

V2204

REPORT NO.: 208-MGA-95-004
212-MGA-95-004
301-MGA-95-004

VEHICLE SAFETY COMPLIANCE TESTING
FOR
FMVSS 208, OCCUPANT CRASH PROTECTION

FMVSS 212, WINDSHIELD MOUNTING

FMVSS 219, WINDSHIELD INTRUSION (PARTIAL)

FMVSS 301, FUEL SYSTEM INTEGRITY

NISSAN MOTOR CO., LTD.
1995 Nissan Maxima 4 Door
NHTSA NO. CS5203

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: November 18, 1994

Report Date: November 30, 1994

FINAL REPORT

Prepared For:

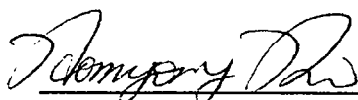
U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
MAIL CODE: NEF-30
400 SEVENTH STREET, SW ROOM 6115
WASHINGTON, D.C. 20590

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. 208-MGA-95-004 212-MGA-95-004 301-MGA-95-004		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle Final Report for FMVSS 208 Compliance Testing of a 1995 Nissan Maxima 4 Door Sedan NHTSA NO. CS5203				5. Report Date November 30, 1994	
				6. Performing Organization Code MGA	
7. Author(s) Homyoung Kim				8. Performing Organization Report No. MGA-DOT-208-04	
9. Performing Organization Name and Address MGA Research Corporation 5000 Warren Road Burlington, WI 53105				10. Work Unit No.	
				11. Contract or Grant No. DTNH22-93-D-21089	
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Compliance (Mail Code: NEF-30) 400 Seventh St., S.W., Room 6115 Washington, D.C. 20590				13. Type of Report and Period Covered Final Report November-December 1994	
				14. Sponsoring Agency Code NEF-30	
15. Supplementary Notes					
16. Abstract Compliance tests were conducted on the subject 1995 Nissan Maxima 4 Door Sedan in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-208-09 on November 18, 1994 for the determination of FMVSS 208 compliance. Test failures identified were as follows: None					
17. Key Words Frontal Impact 30 mph Vehicle Safety Compliance Testing: FMVSS 208, "Occupant Crash Protection" FMVSS 212, "Windshield Mounting" FMVSS 219 (partial), "Windshield Zone Intrusion" FMVSS 301, "Fuel System Integrity"				18. Distribution Statement Copies of this report are available from: NHTSA Technical Reference Division, Room 5108 (NAD-52), 400 Seventh Street, S.W. Washington, D.C. 20590 Telephone No. (202) 366-4946 Attn: Robert Hornick	
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of Pages 118	
				22. Price	

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

PREPARED BY:



Homyoung Kim
MGA Research Corporation

DATE:

12/12/94

APPROVED BY:



John Fleck
MGA Research Corporation

DATE:

12-12-94

FINAL REPORT ACCEPTED BY:



Contracting Officer's Technical Representative (COTR)
NHTSA, Office of Vehicle Safety Compliance

DATE:

9/29/95

TABLE OF CONTENTS

<u>SECTION</u>	<u>DESCRIPTION</u>	<u>PAGE NO.</u>
1	Purpose and Test Procedure	1-1
2	Summary of Frontal Barrier Impact Test	2-1
3	Summary of Results for FMVSS 208, 212, 219 (Partial), & 301	3-1
4	Occupant, Vehicle, and Camera Information	4-1
APPENDIX A	Photographs	
APPENDIX B	Data Plots	
APPENDIX C	Manufacturer's Vehicle Information	

LIST OF TABLES

<u>NUMBER</u>	<u>DESCRIPTION</u>	<u>PAGE NO.</u>
1	Crash Test Summary	2-4
2	General Test and Vehicle Parameter Data	2-5
3	Post Impact Data	2-7
4	Accident Investigation Division Data	2-8
5	Post Test Airbag Data	2-9
6	Vehicle Accelerometer Location and Data Summary	2-10
7	Report of Vehicle Condition at the Completion of Testing	2-11
8	FMVSS 208 Occupant Injury Criteria	3-2
9	Dummy Kinematic Summary	3-3
10	FMVSS 208 Seat Belt Comfort and Convenience Test Summary	3-4
11	FMVSS 208 Equipment Data	3-7
12	FMVSS 212 "Windshield Mounting" Data Summary	3-9
13	FMVSS 219 "Windshield Zone Intrusion" Data Summary	3-10
14	Fuel System Data	3-11
15	FMVSS 301 Post Impact Test Data	3-12
16	FMVSS 301 Static Rollover Test Data	3-13
17	Seat and Steering Column Positioning Data	4-2
18	Dummy Measurement Data for Front Seat Occupants	4-4
19	Camera Locations	4-7

LIST OF FIGURES

<u>NUMBER</u>	<u>DESCRIPTION</u>	<u>PAGE NO.</u>
1	Dummy Measurement Locations for Front Seat Occupants	4-3
2	Vehicle Target Locations	4-5
3	Camera Positions	4-6

SECTION 1
PURPOSE AND TEST PROCEDURE

PURPOSE

This 30 mph flat frontal barrier impact test is part of the Federal Motor Vehicle Safety Standard (FMVSS) 208, 212, 219 (partial), and 301 compliance test program conducted for the National Highway Traffic Safety Administration (NHTSA) by the MGA Research Corporation (MGA) under Contract No. DTNH22-93-D-21089. The purpose of this test was to determine whether the subject vehicle, a 1995 Nissan Maxima 4 Door Sedan, NHTSA No. CS5203, meets the performance requirements of FMVSS 208, "Occupant Crash Protection"; FMVSS 212, "Windshield Mounting"; FMVSS 219 (partial), "Windshield Zone Intrusion"; and FMVSS 301, "Fuel System Integrity," in the flat frontal barrier impact mode.

TEST PROCEDURE

This test was conducted in accordance with NHTSA's Office of Vehicle Safety Compliance (OVSC) Laboratory Test Procedure No. TP-208-09 dated March 15, 1993. Data was obtained relative to FMVSS 208, "Occupant Crash Protection"; FMVSS 212, "Windshield Mounting"; FMVSS 219 (partial), "Windshield Zone Intrusion"; and FMVSS 301, "Fuel System Integrity," performance.

The test vehicle was instrumented with seven (7) accelerometers to measure longitudinal axis accelerations and one (1) accelerometer to measure vertical axis acceleration. The vehicle's specified impact velocity range was 28.9 to 29.9 mph. The vehicle impacted a fixed flat barrier the face of which was covered with a sheet of 3/4 inch thick plywood.

The test vehicle contained two (2) Part 572 E 50th percentile adult male anthropomorphic test devices (dummies). The dummies were positioned in the front outboard designated seating positions according to the dummy placement procedures specified in Appendix C of the Laboratory Test Procedure.

Both dummies were instrumented with head and chest accelerometers to measure longitudinal, lateral, and vertical accelerations, and with left and right femur load cells to measure axial forces. Each Part 572 E dummy's instrumentation also included a chest potentiometer to measure longitudinal deflection.

The twenty-six (26) data channels were multiplexed and recorded on four IBM PC compatible computers with Metrobyte DAS-16F A/D converter boards. The data was digitally sampled at 8170 samples per second and processed per Section 11.13 through 11.15 of the Laboratory Test Procedure.

The crash event was recorded by one (1) real-time panning motion picture camera and fourteen (14) high-speed motion picture cameras. The pre-test and post-test conditions were recorded by the real-time motion picture camera.

The vehicle and occupant data are summarized in Section 2. The FMVSS 208, 212, 219 (partial) and 301 data are presented in Section 3. The vehicle, occupant, and camera measurements are presented in Section 4. Appendix A contains the still photographic prints. Appendix B contains the dummy and vehicle data plots. Appendix C contains the manufacturer's vehicle information.

SECTION 2
SUMMARY OF FRONTAL BARRIER IMPACT TEST

TEST RESULTS SUMMARY

This flat frontal barrier test was conducted at MGA Research Corporation on November 18, 1994.

The test vehicle, a 1995 Nissan Maxima, NHTSA No. CS5203, appeared to comply with the performance requirements of FMVSS 208, 212, 219 (partial), and 301 in the flat frontal barrier impact mode. The Head Injury Criteria (HIC) calculations were less than 1000, the chest resultant accelerations did not exceed 60 g's, and the compressive forces transmitted through the upper legs did not exceed 2,250 pounds as measured by Part 572 E dummies seated in the front outboard designated seating positions. For each Part 572 E dummy, the chest deflection did not exceed 3.0 inches. The vehicle's restraint system met the applicable comfort and convenience requirements. The windshield periphery retention on each side of the vehicle centerline was greater than 50 percent. There was no penetration into any portion of the windshield. No fluid spilled from the vehicle's fuel system following the impact or during the static rollover test.

The test vehicle was equipped with an airbag and a Type 2 seat belt in the front outboard designated seating positions. Both dummies were restrained only by the airbag during the test. The vehicle's test weight was 3460 pounds. The vehicle's impact speed was 28.9 mph. The vehicle's maximum static crush was 12.5 inches.

The driver's HIC was 278. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 43.8 g's. The driver's chest maximum deflection was 1.0 inches. The driver's left and right femur maximum compressive forces were 1115 pounds and 1355 pounds, respectively.

The right front passenger's HIC was 143. The right front passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 35.4 g's. The right front passenger's chest maximum deflection was 0.4 inches. The right front passenger's left and right femur maximum compressive forces were 1308 pounds and 1371 pounds, respectively.

There was no loss of windshield periphery retention and no penetration through the windshield.

Following the impact, no fluid spilled from the vehicle's fuel system prior to the static rollover test or during any portion of the static rollover test.

TEST NOTES

The high speed cameras for the right passenger kinematics view (camera #9) and the front passenger view (camera #13) did not record the timing mark during the test.

TABLE 1 CRASH TEST SUMMARY

Vehicle Yr/Make/Model/Body Style: 1995/Nissan/Maxima/4 Door

Vehicle NHTSA No.: CS5203 Test Type: Frontal Barrier Impact

Test Date: 11/18/94 Time: 17:00 Temp: 70°F

Vehicle Test Weight: 3460 lbs. Vehicle/Barrier Impact Angle: 0°

Impact Velocity: 28.9 mph Maximum Static Crush: 12.5 inches

Vehicle Rebound: 19.7 inches

Dummies:	Driver	Passenger
Dummy Type	<u>Part 572E</u>	<u>Part 572E</u>
Serial Number	<u>403</u>	<u>401</u>
Restraint System	<u>Airbag</u>	<u>Airbag</u>
No. of Data Channels	<u>9</u>	<u>9</u>

Number of Cameras: 1 Real Time
 14 High Speed

Door Opening Data: Left Front: Easy
 Right Front: Easy

Front Seat(s) Data:	Driver	Passenger
Seat Track Failure	<u>None</u>	<u>None</u>
Seat Back Failure	<u>None</u>	<u>None</u>

Visible Dummy Contact Points:	Driver	Passenger
Head	<u>Airbag</u>	<u>Airbag</u>
Chest	<u>Airbag</u>	<u>Airbag</u>
Left Knee	<u>Instrument Panel</u>	<u>Instrument Panel</u>
Right Knee	<u>Instrument Panel</u>	<u>Instrument Panel</u>

TABLE 2 GENERAL TEST AND VEHICLE PARAMETER DATA

Vehicle Yr/Make/Model/Body Style: 1995/Nissan/Maxima/4 Door

NHTSA No: CS5203 VIN: JN1CA21D7ST028972 Body Color: Deep Blue Pearl

Engine: 6 Cylinders; C.I.D.; 3.0 liters; CC

 Gas; Diesel; Turbocharged

 Longitudinal X Transverse

Transmission: 5 Speed; X Manual; Automatic; Overdrive

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

Major Option: X A/C; X P/S; X P/B; X P/wdo; X P/door locks;

 P/seats; X Tilt Wheel; Anti-skid Brakes; X Cruise Control; Other

Date Received: 08/01/94; Odometer Reading: 54 miles

Dealer's Name/Address: Gordie Boucher Nissan
10606 W. Arthur Avenue
West Allis, WI 53227

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured By: Nissan Motor Co., Ltd.

Date of Manufacture: 06/94; VIN: JN1CA21D7ST028972

GVWR: 4273 lbs; GAWR Front: 2352 lbs. GAWR Rear: 1953 lbs.

DATA FROM TIRE PLACARD:

Tire Pressure with maximum capacity vehicle load: Front 29 Psi; Rear 29 Psi

Recommended Tire Size: P205/65R15

Recommended Cold Tire Pressure: Front 29 Psi; Rear 29 Psi

Tires on Vehicle: P205/65R15; Manufacturer: Yokohama

Type of Spare Tire: Space Saver

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; X Lever; Rot. Knob

TABLE 2 GENERAL TEST AND VEHICLE PARAMETER DATA (Cont'd)

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

Right Front = 932 lbs Right Rear = 568 lbs
Left Front = 944 lbs Left Rear = 537 lbs
TOTAL FRONT WEIGHT = 1876 lbs (62.9% of Total Vehicle Weight)
TOTAL REAR WEIGHT = 1105 lbs (37.1% of Total Vehicle Weight)
TOTAL UNLOADED DELIVERED WEIGHT (UDW) = 2981 lbs

CALCULATION FOR TARGET TEST WEIGHT:

UDW (Unloaded Delivered Weight) = 2981 lbs
VCW (Vehicle Capacity Weight) = 900 lbs
DSC (Designated Seating Capacity) = 5
RCLW*(Rated Cargo/Luggage Weight) = VCW - 150 (DSC) = 900 - 150 (5) = 150 lbs
Target Test Weight = UDW + RCLW + (2 Dummies x Dummy Weight)
Target Test Weight = 2981 + 150 + 344 = 3475 lbs

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND CARGO WEIGHT:

Right Front = 999 lbs Right Rear = 726 lbs
Left Front = 1014 lbs Left Rear = 721 lbs
TOTAL FRONT WEIGHT = 2013 lbs (58.2% of Total Vehicle Weight)
TOTAL REAR WEIGHT = 1447 lbs (41.8% of Total Vehicle Weight)
TOTAL TEST WEIGHT = 3460 lbs
Weight of ballast secured in vehicle = 25 lbs
Vehicle components removed to meet target weight: Rear Seat, Spare Tire, Jack, and Muffler

VEHICLE ATTITUDE (all dimensions in inches):

Delivered Attitude: RF 28.4 LF 28.3 RR 28.9 LR 28.6
Fully Loaded Attitude: RF 27.5 LF 27.8 RR 27.5 LR 27.2
Test Attitude: RF 28.0 LF 27.9 RR 27.3 LR 27.3
Wheel Base: 106.1 in; C.G. = 44.4 in rearward of front wheel centerline

* Cargo weight for multi-purpose passenger vehicles, truck, and buses is the vehicle's rated cargo and luggage weight from the vehicle's label or 300 pounds, whichever is less.

TABLE 3 POST-IMPACT DATA

Type of Test: Frontal Barrier Impact Impact Angle: 0°
Test Date: 11/18/94 Time: 17:00 Temperature: 70°F
Vehicle NHTSA No.: CS5203 VIN: JN1CA21D7ST028972

BARRIER IMPACT VELOCITY

Required Impact Velocity Range: 28.9 to 29.9 mph
Impact Velocity: Primary = 28.9 mph; Secondary = 28.9 mph
Distance From Front Bumper to Barrier Face When
Entering Speed Trap: 47.2 inches
Exiting Speed Trap: 7.9 inches

VEHICLE STATIC CRUSH AND REBOUND (inches):

Vehicle Length:	Pre-test	= R	<u>182.4</u>	C _L	<u>187.2</u>	L	<u>181.8</u>
	Post-test	= R	<u>170.9</u>	C _L	<u>174.8</u>	L	<u>172.2</u>
	Crush	= R	<u>11.5</u>	C _L	<u>12.4</u>	L	<u>9.6</u>
	Average	=	<u>11.2</u>				

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

R 19.7 in C_L 19.3 in L 19.5 in

TABLE 4 ACCIDENT INVESTIGATION DIVISION DATA

Vehicle Year/Make/Model/Body Style: 1995/Nissan/Maxima/4 Door

Veh. NHTSA No.: CS5203;

VIN: JN1CA21D7ST028972

Build Date: 06/94;

Test Date: 11/18/94

Veh. Size Category: Mid;

Test Weight: 3460 lbs

Veh. Wheelbase: 106.1 in;

Front Overhang: 39.8 in;

Overall Width: 69.8 in

ACCELEROMETER DATA:

Location: As per measurements on pages 2-10

Calibration Procedure: As per MGA Calibration Procedure

Linearity: >99.9% ; Integration Algorithm: Trapezoidal

COLLISION DEFORMATION CLASSIFICATION (CDC) CODE:

Impact Mode: Frontal Barrier

Crush Depth C1 = 9.6 inches

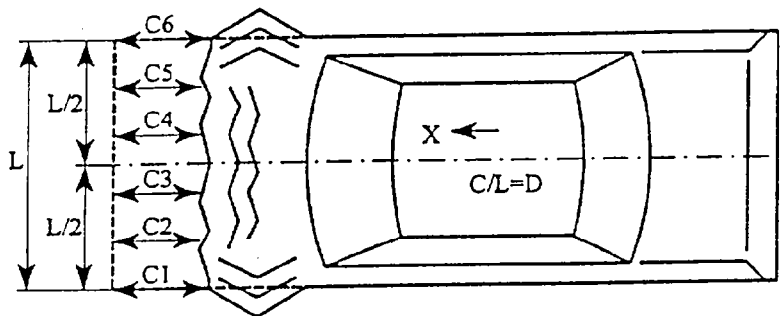
Dimensions: C2 = 11.9 inches

C3 = 12.5 inches

C4 = 12.4 inches

C5 = 11.3 inches

C6 = 11.5 inches



Midpoint of Damage: D = Vehicle Longitudinal Centerline

Length of Damaged Region: L = 53.8 inches

TABLE 5 POST TEST AIRBAG DATA

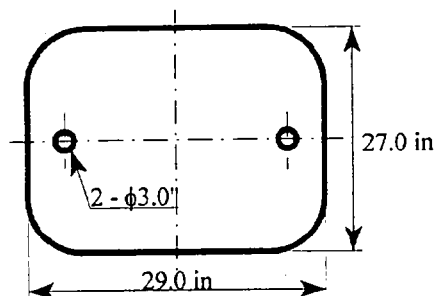
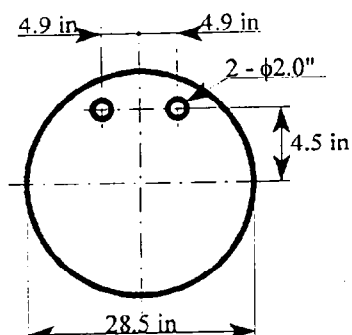
Vehicle Year/Make/Model/Body Style: 1995/Nissan/Maxima/4 Door

NHTSA No: CS5203 ; Test Date: 11/18/94 ; Technician: Homyoung Kim

- A. No of Vent Holes: Driver 2 ; Passenger 2
- B. Size of Vent Holes: Driver 2.0 in. dia. ; Passenger 3.0 in. dia.
- C. Total Vent Area: Driver 3.1 in² ; Passenger 7.1 in²
- D. Deflated Airbag Length and Width Dimensions or, if Round, Diameter
 Driver; Length ; Width ; Diameter 28.5 in
 Passenger; Length 29.0 ; Width 27.0 ; Diameter
- E. Is the Airbag Tethered?
 Driver; X Yes; No; If yes, record length of tether 10 in
 Passenger; Yes; X No; If yes, record length of tether in

Driver Airbag

Passenger Airbag



There were four (4) tethers in driver airbag. One end of each tether was attached to the front face center of the airbag and the other end to the rear face center.

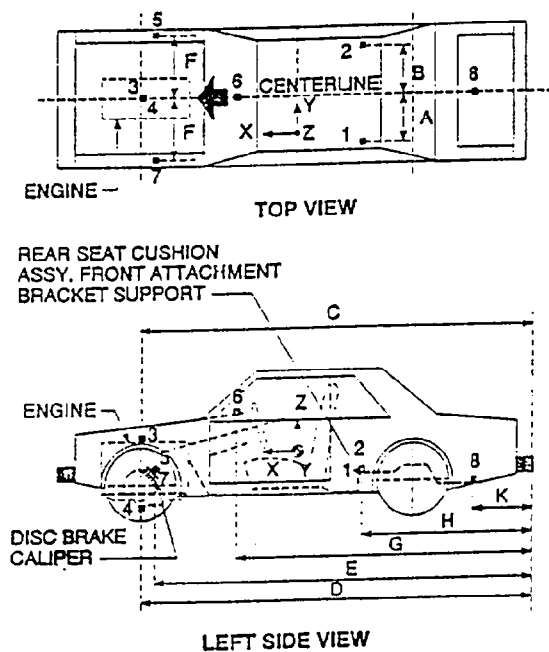
- F. Part Numbers and Manufacture Name of Airbag and Gas Generator

Driver; Mfr N/A ; Airbag TB42U945310163 ; Gen N46E5943312971
 Passenger; Mfr N/A ; Airbag 4A031802 ; Gen N/A

TABLE 6 VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Vehicle Year/Make/Model/Body Style: 1995/Nissan/Maxima/4 Door

Vehicle NHTSA No.: CS5203 ; Test Date: 11/18/94



ACCELEROMETER LOCATION (inches)		
	PRE-TEST	POST-TEST
A	21.0	21.0
B	21.0	21.0
C	144.6	152.4
D	157.3	148.1
E	154.1	141.8
F	26.3	37.3
G	126.1	126.4
H	67.8	67.8
K	7.4	7.4

ACCELEROMETER DATA SUMMARY					
No.	DESCRIPTION	MAXIMUM (g's)	TIME (msec)	MINIMUM (g's)	TIME (msec)
1	Left Rear Seat Crossmember	2.6	105	-31.8	45
2	Right Rear Seat Crossmember	2.1	105	-29.2	55
3	Top of Engine Block	16.5	47	-111.9	28
4	Bottom of Engine	57.5	45	-104.4	38
5	Right Disc Brake Caliper	34.9	72	-92.8	47
6	Instrument Panel	12.3	77	-38.8	63
7	Left Disc Brake Caliper	18.0	72	-84.3	46
8	Trunk	24.8	55	-17.1	40

TABLE 7 REPORT OF VEHICLE CONDITION AT THE COMPLETION OF TESTING

Contract Number: DTNH22-93-D-21089
From: MGA Research Corporation
5000 Warren Road
Burlington, WI 53105
To: Mr. Charles Case
COTR
Office of Vehicle Safety Compliance

The following vehicle has been subjected to testing for FMVSS 208. The vehicle was inspected upon arrival at the laboratory for the test and found to contain all of the equipment listed below. All variances have been reported within 2 working days of vehicle arrival, by letter, to the NHTSA Industrail Property Manager/NAD-30, with a carbon copy of the responsible testing office. The vehicle is again inspected and all changes are noted below. The final condition of the vehicle is also noted in detail.

Vehicle Year/Make/Model/Body Style: 1995/Nissan/Maxima
Vehicle NHTSA No.: CS5203 Body Color: Deep Blue Pearl
VIN: JN1CA21D7ST028972 Cost: \$20,389.00
Odometer: Arrival Date: 08/01/94 Reading: 54 miles
Completion Date: 11/18/94 Reading: 68 miles
Engine: 6 Cylinders; 3.0 Liters; X Gas; Diesel
Transmission: 5 Speed; X Manual; Automatic
Final Drive: X Front Wheel; Rear Wheel; Four Wheel
Tire Size: P205/65R15; Manufacturer: Yokohama

Air Conditioner	<u>Yes</u>	Console	<u>Yes</u>	Brakes	<u>Power</u>
Tinted Glass	<u>Yes</u>	Tachometer	<u>Yes</u>	Front	<u>Disc</u>
Power Steering	<u>Yes</u>	Cruise Control	<u>Yes</u>	Rear	<u>Disc</u>
Power Windows	<u>Yes</u>	Rear Window Def.	<u>Yes</u>	Front Seats	<u>Manual</u>
Power Door Locks	<u>Yes</u>	Sun/Moon Roof	<u>No</u>	Seat Type	Front <u>Bucket</u>
Radio:AM/FM Tape	<u>Yes</u>	T-Top	<u>No</u>		Rear <u>Bench</u>
Clock	<u>Yes</u>	Tilt Steering Wheel	<u>Yes</u>		
Roof Rack	<u>No</u>	Other Options:	<u>No</u>	No. of Seats	<u>Three</u>

Equipment that is no longer on the vehicle as noted above:
Rear Seat

Explanation:
Items removed to allow installation of data acquisition system.

Vehicle Condition:
The vehicle was subjected to a 30 mph frontal crash test. There is severe structural damage on the front body. Various interior and exterior portions of the vehicle have been painted and have had holes drilled to facilitate attachment of instrumentation. Various body parts have been removed. Stoddard solvent replaced the fuel in the fuel system and engine. THE VEHICLE IS FOR SALVAGE ONLY AND IS NOT TO BE REPAIRED FOR HIGHWAY USE.

SECTION 3
SUMMARY OF RESULTS FOR FMVSS 208
212, 219 (PARTIAL), AND 301

TABLE 8 FMVSS 208 OCCUPANT INJURY CRITERIA

Veh. Yr./Make/Model/Body Style: 1995/Nissan/Maxima/4 Door

Veh. NHTSA No.: CS5203 Test Date: 11/18/94

MAXIMUM ACCELERATION VALUES: (g's)	DRIVER DUMMY #403	PASSENGER DUMMY #401
Head Channel X	-48.4	-39.9
Head Channel Y	8.2	-8.4
Head Channel Z	16.9	20.5
HEAD RESULTANT	48.8	42.0
Chest Channel X	-43.3	-35.7
Chest Channel Y	6.7	-6.7
Chest Channel Z	10.5	14.8
CHEST RESULTANT	44.4	36.7

HEAD INJURY CRITERIA (HIC) VALUES:

HIC	278.0	143.1
t_1 = (msec)	67.6	72.1
t_2 = (msec)	100.7	103.9

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

CHEST INJURY CRITERIA (CLIP) VALUES: (g's)

CLIP	43.8	35.4
t^1 = (msec)	73.8	87.9
t^2 = (msec)	76.9	90.9
CHEST DEFLECTION (in)	1.0	0.4

MAX. COMPRESSIVE FEMUR FORCES: (lbs)

Left Side	1115	1308
Right Side	1355	1371

TABLE 9 DUMMY KINEMATIC SUMMARY

DRIVER DUMMY

Upon impact, the driver dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head and chest impacted the airbag with the dummy's head rotating rearward. The driver dummy was restrained by the airbag. The dummy rebounded rearward into the seat back with the dummy's head contacting the head restraint. The driver dummy came to rest in the seat.

RIGHT FRONT PASSENGER DUMMY

Upon impact, the right front passenger dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head and chest impacted the airbag with the dummy's head rotating rearward. The right front passenger dummy was restrained by the airbag. The dummy rebounded rearward into the seat back with the dummy's head contacting the head restraint. The right front passenger dummy came to rest in the seat.

TABLE 10 FMVSS 208 SEAT BELT COMFORT AND CONVENIENCE TEST SUMMARY
FRONT OUTBOARD DESIGNATED SEATING POSITIONS

Vehicle Year/Make/Model/Body Style: 1995/Nissan/Maxima/4 Door

NHTSA No.: CS5203; Date of Comfort/Convenience Check: 11/16/94

Technician Performing Check: Homyoung Kim

GVWR: 4273 lbs

Automatic seat belts installed in any vehicle, other than a walk-in van-type vehicle which has a gross vehicle weight rating of 10,000 pounds or less, and is manufactured on or after September 1, 1986, shall meet the requirements for convenience hooks, webbing tension relieving devices, and belt contact force.

Manual seat belts installed for compliance with this standard in front outboard designated seating positions of any vehicle, other than a walk-in van-type vehicle which has a gross vehicle rating of 10,000 pounds or less, and is manufactured on or after September 1, 1989, shall meet the requirements for belt contact force, plate access, retraction and seat belt guides, and hardware.

VEHICLE EQUIPMENT:

The vehicle's front outboard seating positions were equipped with manual Type 2 seat belts which must comply with the dynamic test requirements of S5.1; requirements for webbing tension-relieving devices (S7.4.2), belt contact force (S7.4.3), latchplate access (S7.4.4), retraction (S7.4.5), and seat belt guides and hardware (S7.4.6) apply.

CONVENIENCE HOOKS (S7.4.1):

Not applicable, the vehicle was not equipped with automatic seat belts.

WEBBING TENSION-RELIEVING DEVICE (S7.4.2)

The seat belt assembly in the front outboard seating positions did not have webbing tension-relieving devices.

TABLE 10 FMVSS 208 SEAT BELT COMFORT AND CONVENIENCE TEST SUMMARY
FRONT OUTBOARD DESIGNATED SEATING POSITIONS, (Cont'd)

BELT CONTACT FORCE (S7.4.3)

The belt contact force on the chest of the test dummy was 0.3 pounds.

LATCHPLATE ACCESS (S7.4.4)

The seat belt latchplates, in their normal stowed position, were within the reach envelope.

The clearance test block moved unhindered to the latchplate or buckle.

RETRACTION (S7.4.5):

The seat belt automatically retracted when the seat belt latchplate was released.

The stowed seat belt webbing and hardware were not pinched when the door was closed.

SEAT BELT GUIDES AND HARDWARE (S7.4.6)

The seat cushion was movable, but the seat back did not serve a function other than seating.

The seat was not removable.

The seat was not movable so that the space formerly occupied by the seat could be used for a secondary function.

Note: If the seat or seat cushion is removable or if the seat is movable so that the space formerly occupied by the seat can be used for a secondary function, the seat belt guides and hardware requirements do not apply.

TABLE 10 FMVSS 208 SEAT BELT COMFORT AND CONVENIENCE TEST SUMMARY
FRONT OUTBOARD DESIGNATED SEATING POSITIONS, (Cont'd)

SEAT BELT GUIDES AND HARDWARE (S7.4.6)(Cont'd)

The webbing was designed to pass through the seat cushion or between the cushion and seat back.

The remaining two parts (the seat belt latchplate and the buckle) were accessible under normal conditions.

The latchplate and buckle did not pass through the guides provided and fall behind the seat when the belt was completely retracted (or detached if not retractable) and the seat was moved to any position.

TABLE 11 FMVSS 208 EQUIPMENT DATA

Vehicle Year/Make/Model/Body Style: 1995/Nissan/Maxima/4 Door

Vehicle NHTSA No.: CS5203 Date of Check: 11/16/94

Technician Performing Check: Homyoung Kim

GVWR: 4273 lbs

FMVSS 208 SEAT BELT WARNING SYSTEM DATA

With an occupant in the driver's position and the lap belt/unibelt in stowed position and the ignition switch placed in the "start/on" position, the duration of audible warning signal was 6.0 seconds and the reminder light stayed on.

With an occupant in the driver's position and the lap belt/unibelt in use and the ignition switch placed in the "start/on" position, the duration of audible warning signal and the reminder light operation were 0 second.

Note: The audible warning should not operate.

The wording of the visual seat belt warning was the symbol from Table 2 of FMVSS 101.

FMVSS 208 LABELING AND DRIVER'S MANUAL DATA

The labels which describe manufacturer's maintenance or replacement schedule for the crash-deployed occupant protection system were located on the driver and passenger sunvisors.

The airbag system is required to be inspected ten (10) years after the date of manufacture shown on the certification label.

Appropriate instructions concerning maintenance and/or replacement of this system were provided in the owner's manual on page 2-20.

A description of the functional operation of the system was provided in the owner's manual on page 2-18.

A reference to the instructions and description of the system was included on the label.

TABLE 11 FMVSS 208 EQUIPMENT DATA, (Cont'd)

FMVSS 208 LABELING AND DRIVER'S MANUAL DATA (Cont'd)

An owner's manual was provided.

The owner's manual contained appropriate information concerning maintenance and/or replacement and a description of the functional operation of the systems on pages 2-18 through 2-21.

FMVSS 208 READINESS INDICATOR DATA

The vehicle contained a crash-deployed occupant protection system which was not totally mechanical. The readiness indicator was located on the left bottom area of the instrument cluster.

The readiness indicator was clearly visible to the driver.

A list of the elements in the occupant restraint system, being monitored by the readiness indicator, was provided in the owner's manual on page 2-20.

TABLE 12 FMVSS 212, "WINDSHIELD MOUNTING", DATA SUMMARY

Vehicle Year/Make/Model/Body Style: 1995/Nissan/Maxima/4 Door

Vehicle NHTSA No.: CS5203 Test Date: 11/18/94

DETAILS OF WINDSHIELD MOUNTING SUCH AS RETENTION METHOD, TRIM TYPE, ETC.:

Rubber molding with glue retention

CLIPS OR BRACKETS USED TO RETAIN WINDSHIELD: None

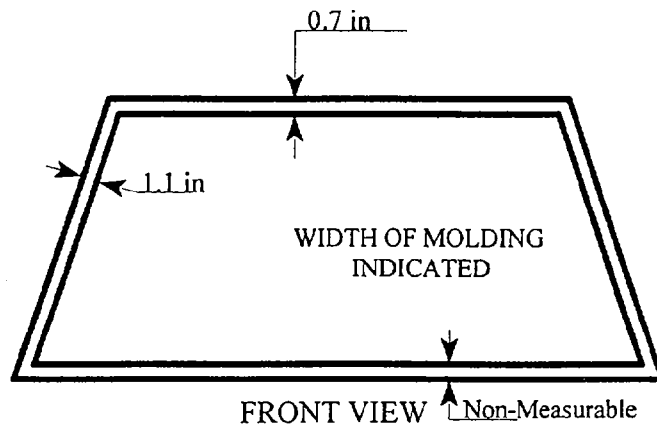
FMVSS 212 REQUIREMENTS:

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 (inches)		PERCENT RETENTION
	PRE-TEST	POST-TEST	
RIGHT SIDE	83.3	83.3	100%
LEFT SIDE	83.3	83.3	100%
TOTAL	166.6	166.6	100%

Pre-Test Windshield Mounting Material Temperature: 70°F



FAILURE DETAILS: None

TABLE 13 FMVSS 219, "WINDSHIELD ZONE INTRUSION", DATA SUMMARY

Vehicle Year/Make/Model/Body Style: 1995/Nissan/Maxima/4 Door

Vehicle NHTSA No.: CS5203 Test Date: 11/18/94

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 top surface of the instrument panel including padding. Draw the locus of points on the inner surface of the windshield contacted 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 1/2" distant from the locus line. The LOWER EDGE OF THE PROTECTED ZONE is the longitudinal projection onto the outer surface of the windshield of this line.

WINDSHIELD MEASUREMENTS:

A = 45.6 in

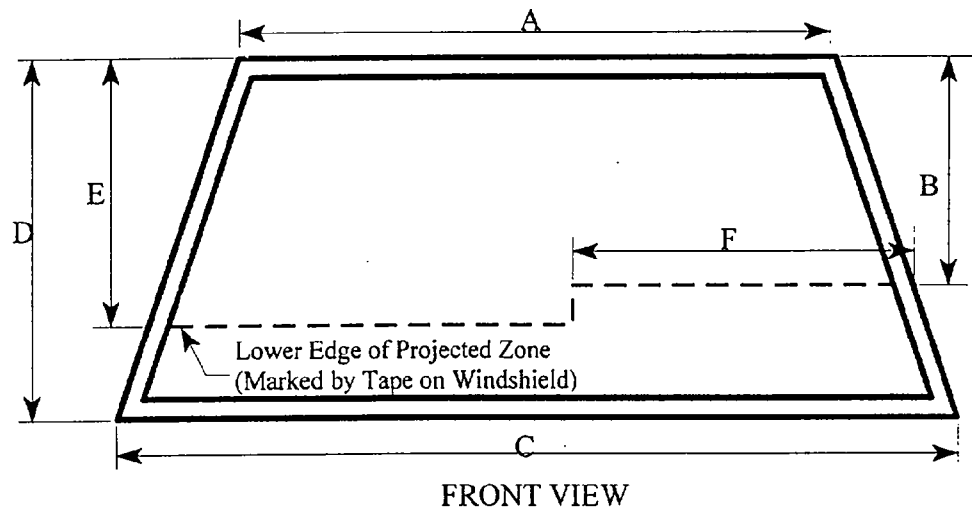
B = 22.4 in

C = 58.8 in

D = 31.1 in

E = 22.0 in

F = 23.1 in



AREAS OF WINDSHIELD TEMPLATE PENETRATION GREATER THAN 1/4 IN:

None

AREAS OF WINDSHIELD PENETRATION, BELOW THE PROTECTED ZONE, THROUGH THE INNER SURFACE OF THE WINDSHIELD:

None

TABLE 14 FUEL SYSTEM DATA

Vehicle Year/Make/Model/Body Style: 1995/Nissan/Maxima/4 Door

Vehicle NHTSA No.: CS5203 Test Date: 11/18/94

Fuel System Capacity from Owner's Manual = 18.5 gallons

Usable Capacity Figure Furnished by COTR = 18.5 gallons

Test Volume Range (92 to 94% of Usable Capacity)

= 17.0 to 17.4 gallons

Actual Test Volume = 17.0 gallons

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

Kinematic Viscosity = 1.788 centistokes; Color = Purple

Type of Fuel Pump: X Electric; Mechanical

Does electric pump operate with ignition switch "On" and engine "Off"?

X Yes; No

Details of Fuel System:

The fuel tank was located in front of the rear axle. The fuel filler pipe
was located on the left side. The fuel lines ran along the left side to
the front.

TABLE 15 FMVSS 301 POST IMPACT TEST DATA

Vehicle Year/Make/Model/Body Style: 1995/Nissan/Maxima/4 Door

Vehicle NHTSA No.: CS5203 Test Date: 11/18/94

TEST REQUIREMENTS:

Test vehicle's fuel tank filled to 92 to 94% of manufacturer's usable capacity and with electric fuel pump operating (if it will operate without engine operation). Part 572 test dummies located at each front designated seating position.

TEST VEHICLE IMPACT TYPE:

- ☒ Frontal (30 mph)
☐ Oblique (30 mph) with ___° barrier face first
contacting (driver/passenger) side
☐ Rear Moving Barrier (30 mph)
☐ Lateral Moving Barrier (20 mph)

FUEL SPILLAGE MEASUREMENT:

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

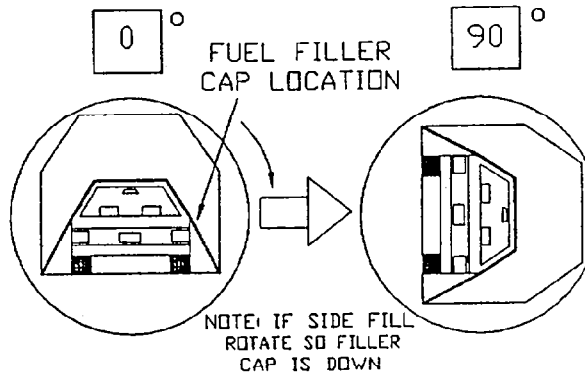
FUEL SPILLAGE LOCATION(S): None

TABLE 16 FMVSS 301 STATIC ROLLOVER TEST DATA

Vehicle Year/Make/Model/Body Style: 1995/Nissan/Maxima/4 Door

Vehicle NHTSA No.: CS5203 Test Date: 11/18/94

TEST PHASE: 0° - 90°



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 TIME = 7 minutes 48 seconds

Next Whole Minute Interval = 8 minutes

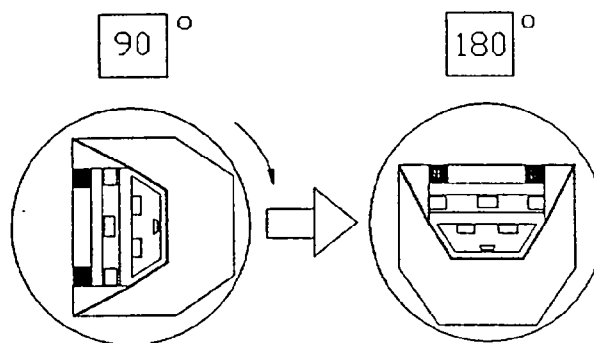
FUEL SPILLAGE MEASUREMENT:

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

FUEL SPILLAGE LOCATIONS(S): None

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

TEST PHASE: 90° - 180°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 55 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 55 seconds

Next Whole Minute Interval = 8 minutes

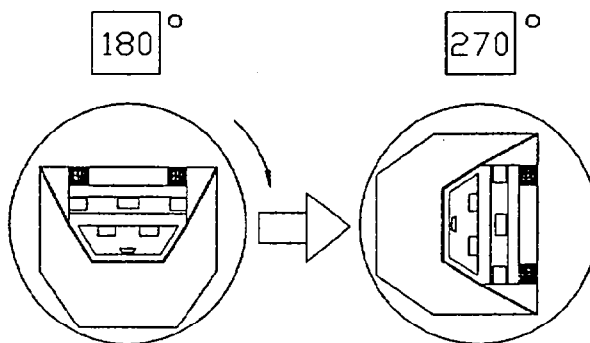
FUEL SPILLAGE MEASUREMENT:

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

FUEL SPILLAGE LOCATIONS(S): None

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

TEST PHASE: 180° - 270°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 26 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 26 seconds

Next Whole Minute Interval = 8 minutes

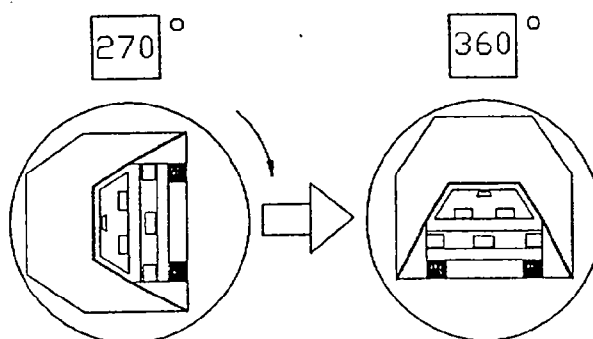
FUEL SPILLAGE MEASUREMENT:

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

FUEL SPILLAGE LOCATIONS(S): None

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

TEST PHASE: 270° - 360°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 42 seconds

Next Whole Minute Interval = 8 minutes

FUEL SPILLAGE MEASUREMENT:

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

FUEL SPILLAGE LOCATIONS(S): None

SECTION 4
OCCUPANT, VEHICLE, AND CAMERA INFORMATION

TABLE 17 SEAT AND STEERING COLUMN POSITIONING DATA

Vehicle Year/Make/Model/Body Style: 1995/Nissan/Maxima/4 Door

Vehicle NHTSA No.: CS5203 Test Date: 11/18/94

NOMINAL DESIGN RIDING POSITION:

Driver Seat: Seat Back Angle = 23°

The seat back angle was adjustable and was positioned at the 7th notch in accordance with the seat back set procedure in the manufacturer's information. The seat back angle was measured on the seat back frame with the inclinometer.

Passenger Seat: Same as driver's seat.

SEAT FORE AND AFT POSITIONS:

Driver Seat: The seat track had 20 detents and was positioned at the 11th notch rearward from the foremost position which was counted as the first notch.

Passenger Seat: Same as driver's seat.

STEERING COLUMN ADJUSTMENTS:

The steering column was positioned at the mid point of its swing. The angle of the steering column was 25° .

FIGURE 1 DUMMY MEASUREMENT LOCATIONS FOR FRONT SEAT OCCUPANTS

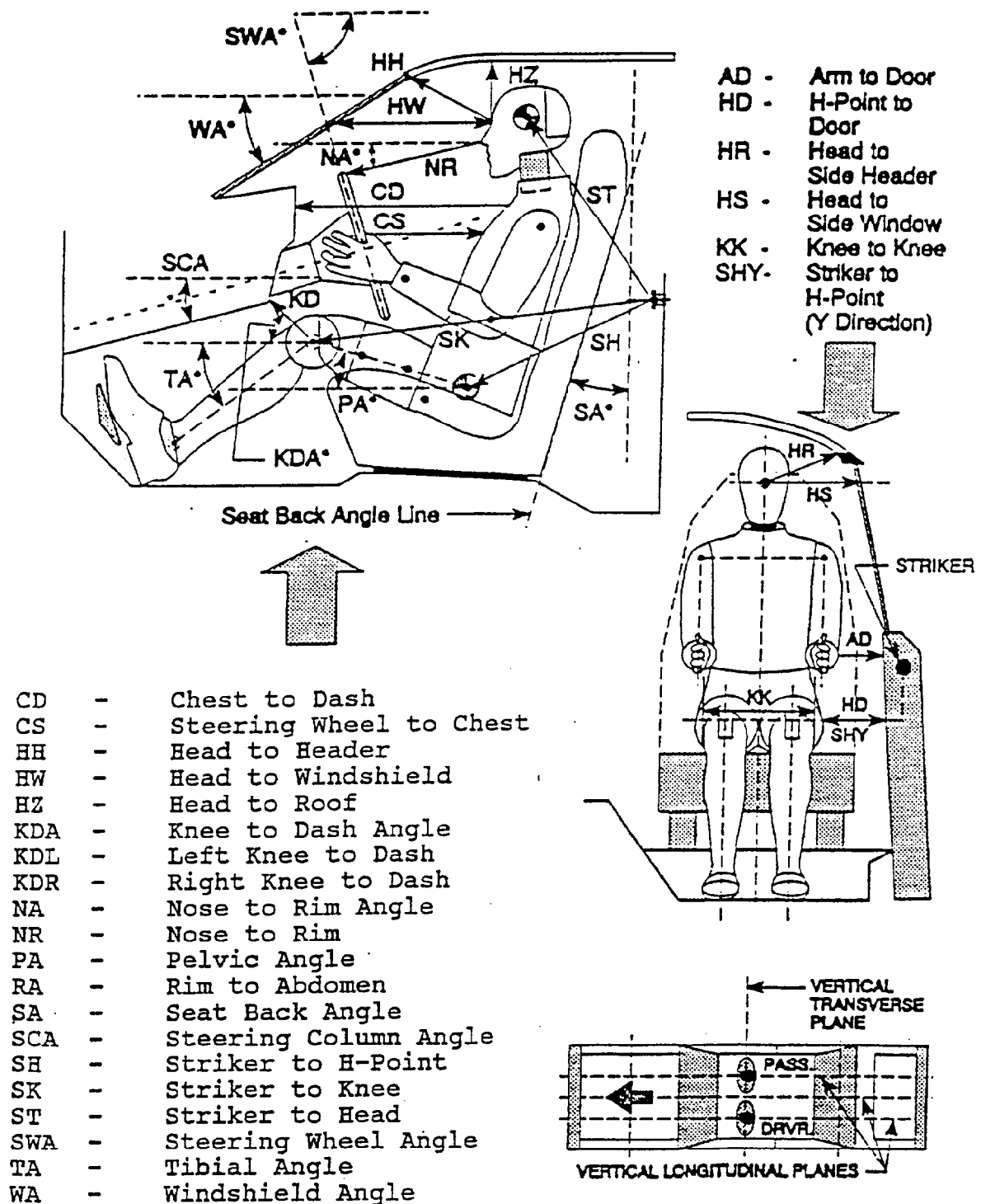


TABLE 18 DUMMY MEASUREMENT DATA FOR FRONT SEAT OCCUPANTS

Vehicle Year/Make/Model/Body Style: 1995/Nissan/Maxima/4 Door

Vehicle NHTSA No.: CS5203 Test Date: 11/18/94

	DRIVER (Serial #403)	PASSENGER (Serial #401)
WA°	29.3°	
SWA°	65.2°	N/A
SCA°	24.8°	N/A
SA°	23.0°	23.0°
HZ	7.1 in	6.9 in
HH	12.1 in	12.1 in
HW	22.1 in	22.4 in
HR	10.3 in	10.1 in
NR	17.0 in	N/A
CD	22.5 in	24.7 in
CS	13.8 in	N/A
RA	9.0 in	N/A
KDL	8.3 in Angle (KDA) 12.6°	7.9 in
KDR	8.3 in	8.6 in Angle (KDA) 11.2°
PA°	23.0°	23.4°
TA°	38.8°	31.6°
KK	13.0 in	9.9 in
ST	20.2 in Angle 78.5°	20.4 in Angle 75.3°
SK	23.3 in Angle -2.1°	24.6 in Angle -5.4°
SH	9.6 in Angle -31.0°	10.7 in Angle -33.4°
SHY	9.4 in	9.8 in
HS	15.0 in	14.9 in
HD	6.7 in	6.7 in
AD	4.7 in	4.6 in

N/A = Not Applicable

FIGURE 2 VEHICLE TARGET LOCATIONS

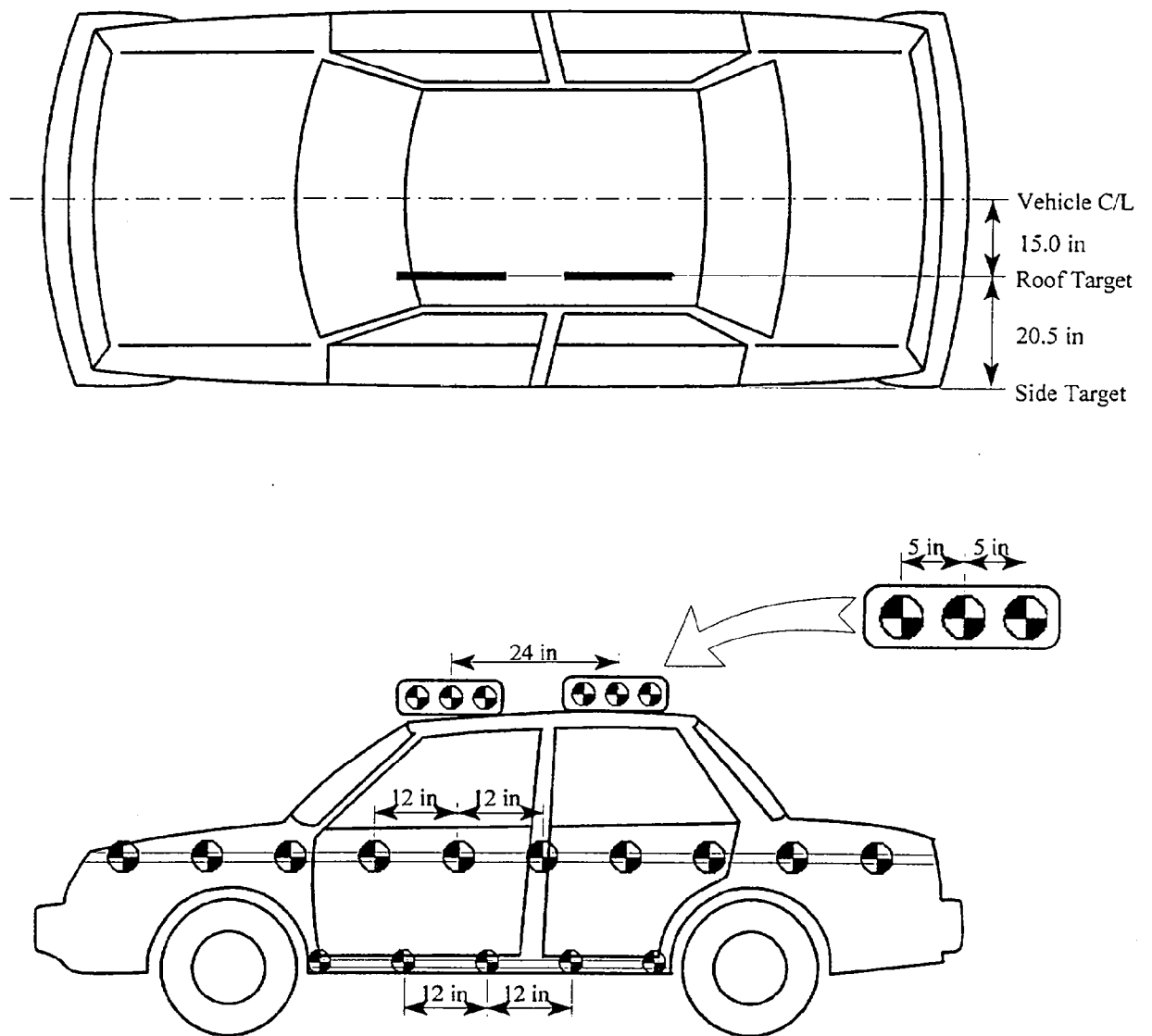


FIGURE 3 CAMERA POSITIONS

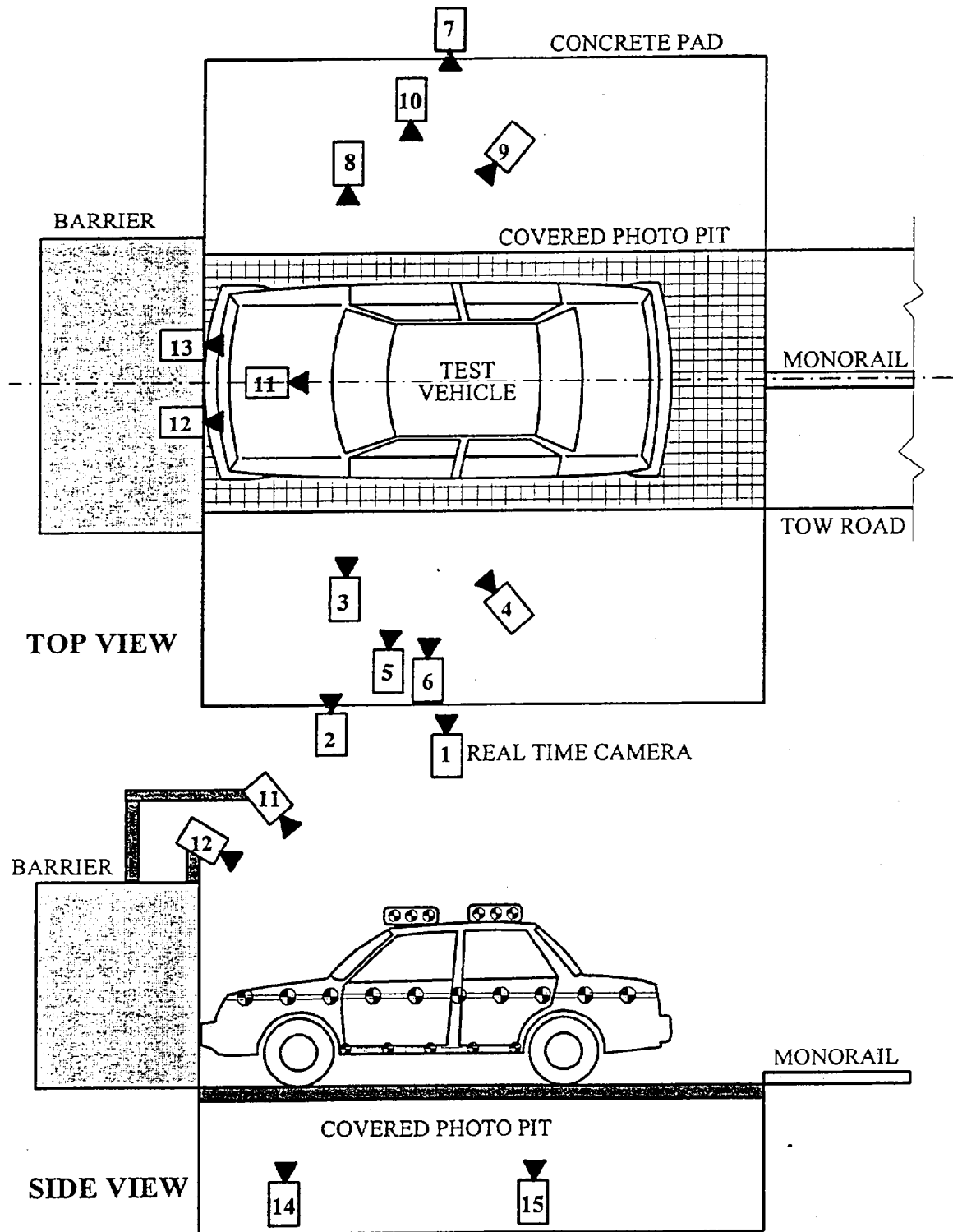


TABLE 19 CAMERA LOCATIONS

Veh. Year/Make/Model/Body Style: 1995/Nissan/Maxima/4 Door

Vehicle NHTSA No.: CS5203 ; Test Date: 11/18/94

	VIEW	CAMERA POSITIONS (inches)*			ANGLE (deg)	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Real-Time Left Side View				90°		10	24
2	Left Vehicle Crush	33.5	345.3	50.8	90°	327.5	25	957
3	Left Windshield Intrusion	59.8	276.4	46.3	90°	258.6	50	881
4	Left Driver Kinematics	169.7	189.8	74.8	50°		35	1282
5	Left Steering Column Motion	79.3	282.7	60.6	90°	264.9	25	1000
6	Left Steering Column Motion	79.5	282.3	40.9	90°	264.5	25	980
7	Right Overall View	107.9	-301.6	44.3	90°	283.8	13	1163
8	Right Vehicle Crush	73.2	-233.1	41.3	90°	215.3	35	840
9	Right Passenger Kinematics	157.9	-197.2	78.7	50°		35	No** Timing
10	Right Windshield Intrusion	48.0	-285.4	50.4	90°	267.6	25	926
11	Front View Windshield	17.3	0	171.7			13	1000
12	Front View Driver	-6.9	14.2	93.7			13	1087
13	Front View Passenger	-6.9	-15.7	95.9			13	No** Timing
14	Pit Camera Engine View	55.9	-5.1	-124.6			13	1010
15	Pit Camera Fuel Tank View	95.3	0	-124.2			13	1250

- * + X = Film plane rearward of barrier
 + Y = Film plane to left of monorail centerline
 + Z = Film plane to above ground level

** See TEST NOTES on page 2-3 in this report.

APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

<u>Description</u>	<u>Page No.</u>
Photo No. A-1 - Pre-Test Front View	A-1
Photo No. A-2 - Post-Test Front View	A-2
Photo No. A-3 - Pre-Test Left Side View	A-3
Photo No. A-4 - Post-Test Left Side View	A-4
Photo No. A-5 - Pre-Test Right Side View	A-5
Photo No. A-6 - Post-Test Right Side View	A-6
Photo No. A-7 - Pre-Test Front Underbody View	A-7
Photo No. A-8 - Post-Test Front Underbody View	A-8
Photo No. A-9 - Pre-Test Driver Dummy Position View	A-9
Photo No. A-10 - Post-Test Driver Dummy Position View	A-10
Photo No. A-11 - Pre-Test Driver Dummy Position View (Door Open)	A-11
Photo No. A-12 - Post-Test Driver Dummy Position View (Door Open)	A-12
Photo No. A-13 - Pre-Test Driver Seat Position View	A-13
Photo No. A-14 - Post-Test Driver Seat Position View	A-14
Photo No. A-15 - Pre-Test Passenger Dummy Position View	A-15
Photo No. A-16 - Post-Test Passenger Dummy Position View	A-16
Photo No. A-17 - Pre-Test Passenger Dummy Position View (Door Open)	A-17
Photo No. A-18 - Post-Test Passenger Dummy Position View (Door Open)	A-18
Photo No. A-19 - Pre-Test Passenger Seat Position View	A-19
Photo No. A-20 - Post-Test Passenger Seat Position View	A-20
Photo No. A-21 - Pre-Test Driver Dummy Knee Bolster View	A-21
Photo No. A-22 - Post-Test Driver Dummy Knee Bolster View	A-22
Photo No. A-23 - Pre-Test Passenger Dummy Knee Bolster View	A-23
Photo No. A-24 - Post-Test Passenger Dummy Knee Bolster View	A-24
Photo No. A-25 - Post-Test Driver Head Contact View (Airbag)	A-25
Photo No. A-26 - Post-Test Driver Knee Contact View	A-26
Photo No. A-27 - Post-Test Passenger Head Contact View (Airbag)	A-27
Photo No. A-28 - Post-Test Passenger Knee Contact View	A-28
Photo No. A-29 - Pre-Test Steering Column at Firewall View (Interior)	A-29
Photo No. A-30 - Vehicle Certification Label	A-30
Photo No. A-31 - Vehicle Tire Placard	A-31

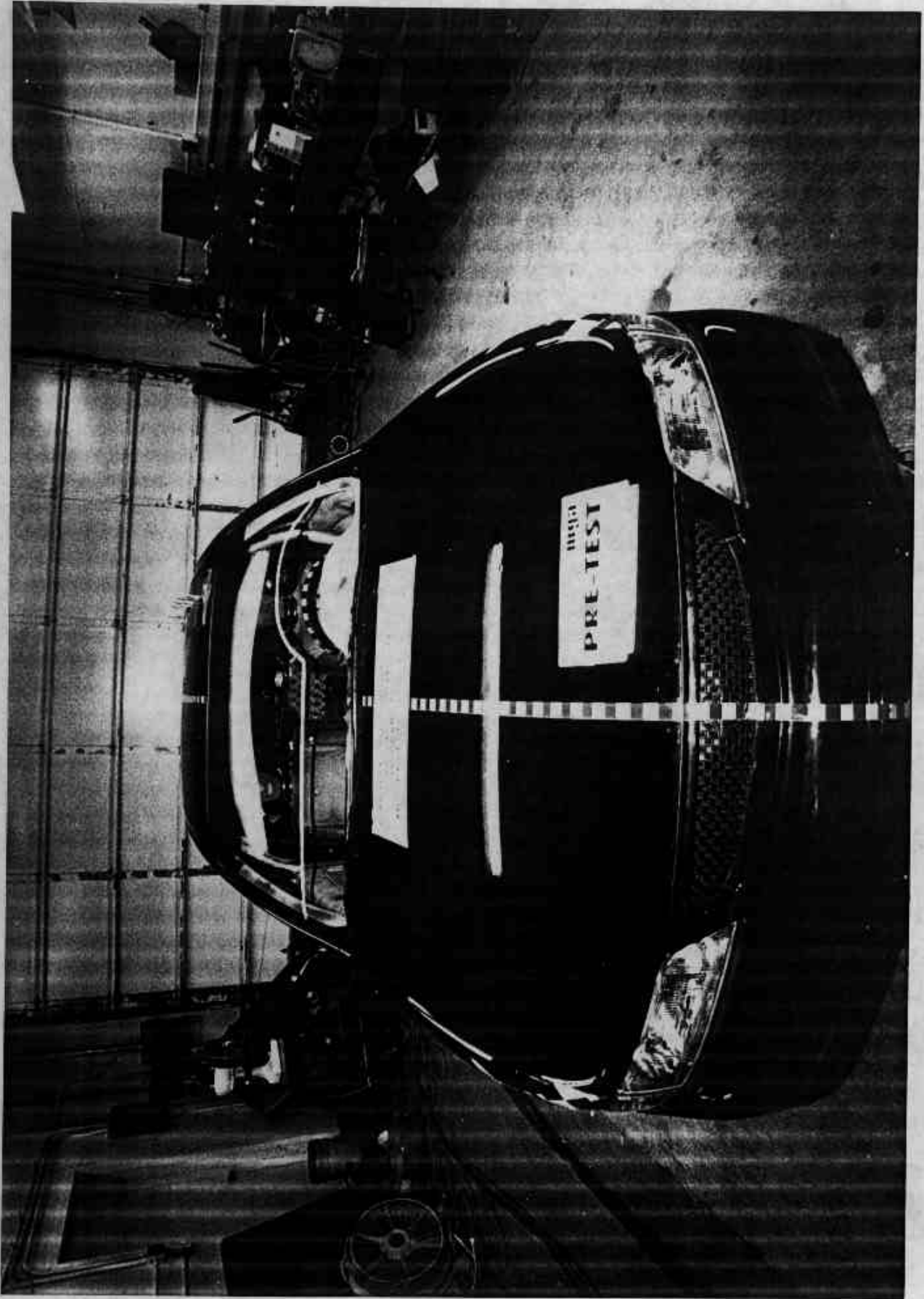


Photo No. A-1 - Pre-Test Front View

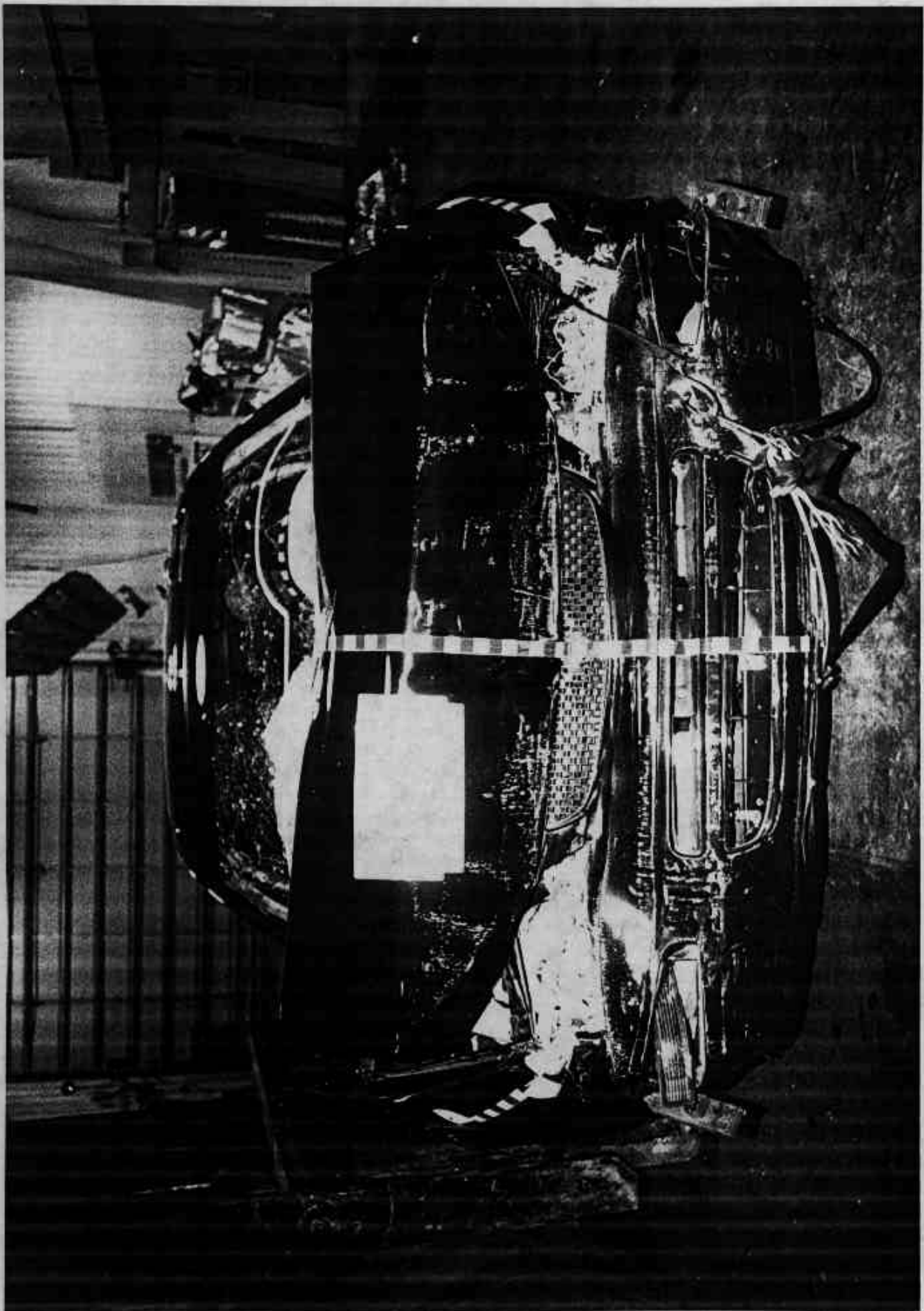


Photo No. A-2 - Post-Test Front View

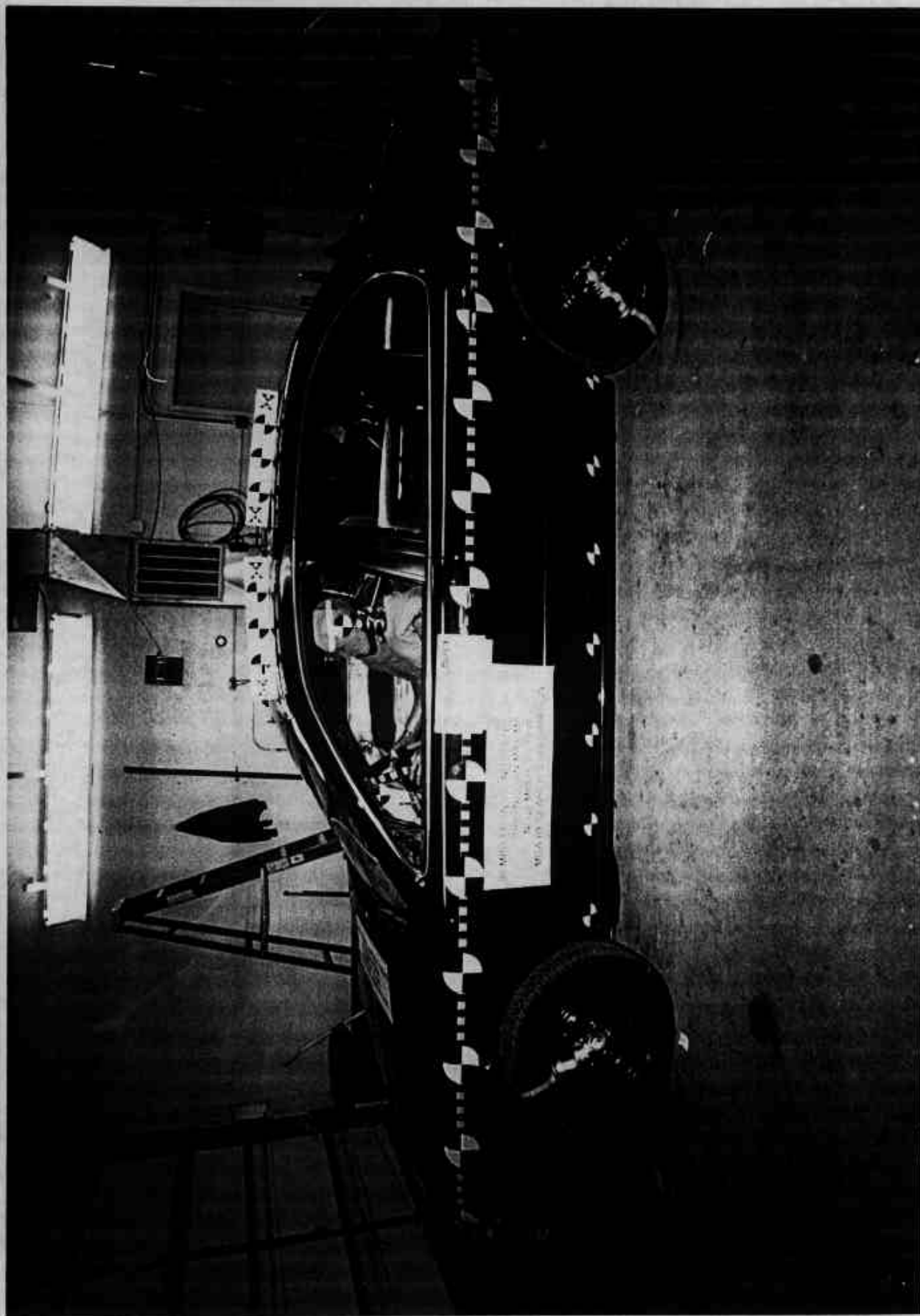


Photo No. A-3 - Pre-Test Left Side View

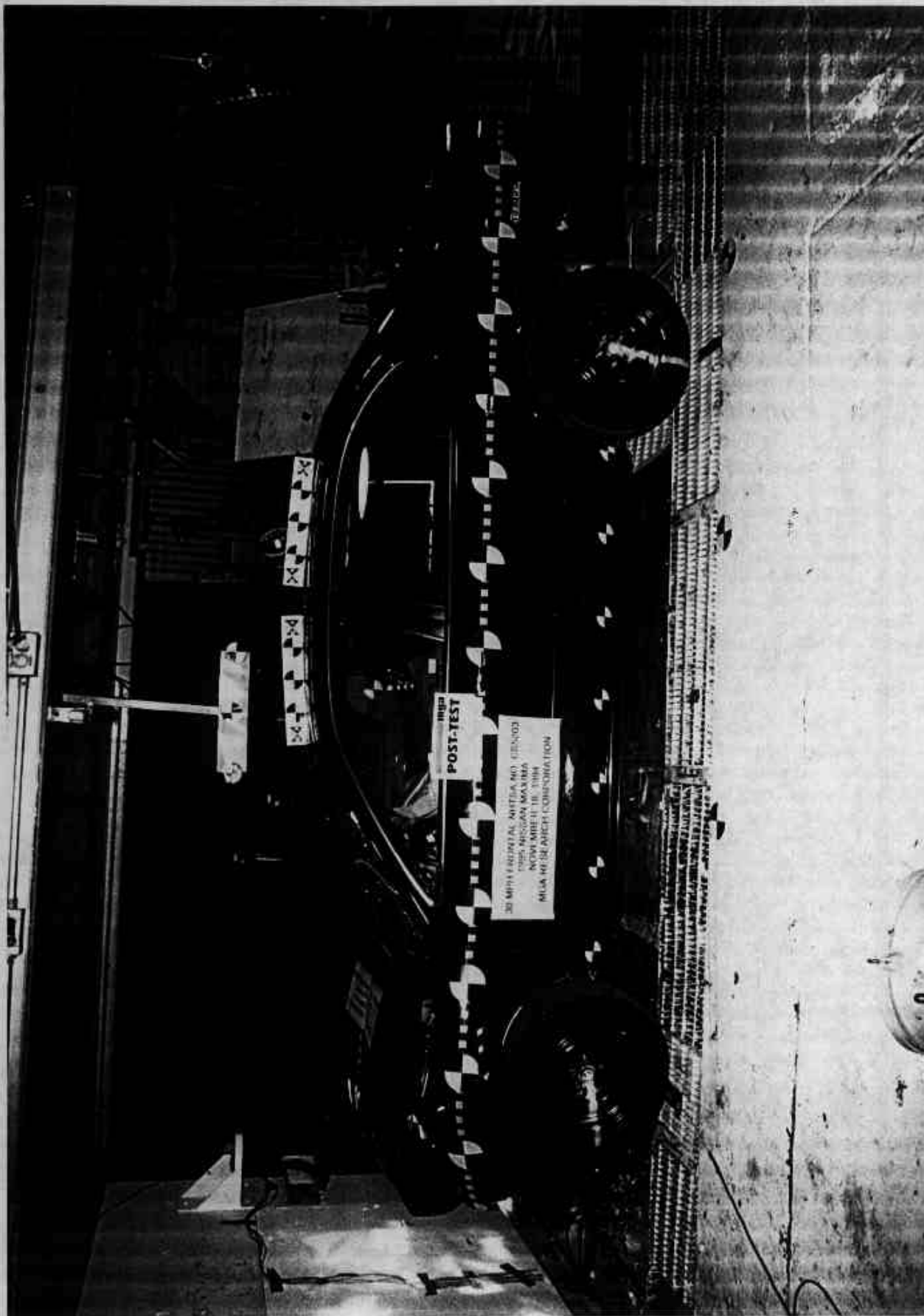
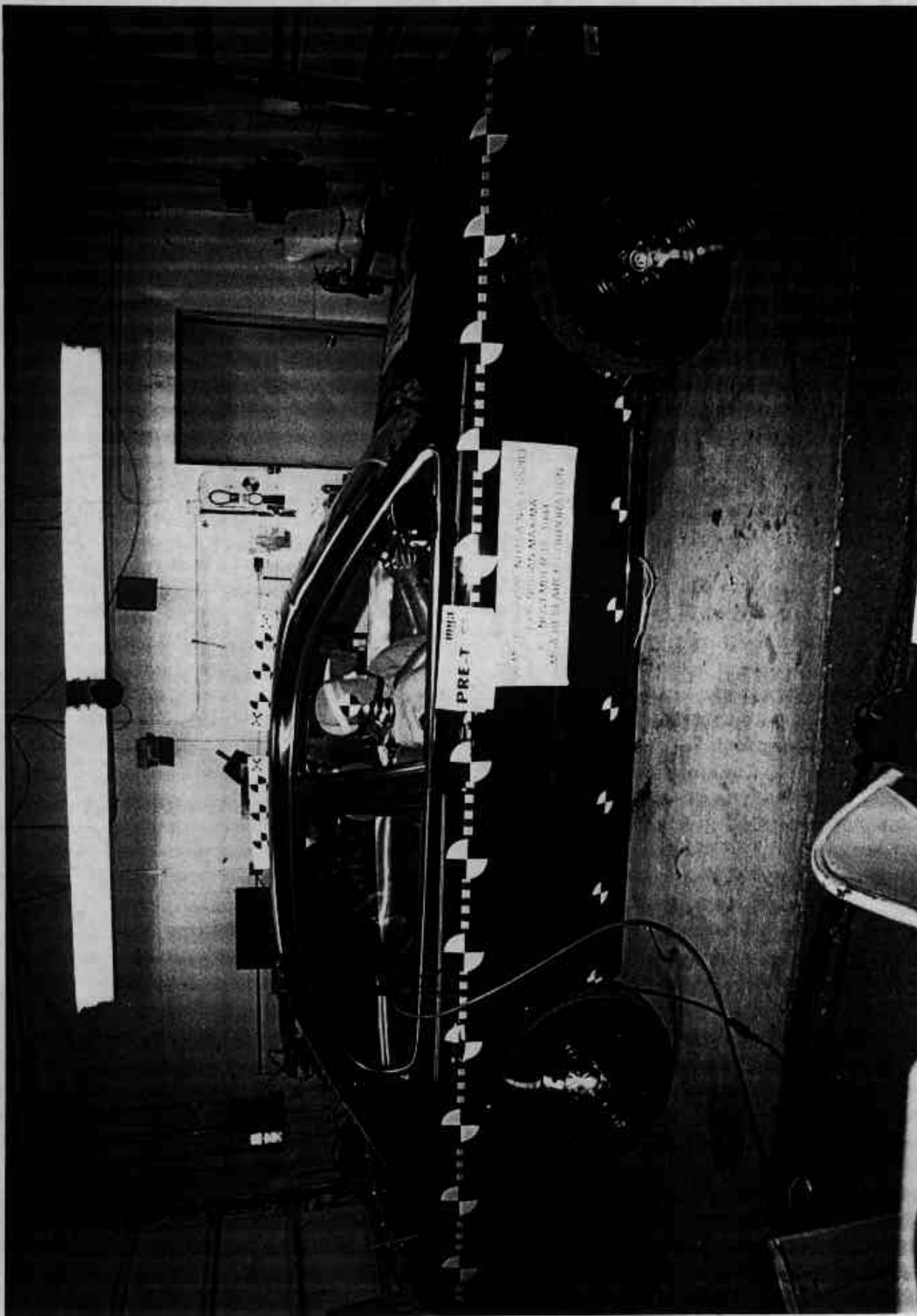


Photo No. A-4 - Post-Test Left Side View



A-5

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



Photo No. A-7 - Pre-Test Front Underbody View

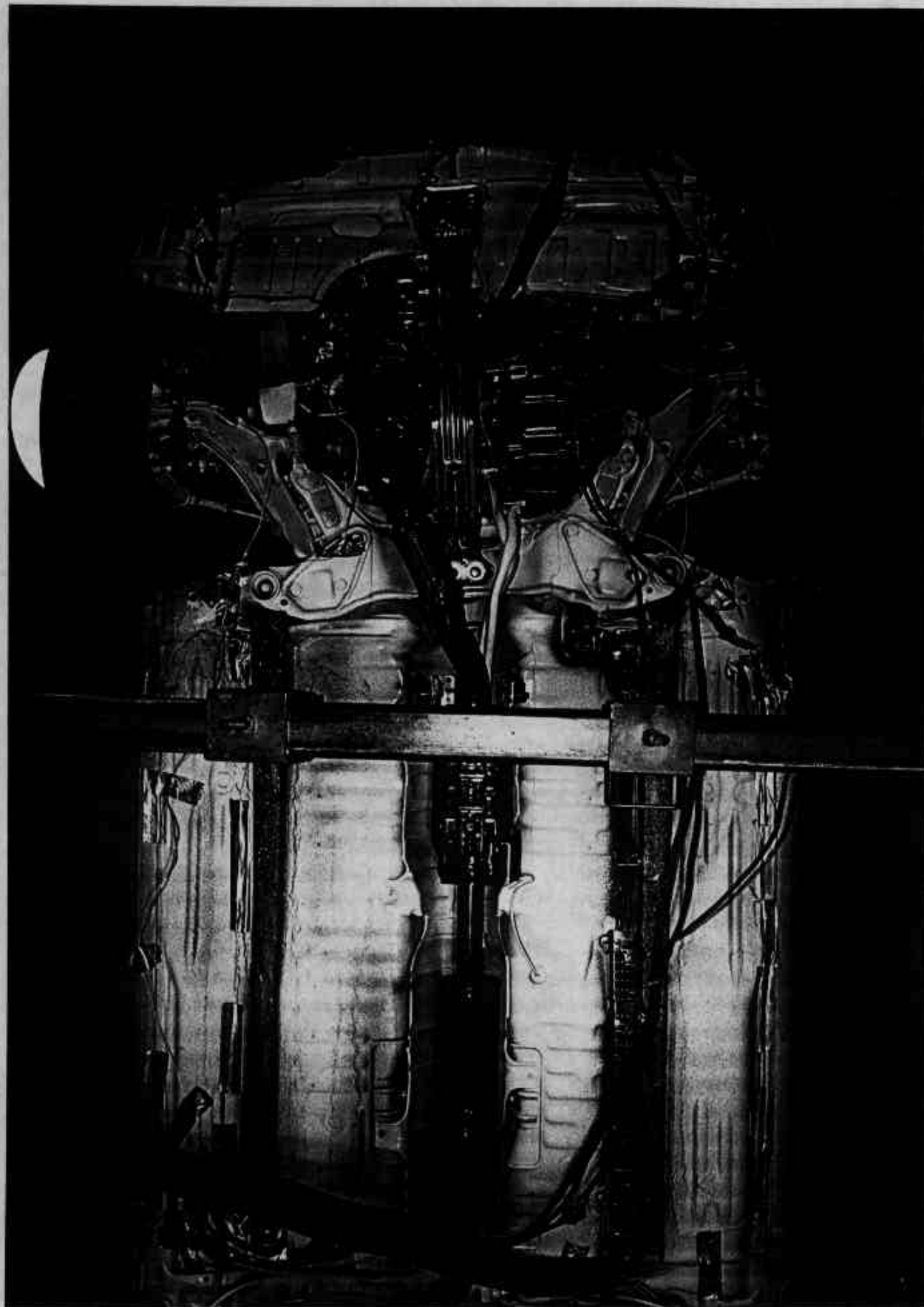
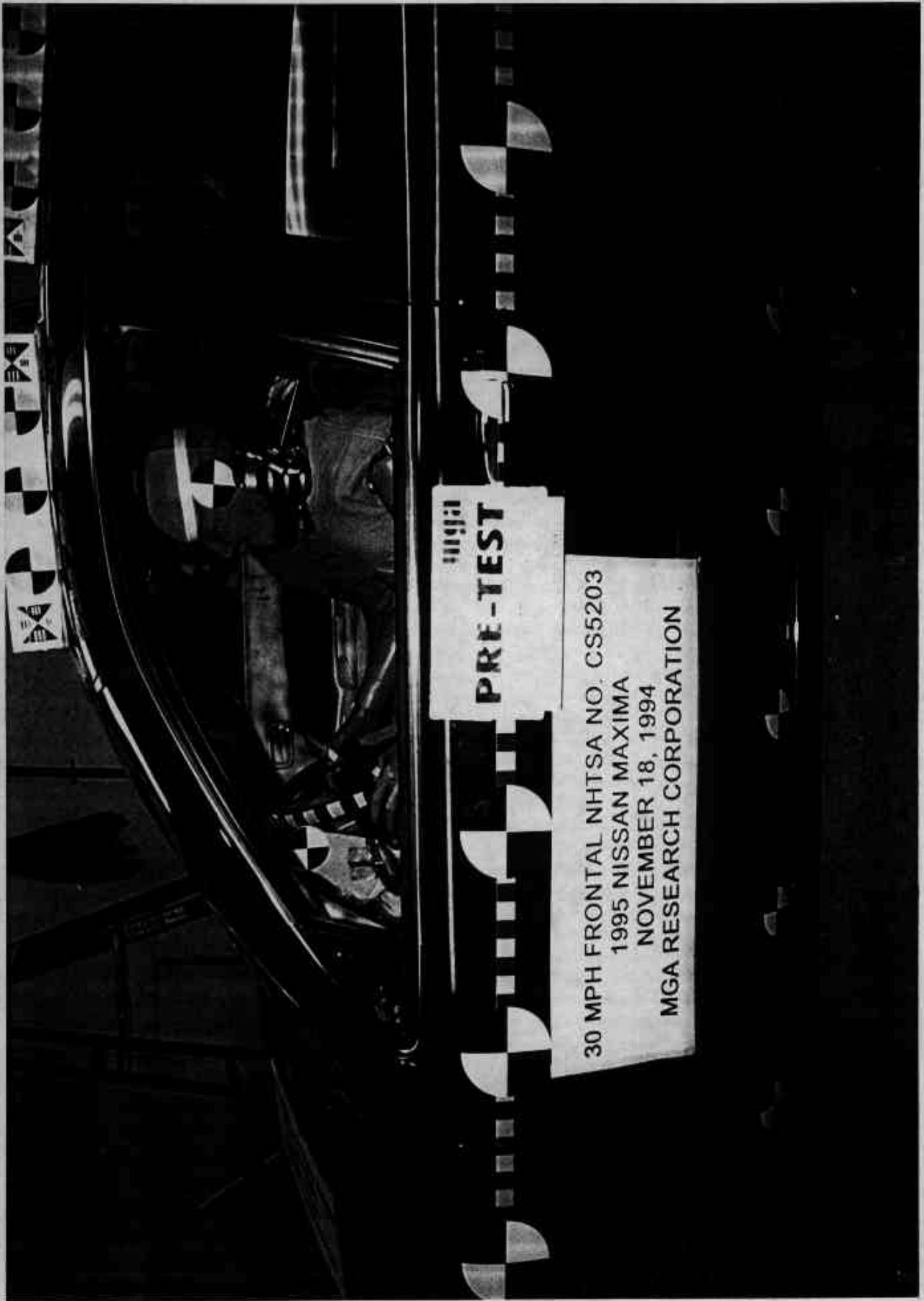


Photo No. A-8 - Post-Test Front Underbody View



A-9

Photo No. A-9 - Pre-Test Driver Dummy Position View



100MPH FRONTAL NHTSA NO. CS5203
1995 NISSAN MAXIMA

Photo No. A-10 - Post-Test Driver Dummy Position View



Photo No. A-11 - Pre-Test Driver Dummy Position View (Door Open)

A-11



A-12

Photo No. A-12 - Post-Test Driver Dummy Position View (Door Open)



mga research corporation

PRE-TEST

208 COMPLIANCE

NHTSA NO. CS5203

1995 NISSAN MAXIMA

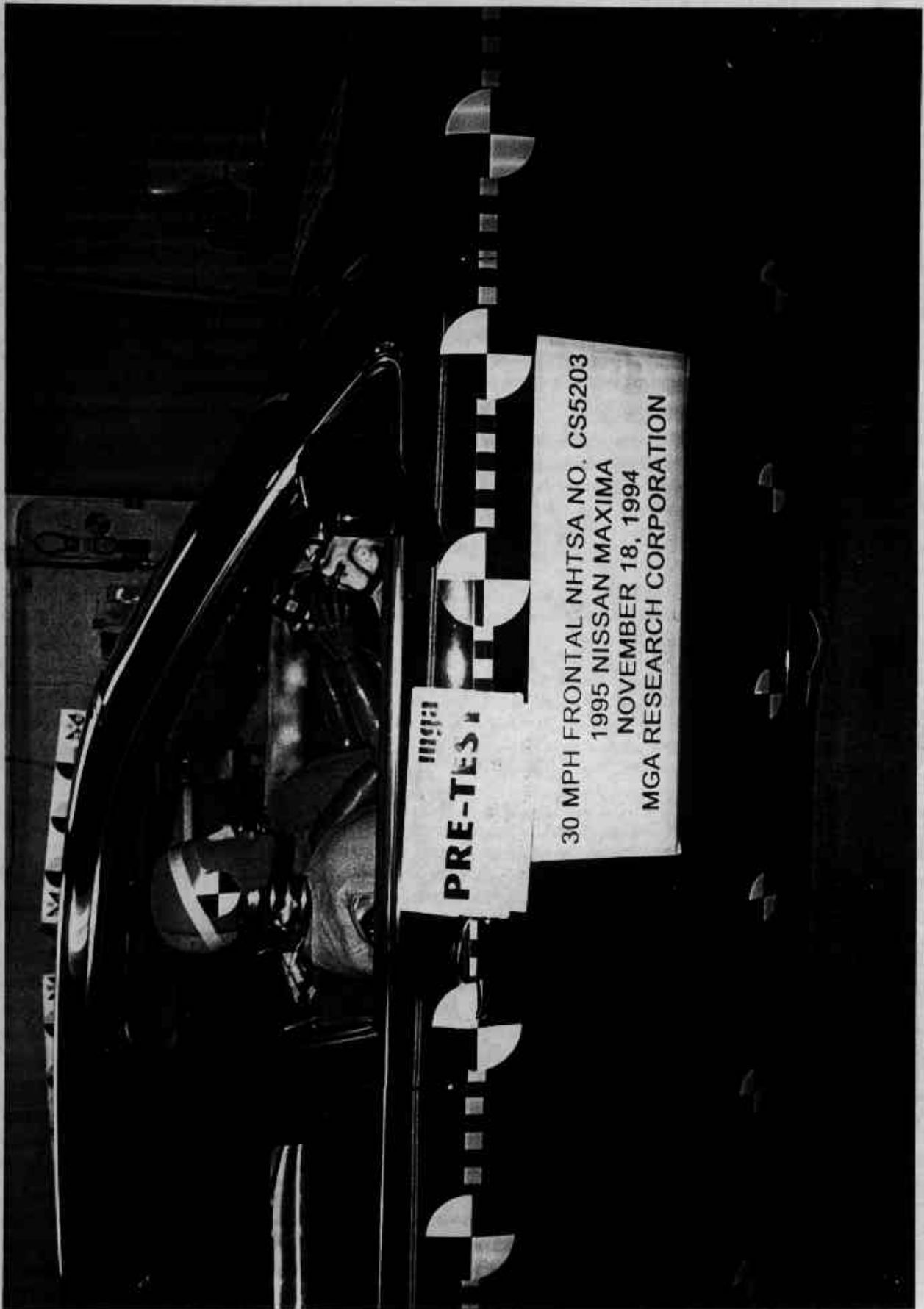
A-13

Photo No. A-13 - Pre-Test Driver Seat Position View



A-14

Photo No. A-14 - Post-Test Driver Seat Position View



A-15

Photo No. A-15 - Pre-Test Passenger Dummy Position View



Photo No. A-16 - Post-Test Passenger Dummy Position View



Photo No. A-17 - Pre-Test Passenger Dummy Position View (Door Open)

A-17

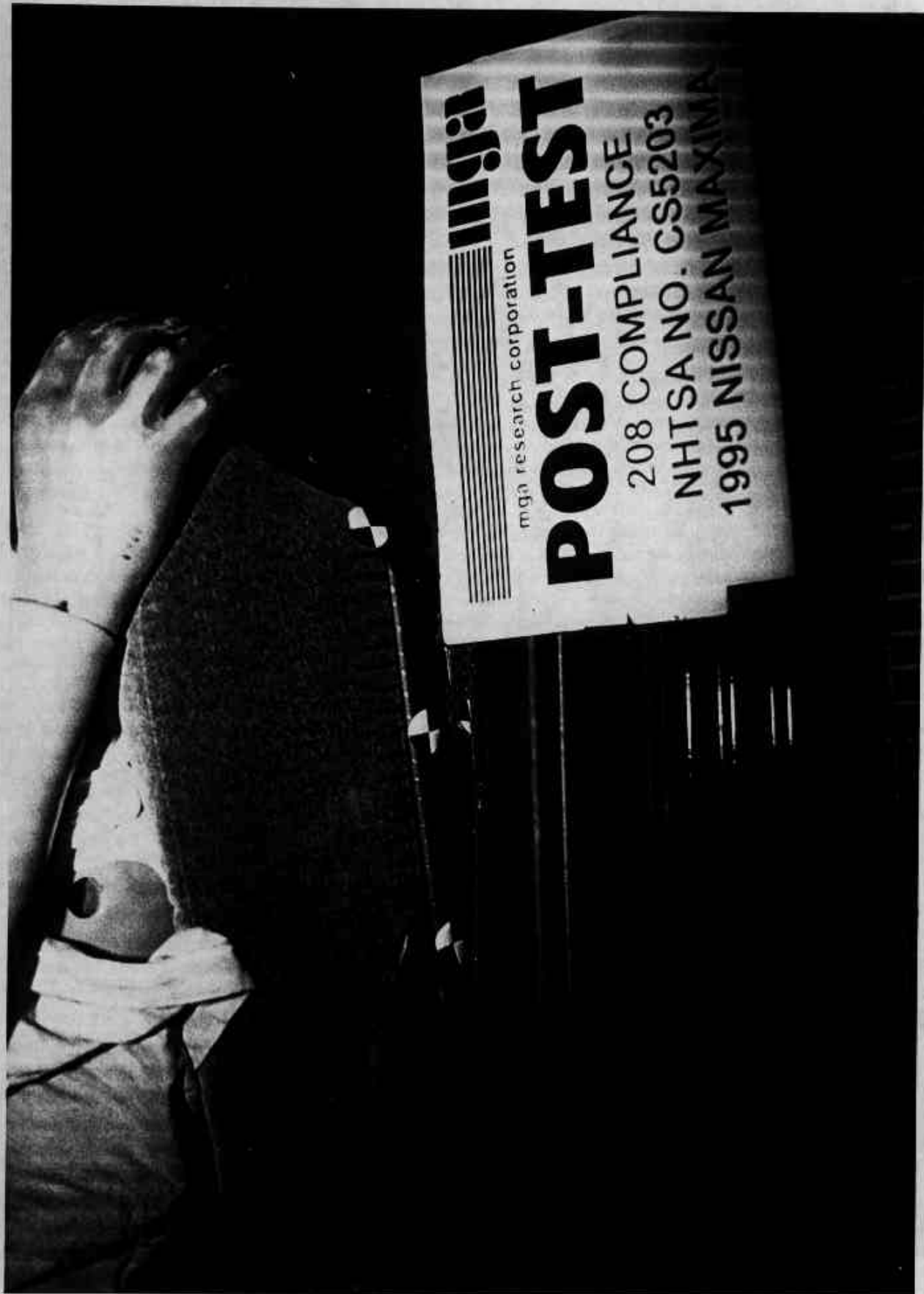


Photo No. A-18 - Post-Test Passenger Dummy Position View (Door Open)



A-19

Photo No. A-19 - Pre-Test Passenger Seat Position View



A-20

Photo No. A-20 - Post-Test Passenger Seat Position View



Photo No. A-21 - Pre-Test Driver Dummy Knee Bolster View

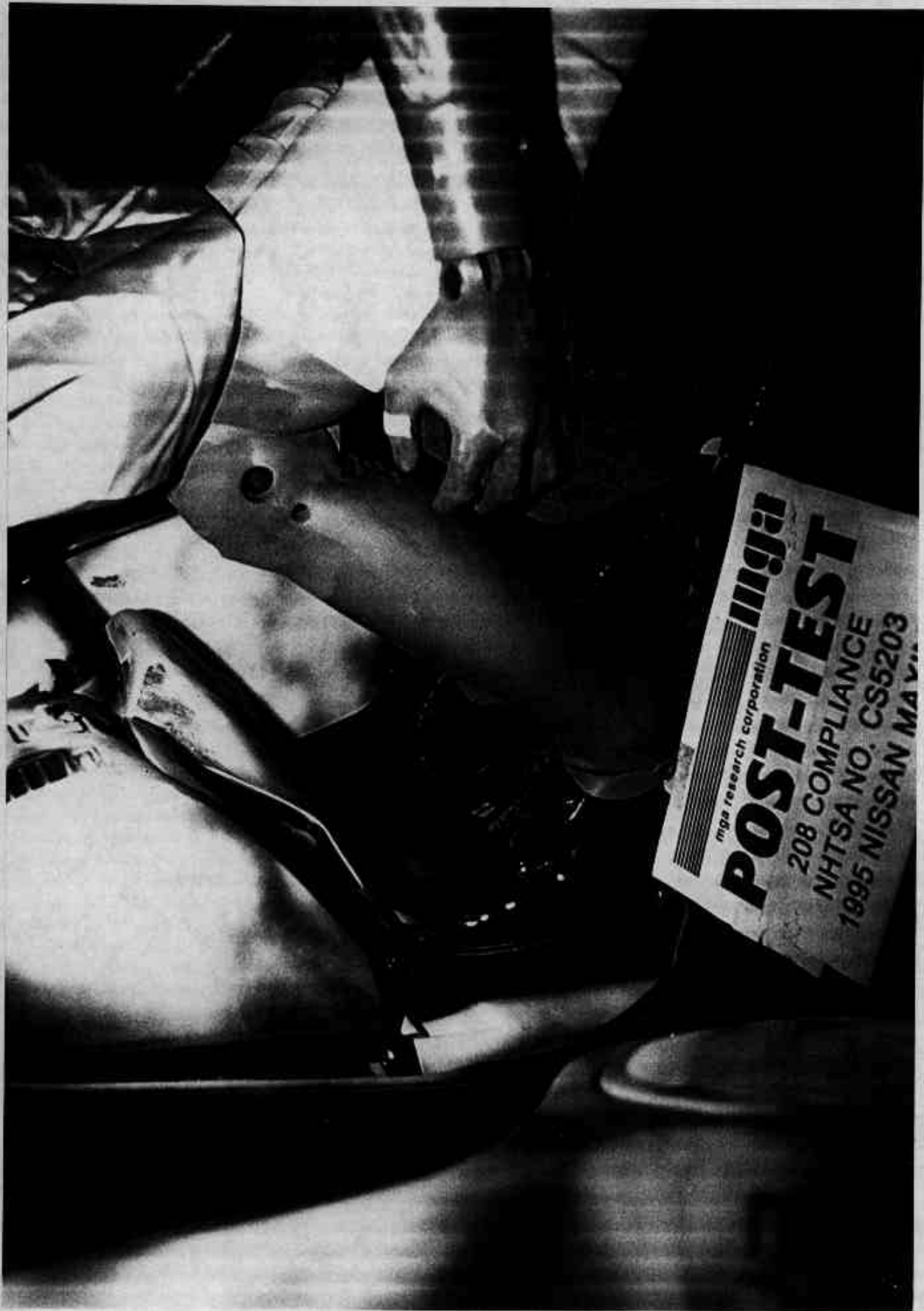


Photo No. A-22 - Post-Test Driver Dummy Knee Bolster View



Photo No. A-23 - Pre-Test Passenger Dummy Knee Bolster View



A-24

Photo No. A-24 - Post-Test Passenger Dummy Knee Bolster View



Photo No. A-25 - Post-Test Driver Head Contact View (Airbag)



Photo No. A-26 - Post-Test Driver Knee Contact View



Photo No. A-27 - Post-Test Passenger Head Contact View (Airbag)

A-27



Photo No. A-28 - Post-Test Passenger Knee Contact View

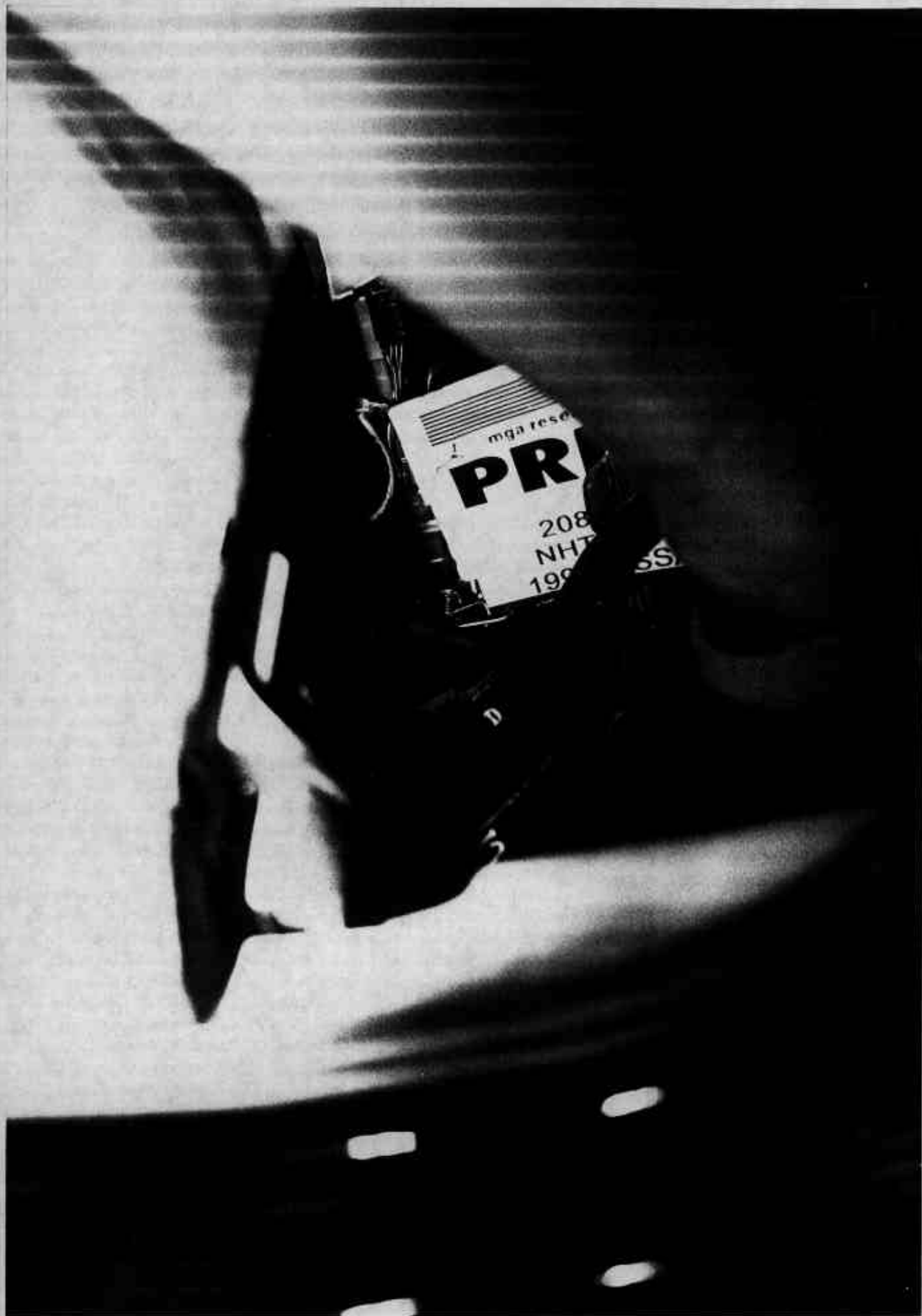


Photo No. A-29 - Pre-Test Steering Column at Firewall View (Interior)



Photo No. A-30 - Vehicle Certification Label

VEHICLE CAPACITY WEIGHT POIDS UTILE DU VEHICULE	800 LB 408 KG	SEATING CAPACITY NOMBRE DE PLACES	FRONT AVANT REAR ARRIERE	2 3	TOTAL TOTAL	5	SPARE TIRE ROUE DE SECOURS T125/70 D16	PSI (kPa) 60 (420)
RECOMMENDED COLD TIRE INFLATION PRESSURE PRESSION DE GONFLAGE RECOMMANDEE DES PNEUS FROIDS								
TIRE SIZE DIMENSIONS	FRONT AVANT	PSI (kPa)	REAR ARRIERE	PSI (kPa)	DO NOT USE IN EXCESS OF 50 MPH (80 km/h) SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION UTILISATION A UNE VITESSE MAX 50 MPH (80 km/h) POUR LES DETAILS SE REFERER AU MANUEL DU CONDUCTEUR			
P205/65R15 92S	29 (200)		29 (200)					

Photo No. A-31 - Vehicle Tire Placard

APPENDIX B
DATA PLOTS

TABLE OF DATA PLOTS

<u>Description</u>	<u>Filter Class</u>	<u>Page No.</u>
Figure B-1 - Driver Head X Acceleration vs. Time	1000	B-1
Figure B-2 - Driver Head Y Acceleration vs. Time	1000	B-2
Figure B-3 - Driver Head Z Acceleration vs. Time	1000	B-3
Figure B-4 - Driver Head Resultant Acceleration vs. Time	1000	B-4
Figure B-5 - Driver Chest X Acceleration vs. Time	180	B-5
Figure B-6 - Driver Chest Y Acceleration vs. Time	180	B-6
Figure B-7 - Driver Chest Z Acceleration vs. Time	180	B-7
Figure B-8 - Driver Chest Resultant Acceleration vs. Time	180	B-8
Figure B-9 - Driver Chest Compression vs. Time	180	B-9
Figure B-10 - Driver Left Femur Force vs. Time	600	B-10
Figure B-11 - Driver Right Femur Force vs. Time	600	B-11
Figure B-12 - Passenger Head X Acceleration vs. Time	1000	B-12
Figure B-13 - Passenger Head Y Acceleration vs. Time	1000	B-13
Figure B-14 - Passenger Head Z Acceleration vs. Time	1000	B-14
Figure B-15 - Passenger Head Resultant Acceleration vs. Time	1000	B-15
Figure B-16 - Passenger Chest X Acceleration vs. Time	180	B-16
Figure B-17 - Passenger Chest Y Acceleration vs. Time	180	B-17
Figure B-18 - Passenger Chest Z Acceleration vs. Time	180	B-18
Figure B-19 - Passenger Chest Resultant Acceleration vs. Time	180	B-19
Figure B-20 - Passenger Chest Compression vs. Time	180	B-20
Figure B-21 - Passenger Left Femur Force vs. Time	600	B-21
Figure B-22 - Passenger Right Femur Force vs. Time	600	B-22
Figure B-23 - Top of Engine Block X Acceleration vs. Time	60	B-23
Figure B-24 - Bottom of Engine X Acceleration vs. Time	60	B-24
Figure B-25 - Instrument Panel X Acceleration vs. Time	60	B-25
Figure B-26 - Left Rear Seat Crossmember X Accel. vs. Time	60	B-26
Figure B-27 - Right Rear Seat Crossmember X Accel. vs. Time	60	B-27
Figure B-28 - Left Brake Caliper X Acceleration vs. Time	60	B-28
Figure B-29 - Right Brake Caliper X Acceleration vs. Time	60	B-29
Figure B-30 - Trunk Floor Z Acceleration vs. Time	60	B-30

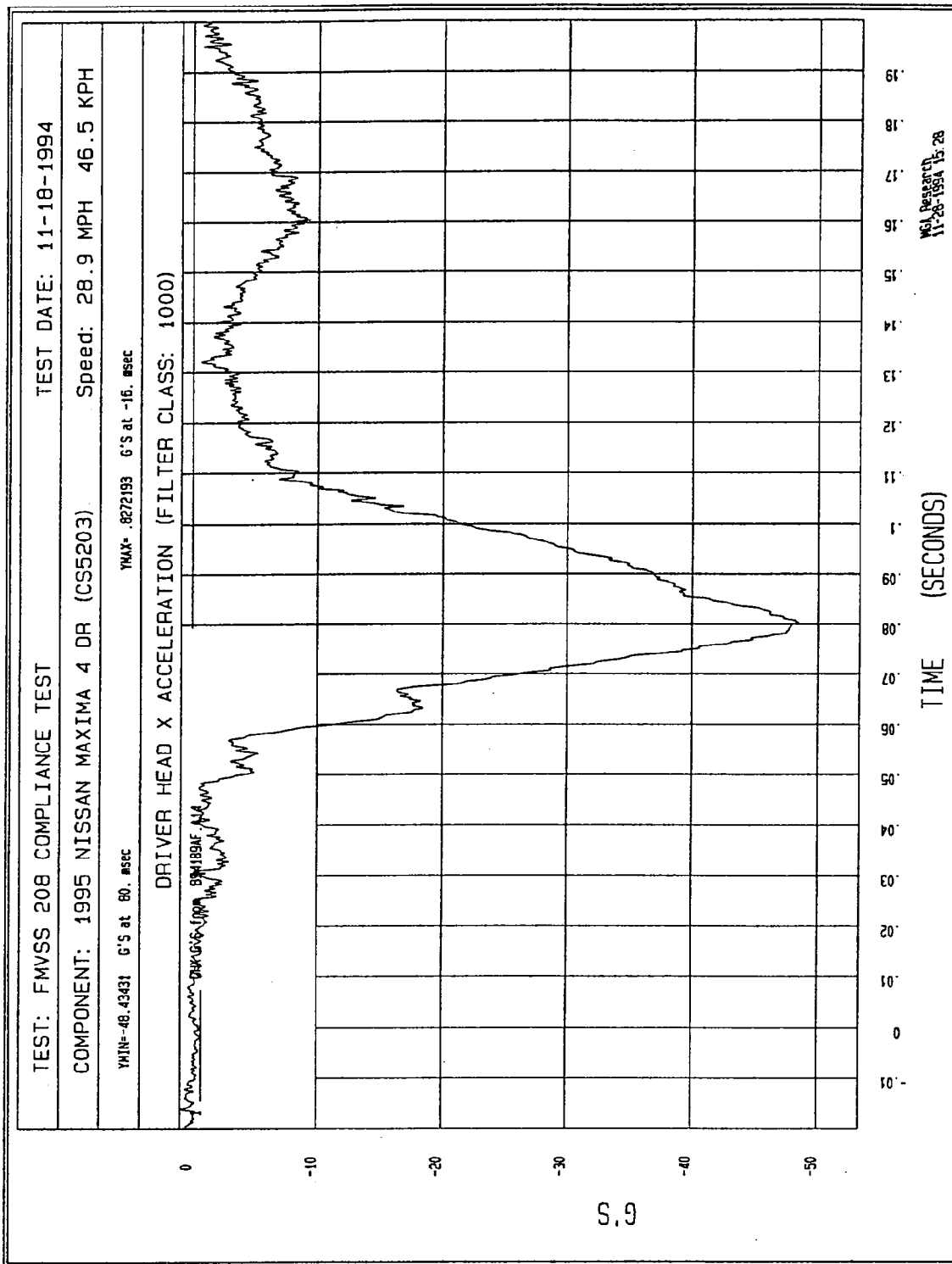


Figure B-1 - Driver Head X Acceleration vs. Time

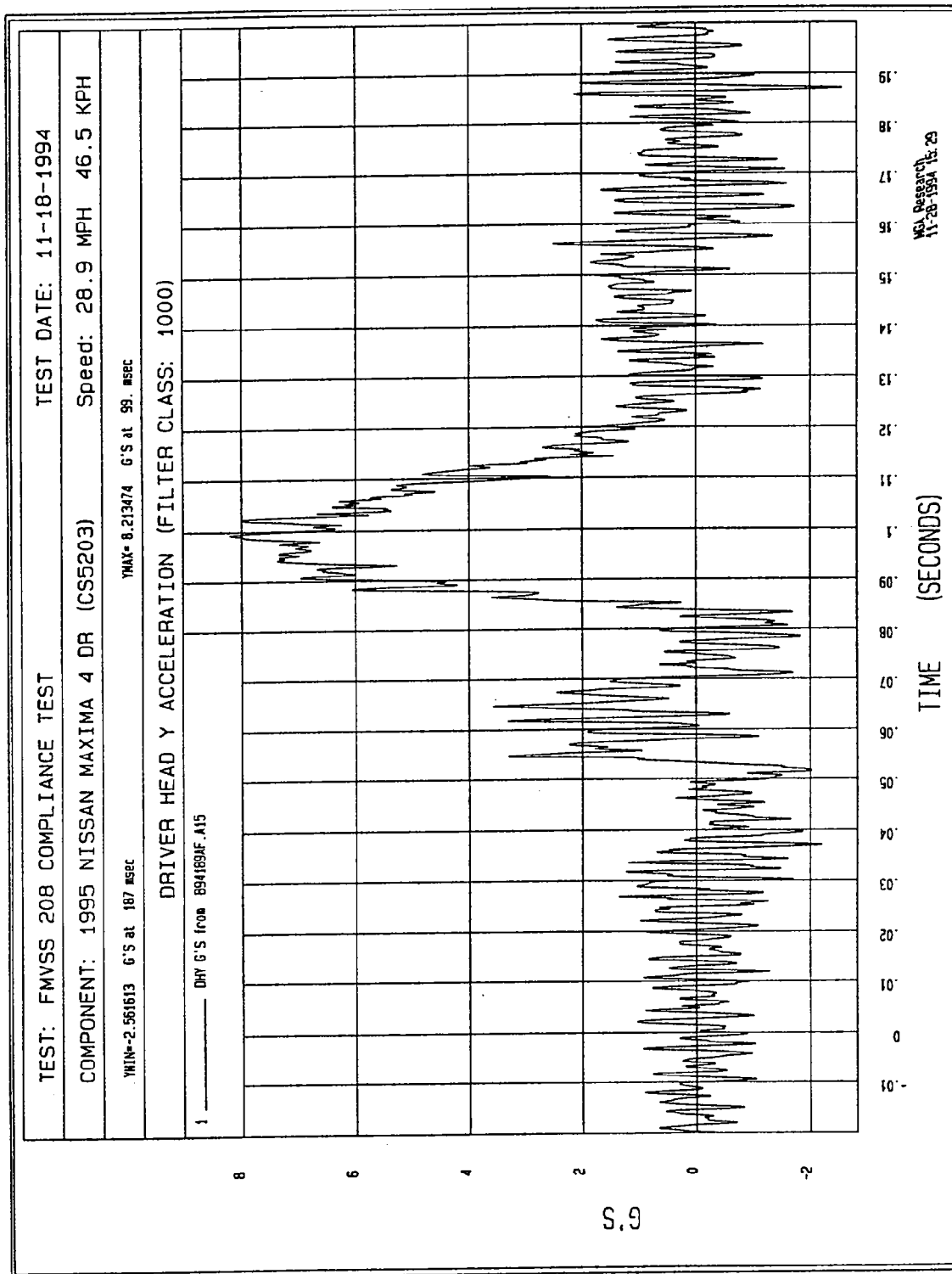


Figure B-2 - Driver Head Y Acceleration vs. Time

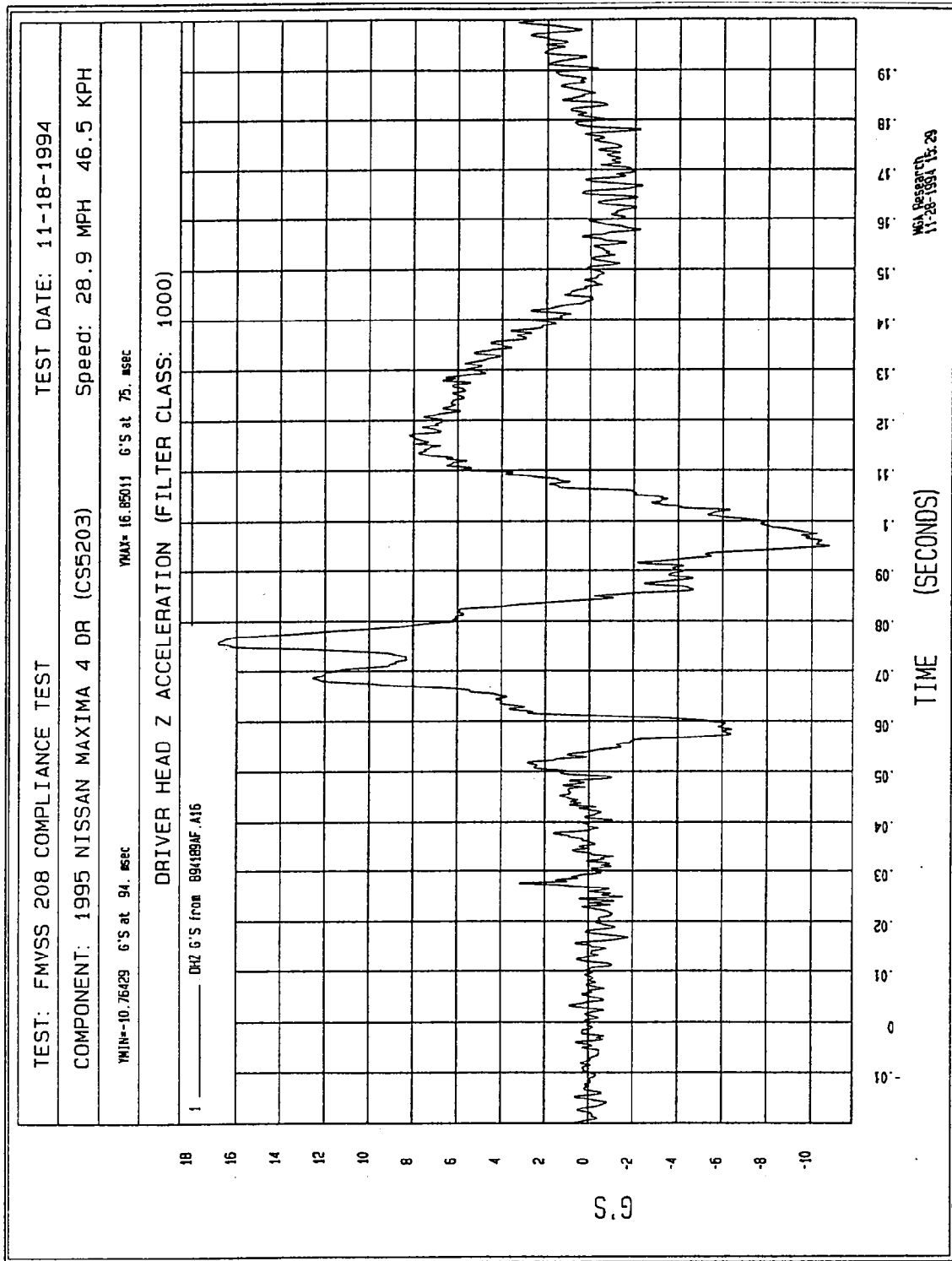


Figure B-3 - Driver Head Z Acceleration vs. Time

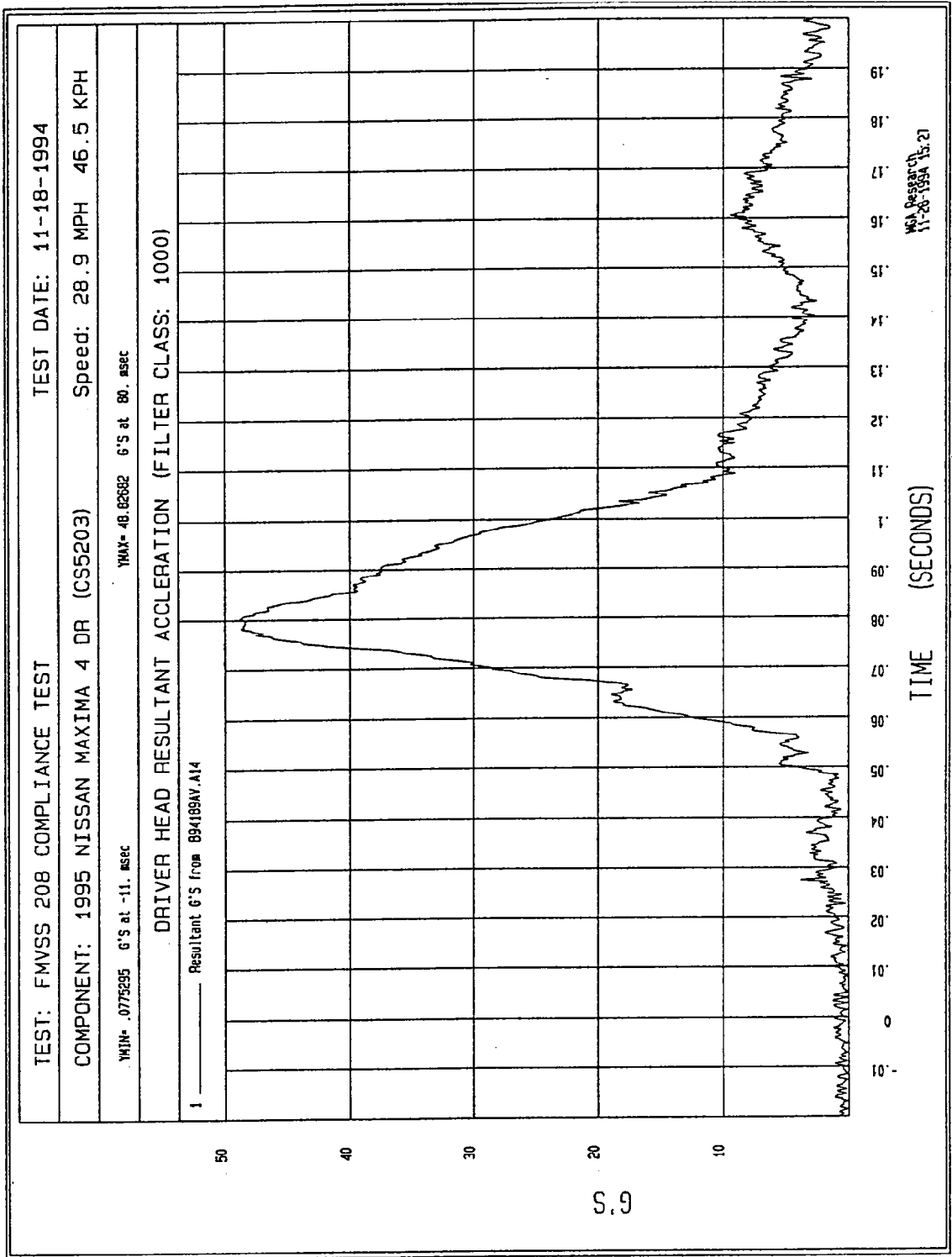


Figure B-4 - Driver Head Resultant Acceleration vs. Time

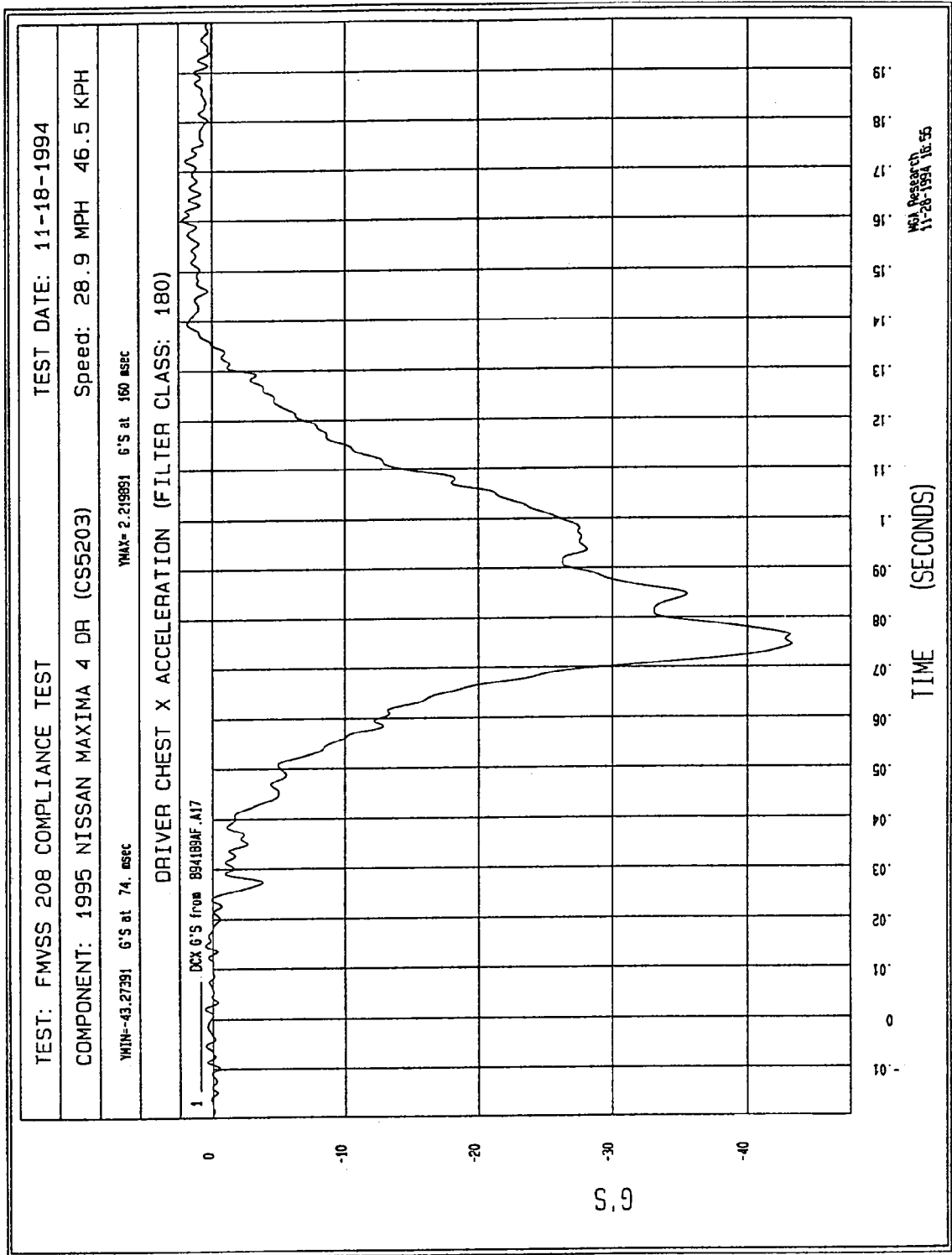


Figure B-5 - Driver Chest X Acceleration vs. Time

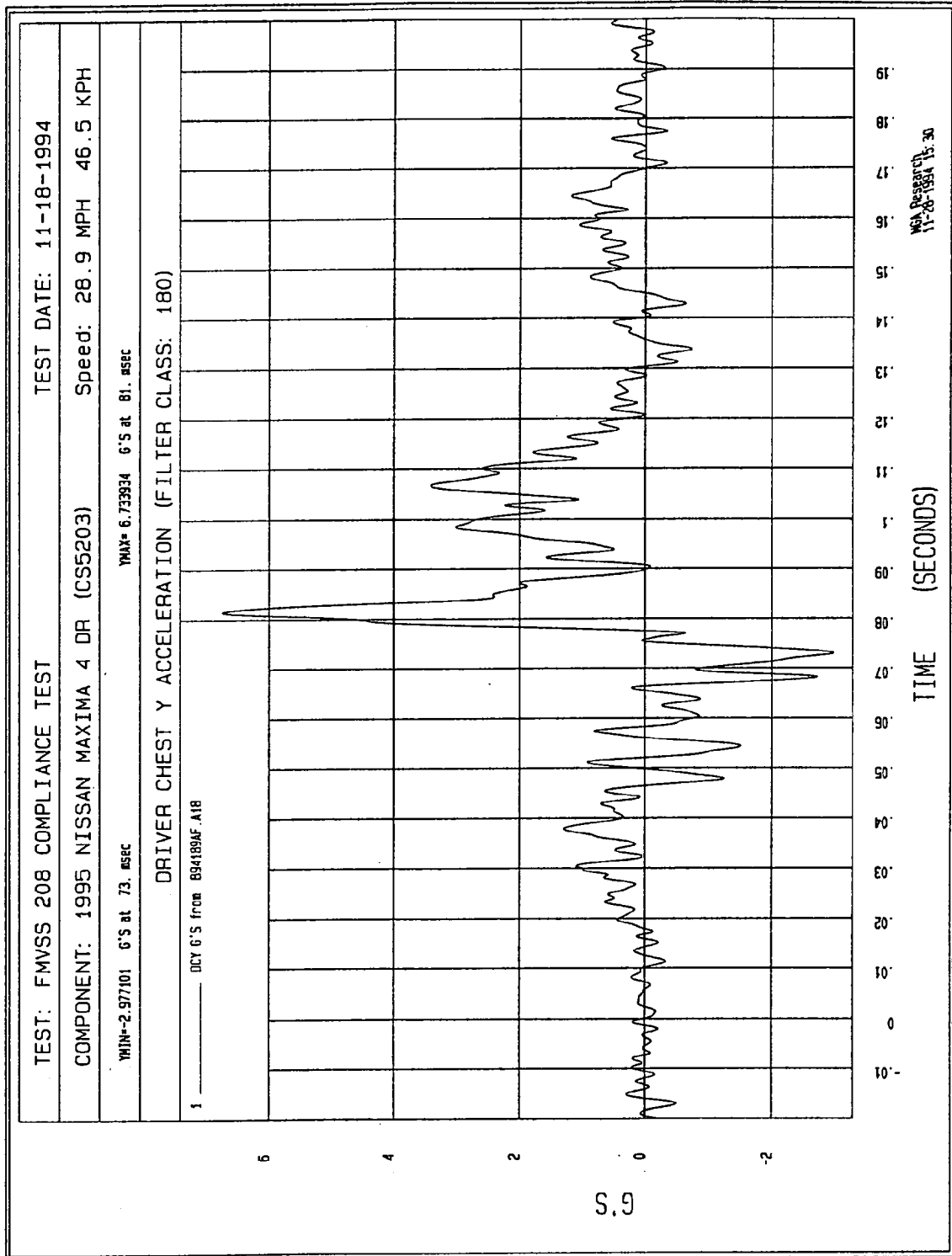


Figure B-6 - Driver Chest Y Acceleration vs. Time

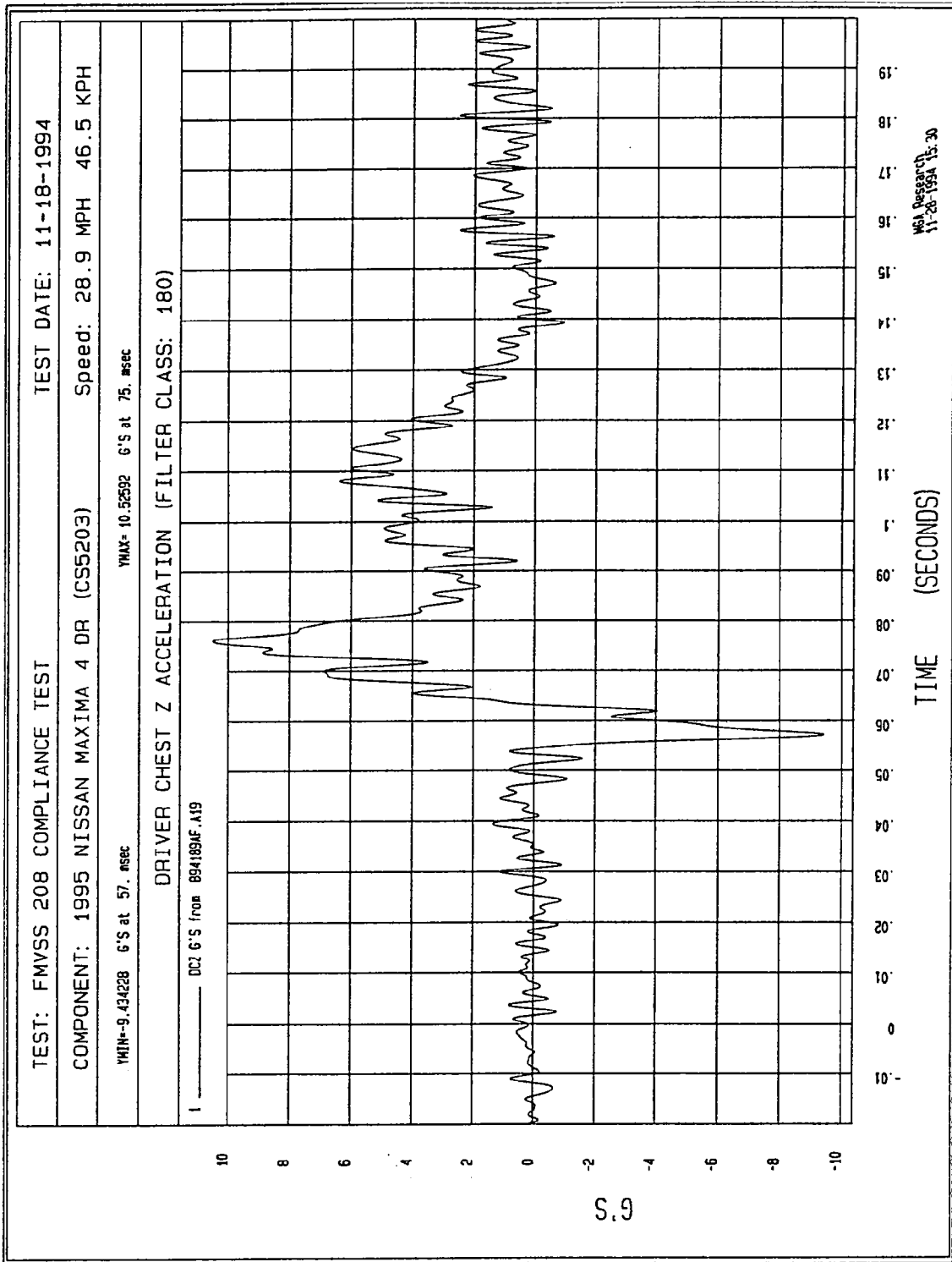


Figure B-7 - Driver Chest Z Acceleration vs. Time

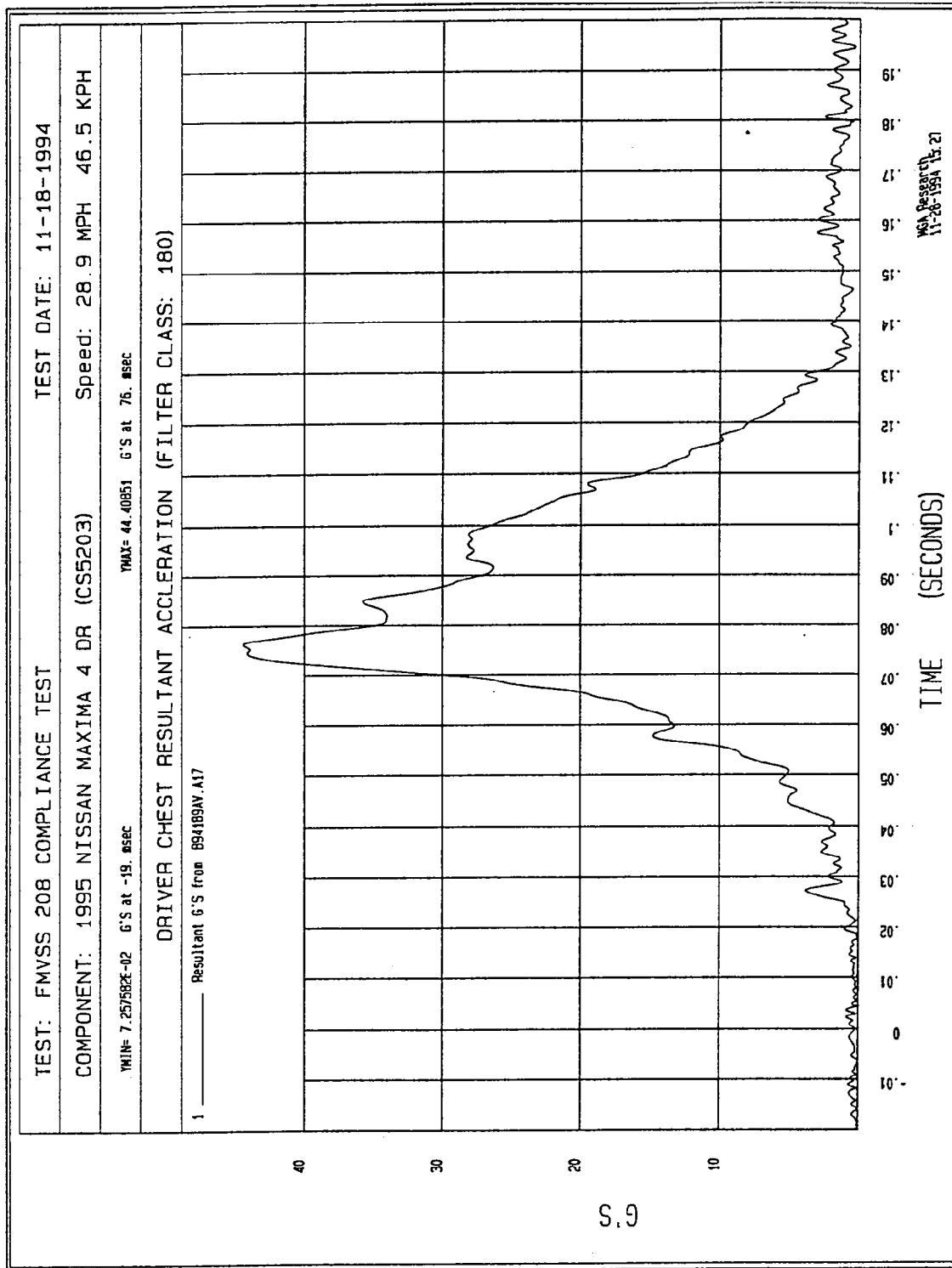


Figure B-8 - Driver Chest Resultant Acceleration vs. Time

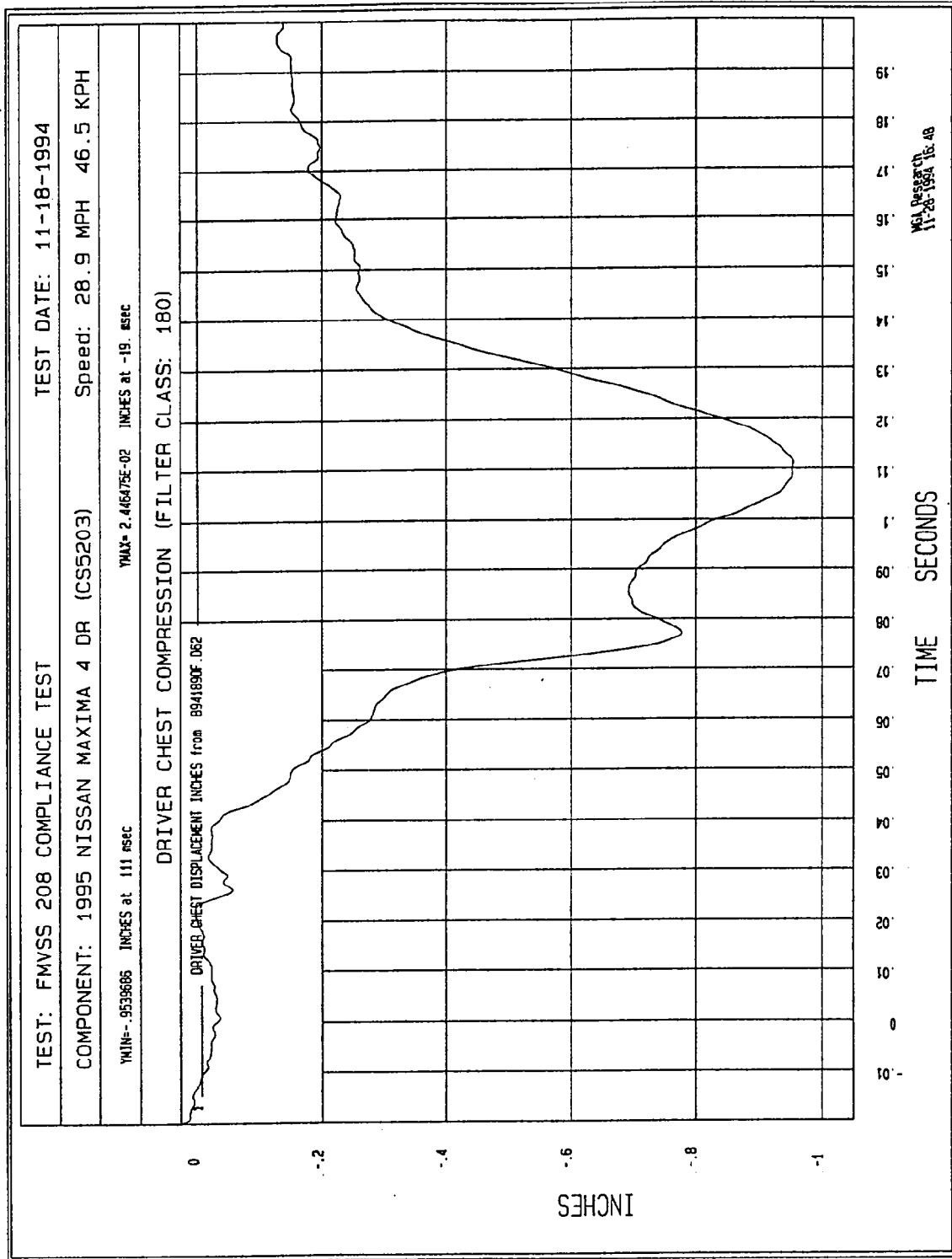


Figure B-9 - Driver Chest Compression vs. Time

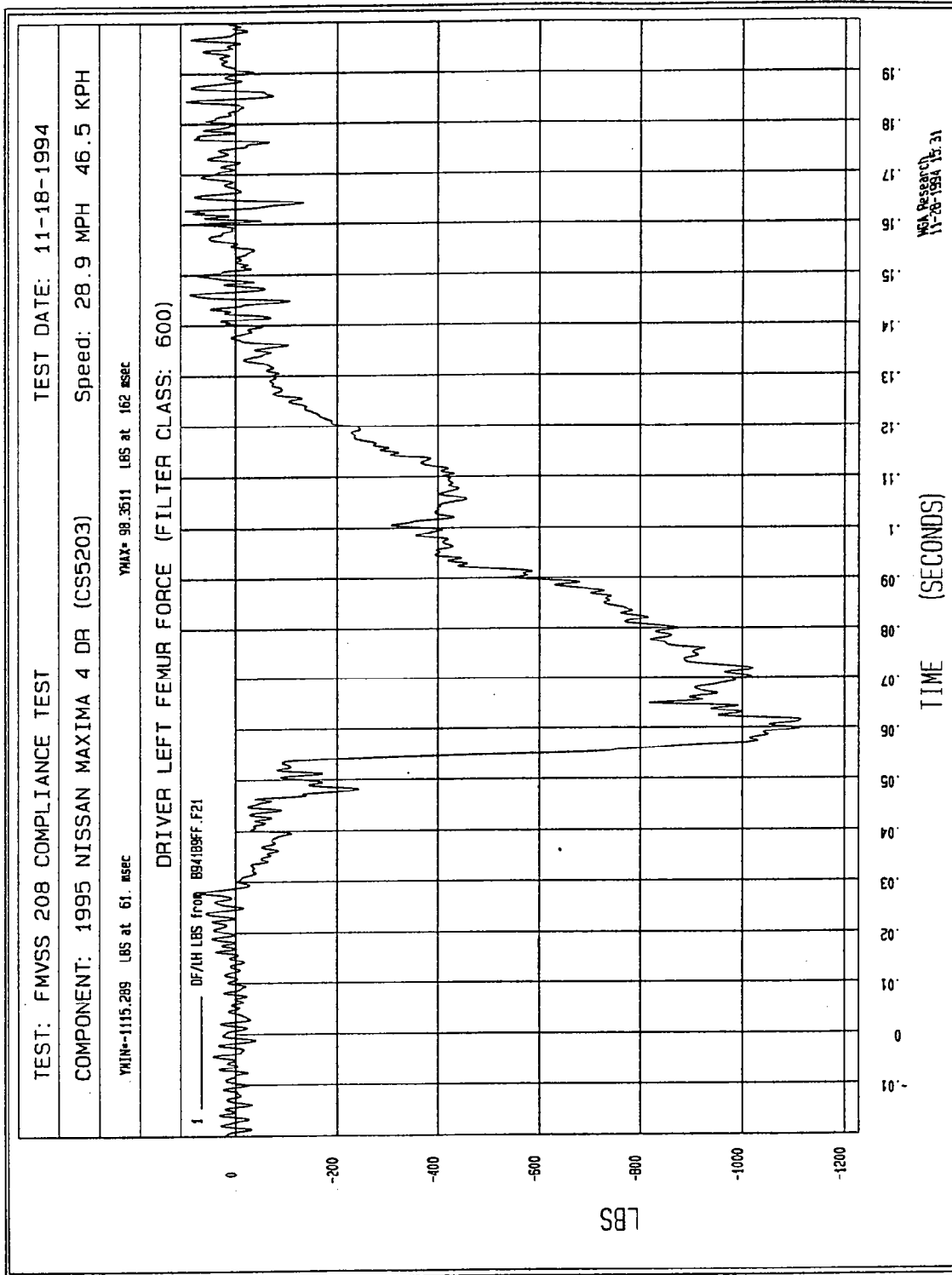


Figure B-10 - Driver Left Femur Force vs. Time

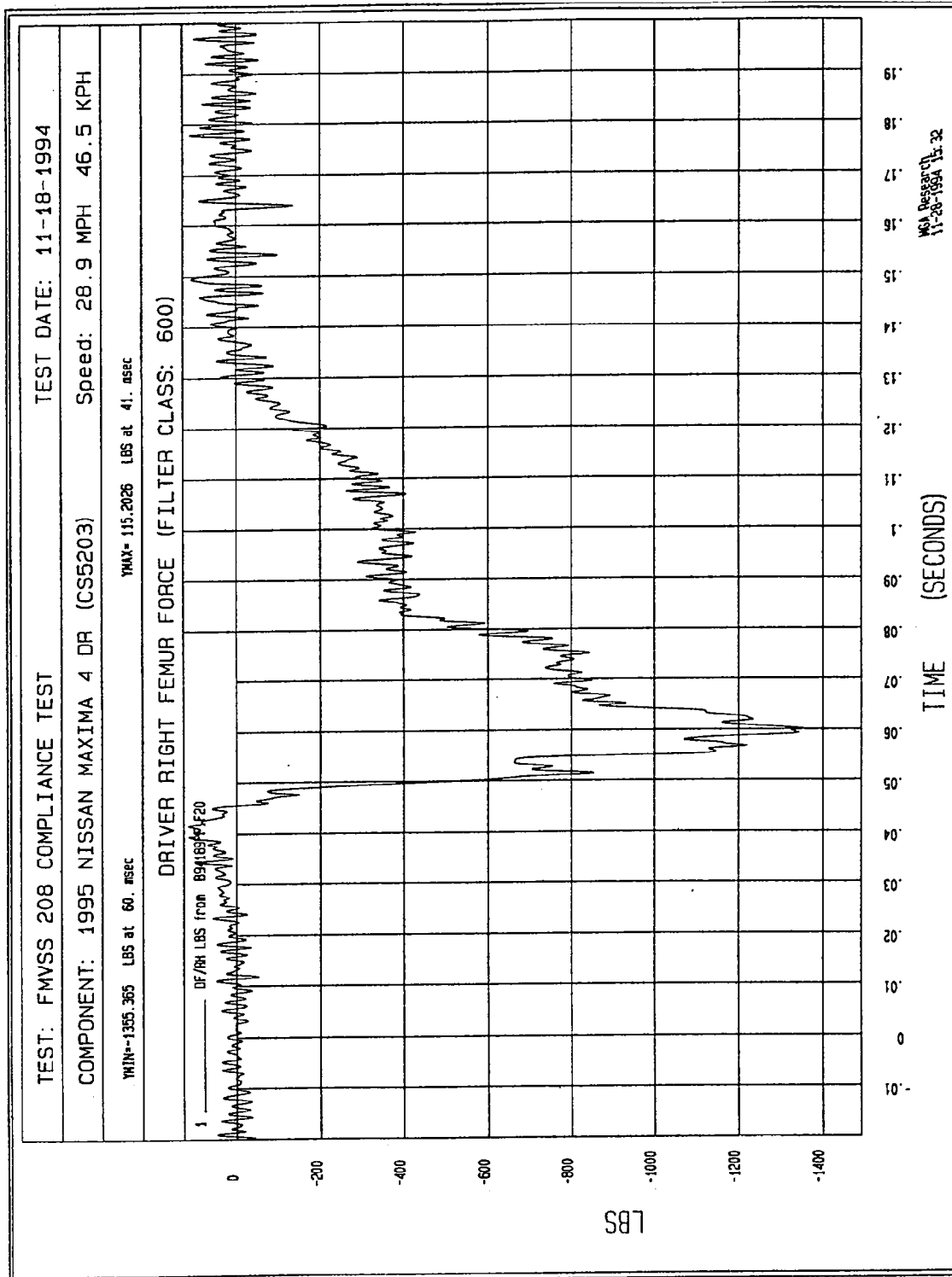


Figure B-11 - Driver Right Femur Force vs. Time

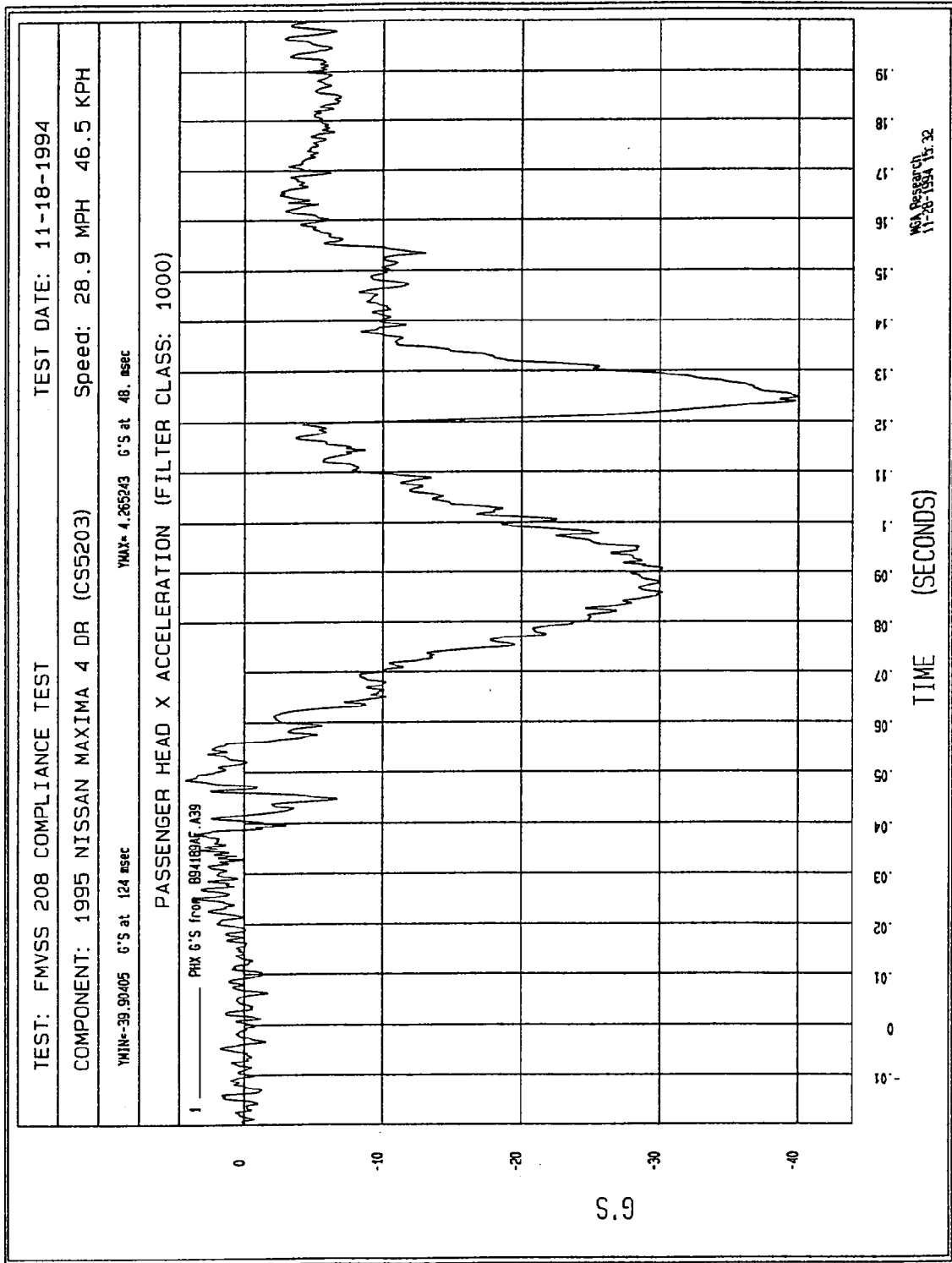


Figure B-12 - Passenger Head X Acceleration vs. Time

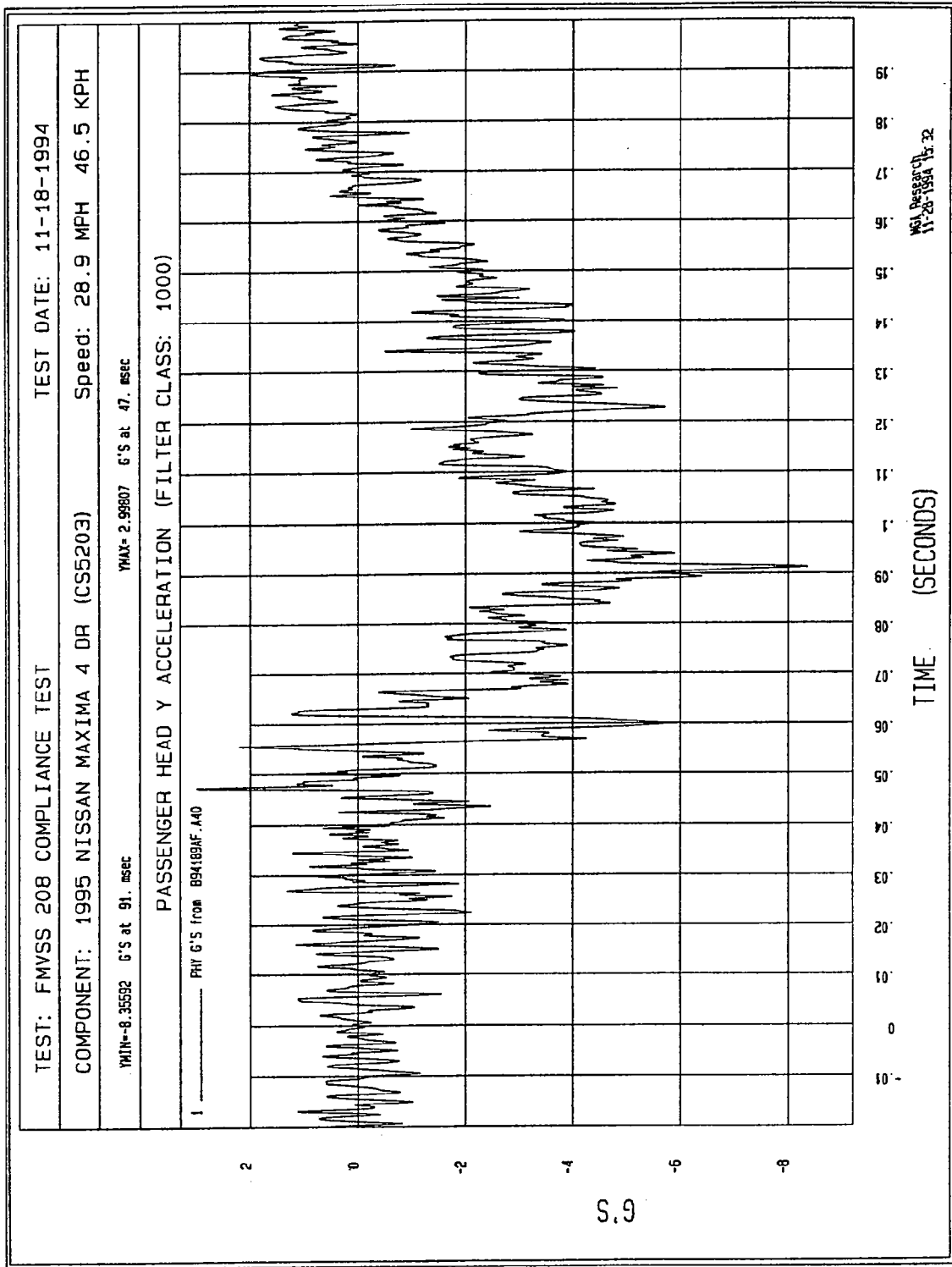


Figure B-13 - Passenger Head Y Acceleration vs. Time

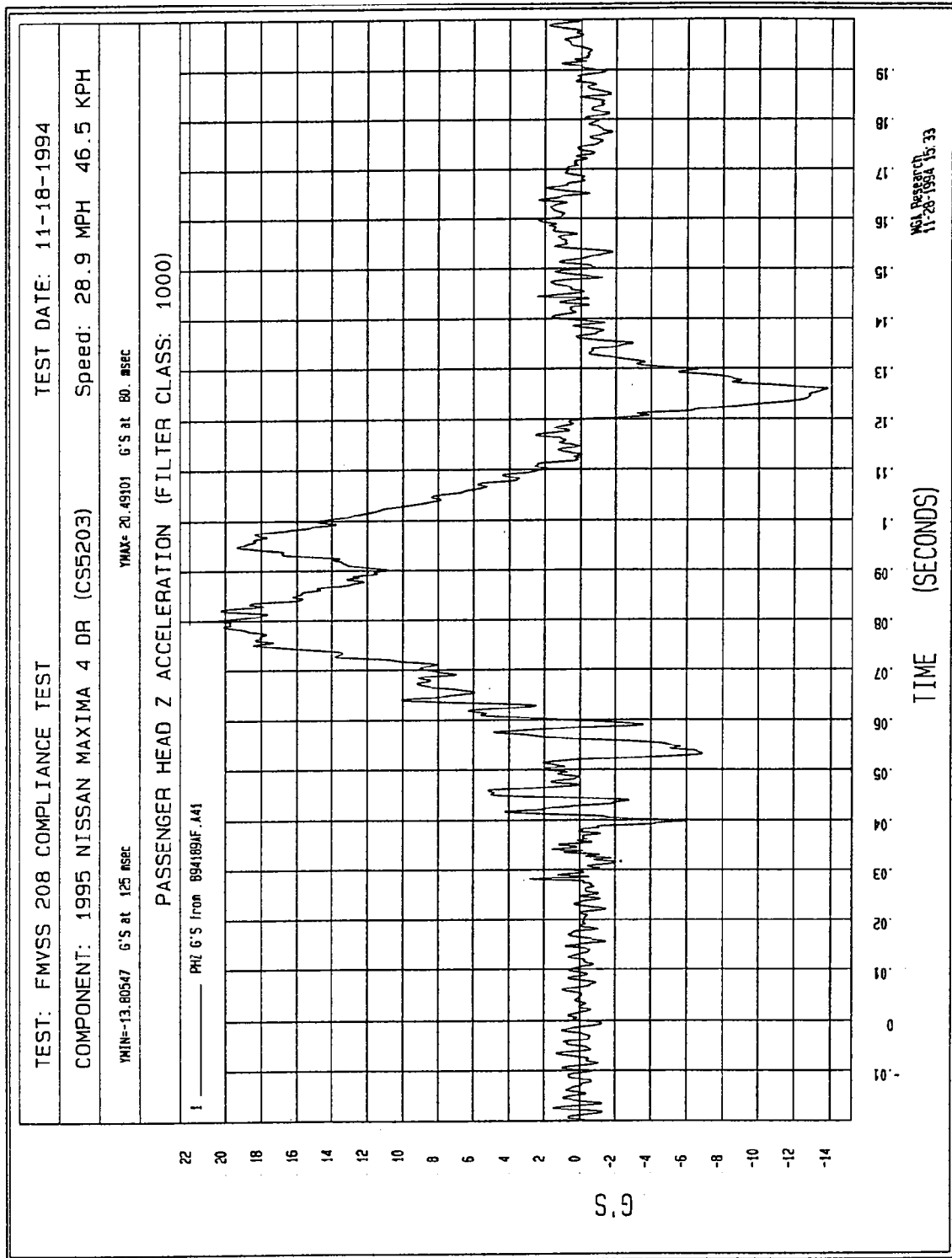


Figure B-14 - Passenger Head Z Acceleration vs. Time

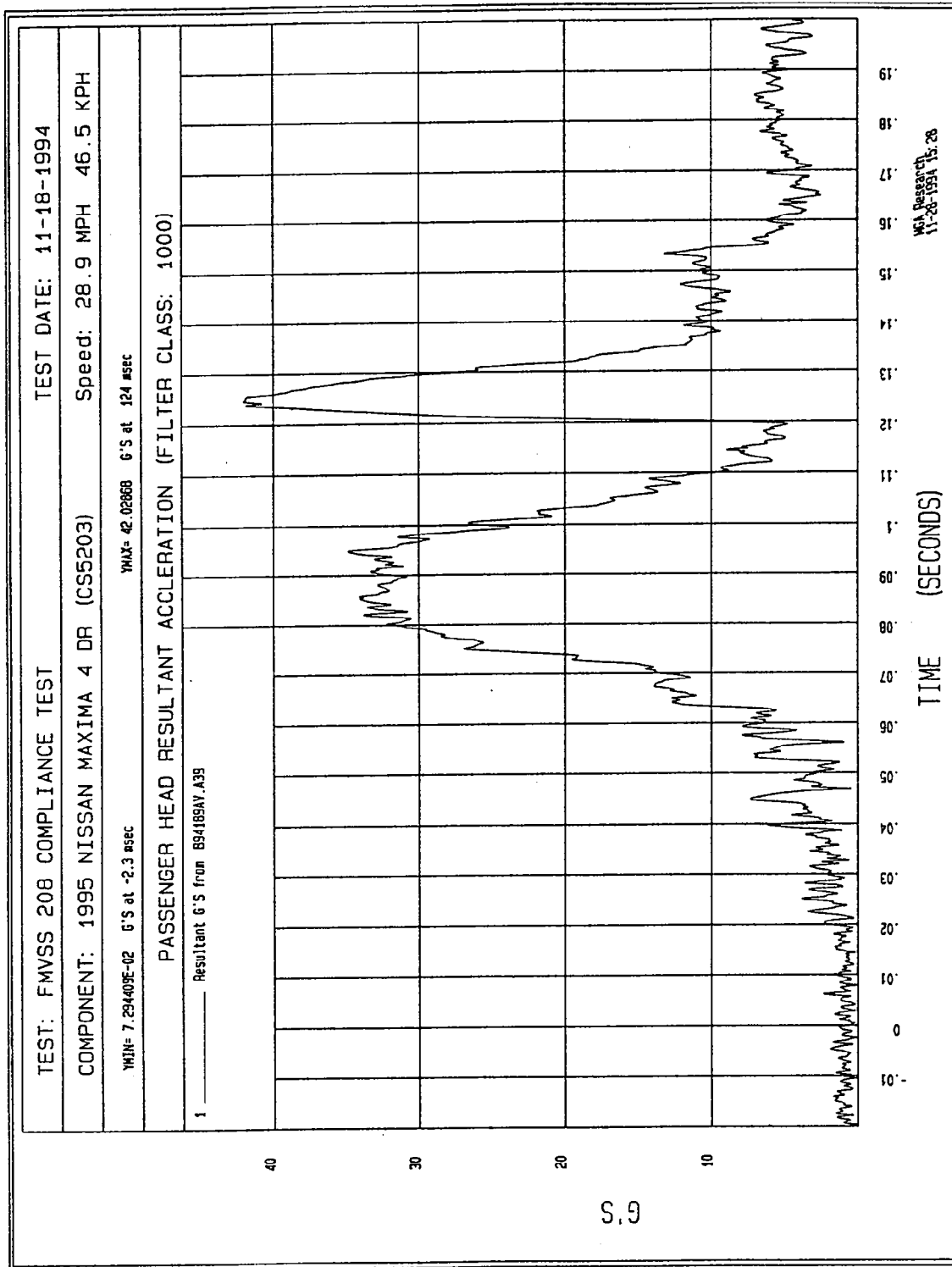


Figure B-15 - Passenger Head Resultant Acceleration vs. Time

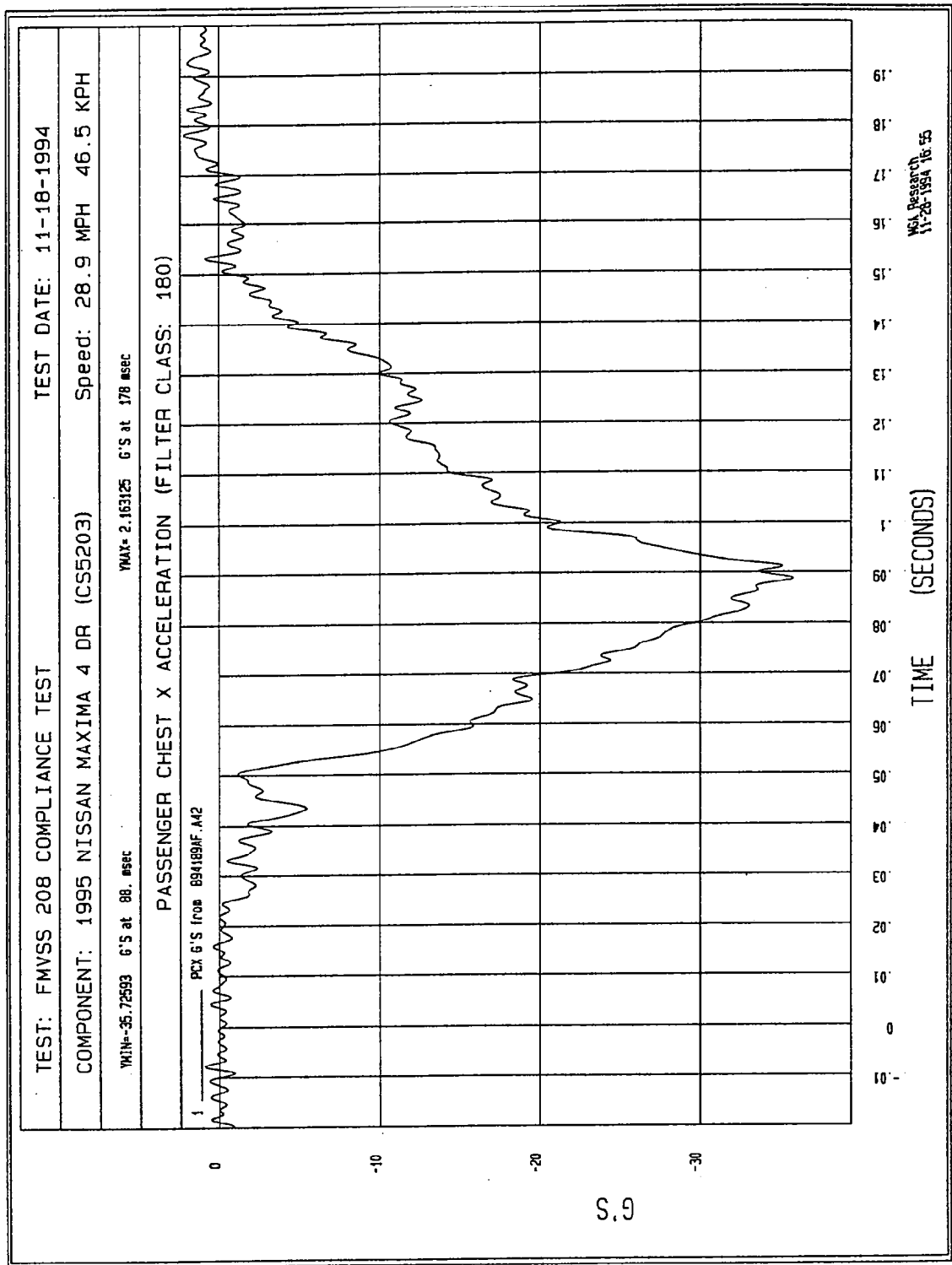


Figure B-16 - Passenger Chest X Acceleration vs. Time

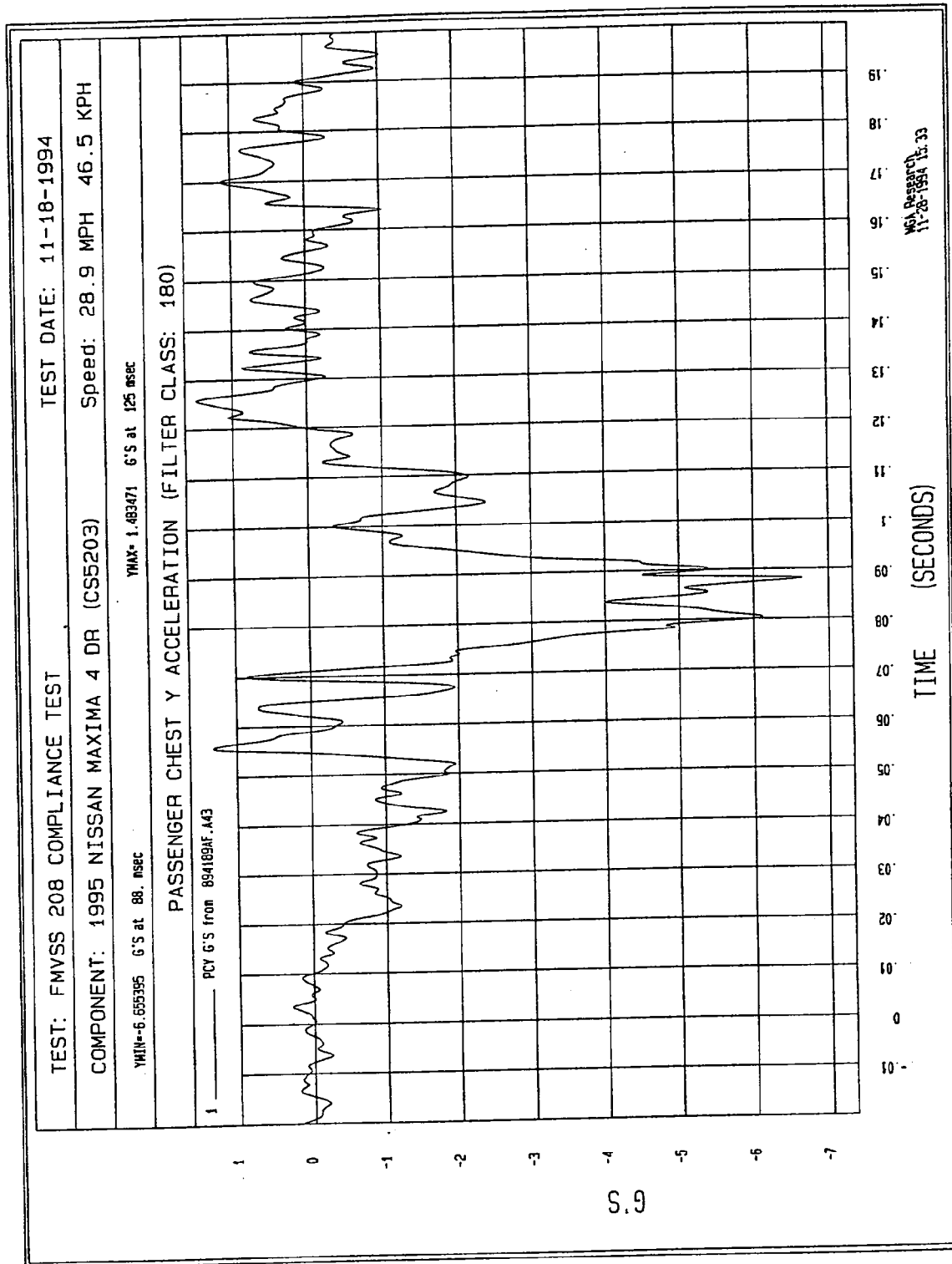


Figure B-17 - Passenger Chest Y Acceleration vs. Time

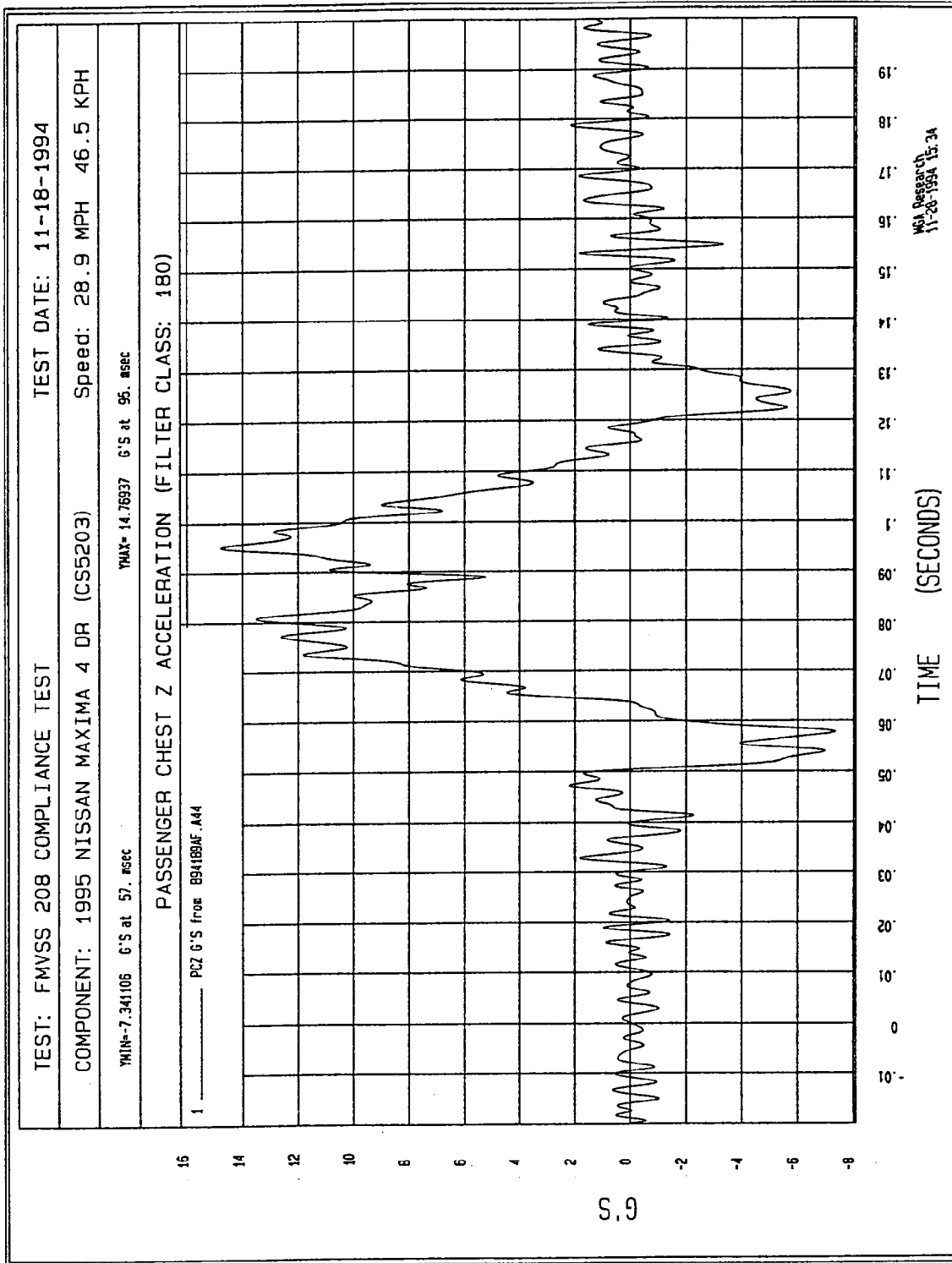


Figure B-18 - Passenger Chest Z Acceleration vs. Time

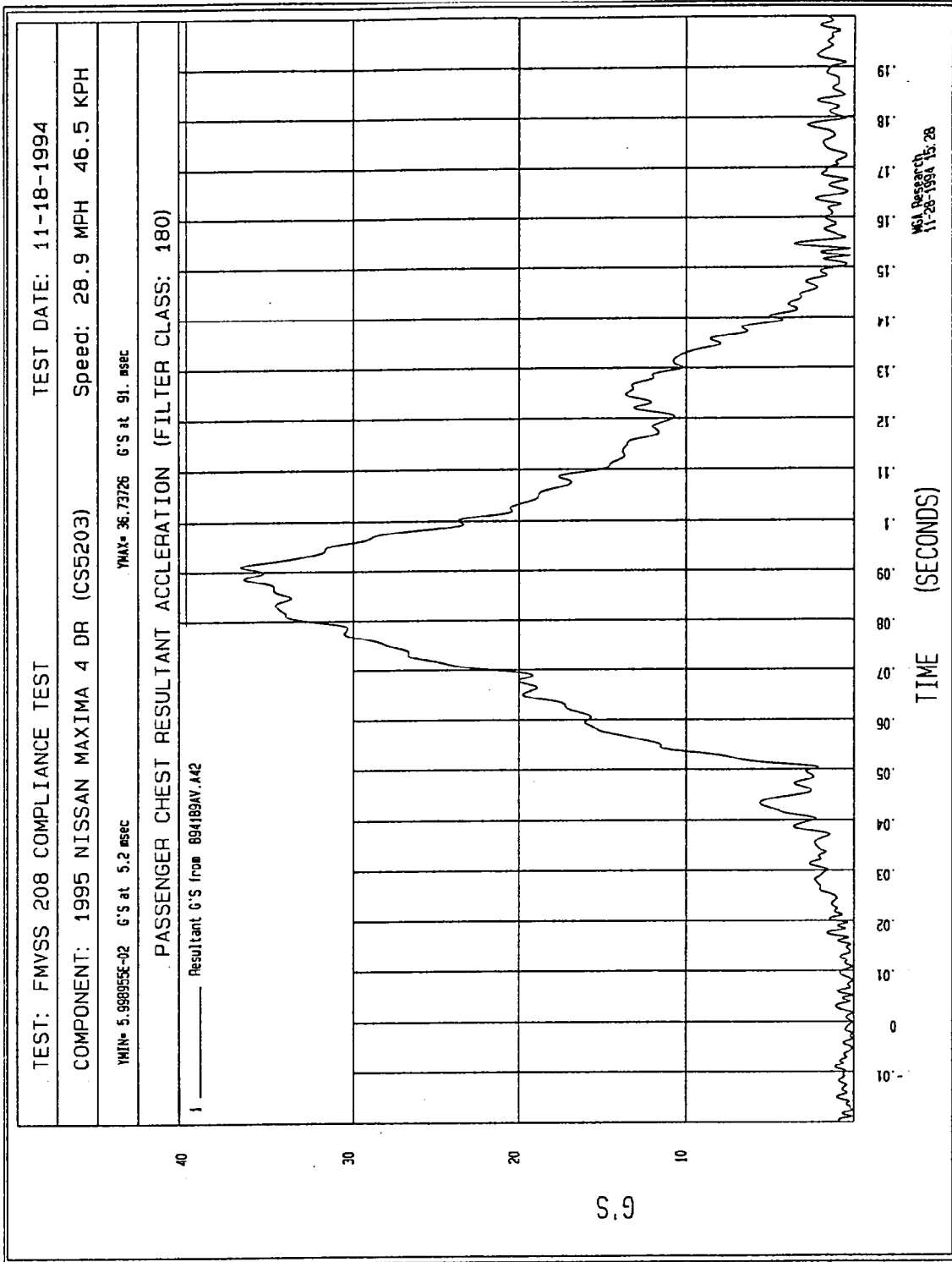


Figure B-19 - Passenger Chest Resultant Acceleration vs. Time

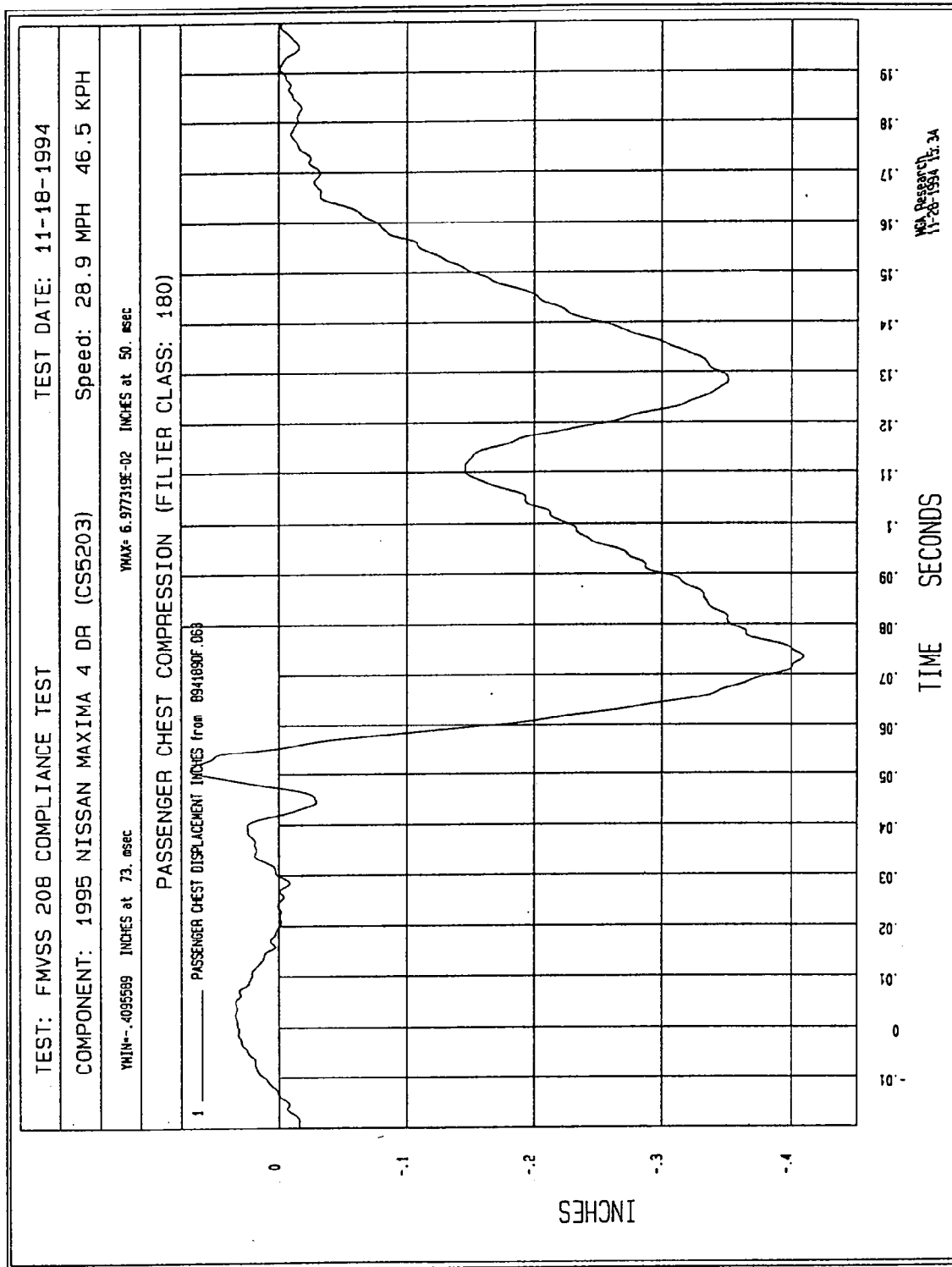


Figure B-20 - Passenger Chest Compression vs. Time

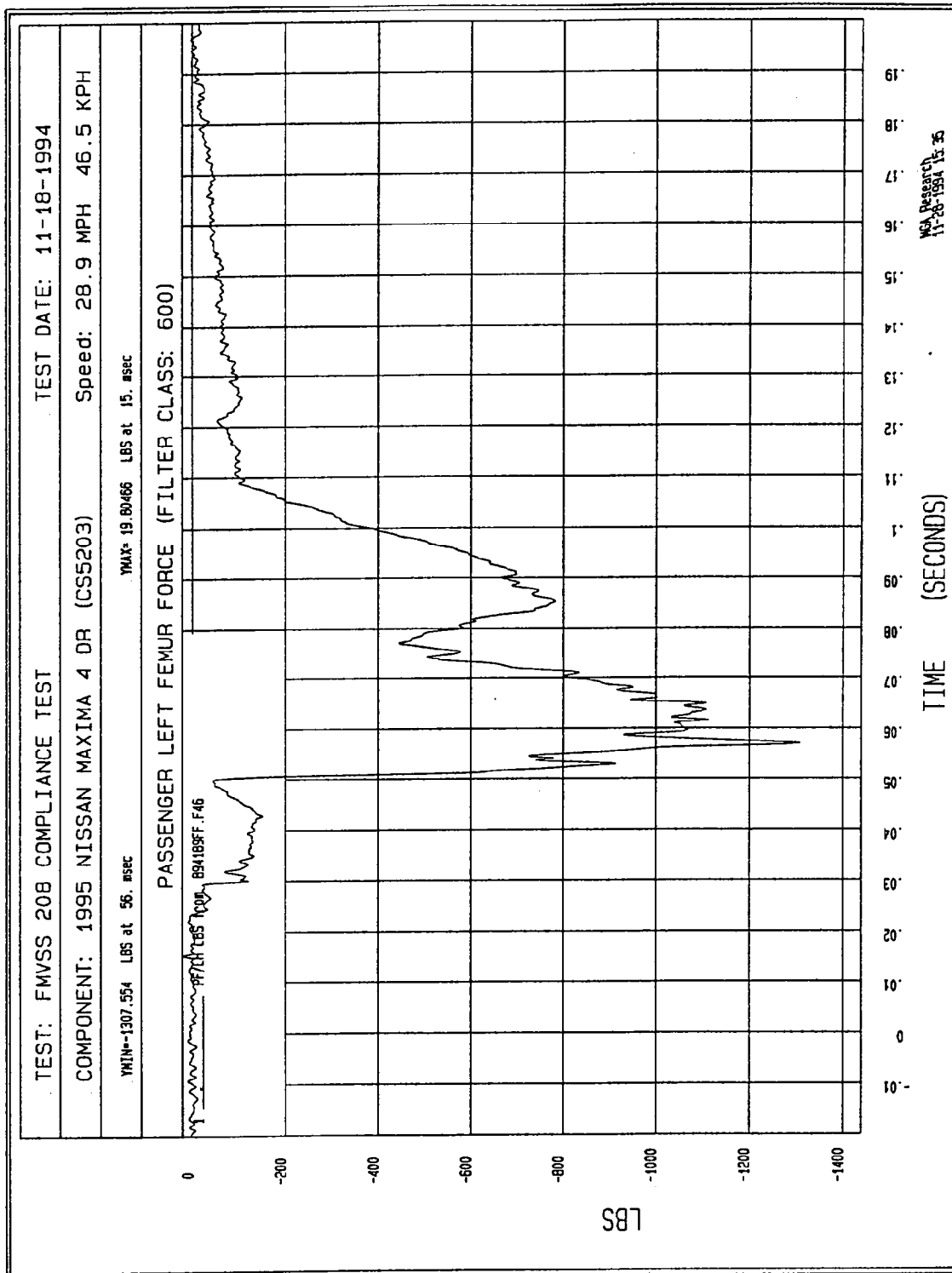


Figure B-21 - Passenger Left Femur Force vs. Time

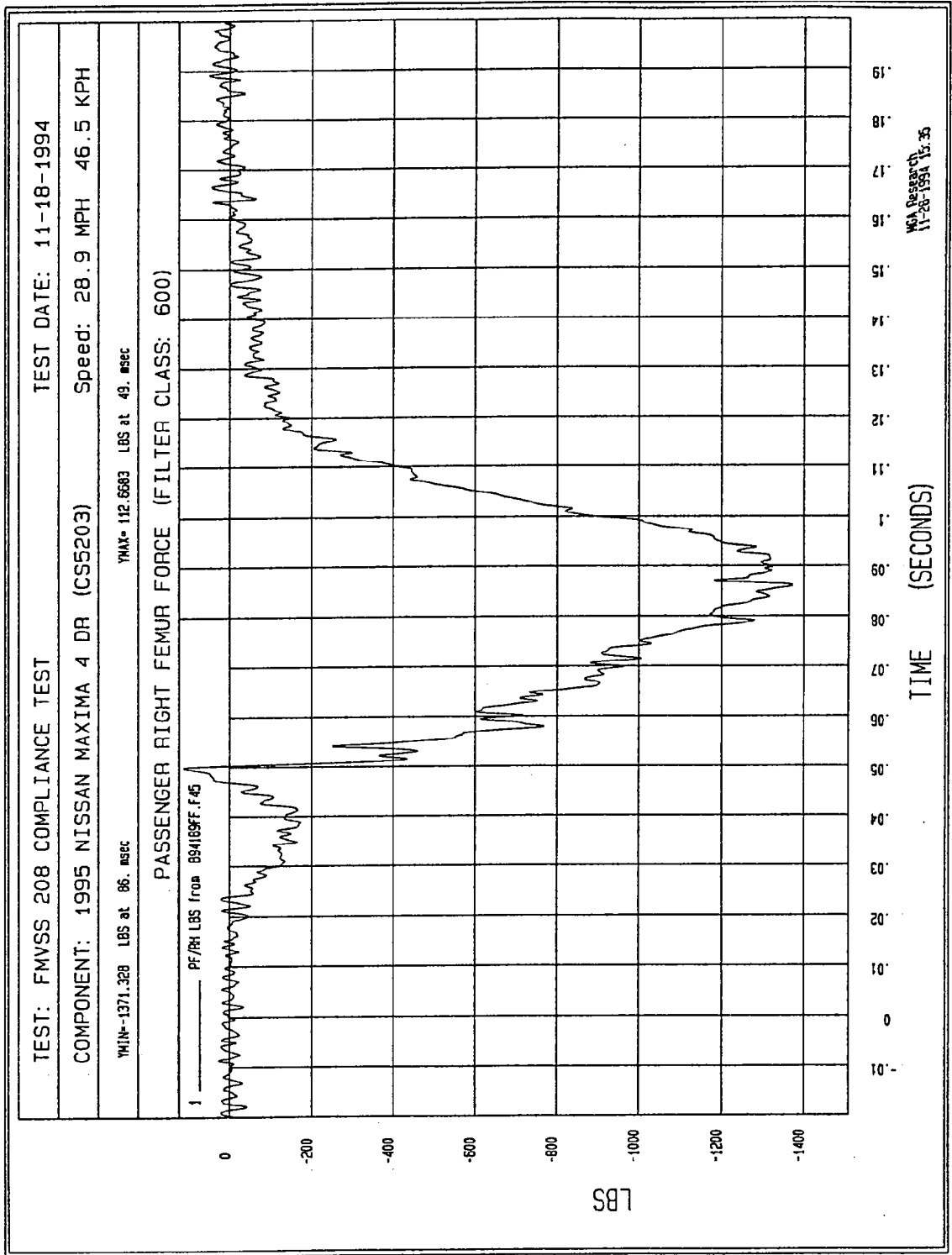


Figure B-22 - Passenger Right Femur Force vs. Time

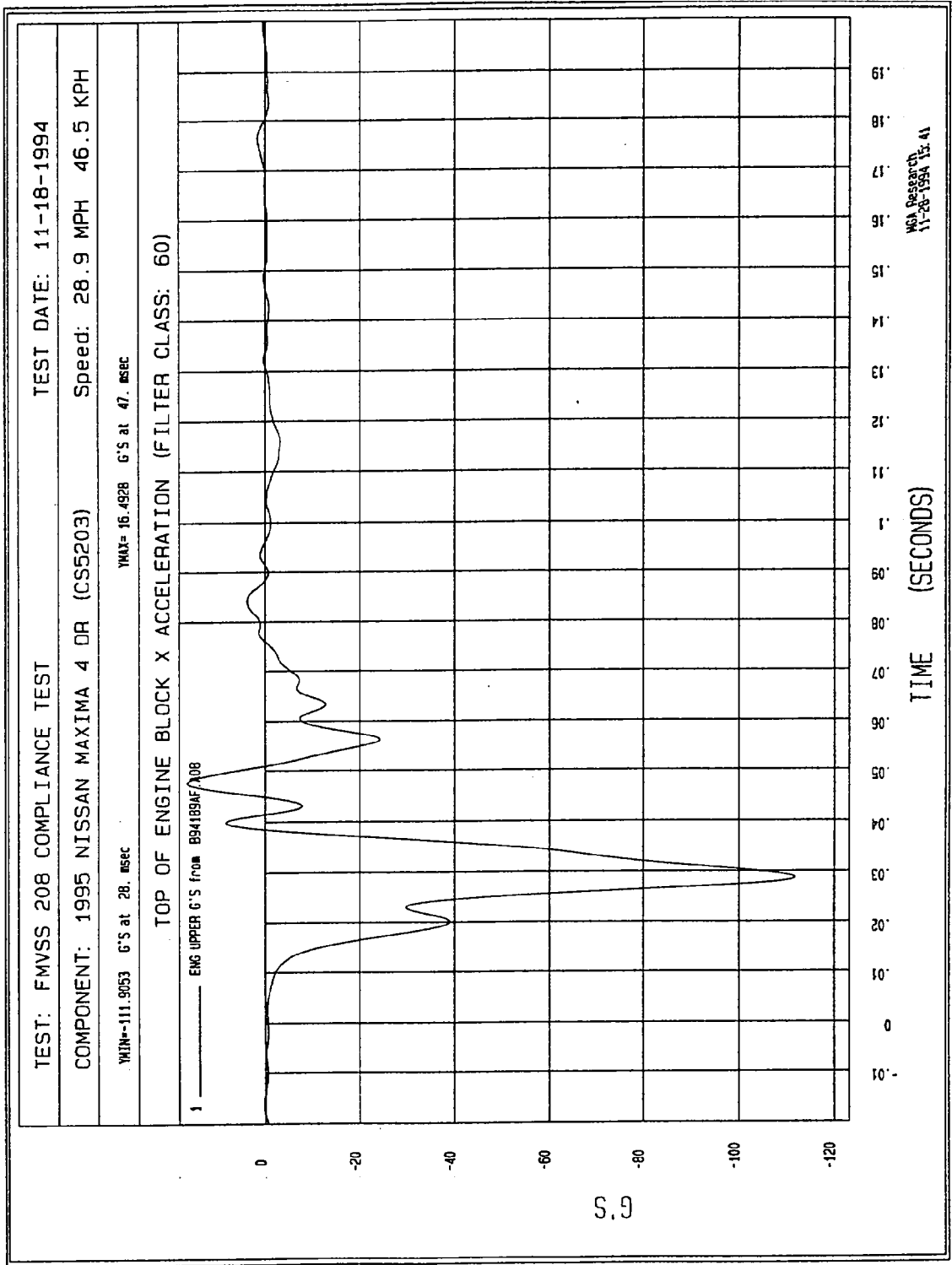


Figure B-23 - Top of Engine Block X Acceleration vs. Time

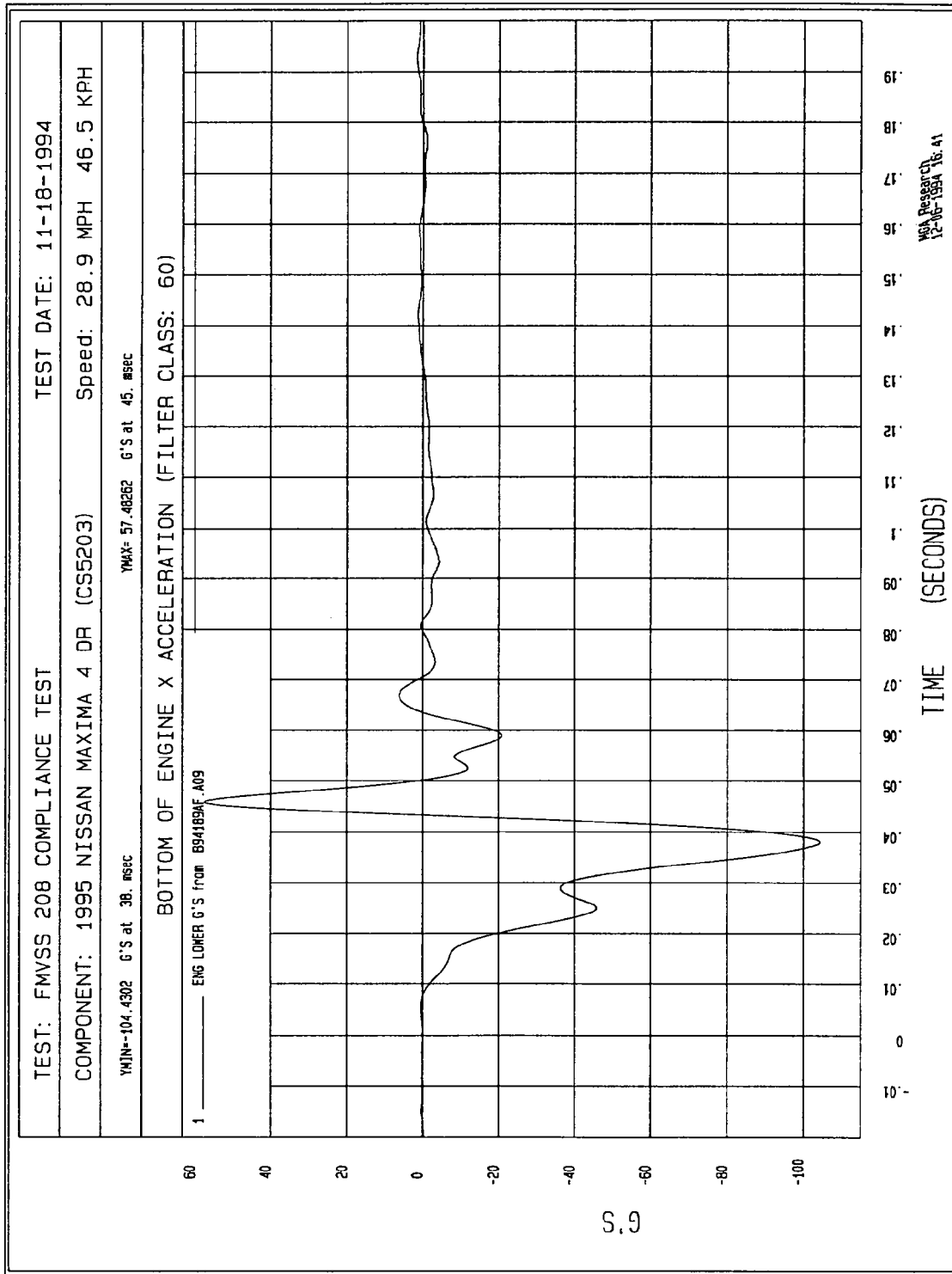


Figure B-24 - Bottom of Engine X Acceleration vs. Time

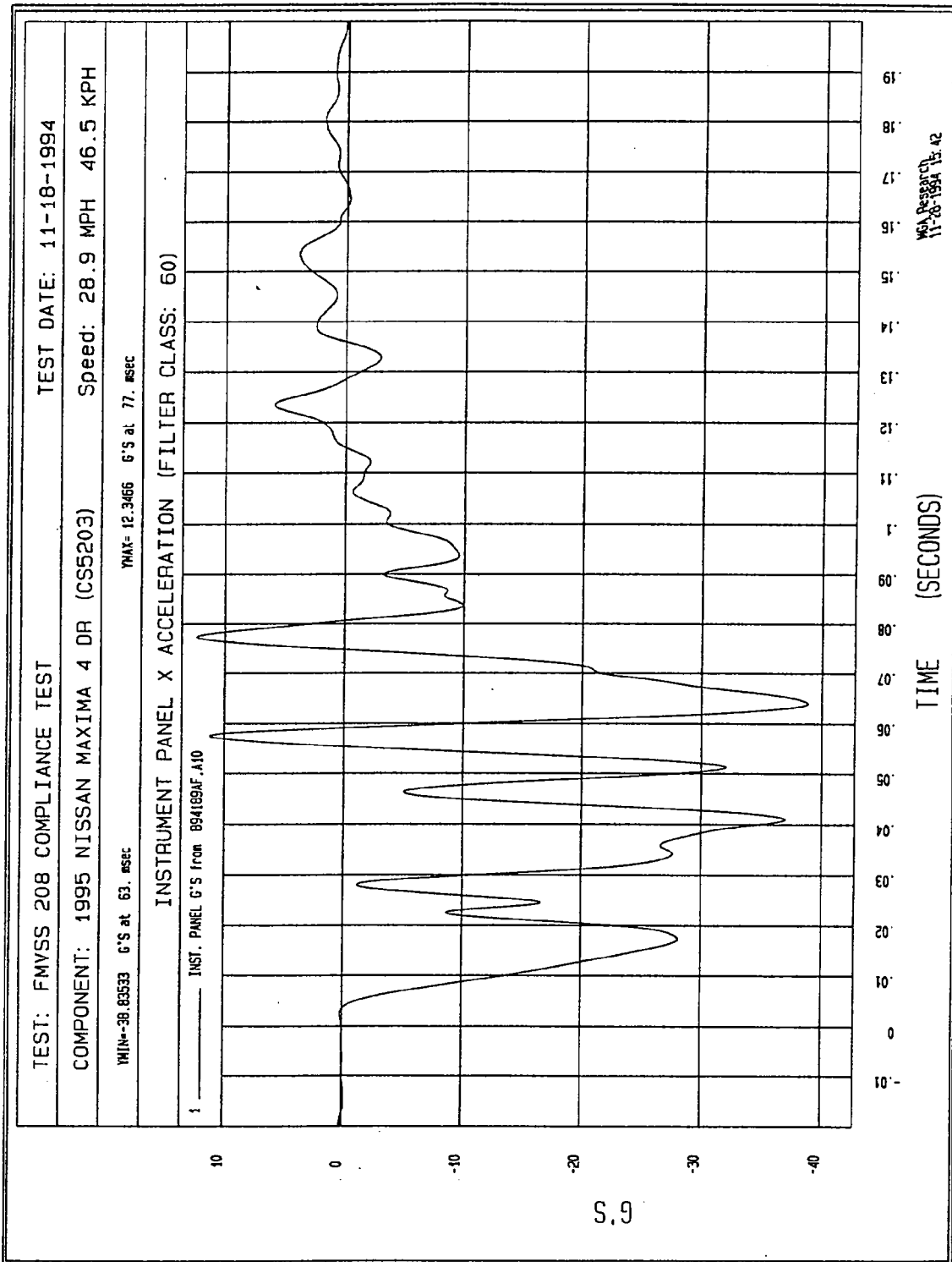


Figure B-25 - Instrument Panel X Acceleration vs. Time

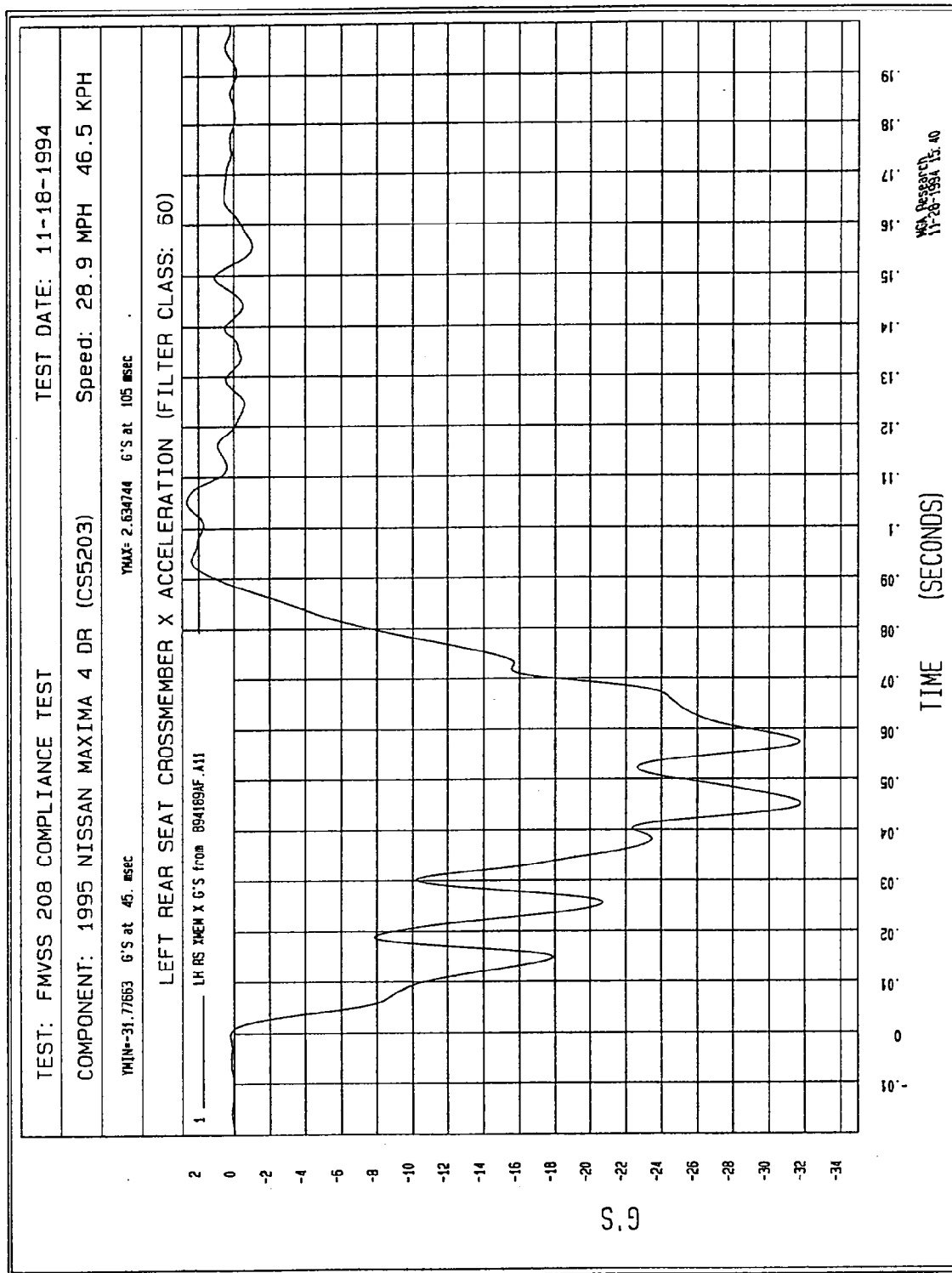


Figure B-26 - Left Rear Seat Crossmember X Acceleration vs. Time

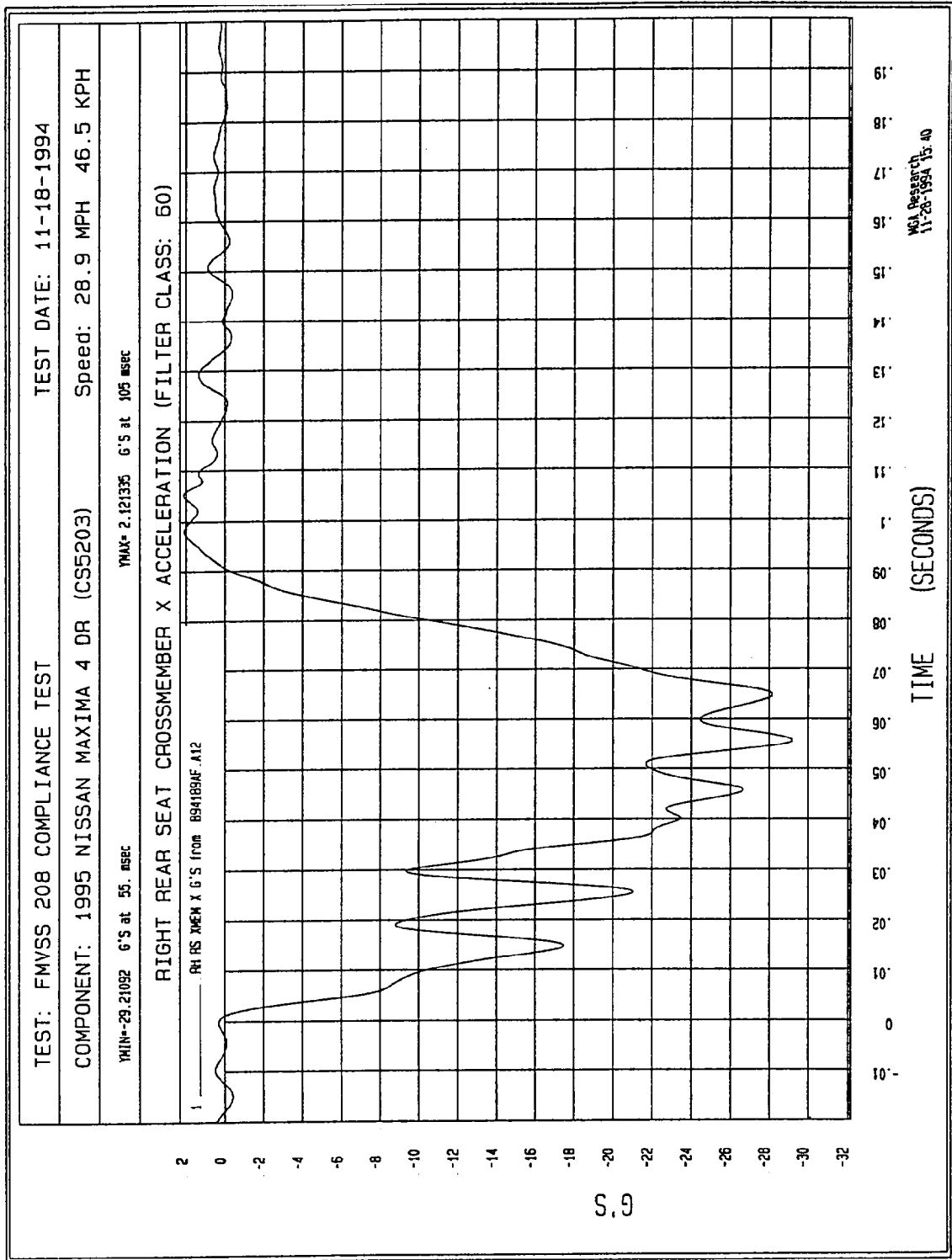


Figure B-27 - Right Rear Seat Crossmember X Acceleration vs. Time

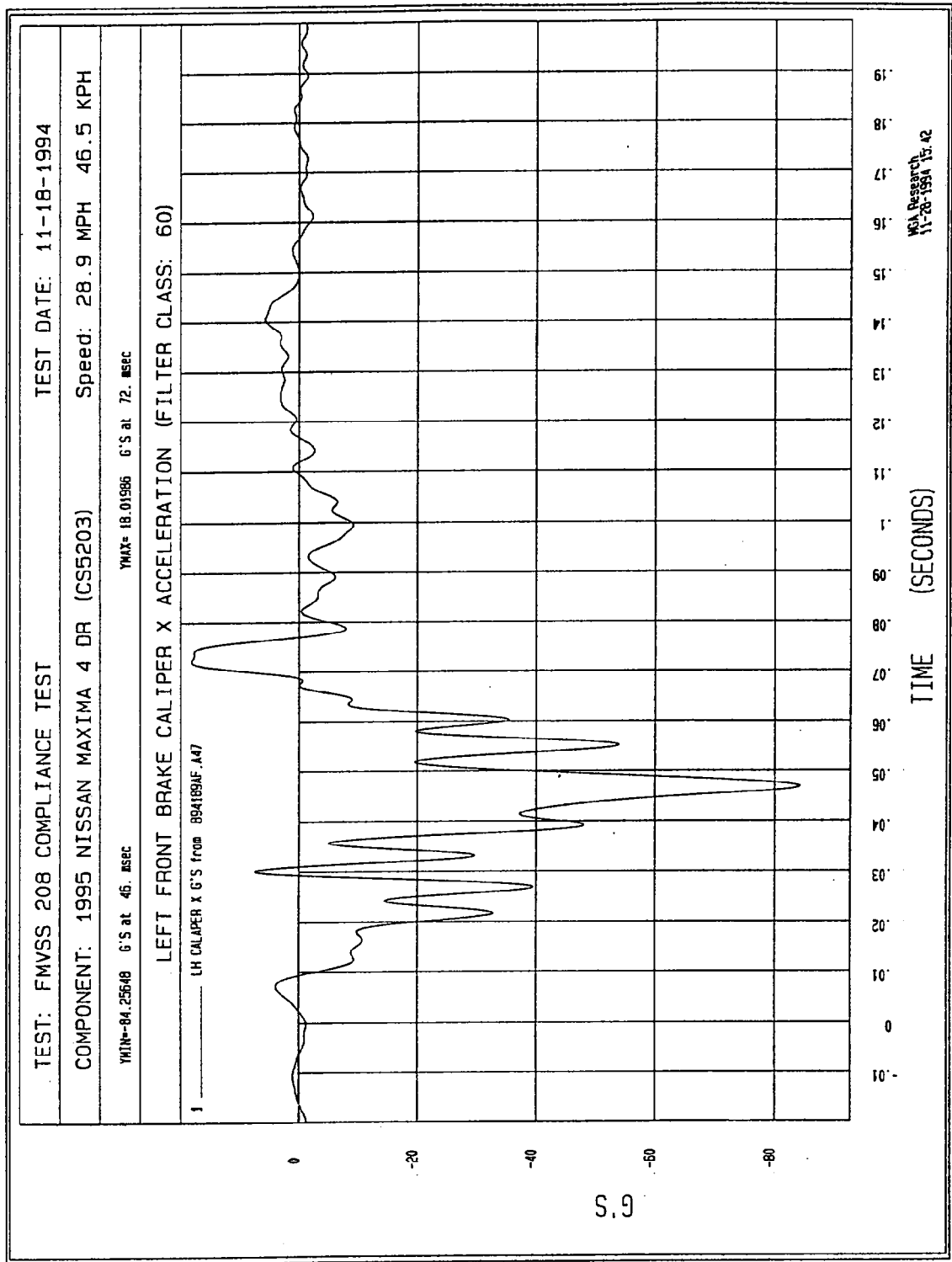


Figure B-28 - Left Brake Caliper X Acceleration vs. Time

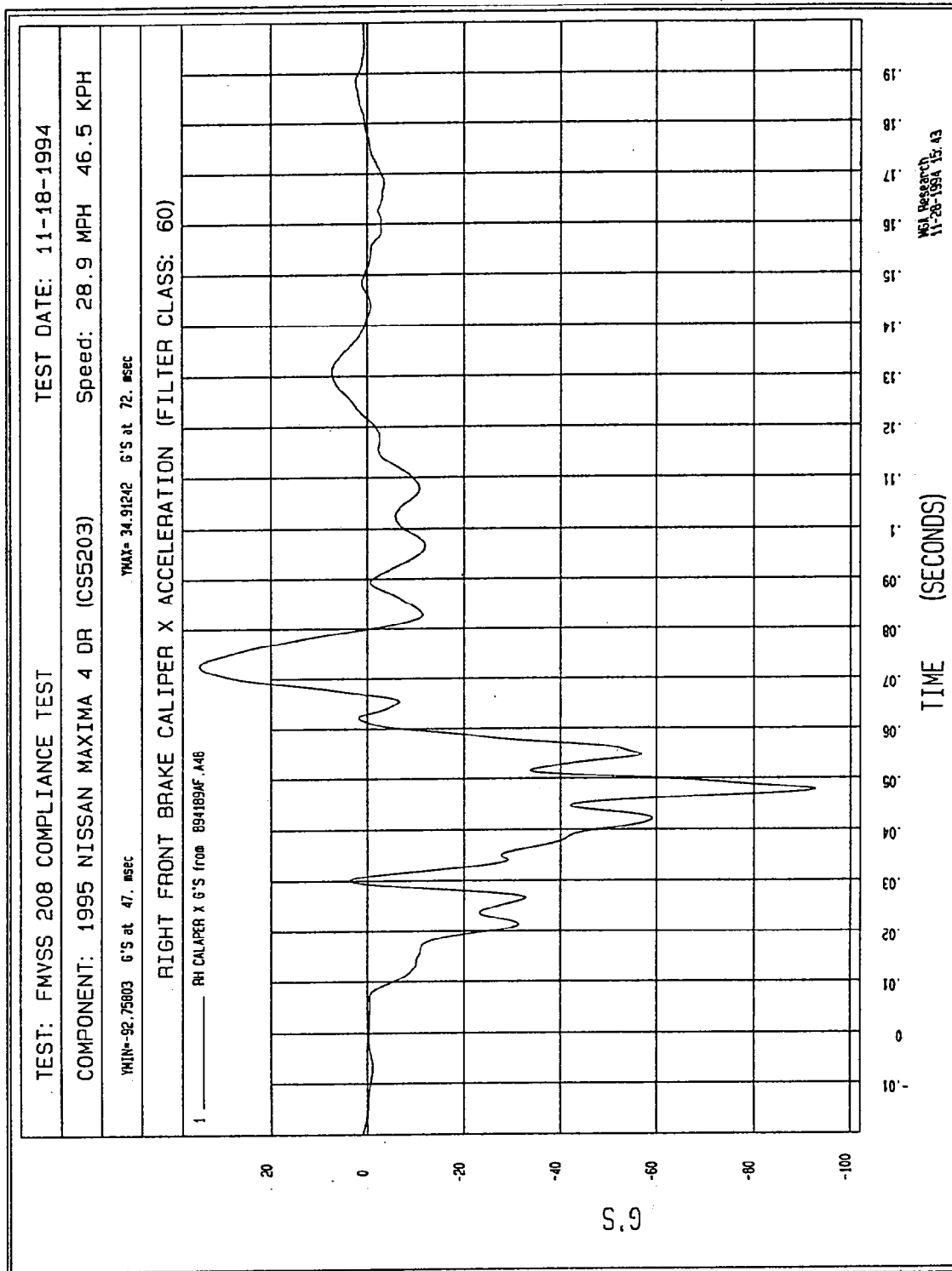


Figure B-29 - Right Brake Caliper X Acceleration vs. Time

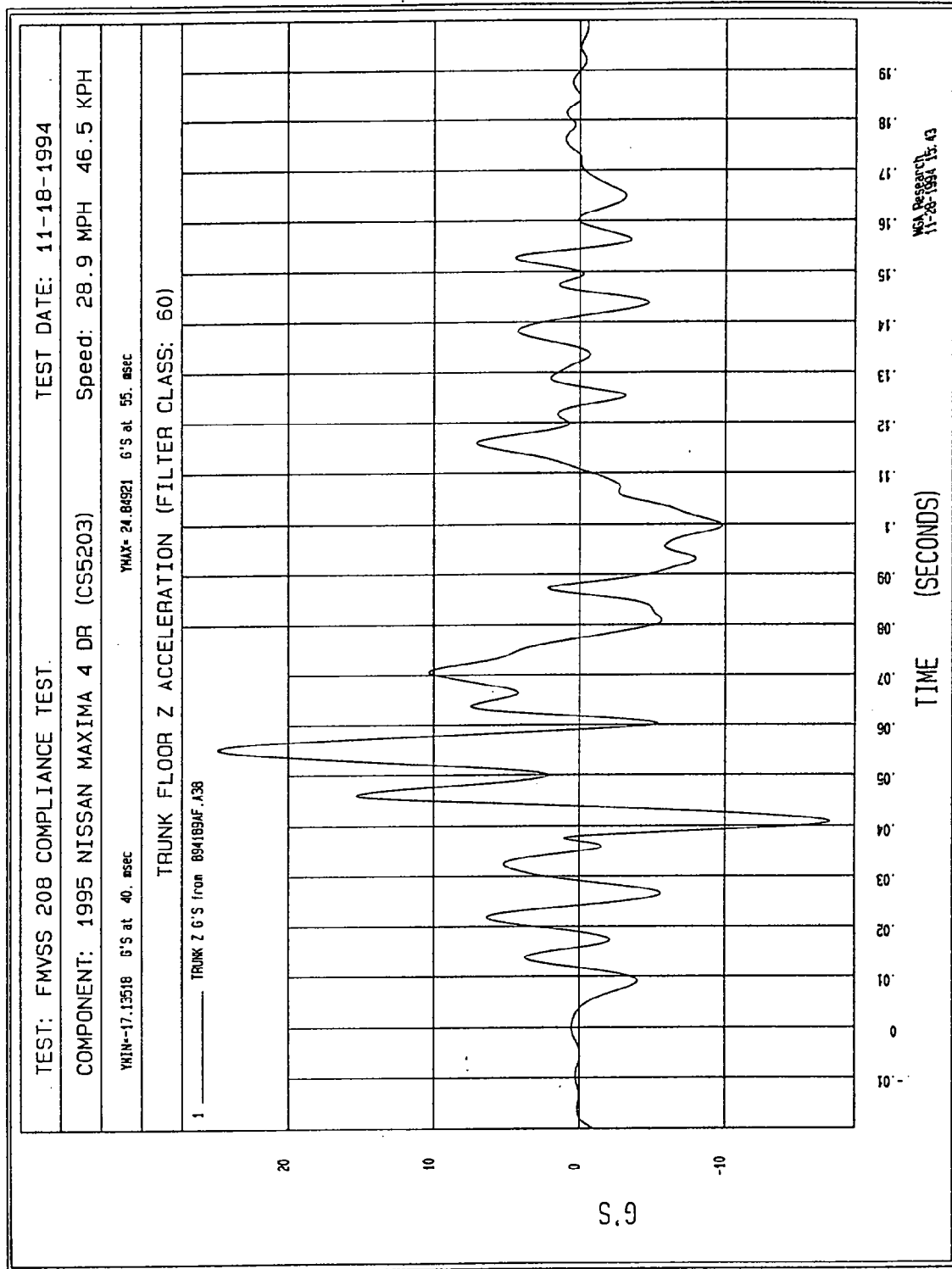


Figure B-30 - Trunk Floor Z Acceleration vs. Time

APPENDIX C
MANUFACTURER'S VEHICLE INFORMATION



NISSAN NORTH AMERICA, INC.

Washington Corporate Office
750 17th Street, N.W.
Suite 901
Washington, D.C. 20006-4607
Telephone: (202) 862-5523
FAX: (202) 659-2646

August 10, 1994

Ref: W-679-H

AST-079-2

Mr. Robert F. Hellmuth
Director, Office of Vehicle Safety Compliance
National Highway Traffic
Safety Administration
400 7th Street, S.W. Room 6113
Washington, D.C. 20590

RE: NEF 31CCa / IR 1543

Dear Mr. Hellmuth:

This letter is in response to your above referenced request regarding certification testing of the 1995 model year Nissan Maxima to the performance requirements of FMVSS No. 208 "Occupant Crash Protection" that was received by our office on July 18th, 1994. On July 26, 1994, Nissan requested that the necessary information required to conduct the test be submitted to the OVSC by August 10th, and that an extension be granted until August 31st, 1994 to complete the balance of the response to IR 1543 (Ref W-673-H; AST-079). That request for extension has been subsequently granted by the Office of Vehicle Safety Compliance.

Nissan North America, Inc., with the specific authority from Nissan Motor Company, Ltd. of Tokyo, Japan ("Nissan"), hereby transmits the following information, which has been formatted to correspond to the numbered questions in IR 1543.

1) The automatic restraint system provided at each front outboard seating position in the 1995 Nissan Maxima is installed to meet the requirements of FMVSS No. 208, S.4.1.2.1(C)(2).

2) Not applicable.

3) The manual safety belt provided at each outboard designated seating position is installed to meet the requirements of FMVSS No. 208.S.4.1.2.1(C)(2). Table #1 shows the summary of Nissan's certification test data for each manual safety belt, both in the fastened and unfastened modes.

4) Not applicable

5) Not applicable.

6) An explosive device to inflate the air bags is used in the 1995 Nissan Maxima. The certification letters from the air bag module supplier that indicate compliance to the requirements of FMVSS No. 208.S.9.2 are included as Attachment #5 of this submission.

7) The safety belt system in the 1995 Maxima is not equipped with a tension relieving device.

8) The windows were closed during certification of the 1995 Maxima. The vehicle is not equipped with vents.

9) The Part 572(E) "Hybrid III" anthropomorphic test dummies (ATD), manufactured by ARL, Inc., were employed in Nissan's certification tests. The dummy seating positioning information is provided in Appendix C. The 1995 Nissan Maxima is equipped with a driver left foot rest. Bench seats are not available in the 1995 Maxima.

10) The seating and steering column positioning information and fuel tank data are included in Form #1 that was provided by the OVSC, and is included as Attachment #1 of this submission.

11) The nominal position of adjustable seat belt anchorages for a 50th percentile adult male occupant is provided in Attachment #1.

12) Table #1 indicates the speed at impact, vehicle test weight and the resultant injury values recorded for all certification tests conducted to meet the requirements of FMVSS No. 208.S.4.1.2.1. The plots of the driver and right front passenger position ATD head and chest accelerations as a function of time and the plots of the ATD femur loads as a function of time are provided as Annexes #1 and #2.

13) Attachment #4 indicates the order of priority in which components of the 1995 Maxima were removed to achieve the proper vehicle test weight.

14) The certification report that demonstrates compliance of the 1995 Maxima to the performance requirements of FMVSS No. 204 is provided as Table #2. The diagram of the steering column control system and the description of the energy management of the system are provided as Attachment #2

15) The 1995 Nissan Maxima is not equipped with a built-in child restraint system.

Nissan is also providing supplemental information relating to the dimensions for seat back angle and seat slide positioning (Appendix A), steering column positioning (Appendix B) and dummy seating positioning information (Appendix C).

If you have any questions or require further information regarding this submission, please contact Mr. Toshio Horiuchi of my staff at (202) 466-5284.

Respectfully submitted,

Timothy A. McCarthy for Michinori Hachiya
Michinori Hachiya

V.I. Government Affairs

Director
Technical Affairs

Washington Corporate Office

enclosures

TEST VEHICLE INFORMATION

Vehicle Model Year & Make: 1995 NISSAN
Vehicle Model & Body Style: MAXIMA 4-DOOR SEDAN

1. NOMINAL DESIGN RIDING POSITION ••

For adjustable driver and passenger seat backs.
Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent if applicable. Indicate, if applicable, how the detents are numbered (Is the first detent "0" or "1"?). Indicate if the seat back angle is measured with the dummy in the seat.

Seat back angle for driver's seat = 25° *1
 23° *2 degrees.
Measurement Instructions:

A MANUAL SEAT

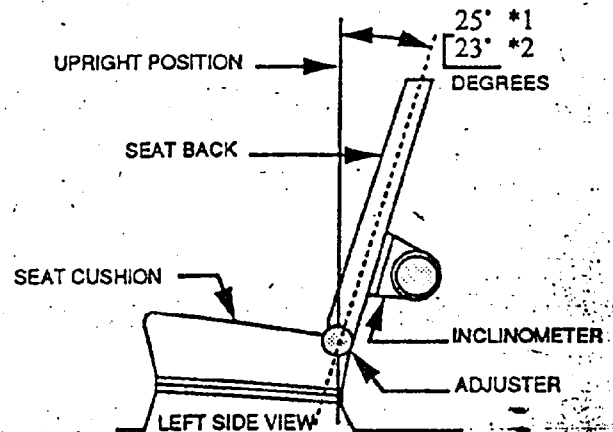
- 1) Pull the folded seat back until the lock position is attained.
- 2) Release the lock by actuating the reclining lever and pushing the seat back to the 7th rearward notch.

B POWER SEAT

- 1) moving the seat back by the switch for reclining to the initial position.
- 2) setting an inclinometer at the position shown in the Attachment 3.
- 3) moving the seat back rearward until the seat back angle reaches to 23° (Neutral position).

Seat back angle for passenger's seat = 25° *1
 23° *2 degrees.
Measurement Instructions:

- 1) Pull the folded seat back until the lock position is attained.
- 2) Release the lock by actuating the reclining lever and pushing the seat back to the 7th rearward notch.



- *1: Nominal designated seat back angle
*2: Seat back angle measured as shown in Attachment 3.

2. SEAT FOR & AFT POSITIONS ••

Provide instructions for positioning the driver and front outboard passenger seat(s) in the center of fore and aft travel. For example, indicate how the detents are numbered (Is the first detent "0" or "1"?). Provide information to locate the detent in which the seat track is to be locked.

Positioning of the driver's seat:

A MANUAL SEAT

- 1) Actuate seat track slide mechanism by lifting the lock lever and push the seat to its forwardmost position on the track.
- 2) With the initial position designated as "0", adjust the seat to the 10th detent to attain the proper position.

B POWER SEAT

- 1) moving the seat by the switch for sliding to the forwardmost position.
- 2) moving the seat 4.5 inch rearward (Neutral position).

Positioning of the passenger's seat (if applicable):

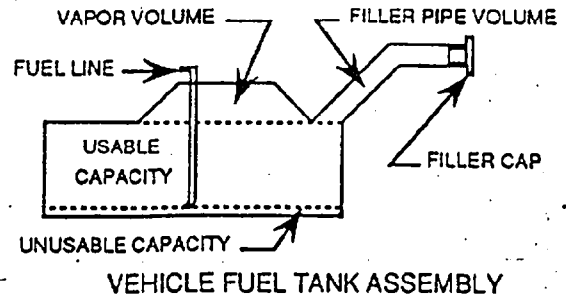
- 1) Actuate seat track slide mechanism by lifting the lock lever and push the seat to its forwardmost position on the track.

- 2) With the initial position designated as "0", adjust the seat to the 10th detent to attain the proper position.

3. FUEL TANK DATA ••

- 3.1 A. "Usable Capacity" of standard equipment fuel tank = 18.5 gallons.
- B. "Usable Capacity" of optional equipment fuel tank = N/A gallons.
- C. Capacity used when certification testing to requirements of FMVSS 301 = 18.5 gallons.

Operational Instructions:



- 3.2 Amount of stoddard solvent added to vehicle for certification test = 17.7 gallons

- 3.3 Is vehicle equipped with electric fuel pump? X YES NO

If YES, explain the vehicle operating conditions under which the fuel pump will pump fuel.
 The fuel pump will pump fuel : 1) for 1 second after the ignition is switched to "on".

2) while the engine is running.

3) for 1.5 seconds after the engine stops.

4. STEERING COLUMN ADJUSTMENTS ••

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions. If the tested vehicle has any of these adjustments, does your company use any specific procedures to determine the geometric center.

Operational Instructions: $a = 24^\circ$

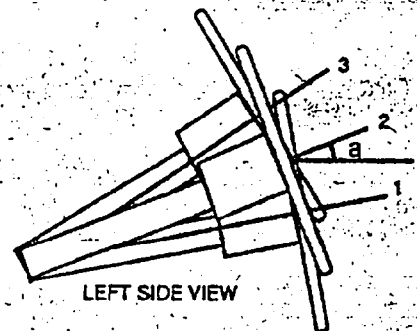
1) Set the inclinometer on the steering column cover.

2) Measure the column angle using the inclinometer

with the steering column at the highest and lowest

elevation and record the resultant angles.

3) Adjust the steering column to the mid position.



STEERING COLUMN ASSEMBLY

5. AUA positioning ••

1. Locate the lock release button on the B-pillar panel.
2. Actuate the release mechanism by depressing the button and position the adjuster to it's highest position.

1995 NISSAN MAXIMA 4DOOR SEDAN

Attachment3

Attachment3

ADJUSTABLE FRONT SEAT BACK ANGLE

(USE INCLINOMETER)

DATA FOR 1995 NISSAN MAXIMA 4DOOR SEDAN



After adjusting the seat back according to Attachment 1, Seat back angle is 23°

when measured at the position shown in the photograph.

ATTACHMENT 4

PRIORITY ORDER OF REMOVED COMPONENTS
TO OBTAIN PROPER TEST WEIGHT
FOR 1995 NISSAN MAXIMA

No.	REMOVED COMPONENTS
1	REAR BUMPER
2	SPARE TIRE AND TOOLS
3	TRUNK LID
4	REAR SEAT COMPONENTS
5	REAR COMBINATION LAMP
6	TRUNK COMPARTMENT TRIM PARTS

TOTAL 6 COMPONENTS

APPENDIX A

DIMENSIONS FOR SEAT BACK ANGLE AND SEAT SLIDE SETTING

VEHICLE MODEL YEAR: 1995 VEHICLE MAKE: NISSAN

VEHICLE MODEL & BODY STYLE: MAXIMA 4DOOR SEDAN

Reset is required when each dimension you measured has more than 0.6 in. difference from the dimension below.
(Refer to Figs.1 -4 and photographs)

	Measurements Points	Photographs	Dimensions	
Driver Side	A Center of headrest stay - Corner point of ventilator	1 to 3	38.81 in. * 38.31 in.	Seat back setting data
	B Front of seat slide - Lower point of instrument panel	4 to 6	26.69 in. * 26.38 in.	Seat slide setting data
Passenger Side	C Center of headrest stay - Corner point of ventilator	7 to 9	38.58 in.	Seat back setting data
	D Front of seat slide - Lower point of instrument panel	10 to 12	26.65 in.	Seat slide setting data

* : Power Seat

