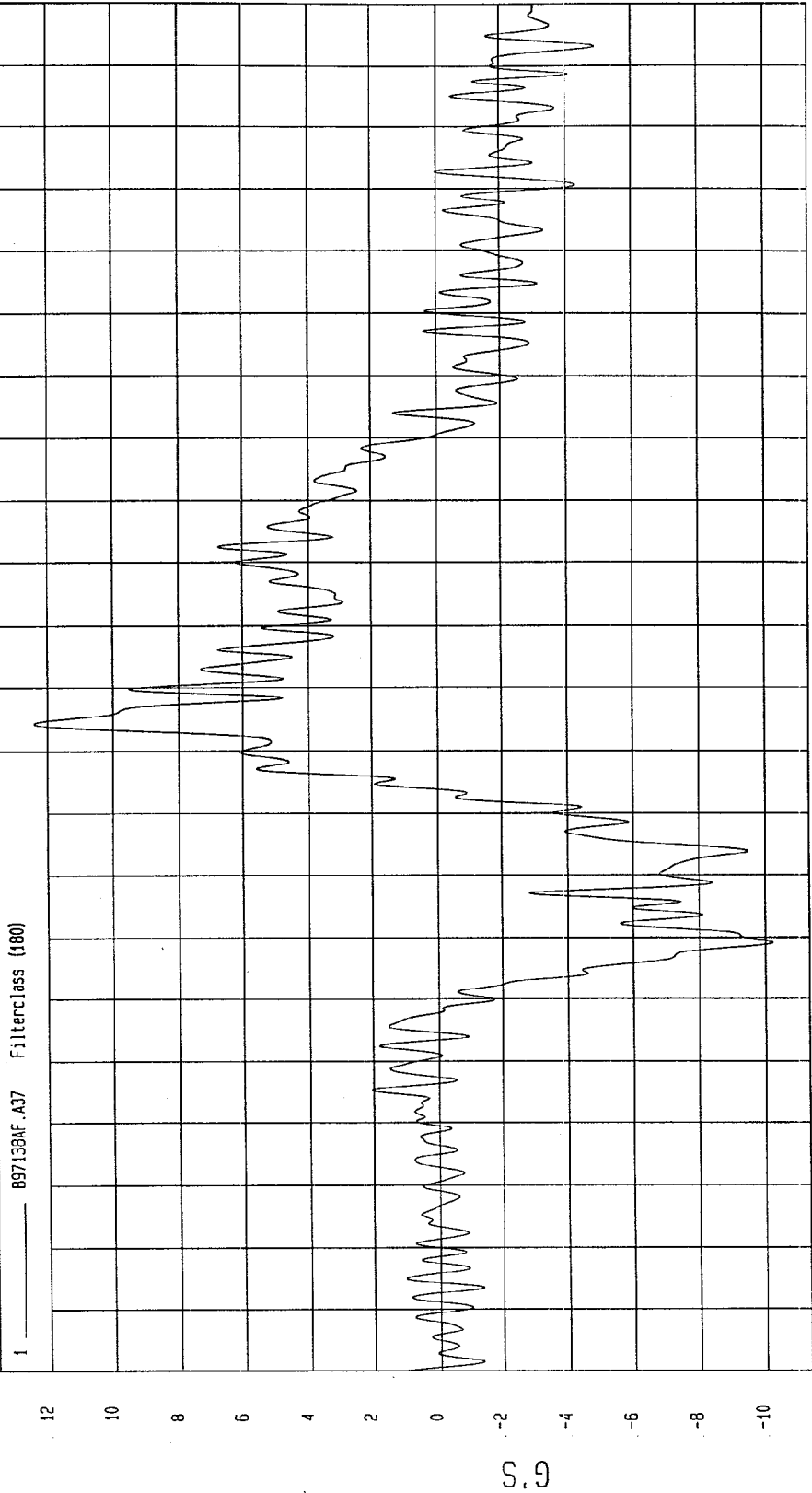


TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

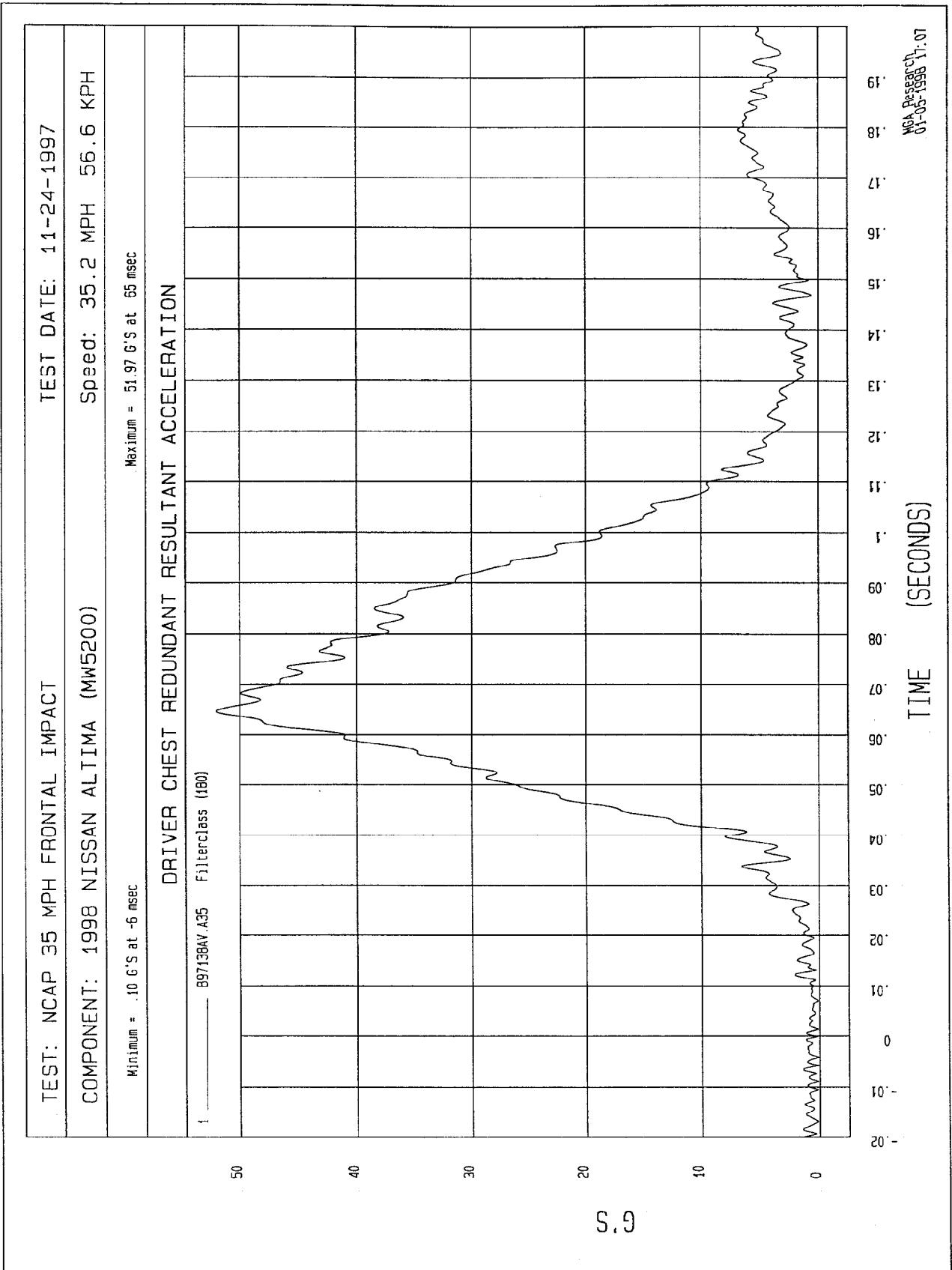
Minimum = -10.22 G'S at 49 msec Maximum = 12.41 G'S at 84 msec

DRIVER CHEST REDUNDANT Z ACCELERATION



TIME (SECONDS)

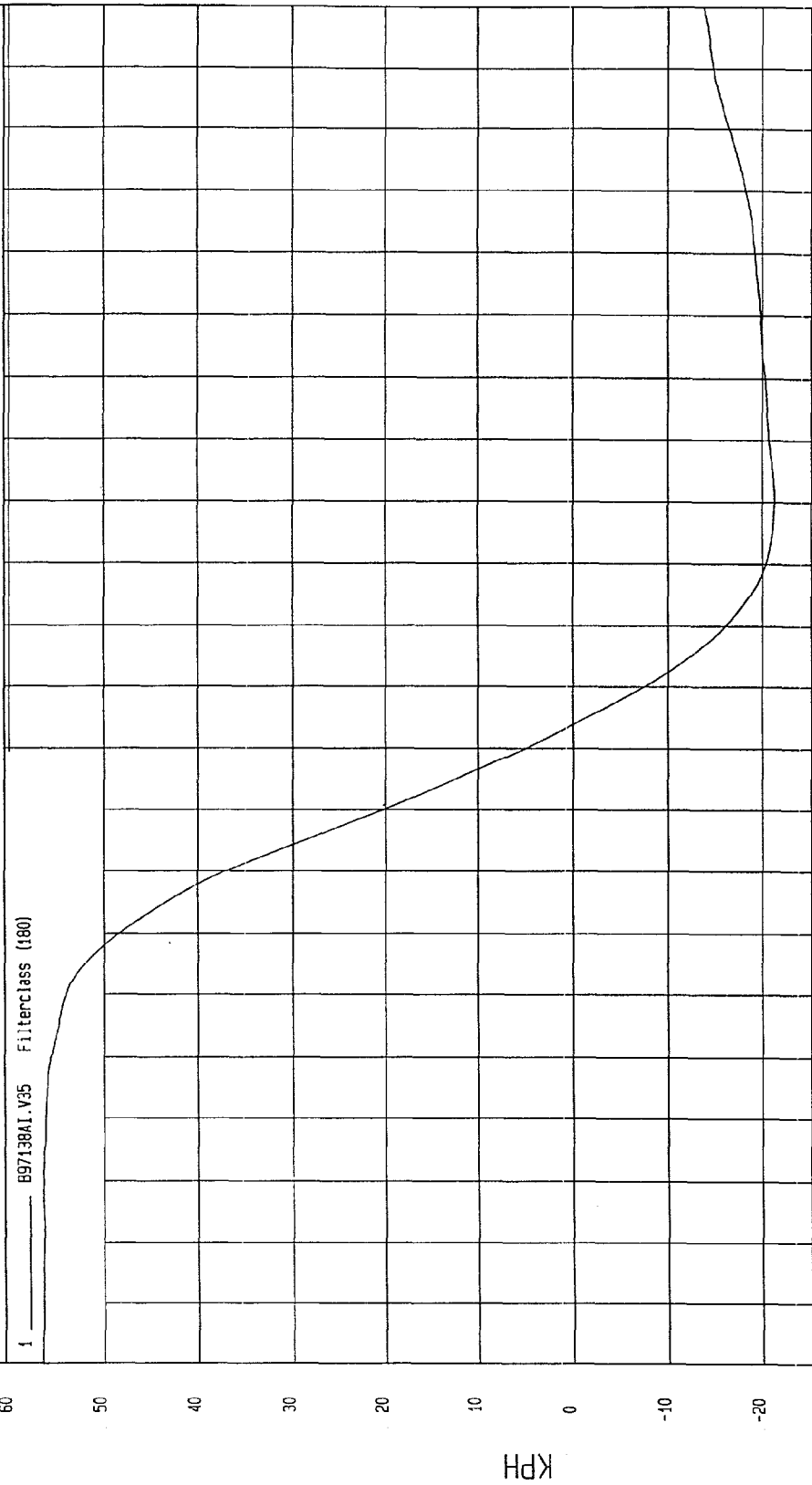
WCA Research
01-05-1998 17:07



TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997
COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

Minimum = -21.28 KPH at 120 msec Maximum = 56.61 KPH at -19 msec

DRIVER CHEST REDUNDANT X VELOCITY



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

NSA Research
01-05-1998 17:26

TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 11-24-1997

Speed: 35.2 MPH 56.6 KPH

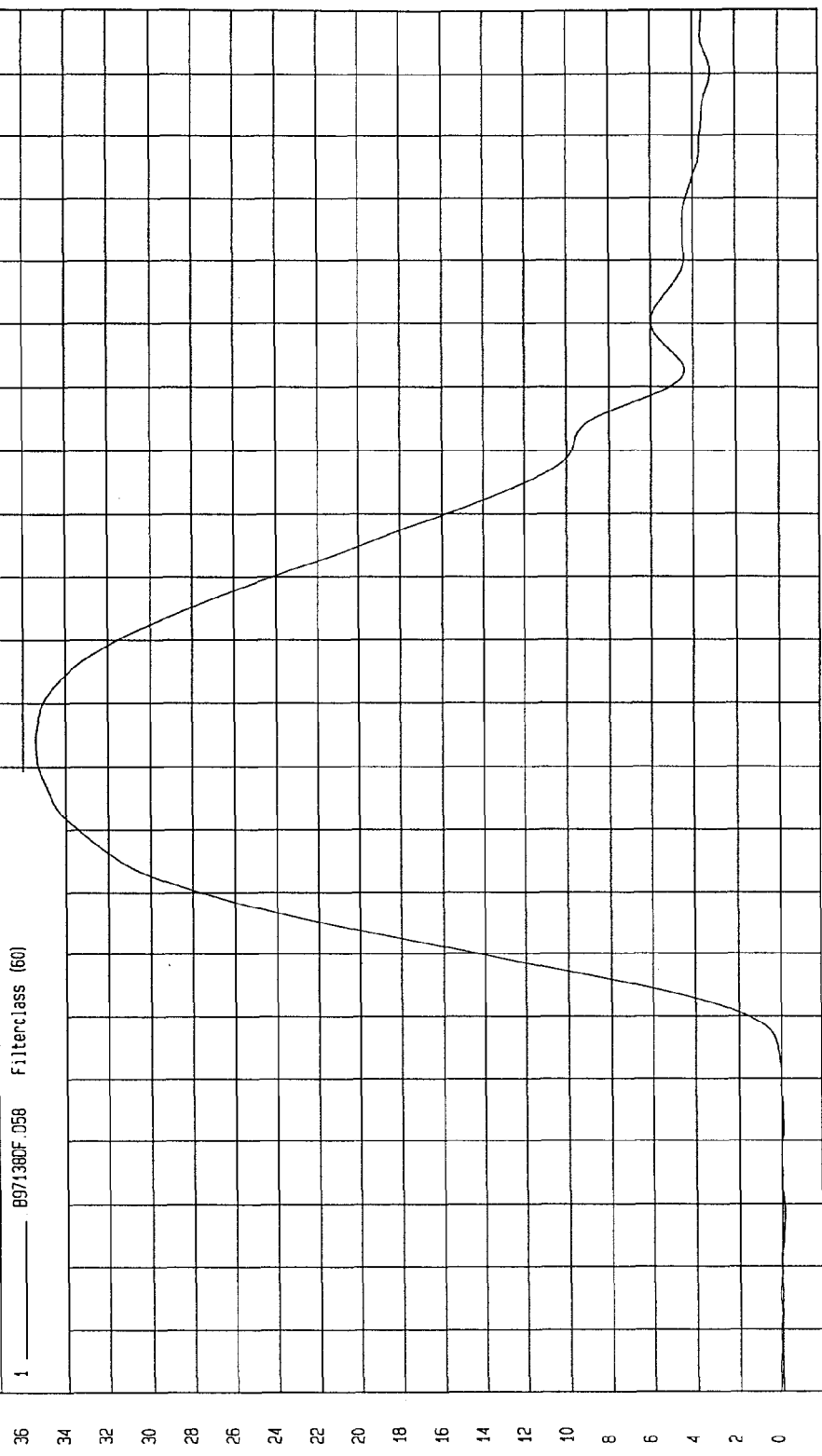
COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Maximum = 35.41 MW at 84 msec

Minimum = -.10 MW at 9 msec

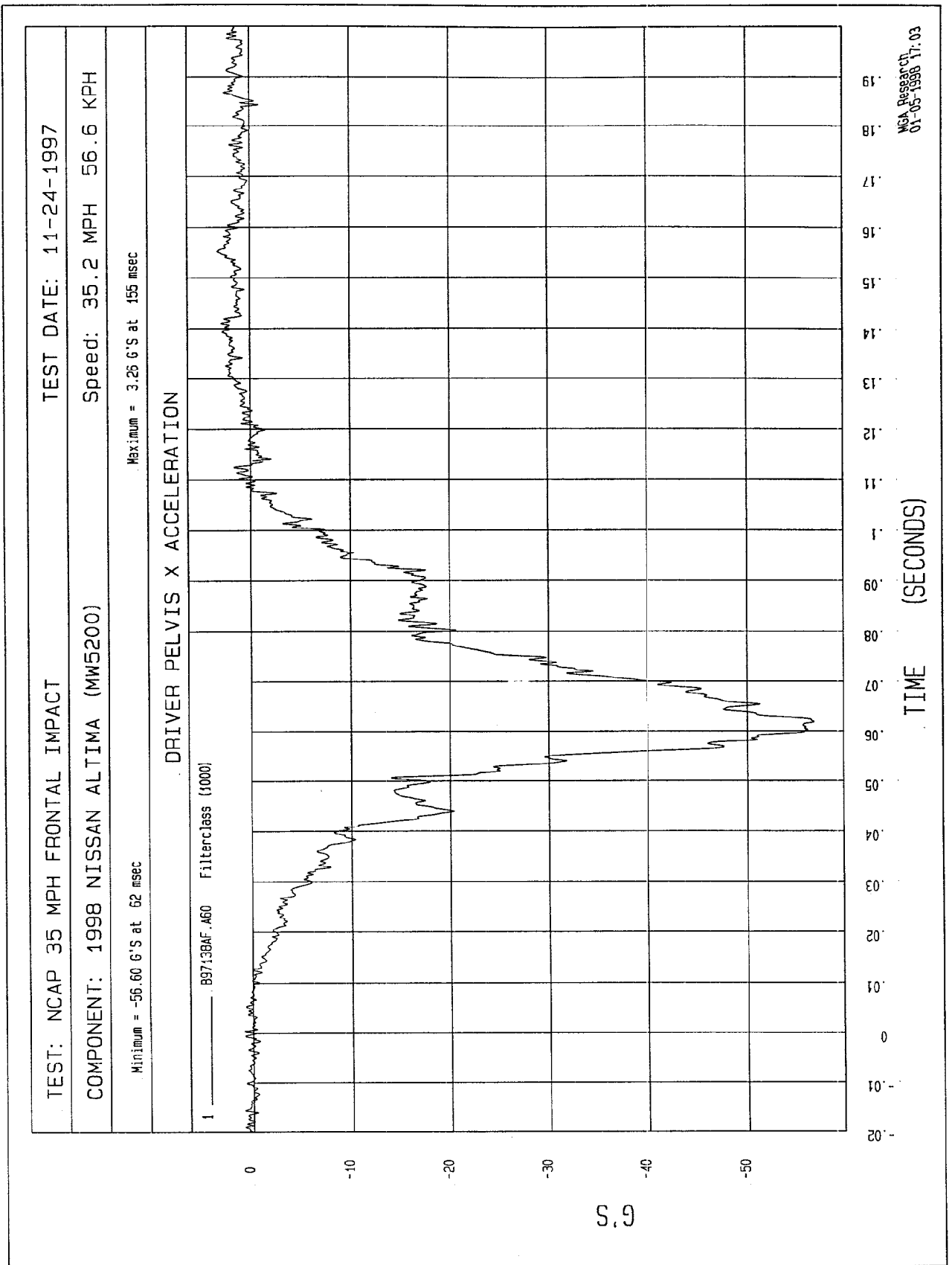
DRIVER CHEST COMPRESSION

1 ——— B971380F.058 Filterclass (60)



MSA Research
01-05-1998 17:03

TIME SECONDS



TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 11-24-1997

Speed: 35.2 MPH 56.6 KPH

COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Minimum = -9.07 G'S at 97 msec

Maximum = 9.13 G'S at 59 msec

DRIVER PELVIS Y ACCELERATION

10

1 ——— B97138AF.A61 Filterclass (1000)

8

6

4

2

0

-2

-4

-6

-8

G'S

-0.02

0

0.01

0.02

0.03

0.04

0.05

0.06

0.07

0.08

0.09

0.1

0.11

0.12

0.13

0.14

0.15

0.16

0.17

0.18

0.19

TIME (SECONDS)

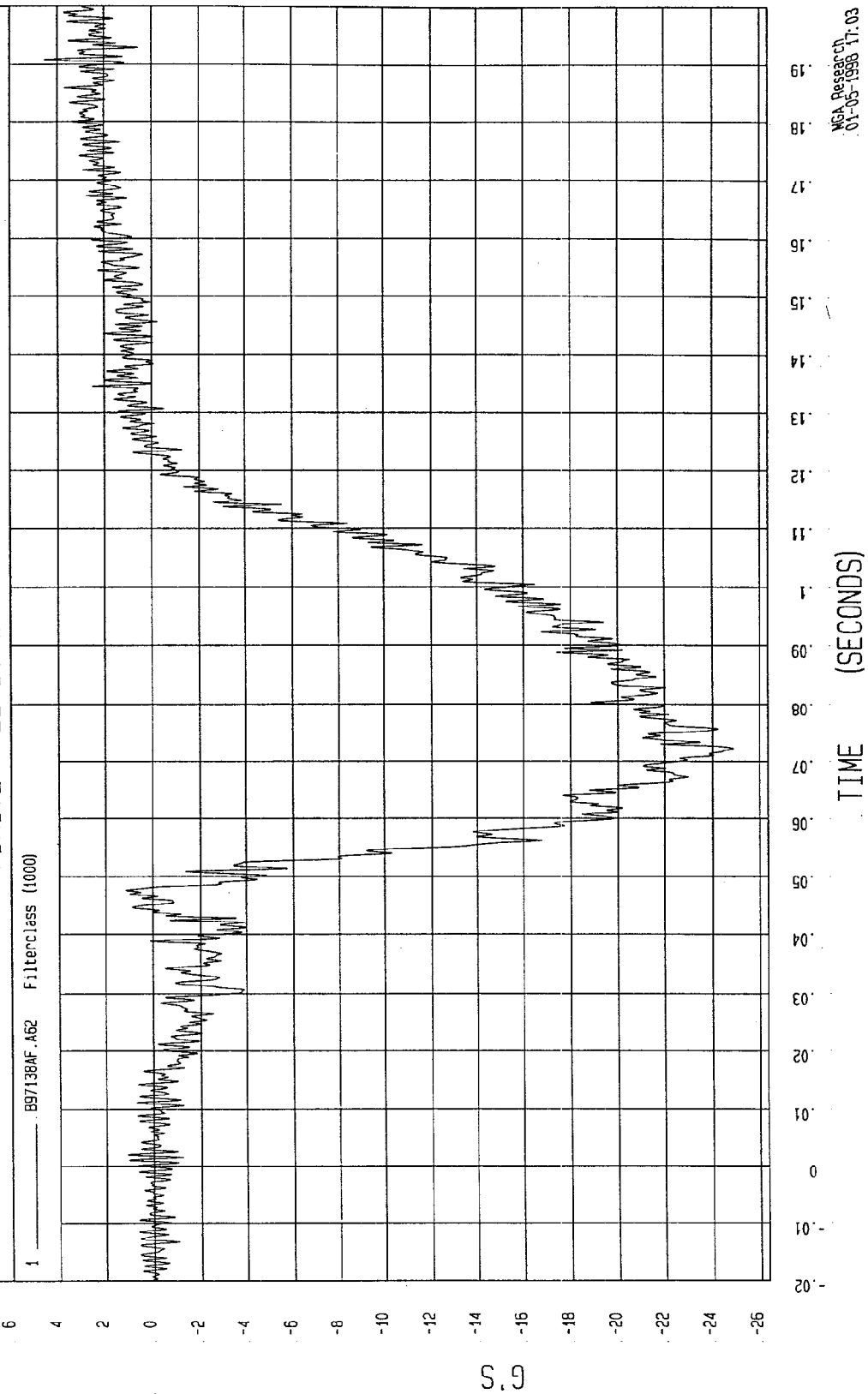
MCA Research
01-05-1998 11:03

TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

Minimum = -24.87 G'S at 72 msec Maximum = 4.53 G'S at 191 msec

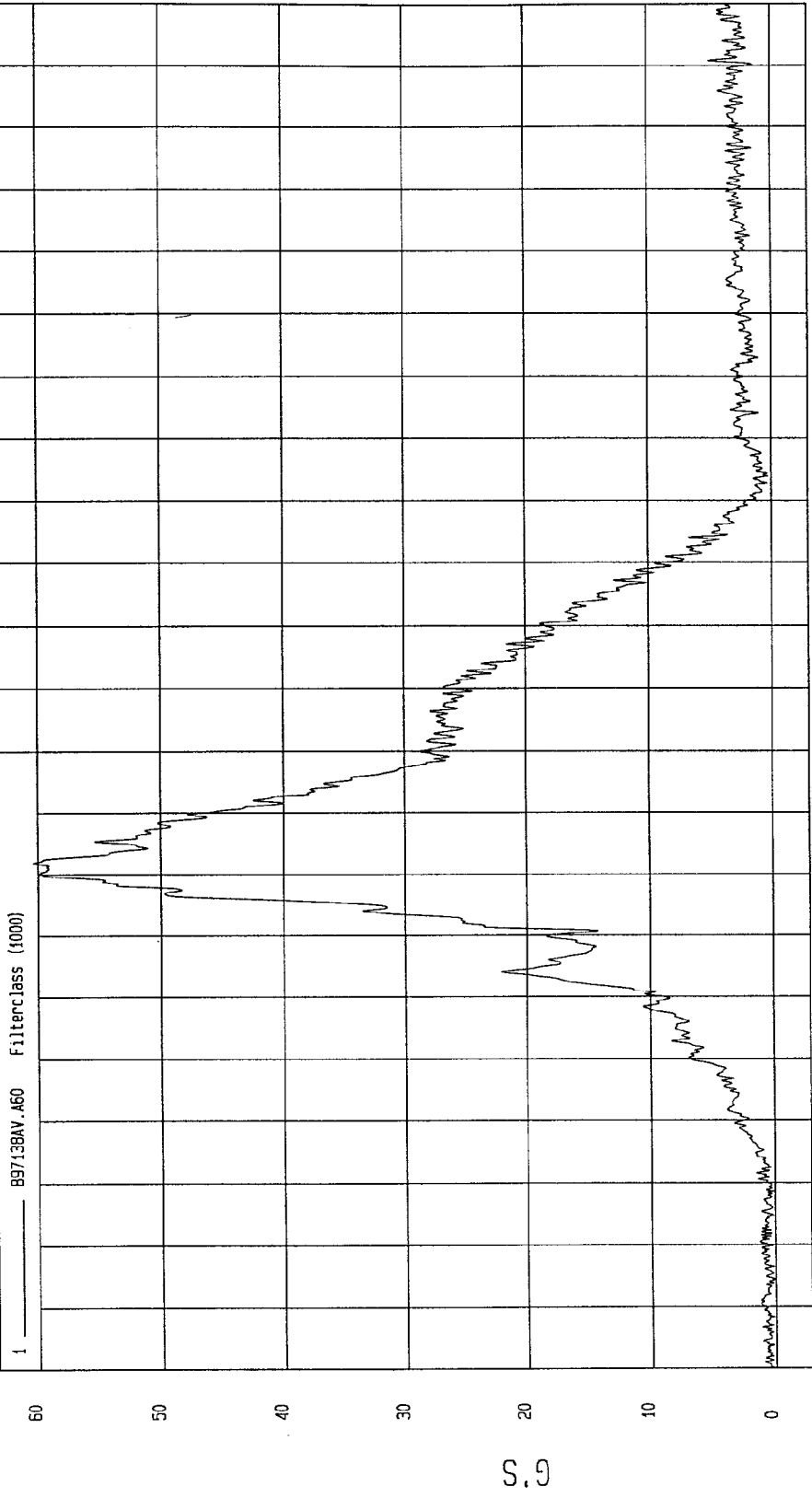
DRIVER PELVIS Z ACCELERATION



NCA Research
01-05-1998 11:03

TEST: NCAP 35 MPH FRONTAL IMPACT
TEST DATE: 11-24-1997
COMPONENT: 1998 NISSAN ALTIMA (MW5200)
Speed: 35.2 MPH 56.6 KPH
Minimum = 5.43E-02 G'S at -6 msec
Maximum = 60.33 G'S at 62 msec

DRIVER PELVIS RESULTANT ACCELERATION

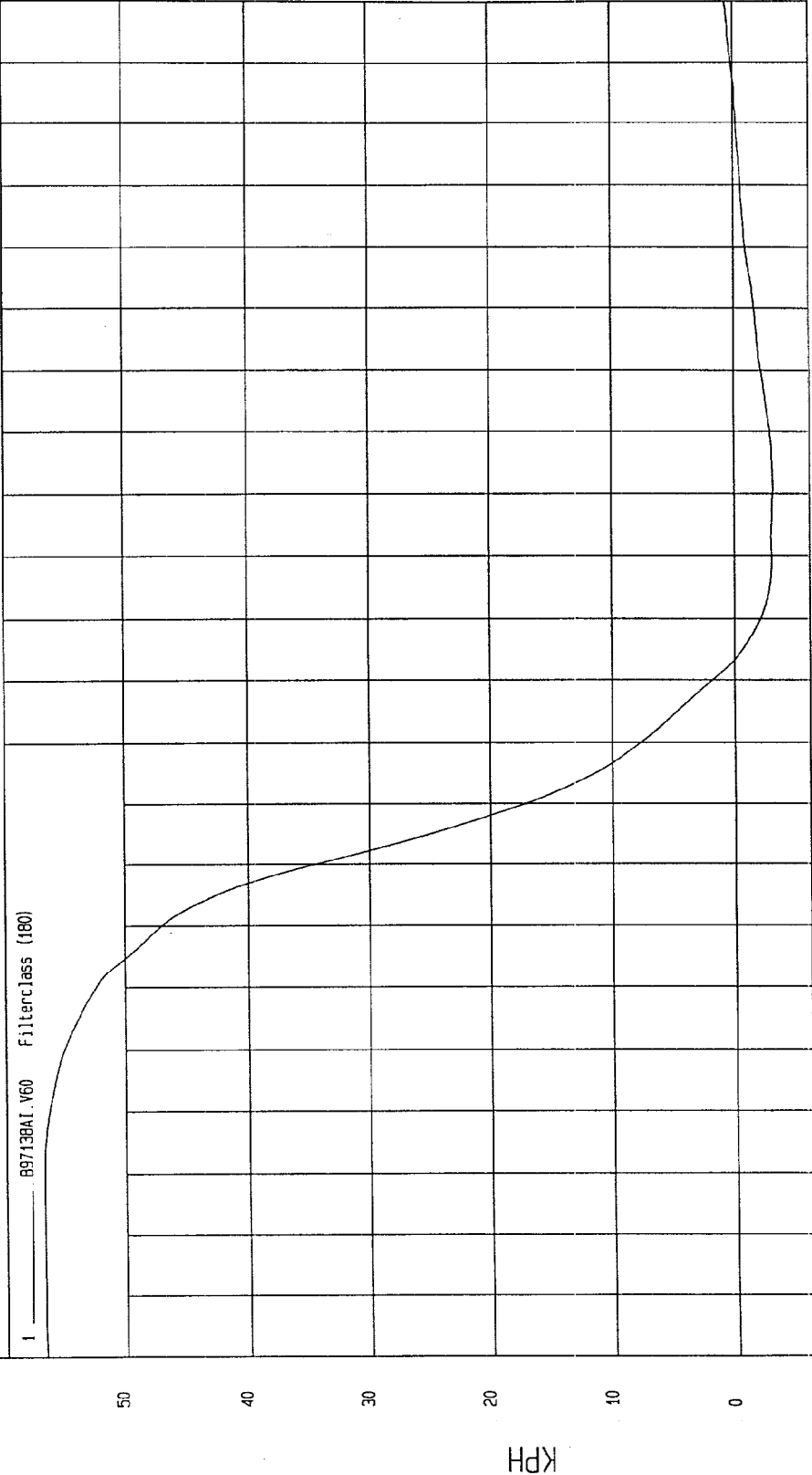


TIME (SECONDS)

MCA Research
01-05-1998 17:03

TEST: NCAP 35 MPH FRONTAL IMPACT	TEST DATE: 11-24-1997
COMPONENT: 1998 NISSAN ALTIMA (MW5200)	Speed: 35.2 MPH 56.6 KPH
Minimum = -3.07 KPH at 121 msec	
Maximum = 56.71 KPH at 8 msec	

DRIVER PELVIS X VELOCITY



TIME Seconds

NCA Research
01-05-1998 17:26

TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 11-24-1997

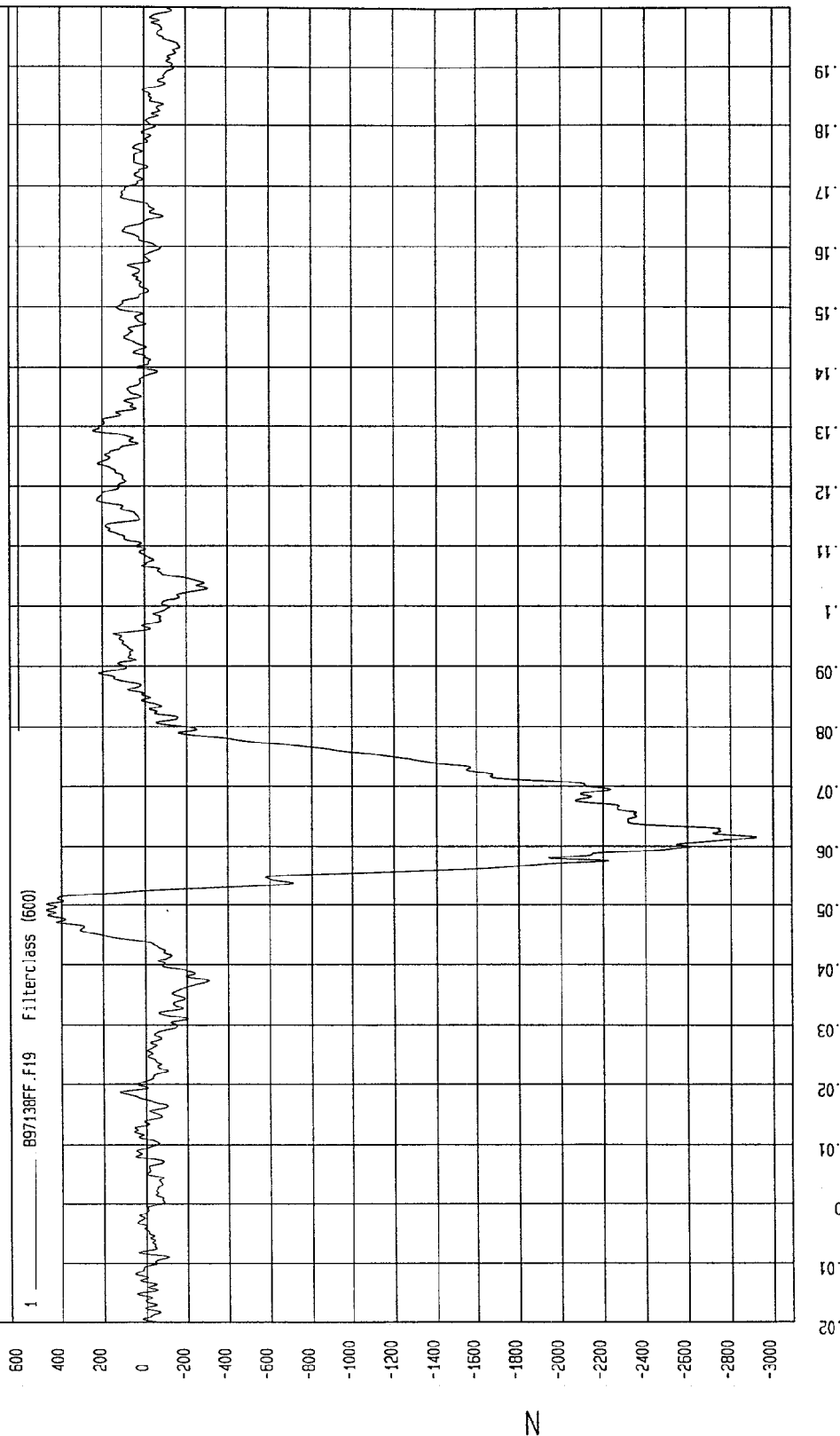
Speed: 35.2 MPH 56.6 KPH

COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Maximum = 472.93 N at 50 msec

Minimum = -2920.18 N at 62 msec

DRIVER LEFT FEMUR FORCE



MGA Research
01-05-1998 17:03

TIME (SECONDS)

N

TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 11-24-1997

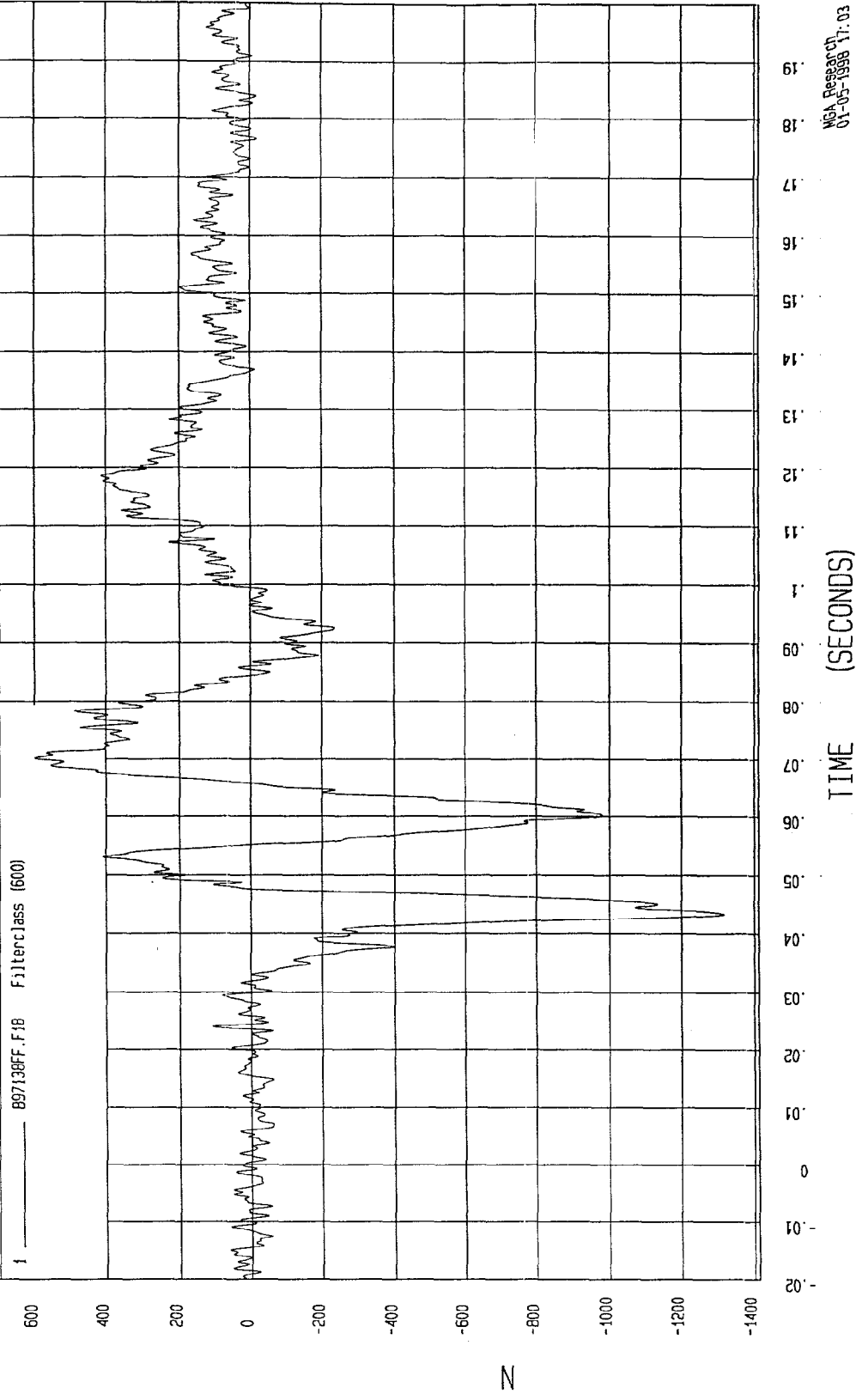
Speed: 35.2 MPH 56.6 KPH

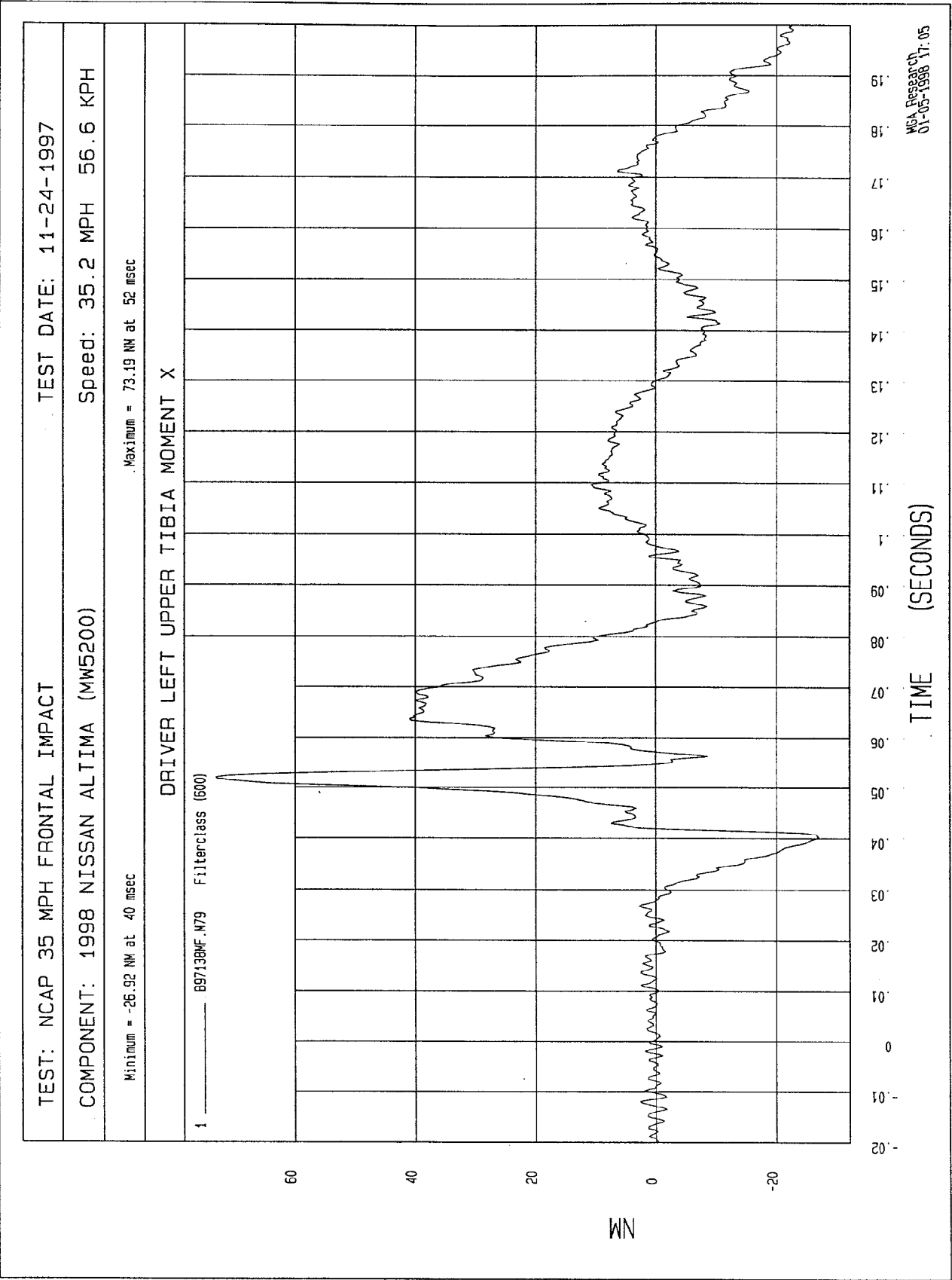
COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Maximum = 596.95 N at 70 msec

Minimum = -1316.66 N at 43 msec

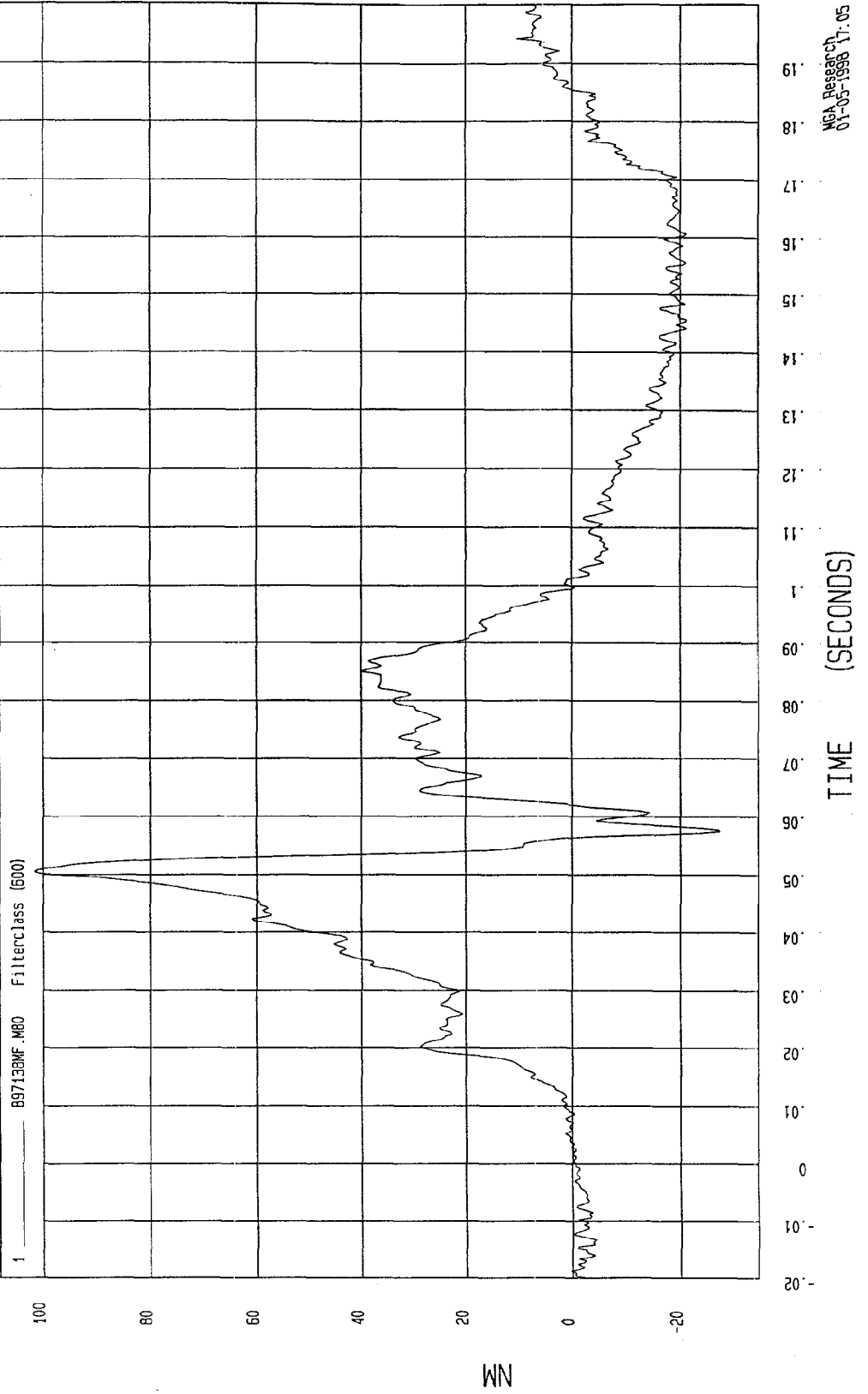
DRIVER RIGHT FEMUR FORCE

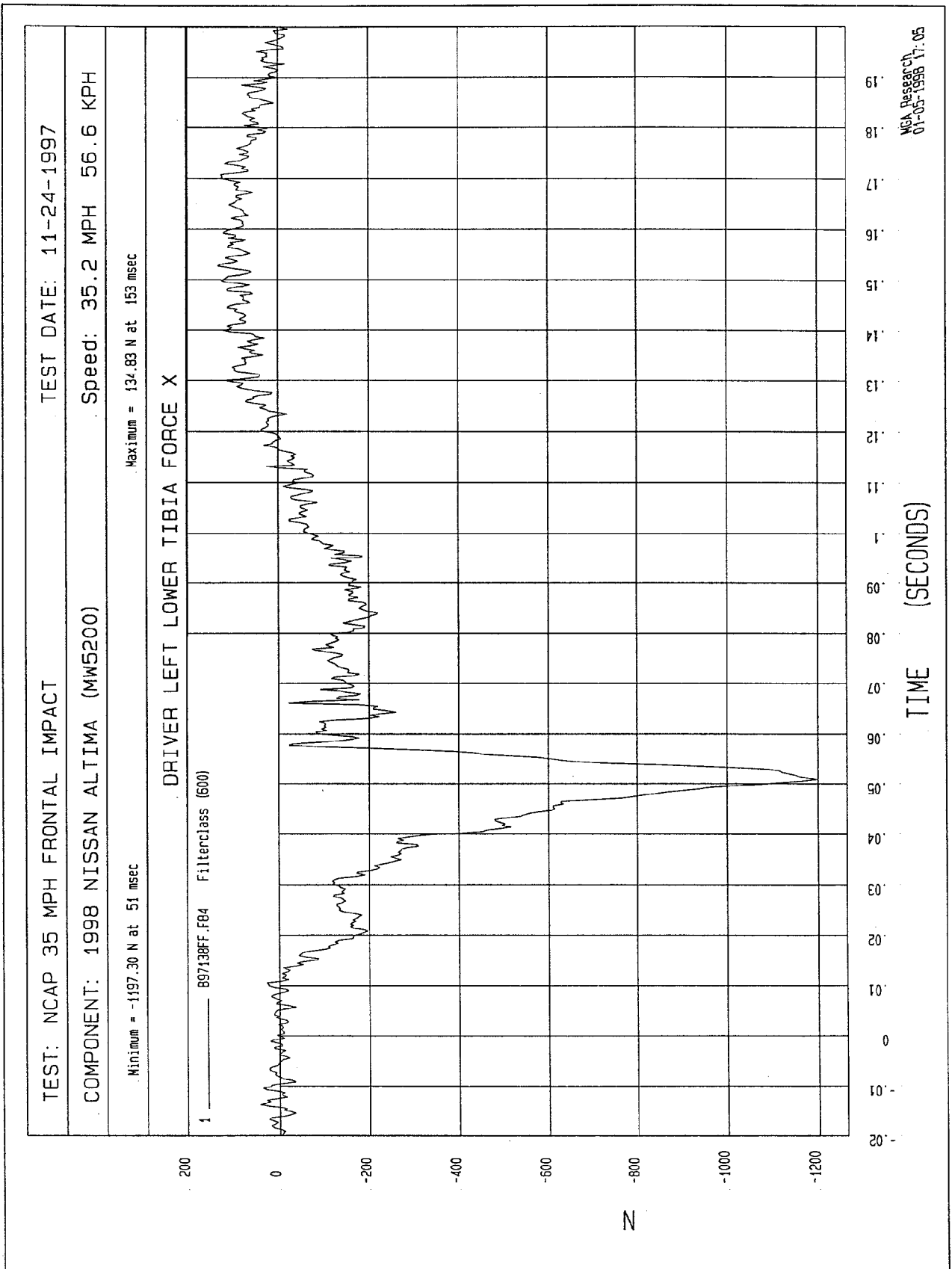




TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997
COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH
Minimum = -27.73 NM at 58 msec Maximum = 101.60 NM at 50 msec

DRIVER LEFT UPPER TIBIA MOMENT Y





TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 11-24-1997

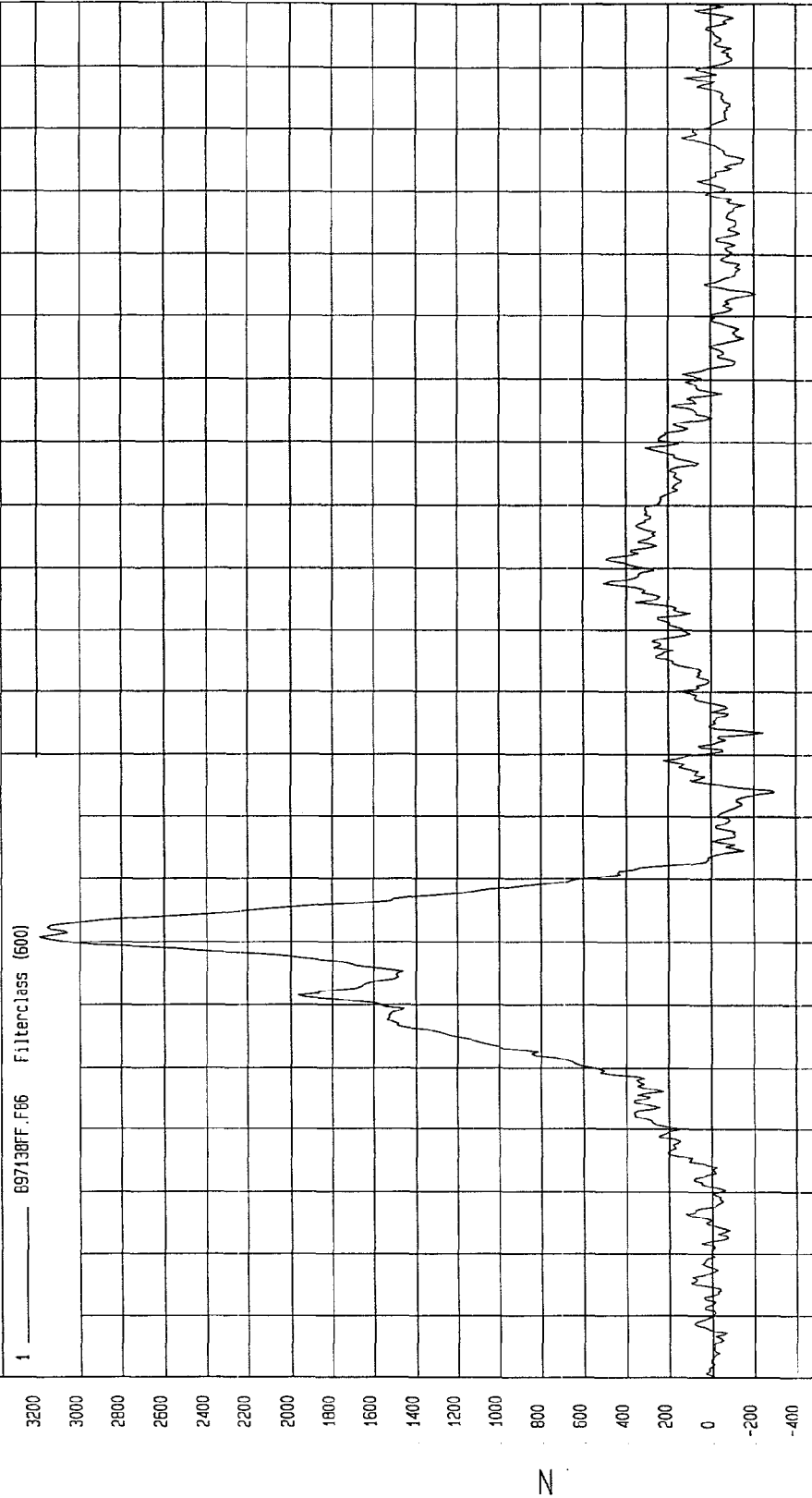
Speed: 35.2 MPH 56.6 KPH

COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Maximum = 3189.70 N at 51 msec

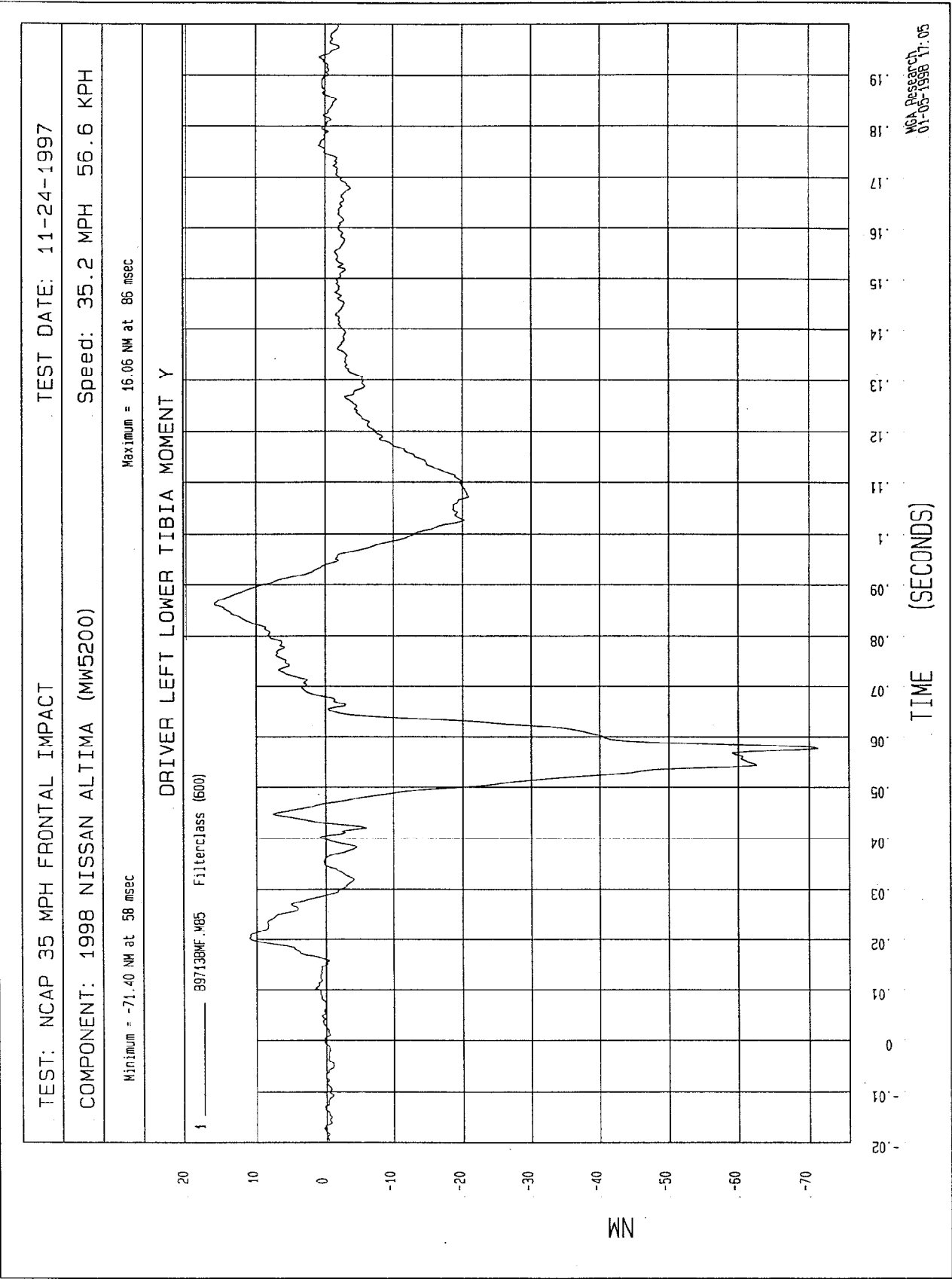
Minimum = -313.78 N at 74 msec

DRIVER LEFT LOWER TIBIA FORCE Z



MOA Research
01-05-1998 17:05

TIME (SECONDS)



TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 11-24-1997

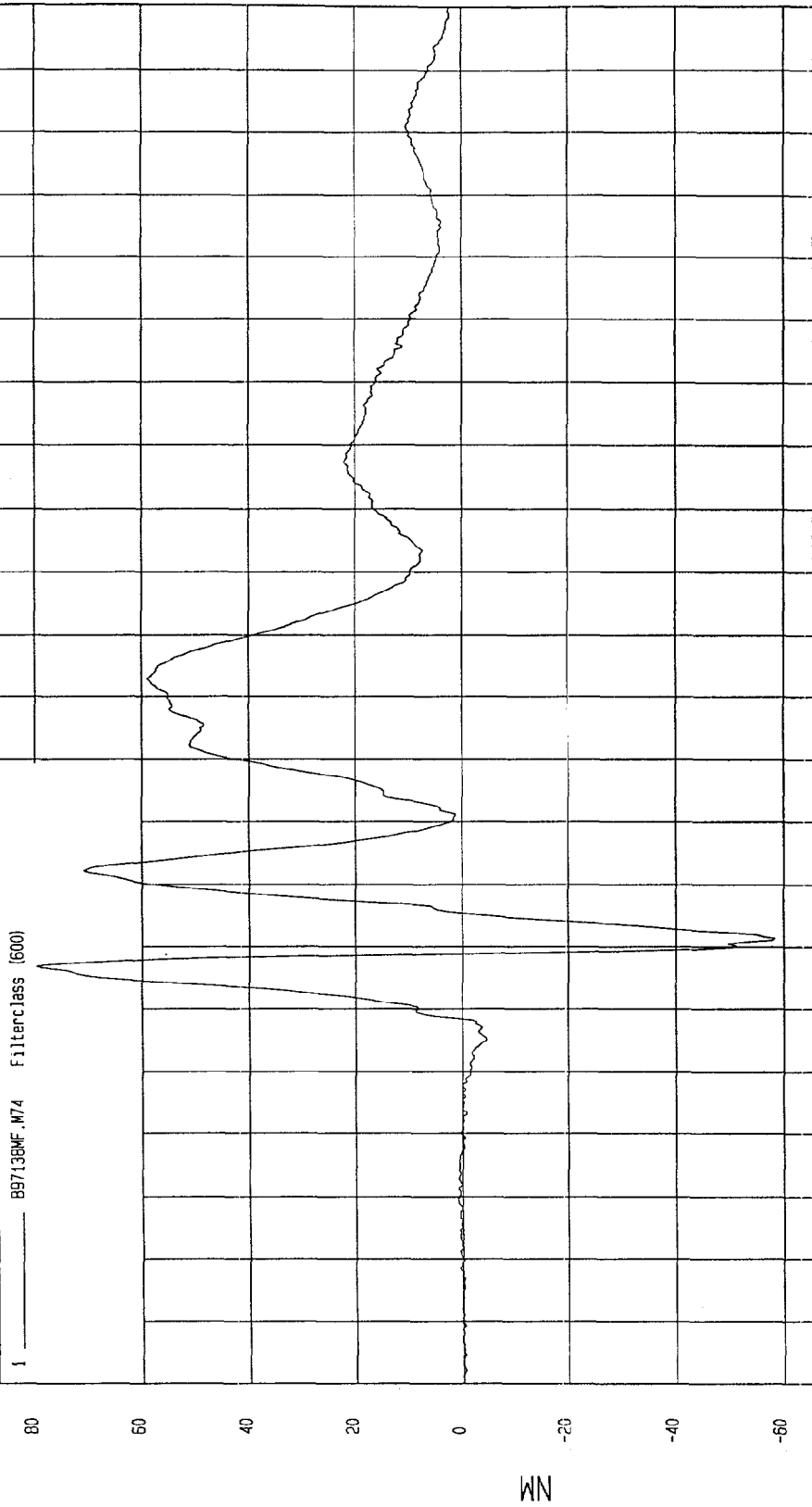
Speed: 35.2 MPH 56.6 KPH

COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Maximum = 79.35 NM at 47 msec

Minimum = -58.63 NM at 51 msec

DRIVER RIGHT UPPER TIBIA MOMENT X



WCA Research
01-05-1998 17:05

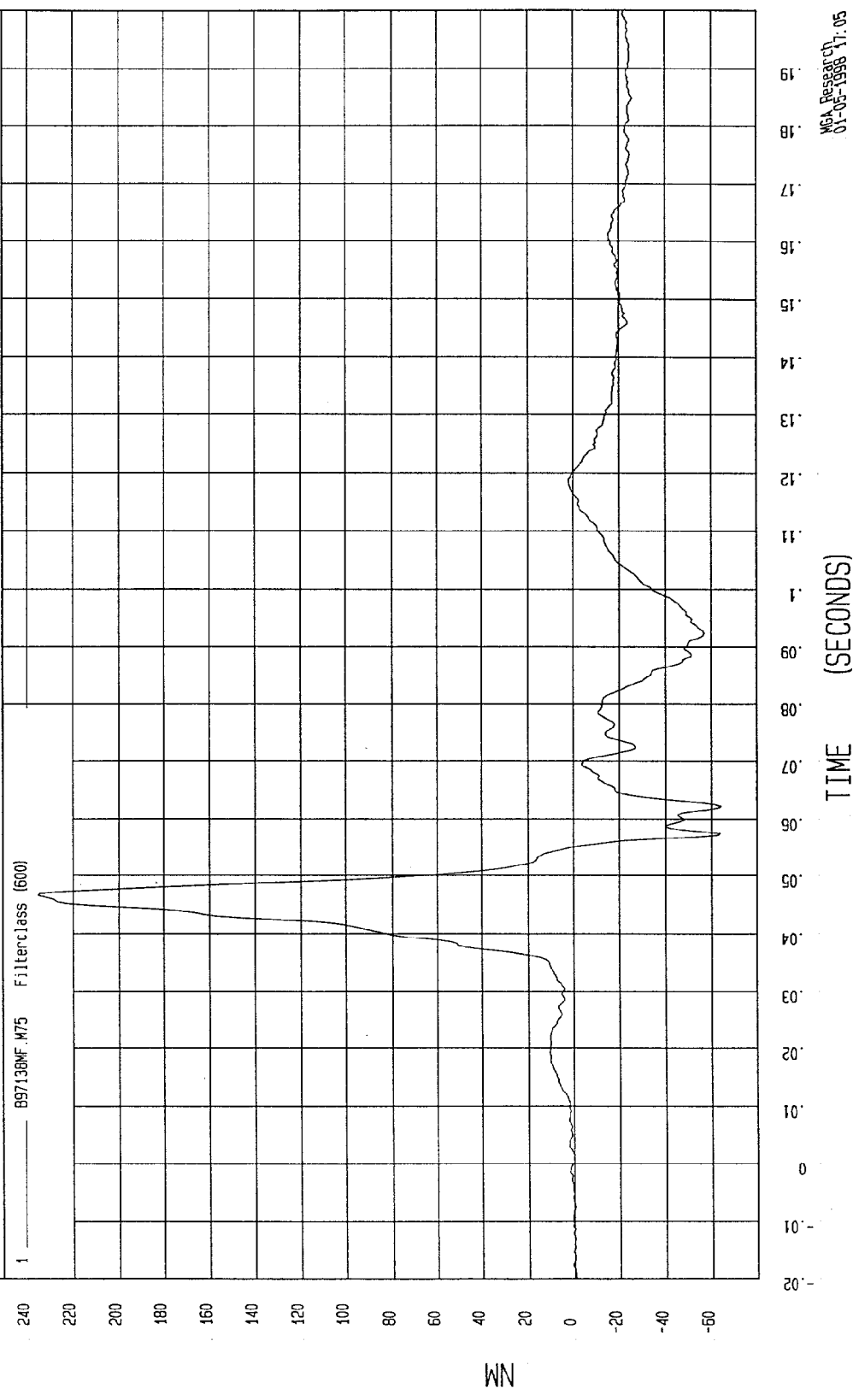
TIME (SECONDS)

TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

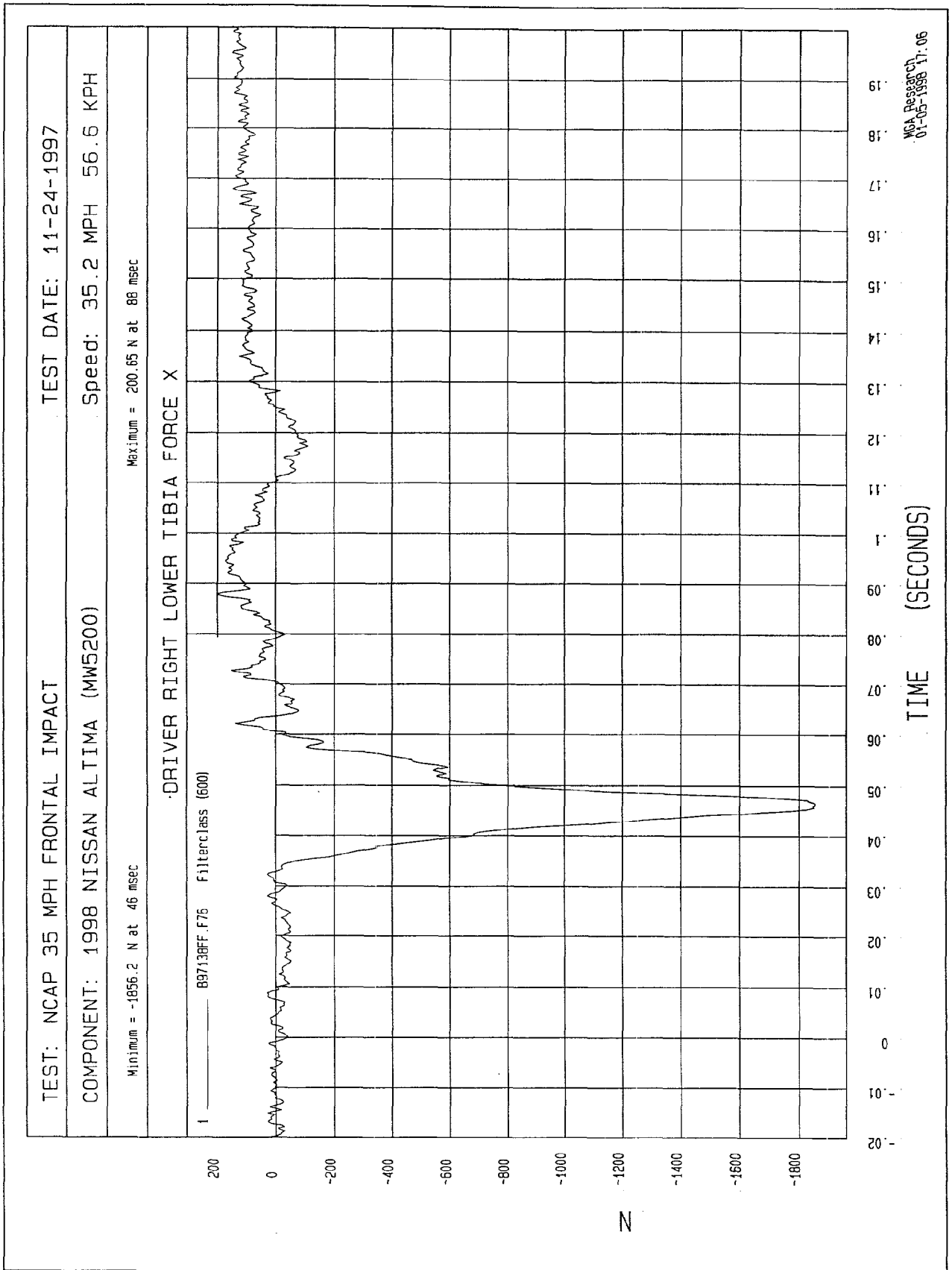
COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

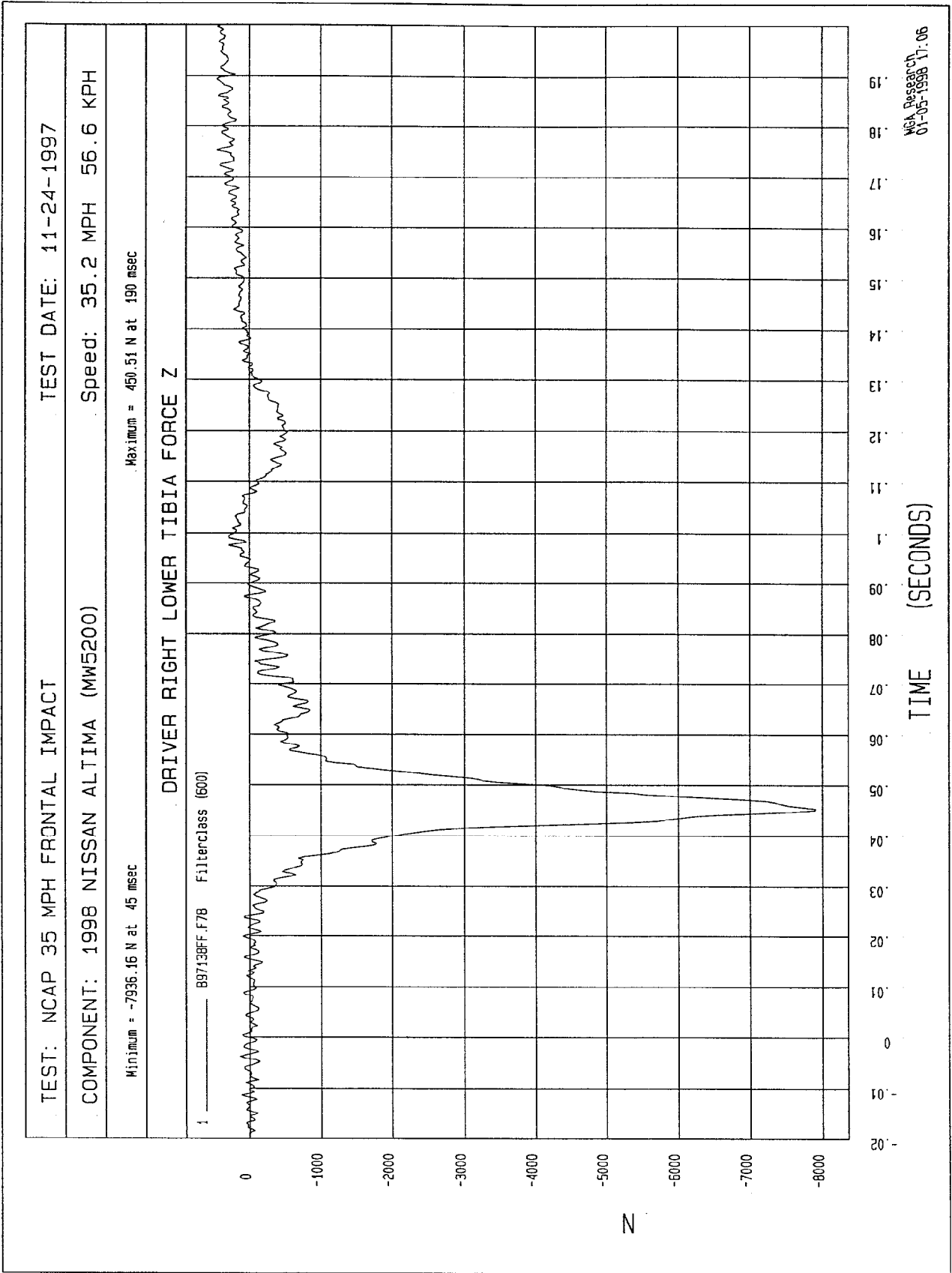
Minimum = -64.42 NM at 57 msec Maximum = 235.69 NM at 47 msec

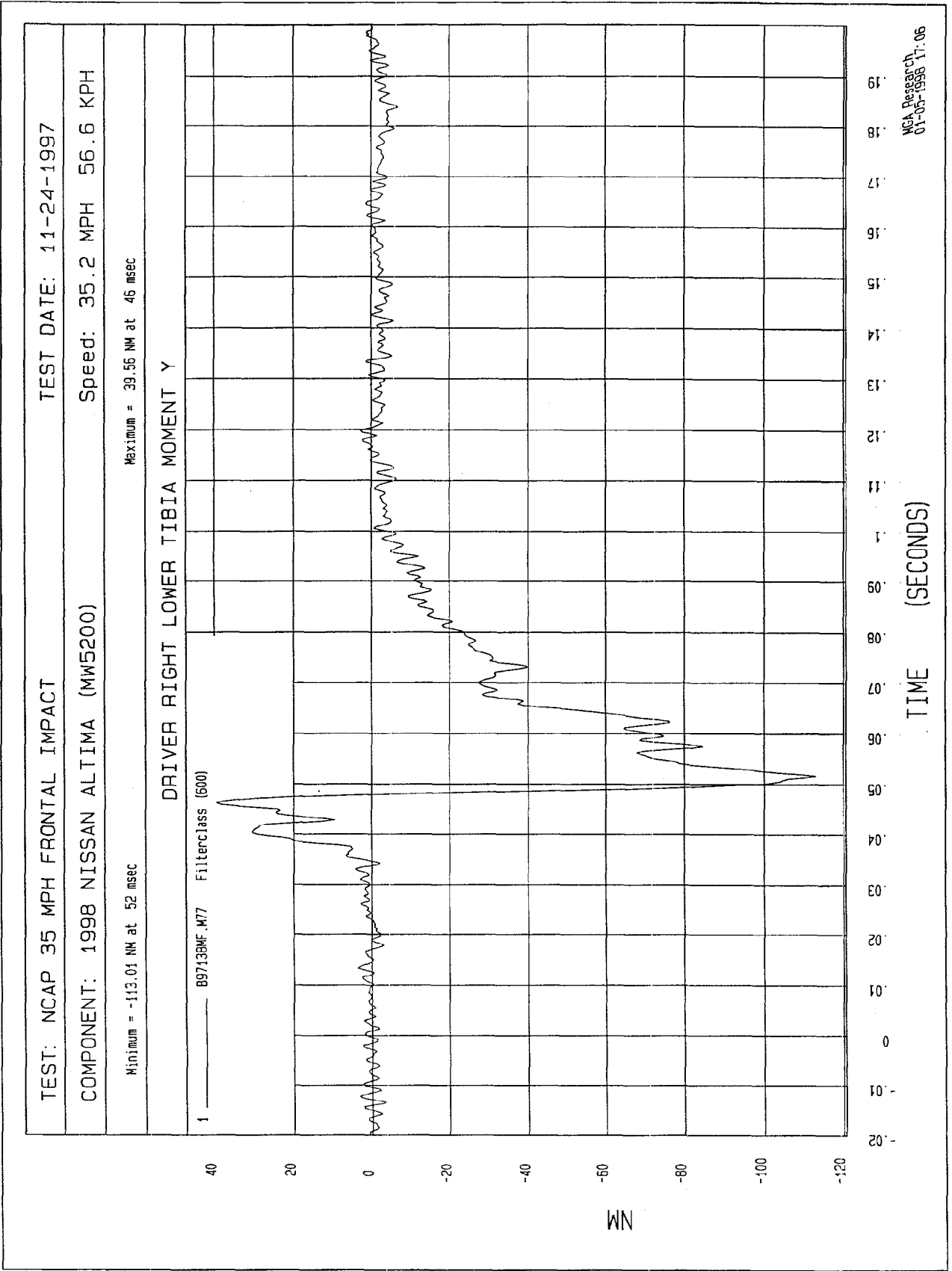
DRIVER RIGHT UPPER TIBIA MOMENT Y



MEA Research
01-05-1998 11:05







TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 11-24-1997

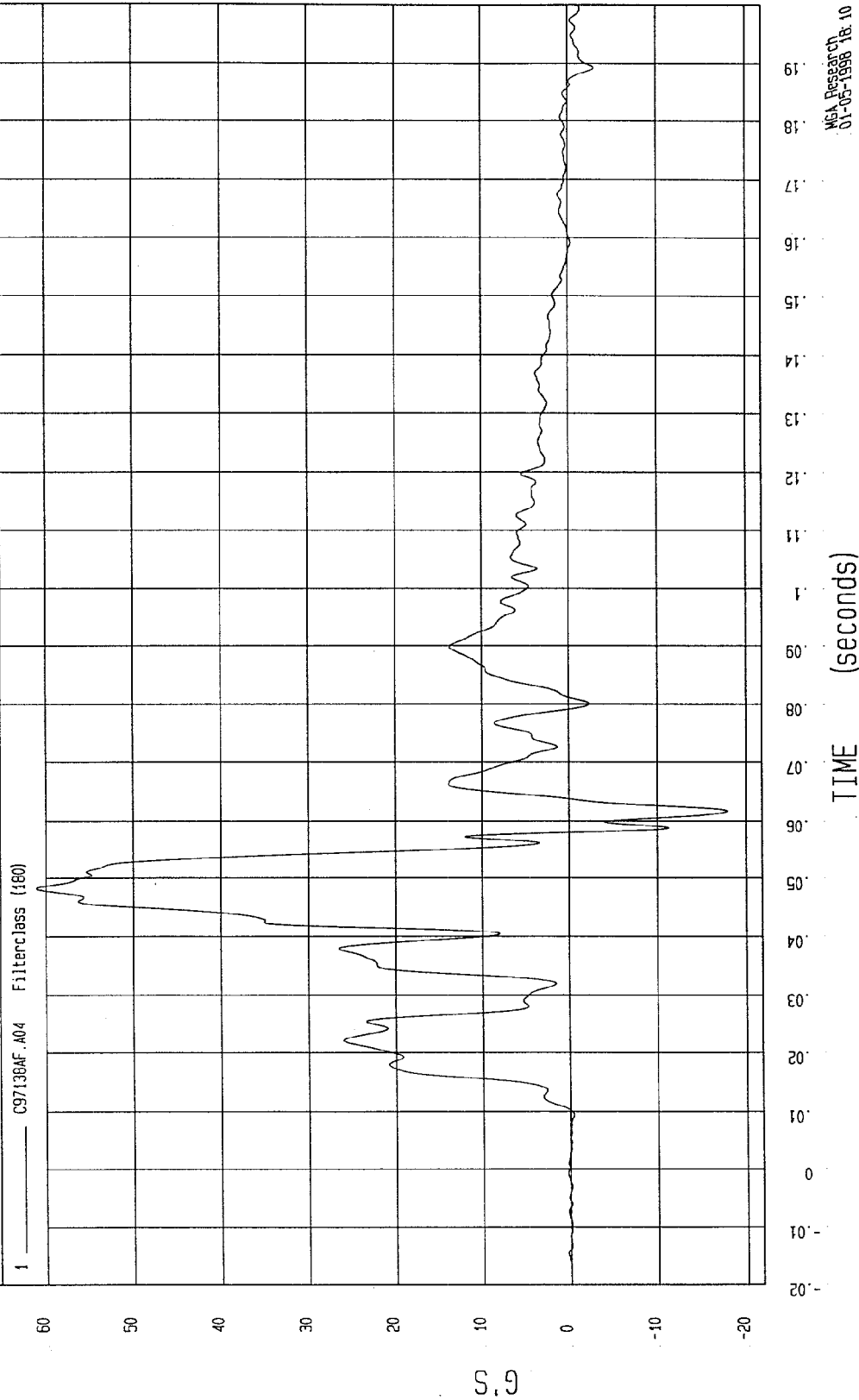
Speed: 35.2 MPH 56.6 KPH

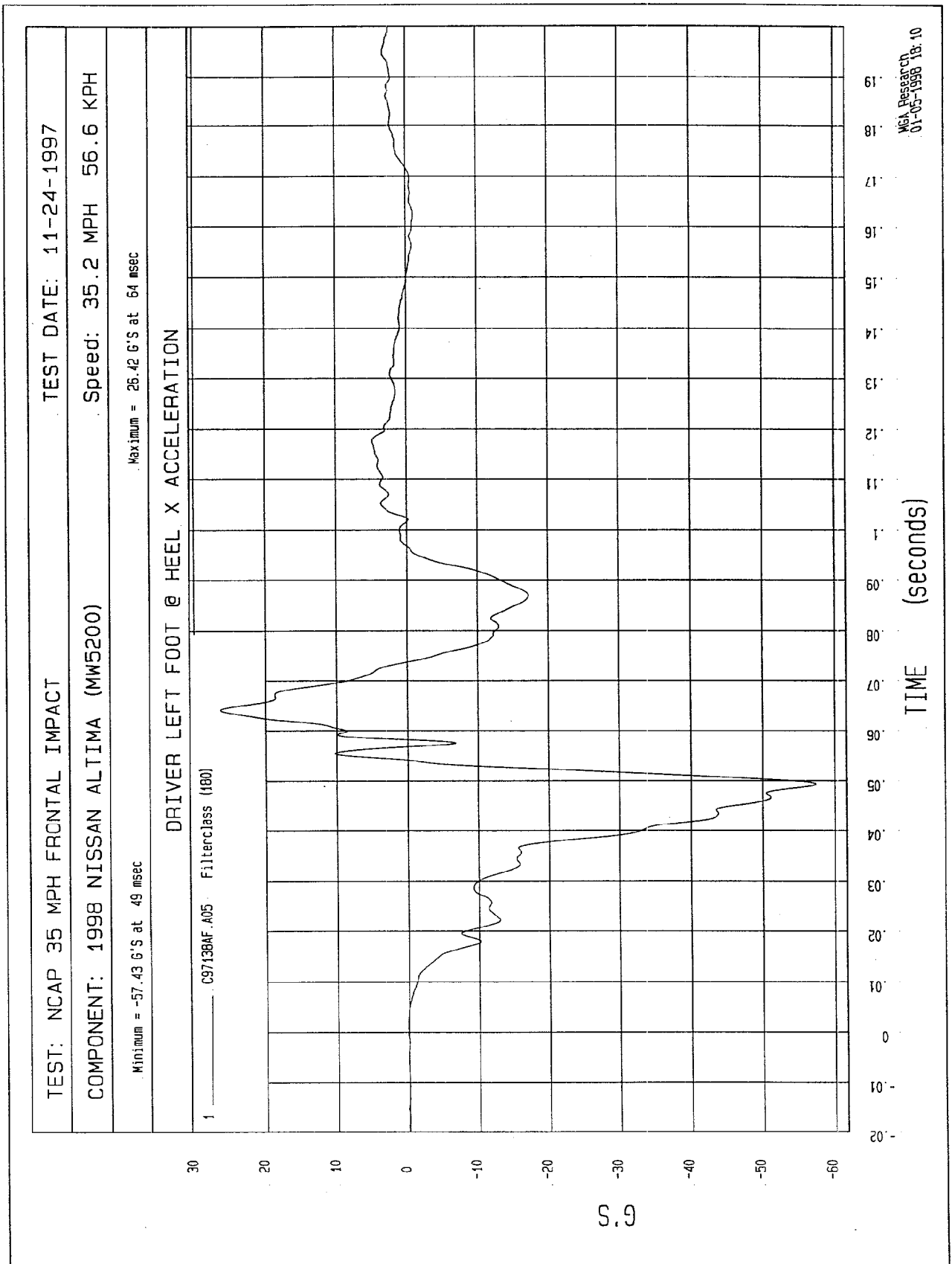
COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Maximum = 61.09 G'S at 48 msec

Minimum = -17.85 G'S at 62 msec

DRIVER LEFT FOOT @ BALL Z ACCELERATION





TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 11-24-1997

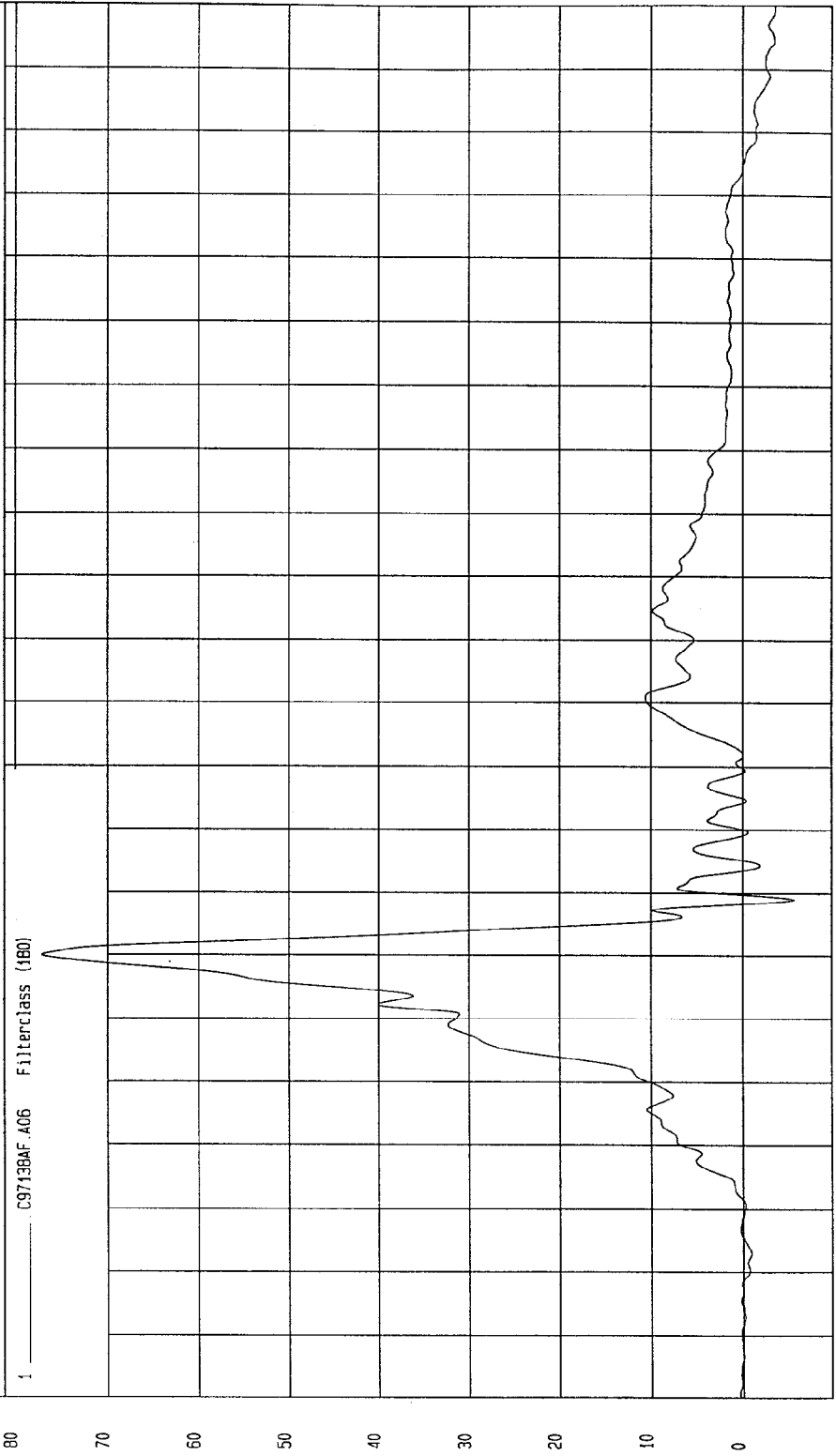
Speed: 35.2 MPH 56.6 KPH

COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Maximum = 77.08 G'S at 50 msec

Minimum = -5.52 G'S at 59 msec

DRIVER LEFT FOOT @ HEEL 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

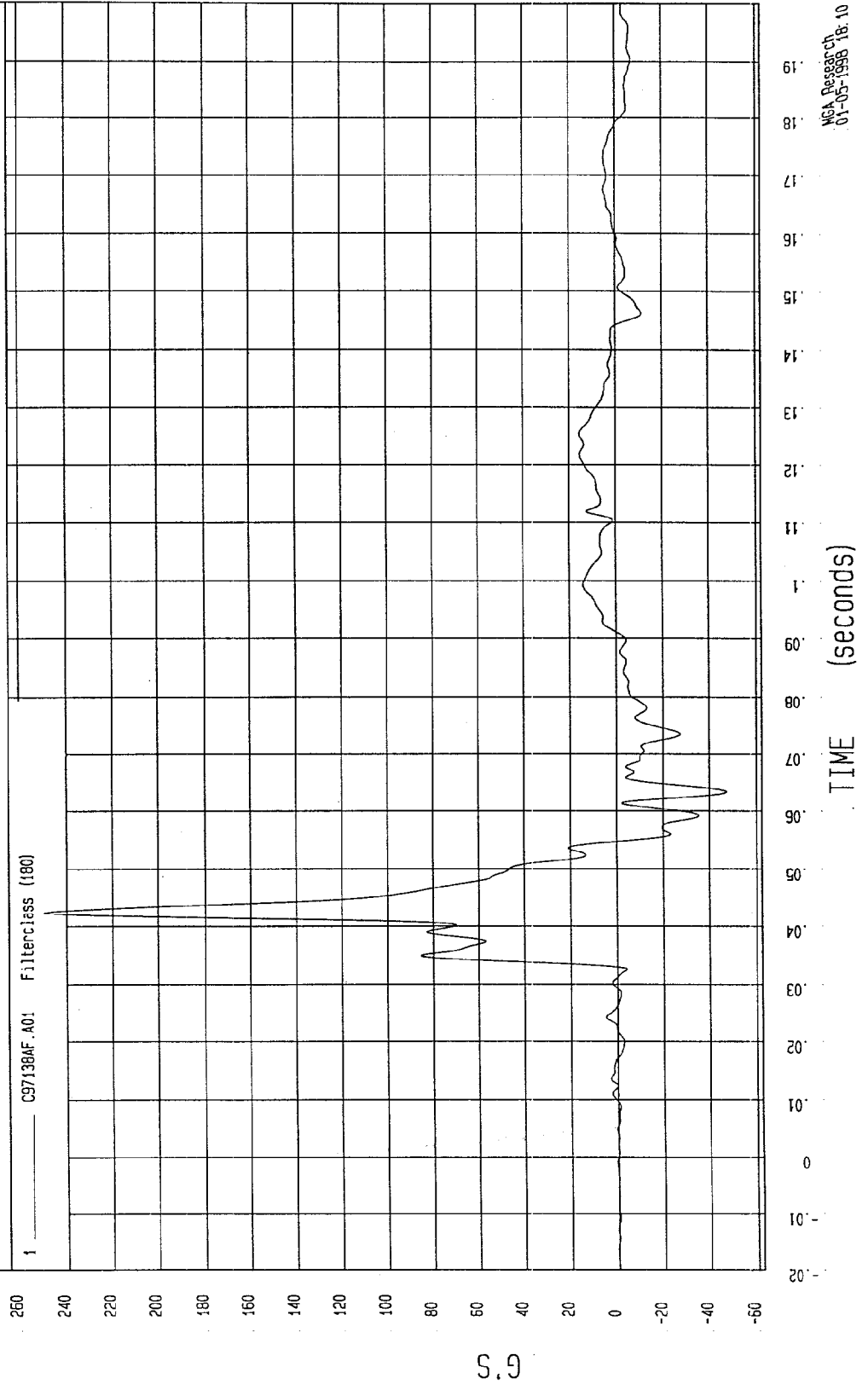
NGA Research
01-05-1998 16:10

TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

Minimum = -47.39 G'S at 63 msec Maximum = 249.51 G'S at 42 msec

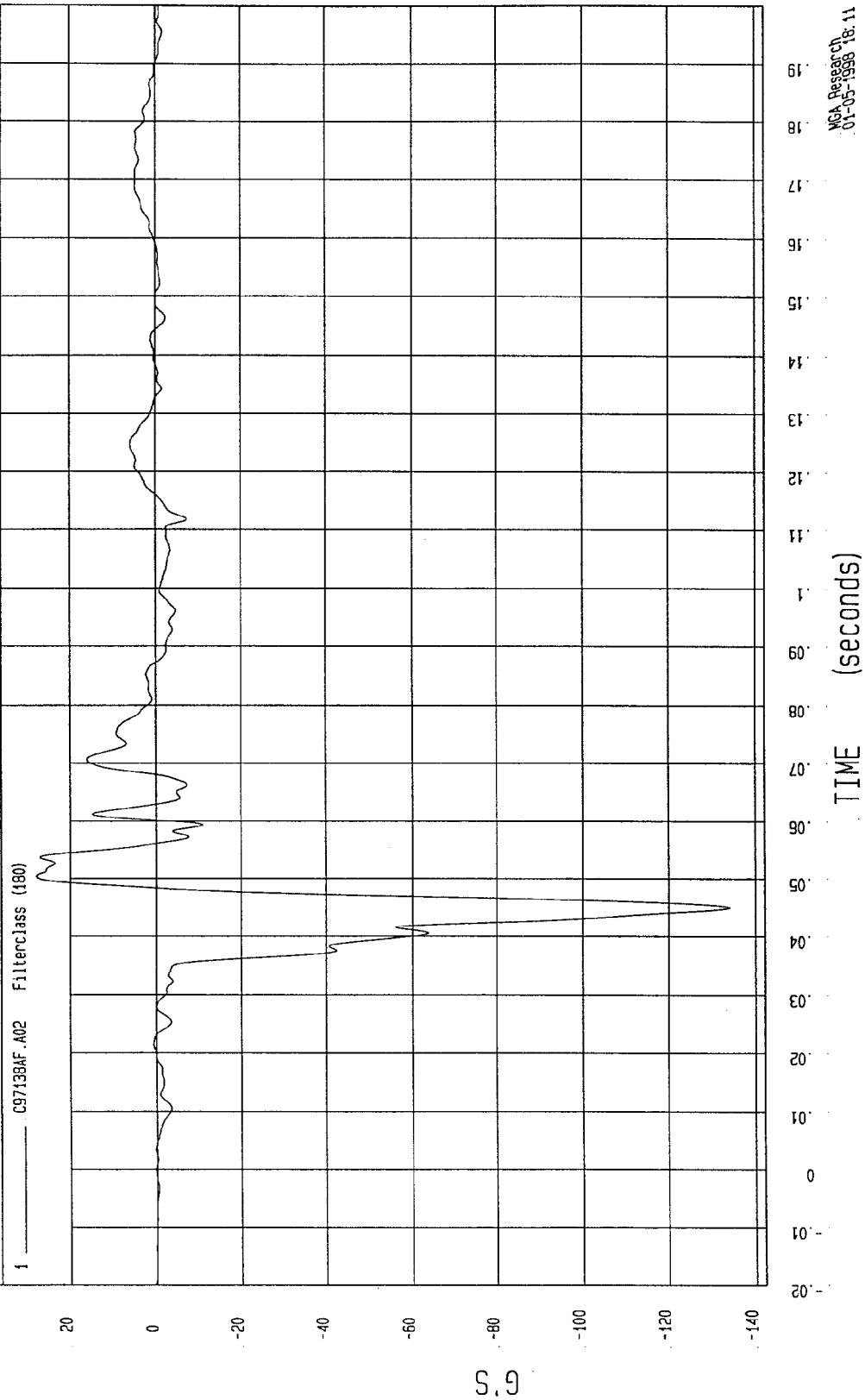
DRIVER RIGHT FOOT @ BALL Z ACCELERATION



NGA Research
01-05-1998 18:10

TEST: NCAP 35 MPH FRONTAL IMPACT	TEST DATE: 11-24-1997
COMPONENT: 1998 NISSAN ALTIMA (MW5200)	Speed: 35.2 MPH 56.6 KPH
Minimum = -134.05 G'S at 45 msec	
Maximum = 27.72 G'S at 50 msec	

DRIVER RIGHT FOOT @ HEEL X ACCELERATION

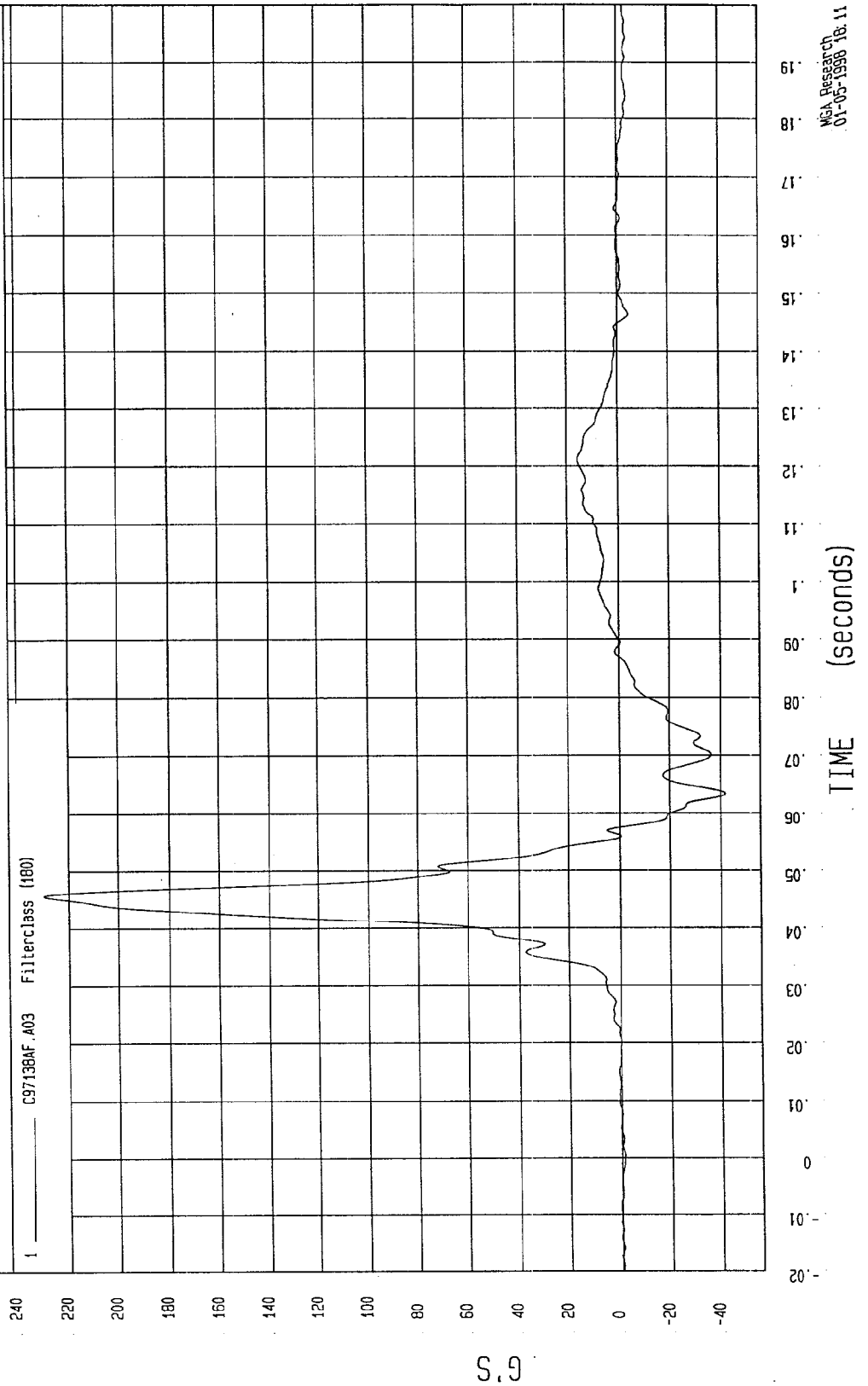


TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

Minimum = -41.87 G'S at 63 msec Maximum = 229.52 G'S at 46 msec

DRIVER RIGHT FOOT @ HEEL Z ACCELERATION



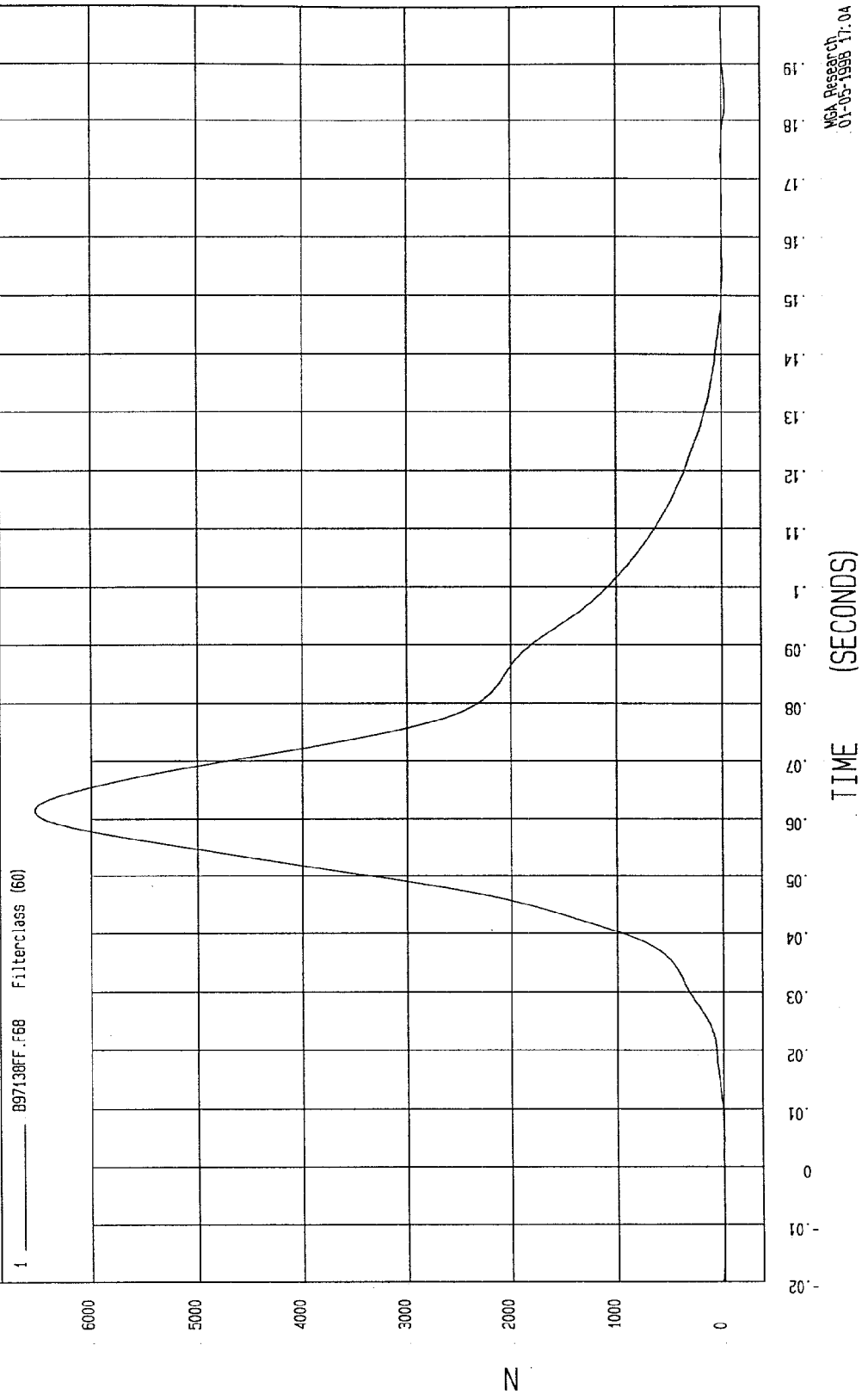
WCA Research
01-05-1998 18:11

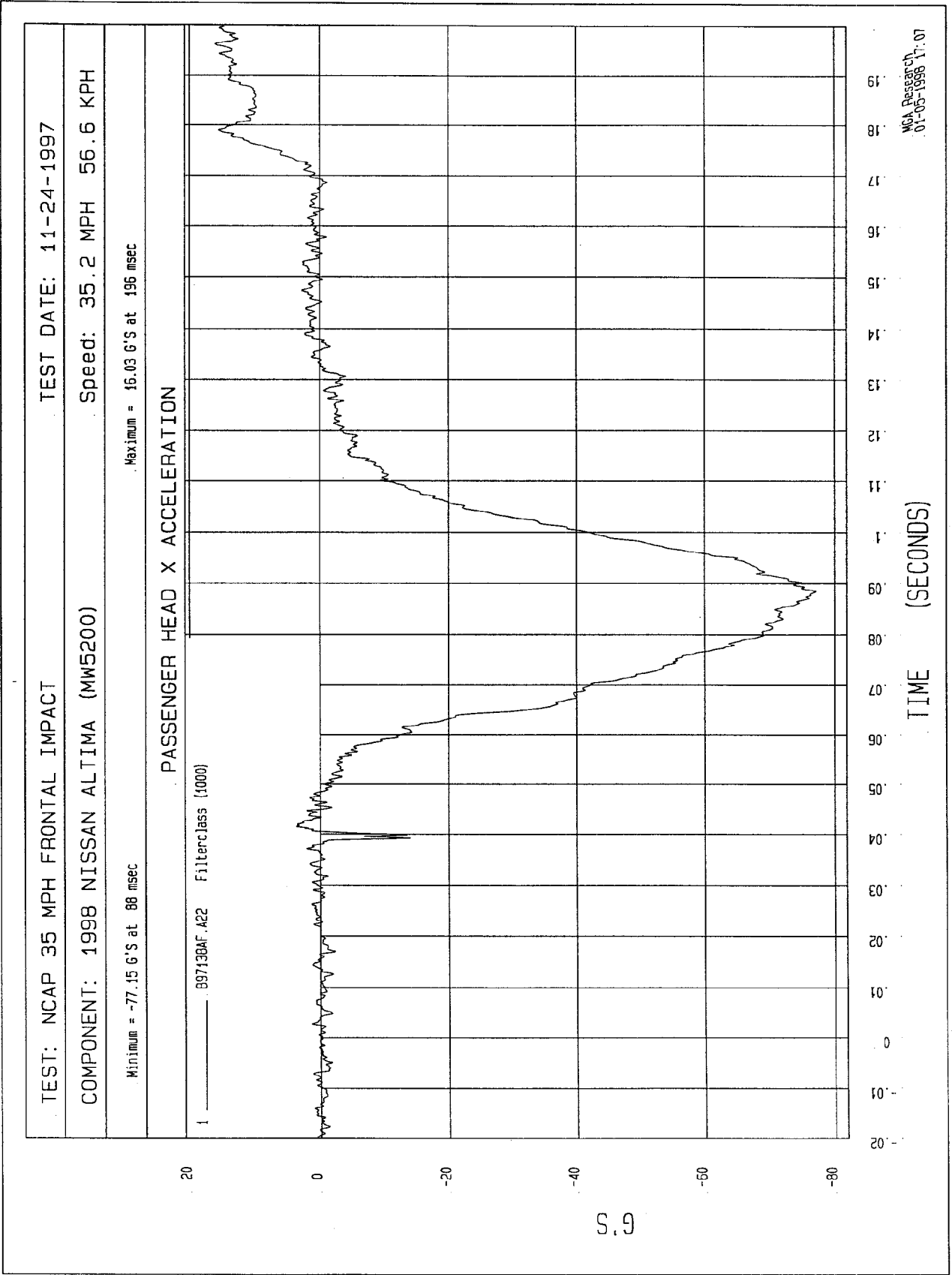
TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

Minimum = -34.62 N at 183 msec Maximum = 6526.22 N at 62 msec

DRIVER LAP BELT FORCE





TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 11-24-1997

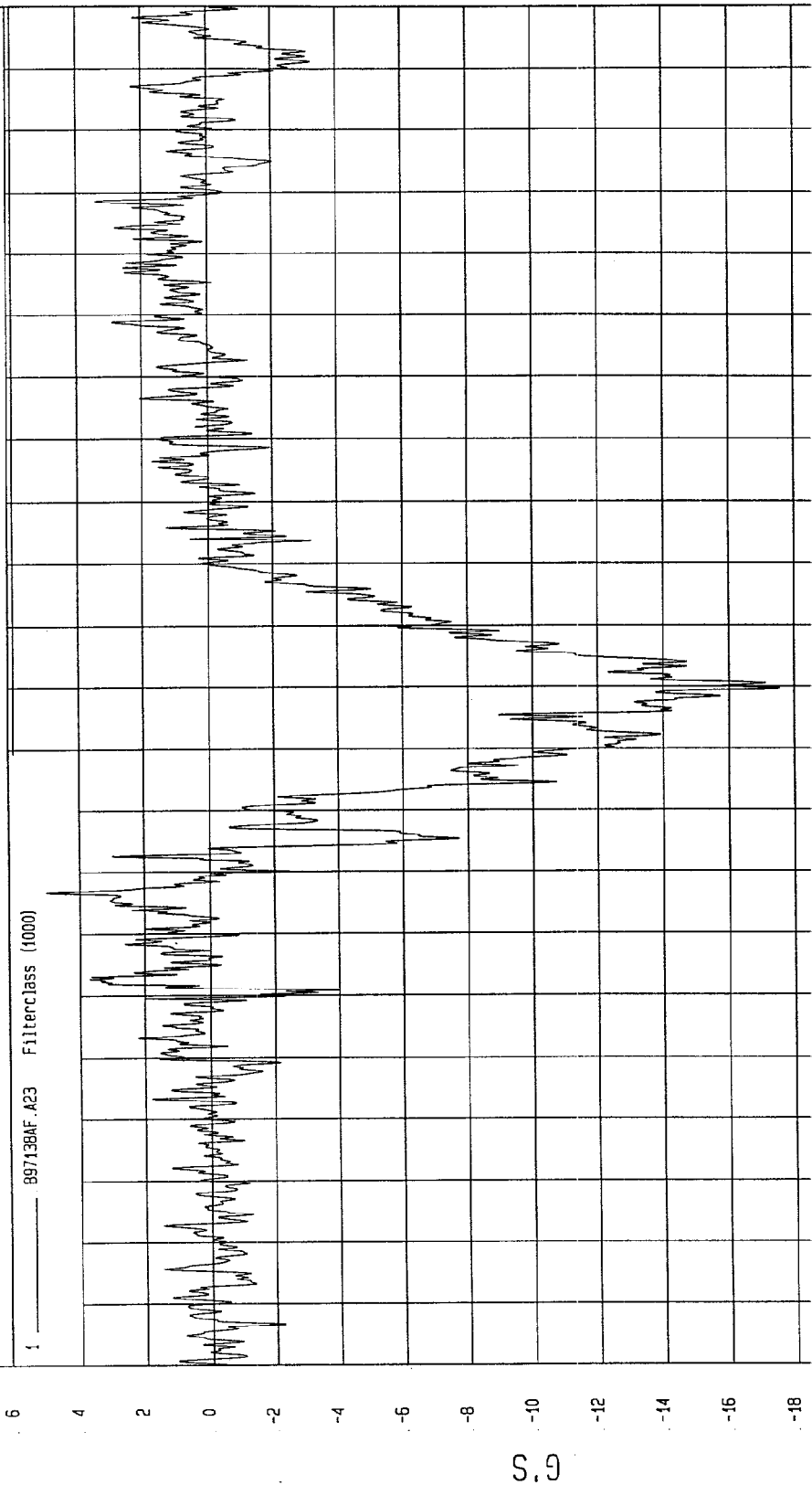
COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Speed: 35.2 MPH 56.6 KPH

Minimum = -17.54 G'S at 90 msec

Maximum = 5.01 G'S at 57 msec

PASSENGER HEAD 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

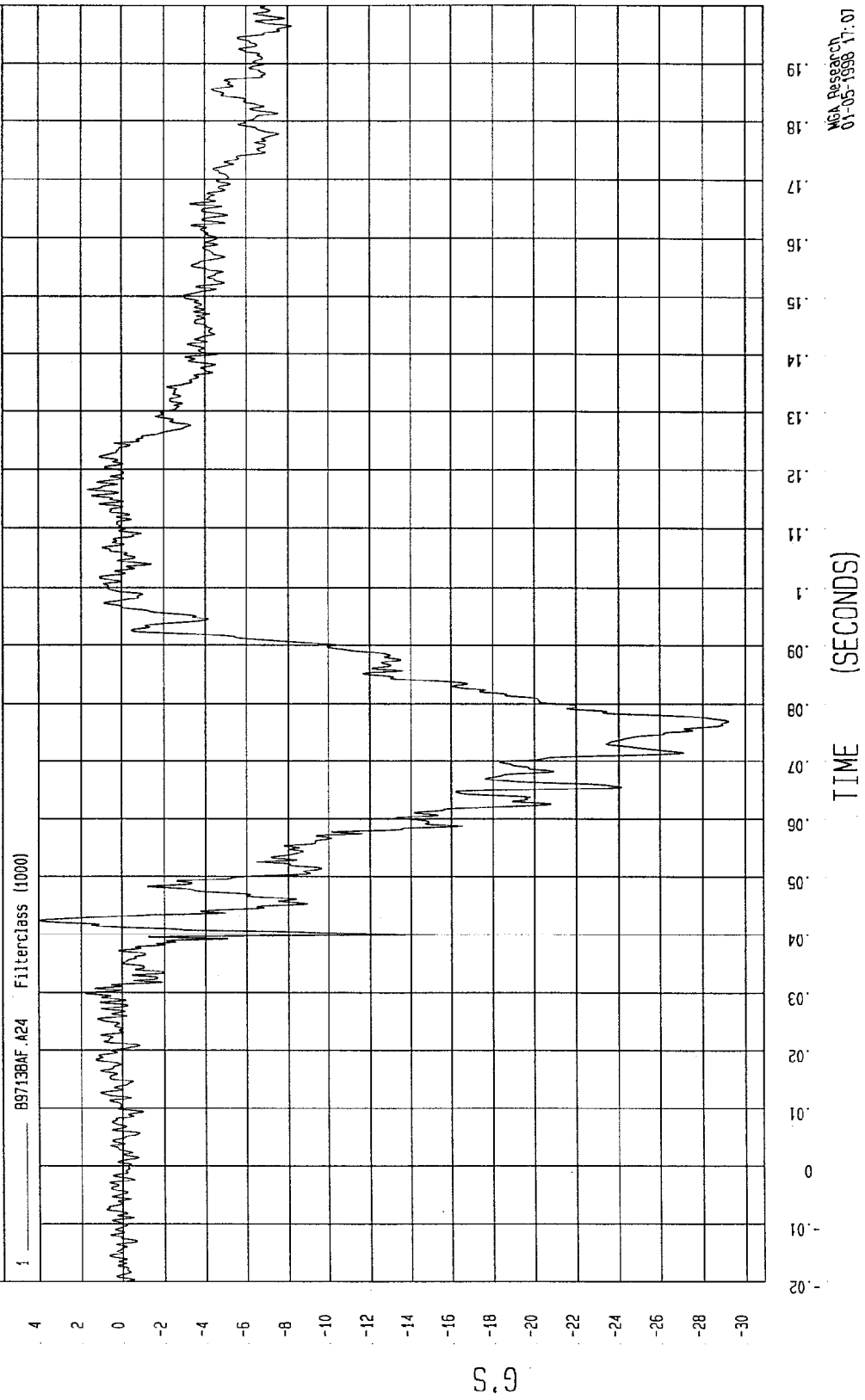
NSA Research
01-05-1998 11:07

TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

Minimum = -29.20 G'S at 77 msec Maximum = 4.03 G'S at 42 msec

PASSENGER HEAD Z ACCELERATION



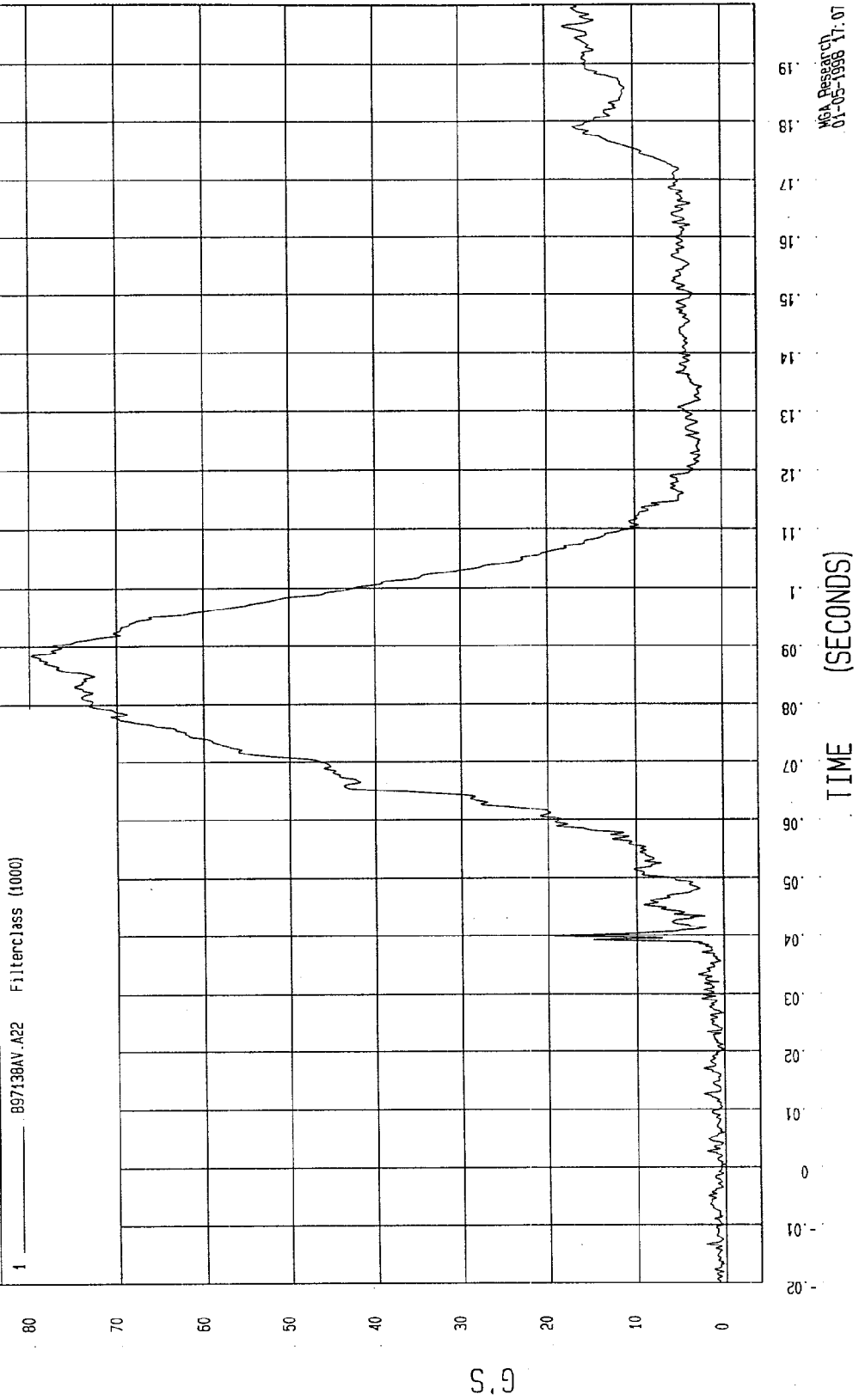
NEA Research
01-05-1998 17.07

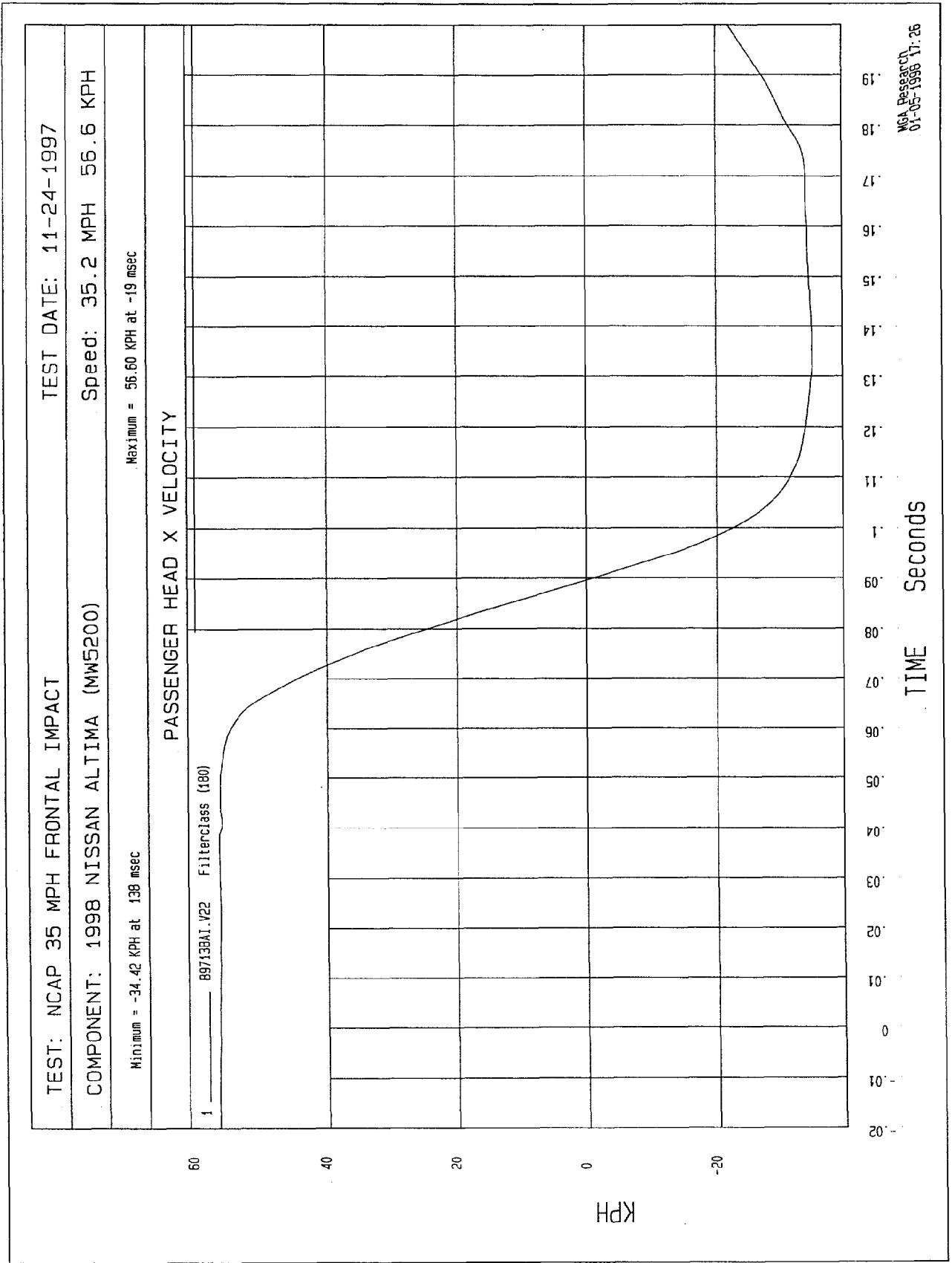
TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

Minimum = 14 G'S at 0 msec Maximum = 79.75 G'S at 88 msec

PASSENGER HEAD RESULTANT ACCELERATION





TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

SPEED: 35.2 MPH 56.6 KPH

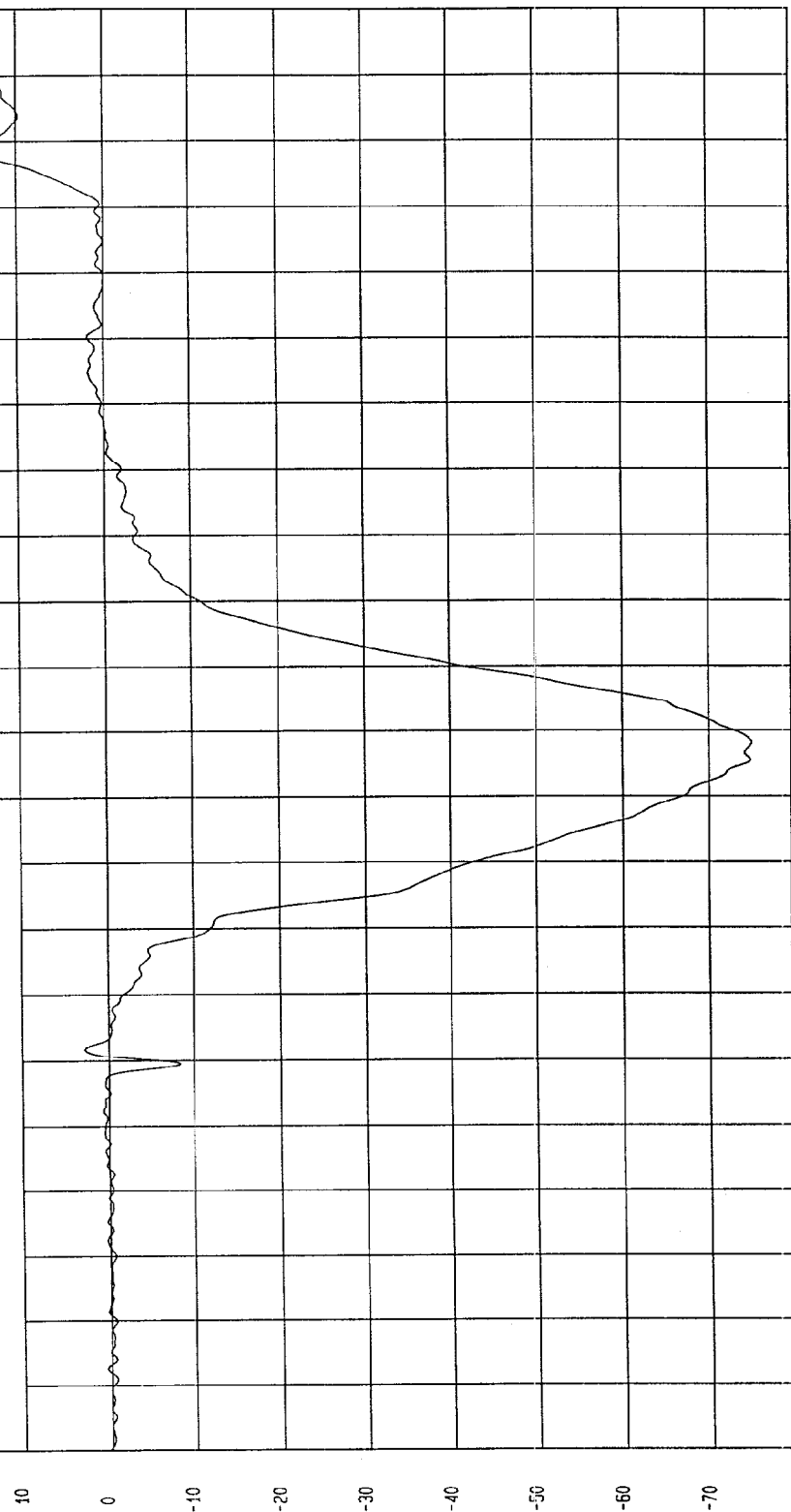
COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Maximum = 15.30 G'S at 196 msec

Minimum = -74.88 G'S at 88 msec

PASSENGER HEAD REDUNDANT X ACCELERATION

1 B97138AF.A38 FilterClass (180)



MGA Research
01-05-1998 17:35

TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 11-24-1997

Speed: 35.2 MPH 56.6 KPH

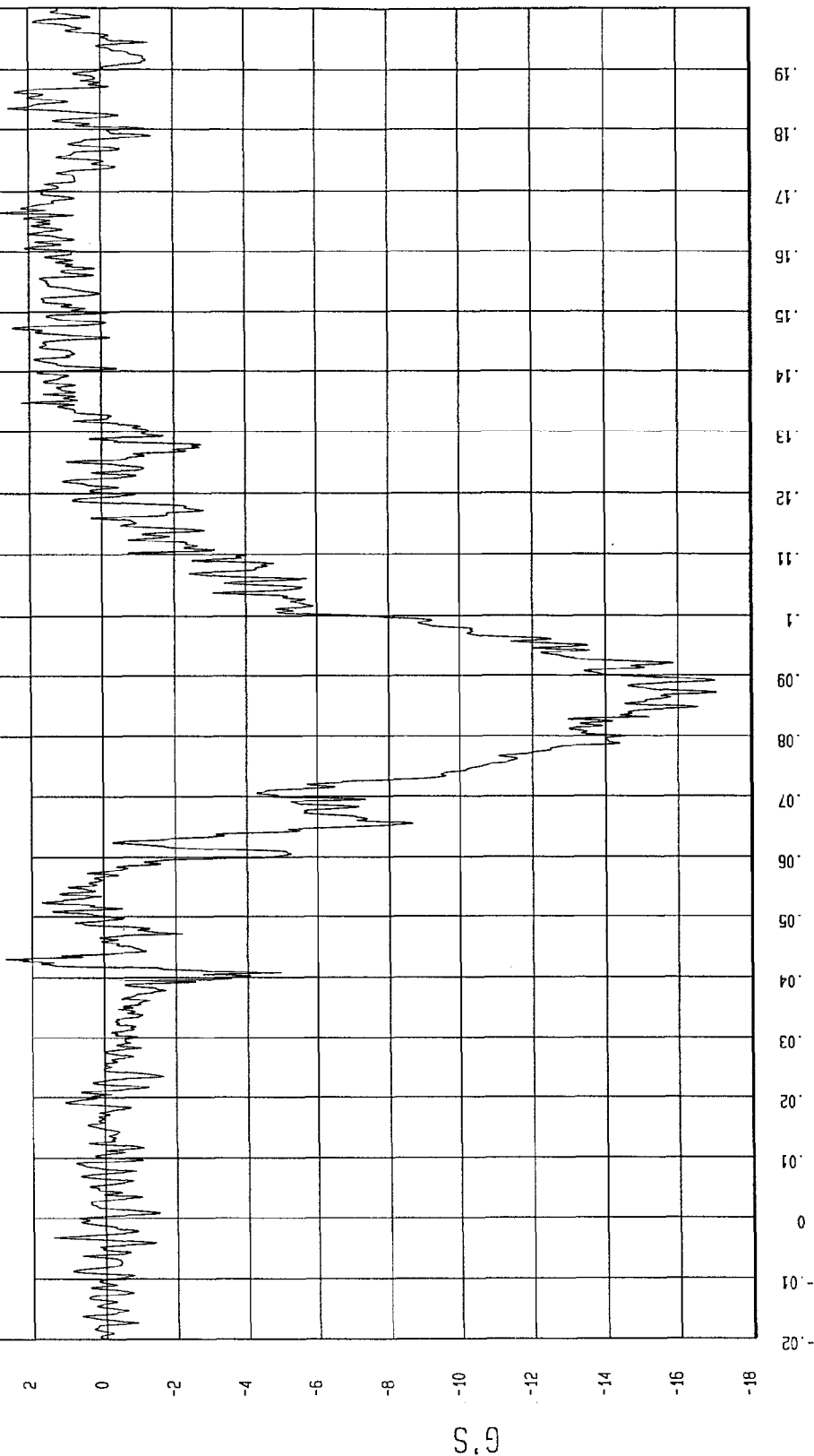
COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Maximum = 2.91 G's at 166 msec

Minimum = -17.05 G's at 87 msec

PASSENGER HEAD REDUNDANT Y ACCELERATION

1 ——— B97136AF.A39 Filterclass (1000)



MSA Research
01-05-1998 17:36

TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 11-24-1997

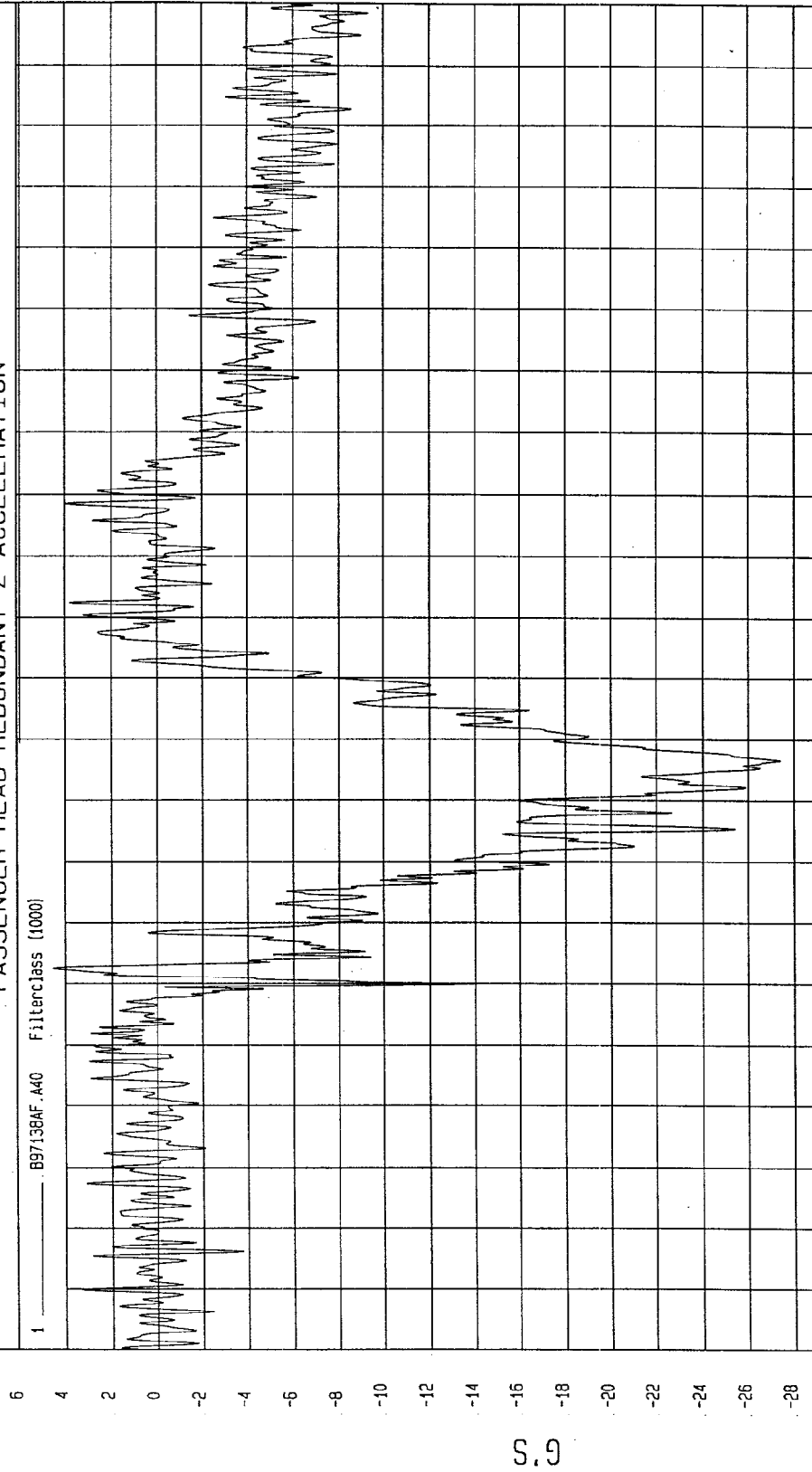
Speed: 35.2 MPH 56.6 KPH

COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Maximum = 4.52 G's at 43 msec

Minimum = -27.40 G's at 76 msec

PASSENGER HEAD REDUNDANT Z ACCELERATION



NSA Research
01-05-1998 17:25

TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 11-24-1997

Speed: 35.2 MPH 56.6 KPH

COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Maximum = 78.08 G'S at 85 msec

Minimum = .16 G'S at -14 msec

PASSENGER HEAD REDUNDANT RESULTANT ACCELERATION

1 B971384V A38 Filterclass (1000)

80

70

60

50

40

30

20

10

0

S.G

-0.02

-0.01

0

.01

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.04

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.19

TIME (SECONDS)

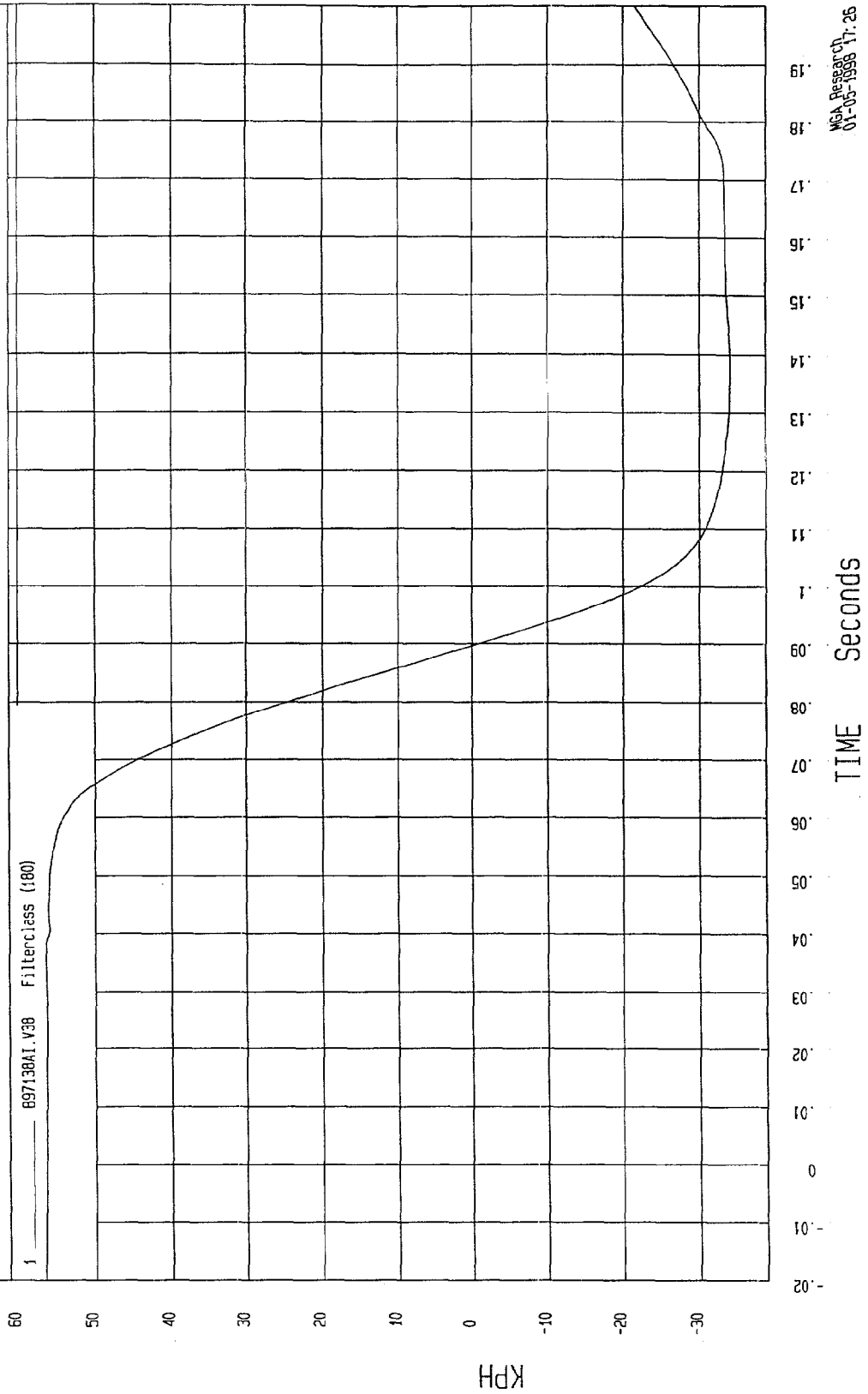
MSA Research
01-05-1998 17.25

TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

Minimum = -34.06 KPH at 136 msec Maximum = 56.60 KPH at -20 msec

PASSENGER HEAD REDUNDANT X VELOCITY



NCA Research
01-05-1998 17:25

TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 11-24-1997

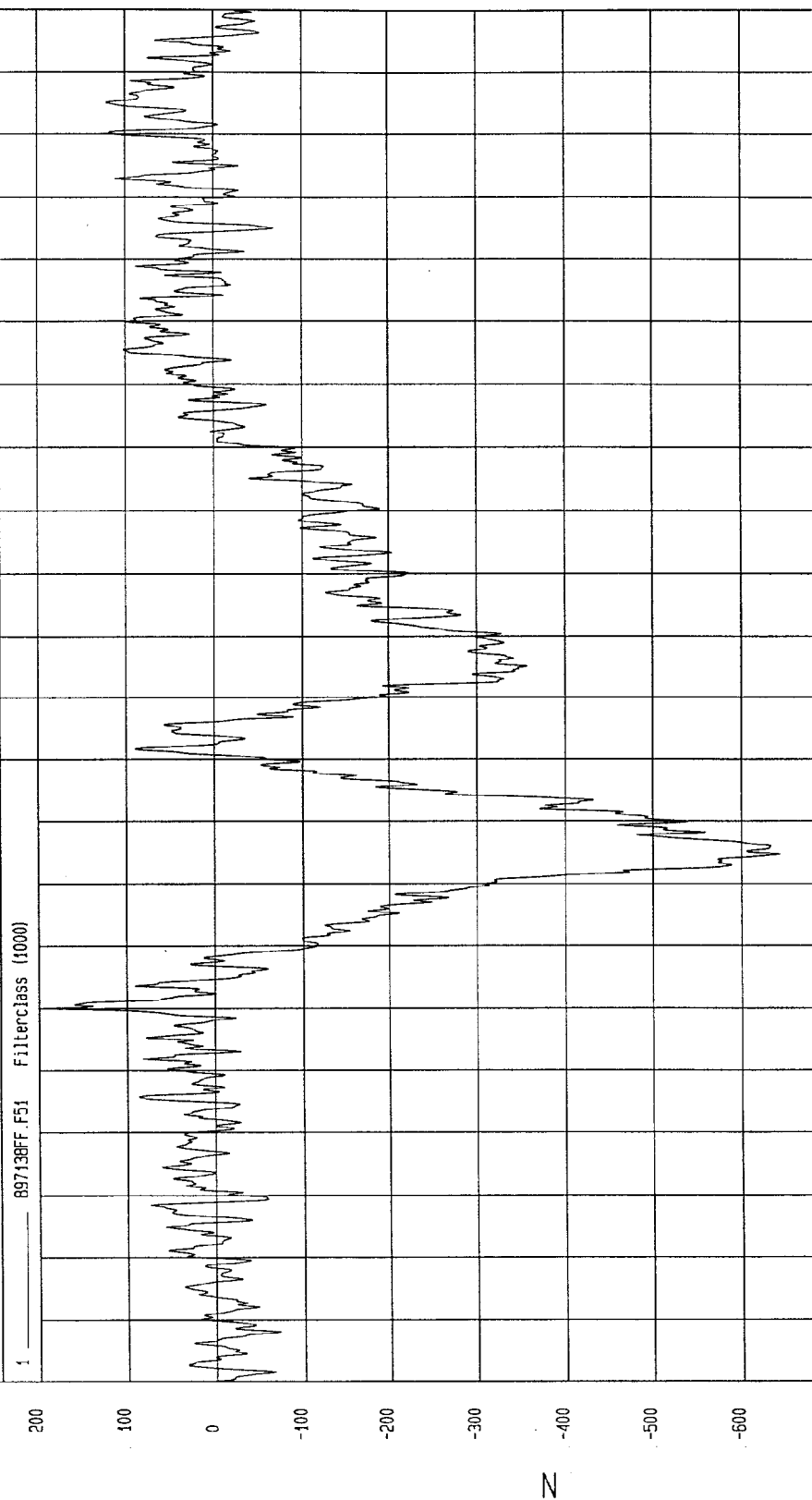
Speed: 35.2 MPH 56.6 KPH

COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Maximum = 200.67 N at 40 msec

Minimum = -642.92 N at 65 msec

PASSENGER NECK FORCE X



MCA Research
01-05-1998 17:09

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

-0.03

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-2.63

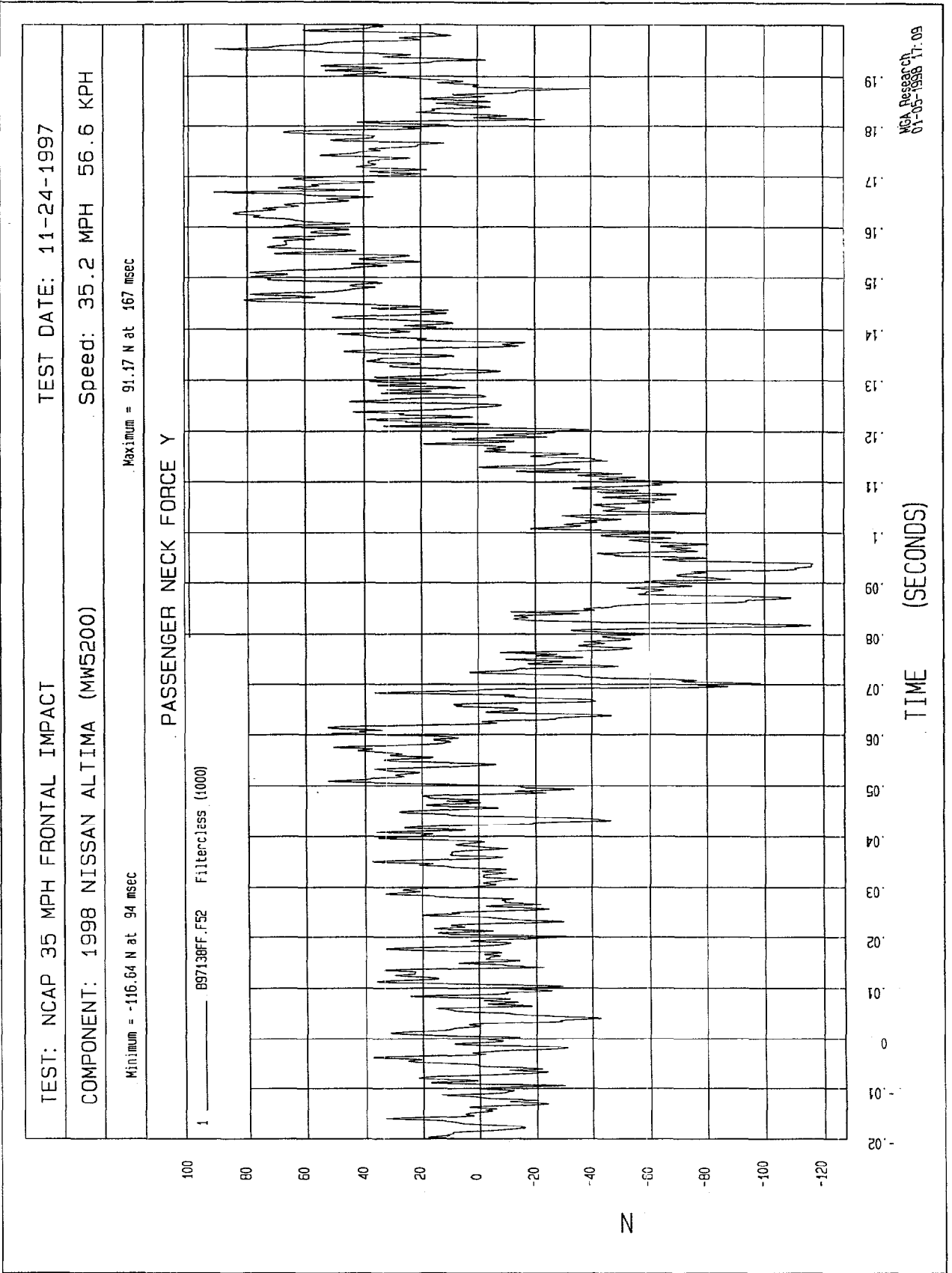
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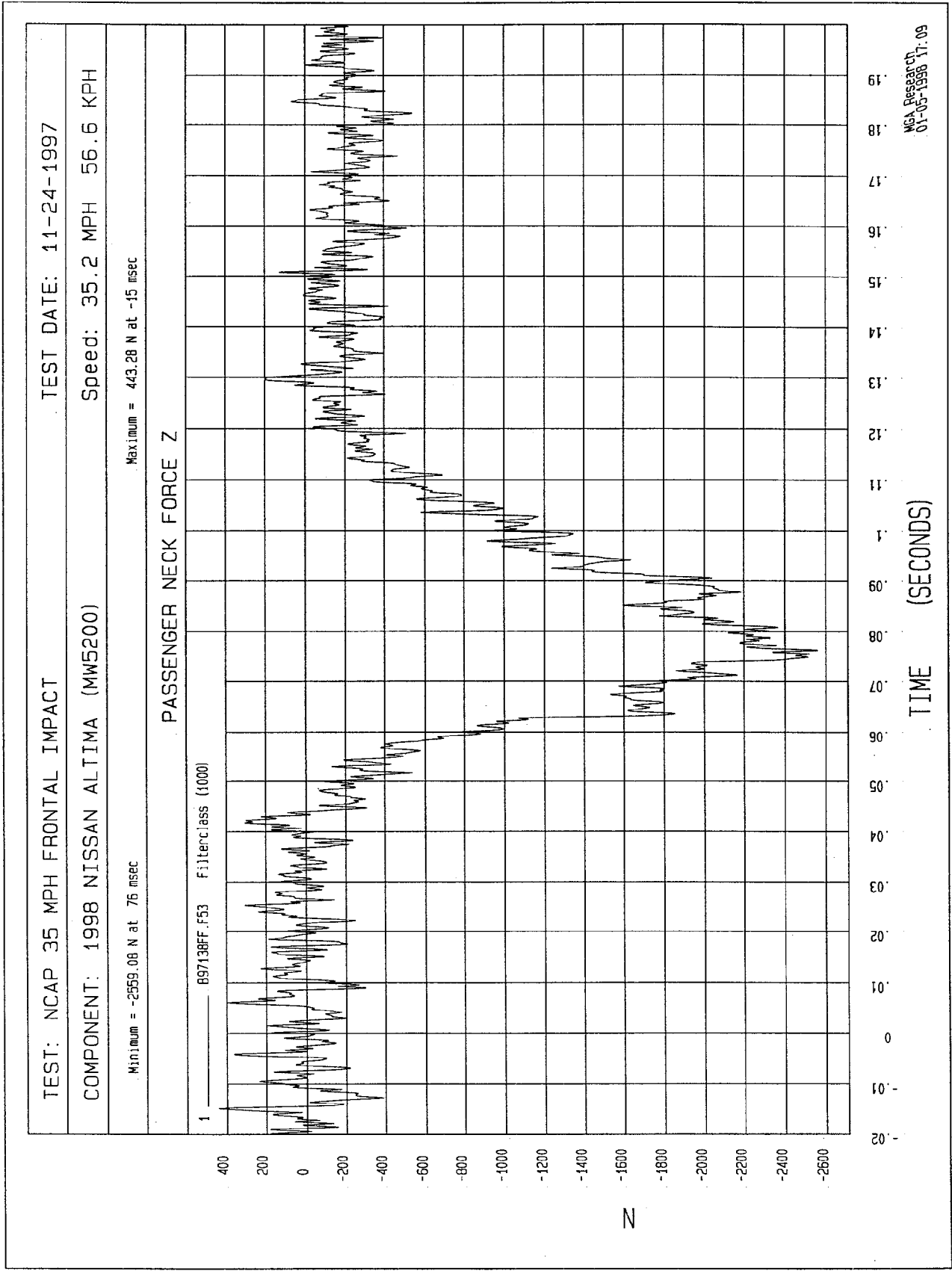
-2.65

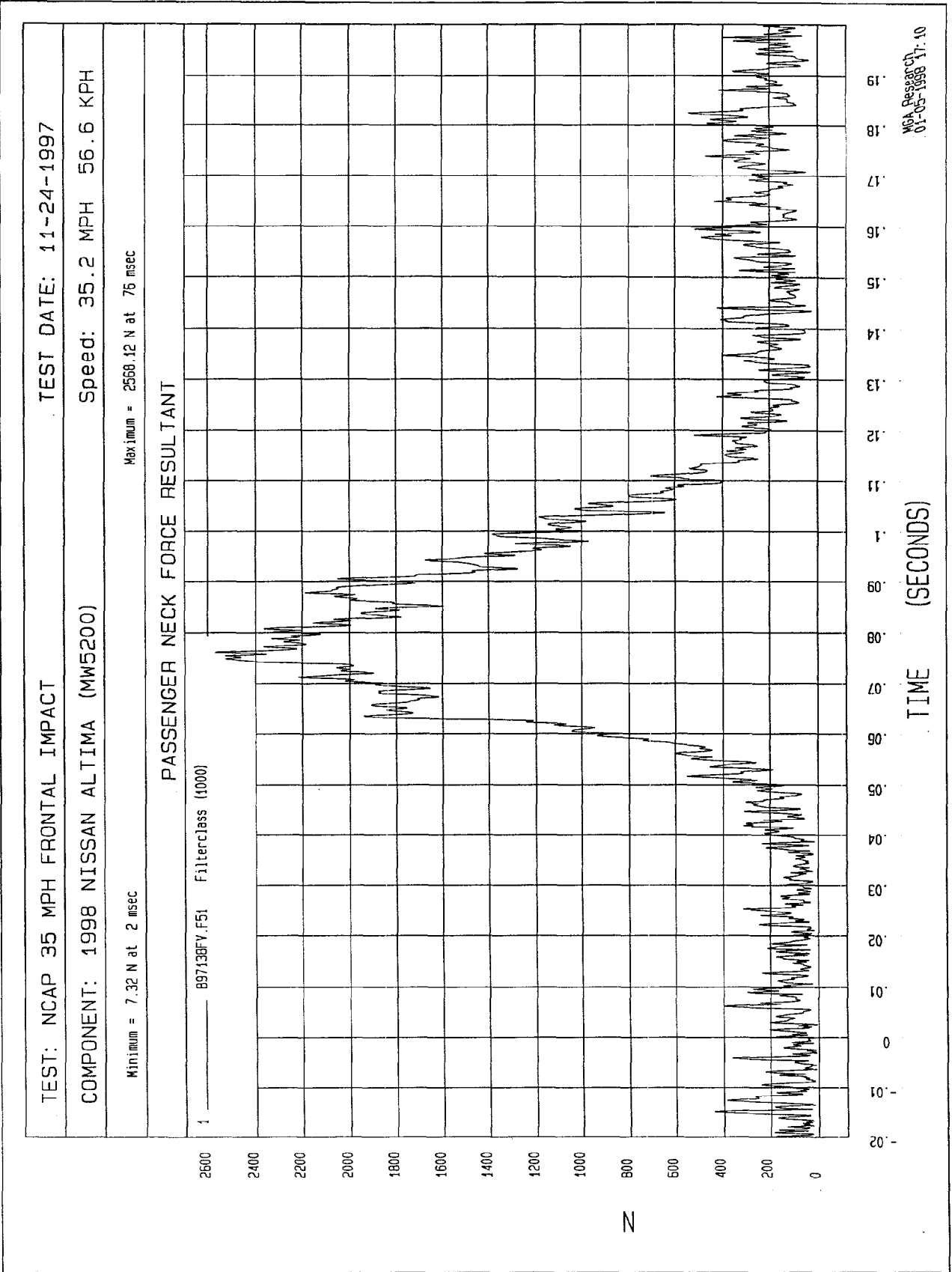
-2.66

-2.67

-2.68







TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

SPEED: 35.2 MPH 56.6 KPH

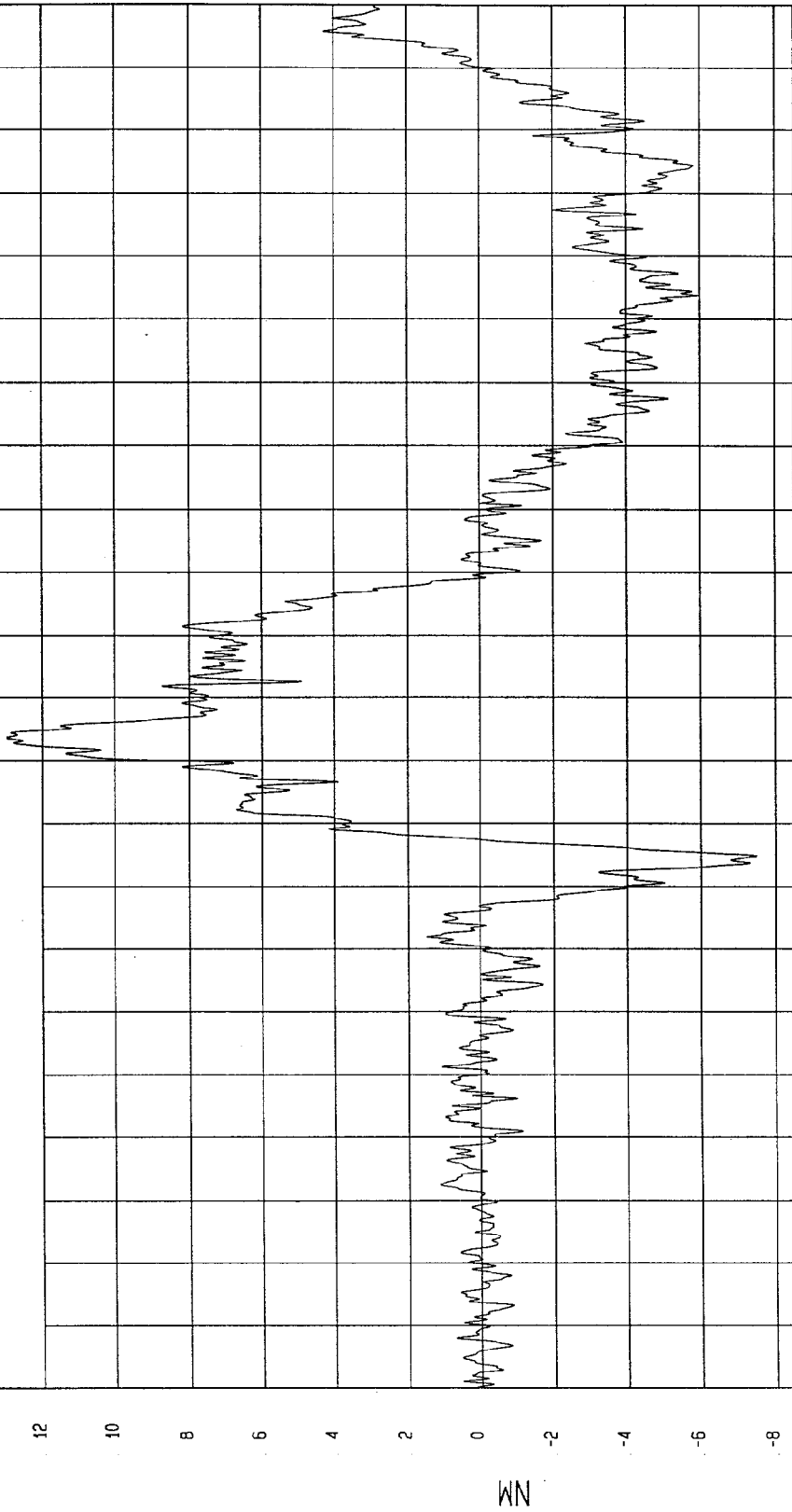
COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Maximum = 12.94 NM at 84 msec

Minimum = -7.48 NM at 65 msec

PASSENGER NECK MOMENT X

1 89713BMF.M54 Filterclass (600)



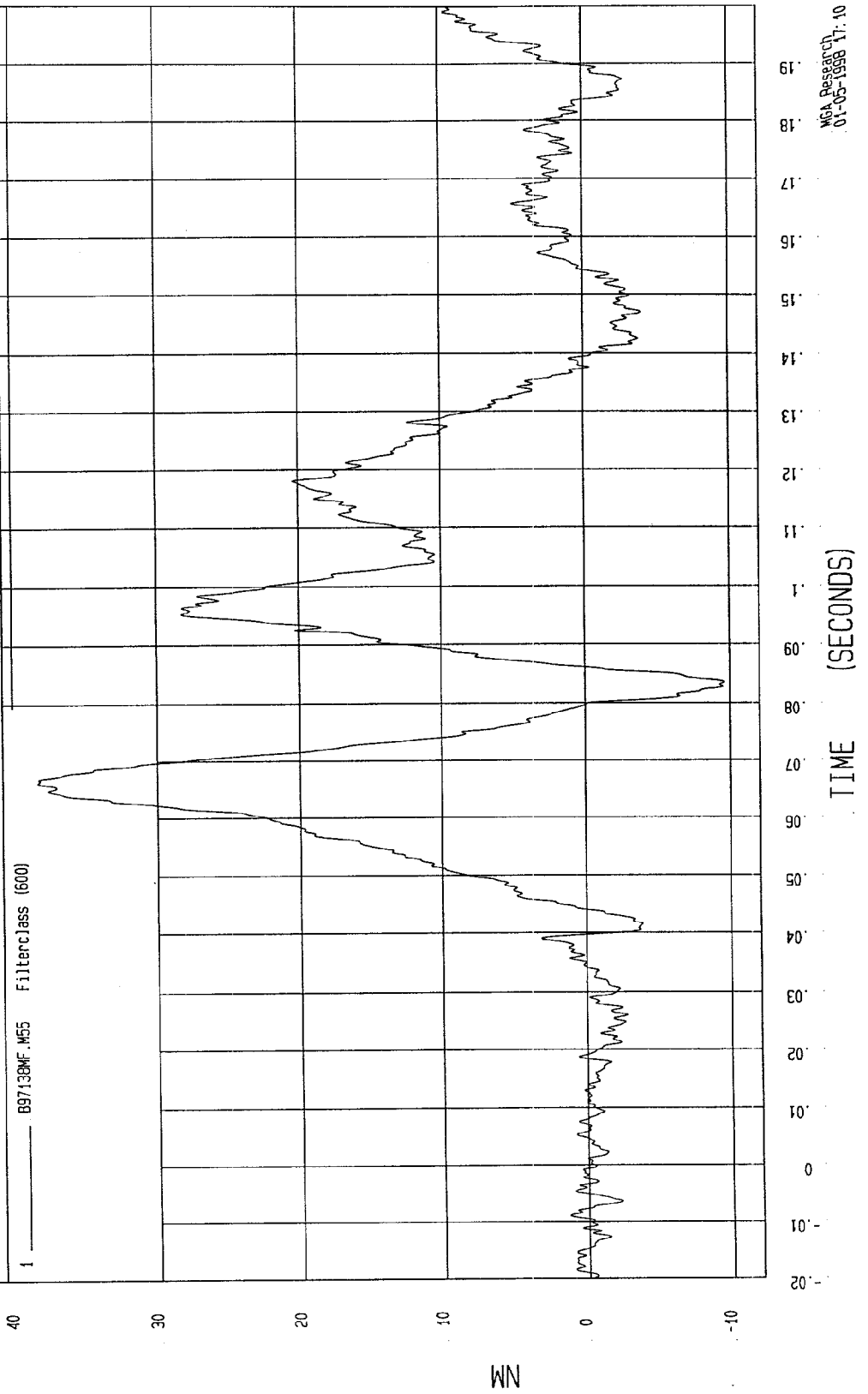
MSA Research
01-05-1998 17:10

TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

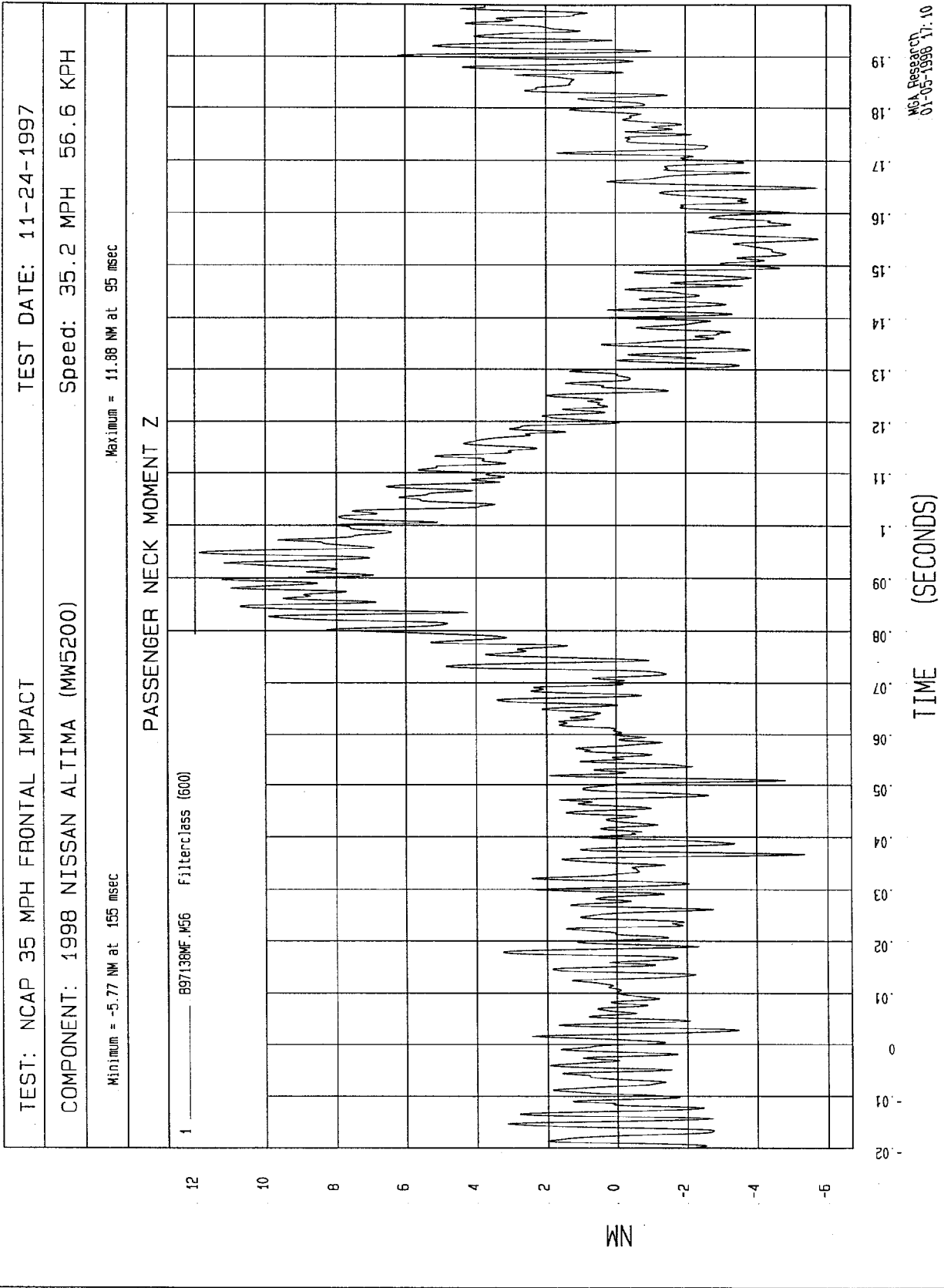
COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

Minimum = -9.62 NM at 84 msec Maximum = 38.27 NM at 66 msec

PASSENGER NECK MOMENT Y



WGA Research
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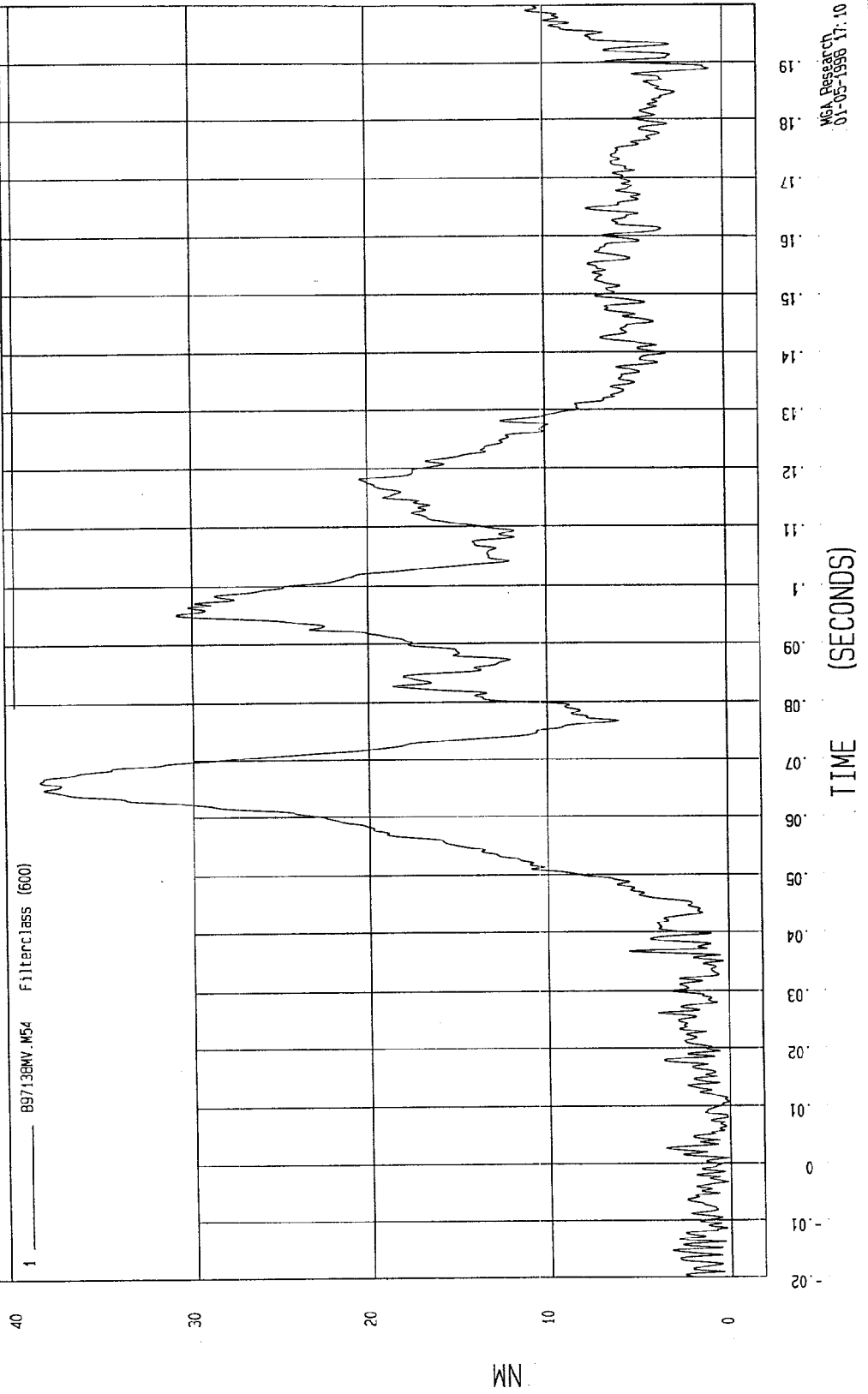


TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

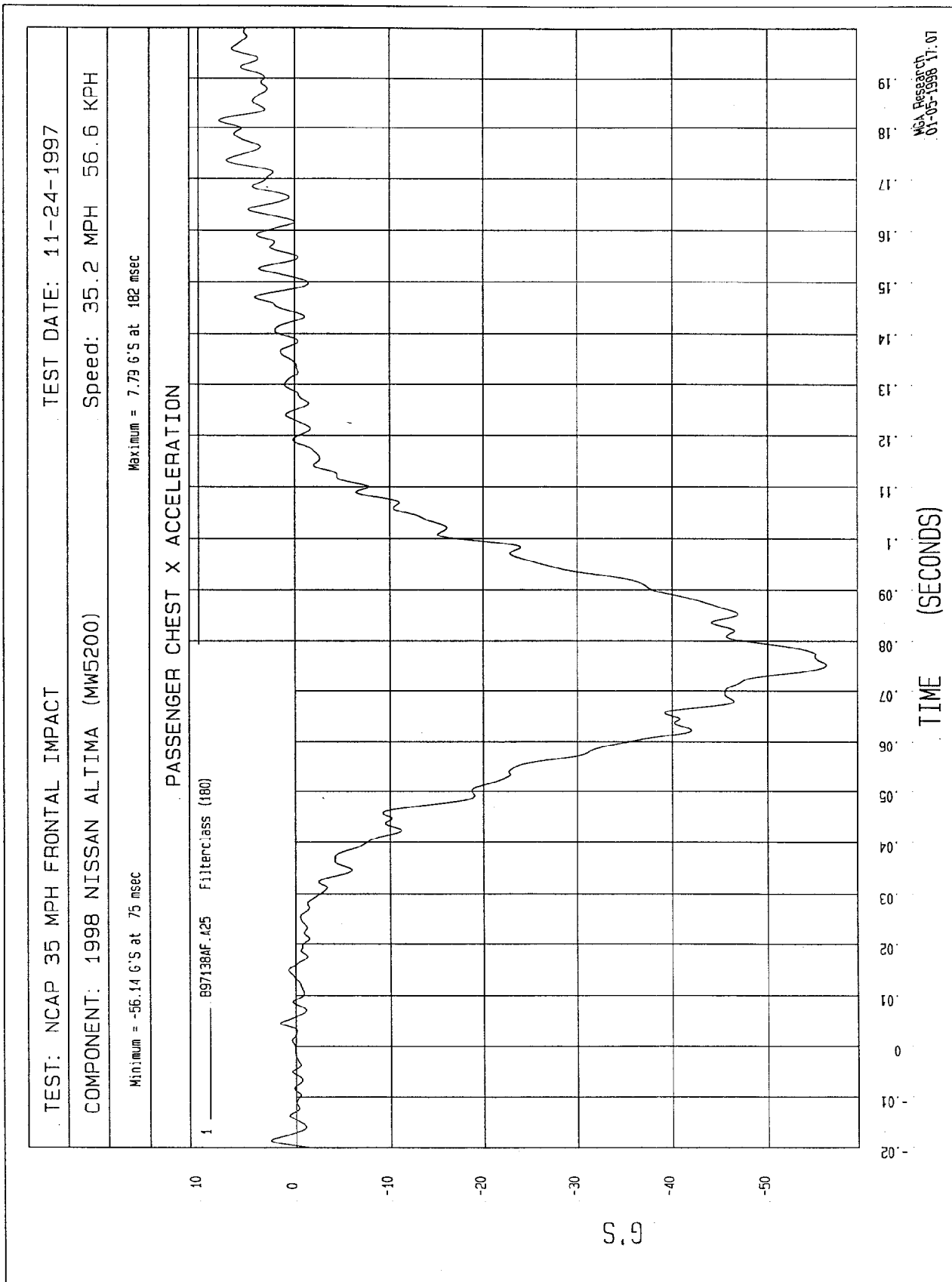
COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

Minimum = 4.40E-02 NM at 11 msec Maximum = 38.53 NM at 56 msec

PASSENGER NECK MOMENT RESULTANT



MCA Research
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TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

SPEED: 35.2 MPH 56.6 KPH

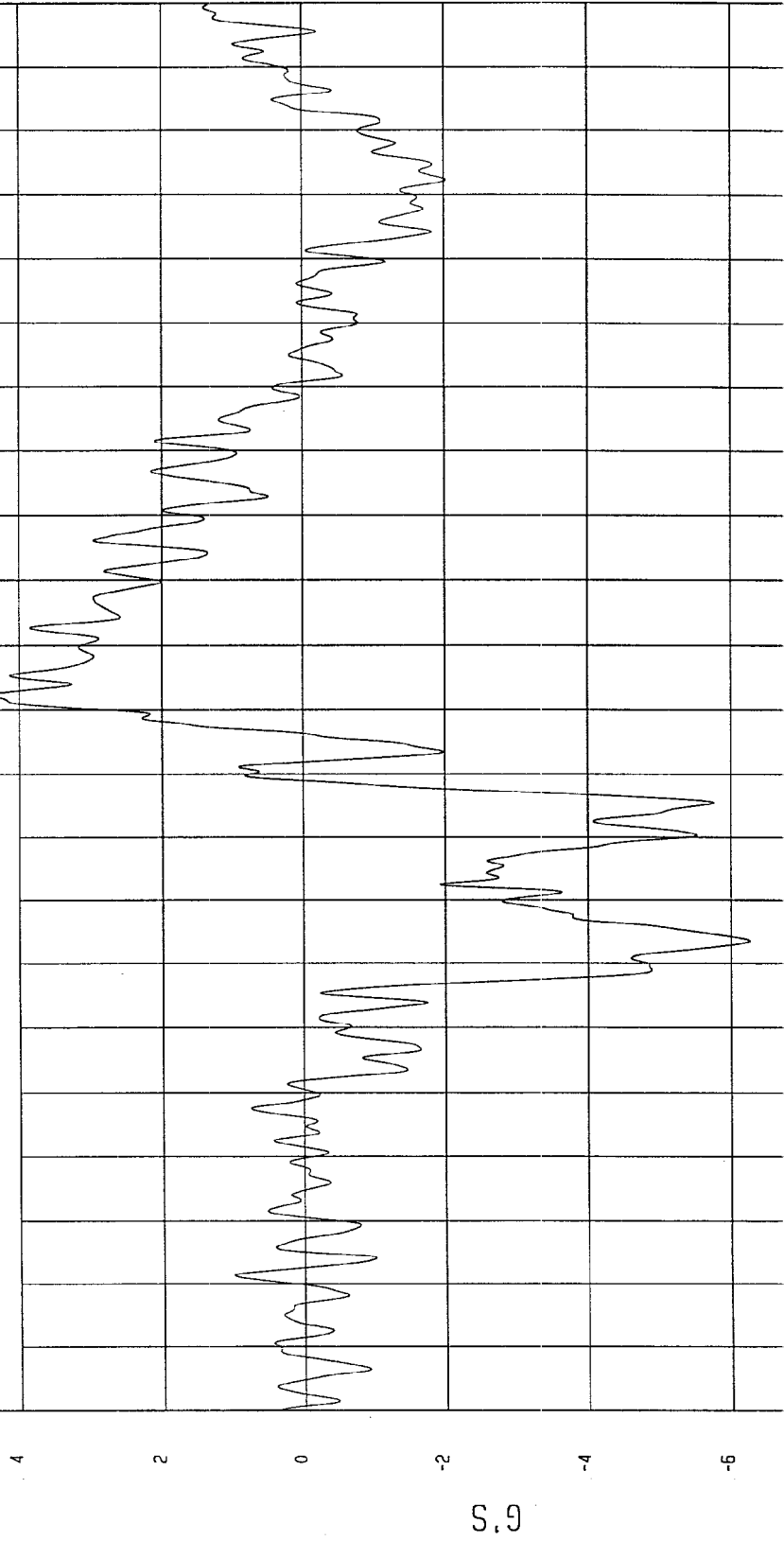
COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Maximum = 4.39 G'S at 92 msec

Minimum = -6.25 G'S at 54 msec

PASSENGER CHEST Y ACCELERATION

1 _____ B97135AF.A26 Filterc:ass (180)

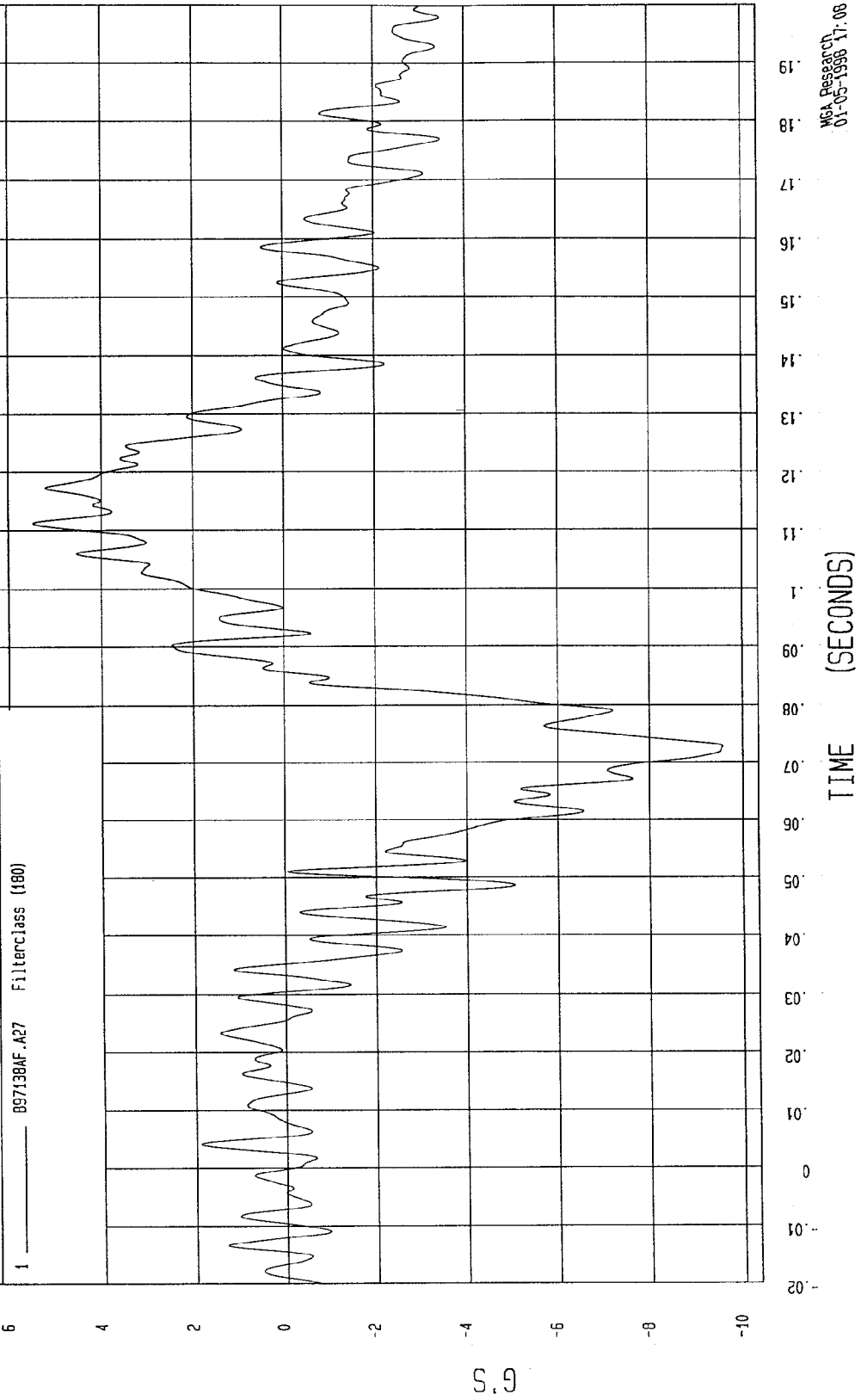


TIME (SECONDS)

NGA Report CD
01-05-1998 11:08

TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997
COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH
Minimum = -9.58 G'S at 73 msec Maximum = 5.47 G'S at 111 msec

PASSENGER CHEST Z ACCELERATION

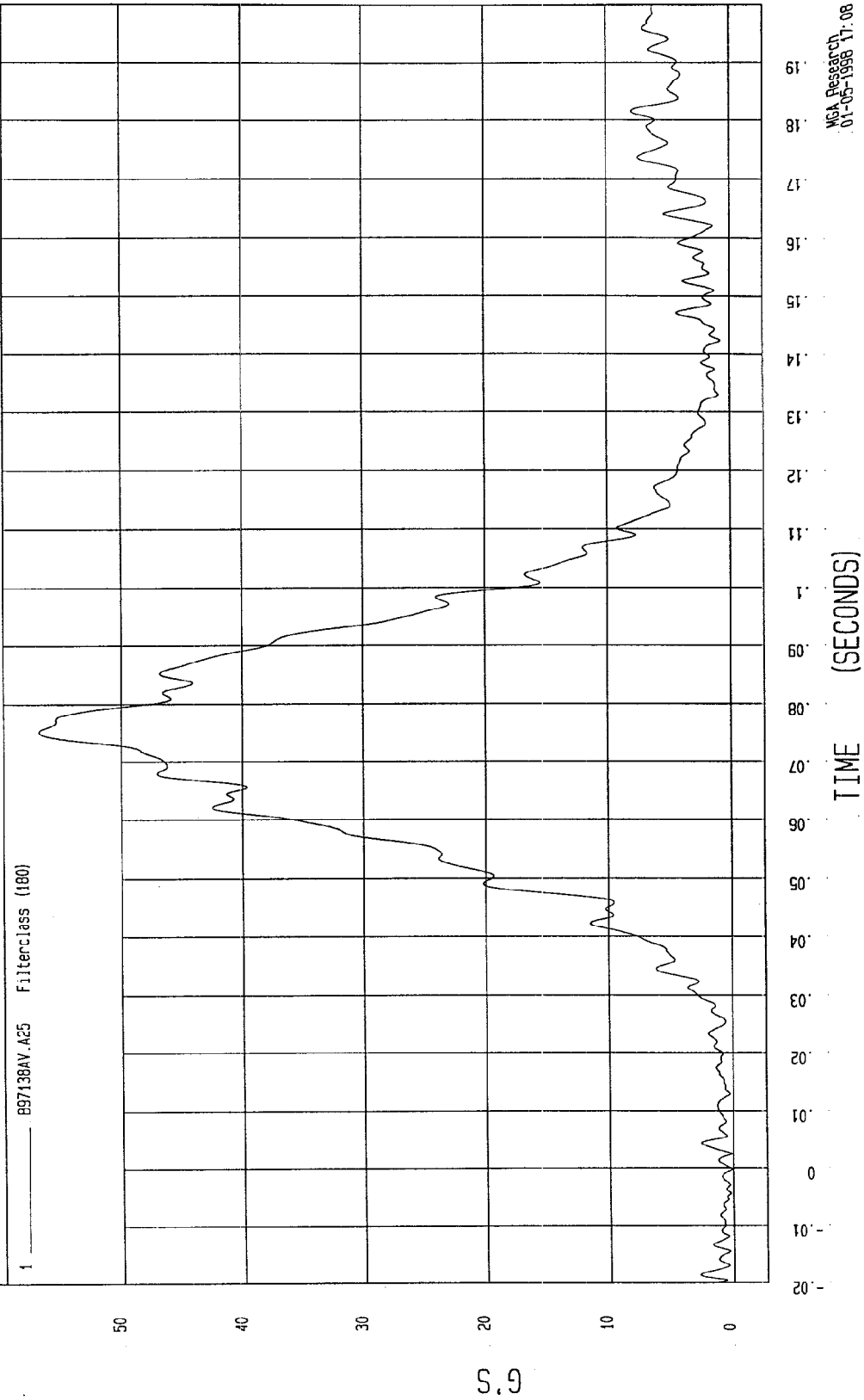


TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

Minimum = 9.20E-02 G'S at 0 msec Maximum = 56.83 G'S at 75 msec

PASSENGER CHEST RESULTANT ACCELERATION



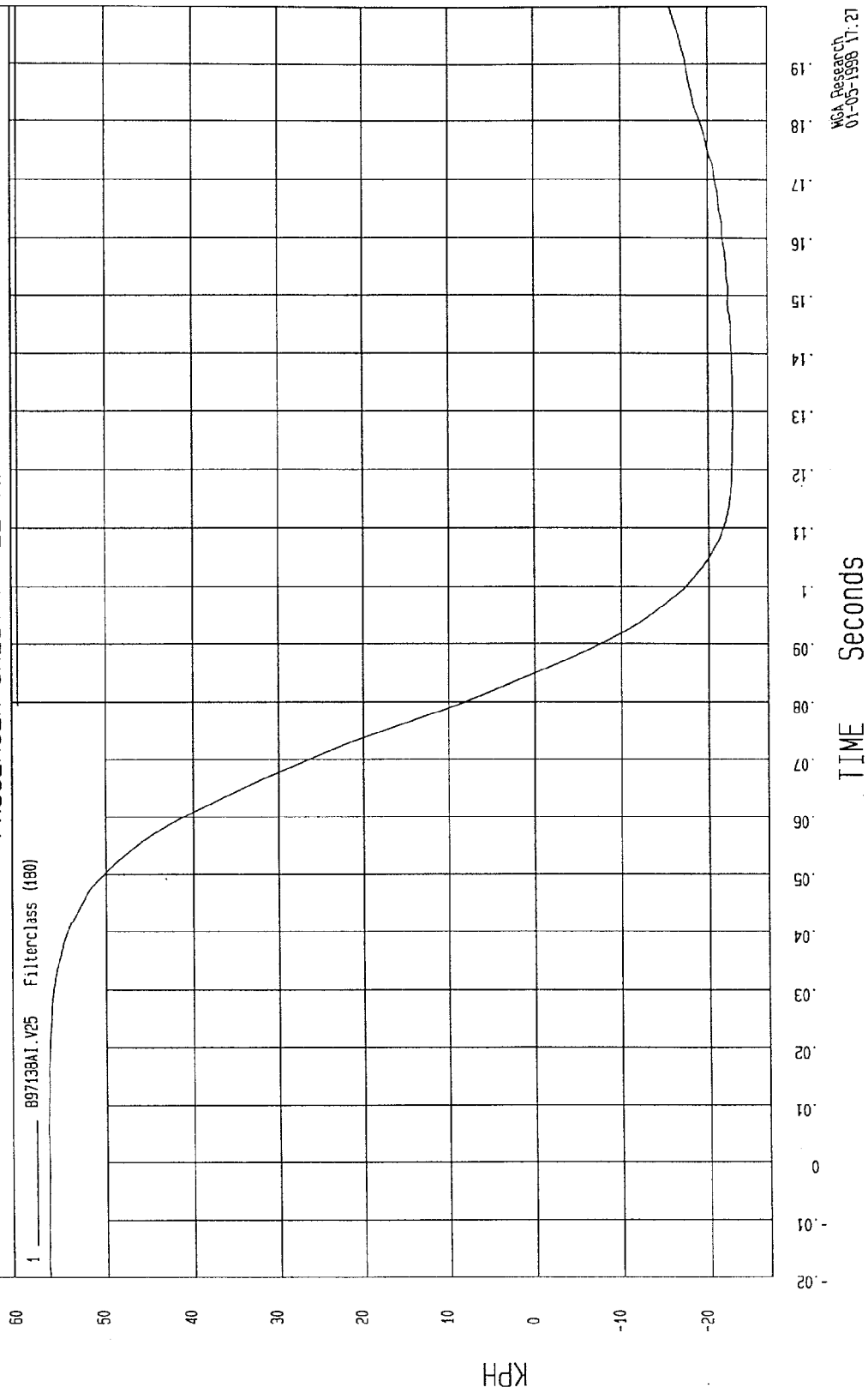
NCA Research
01-05-1998 17:08

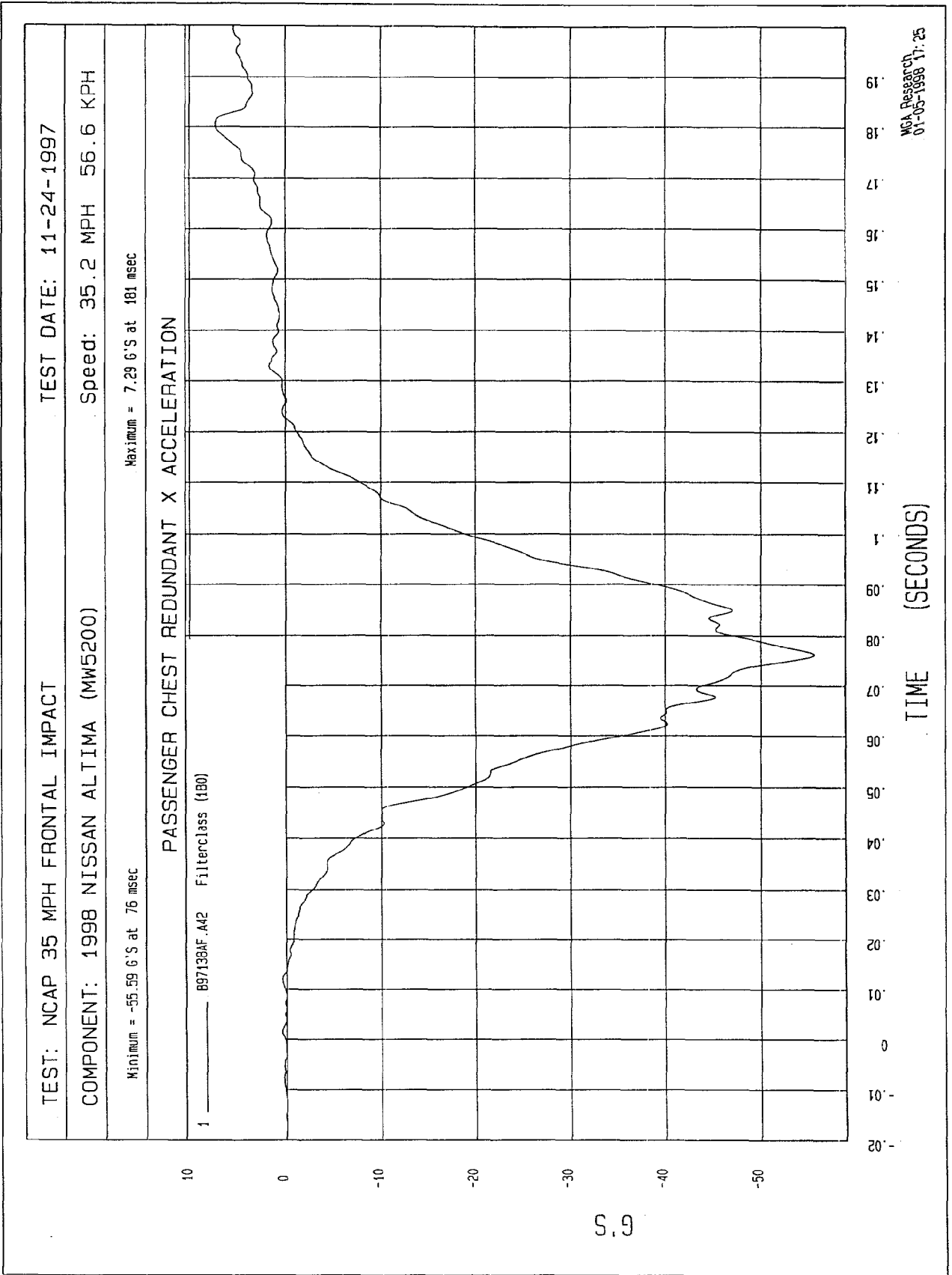
TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

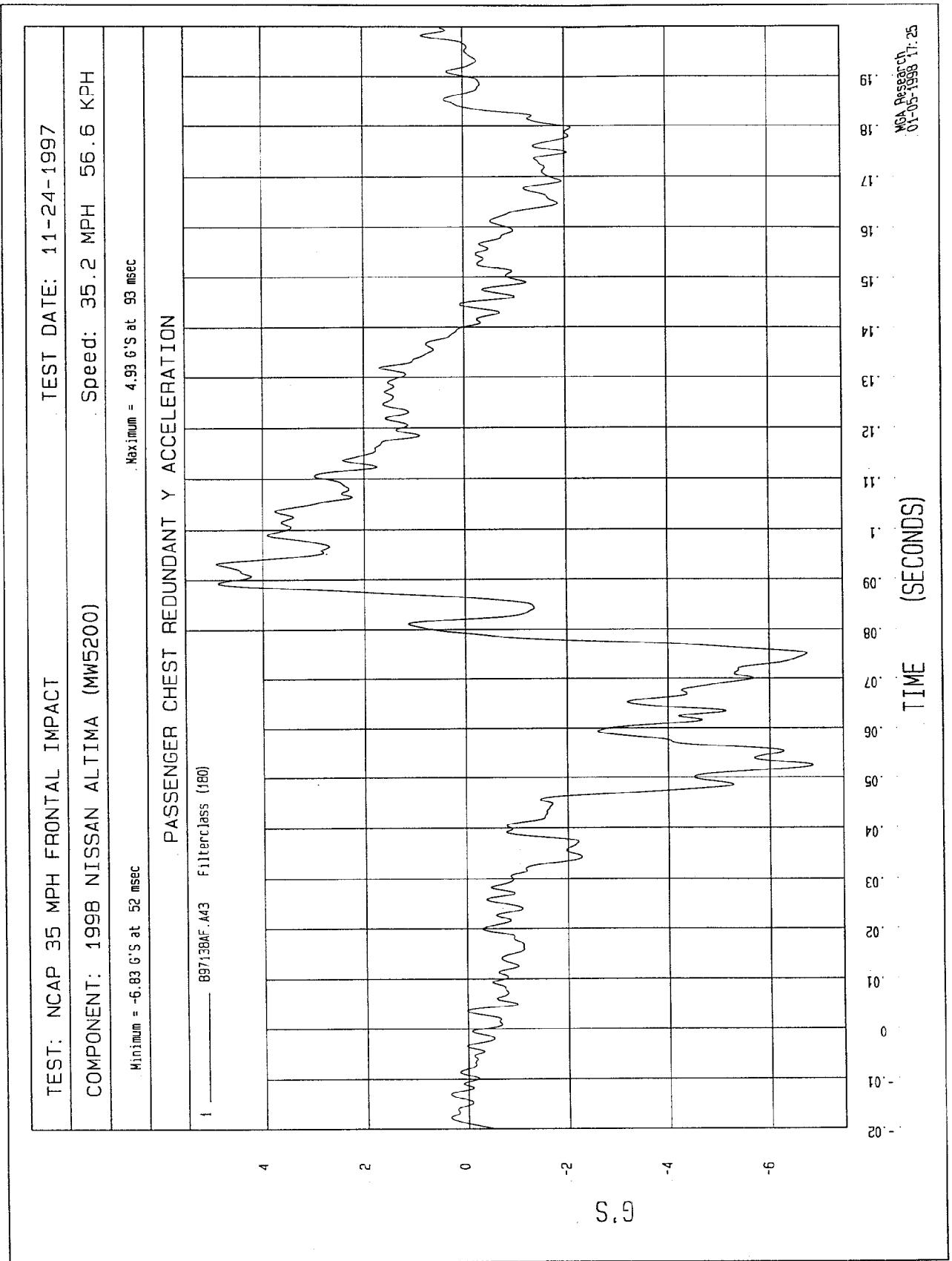
COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

Minimum = -22.85 KPH at 129 msec Maximum = 56.72 KPH at -17 msec

PASSENGER CHEST X VELOCITY







TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 11-24-1997

Speed: 35.2 MPH 56.6 KPH

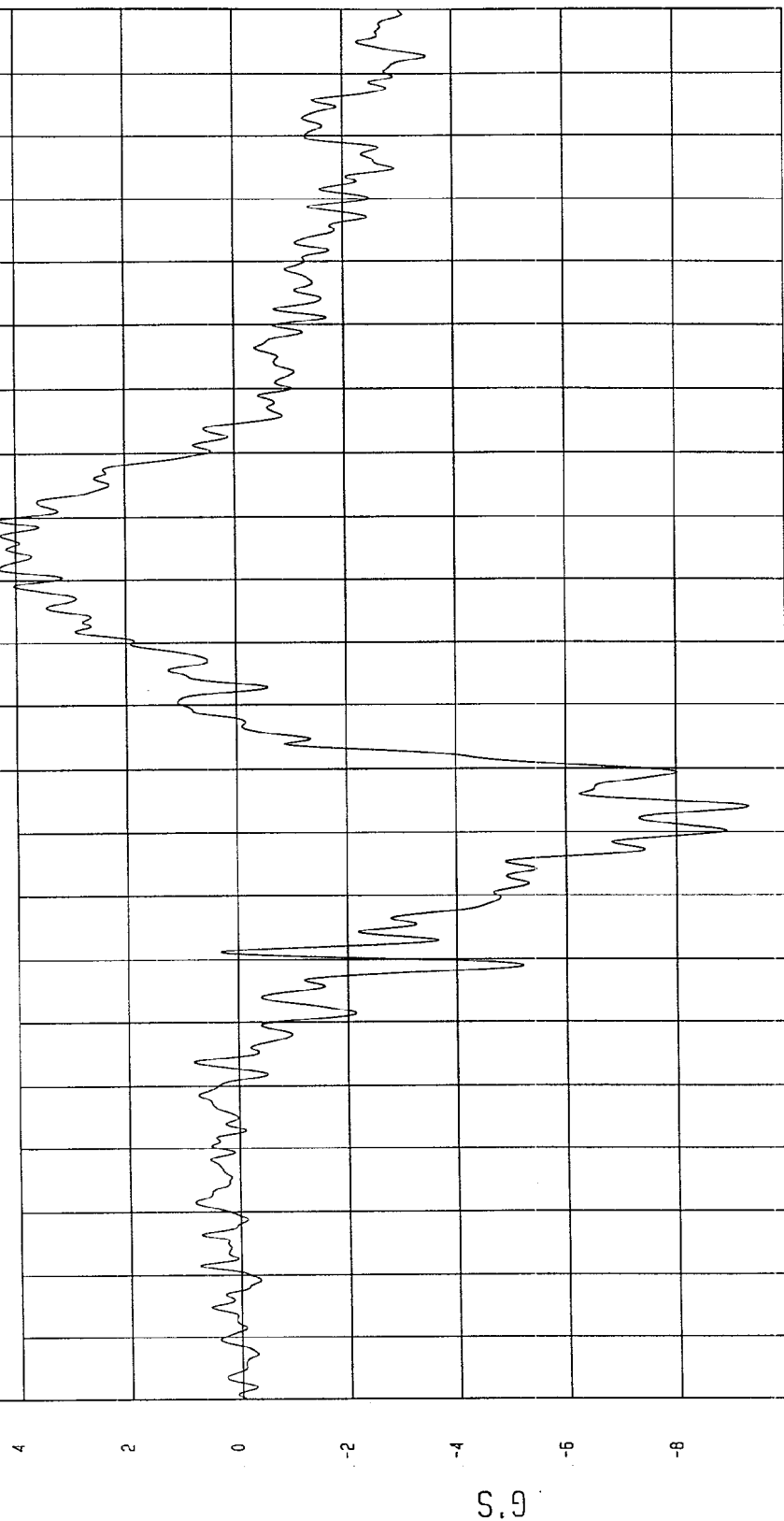
COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Maximum = 4.33 G'S at 120 msec

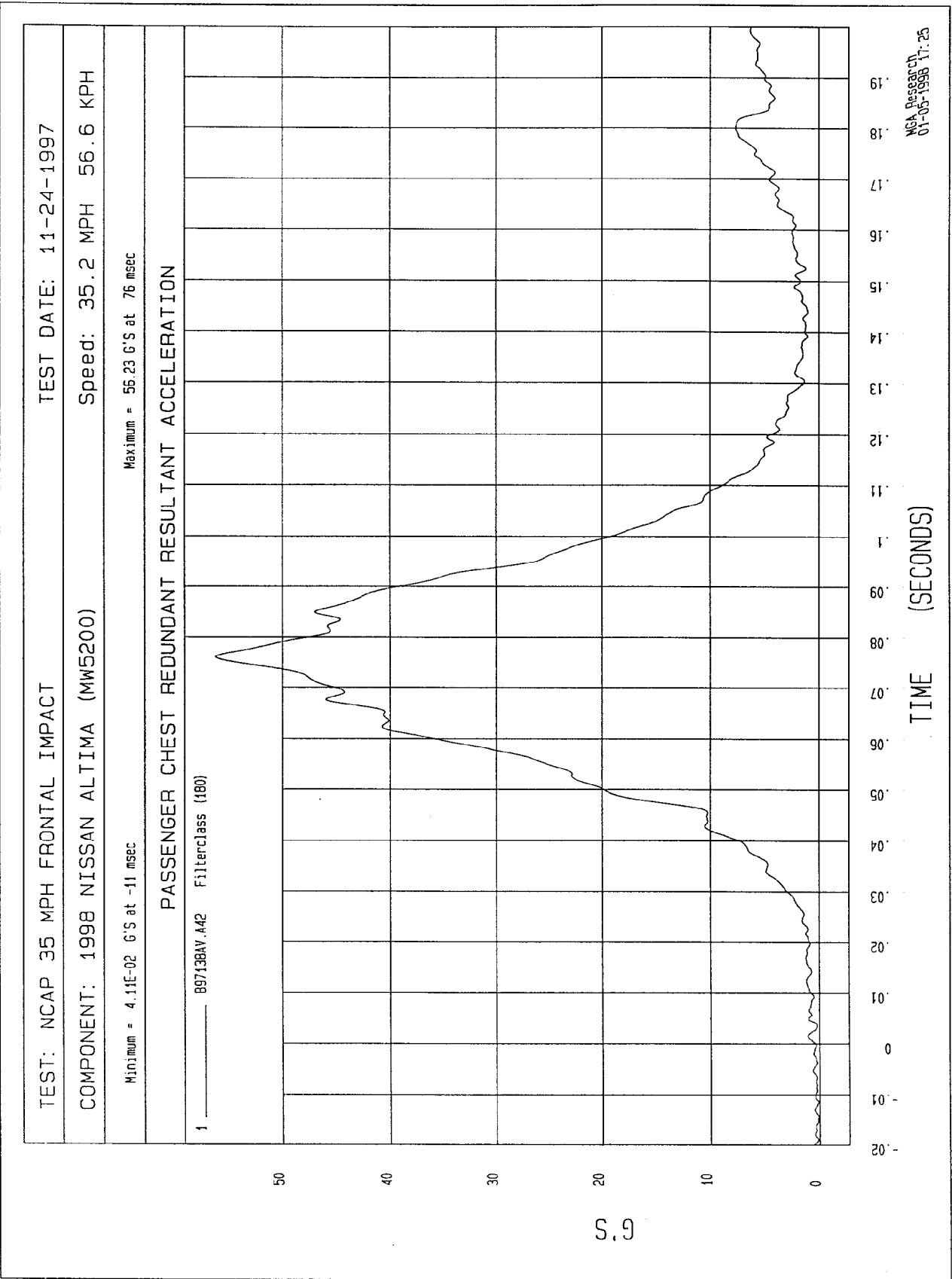
Minimum = -9.30 G'S at 74 msec

PASSENGER CHEST REDUNDANT Z ACCELERATION

1 897138AF.A44 Filterclass (180)



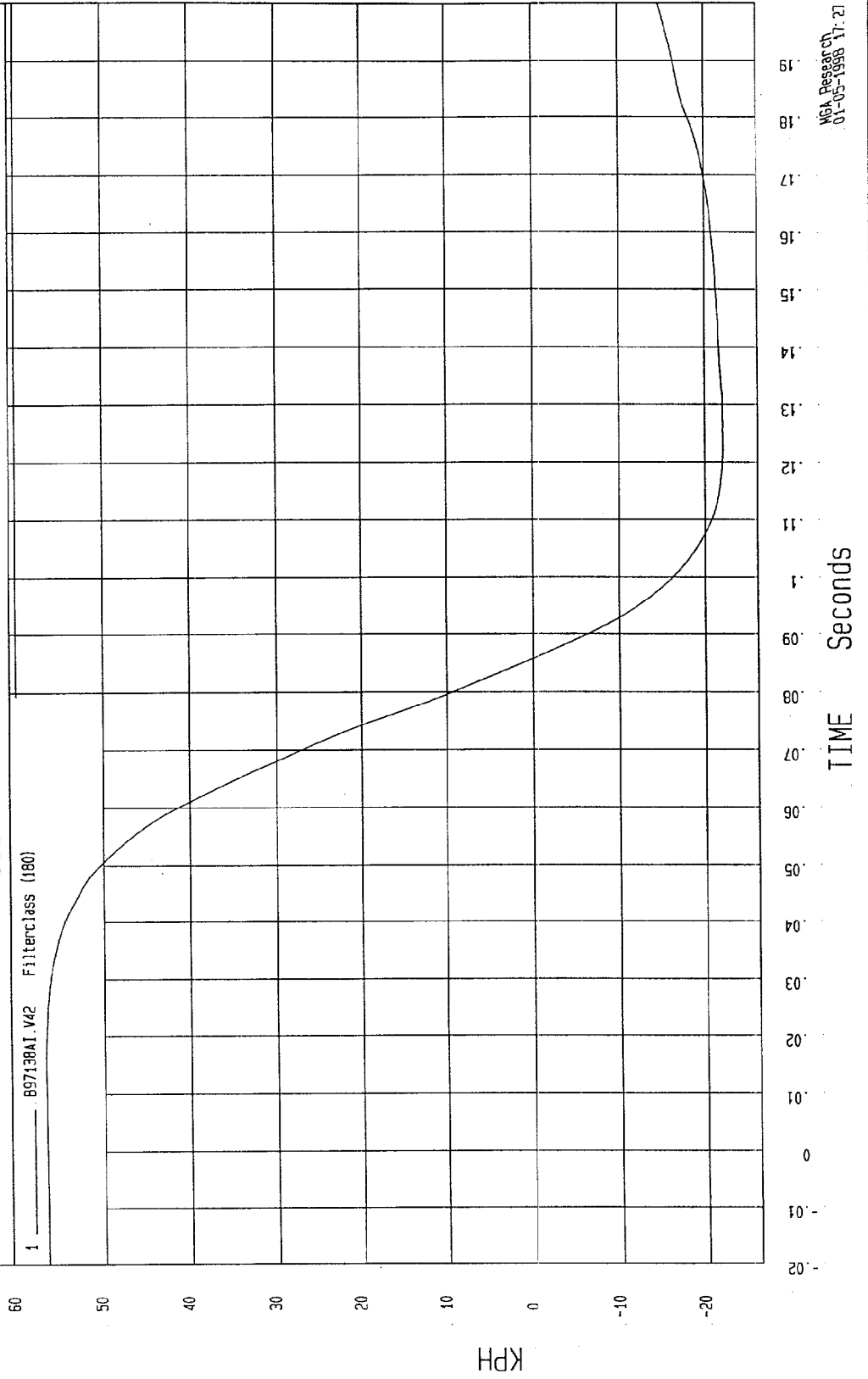
WCA Research
01-05-1998 17:25



TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997
COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

Minimum = -22.08 KPH at 123 msec Maximum = 56.75 KPH at 14 msec

PASSENGER CHEST REDUNDANT X VELOCITY



TEST: NCAP 35 MPH FRONTAL IMPACT

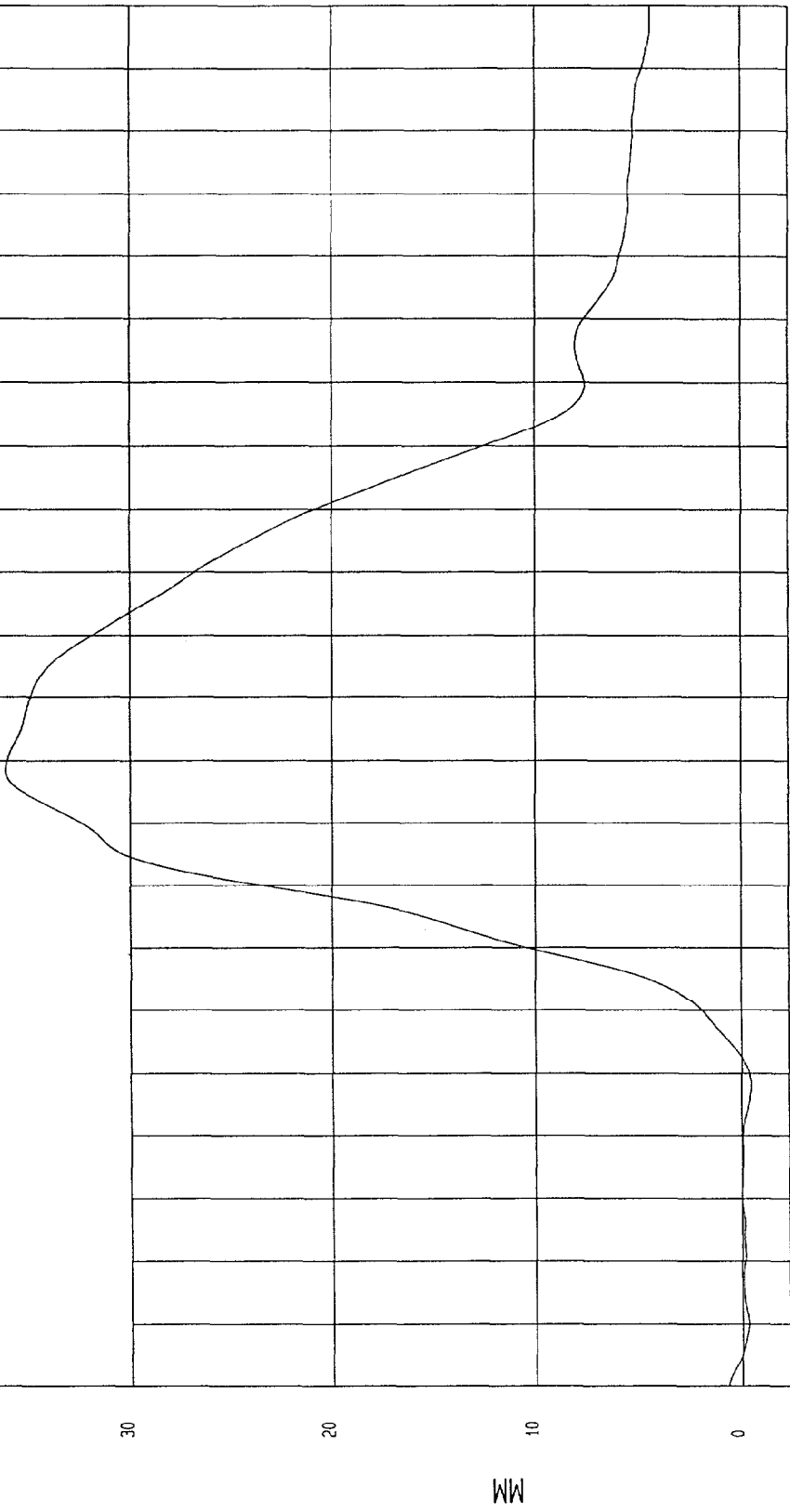
TEST DATE: 11-24-1997

COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

Minimum = -.46 MM at 28 msec Maximum = 36.12 MM at 78 msec

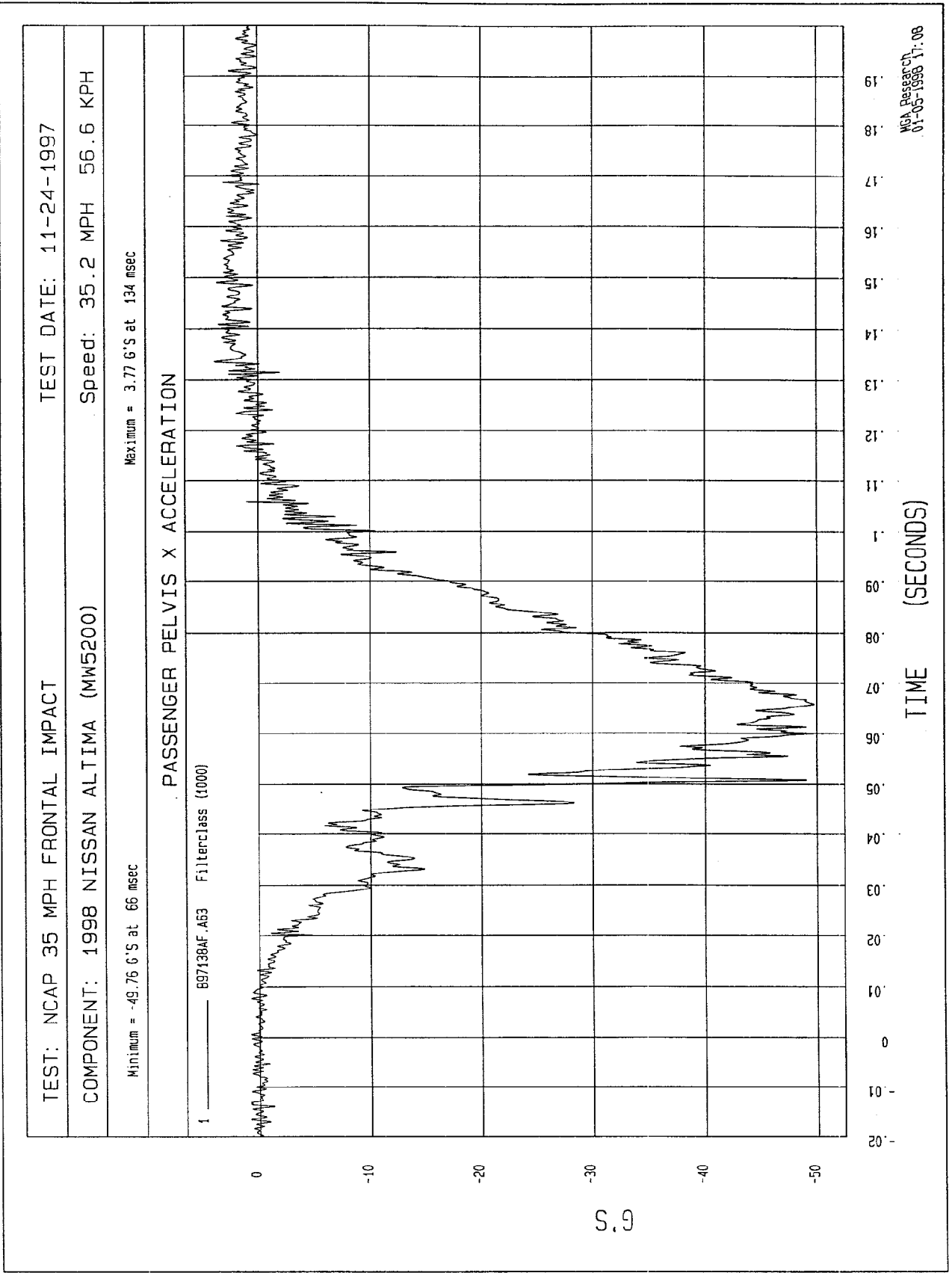
PASSENGER CHEST COMPRESSION

1 B971380F.D59 Filterclass (60)



TIME SECONDS

WCA Research
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TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 11-24-1997

Speed: 35.2 MPH 56.6 KPH

COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Maximum = 9.31 G'S at 72 msec

Minimum = -14.61 G'S at 51 msec

PASSENGER PELVIS Y ACCELERATION

1 _____ B97139AF.A64 Filterclass (1000)

10

8

6

4

2

0

-2

-4

-6

-8

-10

-12

-14

G'S

-0.02

-0.01

0

0.01

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0.16

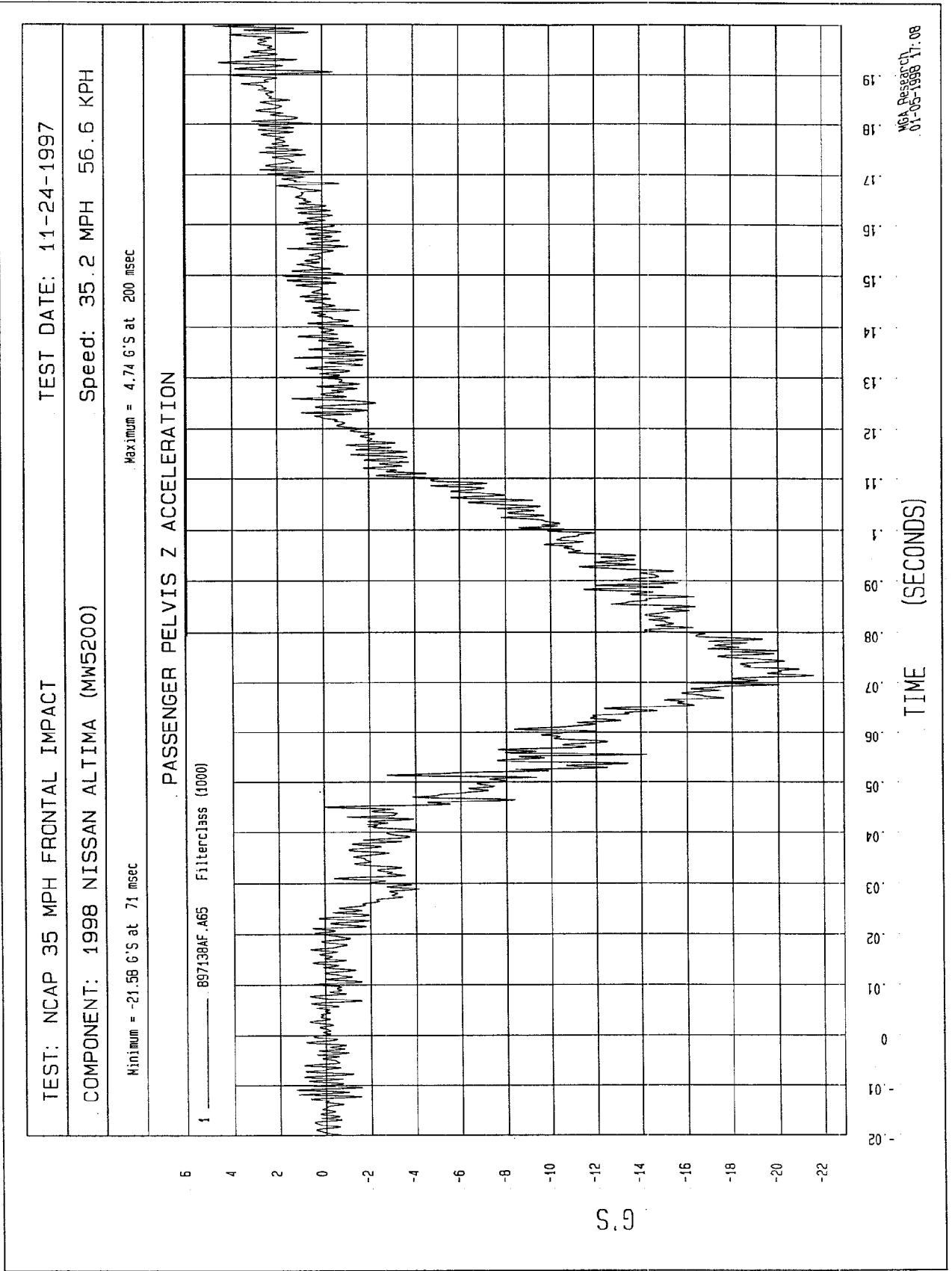
0.17

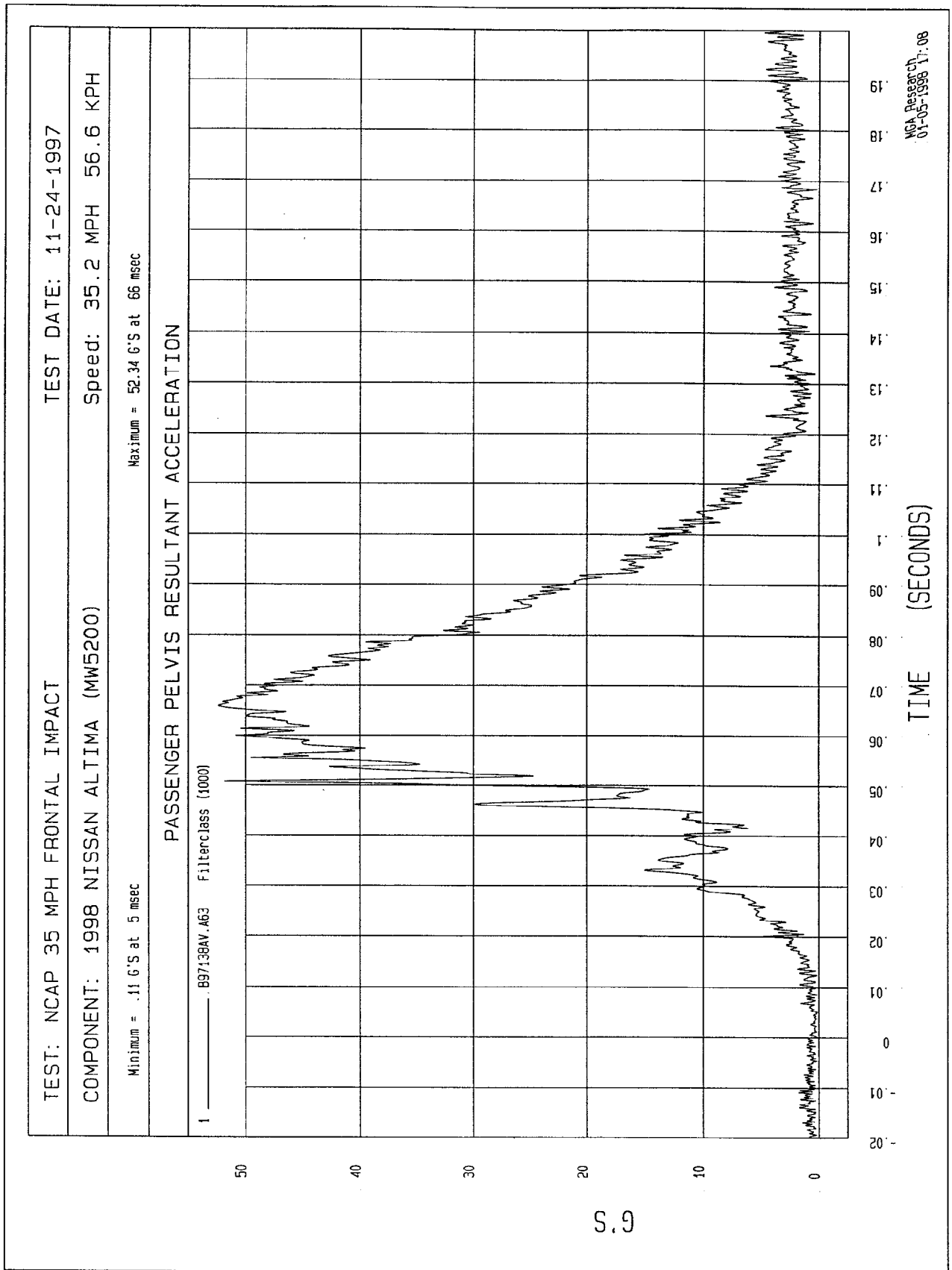
0.18

0.19

TIME (SECONDS)

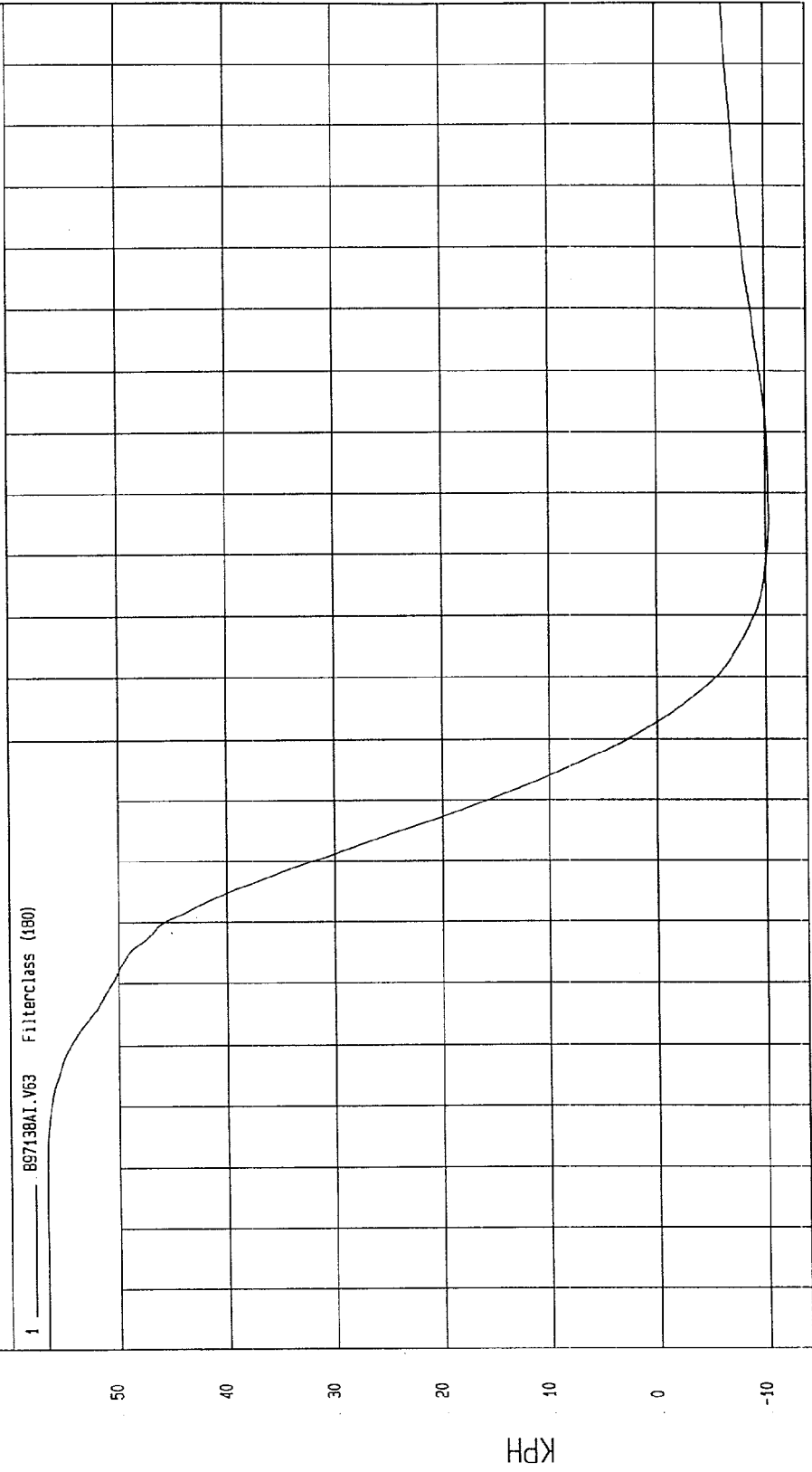
WCA Research
01-05-1998 17:08





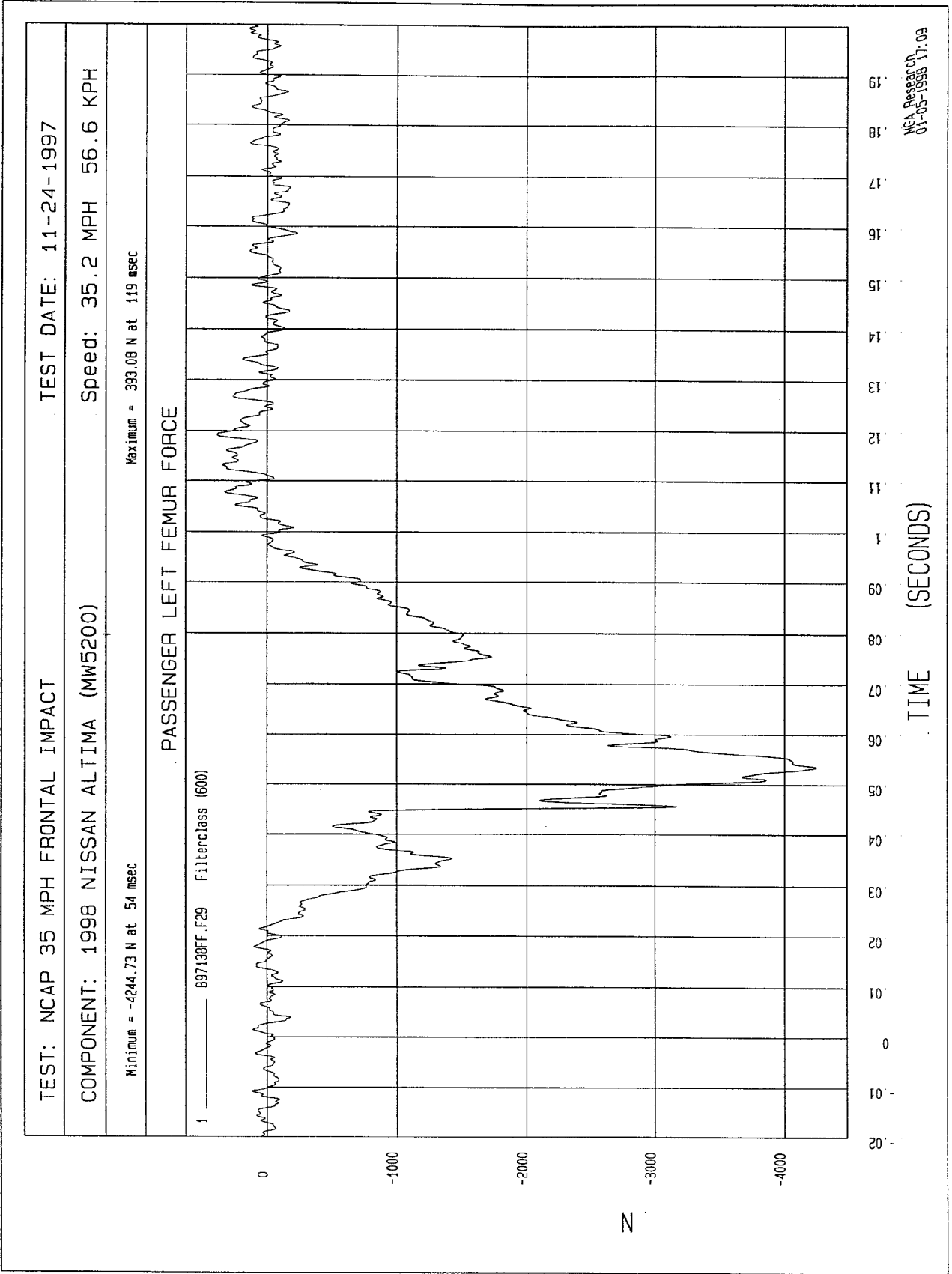
TEST: NCAP 35 MPH FRONTAL IMPACT	TEST DATE: 11-24-1997
COMPONENT: 1998 NISSAN ALTIMA (MW5200)	Speed: 35.2 MPH 56.6 KPH
Minimum = -10.31 KPH at 115 msec	Maximum = 56.64 KPH at 2 msec

PASSENGER PELVIS X VELOCITY



TIME Seconds

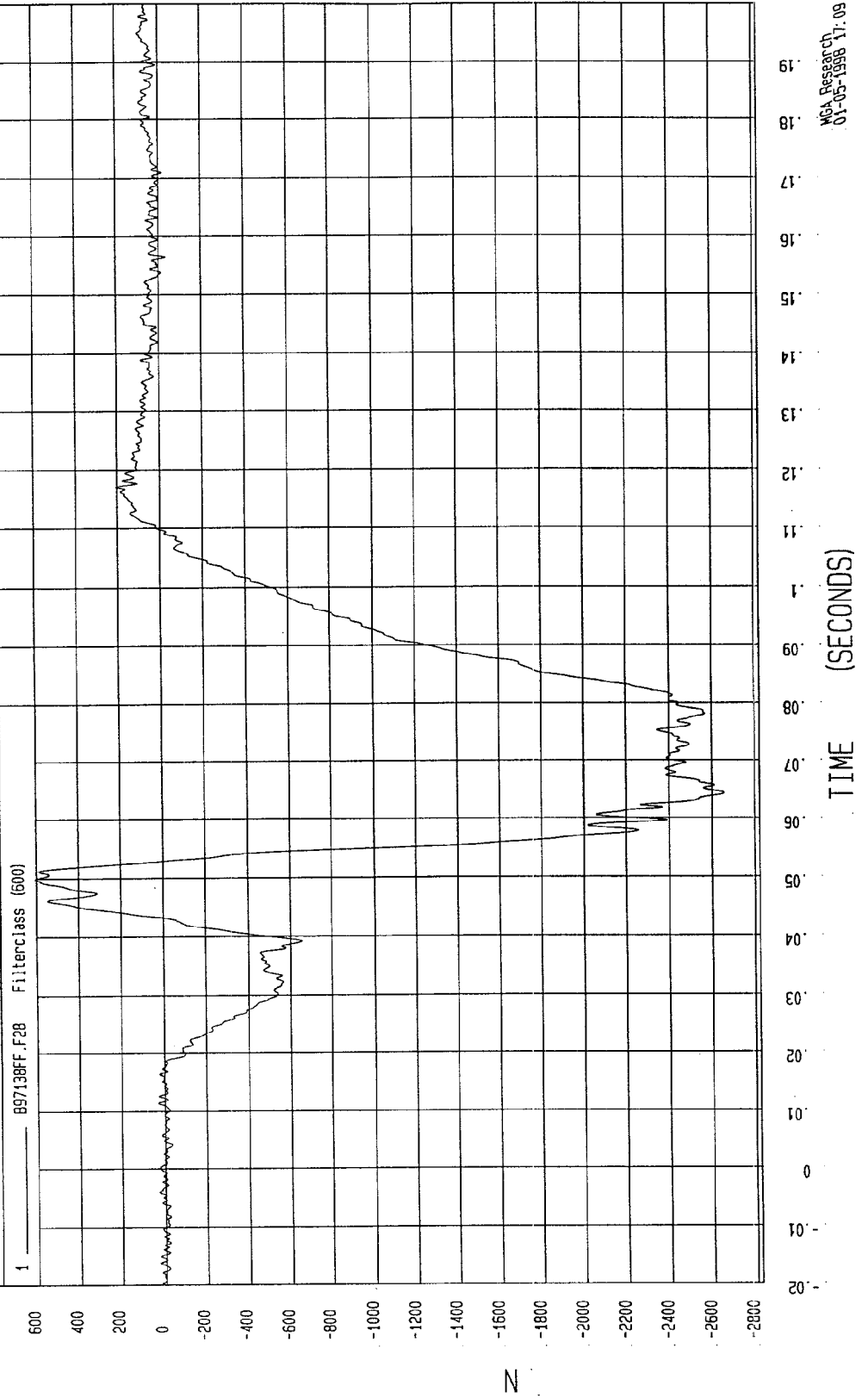
MSA Research
01-05-1998 17:27



TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997
COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 55.6 KPH

Minimum = -2659.30 N at 64 msec Maximum = 605.01 N at 50 msec

PASSENGER RIGHT FEMUR FORCE

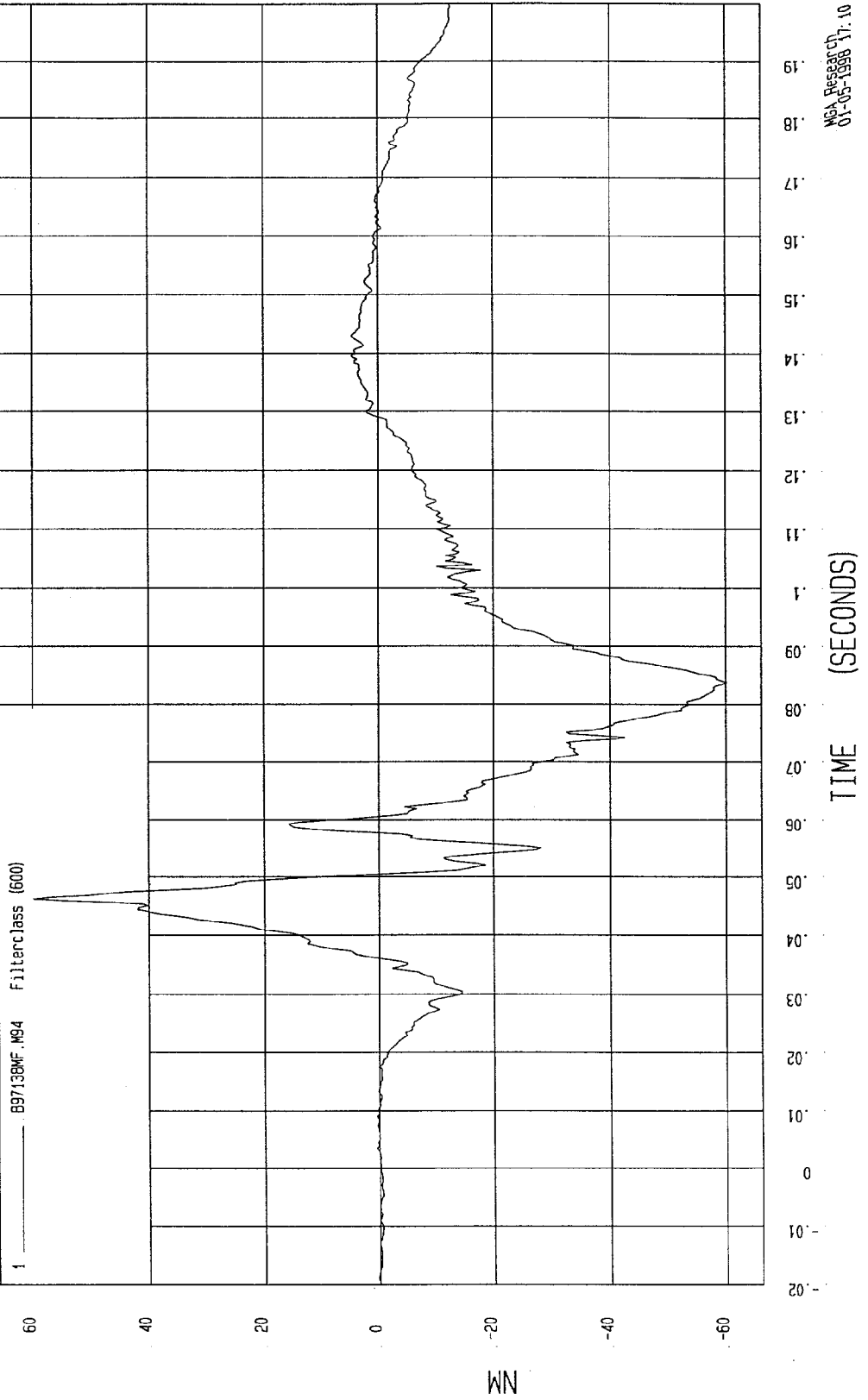


TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

Minimum = -60.14 NM at 84 msec
Maximum = 59.87 NM at 46 msec

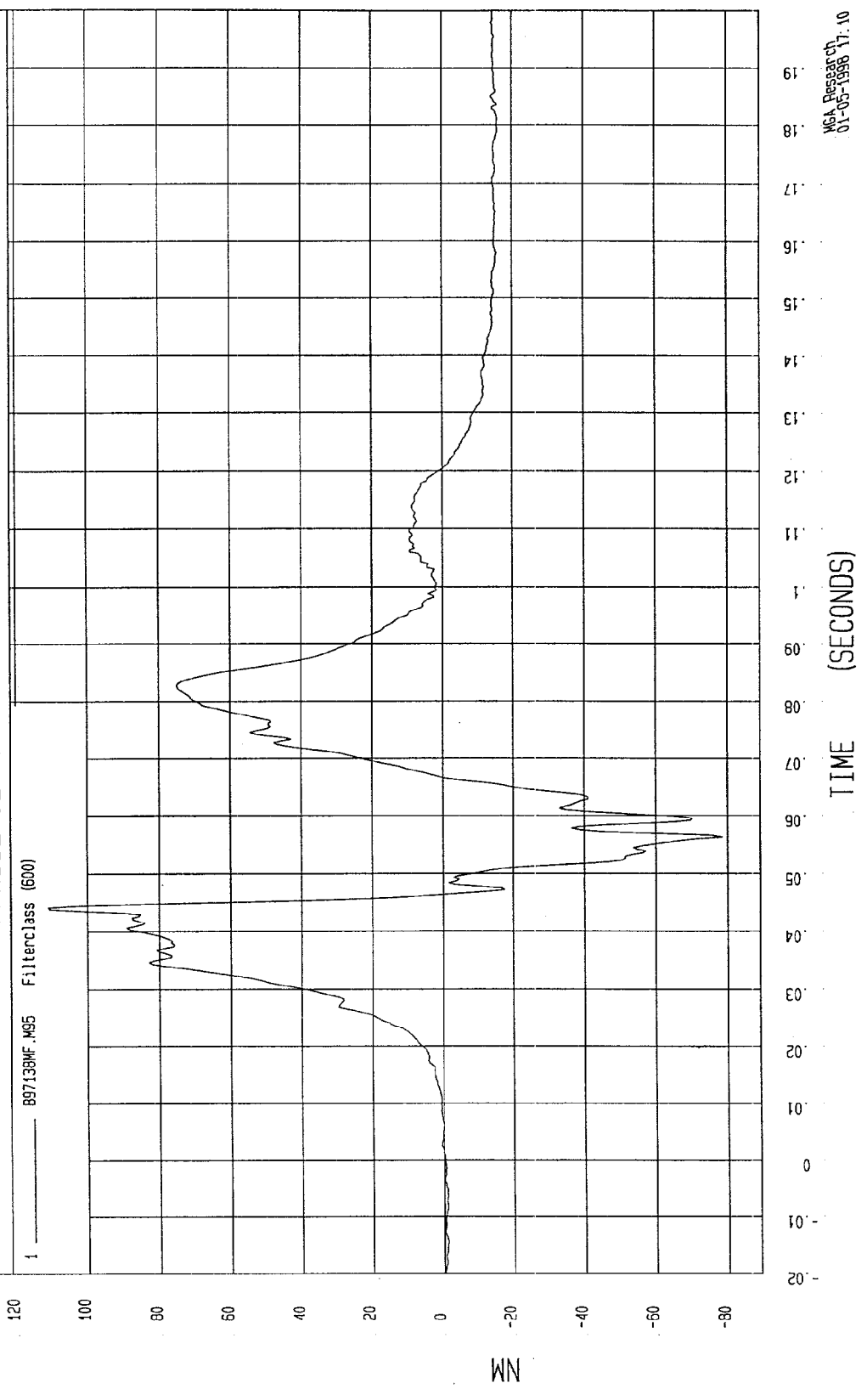
PASSENGER LEFT UPPER TIBIA MOMENT X

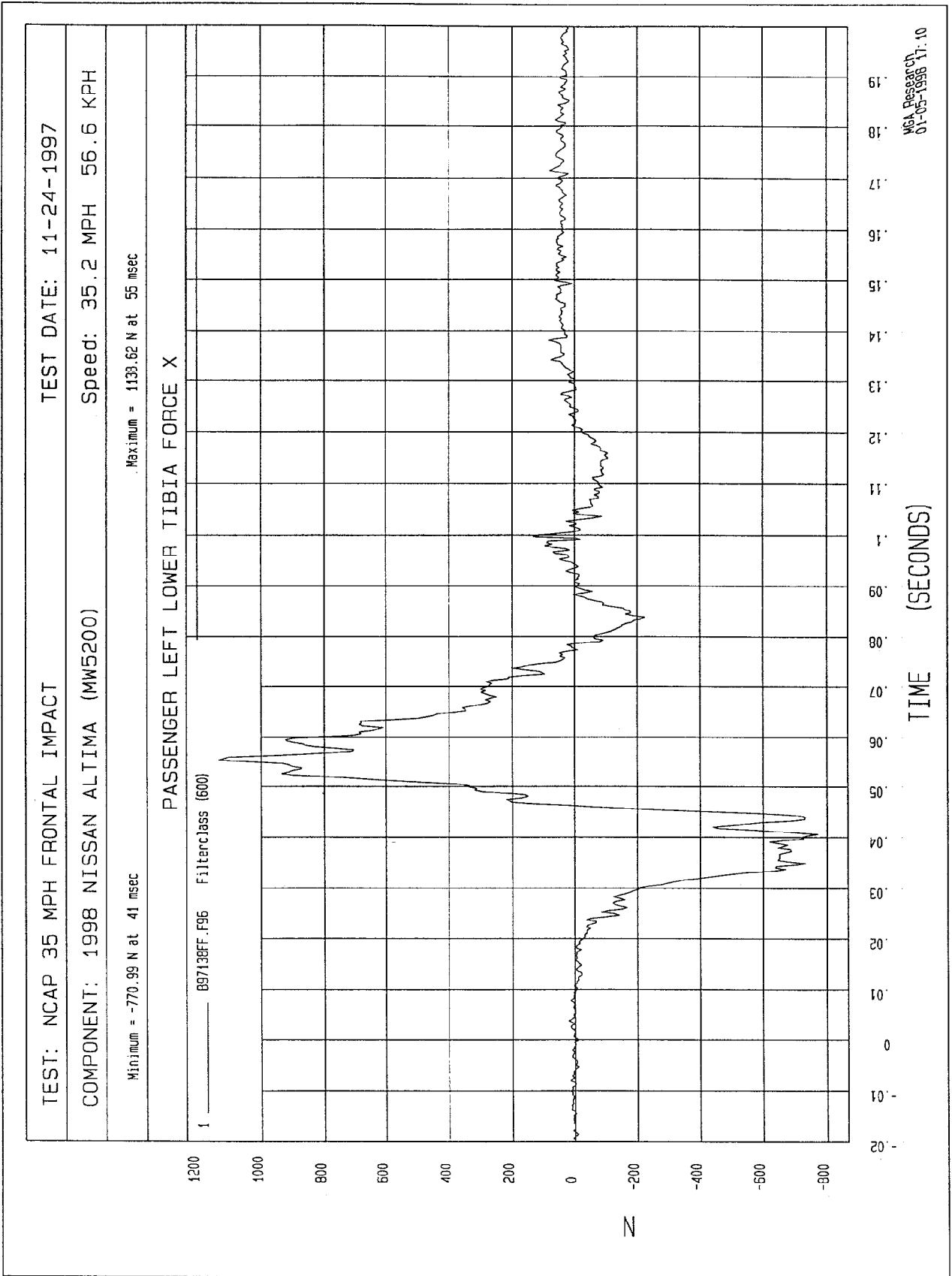


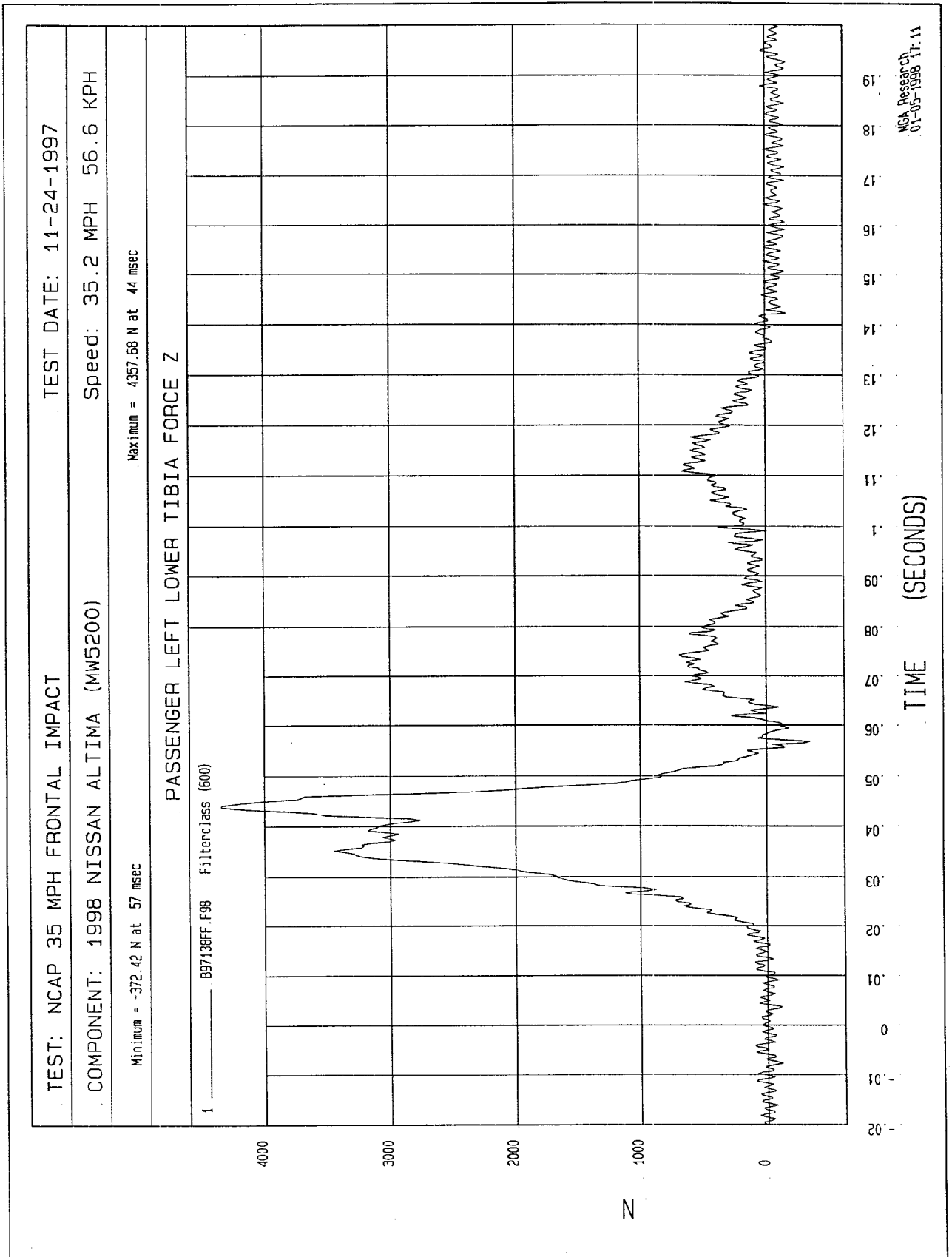
TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997
COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

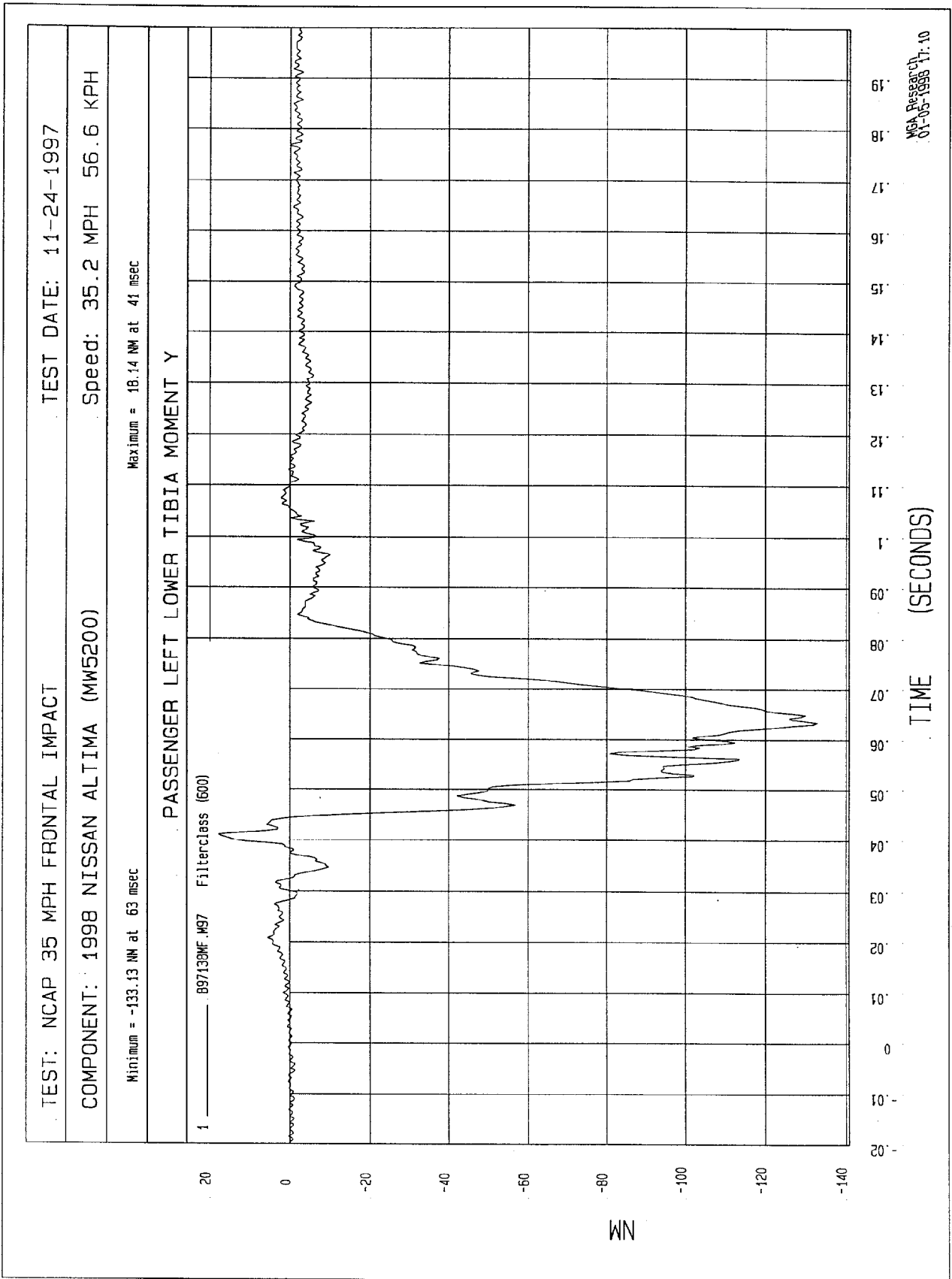
Minimum = -79.52 NM at 56 msec Maximum = 111.96 NM at 44 msec

PASSENGER LEFT UPPER TIBIA MOMENT Y







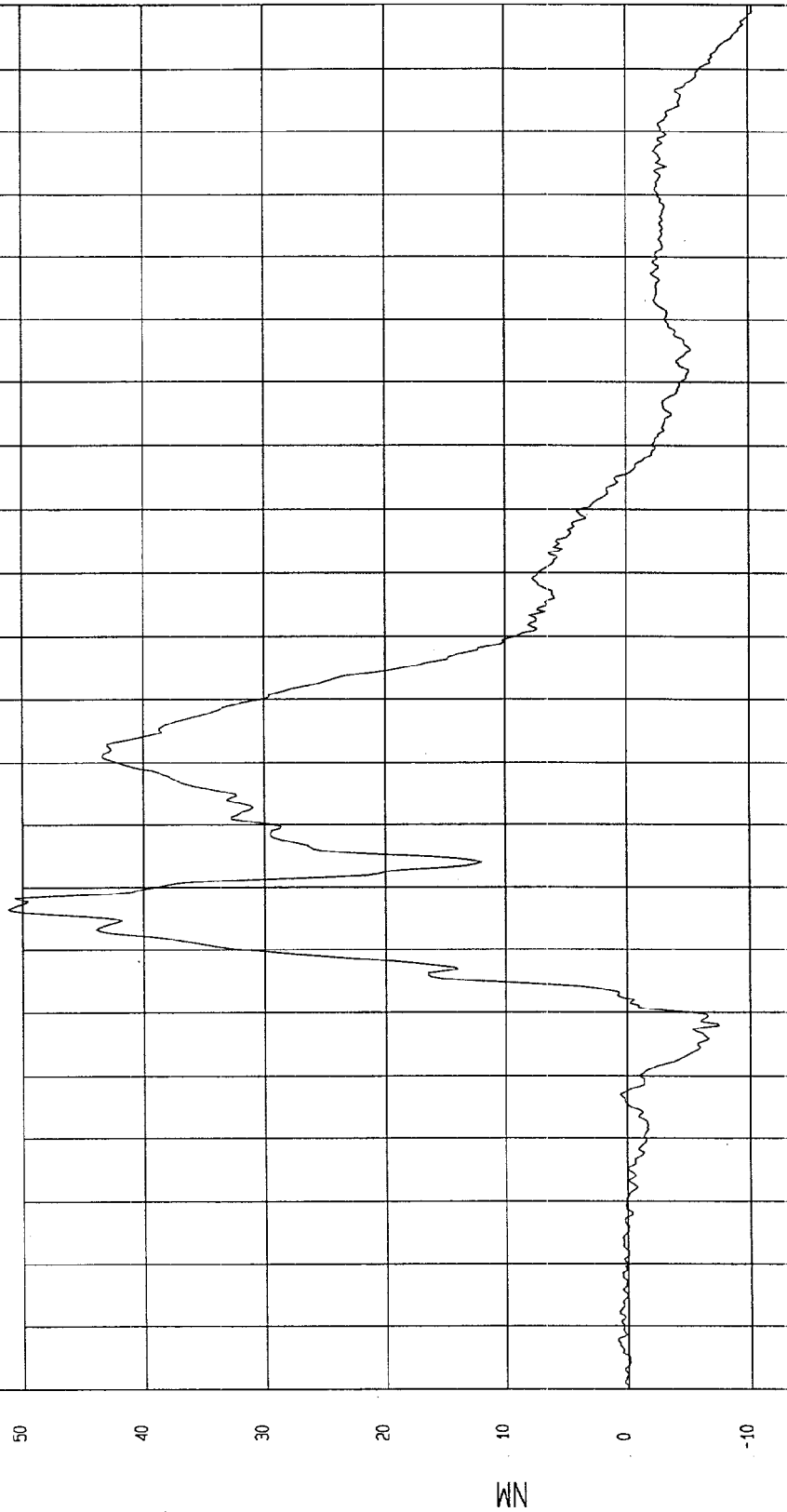


TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997
COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

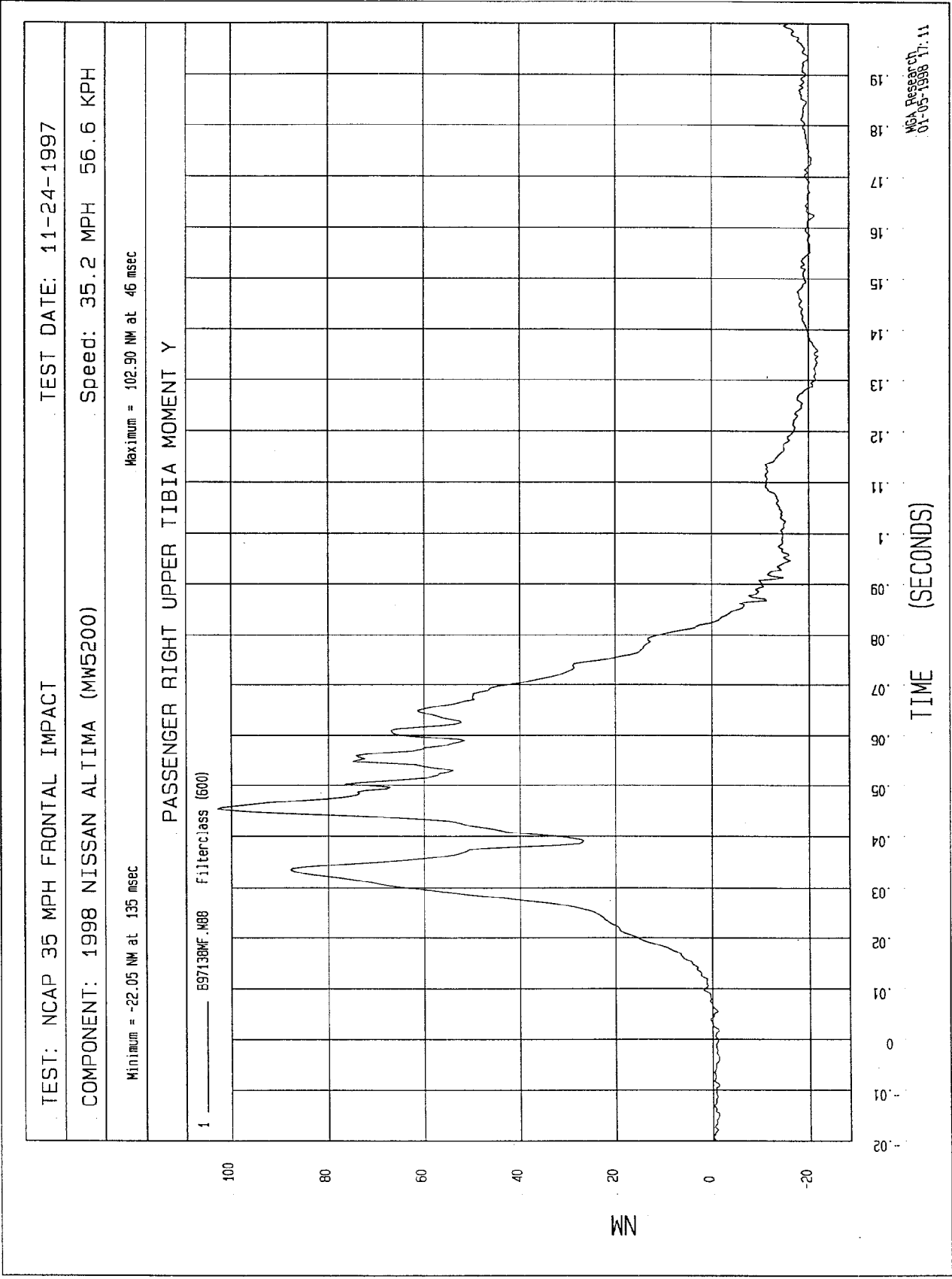
Minimum = -10.32 NM at 199 msec Maximum = 51.17 NM at 56 msec

PASSENGER RIGHT UPPER TIBIA MOMENT X

1 _____ B97138MF.M87 Filterclass (600)



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TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 11-24-1997

COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Speed: 35.2 MPH 56.6 KPH

Minimum = -819.06 N at 45 msec

Maximum = 134.57 N at 133 msec

PASSENGER RIGHT LOWER TIBIA FORCE X

1 ——— B97138FF.F09 Filterclass (600)

N
0
-200
-400
-600
-800

MGA Research
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TIME (SECONDS)

-0.02 -0.01 0 .01 .02 .03 .04 .05 .06 .07 .08 .09 .10 .11 .12 .13 .14 .15 .16 .17 .18 .19

TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 11-24-1997

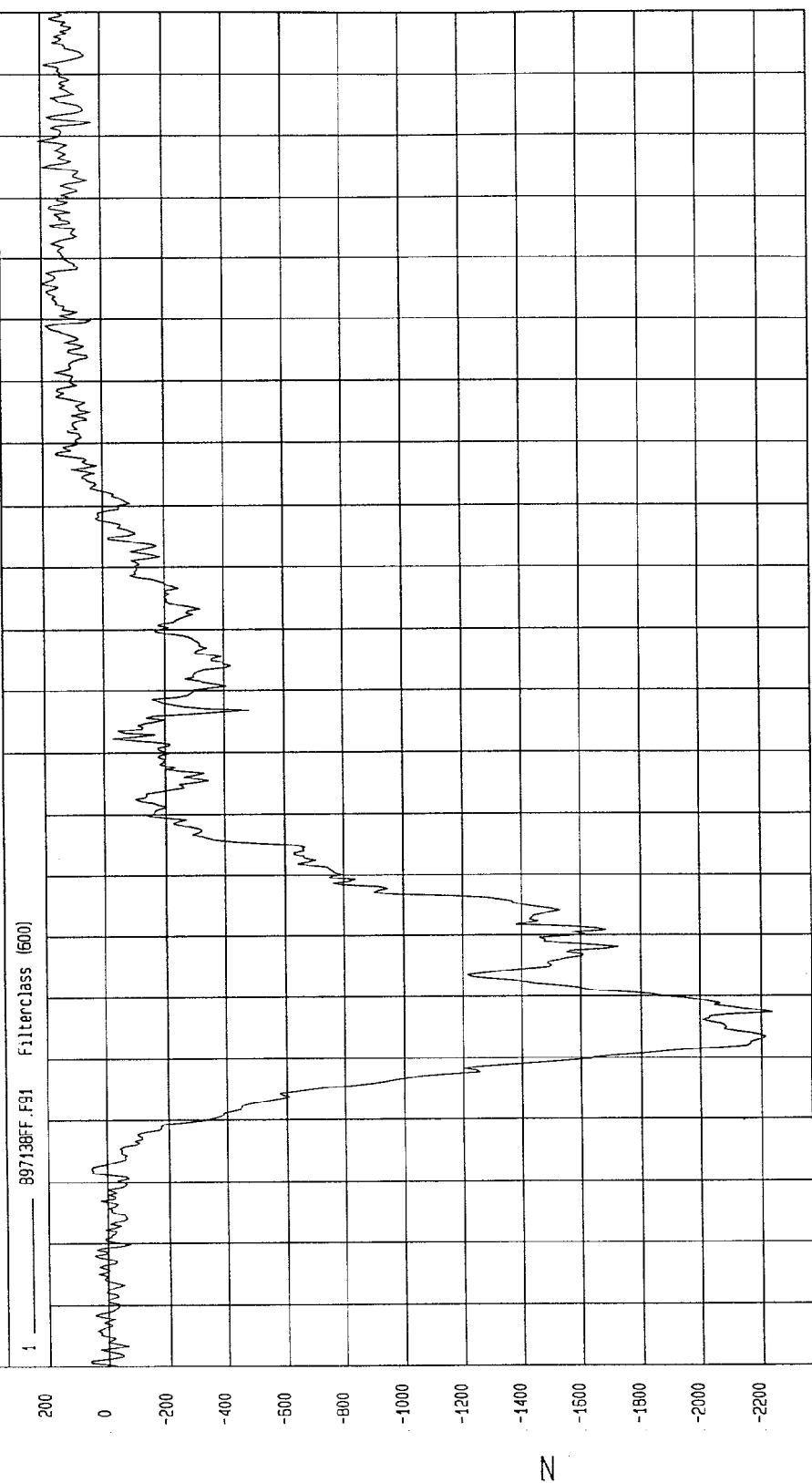
Speed: 35.2 MPH 56.6 KPH

COMPONENT: 1998 NISSAN ALTIMA (MW5200)

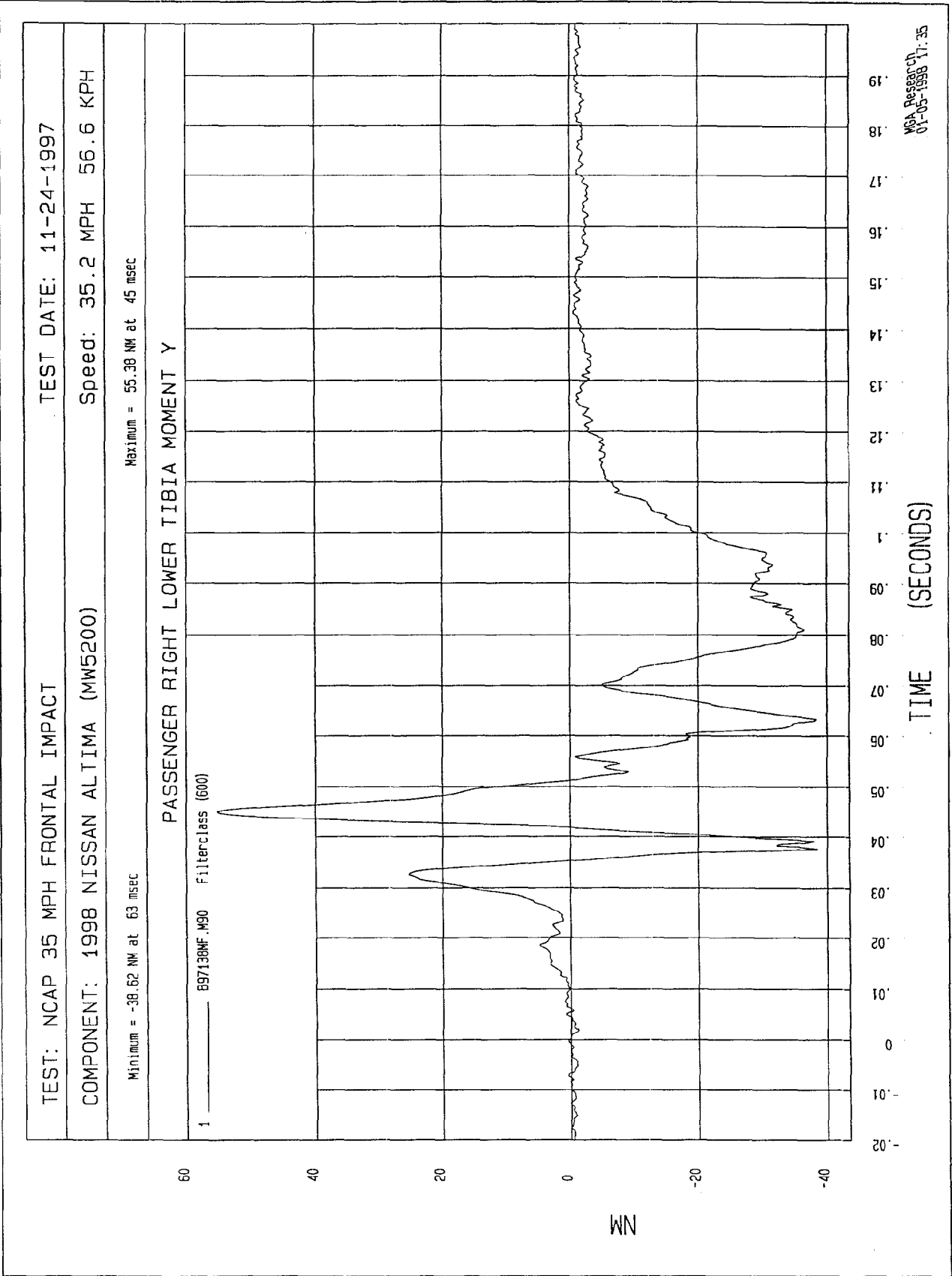
Maximum = 212.64 N at 179 msec

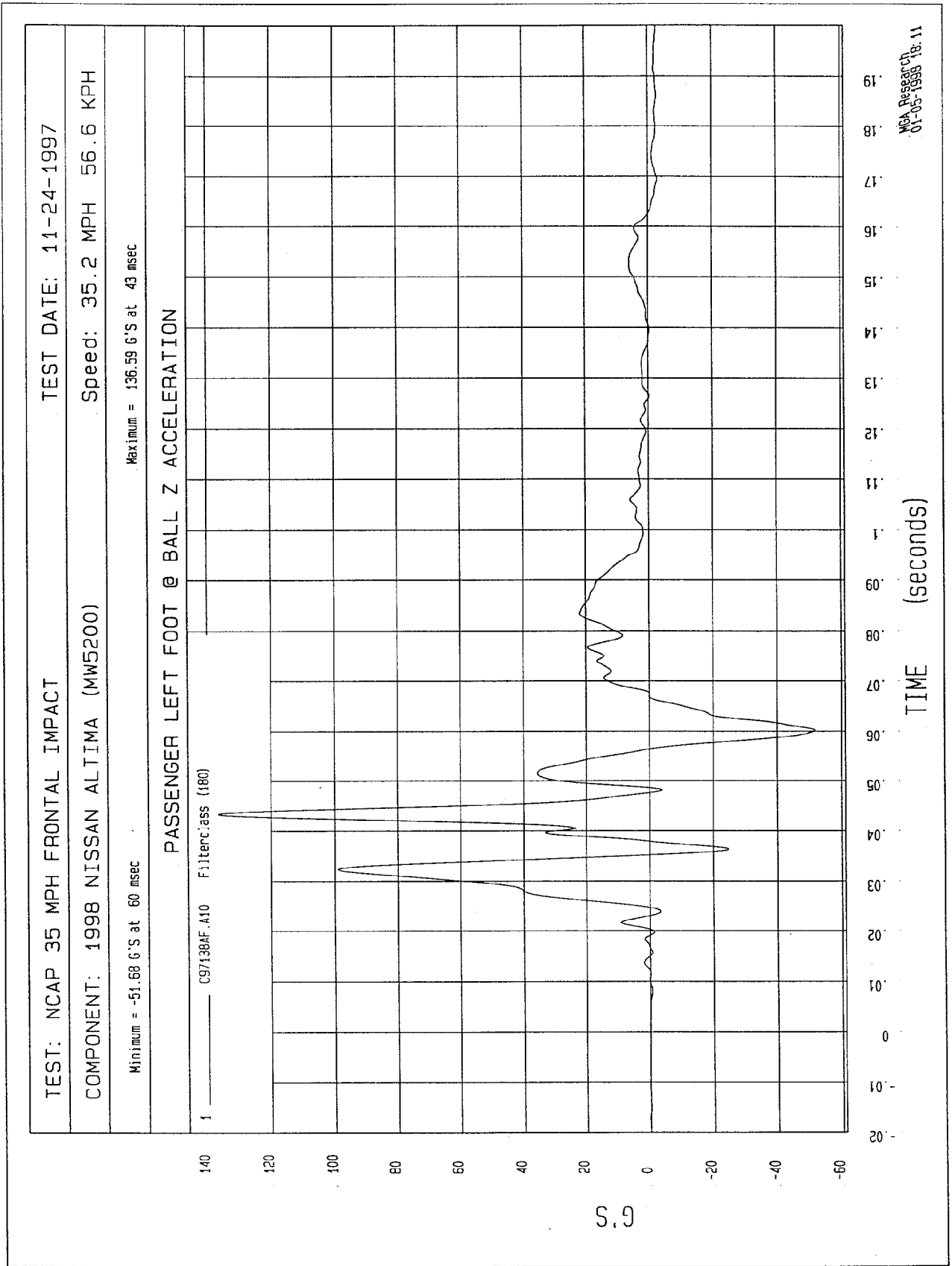
Minimum = -2246.55 N at 37 msec

PASSENGER RIGHT LOWER TIBIA FORCE Z



NGA Research
01-05-1998 17:35



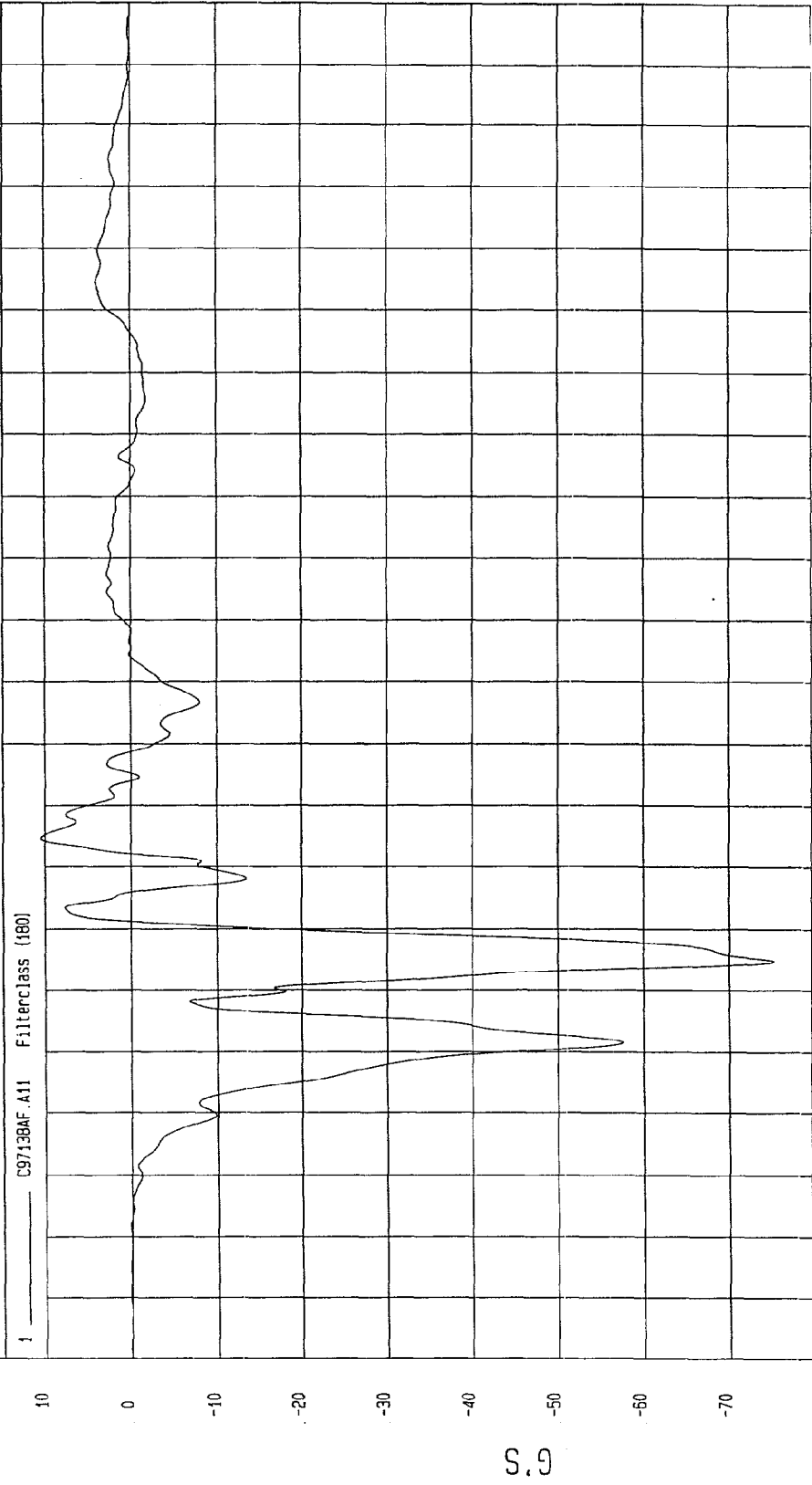


TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

Minimum = -75.15 G'S at 45 msec Maximum = 10.50 G'S at 65 msec

PASSENGER LEFT FOOT @ HEEL X ACCELERATION



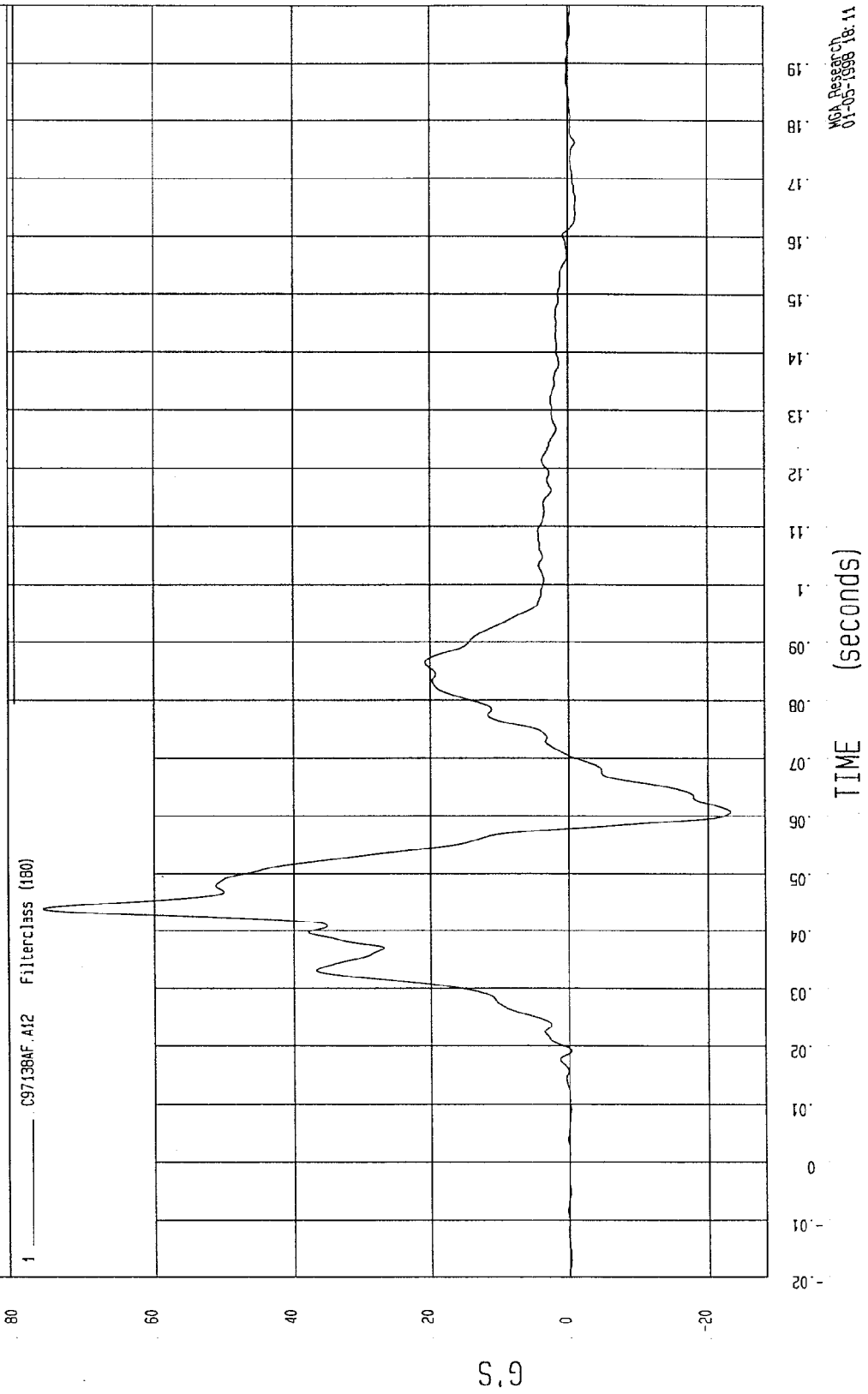
NGA Research
01-05-1996 18:11

TEST: NCAP 35 MPH FRCNTAL IMPACT TEST DATE: 11-24-1997

COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

Minimum = -23.24 G'S at 61 msec Maximum = 75.88 G'S at 44 msec

PASSENGER LEFT FOOT @ HEEL Z ACCELERATION



MPA Research
01-05-1998 18:11

TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 11-24-1997

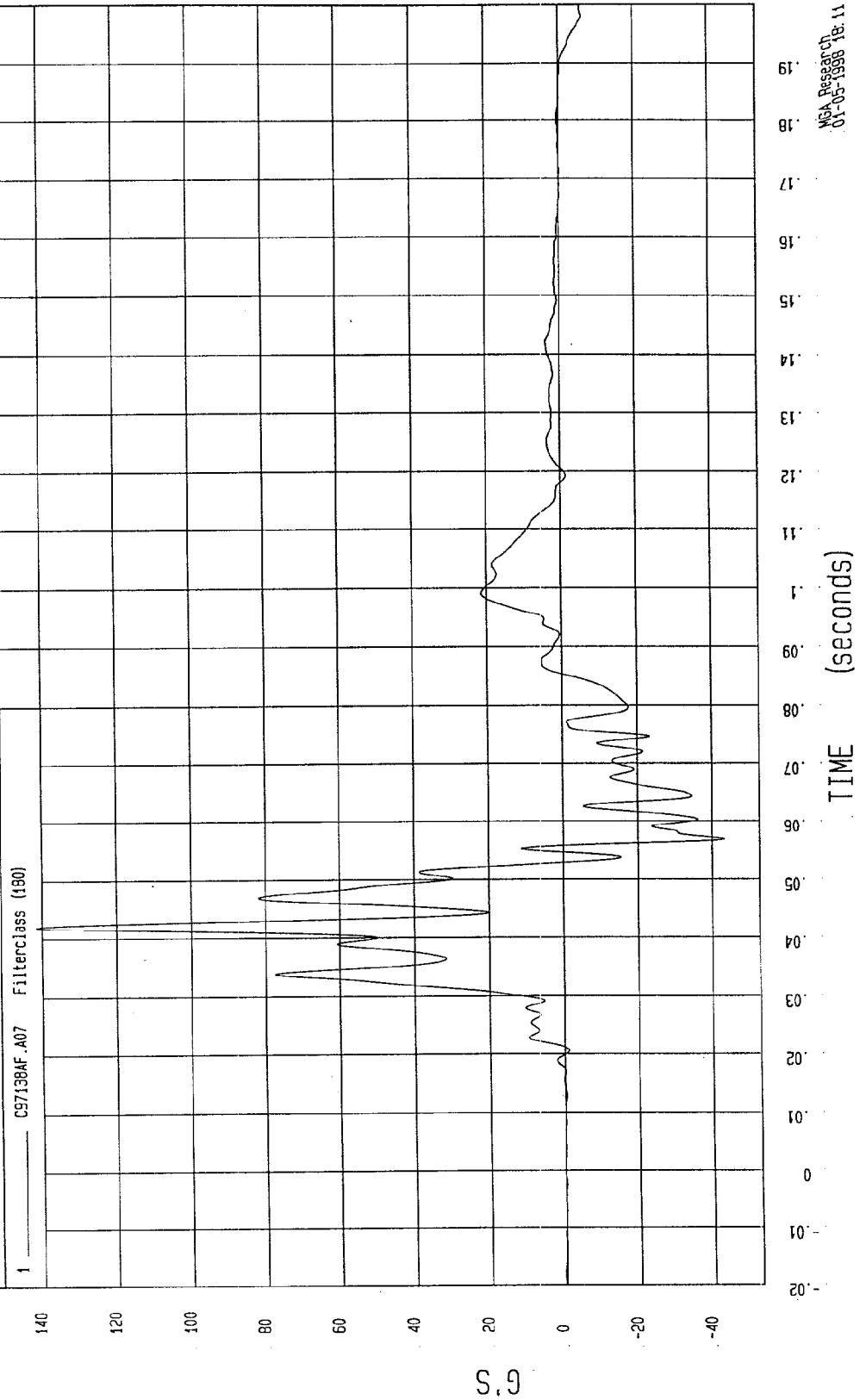
Speed: 35.2 MPH 56.6 KPH

COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Maximum = 141.60 G'S at 42 msec

Minimum = -43.35 G'S at 57 msec

PASSENGER RIGHT FOOT @ BALL Z ACCELERATION



TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

SPEED: 35.2 MPH 56.6 KPH

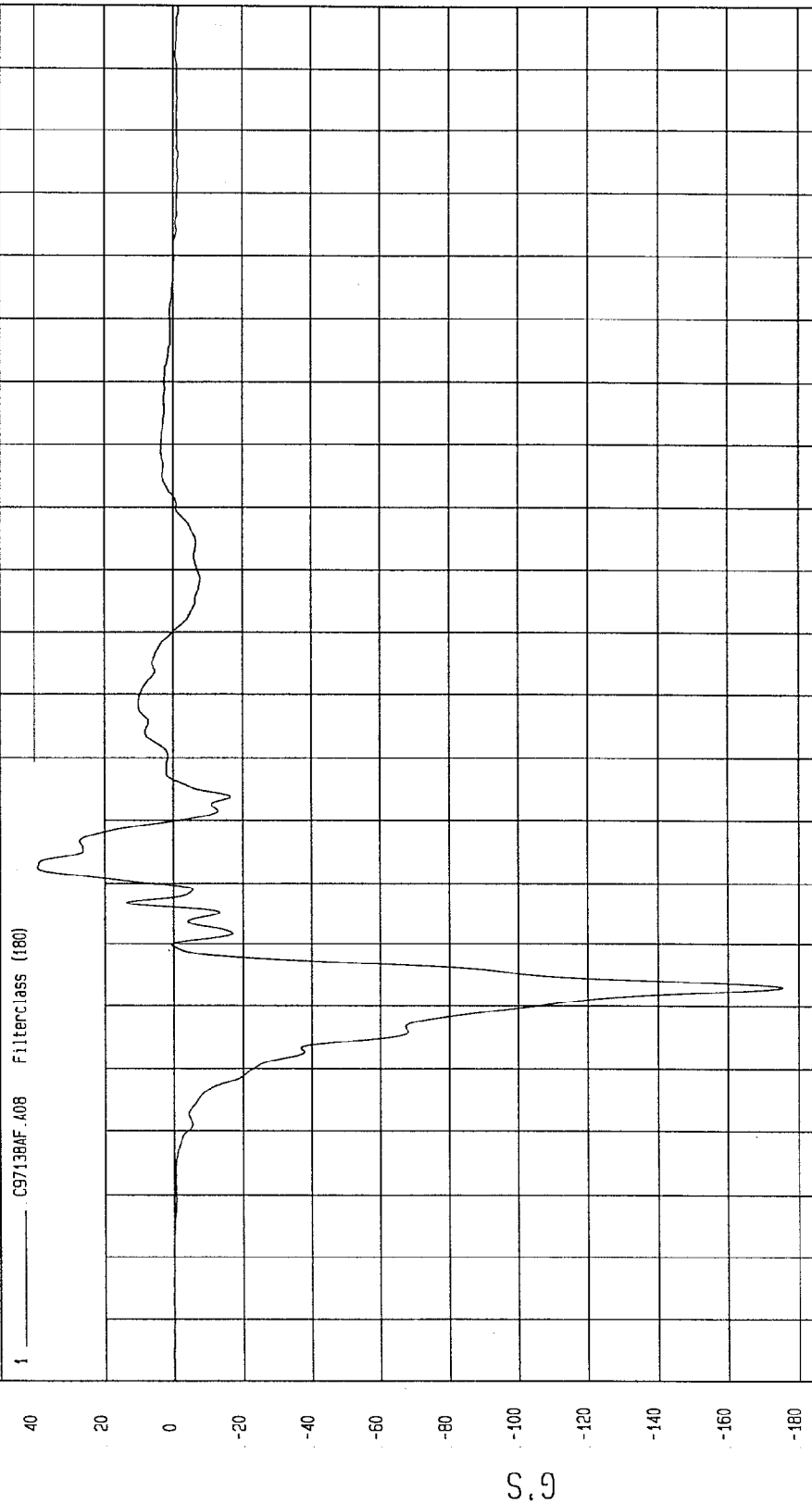
COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Maximum = 39.16 G'S at 62 msec

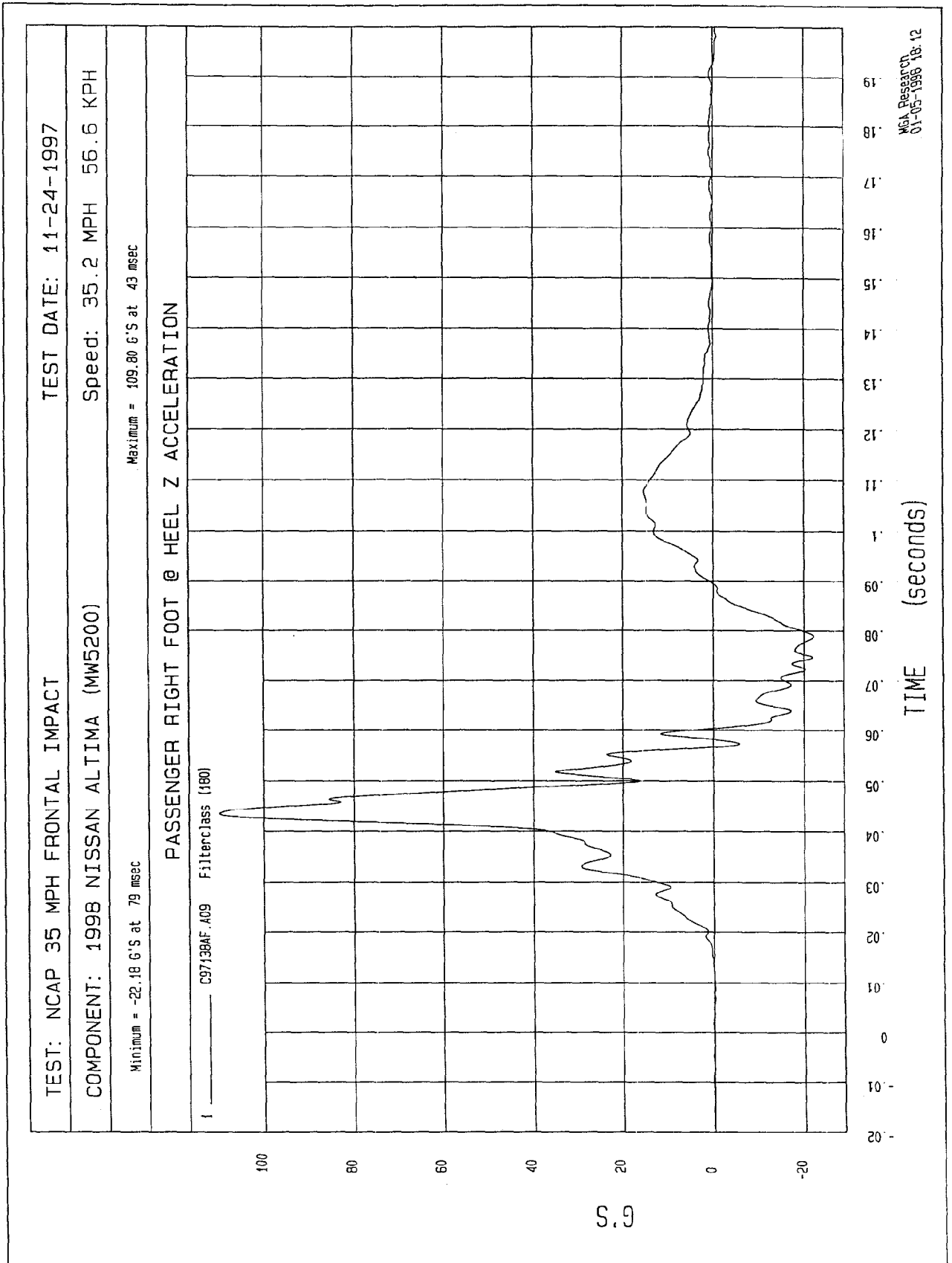
Minimum = -175.59 G'S at 43 msec

PASSENGER RIGHT FOOT @ HEEL X ACCELERATION

1 ——— C9713BAF.408 Filterclass (180)

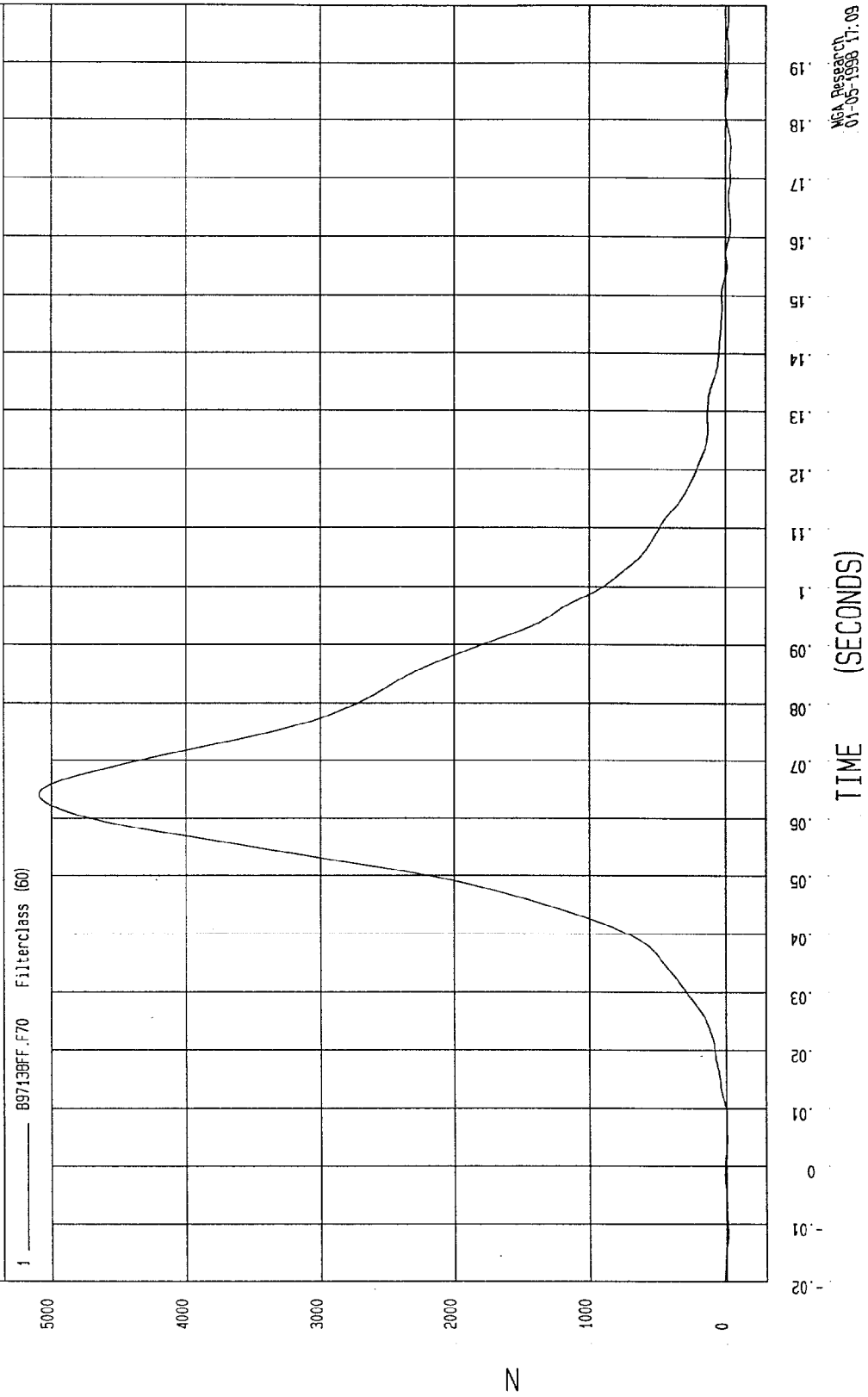


MSA Research
01-05-1998 18:12



TEST: NCAP 35 MPH FRONTAL IMPACT	TEST DATE: 11-24-1997
COMPONENT: 1998 NISSAN ALTIMA (MW5200)	Speed: 35.2 MPH 56.6 KPH
Minimum = -37.50 N at 175 msec	Maximum = 5091.11 N at 64 msec

PASSENGER LAP BELT FORCE



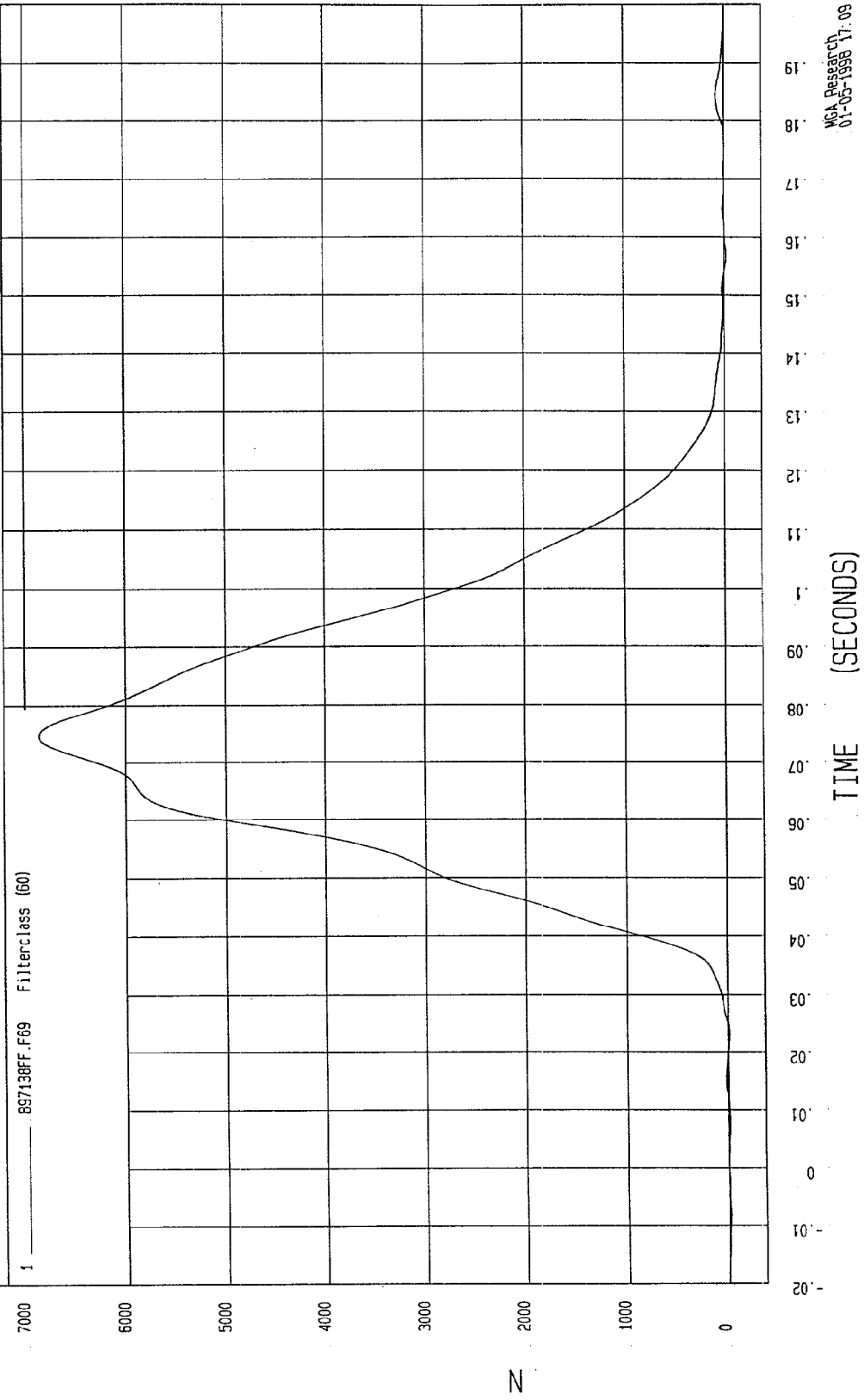
NEA Research
01-05-1998 17.09

TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

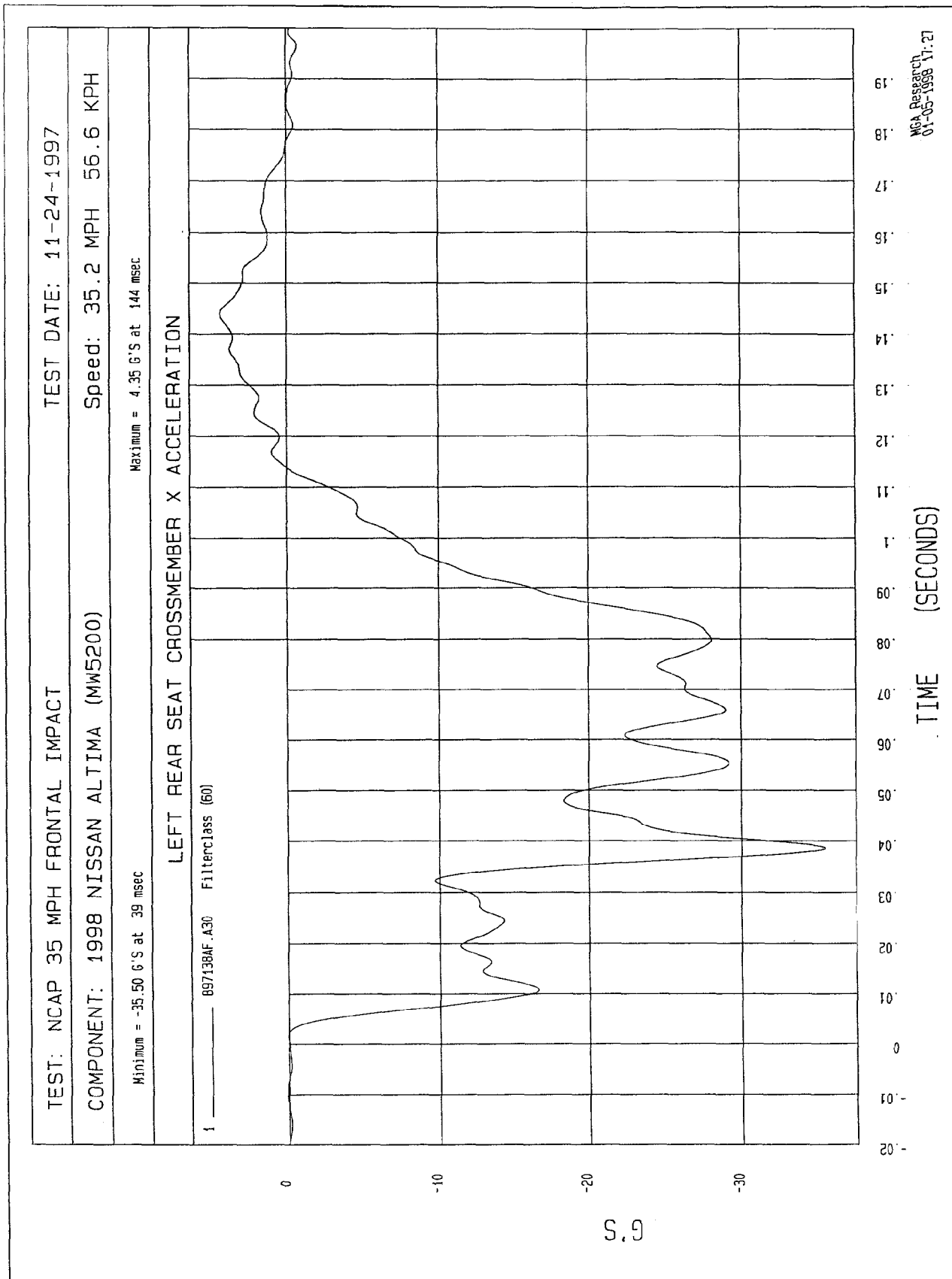
COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

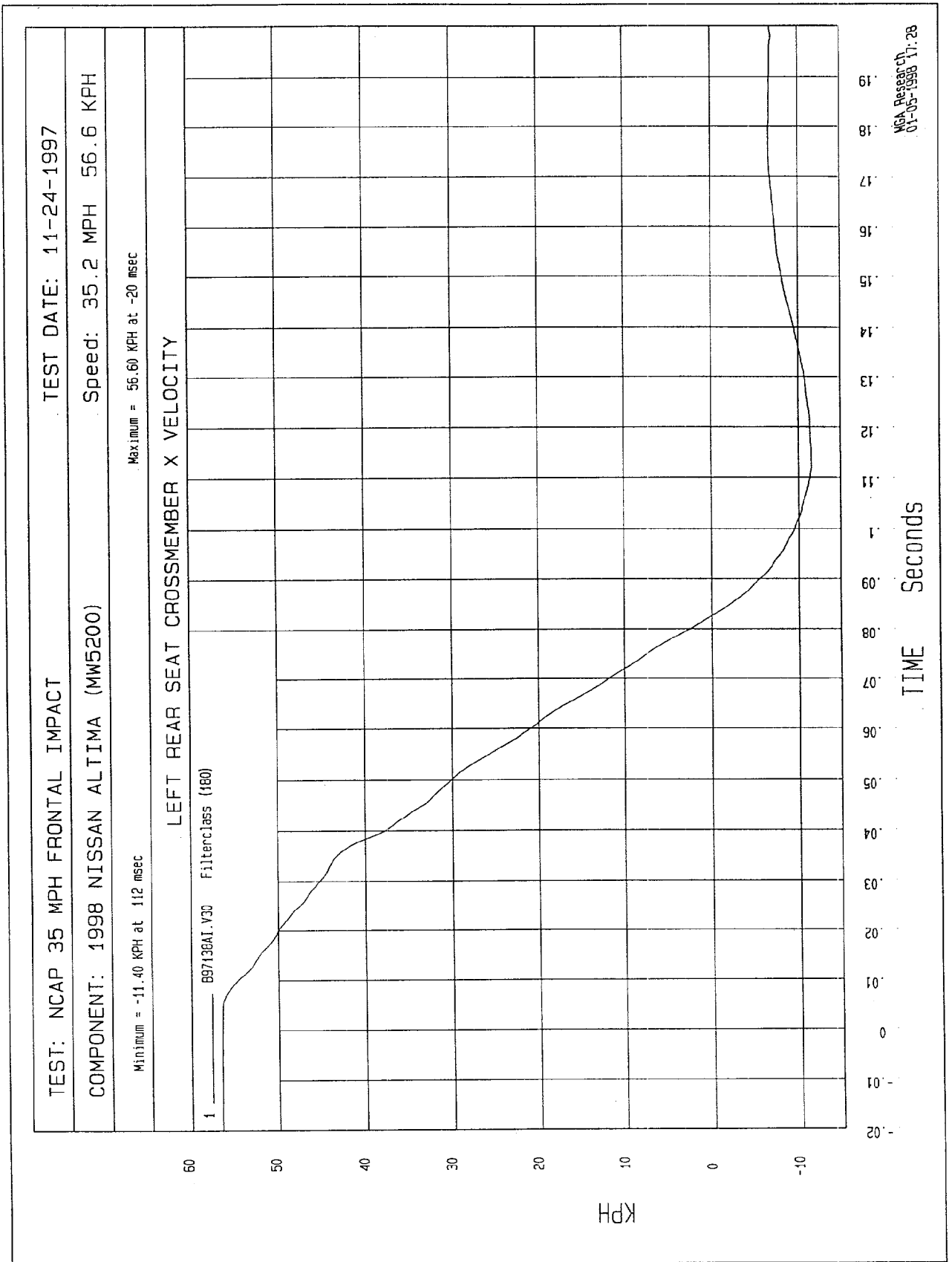
Minimum = -24.42 N at 157 msec Maximum = 6864.47 N at 75 msec

PASSENGER SHOULDER BELT FORCE



MCA Research
01-05-1998 17:09





TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 11-24-1997

Speed: 35.2 MPH 56.6 KPH

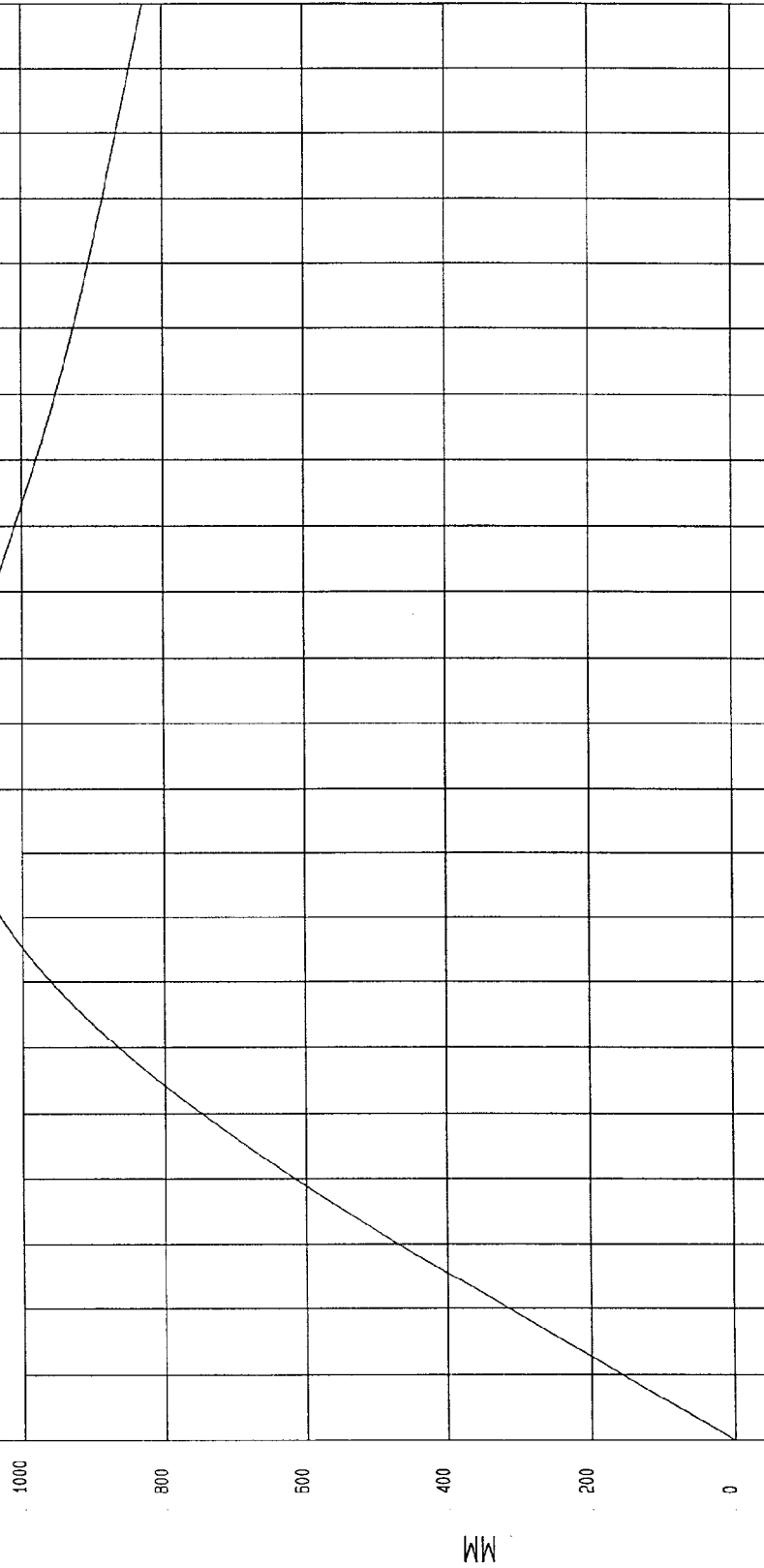
COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Maximum = 1098.43 MM at 83 msec

Minimum = 0 MM at -20 msec

LEFT REAR SEAT CROSSMEMBER X DISPLACEMENT

1 ——— B97138AI.030 Filterclass (180)

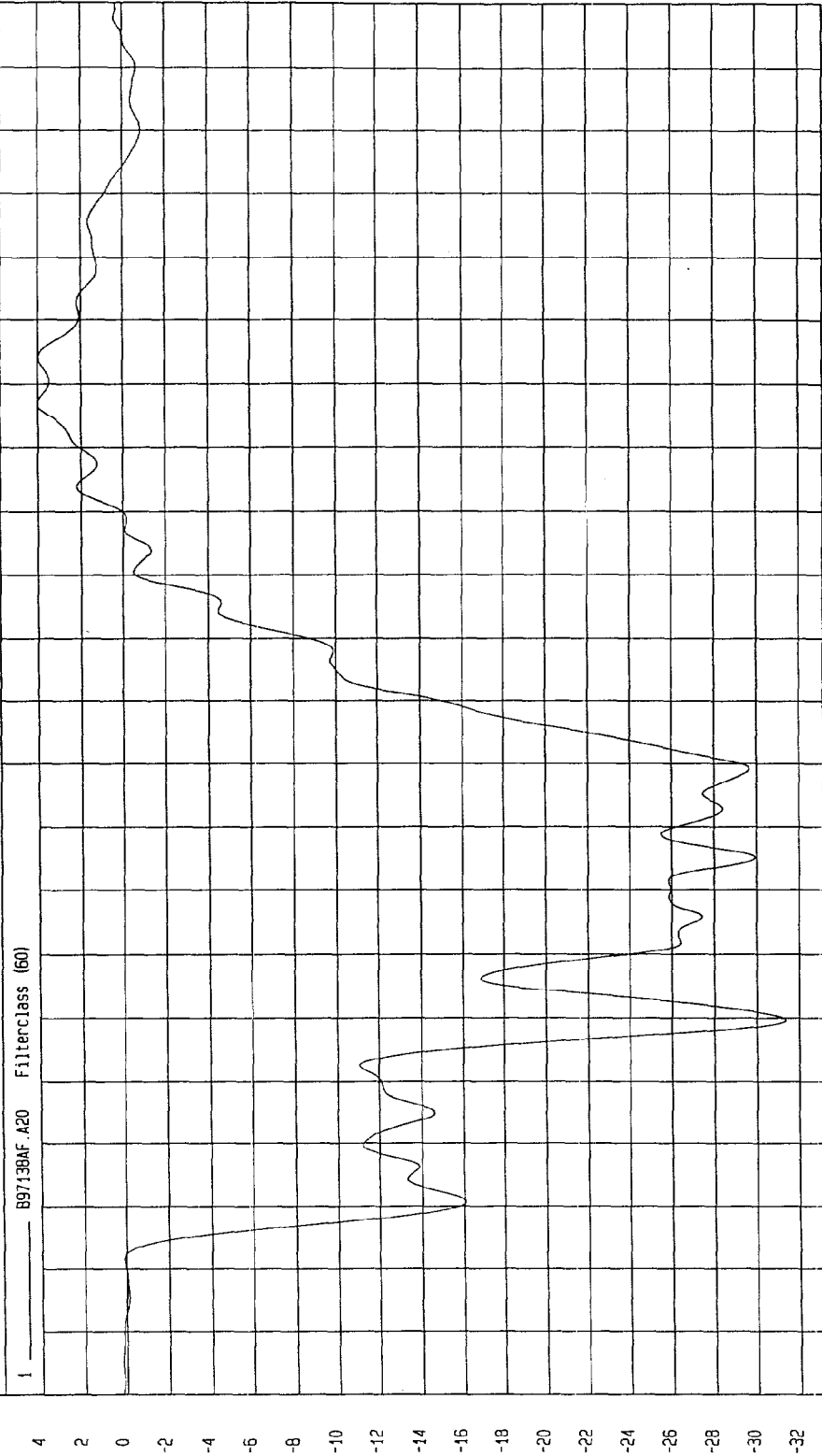


TIME Seconds

NSA Research
01-05-1998 17:29

TEST: NCAP 35 MPH FRONTAL IMPACT	TEST DATE: 11-24-1997
COMPONENT: 1998 NISSAN ALTIMA (MW5200)	Speed: 35.2 MPH 56.6 KPH
Minimum = -31.35 G'S at 40 msec	
Maximum = 4.05 G'S at 137 msec	

RIGHT REAR SEAT CROSSMEMBER X ACCELERATION

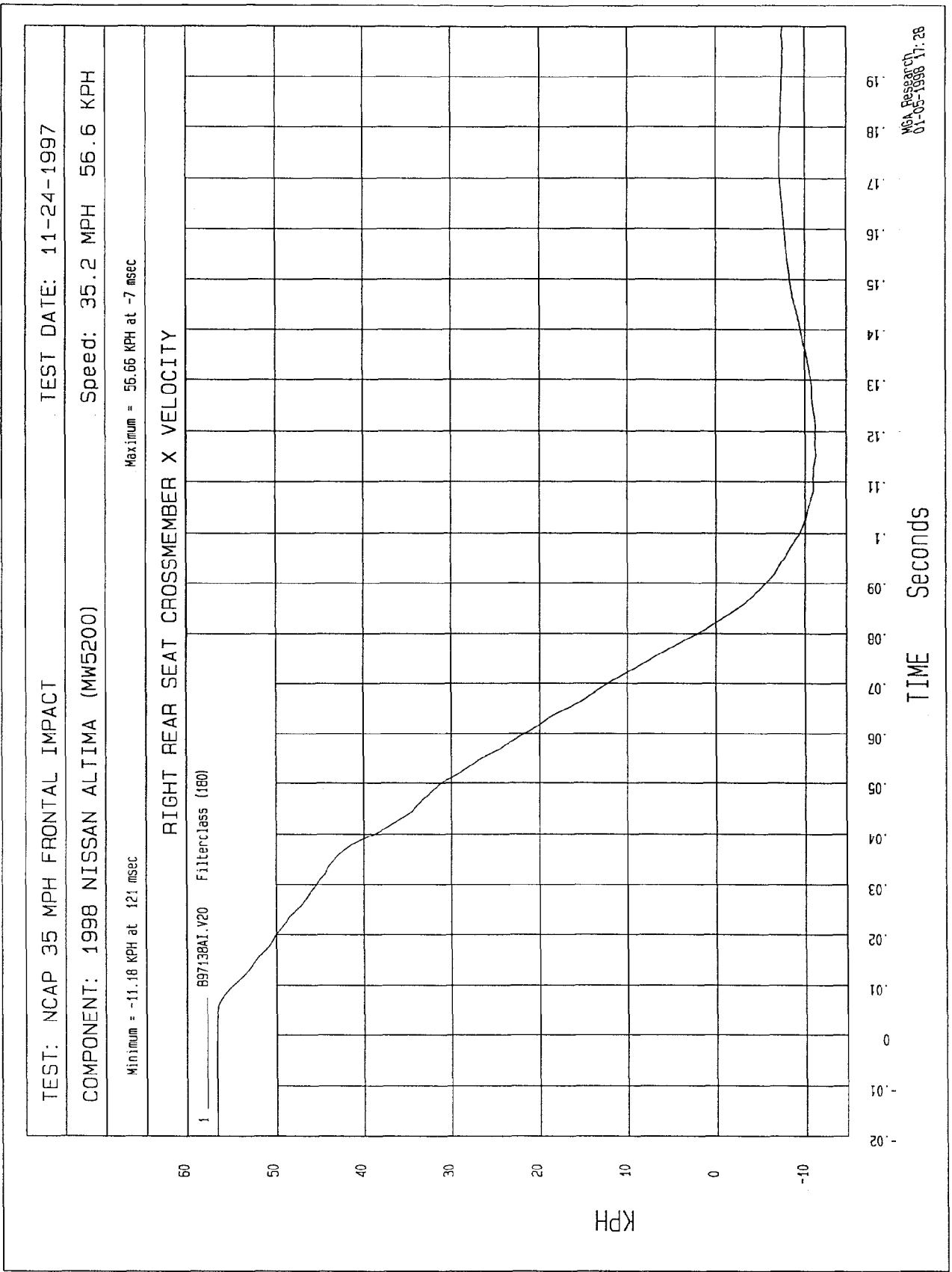


TIME (SECONDS)

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

MCA Research
01-05-1998 17: 27

G

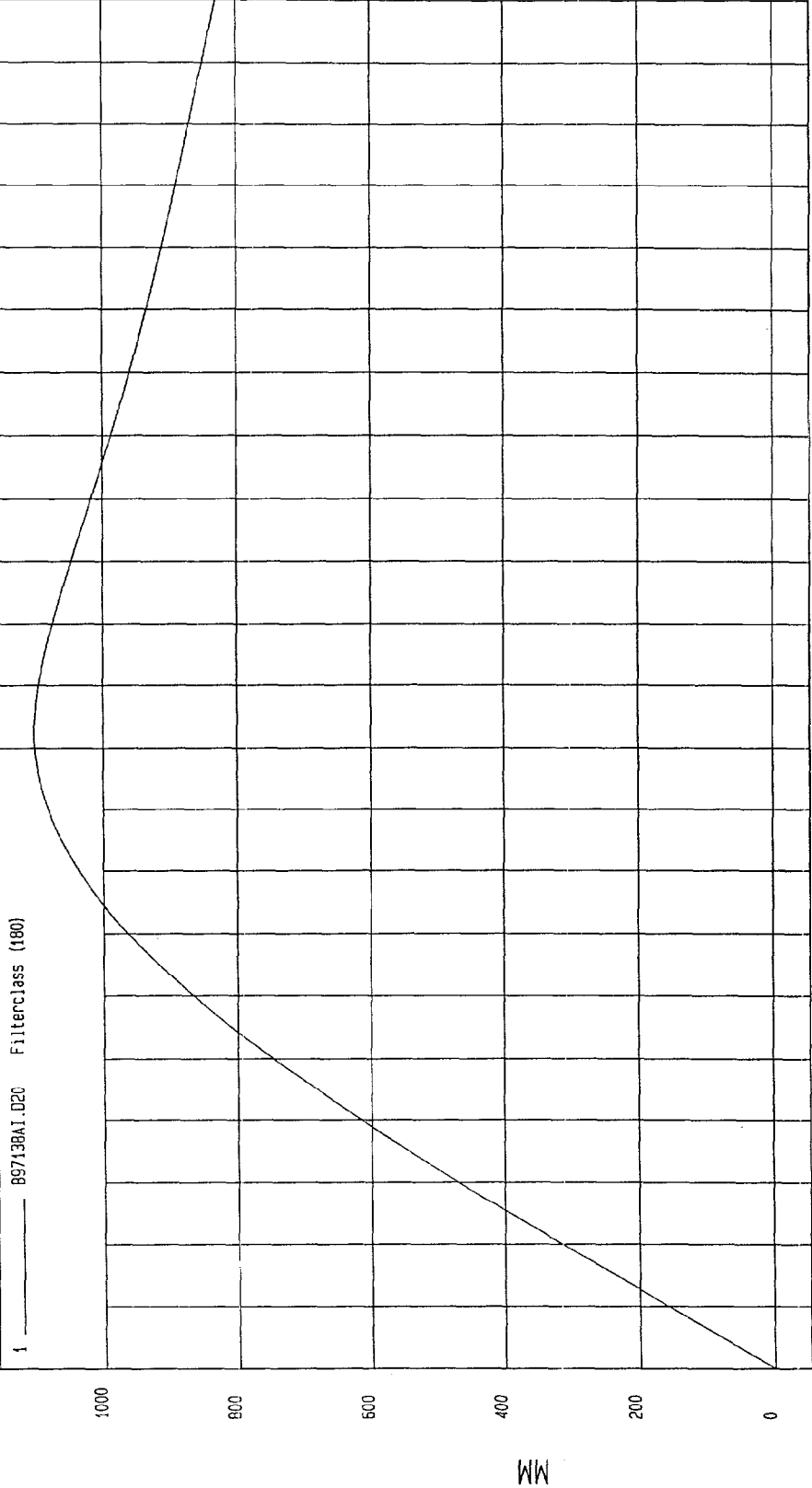


TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

Minimum = 0 MM at -20 msec Maximum = 1104.69 MM at 82 msec

RIGHT REAR SEAT CROSSMEMBER X DISPLACEMENT

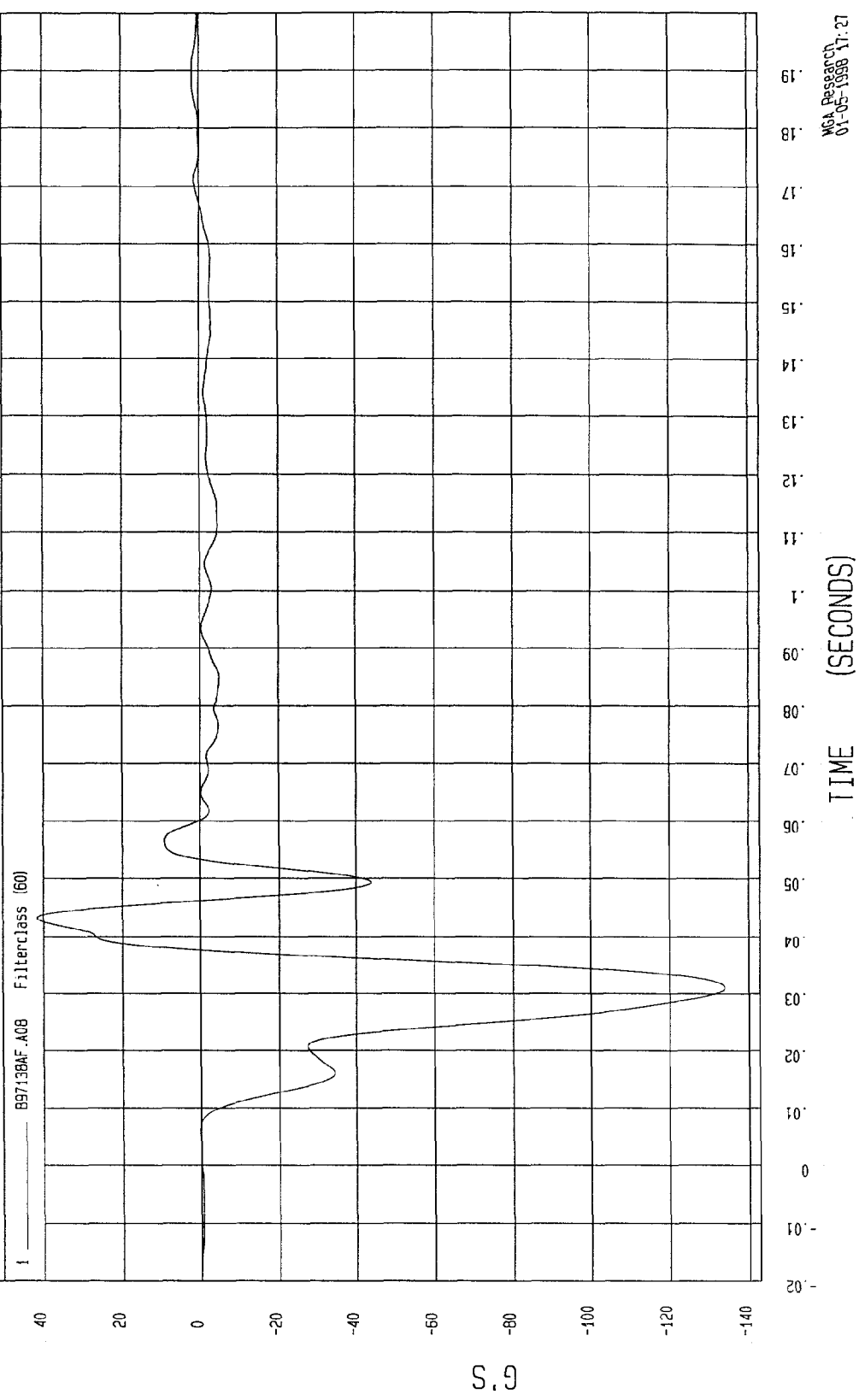


NSA Research
01-05-1996 17:29

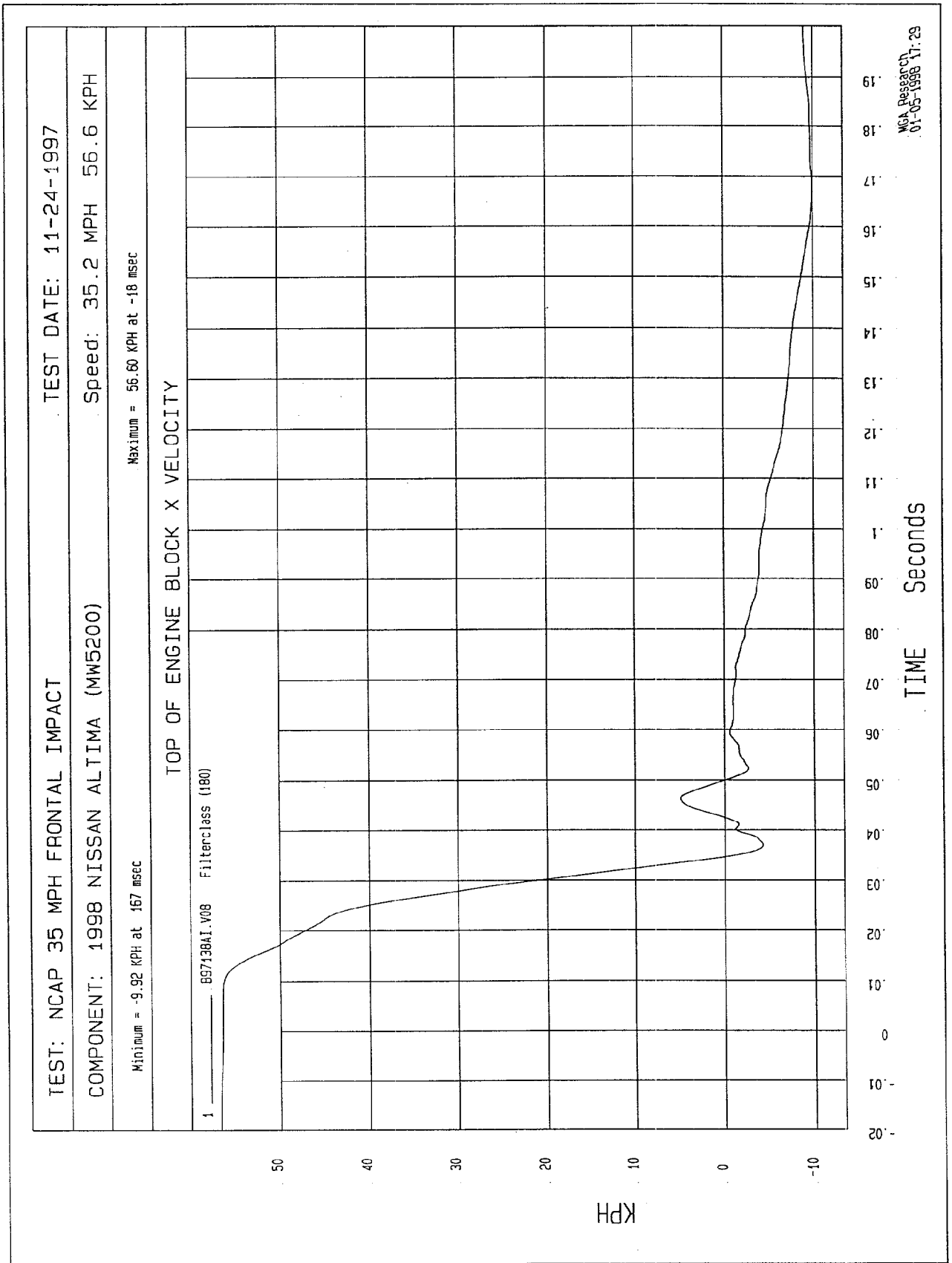
TIME Seconds

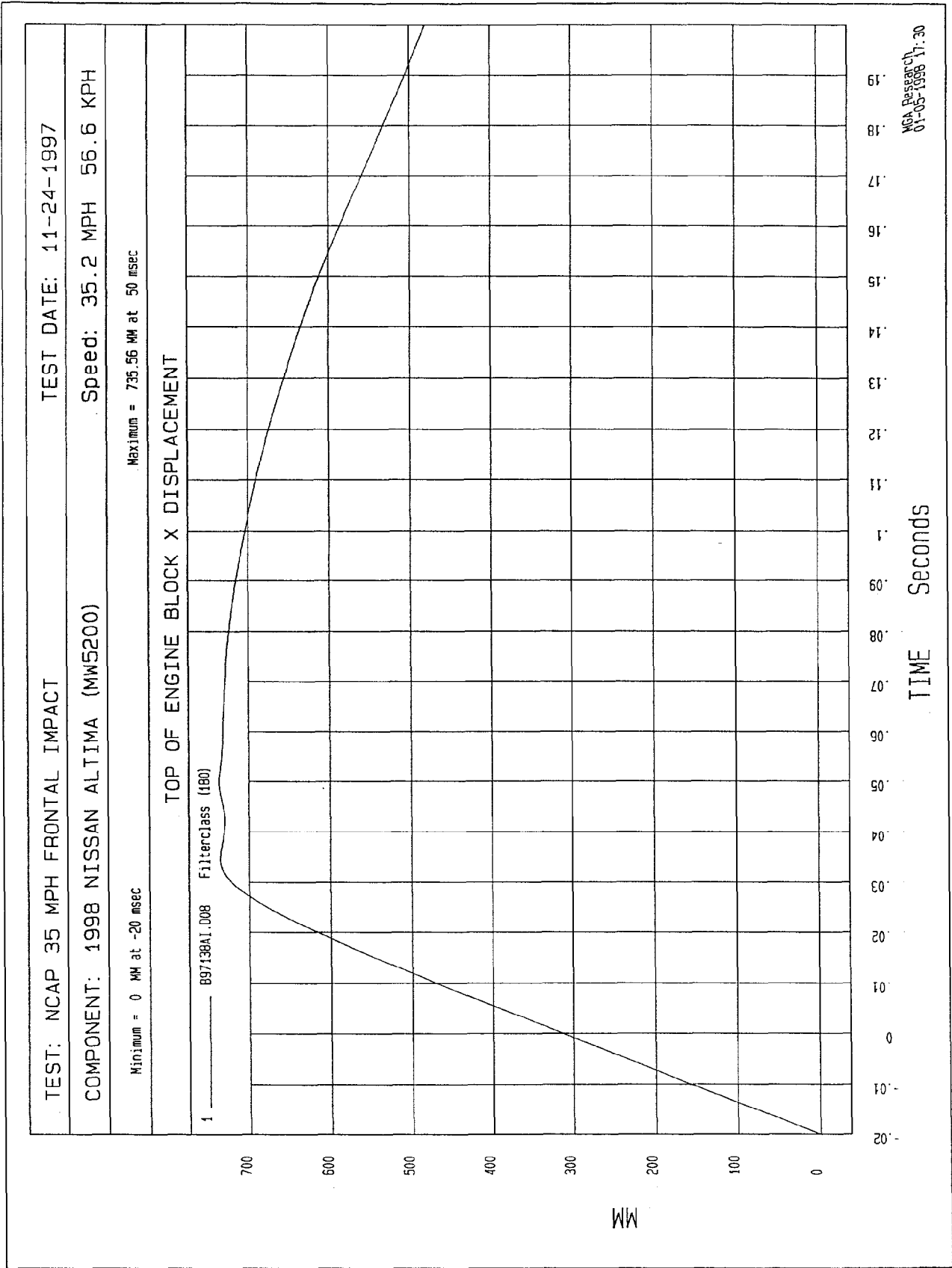
TEST: NCAP 35 MPH FRONTAL IMPACT	TEST DATE: 11-24-1997
COMPONENT: 1998 NISSAN ALTIMA (MW5200)	Speed: 35.2 MPH 56.6 KPH
Minimum = -133.97 G'S at 31 msec	Maximum = 41.52 G'S at 43 msec

TOP OF ENGINE BLOCK X ACCELERATION



MCA Research
01-05-1998 11:27



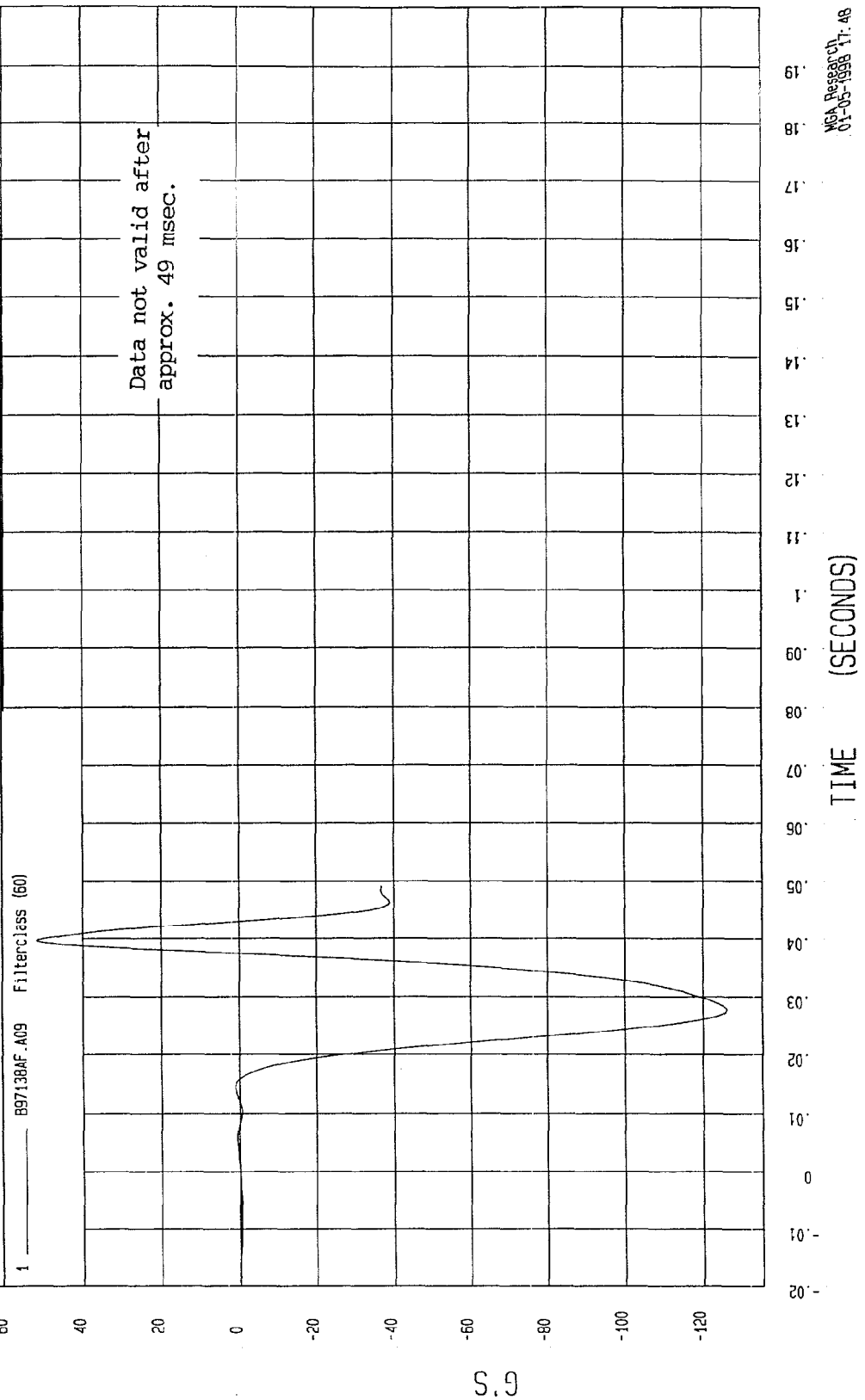


TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

Minimum = -126.00 G'S at 28 msec Maximum = 51.59 G'S at 40 msec

BOTTOM OF ENGINE X ACCELERATION

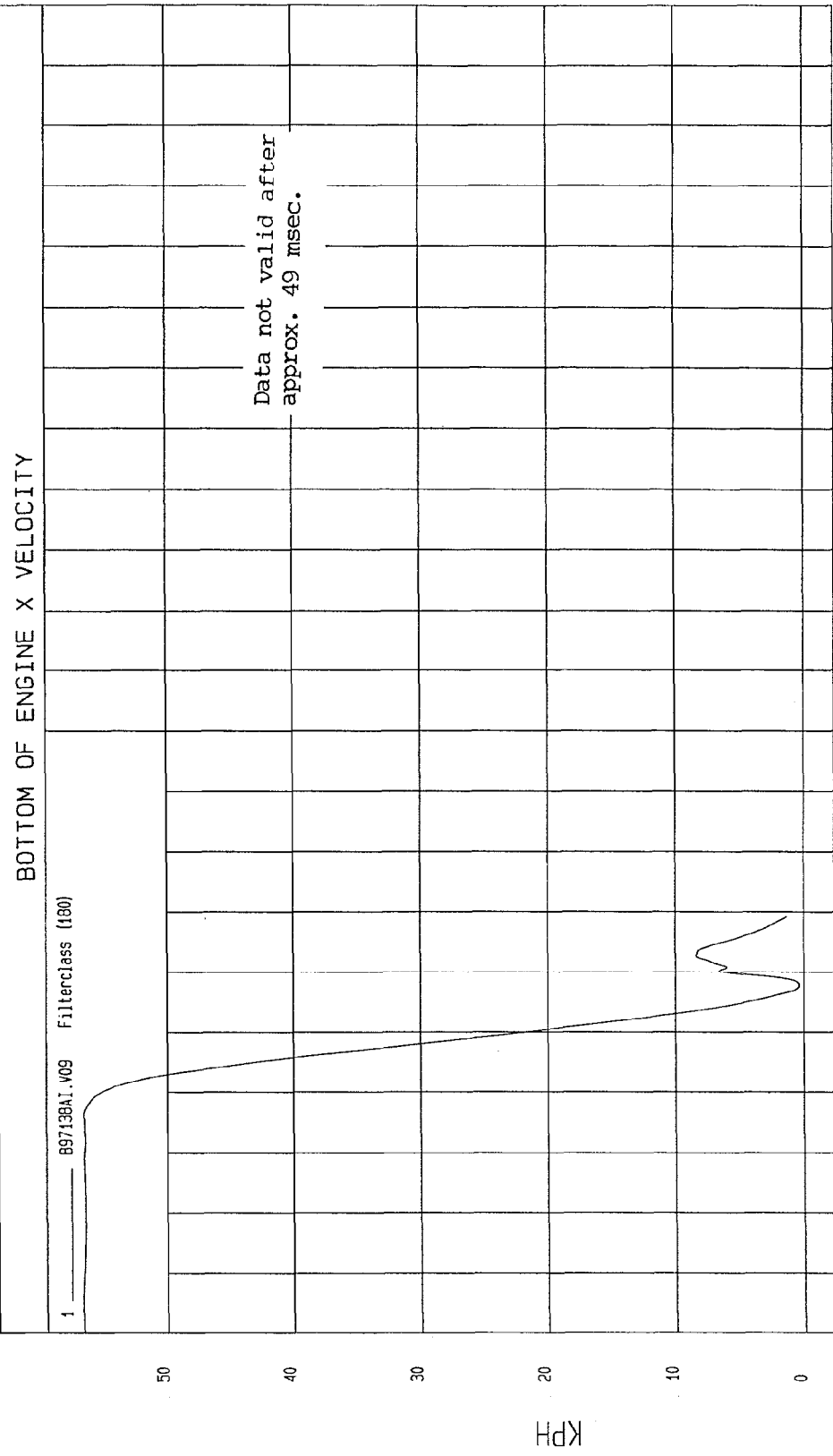


MEA Research
01-05-1998 17:48

TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

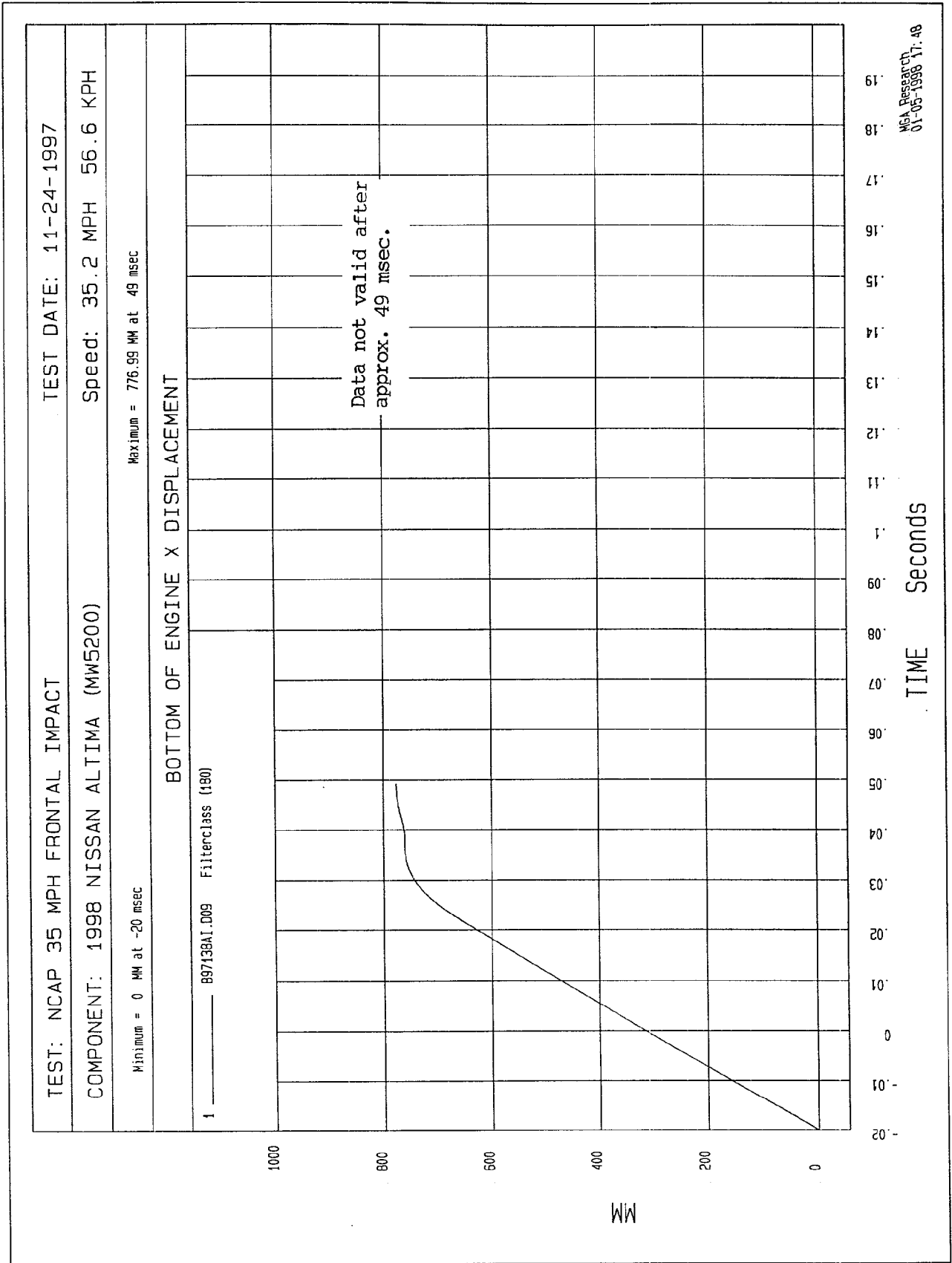
COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

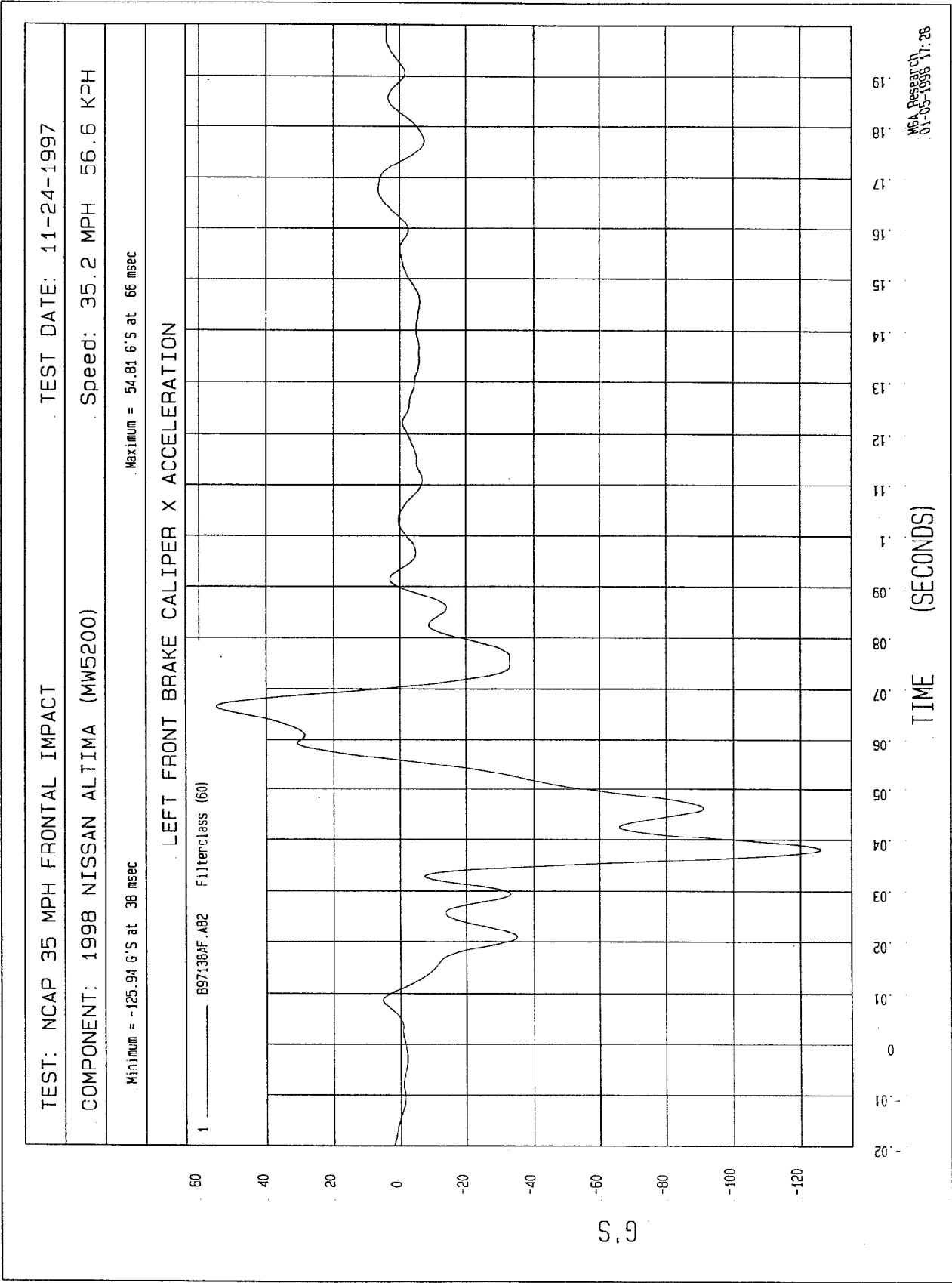
Minimum = .39 KPH at 38 msec Maximum = 56.62 KPH at -15 msec

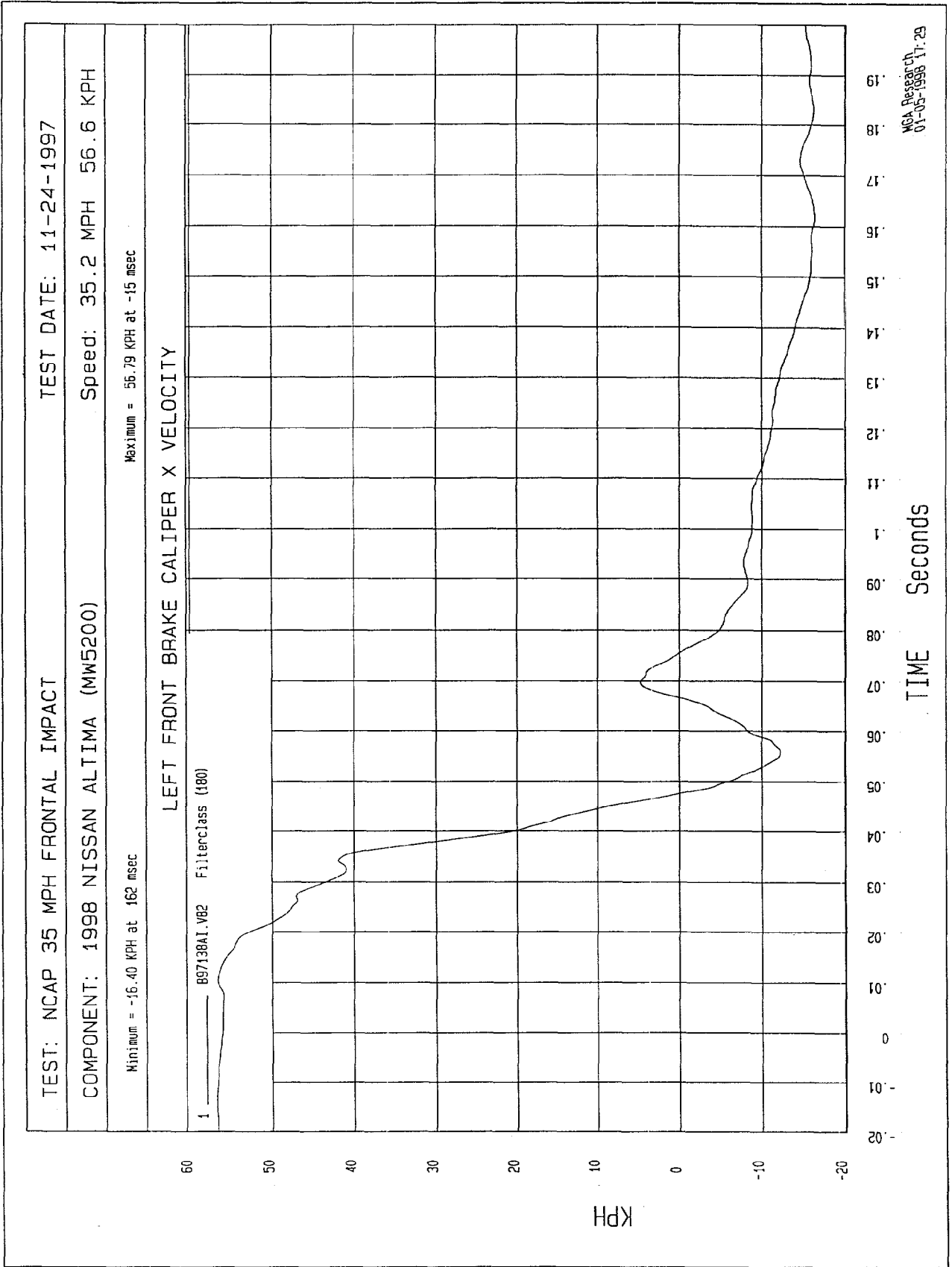


TIME Seconds

NGA Research
01-05-1998 11:48





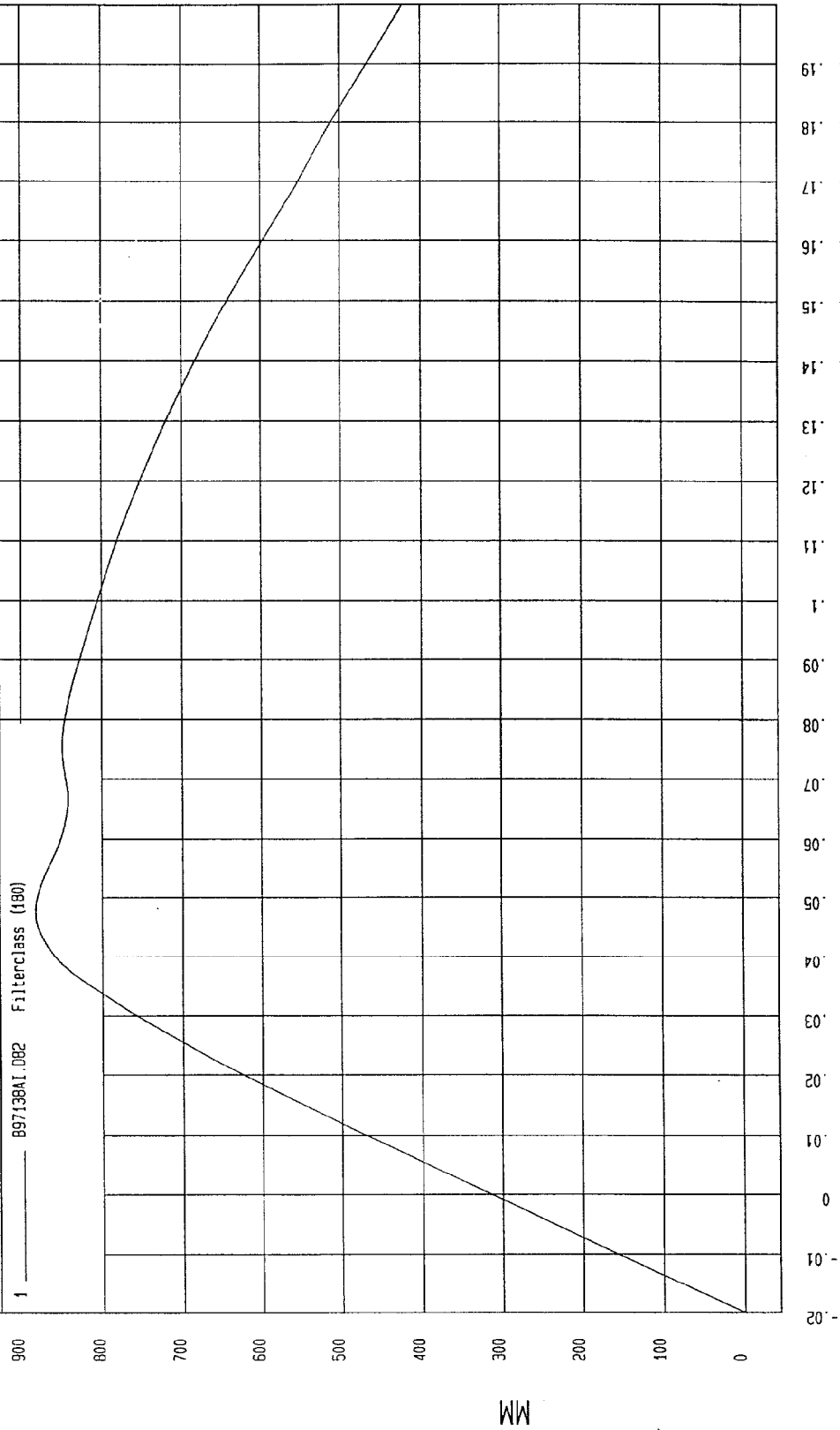


TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

Minimum = 0 MM at -20 msec Maximum = 882.86 MM at 48 msec

LEFT FRONT BRAKE CALIPER X DISPLACEMENT



HGA Research
01-05-1998 17:30

TEST: NCAP 35 MPH FRONTAL IMPACT

TEST DATE: 11-24-1997

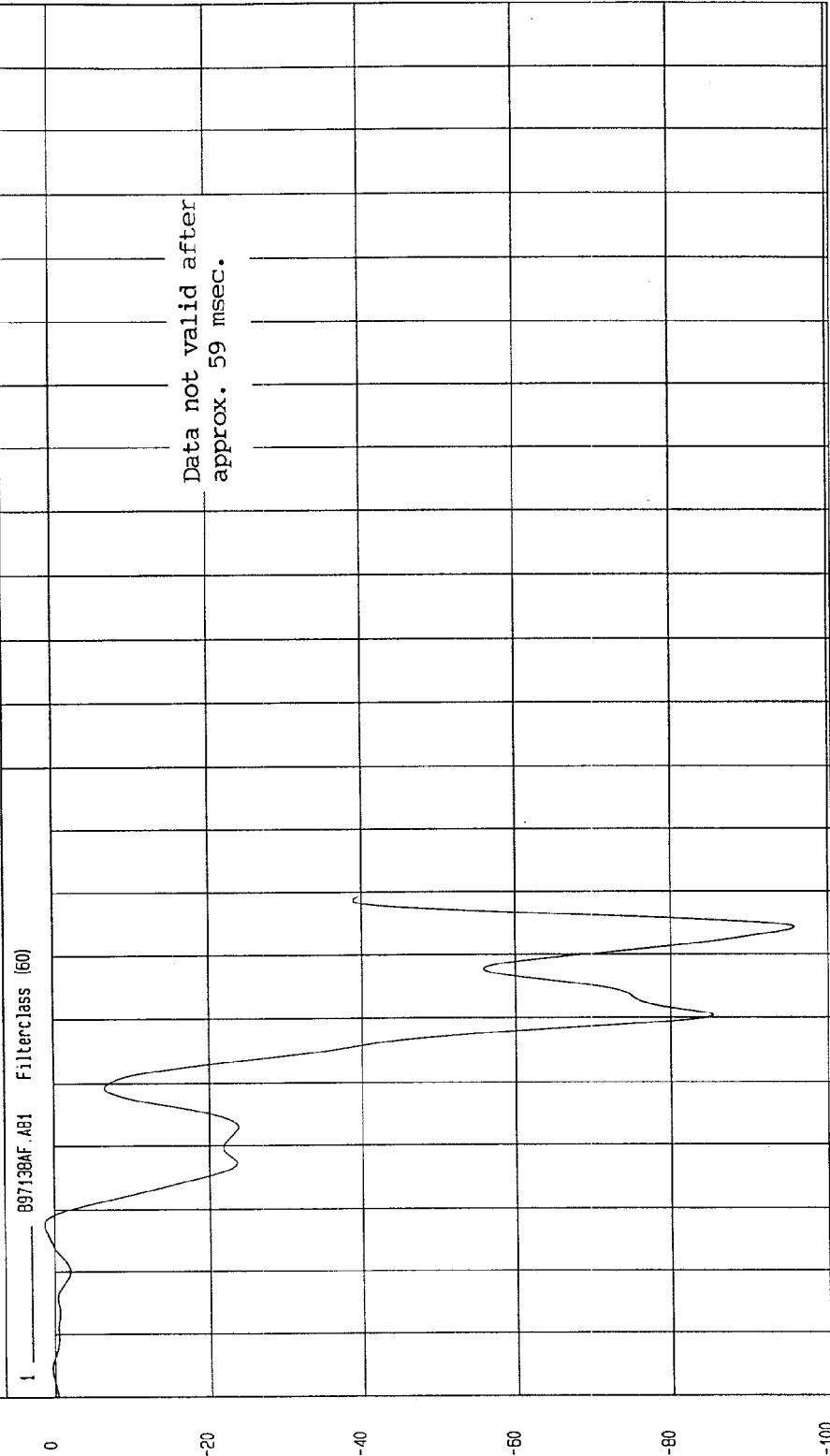
Speed: 35.2 MPH 56.6 KPH

COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Maximum = 1.25 G's at 8 msec

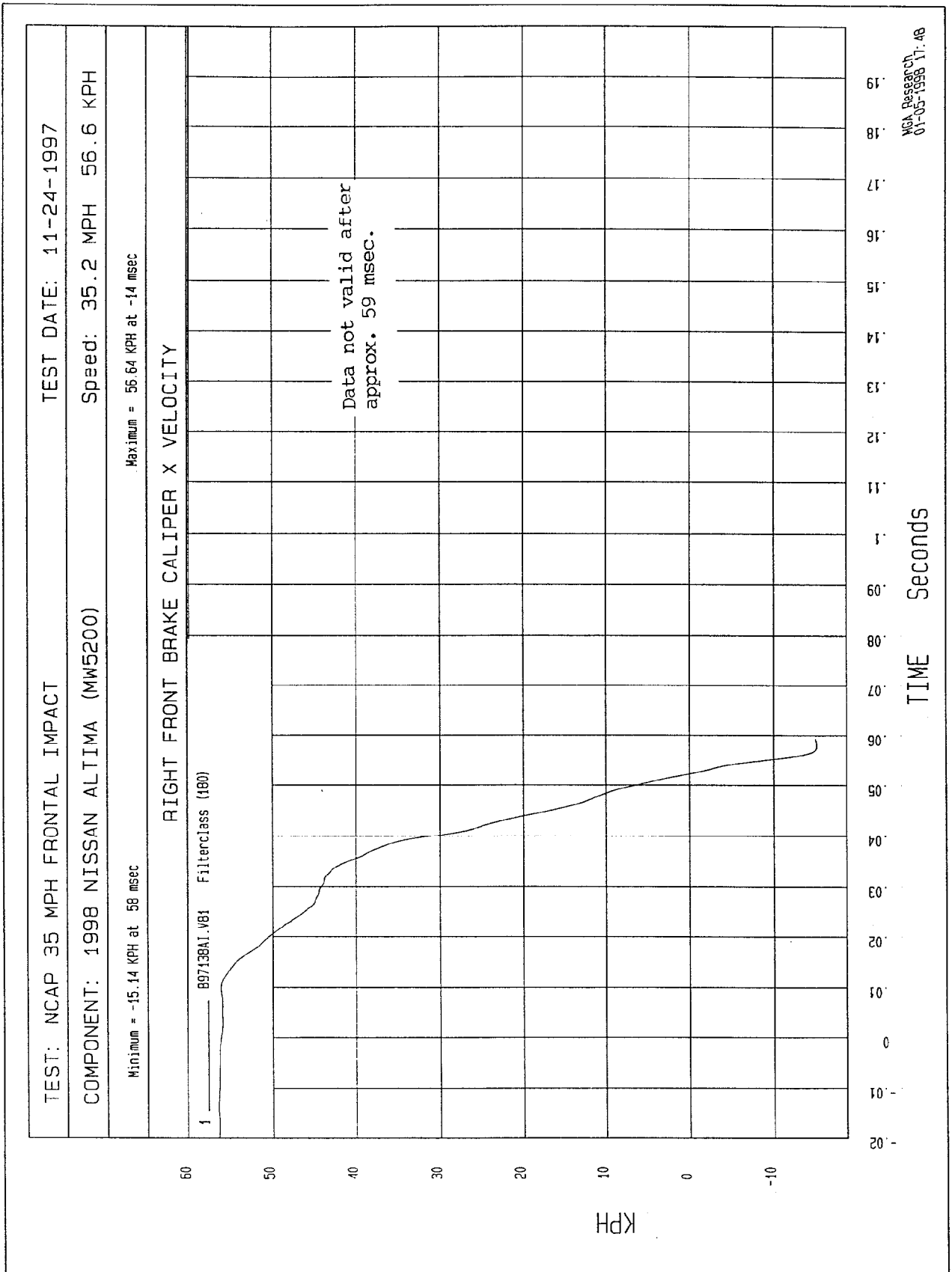
Minimum = -95.70 G's at 54 msec

RIGHT FRONT BRAKE CALIPER X ACCELERATION



MGA Research
01-05-1998 17.48

TIME (SECONDS)

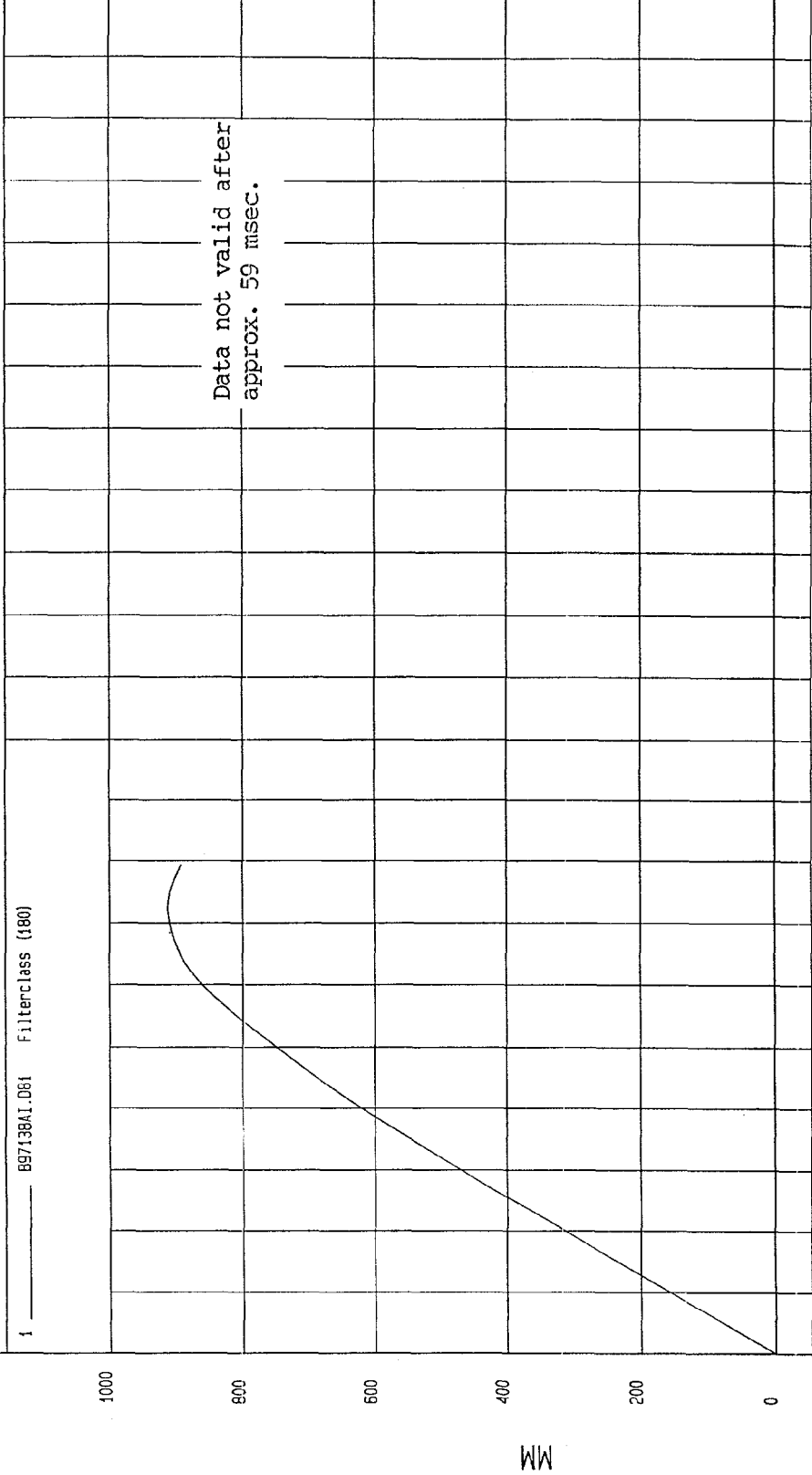


TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 55.6 KPH

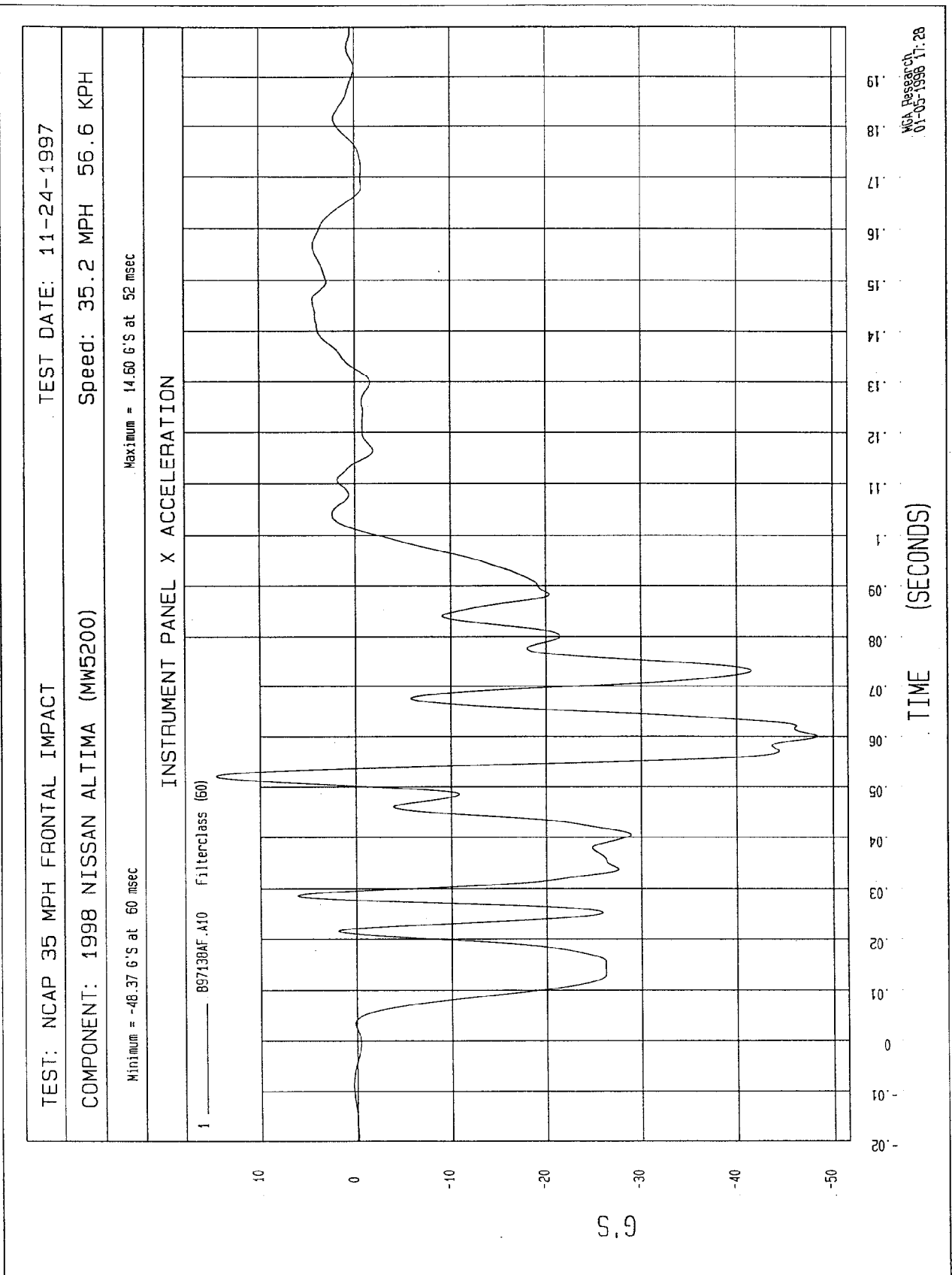
Minimum = 0 MM at -20 msec Maximum = 912.22 MM at 52 msec

RIGHT FRONT BRAKE CALIPER X DISPLACEMENT



TIME Seconds

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

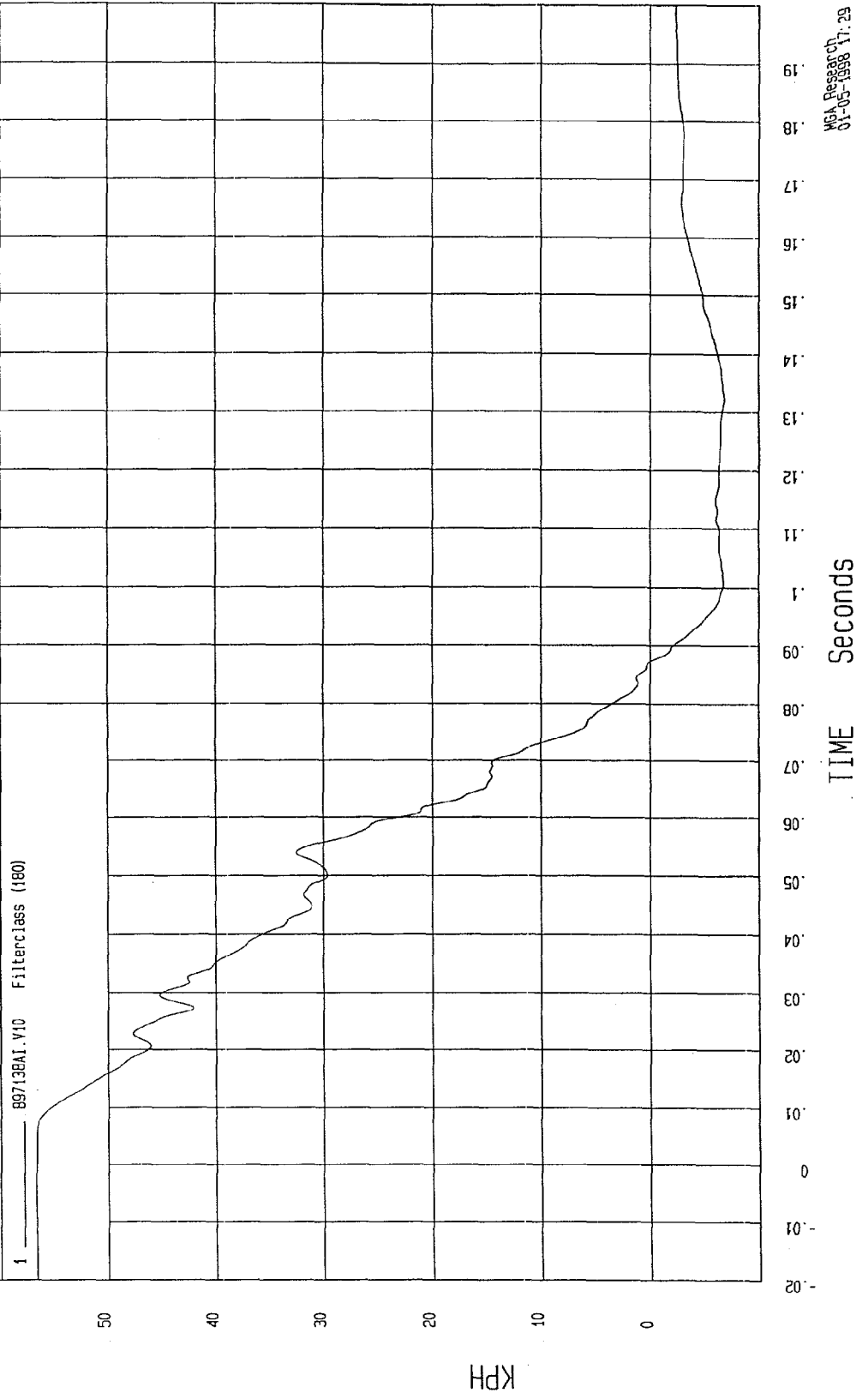


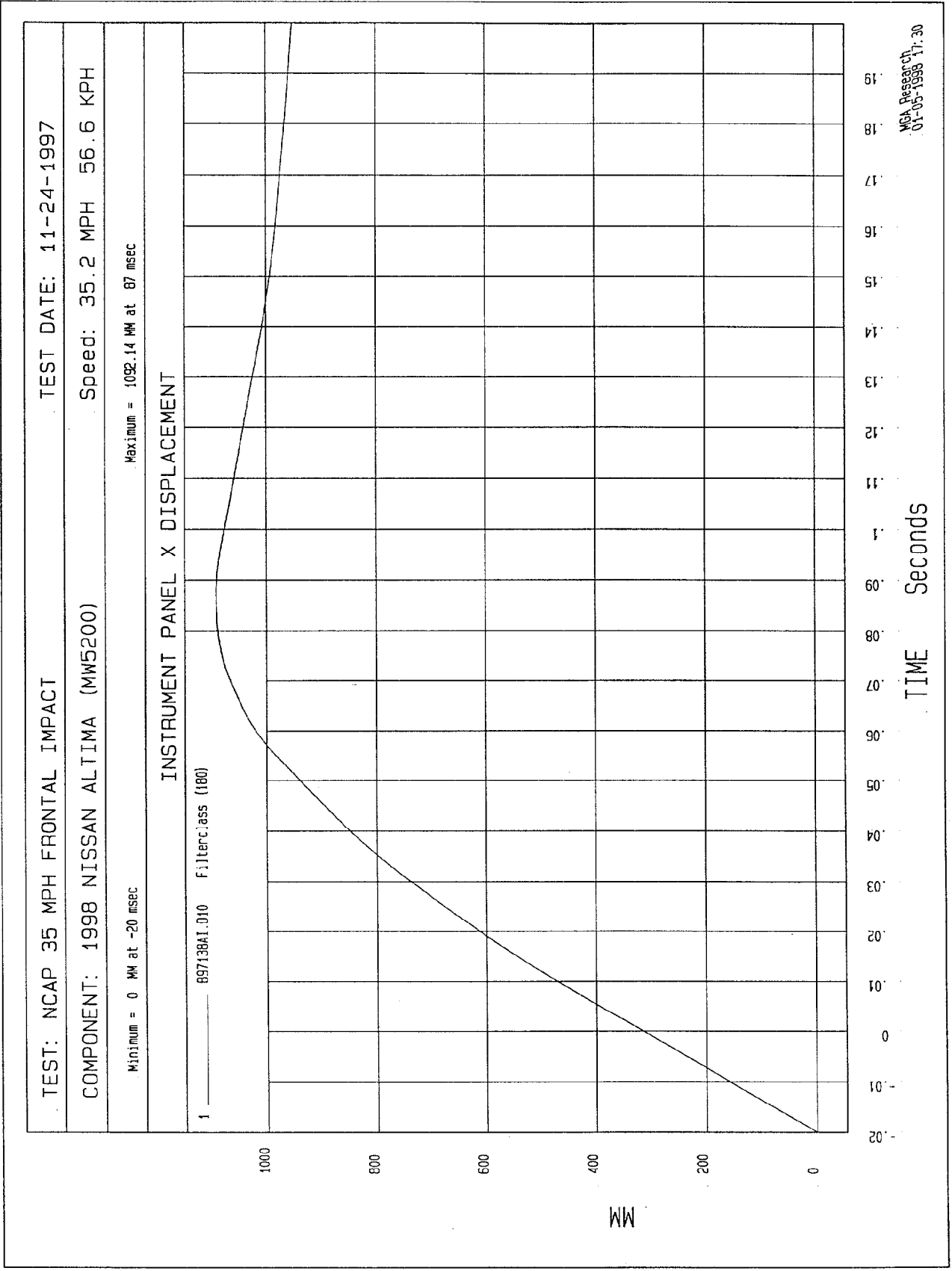
TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

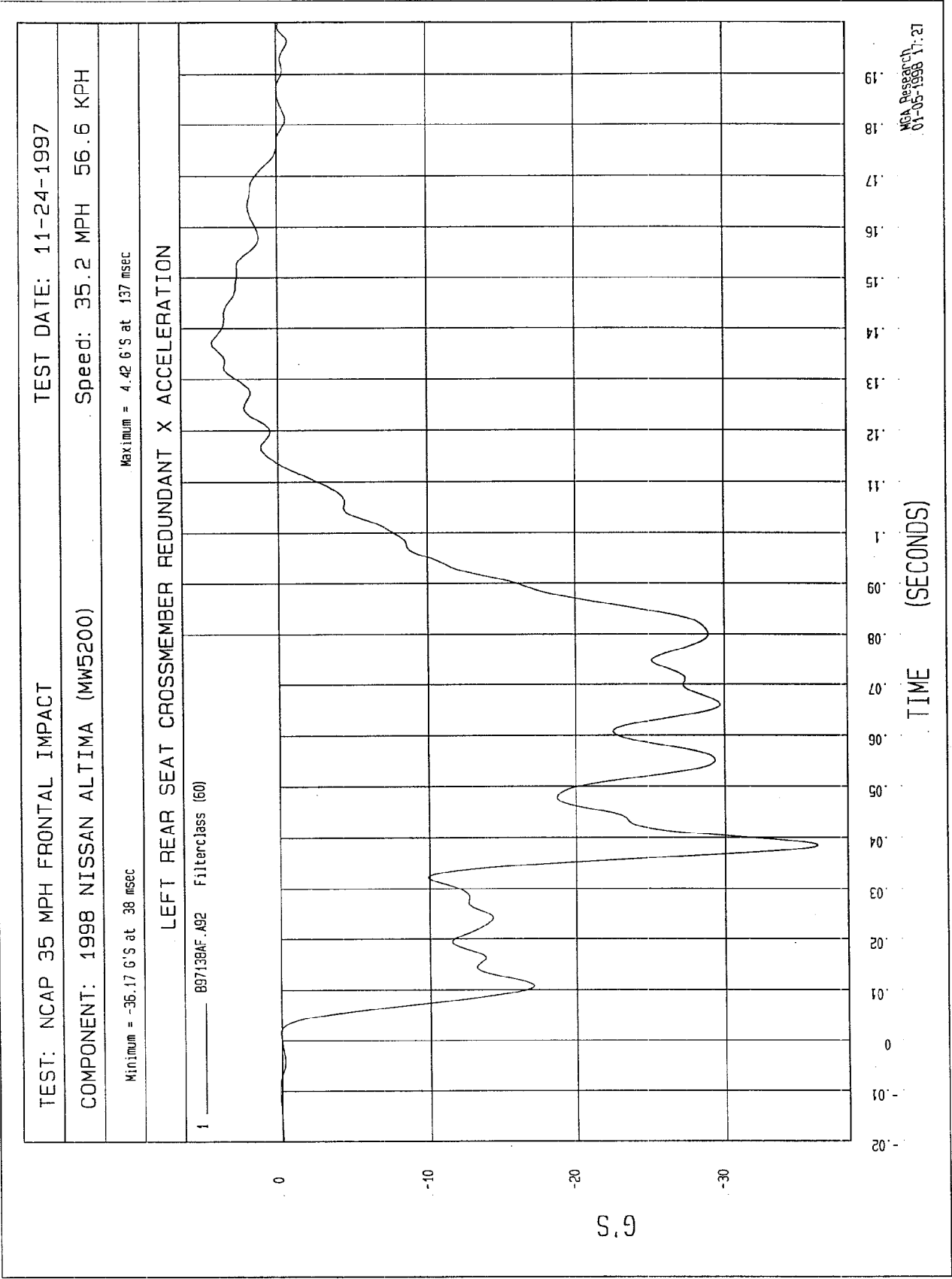
COMPONENT: 1998 NISSAN ALTIMA (MW5200) Speed: 35.2 MPH 56.6 KPH

Minimum = -6.64 KPH at .132 msec Maximum = 56.67 KPH at -.5 msec

INSTRUMENT PANEL X VELOCITY







TEST: NCAP 35 MPH FRONTAL IMPACT TEST DATE: 11-24-1997

SPEED: 35.2 MPH 56.6 KPH

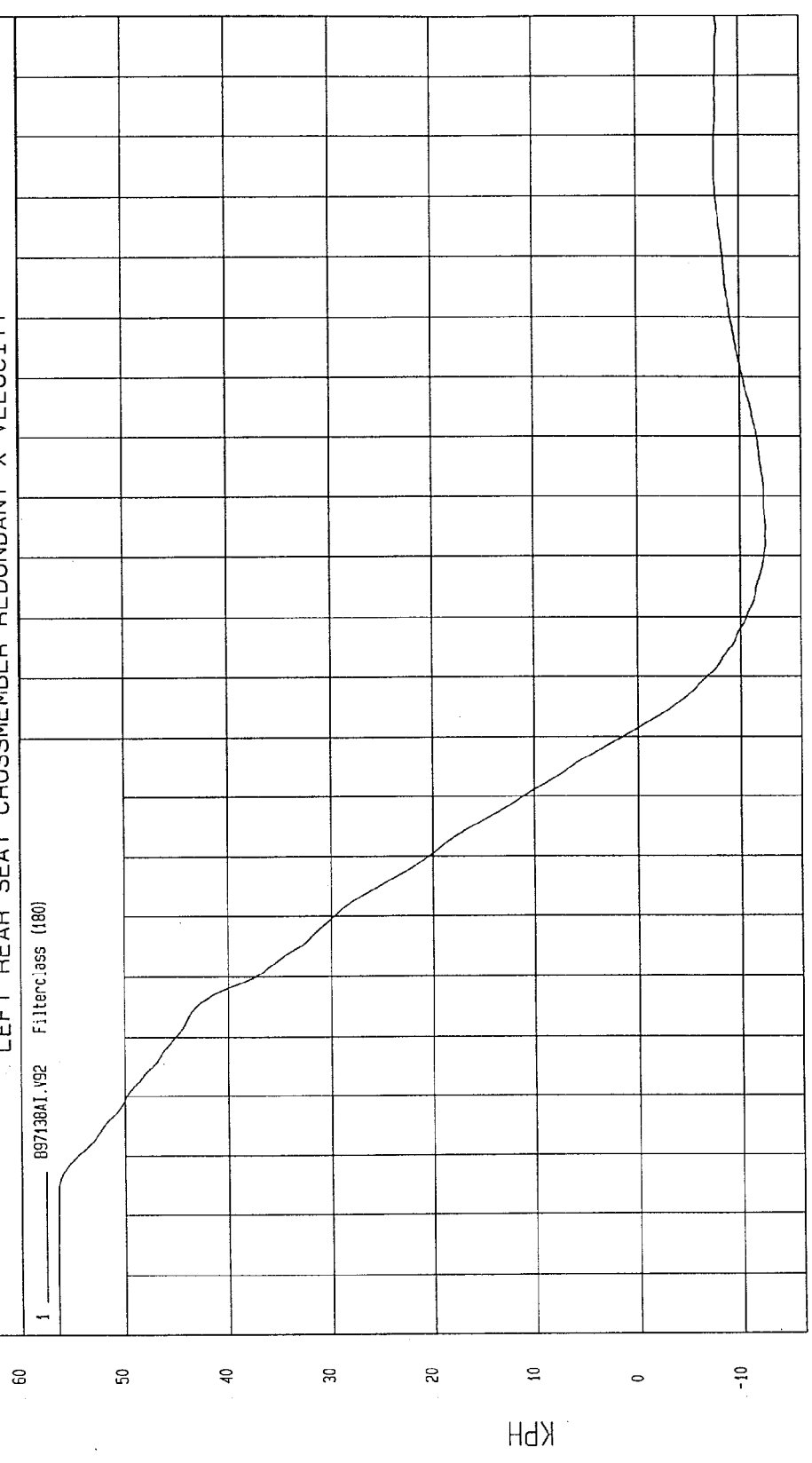
COMPONENT: 1998 NISSAN ALTIMA (MW5200)

Maximum = 56.62 KPH at -6 msec

Minimum = -12.46 KPH at 112 msec

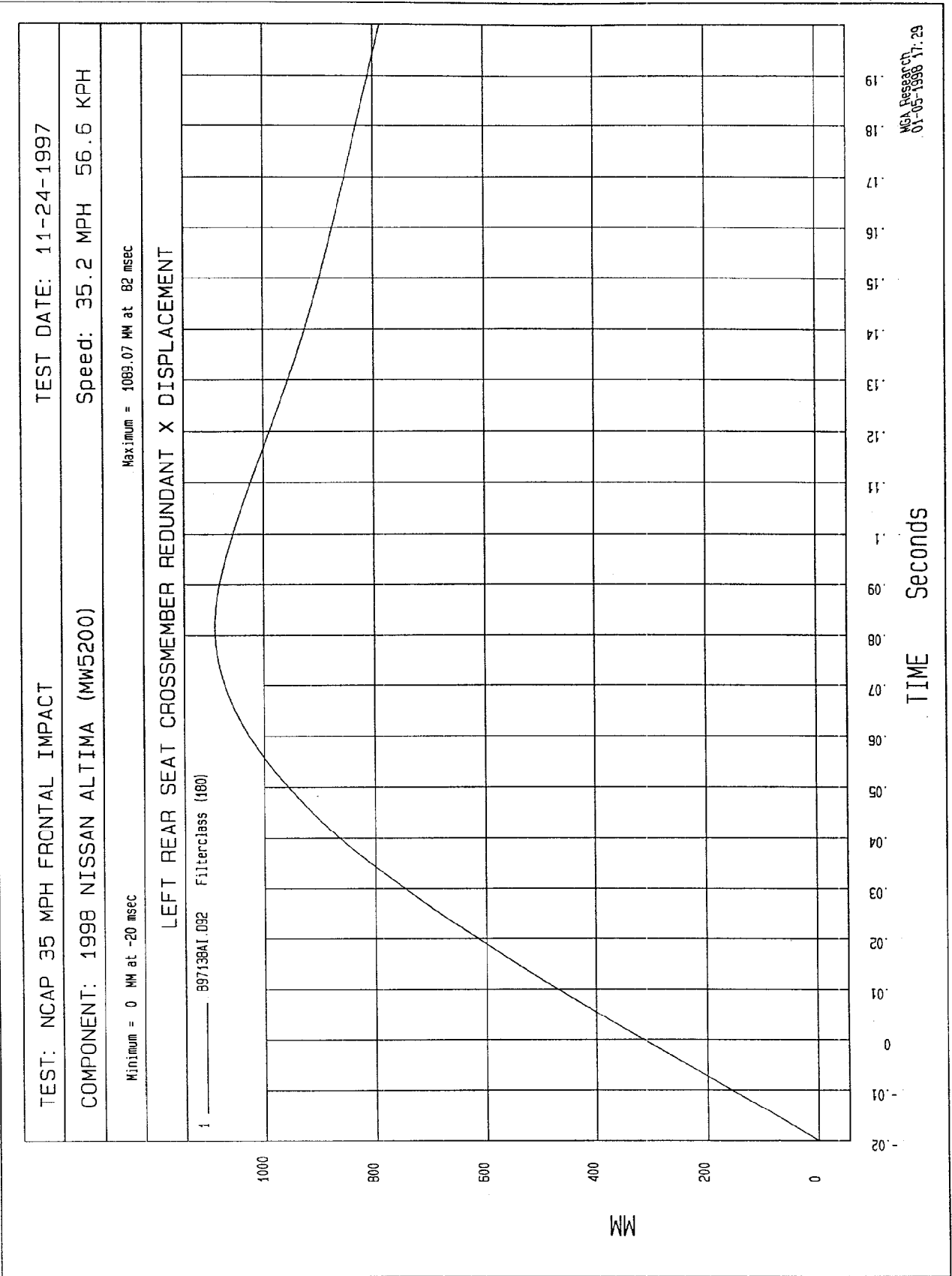
LEFT REAR SEAT CROSSMEMBER REDUNDANT X VELOCITY

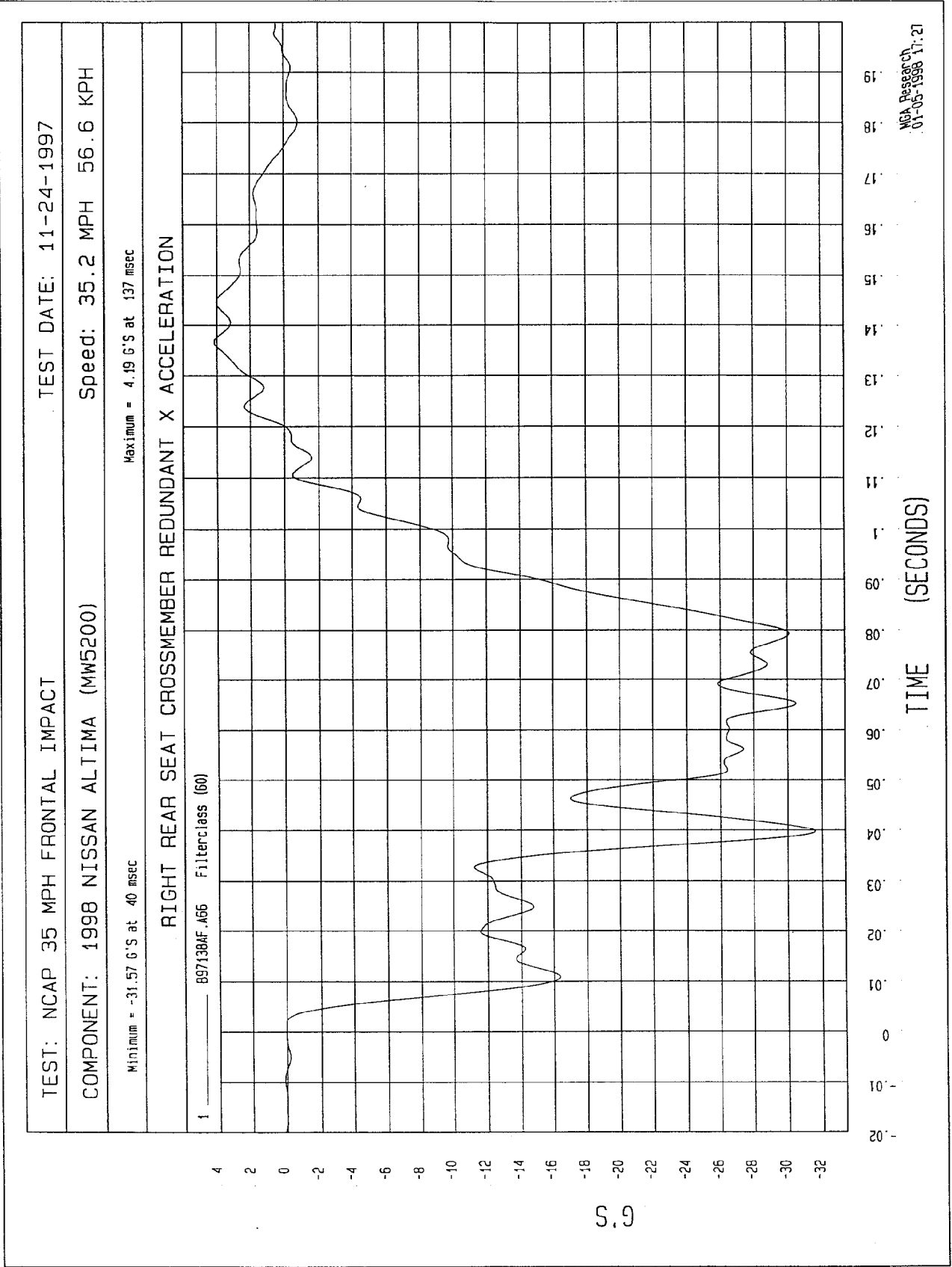
1 897138A1.V92 FilterClass (180)

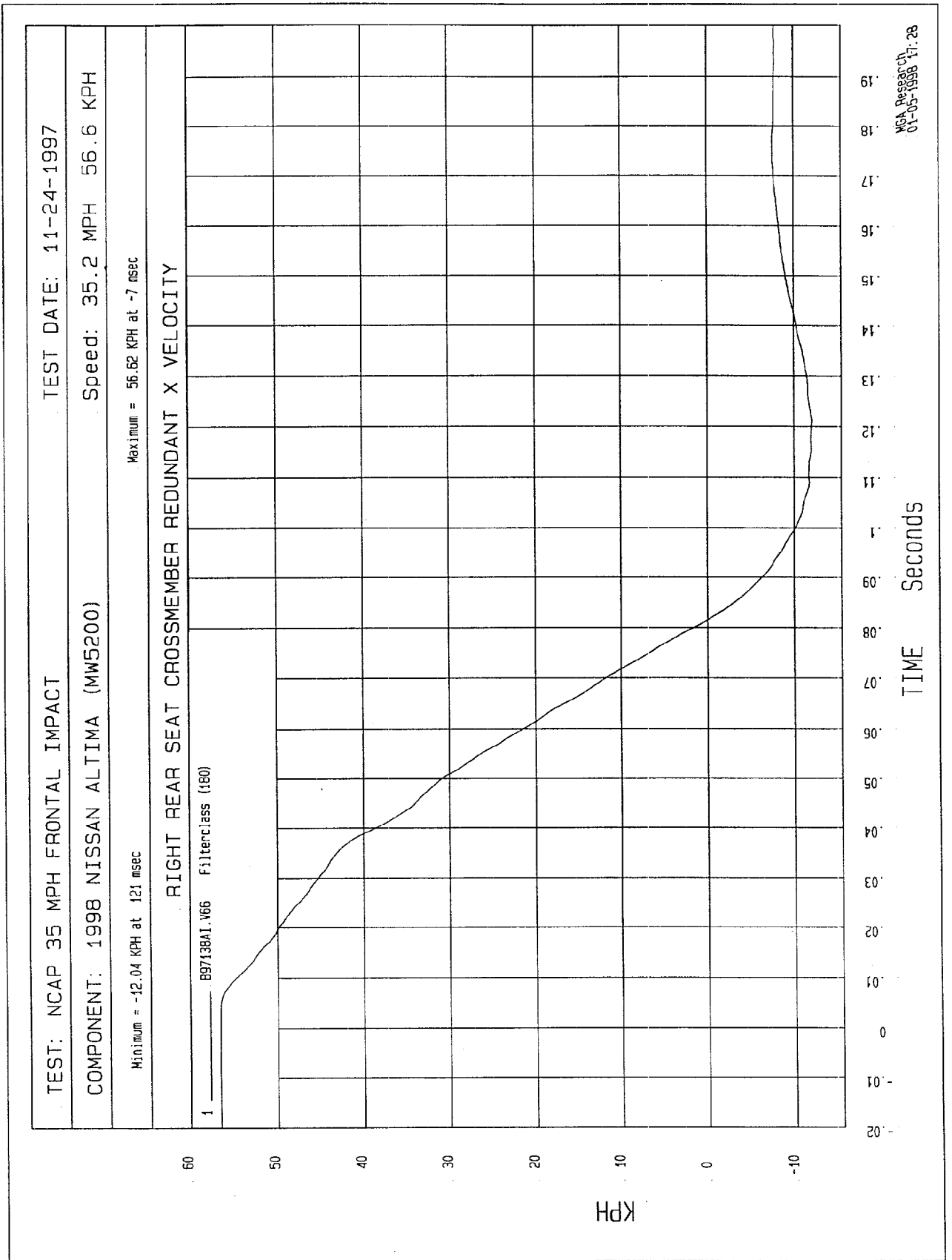


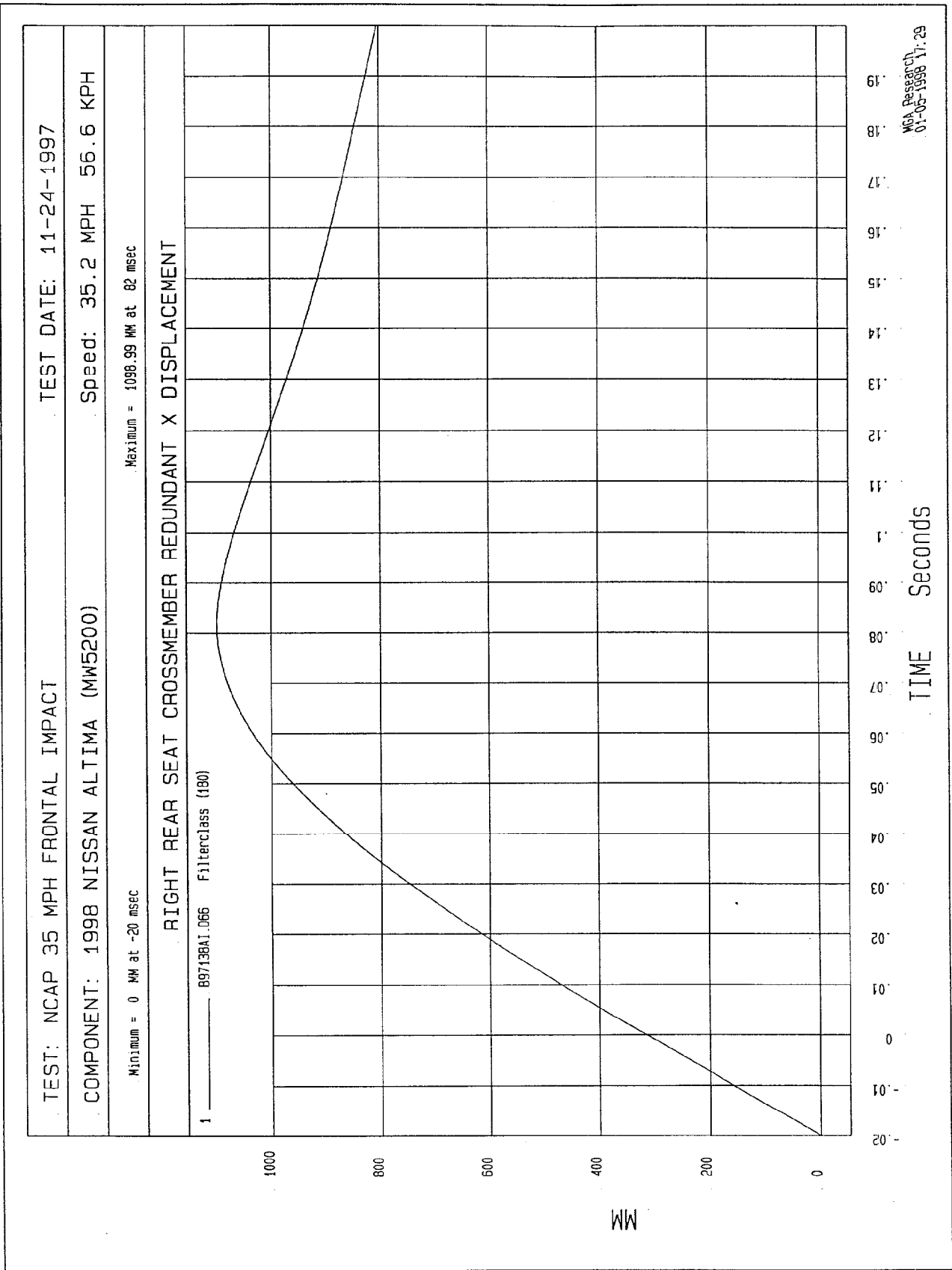
TIME Seconds
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0.17
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0.15
0.14
0.13
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-0.01
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MOA Research
01-05-1998 17:28









APPENDIX C

Dummy Configuration & Performance Verification Data

HYBRID III DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 065 DUMMY CALIBRATION BY: Tim Michnay

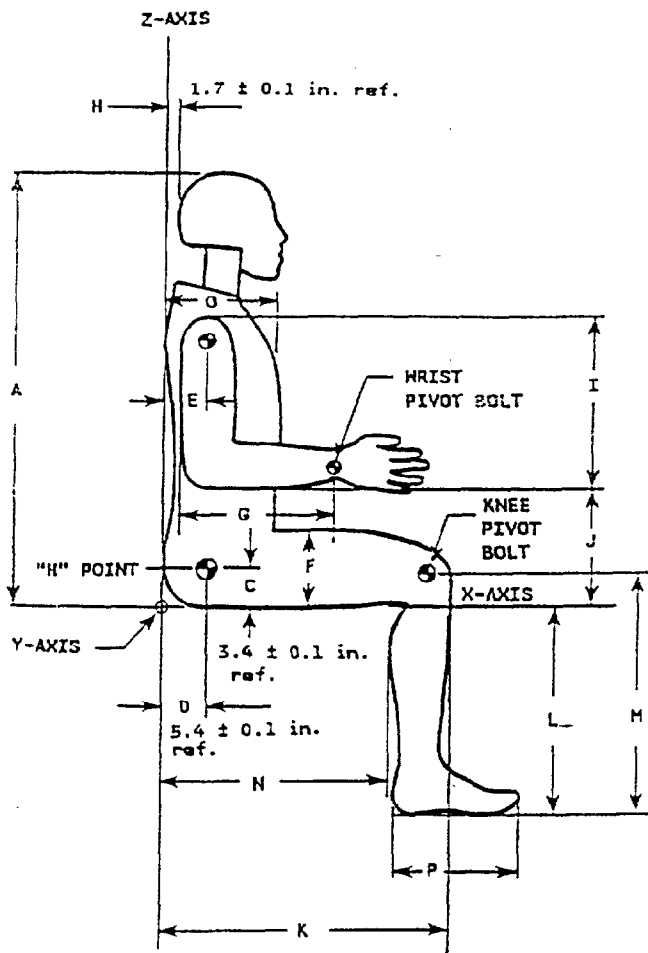
I. CONFIGURATION VERIFICATION DATA

DATE OF VERIFICATION: November 6, 1997

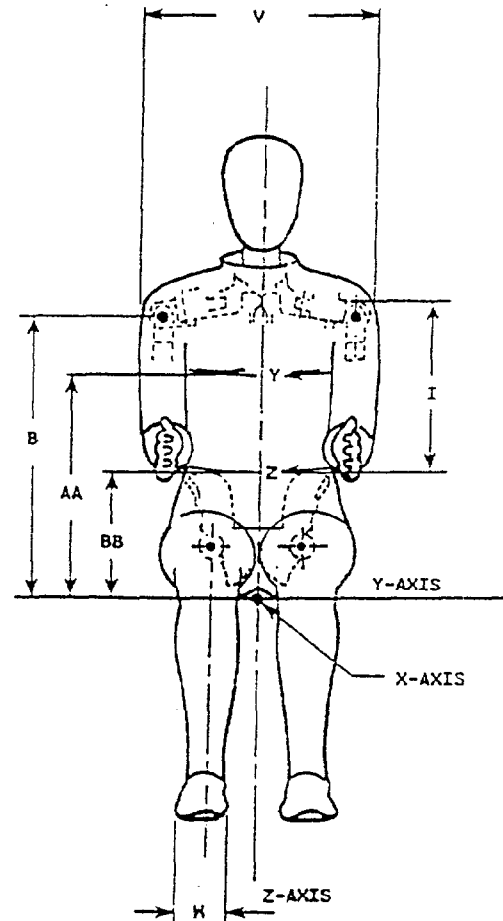
DESCRIPTION	SPECIFICATION (Inches)	ACTUAL MEASUREMENT (inches)
A - Total Sitting Height	34.6 - 35.0	34.9
B - Shoulder Pivot Height	19.9 - 20.5	20.5
C - "H" Point Height	3.3 - 3.5	3.5
D - "H" Point from Seat Back	5.3 - 5.5	5.5
E - Shoulder Pivot From Backline	3.3 - 3.7	3.5
F - Thigh Clearance	5.5 - 6.1	6.1
G - Back of Elbow to Wrist Pivot	11.4 - 12.0	11.5
H - Skull Cap Skin to Backline	1.6 - 1.8	1.7
I - Shoulder Elbow Length	13.0 - 13.6	13.0
J - Elbow Rest Height	7.5 - 8.3	8.0
K - Buttock Knee Length	22.8 - 23.8	23.5
L - Popliteal Height	16.9 - 17.9	17.0
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	8.8
P - Foot Length	9.9 - 10.5	10.3
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	33.5

Note: (See next page for external dimensions)

HYBRID III EXTERNAL DIMENSIONS



SIDE VIEW



FRONT VIEW

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.: 065 DUMMY CALIBRATION BY: Tim Michnay

VERIFICATION DATE: November 6, 1997

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

1.0 HEAD DROP TEST

	SPECIFICATION	MEASUREMENT
Peak Resultant Acceleration	225 - 275 G	239
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	23.0
Pendulum Deceleration	10 MS	22.50 - 27.50 G	24.43
	20 MS	17.60 - 22.60 G	20.83
	30 MS	12.50 - 18.50 G	13.57
Max. Pendulum G Above 30 MS		29.0 G MAX	13.5
Deceleration - Time Curve Decay Time to 5 G		34 - 42 MS	39
D Plane Rotation	MAX	64 - 78 DEG.	76
	TIME	57 - 64 MS	58
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 MS	114
Moment About Occipital Condyle	MIN.	65 - 80 FT.LBS	73
	TIME	47 - 58 MS	52
Positive Moment - Time Curve Decay Time to Zero		97 - 107 MS	102

HYBRID III DUMMY CALIBRATION DATA SUMMARY SHEET (CONT.)

3.0 NECK EXTENSION TEST

		SPECIFICATION	MEASUREMENT
Pendulum Speed		19.50 - 20.30 F/S	19.76
Pendulum Deceleration	10 MS	17.20 - 21.20 G	19.93
	20 MS	14.00 - 19.00 G	17.31
	30 MS	11.00 - 16.00 G	14.11
Max. Pendulum G Above 30 MS		22 G Max	14
Deceleration - Time Curve Decay Time to 5 G		38 - 46 MS	38
D Plane Rotation	MAX	81 - 106 DEG.	99
	TIME	72 - 82 MS	74
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 MS	153
Moment About Occipital Condyle	MIN.	-59.0/-39.0 FT LBS	-54
	TIME	65 - 79 MS	69
Positive Moment - Time Curve Decay Time to Zero		120 - 148 MS	138

4.0 CHEST IMPACT TESTS

		SPECIFICATION	MEASUREMENT
Probe Speed		21.6 to 22.4 F/S	21.8
Peak Deflection		2.50 to 2.86 IN.	2.72
Peak Resistive Force		1160 to 1325 LBS.	1280
Internal Hysteresis		69 to 85%	70

HYBRID III DUMMY CALIBRATION DATA SUMMARY SHEET (CONT.)

5.0 KNEE IMPACT TESTS

LEFT KNEE	SPECIFICATION	MEASUREMENT
Probe Speed	6.8 to 7.0 F/S	6.9
Maximum Force	1060 - 1300 LBS.	1161

RIGHT KNEE	SPECIFICATION	MEASUREMENT
Probe Speed	6.8 to 7.0 F/S	7.0
Maximum Force	1060 - 1300 LBS.	1244

6.0 HIP JOINT-FEMUR FLEXION TEST

LEFT KNEE	SPECIFICATION	MEASUREMENT	
		LEFT	RIGHT
Relative Humidity	10 - 70%	28%	
Rotation Rate	5-10 DEG/SEC.	Yes	Yes
70 FT-LBF	30 DEGREE MAX. ROTATION	66	65
150 FT-LBF	40-50 DEGREE MAX. ROTATION	42	43

HYBRID III DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 066 DUMMY CALIBRATION BY: Tim Michnay

I. CONFIGURATION VERIFICATION DATA

DATE OF VERIFICATION: November 6, 1997

DESCRIPTION	SPECIFICATION (inches)	ACTUAL MEASUREMENT (inches)
A - Total Sitting Height	34.6 - 35.0	34.8
B - Shoulder Pivot Height	19.9 - 20.5	20.5
C - "H" Point Height	3.3 - 3.5	3.5
D - "H" Point from Seat Back	5.3 - 5.5	5.5
E - Shoulder Pivot From Backline	3.3 - 3.7	3.5
F - Thigh Clearance	5.5 - 6.1	6.1
G - Back of Elbow to Wrist Pivot	11.4 - 12.0	11.5
H - Skull Cap Skin to Backline	1.6 - 1.8	1.7
I - Shoulder - Elbow Length	13.0 - 13.6	13.0
J - Elbow Rest Height	7.5 - 8.3	8.0
K - Buttock to Knee Length	22.8 - 23.8	23.5
L - Popliteal Height	16.9 - 17.9	17.0
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	8.8
P - Foot Length	9.9 - 10.5	10.3
V - Shoulder Breadth	16.6 - 17.2	16.8
W - Foot Breadth	3.6 - 4.2	4.0
Y - Chest Circumference	38.2 - 39.4	39.0
Z - Waist Circumference	32.9 - 34.1	33.5

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

HYBRID III DUMMY CALIBRATION DATA SUMMARY SHEET (CONT.)

DUMMY NO.: 066 DUMMY CALIBRATION BY: Tim Michnay

VERIFICATION DATE: November 6, 1997

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

1.0 HEAD DROP TEST

	SPECIFICATION	MEASUREMENT
Peak Resultant Acceleration	225 - 275 G	246
Peak Lateral Acceleration	15 G. MAX	-2.7
Is Acceleration Curve Unimodal	within 10% of peak	Yes

2.0 NECK FLEXION TEST

		SPECIFICATION	MEASUREMENT
Pendulum Speed		22.6 - 23.4 FT/SEC	22.7
Pendulum Deceleration	10 MS	22.50 - 27.50 G	24.4
	20 MS	17.60 - 22.60 G	20.5
	30 MS	12.50 - 18.50 G	14.9
Max. Pendulum G Above 30 MS		29.0 G MAX	15.5
Deceleration - Time Curve Decay Time to 5 G		34 - 42 MS	38
D Plane Rotation	MAX	64 - 78 DEG.	74
	TIME	57 - 64 MS	58
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 MS	113
Moment About Occipital Condyle	MIN.	65 - 80 FT.LBS	71
	TIME	47 - 58 MS	51
Positive Moment - Time Curve Decay Time to Zero		97 - 107 MS	102

HYBRID III DUMMY CALIBRATION DATA SUMMARY SHEET (CONT.)

3.0 NECK EXTENSION TEST

		SPECIFICATION	MEASUREMENT
Pendulum Speed		19.50 - 20.30 F/S	19.90
Pendulum Deceleration	10 MS	17.20 - 21.20 G	20.50
	20 MS	14.00 - 19.00 G	17.76
	30 MS	11.00 - 16.00 G	13.29
Max. Pendulum G Above 30 MS		22 G Max	14
Deceleration - Time Curve Decay Time to 5 G		38 - 46 MS	38
D Plane Rotation	MAX	81 - 106 DEG.	100
	TIME	72 - 82 MS	74
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 MS	153
Moment About Occipital Condyle	MIN.	-59.0/-39.0 FT LBS	-53.8
	TIME	65 - 79 MS	69
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	21.7
Peak Deflection	2.50 to 2.86 IN.	2.54
Peak Resistive Force	1160 to 1325 LBS.	1235
Internal Hysteresis	69 to 85%	72

HYBRID III DUMMY CALIBRATION DATA SUMMARY SHEET (CONT.)

5.0 KNEE IMPACT TESTS

LEFT KNEE	SPECIFICATION	MEASUREMENT
Probe Speed	6.8 to 7.0 F/S	7.0
Maximum Force	1060 - 1300 LBS.	1215

RIGHT KNEE	SPECIFICATION	MEASUREMENT
Probe Speed	6.8 to 7.0 F/S	7.0
Maximum Force	1060 - 1300 LBS.	1292

6.0 HIP JOINT-FEMUR FLEXION TEST

LEFT KNEE	SPECIFICATION	MEASUREMENT	
		LEFT	RIGHT
Relative Humidity	10 - 70%	28%	
Rotation Rate	5-10 DEG/SEC.	Yes	Yes
70 FT-LBF	30 DEGREE MAX. ROTATION	56	50
150 FT-LBF	40-50 DEGREE MAX. ROTATION	45	44

APPENDIX D

Dummy, Vehicle and Laboratory Calibration Data

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENTS FOR DUMMY NO. 065

	DRIVER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	AAMN8	Endevco	October 28, 1997
Head Y	ACC61	Endevco	October 28, 1997
Head Z	ACCW9	Endevco	October 28, 1997
Head X Redundant	AJ621	Endevco	October 28, 1997
Head Y Redundant	AJ619	Endevco	October 28, 1997
Head Z Redundant	AHY54	Endevco	October 28, 1997
Chest X	ACC78	Endevco	October 28, 1997
Chest Y	ACCE6	Endevco	October 28, 1997
Chest Z	ACCY3	Endevco	October 28, 1997
Chest X Redundant	AJ9J7	Endevco	October 28, 1997
Chest Y Redundant	AJ7A2	Endevco	October 28, 1997
Chest Z Redundant	AJ819	Endevco	October 28, 1997
Right Femur Load Cell	259	Denton	October 31, 1997
Left Femur Load Cell	260	Denton	October 31, 1997
Pelvis X	ALB87	Endevco	October 28, 1997
Pelvis Y	AHRP5	Endevco	October 28, 1997
Pelvis Z	AJ9T6	Endevco	October 28, 1997

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENTS FOR DUMMY NO. 065

	DRIVER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Neck Load X	442	Denton	September 22, 1997
Neck Load Y	442	Denton	September 22, 1997
Neck Load Z	442	Denton	September 22, 1997
Neck Moment X	442	Denton	September 22, 1997
Neck Moment Y	442	Denton	September 22, 1997
Neck Moment Z	442	Denton	September 22, 1997
Chest Deflection Gauge	065	Servo	October 30, 1997
Lap Belt Load Cell	212	GSE	June 12, 1997
Torso Belt Load Cell	657	Lebow	June 3, 1997

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENTS FOR DUMMY NO. 065

	DRIVER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Right Tibia Moment X	036	Denton	September 23, 1997
Upper Right Tibia Moment Y	036	Denton	September 23, 1997
Lower Right Tibia Moment Y	040	Denton	September 26, 1997
Lower Right Tibia Force X	040	Denton	September 26, 1997
Lower Right Tibia Force Z	040	Denton	September 26, 1997
Upper Left Tibia Moment X	039	Denton	September 23, 1997
Upper Left Tibia Moment Y	039	Denton	September 23, 1997
Lower Left Tibia Moment Y	033	Denton	September 26, 1997
Lower Left Tibia Force X	033	Denton	September 26, 1997
Lower Left Tibia Force Z	033	Denton	September 26, 1997
Right Foot Ball Z	J11625	Endevco	October 28, 1997
Right Foot Heel X	J10730	Endevco	October 28, 1997
Right Foot Heel Z	J11014	Endevco	October 28, 1997
Left Foot Ball Z	J11784	Endevco	October 28, 1997
Left Foot Heel X	J11047	Endevco	October 28, 1997
Left Foot Heel Z	J11046	Endevco	October 28, 1997

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENTS FOR DUMMY NO. 066

	PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	ACCY6	Endevco	October 28, 1997
Head Y	ACCH1	Endevco	October 28, 1997
Head Z	AAMW5	Endevco	October 28, 1997
Head X Redundant	AJ9D2	Endevco	October 28, 1997
Head Y Redundant	AH1E2	Endevco	October 28, 1997
Head Z Redundant	AJ7K3	Endevco	October 28, 1997
Chest X	ACCY1	Endevco	October 29, 1997
Chest Y	ACCC8	Endevco	October 29, 1997
Chest Z	ACCT7	Endevco	October 29, 1997
Chest X Redundant	AJ9D4	Endevco	October 29, 1997
Chest Y Redundant	AJ9F3	Endevco	October 29, 1997
Chest Z Redundant	AJ9D9	Endevco	October 29, 1997
Right Femur Load Cell	261	Denton	October 31, 1997
Left Femur Load Cell	262	Denton	October 31, 1997
Pelvis X	ALDY8	Endevco	October 28, 1997
Pelvis Y	ALEK9	Endevco	October 28, 1997
Pelvis Z	ALE80	Endevco	October 28, 1997

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENTS FOR DUMMY NO. 066

	PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Neck Load X	443	Denton	September 22, 1997
Neck Load Y	443	Denton	September 22, 1997
Neck Load Z	443	Denton	September 22, 1997
Neck Moment X	443	Denton	September 22, 1997
Neck Moment Y	443	Denton	September 22, 1997
Neck Moment Z	443	Denton	September 22, 1997
Chest Deflection Gauge	066	Servo	October 30, 1997
Lap Belt Load Cell	211	GSE	June 12, 1997
Torso Belt Load Cell	624	Lebow	June 12, 1997

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENTS FOR DUMMY NO. 066

	PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Right Tibia Moment X	040	Denton	September 23, 1997
Upper Right Tibia Moment Y	040	Denton	September 23, 1997
Lower Right Tibia Moment Y	034	Denton	September 26, 1997
Lower Right Tibia Force X	034	Denton	September 26, 1997
Lower Right Tibia Force Z	034	Denton	September 26, 1997
Upper Left Tibia Moment X	023	Denton	September 23, 1997
Upper Left Tibia Moment Y	023	Denton	September 23, 1997
Lower Left Tibia Moment Y	019	Denton	September 26, 1997
Lower Left Tibia Force X	019	Denton	September 26, 1997
Lower Left Tibia Force Z	019	Denton	September 26, 1997
Right Foot Ball Z	J13652	Endevco	October 30, 1997
Right Foot Heel X	J14006	Endevco	October 30, 1997
Right Foot Heel Z	J13628	Endevco	October 30, 1997
Left Foot Ball Z	J13650	Endevco	October 30, 1997
Left Foot Heel X	J13424	Endevco	October 30, 1997
Left Foot Heel Z	J14007	Endevco	October 30, 1997

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

VEHICLE ACCELEROMETERS			
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Left Rear Seat Crossmember X	B14-R03	Entran	August 4, 1997
Right Rear Seat Crossmember X	G13-B03	Entran	August 7, 1997
Top of Engine Block X	J23-E06	Entran	August 1, 1997
Bottom of Engine X	G08-B01	Entran	August 7, 1997
Left Brake Caliper X	F12-G09	Entran	August 7, 1997
Right Brake Caliper X	E10-F10	Entran	August 7, 1997
Instrument Panel X	B14-R13	Entran	July 2, 1997
Redundant Left Rear Seat Crossmember X	B14-R01	Entran	August 1, 1997
Redundant Right Rear Seat Crossmember X	E10-F19	Entran	July 11, 1997

LABORATORY INSTRUMENTS		
	SERIAL NO.	CALIBRATION DATE
Neck Bending Pendulum Accelerometer	C12871	October 27, 1997
Neck Bending Head Rotary Potentiometer	018	August 7, 1997
Neck Bending Pendulum Rotary Potentiometer	019	August 7, 1997
Chest Probe Accelerometer	J13780	September 15, 1997
Knee Impact Accelerometer	J13530	June 4, 1997

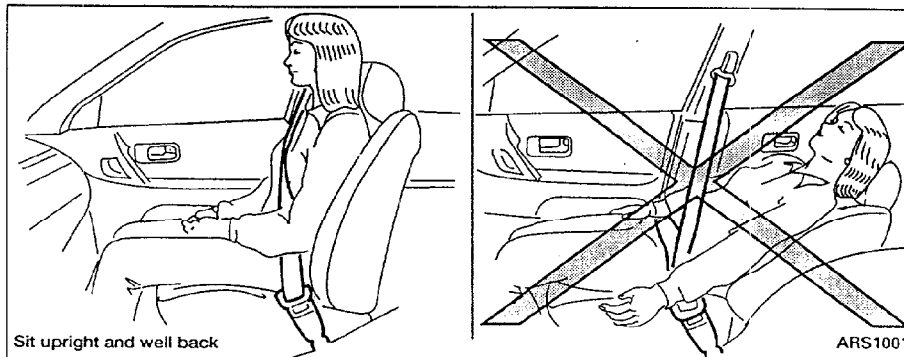
APPENDIX E

Vehicle Owner's Occupant Restraint System Instructions

1 Seats, Restraints and Supplemental air bag systems

Front seats	1-2	Child safety.....	1-16
Seat adjustment	1-2	Pregnant women	1-16
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Warning labels.....	1-12	Seat belt maintenance	1-21
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Seat belts	1-14	Top strap child restraint	1-25
Precautions on seat belt usage	1-14		

FRONT SEATS



⚠ WARNING

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.

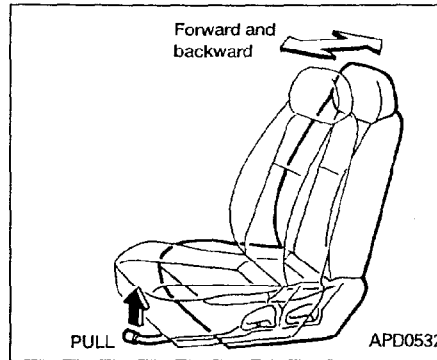
For most effective protection when the vehicle is in motion, the seat should be upright. Always sit well back in the seat and adjust the seat properly. See "Precautions on Seat Belt Usage" later in this chapter.

SEAT ADJUSTMENT

Manual

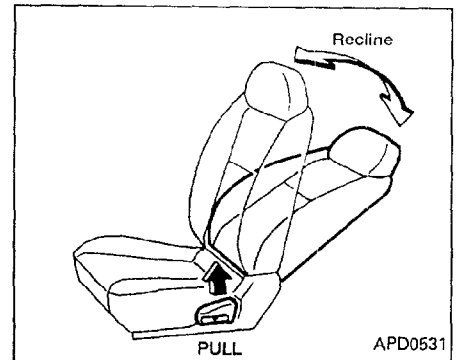
⚠ WARNING

- Do not adjust the driver's seat while driving. The seat may move suddenly and could cause loss of control of the vehicle.
- After adjustment, gently rock in the seat to make sure it is securely locked.



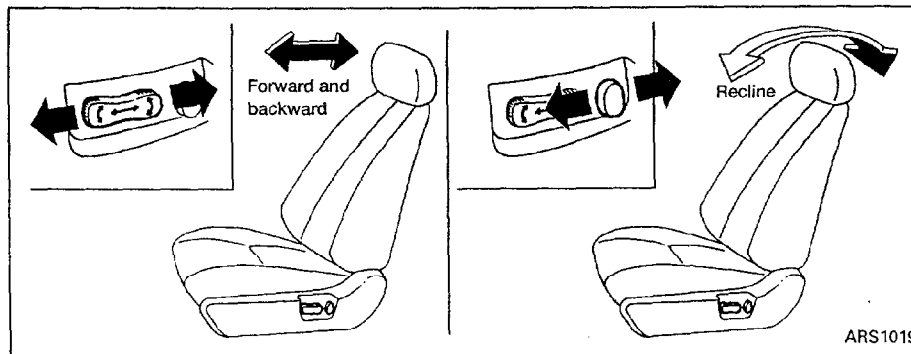
Forward and backward

Pull the lever up while you slide the seat forward or backward to the desired position. Release the lever to lock the seat in position.



Reclining

To recline the seatback, pull the lever up and lean back. To bring the seatback forward again, pull the lever and move your body forward. The seatback moves forward.



Power (if so equipped)

⚠ WARNING

- Do not adjust the driver's seat while driving in order that full attention may be given to the driving operation.
- Do not leave children unattended inside the vehicle. They could unknowingly activate switches or controls. Unattended children could become involved in serious accidents.

Operating Tips

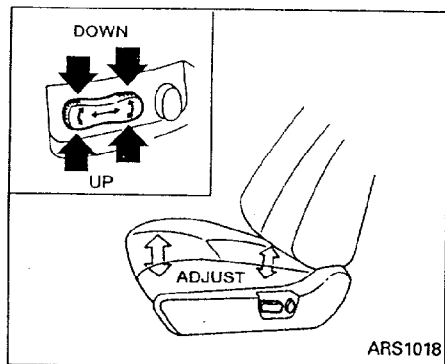
- The motor has an auto-reset overload protection circuit. If the motor stops during operation, wait 30 seconds, then re-activate the switch.
- Do not operate the power support seat for a long period of time when the engine is off. This will discharge the battery.

Forward and backward adjustment

Moving the switch forward or backward will slide the seat forward or backward to the desired position.

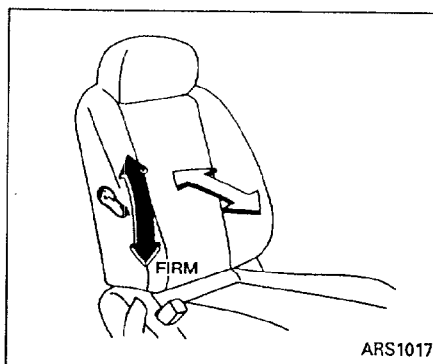
Reclining

Move the recline switch backward until the desired angle is obtained. To bring the seatback forward again, move the switch forward and move your body forward. The seatback will move forward.



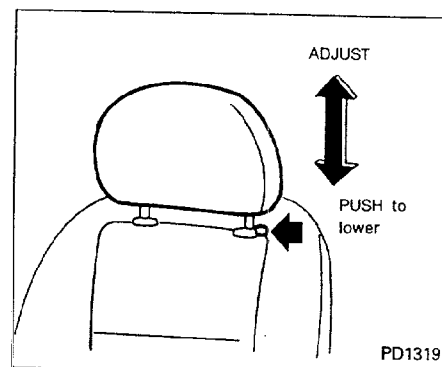
Seat lifter

Push the front or rear end of the switch up or down to adjust the angle and height of the seat cushion.



Lumbar support (If so equipped)

The lumbar support feature provides lower back support to the driver. Move the lever up or down to adjust the seat lumbar area.



HEAD RESTRAINTS

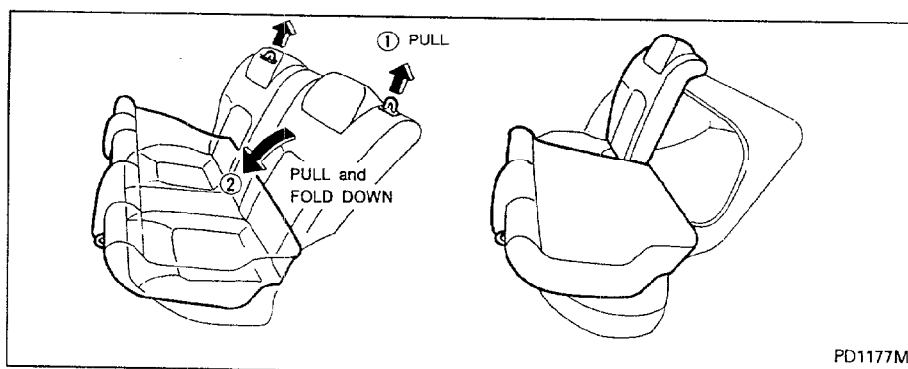
Adjust the head restraints so the top is level with the tops of your ears.

To raise the head restraint, simply pull it up. To lower, push the lock knob and push the head restraint down.

⚠ WARNING

Head restraints should be adjusted properly as they may provide significant protection against injury in an accident. Do not remove them. Check the adjustment after someone else uses the seat.

REAR SEAT



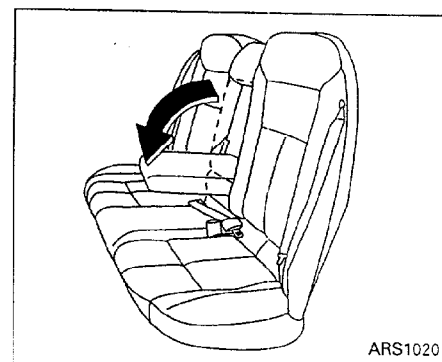
Interior trunk access (if so equipped)

The trunk can be accessed from the rear seat for loading and unloading, as shown.

⚠ WARNING

- Never allow anyone to ride in the luggage area or on the rear seat when it is in the fold-down position. Use of these areas by passengers without proper restraints could result in serious injury in an accident or sudden stop.

- Properly secure all cargo to help prevent it from sliding or shifting. Do not place cargo higher than the seatbacks. In a sudden stop or collision, unsecured cargo could cause personal injury.
- When returning seatbacks to the upright position, be certain they are completely secured in the latched position.



Center armrest (if so equipped)

Pull the armrest forward until it is horizontal.

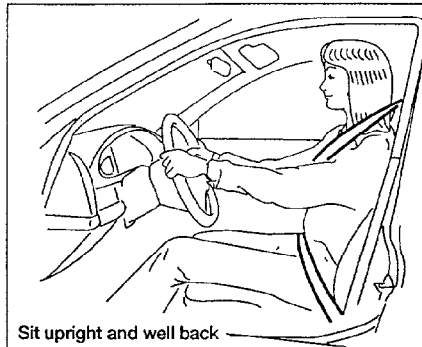
SUPPLEMENTAL RESTRAINT SYSTEM (AIR BAG SYSTEM)

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.)

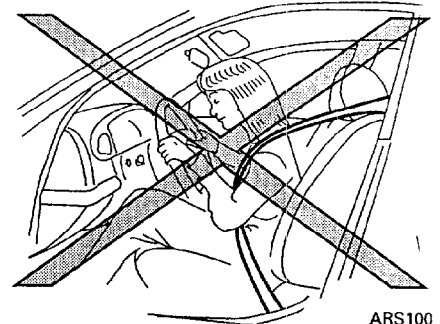
The supplemental air bags operate only when the ignition switch is in the ON or START position.

⚠ 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.



Sit upright and well back

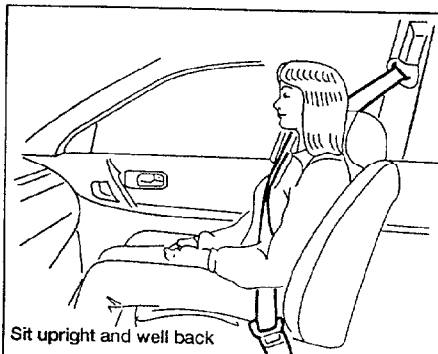


ARS100

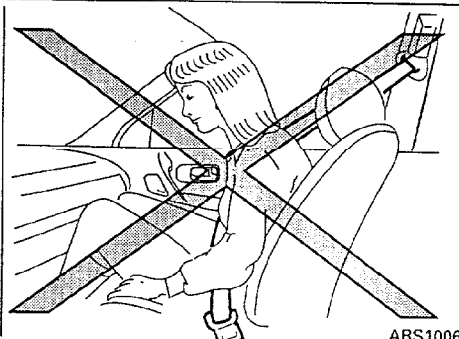
- The seat belts and the supplemental air bags are most effective when you are sitting back and upright in the seat. Supplemental air bags inflate with great force. If you are unrestrained, leaning forward, sitting sideways or out of position in any way, you are at greater risk of injury or death in 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 away as practical from the steering wheel or instrument panel. Always use the seatbelts.

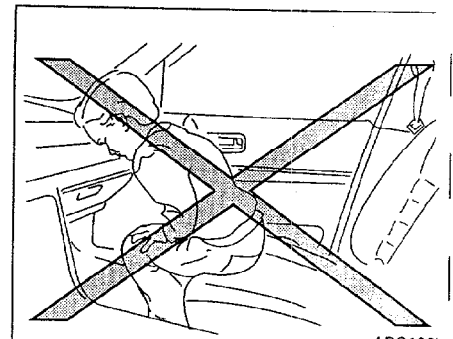
- Keep hands on the outside of the steering wheel. Placing them inside the steering wheel rim could increase the risk that they are injured when the supplemental air bag inflates.



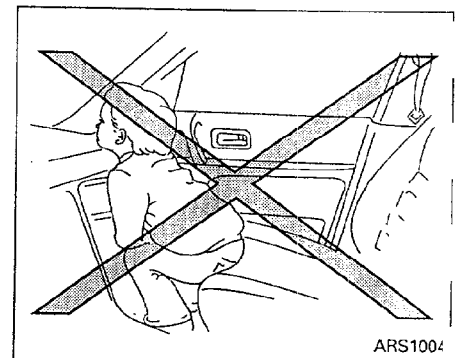
Sit upright and well back



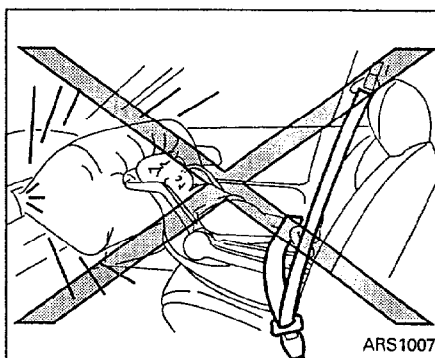
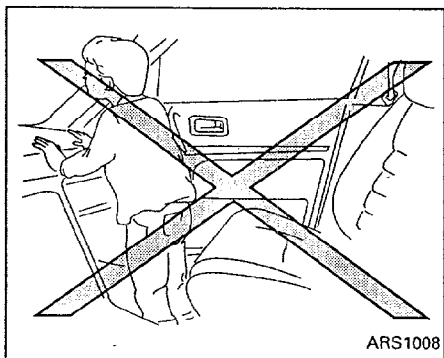
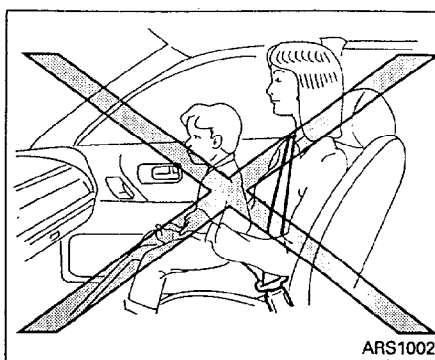
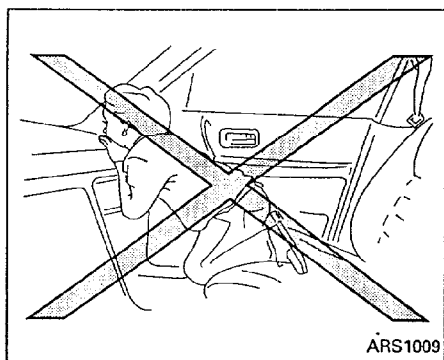
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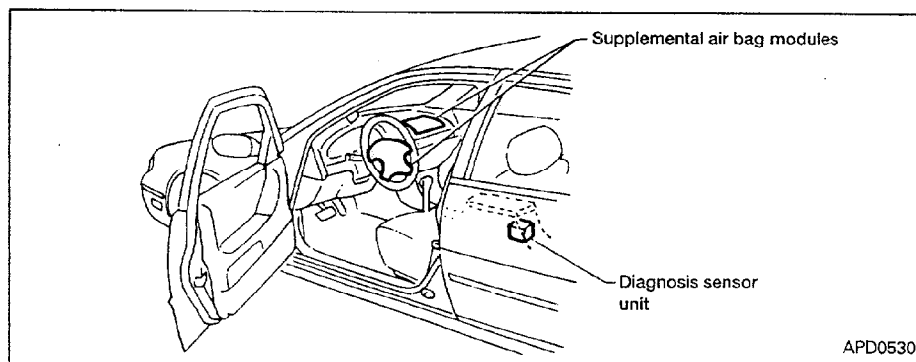
ARS1004



⚠ 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.

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 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 dashboard. Since the supplemental air bag inflates quickly in order to help protect the occupant, 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 bag deflates quickly after a collision.

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

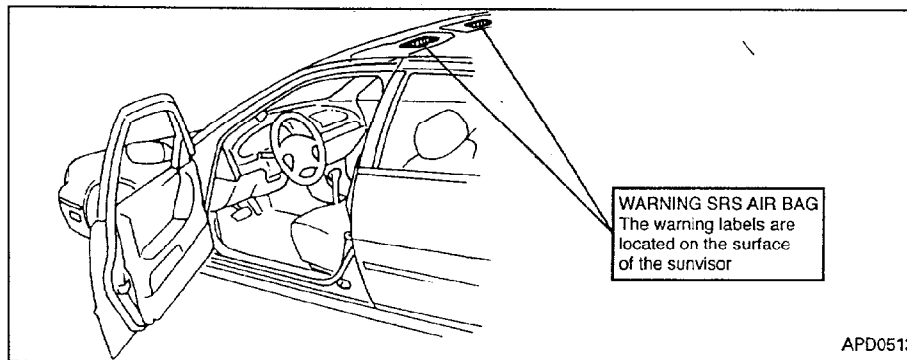
⚠ WARNING

- 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.

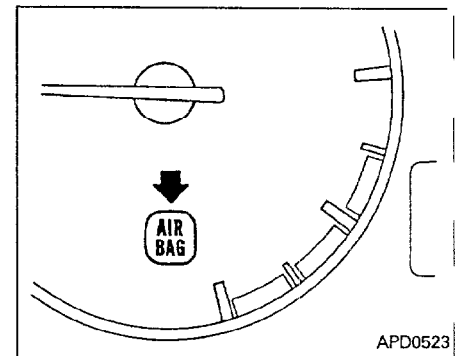
When selling your vehicle, we request that you inform the buyer about the supplemental air bag system and guide the buyer to the appropriate sections in this Owner's Manual.

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. The circuits monitored by the supplemental air bag 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.

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

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

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

▲ WARNING

If the supplemental air bag warning light is on, it could mean that the supplemental air bag system will not operate in an accident.

Repair and replacement procedure

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

- **Once the supplemental air bag inflates, the supplemental air bag module will not function again and should be replaced by an authorized NISSAN dealer. The supplemental air bag module cannot be repaired.**

- **The supplemental air bag system should be inspected by an authorized NISSAN dealer if there is any damage to the front end portion of the vehicle.**

- **If you need to dispose of a supplemental air bag or scrap the vehicle, contact an authorized NISSAN dealer. Correct supplemental air bag disposal procedures are set forth in the appropriate NISSAN Service Manual. Incorrect disposal procedures could cause personal injury.**

CHILD SAFETY

Children need adults to help protect them. They need to be properly restrained.

The proper restraint depends on the child's size. Generally, infants (up to about 1 year and less than 25 pounds) should be placed in rear facing child restraints. Forward facing child restraints are available for children who outgrow rear facing child restraints.

▲ WARNING

Infants and children need special protection. The vehicle's seat belts may not fit them properly. The shoulder belt may come too close to the face or neck. The lap belt may not fit over their small hip bones. In an accident, an improperly fitting seat belt could cause serious or fatal injury. Always use appropriate child restraints.

All U.S. states and provinces of Canada require the use of approved child restraints for infants and small children. See "Child Restraints" later in this section.

In addition, there are many types of child restraints available for larger children which should be used for maximum protection.

NISSAN recommends that all preteens and children be restrained in the rear seat if possible. According to accident statistics, children are safer when properly restrained in the rear seat than in the front seat. This is especially important because your vehicle has a supplemental restraint system (Air bag system) for the front passenger. See "Supplemental restraint system" earlier in this section.

Infants and small children

NISSAN recommends that infants and small children be placed in child restraints that comply with Federal Motor Vehicle Safety Standards or Canadian Motor Vehicle Safety Standards. You should choose a child restraint that fits your vehicle and always follow the manufacturer's instructions for installation and use.

Larger children

Children who are too large for child restraints should be seated and restrained by the seat belts which are provided.

If the child's seating position has a shoulder belt that fits close to the face or neck, the use of a booster seat (commercially available) may help overcome this. The booster seat should raise the child so that the shoulder

belt is properly positioned across the top, middle portion of the shoulder and the lap belt is low on the hips. The booster seat should fit the vehicle seat and have a label certifying that it complies with Federal Motor Vehicle Safety Standards or Canadian Motor Vehicle Safety Standards. Once the child has grown so the shoulder belt is no longer on or near the face and neck, use the shoulder belt without the booster seat.

▲ WARNING

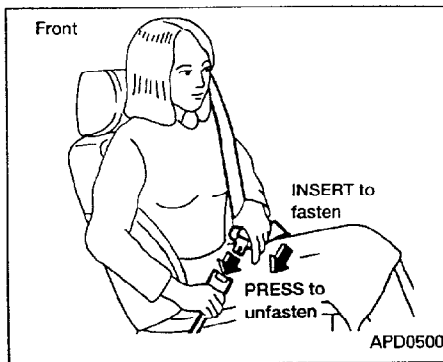
Never let a child stand or kneel on any seat and do not allow a child in the cargo areas while the vehicle is moving. The child could be seriously injured or killed in an accident.

PREGNANT WOMEN

NISSAN recommends that pregnant women use seat belts. Contact your doctor for specific recommendations. The lap belt should be worn snug and positioned as low as possible around the hips, not the waist.

INJURED PERSONS

NISSAN recommends that injured persons use seat belts. Check with your doctor for specific recommendations.

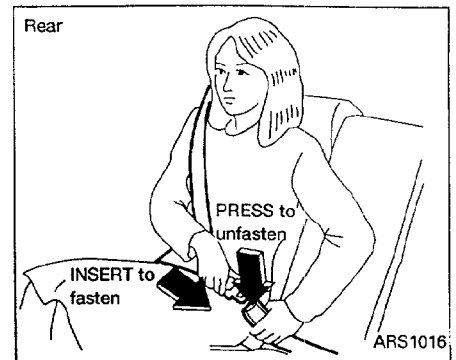


3-POINT TYPE WITH RETRACTOR

⚠ WARNING

- Every person who drives or rides in this vehicle should use a seat belt at all times.
- 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.

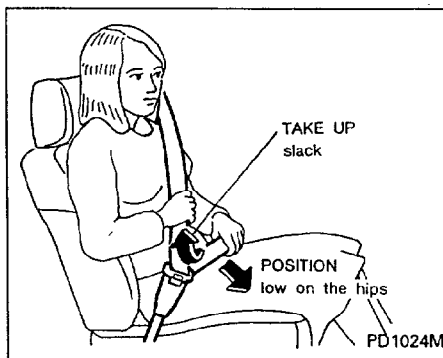
For most effective protection when the vehicle is in motion, the seat should be upright. Always sit well back in the seat and adjust the seat belt properly.



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.



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 3-point seat belts have a cinching mechanism for child restraint installation. It is referred to as the automatic locking mode.

When the cinching mechanism is activated the seat belt cannot be withdrawn further until the seat belt tongue is detached from the buckle and fully retracted. Once retracted, 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 belt, press the button on the buckle. The seat belt automatically retracts.

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

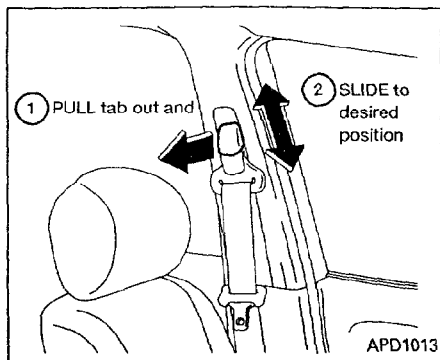
Seat belt retractors are designed to lock belt movement using two separate methods:

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

To increase your confidence in the belts check their operation as follows:

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

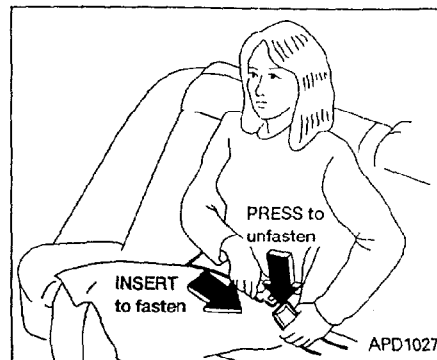
If the retractor does not lock during this check or if you have any questions about belt operation, see an authorized NISSAN dealer.



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 into position.

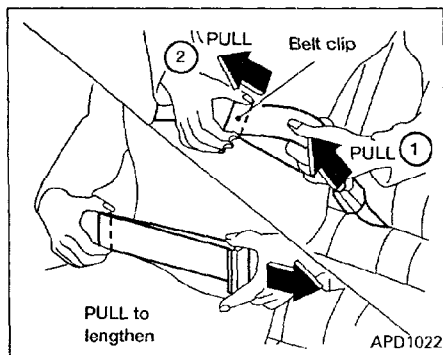
⚠ WARNING
After adjustment, release the adjustment button and try to move the shoulder belt anchor up and down to make sure it is securely fixed in position.



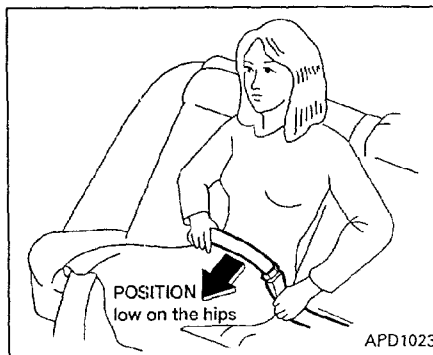
2-POINT TYPE WITHOUT RETRACTOR (rear center lap belt)

Fastening the belts

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



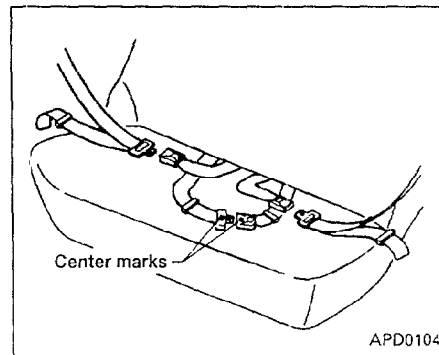
2. To lengthen, hold the tongue at a right angle to the belt and pull on the belt. To shorten, pull the end of the belt attached to the belt clip away from the tongue, then pull the belt clip to take up the slack.



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

Unfastening the belt

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



Selecting correct set of belts

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

CHILD RESTRAINTS

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.

⚠ WARNING

- Only NISSAN seat belt extenders, made by the same company which made the original equipment belts, should be used with NISSAN seat belts.
- Persons who can use the standard seat belt should not use an extender. Such unnecessary use could result in serious personal injury in the event of an accident.

- An improperly installed child restraint could lead to serious injury or death in an accident.

In general, child restraints are designed to be installed with a lap belt or the lap portion of a three-point type seat belt.

Child restraints for infants and children of various sizes are offered by several manufacturers. When selecting any child restraint, keep the following points in mind:

- 1) Choose only a restraint with a label certifying that it complies with Federal Motor Vehicle Safety Standard 213 or Canadian Motor Vehicle Safety Standard 213.
- 2) Check the child restraint in your vehicle to be sure it is compatible with the vehicle's seat and seat belt system. Choose a child restraint that meets the guidelines of the Society of Automotive Engineers recommended practice J1819 for child restraint installation.
- 3) If the child restraint is compatible with your vehicle, place your child in the child restraint and check the various adjustments to be sure the child restraint is compatible with your child. Always follow all recommended procedures.

SEAT BELT MAINTENANCE

- To clean the seat belt webbings, apply a mild soap solution or any solution recommended for cleaning upholstery or carpets. Then brush the webbing, wipe it with a cloth and allow it 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.

⚠ WARNING

- Infants and small children should always be placed in an appropriate child restraint while riding in the vehicle. Failure to use a child restraint can result in serious injury or death.
- Infants and small children should never be carried on your lap. It is not possible for even the strongest adult to resist the forces of a severe accident. The child could be crushed between the adult and parts of the vehicle. Also, do not put the same seat belt around both your child and yourself.
- Never install a rear-facing child restraint in the front seat. An inflating supplemental air bag could seriously injure or kill your child. A rear-facing child restraint must only be used in the rear seat.
- Nissan recommends that the child restraint be installed in the rear seat. According to accident statistics, children are safer when properly restrained in the rear seat than in the front seat.

All U.S. states and provinces of Canada require that infants and small children be restrained in approved child restraints at all times while the vehicle is being operated.

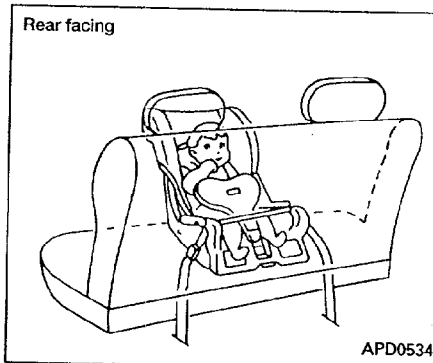
⚠ WARNING

- Improper use of a child restraint can result in increased injuries for both the infant or child and other occupants in the vehicle.
- Follow all of the child restraint manufacturer's instructions for installation and use. When purchasing a child restraint, be sure to select one which will fit your child and vehicle. It may not be possible to properly install some types of child restraints in your vehicle.
- If the child restraint is not anchored properly, the risk of a child being injured in a collision or a sudden stop greatly increases.
- Adjustable seatbacks should be positioned to fit the child restraint, but as upright as possible.

- After attaching the child restraint, test it before you place the child in it. Tilt it from side to side. Try to tug it forward and check to see if the belt holds the restraint in place. If the restraint is not secure, tighten the belt as necessary, or put the restraint in another seat and test it again.
- For a front-facing child restraint, if the seat position where it is installed has a 3-point type lap/shoulder belt, check to make sure the shoulder belt does not go in front of the child's face or neck. If it does, put the shoulder belt behind the child restraint. If you must install a front-facing child restraint in the front seat, see "Installation on front passenger seat" later in this section for details.
- When your child restraint is not in use, keep it secured with a seat belt to prevent it from being thrown around in case of a sudden stop or accident.

CAUTION

- Remember that a child restraint left in a closed vehicle can become very hot. Check the seating surface and buckles before placing your child in the child restraint.

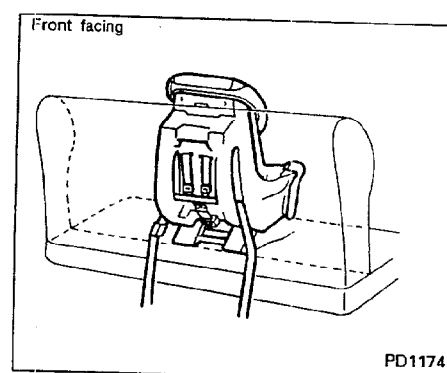


Installation on rear seat

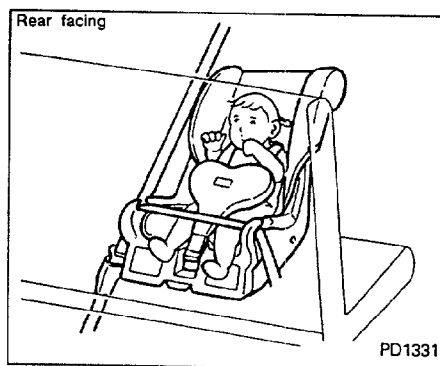
Center lap belt

When you install a child restraint in a rear center seat, follow these steps:

1. Position the child restraint on the seat as illustrated. It can be placed in a forward facing or rear facing direction, depending on the size of the child. Always follow the restraint manufacturer's instructions.
2. Route the seat belt tongue through the child restraint and insert it into the buckle until you hear and feel the latch engage. Be sure to follow the child restraint manufacturer's instructions for belt routing.



3. Remove all slack in the lap belt for a very tight fit by pulling forcefully on the lap belt adjustment.
4. Before placing the child in the child restraint, use force to tilt the child restraint from side to side, and tug it forward to make sure it is securely held in place.
5. If it is not secure, try to tighten the belt again, or put the restraint in another seat.
6. Check to make sure the child restraint is properly secured prior to each use.



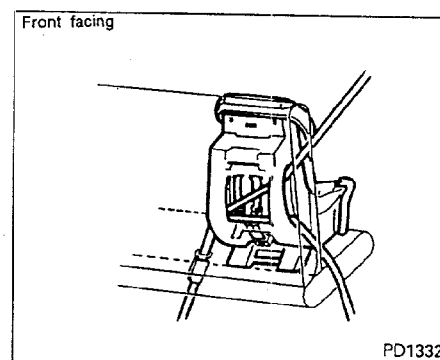
Installation on rear outboard seating positions

WARNING

- The 3-point belt in your vehicle is equipped with a locking mode retractor which must be used when installing a child restraint.
- Failure to do so will result in the child restraint not being properly secured. It could tip over or otherwise be unsecured and cause injury to the child in a sudden stop or collision.

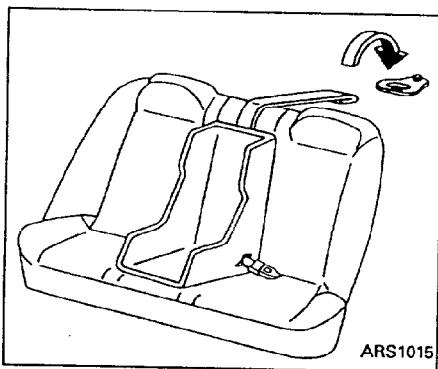
When you install a child restraint in a rear outboard seat, follow these steps:

1. Position the child restraint on the seat. It can be placed in a forward facing or rear facing direction, depending on the size of the child. Always follow the restraint manufacturer's instructions.
2. Route the seat belt tongue through the child restraint and insert it into the buckle until you hear and feel the latch engage. Be sure to follow the child restraint manufacturer's instructions for belt routing.
3. Pull on the shoulder belt until all of the belt is fully extended. At this time, the belt retractor is in the automatic locking mode (child restraint mode). It reverts back to emergency locking mode when the belt is fully retracted.
4. Allow the belt to retract. Pull up on the belt to remove any slack in the belt.
5. Before placing the child in the child restraint, use force to tilt the child restraint from side to side, and tug it forward to make sure it is securely held in place.



6. Check that the retractor is in the automatic locking mode by trying to pull more belt out of the retractor. If you cannot pull any more belt webbing out of the retractor, the belt is in the automatic locking mode.
7. Check to make sure the child restraint is properly secured prior to each use. If the belt is not locked, repeat steps 3 through 6.

After the child restraint is removed and the seat belt is allowed to wind back into the retractor, the automatic locking mode (child restraint mode) is canceled; the seat belt only locks during a sudden stop or impact.



TOP STRAP CHILD RESTRAINT

If your child restraint has a top strap, it must be secured to the provided anchor point. Anchor bracket hardware must be installed. The top strap anchor bracket hardware is available through an authorized NISSAN dealer.

U.S. Part #88894-89900

Canadian Part #88894-89902

Secure the child restraint with the center lap belt or the lap portion of an outboard 3-point belt and latch the top strap hook onto the appropriate anchor bracket. To install the anchor bracket, a metric bolt of the dimen-

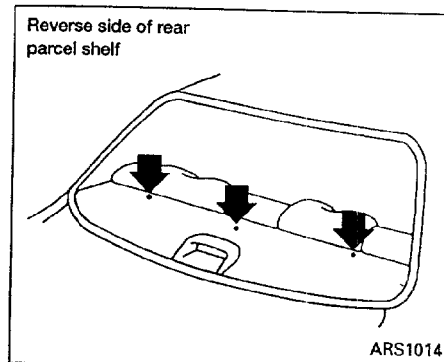
sions listed below must be used:

Bolt diameter: 8.0 mm
Bolt length: more than 1.18 in (30 mm)
Thread pitch: 1.25 mm

Secure the top strap to the attaching bolt which provides the straightest installation of the top strap.

⚠ WARNING

Child restraint anchor points are designed to withstand only those loads imposed by correctly fitted child restraints. Under no circumstances are they to be used for adult seat belts or harnesses.



Anchor point locations

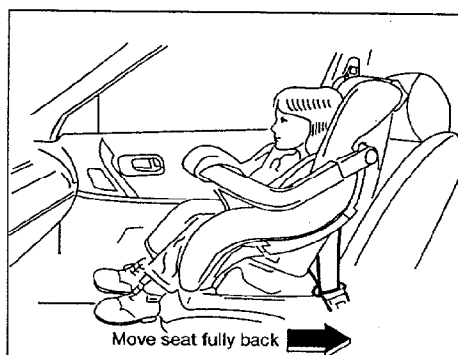
Anchor points are located under the rear parcel shelf finisher.

To use attaching hardware for child restraints with top straps, follow these instructions carefully:

1. Open the trunk and find the anchor point nuts on the underside of the rear parcel shelf. Thread a bolt (8.0 mm diameter, 1.25 pitch) up through the nut behind the seating position where the child restraint will be installed and use it to break through the rear parcel shelf support

material. There are pre-cut circles at each anchor point location that should break away from the shelf support material when pressure is applied to them. Remove the bolt after you feel the pre-cut circle separate from the shelf support material.

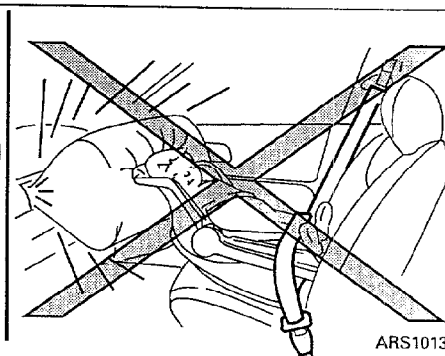
2. Cut a small slit through the parcel shelf fabric at the anchor point location. Reach through the fabric with a tool such as a pair of needle-nose pliers and remove the pre-cut circle in the parcel shelf support material.
3. Install the bolt through the top strap hook and into the anchor point nut.
4. Be sure to follow all of the instructions that accompany the top strap attaching hardware.



Installation on front passenger seat

⚠ WARNING

- **Never install a rear-facing child restraint in the front passenger seat. Supplemental air bags inflate with great force. A rear-facing child restraint could be struck by the supplemental air bag in a crash and could seriously injure or kill your child.**
- **NISSAN recommends that child restraints be installed in the rear seat.**



However, if you must install a forward-facing child restraint in the front passenger seat, move the passenger seat to the rear most position.

A child restraint with a top strap should not be used in the front passenger seat.

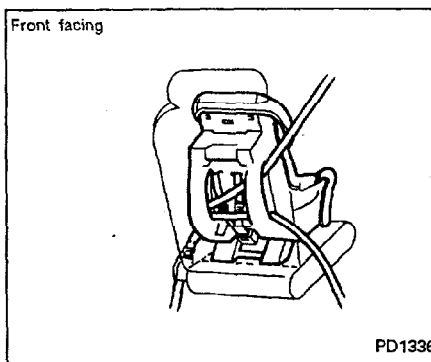
⚠ WARNING

- **The 3-point belt in your vehicle is equipped with a locking mode retractor which must be used when installing a child restraint.**

- **Failure to use the retractor's locking mode will result in the child restraint not being properly secured. The seat could tip over or otherwise be unsecured and cause injury to the child in a sudden stop or collision.**

If you must install a child restraint in the front seat, follow these steps:

1. Position the child restraint on the front passenger seat. **It should be placed in a forward-facing direction only.** Move the seat to the rear most position. Always follow the child restraint manufacturer's instructions. **Child restraints for infants must be used in the rear-facing direction and therefore must not be used in the front seat.**
2. Route the seat belt tongue through the child restraint and insert it into the buckle until you hear and feel the latch engage.



Be sure to follow the child restraint manufacturer's instructions for belt routing.

3. Pull on the shoulder belt until all of the belt is fully extended. At this time, the belt retractor is in the automatic locking mode (child restraint mode). It reverts back to emergency locking mode when the belt is fully retracted.
4. Allow the belt to retract. Pull up on the belt to remove any slack in the belt.
5. Before placing the child in the child restraint, use force to tilt the child restraint from side to side, and tug it forward to

make sure it is securely held in place.

6. Check that the retractor is in the automatic locking mode by trying to pull more belt out of the retractor. If you cannot pull any more belt webbing out of the retractor, the belt is in the automatic locking mode.
7. Check to make sure the child restraint is properly secured prior to each use. If the lap belt is not locked, repeat steps 3 through 6.

After the child restraint is removed and the seat belt is allowed to wind back into the retractor, the automatic locking mode (child restraint mode) is canceled; the seat belt only locks during a sudden stop or impact.