

V 2069

REPORT NO. 208-MGA-94-002
212-MGA-94-002
301-MGA-94-002

VEHICLE SAFETY COMPLIANCE TESTING
FOR
FMVSS 208, OCCUPANT CRASH PROTECTION
FMVSS 212, WINDSHIELD MOUNTING
FMVSS 301, FUEL SYSTEM INTEGRITY
FMVSS 219, WINDSHIELD INTRUSION (PARTIAL)

CHRYSLER CORPORATION
1995 DODGE NEON 4 DOOR SEDAN
NHTSA NO. CS0302

MGA PROVING GROUNDS
5000 WARREN ROAD
BURLINGTON, WI 53105



Test Date: May 03, 1994

Report Date: November 3, 1994

FINAL REPORT

Prepared For:

U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
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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 Dodge Neon 4 Door Sedan, NHTSA No. CS0302, 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-208-89 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 of which face was covered with a sheet of 3/4 inch thick plywood.

The test vehicle contained a Part 572 E 50th percentile adult male anthropomorphic test device (dummy) at the driver's seating position and a Part 572 B 50th percentile dummy at the right front passenger's seating position. The dummies were positioned in the front outboard designated seating positions according to the dummy placement procedures specified in Appendix B and 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. The Part 572 E dummy's instrumentation also included a chest potentiometer to measure longitudinal deflection.

The twenty-five (25) 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 May 3, 1994.

The test vehicle, a 1995 Dodge Neon 4 Door Sedan, NHTSA No. CS0302, 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 B and E dummies seated in the front outboard designated seating positions. For the Part 572 E dummy seated at the driver's seating position, 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 2778 pounds. The vehicle's impact speed was 29.5 mph. The vehicle's maximum static crush was 15.0 inches.

The driver's HIC was 551. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 47.6 g's. The driver's chest maximum deflection was 1.0 inches. The driver's left and right femur maximum compressive forces were 1257 pounds and 1268 pounds, respectively.

The right front passenger's HIC was 274. The right front passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 40.2 g's. The right front passenger's left and right femur maximum compressive forces were 1904 pounds and 1594 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 head and chest of the driver dummy were instrumented with three Endevco 7264-2000 accelerometers. The Endevco 7231C-750 accelerometers were required in the Laboratory Test Procedure No. TP-208-09.

The high-speed camera #13 (passenger dummy front view) and camera #14 (pit camera engine view) did not run during the test due to a wire cut and a feed-reel jamming.

TABLE 1 CRASH TEST SUMMARY

Vehicle Yr/Make/Model/Body Style: 1995/Dodge/Neon/4 Door Sedan

Vehicle NHTSA No.: CS0302 Test Type: Frontal Barrier Impact

Test Date: 05/03/94 Time: 15:54 Temp: 70°F

Vehicle Test Weight: 2778 lbs. Vehicle/Barrier Impact Angle: 0°

Impact Velocity: 29.5 mph Maximum Static Crush: 15.0 inches

Vehicle Rebound: 46.4 inches

Dummies:	Driver	Passenger
Dummy Type	<u>Part 572 E</u>	<u>Part 572 B</u>
Serial Number	<u>312</u>	<u>465</u>
Restraint System	<u>Airbag</u>	<u>Airbag</u>
No. of Data Channels	<u>9</u>	<u>8</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/Dodge/Neon/4 Door Sedan

NHTSA No: CS0302 VIN: 1B3ES47C4SD502336 Body Color: Flame Red

Engine: 4 Cylinders; C.I.D.; 2.0liters; 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; P/wdo; P/door locks;

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

Date Received: 03/21/94; Odometer Reading: 102 miles

Dealer's Name/Address: Stark Dodge Inc.
N83W15474 Appleton Avenue
Menomonee Falls, WI 53051

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured By: Chrysler Corporation

Date of Manufacture: 02/94; VIN: 1B3ES47C4SD502336

GVWR: 3463 lbs; GAWR Front: 1907 lbs. GAWR Rear: 1631 lbs.

DATA FROM TIRE PLACARD:

Tire Pressure with maximum capacity vehicle load: Front 32 Psi; Rear 32 Psi

Recommended Tire Size: P165/80R13

Recommended Cold Tire Pressure: Front 32 Psi; Rear 32 Psi

Tires on Vehicle: P185/65R14; Manufacturer: Goodyear

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 = 742 lbs Right Rear = 411 lbs
Left Front = 763 lbs Left Rear = 437 lbs
TOTAL FRONT WEIGHT = 1505 lbs (64.0% of Total Vehicle Weight)
TOTAL REAR WEIGHT = 848 lbs (36.0% of Total Vehicle Weight)
TOTAL UNLOADED DELIVERED WEIGHT (UDW) = 2353 lbs

CALCULATION FOR TARGET TEST WEIGHT:

UDW (Unloaded Delivered Weight) = 2353 lbs
VCW (Vehicle Capacity Weight) = 865 lbs
DSC (Designated Seating Capacity) = 5
RCLW*(Rated Cargo/Luggage Weight) = VCW - 150 (DSC) = 865 - 150 (5) = 115 lbs
Target Test Weight = UDW + RCLW + (2 dummies x dummy weight)
Target Test Weight = 2353 + 115 + 328 = 2796 lbs

WEIGHT OF TEST VEHICLE WITH REQUIRED DUMMIES AND CARGO WEIGHT:

Right Front = 835 lbs Right Rear = 547 lbs
Left Front = 837 lbs Left Rear = 559 lbs
TOTAL FRONT WEIGHT = 1672 lbs (60.2% of Total Vehicle Weight)
TOTAL REAR WEIGHT = 1106 lbs (39.8% of Total Vehicle Weight)
TOTAL TEST WEIGHT = 2778 lbs
Weight of ballast secured in vehicle = 0 lbs

Vehicle components removed to meet target weight: The rear seat back and cushion were removed to install the data acquisition boxes.

VEHICLE ATTITUDE (all dimensions in inches):

Delivered Attitude: RF 26.2 LF 26.1 RR 26.8 LR 26.7
Fully Loaded Attitude: RF 25.5 LF 25.4 RR 25.5 LR 25.5
Test Attitude: RF 25.5 LF 25.5 RR 25.5 LR 25.5
Wheel Base: 104.0 in; C.G. = 41.4 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: 05/03/94 Time: 15:54 Temperature: 70° F
Vehicle NHTSA No.: CS0302 VIN: 1B3ES47C4SD502336

BARRIER IMPACT VELOCITY

Required Impact Velocity Range: 28.9 to 29.9 mph

Impact Velocity: primary = 29.5 mph; secondary = 29.6 mph

Distance From Front Bumper to Barrier Face When

Entering Speed Trap: 55.1 inches

Exiting Speed Trap: 15.7 inches

VEHICLE STATIC CRUSH AND REBOUND (inches):

Vehicle Length:	Pre-test	= R <u>163.2</u>	C _L <u>171.0</u>	L <u>163.5</u>
	Post-test	= R <u>149.3</u>	C _L <u>156.0</u>	L <u>152.0</u>
	Crush	= R <u>13.9</u>	C _L <u>15.0</u>	L <u>11.5</u>
	Average	= <u>13.5</u>		

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

R 43.9 in C_L 46.4 in L 41.3 in

TABLE 4 ACCIDENT INVESTIGATION DIVISION DATA

Vehicle Year/Make/Model/Body Style: 1995/Dodge/Neon/4 Door Sedan
 Veh. NHTSA No.: CS0302 ; VIN: 1B3ES47C4SD502336
 Build Date: 02/94 ; Test Date: 05/03/94
 Veh. Size Category: Compact Size ; Test Weight: 2778 lbs
 Veh. Wheelbase: 104.0 in; Front Overhang: 33.4 in; Overall Width: 67.8 in

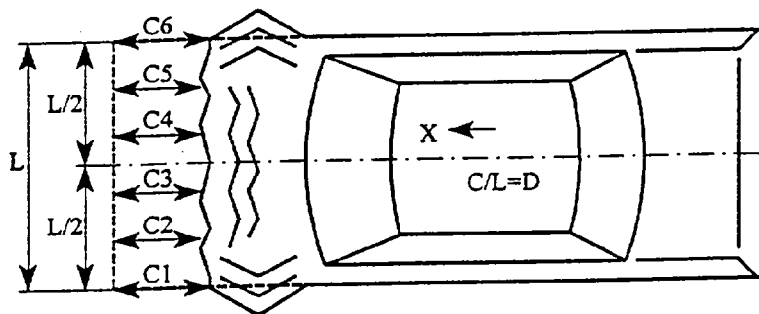
ACCELEROMETER DATA:

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 = 11.5 inches
 Dimensions: C2 = 13.9 inches
 C3 = 15.0 inches
 C4 = 15.0 inches
 C5 = 14.4 inches
 C6 = 13.9 inches



Midpoint of D = Vehicle Longitudinal Centerline
 Damage:

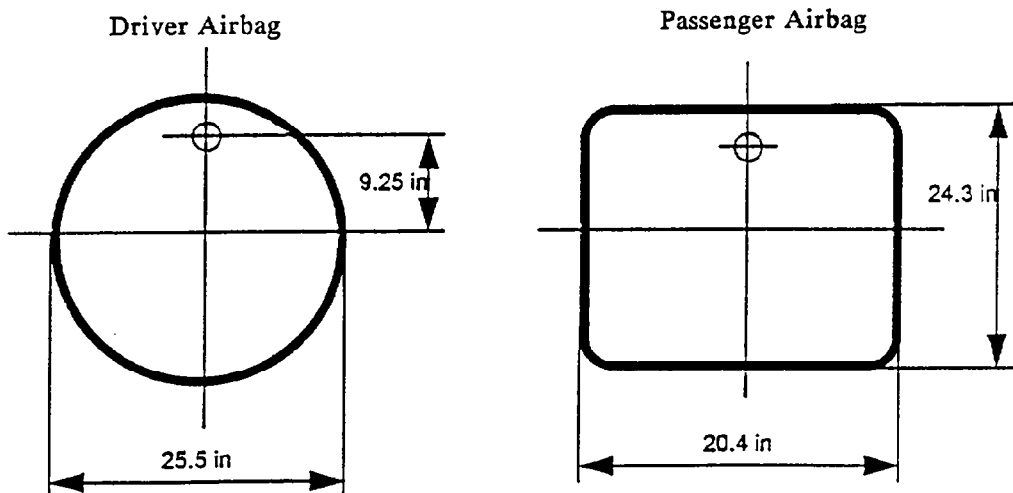
Length of L = 57.9 inches
 Damaged Region:

TABLE 5 POST TEST AIRBAG DATA

Vehicle Year/Make/Model/Body Style: 1995/Dodge/Neon/4 Door Sedan

NHTSA No: CS0302; Test Date: 05/03/94; Technician: Rick Goodfriend

- A. No of Vent Holes: Driver 1; Passenger 1
- B. Size of Vent Holes: Driver 1.0 in. dia; Passenger 2.0 in. dia
- C. Total Vent Area: Driver 0.79 in²; Passenger 3.14 in²
- D. Deflated Airbag Length and Width Dimensions or, if Round, Diameter
 Driver; Length in; Width in; Diameter 25.5 in
 Passenger; Length 24.3 in; Width 20.4 in; Diameter in
- E. Is the Airbag Tethered?
 Driver; X Yes; No; if yes, record length of tether 10 in
 Passenger; X Yes; No; if yes, record length of tether 14 in



There were four (4) tethers in each 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.

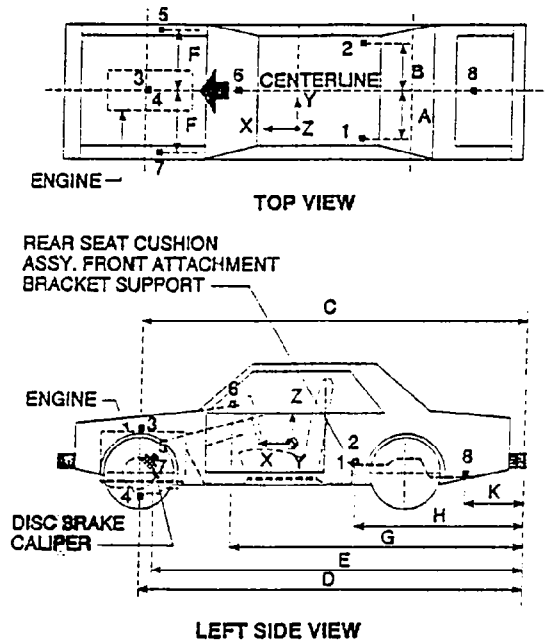
- F. Part Numbers and Manufacture Name of Airbag and Gas Generator
 Driver; Mfr N/A; Airbag 008468R; Gen 01229411
 Passenger; Mfr N/A; Airbag 2000707G; Gen 2000798A

TABLE 6 VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY

Vehicle Year/Make/Model/Body Style: 1995/Dodge/Neon/4 Door Sedan

Vehicle NHTSA No.: CS0302;

Test Date: 05/03/94



ACCELEROMETER LOCATION (inches)		
	PRE-TEST	POST-TEST
A	13.0	13.0
B	12.7	12.7
C	143.6	140.3
D	145.0	139.1
E	140.0	136.3
F	26.8	24.0
G	114.5	112.6
H	63.4	63.4
K	12.0	12.0

ACCELEROMETER DATA SUMMARY					
No.	DESCRIPTION	MAXIMUM (g's)	TIME (msec)	MINIMUM (g's)	TIME (msec)
1	Left Rear Seat Crossmember	1.0	182	-34.1	40
2	Right Rear Seat Crossmember	3.0	93	-33.2	41
3	Top of Engine Block	41.3	46	-123.4	33
4	Bottom of Engine	74.4	36	-149.8	25
5	Right Disc Brake Caliper	42.5	68	-94.1	50
6	Instrument Panel	11.4	58	-53.7	44
7	Left Disc Brake Caliper	19.7	77	-71.0	43
8	Trunk	19.8	38	-12.9	78

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. The vehicle was again inspected after the above test had been conducted, and all changes were noted below. The final condition of the vehicle was also noted in detail.

Vehicle Year/Make/Model/Body Style: 1995/Dodge/Neon/4 Door Sedan

Vehicle NHTSA No.: CS0302 Body Color: Flame Red

VIN: 1B3ES47C4SD502336 Cost: \$12,120.00

Odometer: Arrival Date: 3/21/94 Reading: 102 miles

Completion Date: 5/03/94 Reading: 105 miles

Engine: 4 Cylinders; 2.0 Liters; X Gas; Diesel

Transmission: 5 Speed; X Manual; Automatic

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

Tire Size: P185/65R14; Manufacturer: Goodyear

Air Conditioner	<u>Yes</u>	Console	<u>Yes</u>	Brakes	<u>Power</u>
Tinted Glass	<u>Yes</u>	Tachometer	<u>No</u>	Front	<u>Disc</u>
Power Steering	<u>Yes</u>	Cruise Control	<u>No</u>	Rear	<u>Drum</u>
Power Windows	<u>No</u>	Rear Window Def.	<u>Yes</u>	Front Seats	<u>Manuel</u>
Power Door Locks	<u>No</u>	Sun/Moon Roof	<u>No</u>	Seat Type	Front <u>Bucket</u>
Radio	<u>Yes</u>	T-Top	<u>No</u>		Rear <u>Bench</u>
Clock	<u>Yes</u>	Tilt Steering Wheel	<u>No</u>	No. of Seats	<u>3</u>
Roof Rack	<u>No</u>	Other Options:	<u>No</u>		

TABLE 7 REPORT OF VEHICLE CONDITION AT THE COMPLETION OF TESTING, (Cont'd)

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

Rear Seat

Spare Tire

Trunk Trim

Explanation: Items removed to allow installation of data acquisition system and to reduce test weight.

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 trim and body parts including rear seats 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/Neon/4 Door Sedan

Veh. NHTSA No.: CS0302 Test Date: 05/03/94

MAXIMUM ACCELERATION VALUES: (g's)	DRIVER DUMMY #312	PASSENGER DUMMY #465
Head Channel X	-61.4	-45.1
Head Channel Y	-6.1	-6.3
Head Channel Z	-27.3	27.9
HEAD RESULTANT	61.7	47.3
Chest Channel X	-47.8	-40.1
Chest Channel Y	-5.6	-5.0
Chest Channel Z	7.8	16.0
CHEST RESULTANT	48.1	40.9

HEAD INJURY CRITERIA (HIC) VALUES:

HIC	551.2	273.5
t ₁ = (msec)	64.6	64.3
t ₂ = (msec)	99.8	100.3

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

CHEST INJURY CRITERIA VALUES:

CLIP (g's)	47.6	40.2
t ¹ = (msec)	74.1	73.6
t ² = (msec)	77.1	76.5
CHEST DEFLECTION (in)	1.0	N/A

MAX. COMPRESSIVE FEMUR FORCES: (lbs)

Right Side	1268	1594
Left Side	1257	1904

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/Dodge/Neon/4 Door Sedan
NHTSA No.: CS0302; Date of Comfort/Convenience Check: 05/02/94
Technician Performing Check: Homyoung Kim
GVWR: 3463 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 0.2 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 does not serve as 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/Dodge/Neon/4 Door Sedan

Vehicle NHTSA No.: CS0302 Date of Check: 05/02/94

Technician Performing Check: Rick Goodfriend

GVWR: 3463 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 ignition switch placed in the "start/on" position the duration of audible warning signal and the reminder light were 6.9 and 6.2 seconds, respectively.

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 second and the duration of the remainder light operation was 6.2 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 on the inner glove box door.

No airbag maintenance was required.

Appropriate instructions concerning maintenance and/or replacement of this system were provided in the owner's manual on pages 23-24.

A description of the functional operation of the system was provided in the owner's manual on pages 20-21.

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 18-24.

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 middle right side 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 pages 19-20.

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

Vehicle Year/Make/Model/Body Style: 1995/Dodge/Neon/4 Door Sedan

Vehicle NHTSA No.: CS0302

Test Date: 05/03/94

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

Plastic trim with glue retention

CLIPS OR BRACKETS USED TO RETAIN WINDSHIELD: None

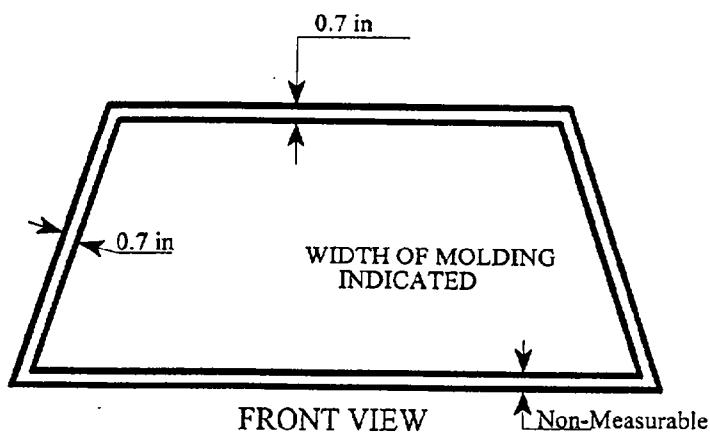
FMVSS 212 REQUIREMENTS:

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	81.4	81.4	100%
LEFT SIDE	81.4	81.4	100%
TOTAL	162.8	162.8	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/Neon/4 Door Sedan

Vehicle NHTSA No.: CS0302

Test Date: 05/03/94

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= 41.6 in

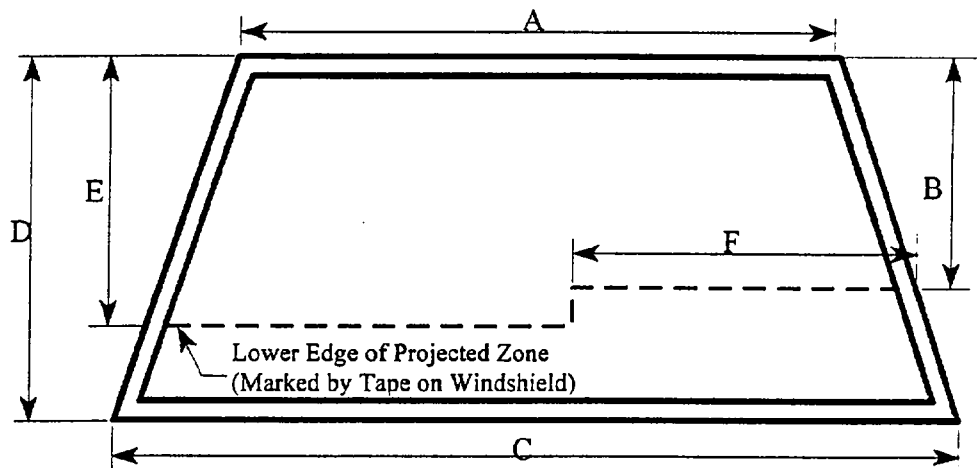
B= 18.9 in

C= 62.3 in

D= 28.0 in

E= 20.3 in

F= 22.3 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/Neon/4 Door Sedan

Vehicle NHTSA No.: CS0302 Test Date: 05/03/94

Fuel System Capacity from Owner's Manual = 11 gallons

Usable Capacity Figure Furnished by COTR = 11.2 gallons

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

= 10.3 to 10.5 gallons

Actual Test Volume = 10.4 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"?

 Yes; X No

Details of Fuel System:

The fuel tank was located in front of the rear axle. The fuel filler pipe was located on the right side.

The fuel lines ran along the right side to the front.

TABLE 15 FMVSS 301 POST IMPACT TEST DATA

Vehicle Year/Make/Model/Body Style: 1995/Dodge/Neon/4 Door Sedan

Vehicle NHTSA No.: CS0302 Test Date: 05/03/94

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

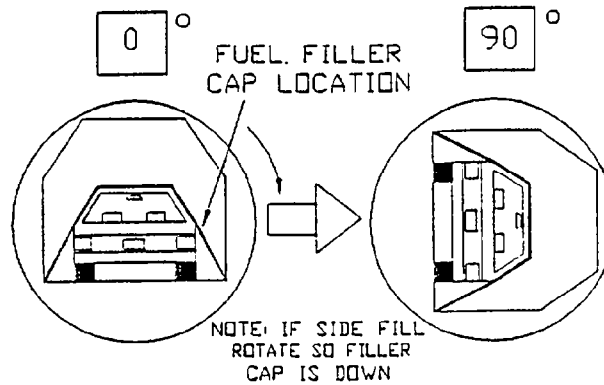
FUEL SPILLAGE LOCATION(S): None

TABLE 16 FMVSS 301 STATIC ROLLOVER TEST DATA

Vehicle Year/Make/Model/Body Style: 1995/Dodge/Neon/4 Door Sedan

Vehicle NHTSA No.: CS0302 Test Date: 05/03/94

TEST PHASE: 0° - 90°



DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time = 2 minutes 50 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds
TOTAL TIME = 7 minutes 50 seconds
Next Whole Minute Interval = 8 minutes

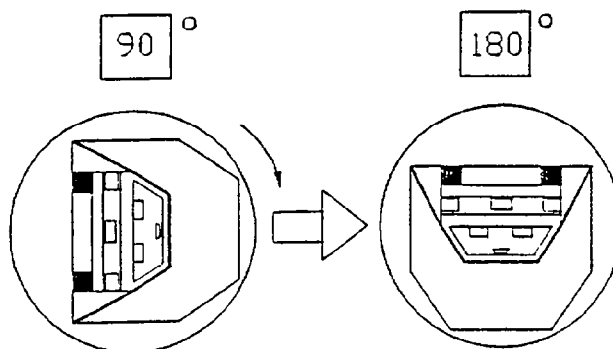
FUEL SPILLAGE MEASUREMENT:

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 37 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 37 seconds

Next Whole Minute Interval = 8 minutes

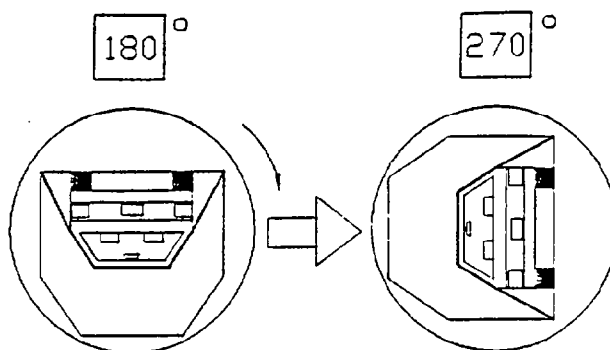
FUEL SPILLAGE MEASUREMENT:

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 10 seconds
(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 10 seconds

Next Whole Minute Interval = 8 minutes

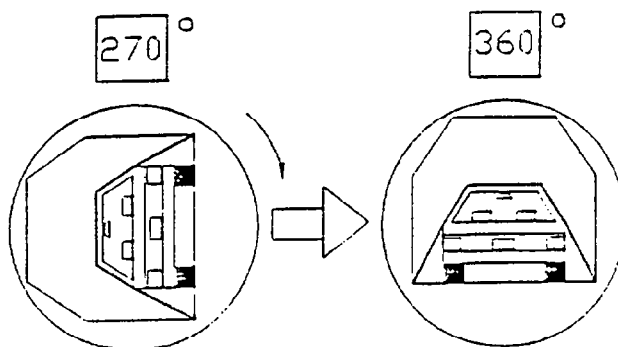
FUEL SPILLAGE MEASUREMENT:

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 40 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time = 5 minutes 0 seconds

TOTAL TIME = 7 minutes 40 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/Dodge/Neon/4 Door Sedan

Vehicle NHTSA No.: CS0302 Test Date: 05/03/94

NOMINAL DESIGN RIDING POSITION:

Driver Seat: Seat Back Angle = 24.0°
The seat back angle was adjustable and was positioned 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 23 detents and was positioned at the 12th notch rearward from the foremost position.

Passenger Seat: Same as driver's seat.

STEERING COLUMN ADJUSTMENTS:

The steering column was not adjustable. The steering column angle was 21.7° .

FIGURE 1 DUMMY MEASUREMENT LOCATIONS FOR FRONT SEAT OCCUPANTS

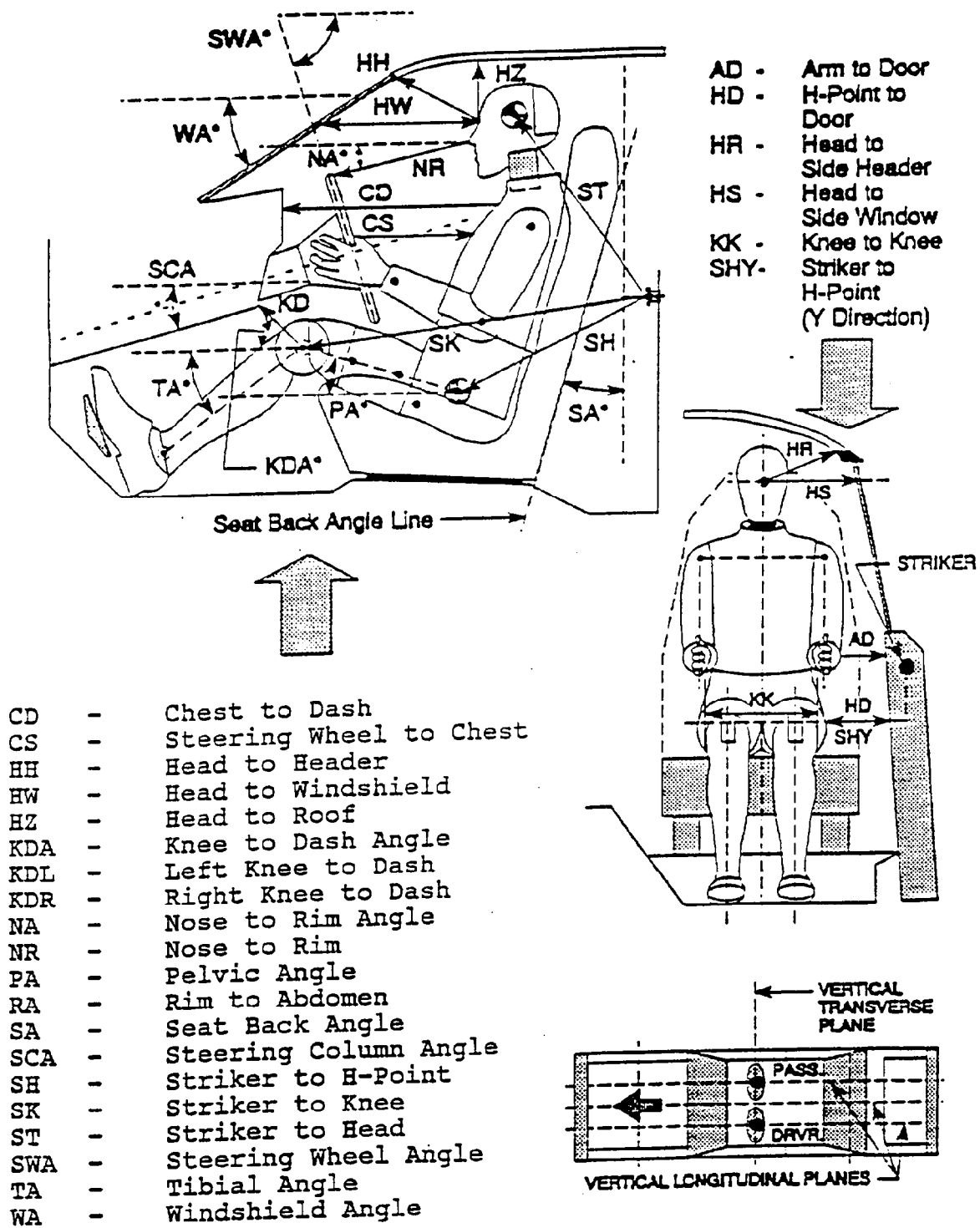


TABLE 18 DUMMY MEASUREMENT DATA FOR FRONT SEAT OCCUPANTS

Vehicle Year/Make/Model/Body Style: 1995/Dodge/Neon/4 Door Sedan

Vehicle NHTSA No.: CS0302 Test Date: 05/03/94

	DRIVER (Serial #312)	PASSENGER (Serial #465)
WA°	27.9°	
SWA°	68.0°	N/A
SCA°	21.7°	N/A
SA°	24.0°	24.0°
HZ	7.3 in	6.8 in
HH	13.3 in	14.1 in
HW	22.0 in	21.1 in
HR	8.4 in	7.4 in
NR	15.3 in	N/A
CD	20.8 in	20.4 in
CS	11.8 in	N/A
RA	7.0 in	N/A
KDL	5.1 in Angle (KDA) 26.6°	5.9 in
KDR	5.0 in	6.3 in Angle (KDA) 30.5°
PA°	24.0°	18.0°
TA°	43.3°	46.8°
KK	14.0 in	11.5 in
ST	21.6 in Angle 6.2°	21.6 in Angle 3.8°
SK	22.8 in Angle 3.7°	21.1 in Angle 1.4°
SH	9.1 in Angle 25.8°	7.6 in Angle 25.5°
SHY	8.8 in	8.5 in
HS	11.1 in	11.0 in
HD	4.3 in	4.1 in
AD	3.1 in	3.4 in

N/A = Not Applicable

FIGURE 2 VEHICLE TARGET LOCATIONS

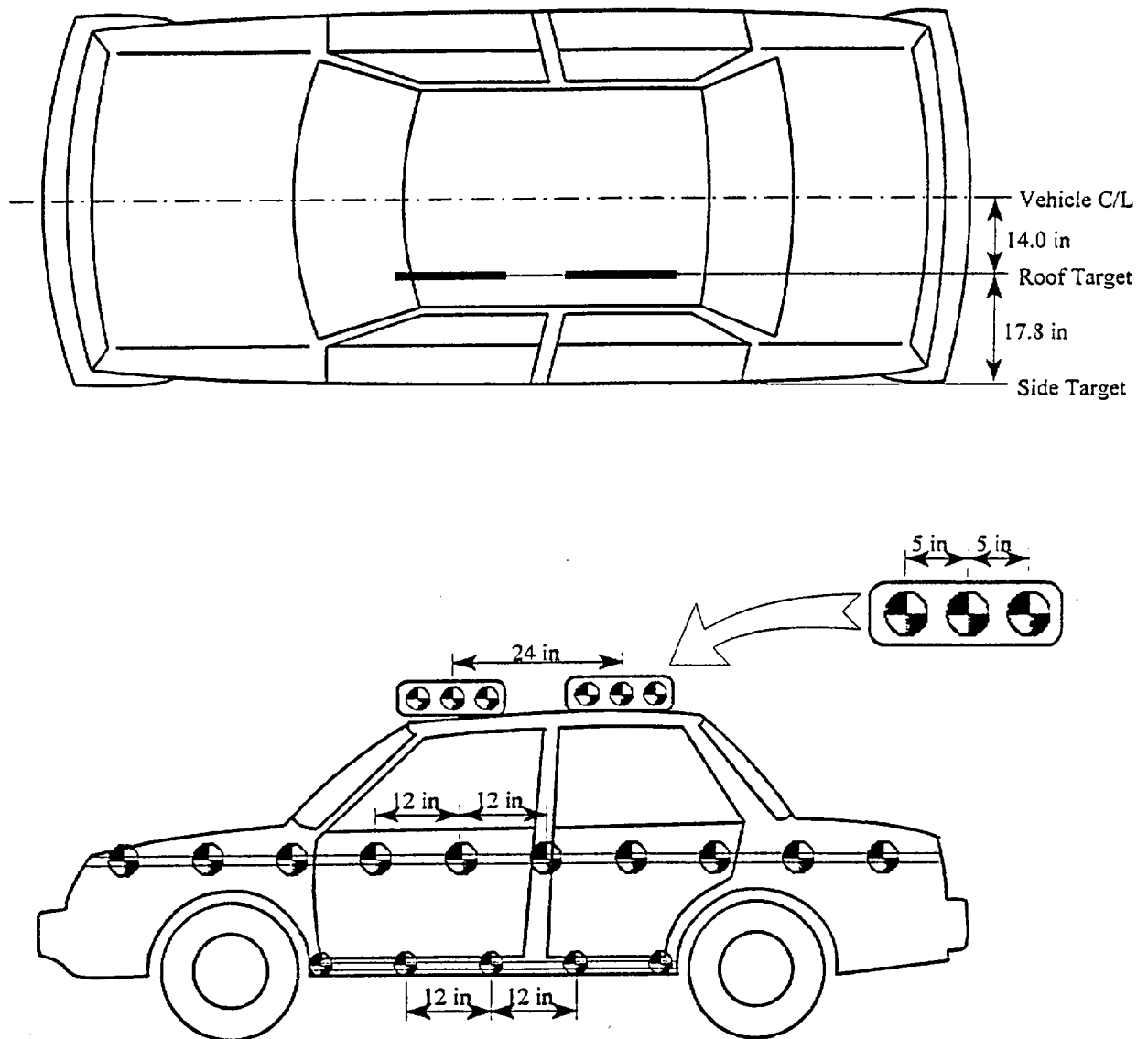


FIGURE 3 CAMERA POSITIONS

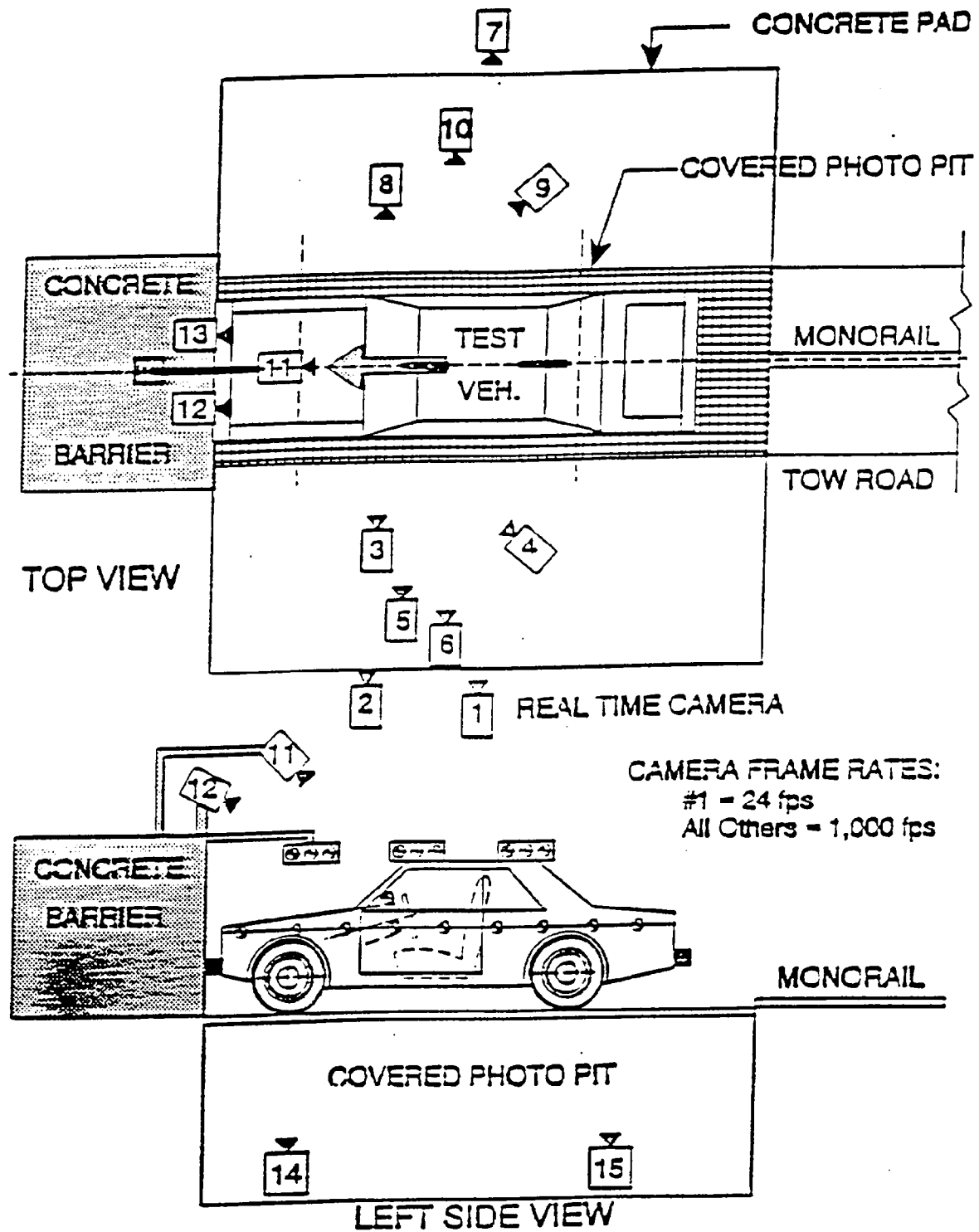


TABLE 19 CAMERA LOCATIONS

Veh. Year/Make/Model/Body Style: 1995/Dodge/Neon/4 Door Sedan

Vehicle NHTSA No.: CS0302 ; Test Date: 05/03/94

	VIEW	CAMERA POSITIONS (inches)*			ANGLE (deg)	FILM PLANE TO HEAD TARGET	LENS (mm)	SPEED (fps)
		X	Y	Z				
1	Real-Time Left Side View						10	24
2	Left Vehicle Crush	40.2	285.8	44.3	90	271.8	25	1015
3	Left Windshield Intrusion	62.6	239.8	42.9	90	225.8	35	1010
4	Left Driver Kinematics	163.8	176.4	83.5	50		35	800
5	Left Steering Column Motion	76.8	301.2	61.8	90	287.2	25	897
6	Left Steering Column Motion	76.8	301.2	40.9	90	287.2	25	1010
7	Right Overall View	88.2	-272.8	42.9	90	258.8	13	1149
8	Right Vehicle Crush	34.6	-282.7	69.3	90	268.7	25	1015
9	Right Windshield Intrusion	57.5	-210.2	40.2	90	196.2	35	985
10	Right Passenger Kinematics	207.1	-248.4	83.9	50		50	1020
11	Front View Windshield	15.6	0	173.8			13	1149
12	Front View Driver	-8.3	14.2	92.8			17	810
13	Front View Passenger	-6.9	-14.2	95.5			13	N/A**
14	Pit Camera Engine View	51.6	0	-121.3			13	N/A**
15	Pit Camera Fuel Tank View	59.8	0	-123.2			13	962

- * +X = Film plane rearward of barrier
 +Y = Film plane to left of monorail centerline
 +Z = Film plane to above ground level
- ** Camera #13 and #14 did not run during test.

APPENDIX A
PHOTOGRAPHS

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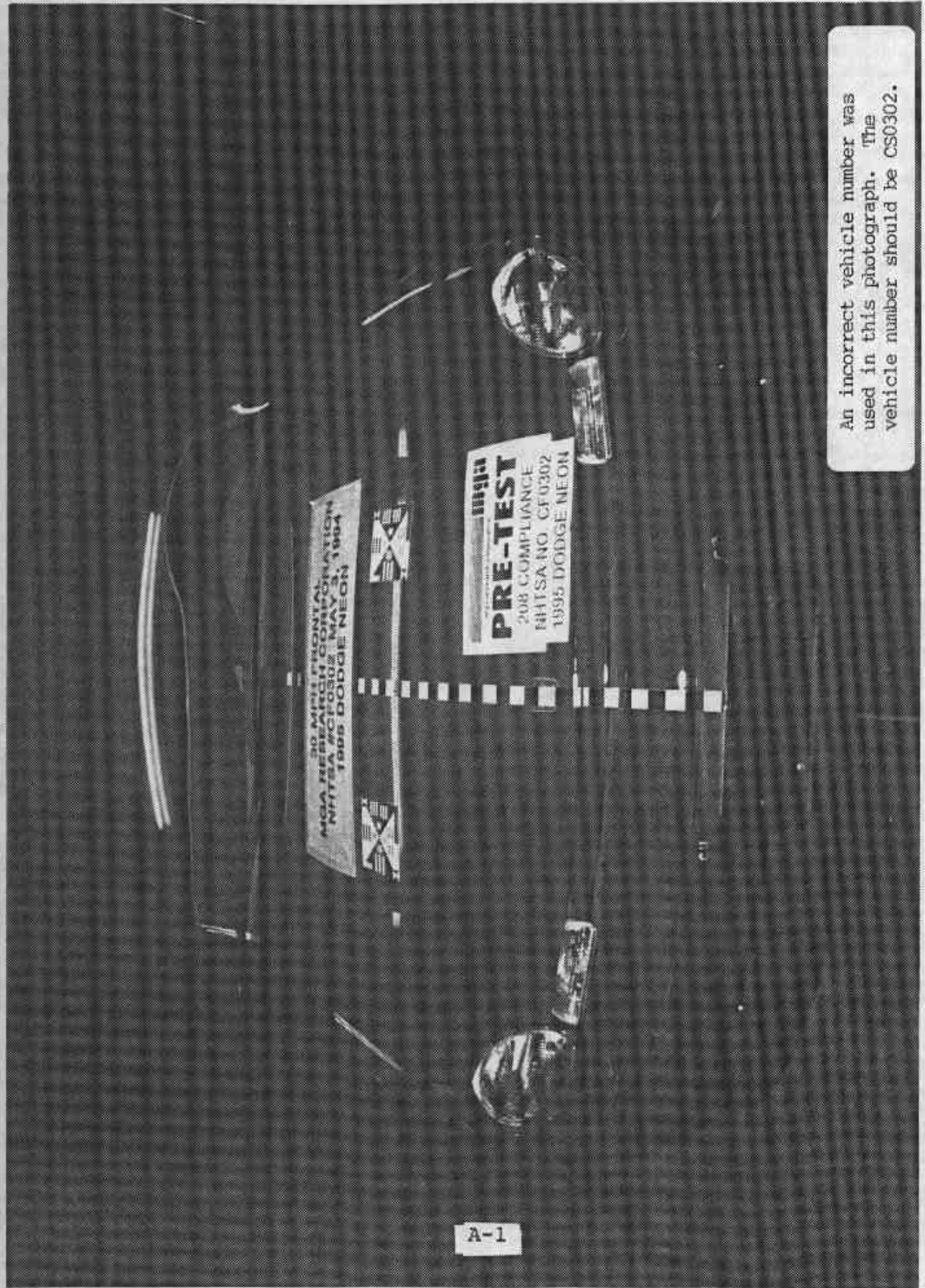


Photo No. A-1 - Pre-Test Front View



An incorrect vehicle number was used in this photograph. The vehicle number should be CPO302.

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

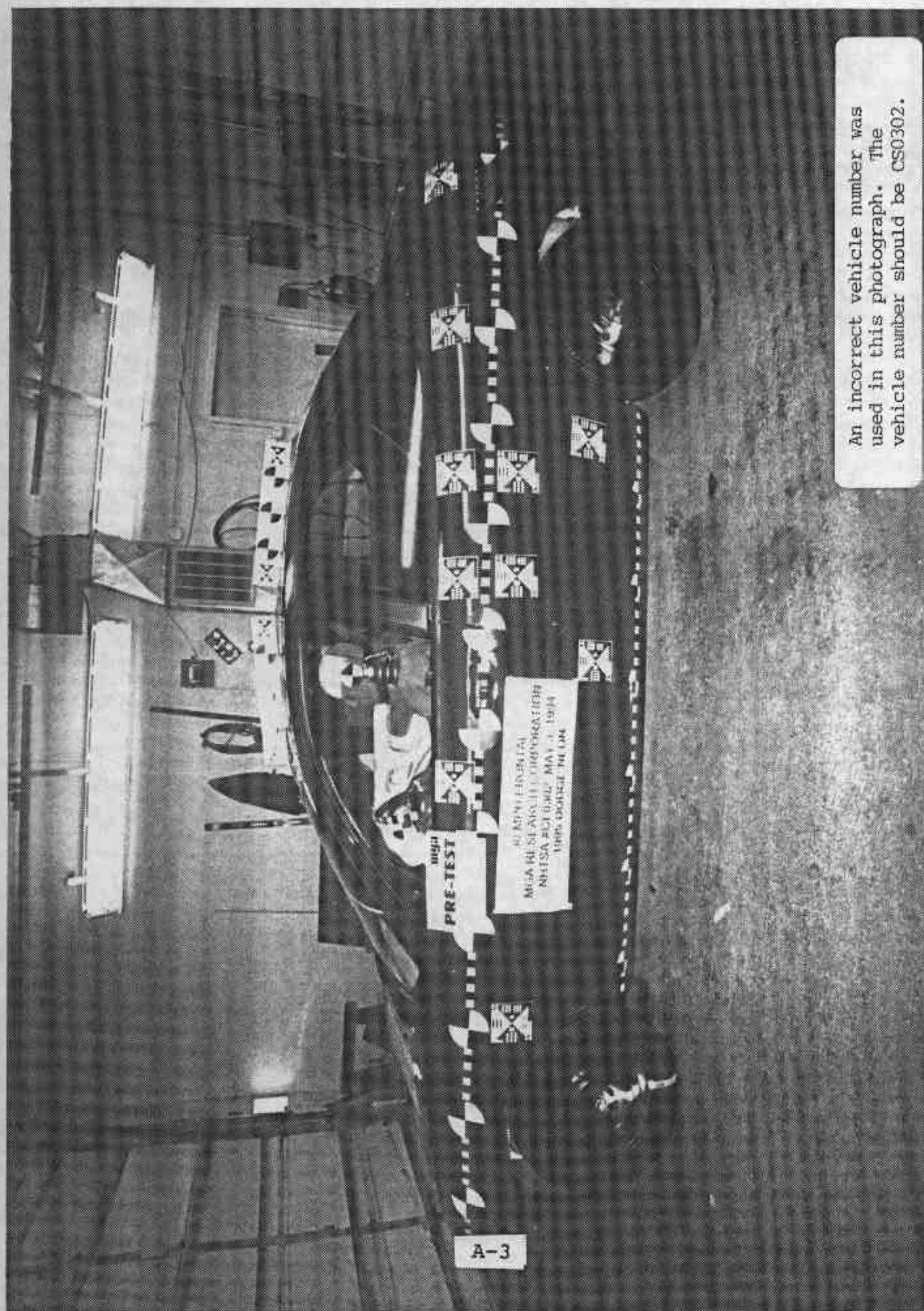
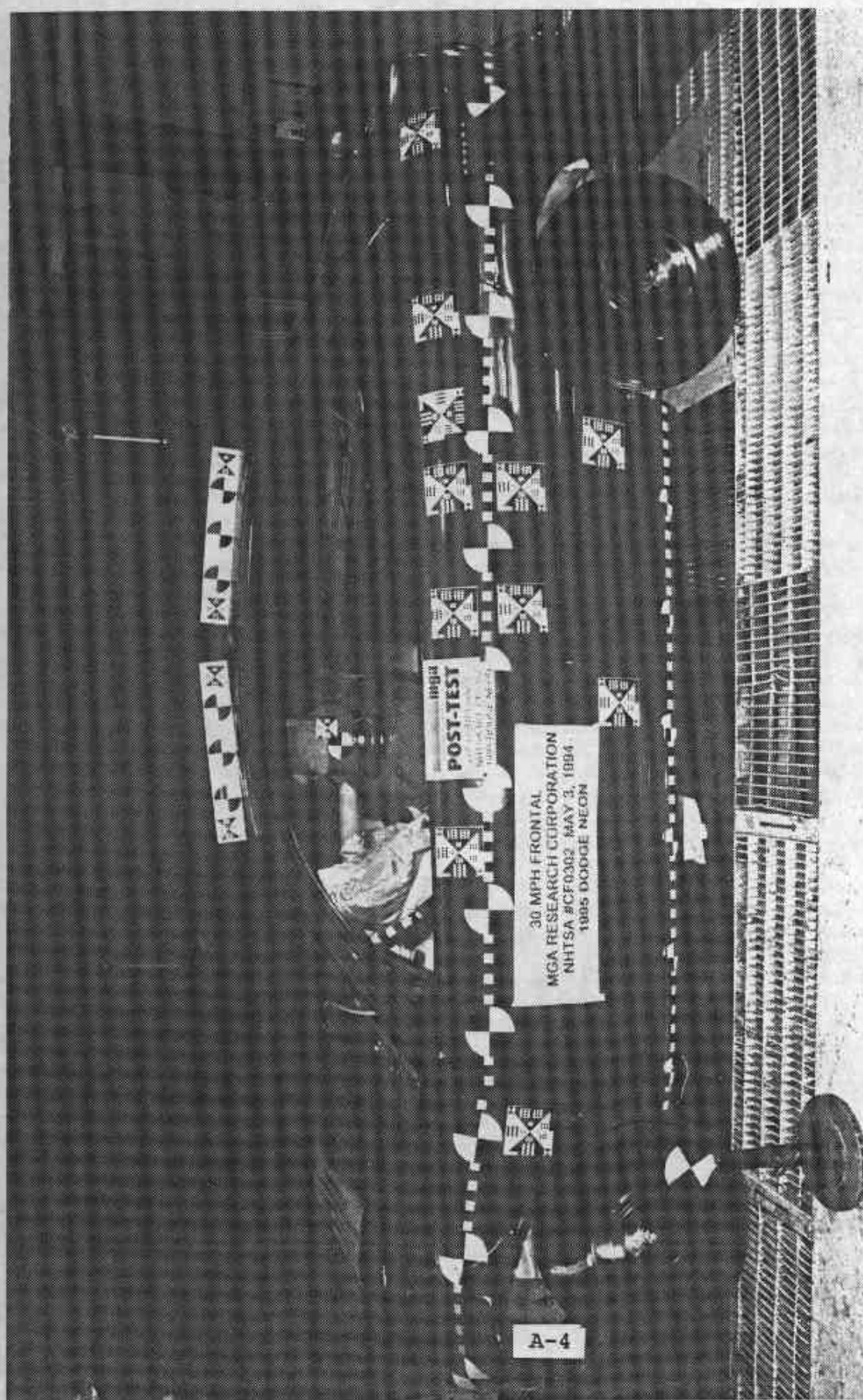


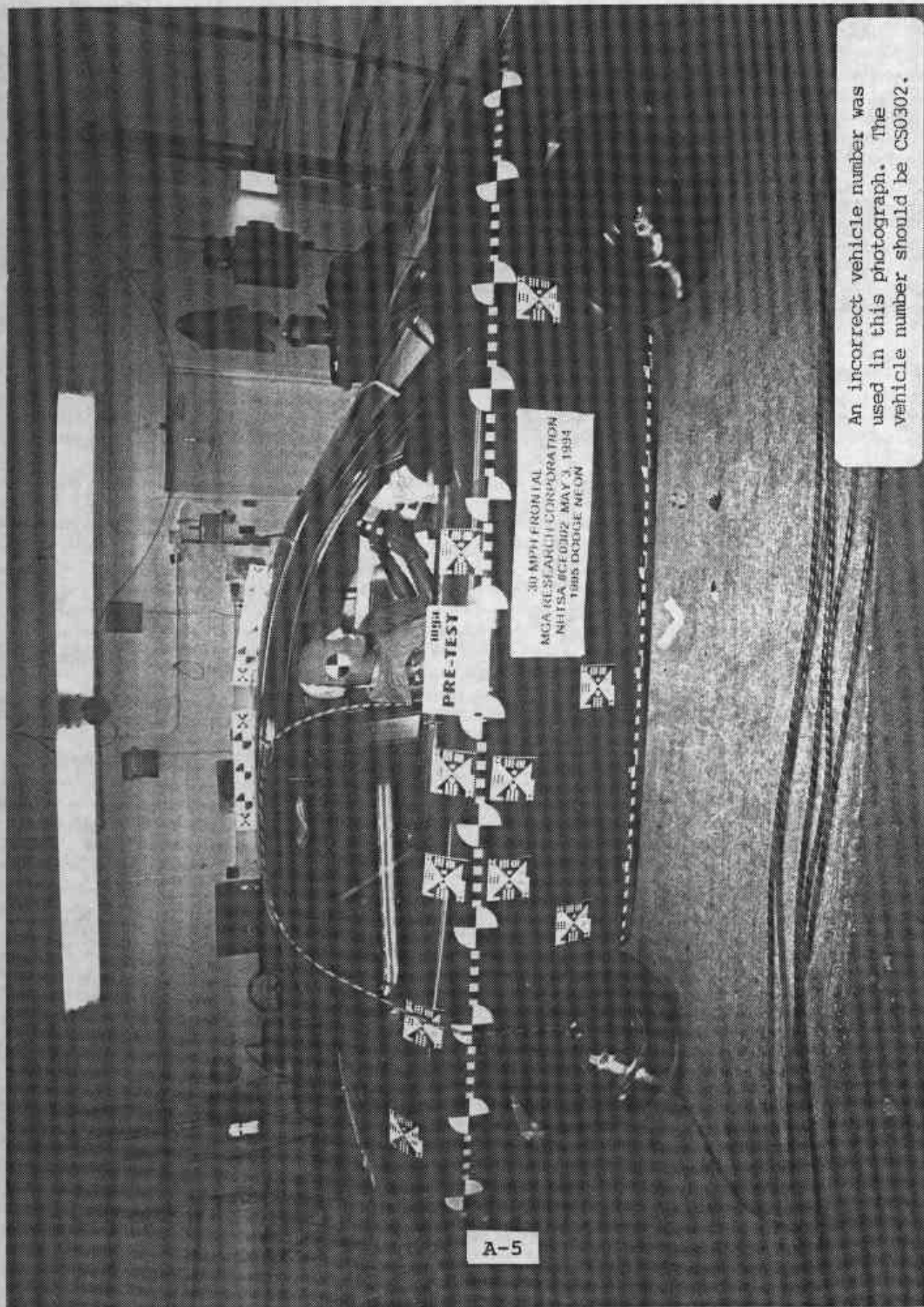
Photo No. A-3 - Pre-Test Left Side View



An incorrect vehicle number was used in this photograph. The vehicle number should be CS0302.

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

A-4



An incorrect vehicle number was used in this photograph. The vehicle number should be CS0302.

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

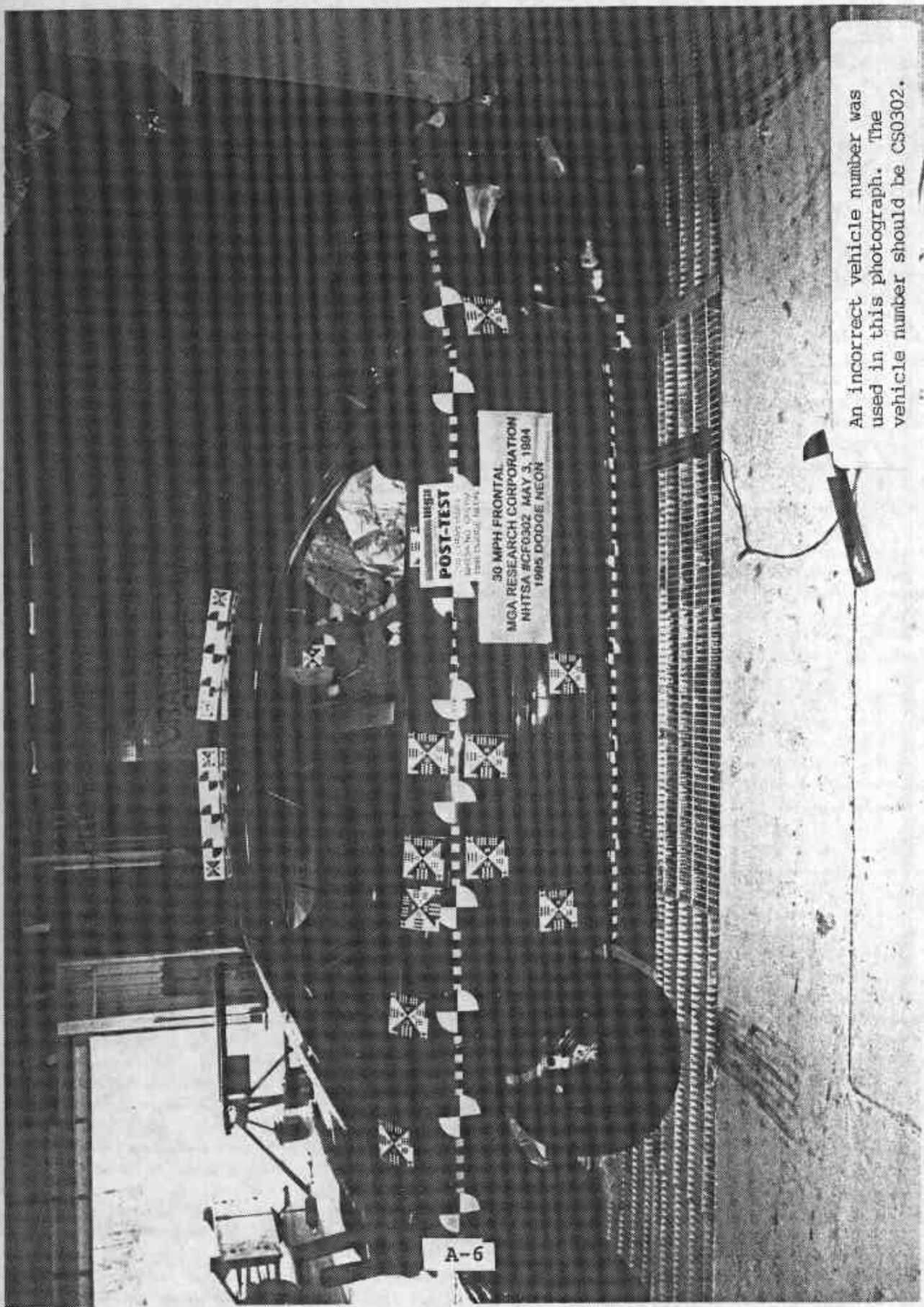


Photo No. A-6 - Post-Test Right Side View

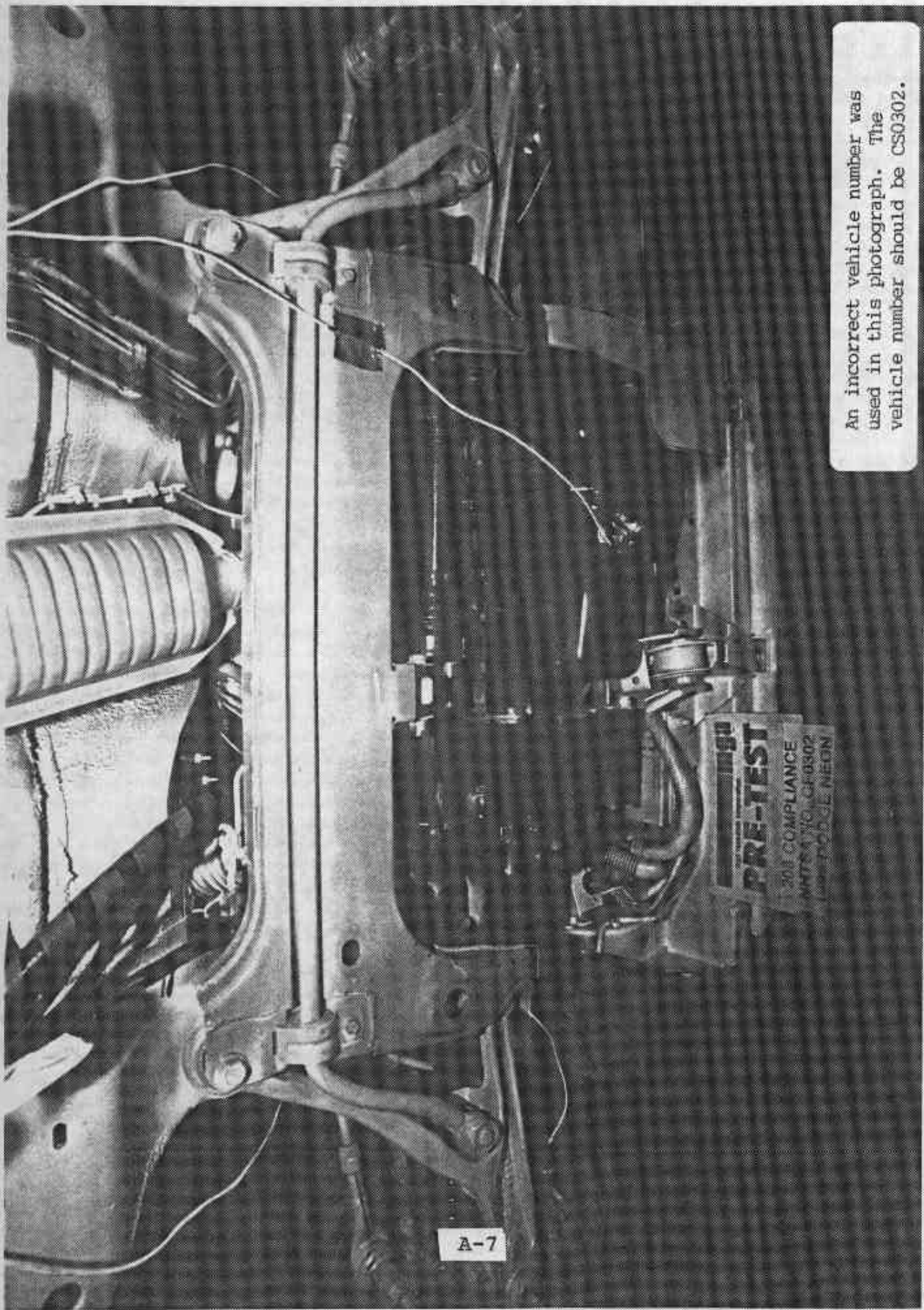


Photo No. A-7 - Pre-Test Front Underbody View

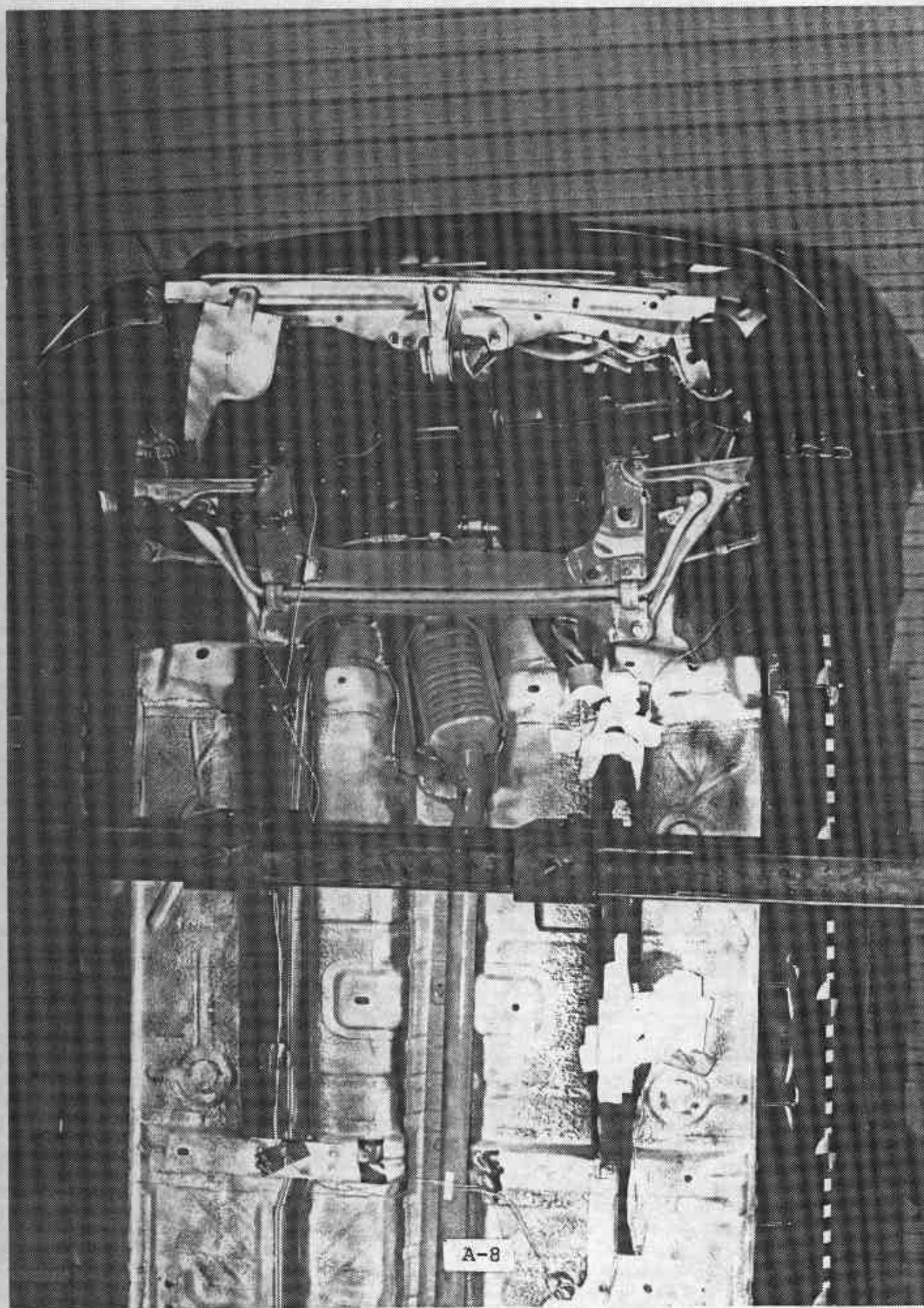


Photo No. A-8 - Post-Test Front Underbody View



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

A-10

POST-TEST
208 COMPLIANCE
NHTSA NO. CF0302
1995 DODGE NEON

30 MPH FRONTAL
MGA RESEARCH CORPORATION
NHTSA #CF0302 MAY 3, 1994
1995 DODGE NEON

An incorrect vehicle number was used in this photograph. The vehicle number should be CS0302.

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



A-11

An incorrect vehicle number was used in this photograph. The vehicle number should be CS0302.

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



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

A-13

 **mga**
mga research corporation

PRE-TEST

208 COMPLIANCE
NHTSA NO. CF0302
1995 DODGE NEON

An incorrect vehicle number was used in this photograph. The vehicle number should be CS0302.

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

A-14

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mga research corporation

POST TEST

208 COMPLIANCE
NHTSA NO. CF0302
1995 DODGE NEON

An incorrect vehicle number was used in this photograph. The vehicle number should be CS0302.

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

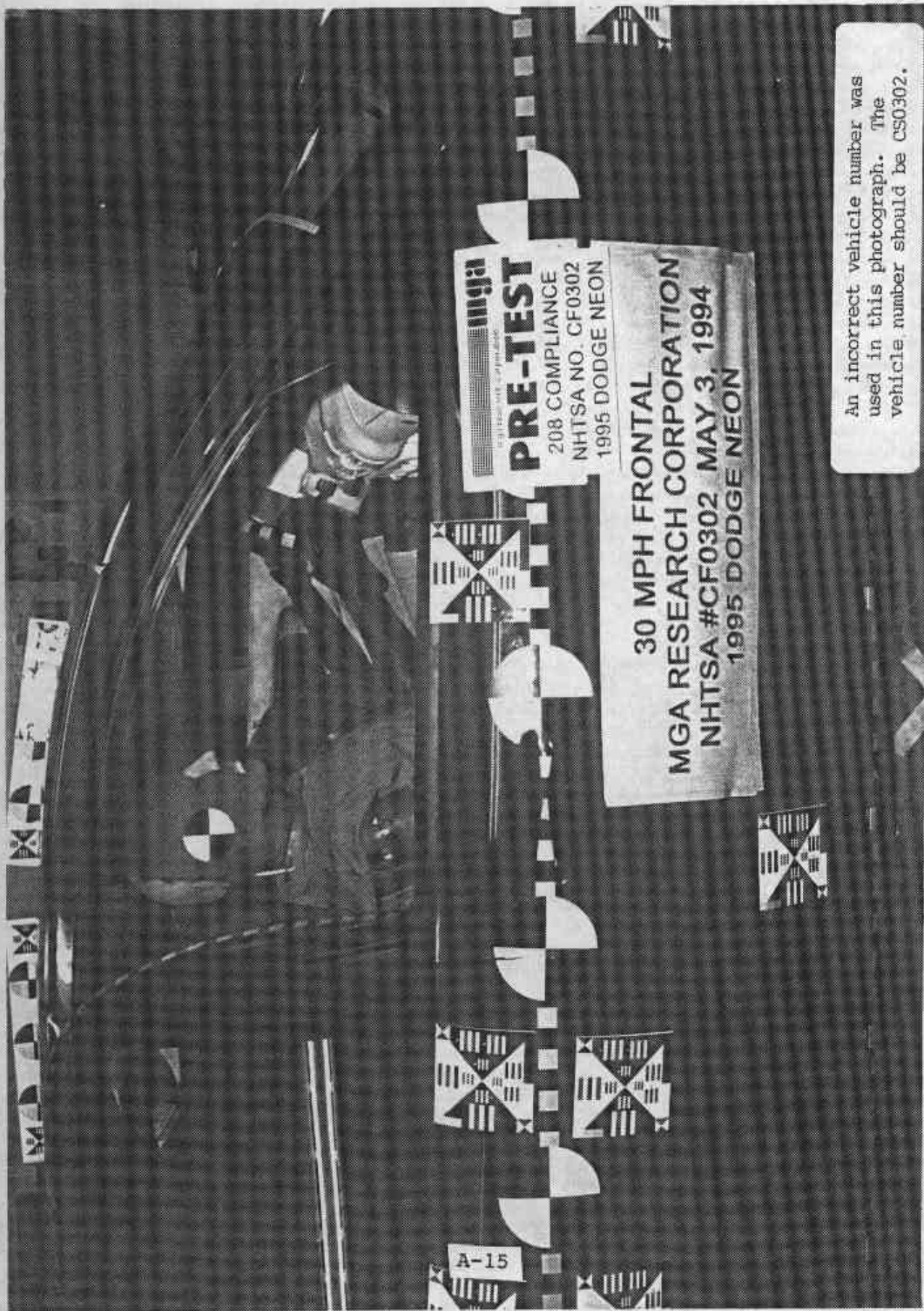


Photo No. A-15 - Pre-Test Passenger Dummy Position View

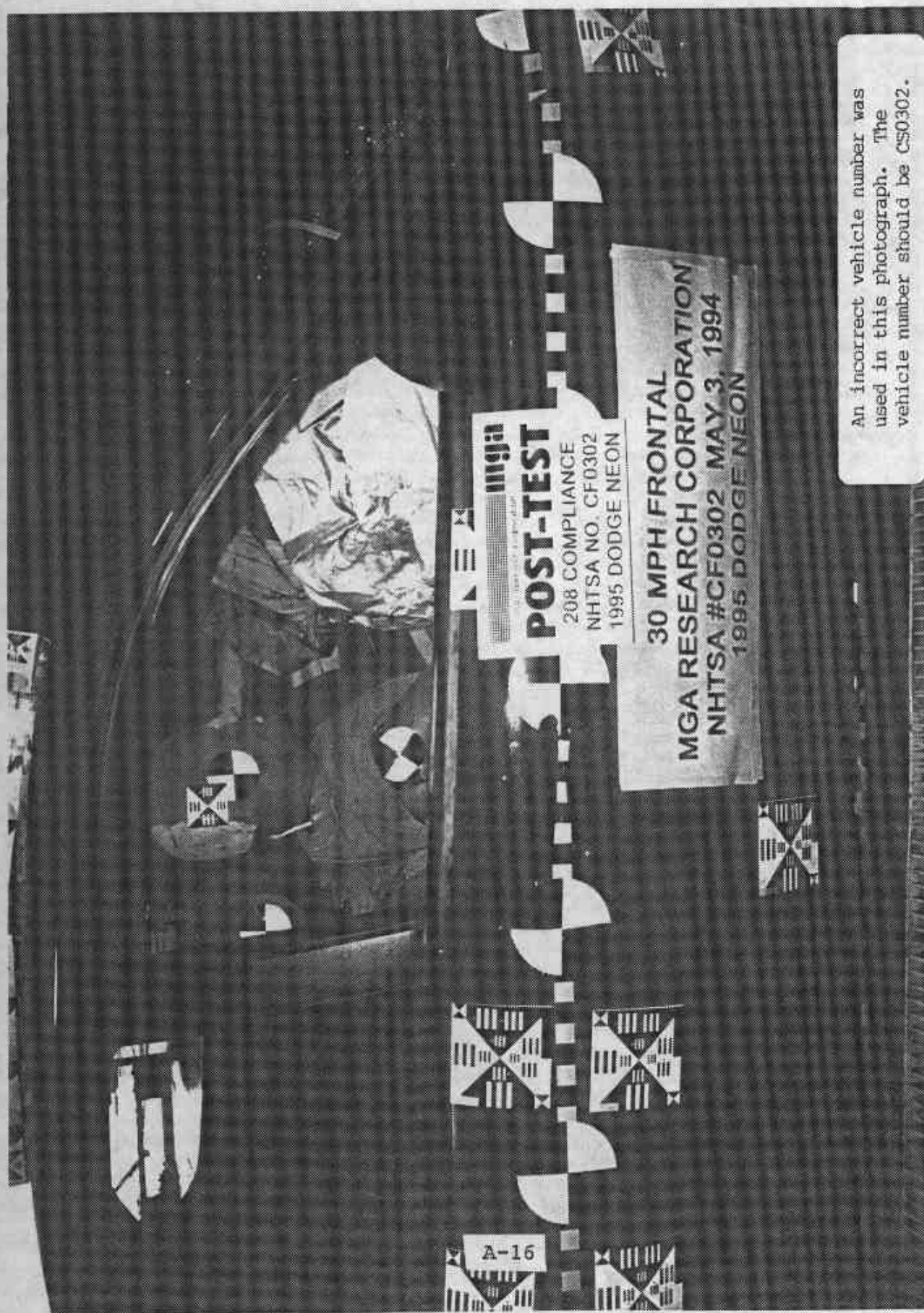


Photo No. A-16 - Post-Test Passenger Dummy Position View



PRE-TEST
208 COMPLIANCE
NHTSA NO. CF0302
1995 DODGE NEON

An incorrect vehicle number was used in this photograph. The vehicle number should be CS0302.

A-17

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



An incorrect vehicle number was used in this photograph. The vehicle number should be CS0302.

POST-TEST
208 COMPLIANCE
NHTSA NO. CF0302
1995 DODGE NEON

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

A-19

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PRE-TEST

208 COMPLIANCE

NHTSA NO. CF0302

1995 DODGE NEON

An incorrect vehicle number was used in this photograph. The vehicle number should be CS0302.

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

A-20

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POST-TEST

208 COMPLIANCE

NHTSA NO. CF0302

1995 DODGE NEON

An incorrect vehicle number was used in this photograph. The vehicle number should be CS0302.

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



A-21

An incorrect vehicle number was used in this photograph. The vehicle number should be CS0302.

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



A-22

An incorrect vehicle number was used in this photograph. The vehicle number should be C50302.

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



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



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



A-25

An incorrect vehicle number was used in this photograph. The vehicle number should be CS0302.

Photo No. A-25 - Pre-Test Passenger Dummy Knee Bolster View

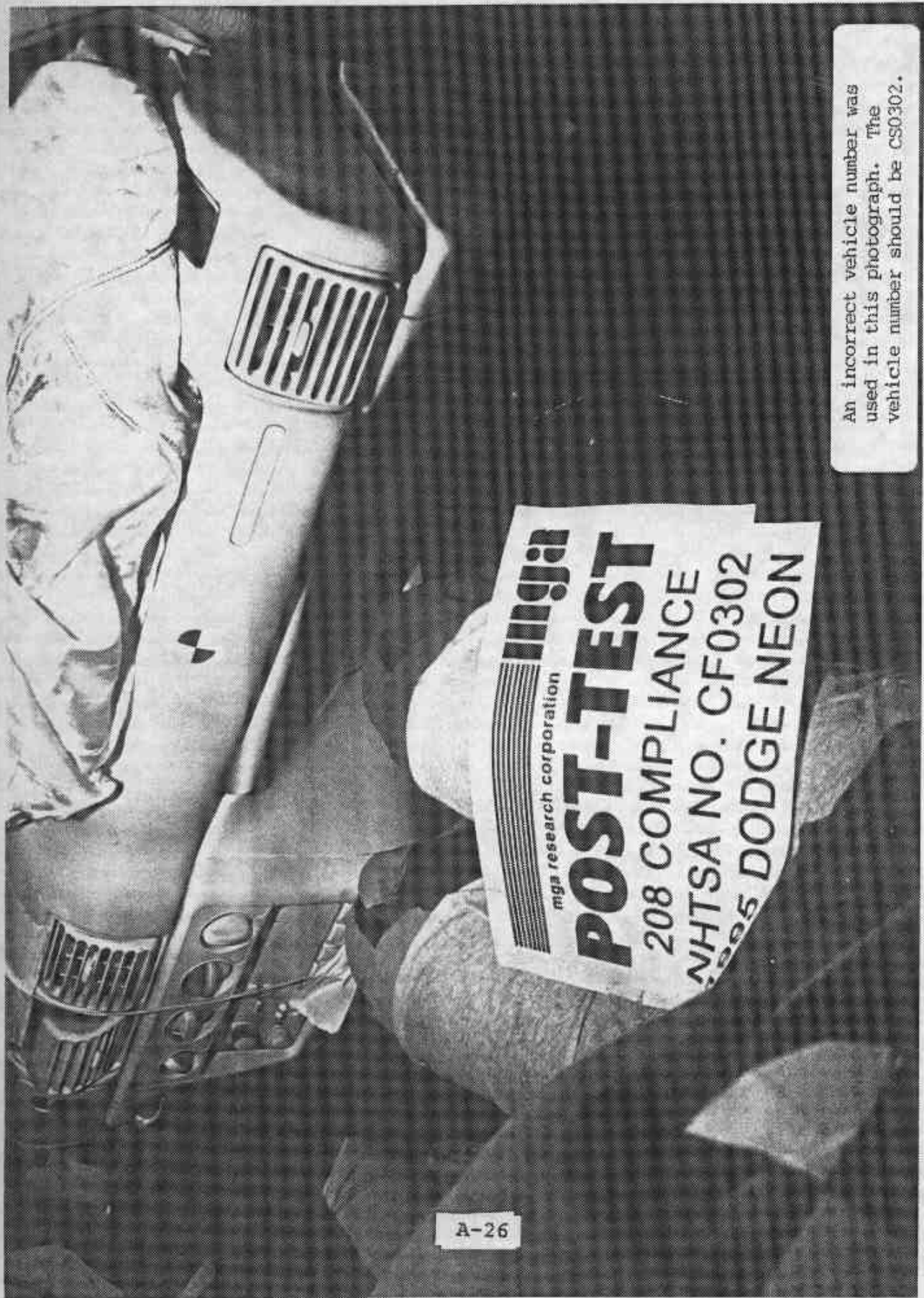


Photo No. A-26 - Post-Test Passenger Dummy Knee Bolster View

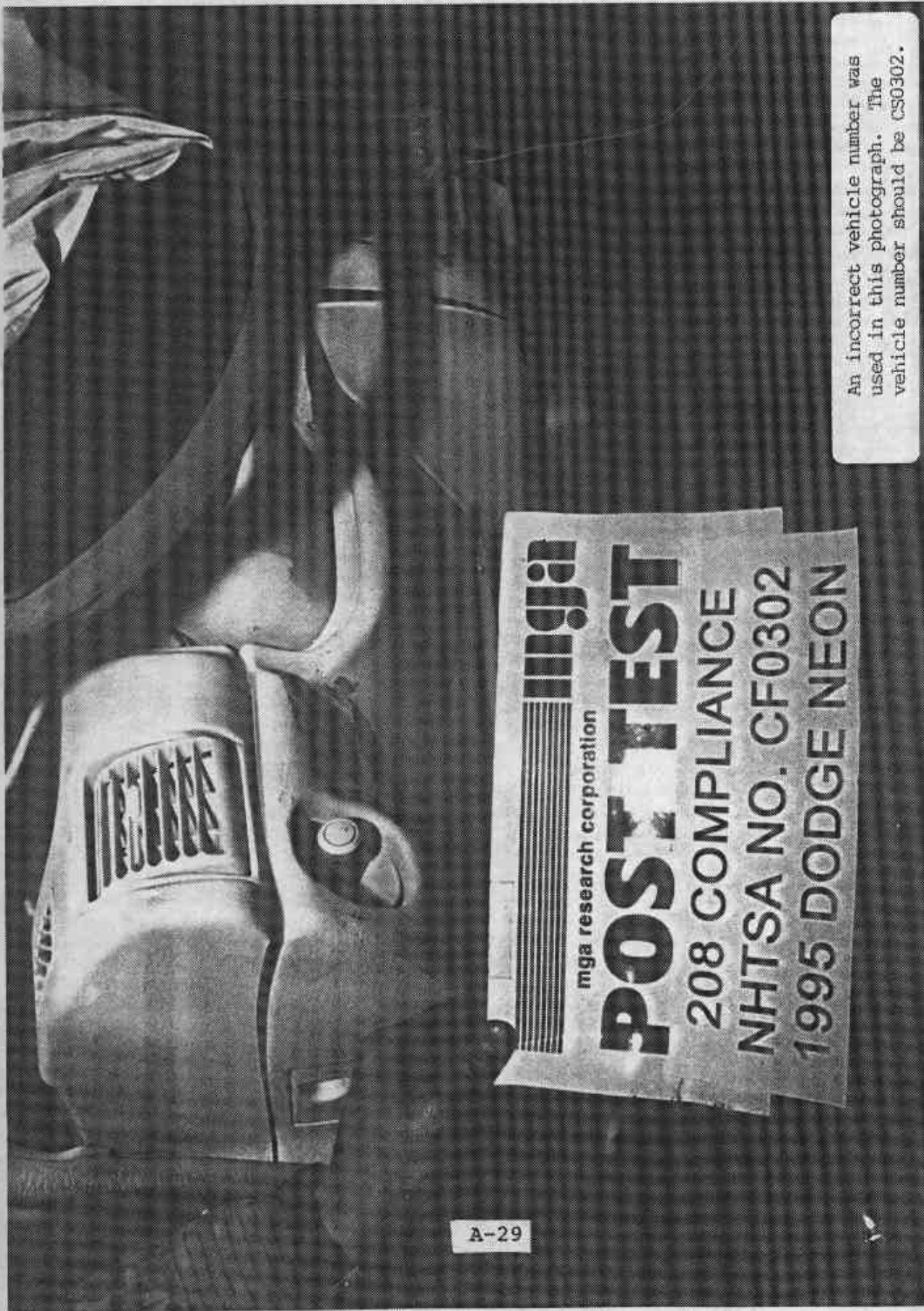


Photo No. A-27 - Driver Head Contact View



An incorrect vehicle number was used in this photograph. The vehicle number should be CS0302.

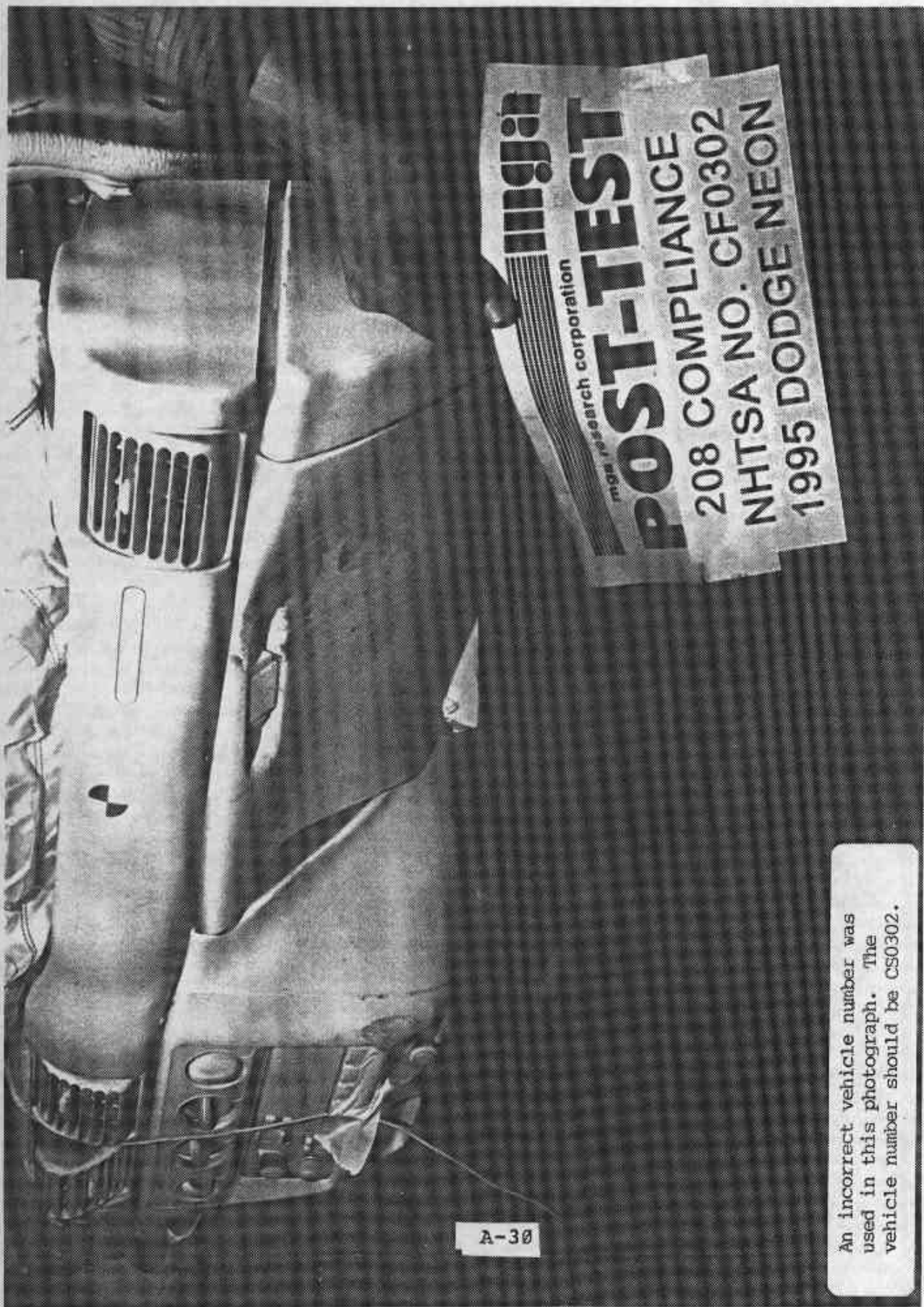
Photo No. A-28 - Passenger Head Contact View



A-29

An incorrect vehicle number was used in this photograph. The vehicle number should be CS0302.

Photo No. A-29 - Driver Knee Contact View



An incorrect vehicle number was used in this photograph. The vehicle number should be CS0302.

Photo No. A-30 - Passenger Knee Contact View



An incorrect vehicle number was used in this photograph. The vehicle number should be CS0302.

Photo No. A-31 - Post-Test Driver Dummy View

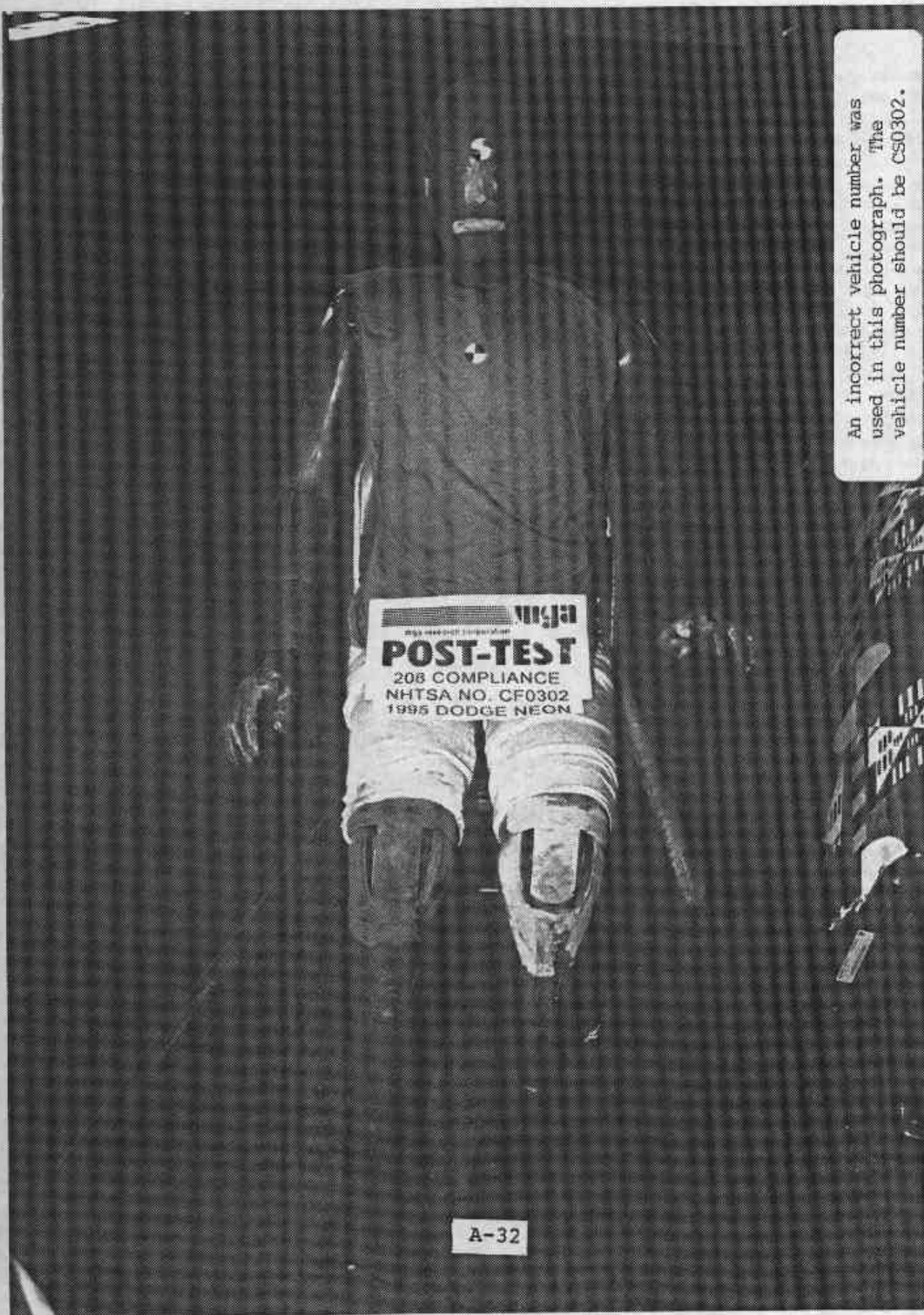
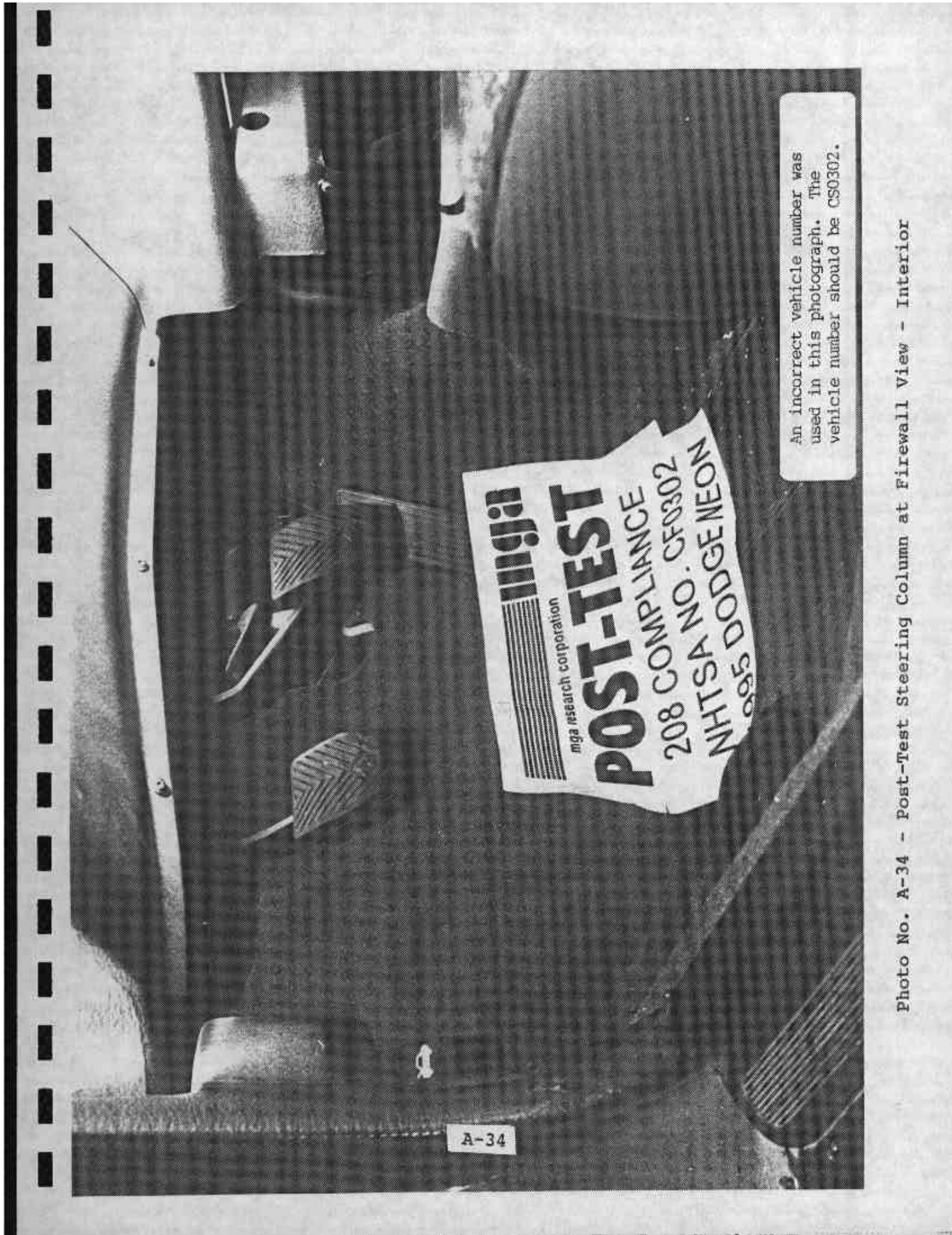


Photo No. A-32 - Post-Test Passenger Dummy View



An incorrect vehicle number was used in this photograph. The vehicle number should be CS0302.

Photo No. A-33 - Pre-Test Steering Column at Firewall View - Interior



An incorrect vehicle number was used in this photograph. The vehicle number should be CS0302.

Photo No. A-34 - Post-Test Steering Column at Firewall View - Interior

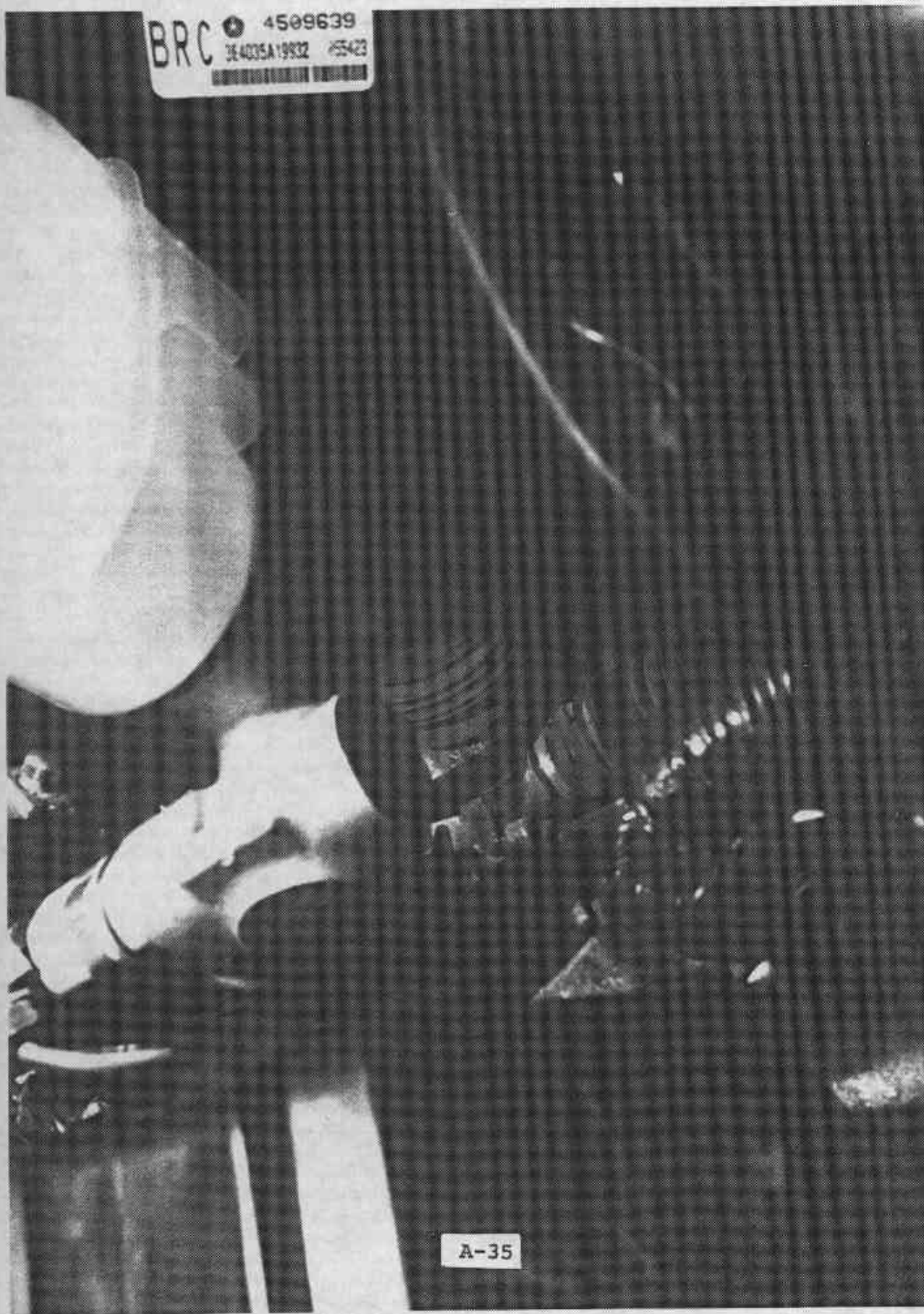


Photo No. A-35 - Pre-Test Steering Column at Firewall View - Underhood

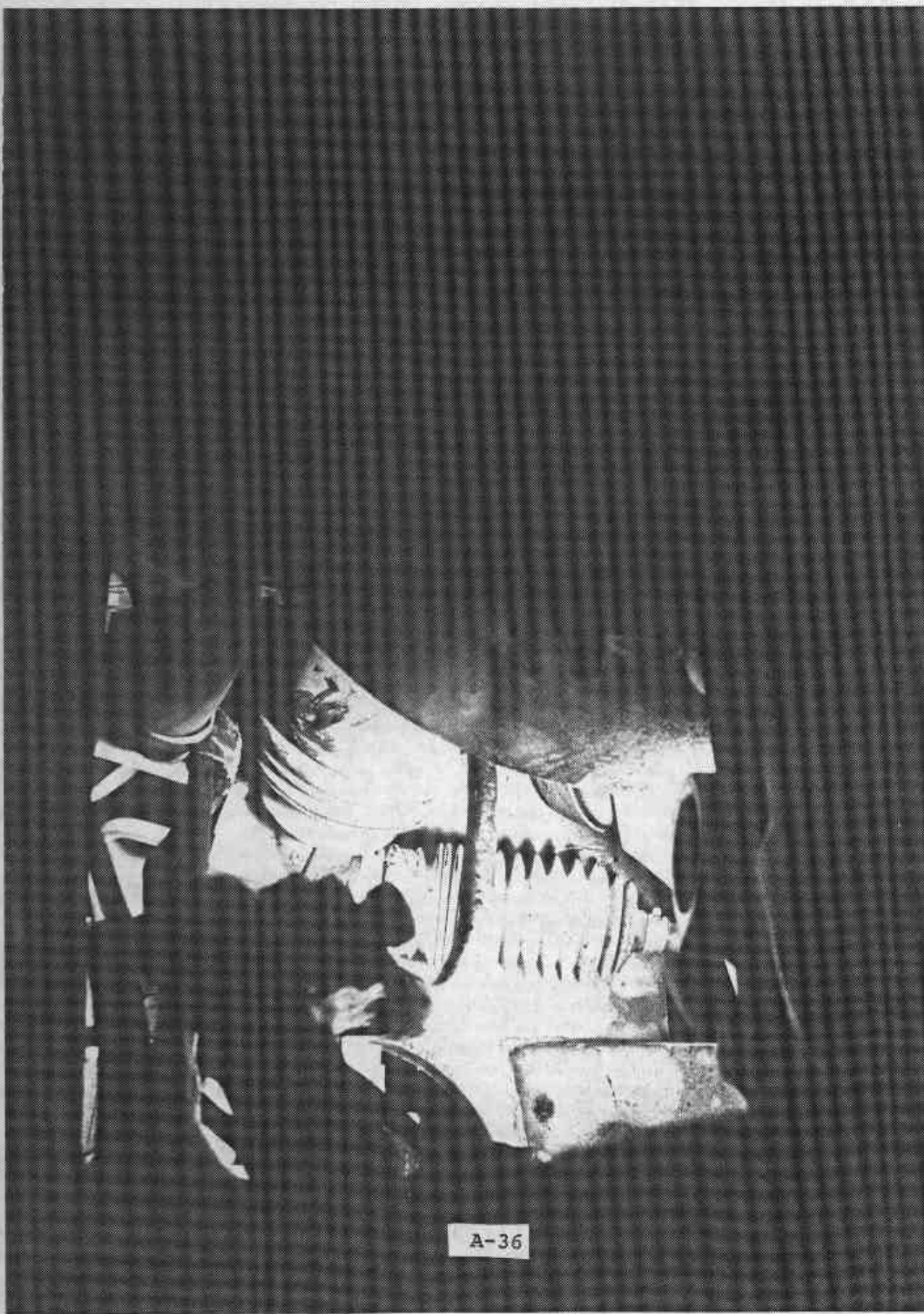


Photo No. A-36 - Pre-Test Steering Column at Firewall View - Underhood

APPENDIX B
DATA PLOTS

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Filter: Class 1000

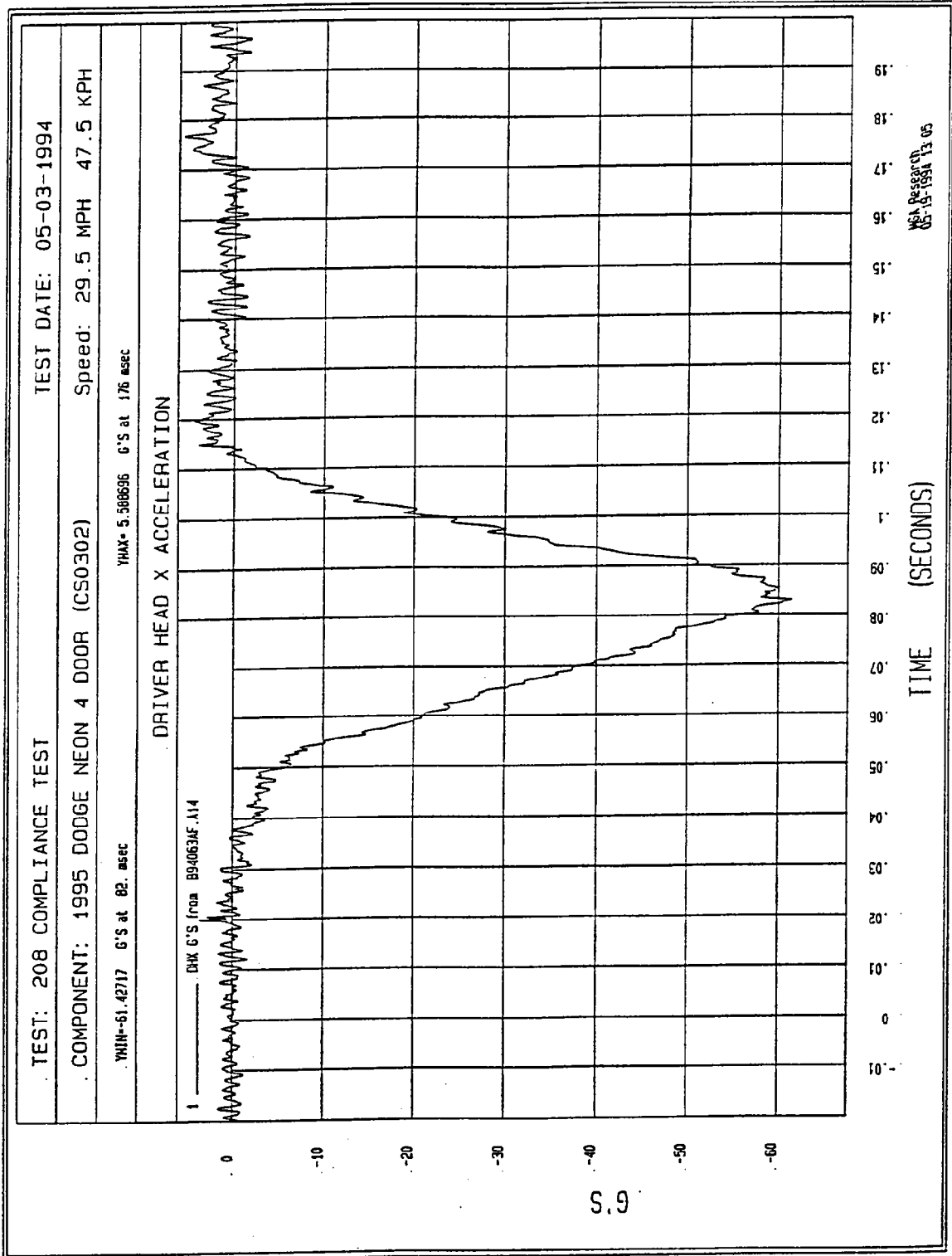


Figure B-1 - Driver Head X Acceleration vs. Time

Filter: Class 1000

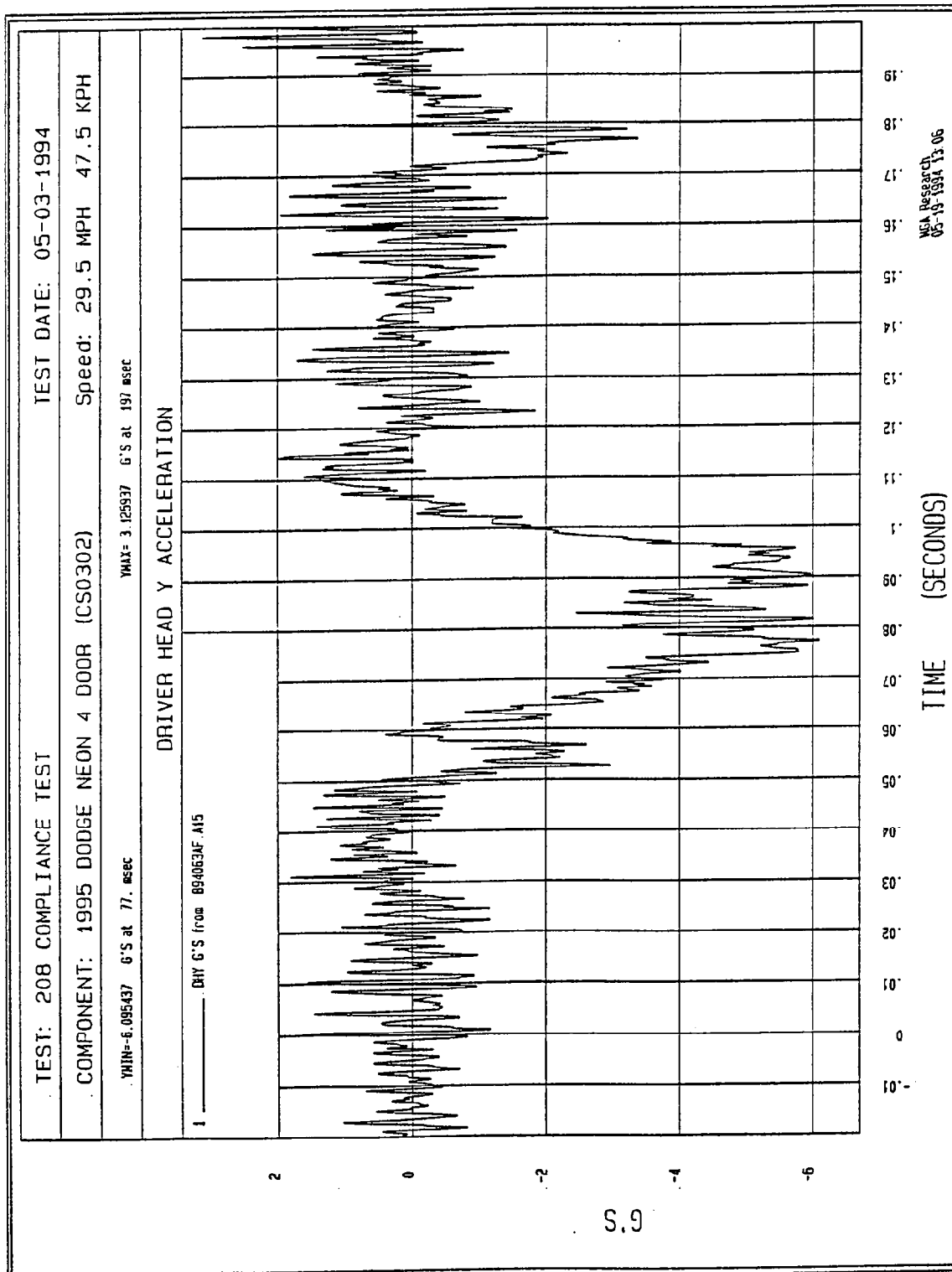


Figure B-2 - Driver Head Y Acceleration vs. Time

Filter: Class 1000

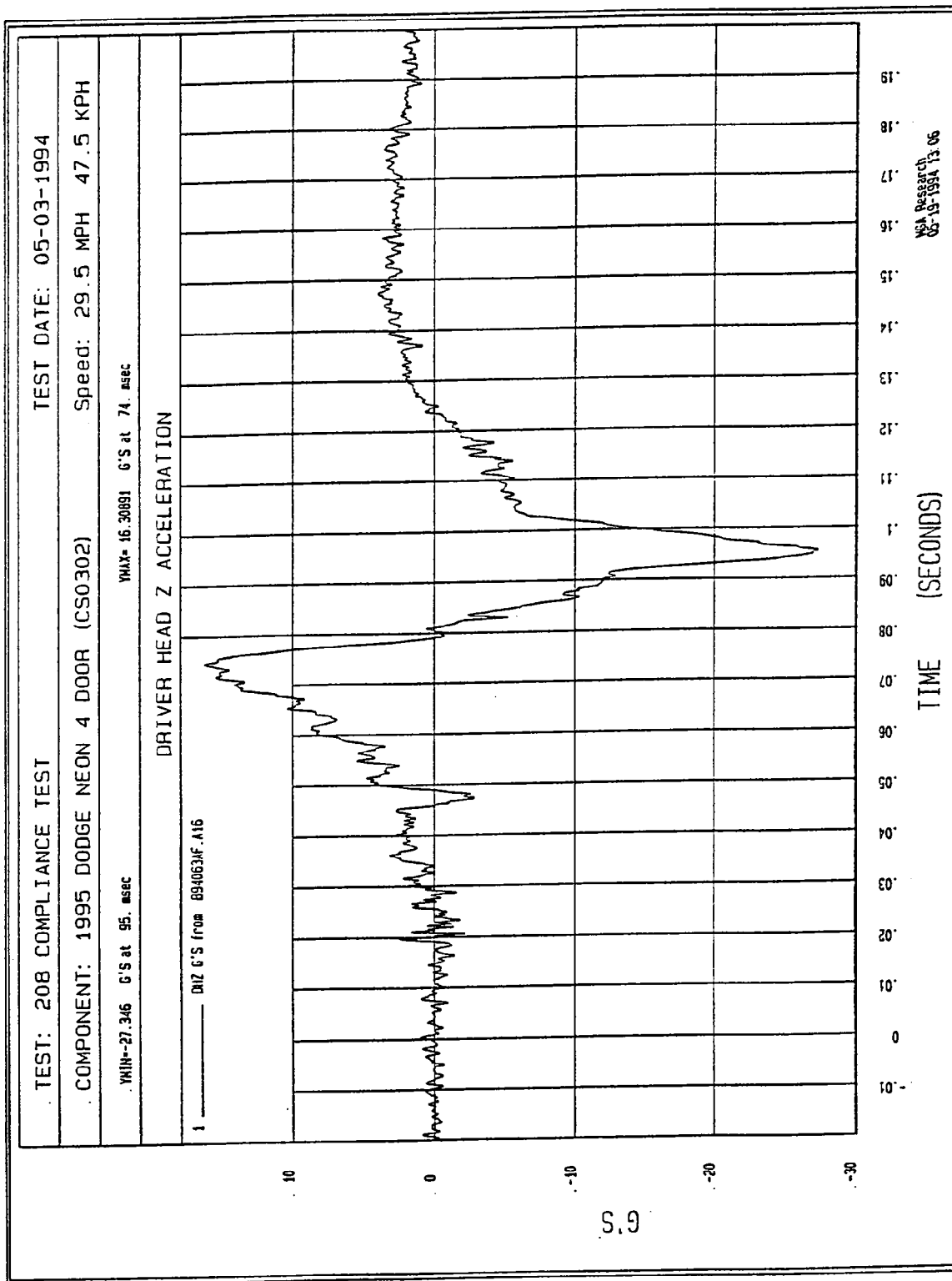


Figure B-3 - Driver Head Z Acceleration vs. Time

Filter: Class 1000

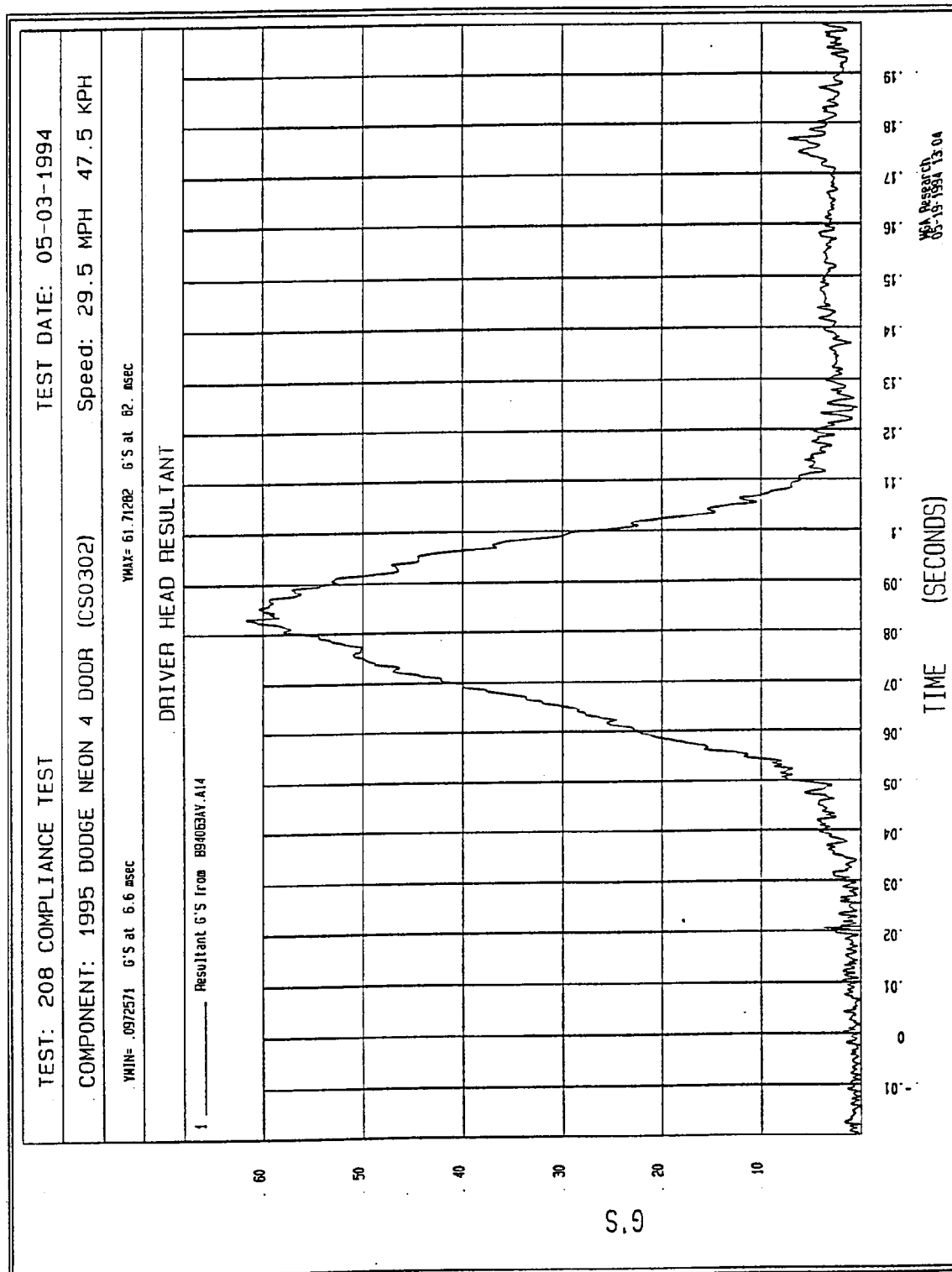


Figure B-4 - Driver Head Resultant Acceleration vs. Time

Filter: Class 180

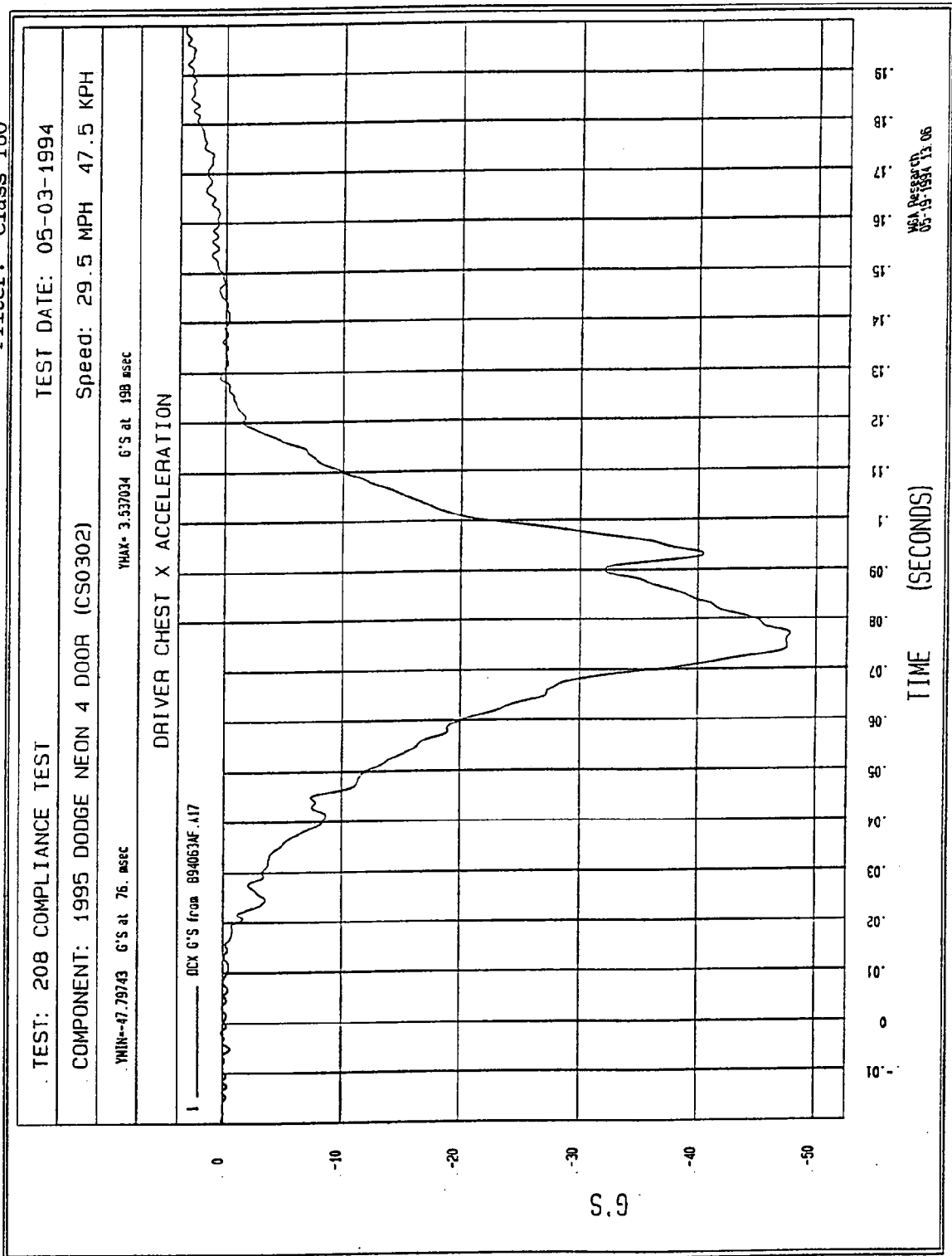


Figure B-5 - Driver Chest X Acceleration vs. Time

TEST: 208 COMPLIANCE TEST TEST DATE: 05-03-1994

COMPONENT: 1995 DODGE NEON 4 DOOR (CS0302) Speed: 29.5 MPH 47.5 KPH

YMIN=-5.597495 G'S at 92. msec YMAX= 3.680257 G'S at 47. msec

DRIVER CHEST Y ACCELERATION

1 _____ DCY G'S from B94063AF.A18

S.G.

TIME (SECONDS)

NSA Research
05-19-1994 13.01

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

Filter: Class 180

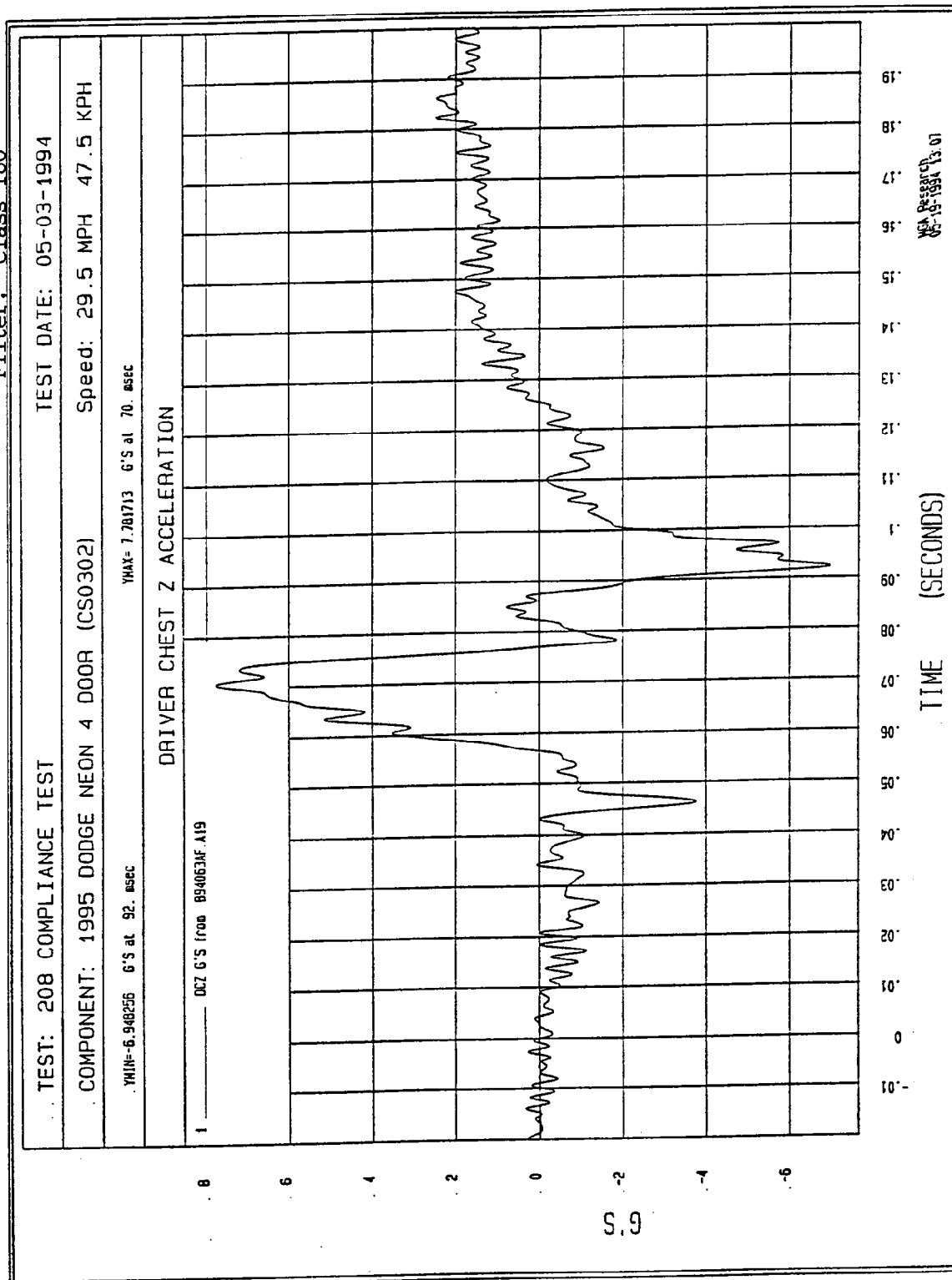


Figure B-7 - Driver Chest Z Acceleration vs. Time

Filter: Class 180

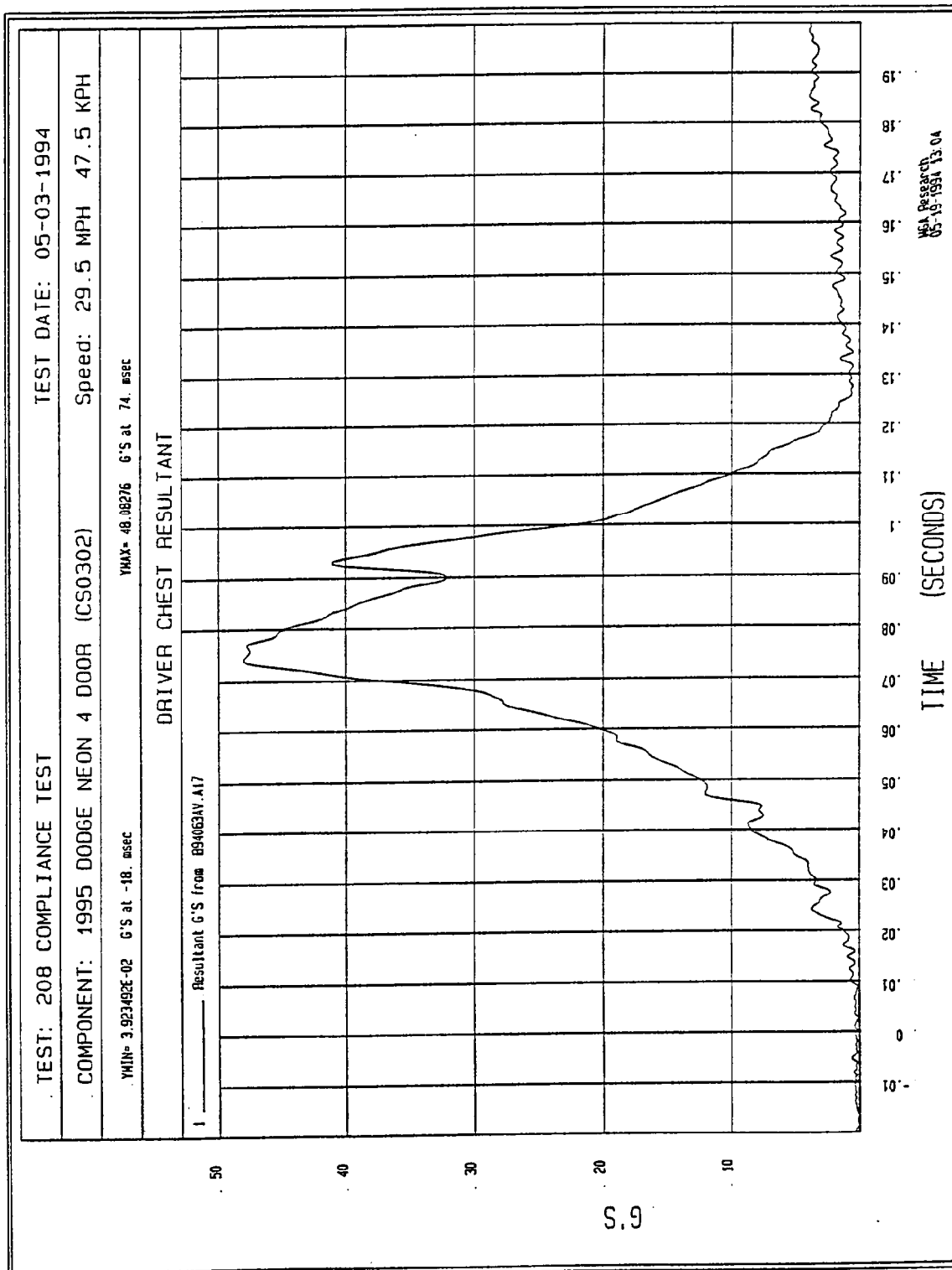


Figure B-8 - Driver Chest Resultant vs. Time

Filter: Class 180

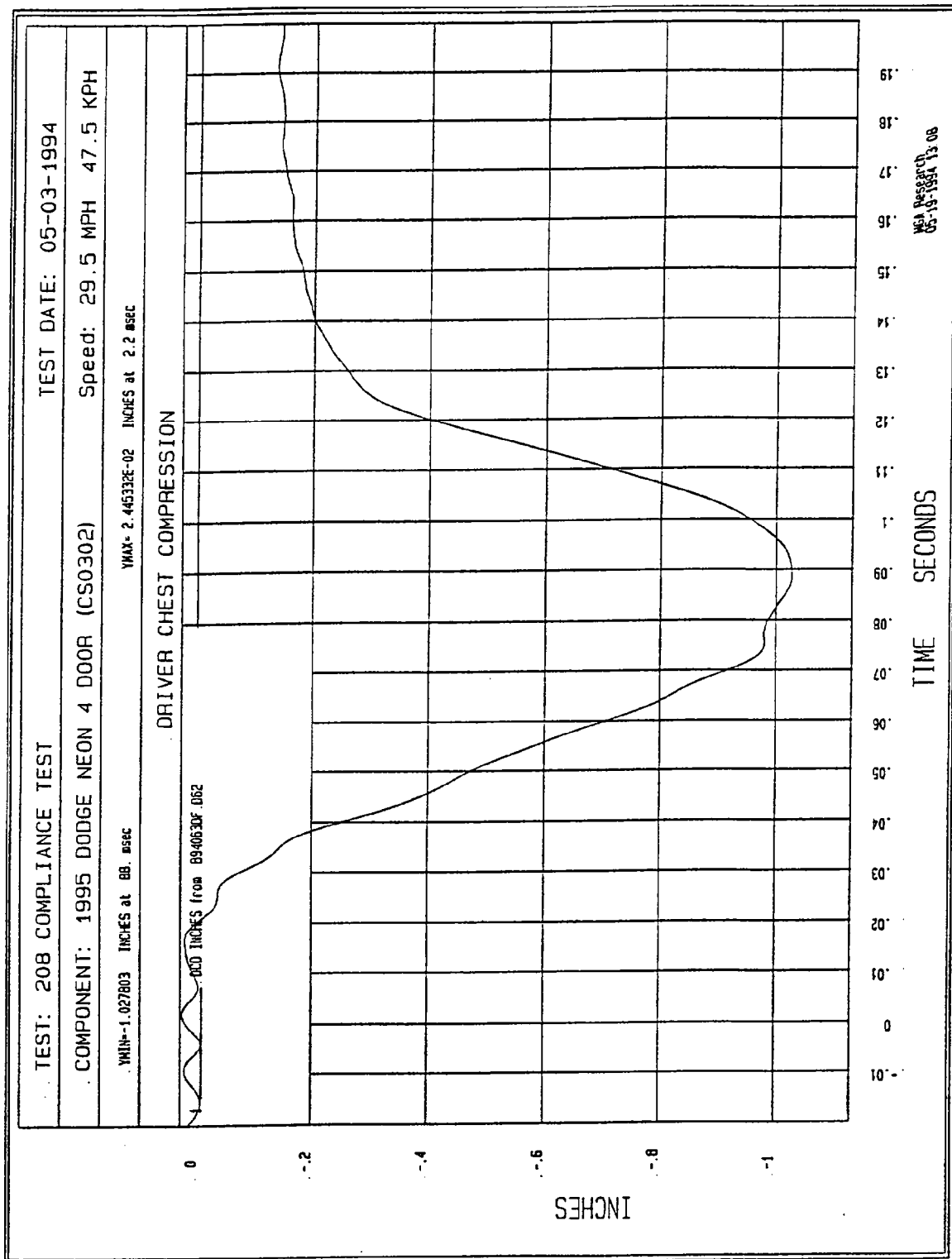


Figure B-9 - Driver Chest Deflection vs. Time

Filter: Class 600

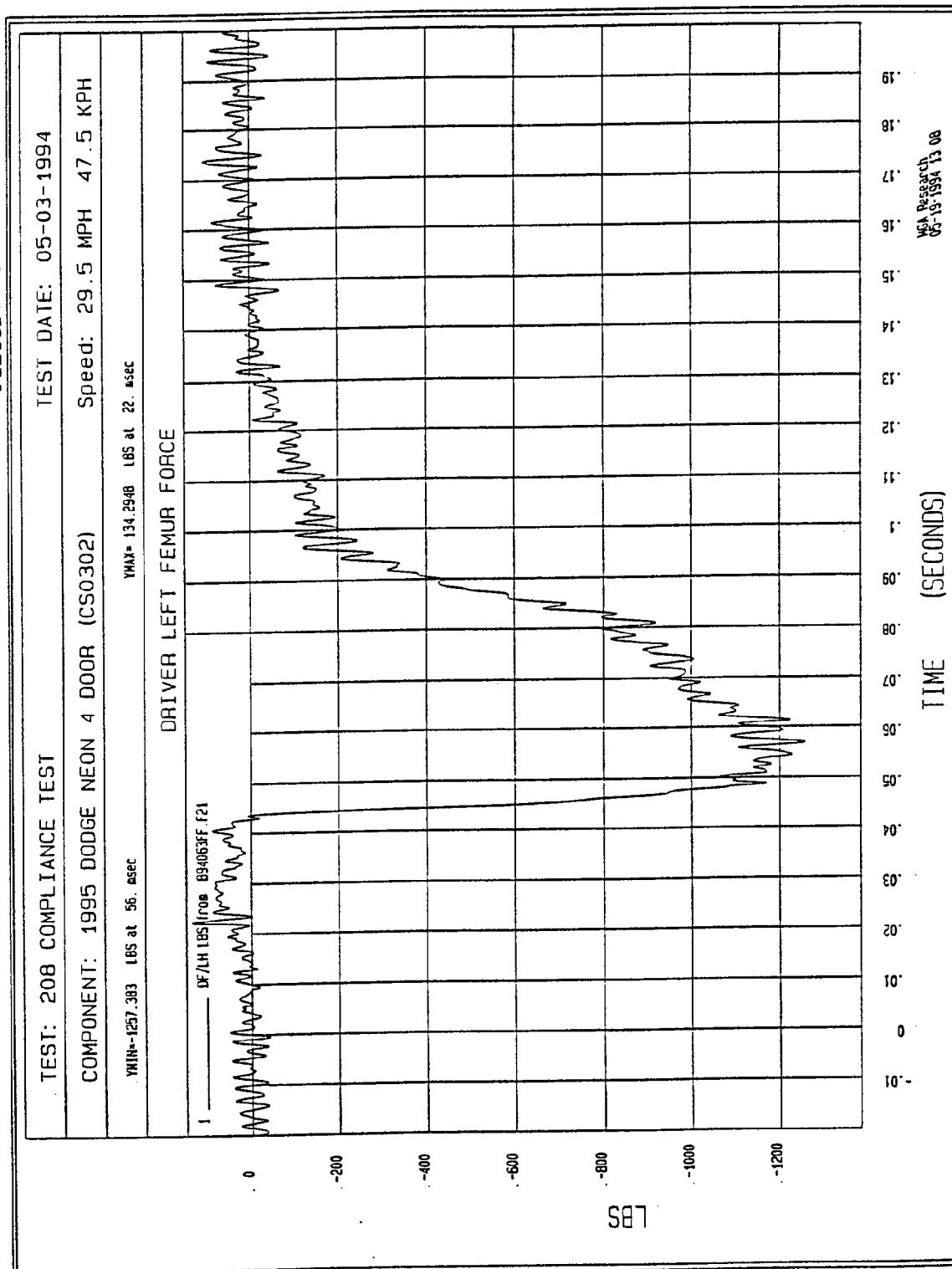


Figure B-10 - Driver Left Femur Force vs. Time

Filter: Class 600

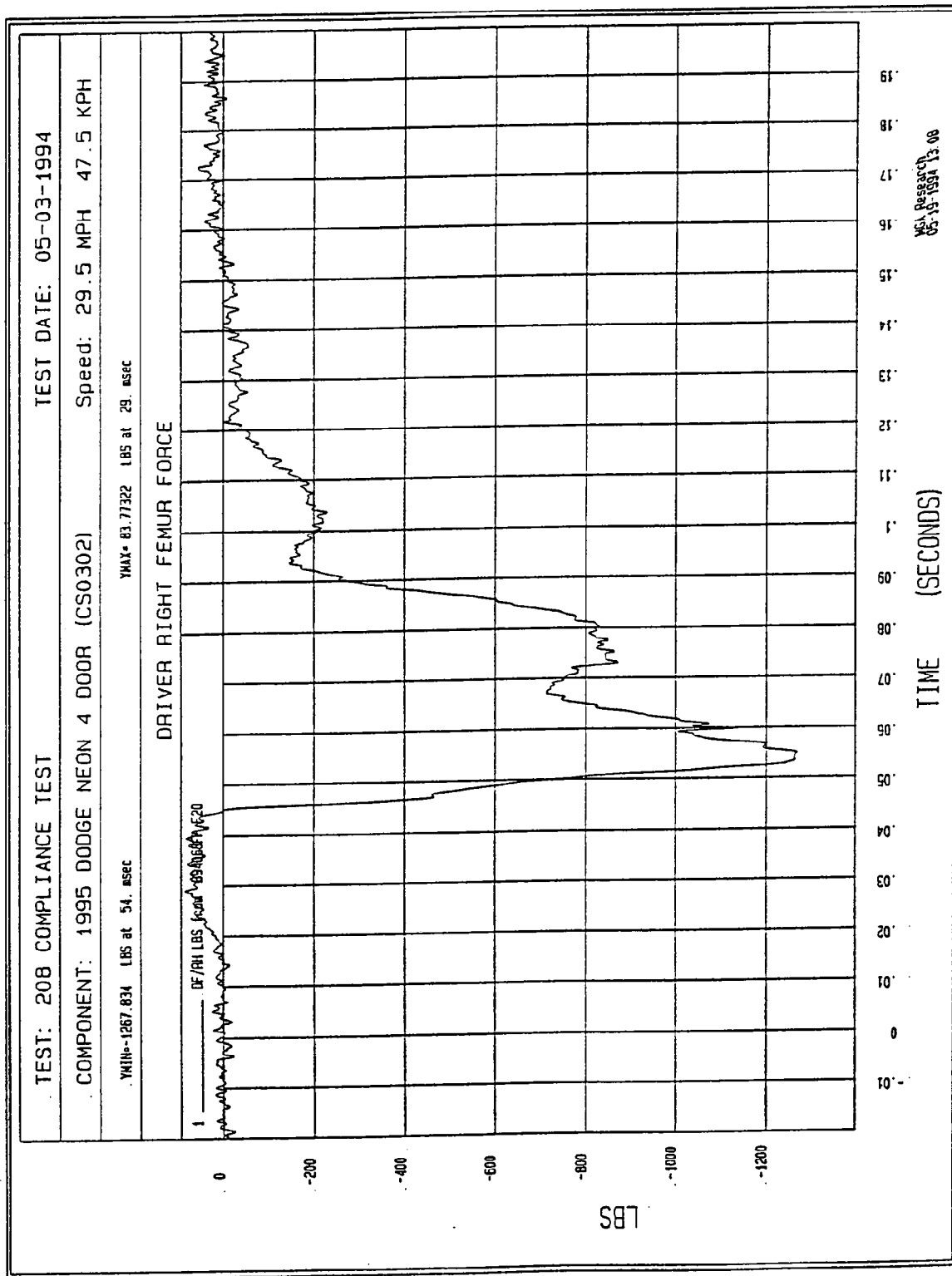


Figure B-11 - Driver Right Femur Force vs. Time

Filter: Class 1000

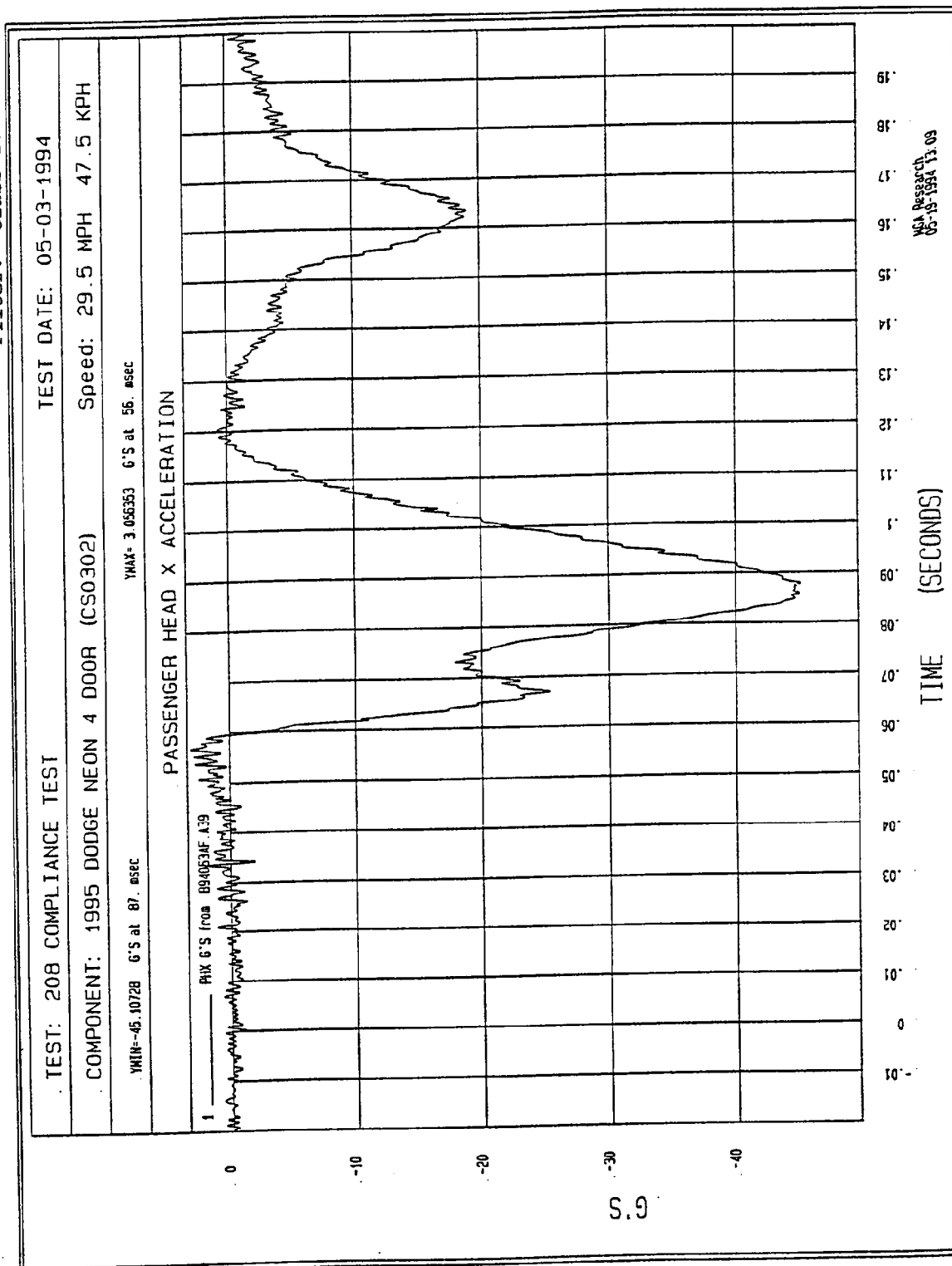


Figure B-12 - Passenger Head X Acceleration vs. Time

Filter: Class 1000

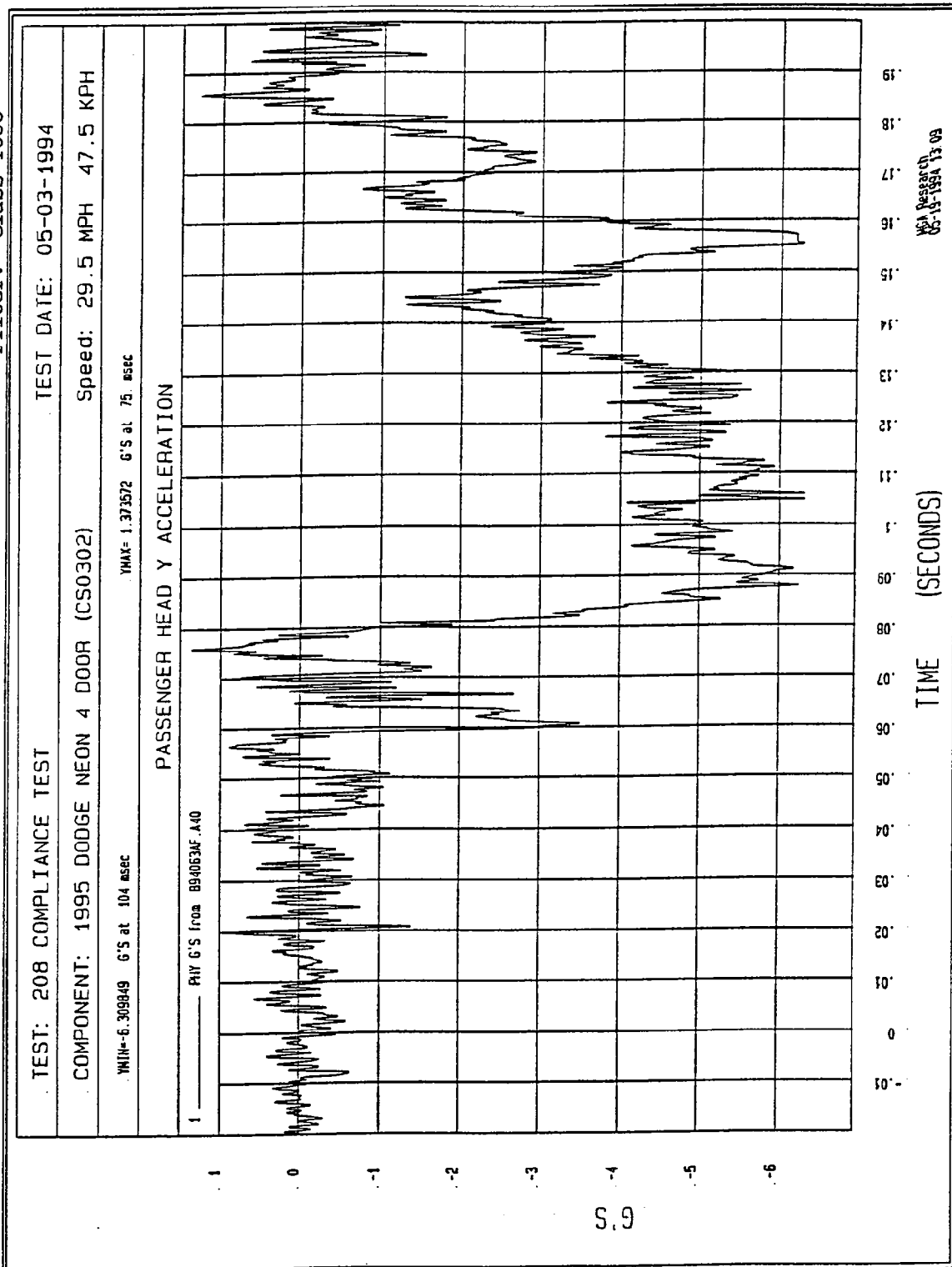


Figure B-13 - Passenger Head Y Acceleration vs. Time

Filter: Class 1000

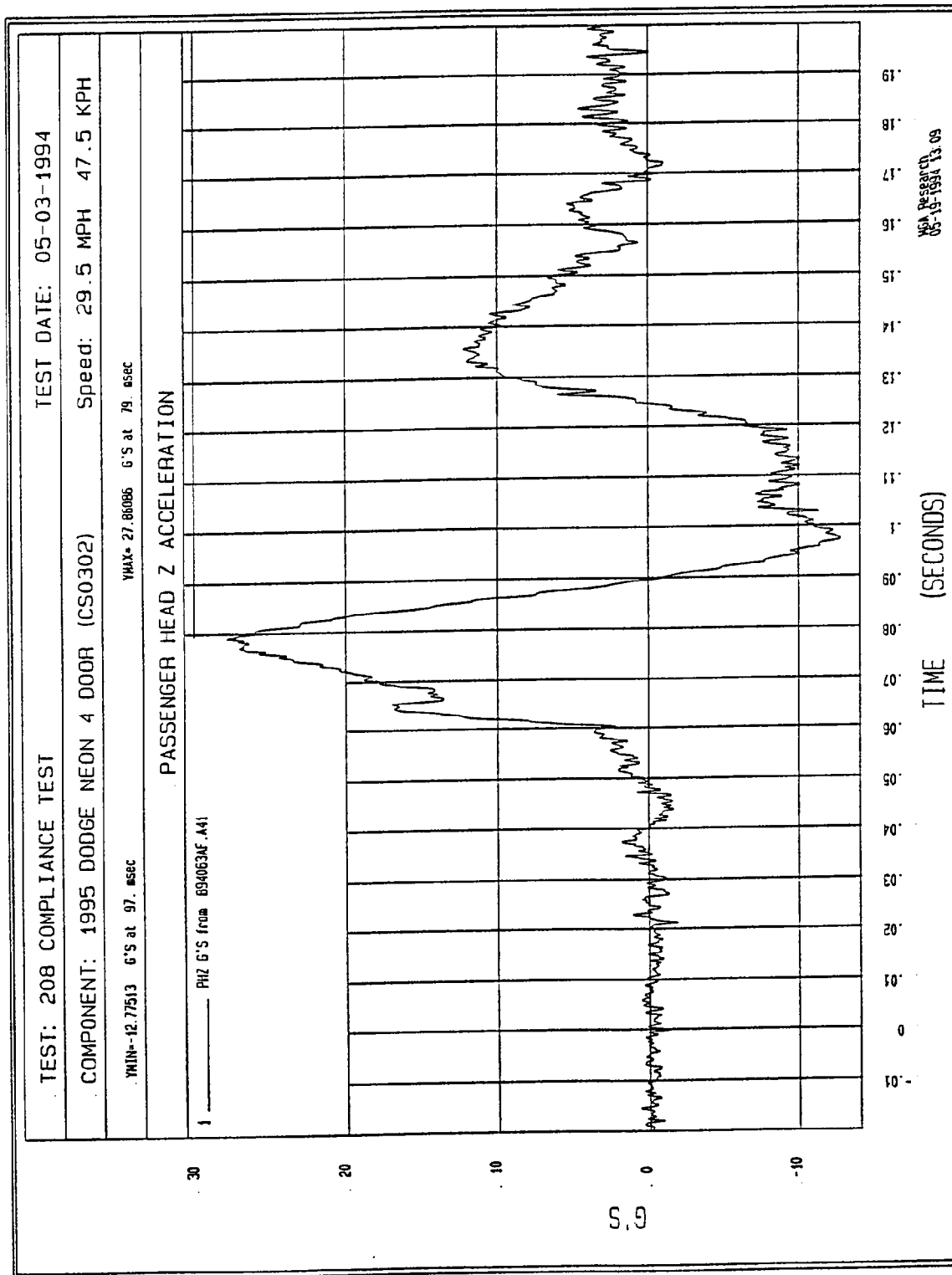


Figure B-14 - Passenger Head Z Acceleration vs. Time

Filter: Class 1000

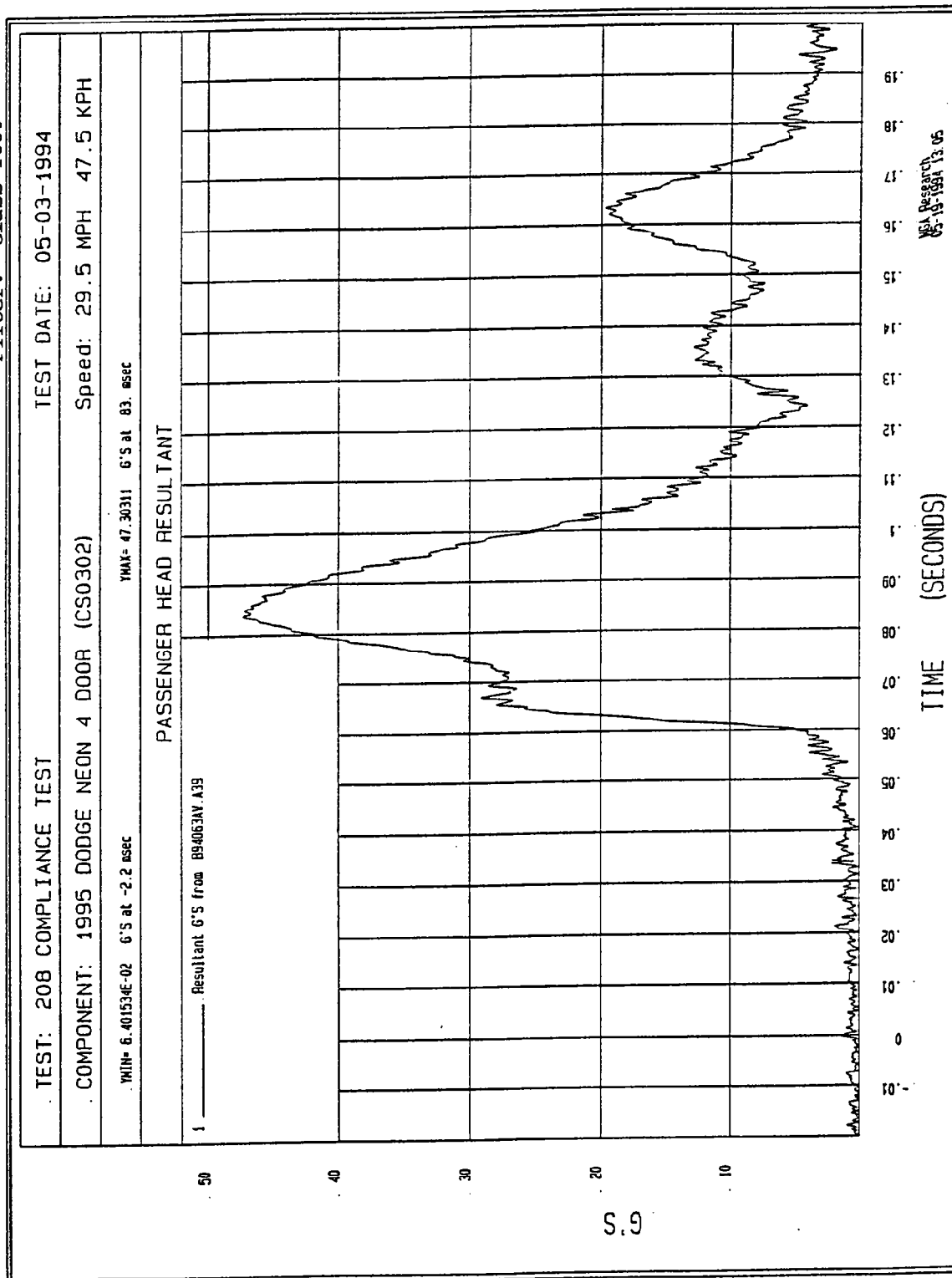


Figure B-15 - Passenger Head Resultant Acceleration vs. Time

Filter: Class 180

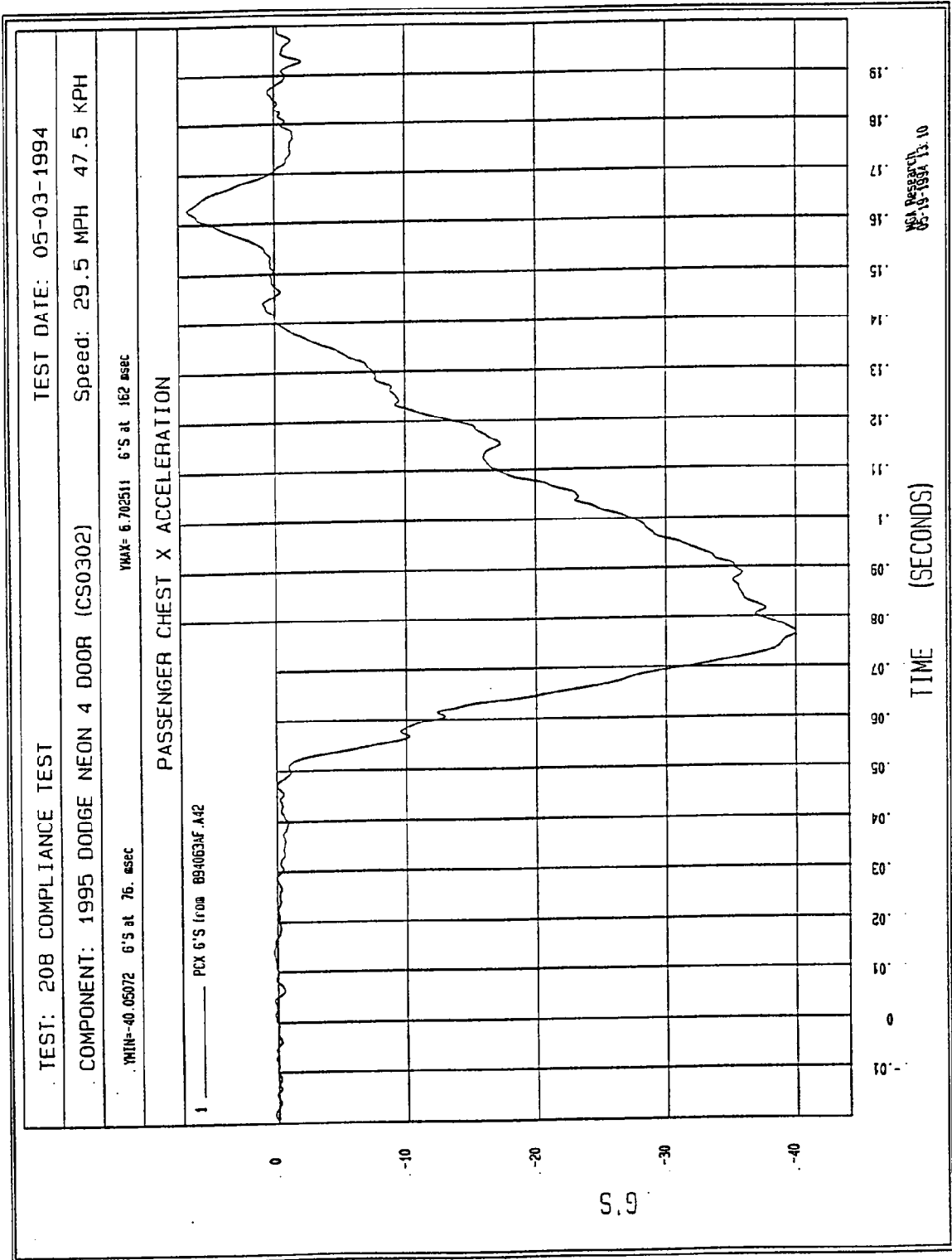


Figure B-16 - Passenger Chest X Acceleration vs. Time

Filter: Class 180

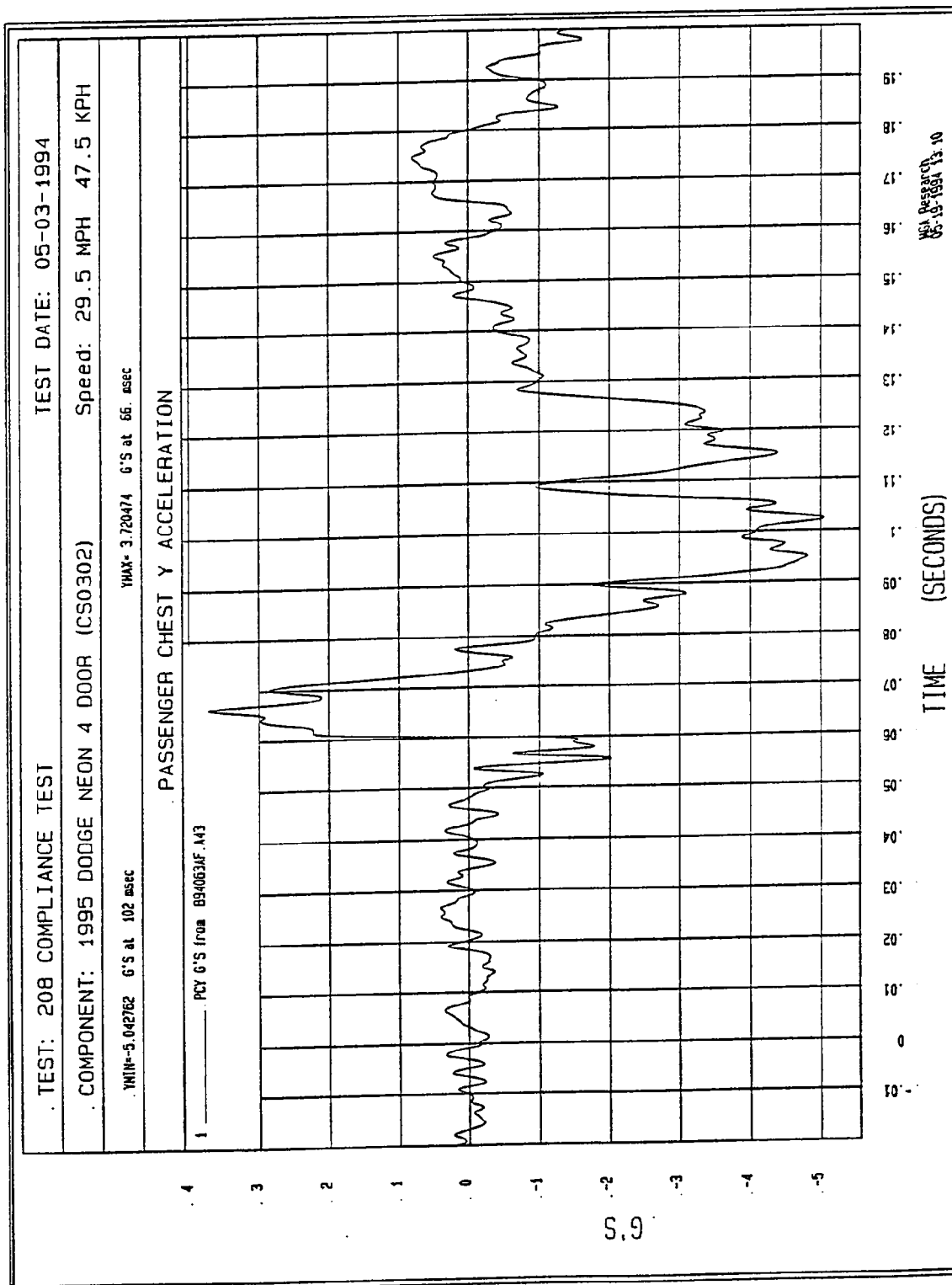


Figure B-17 - Passenger Chest Y Acceleration vs. Time

Filter: Class 180

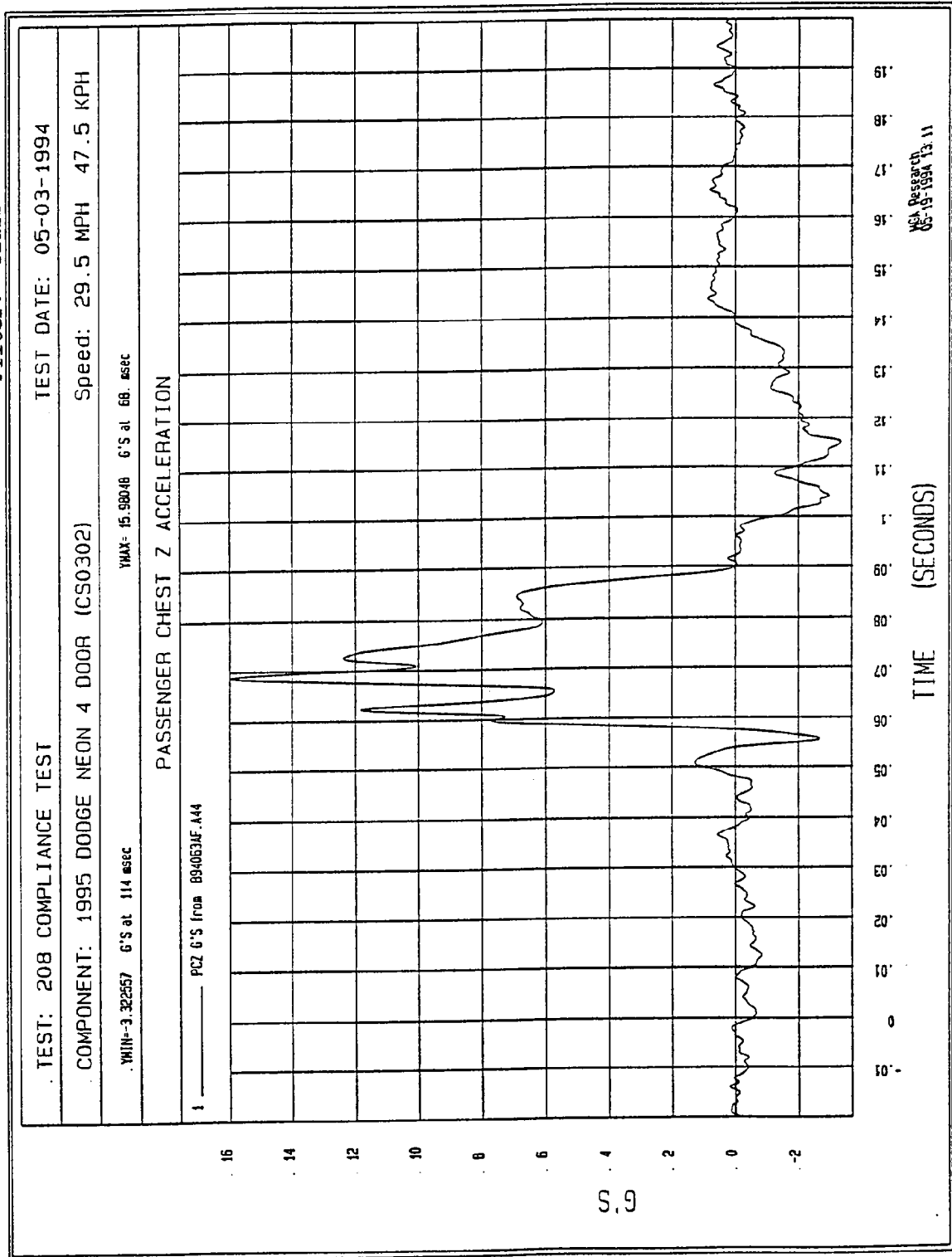


Figure B-18 - Passenger Chest Z Acceleration vs. Time

Filter: Class 180

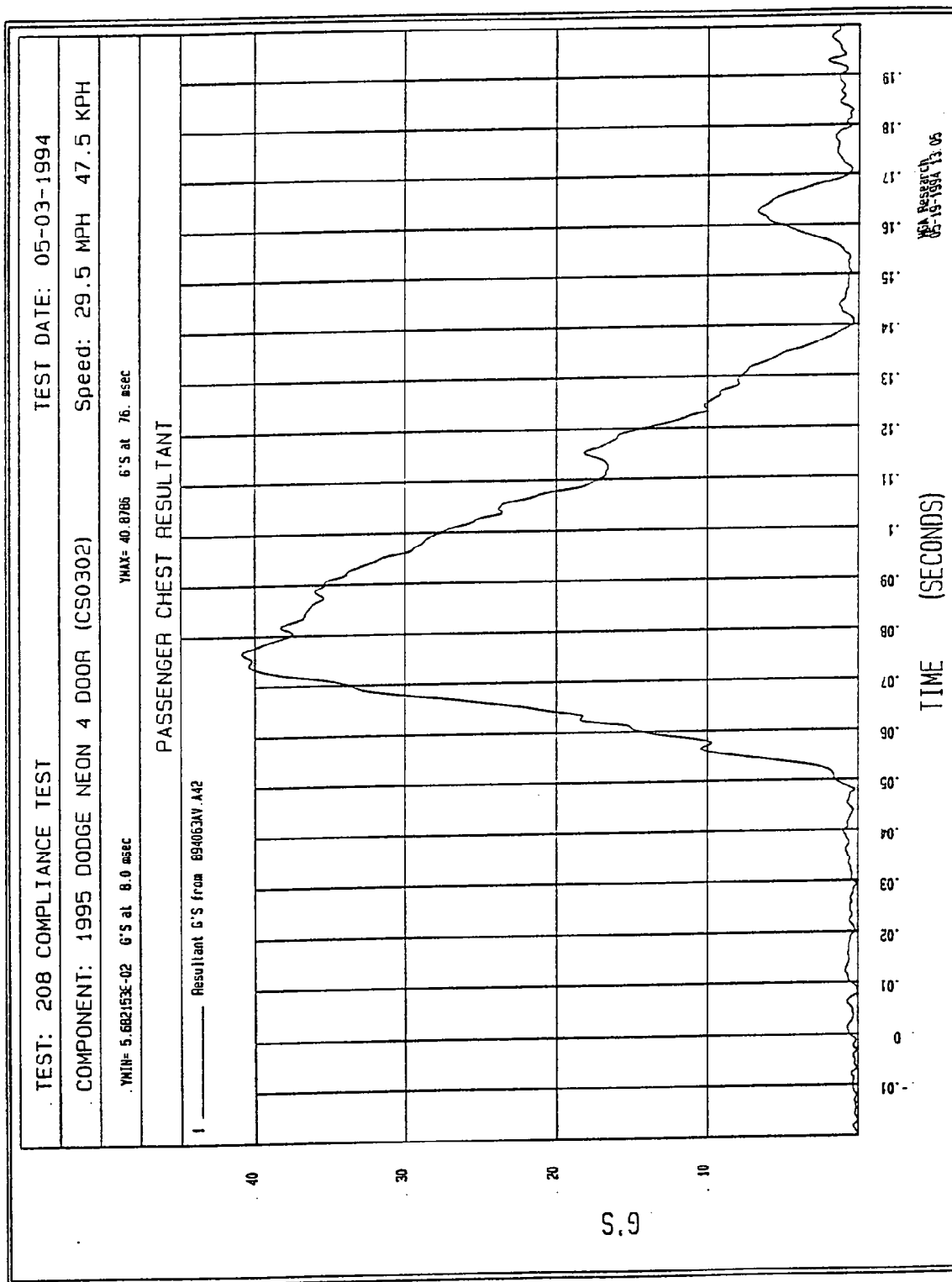
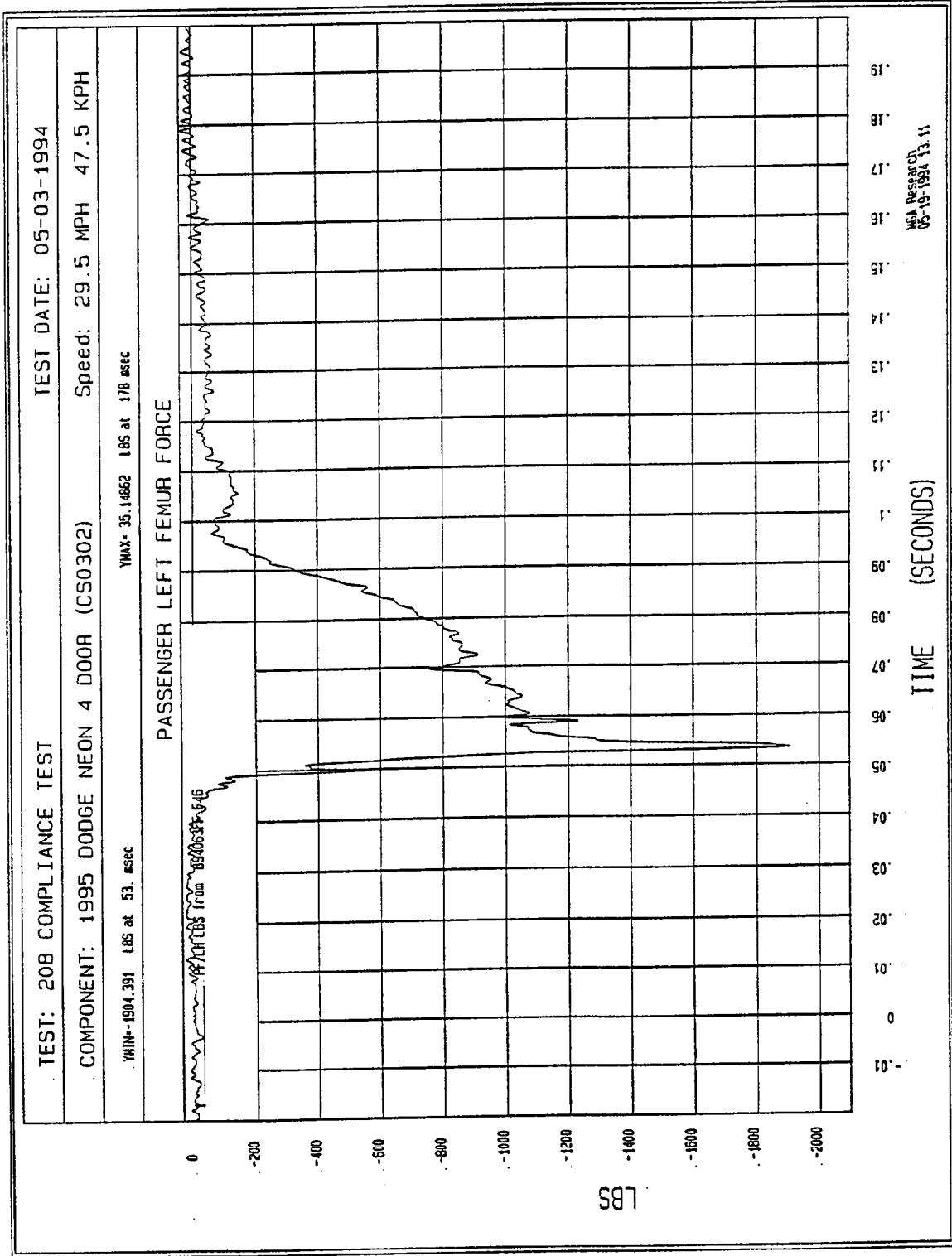


Figure B-19 - Passenger Chest Resultant vs. Time

Filter: Class 600



B-20

Figure B-20 - Passenger Left Femur Force vs. Time

Filter: Class 600

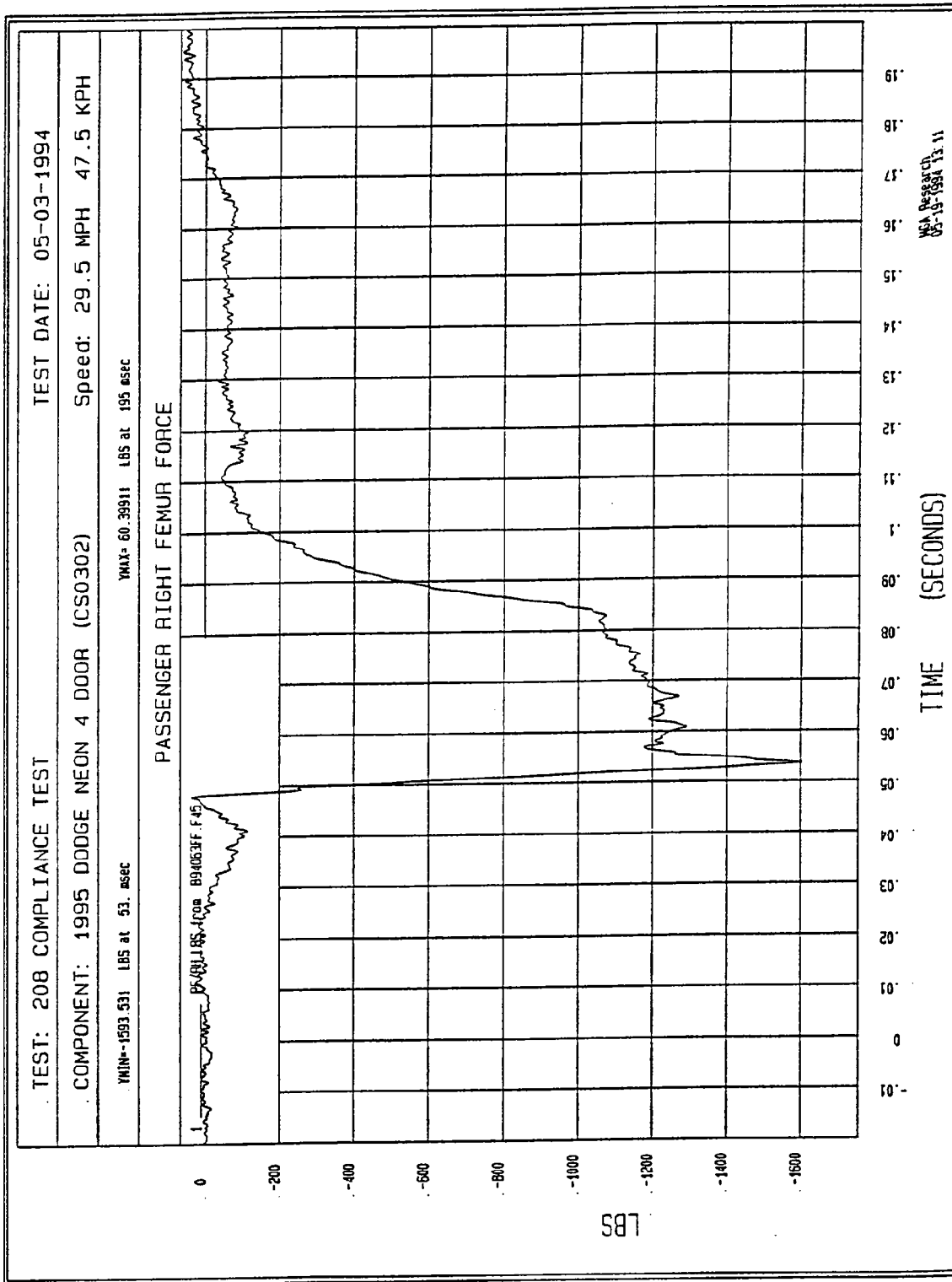


Figure B-21 - Passenger Right Femur Force vs. Time

Filter: Class 60

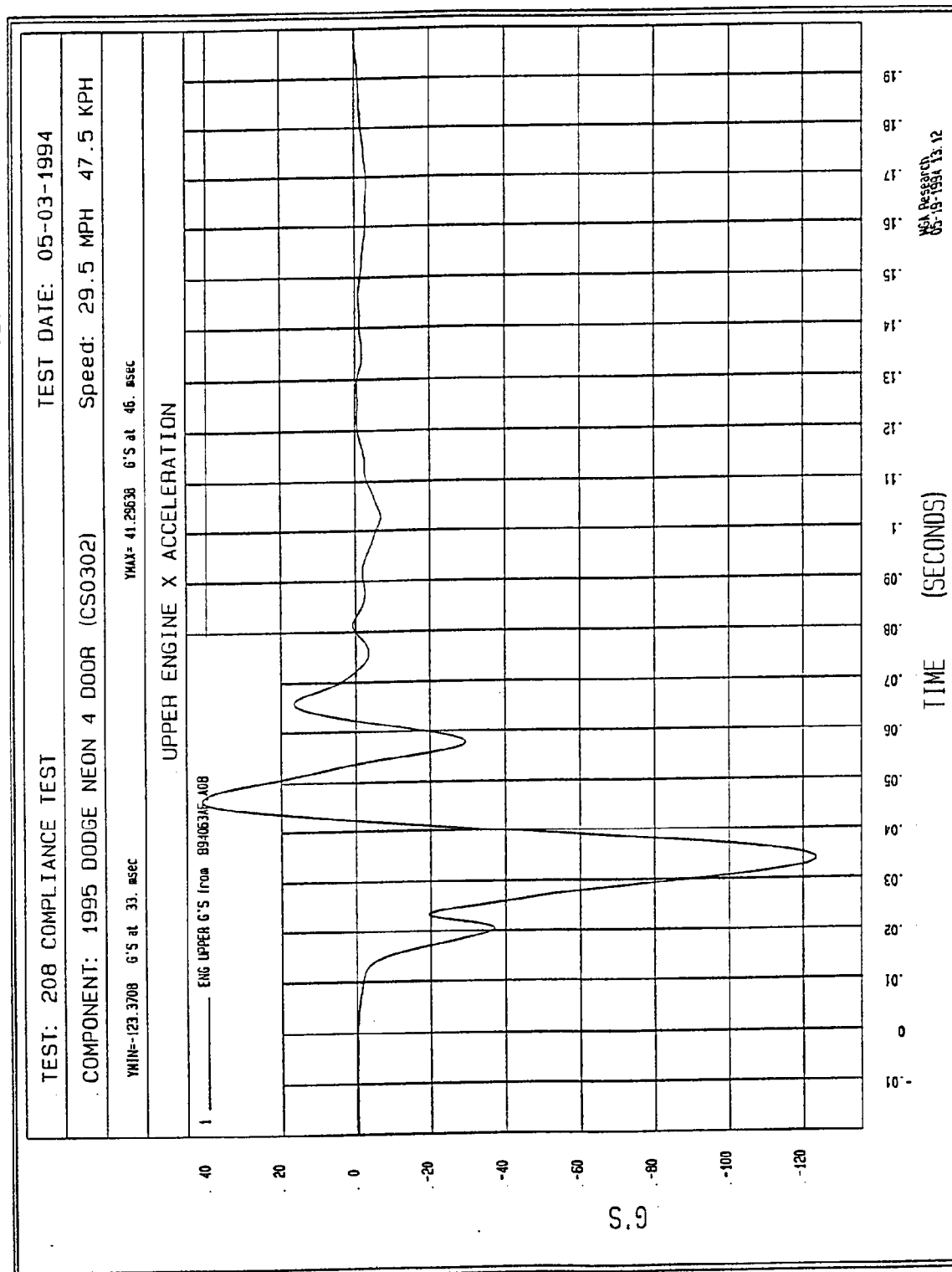


Figure B-22 - Upper Engine X Acceleration vs. Time

Filter: Class 60

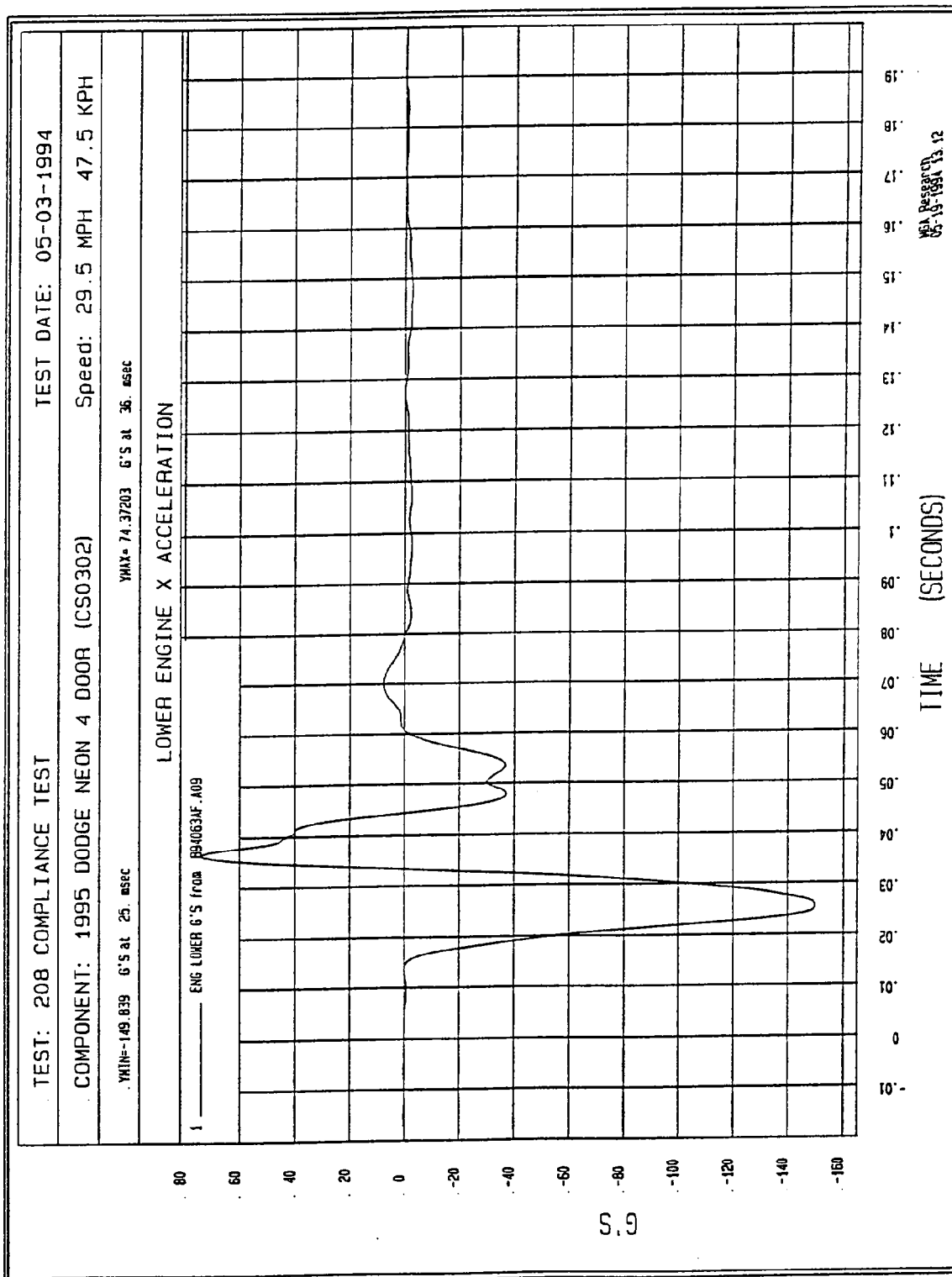


Figure B-23 - Lower Engine X Acceleration vs. Time

TEST: 208 COMPLIANCE TEST	TEST DATE: 05-03-1994
COMPONENT: 1995 DODGE NEON 4 DOOR (CS0302)	Speed: 29.5 MPH 47.5 KPH
YMIN=-53.70857 G'S at 44. msec	
YMAX= 11.44603 G'S at 58. msec	
INSTRUMENT PANEL X ACCELERATION	

1 ——— INST. PANEL G'S from 894053AF.A10

YMIN=-53.70857 G'S at 44. msec

YMAX= 11.44603 G'S at 58. msec

INSTRUMENT PANEL X ACCELERATION

G.S.

TIME (SECONDS)

05-19-1994 13.12

Figure B-24 - Instrument Panel X Acceleration vs. Time

Filter: Class 60

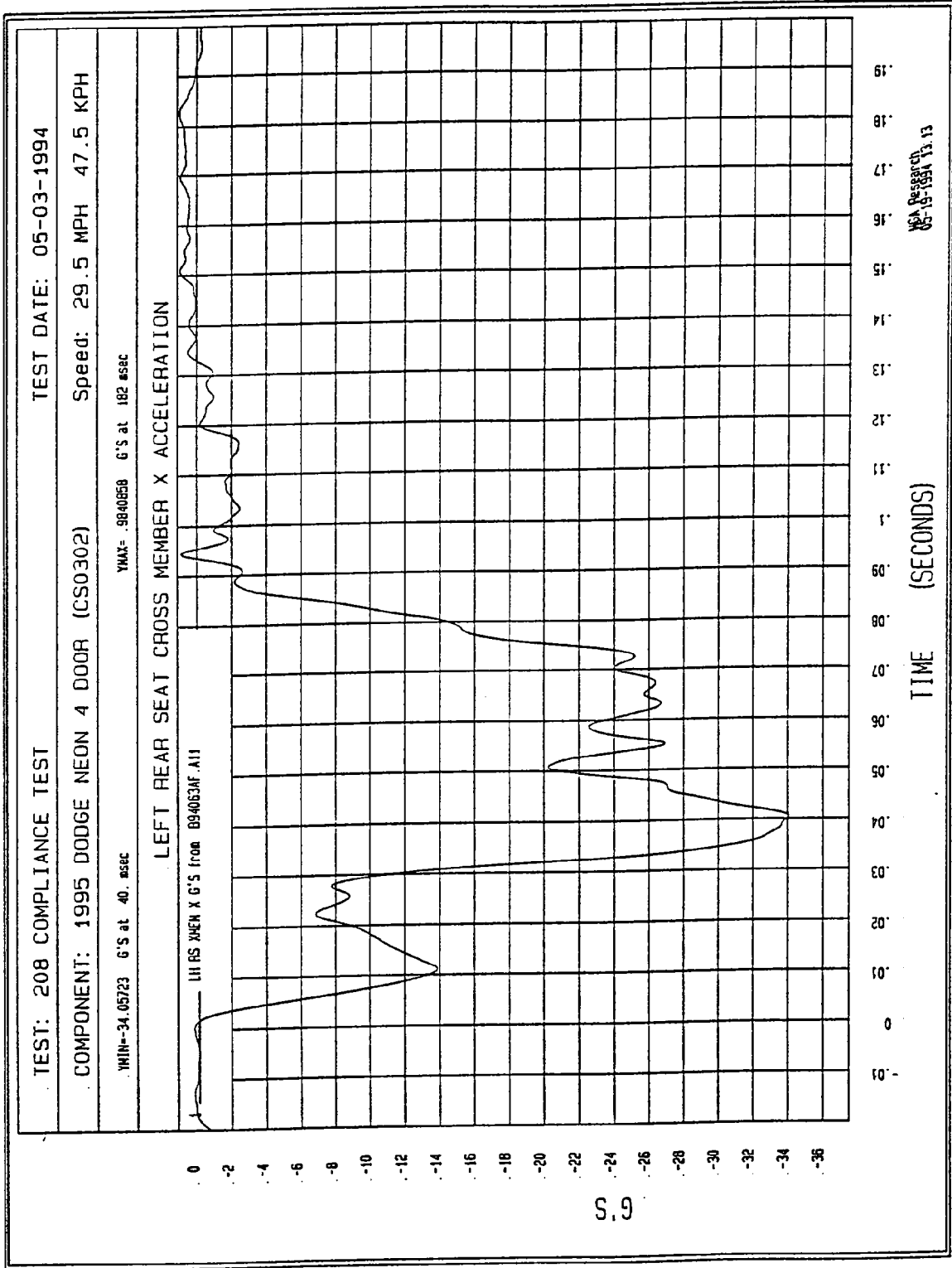


Figure B-25 - Left Rear Seat Crossmember X Acceleration vs. Time

Filter: Class 60

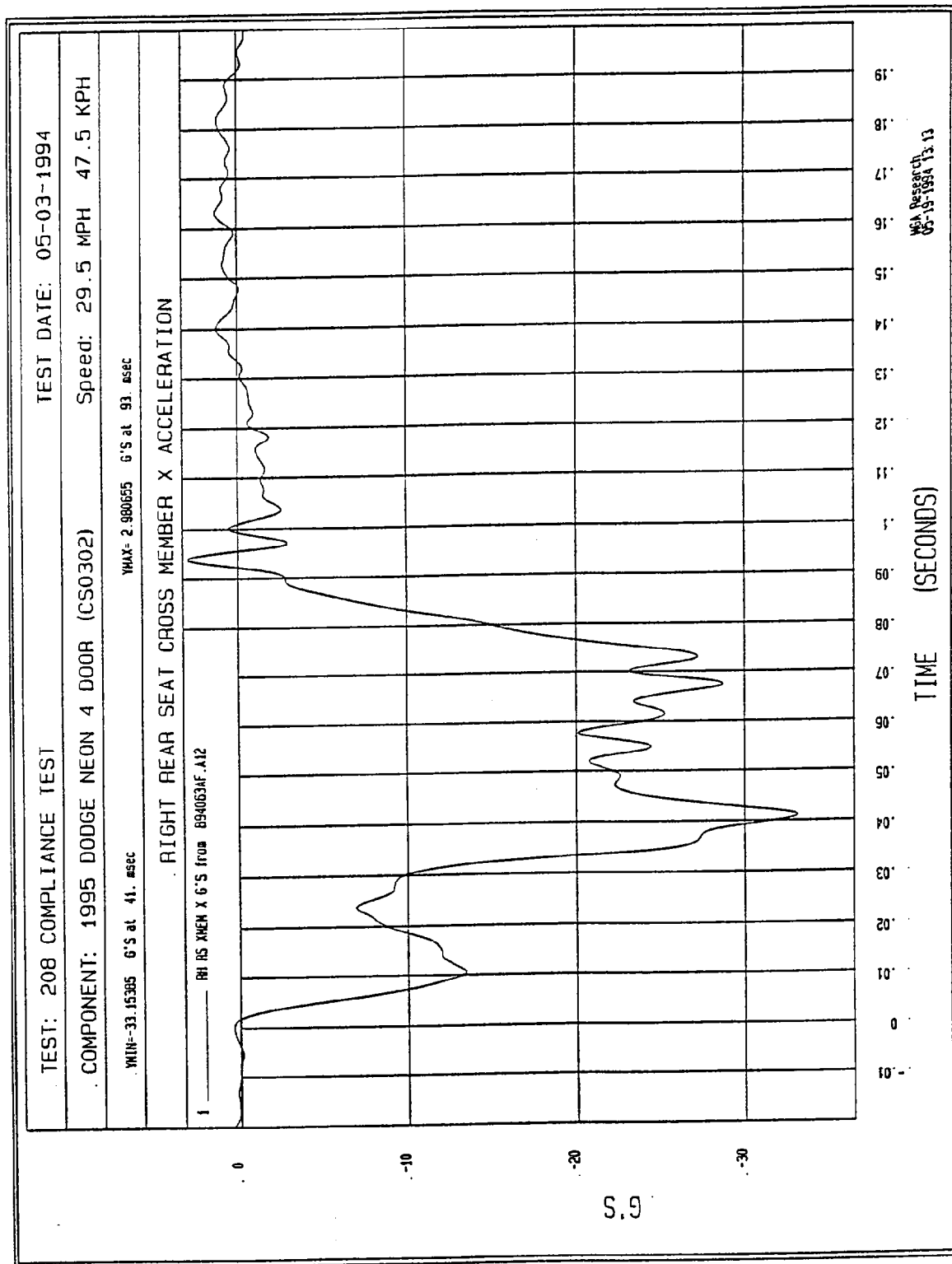
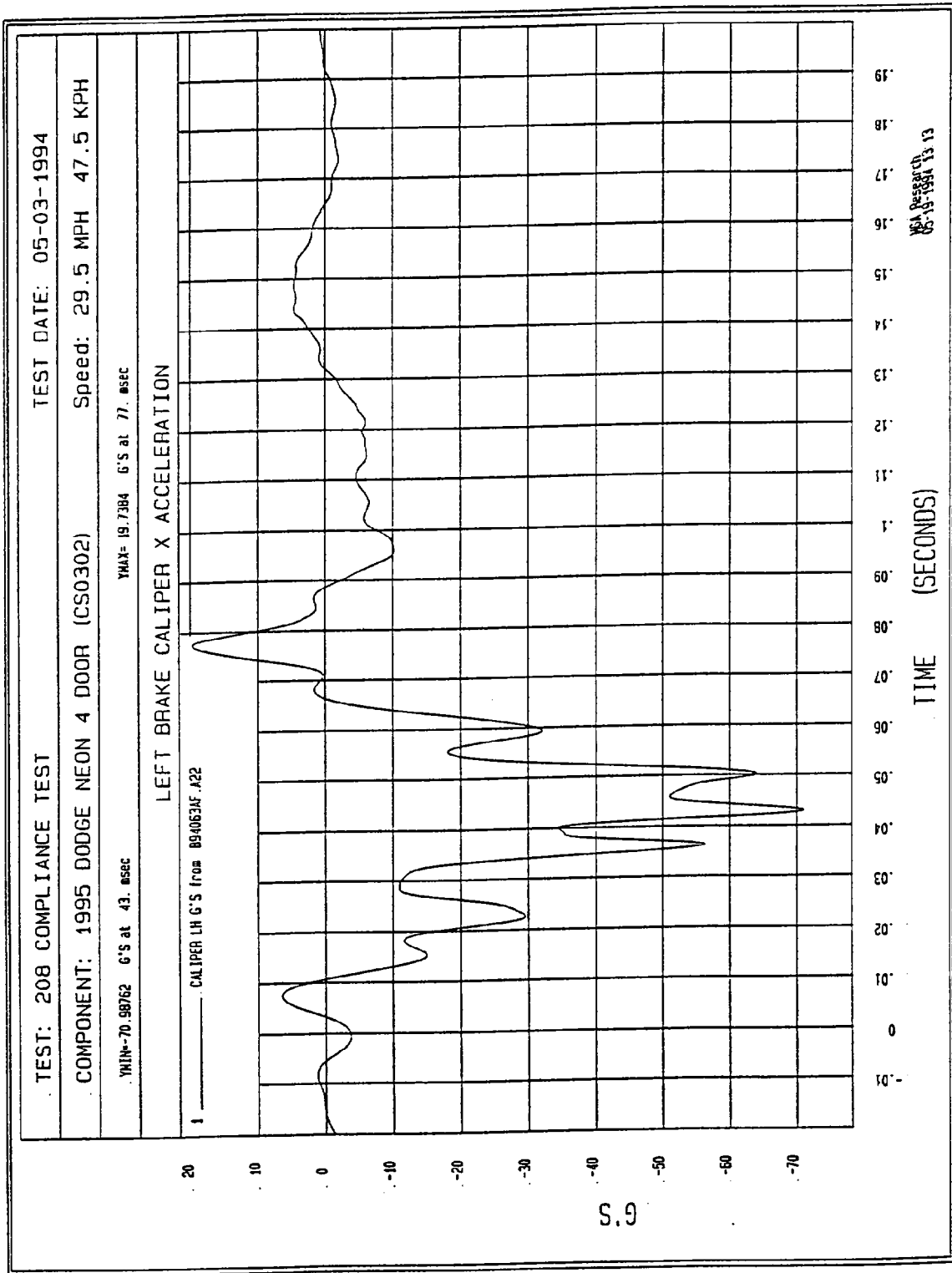


Figure B-26 - Right Rear Seat Crossmember X Acceleration vs. Time

Filter: Class 60



B-27

Figure B-27 - Left Brake Caliper X Acceleration vs. Time

Filter: Class 60

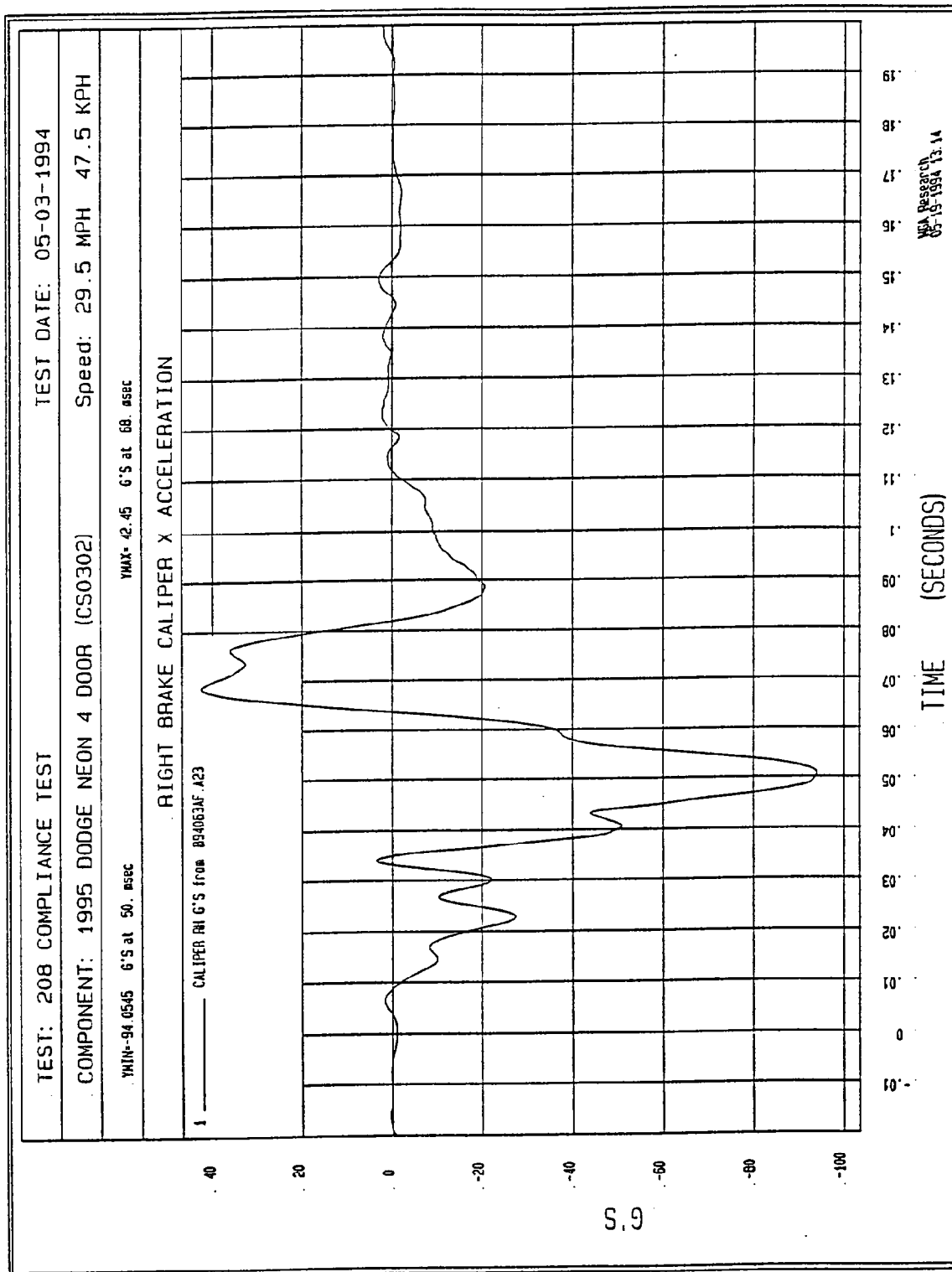


Figure B-28 - Right Brake Caliper X Acceleration vs. Time

Filter: Class 60

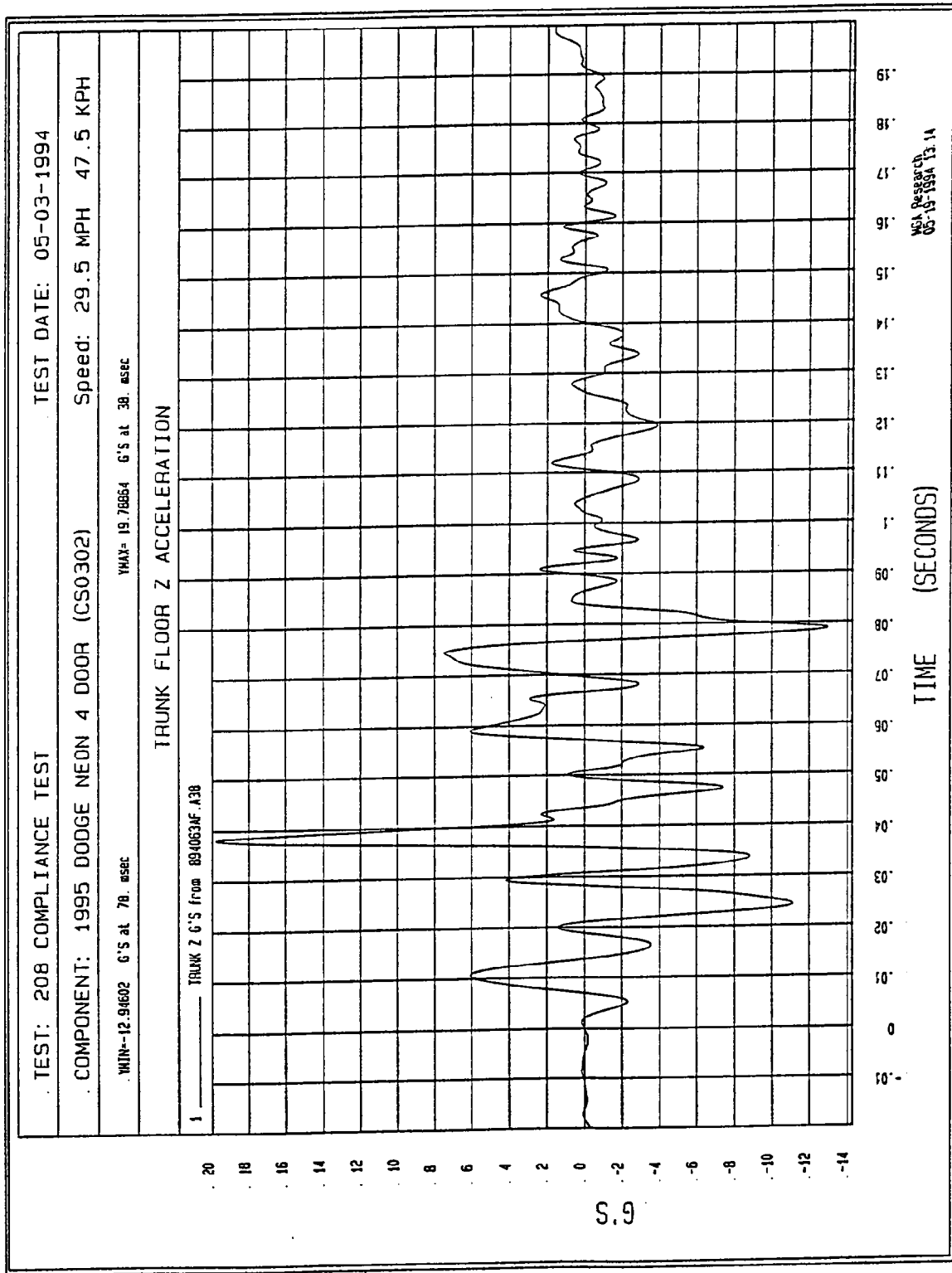


Figure B-29 - Trunk Floor Z Acceleration vs. Time

APPENDIX C
MANUFACTURER'S VEHICLE INFORMATION

Dale E Dawkins
Director, Vehicle Compliance and
Safety Affairs

February 8, 1994

Mr. Robert F. Hellmuth, Director
Office of Vehicle Safety Compliance
National Highway Traffic Safety Administration
U.S. Department of Transportation
400 Seventh Street, S.W.
Washington, D.C. 20590

Dear Mr. Hellmuth:

Reference: NEF-31CCa IR 1415; FMVSS 208 -- 1995 DODGE/PLYMOUTH NEON

The following is provided in response to your January 5, 1994 information request.

Q1. Please inform OVSC whether the air bag automatic restraint system provided at the driver's and passenger's seating positions in your vehicle is certified to meet the requirements of S4.1.2.1(c)(1) or S4.1.2.1(c)(2) for FMVSS No. 208.

A1. The air bag automatic restraint system provided at the driver and passenger seating positions was installed to meet the requirements of S4.1.2.1(c)(2).

Q2. If the automatic restraint system provided at the driver's and passenger's seating positions in the subject vehicle was installed to meet the requirements of S4.1.2.1(c)(1), please provide a copy of the certification test reports for each of the test configurations required by that section of the standard (i.e., moving barrier lateral impact and dynamic rollover) and a copy of the certification reports for the frontal/angular barrier impact test required by S4.1.2.1.

A2. As indicated in our response to Question #1, the automatic restraint system provided at the driver and passenger seating positions was installed to meet the requirements of S4.1.2.1(c)(2).

- Q3. If a manual 3-point safety belt is provided with the driver's and passenger's automatic restraint system in order to meet the requirements of S4.1.2.1(c)(2), please provide a copy of the certification test reports for each of the test configurations required by that section of the standard (i.e., frontal/angular barrier impact test of the automatic restraint system with the manual safety belt unfastened and frontal/angular barrier impact test of the automatic restraint system with the manual safety belt fastened).**
- A3.** All pertinent test reports are summarized and included in Attachment 1. Because previous programs have shown that combined air bag and three point belt tests are typically less severe than unbelted tests, 30 mph belted barrier impacts were not performed for the 1995 MY Neon.
- Q4. If the manual safety belt provided at the driver's and passenger's seating positions was not installed to meet the requirements of S4.1.2.1(c)(2), please provide a copy of a crash test report or engineering analysis showing that the use of the manual safety belt with the automatic restraint system does not affect the ability of the vehicle to meet the requirements of FMVSS No. 208.**
- A4.** As indicated in our response to Question #3, the manual 3-point driver and passenger safety belt was installed in order to meet the requirements of S4.1.2.1(c)(2).
- Q5. If the vehicle uses a pressure vessel to inflate the air bag, provide a copy of the test reports or engineering analysis to demonstrate that it meets all the requirements of S9.1.**
- A5.** A pressure vessel is not used to inflate the air bags on the subject vehicles.
- Q6. If the vehicle uses an explosive device to inflate the air bag, provide a copy of the test reports or engineering analysis to demonstrate that it meets all the requirements of S9.2.**
- A6.** An explosive device is used to inflate the driver and passenger air bags. Information demonstrating that these devices meet all requirements of S9.2 is provided in Attachment 2.

Mr. Robert H. Hellmuth
NEF-31CCa; IR 1415
February 8, 1994
Page 3 of 6

Q7. State, for any automatic safety belt system in this vehicle, whether or not it is equipped with a tension-relieving device. Provide a copy of the information furnished in accordance with S7.4.2, if the tension-relieving device is used.

A7. No tension-relieving device is available.

Q8. FMVSS No. 208, S8.1.5 allows the manufacturer the option of having movable vehicle windows and vents placed in the closed position. State whether the vehicle's movable windows and vents were opened or closed for the certification tests.

A8. Our certification tests were conducted with movable windows in the open position.

Q9. FMVSS No. 208, S5.1 provides a manufacturer with the option of using a Part 572(B) or Part 572(E) test dummy. Please inform OVSC which test dummy was used in each seat for each certification test. Submit dummy placement measurements, including diagrams or photographs which show exactly where measurements were taken. Enclosed is a diagram of some of OVSC's dummy measurements. Where possible, use the dimension shown in the diagram to provide the individual dummy placement measurements.

State whether the vehicle has a foot rest for the driver.

If the vehicle can be equipped with a split front bench seat, state whether the driver dummy was located so that the midsagittal plane was centered on the steering wheel rim or the center of the seat cushion. Also, state whether the passenger dummy was located so that the midsagittal plane was centered the same distance from the longitudinal centerline of the vehicle as the driver dummy or in the center of the seat cushion.

A9. The Part 572(E) test dummy was used in both front outboard designated seating positions for all compliance tests. Attachment 3 contains typical dummy placement measurements and a diagram using the door striker as a reference point.

The vehicle does not have a foot rest for the driver and is equipped with a split front bench seat. The driver dummy was located so that the midsagittal plane was centered on the steering wheel rim. The passenger dummy was located so that the midsagittal plane was centered the same distance from the longitudinal centerline of the vehicle as the driver dummy.

Q10. Provide the seat positioning, steering column positioning, and fuel tank data on the enclosed form.

A10. See Attachment 4.

Q11. If the vehicle is equipped with adjustable seatbelt anchorages, provide the manufacturer's nominal design position for the 50th percentile adult male occupant.

A11. Adjustable turning loops are standard on each B-pillar, with 6 positions. The nominal design position for a 50th percentile adult male is located three positions down from the upper most position.

Q12. Provide the speed at impact, vehicle test weight, and resulting injury criteria (i.e., HIC, chest acceleration, chest compression for the Part 572(E) dummy and femur loads) recorded for all certification tests conducted to meet the requirements of S4.1.2.1.

In addition, include each dummy's head and chest acceleration versus time plots and femur load versus time plots for all full frontal barrier impact tests. Mark these plots to indicate when the following and any other significant events occur:

- 12.1 Driver and passenger knee contact with the knee bolster**
- 12.2 Collapse of the driver and passenger knee bolsters**
- 12.3 Steering column stroke (when it starts and when it ends)**
- 12.4 Driver: Contact of the head with the air bag, steering wheel, hub, windshield, header and any other contact points**
Passenger: Contact of the head with the air bag, instrument panel, windshield, header and any other contact points

- 12.5 **Contact of the driver's torso with the air bag, steering wheel and hub**
- 12.6 **Time during event when each air bag starts to deploy and when it is fully deployed**
- 12.7 **Mark on the plots any unexpected events, like steering wheel fracture, windshield contact, windshield header contact, that affected the normal loading characteristics.**

A12. See Attachment 1 for all certification test information. See Attachment 5 for marked data traces regarding questions 12.1, 12.2, 12.4, 12.5, and 12.6. For question 12.3, steering column stroke will typically start at approximately 40 milliseconds after barrier contact and will typically end at approximately 60 milliseconds after barrier contact. In response to question 12.7, there were no unexpected events in the tests.

Q13. When components must be removed to obtain the proper test weight, what components do you recommend for removal and in what priority order do you recommend removal?

A13. If vehicle components must be removed to obtain the proper test weight, the following priority order should be utilized:

Rear bumper, spare tire and jack, decklid, rear seat, tail lamps, rear door trim, rear door glass, front door glass. Removal of any components other than mentioned above may compromise test results.

Q14. Please provide FMVSS No. 204, "Steering Control Rearward Displacement" certification data. Include a copy of the test report and any engineering analysis forming the basis of the certification. The report should document the vehicle test weight, impact velocity, and the horizontal and vertical displacements of the steering control. Pre and post test photographs are also requested.

Discuss the test procedure detailing the vehicle preparation and the measurement technique used to determine the steering control rearward displacement.

Provide a diagram of the steering control system and describe how the components of the steering control system work to provide energy management in a frontal impact.

Mr. Robert H. Hellmuth
NEF-31CCa; IR 1415
February 8, 1994
Page 6 of 6

A14. The following attachments provide the requested information:

Attachment #6 - Steering Column Rearward Displacement
Report/Procedure (CP-199/200)
Attachment #7 - Test Photographs
Attachment #8 - Drawings

The steering control system absorbs occupant energy in the following manner:

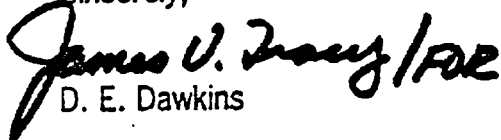
The steering column intermediate coupling collapses as the front suspension crossmember is pushed rearward due to front end crush and corresponding stack-up with the transmission case. Approximately 30 ms after barrier contact, a 5 mm telescoping feature in the steering gear to steering column coupling will collapse. Approximately 40 ms from initial barrier contact and after an additional 18mm of relative motion between the lower and upper coupling halves the shafts will completely separate. Completion of this sequence allows the steering column to achieve maximum stroke.

The driver face and chest will make contact with the deployed air bag, venting gas from the vents located at the back of the bag. The driver knees will contact the knee bolster on either side of the steering column, distorting the energy absorbing materials behind the first surface.

The steering column jacket and both upper and lower mounting brackets may show signs of bending. The steering wheel rim may also become slightly deformed. Typical steering column stroke from the occupant loading is normally from one to two inches.

If you have any questions concerning the information provided, please contact Leo A. Moses of my staff at (313) 370-8556.

Sincerely,


D. E. Dawkins

Attachments
jpr/ded

FMVSS 208

1995 DODGE/PLYMOUTH NEON

NEF - 31CCa; IR 1415

ATTACHMENT # 4

RESPONSE TO QUESTION # 12

SELECTED VEHICLE DATA

TEST VEHICLE INFORMATION

Vehicle Model Year & Make: 1995 Dodge/Plymouth Neon
 Vehicle Model & Body Style: Listed above

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 = 24° degrees.

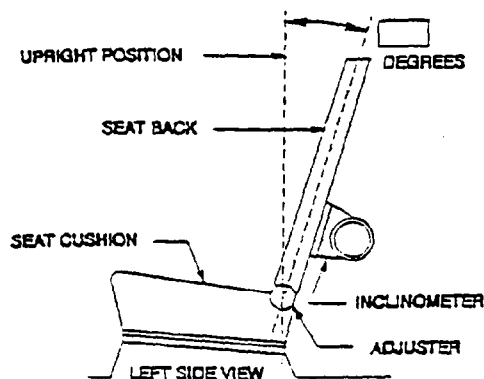
Measurement Instructions:

See Attachment 4, Page 3

Seat back angle for passenger's seat = 24° degrees.

Measurement Instructions:

See Attachment 4, Same as driver



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:

Each detent moves the seat 10 mm. At mid track location approximately 35 mm of lower track is visible at front seat rear floor attachments if more or less is visible move seat as required. Ensure both inboard and outboard tracks are engaged.

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

Same as driver.

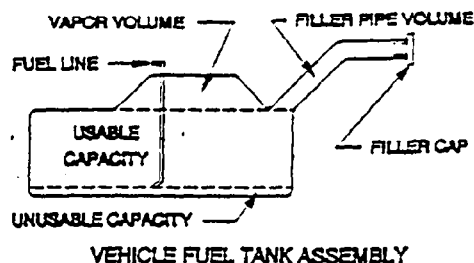
3. FUEL TANK CAPACITY DATA --

3.1 A. "Usable Capacity" of standard equipment fuel tank = 11.2 gallons.

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

C. Capacity used when certification testing to requirements of FMVSS 301 = 10.7 gallons.

Operational Instructions:



3.2 Amount of Stoddard solvent added to vehicle for certification test = 10.7 gallons

3.3 Is vehicle equipped with electric fuel pump? xx YES NO

If YES, does pump normally operate when vehicle's electrical system is activated? xx YES NO

TEST VEHICLE INFORMATION

Attachment 4
Page 2 of 4

* 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.

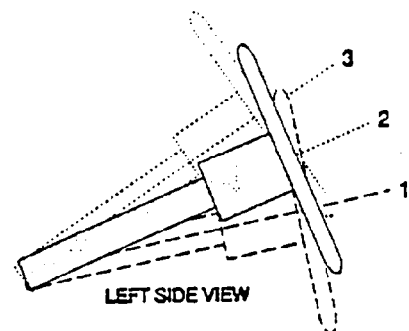
4. STEERING COLUMN ADJUSTMENTS - -

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:

Place column in full down position and measure from bottom of rim to floor. At mid travel location, bottom of rim will be 27 mm above previous full down location.



STEERING COLUMN ASSEMBLY

NEON SEATBACK SET PROCEDURE

1. Remove the seatback recliner plastic side shield by removing the two screws which hold it in place.
2. Lift the recliner handle and rotate the seatback to the full upright position.
3. Insert a 6mm dowel pin in the gage hole provided at the front of the recliner.
4. Lift the recliner handle and recline the seat until it contacts the pin; this sets the back angle to 18 degrees.
5. Remove the pin and recline the seatback an additional 4 notches; this sets the seatback to the design test angle of 24 degrees.
6. Reinstall the plastic side shield.

NOTE: At two notches more reclined than 18 degrees, the moving portion of the recliner will cause the gage hole to appear as a semi-circle. At 24 degrees, the gage hole will be entirely closed.

NEON ATL INFORMATION

The ATL has a total of six different adjustment locations spaced 20 mm apart. The highest ATL adjustment is considered as location number one. The recommended ATL location for the 50th percentile male is at location number four. Location four is found three "clicks" down from location one.