V2202

REPORT NO.: 208-MGA-95-007
212-MGA-95-007
301-MGA-95-007

VEHICLE SAFETY COMPLIANCE TESTING FOR FMVSS 208, OCCUPANT CRASH PROTECTION

FMVSS 212, WINDSHIELD MOUNTING

FMVSS 219, WINDSHIELD INTRUSION (PARTIAL)

FMVSS 301, FUEL SYSTEM INTEGRITY

CHRYSLER CORPORATION
1995 Dodge Ram 2500 Van
NHTSA NO. CS0308

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105

Test Date: January 17, 1995

Report Date: January 25, 1995

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

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PREPARED BY: Nicole Walter DATE: Jan. 30th, 1995

Nicole Walter
MGA Research Corporation

APPROVED BY: John Fleck DATE: 1/30/95

John Fleck
MGA Research Corporation

FINAL REPORT ACCEPTED BY:

Charles R. Case DATE: 2/8/95

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

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. 208-MGA-95-007 212-MGA-95-007 301-MGA-95-007	2. Government Accession No.	3. Recipient's Catalog No.
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16. Abstract Compliance tests were conducted on the subject 1995 Dodge Ram 2500 Van in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-208-09 on January 17, 1995 for the determination of FMVSS 208 compliance. Test failures identified were as follows: It appears that the driver chest acceleration does not meet the criterion of FMVSS 208, paragraph 6.2.3.		
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 Hornickle
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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 Dodge Ram Van, NHTSA No. CS0308, 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 face which was covered with a sheet of 3/4 inch thick plywood.

The test vehicle contained two (2) Part 572E 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 572E dummy's instrumentation also included a chest potentiometer to measure longitudinal deflection.

The twenty-six (26) data channels were multiplexed and recorded on three 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 January 17, 1995.

The test vehicle, a 1995 Dodge Ram Van, NHTSA No. CS0308, appeared to comply with the performance requirements of FMVSS 208, 212, and 219 (partial) in the flat frontal barrier impact mode, except for paragraph 6.2.3 of FMVSS 208. The driver chest resultant acceleration exceeded 60 g's over 3 msec. The passenger chest resultant acceleration met paragraph 6.2.3 of FMVSS 208. The Head Injury Criteria (HIC) calculations were less than 1000. The compressive forces transmitted through the upper legs did not exceed 2,250 pounds as measured by Part 572E dummies seated in the front outboard designated seating positions. For each Part 572E 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.

The test vehicle was equipped with a driver airbag and a Type 2 seat belt system with passive shoulder belts in the front outboard designated seating positions. The driver dummy was restrained by the Type 2 seat belt and airbag where as the passenger dummy was restrained by the Type 2 seatbelt during the test. The vehicle's test weight was 4843 pounds. The vehicle's impact speed was 29.4 mph. The vehicle's maximum static crush was 15.4 inches.

The driver's HIC was 816. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 64 g's. The driver's chest maximum deflection was 1.4 inches. The driver's left and right femur maximum compressive forces were 1837 pounds and 1576 pounds, respectively.

The right front passenger's HIC was 554. The right front passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 58 g's. The right front passenger's chest maximum deflection was 1.6 inches. The right front passenger's left and right femur maximum compressive forces were 514 pounds and 551 pounds, respectively.

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

TEST NOTES

In a post-test inspection of the vehicle, it was noticed that there is an abrasion of the plastic on the lower left side of the steering wheel.

Due to the apparent non-compliance, the FMVSS 301 static rollover test on the 1995 Dodge Ram Van was not conducted.

During the crash, Camera #2 (left front) did not run. The timing marks are faint on Camera #7 (right overall) and Camera #13 (top passenger). The marks are yellow and found at the far right of the film.

Post-test underbody photographs were not taken because the rollover test was not conducted. These photographs are taken during the rollover.

Any missing data is data that cannot be collected without disturbing the vehicle.

TABLE 1 CRASH TEST SUMMARY

Vehicle Yr/Make/Model/Body Style: 1995/Dodge/Ram 2500/Van

Vehicle NHTSA No.: CS0308 Test Type: Frontal Barrier Impact

Test Date: 1/17/95 Time: 2:44 p.m. Temp: 70°F

Vehicle Test Weight: 4843 lbs. Vehicle/Barrier Impact Angle: 0°

Impact Velocity: 29.4 mph Maximum Static Crush: 15.4 inches

Vehicle Rebound: 11.6 inches

Dummies:	Driver	Passenger
Dummy Type	Part 572E	Part 572E
Serial Number	403	401
Restraint System	Type 2 Seatbelts Facebag	Type 2 Seatbelts
No. of Data Channels	9	9

Number of Cameras: 1 Real Time

14 High Speed

Door Opening Data: Left Front: No ; Right Rear: Yes

Right Front: Yes

Front Seat(s) Data:	Driver	Passenger
Seat Track Failure	.197 in - deformation forward	1.18 in - track failure forward
Seat Back Failure	N/A	N/A

Visible Dummy Contact Points:	Driver	Passenger
Head	Airbag, headrest	Headrest
Chest	Airbag, Belt	Belt
Left Knee	Knee Bolster	Lower Dash
Right Knee	Knee Bolster	Lower Dash

TABLE 2 GENERAL TEST AND VEHICLE PARAMETER DATA

Vehicle Yr/Make/Model/Body Style: 1995/Dodge/Ram 2500/Van

NHTSA No: CS0308 VIN: 2B7HB21Y0SK502473 Body Color: Red

Engine: 8 Cylinders; __C.I.D.; 5.2 liters; ___CC

X Gas; __Diesel; __Turbocharged

X Longitudinal __Transverse

Transmission: 3 Speed; __Manual; X Automatic; __Overdrive

Final Drive: __Front Wheel; X Rear Wheel; __Four Wheel

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

__P/seats; __Tilt Wheel; __Anti-skid Brakes; __Cruise Control; __Other

Date Received: 12/19/94 ; Odometer Reading: 133 miles

Dealer's Name/Address: Chuck Van Horn Dodge, Inc.
P.O. Box 252, 110 North Street
Plymouth, WI 53073

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured By: Chrysler Corporation

Date of Manufacture: 8/94 ; VIN: 2B7HB21Y0SK502473

GVWR: 6400 lbs; GAWR Front: 3300 lbs. GAWR Rear: 3100 lbs.

DATA FROM TIRE PLACARD:

Tire Pressure with maximum capacity vehicle load: Front 35 psi; Rear 41 psi

Recommended Tire Size: P235/75R15

Recommended Cold Tire Pressure: Front 35 psi; Rear 41 psi

Tires on Vehicle: P235/75R15 ; Manufacturer: Michelin

Type of Spare Tire: Standard

Number of Occupants: 2 Front; __Rear; __3rd Seat; 2 TOTAL

Type of Front Seats: X Bucket; __Bench; __Split Bench

Type of Front Seat Back: X Fixed; __Adj. With; __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 = 1224 lbs Right Rear = 924 lbs

Left Front = 1173 lbs Left Rear = 891 lbs

TOTAL FRONT WEIGHT = 2397 lbs (57 % of Total Vehicle Weight)

TOTAL REAR WEIGHT = 1815 lbs (43 % of Total Vehicle Weight)

TOTAL UNLOADED DELIVERED WEIGHT (UDW) = 4212 lbs

CALCULATION FOR TARGET TEST WEIGHT:

UDW (Unloaded Delivered Weight) = 4212 lbs

VCW (Vehicle Capacity Weight) = 2188 lbs

DSC (Designated Seating Capacity) = 2

RCLW*(Rated Cargo/Luggage Weight) = VCW - 150 (DSC) or 300 pounds (whichever is less) = 300lbs

Target Test Weight = UDW + RCLW + (2 Dummies x Dummy Weight)

Target Test Weight = 4212 + 300 + 344 = 4856 lbs

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND CARGO WEIGHT:

Right Front = 1340 lbs Right Rear = 1066 lbs

Left Front = 1355 lbs Left Rear = 1082 lbs

TOTAL FRONT WEIGHT = 2695 lbs (55.6% of Total Vehicle Weight)

TOTAL REAR WEIGHT = 2148 lbs (44.4% of Total Vehicle Weight)

TOTAL TEST WEIGHT = 4843 lbs

Weight of ballast secured in vehicle = 180 lbs

Vehicle components removed to meet target weight or to install instrumentation:

Right tail light, spare tire

VEHICLE ATTITUDE (all dimensions in inches):

Delivered Attitude:	RF 31.9	LF 31.9	RR 32.8	LR 33.0
Fully Loaded Attitude:	RF 31.3	LF 31.4	RR 31.8	LR 32.2
Test Attitude:	RF 31.4	LF 31.5	RR 31.9	LR 32.2

Wheel Base: 127.2 in; C.G. = 56.4 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: 1/17/95 Time: 2:44 p.m. Temperature: 70°F

Vehicle NHTSA No.: CS0308 VIN: 2B7HB21Y0SK502473

BARRIER IMPACT VELOCITY

Required Impact Velocity Range: 28.9 to 29.9 mph

Impact Velocity: Primary = 29.4 mph; Secondary = 29.6 mph

Distance From Front Bumper to Barrier Face When

Entering Speed Trap: 51.4 inches

Exiting Speed Trap: 12 inches

VEHICLE STATIC CRUSH AND REBOUND (inches):

Vehicle Length:	Pre-test	= R 421.8	C_L 205.2	L 198.9
	Post-test	= R 187.2	C_L 189.9	L 189.1
	Crush	= R 12.1	C_L 15.4	L 9.8
	Average	= 12.4		

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

R 11.2 in C_L 11.5 in L 11.6 in

TABLE 4 ACCIDENT INVESTIGATION DIVISION DATA

Vehicle Year/Make/Model/Body Style: 1995/Dodge/Ram 2500/Van

Veh. NHTSA No.: CS0308 ; VIN: 2B7HB21Y0SK502473

Build Date: 8/94 ; Test Date: 1/17/95

Veh. Size Category: Van ; Test Weight: 4843 lbs

Veh. Wheelbase: 127.2 in ; Front Overhang: 34.5 in ;

Overall Width: 78.7 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 = 9.8 inches

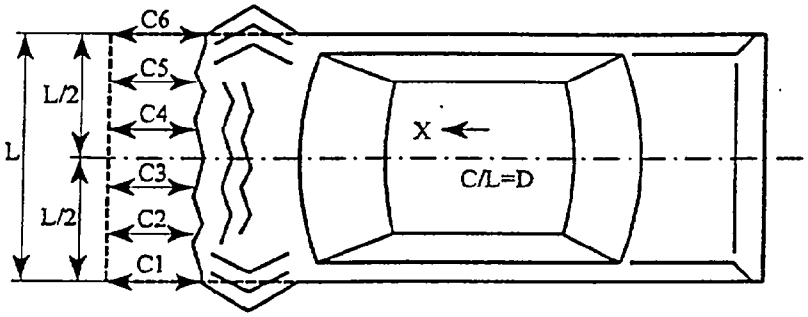
Dimensions: C2 = 13.1 inches

C3 = 15.3 inches

C4 = 15.1 inches

C5 = 13.5 inches

C6 = 12.1 inches



Midpoint of Damage: D = Vehicle Longitudinal Centerline

Length of Damaged Region: L = 67.3 inches

TABLE 5 POST TEST AIRBAG DATA

Vehicle Year/Make/Model/Body Style: 1995/Dodge/Ram 2500/Van

NHTSA No: CS0308 ; Test Date: 1/17/95 ; Technician: Nicole Walter

A. No of Vent Holes: Driver 2 ; Passenger N/A

B. Diameter of Vent Holes: Driver 1.2 in. ; Passenger N/A

C. Total Vent Area: Driver 2.2 in^2 ; Passenger N/A

D. Deflated Airbag Length and Width Dimensions or, if Round, Diameter

Driver; Length ___; Width ___; Diameter 24.3 in.

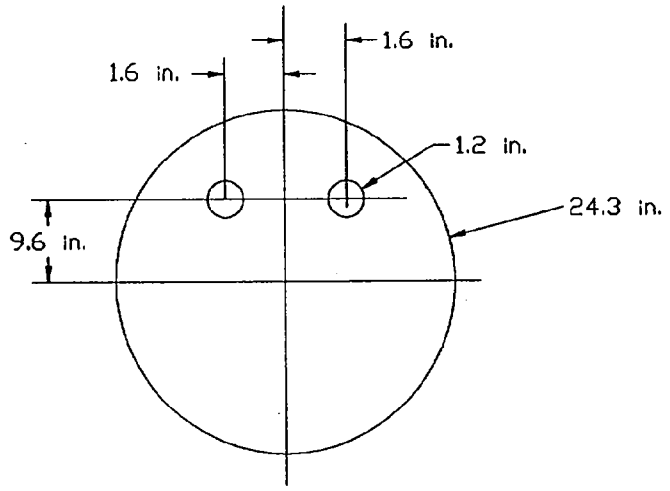
Passenger; Length N/A ; Width N/A ; Diameter N/A

E. Is the Airbag Tethered?

Driver; X Yes; ___ No; If yes, record length of tether * in

Passenger; N/A Yes; __ No; If yes, record length of tether ___in

Driver Airbag



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

Driver; Mfr * ; Airbag * ; Gen *

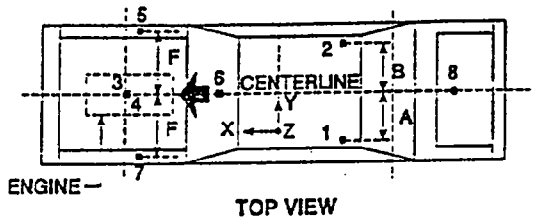
Passenger; Mfr * ; Airbag * ; Gen *

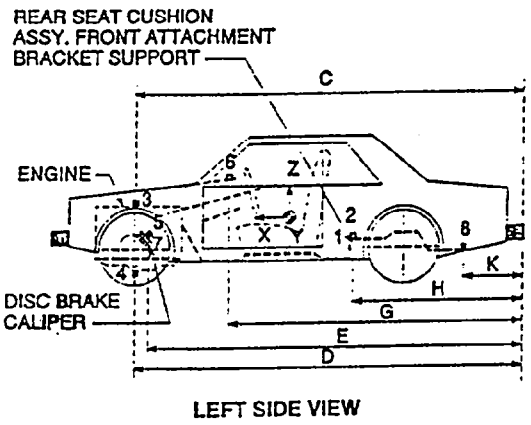
* Not Available

TABLE 6 VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Vehicle Year/Make/Model/Body Style: 1995/Dodge/Ram 2500/Van

Vehicle NHTSA No.: CS0308 ; Test Date: 1/17/95





ACCELEROMETER LOCATION (inches)		
	PRE-TEST	POST-TEST
A	27.2	27.2
B	28.0	27.8
C	158.6	*
D	159.2	158.9
E	165.7	164.1
F	28.5	28.5
G	169.5	169.2
H	126.0	125.0
K	12.2	12.2

ACCELEROMETER DATA SUMMARY (Filtered at 100 hertz cutoff)					
No.	DESCRIPTION	MAXIMUM (g's)	TIME (msec)	MINIMUM (g's)	TIME (msec)
1	Left Rear Seat Crossmember	1.6	167	-46.3	17
2	Right Rear Seat Crossmember	3.4	85	-49.5	17
3	Top of Engine Block	10.1	63	-92.9	46
4	Bottom of Engine	6.3	101	-80.5	47
5	Right Disc Brake Caliper	12.6	59	-58.6	27
6	Instrument Panel	10.3	64	-59.8	38
7	Left Disc Brake Caliper	25.1	55	-77.7	31
8	Trunk	5.1	88	-11.1	34

* Not Available

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 Industrial 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/Dodge/Ram 2500/Van
Vehicle NHTSA No.: CS0308 Body Color: Red
VIN: 2B7HB21Y0SK502473 Cost: $15,209.35
Odometer: Arrival Date: 12/19/94 Reading: 133 miles
Completion Date: 1/17/95 Reading: 133 miles
Engine: 8 Cylinders; 5.2 Liters; X Gas; __ Diesel
Transmission: 3 Speed; ___ Manual; X Automatic
Final Drive: __ Front Wheel; X Rear Wheel; __ Four Wheel
Tire Size: P235/75R15 ; Manufacturer: Michelin

Air Conditioner	No	Console	No	Brakes	Power
Tinted Glass	Yes	Tachometer	No	Front	Disc
Power Steering	Yes	Cruise Control	No	Rear	Drum
Power Windows	No	Rear Window Def.	No	Front Seats	Manual
Power Door Locks	No	Sun/Moon Roof	No	Seat Type	Front Bucket
Radio:AM/FM Tape	Yes	T-Top	No		Rear None
Clock	Yes	Tilt Steering Wheel	No		
Roof Rack	No	Other Options:	Yes	No. of Seats	2

Heavy duty shocks, rear door windows, 35-gallon fuel tank, spare tire and wheel

Equipment that is no longer on the vehicle as noted above:
Spare Tire

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/Dodge/Ram 2500/Van

Veh. NHTSA No.: CS0308 Test Date: 1/17/95

MAXIMUM ACCELERATION VALUES: (g's)	DRIVER DUMMY #403	PASSENGER DUMMY # 401
Head Channel X	-85.8	-57.7
Head Channel Y	9.5	-3.9
Head Channel Z	36.9	55.1
HEAD RESULTANT	86.2	66.0
Chest Channel X	-65.2	-60.2
Chest Channel Y	5.5	-13.3
Chest Channel Z	-17.0	-19.9
CHEST RESULTANT	65.4	61.0

HEAD INJURY CRITERIA (HIC) VALUES:

HIC	815.6	553.6
t_1 = (msec)	59.2	75.2
t_2 = (msec)	88.1	111.2

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

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

CLIP	64.3	57.7
t^1 = (msec)	65.5	71.1
t^2 = (msec)	68.6	74.1
CHEST DEFLECTION (in)	-1.4	-1.6

MAX. COMPRESSIVE FEMUR FORCES: (lbs)

Left Side	-1837.5	-514.0
Right Side	-1576.0	-551.5

TABLE 9 DUMMY KINETIC SUMMARY

DRIVER DUMMY

The dummy was restrained by a manual 3 point safety belt and air bag. Upon impact, the driver dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head impacted the air bag. The dummy's chest impacted the air bag and steering wheel. 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

The dummy was restrained by a manual 3 point safety belt. Upon impact, the right front passenger dummy translated forward on the seat impacting both knees into the dashboard. 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/Dodge/Ram 2500/Van
NHTSA No.: CS0308 ; Date of Comfort/Convenience Check: 1/16/95
Technician Performing Check: Nicole Walter
GVWR: 6400 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 a manual webbing tension-relieving device. The manufacturer recommended having no slack in the seatbelt. A warning was included in the owner's manual that excess slack can significantly reduce the effectiveness of the shoulder belt.

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

Vehicle Year/Make/Model/Body Style: 1995/Dodge/Ram 2500/Van
NHTSA No.: CS0308 ; Date of Comfort/Convenience Check: 1/16/95
Technician Performing Check: Nicole Walter
GVWR: 6400 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 had manual webbing tension-relieving devices. The manufacturer recommended having no slack in the seatbelt. A warning was included in the owner's manual that excess slack can significantly reduce the effectiveness of the shoulder belt.

TABLE 1Ø FMVSS 2Ø8 SEAT BELT COMFORT AND CONVENIENCE TEST SUMMARY
FRONT OUTBOARD DESIGNATED SEATING POSITIONS, (Cont'd)

BELT CONTACT FORCE (S7.4.3)

At one inch from the chest, the contact force exerted by the belt webbing on the dummy's chest was Ø.7 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 not movable.

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 1Ø FMVSS 2Ø8 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 does not 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 and the seat was moved to any position.

TABLE 11 FMVSS 208 EQUIPMENT DATA

Vehicle Year/Make/Model/Body Style: 1995/Dodge/Ram 2500/Van

Vehicle NHTSA No.: CS0308 Date of Check: 1/16/95

Technician Performing Check: Nicole Walter

GVWR: 6400 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 8.0 seconds and the reminder light was on for 8.0 seconds.

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 was 0 seconds. The reminder light was on for 8 seconds.

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 in the owner's manual.

The airbag system is required to be repaired if the airbag warning light malfunctions and replaced (not repaired) if deployed.

Appropriate instructions concerning maintenance and/or replacement of this system were provided in the owner's manual on page 25.

A description of the functional operation of the system was provided in the owner's manual on pages 23-24.

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 page 23 through 26.

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 right side of the instrument panel.

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 23.

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

Vehicle Year/Make/Model/Body Style: 1995/Dodge/Ram 2500/Van

Vehicle NHTSA No.: CS0308 Test Date: 1/16/95

DETAILS OF WINDSHIELD MOUNTING SUCH AS RETENTION METHOD, TRIM TYPE, ETC.:
Rubber molding with glue retention and a plastic trim along the bottom.

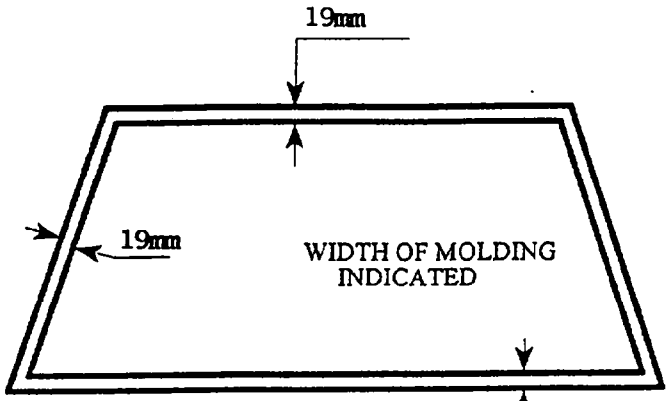
CLIPS OR BRACKETS USED TO RETAIN WINDSHIELD: None

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)		
	PRE-TEST	POST-TEST	PERCENT RETENTION
RIGHT SIDE	90.4	90.4	100%
LEFT SIDE	90.4	90.4	100%
TOTAL	180.8	180.8	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/Dodge/Ram 2500/Van

Vehicle NHTSA No.: CS0308 Test Date: 1/17/95

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= 64.4 in

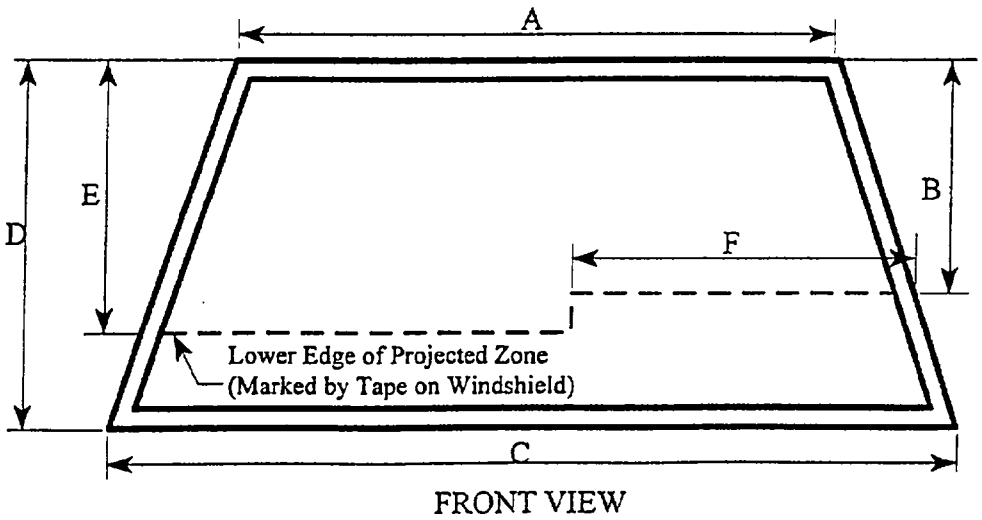
B= 12.6 in

C= 73.0 in

D= 21.7 in

E= 16.7 in

F= 43.9 in



FRONT VIEW

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/Dodge/Ram 2500/Van

Vehicle NHTSA No.: CS0308 Test Date: 1/17/95

Fuel System Capacity from Owner's Manual = 35 gallons

Usable Capacity Figure Furnished by COTR = 35 gallons

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

= 32.2 to 32.9 gallons

Actual Test Volume = 32.5 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 35 gallon fuel tank was a special option on this van

TABLE 15 FMVSS 301 POST IMPACT TEST DATA

Vehicle Year/Make/Model/Body Style: 1995/Dodge/Ram 2500/Van

Vehicle NHTSA No.: CS0308 Test Date: 1/17/95

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:

_X_ 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

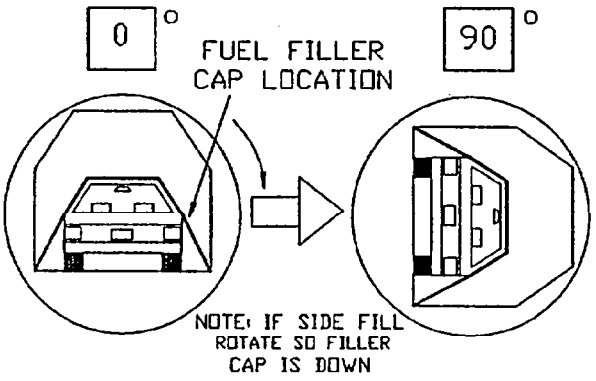
FUEL SPILLAGE LOCATION(S): None

TABLE 16 FMVSS 301 STATIC ROLLOVER TEST DATA

Vehicle Year/Make/Model/Body Style: 1995/Dodge/Ram 2500/Van

Vehicle NHTSA No.: CS0308 Test Date: 1/17/95

TEST PHASE: 0° - 90°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = * minutes * seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = * minutes * seconds

TOTAL TIME = * minutes * seconds

Next Whole Minute Interval = * minutes

FUEL SPILLAGE MEASUREMENT:

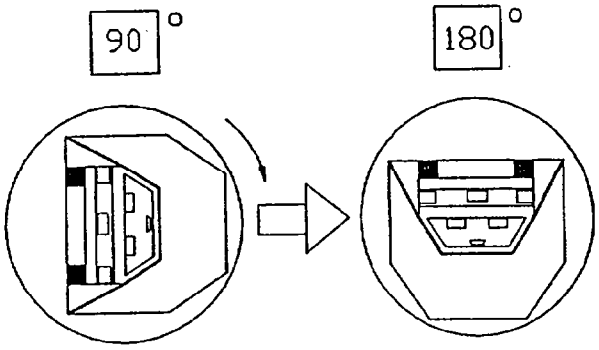
0° TO 90° ROTATION (FILLER CAP DOWN)	TEST RESULTS	MAXIMUM ALLOWABLE
1. First 5 Minutes From Onset of Rotation	*	5 oz
2. Sixth Minute From Onset of Rotation	*	1 oz
3. Seventh Minute From Onset of Rotation	*	1 oz
4. Eighth Minute if Required	*	1 oz

FUEL SPILLAGE LOCATIONS(S):

* Data Not Available

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 = * minutes * seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = * minutes * seconds

TOTAL TIME = * minutes * seconds

Next Whole Minute Interval = * minutes

FUEL SPILLAGE MEASUREMENT:

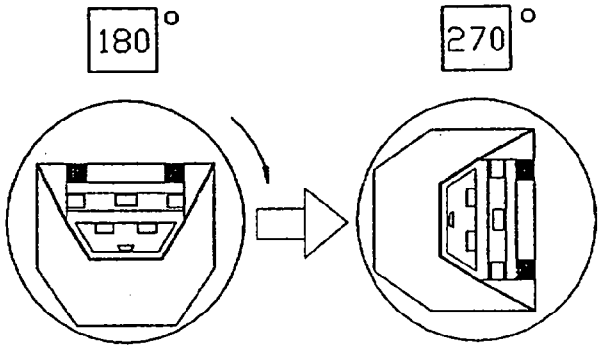
90° TO 180° ROTATION	TEST RESULTS	MAXIMUM ALLOWABLE
1. First 5 Minutes From Onset of Rotation	*	5 oz
2. Sixth Minute From Onset of Rotation	*	1 oz
3. Seventh Minute From Onset of Rotation	*	1 oz
4. Eighth Minute if Required	*	1 oz

FUEL SPILLAGE LOCATIONS(S):

* Data Not Available

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 = * minutes * seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = * minutes * seconds

TOTAL TIME = * minutes * seconds

Next Whole Minute Interval = * minutes

FUEL SPILLAGE MEASUREMENT:

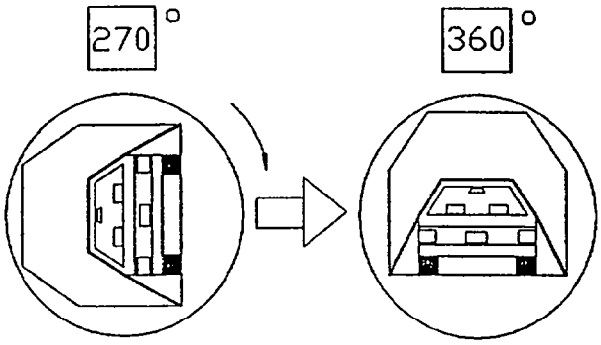
180° TO 270° ROTATION	TEST RESULTS	MAXIMUM ALLOWABLE
1. First 5 Minutes From Onset of Rotation	*	5 oz
2. Sixth Minute From Onset of Rotation	*	1 oz
3. Seventh Minute From Onset of Rotation	*	1 oz
4. Eighth Minute if Required	*	1 oz

FUEL SPILLAGE LOCATIONS(S):

* Data Not Available

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 = * minutes * seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = * minutes * seconds

TOTAL TIME = * minutes * seconds

Next Whole Minute Interval = * minutes

FUEL SPILLAGE MEASUREMENT:

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

FUEL SPILLAGE LOCATIONS(S):

* Data Not Available

SECTION 4
OCCUPANT, VEHICLE, AND CAMERA INFORMATION

TABLE 17 SEAT AND STEERING COLUMN POSITIONING DATA

Vehicle Year/Make/Model/Body Style: 1995/Dodge/Ram 2500/Van

Vehicle NHTSA No.: CS0308 Test Date: 1/17/95

NOMINAL DESIGN RIDING POSITION:

Driver Seat: Seat Back Angle = 20°

Passenger Seat: Same as driver's seat.

SEAT FORE AND AFT POSITIONS:

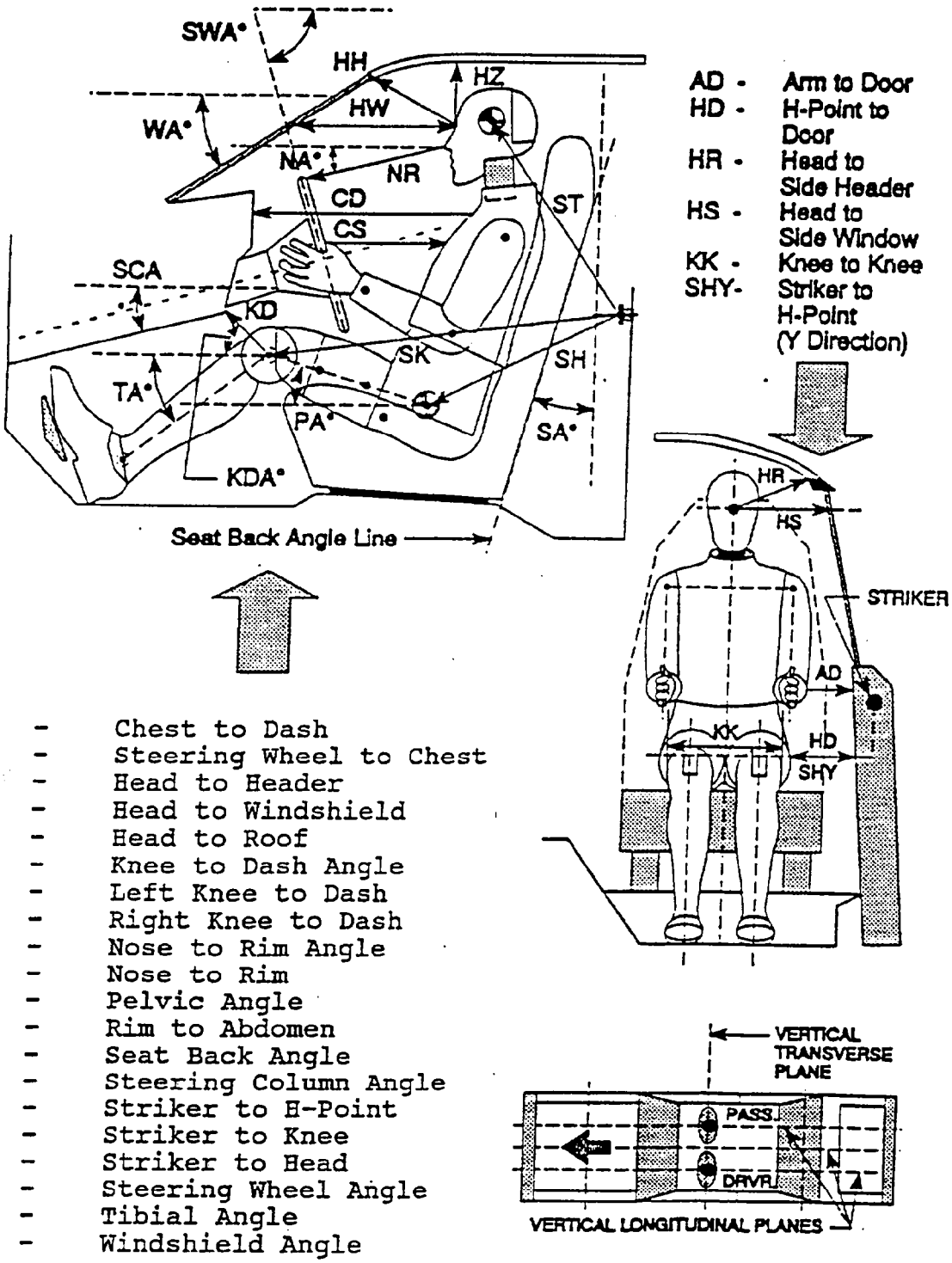
Driver Seat: The seat track had 12 detents and was positioned at the 7th notch rearward from the foremost position which was counted as the first notch.

Passenger Seat: Same as driver's seat.

STEERING COLUMN ADJUSTMENTS:

The angle of the steering column was 37.8°. It was not adjustable.

FIGURE 1 DUMMY MEASUREMENT LOCATIONS FOR FRONT SEAT OCCUPANTS



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

TABLE 18 DUMMY MEASUREMENT DATA FOR FRONT SEAT OCCUPANTS

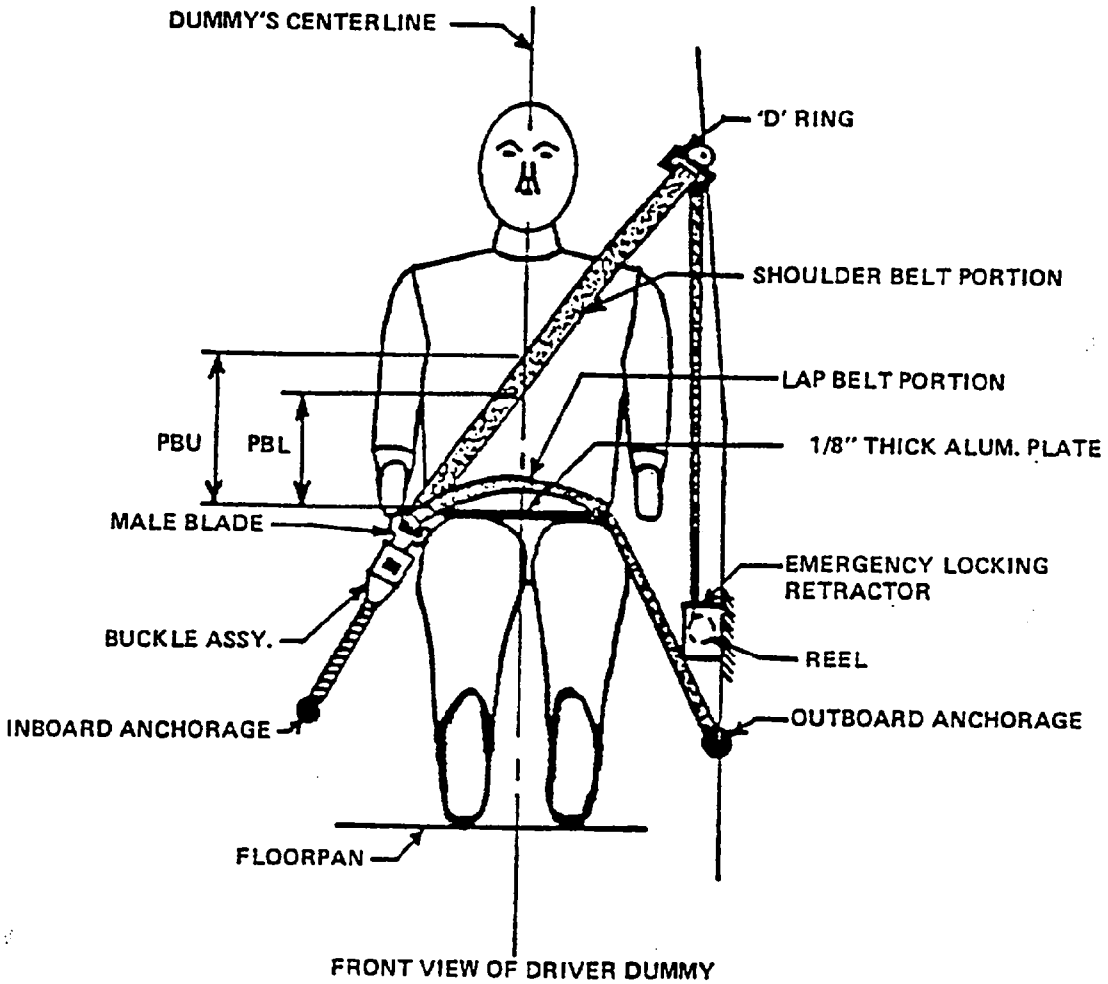
Vehicle Year/Make/Model/Body Style: 1995/Dodge/Ram 2500/Van

Vehicle NHTSA No.: CS0308 Test Date: 1/17/95

	DRIVER (Serial #403)	PASSENGER (Serial #401)
WA°	48.2°	
SWA°	50°	N/A
SCA°	37.8°	N/A
SA°	20°	21°
HZ	8.7 in	8.8 in
HH	26.5 in	29.0 in
HW	30.5 in	33.7 in
HR	11.8 in	11.9 in
NR	21.2 Angle (NA) 12.4°	N/A
CD	26.6 in	31.7 in
CS	15.7 in	N/A
RA	9.1 in	N/A
KDL	6.6 in Angle (KDA) 24.4°	14.4 in
KDR	6.3 in	14.2 in Angle (KDA) 11.2°
PA°	21.7°	22.2°
TA°	43.9°	47.4°
KK	13.4 in	10.1 in
ST	27.6 in Angle 91.7°	28.1 in Angle 93.8°
SK	21.5 in Angle 10.8°	17.5 in Angle 26.8°
SH	5.7 in Angle 20.1°	2.4 in Angle 43.2°
SHY	9.1 in	8.9 in
HS	12.3 in	12.0 in
HD	5.0 in	4.7 in
AD	4.3 in	4.5 in

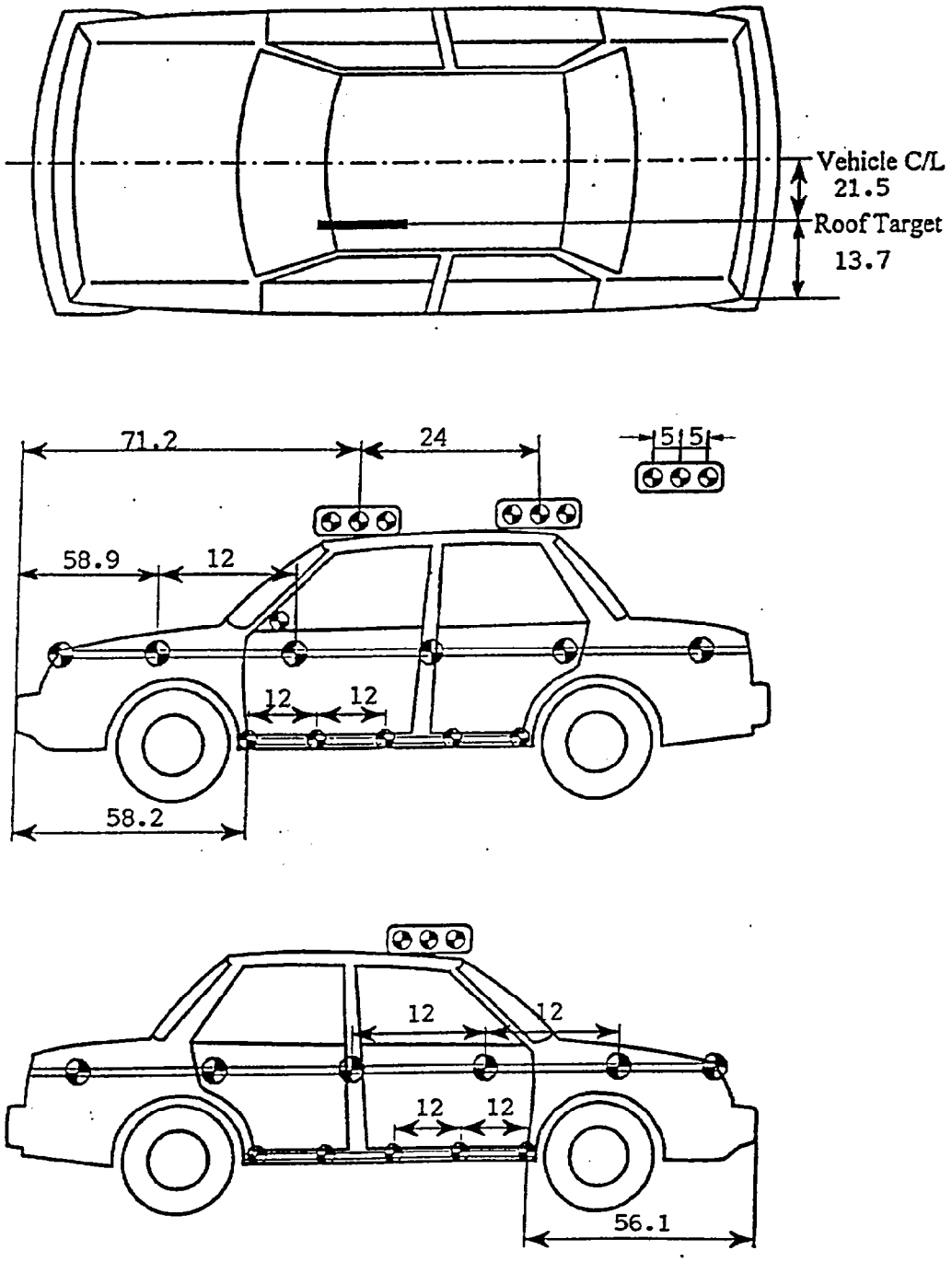
N/A Not Applicable

FIGURE 2 SEAT BELT POSITIONING DATA



	DRIVER DUMMY	PASSENGER DUMMY
TBI - Vertical centerline of 50% dummy to intersection of upper torso belt to lap belt	280	280
PBU - Top surface of aluminum plate to belt upper edge (mm)	328	323
PBL - Top surface of aluminum plate to belt lower edge (mm)	244	240

FIGURE 3 VEHICLE TARGET LOCATIONS



(Dimensions in inches)

FIGURE 4 CAMERA POSITIONS

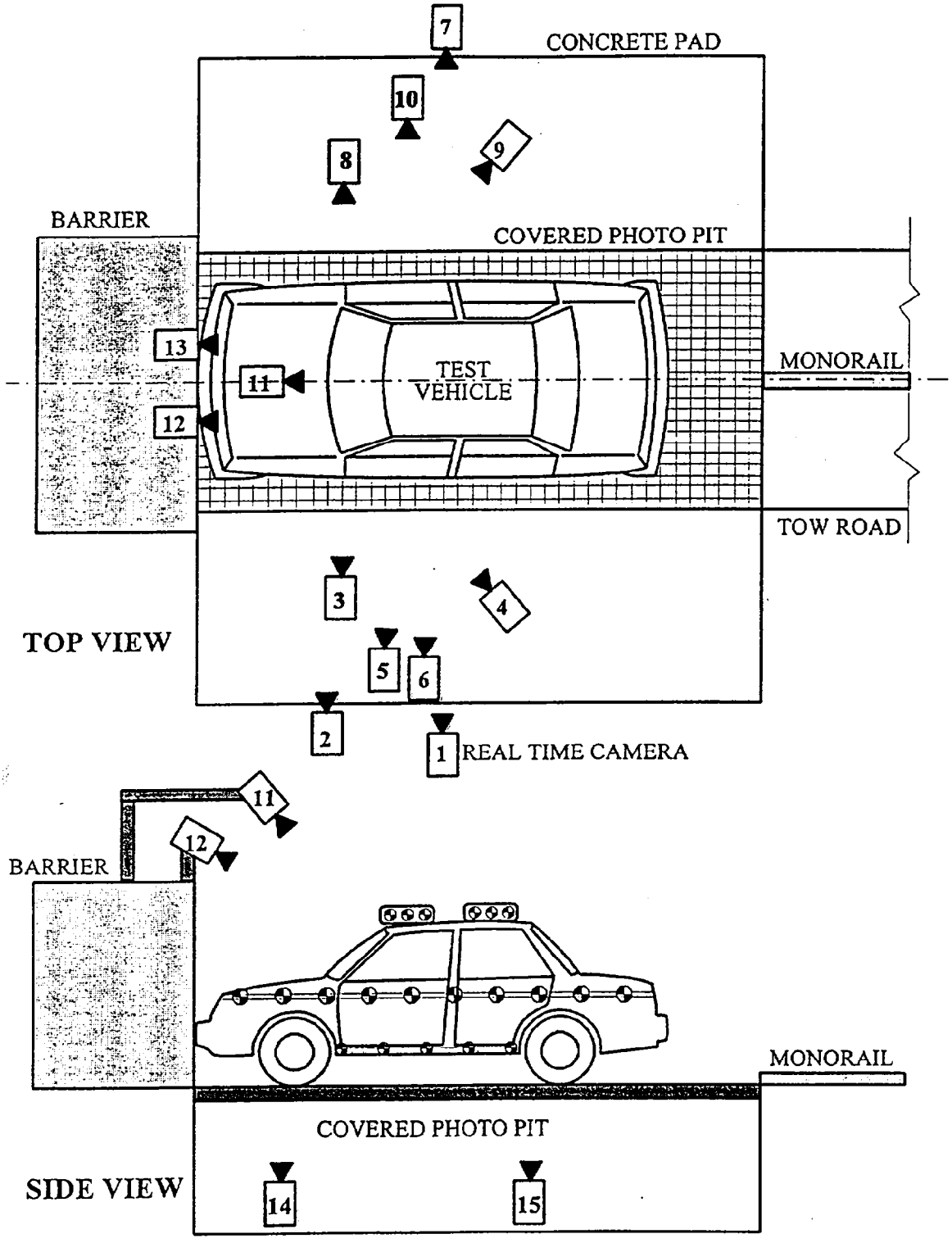


TABLE 19 CAMERA LOCATIONS

Veh. Year/Make/Model/Body Style: 1995/Dodge/Ram 2500/Van

Vehicle NHTSA No.: CS0308 ; Test Date: 1/17/95

	VIEW	CAMERA POSITIONS (inches)*			ANGLE (deg)	FILM PLANE TO HEAD TARGET (in)	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Real-Time Left Side View				90°		10	24
2	Left Front	41.3	355	55.9	90°	331.9	25	**
3	Left Close-up Driver	57.1	328.7	56.3	90°	305.5	50	1010
4	Left Angle	126.4	177.2	84.3	50°		35	1000
5	Left Steering Column Top	89.0	335	60.8	90°	311.8	25	897
6	Left Steering Column Bottom	89.0	335	40.9	90°	311.8	25	1093
7	Right Overall	90.6	366.2	45.7	90°	313.0	13	1087
8	Right Passenger	54.7	270.1	56.9	90°	246.9	25	1010
9	Right Angle	152.0	175.6	86.0	50°		35	1010
10	Right Close-up Passenger	58.7	292.9	63.6	90°	269.7	50	1124
11	Top Overall	19.3	4.0	172.2			13	1111
12	Top Driver	7.5	15.0	94.9			13	1064
13	Top Passenger	6.7	16.1	95.7			13	1053
14	Pit Engine	50.4	0	124.2			13	1000
15	Pit Fuel Tank	123.2	0	87.6			13	1005

* +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 of this report.

APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS (Continued)

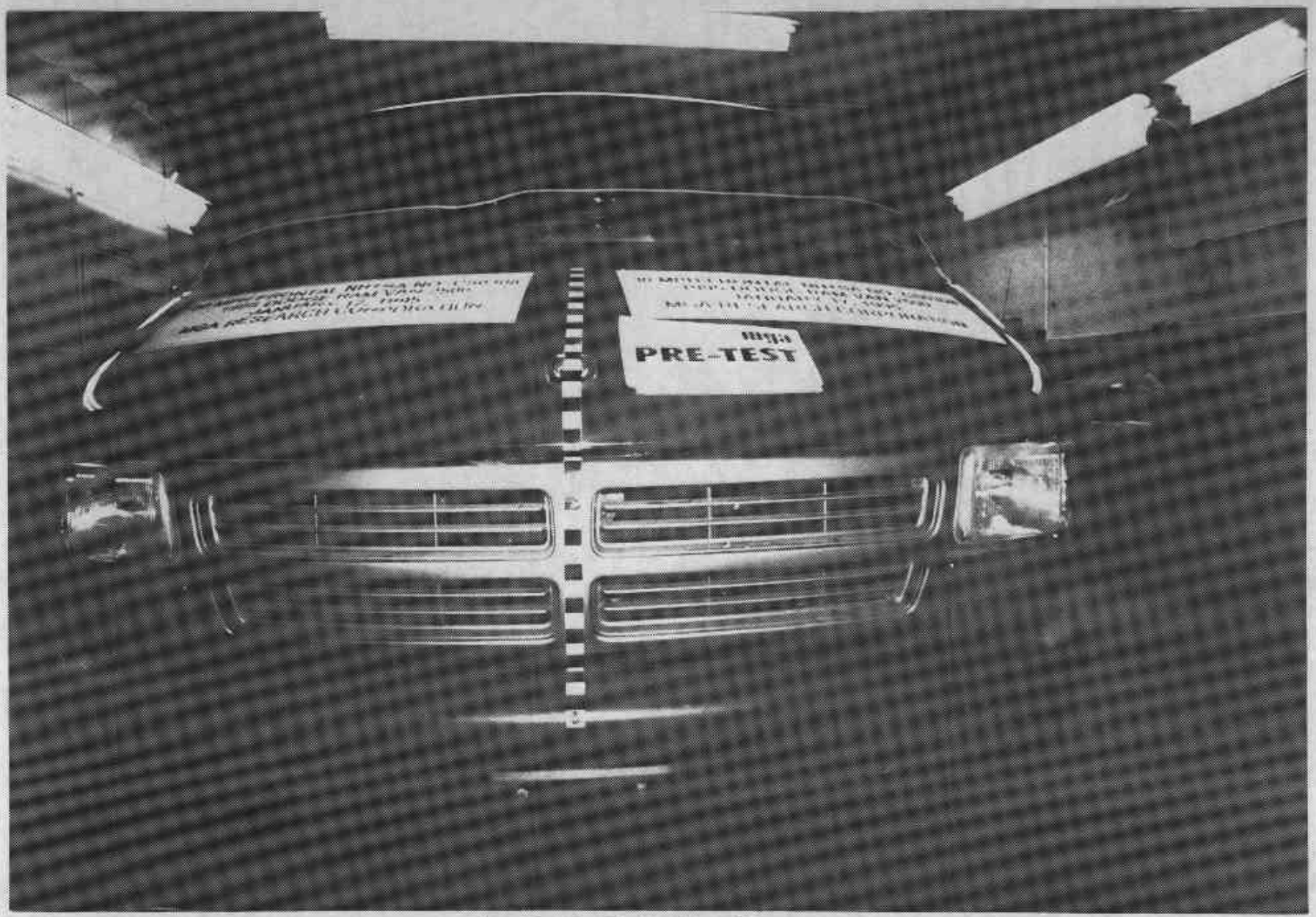


Photo No. A-1 - Pre-Test Front View

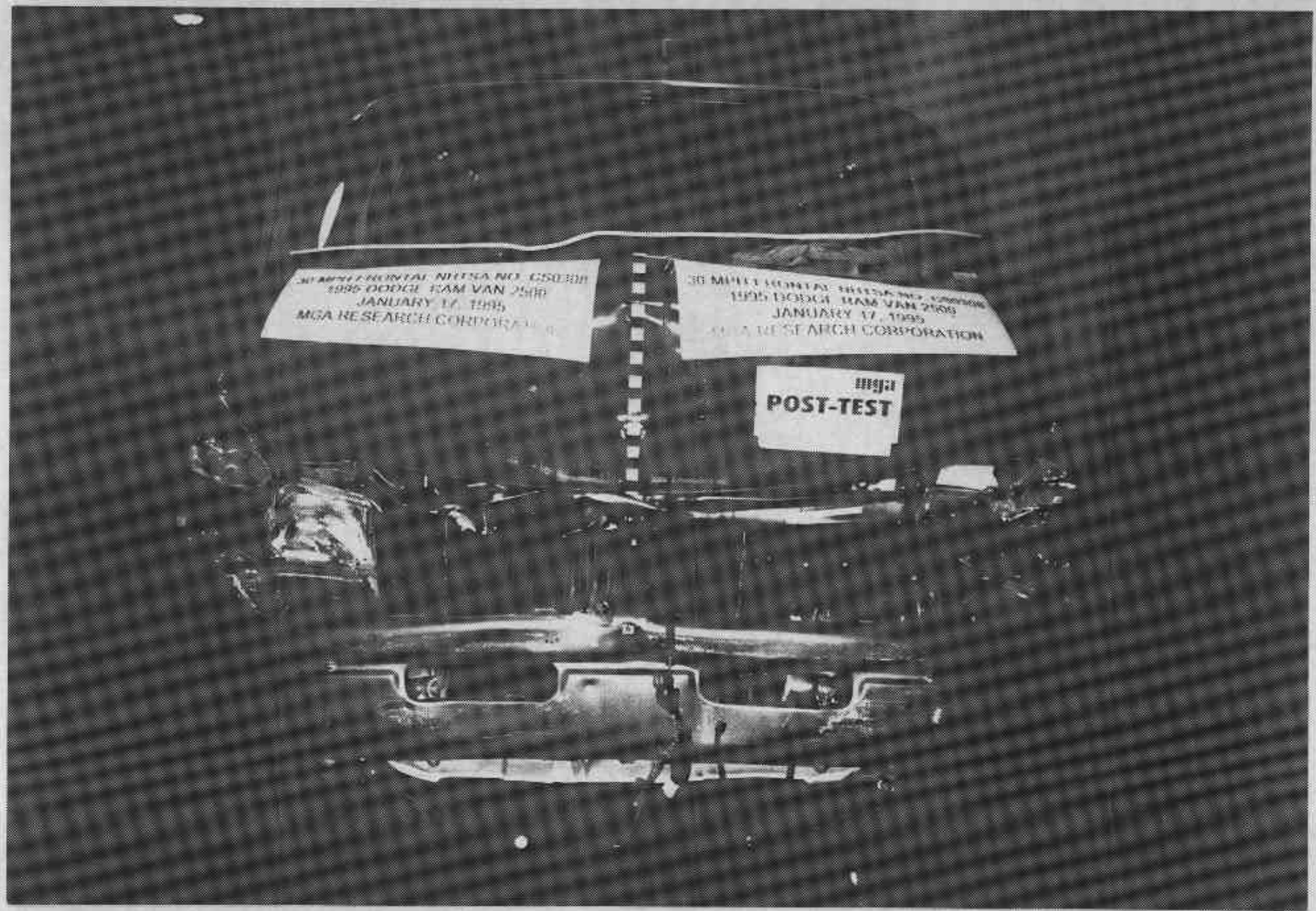


Photo No. A-2 - Post-Test Front View

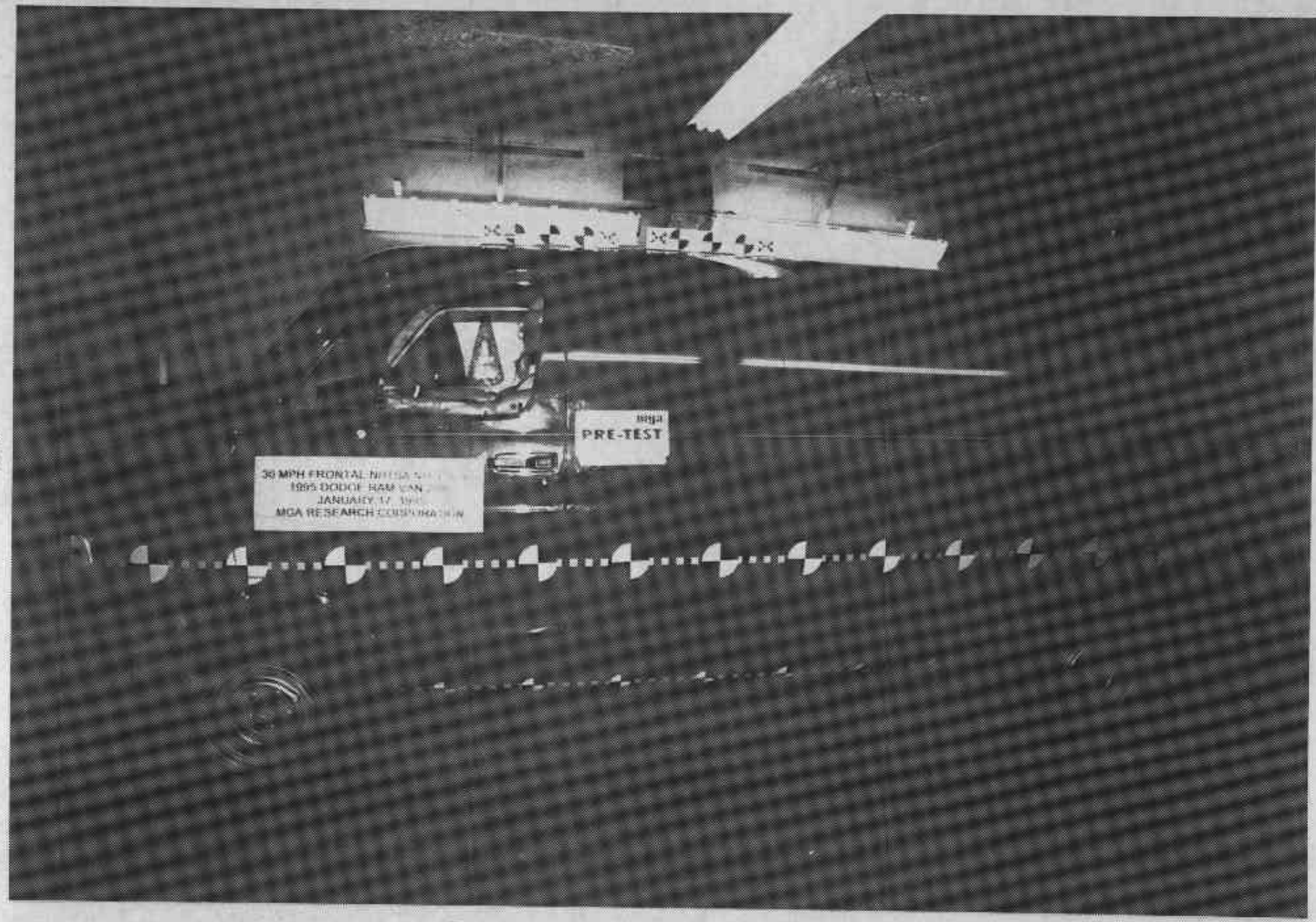


Photo No. A-3 - Pre-Test Left Side View

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

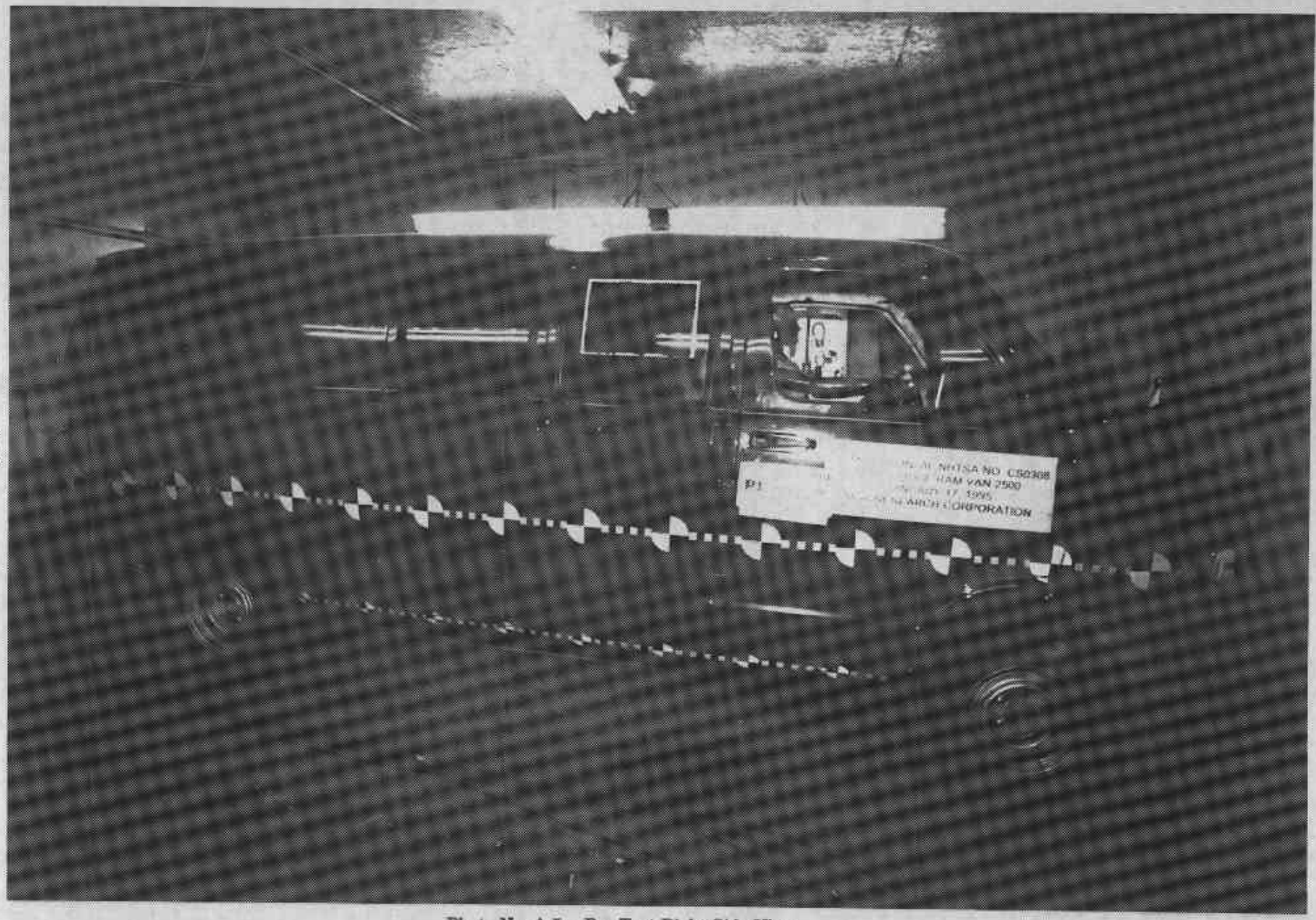


Photo No. A-5 - Pre-Test Right Side View

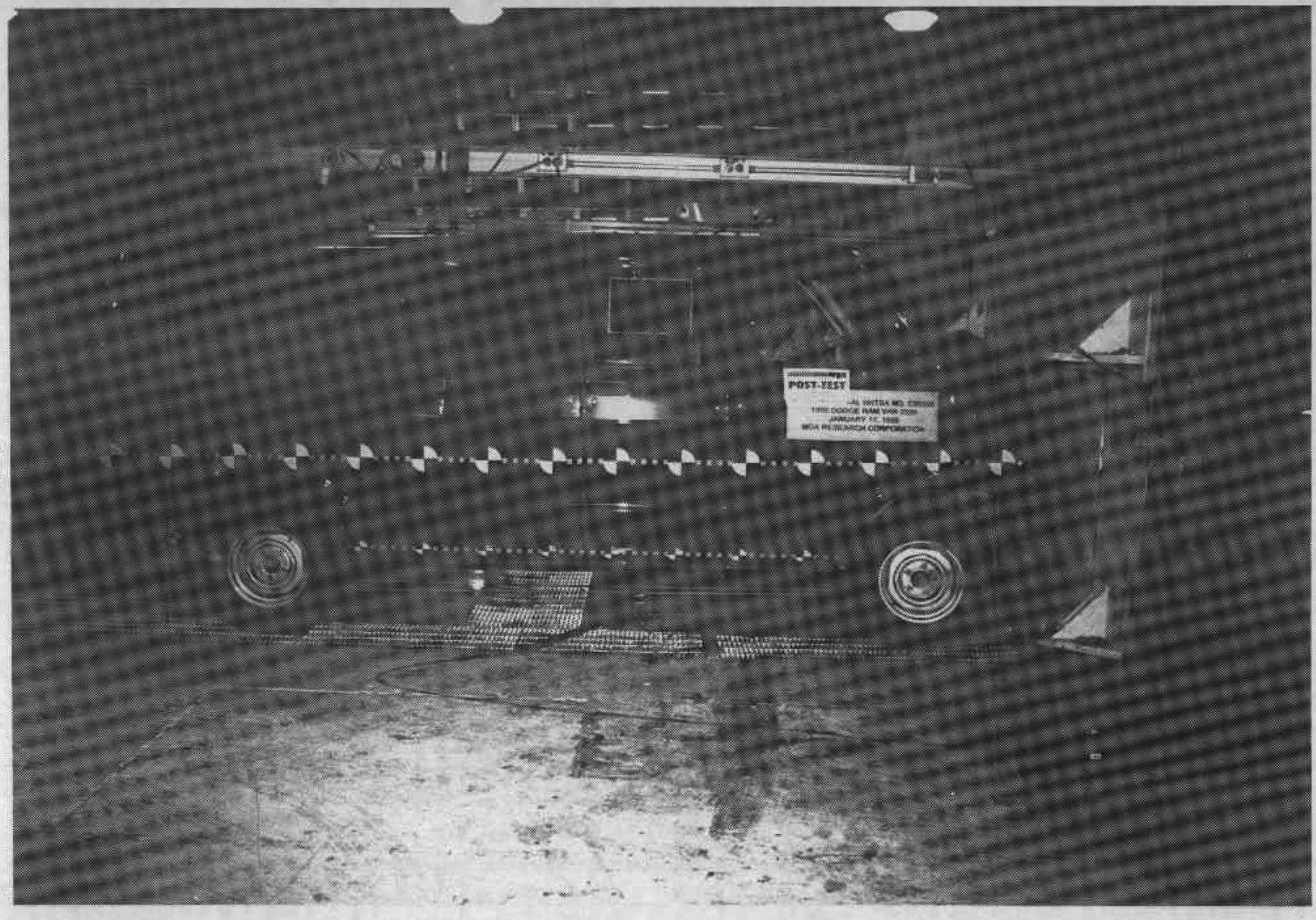


Photo No. A-6 - Post-Test Right Side View

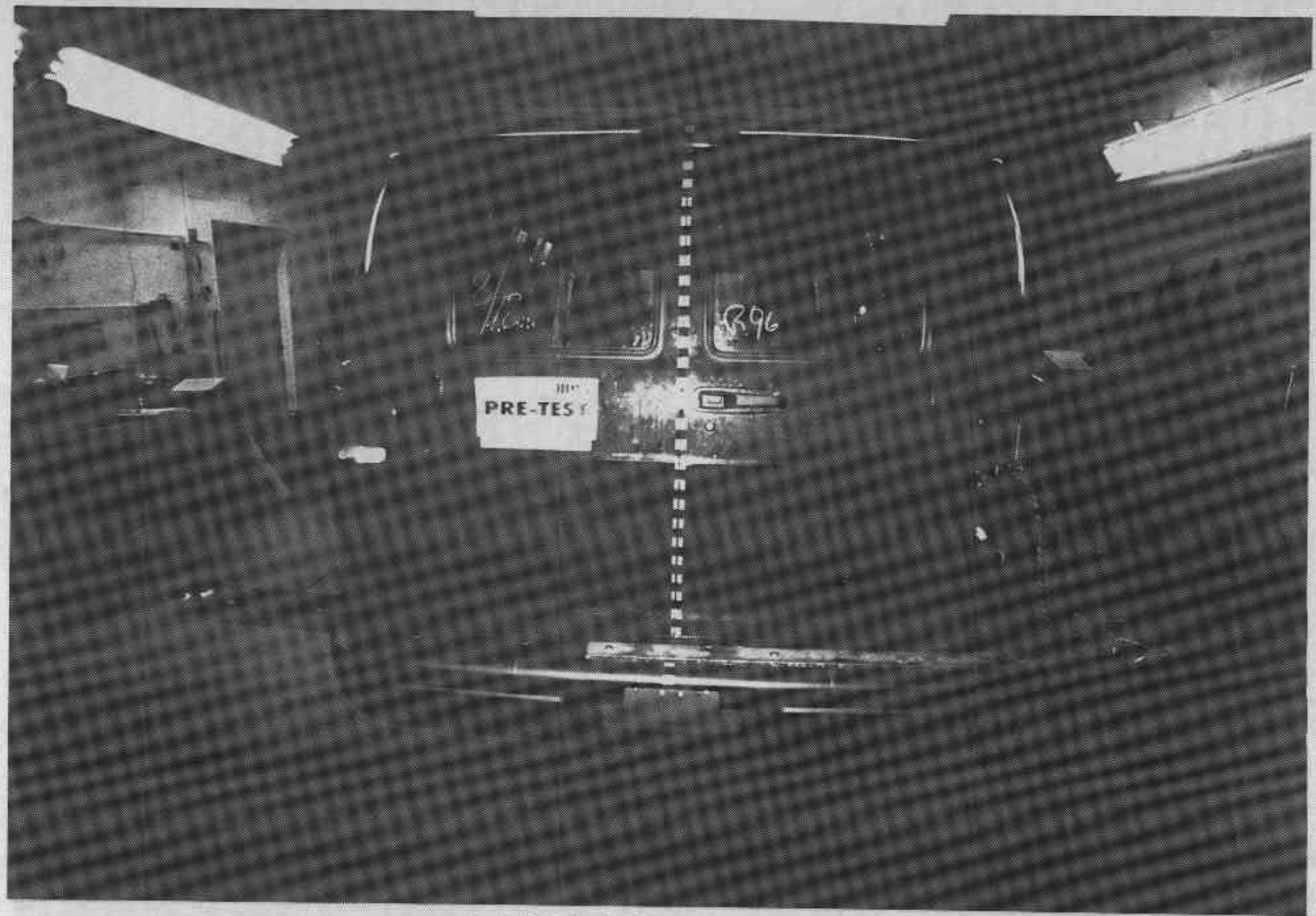


Photo No. A-7 - Pre-Test Rear View

Photo No. A-8 - Post-Test Rear View

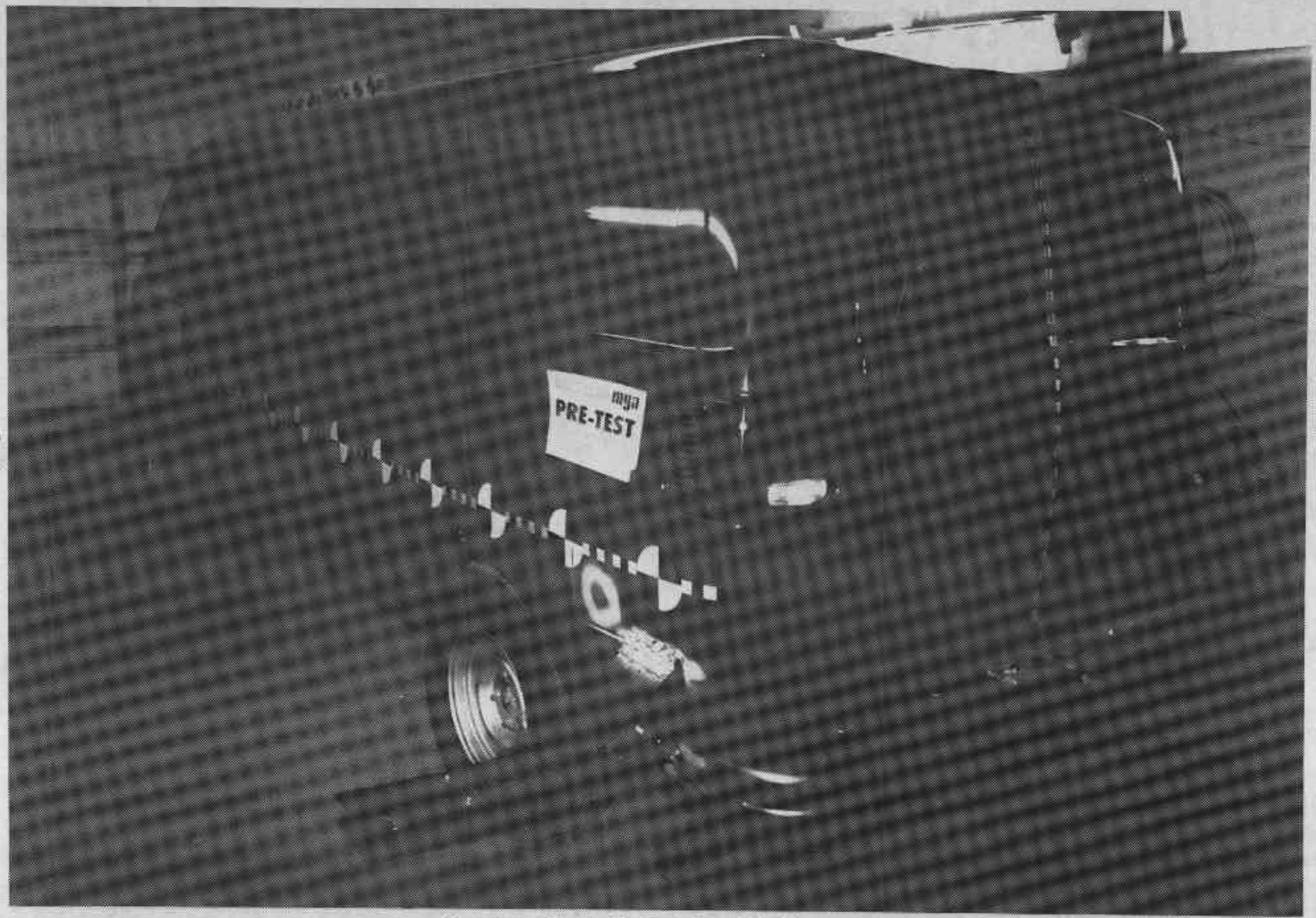


Photo No. A-9 - Pre-Test Left Rear 3/4 View

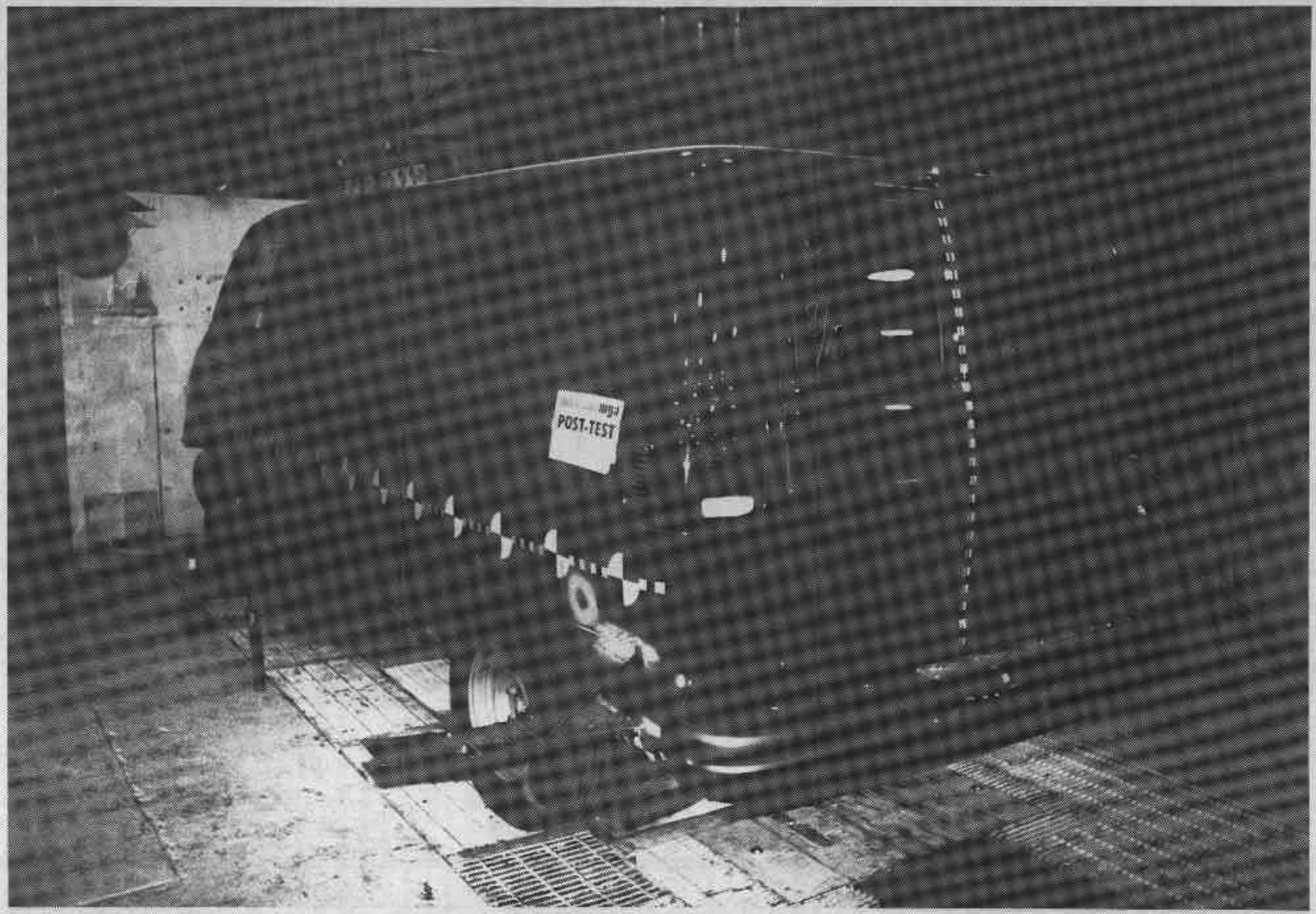


Photo No. A-18 - Post-Test Left Rear 3/4 View

Photo No. A-11 - Pre-Test Right Front 3/4 View

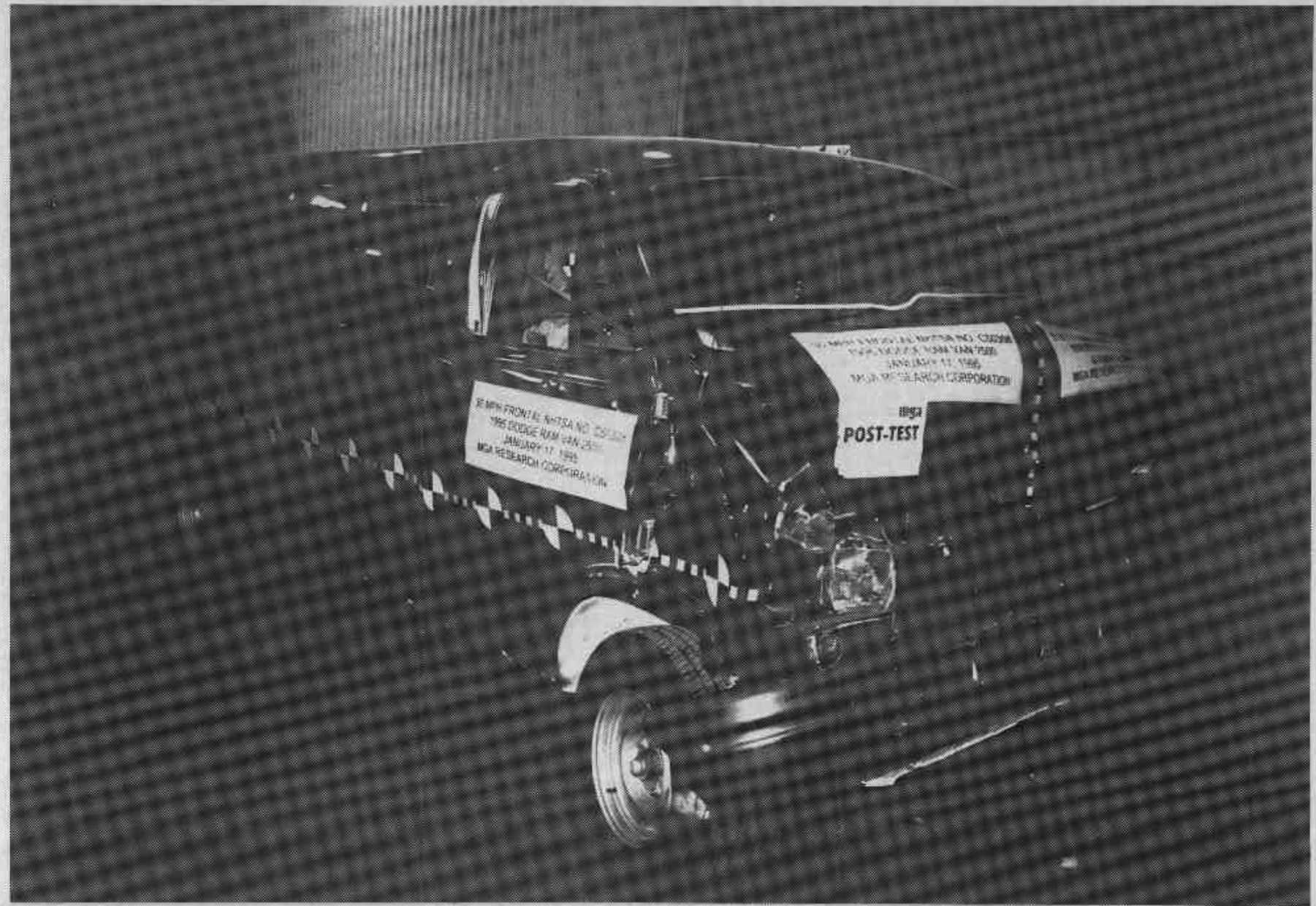
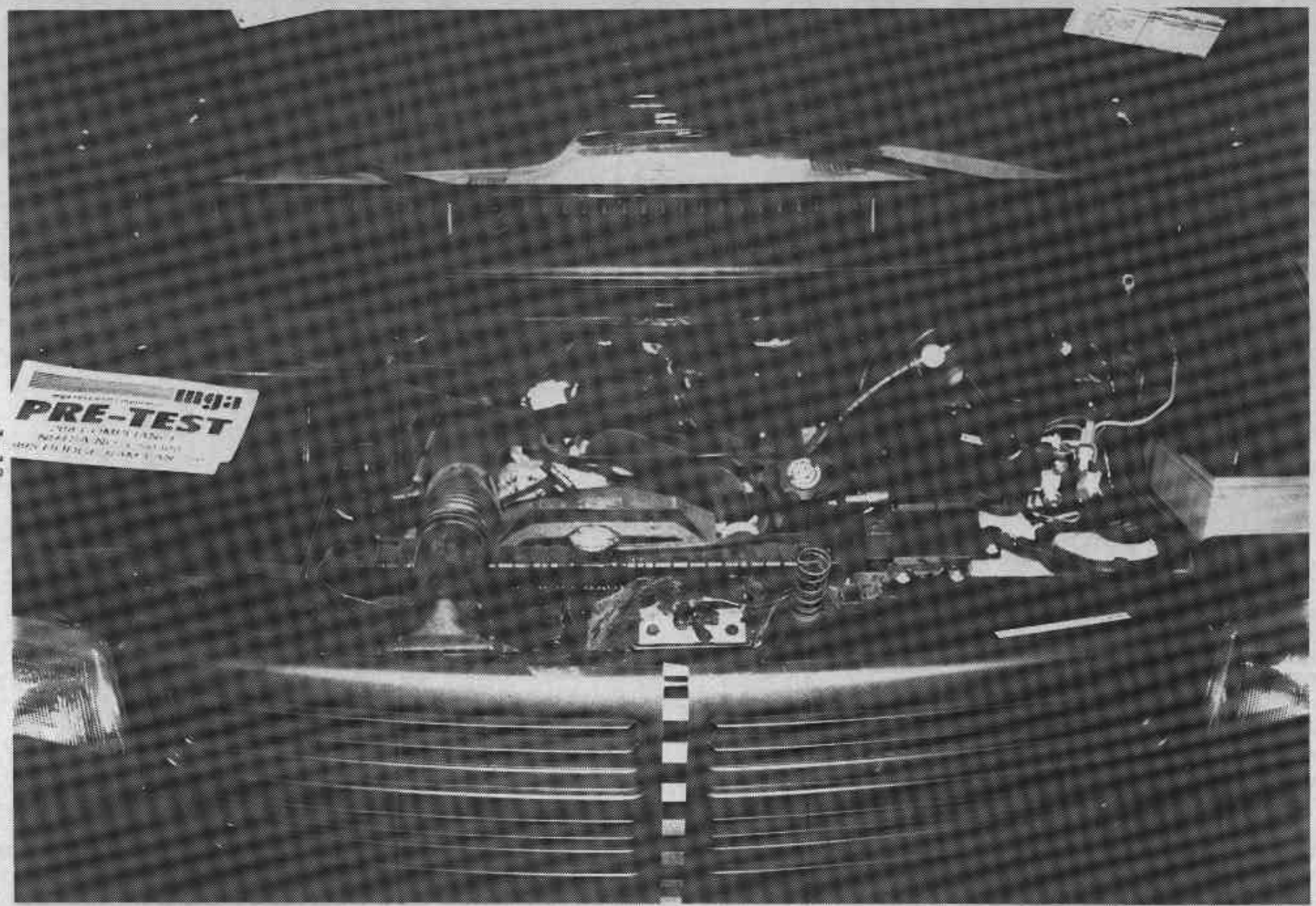


Photo No. A-12 - Post-Test Right Front 3/4 View



A-13

Photo No. A-13 - Pre-Test Engine Compartment View

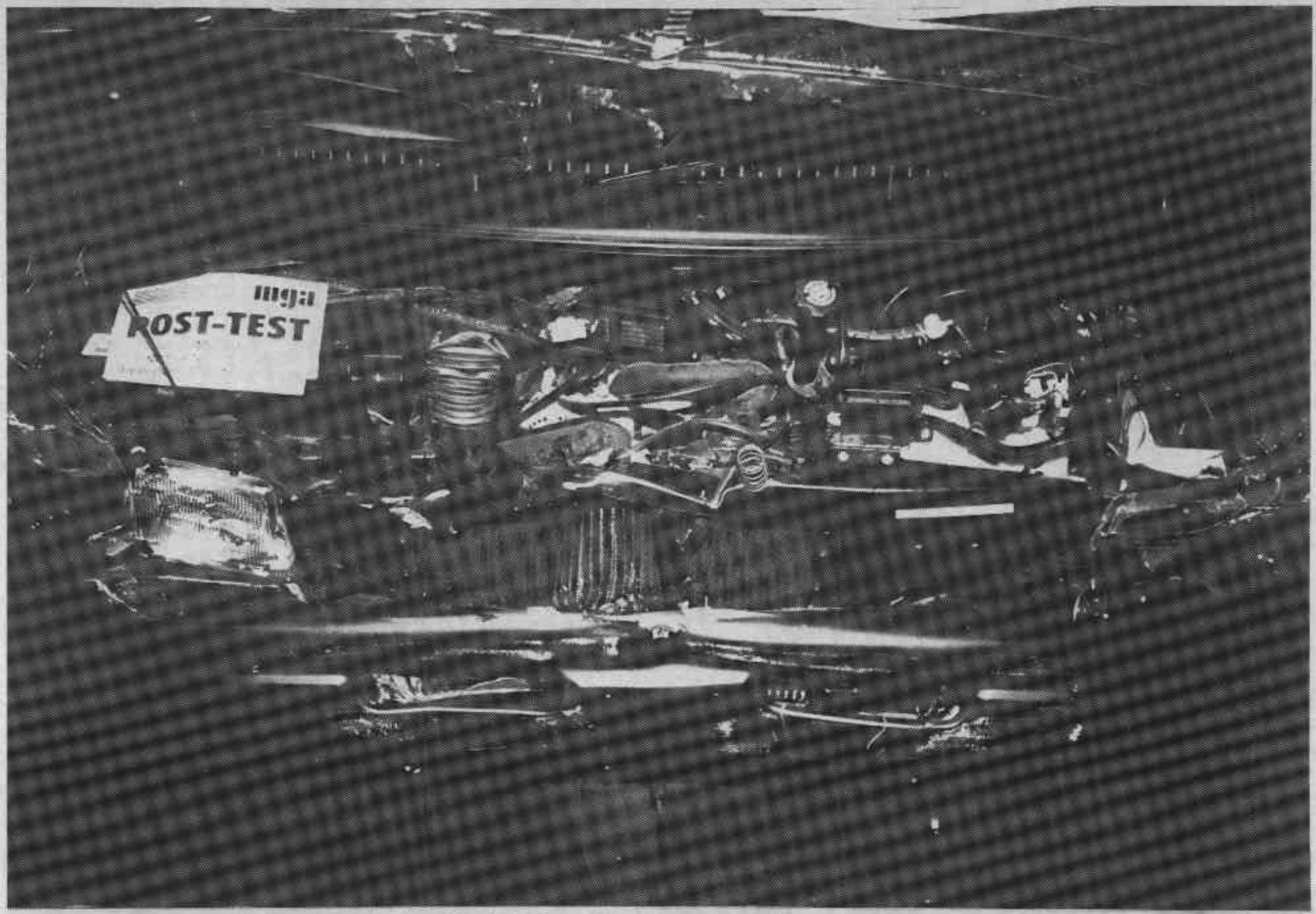


Photo No. A-14 - Post-Test Engine Compartment View

Photo No. A-15 - Pre-Test Fuel Filler Cap View

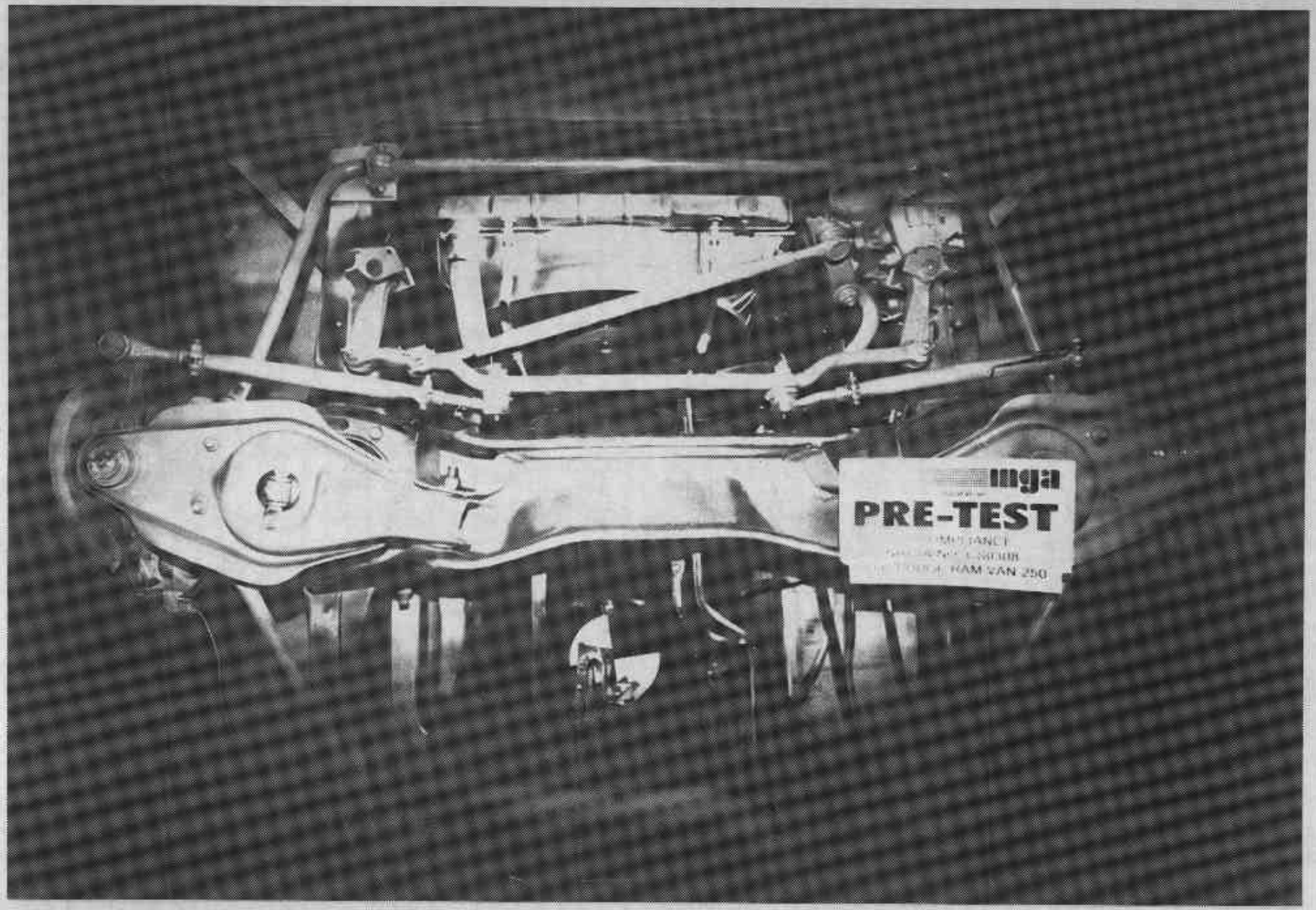


Photo No. A-16 - Pre-Test Front Underbody View

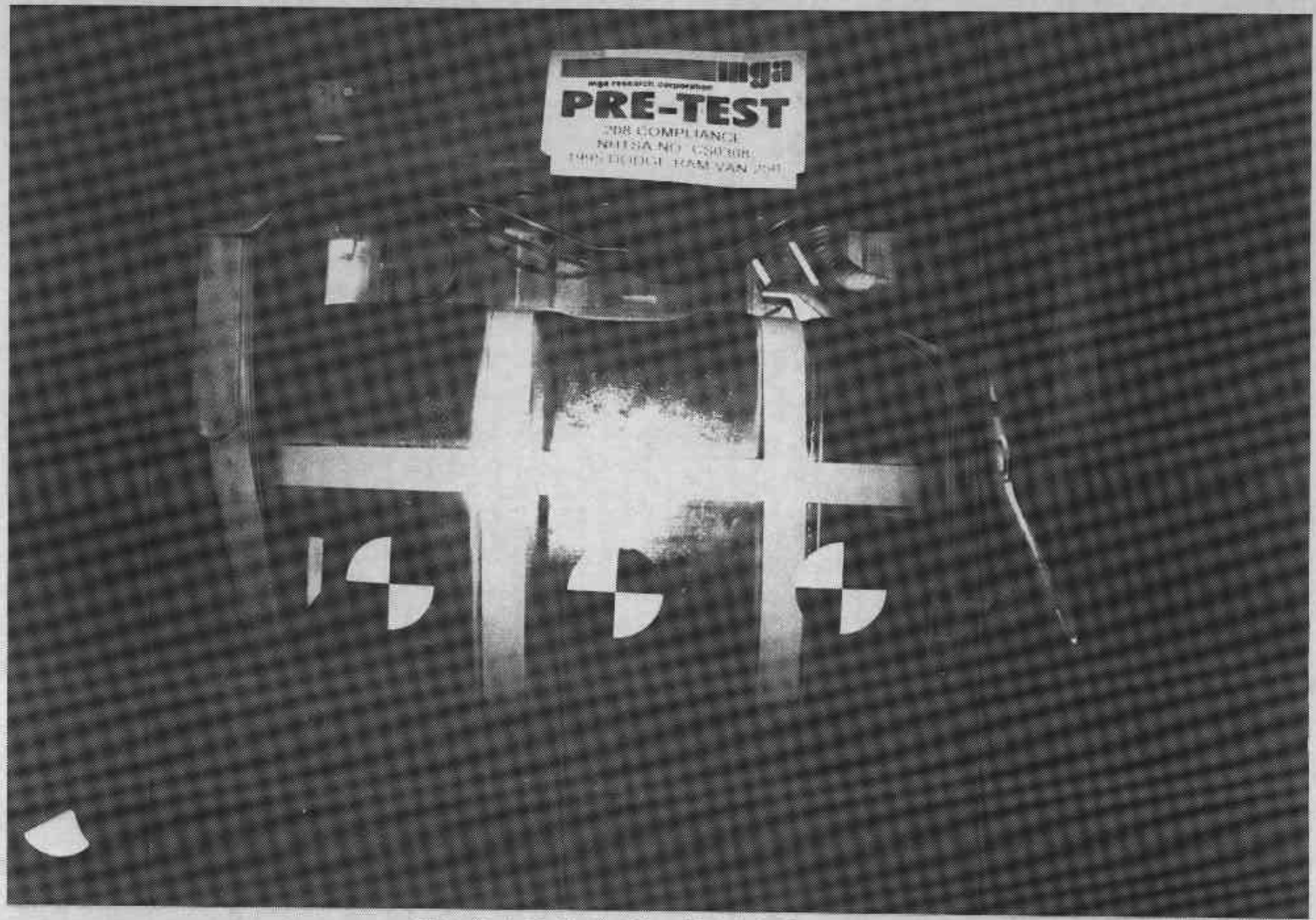


Photo No. A-17 - Pre-Test Rear Underbody View

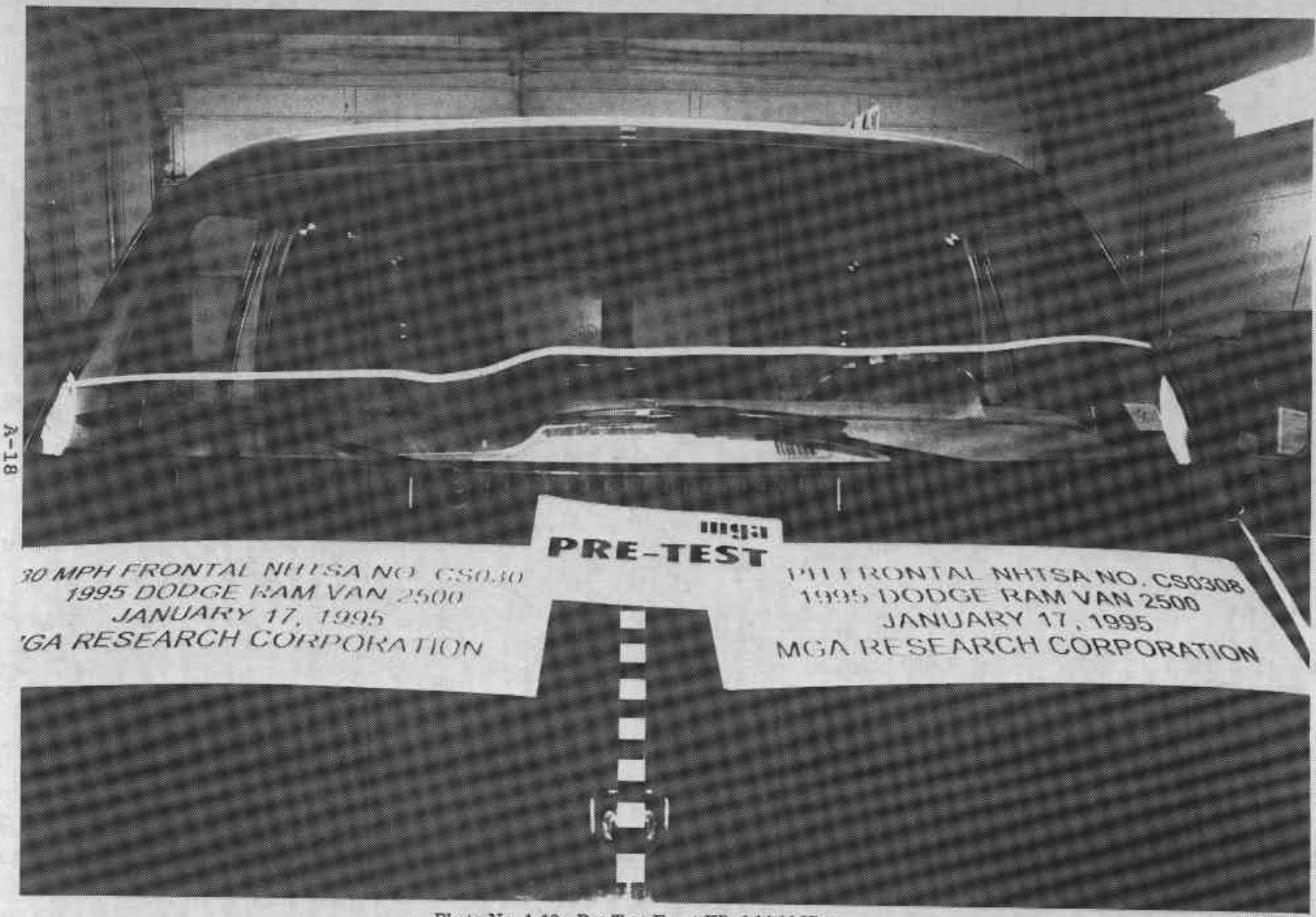


Photo No. A-18 - Pre-Test Front Windshield View

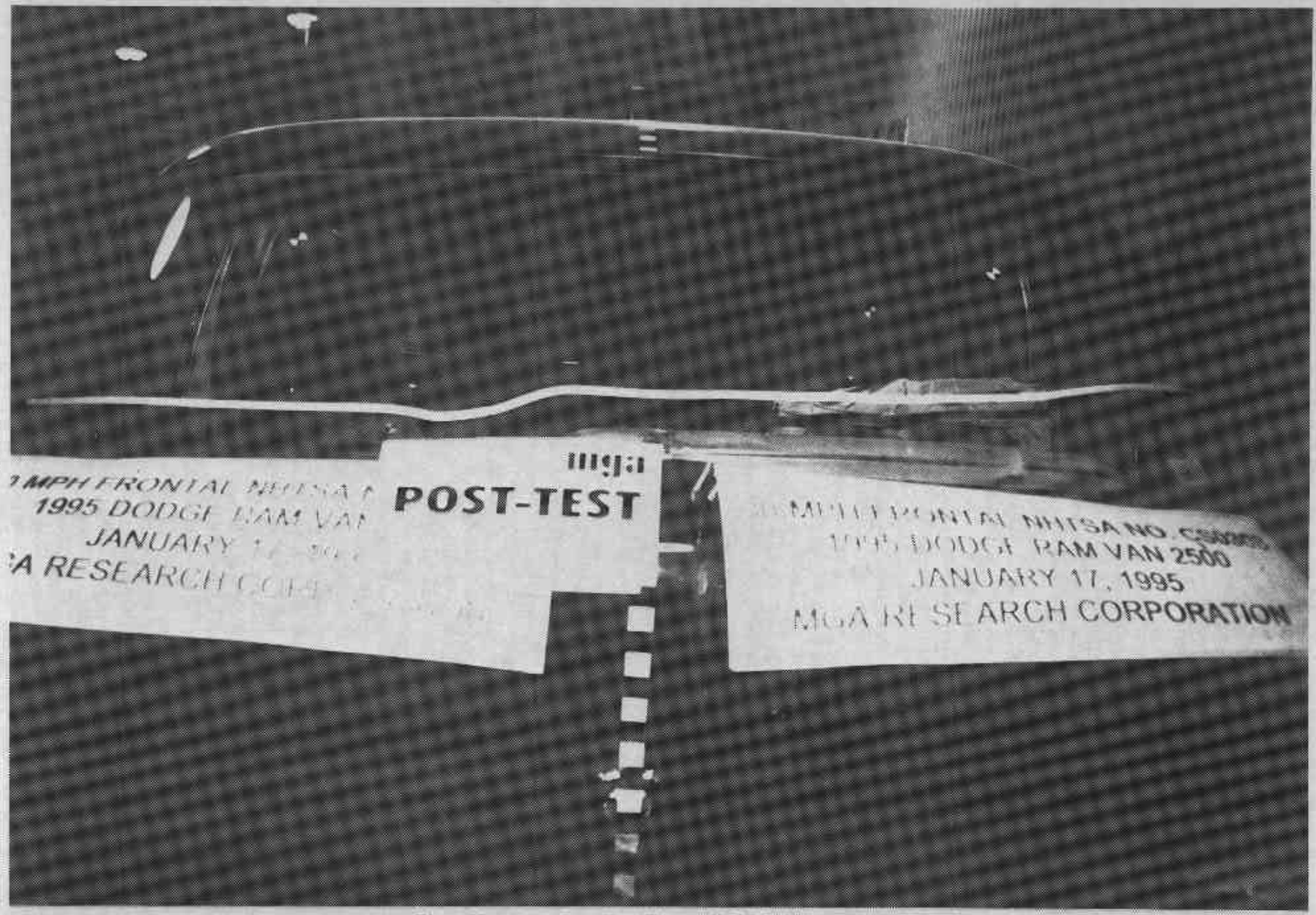


Photo No. A-19 - Post-Test Front Windshield View

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

Photo No. A-21 - Post-Test Driver Dummy Position View

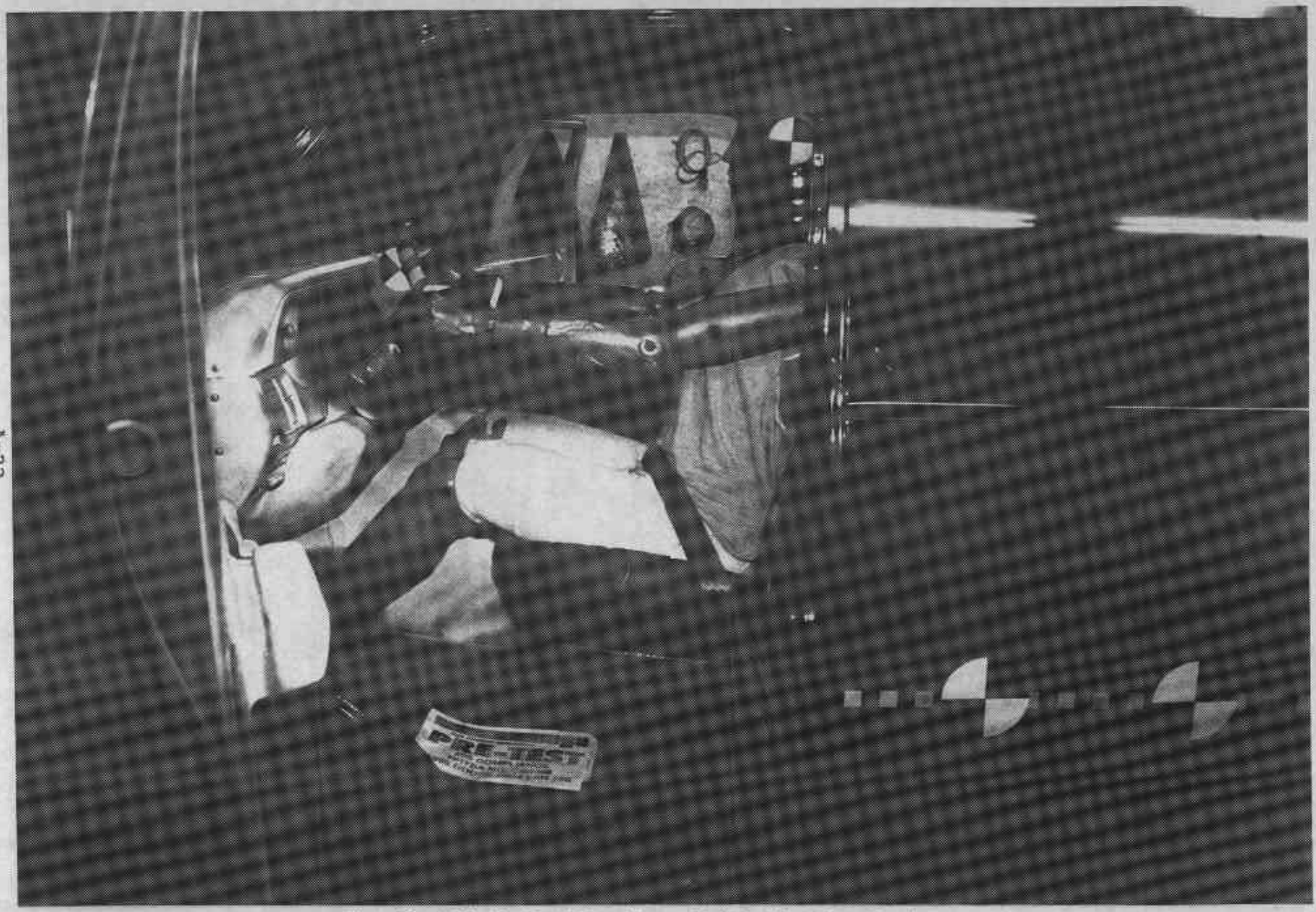


Photo No. A-22 - Pre-Test Driver Dummy Position View (Door Open)

Photo No. A-23 - Post-Test Driver Dummy Position View (Door Open)

Photo No. A-24 - Pre-Test Driver Seat Position View

Photo No. A-25 - Post-Test Driver Seat Position View

A-26

Photo No. A-26 - Pre-Test Driver Windshield View

A-27

Photo No. A-27 - Post-Test Driver Windshield View

Photo No. A-28 - Pre-Test Driver Dummy Knee Bolster View

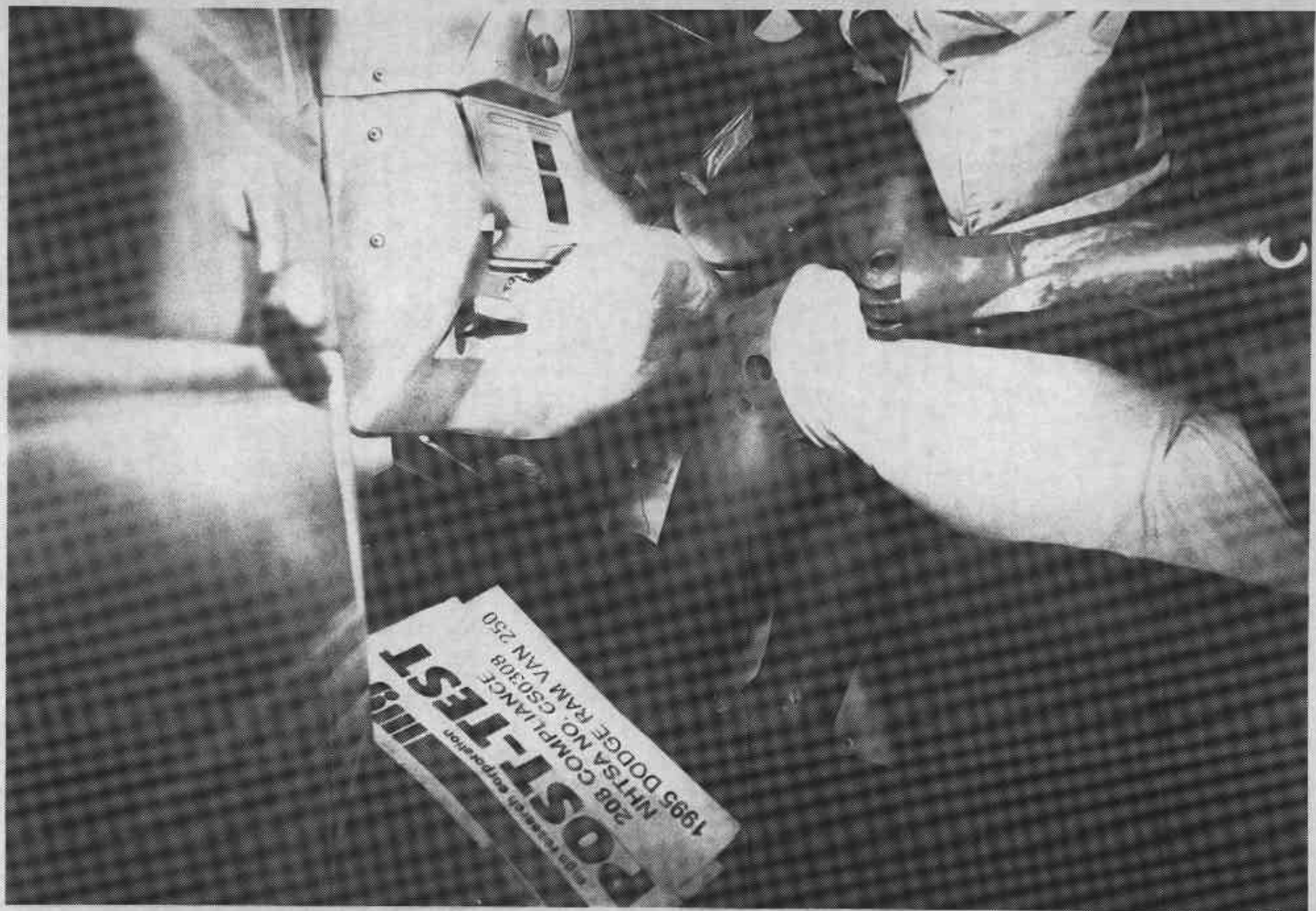


Photo No. A-29 - Post-Test Driver Dummy Knee Bolster View

Photo No. A-30 - Post-Test Driver Head Contact View (Airbag)

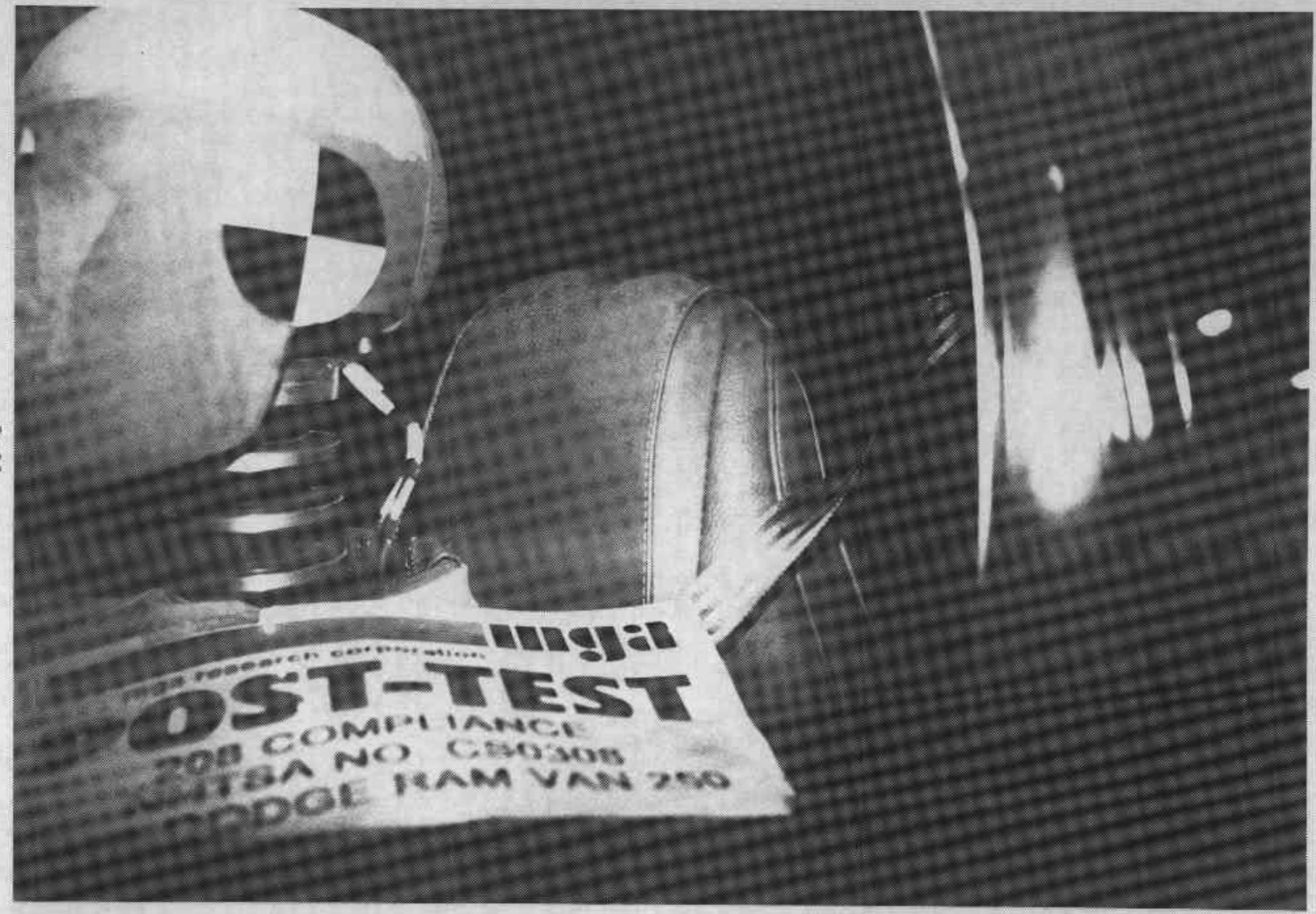


Photo No. A-31 - Post-Test Driver Head Contact View

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

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

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

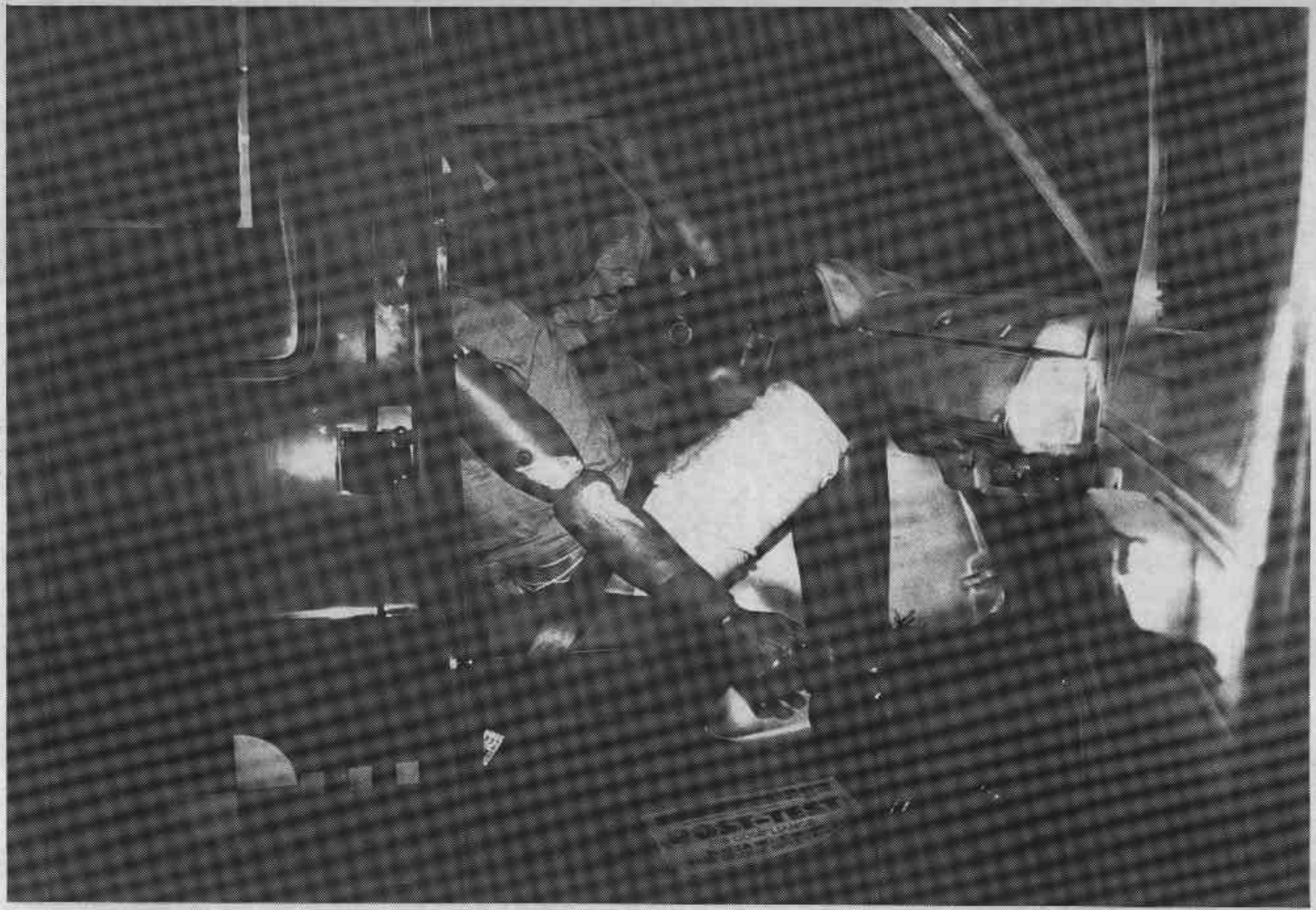


Photo No. A-35 - Post-Test Passenger Dummy Position View (Door Open)

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

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

Photo No. A-38 - Pre-Test Passenger Windshield View

Photo No. A-39 - Post-Test Passenger Windshield View

Photo No. A-48 - Pre-Test Passenger Dummy Knee Bolster View

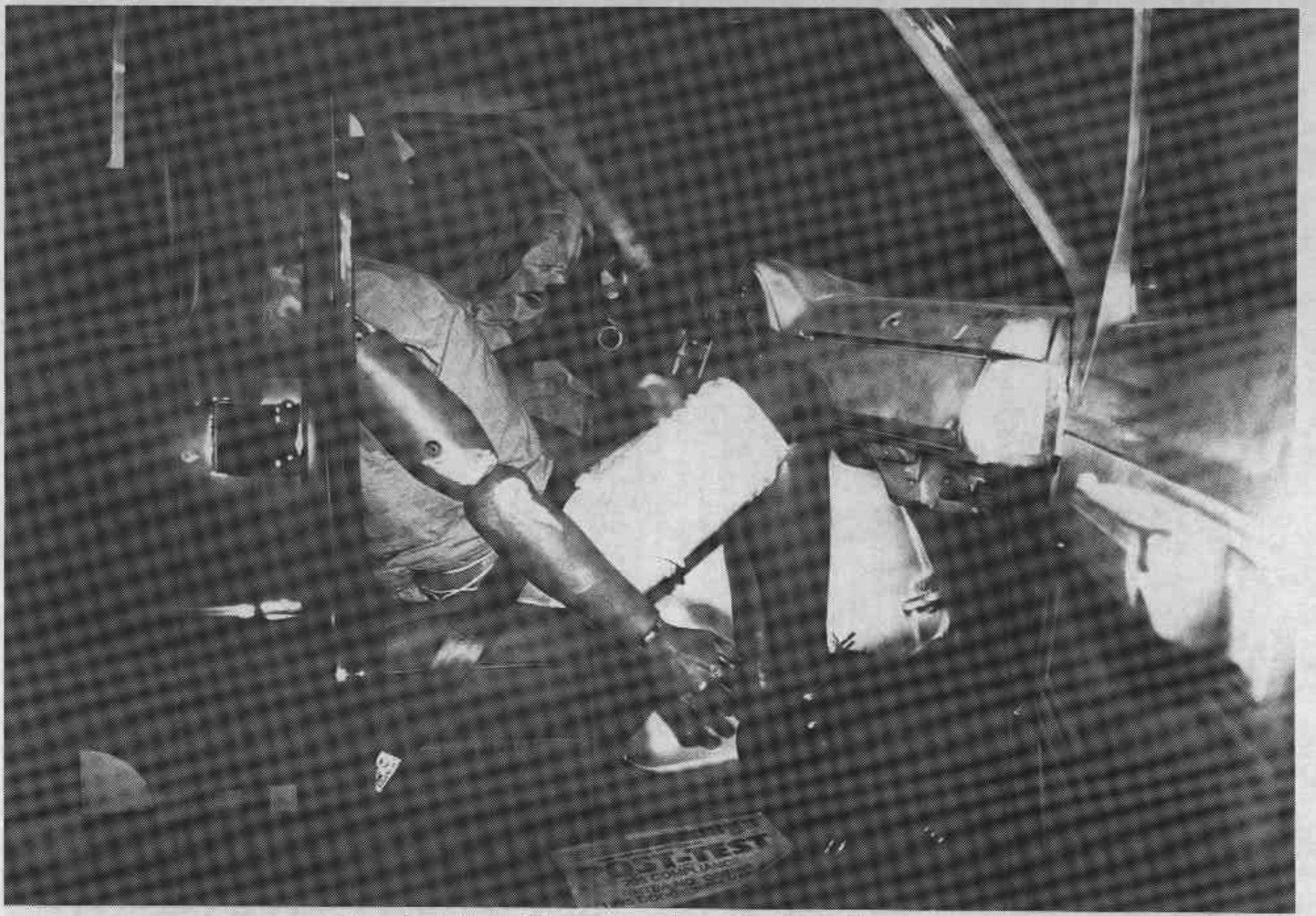


Photo No. A-41 - Post-Test Passenger Dummy Knee Bolster View

Photo No. A-42 - Post-Test Passenger Head Contact View

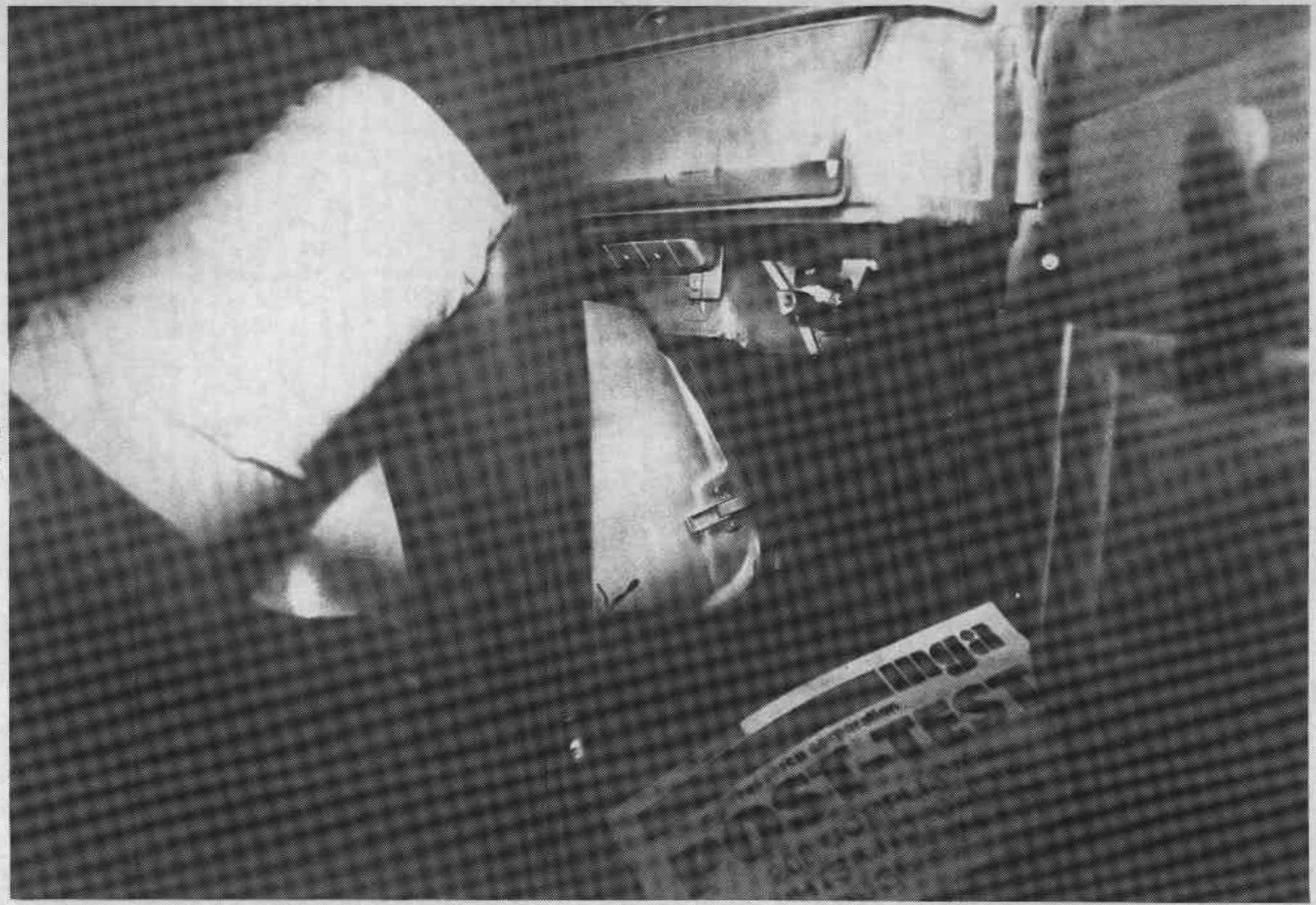


Photo No. A-43 - Post-Test Passenger Knee Contact View

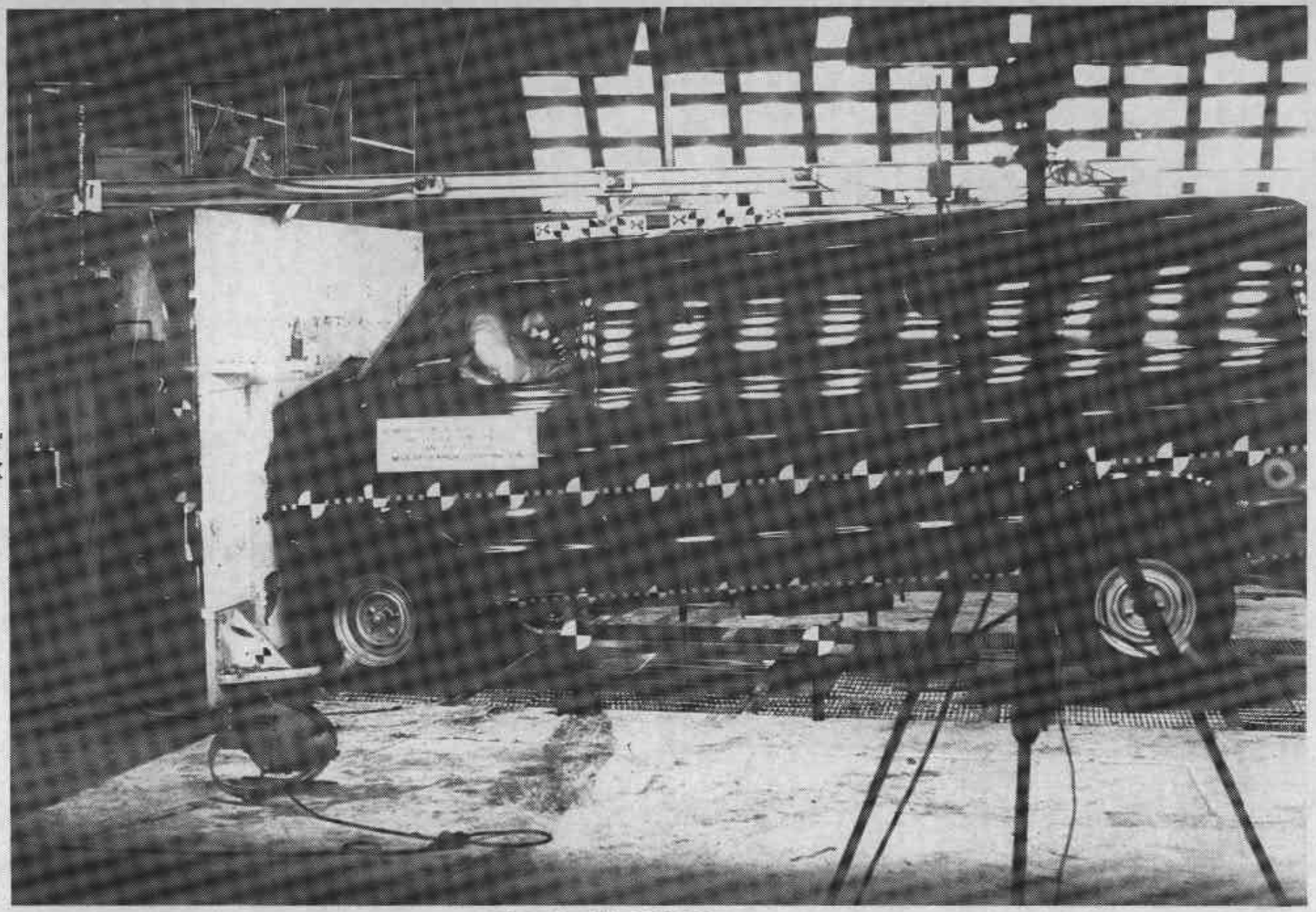


Photo No. A-44 - Vehicle Impact

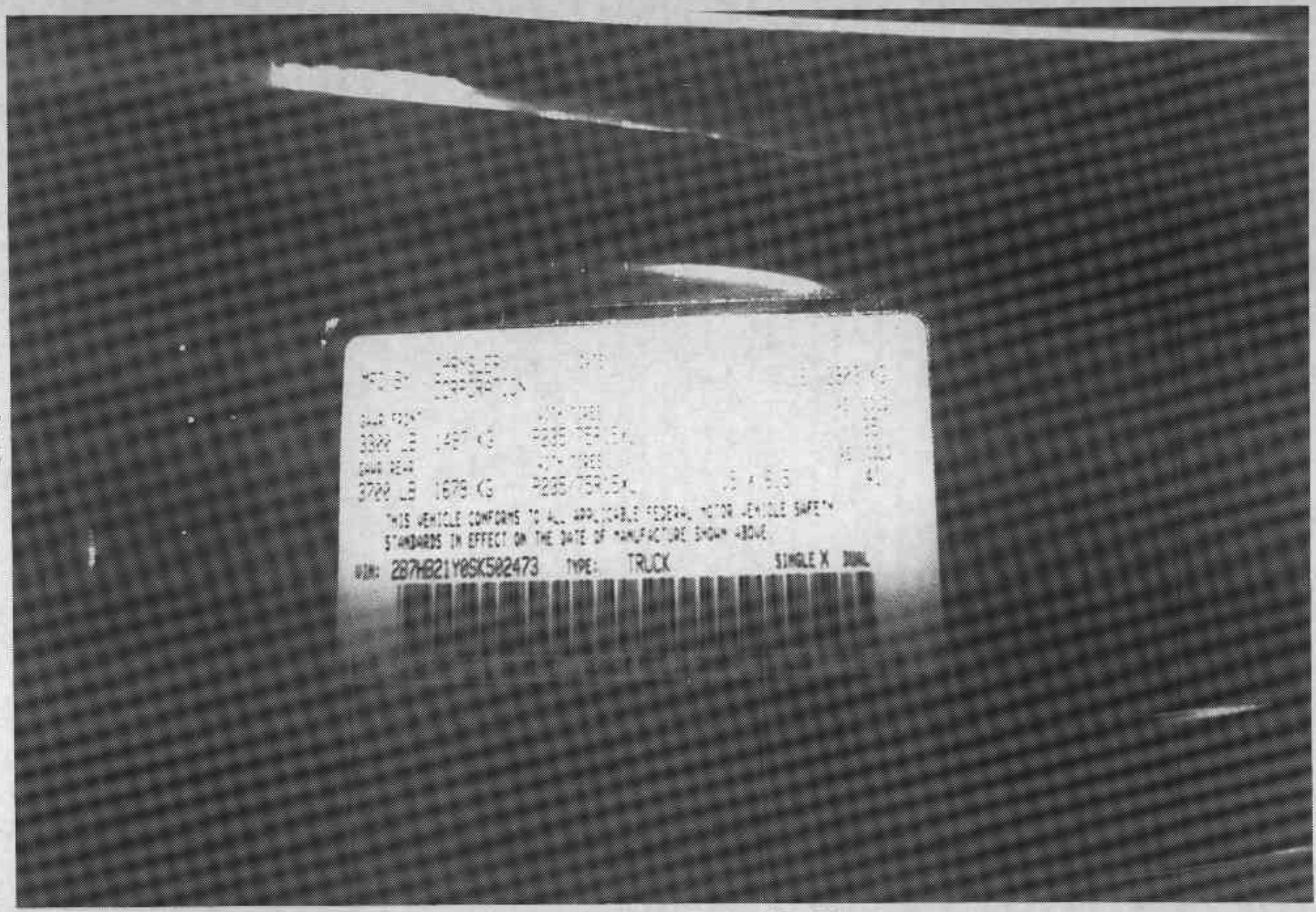


Photo No. A-45 - Vehicle Certification Label and Tire Placard

APPENDIX B
DATA PLOTS

TABLE OF DATA PLOTS

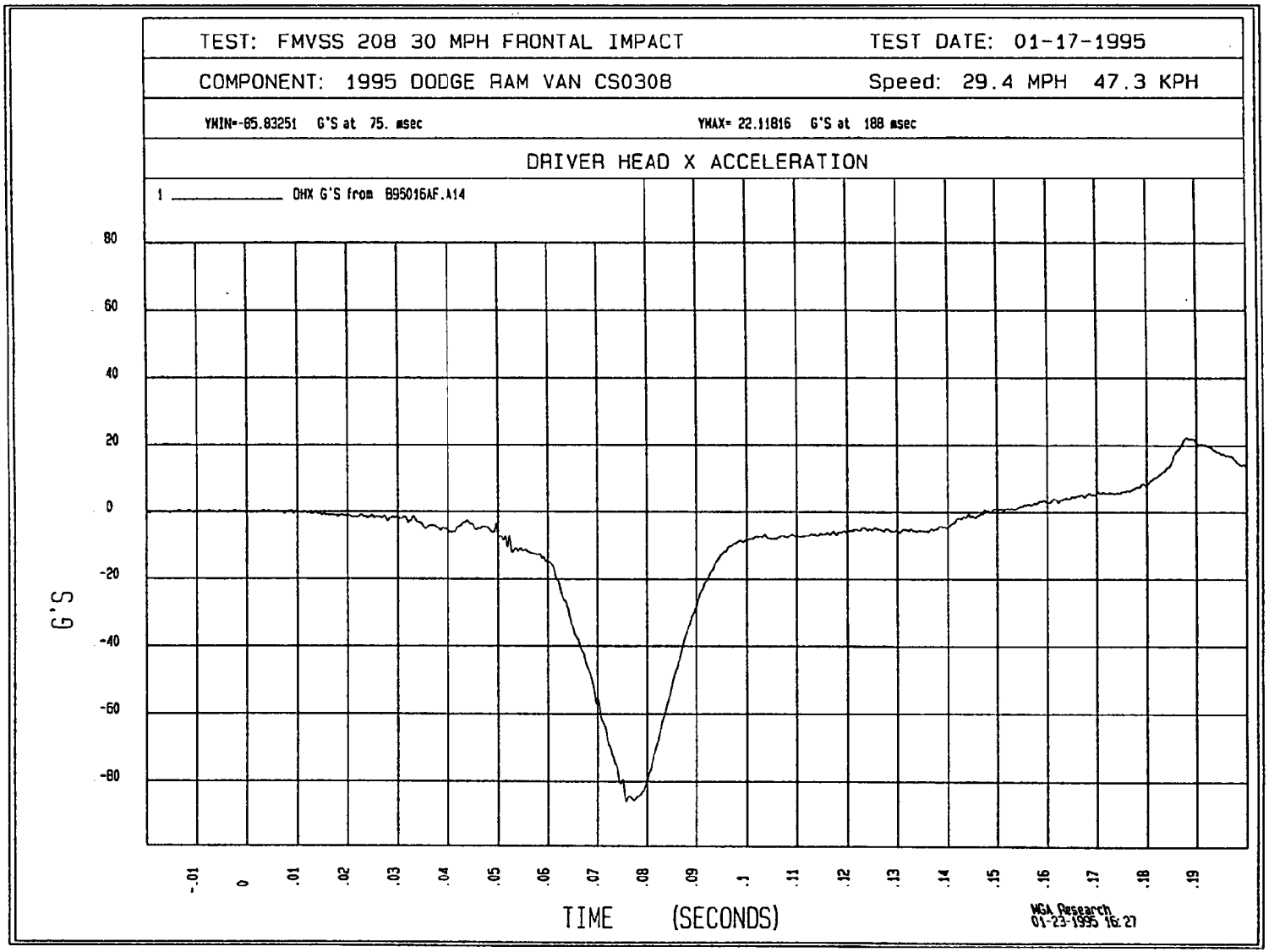


Figure B-1 - Driver Head X Acceleration vs. Time

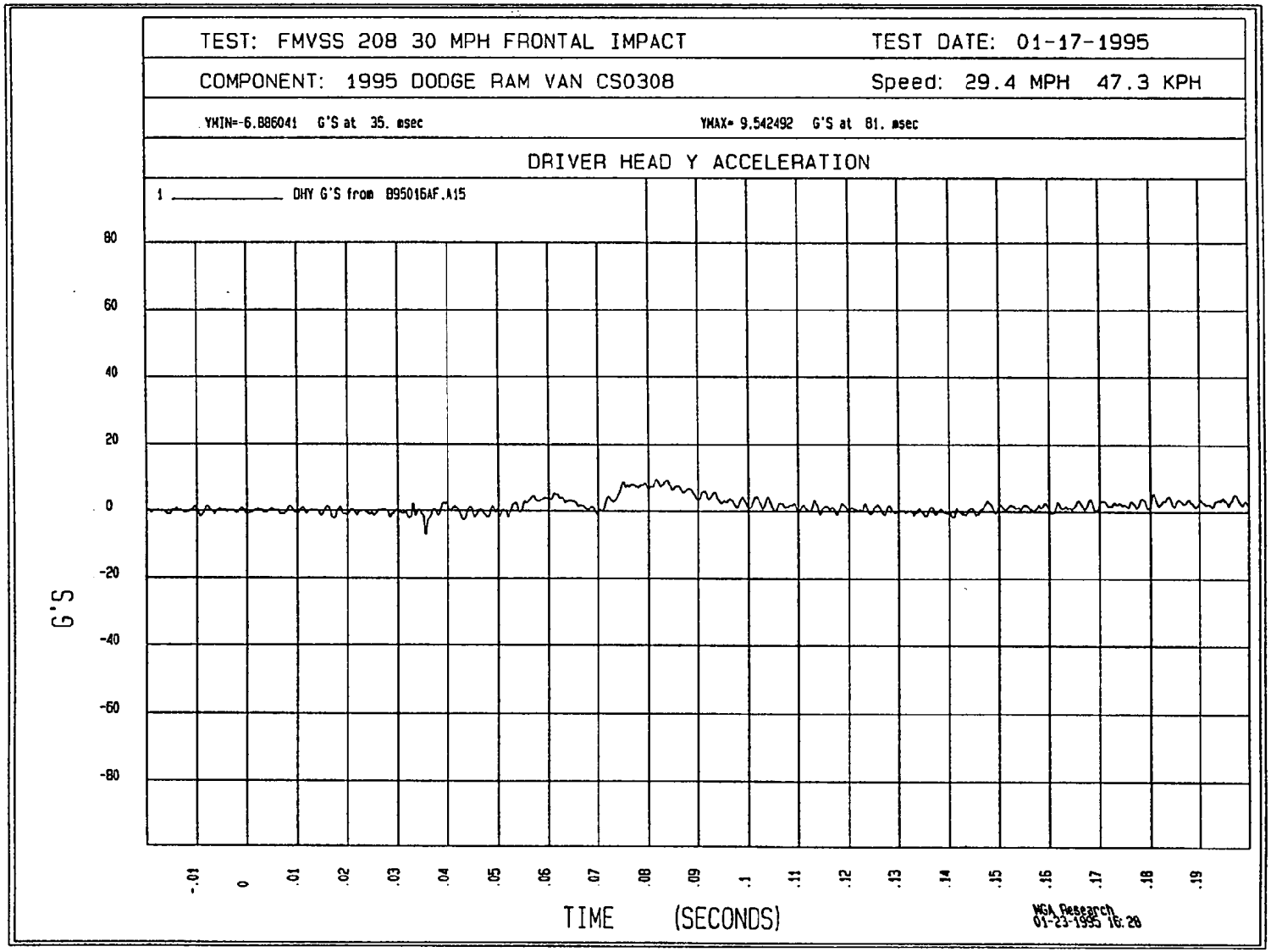


Figure B-2 - Driver Head Y Acceleration vs. Time

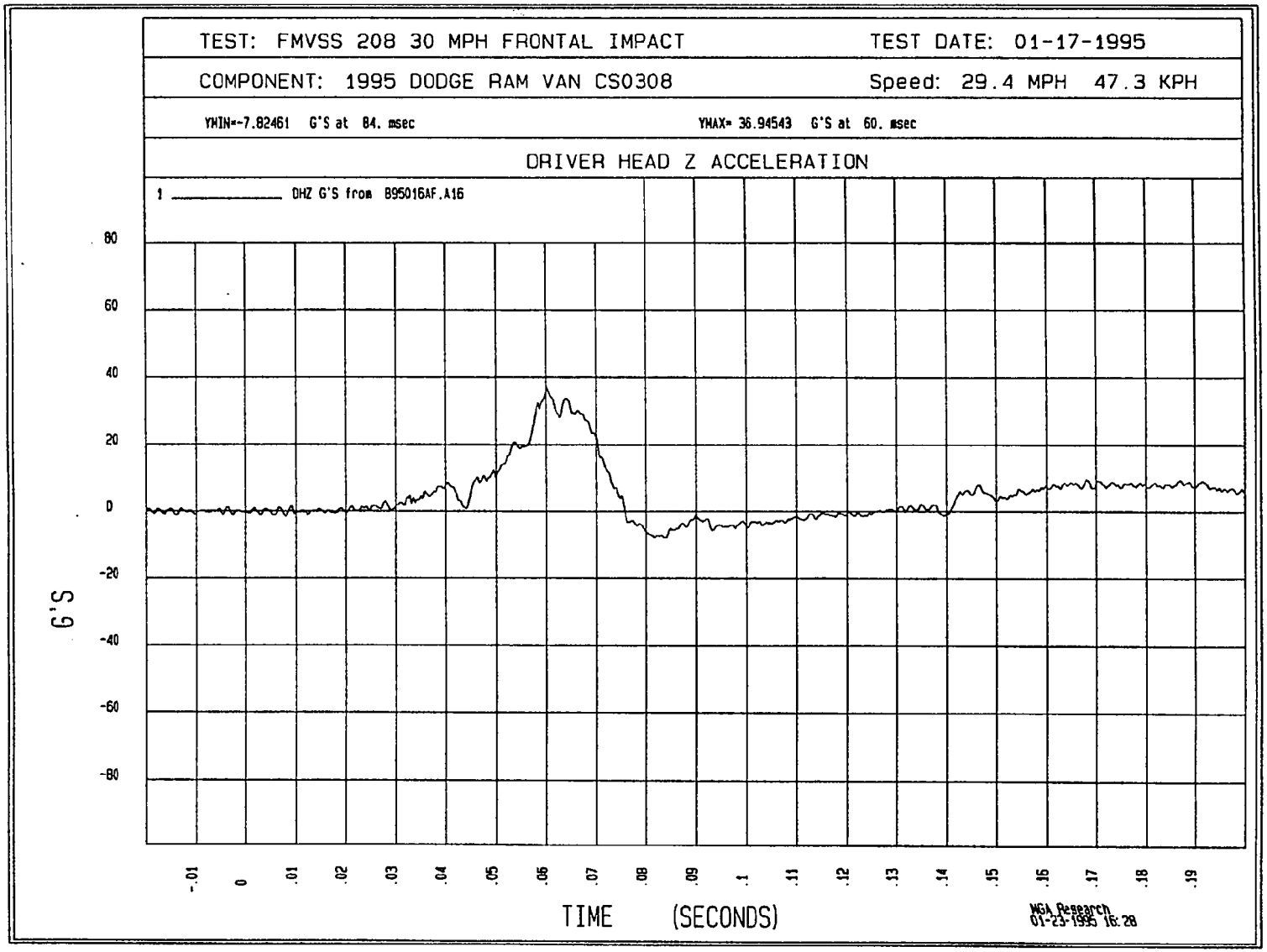


Figure B-3 - Driver Head Z Acceleration vs. Time

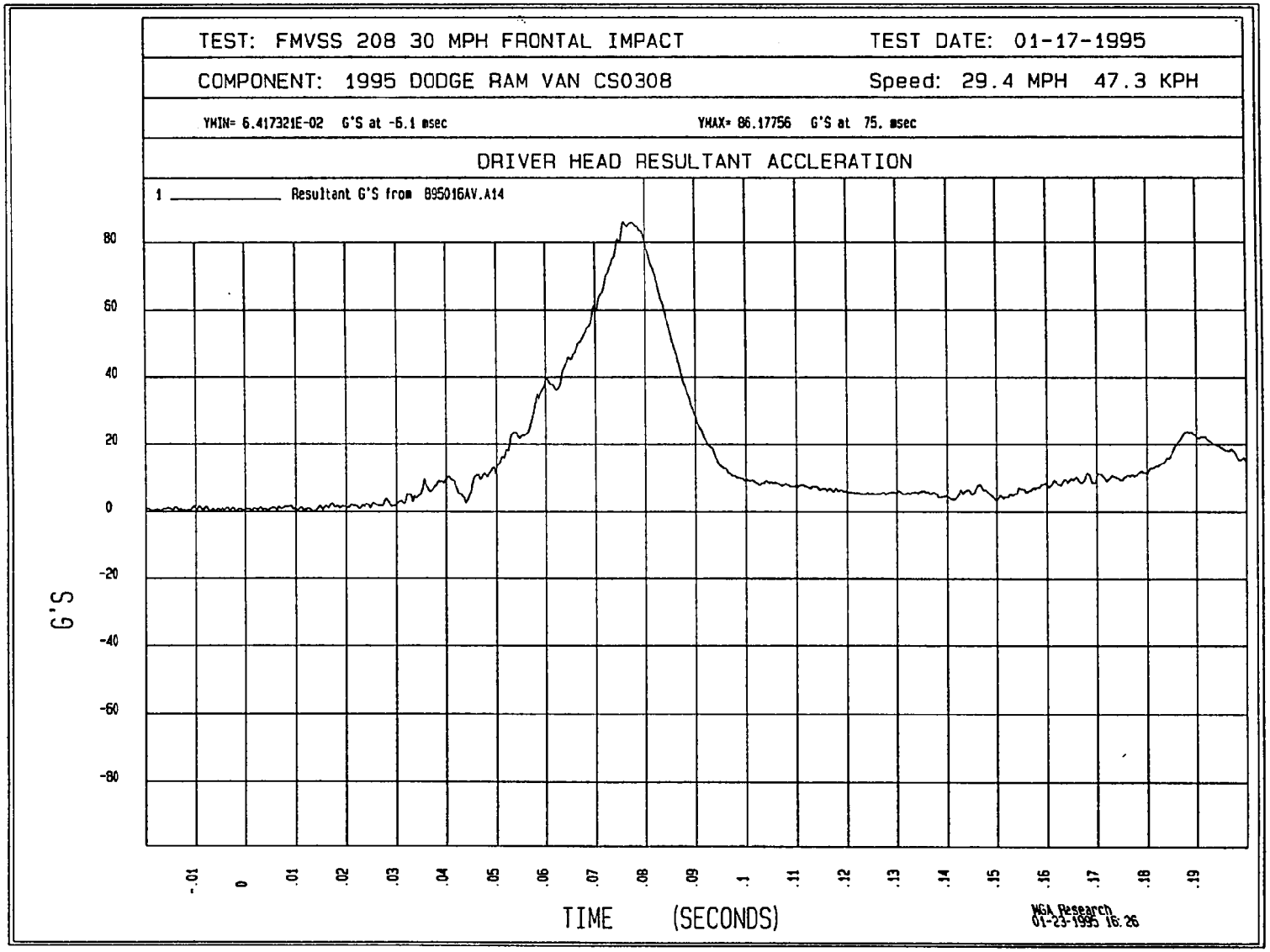


Figure B-4 - Driver Head Resultant Acceleration vs. Time

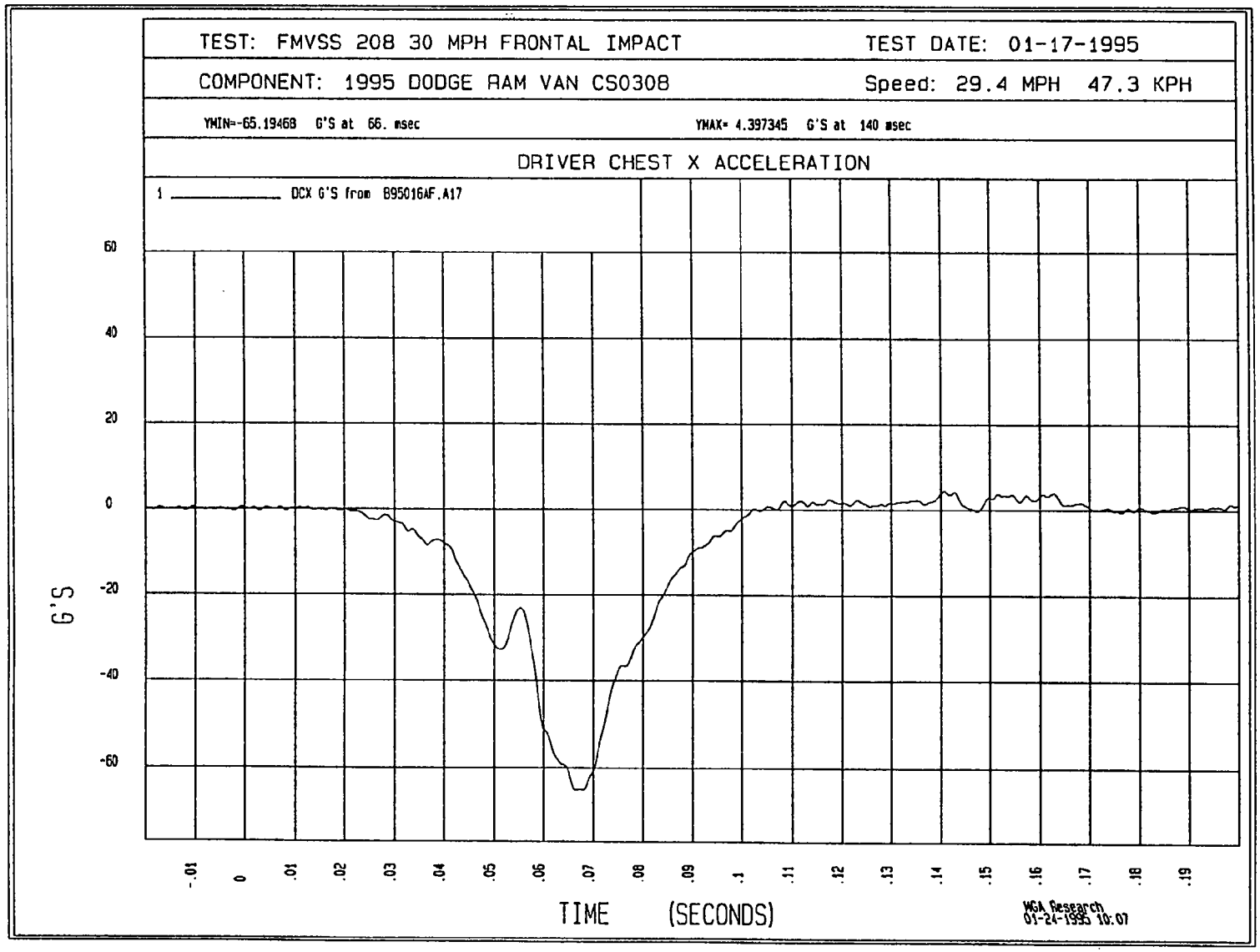


Figure B-5 - Driver Chest X Acceleration vs. Time

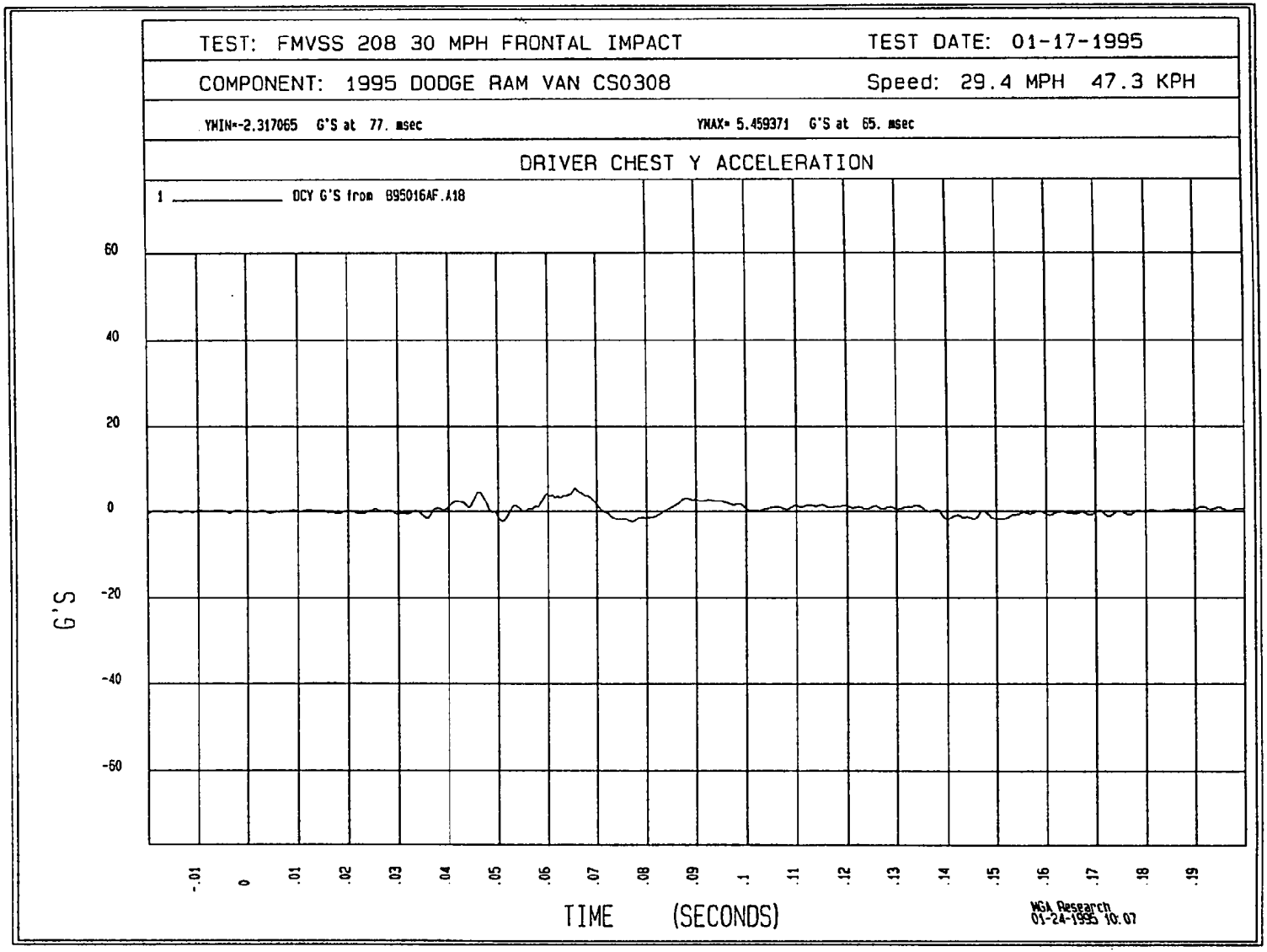


Figure B-6 - Driver Chest Y Acceleration vs. Time

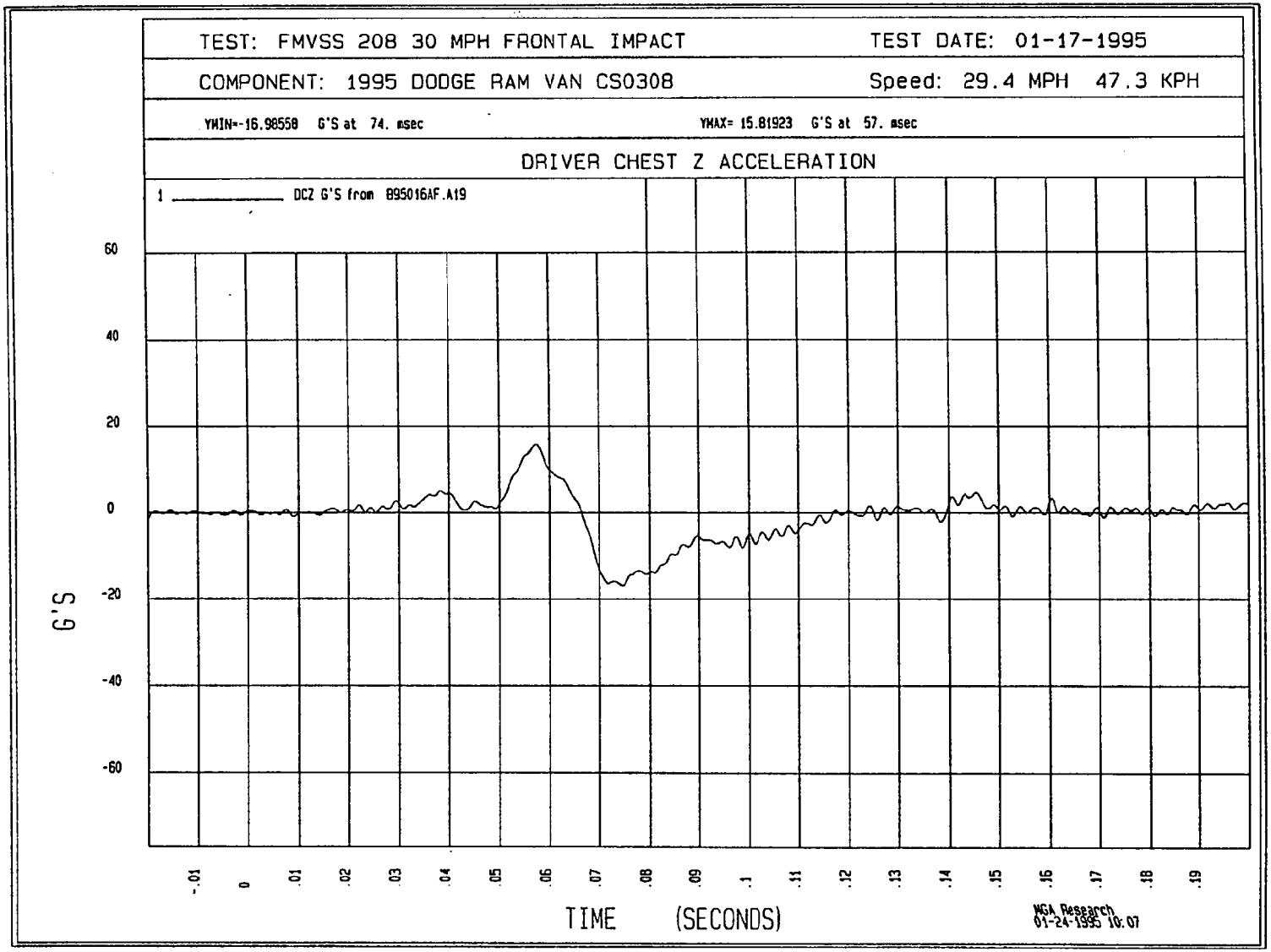


Figure B-7 - Driver Chest Z Acceleration vs. Time

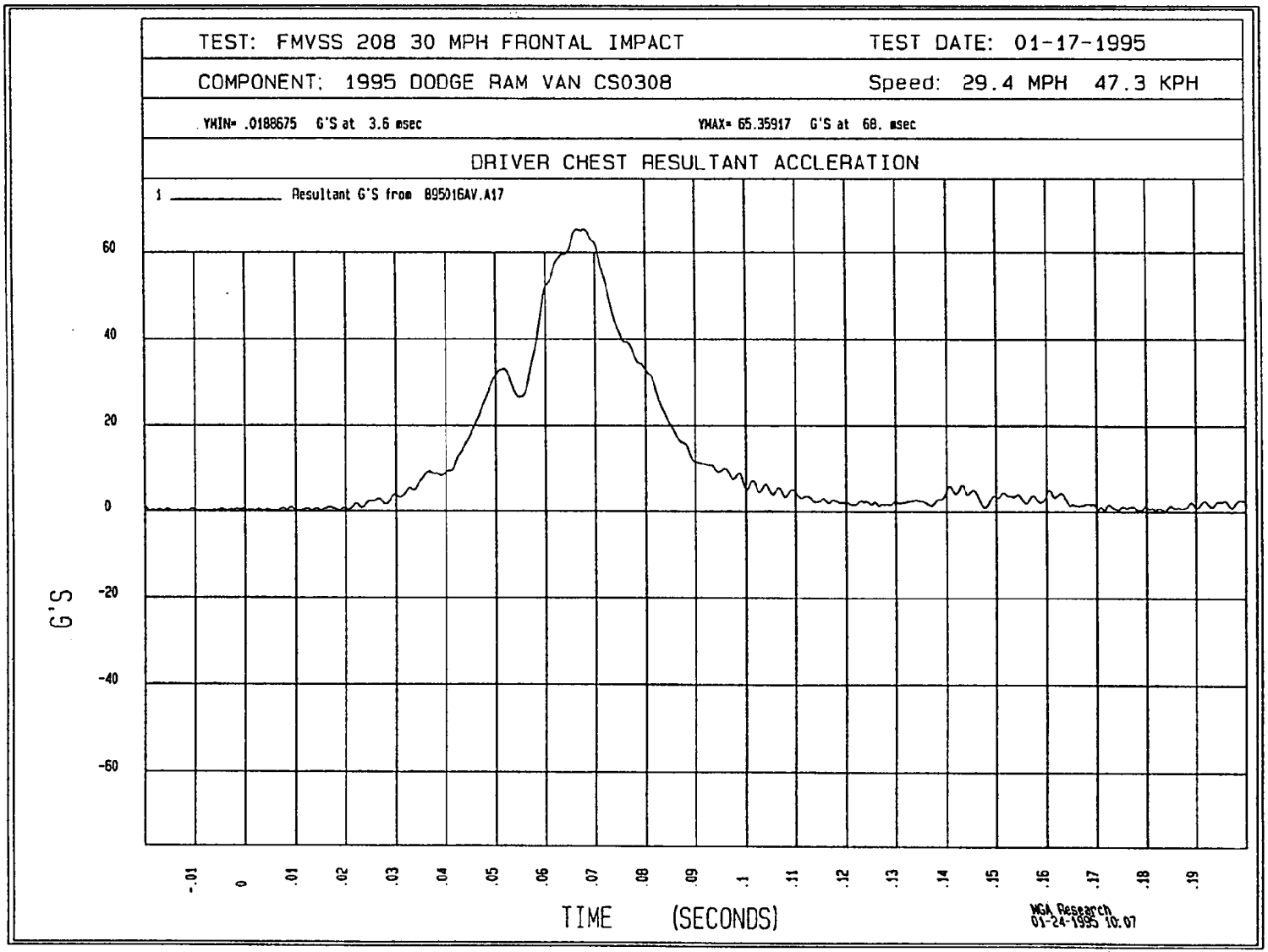


Figure B-8 - Driver Chest Resultant Acceleration vs. Time

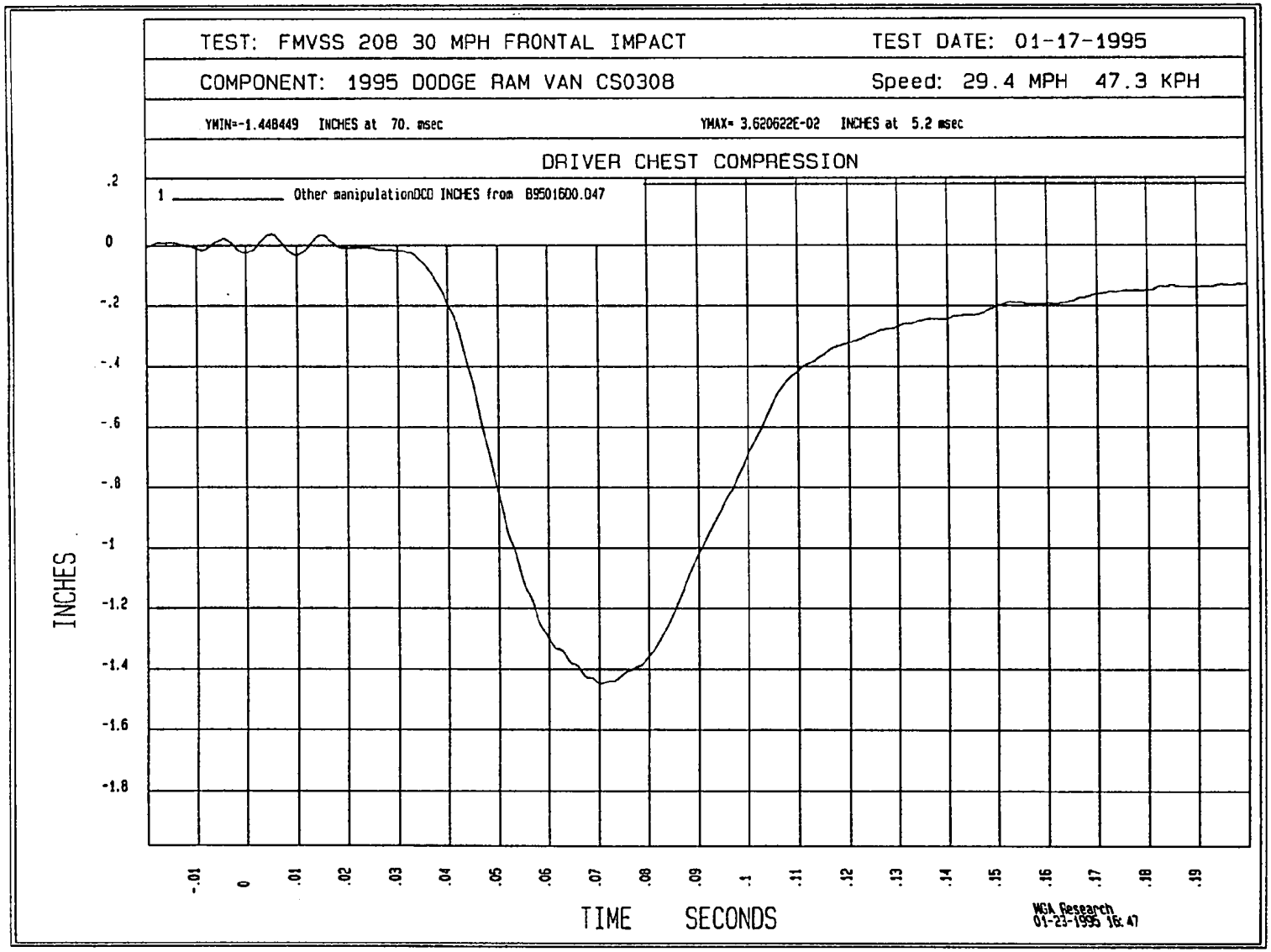


Figure B-9 - Driver Chest Compression vs. Time

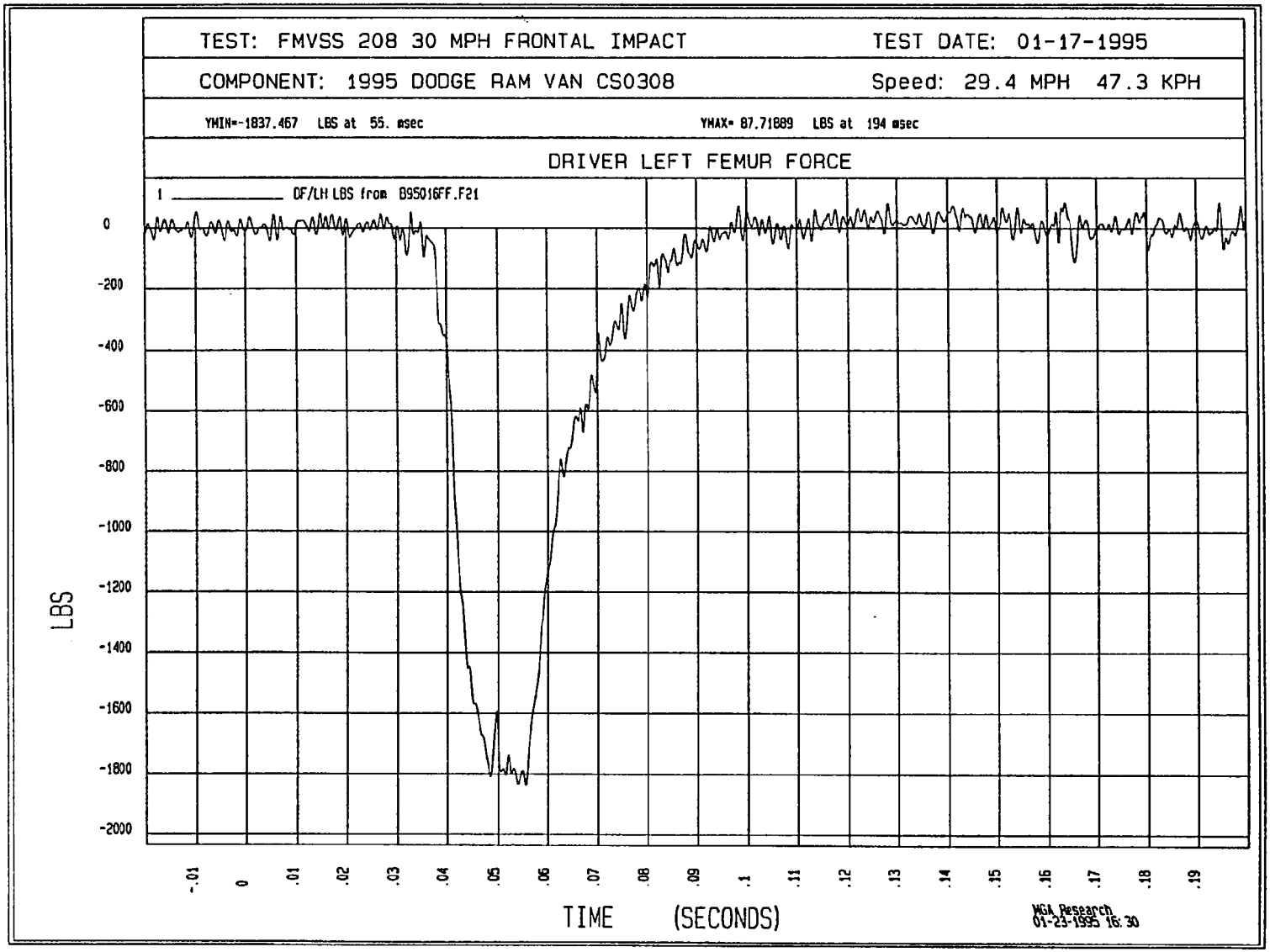


Figure B-10 - Driver Left Femur Force vs. Time

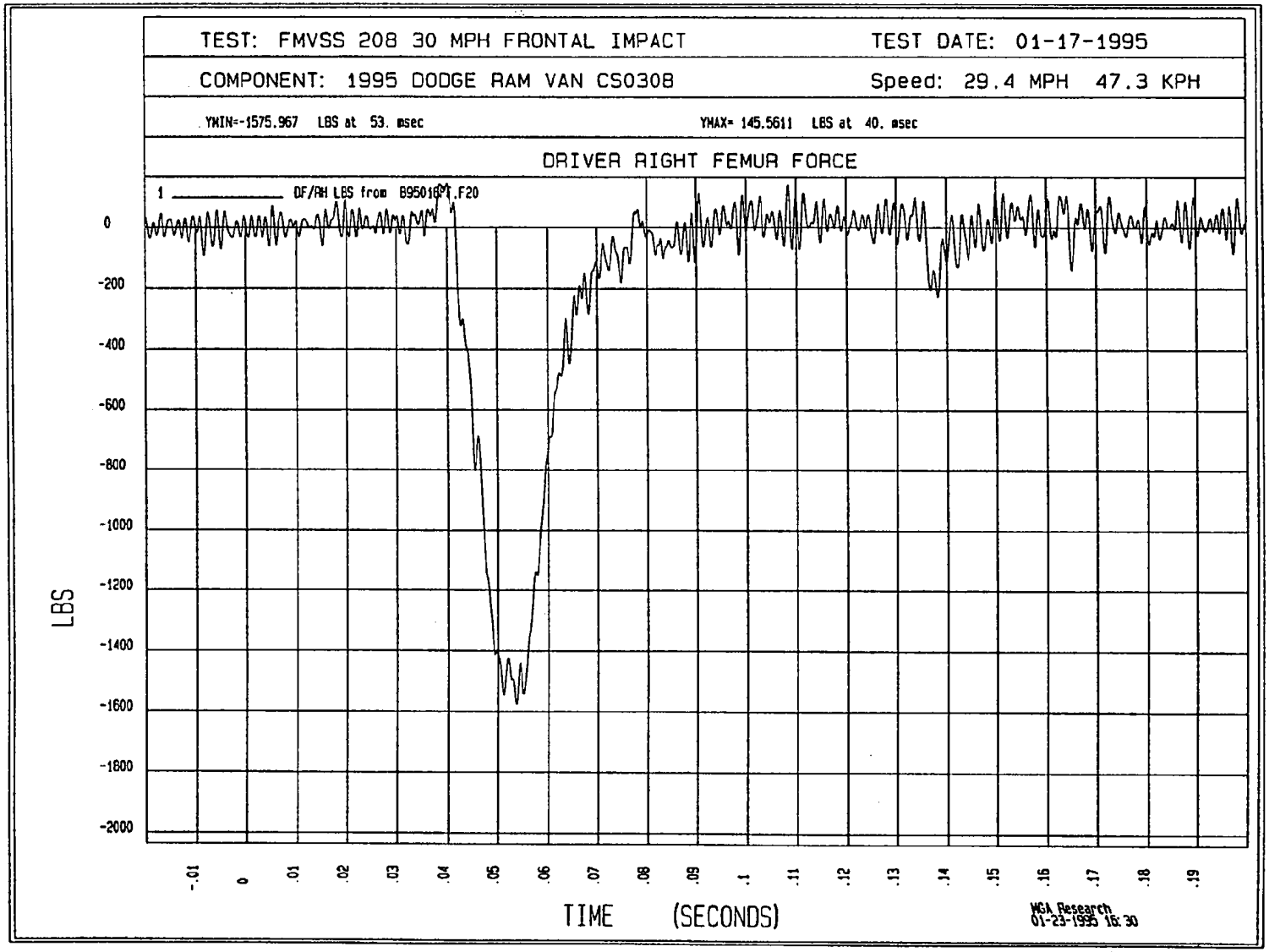


Figure B-11 - Driver Right Femur Force vs. Time

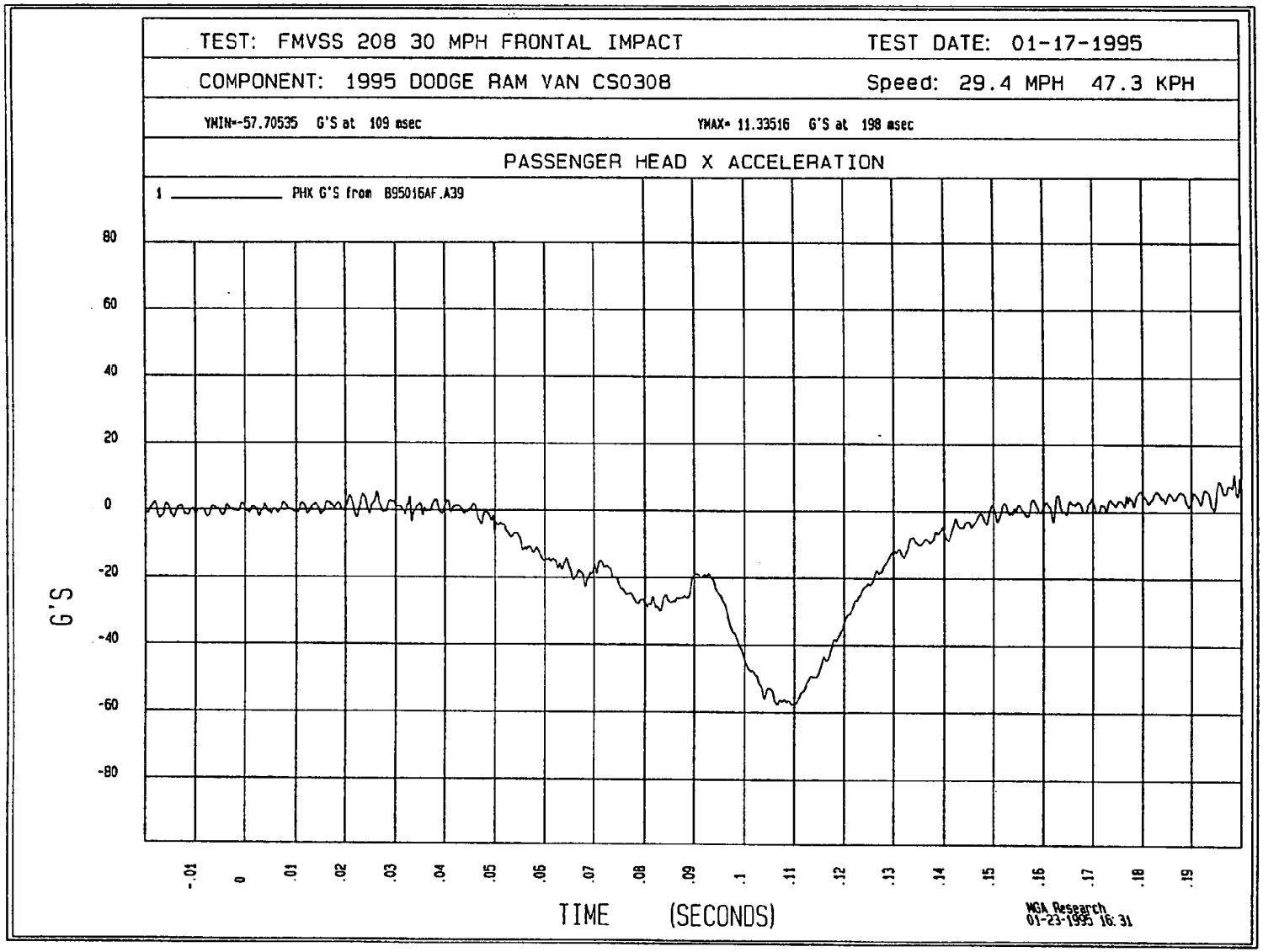


Figure B-12 - Passenger Head X Acceleration vs. Time

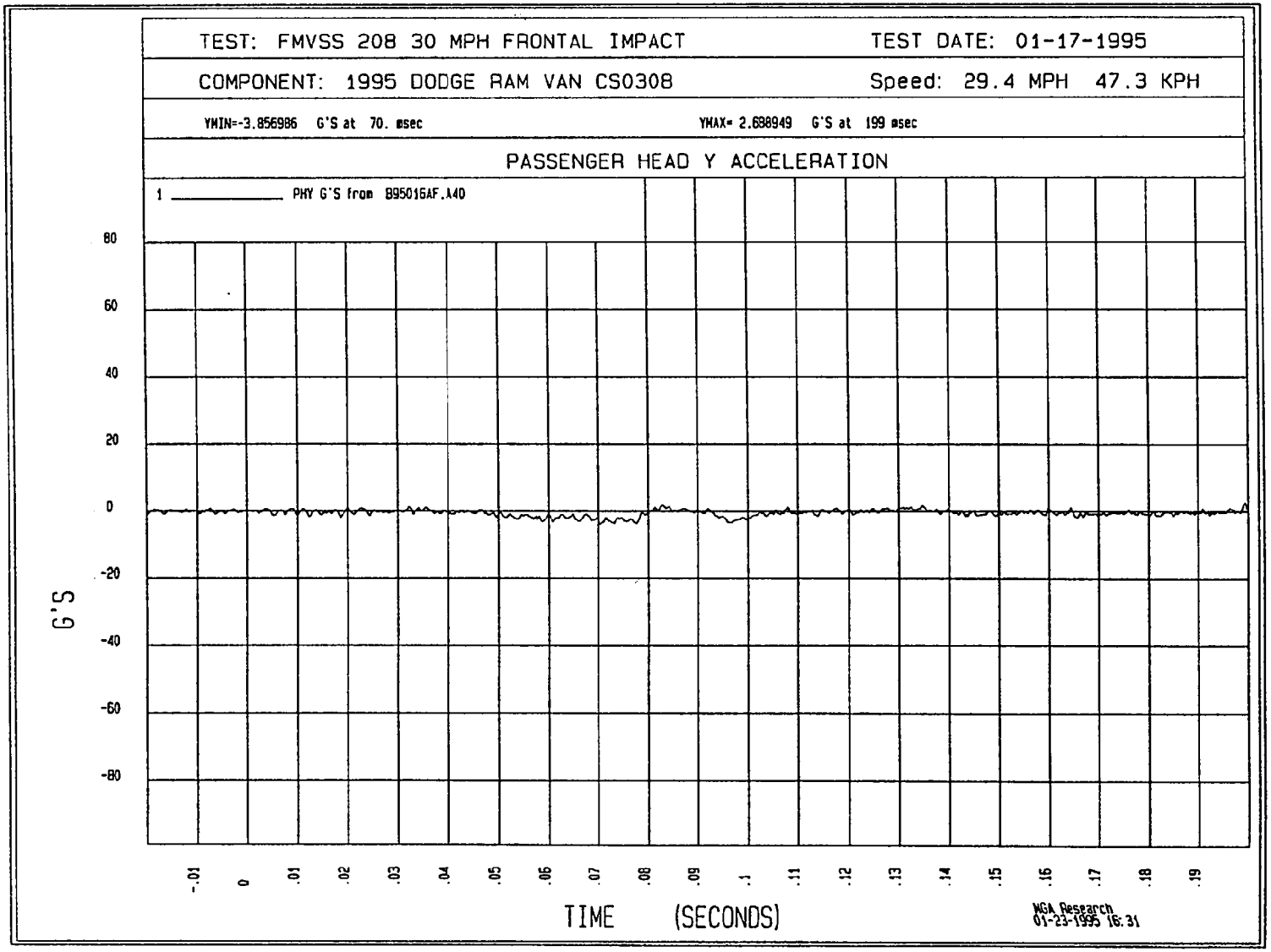


Figure B-13 - Passenger Head Y Acceleration vs. Time

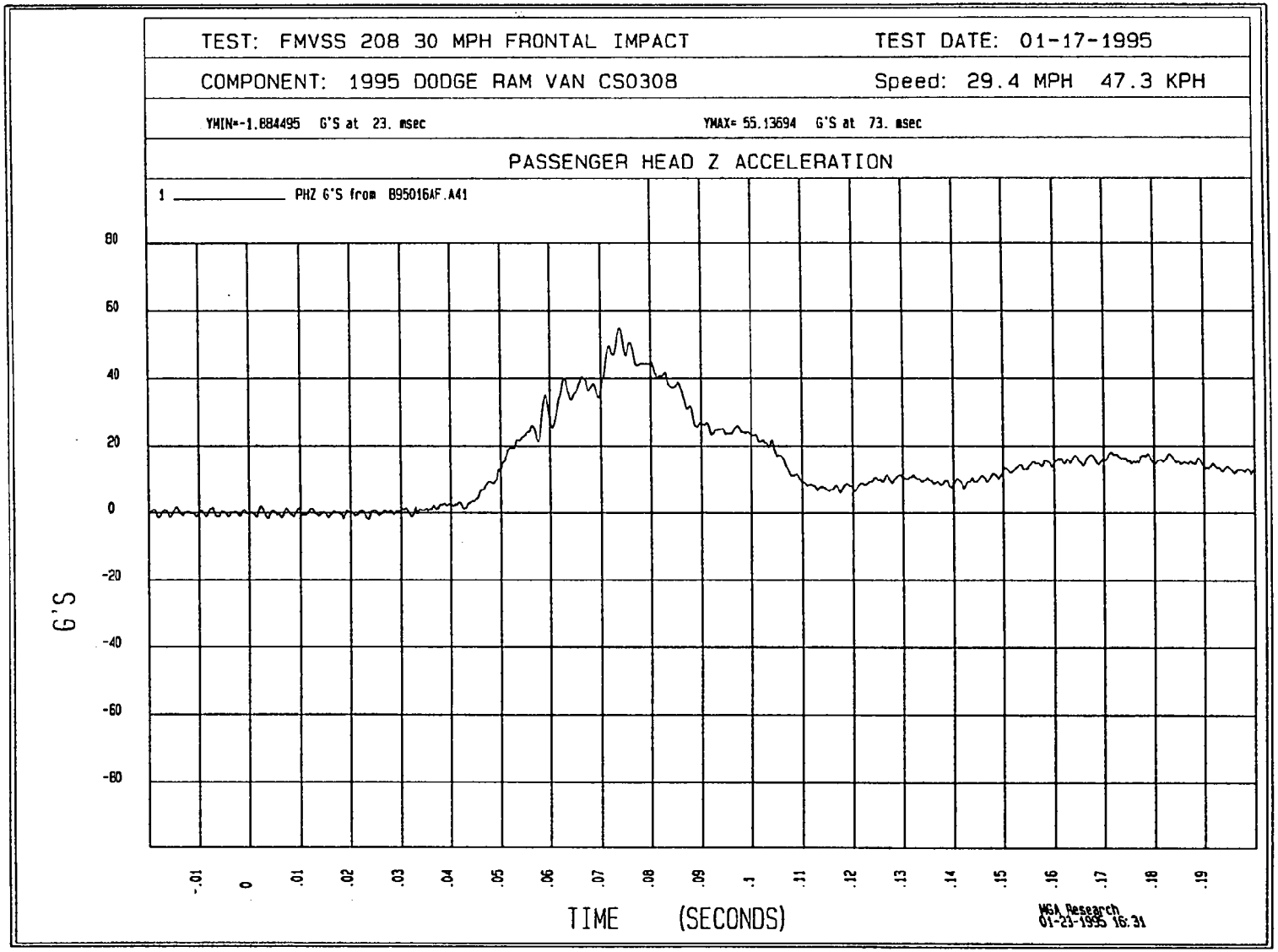


Figure B-14 - Passenger Head Z Acceleration vs. Time

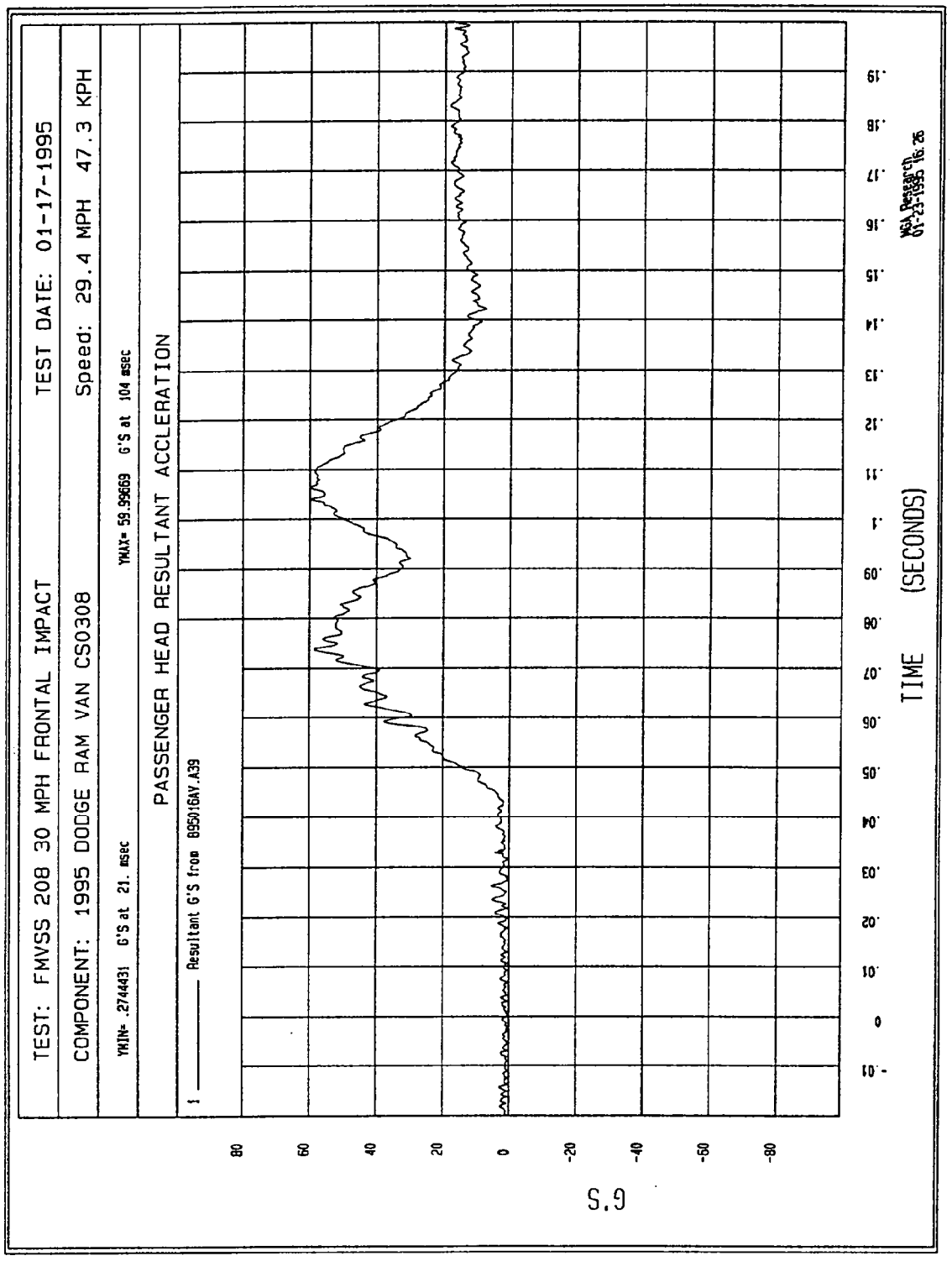


Figure B-15 - Passenger Head Resultant Acceleration vs. Time

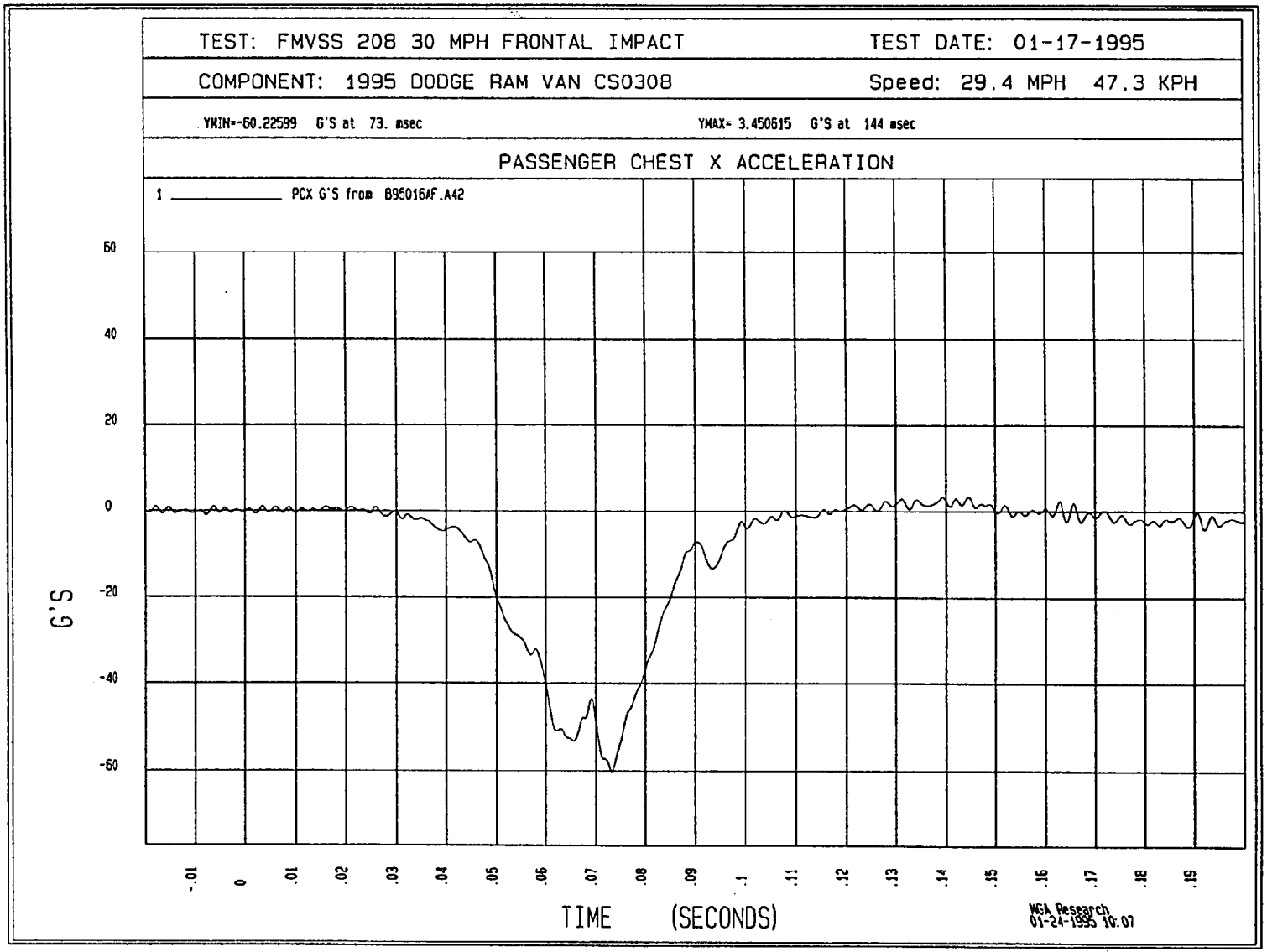


Figure B-16 - Passenger Chest X Acceleration vs. Time

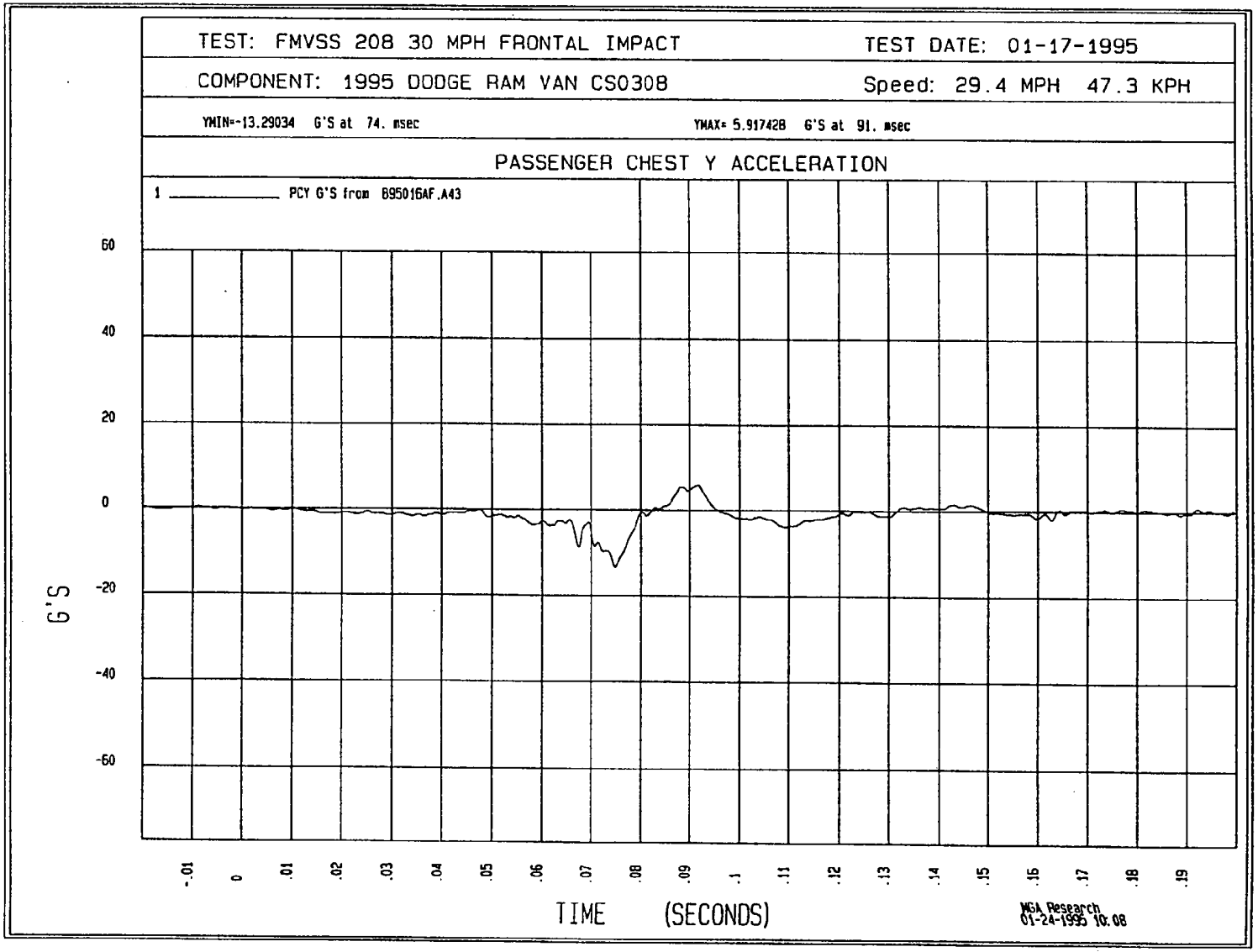


Figure B-17 - Passenger Chest Y Acceleration vs. Time

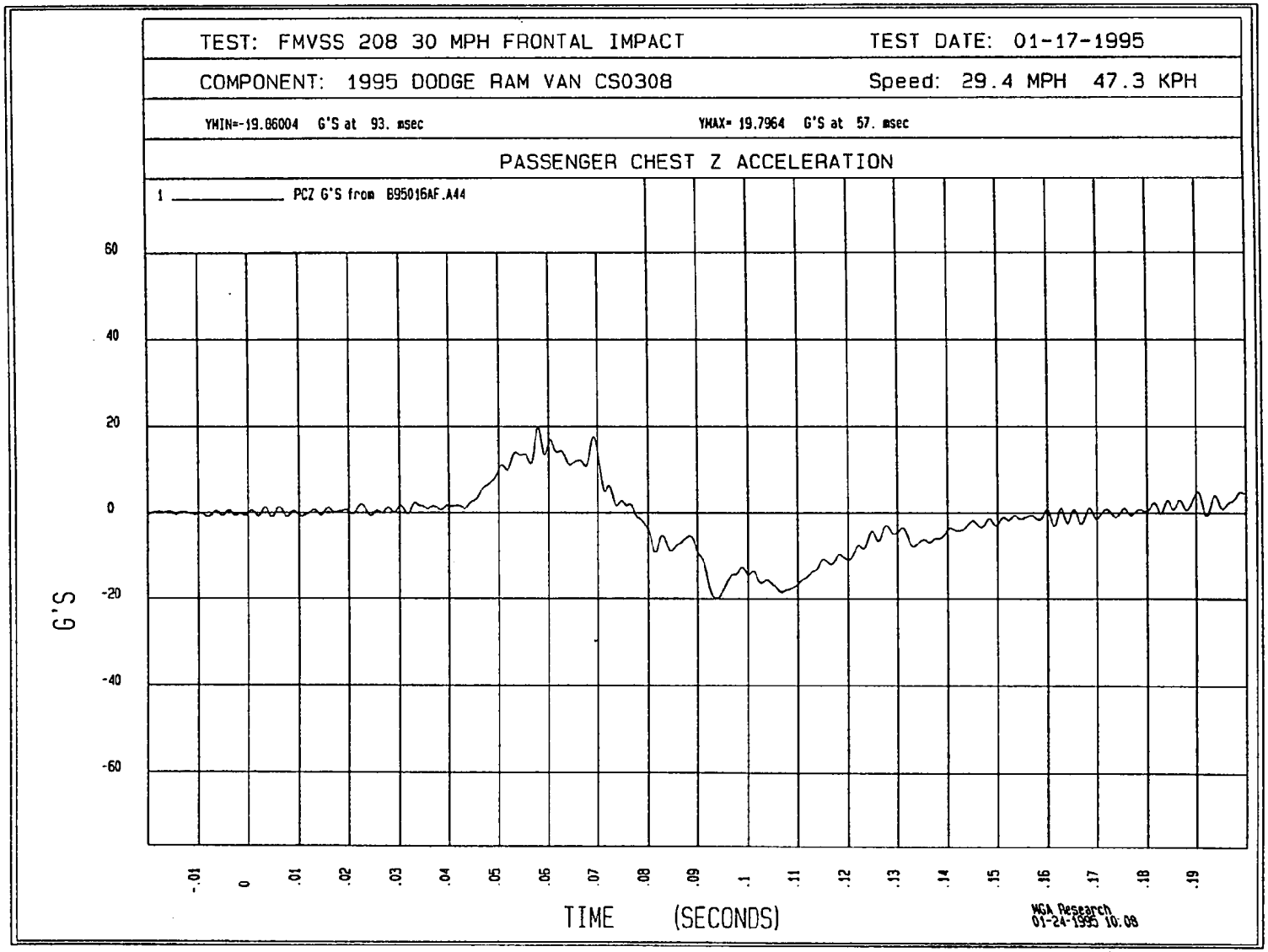


Figure B-18 - Passenger Chest Z Acceleration vs. Time

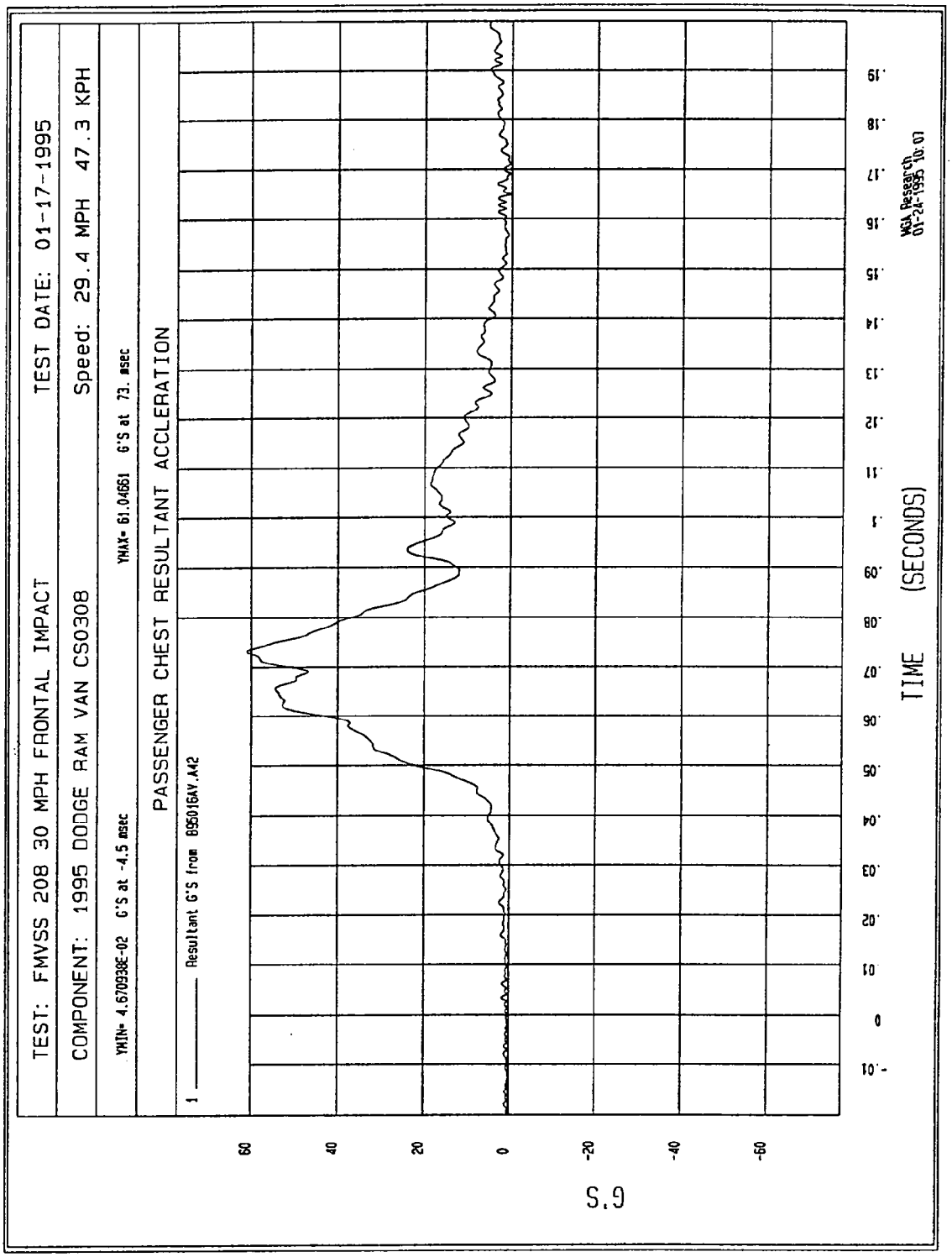


Figure B-19 - Passenger Chest Resultant Acceleration vs. Time

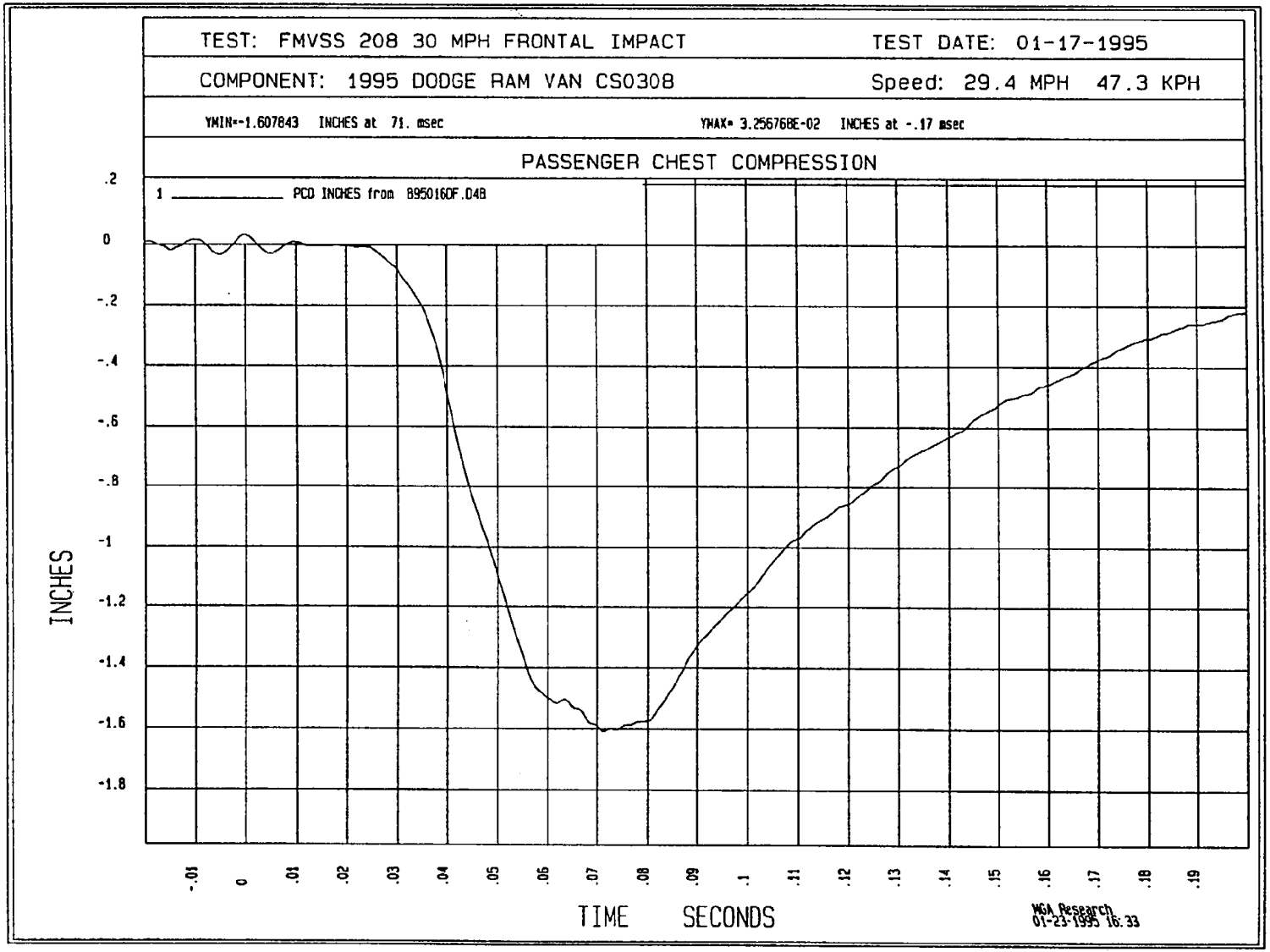


Figure B-2Ø - Passenger Chest Compression vs. Time

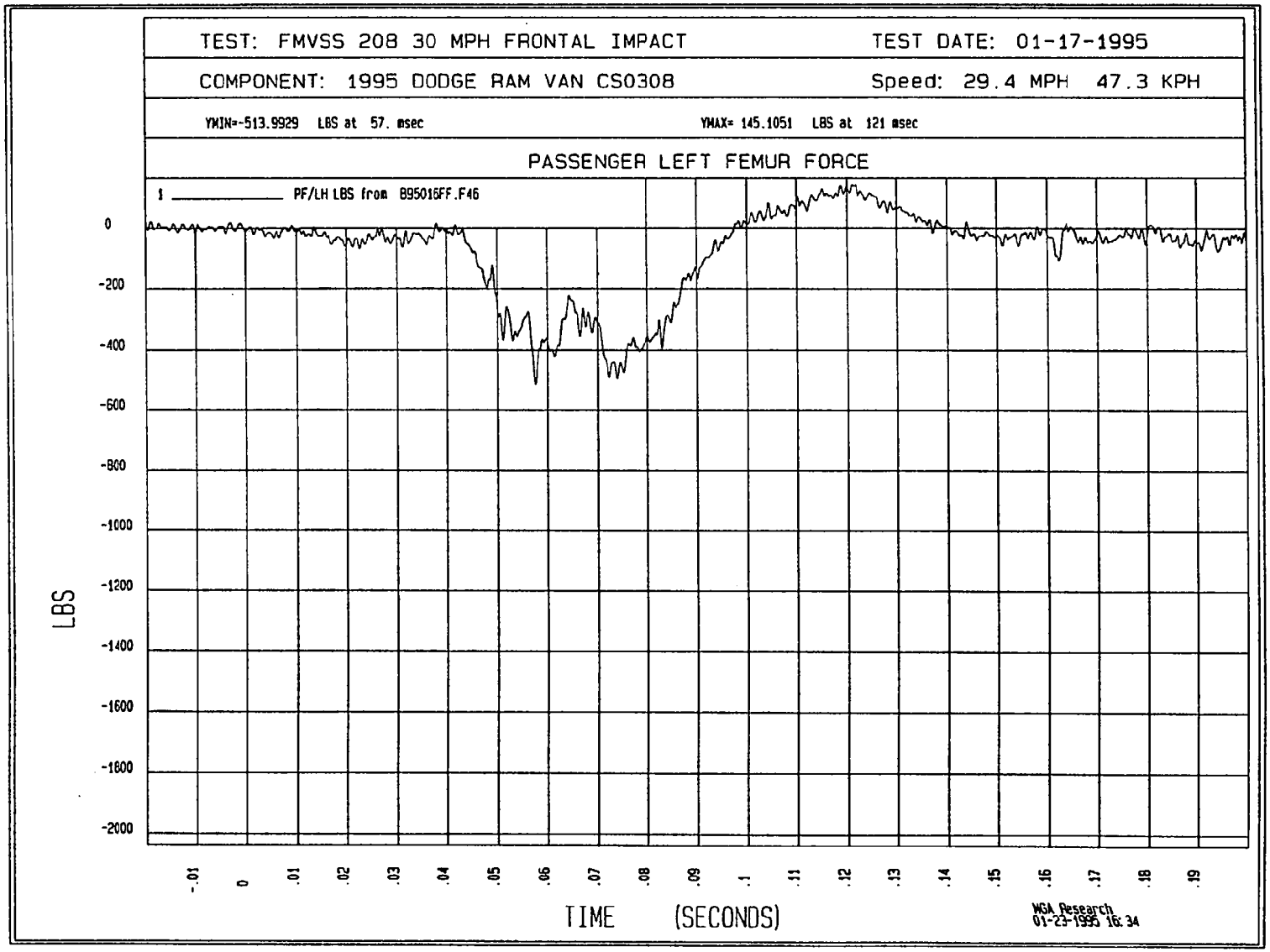


Figure B-21 - Passenger Left Femur Force vs. Time

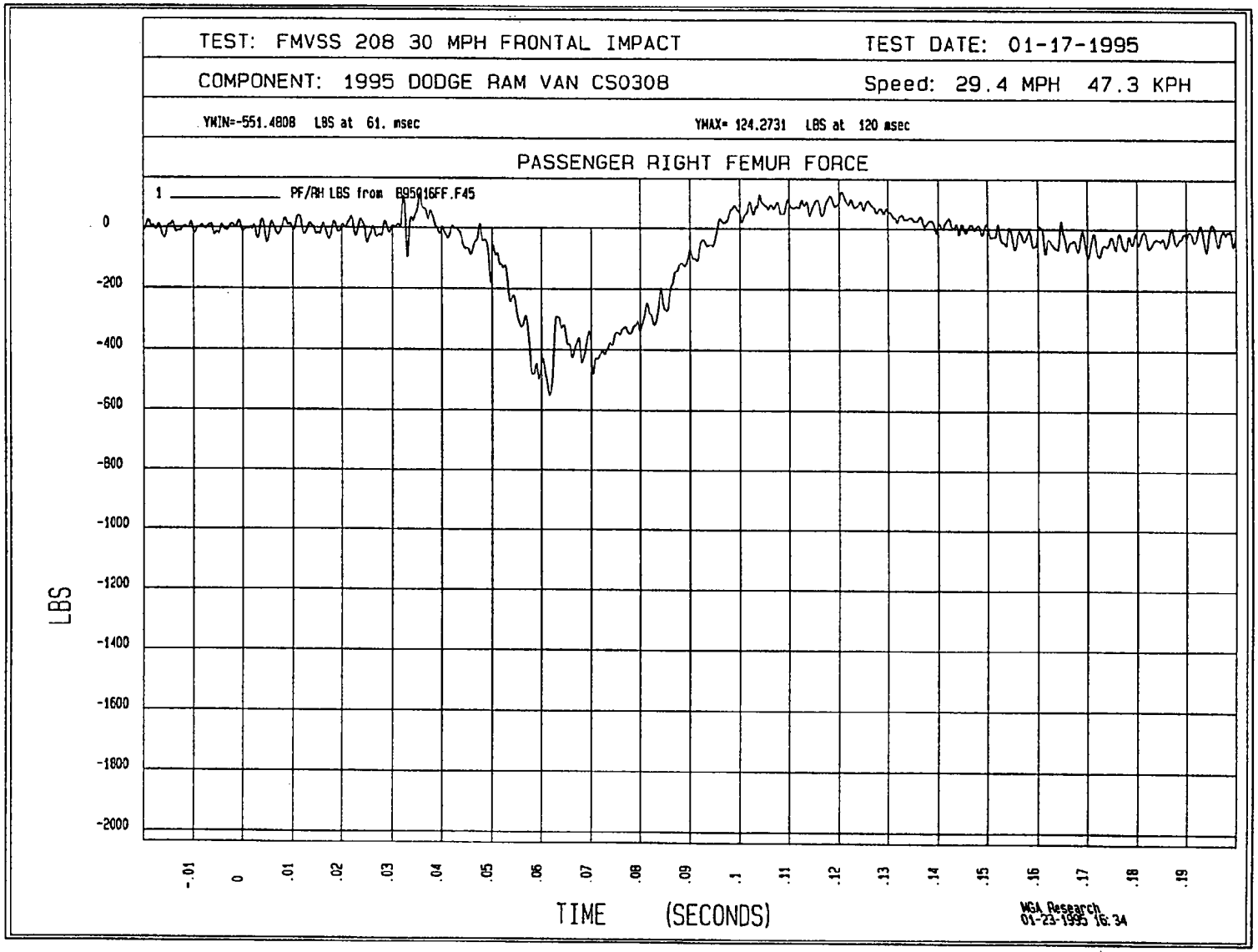


Figure B-22 - Passenger Right Femur Force vs. Time

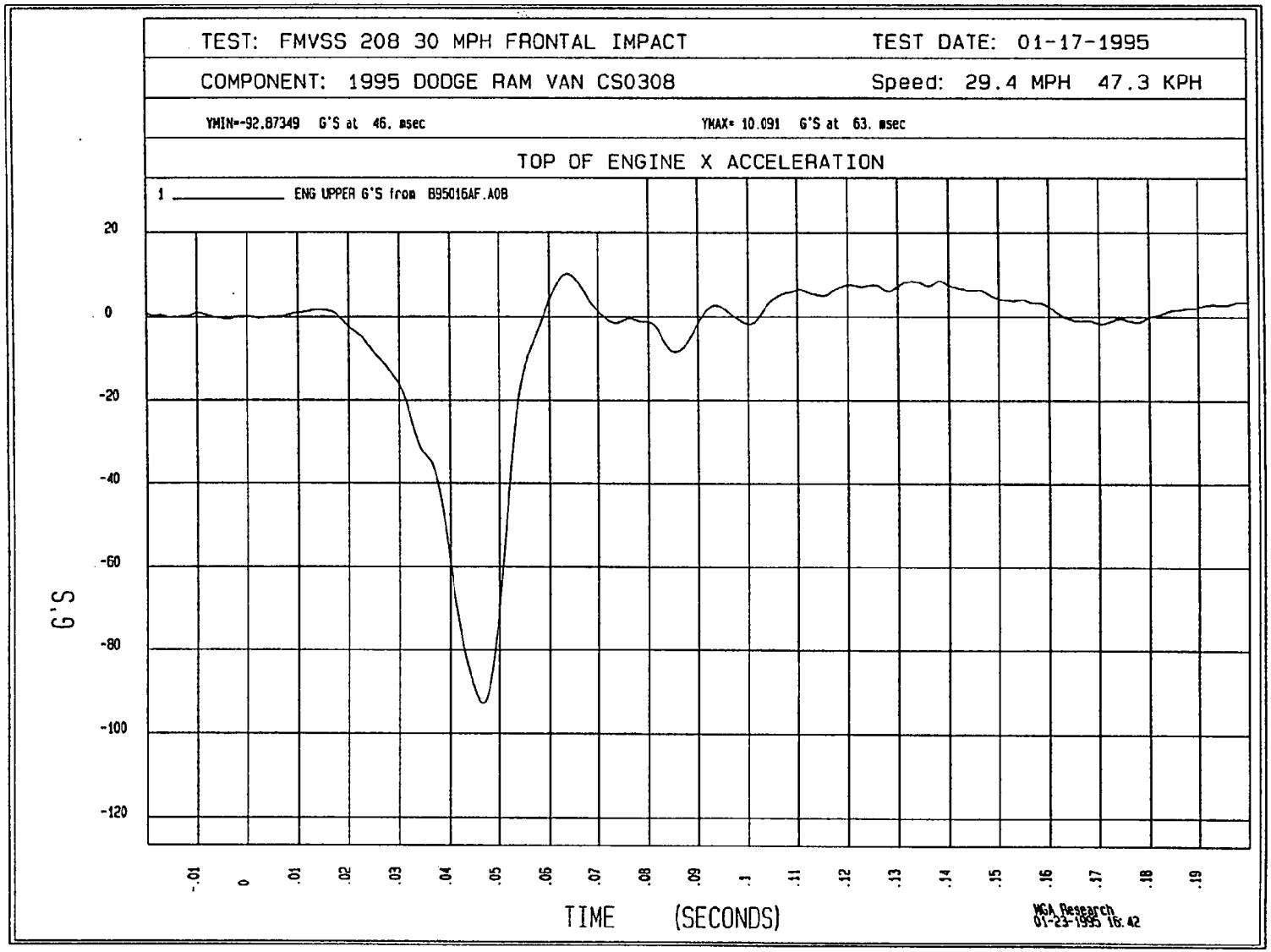


Figure B-23 - Top of Engine Block X Acceleration vs. Time

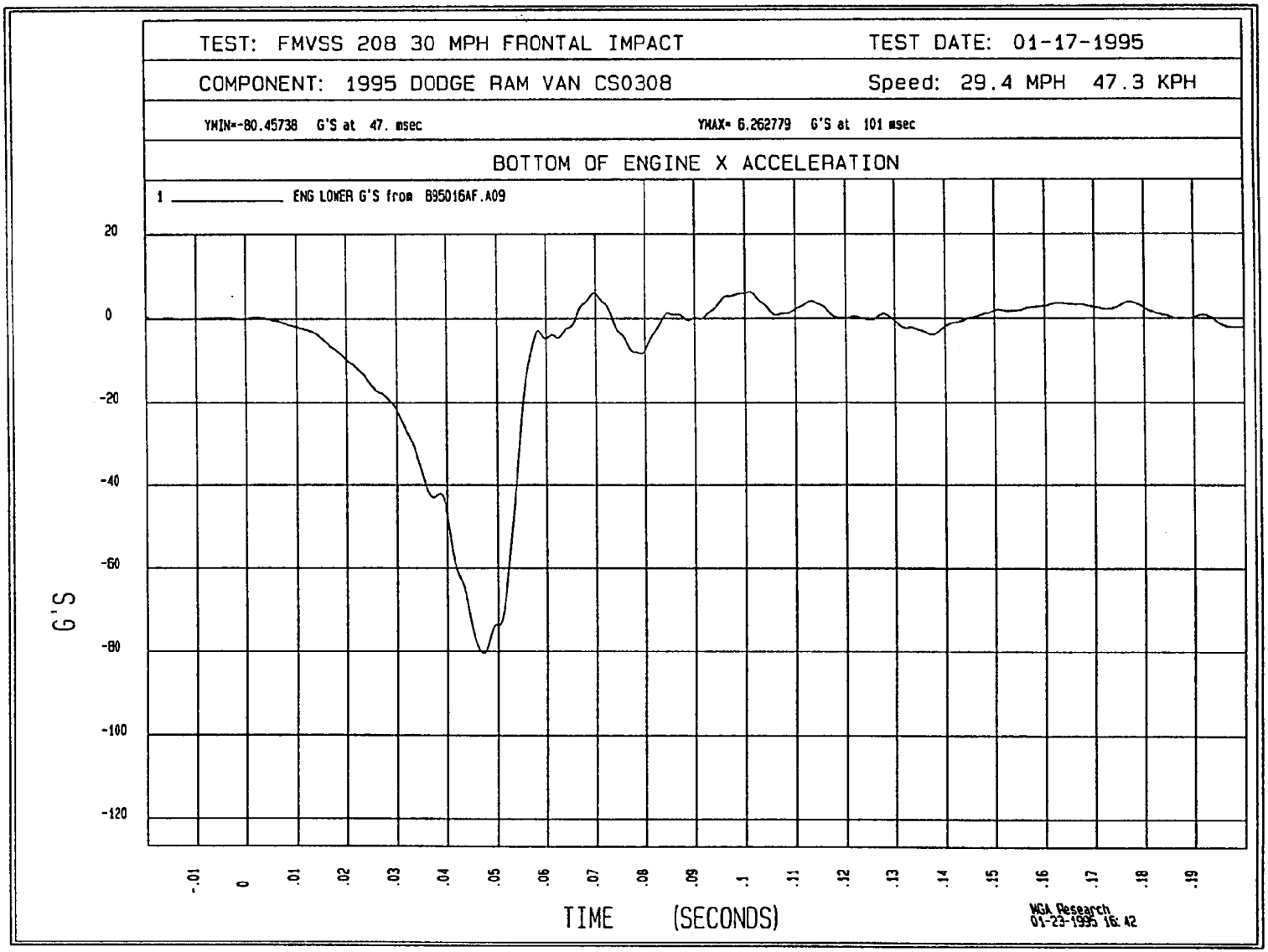
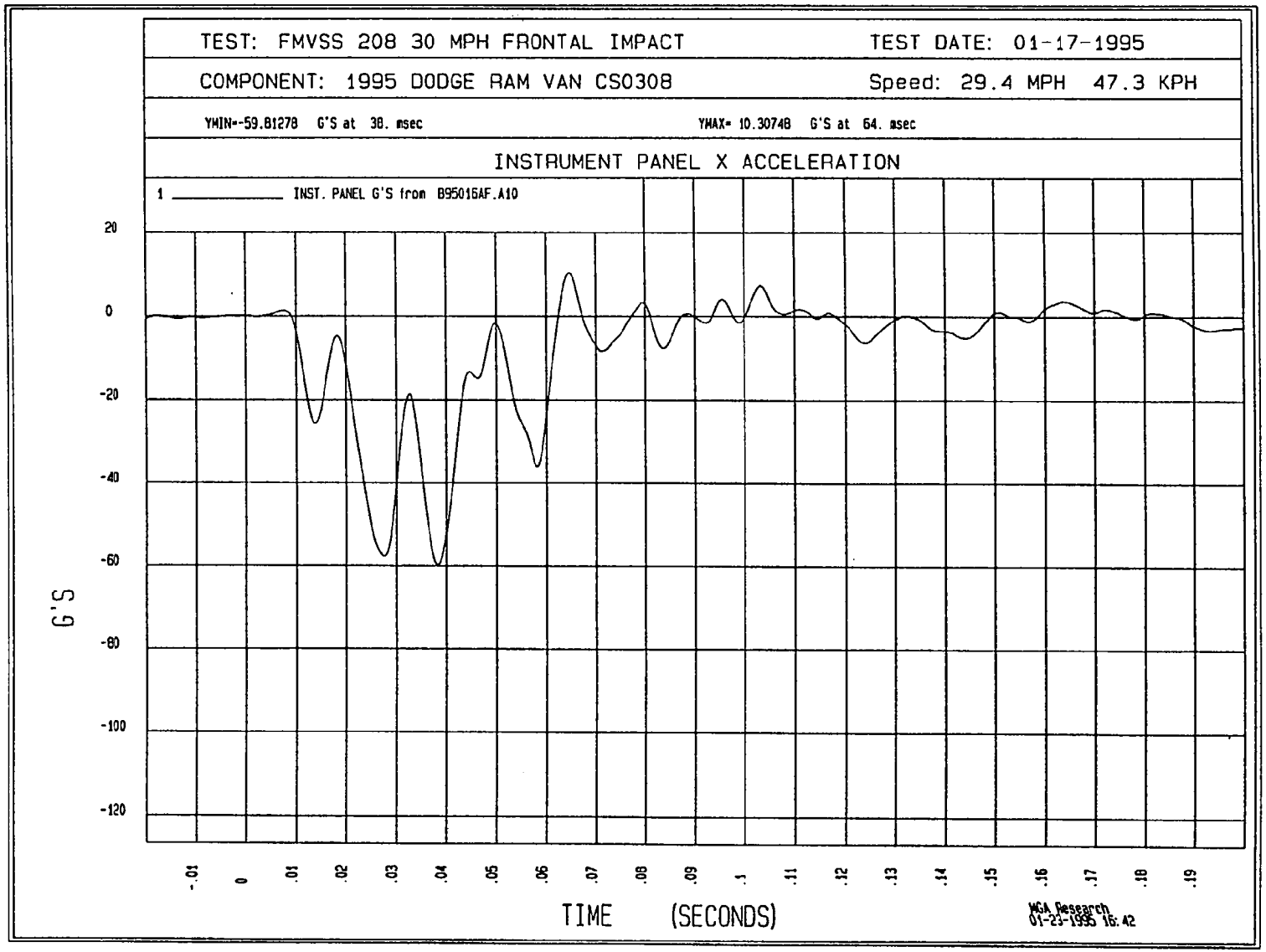


Figure B-24 - Bottom of Engine Block X Acceleration vs. Time



B-25

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

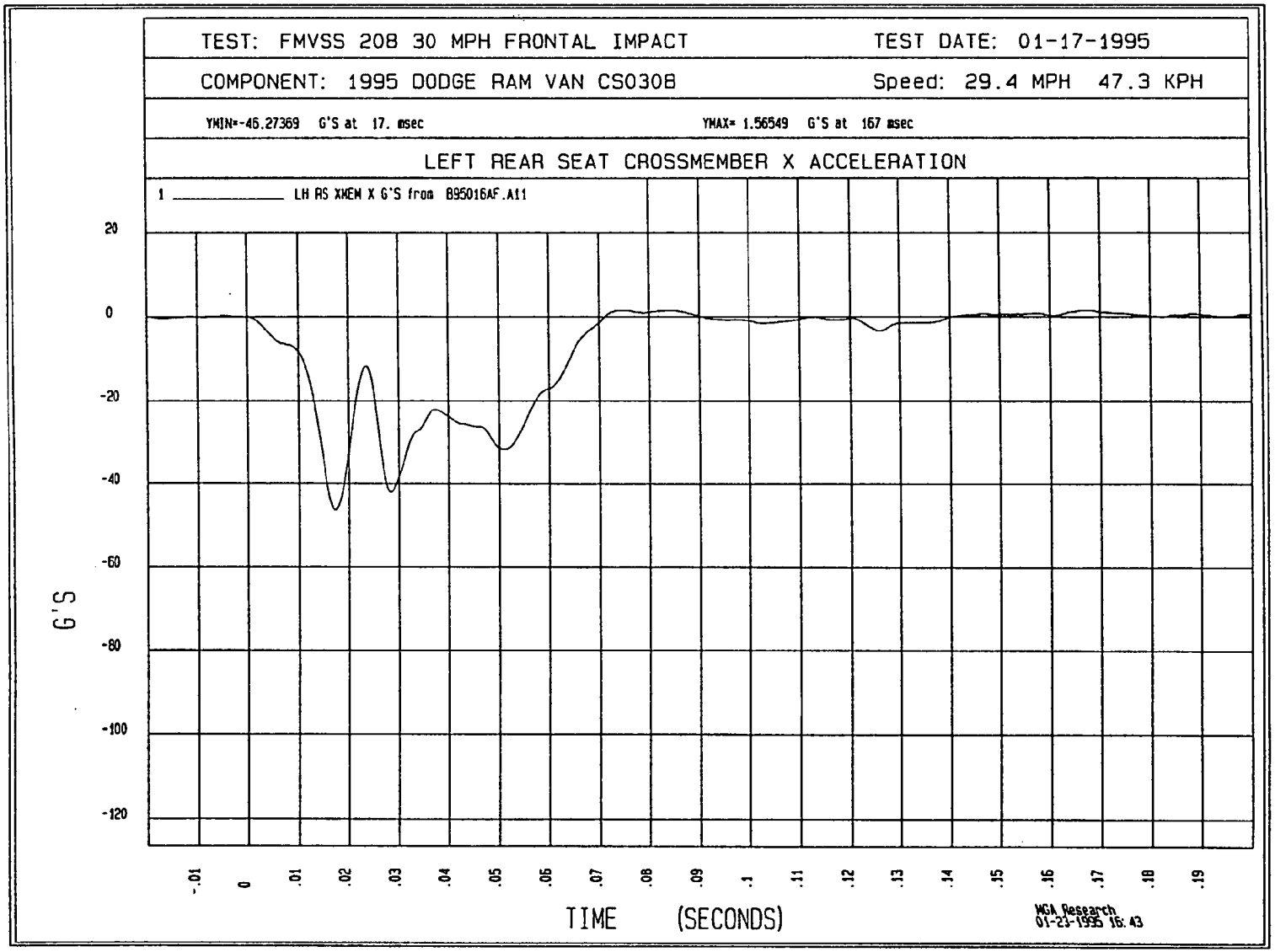


Figure B-26 - Left Rear Seat Crossmember X Acceleration vs. Time

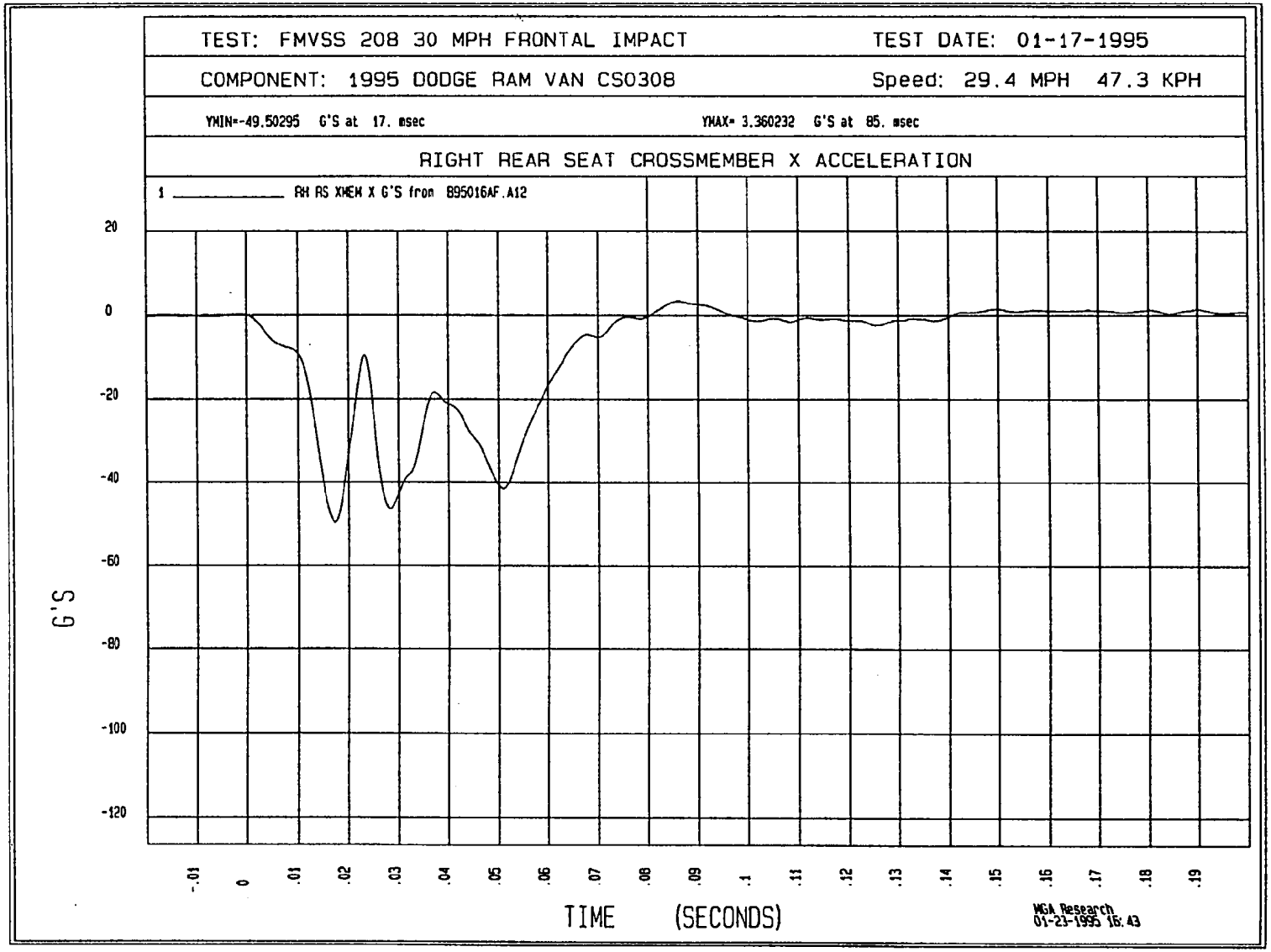


Figure B-27 - Right Rear Seat Crossmember X Acceleration vs. Time

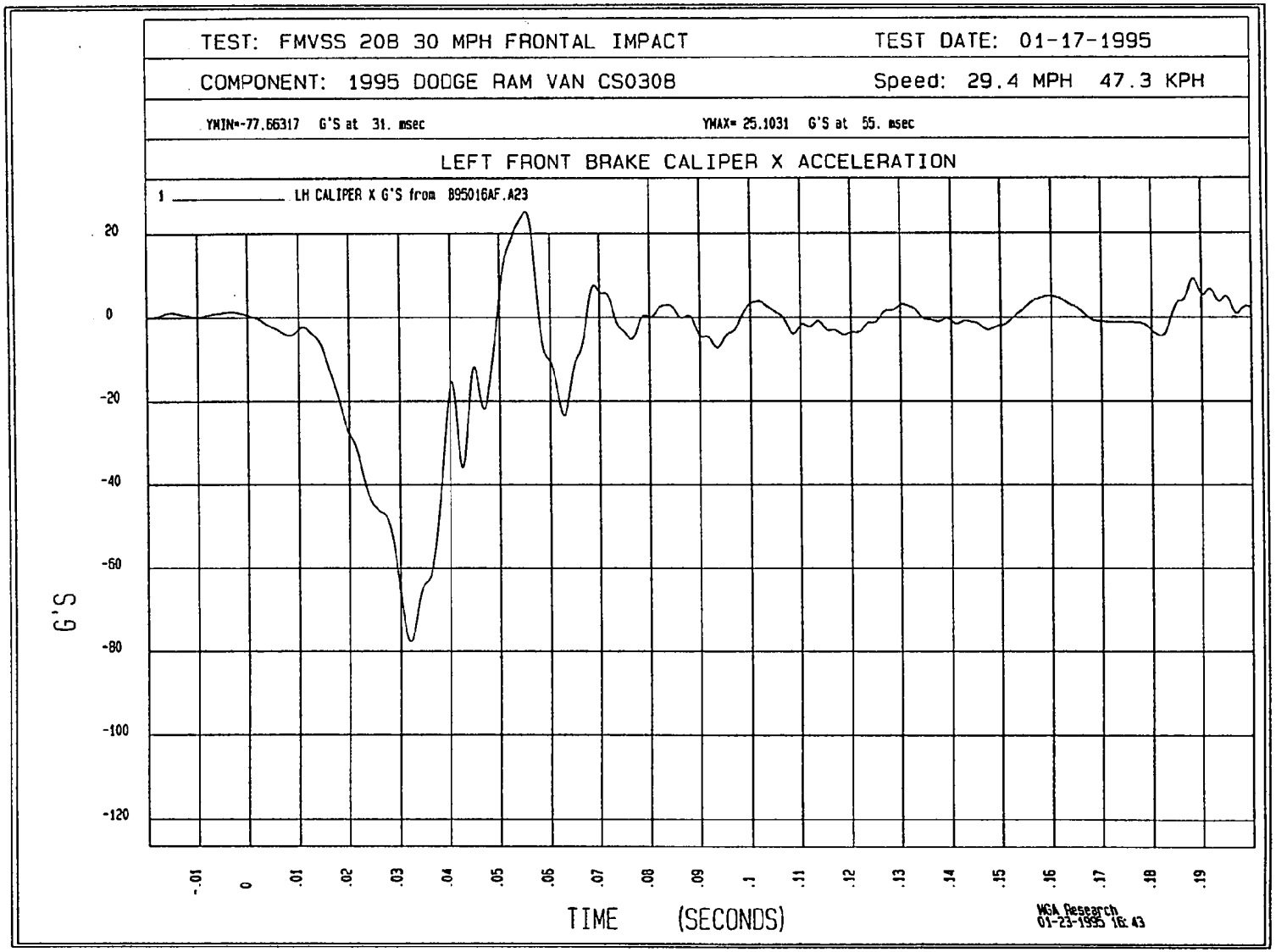


Figure B-28 - Left Brake Caliper X Acceleration vs. Time

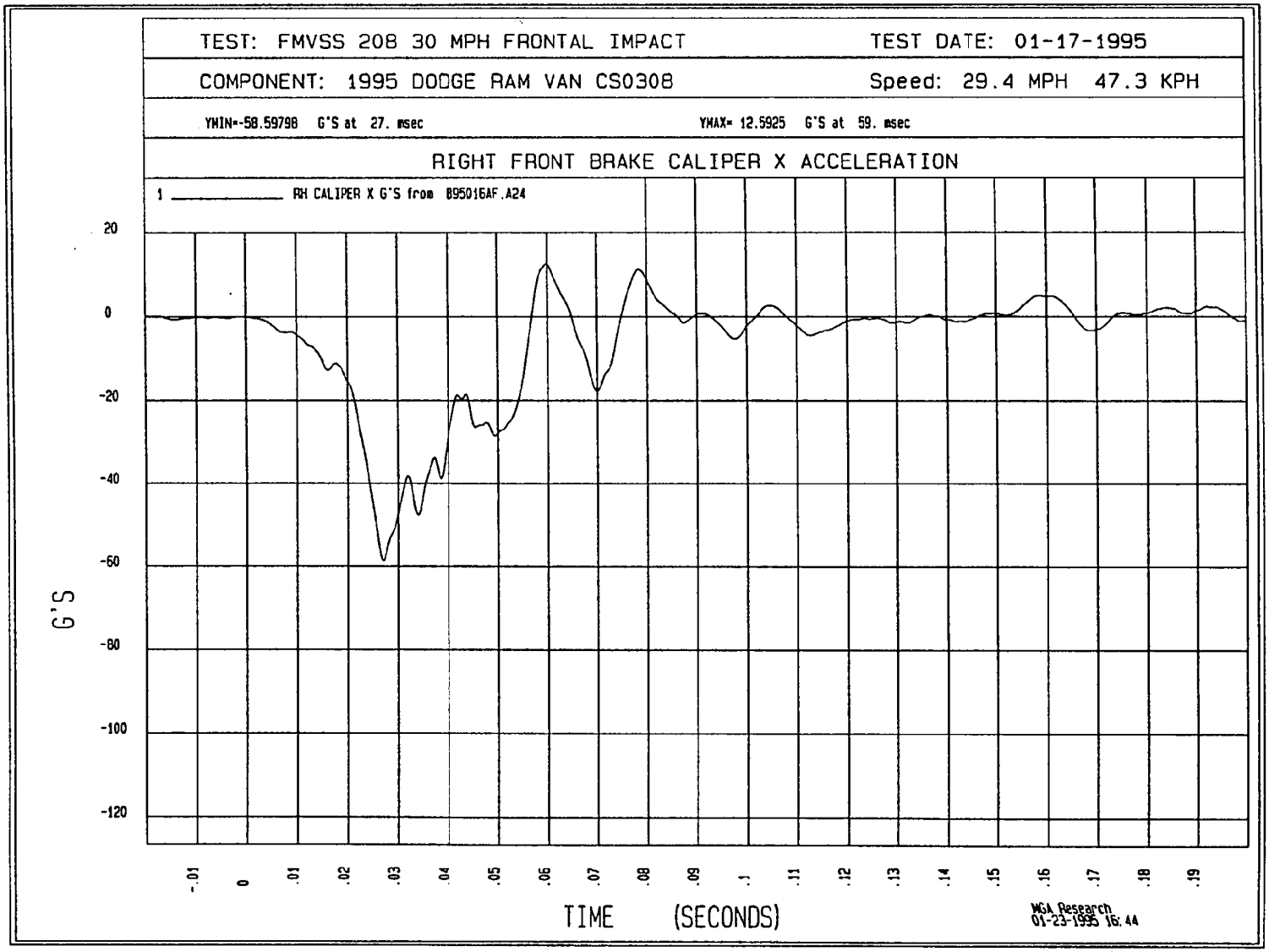


Figure B-29 - Right Brake Caliper X Acceleration vs. Time

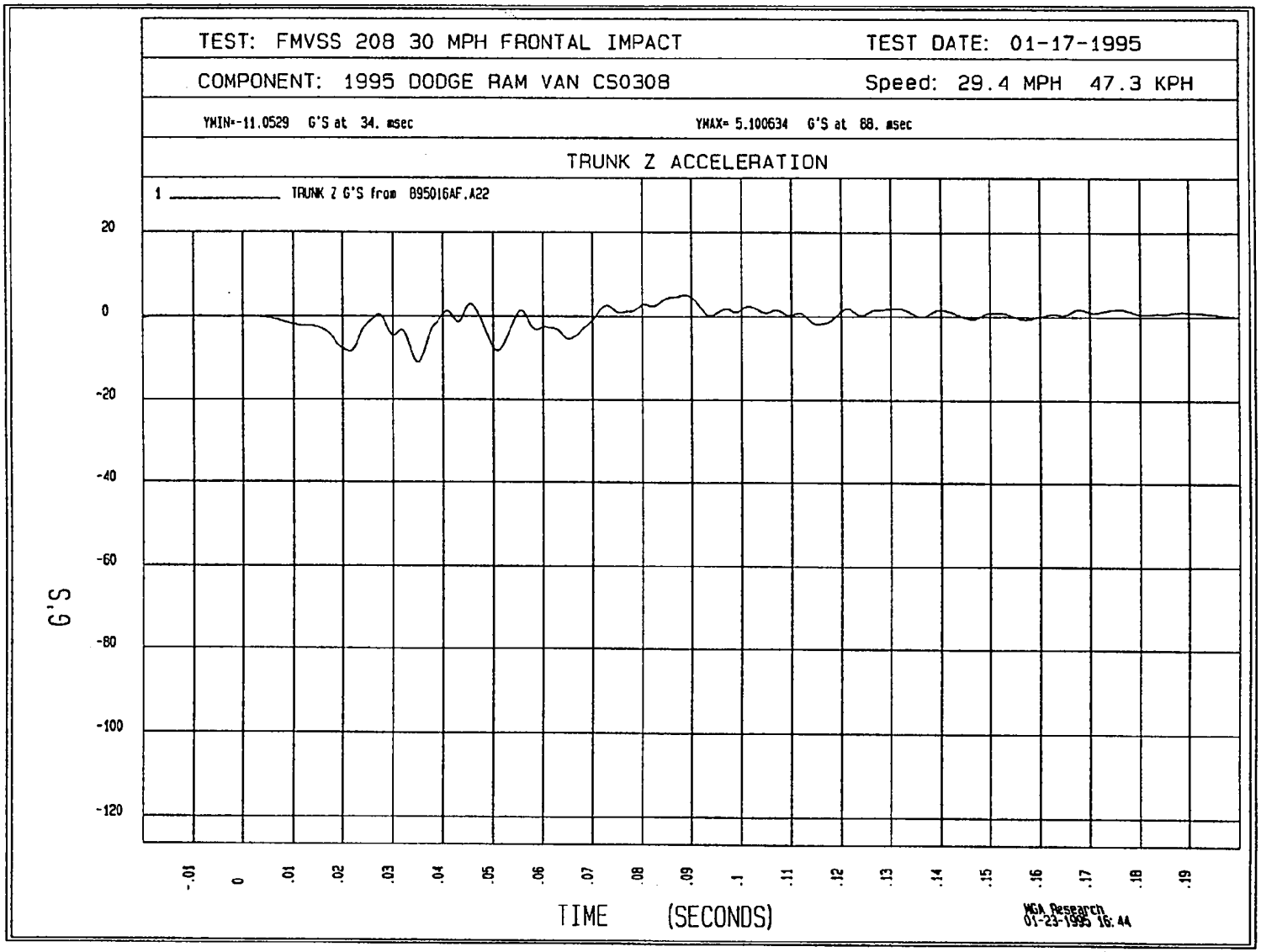


Figure B-3Ø - Trunk Floor Z Acceleration vs. Time

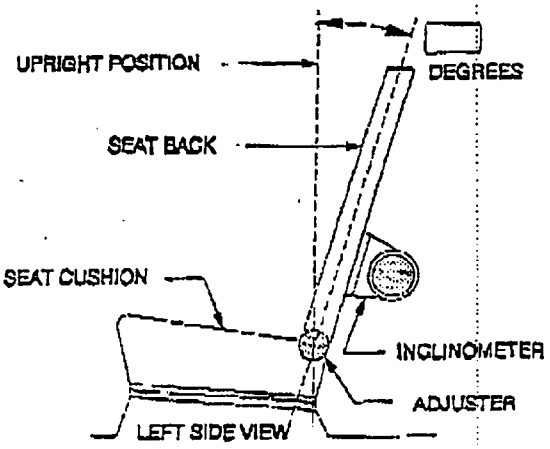
APPENDIX C
MANUFACTURER'S VEHICLE INFORMATION

FORM NO. 1

TEST VEHICLE INFORMATION

Vehicle Modal Year & Make: 1995 Dodge
Vehicle Model & Body Style: Ram Van (B-2500)

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.



Seat back angle for driver's seat = 20 degrees.
Measurement Instructions:
1) Lift the manual recliner handle to allow the seat back to rotate to the fully forward position.
2) Lower the manual recliner handle.
3) Pull rearward on the seat back until the recliner locks.

Seat back angle for passenger's seat = ___ degrees.
Measurement Instructions:
Same as above

2. SEAT FORE & AFT POSITIONS - -
Provide instructions for positioning the driver and front outboard passenger seat(s) in the center of fore and aft travel. For example, provide information to locate the detent in which the seat track is to be locked.

Positioning of the driver's seat:
Take seat to full forward position, then move seat rearward to the seventh (7th) locked position. The first notch (locked position) is "1".

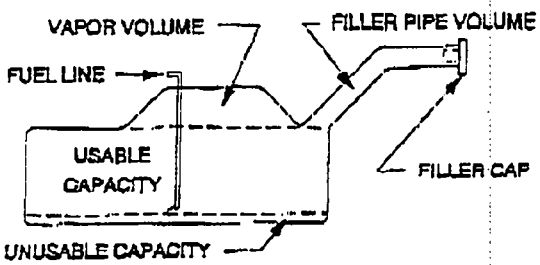
Positioning of the passenger's seat (if applicable):
Same as above.

3. FUEL TANK CAPACITY DATA - -

3.1 A. "Usable Capacity" of standard equipment fuel tank = N/A gallons

B. "Usable Capacity" of optional equipment fuel tank = 35 gallons.

C. Capacity used when certification testing to requirements of FMVSS 301 = 33.2 gallons.



VEHICLE FUEL TANK ASSEMBLY

Operational Instructions:
None

TEST VEHICLE INFORMATION

3.2 Amount of Stoddard solvent added to vehicle for certification test = 33.2 gallons

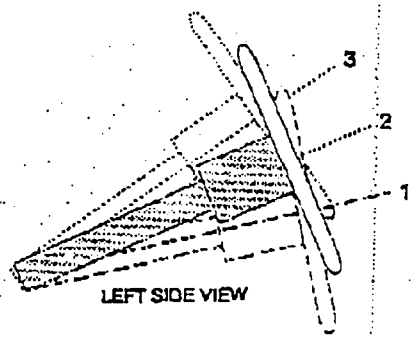
3.3 Is vehicle equipped with electric fuel pump? x YES ___ NO
If YES, does pump normally operate when vehicle's electrical system is activated? x YES ___ NO

FUEL PUMP WILL RUN IN EITHER THE "IGNITION START" OR "IGNITION RUN" KEY POSITIONS.
NOTE: PUMP STOPS IF ENGINE DOES NOT RUN FOR ONE SECOND.

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:
Not applicable



STEERING COLUMN ASSEMBLY