

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

**GENERAL MOTORS CORPORATION
1996 Chevrolet Blazer
NHTSA No. PT0101**

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



**Test Dates: September 1-2, 2004
Report Date: September 3, 2004**

FINAL REPORT

PREPARED FOR:

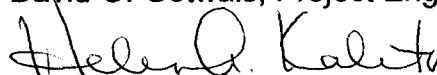
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Prepared By:



David G. Gotwals, Project Engineer



Helen A. Kaleto, Project Manager

Approved By:

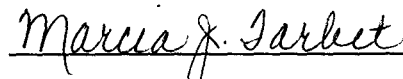


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16. Abstract A pre-standard test series was conducted on the subject 1996 Chevrolet Blazer, NHTSA No. PT0101, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-201U-01 for the determination of FMVSS 201U pre-standard compliance. The testing was conducted at MGA Research Corporation in Troy, Michigan on September 1-2, 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 1996 Chevrolet Blazer, for FMVSS 201U, Occupant Protection in Interior Impact - Upper Interior Head Impact Protection.

Tests were conducted on September 1-2, 2004 on a 1996 Chevrolet Blazer, manufactured by General Motors 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 1996 Chevrolet Blazer was equipped with A, B, C, and rear-pillars, a grab handle over the passenger side door and both rear doors, and a fixed seat belt anchorage on each B and C-pillar.

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	OP1	UR2
AP2	BP3	SR2A	
AP3	BP4	SR3-3	

TABLE 2-1
SUMMARY TABLE OF TEST RESULTS

VEH. MOD YR/MAKE/MODEL/BODY: 1996 Chevrolet Blazer

VEH. NHTSA NO.: PT0101 VIN: 1GNDT13W3T2 COLOR: White

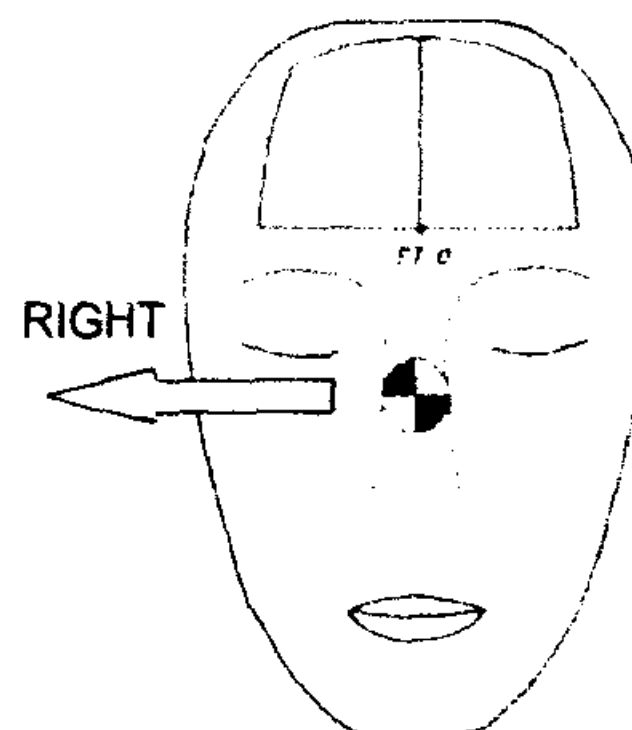
VEH. BUILD DATE: July, 1996 TEST DATES: September 1-2, 2004

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	113	25	23.7	1169	1329	28	0
AP2	Left	206	38	23.9	1293	1493	12	3 Left
AP3	Right	155	36	24.2	1497	1764	20	0
BP1	Right	90	27	23.8	669	666	52	7 Left
BP3	Left	270	-2	23.5	753	778	30	3 Right
BP4	Right	110	-10	23.4	785	820	30	0
OP1	Right	90	5	23.9	745	766	20	7 Left
SR2A	Left	270	43	23.6	1199	1368	23	7 Left
SR3-3	Right	90	30	24.0	665	661	46	6 Right
UR2	Left	270	50	23.6	697	703	36	2 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.

AP2 Left: Pillar trim cracked.

OP1 Right: Cracked seat belt anchor cover.

No damage was observed for any other targets.

REMARKS:

The targets listed were impacted in the following order:

Left: AP2, BP3, UR2, SR2A

Right: AP3, AP1, BP1, OP1, SR3-3, BP4

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 2, 2004

APPROVED BY: Helen A. Kaleto

TABLE 2-2

GENERAL TEST AND VEHICLE PARAMETER DATA

VEH. MOD YR/MAKE/MODEL/BODY: 1996 Chevrolet Blazer

VEH. NHTSA NO.: PT0101 VIN: 1GNDDT13W3T2 COLOR: White

VEH. BUILD DATE: July, 1996 TEST DATES: September 1-2, 2004

TEST LABORATORY: MGA Research Corporation

OBSERVERS: David Gotwals, Nicholas Brzuch, Bryan Hood

INTERIOR TRIM INFORMATION: A, B, C, and rear-pillars, a grab handle over the passenger side door and both rear doors, and a fixed seat belt anchorage on each B and C-pillar.

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: 8/27/04; Odometer Reading: 87,372 miles

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured By: General Motors Corporation

Date of Manufacture: July, 1996; VIN: 1GNDDT13W3T2

GVWR: 2404 kg; GAWR FRONT: 1225 kg

GAWR REAR: 1225 kg

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load:

FRONT: 240 kpa REAR: 240 kpaRecommended Tire Size: P205/75R15

Recommended Cold Tire Pressure:

FRONT: 240 kpa REAR: 240 kpaSize of Tire on Test Vehicle: P205/75R15Type of Spare Tire: P205/75R15; Space Saver: ; Standard: X

VEHICLE CAPACITY DATA:

Type of Front Seats: Bench ; Bucket X; Split Bench Number of Occupants: Front 2; Rear 3; TOTAL: 5VEHICLE CAPACITY WEIGHT (VCW) = 536 kgNo. of Occupants x 68 kg = 340 kgRated Cargo/Luggage Weight (RCLW) = 196 kg (difference)Maximum Cargo/Luggage Weight (201U) = 136 kg

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

Right Front = 507.0 kg Right Rear = 408.0 kgLeft Front = 529.0 kg Left Rear = 440.5 kgTOTAL FRONT = 1036.0 kg TOTAL REAR = 848.5 kg% Total Weight = 55.0 % % Total Weight = 45.0 %TOTAL DELIVERED WEIGHT = 1884.5 kg

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight = 1884.5 kgRated Cargo/Luggage Wt. = 136.0 kgTARGET TEST WEIGHT 2020.5 kg

WEIGHT OF TEST VEHICLE:

Right Front =	<u>510.0</u> kg	Right Rear =	<u>476.0</u> kg
Left Front =	<u>524.5</u> kg	Left Rear =	<u>511.0</u> kg
TOTAL FRONT =	<u>1034.5</u> kg	TOTAL REAR =	<u>987.0</u> kg
% Total Weight =	<u>51.2</u> %	% Total Weight =	<u>48.8</u> %
TOTAL TEST WEIGHT = <u>2021.5</u> kg			
Weight of ballast secured in vehicle's cargo area = <u>137</u> kg			

TEST VEHICLE ATTITUDE:

AS DELIVERED: Right Front 812.0 mm; Left Front 898.0 mm;
 Right Rear 844.0 mm; Left Rear 829.0 mm

Pitch Angle at Right Door Sill = 0.7 Rear higher
 Pitch Angle at Left Door Sill = 0.8 Rear higher
 Roll Angle at Front Bumper = 0.5 Right side higher
 Roll Angle at Rear Bumper = 0.9 Right side higher

Pitch Angle at Right Door Sill = 0.1 Rear higher
 Pitch Angle at Left Door Sill = 0.3 Rear higher
 Roll Angle at Front Bumper = 0.5 Right side higher
 Roll Angle at Rear Bumper = 0.9 Right side higher

AS TARGETED: Right Front 1014.0 mm; Left Front 1010.0 mm;
 Right Rear 1034.0 mm; Left Rear 1028.0 mm;

Pitch Angle at Right Door Sill = 0.3 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 = 0.8 Right side higher

AS TESTED ON RIGHT SIDE:

Pitch Angle at Right Door Sill = 0.3 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 = 0.8 Right side higher

AS TESTED ON LEFT SIDE:

Pitch Angle at Right Door Sill = 0.3 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 = 0.8 Right side higher

VEHICLE WHEELBASE = 2720 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. Gotwals

DATE: August 30, 2004

APPROVED BY: Helen A. Kaleto

TABLE 2-3
HORIZONTAL IMPACT ANGLE RANGE FOR A AND B PILLARS

VEH. MOD YR/MAKE/MODEL/BODY: 1996 Chevrolet Blazer
VEH. NHTSA NO.: PT0101 VIN: 1GNDT13W3T2 COLOR: White
VEH. BUILD DATE: July, 1996 TEST DATES: September 1-2, 2004
TEST LABORATORY: MGA Research Corporation
OBSERVERS: David Gotwals, Nicholas Brzuch, Bryan Hood

HORIZONTAL IMPACT ANGLE RANGE FOR A AND B PILLARS			
	HORIZONTAL ANGLE SPECIFIED RANGE	MINIMUM HORIZONTAL ANGLE	MAXIMUM HORIZONTAL ANGLE
A-PILLAR	L 195°-255°	L 205.2°	L 246.0°
	R 105°-165°	R 113.0°	R 155.4°
B-PILLAR	L 195°-345°	L 199.6°	L 283.9°
	R 15°-165°	R 78.1°	R 160.3°

AS DETERMINED USING THE PROCEDURES SPECIFIED IN S8.13.4.1

REMARKS:

RECORDED BY: David G. Gotwals DATE: August 30, 2004
APPROVED BY: Helen A. Kalet

TABLE 2-4

VERTICAL IMPACT ANGLE RANGES

VEH. MOD YR/MAKE/MODEL/BODY: 1996 Chevrolet BlazerVEH. NHTSA NO.: PT0101 VIN: 1GNLT13W3T2 COLOR: WhiteVEH. BUILD DATE: July, 1996 TEST DATES: September 1-2, 2004TEST LABORATORY: MGA Research CorporationOBSERVERS: David Gotwals, Nicholas Brzuch, Bryan Hood

VERTICAL IMPACT ANGLE RANGES

		VERTICAL ANGLE SPECIFIED RANGE	MINIMUM VERTICAL ANGLE	MAXIMUM VERTICAL 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 43°
		R 0°-50°	R 0°	R 44°
	SR2A	L 0°-50°	L 0°	L 43°
		R 0°-50°	R 0°	R 47°
	SR2B	L 0°-50°	L 0°	L 43°
		R 0°-50°	R 0°	R 50°
	SR3-1	L 0°-50°	L 0°	L 42°
		R 0°-50°	R 0°	R 42°
	SR3-2	L 0°-50°	L 0°	L 50°
		R 0°-50°	R 0°	R 50°
	SR3-3	L 0°-50°	L 0°	L 30°
		R 0°-50°	R 0°	R 30°
A-PILLAR	AP1	L -5°-50°	L -5°	L 25°
		R -5°-50°	R -5°	R 25°
	AP2	L -5°-50°	L -5°	L 38°
		R -5°-50°	R -5°	R 38°

		VERTICAL ANGLE SPECIFIED RANGE	MINIMUM VERTICAL ANGLE	MAXIMUM VERTICAL ANGLE
	AP3	L -5°-50°	L -5°	L 36°
		R -5°-50°	R -5°	R 36°
B-PILLAR	BP1	L -10°-50°	L -10°	L 27°
		R -10°-50°	R -10°	R 27°
	BP2*	L 0°-50°	L 0°	L 1°
		R 0°-50°	R 0°	R 1°
	BP3	L -10°-50°	L -10°	L -2°
		R -10°-50°	R -10°	R -2°
	BP4	L -10°-50°	L -10°	L -10°
		R -10°-50°	R -10°	R -10°
OTHER PILLAR	OP1*	L 0°-50°	L 0°	L 5°
		R 0°-50°	R 0°	R 5°
	OP2	L -10°-50°	L -10°	L 1°
		R -10°-50°	R -10°	R 1°
UPPER ROOF 1		0°-50°	0°	50°
UPPER ROOF 2		0°-50°	0°	50°
UPPER ROOF 3		0°-50°	0°	50°
UPPER ROOF 4		0°-50°	0°	50°
UPPER ROOF 5		0°-50°	0°	50°
UPPER ROOF 6		0°-50°	0°	50°

As determined using the Procedures specified in S8.13.4.2. *Targets BP2 and OP1 are seat belt anchorage locations.

RECORDED BY: David G. Gotwals

DATE: August 30, 2004

APPROVED BY: Helen A. Kalet

TABLE 2-5

TARGET MEASUREMENTS

VEH. MOD YR/MAKE/MODEL/BODY: 1996 Chevrolet BlazerVEH. NHTSA NO.: PT0101 VIN: 1GNDT13W3T2 COLOR: WhiteVEH. BUILD DATE: July, 1996 TEST DATES: September 1-2, 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)}	114.0°	--
A1°	360° - T°	246.0°	--
W°	Horizontal ∠ {CG-2 (Left Seat) to (Left A-Pillar)}	205.2°	--
A2°	A2° = W°	205.2°	--
U°	Horizontal ∠ {CG-2 (Left Seat) to (Left B-Pillar)}	283.9°	--
B1°	B1° = U°	283.9°	--
V°	Horizontal ∠ {CG-R (Left Seat) to (Left B-Pillar)}	199.6°	--
B2°	B2° = V°	199.6°	--
W° (right)	Horizontal ∠ {CG-F2 (Right Seat) to (Right A-Pillar)}	--	155.4°
A1° (right)	A1° (right) = W° (right)	--	155.4°
T° (right)	Horizontal ∠ {CG-F1 (Right Seat) to (Left A-Pillar)}	--	247.0°
A2° (right)	360° - T° (right)	--	113.0°
V° (right)	Horizontal ∠ {CG-R (Right Seat) to (Right B-Pillar)}	--	160.3°
B1° (right)	B1° (right) = V° (right)	--	160.3°
U° (right)	Horizontal ∠ {CG-F2 (Right Seat) to (Right B-Pillar)}	--	78.1°
B2° (right)	B2° (right) = U° (right)	--	78.1°
J	A-Pillar {(Plane 3) - (Plane 5)}	346.4 mm	371.8 mm
J/2	J ÷ 2	173.2 mm	185.9 mm
D1	Upper Roof {(Plane A) - (Plane B)}	2430.0 mm	
D1/2	D1 ÷ 2	1215.0 mm	
D2	Upper Roof {(Plane C) - (Plane D)}	1182.3 mm	
D2/2	D2 ÷ 2	591.2 mm	
.35D1	.35 x D1	850.5 mm	
.35D2	.35 x D2	413.8 mm	

Measurement	Description	Left Side	Right Side
N	B-Pillar {(BPR) - (lowest point on daylight opening forward of B-Pillar)}	453.0 mm	446.8 mm
N/2	B-Pillar {(BP3) - (lowest point on daylight opening forward of B-Pillar)}	226.5 mm	113.4 mm
N/4	B-Pillar {(BP4) - (lowest point on daylight opening forward of B-Pillar)}	113.3 mm	111.7 mm
Q	Q-Pillar (Plane 13 – Plane 14)	446.0 mm	445.9 mm
Q/2	Q / 2	223.0 mm	223.0 mm
D	R-Pillar (Point 7 – Point M)	955.0 mm	960.0 mm
3D/7	3 D / 7	409.3 mm	411.4 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	2375.0	-343.0	795.3	2375.0	343.0	795.3
Rear	3237.0	-343.0	901.3	3237.0	343.0	901.3

SgRP Locations (world coordinates)						
	Left (mm)			Right (mm)		
	x	y	z	x	y	z
Front	2375.0	-343.0	795.3	2375.0	343.0	795.3
Rear	3237.0	-343.0	901.3	3237.0	343.0	901.3

CG Locations (world coordinates)						
	Left (mm)			Right (mm)		
	x	y	z	x	y	z
CGF1	2320.0	-343.0	1455.3	2320.0	343.0	1455.3
CGF2	2535.0	-343.0	1455.3	2535.0	343.0	1455.3
CGR	3397.0	-343.0	1561.3	3397.0	343.0	1561.3

REFERENCE FOR VEHICLE COORDINATE SYSTEM:

REMARKS: Front inboard driver seat anchor (x, y, z) = (2014.4, -223.0, 626.2)

Rear inboard driver seat anchor (x, y, z) = (2468.5, -120.0, 590.3)

Front outboard passenger seat anchor (x, y, z) = (2145.2, 599.0, 599.3)

RECORDED BY: David G. Gotwals

DATE: August 30, 2004

APPROVED BY: Helen A. Kaleto

TABLE 2-6

SUMMARY OF TARGETING RESULTS

VEH. MOD YR/MAKE/MODEL/BODY: 1996 Chevrolet BlazerVEH. NHTSA NO.: PT0101VIN: 1GNDT13W3T2COLOR: WhiteVEH. BUILD DATE: July, 1996 TEST DATES: September 1-2, 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	2083.5	-546.7	1590.8	246	25	No	--	No
AP2	1994.6	-598.9	1503.7	206	38	No	--	Yes
AP3	1890.8	-643.1	1417.8	206	36	No	--	No
A-Pillar Right Side								
AP1	2084.8	543.3	1594.2	113	25	No	--	Yes
AP2	1985.1	594.3	1505.6	155	38	No	--	No
AP3	1865.7	643.5	1408.5	155	36	No	--	Yes
B-Pillar Left Side								
BP1	2638.4	-486.3	1623.9	270	27	No	--	No
BP2	2647.8	-613.4	1452.9	270	1	No	--	No
BP3	2604.1	-657.1	1398.3	270	-2	No	--	Yes
BP4	2721.2	-699.4	1286.5	--	--	Yes	--	--
REL	2713.4	-686.4	1307.0	250	-10	--	1	No
B-Pillar Right Side								
BP1	2635.9	483.8	1625.7	90	27	No	--	Yes
BP2	2647.0	617.5	1454.7	90	1	No	--	No
BP3	2604.1	-657.1	1398.3	90	-2	No	--	No
BP4	2715.5	706.4	1291.8	--	--	Yes	--	--
REL	2707.6	693.1	1315.0	110	-10	--	1	Yes
Other Pillar Left Side								
OPR	3391.1	-475.5	1633.7	--	--	No	--	No
OP1	3505.0	-601.8	1456.6	270	5	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					
OP2	3525.1	-644.1	1415.7	--	--	Yes	--	--
REL	3547.7	-644.0	1404.4	270	1	--	1	No
Other Pillar Right Side								
OPR	3389.5	482.8	1637.8	--	--	No	--	No
OP1	3496.3	616.2	1458.2	90	5	No	--	Yes
OP2	3513.3	660.6	1414.8	--	--	Yes	--	--
REL	3538.3	661.3	1407.1	90	1	--	1	No
Rear Pillar Left Side								
RP1	4108.2	-501.6	1572.3	Exempt from testing.				
RP2	4257.3	-575.5	1423.3	Exempt from testing.				
Rear Pillar Right Side								
RP1	4112.0	498.7	1577.6	Exempt from testing.				
RP2	4254.8	597.4	1428.4	Exempt from testing.				
Front Header Left Side								
FH1	1968.1	-438.5	1592.4	--	--	Yes	--	--
REL	1949.3	-422.5	1582.8	180	50	--	1	No
FH2	1939.7	-287.5	1602.0	--	--	Yes	--	--
REL	1919.2	-289.7	1584.3	180	50	--	1	No
Front Header Right Side								
FH1	1970.3	440.8	1598.2	--	--	Yes	--	--
REL	1954.7	423.2	1589.9	180	50	--	1	No
FH2	1944.4	285.7	1608.7	--	--	Yes	--	--
REL	1922.9	288.7	1590.2	180	50	--	1	No
Side Rail Left Side								
SR1	2233.3	-499.2	1627.7	270	43	No	--	No
SR2A	2383.3	-497.6	1633.8	270	43	No	--	Yes
SR2B	2337.8	-498.3	1634.1	270	43	No	--	No
SR3-1	3074.2	-501.5	1585.5	270	42	No	--	No
SR3-2	3199.4	-517.1	1610.7	270	50	No	--	No
SR3-3	3541.3	-514.8	1611.4	270	30	No	--	No
Side Rail Right Side								
SR1	2235.1	500.6	1633.6	--	--	Yes	--	--

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					
REL	2207.2	499.1	1631.5	90	44	--	1	No
SR2A	2383.9	499.4	1639.5	--	--	Yes	--	--
REL	2430.1	508.1	1617.5	90	47	--	2	No
SR2B	2336.7	500.5	1638.1	--	--	Yes	--	--
REL	2329.6	498.9	1584.3	90	50	--	2	No
SR3-1	3058.2	517.6	1596.8	90	42	No	--	No
SR3-2	3197.7	525.4	1613.6	90	50	No	--	No
SR3-3	3540.3	518.5	1618.0	90	30	No	--	Yes
Rear Header Left Side								
RH	4046.8	-342.8	1636.1	Exempt from testing.				
Rear Header Right Side								
RH	4042.2	343.4	1639.5	Exempt from testing.				
Upper Roof Left Side								
UR1	2244.7	-409.4	1650.4	270	50	No	--	No
UR2	2636.8	-406.7	1641.0	270	50	No	--	Yes
UR3	3395.8	-410.9	1659.6	270	50	No	--	No
Upper Roof Right Side								
UR4	3391.0	407.6	1665.1	90	50	No	--	No
UR5	2637.3	404.8	1643.4	90	50	No	--	No
UR6	2248.9	410.2	1653.7	90	50	No	--	No

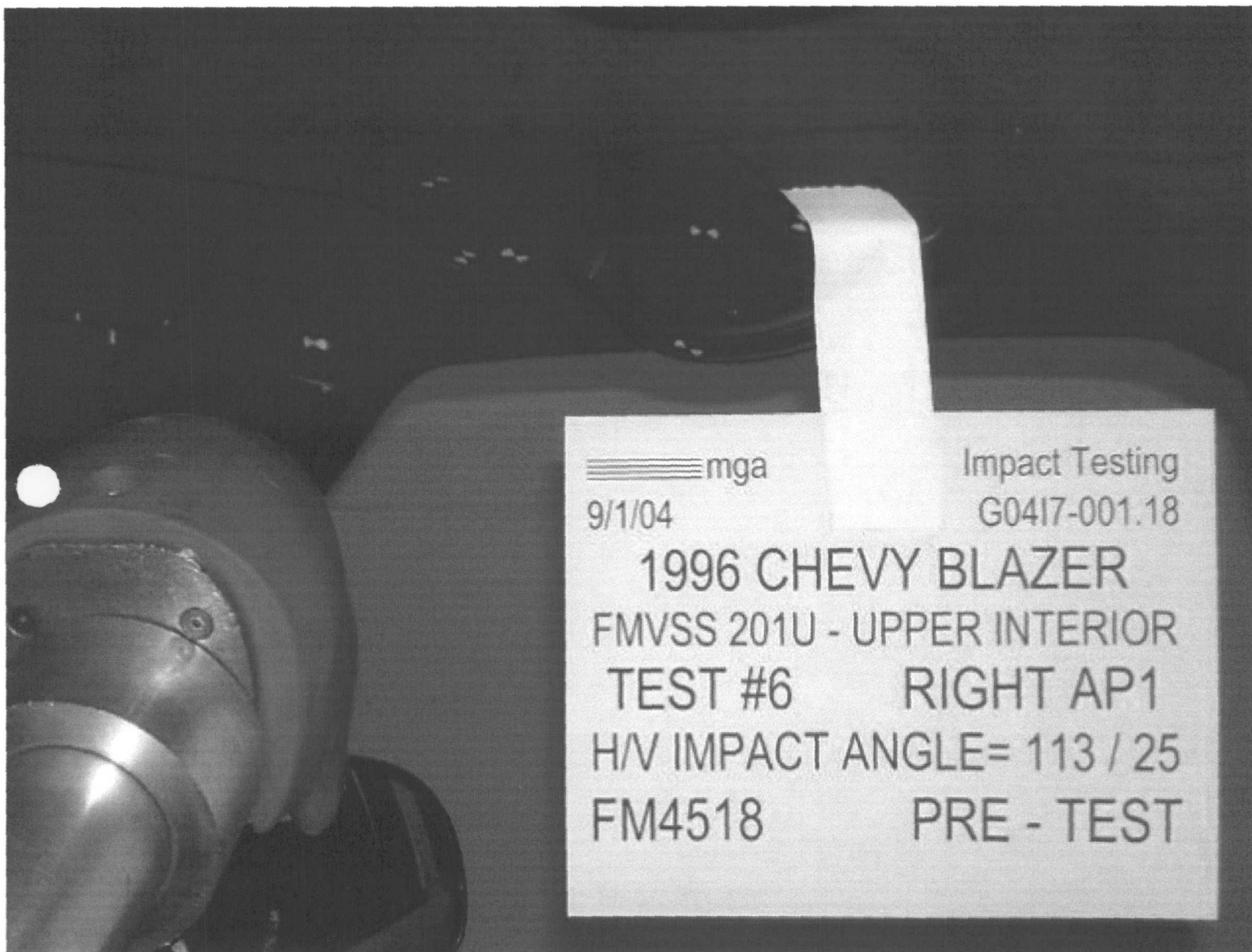
As determined using the Procedures specified in S10.1-10.13.

REMARKS: Targets RP1 and RH were located rearward of the 600 mm cut-off line (measured rearward of the rearmost SgRP). Therefore, they are exempt from testing.

RECORDED BY: David G. Gotwals

DATE: August 30, 2004

APPROVED BY: Helen A. Kaleto



=====mga

9/1/04

Impact Testing

G0417-001.18

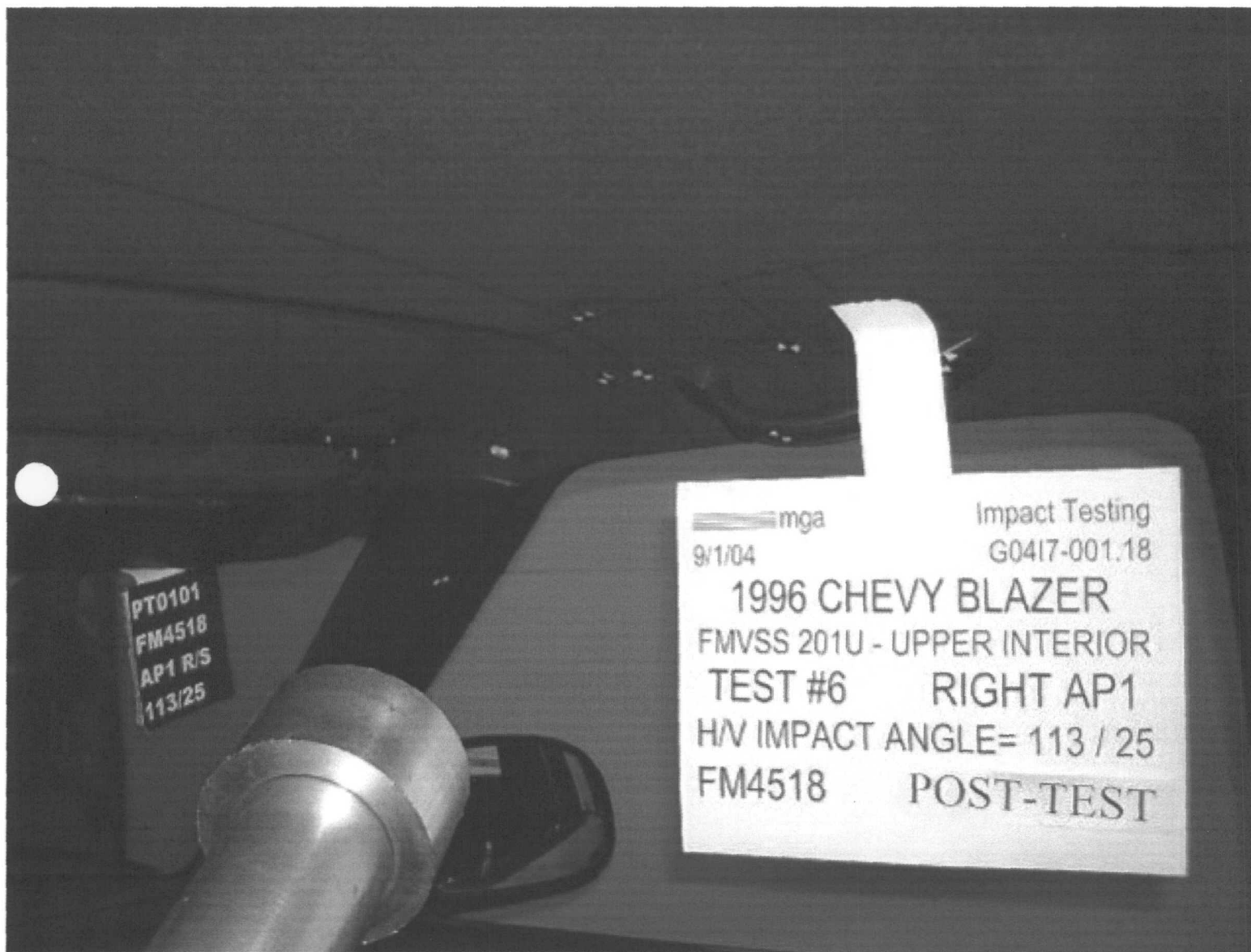
1996 CHEVY BLAZER

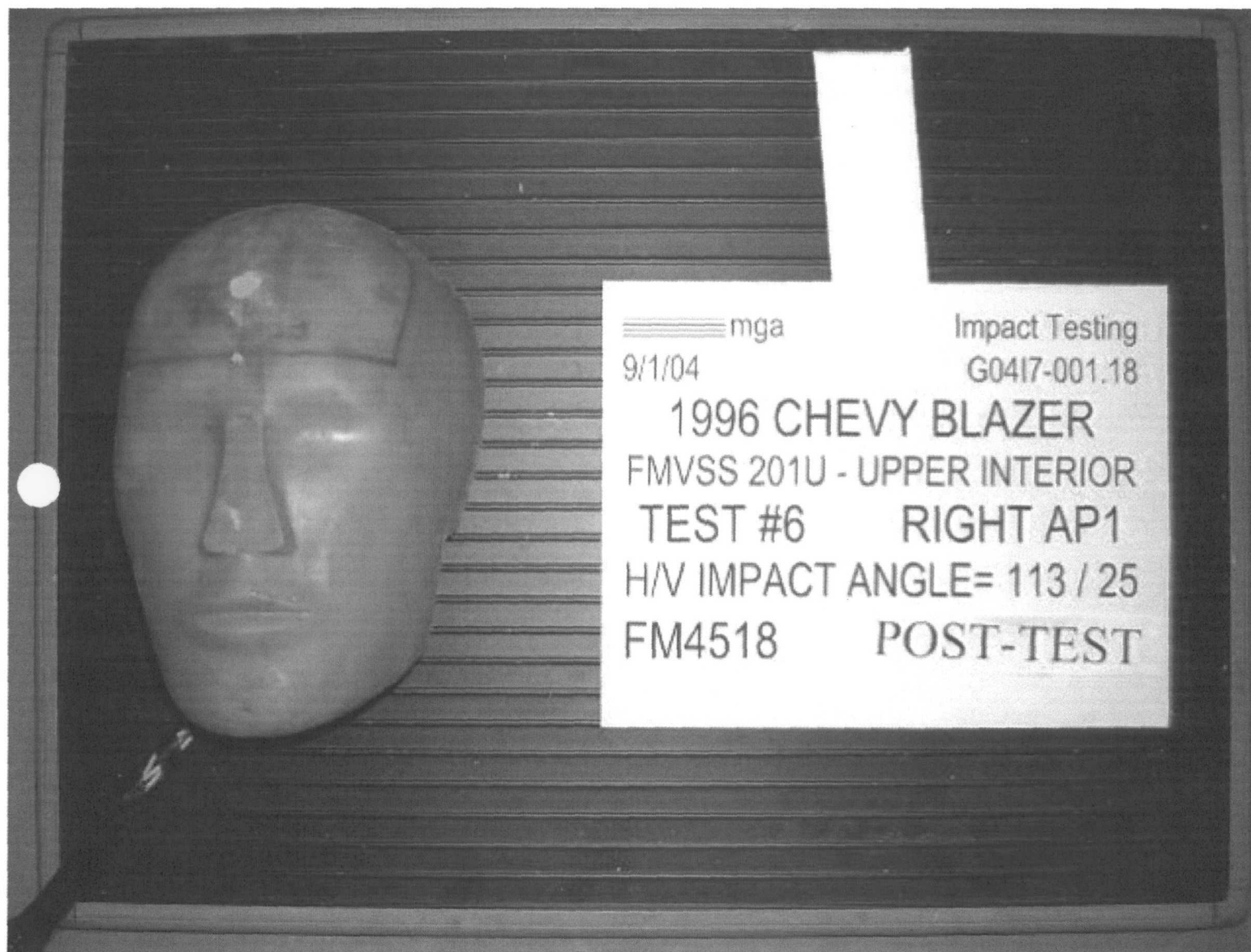
FMVSS 201U - UPPER INTERIOR

TEST #6 RIGHT AP1

H/V IMPACT ANGLE= 113 / 25

FM4518 PRE - 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: G04I7-001.18 VEHICLE YR/MAKE/MODEL:BLAZER 1996

GENERAL TEST PARAMETERS:

Test Number:#6

Target (Vehicle Side): AP1 Right

Temperature:22C

MGA Test Reference No.:FM4518

Humidity:56%

Approach Horizontal Angles:113°

Time of Test:5:10 PM

Approach Vertical Angles:25°

FMH Serial No:038

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
1169	1329	2.8	23.7	28	0

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J36197	-108	1.67	1.67
Y	6	J36193	101.4	1.54	1.54
Z	7	J36353	96.8	1.35	1.58

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

No visible damage

Recorded By: mjm Approved By: Helen A. Kaloto Date: 9-1-04

*Only necessary for NHTSA (Government) Compliance testing.

FMH
G04I7-001.18

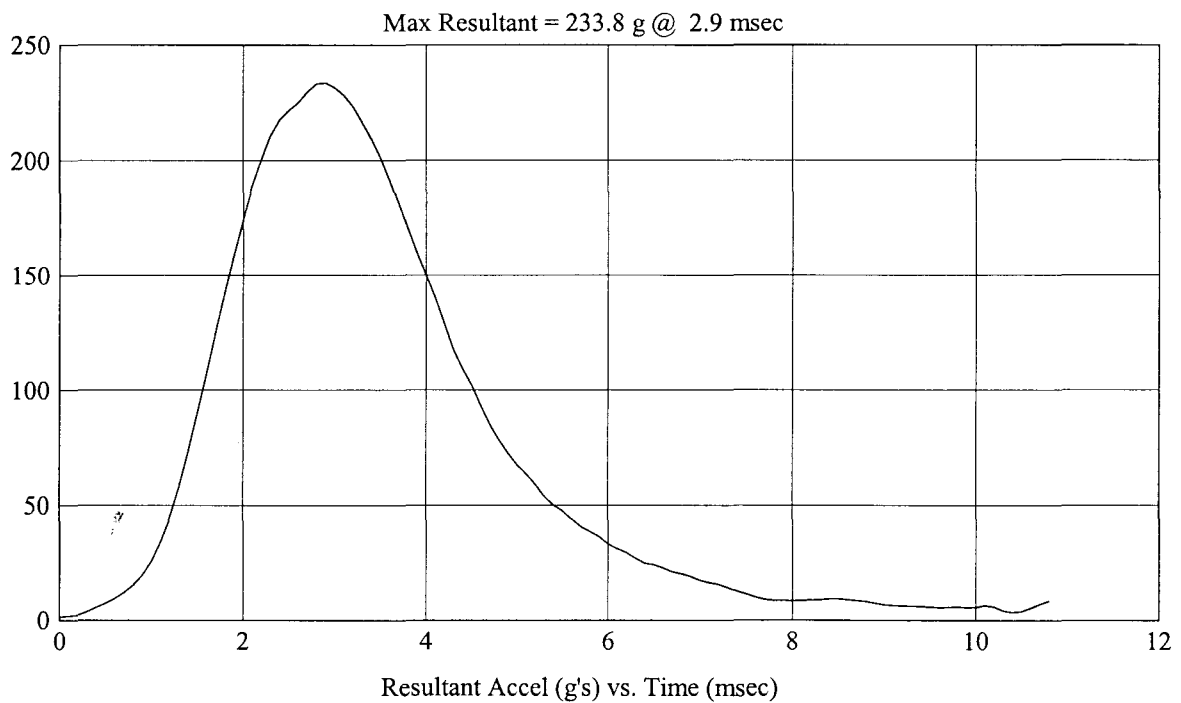
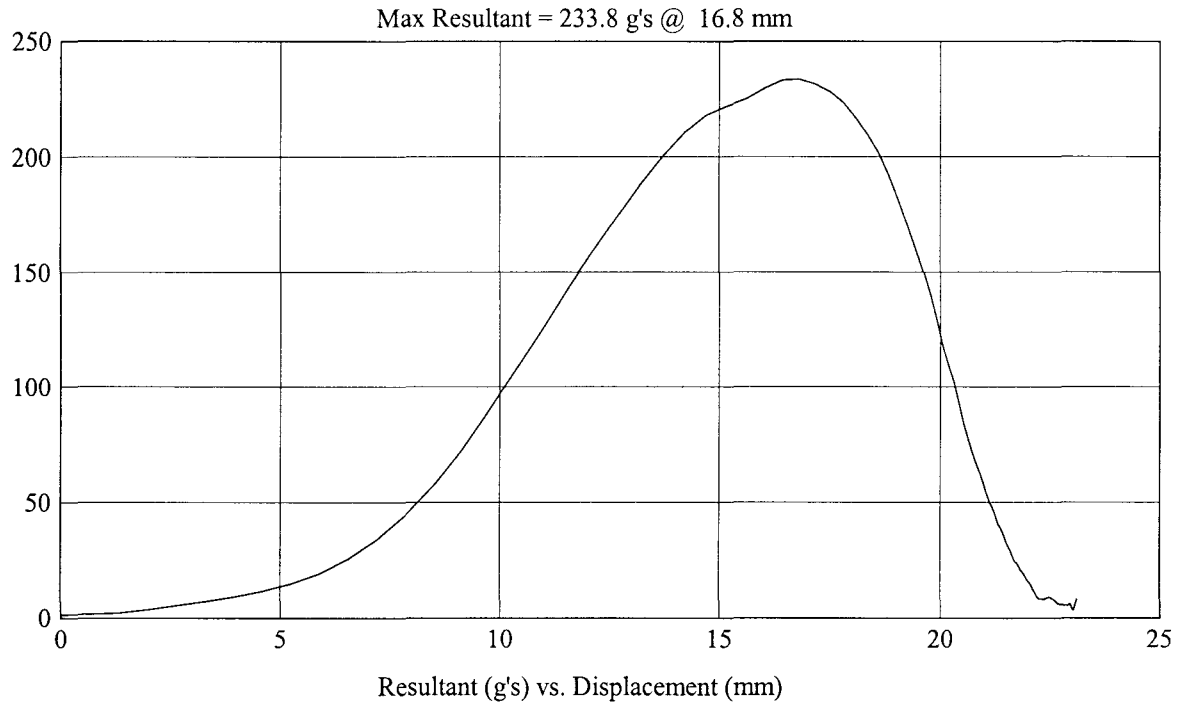
Customer: CHEVY
Test # 6
FM4518
Additional Desc: N/A

Vehicle Program : BLAZER

Model Year: 1996
Target: AP1
Vehicle Side: Right
Horz/Vert Angle: 113/25

Test Date: 9/1/04

HIC(d) = 1169, HIC = 1329, Delta T = 2.8 msec



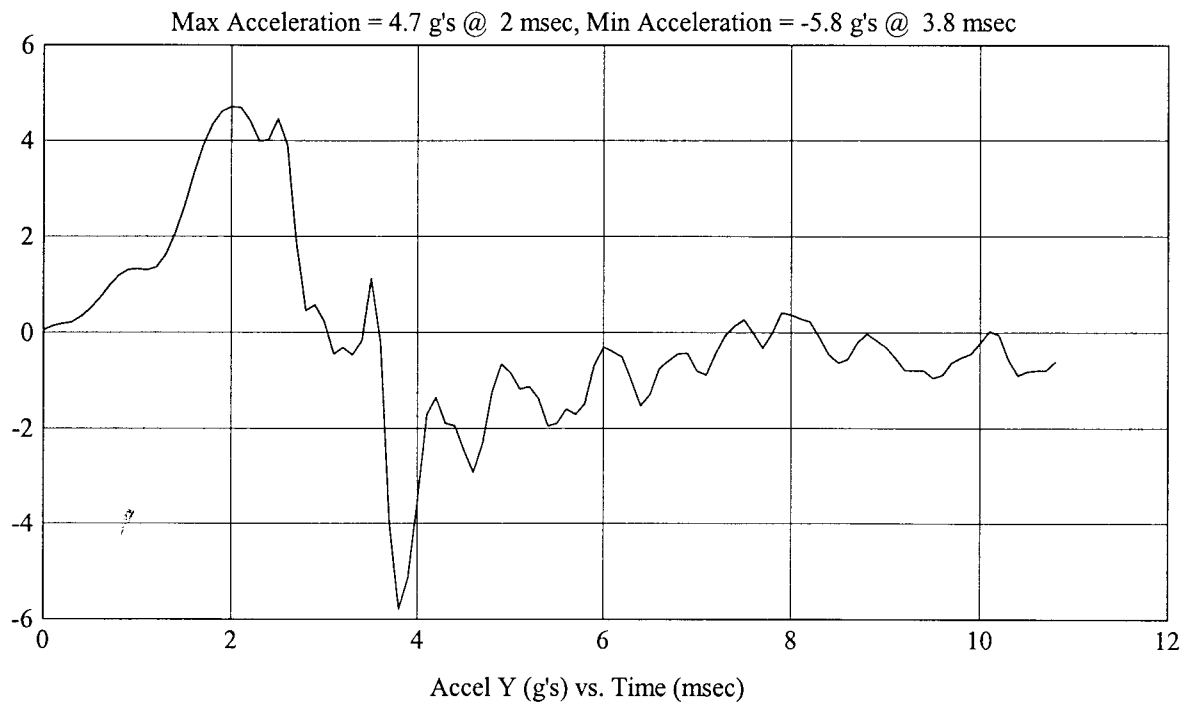
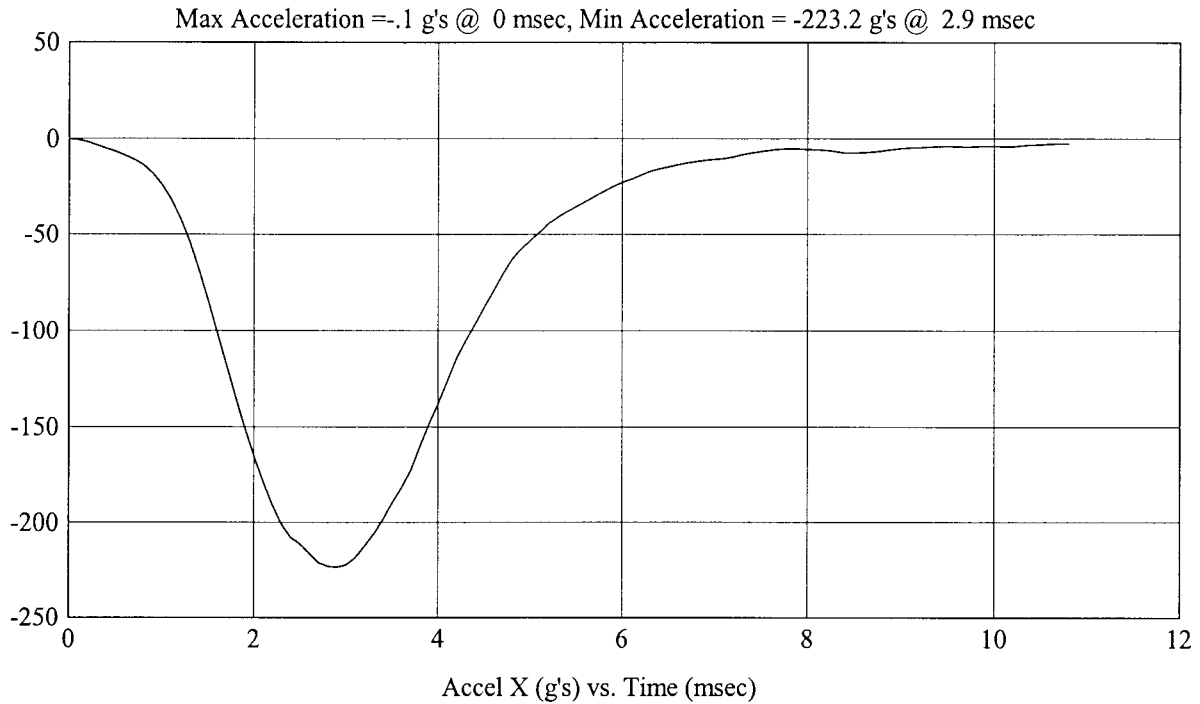
FMH
G04I7-001.18

Customer: CHEVY
Test # 6
FM4518
Additional Desc: N/A

Vehicle Program : BLAZER

Model Year: 1996
Target: AP1
Vehicle Side: Right
Horz/Vert Angle: 113/25

Test Date: 9/1/04
HIC(d) = 1169, HIC = 1329, Delta T = 2.8 msec



FMH
G04I7-001.18

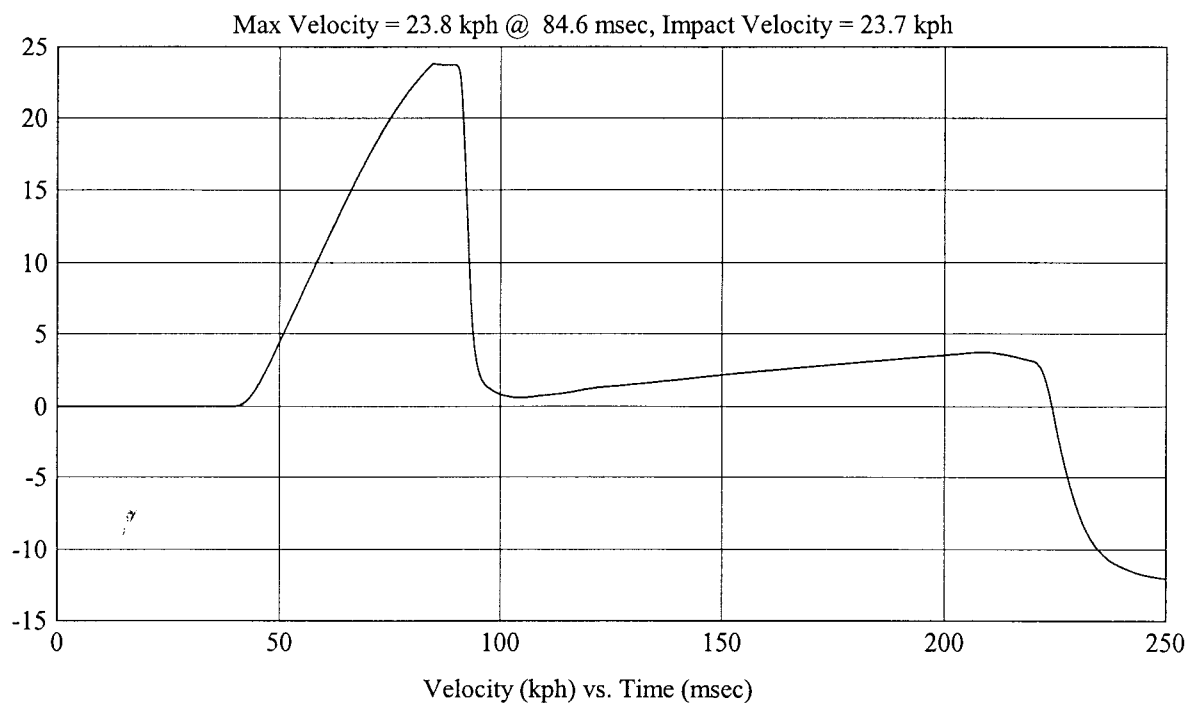
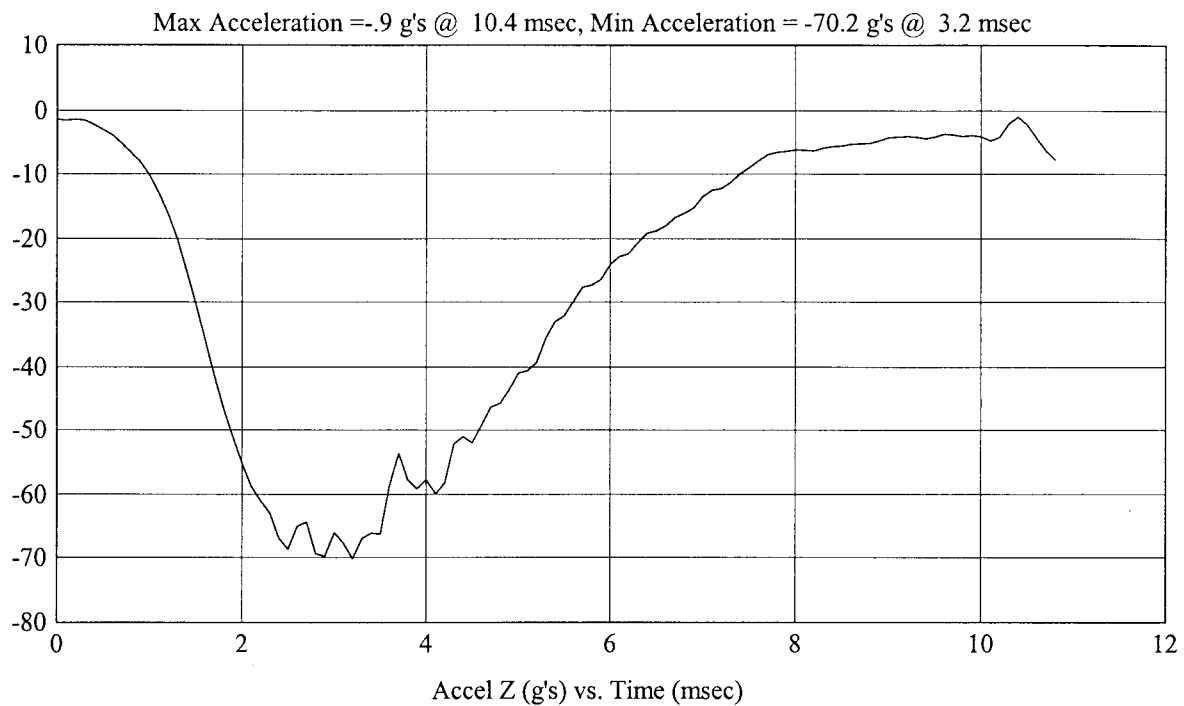
Customer: CHEVY
Test # 6
FM4518
Additional Desc: N/A

Vehicle Program : BLAZER

Model Year: 1996
Target: AP1
Vehicle Side: Right
Horz/Vert Angle: 113/25

Test Date: 9/1/04

HIC(d) = 1169, HIC = 1329, Delta T = 2.8 msec



FMH
G04I7-001.18

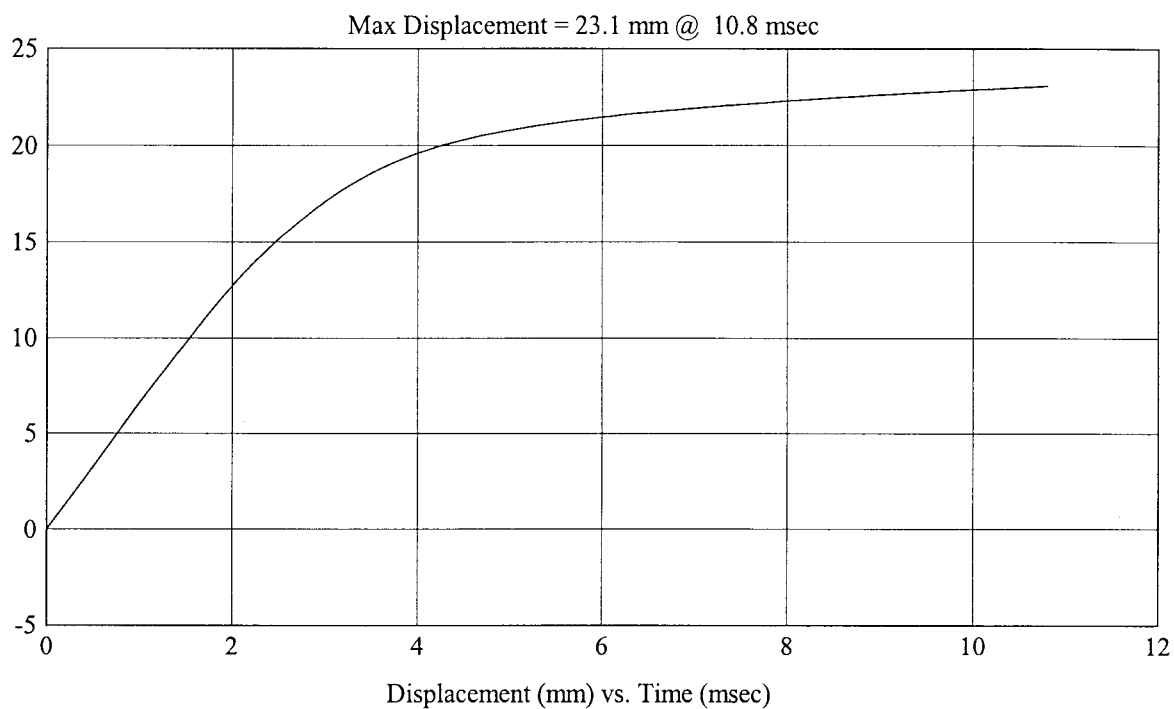
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Test # 6
FM4518
Additional Desc: N/A

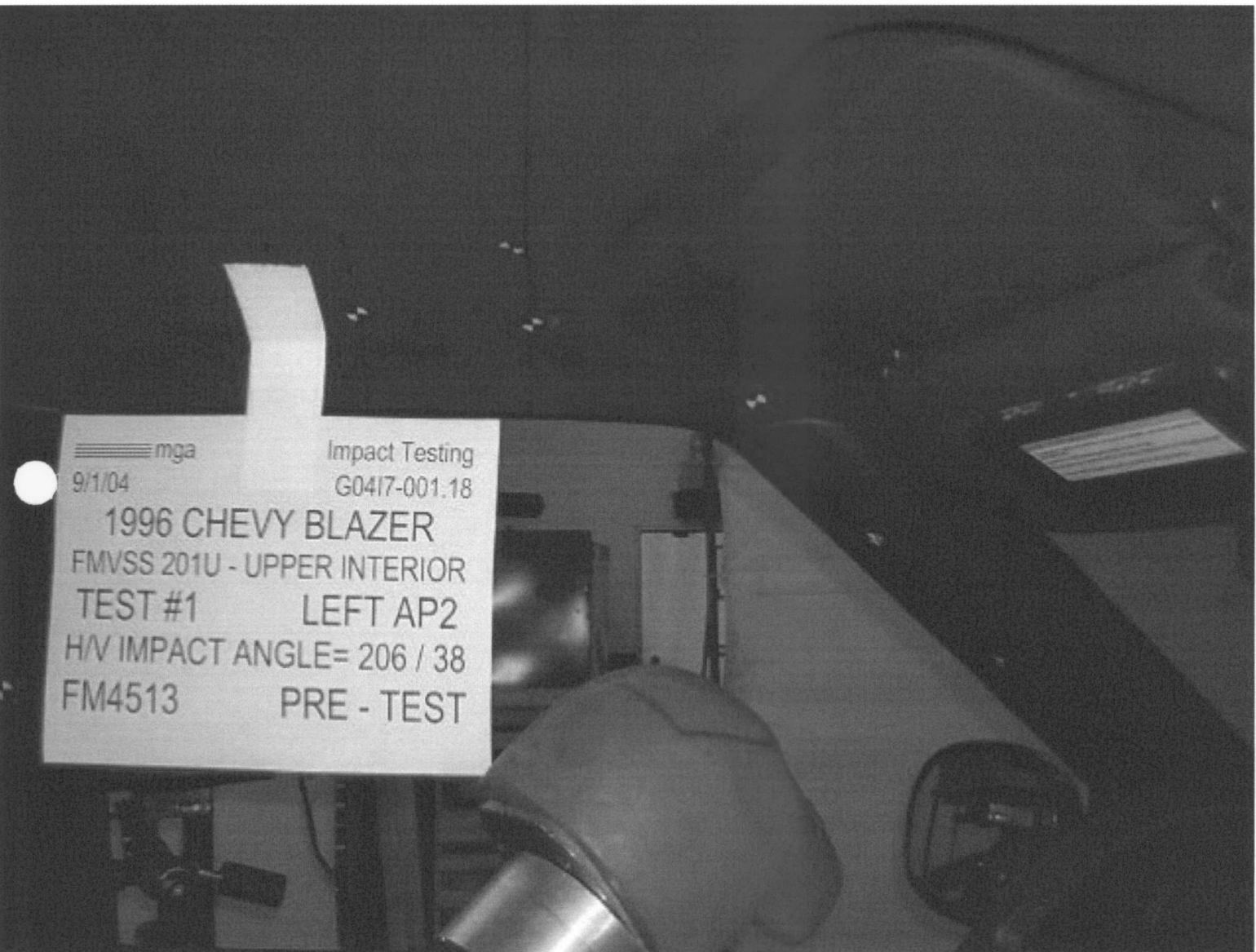
Vehicle Program : BLAZER

Model Year: 1996
Target: AP1
Vehicle Side: Right
Horz/Vert Angle: 113/25

Test Date: 9/1/04

HIC(d) = 1169, HIC = 1329, Delta T = 2.8 msec





mga
9/1/04
1996 CHEVY BLAZER
FMVSS 201U - UPPER INTERIOR
TEST #1 LEFT AP2
H/V IMPACT ANGLE= 206 / 38
FM4513 PRE - TEST

Impact Testing
G0417-001.18

 mga

9/1/04

Impact Testing

G0417-001.18

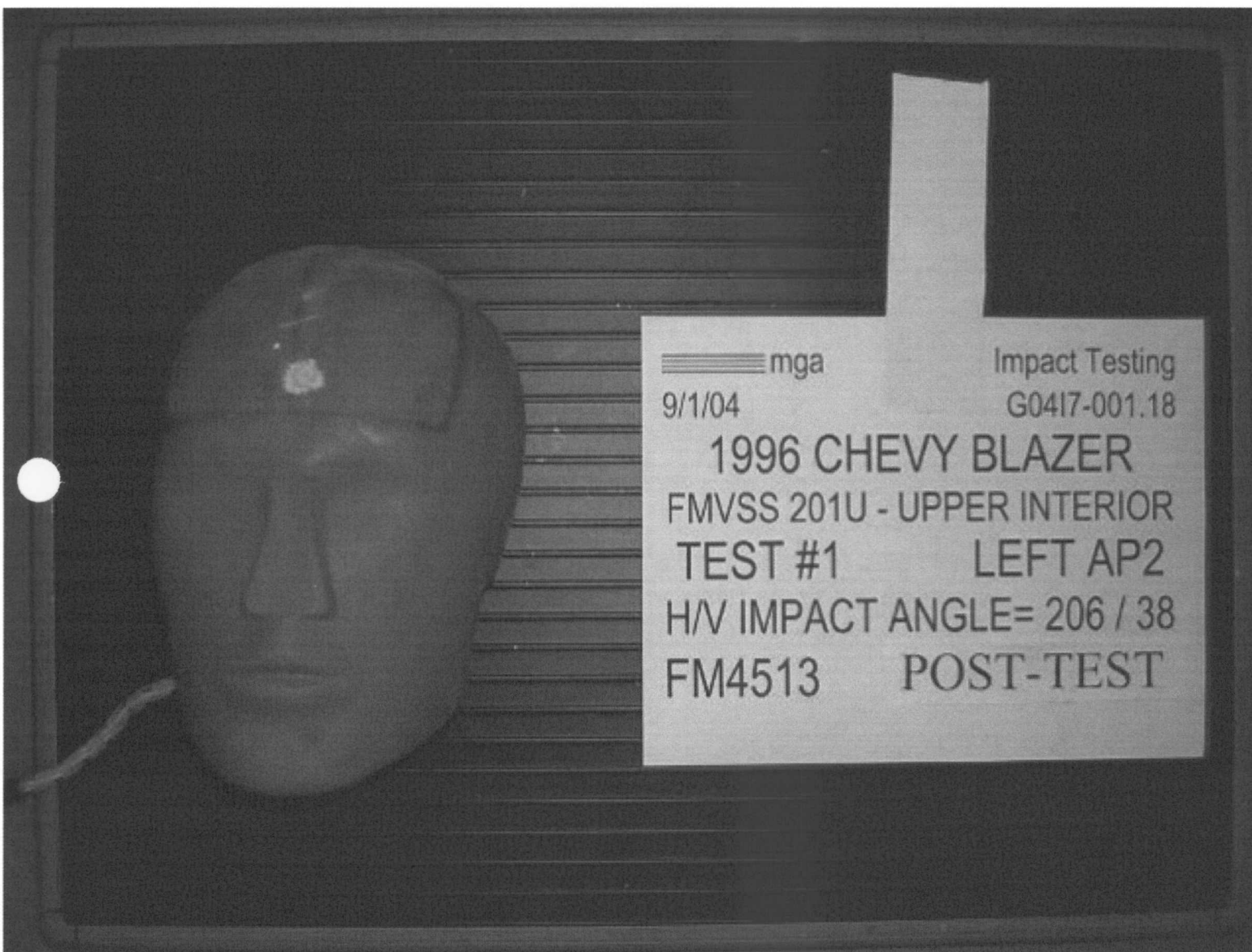
1996 CHEVY BLAZER

FMVSS 201U - UPPER INTERIOR

TEST #1 LEFT AP2

H/V IMPACT ANGLE= 206 / 38

FM4513 POST-TEST



===== mga

9/1/04

Impact Testing

G04I7-001.18

1996 CHEVY BLAZER

FMVSS 201U - UPPER INTERIOR

TEST #1 LEFT AP2

H/V IMPACT ANGLE= 206 / 38

FM4513 POST-TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G04I7-001.18 VEHICLE YR/MAKE/MODEL:BLAZER 1996

GENERAL TEST PARAMETERS:

Test Number:#1

Target (Vehicle Side): AP2 Left

Temperature:22C

MGA Test Reference No.:FM4513

Humidity:61%

Approach Horizontal Angles:206°

Time of Test:11:45 AM

Approach Vertical Angles:38°

FMH Serial No:035

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
1293	1493	3	23.9	12	3 L

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV 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	1.40	1.32

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

Cracked pillar trim

Recorded By: [Signature] Approved By*: Helen A. Kalita Date: 9-1-04

*Only necessary for NHTSA (Government) Compliance testing.

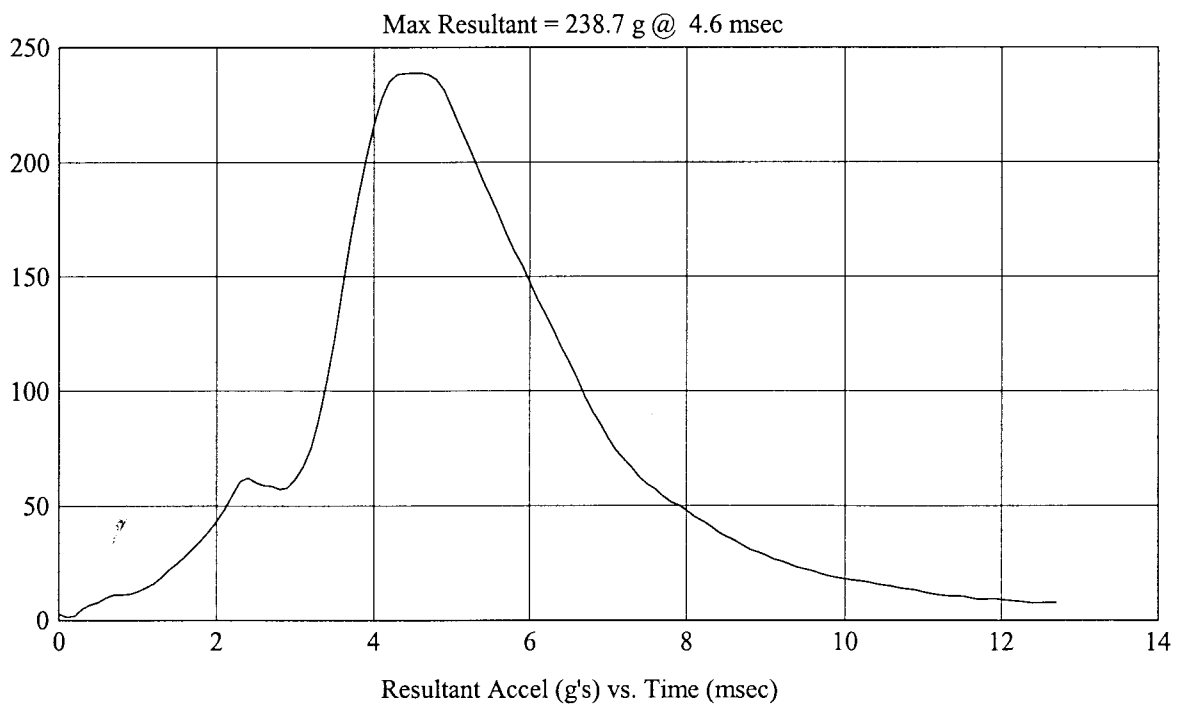
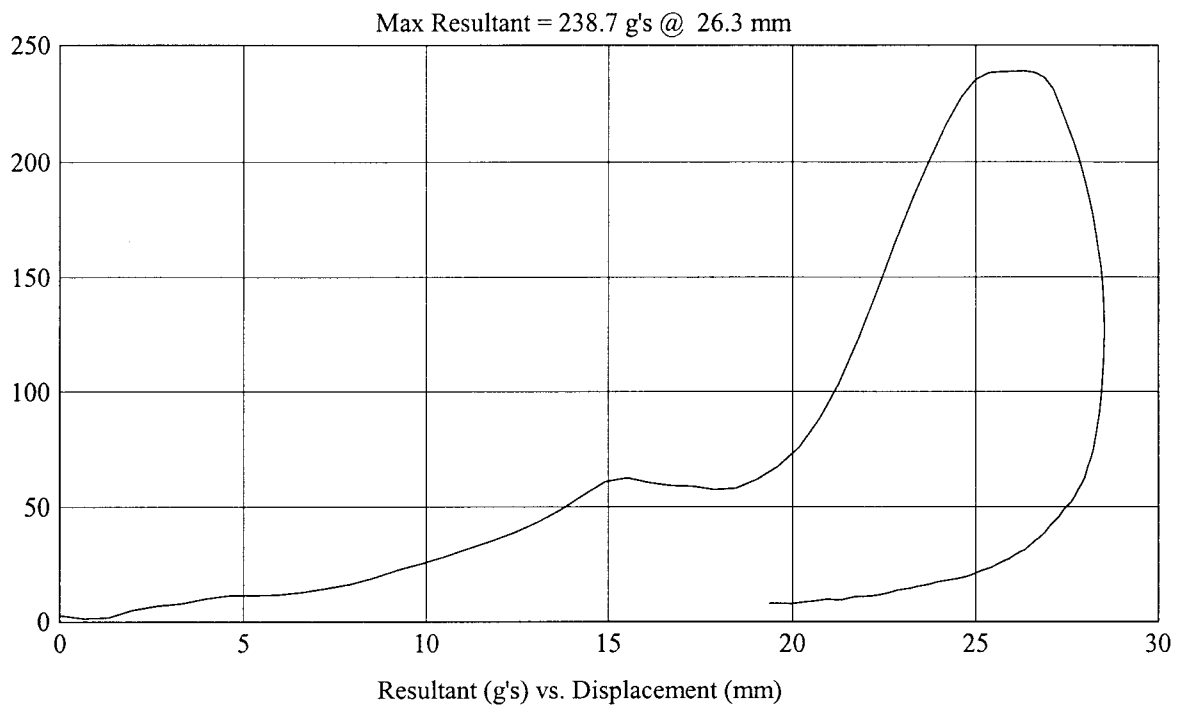
FMH
G04I7-001.18

Customer: CHEVY
Test # 1
FM4513
Additional Desc: N/A

Vehicle Program : BLAZER

Model Year: 1996
Target: AP2
Vehicle Side: Left
Horz/Vert Angle: 206/38

Test Date: 9/1/04
HIC(d) = 1293, HIC = 1493, Delta T = 3 msec



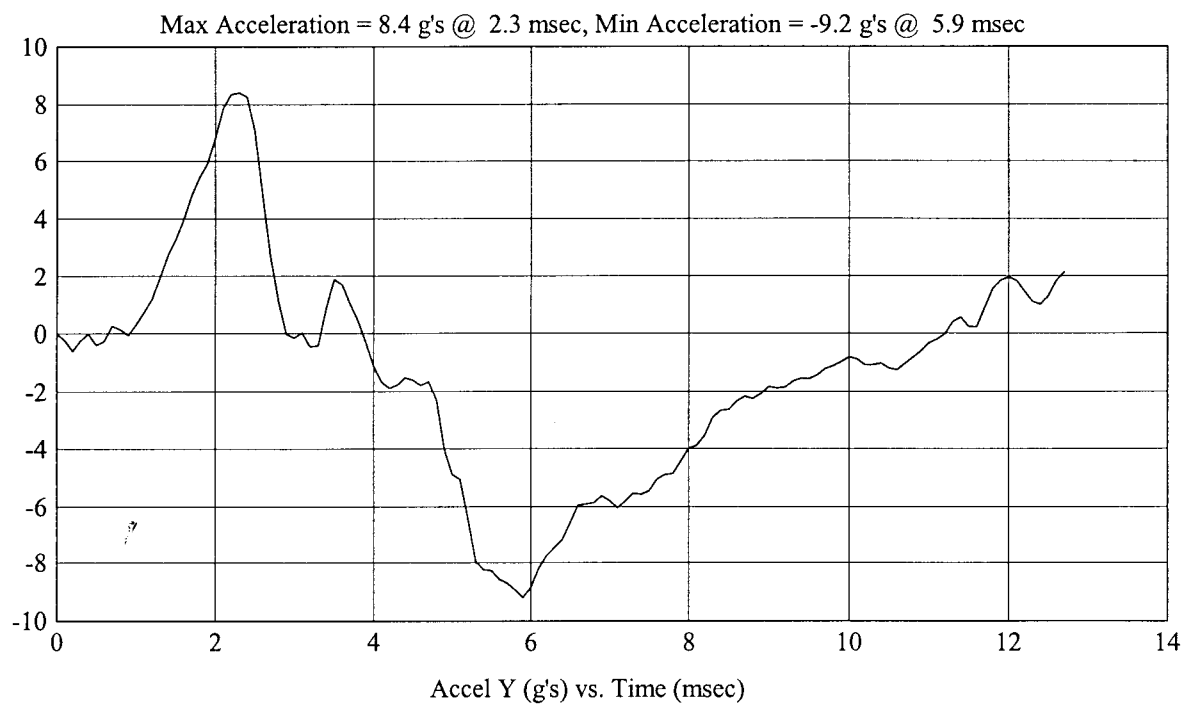
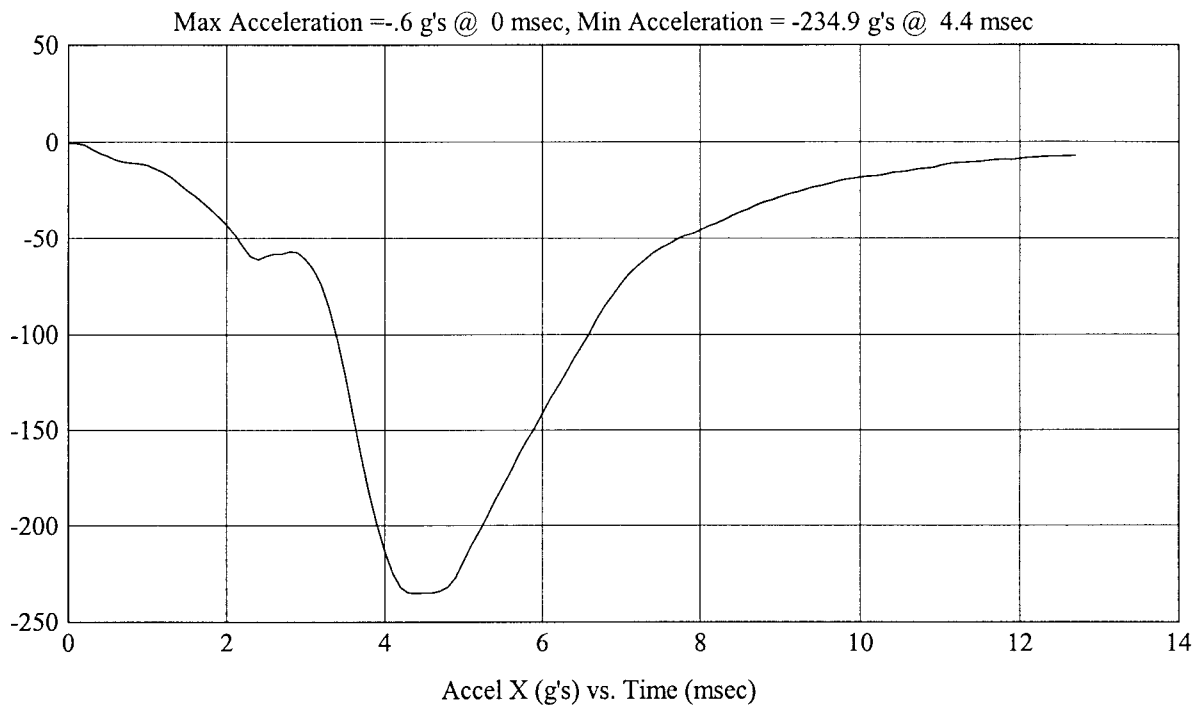
FMH
G0417-001.18

Customer: CHEVY
Test # 1
FM4513
Additional Desc: N/A

Vehicle Program : BLAZER

Model Year: 1996
Target: AP2
Vehicle Side: Left
Horz/Vert Angle: 206/38

Test Date: 9/1/04
HIC(d) = 1293, HIC = 1493, Delta T = 3 msec



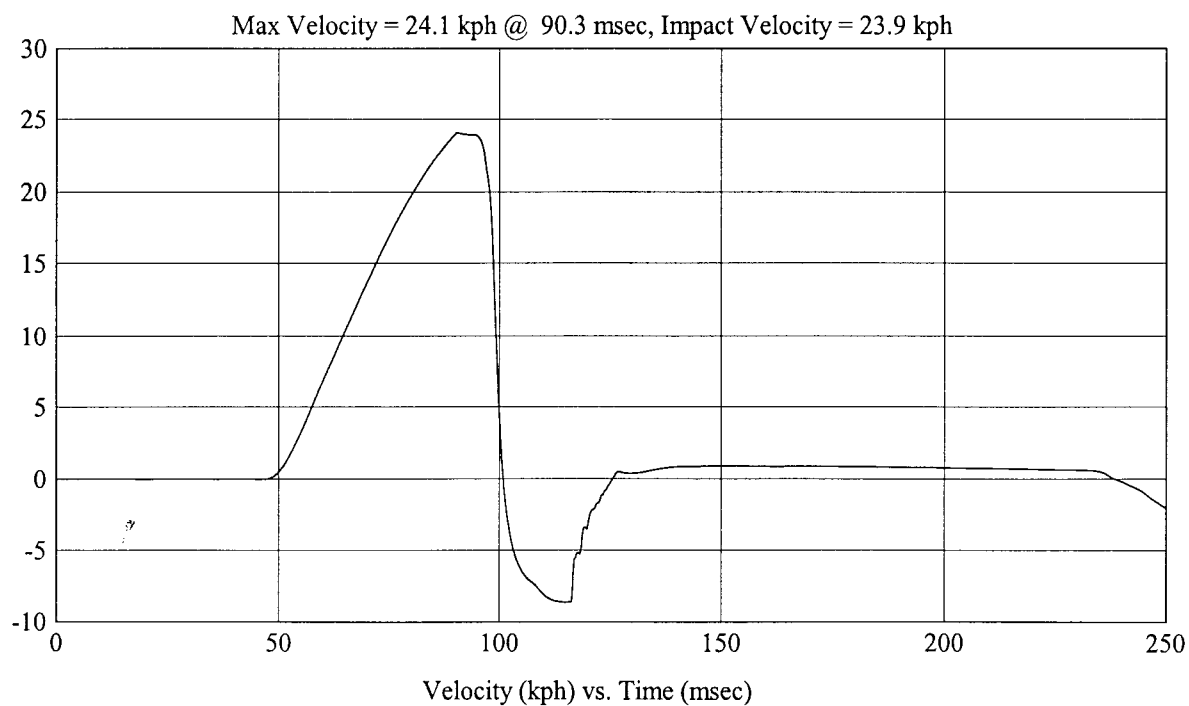
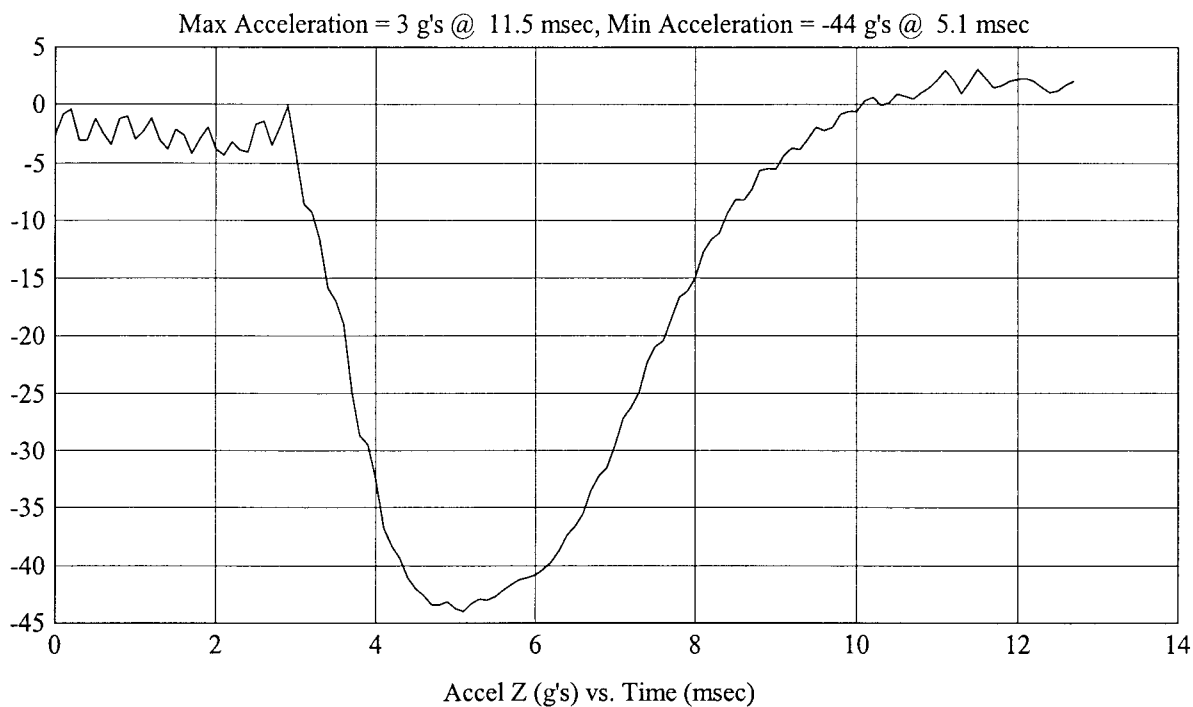
FMH
G04I7-001.18

Customer: CHEVY
Test # 1
FM4513
Additional Desc: N/A

Vehicle Program : BLAZER

Model Year: 1996
Target: AP2
Vehicle Side: Left
Horz/Vert Angle: 206/38

Test Date: 9/1/04
HIC(d) = 1293, HIC = 1493, Delta T = 3 msec



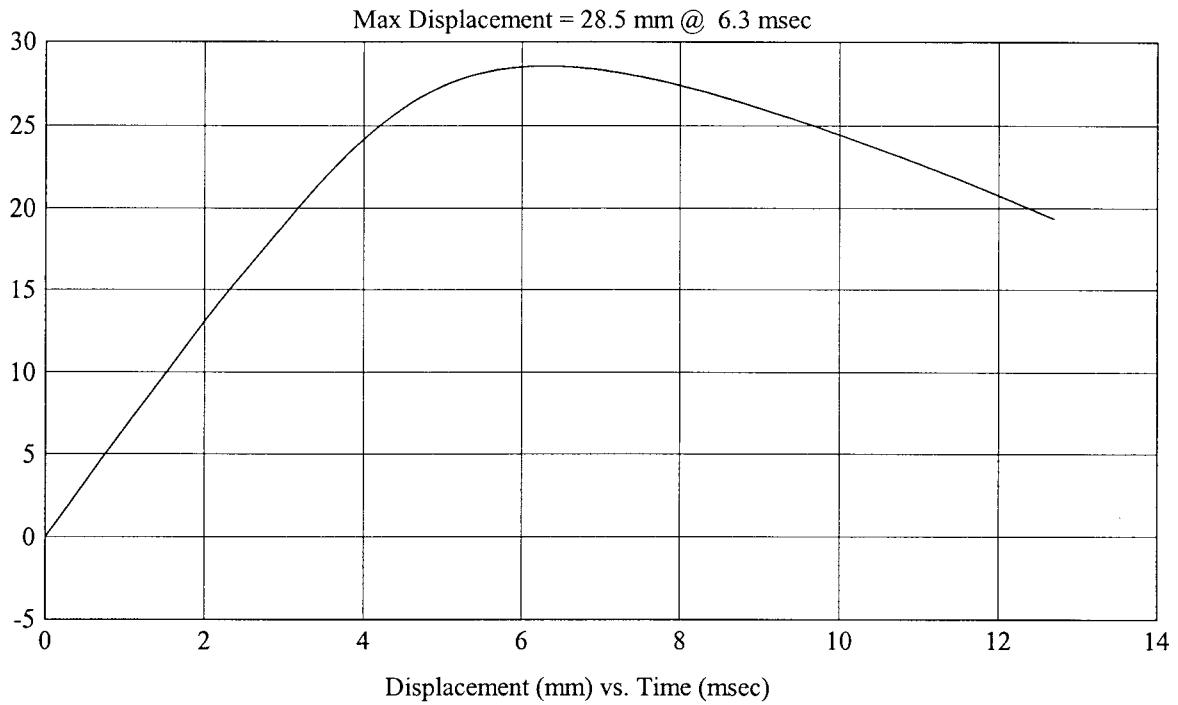
FMH
G04I7-001.18

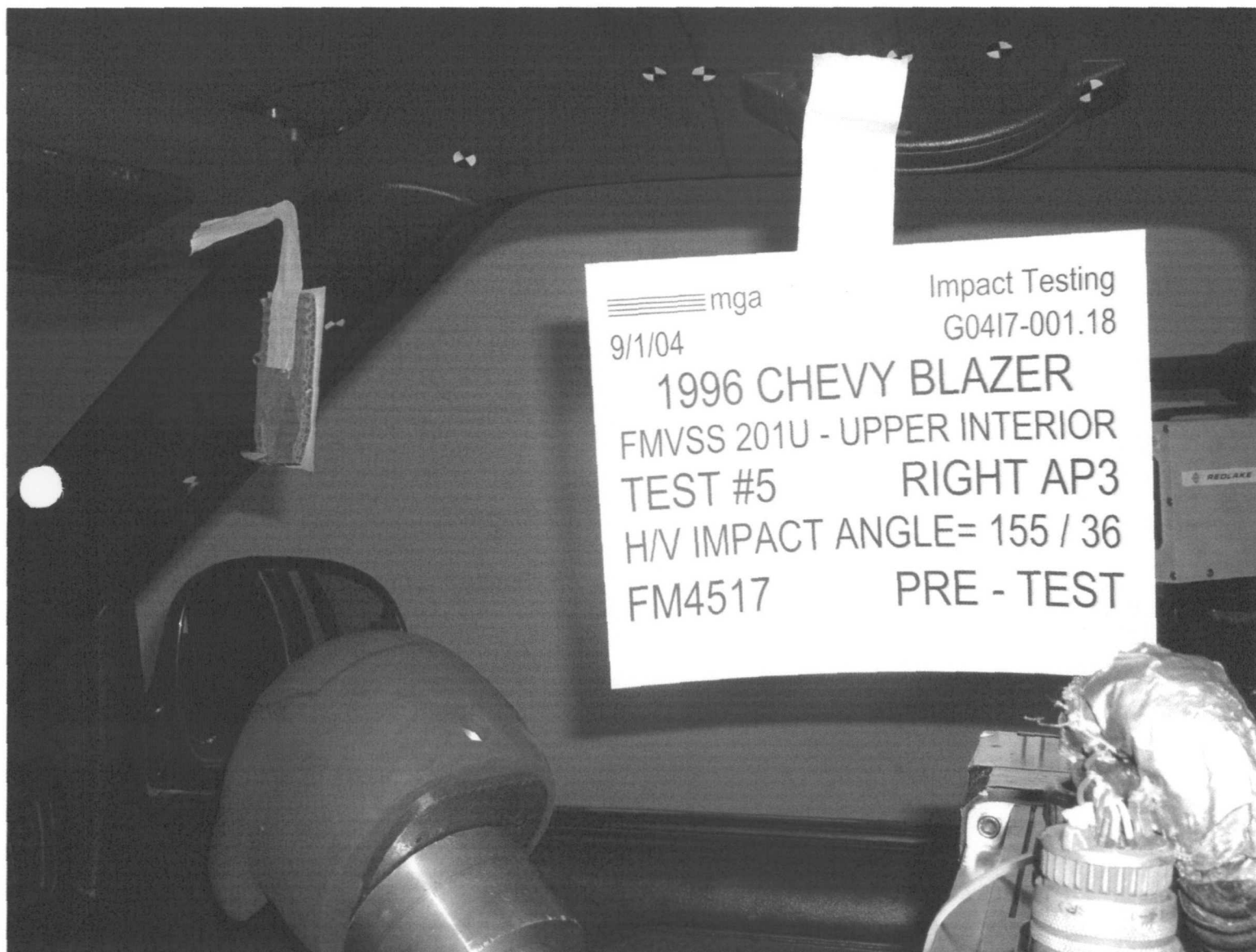
Customer: CHEVY
Test # 1
FM4513
Additional Desc: N/A

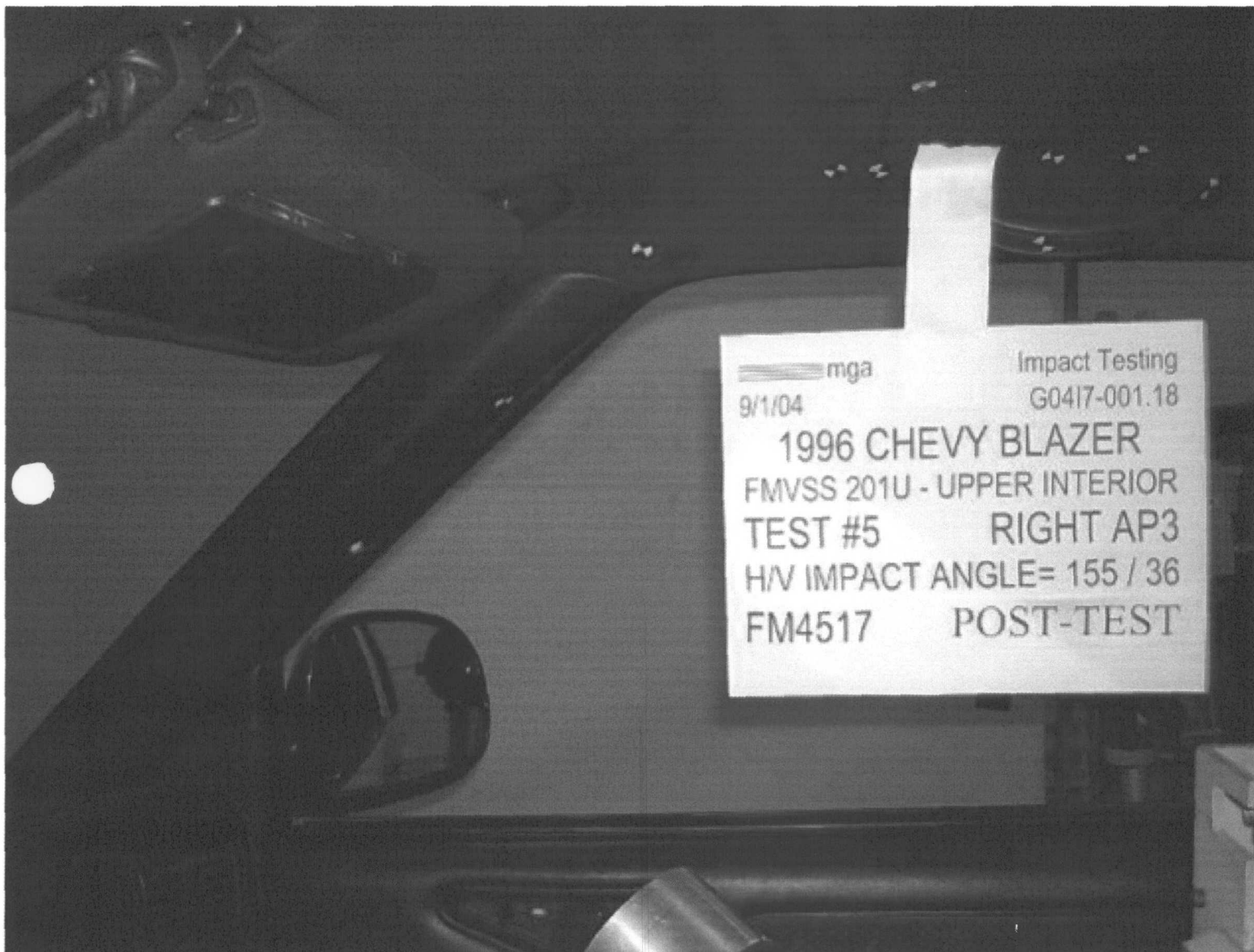
Vehicle Program : BLAZER

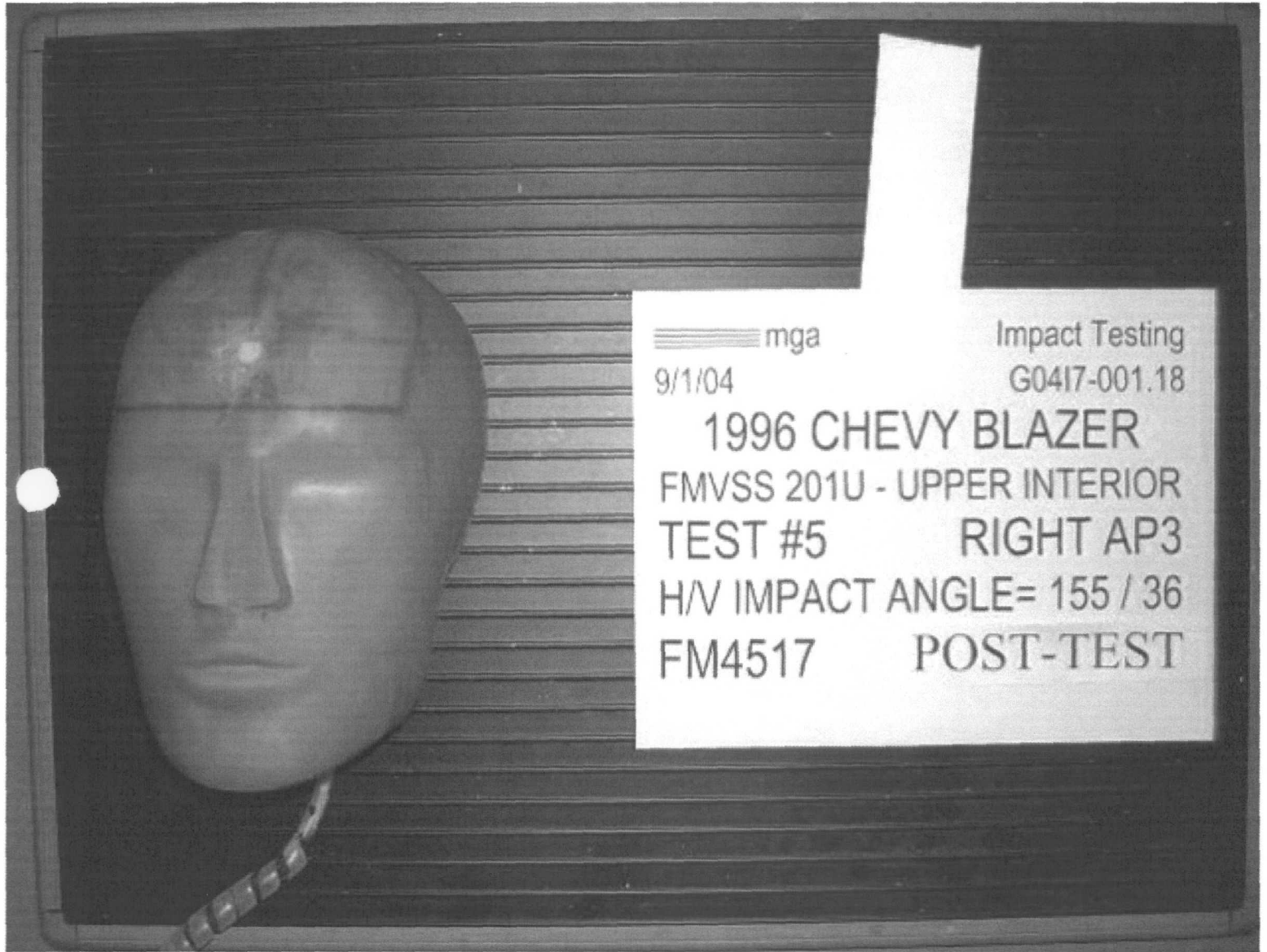
Model Year: 1996
Target: AP2
Vehicle Side: Left
Horz/Vert Angle: 206/38

Test Date: 9/1/04
HIC(d) = 1293, HIC = 1493, Delta T = 3 msec









 mga

Impact Testing

9/1/04

G0417-001.18

1996 CHEVY BLAZER

FMVSS 201U - UPPER INTERIOR

TEST #5 RIGHT AP3

H/V IMPACT ANGLE= 155 / 36

FM4517 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: G04I7-001.18 VEHICLE YR/MAKE/MODEL:BLAZER 1996

GENERAL TEST PARAMETERS:

Test Number:#5

Target (Vehicle Side): AP3 Right

Temperature:22C

MGA Test Reference No.:FM4517

Humidity:59%

Approach Horizontal Angles:155°

Time of Test: 4:40 PM

Approach Vertical Angles:36°

FMH Serial No:036

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
1497	1764	3.5	24.2	20	0

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J35923	-100.8	1.67	1.67
Y	6	J35916	100.2	1.55	1.54
Z	7	J35918	97.9	1.33	1.32

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

No visible damage

Recorded By: *mm j pm* Approved By*: *Helen Q. Kalita* Date: *9-1-04*

*Only necessary for NHTSA (Government) Compliance testing.

FMH
G04I7-001.18

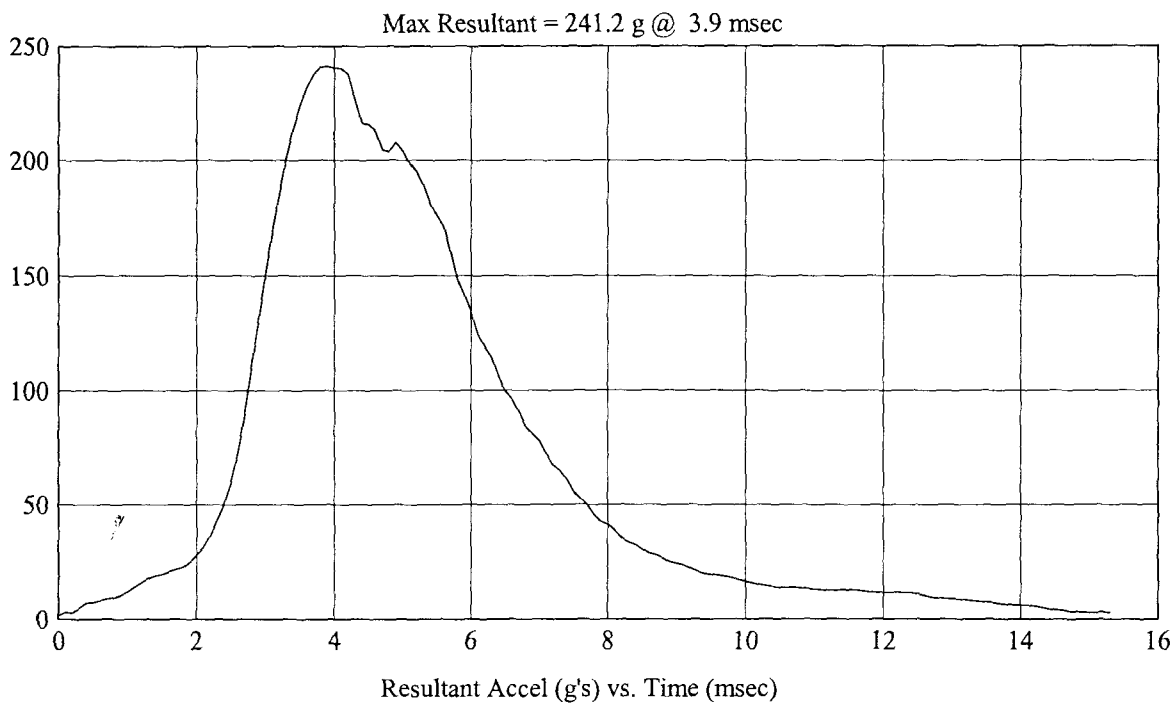
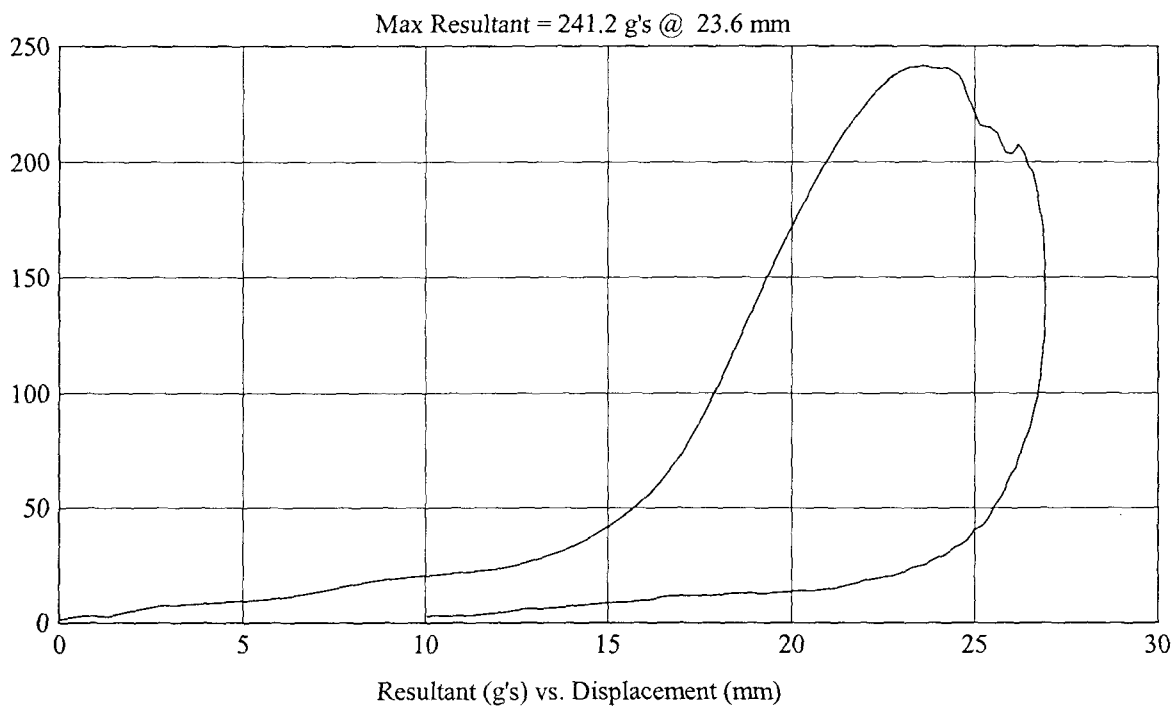
Customer: CHEVY
Test # 5
FM4517
Additional Desc: N/A

Vehicle Program : BLAZER

Model Year: 1996
Target: AP3
Vehicle Side: Right
Horz/Vert Angle: 155/36

Test Date: 9/1/04

HIC(d) = 1497, HIC = 1764, Delta T = 3.5 msec



FMH
G0417-001.18

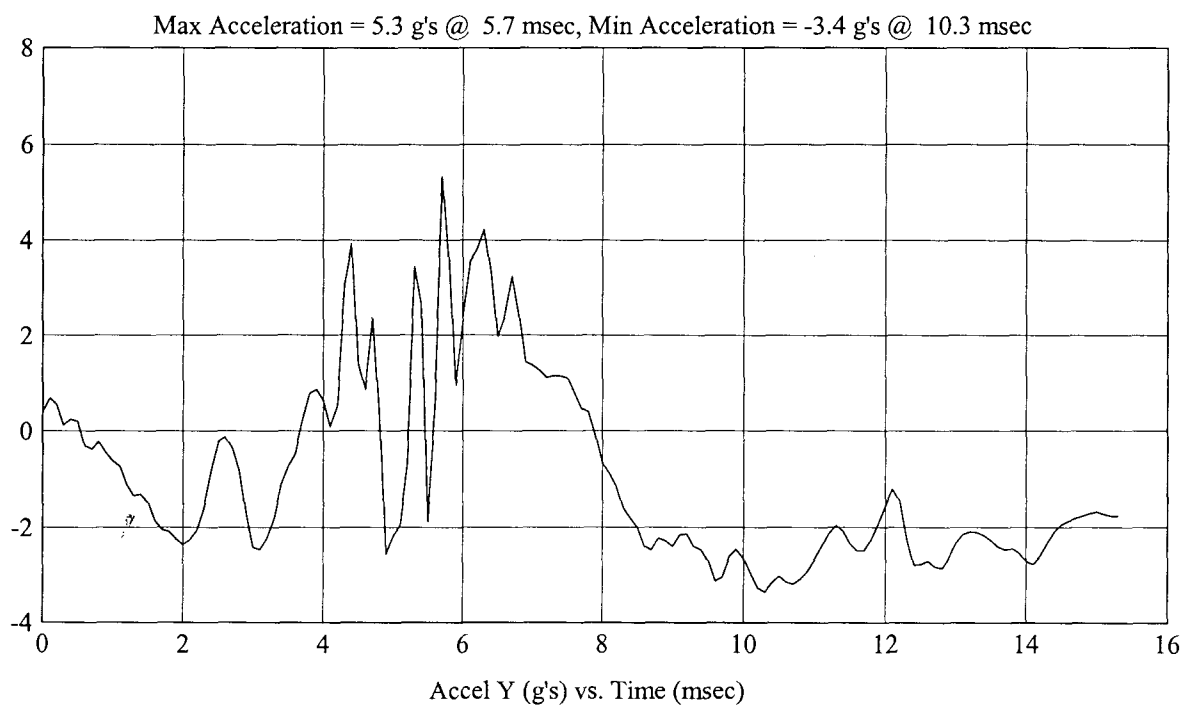
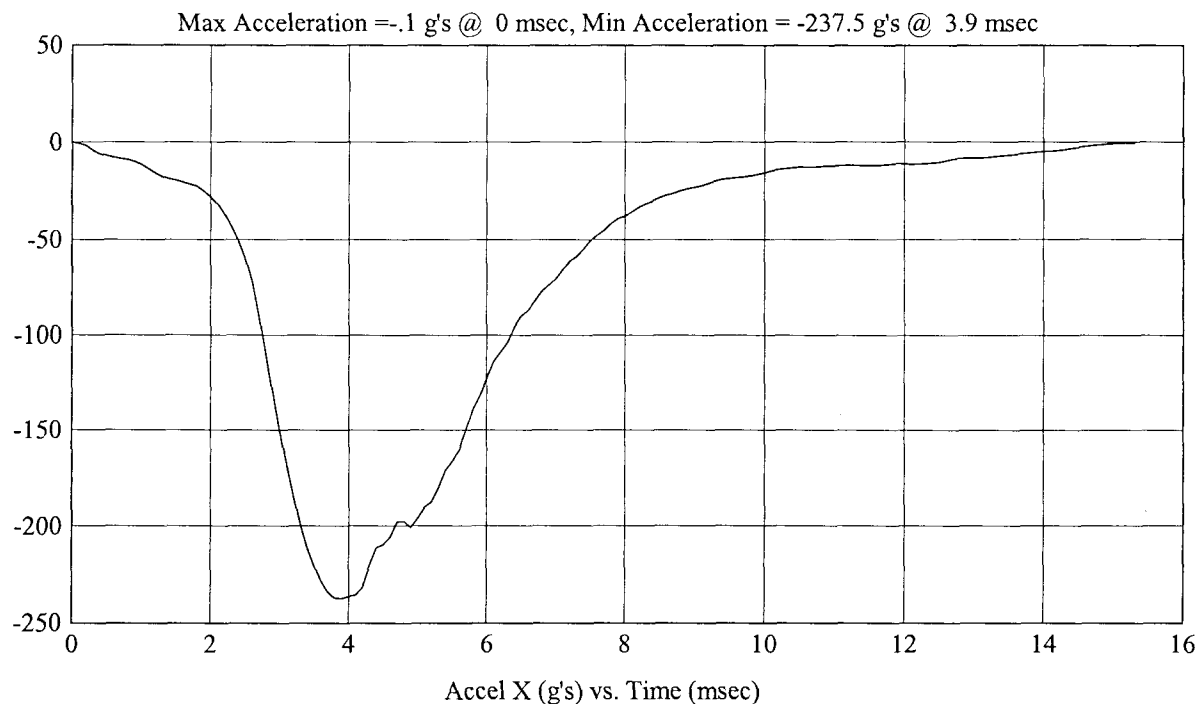
Customer: CHEVY
Test # 5
FM4517
Additional Desc: N/A

Vehicle Program : BLAZER

Model Year: 1996
Target: AP3
Vehicle Side: Right
Horz/Vert Angle: 155/36

Test Date: 9/1/04

HIC(d) = 1497, HIC = 1764, Delta T = 3.5 msec



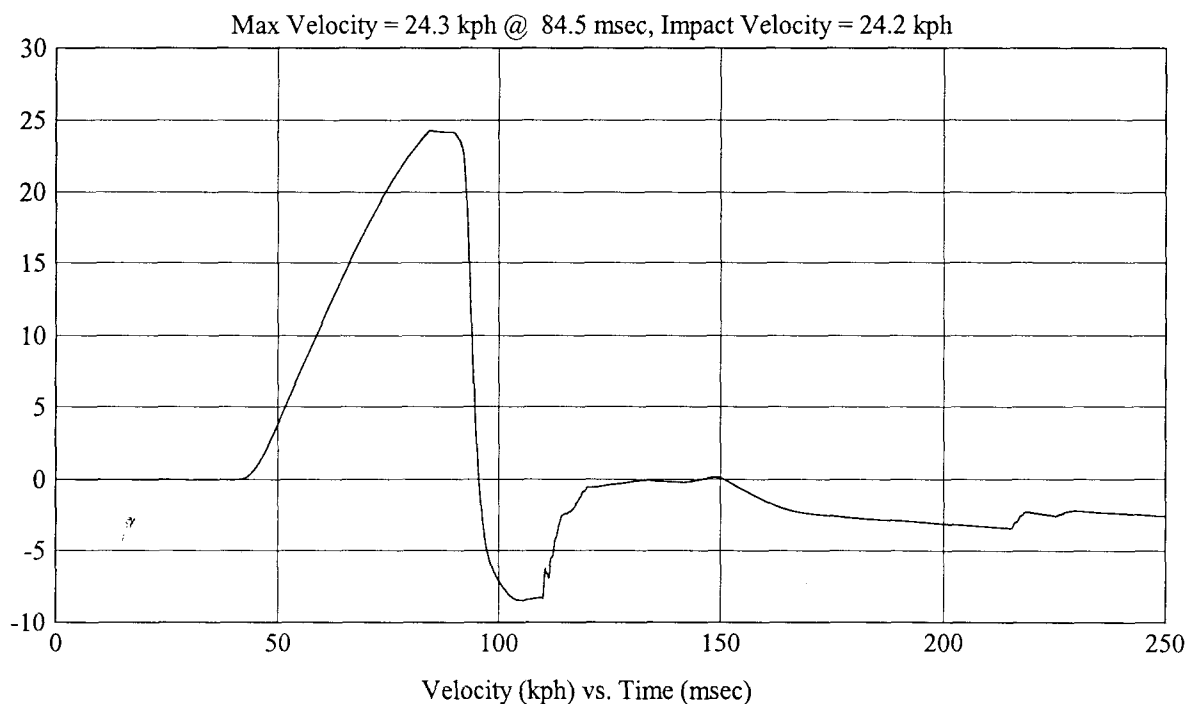
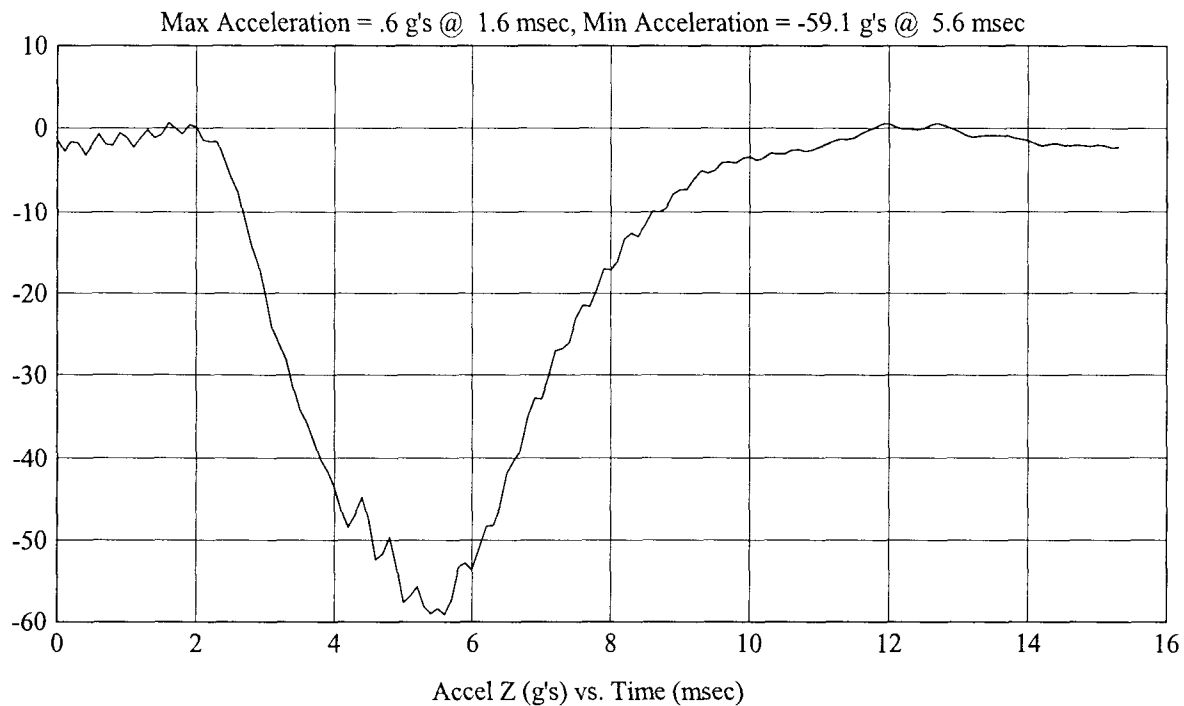
FMH
G04I7-001.18

Customer: CHEVY
Test # 5
FM4517
Additional Desc: N/A

Vehicle Program : BLAZER

Model Year: 1996
Target: AP3
Vehicle Side: Right
Horz/Vert Angle: 155/36

Test Date: 9/1/04
HIC(d) = 1497, HIC = 1764, Delta T = 3.5 msec



FMH
G0417-001.18

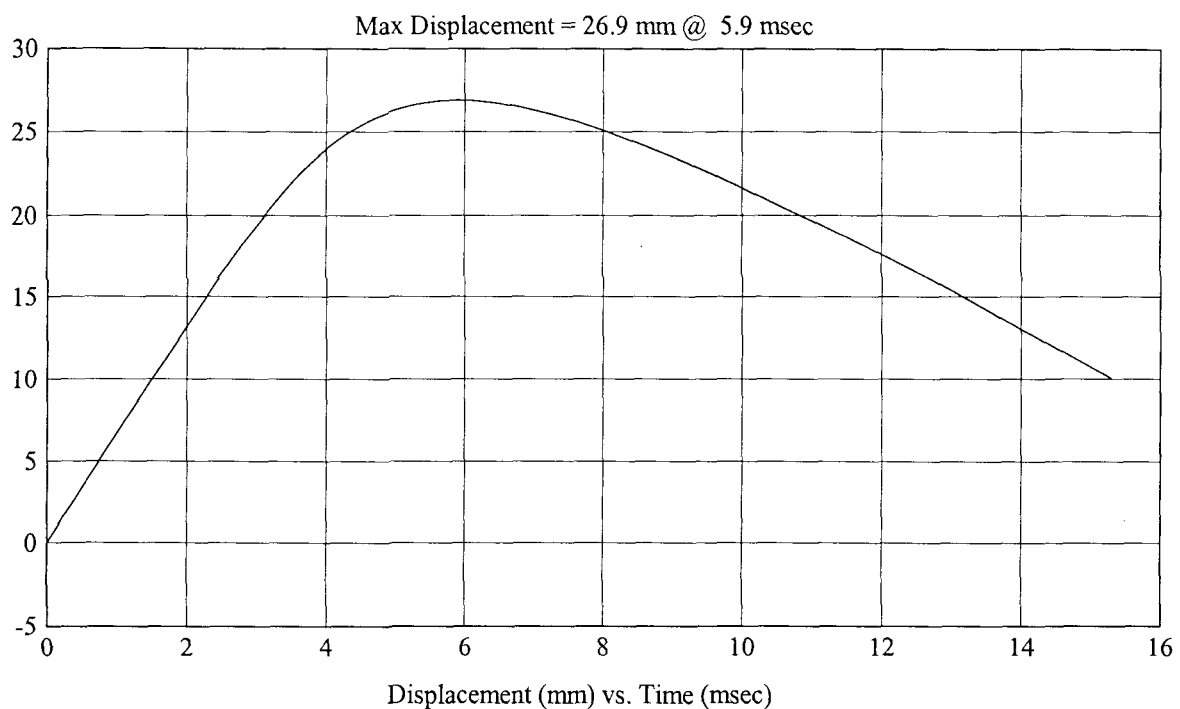
Customer: CHEVY
Test # 5
FM4517
Additional Desc: N/A

Vehicle Program : BLAZER

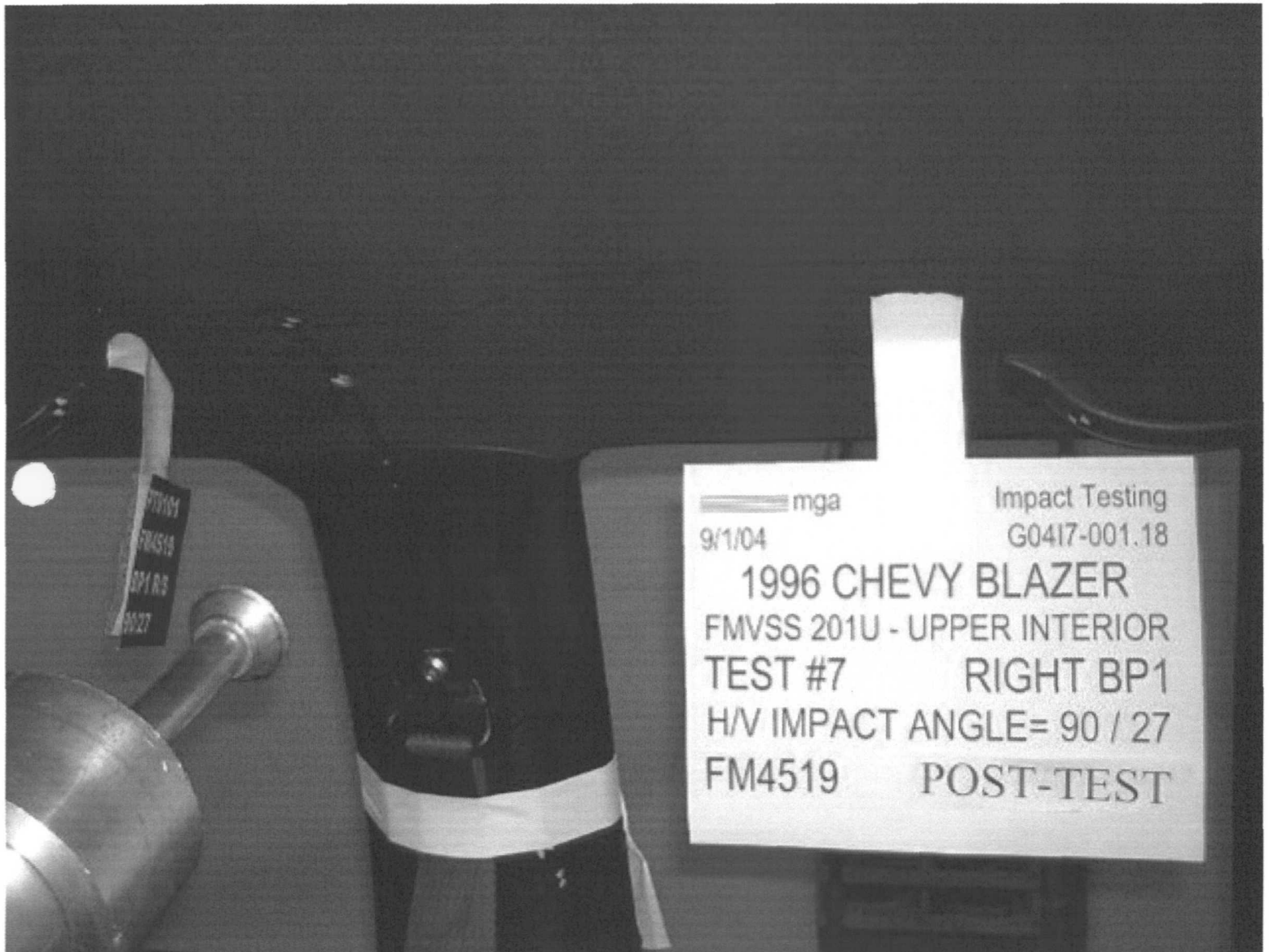
Model Year: 1996
Target: AP3
Vehicle Side: Right
Horz/Vert Angle: 155/36

Test Date: 9/1/04

HIC(d) = 1497, HIC = 1764, Delta T = 3.5 msec









===== mga

9/1/04

Impact Testing

G04I7-001.18

1996 CHEVY BLAZER

FMVSS 201U - UPPER INTERIOR

TEST #7 RIGHT BP1

H/V IMPACT ANGLE= 90 / 27

FM4519 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: G04I7-001.18 VEHICLE YR/MAKE/MODEL:BLAZER 1996

GENERAL TEST PARAMETERS:

Test Number:#7

Target (Vehicle Side): BP1 Right

Temperature:22C

MGA Test Reference No.:FM4519

Humidity:54%

Approach Horizontal Angles:90°

Time of Test:5:45 PM

Approach Vertical Angles:27°

FMH Serial No:035

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
669	666	2.7	23.8	52	7 L

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J35924	-92.4	1.67	1.66
Y	6	J35919	93.8	1.54	1.53
Z	7	J21969	88.5	1.58	1.57

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

No visible damage

Recorded By: mjm Approved By*: Helen Q. Kato Date: 9-1-01

*Only necessary for NHTSA (Government) Compliance testing.

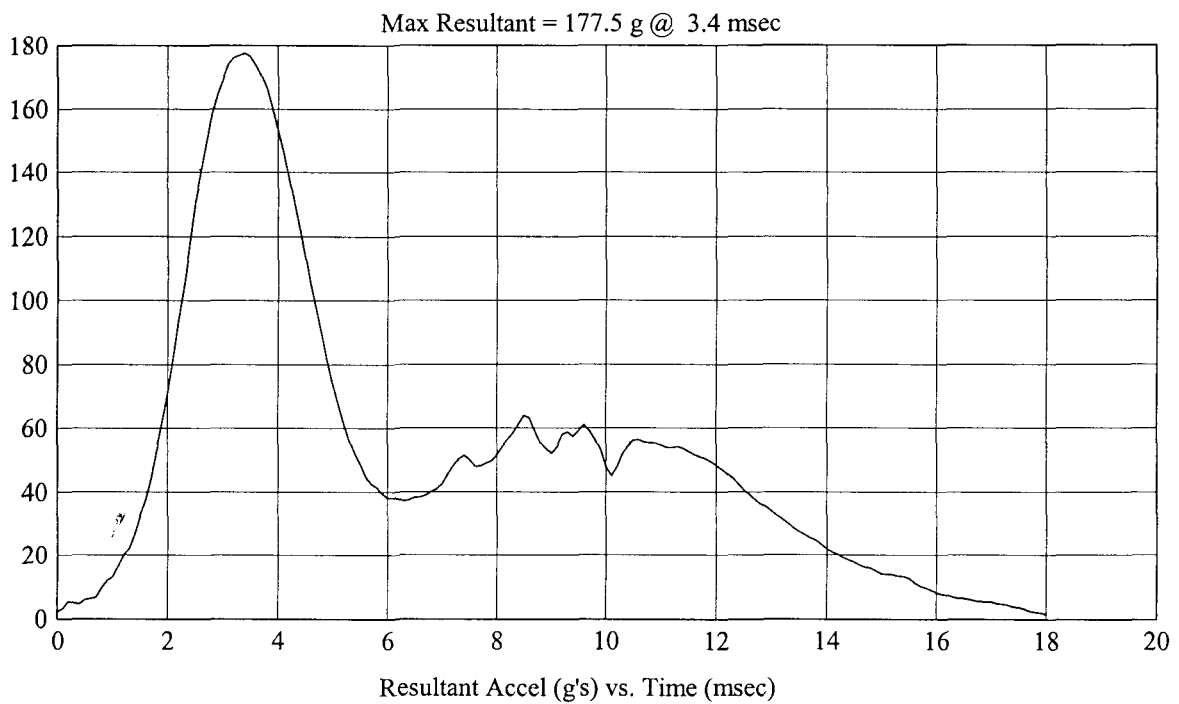
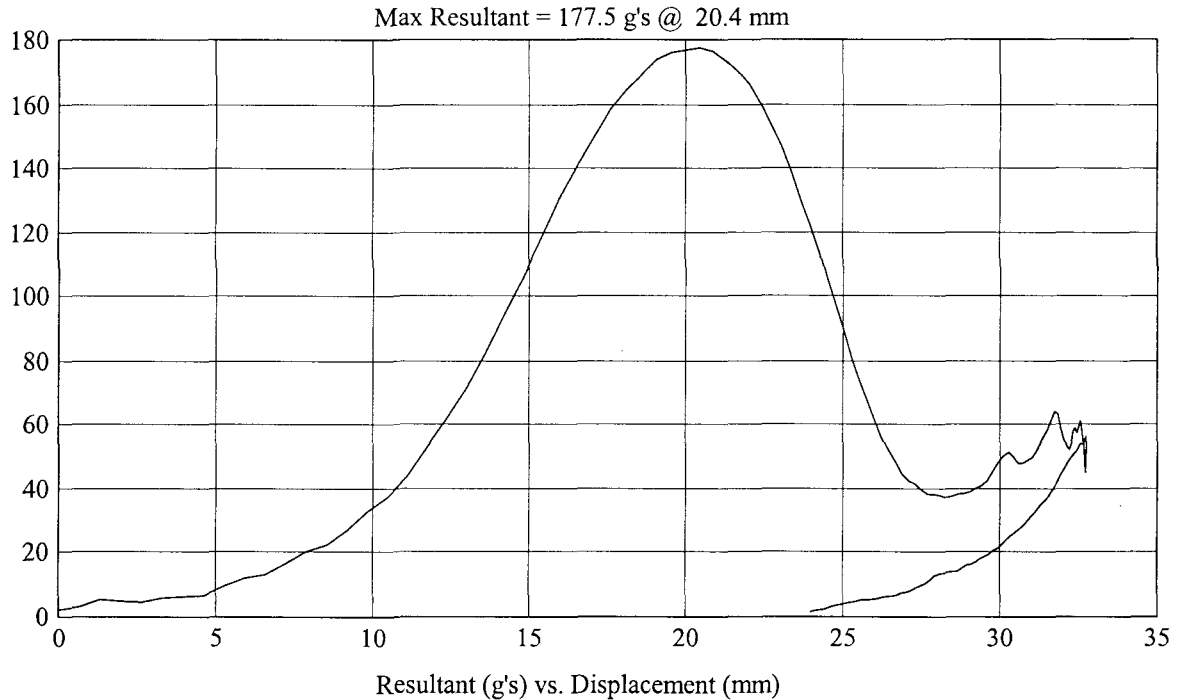
FMH
G04I7-001.18

Customer: CHEVY
Test # 7
FM4519
Additional Desc: N/A

Vehicle Program : BLAZER

Model Year: 1996
Target: BP1
Vehicle Side: Right
Horz/Vert Angle: 90/27

Test Date: 9/1/04
HIC(d) = 669, HIC = 666, Delta T = 2.7 msec



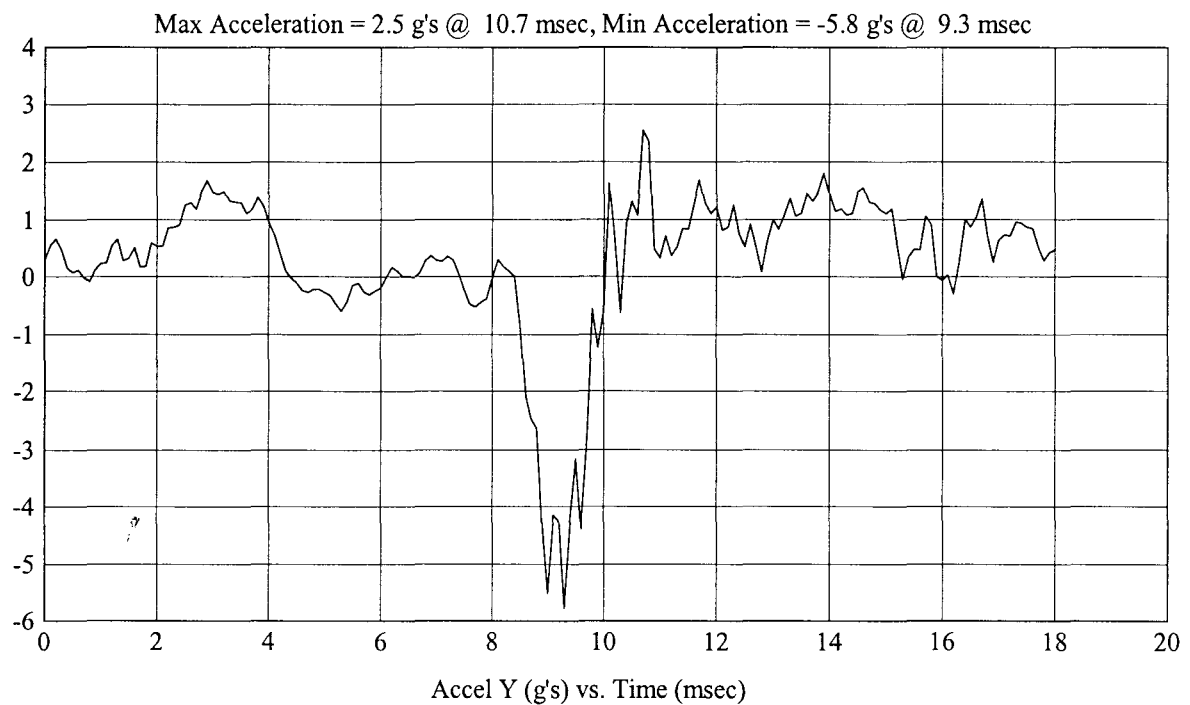
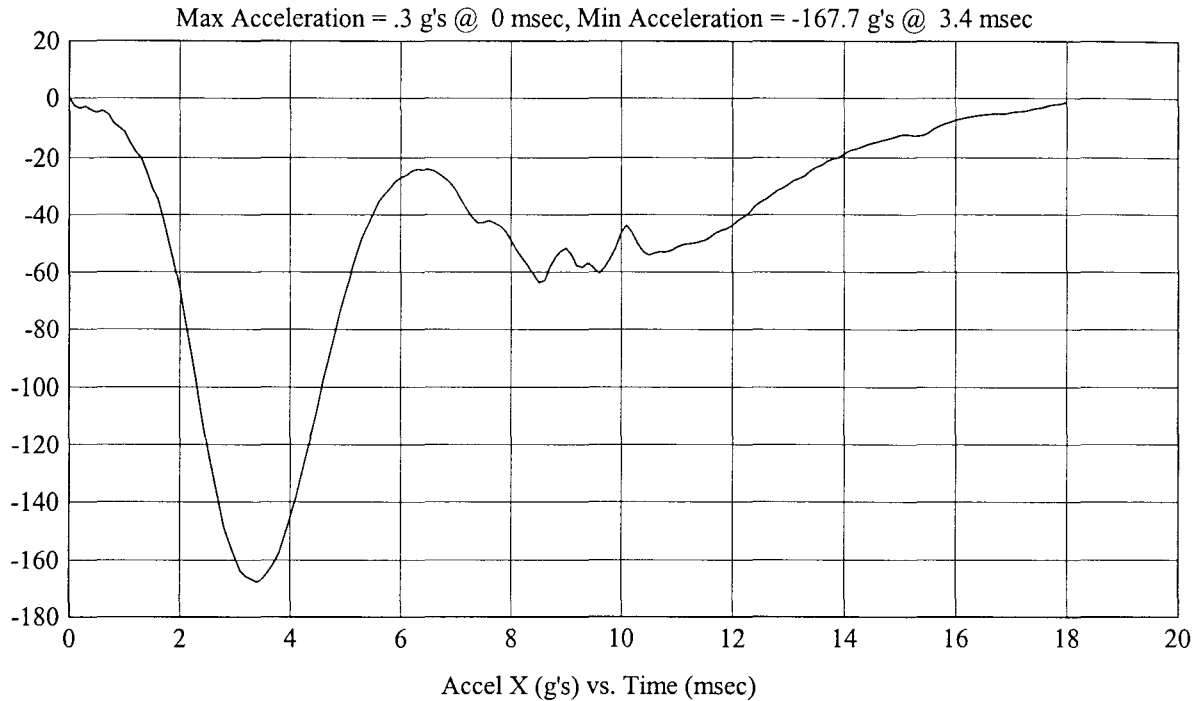
FMH
G04I7-001.18

Customer: CHEVY
Test # 7
FM4519
Additional Desc: N/A

Vehicle Program : BLAZER

Model Year: 1996
Target: BP1
Vehicle Side: Right
Horz/Vert Angle: 90/27

Test Date: 9/1/04
HIC(d) = 669, HIC = 666, Delta T = 2.7 msec



FMH
G04I7-001.18

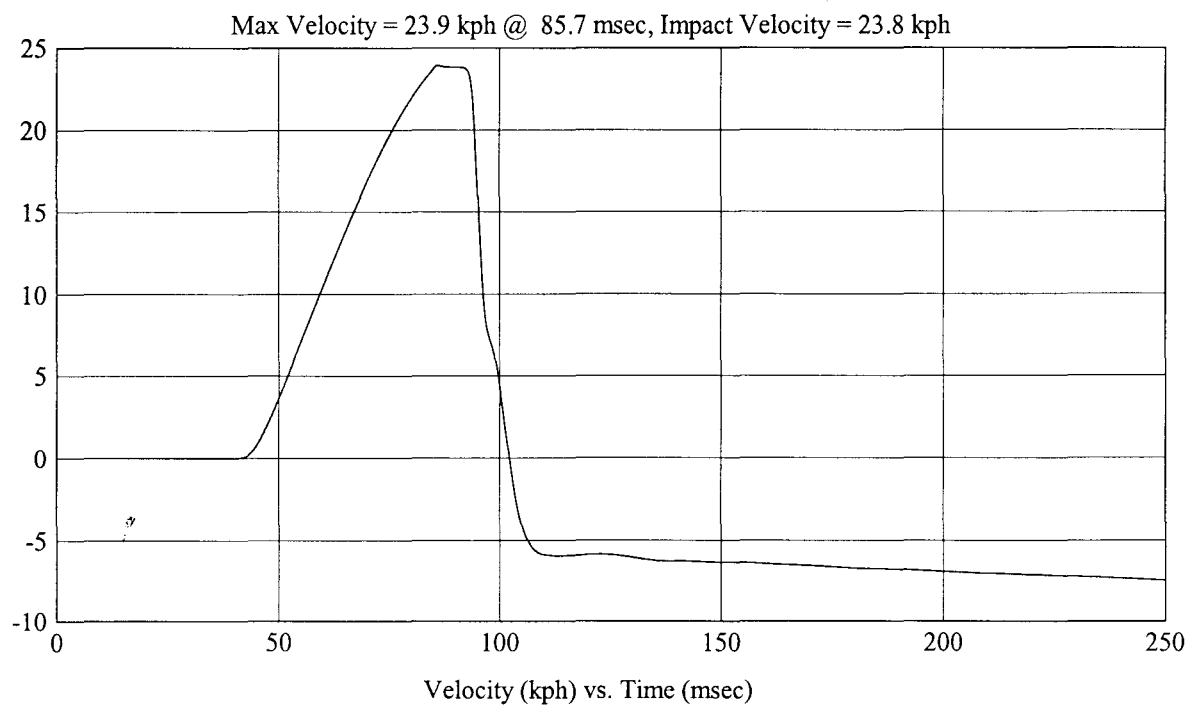
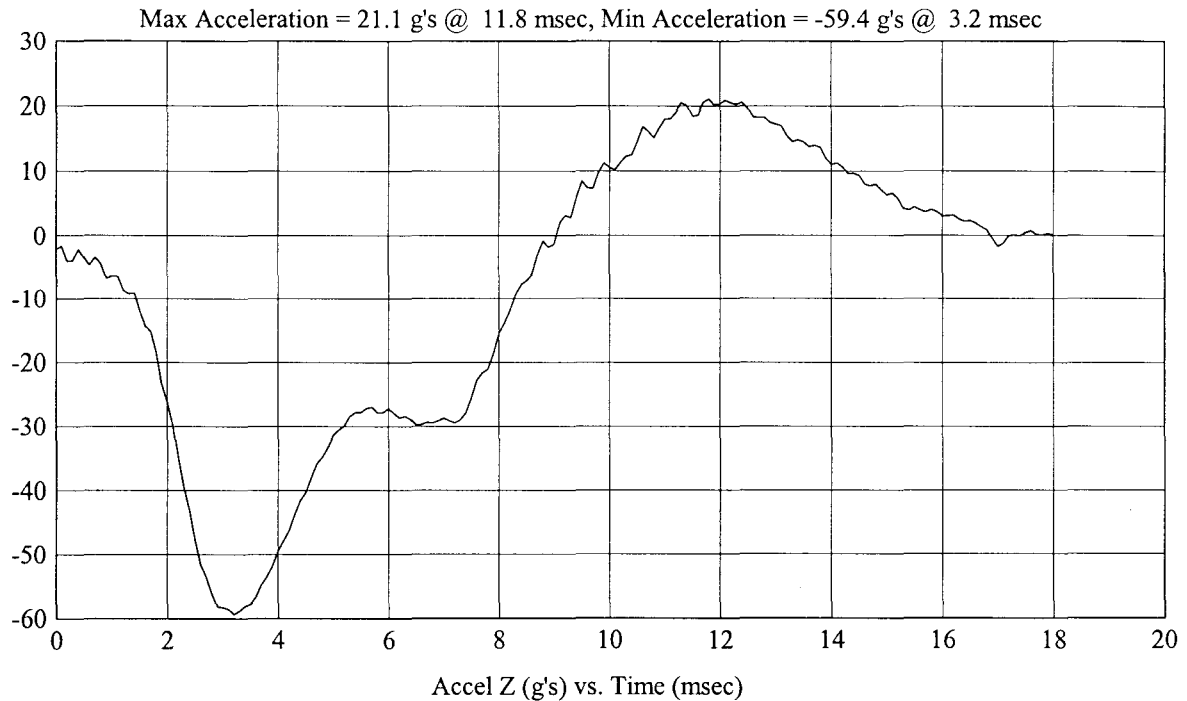
Customer: CHEVY
Test # 7
FM4519
Additional Desc: N/A

Vehicle Program : BLAZER

Model Year: 1996
Target: BP1
Vehicle Side: Right
Horz/Vert Angle: 90/27

Test Date: 9/1/04

HIC(d) = 669, HIC = 666, Delta T = 2.7 msec



FMH
G04I7-001.18

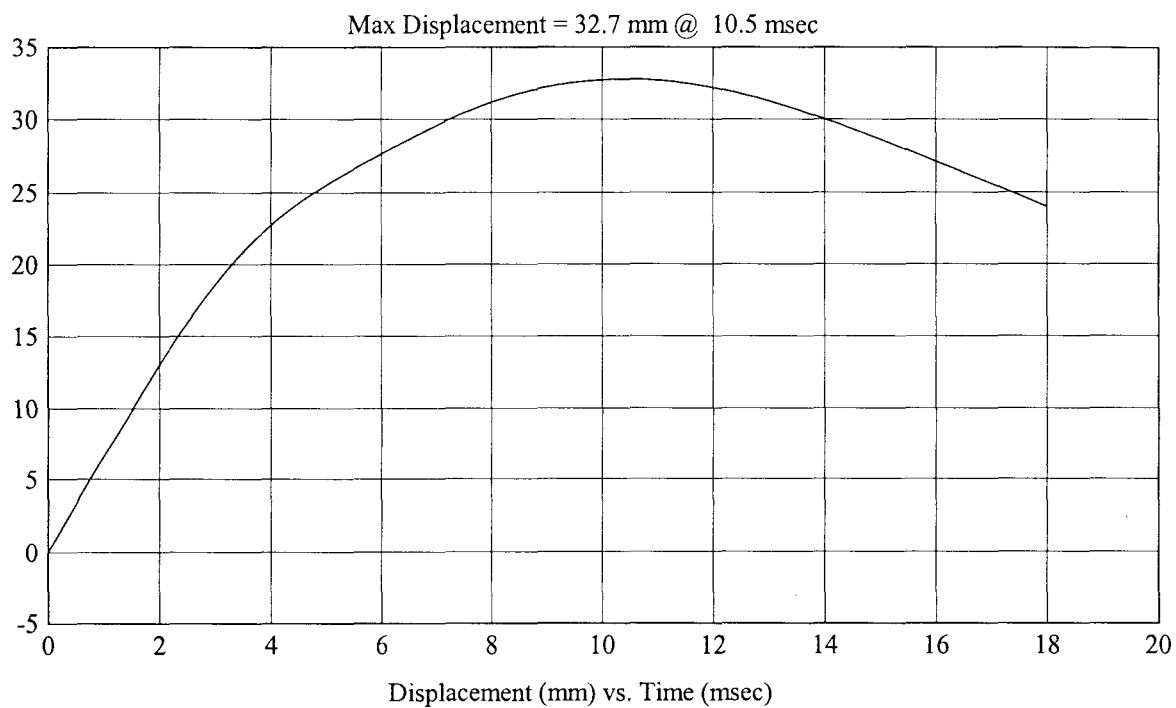
Customer: CHEVY
Test # 7
FM4519
Additional Desc: N/A

Vehicle Program : BLAZER

Model Year: 1996
Target: BP1
Vehicle Side: Right
Horz/Vert Angle: 90/27

Test Date: 9/1/04

HIC(d) = 669, HIC = 666, Delta T = 2.7 msec



 mga

9/1/04

Impact Testing
G0417-001.18

1996 CHEVY BLAZER

FMVSS 201U - UPPER INTERIOR

TEST #2 LEFT BP3

H/V IMPACT ANGLE= 270 / -2

FM4514 PRE - TEST

 mga

9/1/04

Impact Testing

G0417-001.18

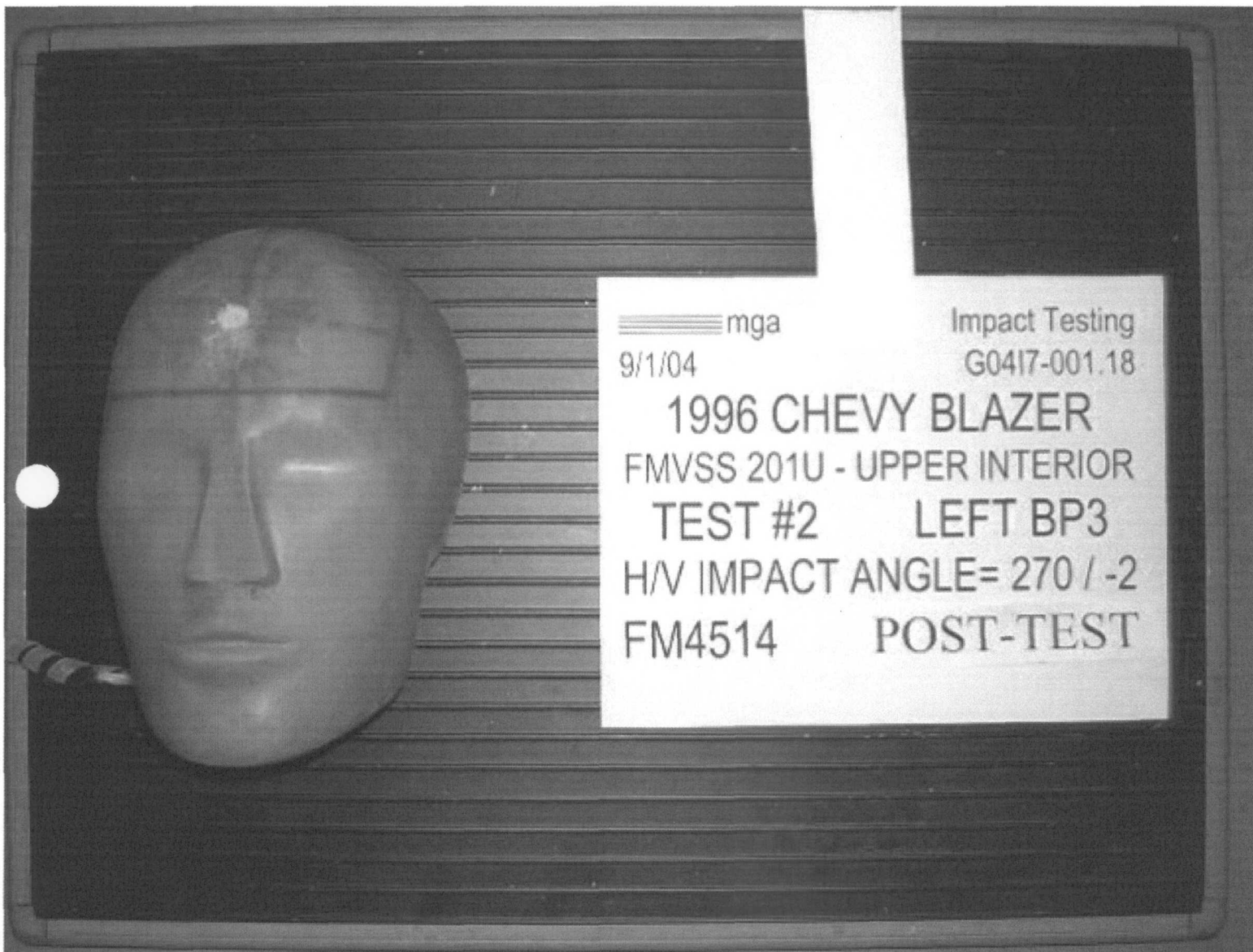
1996 CHEVY BLAZER

FMVSS 201U - UPPER INTERIOR

TEST #2 LEFT BP3

H/V IMPACT ANGLE= 270 / -2

FM4514 POST-TEST



==== mga

9/1/04

Impact Testing

G04I7-001.18

1996 CHEVY BLAZER

FMVSS 201U - UPPER INTERIOR

TEST #2 LEFT BP3

H/V IMPACT ANGLE= 270 / -2

FM4514 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: G04I7-001.18 VEHICLE YR/MAKE/MODEL:BLAZER 1996

GENERAL TEST PARAMETERS:

Target (Vehicle Side): BP3 Left

MGA Test Reference No.:FM4514

Approach Horizontal Angles:270°

Approach Vertical Angles:-2°

Test Number:#2

Temperature:22C

Humidity:62%

Time of Test:12:45 PM

FMH Serial No:036

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
753	778	3.9	23.5	30	3 R

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV 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 m Approved By*: Helen Q. Kales Date: 9-1-04

*Only necessary for NHTSA (Government) Compliance testing.

FMH
G04I7-001.18

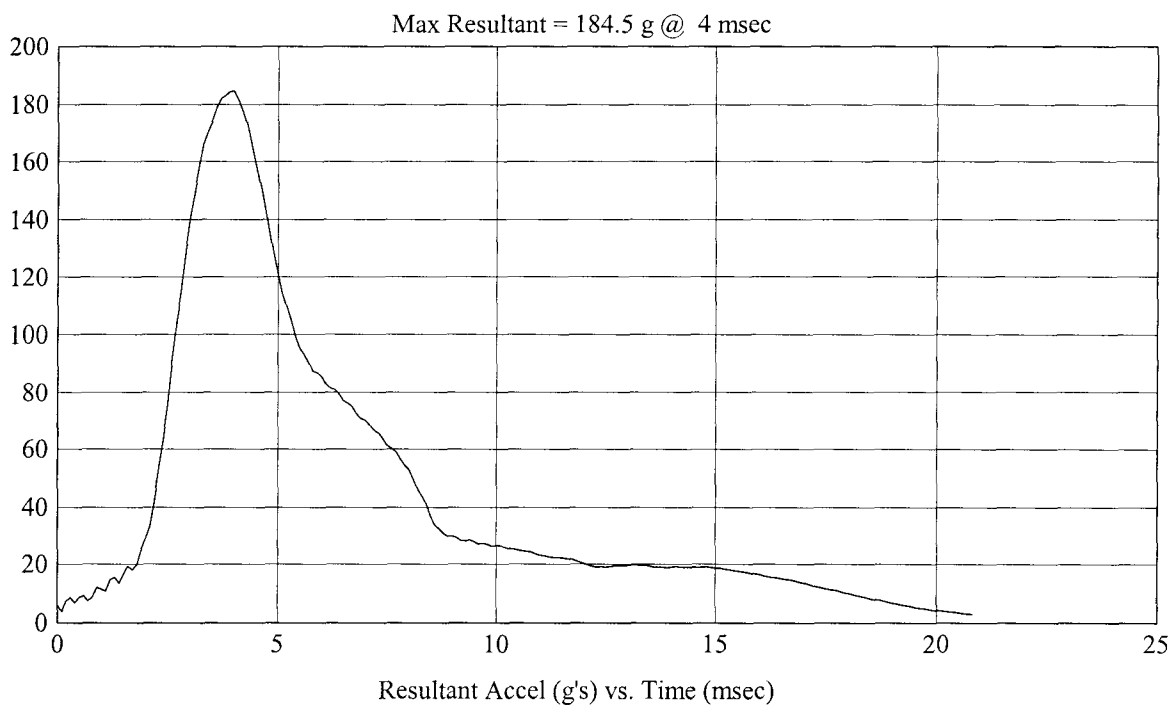
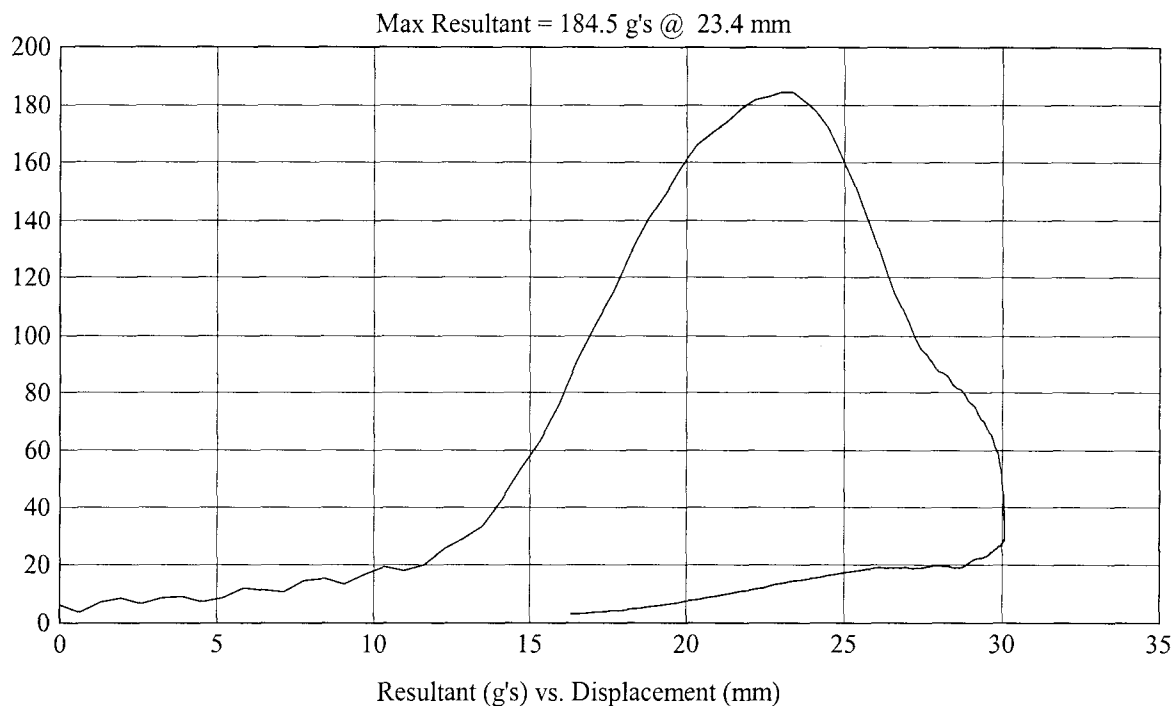
Customer: CHEVY
Test # 2
FM4514
Additional Desc: N/A

Vehicle Program : BLAZER

Model Year: 1996
Target: BP3
Vehicle Side: Left
Horz/Vert Angle: 270/-2

Test Date: 9/1/04

HIC(d) = 753, HIC = 778, Delta T = 3.9 msec



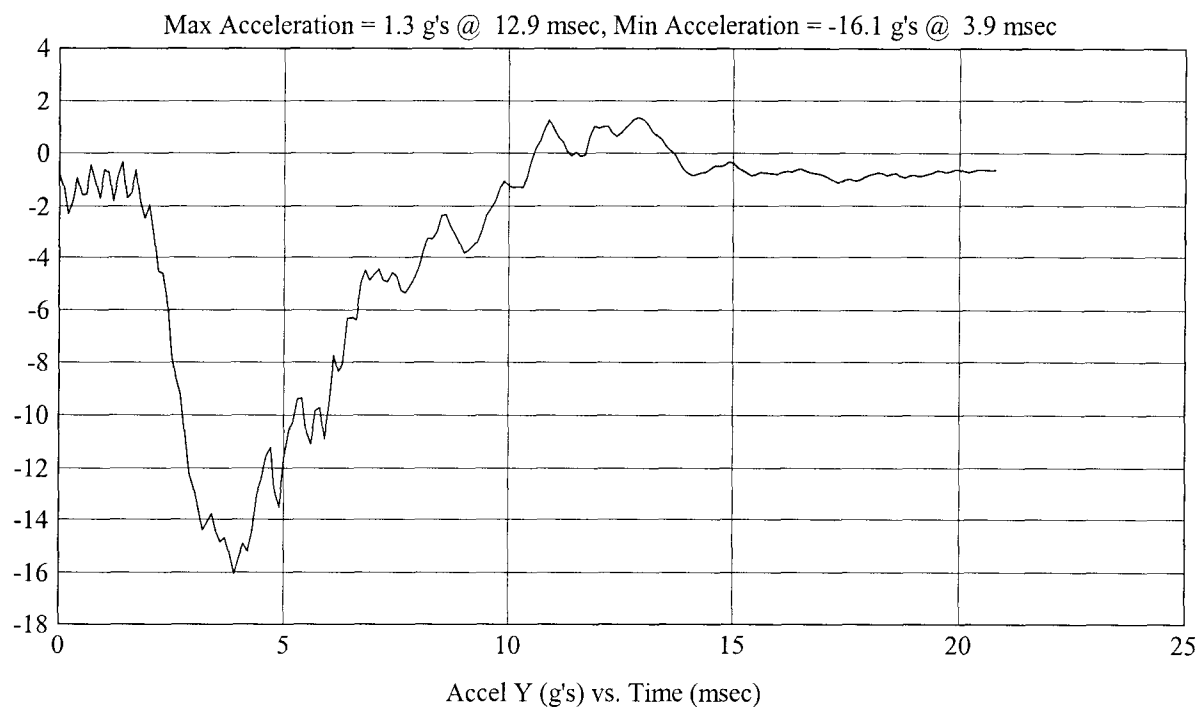
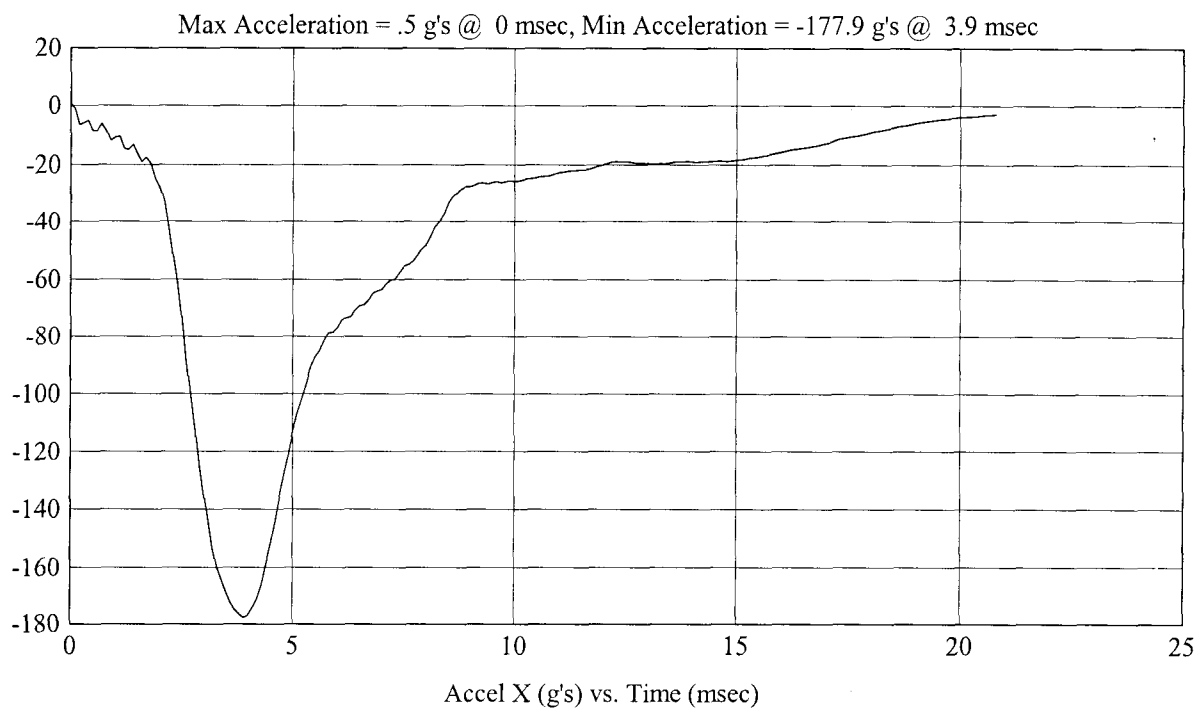
FMH
G04I7-001.18

Customer: CHEVY
Test # 2
FM4514
Additional Desc: N/A

Vehicle Program : BLAZER

Test Date: 9/1/04
HIC(d) = 753, HIC = 778, Delta T = 3.9 msec

Model Year: 1996
Target: BP3
Vehicle Side: Left
Horz/Vert Angle: 270/-2



FMH
G04I7-001.18

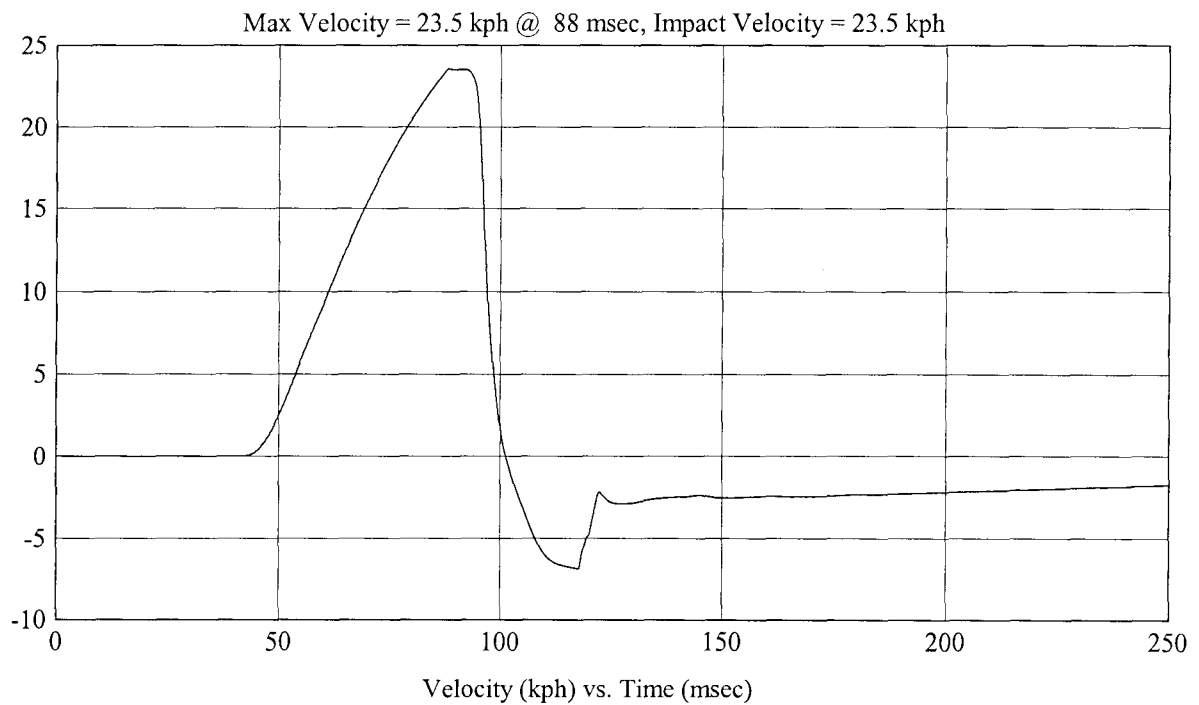
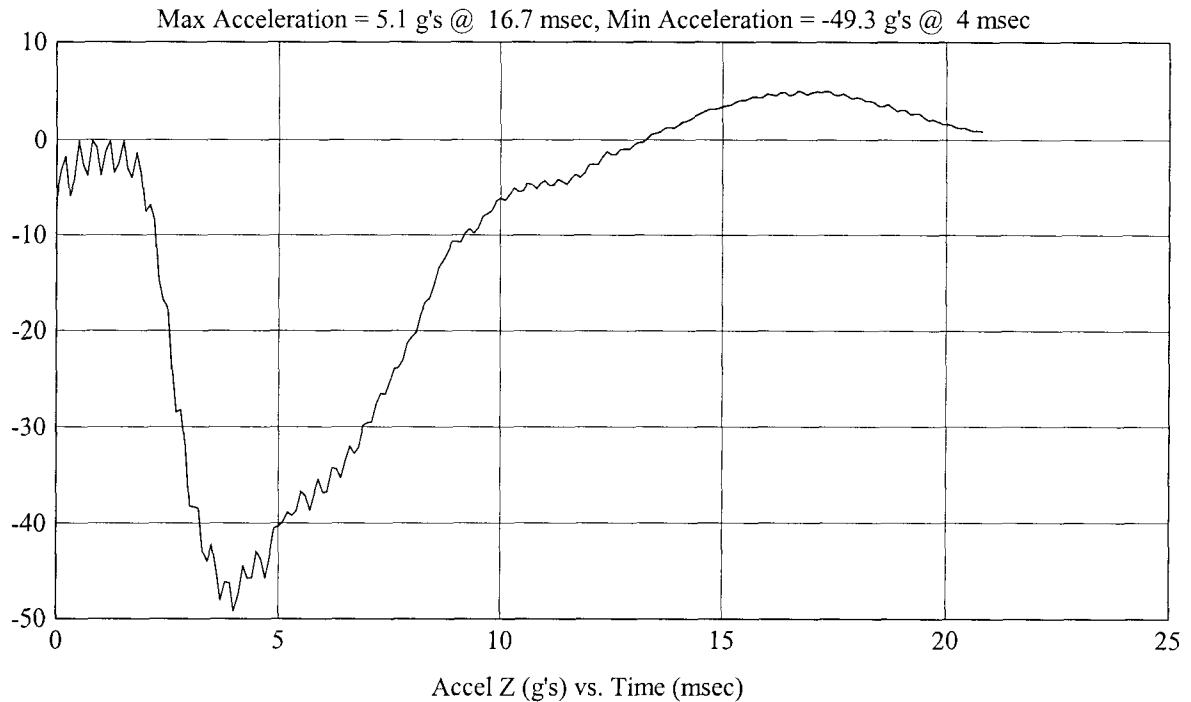
Customer: CHEVY
Test # 2
FM4514
Additional Desc: N/A

Vehicle Program : BLAZER

Model Year: 1996
Target: BP3
Vehicle Side: Left
Horz/Vert Angle: 270/-2

Test Date: 9/1/04

HIC(d) = 753, HIC = 778, Delta T = 3.9 msec



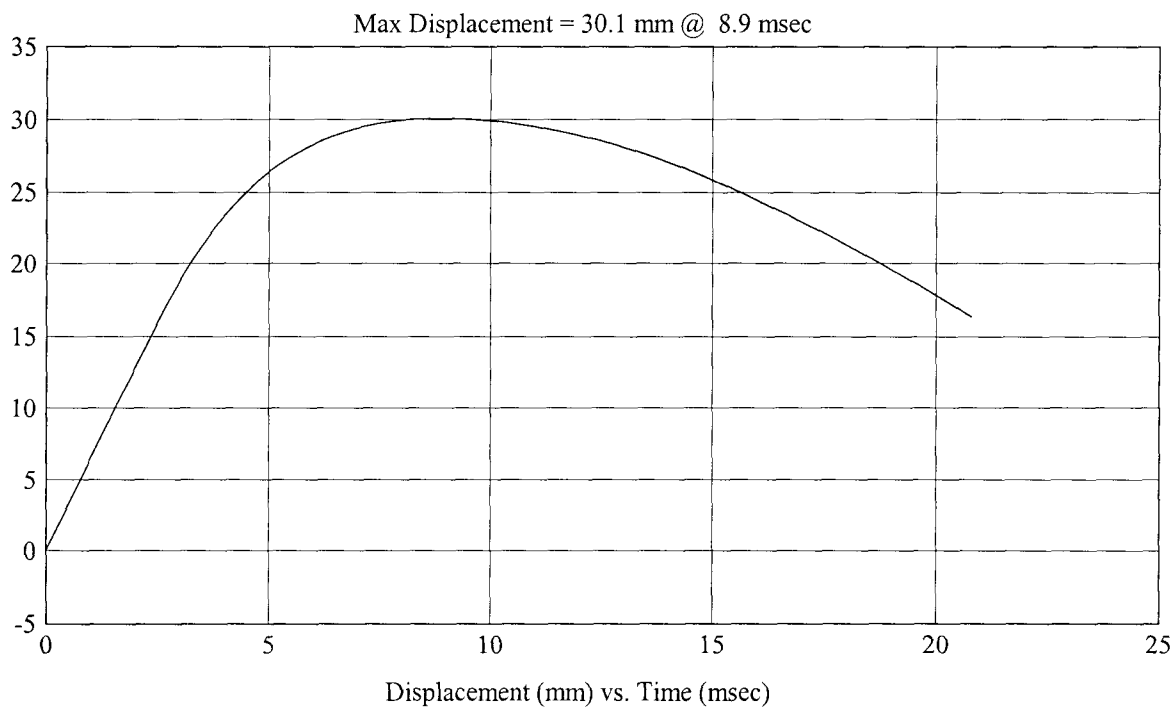
FMH
G04I7-001.18

Customer: CHEVY
Test # 2
FM4514
Additional Desc: N/A

Vehicle Program : BLAZER

Model Year: 1996
Target: BP3
Vehicle Side: Left
Horz/Vert Angle: 270/-2

Test Date: 9/1/04
HIC(d) = 753, HIC = 778, Delta T = 3.9 msec



mga
9/2/04

Impact Testing
G0417-001.18

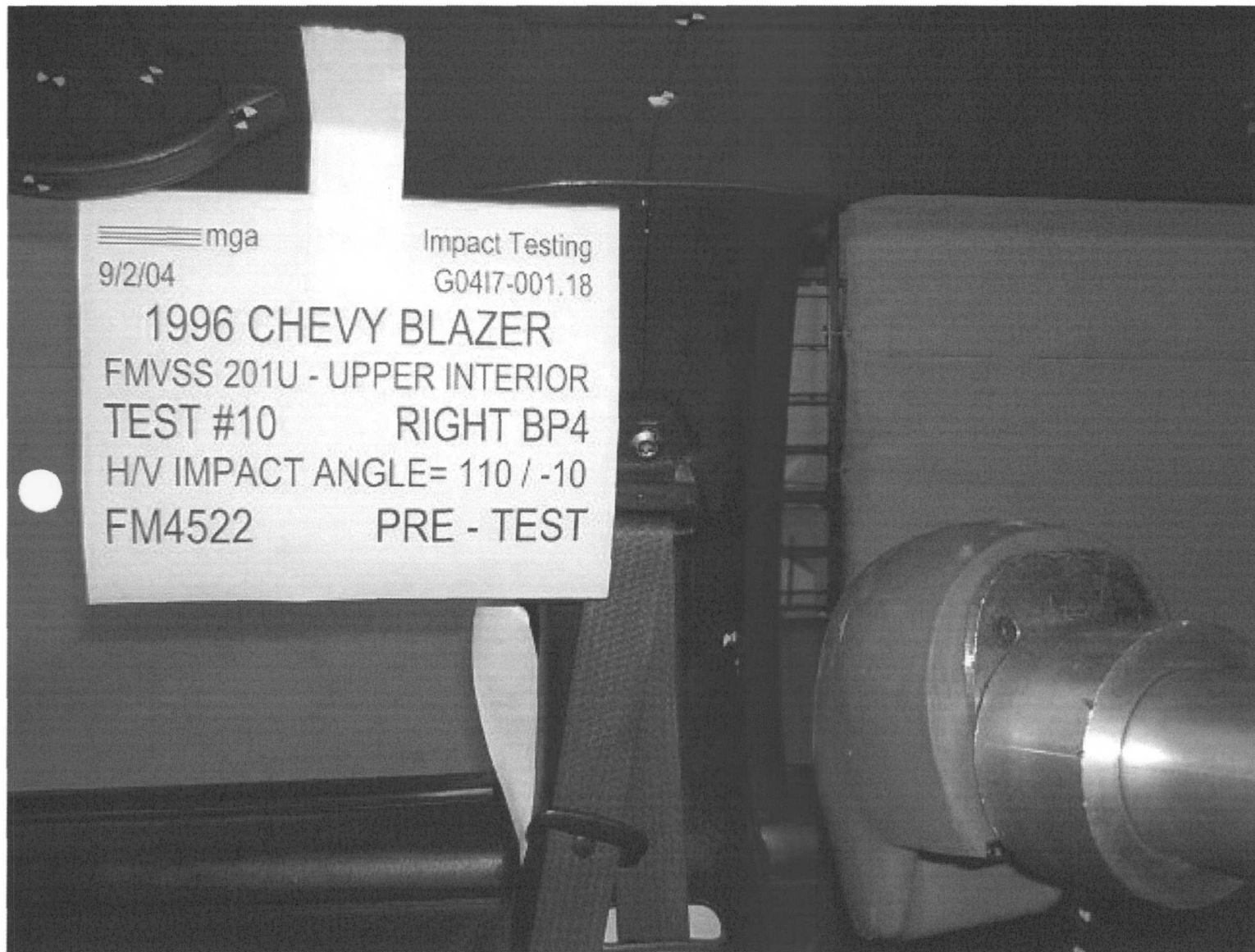
1996 CHEVY BLAZER

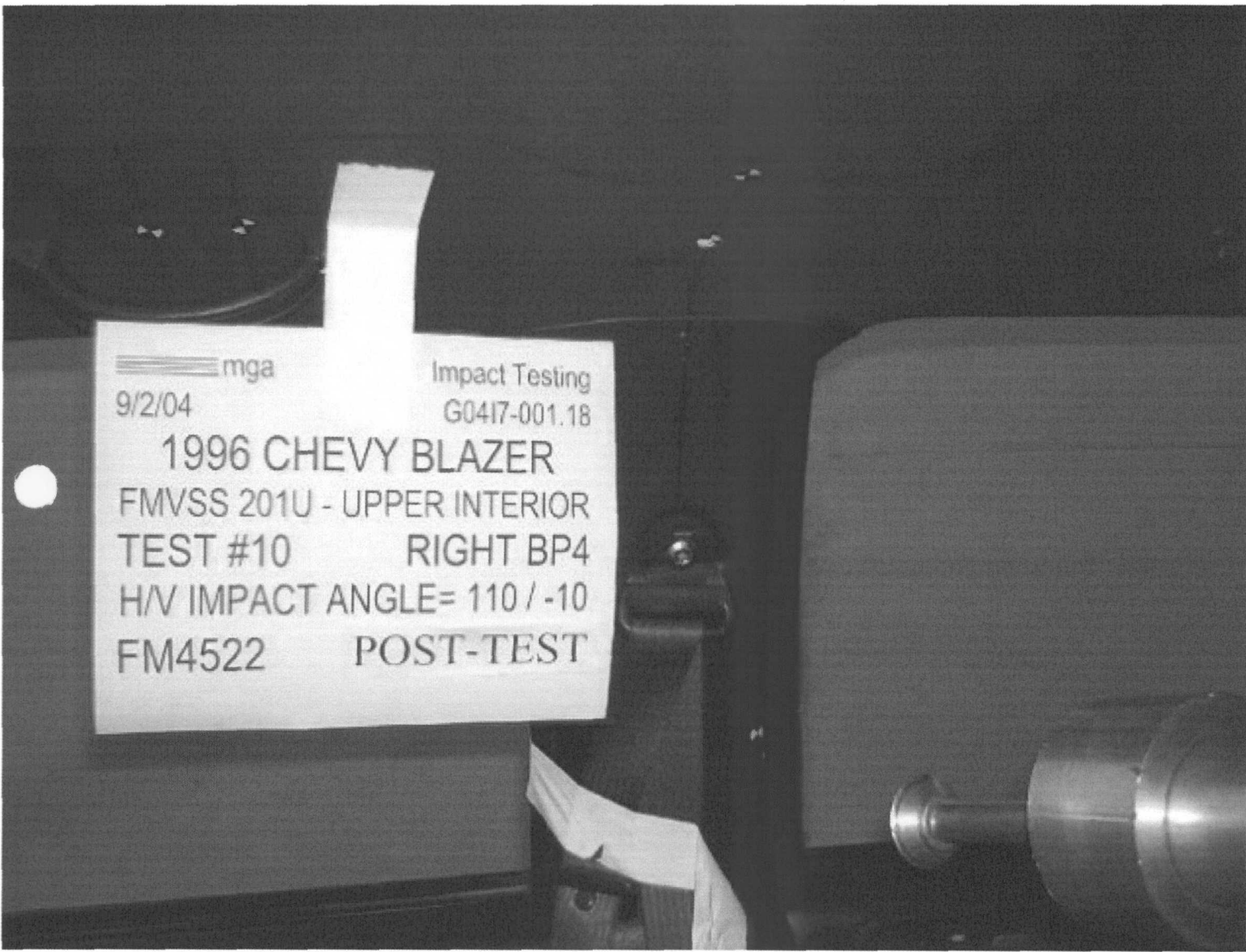
FMVSS 201U - UPPER INTERIOR

TEST #10 RIGHT BP4

H/V IMPACT ANGLE= 110 / -10

FM4522 PRE - TEST





mga

9/2/04

Impact Testing

G0417-001.18

1996 CHEVY BLAZER

FMVSS 201U - UPPER INTERIOR

TEST #10 RIGHT BP4

H/V IMPACT ANGLE= 110 / -10

FM4522 POST-TEST



mga

9/2/04

Impact Testing

G0417-001.18

1996 CHEVY BLAZER

FMVSS 201U - UPPER INTERIOR

TEST #10

RIGHT BP4

H/V IMPACT ANGLE= 110 / -10

FM4522

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: G0417-001.18 VEHICLE YR/MAKE/MODEL:BLAZER 1996

GENERAL TEST PARAMETERS:

Test Number:#10

Target (Vehicle Side): BP4 Right

Temperature:22C

MGA Test Reference No.:FM4522

Humidity:58%

Approach Horizontal Angles:110°

Time of Test:9:45 AM

Approach Vertical Angles:-10°

FMH Serial No:038

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
785	820	5.9	23.4	30	0

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV 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: m j m Approved By*: Helen Q. Kalito Date: 9-2-04

*Only necessary for NHTSA (Government) Compliance testing.

FMH
G04I7-001.18

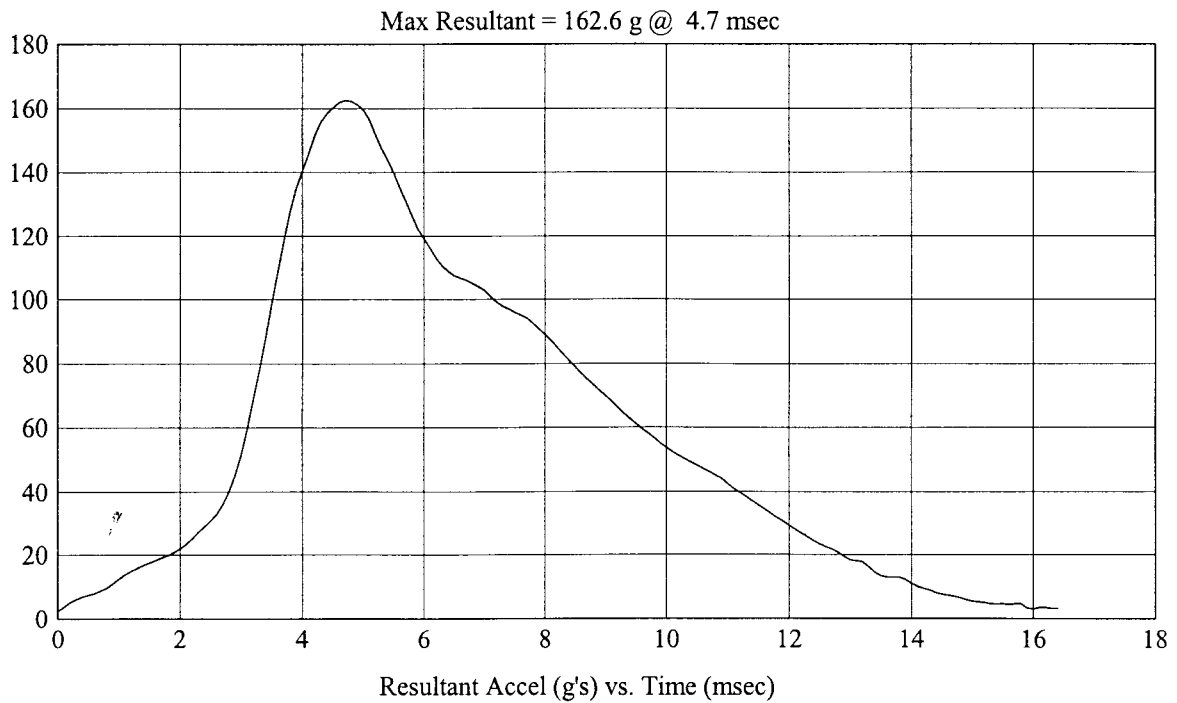
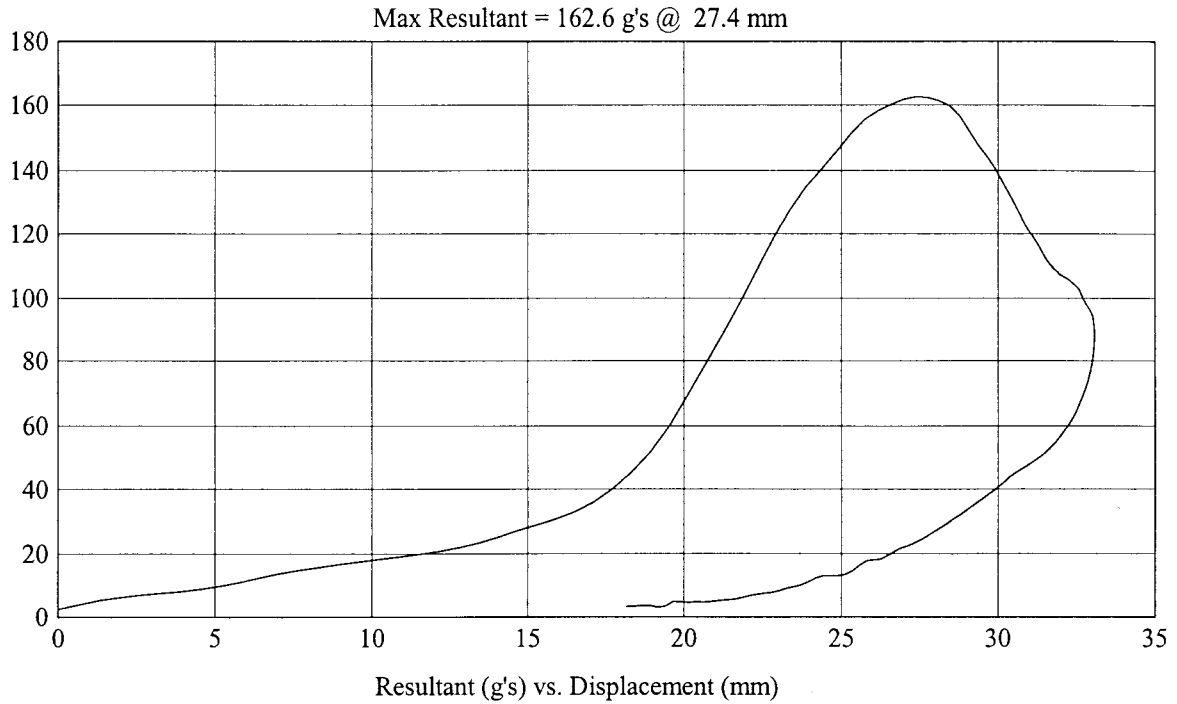
Customer: CHEVY
Test # 10
FM4522
Additional Desc: N/A

Vehicle Program : BLAZER

Model Year: 1996
Target: BP4
Vehicle Side: Right
Horz/Vert Angle: 110/-10

Test Date: 9/2/04

HIC(d) = 785, HIC = 820, Delta T = 5.9 msec



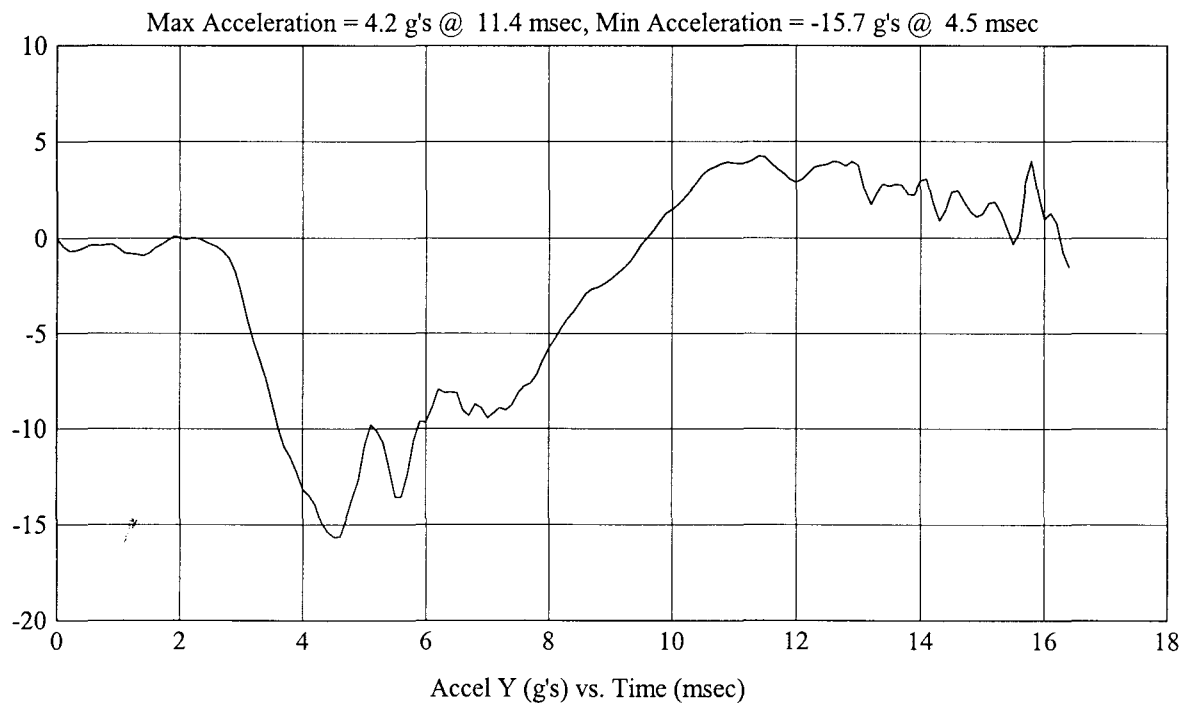
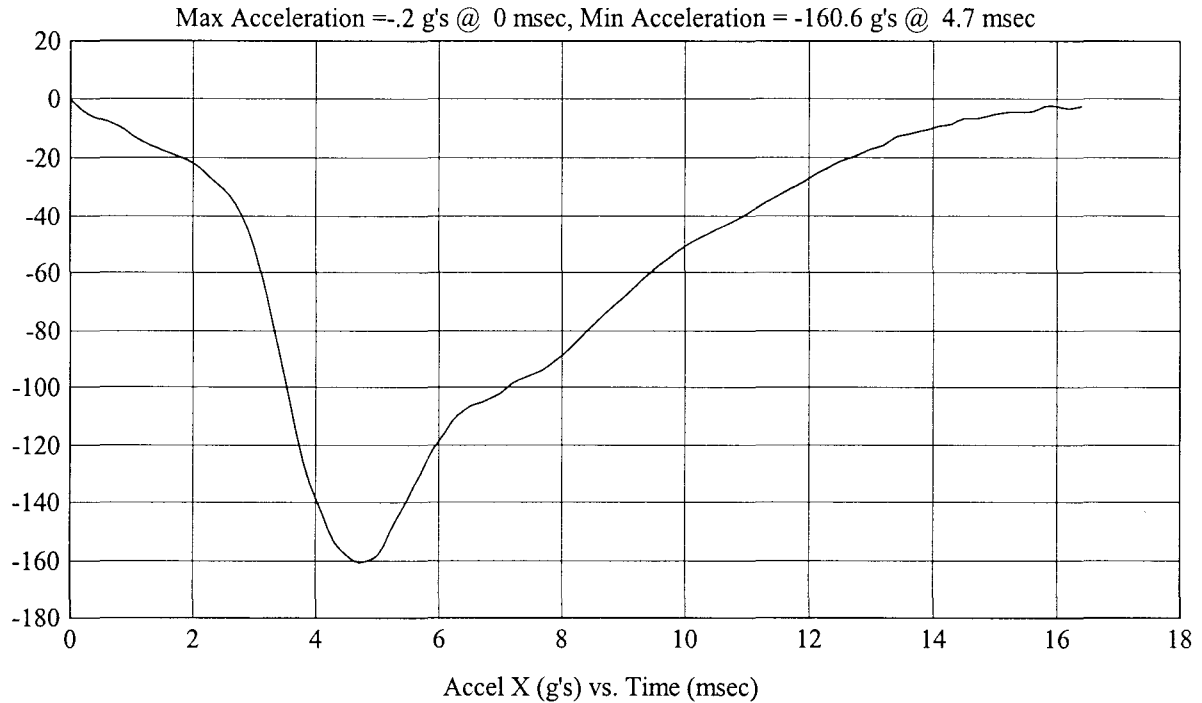
FMH
G04I7-001.18

Customer: CHEVY
Test # 10
FM4522
Additional Desc: N/A

Vehicle Program : BLAZER

Test Date: 9/2/04
HIC(d) = 785, HIC = 820, Delta T = 5.9 msec

Model Year: 1996
Target: BP4
Vehicle Side: Right
Horz/Vert Angle: 110/-10



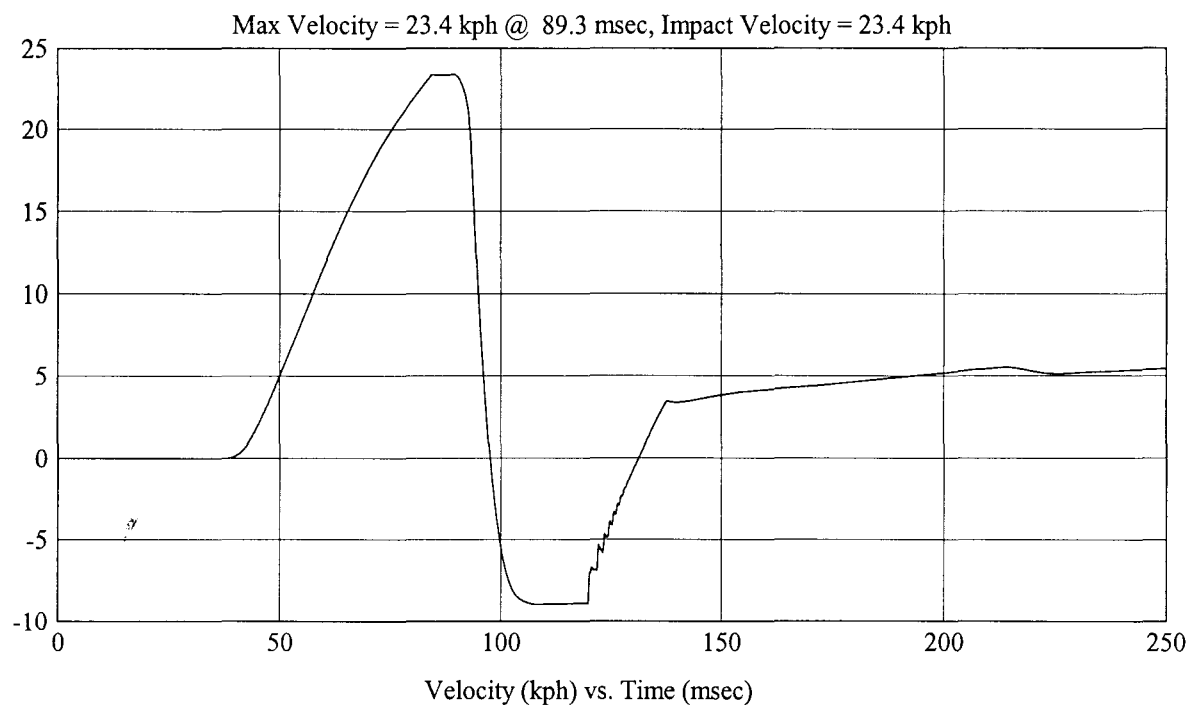
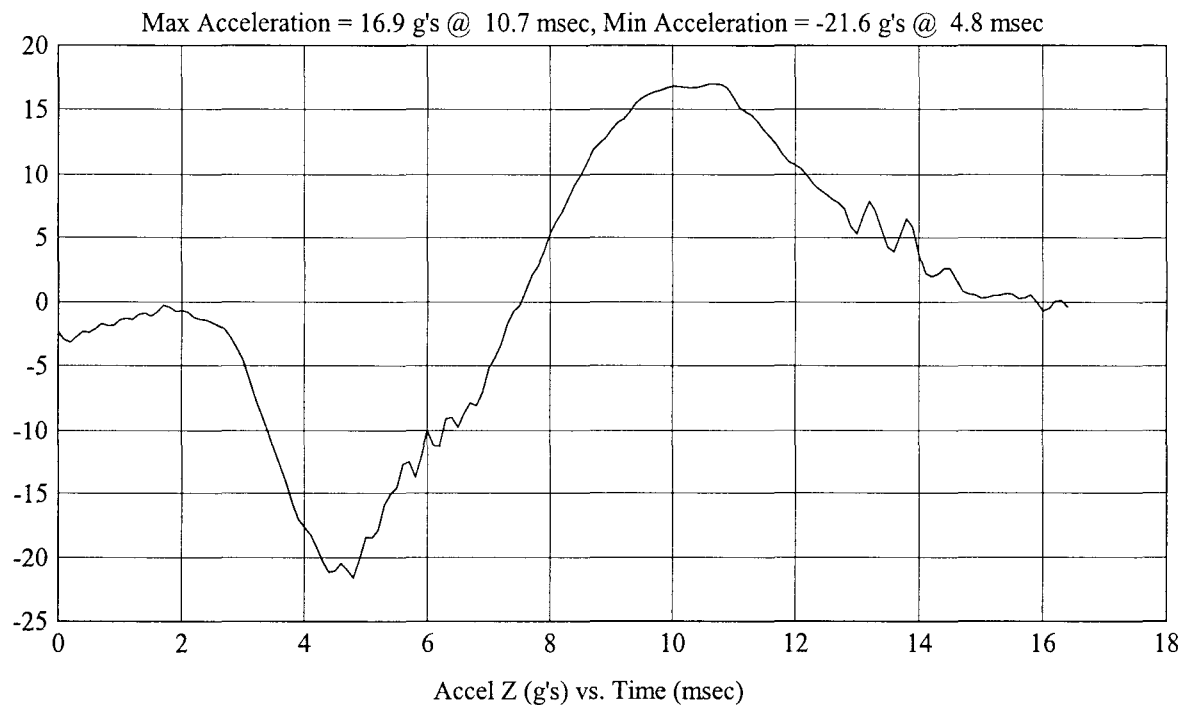
FMH
G04I7-001.18

Customer: CHEVY
Test # 10
FM4522
Additional Desc: N/A

Vehicle Program : BLAZER

Test Date: 9/2/04
HIC(d) = 785, HIC = 820, Delta T = 5.9 msec

Model Year: 1996
Target: BP4
Vehicle Side: Right
Horz/Vert Angle: 110/-10



FMH
G0417-001.18

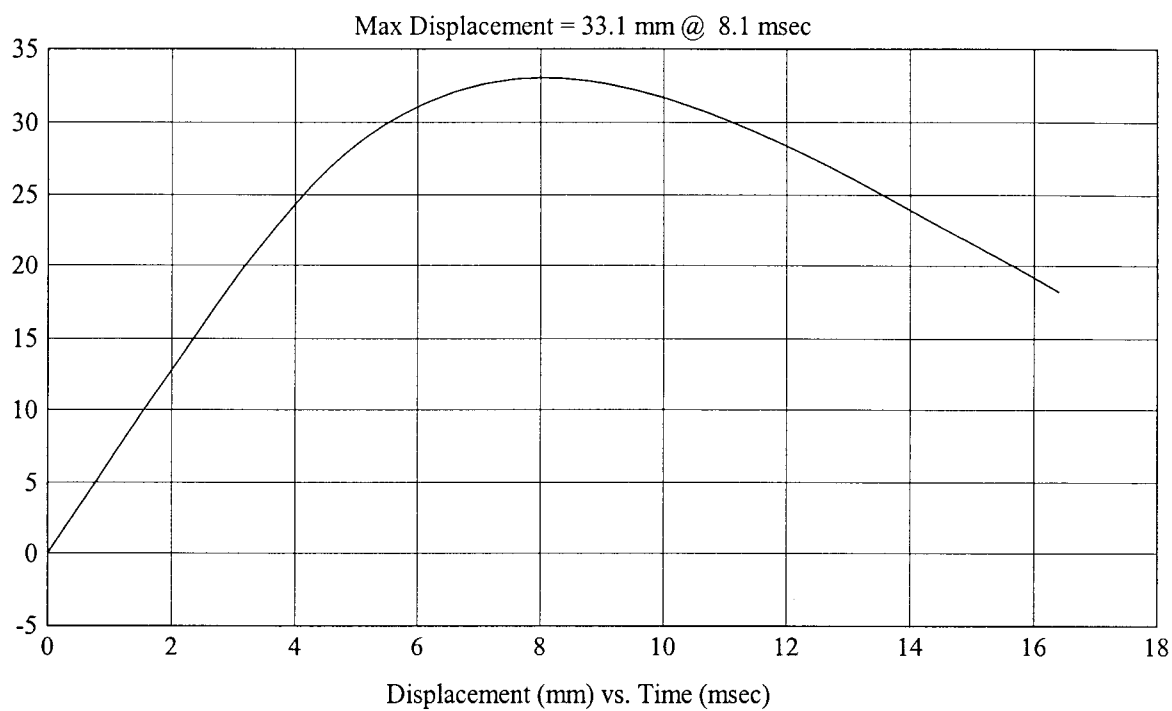
Customer: CHEVY
Test # 10
FM4522
Additional Desc: N/A

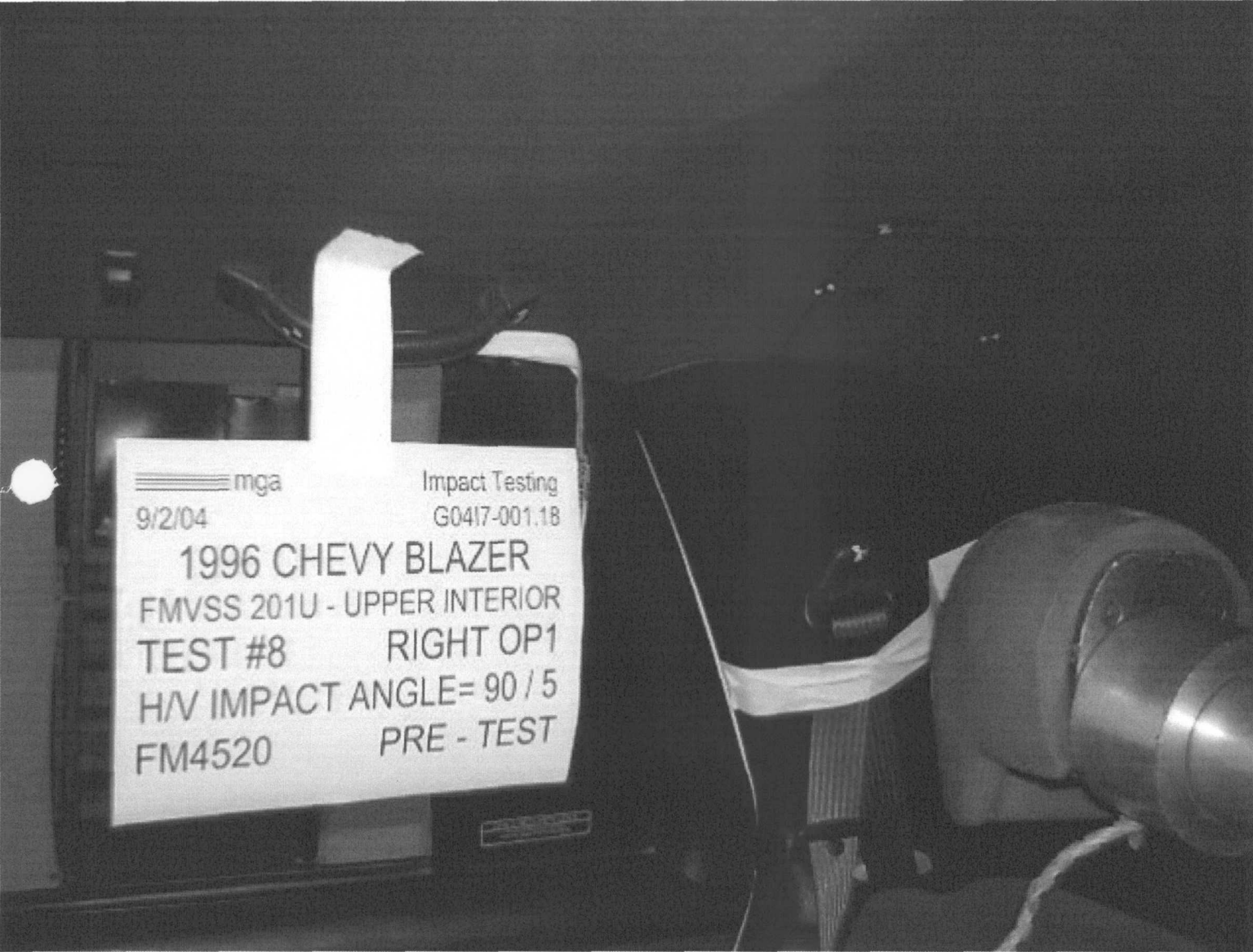
Vehicle Program : BLAZER

Model Year: 1996
Target: BP4
Vehicle Side: Right
Horz/Vert Angle: 110/-10

Test Date: 9/2/04

HIC(d) = 785, HIC = 820, Delta T = 5.9 msec





mga

9/2/04

Impact Testing

G0417-001.18

1996 CHEVY BLAZER

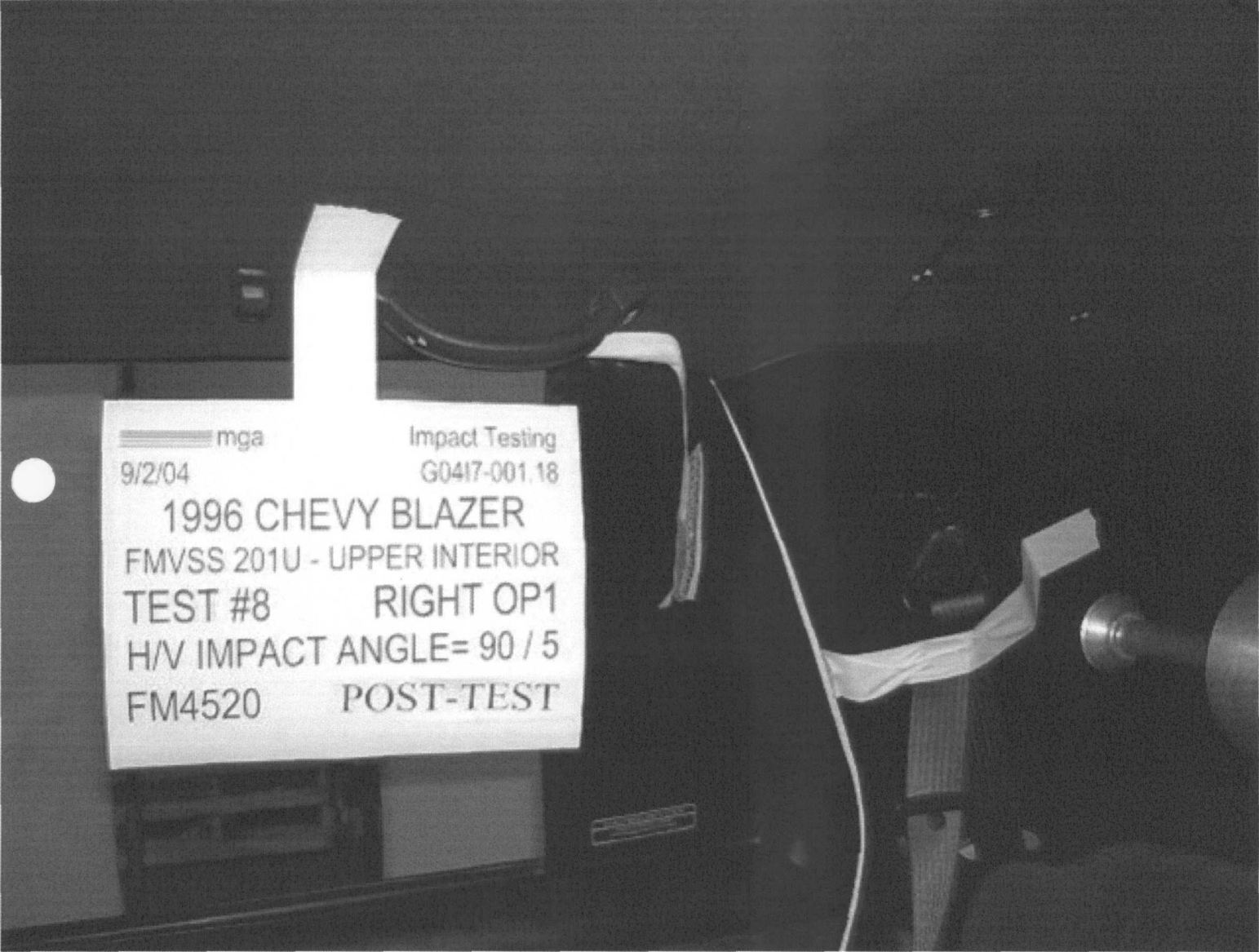
FMVSS 201U - UPPER INTERIOR

TEST #8 RIGHT OP1

H/V IMPACT ANGLE= 90 / 5

FM4520

PRE - TEST



mga

9/2/04

Impact Testing

G0417-001.18

1996 CHEVY BLAZER

FMVSS 201U - UPPER INTERIOR

TEST #8 RIGHT OP1

H/V IMPACT ANGLE= 90 / 5

FM4520 POST-TEST



===== mga

9/2/04

Impact Testing

G04I7-001.18

1996 CHEVY BLAZER

FMVSS 201U - UPPER INTERIOR

TEST #8 RIGHT OP1

H/V IMPACT ANGLE= 90 / 5

FM4520 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: G04I7-001.18 VEHICLE YR/MAKE/MODEL:BLAZER 1996

GENERAL TEST PARAMETERS:

Test Number:#8

Target (Vehicle Side): OP1 Right

Temperature:22C

MGA Test Reference No.:FM4520

Humidity:57%

Approach Horizontal Angles:90°

Time of Test:8:35 AM

Approach Vertical Angles:5°

FMH Serial No:035

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
745	766	6.5	23.9	20	7 L

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV 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.):

Cracked seat belt anchor cover

Recorded By: *m j m* Approved By*: _____ Date: 9-2-04

*Only necessary for NHTSA (Government) Compliance testing.

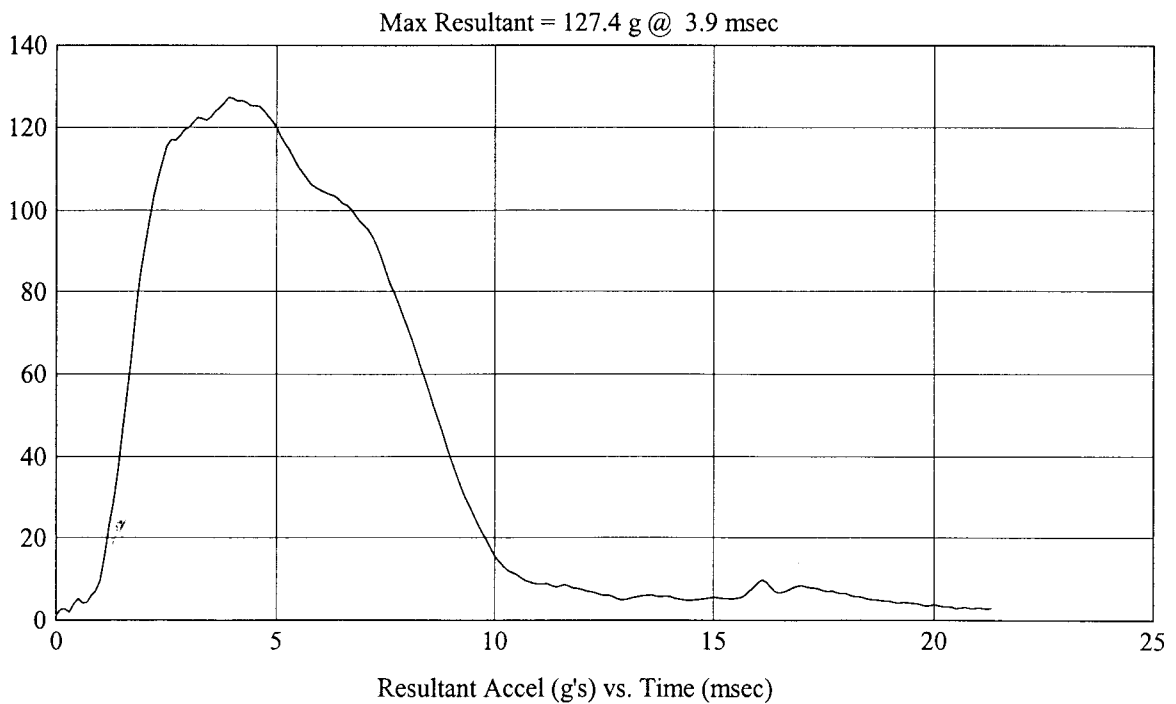
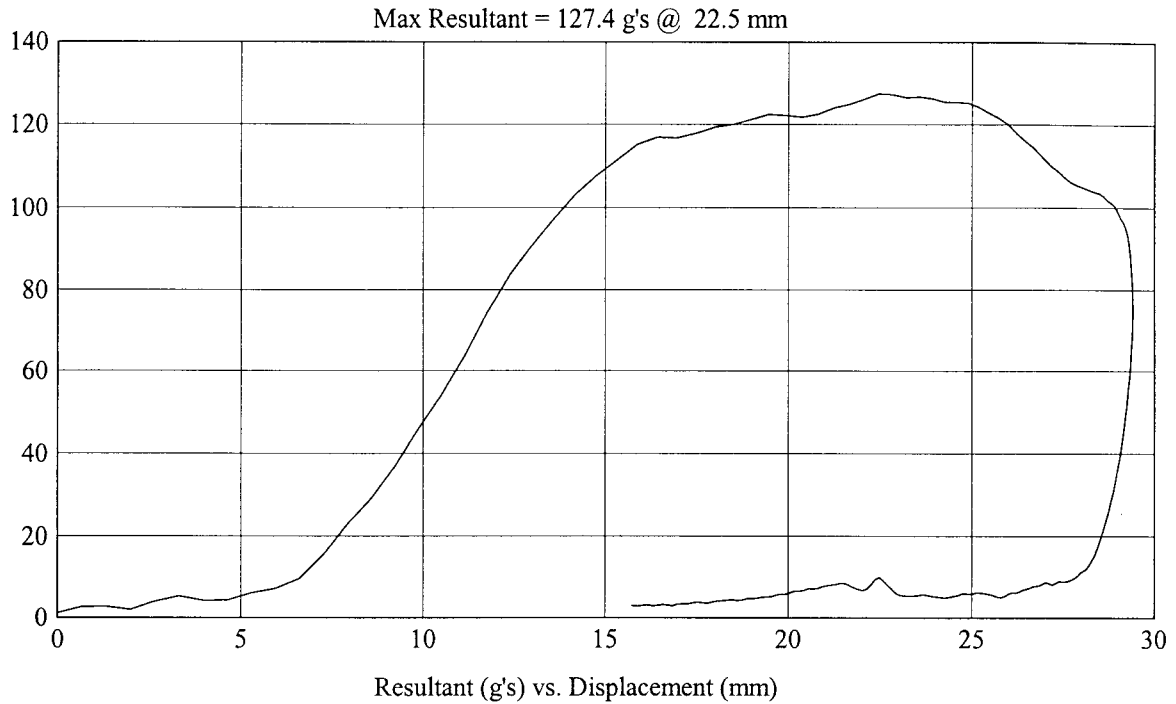
FMH
G04I7-001.18

Customer: CHEVY
Test # 8
FM4520
Additional Desc: N/A

Vehicle Program : BLAZER

Model Year: 1996
Target: OP1
Vehicle Side: Right
Horz/Vert Angle: 90/5

Test Date: 9/2/04
HIC(d) = 745, HIC = 766, Delta T = 6.5 msec



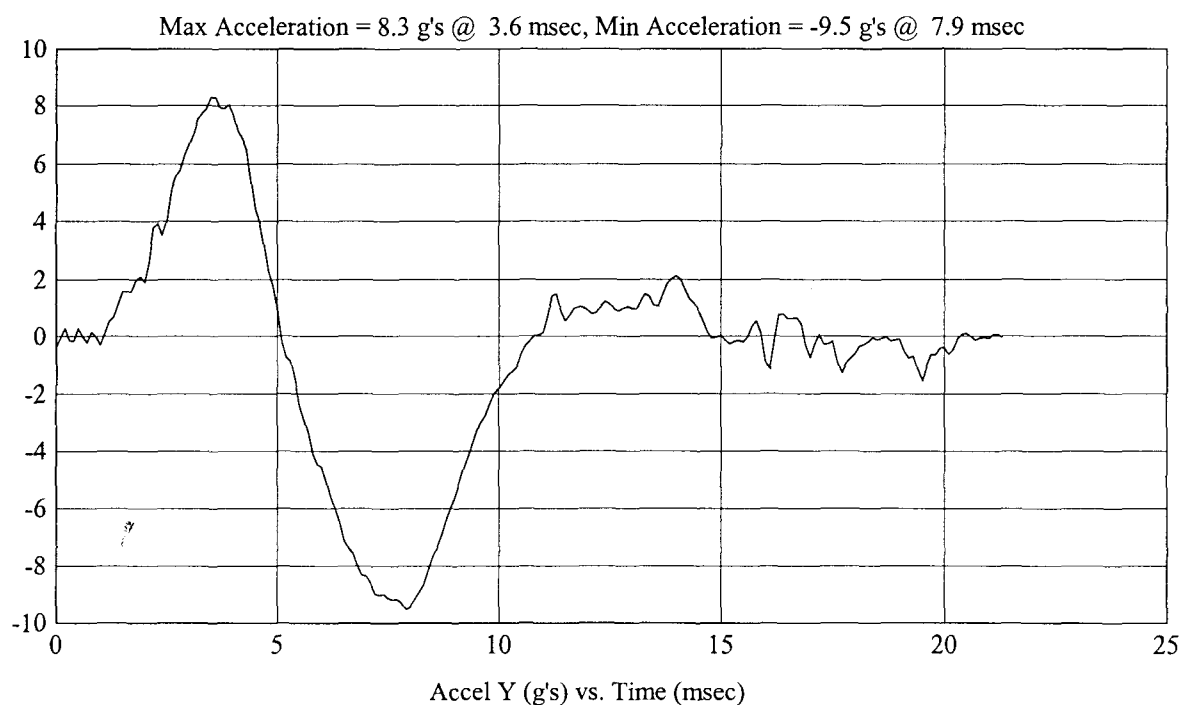
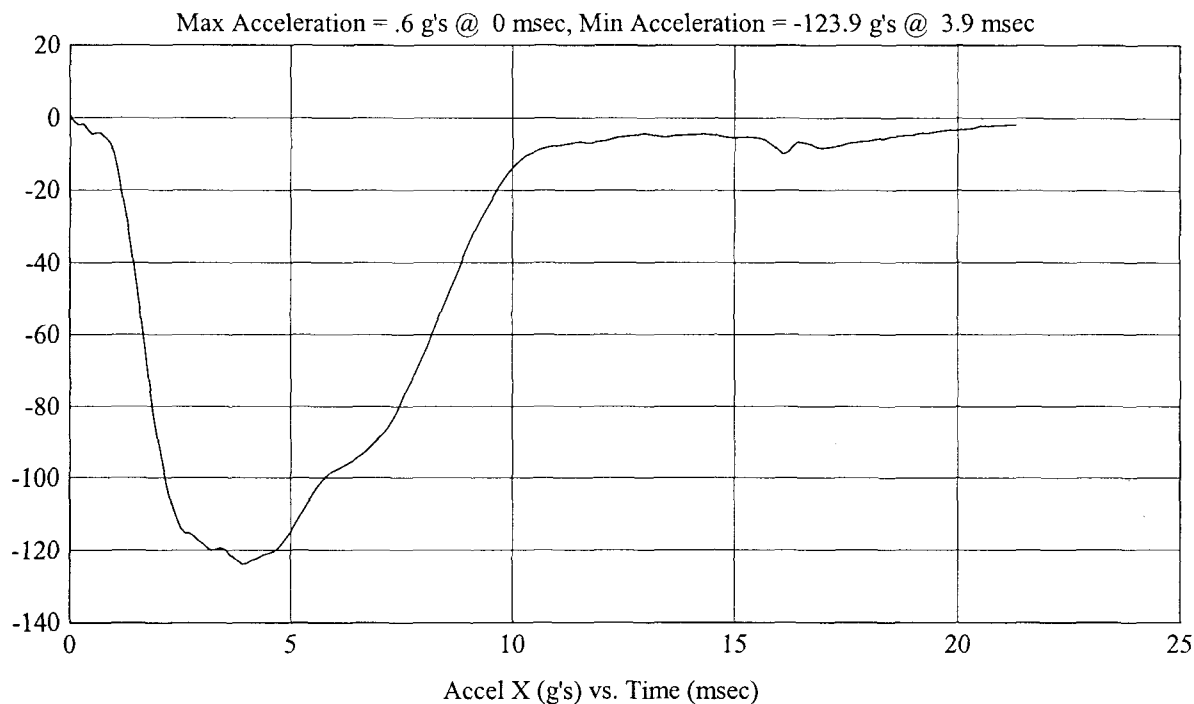
FMH
G04I7-001.18

Customer: CHEVY
Test # 8
FM4520
Additional Desc: N/A

Vehicle Program : BLAZER

Model Year: 1996
Target: OP1
Vehicle Side: Right
Horz/Vert Angle: 90/5

Test Date: 9/2/04
HIC(d) = 745, HIC = 766, Delta T = 6.5 msec



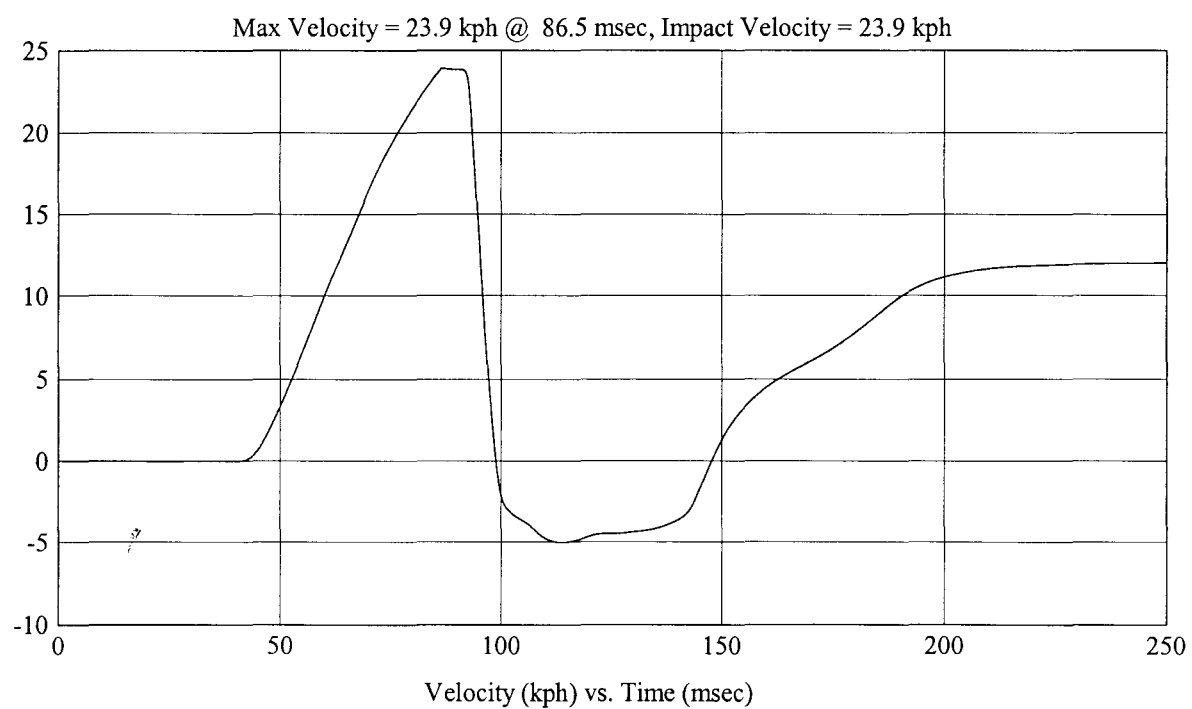
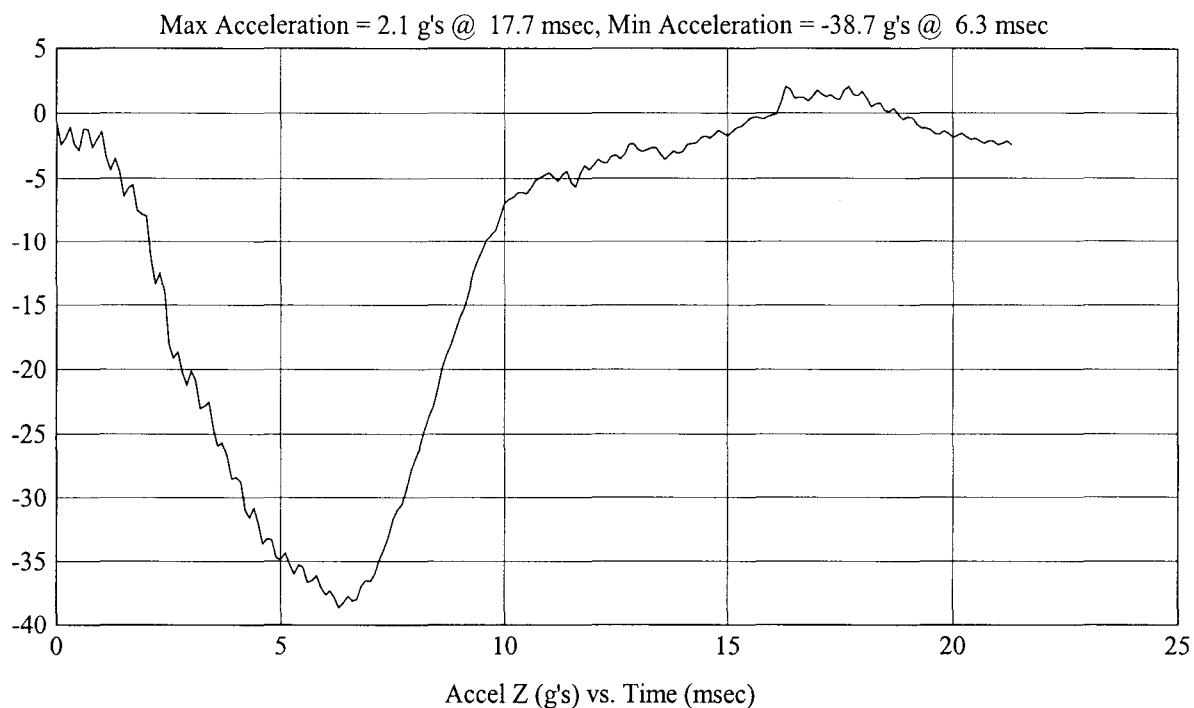
FMH
G04I7-001.18

Customer: CHEVY
Test # 8
FM4520
Additional Desc: N/A

Vehicle Program : BLAZER

Test Date: 9/2/04
HIC(d) = 745, HIC = 766, Delta T = 6.5 msec

Model Year: 1996
Target: OP1
Vehicle Side: Right
Horz/Vert Angle: 90/5



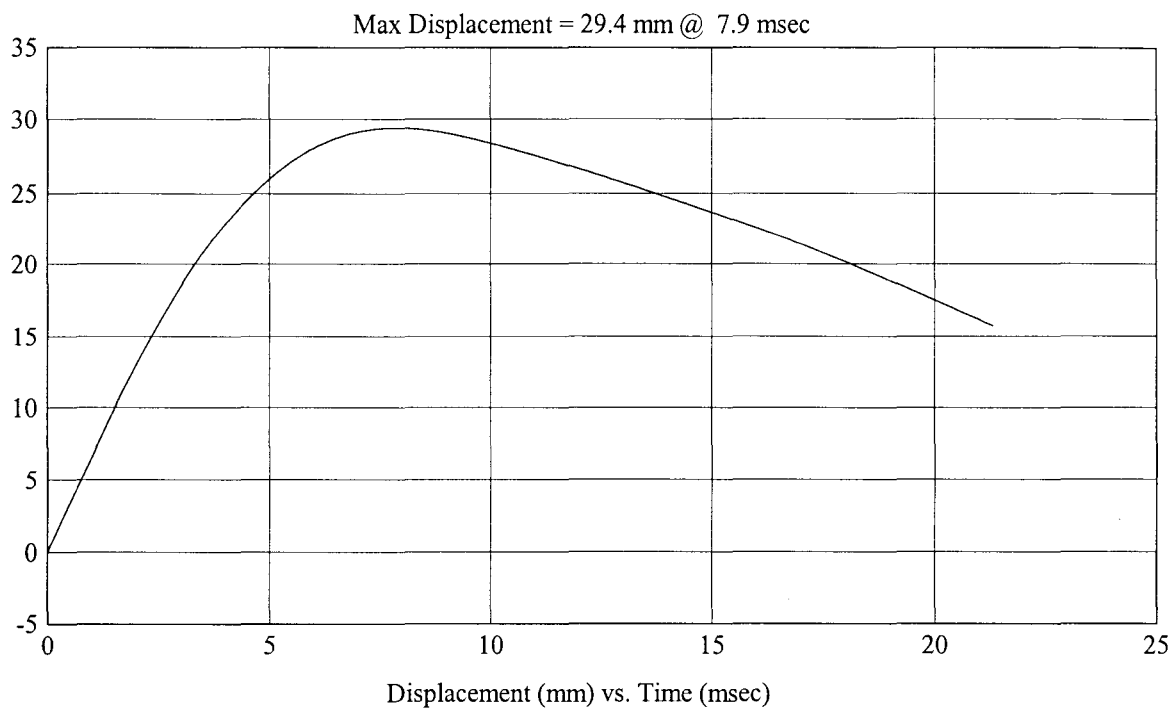
FMH
G04I7-001.18

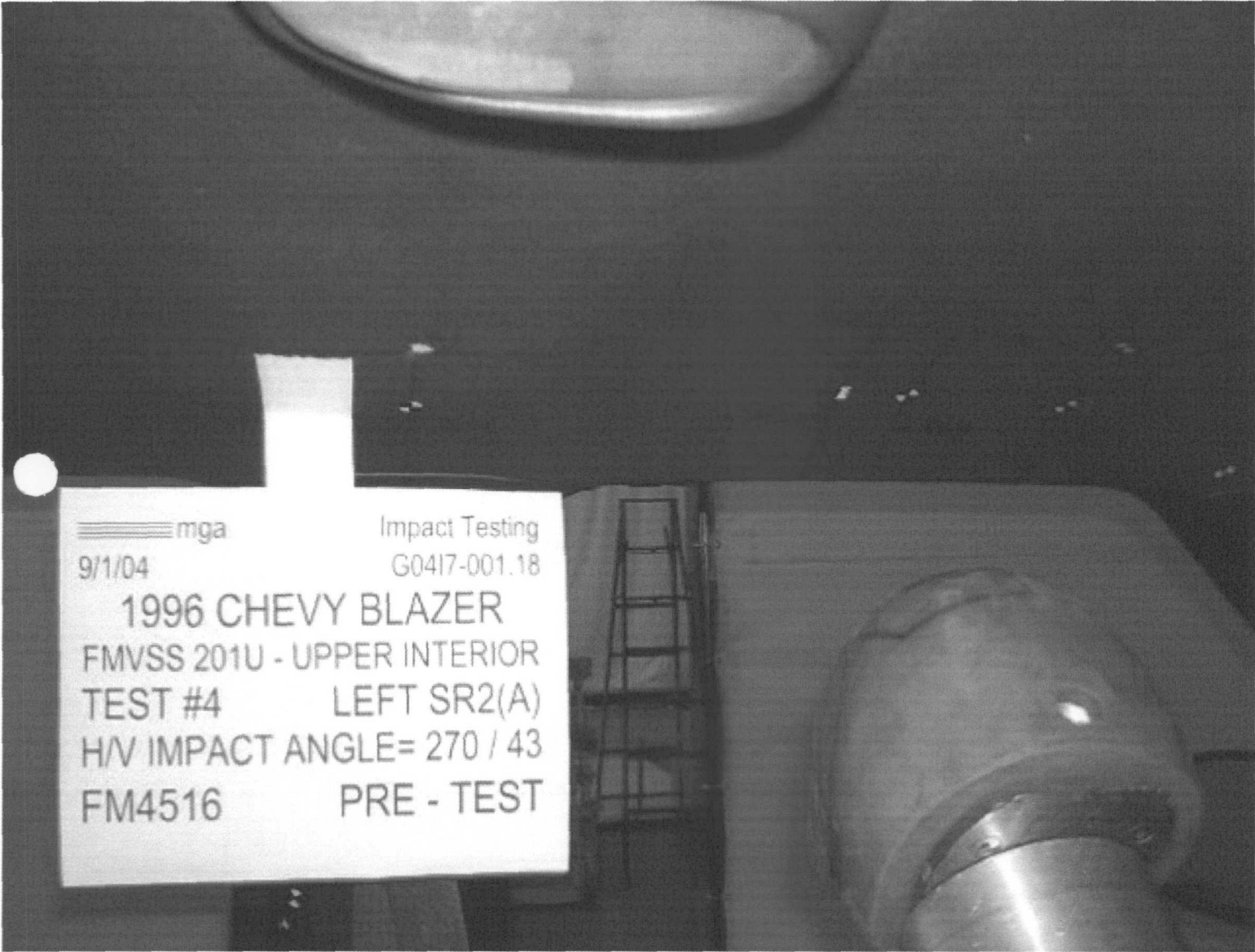
Customer: CHEVY
Test # 8
FM4520
Additional Desc: N/A

Vehicle Program : BLAZER

Test Date: 9/2/04
HIC(d) = 745, HIC = 766, Delta T = 6.5 msec

Model Year: 1996
Target: OP1
Vehicle Side: Right
Horz/Vert Angle: 90/5





mga

9/1/04

Impact Testing

G0417-001.18

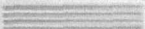
1996 CHEVY BLAZER

FMVSS 201U - UPPER INTERIOR

TEST #4 LEFT SR2(A)

H/V IMPACT ANGLE= 270 / 43

FM4516 PRE - TEST

 mga

9/1/04

Impact Testing

G0417-001.18

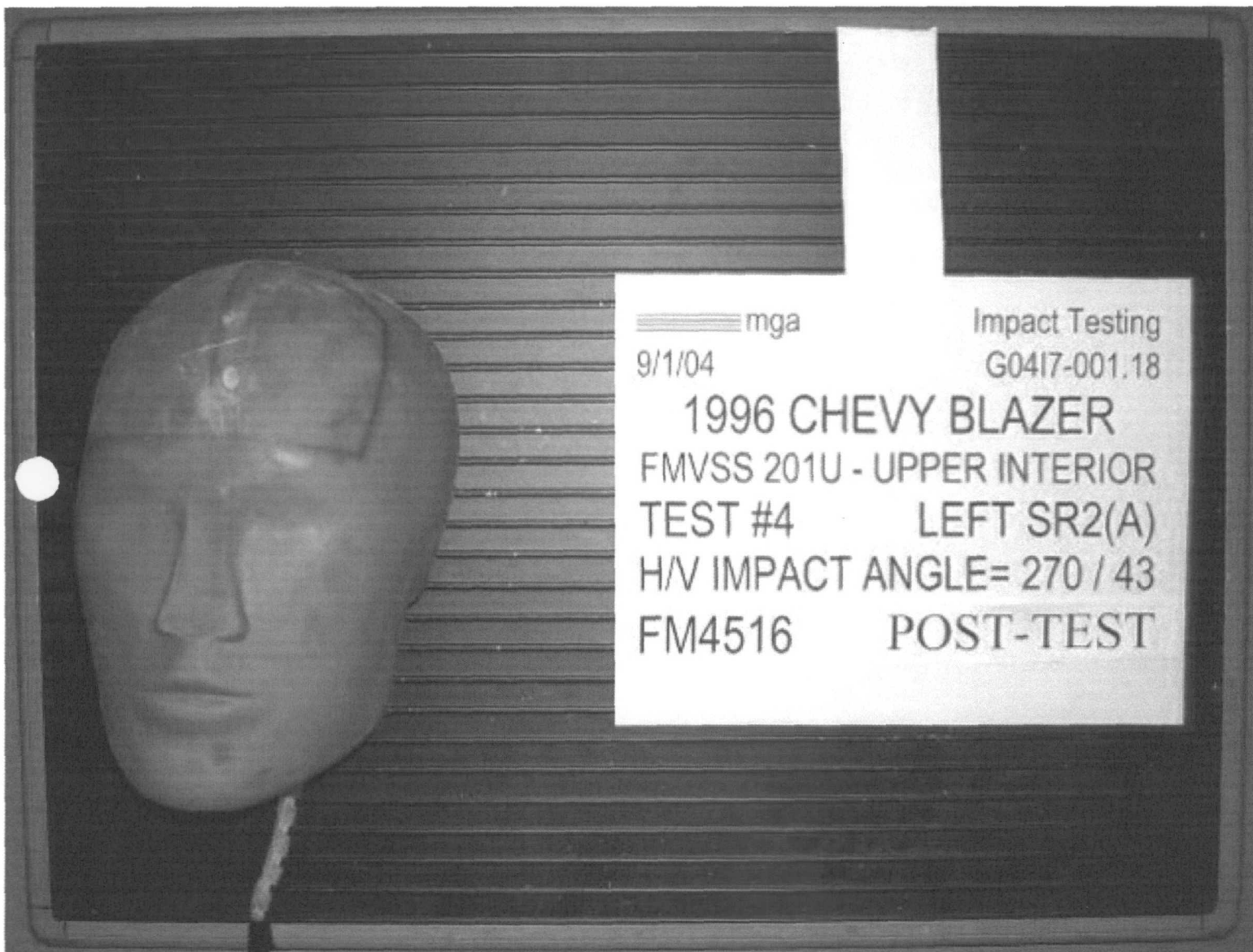
1996 CHEVY BLAZER

FMVSS 201U - UPPER INTERIOR

TEST #4 LEFT SR2(A)

H/V IMPACT ANGLE= 270 / 43

FM4516 POST-TEST



 mga

Impact Testing

9/1/04

G04I7-001.18

1996 CHEVY BLAZER

FMVSS 201U - UPPER INTERIOR

TEST #4 LEFT SR2(A)

H/V IMPACT ANGLE= 270 / 43

FM4516 POST-TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G04I7-001.18 VEHICLE YR/MAKE/MODEL:BLAZER 1996

GENERAL TEST PARAMETERS:

Test Number:#4

Target (Vehicle Side): SR2(a) Left

Temperature:22C

MGA Test Reference No.:FM4516

Humidity:58%

Approach Horizontal Angles:270°

Time of Test:3:00 PM

Approach Vertical Angles:43°

FMH Serial No:035

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
1199	1368	5.1	23.6	23	7 L

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV 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: m j m Approved By*: Helen Q. Kaleb Date: 9-1-04

*Only necessary for NHTSA (Government) Compliance testing.

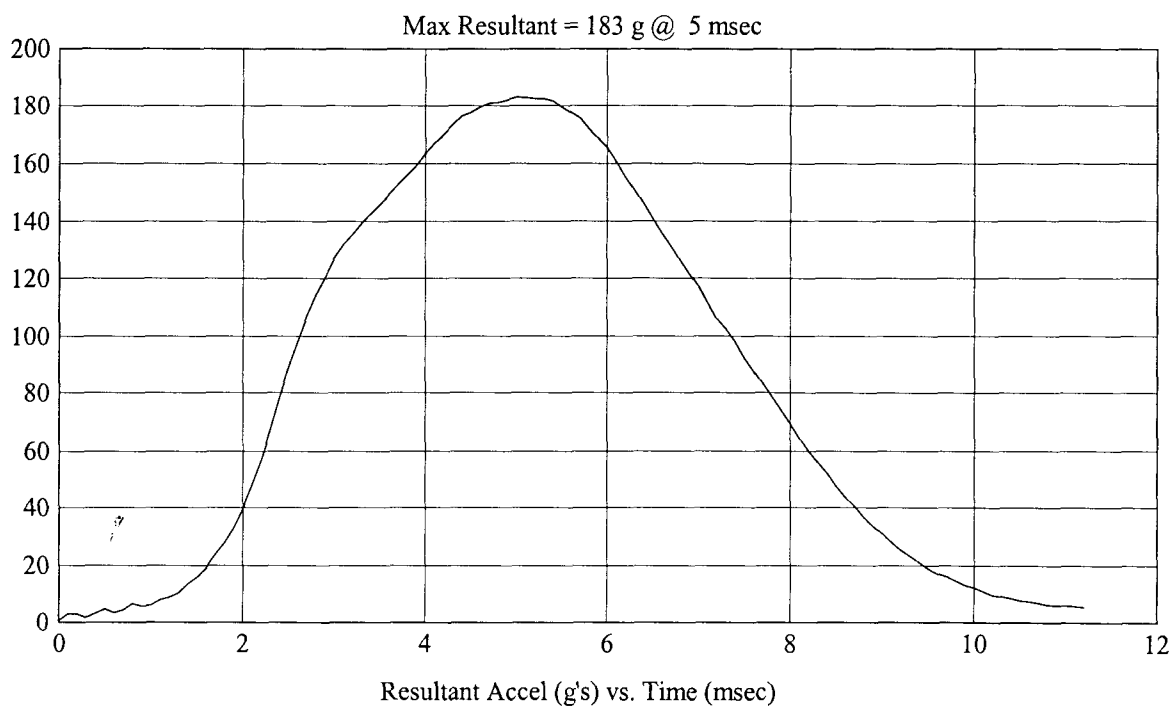
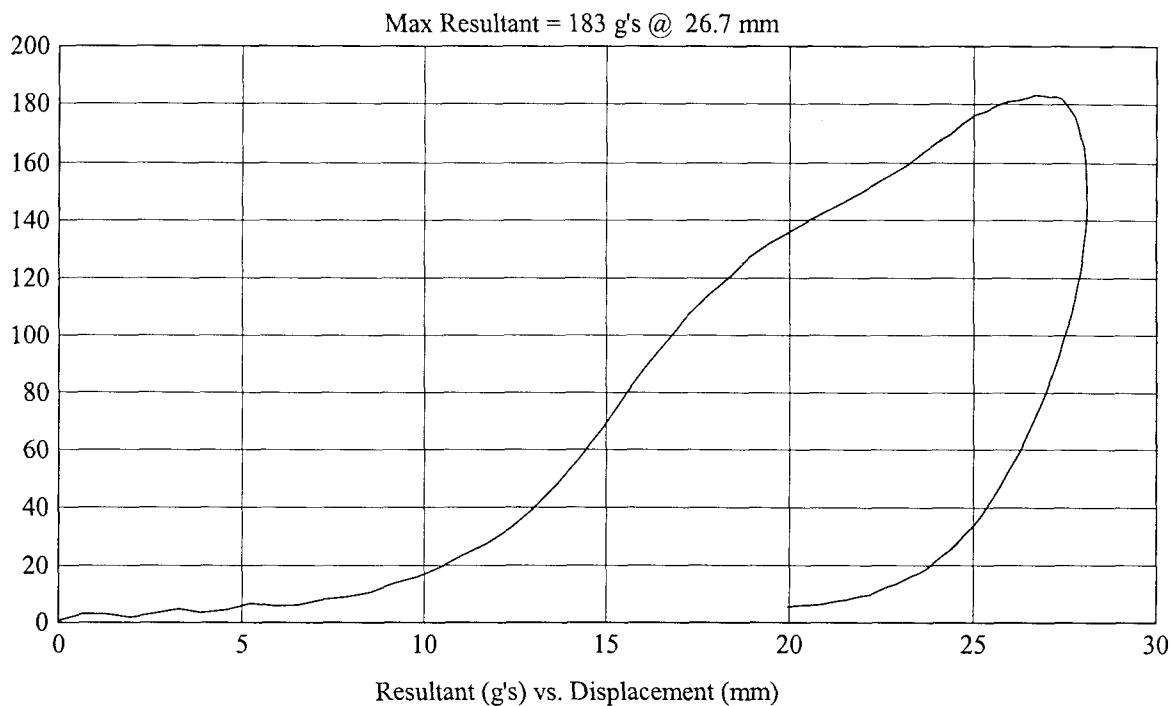
FMH
G04I7-001.18

Customer: CHEVY
Test # 4
FM4516
Additional Desc: N/A

Vehicle Program : BLAZER

Model Year: 1996
Target: SR2(a)
Vehicle Side: Left
Horz/Vert Angle: 270/43

Test Date: 9/1/04
HIC(d) = 1199, HIC = 1368, Delta T = 5.1 msec



FMH
G04I7-001.18

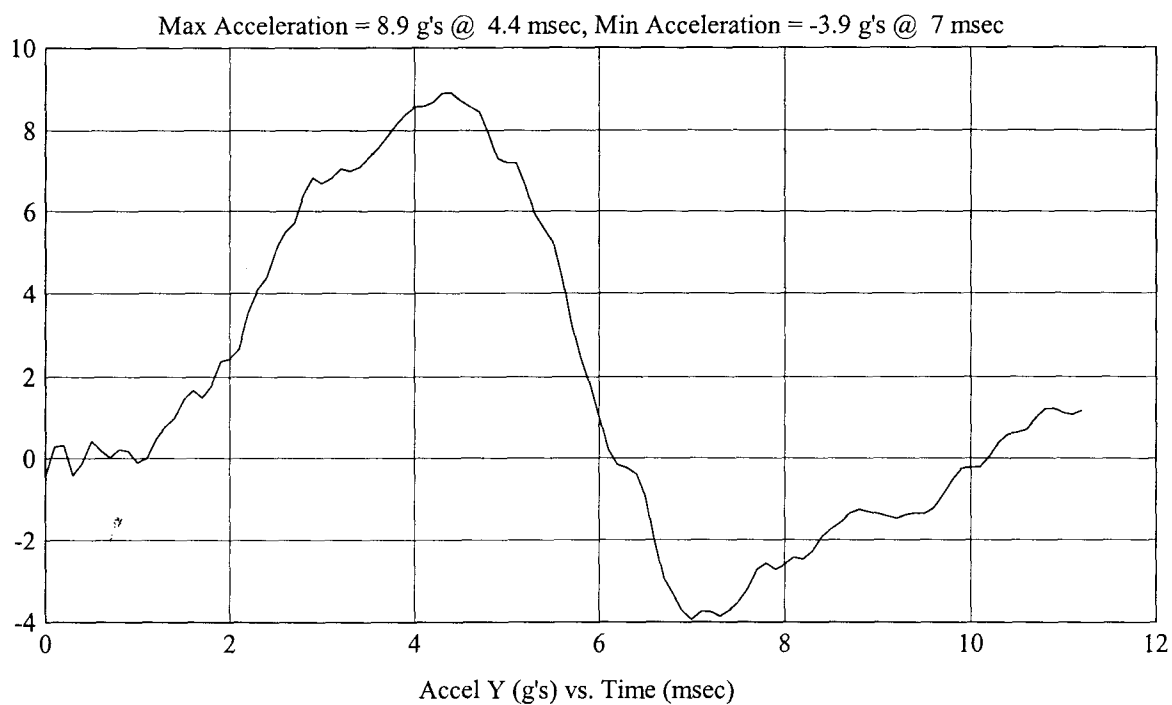
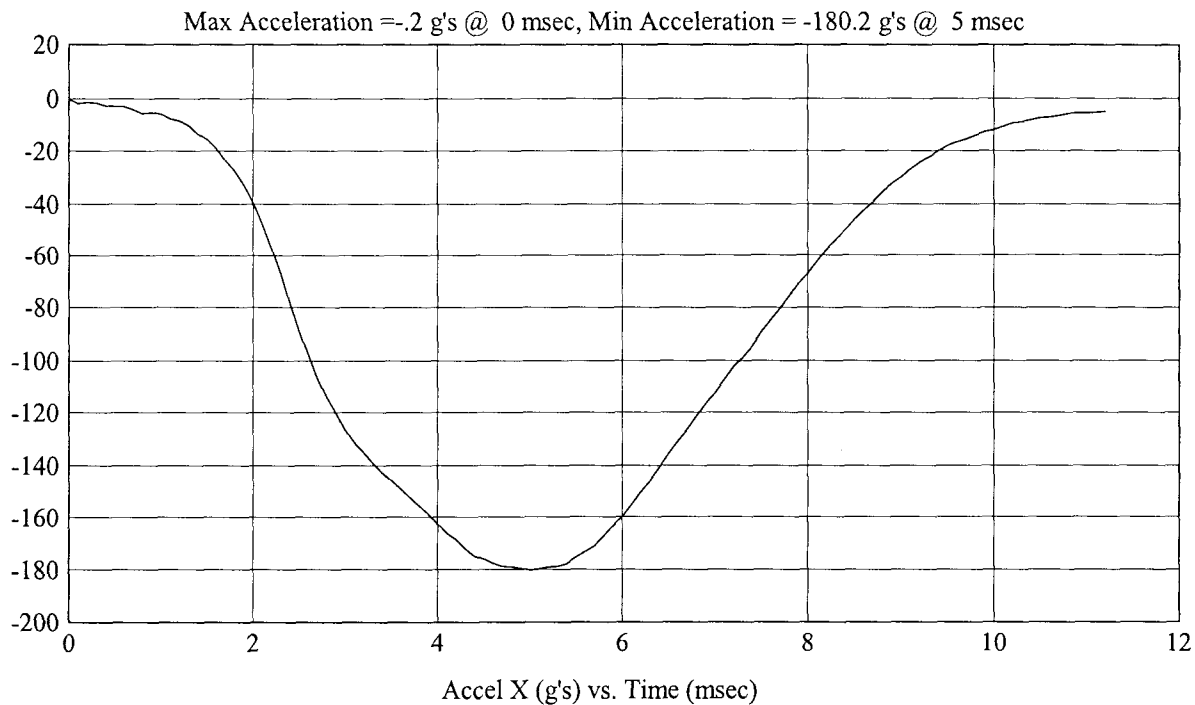
Customer: CHEVY
Test # 4
FM4516
Additional Desc: N/A

Vehicle Program : BLAZER

Model Year: 1996
Target: SR2(a)
Vehicle Side: Left
Horz/Vert Angle: 270/43

Test Date: 9/1/04

HIC(d) = 1199, HIC = 1368, Delta T = 5.1 msec



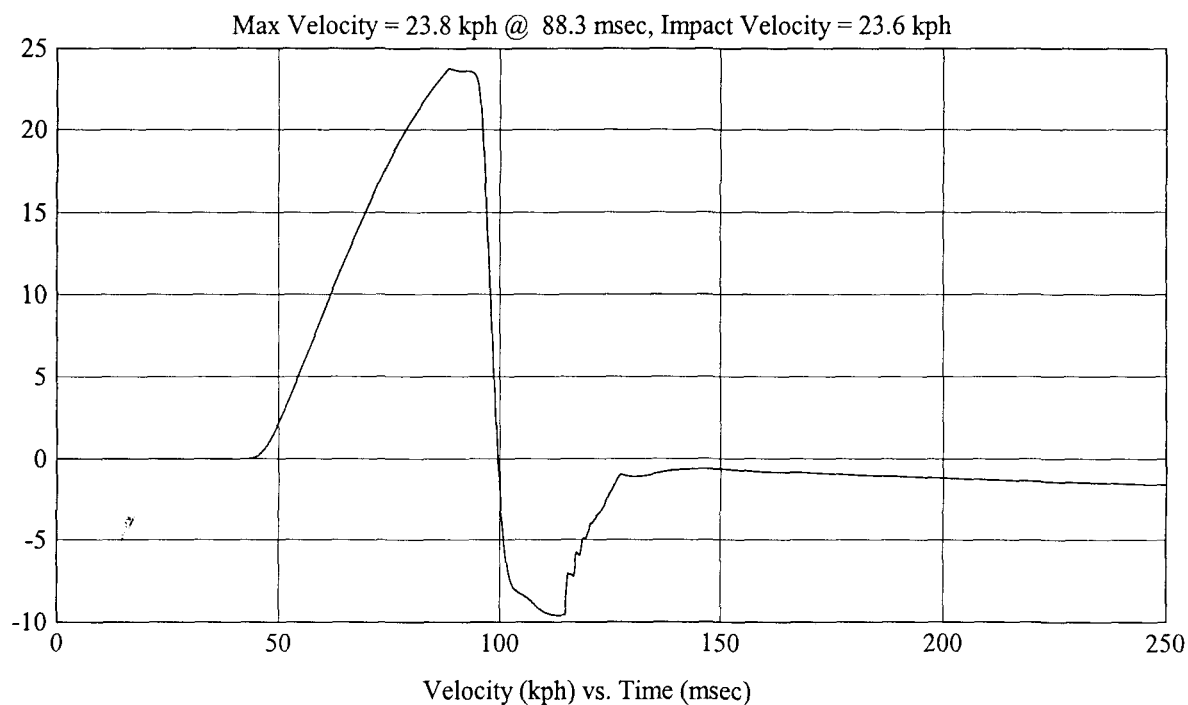
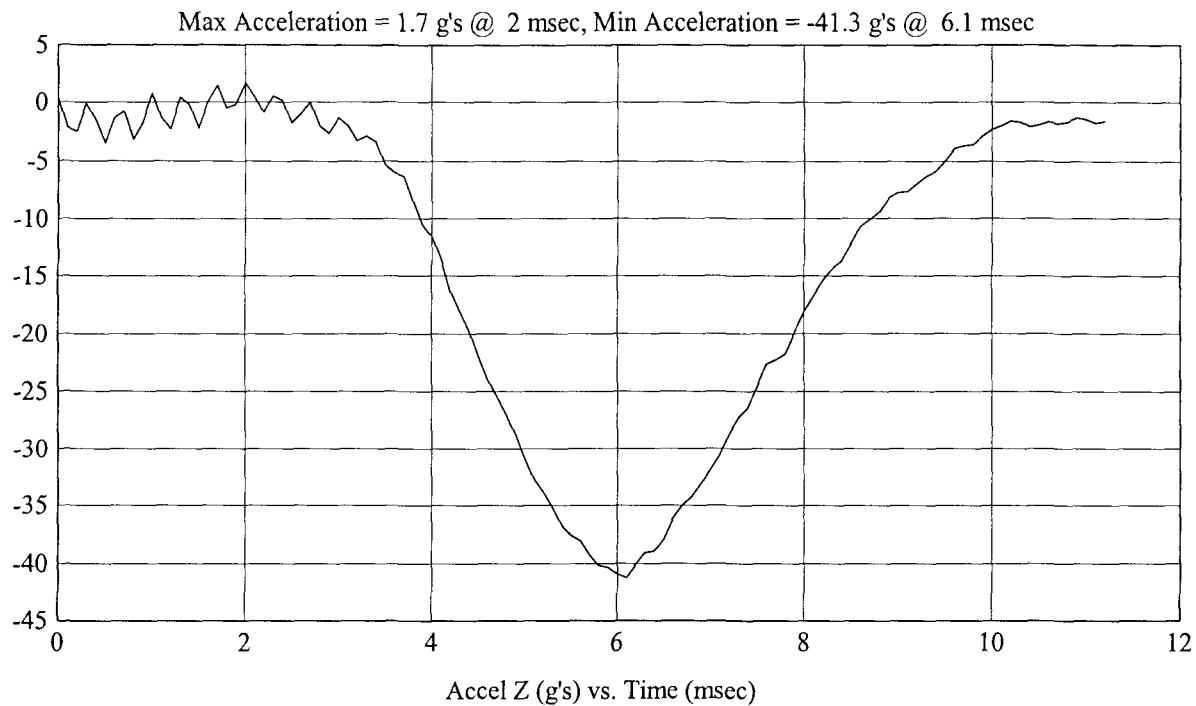
FMH
G04I7-001.18

Customer: CHEVY
Test # 4
FM4516
Additional Desc: N/A

Vehicle Program : BLAZER

Test Date: 9/1/04
HIC(d) = 1199, HIC = 1368, Delta T = 5.1 msec

Model Year: 1996
Target: SR2(a)
Vehicle Side: Left
Horz/Vert Angle: 270/43



FMH
G04I7-001.18

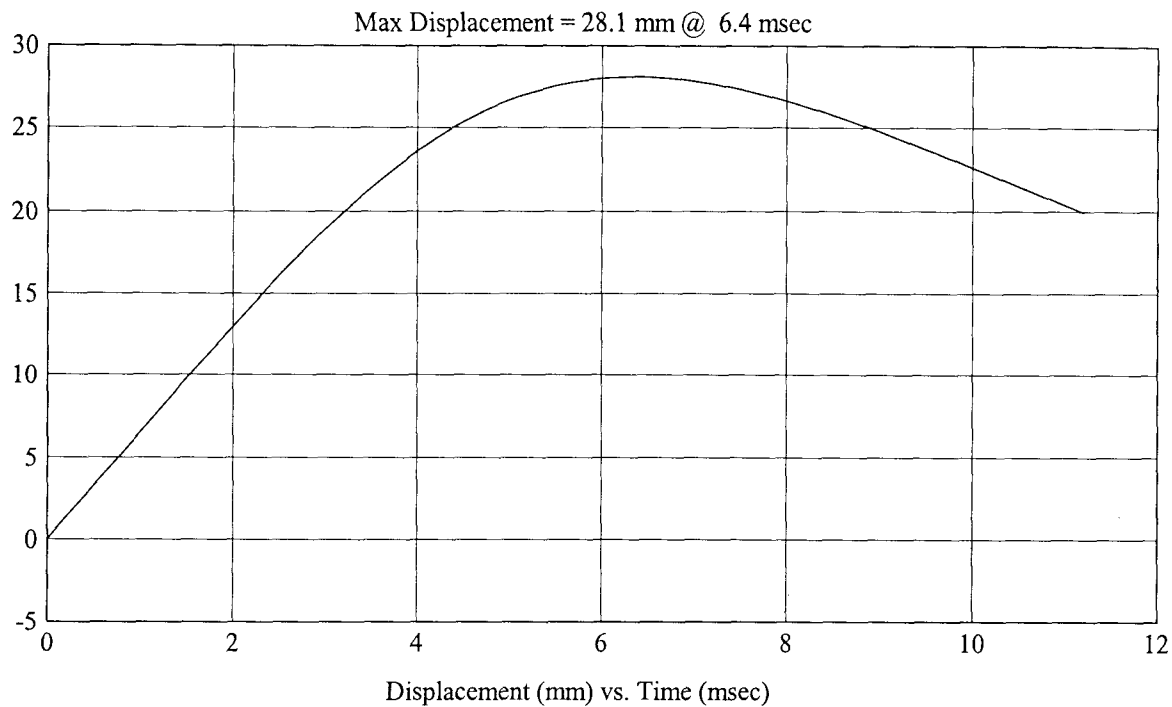
Customer: CHEVY
Test # 4
FM4516
Additional Desc: N/A

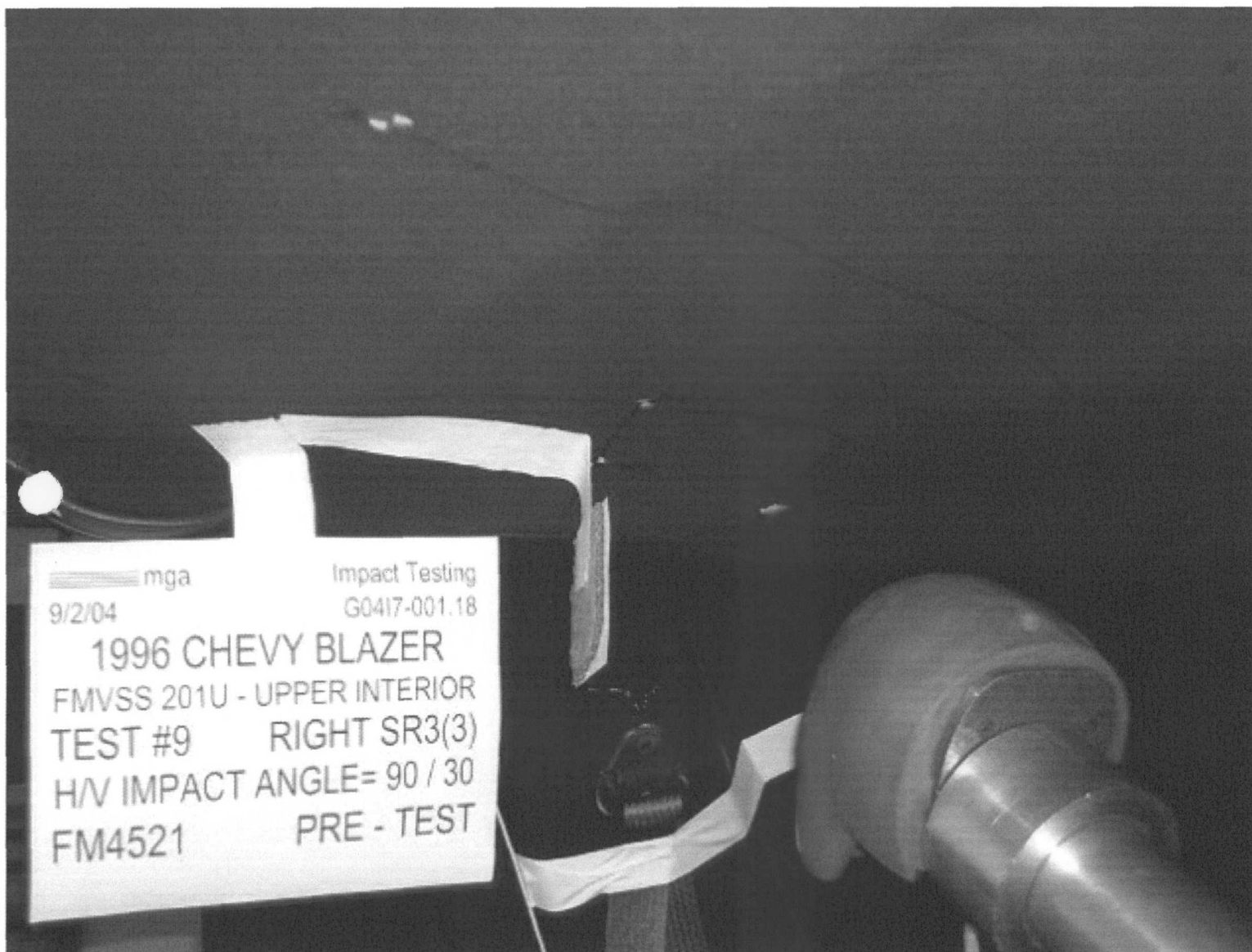
Vehicle Program : BLAZER

Model Year: 1996
Target: SR2(a)
Vehicle Side: Left
Horz/Vert Angle: 270/43

Test Date: 9/1/04

HIC(d) = 1199, HIC = 1368, Delta T = 5.1 msec





mga
9/2/04

Impact Testing
G0417-001.18

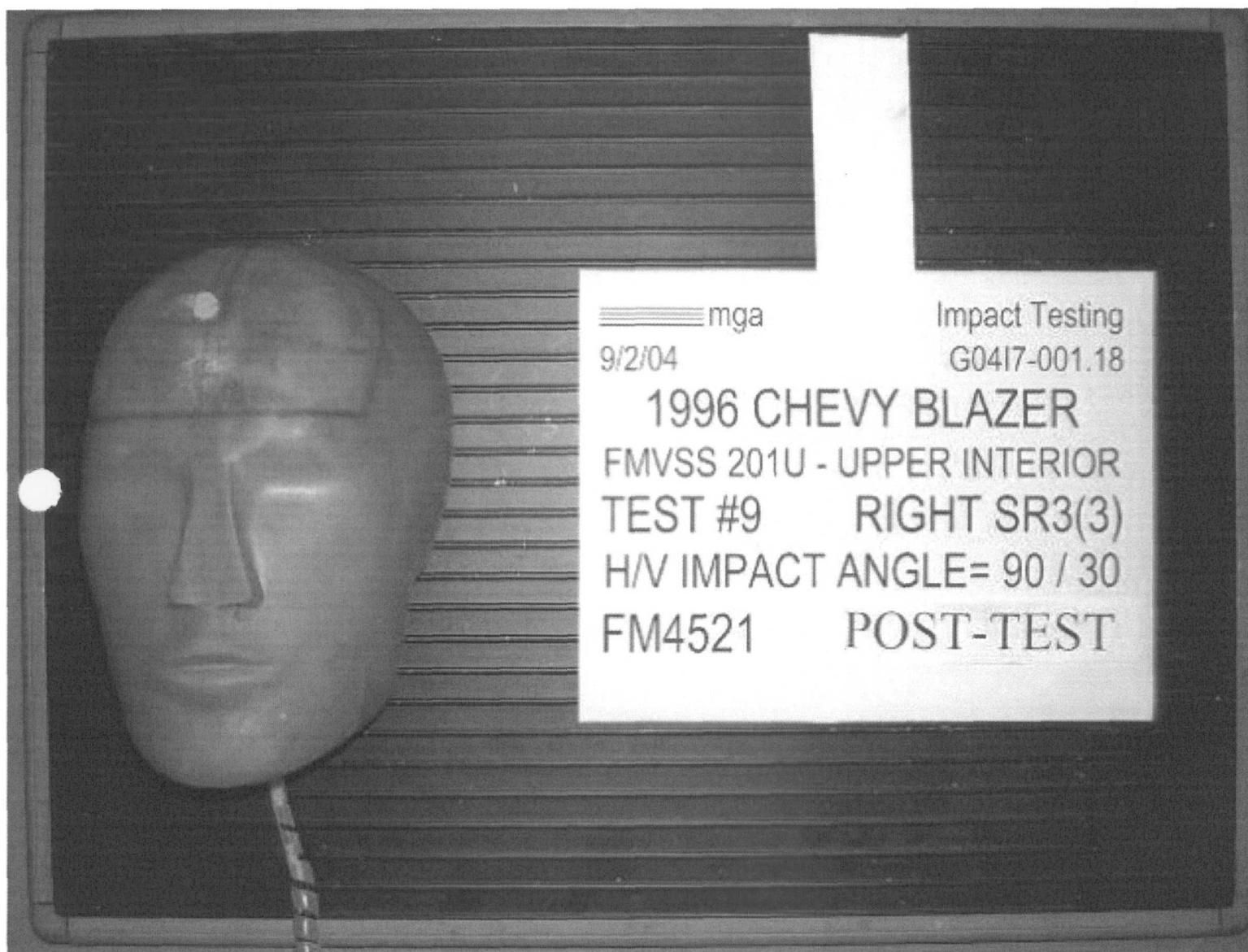
1996 CHEVY BLAZER

FMVSS 201U - UPPER INTERIOR

TEST #9 RIGHT SR3(3)

H/V IMPACT ANGLE= 90 / 30

FM4521 POST-TEST



==== mga

9/2/04

Impact Testing

G04I7-001.18

1996 CHEVY BLAZER

FMVSS 201U - UPPER INTERIOR

TEST #9 RIGHT SR3(3)

H/V IMPACT ANGLE= 90 / 30

FM4521 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: G0417-001.18 VEHICLE YR/MAKE/MODEL:BLAZER 1996

GENERAL TEST PARAMETERS:

Test Number:#9

Target (Vehicle Side): SR3(3) Right

Temperature:22C

MGA Test Reference No.:FM4521

Humidity:57%

Approach Horizontal Angles:90°

Time of Test:9:15 AM

Approach Vertical Angles:30°

FMH Serial No:036

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
665	661	7.8	24.0	46	6 R

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J35923	-100.8	1.67	1.67
Y	6	J35916	100.2	1.54	1.56
Z	7	J35918	97.9	1.58	1.33

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

No visible damage

Recorded By: on j m Approved By*: Helen Q. Kalish Date: 9-2-01

*Only necessary for NHTSA (Government) Compliance testing.

FMH
G04I7-001.18

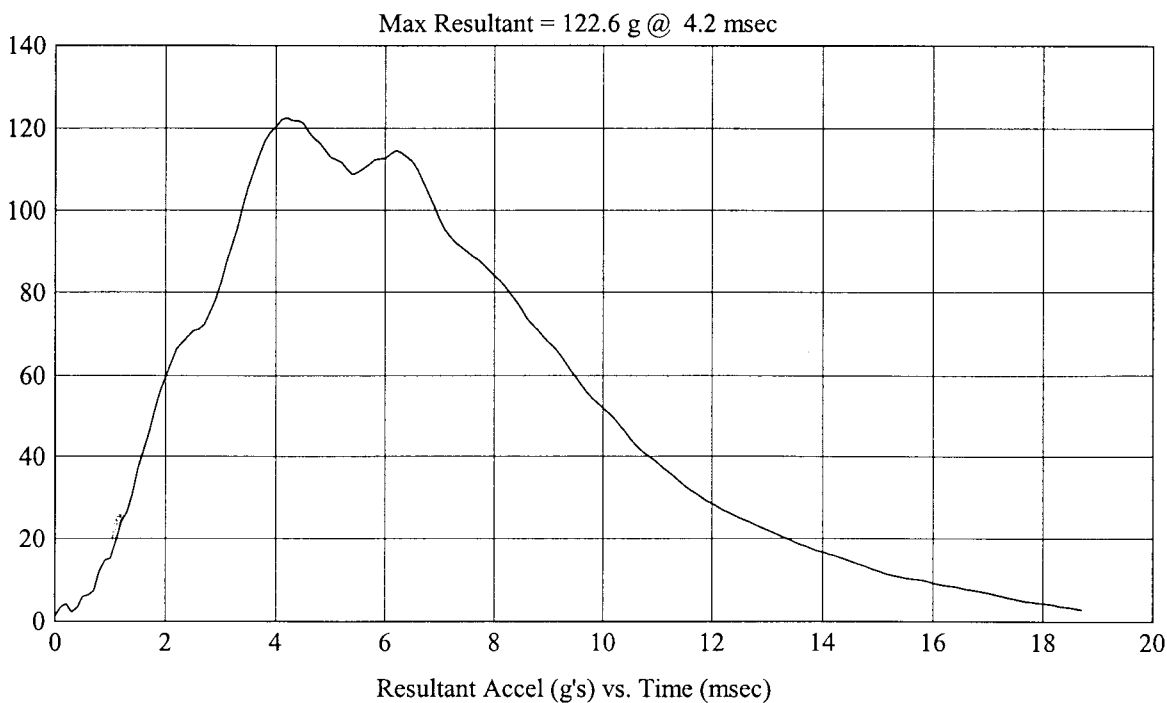
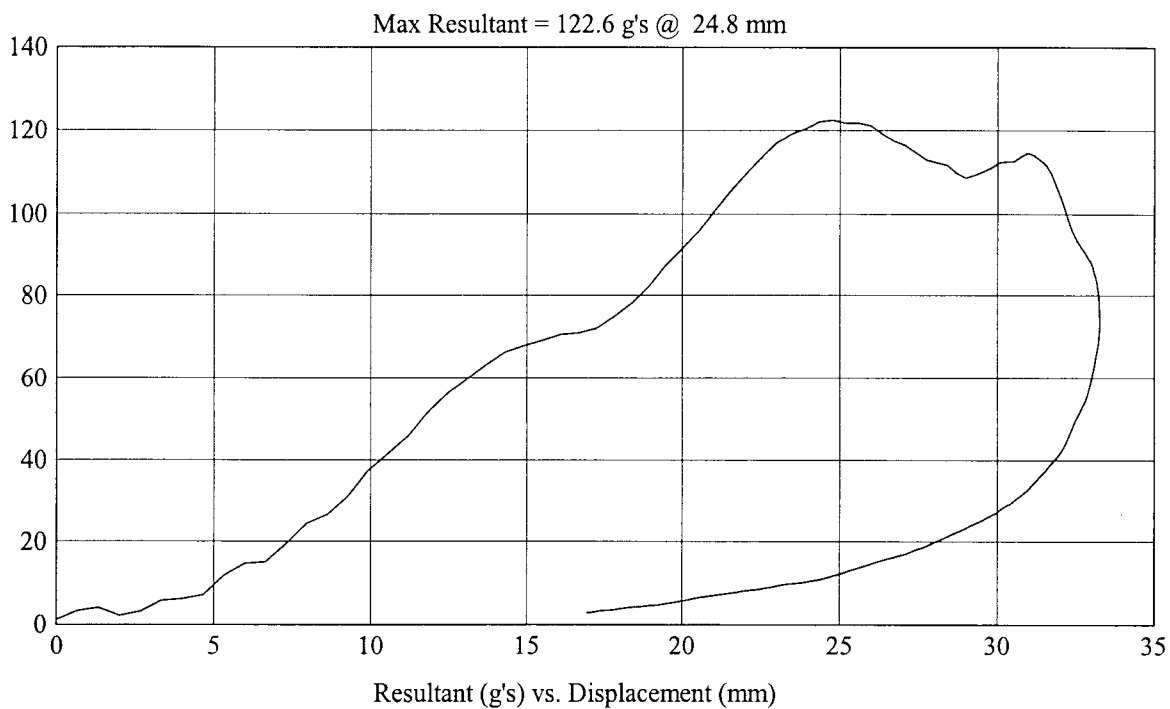
Customer: CHEVY
Test # 9
FM4521
Additional Desc: N/A

Vehicle Program : BLAZER

Model Year: 1996
Target: SR3(3)
Vehicle Side: Right
Horz/Vert Angle: 90/30

Test Date: 9/2/04

HIC(d) = 665, HIC = 661, Delta T = 7.8 msec



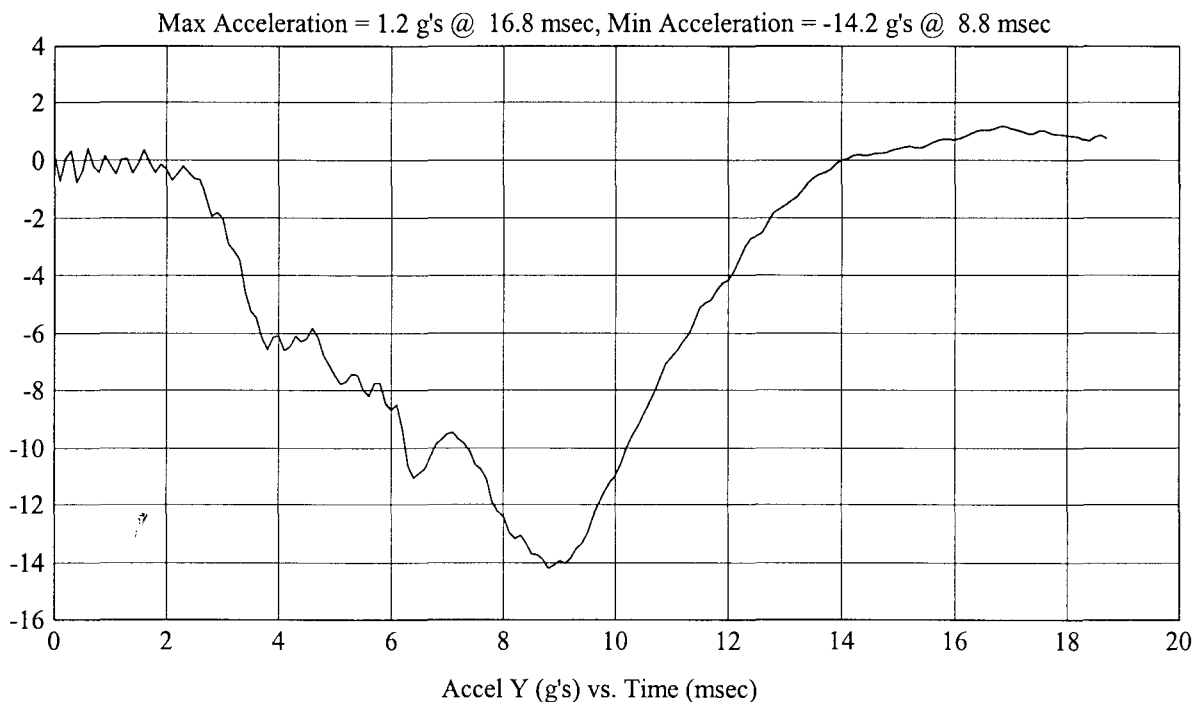
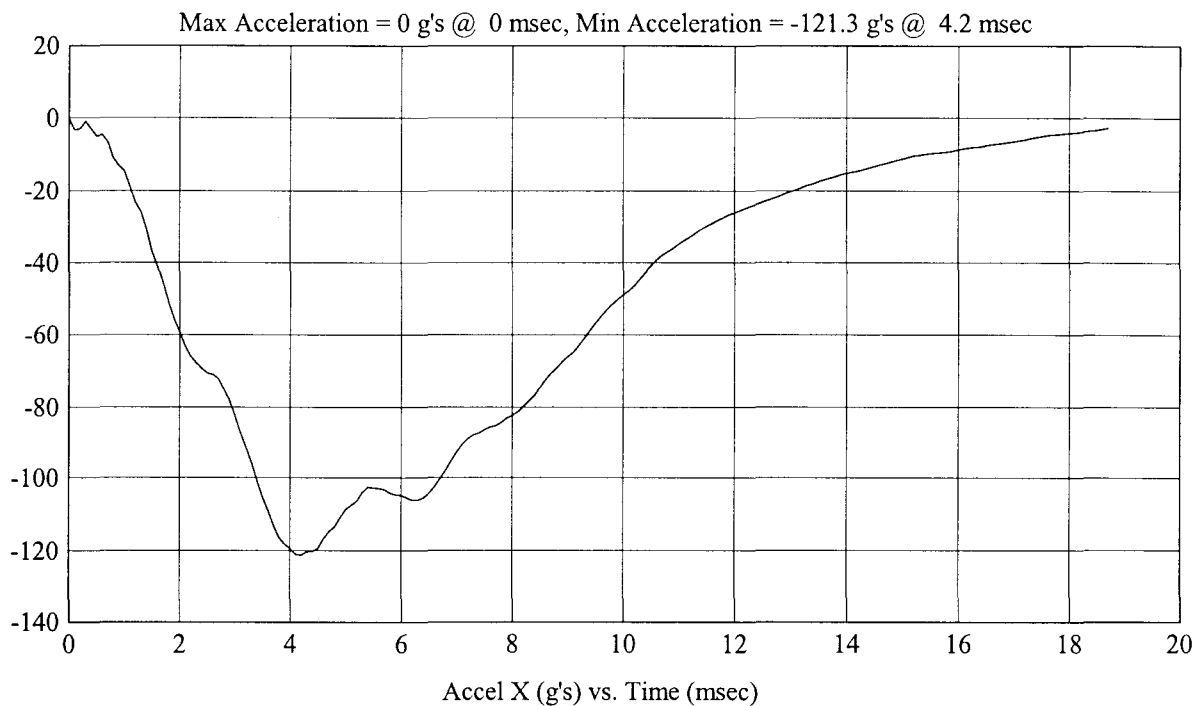
FMH
G04I7-001.18

Customer: CHEVY
Test # 9
FM4521
Additional Desc: N/A

Vehicle Program : BLAZER

Model Year: 1996
Target: SR3(3)
Vehicle Side: Right
Horz/Vert Angle: 90/30

Test Date: 9/2/04
HIC(d) = 665, HIC = 661, Delta T = 7.8 msec



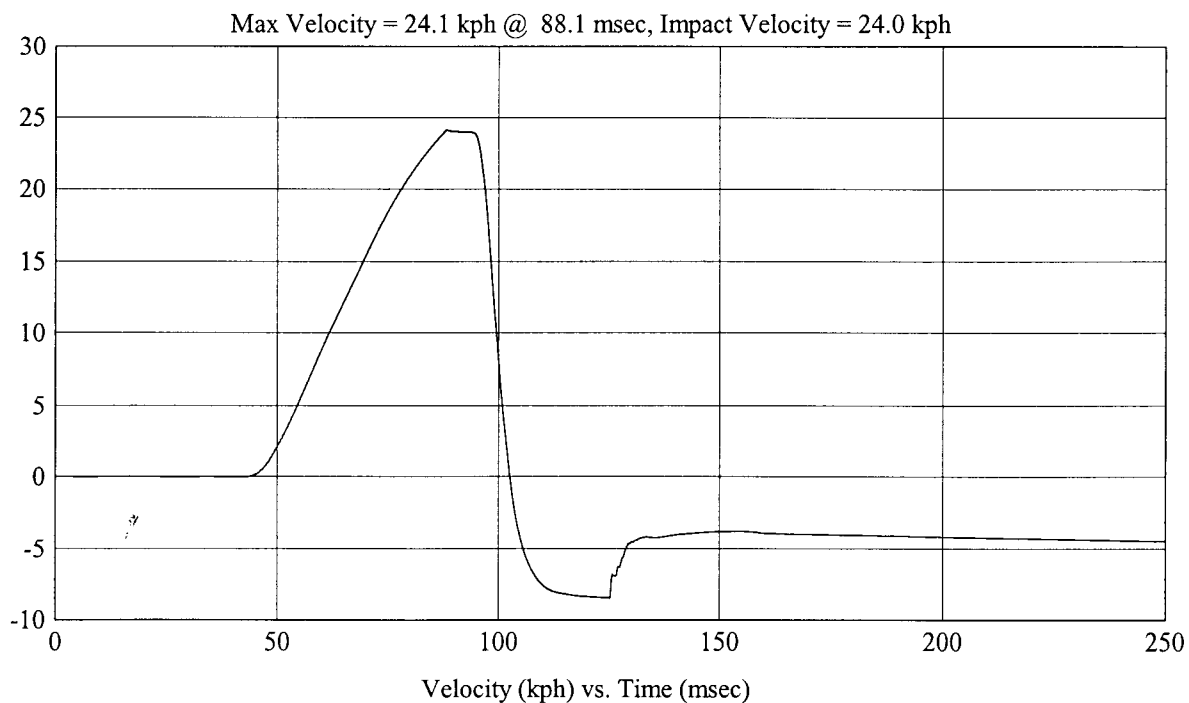
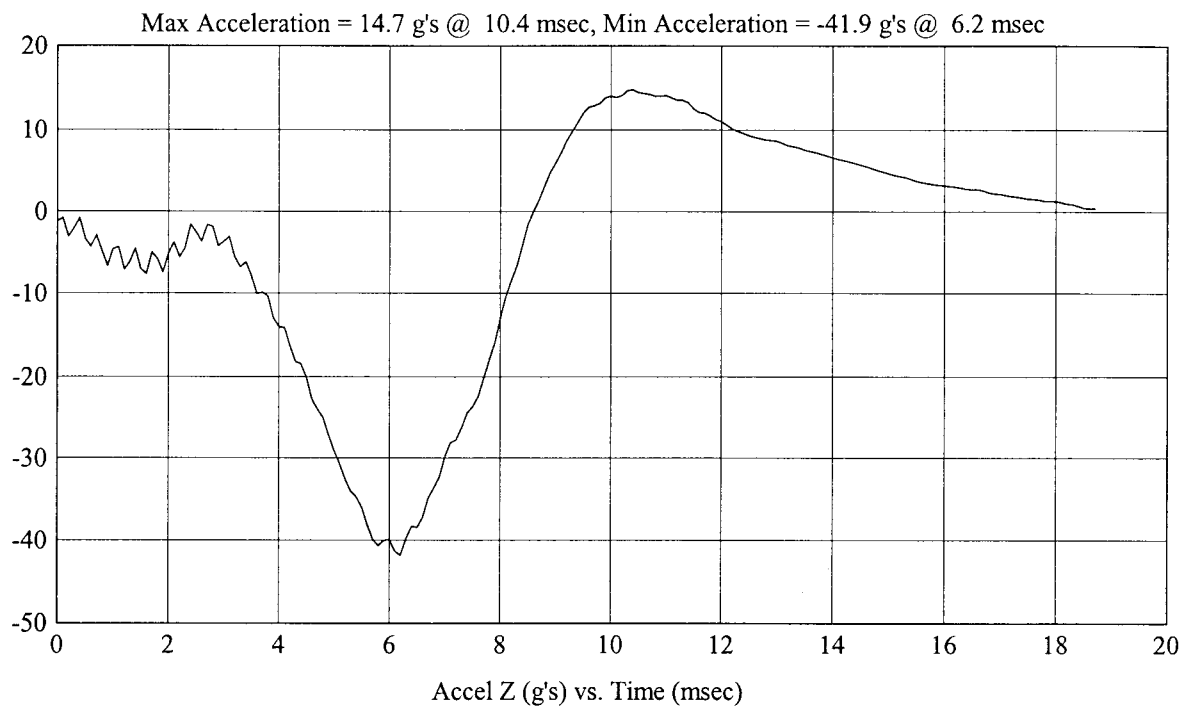
FMH
G04I7-001.18

Customer: CHEVY
Test # 9
FM4521
Additional Desc: N/A

Vehicle Program : BLAZER

Model Year: 1996
Target: SR3(3)
Vehicle Side: Right
Horz/Vert Angle: 90/30

Test Date: 9/2/04
HIC(d) = 665, HIC = 661, Delta T = 7.8 msec



FMH
G04I7-001.18

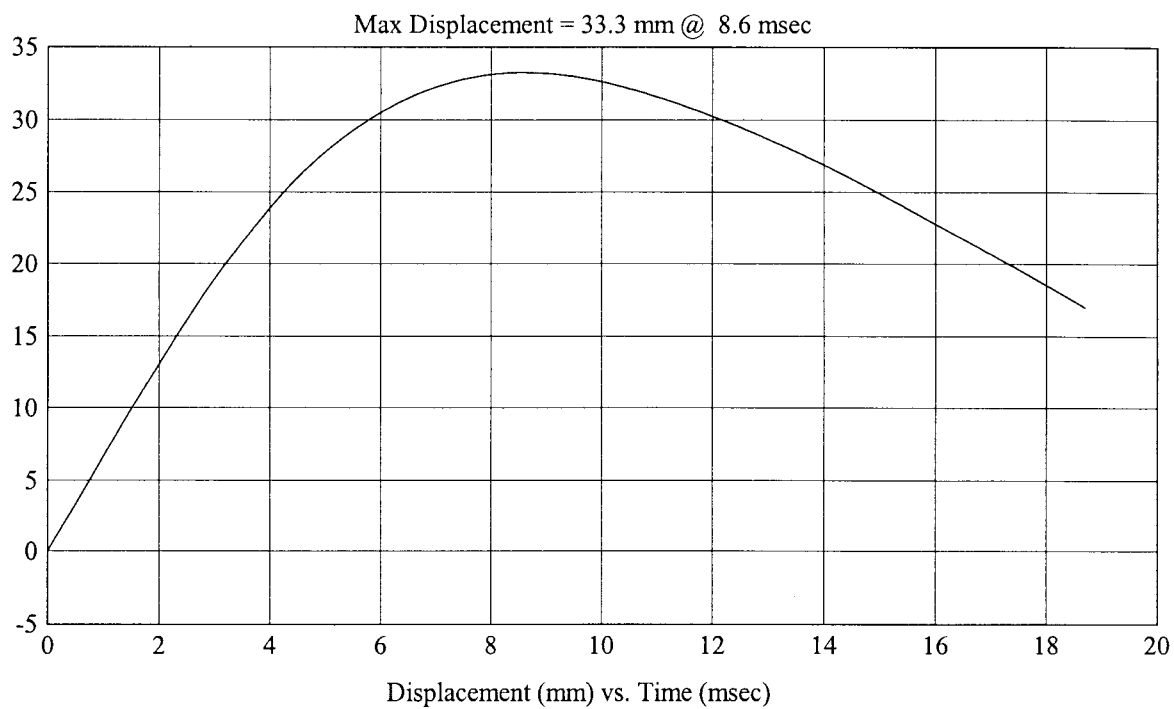
Customer: CHEVY
Test # 9
FM4521
Additional Desc: N/A

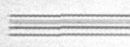
Vehicle Program : BLAZER

Model Year: 1996
Target: SR3(3)
Vehicle Side: Right
Horz/Vert Angle: 90/30

Test Date: 9/2/04

HIC(d) = 665, HIC = 661, Delta T = 7.8 msec



 mga

Impact Testing

9/1/04

G04I7-001.18

1996 CHEVY BLAZER

FMVSS 201U - UPPER INTERIOR

TEST #3 LEFT UR2

H/V IMPACT ANGLE= 270 / 50

FM4515 PRE - TEST

mga
9/1/04

Impact Testing
G0417-001.18

1996 CHEVY BLAZER

FMVSS 201U - UPPER INTERIOR

TEST #3 LEFT UR2

H/V IMPACT ANGLE= 270 / 50

FM4515 POST-TEST



===== mga

9/1/04

Impact Testing

G04I7-001.18

1996 CHEVY BLAZER

FMVSS 201U - UPPER INTERIOR

TEST #3 LEFT UR2

H/V IMPACT ANGLE= 270 / 50

FM4515 POST-TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G04I7-001.18 VEHICLE YR/MAKE/MODEL:BLAZER 1996

GENERAL TEST PARAMETERS:

Target (Vehicle Side): UR2 Left

MGA Test Reference No.:FM4515

Approach Horizontal Angles:270°

Approach Vertical Angles:50°

Test Number:#3

Temperature:22C

Humidity:59%

Time of Test:1:50 PM

FMH Serial No:038

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
697	703	6.5	23.6	36	2 L

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J36197	-108	1.67	1.66
Y	6	J36193	101.4	1.54	1.54
Z	7	J36353	96.8	1.58	1.59

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

No visible damage

Recorded By: an j m Approved By: Heleen A. Kalito Date: 9-1-04

*Only necessary for NHTSA (Government) Compliance testing.

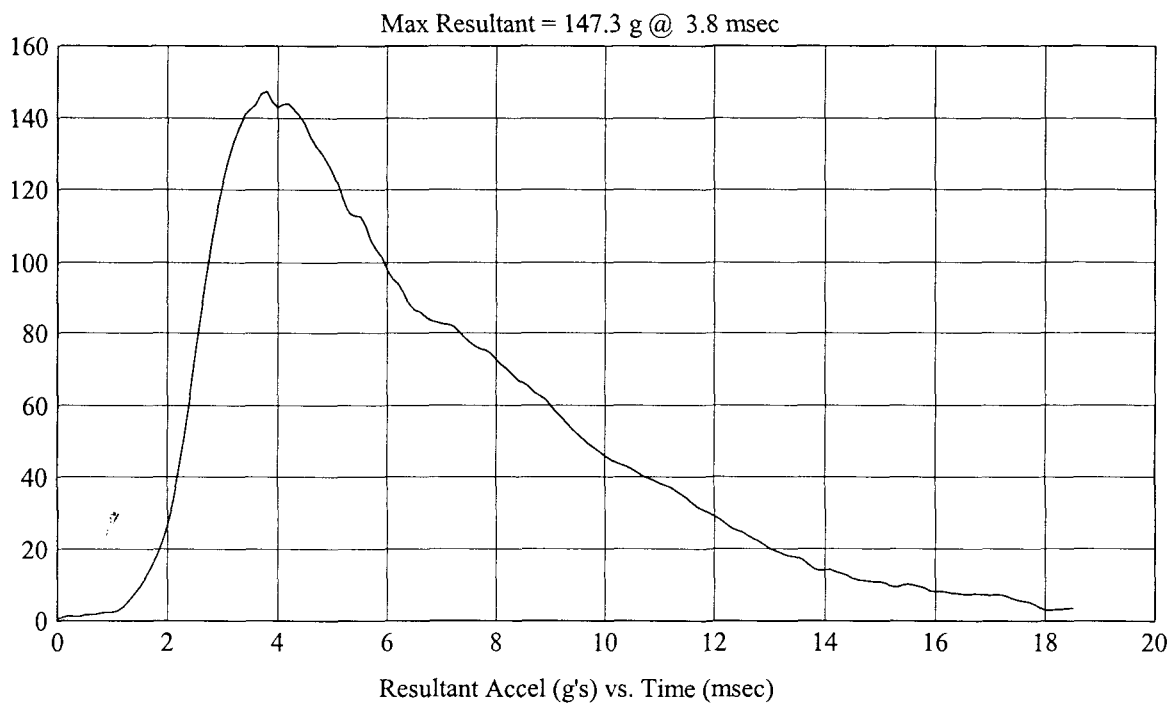
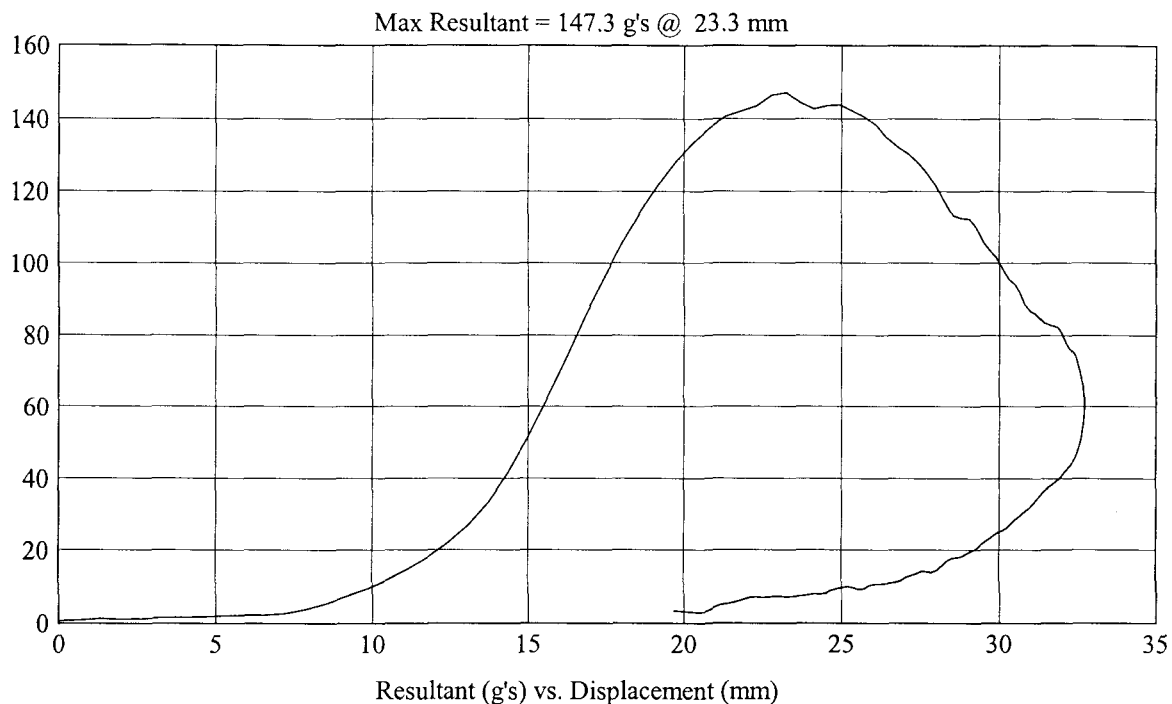
FMH
G04I7-001.18

Customer: CHEVY
Test # 3
FM4515
Additional Desc: N/A

Vehicle Program : BLAZER

Model Year: 1996
Target: UR2
Vehicle Side: Left
Horz/Vert Angle: 270/50

Test Date: 9/1/04
HIC(d) = 697, HIC = 703, Delta T = 6.5 msec



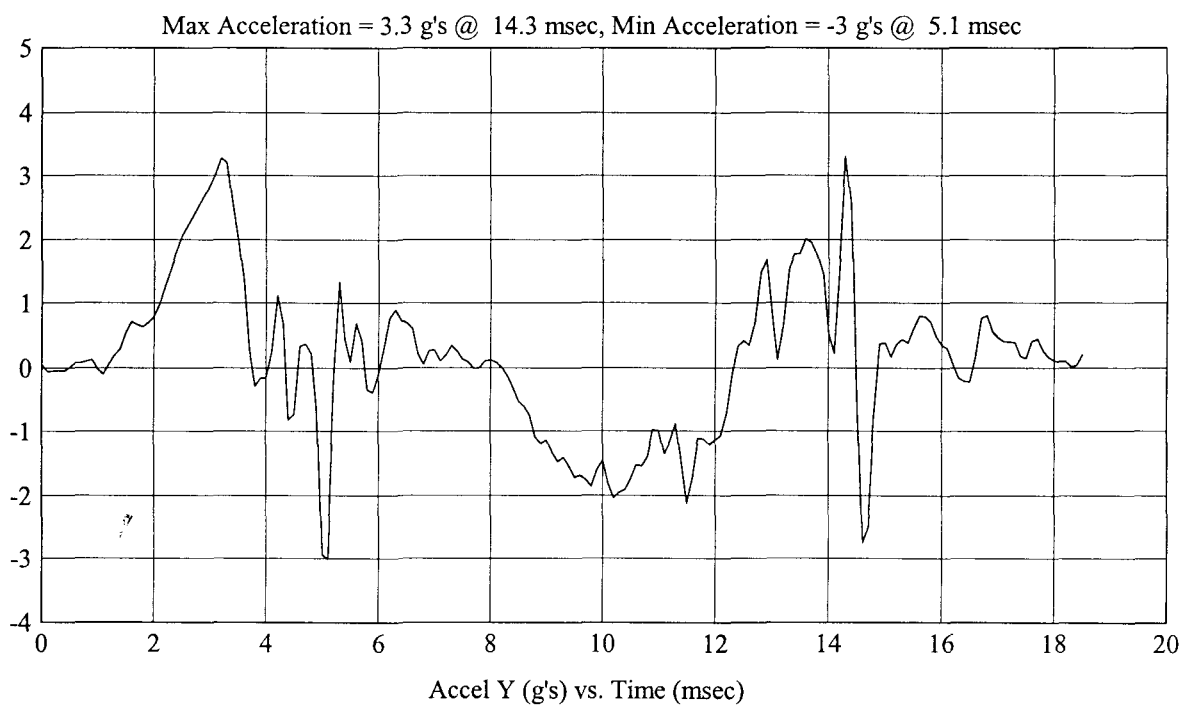
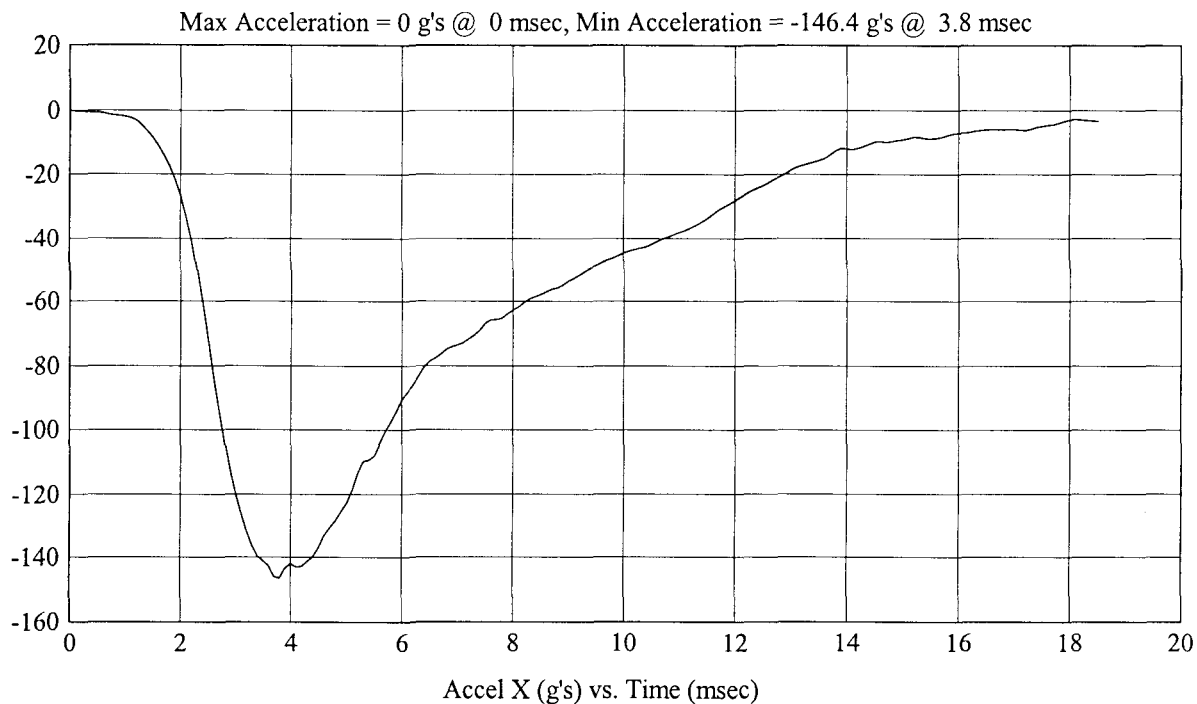
FMH
G04I7-001.18

Customer: CHEVY
Test # 3
FM4515
Additional Desc: N/A

Vehicle Program : BLAZER

Model Year: 1996
Target: UR2
Vehicle Side: Left
Horz/Vert Angle: 270/50

Test Date: 9/1/04
HIC(d) = 697, HIC = 703, Delta T = 6.5 msec



FMH
G04I7-001.18

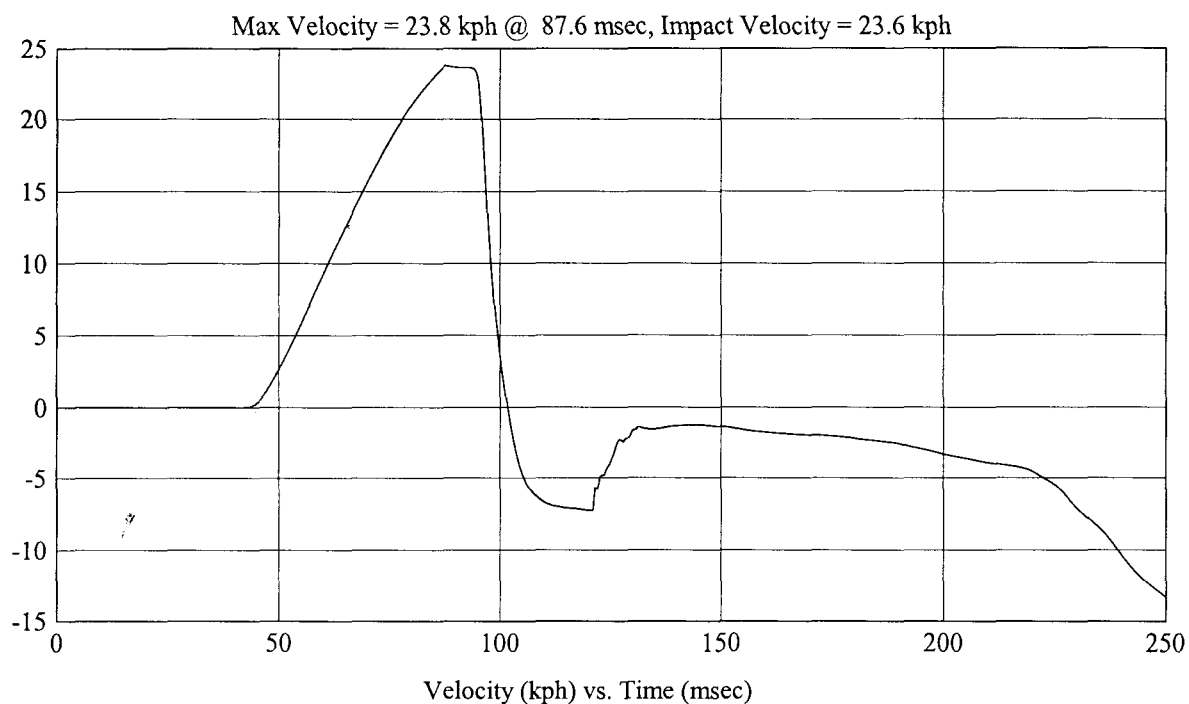
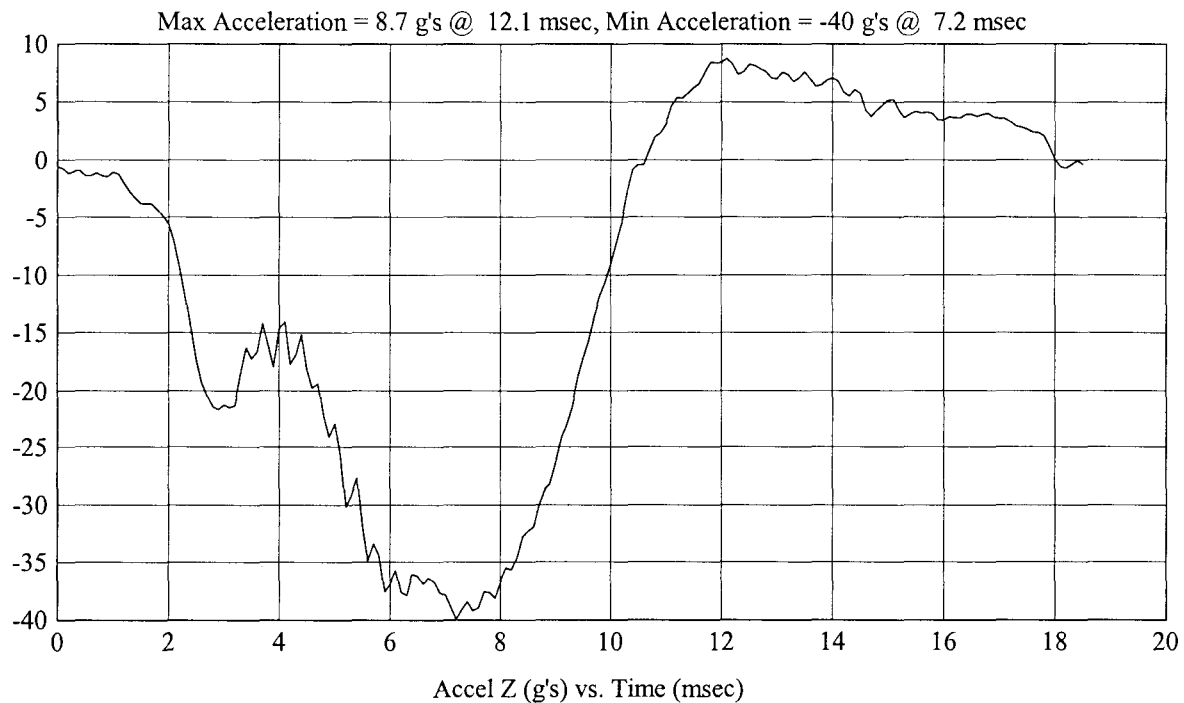
Customer: CHEVY
Test # 3
FM4515
Additional Desc: N/A

Vehicle Program : BLAZER

Model Year: 1996
Target: UR2
Vehicle Side: Left
Horz/Vert Angle: 270/50

Test Date: 9/1/04

HIC(d) = 697, HIC = 703, Delta T = 6.5 msec

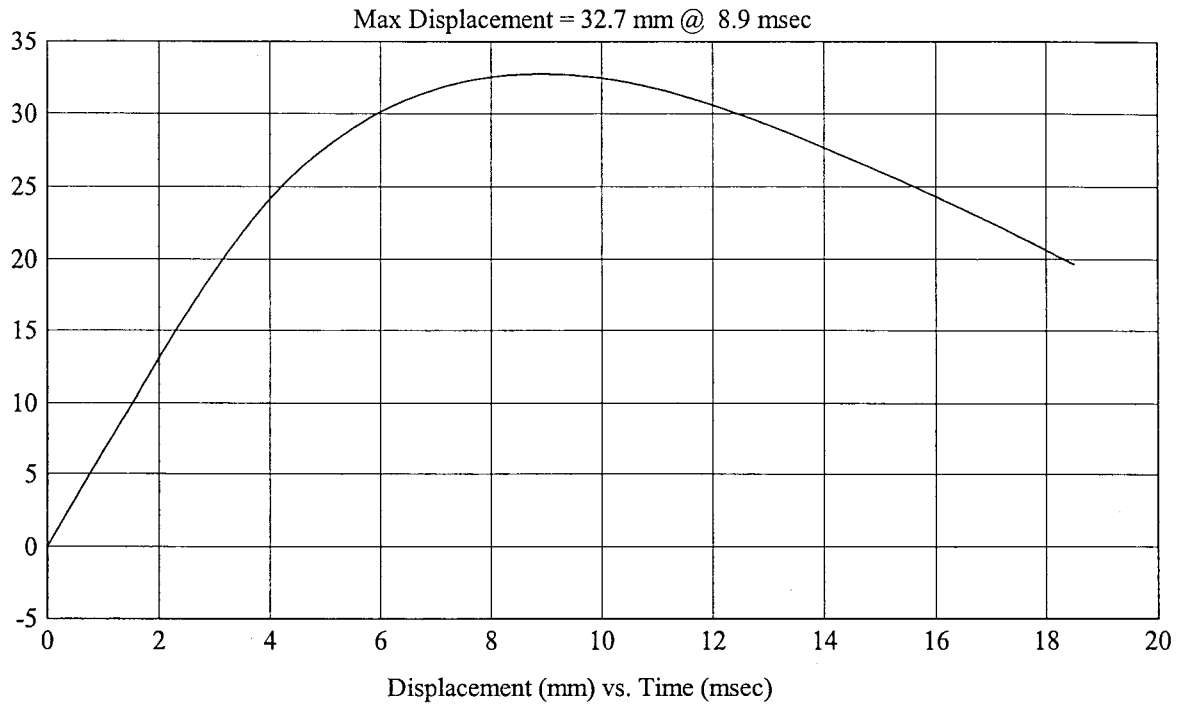


Customer: CHEVY
Test # 3
FM4515
Additional Desc: N/A

Vehicle Program : BLAZER

Model Year: 1996
Target: UR2
Vehicle Side: Left
Horz/Vert Angle: 270/50

Test Date: 9/1/04
HIC(d) = 697, HIC = 703, Delta T = 6.5 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 Inclinator	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 UTAMA UTAMA	035 036 038	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: - Tape Measure - Plumb Bobs - Protractor	Stanley N/A Mitutoyo	289 -- --	Measurement Targeting FMH setup Horizontal Measurement	1 mm N/A 0.5°	Annual
*Vehicle Scale 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 ± 1% RH	Annual

TABLE 4-2 FMH CALIBRATION SUMMARY DATA SUMMARY TABLE

FMH Serial #		Weight (lbs)	Temp (°C)	% Humidity	Peak Resultant Acceleration (G's)	Peak Lateral Acceleration (G's)	Unimodal
Pre	#35	10.02	22.0	57.0	232.9	11.7	Yes
Post	#35	10.02	22.0	58.0	237.6	1.8	Yes
Pre	#36	10.03	22.0	57.0	256.5	7.7	Yes
Post	#36	10.03	22.0	58.0	235.7	9.2	Yes
Pre	#38	9.99	22.0	57.0	254.4	8.3	Yes
Post	#38	9.99	22.0	57.0	236.2	6.9	Yes

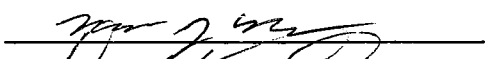
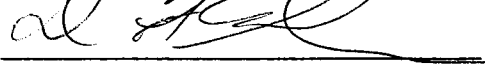
RECORDED BY: David G. GotwalsDATE: September 2, 2004APPROVED BY: Helen A. Kalet

HEAD DROP TEST SUMMARY
PART 572L

HEADFORM SERIAL NUMBER: <u>035</u> CALIBRATION DATE: <u>8-31-04</u>		
TEST PARAMETER	SPECIFICATION	TEST RESULTS
Weight	9.90 to 10.10 lbs.	<u>10.02</u>
Temperature	19° C to 26° C	<u>22</u>
Relative Humidity	10% to 70%	<u>57</u>
Peak Resultant Acceleration	225 G's to 275 G's	<u>232.9</u>
Peak Lateral Acceleration	15 G's Maximum	<u>11.7</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>J35924</u>	<u>5-20-04</u>	<u>11-20-04</u>
<u>3</u>	ENDEVCO	7264-2000	<u>J35919</u>	<u>5-20-04</u>	<u>11-20-04</u>
<u>4</u>	ENDEVCO	7264-2000	<u>J21969</u>	<u>5-19-04</u>	<u>11-20-04</u>

REMARKS:

RECORDED BY:  DATE: 8-31-04
APPROVED BY: 

Head Drop
(Preliminary Test Report)

Test Number: H35257

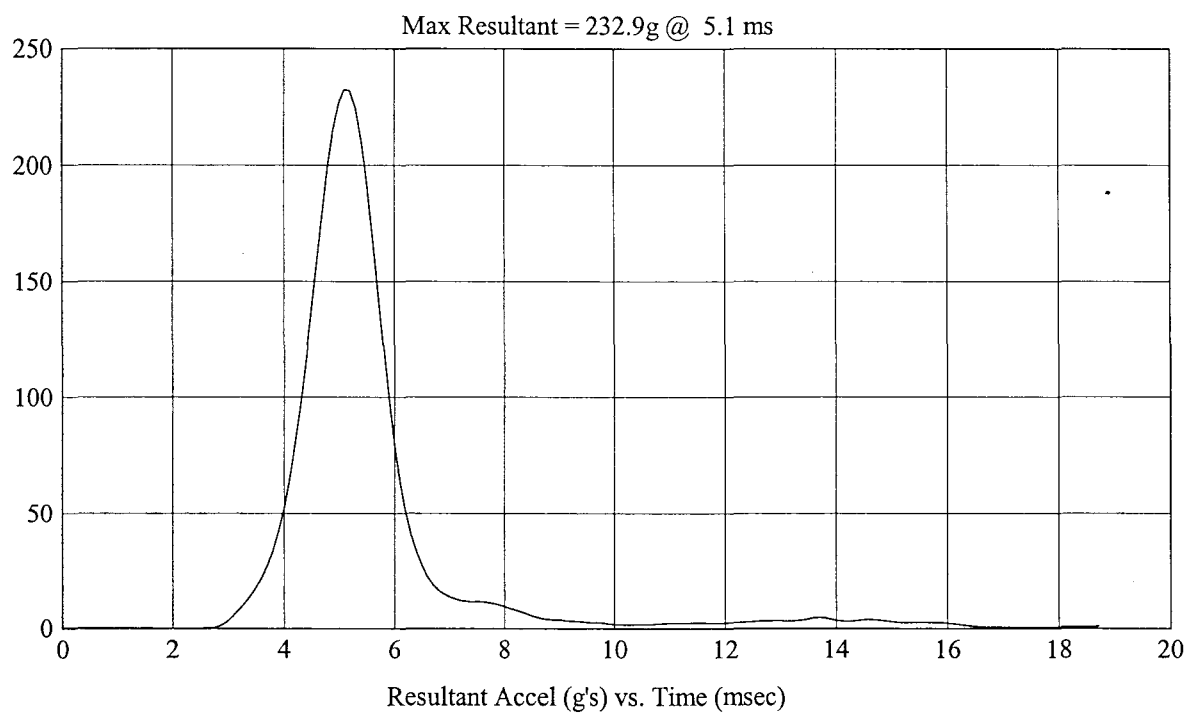
MGA Job Number: G0417-001.18

Pre - G0417-001.18

Test Date: 8/31/04

Test Description: Pre - Test Calibration

Head #: 035



Head Drop
(Preliminary Test Report)

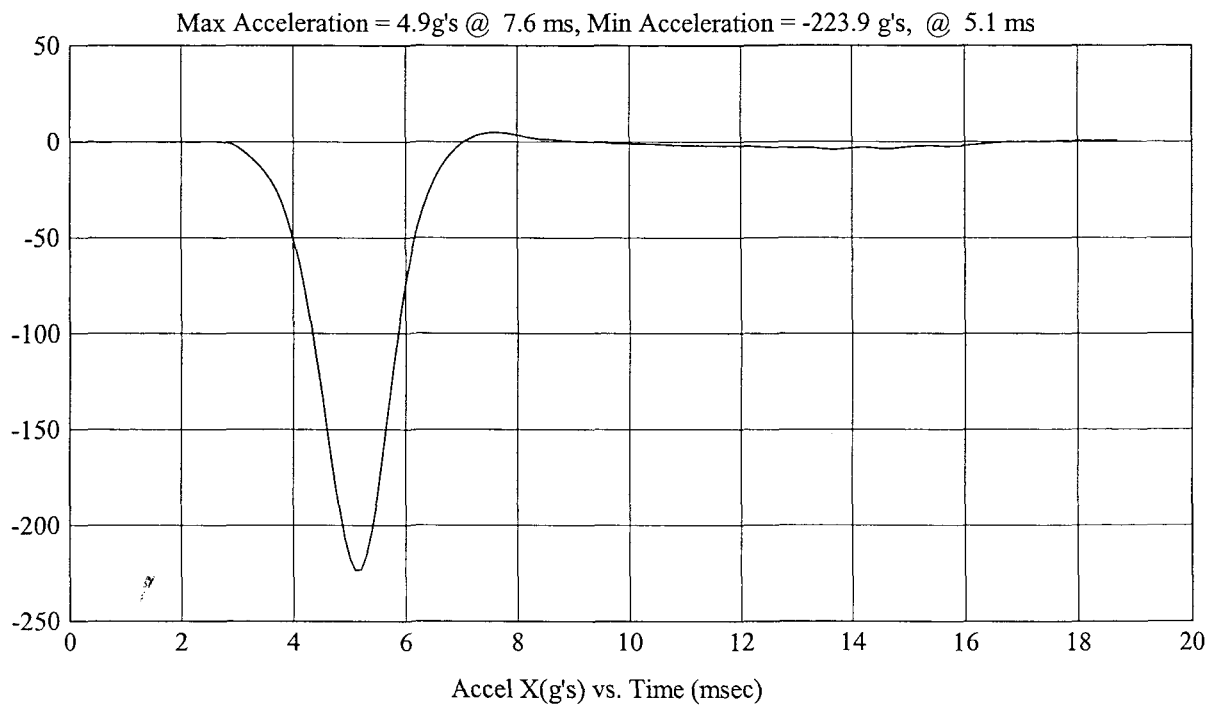
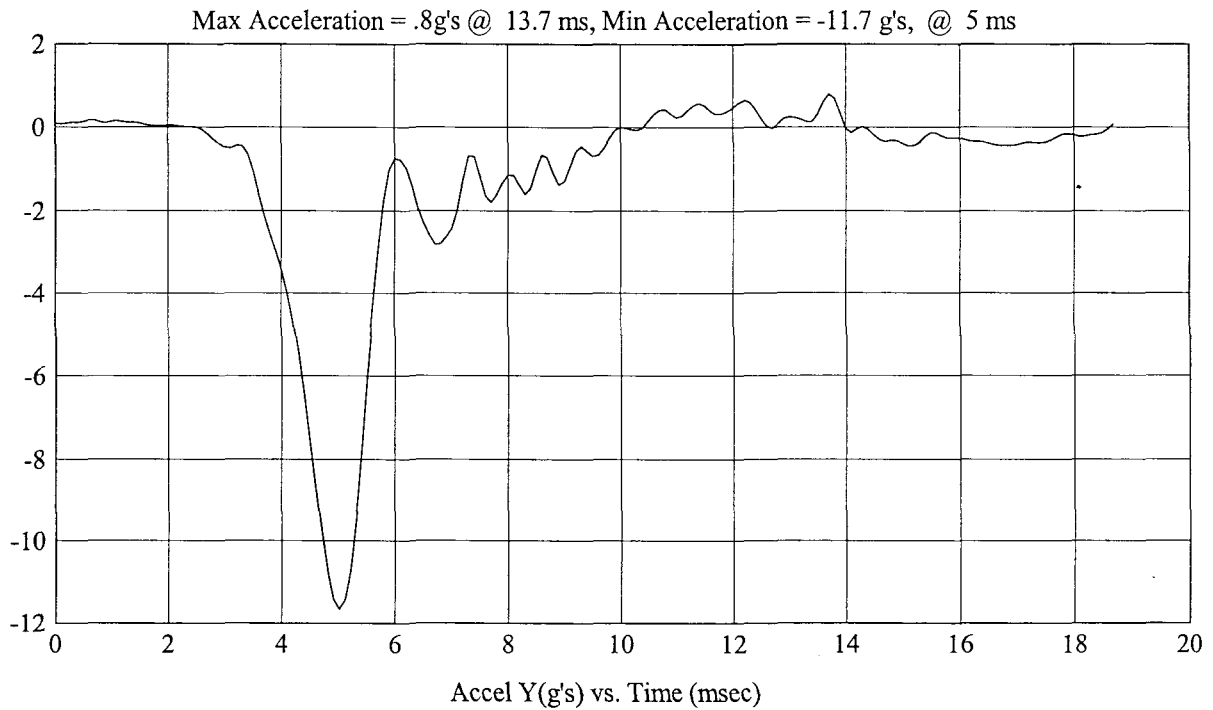
Test Number: H35257

MGA Job Number: G04I7-001.18

Test Date: 8/31/04

Test Description: Pre - Test Calibration

Head # : 035



Head Drop
(Preliminary Test Report)

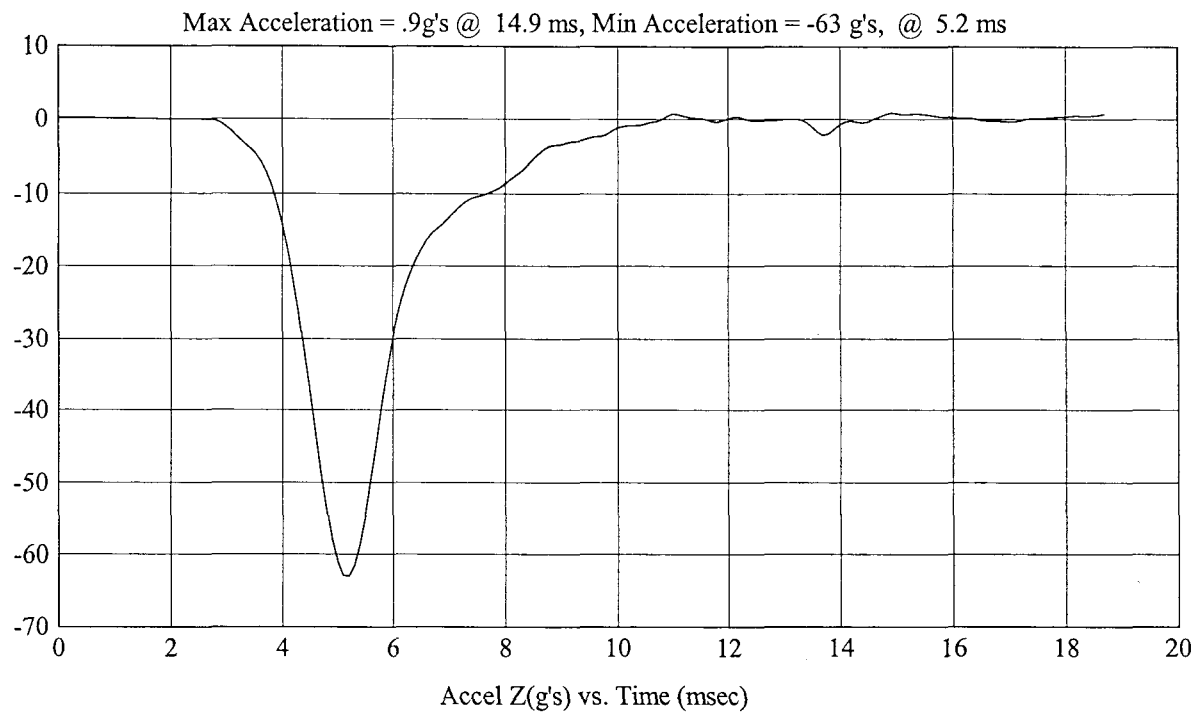
Test Number: H35257

MGA Job Number: G04I7-001.18

Test Date: 8/31/04

Test Description: Pre - Test Calibration

Head # : 035



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

DOC. NO.: MGATP201UHD
REVISION NO.: 6
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Post-Mazon

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%	58
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)

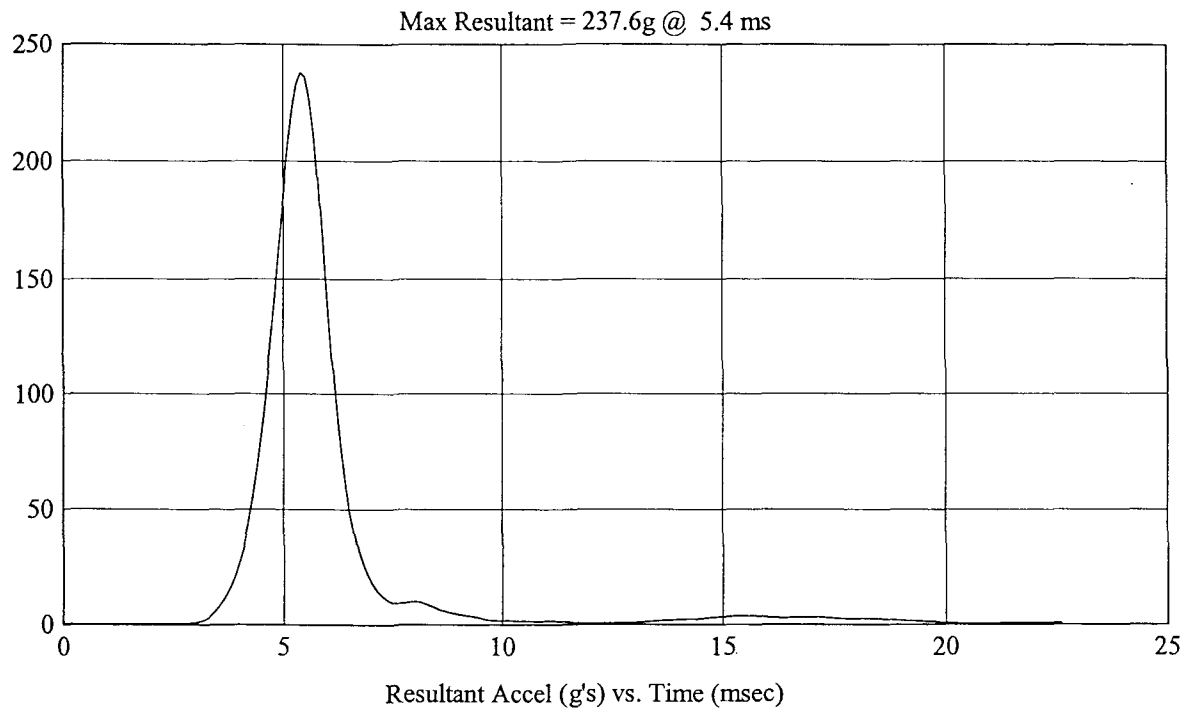
Test Number: H35258

MGA Job Number: G04I7-001.18

Test Date: 9/2/04

Test Description: Post - Test Calibration

Head #: 35



Head Drop
(Preliminary Test Report)

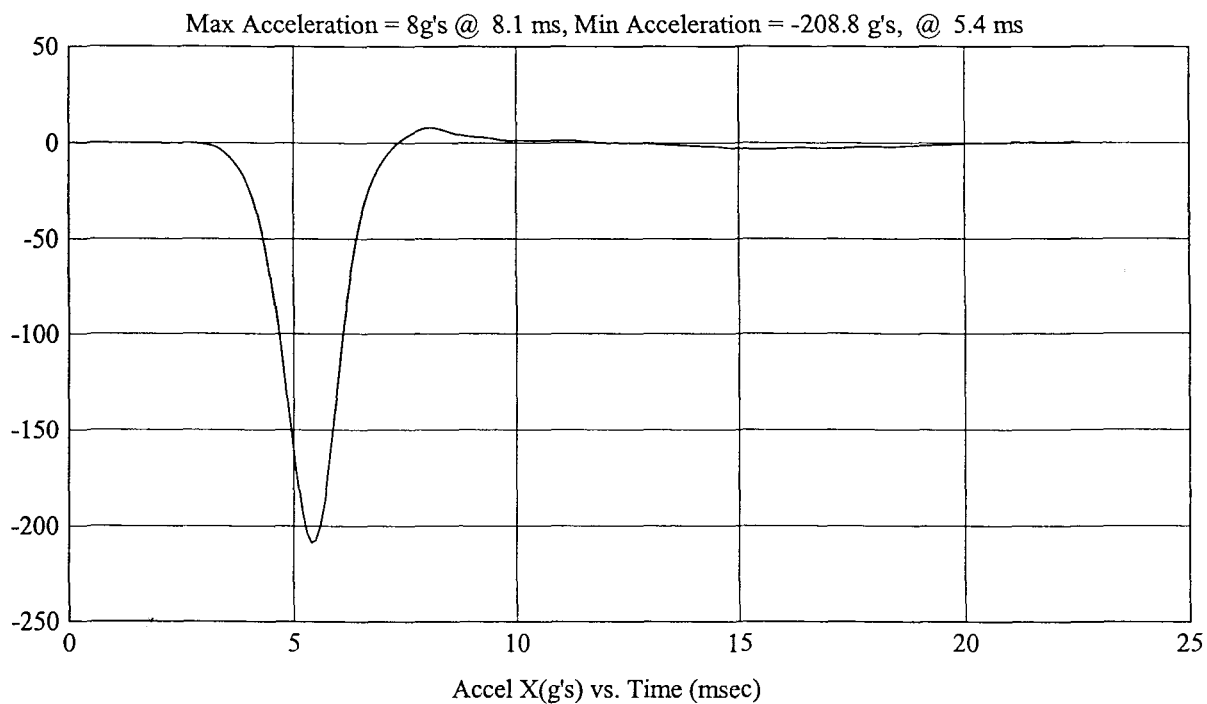
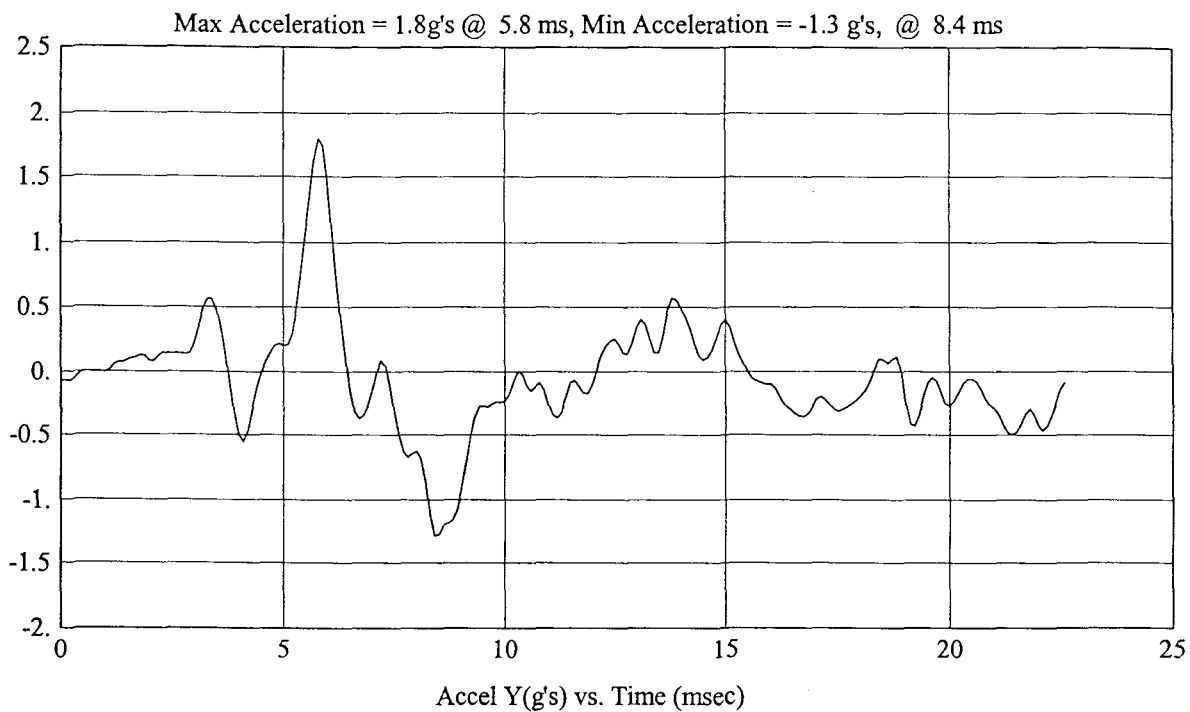
Test Number: H35258

MGA Job Number: G04I7-001.18

Test Date: 9/2/04

Test Description: Post - Test Calibration

Head #: 35



Head Drop
(Preliminary Test Report)

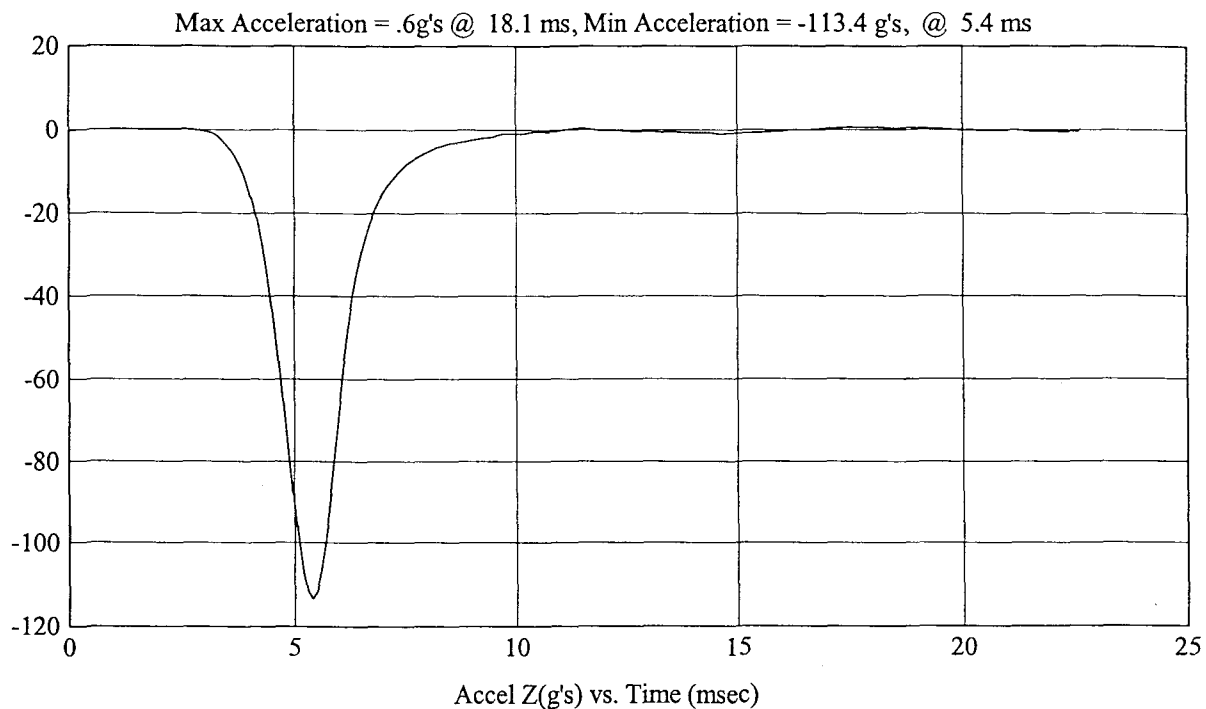
Test Number: H35258

MGA Job Number: G0417-001.18

Test Date: 9/2/04

Test Description: Post - Test Calibration

Head # : 35



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

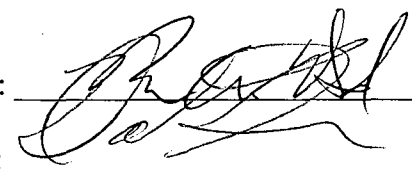
DOC. NO.: MGATP201UHD
REVISION NO.: 6
PAGE 6 OF 7

HEAD DROP TEST SUMMARY PART 572L

HEADFORM SERIAL NUMBER: <u>036</u> CALIBRATION DATE: <u>8-31-04</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	256.5
Peak Lateral Acceleration	15 G's Maximum	7.7
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	535923	5-23-04	11-23-04
3	ENDEVCO	7264-2000	535916	5-23-04	11-23-04
4	ENDEVCO	7264-2000	535918	5-23-04	11-23-04

REMARKS:

RECORDED BY: 

DATE: 8-31-04

APPROVED BY: _____

Head Drop
(Preliminary Test Report)

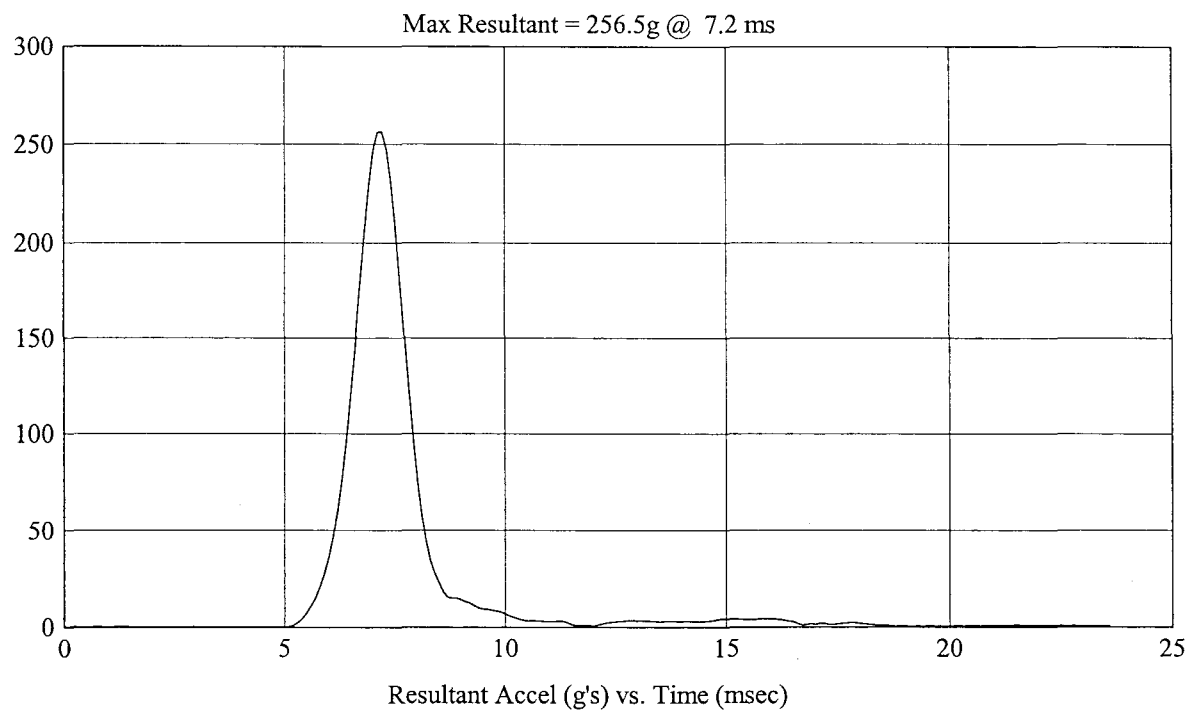
Test Number: H36256

MGA Job Number: G04I7-001.18

Test Date: 8/31/04

Test Description: Pre - Test Calibration

Head # : 036



Head Drop
(Preliminary Test Report)

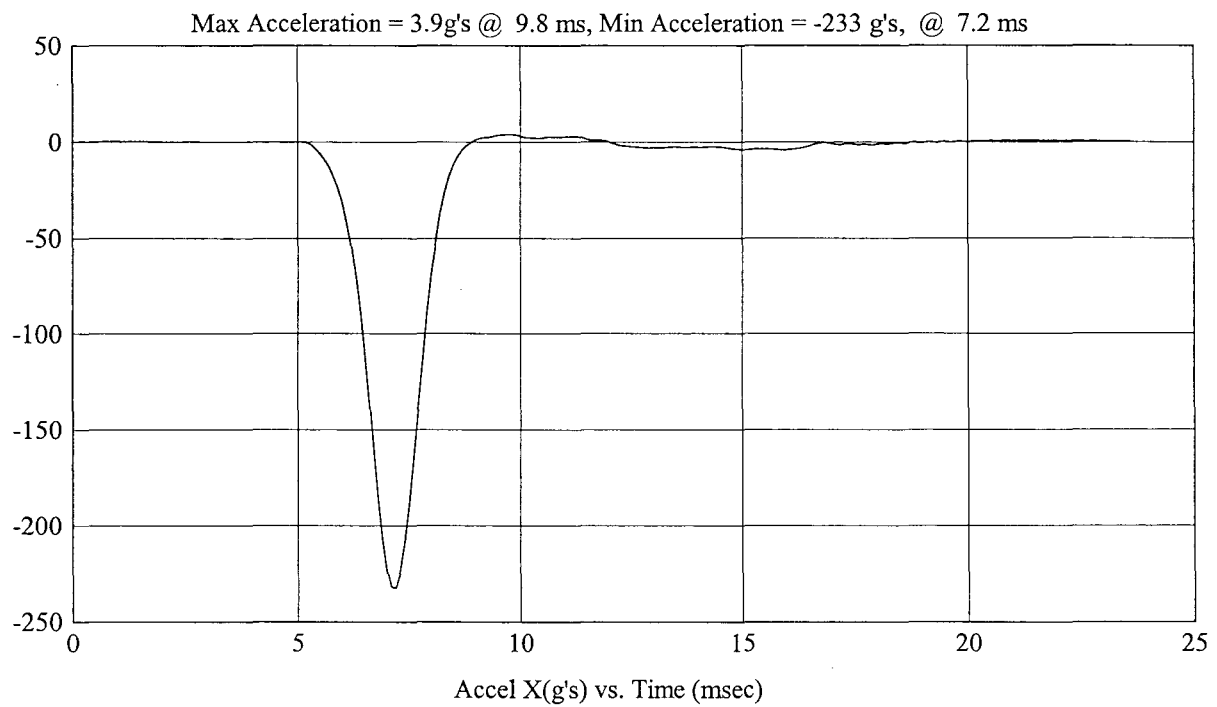
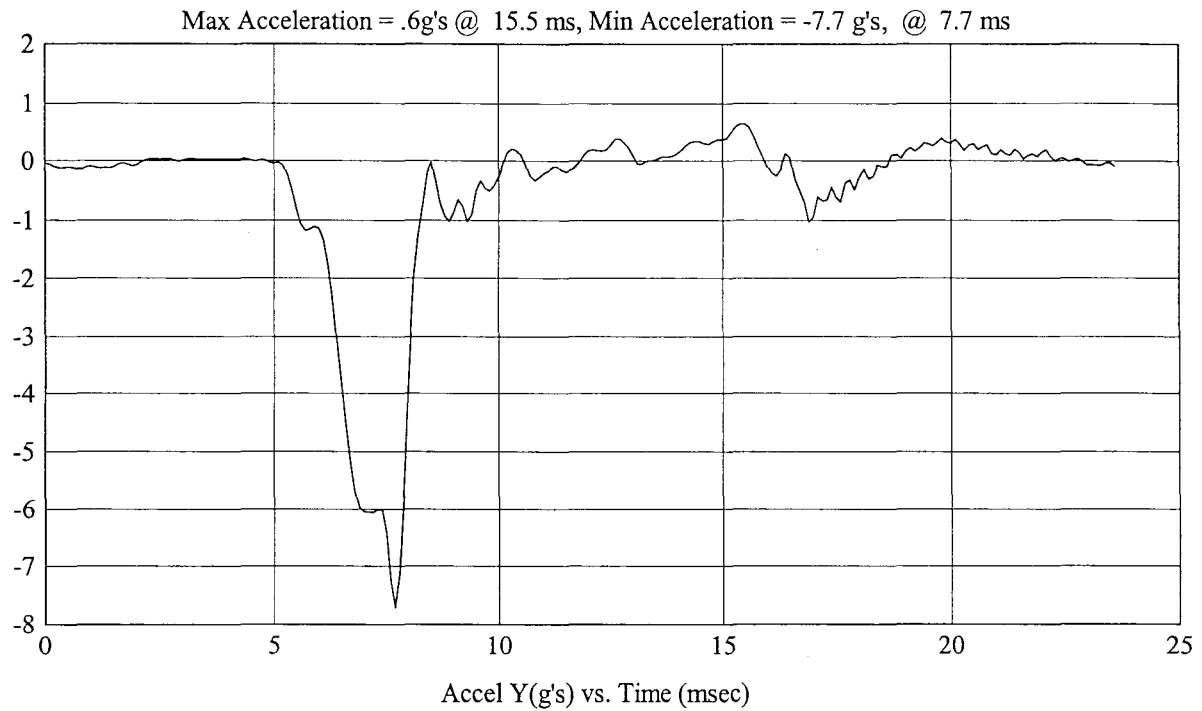
Test Number: H36256

MGA Job Number: G04I7-001.18

Test Date: 8/31/04

Test Description: Pre - Test Calibration

Head #: 036



Head Drop
(Preliminary Test Report)

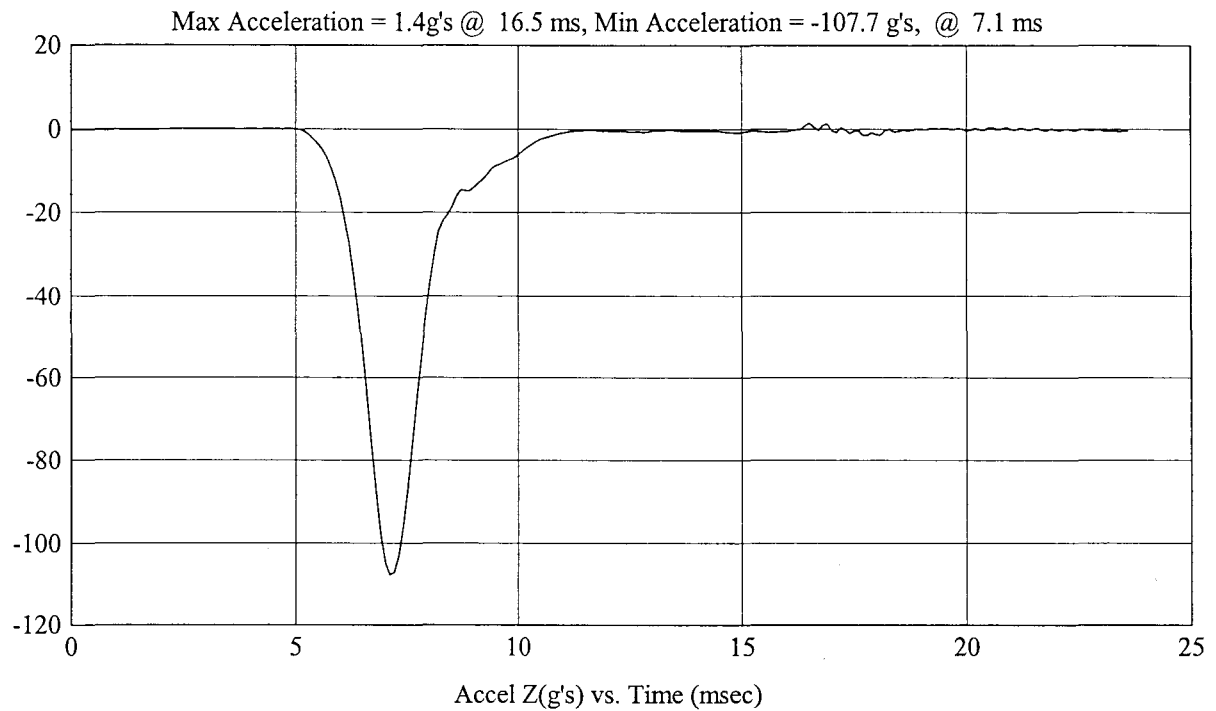
Test Number: H36256

MGA Job Number: G04I7-001.18

Test Date: 8/31/04

Test Description: Pre - Test Calibration

Head #: 036



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

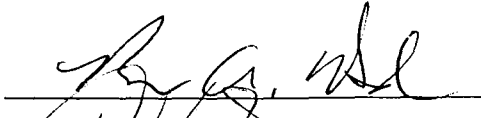
DOC. NO.: MGATP201UHD
 REVISION NO.: 6
 PAGE 6 OF 7

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%	58
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)

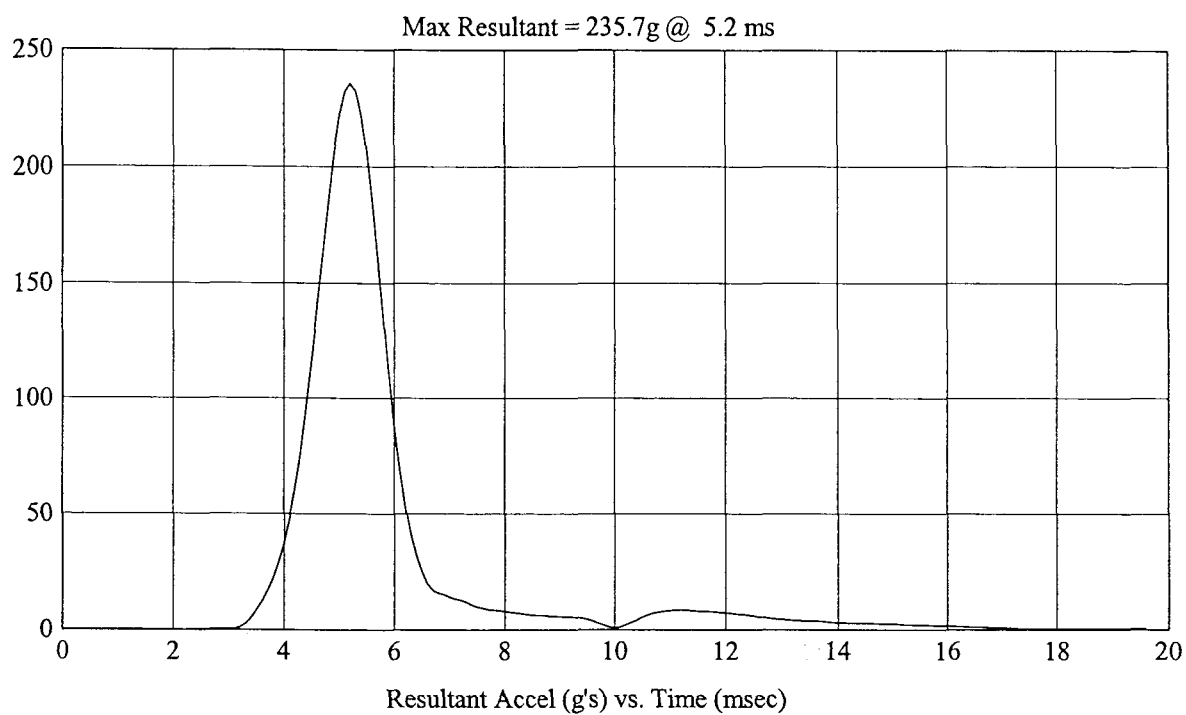
Test Number: H36257

MGA Job Number: G04I7-001.18

Test Date: 9/2/04

Test Description: Post - Test Calibration

Head # : 36



Head Drop
(Preliminary Test Report)

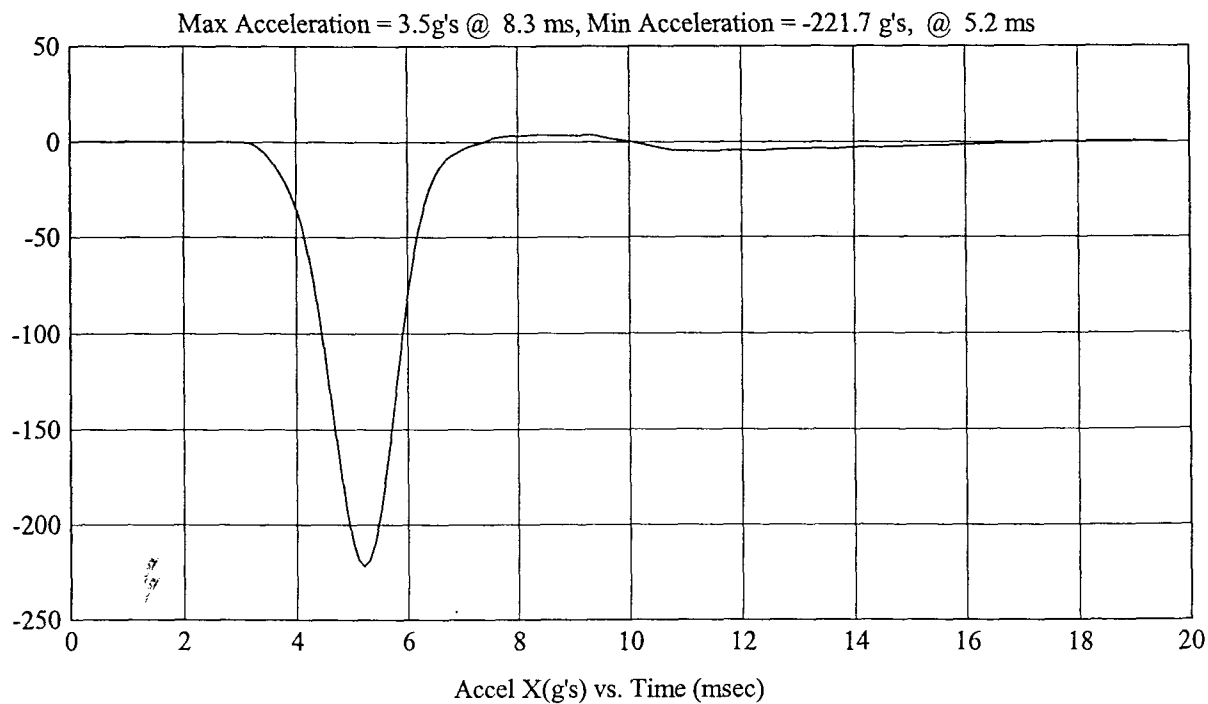
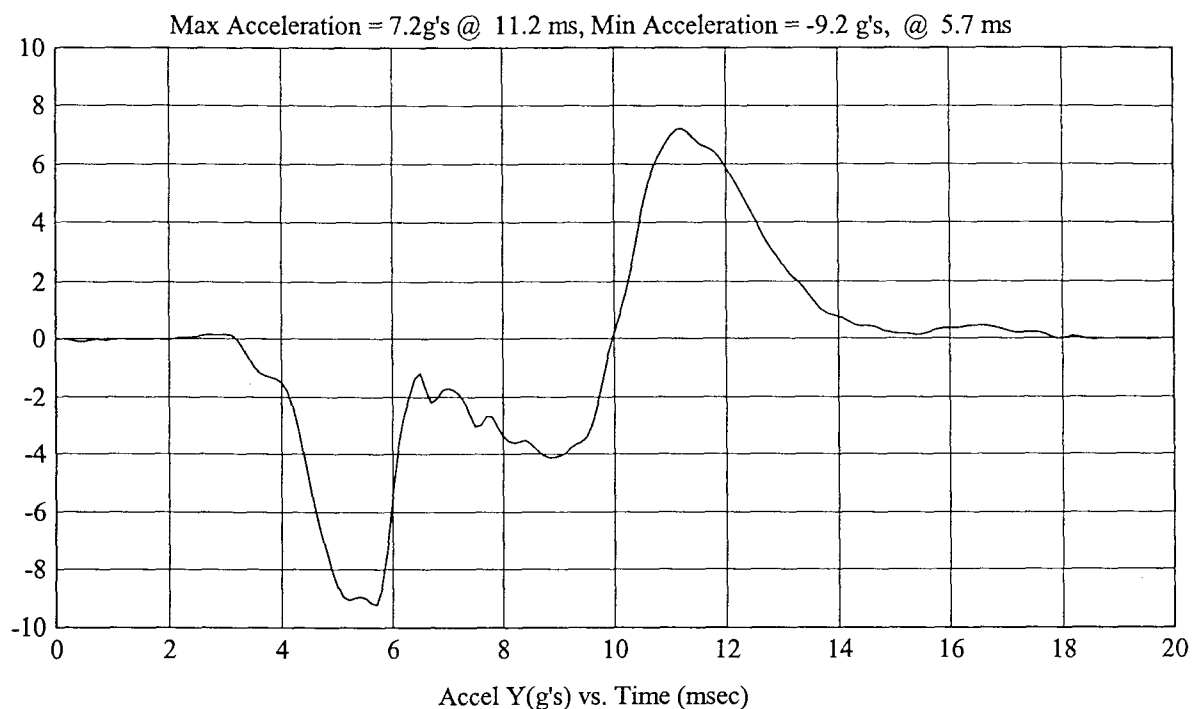
Test Number: H36257

MGA Job Number: G04I7-001.18

Test Date: 9/2/04

Test Description: Post - Test Calibration

Head #: 36



Head Drop
(Preliminary Test Report)

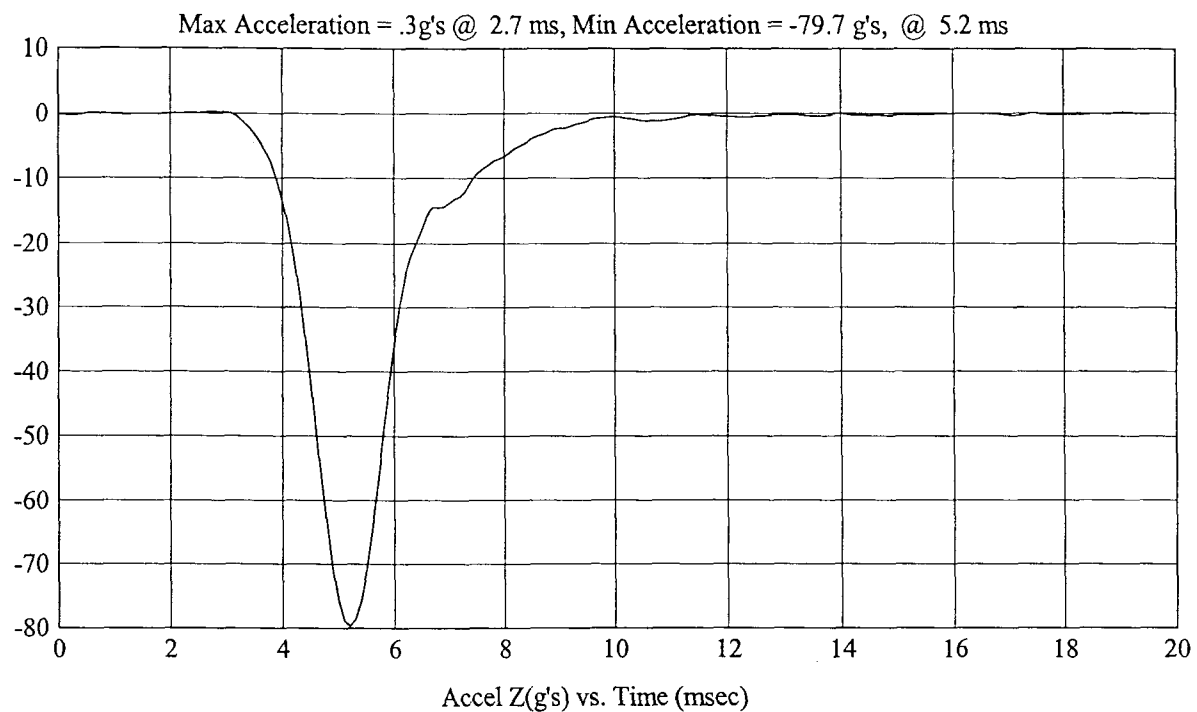
Test Number: H36257

MGA Job Number: G04I7-001.18

Test Date: 9/2/04

Test Description: Post - Test Calibration

Head # : 36



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

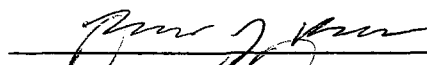
DOC. NO.: MGATP201UHD
REVISION NO.: 6
PAGE 6 OF 7

HEAD DROP TEST SUMMARY PART 572L

HEADFORM SERIAL NUMBER: <u>038</u> CALIBRATION DATE: <u>8-31-04</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	254.4
Peak Lateral Acceleration	15 G's Maximum	8.3
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	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: 8-31-04

APPROVED BY: 

Head Drop
(Preliminary Test Report)

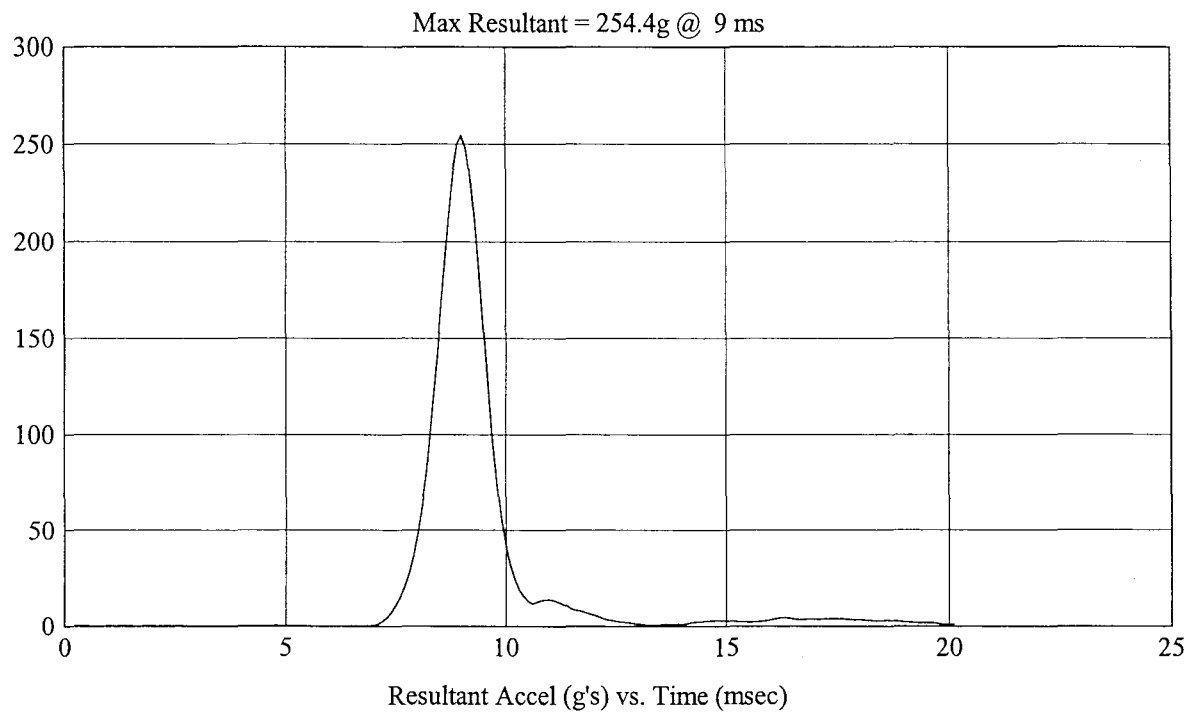
Test Number: H38242

MGA Job Number: G04I7-001.18

Test Date: 8/31/04

Test Description: Pre - Test Calibration

Head #: 038



Head Drop
(Preliminary Test Report)

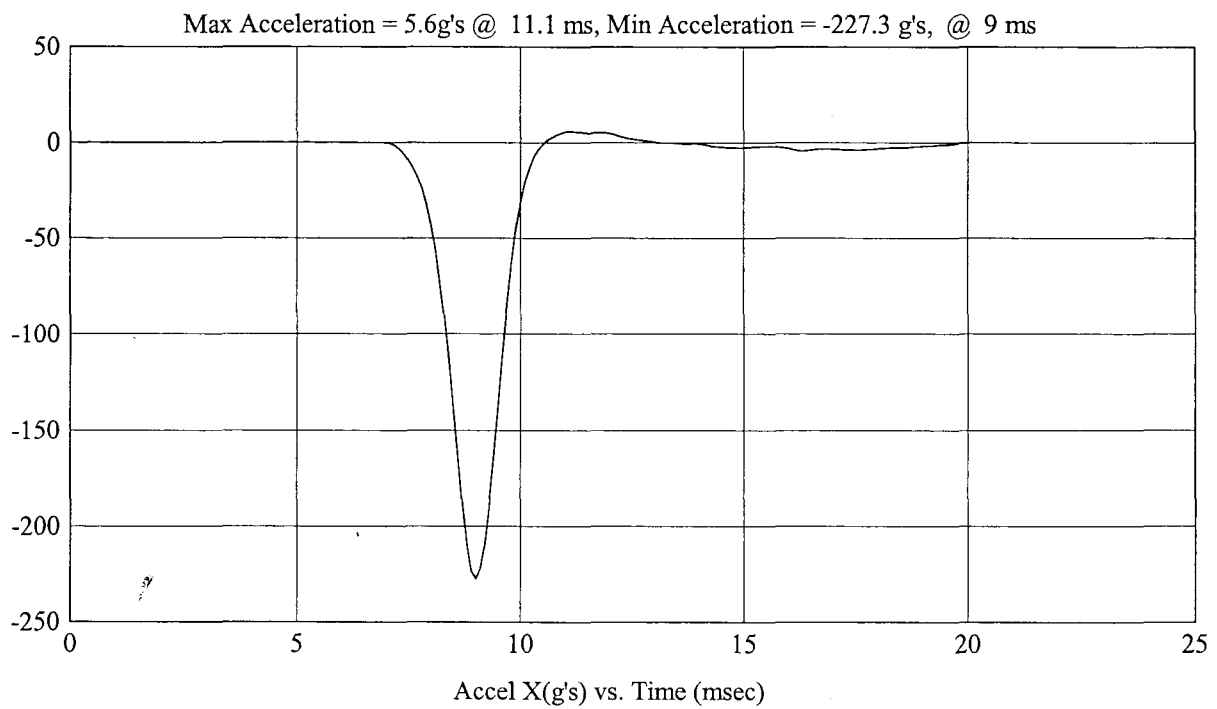
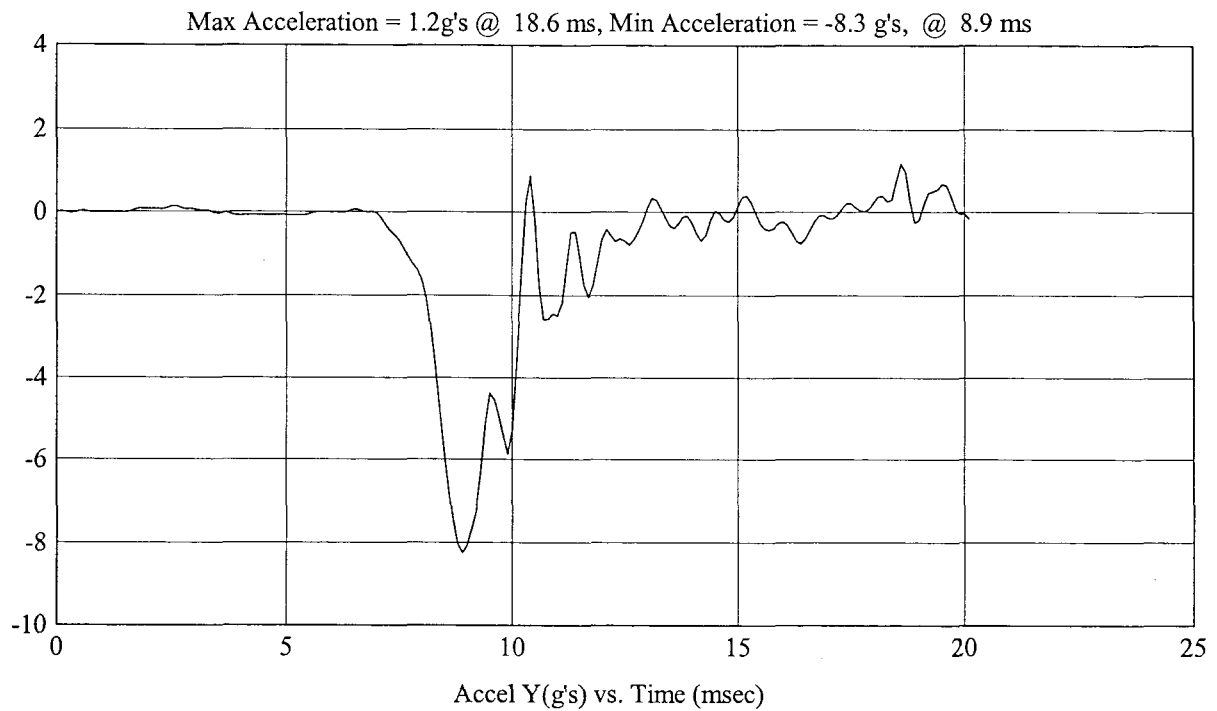
Test Number: H38242

MGA Job Number: G04I7-001.18

Test Date: 8/31/04

Test Description: Pre - Test Calibration

Head # : 038



Head Drop
(Preliminary Test Report)

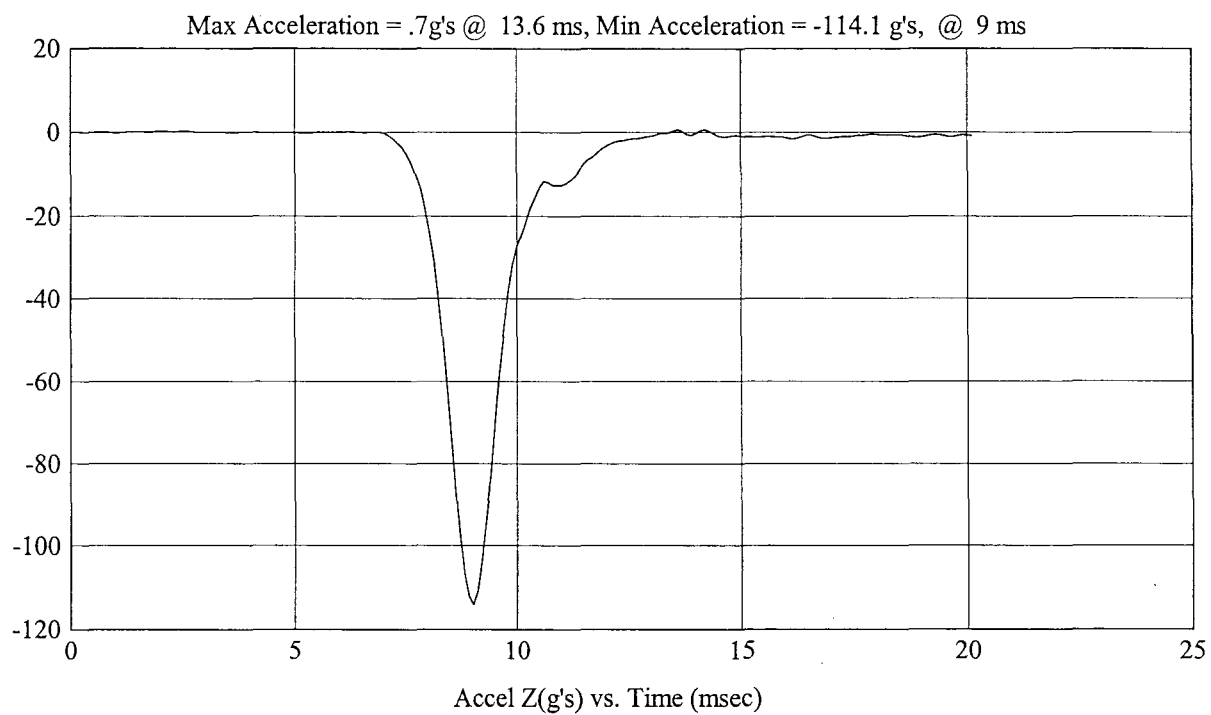
Test Number: H38242

MGA Job Number: G04I7-001.18

Test Date: 8/31/04

Test Description: Pre - Test Calibration

Head #: 038



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

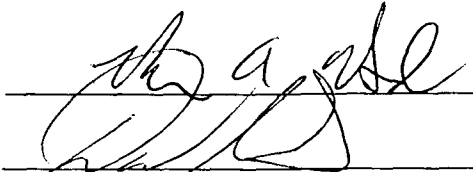
DOC. NO.: MGATP201UHD
REVISION NO.: 6
PAGE 6 OF 7

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	536197	5-23-04	11-23-04
3	ENDEVCO	7264-2000	536193	5-23-04	11-23-04
4	ENDEVCO	7264-2000	536353	5-23-04	11-23-04

REMARKS:

RECORDED BY: 

DATE: 9-2-04

APPROVED BY: 

Head Drop
(Preliminary Test Report)

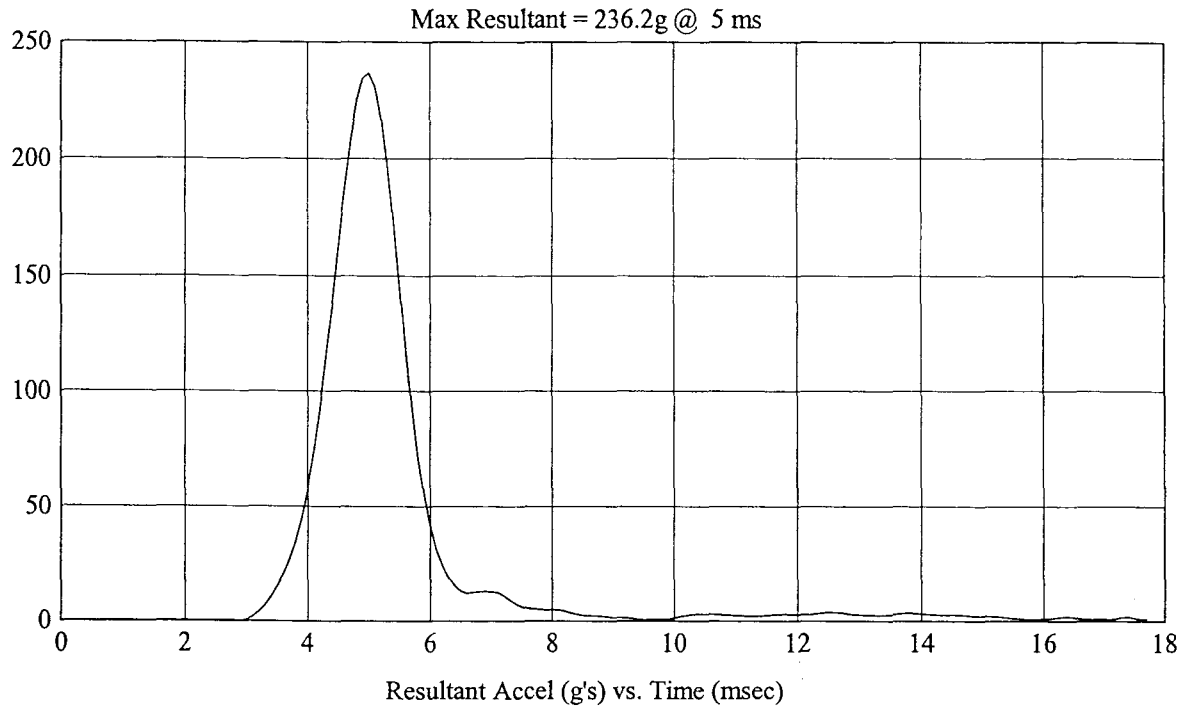
Test Number: H38243

MGA Job Number: G04I7-001.18

Test Date: 9/2/04

Test Description: Post - Test Calibration

Head # : 38



Head Drop
(Preliminary Test Report)

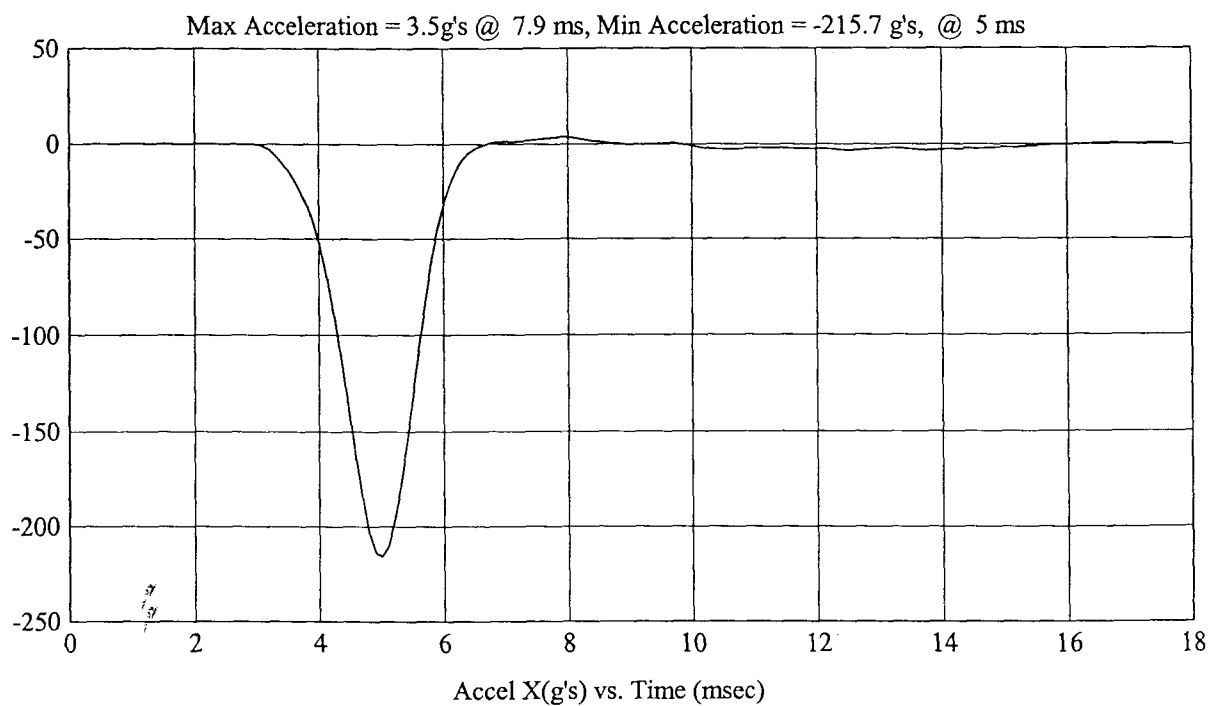
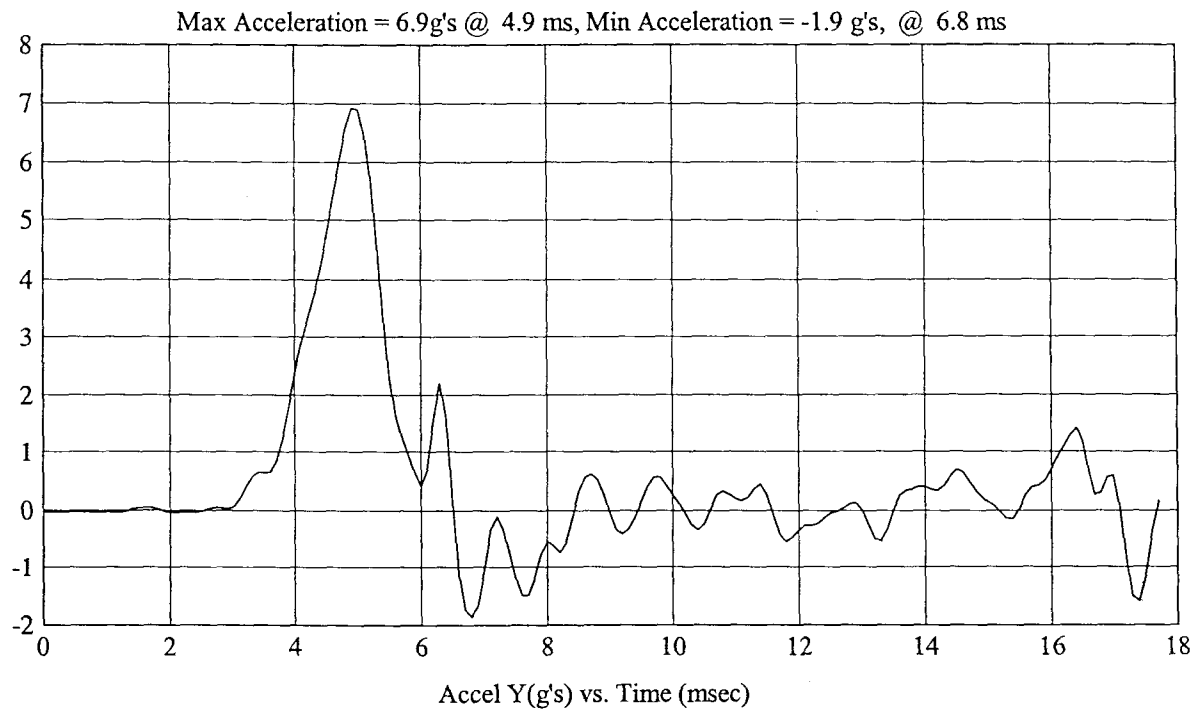
Test Number: H38243

MGA Job Number: G04I7-001.18

Test Date: 9/2/04

Test Description: Post - Test Calibration

Head #: 38



Head Drop
(Preliminary Test Report)

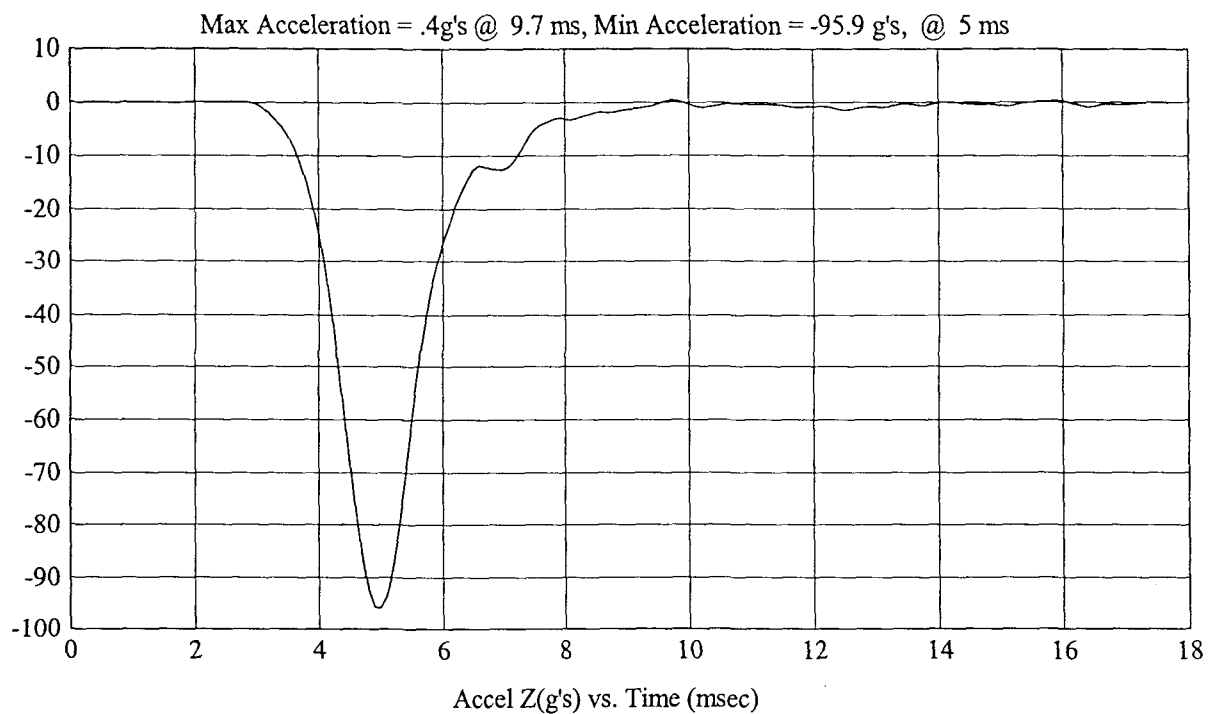
Test Number: H38243

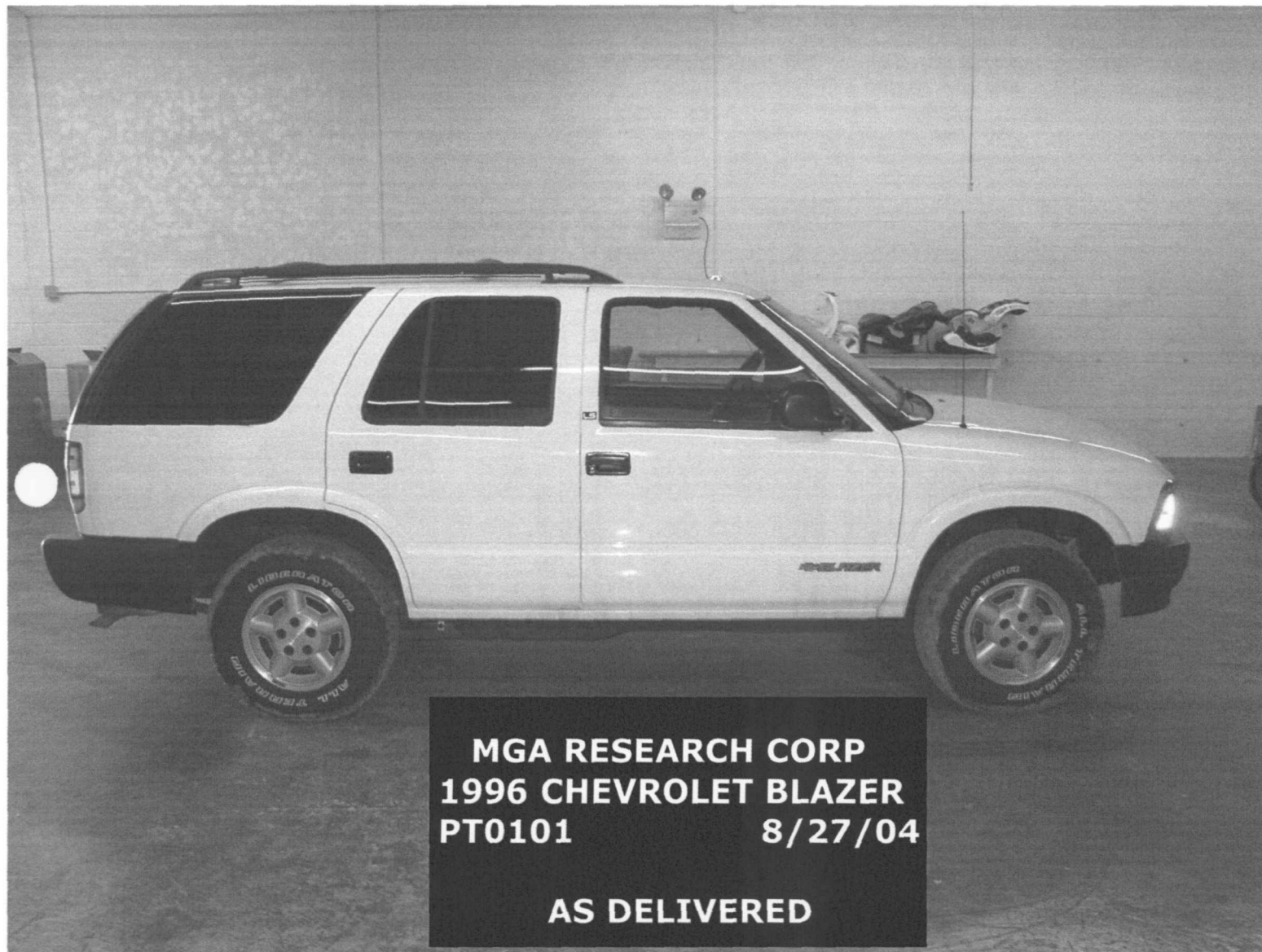
MGA Job Number: G04I7-001.18

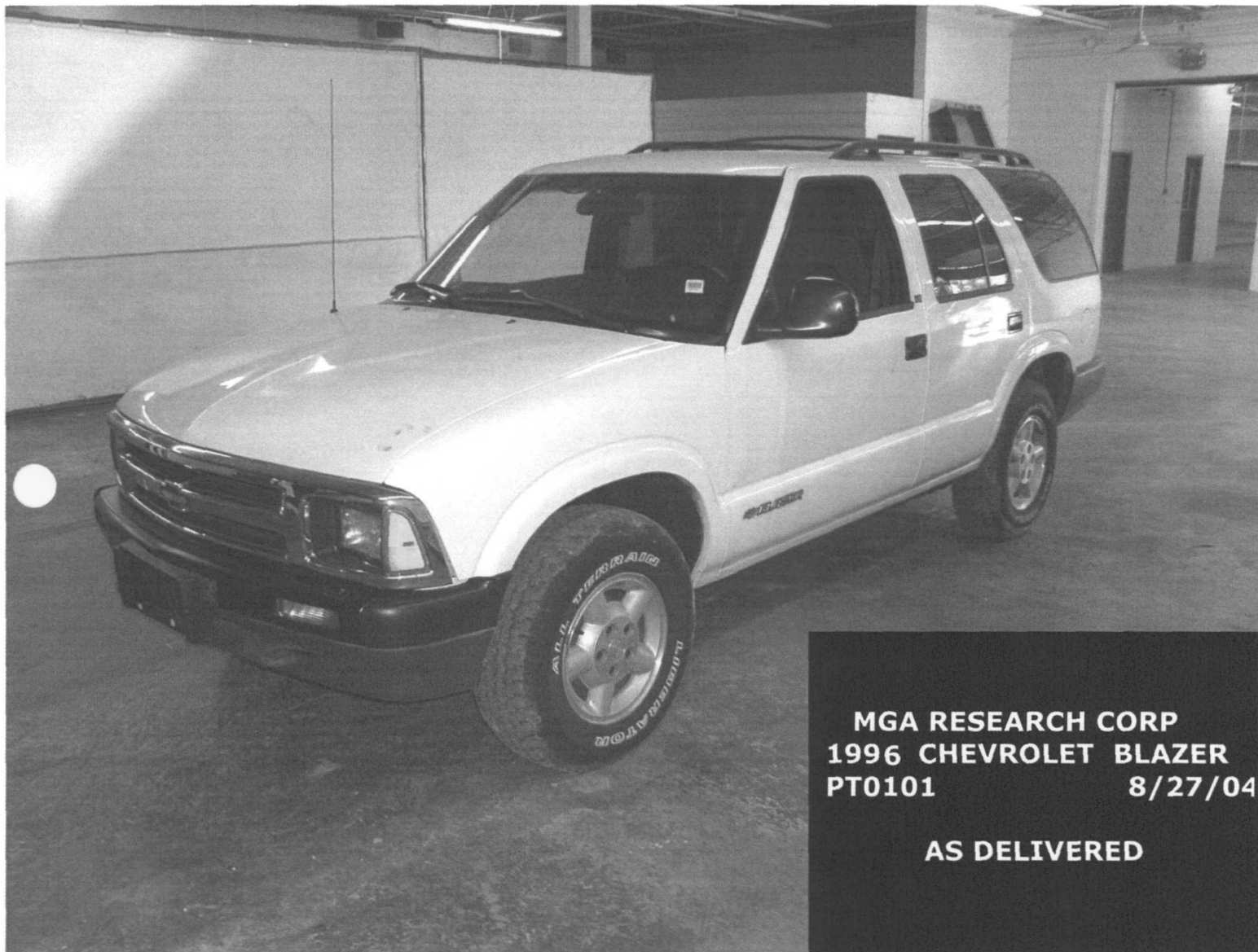
Test Date: 9/2/04

Test Description: Post - Test Calibration

Head # : 38







MGA RESEARCH CORP
1996 CHEVROLET BLAZER
PT0101 **8/27/04**

AS DELIVERED



MGA RESEARCH CORP
1996 CHEVROLET BLAZER
PT0101 8/27/04

AS DELIVERED



MFD BY GENERAL MOTORS CORP

07/96

GVWR
5300/2404GAWR FRT
2700/1225GAWR RR
2700/1225 LB/KG

THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR
VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF
MANUFACTURE SHOWN ABOVE.

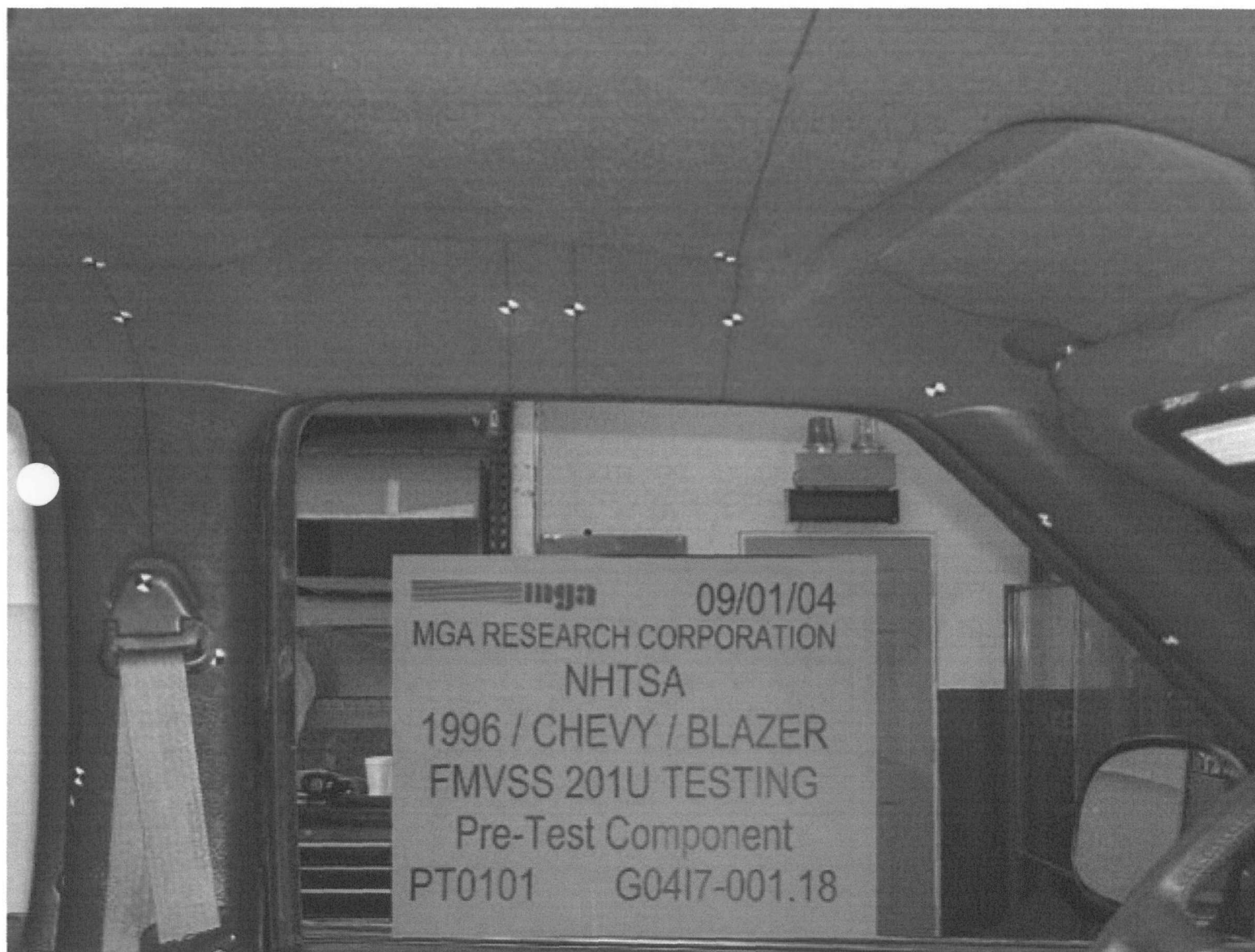
1GNDT13W3T2

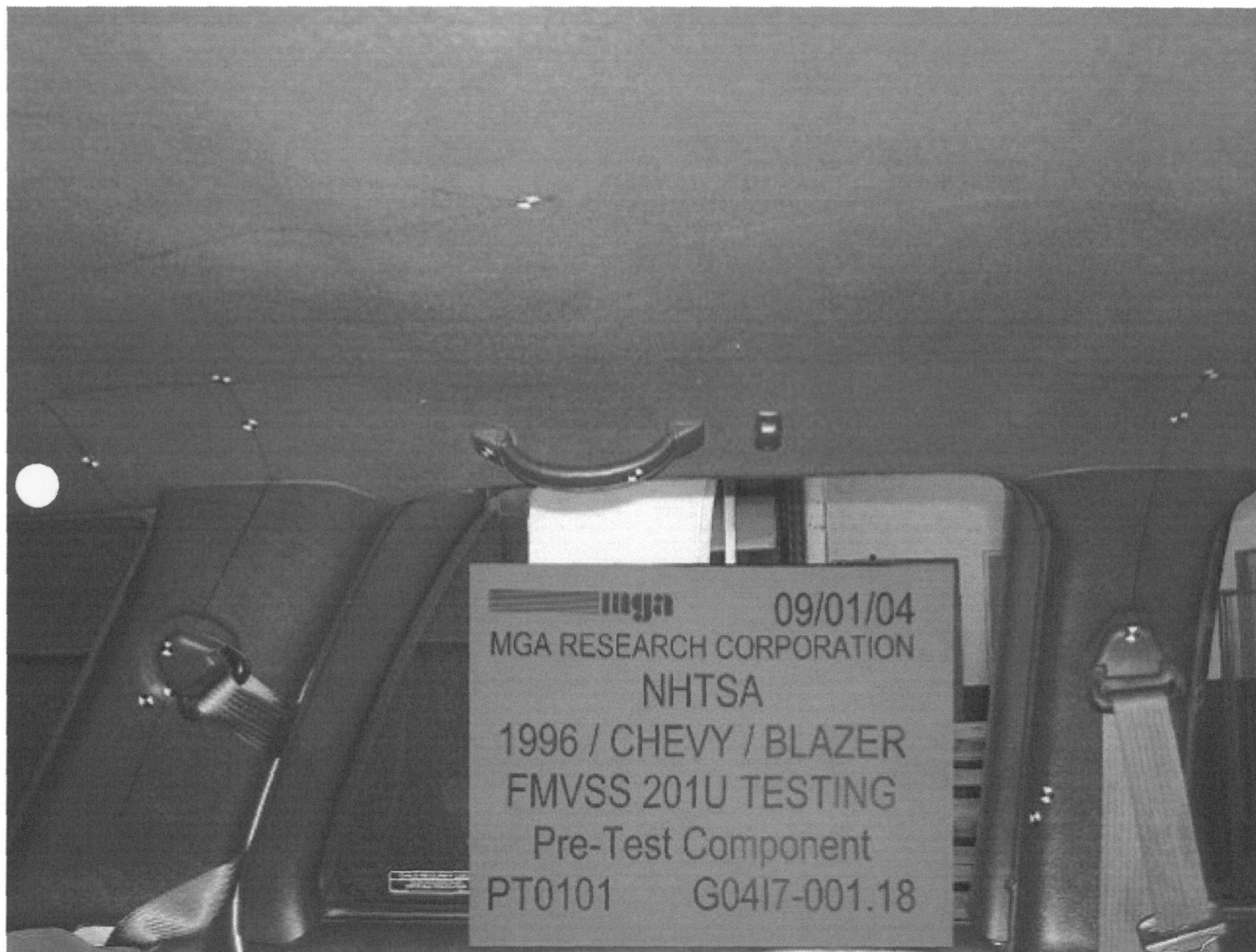
TYPE: M.P.V.

MODEL: T10506 PAYLOAD = 1181 LB / 536 KG

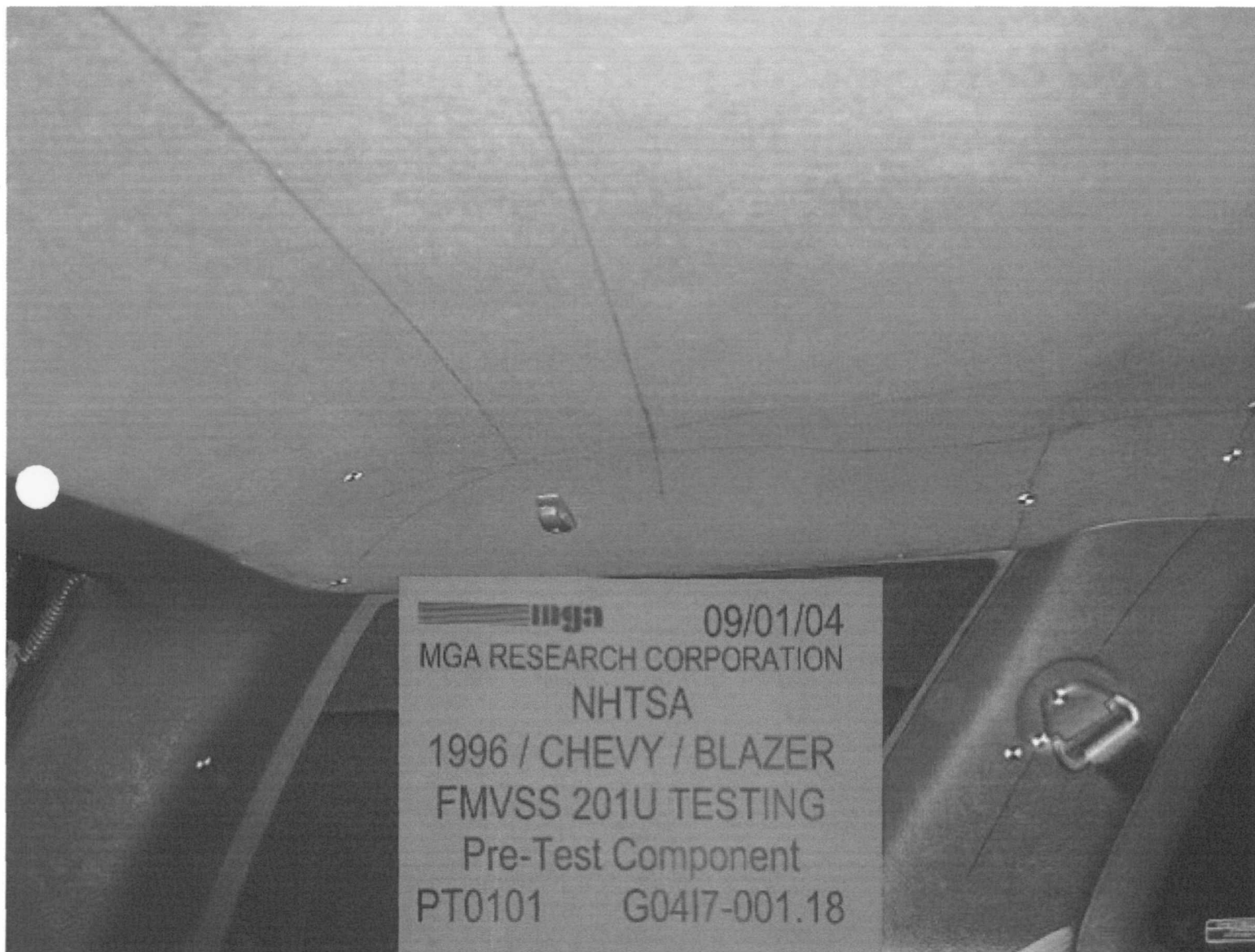
TPAA	TIRE SIZE	SPEED RTG	RIM	COLD TIRE PRESSURE
FRT	P205/75R15	S	15X7J	35/240 PSI/KPA
RR	P205/75R15	S	15X7J	35/240 PSI/KPA
SPA	P205/75R15	S	15X7J	35/240 PSI/KPA

SEE OWNER'S MANUAL FOR MORE INFORMATION.





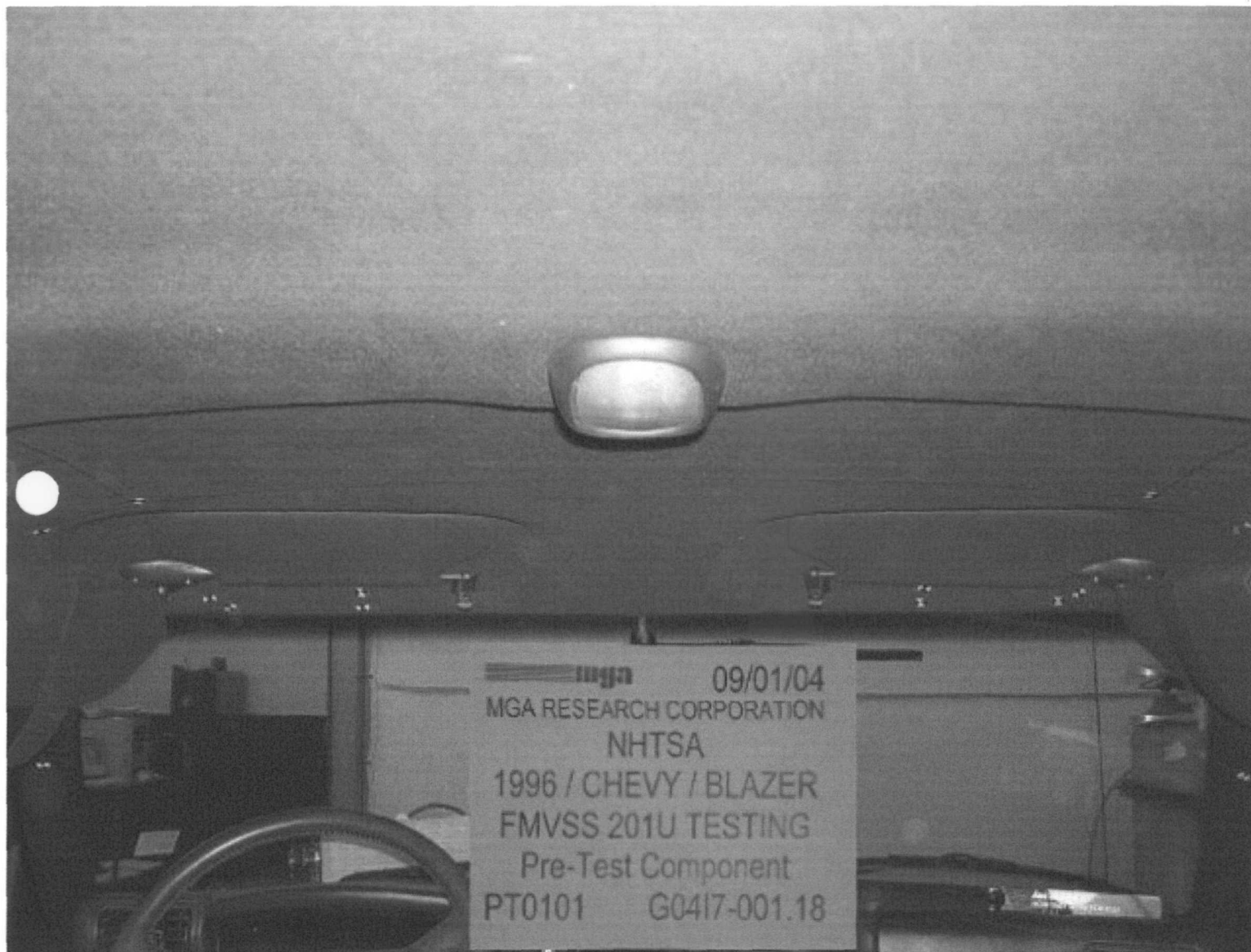
 **mga** 09/01/04
MGA RESEARCH CORPORATION
NHTSA
1996 / CHEVY / BLAZER
FMVSS 201U TESTING
Pre-Test Component
PT0101 G04I7-001.18

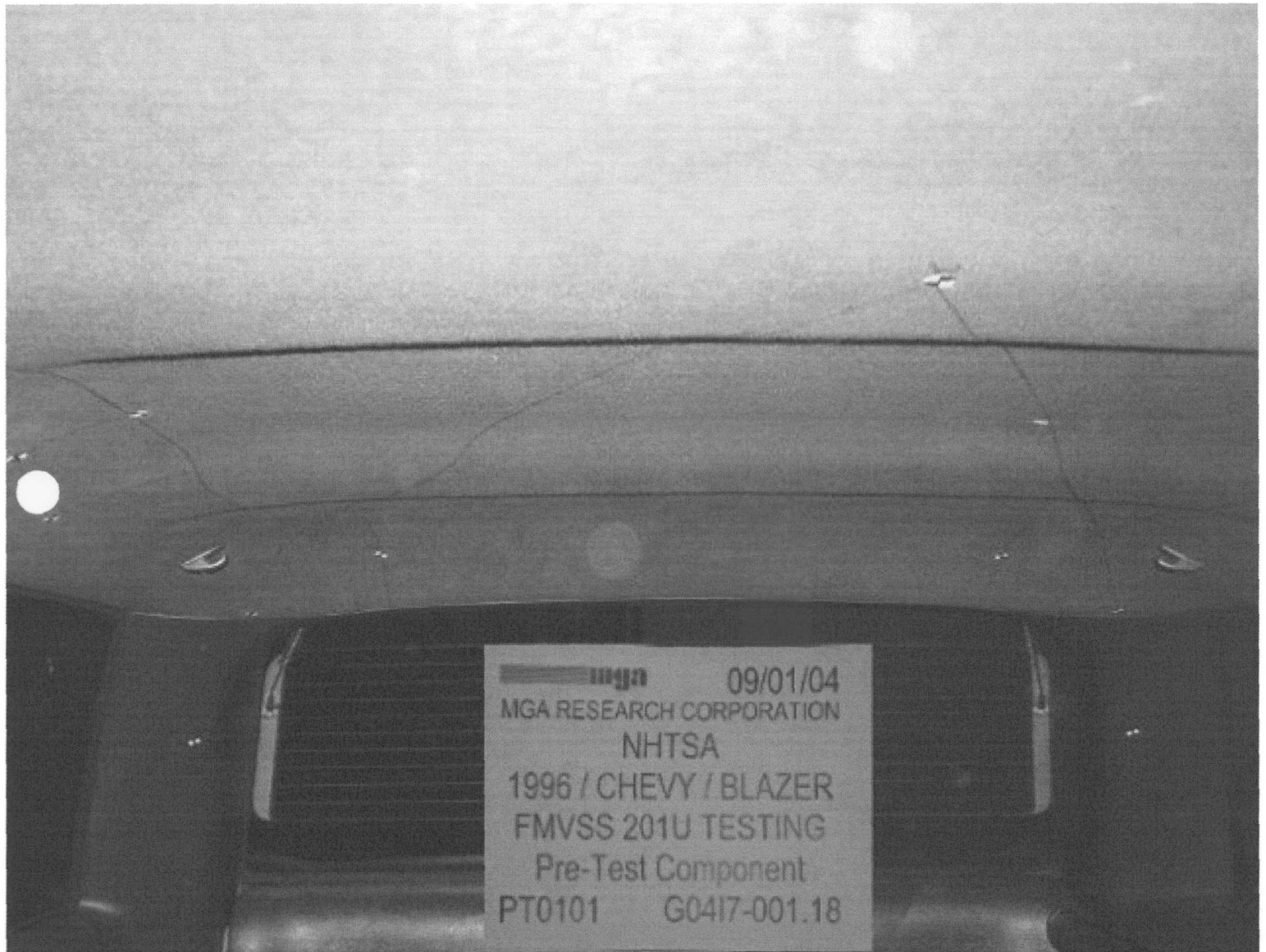




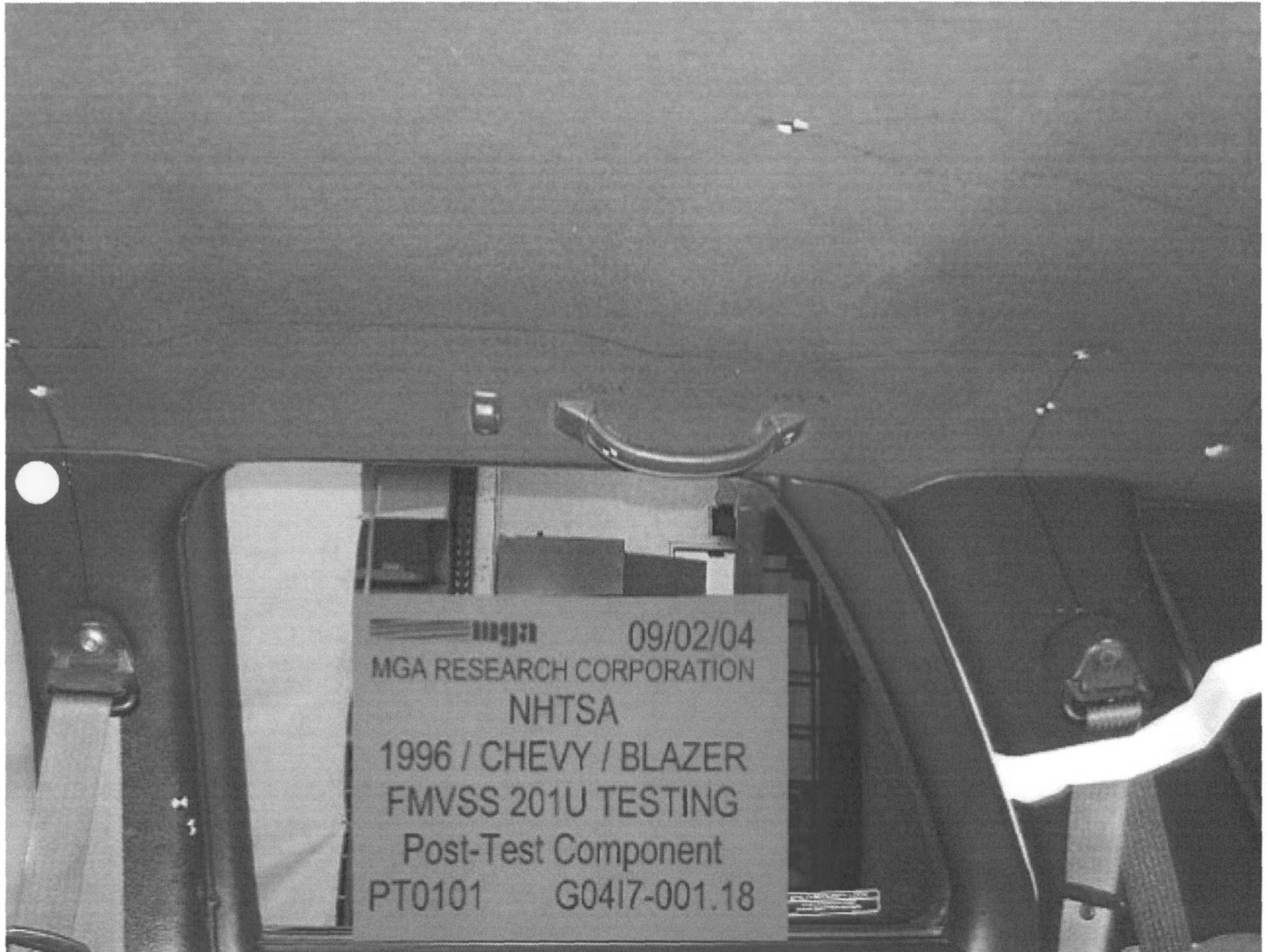




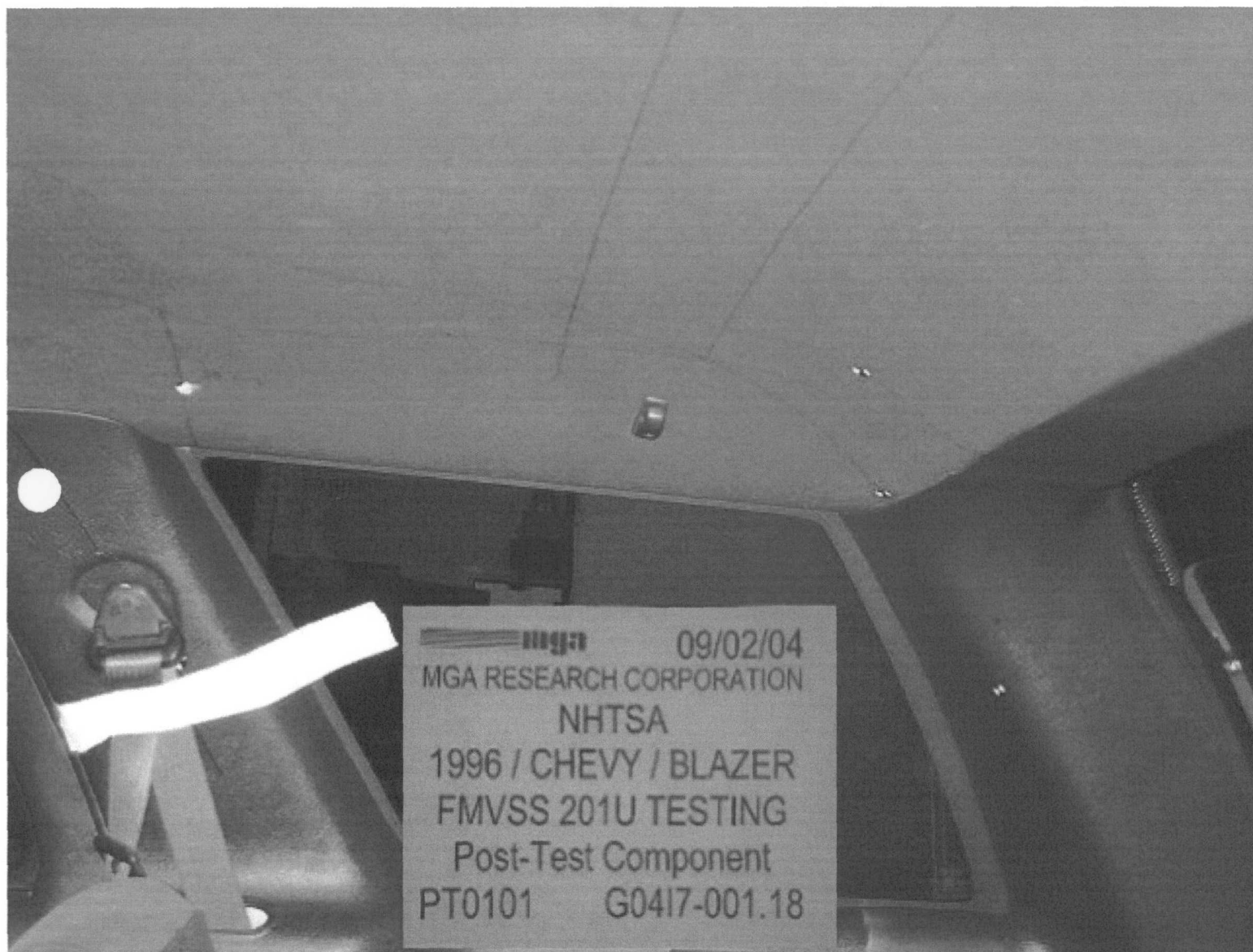


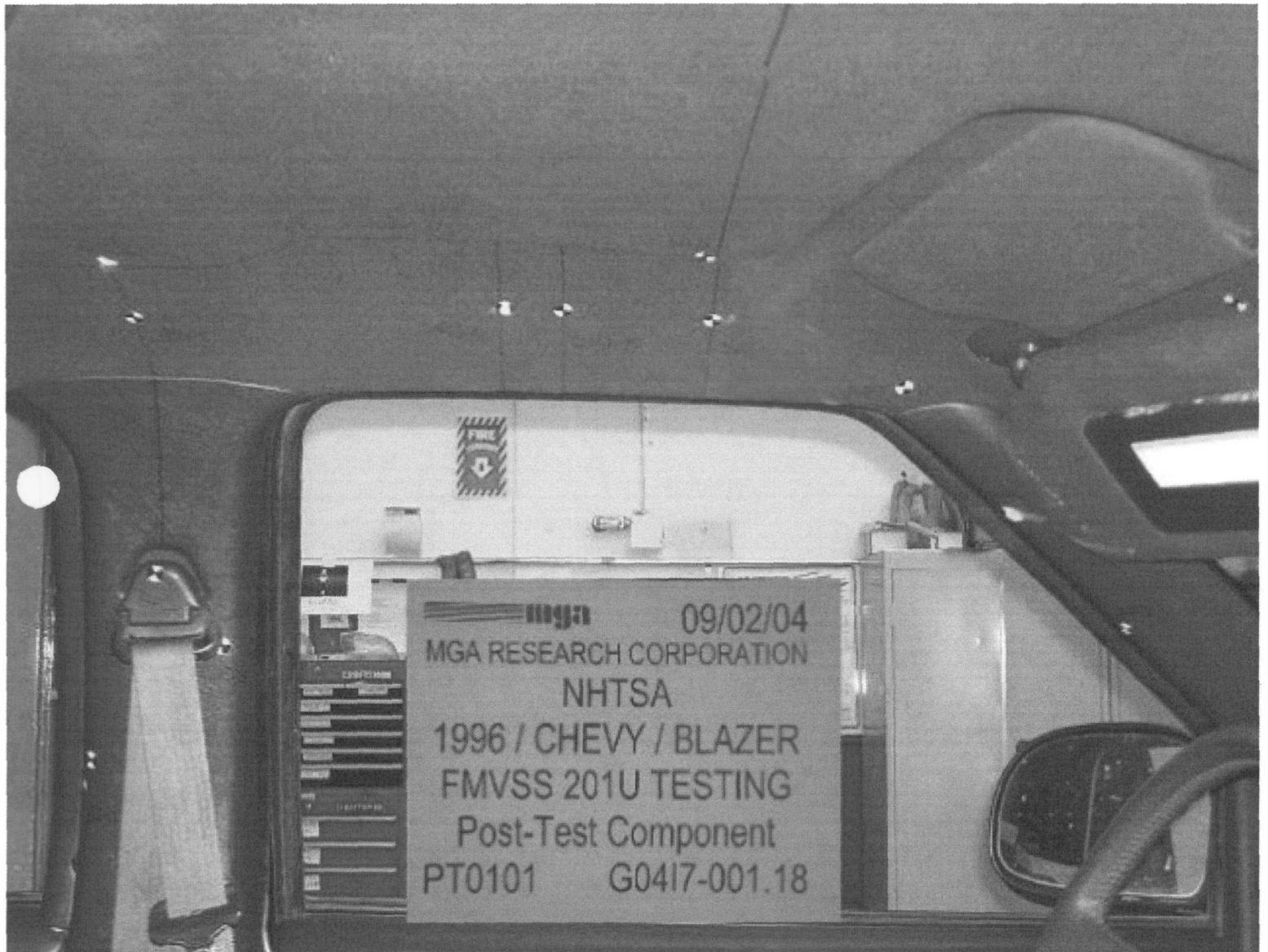




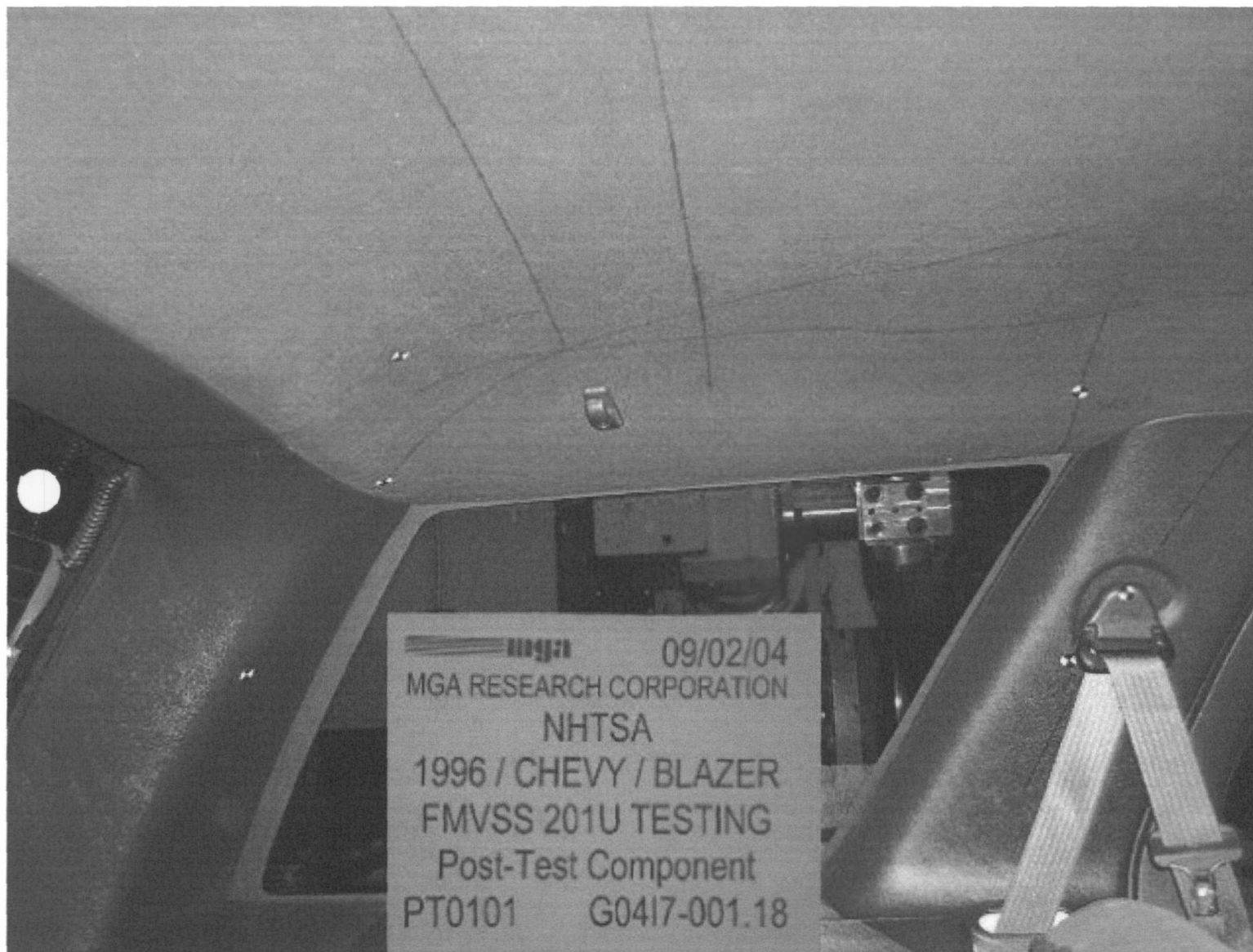


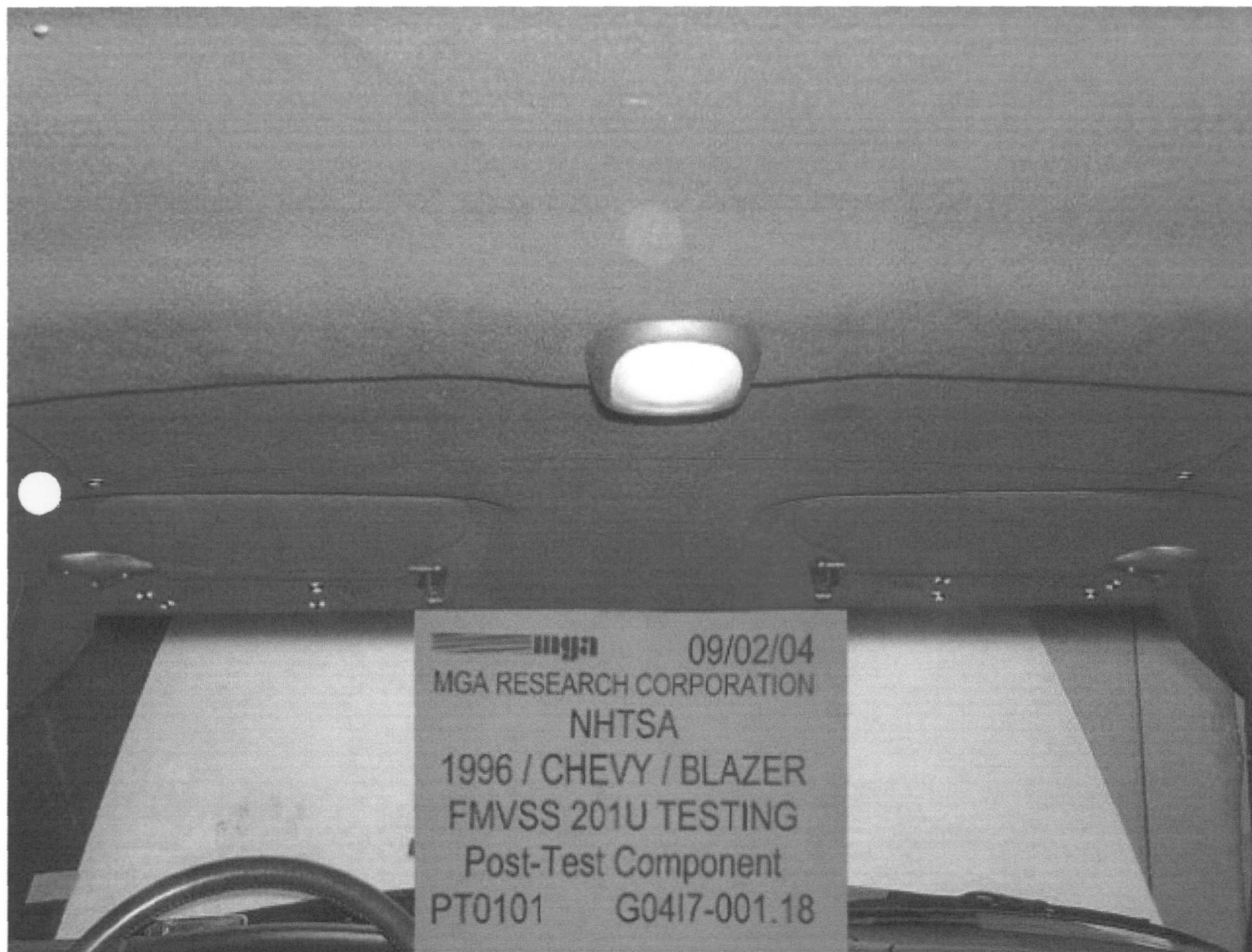
 09/02/04
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NHTSA
1996 / CHEVY / BLAZER
FMVSS 201U TESTING
Post-Test Component
PT0101 G0417-001.18

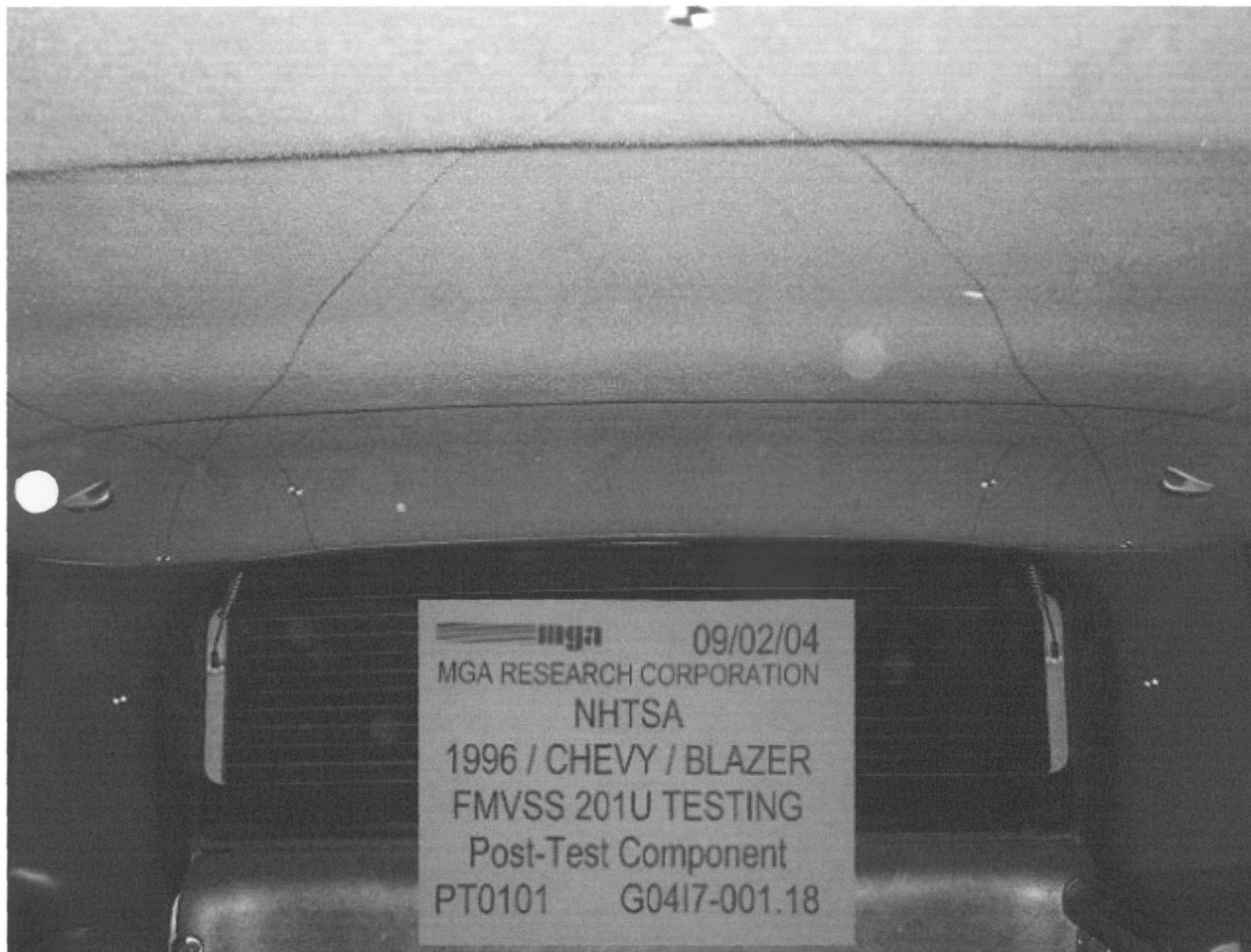






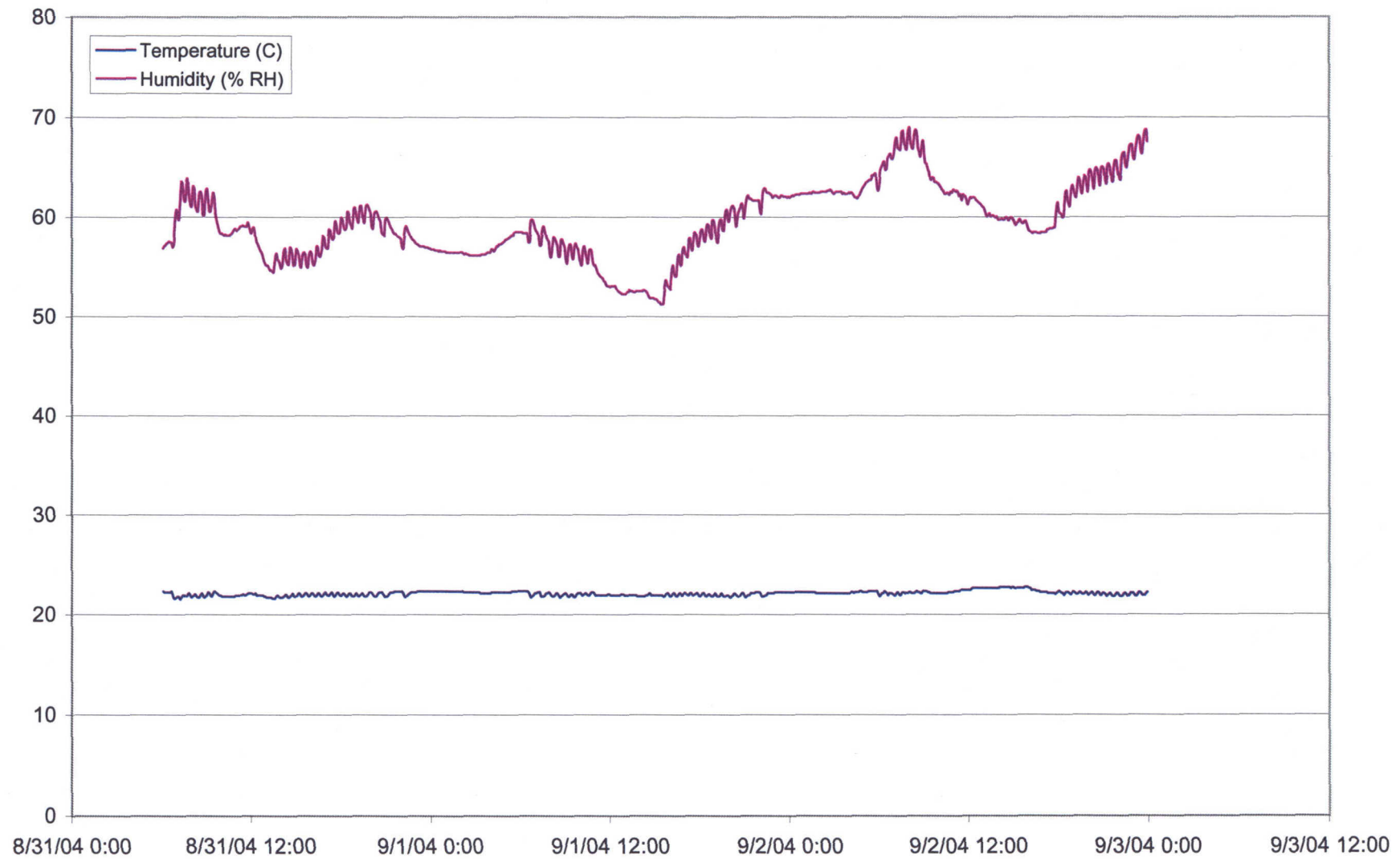


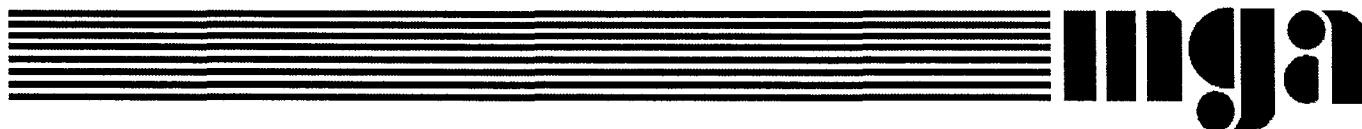




 09/02/04
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NHTSA
1996 / CHEVY / BLAZER
FMVSS 201U TESTING
Post-Test Component
PT0101 G04I7-001.18

1996 Chevrolet Blazer PT0101
August 31st - September 2nd, 2004





mga research corporation

CALIBRATION CERTIFICATE

Sensor Information	Reference Sensor Information
Name: 2000 G Accelerometer	Name: <i>Reference Accelerometer</i>
Model: 7624-2000	Model: <i>301M09/484B</i>
S/N: J36197	S/N: <i>862/247</i>
Capacity: 2000 G	Capacity: <i>170 G</i>
Calibration Date: 5/23/04	Calibration Date: <i>5/11/04</i>
	Calibrated By: <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

CALIBRATION CERTIFICATE

Sensor Information	Reference Sensor Information
Name: 2000 G Accelerometer	Name: <i>Reference Accelerometer</i>
Model: 7624-2000	Model: 301M09/484B
S/N: J36193	S/N: 862/247
Capacity: 2000 G	Capacity: 170 G
Calibration Date: 5/23/04	Calibration Date: 5/11/04
	Calibrated By: <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

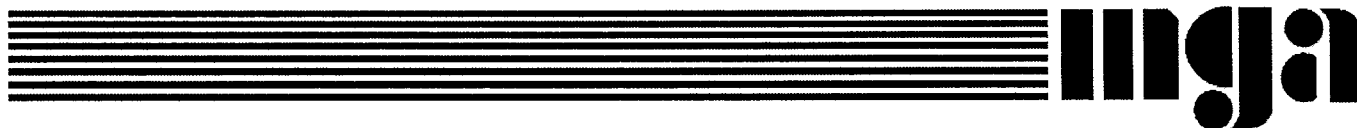
Temperature (°F): 74

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 $k=2$.



mga research corporation

CALIBRATION CERTIFICATE

Sensor Information	Reference Sensor Information
Name: 2000 G Accelerometer	Name: <i>Reference Accelerometer</i>
Model: 7624-2000	Model: <i>301M09/484B</i>
S/N: J36353	S/N: <i>862/247</i>
Capacity: 2000 G	Capacity: <i>170 G</i>
Calibration Date: 5/23/04	Calibration Date: <i>5/11/04</i>
	Calibrated By: <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:

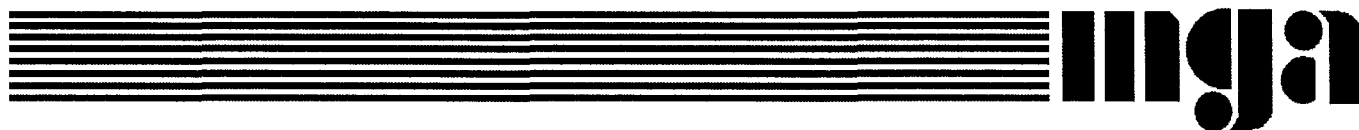
Approved By:

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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248 / 577-5001 • fax 248 / 577-5025

www.mgaresearch.com



mga research corporation

CALIBRATION CERTIFICATE

Sensor Information	Reference Sensor Information
Name: 2000 G Accelerometer	Name: <i>Reference Accelerometer</i>
Model: 7624-2000	Model: 301M09/484B
S/N: J35924	S/N: 862/247
Capacity: 2000 G	Capacity: 170 G
Calibration Date: 5/21/04	Calibration Date: 5/11/04
	Calibrated By: <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
Name: 2000 G Accelerometer	Name: <i>Reference Accelerometer</i>
Model: 7624-2000	Model: <i>301M09/484B</i>
S/N: J35919	S/N: <i>862/247</i>
Capacity: 2000 G	Capacity: <i>170 G</i>
Calibration Date: 5/21/04	Calibration Date: <i>5/11/04</i>
	Calibrated By: <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:

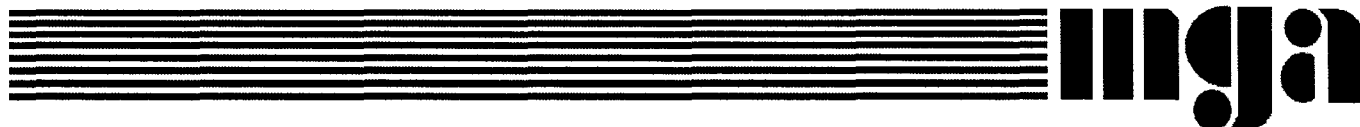
Approved By:

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
Name: 2000 G Accelerometer	Name: <i>Reference Accelerometer</i>
Model: 7624-2000	Model: 301M09/484B
S/N: J21969	S/N: 862/247
Capacity: 2000 G	Capacity: 170 G
Calibration Date: 5/19/04	Calibration Date: 5/11/04
	Calibrated By: <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
Name: 2000 G Accelerometer	Name: <i>Reference Accelerometer</i>
Model: 7624-2000	Model: 301M09/484B
S/N: J35923	S/N: 862/247
Capacity: 2000 G	Capacity: 170 G
Calibration Date: 5/23/04	Calibration Date: 5/11/04
	Calibrated By: <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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mga research corporation

CALIBRATION CERTIFICATE

Sensor Information	Reference Sensor Information
Name: 2000 G Accelerometer	Name: <i>Reference Accelerometer</i>
Model: 7624-2000	Model: <i>301M09/484B</i>
S/N: J35916	S/N: <i>862/247</i>
Capacity: 2000 G	Capacity: <i>170 G</i>
Calibration Date: 5/23/04	Calibration Date: <i>5/11/04</i>
	Calibrated By: <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
Name: 2000 G Accelerometer	Name: <i>Reference Accelerometer</i>
Model: 7624-2000	Model: 301M09/484B
S/N: J35918	S/N: 862/247
Capacity: 2000 G	Capacity: 170 G
Calibration Date: 5/23/04	Calibration Date: 5/11/04
	Calibrated By: <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~

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

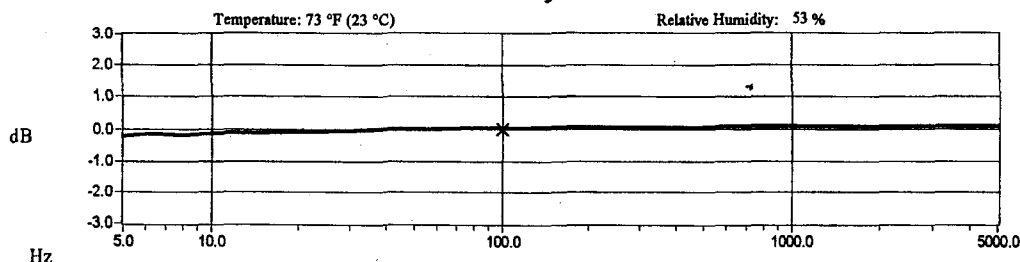
Per ISO 16063-21

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/s²) 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

Vertical

Acceleration Level (g): 10.0 g (98.1 m/s²)

*The acceleration level may be limited by shaker displacement at low frequencies. 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)².

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 **CD**

Date:

05/13/04



Cert No 1862.01

PCB PIEZOTRONICS™
 VIBRATION DIVISION

 3425 Walden Avenue Depew, NY 14043
 TEL: 888-684-0013 FAX: 716-685-3886 www.pcb.com

NuWeigh, Inc.

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

CALIBRATION / TEST REPORTPage 1 of 1

SCR 4365

Customer: <u>MCA Research</u>	Date of service: <u>3-23-04</u>	Location: <u>C.S.</u>
Address: <u>446 Executive Dr.</u>	Last known test date: <u>3-28-03</u>	Environmental conditions acceptable: ☒ Yes ☐ No
City: <u>Troy</u> State: <u>MI</u> Zip: <u>48063</u>	Frequency: ☒ Annual ☐ Semi Annual ☐ Quarterly ☐ Monthly ☐ Bi Monthly ☐ Other	

Indicator Mfg: <u>Cardinal</u>	Platform Mfg: <u>Cardinal</u>	Indicator Mfg:	Platform Mfg:
Model: <u>708</u>	Model: <u>8950 F</u>	Model:	Model:
Serial No: <u>9804-022</u>	Serial No: <u>9805-175</u>	Serial No:	Serial No:
Seal Applied? ☐ Yes ☒ No	Platform size: <u>28"x28"</u>	Seal Applied? ☐ Yes ☒ No	Platform size:
Customer Id: <u>shop</u>	Cap. x Grads: <u>2000 x 1 lb</u>	Customer Id:	Cap. x Grads:
Printer Mfg/model:	General device condition: ☒ Good ☐ Fair ☐ Poor	Printer Mfg/model:	General device condition: ☐ Good ☐ Fair ☐ Poor

Weight Applied	Reading as Found	Error as Found	Reading as Left	Error as Left	Weight Applied	Reading as Found	Error as Found	Reading as Left	Error as Left
<u>0</u>	<u>0</u>	<u>0</u>							
<u>100 lb</u>	<u>100</u>	<u>0</u>							
<u>300 lb</u>	<u>300</u>	<u>0</u>							
<u>500 lb</u>	<u>500</u>	<u>0</u>							
<u>300 lb</u>	<u>300</u>	<u>0</u>							
<u>100 lb</u>	<u>100</u>	<u>0</u>							
<u>0</u>	<u>0</u>	<u>0</u>							
<u>X</u>	<u>X</u>	<u>X</u>							
Load Section #1	<u>100</u>	<u>0</u>			Load Section #1				
Load Section #2	<u>100</u>	<u>0</u>			Load Section #2				
Load Section #3	<u>100</u>	<u>0</u>			Load Section #3				
Load Section #4	<u>100</u>	<u>0</u>			Load Section #4				

Scale meets NIB44 tolerance: Yes ☒ No ☐
 Standards 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 NIB44 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 Kintz
 TECHNICIAN

3-23-04
 DATE

George Baber
 CUSTOMER

White - Customer Copy

Canary - File Copy

SCR Rev. 7.8.02

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

U.K.A.S. Cert. No.: FBB-473-12012003 Date: 12/01/2003

Mitutoyo Corporation, 10mm Step Gage,
Measuring Range: 1.5m

Code No.: 515-744, Serial No.: 810107

N.I.S.T. Control No.: 279517

Date: 01/13/2003

U.K.A.S. Cert. No.: 133193

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

02/03/04

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\07qcont\English\07frm07-006.doc



Certificate Number: 20040204Cal

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

System ID: MGA00072

Customer Asset No.: M6A00072(012904)

Calibration Information

Calibration Date: 1/28/04
Calibration Due: 1/28/05
Calibration Interval: 12 Month
Rcvd In Tol: ¹ Yes/Pass
Returned In Tol: ¹ 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

¹ 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> Paul Wonsowicz	Date: <u>1-29-04</u> Technician	Approved: <u>[Signature]</u> Date: <u>1/29/04</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:¹ Yes/Pass
Returned In Tol:¹ 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

¹ 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 as a confidence level of approximately 95% (coverage factor k=2).

Signature: <u>Jerry Wells</u> Jerry Wells	Date: <u>3-24-04</u> Technician	Approved: <u>Paul W.</u> Date: <u>3-24-04</u>
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Date Printed: 03/24/04 Printed By: Jerry Wells Page: 1 of 2 QFC 1048-1 Rev 4/17/03

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Detroit Testing Laboratory, Inc.

CALIBRATION DATA SHEET

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

Cal Point lb std	Reading As Found lb out	Reading As Left lb out	Deviation As Found lb	Deviation As Left lb	% of Allowed Dev as Found	% of Allowed 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: MQATPTMC.3

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

Tape Measure Calibration Certificate

Reference Steel Rule

Brand: G&E
S/N: 118033
Calibration Date: 11.24.03

Subject Tape Measure

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

Reference mm	Subject Tape Measure	Difference	Reference mm	Subject Tape 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 ± 1 mm, then the tape measure is acceptable.

Pass X Fail Maximum Difference = 0

Date: 1.7.05

Performed By: RJ Miller

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: **Kitty McReynolds**

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

Calibration Standards

General Eastern: Model # M3

Ser. # 0850800 / 2360502

Accuracy: $\pm 0.4\%$ FS RH and $\pm 0.4^\circ\text{F}$

Certified February, 2003 / August, 2003

Azoxis Model # A1011 Ser. # T2513-9027

RTD Platinum Probe Ser. # 496013 Accuracy: $\pm 0.2^\circ\text{F}$

Certified February, 2003

Cole Farmer: Model # PT1000/ 90111-00

Ser. # 10067869 / Ser. # 10148057 Accuracy: $\pm 0.4^\circ\text{F}$

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 25, 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	56.1	$\pm 2\%$ 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.
☐ 6 Red Pens	P222	_____	\$36 pk.
☐ 3 Red/3 Blue Pens	P246	_____	\$36 pk.
☐ 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, 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

Dickson Calibration Services

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