

VZ527

REPORT NO. MGA-97-N07

NEW CAR ASSESSMENT PROGRAM (NCAP)

FRONTAL BARRIER IMPACT TEST

1997 HYUNDAI ACCENT
NHTSA NO. MV0501

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: February 13, 1997

Report Date: March 10, 1997

FINAL REPORT

Prepared For:

U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
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16. Abstract A 56 kph (35 mph) frontal barrier impact using a 30 load cell barrier was conducted on a 1997 Hyundai Accent at the MGA Proving Grounds and Crash Test Center in Burlington, WI. on February 13, 1997. The barrier impact velocity was 56.2 kph (35.0 mph), and the ambient temperature at the time of impact was 22°C. The post-test maximum static crush was 488 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 FMVSS 208, "Occupant Crash Protection" injury criteria, the driver's HIC was 918 and the 3 msec. Clip (Chest g's) was 59 g's. The left and right femur loads for the driver were 3938 and 4328 Newtons, respectively. The passenger's HIC was 252 and the 3 msec Clip was 54 g's. The left and right femur maximum loads were 3192 and 3394 Newtons respectively.					
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Contracting Officer's Tech. Rep. (COTR)

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SECTION 1
PURPOSE AND TEST PROCEDURE

This 35 mph frontal barrier impact test is part of the Composite FY'97 Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-90-D-12121. 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.

SECTION 2

SUMMARY OF FRONTAL BARRIER IMPACT TEST

A load cell barrier consisting of 30 load cells was impacted by a 1997 Hyundai Accent 4 Door at a velocity of 56.2 kph (35.0 mph). The test was performed at the MGA Proving Grounds and Crash Test Center on February 13, 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 fully instrumented with head and chest primary and redundant triaxial accelerometers, pelvis triaxial accelerometers, chest displacement transducer, neck load cell, right/left femur load cells, right/left lower leg sensors, and right/left feet 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. 037), and the right front passenger (Serial No. 036), were used for this test. Certification details, along with instrumentation calibration data, are found in Appendix C and D.

The 111 channels of data were recorded on 10 computers. Appendix B contains the vehicle, load cell barrier and dummy response data traces.

The driver's head struck the inflated airbag. The driver HIC was 918 and the maximum chest (CLIP) deceleration over 3 milliseconds was 59 g's. The maximum chest compression was 36 mm. The left and right femur loads were -3938 and -4328 Newtons respectively.

The right front passenger's head struck the inflated airbag. The passenger HIC was 252 and maximum chest (CLIP) deceleration over 3 milliseconds was 54 g's. The maximum chest compression was 35 mm. The left and right femur loads were -3192 and -3394 Newtons respectively.

GENERAL TEST AND VEHICLE PARAMETER DATA

Vehicle Yr/Make/Model/Body Style: 1997/Hyundai/Accent/4 Door

NHTSA No.: MV0501 VIN.: KMHVF24NXVU372687

Body color: Red Date of Manufacture: 10/96

Engine: 4 Cylinders; C.I.D.; 1.5 Liters;
X Gas; Diesel; Turbocharged
 Longitudinal; X Transverse

Transmission: 3 Speed; Manual; X Automatic; X Overdrive

Final Drive: X Front Wheel; Rear Wheel; Four Wheel

Odometer Reading: 111 miles

X A/C; X P/S; X P/B; P/wdo;
 P/seats; Tilt Wheel; Cruise Control; ABS

Type of Occupant Restraint: Type II with driver and front passenger airbags

DATA RECORDED FROM VEHICLE'S TIRE PLACARD:

Tire Pressure (at capacity): Front 220 kPa (32 Psi) Rear 220 kPa (32 Psi)

Recommended Tire Size: P155/80R13-P175/70R13-P175/65R14

Recommended Cold Tire Pressure: Front 220 kPa (32 Psi) Rear 220 kPa (32 Psi)

Tires on Vehicle: P175/70R13 Manufacturer: General

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

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

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

Vehicle Capacity Weight (VCW) = 385.6 kg. (A)

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

Rated Cargo Weight (RCW) A-B = 45.6 kg.

GVWR 1435.0 kg. GAWR: Front 790.0 kg.; Rear 730.0 kg.

GENERAL TEST AND VEHICLE PARAMETER DATA (Cont'd)

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

Right Front = 310.7 kg

Right Rear = 191.0 kg

Left Front = 323.4 kg

Left Rear = 197.3 kg

TOTAL FRONT WEIGHT = 634.1 kg (62.0 % of Total Vehicle Weight)

TOTAL REAR WEIGHT = 388.3 kg (38.0 % of Total Vehicle Weight)

TOTAL UNLOADED DELIVERED WEIGHT (UDW) = 1022.4 kg

CALCULATION FOR TARGET TEST WEIGHT:

UDW = Unloaded Delivered Weight 1022.4 kg

VCW = Vehicle Capacity Weight 385.6 kg

DSC = Designated Seating Capacity 5 RCW = VCW - 68 (DSC) = 45.6 kg*

Target Test Weight = UDW + RCW + (2 dummies x 78.0 kg/dummy)

Target Test Weight = 1224.0 kg

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND CARGO:

Right Front = 357.4 kg

Right Rear = 247.7 kg

Left Front = 367.9 kg

Left Rear = 246.8 kg

TOTAL FRONT WEIGHT = 725.3 kg (59.5 % of Total Vehicle Weight)

TOTAL REAR WEIGHT = 494.5 kg (40.5 % of Total Vehicle Weight)

TOTAL TEST WEIGHT = 1219.8 kg

Weight of ballast secured in vehicle trunk area = 0 kg

Vehicle components removed to meet target weight: rear seat, trunk deck, muffler, rear bumper,
spare, all trunk interior

VEHICLE ATTITUDE (all dimensions in mm):

Delivered Attitude: RF 639 LF 633 RR 633 LR 630

Test Attitude: RF 620 LF 615 RR 607 LR 606

Post Test RF 729 LF 656 RR 605 LR 597

Wheel Base: 2400 mm; C.G. = 973 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)

POST-IMPACT DATA:

Type of Test: 35 mph Frontal Impact Impact Angle: 90°
Date of Test: February 13, 1997 Time of Test: 2:12 p.m.
Ambient Temperature: 22°C (69°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 = 56.2 kph; secondary = 56.4 kph
Distance From Front Bumper to Barrier Face When
 Entering Speed Trap: 1203 mm
 Exiting Speed Trap: 203 mm

VEHICLE REBOUND AND CRUSH (mm):

Vehicle Length: Pre-test = R 3775 C_L 3912 L 3775
 Post-test = R 3368 C_L 3424 L 3342
 Crush = R 407 C_L 488 L 433

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

R 608 mm C_L 550 mm L 605 mm

VISIBLE DUMMY CONTACT POINTS:

	<u>Driver</u>	<u>Passenger</u>
Head	<u>to airbag</u>	<u>to airbag</u>
Chest	<u>to airbag & belts</u>	<u>to airbag & belts</u>
Left Knee	<u>to instrument panel</u>	<u>to instrument panel</u>
Right Knee	<u>to instrument panel</u>	<u>to instrument panel</u>

GENERAL TEST AND VEHICLE PARAMETER DATA (Cont'd)

	<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>opened</u>	<u>opened</u>	<u>opened</u>	<u>opened</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>2 mm forward</u>		<u>0 mm forward</u>	

Glazing Damage

Backlight/Windshield Windshield cracked

Other Notable Impact Effects: airbags deployed

GENERAL TEST AND VEHICLE PARAMETER DATA (Cont'd)

POST TEST AIRBAG DATA

Vehicle Yr/Make/Model/Body Style: 1997/Hyundai/Accent/4 Door

NHTSA No.: MV0501 VIN: KMHVF24NXVU372687

- A. Number of Vent Holes: Driver 2; Passenger 2
- B. Size of Vent Holes: Driver 25 mm dia.; Passenger 50 mm dia.
- C. Total Vent Area; Driver 9.8 cm² Passenger 19.6 cm²
- D. Deflated Airbag Length and Width Dimensions or, if Round, Diameter
Driver; Length____mm, Width____mm, Diameter 654 mm
Passenger; Length 635 mm, Width 457 mm, Diameter ____ mm
- E. Is the Airbag Tethered?
Driver; X Yes; __ No; If yes, record length of tether 285 mm
Passenger; X Yes; __ No, If yes, record length of tether 641 mm

SECTION 3

SUMMARY OF RESULTS FOR-----

FMVSS 212, "Windshield Mounting"

FMVSS 219 (Partial), "Windshield Zone Intrusion"

FMVSS 301-75, "Fuel System Integrity"

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

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

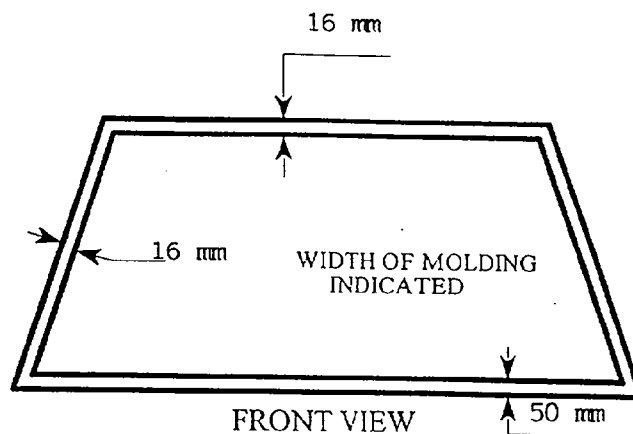
Windshield set in rubber molding with glue

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	1954	1954	100%
LEFT SIDE	1954	1954	100%
TOTAL	3908	3908	100%

AREA OF RETENTION FAILURE: None



FAILURE DETAILS: None

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= 1016 mm

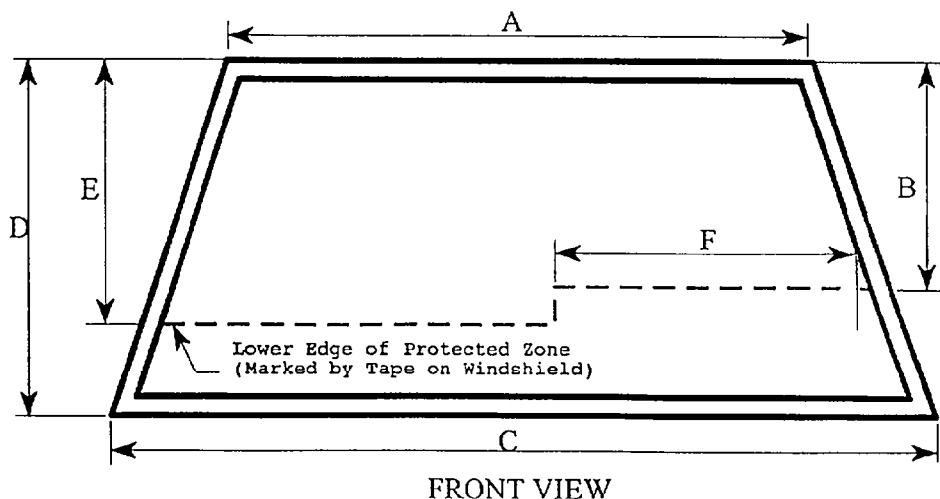
B= 590 mm

C= 1412 mm

D= 735 mm

E= 488 mm

F= 576 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

FMVSS NO. 301

TEST VEHICLE NHTSA NO.: MV0501 Test Date: February 13, 1997

Vehicle Mfgr./Make/Model: 1997/Hyundai/Accent/4 Door

Usable Capacity of Vehicle's Fuel Tank: 45 Liters
(figure furnished by vehicle manufacturer)

TEST REQUIREMENTS:

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

AMOUNT OF STODDARD SOLVENT ADDED TO VEHICLE'S FUEL TANK:

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

TEST VEHICLE IMPACT TYPE: X Frontal (35 mph)

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

___ Rear Moving Barrier (30 mph)

___ Side Impact MDB (33.2 mph)

FUEL SPILLAGE MEASUREMENT:

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

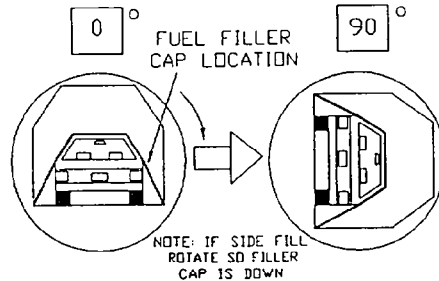
ACTUAL	MAX ALLOWED
0	1 OZ
0	5 OZ
0	1 oz./1 MIN

SOLVENT SPILLAGE DETAILS: None

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE: 0° - 90°

Vehicle NHTSA ID No.: MV0501



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 42 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 42 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
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III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0
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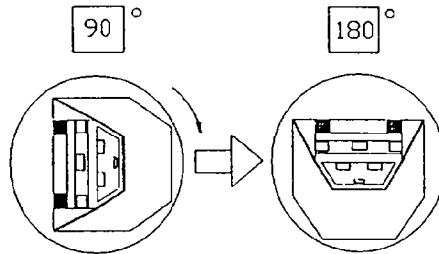
Note: Record Spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATIONS(S): None

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE: 90° - 180°

Vehicle NHTSA ID No.: MV0501



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 22 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 22 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
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III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

0	0	0	0
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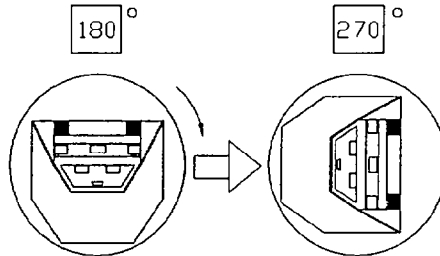
Note: Record Spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATIONS(S): None

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE: 180° - 270°

Vehicle NHTSA ID No.: MV0501



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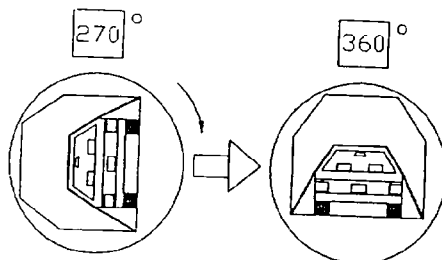
Note: Record Spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATIONS(S): None

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

TEST PHASE: 270° - 360°

Vehicle NHTSA ID No.: MV0501



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time 2 minutes 48 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

TOTAL 7 minutes 48 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

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. Load Cell Barrier Data
 - 2. Vehicle Accelerometer Data
 - 3. Test Vehicle Measurements
- III. AID DATA
 - 1. Accident Investigation Damage Data Summary

FMVSS NO. 208, "OCCUPANT CRASH PROTECTION", DATA SHEET

VEH. YR./MAKE/MODEL/BODY STYLE: 1997/Hyundai/Accent/4 Door

VEH. NHTSA NO.: MV0501 TEST DATE: February 13, 1997

MAX. ACCELERATION VALUES: (g's)	DRIVER # <u>037</u>	PASSENGER # <u>036</u>
Head Channel X	-75.5 @ 71 msec.	-30.7 @ 86 msec.
Head Channel Y	14.1 @ 74 msec.	20.4 @ 77 msec.
Head Channel Z	-23.7 @ 70 msec.	-26.7 @ 92 msec.
HEAD RESULTANT	79.6 @ 71 msec.	43.1 @ 86 msec.
Chest Channel X	-60.1 @ 59 msec.	-50.2 @ 55 msec.
Chest Channel Y	4.9 @ 42 msec.	-7.3 @ 71 msec.
Chest Channel Z	21.5 @ 77 msec.	10.9 @ 64 msec.
CLIP	58.5	49.0
TIME INTERVAL (msec) [3. msec. minimum]	$t_1 = 58.3$ $t_2 = 61.4$	$t_1 = 53.5$ $t_2 = 56.6$

HEAD INJURY CRITERIA (HIC)
VALUES:

HIC	917.9	251.7
$t_1 =$ (msec)	53.9	65.0
$t_2 =$ (msec)	84.0	101.0
Avg. Accel. t_1 to t_2 (g's)	62.2	34.5

[The maximum time interval from t_1 to t_2 is 36 milliseconds.]

MAX. COMPRESSIVE FEMUR FORCES:

Left Side (N)	-3938 @ 54 msec.	-3192 @ 53 msec.
Right Side (N)	-4328 @ 33 msec.	-3394 @ 54 msec.

MAXIMUM SEAT BELT FORCES:

Lap Belt (N)	4800 @ 89 msec.	5996 @ 88 msec.
Shoulder Belt (N)	6990 @ 110 msec.	6571 @ 126 msec.

HYBRID III NECK, CHEST AND PELVIS DATA SHEET

VEHICLE YR./MAKE/MODEL/BODY STYLE: 1997/Hyundai/Accent/4 Door

VEHICLE NHTSA NO.: MV0501 TEST DATE: February 13, 1997

MAXIMUM VALUES	DRIVER DUMMY # 036	PASSENGER DUMMY # 037
Neck Load X (N)	-499 @ 98 msec.	-860 @ 118 msec.
Neck Load Y (N)	128 @ 162 msec.	-293 @ 101 msec.
Neck Load Z (N)	-1805 @ 63 msec.	-1372 @ 35 msec.
Neck Moment X (NM)	-23.4 @ 69 msec.	37.1 @ 77 msec.
Neck Moment Y (NM)	-33.3 @ 106 msec.	-56.6 @ 120 msec.
Neck Moment Z (NM)	-18.4 @ 91 msec.	-27.4 @ 71 msec.
Chest Deflection X (mm)	-36.3	-35.3
Time of Max. Occurrence	119 msec.	140 msec.
Pelvis X Acceleration (g's)	-45.9 @ 87 msec.	-59.2 @ 85 msec.
Pelvis Y Acceleration (g's)	-13.6 @ 83 msec.	-11*
Pelvis Z Acceleration (g's)	39.3 @ 104 msec.	30.8 @ 125 msec.
Pelvis Resultant (g's)	53.6 @ 87 msec.	61.1 @ 85 msec.

* Noise spike @ 53 msec.

PART 572 DUMMY IN-VEHICLE POSITION

Vehicle NHTSA No.: MV0501 Vehicle: 1997/Hyundai/Accent/4 Door

SEAT TYPE:

X Bench
X Bucket
____ Split Bench

ADJUSTER TYPE:

Driver: X Manual
____ Power

Passenger: X Manual
____ Power

BUCKET SEAT BACK TYPE:

____ Fixed
X Adjustable Reclining

____ Fixed
____ Adjustable Reclining

DRIVER SEAT POSITION

8th detent out of 14 detents

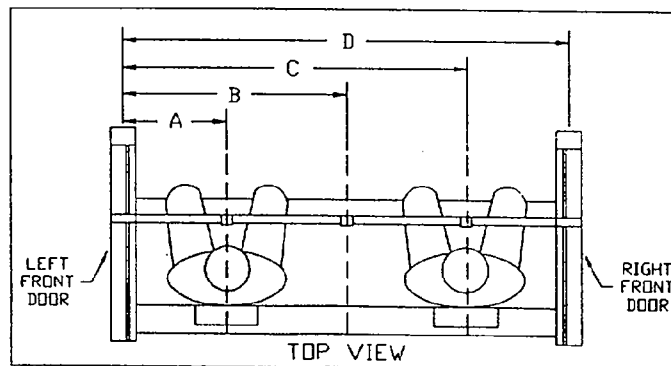
Seat back angle 27.2°

PASSENGER SEAT POSITION

8th detent of 14 detents

Seat back angle 26.7°

Steering column set to mid position. Steering column angle 25.1°



037 DUMMY ID 036

A = Left Door to Driver Centerline	<u>374</u> mm
B = Left Door to Center Passenger Centerline	<u>706</u> mm
C = Left Door to Right Passenger Centerline	<u>1035</u> mm
D = Left Door to Right Door	<u>1412</u> mm

FRONT SEAT MEASUREMENT TABLE

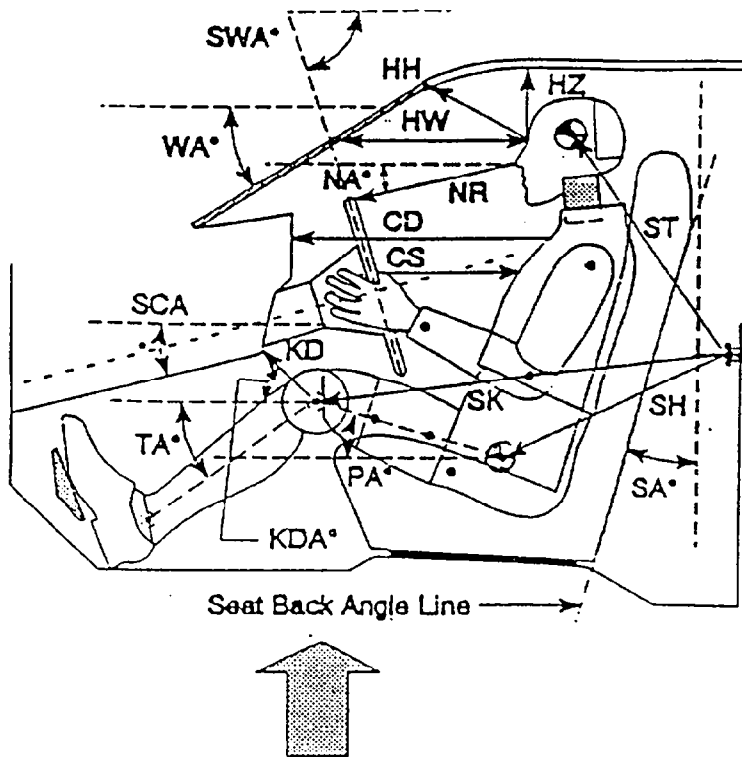
Units (mm)

	DRIVER (Serial # 037)	PASSENGER (Serial # 036)
WA°	29.4°	
SWA°	25.5°	N/A
SCA°	25.1°	N/A
SA°	16.3°	15.9°
HZ	146	152
HH	318	323
HW	498	508
HR	191	197
NR	442 Angle 10.9°	N/A
CD	549	611
CS	347	N/A
RA	214	N/A
KDL	210 Angle (KDA) 9.8°	172
KDR	183	203 Angle 38.4°
PA°	24.3°	23.1°
TA°	41.8°	35.6°
KK	282	233
ST*	527 Angle 84.8°	189 Angle 128°
SK*	565 Angle 93.9°	552 Angle 180°
SH*	199 Angle 160°	531 Angle 87°
SHY	231	233
HS	287	294
HD	170	182
AD	105	115

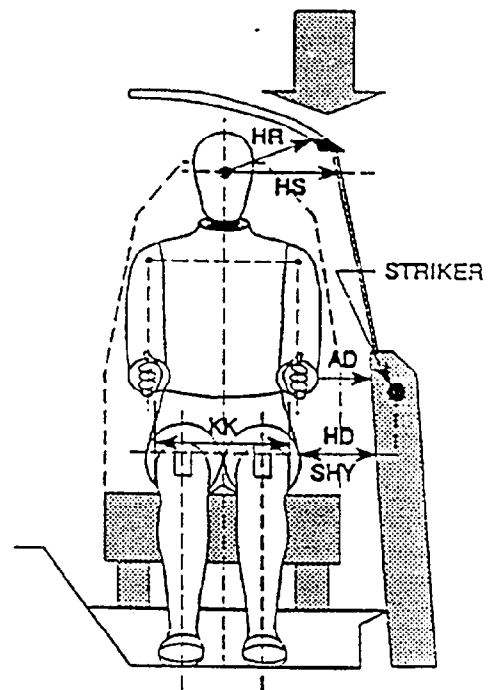
N/A = Not Applicable

* Angles measured from vertical

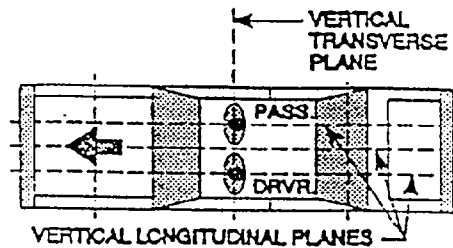
FRONT SEAT MEASUREMENTS



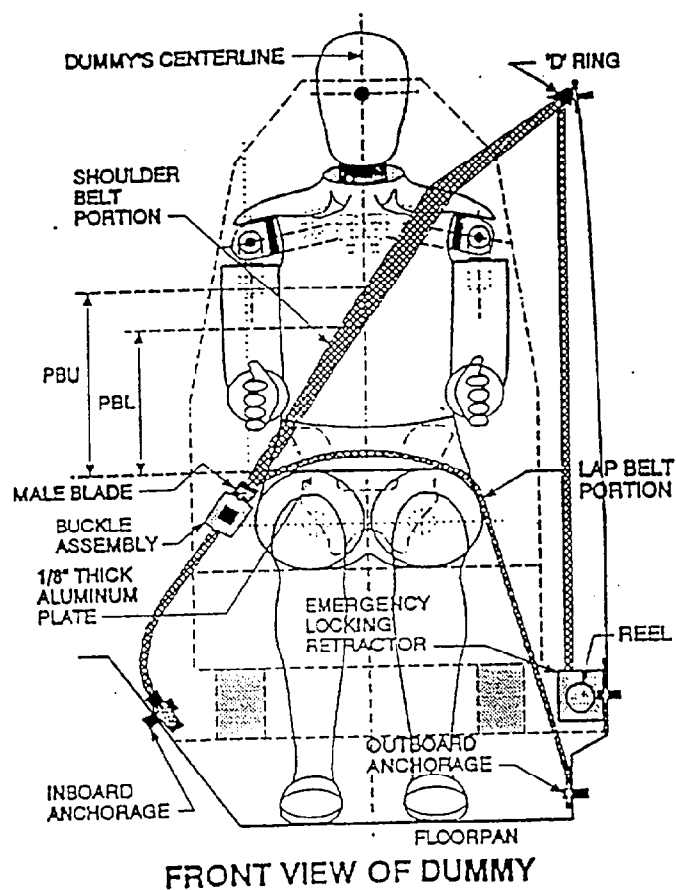
- AD - Arm to Door
- HD - H-Point to Door
- HR - Head to Side Header
- HS - Head to Side Window
- KK - Knee to Knee
- SHY - Striker to H-Point (Y-Direction)



- CD - Chest to Dash
- CS - Steering Wheel to Chest
- HH - Head to Header
- HW - Head to Windshield
- HZ - Head to Roof
- KDA - Knee to Dash Angle
- KDL - Left Knee to Dash
- KDR - Right Knee to Dash
- NA - Nose to Rim Angle
- NR - Nose to Rim
- PA - Pelvic Angle
- RA - Rim to Abdomen
- SA - Seat Back Angle
- SCA - Steering Column Angle
- SH - Striker to H-Point
- SK - Striker to Knee
- ST - Striker to Head
- SWA - Steering Wheel Angle
- TA - Tibial Angle
- WA - Windshield Angle



SEAT BELT POSITIONING DATA



(illustration)

Dimension = mm		
	DRIVER DUMMY	PASSENGER DUMMY
<u>PBU</u> -- Top surface of alum. plate to upper edge	300	314
<u>PBL</u> -- Top surface of alum. plate to belt lower edge	21	238

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>565 mm</u>	<u>580 mm</u>
Shoulder belt length as measured on Part 572 Dummy.	<u>762 mm</u>	<u>776 mm</u>
Lap belt length as measured on Part 572 Dummy.	<u>768 mm</u>	<u>770 mm</u>

SHOULDER BELT SPOOL-OFF DATA:

As determined by film analysis	<u>* mm</u>	<u>* mm</u> at shoulder
As determined mechanically	<u>99 mm</u>	<u>98 mm</u> at retractor

BELT STRETCH DATA:

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

RETRACTOR LOCK-UP TIME:

As determined by shoulder belt spool-off observed in on-board cameras	<u>* msec.</u>	<u>* msec.</u>
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* Weight restrictions prevented the use of onboard cameras

NR = Not Recorded

CAMERA LOCATIONS

VEH. NHTSA NO.: MV0501; TEST DATE: February 13, 1997

VEH. YEAR/MAKE/MODEL/BODY STYLE: 1997/Hyundai/Accent/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	-	-	-	-	-		
2	Left Front View	-1060	-7510	1440	90	7100	25	1000
3	Steering Column Top	-1960	-7200	1530	90	6790	25	1010
4	Steering Column Bottom	-1940	-7190	1005	90	6780	25	966
5	Driver Close-up	-1510	-10000	1455	90	9590	75	1093
6	Driver Angle	-5140	-5650	2080			50	873
7	Onboard Driver**							
8	Onboard Passenger**							
9	Right Overall	-1940	7110	1180	90	6710	13	1117
10	Right Passenger Half	-880	7520	1145	90	7120	25	1020
11	Right Close-up	-1370	10090	1260	90	9690	75	NT
12	Right Angle	-5000	5580	1960			50	1026
13	Top Overall	380	0	2700			13	1117
14	Top Driver	-100	-460	1720			13	985
15	Top Passenger	-100	460	1720			13	917
16	Pit Front	-1090	0	-3175			13	1020
17	Pit Rear	-2590	0	-3175			13	1020

* COORDINATES:

+X = film plane rearward of barrier

+Y = film plane to left of monorail centerline

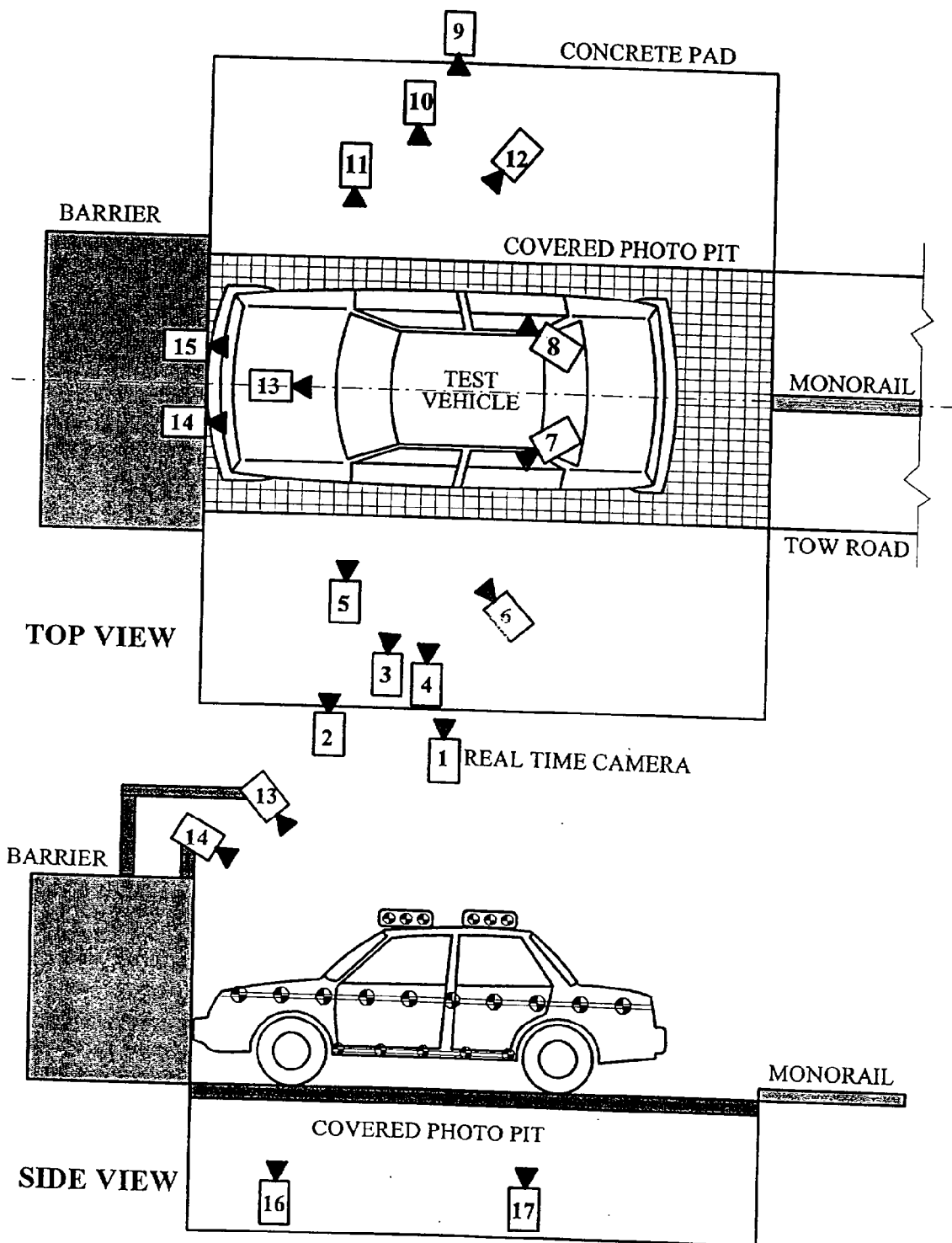
+Z = film plane to above ground level

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

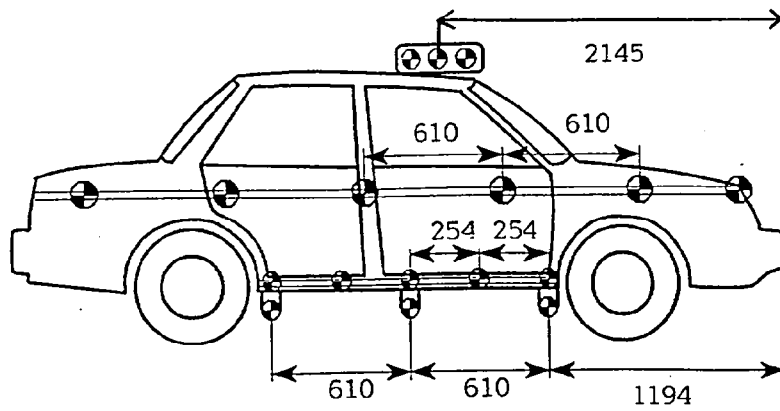
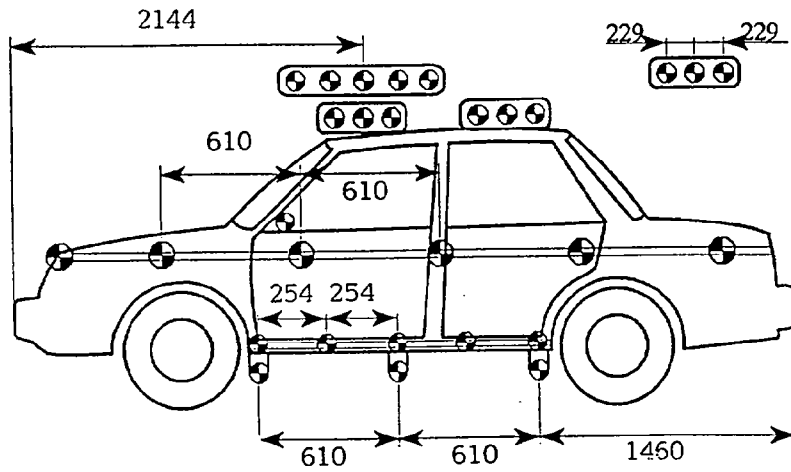
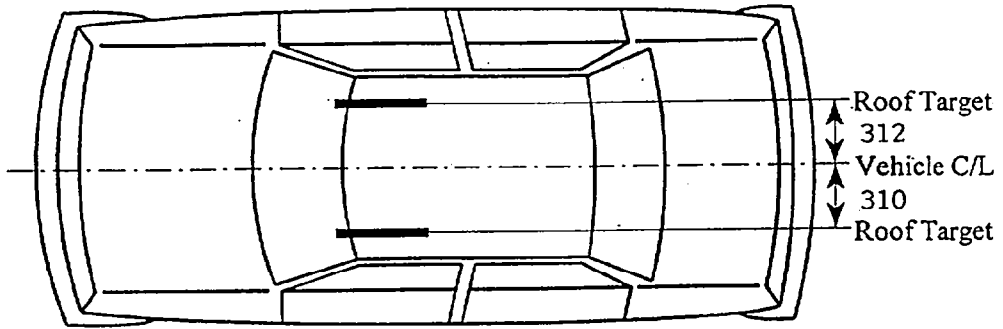
** Weight restrictions prevented the use of onboard cameras

NT = No timing

CAMERA LOCATIONS (Cont'd)



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(DIMENSIONS IN MM)

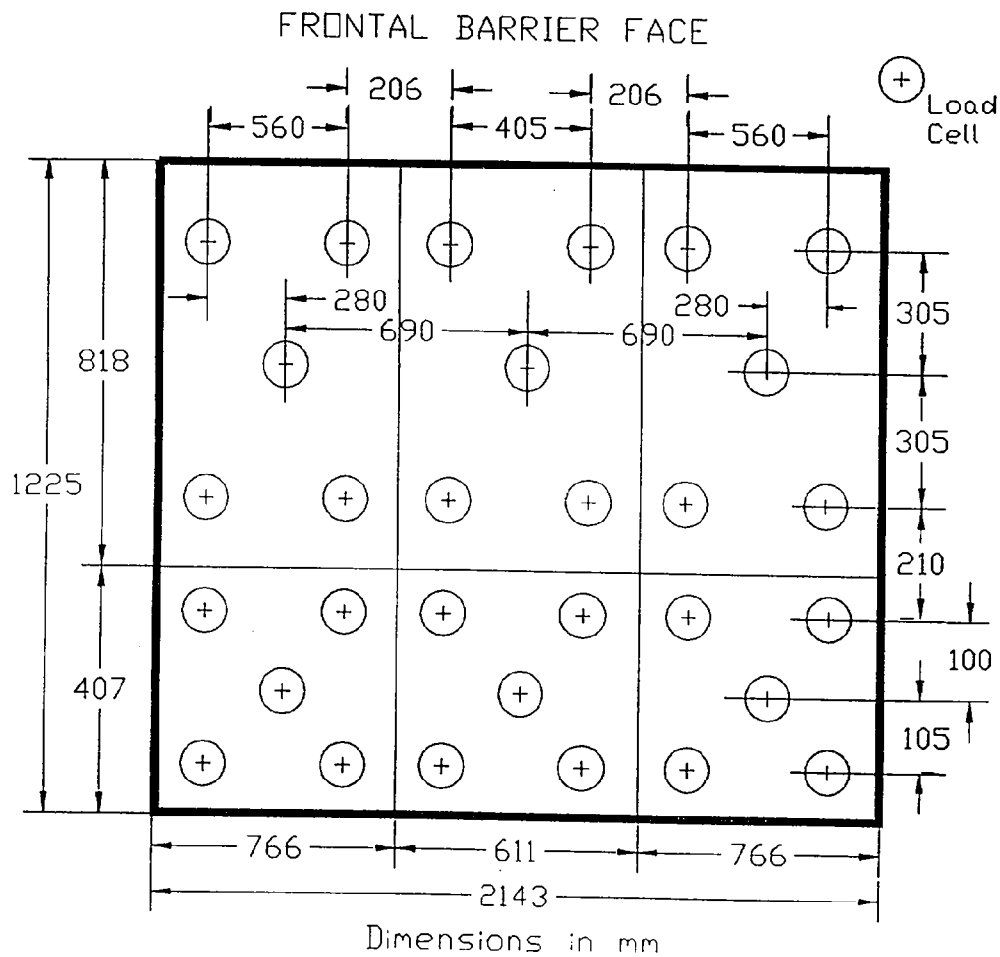
LOAD CELL LOCATIONS ON FIXED BARRIER

30 Load Cells

6 Rows

9 Columns

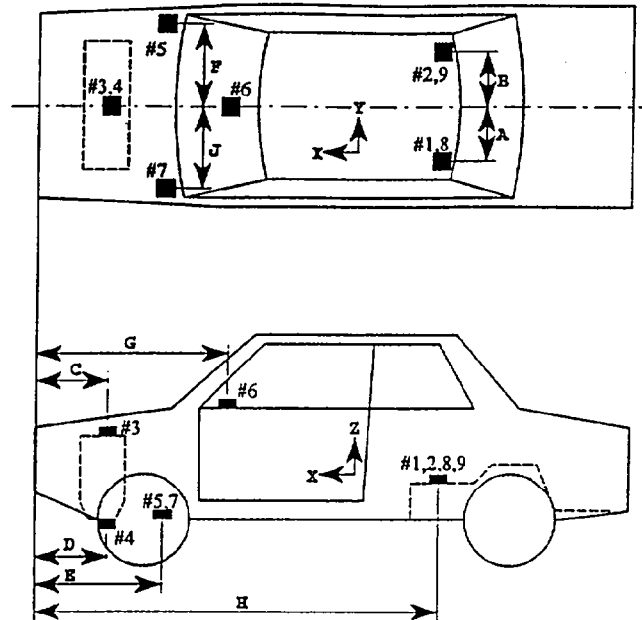
6 Groupings (5 cells/group)



The following data is presented in Appendix B:

- (1) Total or Sum of 30 individual load cells
- (2) Data from 6 Groupings shown above (5 cells/group)

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY



Units: (mm)

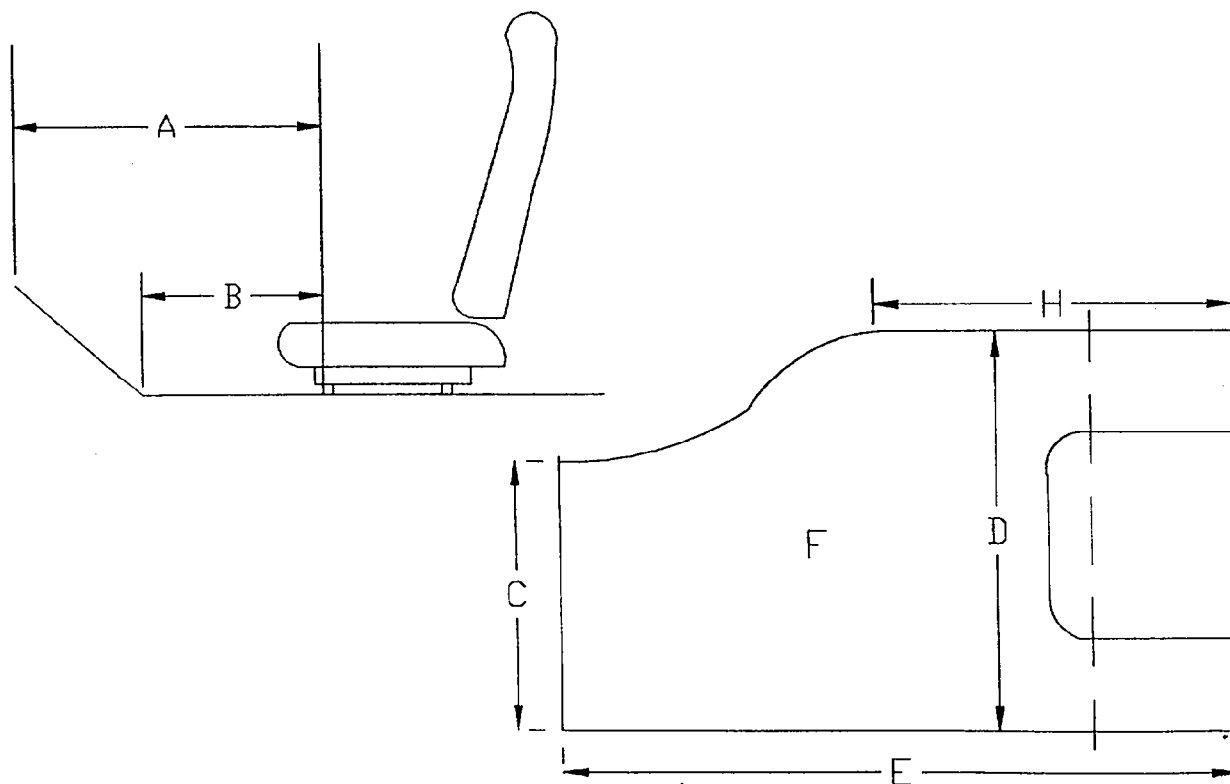
Dimension	Length
A	-305
B	305
C	842
D	617
E	667
F	608
G	1309
H	2558
J	-608

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

TEST VEHICLE MEASUREMENTS

STATIC FOOTWELL DEFORMATION

Driver's Side



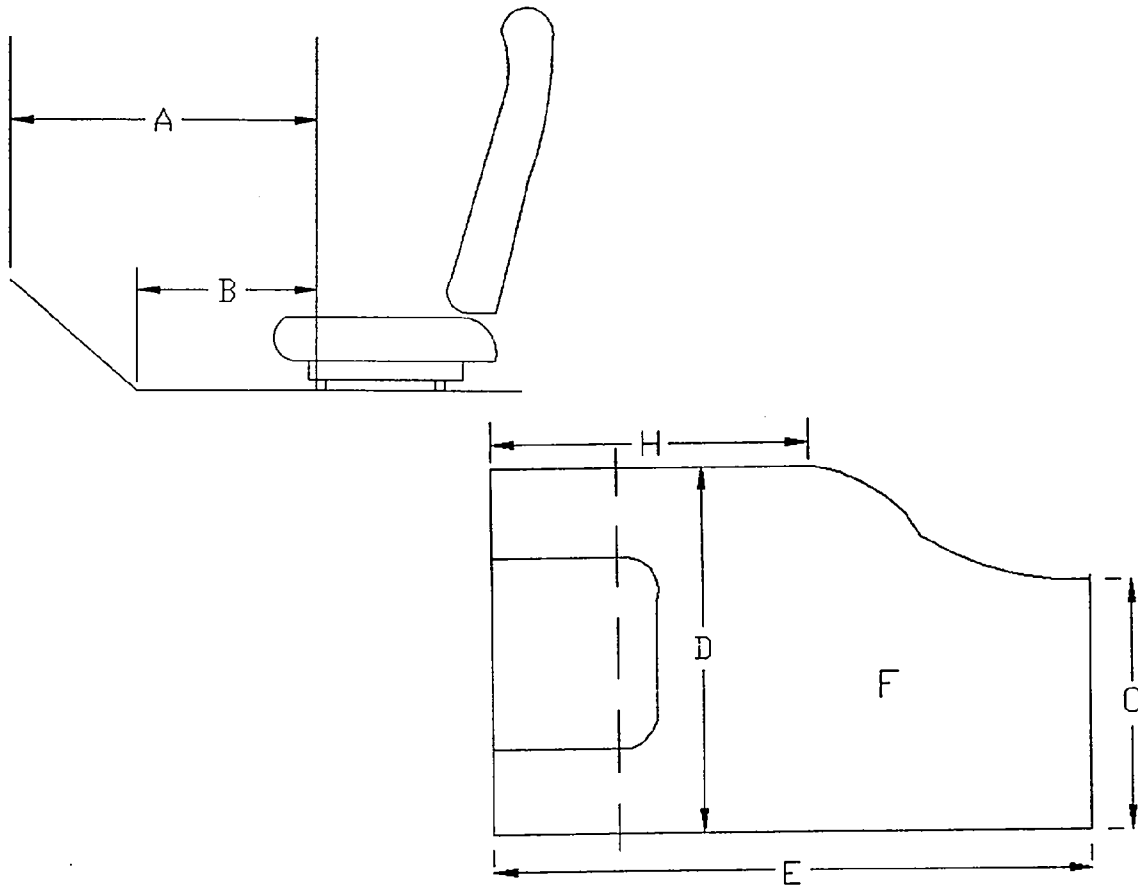
Units = mm

MEASUREMENT	PRE TEST	POST TEST	DIFFERENCE
A	790	607	183
B	580	384	196
C	340	316	24
D	399	402	3
E	1918	1817	101
H	1710	1718	8

TEST VEHICLE MEASUREMENTS (Cont'd)

STATIC FOOTWELL DEFORMATION

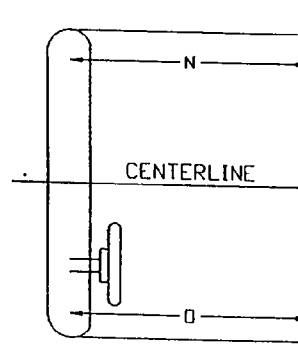
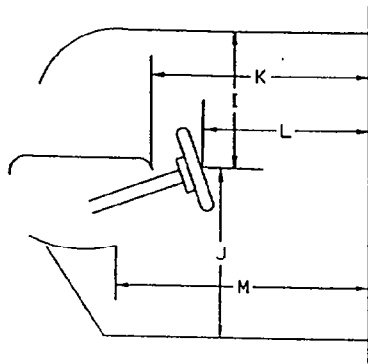
Passenger's Side



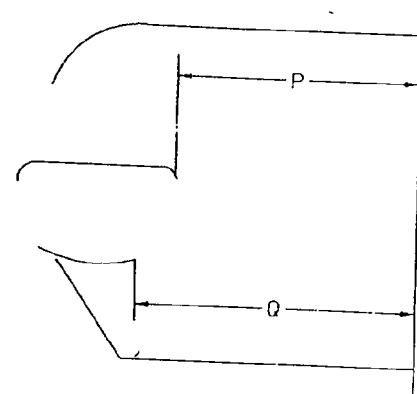
Units = mm

MEASUREMENT	PRE TEST	POST TEST	DIFFERENCE
A	796	619	177
B	561	444	117
C	355	355	0
D	405	403	2
E	1898	1857	41
H	1734	1707	27

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



MEASUREMENTS
FROM C-PILLAR
BELT ANCHORAGE



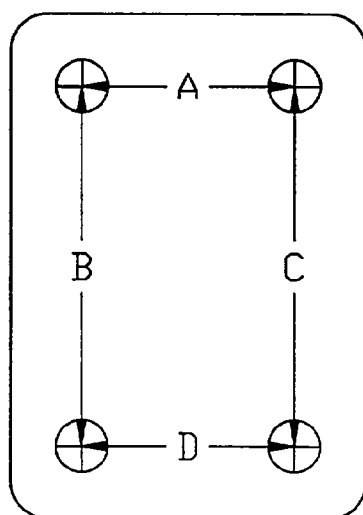
Units = mm

MEASUREMENT	PRE TEST	POST TEST	DIFFERENCE
I	457	438	19
J	612	689	77
K	1648	1631	17
L	1468	1436	32
M	1883	1801	82
N	1928	1909	19
O	1925	1853	72
P	1740	1691	49
Q	1874	1769	105

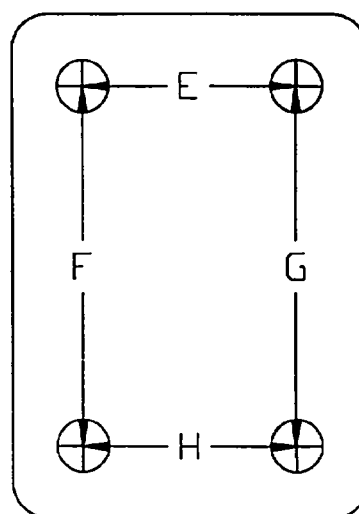
TEST VEHICLE MEASUREMENTS (Cont'd)

UNDERBODY FLOORBOARD DEFORMATION

DRIVER'S SIDE



PASSENGER'S SIDE

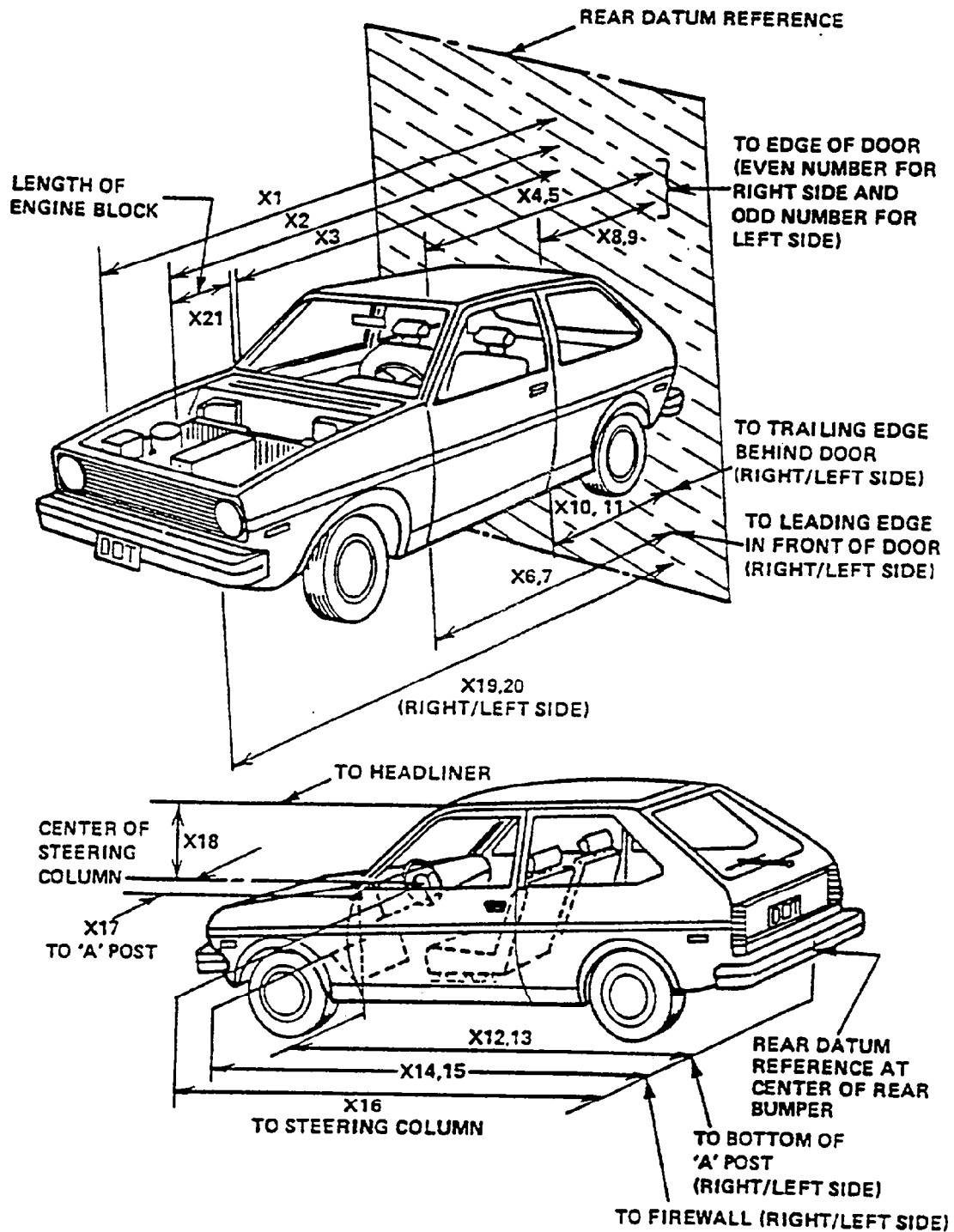


MEASUREMENT	PRE TEST	POST TEST	DIFFERENCE
A	374	350	24
B	539	458	81
C	575	384	191
D	340	334	6
E	363	363	0
F	538	405	133
G	550	498	52
H	323	323	0

TEST VEHICLE MEASUREMENTS (Cont'd)

No.	MEASUREMENT DESCRIPTION:	Pre-Test (mm)	Post-Test (mm)	Diff. (mm)
X1	Total Length of Test Vehicle at Centerline	3912	3424	488
X2	Rear Surface of Vehicle to Front of Engine	3382	3183	199
X3	Rear Surface of Vehicle to Firewall	2952	2928	24
X4	Rear Surface to Upr. Leading Edge of Rt. Door	2597	2607	10
X5	Rear Surface to Upr. Leading Edge of Left Door	2598	2584	14
X6	Rear Surface to Lwr. Leading Edge of Rt. Door	2632	2622	10
X7	Rear Surface to Lwr. Leading Edge of Left Door	2634	2603	31
X8	Rear Surface to Upr. Trailing Edge of Rt. Door	1642	1648	6
X9	Rear Surface to Upr. Trailing Edge of Left Door	1645	1624	21
X10	Rear Surface to Lwr. Trailing Edge of Rt. Door	1659	1652	7
X11	Rear Surface to Lwr. Trailing Edge of Left Door	1660	1632	28
X12	Rear Surface to Bottom of A-Post on Rt. Side	2635	2623	12
X13	Rear Surface to Bottom of A-Post on Left Side	2636	2618	18
X14	Rear Surface to Firewall on Right Side	2945	2923	22
X15	Rear Surface to Firewall on Left Side	2944	2894	50
X16	Rear Surface to Steering Column	2205	2171	34
X17	Center of Steering Column to A-Post	387	352	35
X18	Center of Steering Column to Headlining	454	438	16
X19	Rear Surface to Right Side of Front Bumper	3775	3368	407
X20	Rear Surface to Left Side of Front Bumper	3775	3342	433
X21	Length of Engine Block	400	400	0

TEST VEHICLE MEASUREMENTS (Cont'd)



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VEH. WHEELBASE: 2400 mm; FRONT OVERHANG: 790 mm; OVERALL WIDTH: 1600 mm

COLLISION DEFORMATION CLASSIFICATION (CDC) CODE: F (Frontal)

DAMAGED REGION: L = 1340 mm



APPENDIX A
PHOTOGRAPHS

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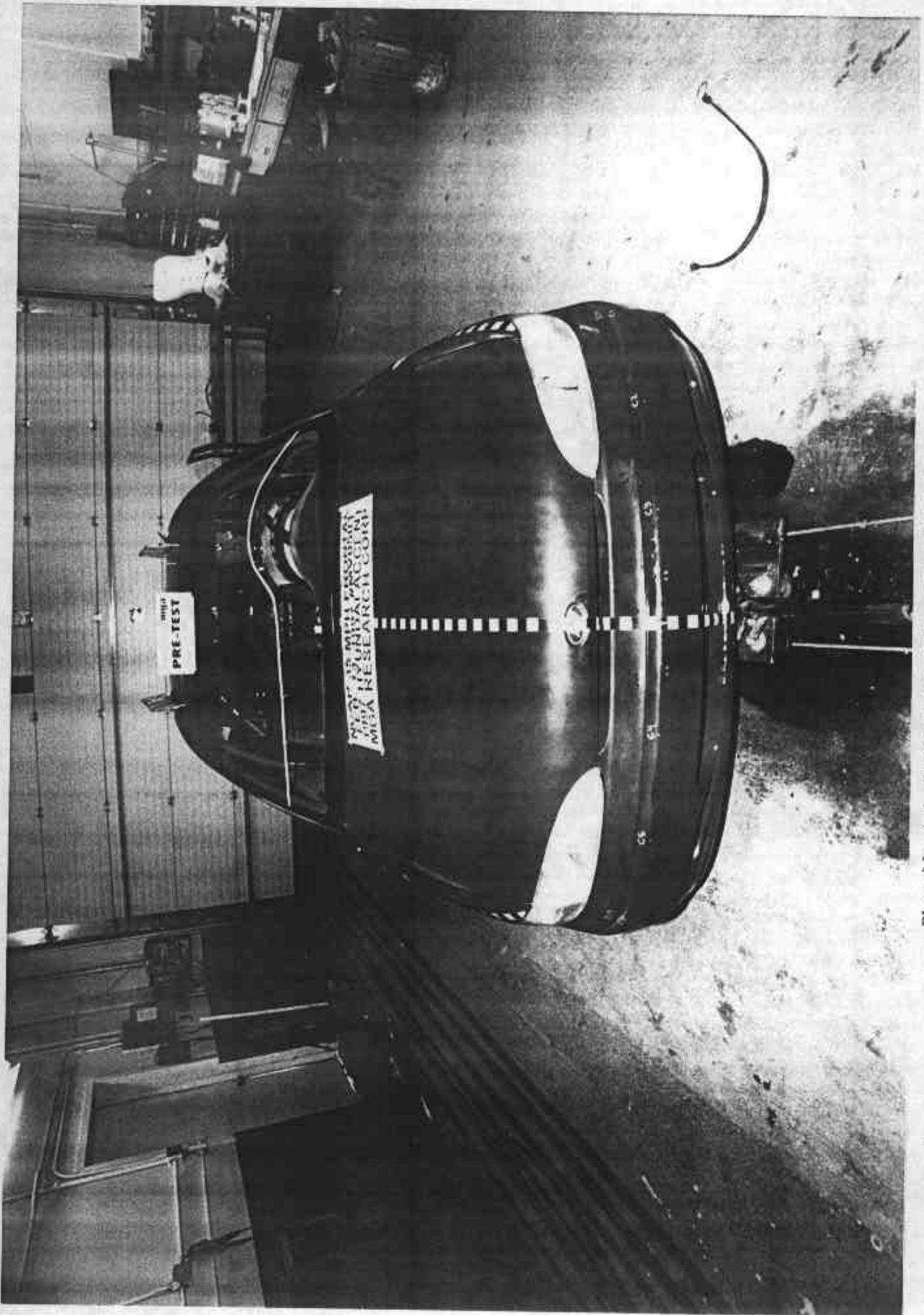


Photo No. A-1 - Pre-Test Front View of Test Vehicle

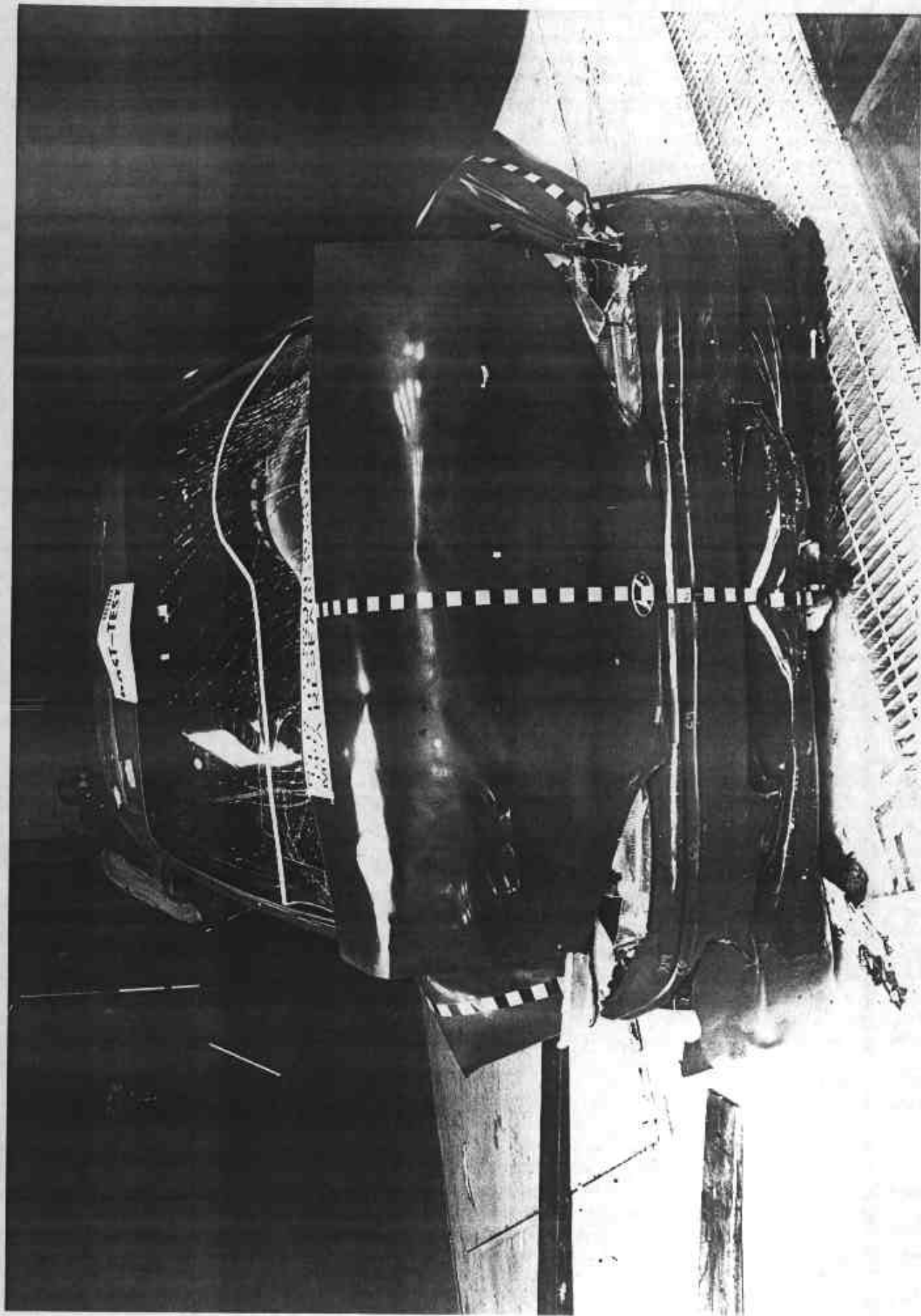


Photo No. A-2 - Post-Test Front View of Test Vehicle

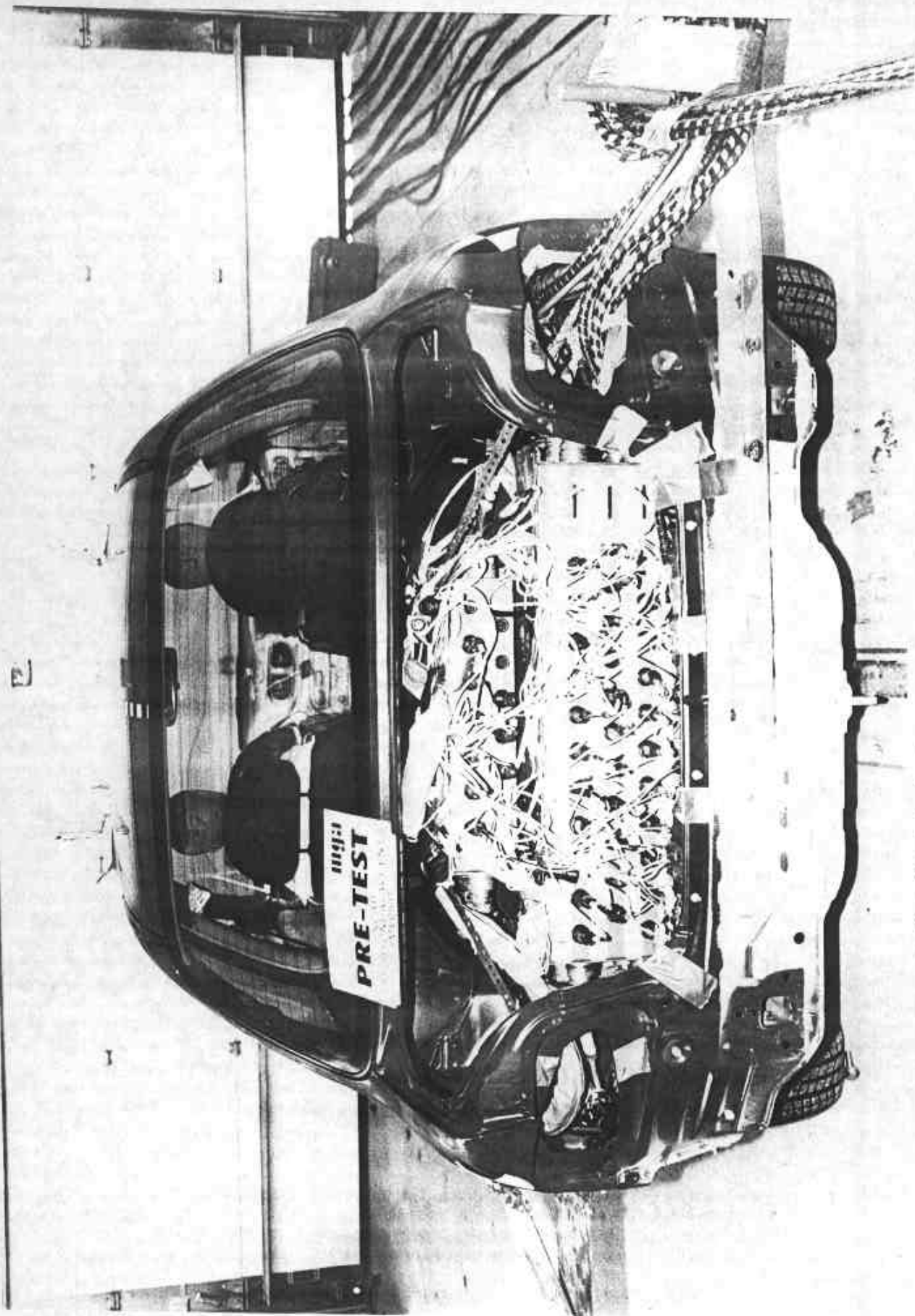


Photo No. A-3 - Pre-Test Rear View of Test Vehicle

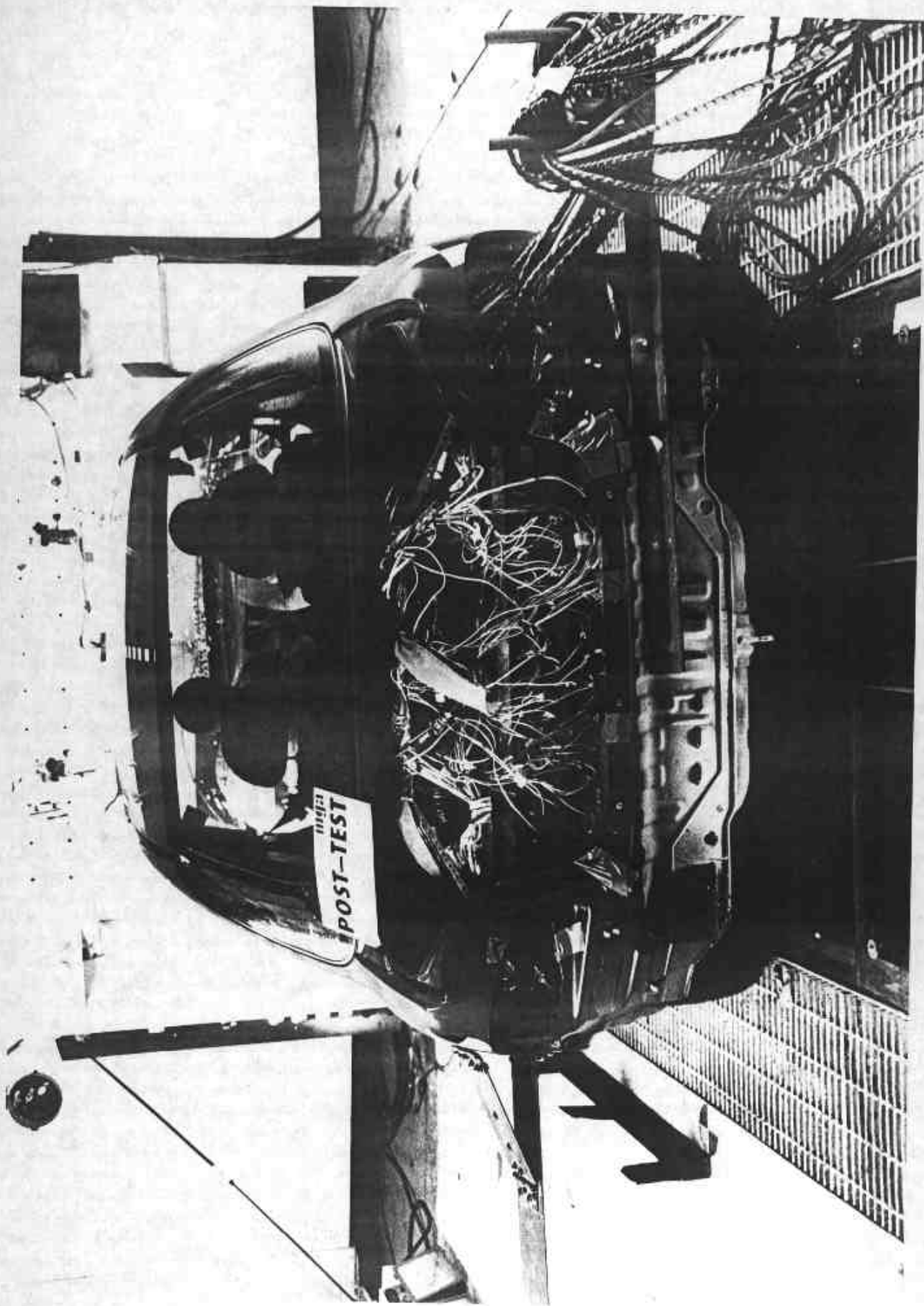


Photo No. A-4 - Post-Test Rear View of Test Vehicle

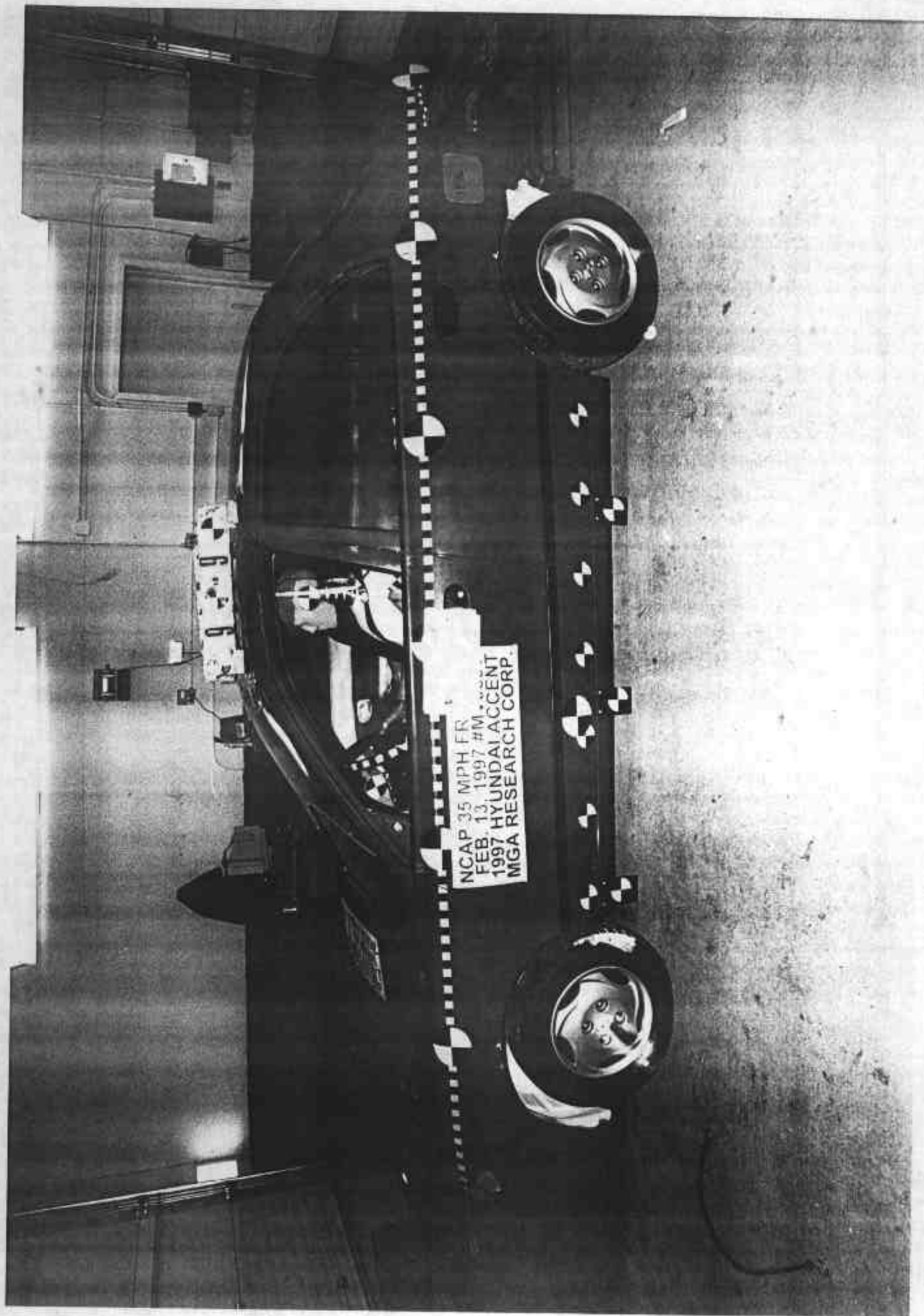


Photo No. A-5 - Pre-Test Left Side View of Test Vehicle

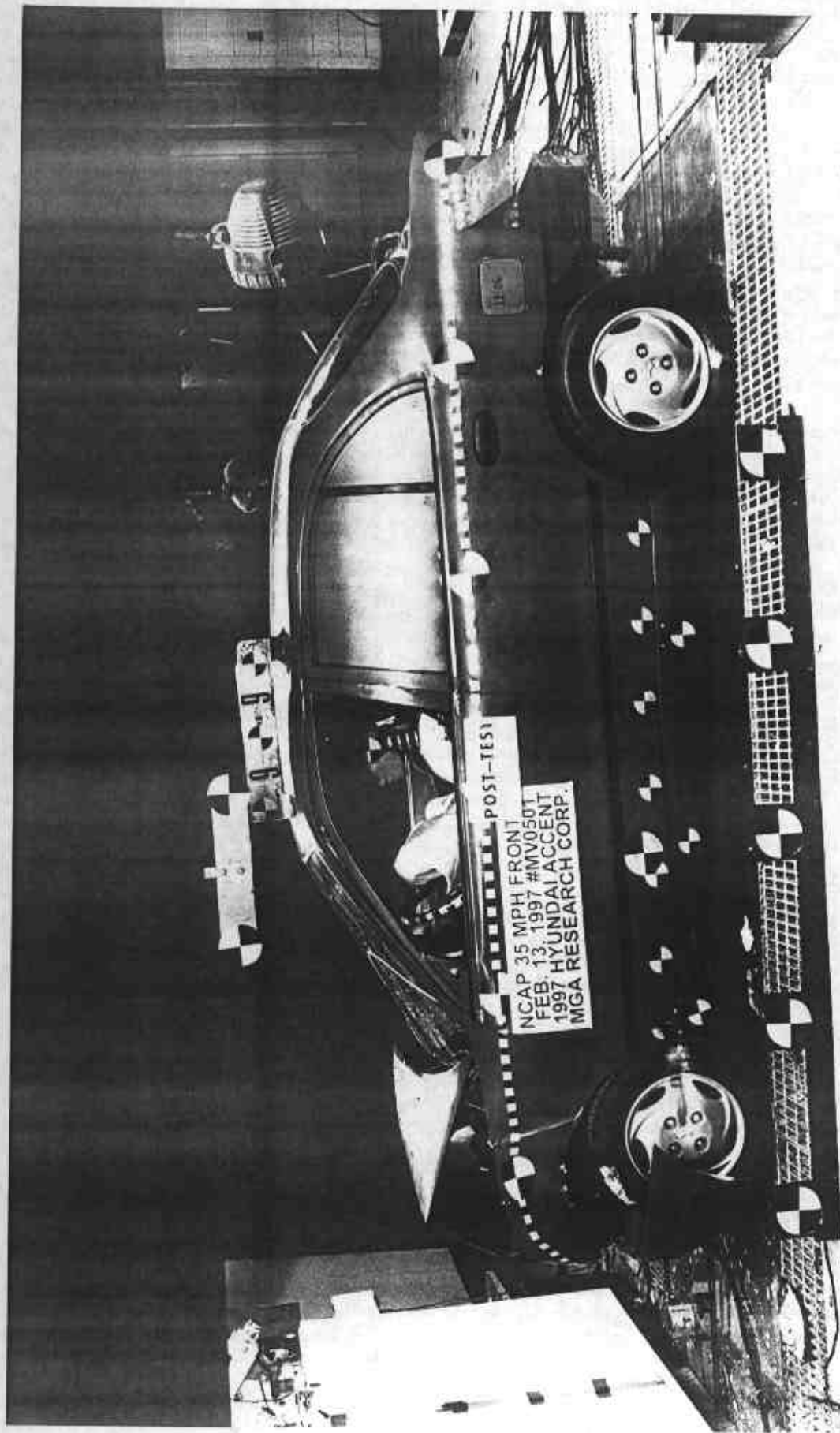


Photo No. A-6 - Post-Test Left Side View of Test Vehicle

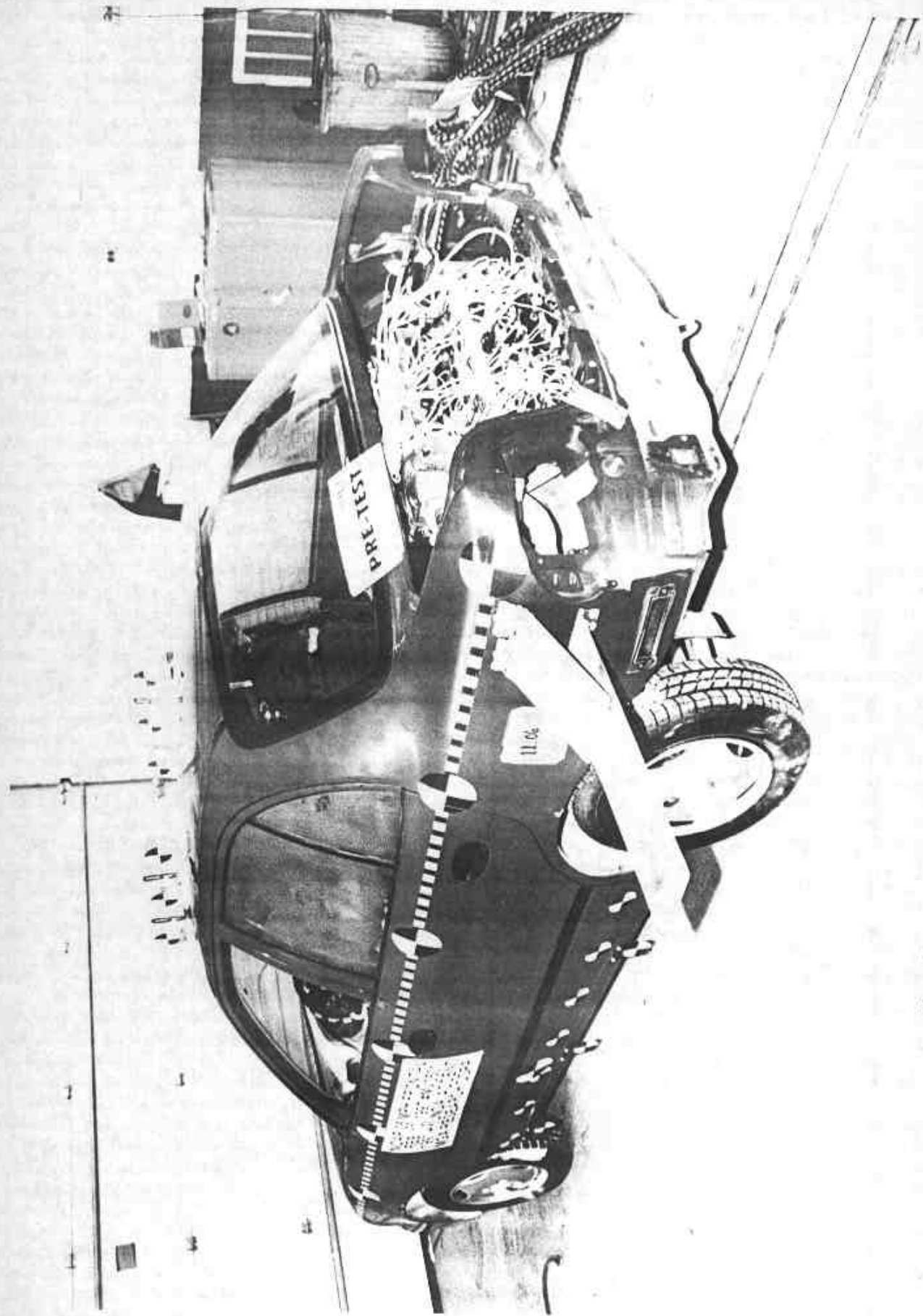


Photo No. A-7 - Pre-Test Left Rear Three-Quarter View of Test Vehicle

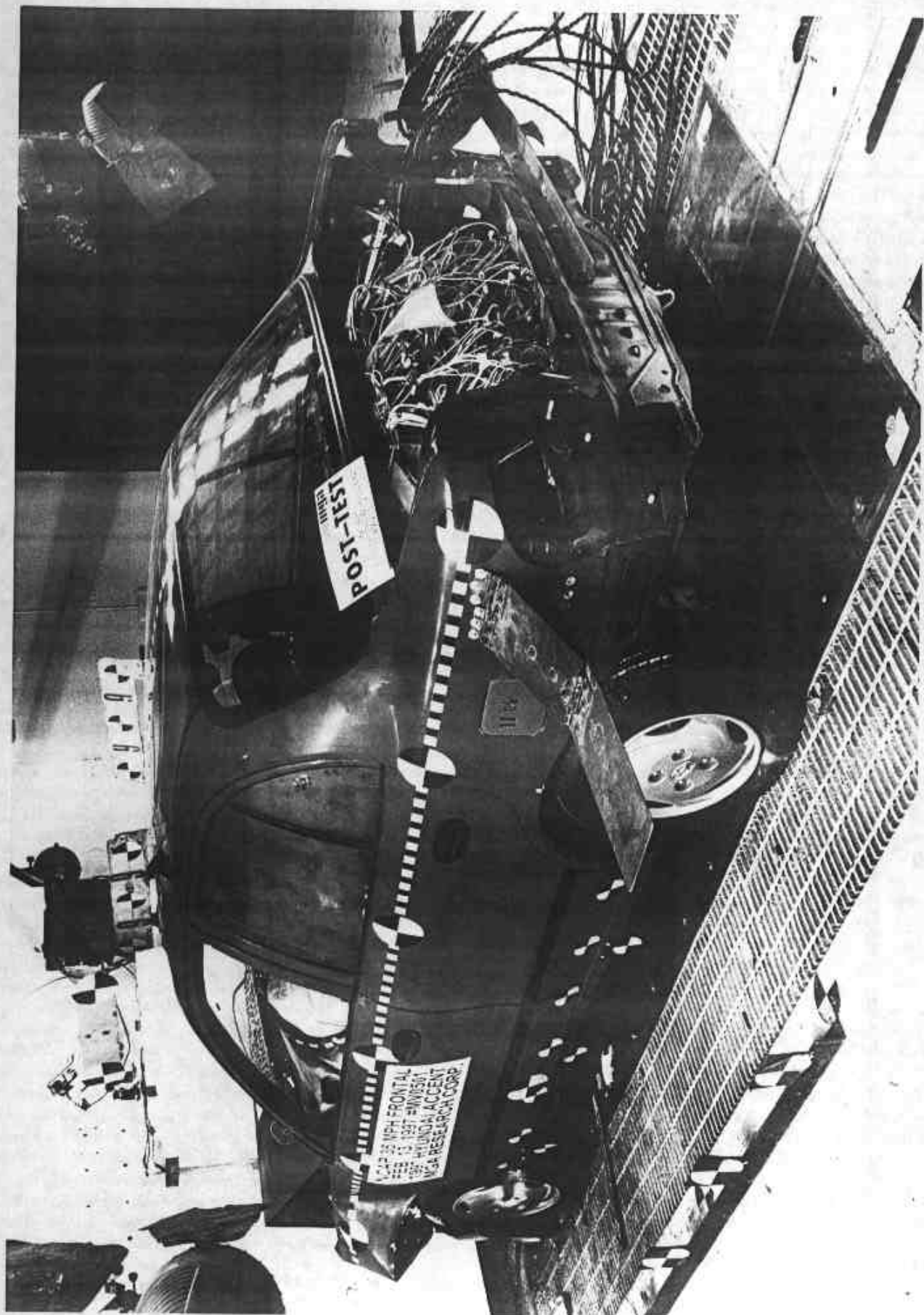


Photo No. A-8 - Post-Test Left Rear Three-Quarter View of Test Vehicle

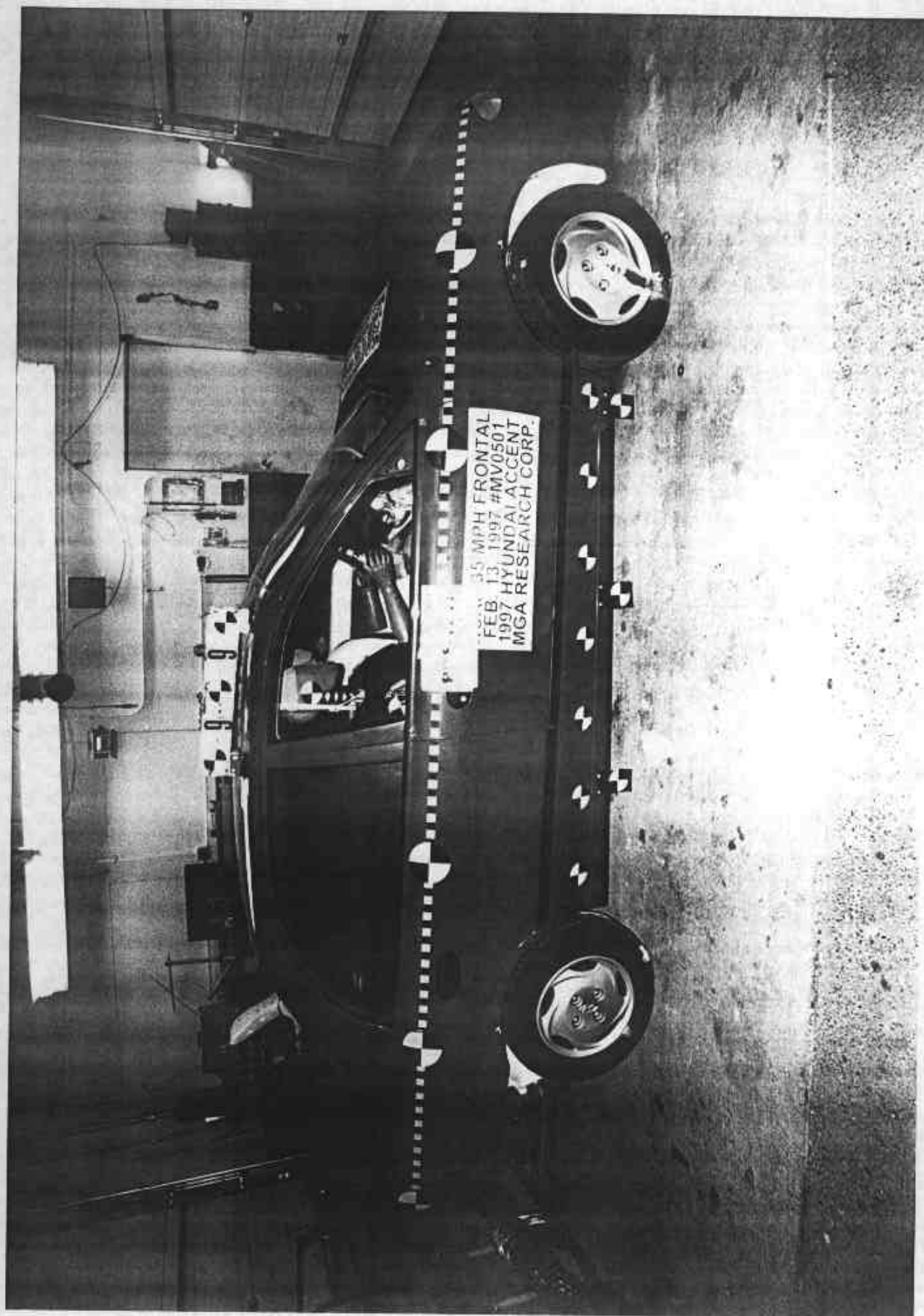
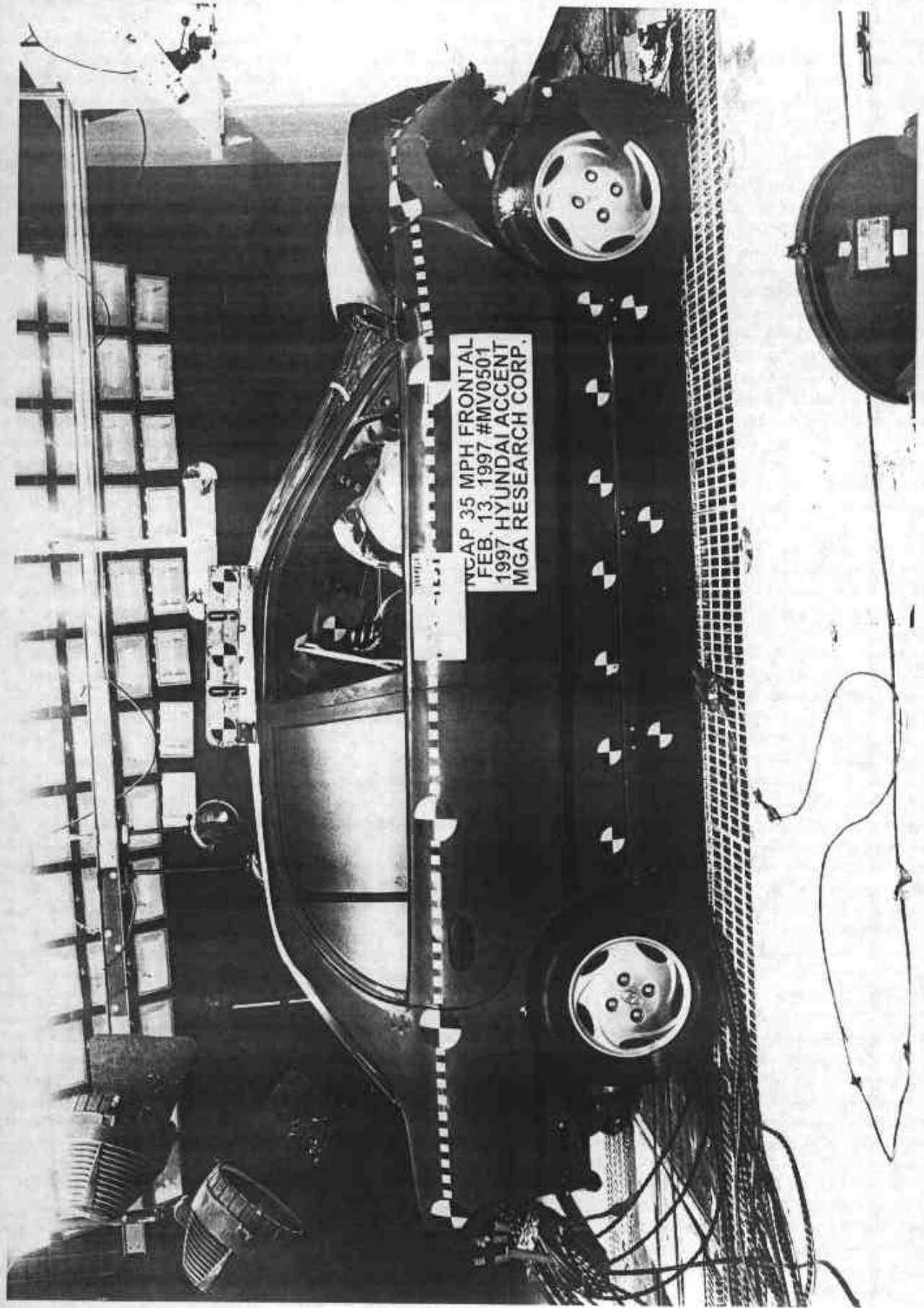


Photo No. A-9 - Pre-Test Right Side View of Test Vehicle



A-10

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

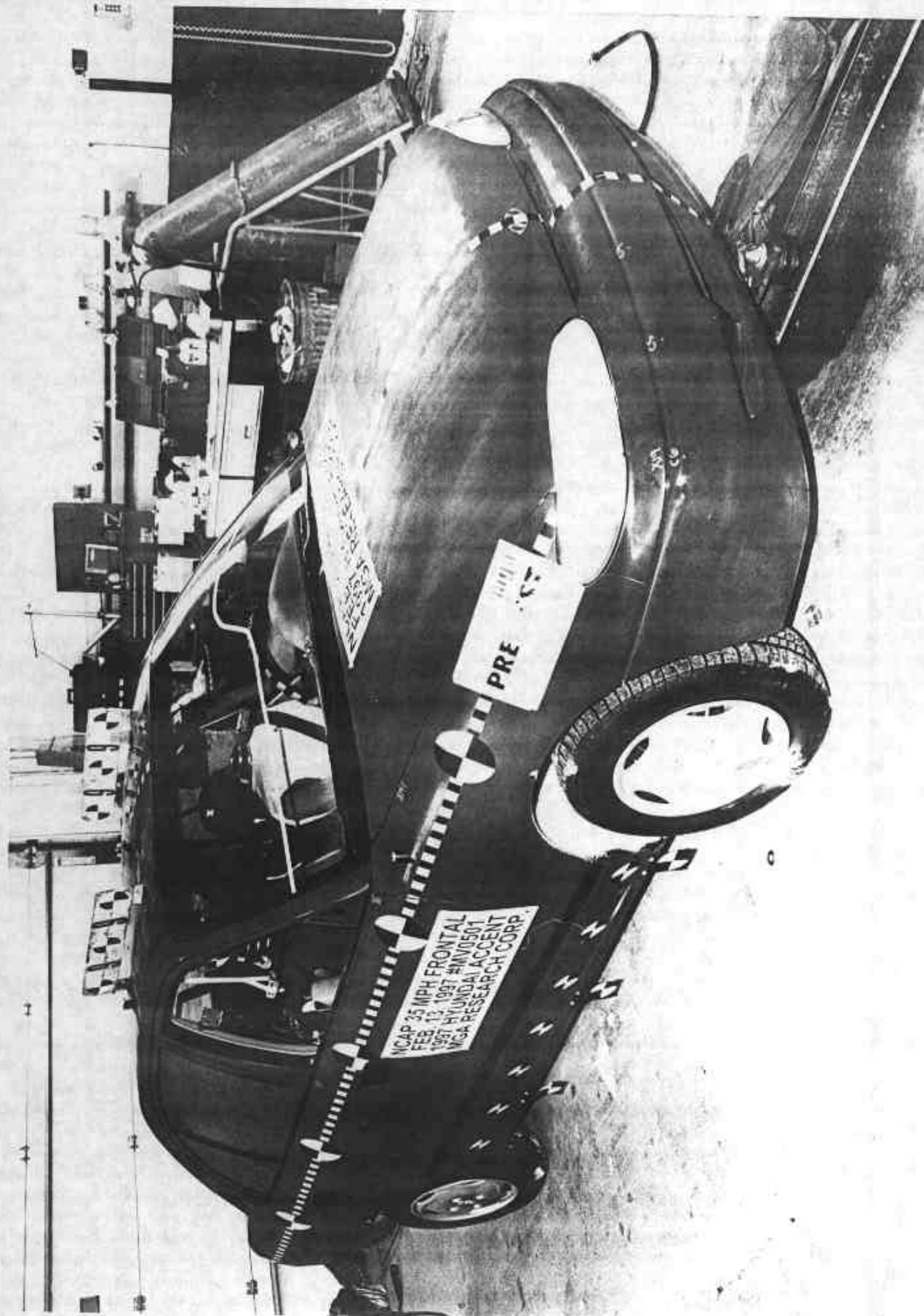


Photo No. A-11 - Pre-Test Right Front Three-Quarter View of Test Vehicle

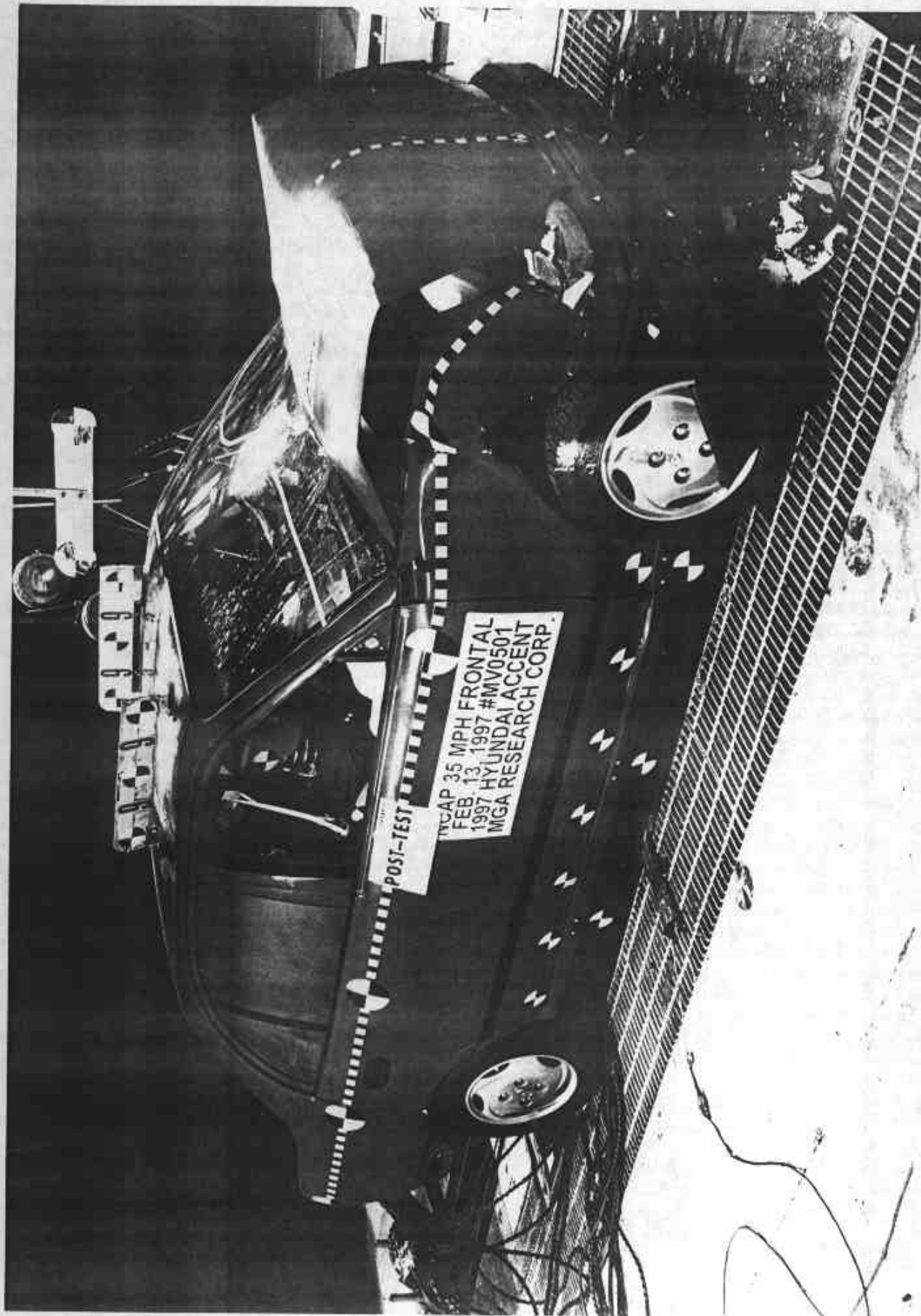


Photo No. A-12 - Post-Test Right Front Three-Quarter View of Test Vehicle



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

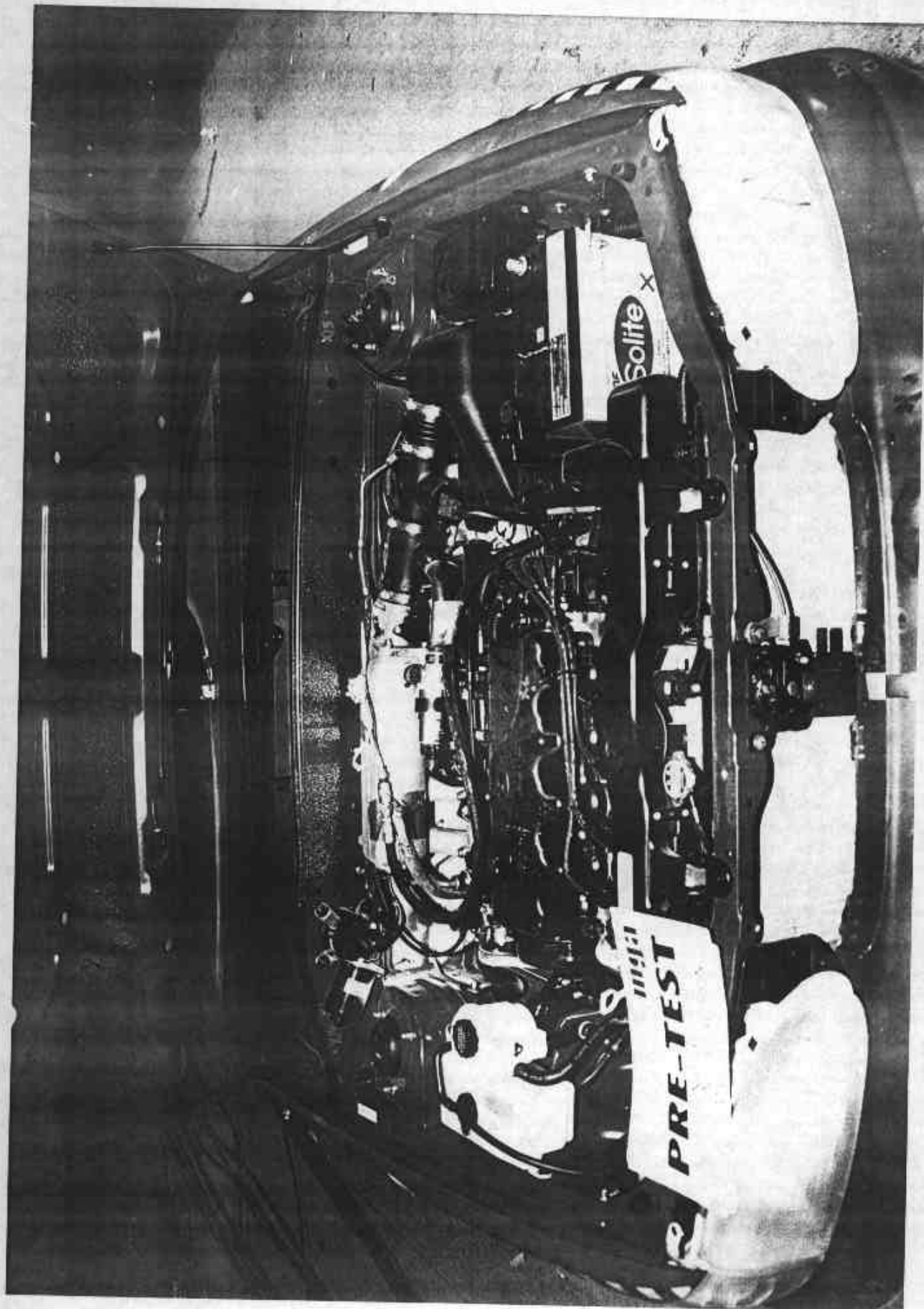


Photo No. A-14 - Pre-Test Engine Compartment View

A-14

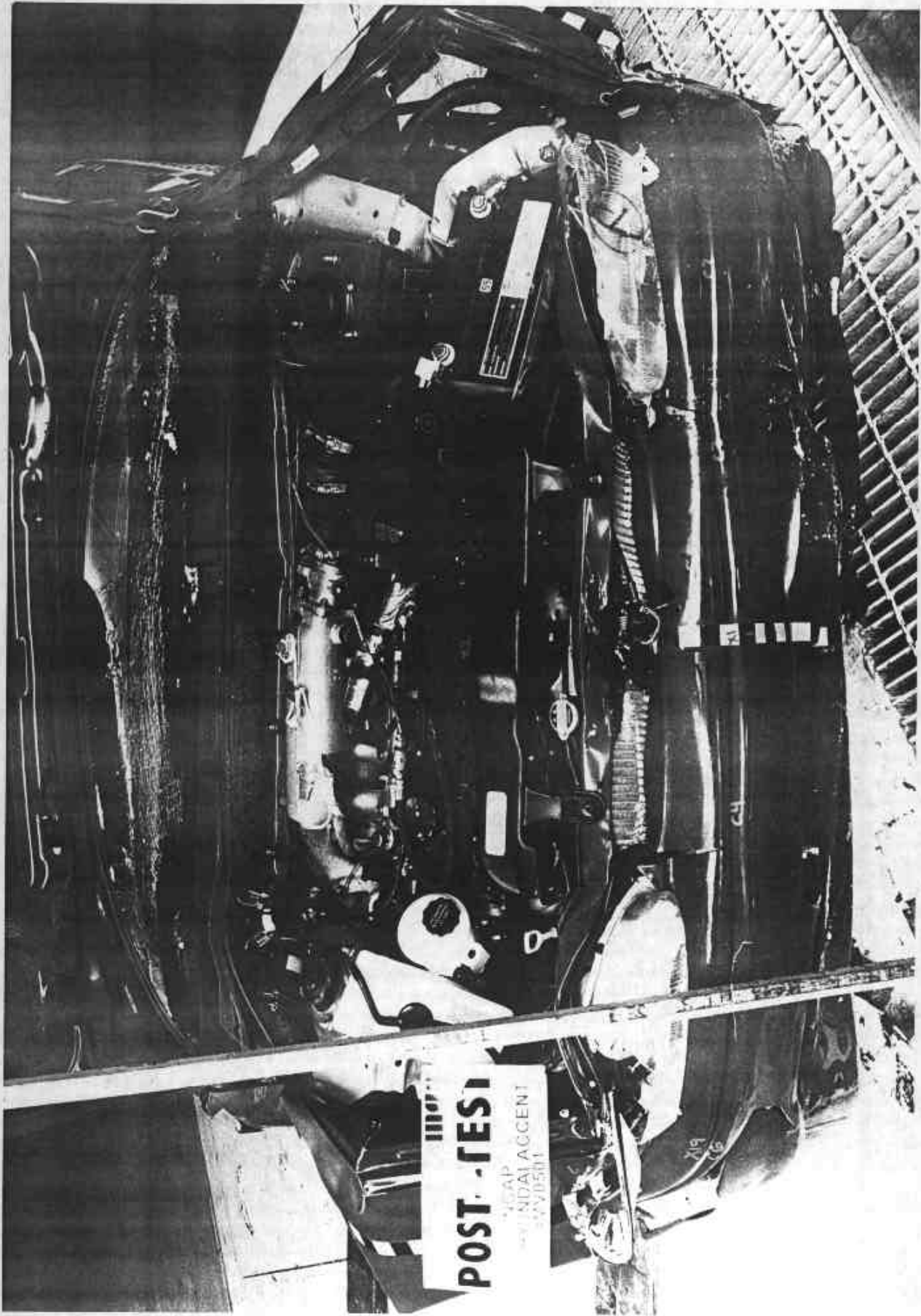


Photo No. A-15 - Post-Test Engine Compartment View

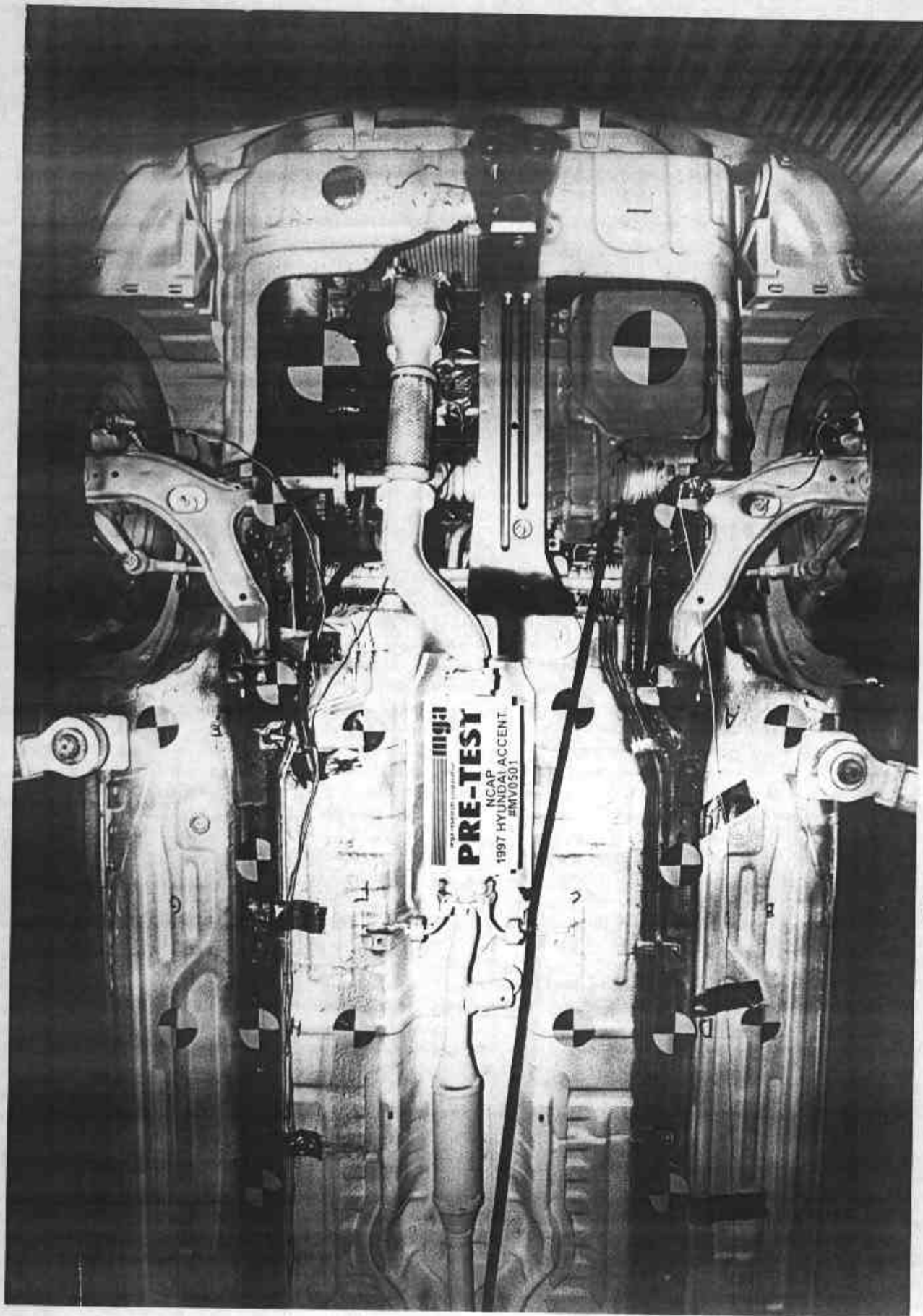


Photo No. A-16 - Pre-Test Front Underbody View

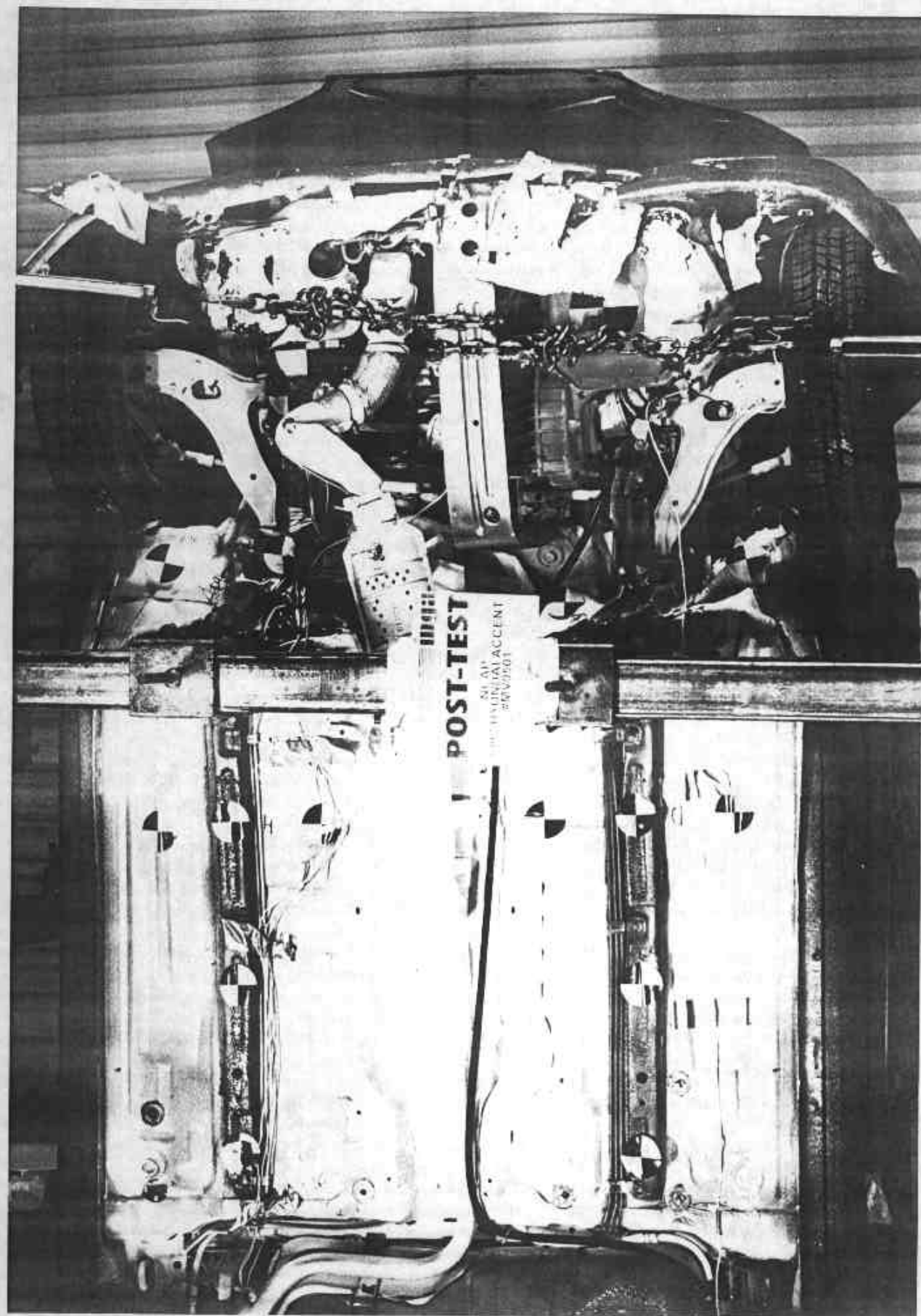


Photo No. A-17 - Post-Test Front Underbody View

A-17

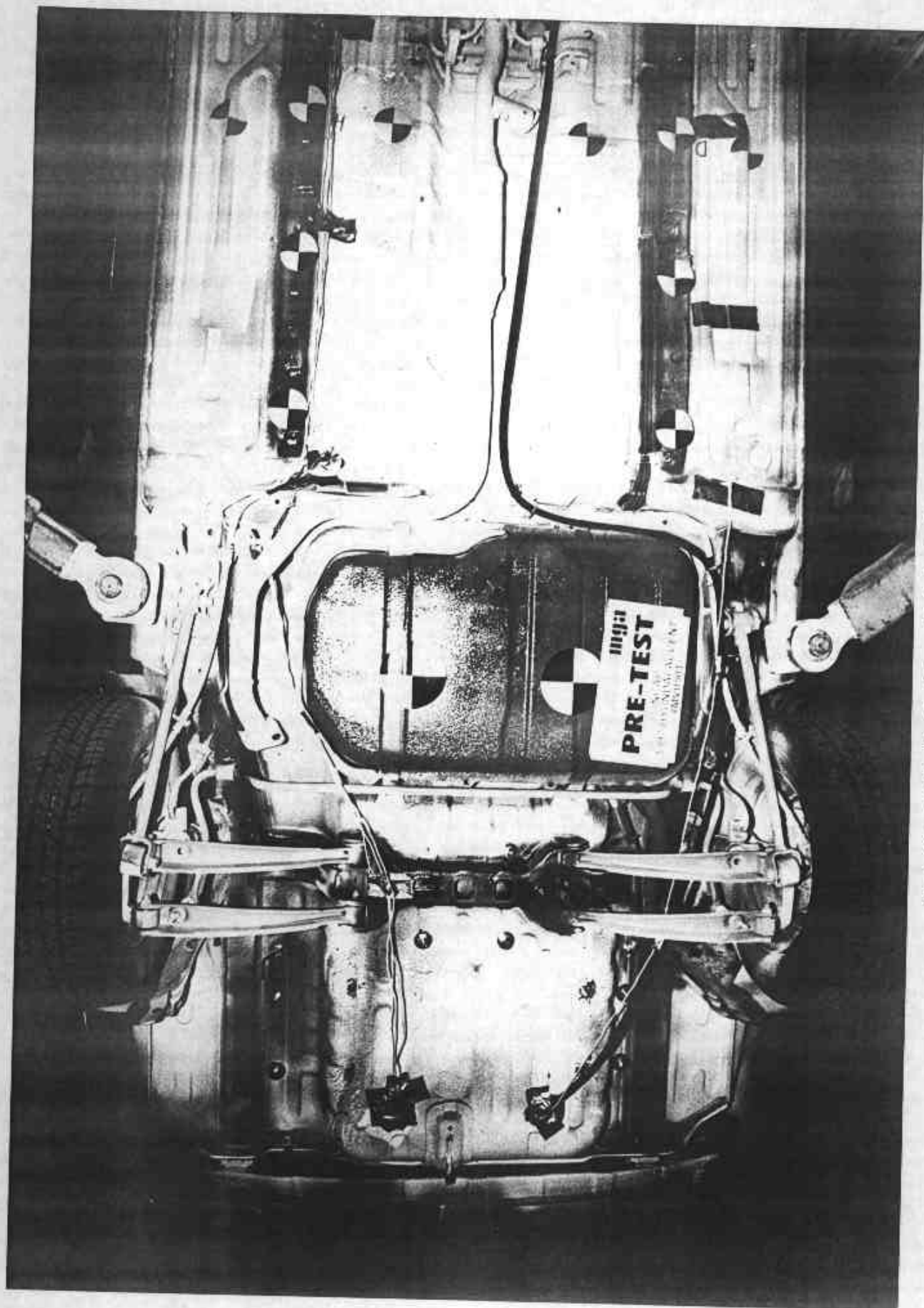


Photo No. A-18 - Pre-Test Rear Underbody View.

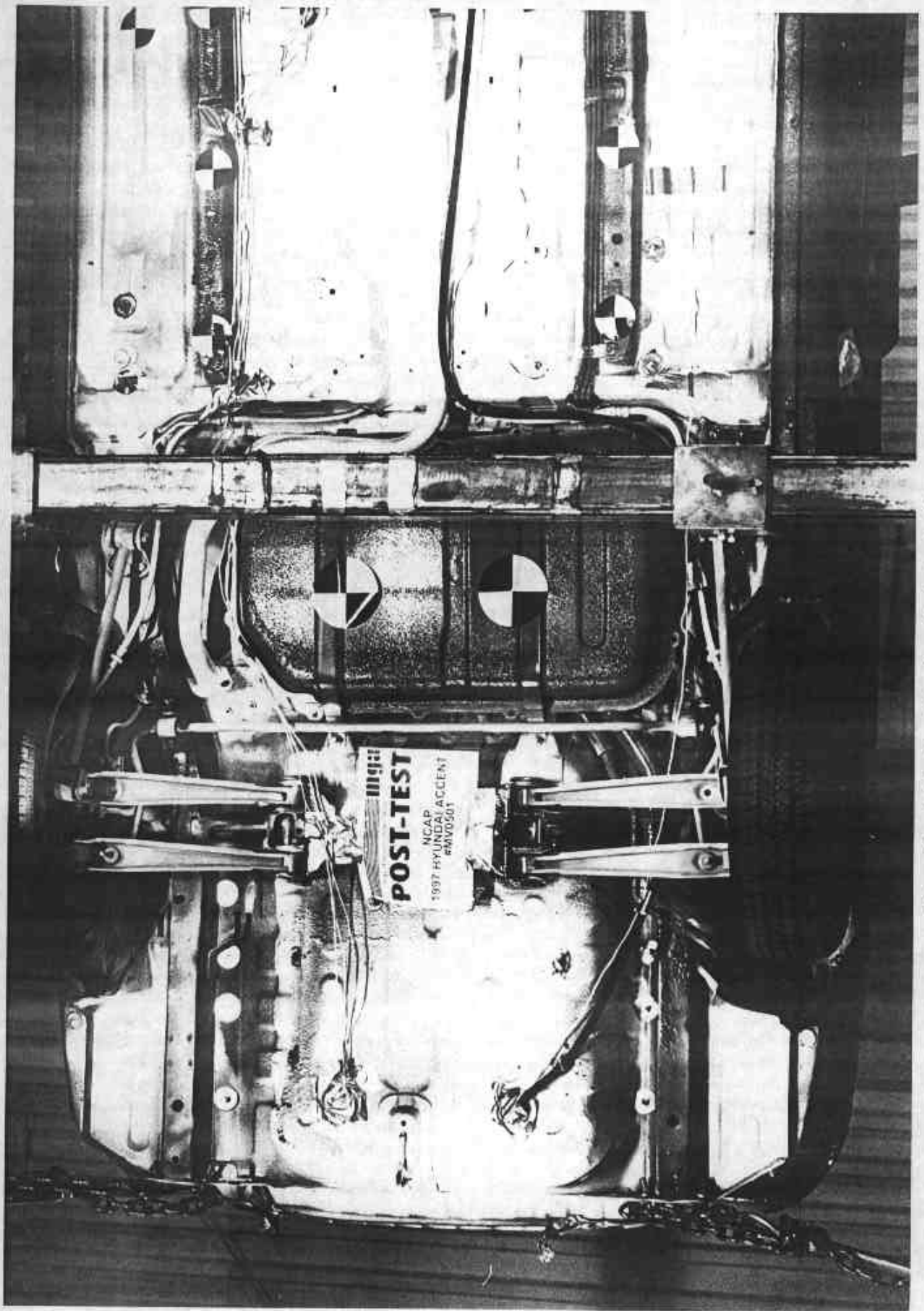


Photo No. A-19 - Post-Test Rear Underbody View



A-21

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

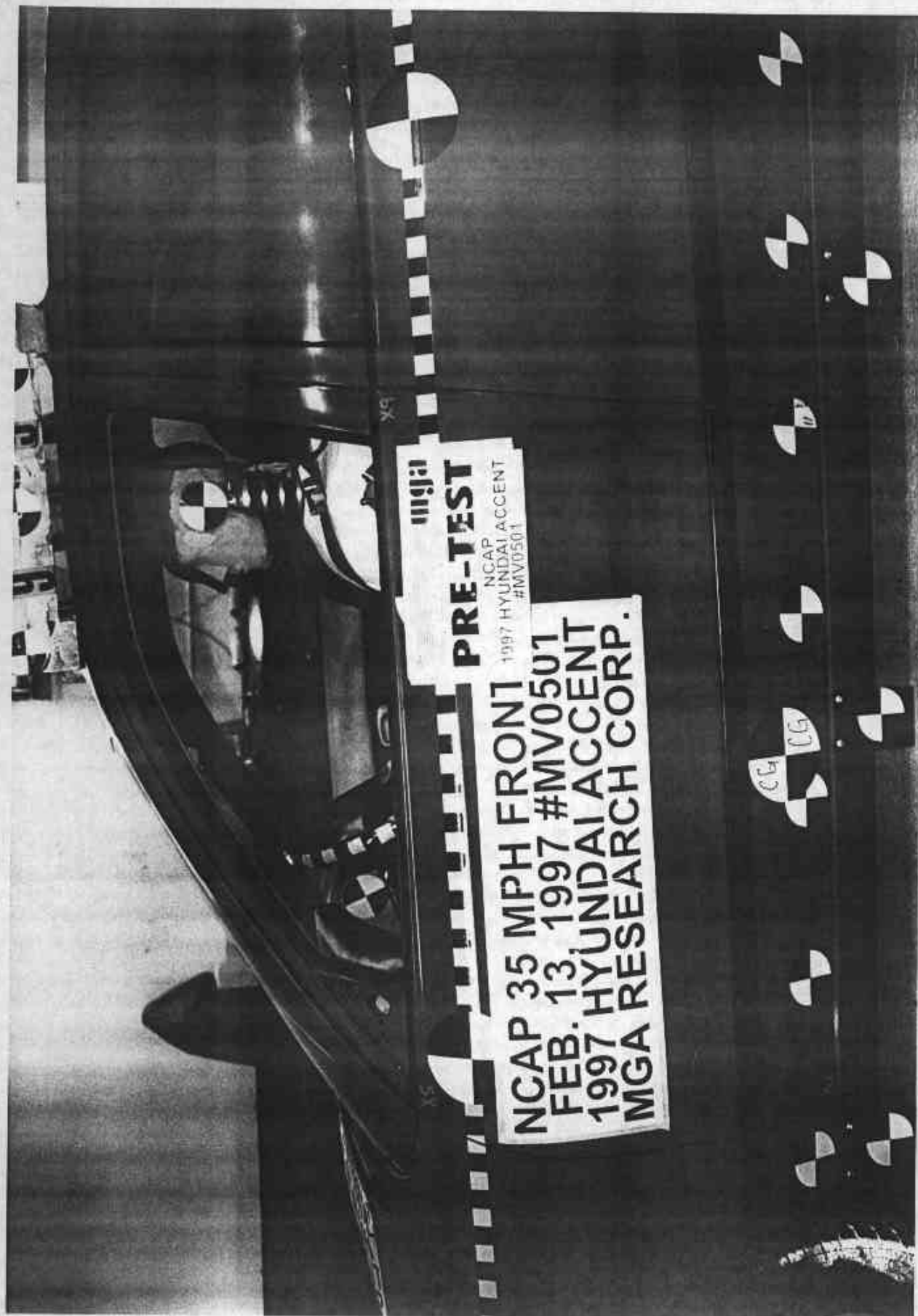


Photo No. A-22 - Pre-Test Driver Dummy Position Left Side View



A-23

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

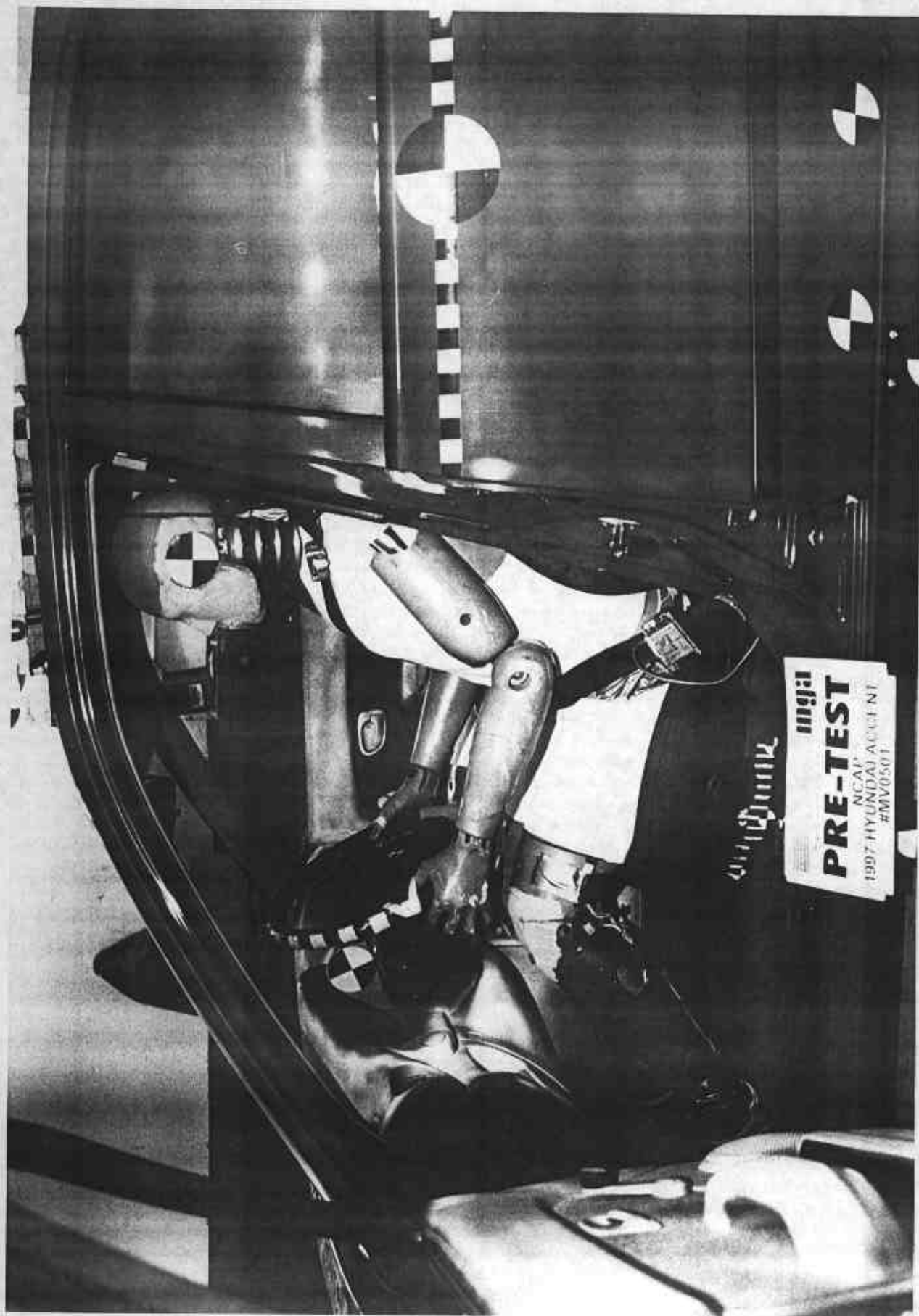


Photo No. A-24 - Pre-Test Driver Dummy Position Left Side View (Door Open)

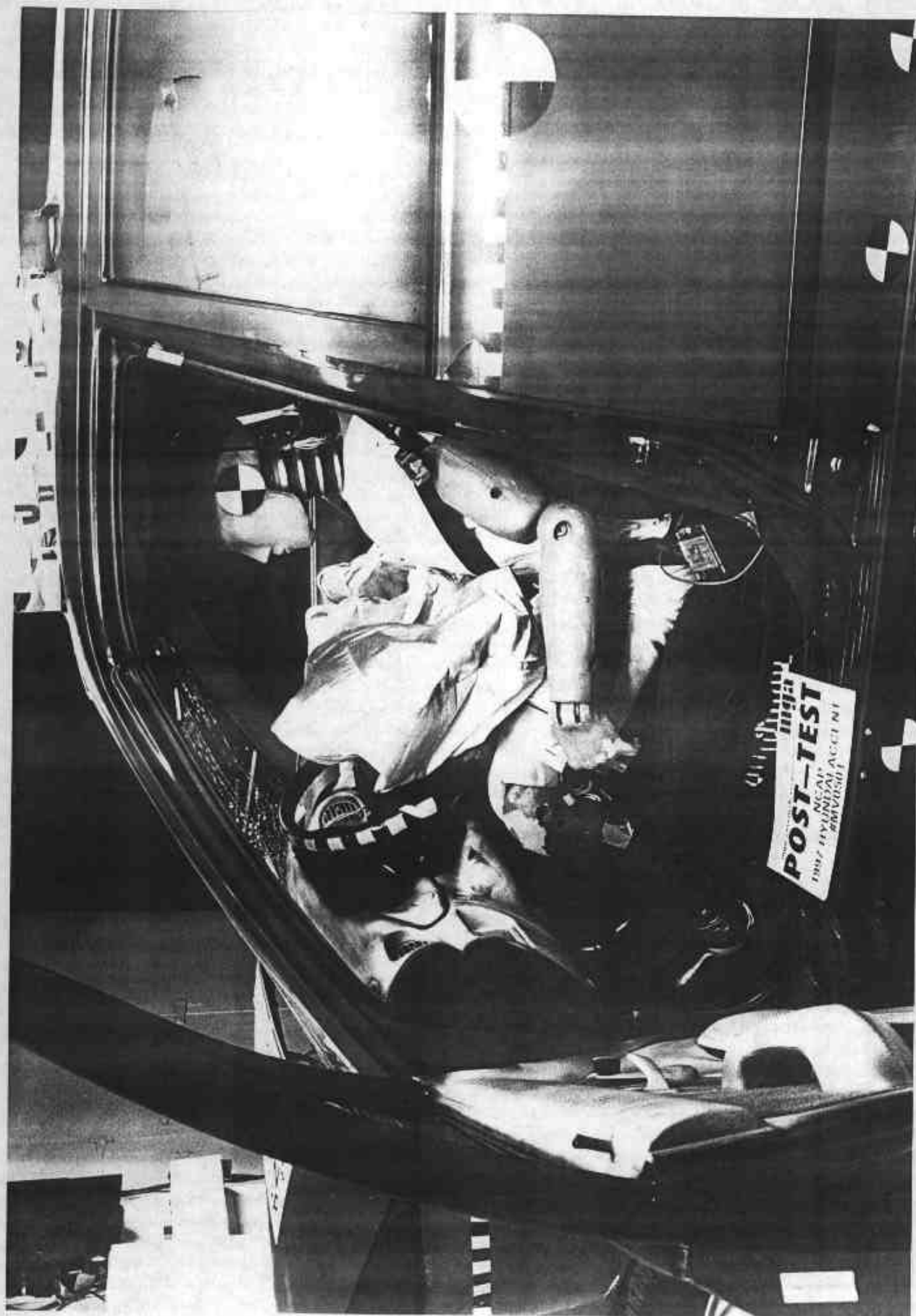


Photo No. A-25 - Post-Test Driver Dummy Position Left Side View (Door Open)



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

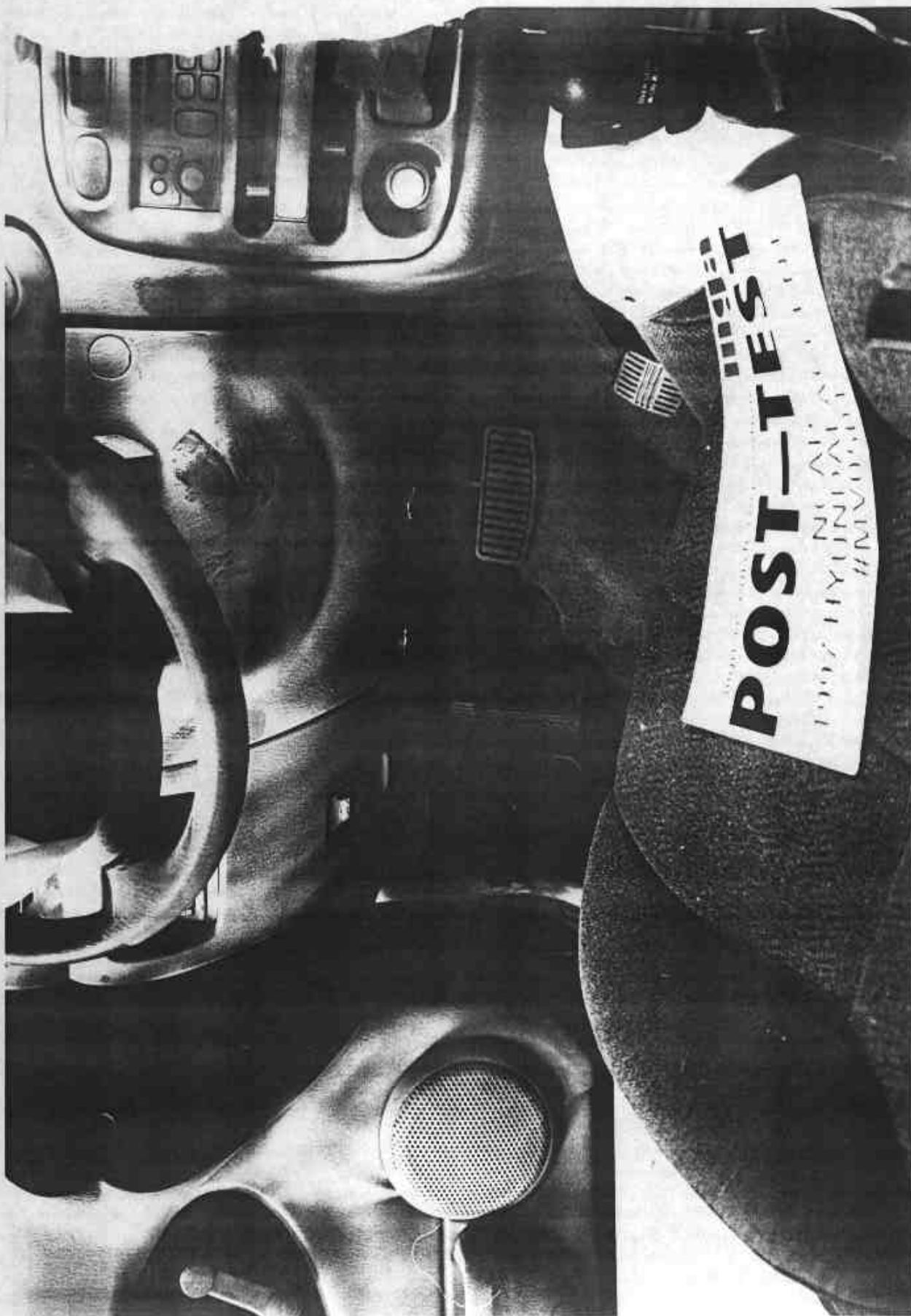


Photo No. A-31 - Post-Test Driver Knee Contact View

A-31

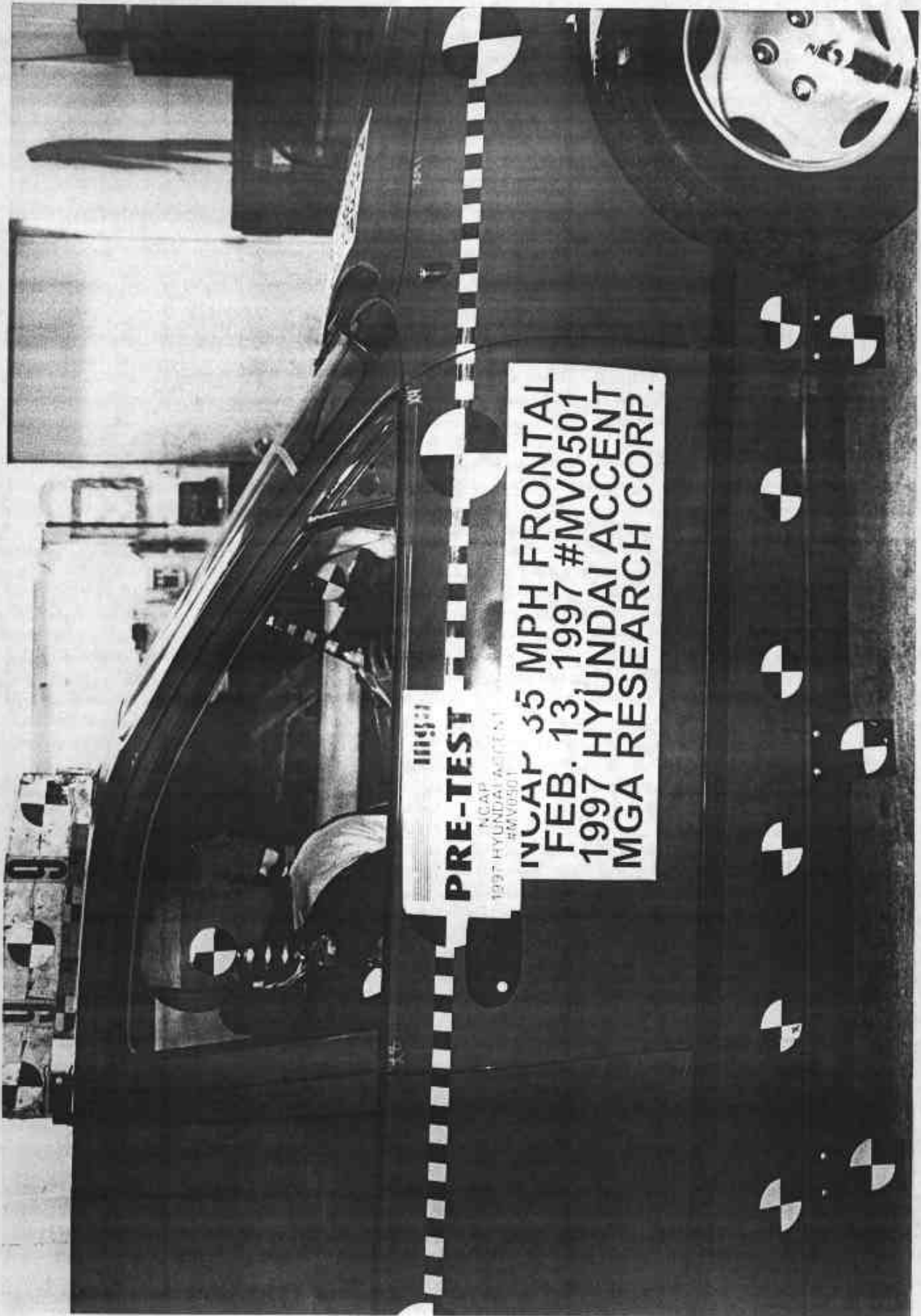


Photo No. A-32 - Pre-Test Passenger Dummy Position Right Side View

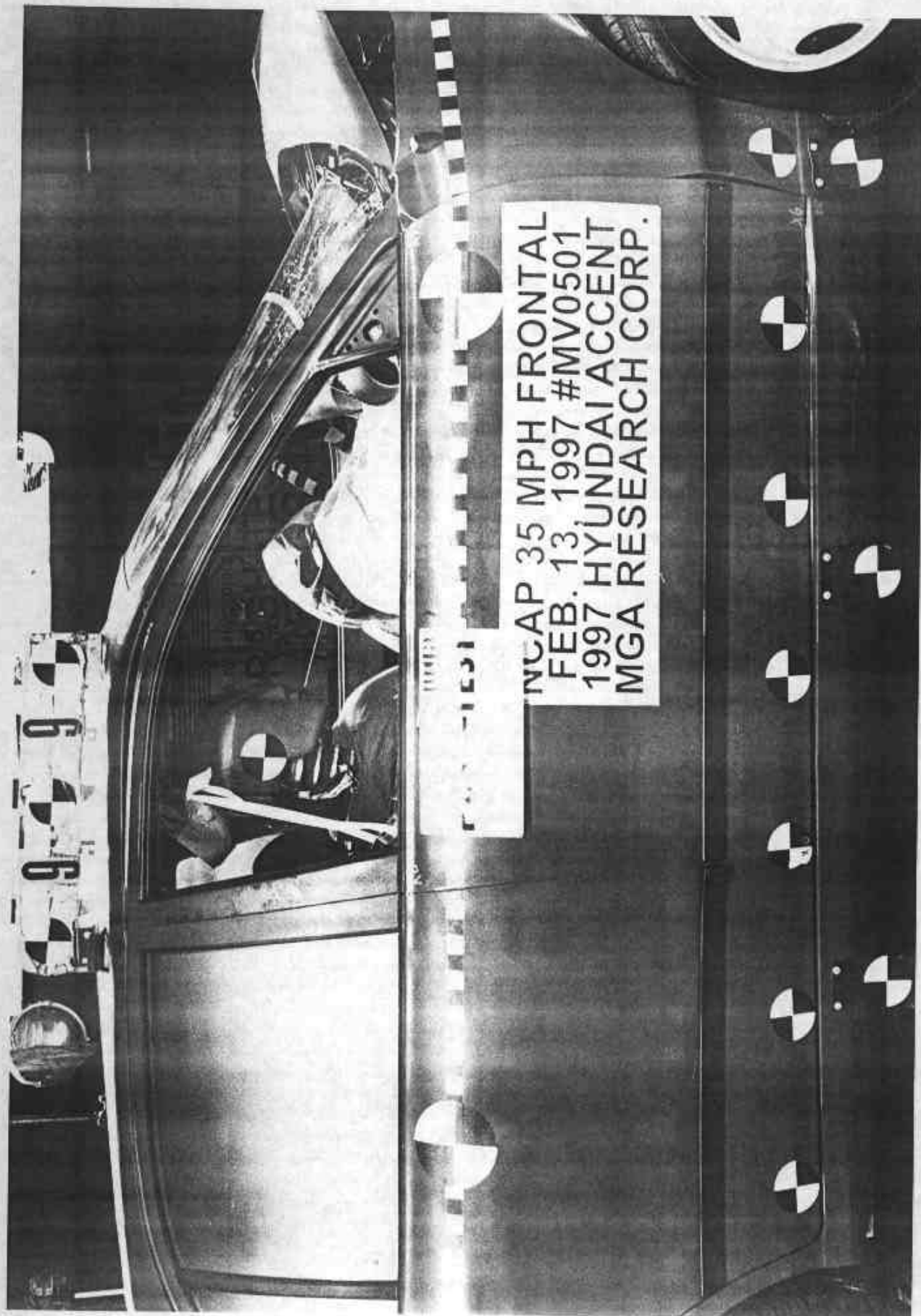


Photo No. A-33 - Post-Test Passenger Dummy Position Right Side View

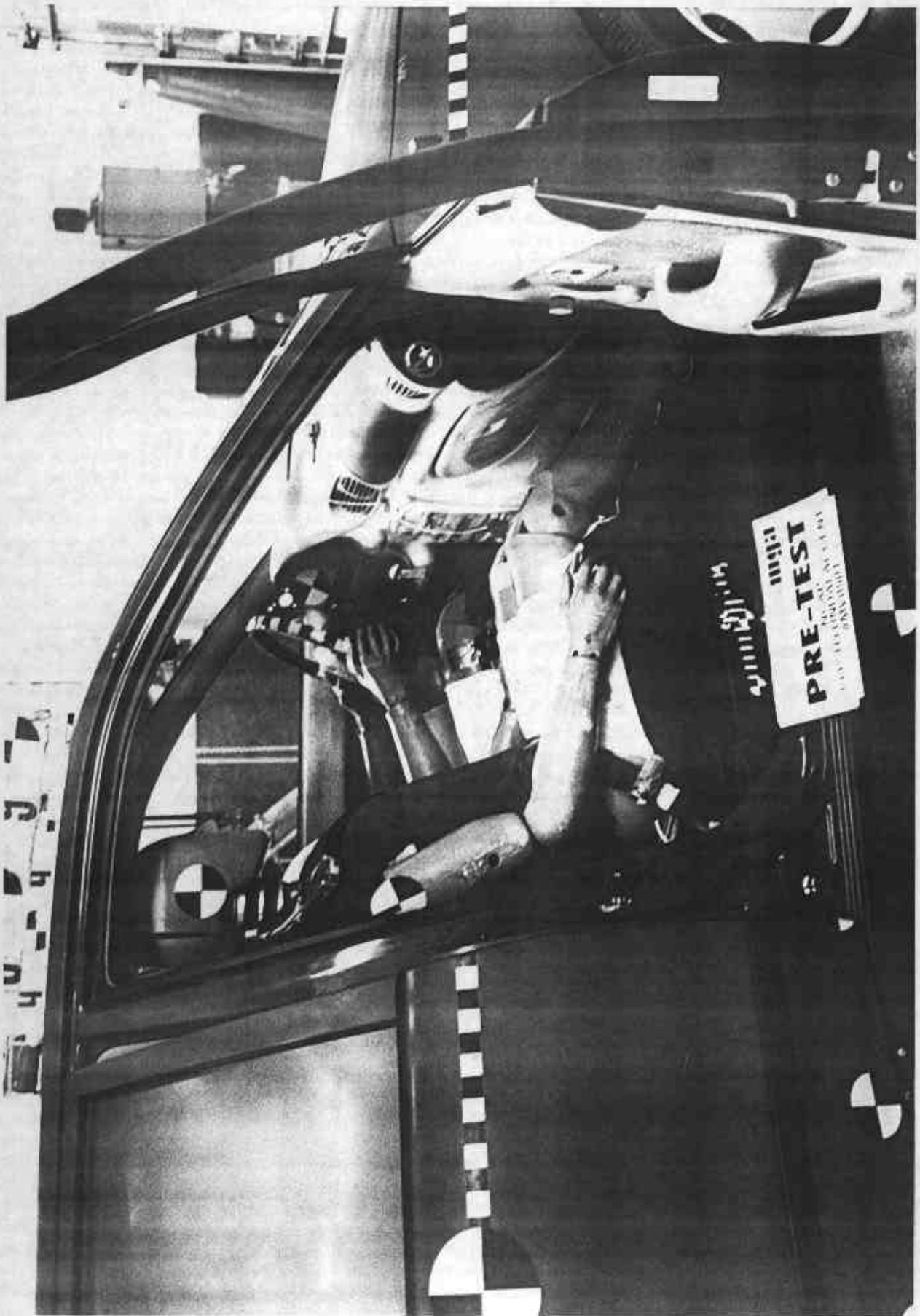


Photo No. A-34 - Pre-Test Passenger Dummy Position Right Side View (Door Open)

A-34



A-36

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

MANUFACTURED IN KOREA BY
HYUNDAI MOTOR COMPANY
OCT/26/96 GVWR 3164 LBS PARTIAL
GAWR 1742 LBS GAWR 1610 LBS TRIM LG
THIS VEHICLE CONFORMS TO ALL APPLICABLE USA FEDERAL
MOTOR VEHICLE SAFETY, BUMPER, AND THEFT PREVENTION STANDARDS
IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE
V.I.N KMHVF24NXVU372687
PASSENGER CAR

Photo No. A-42 - Vehicle Certification Label

TIRE INFLATION PRESSURES				
La Pression De gonflage des Pneus				
VEHICLE CAPACITY WEIGHT 1100-1500				
Poids en lb de la capacité du véhicule 4800-6500				
SEATING CAPACITY TOTAL 10-15				
Capacité de transport Total 4-3-11				
TIRE PRESSURES COLD KPA (PSI)				
Pression de gonflage a froid KPA (PSI)				
TIRE SIZE Dimension du pneu	UP TO 2 PERSONS Jusqu'à 2 personnes		UP TO MAX 10-15 SEATERS (4-3-11)	
	FRONT Avant	REAR Arrière	FRONT Avant	REAR Arrière
P155/80 R13	207 30	207 30	221 32	221 32
P175/70 R13	207 30	207 30	221 32	221 32
P175/65 R14	207 30	207 30	221 32	221 32
T105/70 D14	414 60	414 60	424 60	424 60

Photo No. A-43 - Tire Placard

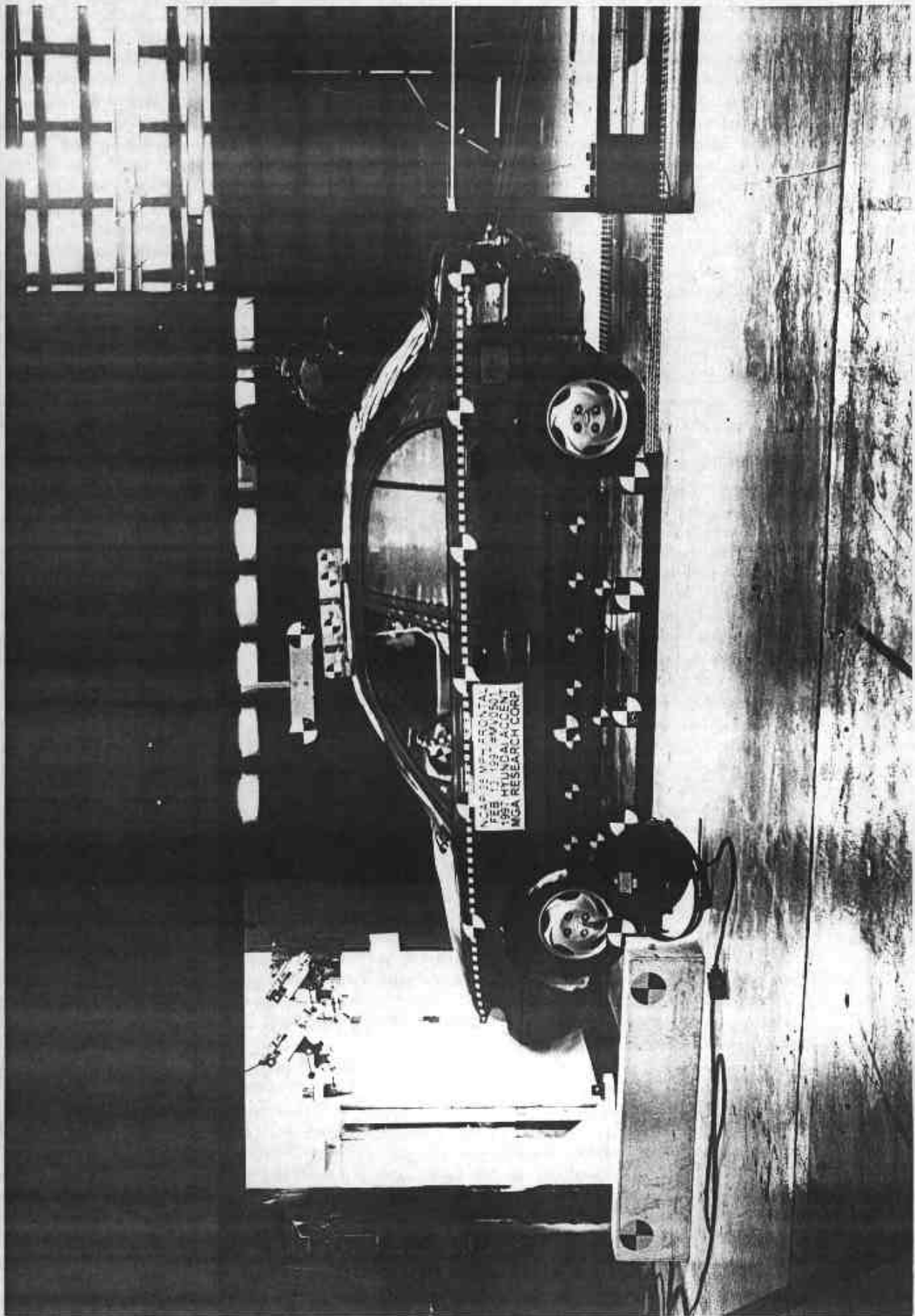
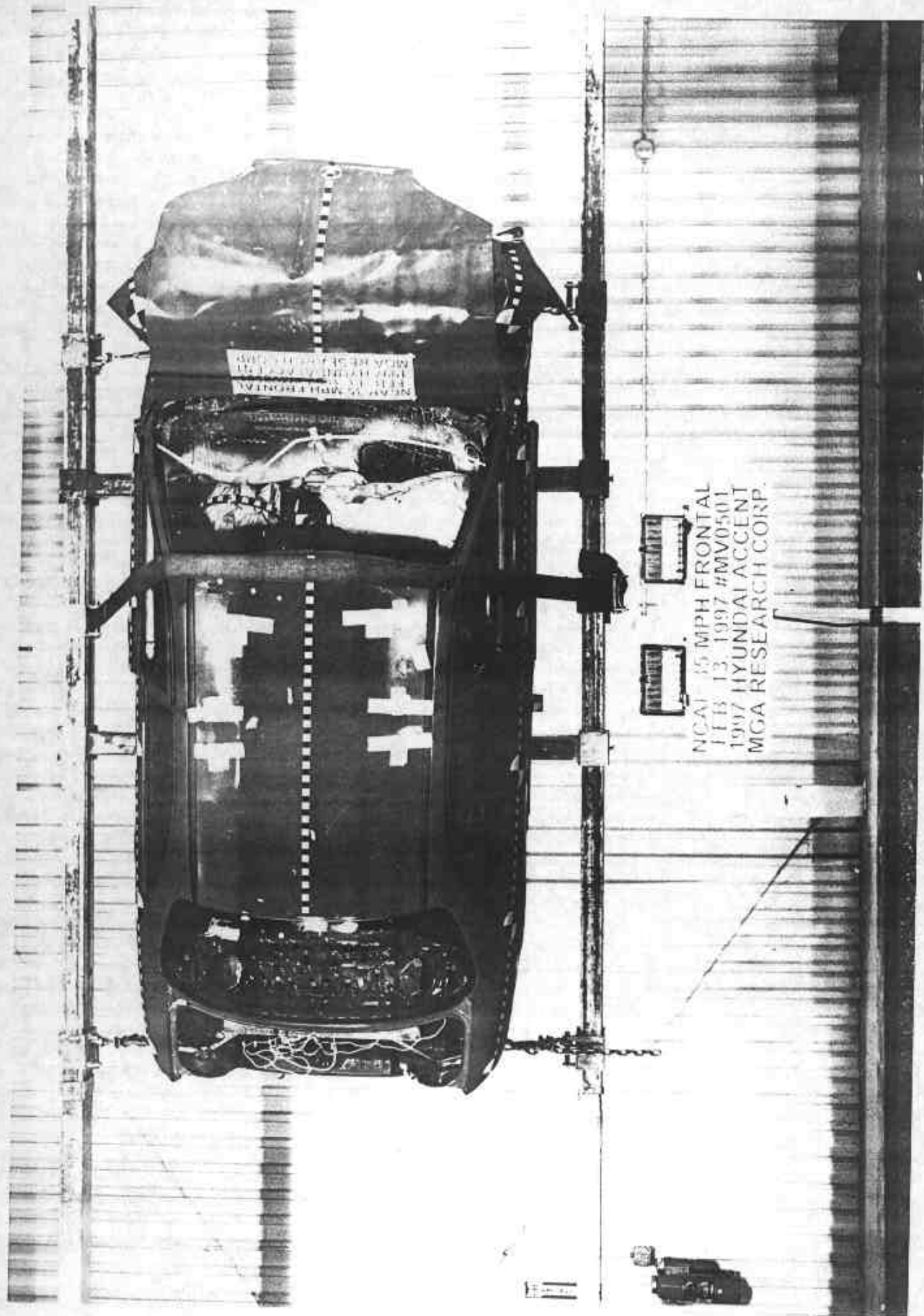


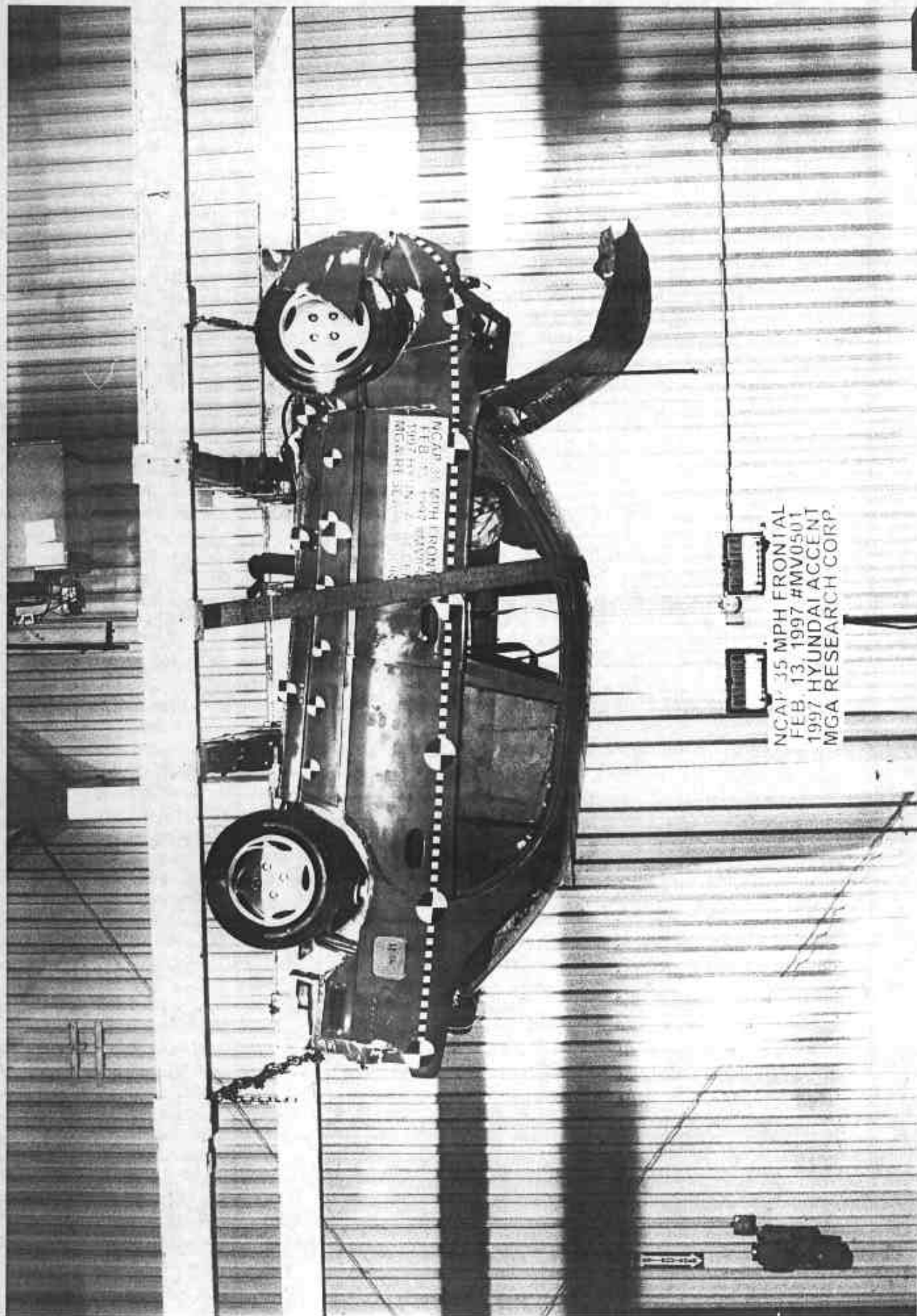
Photo No. A-44 - Vehicle Impact

A-44



NCAI 15 MPH FRONTAL
JTB 13 1997 #MV0501
1997 HYUNDAI ACCENT
MGA RESEARCH CORP.

Photo No. A-45 - Rollover 90°



Photo, No. A-46 - Rollover 180°

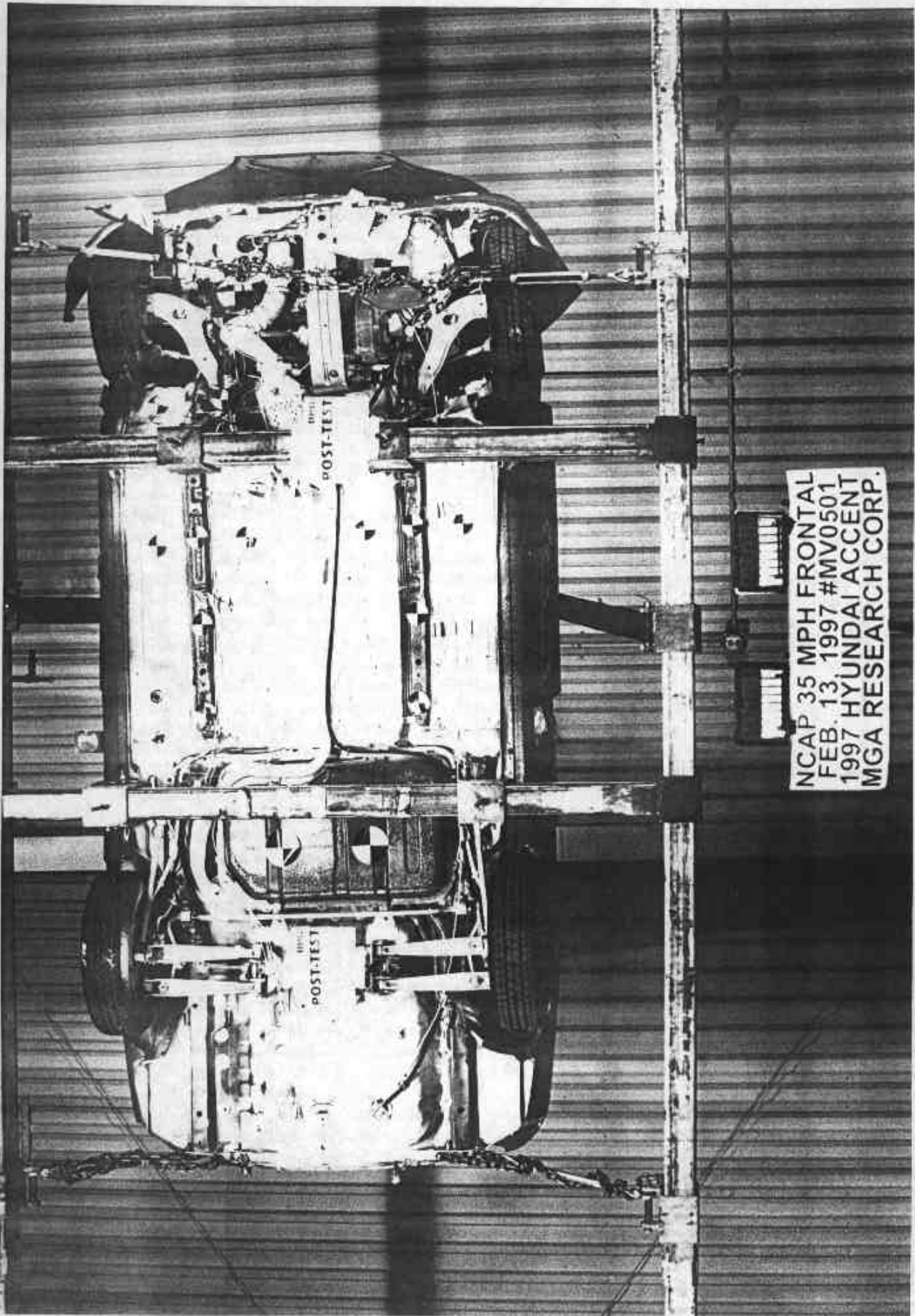


Photo No. A-47 - Rollover 270°

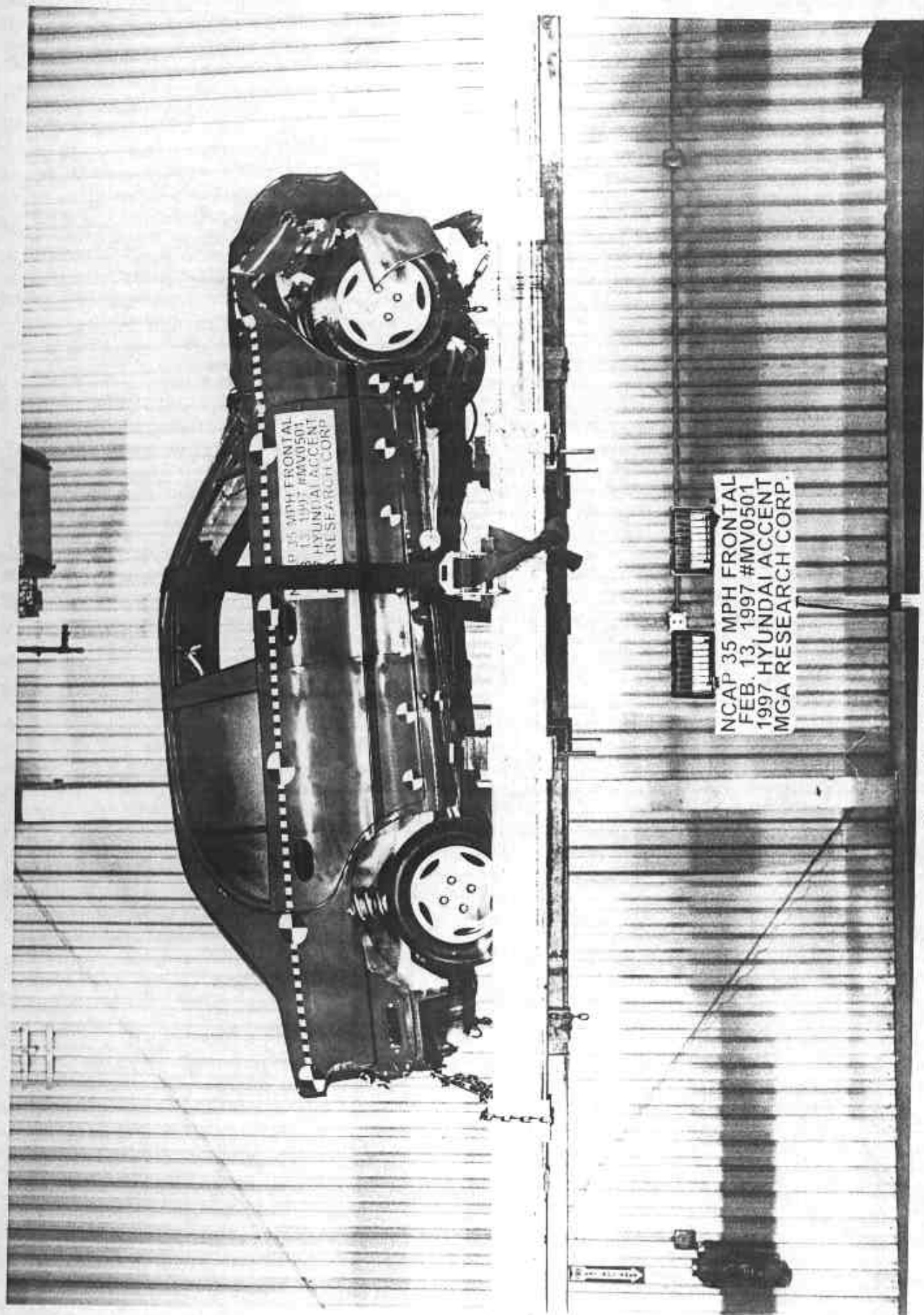


Photo No. A-48 - Rollover 360°

APPENDIX B

Vehicle, Load Cell Barrier and Dummy Response Data

1997 Hyundai Accent 4 Door

NHTSA NO.: MV0501

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)

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* No valid data collected

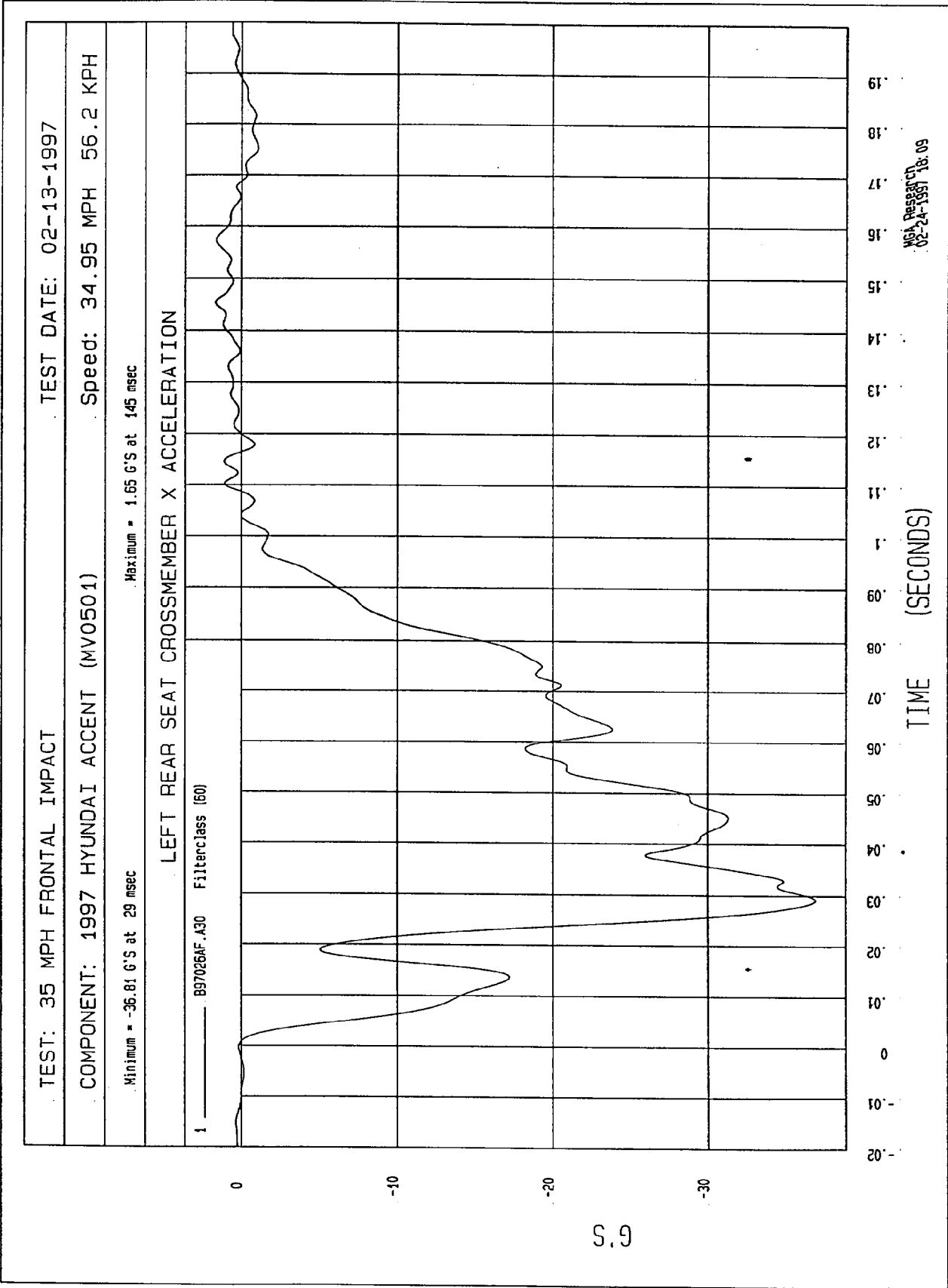
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TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501)

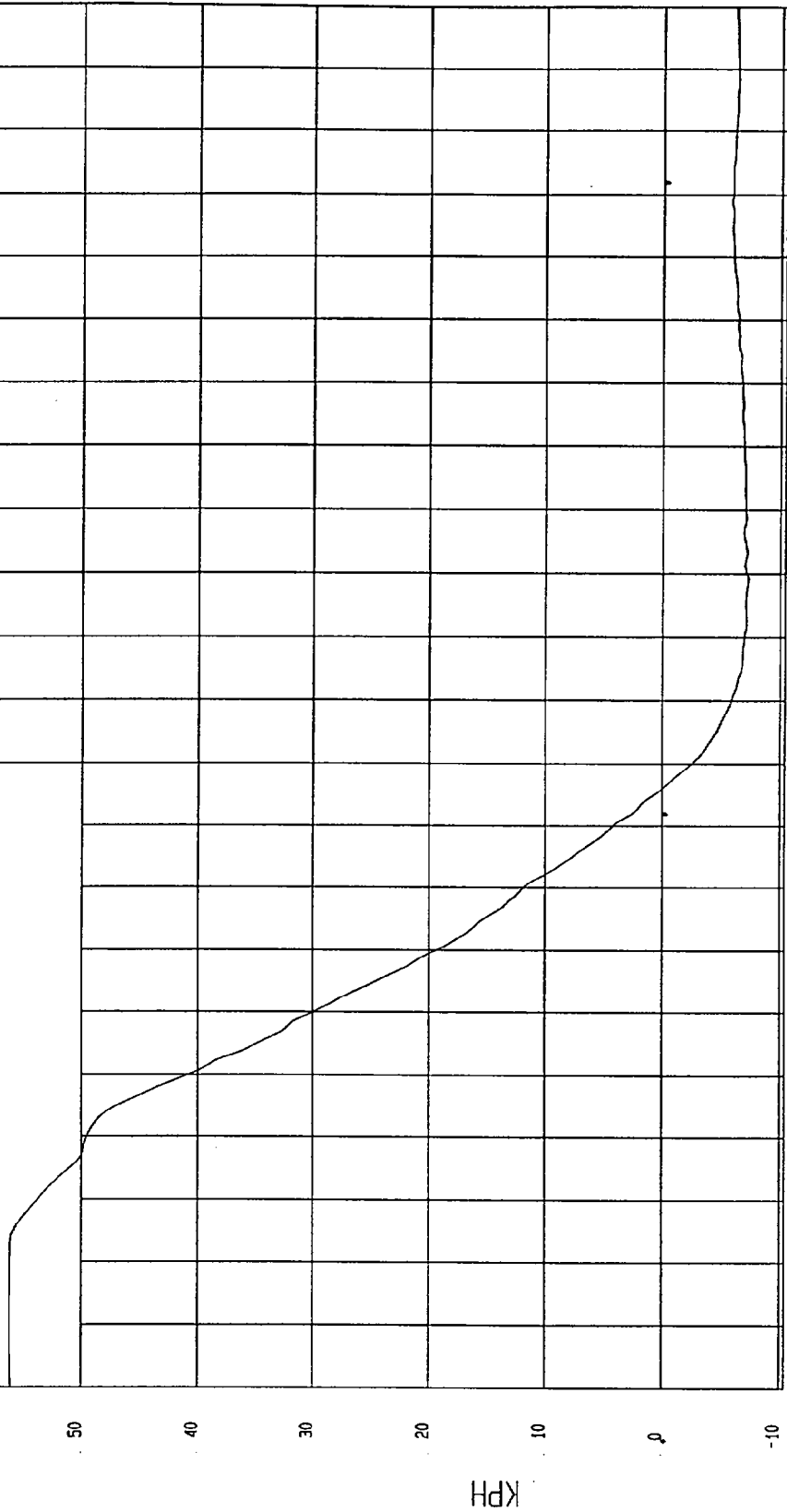
Speed: 34.95 MPH 56.2 KPH

Minimum = -7.26 KPH at 103 msec

Maximum = 56.27 KPH at -8 msec

LEFT REAR SEAT CROSSMEMBER X VELOCITY

1 ——— B97026A1.V30 Filterclass (180)



TIME Seconds

MGA Research
02-24-1997 18:09

TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

Speed: 34.95 MPH 56.2 KPH

COMPONENT: 1997 HYUNDAI ACCENT (MV0501)

Maximum = 971.66 MM at 76 msec

Minimum = 0 MM at -20 msec

LEFT REAR SEAT CROSSMEMBER X DISPLACEMENT

1 ——— B97026A1.D30 Filterclass (180)

1000

800

600

400

200

0

MM

19

18

17

16

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

-02

TIME Seconds

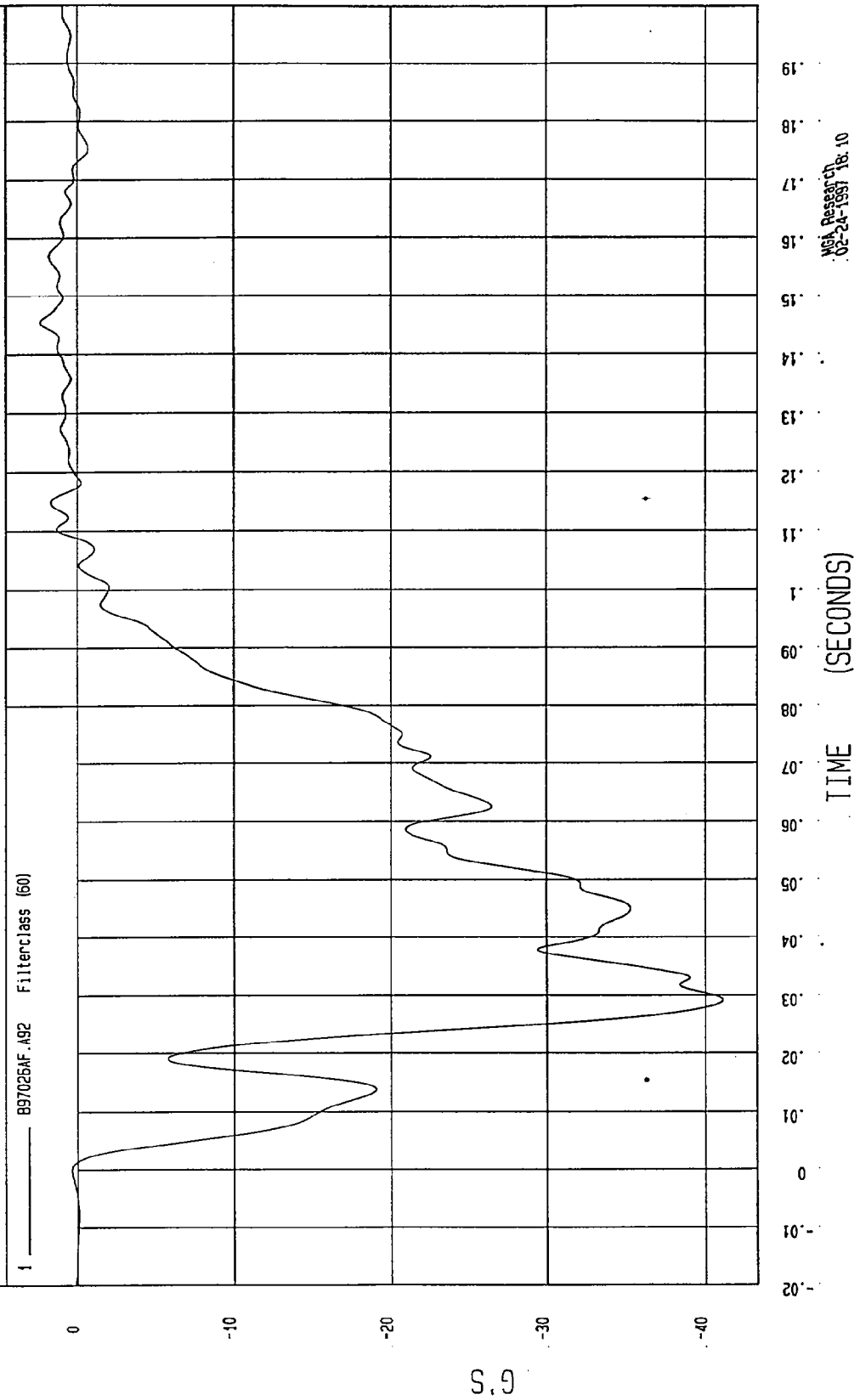
NSA Research
02-24-1997 18:10

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -41.10 G'S at 29 msec Maximum = 2.35 G'S at 145 msec

LEFT REAR SEAT CROSSMEMBER REDUNDANT X ACCELERATION



NSI Research
02-24-1997 18.10

TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

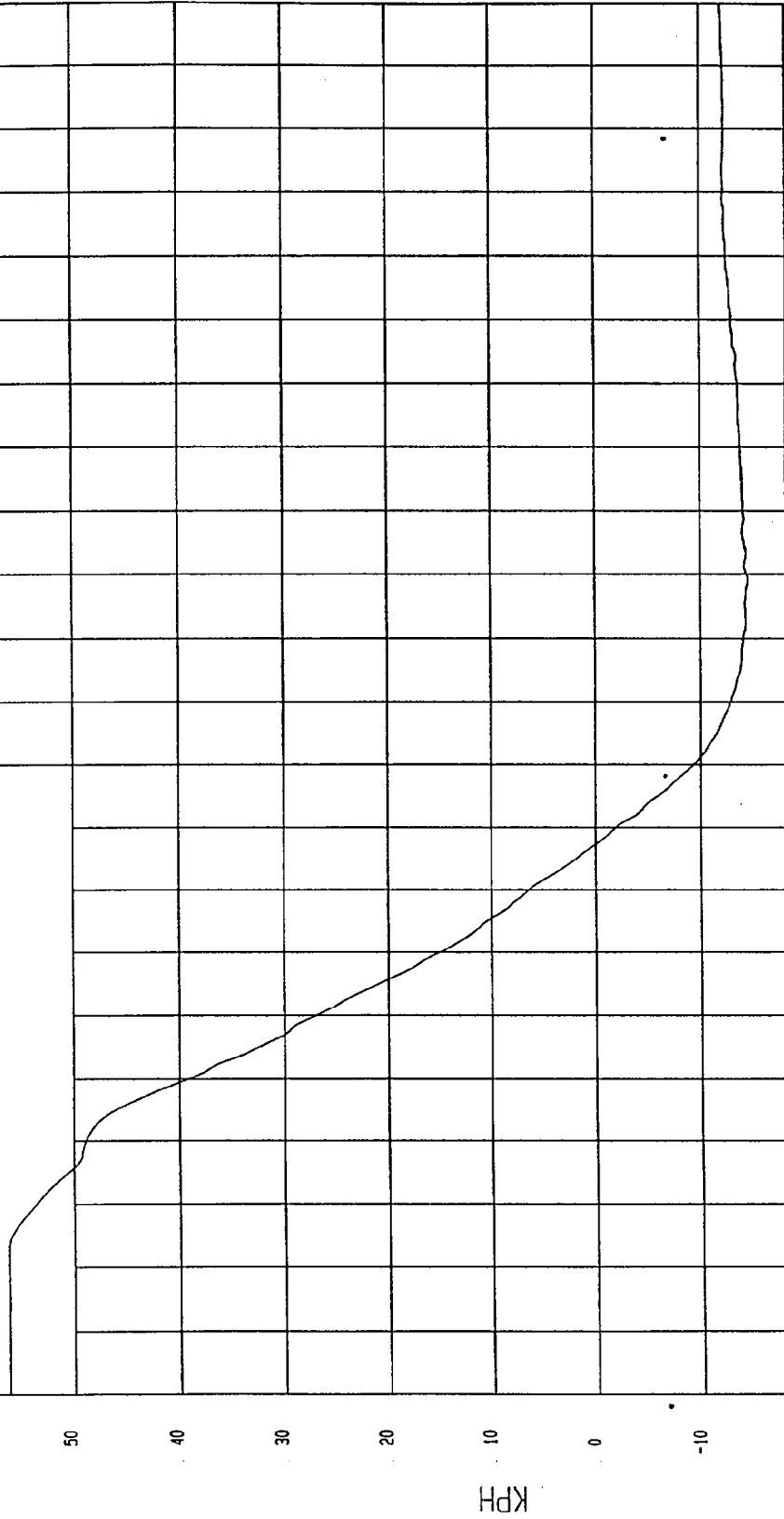
COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -14.48 KPH at 109 msec

Maximum = 56.21 KPH at 3 msec

LEFT REAR SEAT CROSSMEMBER REDUNDANT X VELOCITY

1 B97026AT.V92 Filterclass (180)



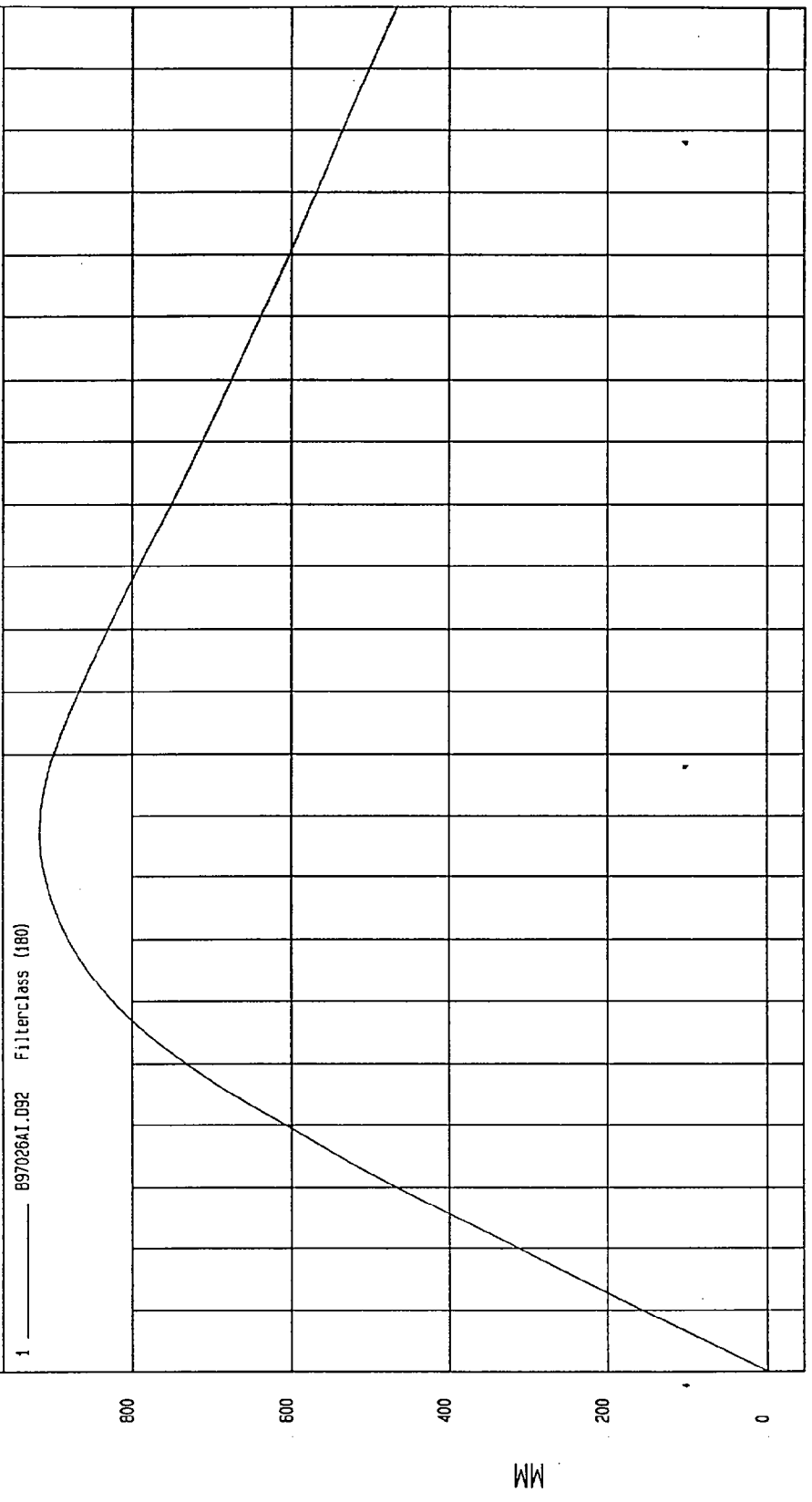
TIME Seconds
NSA Research
02-24-1997 18:10

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = 0 MM at -20 msec Maximum = 917.49 MM at 67 msec

LEFT REAR SEAT CROSSMEMBER REDUNDANT X DISPLACEMENT



TIME Seconds

MGA Research
02-24-1997 18:10

TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

Speed: 34.95 MPH 56.2 KPH

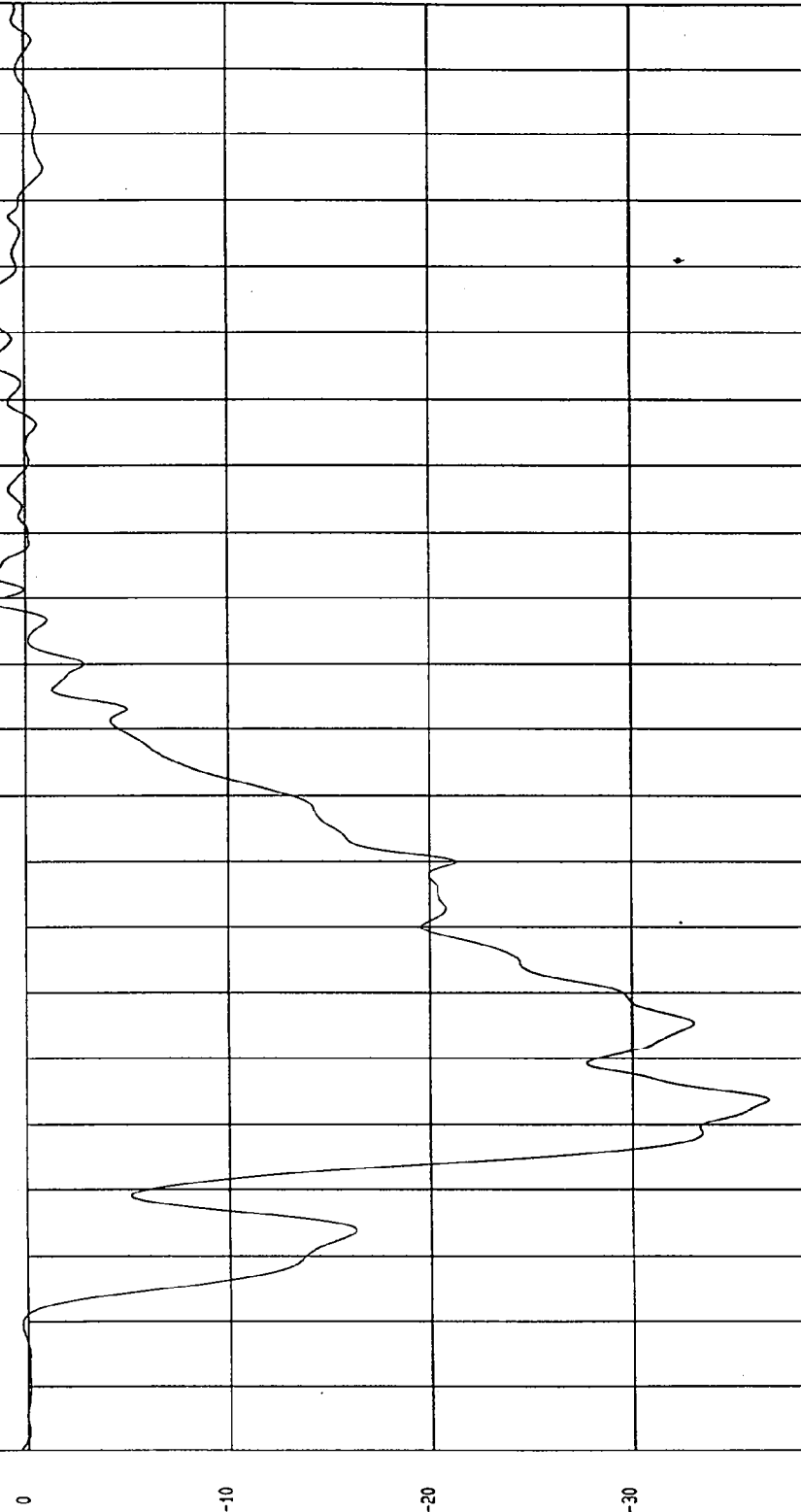
COMPONENT: 1997 HYUNDAI ACCENT (MV0501)

Maximum = 1.70 G'S at 113 msec

Minimum = -36.60 G'S at 34 msec

RIGHT REAR SEAT CROSMEMBER X ACCELERATION

1 — 89702BAF.A20 Filterclass (60)



MSA Research
02-24-1997 16:11

TIME (SECONDS)

S.G

TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

Speed: 34.95 MPH 56.2 KPH

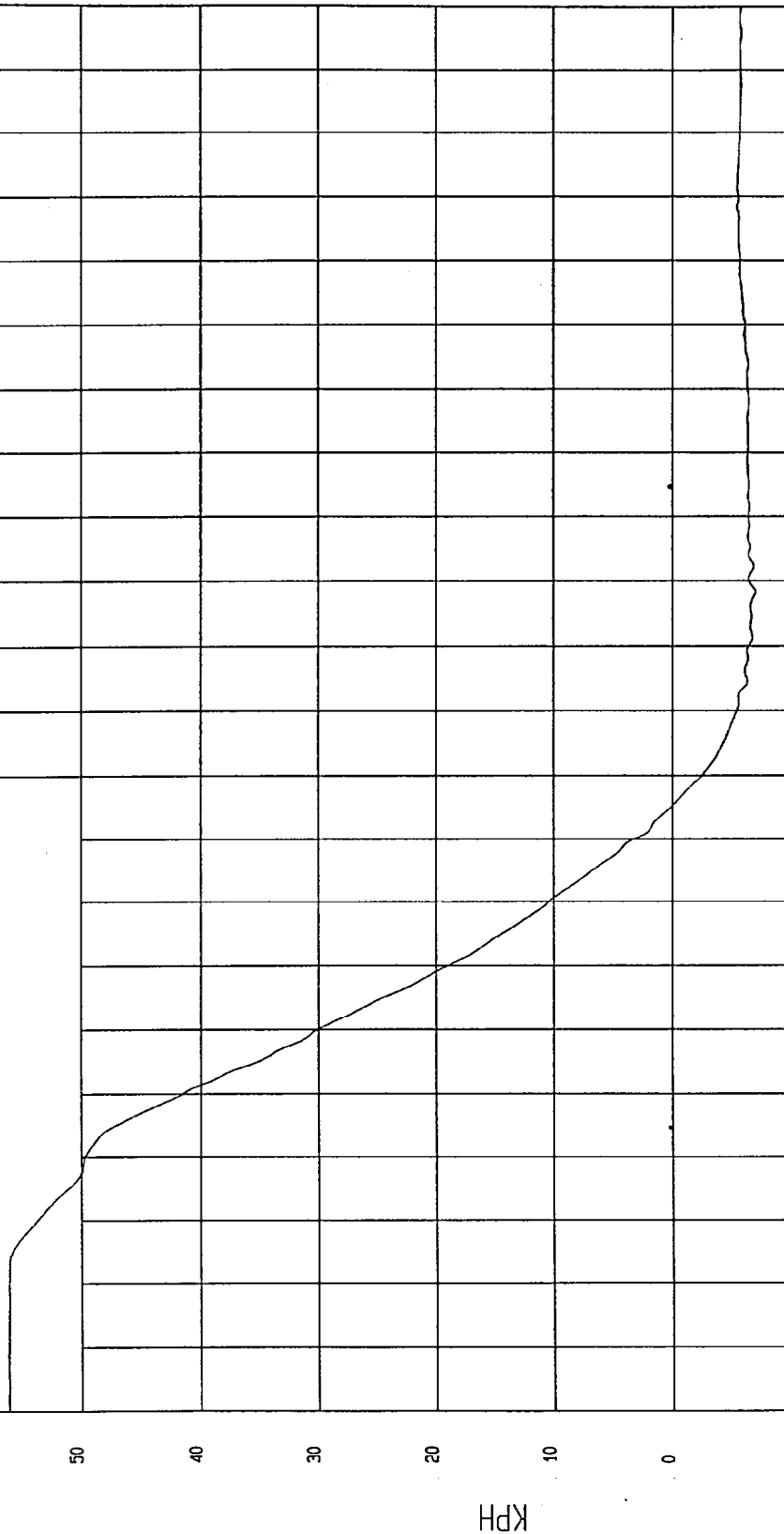
COMPONENT: 1997 HYUNDAI ACCENT (MV0501)

Maximum = 56.21 KPH at -19 msec

Minimum = -6.78 KPH at 108 msec

RIGHT REAR SEAT CROSSMEMBER X VELOCITY

1 897026A1.V20 Filterclass (180)



TIME Seconds

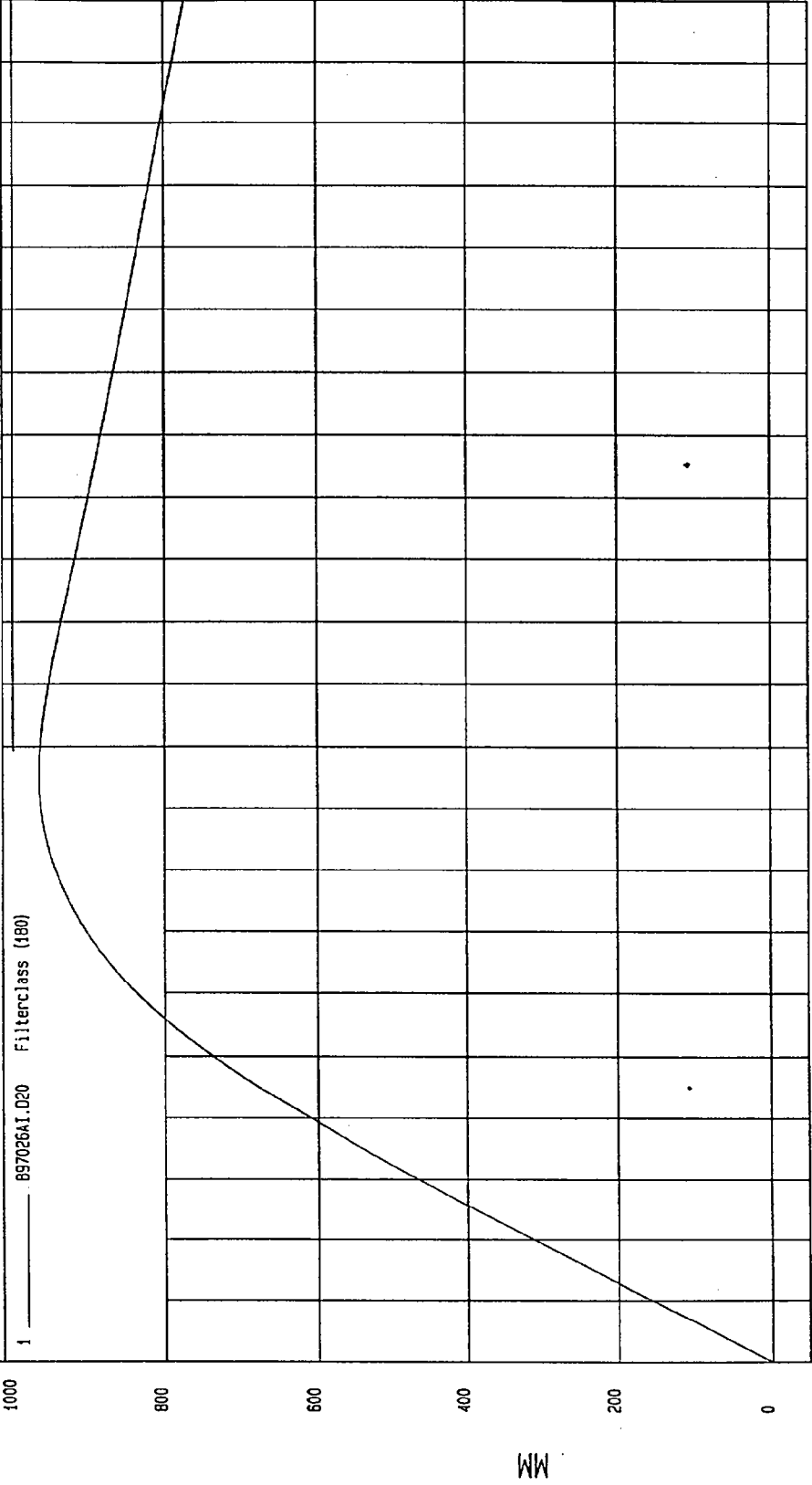
MCA Research
02-24-1997 18:11

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = 0 MM at -20 msec Maximum = 955.91 MM at 75 msec

RIGHT REAR SEAT CROSSMEMBER X DISPLACEMENT



TIME Seconds

MGA Research
02-24-1997 18: 11

RIGHT REAR SEAT CROSSMEMBER REDUNDANT X ACCELERATION VS. TIME

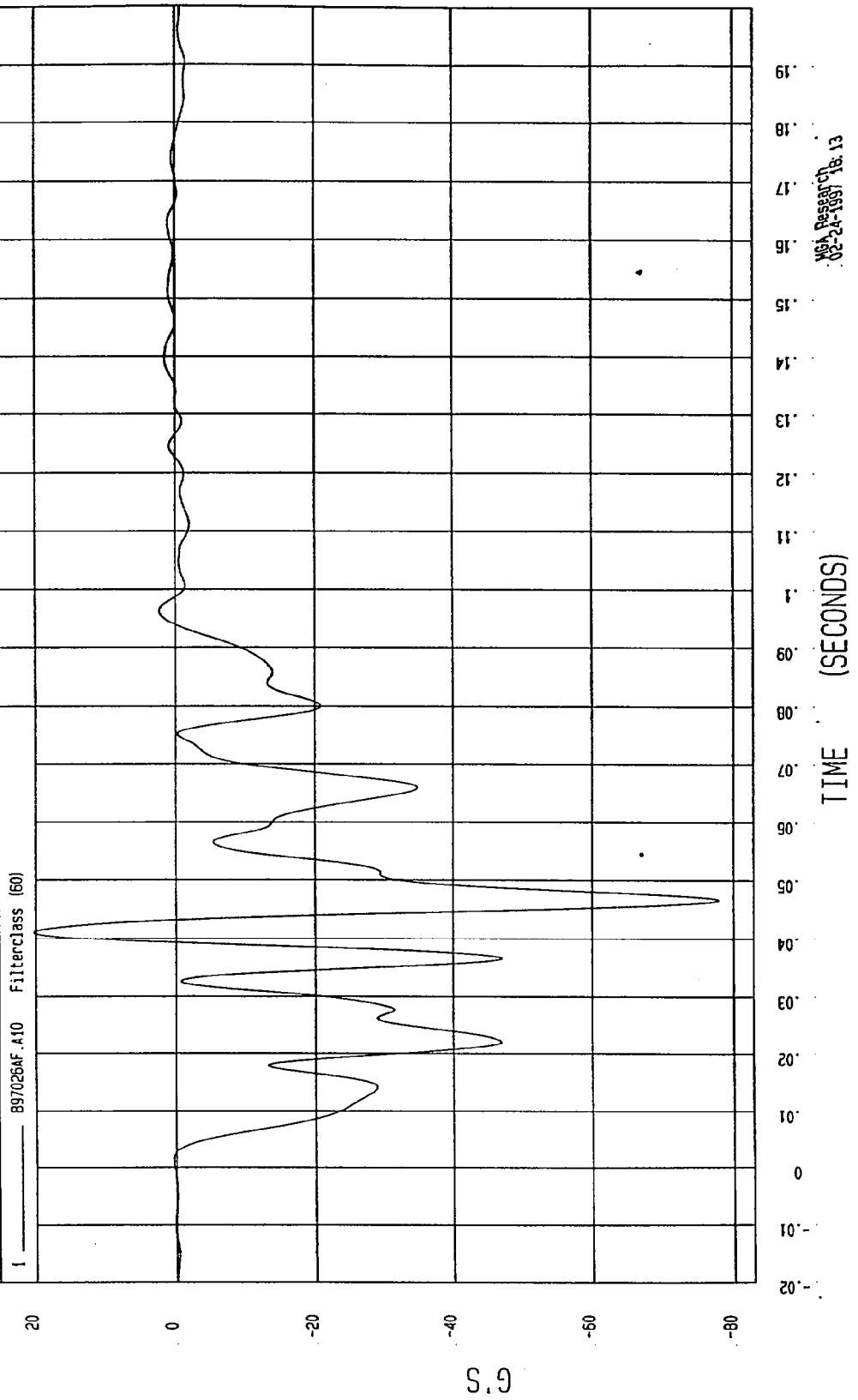
NO VALID DATA COLLECTED

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -77.89 G'S at 47 msec Maximum = 20.26 G'S at 41 msec

INSTRUMENT PANEL X ACCELERATION



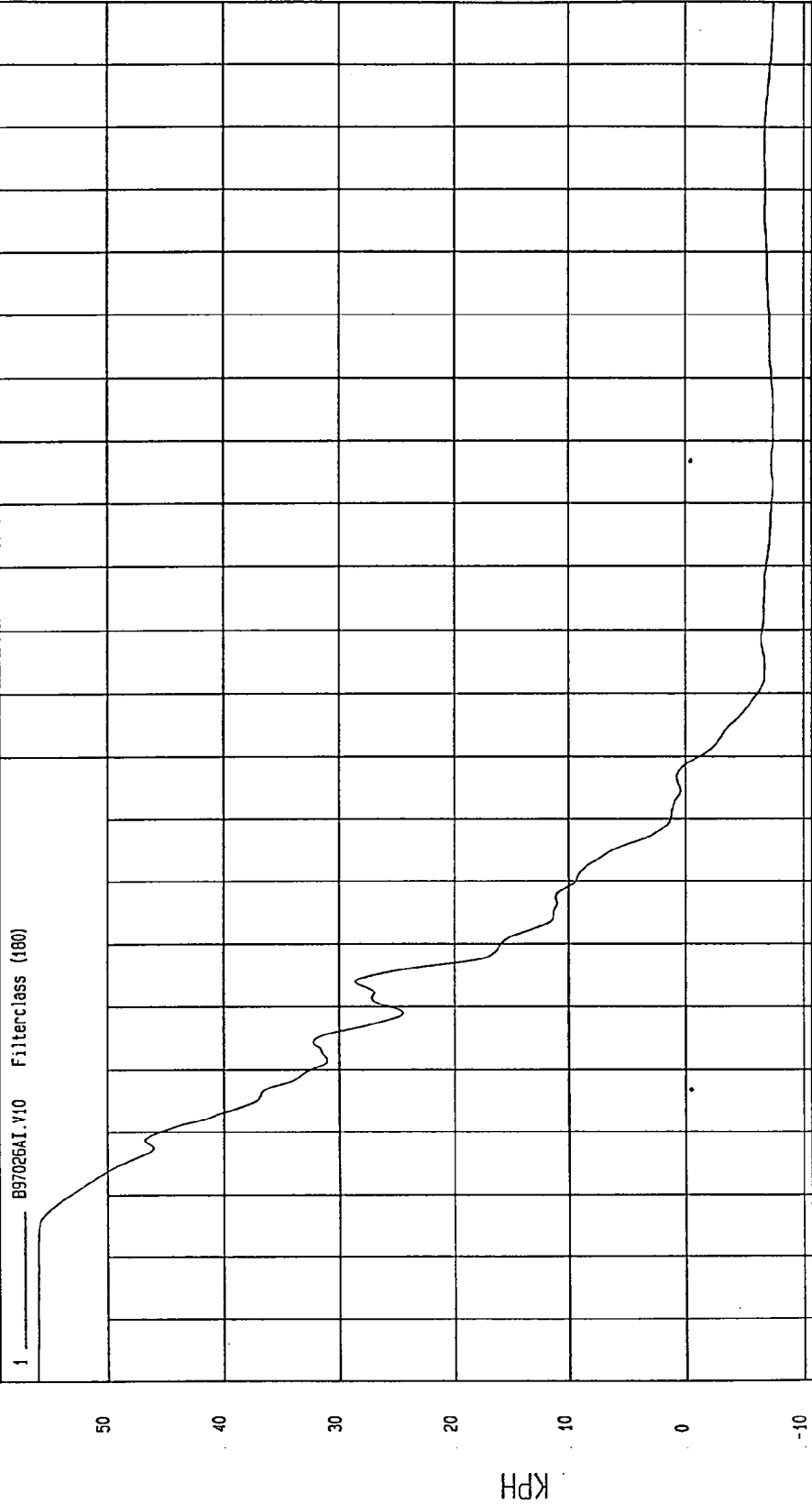
MSA Research
02-24-1997 16:13

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -7.50 KPH at 200 msec Maximum = 56.20 KPH at -18 msec

INSTRUMENT PANEL X VELOCITY



TIME Seconds

MGA Research
02-24-1997 18:13

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

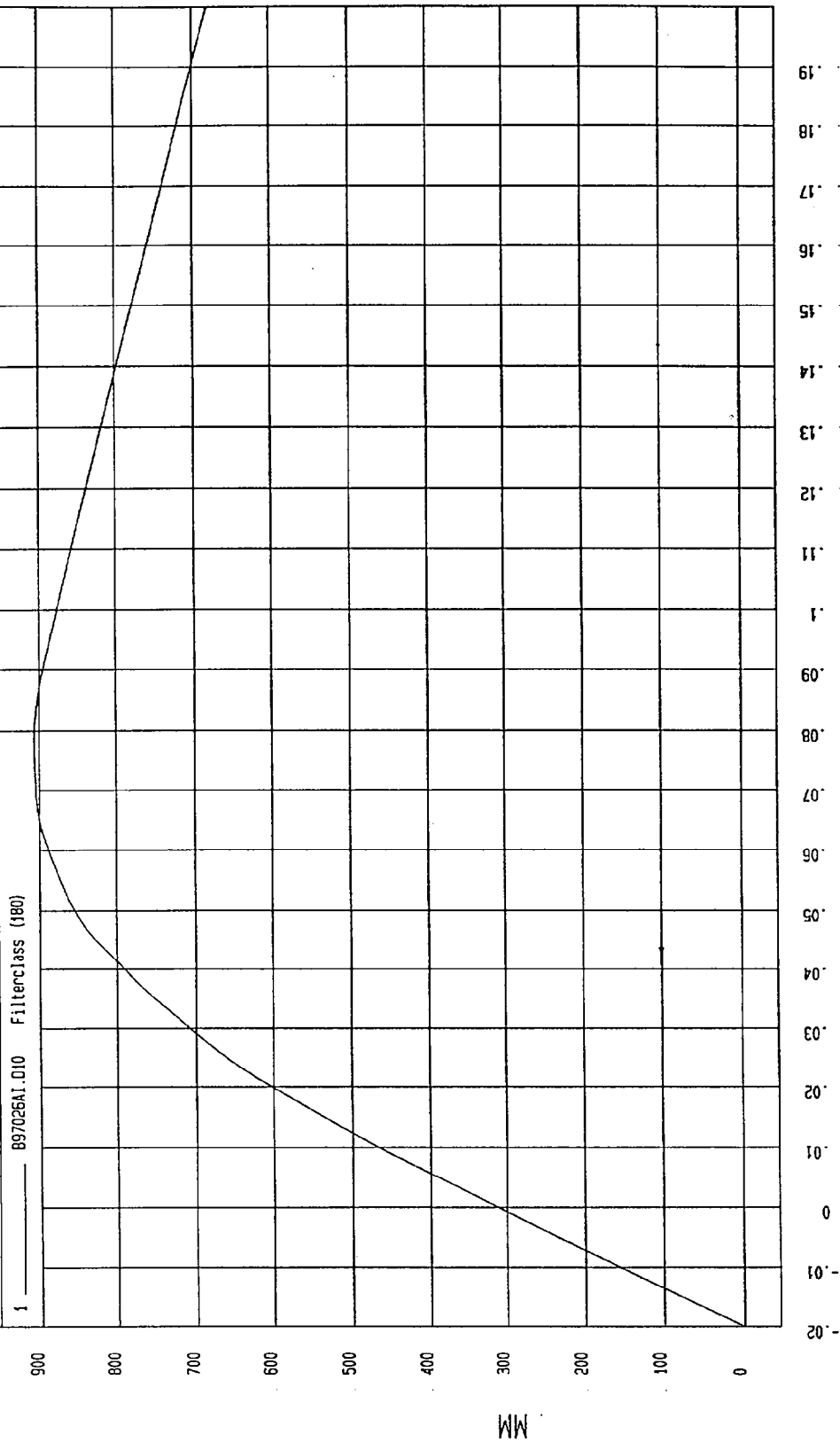
SPEED: 34.95 MPH 56.2 KPH

COMPONENT: 1997 HYUNDAI ACCENT (MV0501)

Maximum = 906.46 MM at 79 msec

Minimum = 0 MM at -20 msec

INSTRUMENT PANEL X DISPLACEMENT



MSA Research
02-24-1997 18:14

TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

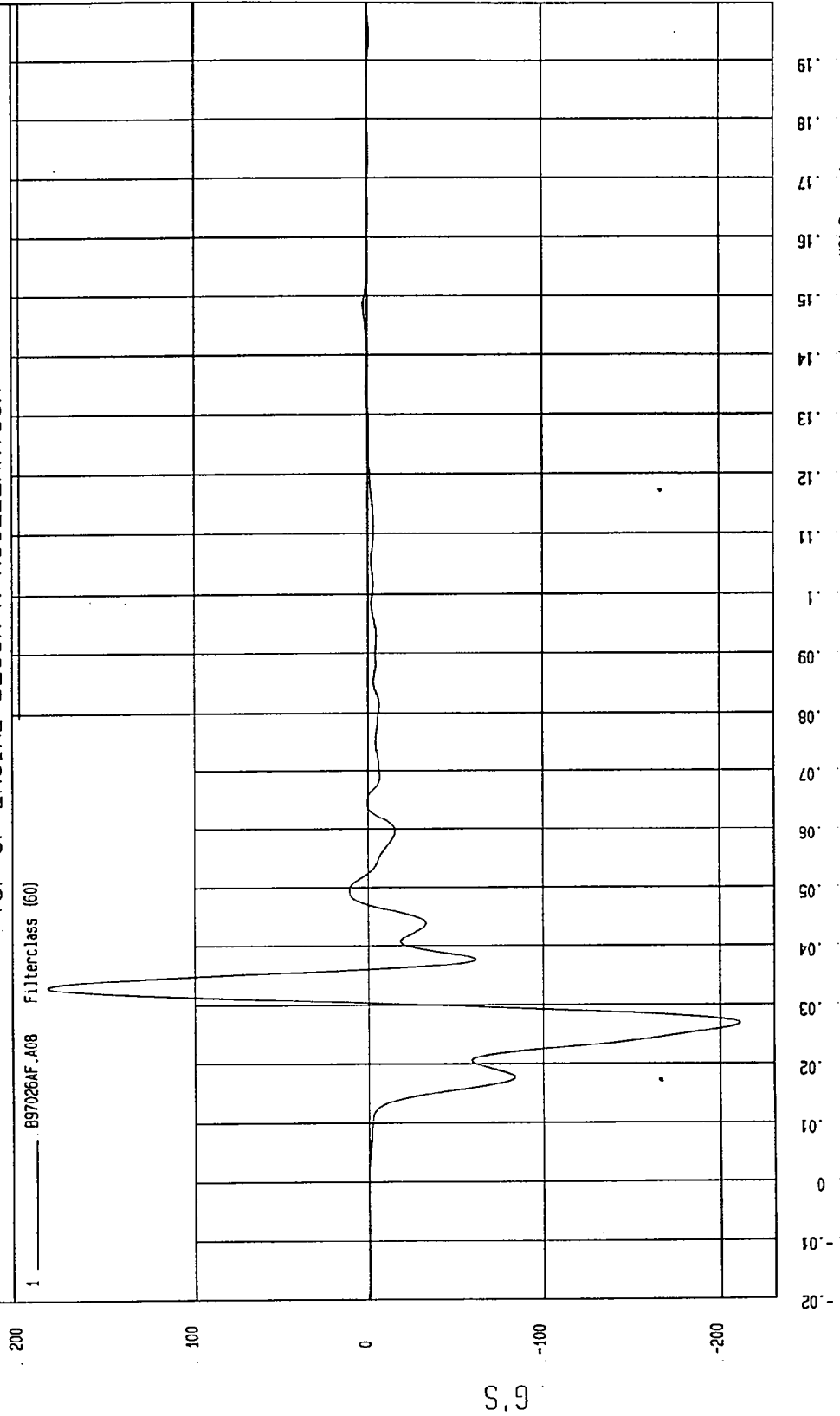
Speed: 34.95 MPH 56.2 KPH

COMPONENT: 1997 HYUNDAI ACCENT (MV0501)

Maximum = 184.08 G'S at 33 msec

Minimum = -211.02 G'S at 27 msec

TOP OF ENGINE BLOCK X ACCELERATION



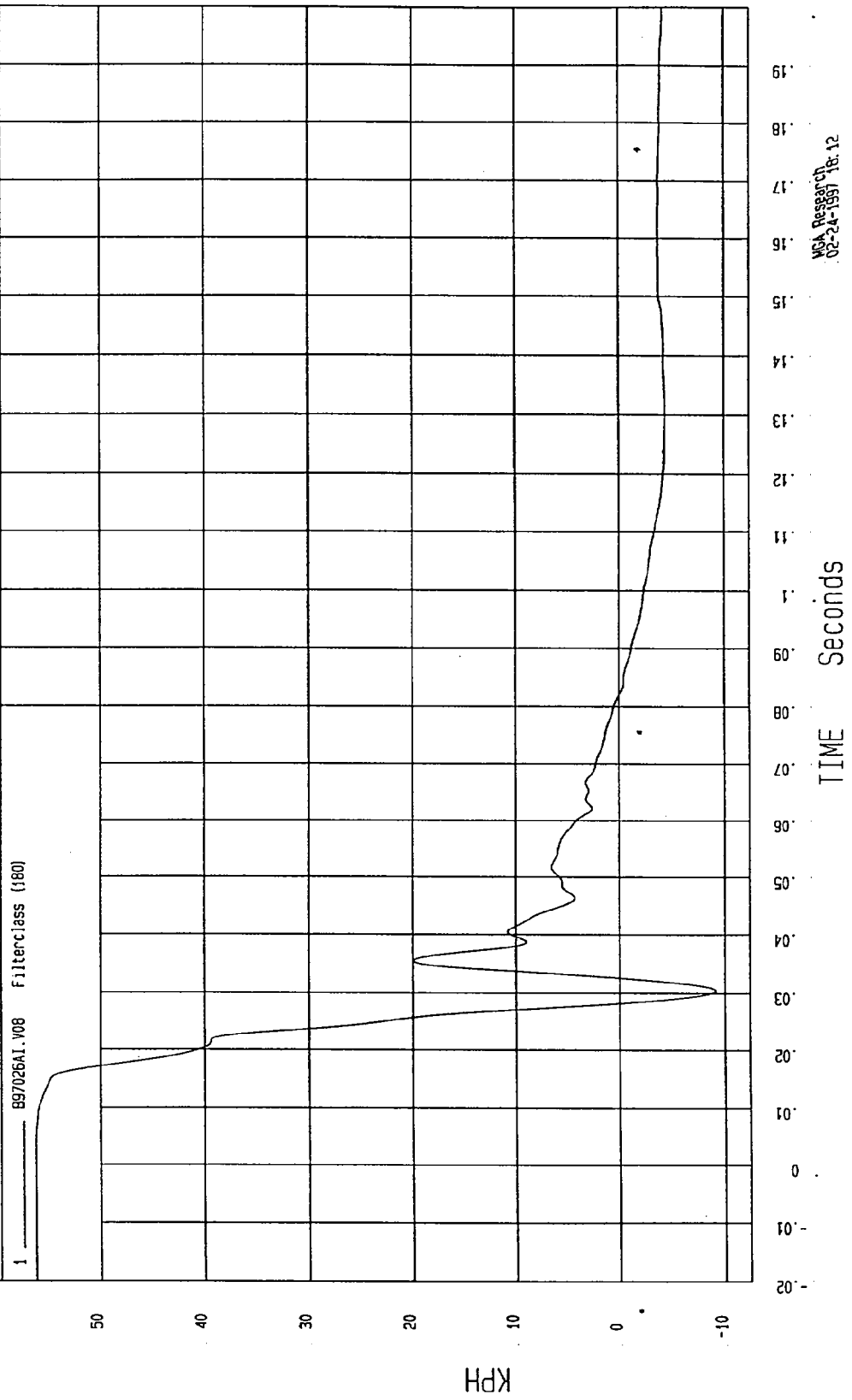
WCA Research
02-24-1997 18:12

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -9.13 KPH at 30 msec Maximum = 56.26 KPH at 3 msec

TOP OF ENGINE BLOCK X VELOCITY



TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997
COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = 0 MM at -20 msec Maximum = 738.42 MM at 82 msec

TOP OF ENGINE BLOCK X DISPLACEMENT

1 ——— B97026A1.D08 Filterclass (180)



TIME Seconds

NSA Research
02-24-1997 18:12

TEST: 35 MPH FRONTAL IMPACT

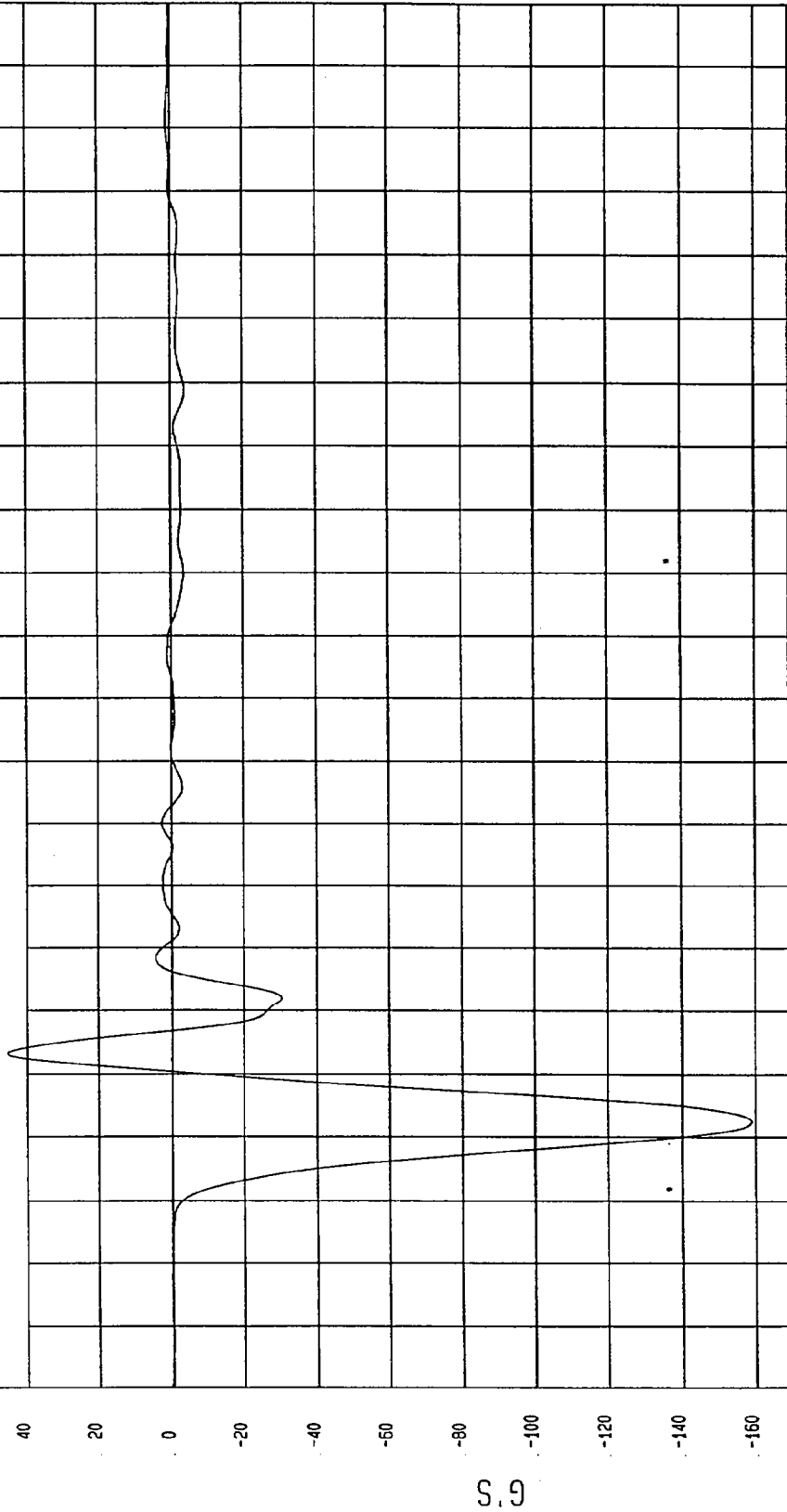
TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -158.94 G'S at 22 msec Maximum = 45.36 G'S at 33 msec

BOTTOM OF ENGINE X ACCELERATION

1 897026AF.A09 Filterclass (50)



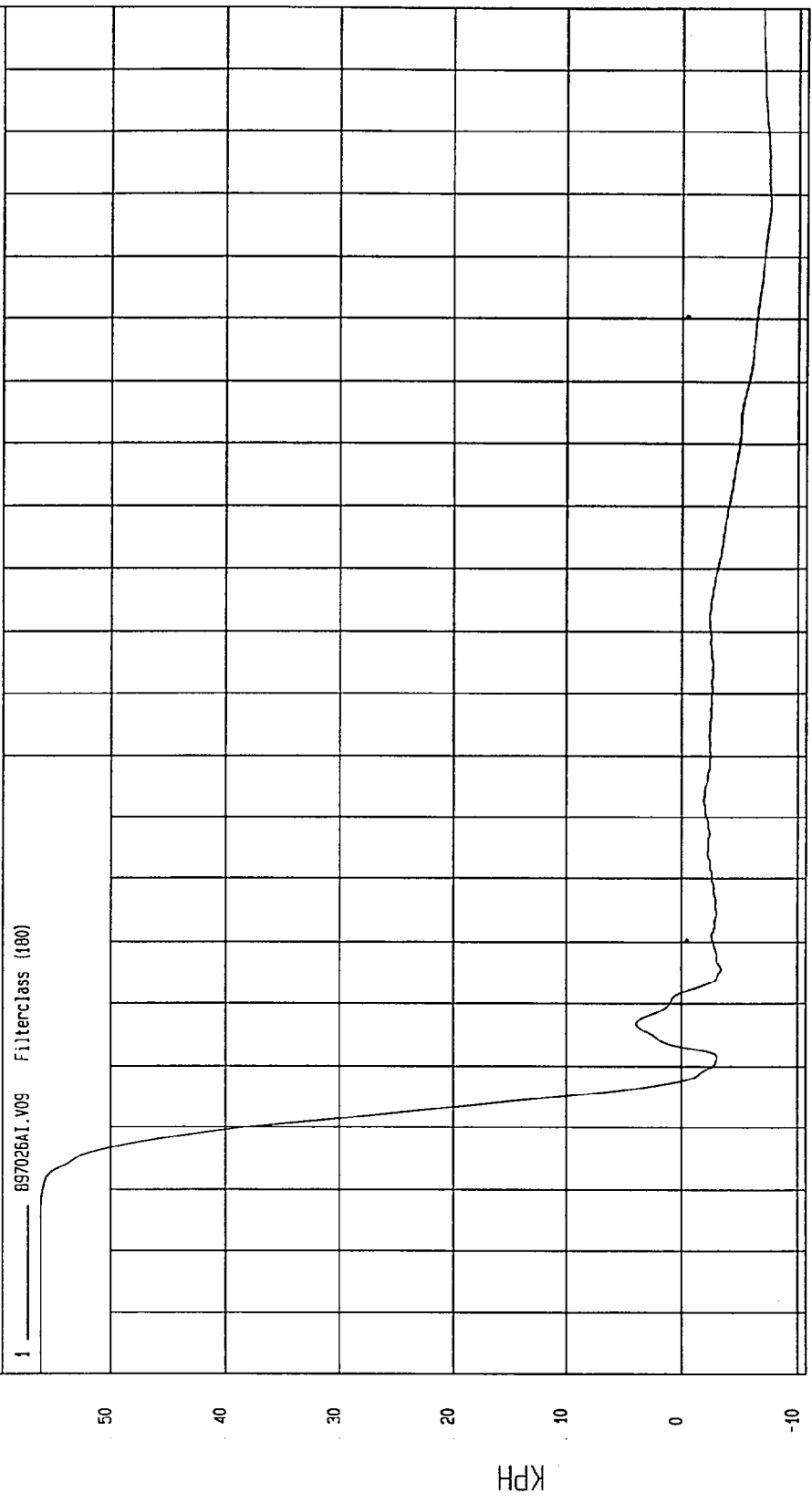
NSA Research
02-24-1997 18:13

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -7.52 KPH at 158 msec Maximum = 56.21 KPH at -14 msec

BOTTOM OF ENGINE X VELOCITY



TIME Seconds

WCA Research
02-24-1997 18:13

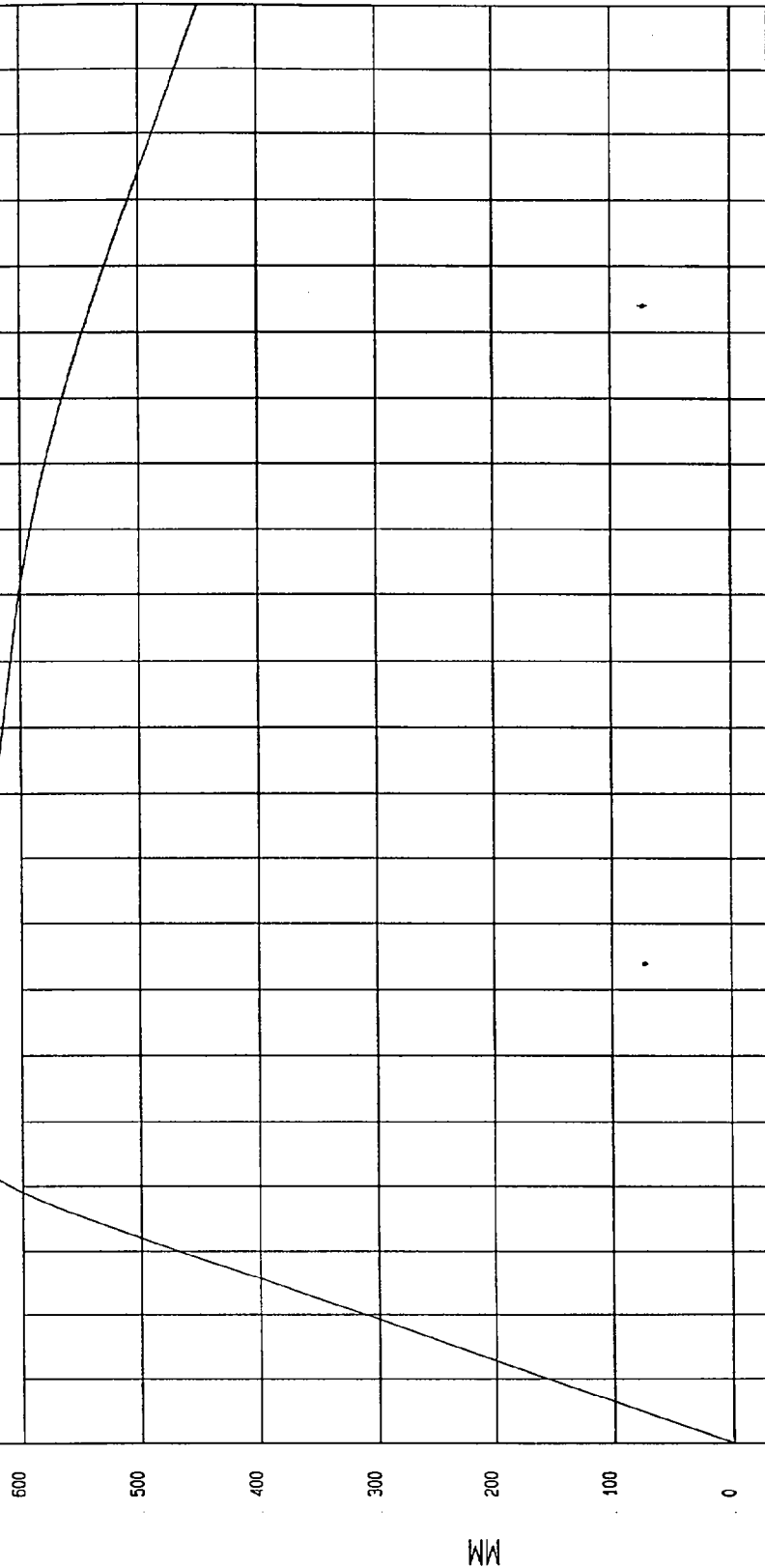
TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = 0 MM at -20 msec Maximum = 649.14 MM at 42 msec

BOTTOM OF ENGINE X DISPLACEMENT

1 ——— 897026A1.009 Filterclass (180)



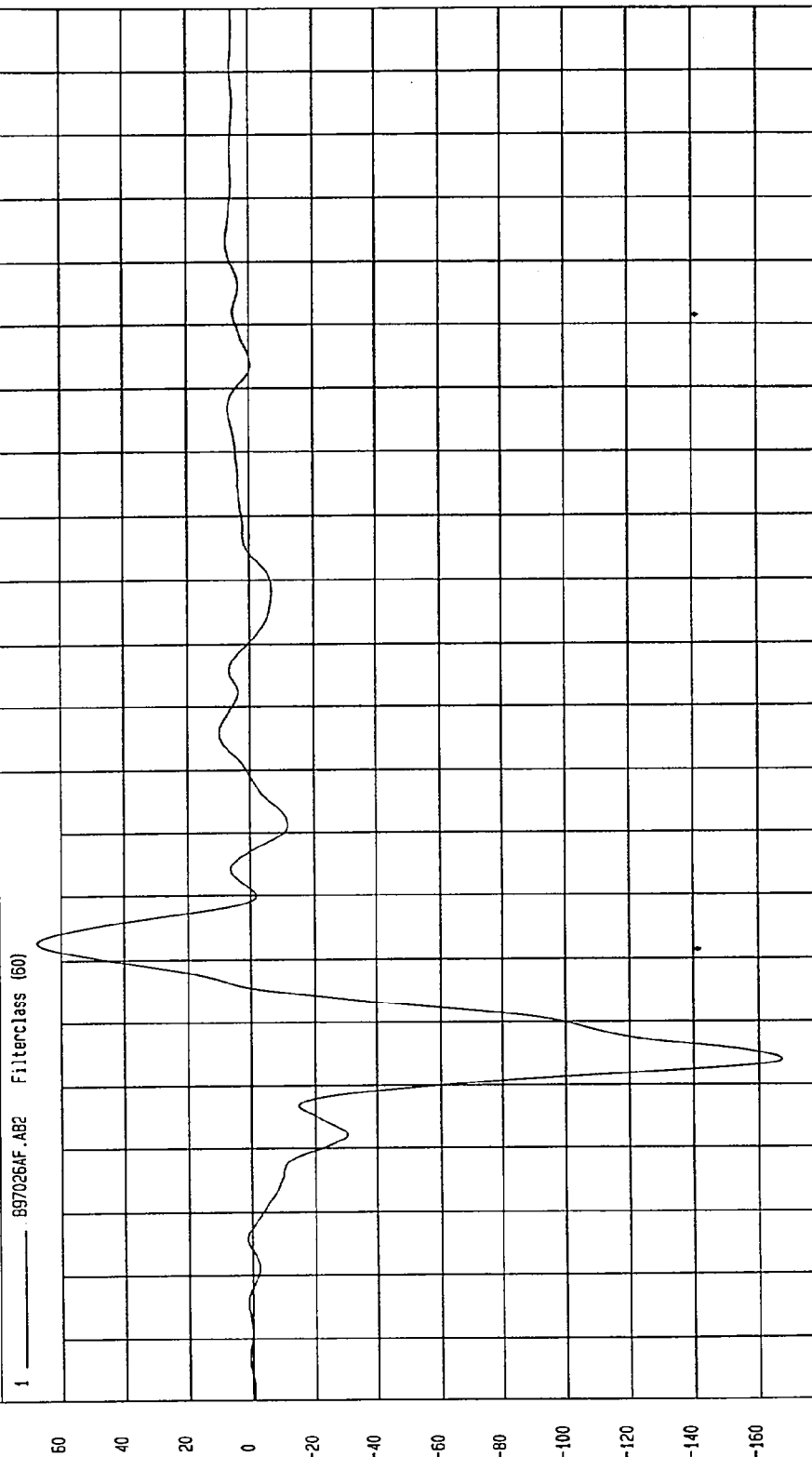
NGA Research
02-24-1997 18:13

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -167.36 G'S at 34 msec Maximum = 67.75 G'S at 53 msec

LEFT FRONT BRAKE CALIPER X ACCELERATION



NGA Research
02-24-1997 16:14

TIME (SECONDS)

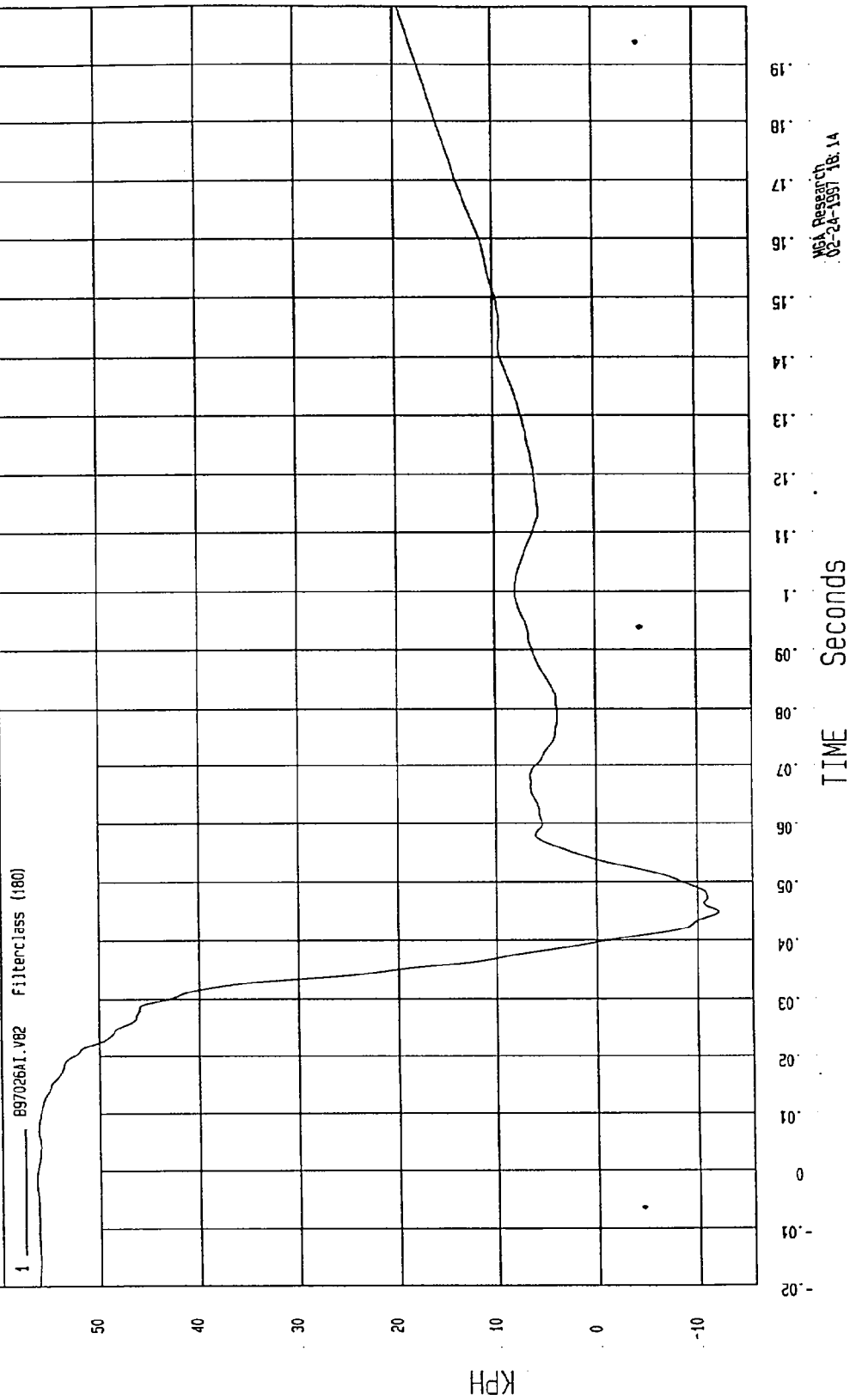
G.S

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -12.11 KPH at 45 msec Maximum = 56.40 KPH at -2 msec

LEFT FRONT BRAKE CALIPER X VELOCITY

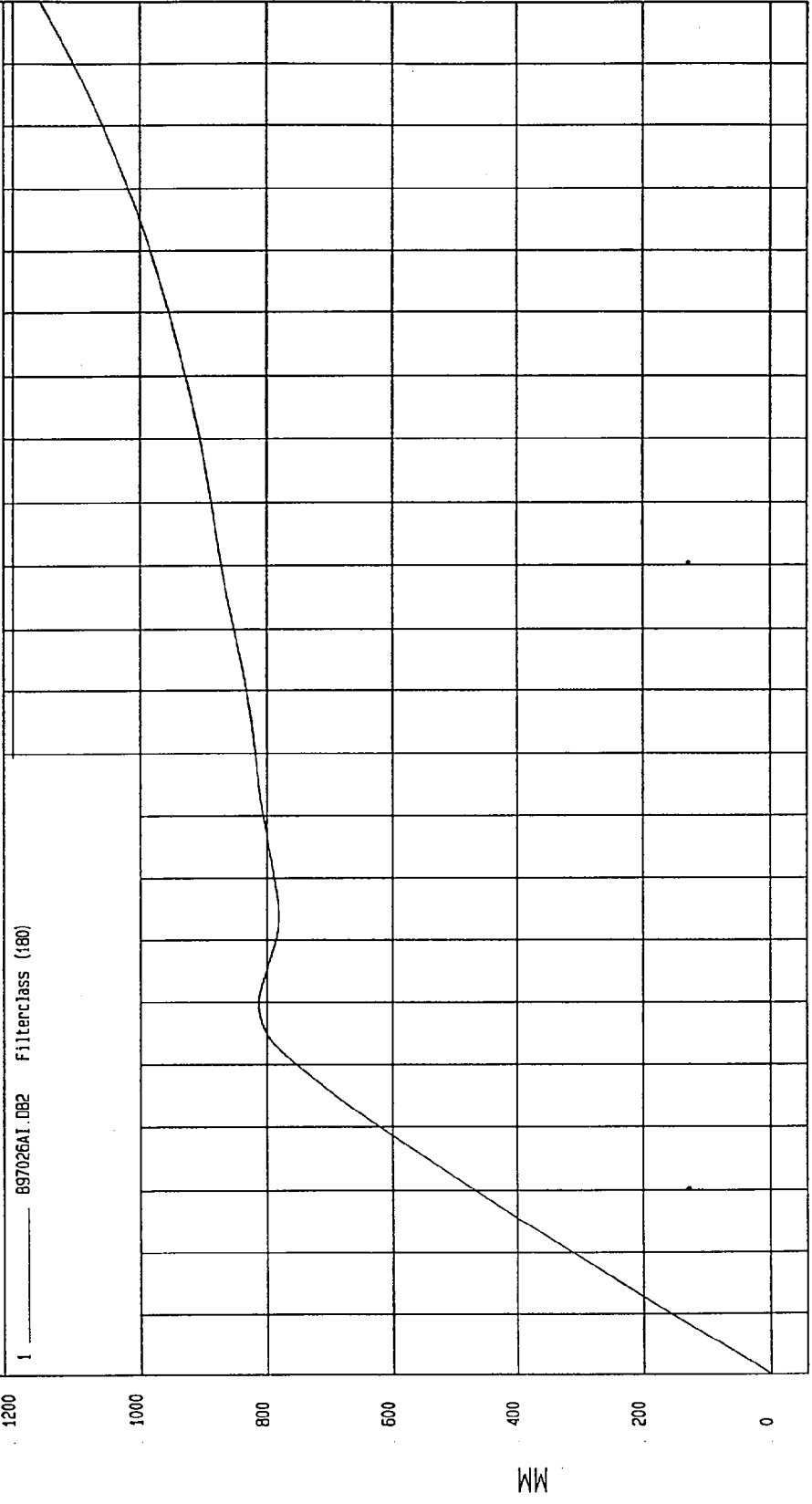


TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = 0 MM at -20 msec Maximum = 1156.76 MM at 200 msec

LEFT FRONT BRAKE CALIPER X DISPLACEMENT



TIME Seconds

19
18
17
16
15
14
13
12
11
1
0
-01
-02

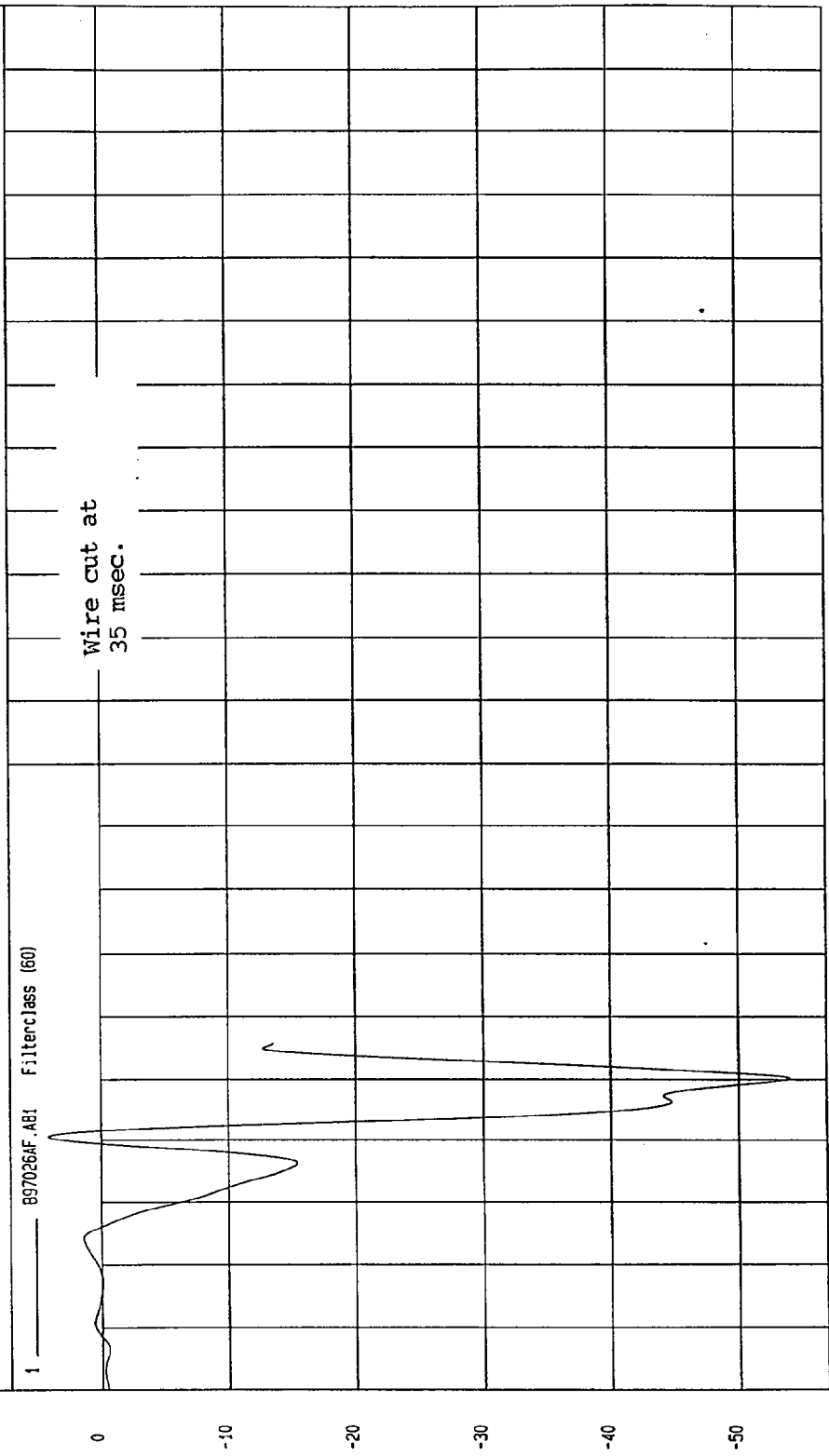
WCA Research
02-24-1997 18:14

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -53.93 G'S at 30 msec Maximum = 4.09 G'S at 21 msec

RIGHT FRONT BRAKE CALIPER 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

NGA Research
03-01-1997 09:42

TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501)

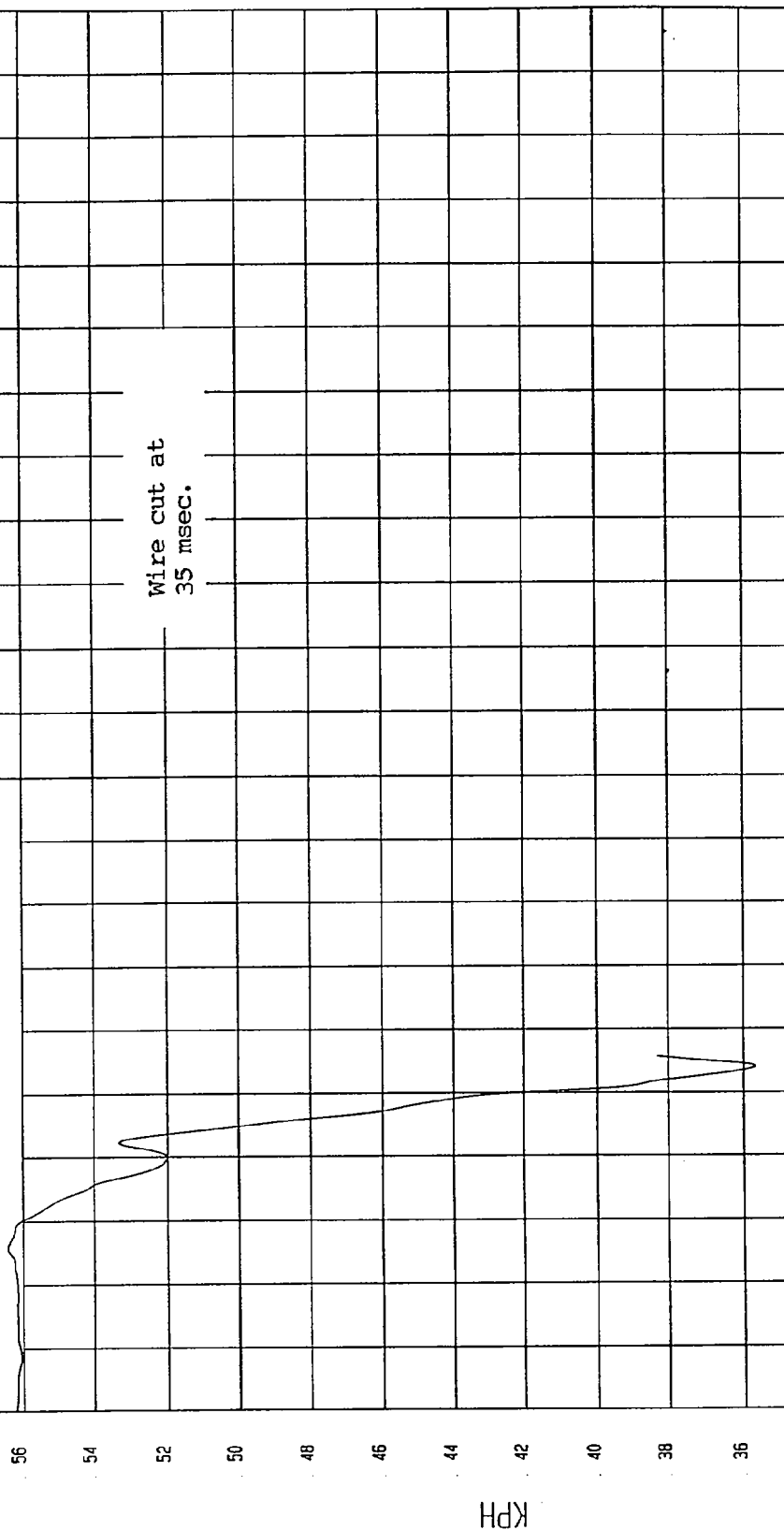
Speed: 34.95 MPH 56.2 KPH

Minimum = 35.66 KPH at 34 msec

Maximum = 56.41 KPH at 6 msec

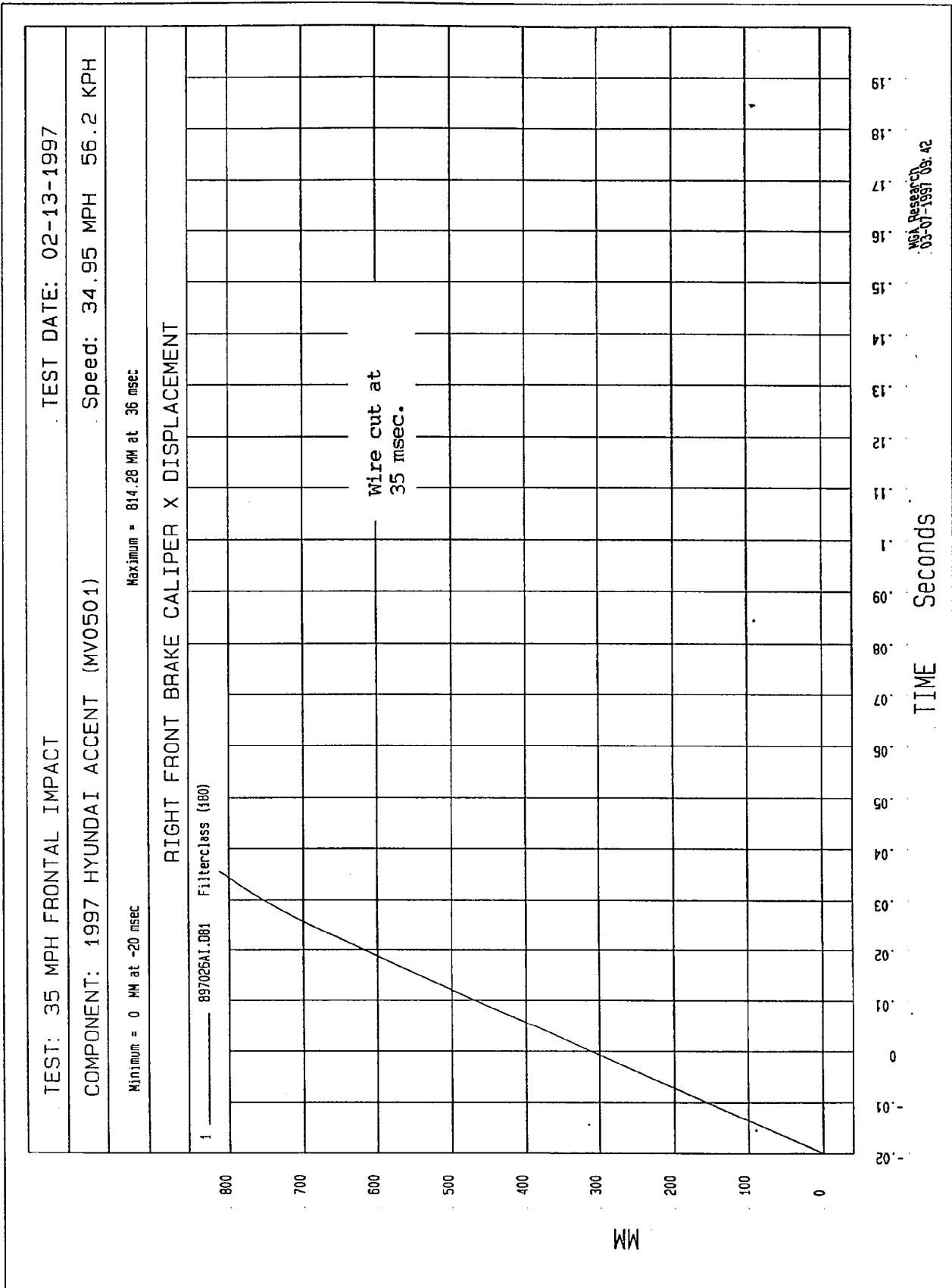
RIGHT FRONT BRAKE CALIPER X VELOCITY

1 897026A1.VB1 Filterclass (180)



TIME Seconds

MGA Research
03-07-1997 09:42

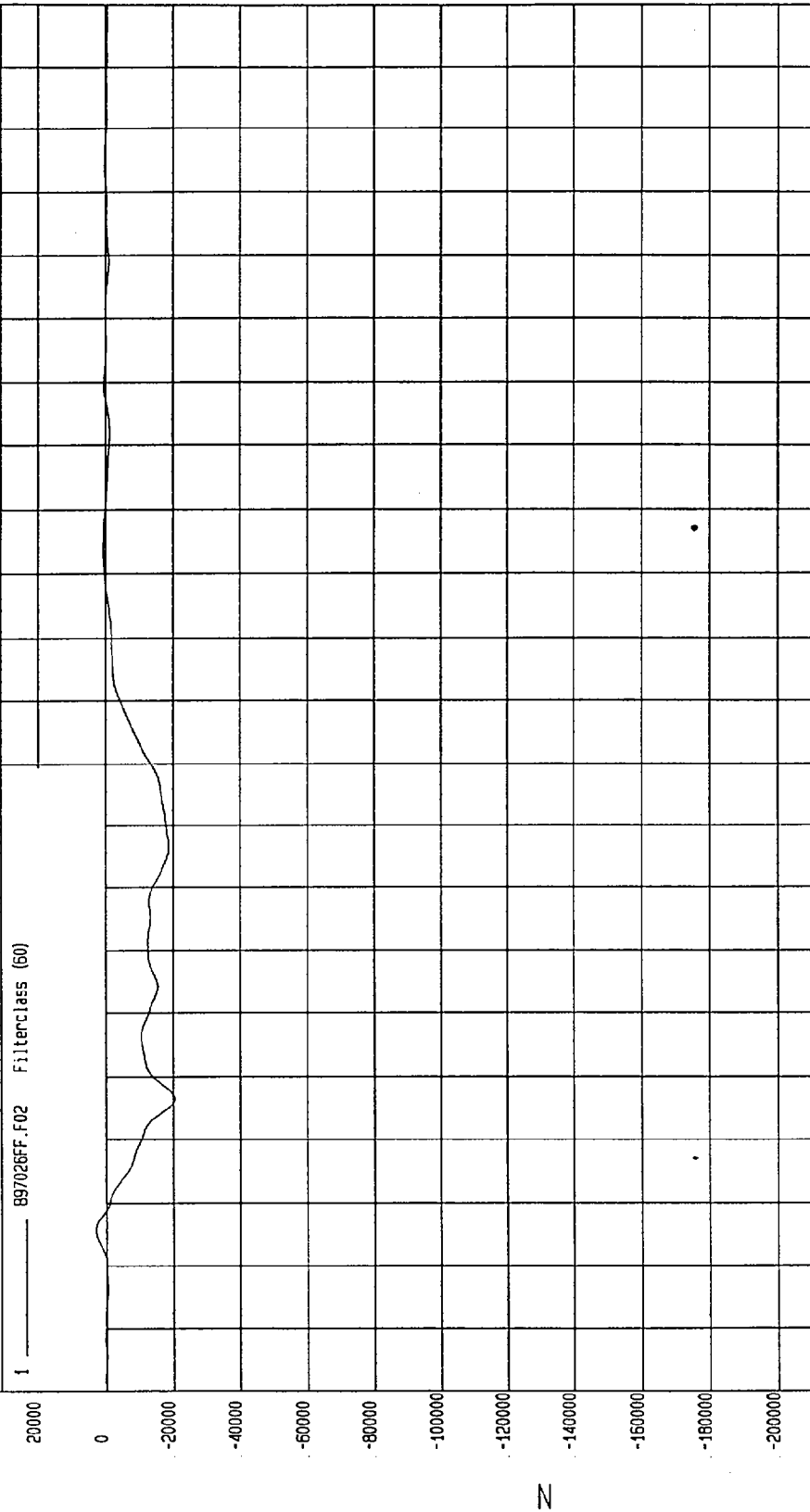


TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -20336.35 N at 26 msec Maximum = 3184.02 N at 6 msec

UPPER LEFT BARRIER FORCE



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

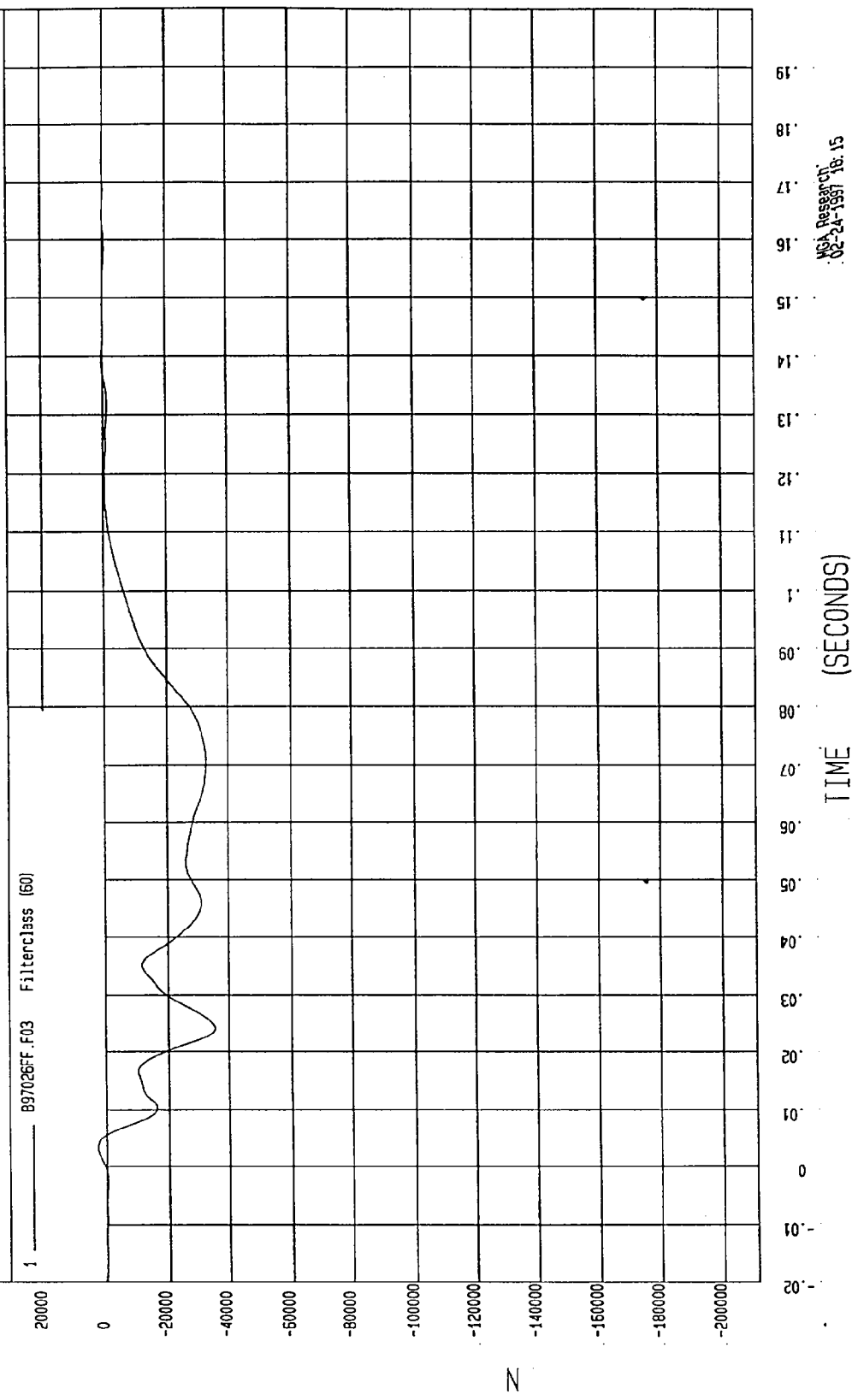
MCA Research
02-24-1997 18.15

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -35270.01 N at 24 msec Maximum = 2989.68 N at 3 msec

UPPER CENTER BARRIER FORCE

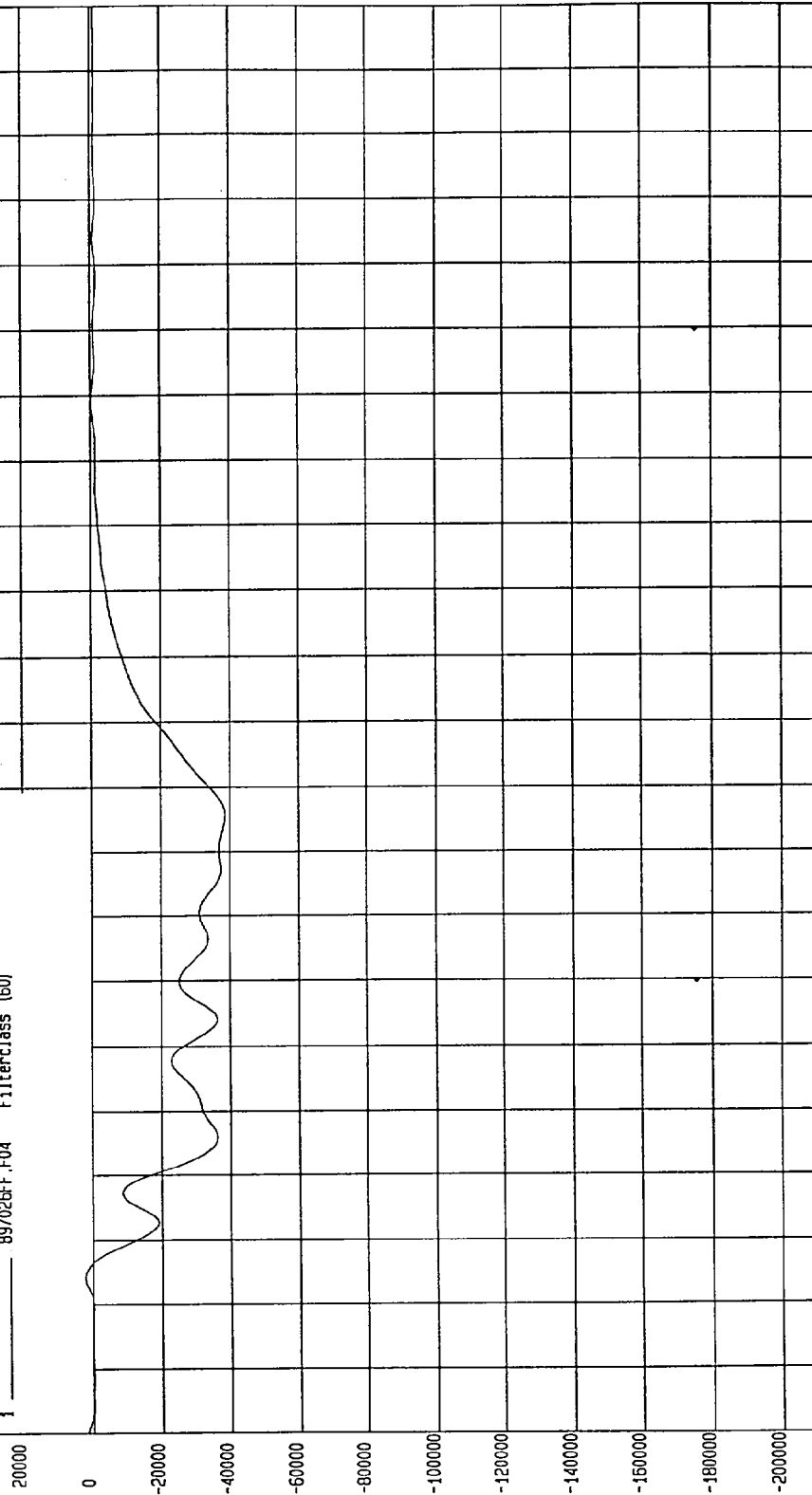


TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997
COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -38593.78 N at 76 msec Maximum = 2292.17 N at 4 msec

UPPER RIGHT BARRIER FORCE

1 — 897026FF.F04 Filterclass (60)



TIME (SECONDS)

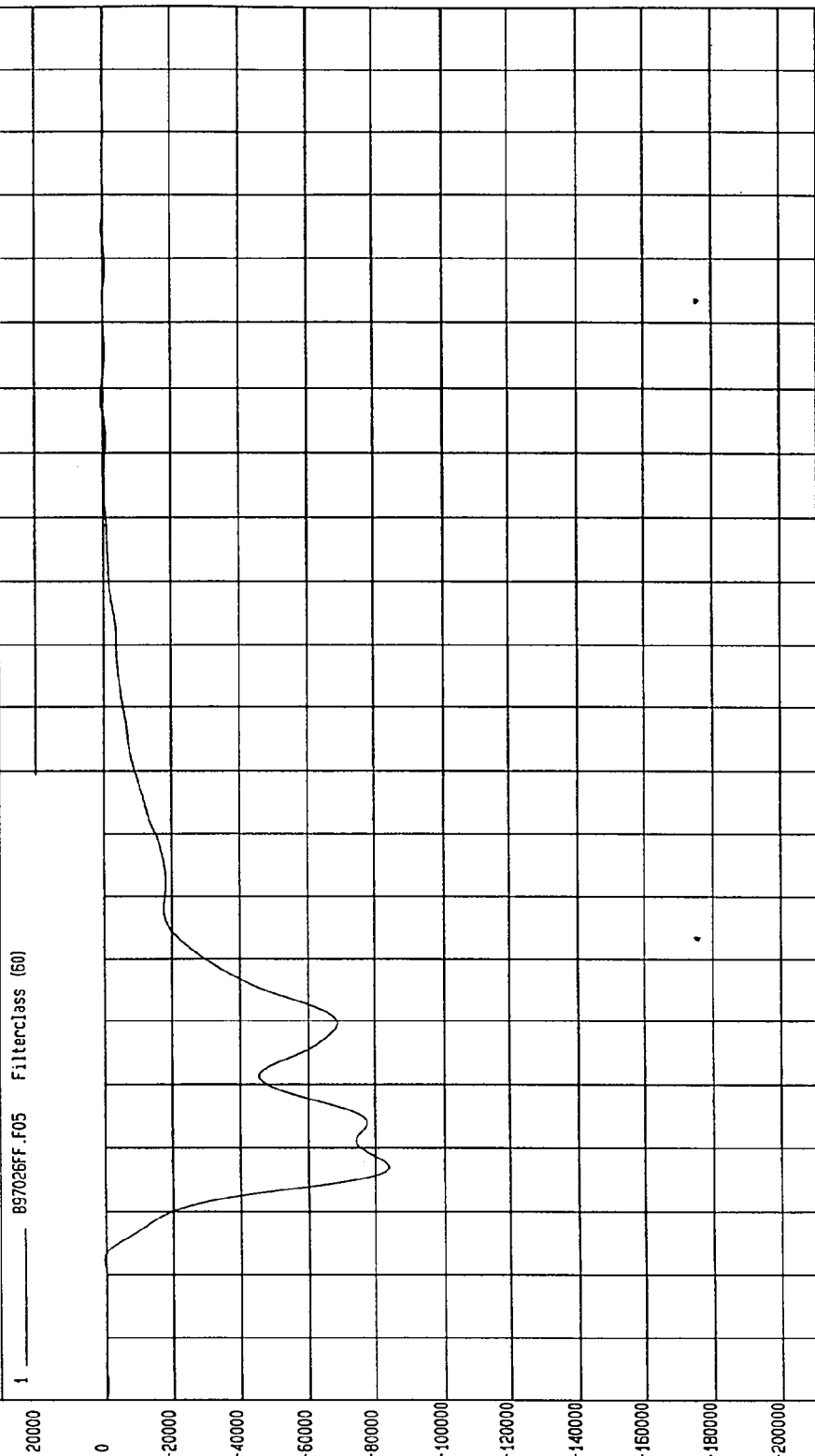
WCA Research
02-24-1997 16:16

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -84145.64 N at 17 msec Maximum = 765.60 N at 139 msec

LOWER LEFT BARRIER FORCE



TIME (SECONDS)

MSA Research
02-24-1997 18:16

TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

Speed: 34.95 MPH 56.2 KPH

COMPONENT: 1997 HYUNDAI ACCENT (MV0501)

Maximum = 2420.20 N at 138 msec

Minimum = -242078.6 N at 26 msec

LOWER CENTER BARRIER FORCE

1 ——— 897026FF.F06 Filterclass (50)

20000

0

-20000

-40000

-60000

-80000

-100000

-120000

-140000

-160000

-180000

-200000

-220000

-240000

-260000

-280000

-300000

N

19

18

17

16

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

0

-01

-02

TIME (SECONDS)

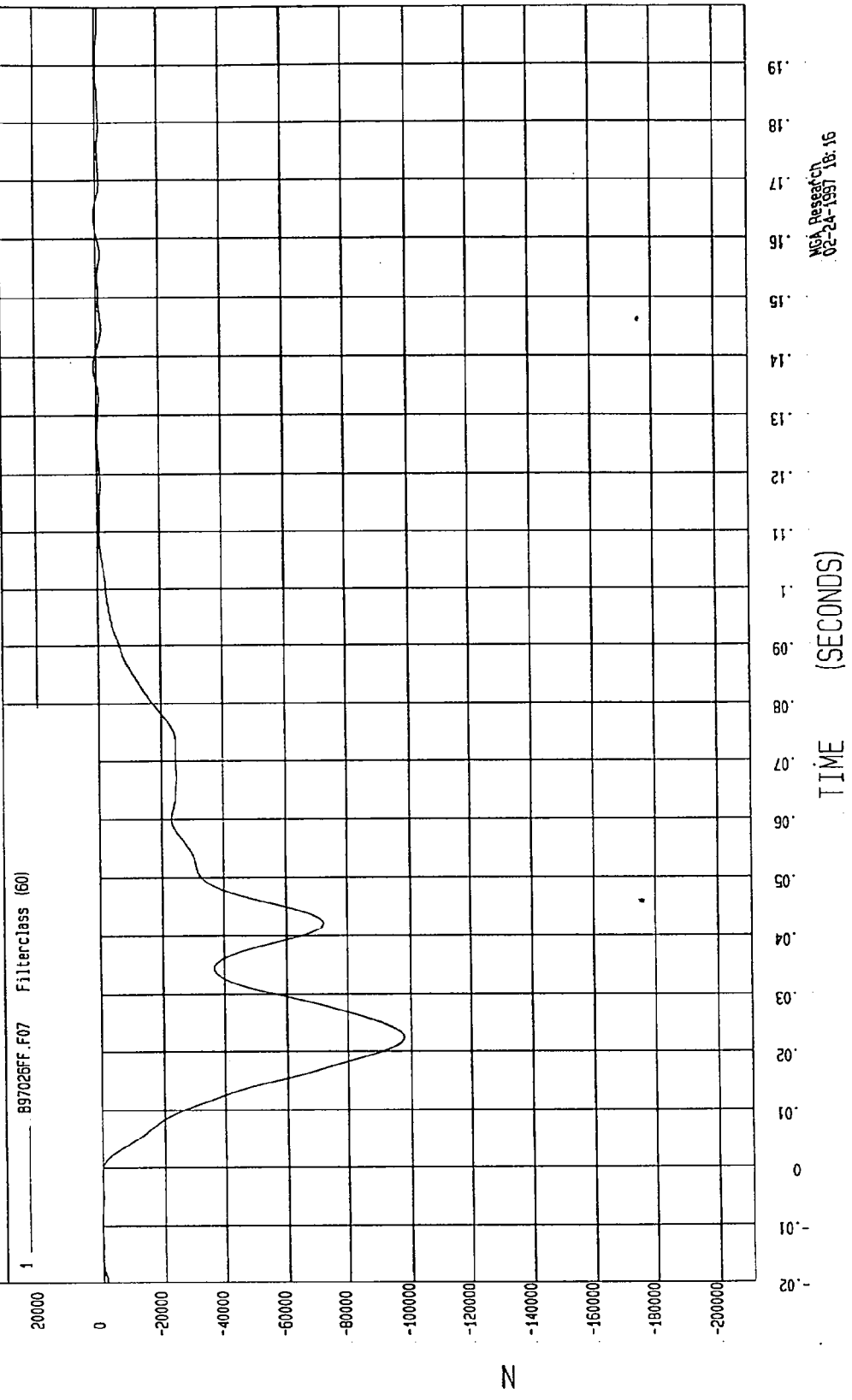
WCA Research
02-24-1997 18:15

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -97775.61 N at 22 msec Maximum = 1016.61 N at 138 msec

LOWER RIGHT BARRIER FORCE



NSA Research
02-24-1997 18.16

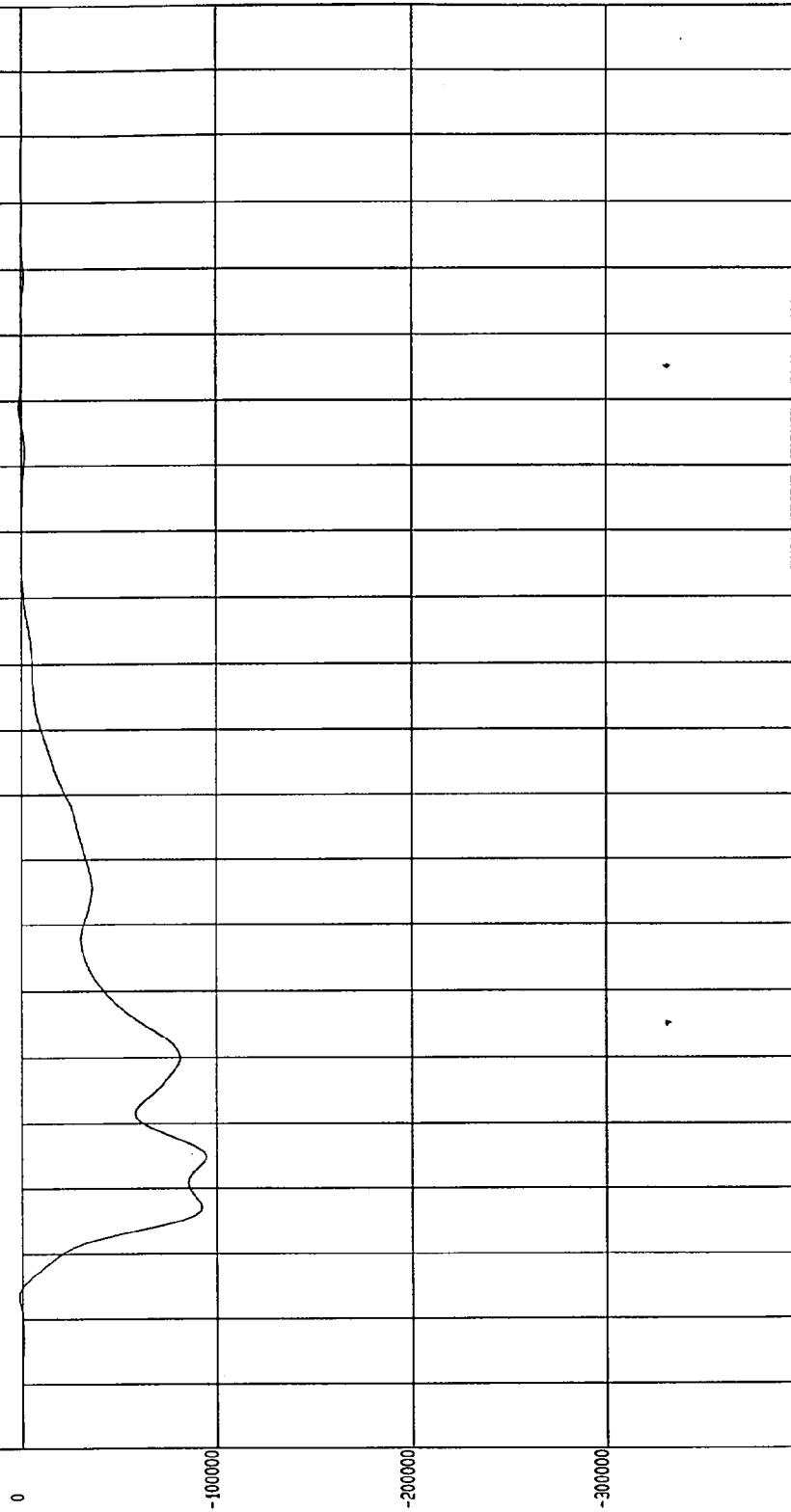
TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -94723.98 N at 25 msec Maximum = 1756.13 N at 3 msec

SUM OF LEFT BARRIER FORCES

1 ——— B97026FU.F02 Filterclass (60)



TIME (SECONDS)

NCA Research
02-24-1997 18:17

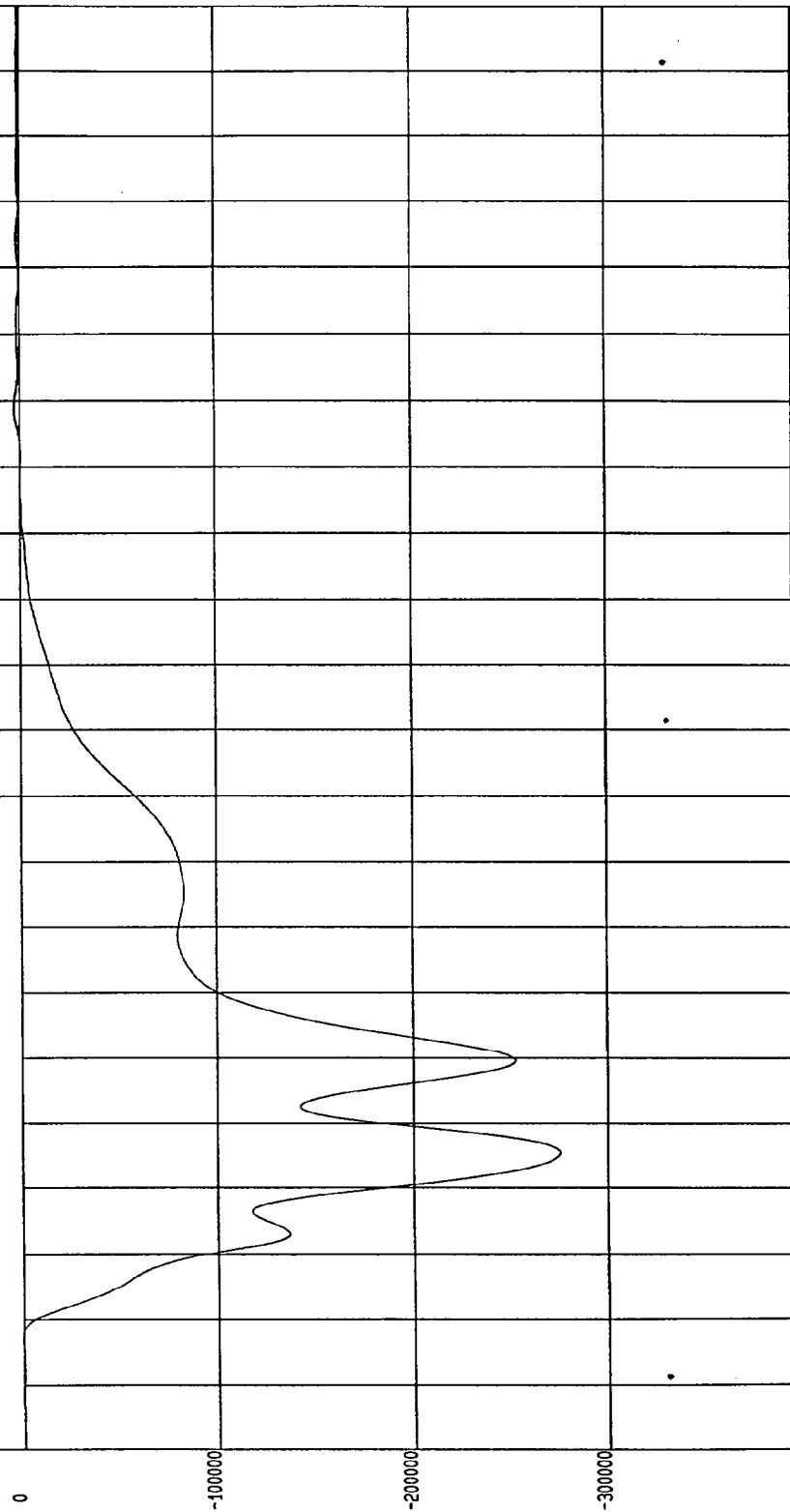
TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -276037.4 N at 26 msec Maximum = 3031.77 N at 139 msec

SUM OF CENTER BARRIER FORCES

1 ——— B97026FU.F03 Filterclass (60)



TIME (SECONDS)

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

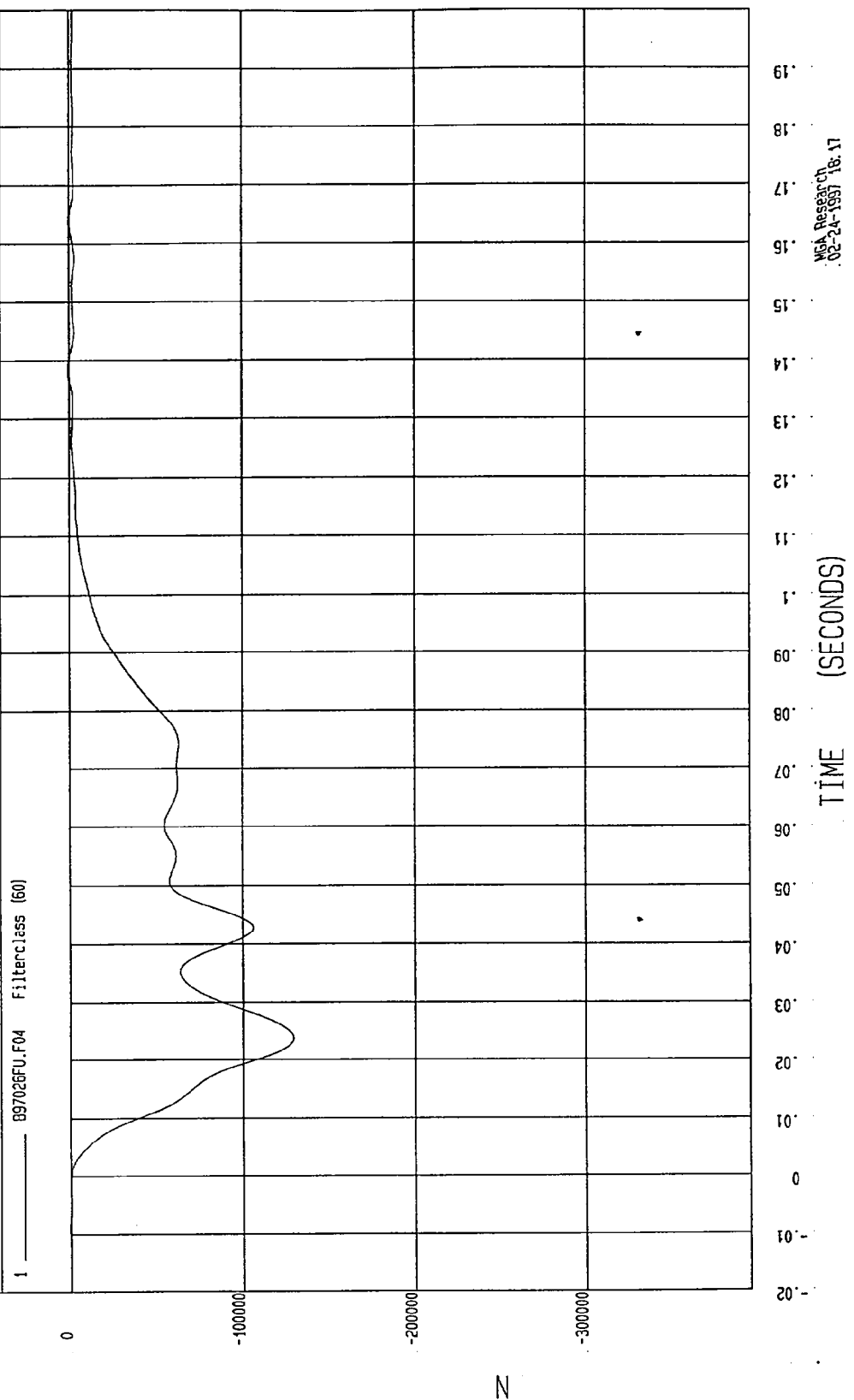
WCA Research
02-24-1997 18:17

TEST DATE: 02-13-1997

Speed: 34.95 MPH 56.2 KPH

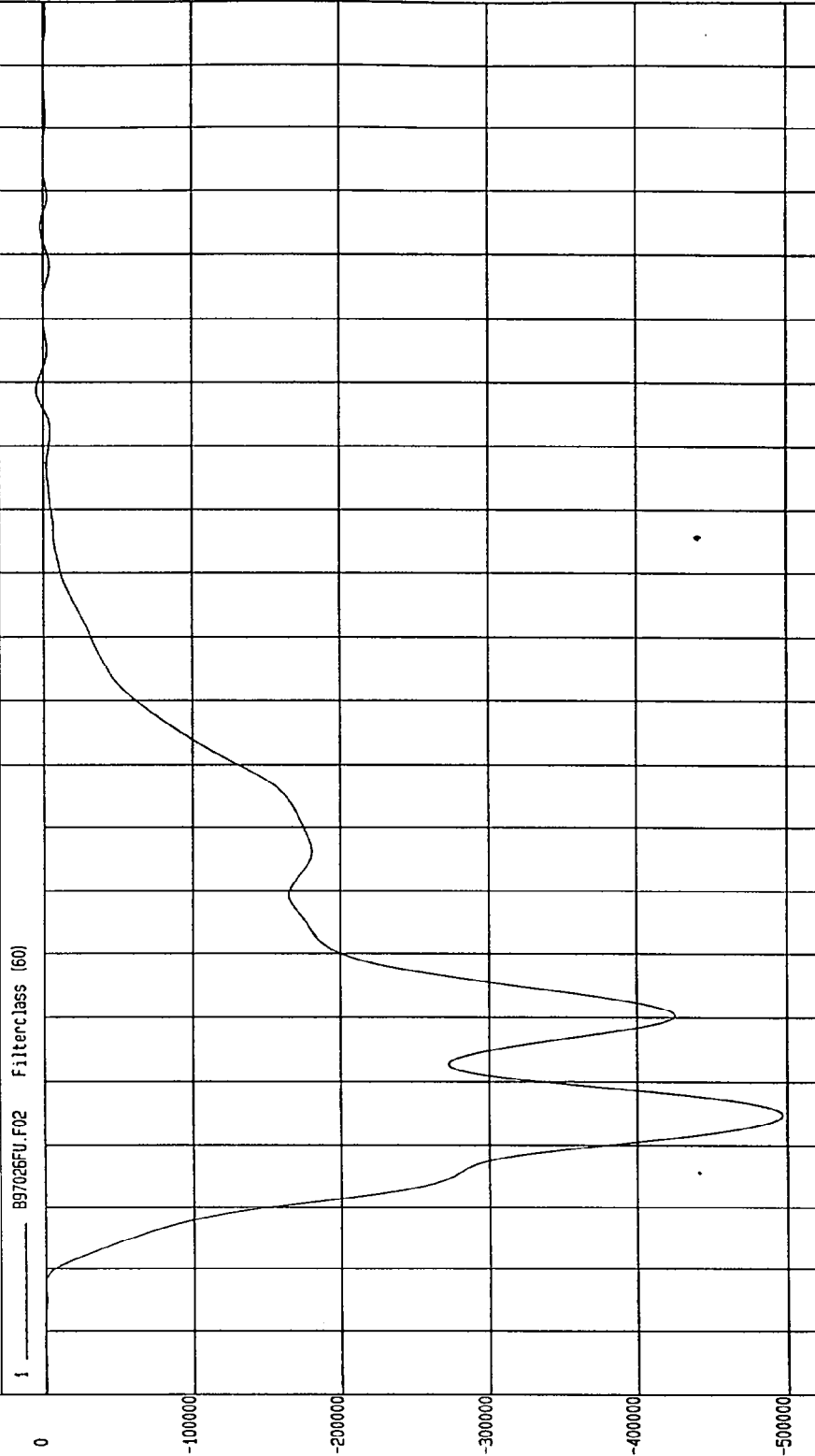
Maximum = 742.05 N at 138 msec

SUM OF RIGHT BARRIER FORCES



TEST: 35 MPH FRONTAL IMPACT	TEST DATE: 02-13-1997
COMPONENT: 1997 HYUNDAI ACCENT (MV0501)	Speed: 34.95 MPH 56.2 KPH
Minimum = -496877.6 N at 25 msec	Maximum = 5026.95 N at 139 msec

SUM OF BARRIER FORCES



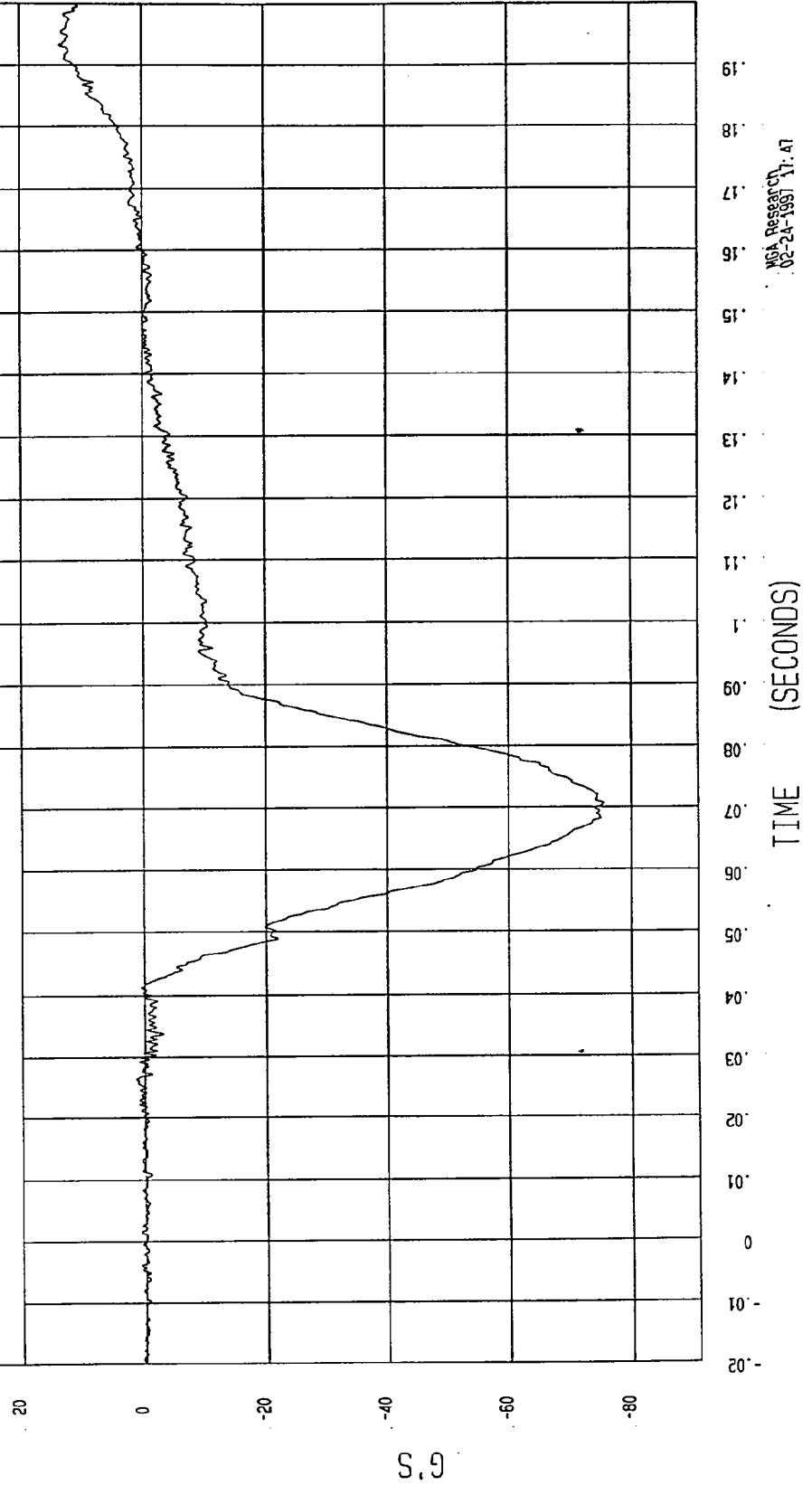
TIME (SECONDS)

Mot. Research
02-24-1997 18:17

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997
COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH
Minimum = -75.52 G'S at 71 msec Maximum = 13.58 G'S at 193 msec

DRIVER HEAD X ACCELERATION

1 ——— B97026AF.A12 Filterclass (1000)



MOA Research
02-24-1997 17:47

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -2.00 G'S at 123 msec Maximum = 14.07 G'S at 74 msec

DRIVER HEAD Y ACCELERATION

1 ——— 897026AF.A13 Filterclass (1000)

G.S

20

0

-20

-40

-60

-80

TIME (SECONDS)

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

NSA Research
02-24-1997 17:48

TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501)

Speed: 34.95 MPH 56.2 KPH

Minimum = -23.68 G'S at 70 msec

Maximum = 1.41 G'S at 31 msec

DRIVER HEAD Z ACCELERATION

1 897026AF.A14 Filterclass (1000)

20

0

-20

-40

-60

-80

G.S

-0.02

-0.01

0

0.01

0.02

0.03

0.04

0.05

0.06

0.07

0.08

0.09

0.1

0.11

0.12

0.13

0.14

0.15

0.16

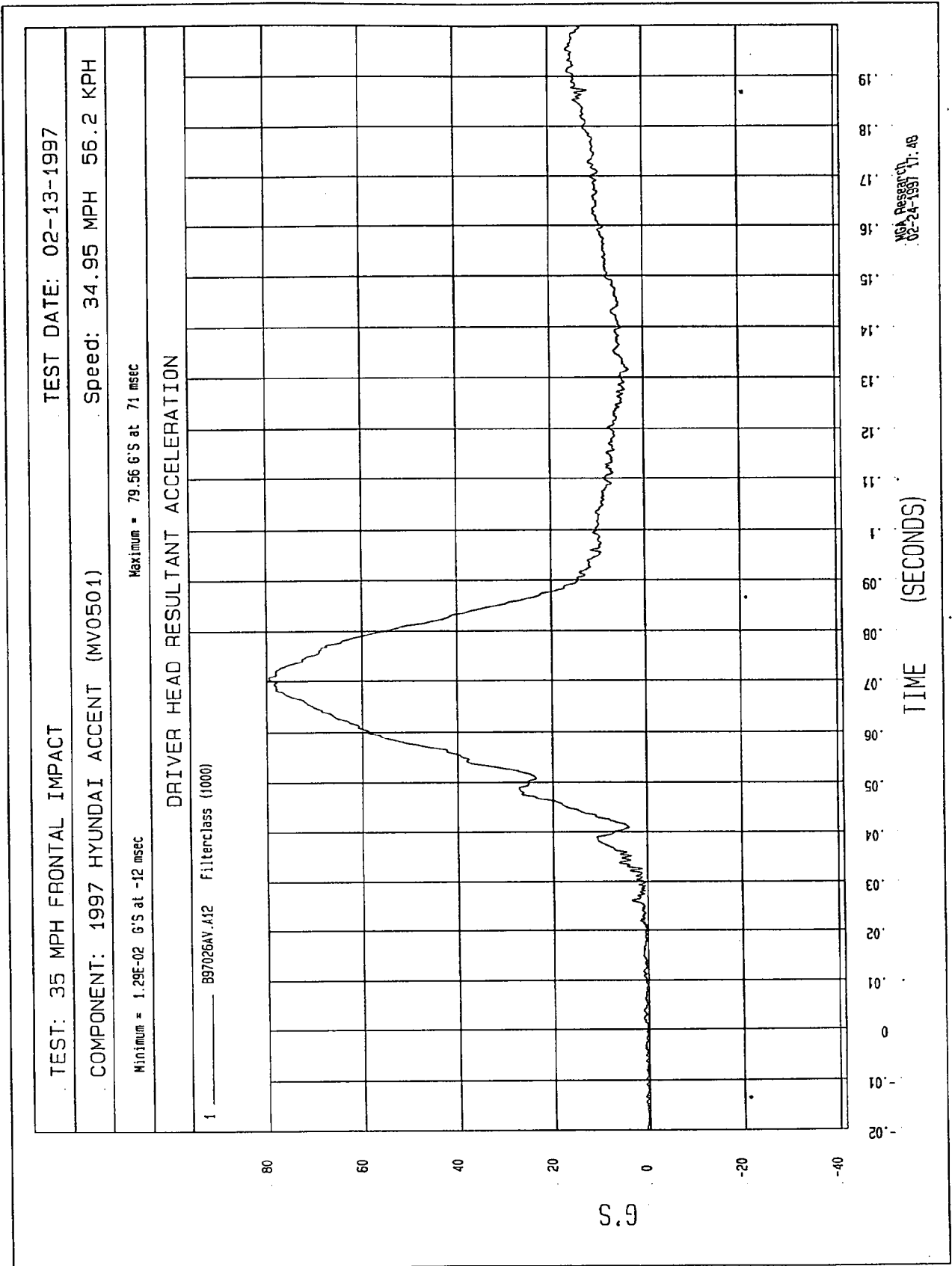
0.17

0.18

0.19

TIME (SECONDS)

MSA Research
02-21-1997 17:48

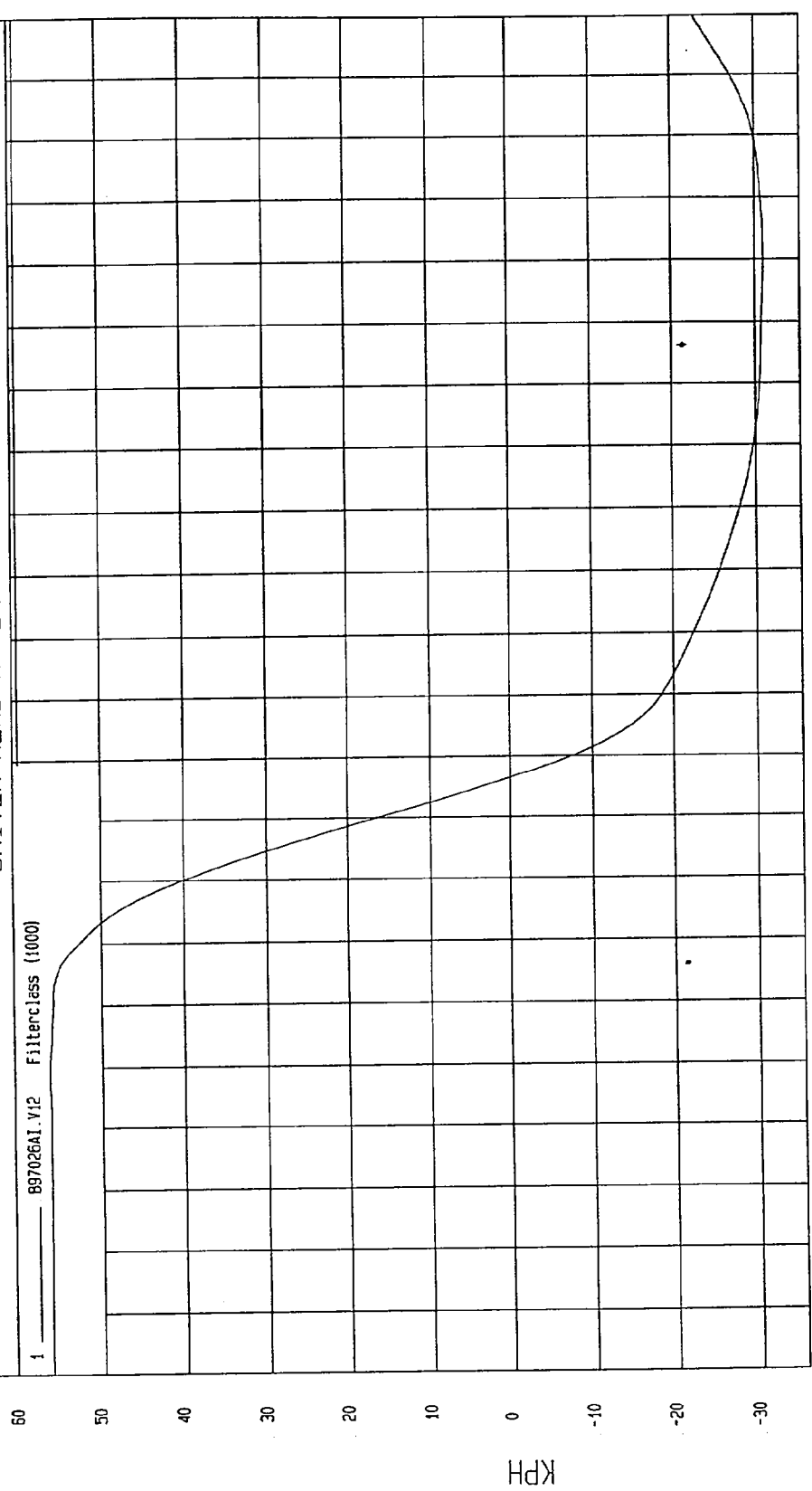


TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -31.05 KPH at 160 msec Maximum = 56.26 KPH at 27 msec

DRIVER HEAD X VELOCITY



TIME Seconds

MGA Research
02-24-1997 18:05

TEST: 35 MPH FRONTAL IMPACT

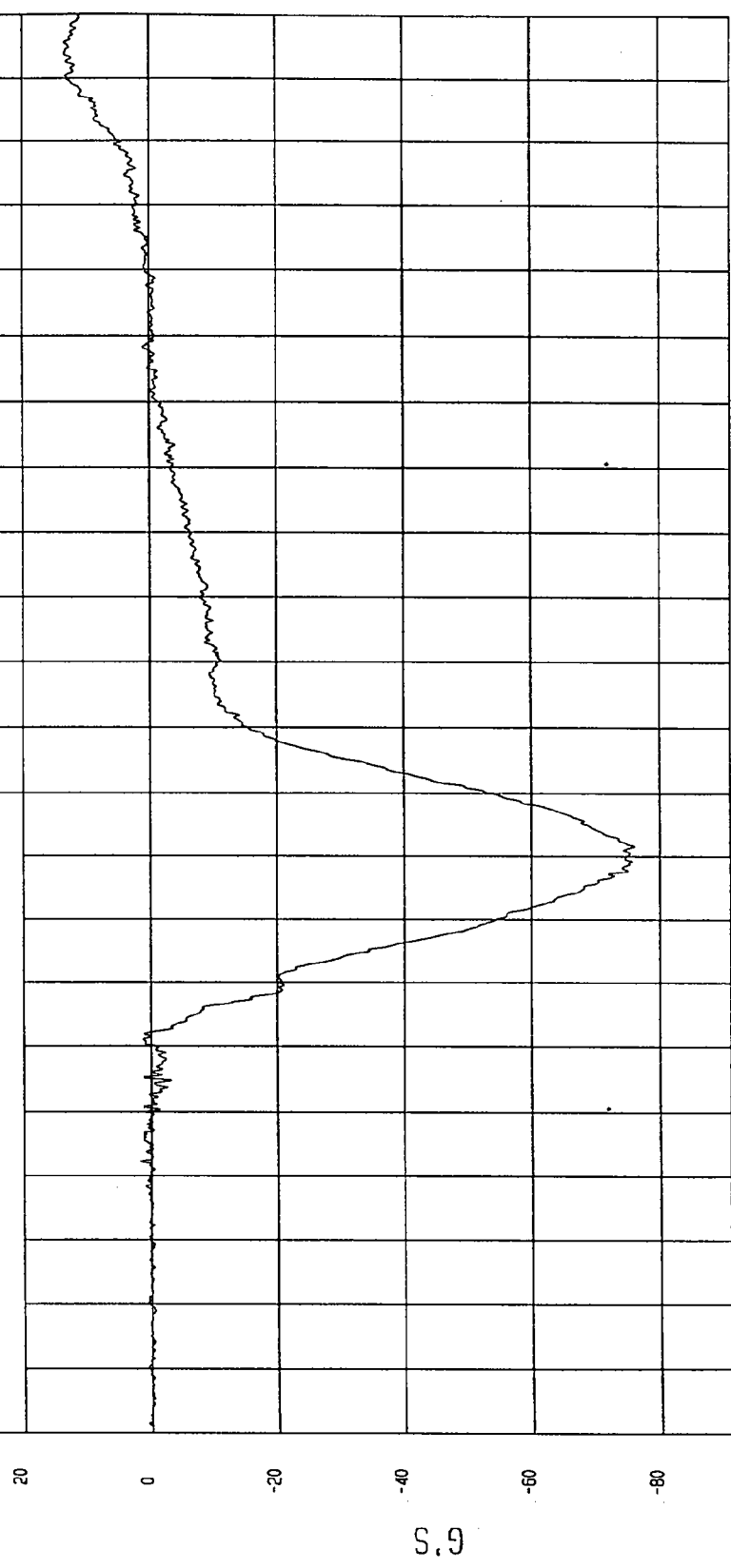
TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -75.99 G'S at 72 msec Maximum = 13.30 G'S at 196 msec

DRIVER HEAD REDUNDANT X ACCELERATION

1 897026AF.A32 Filterclass (1000)



TIME (SECONDS)

MGA Research
03-07-1997 10:00

TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -3.28 G'S at 110 msec

Maximum = 10.20 G'S at 81 msec

DRIVER HEAD REDUNDANT Y ACCELERATION

1 B97026AF.A33 Filterclass (1000)

20

0

-20

-40

-60

G'S

-0.20

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)

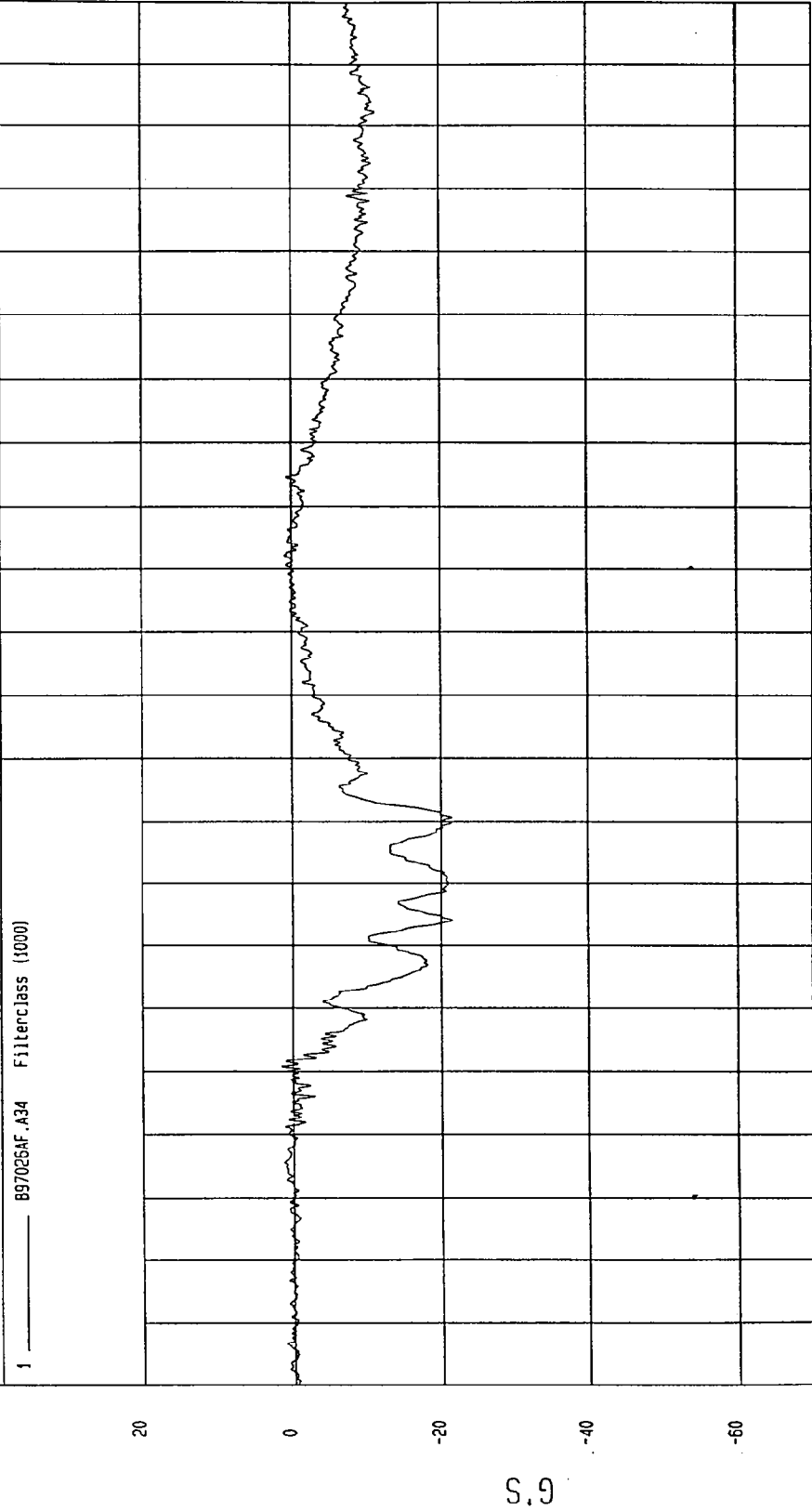
WCA Research
02-24-1997 17:53

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -21.48 G'S at 54 msec Maximum = 1.51 G'S at 31 msec

DRIVER HEAD REDUNDANT Z ACCELERATION



TIME (SECONDS)

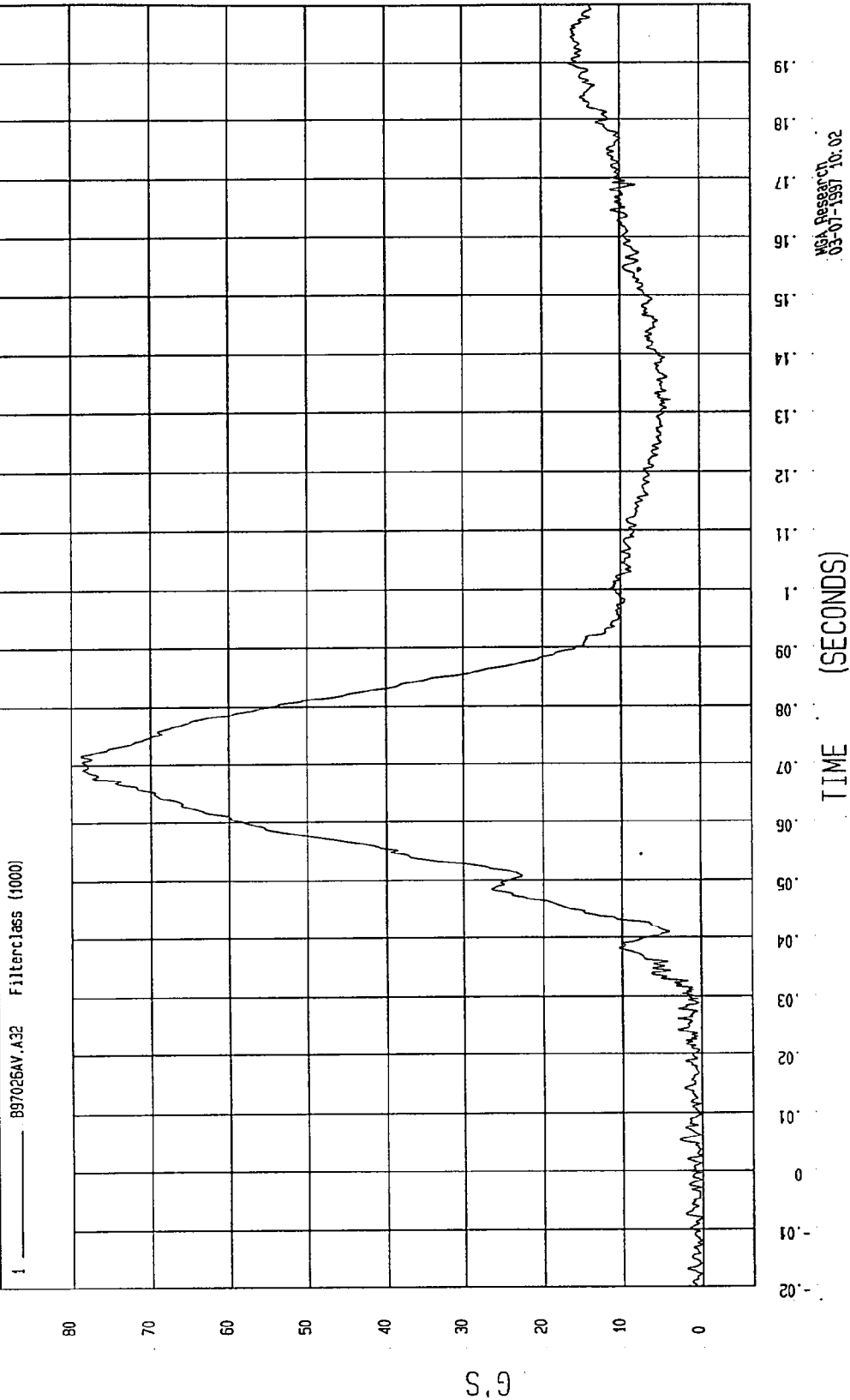
MOA Research
02-24-1997 17:53

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = 8.76E-02 G'S at 2 msec Maximum = 78.83 G'S at 72 msec

DRIVER HEAD REDUNDANT RESULTANT ACCELERATION

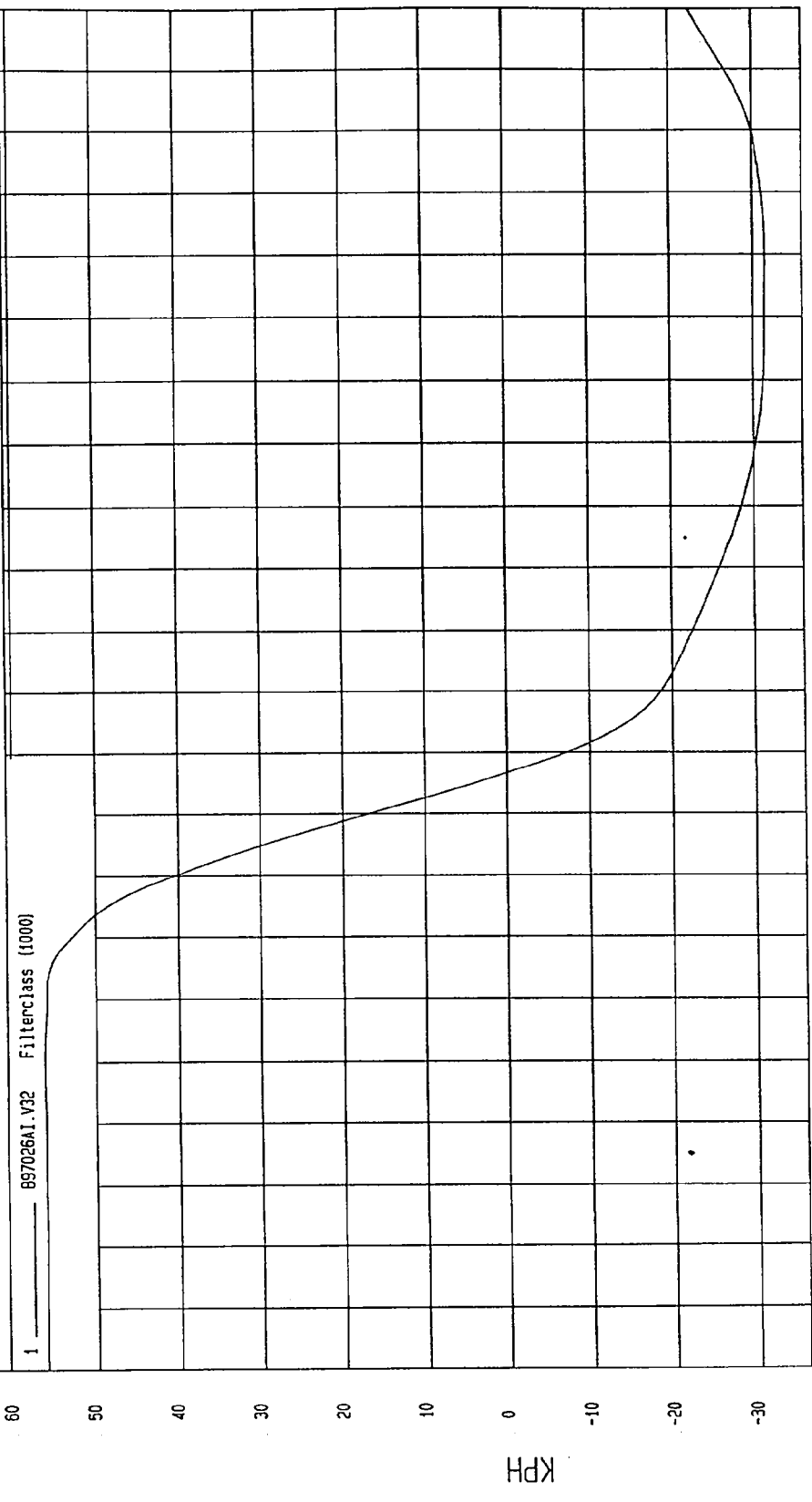


TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -31.47 KPH at 159 msec Maximum = 56.28 KPH at 30 msec

DRIVER HEAD REDUNDANT X VELOCITY



TIME Seconds

MCA Research
02-24-1997 18:06

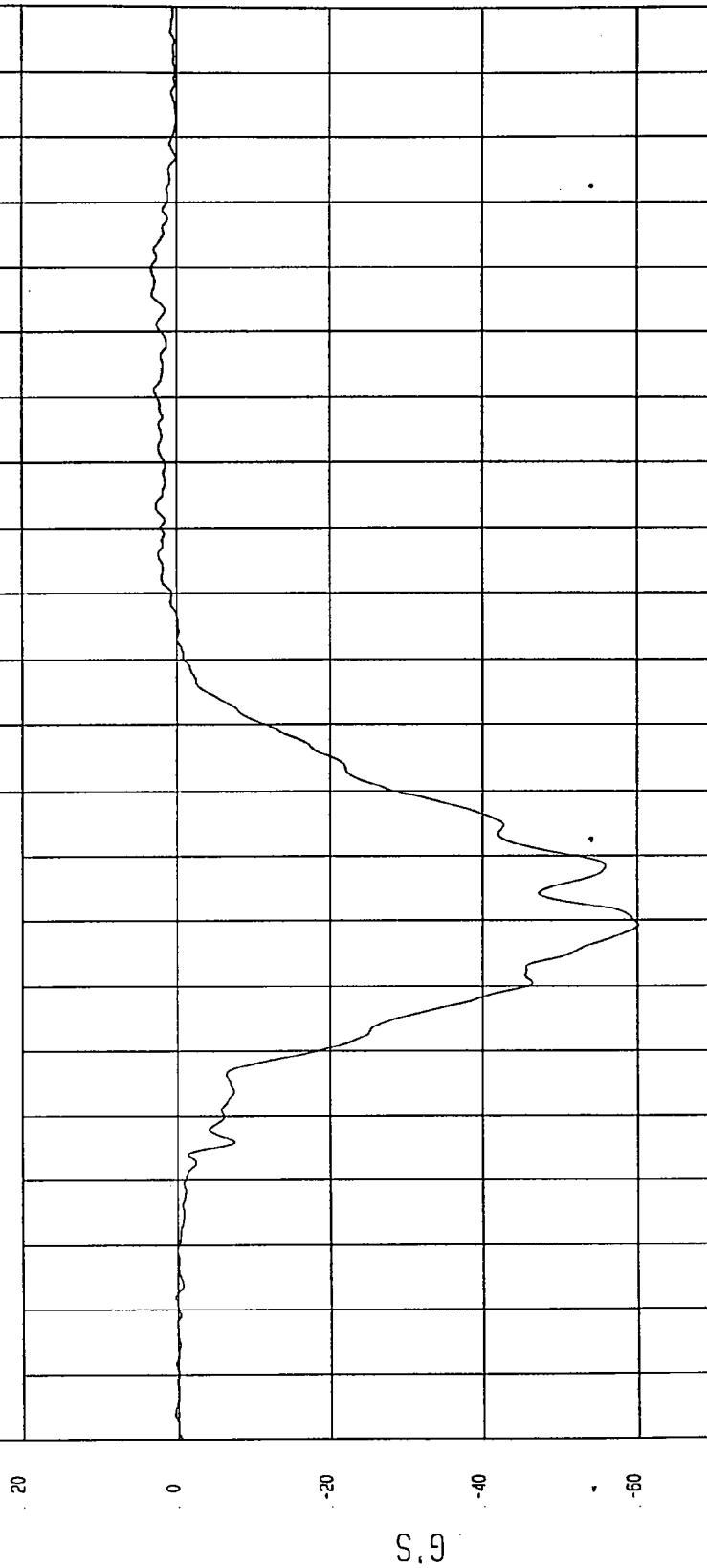
TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

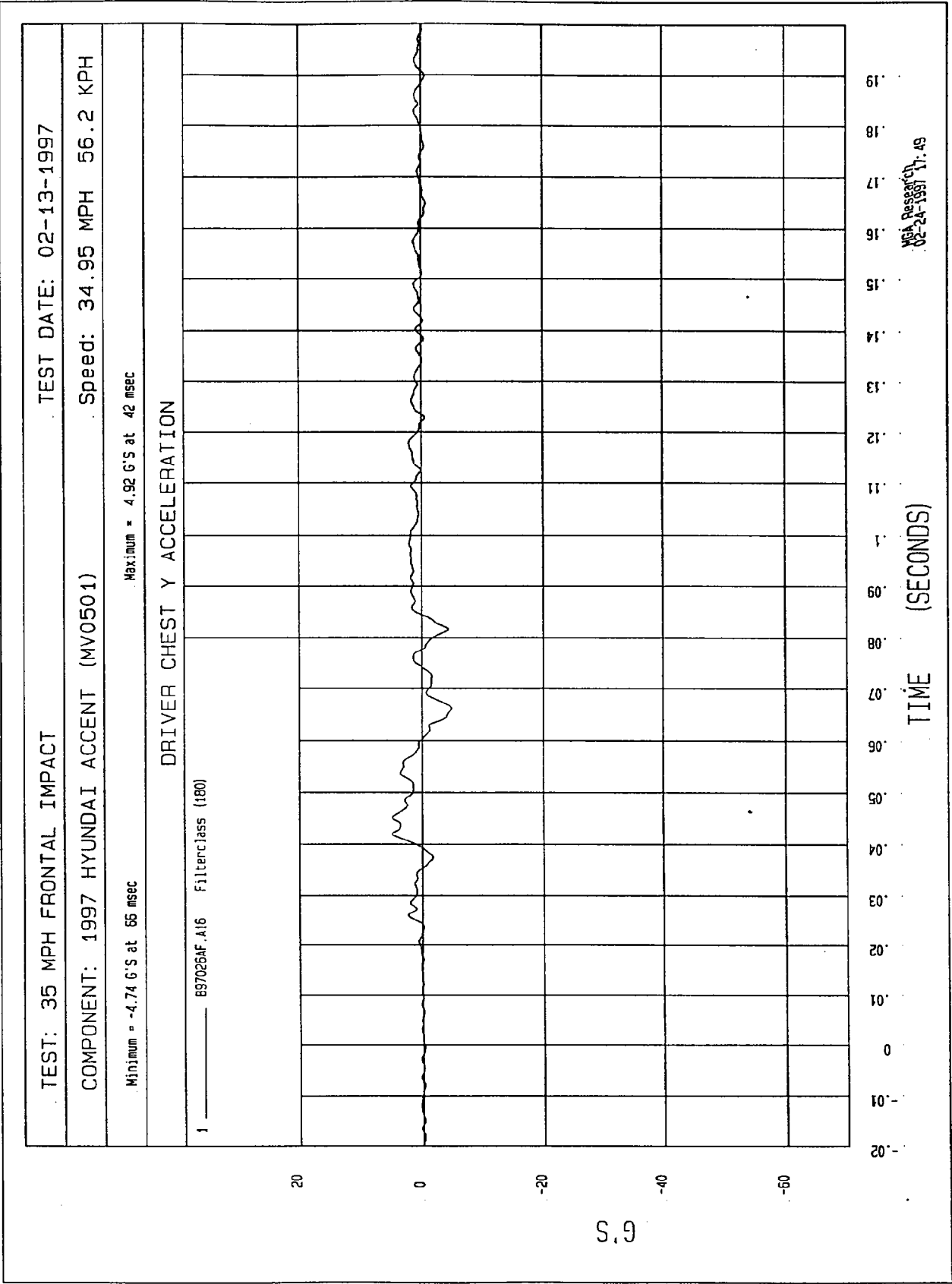
Minimum = -60.11 G'S at 59 msec Maximum = 3.27 G'S at 160 msec

DRIVER CHEST X ACCELERATION

1 B97026AF.A15 Filterclass (180)



MSA Research
02-28-1997 17:48



TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501)

Speed: 34.95 MPH 56.2 KPH

Minimum = -8.94 G'S at 37 msec

Maximum = 21.52 G'S at 77 msec

DRIVER CHEST Z ACCELERATION

1 B97026AF.A17 Filterclass (180)

G.S.

20

0

-20

-40

-60

TIME (SECONDS)

19

18

17

16

15

14

13

12

11

10

09

08

07

06

05

04

03

02

01

00

10

20

WCA Research
02-24-1997 17:49

TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501)

Speed: 34.95 MPH 56.2 KPH

Minimum = 4.38E-02 G'S at 0 msec

Maximum = 60.15 G'S at 59 msec

DRIVER CHEST RESULTANT ACCELERATION

1 897026AV.A15 Filterclass (180)



MCA Research
02-24-1997 17:49

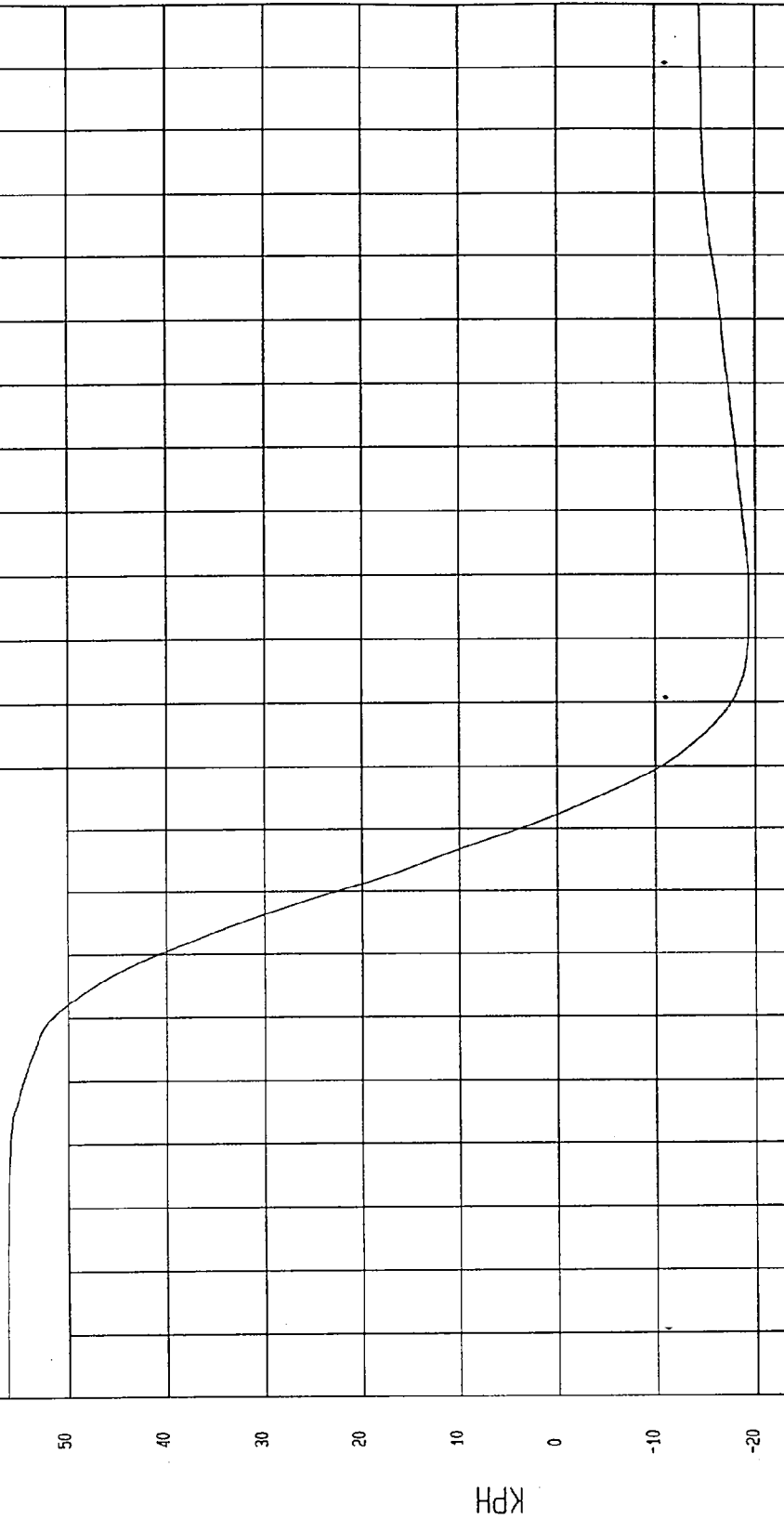
TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -19.39 KPH at 106 msec Maximum = 56.21 KPH at -14 msec

DRIVER CHEST X VELOCITY

1 ——— B97025A1.V15 Filterclass (180)



MOA Research
02-24-1997 18:05

TIME Seconds

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -59.12 G'S at 59 msec Maximum = 3.95 G'S at 159 msec

DRIVER CHEST REDUNDANT X ACCELERATION

1 ——— 897026AF.A35 Filterclass (180)



TIME (SECONDS)

MOA Research
02-24-1997 17:54

TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -3.97 G'S at 66 msec Maximum = 4.27 G'S at 42 msec

DRIVER CHEST REDUNDANT Y ACCELERATION

1 B97026AF.A36 Filterclass (180)

20

0

-20

-40

-60

G'S

TIME (SECONDS)

MSA Research
02-24-1997 17:54

TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501)

Speed: 34.95 MPH 56.2 KPH

Minimum = -9.03 G'S at 36 msec

Maximum = 20.08 G'S at 76 msec

DRIVER CHEST REDUNDANT Z ACCELERATION

1 _____ B97026AF.A37 Filterclass (160)

20

0

-20

-40

-60

G.S

TIME (SECONDS)

NSA Research
02-24-1997 17:54

TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501)

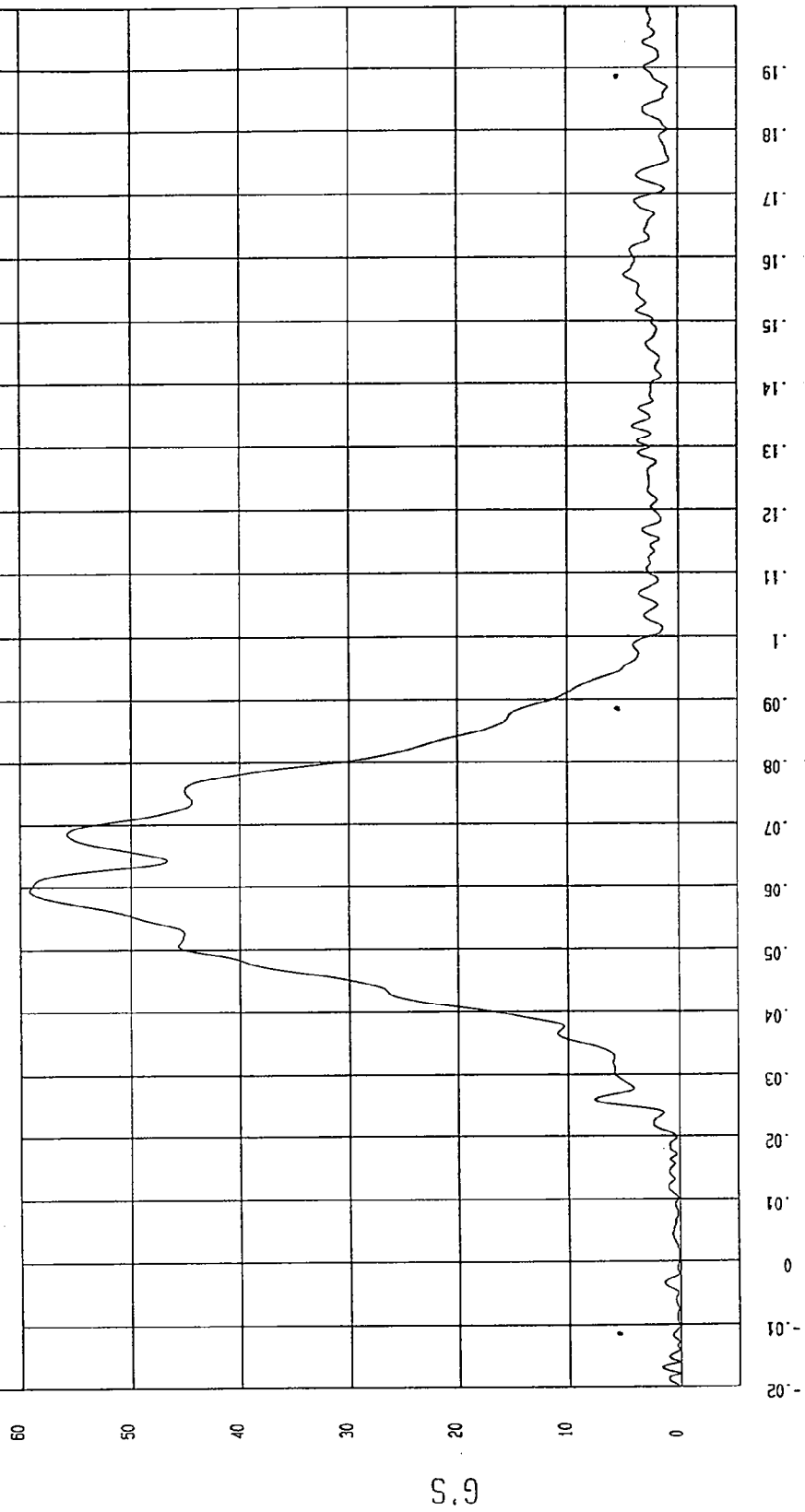
Speed: 34.95 MPH 56.2 KPH

Minimum = 2.03E-02 G'S at -18 msec

Maximum = 59.12 G'S at 59 msec

DRIVER CHEST REDUNDANT RESULTANT ACCELERATION

1 897026AV.A35 Filterclass (180)



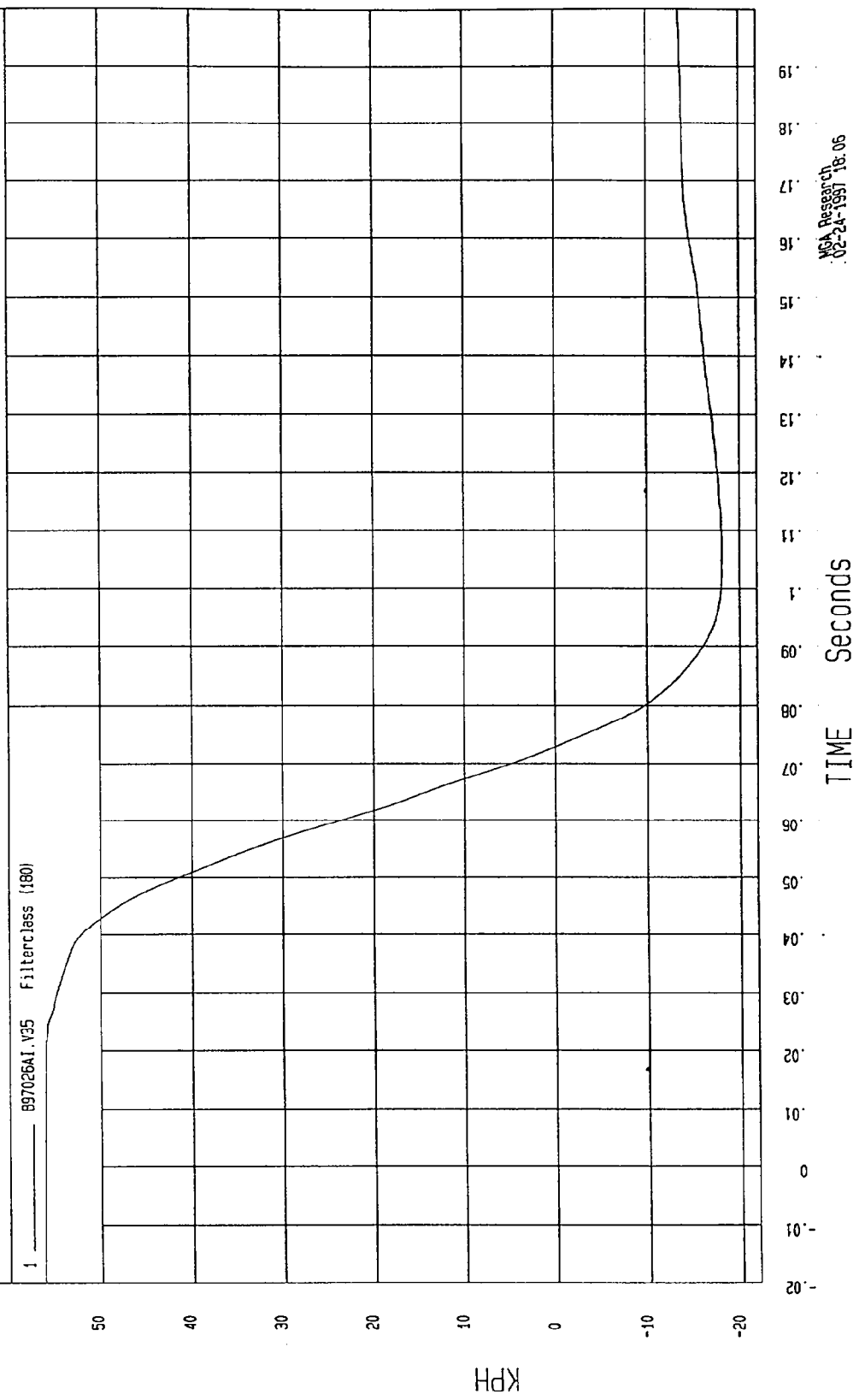
MOA Research
02-24-1997 11:55

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -18.14 KPH at 108 msec Maximum = 56.22 KPH at -18 msec

DRIVER CHEST REDUNDANT X VELOCITY



MSA Research
02-24-1997 18:06

TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

Speed: 34.95 MPH 56.2 KPH

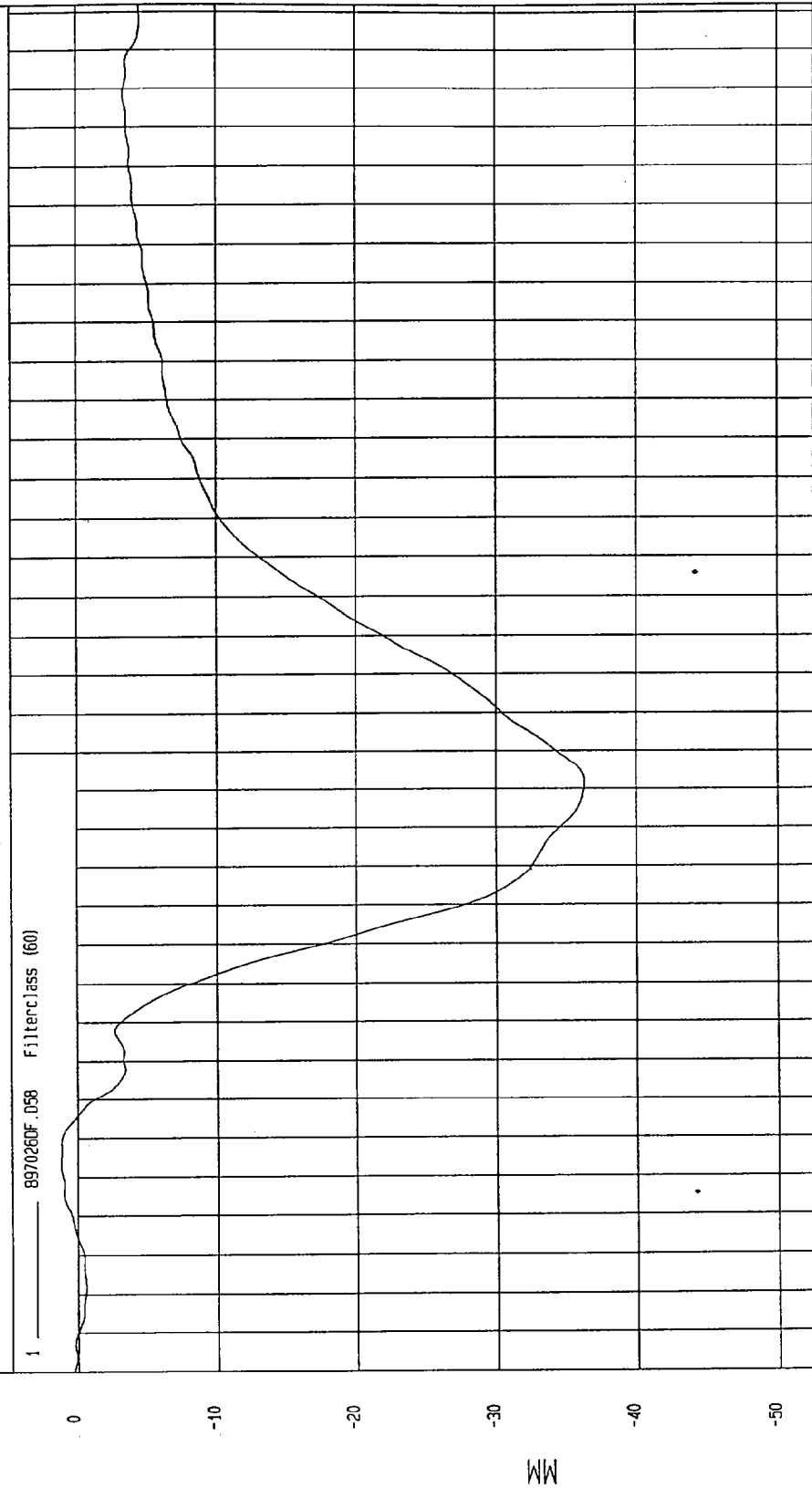
COMPONENT: 1997 HYUNDAI ACCENT (MV0501)

Maximum = 1.18 MM at 21 msec

Minimum = -36.34 MM at 119 msec

DRIVER CHEST COMPRESSION

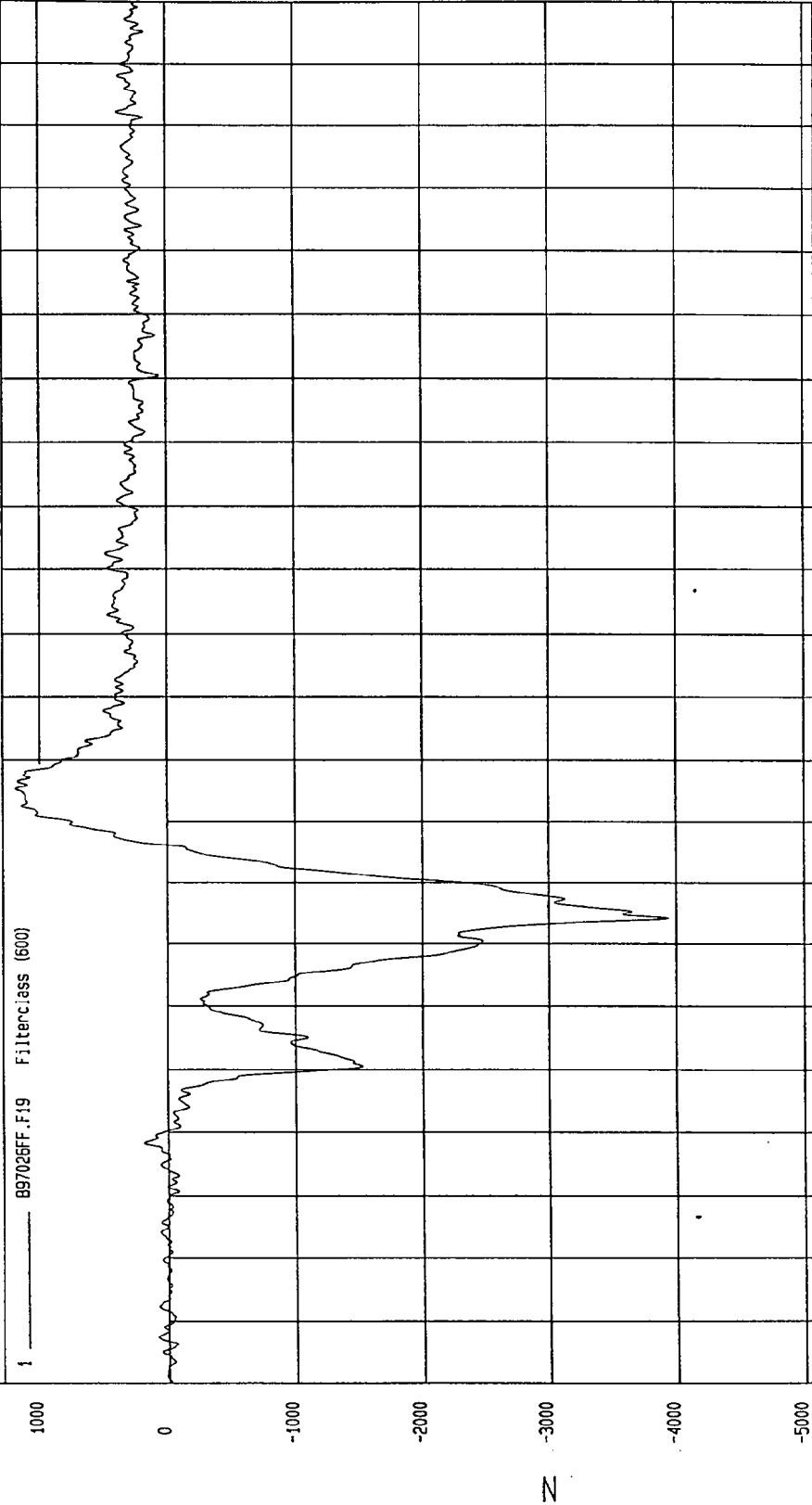
1 897026DF.056 Filterclass (60)



MSA Research
02-24-1997 17.49

TEST: 35 MPH FRONTAL IMPACT	TEST DATE: 02-13-1997
COMPONENT: 1997 HYUNDAI ACCENT (MV0501)	Speed: 34.95 MPH 56.2 KPH
Minimum = -3938.02 N at 54 msec	Maximum = 1192.31 N at 75 msec

DRIVER LEFT FEMUR FORCE

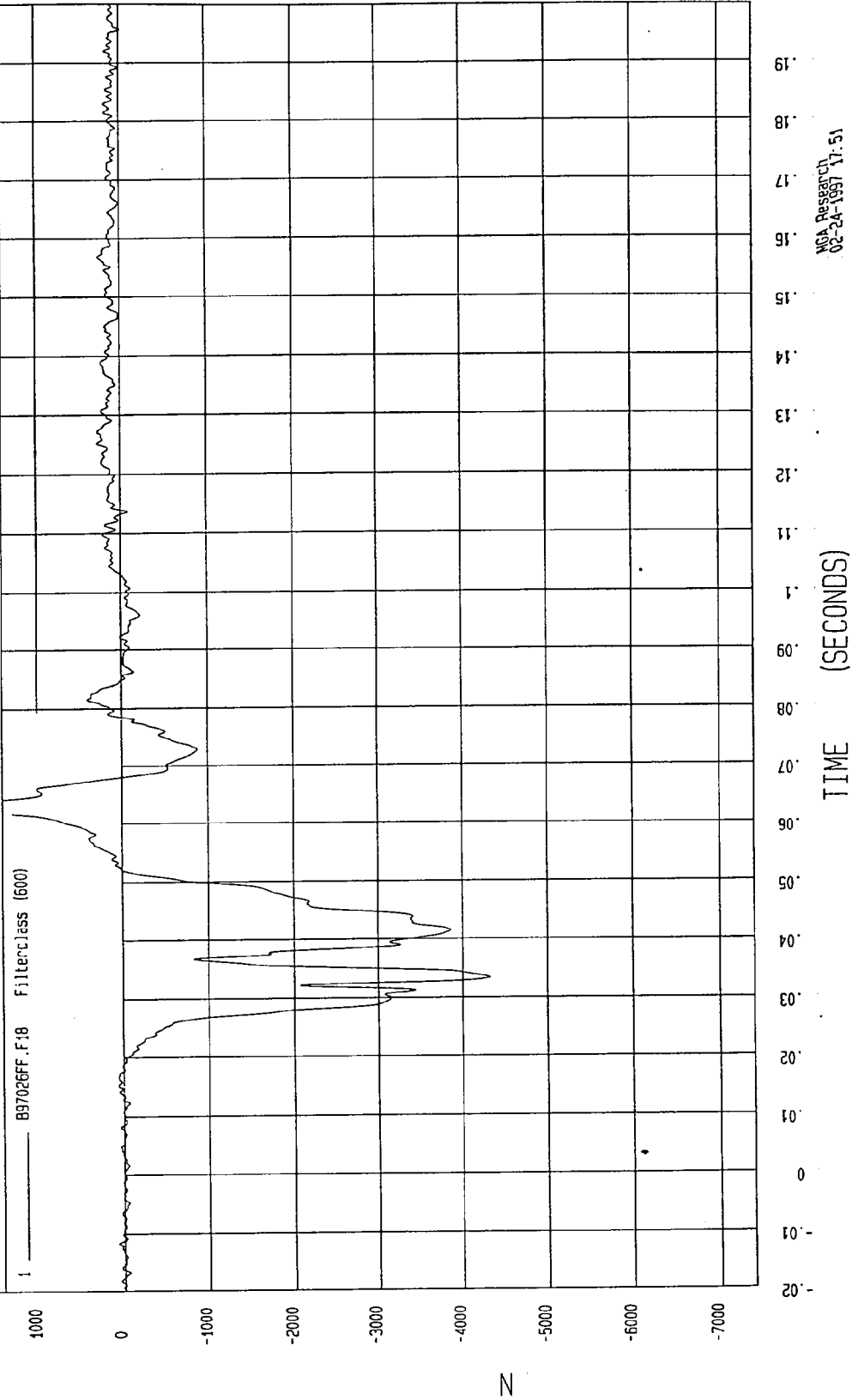


TIME (SECONDS)

MSA Research
02-24-1997 17:50

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997
COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH
Minimum = -4328.22 N at 33 msec Maximum = 1861.53 N at 62 msec

DRIVER RIGHT FEMUR FORCE



TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

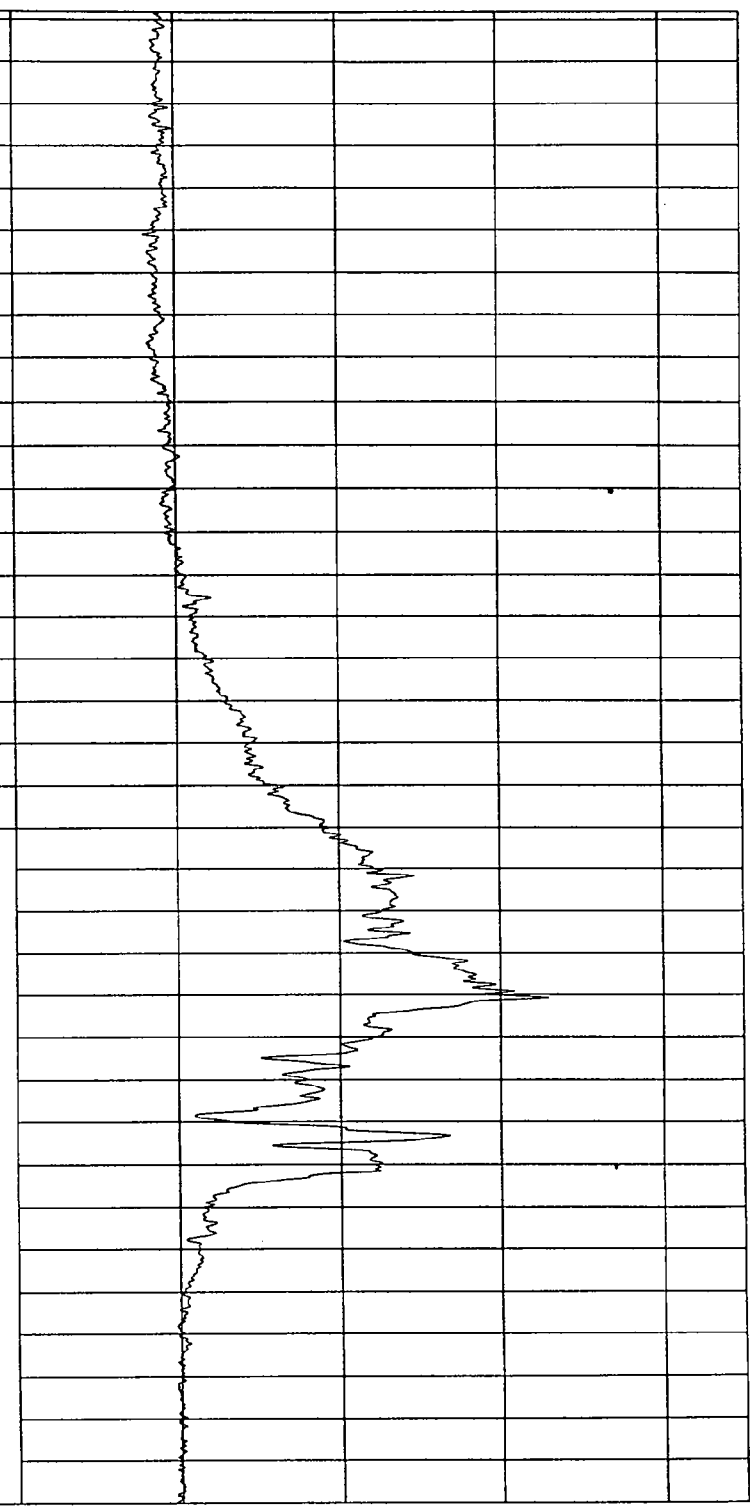
COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -45.90 G'S at 87 msec Maximum = 3.74 G'S at 267 msec

DRIVER PELVIS X ACCELERATION

1 897026AF.A60 Filterclass (1000)

G.S
20
0
-20
-40
-60



TIME (SECONDS)
0.32
0.31
0.3
0.29
0.28
0.27
0.26
0.25
0.24
0.23
0.22
0.21
0.2
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

MCA Research
02-24-1997 17:49

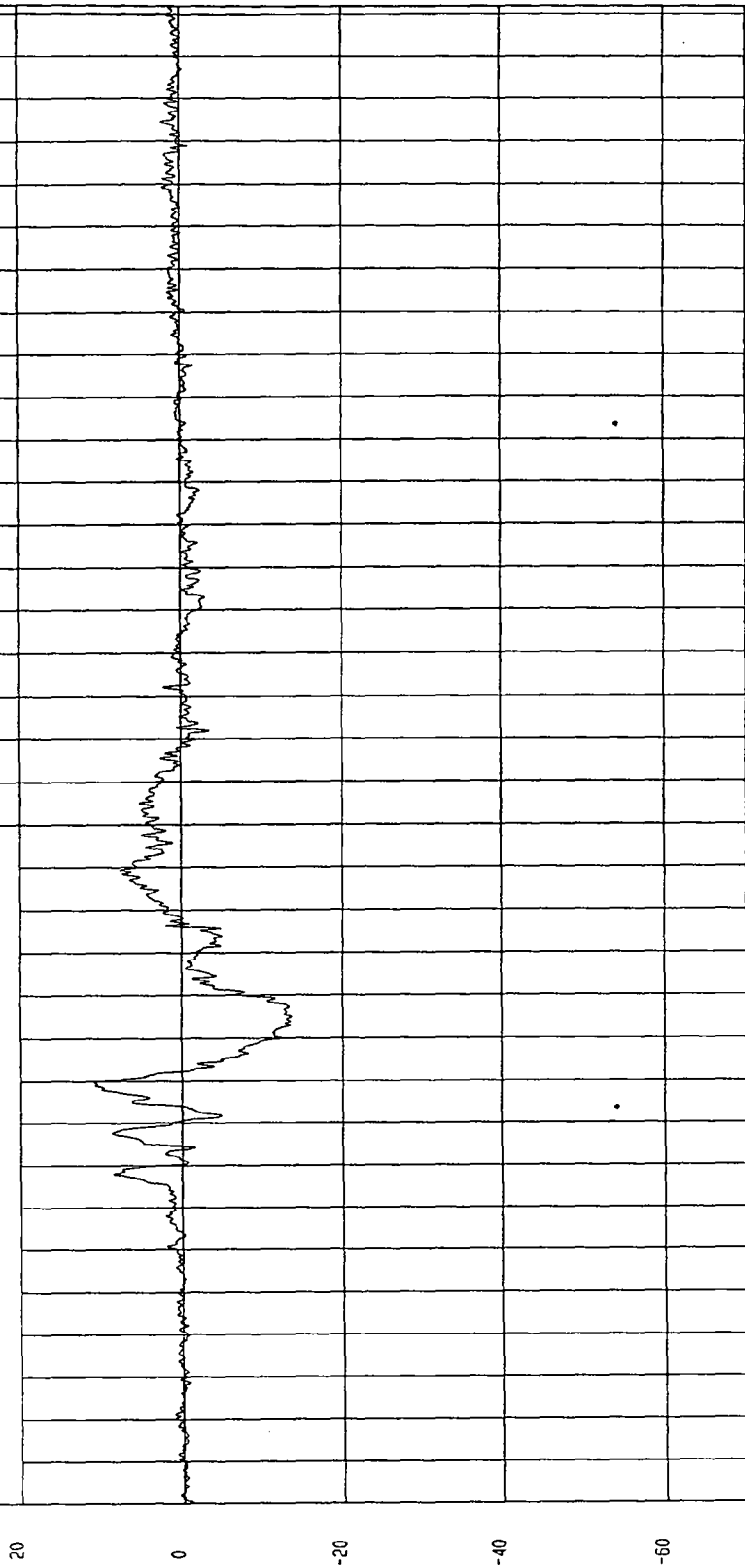
TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -13.64 G'S at 83 msec Maximum = 10.91 G'S at 60 msec

DRIVER PELVIS Y ACCELERATION

1 — 897026AF.A61 Filterclass (1000)



TIME (SECONDS)

MSA Research
02-24-1997 17:50

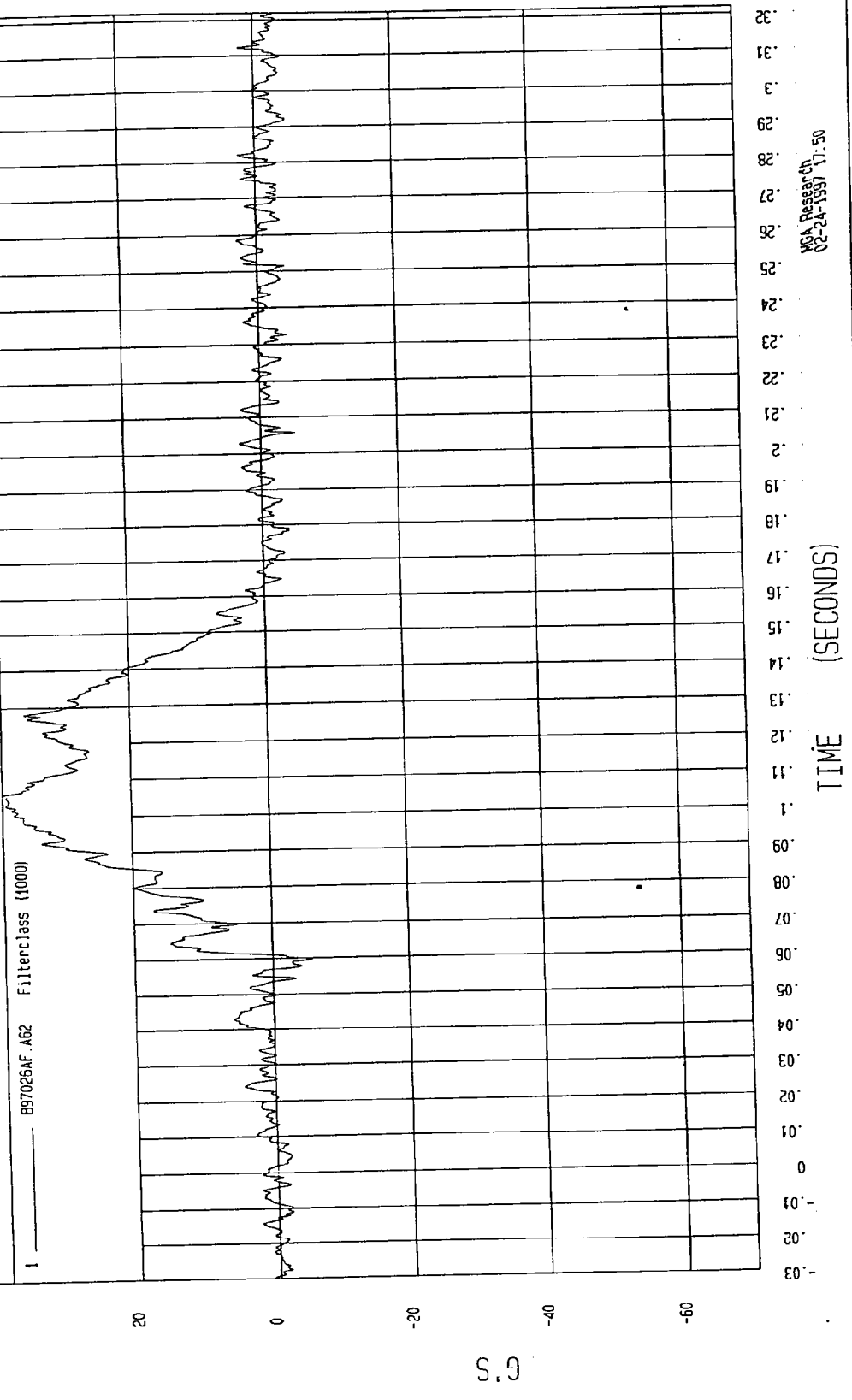
S.G

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -5.78 G'S at 58 msec Maximum = 39.30 G'S at 104 msec

DRIVER PELVIS Z ACCELERATION



MCA Research
02-24-1997 17:50

TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

Speed: 34.95 MPH 56.2 KPH

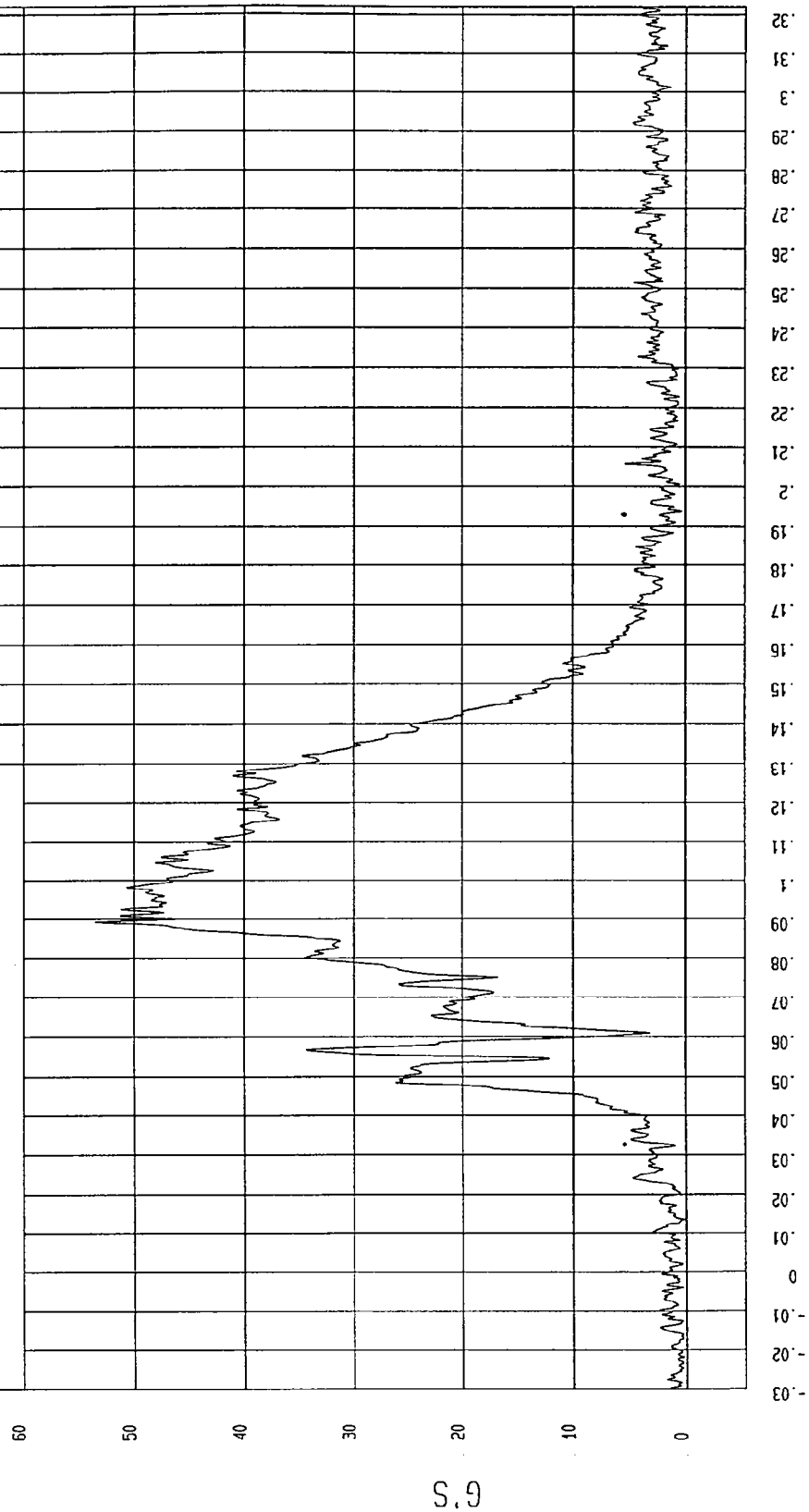
COMPONENT: 1997 HYUNDAI ACCENT (MV0501)

Maximum = 53.56 G'S at 87 msec

Minimum = .14 G'S at 12 msec

DRIVER PELVIS RESULTANT ACCELERATION

1 897026KV.A60 Filterclass (1000)



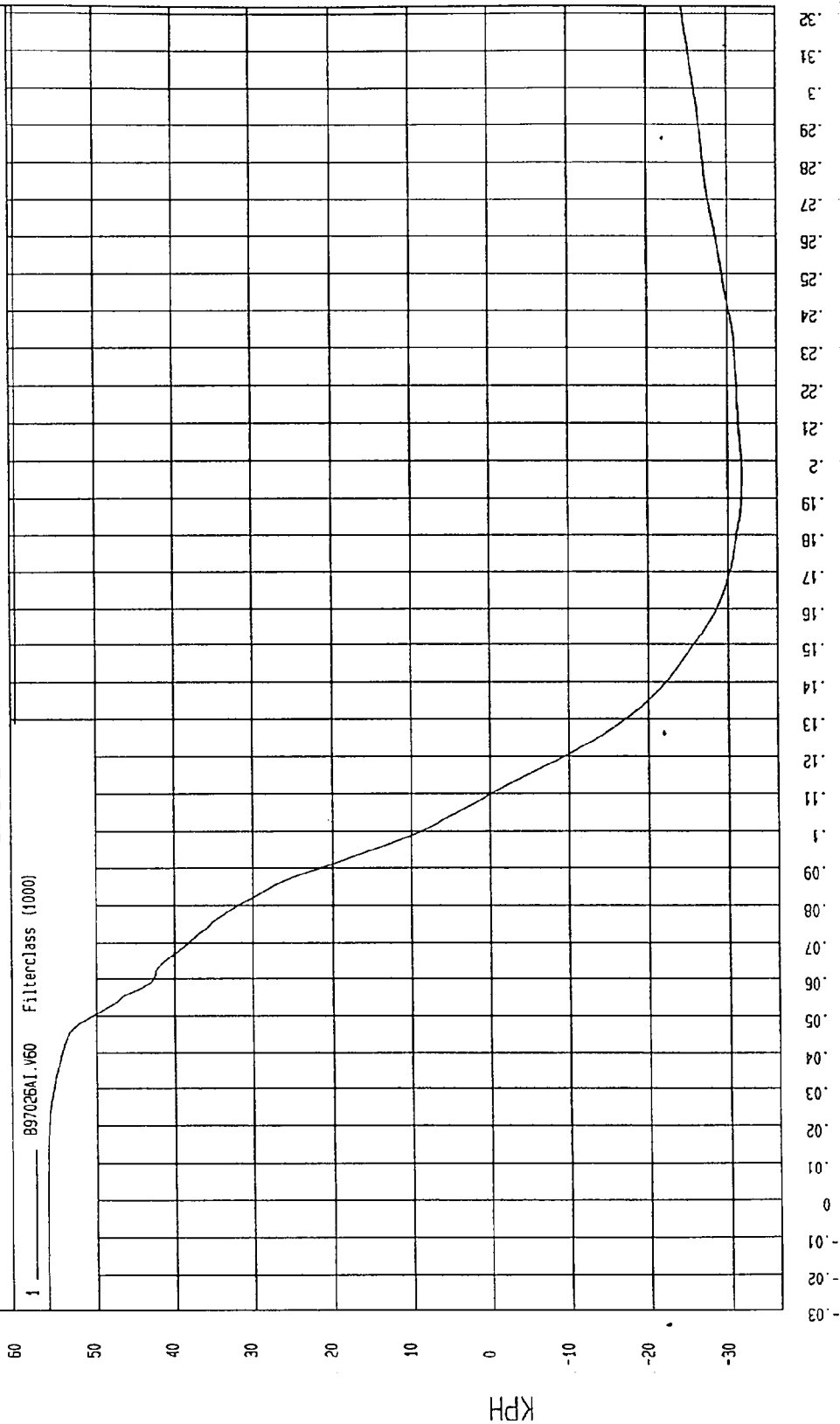
MGA Research
02-24-1997 11:50

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -31.74 KPH at 195 msec Maximum = 56.25 KPH at -3 msec

DRIVER PELVIS X VELOCITY



MCA Research
02-24-1997 18:05

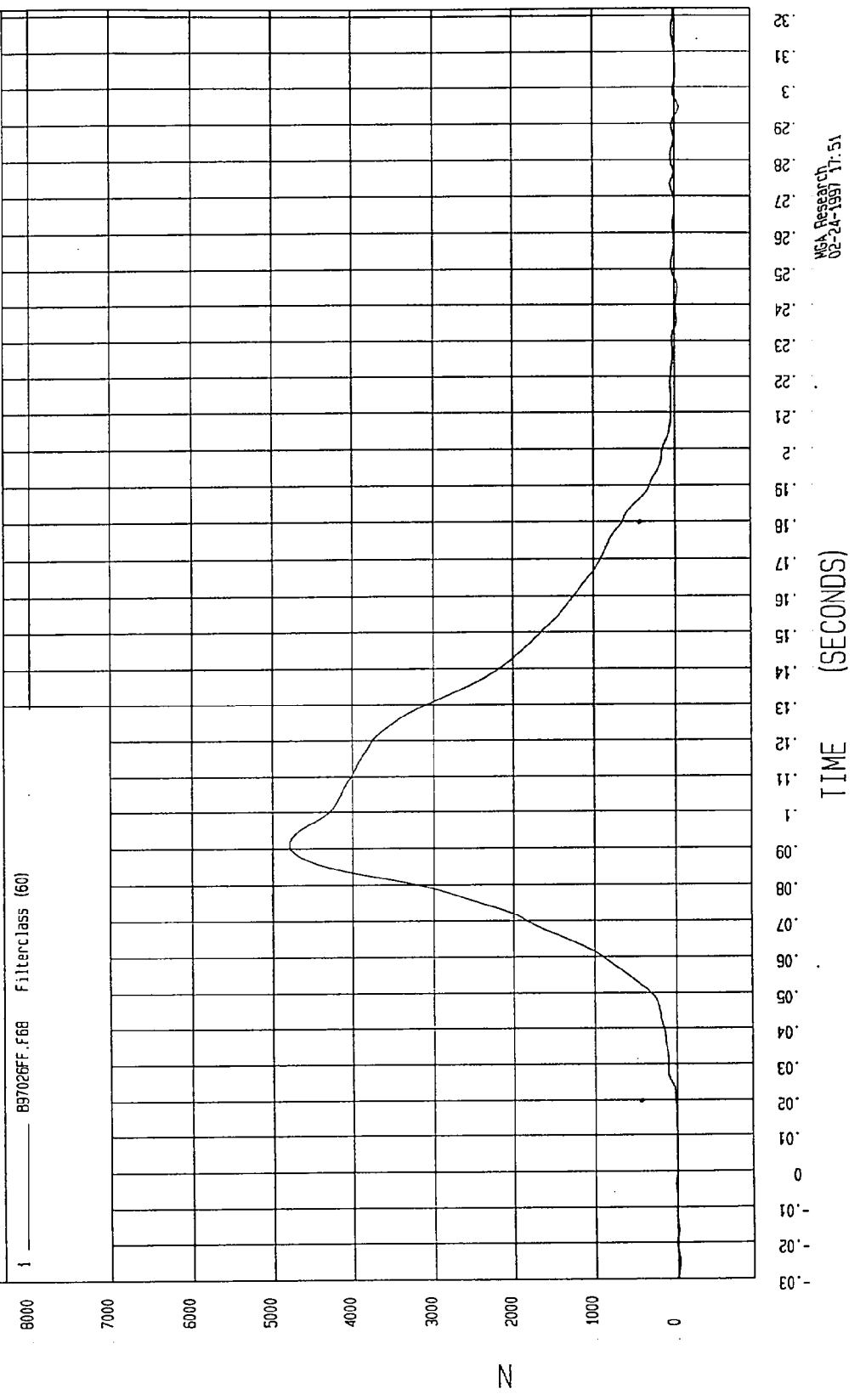
TIME Seconds

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -53.02 N at 292 msec Maximum = 4800.49 N at 89 msec

DRIVER LAP BELT FORCE



MSA Research
02-24-1997 17:51

TEST: 35 MPH FRONTAL IMPACT

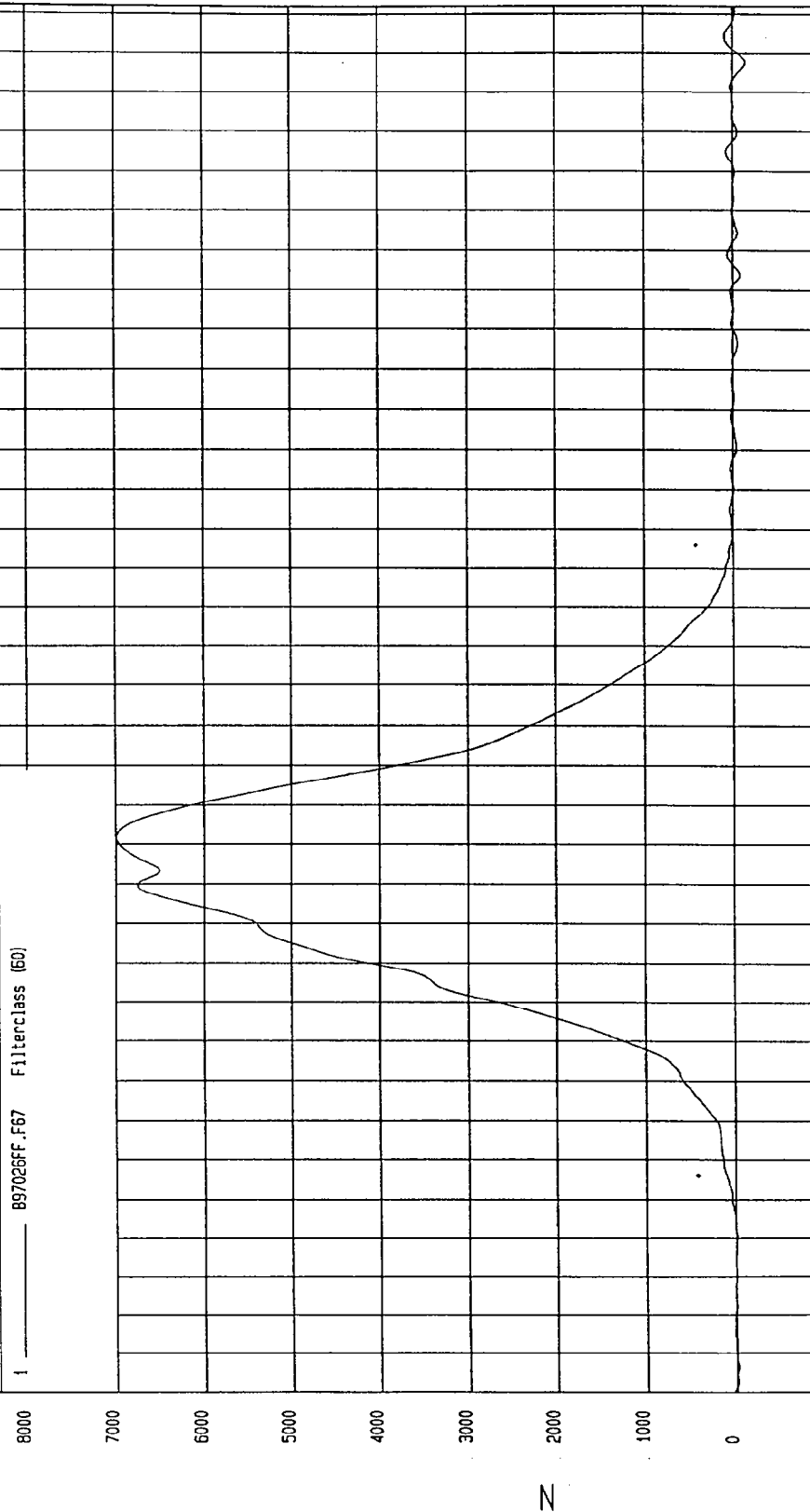
TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -145.09 N at 306 msec Maximum = 6990.14 N at 110 msec

DRIVER SHOULDER BELT FORCE

1 897026FF.F67 Filterclass (60)



MSA Research
02-24-1997 17:51

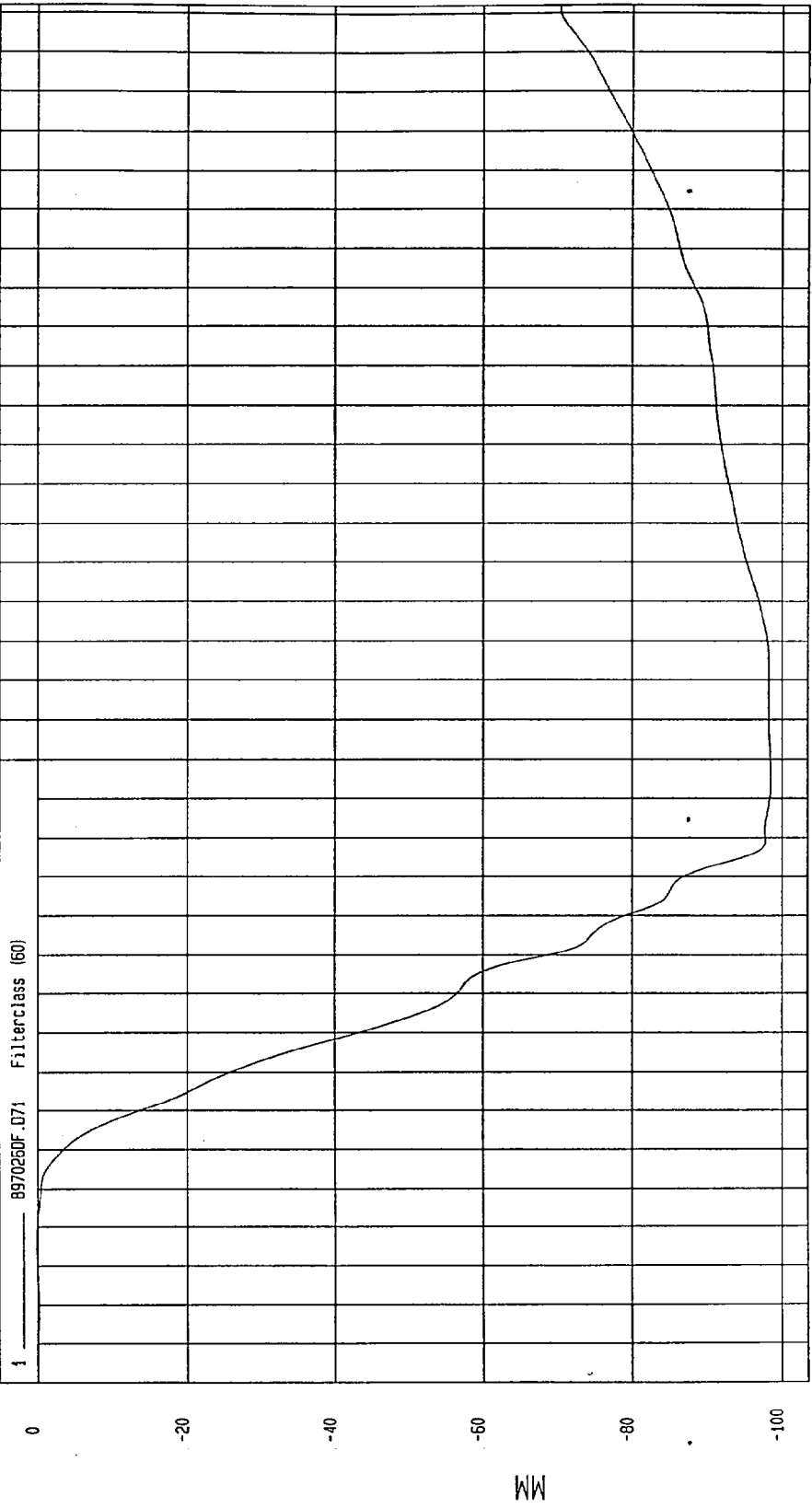
TIME (SECONDS)

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -98.50 MM at 123 msec Maximum = .19 MM at 3 msec

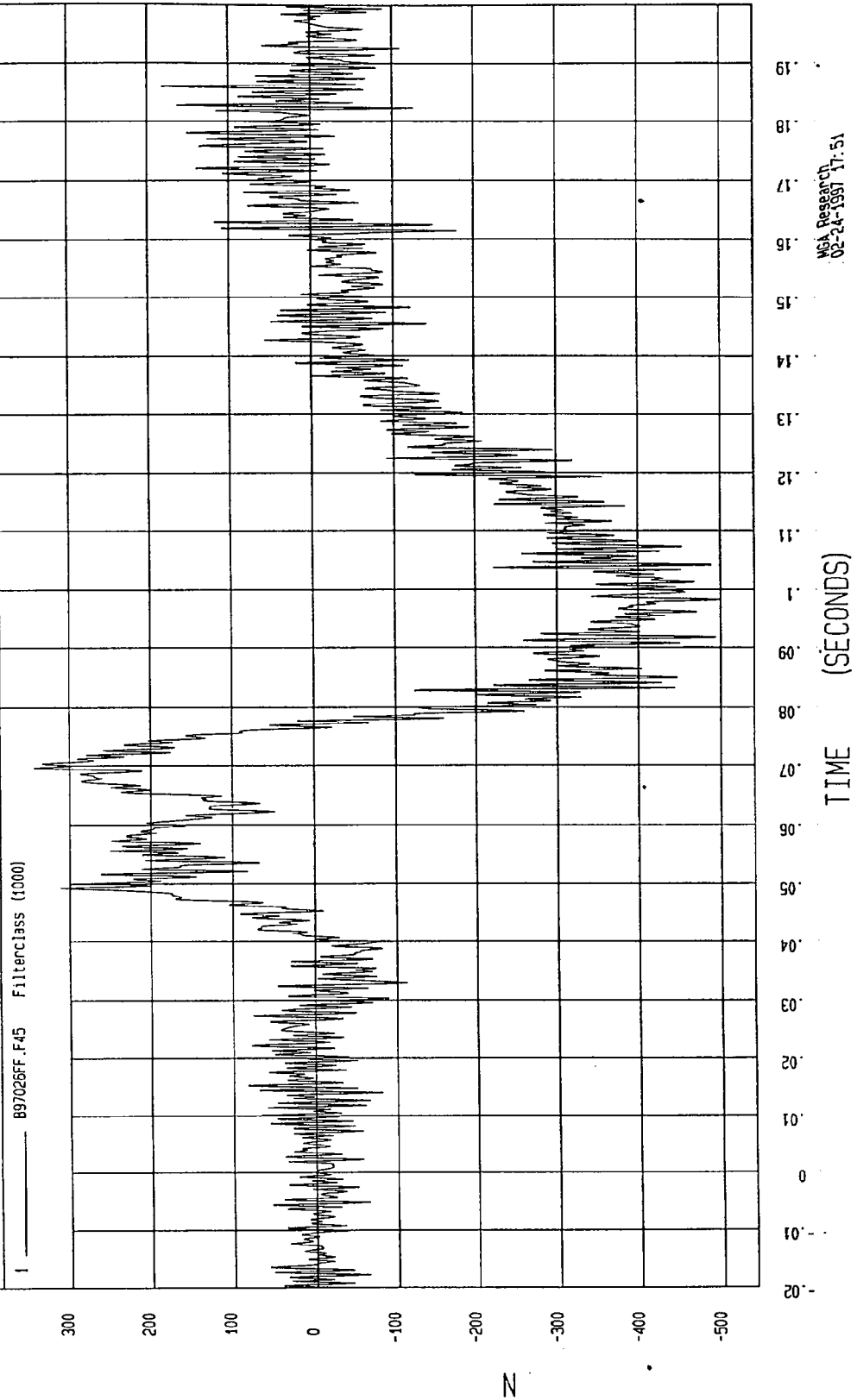
DRIVER BELT SPOOLOUT



MCA Research
02-24-1997 11.46

TEST: 35 MPH FRONTAL IMPACT	TEST DATE: 02-13-1997
COMPONENT: 1997 HYUNDAI ACCENT (MV0501)	Speed: 34.95 MPH 56.2 KPH
Minimum = -499.10 N at 98 msec	Maximum = 342.18 N at 70 msec

DRIVER NECK FORCE X

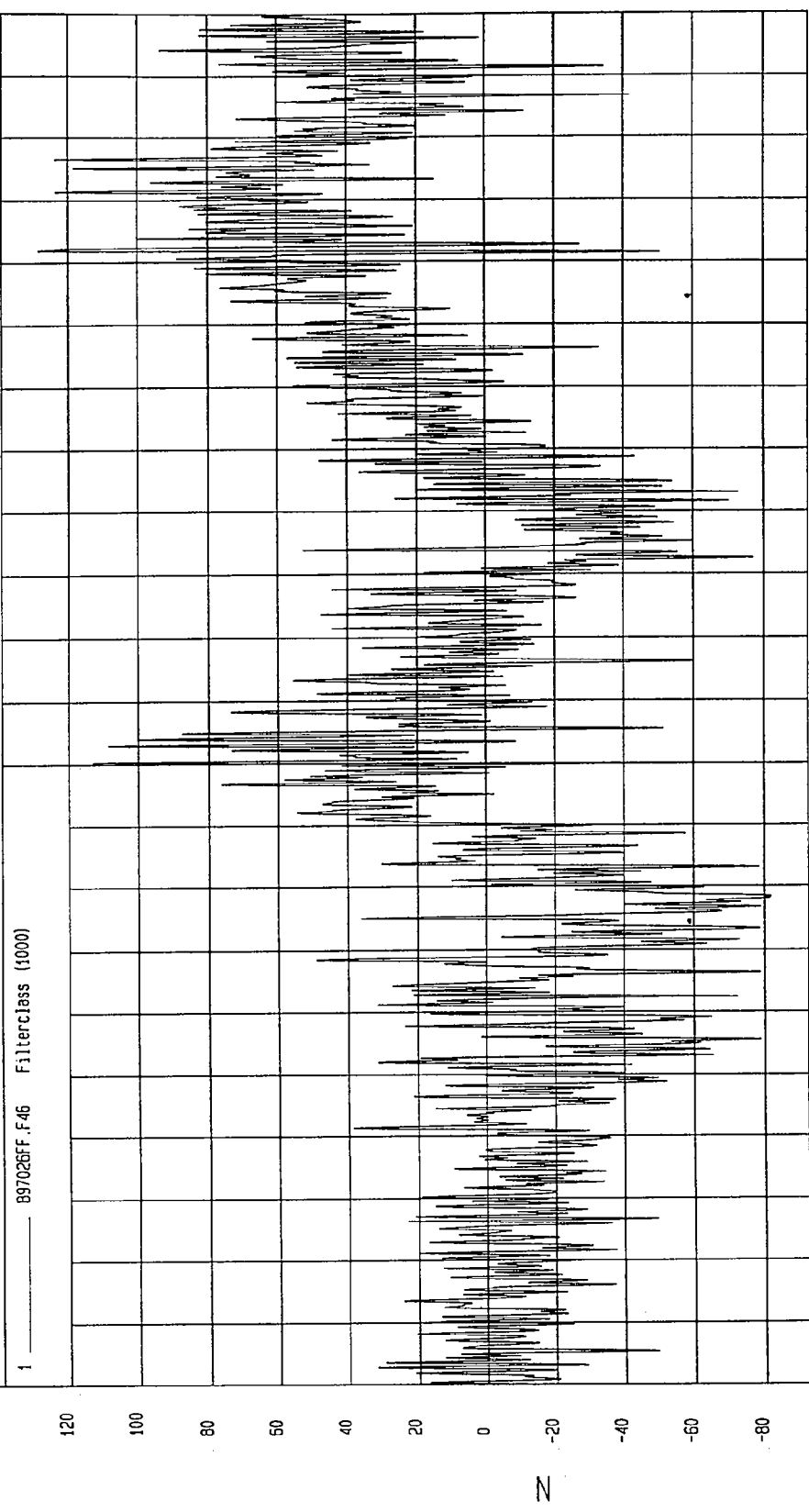


TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -81.97 N at 58 msec Maximum = 128.40 N at 162 msec

DRIVER NECK FORCE Y



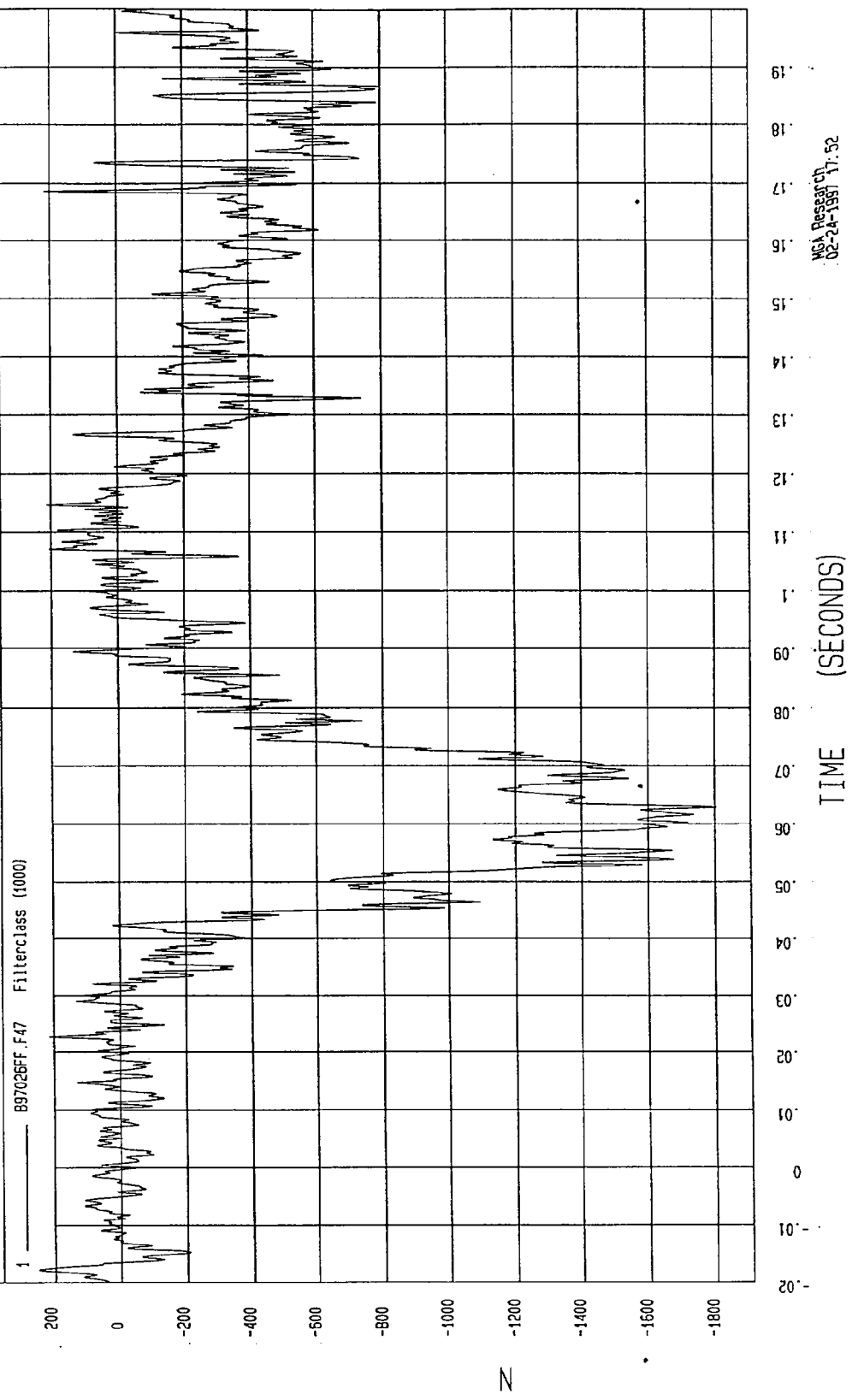
TIME (SECONDS)

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

NCA Research
02-24-1997 17:51

TEST: 35 MPH FRONTAL IMPACT	TEST DATE: 02-13-1997
COMPONENT: 1997 HYUNDAI ACCENT (MV0501)	Speed: 34.95 MPH 56.2 KPH
Minimum = -1804.62 N at 63 msec	Maximum = 250.69 N at -18 msec

DRIVER NECK FORCE Z

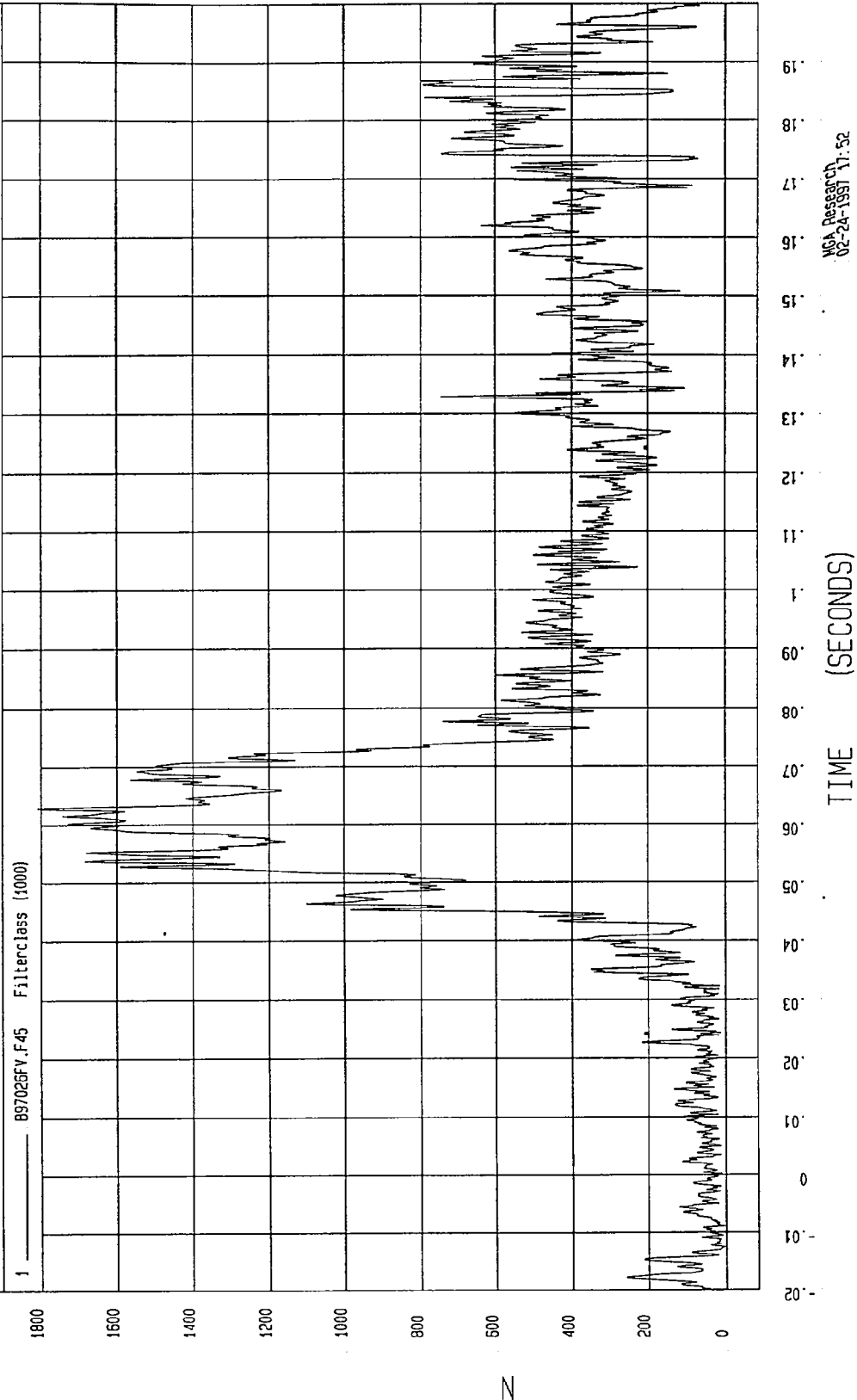


TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = 5.24 N at -13 msec Maximum = 1809.52 N at 63 msec

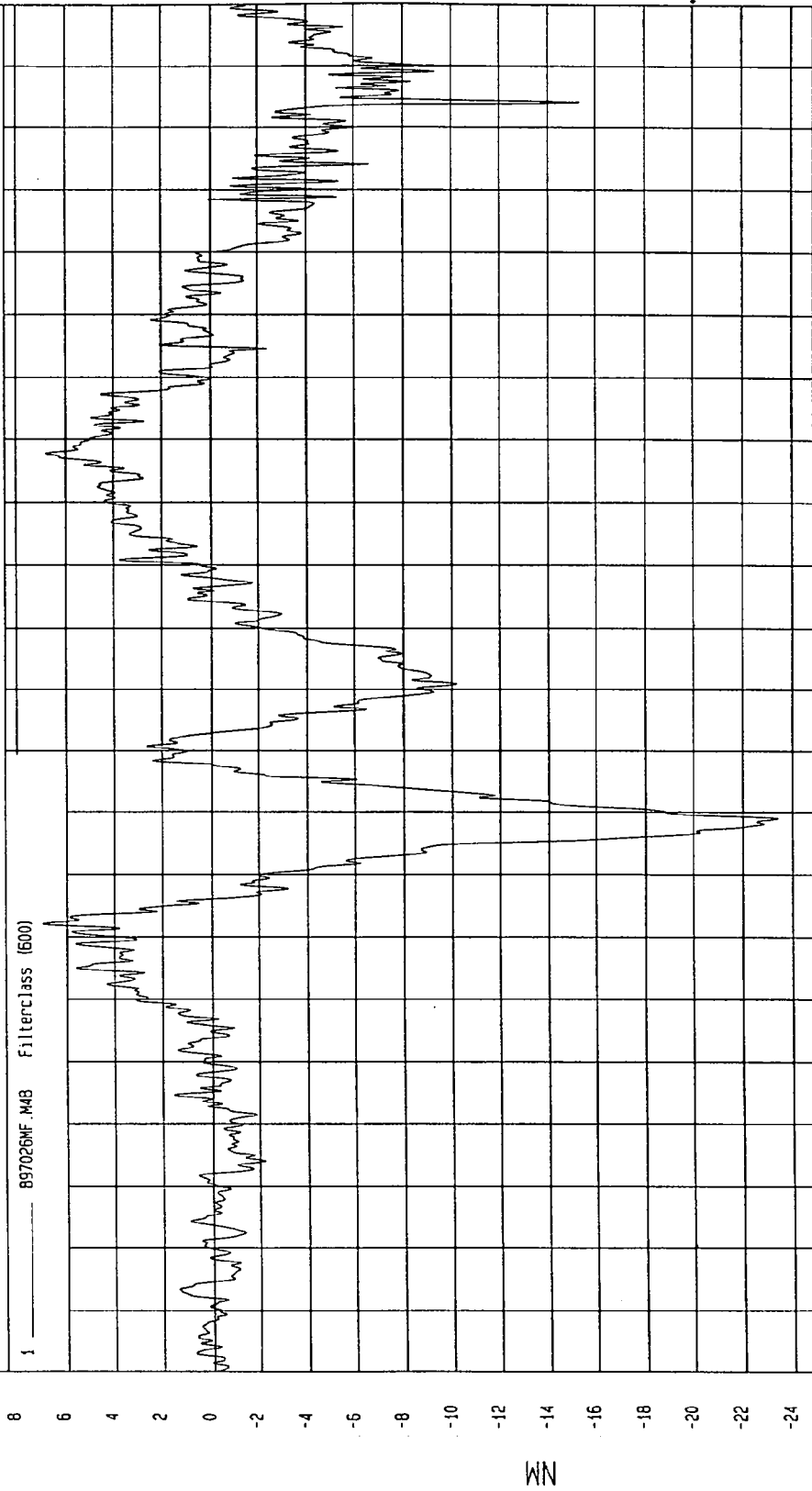
DRIVER NECK FORCE RESULTANT



TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997
COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -23.37 NM at 69 msec Maximum = 6.94 NM at 52 msec

DRIVER NECK MOMENT X

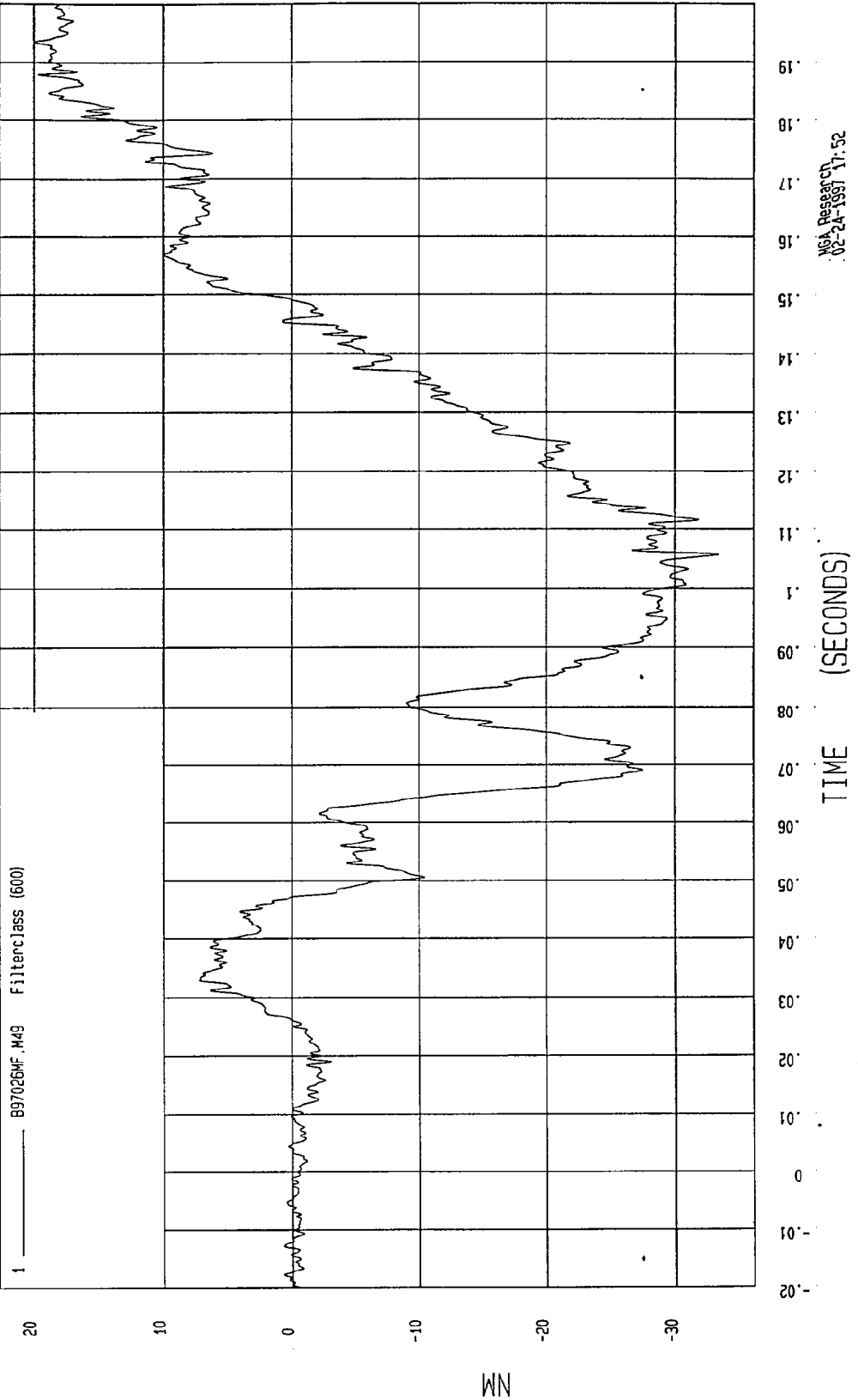


TIME (SECONDS)

MCA Research
02-24-1997 17:52

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997
COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH
Minimum = -33.33 NM at 106 msec Maximum = 20.00 NM at 193 msec

DRIVER NECK MOMENT Y



TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -18.38 NM at 91 msec
Maximum = 14.67 NM at 183 msec

DRIVER NECK MOMENT Z

1 ——— B97025MF.M50 Filterclass (600)

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

NM

TIME (SECONDS)
0.00 0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.10 0.11 0.12 0.13 0.14 0.15 0.16 0.17 0.18 0.19
MVA Research
02-24-1997 17:53

TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

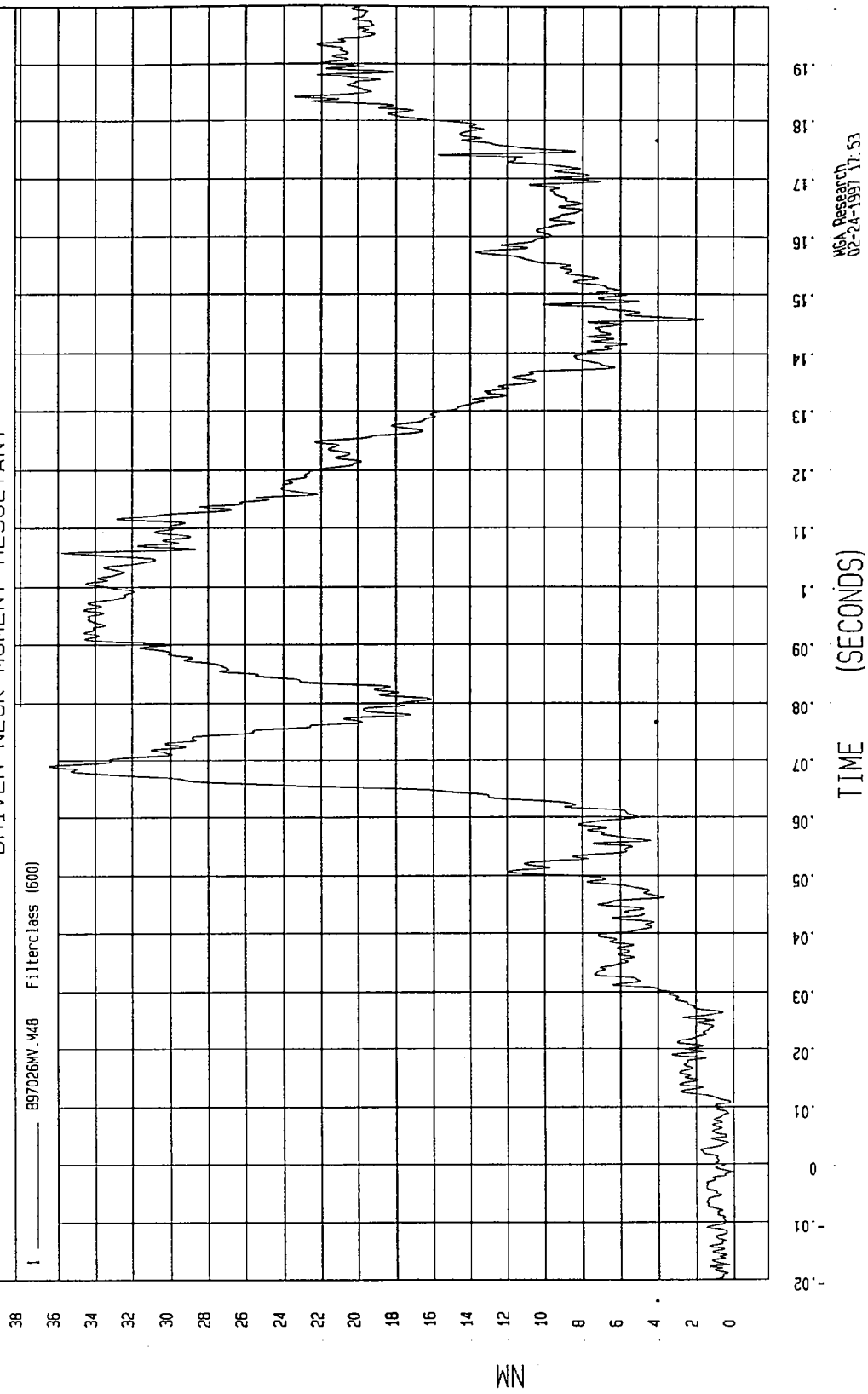
COMPONENT: 1997 HYUNDAI ACCENT (MV0501)

Speed: 34.95 MPH 56.2 KPH

Minimum = 4.26E-02 NM at -1 msec

Maximum = 36.47 NM at 69 msec

DRIVER NECK MOMENT RESULTANT

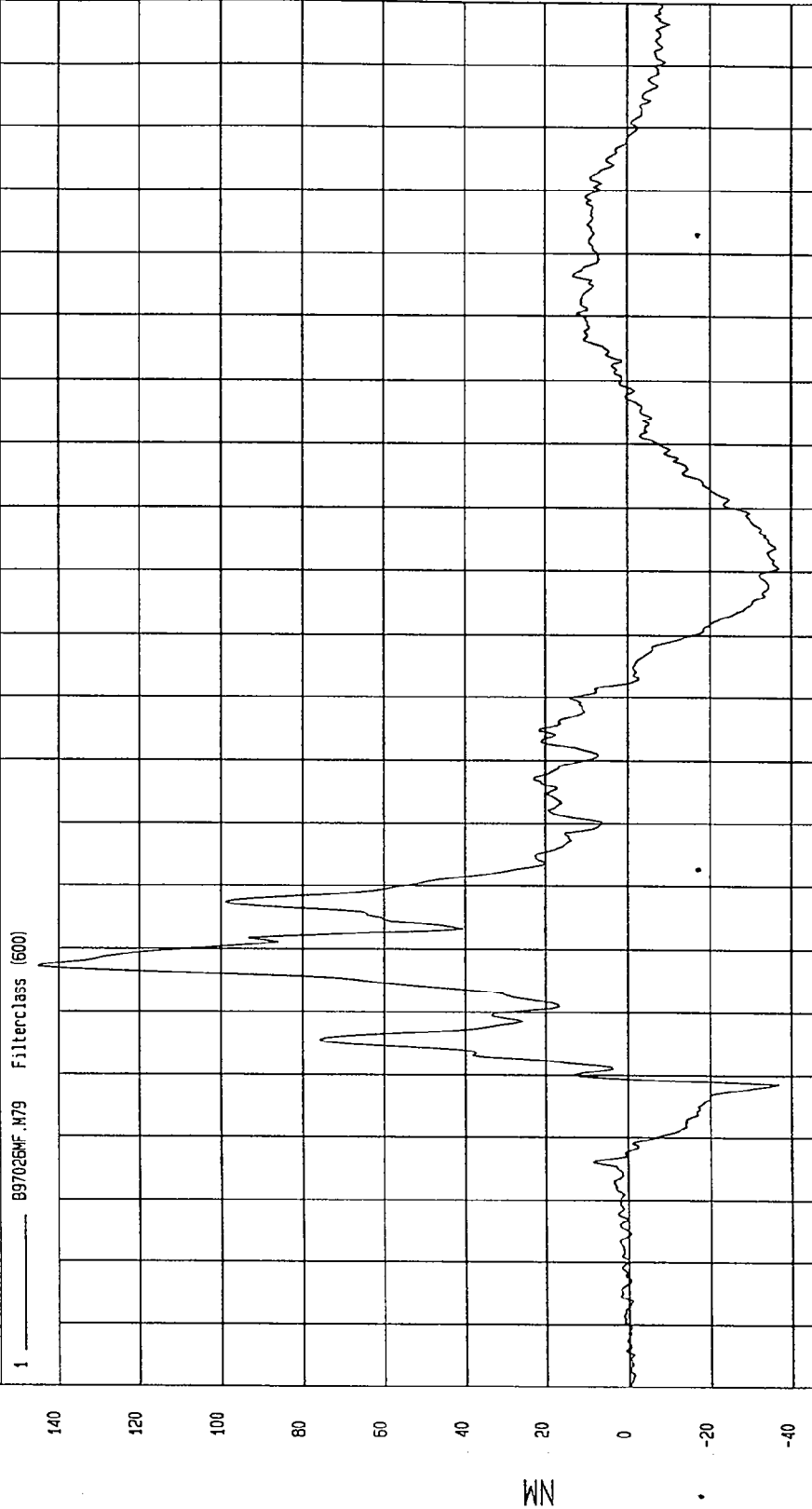


TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -37.24 NM at 28 msec Maximum = 145.19 NM at 47 msec

DRIVER LEFT UPPER TIBIA MOMENT X

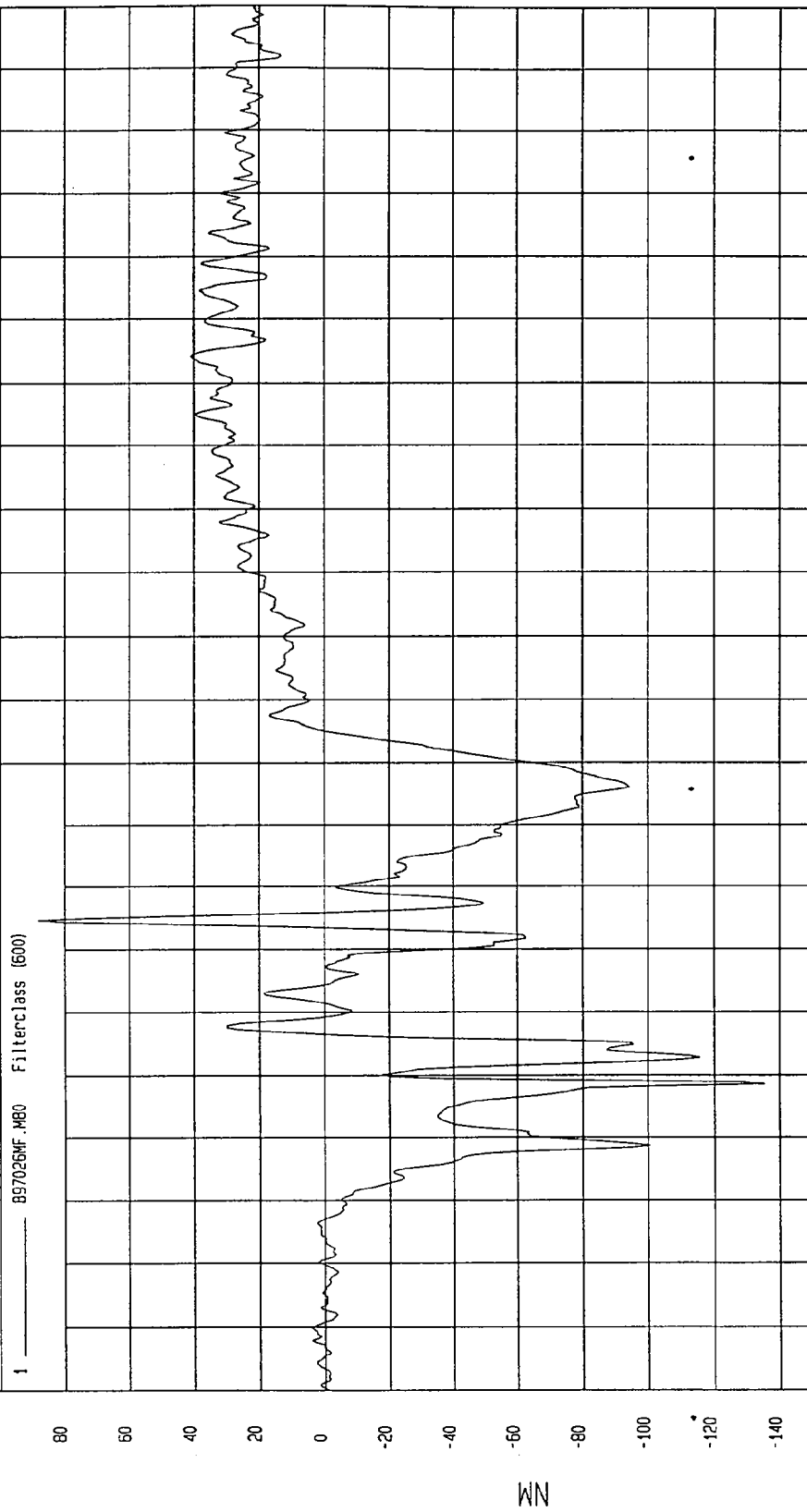


TIME (SECONDS)

NSA Research
02-24-1997 18:02

TEST: 35 MPH FRONTAL IMPACT	TEST DATE: 02-13-1997
COMPONENT: 1997 HYUNDAI ACCENT (MV0501)	Speed: 34.95 MPH 56.2 KPH
Minimum = -138.45 NM at 29 msec	
Maximum = 88.43 NM at 55 msec	

DRIVER LEFT UPPER TIBIA MOMENT Y



TIME (SECONDS)

NGA Research
02-24-1997 18:03

TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

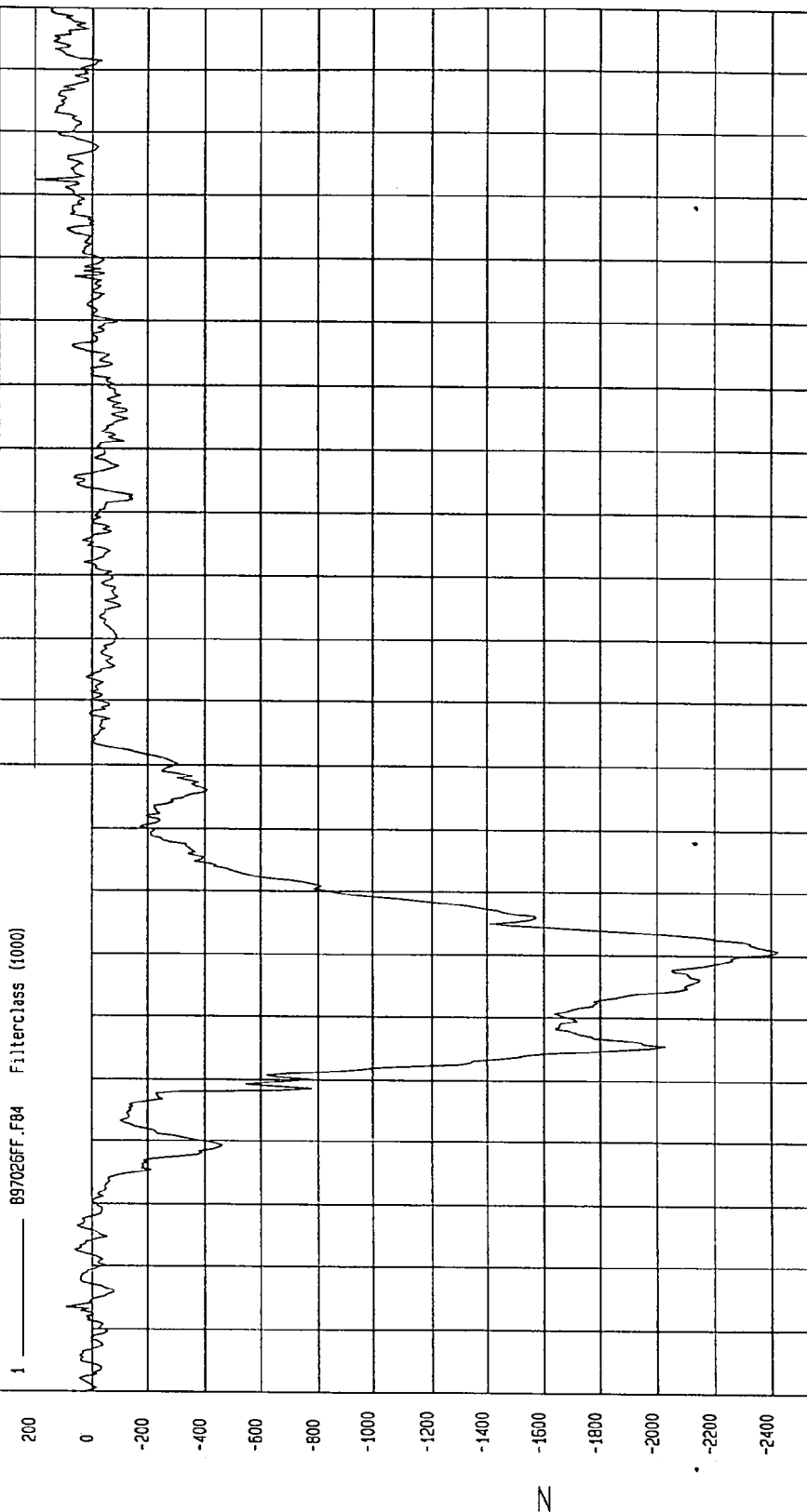
COMPONENT: 1997 HYUNDAI ACCENT (MV0501)

Speed: 34.95 MPH 56.2 KPH

Minimum = -2423.21 N at 51 msec

Maximum = 196.78 N at 172 msec

DRIVER LEFT LOWER TIBIA FORCE X



MSA Research
02-24-1997 18:03

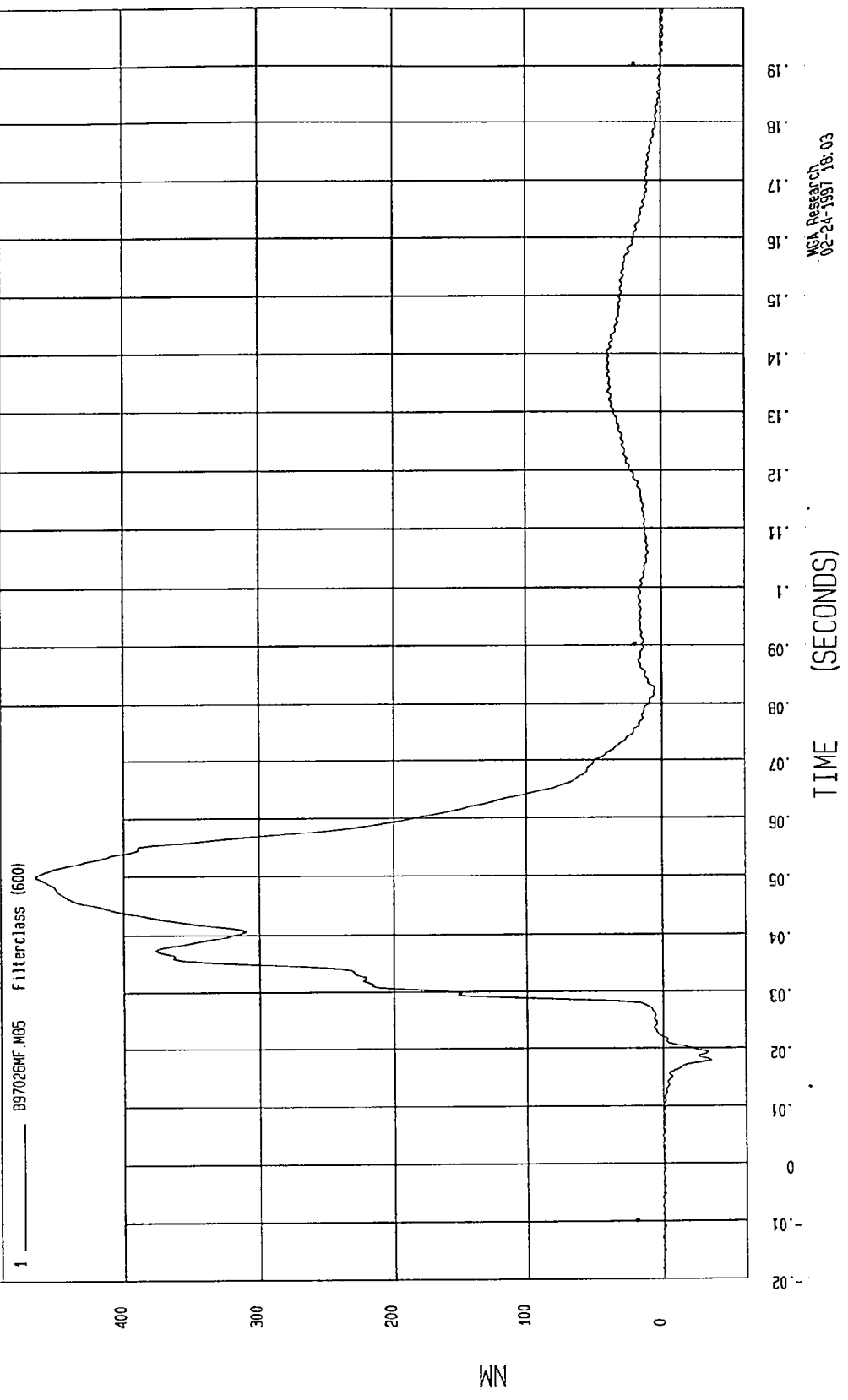
TIME (SECONDS)

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -35.70 NM at 10 msec Maximum = 465.87 NM at 50 msec

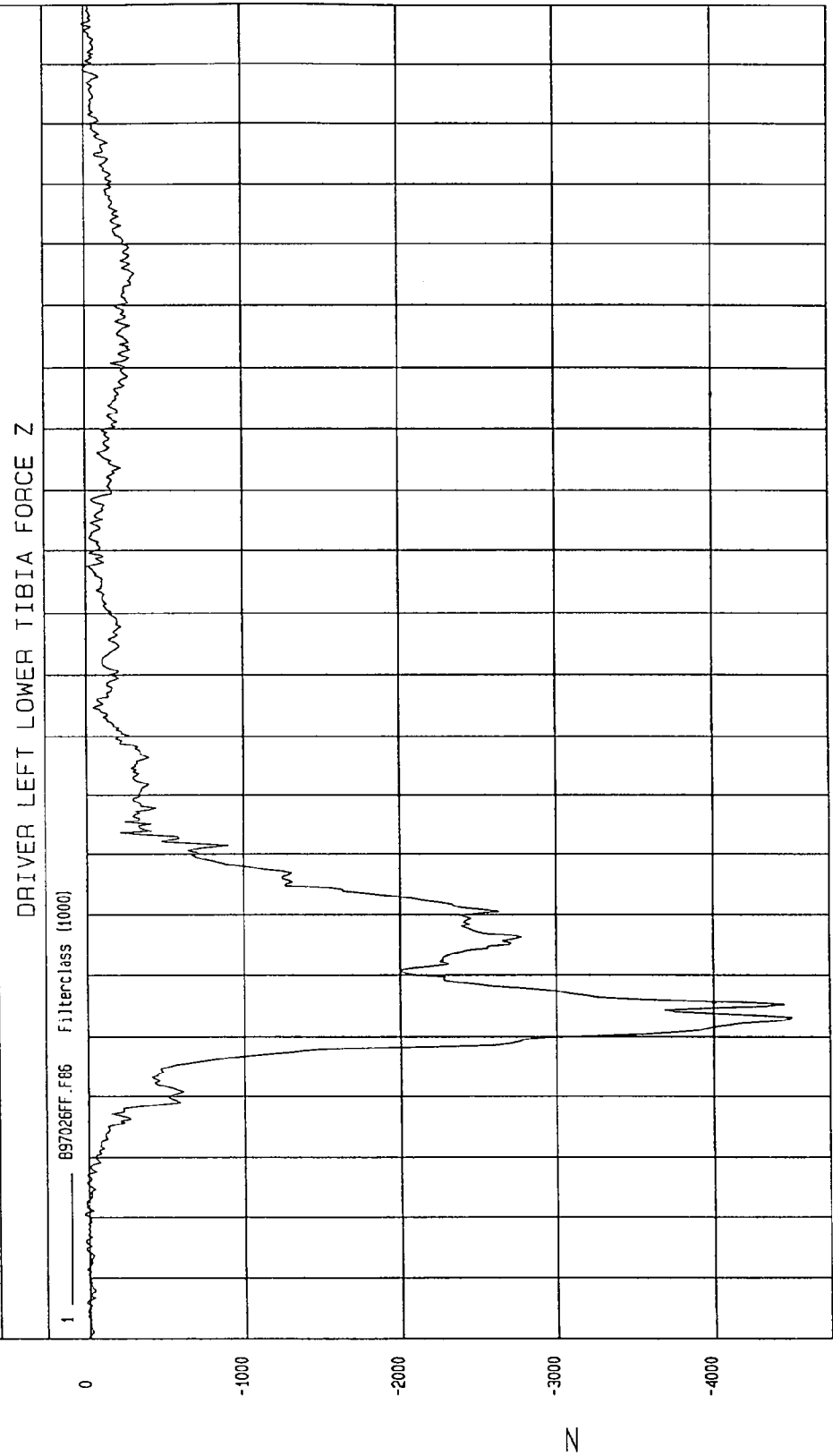
DRIVER LEFT LOWER TIBIA MOMENT Y



TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -4505.50 N at 33 msec Maximum = 36.94 N at 0 msec



TIME (SECONDS)

ME Research
02-24-1997 18:03

TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

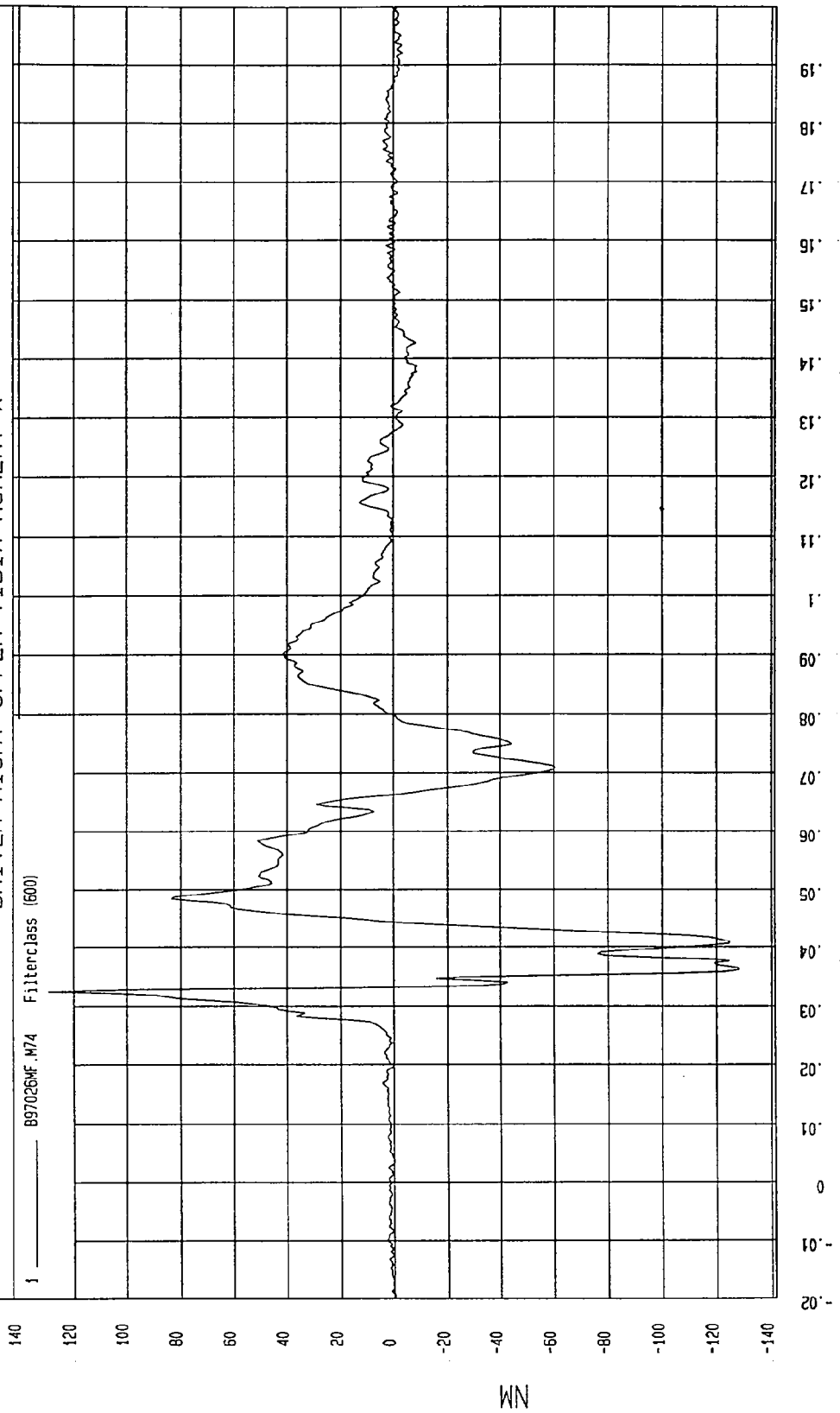
COMPONENT: 1997 HYUNDAI ACCENT (MV0501)

Speed: 34.95 MPH 56.2 KPH

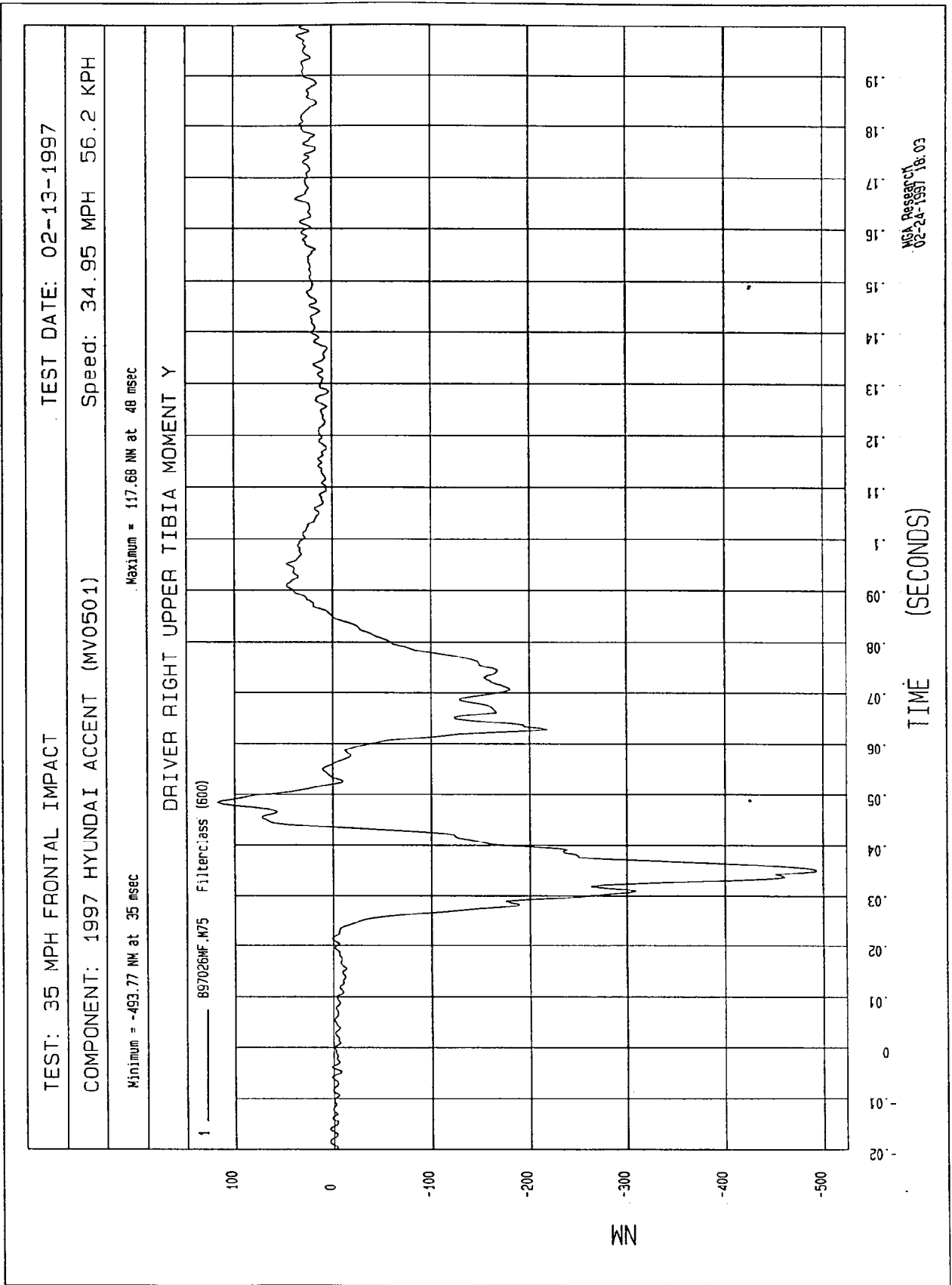
Minimum = -128.61 NM at 36 msec

Maximum = 129.40 NM at 32 msec

DRIVER RIGHT UPPER TIBIA MOMENT X



MCA Research
02-24-1997 18:03



TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

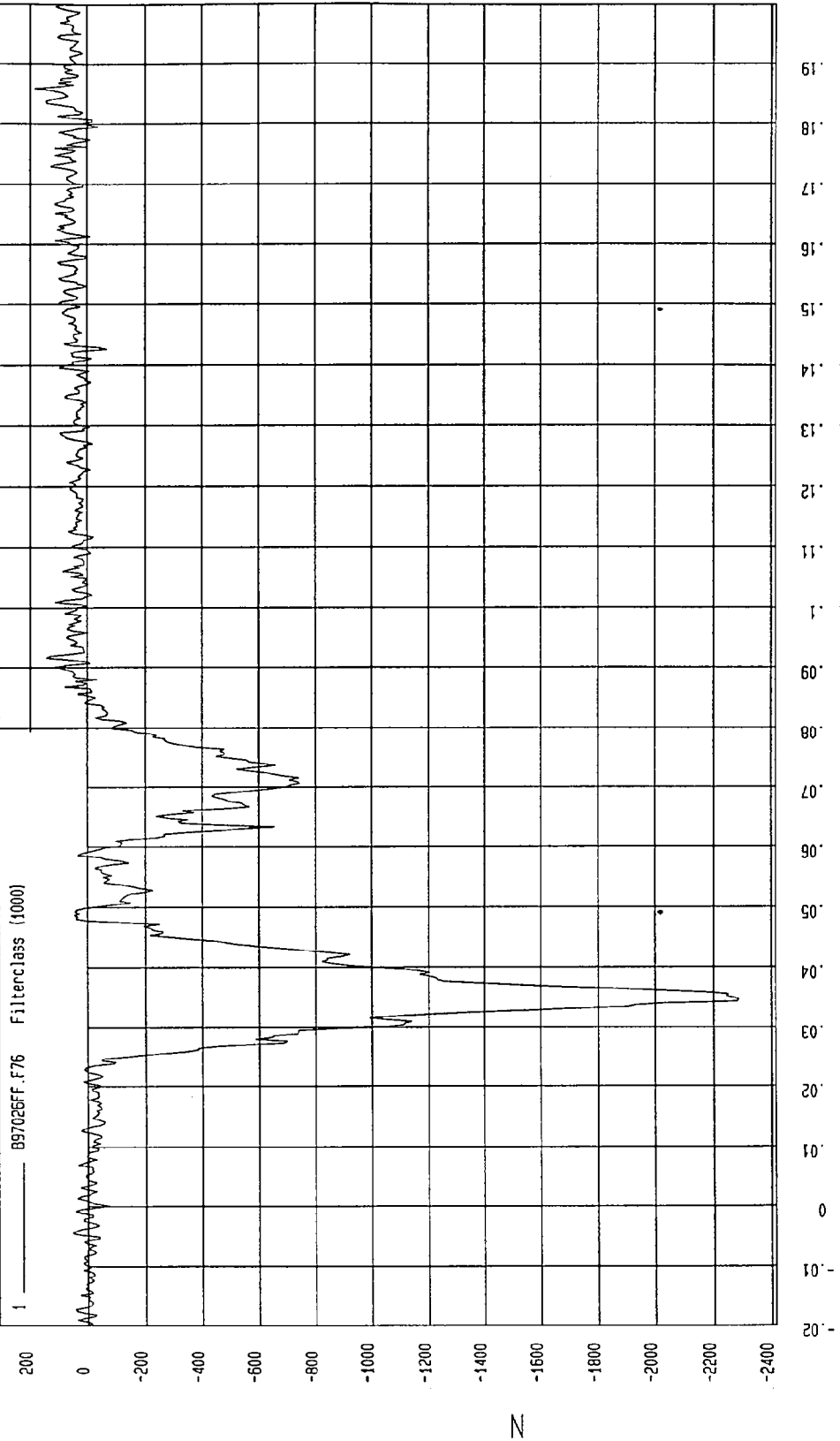
COMPONENT: 1997 HYUNDAI ACCENT (MV0501)

Speed: 34.95 MPH 56.2 KPH

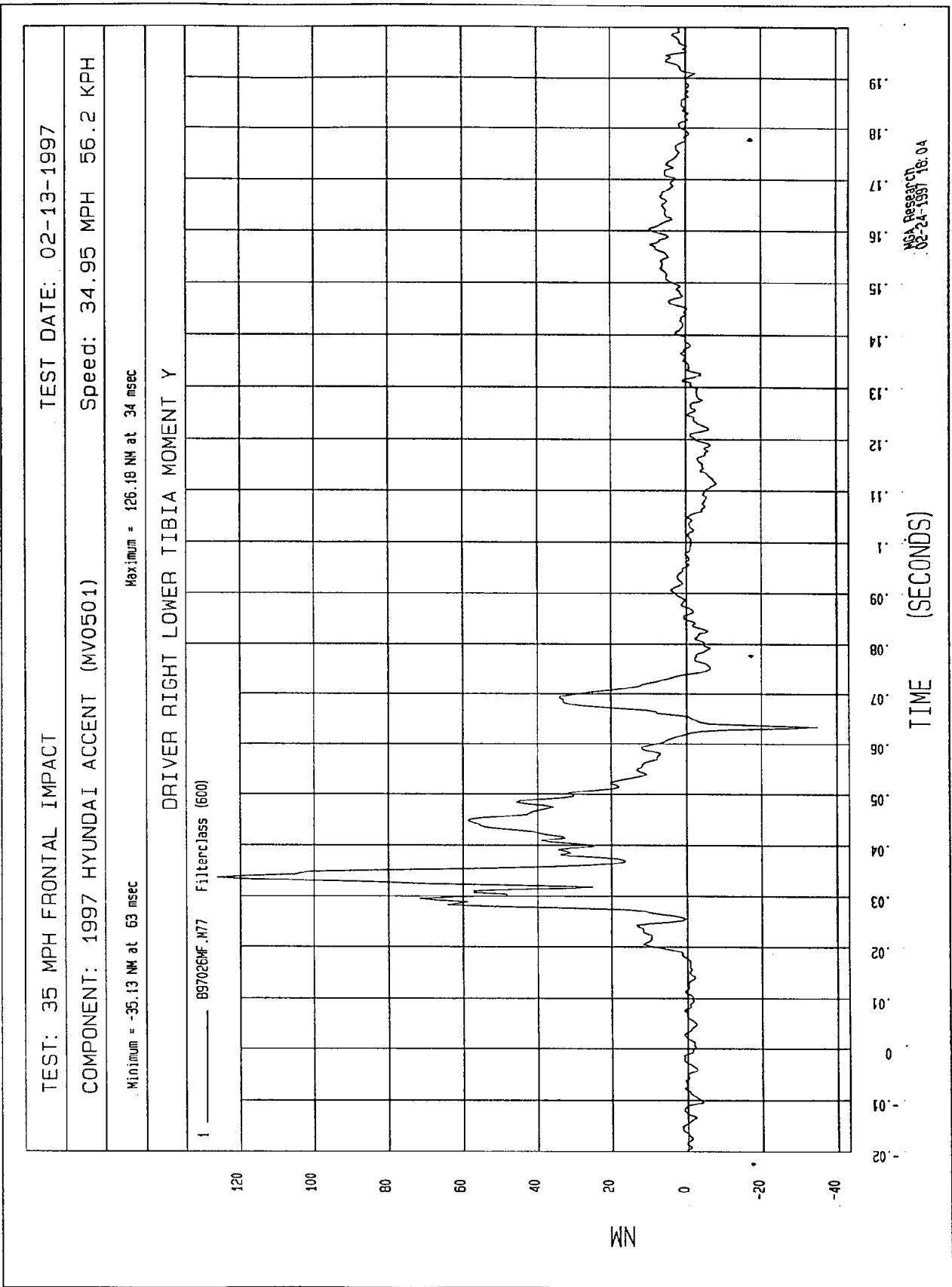
Minimum = -2291.56 N at 34 msec

Maximum = 185.56 N at 186 msec

DRIVER RIGHT LOWER TIBIA FORCE X

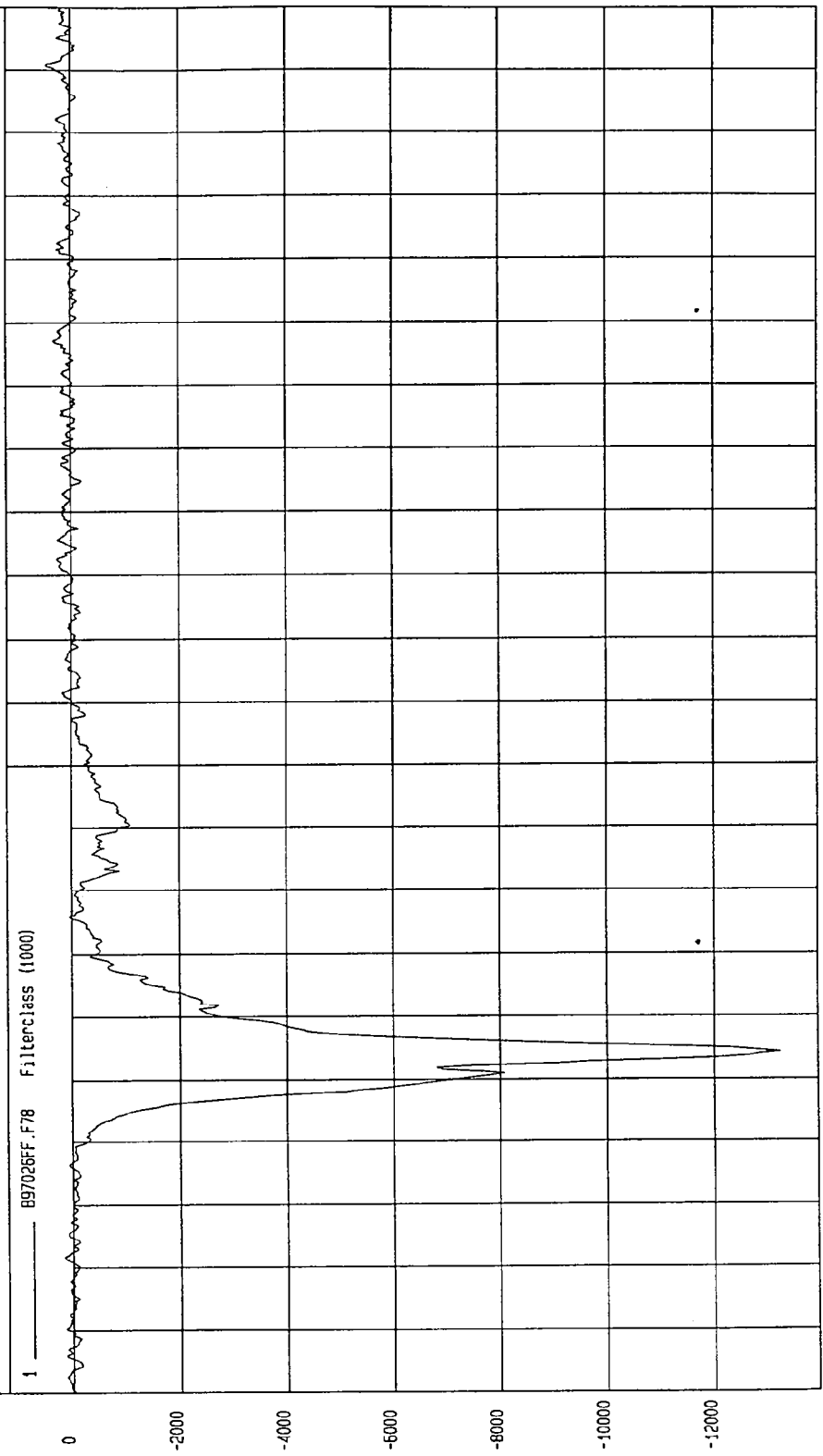


MOA Research
02-24-1997 18:03



TEST: 35 MPH FRONTAL IMPACT	TEST DATE: 02-13-1997
COMPONENT: 1997 HYUNDAI ACCENT (MV0501)	Speed: 34.95 MPH 56.2 KPH
Minimum = -13241.07 N at 34 msec	Maximum = 502.16 N at 191 msec

DRIVER RIGHT LOWER TIBIA FORCE Z



TIME (SECONDS)

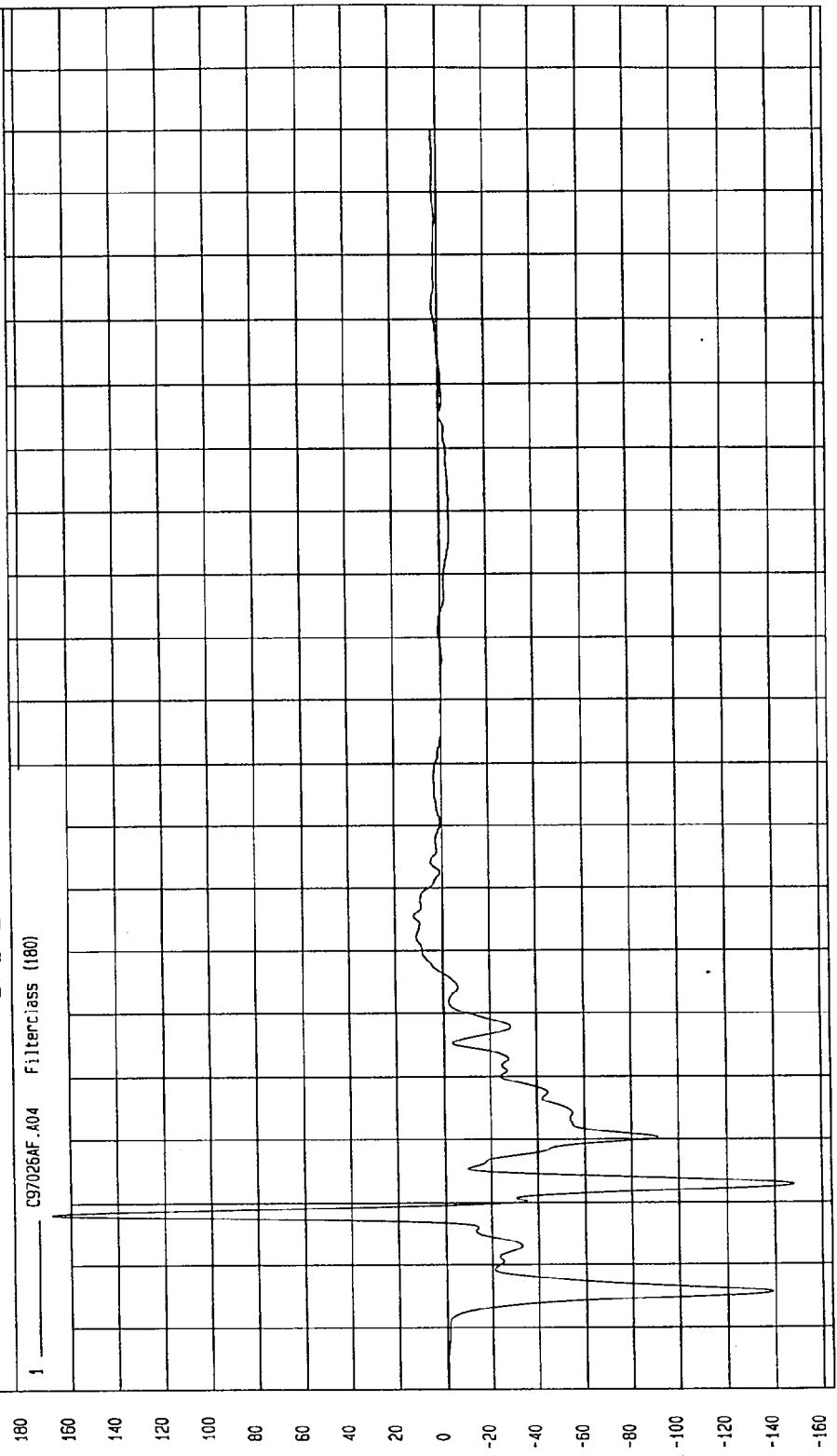
MSA Research
02-24-1997 18:04

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -148.25 G's at 13 msec Maximum = 168.04 G's at 8 msec

DRIVER LEFT FOOT BALL 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

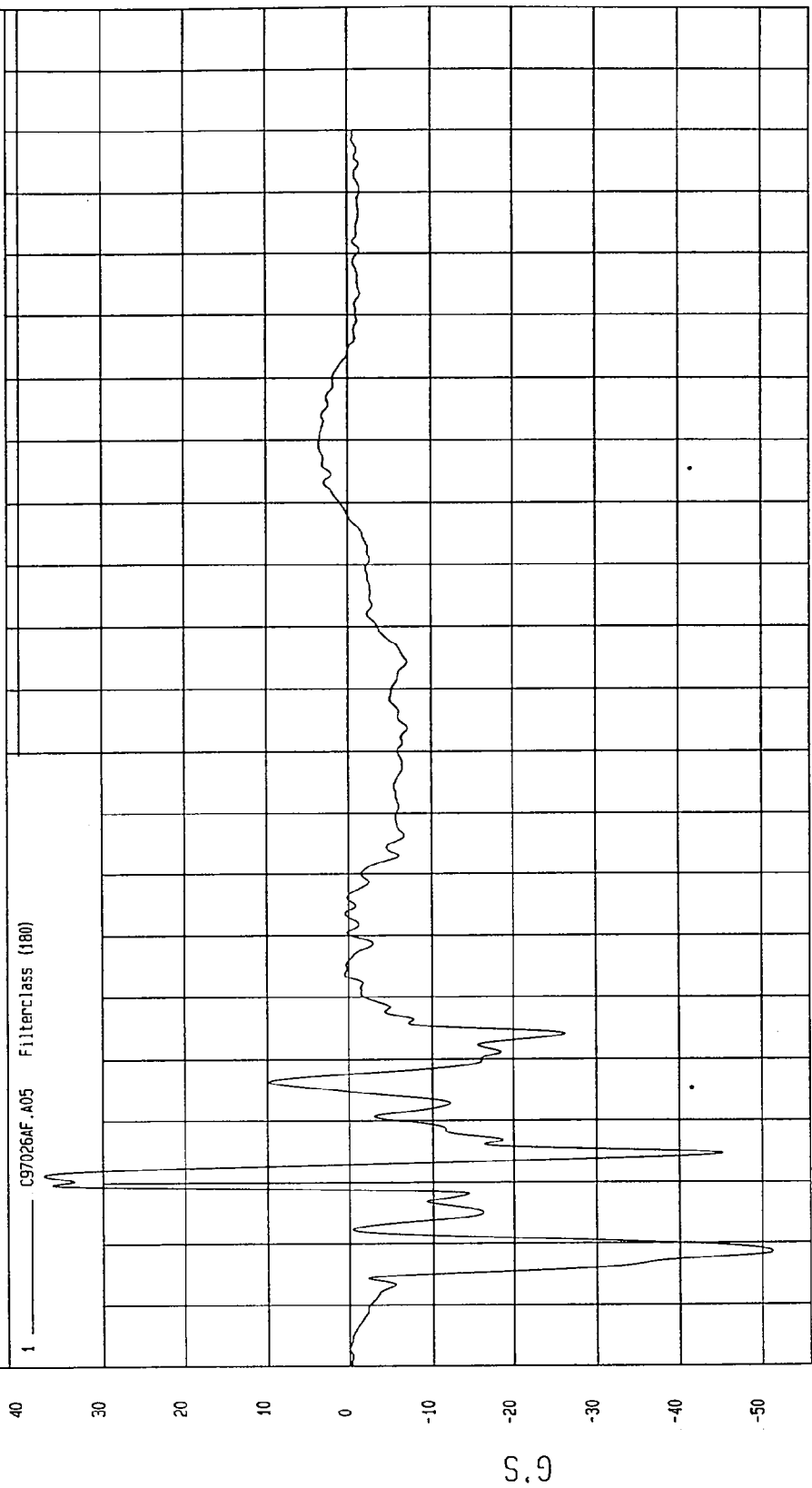
MGA Research
03-07-1997 10:20

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -51.24 G'S at -2 msec Maximum = 37.06 G'S at 11 msec

DRIVER LEFT FOOT HEEL 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

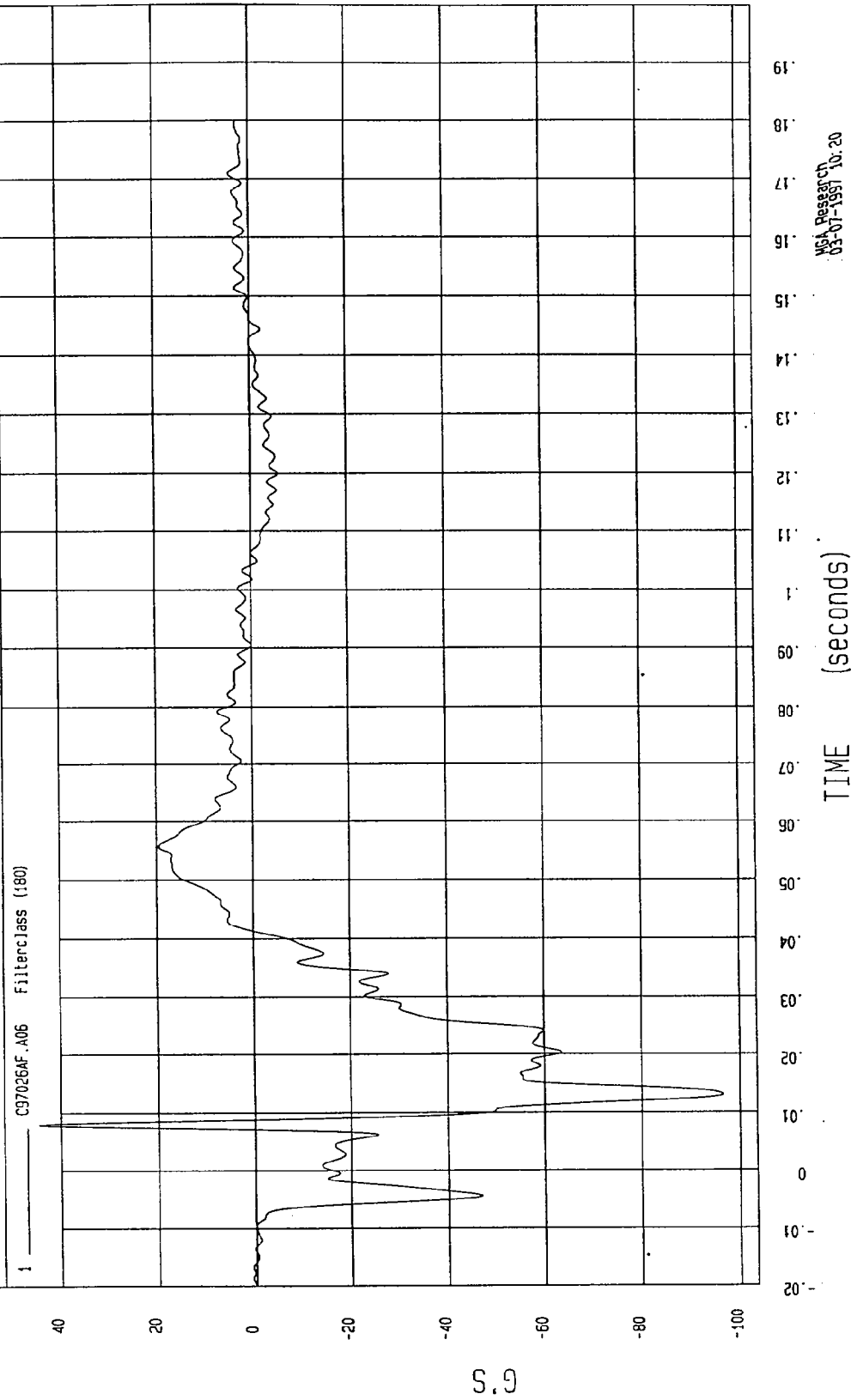
VCA Research
03-01-1997 10:20

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -96.52 G'S at 13 msec Maximum = 44.51 G'S at 8 msec

DRIVER LEFT FOOT HEEL Z ACCELERATION

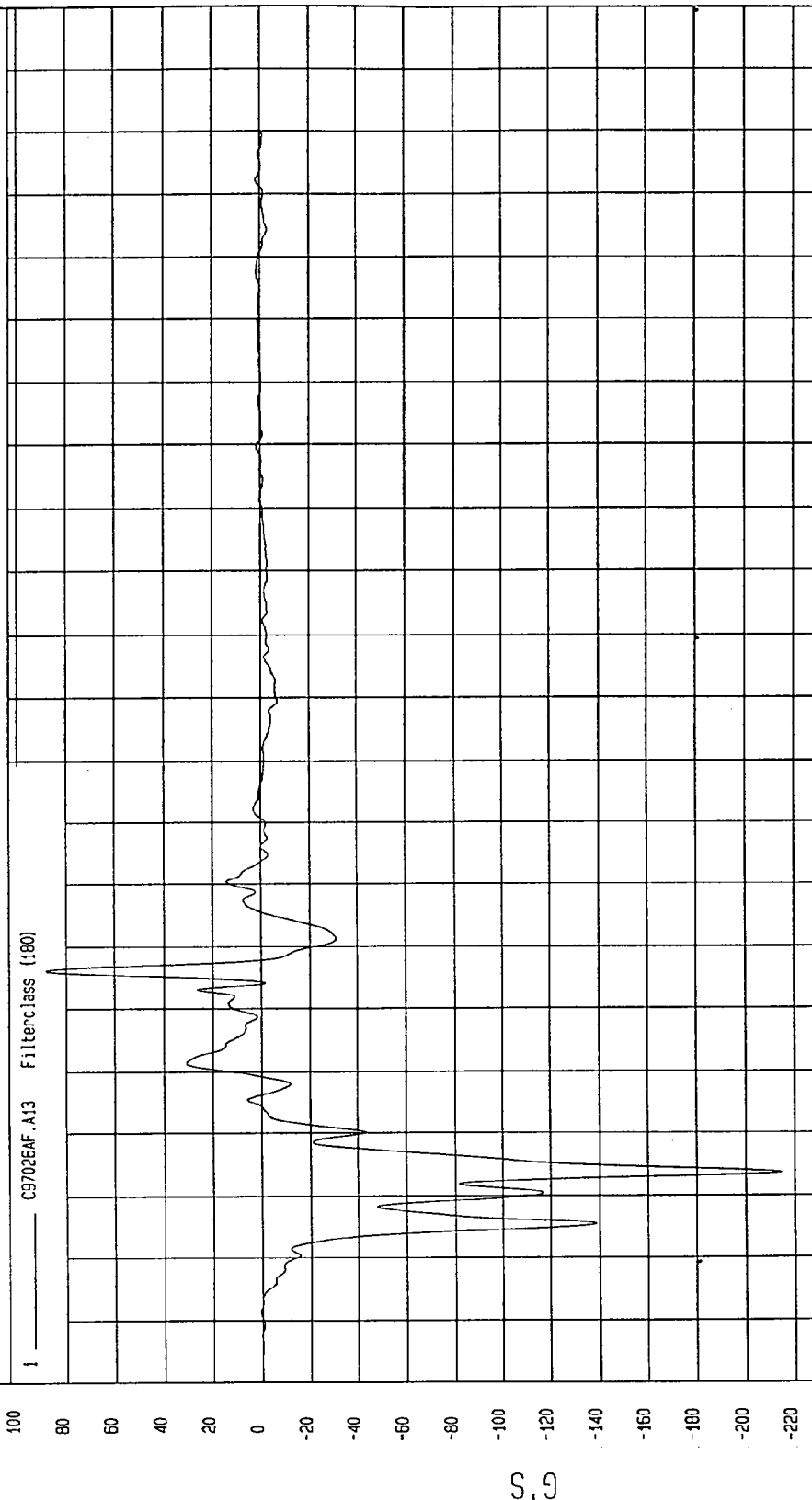


TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -214.45 G'S at 14 msec Maximum = 88.24 G'S at 46 msec

DRIVER RIGHT FOOT BALL Z ACCELERATION



NSA Research
03-01-1997 10:23

TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

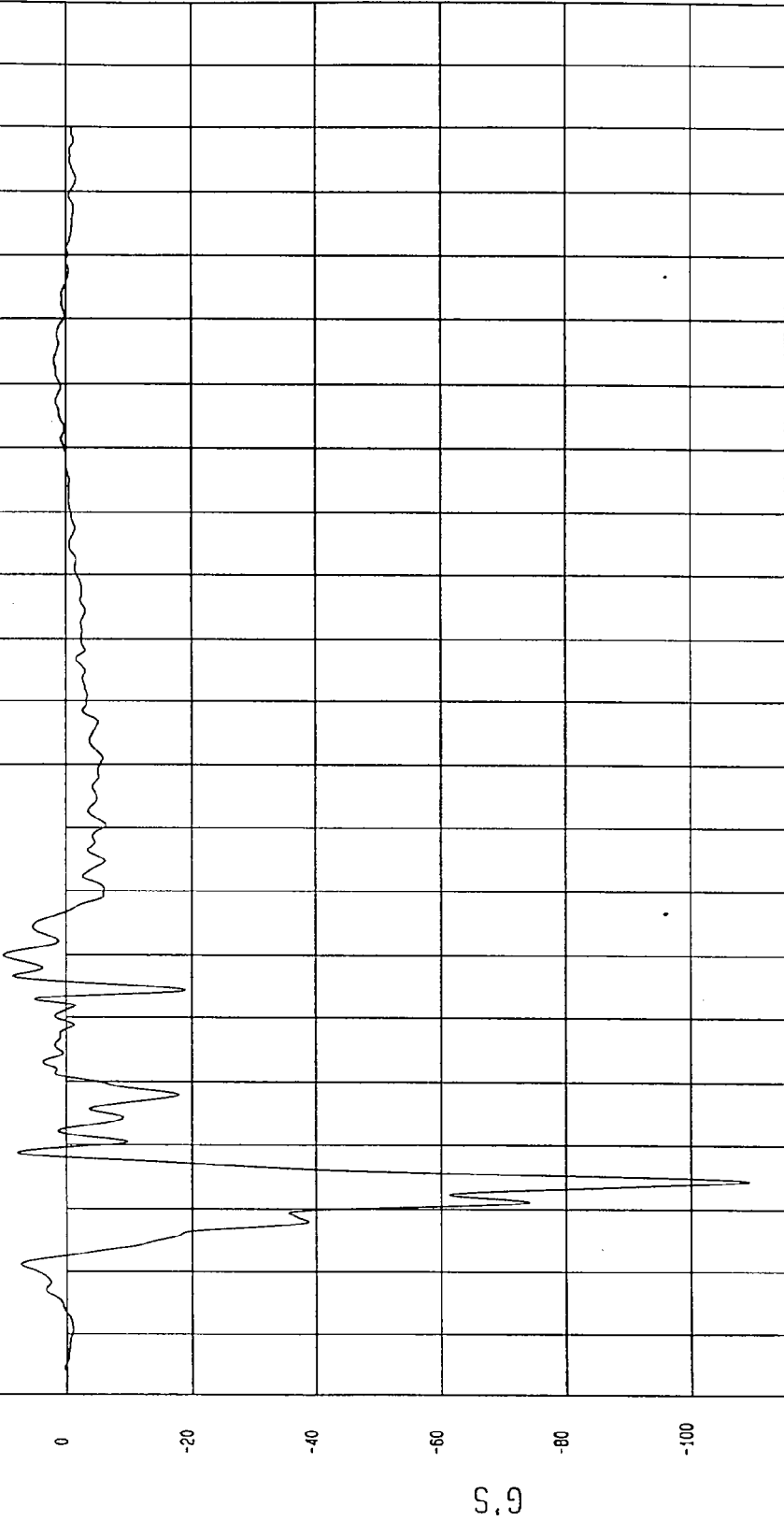
COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -109.18 G'S at 14 msec

Maximum = 10.11 G'S at 50 msec

DRIVER RIGHT FOOT HEEL X ACCELERATION

1 C97026AF.A02 Filterclass (180)



TIME (seconds)

MSA Research
03-07-1997 10:21

TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501)

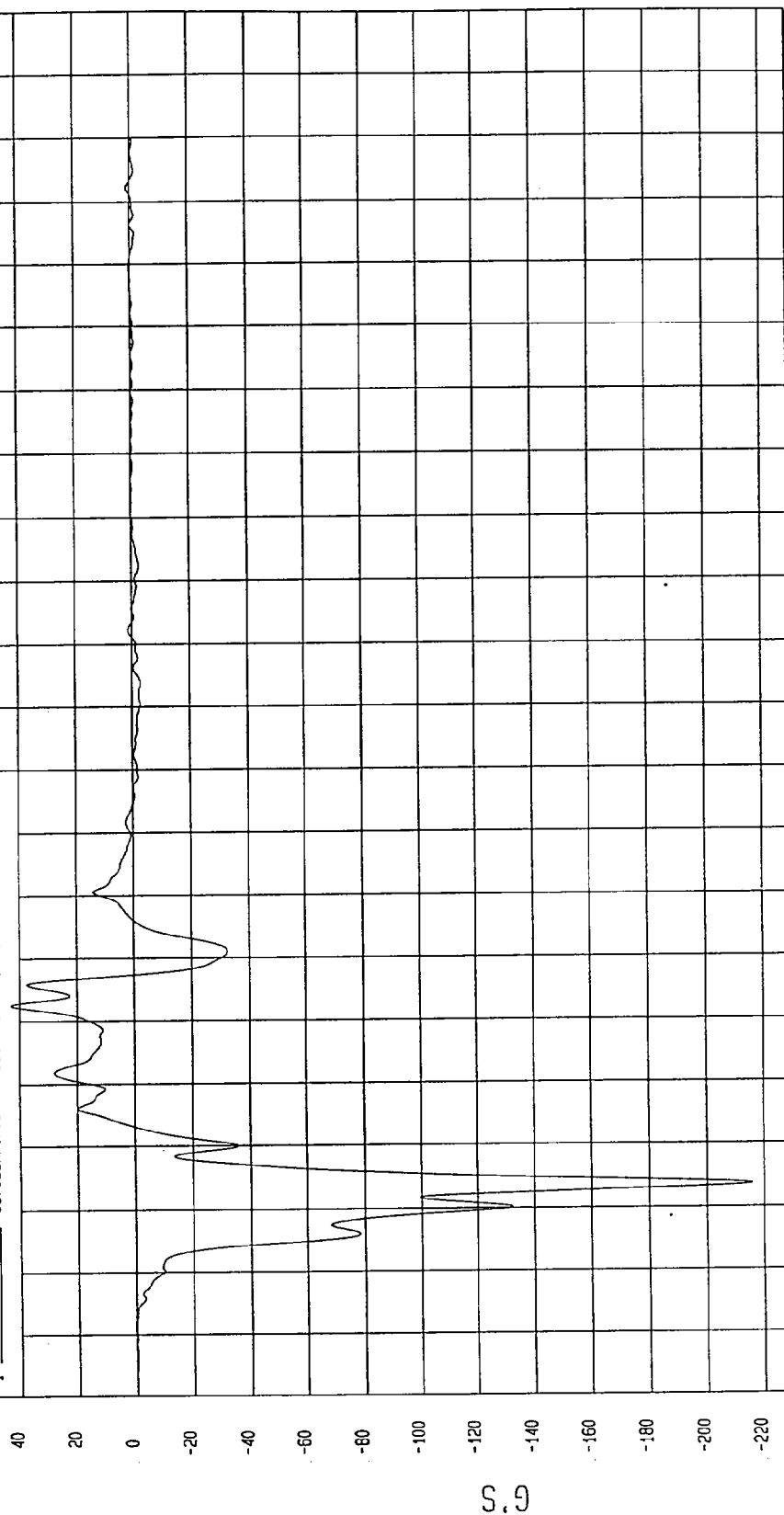
Speed: 34.95 MPH 56.2 KPH

Minimum = -215.90 G'S at 14 msec

Maximum = 42.97 G'S at 43 msec

DRIVER RIGHT FOOT HEEL Z ACCELERATION

1 CS7026AF.A03 Filterclass (180)



MGA Research
03-07-1997 10:21

TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501)

Speed: 34.95 MPH 56.2 KPH

Minimum = -30.65 G'S at 86 msec

Maximum = 4.47 G'S at 31 msec

PASSENGER HEAD X ACCELERATION

1 B97026AF.A22 Filterclass (1000)

20

0

-20

-40

-60

G'S

19

18

17

16

15

14

13

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01

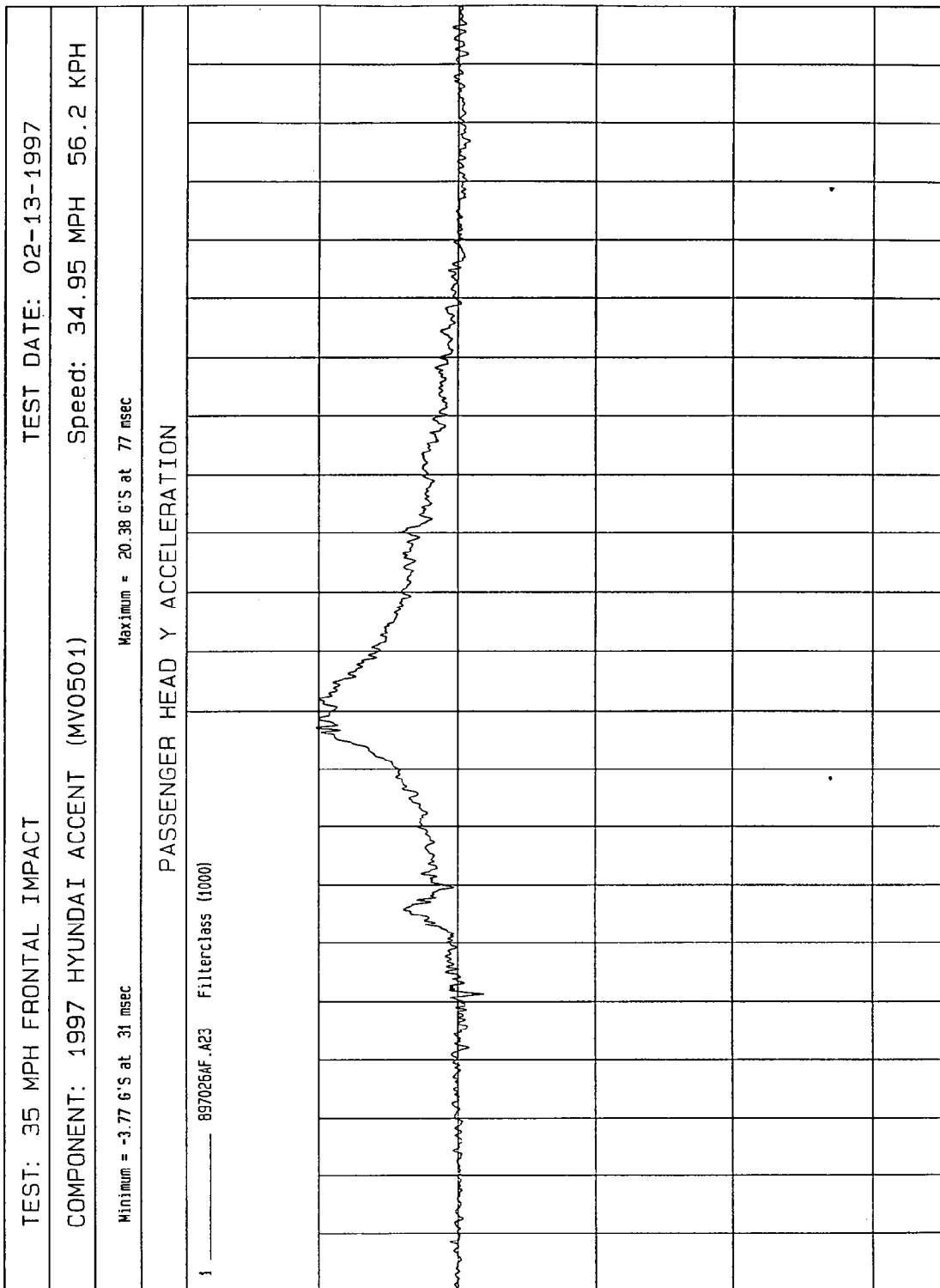
0

-01

-02

TIME (SECONDS)

MCA Research
02-24-1997 17:55



MGA Research
02-24-1997 17:55

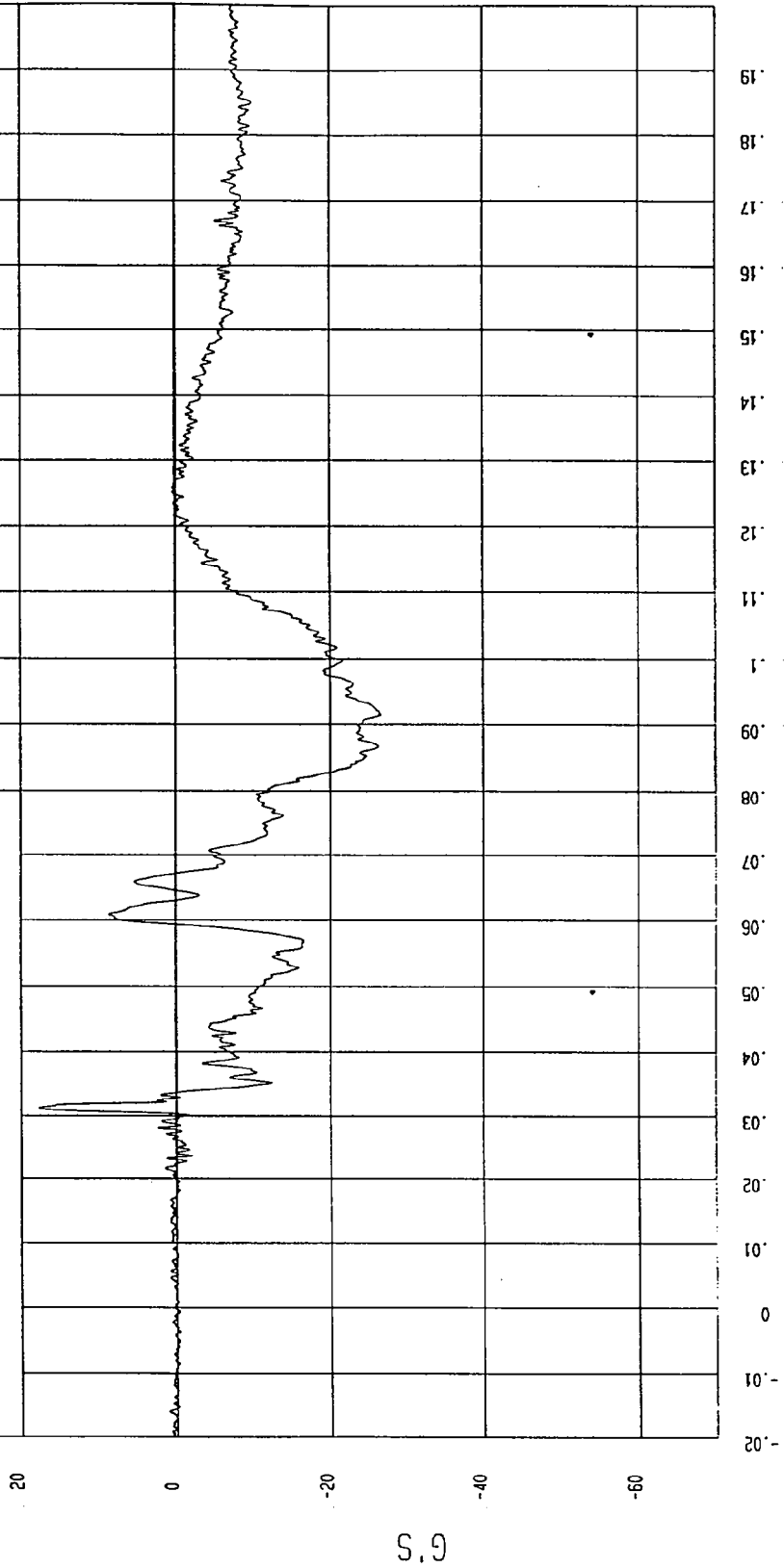
TIME (SECONDS)

G's

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997
COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH
Minimum = -26.73 G'S at 92 msec Maximum = 17.66 G'S at 31 msec

PASSENGER HEAD Z ACCELERATION

1 _____ B97026AF.A24 Filterclass (1000)



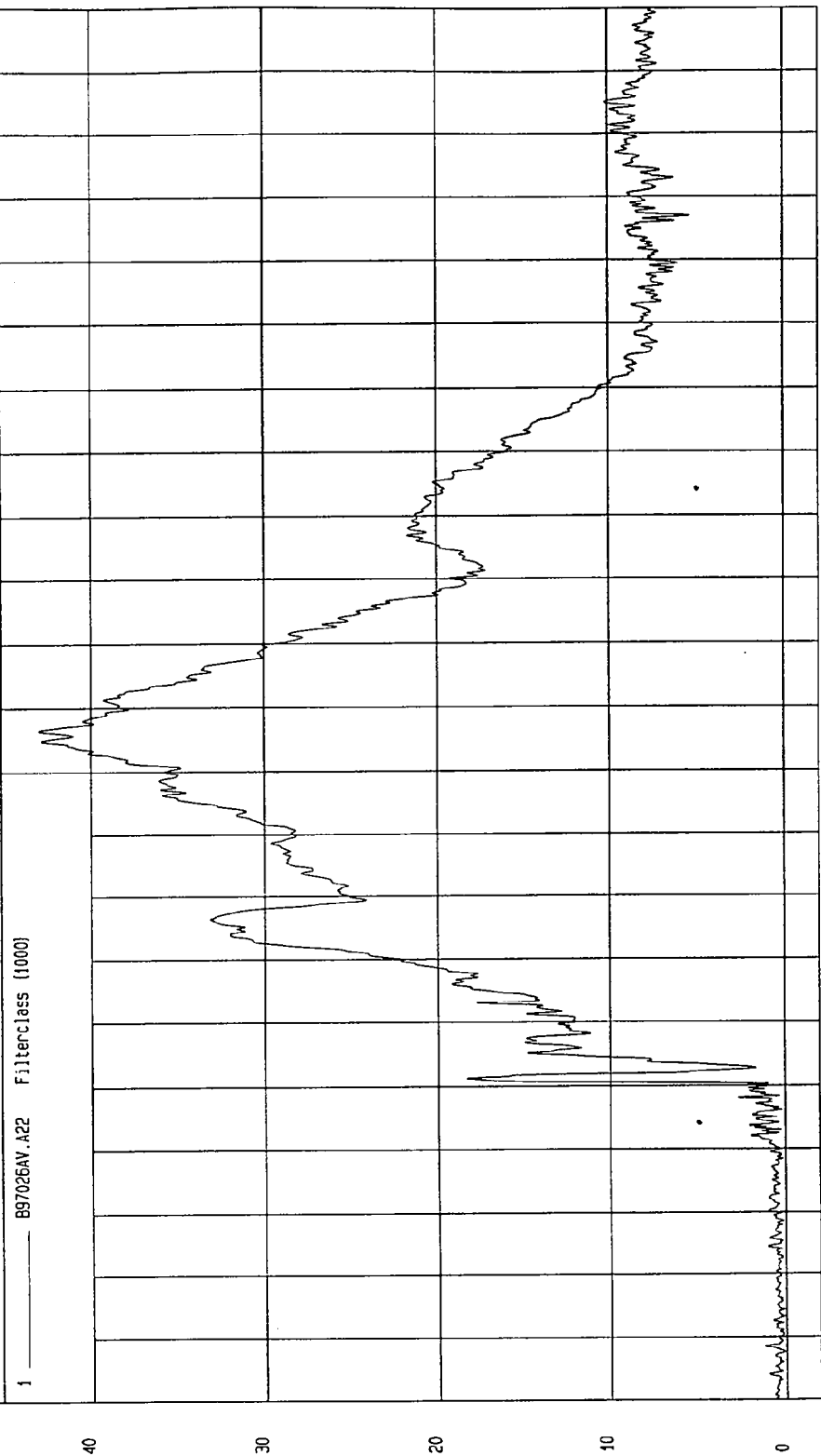
MCA Research
02-24-1997 11:55

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = .10 G'S at -7 msec Maximum = 43.08 G'S at 86 msec

PASSENGER HEAD RESULTANT ACCELERATION



TIME (SECONDS)

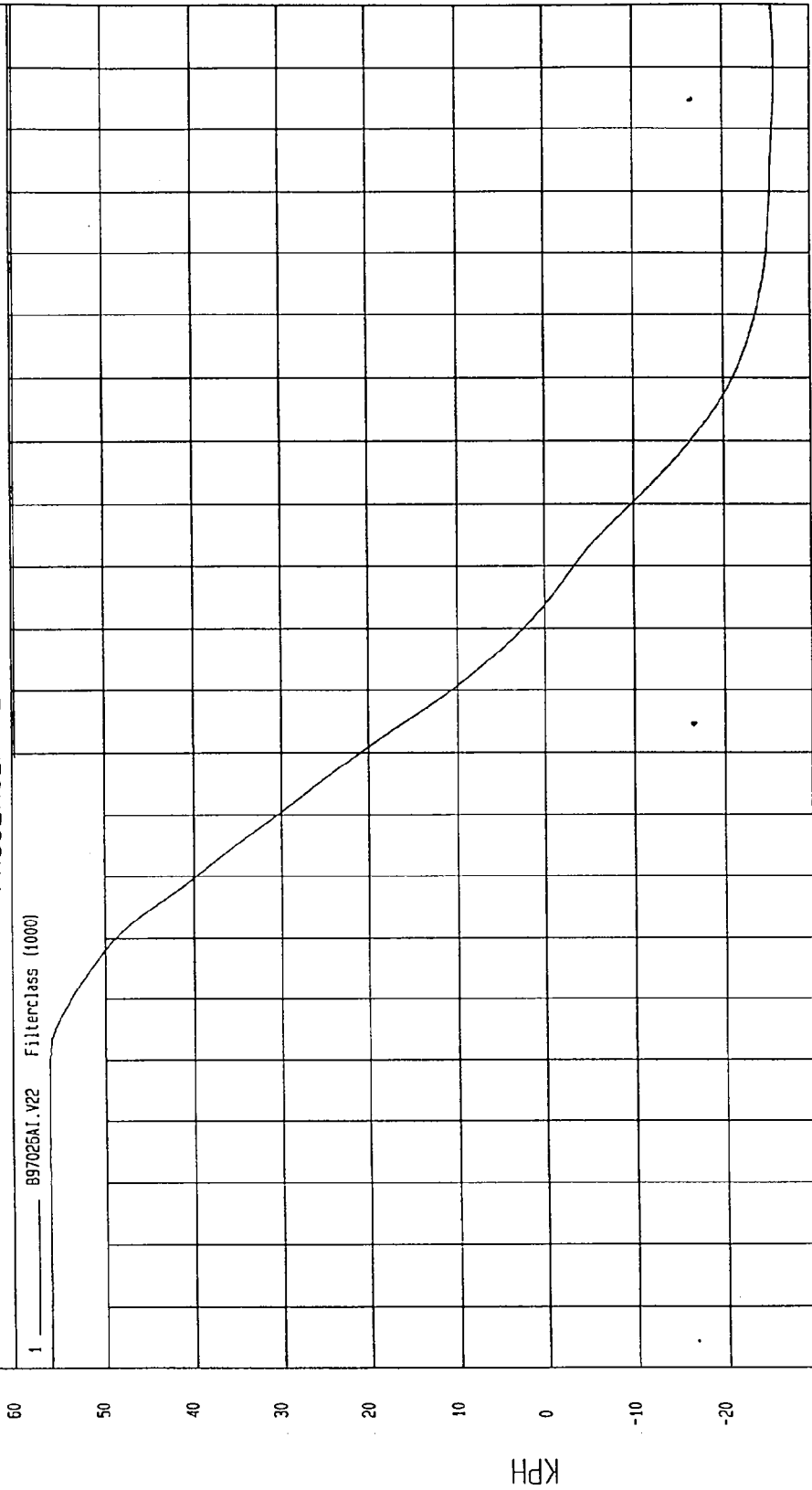
NCA Research
02-24-1997 17:55

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -25.68 KPH at 188 msec Maximum = 56.23 KPH at 29 msec

PASSENGER HEAD X VELOCITY



TIME Seconds

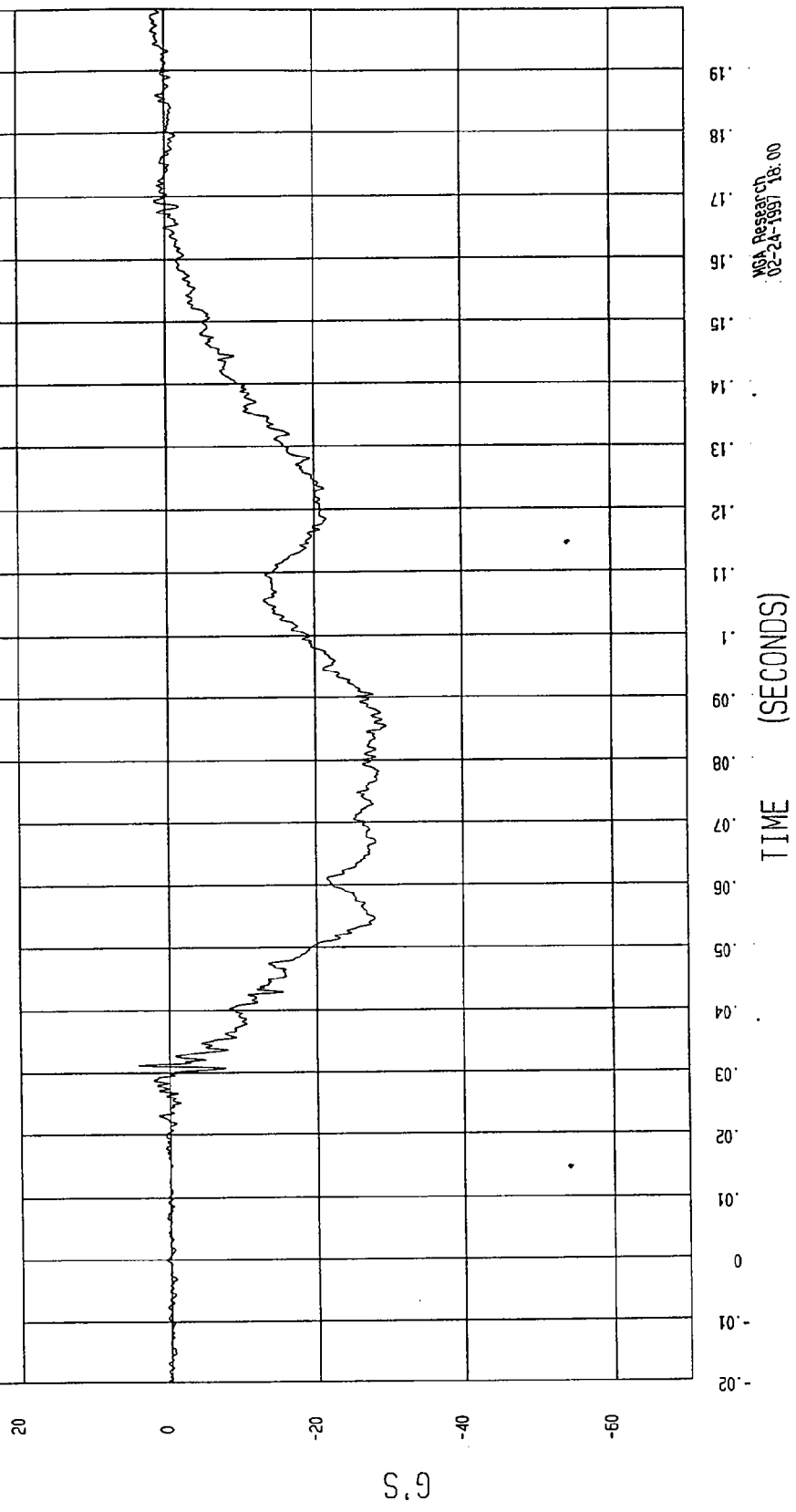
MSA Research
02-24-1997 18:05

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997
COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -29.62 G'S at 85 msec Maximum = 4.12 G'S at 31 msec

PASSENGER HEAD REDUNDANT X ACCELERATION

1 ——— B9702CAF A38 Filterclass (1000)



WGA Research
02-24-1997 18:00

TEST DATE: 02-13-1997

TEST: 35 MPH FRONTAL IMPACT

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -3.76 G'S at 31 msec Maximum = 19.07 G'S at 80 msec

PASSENGER HEAD REDUNDANT Y ACCELERATION

1 997026AF.A39 Filterclass (1000)

20

0

-20

-40

-60

G.S

TIME (SECONDS)

MSA Research
02-24-1997 18:01

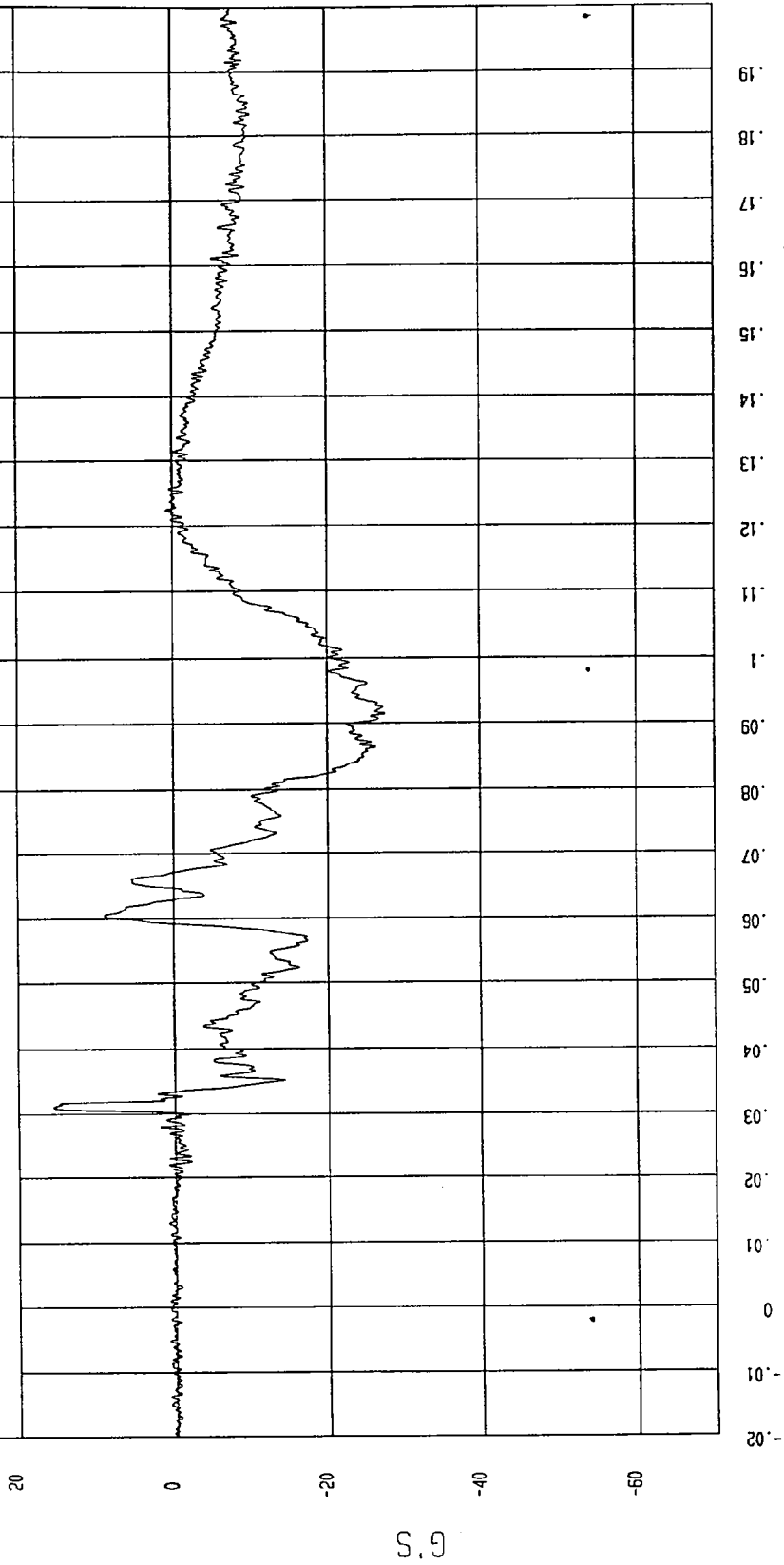
TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -27.69 G'S at 92 msec Maximum = 15.70 G'S at 31 msec

PASSENGER HEAD REDUNDANT Z ACCELERATION

1 _____ B97026AF.A40 Filterclass (1000)



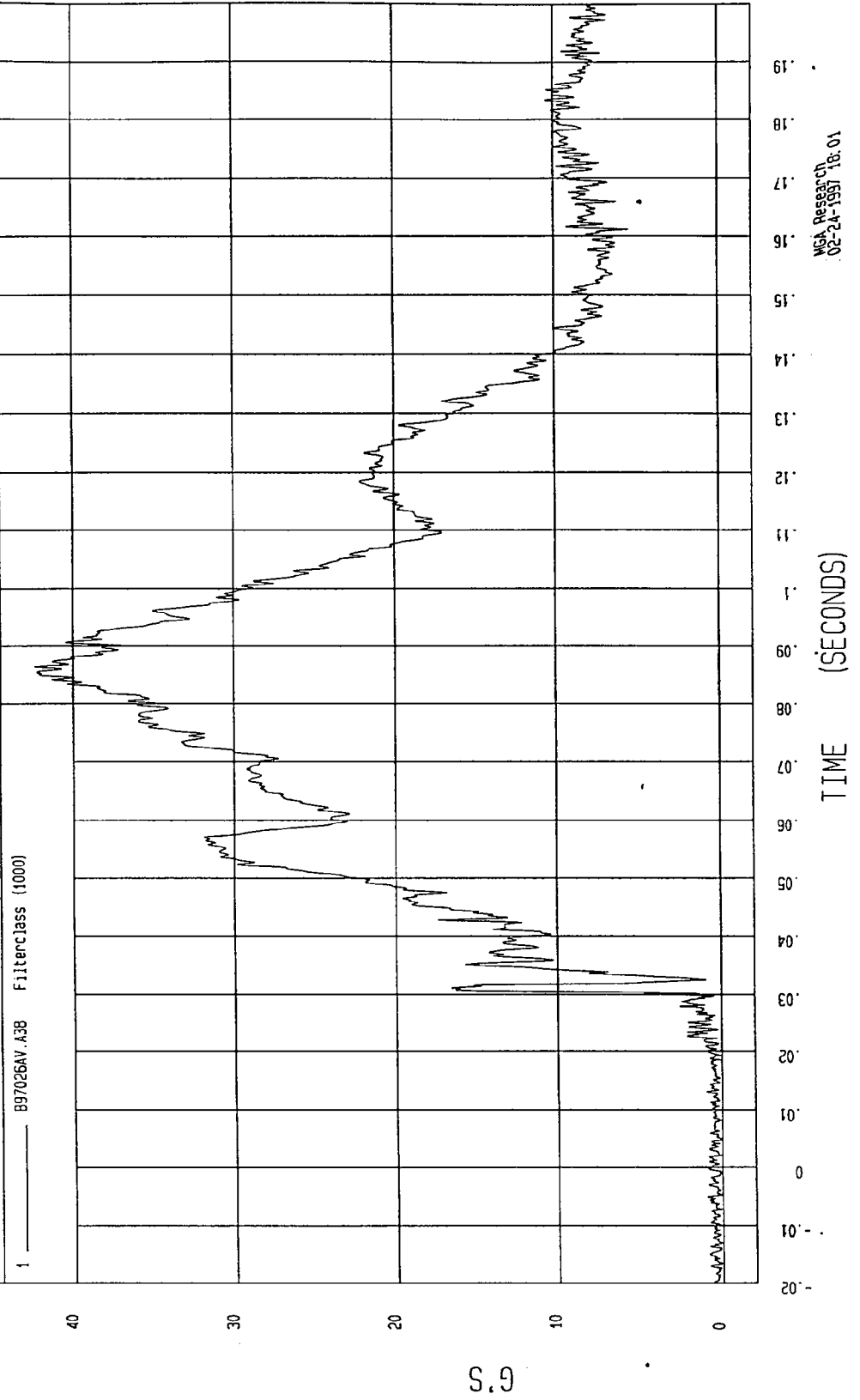
MCA Research
02-24-1997 18:01

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

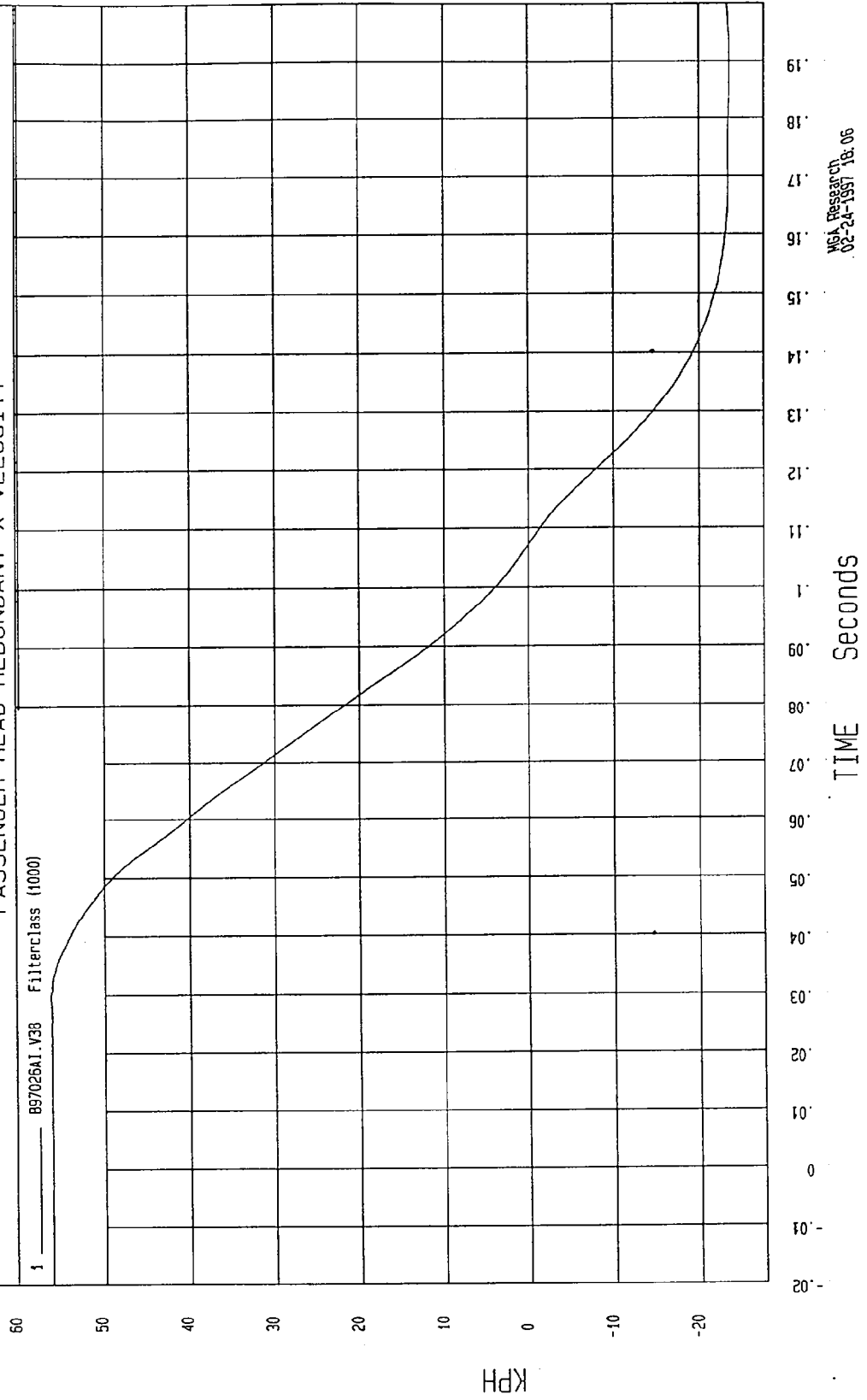
Minimum = 4.90E-02 G'S at -5 msec Maximum = 42.36 G'S at 86 msec

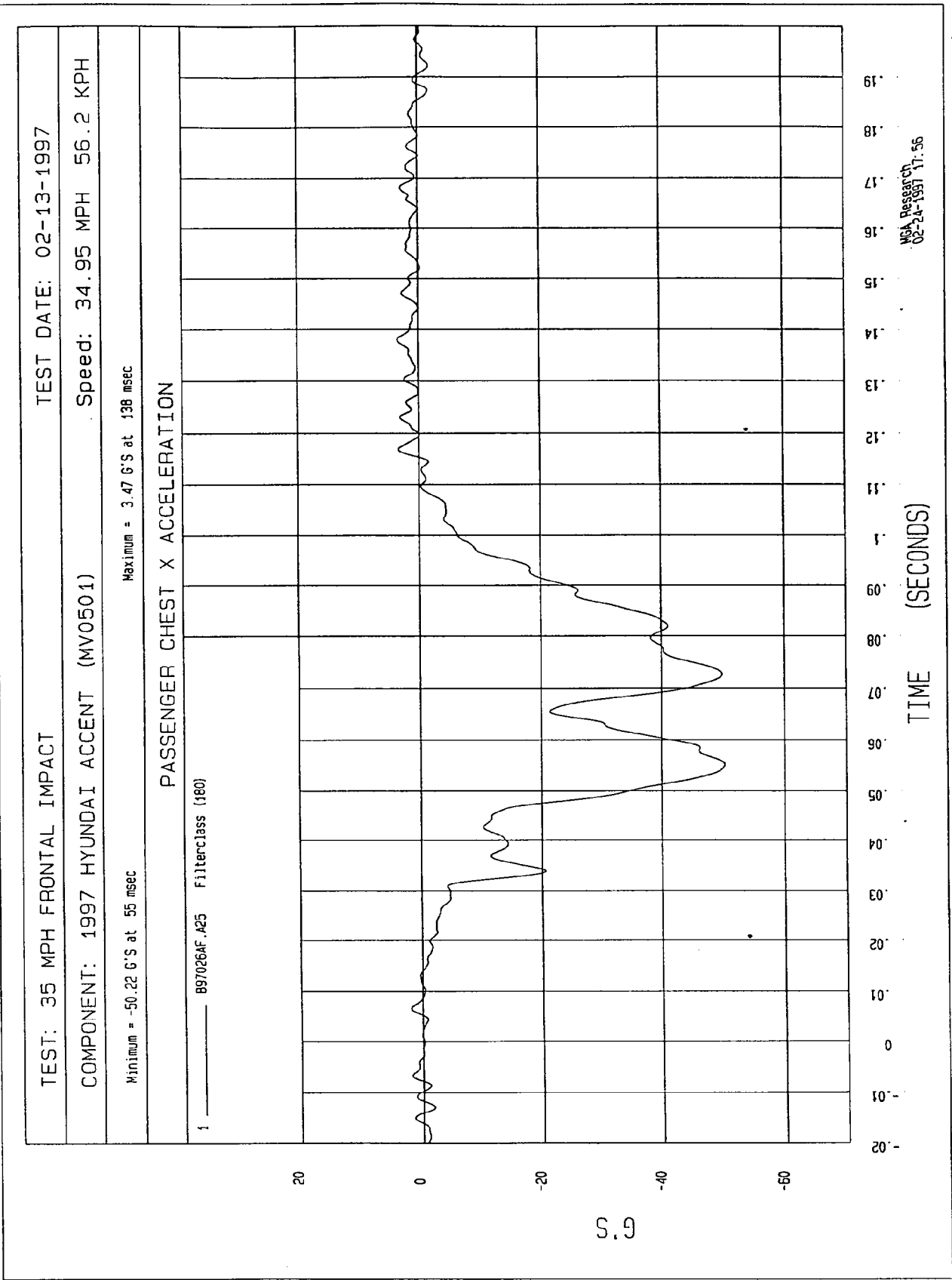
PASSENGER HEAD REDUNDANT RESULTANT ACCELERATION



TEST: 35 MPH FRONTAL IMPACT	TEST DATE: 02-13-1997
COMPONENT: 1997 HYUNDAI ACCENT (MV0501)	Speed: 34.95 MPH 56.2 KPH
Minimum = -23.50 KPH at 185 msec	Maximum = 56.30 KPH at 29 msec

PASSENGER HEAD REDUNDANT X VELOCITY

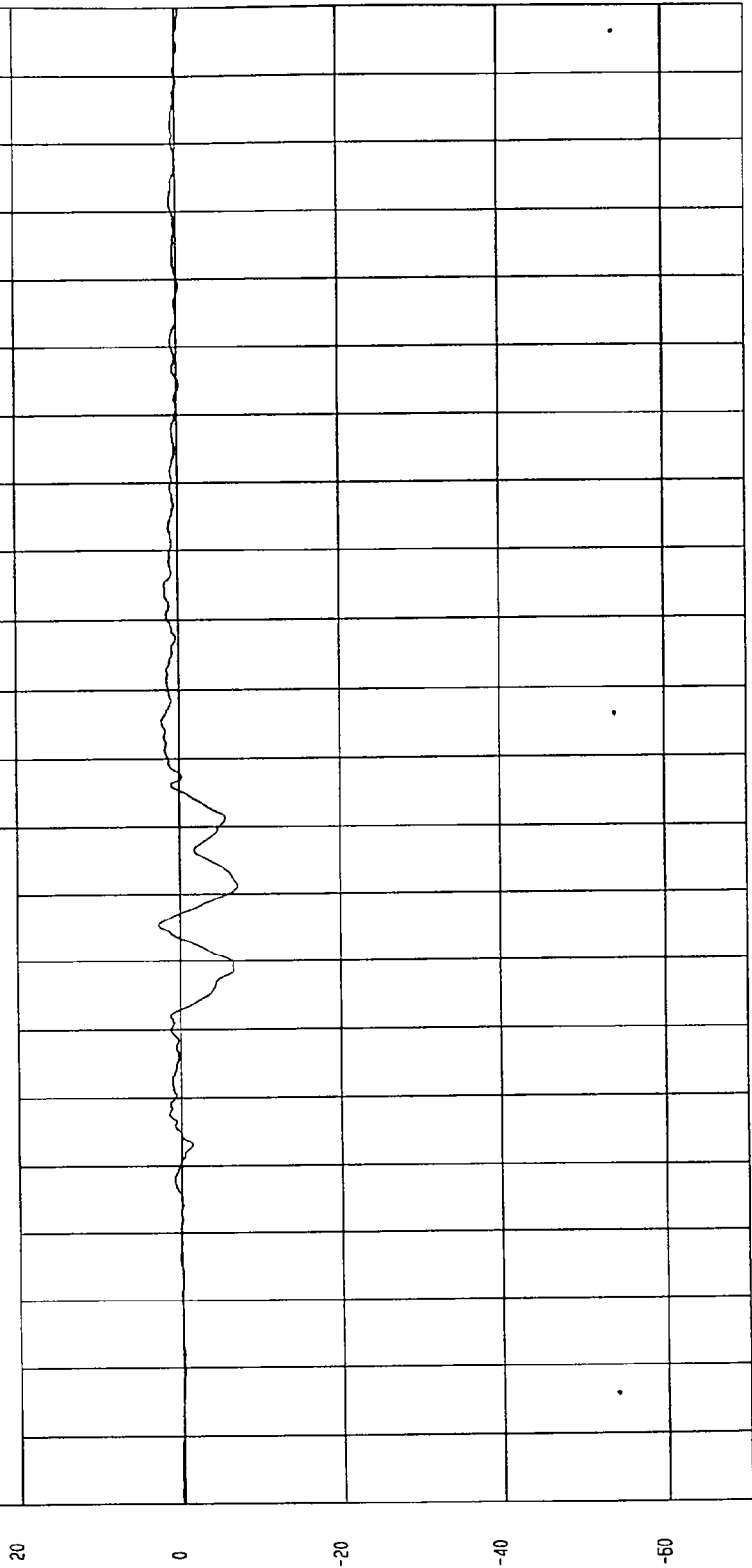




TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997
COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH
Minimum = -7.28 G'S at 71 msec Maximum = 2.52 G'S at 65 msec

PASSENGER CHEST Y ACCELERATION

1 _____ 897026AF.A26 Filterclass (100)



MSA Research
02-24-1997 17:56

TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -9.12 G'S at 54 msec Maximum = 10.93 G'S at 64 msec

PASSENGER CHEST Z ACCELERATION

1 ——— B97026AF.A27 Filterclass (180)

20 0 -20 -40 -60

G

TIME (SECONDS)

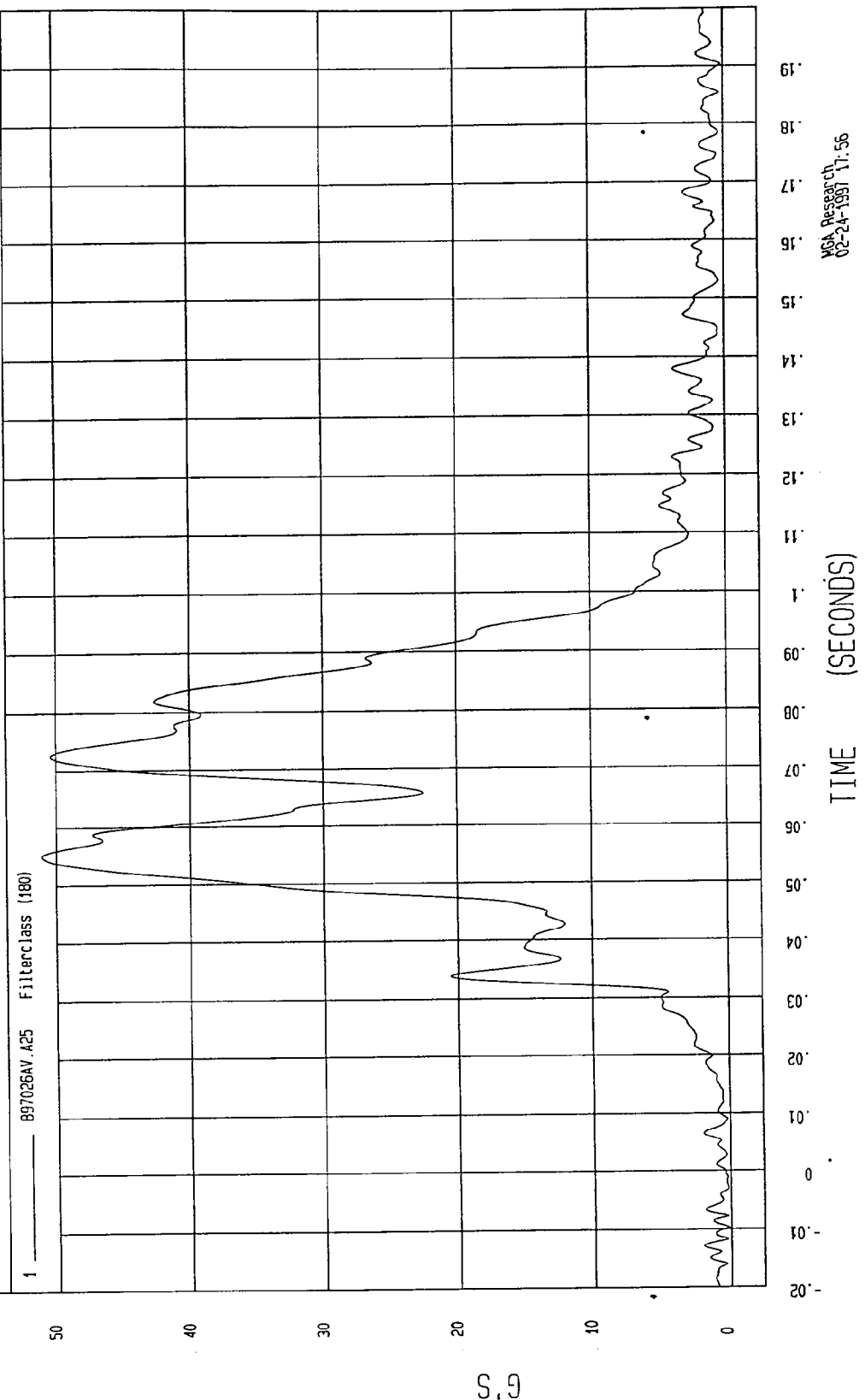
NSA Research
02-24-1997 17:55

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = .13 G'S at ~10 msec Maximum = 51.09 G'S at 55 msec

PASSENGER CHEST RESULTANT ACCELERATION



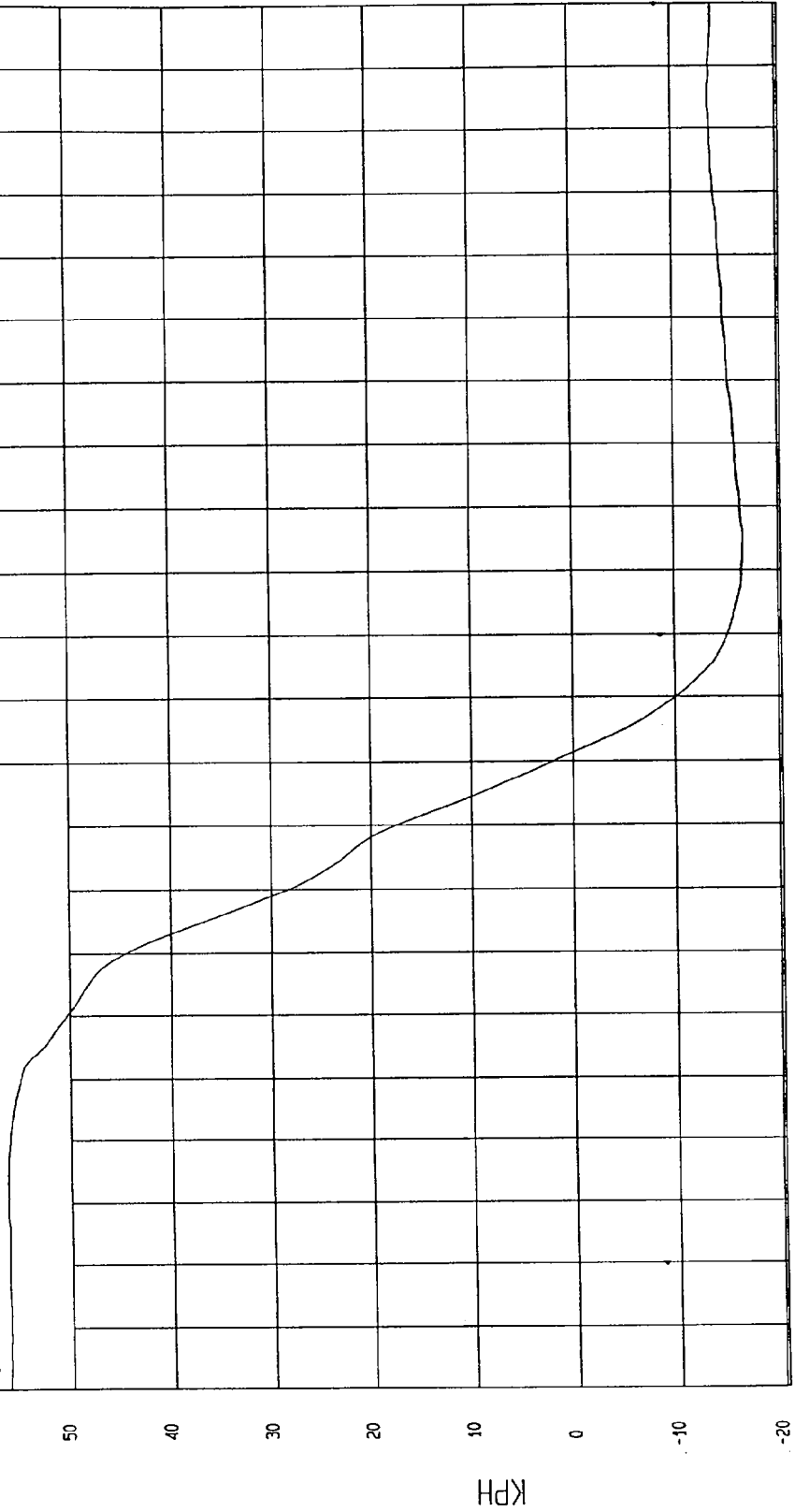
TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -16.63 KPH at 115 msec Maximum = 56.23 KPH at 9 msec

PASSENGER CHEST X VELOCITY

1 ——— B97026A1 V25 Filterclass (180)



MCA Research
02-24-1997 18:05

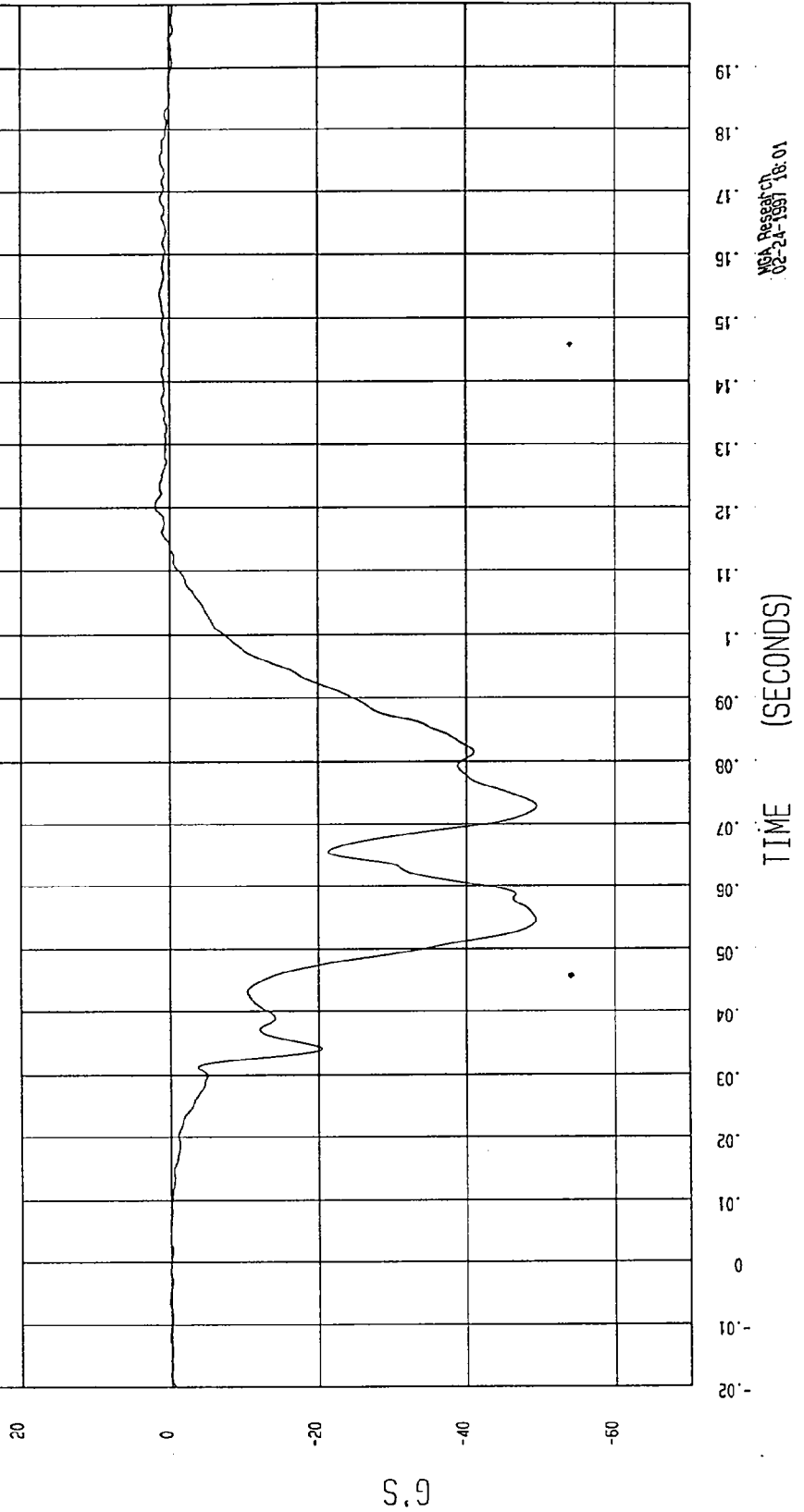
TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

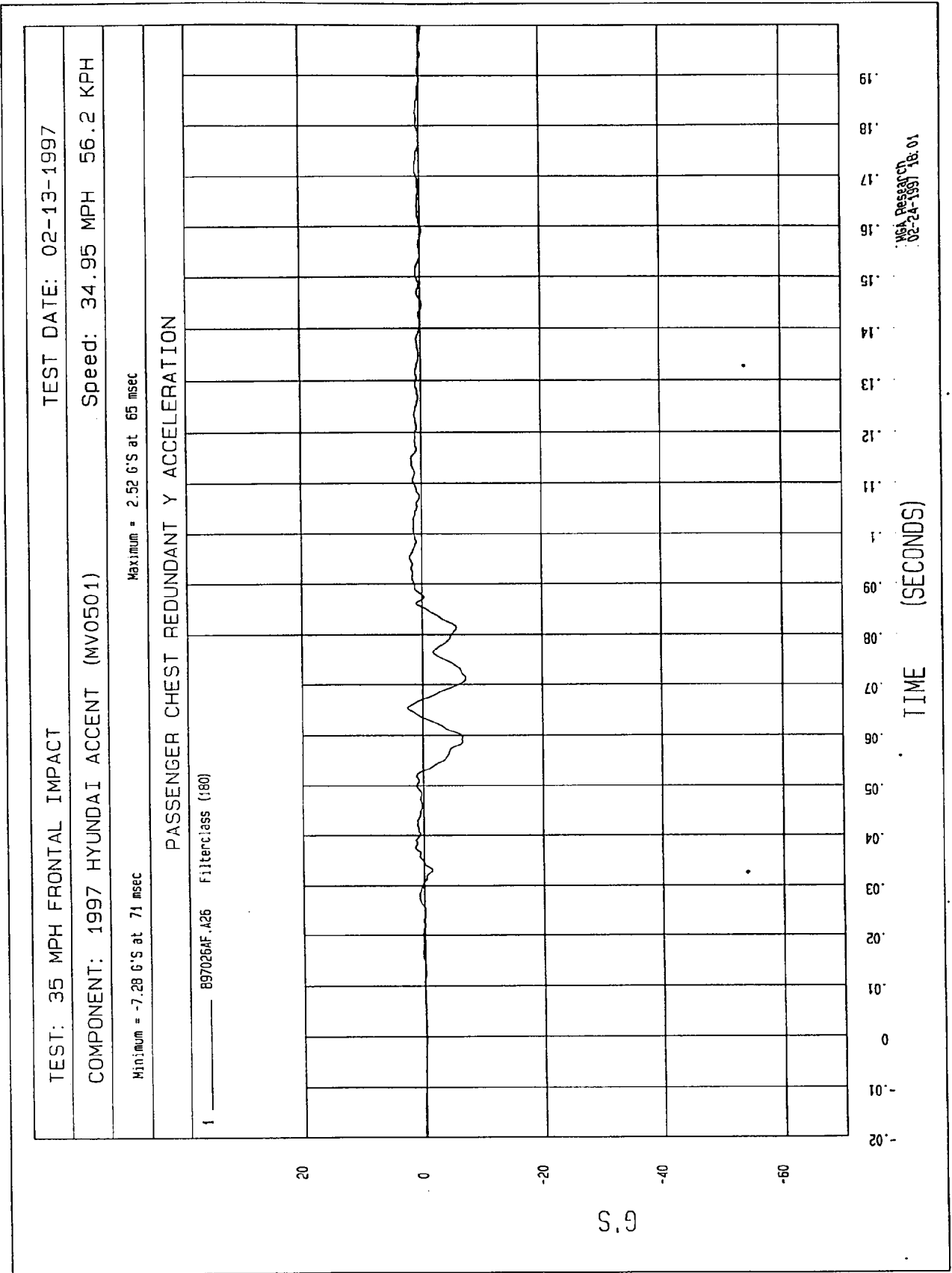
Minimum = -49.52 G'S at 73 msec Maximum = 1.91 G'S at 120 msec

PASSENGER CHEST REDUNDANT X ACCELERATION

1 ——— B97026AF.A42 Filterclass (180)



MCA Research
02-24-1997 18:01



TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -9.21 G'S at 55 msec

Maximum = 11.50 G'S at 64 msec

PASSENGER CHEST REDUNDANT Z ACCELERATION

1 _____ B97026AF.A44 Filterclass (180)

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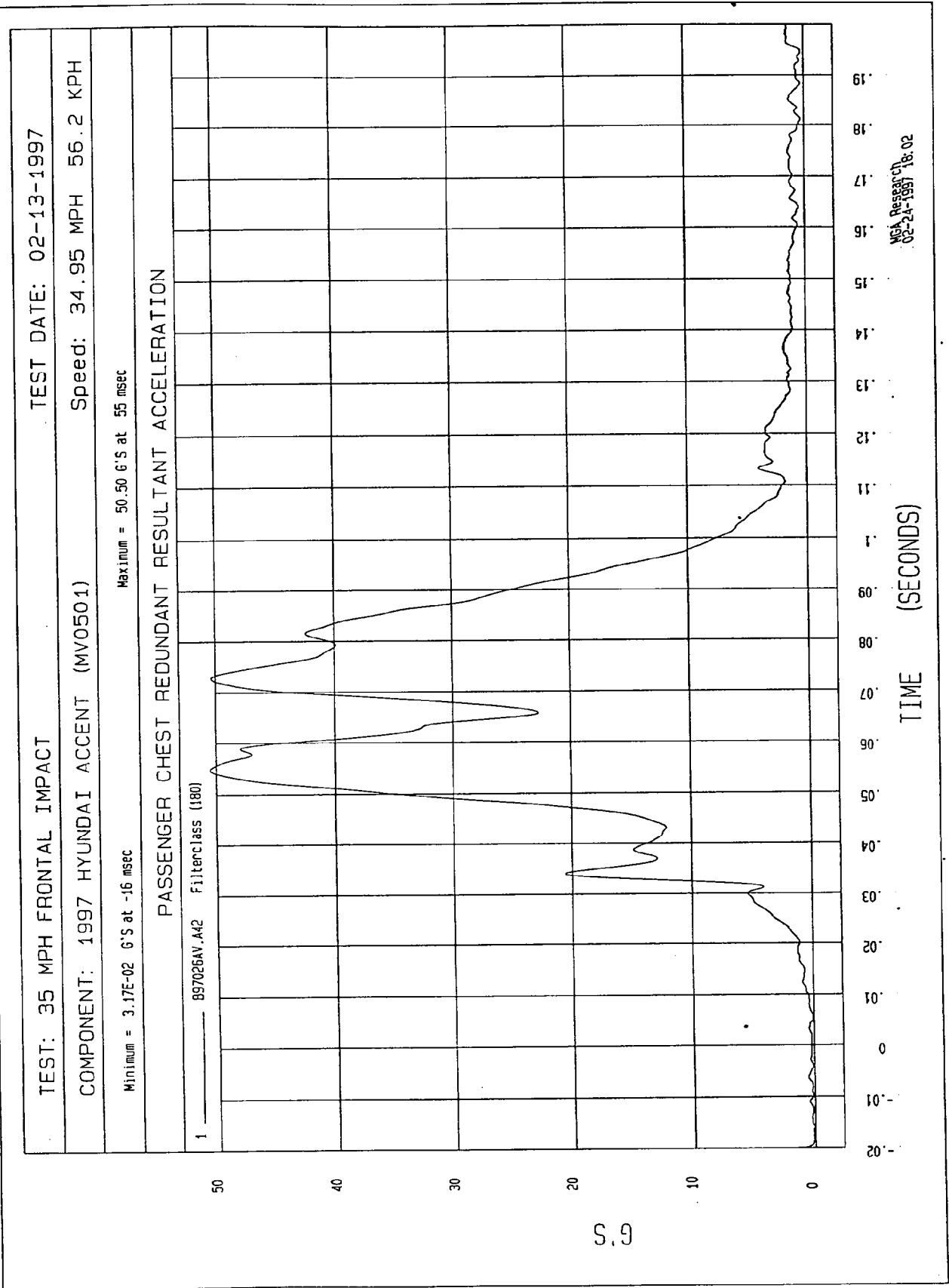
0

-01

-02

TIME (SECONDS)

NGA Research
02-24-1997 18:02

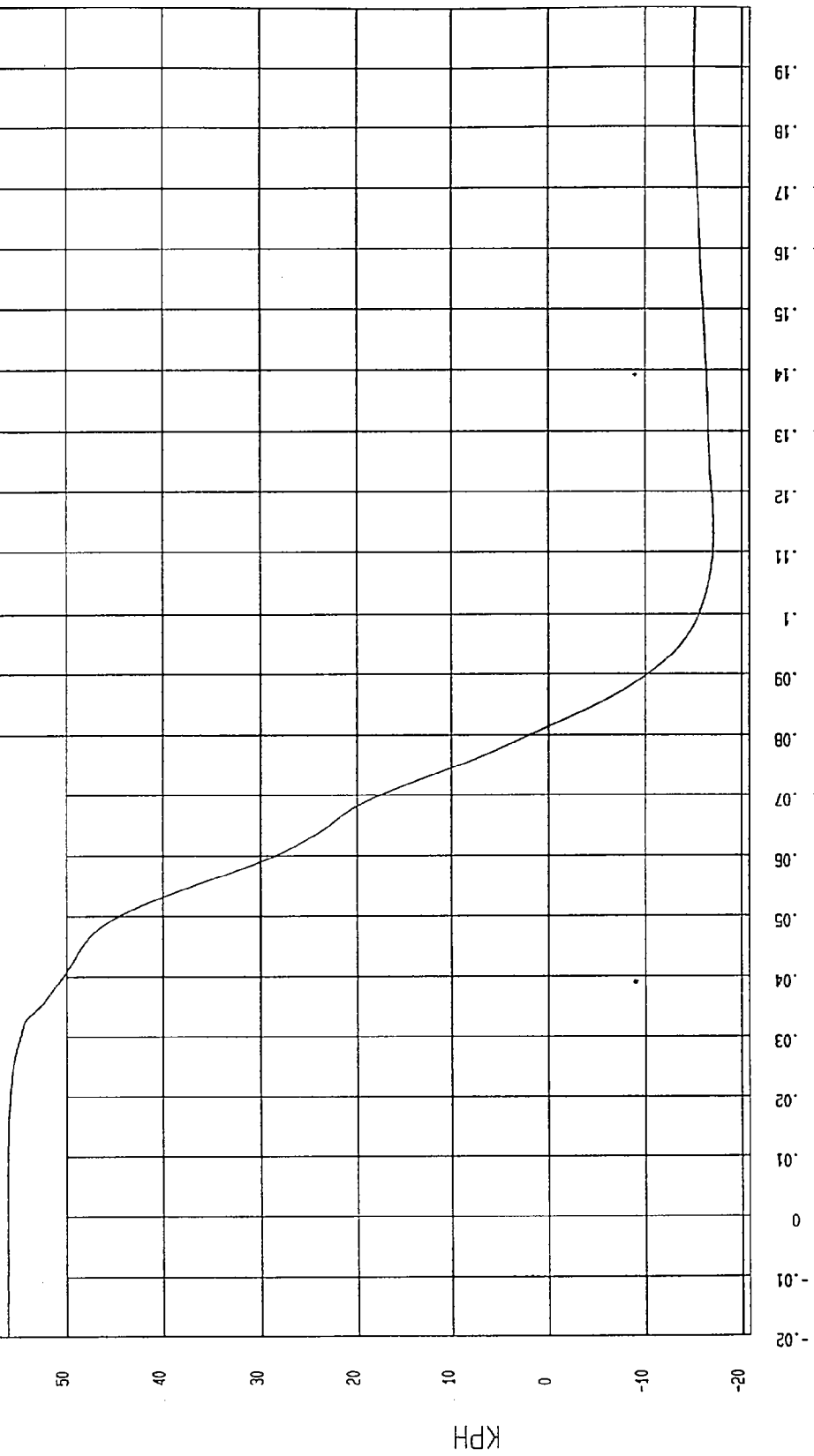


TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997
COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -17.07 KPH at 114 msec Maximum = 56.2 KPH at -20 msec

PASSENGER CHEST REDUNDANT X VELOCITY

1 ——— B97026A1.V42 Filterclass (180)



MCA Research
02-24-1997 18.06

TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

Speed: 34.95 MPH 56.2 KPH

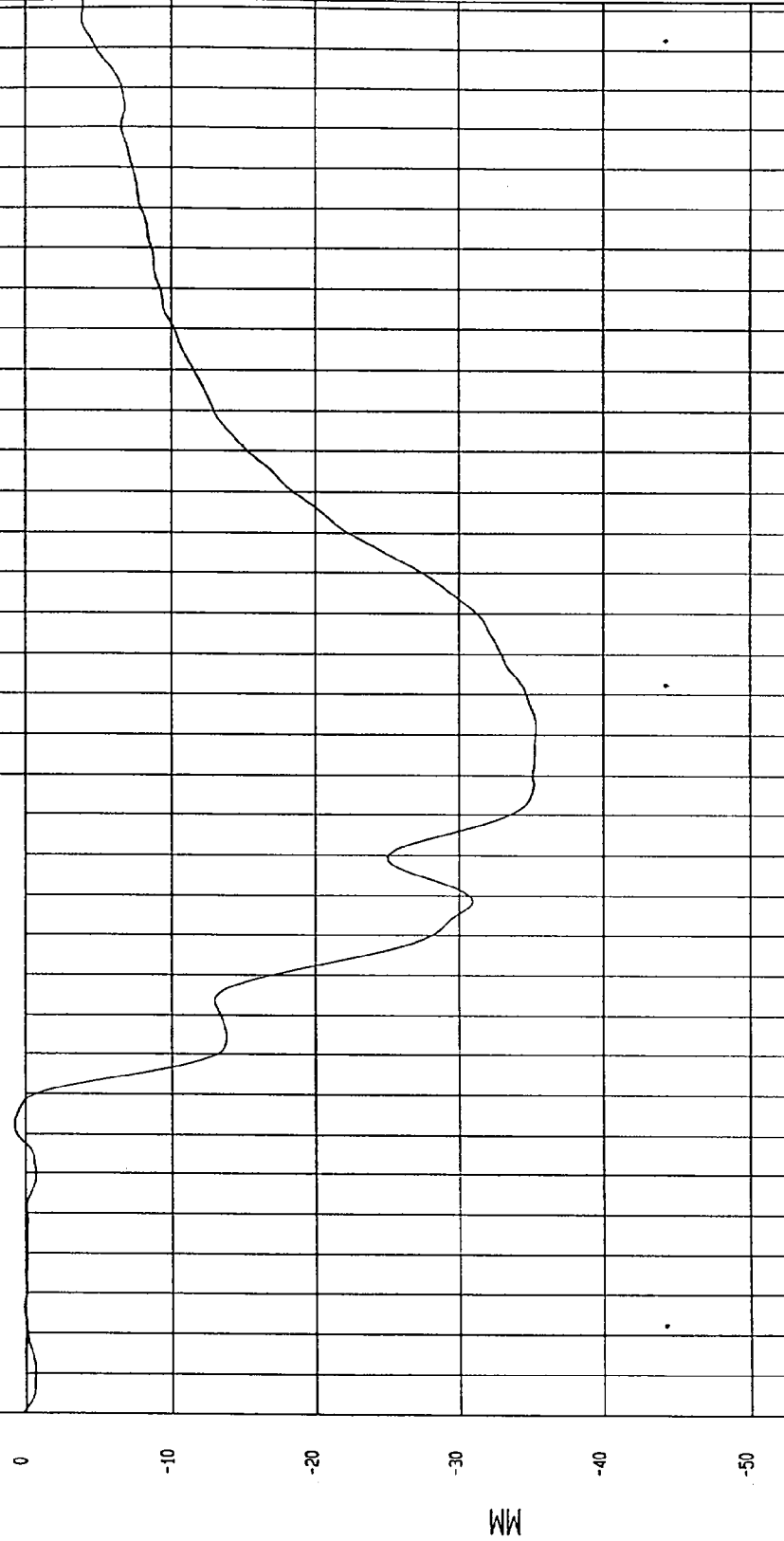
COMPONENT: 1997 HYUNDAI ACCENT (MV0501)

Maximum = .72 MM at 40 msec

Minimum = -35.34 MM at 140 msec

PASSENGER CHEST COMPRESSION

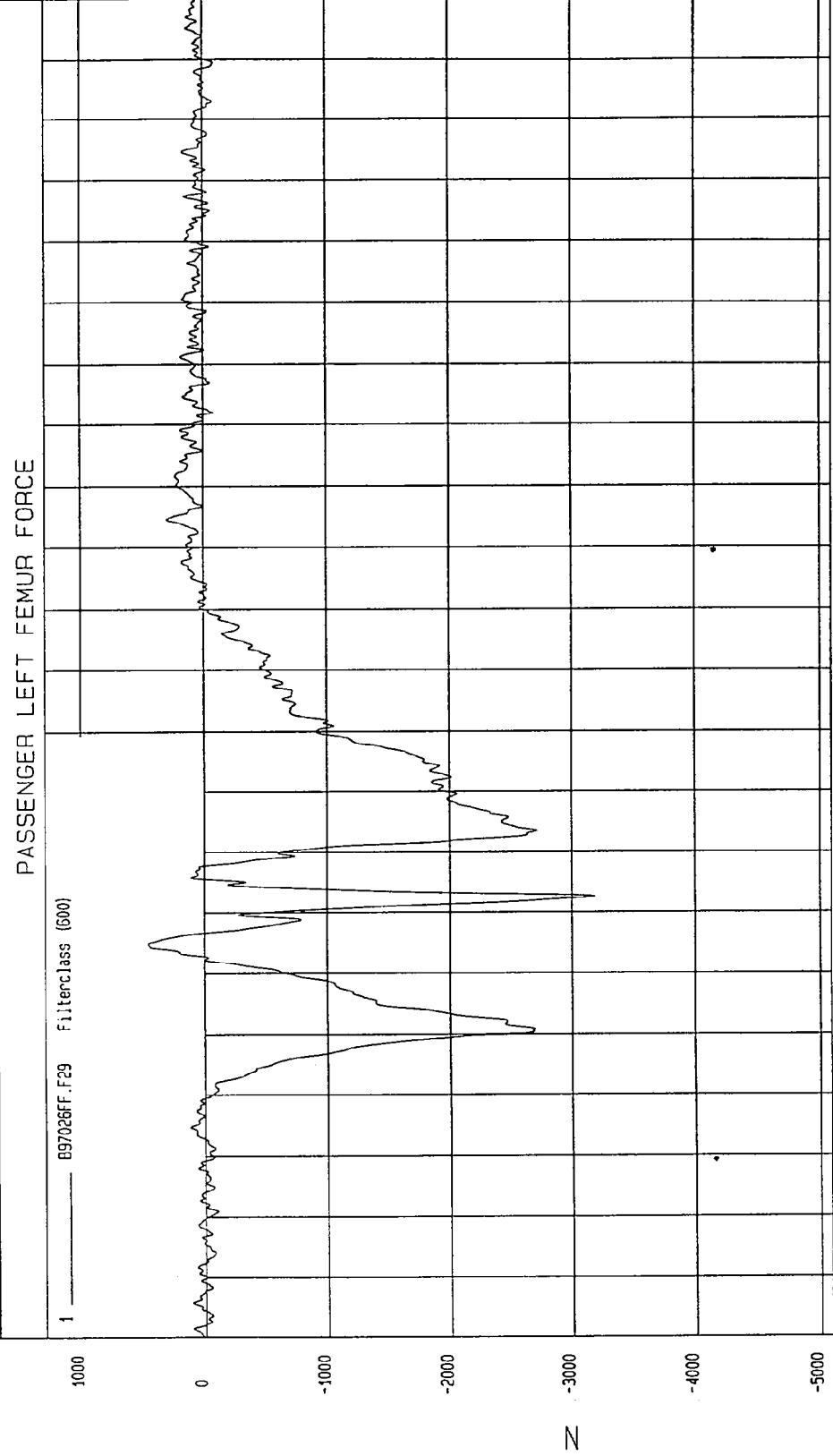
1 B970260F.059 Filterclass (60)



NSA Research
02-24-1997 17:57

TIME SECONDS

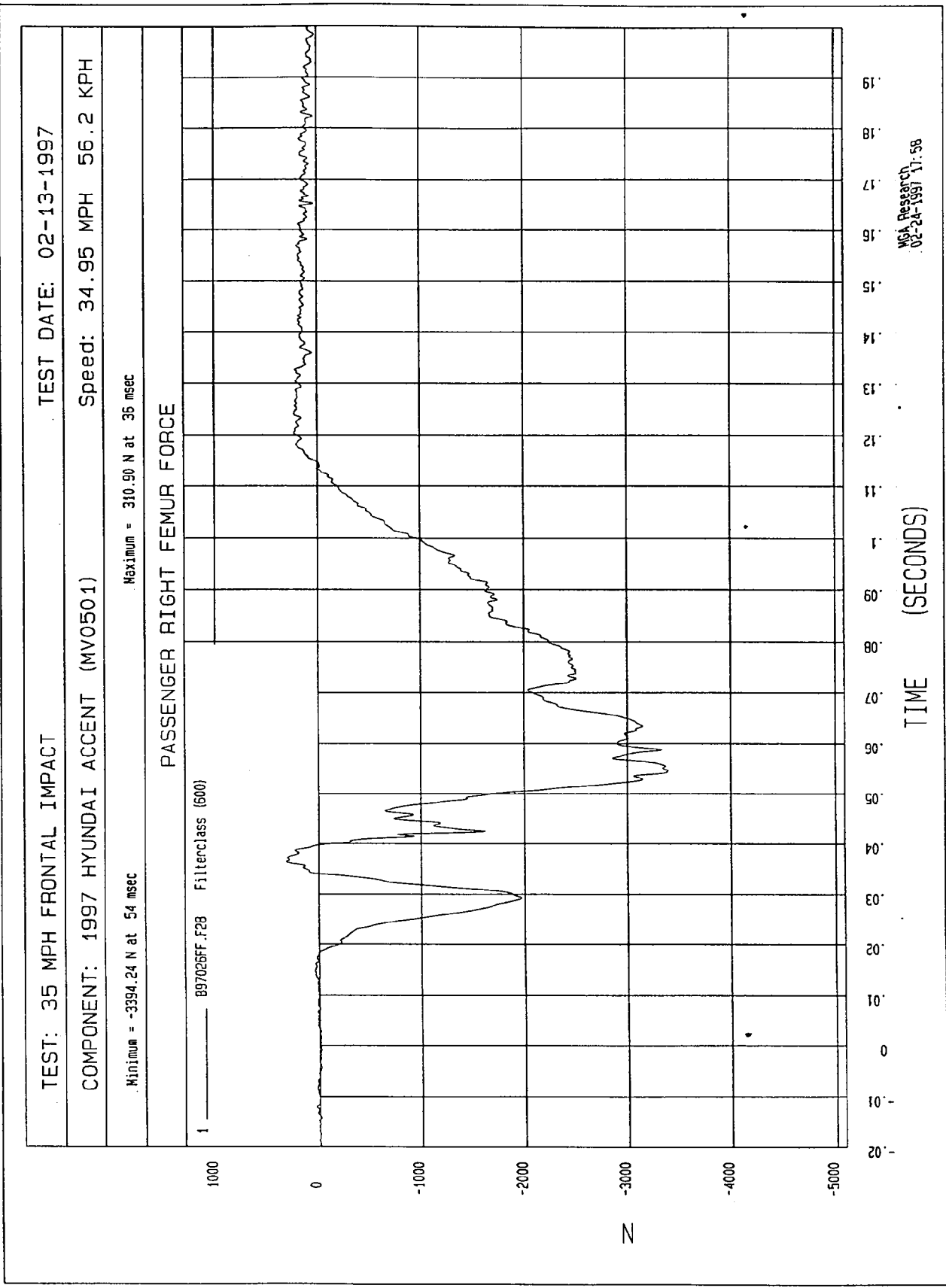
TEST: 35 MPH FRONTAL IMPACT	TEST DATE: 02-13-1997
COMPONENT: 1997 HYUNDAI ACCENT (MV0501)	Speed: 34.95 MPH 56.2 KPH
Minimum = -3191.9 N at 53 msec	Maximum = 463.59 N at 45 msec



TIME (SECONDS)

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

NGA Research
02-2A-1997 17:58

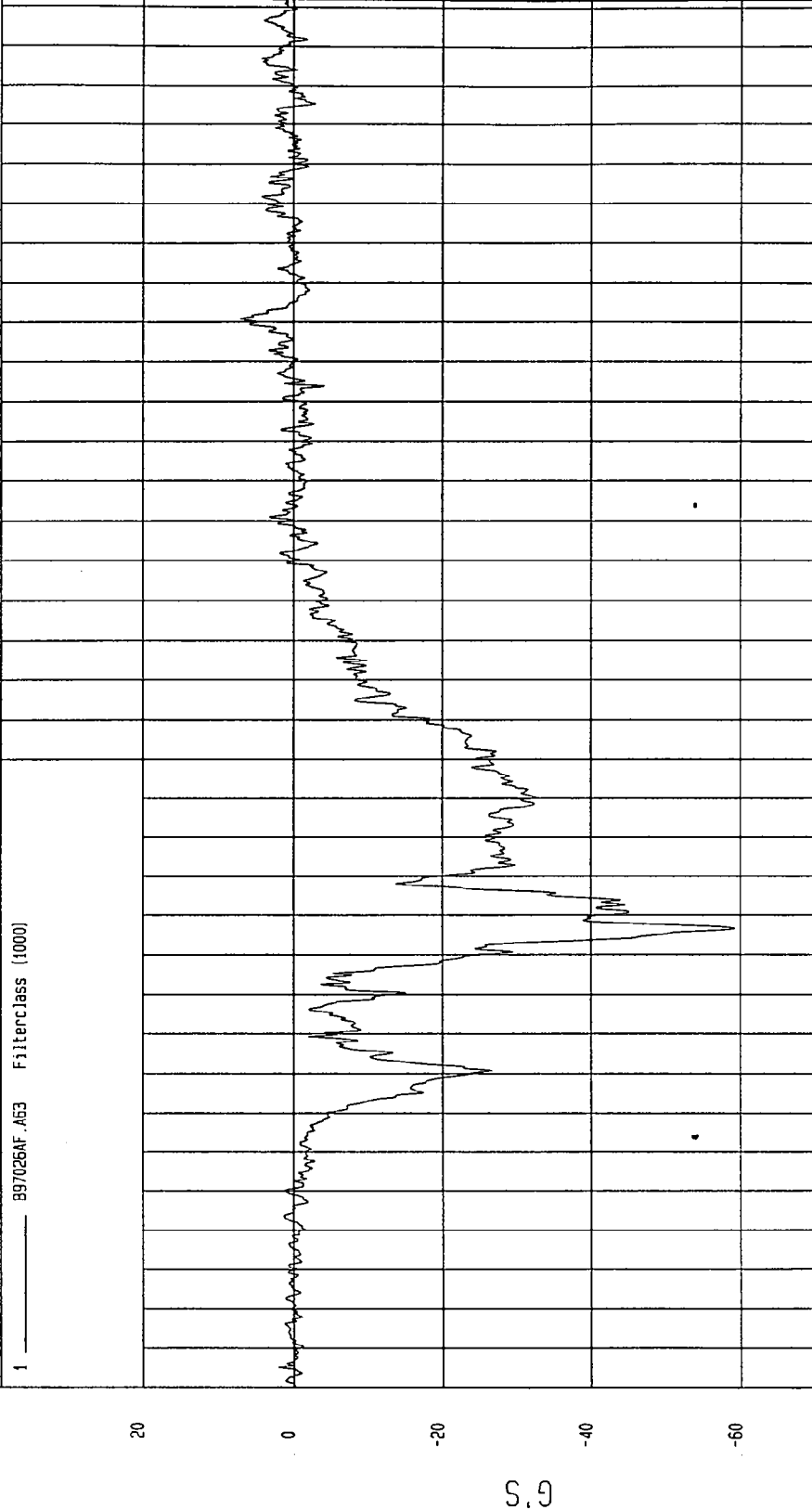


TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

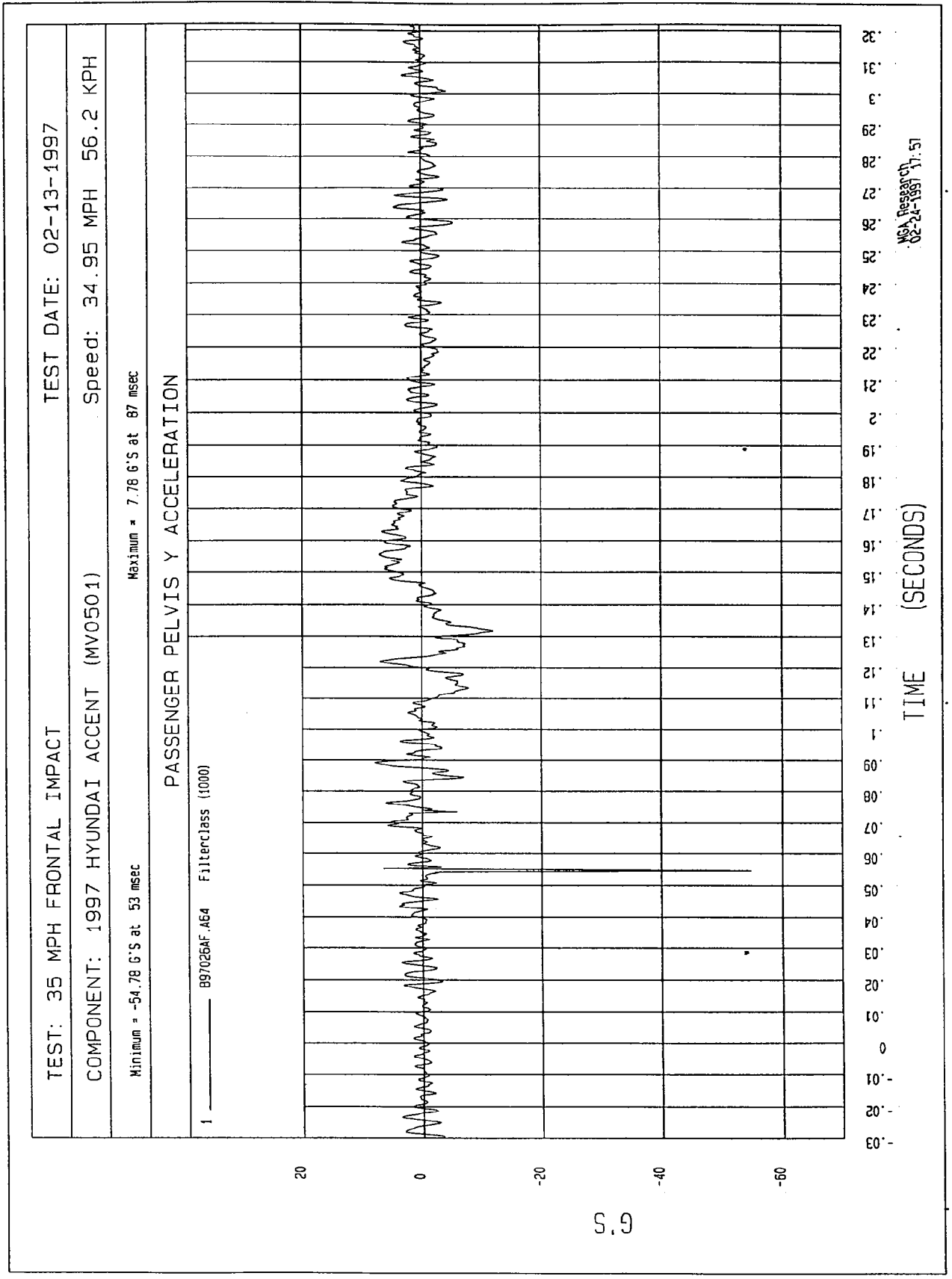
Minimum = -59.18 G'S at 85 msec Maximum = 6.88 G'S at 239 msec

PASSENGER PELVIS X ACCELERATION



TIME (SECONDS)

NGA Research
02-2A-1997 11:57



TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

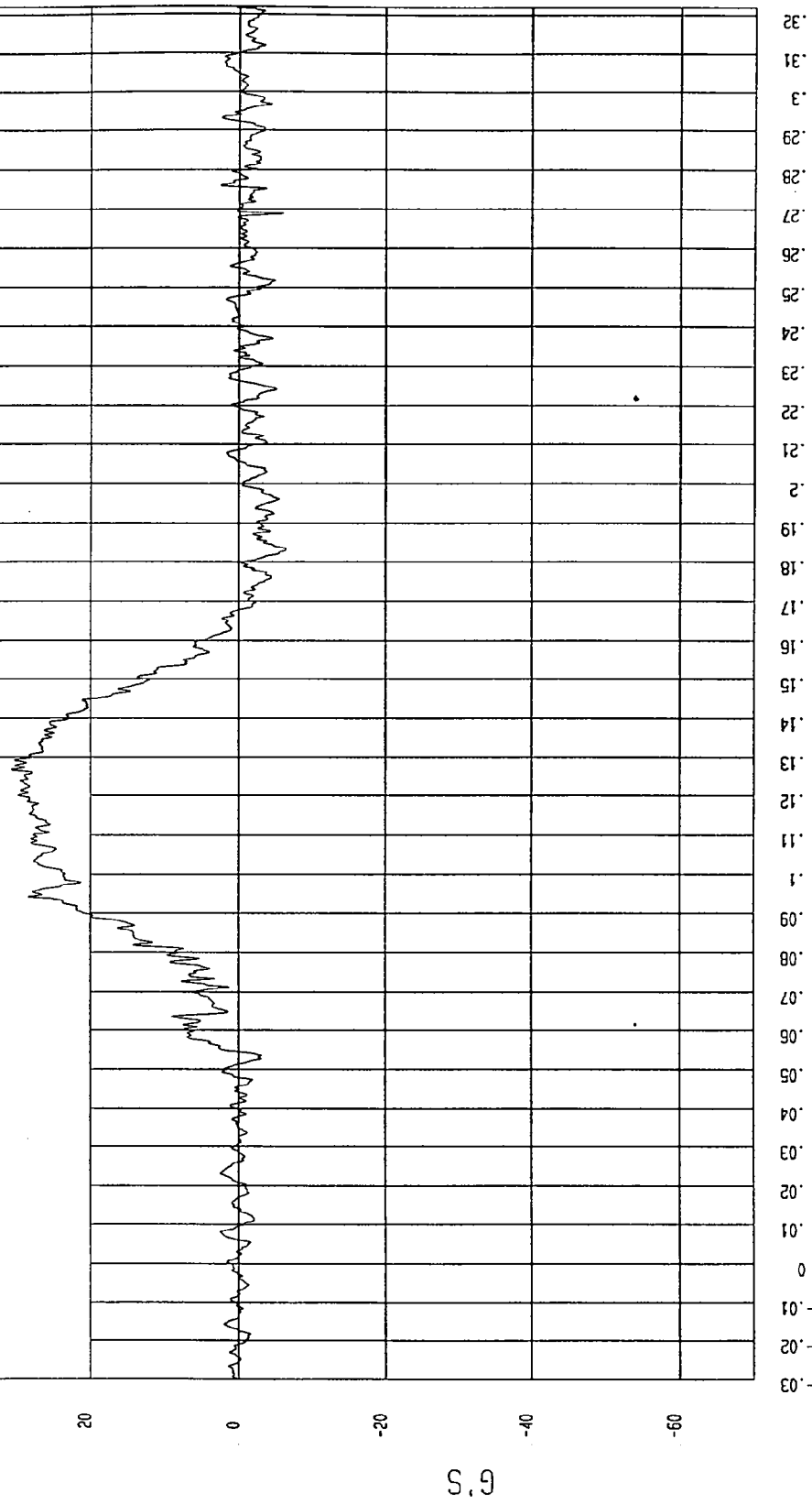
COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -6.56 G'S at 181 msec

Maximum = 30.83 G'S at 125 msec

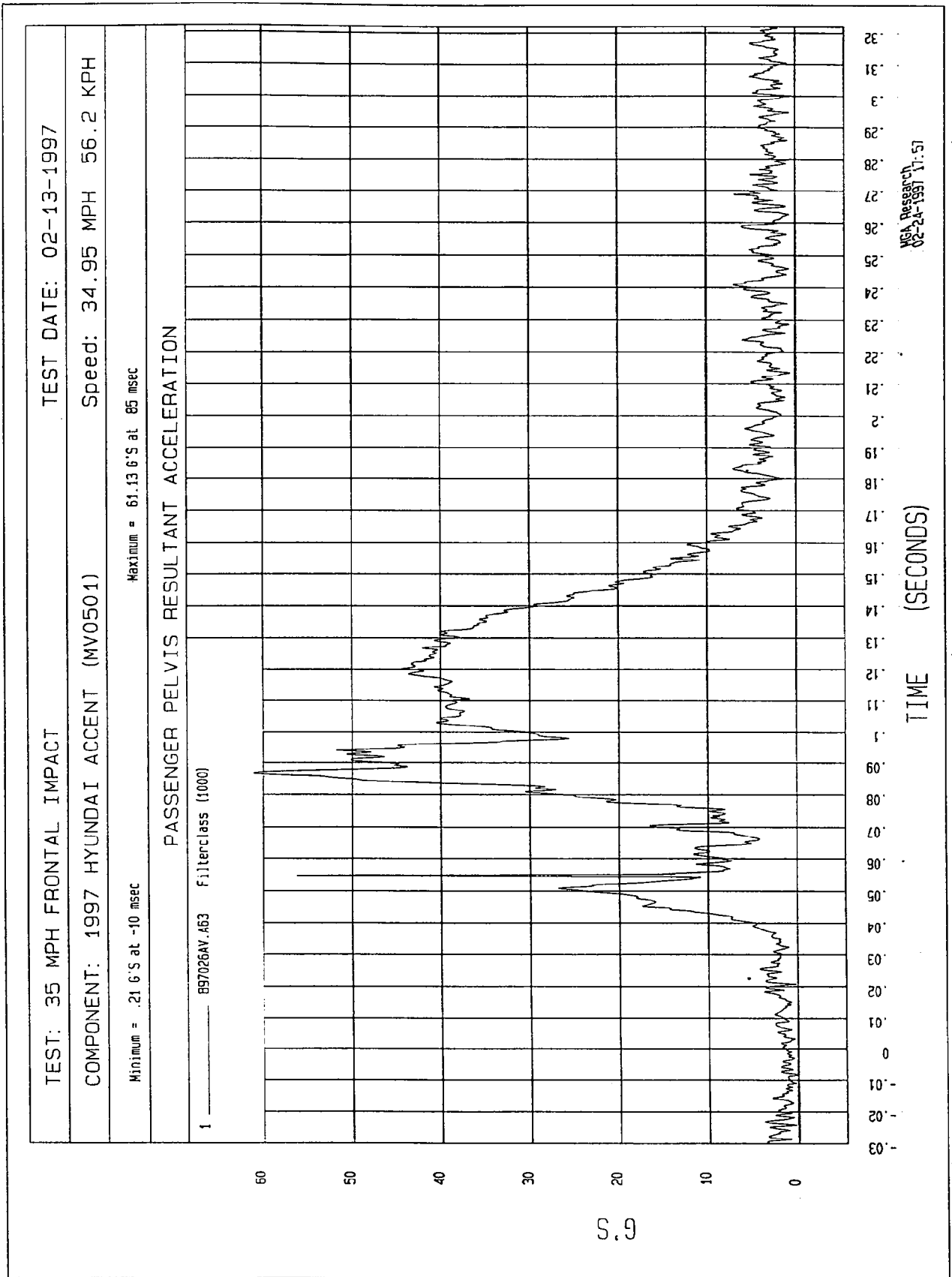
PASSENGER PELVIS Z ACCELERATION

1 ——— B97025AF.A65 Filterclass (1000)



NCE Research
02-24-1997 17:57

TIME (SECONDS)



TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

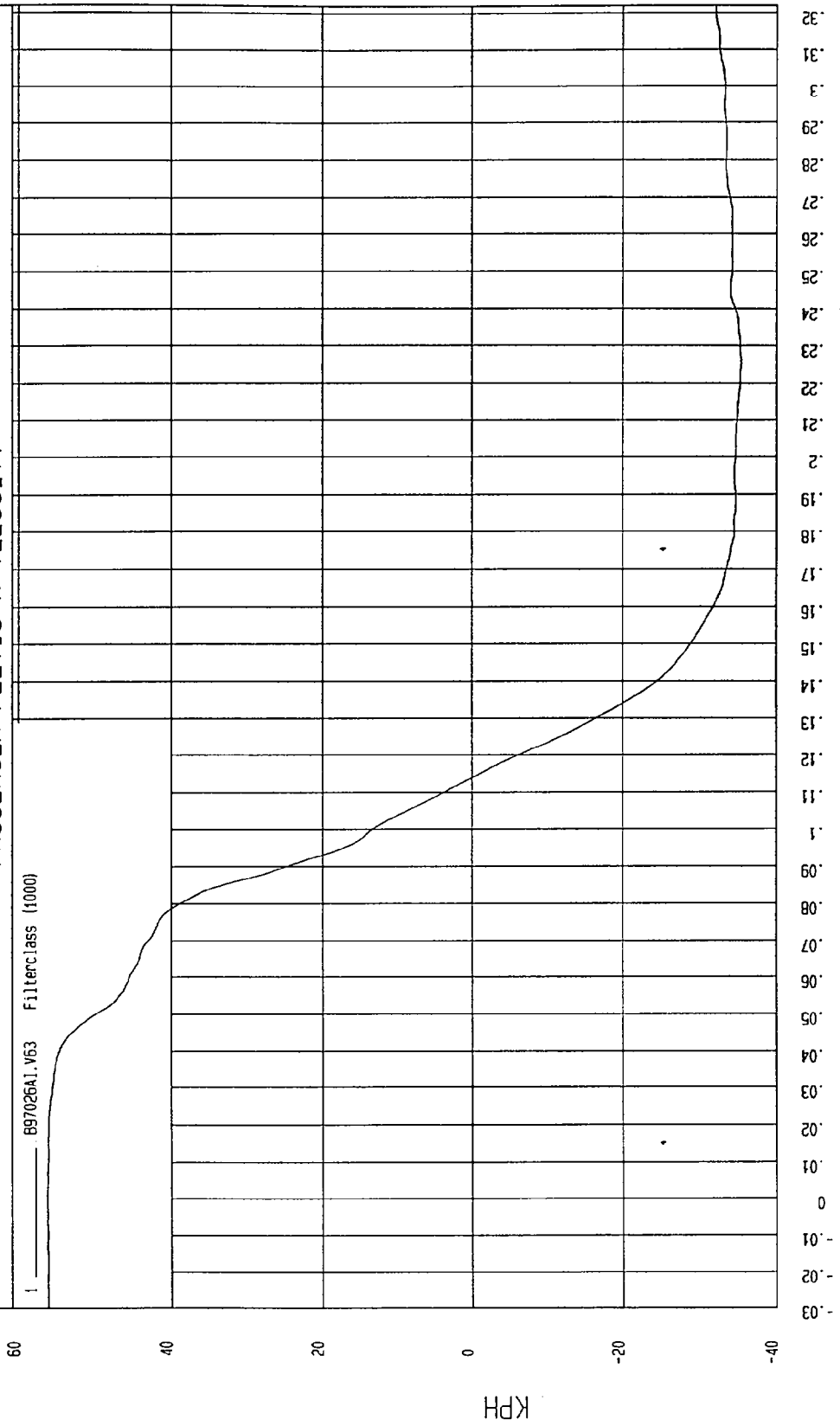
COMPONENT: 1997 HYUNDAI ACCENT (MV0501)

Speed: 34.95 MPH 56.2 KPH

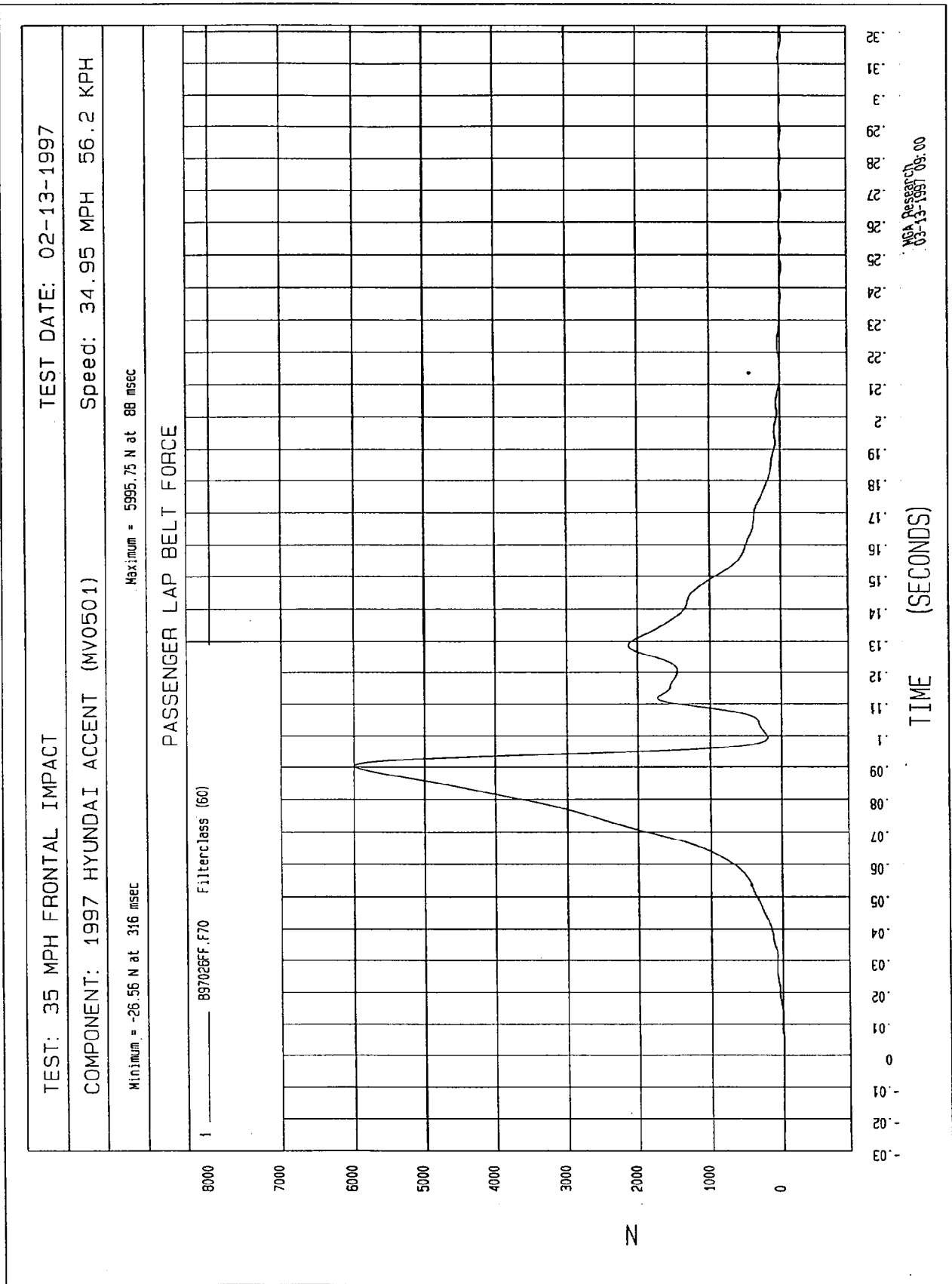
Minimum = -35.44 KPH at 224 msec

Maximum = 56.31 KPH at 0 msec

PASSENGER PELVIS X VELOCITY

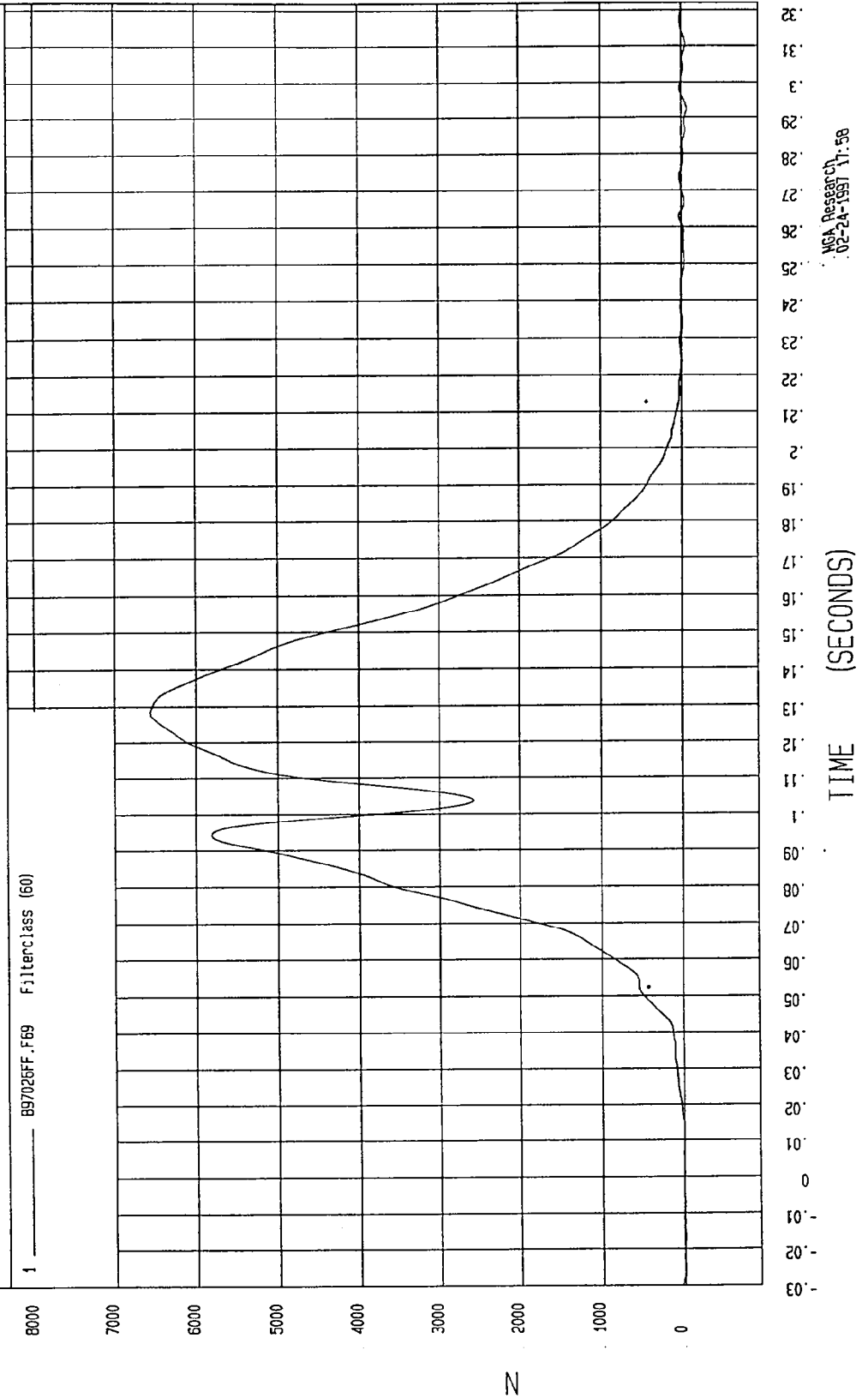


WCA Research
02-24-1997 18:06



TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997
COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH
Minimum = -64.24 N at 290 msec Maximum = 6571.37 N at 126 msec

PASSENGER SHOULDER BELT FORCE

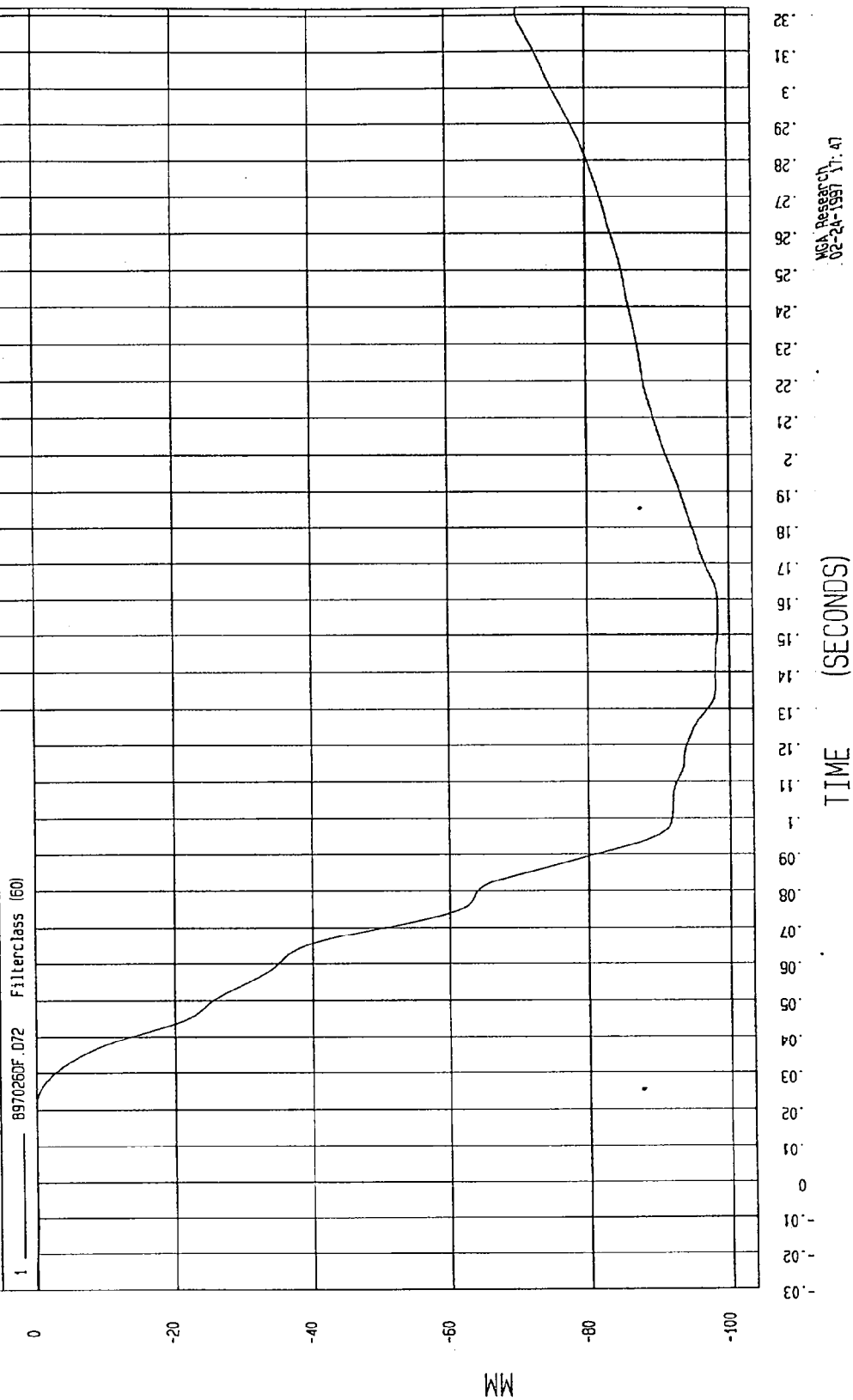


TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -98.41 MM at 149 msec
Maximum = .21 MM at -28 msec

PASSENGER BELT SPOOLLOUT



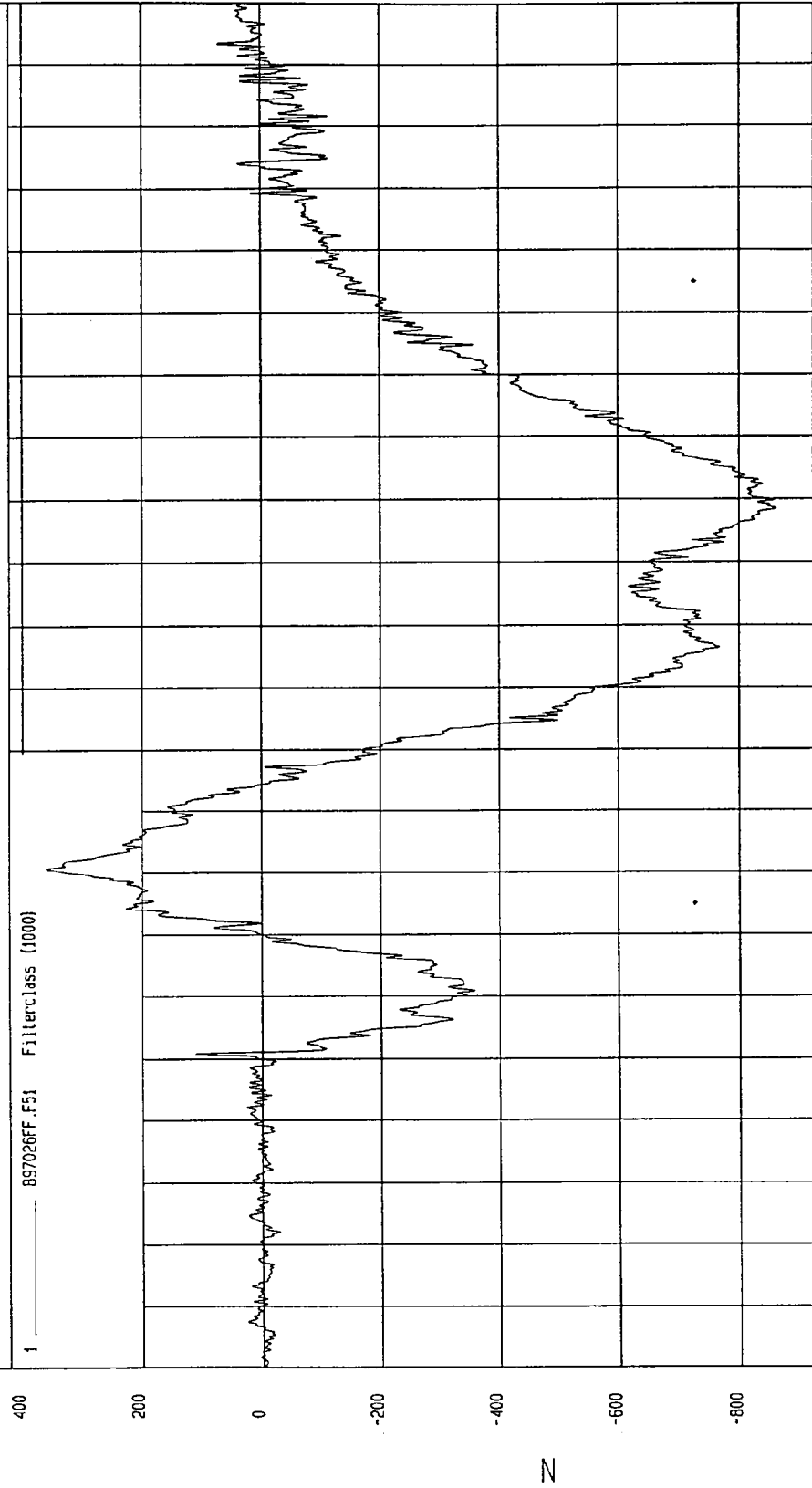
TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

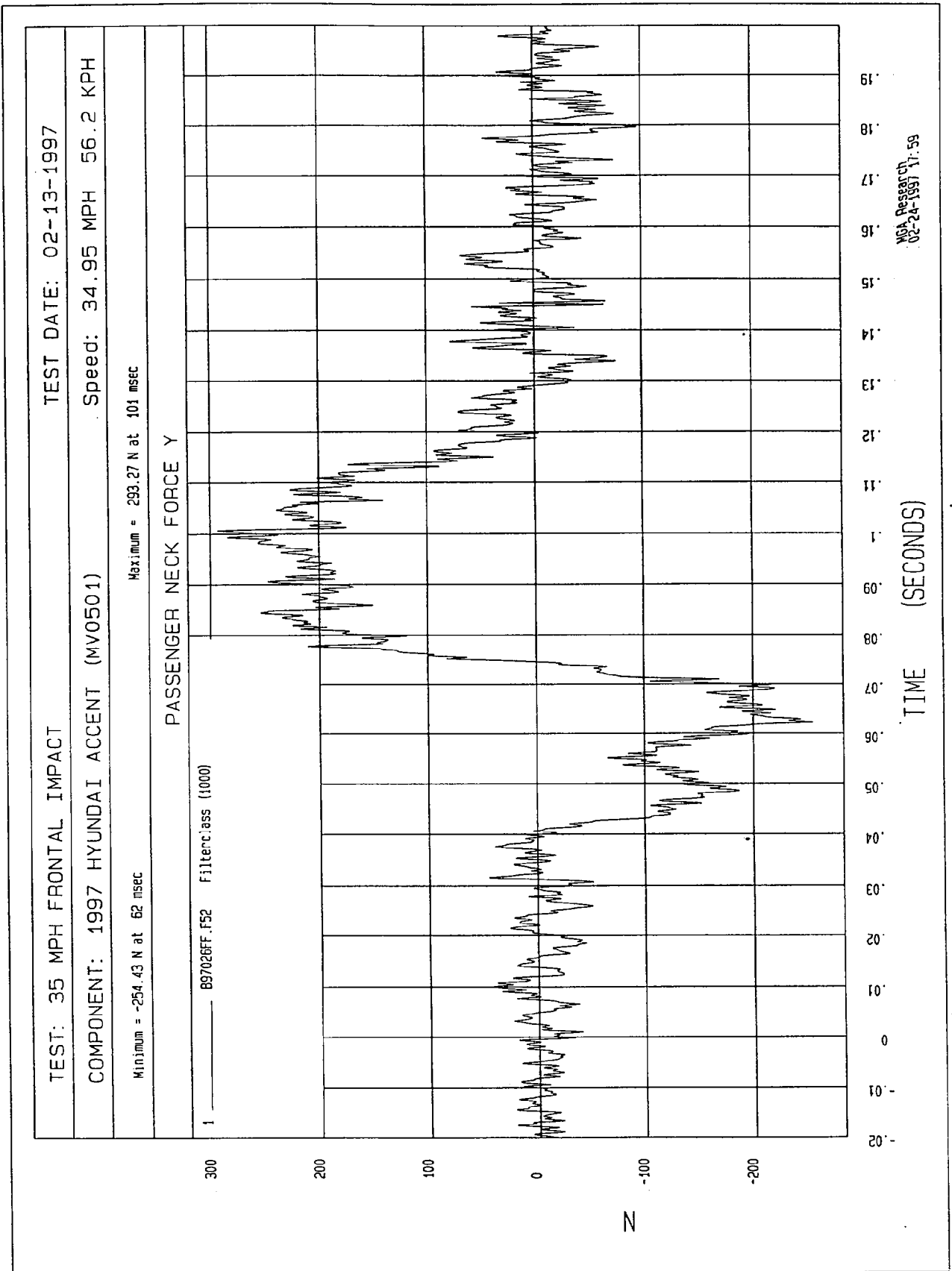
Minimum = -860.16 N at 118 msec Maximum = 360.80 N at 61 msec

PASSENGER NECK FORCE X



MCA Research
02-24-1997 17:59

TIME (SECONDS)



TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

Speed: 34.95 MPH 56.2 KPH

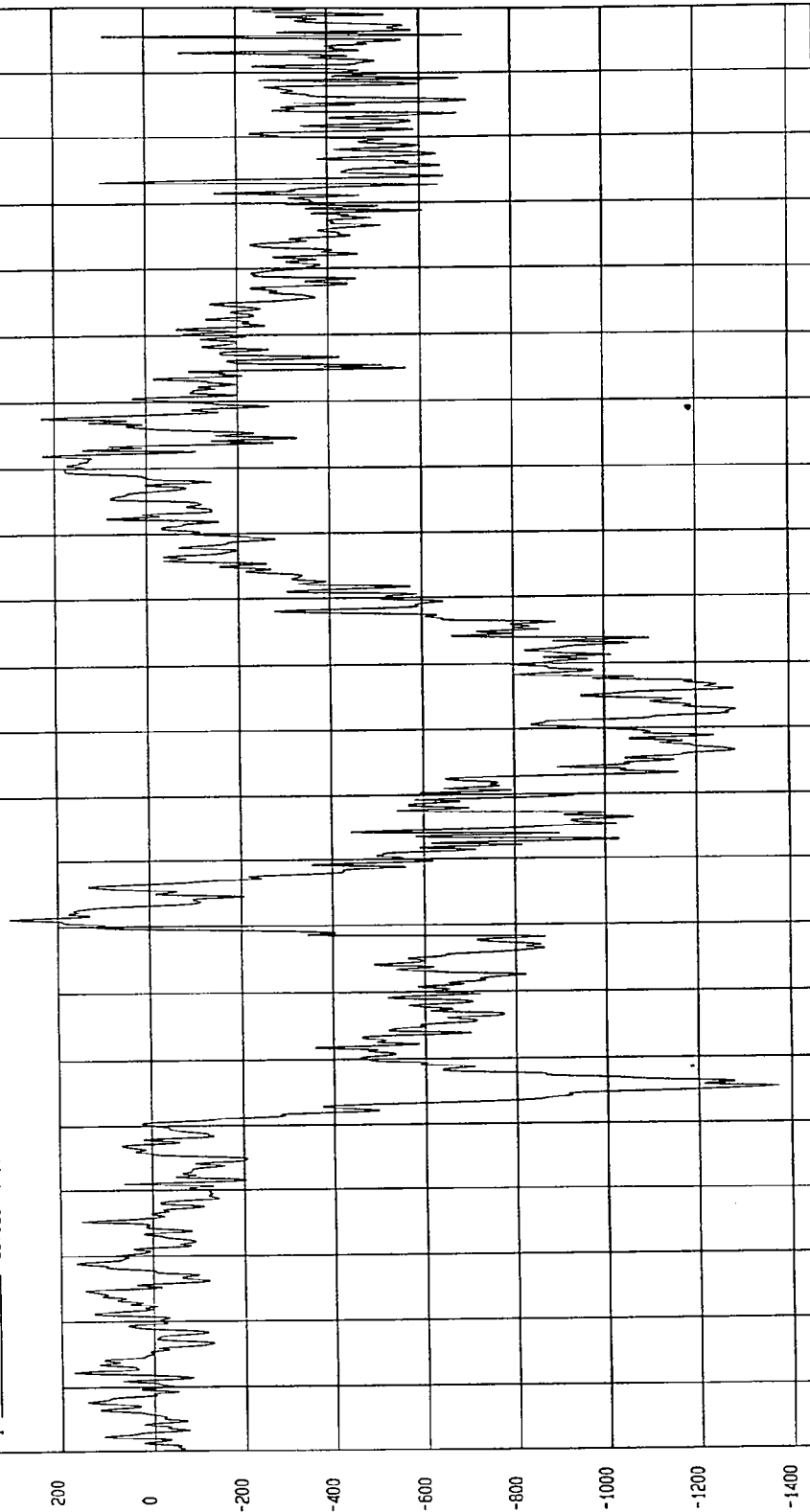
COMPONENT: 1997 HYUNDAI ACCENT (MV0501)

Maximum = 304.73 N at 61 msec

Minimum = -1372.04 N at 35 msec

PASSENGER NECK FORCE Z

1 ——— 897026FF.F53 Filterclass (1000)



MSA Research
02-24-1997 17:59

TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501)

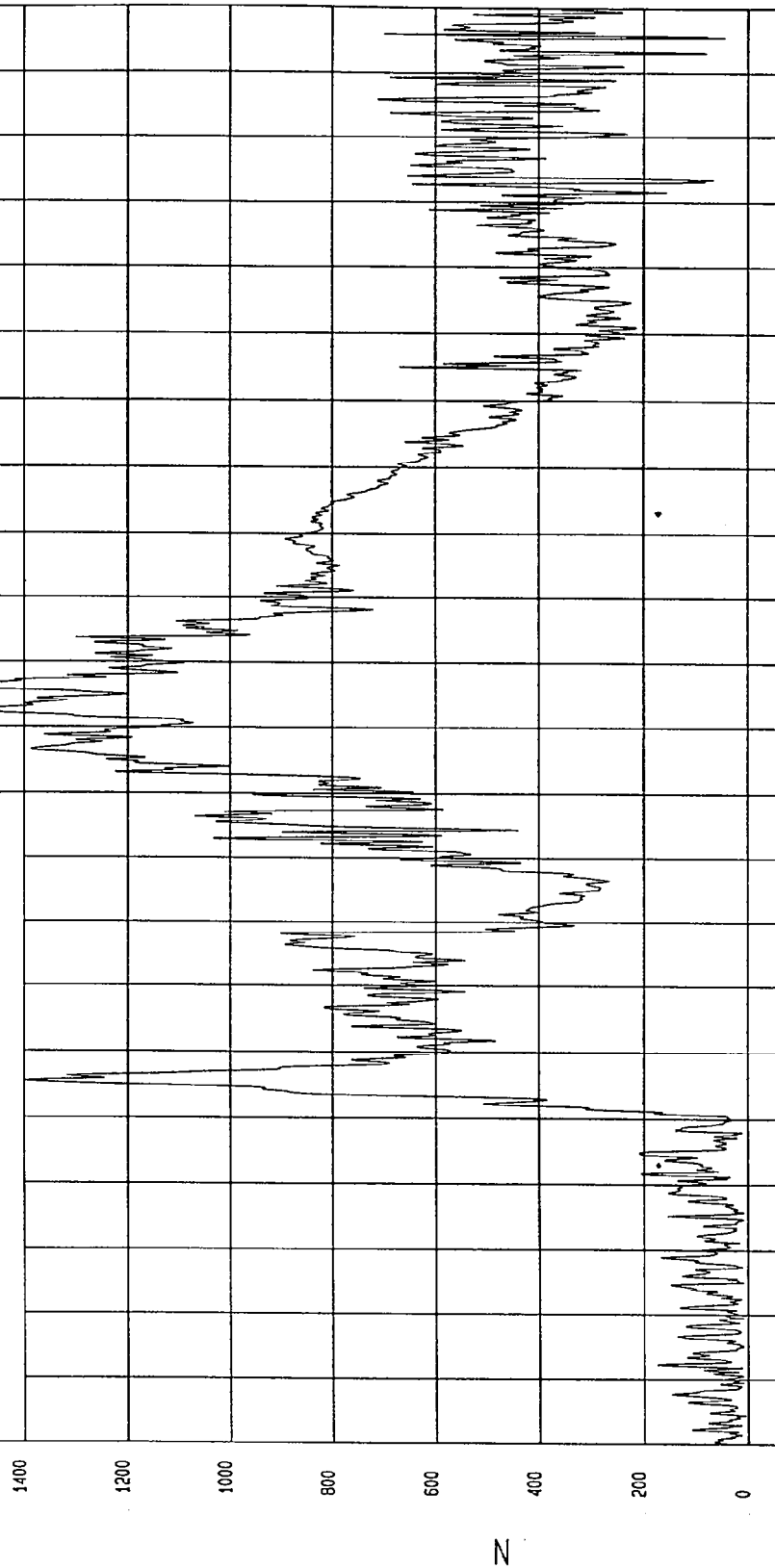
Speed: 34.95 MPH 56.2 KPH

Minimum = 5.78 N at -15 msec

Maximum = 1493.85 N at 96 msec

PASSENGER NECK FORCE RESULTANT

1 ——— B97026FV.F51 Filterclass (1000)



MCA Research
02-24-1997 11:59

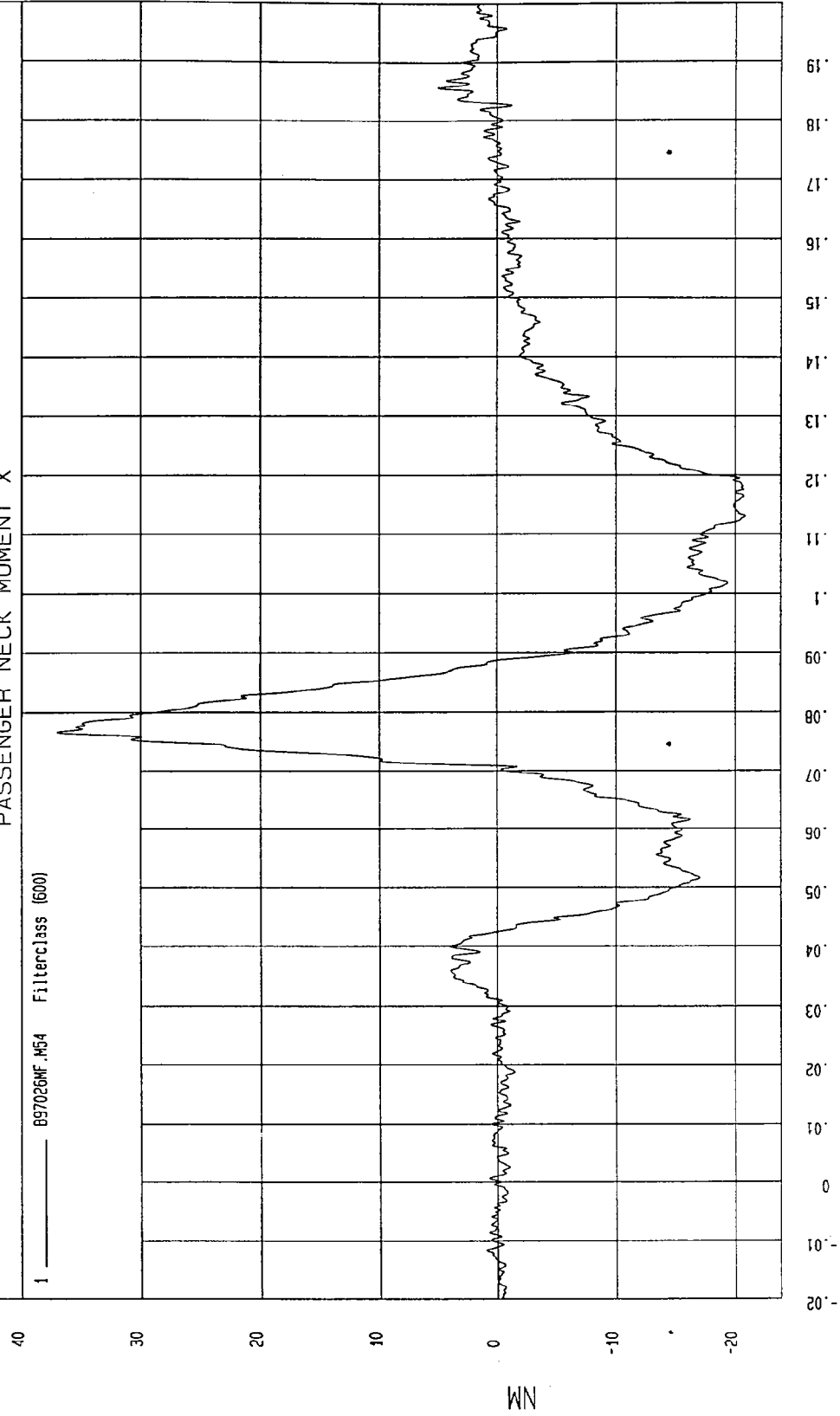
TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

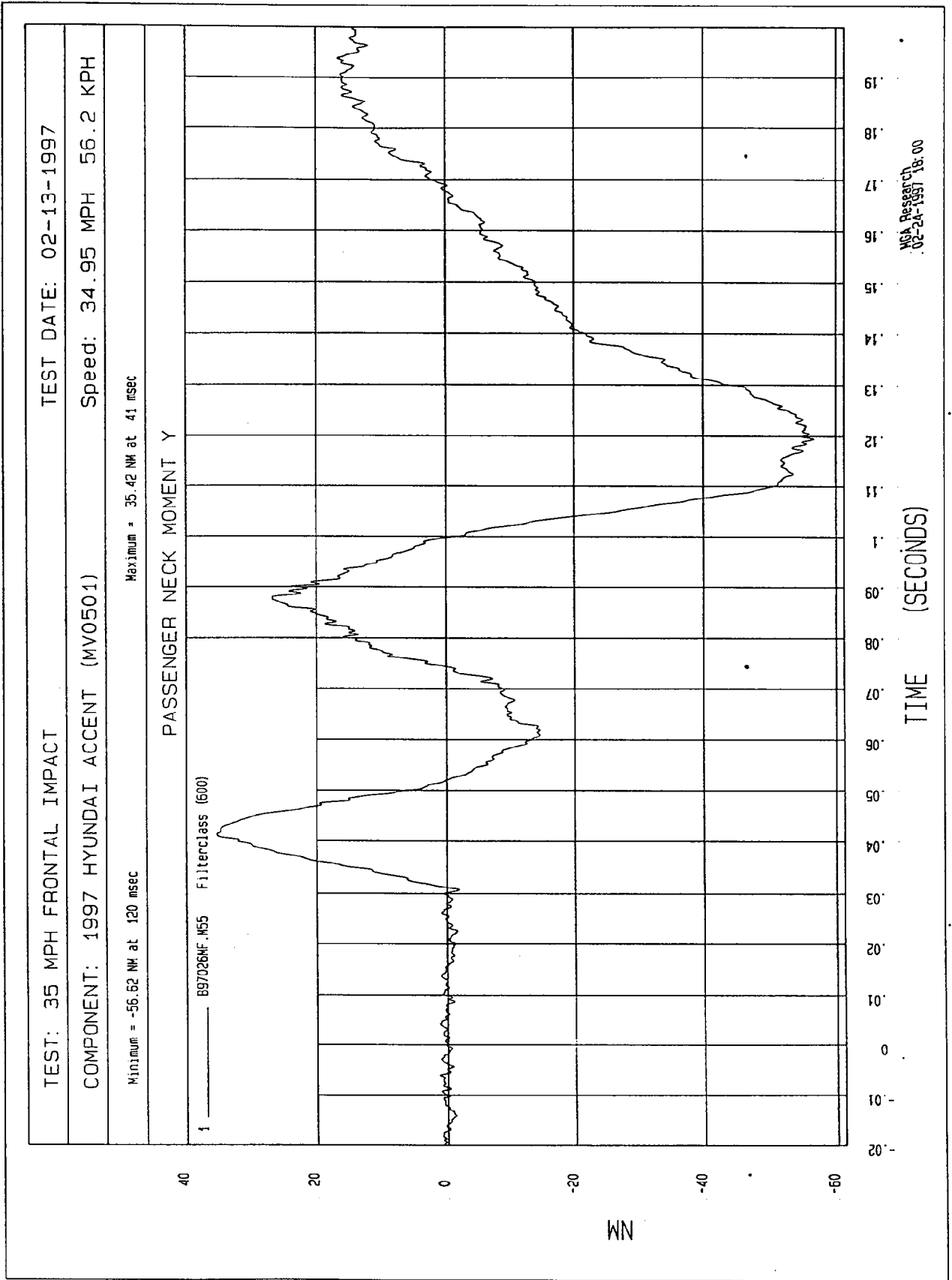
Minimum = -20.91 NM at 113 msec Maximum = 37.14 NM at 77 msec

PASSENGER NECK MOMENT X

1 ——— B97026MF.M54 Filterclass (600)



WGA Research
02-24-1997 17:59



TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

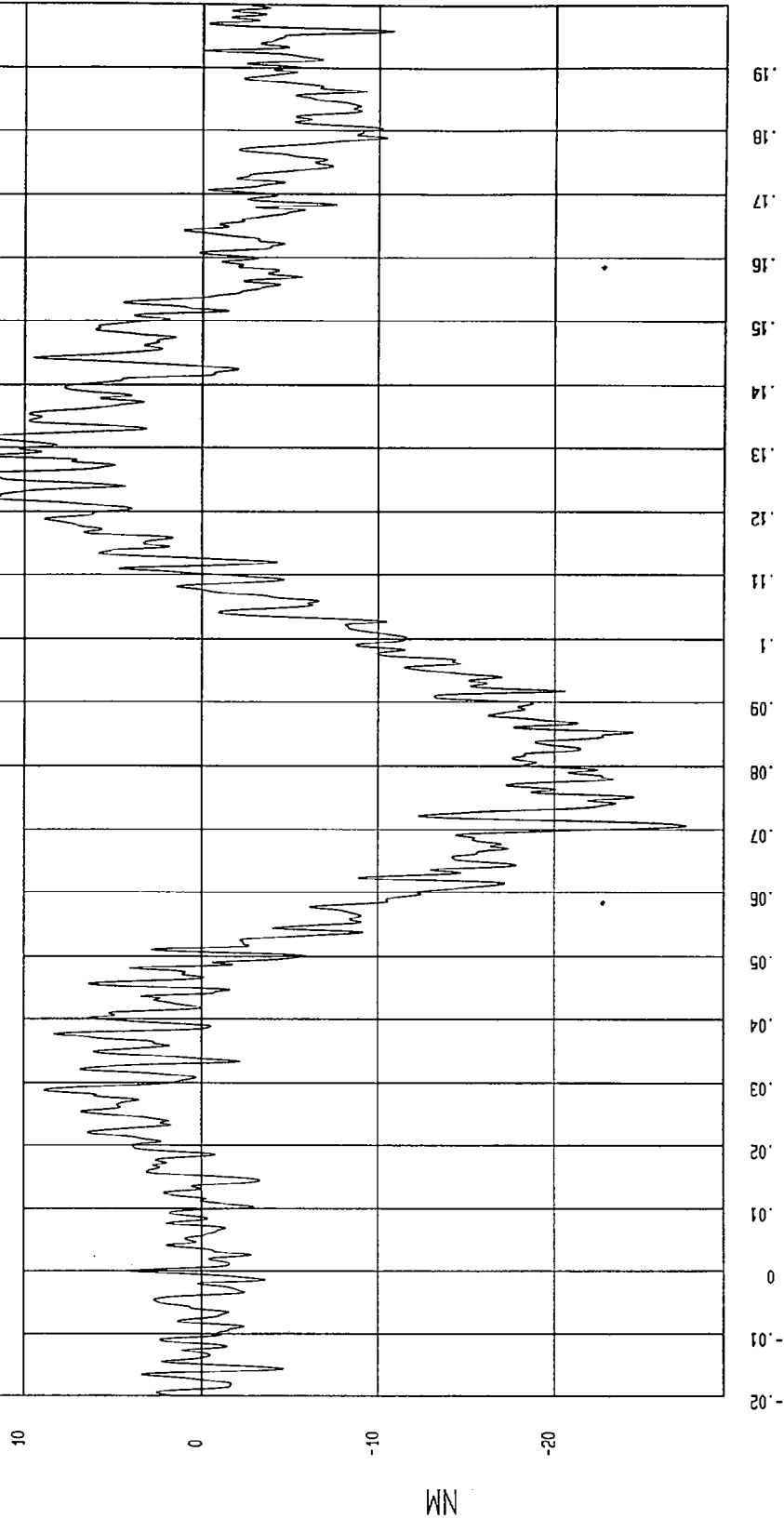
COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -27.36 NM at 71 msec

Maximum = 14.58 NM at 126 msec

PASSENGER NECK MOMENT Z

1 897026NF.M56 Filterclass (600)



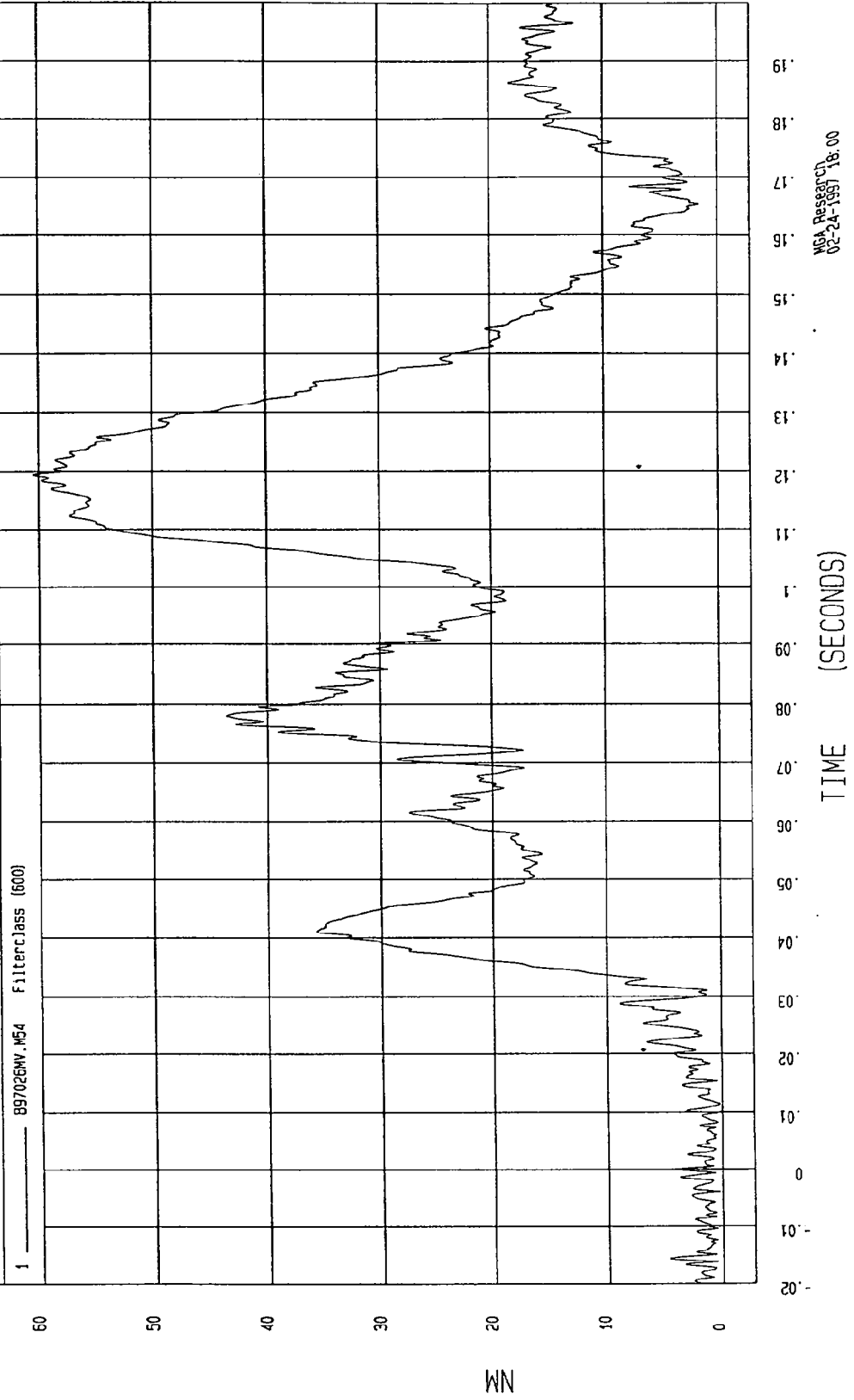
MEV Research
02-24-1997 18:00

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = .18 NM at 11 msec Maximum = 60.49 NM at 120 msec

PASSENGER NECK MOMENT RESULTANT



TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

Speed: 34.95 MPH 56.2 KPH

COMPONENT: 1997 HYUNDAI ACCENT (MV0501)

Minimum = -15.44 NM at 85 msec

Maximum = 77.87 NM at 44 msec

PASSENGER LEFT UPPER TIBIA MOMENT X

1 ——— B97026MF.M34 Filterclass (600)

80

60

40

20

0

-20

NM

19

18

17

16

15

14

13

12

11

10

09

08

07

06

05

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01

0

-01

-02

TIME (SECONDS)

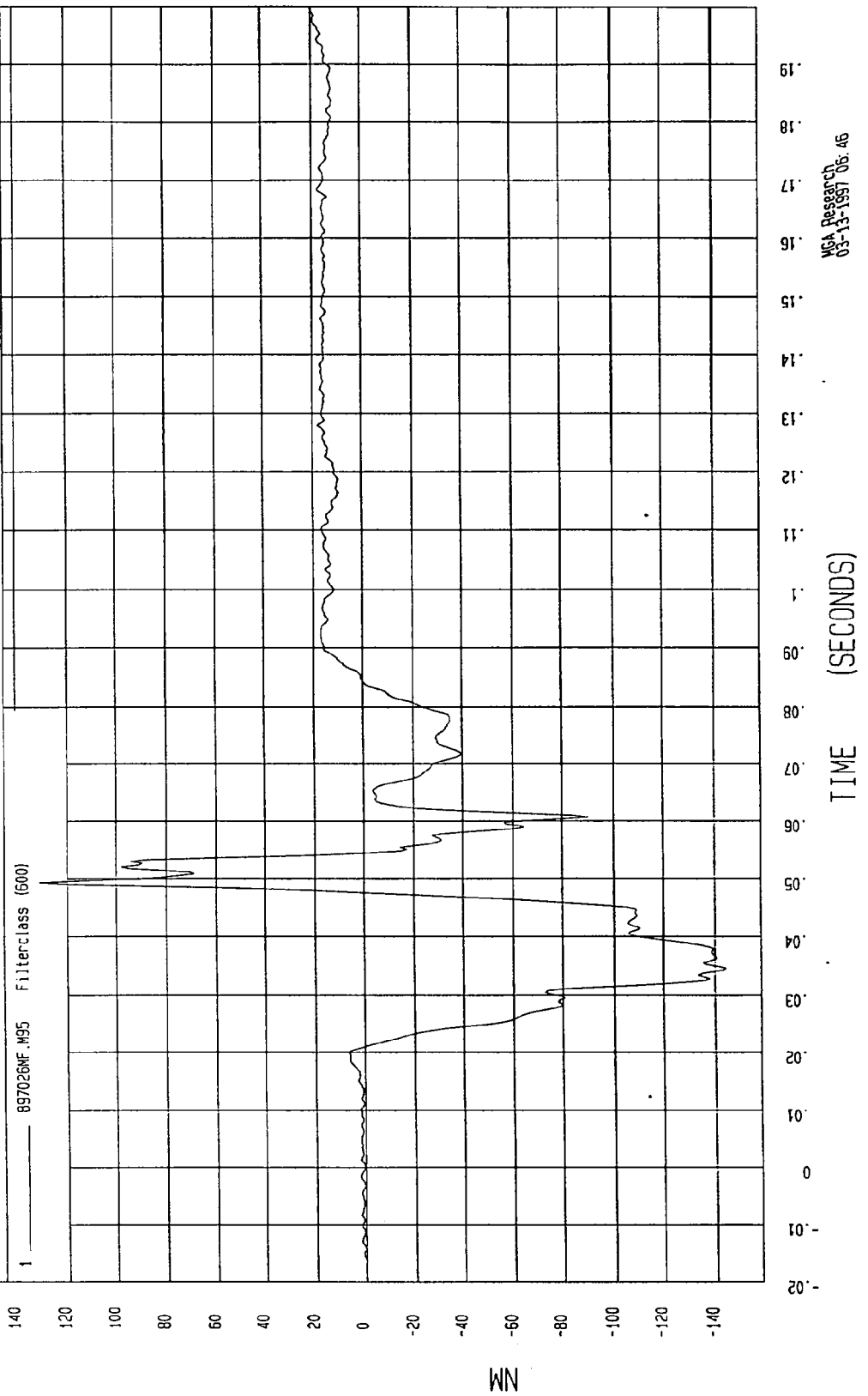
WCA Research
03-13-1997 06:45

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -144.27 NM at 34 msec Maximum = 130.94 NM at 49 msec

PASSENGER LEFT UPPER TIBIA MOMENT Y



TEST DATE: 02-13-1997

TEST: 35 MPH FRONTAL IMPACT

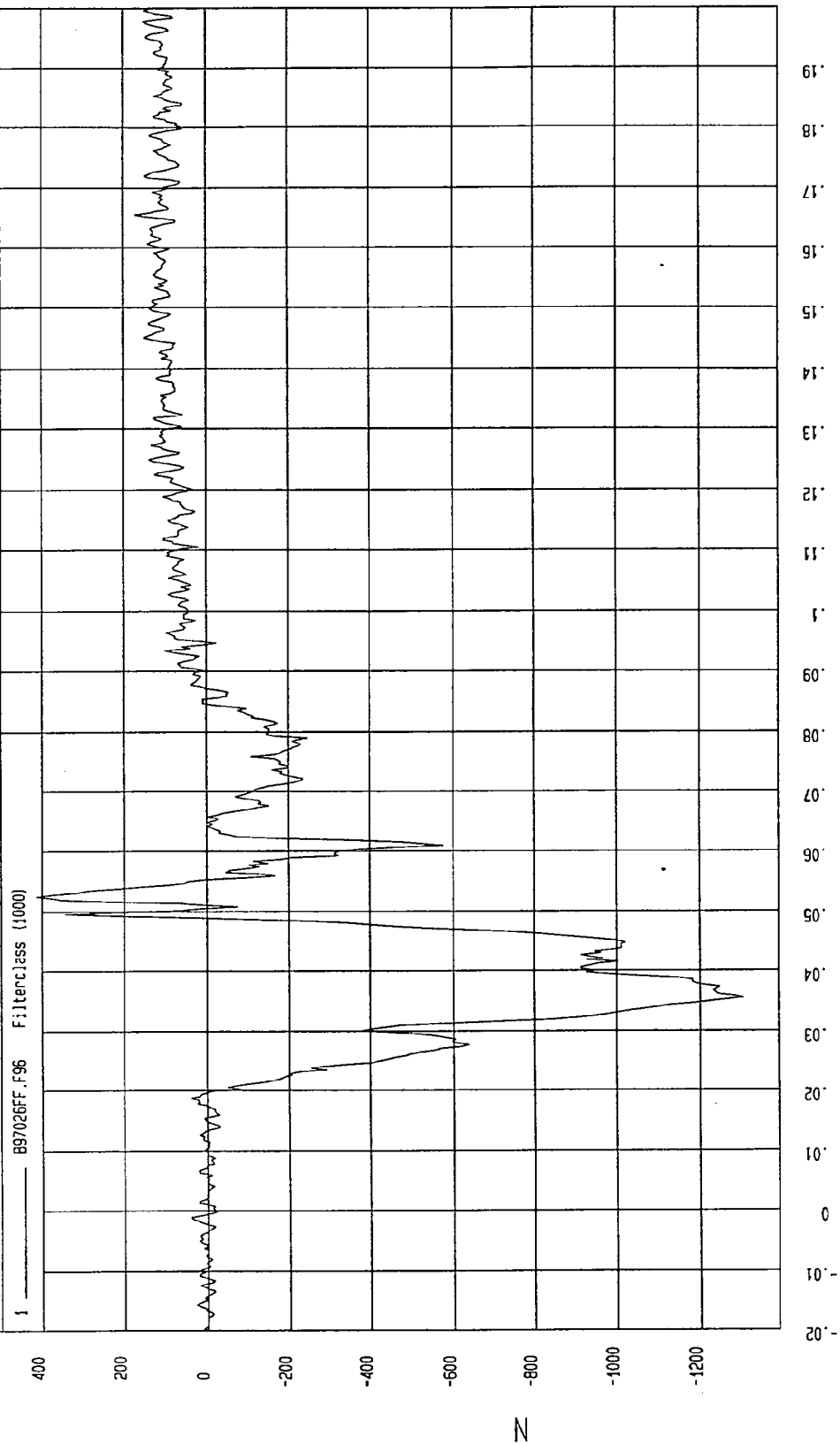
Speed: 34.95 MPH 56.2 KPH

COMPONENT: 1997 HYUNDAI ACCENT (MVO501)

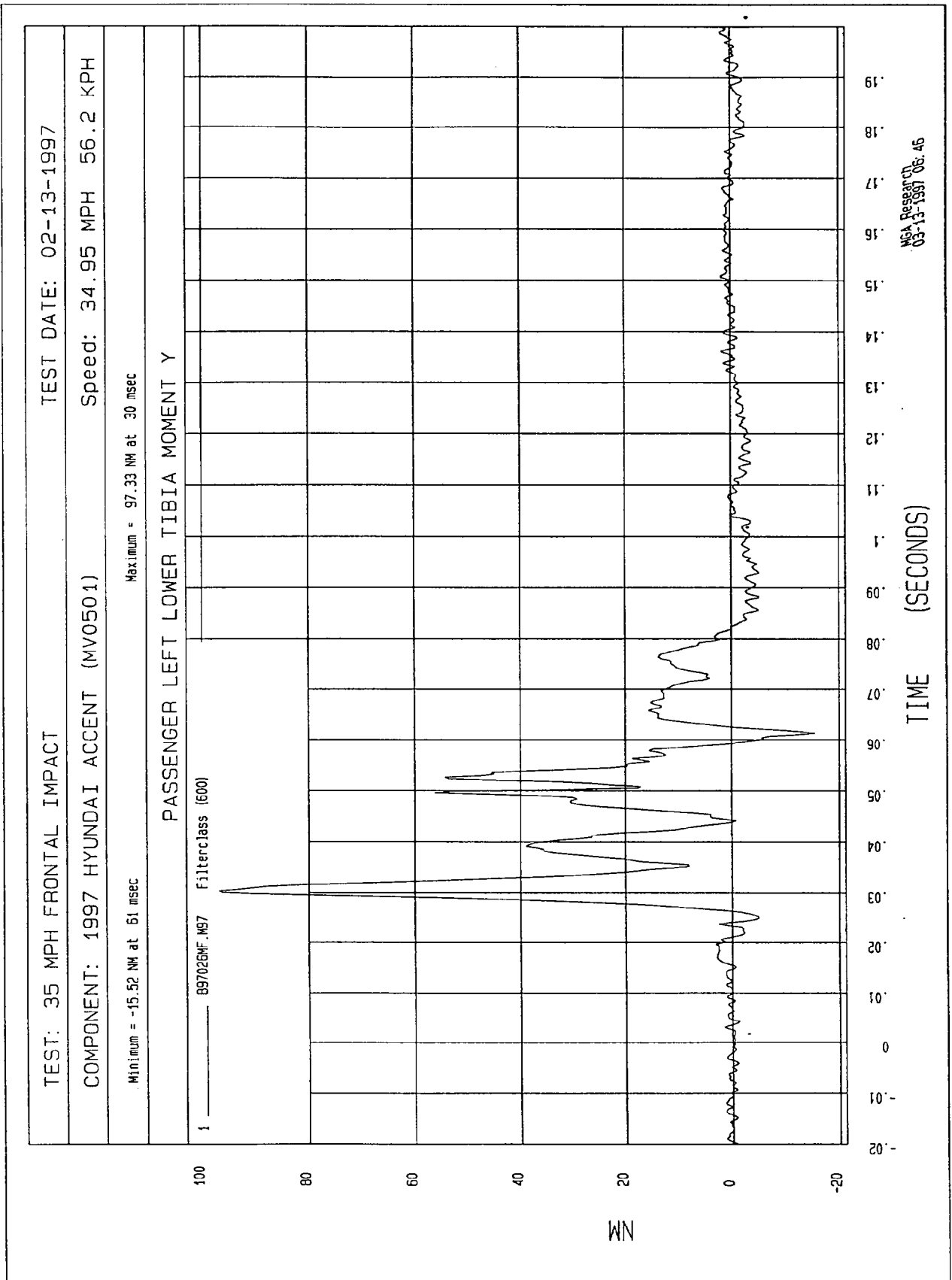
Maximum = 414.36 N at 53 msec

Minimum = -1304.02 N at 36 msec

PASSENGER LEFT LOWER TIBIA FORCE X



MSA Research
03-13-1997 06:46



TEST: 35 MPH FRONTAL IMPACT

TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501)

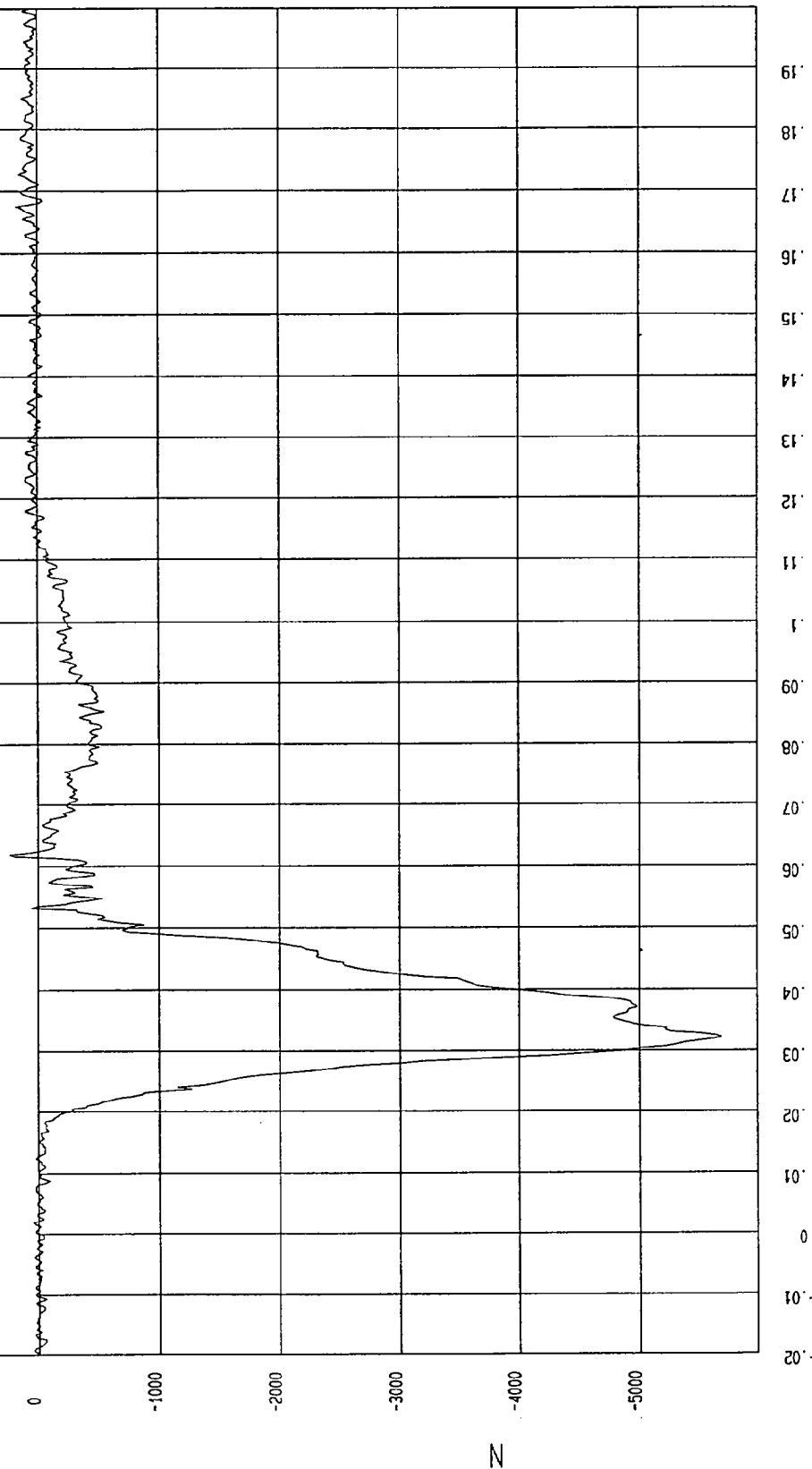
Speed: 34.95 MPH 56.2 KPH

Minimum = -5668.57 N at 32 msec

Maximum = 278.59 N at 62 msec

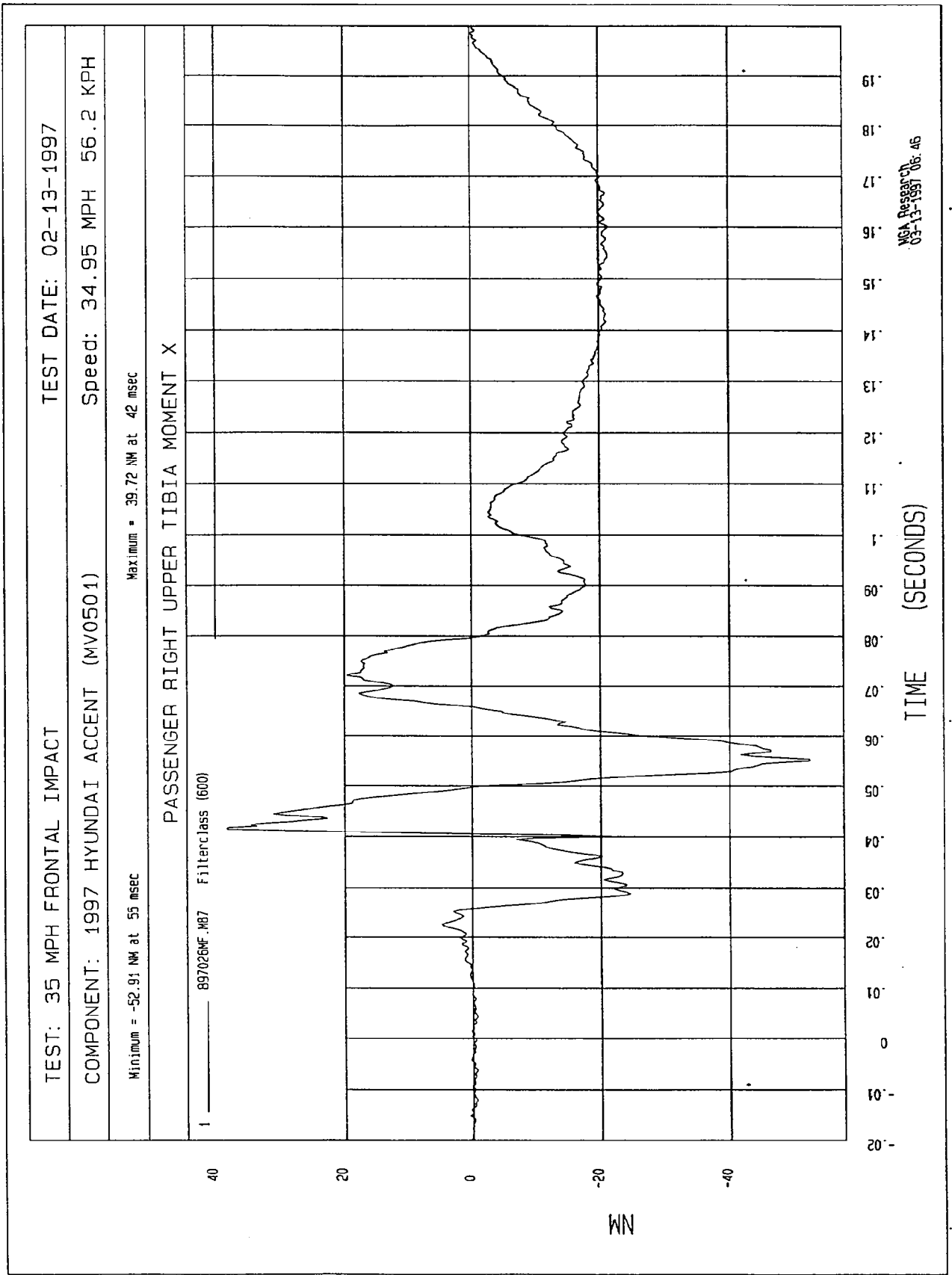
PASSENGER LEFT LOWER TIBIA FORCE Z

1 B97026FF.F98 Filterclass (1000)



WGA Research
03-13-1997 08:46

TIME (SECONDS)

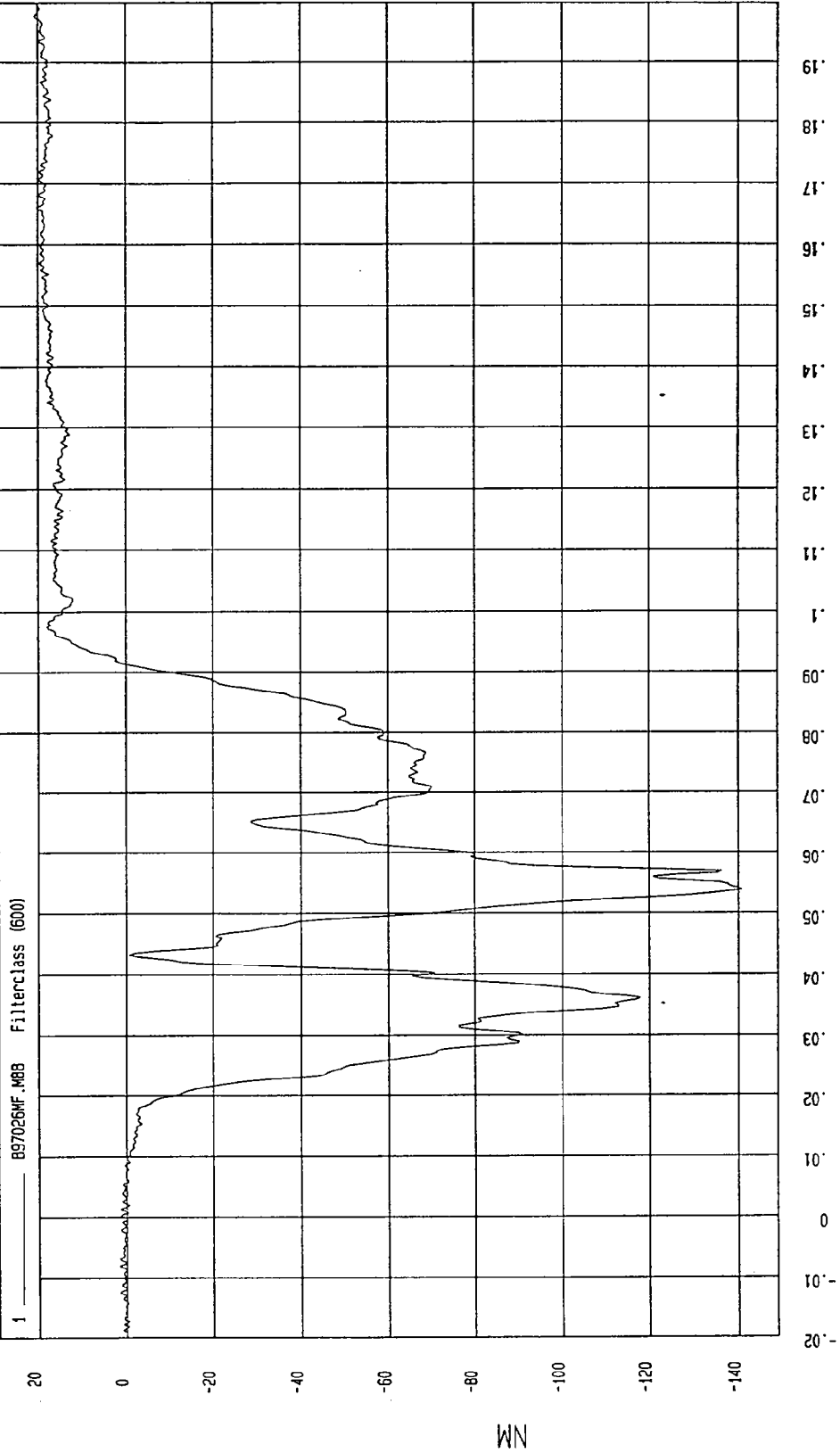


TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

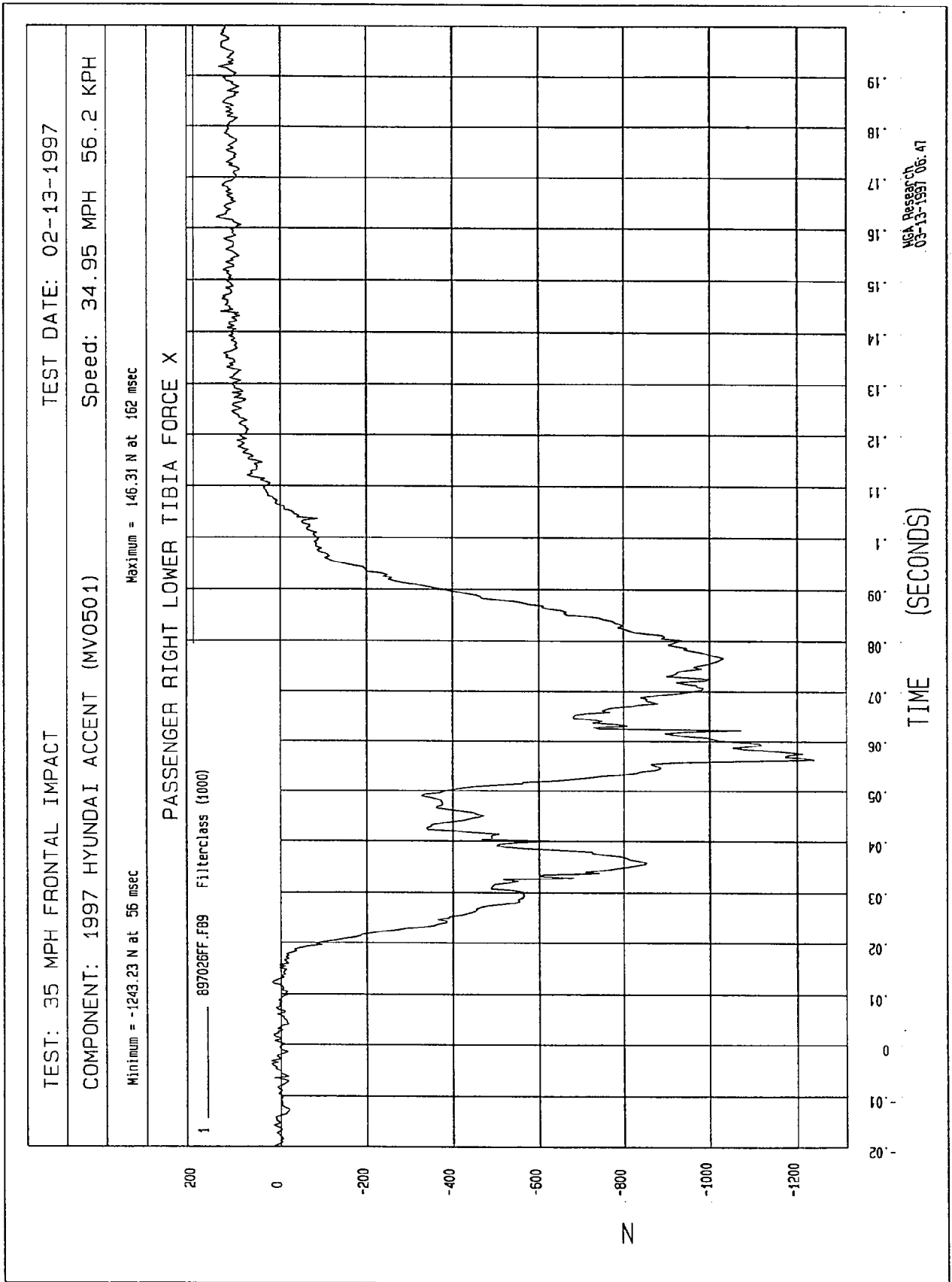
COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -140.85 NM at 54 msec Maximum = 20.83 NM at 198 msec

PASSENGER RIGHT UPPER TIBIA MOMENT Y



NSA Research
03-13-1997 06.47

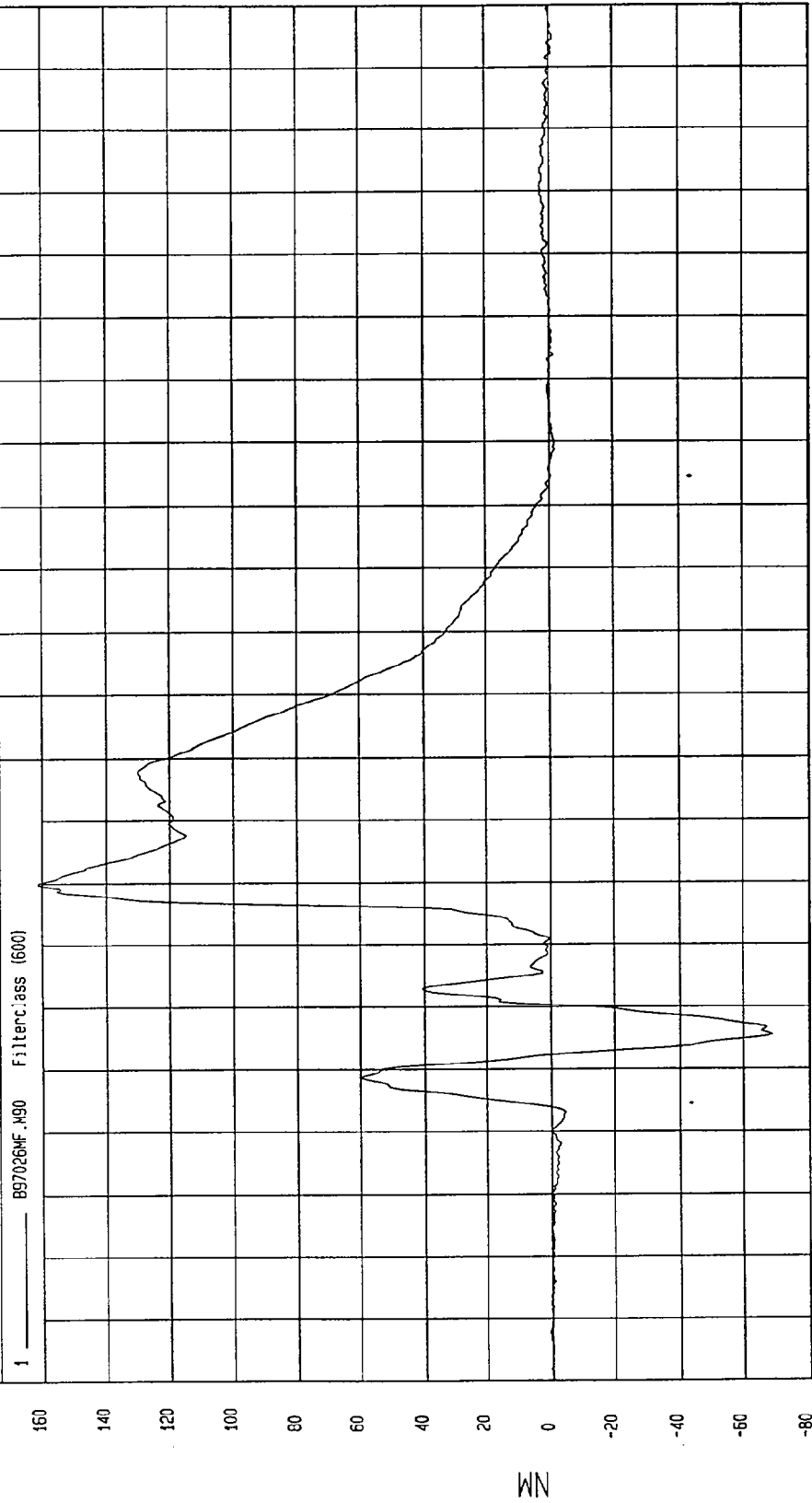


TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -68.84 NM at 36 msec Maximum = 161.78 NM at 60 msec

PASSENGER RIGHT LOWER TIBIA MOMENT Y

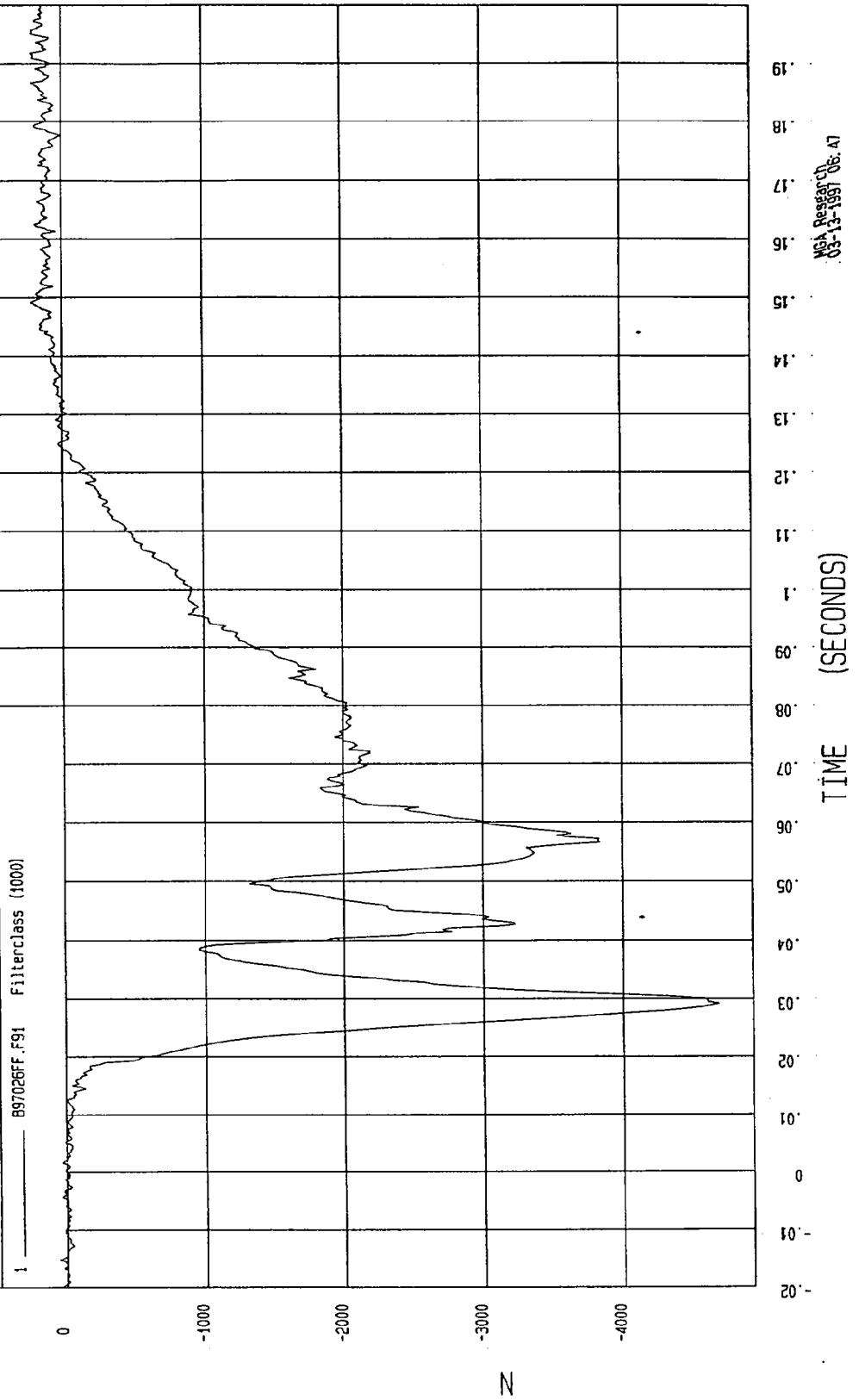


MOA Research
03-13-1997 08:47

TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997
COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -4681.51 N at 29 msec Maximum = 221.01 N at 187 msec

PASSENGER RIGHT LOWER TIBIA FORCE Z

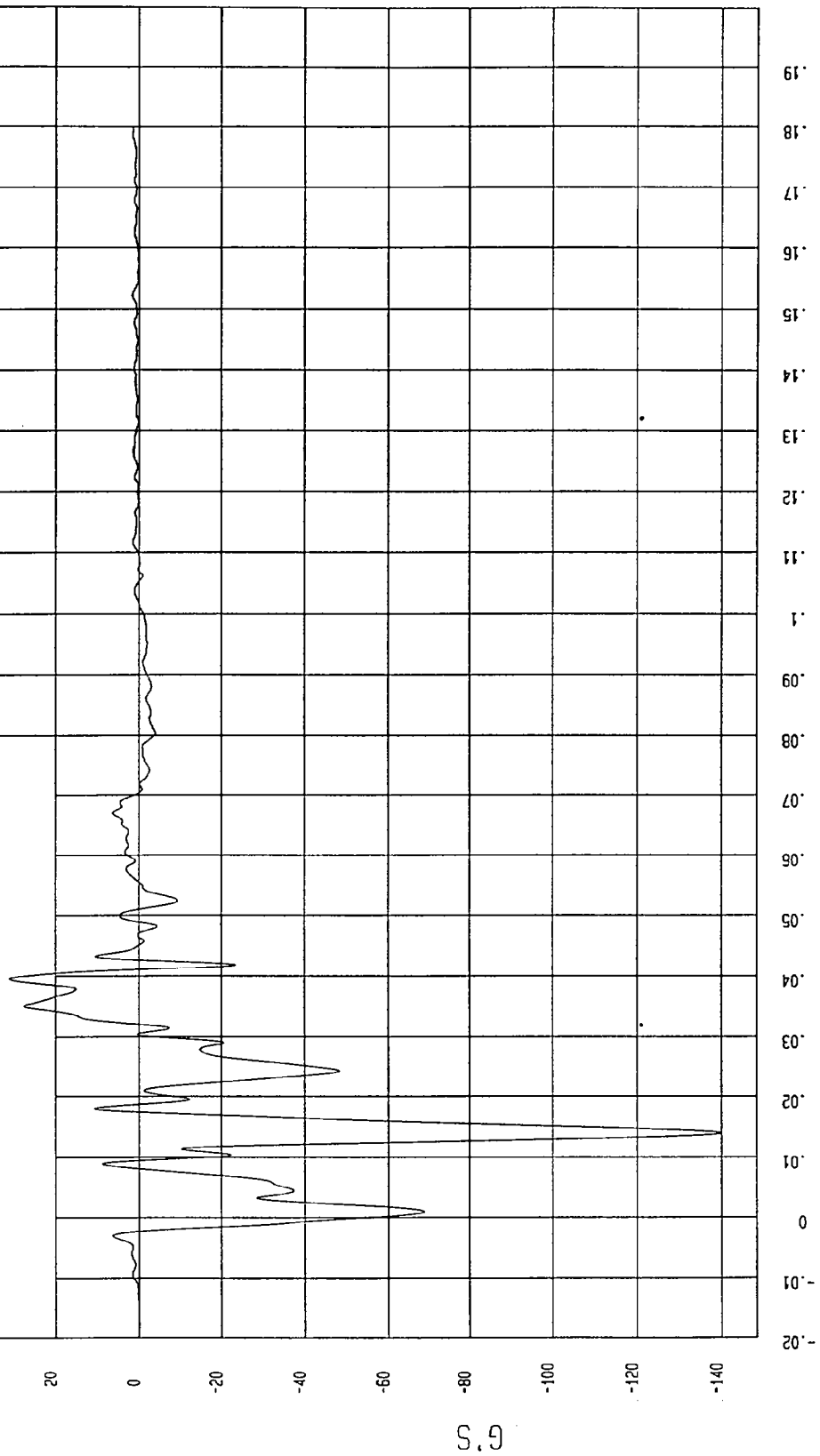


TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997
COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

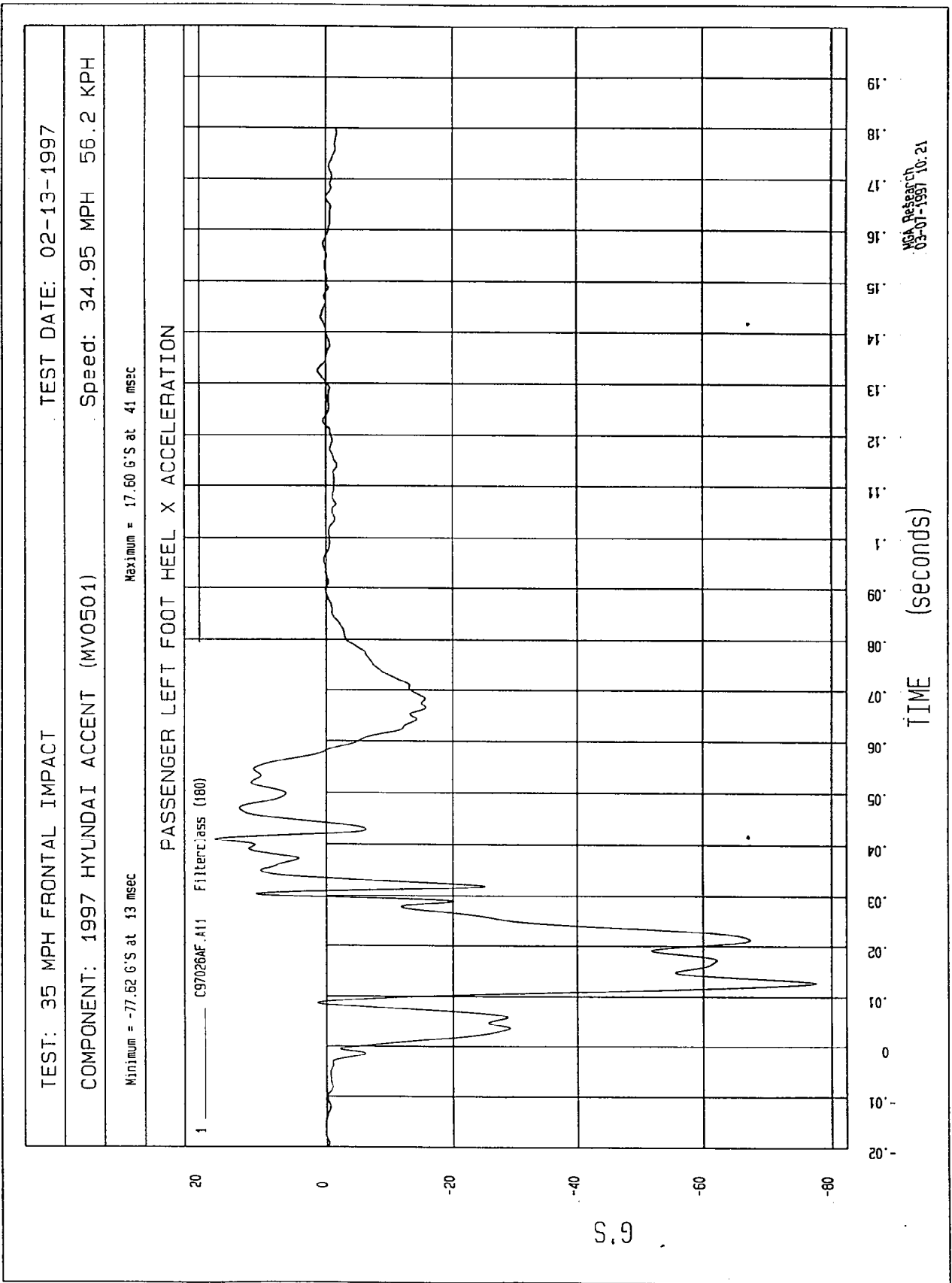
Minimum = -140.02 G'S at 14 msec Maximum = 31.18 G'S at 40 msec

PASSENGER LEFT FOOT BALL Z ACCELERATION

1 — C97026AF.A10 Filterclass (180)



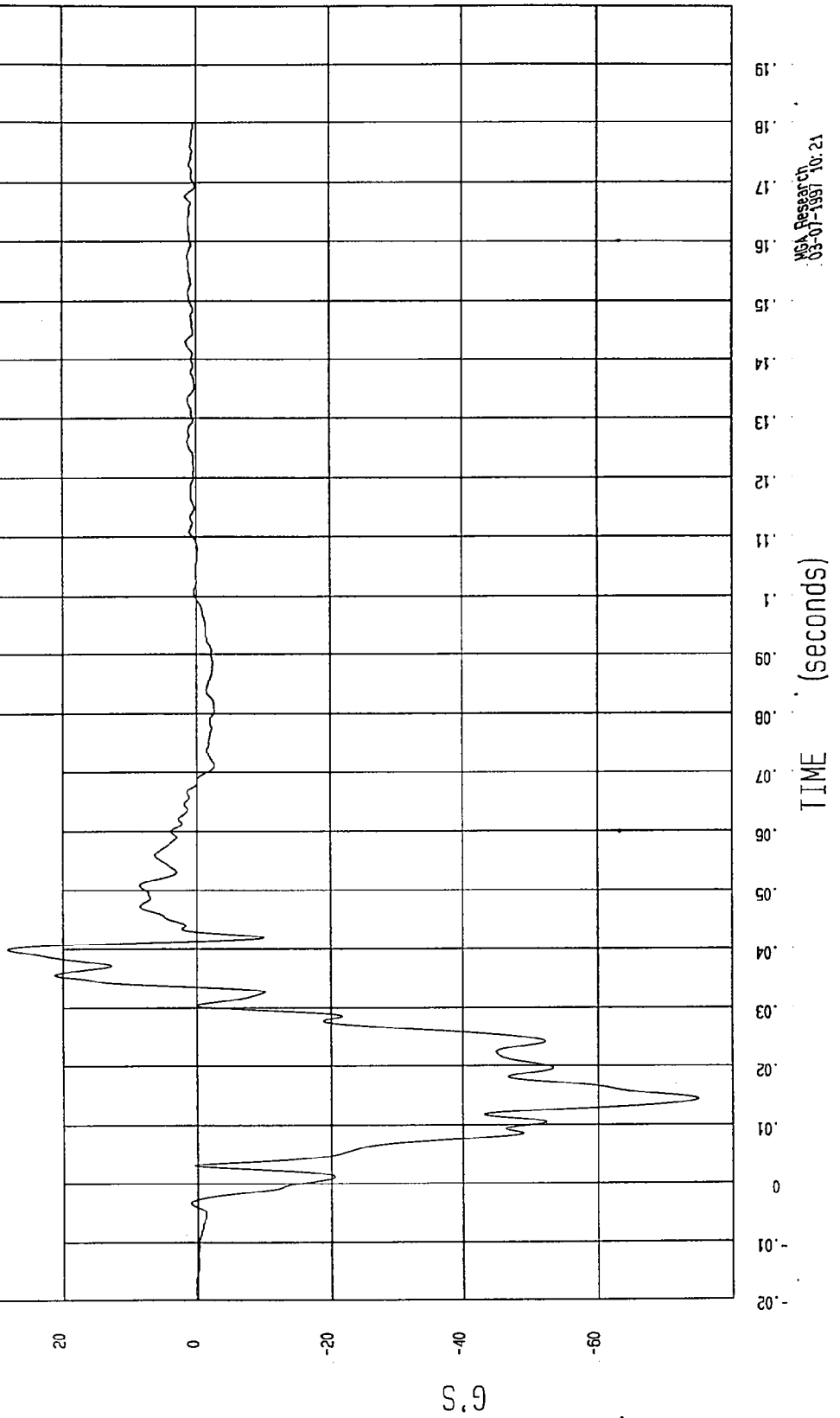
NGA Research
03-01-1997 10:21

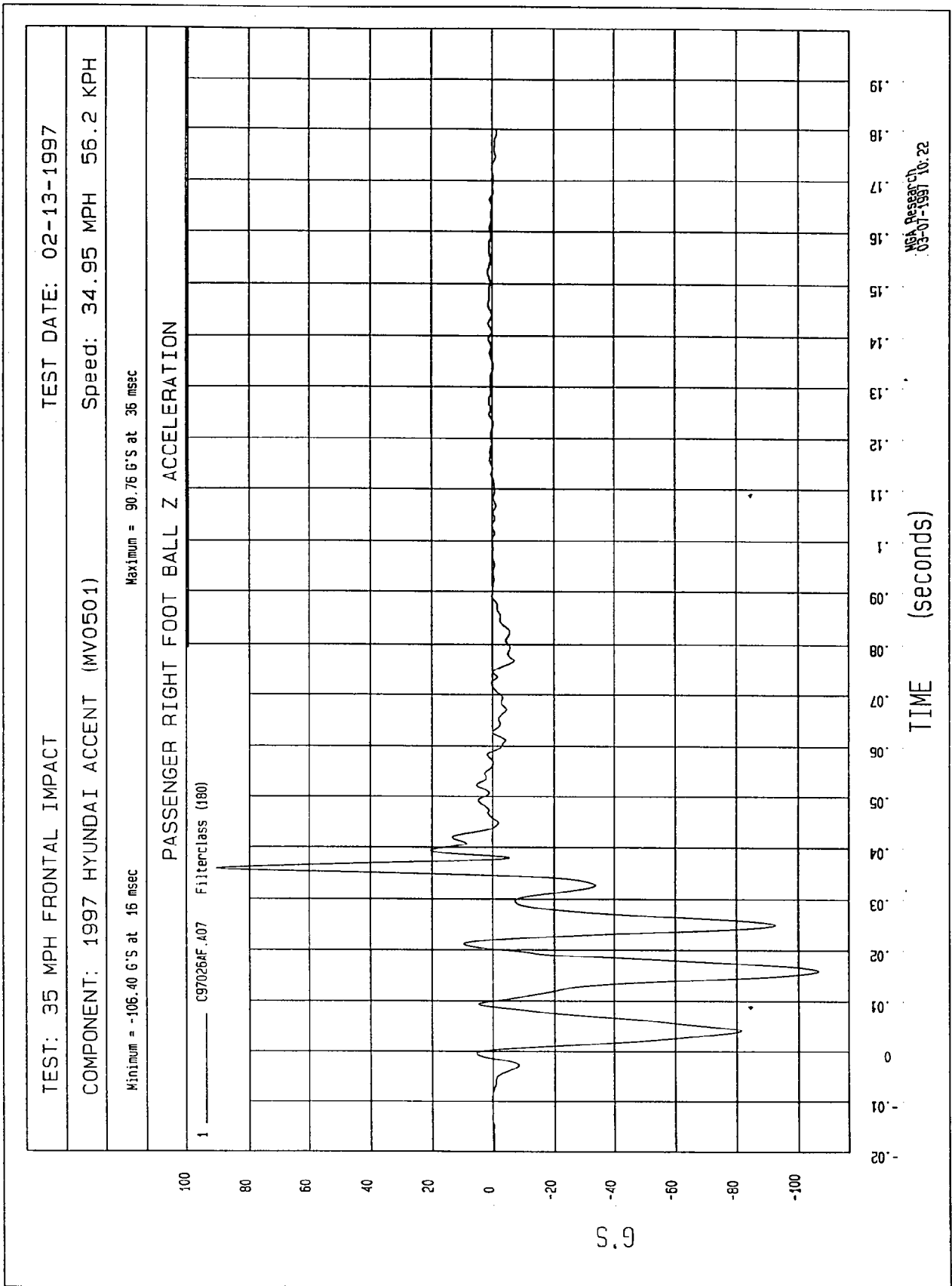


TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997
COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH
Minimum = -74.63 G'S at 14 msec Maximum = 28.33 G'S at 40 msec

PASSENGER LEFT FOOT HEEL Z ACCELERATION

1 — C97026AF.A12 FilterClass (180)





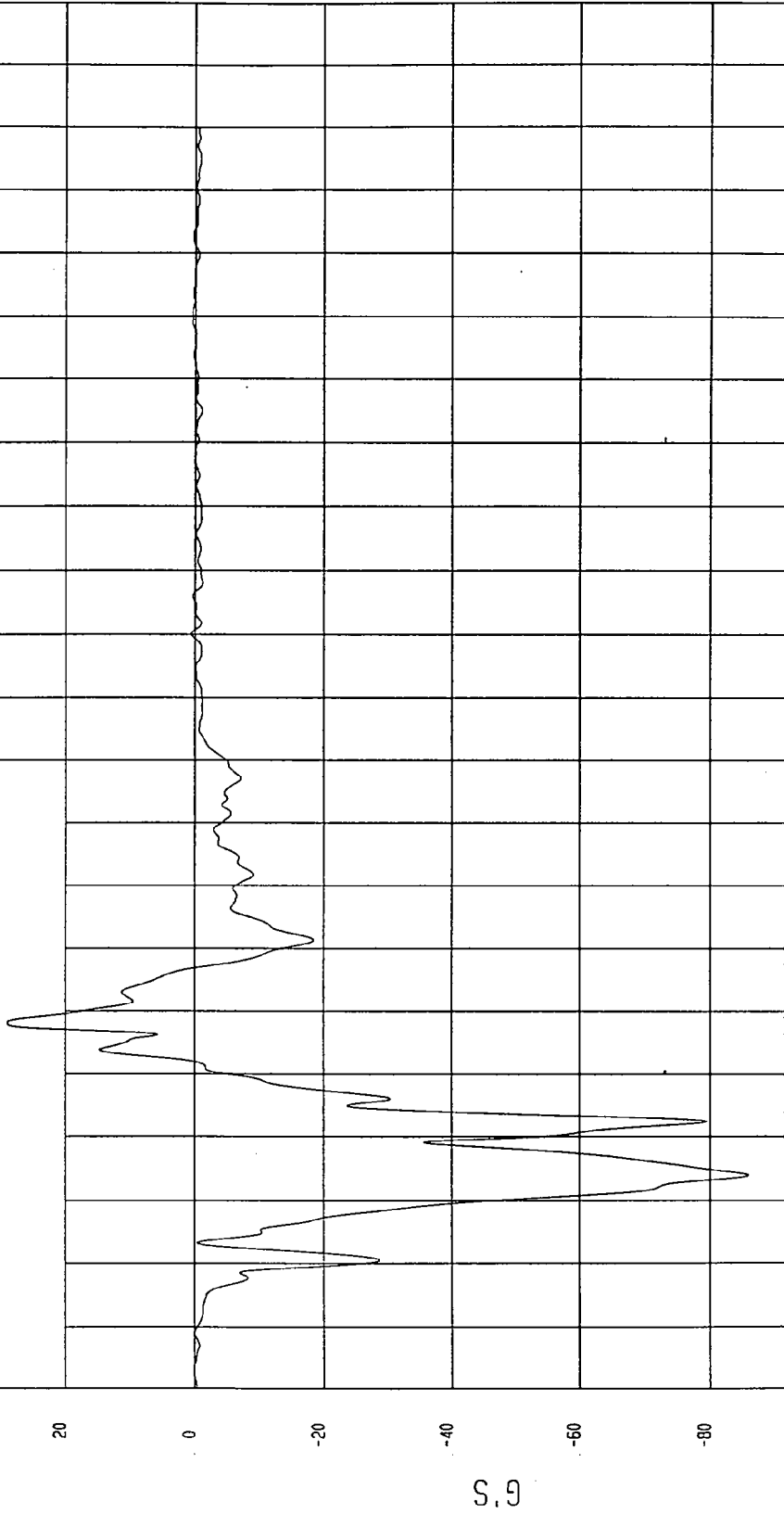
TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -85.87 G'S at 14 msec Maximum = 29.01 G'S at 38 msec

PASSENGER RIGHT FOOT HEEL X ACCELERATION

1 — C97026AF.A08 Filterclass (180)



MSA Research
03-07-1997 10:22

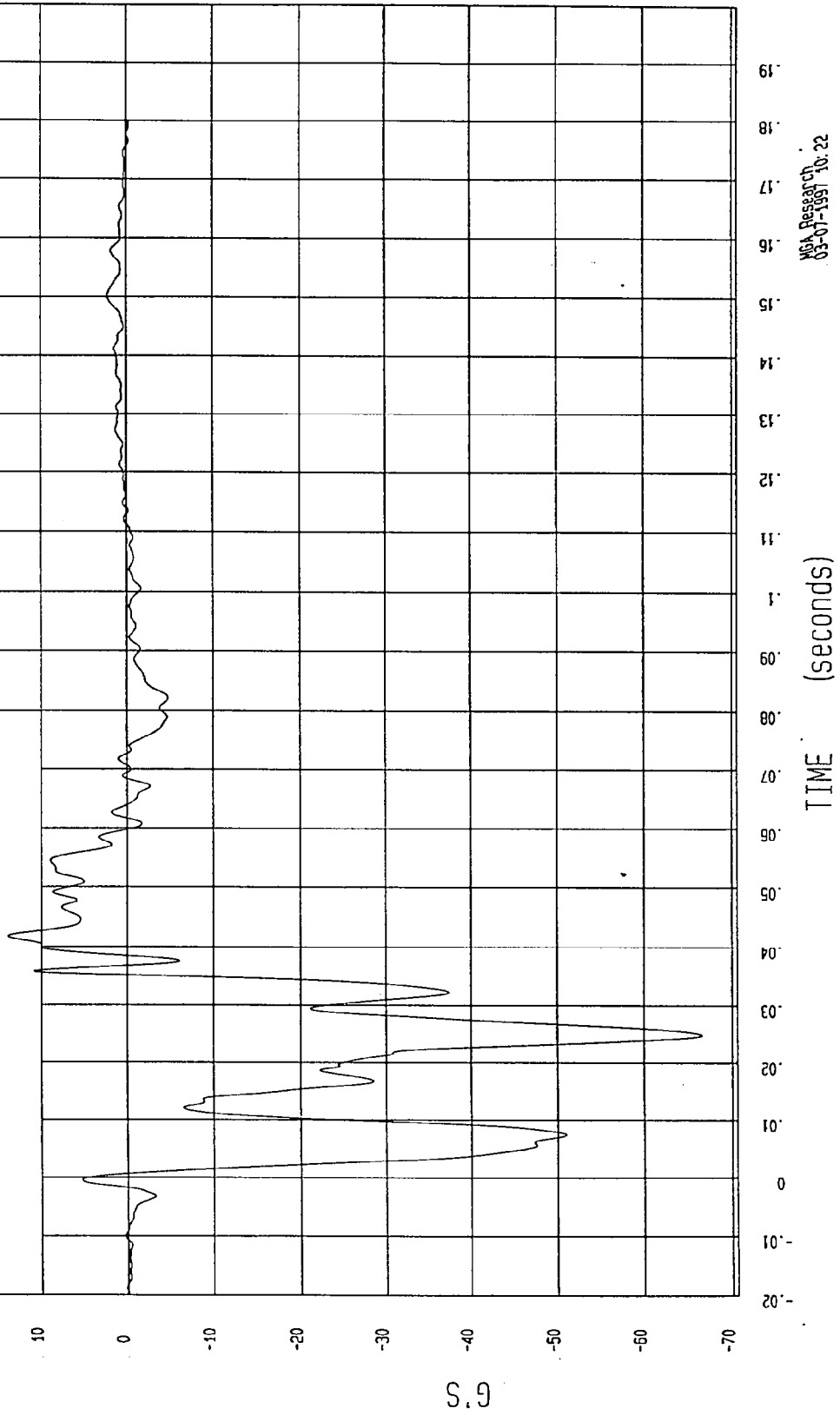
TEST: 35 MPH FRONTAL IMPACT TEST DATE: 02-13-1997

COMPONENT: 1997 HYUNDAI ACCENT (MV0501) Speed: 34.95 MPH 56.2 KPH

Minimum = -66.55 G'S at 25 msec Maximum = 13.84 G'S at 42 msec

PASSENGER RIGHT FOOT HEEL Z ACCELERATION

1 C9702EAF.A09 Filterclass (180)



MCA Research
03-07-1997 10:22

APPENDIX C

Dummy Configuration & Performance Verification Data

HYBRID III DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 037 DUMMY CALIBRATION BY: Tim Michnay

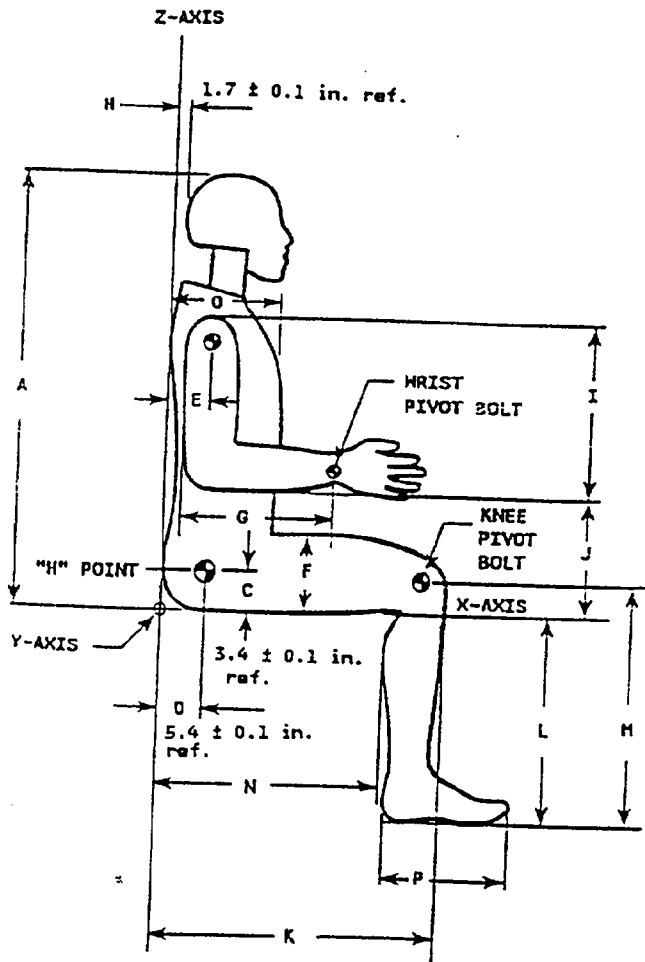
I. CONFIGURATION VERIFICATION DATA

DATE OF VERIFICATION: 2-4-97

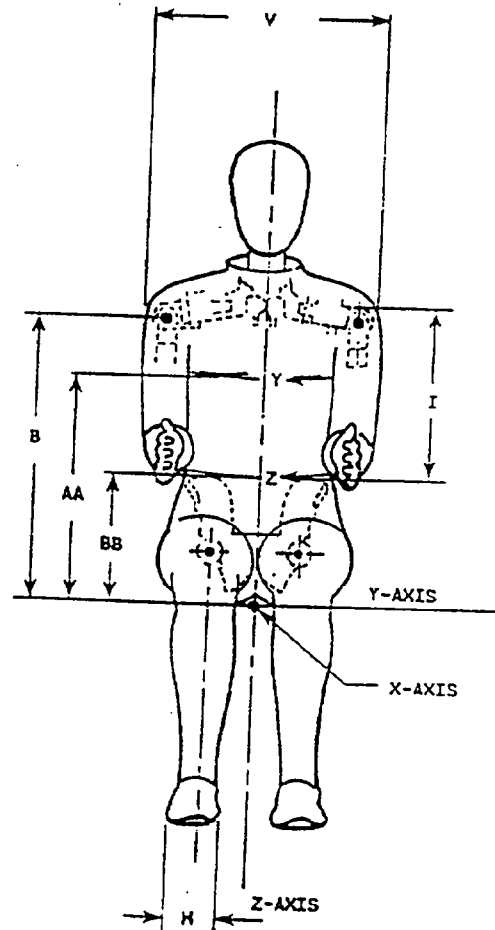
DESCRIPTION	SPECIFICATION (Inches)	ACTUAL MEASUREMENT (inches)
A - Total Sitting Height	34.6 - 35.0	34.8
B - Shoulder Pivot Height	19.9 - 20.5	20.5
C - "H" Point Height	3.3 - 3.5	3.5
D - "H" Point from Seat Back	5.3 - 5.5	5.5
E - Shoulder Pivot From Backline	3.3 - 3.7	3.5
F - Thigh Clearance	5.5 - 6.1	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 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.: 037 DUMMY CALIBRATION BY: Tim Michnay

VERIFICATION DATE: February 4, 1997

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

1.0 HEAD DROP TEST

	SPECIFICATION	MEASUREMENT
Peak Resultant Acceleration	225 - 275 G	273
Peak Lateral Acceleration	15 G. MAX	13
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	23.23
	20 MS	17.60 - 22.60 G	20.78
	30 MS	12.50 - 18.50 G	15.77
Max. Pendulum G Above 30 MS		29.0 G MAX	15.70
Deceleration - Time Curve Decay Time to 5 G		34 - 42 MS	35
D Plane Rotation	MAX	64 - 78 DEG.	77
	TIME	57 - 64 MS	60
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 MS	120
Moment About Occipital Condyle	MIN.	65 - 80 FT.LBS	72
	TIME	47 - 58 MS	47
Positive Moment - Time Curve Decay Time to Zero		97 - 107 MS	101

HYBRID III DUMMY CALIBRATION DATA SUMMARY SHEET (CONT.)

3.0 NECK EXTENSION TEST

		SPECIFICATION	MEASUREMENT
Pendulum Speed		19.50 - 20.30 F/S	20.01
Pendulum Deceleration	10 MS	17.20 - 21.20 G	17.48
	20 MS	14.00 - 19.00 G	16.49
	30 MS	11.00 - 16.00 G	14.11
Max. Pendulum G Above 30 MS		22 G Max	14.05
Deceleration - Time Curve Decay Time to 5 G		38 - 46 MS	39
D Plane Rotation	MAX	81 - 106 DEG.	99
	TIME	72 - 82 MS	77
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 MS	160
Moment About Occipital Condyle	MIN.	-59.0/-39.0 FT LBS	-53
	TIME	65 - 79 MS	70
Positive Moment - Time Curve Decay Time to Zero		120 - 148 MS	141

4.0 CHEST IMPACT TESTS

	SPECIFICATION	MEASUREMENT
Probe Speed	21.6 to 22.4 F/S	21.9
Peak Deflection	2.50 to 2.86 IN.	2.56
Peak Resistive Force	1160 to 1325 LBS.	1314
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.	1292

RIGHT KNEE	SPECIFICATION	MEASUREMENT
Probe Speed	6.8 to 7.0 F/S	7.0
Maximum Force	1060 - 1300 LBS.	1134

HYBRID III DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

DUMMY NO.: 036 DUMMY CALIBRATION BY: Tim Michnay

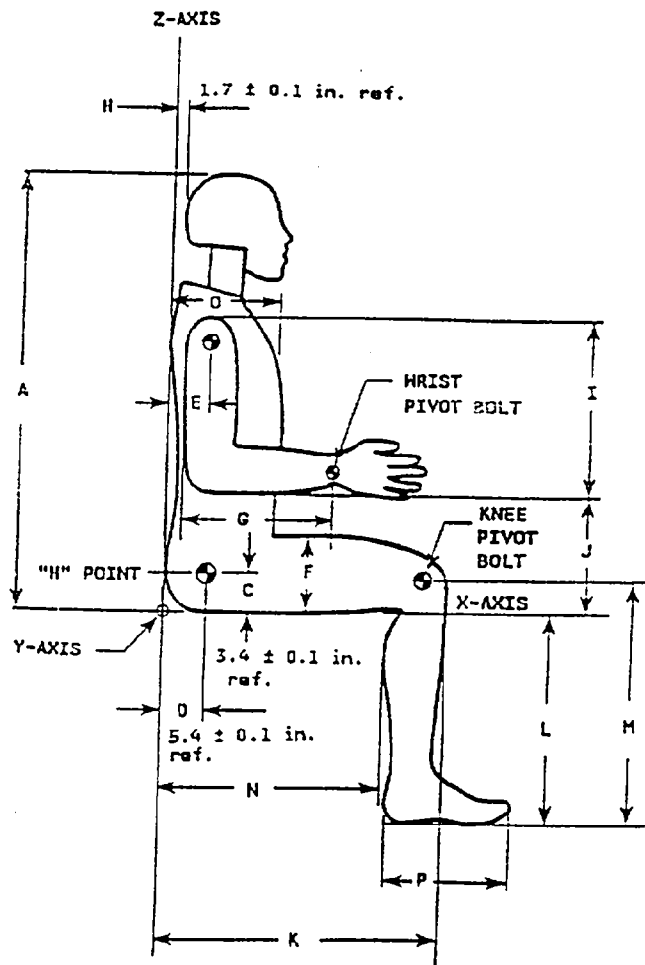
I. CONFIGURATION VERIFICATION DATA

DATE OF VERIFICATION: February 4, 1997

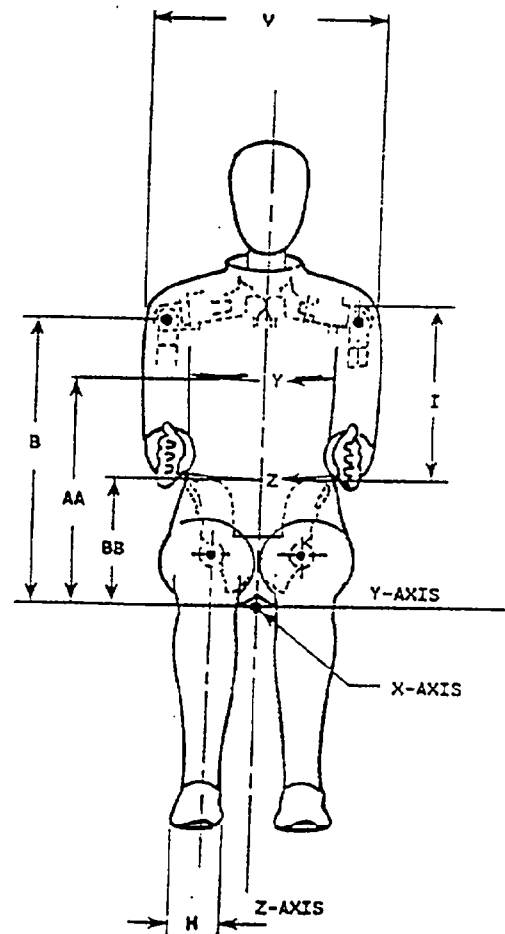
DESCRIPTION	SPECIFICATION (inches)	ACTUAL MEASUREMENT (inches)
A - Total Sitting Height	34.6 - 35.0	34.9
B - Shoulder Pivot Height	19.9 - 20.5	20.5
C - "H" Point Height	3.3 - 3.5	3.5
D - "H" Point from Seat Back	5.3 - 5.5	5.5
E - Shoulder Pivot From Backline	3.3 - 3.7	3.5
F - Thigh Clearance	5.5 - 6.1	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 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 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 (CONT.)

DUMMY NO.: 036 DUMMY CALIBRATION BY: Tim Michnay

VERIFICATION DATE: February 4, 1997

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

1.0 HEAD DROP TEST

	SPECIFICATION	MEASUREMENT
Peak Resultant Acceleration	225 - 275 G	245
Peak Lateral Acceleration	15 G. MAX	8
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	22.57
	20 MS	17.60 - 22.60 G	19.87
	30 MS	12.50 - 18.50 G	15.70
Max. Pendulum G Above 30 MS		29.0 G MAX	16.0
Deceleration - Time Curve Decay Time to 5 G		34 - 42 MS	37
D Plane Rotation	MAX	64 - 78 DEG.	76
	TIME	57 - 64 MS	59
Rotation Angle - Time Curve Decay Time to Zero		113 - 128 MS	116
Moment About Occipital Condyle	MIN.	65 - 80 FT.LBS	73
	TIME	47 - 58 MS	49
Positive Moment - Time Curve Decay Time to Zero		97 - 107 MS	104

HYBRID III DUMMY CALIBRATION DATA SUMMARY SHEET (CONT.)

3.0 NECK EXTENSION TEST

		SPECIFICATION	MEASUREMENT
Pendulum Speed		19.50 - 20.30 F/S	19.96
Pendulum Deceleration	10 MS	17.20 - 21.20 G	17.72
	20 MS	14.00 - 19.00 G	16.39
	30 MS	11.00 - 16.00 G	13.50
Max. Pendulum G Above 30 MS		22 G Max	13
Deceleration - Time Curve Decay Time to 5 G		38 - 46 MS	40
D Plane Rotation	MAX	81 - 106 DEG.	101
	TIME	72 - 82 MS	75
Rotation Angle - Time Curve Decay Time to Zero		147 - 174 MS	158
Moment About Occipital Condyle	MIN.	-59.0/-39.0 FT LBS	-55
	TIME	65 - 79 MS	72
Positive Moment - Time Curve Decay Time to Zero		120 - 148 MS	143

4.0 CHEST IMPACT TESTS

	SPECIFICATION	MEASUREMENT
Probe Speed	21.6 to 22.4 F/S	21.9
Peak Deflection	2.50 to 2.86 IN.	2.81
Peak Resistive Force	1160 to 1325 LBS.	1269
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	7.0
Maximum Force	1060 - 1300 LBS.	1289

RIGHT KNEE	SPECIFICATION	MEASUREMENT
Probe Speed	6.8 to 7.0 F/S	7.0
Maximum Force	1060 - 1300 LBS.	1213

APPENDIX D

Dummy, Vehicle and Laboratory Calibration Data

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENTS FOR DUMMY NO. 037

	DRIVER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	ACCY6	Endevco	12/4/96
Head Y	ACCH1	Endevco	12/4/96
Head Z	AAMW5	Endevco	12/4/96
Head X Redundant	AJ9D2	Endevco	12/4/96
Head Y Redundant	AH2E2	Endevco	12/4/96
Head Z Redundant	AJ7K3	Endevco	12/4/96
Chest X	ACCY1	Endevco	12/3/96
Chest Y	ACCC8	Endevco	12/3/96
Chest Z	ACCT7	Endevco	12/3/96
Chest X Redundant	AJ9D4	Endevco	12/3/96
Chest Y Redundant	AJ9F3	Endevco	12/3/96
Chest Z Redundant	AJ9D9	Endevco	12/3/96
Right Femur Load Cell	261	Denton	8/28/96
Left Femur Load Cell	262	Denton	8/28/96
Pelvis X	ALD48	Endevco	12/3/96
Pelvis Y	ALEK9	Endevco	12/3/96
Pelvis Z	ALE80	Endevco	12/3/96

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENTS FOR DUMMY NO. 037

	DRIVER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Neck Load Cell X	443	Denton	1/10/97
Neck Load Cell Y	443	Denton	1/10/97
Neck Load Cell Z	443	Denton	1/10/97
Neck Moment X	443	Denton	1/10/97
Neck Moment Y	443	Denton	1/10/97
Neck Moment Z	443	Denton	1/10/97
Chest Deflection Gauge	037	Servo	1/16/97
Lap Belt Load Cell	624	GSE	11/6/96
Torso Belt Load Cell	625	GSE	11/15/96

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENTS FOR DUMMY NO. 037

	DRIVER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Right Tibia Moment X	036	Denton	10/1/96
Upper Right Tibia Moment Y	036	Denton	10/1/96
Lower Right Tibia Moment Y	040	Denton	9/24/96
Lower Right Tibia Force X	040	Denton	9/24/96
Lower Right Tibia Force Z	040	Denton	9/24/96
Upper Left Tibia Moment X	039	Denton	10/1/96
Upper Left Tibia Moment Y	039	Denton	10/1/96
Lower Left Tibia Moment Y	033	Denton	9/24/96
Lower Left Tibia Force X	033	Denton	9/24/96
Lower Left Tibia Force Z	033	Denton	9/24/96
Right Foot Ball Z	J13652	Endevco	1/13/97
Right Foot Heel X	J13628	Endevco	12/5/96
Right Foot Heel Z	J14006	Endevco	12/5/96
Left Foot Ball Z	J13650	Endevco	12/5/96
Left Foot Heel X	J13424	Endevco	12/5/96
Left Foot Heel Z	J14007	Endevco	12/5/96

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENTS FOR DUMMY NO. 037

	PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Head X	AAMW8	Endevco	12/4/96
Head Y	ACC61	Endevco	12/4/96
Head Z	ACCW9	Endevco	12/4/96
Head X Redundant	AJ621	Endevco	12/4/96
Head Y Redundant	AJ619	Endevco	12/4/96
Head Z Redundant	AHY54	Endevco	12/4/96
Chest X	ACC78	Endevco	12/4/96
Chest Y	ACCE6	Endevco	12/4/96
Chest Z	ACC43	Endevco	12/4/96
Chest X Redundant	AJ9J7	Endevco	12/4/96
Chest Y Redundant	AJ7A2	Endevco	12/4/96
Chest Z Redundant	AJ819	Endevco	12/4/96
Right Femur Load Cell	259	Denton	8/28/96
Left Femur Load Cell	260	Denton	8/28/96
Pelvis X	ALB87	Endevco	12/4/96
Pelvis Y	AHRP5	Endevco	12/4/96
Pelvis Z	AJ9T6	Endevco	12/4/96

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENTS FOR DUMMY NO. 036

	PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Neck Load Cell X	442	Denton	1/10/97
Neck Load Cell Y	442	Denton	1/10/97
Neck Load Cell Z	442	Denton	1/10/97
Neck Moment X	442	Denton	1/10/97
Neck Moment Y	442	Denton	1/10/97
Neck Moment Z	442	Denton	1/10/97
Chest Deflection Gauge	036	Servo	12/5/96
Lap Belt Load Cell	625	GSE	11/15/96
Torso Belt Load Cell	627	Lebow	11/6/96

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENTS FOR DUMMY NO. 036

	PASSENGER		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Upper Right Tibia Moment X	040	Denton	11/5/96
Upper Right Tibia Moment Y	040	Denton	11/5/96
Lower Right Tibia Moment Y	034	Denton	11/5/96
Lower Right Tibia Force X	034	Denton	11/5/96
Lower Right Tibia Force Z	034	Denton	11/5/96
Upper Left Tibia Moment X	023	Denton	11/5/96
Upper Left Tibia Moment Y	023	Denton	11/5/96
Lower Left Tibia Moment Y	019	Denton	11/5/96
Lower Left Tibia Force X	019	Denton	11/5/96
Lower Left Tibia Force Z	019	Denton	11/5/96
Right Foot Ball Z	J11046	Endevco	12/2/96
Right Foot Heel X	J11784	Endevco	12/2/96
Right Foot Heel Z	J11047	Endevco	12/2/96
Left Foot Ball Z	J11014	Endevco	12/2/96
Left Foot Heel X	J10730	Endevco	12/2/96
Left Foot Heel Z	J11625	Endevco	12/2/96

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

	VEHICLE ACCELEROMETERS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Left Rear Seat Crossmember X	L14-D04	Entran	1/6/97
Right Rear Seat Crossmember X	L18-G02	Entran	1/2/97
Top of Engine Block X	A09-G06	Entran	2/7/97
Bottom of Engine X	E24-G10	Entran	1/2/97
Left Brake Caliper X	H07-A25	Entran	1/2/97
Right Brake Caliper X	D05-R16	Entran	1/6/97
Instrument Panel X	MGA125	Entran	1/6/97
Redundant Left Rear Seat Crossmember X	L18-E18	Entran	1/8/97
Redundant Right Rear Seat Crossmember X	H09-G07	Entran	1/2/97

	LABORATORY INSTRUMENTS		
	SERIAL NO.	MANUFACTURER	CALIBRATION DATE
Neck Bending Pendulum Accelerometer	AH5N9	Endevco	5/08/95
Neck Bending Head Rotary Potentiometer	018	Spectrol	3/13/95
Neck Bending Pendulum Rotary Potentiometer	019	Spectrol	3/13/95
Chest Probe Accelerometer	AN8A4	Endevco	6/12/95
Knee Impact Accelerometer	MGA001	Entran	4/21/95

APPENDIX E

Vehicle Owner's Occupant Restraint System Instructions

ZB09011-A

CARE OF SEAT BELTS

Seat belt systems should never be disassembled or modified. In addition, care should be taken to assure that seat belts and belt hardware are not damaged by seat hinges, doors or other abuse.

WARNING:

When you return the rear seatback to its upright position after the rear seatback was folded down, be careful not to damage the seat belt webbing or buckle. Be sure that the webbing or buckle does not get caught or pinched in the rear seat.

ZB09011-A

Periodic Inspection

It is recommended that all seat belts be inspected periodically for wear or damage of any kind. Parts of the system that are damaged should be replaced as soon as possible.

ZB09011-A

Keep Belts Clean and Dry

Seat belts should be kept clean and dry. If belts become dirty, they can be cleaned using a mild soap solution and warm water. Bleach, dye, strong detergents or abrasives should not be used because they may damage and weaken the fabric.

ZB09011-A

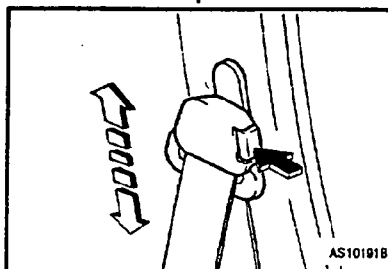
When to Replace Seat Belts

The entire seat belt assembly or assemblies should be replaced if the vehicle has been involved in an accident. This should be done even if no damage is visible. Additional questions concerning seat belt operation should be directed to your Hyundai Dealer.

AB09021-B

HEIGHT ADJUSTABLE FRONT SEAT SHOULDER BELT (If Installed)

You can adjust the height of the shoulder belt anchor to one of the 4 positions.



If the height of the adjusting seat belt is too near your neck, you will not be getting the most effective protection.

To adjust the height of seat belt anchor, lower or raise the height adjuster into an appropriate position when the height adjuster knob is pulled up.

Release the button the lock the anchor into position. Try to slide the releasing the button the make sure that it has locked into position

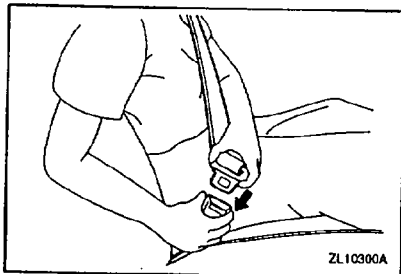
WARNING:

The height adjuster must be in the locked position when the vehicle is moving.

YB09011-A

SEAT BELT-Driver's 3-Point System with Emergency Locking Retractor To Fasten Your Belt

To fasten your seat belt, pull it out of the retractor and insert the metal tab into the buckle. There will



be an audible "click" when the tab locks into the buckle.

The seat belt automatically adjusts to the proper length only after the lap belt portion is adjusted manually so that it fits snugly around your hips. If you lean forward in a slow, easy motion, the belt will extend and let you move around. If there is a sudden stop or impact, however, the belt will lock into position. It will also lock if you try to lean forward too quickly.

NOTE:

If the driver's seat belt is not fastened when the Ignition key is in the "ON" position, the seat belt warning light will flash and the warning chime will sound for approximately six seconds.

YB09044-A

SEAT BELTS-Front Passenger and Outboard Rear Seat 3-Point System with Combination Locking Retractor To Fasten Your Belt

Combination retractor type seat belts are installed in the rear seat outboard positions to help accommodate the installation of child restraint systems. Although a combination retractor is also installed in the front passenger seat position, Hyundai recommends that children always be seated in the rear seat.

This type of seat belt combines the features of both an emergency locking retractor seat belt and an automatic locking retractor seat belt.

To fasten your seat belt, pull it out of the retractor and insert the metal tab into the buckle. There will be an audible "click" when the tab locks into the buckle. When not securing a child restraint, the seat belt operates in the same way as driver's seat belt (Emergency Locking Retractor Type). It automatically adjusts to the proper length only after the lap belt portion of the seat belt is adjusted manually so that it fits snugly around your hips. When the seat belt is fully extended from the retractor to allow the installation of a child restraint system, the seat belt operation changes to allow the belt to retract, but not to extend. (Automatic Locking Retractor Type)

NOTE:

Although the combination retractor provides the same level of protection for seated passengers in either emergency or automatic locking modes, it is recommended that seated passengers use the emergency locking feature for improved convenience. The automatic locking function is intended to facilitate child restraint installation. To convert from the automatic locking feature to the emergency locking operation mode, allow the unbuckled seat belt to fully retract.

WARNING:

- o For maximum restraint system protection, the seat belts must always be used when-ever the car is moving.
- o Seat belts are most effective when seatbacks are in the upright position.
- o Hyundai recommends that children be seated in the rear seats.
- o The shoulder belt should be positioned midway over the shoulder nearest the door for the most effective protection. Never wear the seat belt under the arm nearest the door.
- o Avoid wearing twisted seat belts.
- o Be careful not to damage the belt webbing or hardware.
- o The retractors lock only on sudden impacts or stops. The belt will allow some freedom of movement if done slowly.

AB000U1-A

Adjusting Your Seat Belt**WARNING:**

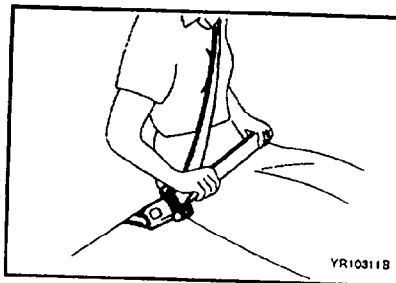
You should place the lap belt portion as low as possible and snugly across your hips, not on your waist. If the lap belt is located too high and on your waist, it may increase the chance of injury in the event of a collision. Both arms should not be under or over the shoulder belt. Rather, one should be over and the other under, as shown in the illustration.

ZB090V1-A

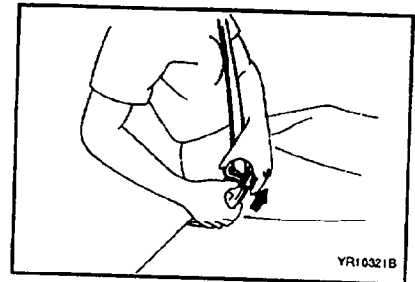
To Release the Seat Belt

The seat belt is released by pressing the release button in the locking buckle. When it is released, the belt should automatically draw back into the retractor.

If this does not happen, check the belt to be sure it is not twisted, then try again.



YR10311B



YR10321B

ZB090W2-A

SEAT BELTS**(2-Point Static Type) (Rear Seat Center)****To Fasten Your Seat Belt**

To fasten a 2-point static type seat belt, insert the metal tab into the locking buckle. There will be an audible "click" when the tab locks into the buckle. Check to make sure the belt is properly locked and that the belt is not twisted.

ZB090X2-A

Adjusting Your Seat Belt

With a 2-point static type seat belt, the length must be adjusted manually so it fits snugly around your body. Fasten the belt and pull on the loose end to tighten. The belt should be placed as low as possible on your hips, not on your waist. If the belt is too high, it could increase the possibility of your being injured in an accident because you could slide under it.

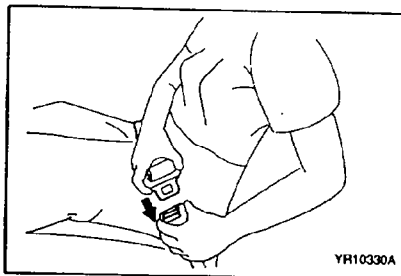
ZB090Y1-A

To Release the Seat Belt

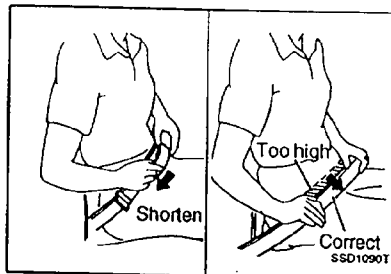
When you want to release the seat belt, press the button in the locking buckle.

WARNING:

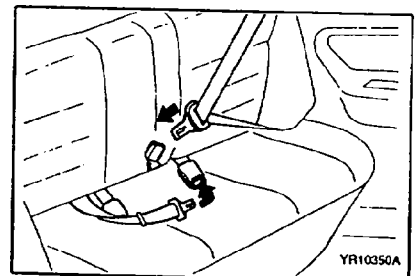
The center lap belt latching mechanism is different from those for the rear seat shoulder belts. When fastening the rear seat shoulder belts or the center lap belt, make sure they are inserted into the correct buckle to obtain maximum protection from the seat belt system and assure proper operation.



YR10330A



SSD1090T



YR10350A

WARNING:

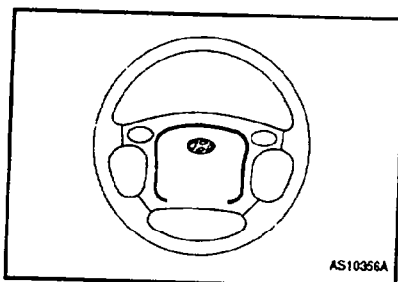
- o If the retractor is not in the Automatic Locking mode, the child restraint system can move when your vehicle turns or stops abruptly.
- o Do not install a child restraint system in the front passenger seat. Should an accident occur and cause the passenger side supplemental airbag to deploy, it could severely injure an infant seated in a child restraint. Therefore, only use a child restraint in the rear seat of your vehicle.

YB15042-A

SUPPLEMENTAL RESTRAINT (AIRBAG) SYSTEM

Your Hyundai is equipped with a Supplemental Restraint (Airbag) System. The indications of the system's presence are the letters "SRS Air Bag" embossed on the airbag pad cover in the steering wheel and the passenger's side front panel pad above the glove box.

The Hyundai SRS consists of airbags installed under the pad covers in the center of the steering wheel and the passenger's side front panel above the glove box. The purpose of the SRS is to provide the vehicle's driver and/or the front passenger with additional restraint than that offered by the seat-belt system alone, in case of a frontal impact of sufficient severity.



NOTE:

Be sure to read information about the SRS on the labels provided on the backside of the sun visors and in the glove box.

WARNING:

As its name implies, the SRS is designed to work with, and be supplemental to, the driver's and the passenger's three point seat belt systems and is not a substitute for them. Therefore, your seat belts must be worn at all times while the vehicle is in motion. In addition, the airbags deploy only in certain frontal impact conditions severe enough to likely cause significant injury to the vehicle occupants.

The SRS is designed to deploy the airbags only when an impact is sufficiently severe and when the impact angle is less than 30° from the forward longitudinal axis of the vehicle and will not deploy in side, rear or rollover impacts.

For maximum safety protection in all types of crashes, all occupants including the driver should always wear their seat belts whether or not an airbag is also provided at their seating position to minimize the risk of severe injury or death in the event of a crash. Do not sit or lean unnecessarily close to the airbag while the vehicle is in motion.

YB15082-A

SRS Components and Functions

The SRS consists of the following components:

- Driver's Side Airbag Module
- Passenger's Side Airbag Module
- Knee Bolster
- SRS Service Reminder Indicator (SRI)
- SRS Control Module (SRSCM)

The SRSCM continually monitors all elements while the Ignition is "ON" to determine if a frontal or near-frontal impact is severe enough to require airbag deployment.

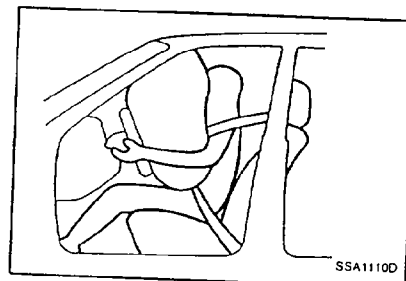
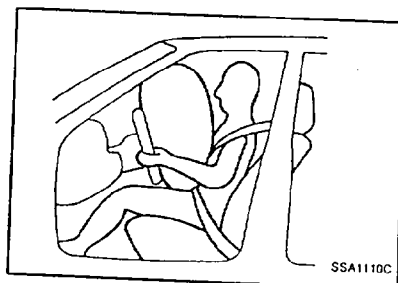
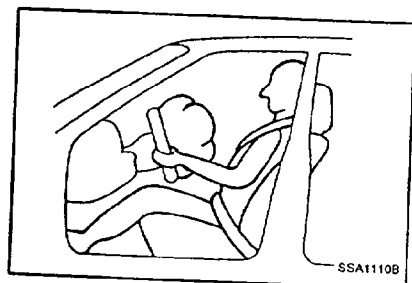
The SRS service reminder indicator (SRI) on the instrument panel will blink for about 6 seconds after the ignition key is turned to the "ON" position or after the engine is started, after which the SRI should go out.

The airbag modules are located both in the center of the steering wheel and in the front passenger's panel above the glove box. When the SRSCM detects a considerable impact to the front of the vehicle, it will automatically deploy the airbags.

Upon deployment, tear seams molded directly into the pad covers will separate under pressure from the expansion of the airbags. Further opening of the covers then allows full inflation of the airbags.

A fully inflated airbag in combination with a properly worn seat belt slows the driver's or the passenger's forward motion, thus reducing the risk of head or chest injury.

After complete inflation, the airbag immediately starts deflating, enabling the driver to obtain forward visibility.



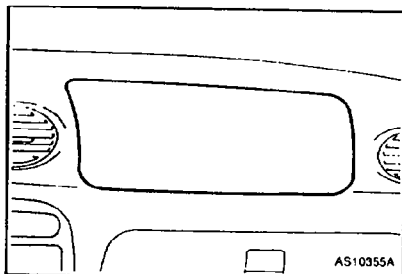
WARNING:

- o When the SRS is activated, there may be a loud noise and fine dust will be released through the instruments.

These conditions are normal and are not hazardous.

However, the fine dust generated during airbag deployment may cause skin irritation. Be sure to wash your hands and face thoroughly with lukewarm water and a mild soap after an accident in which the airbags were deployed.

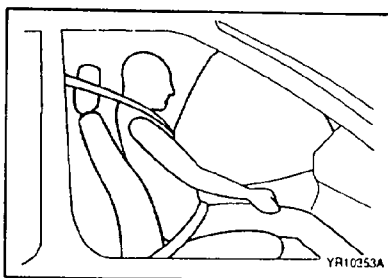
- o The SRS can function only when the Ignition key is in the "ON" position. If the SRS SRI does not come on, or continuously remains on, after flashing for about 6 seconds when the Ignition key is turned to the "ON" position, or after the engine is started, or comes on while driving, the SRS is not working properly.



If this occurs, have your vehicle immediately inspected by your Hyundai dealer.

- o Before you replace a fuse or disconnect a battery terminal, turn the Ignition key to the "LOCK" position or remove the Ignition key.

Never remove or replace the Air Bag related fuse(s) when the Ignition key is in the "ON" position. Failure to heed this warning will cause the SRS SRI to illuminate.



YB150C1-A

SRS Care

- o The SRS is virtually maintenance free and so there are no parts you can safely service by yourself. The entire SRS system must be inspected by an authorized Hyundai dealer 10 years after the date that the vehicle was manufactured.
- o Any work on the SRS system, such as removing, installing, repairing, or any work on the steering wheel must be performed by a qualified Hyundai technician. Improper handling of the airbag system may result in serious personal injury.

WARNING:

- o Modification to SRS components or wiring, including the addition of any kind of badges to the pad covers or modifications to the body structure, can adversely affect SRS performance and lead to possible injury.
- o For cleaning the airbag pad covers, use only a soft, dry cloth or one which has been moistened with plain water. Solvents or cleaners could adversely affect the airbag covers and proper deployment of the system.
- o No objects should be placed over or near the airbag modules on the steering wheel, instrument panel, and the front passenger's panel above the glove box, because any such object could cause harm if the

vehicle is in a crash severe enough to cause the airbags to inflate.

- o If the airbags inflate, they must be replaced by an authorized Hyundai dealer.
- o Do not tamper with or disconnect SRS wiring, or other components of the SRS system. Doing so could result in injury, due to accidental firing of the airbags or by rendering the SRS inoperative.
- o Do not install a child restraint system in the front passenger seat position. A child restraint system must never be placed in the front seat. The infant or baby could be severely injured by an airbag deployment in case of an accident.
- o If components of the airbag system must be discarded, or if the vehicle must be scrapped, certain safety precautions must be observed. Your Hyundai dealer knows these precautions and can give you the necessary information. Failure to follow these precautions and procedures could increase the risk of personal injury.
- o If you sell your vehicle, be sure to inform the new owner of these important points and make certain that this manual is transferred to the new owner.
- o If your car was flooded and has soaked carpeting or water on flooring, you shouldn't try to start engine; have the car towed to authorized Hyundai dealer.