

**SAFETY PRE-STANDARD TESTING FOR FMVSS 201U**  
**Occupant Protection In Interior Impact**  
**Upper Interior Head Impact Protection**

**CHRYSLER CORPORATION**  
**1997 Dodge Neon 4-Door**  
**NHTSA No. PV0300**

**MGA RESEARCH CORPORATION**  
**446 Executive Drive**  
**Troy, Michigan 48083**



**Test Dates: September 2-3, 2004**  
**Report Date: September 7, 2004**

**FINAL REPORT**

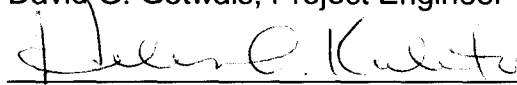
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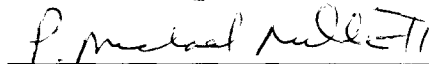
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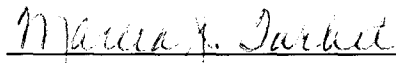


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| 15. Supplementary Notes                                                                                                                                                                                                                                                                                                                                                                       |                                                      |                                                                                                                                                                                                                                     |                  |
| 16. Abstract<br>A pre-standard test series was conducted on the subject 1997 Dodge Neon 4-Door, NHTSA No. PV0300, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-201U-01 for the determination of FMVSS 201U pre-standard compliance. The testing was conducted at MGA Research Corporation in Troy, Michigan on September 2-3, 2004. |                                                      |                                                                                                                                                                                                                                     |                  |
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## 1.0 PURPOSE OF COMPLIANCE TEST

The purpose of this head impact pre-standard test series was to measure the performance of the subject vehicle, a 1997 Dodge Neon 4-Door, for FMVSS 201U, Occupant Protection in Interior Impact - Upper Interior Head Impact Protection.

Tests were conducted on September 2-3, 2004 on a 1997 Dodge Neon 4-Door, manufactured by Chrysler Corporation.

All tests were conducted in accordance with the U. S. Department of Transportation, National Highway Traffic Safety Administration's Laboratory Test Procedure TP-201U-01 dated April 3, 1998 and the corresponding MGA Research Corporation's FMVSS 201U procedure number MGATP201U\_FRAME#2 dated March 20, 2003.

All tests were conducted at MGA Research Corporation in Troy, Michigan and were performed by MGA engineers and technicians. The FMVSS 201U impactor test machine was used to conduct the testing. Target locations were determined by using a Coordinate Measurement Machine in conjunction with the MGA EZ-Target™ program and MGA procedure MGATP201U\_Test Series dated March 20, 2003.

## 2.0 TEST DATA SUMMARY

The 1997 Dodge Neon 4-Door was equipped with A, B, and rear-pillars, an adjustable seat belt anchorage on each B-pillar, a hanger hook over each rear door, and a light in the center of the upper roof.

Upon completion of targeting the test vehicle, ten (10) targets were chosen to be impacted based upon engineering judgment and discussion with the COTR. Targets were chosen which appeared most likely to give high HIC(d) values. The ten (10) targets chosen were:

|     |     |      |     |
|-----|-----|------|-----|
| AP1 | BP1 | RP2  | UR2 |
| AP2 | BP3 | SR1  |     |
| AP3 | BP4 | SR2A |     |

TABLE 2-1  
SUMMARY TABLE OF TEST RESULTS

VEH. MOD YR/MAKE/MODEL/BODY: 1997 Dodge Neon 4-Door

VEH. NHTSA NO.: PV0300      VIN: 1B3ES47C4VD      COLOR: Green

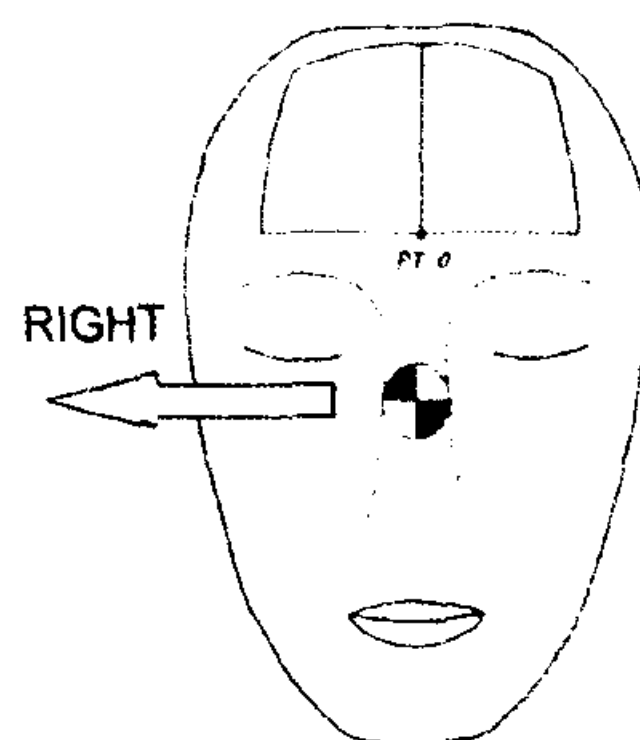
VEH. BUILD DATE: July, 1996      TEST DATES: September 2-3, 2004

TEST LABORATORY: MGA Research Corporation

OBSERVERS: David Gotwals, Nicholas Brzuch, Bryan Hood

| TARGET | VEHICLE SIDE | HORIZONTAL ANGLE (deg) | VERTICAL ANGLE (deg) | VELOCITY (kph) | HIC(d) | FMH HIC | IMPACT ON FMH (mm) |            |
|--------|--------------|------------------------|----------------------|----------------|--------|---------|--------------------|------------|
|        |              |                        |                      |                |        |         | Above              | Left/Right |
| AP1    | Right        | 130                    | 42                   | 23.6           | 793    | 831     | 15                 | 0          |
| AP2    | Left         | 205                    | 44                   | 23.4           | 926    | 1007    | 8                  | 3 Left     |
| AP3    | Right        | 154                    | 41                   | 23.9           | 1136   | 1285    | 14                 | 10 Left    |
| BP1    | Right        | 90                     | 11                   | 23.9           | 885    | 952     | 53                 | 0          |
| BP3    | Left         | 280                    | 2                    | 23.6           | 591    | 563     | 40                 | 32 Left    |
| BP4    | Right        | 157                    | -6                   | 23.6           | 515    | 462     | 18                 | 0          |
| RP2    | Right        | 40                     | 21                   | 23.6           | 853    | 910     | 35                 | 8 Left     |
| SR1    | Left         | 270                    | 33                   | 23.5           | 1085   | 1217    | 32                 | 9 Right    |
| SR2A   | Right        | 90                     | 27                   | 23.1           | 897    | 969     | 35                 | 15 Left    |
| UR2    | Left         | 270                    | 25                   | 23.3           | 980    | 1079    | 65                 | 15 Left    |

Above and left/right refers to the position relative to reference pt. 0 where the target made contact with the Free Motion Headform. See the diagram below for details.



## POST TEST COMMENTS:

The following description lists any post-test damage or other test observations for each target.

BP3 Left: Crack in the B-pillar trim.

No damage was observed for any other targets.

## REMARKS:

The targets listed were impacted in the following order:

Left: AP2, BP3, SR1, UR2

Right: AP3, AP1, SR2(A), BP1, BP4, RP2

The 150 mm rule was observed for targets horizontal to each other and the 200 mm rule was observed for vertical components.

RECORDED BY: David G. Gotwals      DATE: September 3, 2004

APPROVED BY: Helen A. Kaleto



TABLE 2-2

## GENERAL TEST AND VEHICLE PARAMETER DATA

VEH. MOD YR/MAKE/MODEL/BODY: 1997 Dodge Neon 4-Door

VEH. NHTSA NO.: PV0300 VIN: 1B3ES47C4VD COLOR: Green

VEH. BUILD DATE: July, 1996 TEST DATES: September 2-3, 2004

TEST LABORATORY: MGA Research Corporation

OBSERVERS: David Gotwals, Nicholas Brzuch, Bryan Hood

INTERIOR TRIM INFORMATION: A, B, and rear-pillars, an adjustable seat belt anchorage on each B-pillar, a hanger hook over each rear door, and a light in the center of the upper roof.

## SUNROOF INFORMATION:

Installed:      Yes   X   No  
Operation:      Electric      Manual

## ROLL-BAR INFORMATION:

Installed:      Yes   X   No  
Padded:      Yes   X   No  
Braces:      Yes   X   No

## GENERAL INFORMATION:

Date Received: 8/31/04; Odometer Reading: 97,733 miles

## DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured By: Chrysler Corporation

Date of Manufacture: July, 1996 VIN: 1B3ES47C4VD

GVWR: 1595 kg;

GAWR FRONT: 887 kg

GAWR REAR: 731 kg

## DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load:

FRONT: 220 kpa      REAR: 220 kpaRecommended Tire Size: P185/65R14

Recommended Cold Tire Pressure:

FRONT: 220 kpa      REAR: 220 kpaSize of Tire on Test Vehicle: P185/65R14Type of Spare Tire: Not Available;      Space Saver: X;      Standard: \_\_\_\_\_

## VEHICLE CAPACITY DATA:

Type of Front Seats: Bench \_\_\_\_\_;      Bucket X; Split Bench \_\_\_\_\_Number of Occupants:      Front 2;      Rear 3;      TOTAL 5VEHICLE CAPACITY WEIGHT (VCW) = 392 kgNo. of Occupants x 68 kg = 340 kgRated Cargo/Luggage Weight (RCLW) = 52 kg (difference)

## WEIGHT OF TEST VEHICLE AS DELIVERED AT LABORATORY: (with maximum fluids)

Right Front = 385.5 kg      Right Rear = 192.0 kgLeft Front = 369.0 kg      Left Rear = 218.0 kgTOTAL FRONT = 754.5 kg      TOTAL REAR = 410.0 kg% Total Weight = 64.8 %      % Total Weight = 35.2 %TOTAL DELIVERED WEIGHT = 1164.5 kg

## CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight = 1164.5 kgRated Cargo/Luggage Wt. = 52.0 kgTARGET TEST WEIGHT 1216.5 kg

## WEIGHT OF TEST VEHICLE:

|                                                                  |                 |                  |                 |
|------------------------------------------------------------------|-----------------|------------------|-----------------|
| Right Front =                                                    | <u>385.0</u> kg | Right Rear =     | <u>220.0</u> kg |
| Left Front =                                                     | <u>370.0</u> kg | Left Rear =      | <u>243.0</u> kg |
| TOTAL FRONT =                                                    | <u>755.0</u> kg | TOTAL REAR =     | <u>463.0</u> kg |
| % Total Weight =                                                 | <u>62.0</u> %   | % Total Weight = | <u>38.0</u> %   |
| TOTAL TEST WEIGHT = <u>1218.0</u> kg                             |                 |                  |                 |
| Weight of ballast secured in vehicle's cargo area = <u>52</u> kg |                 |                  |                 |

## TEST VEHICLE ATTITUDE:

AS DELIVERED: Right Front 660.0 mm; Left Front 637.0 mm;  
 Right Rear 678.0 mm; Left Rear 660.0 mm  
 Pitch Angle at Right Door Sill = 0.6 Rear higher  
 Pitch Angle at Left Door Sill = 0.5 Rear higher  
 Roll Angle at Front Bumper = 0.5 Right side higher  
 Roll Angle at Rear Bumper = 1.5 Right side higher

FULLY LOADED: Right Front 660.0 mm; Left Front 637.0 mm;  
 Right Rear 668.0 mm; Left Rear 650.0 mm;  
 Pitch Angle at Right Door Sill = 0.5 Rear higher  
 Pitch Angle at Left Door Sill = 0.4 Rear higher  
 Roll Angle at Front Bumper = 0.4 Right side higher  
 Roll Angle at Rear Bumper = 1.5 Right side higher

AS TARGETED: Right Front 875.0 mm; Left Front 878.0 mm;  
 Right Rear 899.0 mm; Left Rear 905.0 mm;  
 Pitch Angle at Right Door Sill = 0.6 Rear higher  
 Pitch Angle at Left Door Sill = 0.5 Rear higher  
 Roll Angle at Front Bumper = 0.4 Right side higher  
 Roll Angle at Rear Bumper = 1.4 Right side higher

## AS TESTED ON RIGHT SIDE:

Pitch Angle at Right Door Sill = 0.6 Rear higher  
 Pitch Angle at Left Door Sill = 0.5 Rear higher  
 Roll Angle at Front Bumper = 0.4 Right side higher  
 Roll Angle at Rear Bumper = 1.4 Right side higher



## AS TESTED ON LEFT SIDE:

Pitch Angle at Right Door Sill = 0.6 Rear higherPitch Angle at Left Door Sill = 0.5 Rear higherRoll Angle at Front Bumper = 0.4 Right side higherRoll Angle at Rear Bumper = 1.4 Right side higherVEHICLE WHEELBASE = 2640 mm

REMARKS: The seat travel distance was measured to be 215 mm for the driver front seat and 215 mm for the passenger front seat.

RECORDED BY: David G. GotwalsDATE: September 1, 2004APPROVED BY: Helen A. Kaleto

TABLE 2-3

HORIZONTAL IMPACT ANGLE RANGE FOR A AND B PILLARS

VEH. MOD YR/MAKE/MODEL/BODY: 1997 Dodge Neon 4-Door

VEH. NHTSA NO.: PV0300 VIN: 1B3ES47C4VD COLOR: Green

VEH. BUILD DATE: July, 1996 TEST DATES: September 2-3, 2004

TEST LABORATORY: MGA Research Corporation

OBSERVERS: David Gotwals, Nicholas Brzuch, Bryan Hood

HORIZONTAL IMPACT ANGLE RANGE FOR A AND B PILLARS

|          | HORIZONTAL ANGLE<br>SPECIFIED RANGE | MINIMUM<br>HORIZONTAL ANGLE | MAXIMUM<br>HORIZONTAL ANGLE |
|----------|-------------------------------------|-----------------------------|-----------------------------|
| A-PILLAR | L 195°-255°                         | L 204.1°                    | L 248.8°                    |
|          | R 105°-165°                         | R 111.2°                    | R 154.6°                    |
| B-PILLAR | L 195°-345°                         | L 202.0°                    | L 290.8°                    |
|          | R 15°-165°                          | R 70.1°                     | R 156.8°                    |

AS DETERMINED USING THE PROCEDURES SPECIFIED IN S8.13.4.1

REMARKS:

RECORDED BY: David G. Gotwals

DATE: September 1, 2004

APPROVED BY: Helen A. Kaleto



TABLE 2-4

## VERTICAL IMPACT ANGLE RANGES

VEH. MOD YR/MAKE/MODEL/BODY: 1997 Dodge Neon 4-DoorVEH. NHTSA NO.: PV0300 VIN: 1B3ES47C4VD COLOR: GreenVEH. BUILD DATE: July, 1996 TEST DATES: September 2-3, 2004TEST LABORATORY: MGA Research CorporationOBSERVERS: David Gotwals, Nicholas Brzuch, Bryan Hood

## VERTICAL IMPACT ANGLE RANGES

|              |       | VERTICAL ANGLE<br>SPECIFIED RANGE | MINIMUM VERTICAL<br>ANGLE | MAXIMUM VERTICAL<br>ANGLE |
|--------------|-------|-----------------------------------|---------------------------|---------------------------|
| FRONT HEADER | FH1   | L 0°-50°                          | L 0°                      | L 50°                     |
|              |       | R 0°-50°                          | R 0°                      | R 50°                     |
|              | FH2   | L 0°-50°                          | L 0°                      | L 50°                     |
|              |       | R 0°-50°                          | R 0°                      | R 50°                     |
| SIDE RAIL    | SR1   | L 0°-50°                          | L 0°                      | L 33°                     |
|              |       | R 0°-50°                          | R 0°                      | R 33°                     |
|              | SR2A  | L 0°-50°                          | L 0°                      | L 27°                     |
|              |       | R 0°-50°                          | R 0°                      | R 27°                     |
|              | SR2B  | L 0°-50°                          | L 0°                      | L 39°                     |
|              |       | R 0°-50°                          | R 0°                      | R 39°                     |
|              | SR3-1 | L 0°-50°                          | L 0°                      | L 32°                     |
|              |       | R 0°-50°                          | R 0°                      | R 32°                     |
| A-PILLAR     | AP1   | L -5°-50°                         | L -5°                     | L 42°                     |
|              |       | R -5°-50°                         | R -5°                     | R 42°                     |
|              | AP2   | L -5°-50°                         | L -5°                     | L 44°                     |
|              |       | R -5°-50°                         | R -5°                     | R 44°                     |
|              | AP3   | L -5°-50°                         | L -5°                     | L 41°                     |
|              |       | R -5°-50°                         | R -5°                     | R 41°                     |
| 3-PILLAR     | BP1   | L -10°-50°                        | L -10°                    | L 11°                     |
|              |       | R -10°-50°                        | R -10°                    | R 11°                     |

|              |      | VERTICAL ANGLE<br>SPECIFIED RANGE | MINIMUM VERTICAL<br>ANGLE | MAXIMUM VERTICAL<br>ANGLE |
|--------------|------|-----------------------------------|---------------------------|---------------------------|
|              | BP2* | L     0°-50°                      | L     0°                  | L     10°                 |
|              |      | R     0°-50°                      | R     0°                  | R     10°                 |
|              | BP3  | L     -10°-50°                    | L     -10°                | L     2°                  |
|              |      | R     -10°-50°                    | R     -10°                | R     2°                  |
|              | BP4  | L     -10°-50°                    | L     -10°                | L     -6°                 |
|              |      | R     -10°-50°                    | R     -10°                | R     -6°                 |
| REAR PILLAR  | RP1  | L     -10°-50°                    | L     -10°                | L     35°                 |
|              |      | R     -10°-50°                    | R     -10°                | R     35°                 |
|              | RP2  | L     -10°-50°                    | L     -10°                | L     21°                 |
|              |      | R     -10°-50°                    | R     -10°                | R     21°                 |
| REAR HEADER  | RH   | L     0°-50°                      | L     -10°                | L     50°                 |
|              |      | R     0°-50°                      | R     -10°                | R     50°                 |
| UPPER ROOF 1 |      | 0°-50°                            | 0°                        | 49°                       |
| UPPER ROOF 2 |      | 0°-50°                            | 0°                        | 25°                       |
| UPPER ROOF 3 |      | 0°-50°                            | 0°                        | 44°                       |
| UPPER ROOF 4 |      | 0°-50°                            | 0°                        | 49°                       |
| UPPER ROOF 5 |      | 0°-50°                            | 0°                        | 25°                       |
| UPPER ROOF 6 |      | 0°-50°                            | 0°                        | 44°                       |

As determined using the Procedures specified in S8.13.4.2. \*Target BP2 is a seat belt anchorage location.

RECORDED BY: David G. Gotwals

DATE: September 1, 2004

APPROVED BY: Helen A. Kalet



TABLE 2-5

## TARGET MEASUREMENTS

VEH. MOD YR/MAKE/MODEL/BODY: 1997 Dodge Neon 4-DoorVEH. NHTSA NO.: PV0300 VIN: 1B3ES47C4VD COLOR: GreenVEH. BUILD DATE: July, 1996 TEST DATES: September 2-3, 2004TEST LABORATORY: MGA Research CorporationOBSERVERS: David Gotwals, Nicholas Brzuch, Bryan Hood

| Measurement | Description                                           | Left Side | Right Side |
|-------------|-------------------------------------------------------|-----------|------------|
| M           | Seat Fore/Aft Travel (Front seats)                    | 215 mm    | 215 mm     |
| T°          | Horizontal ∠ {CG-F1 (Left Seat) to (Right A-Pillar)}  | 111.2°    | --         |
| A1°         | 360° - T°                                             | 248.8°    | --         |
| W°          | Horizontal ∠ {CG-2 (Left Seat) to (Left A-Pillar)}    | 204.1°    | --         |
| A2°         | A2° = W°                                              | 204.1°    | --         |
| U°          | Horizontal ∠ {CG-2 (Left Seat) to (Left B-Pillar)}    | 290.8°    | --         |
| B1°         | B1° = U°                                              | 290.8°    | --         |
| V°          | Horizontal ∠ {CG-R (Left Seat) to (Left B-Pillar)}    | 202.0°    | --         |
| B2°         | B2° = V°                                              | 202.0°    | --         |
| W° (right)  | Horizontal ∠ {CG-F2 (Right Seat) to (Right A-Pillar)} | --        | 154.6°     |
| A1° (right) | A1° (right) = W° (right)                              | --        | 154.6°     |
| T° (right)  | Horizontal ∠ {CG-F1 (Right Seat) to (Left A-Pillar)}  | --        | 248.8°     |
| A2° (right) | 360°-T° (right)                                       | --        | 111.2°     |
| V° (right)  | Horizontal ∠ {CG-R (Right Seat) to (Right B-Pillar)}  | --        | 156.8°     |
| B1° (right) | B1° (right) = V° (right)                              | --        | 156.8°     |
| U° (right)  | Horizontal ∠ {CG-F2 (Right Seat) to (Right B-Pillar)} | --        | 70.1°      |
| B2° (right) | B2° (right) = U° (right)                              | --        | 70.1°      |
| J           | A-Pillar {(Plane 3) - (Plane 5)}                      | 354.9 mm  | 363.3 mm   |
| J/2         | J ÷ 2                                                 | 177.5 mm  | 181.7 mm   |
| D1          | Upper Roof {(Plane A) - (Plane B)}                    | 1372.9 mm |            |
| D1/2        | D1 ÷ 2                                                | 686.5 mm  |            |
| D2          | Upper Roof {(Plane C) - (Plane D)}                    | 1098.8 mm |            |
| D2/2        | D2 ÷ 2                                                | 549.4 mm  |            |
| .35D1       | .35 x D1                                              | 480.5 mm  |            |

| Measurement | Description                                                               | Left Side | Right Side |
|-------------|---------------------------------------------------------------------------|-----------|------------|
| .35D2       | .35 x D2                                                                  | 384.6 mm  |            |
| N           | B-Pillar {(BPR) - (lowest point on daylight opening forward of B-Pillar)} | 439.5 mm  | 441.0 mm   |
| N/2         | B-Pillar {(BP3) - (lowest point on daylight opening forward of B-Pillar)} | 219.8 mm  | 220.5 mm   |
| N/4         | B-Pillar {(BP4) - (lowest point on daylight opening forward of B-Pillar)} | 109.9 mm  | 110.3 mm   |
| D           | R-Pillar (Point 7 - Point M)                                              | 616.0 mm  | 615.0 mm   |
| 3D/7        | 3 D / 7                                                                   | 264.0 mm  | 263.6 mm   |

As determined using the Procedures specified in S10.1-10.13.

| SgRP Locations (vehicle coordinates) |           |        |       |            |       |       |
|--------------------------------------|-----------|--------|-------|------------|-------|-------|
|                                      | Left (mm) |        |       | Right (mm) |       |       |
|                                      | x         | y      | z     | x          | y     | z     |
| Front                                | 1988.5    | -343.0 | 745.2 | 1988.5     | 343.0 | 745.2 |
| Rear                                 | 2775.6    | -331.0 | 663.7 | 2775.6     | 331.0 | 663.7 |

| SgRP Locations (world coordinates) |           |        |       |            |       |       |
|------------------------------------|-----------|--------|-------|------------|-------|-------|
|                                    | Left (mm) |        |       | Right (mm) |       |       |
|                                    | x         | y      | z     | x          | y     | z     |
| Front                              | 1988.5    | -343.0 | 745.2 | 1988.5     | 343.0 | 745.2 |
| Rear                               | 2775.6    | -331.0 | 663.7 | 2775.6     | 331.0 | 663.7 |

| CG Locations (world coordinates) |           |        |        |            |       |        |
|----------------------------------|-----------|--------|--------|------------|-------|--------|
|                                  | Left (mm) |        |        | Right (mm) |       |        |
|                                  | x         | y      | z      | x          | y     | z      |
| CGF1                             | 1933.5    | -343.0 | 1405.2 | 1933.5     | 343.0 | 1405.2 |
| CGF2                             | 2148.5    | -343.0 | 1405.2 | 2148.5     | 343.0 | 1405.2 |
| CGR                              | 2935.6    | -331.0 | 1323.7 | 2935.6     | 3310  | 1323.7 |

REFERENCE FOR VEHICLE COORDINATE SYSTEM:

REMARKS: Upper driver door striker bolt (x, y, z) = (2130.4, -743.7, 886.3)  
 Front outboard seat anchor (x, y, z) = (1696.6, -538.8, 536.7)

RECORDED BY: David G. Gotwals      DATE: September 1, 2004

APPROVED BY: Helen A. Kaleto



TABLE 2-6

## SUMMARY OF TARGETING RESULTS

VEH. MOD YR/MAKE/MODEL/BODY: 1997 Dodge Neon 4-DoorVEH. NHTSA NO.: PV0300 VIN: 1B3ES47C4VD COLOR: GreenVEH. BUILD DATE: July, 1996 TEST DATES: September 2-3, 2004TEST LABORATORY: MGA Research CorporationOBSERVERS: David Gotwals, Nicholas Brzuch, Bryan Hood

| SUMMARY OF TARGETING RESULTS |               |        |        |                        |                      |                     |                                |                 |
|------------------------------|---------------|--------|--------|------------------------|----------------------|---------------------|--------------------------------|-----------------|
| Target                       | Location (mm) |        |        | Horizontal Angle (deg) | Vertical Angle (deg) | Relocation (Yes/No) | Extension (# of 25 mm Spheres) | Impact (Yes/No) |
|                              | x             | y      | z      |                        |                      |                     |                                |                 |
| A-Pillar Left Side           |               |        |        |                        |                      |                     |                                |                 |
| AP1                          | 1763.4        | -494.7 | 1520.4 | 230                    | 42                   | No                  | --                             | No              |
| AP2                          | 1645.8        | -578.7 | 1433.3 | 205                    | 44                   | No                  | --                             | Yes             |
| AP3                          | 1502.8        | -620.3 | 1342.3 | 205                    | 41                   | No                  | --                             | No              |
| A-Pillar Right Side          |               |        |        |                        |                      |                     |                                |                 |
| AP1                          | 1760.3        | 495.7  | 1521.2 | 130                    | 42                   | No                  | --                             | Yes             |
| AP2                          | 1648.2        | 581.5  | 1433.9 | 154                    | 44                   | No                  | --                             | No              |
| AP3                          | 1496.5        | 623.2  | 1338.8 | 154                    | 41                   | No                  | --                             | Yes             |
| B-Pillar Left Side           |               |        |        |                        |                      |                     |                                |                 |
| BP1                          | 2270.6        | -430.5 | 1603.8 | 270                    | 11                   | No                  | --                             | No              |
| BP2                          | 2253.1        | -546.6 | 1359.7 | 270                    | 10                   | No                  | --                             | No              |
| BP3                          | 2226.1        | -560.7 | 1384.9 | 280                    | 2                    | No                  | --                             | Yes             |
| BP4                          | 2275.4        | -625.9 | 1276.2 | 202                    | -6                   | No                  | --                             | No              |
| B-Pillar Right Side          |               |        |        |                        |                      |                     |                                |                 |
| BP1                          | 2276.7        | 437.4  | 1602.4 | 90                     | 11                   | No                  | --                             | Yes             |
| BP2                          | 2253.6        | 555.5  | 1359.9 | 90                     | 10                   | No                  | --                             | No              |
| BP3                          | 2223.7        | 566.8  | 1383.2 | 80                     | 2                    | No                  | --                             | No              |
| BP4                          | 2278.2        | 632.6  | 1273.8 | 157                    | -6                   | No                  | --                             | Yes             |
| Rear Pillar Left Side        |               |        |        |                        |                      |                     |                                |                 |
| RP1                          | 2866.8        | -461.7 | 1566.3 | 305                    | 35                   | No                  | --                             | No              |
| RP2                          | 3079.6        | -568.8 | 1417.0 | 320                    | 21                   | No                  | --                             | No              |

| SUMMARY OF TARGETING RESULTS |               |        |        |                        |                      |                     |                                |                 |
|------------------------------|---------------|--------|--------|------------------------|----------------------|---------------------|--------------------------------|-----------------|
| Target                       | Location (mm) |        |        | Horizontal Angle (deg) | Vertical Angle (deg) | Relocation (Yes/No) | Extension (# of 25 mm Spheres) | Impact (Yes/No) |
|                              | x             | y      | z      |                        |                      |                     |                                |                 |
| Rear Pillar Right Side       |               |        |        |                        |                      |                     |                                |                 |
| RP1                          | 2871.8        | 464.5  | 1572.8 | 55                     | 35                   | No                  | --                             | No              |
| RP2                          | 3060.1        | 581.5  | 1423.6 | 40                     | 21                   | No                  | --                             | Yes             |
| Front Header Left Side       |               |        |        |                        |                      |                     |                                |                 |
| FH1                          | 1691.1        | -377.5 | 1531.6 | 180                    | 50                   | No                  | --                             | No              |
| FH2                          | 1669.3        | -227.3 | 1536.4 | 180                    | 50                   | No                  | --                             | No              |
| Front Header Right Side      |               |        |        |                        |                      |                     |                                |                 |
| FH1                          | 1688.4        | 379.4  | 1529.3 | 180                    | 50                   | No                  | --                             | No              |
| FH2                          | 1667.1        | 230.7  | 1534.8 | 180                    | 50                   | No                  | --                             | No              |
| Side Rail Left Side          |               |        |        |                        |                      |                     |                                |                 |
| SR1                          | 1913.1        | -465.6 | 1576.2 | 270                    | 33                   | No                  | --                             | Yes             |
| SR2A                         | 2064.0        | -458.9 | 1594.1 | 270                    | 27                   | No                  | --                             | No              |
| SR2B                         | 1970.8        | -462.4 | 1586.9 | 270                    | 39                   | No                  | --                             | No              |
| SR3-1                        | 2420.0        | -446.4 | 1606.1 | 270                    | 32                   | No                  | --                             | No              |
| Side Rail Right Side         |               |        |        |                        |                      |                     |                                |                 |
| SR1                          | 1909.8        | 470.4  | 1575.5 | 90                     | 33                   | No                  | --                             | No              |
| SR2A                         | 2061.1        | 466.4  | 1595.3 | 90                     | 27                   | No                  | --                             | Yes             |
| SR2B                         | 1976.6        | 468.8  | 1587.2 | 90                     | 39                   | No                  | --                             | No              |
| SR3-1                        | 2426.8        | 459.4  | 1602.0 | 90                     | 32                   | No                  | --                             | No              |
| Rear Header Left Side        |               |        |        |                        |                      |                     |                                |                 |
| RH                           | 2855.5        | -331.6 | 1599.5 | 0                      | 50                   | No                  | --                             | No              |
| Rear Header Right Side       |               |        |        |                        |                      |                     |                                |                 |
| RH                           | 2859.1        | 331.3  | 1598.5 | 0                      | 50                   | No                  | --                             | No              |
| Upper Roof Left Side         |               |        |        |                        |                      |                     |                                |                 |
| UR1                          | 1816.4        | -377.2 | 1572.0 | 225                    | 49                   | No                  | --                             | No              |
| UR2                          | 2271.5        | -371.8 | 1628.9 | 270                    | 25                   | No                  | --                             | Yes             |
| UR3                          | 2762.3        | -367.3 | 1614.3 | 270                    | 44                   | No                  | --                             | No              |
| Upper Roof Right Side        |               |        |        |                        |                      |                     |                                |                 |
| UR4                          | 1818.0        | 384.6  | 1574.1 | 135                    | 49                   | No                  | --                             | No              |
| UR5                          | 2276.7        | 382.4  | 1628.2 | 90                     | 25                   | No                  | --                             | No              |
| UR6                          | 2760.5        | 382.1  | 1615.8 | 90                     | 44                   | No                  | --                             | No              |



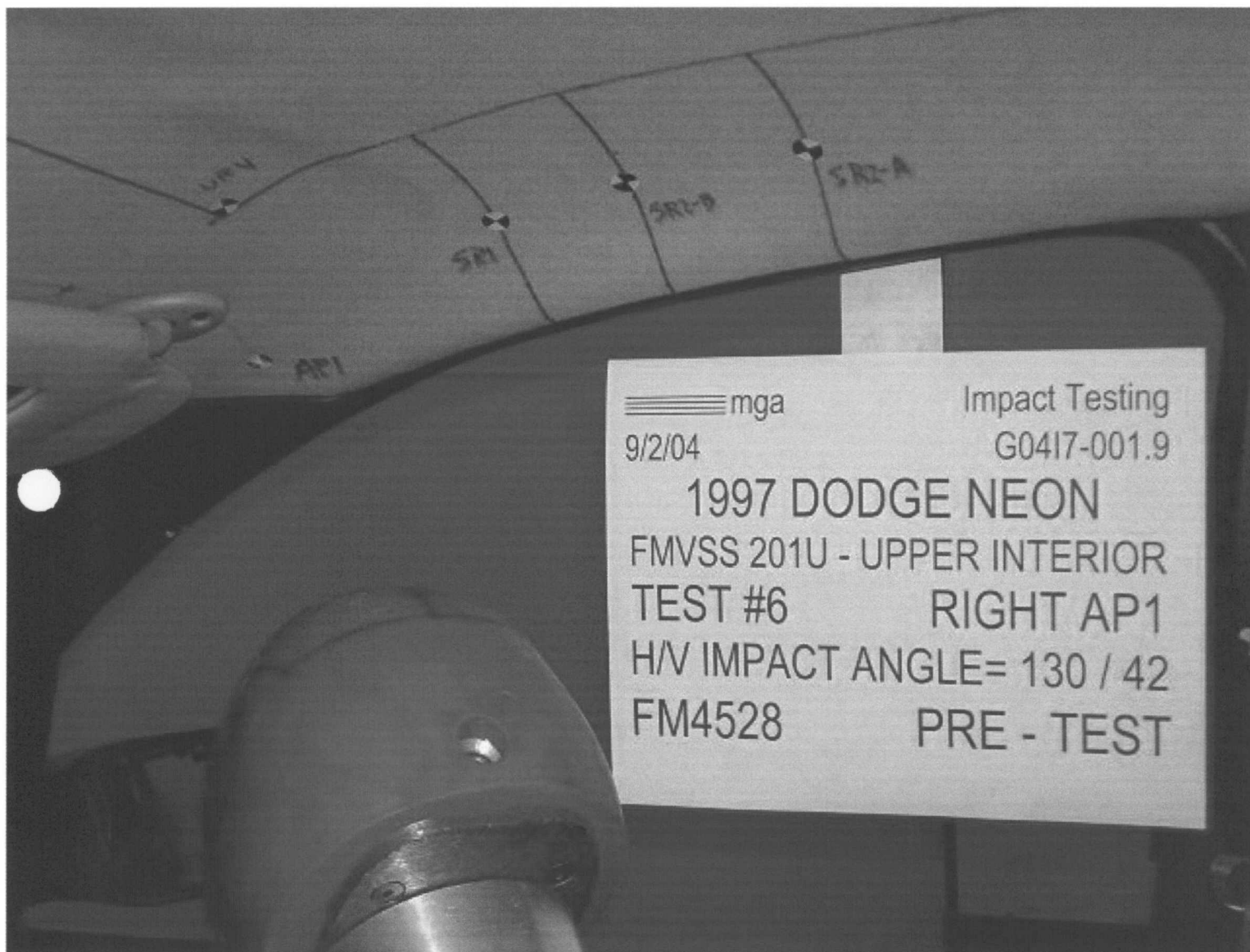
As determined using the Procedures specified in S10.1-10.13.

REMARKS:

RECORDED BY: David G. Gotwals

DATE: September 1, 2004

APPROVED BY: Helen A. Kaleto



===== mga

9/2/04

Impact Testing

G0417-001.9

1997 DODGE NEON

FMVSS 201U - UPPER INTERIOR

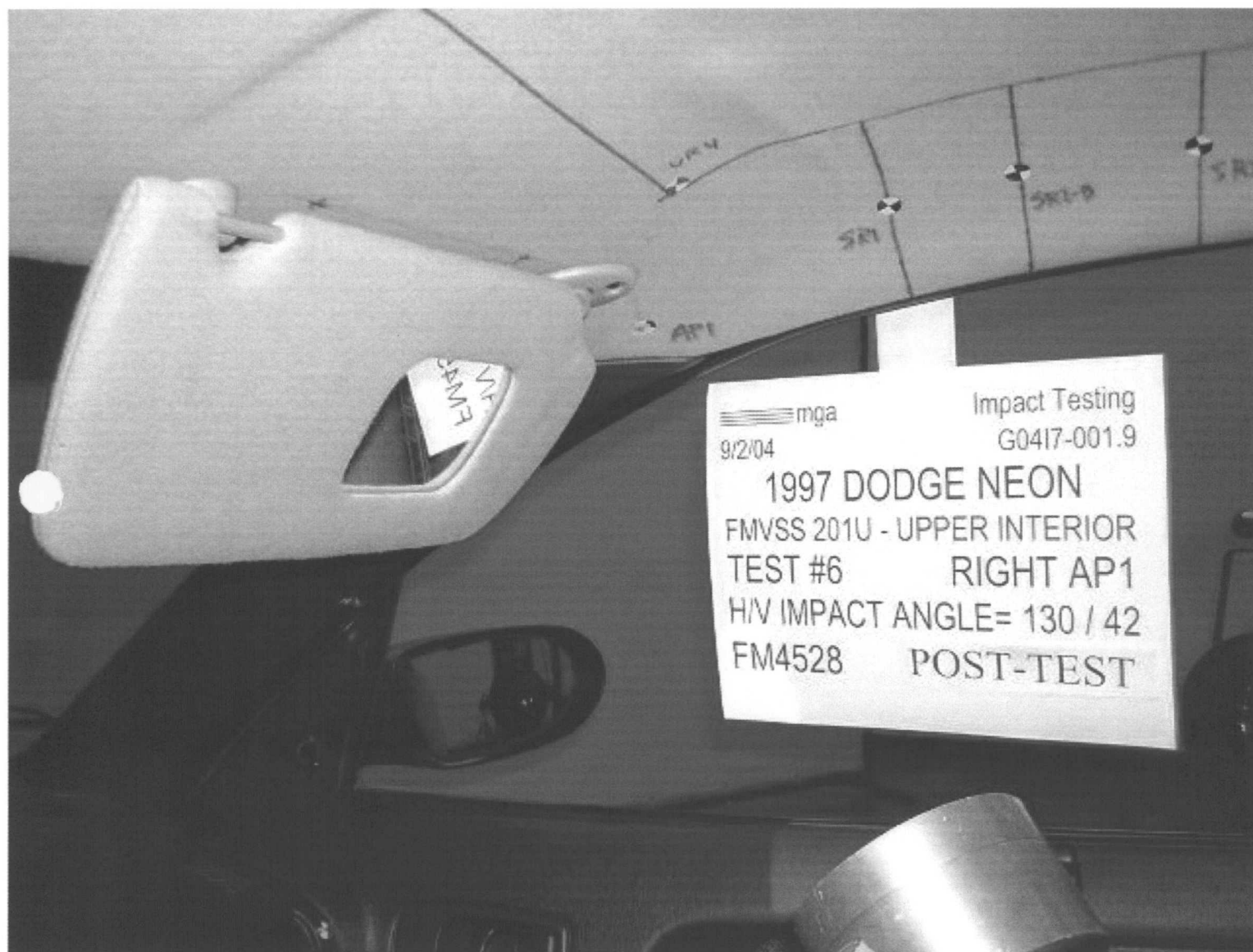
TEST #6

RIGHT AP1

H/V IMPACT ANGLE= 130 / 42

FM4528

PRE - TEST





===== mga

9/2/04

Impact Testing

G0417-001.9

1997 DODGE NEON

FMVSS 201U - UPPER INTERIOR

TEST #6

RIGHT AP1

H/V IMPACT ANGLE= 130 / 42

FM4528

POST-TEST

MICHIGAN OPERATIONS  
 DATE: 2/8/01  
 SUPERCEDES: MGATP207210.2

DOC. NO.: MGATP207210.3  
 REVISION NO.: 2  
 PAGE 1 OF 1

### SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G04I7-001.9 VEHICLE YR/MAKE/MODEL: NEON 1997

#### GENERAL TEST PARAMETERS:

Test Number: #6

Target (Vehicle Side): AP1 Right

Temperature: 22C

MGA Test Reference No.: FM4528

Humidity: 52%

Approach Horizontal Angles: 130°

Time of Test: 7:30 PM

Approach Vertical Angles: 42°

FMH Serial No: 038

#### TEST RESULTS:

| HIC(d) | HIC | $\Delta t$ (msec) | Velocity (kph) | Impact location on FMH (mm) |                  |
|--------|-----|-------------------|----------------|-----------------------------|------------------|
|        |     |                   |                | Above Pt. O                 | Left/Right Pt. O |
| 793    | 831 | 4.1               | 23.6           | 15                          | 0                |

#### INSTRUMENTAION INFORMATION: (all accelerometers are Endevco 7264-2000)

| Axis | Channel | Serial No. | DLR Value | $\Delta V$ Pre-Test | $\Delta V$ Post-Test |
|------|---------|------------|-----------|---------------------|----------------------|
| X    | 5       | J36197     | -108      | 1.67                | 1.67                 |
| Y    | 6       | J36193     | 101.4     | 1.54                | 1.54                 |
| Z    | 7       | J36353     | 96.8      | 1.58                | 1.58                 |

#### REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

No visible damage

Recorded By: ms j r Approved By\*: Helen Q. Kalish Date: 9-2-04

\*Only necessary for NHTSA (Government) Compliance testing.

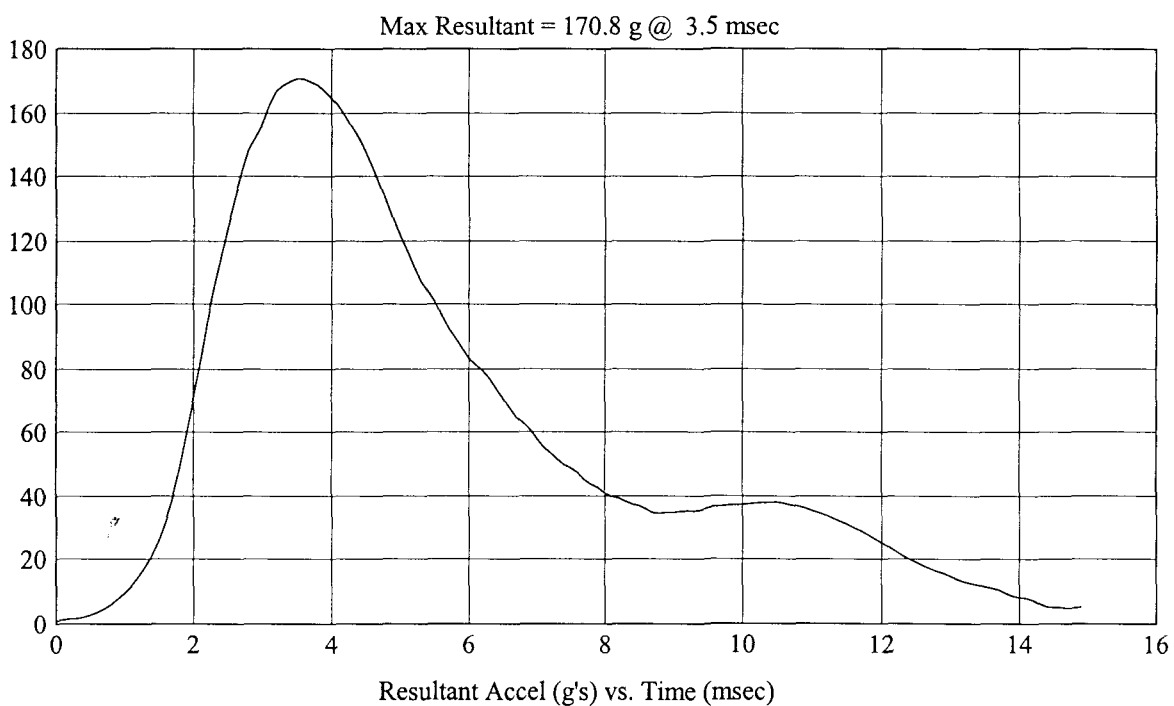
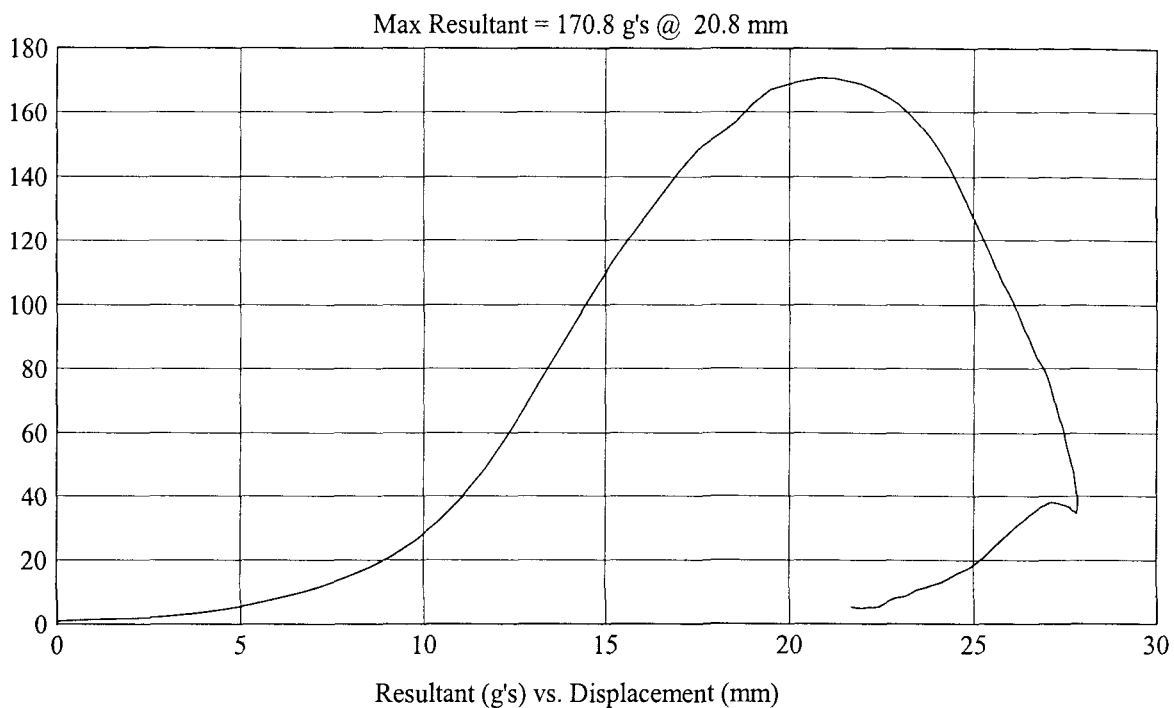
FMH  
G04I7-001.9

Customer: DODGE  
Test # 6  
FM4528  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: AP1  
Vehicle Side: Right  
Horz/Vert Angle: 130/42

Test Date: 9/2/04  
HIC(d) = 793, HIC = 831, Delta T = 4.1 msec



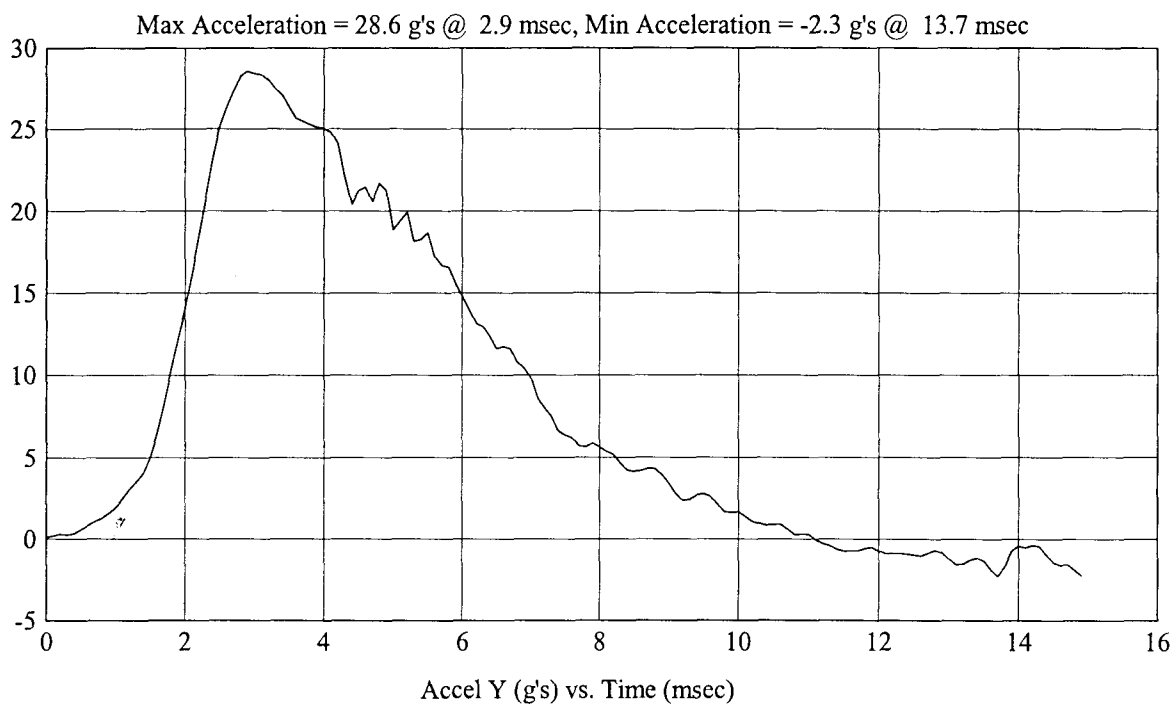
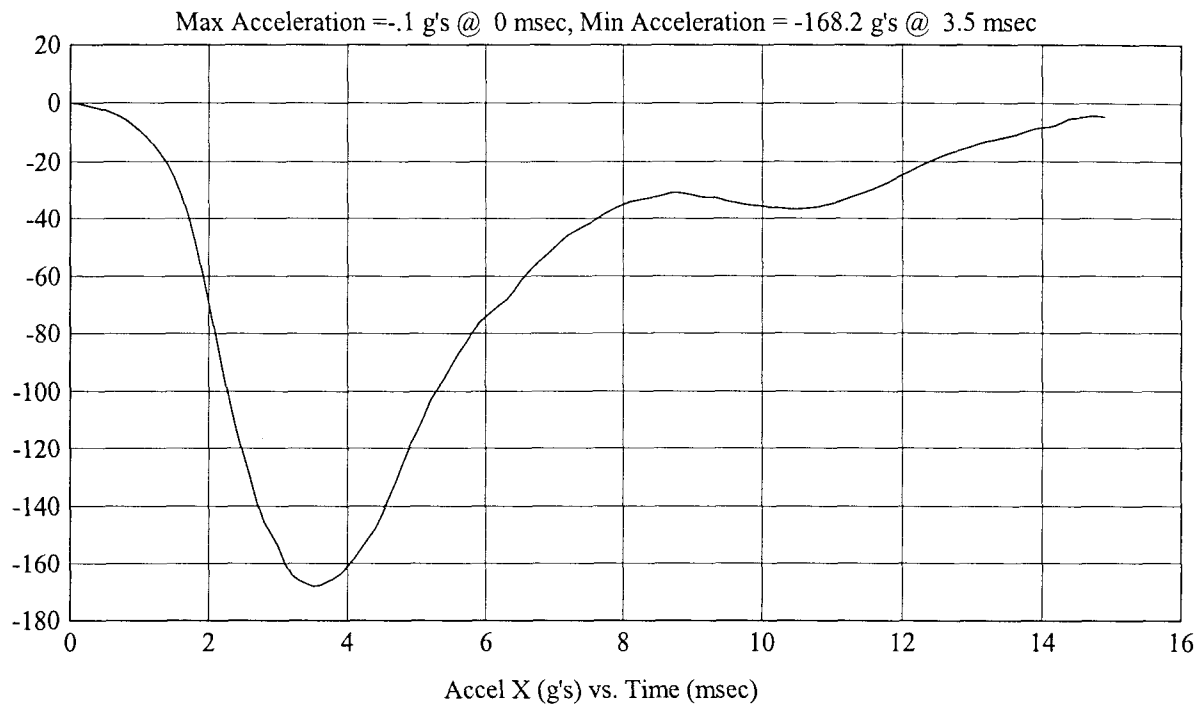
FMH  
G04I7-001.9

Customer: DODGE  
Test # 6  
FM4528  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: AP1  
Vehicle Side: Right  
Horz/Vert Angle: 130/42

Test Date: 9/2/04  
HIC(d) = 793, HIC = 831, Delta T = 4.1 msec



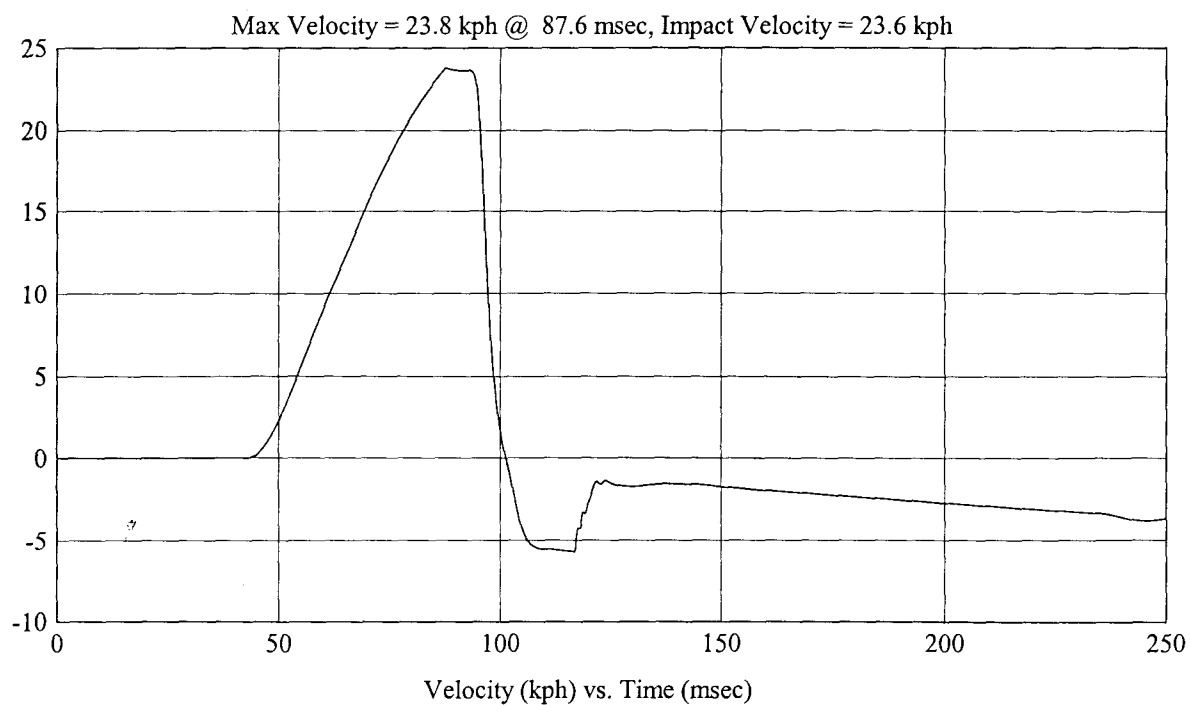
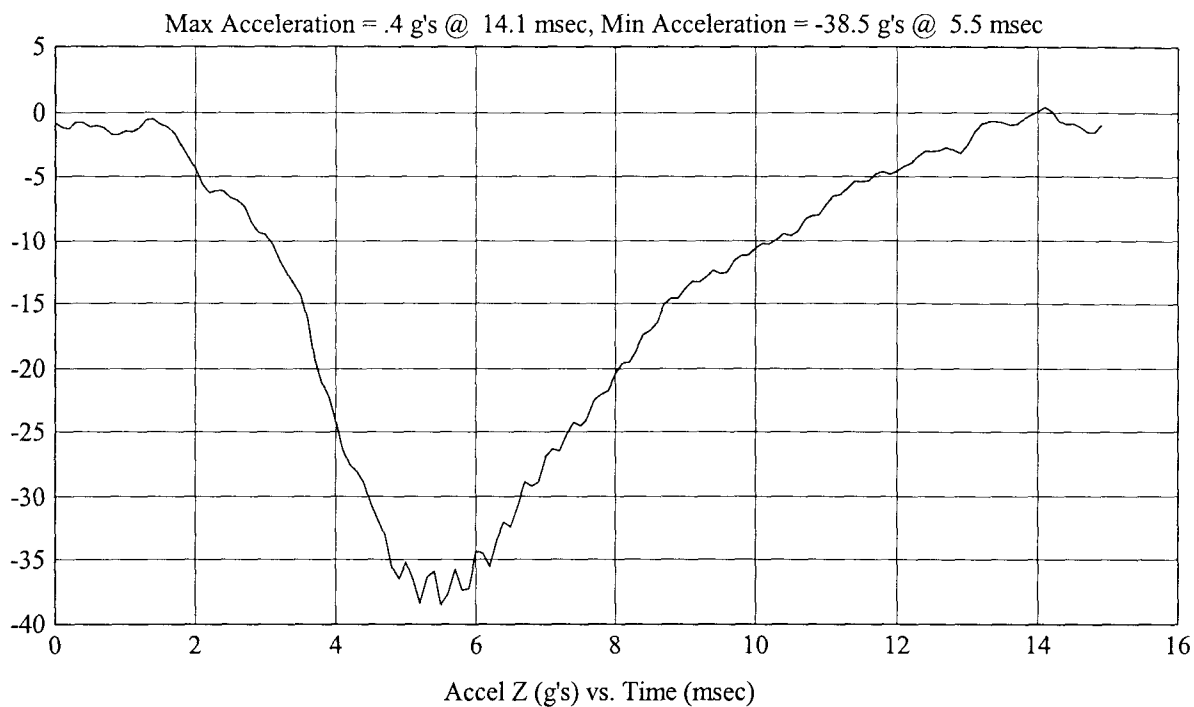
FMH  
G0417-001.9

Customer: DODGE  
Test # 6  
FM4528  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: AP1  
Vehicle Side: Right  
Horz/Vert Angle: 130/42

Test Date: 9/2/04  
HIC(d) = 793, HIC = 831, Delta T = 4.1 msec





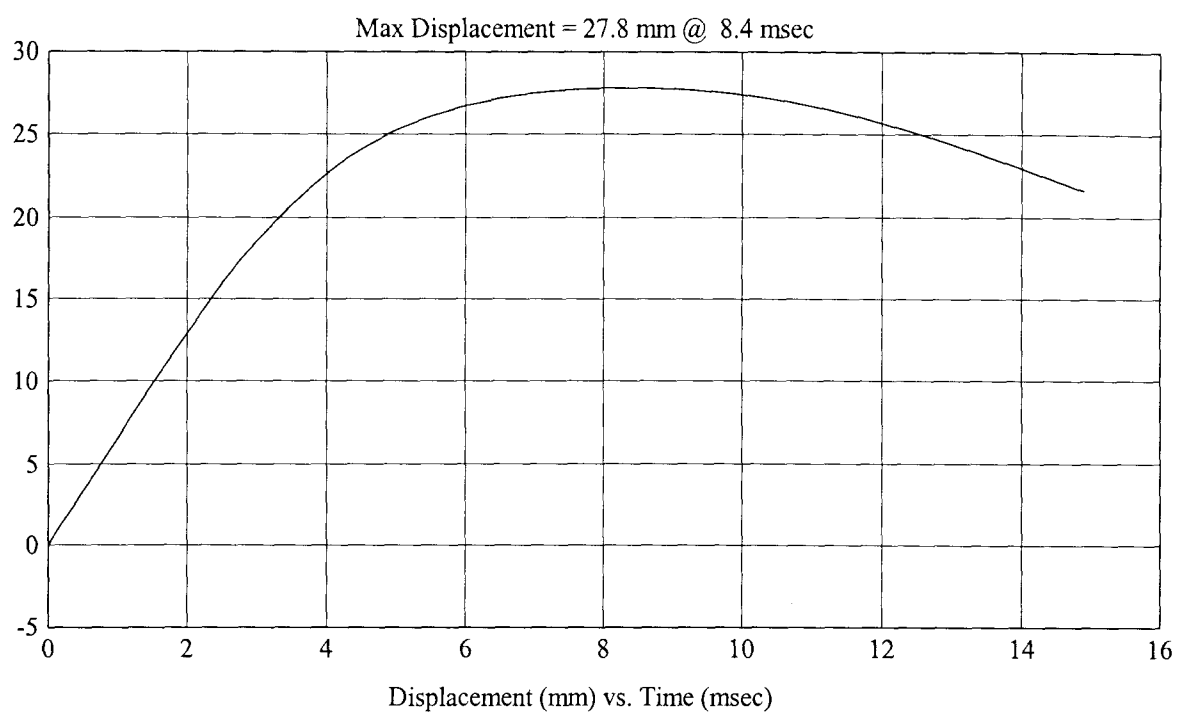
FMH  
G04I7-001.9

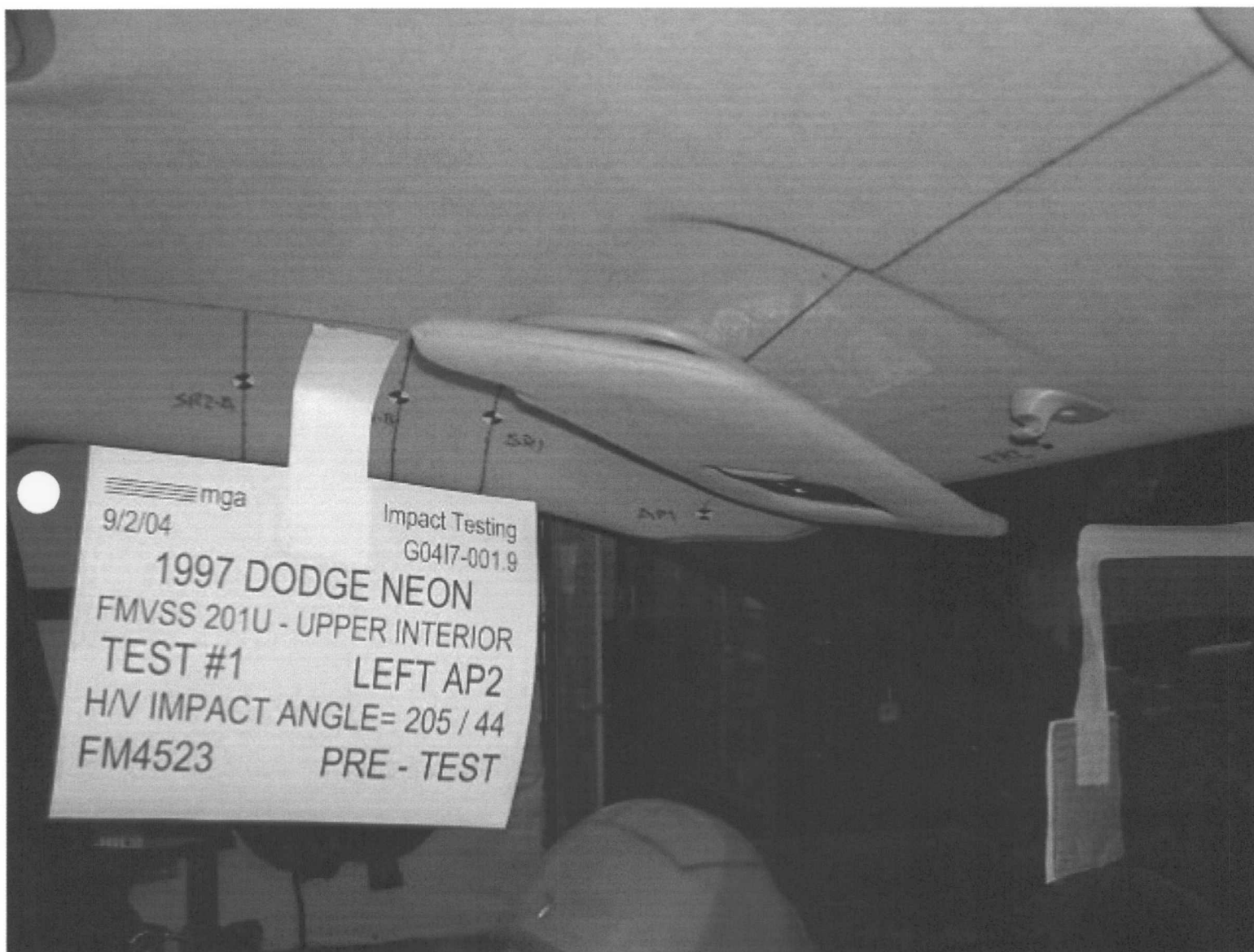
Customer: DODGE  
Test # 6  
FM4528  
Additional Desc: N/A

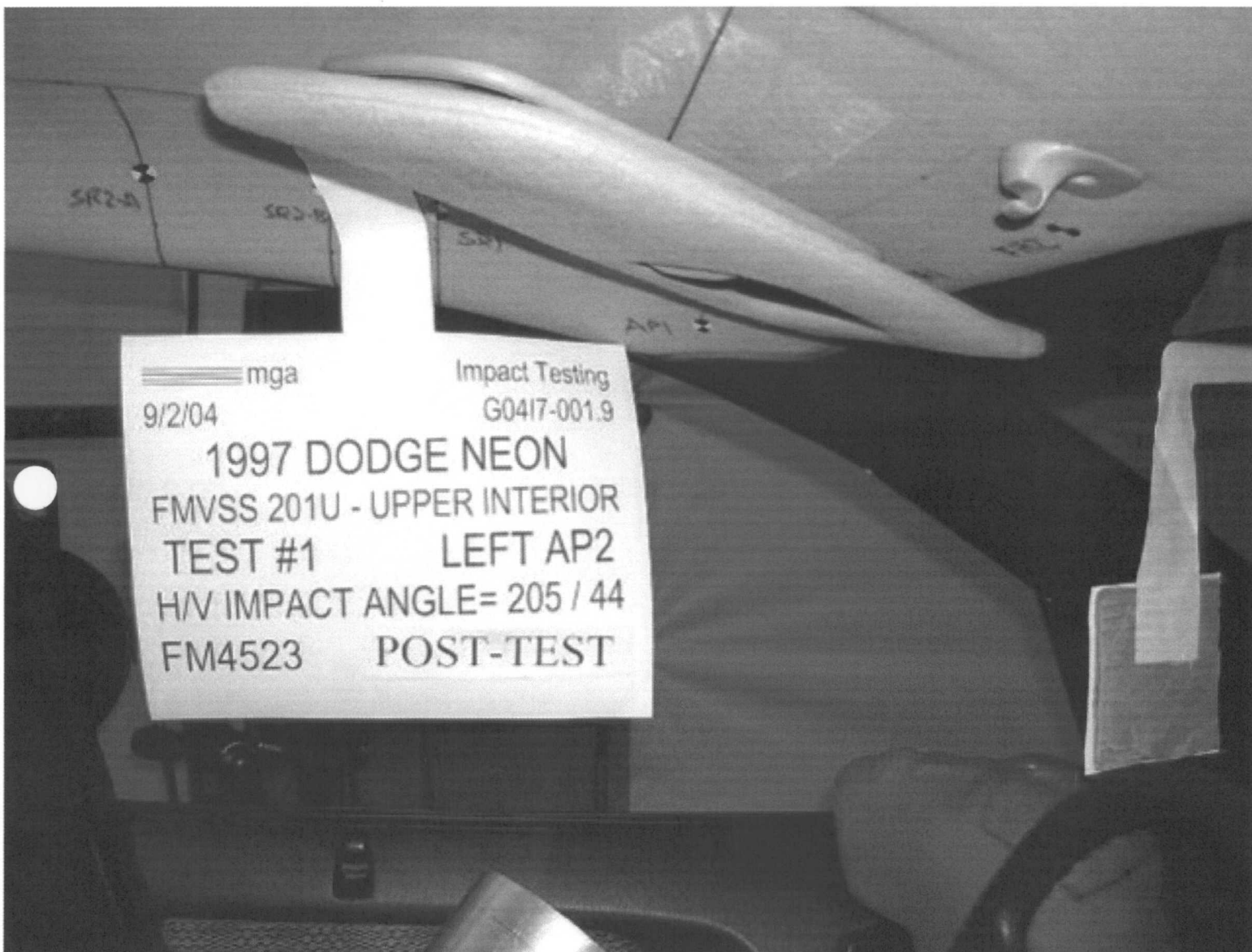
Vehicle Program : NEON

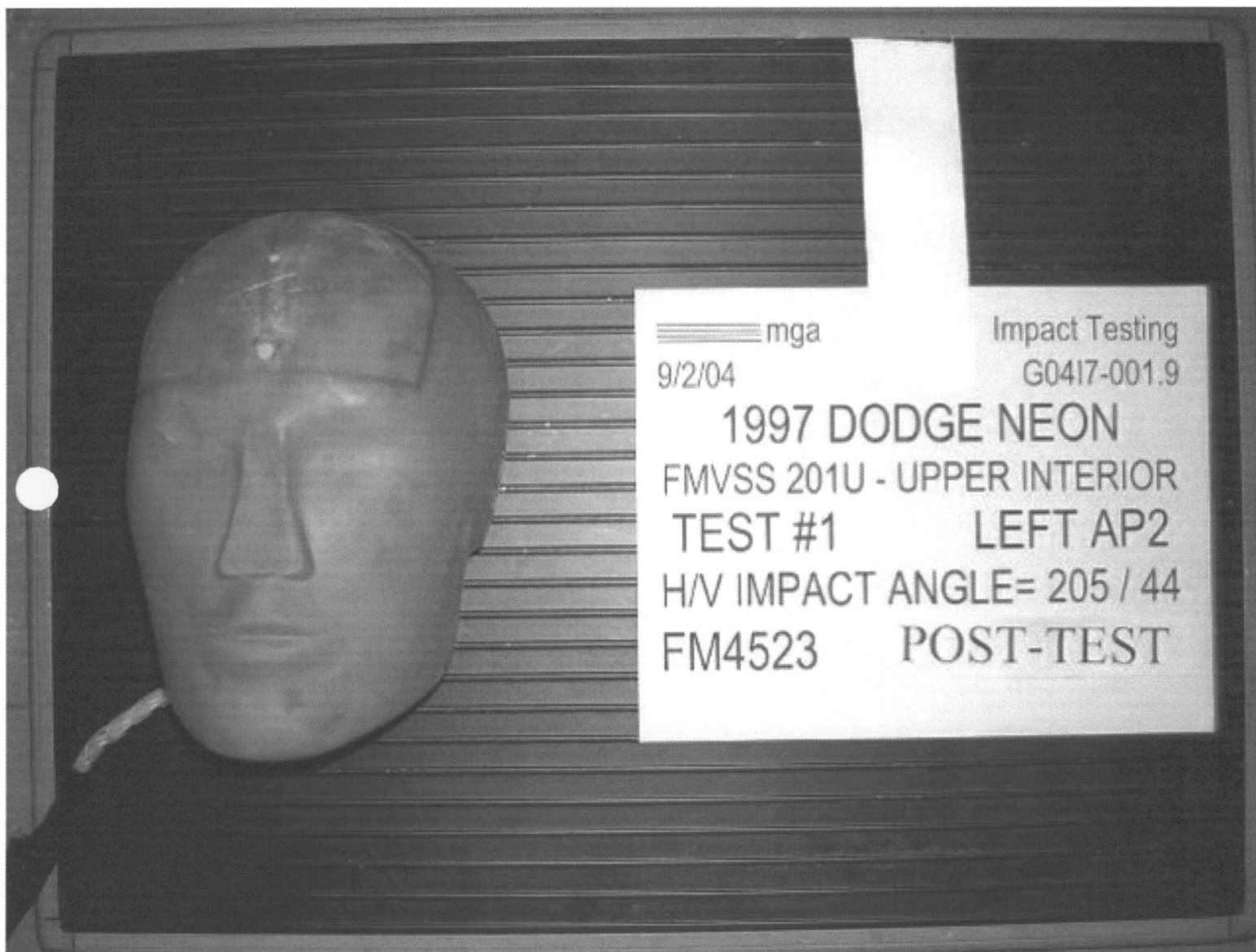
Model Year: 1997  
Target: AP1  
Vehicle Side: Right  
Horz/Vert Angle: 130/42

Test Date: 9/2/04  
HIC(d) = 793, HIC = 831, Delta T = 4.1 msec









MICHIGAN OPERATIONS  
DATE: 2/8/01  
SUPERCEDES: MGATP207210.2

DOC. NO.: MGATP207210.3  
REVISION NO.: 2  
PAGE 1 OF 1

### SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G0417-001.9      VEHICLE YR/MAKE/MODEL: NEON 1997

#### GENERAL TEST PARAMETERS:

Test Number: #1

Target (Vehicle Side): AP2 Left

Temperature: 22C

MGA Test Reference No.: FM4523

Humidity: 57%

Approach Horizontal Angles: 205°

Time of Test: 3:00 PM

Approach Vertical Angles: 44°

FMH Serial No: 035

#### TEST RESULTS:

| HIC(d) | HIC  | $\Delta t$ (msec) | Velocity (kph) | Impact location on FMH (mm) |                  |
|--------|------|-------------------|----------------|-----------------------------|------------------|
|        |      |                   |                | Above Pt. O                 | Left/Right Pt. O |
| 926    | 1007 | 3.6               | 23.4           | 8                           | 3 L              |

#### INSTRUMENTAION INFORMATION: (all accelerometers are Endevco 7264-2000)

| Axis | Channel | Serial No. | DLR Value | $\Delta V$ Pre-Test | $\Delta V$ Post-Test |
|------|---------|------------|-----------|---------------------|----------------------|
| X    | 5       | J35924     | -92.4     | 1.67                | 1.67                 |
| Y    | 6       | J35919     | 93.8      | 1.54                | 1.54                 |
| Z    | 7       | J21969     | 88.5      | 1.58                | 1.58                 |

#### REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

No visible damage

Recorded By: *mjm* Approved By\*: *Helen A. Kales* Date: 4-2-04

\*Only necessary for NHTSA (Government) Compliance testing.

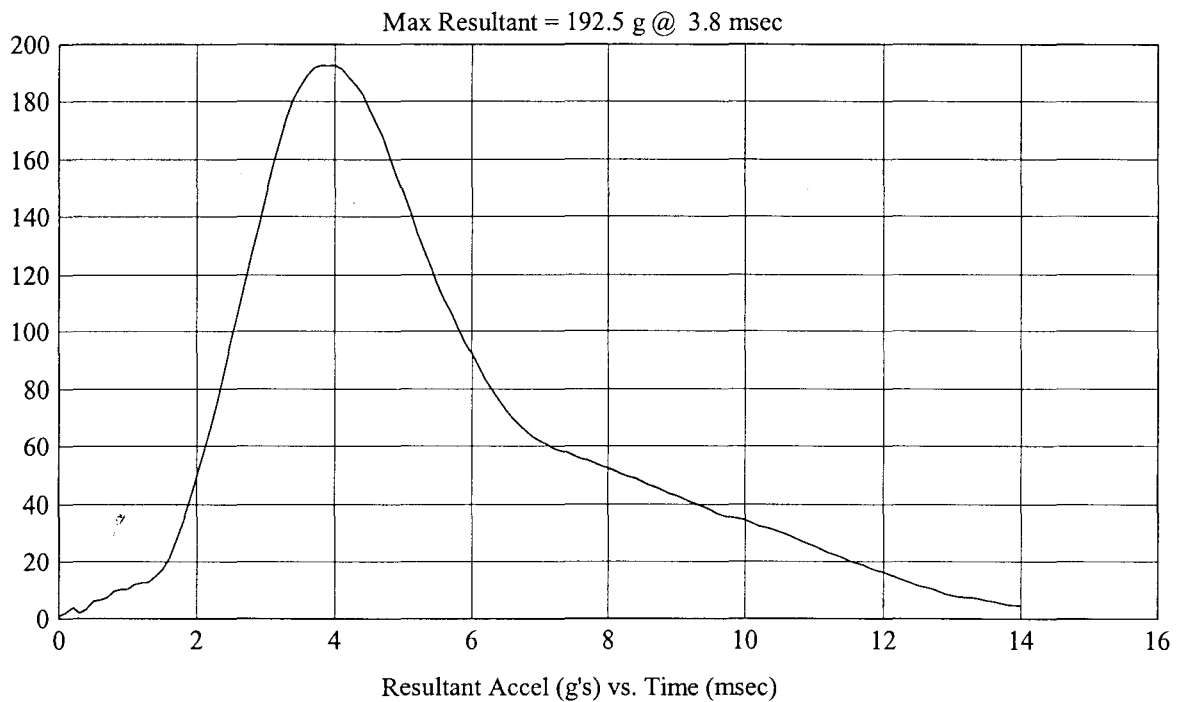
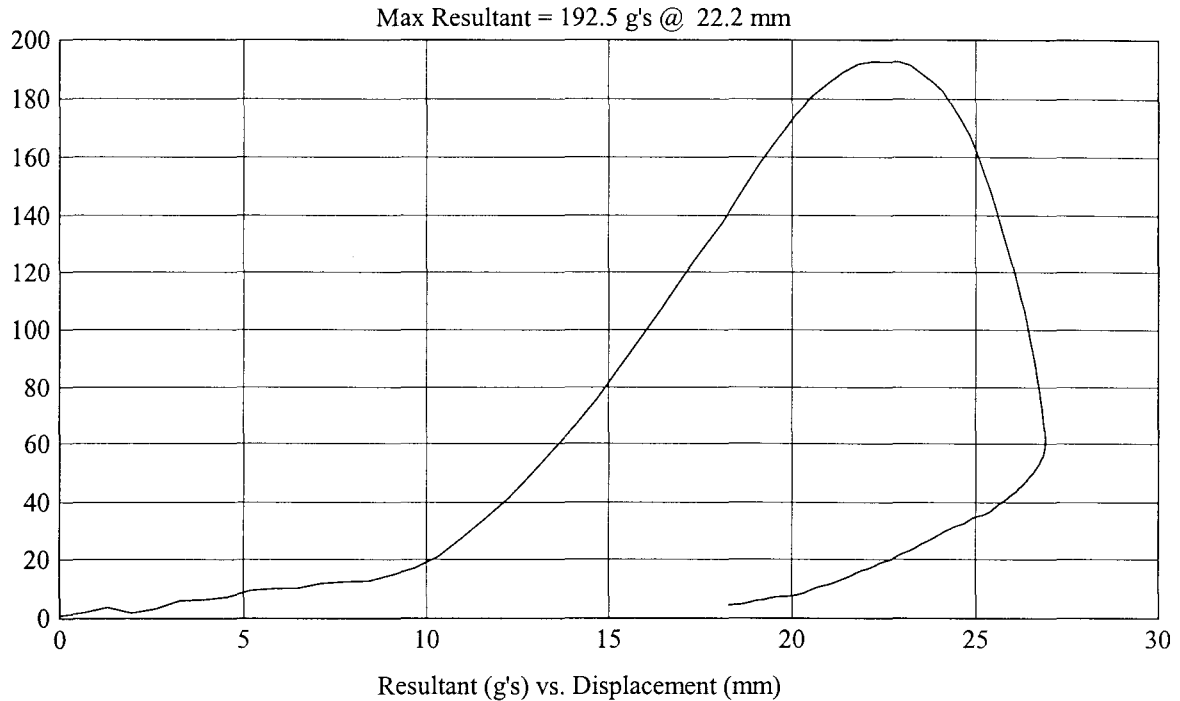
FMH  
G04I7-001.9

Customer: DODGE  
Test # 1  
FM4523  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: AP2  
Vehicle Side: Left  
Horz/Vert Angle: 205/44

Test Date: 9/2/04  
HIC(d) = 926, HIC = 1007, Delta T = 3.6 msec



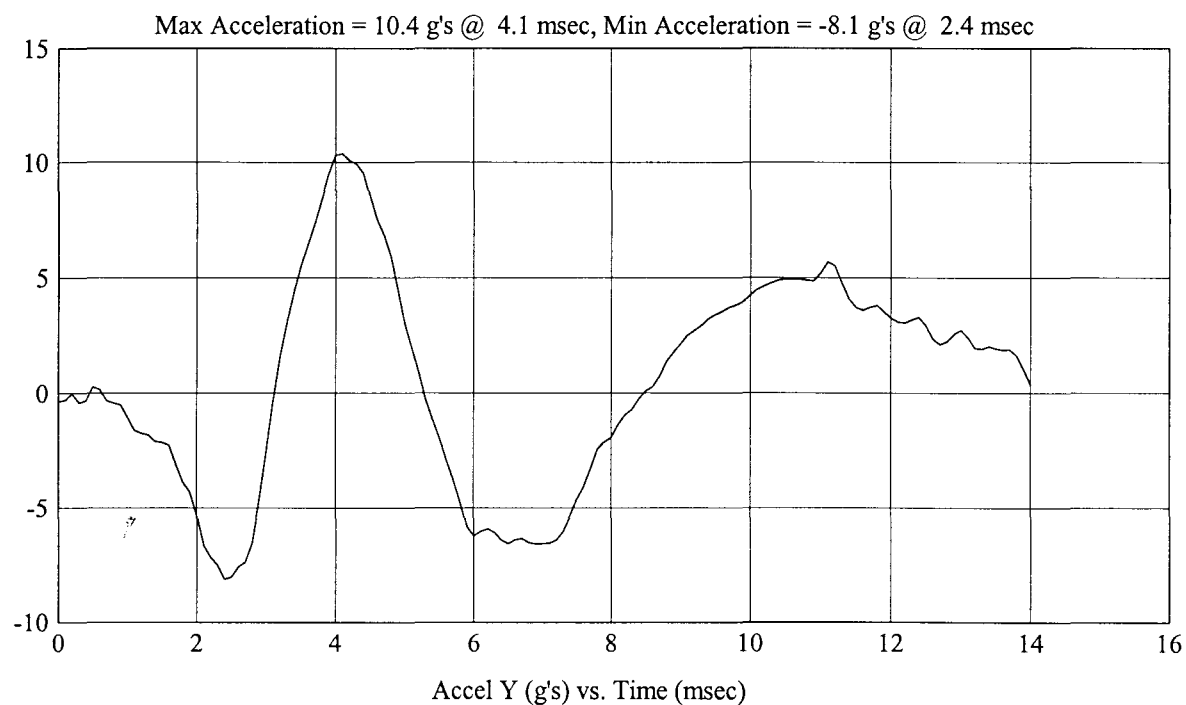
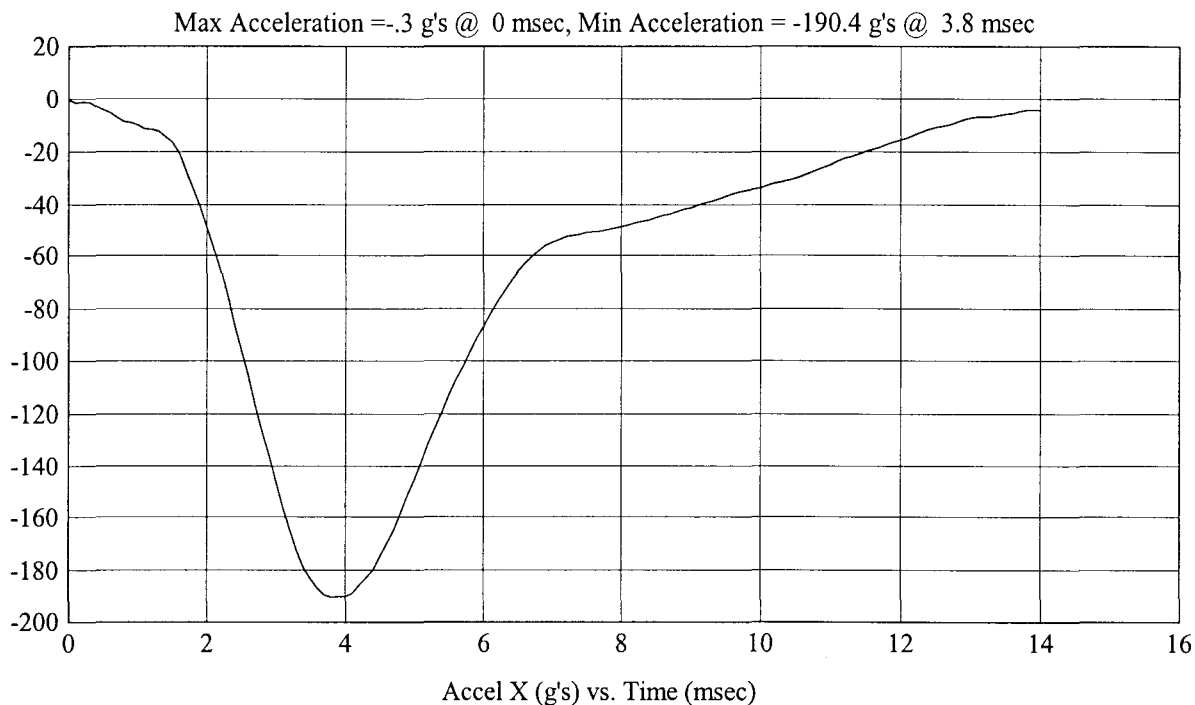
FMH  
G04I7-001.9

Customer: DODGE  
Test # 1  
FM4523  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: AP2  
Vehicle Side: Left  
Horz/Vert Angle: 205/44

Test Date: 9/2/04  
HIC(d) = 926, HIC = 1007, Delta T = 3.6 msec



FMH  
G04I7-001.9

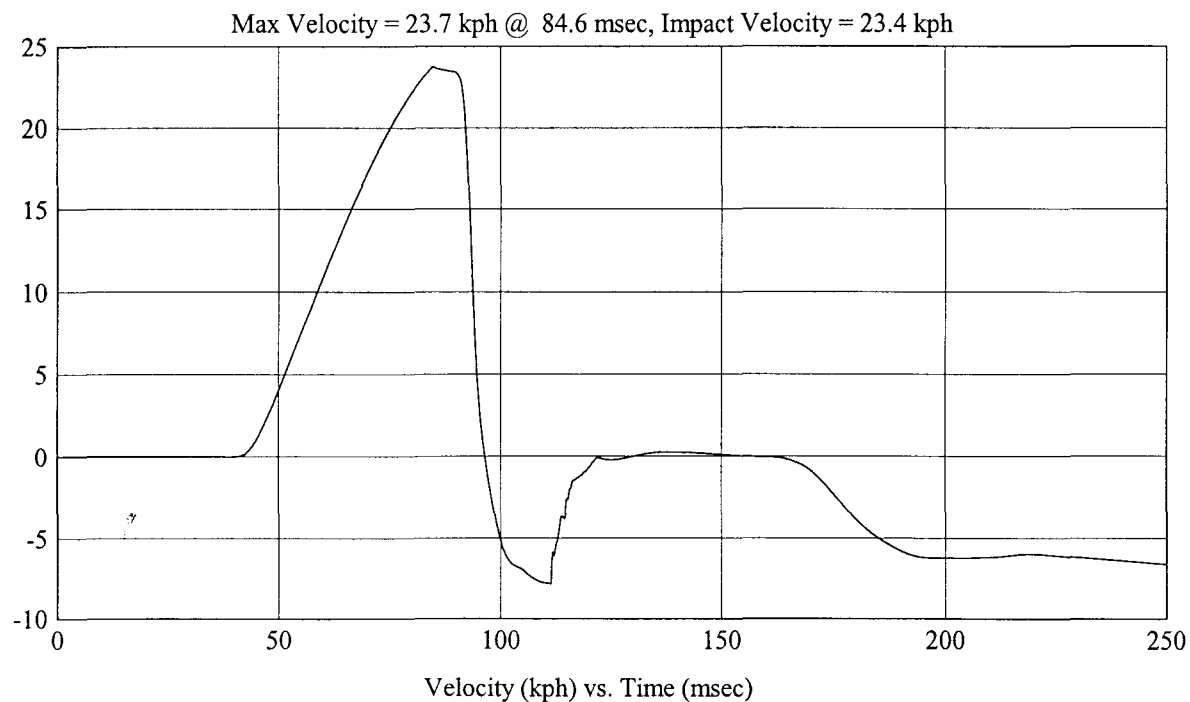
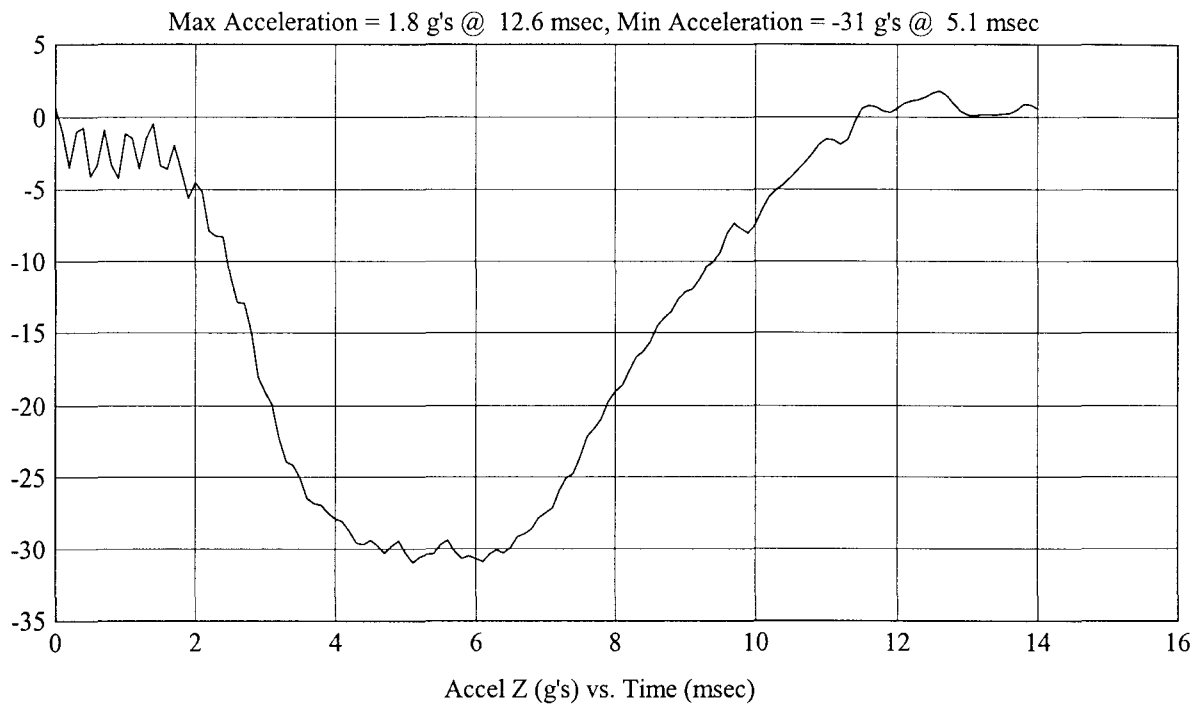
Customer: DODGE  
Test # 1  
FM4523  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: AP2  
Vehicle Side: Left  
Horz/Vert Angle: 205/44

Test Date: 9/2/04

HIC(d) = 926, HIC = 1007, Delta T = 3.6 msec





FMH  
G04I7-001.9

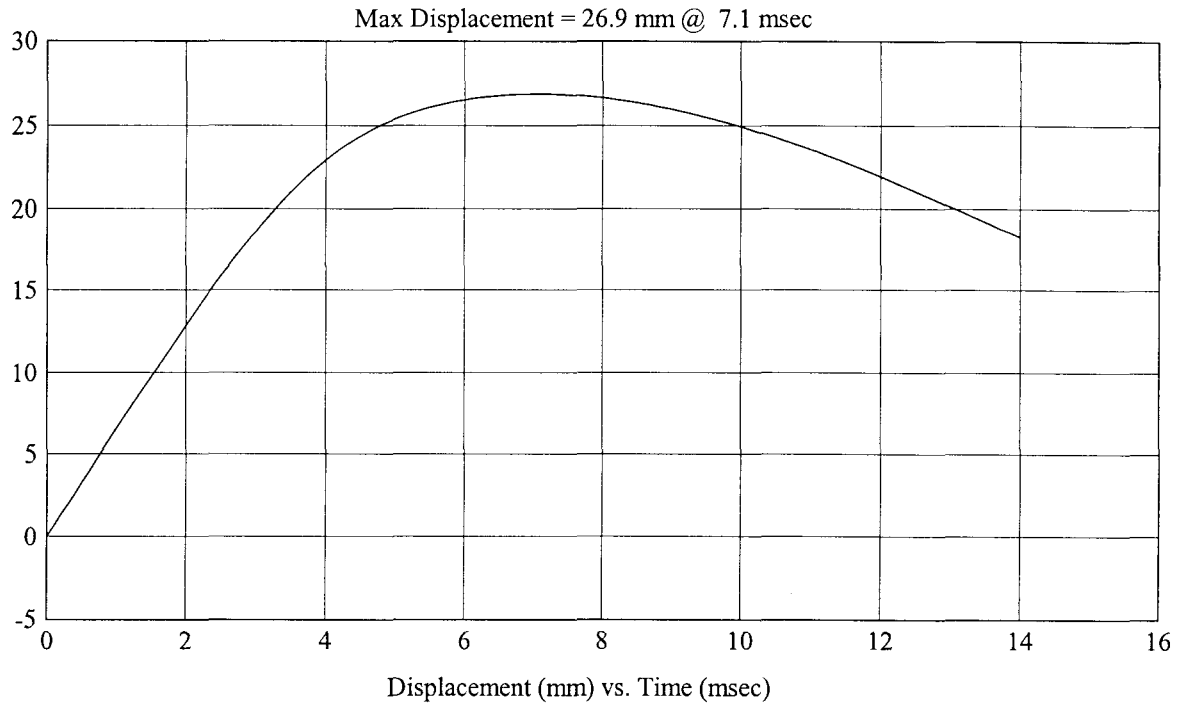
Customer: DODGE  
Test # 1  
FM4523  
Additional Desc: N/A

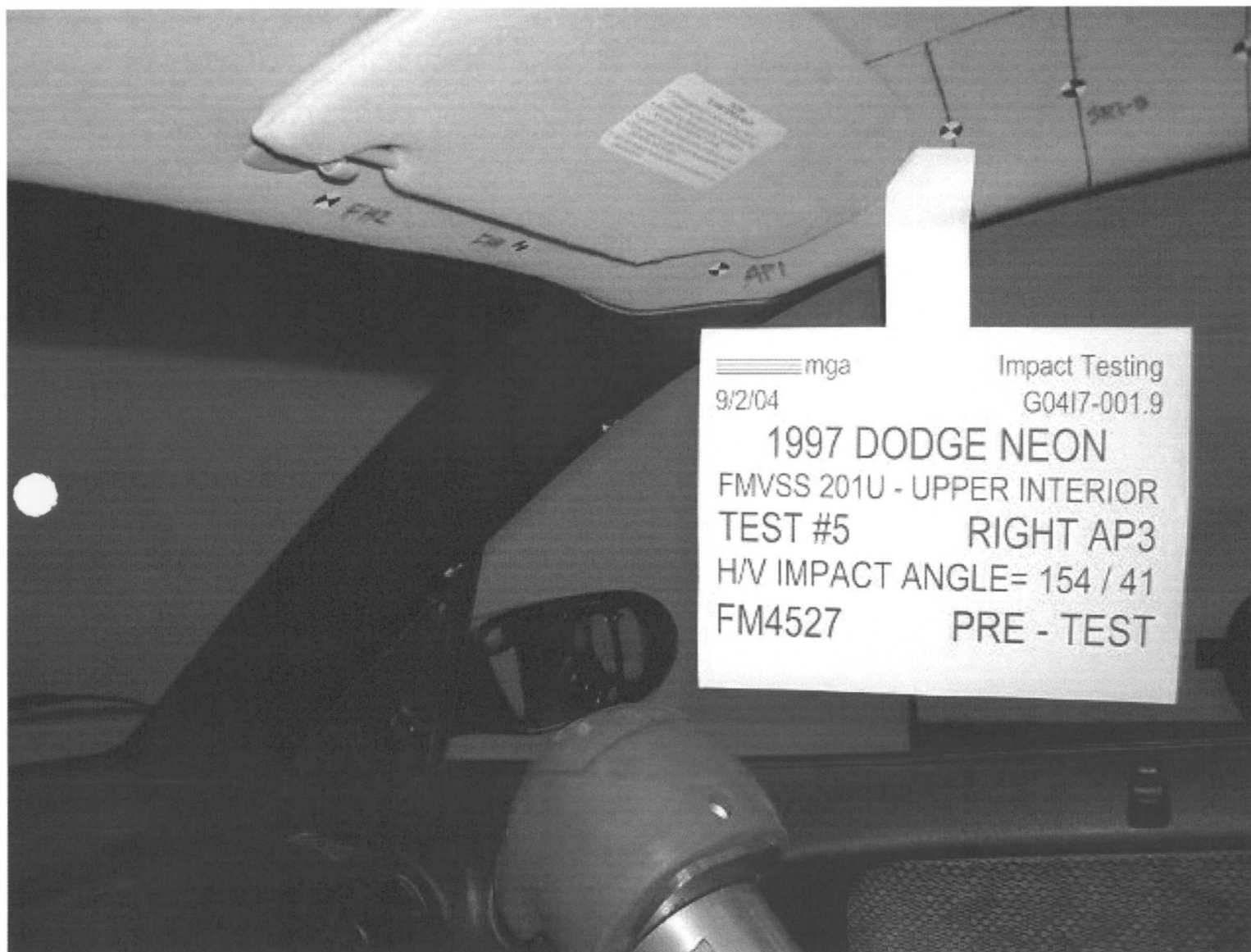
Vehicle Program : NEON

Model Year: 1997  
Target: AP2  
Vehicle Side: Left  
Horz/Vert Angle: 205/44

Test Date: 9/2/04

HIC(d) = 926, HIC = 1007, Delta T = 3.6 msec





mga

Impact Testing

9/2/04

G0417-001.9

1997 DODGE NEON

FMVSS 201U - UPPER INTERIOR

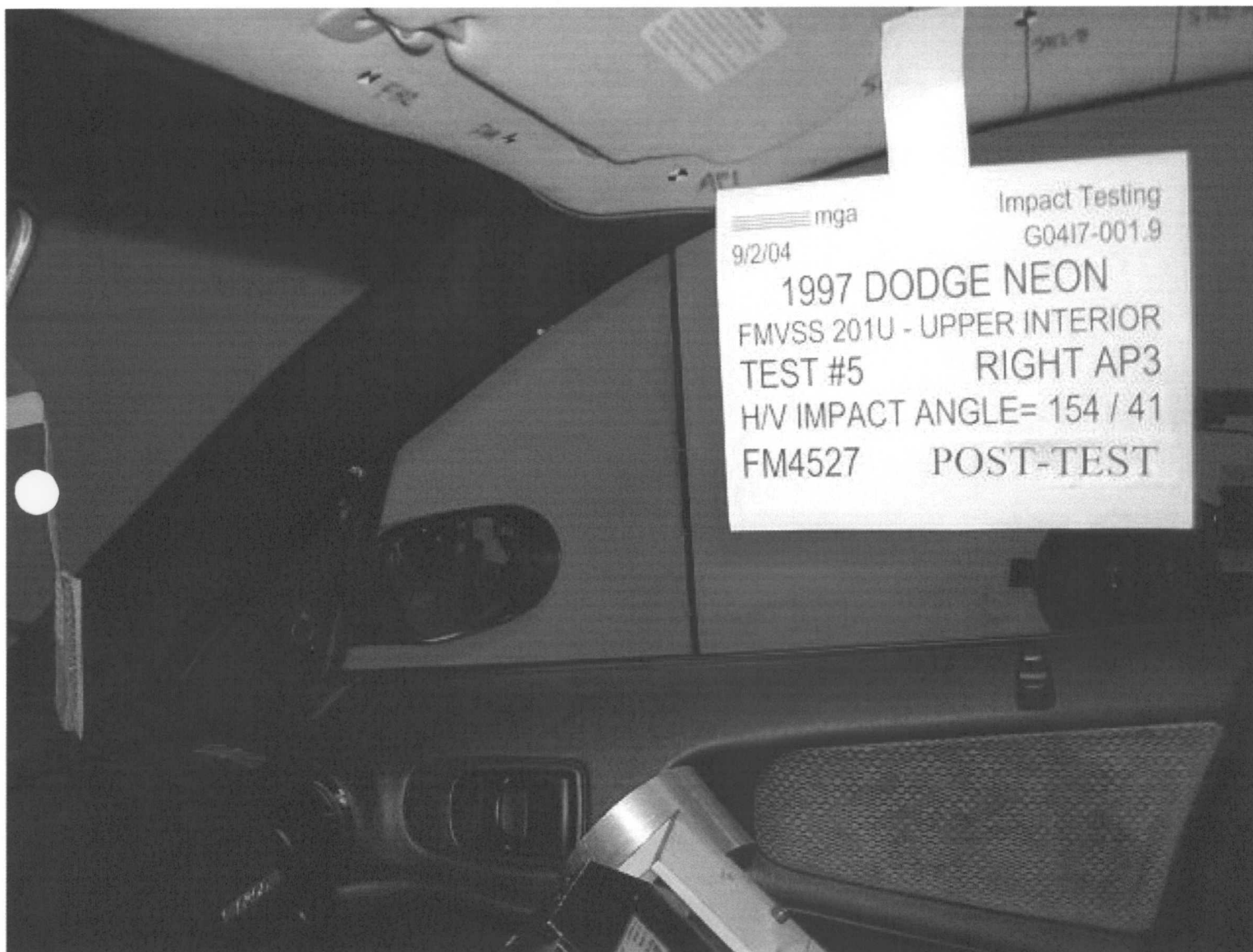
TEST #5

RIGHT AP3

H/V IMPACT ANGLE= 154 / 41

FM4527

PRE - TEST



mga

Impact Testing

9/2/04

G04I7-001.9

1997 DODGE NEON

FMVSS 201U - UPPER INTERIOR

TEST #5 RIGHT AP3

H/V IMPACT ANGLE= 154 / 41

FM4527 POST-TEST



===== mga

9/2/04

Impact Testing

G0417-001.9

1997 DODGE NEON

FMVSS 201U - UPPER INTERIOR

TEST #5

RIGHT AP3

H/V IMPACT ANGLE= 154 / 41

FM4527

POST-TEST

MICHIGAN OPERATIONS  
 DATE: 2/8/01  
 SUPERCEDES: MGATP207210.2

DOC. NO.: MGATP207210.3  
 REVISION NO.: 2  
 PAGE 1 OF 1

### SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G0417-001.9 VEHICLE YR/MAKE/MODEL: NEON 1997

#### GENERAL TEST PARAMETERS:

Test Number: #5

Target (Vehicle Side): AP3 Right

Temperature: 22C

MGA Test Reference No.: FM4527

Humidity: 53%

Approach Horizontal Angles: 154°

Time of Test: 7:00 PM

Approach Vertical Angles: 41°

FMH Serial No: 036

#### TEST RESULTS:

| HIC(d) | HIC  | $\Delta t$ (msec) | Velocity (kph) | Impact location on FMH (mm) |                  |
|--------|------|-------------------|----------------|-----------------------------|------------------|
|        |      |                   |                | Above Pt. O                 | Left/Right Pt. O |
| 1136   | 1285 | 4.1               | 23.9           | 14                          | 10 L             |

#### INSTRUMENTATION INFORMATION: (all accelerometers are Endevco 7264-2000)

| Axis | Channel | Serial No. | DLR Value | $\Delta V$ Pre-Test | $\Delta V$ Post-Test |
|------|---------|------------|-----------|---------------------|----------------------|
| X    | 5       | J35923     | -100.8    | 1.67                | 1.67                 |
| Y    | 6       | J35916     | 100.2     | 1.54                | 1.54                 |
| Z    | 7       | J35918     | 97.9      | 1.58                | 1.58                 |

#### REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

No visible damage

Recorded By: *m j d* Approved By: *Helen G. Kalita* Date: *9-2-01*

\*Only necessary for NHTSA (Government) Compliance testing.

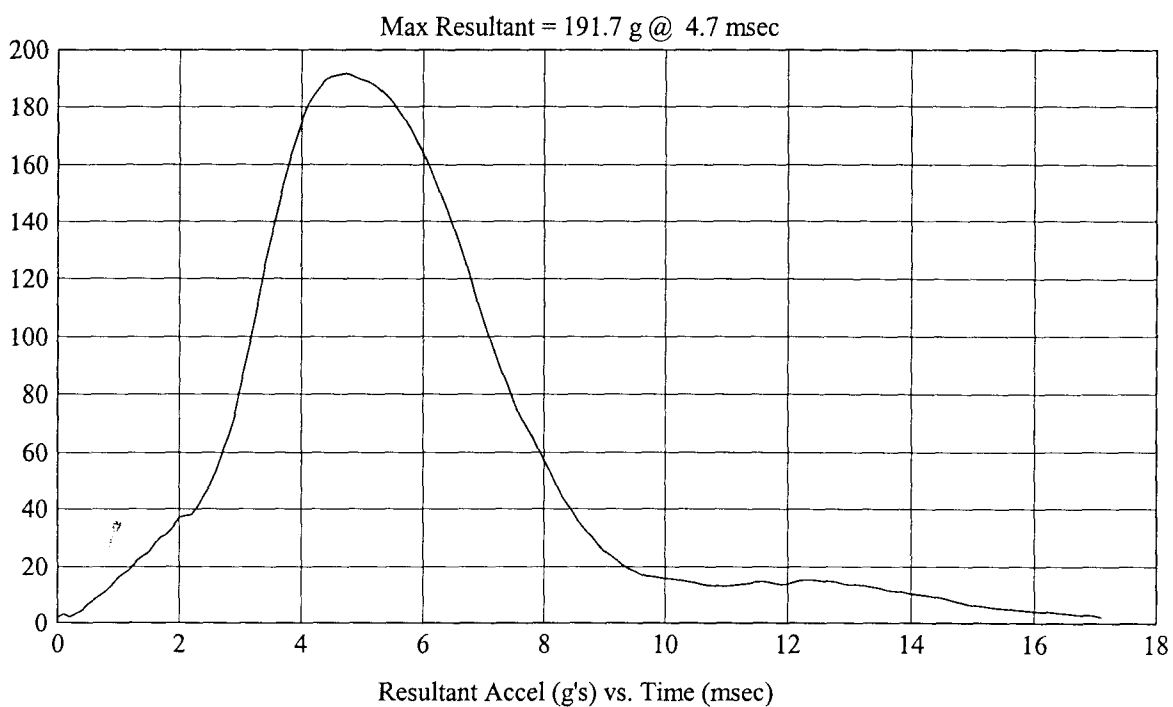
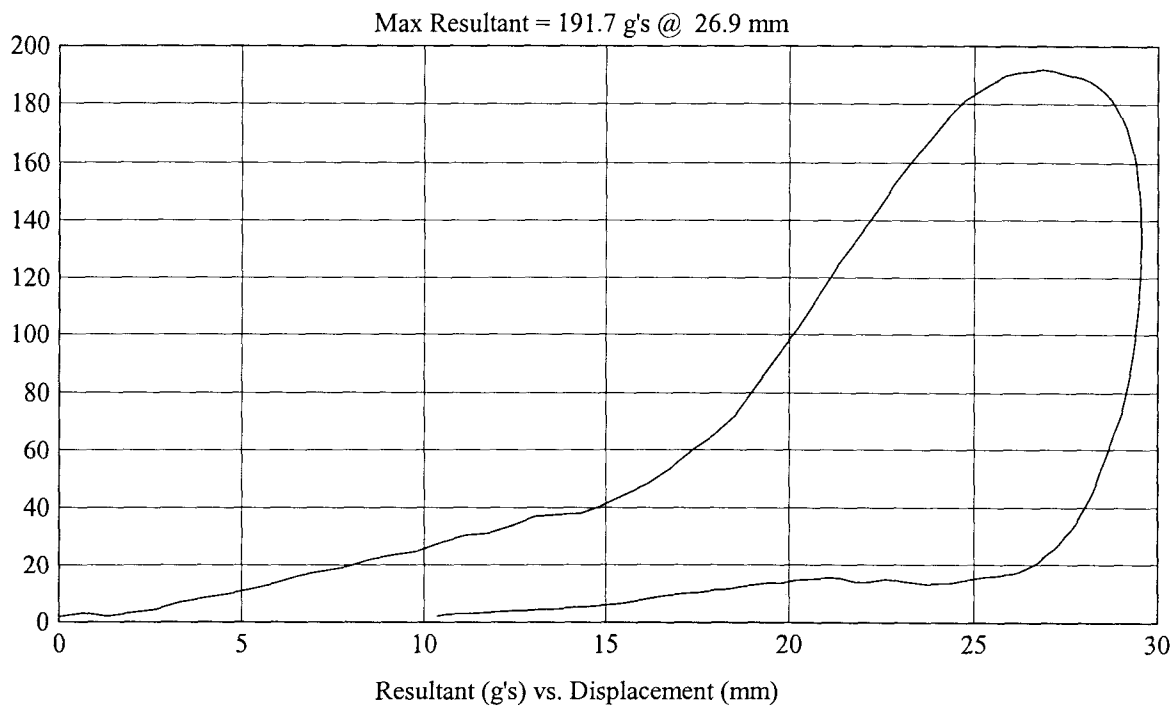
FMH  
G04I7-001.9

Customer: DODGE  
Test # 5  
FM4527  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: AP3  
Vehicle Side: Right  
Horz/Vert Angle: 154/41

Test Date: 9/2/04  
HIC(d) = 1136, HIC = 1285, Delta T = 4.1 msec



FMH  
G04I7-001.9

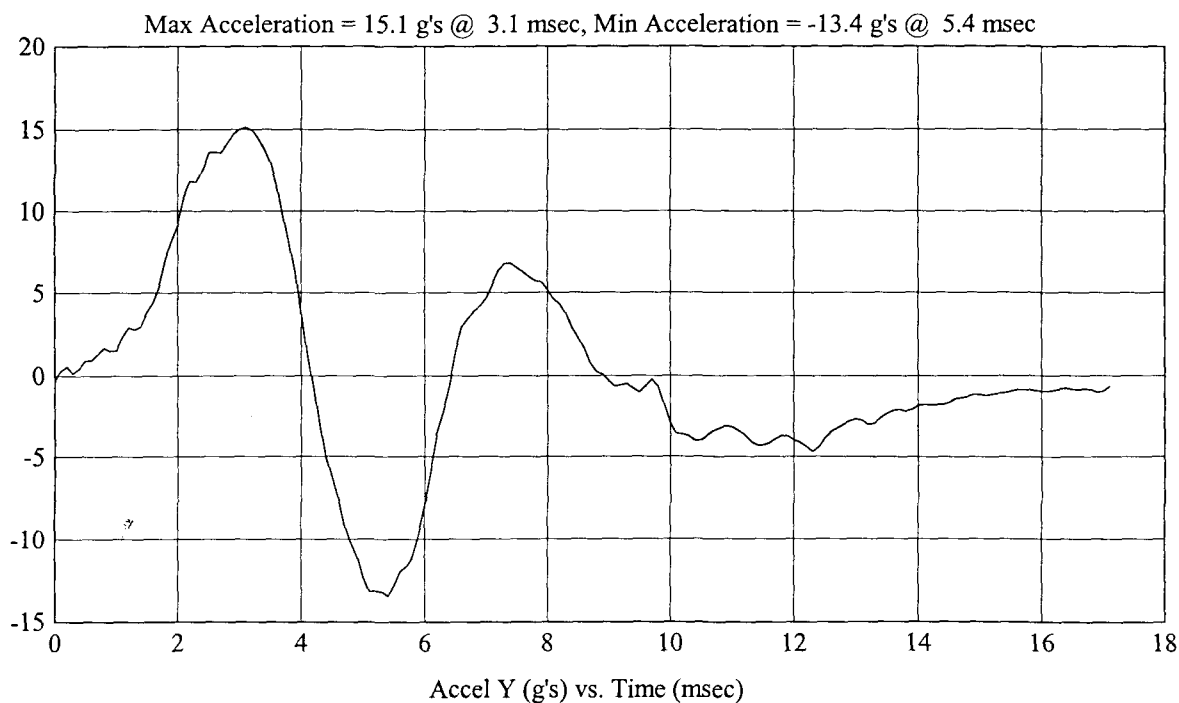
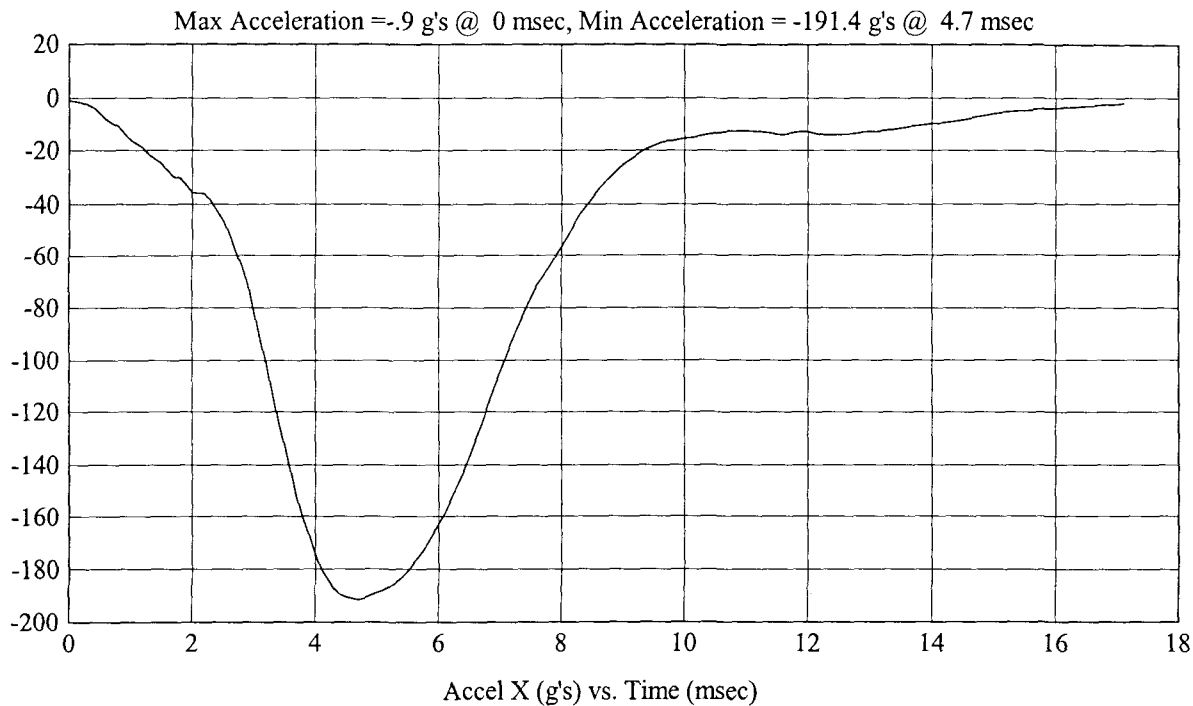
Customer: DODGE  
Test # 5  
FM4527  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: AP3  
Vehicle Side: Right  
Horz/Vert Angle: 154/41

Test Date: 9/2/04

HIC(d) = 1136, HIC = 1285, Delta T = 4.1 msec



FMH  
G04I7-001.9

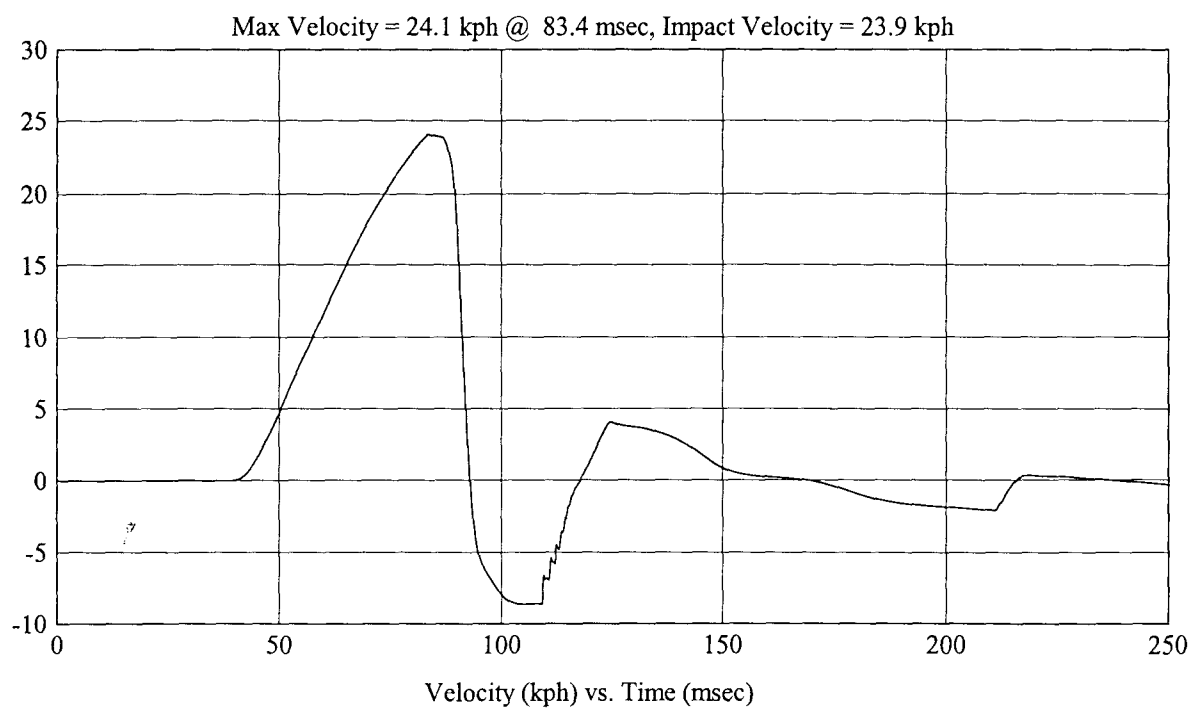
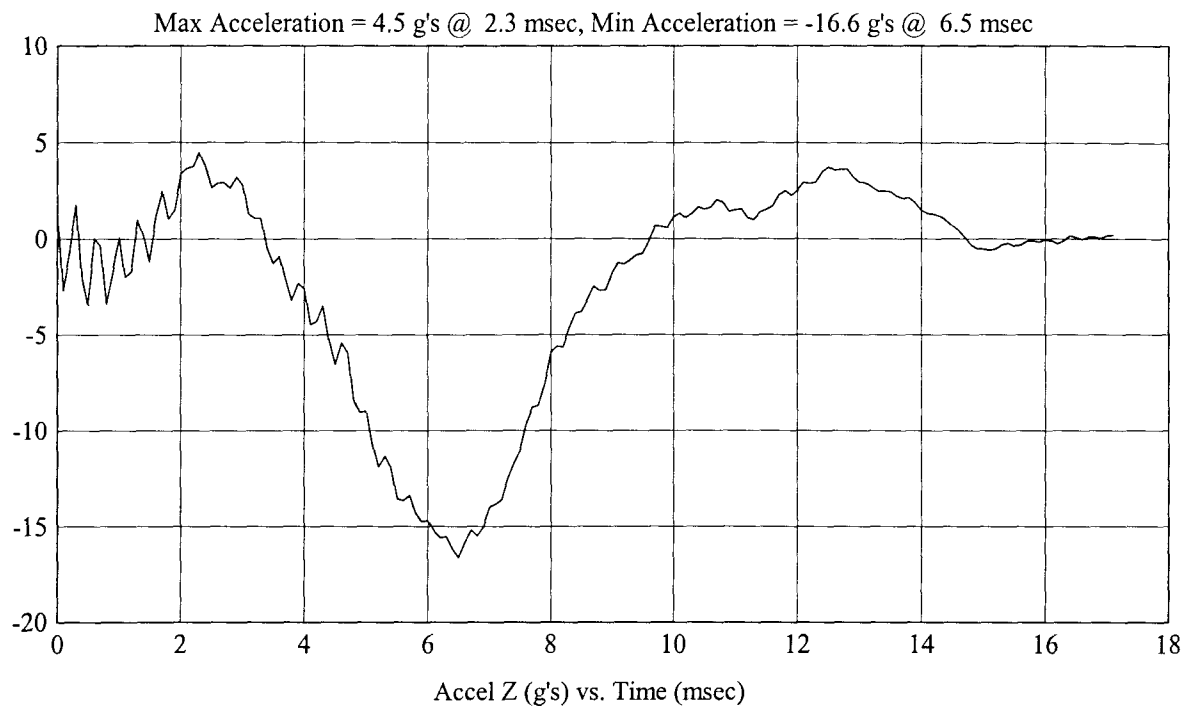
Customer: DODGE  
Test # 5  
FM4527  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: AP3  
Vehicle Side: Right  
Horz/Vert Angle: 154/41

Test Date: 9/2/04

HIC(d) = 1136, HIC = 1285, Delta T = 4.1 msec





FMH  
G04I7-001.9

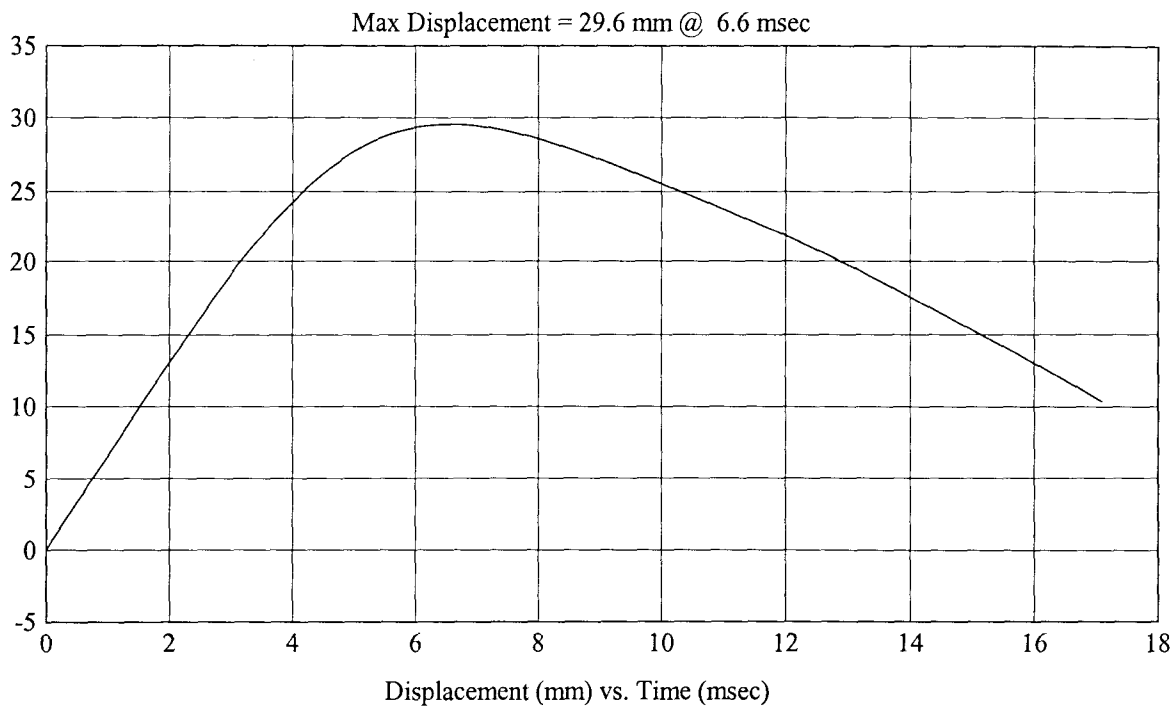
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Test # 5  
FM4527  
Additional Desc: N/A

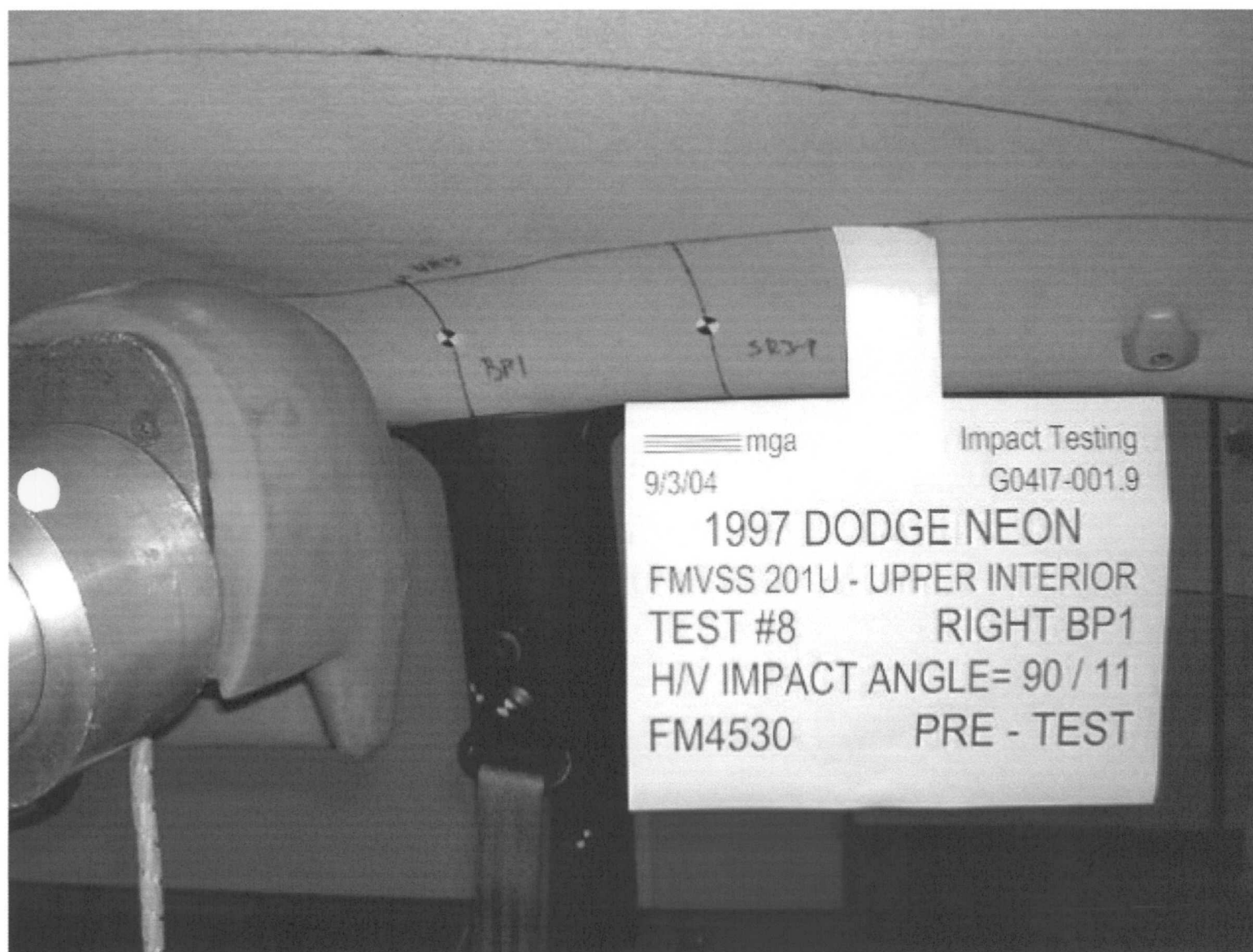
Vehicle Program : NEON

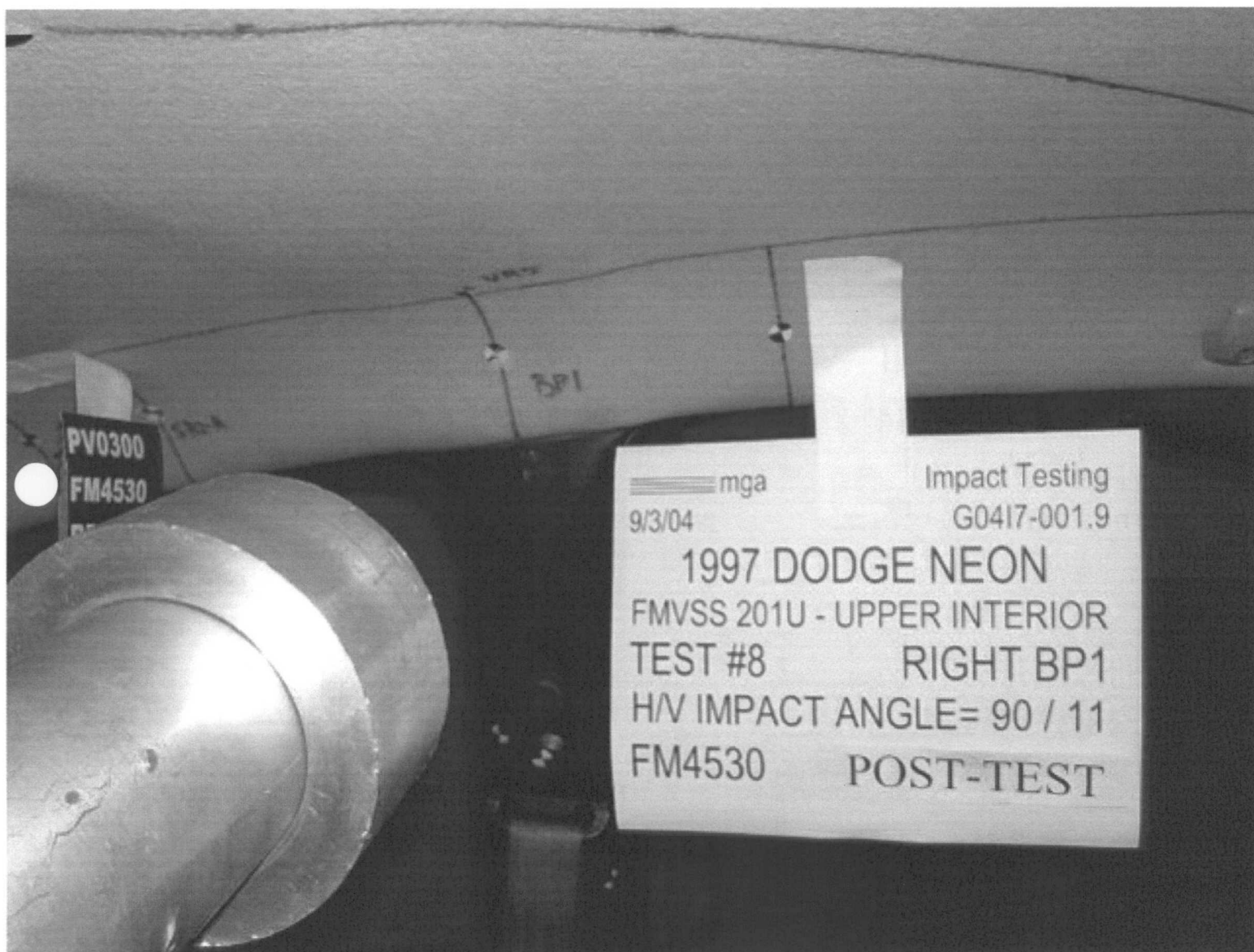
Model Year: 1997  
Target: AP3  
Vehicle Side: Right  
Horz/Vert Angle: 154/41

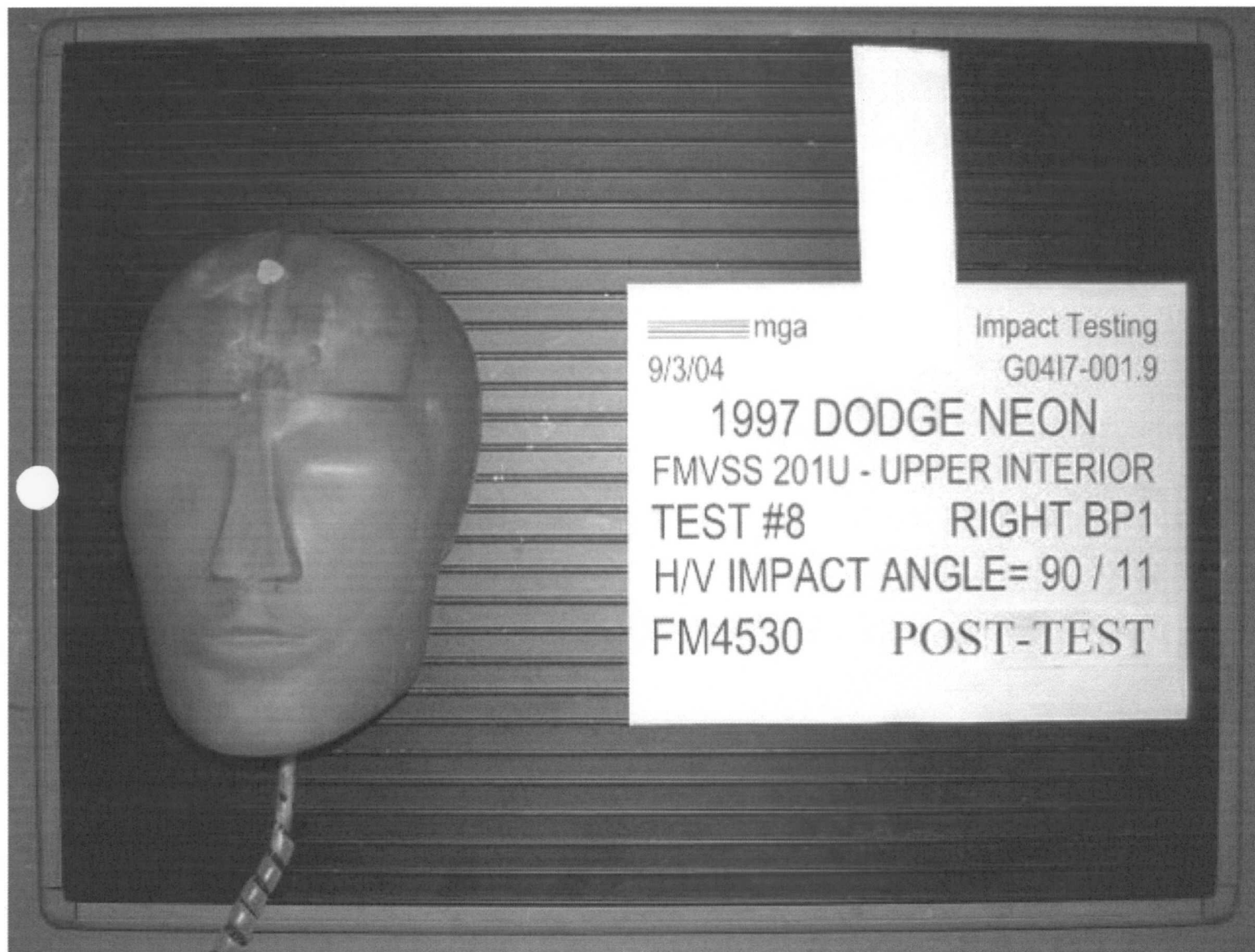
Test Date: 9/2/04

HIC(d) = 1136, HIC = 1285, Delta T = 4.1 msec









MICHIGAN OPERATIONS  
 DATE: 2/8/01  
 SUPERCEDES: MGATP207210.2

DOC. NO.: MGATP207210.3  
 REVISION NO.: 2  
 PAGE 1 OF 1

### SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G0417-001.9 VEHICLE YR/MAKE/MODEL: NEON 1997

#### GENERAL TEST PARAMETERS:

Test Number: #8

Target (Vehicle Side): BP1 Right

Temperature: 22C

MGA Test Reference No.: FM4530

Humidity: 63%

Approach Horizontal Angles: 90°

Time of Test: 9:00 AM

Approach Vertical Angles: 11°

FMH Serial No: 036

#### TEST RESULTS:

| HIC(d) | HIC | $\Delta t$ (msec) | Velocity (kph) | Impact location on FMH (mm) |                  |
|--------|-----|-------------------|----------------|-----------------------------|------------------|
|        |     |                   |                | Above Pt. O                 | Left/Right Pt. O |
| 885    | 952 | 4.7               | 23.9           | 53                          | 0                |

#### INSTRUMENTAION INFORMATION: (all accelerometers are Endevco 7264-2000)

| Axis | Channel | Serial No. | DLR Value | $\Delta V$ Pre-Test | $\Delta V$ Post-Test |
|------|---------|------------|-----------|---------------------|----------------------|
| X    | 5       | J35923     | -100.8    | 1.67                | 1.67                 |
| Y    | 6       | J35916     | 100.2     | 1.54                | 1.54                 |
| Z    | 7       | J35918     | 97.9      | 1.58                | 1.58                 |

#### REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

No visible damage

Recorded By: me g m Approved By\*: Deen Q. Kalo Date: 9-3-04

\*Only necessary for NHTSA (Government) Compliance testing.

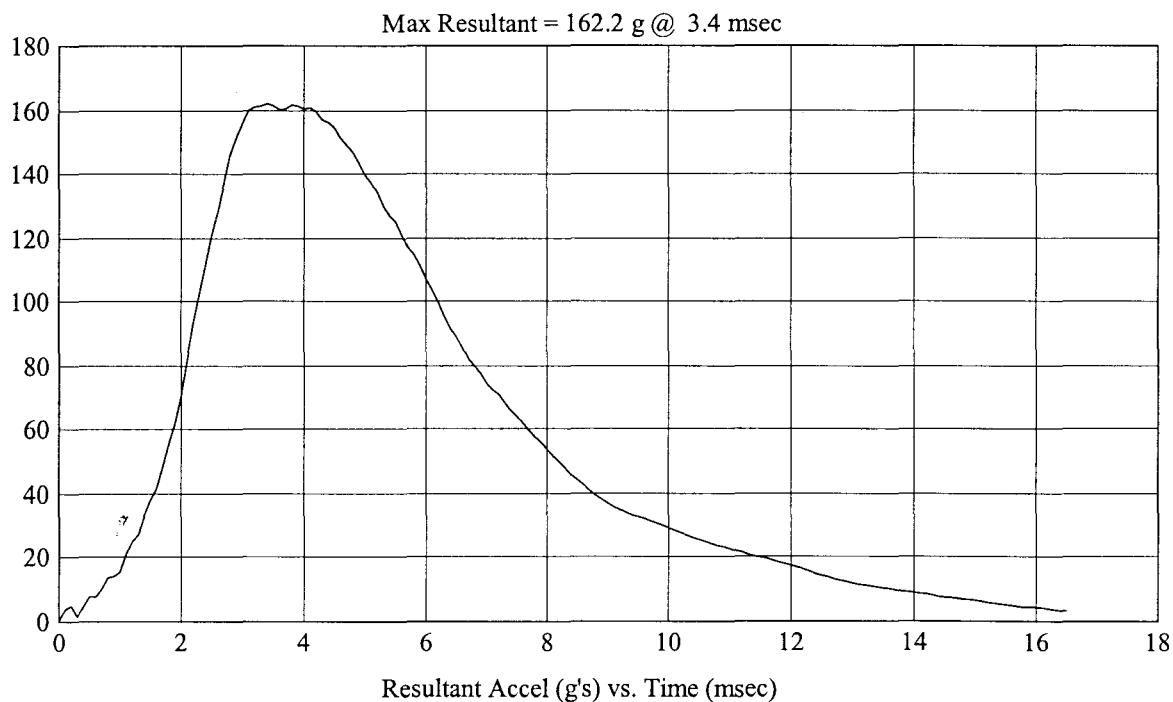
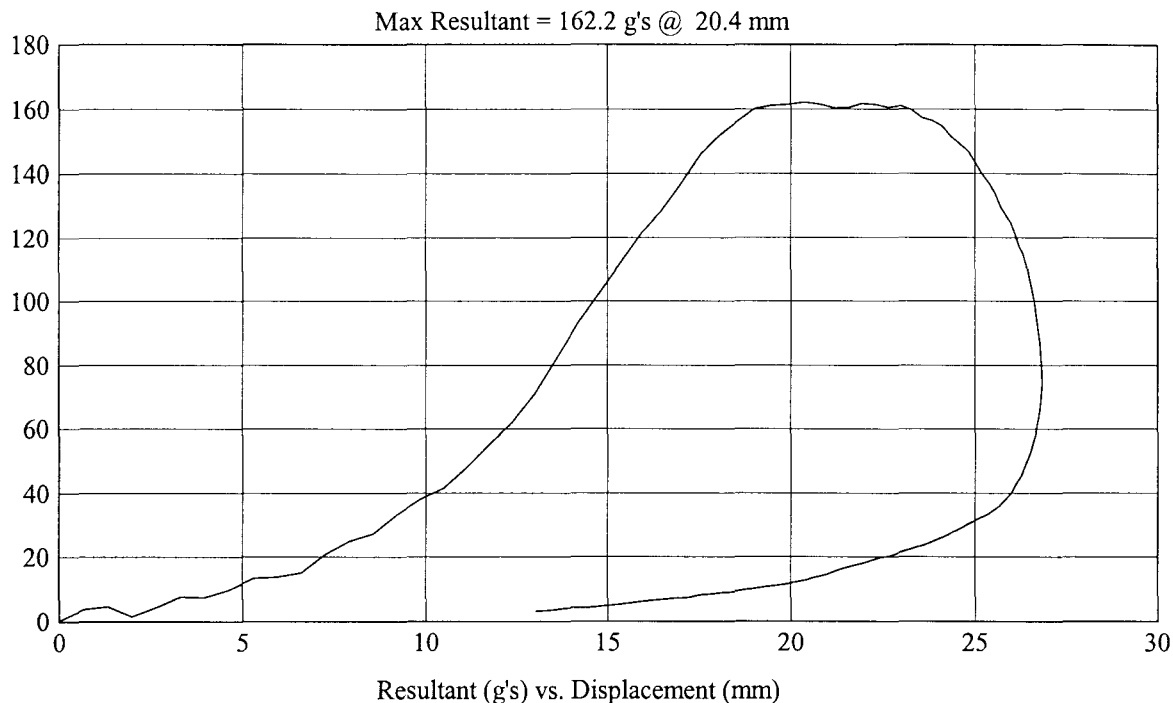
FMH  
G04I7-001.9

Customer: DODGE  
Test # 8  
FM4530  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: BP1  
Vehicle Side: Right  
Horz/Vert Angle: 90/11

Test Date: 9/3/04  
HIC(d) = 885, HIC = 952, Delta T = 4.7 msec



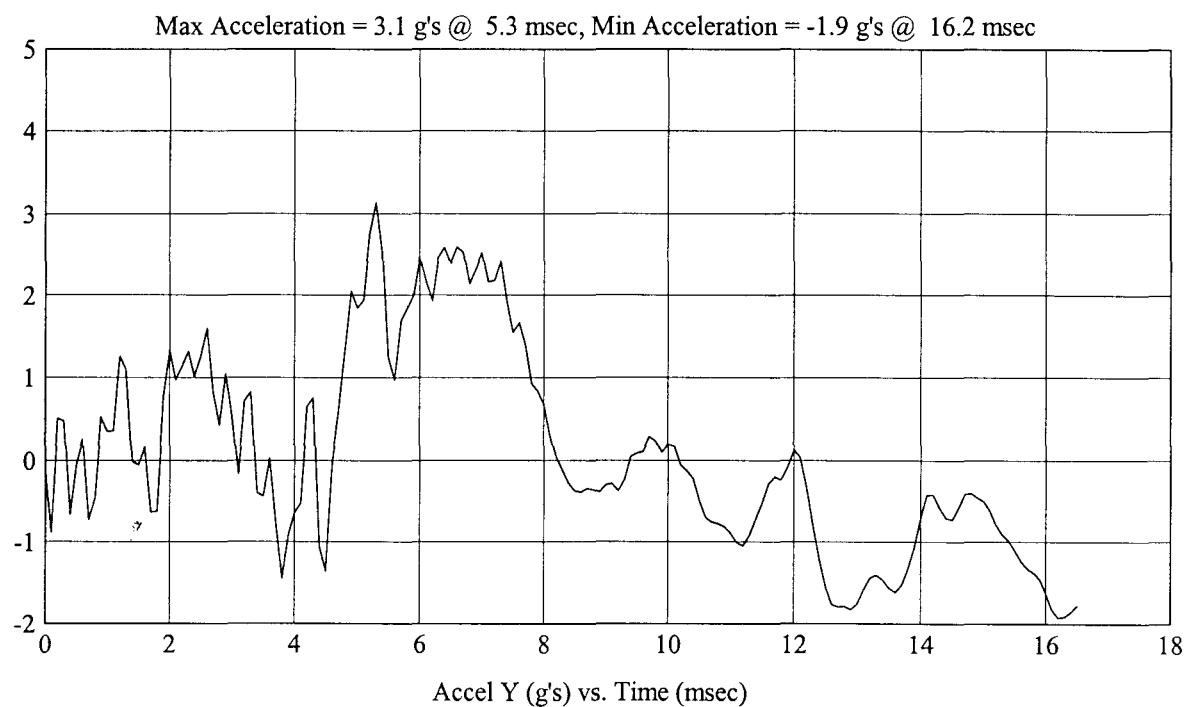
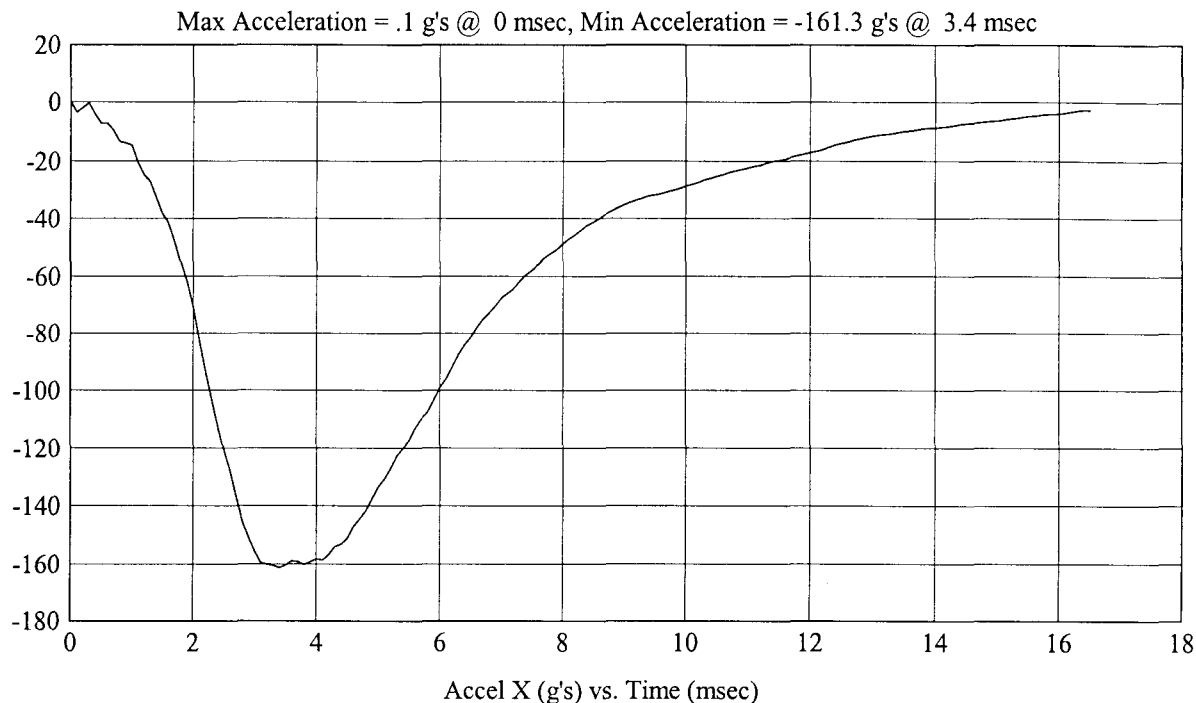
FMH  
G04I7-001.9

Customer: DODGE  
Test # 8  
FM4530  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: BP1  
Vehicle Side: Right  
Horz/Vert Angle: 90/11

Test Date: 9/3/04  
HIC(d) = 885, HIC = 952, Delta T = 4.7 msec



FMH  
G0417-001.9

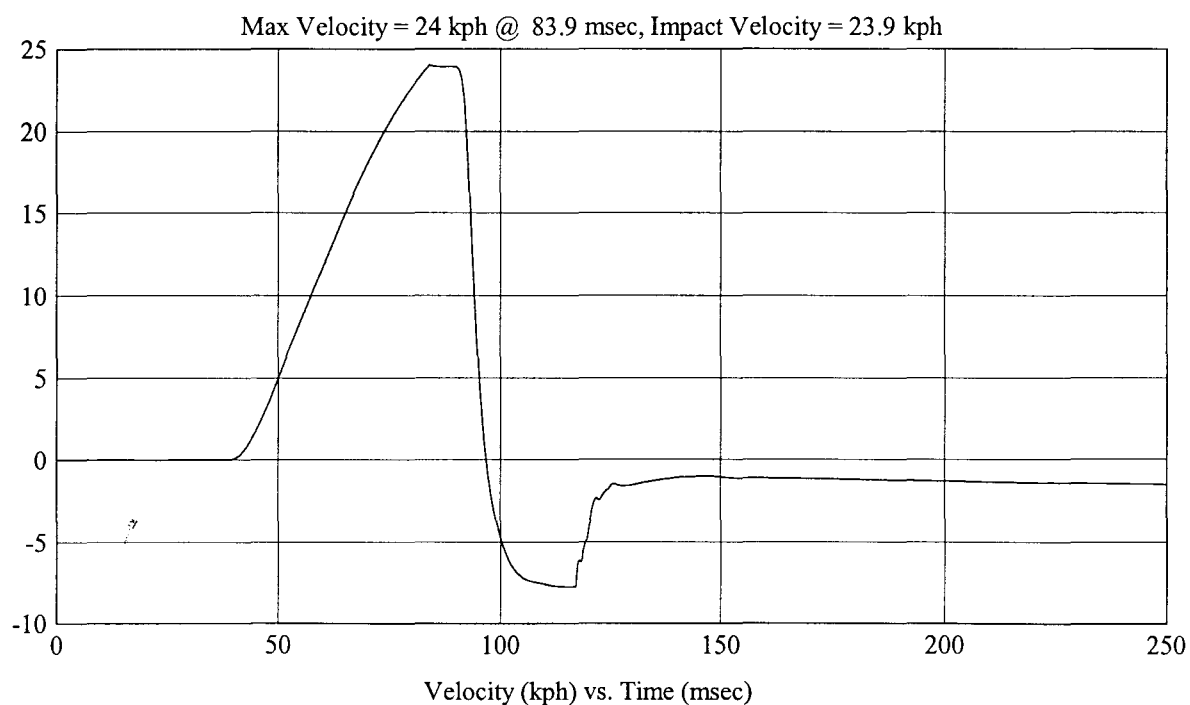
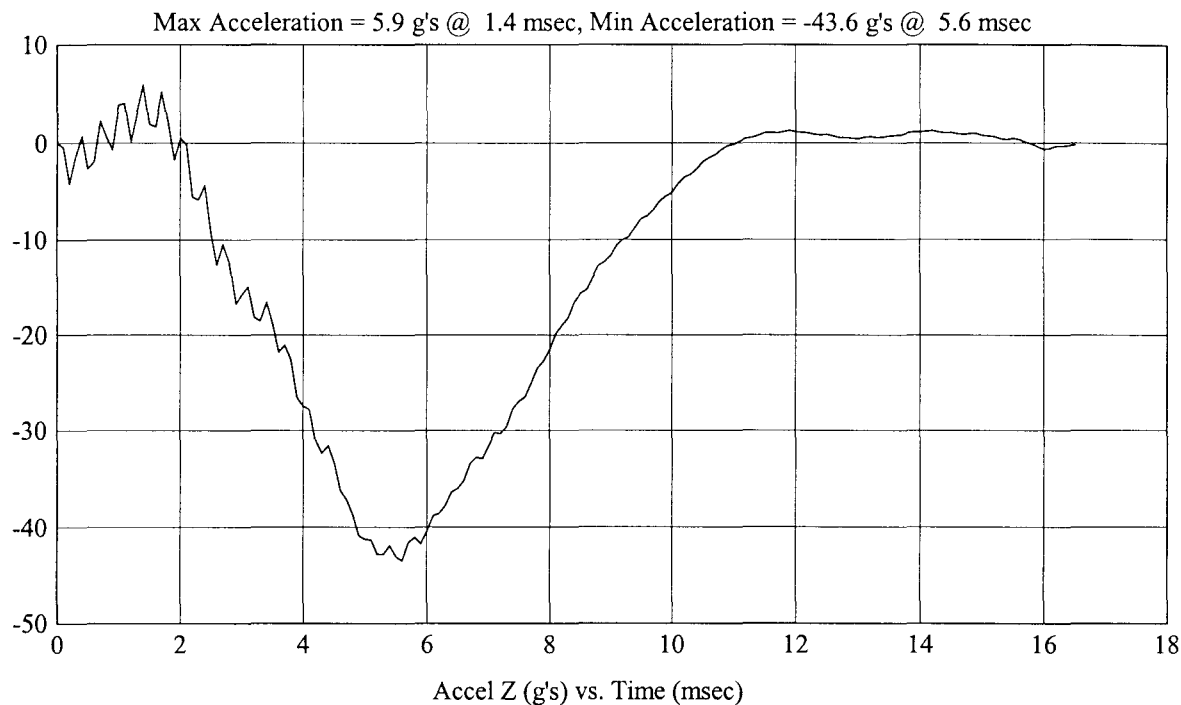
Customer: DODGE  
Test # 8  
FM4530  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: BP1  
Vehicle Side: Right  
Horz/Vert Angle: 90/11

Test Date: 9/3/04

HIC(d) = 885, HIC = 952, Delta T = 4.7 msec





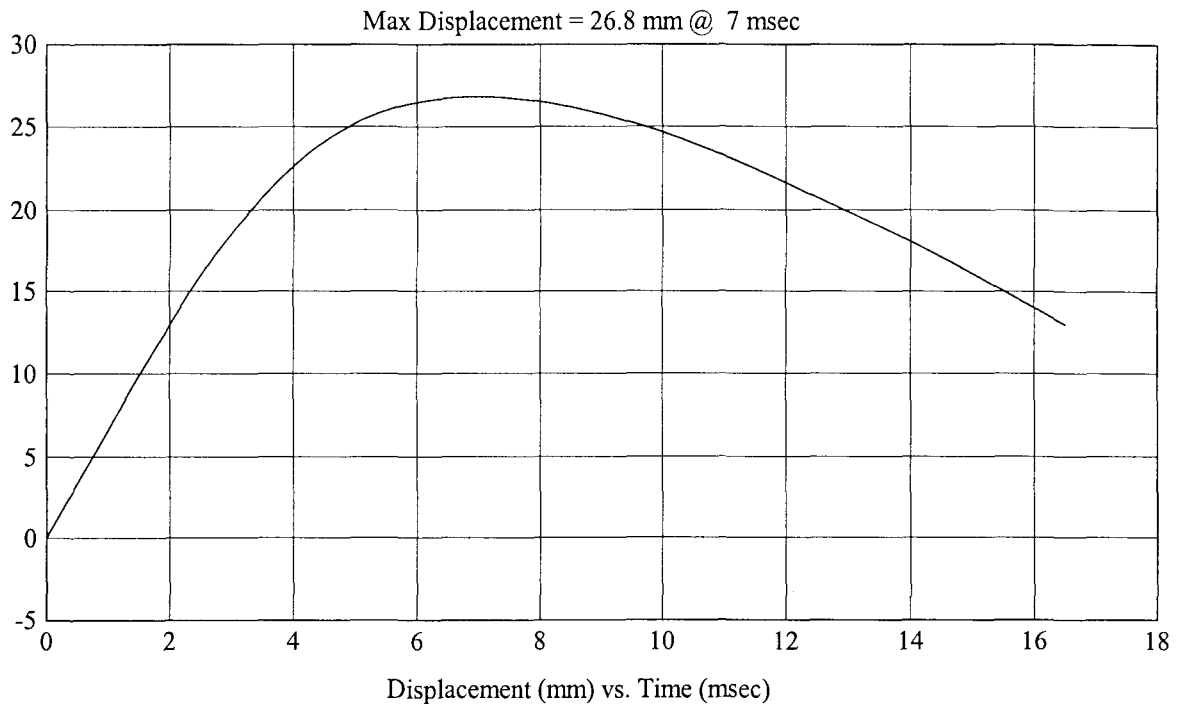
FMH  
G0417-001.9

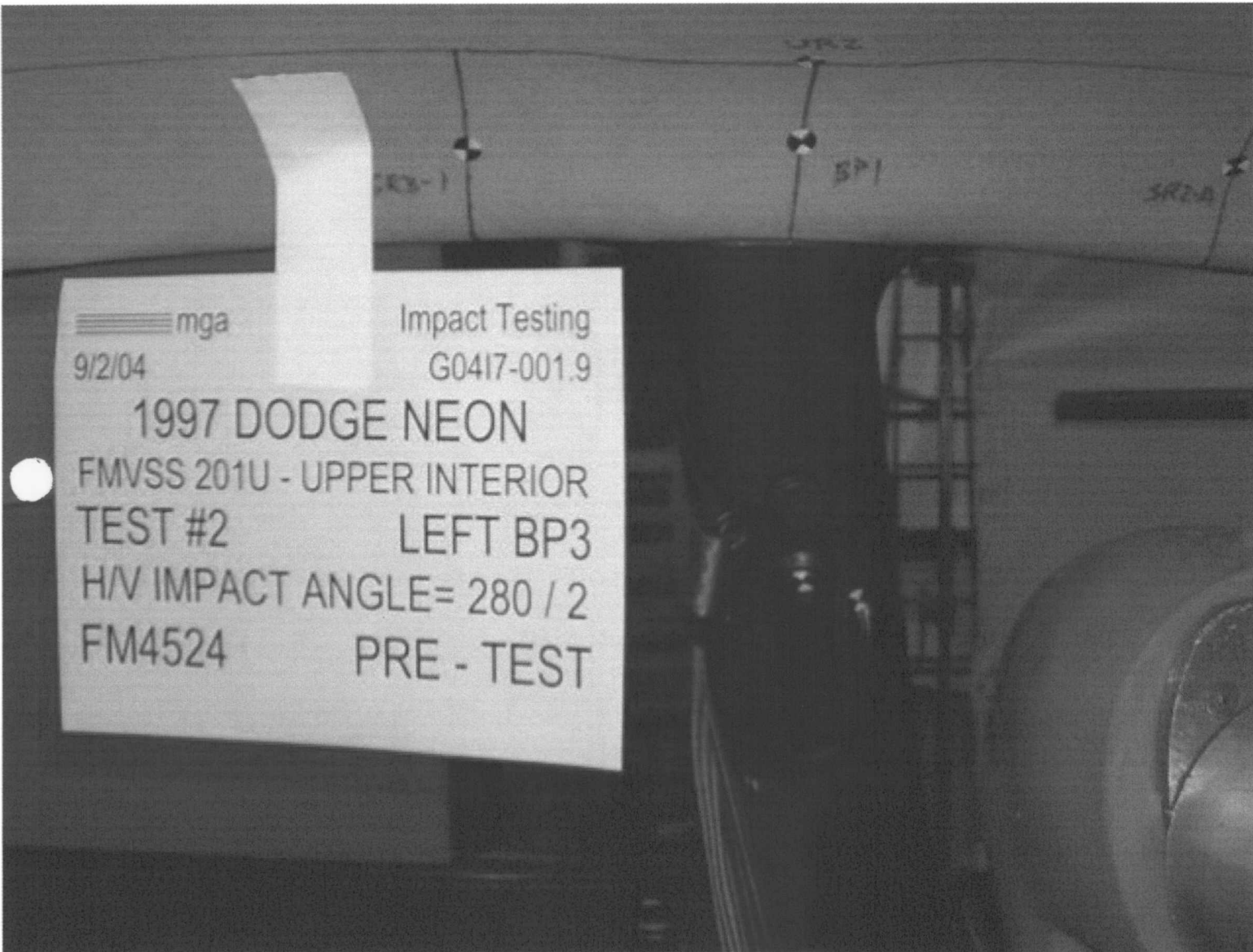
Customer: DODGE  
Test # 8  
FM4530  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: BP1  
Vehicle Side: Right  
Horz/Vert Angle: 90/11

Test Date: 9/3/04  
HIC(d) = 885, HIC = 952, Delta T = 4.7 msec





mga

9/2/04

Impact Testing

G04I7-001.9

1997 DODGE NEON

FMVSS 201U - UPPER INTERIOR

TEST #2

LEFT BP3

H/V IMPACT ANGLE= 280 / 2

FM4524

PRE - TEST

 mga

9/2/04

Impact Testing

G04I7-001.9

1997 DODGE NEON

FMVSS 201U - UPPER INTERIOR

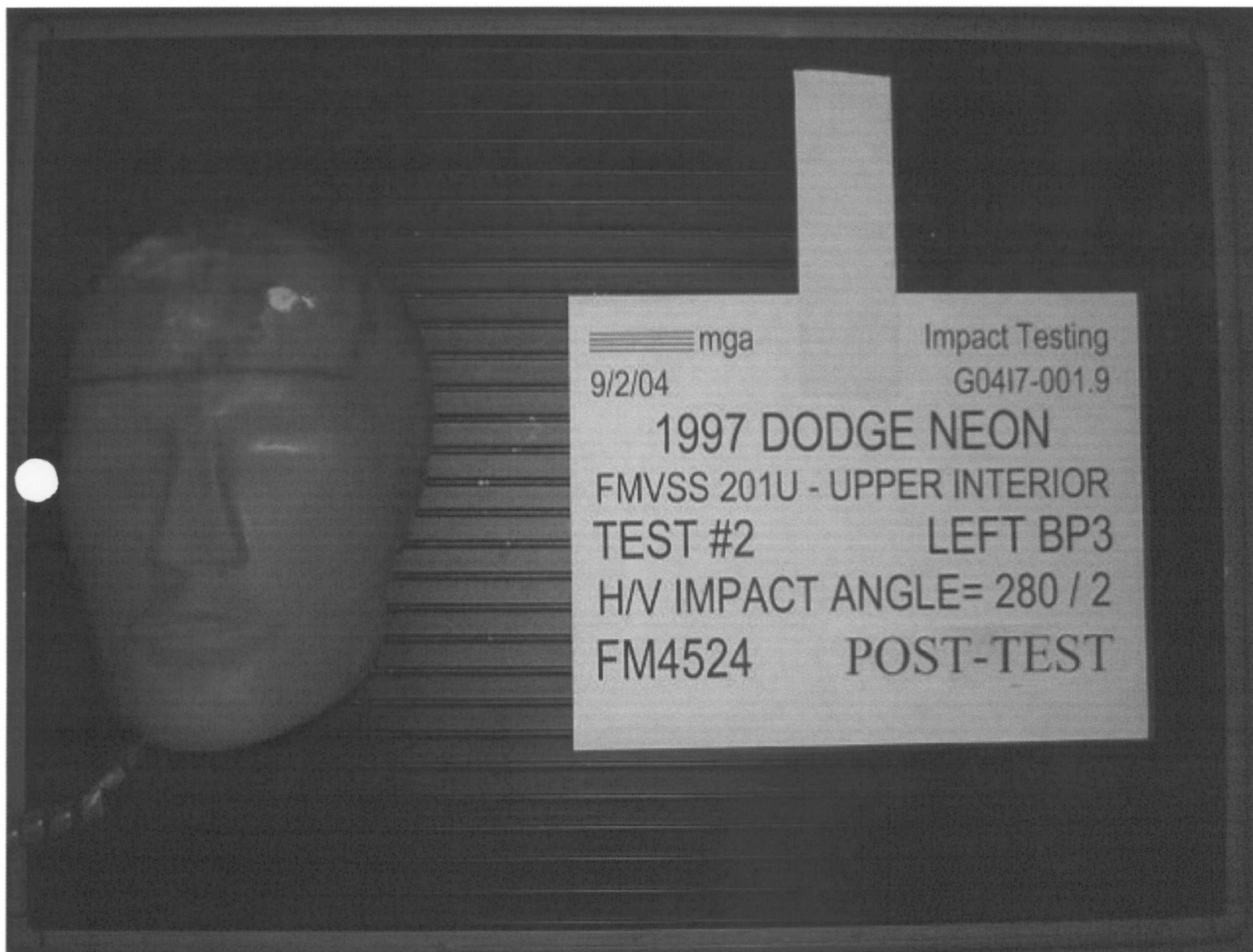
TEST #2

LEFT BP3

H/V IMPACT ANGLE= 280 / 2

FM4524

POST-TEST



==== mga

Impact Testing

9/2/04

G0417-001.9

1997 DODGE NEON

FMVSS 201U - UPPER INTERIOR

TEST #2

LEFT BP3

H/V IMPACT ANGLE= 280 / 2

FM4524

POST-TEST

MICHIGAN OPERATIONS  
 DATE: 2/8/01  
 SUPERCEDES: MGATP207210.2

DOC. NO.: MGATP207210.3  
 REVISION NO.: 2  
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### SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G04I7-001.9      VEHICLE YR/MAKE/MODEL: NEON 1997

#### GENERAL TEST PARAMETERS:

Test Number: #2

Target (Vehicle Side): BP3 Left

Temperature: 22C

MGA Test Reference No.: FM4524

Humidity: 54%

Approach Horizontal Angles: 280°

Time of Test: 3:45 PM

Approach Vertical Angles: 2°

FMH Serial No: 036

#### TEST RESULTS:

| HIC(d) | HIC | $\Delta t$ (msec) | Velocity (kph) | Impact location on FMH (mm) |                  |
|--------|-----|-------------------|----------------|-----------------------------|------------------|
|        |     |                   |                | Above Pt. O                 | Left/Right Pt. O |
| 591    | 563 | 8.4               | 23.6           | 40                          | 32 L             |

#### INSTRUMENTAION INFORMATION: (all accelerometers are Endevco 7264-2000)

| Axis | Channel | Serial No. | DLR Value | $\Delta V$ Pre-Test | $\Delta V$ Post-Test |
|------|---------|------------|-----------|---------------------|----------------------|
| X    | 5       | J35923     | -100.8    | 1.67                | 1.67                 |
| Y    | 6       | J35916     | 100.2     | 1.55                | 1.55                 |
| Z    | 7       | J35918     | 97.9      | 1.58                | 1.52                 |

#### REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

Cracked pillar trim

Recorded By: *He Jue* Approved By\*: *Helen Q. Kalto* Date: 9-2-01

\*Only necessary for NHTSA (Government) Compliance testing.

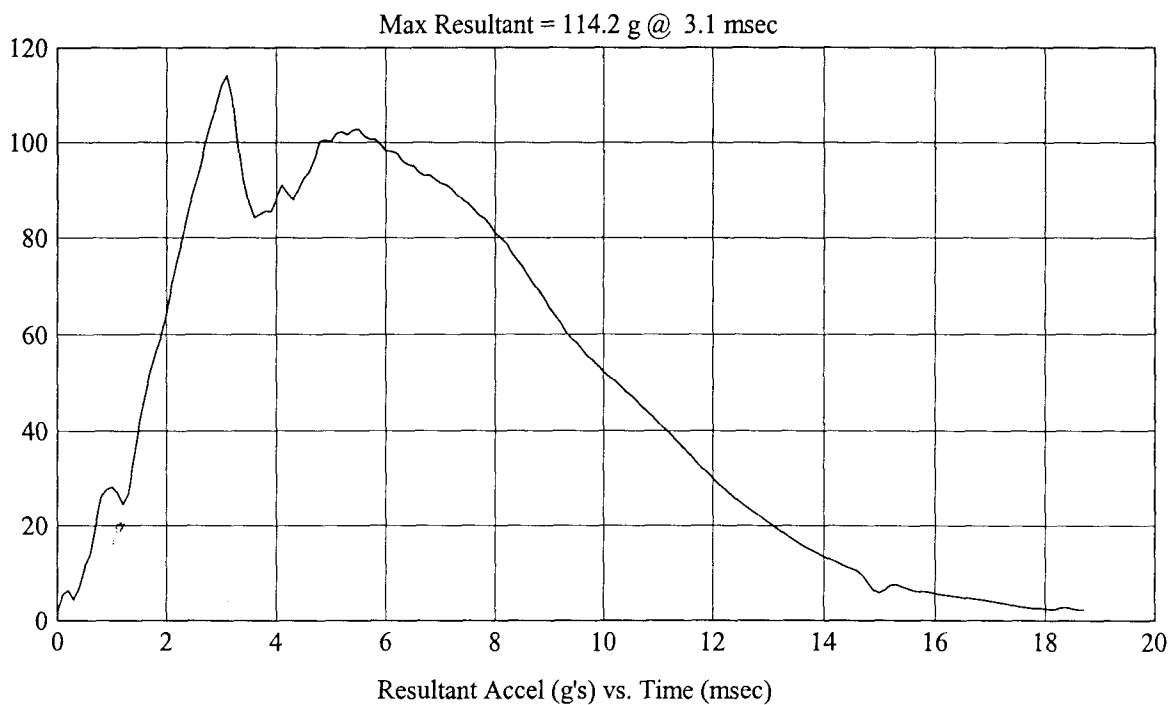
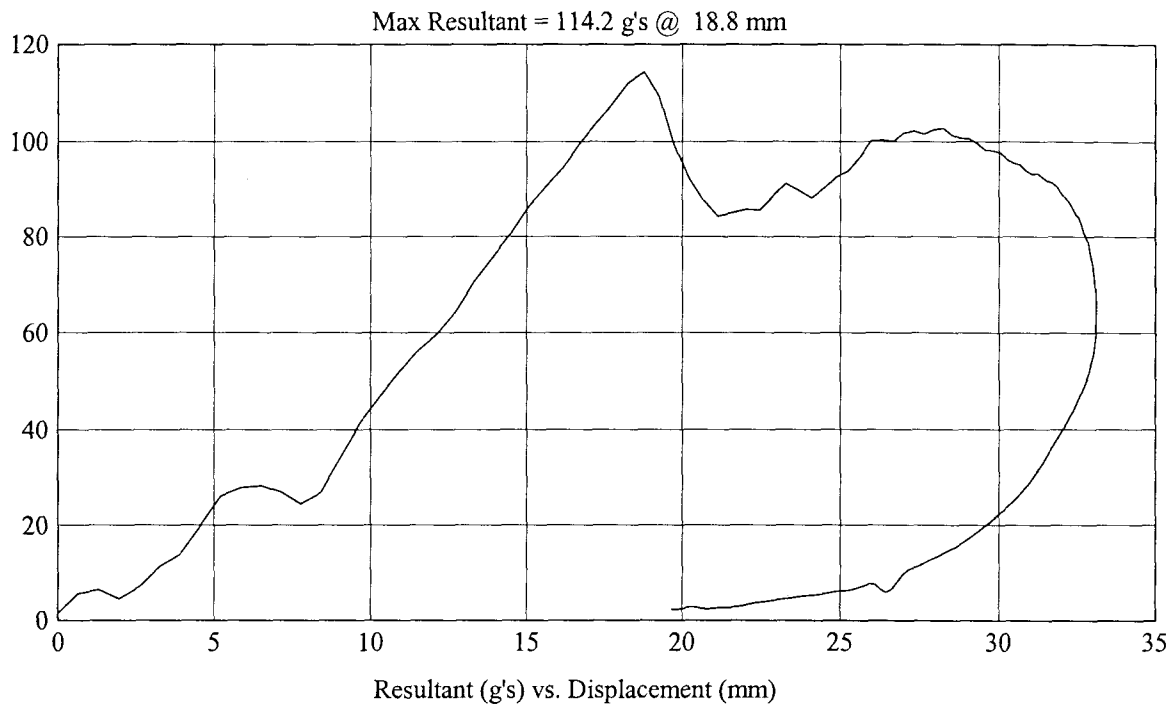
FMH  
G04I7-001.9

Customer: DODGE  
Test # 2  
FM4524  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: BP3  
Vehicle Side: Left  
Horz/Vert Angle: 280/2

Test Date: 9/2/04  
HIC(d) = 591, HIC = 563, Delta T = 8.4 msec



FMH  
G04I7-001.9

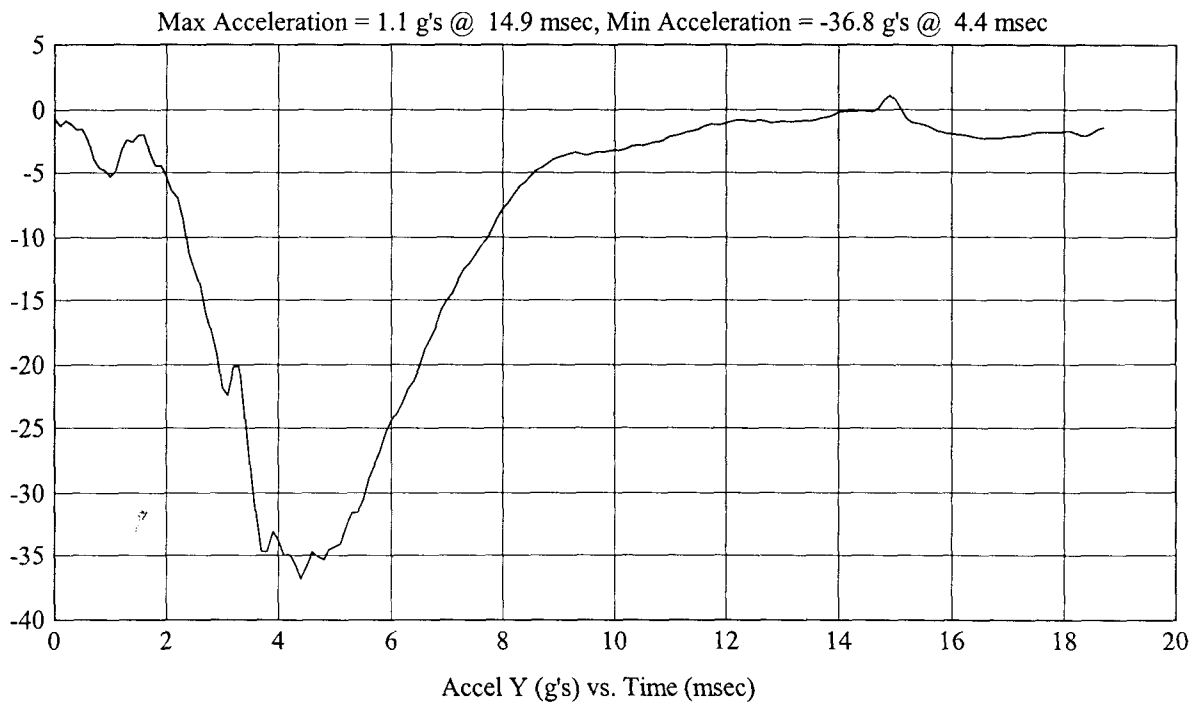
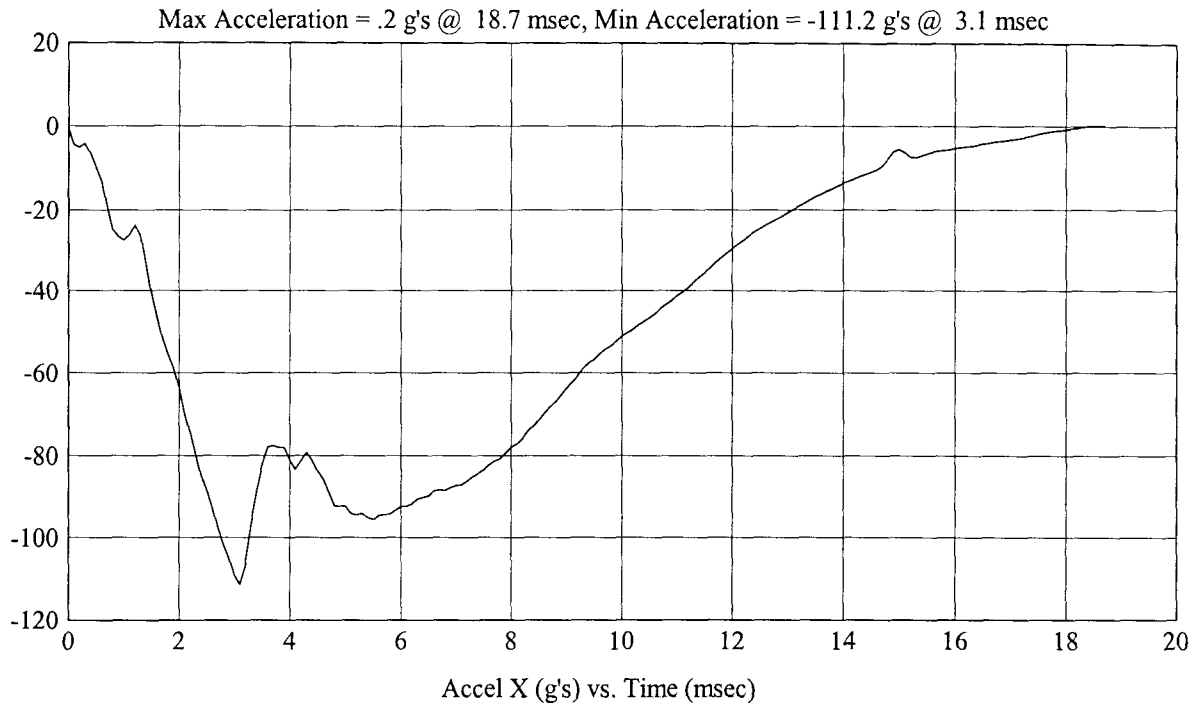
Customer: DODGE  
Test # 2  
FM4524  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: BP3  
Vehicle Side: Left  
Horz/Vert Angle: 280/2

Test Date: 9/2/04

HIC(d) = 591, HIC = 563, Delta T = 8.4 msec



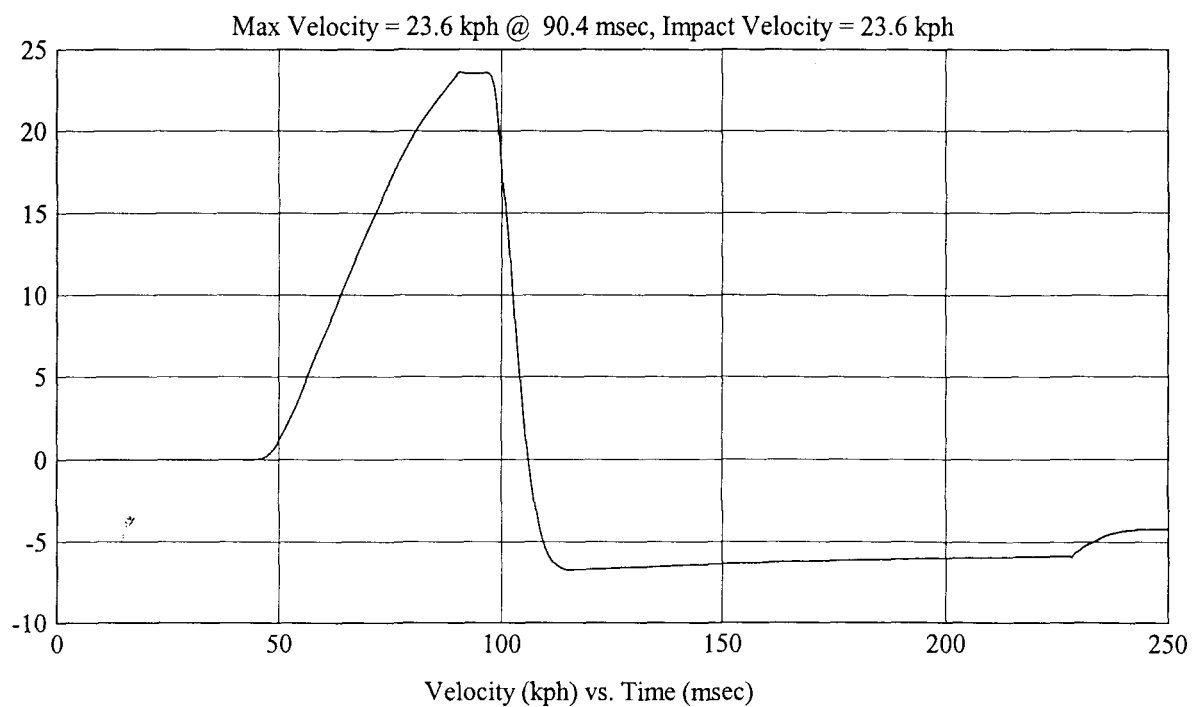
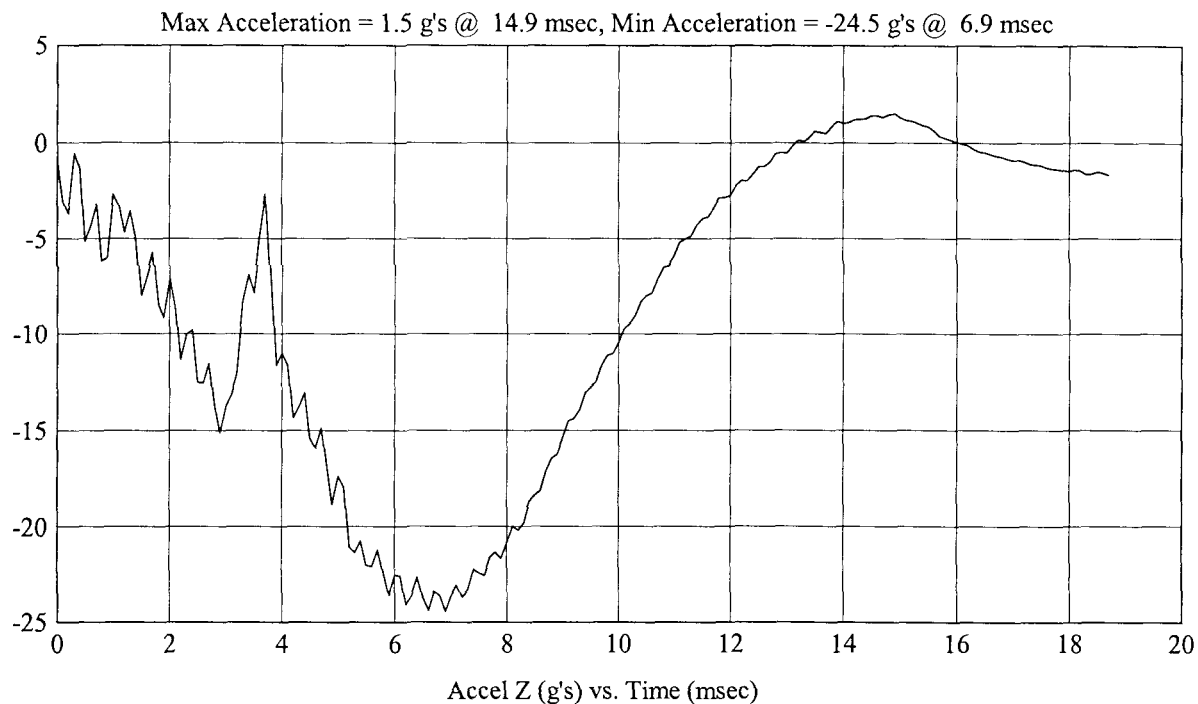
FMH  
G04I7-001.9

Customer: DODGE  
Test # 2  
FM4524  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: BP3  
Vehicle Side: Left  
Horz/Vert Angle: 280/2

Test Date: 9/2/04  
HIC(d) = 591, HIC = 563, Delta T = 8.4 msec





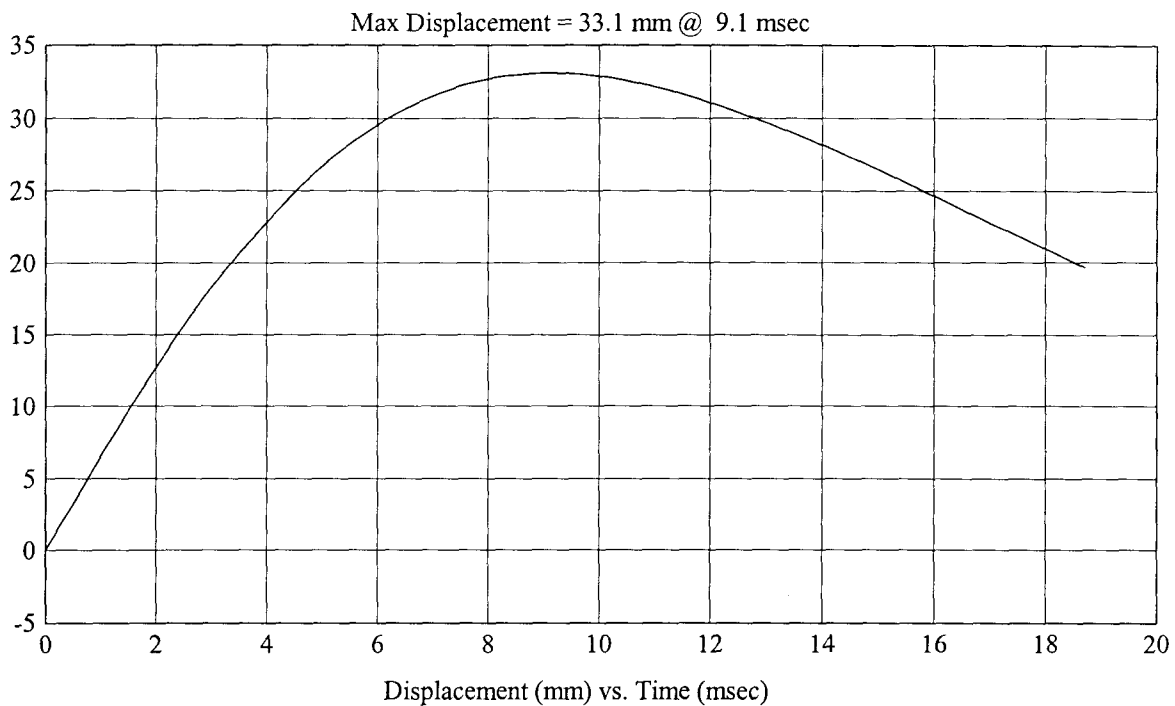
FMH  
G04I7-001.9

Customer: DODGE  
Test # 2  
FM4524  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: BP3  
Vehicle Side: Left  
Horz/Vert Angle: 280/2

Test Date: 9/2/04  
HIC(d) = 591, HIC = 563, Delta T = 8.4 msec



mga

9/3/04

Impact Testing

G0417-001.9

1997 DODGE NEON

FMVSS 201U - UPPER INTERIOR

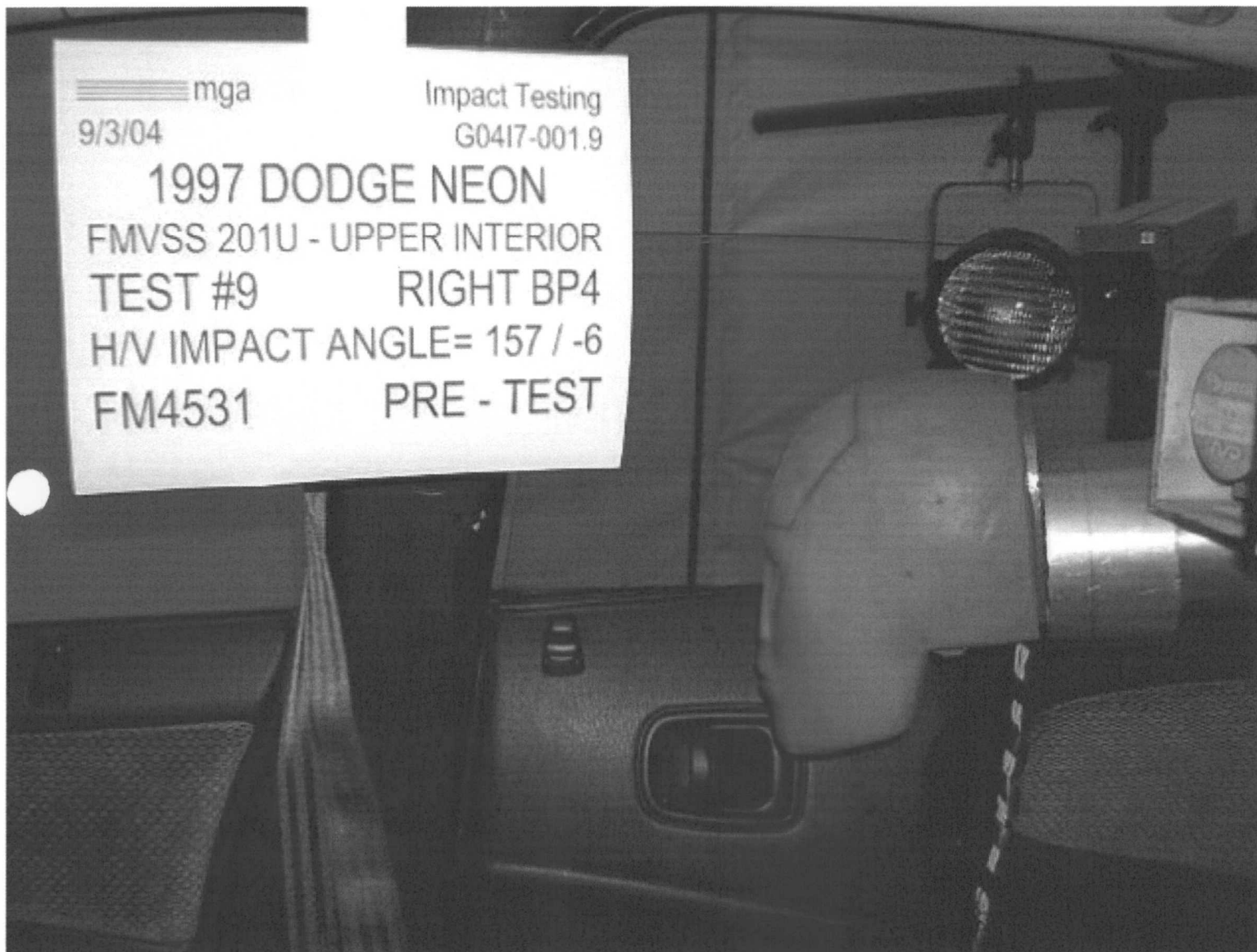
TEST #9

RIGHT BP4

H/V IMPACT ANGLE= 157 / -6

FM4531

PRE - TEST



mga  
9/3/04

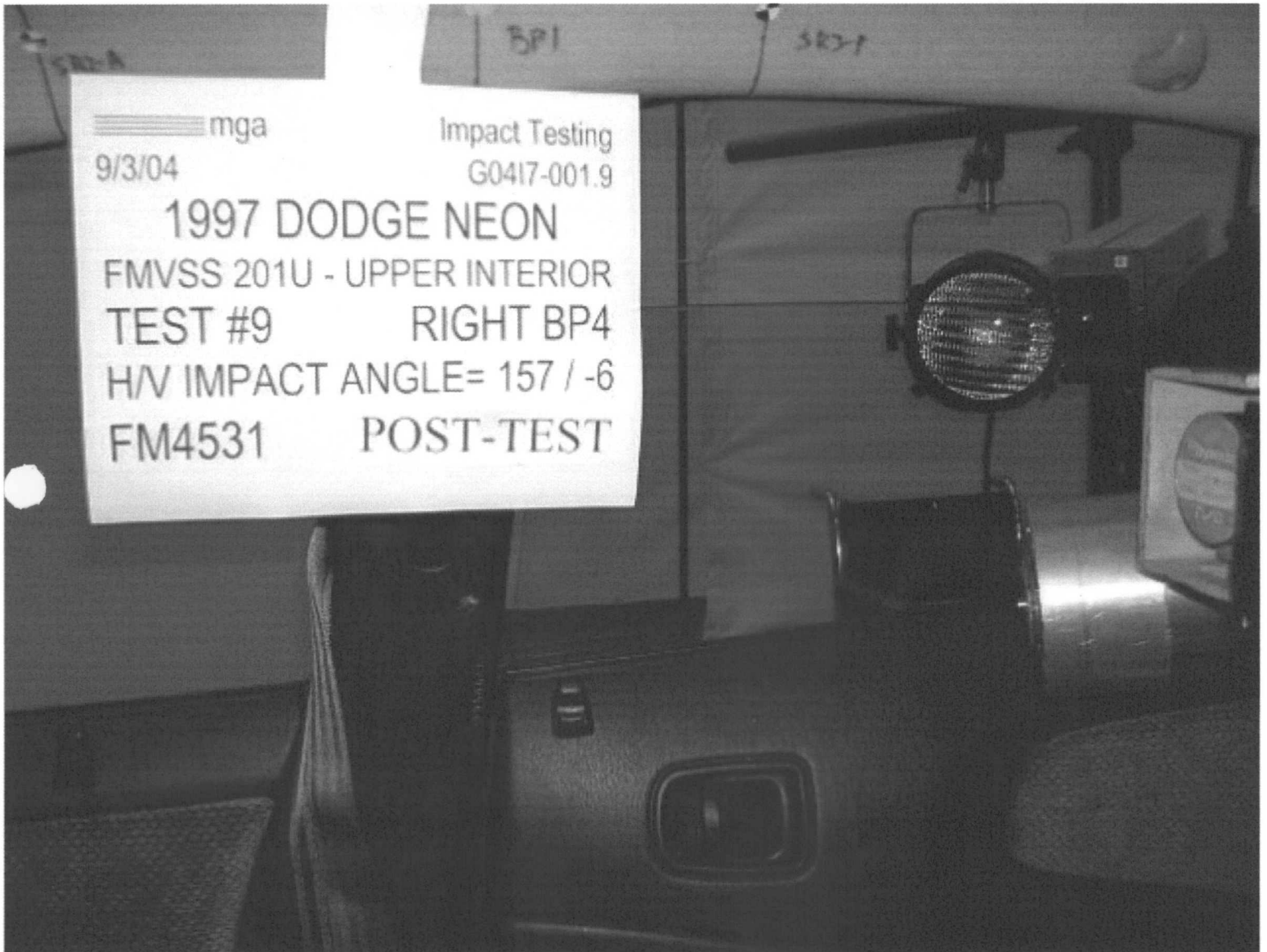
Impact Testing  
G0417-001.9

1997 DODGE NEON

FMVSS 201U - UPPER INTERIOR  
TEST #9 RIGHT BP4

H/V IMPACT ANGLE= 157 / -6

FM4531 POST-TEST





===== mga

9/3/04

Impact Testing

G04I7-001.9

1997 DODGE NEON

FMVSS 201U - UPPER INTERIOR

TEST #9

RIGHT BP4

H/V IMPACT ANGLE= 157 / -6

FM4531

POST-TEST

MICHIGAN OPERATIONS  
 DATE: 2/8/01  
 SUPERCEDES: MGATP207210.2

DOC. NO.: MGATP207210.3  
 REVISION NO.: 2  
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### SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G04I7-001.9      VEHICLE YR/MAKE/MODEL: NEON 1997

#### GENERAL TEST PARAMETERS:

Test Number: #9

Target (Vehicle Side): BP4 Right

Temperature: 22C

MGA Test Reference No.: FM4531

Humidity: 64%

Approach Horizontal Angles: 157°

Time of Test: 9:50 AM

Approach Vertical Angles: -6°

FMH Serial No: 038

#### TEST RESULTS:

| HIC(d) | HIC | $\Delta t$ (msec) | Velocity (kph) | Impact location on FMH (mm) |                  |
|--------|-----|-------------------|----------------|-----------------------------|------------------|
|        |     |                   |                | Above Pt. O                 | Left/Right Pt. O |
| 515    | 462 | 5.8               | 23.6           | 18                          | 0                |

#### INSTRUMENTAION INFORMATION: (all accelerometers are Endevco 7264-2000)

| Axis | Channel | Serial No. | DLR Value | $\Delta V$ Pre-Test | $\Delta V$ Post-Test |
|------|---------|------------|-----------|---------------------|----------------------|
| X    | 5       | J36197     | -108      | 1.68                | 1.67                 |
| Y    | 6       | J36193     | 101.4     | 1.54                | 1.54                 |
| Z    | 7       | J36353     | 96.8      | 1.58                | 1.58                 |

#### REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

No visible damage

Recorded By: [Signature] Approved By\*: Helen A. Kalish Date: 9-3-04

\*Only necessary for NHTSA (Government) Compliance testing.

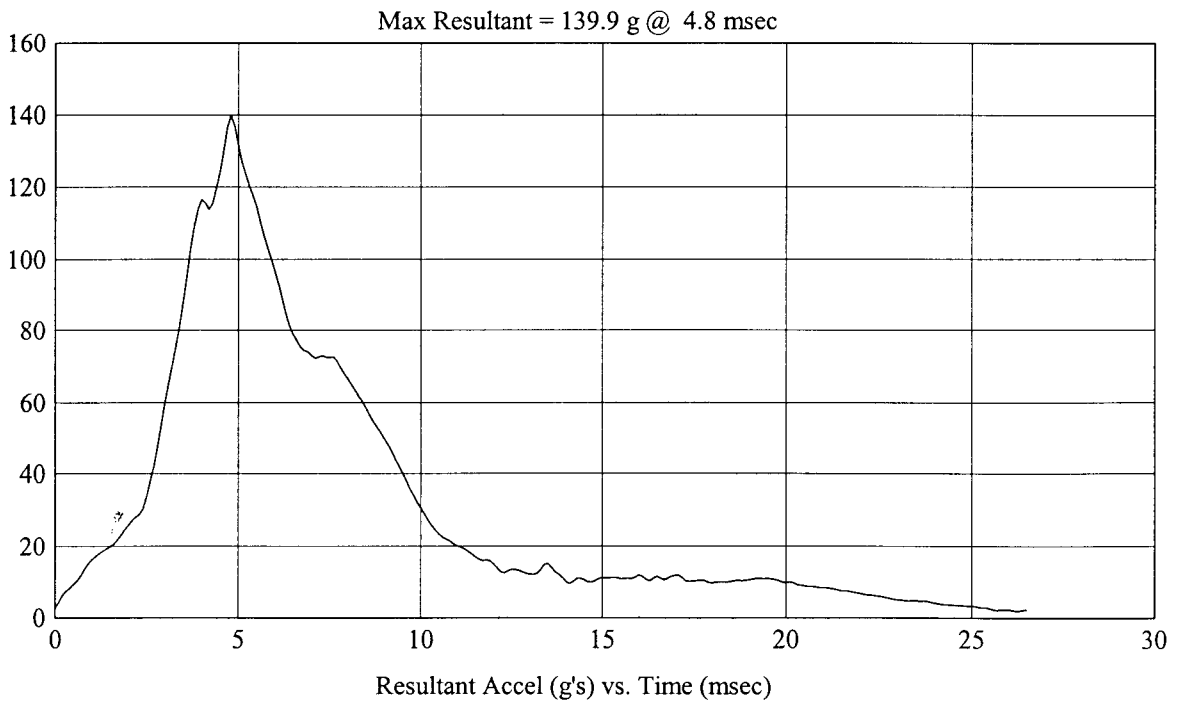
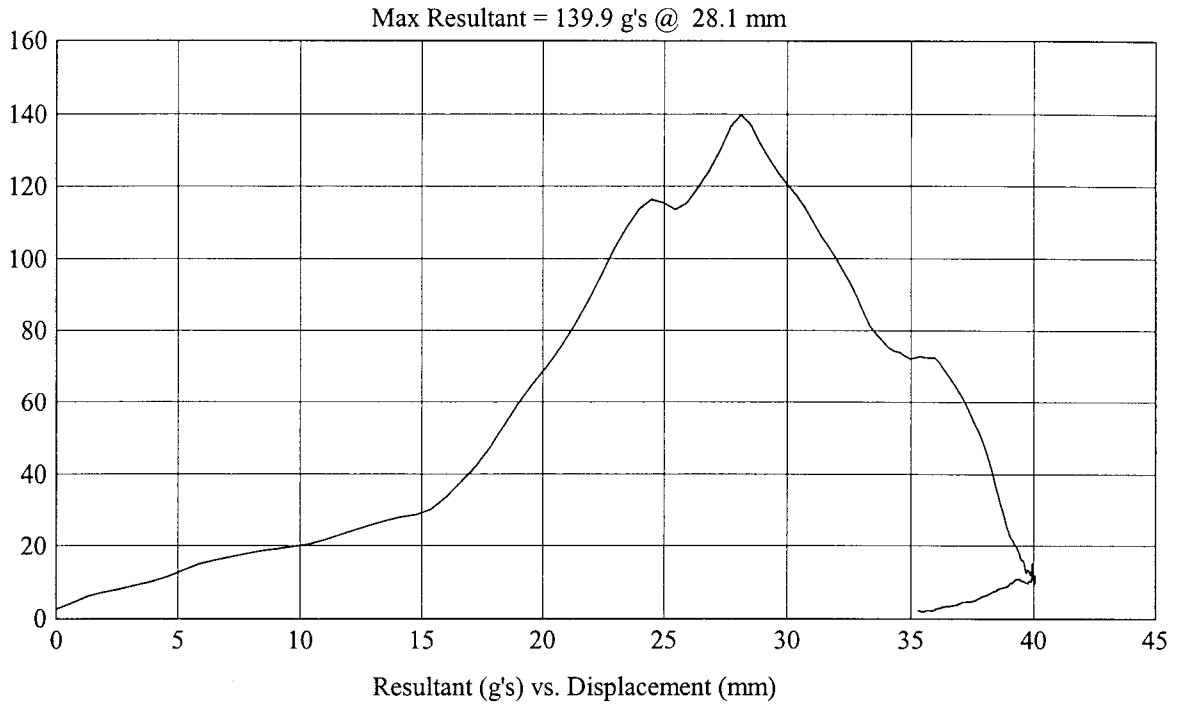
FMH  
G04I7-001.9

Customer: DODGE  
Test # 9  
FM4531  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: BP4  
Vehicle Side: Right  
Horz/Vert Angle: 157/-6

Test Date: 9/3/04  
HIC(d) = 515, HIC = 462, Delta T = 5.8 msec



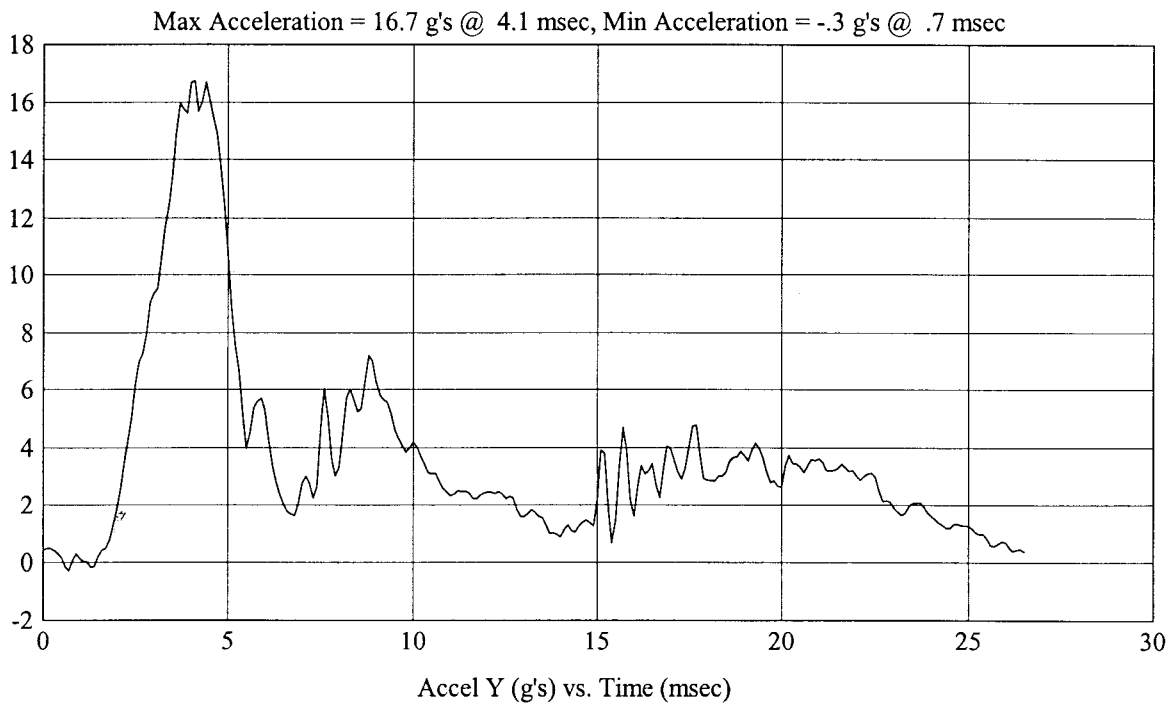
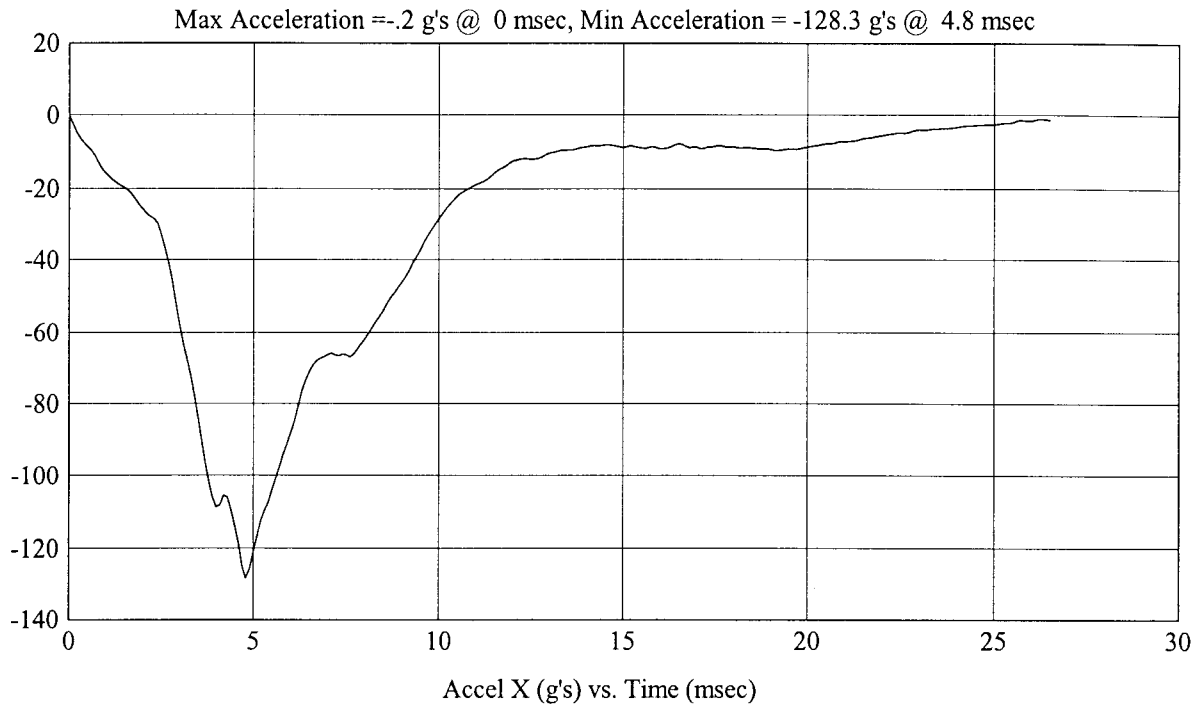
FMH  
G04I7-001.9

Customer: DODGE  
Test # 9  
FM4531  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: BP4  
Vehicle Side: Right  
Horz/Vert Angle: 157/-6

Test Date: 9/3/04  
HIC(d) = 515, HIC = 462, Delta T = 5.8 msec



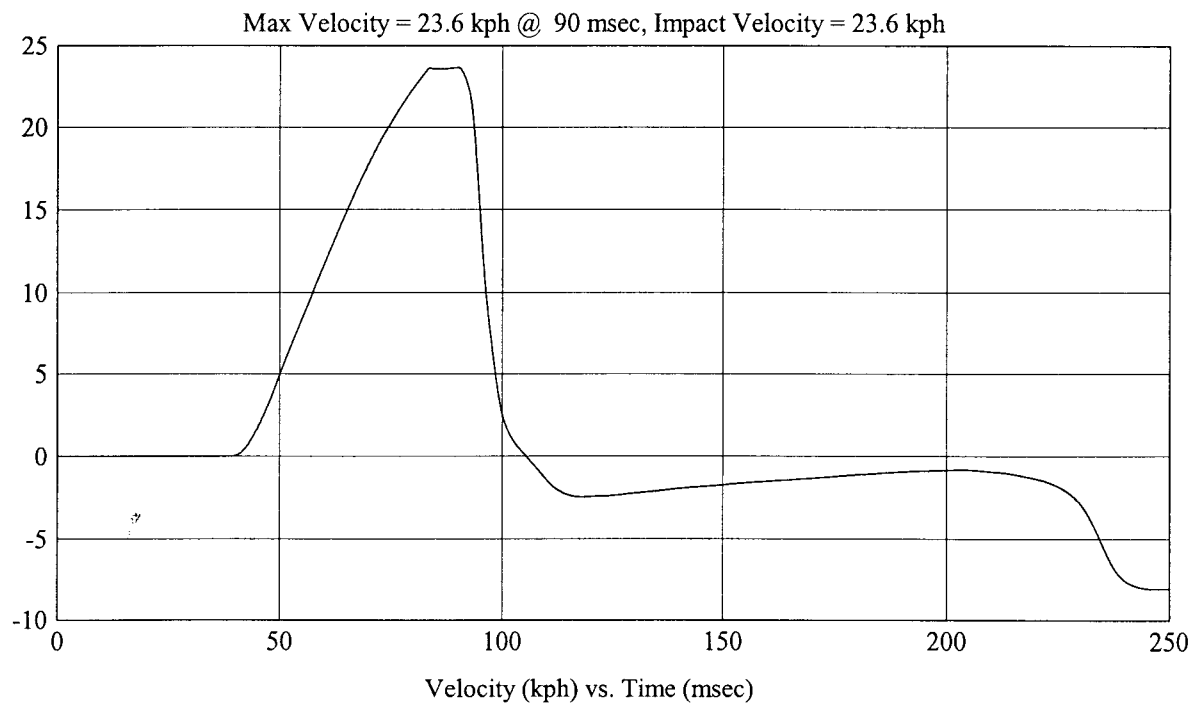
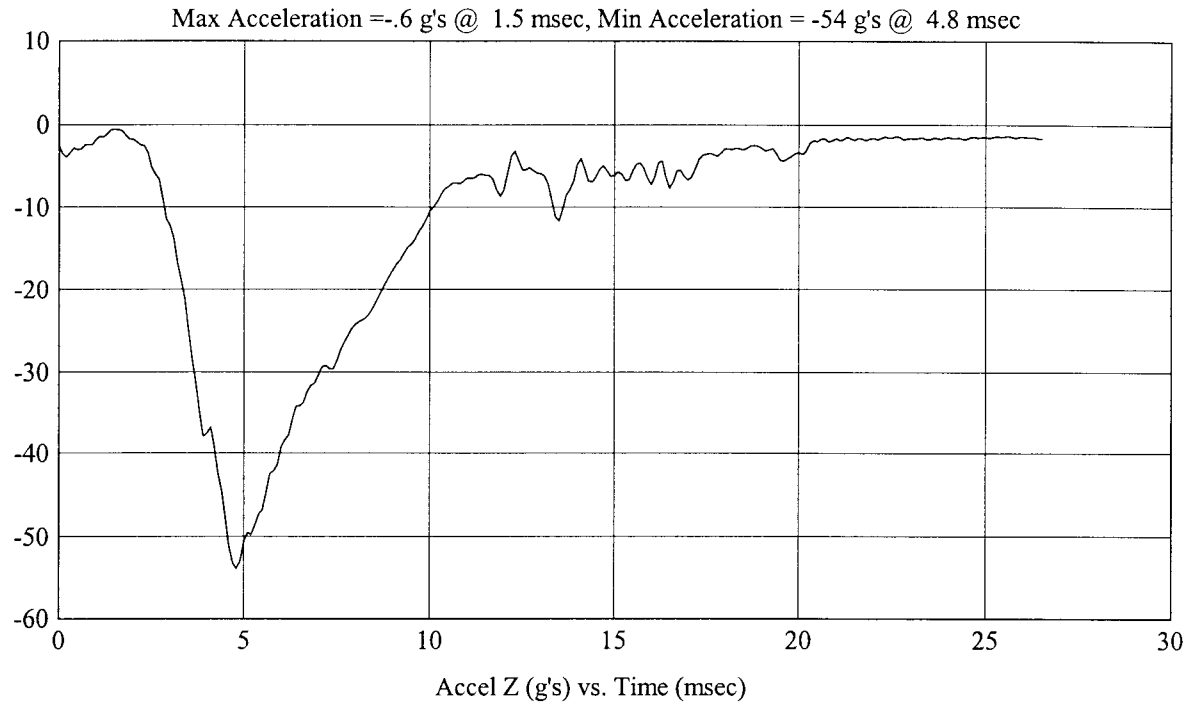
FMH  
G0417-001.9

Customer: DODGE  
Test # 9  
FM4531  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: BP4  
Vehicle Side: Right  
Horz/Vert Angle: 157/-6

Test Date: 9/3/04  
HIC(d) = 515, HIC = 462, Delta T = 5.8 msec





FMH  
G04I7-001.9

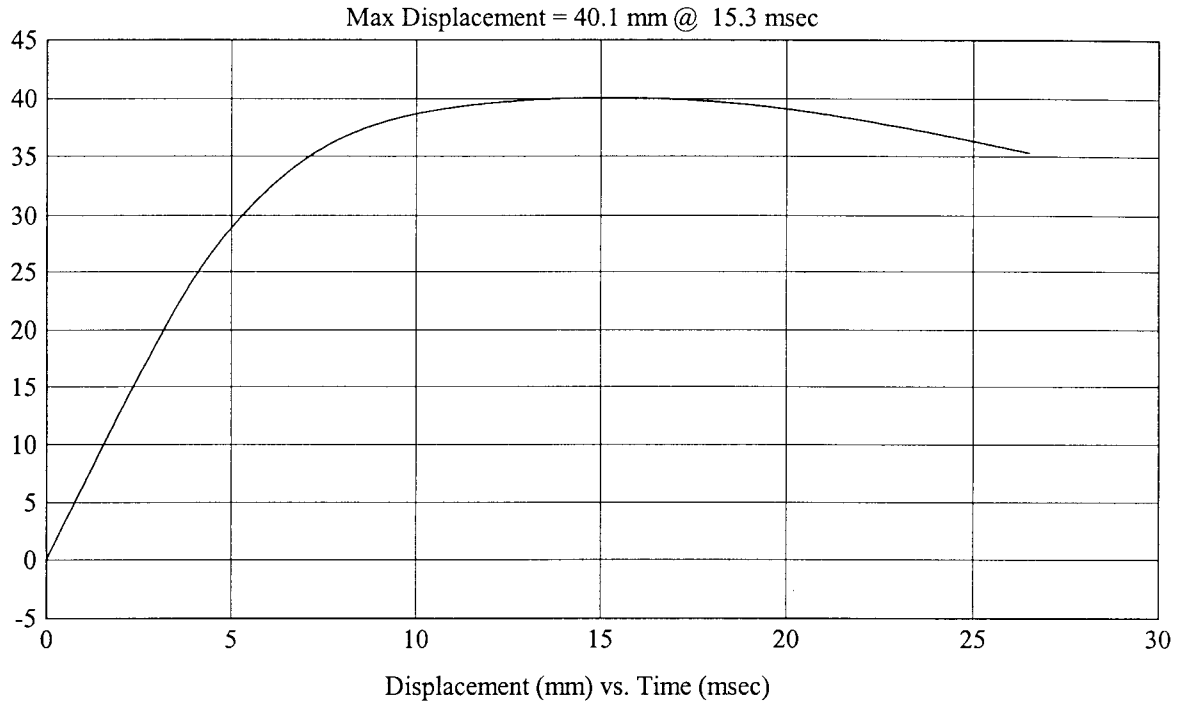
Customer: DODGE  
Test # 9  
FM4531  
Additional Desc: N/A

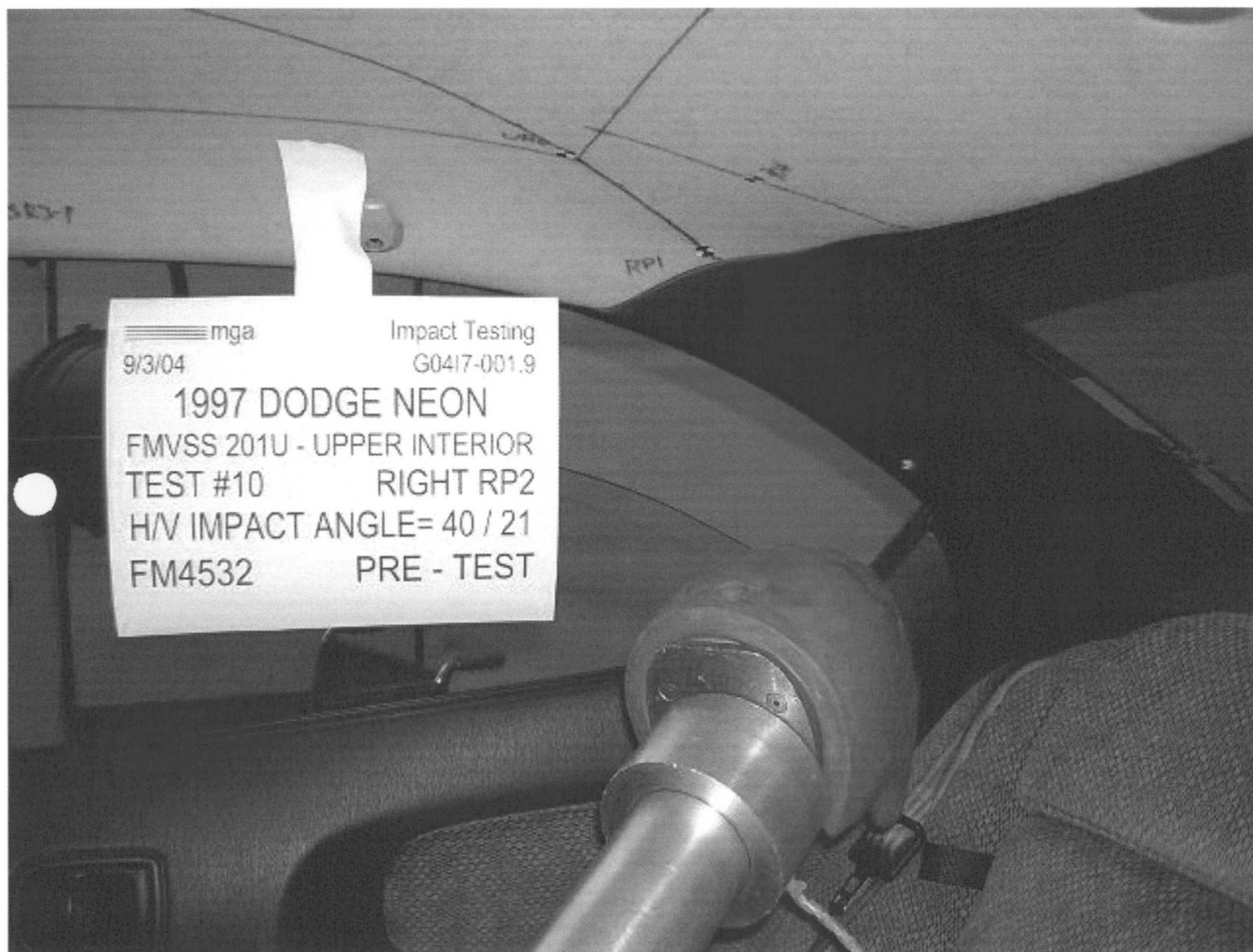
Vehicle Program : NEON

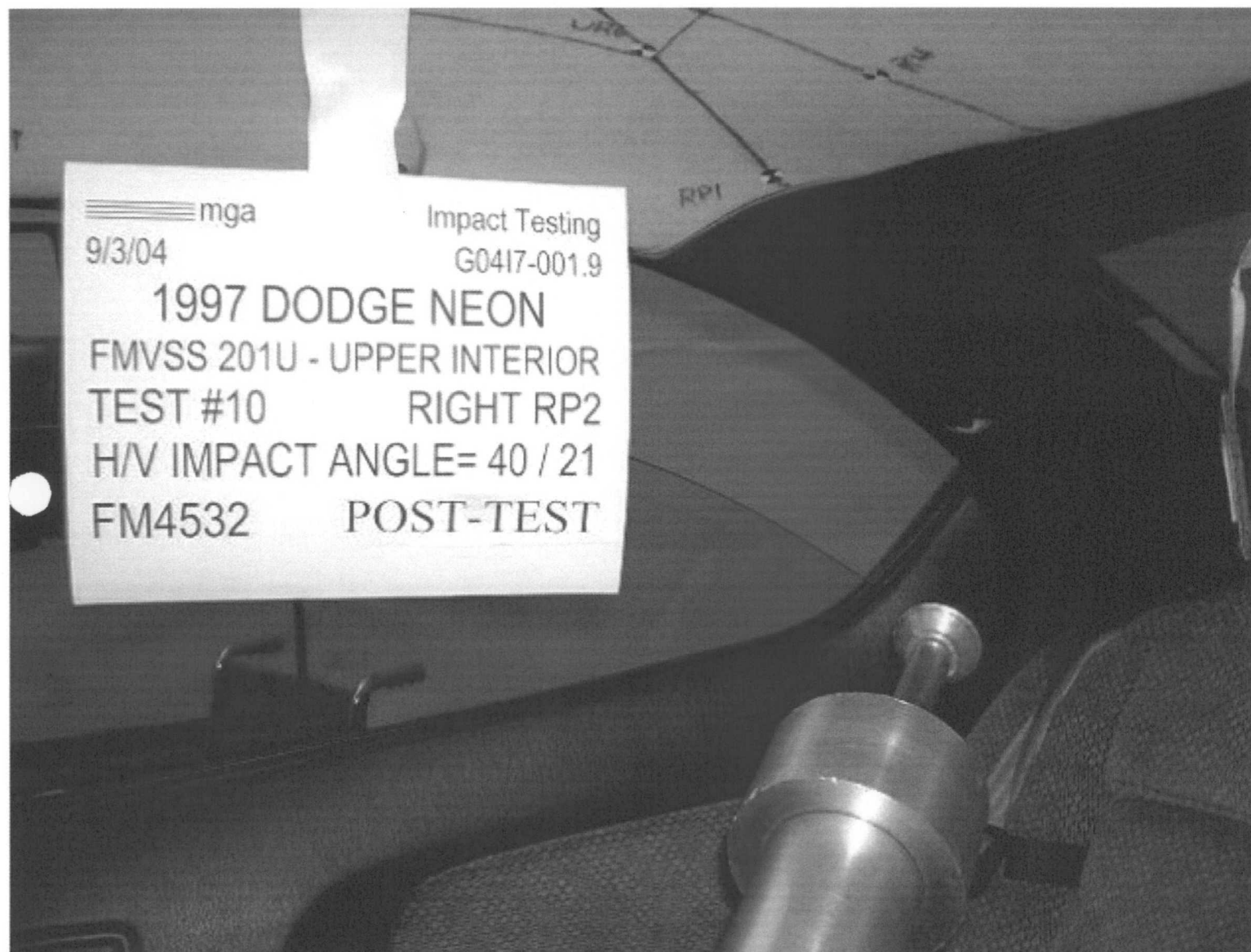
Model Year: 1997  
Target: BP4  
Vehicle Side: Right  
Horz/Vert Angle: 157/-6

Test Date: 9/3/04

HIC(d) = 515, HIC = 462, Delta T = 5.8 msec







mga

9/3/04

Impact Testing

G04I7-001.9

1997 DODGE NEON

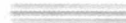
FMVSS 201U - UPPER INTERIOR

TEST #10 RIGHT RP2

H/V IMPACT ANGLE= 40 / 21

FM4532 POST-TEST



 mga

9/3/04

Impact Testing

G0417-001.9

1997 DODGE NEON

FMVSS 201U - UPPER INTERIOR

TEST #10      RIGHT RP2

H/V IMPACT ANGLE= 40 / 21

FM4532      POST-TEST

MICHIGAN OPERATIONS  
 DATE: 2/8/01  
 SUPERCEDES: MGATP207210.2

DOC. NO.: MGATP207210.3  
 REVISION NO.: 2  
 PAGE 1 OF 1

### SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G0417-001.9 VEHICLE YR/MAKE/MODEL: NEON 1997

#### GENERAL TEST PARAMETERS:

Test Number: #10

Target (Vehicle Side): RP2 Right

Temperature: 22C

MGA Test Reference No.: FM4532

Humidity: 65%

Approach Horizontal Angles: 40°

Time of Test: 11:40 AM

Approach Vertical Angles: 21°

FMH Serial No: 035

#### TEST RESULTS:

| HIC(d) | HIC | $\Delta t$ (msec) | Velocity (kph) | Impact location on FMH (mm) |                  |
|--------|-----|-------------------|----------------|-----------------------------|------------------|
|        |     |                   |                | Above Pt. O                 | Left/Right Pt. O |
| 853    | 910 | 4.2               | 23.6           | 35                          | 8 L              |

#### INSTRUMENTAION INFORMATION: (all accelerometers are Endevco 7264-2000)

| Axis | Channel | Serial No. | DLR Value | $\Delta V$ Pre-Test | $\Delta V$ Post-Test |
|------|---------|------------|-----------|---------------------|----------------------|
| X    | 5       | J35924     | -92.4     | 1.67                | 1.67                 |
| Y    | 6       | J35919     | 93.8      | 1.54                | 1.54                 |
| Z    | 7       | J21969     | 88.5      | 1.58                | 1.58                 |

#### REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

No visible damage

Recorded By: [Signature] Approved By\*: [Signature] Date: 4-3-04

\*Only necessary for NHTSA (Government) Compliance testing.

FMH  
G04I7-001.9

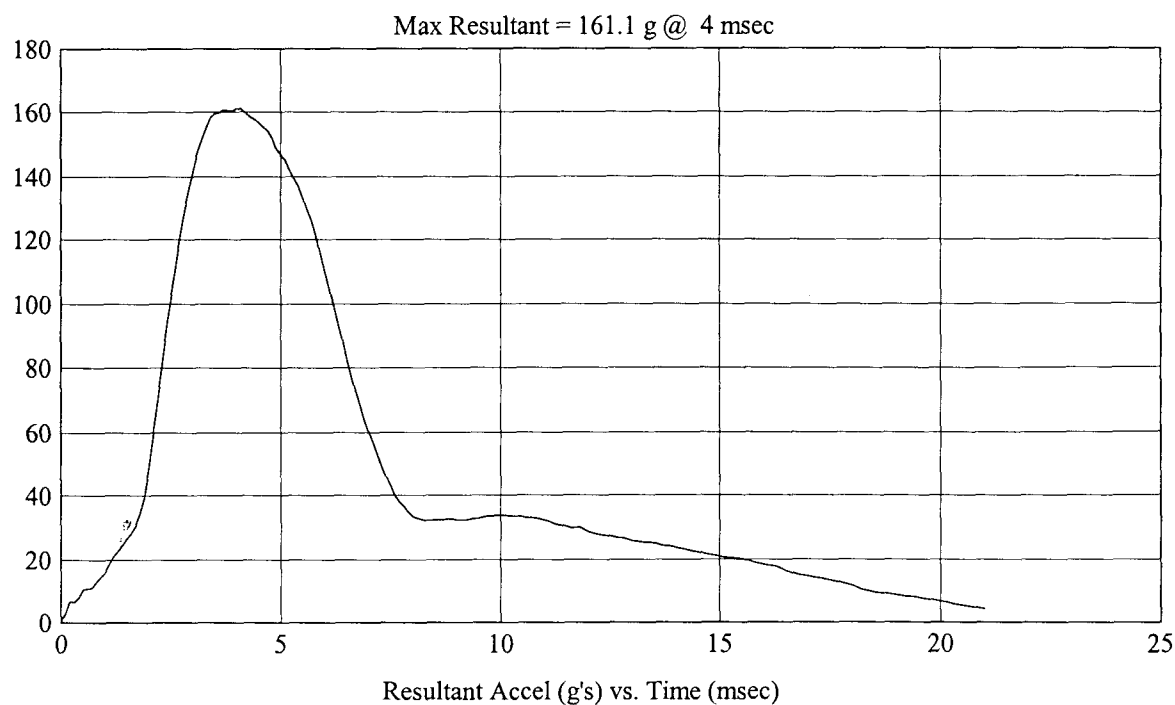
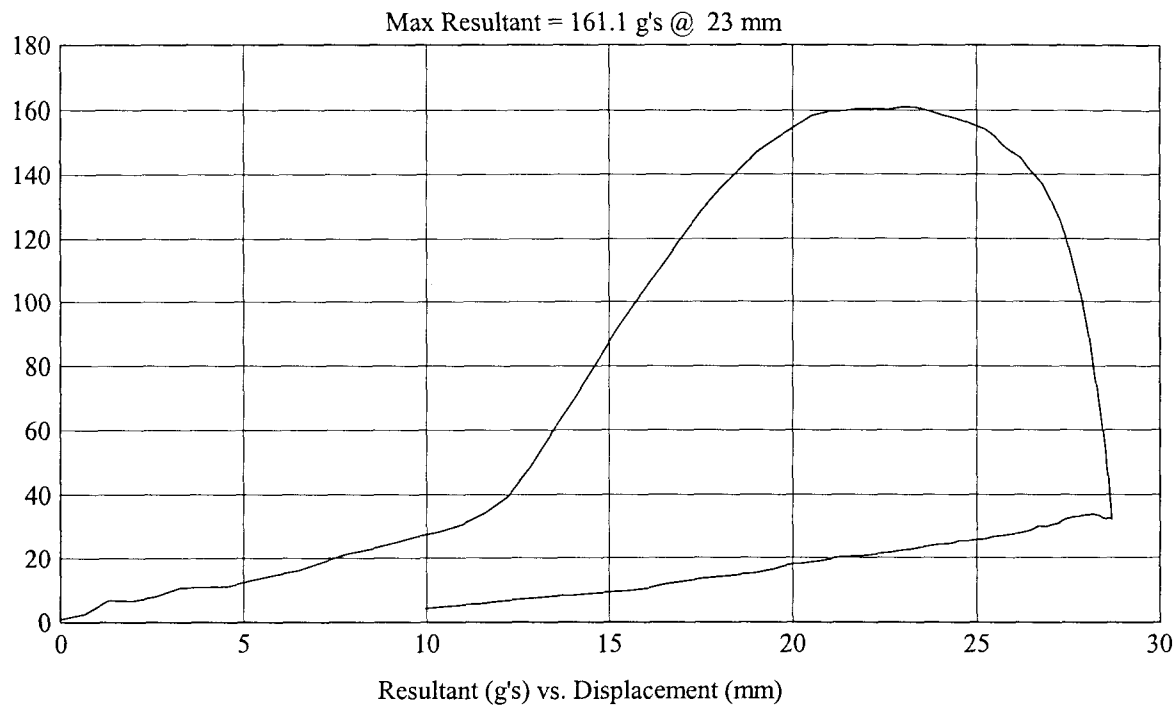
Customer: DODGE  
Test # 10  
FM4532  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: RP2  
Vehicle Side: Right  
Horz/Vert Angle: 40/21

Test Date: 9/3/04

HIC(d) = 853, HIC = 910, Delta T = 4.2 msec



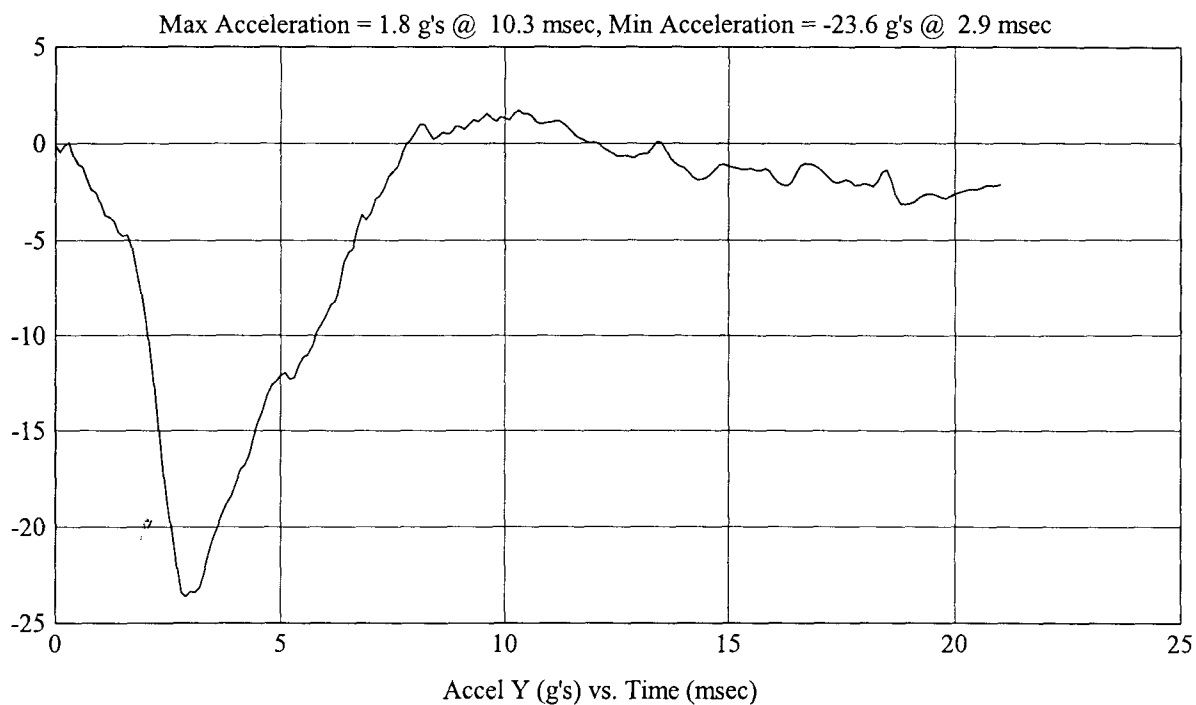
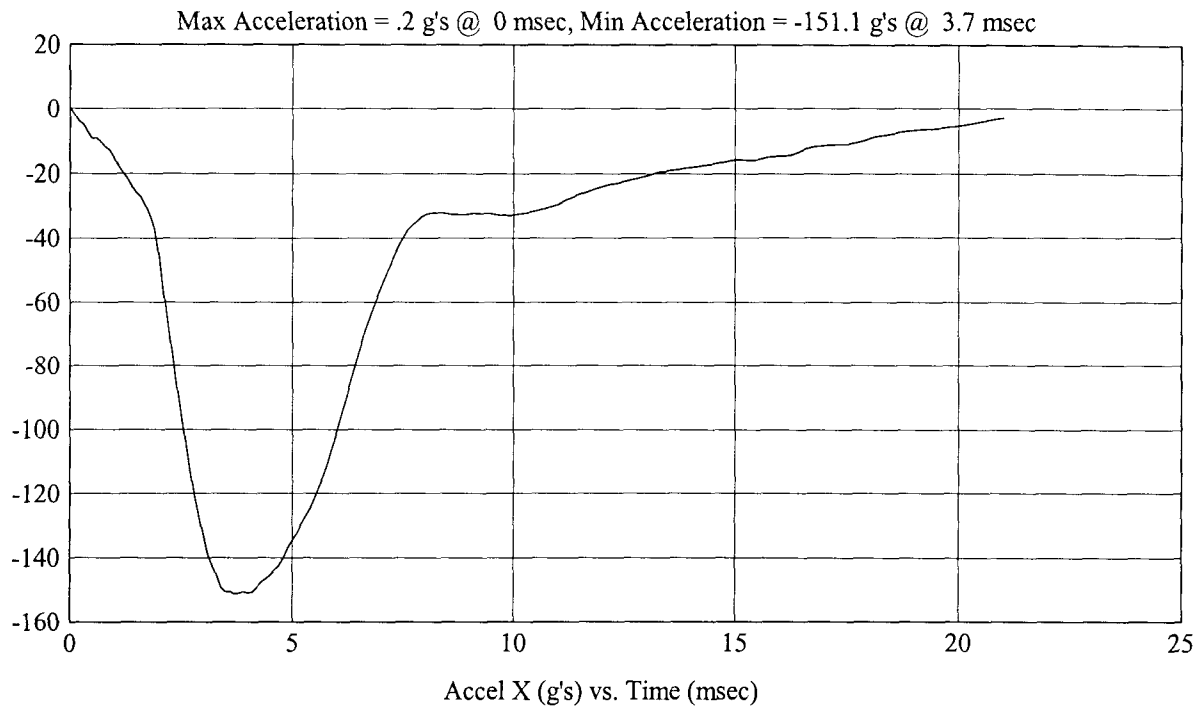
FMH  
G04I7-001.9

Customer: DODGE  
Test # 10  
FM4532  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: RP2  
Vehicle Side: Right  
Horz/Vert Angle: 40/21

Test Date: 9/3/04  
HIC(d) = 853, HIC = 910, Delta T = 4.2 msec



FMH  
G04I7-001.9

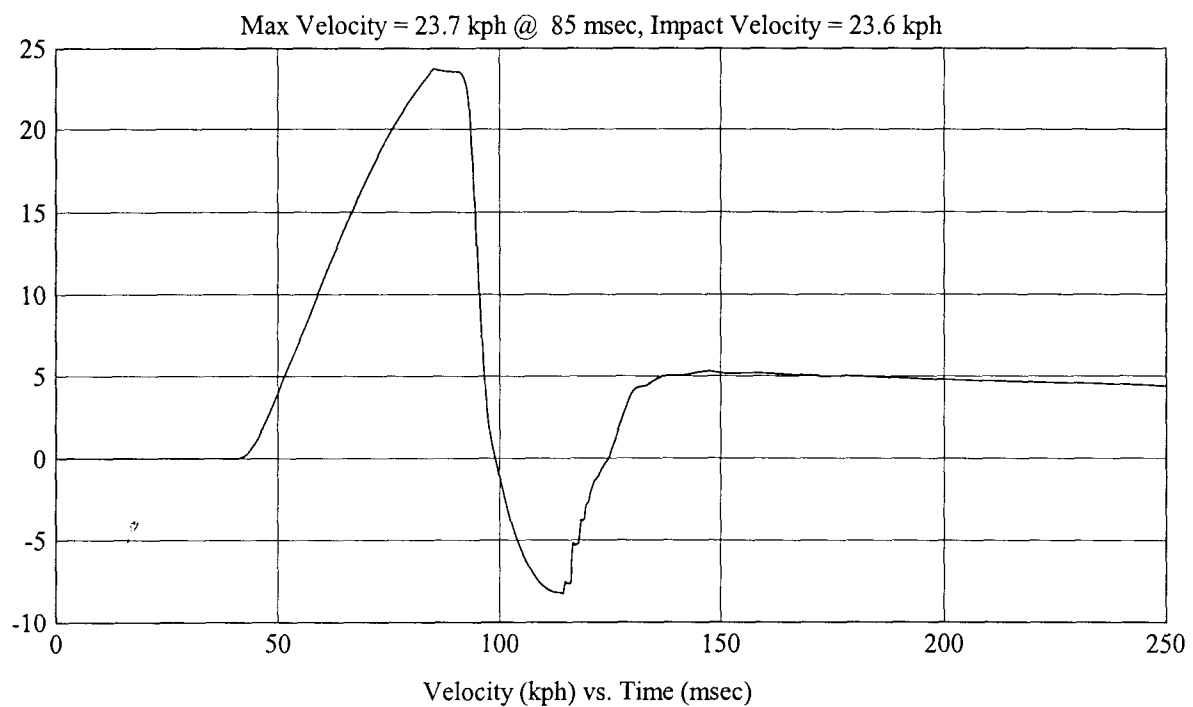
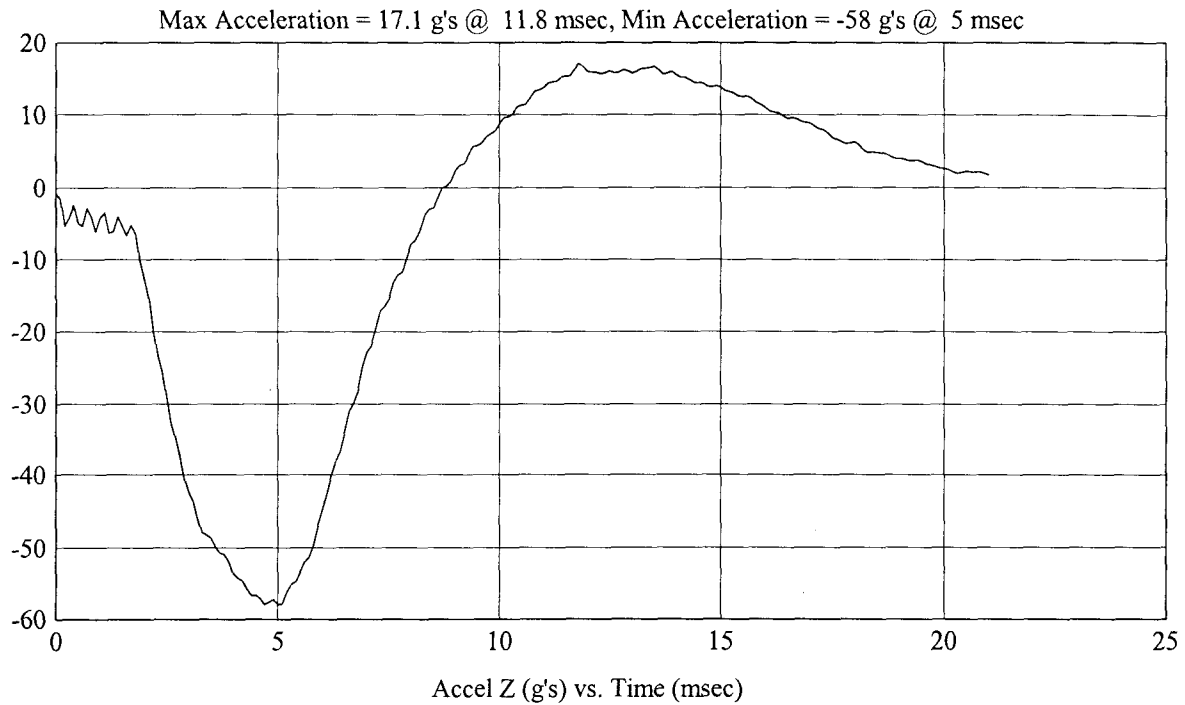
Customer: DODGE  
Test # 10  
FM4532  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: RP2  
Vehicle Side: Right  
Horz/Vert Angle: 40/21

Test Date: 9/3/04

HIC(d) = 853, HIC = 910, Delta T = 4.2 msec





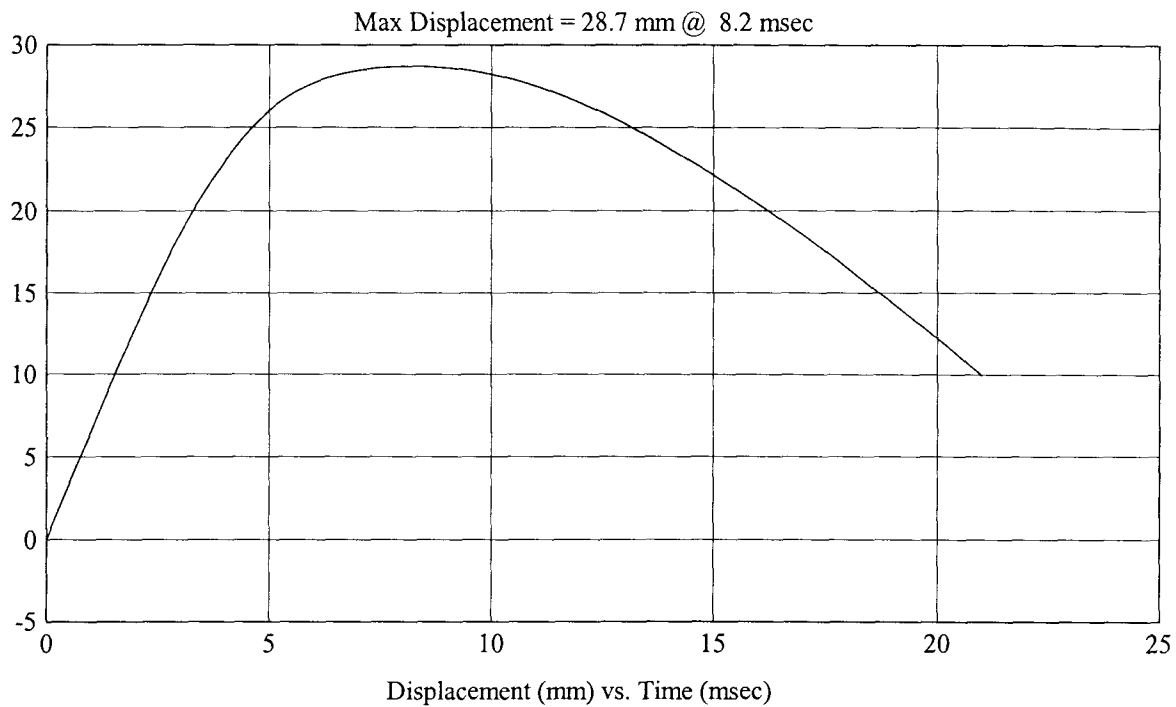
FMH  
G04I7-001.9

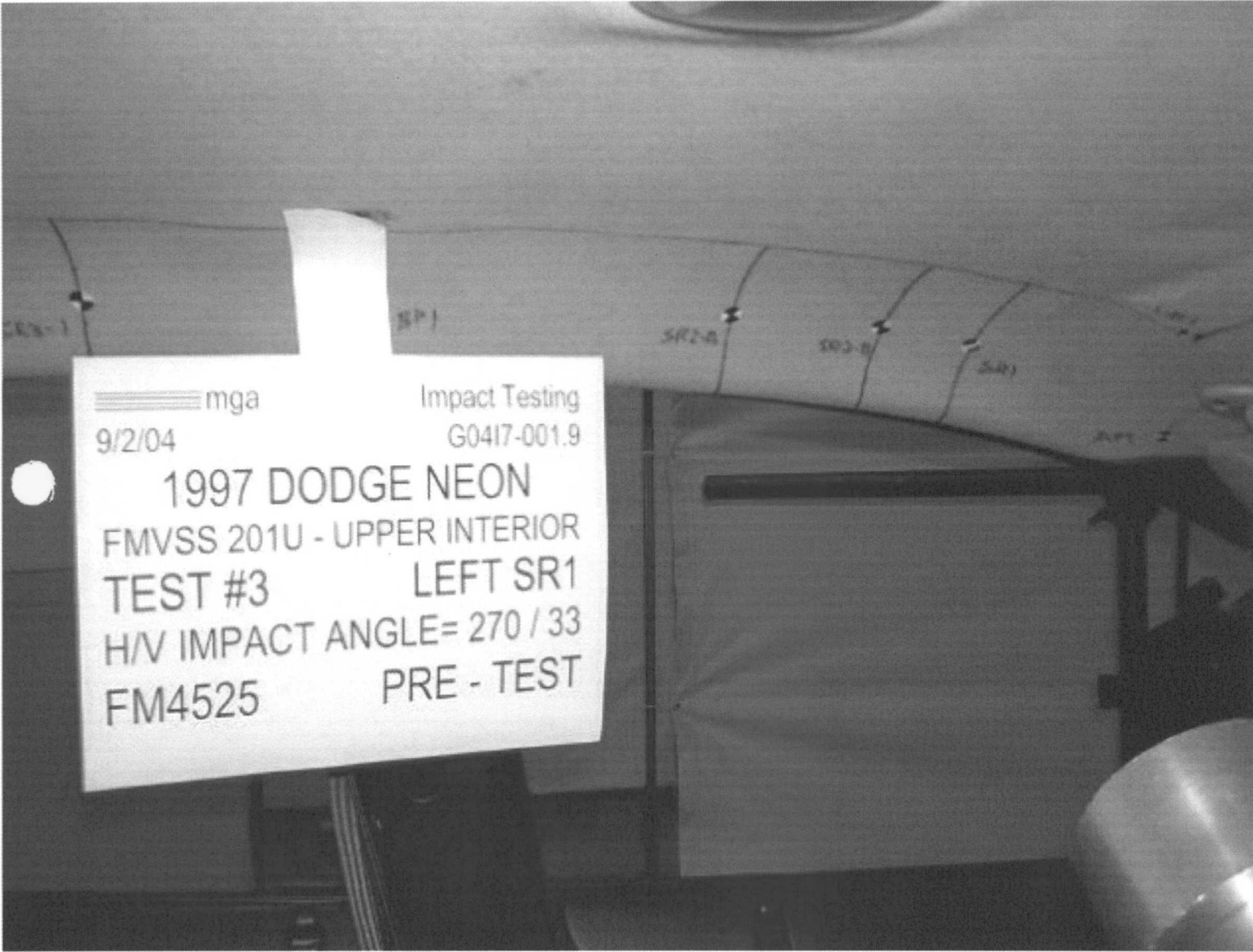
Customer: DODGE  
Test # 10  
FM4532  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: RP2  
Vehicle Side: Right  
Horz/Vert Angle: 40/21

Test Date: 9/3/04  
HIC(d) = 853, HIC = 910, Delta T = 4.2 msec





mga

9/2/04

Impact Testing

G0417-001.9

1997 DODGE NEON

FMVSS 201U - UPPER INTERIOR

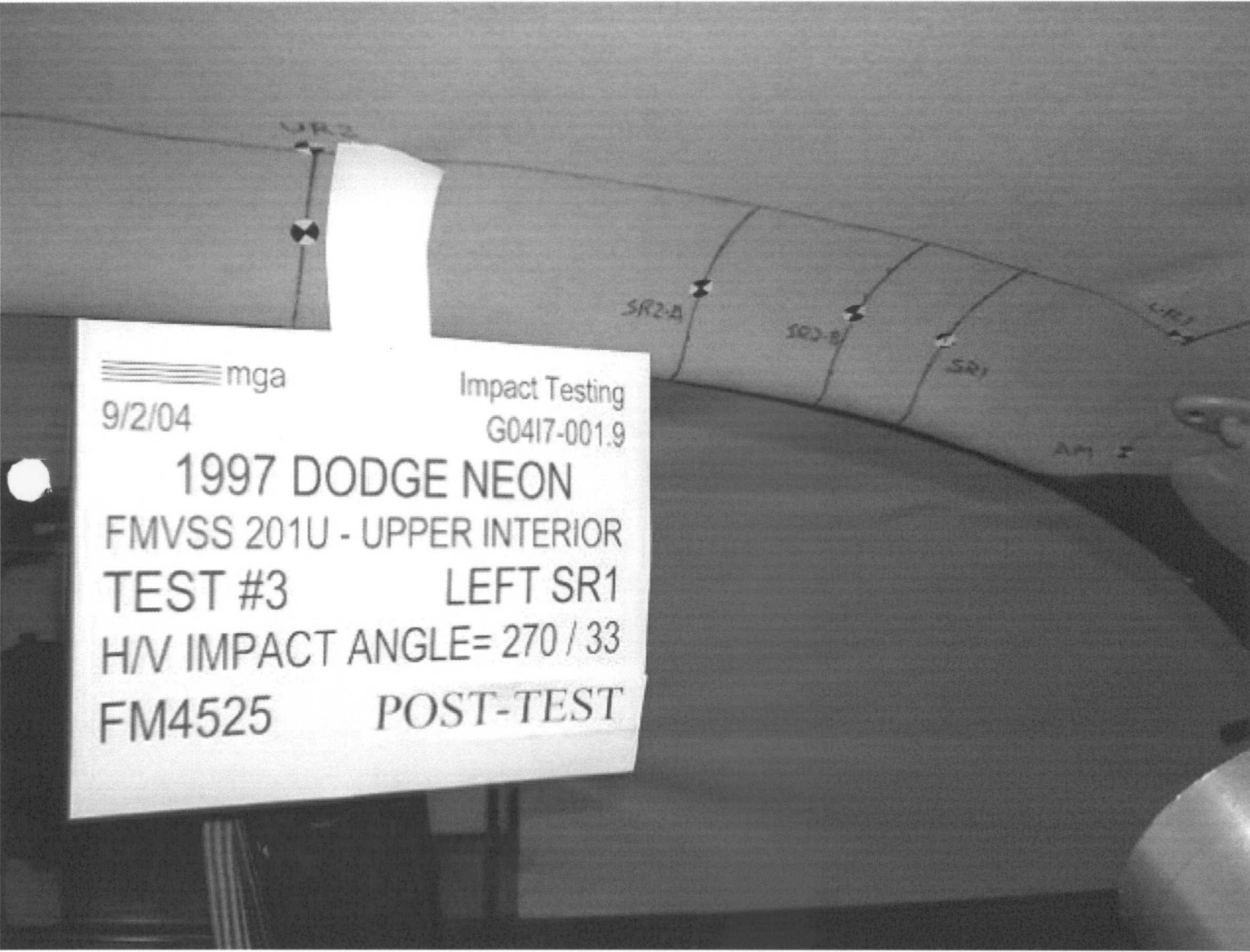
TEST #3

LEFT SR1

H/V IMPACT ANGLE= 270 / 33

FM4525

PRE - TEST



mga

9/2/04

Impact Testing  
G0417-001.9

1997 DODGE NEON

FMVSS 201U - UPPER INTERIOR

TEST #3 LEFT SR1

H/V IMPACT ANGLE= 270 / 33

FM4525 POST-TEST



==== mga

Impact Testing

9/2/04

G04I7-001.9

1997 DODGE NEON

FMVSS 201U - UPPER INTERIOR

TEST #3 LEFT SR1

H/V IMPACT ANGLE= 270 / 33

FM4525 POST-TEST

MICHIGAN OPERATIONS  
 DATE: 2/8/01  
 SUPERCEDES: MGATP207210.2

DOC. NO.: MGATP207210.3  
 REVISION NO.: 2  
 PAGE 1 OF 1

### SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G0417-001.9

VEHICLE YR/MAKE/MODEL: NEON 1997

#### GENERAL TEST PARAMETERS:

Test Number: #3

Target (Vehicle Side): SR1 Left

Temperature: 22C

MGA Test Reference No.: FM4525

Humidity: 53%

Approach Horizontal Angles: 270°

Time of Test: 4:30 PM

Approach Vertical Angles: 33°

FMH Serial No: 038

#### TEST RESULTS:

| HIC(d) | HIC  | $\Delta t$ (msec) | Velocity (kph) | Impact location on FMH (mm) |                  |
|--------|------|-------------------|----------------|-----------------------------|------------------|
|        |      |                   |                | Above Pt. O                 | Left/Right Pt. O |
| 1085   | 1217 | 3.7               | 23.5           | 32                          | 9 R              |

#### INSTRUMENTAION INFORMATION: (all accelerometers are Endevco 7264-2000)

| Axis | Channel | Serial No. | DLR Value | $\Delta V$ Pre-Test | $\Delta V$ Post-Test |
|------|---------|------------|-----------|---------------------|----------------------|
| X    | 5       | J36197     | -108      | 1.67                | 1.67                 |
| Y    | 6       | J36193     | 101.4     | 1.54                | 1.54                 |
| Z    | 7       | J36353     | 96.8      | 1.58                | 1.51                 |

#### REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

No visible damage

Recorded By: sm j m Approved By\*: Helen A. Kalish Date: 4-2-01

\*Only necessary for NHTSA (Government) Compliance testing.

FMH  
G04I7-001.9

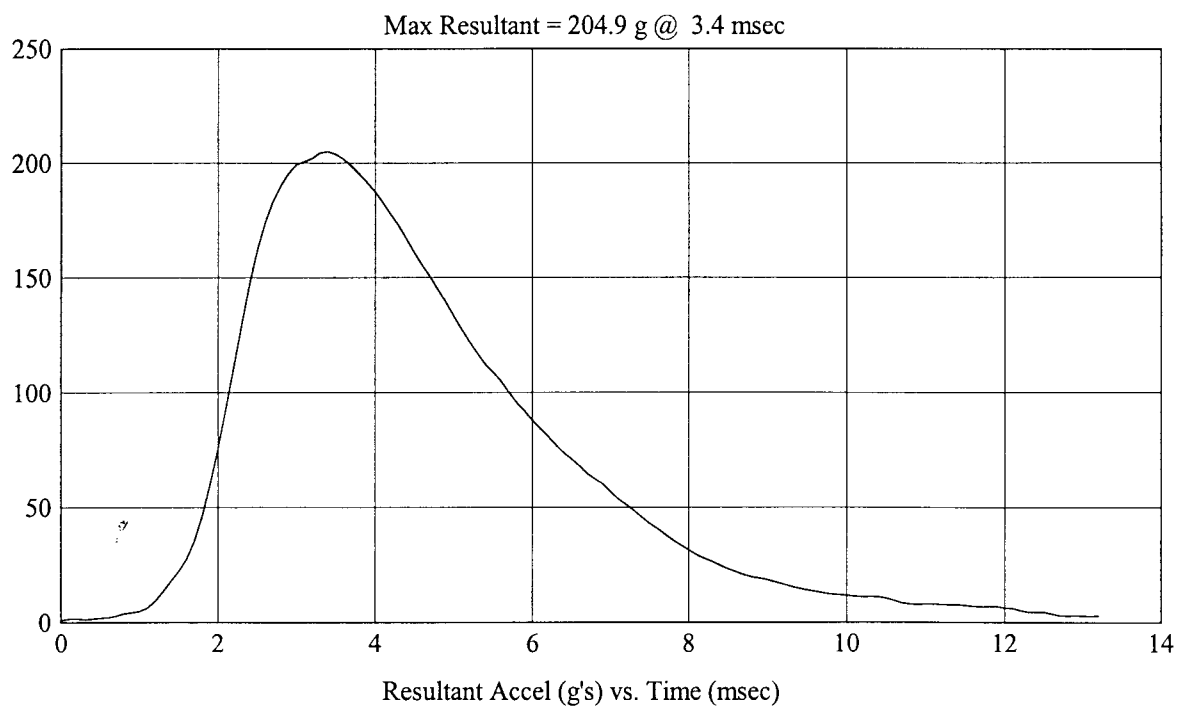
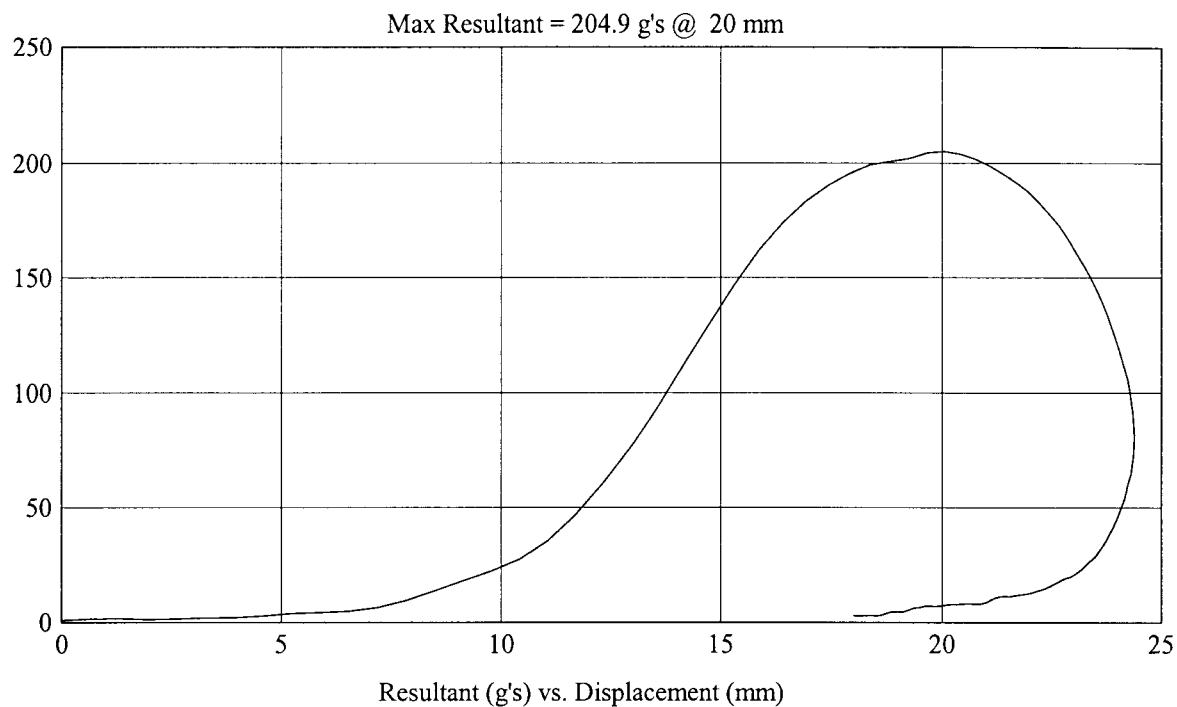
Customer: DODGE  
Test # 3  
FM4525  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: SR1  
Vehicle Side: Left  
Horz/Vert Angle: 270/33

Test Date: 9/2/04

HIC(d) = 1085, HIC = 1217, Delta T = 3.7 msec



FMH  
G04I7-001.9

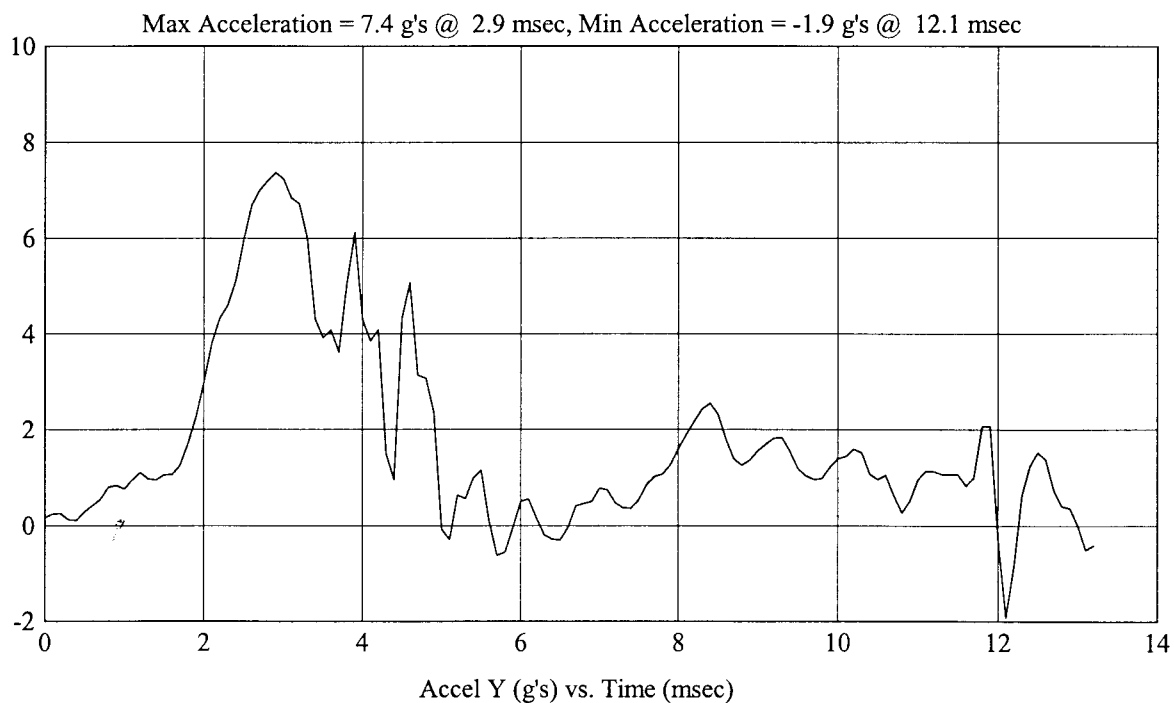
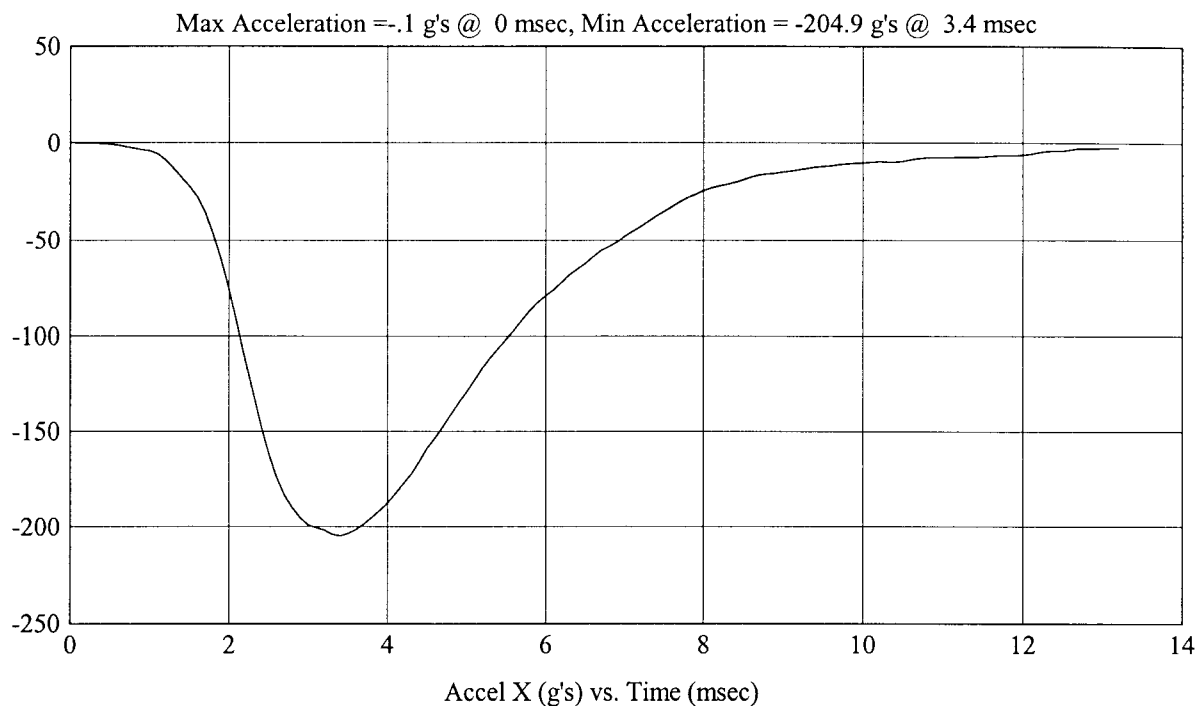
Customer: DODGE  
Test # 3  
FM4525  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: SR1  
Vehicle Side: Left  
Horz/Vert Angle: 270/33

Test Date: 9/2/04

HIC(d) = 1085, HIC = 1217, Delta T = 3.7 msec



FMH  
G04I7-001.9

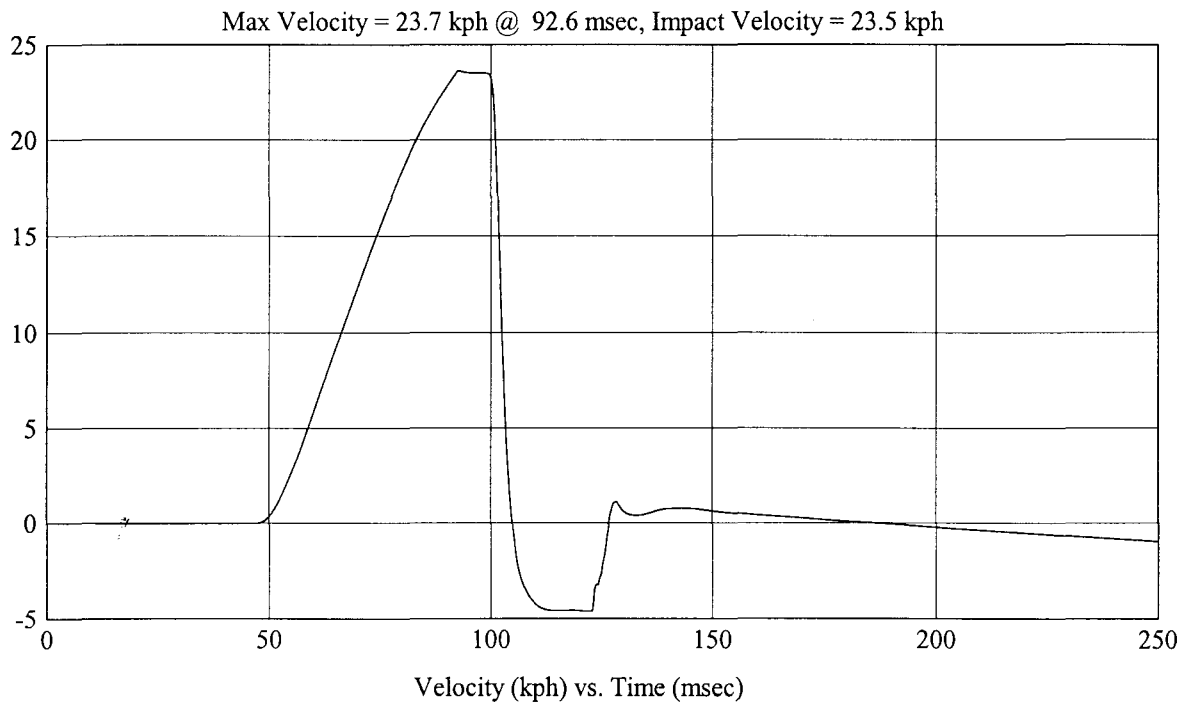
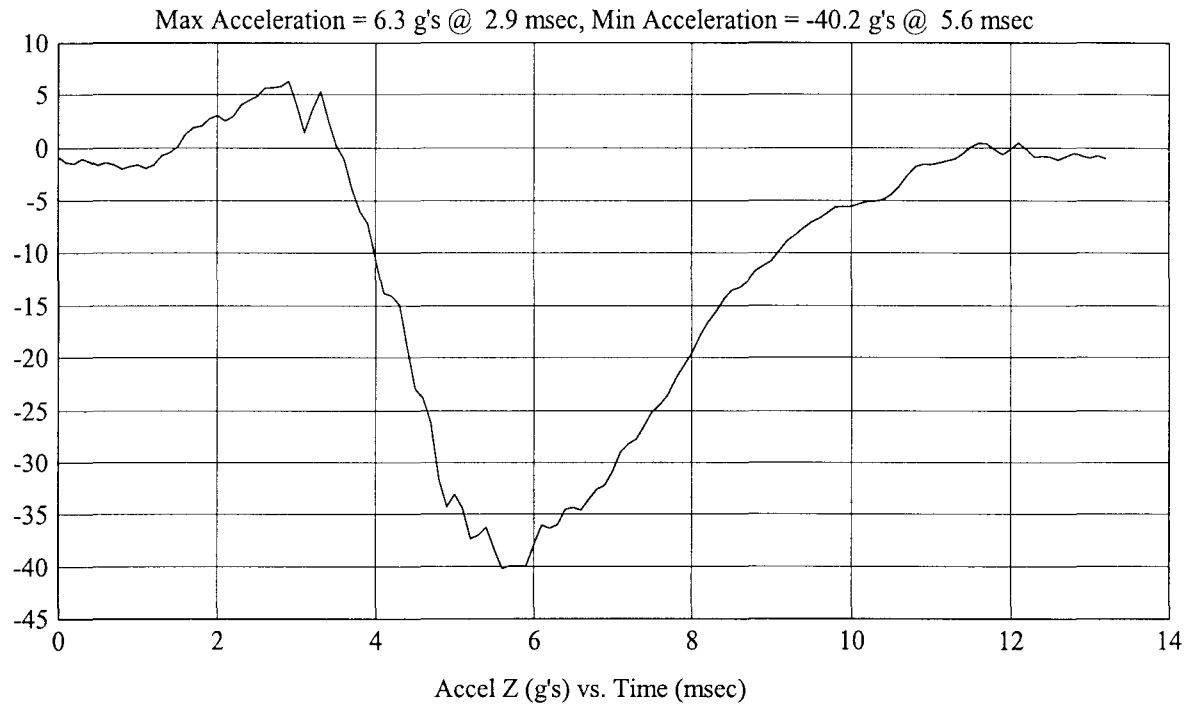
Customer: DODGE  
Test # 3  
FM4525  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: SR1  
Vehicle Side: Left  
Horz/Vert Angle: 270/33

Test Date: 9/2/04

HIC(d) = 1085, HIC = 1217, Delta T = 3.7 msec





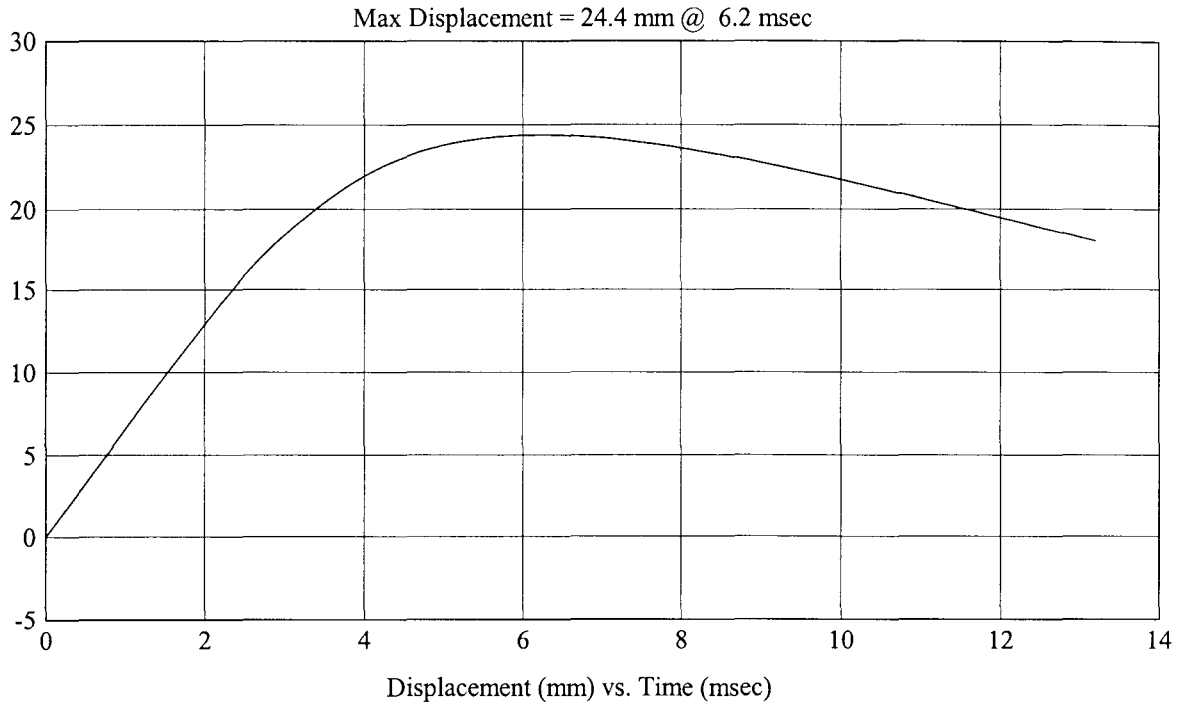
FMH  
G04I7-001.9

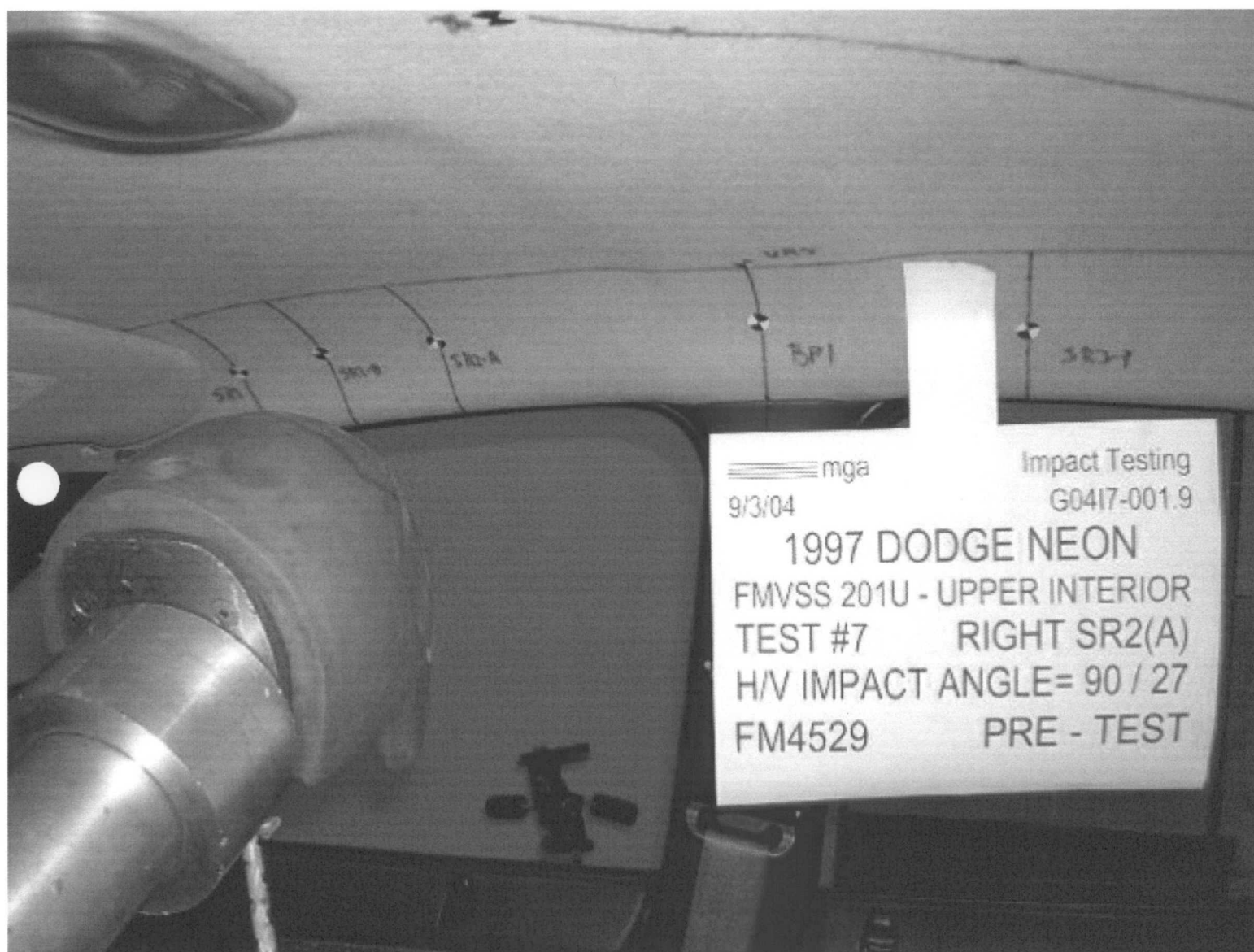
Customer: DODGE  
Test # 3  
FM4525  
Additional Desc: N/A

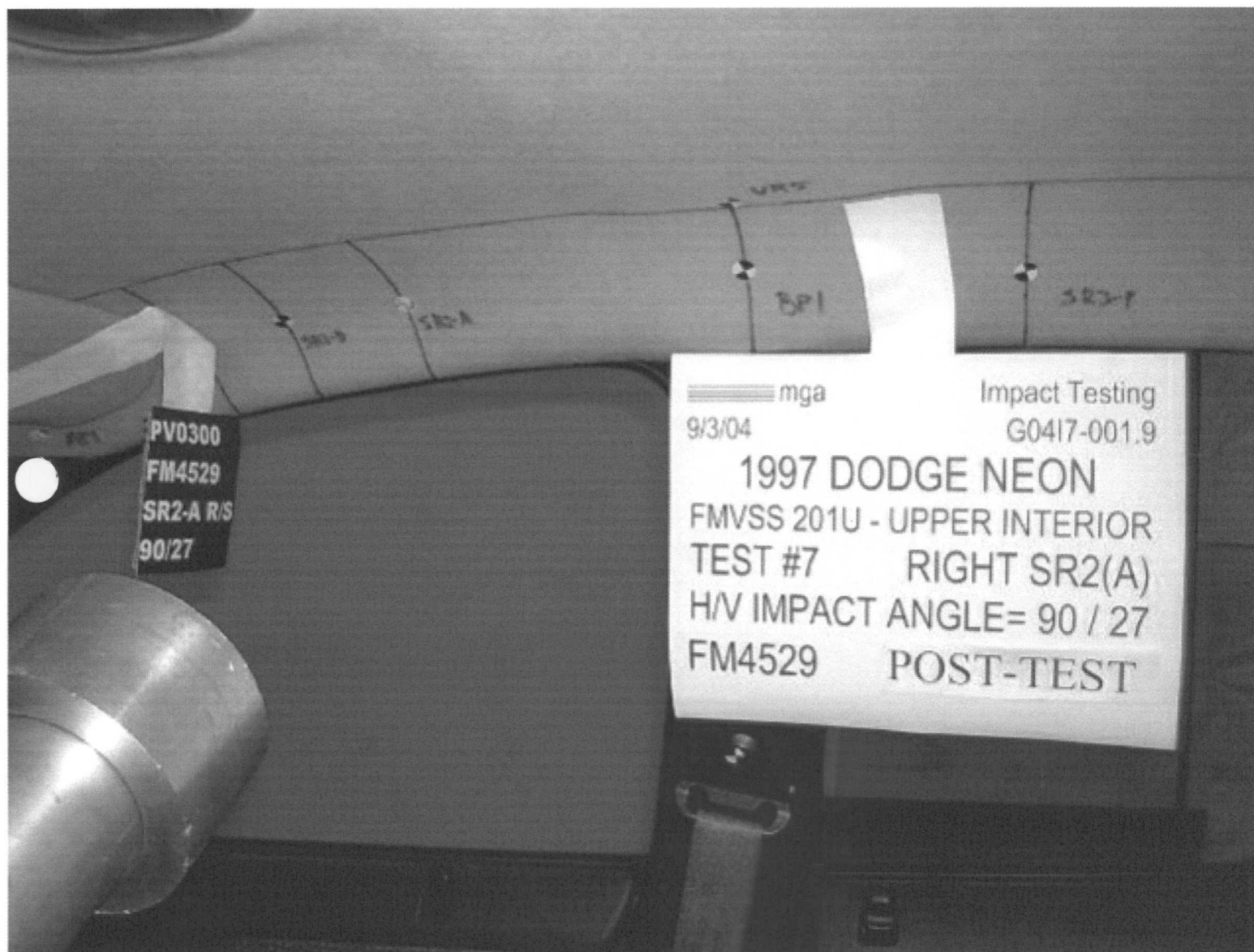
Vehicle Program : NEON

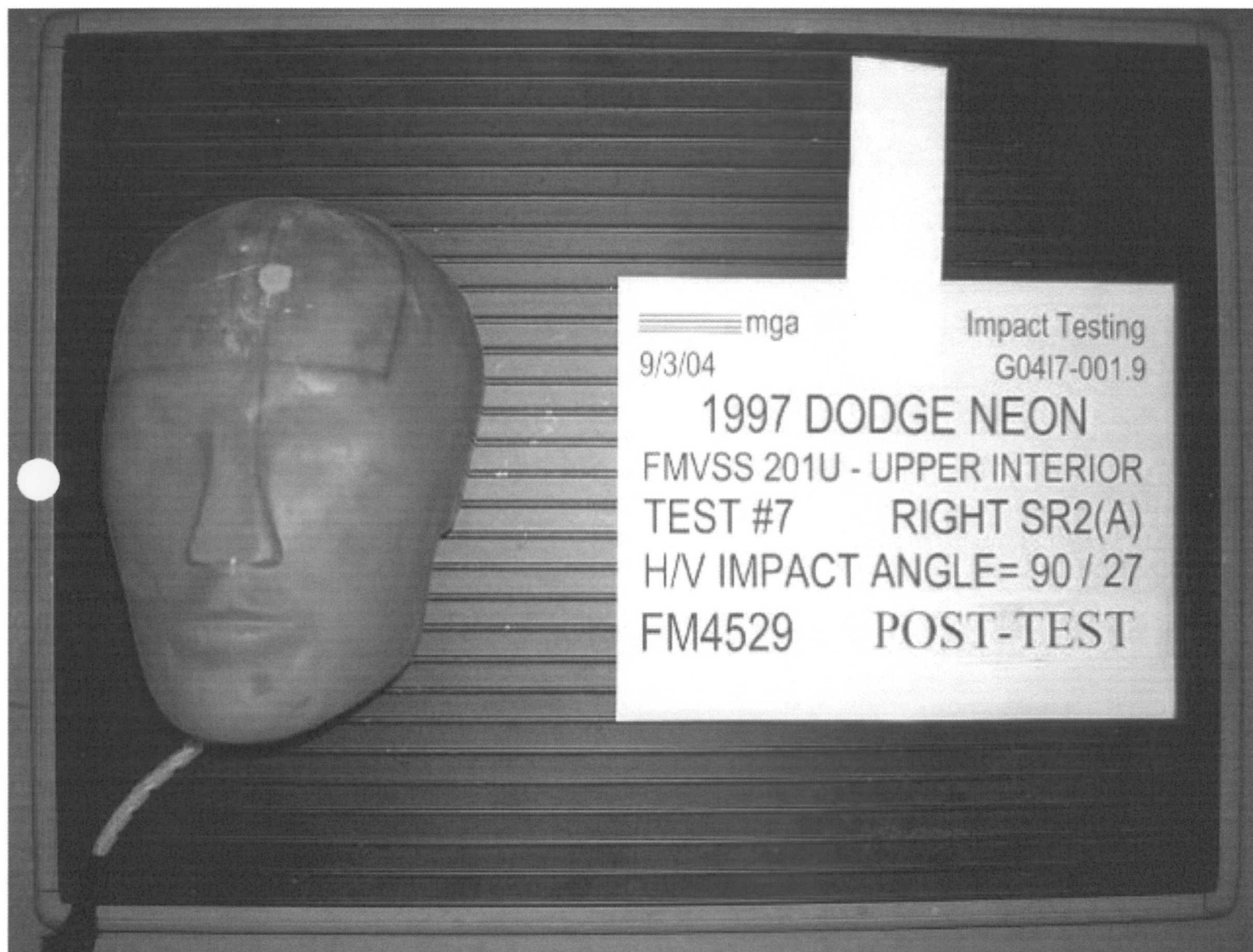
Test Date: 9/2/04  
HIC(d) = 1085, HIC = 1217, Delta T = 3.7 msec

Model Year: 1997  
Target: SR1  
Vehicle Side: Left  
Horz/Vert Angle: 270/33









mga

Impact Testing

9/3/04

G04I7-001.9

1997 DODGE NEON

FMVSS 201U - UPPER INTERIOR

TEST #7 RIGHT SR2(A)

H/V IMPACT ANGLE= 90 / 27

FM4529 POST-TEST

MICHIGAN OPERATIONS  
 DATE: 2/8/01  
 SUPERCEDES: MGATP207210.2

DOC. NO.: MGATP207210.3  
 REVISION NO.: 2  
 PAGE 1 OF 1

### SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G0417-001.9      VEHICLE YR/MAKE/MODEL: NEON 1997

#### GENERAL TEST PARAMETERS:

Test Number: #7

Target (Vehicle Side): SR2(a) Right

Temperature: 22C

MGA Test Reference No.: FM4529

Humidity: 62%

Approach Horizontal Angles: 90°

Time of Test: 8:30 AM

Approach Vertical Angles: 27°

FMH Serial No: 035

#### TEST RESULTS:

| HIC(d) | HIC | $\Delta t$ (msec) | Velocity (kph) | Impact location on FMH (mm) |                  |
|--------|-----|-------------------|----------------|-----------------------------|------------------|
|        |     |                   |                | Above Pt. O                 | Left/Right Pt. O |
| 897    | 969 | 4.3               | 23.1           | 35                          | 15 L             |

#### INSTRUMENTAION INFORMATION: (all accelerometers are Endevco 7264-2000)

| Axis | Channel | Serial No. | DLR Value | $\Delta V$ Pre-Test | $\Delta V$ Post-Test |
|------|---------|------------|-----------|---------------------|----------------------|
| X    | 5       | J35924     | -92.4     | 1.67                | 1.67                 |
| Y    | 6       | J35919     | 93.8      | 1.54                | 1.54                 |
| Z    | 7       | J21969     | 88.5      | 1.58                | 1.58                 |

#### REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

No visible damage

Recorded By: *[Signature]* Approved By\*: *Helen Q. Kales* Date: 9-3-04

\*Only necessary for NHTSA (Government) Compliance testing.

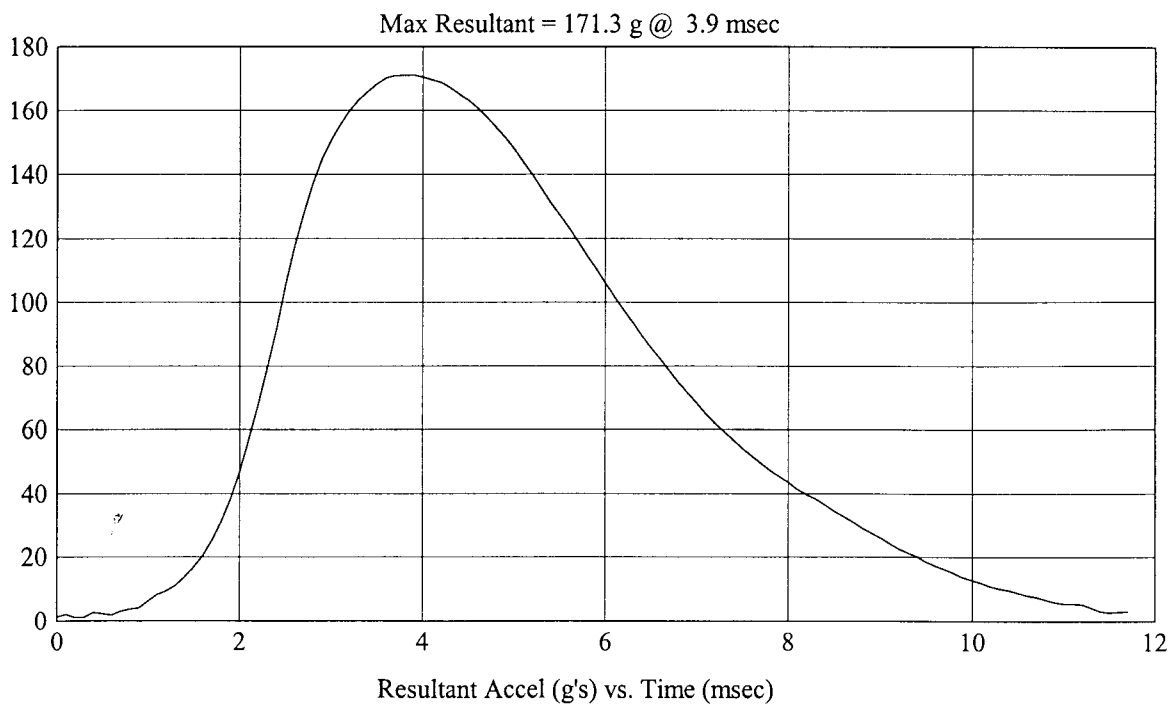
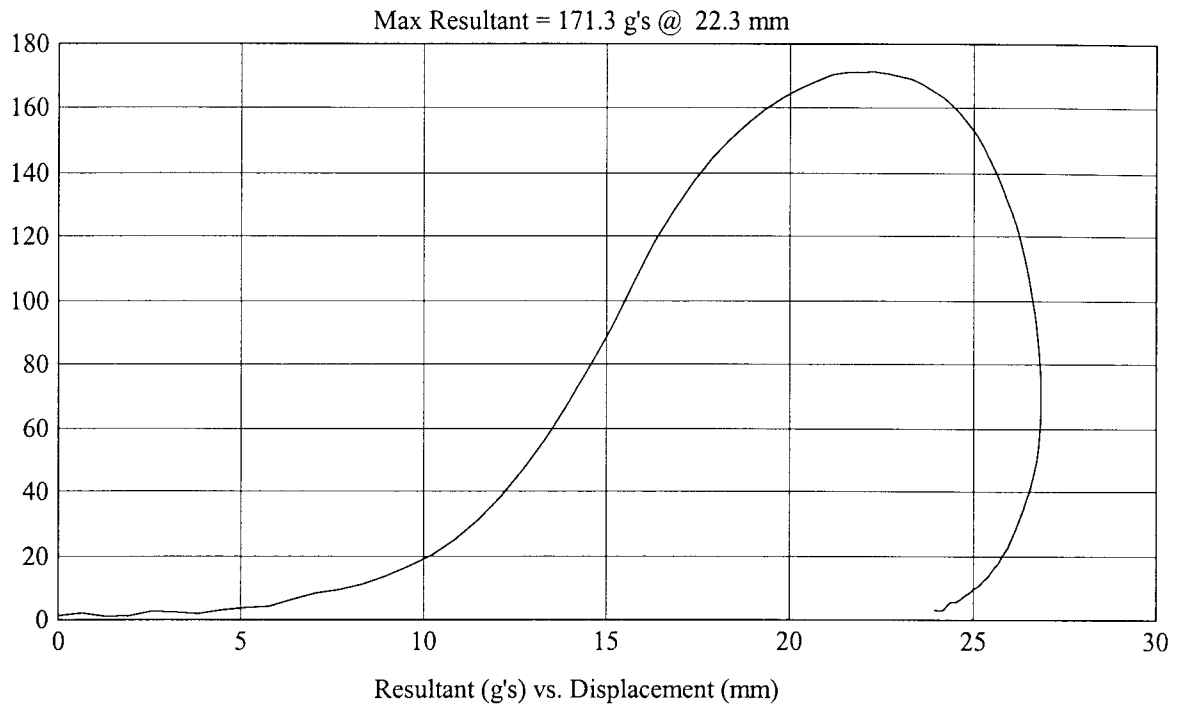
FMH  
G04I7-001.9

Customer: DODGE  
Test # 7  
FM4529  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: SR2(a)  
Vehicle Side: Right  
Horz/Vert Angle: 90/27

Test Date: 9/3/04  
HIC(d) = 897, HIC = 969, Delta T = 4.3 msec



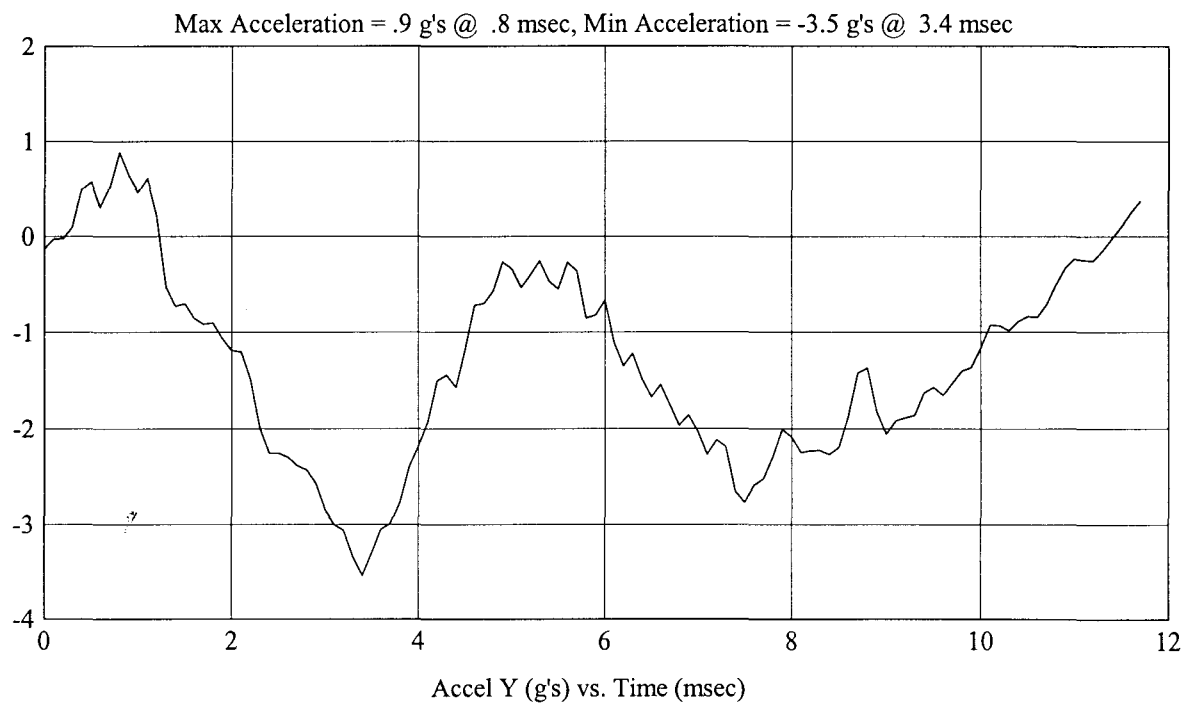
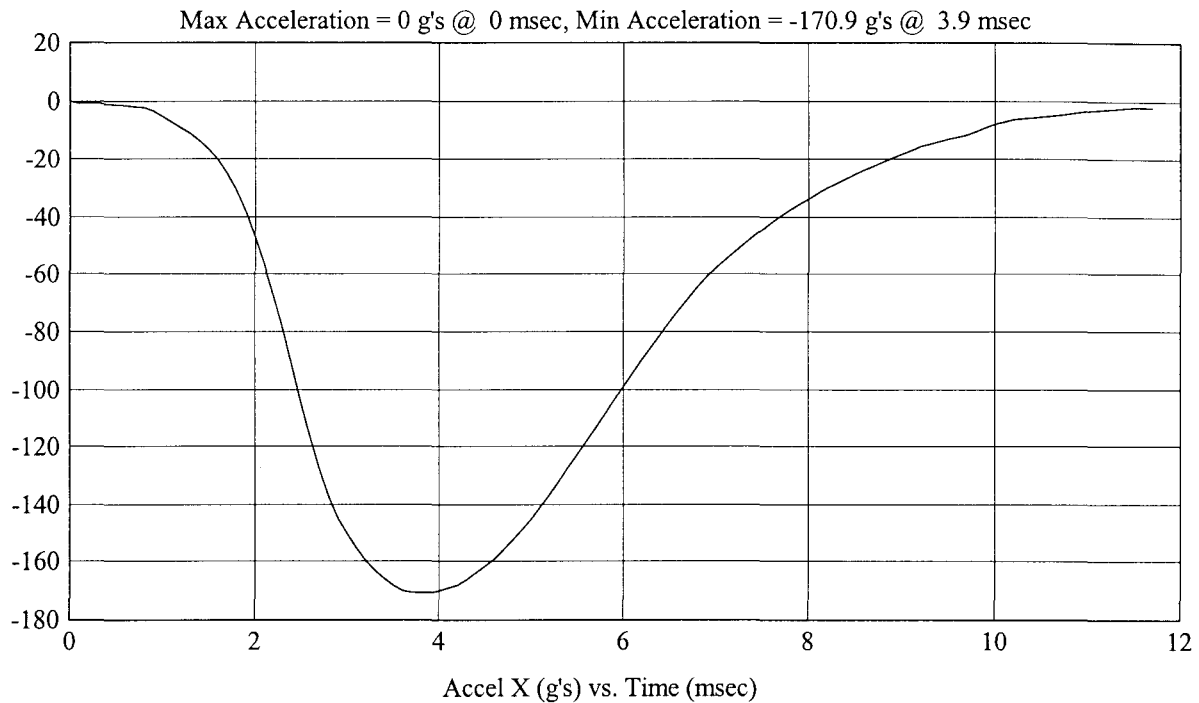
FMH  
G04I7-001.9

Customer: DODGE  
Test # 7  
FM4529  
Additional Desc: N/A

Vehicle Program : NEON

Test Date: 9/3/04  
HIC(d) = 897, HIC = 969, Delta T = 4.3 msec

Model Year: 1997  
Target: SR2(a)  
Vehicle Side: Right  
Horz/Vert Angle: 90/27



FMH  
G04I7-001.9

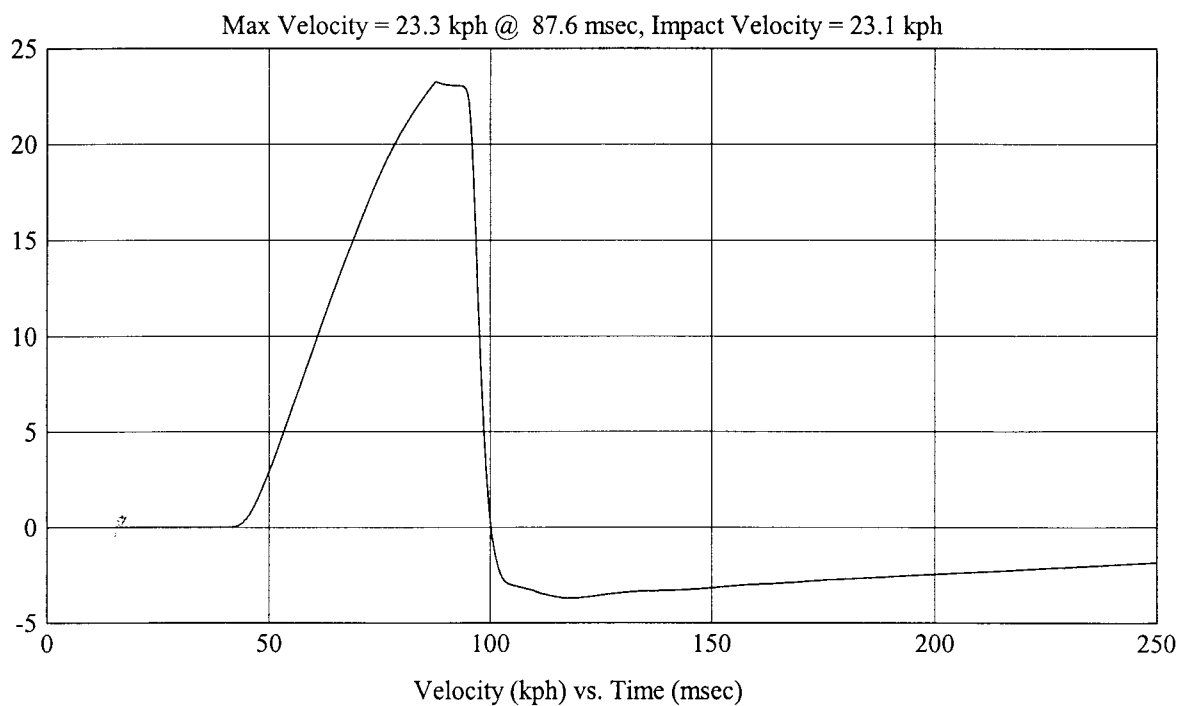
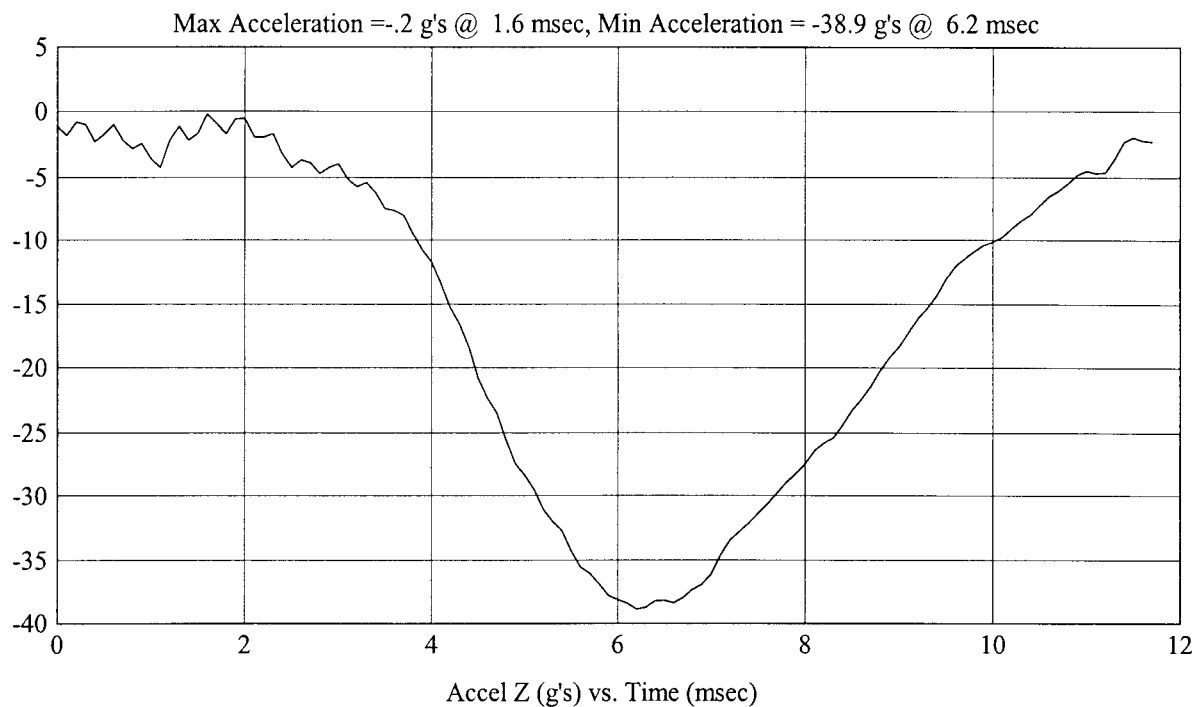
Customer: DODGE  
Test # 7  
FM4529  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: SR2(a)  
Vehicle Side: Right  
Horz/Vert Angle: 90/27

Test Date: 9/3/04

HIC(d) = 897, HIC = 969, Delta T = 4.3 msec





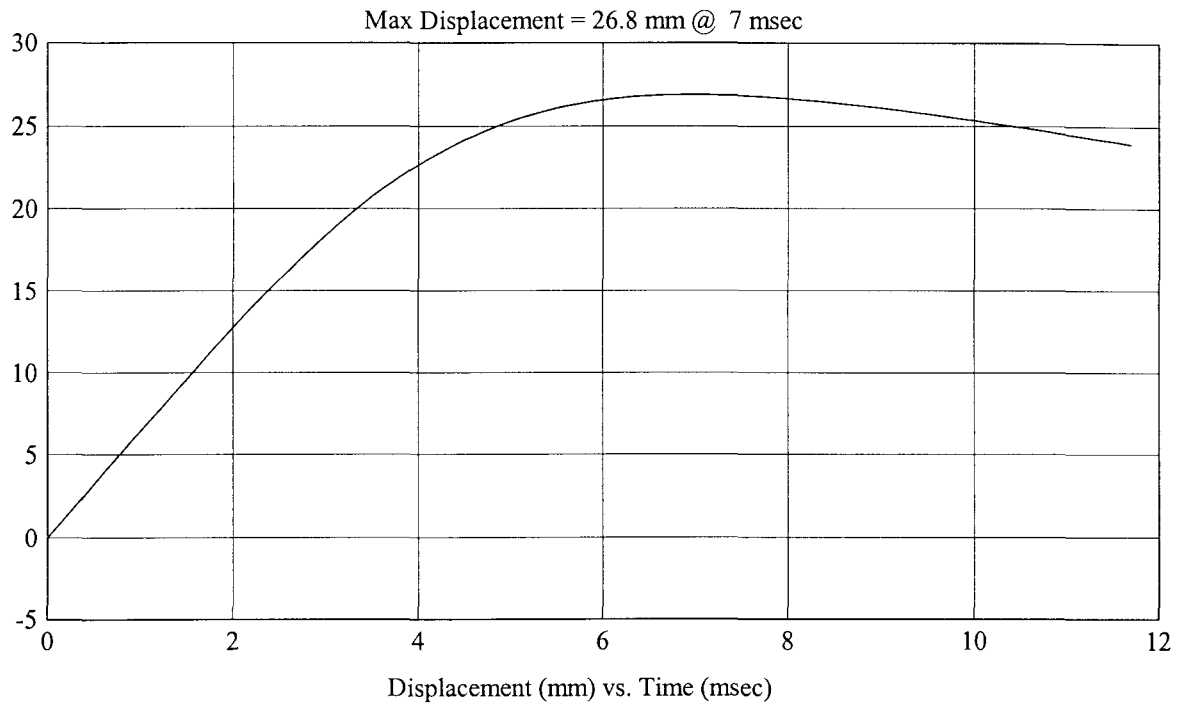
FMH  
G04I7-001.9

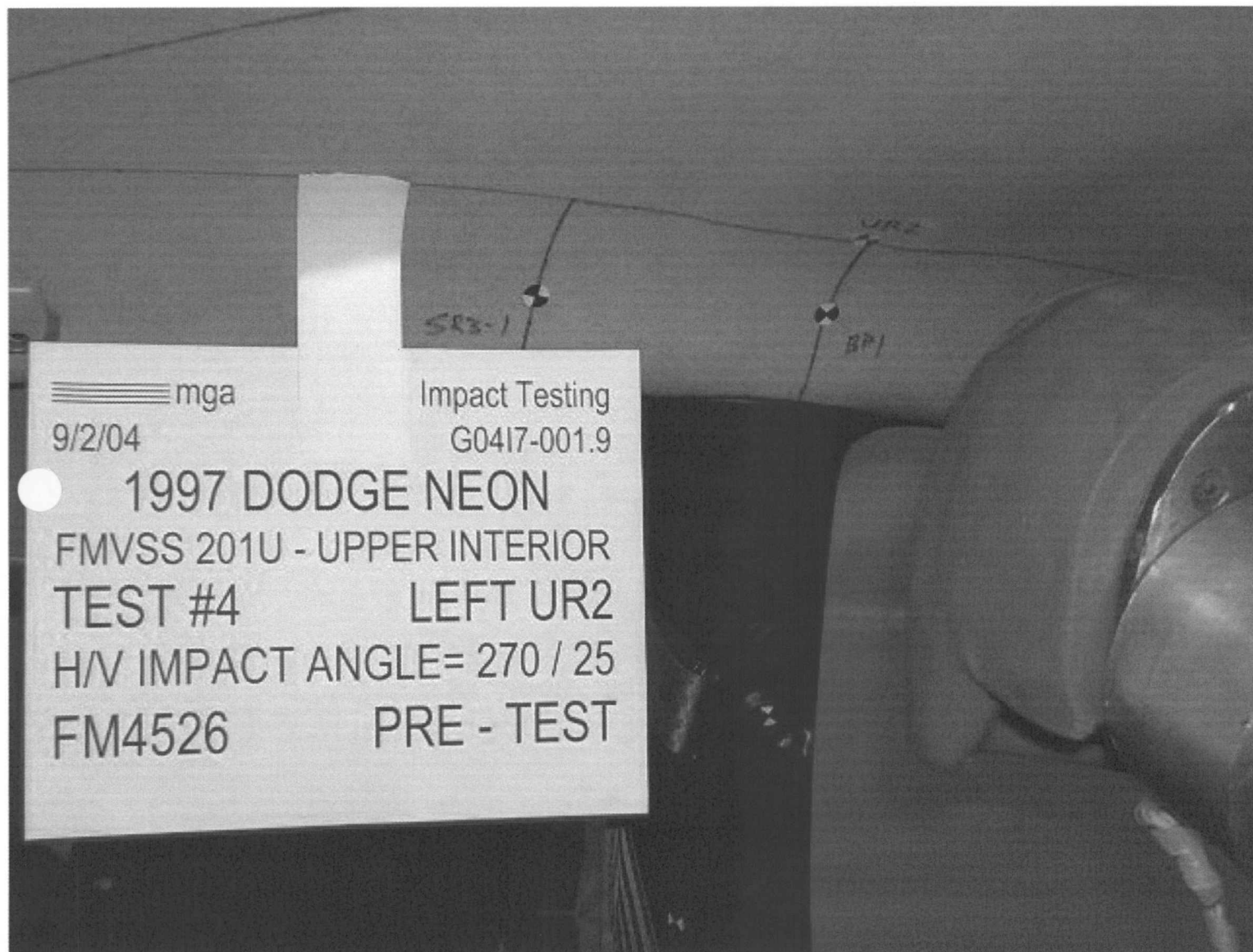
Customer: DODGE  
Test # 7  
FM4529  
Additional Desc: N/A

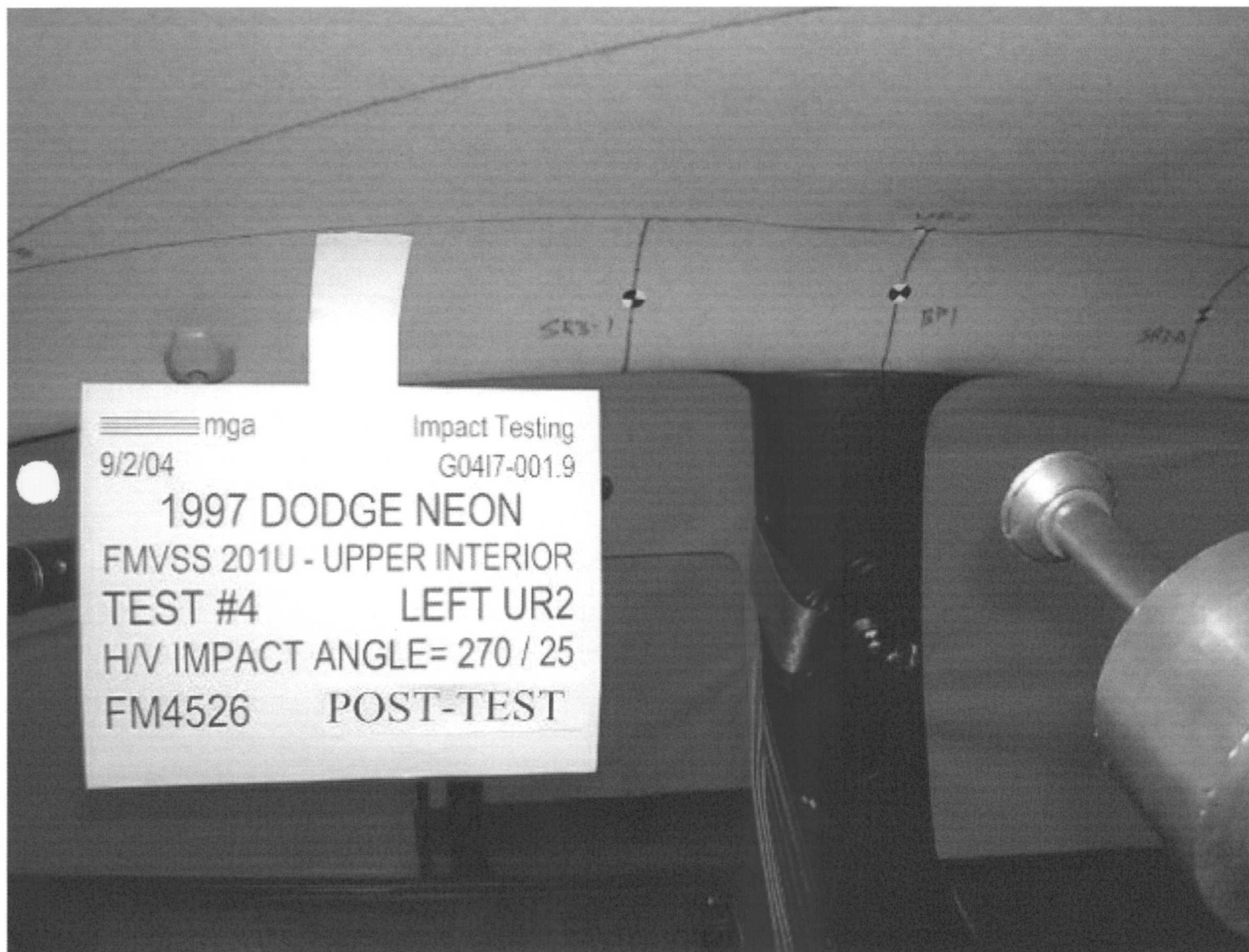
Vehicle Program : NEON

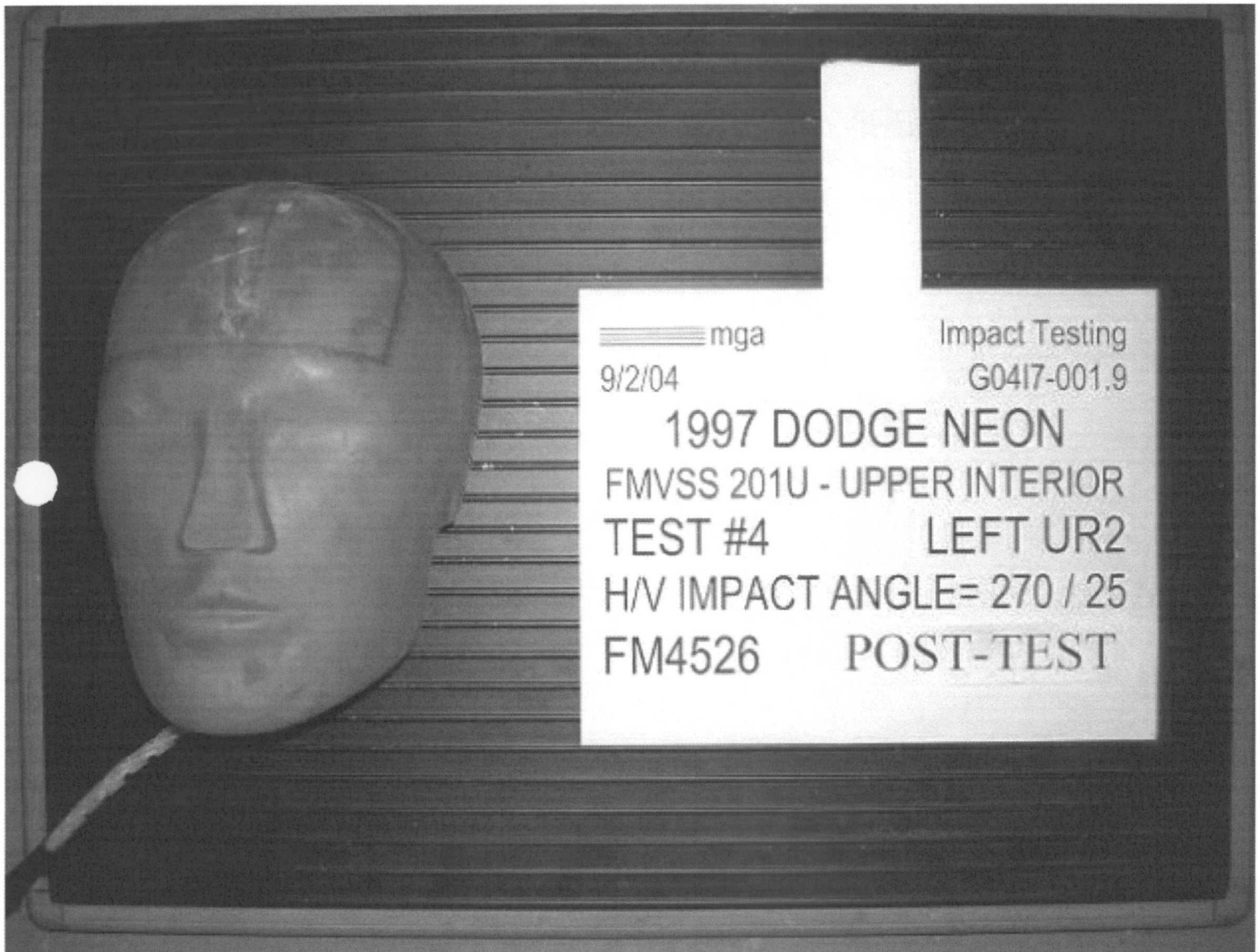
Test Date: 9/3/04  
HIC(d) = 897, HIC = 969, Delta T = 4.3 msec

Model Year: 1997  
Target: SR2(a)  
Vehicle Side: Right  
Horz/Vert Angle: 90/27









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Impact Testing

9/2/04

G04I7-001.9

1997 DODGE NEON

FMVSS 201U - UPPER INTERIOR

TEST #4

LEFT UR2

H/V IMPACT ANGLE= 270 / 25

FM4526

POST-TEST

MICHIGAN OPERATIONS  
 DATE: 2/8/01  
 SUPERCEDES: MGATP207210.2

DOC. NO.: MGATP207210.3  
 REVISION NO.: 2  
 PAGE 1 OF 1

### SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G04I7-001.9      VEHICLE YR/MAKE/MODEL: NEON 1997

#### GENERAL TEST PARAMETERS:

Test Number: #4

Target (Vehicle Side): UR2 Left

Temperature: 22C

MGA Test Reference No.: FM4526

Humidity: 52%

Approach Horizontal Angles: 270°

Time of Test: 6:00 PM

Approach Vertical Angles: 25°

FMH Serial No: 035

#### TEST RESULTS:

| HIC(d) | HIC  | $\Delta t$ (msec) | Velocity (kph) | Impact location on FMH (mm) |                  |
|--------|------|-------------------|----------------|-----------------------------|------------------|
|        |      |                   |                | Above Pt. O                 | Left/Right Pt. O |
| 980    | 1079 | 4.5               | 23.3           | 65                          | 15 L             |

#### INSTRUMENTAION INFORMATION: (all accelerometers are Endevco 7264-2000)

| Axis | Channel | Serial No. | DLR Value | $\Delta V$ Pre-Test | $\Delta V$ Post-Test |
|------|---------|------------|-----------|---------------------|----------------------|
| X    | 5       | J35924     | -92.4     | 1.67                | 1.67                 |
| Y    | 6       | J35919     | 93.8      | 1.54                | 1.54                 |
| Z    | 7       | J21969     | 88.5      | 1.58                | 1.58                 |

#### REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

No visible damage

Recorded By: [Signature] Approved By\*: [Signature] Date: 9-2-01

\*Only necessary for NHTSA (Government) Compliance testing.

FMH  
G04I7-001.9

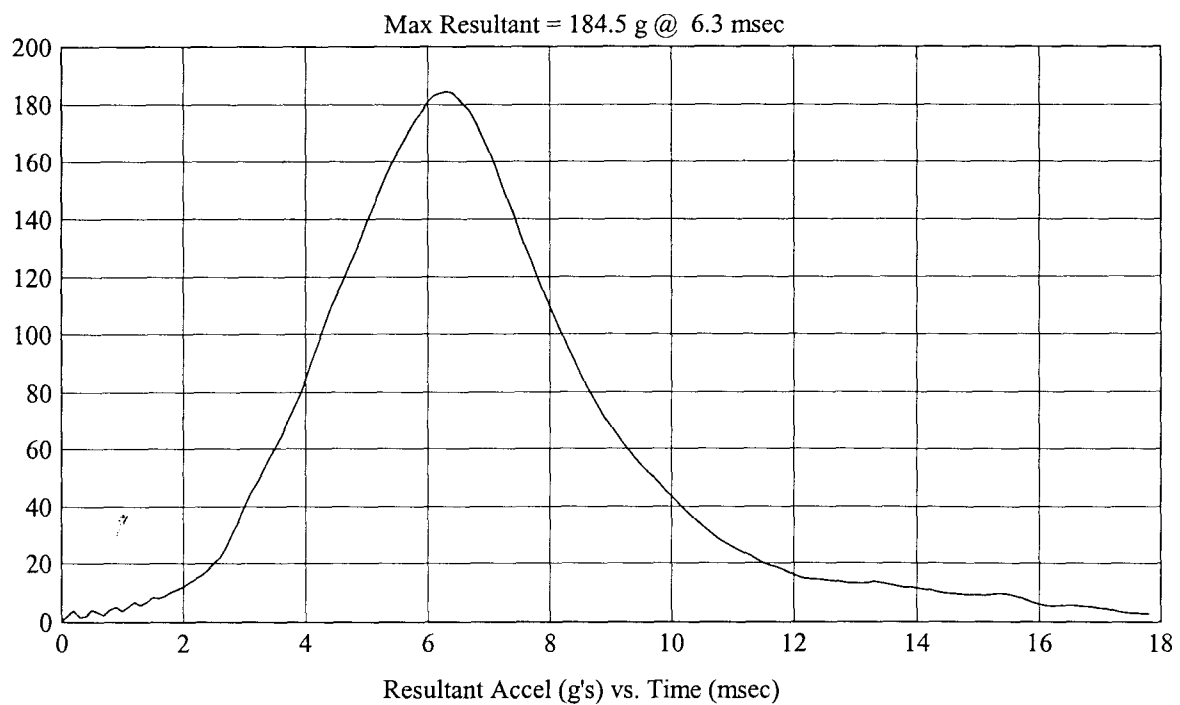
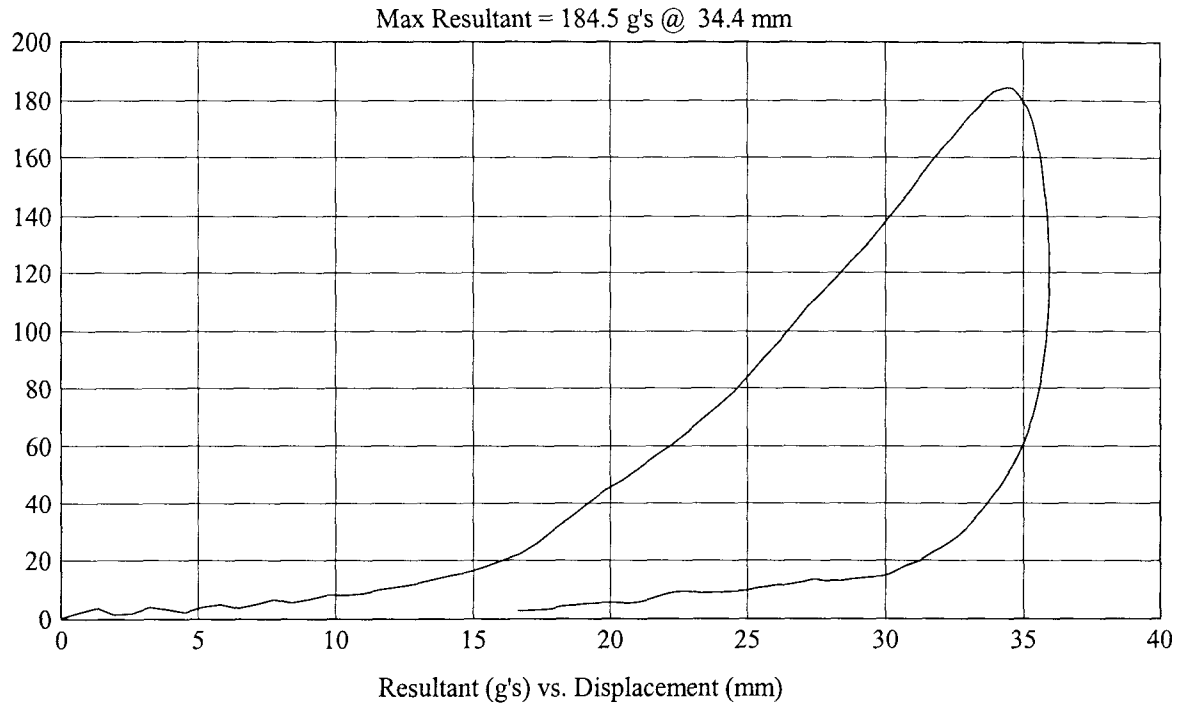
Customer: DODGE  
Test # 4  
FM4526  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: UR2  
Vehicle Side: Left  
Horz/Vert Angle: 270/25

Test Date: 9/2/04

HIC(d) = 980, HIC = 1079, Delta T = 4.5 msec



FMH  
G04I7-001.9

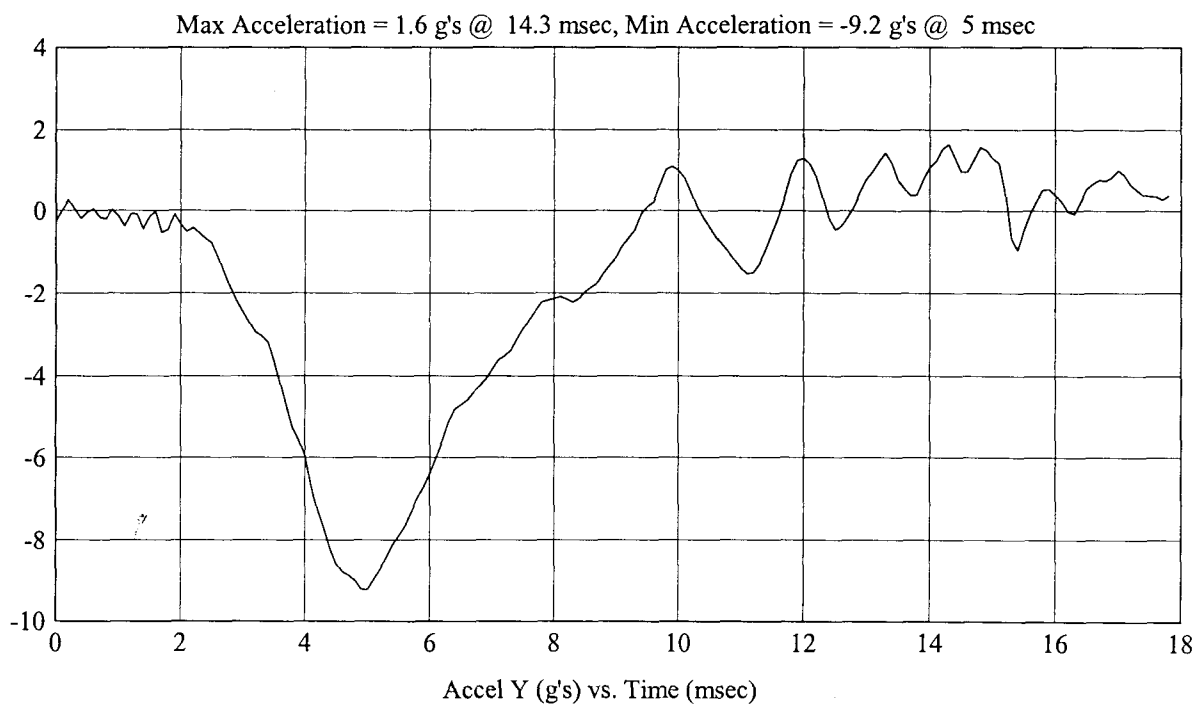
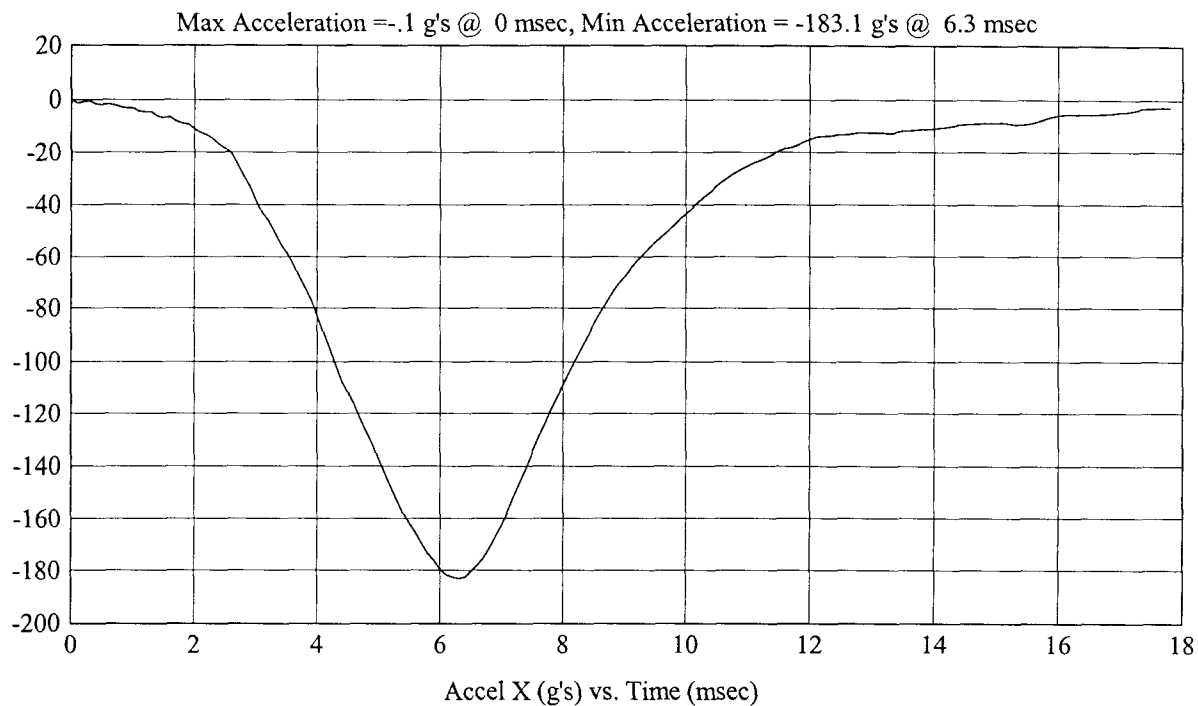
Customer: DODGE  
Test # 4  
FM4526  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: UR2  
Vehicle Side: Left  
Horz/Vert Angle: 270/25

Test Date: 9/2/04

HIC(d) = 980, HIC = 1079, Delta T = 4.5 msec



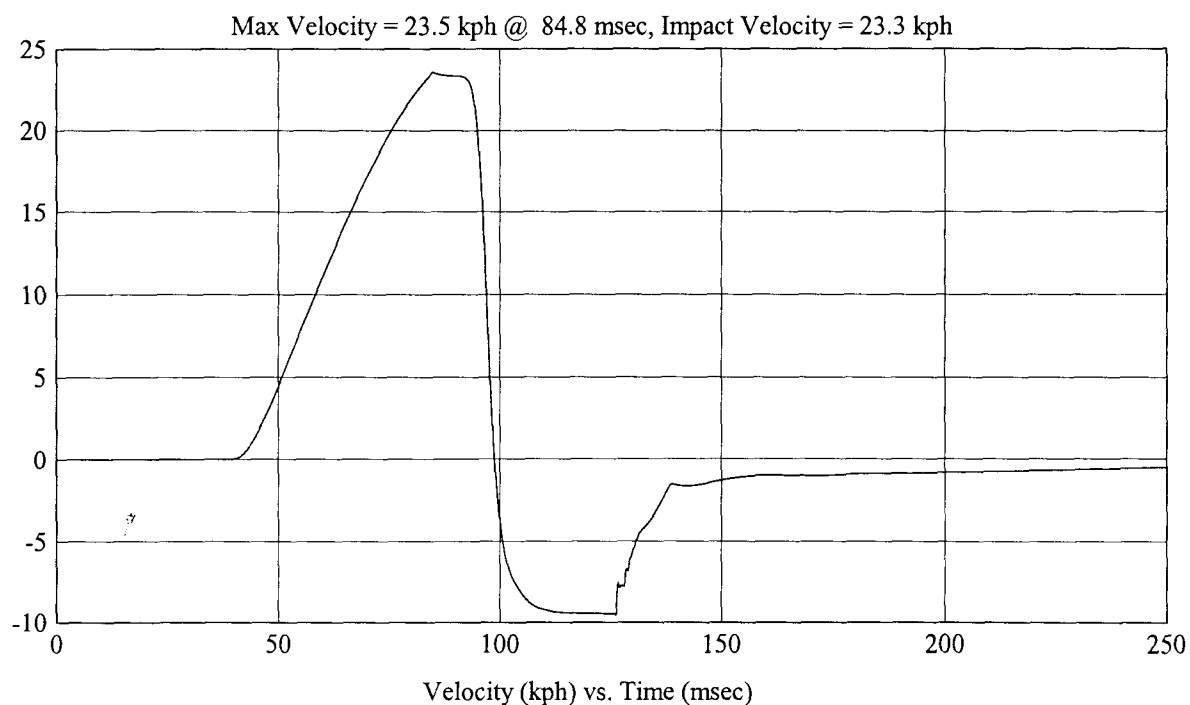
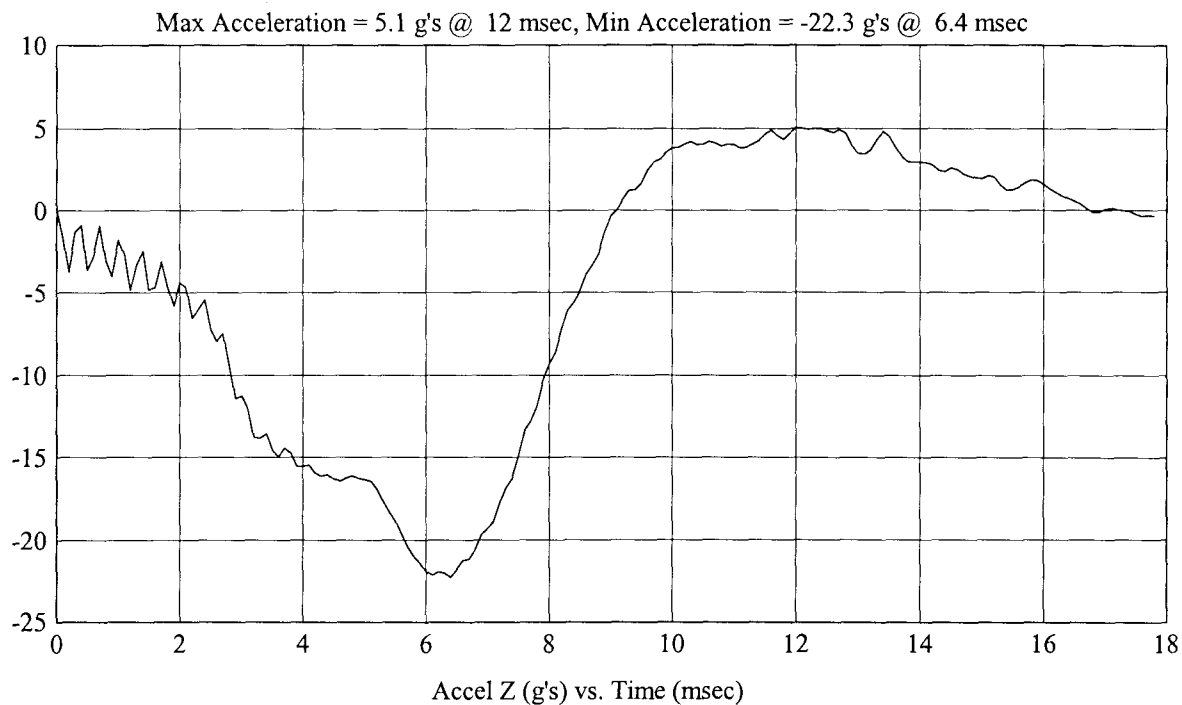
FMH  
G04I7-001.9

Customer: DODGE  
Test # 4  
FM4526  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: UR2  
Vehicle Side: Left  
Horz/Vert Angle: 270/25

Test Date: 9/2/04  
HIC(d) = 980, HIC = 1079, Delta T = 4.5 msec





FMH  
G04I7-001.9

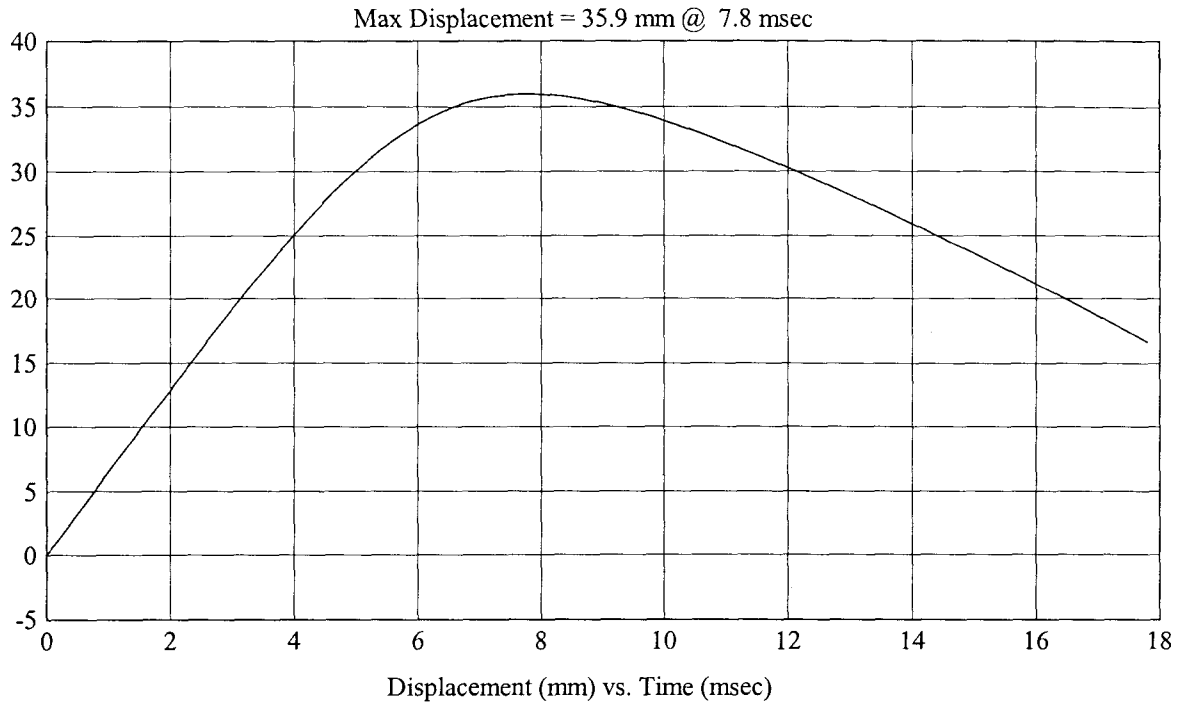
Customer: DODGE  
Test # 4  
FM4526  
Additional Desc: N/A

Vehicle Program : NEON

Model Year: 1997  
Target: UR2  
Vehicle Side: Left  
Horz/Vert Angle: 270/25

Test Date: 9/2/04

HIC(d) = 980, HIC = 1079, Delta T = 4.5 msec



## 4.0 TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

The following section lists the test equipment for the test series. Items marked with an asterisk are calibrated by an external lab. An additional summary table is given for the pre and post-test calibration data for the Free Motion Headforms. The temperature trace to confirm testing was conducted between 66°F and 78°F (19°C - 26°C) is included in Appendix A. Calibration certificates can be found in Appendix B.

**TABLE 4-1 LIST OF ITEMS USED**

| ITEM                                                                                          | MANUFACTURER NAME          | MODEL #           | FUNCTION OF ITEM                                                   | ACCURACY              | CAL. INTERNAL            |
|-----------------------------------------------------------------------------------------------|----------------------------|-------------------|--------------------------------------------------------------------|-----------------------|--------------------------|
| Head Drop Tower (includes test frame and DAS)                                                 | MGA Research Corp.         | MGA-100-DC        | FMH Calibration                                                    | N/A                   | N/A                      |
| Accelerometers                                                                                | Endevco                    | 7264-2000         | Acceleration Data                                                  | ±0.5%                 | 6 months                 |
| *Digital Inclinometer                                                                         | Mitutoyo                   | PRO 360           | Set Angle of FMH/Targeting                                         | ±0.1°                 | Annual                   |
| FMVSS 201U Test Frame (includes the propulsion control system, actuator, test frame, and DAS) | MGA Research Corp.         | MGA-100-FMH       | Test System                                                        | N/A                   | N/A                      |
| Free Motion Headforms                                                                         | UTAMA<br>UTAMA<br>UTAMA    | 035<br>036<br>038 | Test Device                                                        | N/A                   | Pre and Post-Test Series |
| High Speed Video                                                                              | Kodak                      | RO1000            | Record Event                                                       | N/A                   | N/A                      |
| *FARO™                                                                                        | Faro Technologies          | G08020203122      | Targeting                                                          | ±0.1 mm               | Annual                   |
| Measuring Devices:<br>- Tape Measure<br>- Plumb Bobs<br>- Protractor                          | Stanley<br>N/A<br>Mitutoyo | 289<br>--<br>--   | Measurement<br>Targeting<br>FMH setup<br>Horizontal<br>Measurement | ±1 mm<br>N/A<br>±0.5° | Annual                   |
| *Vehicle Scale<br>9804-022/9805-175                                                           | Cardinal                   | 8950F             | Weighing Vehicle                                                   | ± .5 kg               | Annual                   |
| * Scale                                                                                       | Detecto                    | AP-20             | Weigh FMH Head                                                     | ± 0.01 lb             | Annual                   |
| *Temperature Recorder                                                                         | Dickson                    | TR-320            | Record Temperature and Humidity                                    | ± 1°C<br>± 1% RH      | Annual                   |

TABLE 4-2 FMH CALIBRATION SUMMARY DATA SUMMARY TABLE

| FMH Serial # |     | Weight<br>(lbs) | Temp<br>(°C) | %<br>Humidity | Peak<br>Resultant<br>Acceleration<br>(G's) | Peak<br>Lateral<br>Acceleration<br>(G's) | Unimodal |
|--------------|-----|-----------------|--------------|---------------|--------------------------------------------|------------------------------------------|----------|
| Pre          | #35 | 10.02           | 22.0         | 57.0          | 237.6                                      | 1.8                                      | Yes      |
| Post         | #35 | 10.02           | 22.0         | 64.0          | 230.5                                      | 1.3                                      | Yes      |
| Pre          | #36 | 10.03           | 22.0         | 57.0          | 235.7                                      | 9.2                                      | Yes      |
| Post         | #36 | 10.03           | 22.0         | 64.0          | 243.1                                      | 4.4                                      | Yes      |
| Pre          | #38 | 9.99            | 22.0         | 57.0          | 236.2                                      | 6.9                                      | Yes      |
| Post         | #38 | 9.99            | 22.0         | 64.0          | 243.3                                      | 12.2                                     | Yes      |

RECORDED BY: David G. GotwalsDATE: September 3, 2004APPROVED BY: Helen A. Kaletto

MICHIGAN OPERATIONS  
DATE: 3/20/03  
SUPERCEDES: MGATPHDT.5

DOC. NO.: MGATP201UHD  
REVISION NO.: 6  
PAGE 6 OF 7

*Pre-Neon*

### HEAD DROP TEST SUMMARY PART 572L

| HEADFORM SERIAL NUMBER: <u>035</u> CALIBRATION DATE: <u>9-2-04</u> |                    |              |
|--------------------------------------------------------------------|--------------------|--------------|
| TEST PARAMETER                                                     | SPECIFICATION      | TEST RESULTS |
| Weight                                                             | 9.90 to 10.10 lbs. | 10.02        |
| Temperature                                                        | 19° C to 26° C     | 22           |
| Relative Humidity                                                  | 10% to 70%         | 57           |
| Peak Resultant Acceleration                                        | 225 G's to 275 G's | 237.6        |
| Peak Lateral Acceleration                                          | 15 G's Maximum     | 1.8          |
| Unimodal Acceleration Curve                                        | YES                | Yes          |

| FMH INSTRUMENTATION |              |              |               |                          |                          |
|---------------------|--------------|--------------|---------------|--------------------------|--------------------------|
| HEAD ACCELEROMETERS |              |              |               |                          |                          |
| Channel Number      | Manufacturer | Model Number | Serial Number | Date of Last Calibration | Date of Next Calibration |
| 1                   | ENDEVCO      | 7264-2000    | J35924        | 5-20-04                  | 11-20-04                 |
| 3                   | ENDEVCO      | 7264-2000    | J35919        | 5-20-04                  | 11-20-04                 |
| 4                   | ENDEVCO      | 7264-2000    | J21969        | 5-19-04                  | 11-19-04                 |

REMARKS:

RECORDED BY: *[Signature]*

DATE: 9-2-04

APPROVED BY: *[Signature]*

Head Drop  
(Preliminary Test Report)

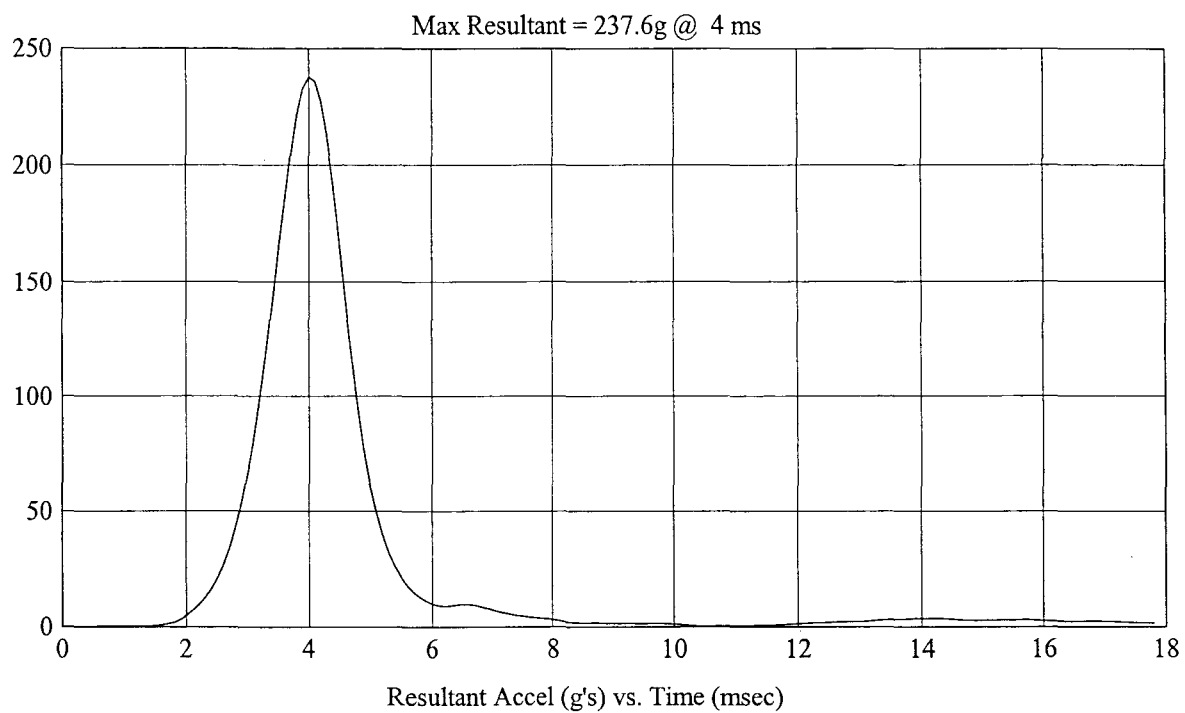
Test Number: H35259

MGA Job Number: G04I7-001.9

Test Date: 9/2/04

Test Description: Pre - Test Calibration

Head # : 35



Head Drop  
(Preliminary Test Report)

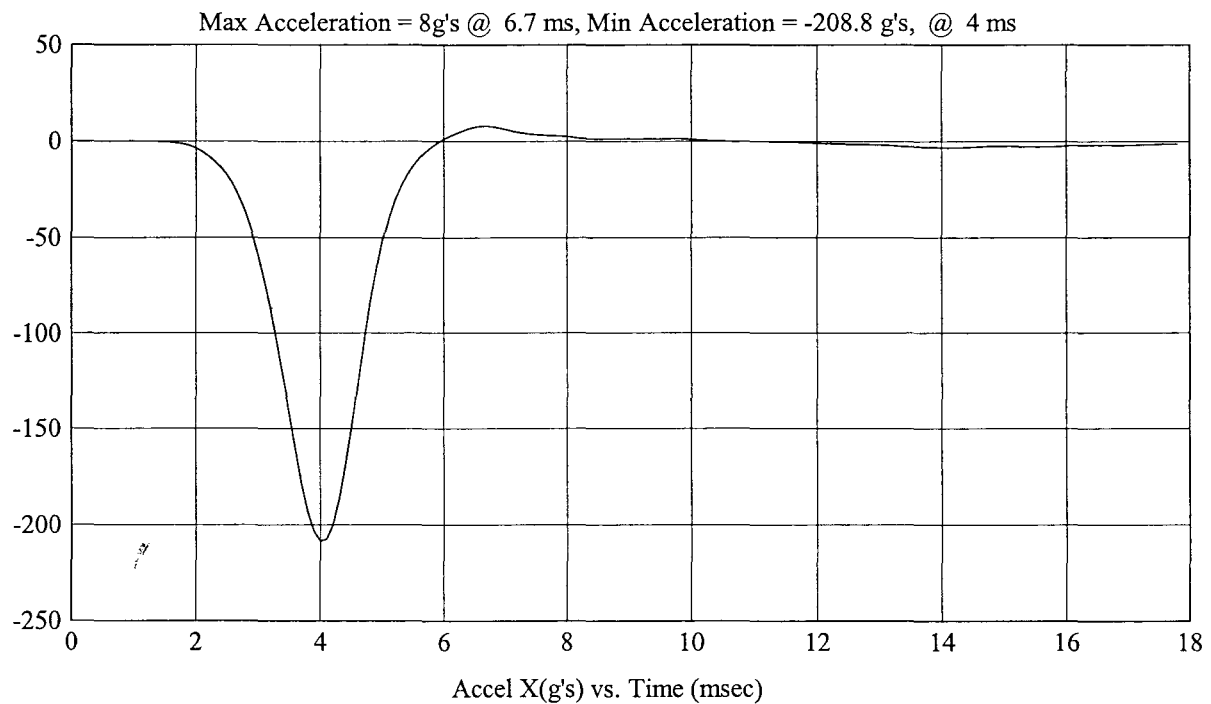
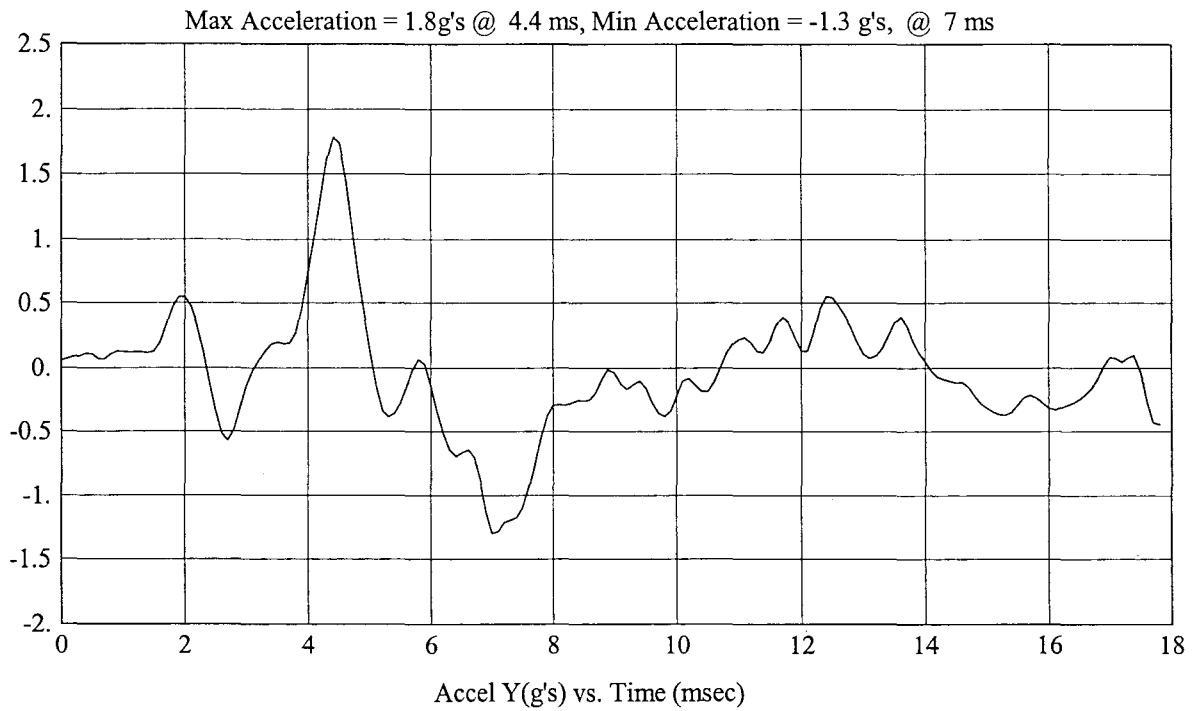
Test Number: H35259

MGA Job Number: G04I7-001.9

Test Date: 9/2/04

Test Description: Pre - Test Calibration

Head #: 35



Head Drop  
(Preliminary Test Report)

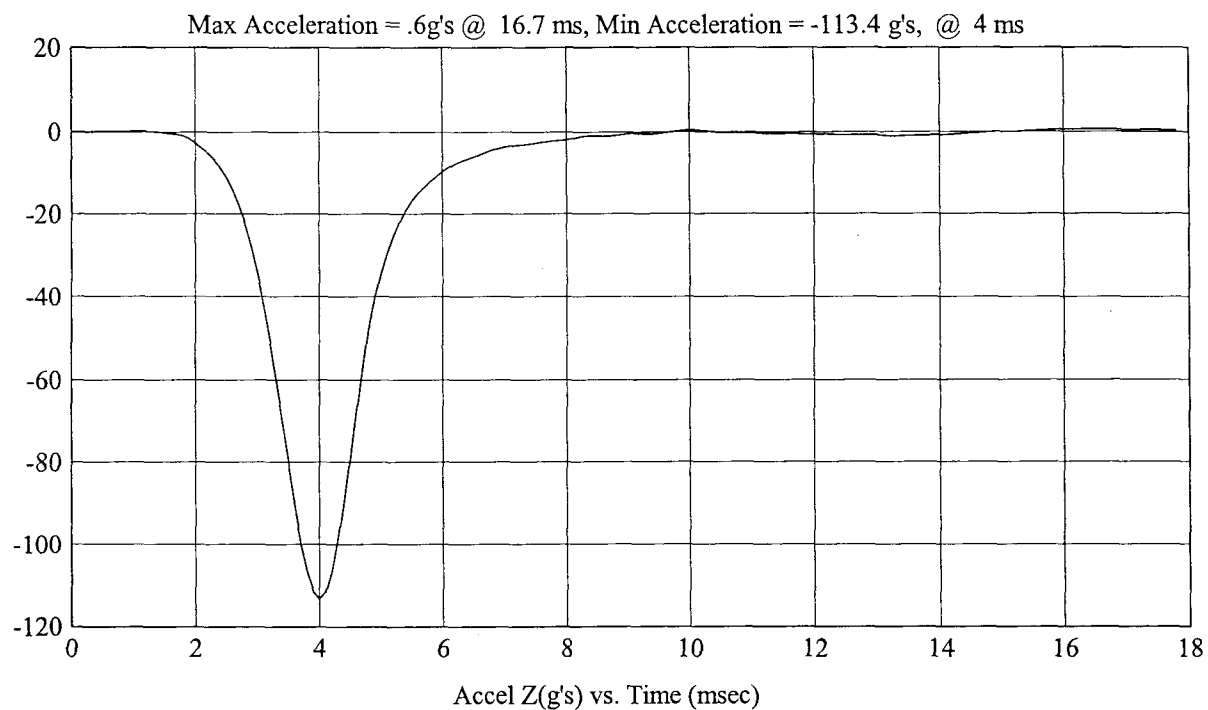
Test Number: H35259

MGA Job Number: G04I7-001.9

Test Date: 9/2/04

Test Description: Pre - Test Calibration

Head #: 35



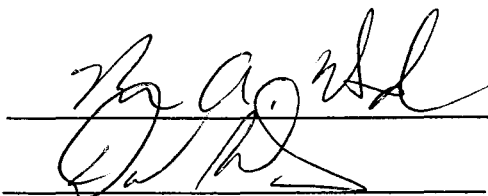
**HEAD DROP TEST SUMMARY  
PART 572L**

| HEADFORM SERIAL NUMBER: <u>035</u> CALIBRATION DATE: <u>9-3-04</u> |                    |              |
|--------------------------------------------------------------------|--------------------|--------------|
| TEST PARAMETER                                                     | SPECIFICATION      | TEST RESULTS |
| Weight                                                             | 9.90 to 10.10 lbs. | 10.02        |
| Temperature                                                        | 19° C to 26° C     | 22           |
| Relative Humidity                                                  | 10% to 70%         | 64           |
| Peak Resultant Acceleration                                        | 225 G's to 275 G's | 230.5        |
| Peak Lateral Acceleration                                          | 15 G's Maximum     | 1.3          |
| Unimodal Acceleration Curve                                        | YES                | Yes          |

| FMH INSTRUMENTATION |              |              |               |                          |                          |
|---------------------|--------------|--------------|---------------|--------------------------|--------------------------|
| HEAD ACCELEROMETERS |              |              |               |                          |                          |
| Channel Number      | Manufacturer | Model Number | Serial Number | Date of Last Calibration | Date of Next Calibration |
| 1                   | ENDEVCO      | 7264-2000    | J35924        | 5-20-04                  | 11-20-04                 |
| 3                   | ENDEVCO      | 7264-2000    | J35919        | 5-20-04                  | 11-20-04                 |
| 4                   | ENDEVCO      | 7264-2000    | J21969        | 5-19-04                  | 11-19-04                 |

REMARKS:

RECORDED BY:



DATE:

9-3-04

APPROVED BY:





Head Drop  
(Preliminary Test Report)

4-8

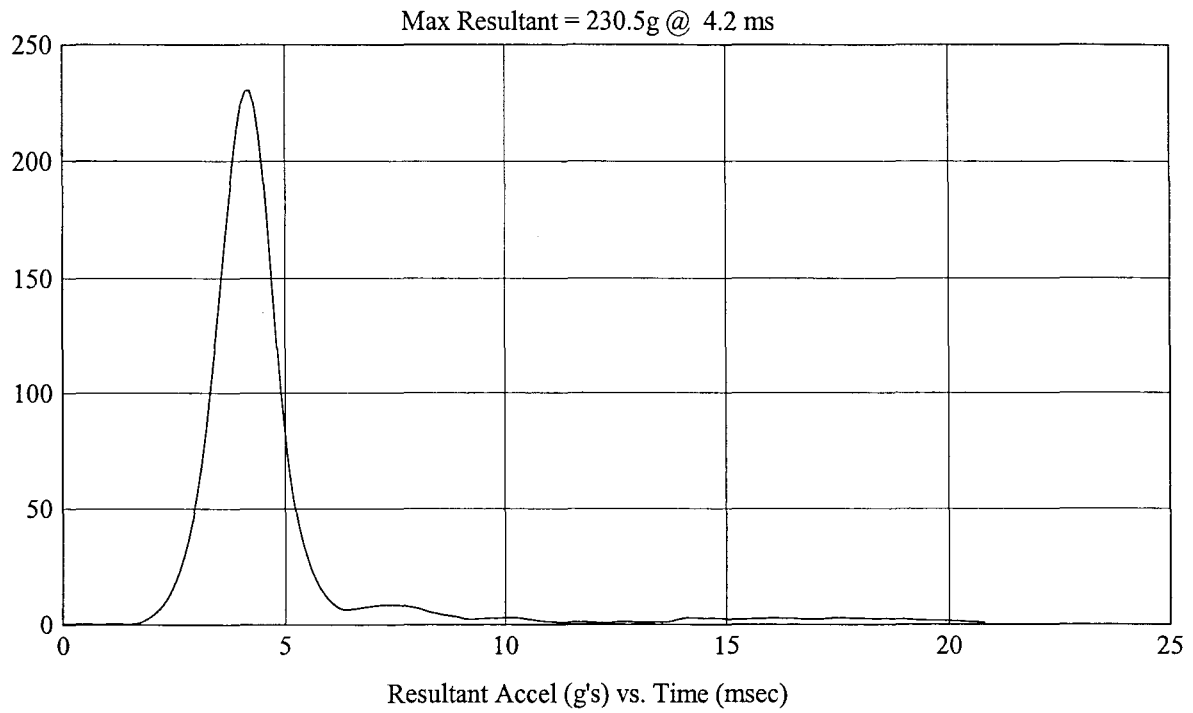
Test Number: H35260

MGA Job Number: G04I7-001.9

Test Date: 9/3/04

Test Description: Post - Test Calibration

Head # : 35



Head Drop  
(Preliminary Test Report)

4-9

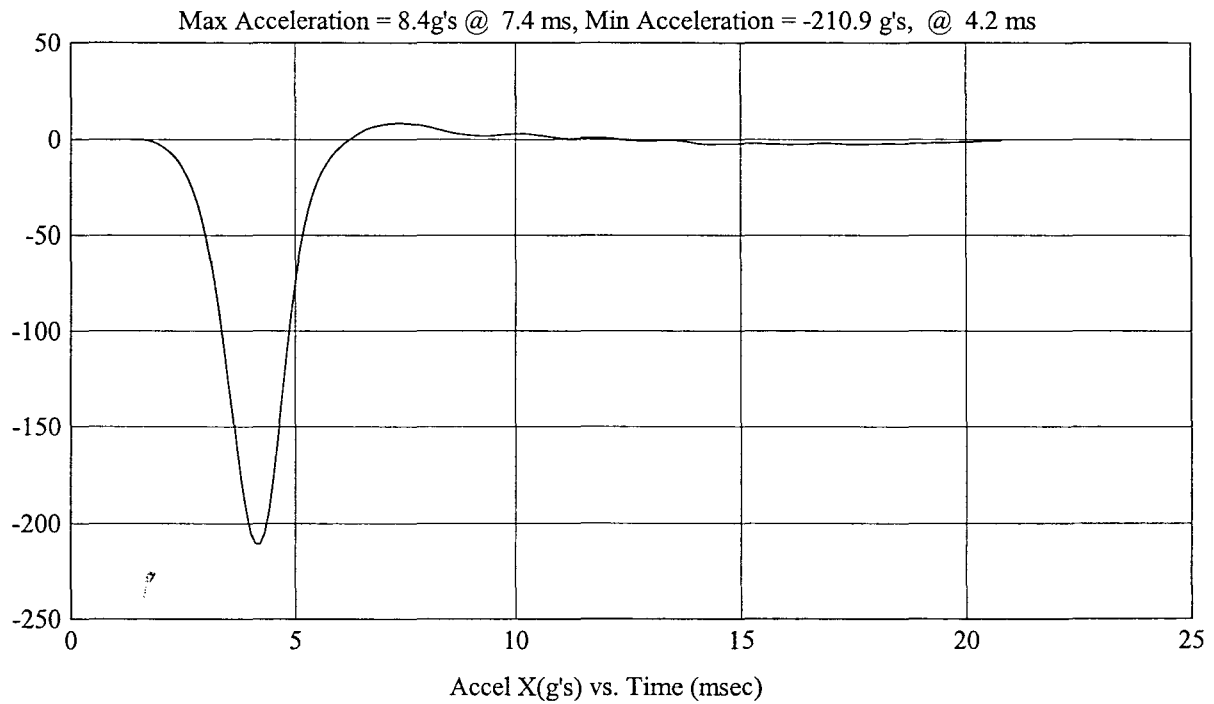
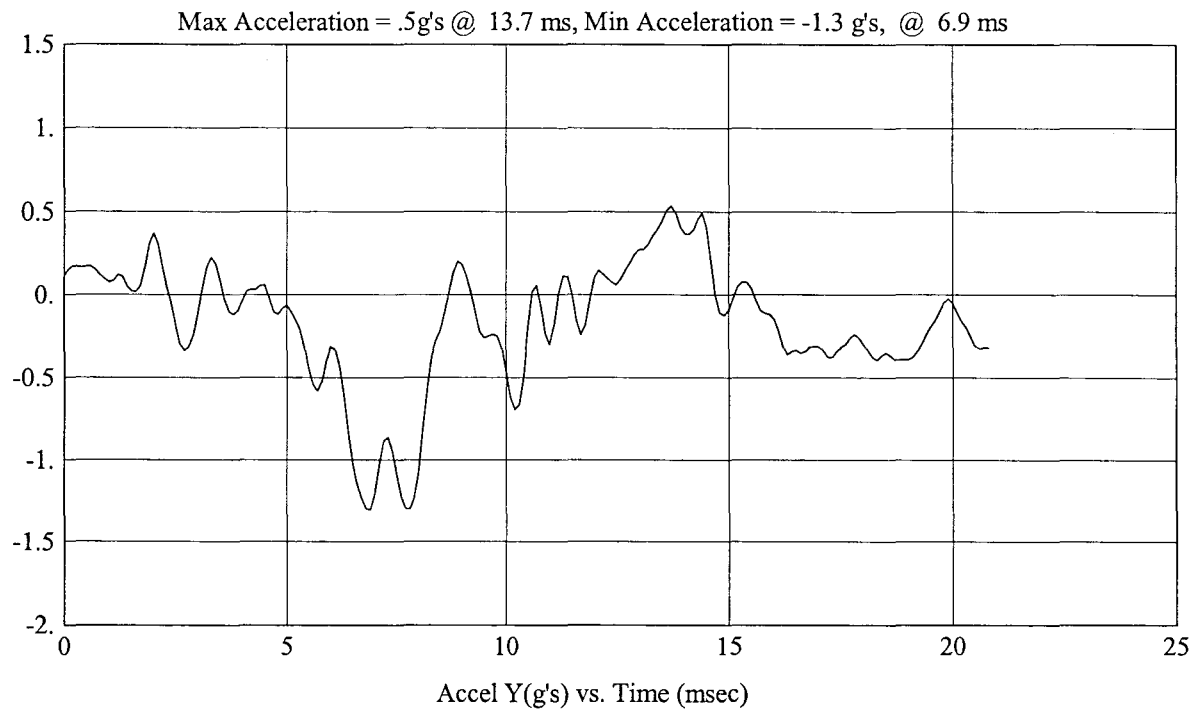
Test Number: H35260

MGA Job Number: G04I7-001.9

Test Date: 9/3/04

Test Description: Post - Test Calibration

Head #: 35



Head Drop  
(Preliminary Test Report)

4-10

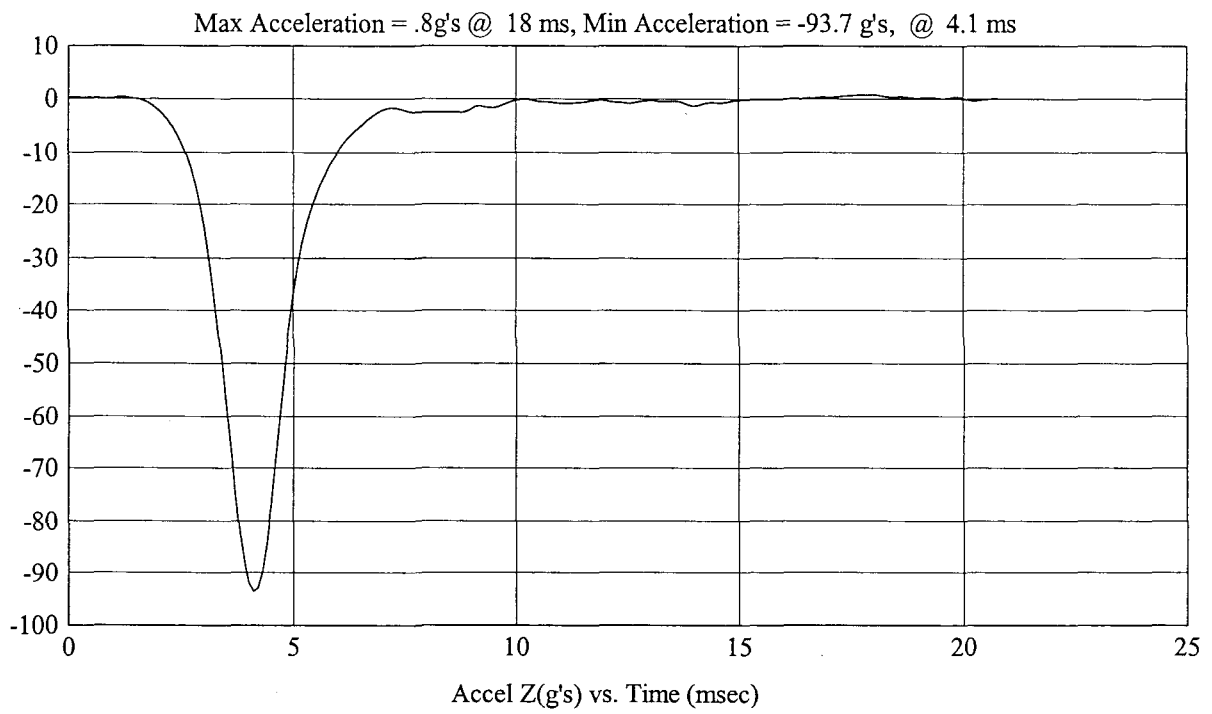
Test Number: H35260

MGA Job Number: G04I7-001.9

Test Date: 9/3/04

Test Description: Post - Test Calibration

Head #: 35



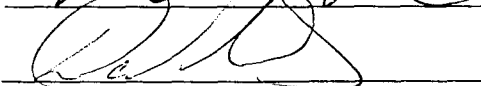
**HEAD DROP TEST SUMMARY**  
**PART 572L**

| HEADFORM SERIAL NUMBER: <u>036</u> CALIBRATION DATE: <u>9-2-04</u> |                    |              |
|--------------------------------------------------------------------|--------------------|--------------|
| TEST PARAMETER                                                     | SPECIFICATION      | TEST RESULTS |
| Weight                                                             | 9.90 to 10.10 lbs. | 10.03        |
| Temperature                                                        | 19° C to 26° C     | 22           |
| Relative Humidity                                                  | 10% to 70%         | 57           |
| Peak Resultant Acceleration                                        | 225 G's to 275 G's | 235.7        |
| Peak Lateral Acceleration                                          | 15 G's Maximum     | 9.2          |
| Unimodal Acceleration Curve                                        | YES                | Yes          |

| FMH INSTRUMENTATION |              |              |               |                          |                          |
|---------------------|--------------|--------------|---------------|--------------------------|--------------------------|
| HEAD ACCELEROMETERS |              |              |               |                          |                          |
| Channel Number      | Manufacturer | Model Number | Serial Number | Date of Last Calibration | Date of Next Calibration |
| 1                   | ENDEVCO      | 7264-2000    | J35923        | 5-23-04                  | 11-23-04                 |
| 3                   | ENDEVCO      | 7264-2000    | J35916        | 5-23-04                  | 11-23-04                 |
| 4                   | ENDEVCO      | 7264-2000    | J35918        | 5-23-04                  | 11-23-04                 |

REMARKS:

RECORDED BY:  DATE: 9-2-04

APPROVED BY: 

Head Drop  
(Preliminary Test Report)

4-12

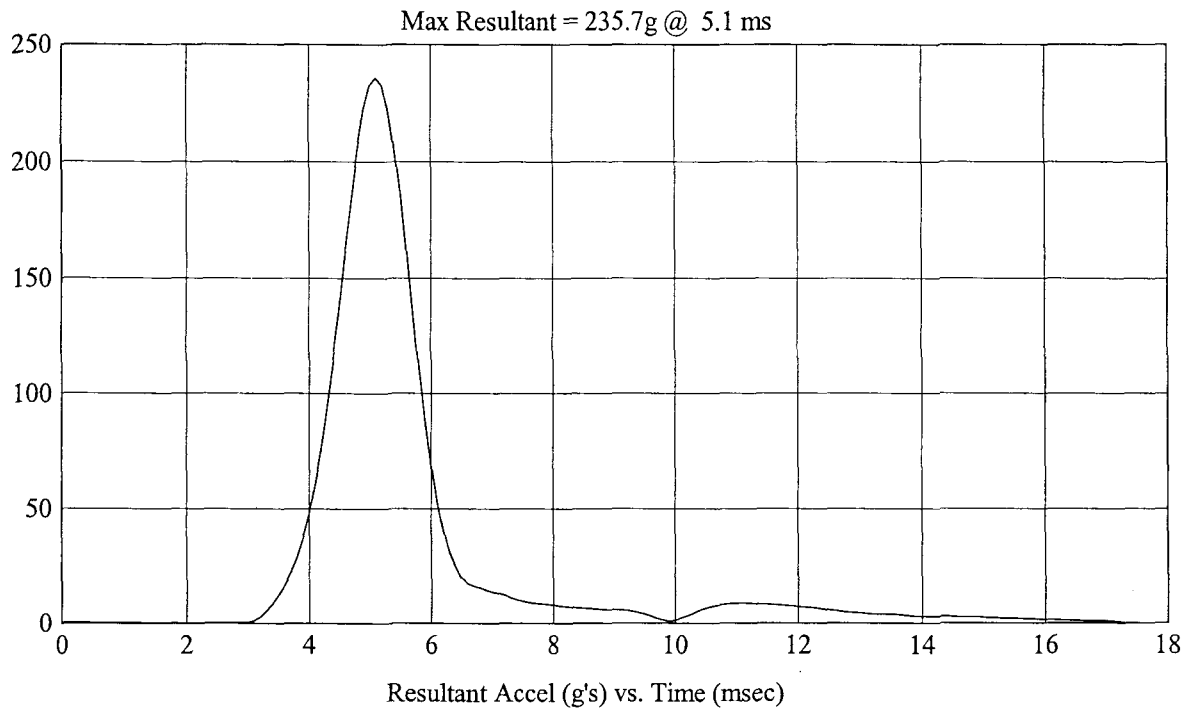
Test Number: H36258

MGA Job Number: G04I7-001.9

Test Date: 9/2/04

Test Description: Pre - Test Calibration

Head #: 36



Head Drop  
(Preliminary Test Report)

4-13

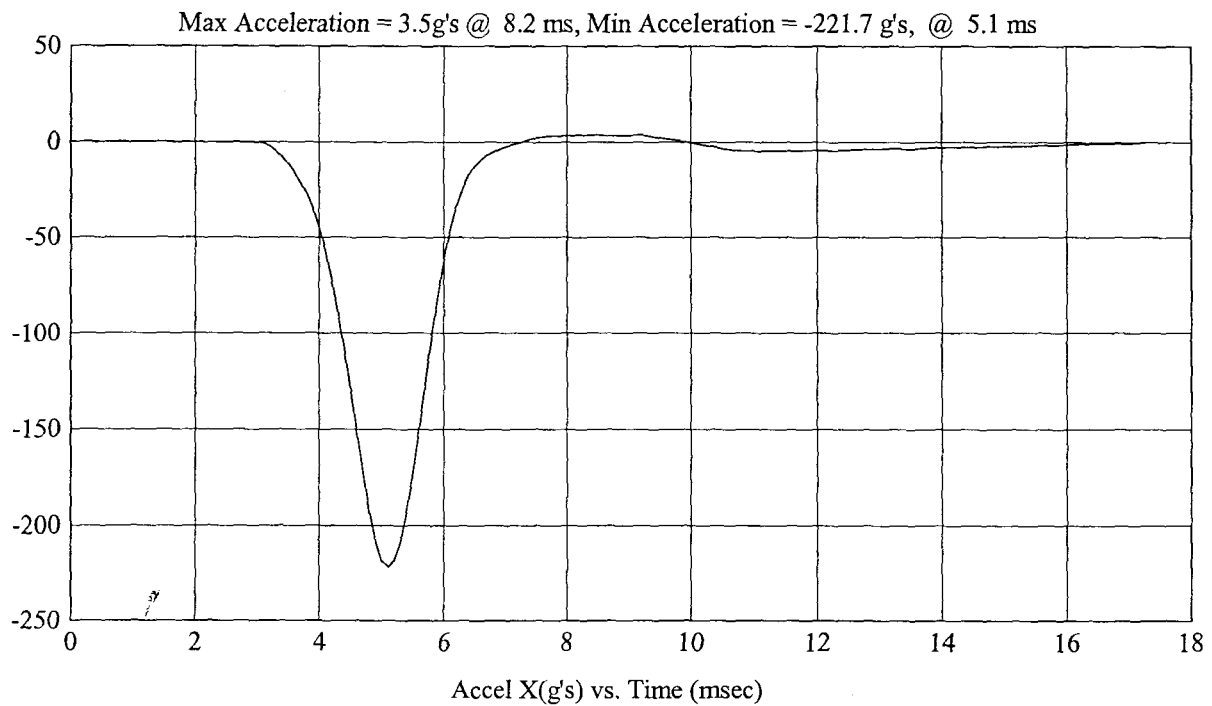
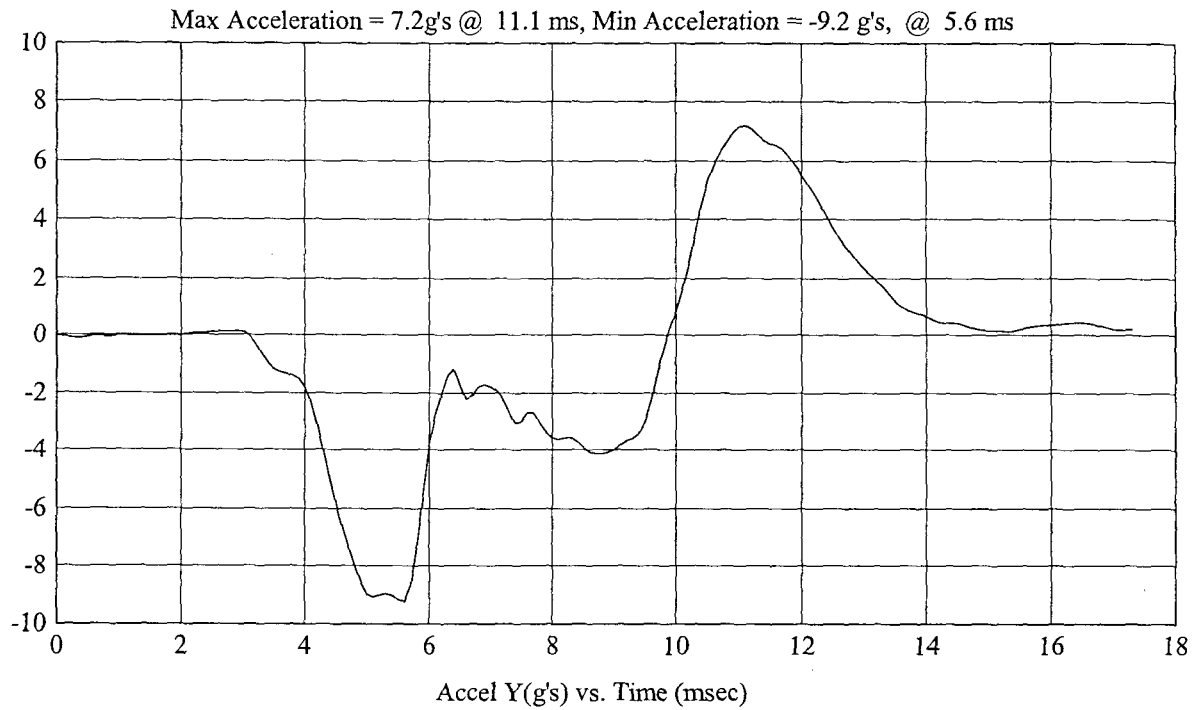
Test Number: H36258

MGA Job Number: G04I7-001.9

Test Date: 9/2/04

Test Description: Pre - Test Calibration

Head #: 36



Head Drop  
(Preliminary Test Report)

4-14

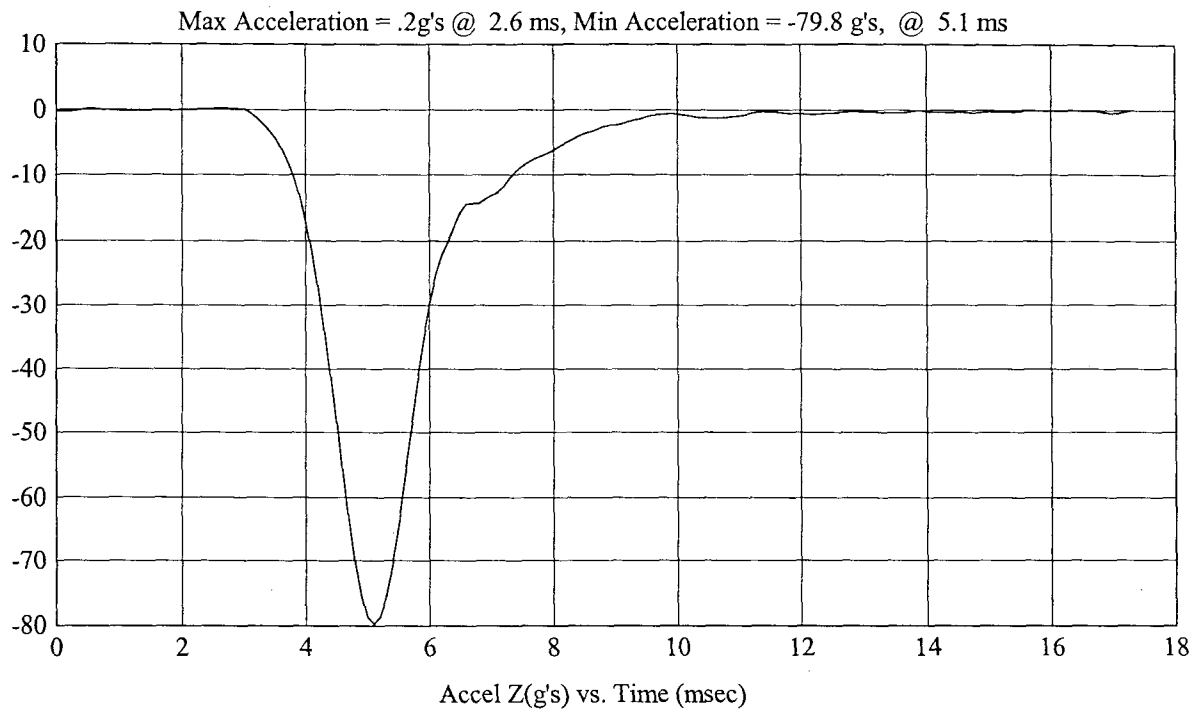
Test Number: H36258

MGA Job Number: G04I7-001.9

Test Date: 9/2/04

Test Description: Pre - Test Calibration

Head # : 36

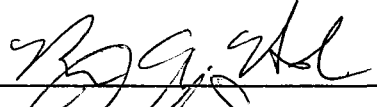


**HEAD DROP TEST SUMMARY  
PART 572L**

| HEADFORM SERIAL NUMBER: <u>036</u> CALIBRATION DATE: <u>9-3-04</u> |                    |              |
|--------------------------------------------------------------------|--------------------|--------------|
| TEST PARAMETER                                                     | SPECIFICATION      | TEST RESULTS |
| Weight                                                             | 9.90 to 10.10 lbs. | <u>10.03</u> |
| Temperature                                                        | 19° C to 26° C     | <u>22</u>    |
| Relative Humidity                                                  | 10% to 70%         | <u>64</u>    |
| Peak Resultant Acceleration                                        | 225 G's to 275 G's | <u>243.1</u> |
| Peak Lateral Acceleration                                          | 15 G's Maximum     | <u>4.4</u>   |
| Unimodal Acceleration Curve                                        | YES                | <u>Yes</u>   |

| FMH INSTRUMENTATION |              |              |               |                          |                          |
|---------------------|--------------|--------------|---------------|--------------------------|--------------------------|
| HEAD ACCELEROMETERS |              |              |               |                          |                          |
| Channel Number      | Manufacturer | Model Number | Serial Number | Date of Last Calibration | Date of Next Calibration |
| <u>1</u>            | ENDEVCO      | 7264-2000    | <u>J35923</u> | <u>5-23-04</u>           | <u>11-23-04</u>          |
| <u>3</u>            | ENDEVCO      | 7264-2000    | <u>J35916</u> | <u>5-23-04</u>           | <u>11-23-04</u>          |
| <u>4</u>            | ENDEVCO      | 7264-2000    | <u>J35918</u> | <u>5-23-04</u>           | <u>11-23-04</u>          |

REMARKS:

RECORDED BY:  DATE: 9-3-04  
APPROVED BY: 



Head Drop  
(Preliminary Test Report)

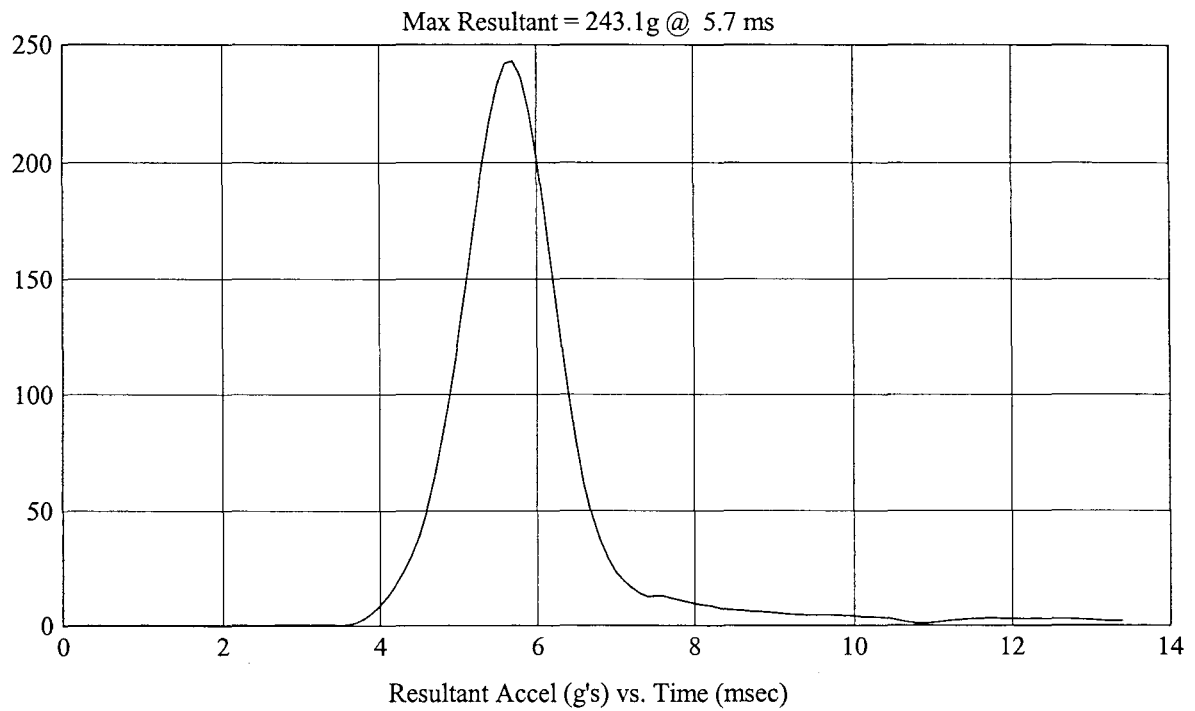
Test Number: H36259

MGA Job Number: G04I7-001.9

Test Date: 9/3/04

Test Description: Post - Test Calibration

Head #: 36



Head Drop  
(Preliminary Test Report)

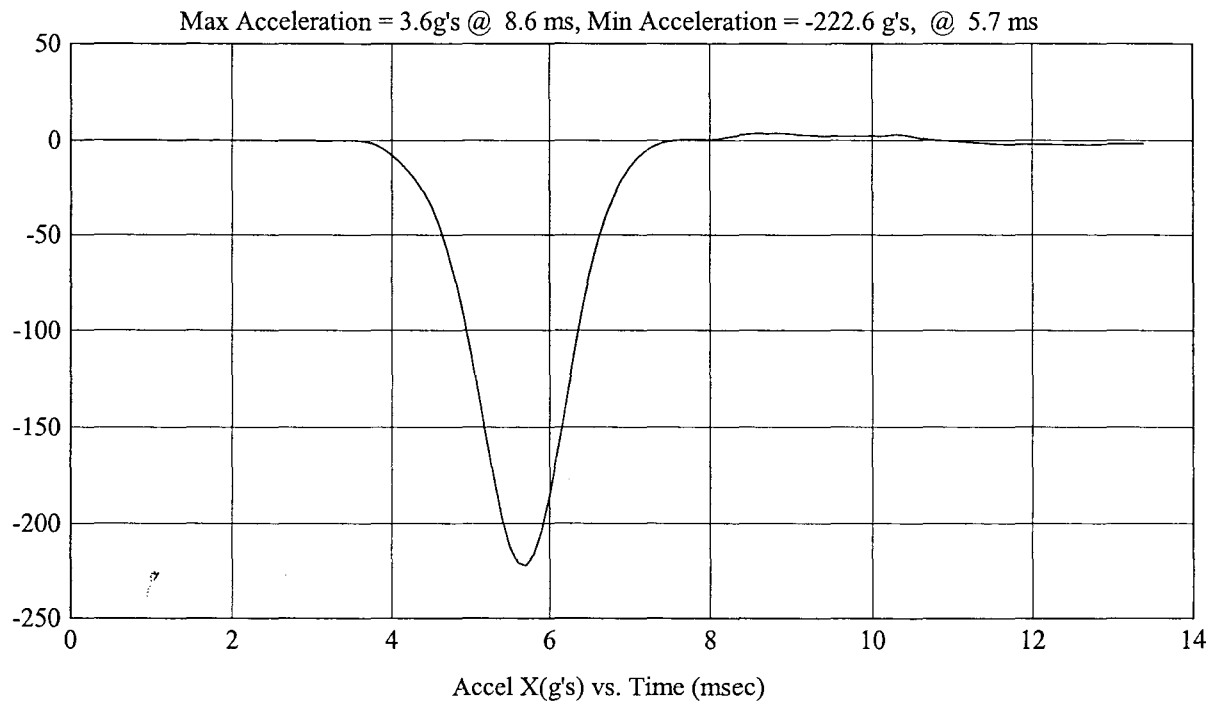
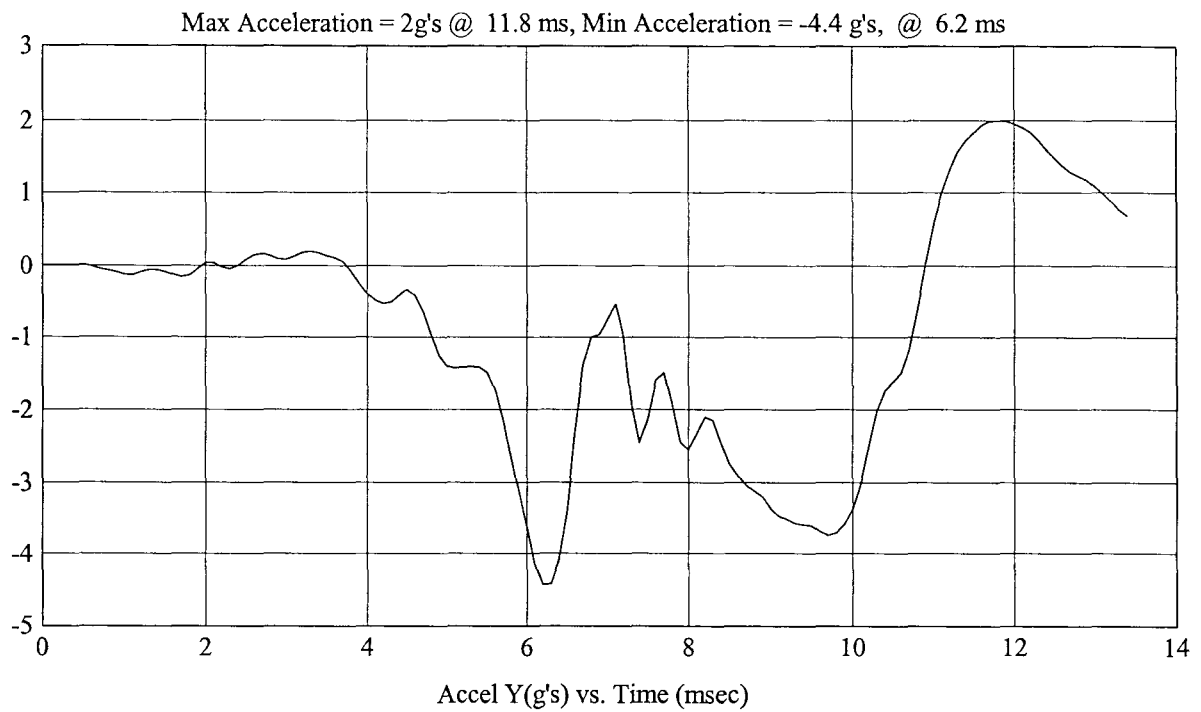
Test Number: H36259

MGA Job Number: G04I7-001.9

Test Date: 9/3/04

Test Description: Post - Test Calibration

Head #: 36



Head Drop  
(Preliminary Test Report)

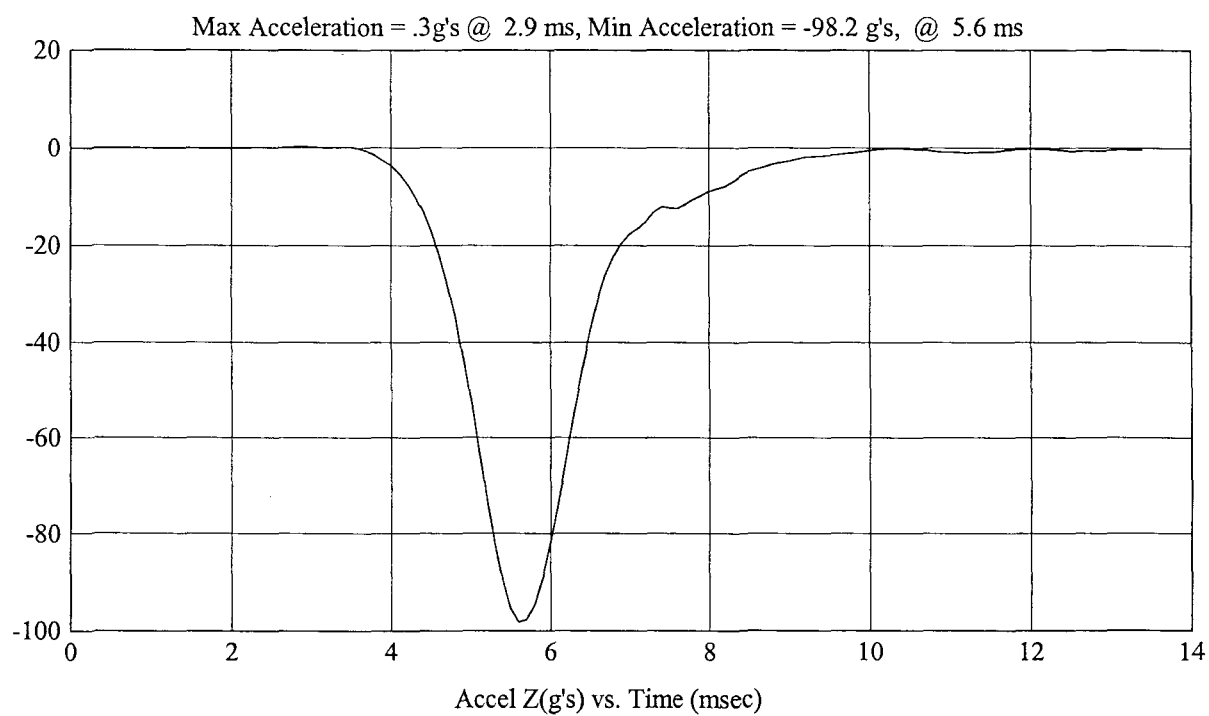
Test Number: H36259

MGA Job Number: G04I7-001.9

Test Date: 9/3/04

Test Description: Post - Test Calibration

Head # : 36

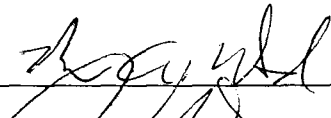


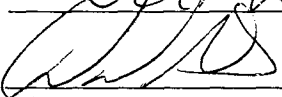
HEAD DROP TEST SUMMARY  
PART 572L

| HEADFORM SERIAL NUMBER: <u>038</u> CALIBRATION DATE: <u>9-2-04</u> |                    |              |
|--------------------------------------------------------------------|--------------------|--------------|
| TEST PARAMETER                                                     | SPECIFICATION      | TEST RESULTS |
| Weight                                                             | 9.90 to 10.10 lbs. | 9.99         |
| Temperature                                                        | 19° C to 26° C     | 22           |
| Relative Humidity                                                  | 10% to 70%         | 57           |
| Peak Resultant Acceleration                                        | 225 G's to 275 G's | 236.2        |
| Peak Lateral Acceleration                                          | 15 G's Maximum     | 6.9          |
| Unimodal Acceleration Curve                                        | YES                | Yes          |

| FMH INSTRUMENTATION |              |              |               |                          |                          |
|---------------------|--------------|--------------|---------------|--------------------------|--------------------------|
| HEAD ACCELEROMETERS |              |              |               |                          |                          |
| Channel Number      | Manufacturer | Model Number | Serial Number | Date of Last Calibration | Date of Next Calibration |
| 1                   | ENDEVCO      | 7264-2000    | J36197        | 5-23-04                  | 11-23-04                 |
| 3                   | ENDEVCO      | 7264-2000    | J36193        | 5-23-04                  | 11-23-04                 |
| 4                   | ENDEVCO      | 7264-2000    | J36353        | 5-23-04                  | 11-23-04                 |

## REMARKS:

RECORDED BY:  DATE: 9-2-04

APPROVED BY: 

Head Drop  
(Preliminary Test Report)

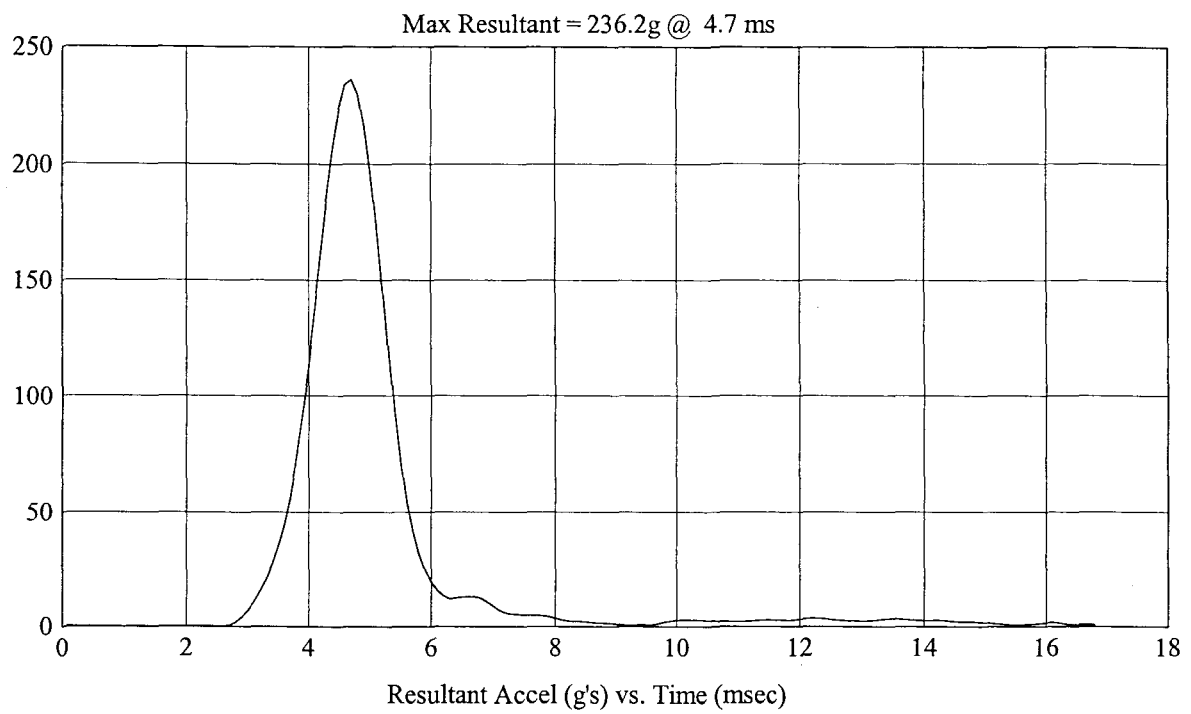
Test Number: H38244

MGA Job Number: G04I7-001.9

Test Date: 9/2/04

Test Description: Pre - Test Calibration

Head # : 38



Head Drop  
(Preliminary Test Report)

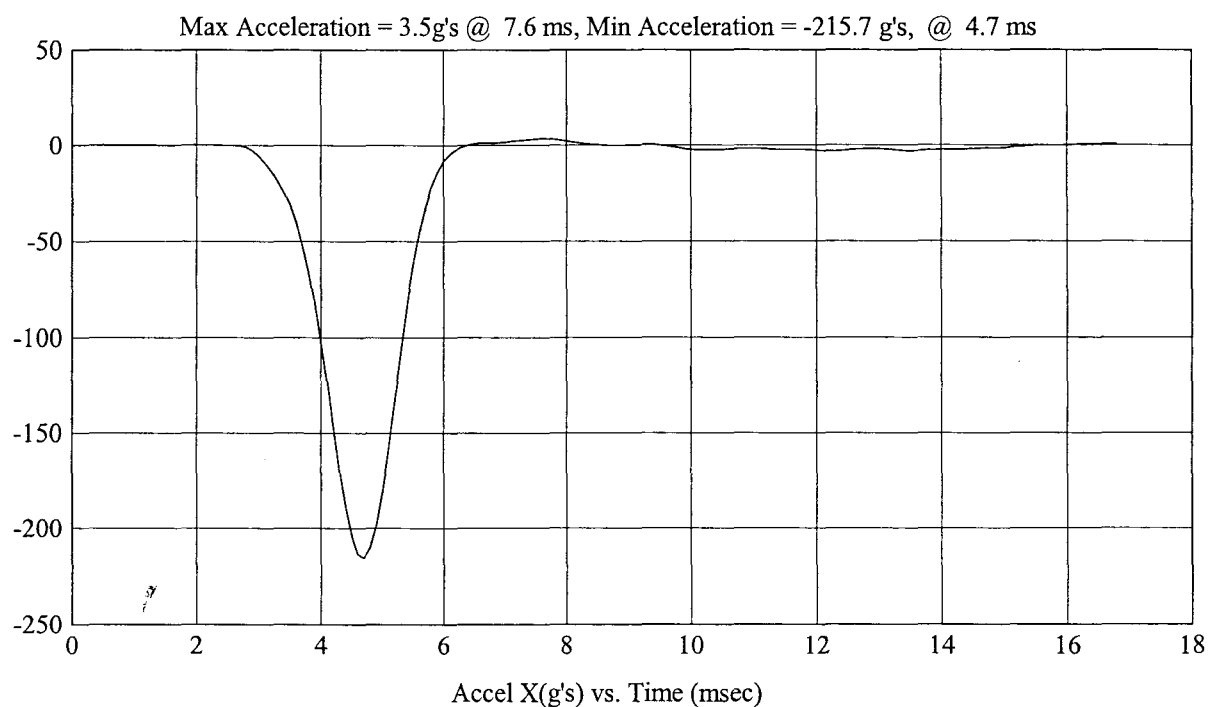
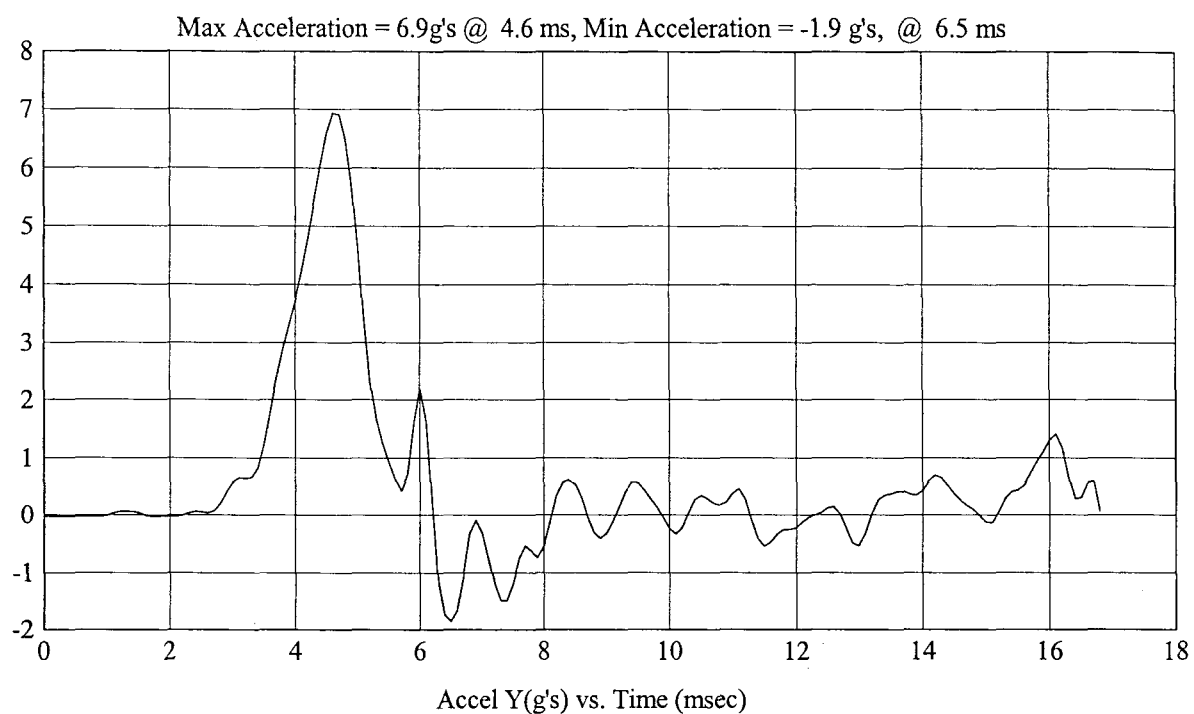
Test Number: H38244

MGA Job Number: G04I7-001.9

Test Date: 9/2/04

Test Description: Pre - Test Calibration

Head #: 38



Head Drop  
(Preliminary Test Report)

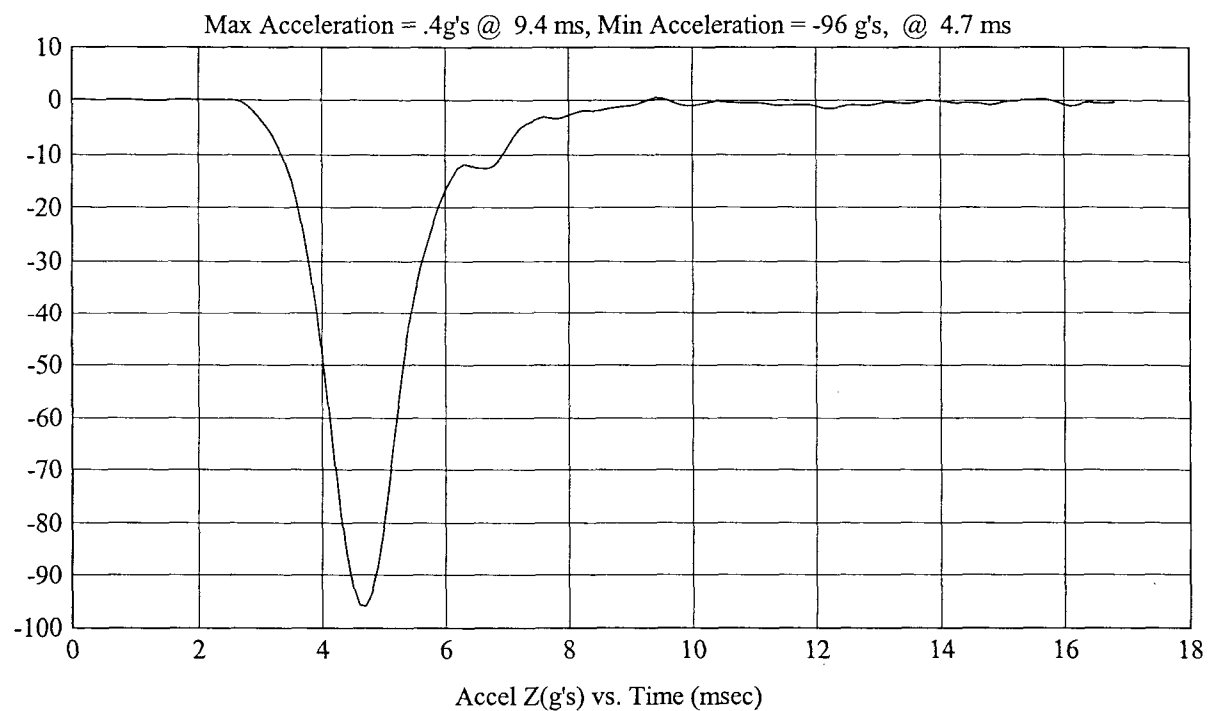
Test Number: H38244

MGA Job Number: G04I7-001.9

Test Date: 9/2/04

Test Description: Pre - Test Calibration

Head # : 38



**HEAD DROP TEST SUMMARY**  
**PART 572L**

| HEADFORM SERIAL NUMBER: <u>038</u> CALIBRATION DATE: <u>9-3-04</u> |                    |              |
|--------------------------------------------------------------------|--------------------|--------------|
| TEST PARAMETER                                                     | SPECIFICATION      | TEST RESULTS |
| Weight                                                             | 9.90 to 10.10 lbs. | 9.99         |
| Temperature                                                        | 19° C to 26° C     | 22           |
| Relative Humidity                                                  | 10% to 70%         | 64           |
| Peak Resultant Acceleration                                        | 225 G's to 275 G's | 243.3        |
| Peak Lateral Acceleration                                          | 15 G's Maximum     | 12.2         |
| Unimodal Acceleration Curve                                        | YES                | Yes          |

| FMH INSTRUMENTATION |              |              |               |                          |                          |
|---------------------|--------------|--------------|---------------|--------------------------|--------------------------|
| HEAD ACCELEROMETERS |              |              |               |                          |                          |
| Channel Number      | Manufacturer | Model Number | Serial Number | Date of Last Calibration | Date of Next Calibration |
| 1                   | ENDEVCO      | 7264-2000    | J36197        | 5-23-04                  | 11-23-04                 |
| 3                   | ENDEVCO      | 7264-2000    | J36193        | 5-23-04                  | 11-23-04                 |
| 4                   | ENDEVCO      | 7264-2000    | J36353        | 5-23-04                  | 11-23-04                 |

REMARKS:

RECORDED BY: *R. A. M.* DATE: 9-3-04

APPROVED BY: *am j m*



Head Drop  
(Preliminary Test Report)

4-24

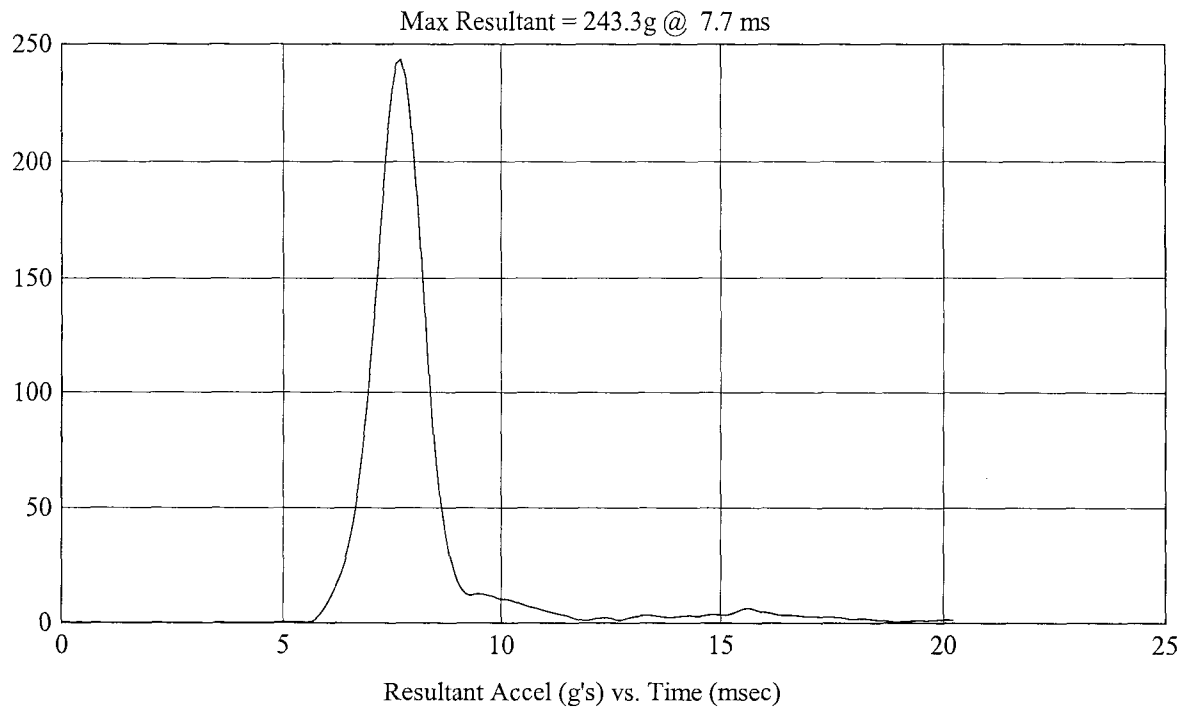
Test Number: H38245

MGA Job Number: G04I7-001.9

Test Date: 9/3/04

Test Description: Post - Test Calibration

Head # : 038



Head Drop  
(Preliminary Test Report)

4-25

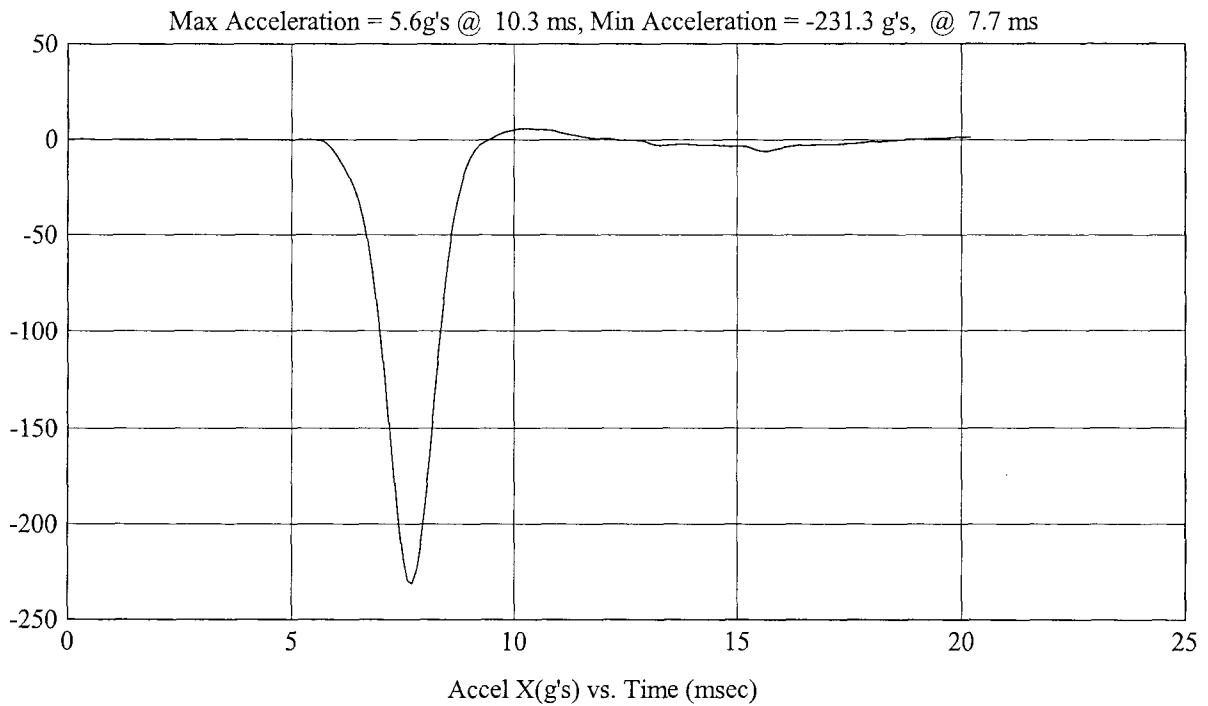
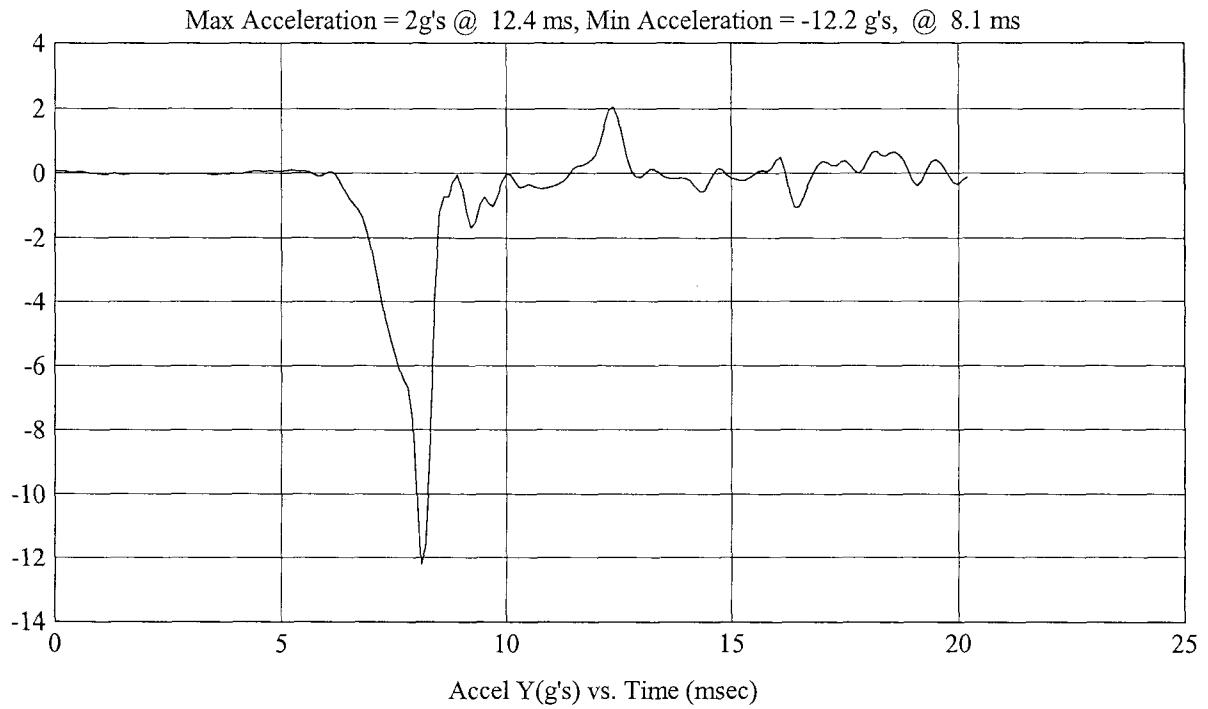
Test Number: H38245

MGA Job Number: G04I7-001.9

Test Date: 9/3/04

Test Description: Post - Test Calibration

Head # : 038



Head Drop  
(Preliminary Test Report)

4-26

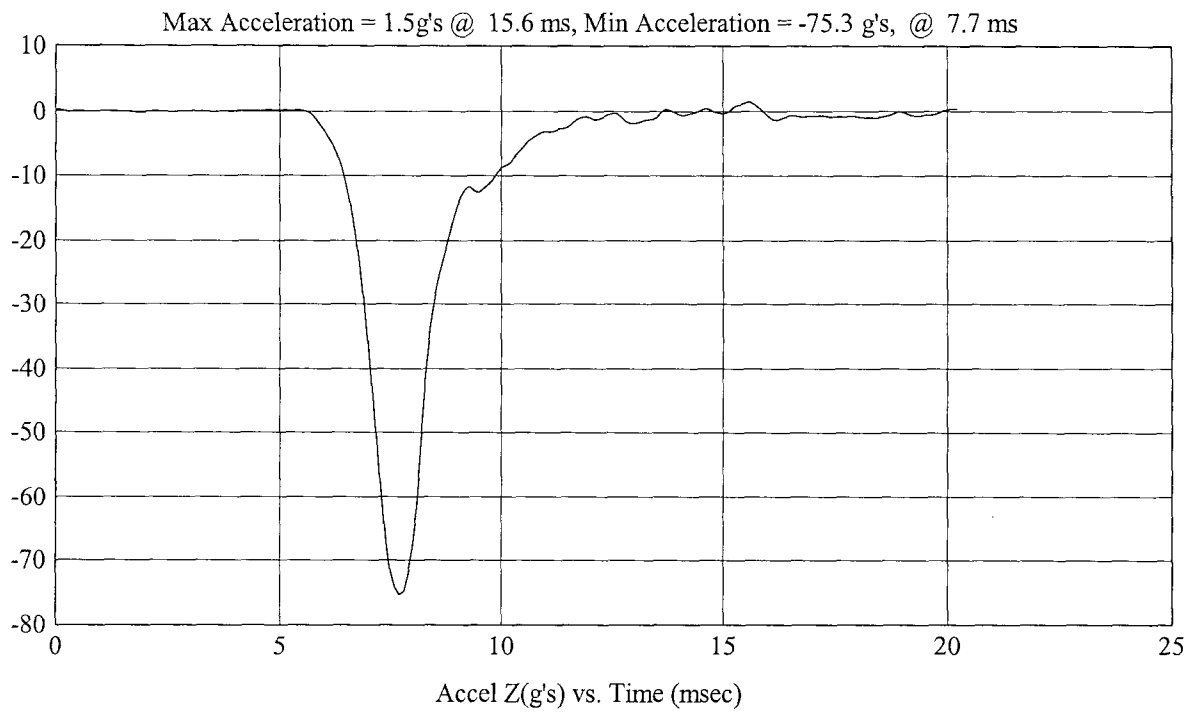
Test Number: H38245

MGA Job Number: G04I7-001.9

Test Date: 9/3/04

Test Description: Post - Test Calibration

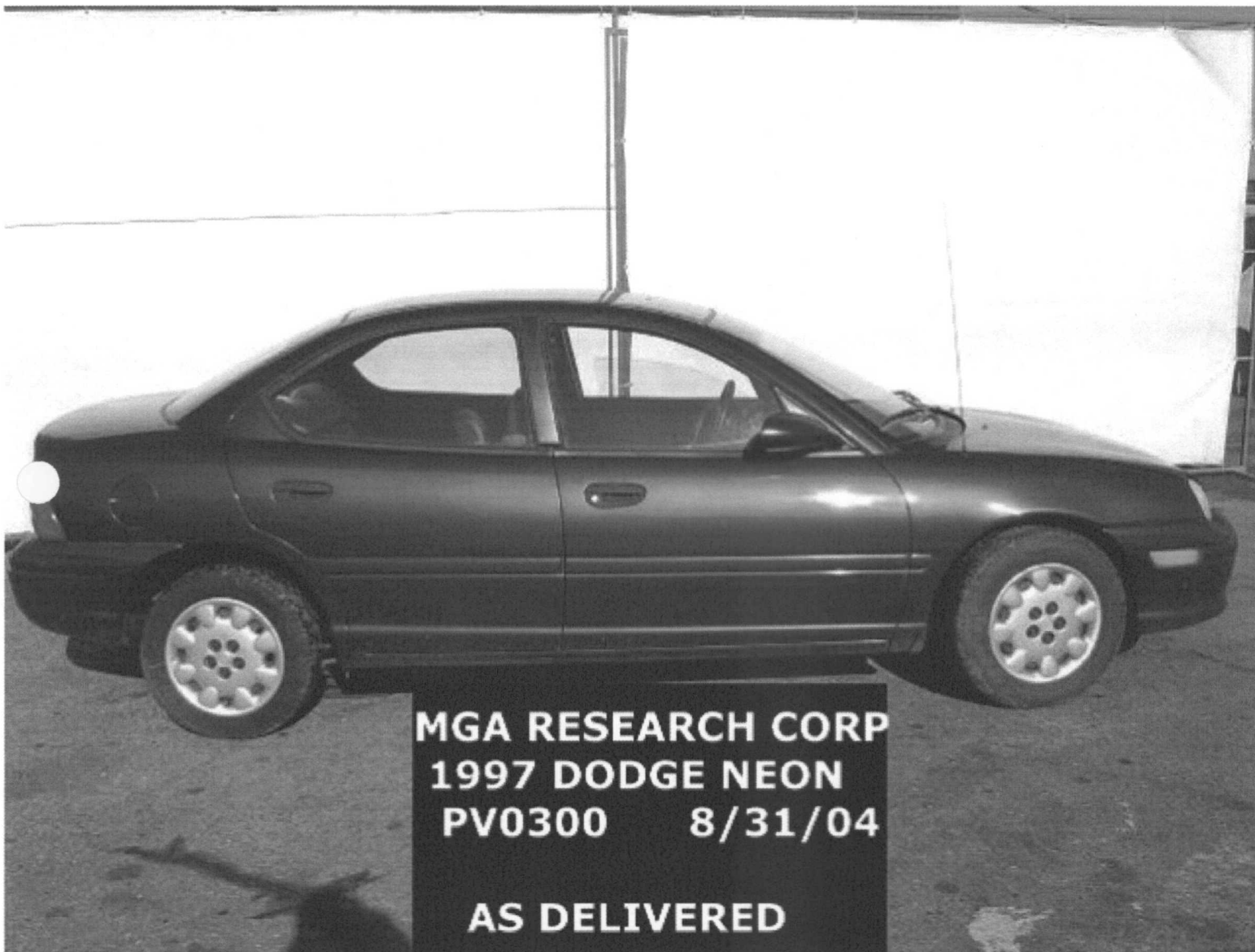
Head #: 038





**MGA RESEACH CORP**  
**1997 DODGE NEON**  
**PV0300 8/31/04**

**AS DELIVERED**



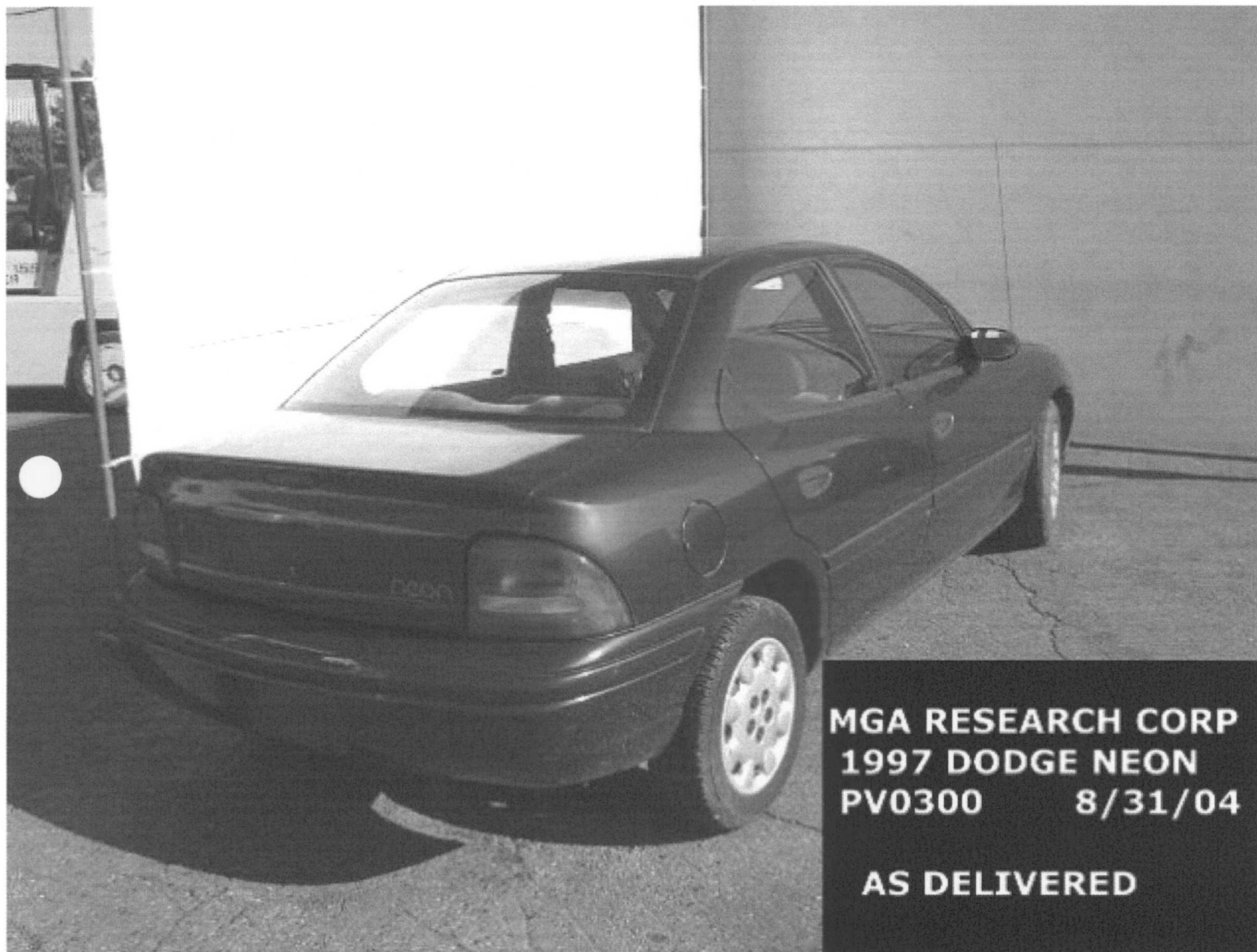
**MGA RESEARCH CORP**  
**1997 DODGE NEON**  
**PV0300 8/31/04**

**AS DELIVERED**



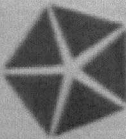
**MGA RESEARCH CORP  
1997 DODGE NEON  
PV0300 8/31/04**

**AS DELIVERED**



**MGA RESEARCH CORP**  
**1997 DODGE NEON**  
**PV0300      8/31/04**

**AS DELIVERED**

|  | VEHICLE<br>CAPACITY<br>OR LESS |
|-------------------------------------------------------------------------------------|--------------------------------|
| 1st SEAT                                                                            | 2 PASS                         |
| 2nd SEAT                                                                            | 3 PASS                         |
| LUGGAGE                                                                             | 115 LBS-52 kg                  |
| TOTAL                                                                               | 5 PASS                         |
| TOTAL<br>WEIGHT                                                                     | 865 LBS-392 kg                 |
| TIRE<br>PRESSURE<br>COLD                                                            | 32 PSI<br>220 kPa              |

## RECOMMENDED TIRE SIZES

**P175/70R14**

STANDARD LOAD

**P185/65R14**

STANDARD LOAD

SEE OWNERS MANUAL FOR  
ADDITIONAL DATA

PRINTED IN USA 4472 985



MFD BY CHRYSLER CORPORATION

DATE OF MFR: 7-96

GVWR: 1595 KG

GVWR: 0887 KG

GVWR: 0731 KG

03515 LB

FRONT: 1955 LB

REAR: 1610 LB

VIN: 1B3ES47C4V0

TYPE: PASSENGER CAR

NCH: 073017 996

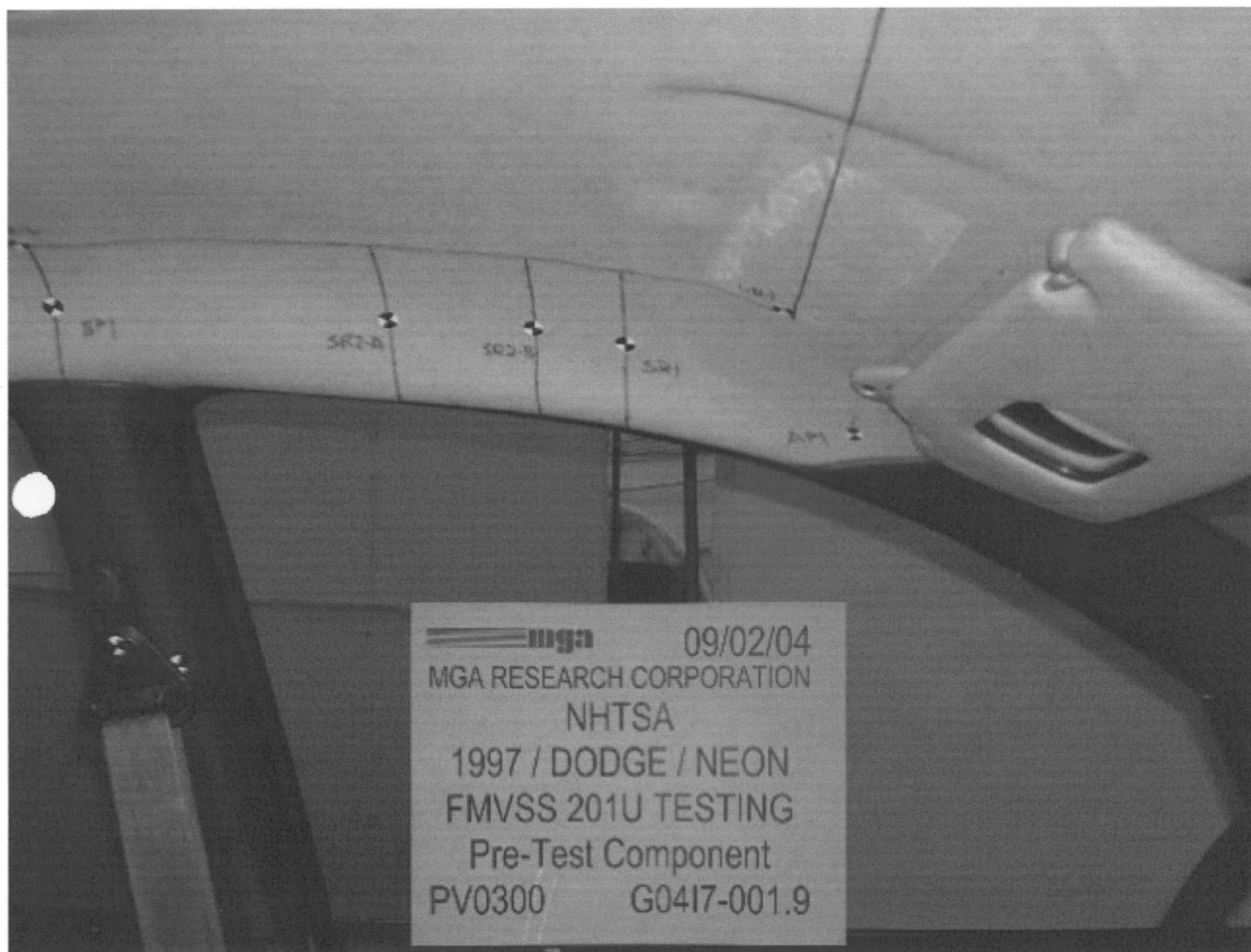
PAINT: P03

TRIM: K74Z

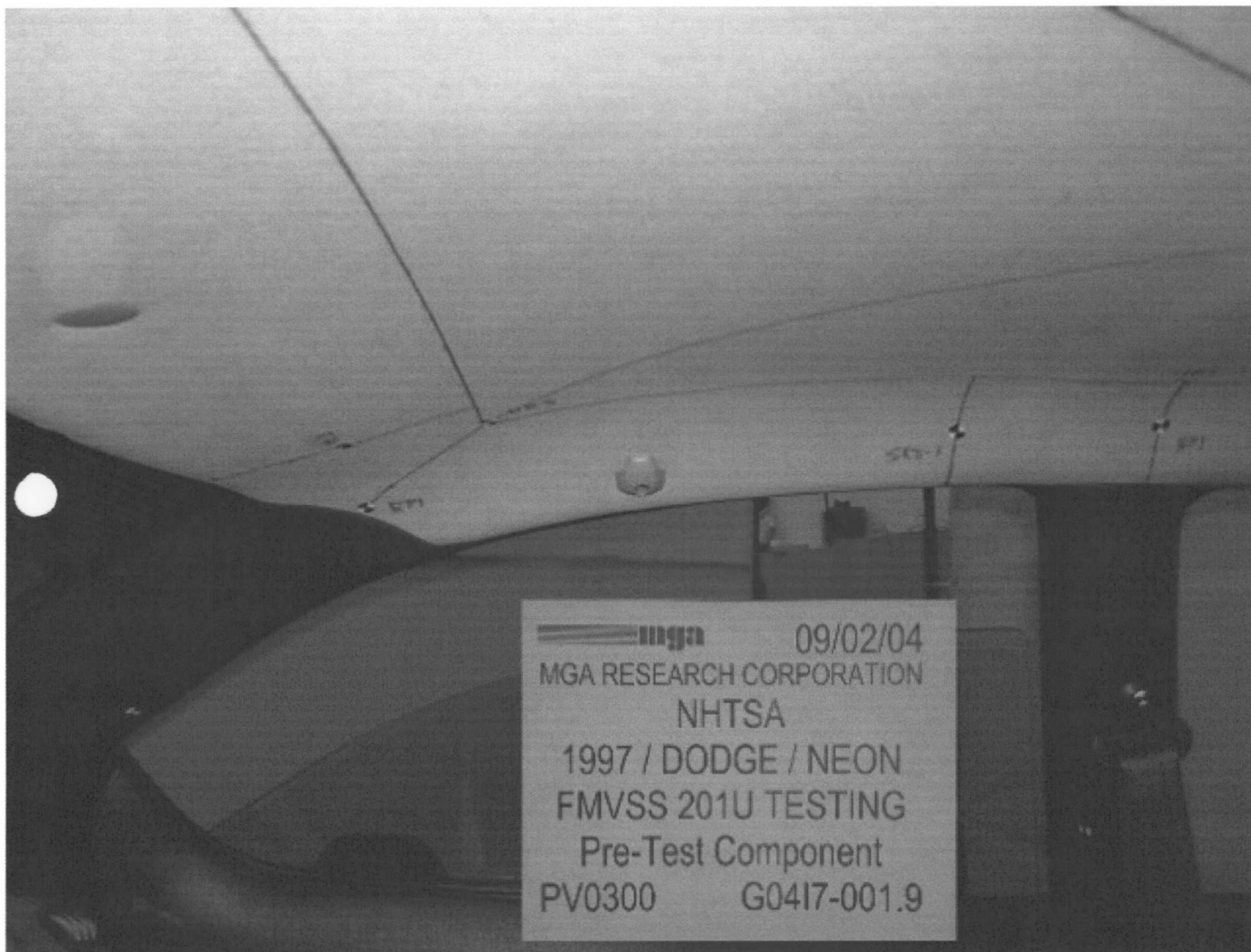
4658043

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

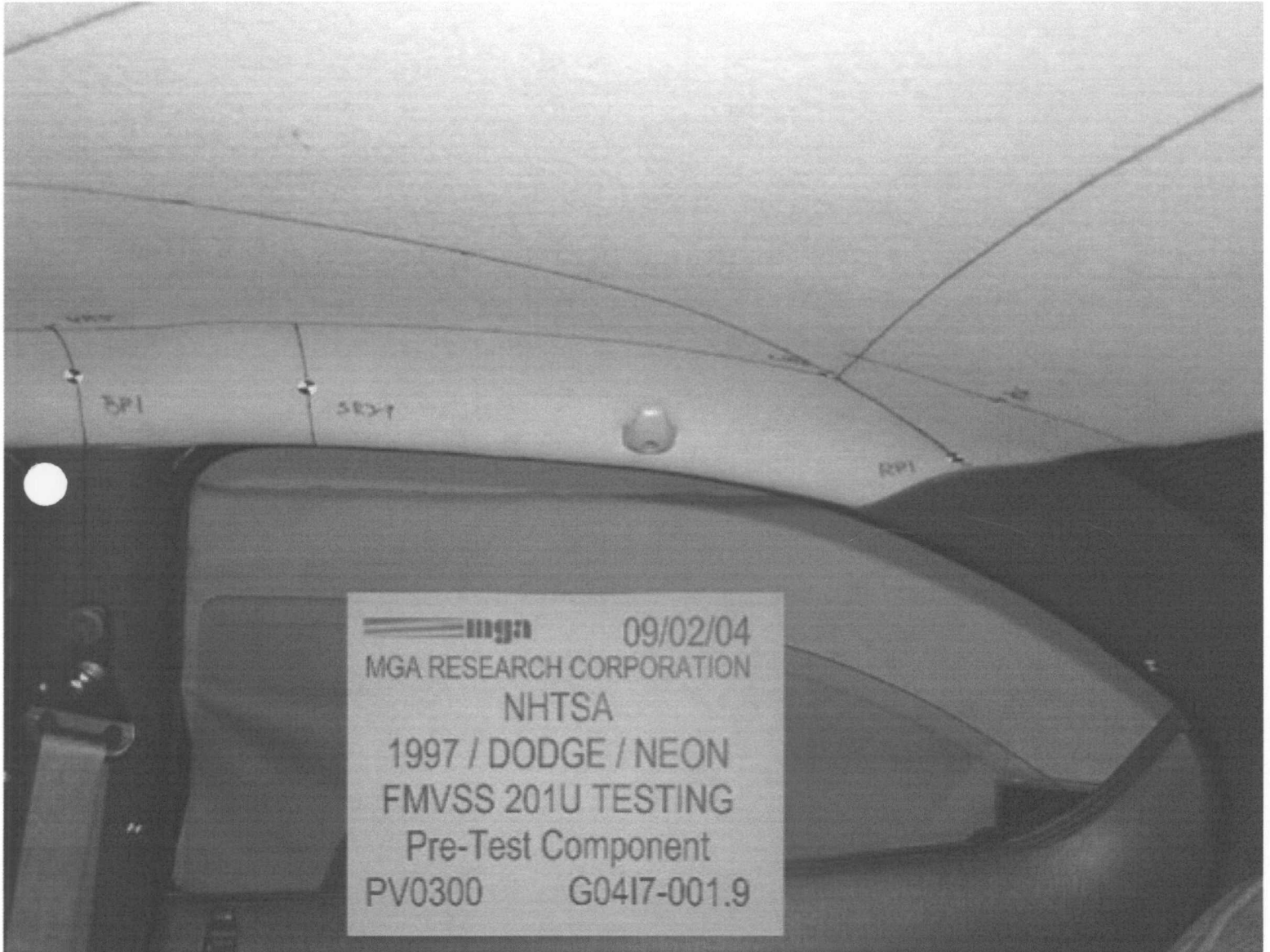
VEHICLE MADE IN U.S.A.



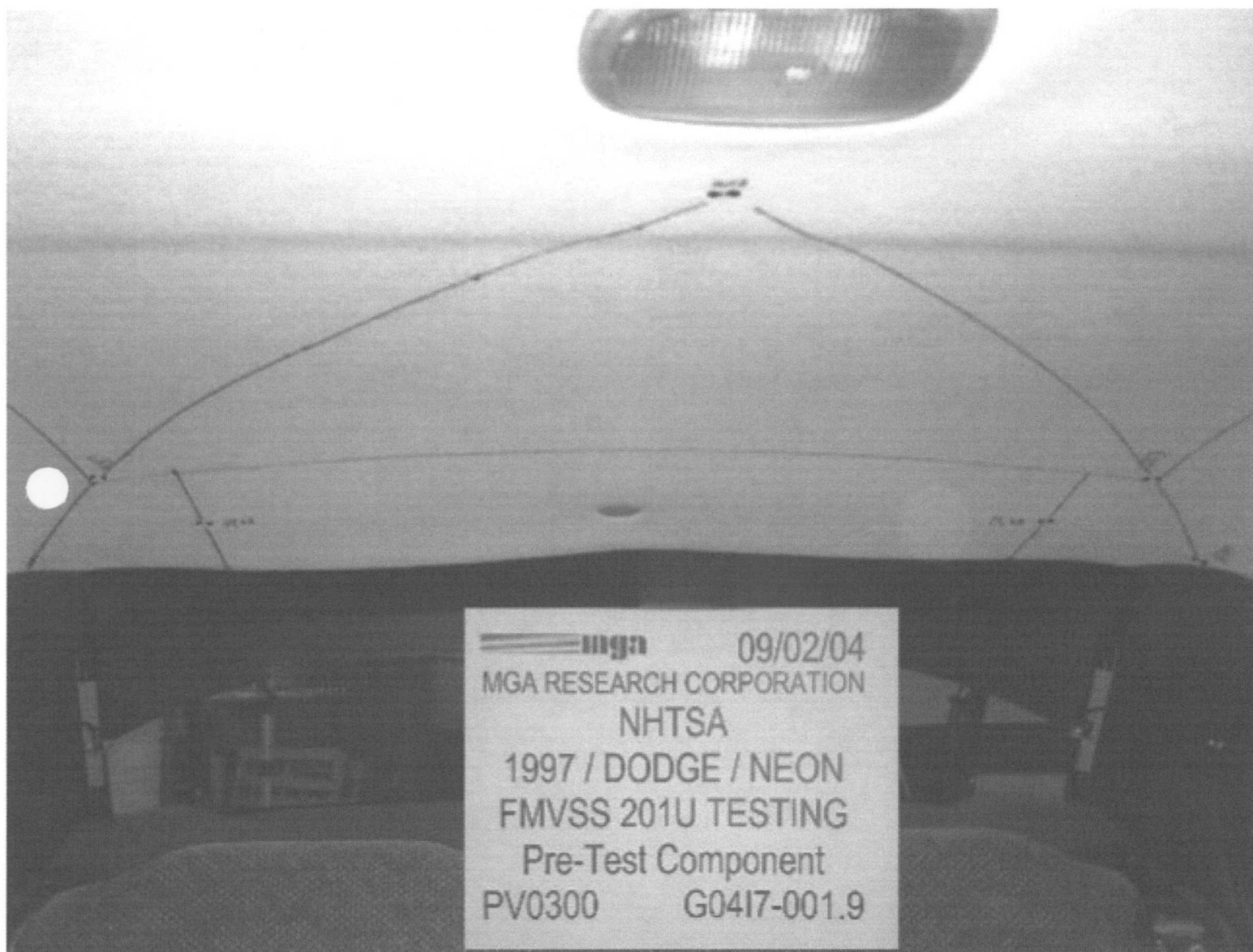


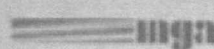




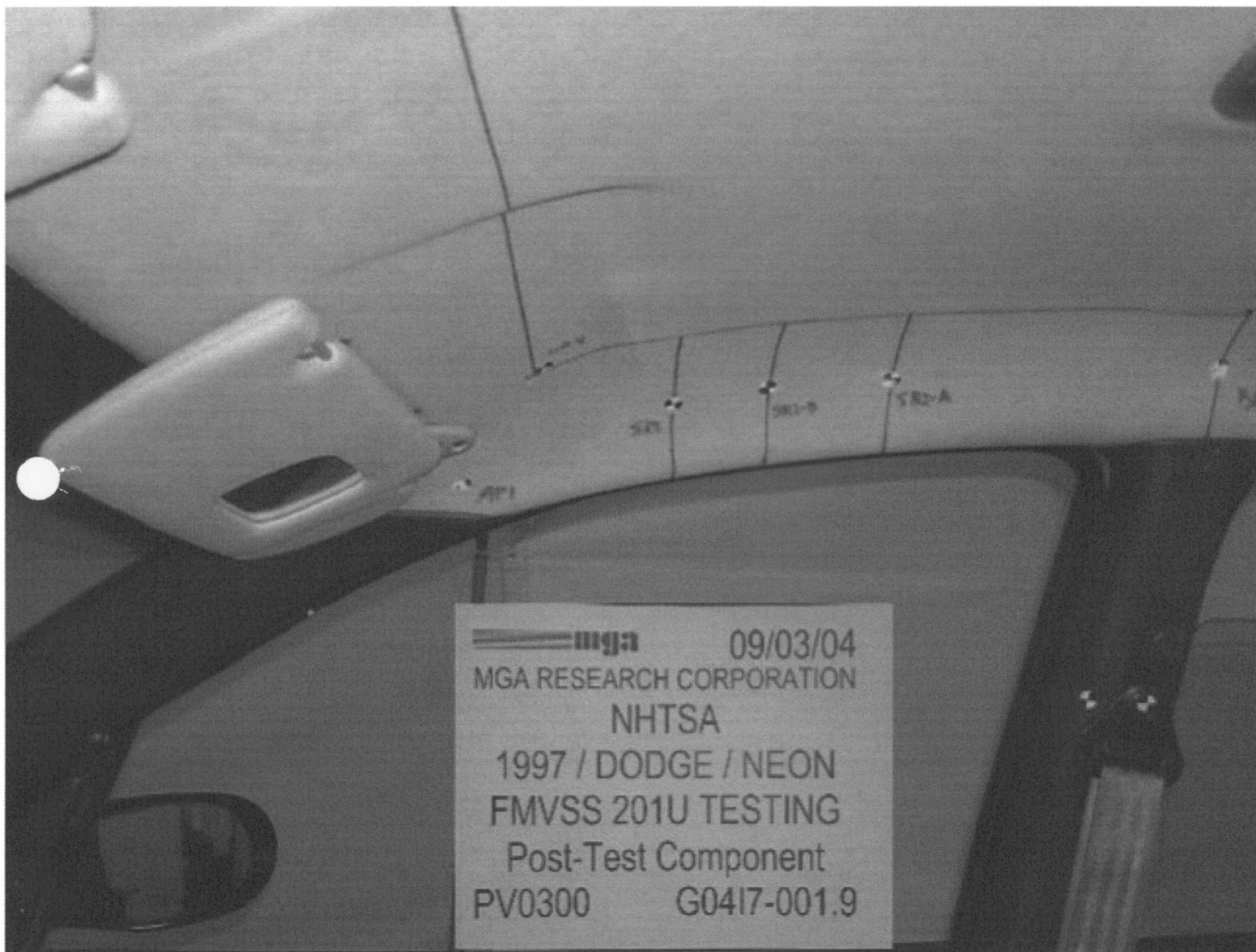




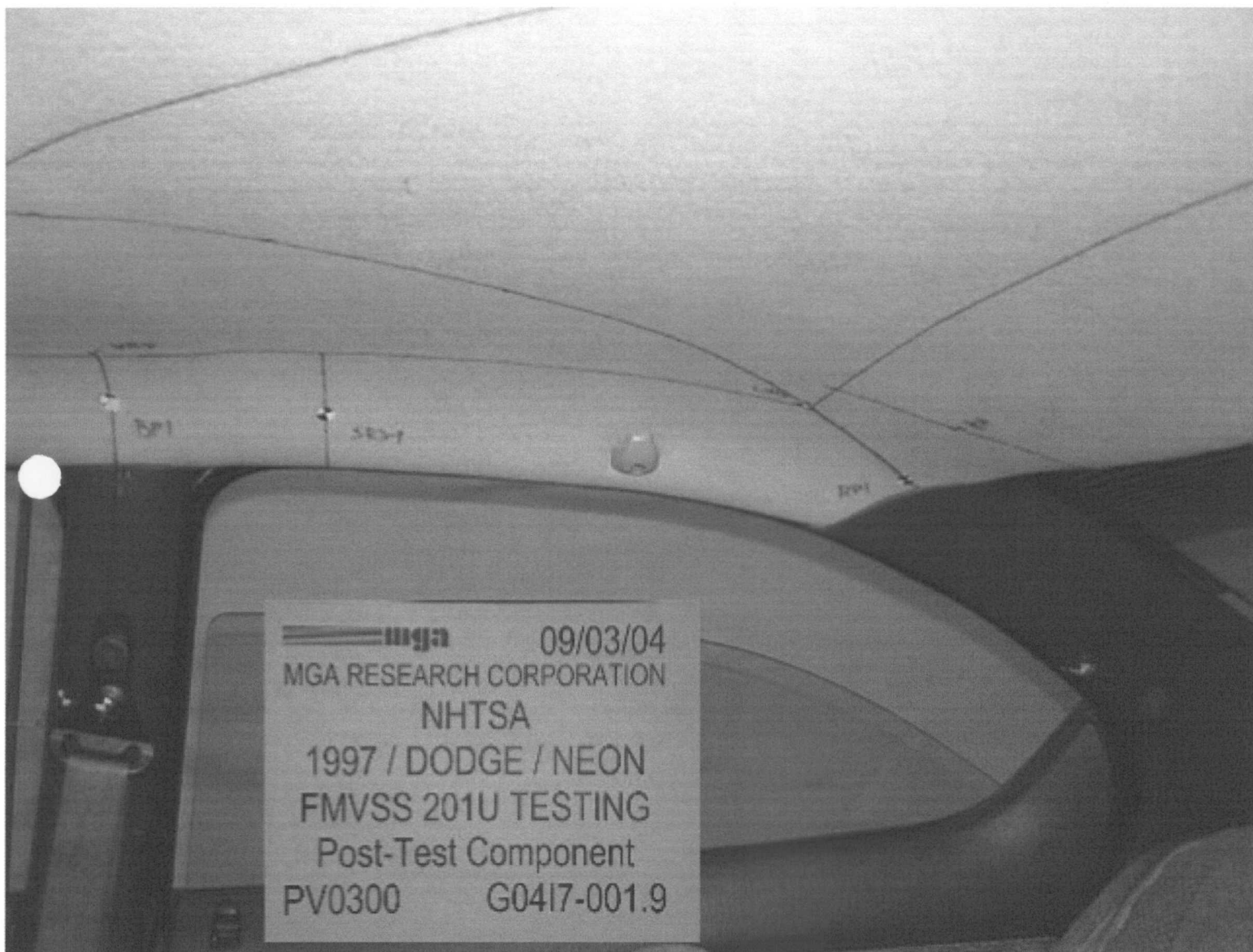


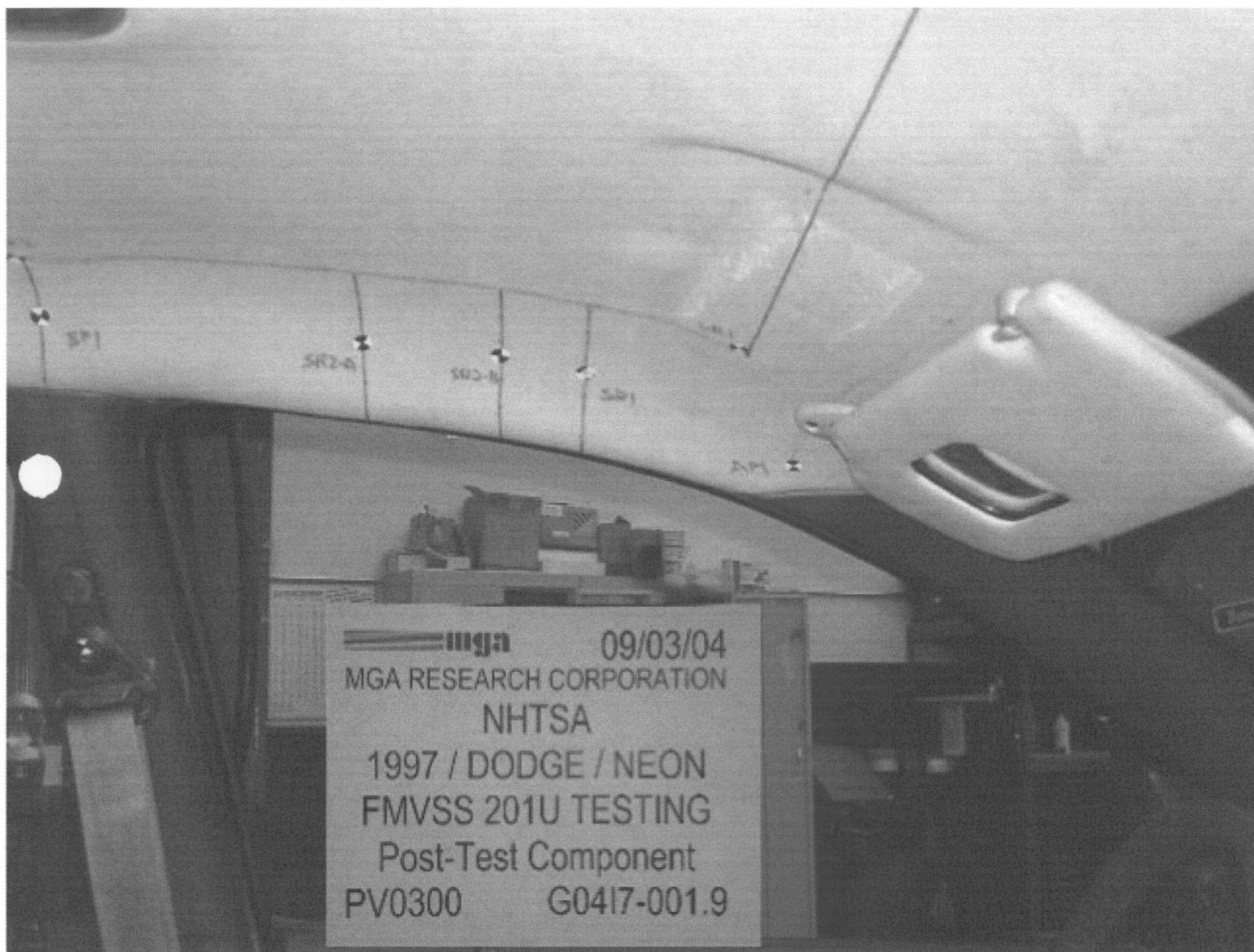
 09/02/04  
MGA RESEARCH CORPORATION  
NHTSA  
1997 / DODGE / NEON  
FMVSS 201U TESTING  
Pre-Test Component  
PV0300 G04I7-001.9

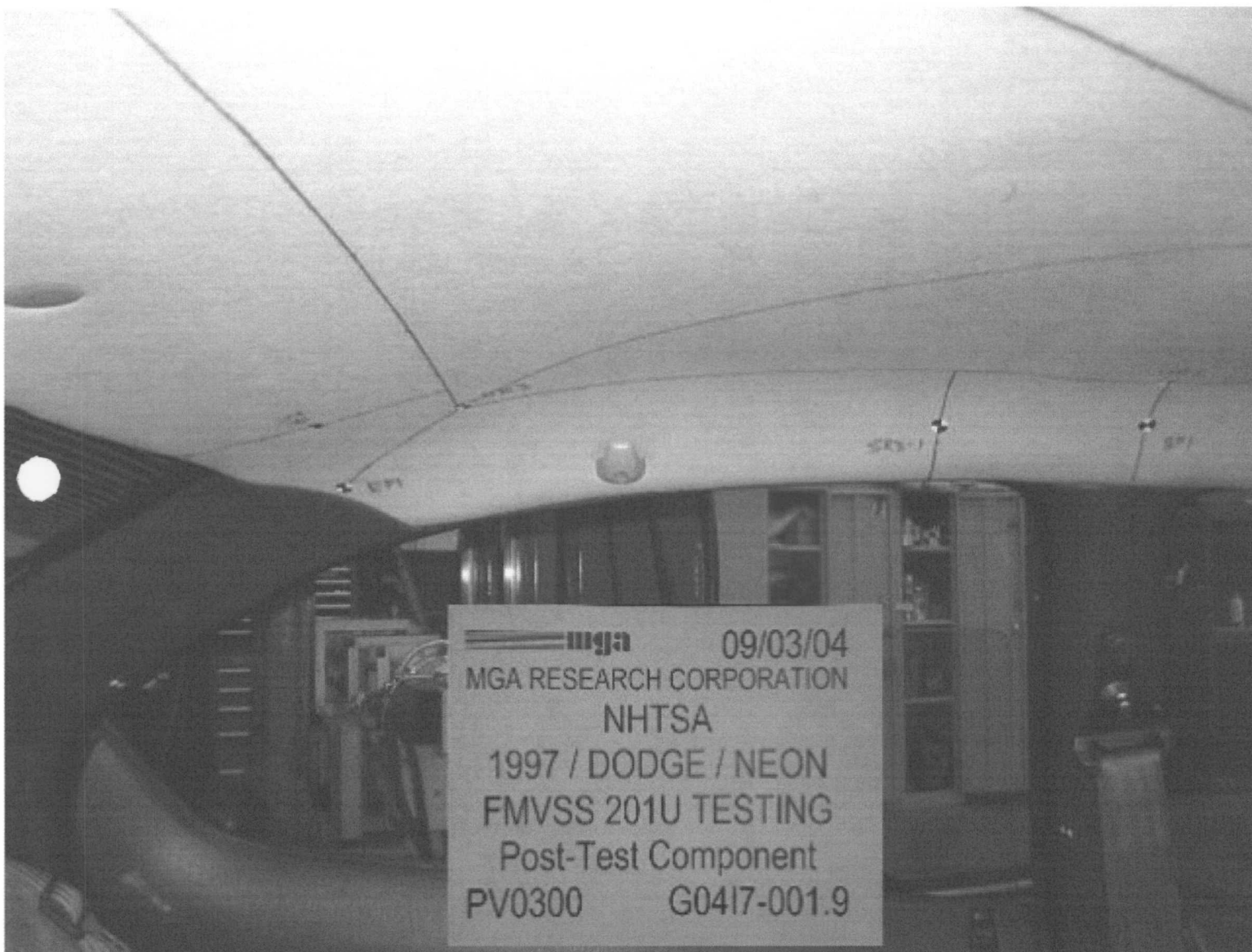


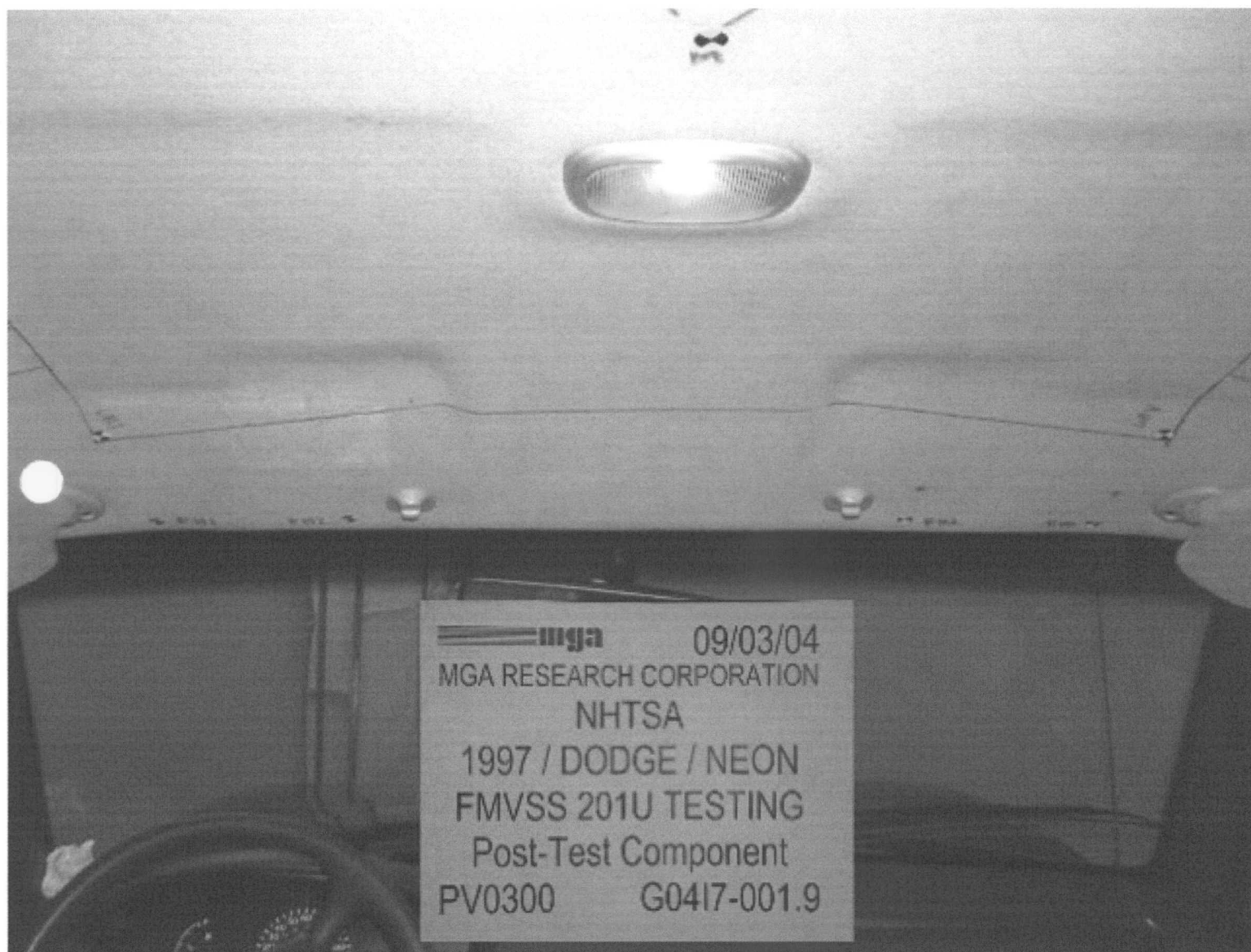




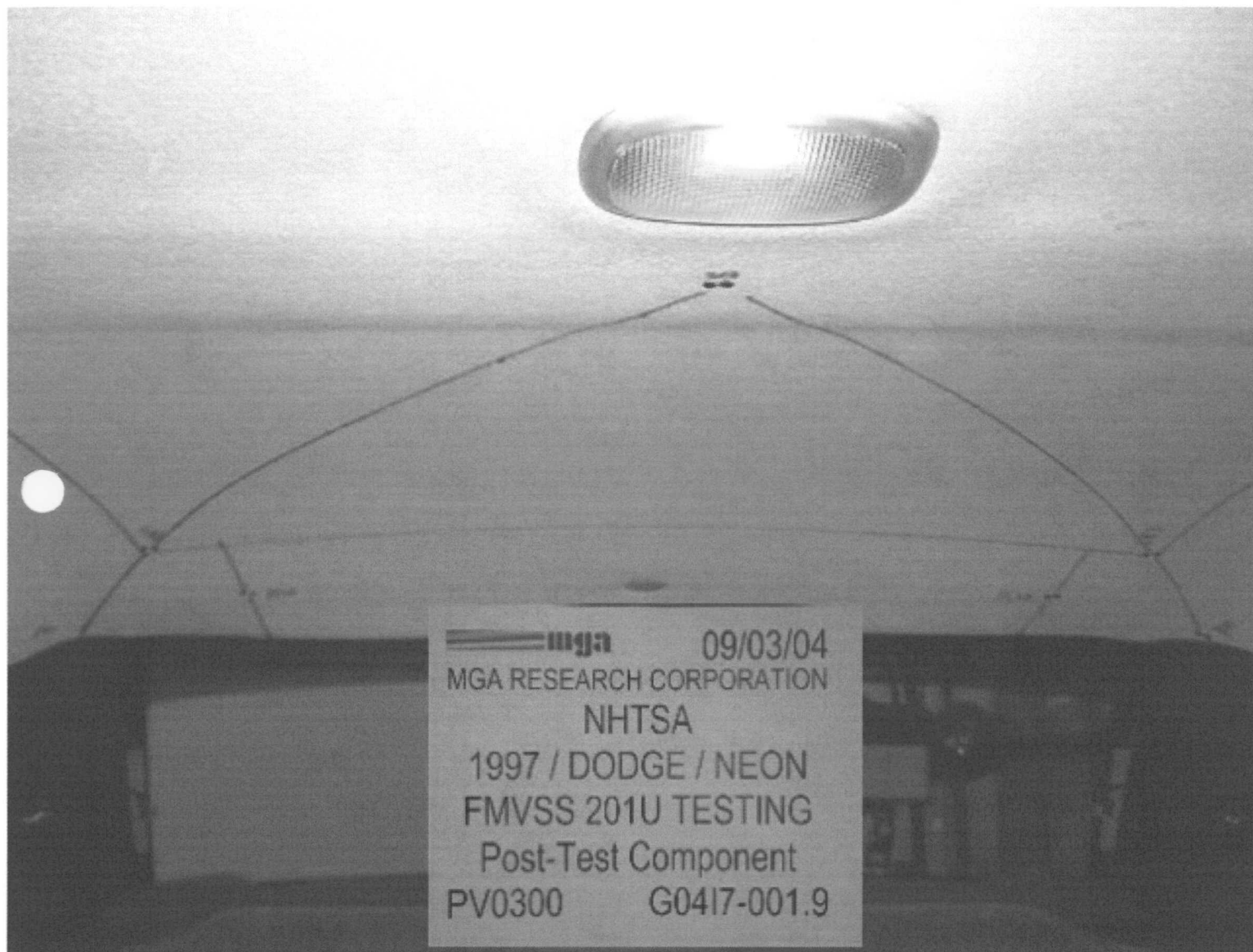




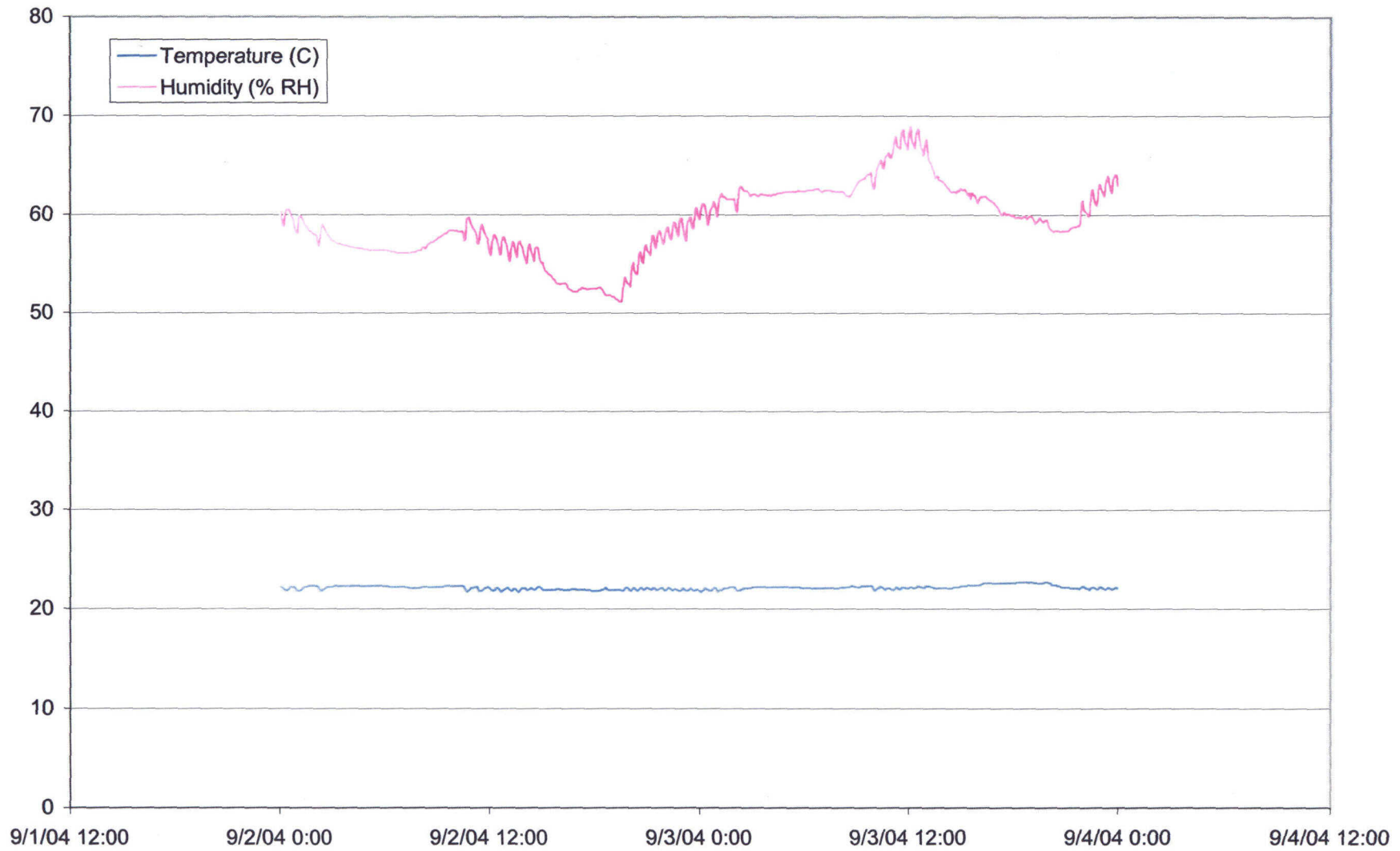


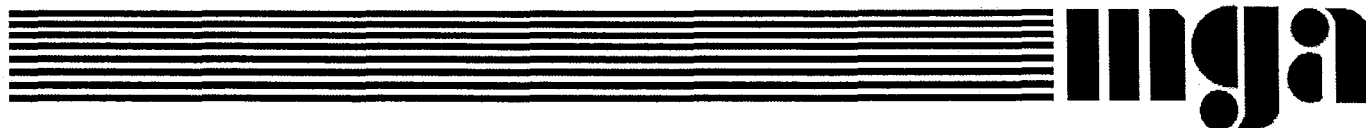






**1997 Dodge Neon PV0300**  
**September 2-3, 2004**





## mga research corporation

### CALIBRATION CERTIFICATE

| Sensor Information                | Reference Sensor Information                                   |
|-----------------------------------|----------------------------------------------------------------|
| <b>Name:</b> 2000 G Accelerometer | <b>Name:</b> <i>Reference Accelerometer</i>                    |
| <b>Model:</b> 7624-2000           | <b>Model:</b> 301M09/484B                                      |
| <b>S/N:</b> J36197                | <b>S/N:</b> 862/247                                            |
| <b>Capacity:</b> 2000 G           | <b>Capacity:</b> 170 G                                         |
| <b>Calibration Date:</b> 5/23/04  | <b>Calibration Date:</b> 5/11/04                               |
|                                   | <b>Calibrated By:</b> <i>Chris Vega/PCB Piezotronics, Inc.</i> |

**Test Reference Number:** A0412

**New DLR (100k , Units: G):** 108.0

**StdDeviation (%):** 0.915

**% Difference in DLR (New vs. Old):** 0.719

**Temperature (°F):** 74

**Humidity (%):** 50

**Performed By:**

**Approved By:**

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is  $\pm 3.8\%$ .  
All certification data and equipment are on file for inspection at your request. Best uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor  $k=2$ .



## mga research corporation

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| Sensor Information                | Reference Sensor Information                                   |
|-----------------------------------|----------------------------------------------------------------|
| <b>Name:</b> 2000 G Accelerometer | <b>Name:</b> <i>Reference Accelerometer</i>                    |
| <b>Model:</b> 7624-2000           | <b>Model:</b> 301M09/484B                                      |
| <b>S/N:</b> J36193                | <b>S/N:</b> 862/247                                            |
| <b>Capacity:</b> 2000 G           | <b>Capacity:</b> 170 G                                         |
| <b>Calibration Date:</b> 5/23/04  | <b>Calibration Date:</b> 5/11/04                               |
|                                   | <b>Calibrated By:</b> <i>Chris Vega/PCB Piezotronics, Inc.</i> |

**Test Reference Number:** A0412

**New DLR (100k , Units: G):** 101.4

**StdDeviation (%)** 0.375

**% Difference in DLR (New vs. Old):** -3.509

**Temperature (°F):** 74

**Humidity (%):** 50

**Performed By:**

**Approved By:**

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is  $\pm 3.8\%$ .  
All certification data and equipment are on file for inspection at your request. Best uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor  $k=2$ .

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## mga research corporation

### CALIBRATION CERTIFICATE

| Sensor Information                | Reference Sensor Information                                   |
|-----------------------------------|----------------------------------------------------------------|
| <b>Name:</b> 2000 G Accelerometer | <b>Name:</b> <i>Reference Accelerometer</i>                    |
| <b>Model:</b> 7624-2000           | <b>Model:</b> 301M09/484B                                      |
| <b>S/N:</b> J36353                | <b>S/N:</b> 862/247                                            |
| <b>Capacity:</b> 2000 G           | <b>Capacity:</b> 170 G                                         |
| <b>Calibration Date:</b> 5/23/04  | <b>Calibration Date:</b> 5/11/04                               |
|                                   | <b>Calibrated By:</b> <i>Chris Vega/PCB Piezotronics, Inc.</i> |

**Test Reference Number:** A0412

**New DLR (100k , Units: G):** 96.8

**StdDeviation (%):** 0.376

**% Difference in DLR (New vs. Old):** -0.677

**Temperature (°F):** 74

**Humidity (%):** 50

**Performed By:**

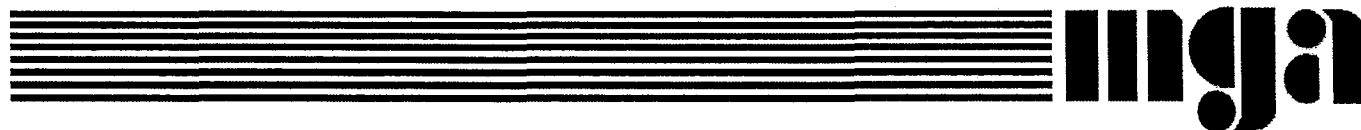
**Approved By:**

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is  $\pm 3.8\%$ .  
All certification data and equipment are on file for inspection at your request. Best uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor  $k=2$ .

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### CALIBRATION CERTIFICATE

| Sensor Information                | Reference Sensor Information                                   |
|-----------------------------------|----------------------------------------------------------------|
| <b>Name:</b> 2000 G Accelerometer | <b>Name:</b> <i>Reference Accelerometer</i>                    |
| <b>Model:</b> 7624-2000           | <b>Model:</b> 301M09/484B                                      |
| <b>S/N:</b> J35924                | <b>S/N:</b> 862/247                                            |
| <b>Capacity:</b> 2000 G           | <b>Capacity:</b> 170 G                                         |
| <b>Calibration Date:</b> 5/21/04  | <b>Calibration Date:</b> 5/11/04                               |
|                                   | <b>Calibrated By:</b> <i>Chris Vega/PCB Piezotronics, Inc.</i> |

**Test Reference Number:** A0410

**New DLR (100k , Units: G):** 92.3

**StdDeviation (%):** 0.106

**% Difference in DLR (New vs. Old):** 0.506

**Temperature (°F):** 72

**Humidity (%):** 47

**Performed By:**

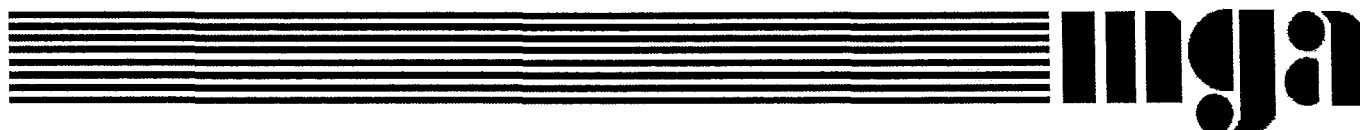
**Approved By:**

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is  $\pm 3.8\%$ .  
All certification data and equipment are on file for inspection at your request. Best uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor  $k=2$ .

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### CALIBRATION CERTIFICATE

| Sensor Information                | Reference Sensor Information                                   |
|-----------------------------------|----------------------------------------------------------------|
| <b>Name:</b> 2000 G Accelerometer | <b>Name:</b> <i>Reference Accelerometer</i>                    |
| <b>Model:</b> 7624-2000           | <b>Model:</b> 301M09/484B                                      |
| <b>S/N:</b> J35919                | <b>S/N:</b> 862/247                                            |
| <b>Capacity:</b> 2000 G           | <b>Capacity:</b> 170 G                                         |
| <b>Calibration Date:</b> 5/21/04  | <b>Calibration Date:</b> 5/11/04                               |
|                                   | <b>Calibrated By:</b> <i>Chris Vega/PCB Piezotronics, Inc.</i> |

**Test Reference Number:** A0410

**New DLR (100k , Units: G):** 93.8

**StdDeviation (%)** 0.066

**% Difference in DLR (New vs. Old):** -0.27

**Temperature (°F):** 72

**Humidity (%):** 47

**Performed By:**

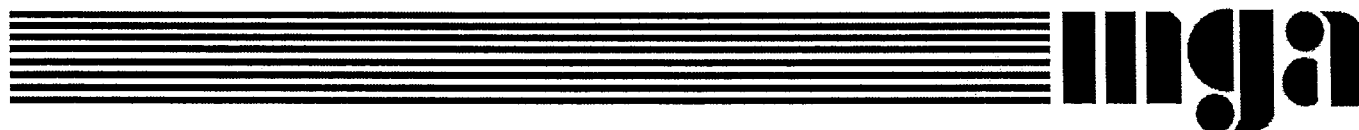
**Approved By:**

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is  $\pm 3.8\%$ .  
All certification data and equipment are on file for inspection at your request. Best uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor  $k=2$ .

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### CALIBRATION CERTIFICATE

| Sensor Information                | Reference Sensor Information                                   |
|-----------------------------------|----------------------------------------------------------------|
| <b>Name:</b> 2000 G Accelerometer | <b>Name:</b> <i>Reference Accelerometer</i>                    |
| <b>Model:</b> 7624-2000           | <b>Model:</b> 301M09/484B                                      |
| <b>S/N:</b> J21969                | <b>S/N:</b> 862/247                                            |
| <b>Capacity:</b> 2000 G           | <b>Capacity:</b> 170 G                                         |
| <b>Calibration Date:</b> 5/19/04  | <b>Calibration Date:</b> 5/11/04                               |
|                                   | <b>Calibrated By:</b> <i>Chris Vega/PCB Piezotronics, Inc.</i> |

**Test Reference Number:** A0409

**New DLR (100k , Units: G):** 88.5

**StdDeviation (%):** 0.194

**% Difference in DLR (New vs. Old):** -1.641

**Temperature (°F):** 73

**Humidity (%):** 43

**Performed By:**

**Approved By:**

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is  $\pm 3.8\%$ .  
All certification data and equipment are on file for inspection at your request. Best uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor  $k=2$ .



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### CALIBRATION CERTIFICATE

| Sensor Information                | Reference Sensor Information                                   |
|-----------------------------------|----------------------------------------------------------------|
| <b>Name:</b> 2000 G Accelerometer | <b>Name:</b> <i>Reference Accelerometer</i>                    |
| <b>Model:</b> 7624-2000           | <b>Model:</b> 301M09/484B                                      |
| <b>S/N:</b> J35923                | <b>S/N:</b> 862/247                                            |
| <b>Capacity:</b> 2000 G           | <b>Capacity:</b> 170 G                                         |
| <b>Calibration Date:</b> 5/23/04  | <b>Calibration Date:</b> 5/11/04                               |
|                                   | <b>Calibrated By:</b> <i>Chris Vega/PCB Piezotronics, Inc.</i> |

**Test Reference Number:** A0412

**New DLR (100k , Units: G):** 100.8

**StdDeviation (%):** 0.782

**% Difference in DLR (New vs. Old):** -1.506

**Temperature (°F):** 74

**Humidity (%):** 50

**Performed By:**

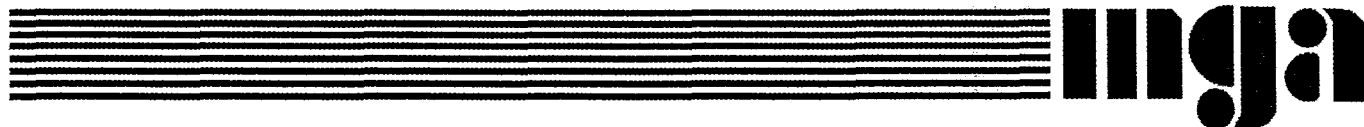
**Approved By:**

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is  $\pm 3.8\%$ .  
All certification data and equipment are on file for inspection at your request. Best uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor  $k=2$ .

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### CALIBRATION CERTIFICATE

| Sensor Information                | Reference Sensor Information                                   |
|-----------------------------------|----------------------------------------------------------------|
| <b>Name:</b> 2000 G Accelerometer | <b>Name:</b> <i>Reference Accelerometer</i>                    |
| <b>Model:</b> 7624-2000           | <b>Model:</b> 301M09/484B                                      |
| <b>S/N:</b> J35916                | <b>S/N:</b> 862/247                                            |
| <b>Capacity:</b> 2000 G           | <b>Capacity:</b> 170 G                                         |
| <b>Calibration Date:</b> 5/23/04  | <b>Calibration Date:</b> 5/11/04                               |
|                                   | <b>Calibrated By:</b> <i>Chris Vega/PCB Piezotronics, Inc.</i> |

**Test Reference Number:** A0412

**New DLR (100k , Units: G):** 100.2

**StdDeviation (%)** 0.215

**% Difference in DLR (New vs. Old):** 0.872

**Temperature (°F):** 74

**Humidity (%):** 50

**Performed By:**

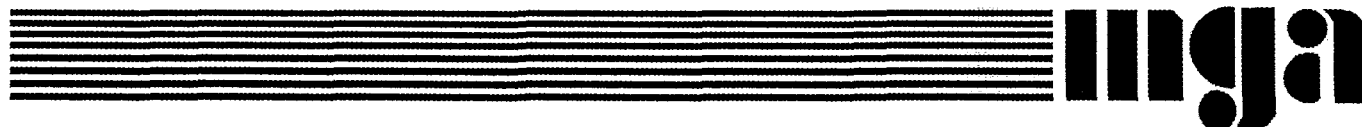
**Approved By:**

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is  $\pm 3.8\%$ .  
All certification data and equipment are on file for inspection at your request. Best uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor  $k=2$ .

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### CALIBRATION CERTIFICATE

| Sensor Information                | Reference Sensor Information                                   |
|-----------------------------------|----------------------------------------------------------------|
| <b>Name:</b> 2000 G Accelerometer | <b>Name:</b> <i>Reference Accelerometer</i>                    |
| <b>Model:</b> 7624-2000           | <b>Model:</b> 301M09/484B                                      |
| <b>S/N:</b> J35918                | <b>S/N:</b> 862/247                                            |
| <b>Capacity:</b> 2000 G           | <b>Capacity:</b> 170 G                                         |
| <b>Calibration Date:</b> 5/23/04  | <b>Calibration Date:</b> 5/11/04                               |
|                                   | <b>Calibrated By:</b> <i>Chris Vega/PCB Piezotronics, Inc.</i> |

**Test Reference Number:** A0412

**New DLR (100k , Units: G):** 97.9

**StdDeviation (%):** 0.929

**% Difference in DLR (New vs. Old):** -0.762

**Temperature (°F):** 74

**Humidity (%):** 50

**Performed By:**

**Approved By:**

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is  $\pm 3.8\%$ .  
All certification data and equipment are on file for inspection at your request. Best uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor  $k=2$ .

## ~Certificate of Calibration~

|                                        |                                                          |
|----------------------------------------|----------------------------------------------------------|
| <b>Model Number:</b> 484B              | <b>N.I.S.T. Project #:</b> 6720012                       |
| <b>Serial Number:</b> 2470             | <b>Calibration Date:</b> 05/11/2004                      |
| <b>Description:</b> Signal Conditioner | <b>Recalibration Date:</b>                               |
| <b>Test Procedure:</b> AT-106-1        | <b>Calibration Technician:</b> Chris Vega <i>CV. #36</i> |
| <b>Temperature:</b> 74° F              | <b>Relative Humidity:</b> 42%                            |

| <u>TESTS</u>                                   | <u>BEFORE</u>  | <u>AFTER</u>   |
|------------------------------------------------|----------------|----------------|
| INPUT VOLTAGE ( $24 \pm 0.1V$ )                | 24.02          | 24.02          |
| ICP CURRENT ( $4 \pm 0.6mA$ )                  | 3.97           | 3.97           |
| DC OFFSET A.C. MODE (volts)                    | -.001          | -.001          |
| GAIN (REF 1 VRMS, 1kHz)                        | 1.0000         | NOT ADJUSTABLE |
| DRIFT (DC MODE)                                | < 2mV/min.     | NOT ADJUSTABLE |
| FREQUENCY RESPONSE<br>10 Vp-p, 1 kHz REFERENCE | FLAT TO 200kHz | NOT ADJUSTABLE |

As Received: In tolerance

As Left: In tolerance

Special Notes: MGA Research

This document certifies that the equipment referenced above meets published specifications. The calibration procedure is in compliance with ISO 10012-1, and former MIL-STD-45662A and is traceable to NIST. \*Measurement uncertainty (95% confidence level w/coverage factor of 2) for scale factors is +/- 0.2%.

This certificate may not be reproduced, except in full, without written approval of



# ~ Calibration Certificate ~

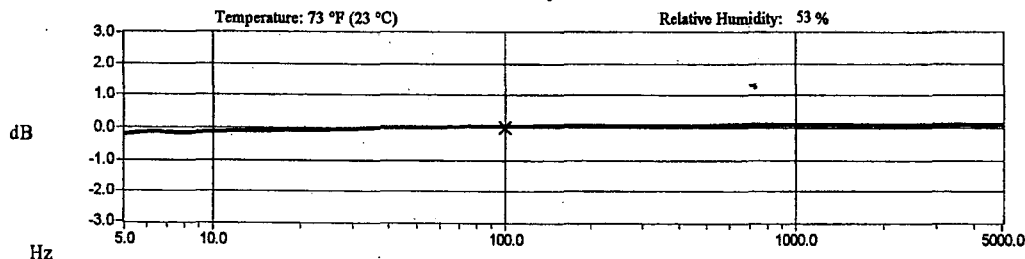
Per ISO 16063-21

Model Number: **301M09/484B (394M17 SYSTEM)**Serial Number: **862/2470**Description: **ICP® Accelerometer**Method: **Back-to-Back Comparison Calibration**Manufacturer: **PCB**

## Calibration Data

Sensitivity @ 100.0 Hz    **31.17 mV/g**    Output Bias    **8.6 VDC**  
                                          **(3.179 mV/m/s<sup>2</sup>)**    Transverse Sensitivity    **3.0 %**

## Sensitivity



## Data Points

| Frequency (Hz) | Dev. (%) | Frequency (Hz) | Dev. (%) | Frequency (Hz) | Dev. (%) |
|----------------|----------|----------------|----------|----------------|----------|
| 5.0            | -2.5     | REF. FREQ.     | 0.0      | 5000.0         | 1.1      |
| 10.0           | -1.9     | 300.0          | 0.7      |                |          |
| 15.0           | -1.4     | 500.0          | 0.8      |                |          |
| 30.0           | -0.6     | 1000.0         | 1.0      |                |          |
| 50.0           | -0.2     | 3000.0         | 1.1      |                |          |

Mounting Surface: Stainless Steel w/Silicone Grease Coating    Fastener: Steel Mount

Acceleration Level (mm/s<sup>2</sup>): 10.0 g (98.1 m/s<sup>2</sup>)

Vertical

\*The acceleration level may be limited by shaker displacement at low frequency. If the listed level cannot be obtained, the calibration system uses the following formula to set the vibration amplitude: Acceleration Level (g) = 0.010 x (Hz)<sup>0.7</sup>.

## Condition of Unit

As Found: **In Tolerance, No Adjustment Necessary**As Left: **In Tolerance**

## Notes

1. Calibration is NIST Traceable thru Project 822/267400 and PTB Traceable thru Project 1055.
2. This certificate shall not be reproduced, except in full, without written approval from PCB Piezotronics, Inc.
3. Calibration is performed in compliance with ISO 9001, ISO 10012-1, ANSI/NCCL Z540-1-1994 and ISO 17025.
4. See Manufacturer's Specification Sheet for a detailed listing of performance specifications.
5. Measurement uncertainty (95% confidence level with coverage factor of 2) for frequency ranges tested during calibration are as follows: 5-9 Hz; +/- 2.0%, 10-99 Hz; +/- 1.5%, 100-1999 Hz; +/- 1.0%, 2-10 kHz; +/- 2.5%.

Technician: **Chuck DiMaggio**Date: **05/13/04**

Cert No 1882.01

**PCB PIEZOTRONICS™**  
 VIBRATION DIVISION

3425 Walden Avenue    Depew, NY 14043

TEL: 888-684-0013    FAX: 716-685-3886    www.pcb.com

PAGE 1 of 1

cmt - 316728389.24

**NuWeigh, Inc.**

10421 Enterprise Drive  
 Davisburg, MI 48350  
 248-922-1435 Fax: 248-922-1465  
 ISO/IEC 17025 ACCREDITED

**CALIBRATION / TEST REPORT**Page 1 of 1

SCR 4365

|                                                            |                                                                                                                                                                                                                                     |                                                                                                            |
|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Customer<br><b>MCA Research</b>                            | Date of service<br><b>3-23-04</b>                                                                                                                                                                                                   | Location<br><b>C.S.</b>                                                                                    |
| Address<br><b>446 Executive Dr.</b>                        | Last known test date<br><b>3-28-03</b>                                                                                                                                                                                              | Environmental conditions acceptable<br><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No |
| City<br><b>Troy</b> State<br><b>MI</b> Zip<br><b>48063</b> | Frequency<br><input checked="" type="checkbox"/> Annual <input type="checkbox"/> Semi Annual <input type="checkbox"/> Quarterly <input type="checkbox"/> Monthly <input type="checkbox"/> Di Monthly <input type="checkbox"/> Other |                                                                                                            |

|                                                                                   |                                                                                                                                  |                                                                                   |                                                                                                                       |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Indicator Mfg.<br><b>Cardinal</b>                                                 | Platform Mfg.<br><b>Cardinal</b>                                                                                                 | Indicator Mfg.                                                                    | Platform Mfg.                                                                                                         |
| Model<br><b>708</b>                                                               | Model<br><b>8950 F</b>                                                                                                           | Model                                                                             | Model                                                                                                                 |
| Serial No.<br><b>9804-022</b>                                                     | Serial No.<br><b>9805-175</b>                                                                                                    | Serial No.                                                                        | Serial No.                                                                                                            |
| Seal Applied? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Platform size<br><b>28"x28"</b>                                                                                                  | Seal Applied? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | Platform size                                                                                                         |
| Customer Id.<br><b>Shop</b>                                                       | Cap. & Grade<br><b>2000x1 lb</b>                                                                                                 | Customer Id.                                                                      | Cap. & Grade                                                                                                          |
| Printer Mfg./model                                                                | General device condition<br><input checked="" type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor | Printer Mfg./model                                                                | General device condition<br><input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor |
| Weight Applied                                                                    | Reading as Found                                                                                                                 | Error as Found                                                                    | Reading as Left                                                                                                       |
| <b>0</b>                                                                          | <b>0</b>                                                                                                                         | <b>0</b>                                                                          | <b>0</b>                                                                                                              |
| <b>100 lb</b>                                                                     | <b>100</b>                                                                                                                       | <b>0</b>                                                                          | <b>0</b>                                                                                                              |
| <b>300 lb</b>                                                                     | <b>300</b>                                                                                                                       | <b>0</b>                                                                          | <b>0</b>                                                                                                              |
| <b>500 lb</b>                                                                     | <b>500</b>                                                                                                                       | <b>0</b>                                                                          | <b>0</b>                                                                                                              |
| <b>300 lb</b>                                                                     | <b>300</b>                                                                                                                       | <b>0</b>                                                                          | <b>0</b>                                                                                                              |
| <b>100 lb</b>                                                                     | <b>100</b>                                                                                                                       | <b>0</b>                                                                          | <b>0</b>                                                                                                              |
| <b>0</b>                                                                          | <b>0</b>                                                                                                                         | <b>0</b>                                                                          | <b>0</b>                                                                                                              |
| <b>X</b>                                                                          | <b>X</b>                                                                                                                         | <b>X</b>                                                                          | <b>0</b>                                                                                                              |
| Load Section #1                                                                   | <b>100</b>                                                                                                                       | <b>0</b>                                                                          | <b>0</b>                                                                                                              |
| Load Section #2                                                                   | <b>100</b>                                                                                                                       | <b>0</b>                                                                          | <b>0</b>                                                                                                              |
| Load Section #3                                                                   | <b>100</b>                                                                                                                       | <b>0</b>                                                                          | <b>0</b>                                                                                                              |
| Load Section #4                                                                   | <b>100</b>                                                                                                                       | <b>0</b>                                                                          | <b>0</b>                                                                                                              |

Scale meets HB44 tolerance: Yes ☒ NoStandards used (serial nos.): **6-15**Estimated measurement uncertainty of applied load is **.038** %Traceable report nos. **MI 10-01-6285****RECOMMENDATIONS/OPINIONS**

**No adjustments needed**  
**Scale Tested good**

Scale meets HB44 tolerance: Yes ☐ No

Standards used (serial nos.):

Estimated measurement uncertainty of applied load is %

Traceable report nos.

**RECOMMENDATIONS/OPINIONS**

Test procedure: NuWeigh Quality Manual and Procedures, Handbook 44

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**Mike Kint**  
 TECHNICIAN

**3-23-04**  
 DATE

**George Baber**  
 CUSTOMER

White - Customer Copy

Canary - File Copy

SCR Rev. 7.602

# Interim Certification Document

Part Description: Gold Series Faro Arm

Serial Number: G08020203122

Single Point 2 Sigma: G08-00 +/-0.051mm (+/-0.0020 in)

Linear Displacement 2 Sigma: G08-00 +/-0.072mm (+/-0.0028 in)

Certification Date: February 03, 2004

## MEASUREMENT STANDARDS, N.I.S.T., U.K.A.S. TRACEABILITY

|                                                                |                                      |                                                            |                                                      |
|----------------------------------------------------------------|--------------------------------------|------------------------------------------------------------|------------------------------------------------------|
| Bal-Tec Invar Ball Bar Kit                                     | Kit Serial Number: 473               | N.I.S.T. Test No.: FBB-473-12012003 Date: 12/01/2003       | UK A.S. Cert. No.: FBB-473-12012003 Date: 12/01/2003 |
| Mitutoyo Corporation, 10mm Step Gage,<br>Measuring Range: 1.5m | Code No.: 515744, Serial No.: 810107 | N.I.S.T. Control No.: 279517<br>U.K.A.S. Cert. No.: 133193 | Date: 01/13/2003<br>Date: 12/18/2002                 |

## CERTIFICATION RESULTS

|                                                                                                                                                                                    |        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| A basic 4 quadrant certification included with all Gold Series and comprised of: 2 vertical level single point repeatability test in 4 quadrants with 5 repeats from 4 directions. | PASSED |
| 12 Step gauge tests in 12 positions.                                                                                                                                               | PASSED |
| FARO ball bar 10 points per quadrant in 4 quadrants.                                                                                                                               | PASSED |
| 3 lengths in 8 positions free ball bar test.                                                                                                                                       | PASSED |

This instrument, as received, was within specifications.

Ambient Temperature: 22°C ± 3°C

Technician:

*Rafael Rocha*

Rafael Rocha

02/03/04

This certificate shall not be reproduced, except in full, without the written permission of FARO Technologies, Inc.

The results of this certificate relate only to the items calibrated or tested

Faro Technologies, Inc.  
ph: (407) 333-9911

125 Technology Park  
1-800-736-2771

Lake Mary, FL 32746  
(407) 333-8056 fax

# FARO

Revised: January 22, 2004

f:\control\forms\07qcontr\English\07frm07-006.doc



Certificate Number: 20040204Cal

# Detroit Testing Laboratory, Inc.



7111 E. 11 Mile Road, Warren, MI 48092-2709 • (586) 754-0000 • FAX (586) 754-9045 • www.dtl-inc.com

## Certificate of Calibration

### Equipment Information

Customer: MGA Research Corporation  
446 Executive Drive  
Troy, MI 48083

Model: Pro 360  
Serial Number: NONE  
Manufacturer: Mitutoyo  
Description: Protractor

System ID: MGA00072

Customer Asset No.: MGA00072(012904)

### Calibration Information

Calibration Date: 1/28/04  
Calibration Due: 1/28/05  
Calibration Interval: 12 Month  
Rec'd In Tol: <sup>1</sup> Yes/Pass  
Returned In Tol: <sup>1</sup> Yes/Pass  
Performed On Site: No

Procedure Used: 33K6-4-1597-1/99  
Calibrated to: MFR SPEC  
Temperature: 20 °C  
Humidity: 35 %RH

### Calibration Limitation:

The Uncertainty of the Measurements Pertaining to This Calibration are Estimated to be: Various

<sup>1</sup> Pass/Fail or In/Out of Tolerance statements are opinions only of the person performing the calibration based on data from measurements at the time they were made, procedure utilized, professional experience, and the uncertainty associated with this calibration. It is ultimately up to the user of this equipment to determine if this item meets their specific requirements for accuracy for its intended application.

### Calibration Standards Used

| System ID: | Model:          | Serial:  | Manufacturer        | Description:          | Date Due: |
|------------|-----------------|----------|---------------------|-----------------------|-----------|
| 09098      | CT485B          | 61201094 | Omega               | Thermohumidigraph     | 7/28/04   |
| 07748      | 2 X 2'          | 13928    | TRU-STONE           | Granite Surface Plate | 2/19/04   |
| 10493      | SP-66-S1        | 9902     | Suburban Tool, Inc. | Sine Plate            | 2/17/06   |
| 09156      | CHALLENGER 81 P | 09156    | AA JANSSON          | Gage Blocks           | 3/5/04    |

Any calibration interval and due date of this device, if stated, is at the request of the customer. Due to the fact that many variables may effect drift of reported values over time there is no assurance implied that this item will maintain it's stated accuracy through the end of this interval.

This Calibration has been performed per requirements of ISO 17025-1999. Reported results are from standards with accuracies that are traceable to the International Systems of Units (SI), derived from physical constants, ratio measurements, national measurement standards, or compared to consensus standards. Measurement uncertainty is expressed at a confidence level of approximately 95% (coverage factor k=2).

|                                                                  |                            |                                                      |
|------------------------------------------------------------------|----------------------------|------------------------------------------------------|
| Signature: <u>Paul Wonsowicz</u><br>Paul Wonsowicz<br>Technician | Date: <u>1-29-04</u>       | Approved: <u>[Signature]</u><br>Date: <u>1/30/04</u> |
| Date Printed: 01/29/04                                           | Printed By: Paul Wonsowicz | Page: 1 of 2                                         |

QFC 1048-1 Rev 4/17/03

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Certificate Number: 20040729Cal

# Detroit Testing Laboratory, Inc.



7111 E. 11 Mile Road, Warren, MI 48092-2709 • (586) 754-9000 • FAX (586) 754-9045 • www.dtl-inc.com

## Certificate of Calibration

### Equipment Information

Customer: MGA Research Corporation  
446 Executive Drive  
Troy, MI 48083

Model: AP 20  
Serial Number: E33603-0213  
Manufacturer: Detecto  
Description: Scale

System ID: MGA00081  
Customer Asset No.:

### Calibration Information

Calibration Date: 3/24/04  
Calibration Due: 3/24/05  
Calibration Interval: 12 Month  
Rec'd In Tol:<sup>1</sup> Yes/Pass  
Returned In Tol:<sup>1</sup> Yes/Pass  
Performed On Site: No

Procedure Used: 33K6-4-72-1/98  
Calibrated to: MFR SPEC  
Temperature: 24 °C  
Humidity: 37 %RH

Calibration Limitation:

The Uncertainty of the Measurements Pertaining to This Calibration are Estimated to be: (0.006 + 0.01% Ind) lb

<sup>1</sup> Pass/Fail or In/Out of Tolerance statements are opinions only of the person performing the calibration based on data from measurements at the time they were made, procedure utilized, professional experience, and the uncertainty associated with this calibration. It is ultimately up to the user of this equipment to determine if this item meets their specific requirements for accuracy for its intended application.

### Calibration Standards Used

| System ID: | Model:  | Serial:  | Manufacturer: | Description:      | Date Due: |
|------------|---------|----------|---------------|-------------------|-----------|
| 09126      | CT485B  | 61201050 | OMEGA         | Thermohumidigraph | 5/12/04   |
| 07580      | CLASS C | 07580    | TROEMNER      | WEIGHT SET        | 9/11/04   |

Any calibration interval and due date of this device, if stated, is at the request of the customer. Due to the fact that many variables may effect drift of reported values over time there is no assurance implied that this item will maintain it's stated accuracy through the end of this interval.

This Calibration has been performed per requirements of ISO 17025-1999. Reported results are from standards with accuracies that are traceable to the International Systems of Units (SI), derived from physical constants, ratio measurements, national measurement standards, or compared to consensus standards. Measurement uncertainty is expressed at a confidence level of approximately 95% (coverage factor k=2).

|                                              |                                    |                                     |                      |
|----------------------------------------------|------------------------------------|-------------------------------------|----------------------|
| Signature: <u>Jerry Wells</u><br>Jerry Wells | Date: <u>3-24-04</u><br>Technician | Approved: <u>Paul W.</u><br>Paul W. | Date: <u>3-24-04</u> |
|----------------------------------------------|------------------------------------|-------------------------------------|----------------------|

Date Printed: 03/24/04

Printed By: Jerry Wells

Page: 1 of 2

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Detroit Testing Laboratory, Inc.

## CALIBRATION DATA SHEET

Date: 3/24/04  
DTL I.D: MGA00081  
Cert. Number: 20040729Cal

| Cal Point<br>lb<br>std | Reading<br>As Found<br>lb<br>out | Reading<br>As Left<br>lb<br>out | Deviation<br>As Found<br>lb | Deviation<br>As Left<br>lb | % of Allowed<br>Dev as Found | % of Allowed<br>Dev as Left |
|------------------------|----------------------------------|---------------------------------|-----------------------------|----------------------------|------------------------------|-----------------------------|
| 5.00                   | 5.00                             | 5.00                            | 0.00                        | 0.00                       | 0.0                          | 0.0                         |
| 10.00                  | 10.01                            | 10.00                           | 0.01                        | 0.00                       | 100.0                        | 0.0                         |
| 15.00                  | 15.01                            | 15.00                           | 0.01                        | 0.00                       | 100.0                        | 0.0                         |
| 20.00                  | 20.01                            | 20.00                           | 0.01                        | 0.00                       | 100.0                        | 0.0                         |

MICHIGAN OPERATIONS  
DATE: 3/21/03  
SUPERCEDES: MQATPTMCJ

DOC. NO.: MQATPTMC  
REVISION NO.: 4  
PAGE 3 OF 3

### Tape Measure Calibration Certificate

#### Reference Steel Rule

Brand: GLE  
S/N: 118033  
Calibration Date: 11.24.03

#### Subject Tape Measure

Brand: STANLEY  
S/N: 289  
Calibration Date: 1.7.04

| Reference<br>mm | Subject Tape<br>Measure | Difference | Reference<br>mm | Subject Tape<br>Measure | Difference |
|-----------------|-------------------------|------------|-----------------|-------------------------|------------|
| 0               | 0                       | 0          | 450             | 450                     | 0          |
| 25              | 25                      | 0          | 475             | 475                     | 0          |
| 50              | 50                      | 0          | 500             | 500                     | 0          |
| 75              | 75                      | 0          | 525             | 525                     | 0          |
| 100             | 100                     | 0          | 550             | 550                     | 0          |
| 125             | 125                     | 0          | 575             | 575                     | 0          |
| 150             | 150                     | 0          | 600             | 600                     | 0          |
| 175             | 175                     | 0          | 625             | 625                     | 0          |
| 200             | 200                     | 0          | 650             | 650                     | 0          |
| 225             | 225                     | 0          | 675             | 675                     | 0          |
| 250             | 250                     | 0          | 700             | 700                     | 0          |
| 275             | 275                     | 0          | 725             | 725                     | 0          |
| 300             | 300                     | 0          | 750             | 750                     | 0          |
| 325             | 325                     | 0          | 775             | 775                     | 0          |
| 350             | 350                     | 0          | 800             | 800                     | 0          |
| 375             | 375                     | 0          | 825             | 825                     | 0          |
| 400             | 400                     | 0          | 850             | 850                     | 0          |
| 425             | 425                     | 0          | 875             | 875                     | 0          |

If all differences are  $\pm 1$  mm, then the tape measure is acceptable.

Pass X Fail      Maximum Difference = 0

Date: 1.7.05

Performed By: Rf Mill

# Certificate of Instrument Calibration and Testing

Calibration report shall not be reproduced, except in full, without written authorization from Dickson.

## Customer Instrument

Dickson Model Number: **TR320**

Serial Number: **04018409**

Calibration Technician: **Kelly McReynolds**

Calibration Date: **01/22/2004**

## Calibration Standards

General Eastern Model # M3

Ser. # 0850806 / 2360502

Accuracy:  $\pm 4\%$  FS RH and  $\pm 4^\circ\text{F}$

Certified February, 2003 / August, 2003

Axonix Model # AL011 Ser. # T2513-9027

RTD Platinum Probe Ser. # 496013 Accuracy:  $\pm 2^\circ\text{F}$

Certified February, 2003

Cole Parmer Model # PT1000/ 90111-00

Ser. # 10067869 / Ser. # 10148057 Accuracy:  $\pm 4^\circ\text{F}$

Certified June, 2003

The calibration standards are traceable through the National Institute of Standards and Technology.



## Calibration Procedure P1130

The customer instrument was compared to the calibration standard. Drifts and faults were determined, and any necessary mechanical or electronic adjustments were taken. The Dickson calibration system conforms to the requirements of MIL-STD-45662A, ANSI/NCCL Z540, ISO/IEC guide 75, and ISO 17025 as appropriate. Recalibration of the customer instrument is recommended within 6 months after the unit is placed into service. Any number of factors may cause the calibration item to drift before the recommended interval has expired. A2LA Certificate Number - 1621.01

## Environmental Conditions

72 °F

41 %RH

| Calibration Standard Reading | Customer Instrument Reading | Unit Specification                                  |
|------------------------------|-----------------------------|-----------------------------------------------------|
| Humidity (%RH)               | Humidity (%RH)              | Humidity                                            |
| 22.1                         | 22.9                        | $\pm 2\%$ RH                                        |
| 55                           | 58.1                        | $\pm 2\%$ RH                                        |
| 86.6                         | 88.2                        | $\pm 3\%$ RH                                        |
| Temperature °F               | Temperature °F              | Temperature                                         |
| -7.6                         | -7.1                        | $\pm 1.8^\circ\text{F}$ ( $\pm 1.0^\circ\text{C}$ ) |
| 75.1                         | 75                          |                                                     |
| 111.5                        | 111.4                       |                                                     |

The TR320 has an ISO/IEC:17025 required NIST Technical note 1297, Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results, estimated measurement uncertainty at 95% CL (K=2) of  $\pm 0.7^\circ\text{F}$  and  $\pm 1.1\%$  RH.

## FOR YOUR NEXT CALIBRATION NO PHONE CALLS REQUIRED

Fill out and send this form along with your instrument to Dickson. Label the outside of the box with "CCM", that is your RA#.

That's all there is to it!

### 1. Purchase Order #:

Name: \_\_\_\_\_

Phone: \_\_\_\_\_

Model #: **TR320**

Serial #: **04018409**

### 3. Please return via:

☐ Ground Freight\*

☐ 2nd Day Air\*

☐ Next Day Air\*

\*Charges added at factory

### 2. ☐ 1-Point Deluxe NIST Calibration \$149.00

☐ 3-Point Deluxe NIST Calibration \$199.00

☐ 3-Point Ultima Deluxe A2LA NIST \$299.00 (with incoming reading)

☐ N995 - User selectable NIST Temperature points \$50.00 each

(to be selected in addition to one of the above calibration options)

☐ N997- Next Day Service \$50.00 (Not available for ULTIMA service)

### 4. Ship To:

Bill To:

### Charts/Pens

(Order now and receive them with your calibrated unit)

|                                               | Order No. | Qty. | Price Ea. |
|-----------------------------------------------|-----------|------|-----------|
| <input type="checkbox"/> 6 Red Pens           | P222      |      | \$36 pk.  |
| <input type="checkbox"/> 3 Red/3 Blue Pens    | P246      |      | \$36 pk.  |
| <input type="checkbox"/> Charts* (60 per box) | C         |      | \$24 box  |

\*Please fill in the chart order number. For a listing of available charts go to [www.dicksonweb.com](http://www.dicksonweb.com), click on "product search" and select the product type, "Parts/Accessories."

Prices are subject to change

Let Dickson remind you the next time your unit is due for calibration. Register for our FREE Calibration Club now at [www.dicksonweb.com](http://www.dicksonweb.com)

# Dickson Calibration Services

930 South Westwood Avenue Addison, Illinois 60101 630-543-3747 Fax 630-543-0498