FINAL REPORT NUMBER 201UI-MGA-07-01

SAFETY COMPLIANCE TESTING FOR FMVSS 201
Occupant Protection In Interior Impact
Upper Interior Head Impact Protection

NISSAN MOTOR CO., LTD.
2007 Nissan Altima, 4-Door Sedan
NHTSA No. C75202

MGA RESEARCH CORPORATION
446 Executive Drive
Troy, Michigan 48083

Test Dates: July 24-26, 2007
Report Date: August 13, 2007

FINAL REPORT

PREPARED FOR:

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
1200 New Jersey Avenue, SE
West Building
4th Floor
WASHINGTON, D.C. 20590

Prepared By: Helen A. Kaleto
Helen A. Kaleto, Project Engineer

Helen A. Kaleto
Helen A. Kaleto, Project Manager

Approved By: _____

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Accepted By: _____

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16. Abstract A compliance test series was conducted on the subject vehicle 2007 Nissan Altima, 4-Door Sedan, NHTSA No. C75202, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-201U-01 for the determination of FMVSS 201 compliance. The testing was conducted at MGA Research Corporation in Troy, Michigan on July 24-26, 2007. Test failures identified were as follows: None The data recorded indicates that the 2007 Nissan Altima, 4-Door Sedan, tested appears to comply with the upper interior requirements of FMVSS 201.			
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1.0 PURPOSE OF COMPLIANCE TEST

The purpose of this head impact compliance test was to determine whether the subject vehicle, a 2007 Nissan Altima, 4-Door Sedan, meets the performance requirements of FMVSS 201, Occupant Protection in Interior Impact - Upper Interior Head Impact Protection.

Tests were conducted on July 24-26, 2007 on a 2007 Nissan Altima, 4-Door Sedan, manufactured by Nissan Motor Co., Ltd.

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 July 1, 2005.

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 July 1, 2005.

2.0 COMPLIANCE TEST DATA SUMMARY

The 2007 Nissan Altima, 4-Door Sedan, was equipped with A, B, and rear-pillars, an adjustable seat belt anchorage on each B-pillar, and a grab handle located on the side rail above the front passenger door and above each of the rear doors.

Upon completion of targeting the test vehicle, twelve (12) targets were chosen to be impacted based upon engineering judgment and certification test data provided by the manufacturer. The twelve (12) targets chosen were:

AP1	BP1	FH1	SR3-1
AP2	BP3	SR1	SR3-2
AP3	BP4	SR2(A)	UR5(BPR)

The 2007 Nissan Altima, 4-Door Sedan, tested appears to comply with the upper interior performance criteria for FMVSS 201. The HIC(d) measured using the Part 572L (Free Motion Headform) was below 1000 for each tested component.

TABLE 2-1

SUMMARY TABLE OF TEST RESULTS

VEH. MOD YR/MAKE/MODEL/BODY: 2007 Nissan Altima, 4-Door Sedan

VEH. NHTSA NO.: C75202 VIN: 1N4AL21EX7C173492 COLOR: Beige

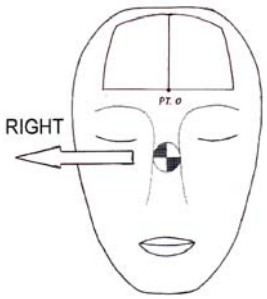
VEH. BUILD DATE: February, 2007 TEST DATES: July 24-26, 2007

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Helen A. Kaleto, Louis Campbell

TARGET	VEHICLE SIDE	HORIZONTAL ANGLE (deg)	VERTICAL ANGLE (deg)	VELOCITY (kph)	HIC(d)	FMH HIC	IMPACT ON FMH (mm)	
							Above	Left/Right
AP1	Right	115	28	19.1	484	421	32	0
AP2	Left	199	50	19.2	368	267	11	4 Right
AP3	Right	161	45	18.7	386	291	25	11 Left
BP1	Left	270	19	18.6	465	395	55	4 Left
BP3	Right	78	-1	23.6	734	753	25	5 Right
BP4	Left	225	-1	23.7	648	638	9	6 Right
FH1	Left	180	50	24.0	584	554	21	2 Right
SR1	Right	90	22	19.0	432	352	29	18 Left
SR2(A)	Left	270	20	18.2	321	205	35	5 Right
SR3-1	Left	270	30	19.1	428	347	23	8 Right
SR3-2	Right	90	30	18.9	432	352	9	3 Left
UR5 (BPR)	Right	90	49	23.7	953	1043	30	0

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: A-Pillar displacement.

SR1 Right: The grab handle pushed in.

SR3-2 Right: The grab handle pushed in.

REMARKS:

The targets listed were impacted in the following order:

Left: AP2, FH1, SR2(A), BP4, BP1, SR3-1

Right: AP3, AP1, SR1, BP3, UR5 (BPR), SR3-2

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

RECORDED BY: Louis Campbell DATE: July 26, 2007

APPROVED BY: Helen A. Kaleto

TABLE 2-2

GENERAL TEST AND VEHICLE PARAMETER DATA

VEH. MOD YR/MAKE/MODEL/BODY: 2007 Nissan Altima, 4-Door Sedan

VEH. NHTSA NO.: C75202 VIN: 1N4AL21EX7C173492 COLOR: Beige

VEH. BUILD DATE: February, 2007 TEST DATES: July 24-26, 2007

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Helen A. Kaleto, Louis Campbell

INTERIOR TRIM INFORMATION: A, B, and rear-pillars, an adjustable seat belt anchorage on each B-pillar, and a grab handle located on the side rail above the front passenger door and above each of the rear doors.

SUNROOF INFORMATION:

Installed:	_____Yes	_X_ No
Operation:	_____Electric	____ Manual

SIDE RAIL CURTAIN AIRBAG INFORMATION:

Installed:	_X_Yes	___ No

ROLL-BAR INFORMATION:

Installed:	_____Yes	_X_ No
Padded:	_____Yes	_X_ No
Braces:	_____Yes	_X_ No

GENERAL INFORMATION:

Date Received: March 20, 2007; Odometer Reading 7 miles

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured By: Nissan Motor Co., Ltd.

Date of Manufacture: February, 2007; VIN: 1N4AL21EX7C173492

GVWR: 4279 lb; GAWR FRONT: 2242 lb;

GAWR REAR: 2189 lb

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load:

FRONT: 220 kPa REAR: 220 kPa

Recommended Tire Size: P215/60R16 94T

Recommended Cold Tire Pressure:

FRONT: 220 kPa REAR: 220 kPa

Size of Tire on Test Vehicle: P215/60R16 94T

Type of Spare Tire: T135/90R16; Space Saver: X; Standard_

VEHICLE CAPACITY DATA:

Type of Front Seats: Bench__; Bucket X; Split Bench __

Number of Occupants: Front 2; Rear 3; TOTAL 5

VEHICLE CAPACITY WEIGHT:

Vehicle Capacity Weight (VCW) = 408 kg

No. of Occupants x 68 kg = 340 kg

Rated Cargo/Luggage Weight (RCLW) = 68 kg (difference)

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

Right Front =	421.0 kg	Right Rear =	294.5 kg
Left Front =	441.5 kg	Left Rear =	286.0 kg
TOTAL FRONT =	862.5 kg	TOTAL REAR =	580.5 kg
% Total Weight =	59.8 %	% Total Weight =	40.2 %

TOTAL DELIVERED WEIGHT = 1443.0 kg

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight = 1443.0 kg

Max. Test Cargo/Luggage Weight = 68.0 kg

Target Test Weight = 1511.0 kg

WEIGHT OF TEST VEHICLE FULLY LOADED:

Right Front =	419.5 kg	Right Rear =	331.0 kg
Left Front =	437.0 kg	Left Rear =	324.0 kg
TOTAL FRONT =	856.5 kg	TOTAL REAR =	655.0 kg
% Total Weight =	56.7 %	% Total Weight =	43.3 %

TOTAL TEST WEIGHT = 1511.5 kg

Weight of ballast secured in vehicle's cargo area = 68.0 kg

TEST VEHICLE ATTITUDE:

AS DELIVERED: Right Front 729 mm; Left Front 727 mm;
Right Rear 718 mm; Left Rear 720 mm;
Pitch Angle at Right Door Sill = 0.4 Rear is higher
Pitch Angle at Left Door Sill = 0.1 Front is higher
Roll Angle at Front Bumper = 0.2 Left is higher
Roll Angle at Rear Bumper = 0.1 Left is higher

FULLY LOADED: Right Front 729 mm; Left Front 728 mm;
Right Rear 706 mm; Left Rear 709 mm;
Pitch Angle at Right Door Sill = 0.2 Rear is higher
Pitch Angle at Left Door Sill = 0.4 Front is higher
Roll Angle at Front Bumper = 0.1 Left is higher
Roll Angle at Rear Bumper = 0.2 Left is higher

AS TARGETED: Right Front 954 mm; Left Front 946 mm;
Right Rear 934 mm; Left Rear 929 mm;
Pitch Angle at Right Door Sill = 0.2 Rear is higher
Pitch Angle at Left Door Sill = 0.4 Front is higher
Roll Angle at Front Bumper = 0.1 Left is higher
Roll Angle at Rear Bumper = 0.1 Left is higher

AS TESTED ON RIGHT SIDE:

Pitch Angle at Right Door Sill =	0.3 Rear is higher
Pitch Angle at Left Door Sill =	0.4 Front is higher
Roll Angle at Front Bumper =	0.2 Left is higher
Roll Angle at Rear Bumper =	0.2 Left is higher

AS TESTED ON LEFT SIDE:

Pitch Angle at Right Door Sill =	0.2 Rear is higher
Pitch Angle at Left Door Sill =	0.4 Front is higher
Roll Angle at Front Bumper =	0.1 Left is higher
Roll Angle at Rear Bumper =	0.1 Left is higher

VEHICLE WHEELBASE = 2760 mm

REMARKS: The seat travel distance was measured to be 240 mm for the driver front seat and 240 mm for the passenger front seat.

RECORDED BY: Louis Campbell DATE: July 23, 2007

APPROVED BY: Helen A. Kaleto

TABLE 2-3

HORIZONTAL IMPACT ANGLE RANGE FOR A AND B PILLARS

VEH. MOD YR/MAKE/MODEL/BODY: 2007 Nissan Altima, 4-Door Sedan

VEH. NHTSA NO.: C75202 VIN: 1N4AL21EX7C173492 COLOR: Beige

VEH. BUILD DATE: February, 2007 TEST DATES: July 24-26, 2007

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Helen A. Kaleto, Louis Campbell

HORIZONTAL IMPACT ANGLE RANGE FOR A AND B PILLARS

	HORIZONTAL ANGLE SPECIFIED RANGE	MINIMUM HORIZONTAL ANGLE	MAXIMUM HORIZONTAL ANGLE
A-PILLAR	L 195º-255º	L 199.4º	L 245.1º
	R 105º-165º	R 114.7º	R 160.6º
B-PILLAR	L 195º-345º	L 198.6º	L 282.2º
	R 15º-165º	R 78.0º	R 160.9º

AS DETERMINED USING THE PROCEDURES SPECIFIED IN S8.13.4.1

REMARKS:

RECORDED BY: Louis Campbell DATE: July 23, 2007

APPROVED BY: Helen A. Kaleto

TABLE 2-4

VERTICAL IMPACT ANGLE RANGES

VEH. MOD YR/MAKE/MODEL/BODY: 2007 Nissan Altima, 4-Door Sedan

VEH. NHTSA NO.: C75202 VIN: 1N4AL21EX7C173492 COLOR: Beige

VEH. BUILD DATE: February, 2007 TEST DATES: July 24-26, 2007

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Helen A. Kaleto, Louis Campbell

VERTICAL IMPACT ANGLE RANGES

		VERTICAL ANGLE SPECIFIED RANGE	MINIMUM VERTICAL ANGLE	MAXIMUM VERTICAL ANGLE
FRONT HEADER	FH1	L 0º-50º	L 0º	L 50º
		R 0º-50º	R 0º	R 50º
	FH2	L 0º-50º	L 0º	L 50º
		R 0º-50º	R 0º	R 50º
SIDE RAIL	SR1	L 0º-50º	L 0º	L 26º
		R 0º-50º	R 0º	R 22º
	SR2A	L 0º-50º	L 0º	L 20º
		R 0º-50º	R 0º	R 25º
	SR2B	L 0º-50º	L 0º	L 28º
		R 0º-50º	R 0º	R 28º
	SR3-1	L 0º-50º	L 0º	L 30º
		R 0º-50º	R 0º	R 33º
	SR3-2	L 0º-50º	L 0º	L 31º
		R 0º-50º	R 0º	R 30º
REAR HEADER	RH	L 0º-50º	L 0º	L 50º
		R 0º-50º	R 0º	R 50º
A-PILLAR	AP1	L -5º-50º	L -5º	L 27º
		R -5º-50º	R -5º	R 28º

		VERTICAL ANGLE SPECIFIED RANGE	MINIMUM VERTICAL ANGLE	MAXIMUM VERTICAL ANGLE
A-PILLAR	AP2	L -5º-50º	L -5º	L 50º
		R -5º-50º	R -5º	R 50º
	AP3	L -5º-50º	L -5º	L 46º
		R -5º-50º	R -5º	R 45º
B-PILLAR	BP1	L -10º-50º	L -10º	L 19º
		R -10º-50º	R -10º	R 22º
	BP2*	L 0º-50º	L 0º	L 0º
		R 0º-50º	R 0º	R 0º
	BP3	L -10º-50º	L -10º	L -1º
		R -10º-50º	R -10º	R -1º
	BP4	L -10º-50º	L -10º	L -1º
		R -10º-50º	R -10º	R -1º
REAR PILLAR	RP1	L -10º-50º	L -10º	L 13º
		R -10º-50º	R -10º	R 12º
	RP2	L -10º-50º	L -10º	L 20º
		R -10º-50º	R -10º	R 20º
UPPER ROOF 1		0º-50º	0º	50º
UPPER ROOF 2		0º-50º	0º	50º
UPPER ROOF 3		0º-50º	0º	47º
UPPER ROOF 4		0º-50º	0º	50º
UPPER ROOF 5		0º-50º	0º	49º
UPPER ROOF 6		0º-50º	0º	48º

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

RECORDED BY: Louis Campbell DATE: July 23, 2007

APPROVED BY: Helen A. Kaleto

TABLE 2-5

TARGET MEASUREMENTS

VEH. MOD YR/MAKE/MODEL/BODY: 2007 Nissan Altima, 4-Door Sedan

VEH. NHTSA NO.: C75202 VIN: 1N4AL21EX7C173492 COLOR: Beige

VEH. BUILD DATE: February, 2007 TEST DATES: July 24-26, 2007

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Helen A. Kaleto, Louis Campbell

Measurement	Description	Left Side	Right Side
M	Seat Fore/Aft Travel (Front seats)	240 mm	240 mm
T^{o}	Horizontal < {CG-F1 (Left Seat) to (Right A-Pillar)}	114.9^{o}	--
A1^{o}	360^{o} - T^{o}	245.1^{o}	--
W^{o}	Horizontal < {CG-2 (Left Seat) to (Left A-Pillar)}	199.4^{o}	--
A2^{o}	A2^{o} = W^{o}	199.4^{o}	--
U^{o}	Horizontal < {CG-2 (Left Seat) to (Left B-Pillar)}	282.2^{o}	--
B1^{o}	B1^{o} = U^{o}	282.2^{o}	--
V^{o}	Horizontal < {CG-R (Left Seat) to (Left B-Pillar)}	198.6^{o}	--
B2^{o}	B2^{o} = V^{o}	198.6^{o}	--
W^{o} (right)	Horizontal < {CG-F2 (Right Seat) to (Right A-Pillar)}	--	160.6^{o}
A1^{o} (right)	A1^{o} (right) = W^{o} (right)	--	160.6^{o}
T ^{o} (right)	Horizontal < {CG-F1 (Right Seat) to (Left A-Pillar)}	--	245.3^{o}
A2^{o} (right)	360^{o}-T^{o} (right)	--	114.7^{o}
V ^{o} (right)	Horizontal < {CG-R (Right Seat) to (Right B-Pillar)}	--	160.9^{o}
B1^{o} (right)	B1^{o} (right) = V^{o} (right)	--	160.9^{o}
U ^{o} (right)	Horizontal < {CG-F2 (Right Seat) to (Right B-Pillar)}	--	78.0^{o}
B2^{o} (right)	B2^{o} (right) = U^{o} (right)	--	78.0^{o}
J	A-Pillar {(Plane 3) - (Plane 5)}	342.9 mm	339.1 mm
J/2	J ÷ 2	171.5 mm	169.6 mm
D1	Upper Roof {(Plane A) - (Plane B)}	1619.3 mm	
D1/2	D1 ÷ 2	809.7 mm	
D2	Upper Roof {(Plane C) - (Plane D)}	1153.6 mm	

Measurement	Description	Left Side	Right Side
D2/2	D2 ÷ 2	576.8 mm	
.35D1	.35 x D1	566.8 mm	
.35D2	.35 x D2	403.8 mm	
N	B-Pillar {(BPR) - (lowest point on daylight opening forward of B-Pillar)}	425.4 mm	426.3 mm
N/2	B-Pillar {(BP3) - (lowest point on daylight opening forward of B-Pillar)}	212.7 mm	213.2 mm
N/4	B-Pillar {(BP4) - (lowest point on daylight opening forward of B-Pillar)}	106.4 mm	106.6 mm
D	R-Pillar (Point 7 – Point M)	700.0 mm	700.0 mm
3D/7	3*D / 7	300.0 mm	300.0 mm

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

SgRP Locations (world coordinates)						
	Left (mm)			Right (mm)		
	x	y	z	x	y	z
Front	1460.3	-356.5	235.0	1460.3	365.5	235.0
Rear	2295.0	-365.5	266.0	2295.0	365.5	266.0

SgRP Locations (vehicle coordinates)						
	Left (mm)			Right (mm)		
	x	y	z	x	y	z
Front	1460.3	-365.5	235.0	1460.3	365.5	235.0
Rear	2295.0	-365.5	266.0	2295.0	365.5	266.0

CG Locations (world coordinates)						
	Left (mm)			Right (mm)		
	x	y	z	x	y	z
CGF1	1380.3	-365.5	895.0	1380.3	365.5	895.0
CGF2	1620.3	-365.5	895.0	1620.3	365.5	895.0
CGR	2455.0	-365.5	926.0	2455.0	365.5	926.0

REFERENCE FOR VEHICLE COORDINATE SYSTEM (measured in millimeters):

Passenger door, front outboard seat bolt hole (x, y, z) = 1074.0, 596.5, 12.4

Driver door, front outboard seat bolt hole (x, y, z) = 1074.0, -596.5, 12.4

Driver door, front upper striker bolt hole (x, y, z) = 1575.7, -786.6, 395.5

REMARKS:

RECORDED BY: Louis Campbell DATE: July 23, 2007

APPROVED BY: Helen A. Kaleto

TABLE 2-6

SUMMARY OF TARGETING RESULTS

VEH. MOD YR/MAKE/MODEL/BODY: 2007 Nissan Altima, 4-Door Sedan

VEH. NHTSA NO.: C75202 VIN: 1N4AL21EX7C173492 COLOR: Beige

VEH. BUILD DATE: February, 2007 TEST DATES: July 24-26, 2007

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Helen A. Kaleto, Louis Campbell

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	1166.3	-523.8	1043.9	--	--	Yes	--	--
REL	1179.5	-534.3	1026.2	245	27	--	1	No
AP2	1071.1	-573.5	956.6	199	50	No	--	Yes
AP3	898.6	-611.2	872.9	199	46	No	--	No
A-Pillar Right Side								
AP1	1166.2	524.4	1041.8	--	--	Yes	--	--
REL	1182.7	534.1	1025.5	115	28	--	1	Yes
AP2	1064.1	573.7	954.7	161	50	No	--	No
AP3	895.2	611.7	873.1	161	45	No	--	Yes
B-Pillar Left Side								
BP1	1745.3	-466.1	1115.3	270	19	No	--	Yes
BP2	1705.0	-599.3	843.4	270	0	No	--	No
BP3	1668.5	-605.4	903.1	199	-1	No	--	--
BP4	1749.1	-655.5	797.5	225	-1	No	--	Yes
B-Pillar Right Side								
BP1	1739.3	470.3	1113.5	90	22	No	--	No
BP2	1701.9	600.4	842.5	90	0	No	--	No
BP3	1671.8	607.7	901.0	78	-1	No	--	Yes
BP4	1747.0	653.2	795.2	161	-1	No	--	No

SUMMARY OF TARGETING RESULTS								
Target	**Location (mm)**			**Horizontal Angle (deg)**	**Vertical Angle (deg)**	**Relocation (Yes/No)**	**Extension (# of 25 mm Spheres)**	**Impact (Yes/No)**
	x	**y**	**z**					
Rear Pillar Left Side								
RP1	2500.2	-489.0	1057.7	--	--	No	--	No
REL	2490.7	-522.4	1021.1	270	13	--	--	No
RP2	2663.0	-544.1	964.8	270	20	No	--	No
Rear Pillar Right Side								
RP1	2499.8	484.2	1059.4	--	--	Yes	--	--
REL	2493.8	522.3	1024.2	90	12	--	2	No
RP2	2666.8	544.0	967.7	90	20	No	--	No
Front Header Left Side								
FH1	1087.5	-405.1	1059.0	180	50	No	--	Yes
FH2	1071.9	-256.6	1065.9	--	--	Yes	--	--
REL	1073.2	-283.2	1063.5	180	50	--	1	No
Front Header Right Side								
FH1	1088.6	410.2	1059.9	180	50	No	--	No
FH2	1072.9	260.0	1065.5	--	--	Yes	--	--
REL	1067.8	284.8	1063.2	180	50	--	1	No
Side Rail Left Side								
SR1	1316.9	-482.2	1080.0	--	--	Yes	--	--
REL	1296.6	-466.5	1077.8	270	26	--	1	No
SR2A	1466.2	-480.6	1107.2	--	--	Yes	--	--
REL	1465.1	-498.9	1087.8	270	20	--	1	Yes
SR2B	1444.9	-481.8	1103.7	--	--	Yes	--	--
REL	1442.9	-500.2	1084.9	270	28	--	1	No
SR3-1	2108.5	-489.2	1065.0	270	30	No	--	Yes
SR3-2	2275.6	-495.4	1045.8	270	31	No	--	No
Side Rail Right Side								
SR1	1315.8	485.9	1080.3	--	--	Yes	--	--
REL	1319.1	501.4	1061.2	90	22	--	1	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**					
SR2A	1466.3	475.8	1094.4	90	25	No	--	No
SR2B	1438.9	488.1	1116.1	--	--	Yes	--	--
REL	1442.6	476.1	1095.3	90	28	--	1	No
SR3-1	2109.2	492.0	1064.5	90	33	No	--	No
SR3-2	2277.0	499.4	1044.6	90	30	No	--	Yes
Rear Header Left Side								
RH	2479.1	-366.3	1081.9	0	50	No	--	No
Rear Header Right Side								
RH	2478.3	365.2	1081.8	0	50	No	--	No
Upper Roof Left Side								
UR1 (BPR)	1299.2	-384.9	1084.6	270	50	No	--	No
UR2 (BPR)	1903.3	-382.8	1136.9	270	50	No	--	No
UR3 (BPR)	2363.8	-387.7	1097.4	315	47	No	--	No
Upper Roof Right Side								
UR4 (SR2(A))	1474.4	387.0	1124.0	90	50	No	--	No
UR5 (BPR)	1779.2	381.2	1133.6	90	49	No	--	Yes
UR6 (SR3-1)	2113.8	380.4	1129.3	90	48	No	--	No

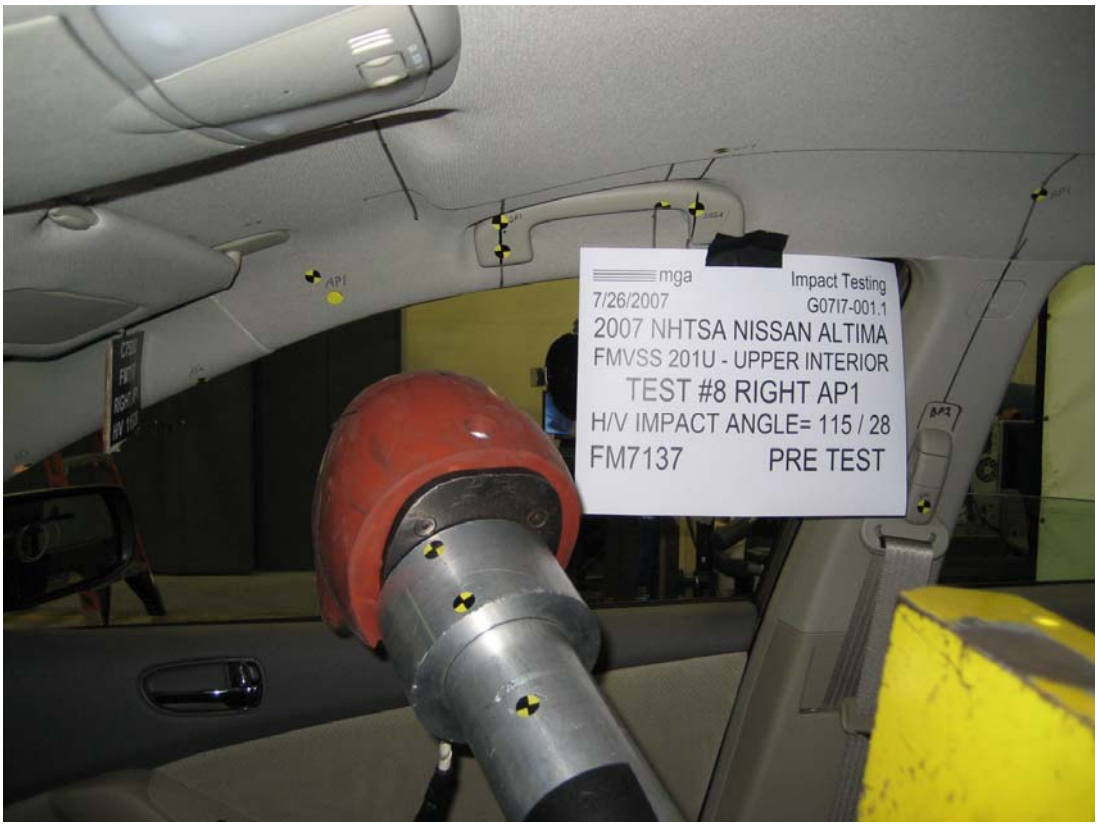
As determined using the Procedures specified in S10.1-10.13.

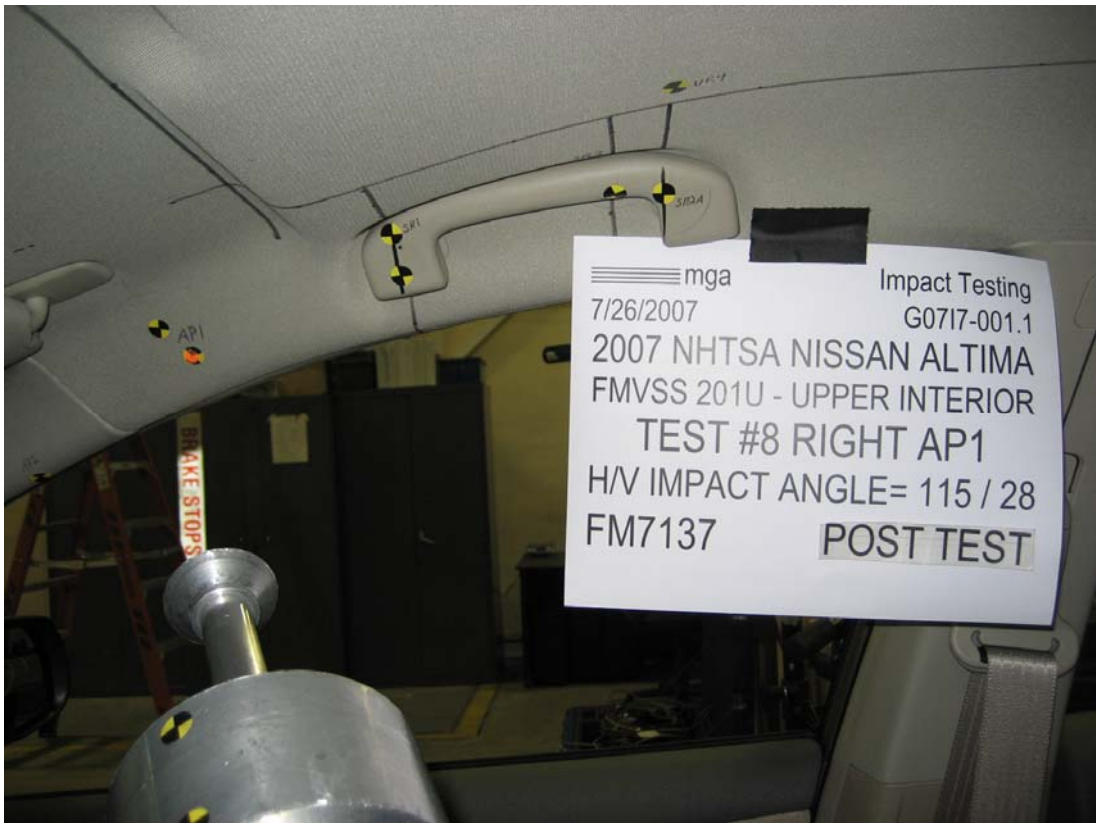
REMARKS: Targets AP1, AP2, AP3, SR1, SR2(A), SR2(B), BP1, SR3-1, SR3-2, RP1, and RP2 are located in the curtain airbag zone and are subject to a reduced velocity impact if tested.

RECORDED BY: Louis Campbell DATE: July 23, 2007

APPROVED BY: Helen A. Kaleto

3.0 TEST DATA (Including Acceleration and Velocity Plots)

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G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #8 RIGHT AP1
H/V IMPACT ANGLE= 115 / 28
FM7137
POST TEST
AP1
BRAKE STOPS


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7/26/2007
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #8 RIGHT AP1
H/V IMPACT ANGLE= 115 / 28
FM7137
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G07I7-001.1 VEHICLE YR/MAKE/MODEL:2007/NHTSA/Nissan Altima

GENERAL TEST PARAMETERS:

Target (Vehicle Side): AP1 Right

MGA Test Reference No.:FM7137

Approach Horizontal Angles:115º

Approach Vertical Angles:28º

Additional Description:Relocated

Test Number:#8

Temperature:21C

Humidity:41%

Time of Test:9:33:30 AM

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
484	421	4.1	19.1	32	0

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J14103	-94.598	0.78	0.78
Y	6	J36197	110.692	0.80	0.80
Z	7	J36353	99.391	0.81	0.81

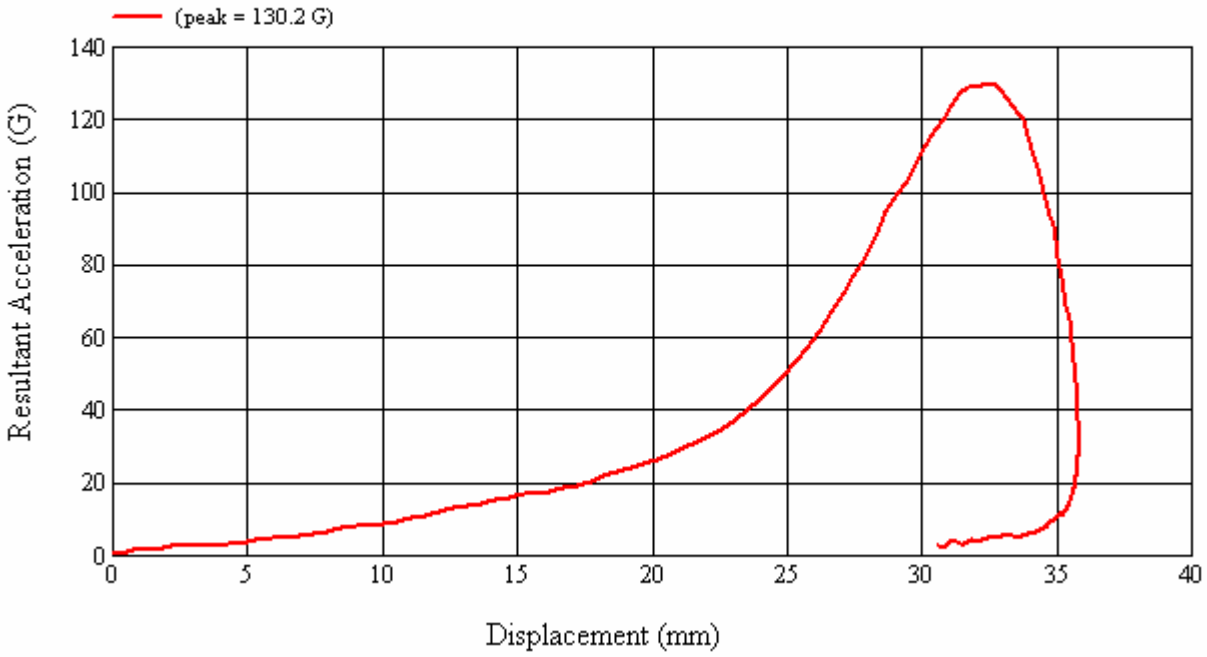
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

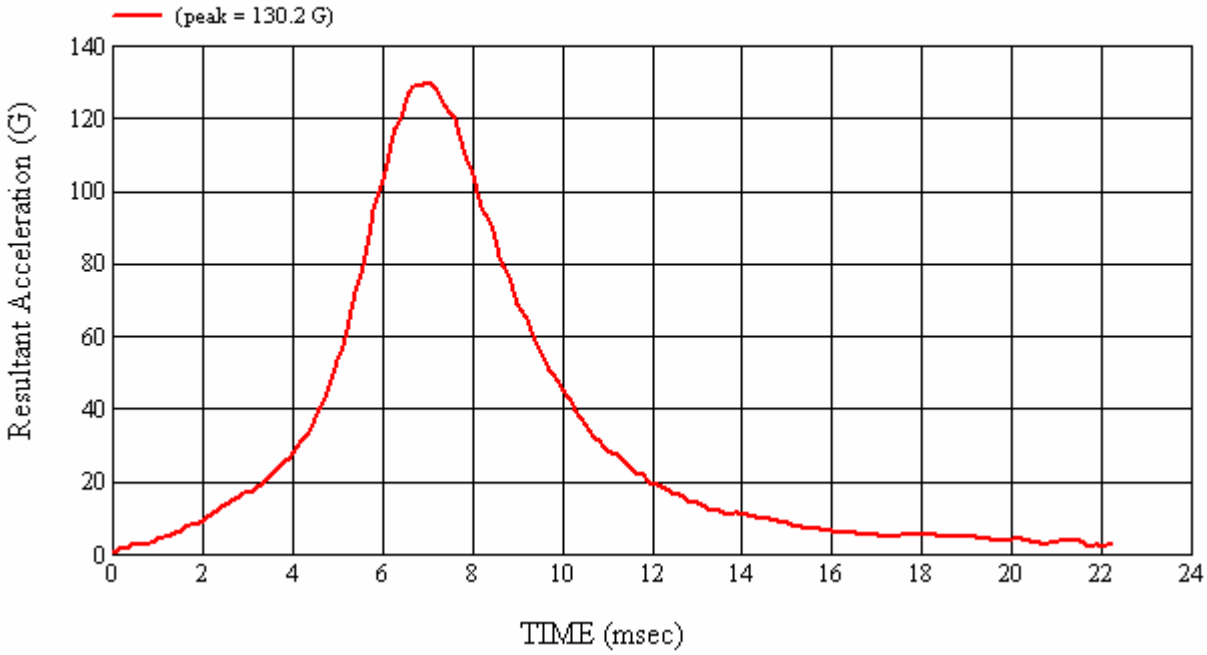
No visible damage.

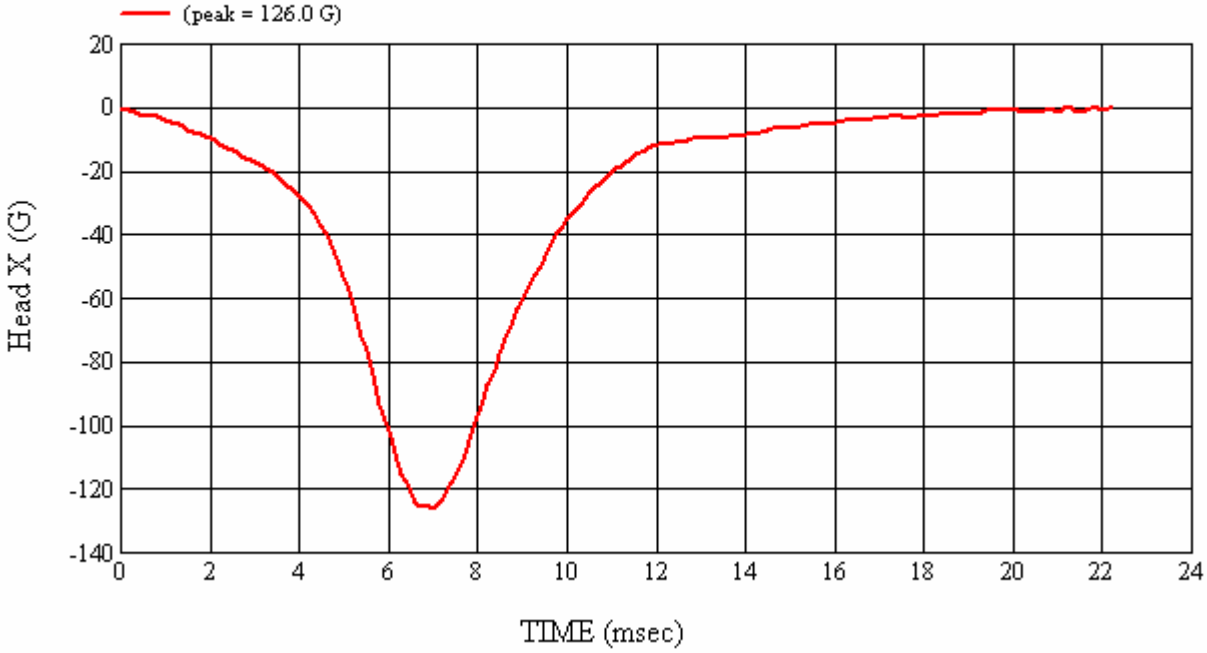
Recorded By: Travis Campbell Approved By*: Eileen A. Kaleto Date: 7/26/2007

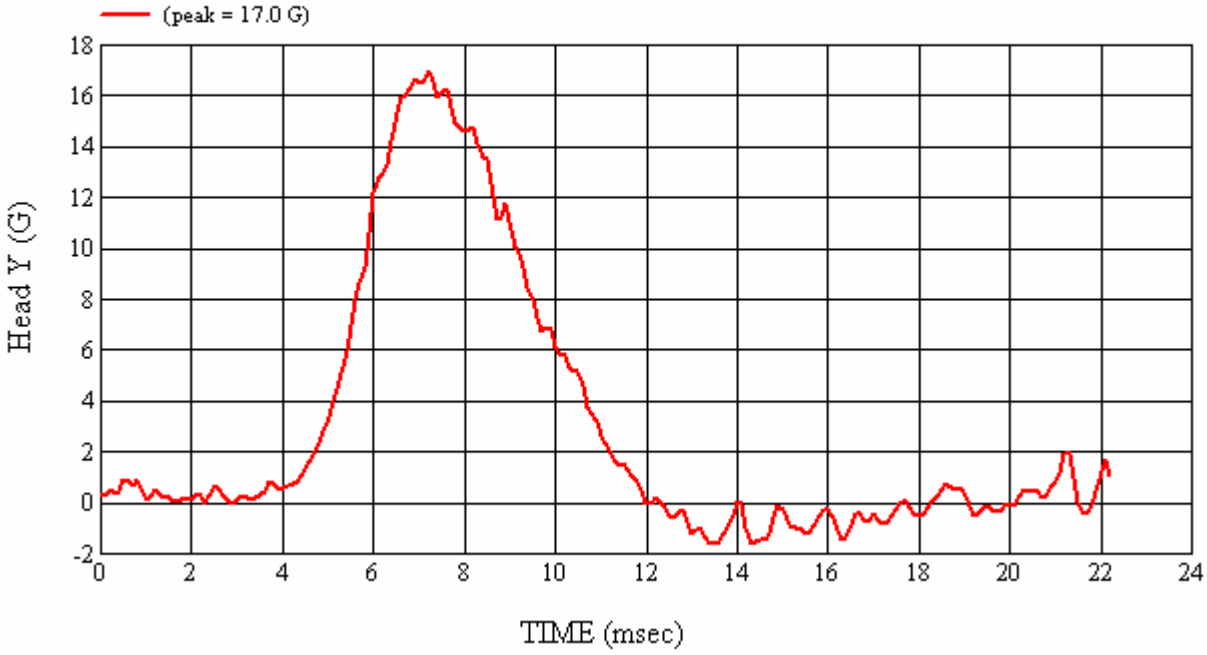
*Only necessary for NHTSA (Government) Compliance testing.

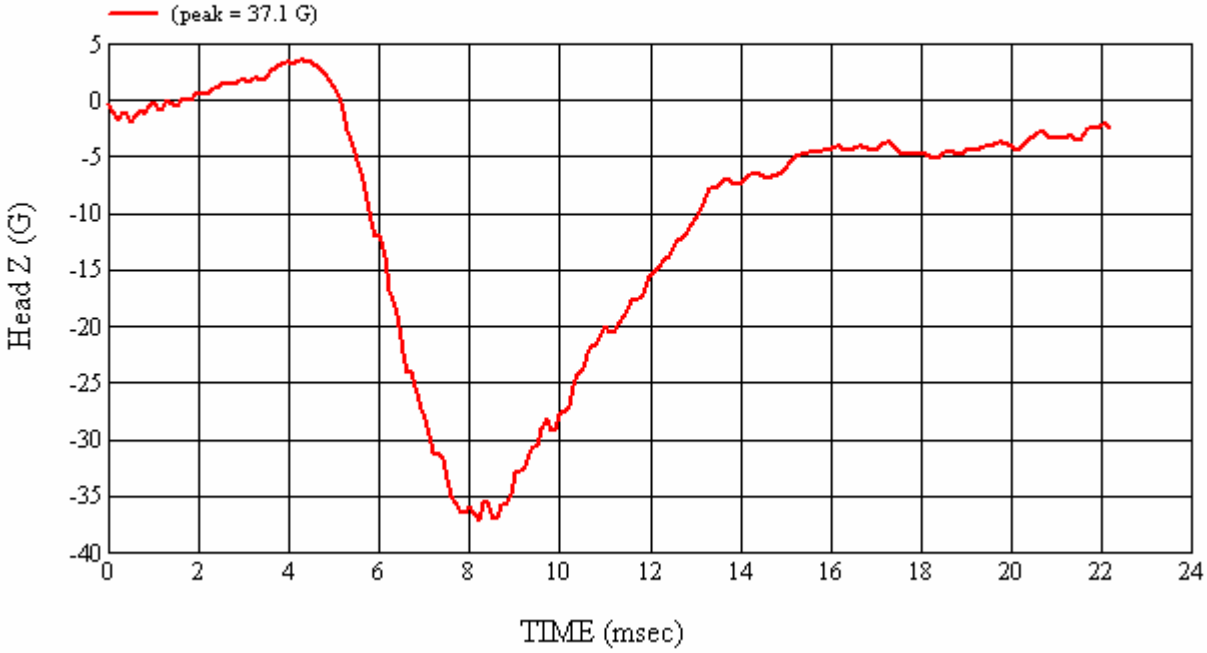
MGA Test #: FM7137 Target Location: AP1, Right Side Test Date: 7/26/2007

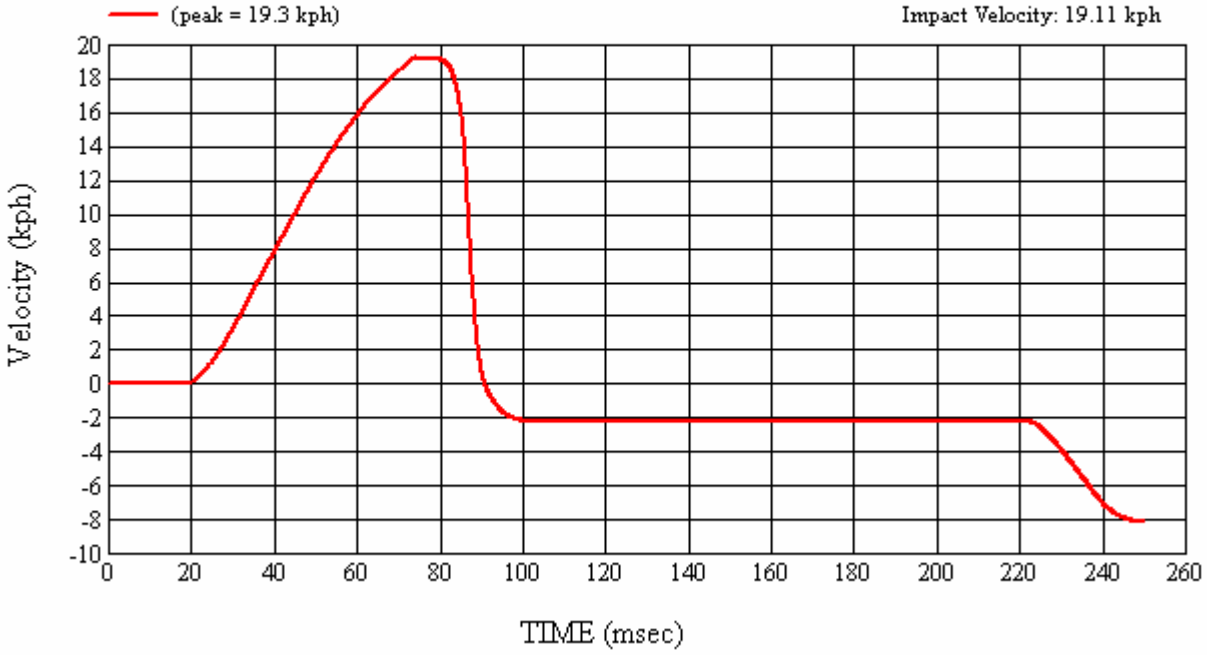


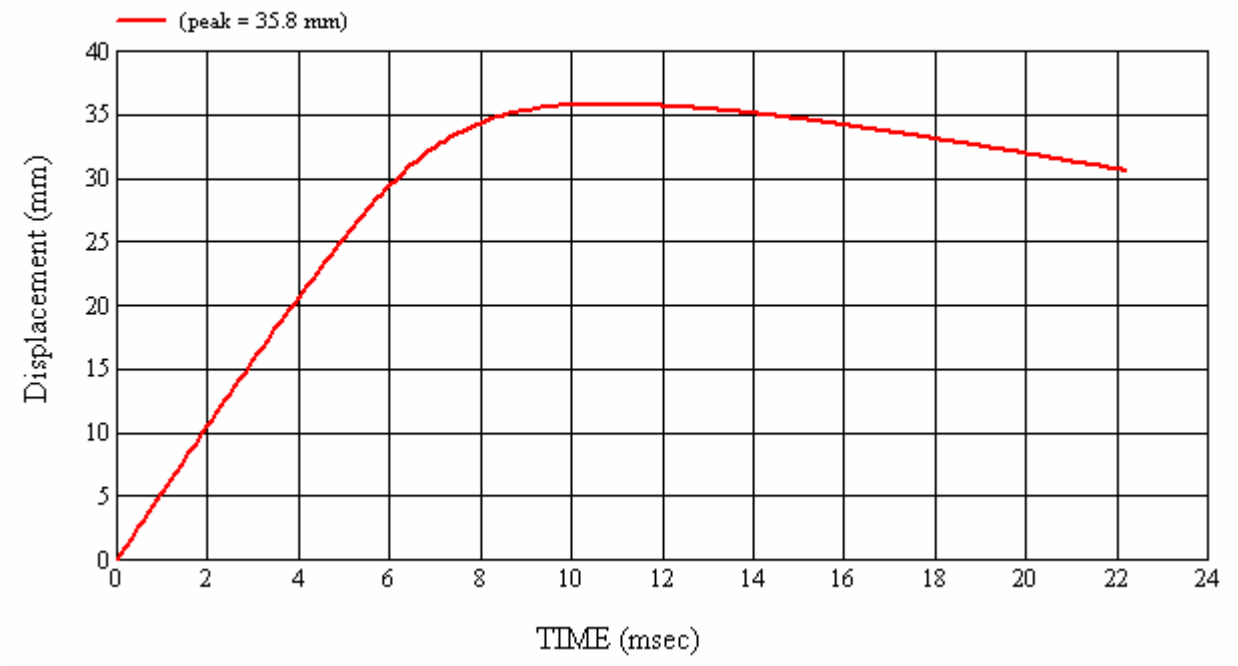



(peak = 126.0 G)
Head X (G)
20
0
-20
-40
-60
-80
-100
-120
-140
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)


(peak = 17.0 G)
Head Y (G)
18
16
14
12
10
8
6
4
2
0
-2
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)


(peak = 37.1 G)
Head Z (G)
5
0
-5
-10
-15
-20
-25
-30
-35
-40
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)


(peak = 19.3 kph)
Impact Velocity: 19.11 kph
Velocity (kph)
20
18
16
14
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
0
20
40
60
80
100
120
140
160
180
200
220
240
260
TIME (msec)


(peak = 35.8 mm)
Displacement (mm)
TIME (msec)
0
5
10
15
20
25
30
35
40
0
2
4
6
8
10
12
14
16
18
20
22
24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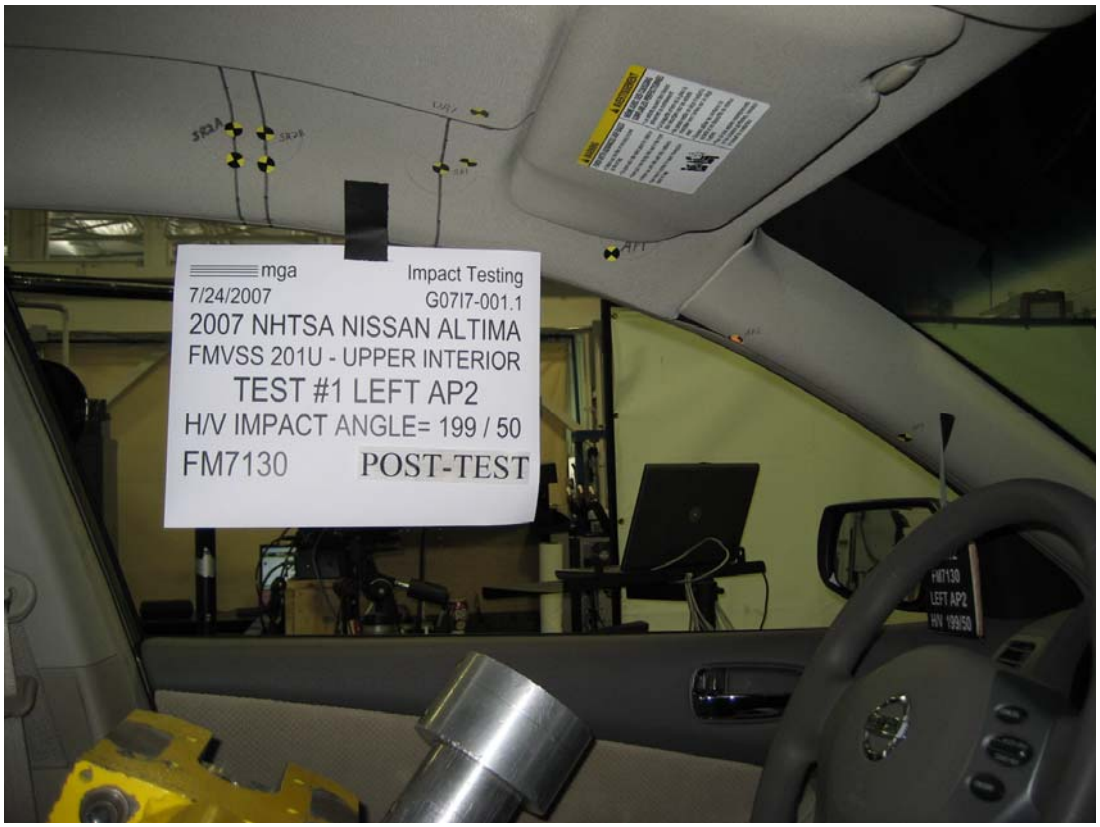
Impact Testing
7/24/2007
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #1 LEFT AP2
H/V IMPACT ANGLE= 199 / 50
FM7130
PRE TEST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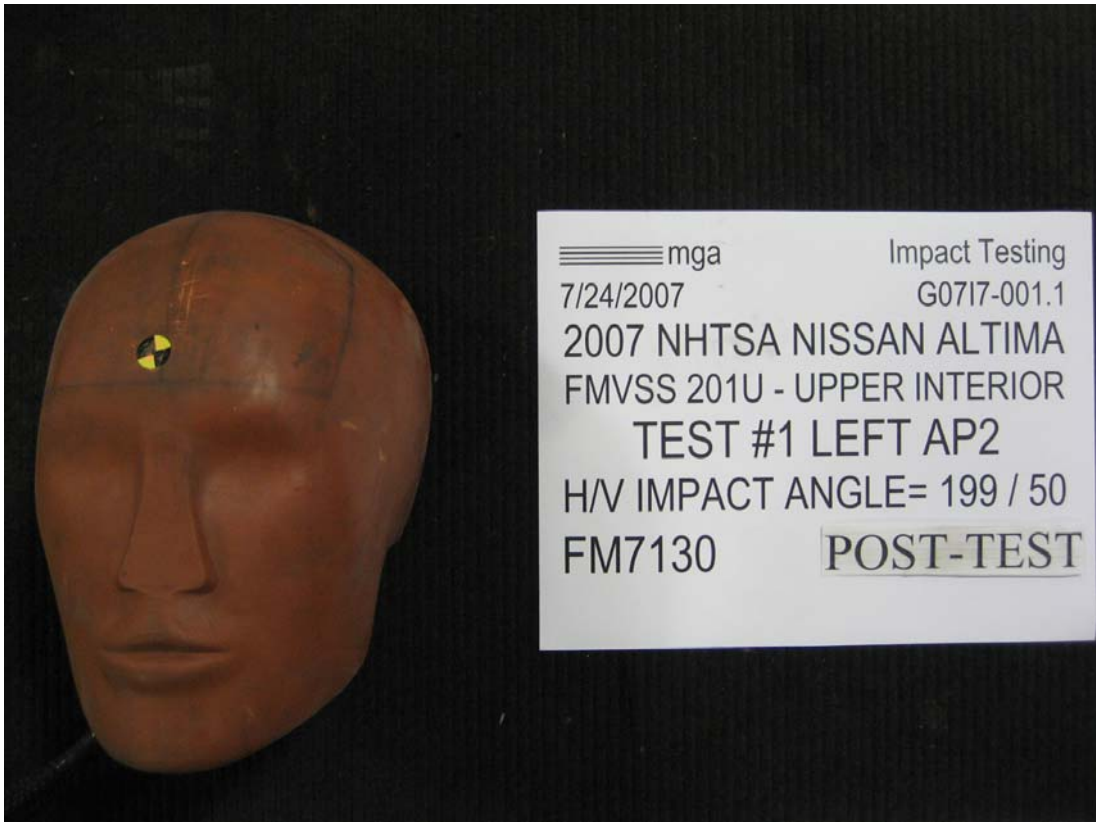
Impact Testing
7/24/2007
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #1 LEFT AP2
H/V IMPACT ANGLE= 199 / 50
FM7130
POST-TEST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Impact Testing
7/24/2007
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #1 LEFT AP2
H/V IMPACT ANGLE= 199 / 50
FM7130
POST-TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G07I7-001.1 VEHICLE YR/MAKE/MODEL:2007/NHTSA/Nissan Altima

GENERAL TEST PARAMETERS:

Test Number:#1

Target (Vehicle Side): AP2 Left

Temperature:21C

MGA Test Reference No.:FM7130

Humidity:40%

Approach Horizontal Angles:199º

Time of Test:1:59:25 PM

Approach Vertical Angles:50º

FMH Serial No:[035]

Additional Description:

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
368	267	10.4	19.2	11	4 Right

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J22664	-94.161	0.78	0.78
Y	6	J35919	97.442	0.80	0.80
Z	7	J35924	93.891	0.81	0.81

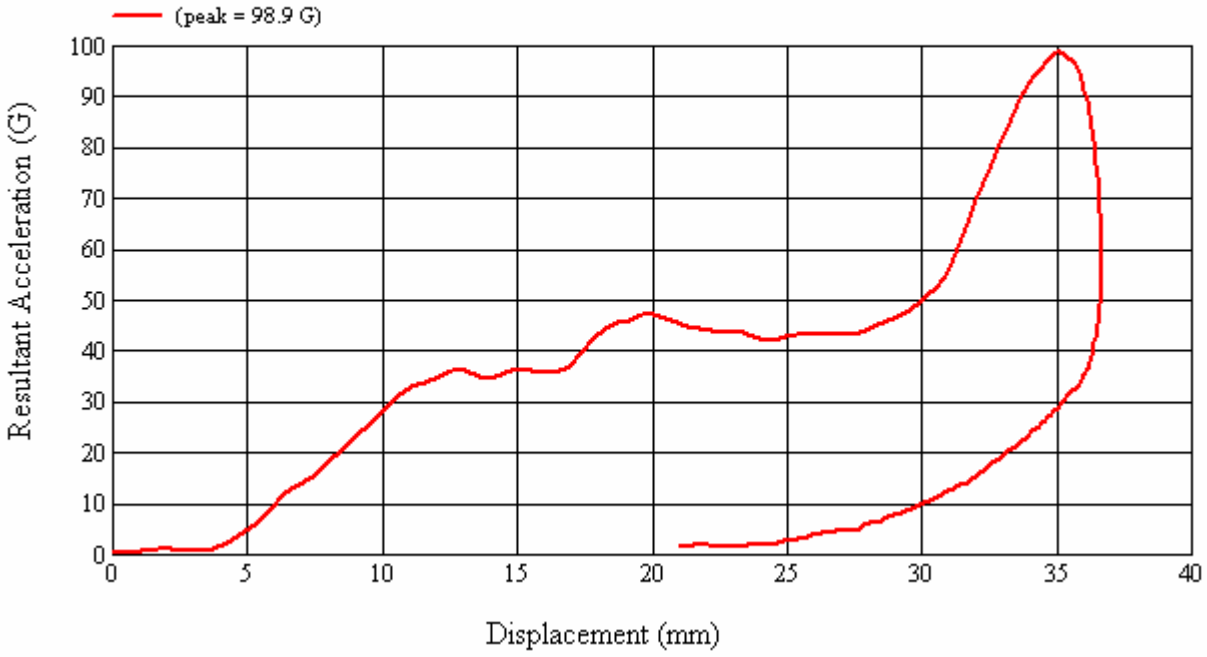
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

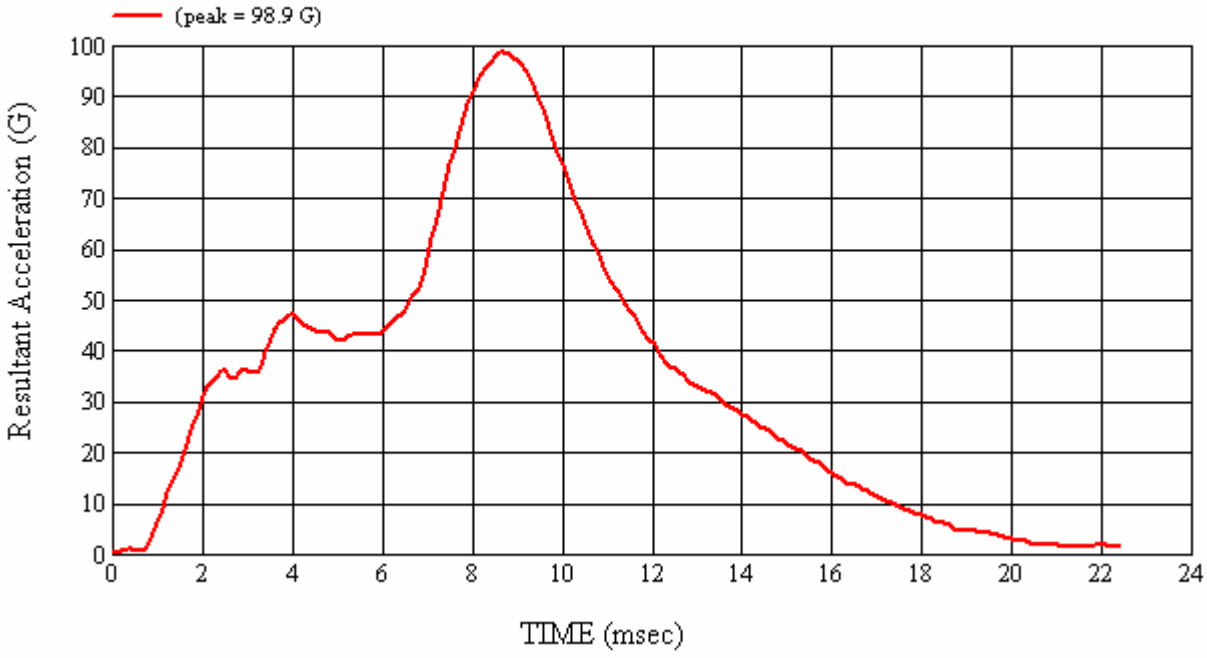
A-pillar displacement.

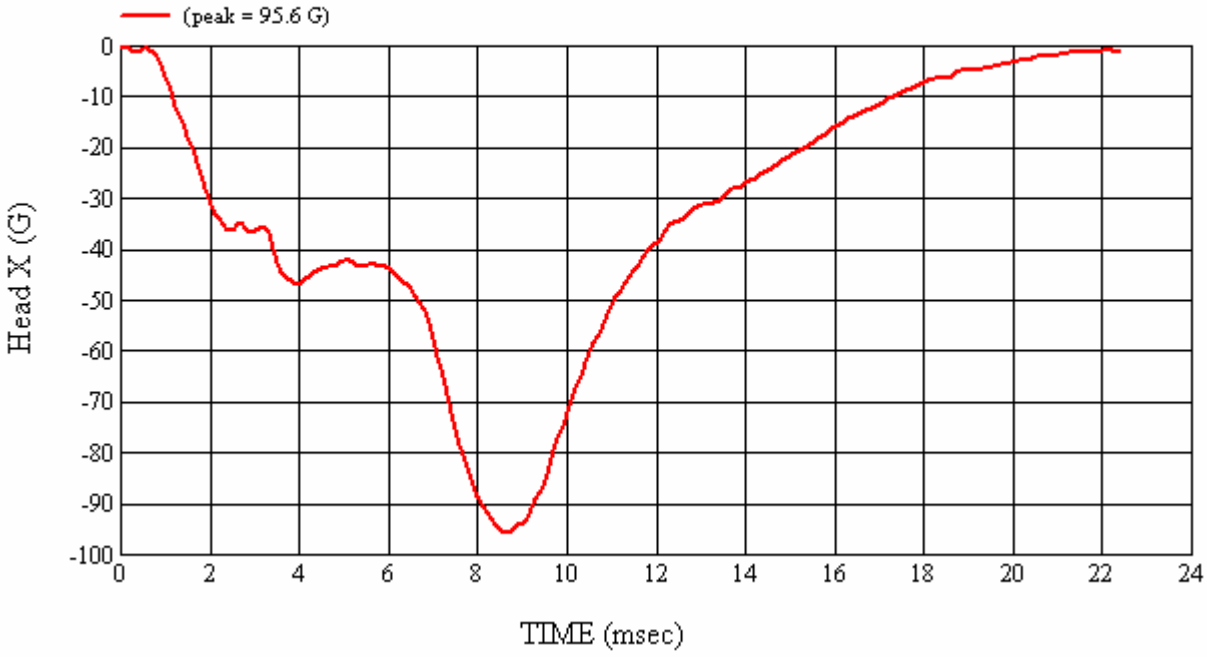
Recorded By: _____ Approved By*: _____ Date: 7/24/2007

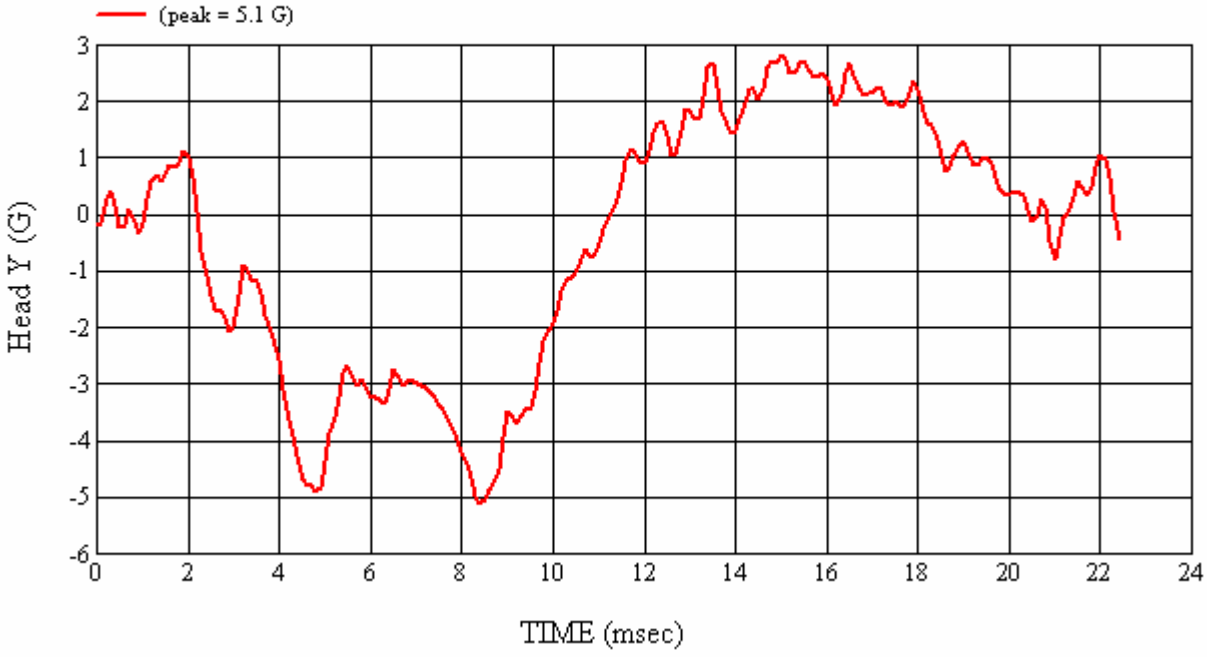
*Only necessary for NHTSA (Government) Compliance testing.

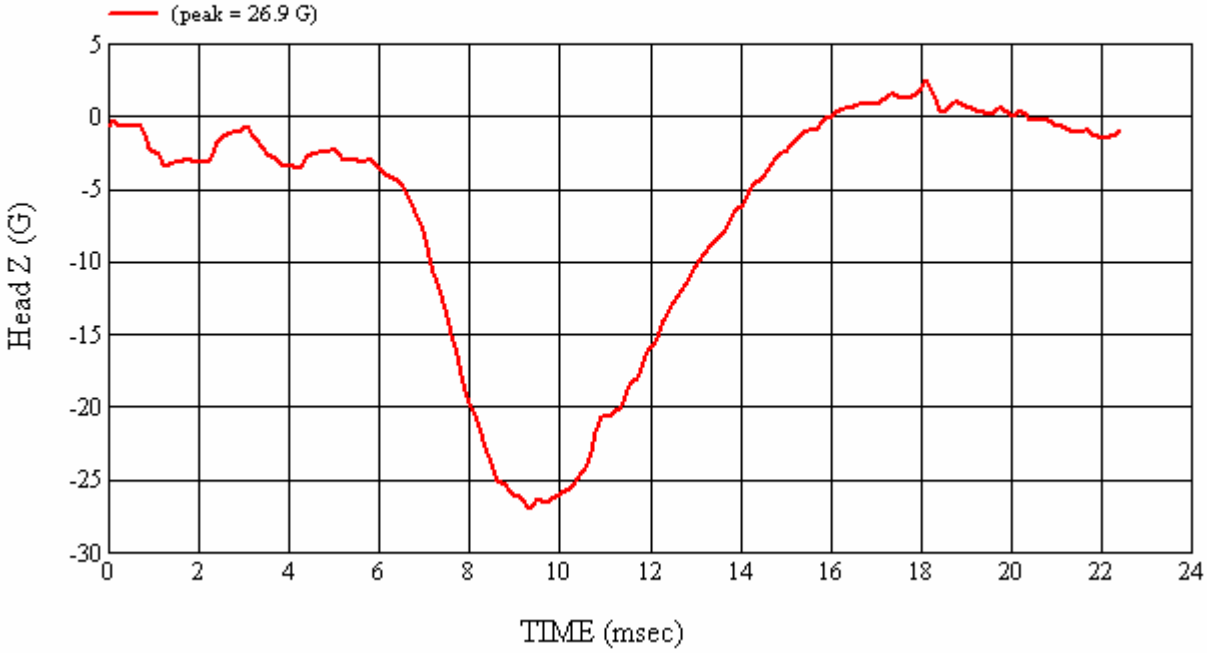
MGA Test #: FM7130 Target Location: AP2, Left Side Test Date: 7/24/2007

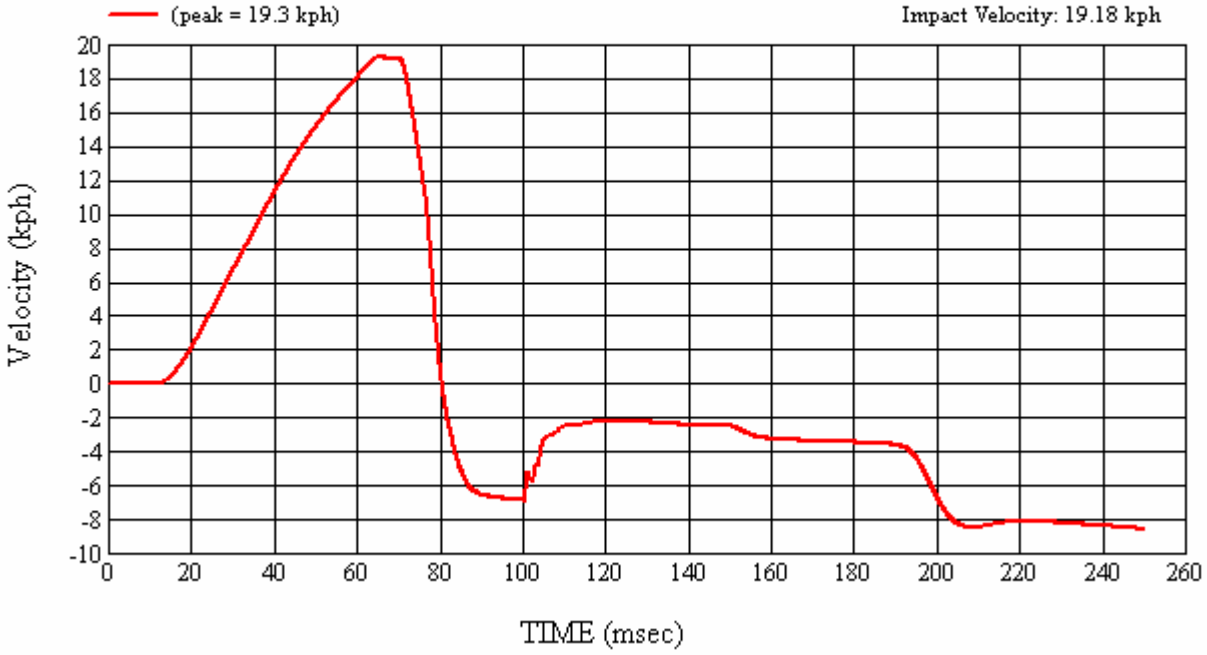


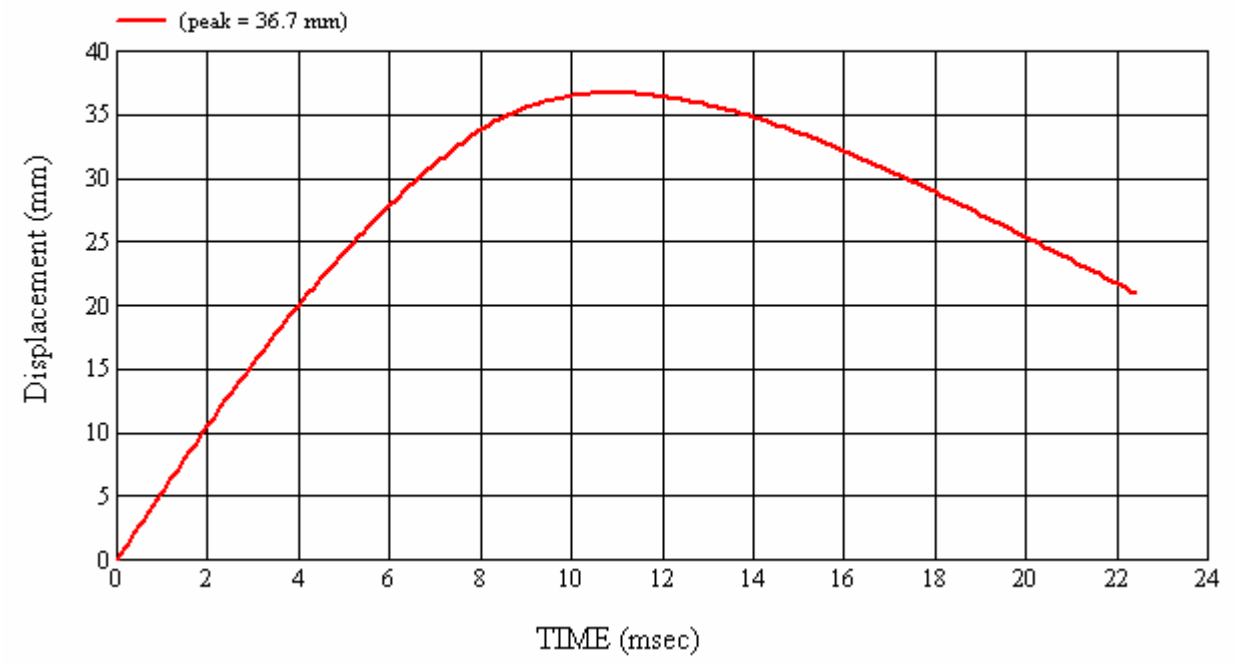



(peak = 95.6 G)
Head X (G)
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)


(peak = 5.1 G)
Head Y (G)
3
2
1
0
-1
-2
-3
-4
-5
-6
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)


(peak = 26.9 G)
Head Z (G)
5
0
-5
-10
-15
-20
-25
-30
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)


(peak = 19.3 kph)
Impact Velocity: 19.18 kph
Velocity (kph)
20
18
16
14
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
0
20
40
60
80
100
120
140
160
180
200
220
240
260
TIME (msec)


(peak = 36.7 mm)
Displacement (mm)
TIME (msec)
0
5
10
15
20
25
30
35
40
0
2
4
6
8
10
12
14
16
18
20
22
24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Impact Testing
G07I7-001.1
7/25/2007
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #7 RIGHT AP3
H/V IMPACT ANGLE= 161 / 45
FM7136
PRE TEST


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Impact Testing
7/25/2007
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #7 RIGHT AP3
H/V IMPACT ANGLE= 161 / 45
FM7136
POST TEST


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Impact Testing
7/25/2007
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #7 RIGHT AP3
H/V IMPACT ANGLE= 161 / 45
FM7136
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G07I7-001.1 VEHICLE YR/MAKE/MODEL:2007/NHTSA/Nissan Altima

GENERAL TEST PARAMETERS:

Test Number:#7

Target (Vehicle Side): AP3 Right

Temperature:21C

MGA Test Reference No.:FM7136

Humidity:40%

Approach Horizontal Angles:161º

Time of Test:4:26:11 PM

Approach Vertical Angles:45º

FMH Serial No:[037]

Additional Description:

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
386	291	10.2	18.7	25	11 Left

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J22696	-100.013	0.78	0.78
Y	6	J35791	91.856	0.80	0.80
Z	7	J35800	97.996	0.81	0.81

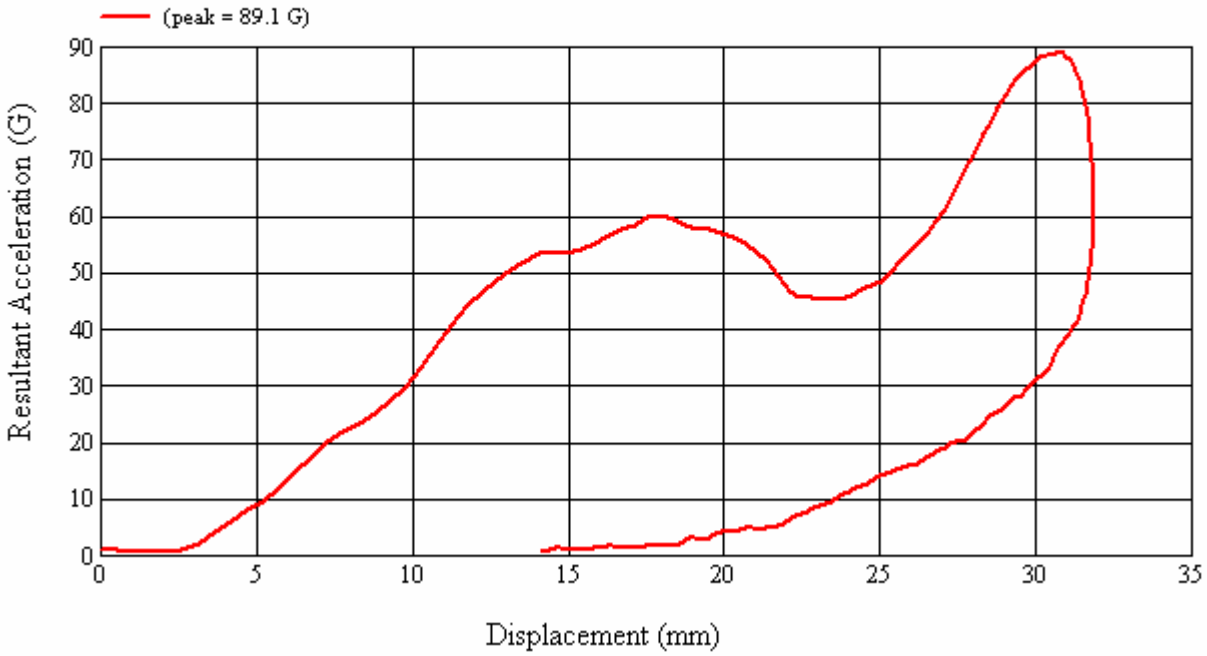
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

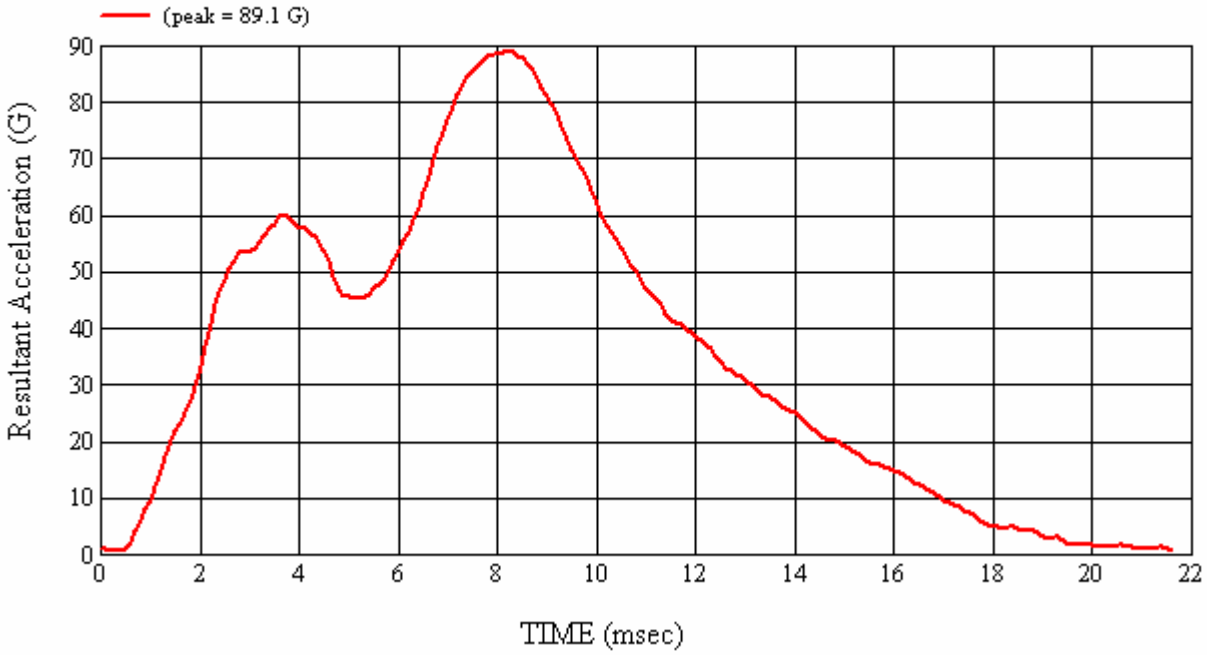
No visible damage.

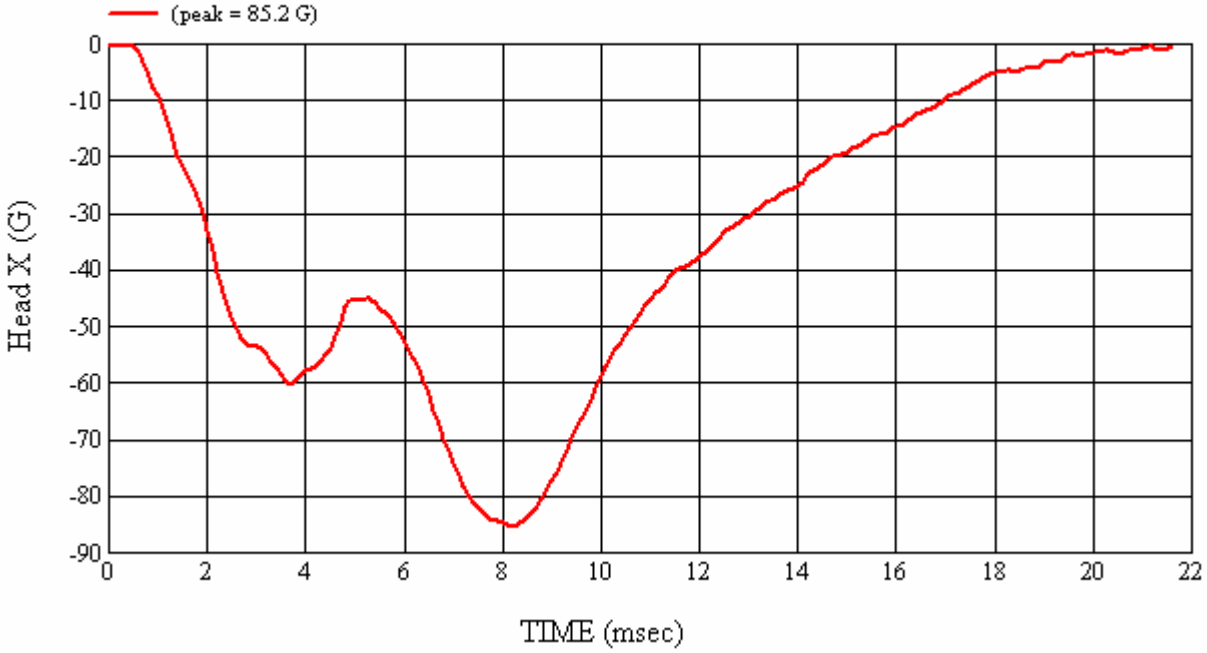
Recorded By: _____ Approved By*: _____ Date: 7/25/2007

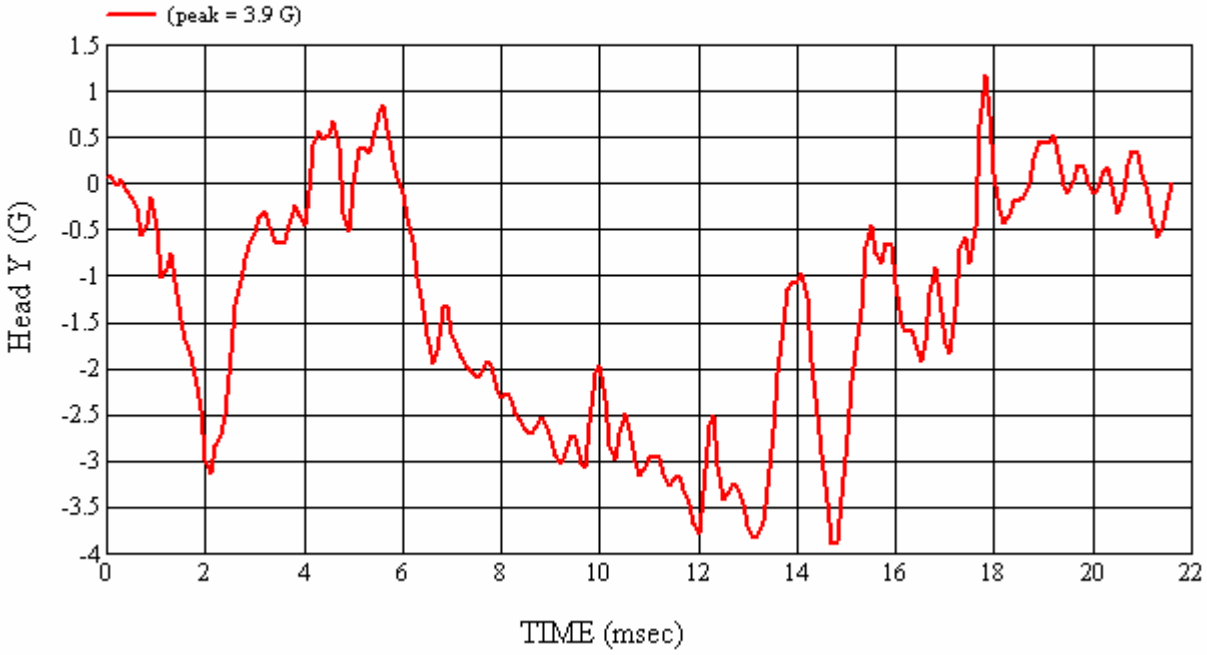
*Only necessary for NHTSA (Government) Compliance testing.

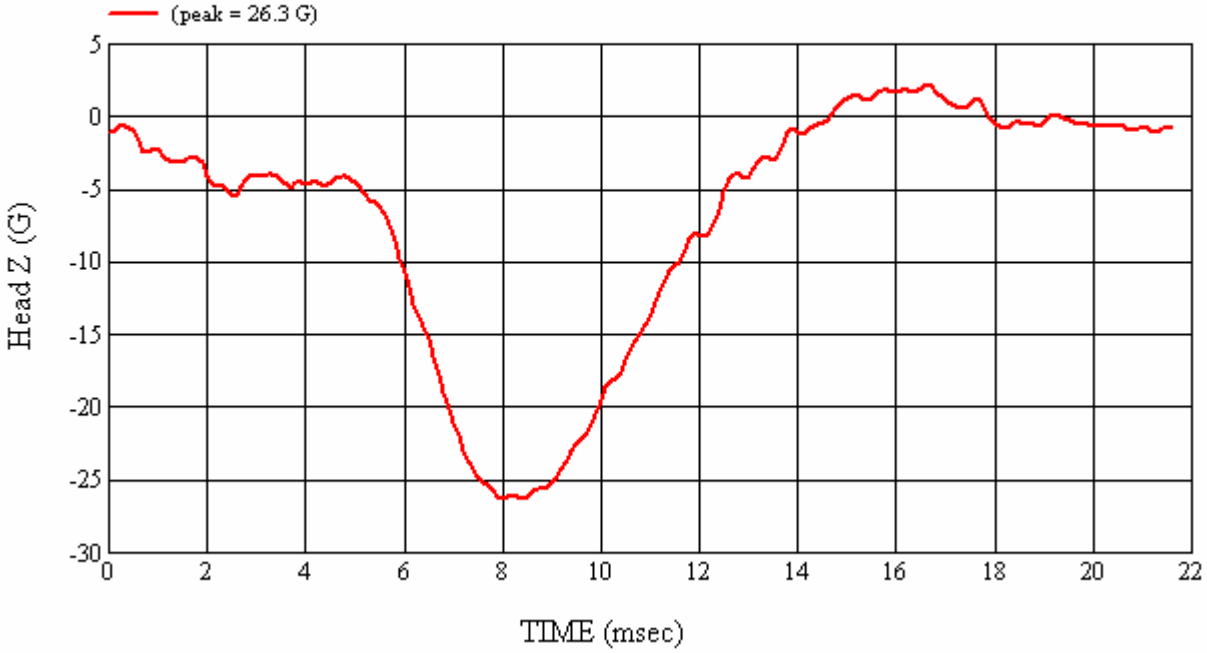
MGA Test #: FM7136 Target Location: AP3, Right Side Test Date: 7/25/2007

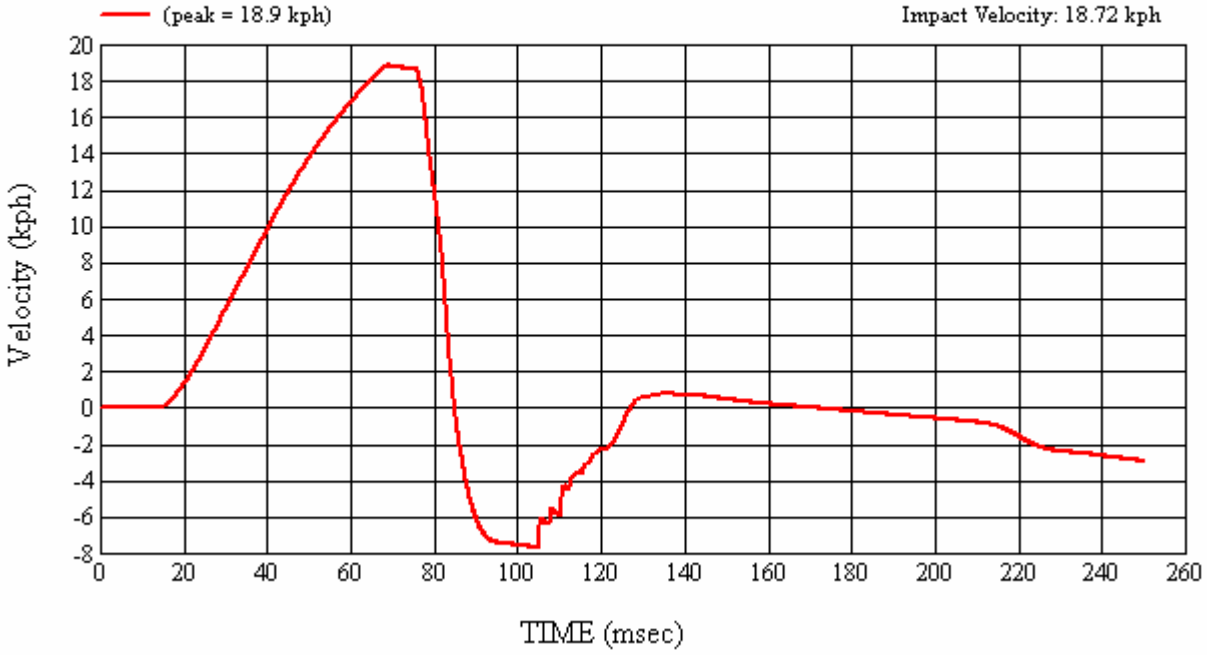


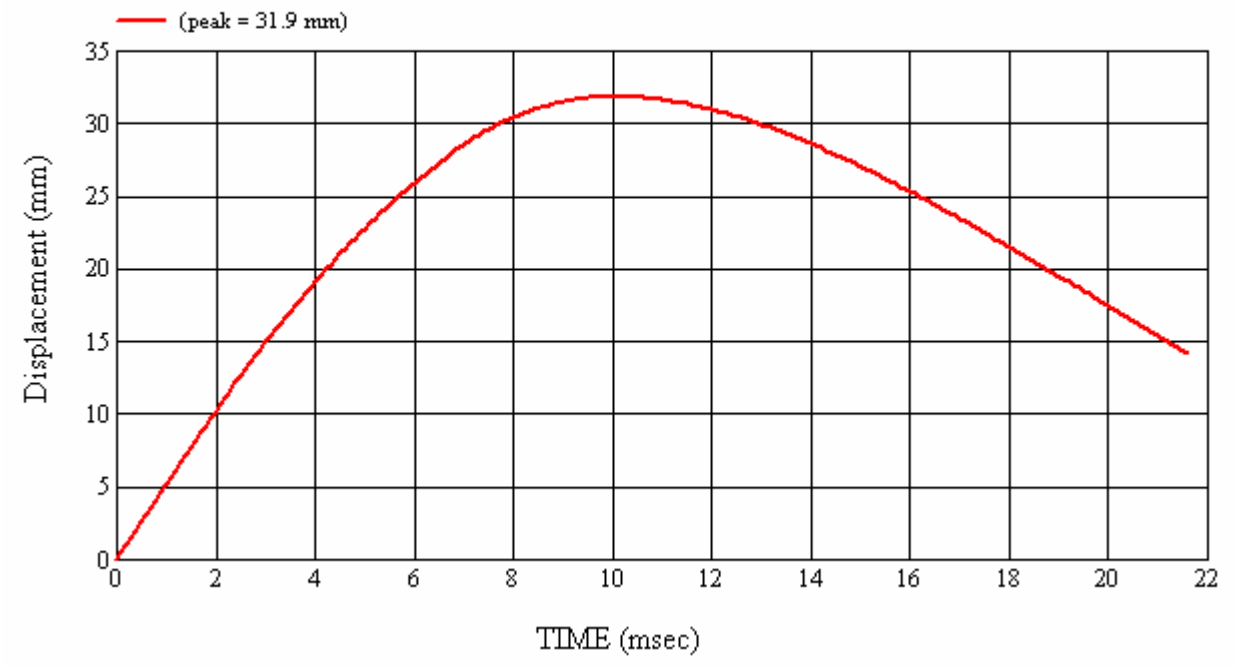



(peak = 85.2 G)
Head X (G)
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
0
2
4
6
8
10
12
14
16
18
20
22
TIME (msec)


(peak = 3.9 G)
Head Y (G)
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
0
2
4
6
8
10
12
14
16
18
20
22
TIME (msec)


(peak = 26.3 G)
Head Z (G)
5
0
-5
-10
-15
-20
-25
-30
0
2
4
6
8
10
12
14
16
18
20
22
TIME (msec)


(peak = 18.9 kph)
Impact Velocity: 18.72 kph
Velocity (kph)
20
18
16
14
12
10
8
6
4
2
0
-2
-4
-6
-8
0
20
40
60
80
100
120
140
160
180
200
220
240
260
TIME (msec)


(peak = 31.9 mm)
Displacement (mm)
TIME (msec)
0
5
10
15
20
25
30
35
0
2
4
6
8
10
12
14
16
18
20
22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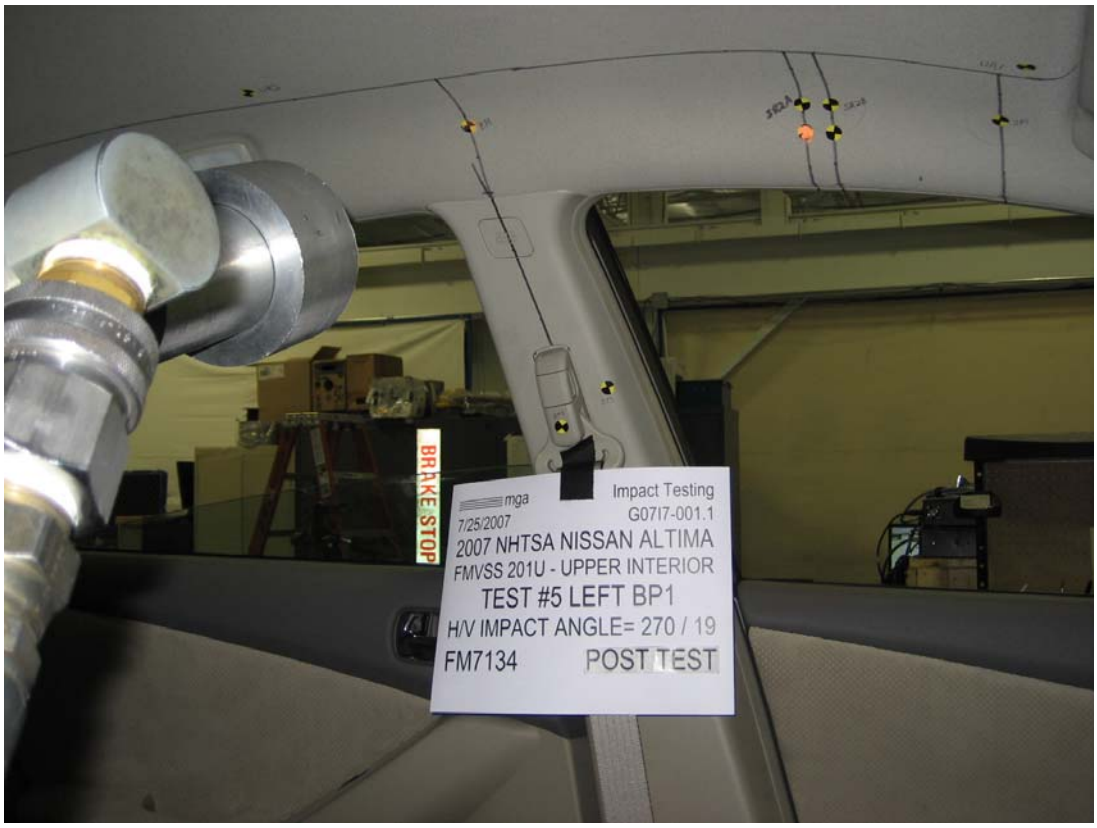
G07I7-001.1
7/25/2007
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #5 LEFT BP1
H/V IMPACT ANGLE= 270 / 19
FM7134
PRE TEST


BRAKE STOP
mga
Impact Testing
7/25/2007
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #5 LEFT BP1
H/V IMPACT ANGLE= 270 / 19
FM7134
POST TEST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Impact Testing
7/25/2007
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #5 LEFT BP1
H/V IMPACT ANGLE= 270 / 19
FM7134
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G07I7-001.1 VEHICLE YR/MAKE/MODEL:2007/NHTSA/Nissan Altima

GENERAL TEST PARAMETERS:

Test Number:#5

Target (Vehicle Side): BP1 Left

Temperature:21C

MGA Test Reference No.:FM7134

Humidity:40%

Approach Horizontal Angles:270º

Time of Test:11:10:24 AM

Approach Vertical Angles:19º

FMH Serial No:[035]

Additional Description:

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
465	395	6.2	18.6	55	4 Left

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J22664	-94.161	0.78	0.78
Y	6	J35919	97.442	0.80	0.80
Z	7	J35924	93.891	0.81	0.81

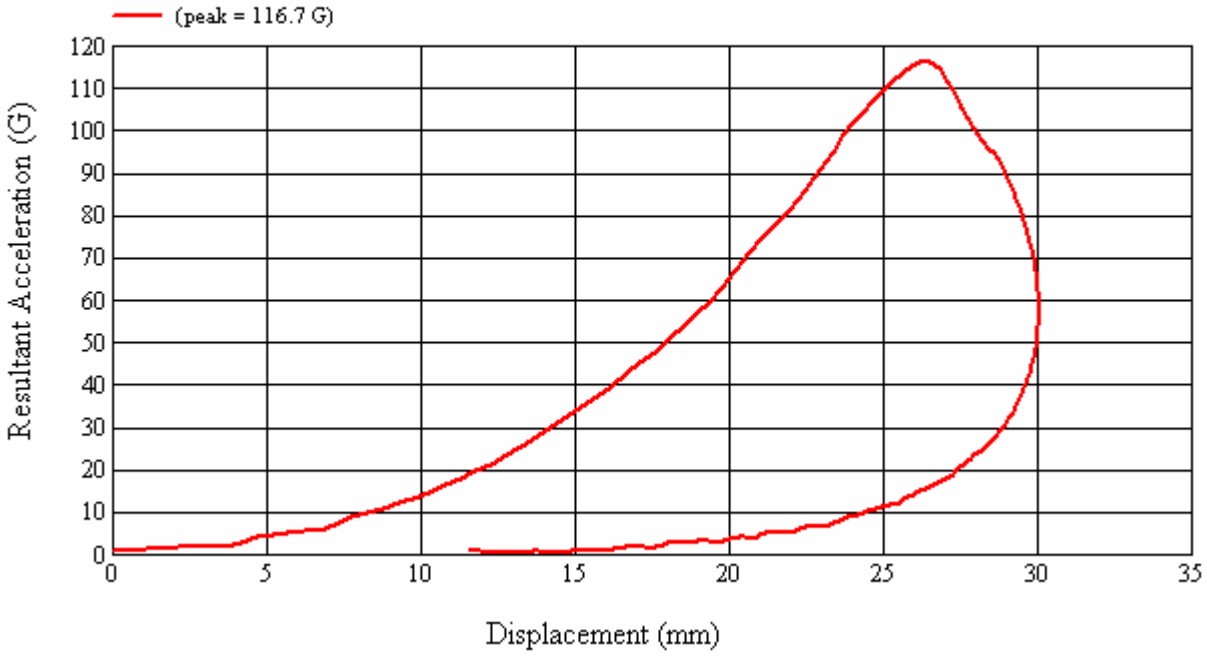
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

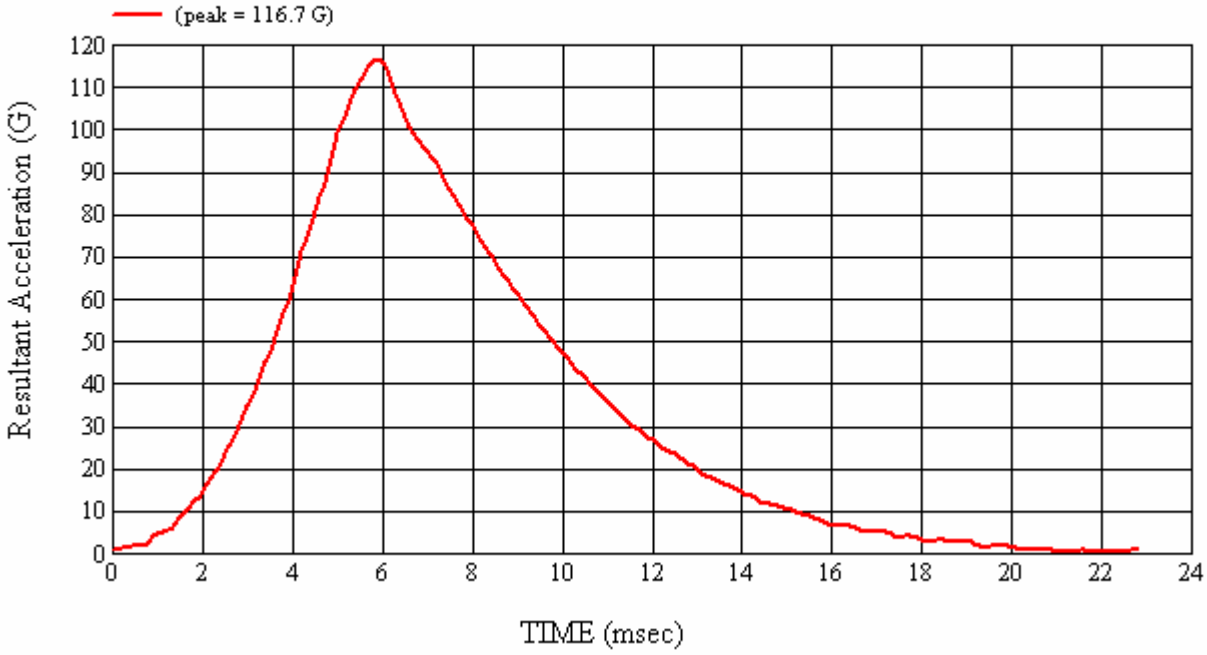
No visible damage.

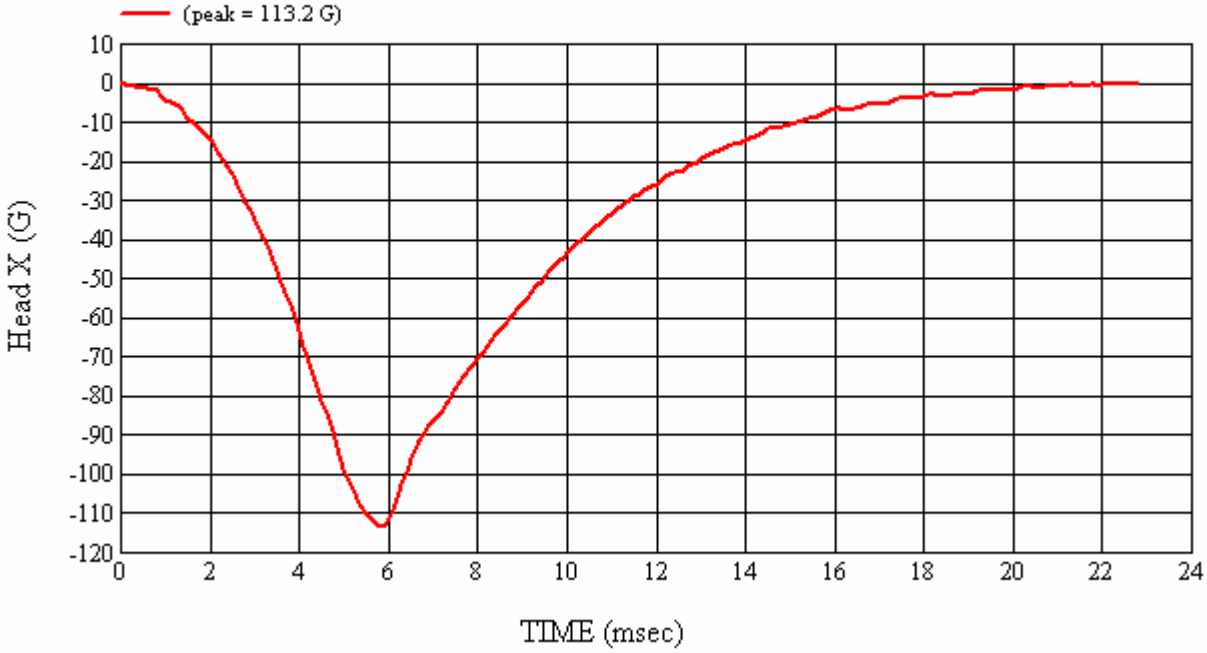
Recorded By: Laurie Campbell Approved By*: Helen A. Kalafus Date: 7/25/2007

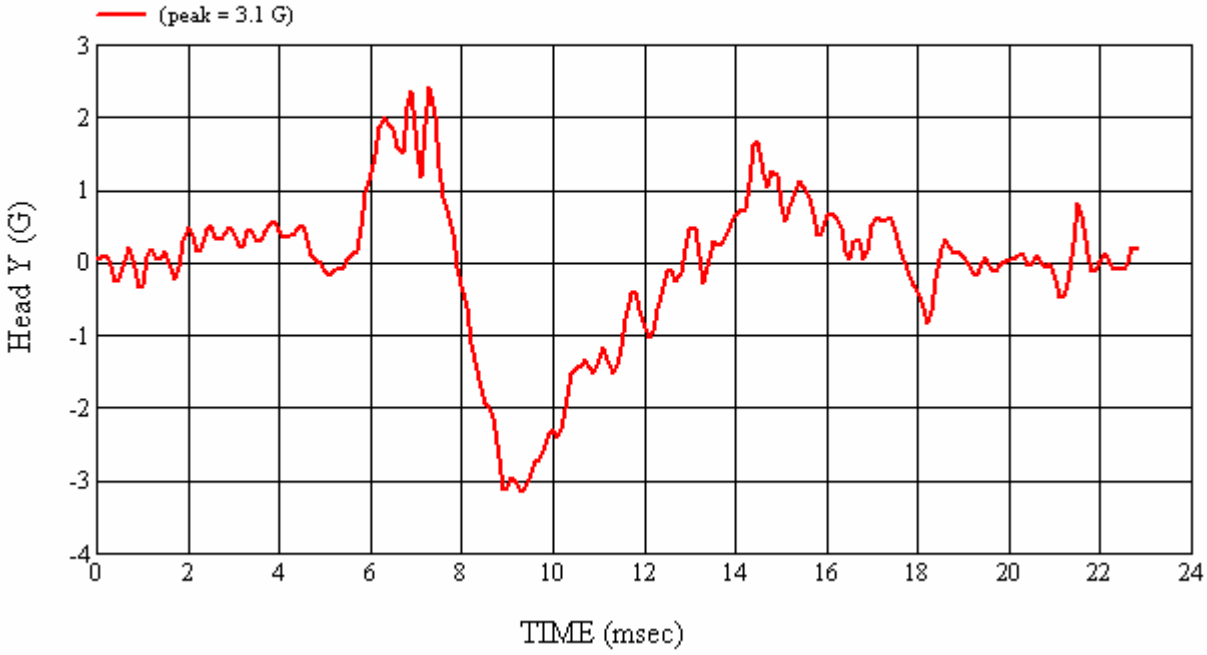
*Only necessary for NHTSA (Government) Compliance testing.

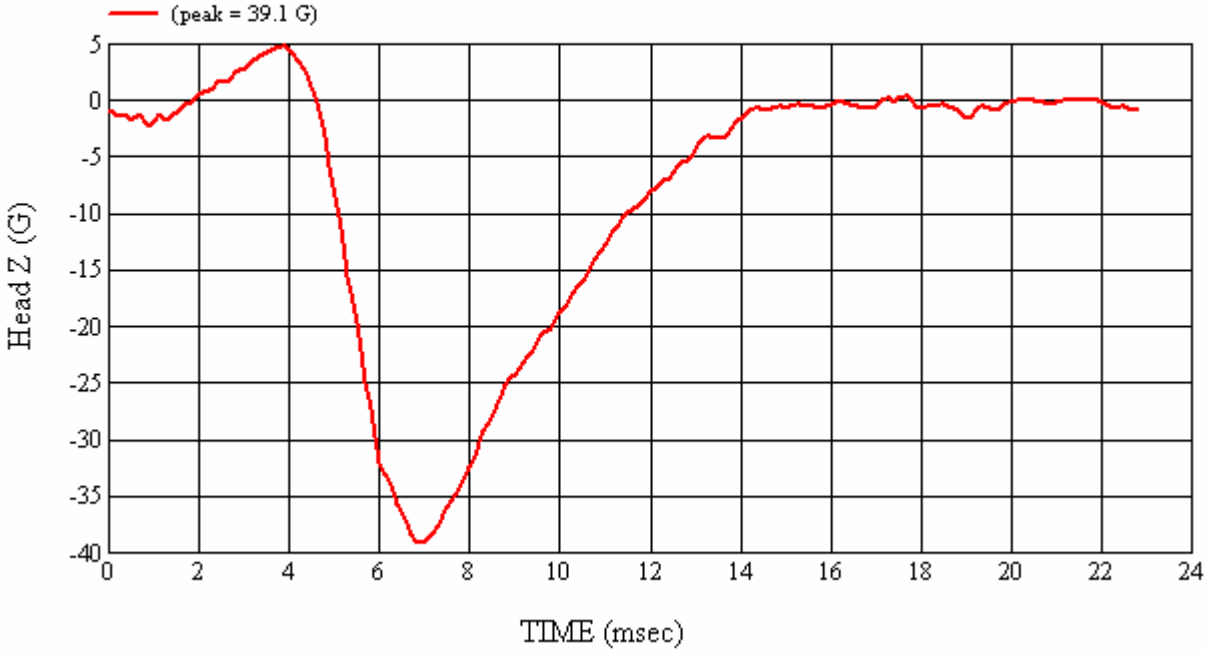
MGA Test #: FM7134 Target Location: BP1, Left Side Test Date: 7/25/2007

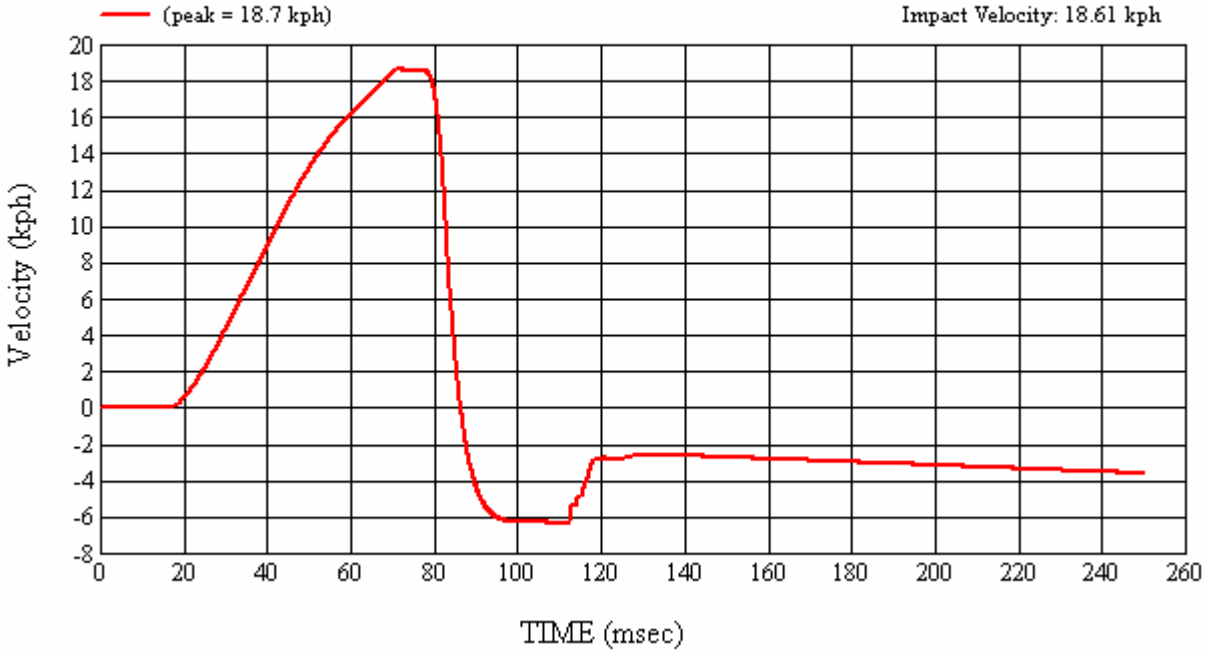


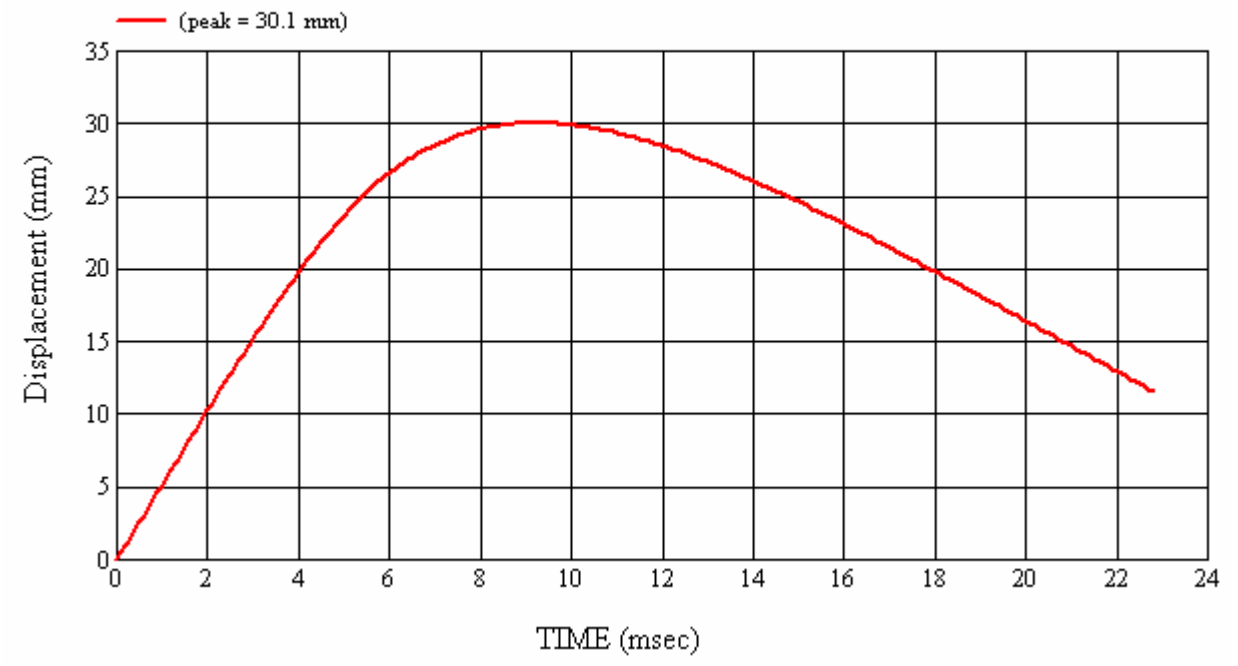



(peak = 113.2 G)
Head X (G)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)


(peak = 3.1 G)
Head Y (G)
3
2
1
0
-1
-2
-3
-4
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)


(peak = 39.1 G)
Head Z (G)
5
0
-5
-10
-15
-20
-25
-30
-35
-40
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)


(peak = 18.7 kph)
Impact Velocity: 18.61 kph
Velocity (kph)
20
18
16
14
12
10
8
6
4
2
0
-2
-4
-6
-8
0
20
40
60
80
100
120
140
160
180
200
220
240
260
TIME (msec)


(peak = 30.1 mm)
Displacement (mm)
TIME (msec)
0
5
10
15
20
25
30
35
0
2
4
6
8
10
12
14
16
18
20
22
24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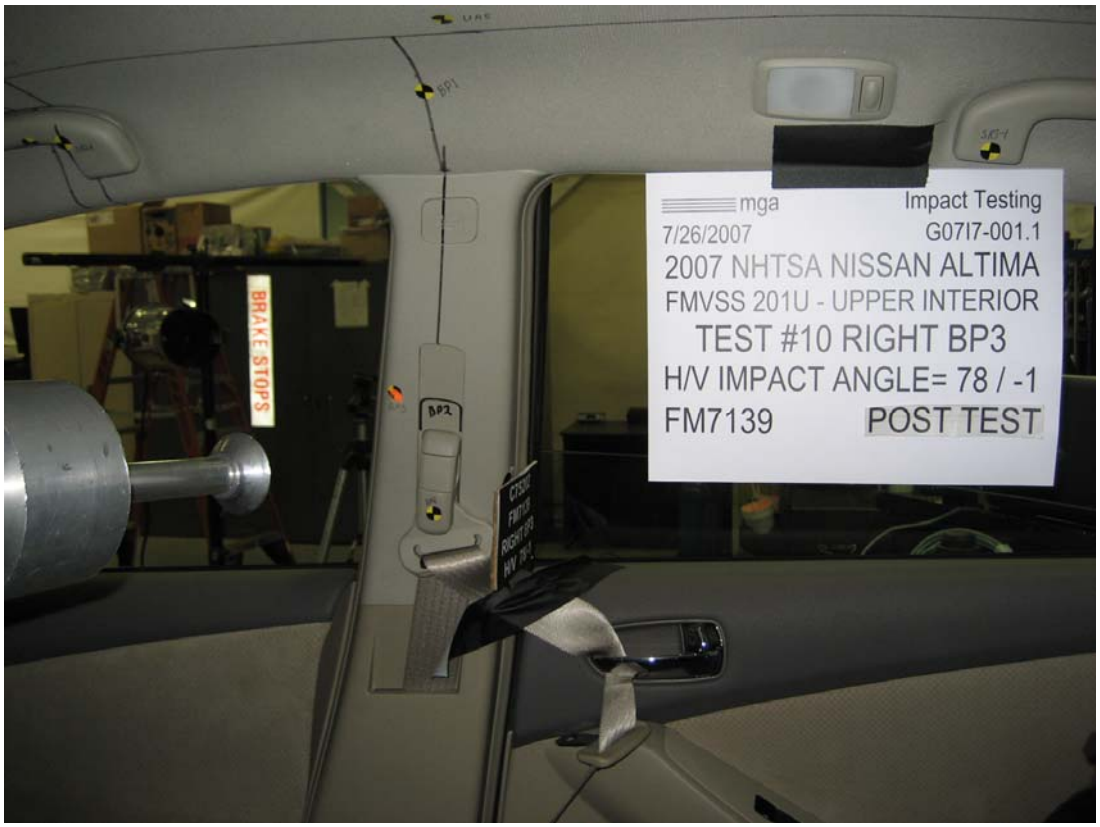
Impact Testing
7/26/2007
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #10 RIGHT BP3
H/V IMPACT ANGLE= 78 / -1
FM7139
PRE TEST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Impact Testing
7/26/2007
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #10 RIGHT BP3
H/V IMPACT ANGLE= 78 / -1
FM7139
POST TEST
BRAKE STOPS
BP1
BP2


mga
Impact Testing
7/26/2007
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #10 RIGHT BP3
H/V IMPACT ANGLE= 78 / -1
FM7139
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G07I7-001.1 VEHICLE YR/MAKE/MODEL:2007/NHTSA/Nissan Altima

GENERAL TEST PARAMETERS:

Test Number:#10

Target (Vehicle Side): BP3 Right

Temperature:22C

MGA Test Reference No.:FM7139

Humidity:48%

Approach Horizontal Angles:78º

Time of Test:12:17:27 PM

Approach Vertical Angles:-1º

FMH Serial No:[036]

Additional Description:

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
734	753	7.8	23.6	25	5 Right

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J21969	-90.883	0.78	0.78
Y	6	J35916	103.15	0.80	0.80
Z	7	J35918	99.409	0.81	0.81

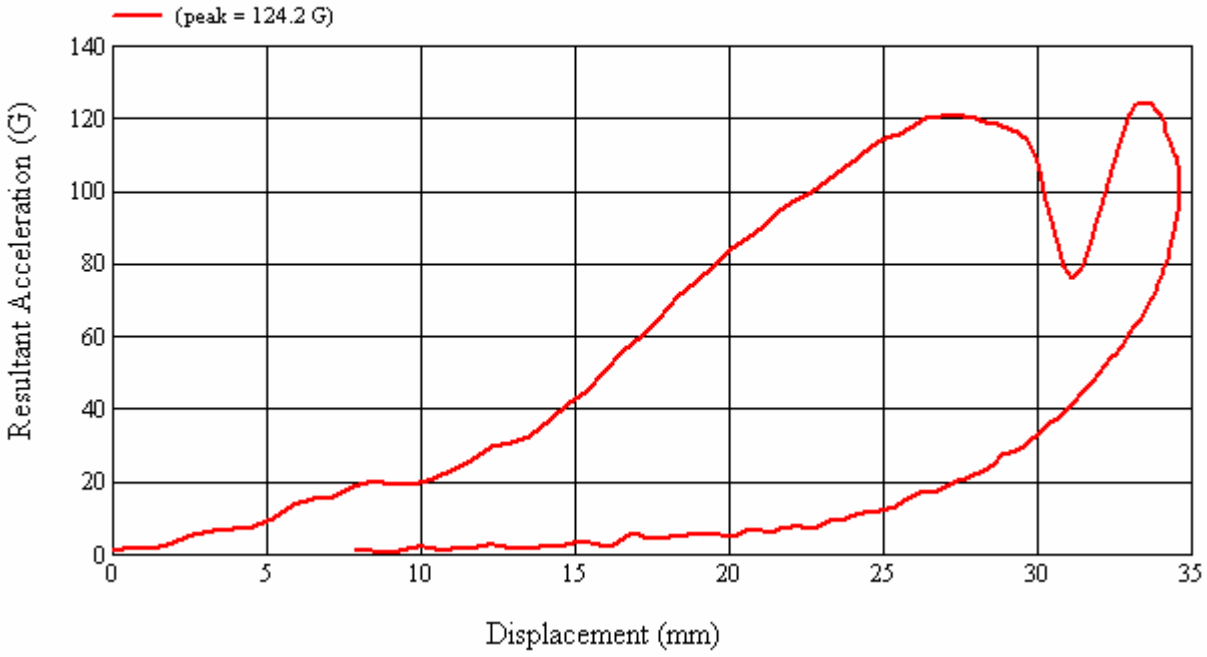
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

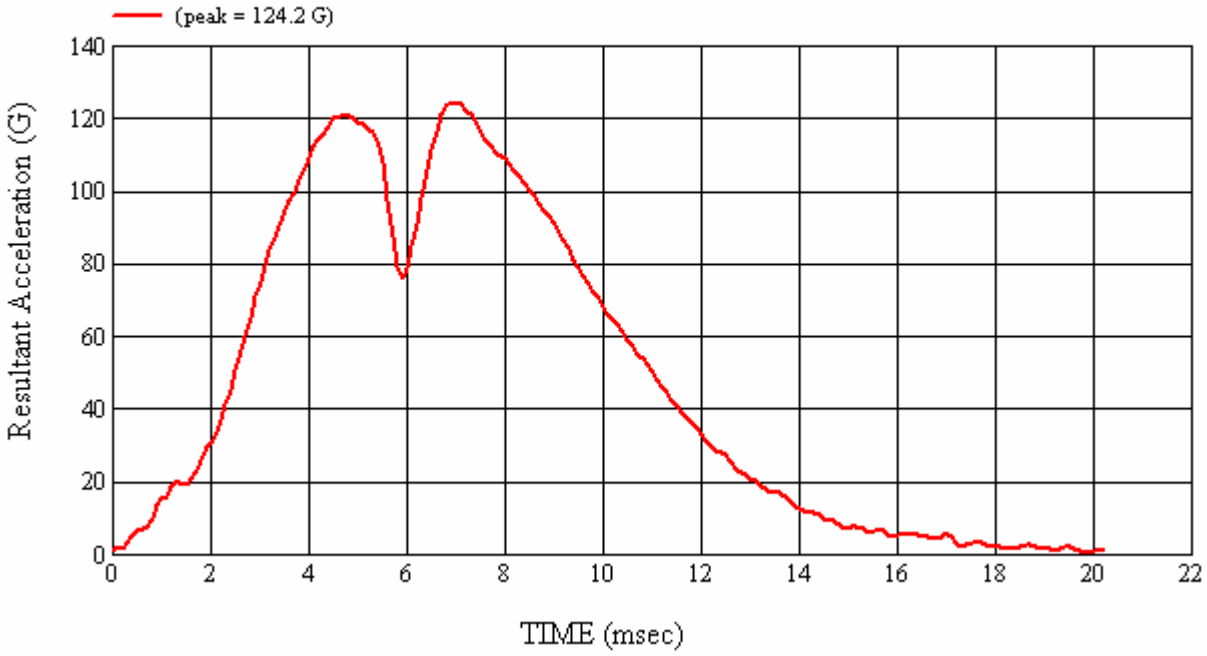
No visible damage.

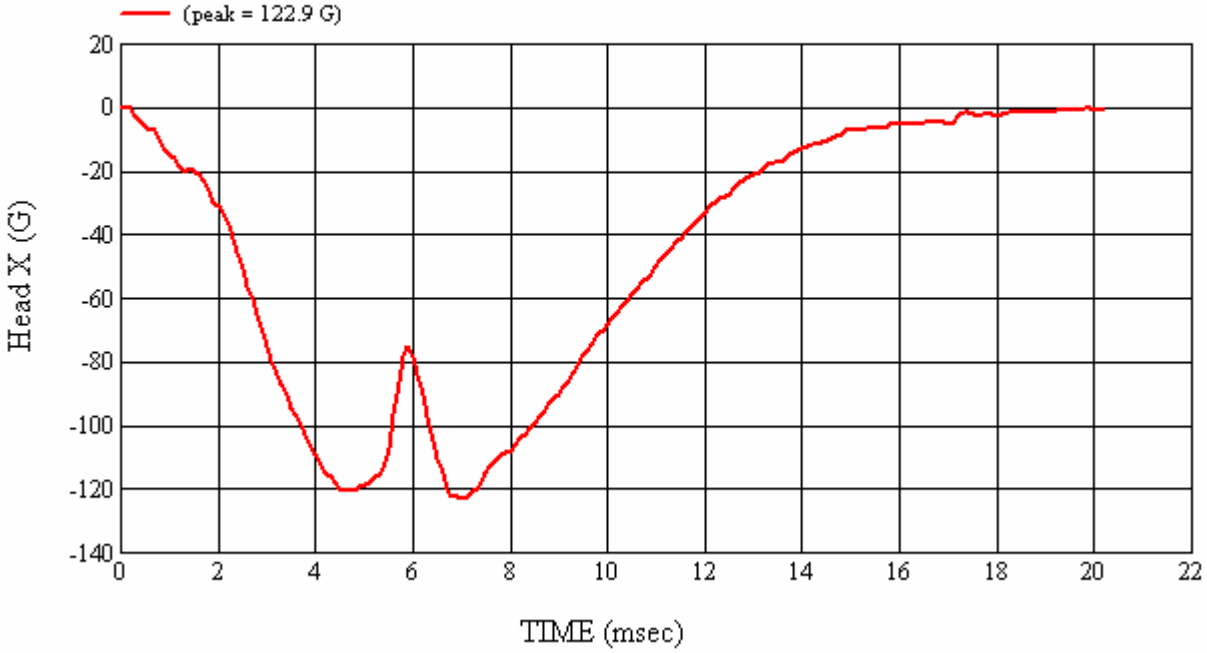
Recorded By: Travis Campbell Approved By*: Helen A. Kaleto Date: 7/26/2007

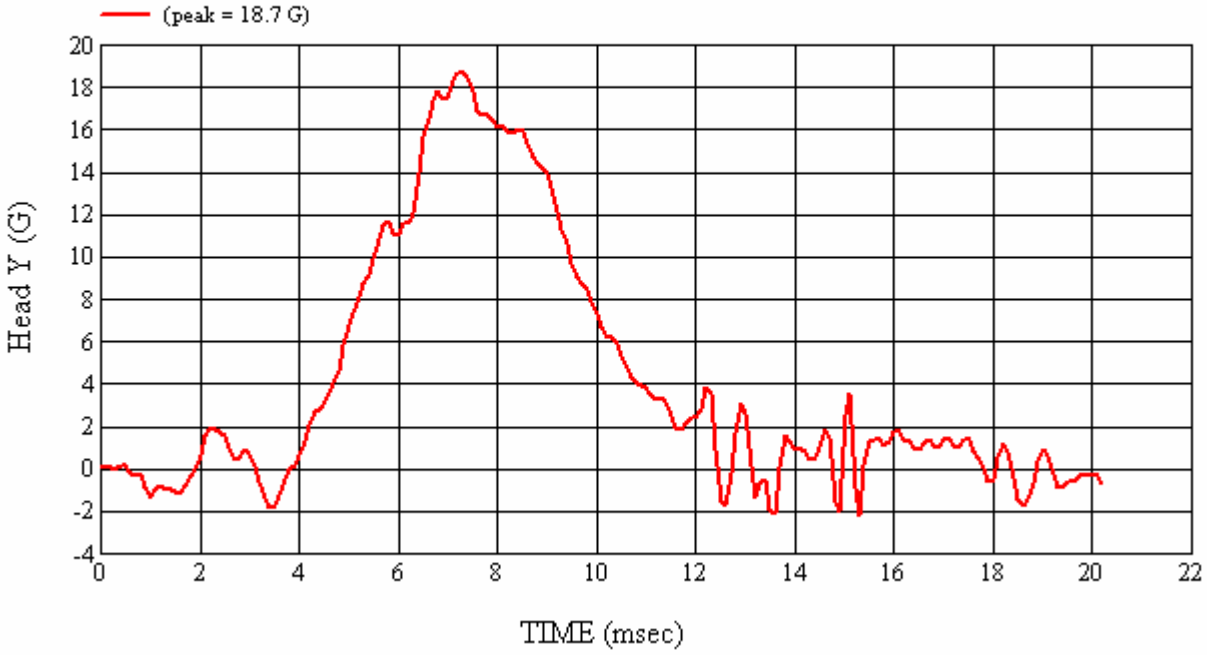
*Only necessary for NHTSA (Government) Compliance testing.

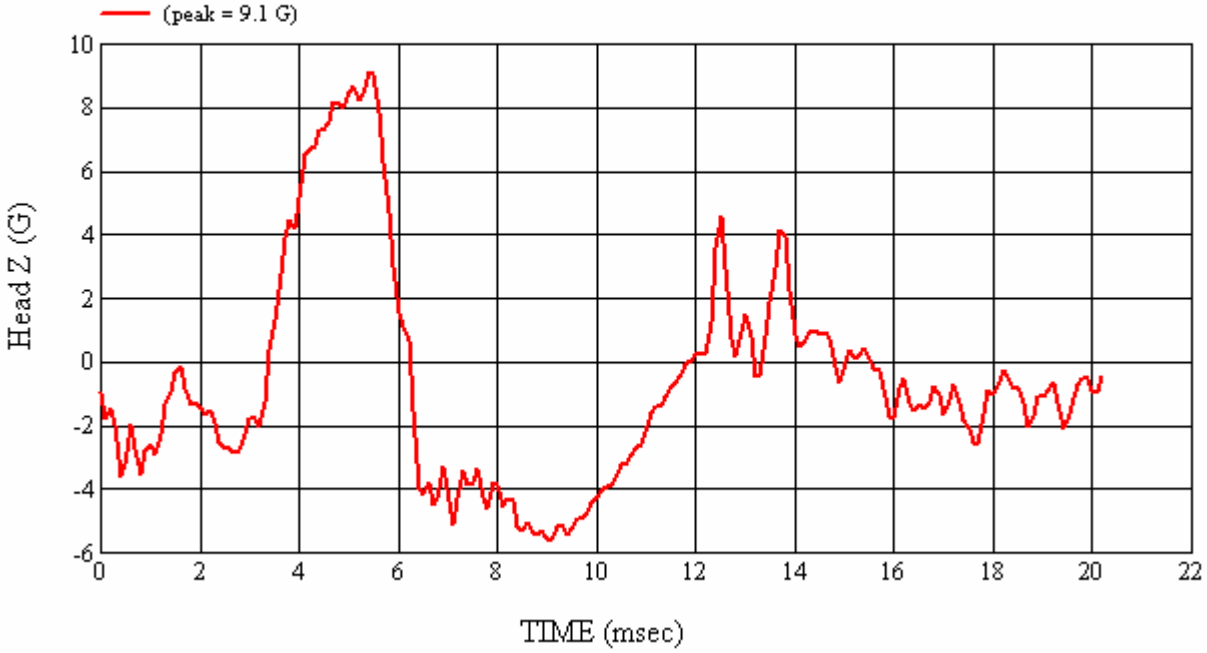
MGA Test #: FM7139 Target Location: BP3, Right Side Test Date: 7/26/2007

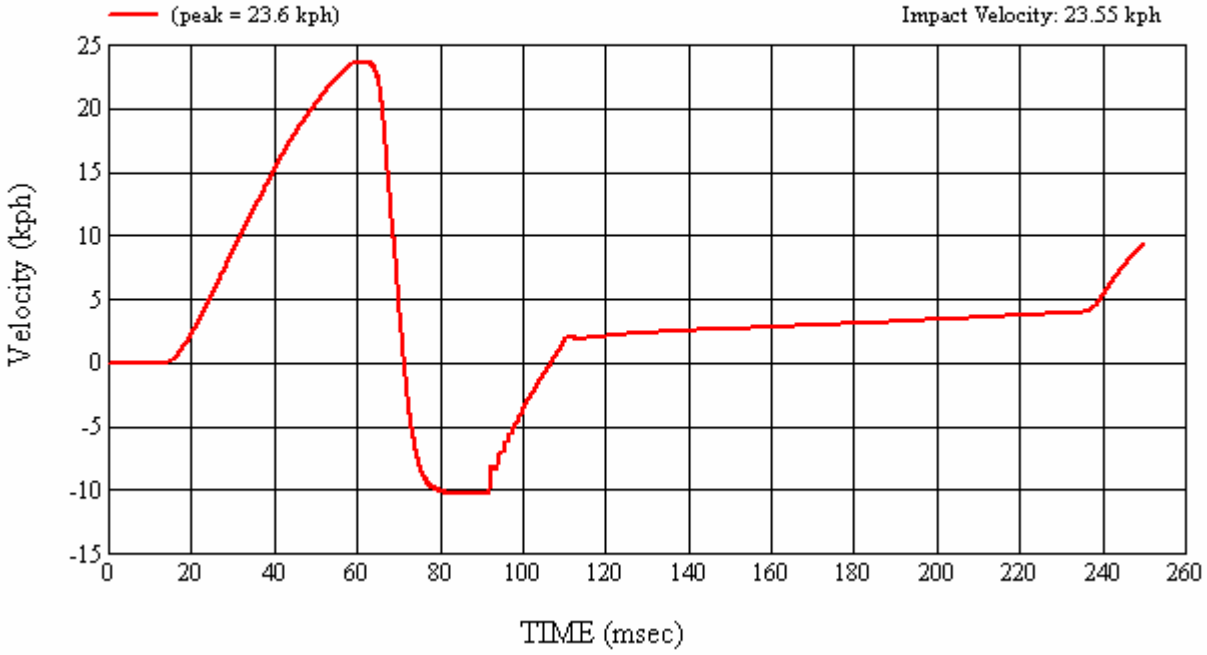


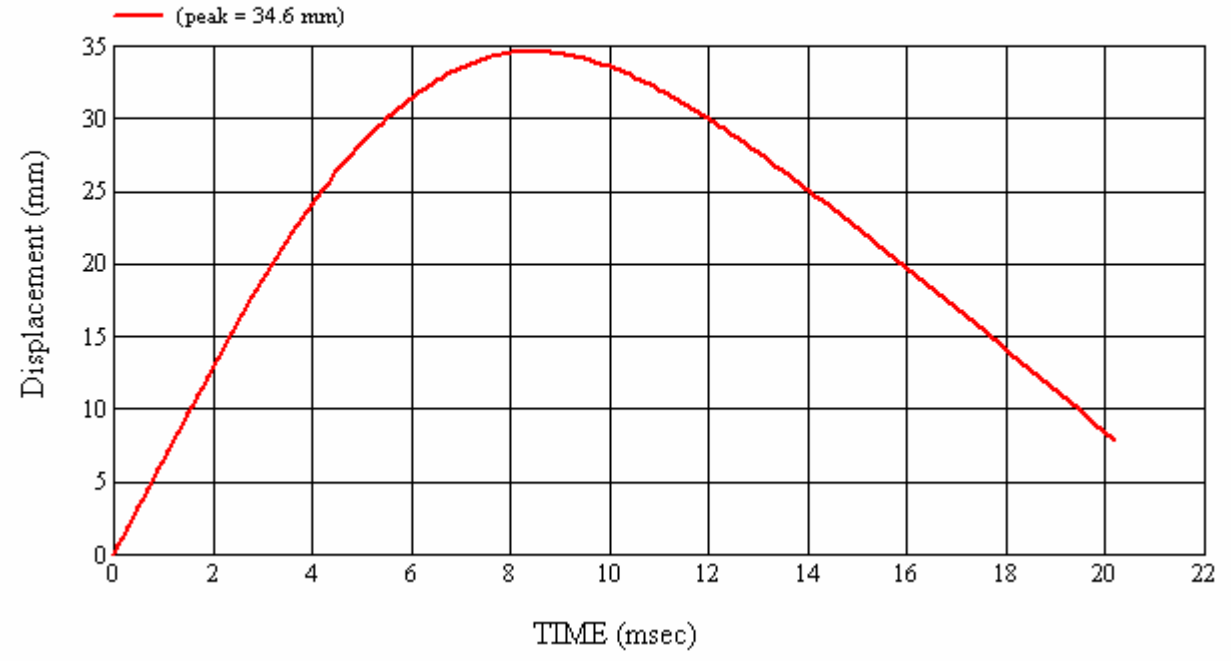



(peak = 122.9 G)
Head X (G)
20
0
-20
-40
-60
-80
-100
-120
-140
0
2
4
6
8
10
12
14
16
18
20
22
TIME (msec)


(peak = 18.7 G)
Head Y (G)
20
18
16
14
12
10
8
6
4
2
0
-2
-4
0
2
4
6
8
10
12
14
16
18
20
22
TIME (msec)


(peak = 9.1 G)
Head Z (G)
10
8
6
4
2
0
-2
-4
-6
0
2
4
6
8
10
12
14
16
18
20
22
TIME (msec)


(peak = 23.6 kph)
Impact Velocity: 23.55 kph
Velocity (kph)
25
20
15
10
5
0
-5
-10
-15
0
20
40
60
80
100
120
140
160
180
200
220
240
260
TIME (msec)


(peak = 34.6 mm)
Displacement (mm)
0
5
10
15
20
25
30
35
0
2
4
6
8
10
12
14
16
18
20
22
TIME (msec)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7/25/2007
Impact Testing
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #4 LEFT BP4
H/V IMPACT ANGLE= 225 / -1
FM7133
PRE TEST


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7/25/2007
Impact Testing
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #4 LEFT BP4
H/V IMPACT ANGLE= 225 / -1
FM7133
POST TEST


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7/25/2007
Impact Testing
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #4 LEFT BP4
H/V IMPACT ANGLE= 225 / -1
FM7133
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G07I7-001.1 VEHICLE YR/MAKE/MODEL:2007/NHTSA/Nissan Altima

GENERAL TEST PARAMETERS:

Test Number:#4

Target (Vehicle Side): BP4 Left

Temperature:21C

MGA Test Reference No.:FM7133

Humidity:40%

Approach Horizontal Angles:225º

Time of Test:10:06:44 AM

Approach Vertical Angles:-1º

FMH Serial No:[038]

Additional Description:

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
648	638	7.9	23.7	9	6 Right

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J14103	-94.598	0.78	0.78
Y	6	J36197	110.692	0.80	0.80
Z	7	J36353	99.391	0.81	0.81

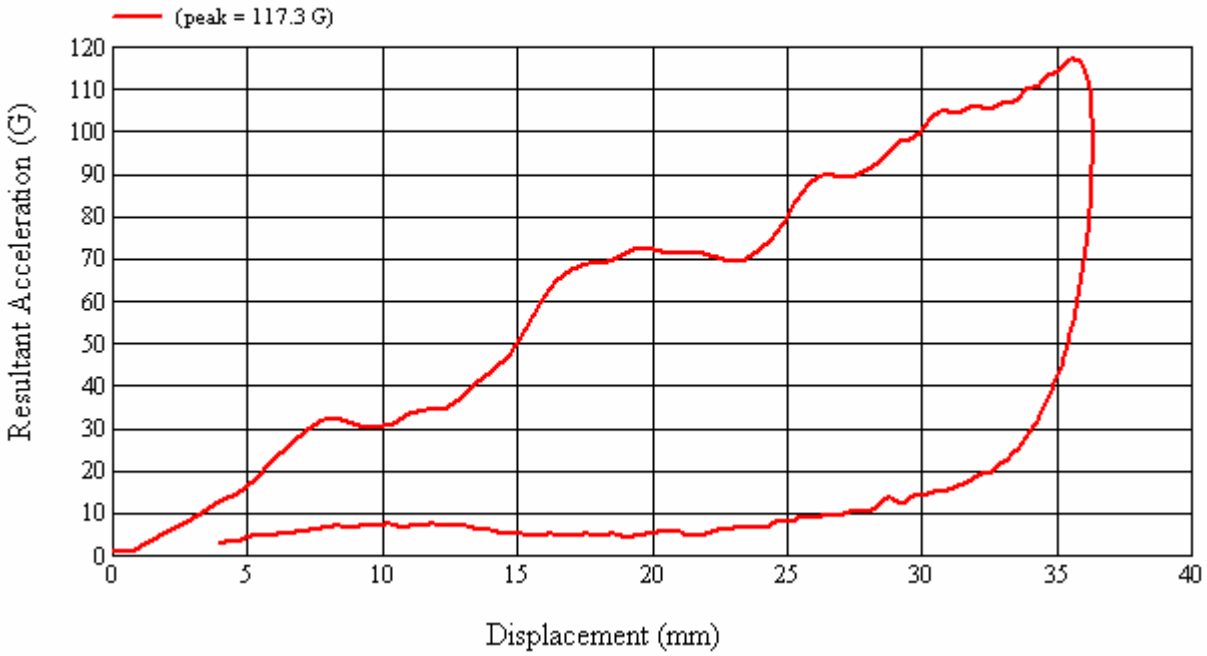
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

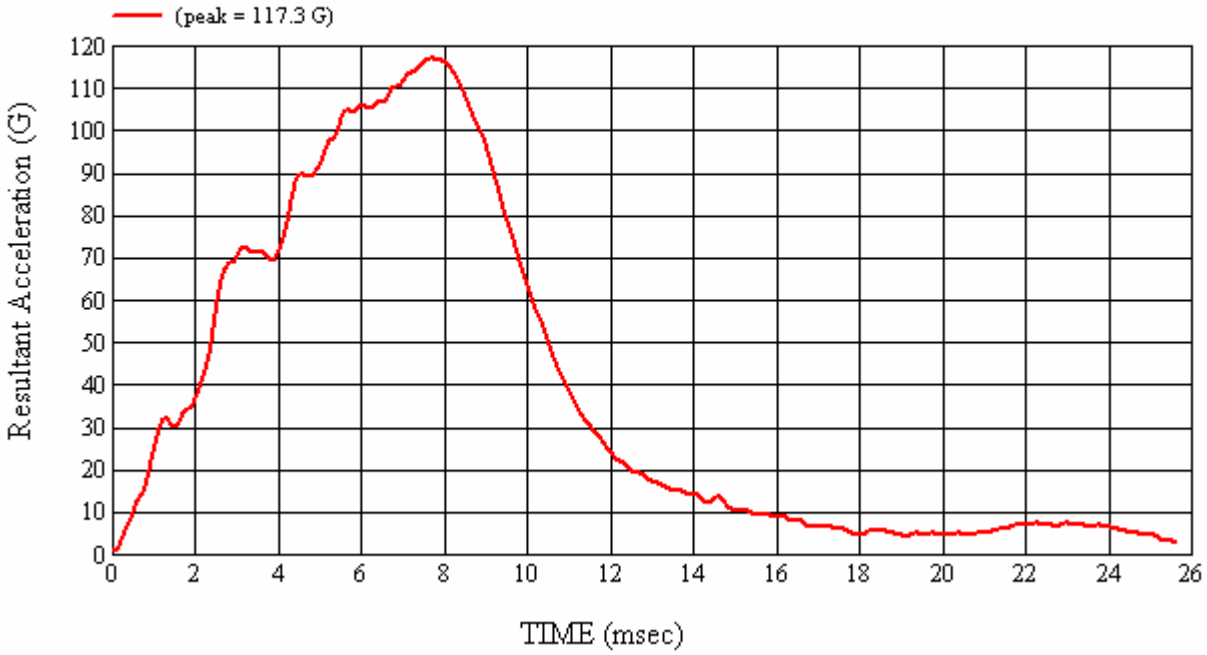
No visible damage.

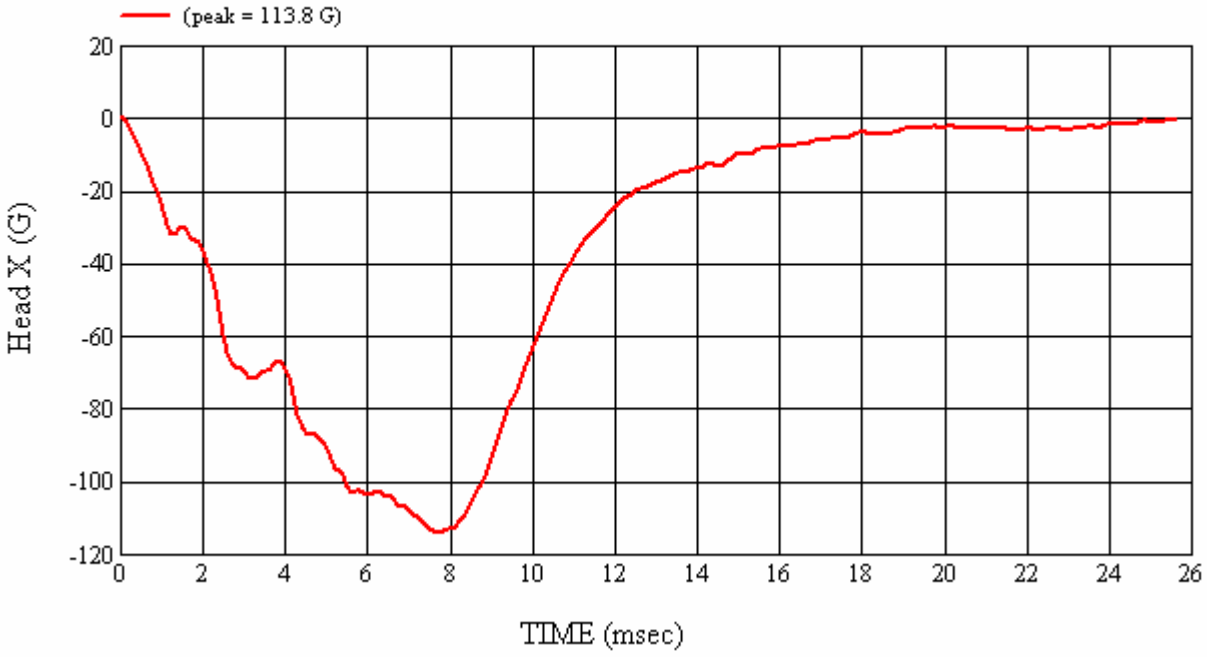
Recorded By: Kevin Campbell Approved By*: Eileen A. Kaleto Date: 7/25/2007

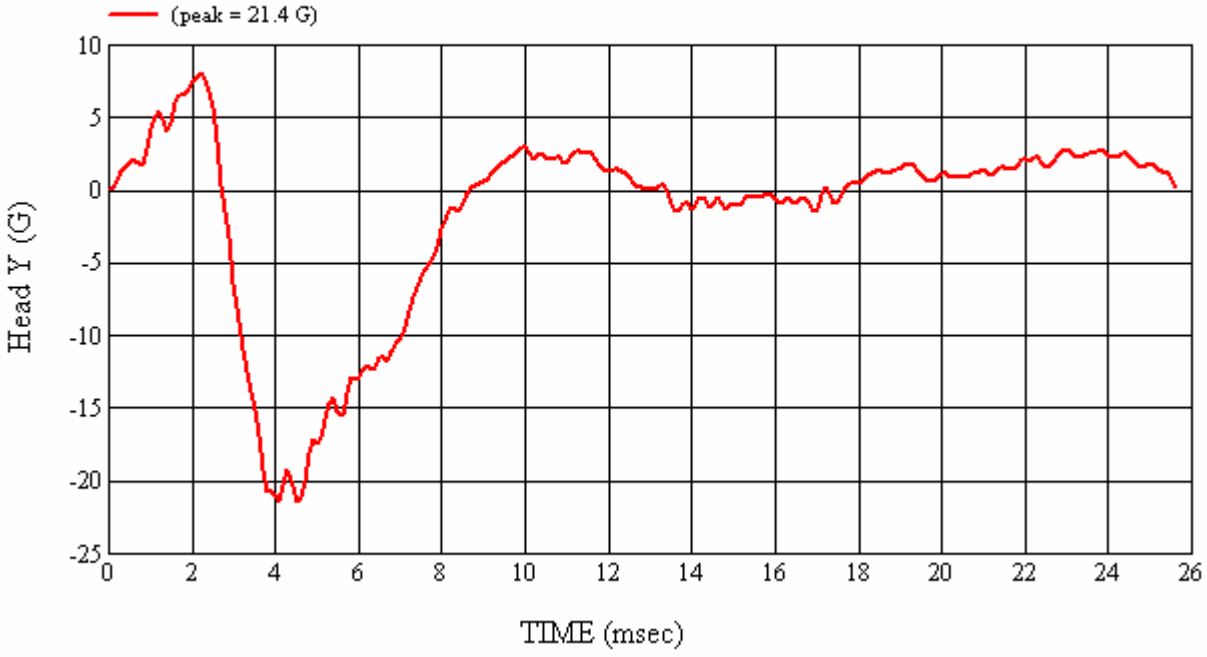
*Only necessary for NHTSA (Government) Compliance testing.

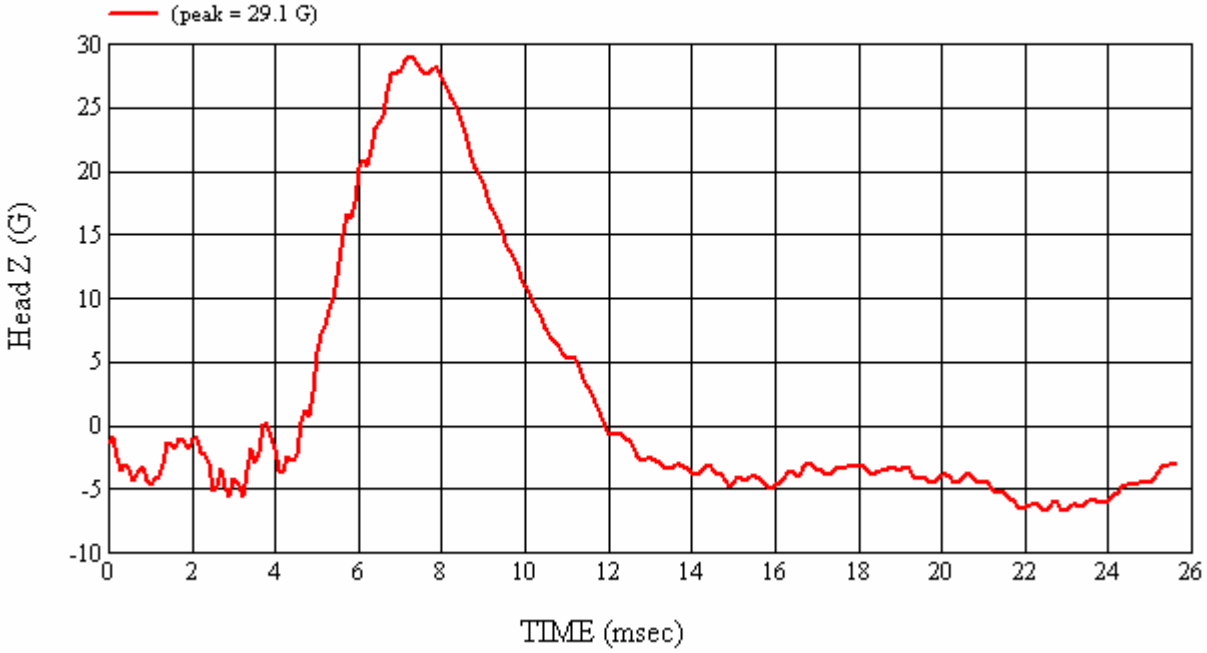
MGA Test #: FM7133 Target Location: BP4, Left Side Test Date: 7/25/2007

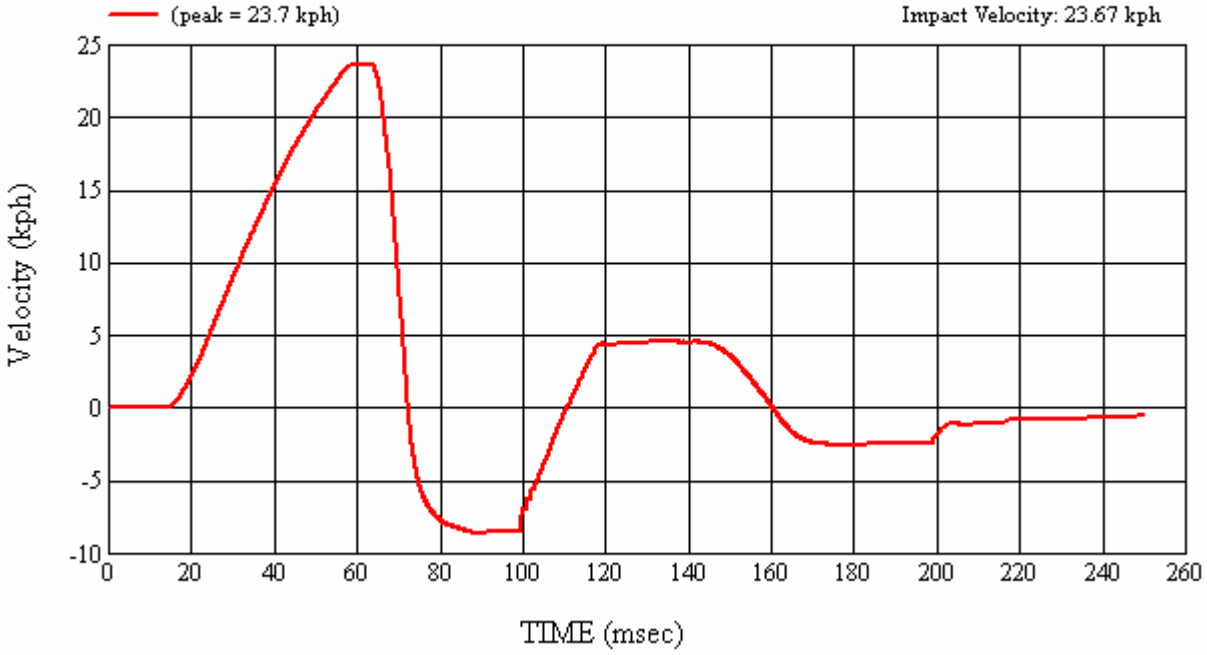


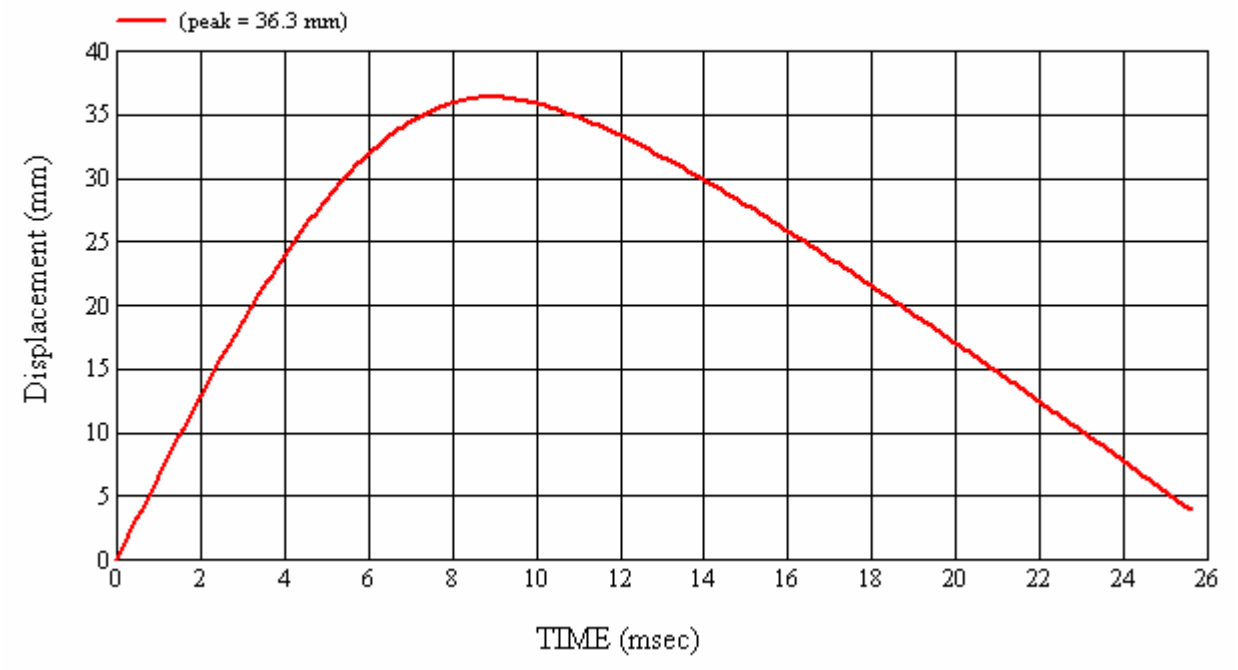



(peak = 113.8 G)
Head X (G)
20
0
-20
-40
-60
-80
-100
-120
0
2
4
6
8
10
12
14
16
18
20
22
24
26
TIME (msec)


(peak = 21.4 G)
Head Y (G)
10
5
0
-5
-10
-15
-20
-25
0
2
4
6
8
10
12
14
16
18
20
22
24
26
TIME (msec)


(peak = 29.1 G)
Head Z (G)
30
25
20
15
10
5
0
-5
-10
0
2
4
6
8
10
12
14
16
18
20
22
24
26
TIME (msec)


(peak = 23.7 kph)
Impact Velocity: 23.67 kph
Velocity (kph)
25
20
15
10
5
0
-5
-10
0
20
40
60
80
100
120
140
160
180
200
220
240
260
TIME (msec)


(peak = 36.3 mm)
Displacement (mm)
0
5
10
15
20
25
30
35
40
0
2
4
6
8
10
12
14
16
18
20
22
24
26
TIME (msec)


mga
Impact Testing
7/24/2007
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #2 LEFT FH1
H/V IMPACT ANGLE= 180 / 50
FM7131
PRE TEST
C75202
FM7131
LEFT FH1
H/V 180/50


mga
7/24/2007
Impact Testing
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #2 LEFT FH1
H/V IMPACT ANGLE= 180 / 50
FM7131
POST-TEST


mga
7/24/2007
Impact Testing
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #2 LEFT FH1
H/V IMPACT ANGLE= 180 / 50
FM7131
POST-TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G07I7-001.1 VEHICLE YR/MAKE/MODEL:2007/NHTSA/Nissan Altima

GENERAL TEST PARAMETERS:

Test Number:#2

Target (Vehicle Side): FH1 Left

Temperature:21C

MGA Test Reference No.:FM7131

Humidity:40%

Approach Horizontal Angles:180º

Time of Test:3:29:39 PM

Approach Vertical Angles:50º

FMH Serial No:[036]

Additional Description:

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
584	554	7.1	24.0	21	2 Right

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J21969	-90.883	0.78	0.78
Y	6	J35916	103.15	0.80	0.80
Z	7	J35918	99.409	0.81	0.81

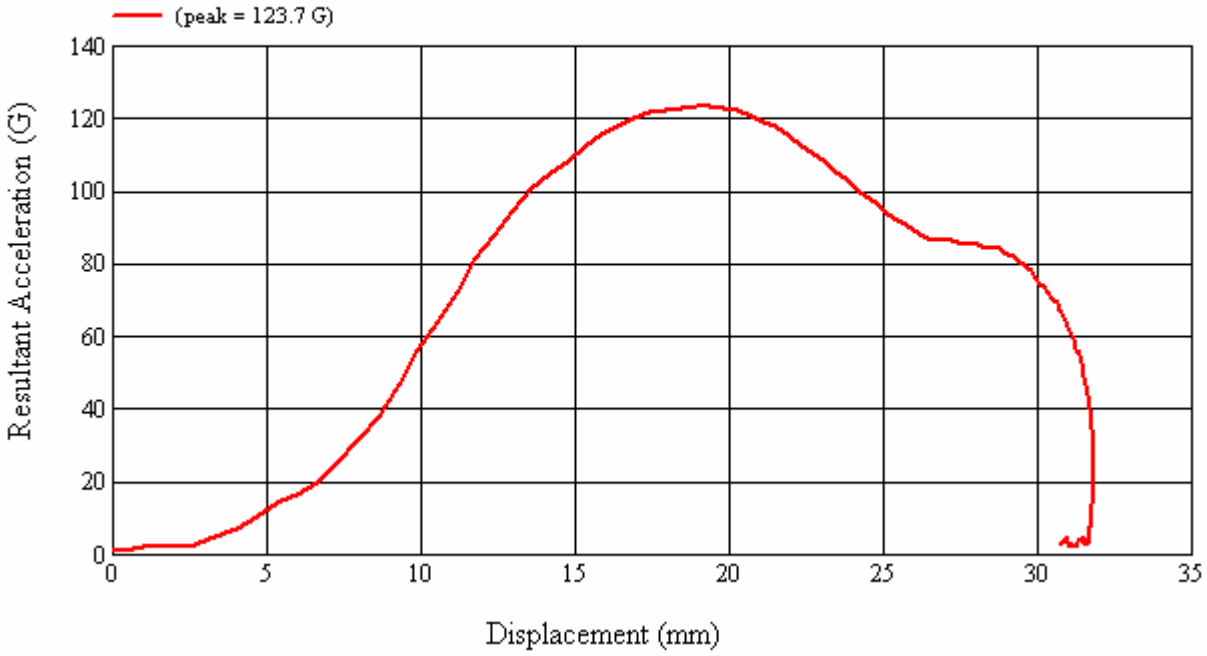
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

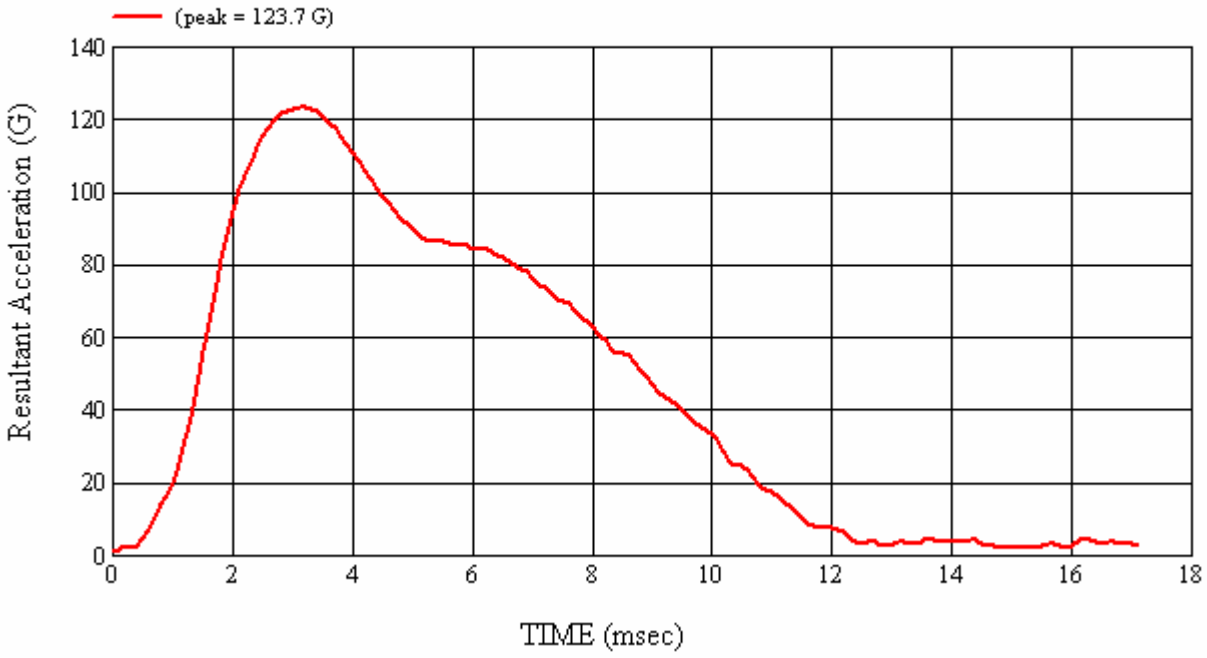
No visible damage.

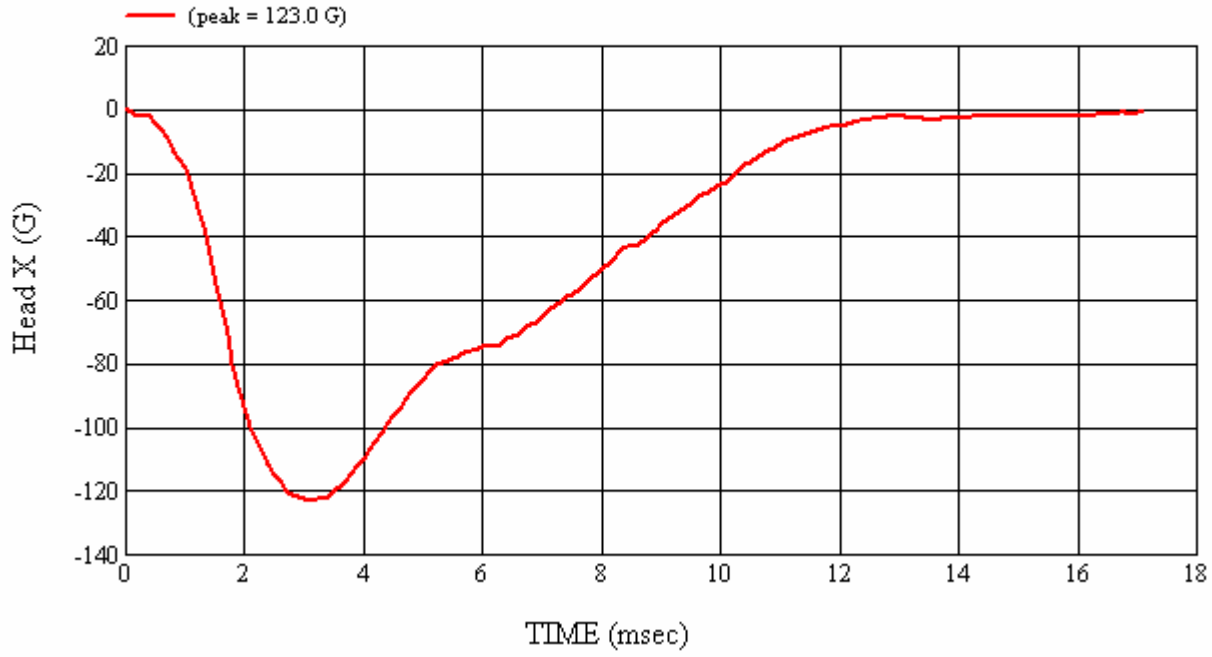
Recorded By: _____ Approved By*: _____ Date: 7/24/2007

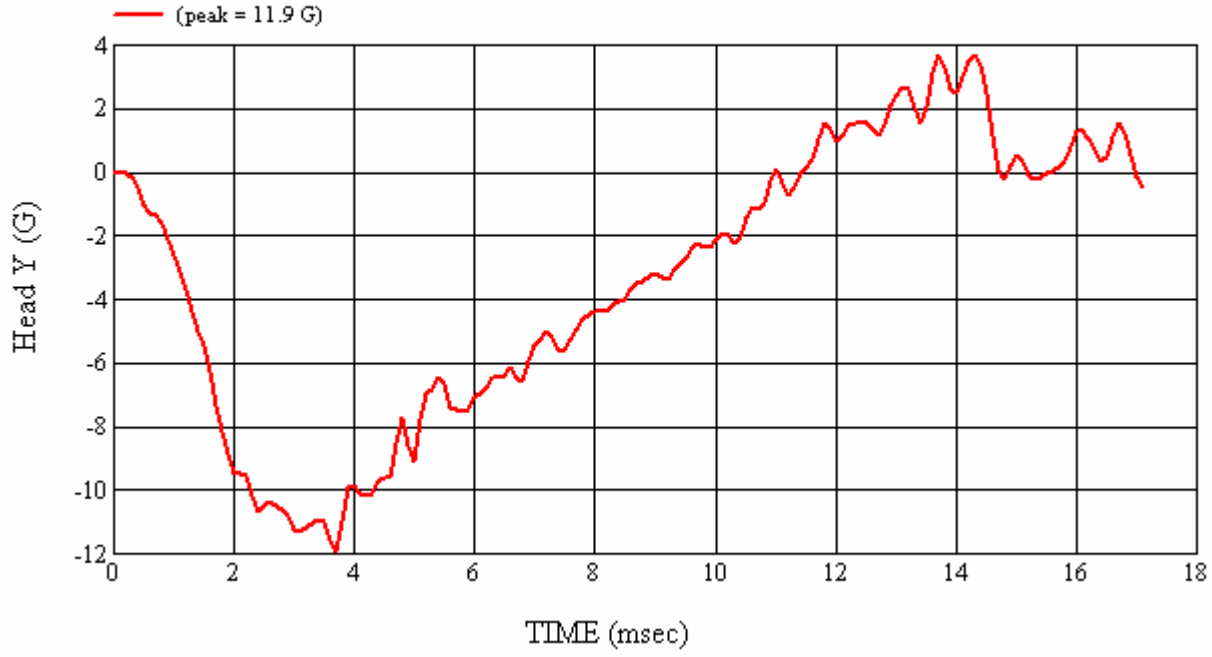
*Only necessary for NHTSA (Government) Compliance testing.

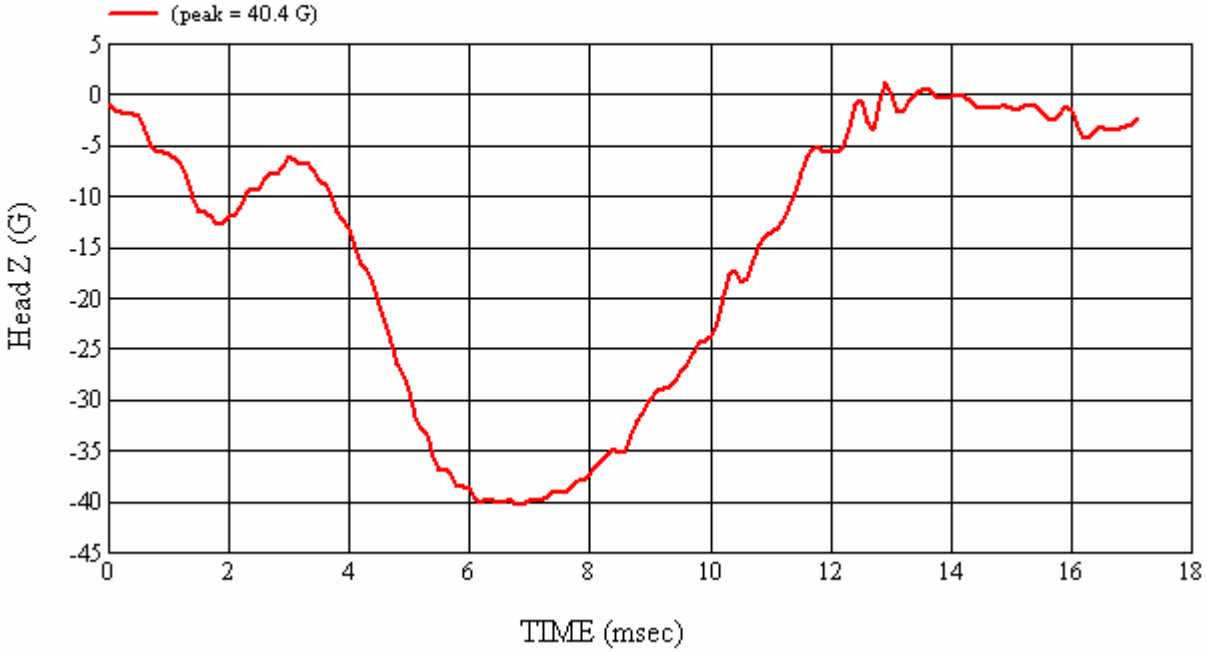
MGA Test #: FM7131 Target Location: FH1, Left Side Test Date: 7/24/2007

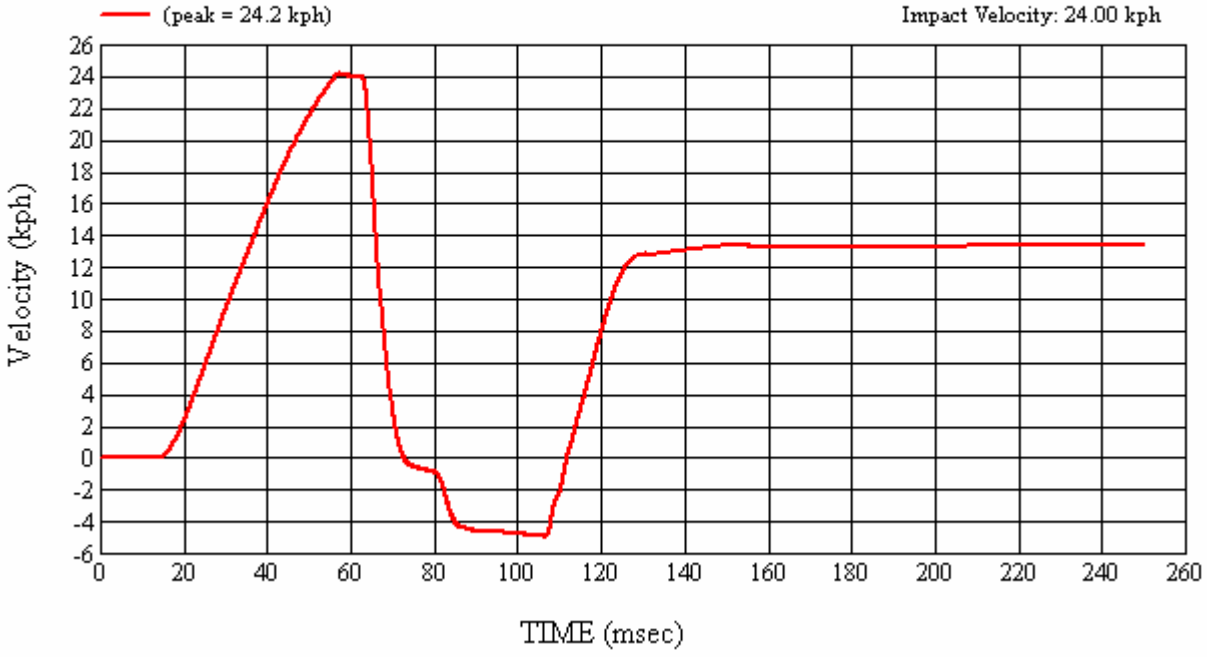


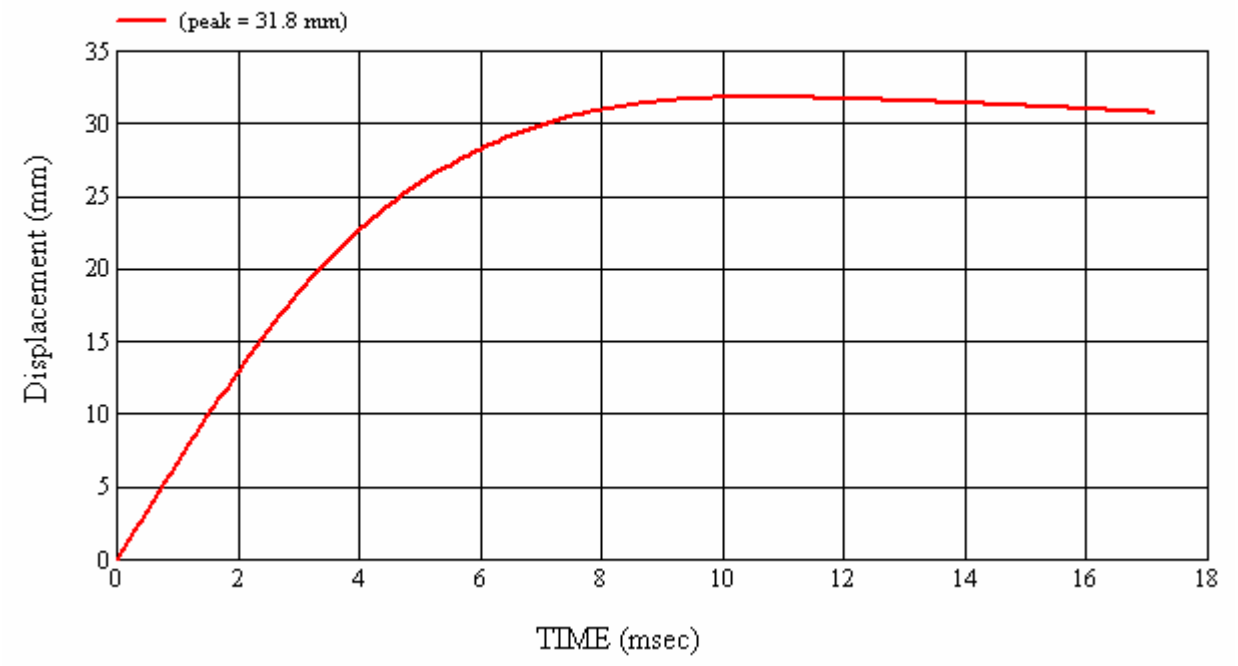



(peak = 123.0 G)
Head X (G)
20
0
-20
-40
-60
-80
-100
-120
-140
0
2
4
6
8
10
12
14
16
18
TIME (msec)


(peak = 11.9 G)
Head Y (G)
4
2
0
-2
-4
-6
-8
-10
-12
0
2
4
6
8
10
12
14
16
18
TIME (msec)


(peak = 40.4 G)
Head Z (G)
5
0
-5
-10
-15
-20
-25
-30
-35
-40
-45
0
2
4
6
8
10
12
14
16
18
TIME (msec)


(peak = 24.2 kph)
Impact Velocity: 24.00 kph
Velocity (kph)
26
24
22
20
18
16
14
12
10
8
6
4
2
0
-2
-4
-6
0
20
40
60
80
100
120
140
160
180
200
220
240
260
TIME (msec)


(peak = 31.8 mm)
Displacement (mm)
TIME (msec)
0
5
10
15
20
25
30
35
0
2
4
6
8
10
12
14
16
18


C75202
FM7138
mga
7/26/2007
Impact Testing
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #9 RIGHT SR1
H/V IMPACT ANGLE= 90 / 22
FM7138
PRE TEST


C75202
FM7138
RIGHT SR1
H/V 90/22
BRAKE STOPS
mga
Impact Testing
7/26/2007
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #9 RIGHT SR1
H/V IMPACT ANGLE= 90 / 22
FM7138
POST TEST


mga
Impact Testing
7/26/2007
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #9 RIGHT SR1
H/V IMPACT ANGLE= 90 / 22
FM7138
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G07I7-001.1 VEHICLE YR/MAKE/MODEL:2007/NHTSA/Nissan Altima

GENERAL TEST PARAMETERS:

Test Number:#9

Target (Vehicle Side): SR1 Right

Temperature:21C

MGA Test Reference No.:FM7138

Humidity:42%

Approach Horizontal Angles:90º

Time of Test:10:38:50 AM

Approach Vertical Angles:22º

FMH Serial No:[035]

Additional Description:Relocated

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
432	352	5.9	19.0	29	18 Left

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J22664	-94.161	0.78	0.78
Y	6	J35919	97.442	0.80	0.80
Z	7	J35924	93.891	0.81	0.81

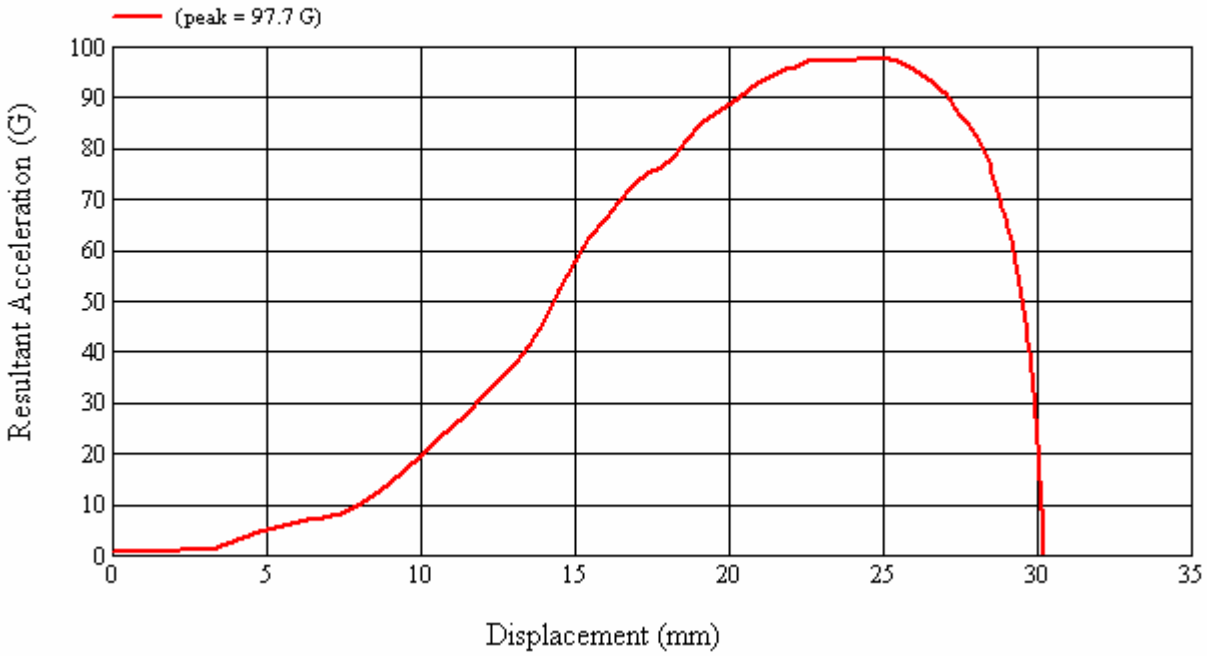
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

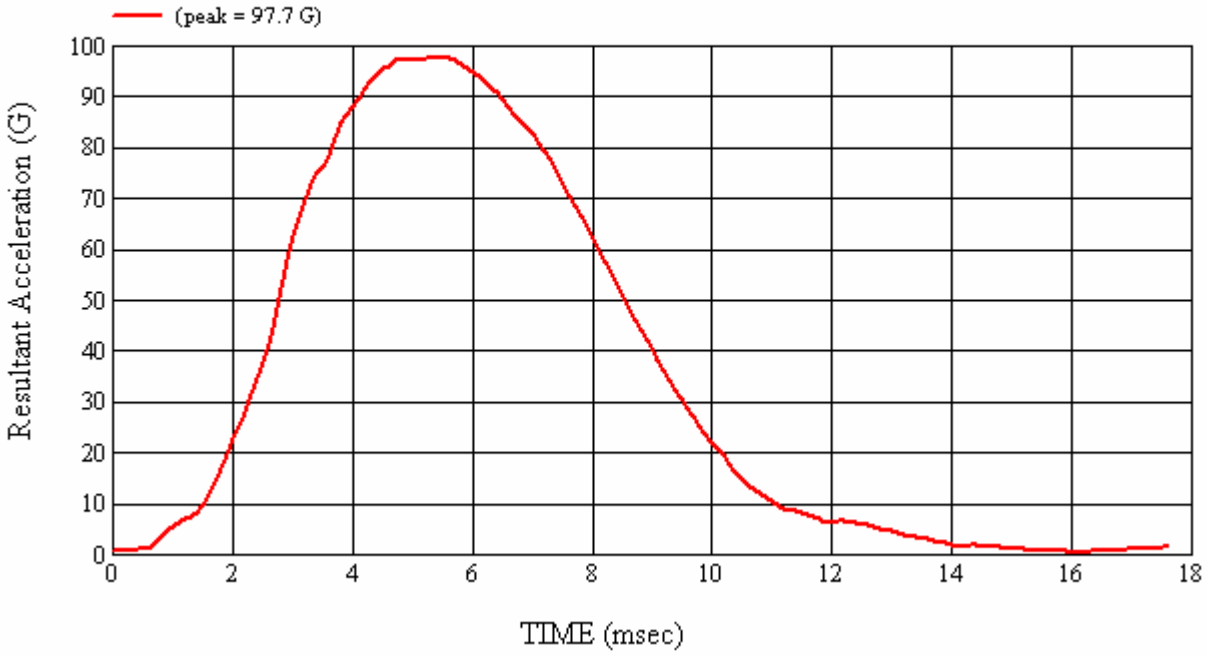
Grab handle pushed in.

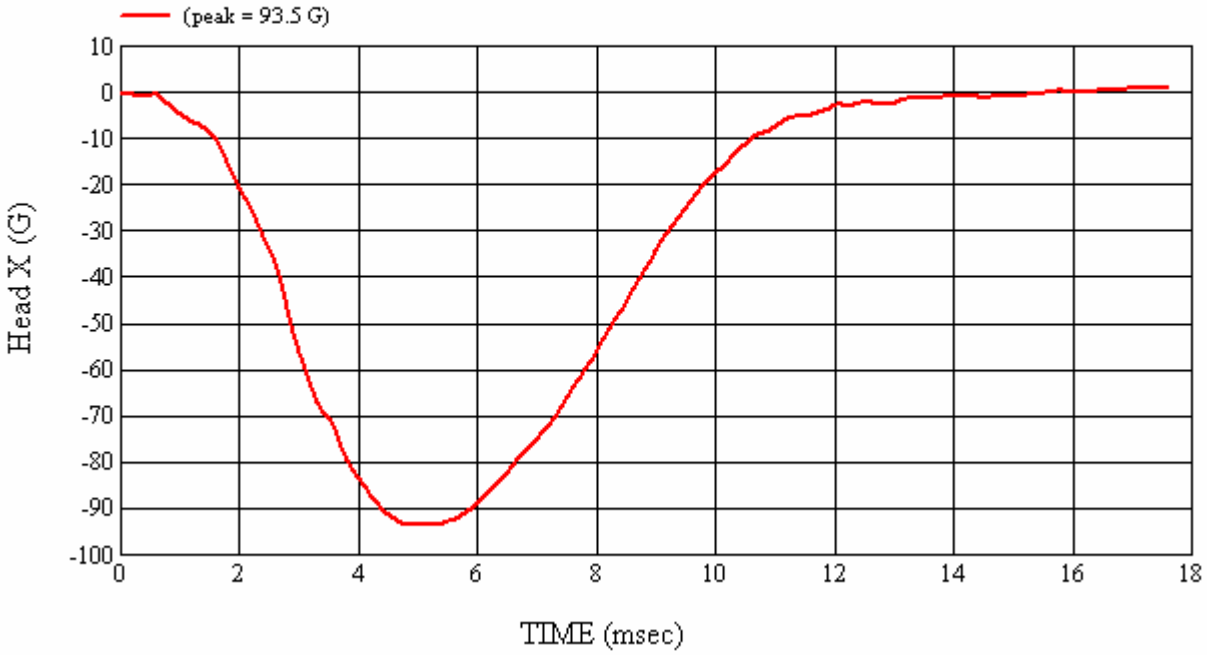
Recorded By: _____ Approved By*: _____ Date: 7/26/2007

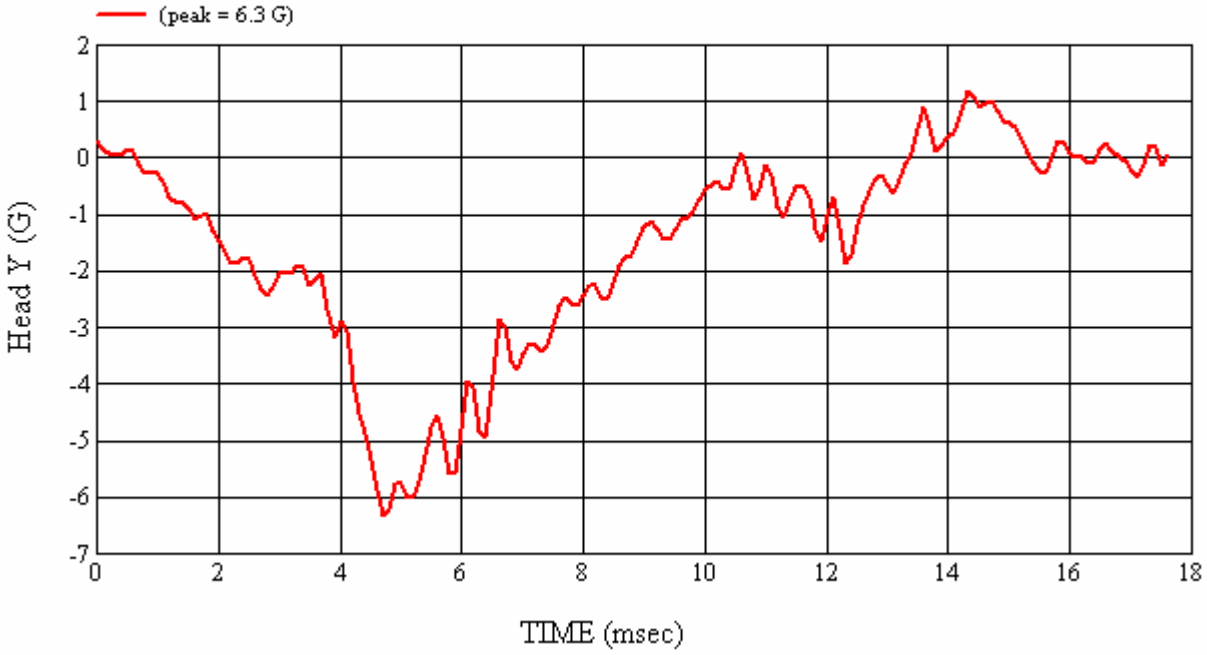
*Only necessary for NHTSA (Government) Compliance testing.

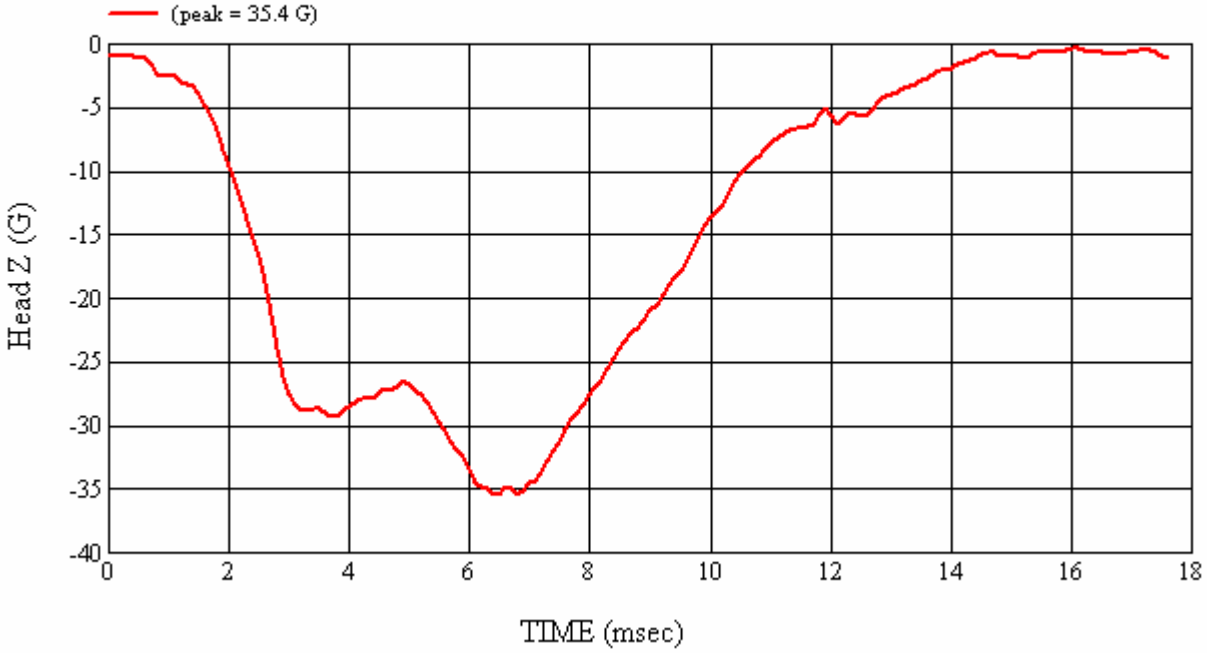
MGA Test #: FM7138 Target Location: SR1, Right Side Test Date: 7/26/2007

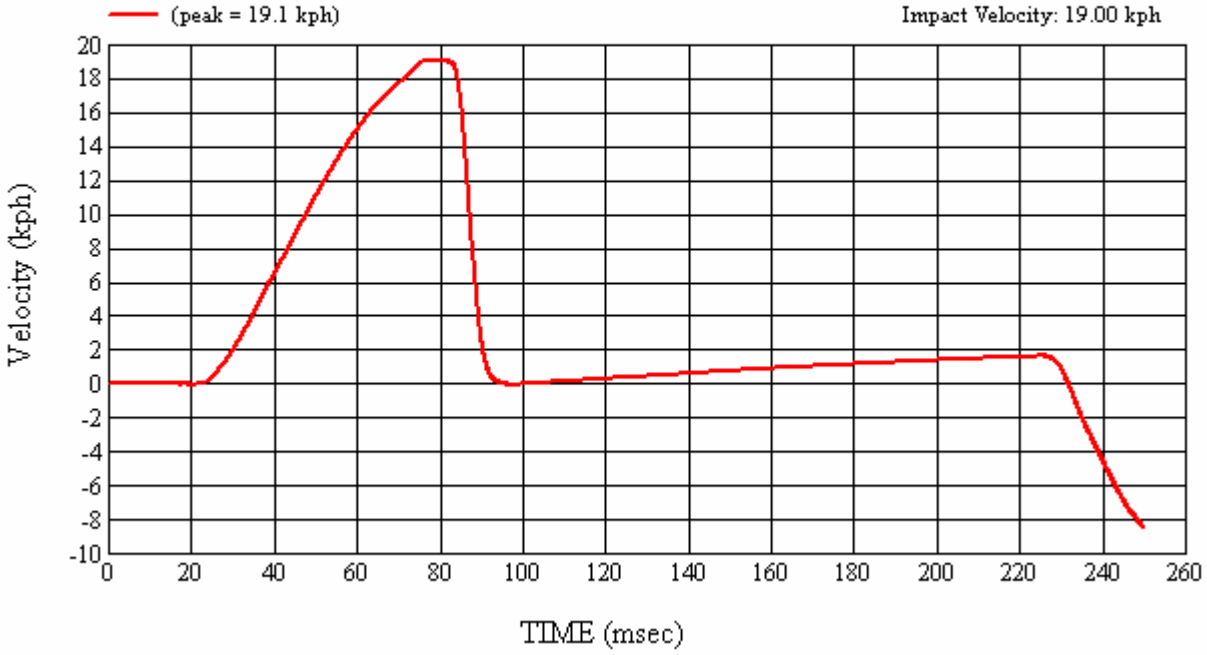


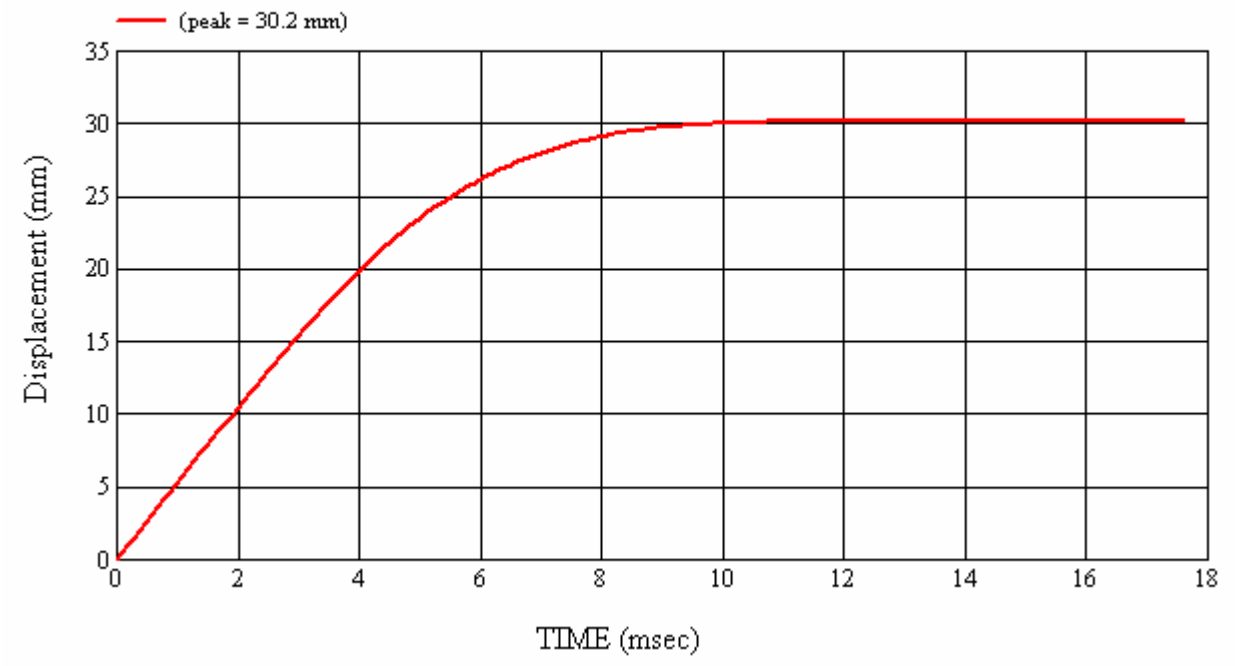


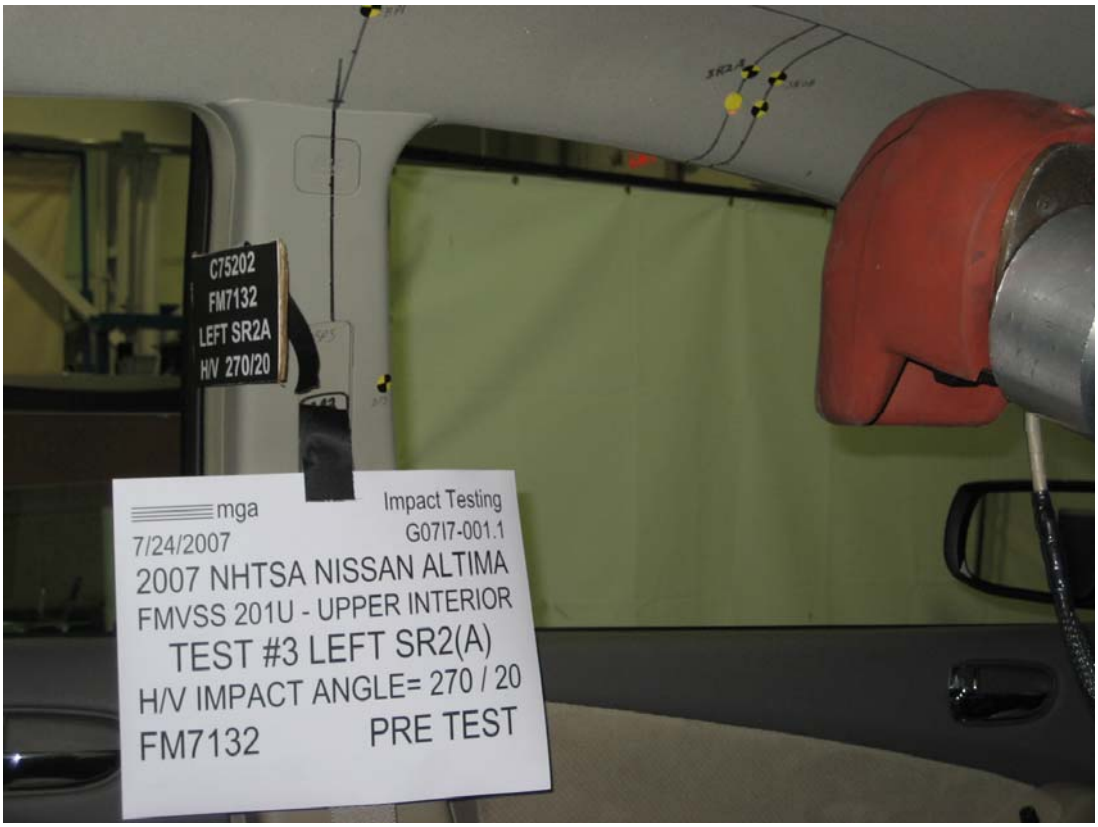

(peak = 93.5 G)
Head X (G)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
0
2
4
6
8
10
12
14
16
18
TIME (msec)

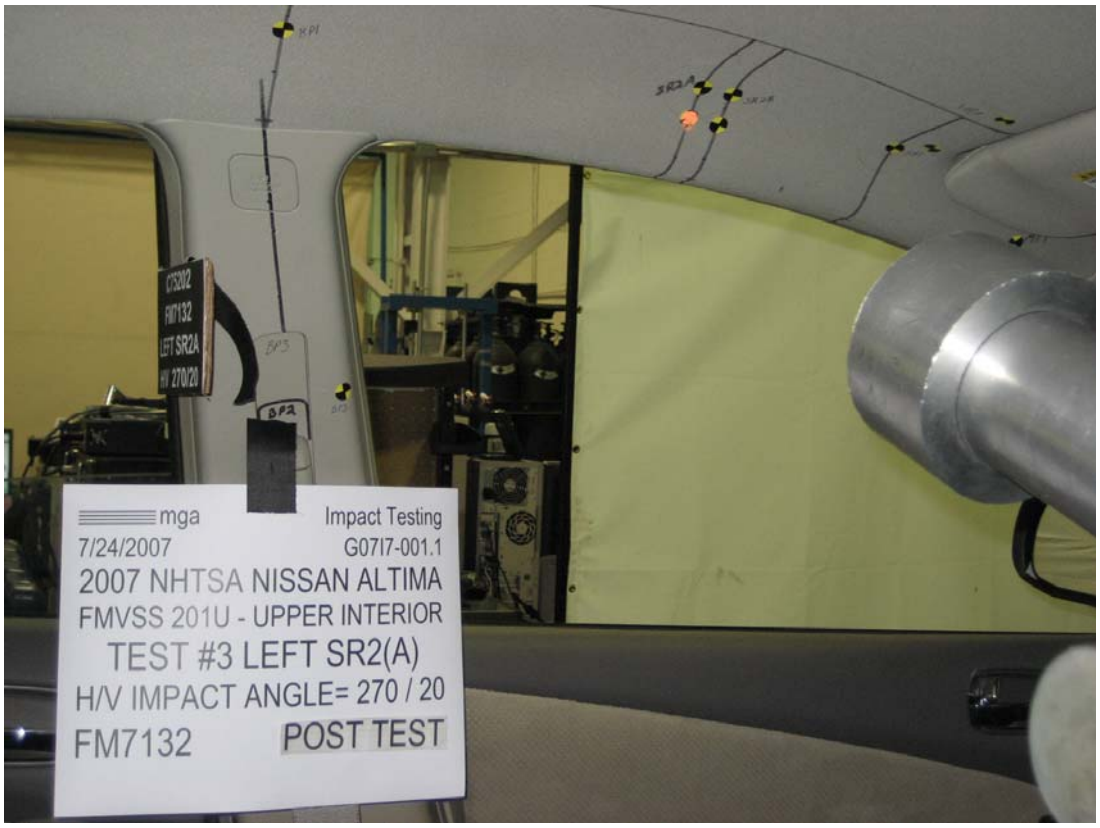

(peak = 6.3 G)
Head Y (G)
2
1
0
-1
-2
-3
-4
-5
-6
-7
0
2
4
6
8
10
12
14
16
18
TIME (msec)


(peak = 35.4 G)
Head Z (G)
0
-5
-10
-15
-20
-25
-30
-35
-40
0
2
4
6
8
10
12
14
16
18
TIME (msec)


(peak = 19.1 kph)
Impact Velocity: 19.00 kph
Velocity (kph)
20
18
16
14
12
10
8
6
4
2
0
-2
-4
-6
-8
-10
0
20
40
60
80
100
120
140
160
180
200
220
240
260
TIME (msec)


(peak = 30.2 mm)
Displacement (mm)
TIME (msec)
0
5
10
15
20
25
30
35
0
2
4
6
8
10
12
14
16
18


C75202
FM7132
LEFT SR2A
H/V 270/20
mga
Impact Testing
G07I7-001.1
7/24/2007
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #3 LEFT SR2(A)
H/V IMPACT ANGLE= 270 / 20
FM7132
PRE TEST


C75202
FM7132
LEFT SR2A
H/V 270/20
mga
Impact Testing
7/24/2007
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #3 LEFT SR2(A)
H/V IMPACT ANGLE= 270 / 20
FM7132
POST TEST


mga
Impact Testing
7/24/2007
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #3 LEFT SR2(A)
H/V IMPACT ANGLE= 270 / 20
FM7132
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G07I7-001.1 VEHICLE YR/MAKE/MODEL:2007/NHTSA/Nissan Altima

GENERAL TEST PARAMETERS:

Test Number:#3

Target (Vehicle Side): SR2(a) Left

Temperature:21C

MGA Test Reference No.:FM7132

Humidity:40%

Approach Horizontal Angles:270º

Time of Test:4:50:03 PM

Approach Vertical Angles:20º

FMH Serial No:[037]

Additional Description: Relocated

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
321	205	8.3	18.2	35	5 Right

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J22696	-100.013	0.78	0.78
Y	6	J35791	91.856	0.80	0.80
Z	7	J35800	97.996	0.81	0.81

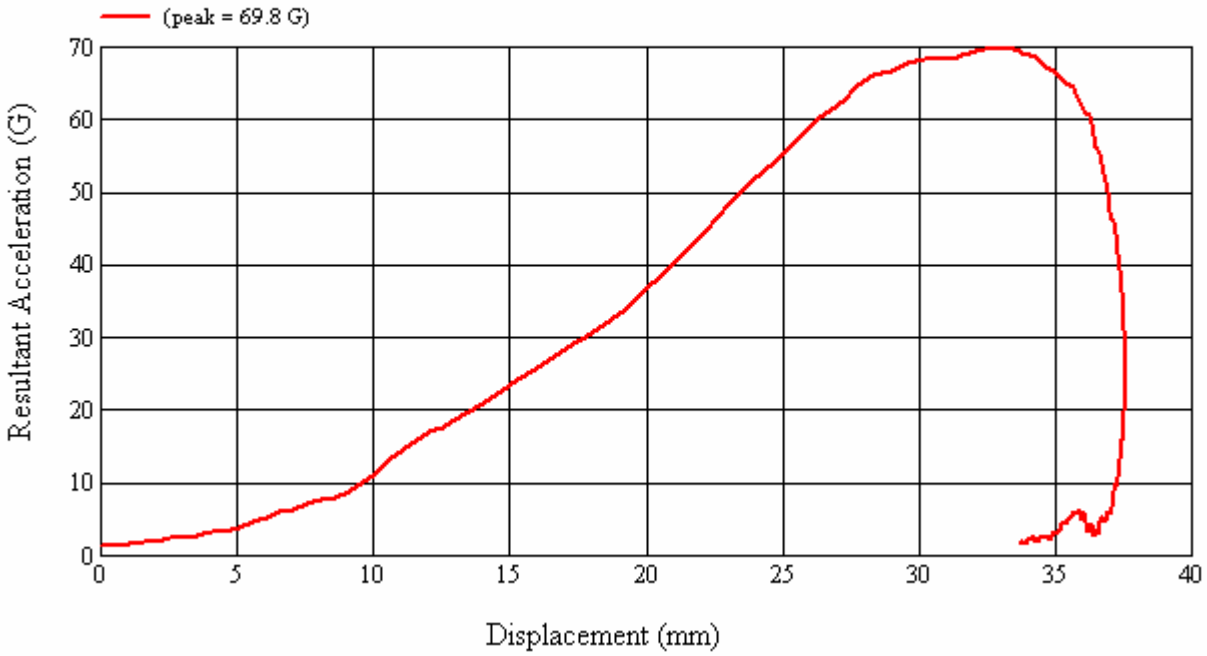
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

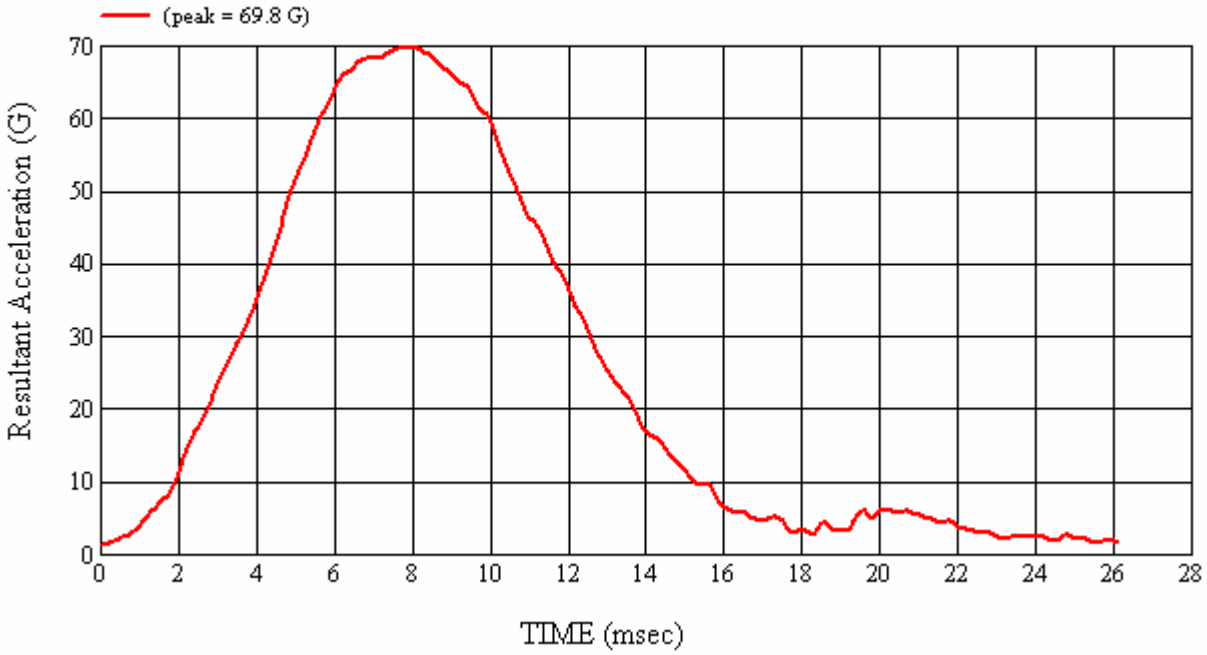
No visible damage.

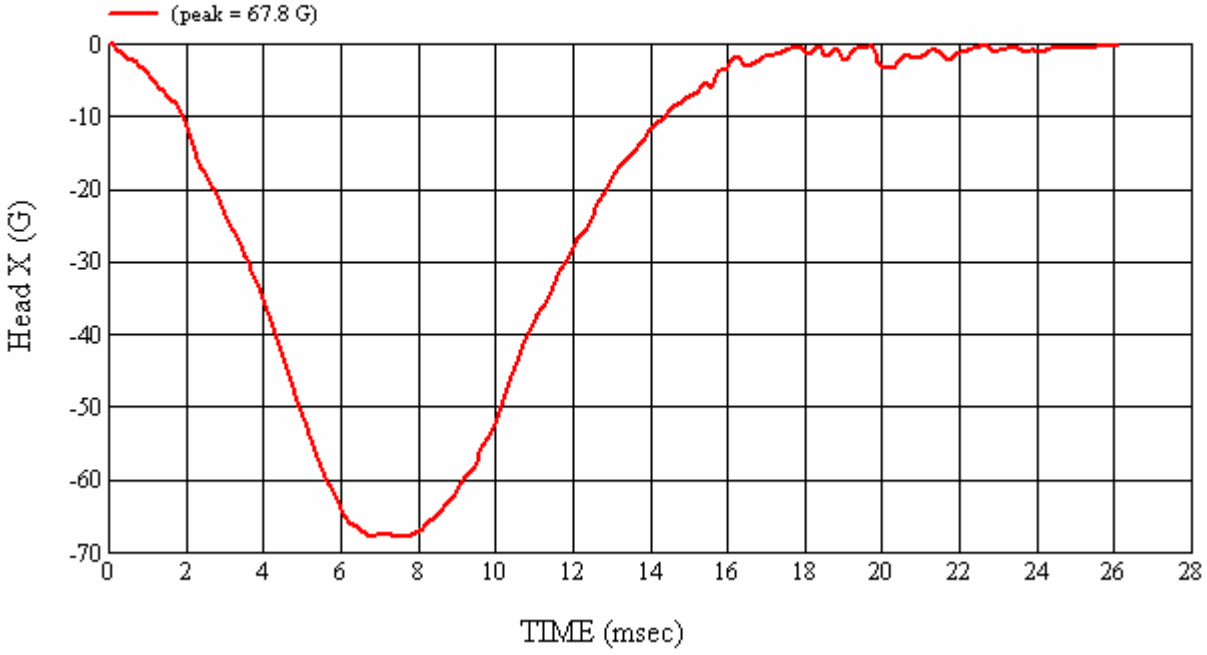
Recorded By: Kevin Campbell Approved By*: Eileen A. Kaleto Date: 7/24/2007

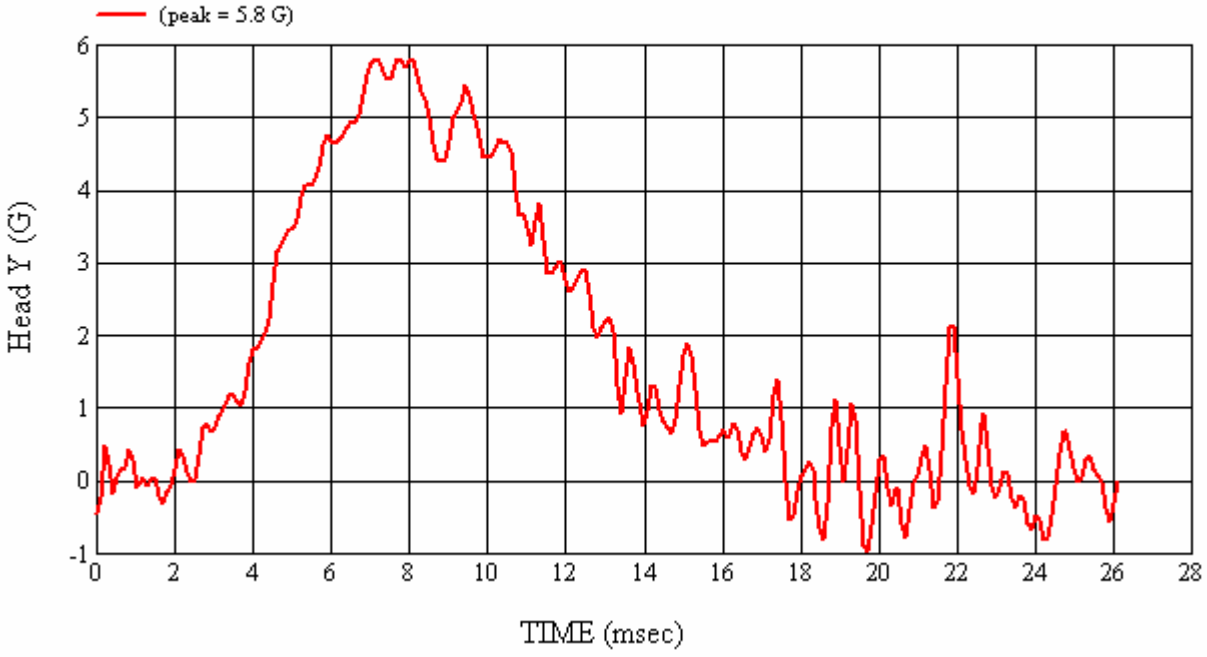
*Only necessary for NHTSA (Government) Compliance testing.

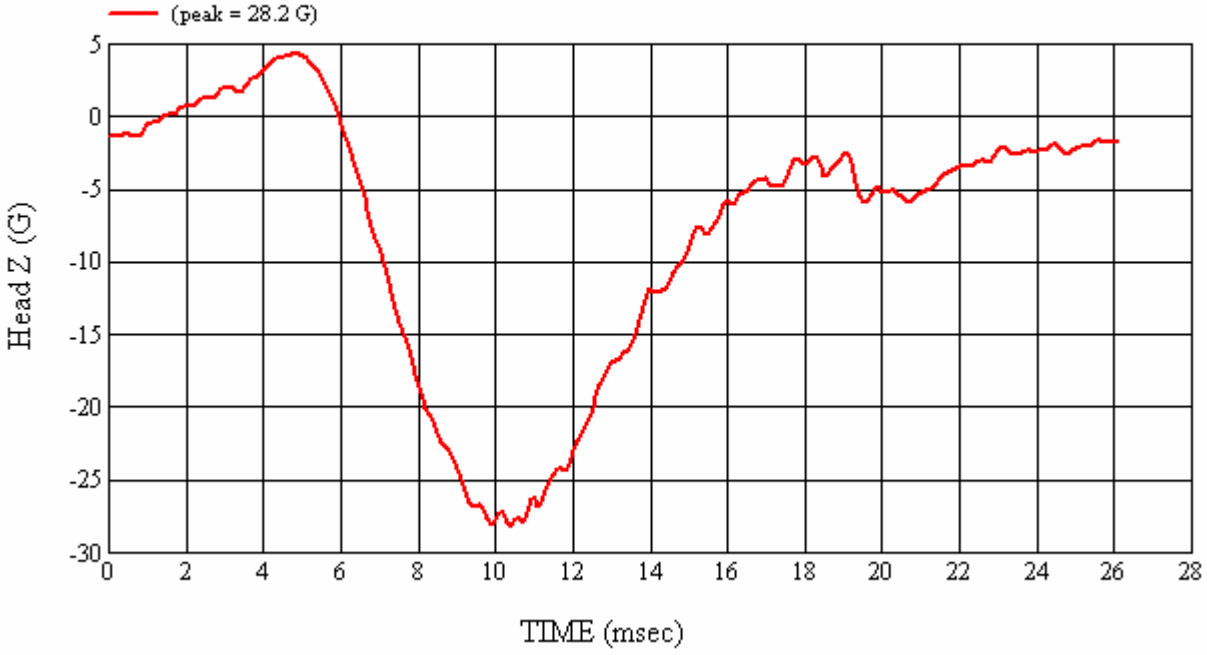
MGA Test #: FM7132 Target Location: SR2(a), Left Side Test Date: 7/24/2007

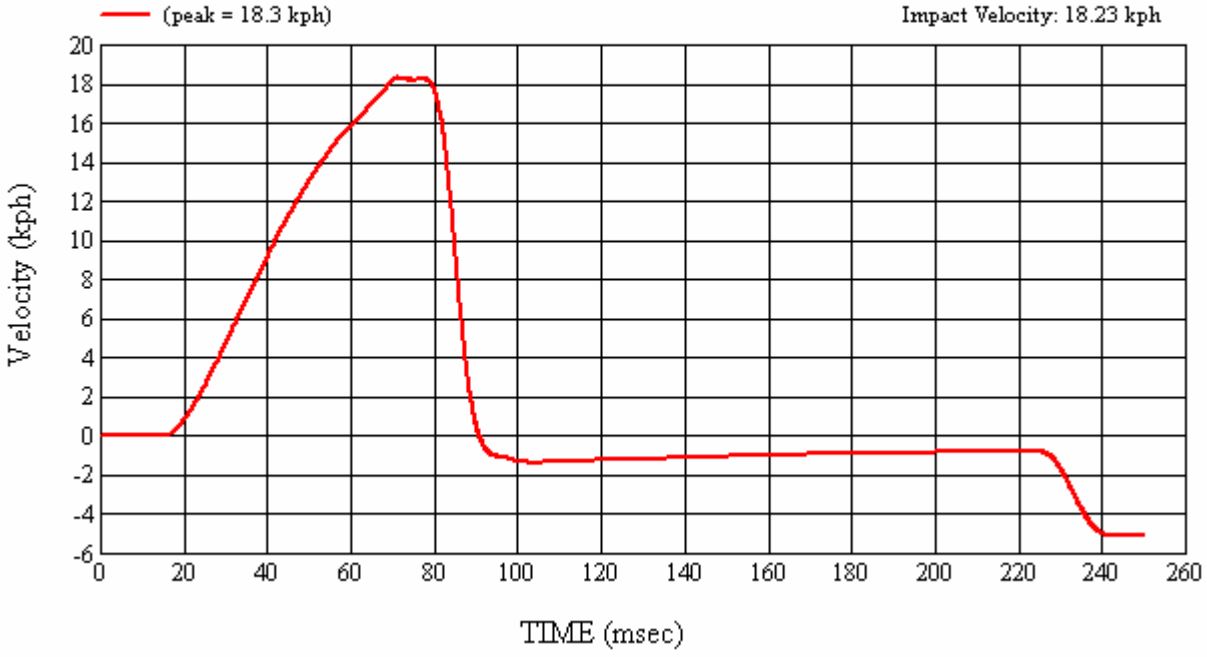


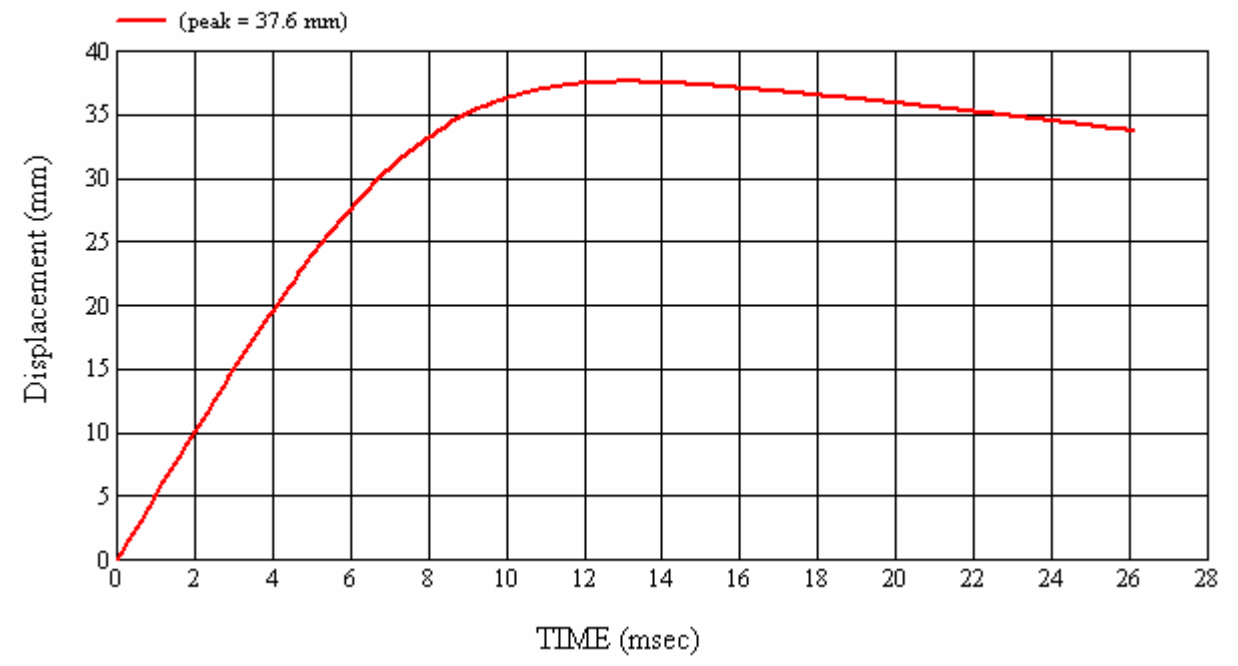



(peak = 67.8 G)
Head X (G)
0
-10
-20
-30
-40
-50
-60
-70
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
TIME (msec)


(peak = 5.8 G)
Head Y (G)
6
5
4
3
2
1
0
-1
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
TIME (msec)


(peak = 28.2 G)
Head Z (G)
5
0
-5
-10
-15
-20
-25
-30
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
TIME (msec)


(peak = 18.3 kph)
Impact Velocity: 18.23 kph
Velocity (kph)
20
18
16
14
12
10
8
6
4
2
0
-2
-4
-6
0
20
40
60
80
100
120
140
160
180
200
220
240
260
TIME (msec)


(peak = 37.6 mm)
Displacement (mm)
TIME (msec)
0
5
10
15
20
25
30
35
40
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28


mga
Impact Testing
7/25/2007
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #6 LEFT SR3(1)
H/V IMPACT ANGLE= 270 / 30
FM7135
PRE TEST


mga
Impact Testing
7/25/2007
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #6 LEFT SR3(1)
H/V IMPACT ANGLE= 270 / 30
FM7135
POST TEST


mga
Impact Testing
7/25/2007
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #6 LEFT SR3(1)
H/V IMPACT ANGLE= 270 / 30
FM7135
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G07I7-001.1 VEHICLE YR/MAKE/MODEL:2007/NHTSA/Nissan Altima

GENERAL TEST PARAMETERS:

Test Number:#6

Target (Vehicle Side): SR3(1) Left

Temperature:21C

MGA Test Reference No.:FM7135

Humidity:40%

Approach Horizontal Angles:270º

Time of Test:11:46:53 AM

Approach Vertical Angles:30º

FMH Serial No:[036]

Additional Description:

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
428	347	7.1	19.1	23	8 Right

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J21969	-90.883	0.78	0.78
Y	6	J35916	103.15	0.80	0.80
Z	7	J35918	99.409	0.81	0.81

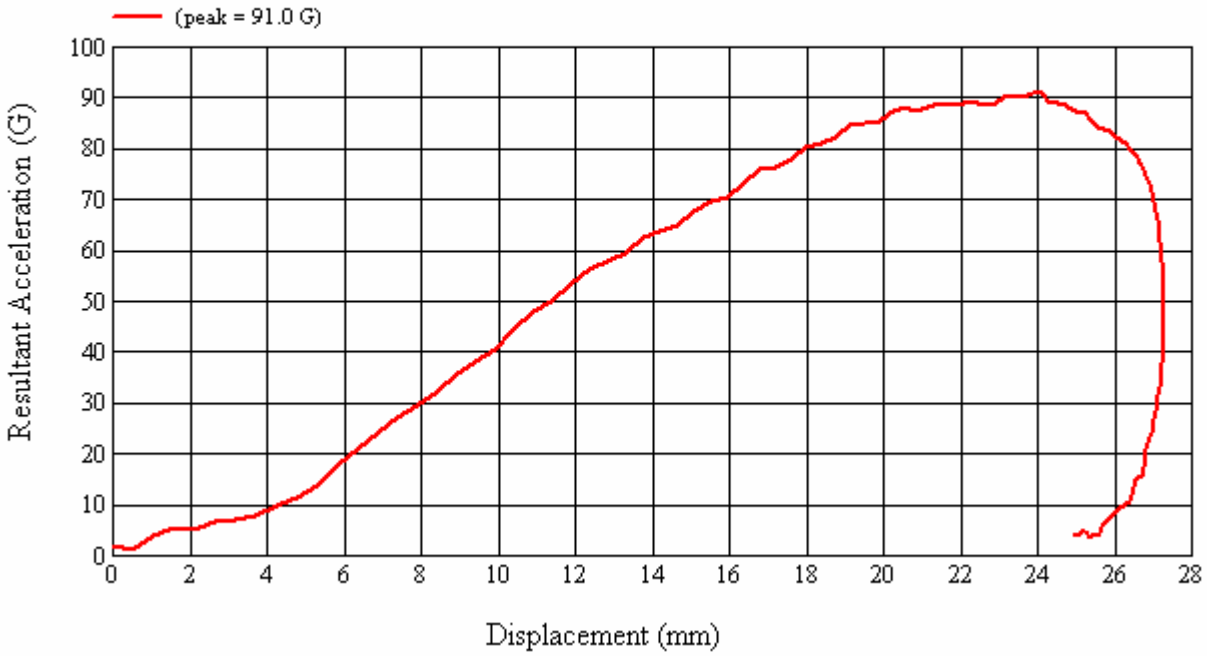
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

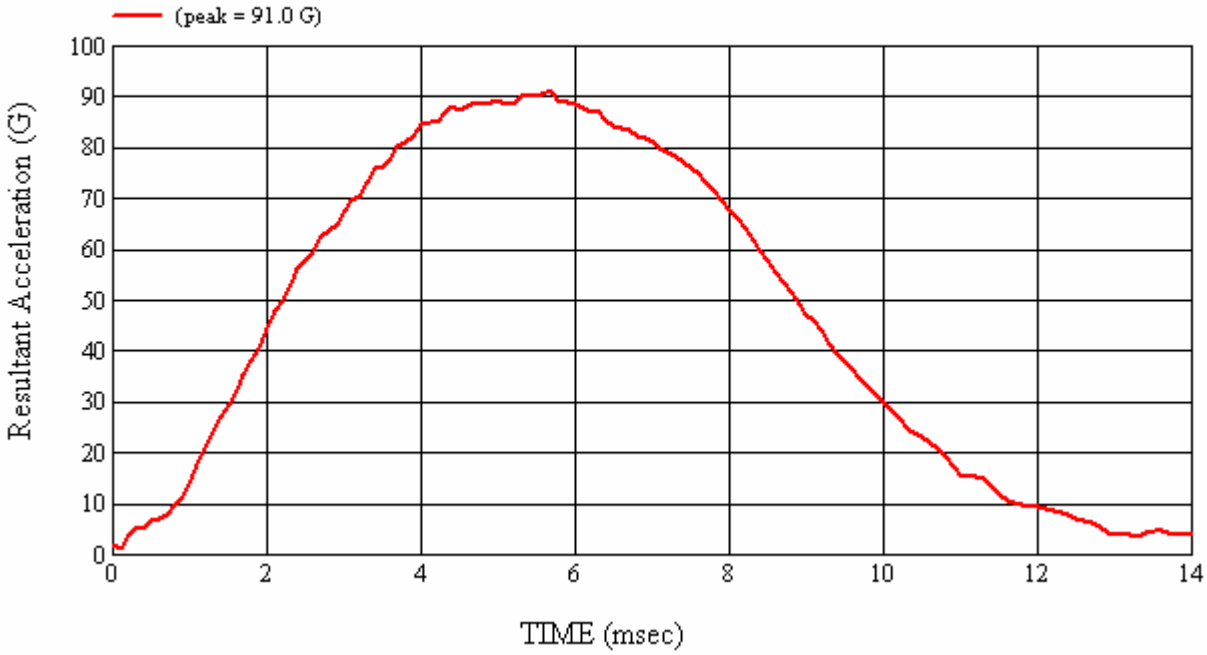
No visible damage.

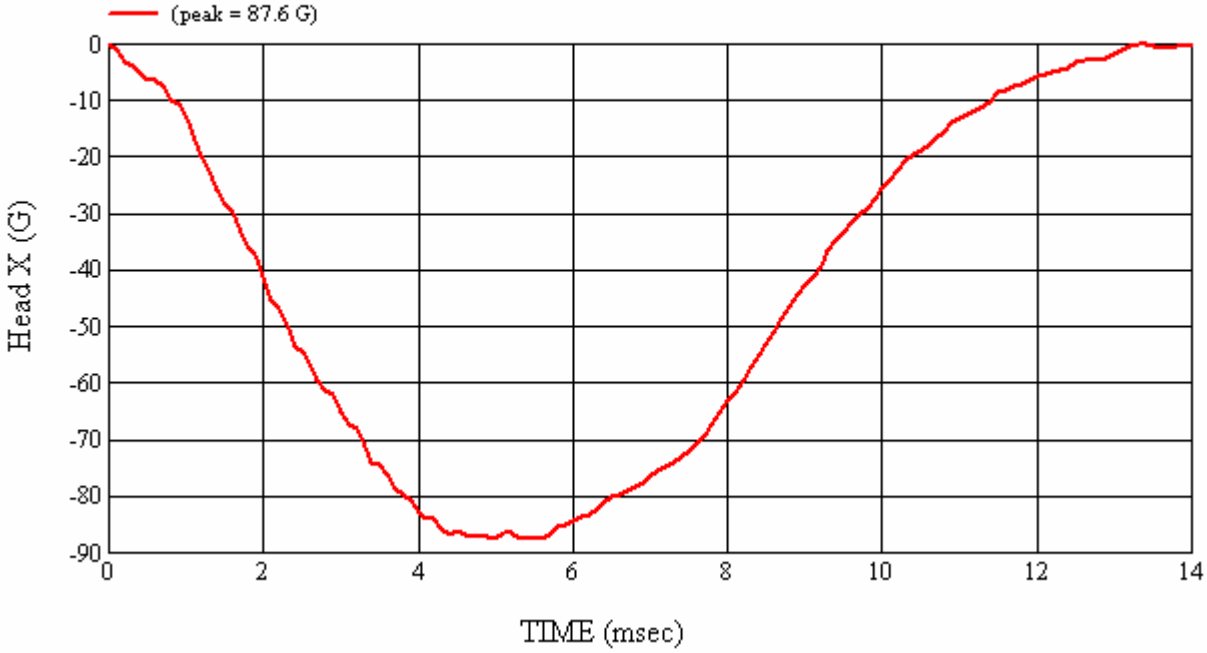
Recorded By: Kaitlin Campbell Approved By*: Helen A. Kalafut Date: 7/25/2007

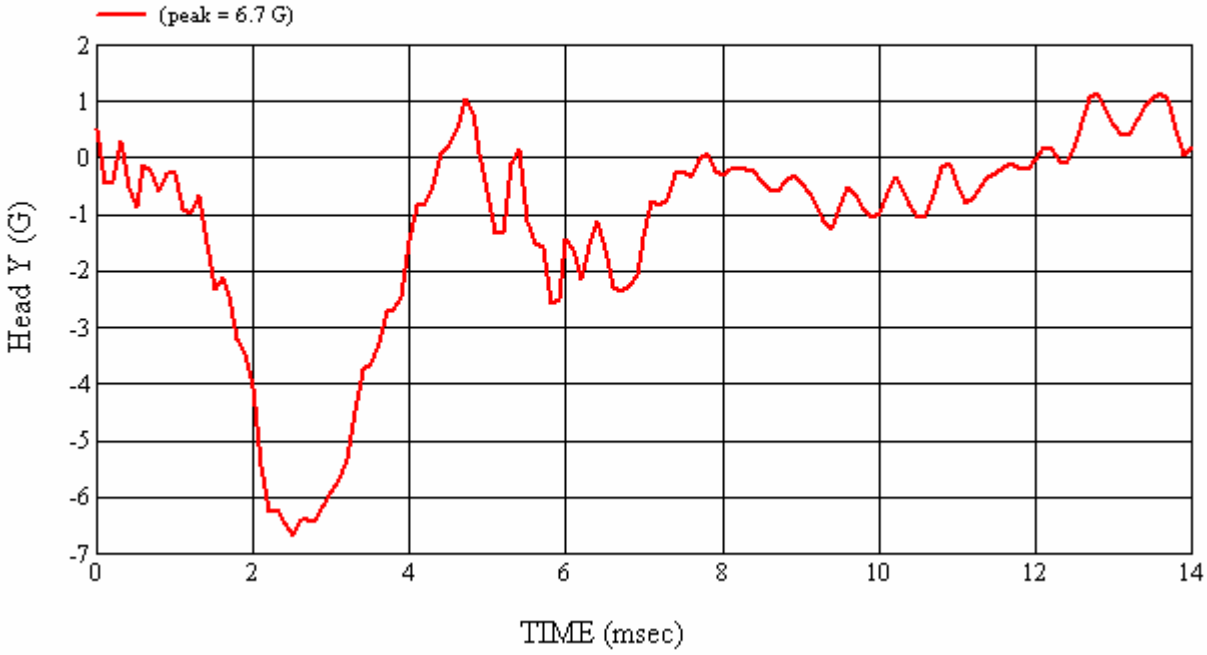
*Only necessary for NHTSA (Government) Compliance testing.

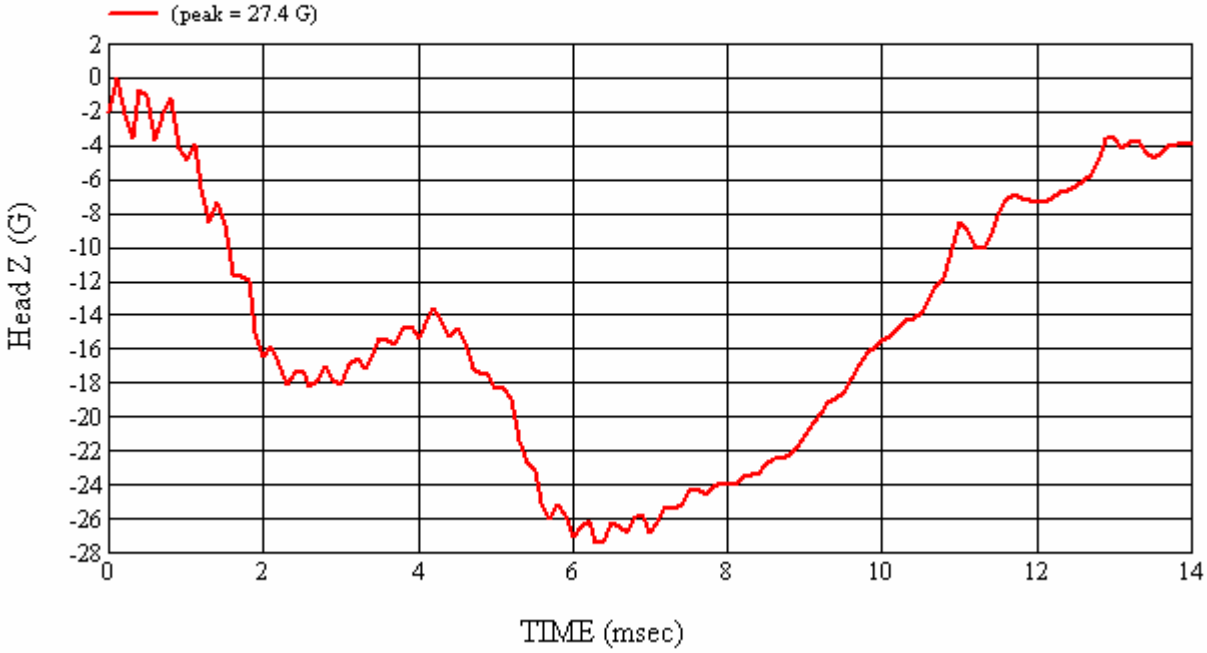
MGA Test #: FM7135 Target Location: SR3(1), Left Side Test Date: 7/25/2007

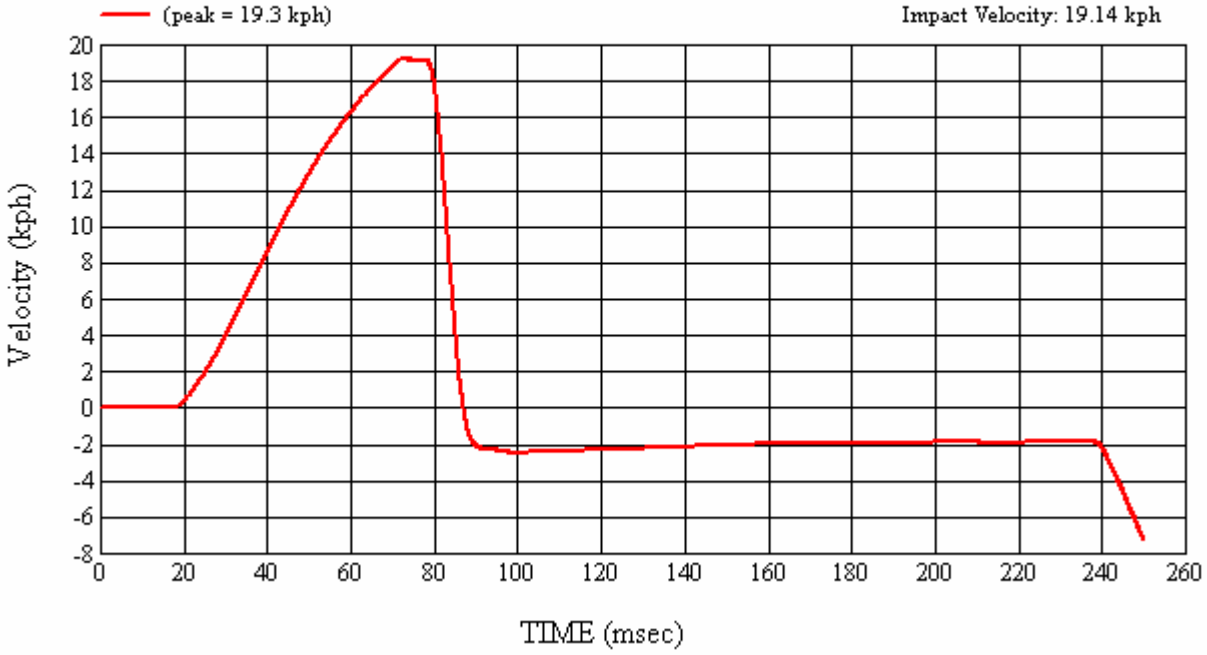


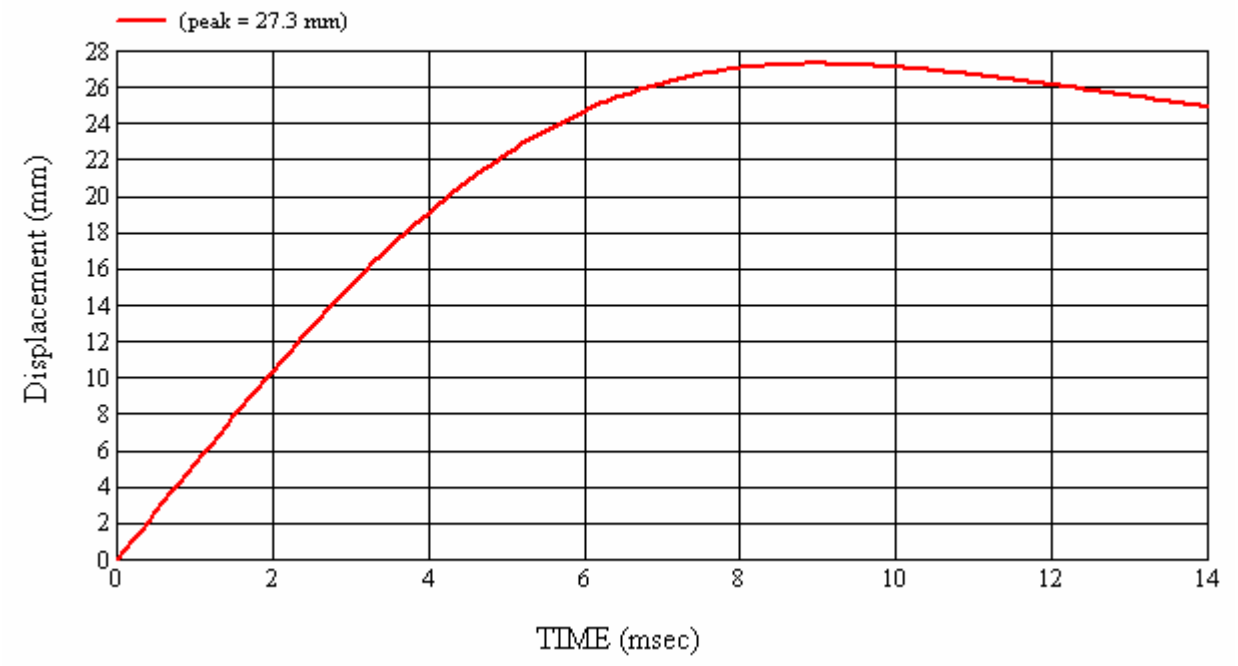



(peak = 87.6 G)
Head X (G)
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
0
2
4
6
8
10
12
14
TIME (msec)


(peak = 6.7 G)
Head Y (G)
2
1
0
-1
-2
-3
-4
-5
-6
-7
0
2
4
6
8
10
12
14
TIME (msec)


(peak = 27.4 G)
Head Z (G)
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
0
2
4
6
8
10
12
14
TIME (msec)


(peak = 19.3 kph)
Impact Velocity: 19.14 kph
Velocity (kph)
20
18
16
14
12
10
8
6
4
2
0
-2
-4
-6
-8
0
20
40
60
80
100
120
140
160
180
200
220
240
260
TIME (msec)


(peak = 27.3 mm)
Displacement (mm)
TIME (msec)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28


mga
Impact Testing
7/26/2007
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #12 RIGHT SR3(2)
H/V IMPACT ANGLE= 90 / 30
FM7141
PRE TEST
C75202
FM7141
H/V 90/30


mga
Impact Testing
7/26/2007
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #12 RIGHT SR3(2)
H/V IMPACT ANGLE= 90 / 30
FM7141
POST-TEST


mga
Impact Testing
7/26/2007
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #12 RIGHT SR3(2)
H/V IMPACT ANGLE= 90 / 30
FM7141
POST-TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G07I7-001.1 VEHICLE YR/MAKE/MODEL:2007/NHTSA/Nissan Altima

GENERAL TEST PARAMETERS: Test Number:#12

Target (Vehicle Side): SR3(2) Right
Temperature:22C

MGA Test Reference No.:FM7141
Humidity:55%

Approach Horizontal Angles:90º
Time of Test:5:12:20 PM

Approach Vertical Angles:30º
FMH Serial No:[038]

Additional Description:

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
432	352	7.5	18.9	9	3 Left

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J14103	-94.598	0.78	0.78
Y	6	J36197	110.692	0.80	0.80
Z	7	J36353	99.391	0.81	0.81

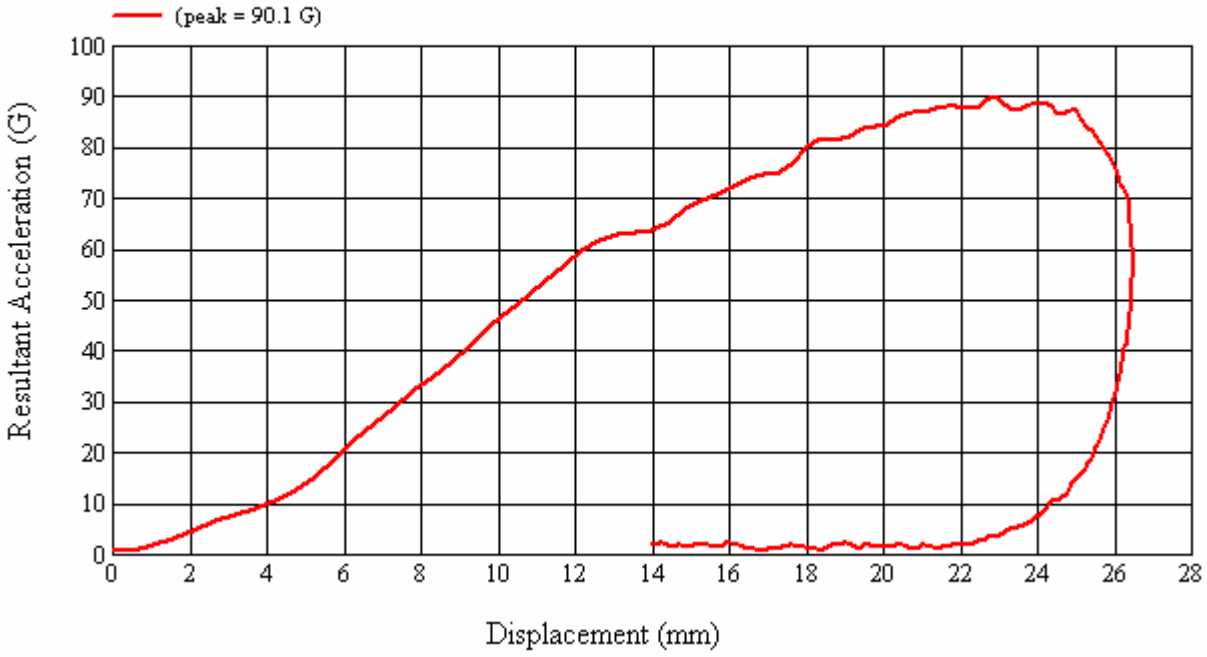
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

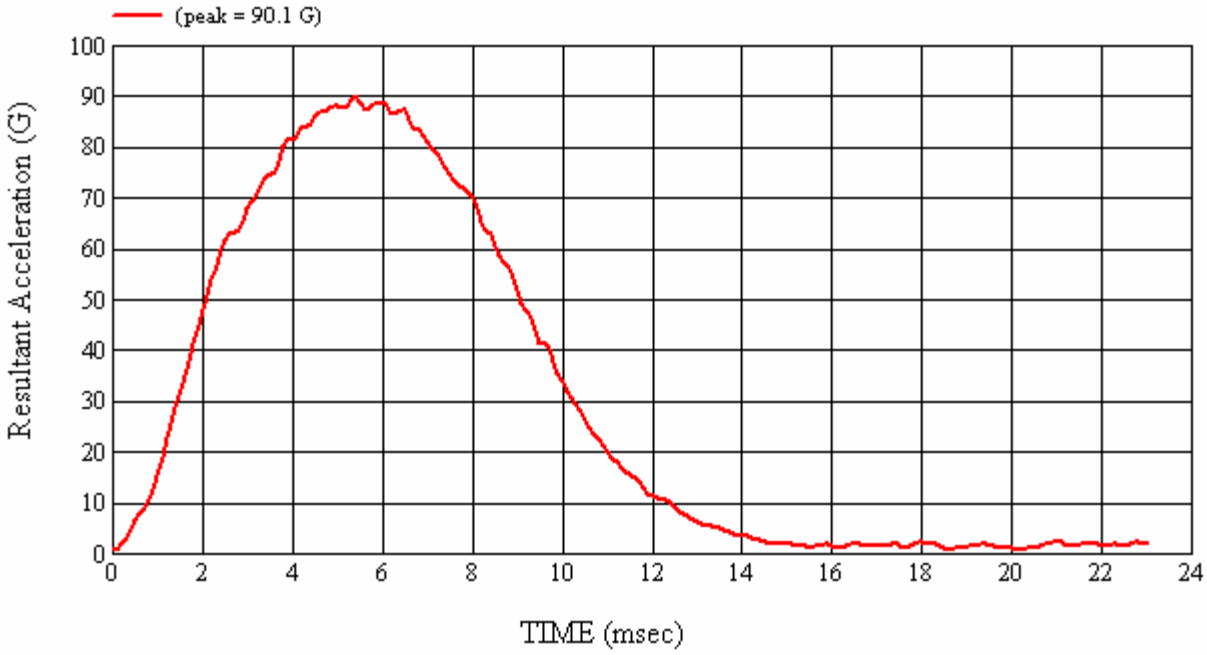
Grab handle pushed in.

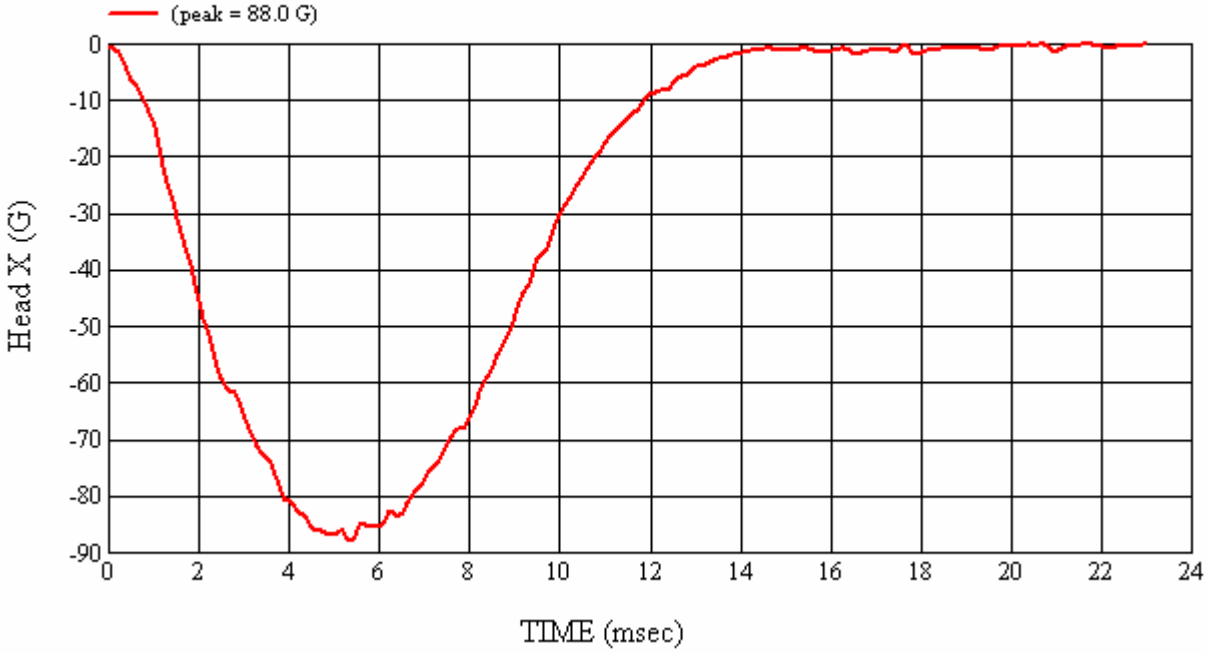
Recorded By: Kevin Campbell Approved By*: Eileen A. Kaleto Date: 7/26/2007

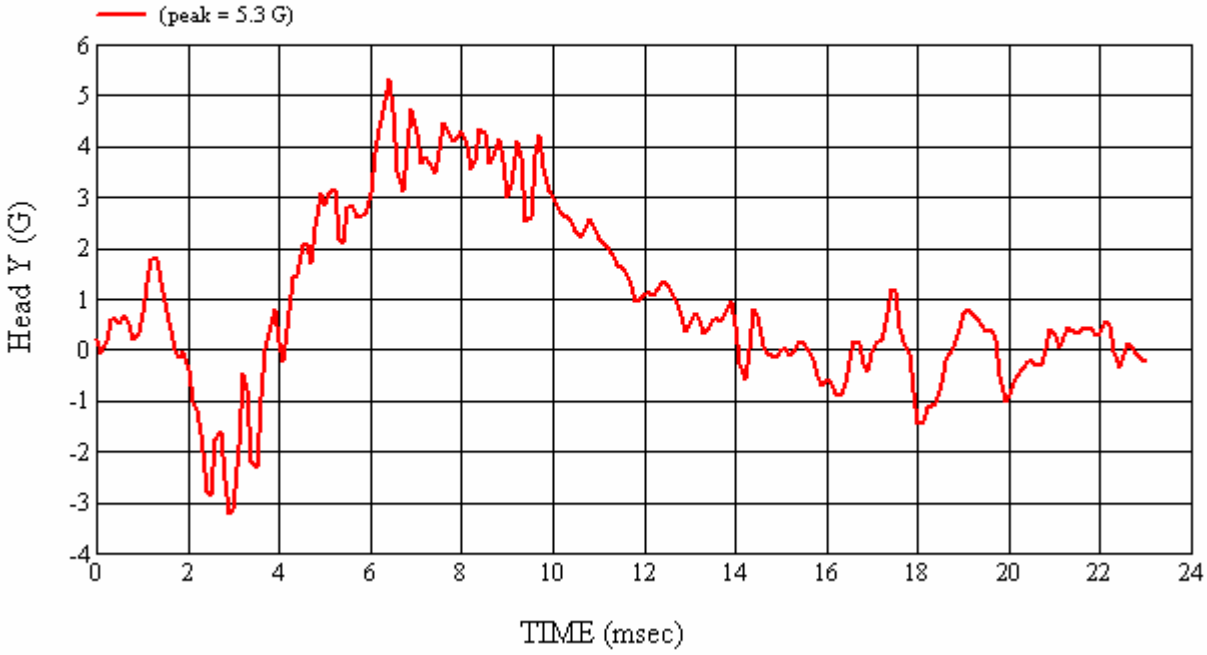
*Only necessary for NHTSA (Government) Compliance testing.

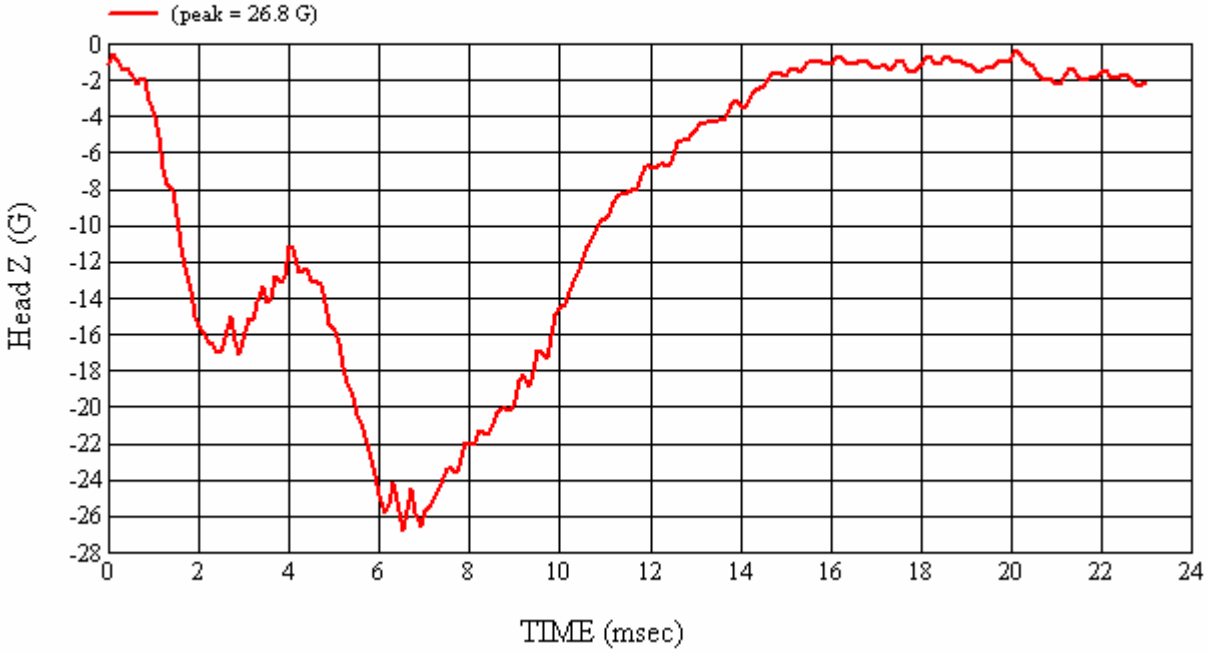
MGA Test #: FM7141 Target Location: SR3(2), Right Side Test Date: 7/26/2007

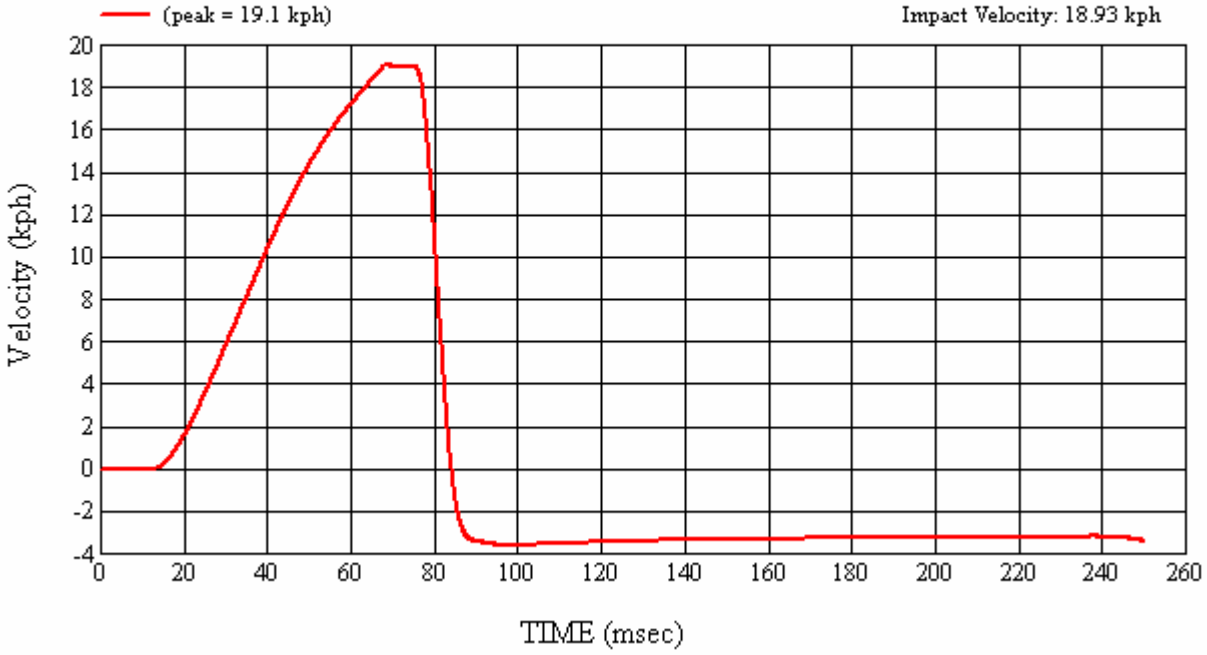


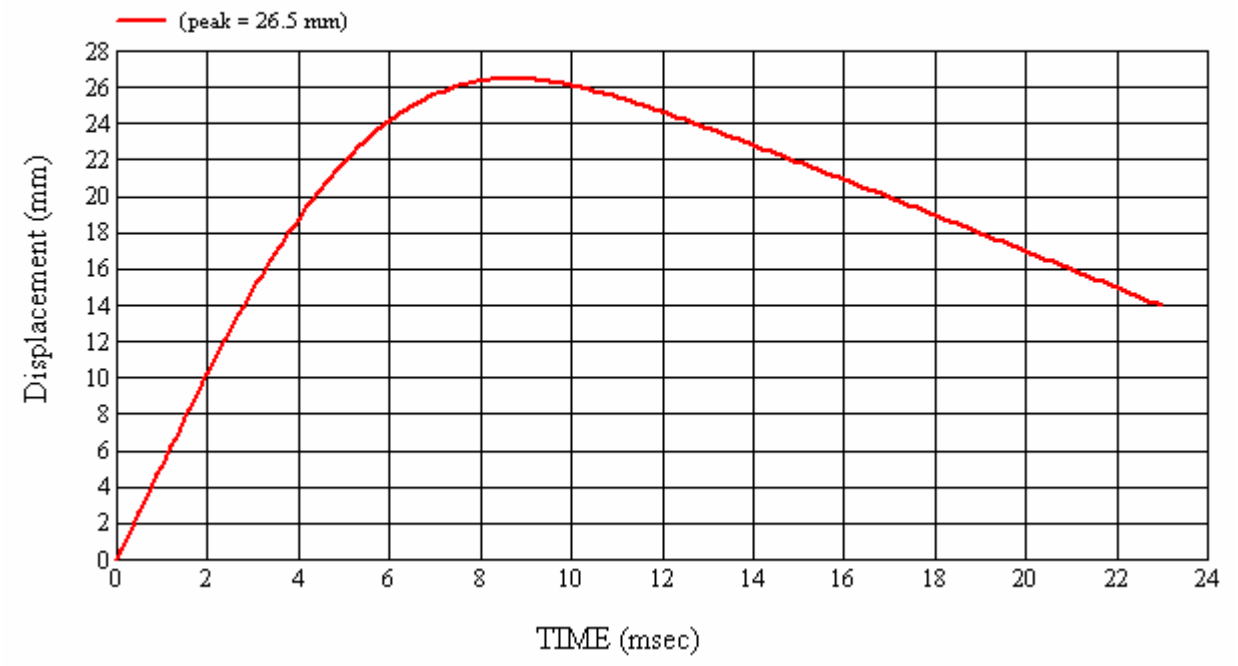



(peak = 88.0 G)
Head X (G)
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)


(peak = 5.3 G)
Head Y (G)
6
5
4
3
2
1
0
-1
-2
-3
-4
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)

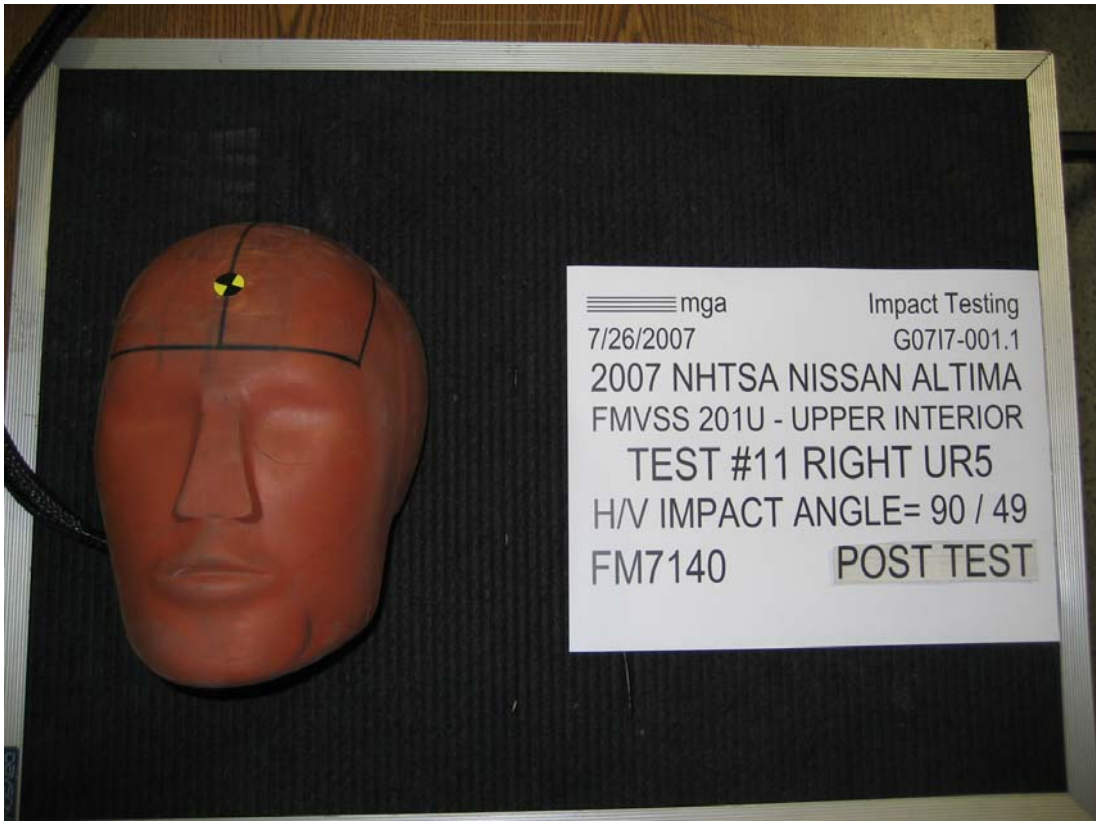

(peak = 26.8 G)
Head Z (G)
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)


(peak = 19.1 kph)
Impact Velocity: 18.93 kph
Velocity (kph)
20
18
16
14
12
10
8
6
4
2
0
-2
-4
0
20
40
60
80
100
120
140
160
180
200
220
240
260
TIME (msec)


(peak = 26.5 mm)
Displacement (mm)
TIME (msec)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28


mga
Impact Testing
7/26/2007
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #11 RIGHT UR5
H/V IMPACT ANGLE= 90 / 49
FM7140
PRE TEST
C75202
FM7140
RIGHT UR5
H/V 90/49


mga
Impact Testing
7/26/2007
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #11 RIGHT UR5
H/V IMPACT ANGLE= 90 / 49
FM7140
POST TEST


mga
Impact Testing
7/26/2007
G07I7-001.1
2007 NHTSA NISSAN ALTIMA
FMVSS 201U - UPPER INTERIOR
TEST #11 RIGHT UR5
H/V IMPACT ANGLE= 90 / 49
FM7140
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G07I7-001.1 VEHICLE YR/MAKE/MODEL:2007/NHTSA/Nissan Altima

GENERAL TEST PARAMETERS:

Target (Vehicle Side): UR5 Right

MGA Test Reference No.:FM7140

Approach Horizontal Angles:90º

Approach Vertical Angles:49º

Additional Description:Upper Roof @ BP1

Test Number:#11

Temperature:22C

Humidity:50%

Time of Test:3:39:34 PM

FMH Serial No:[037]

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
953	1043	5.9	23.7	30	0

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J22696	-100.013	0.78	0.78
Y	6	J35791	91.856	0.80	0.80
Z	7	J35800	97.996	0.81	0.81

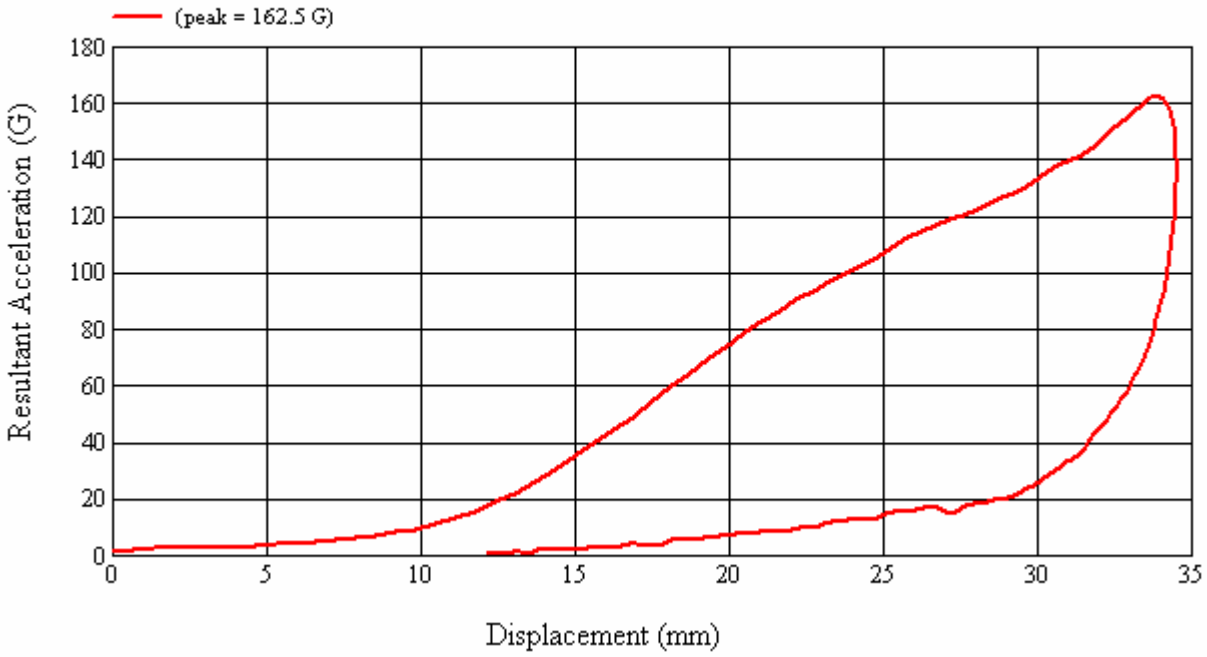
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

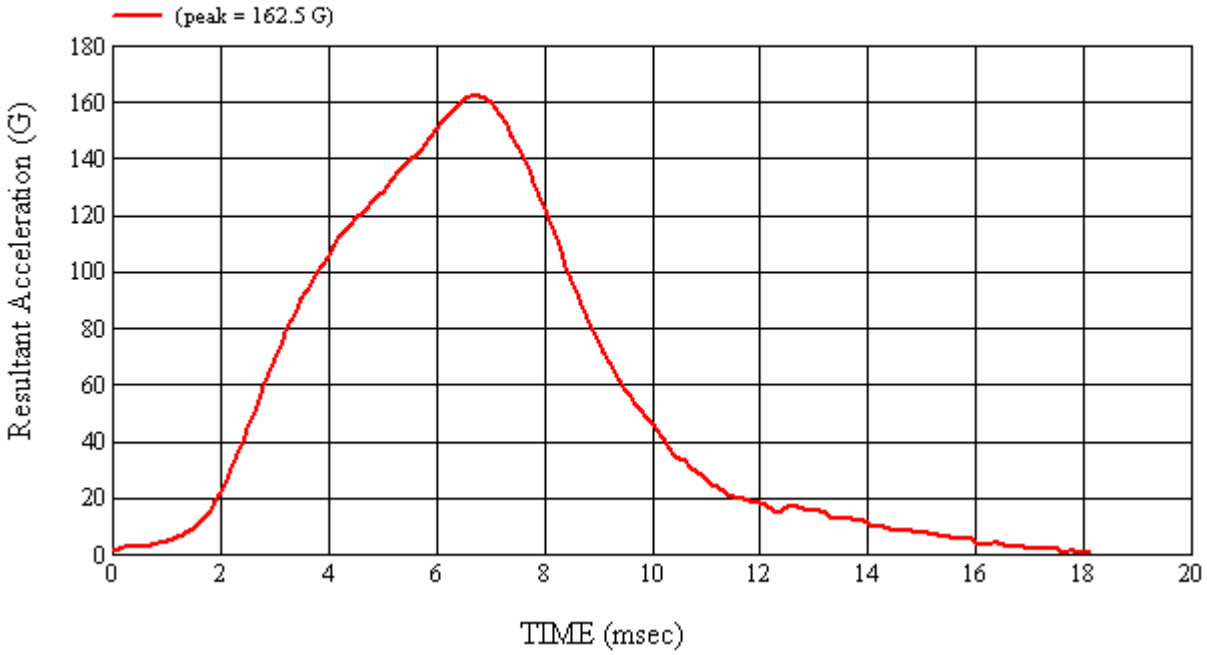
No visible damage.

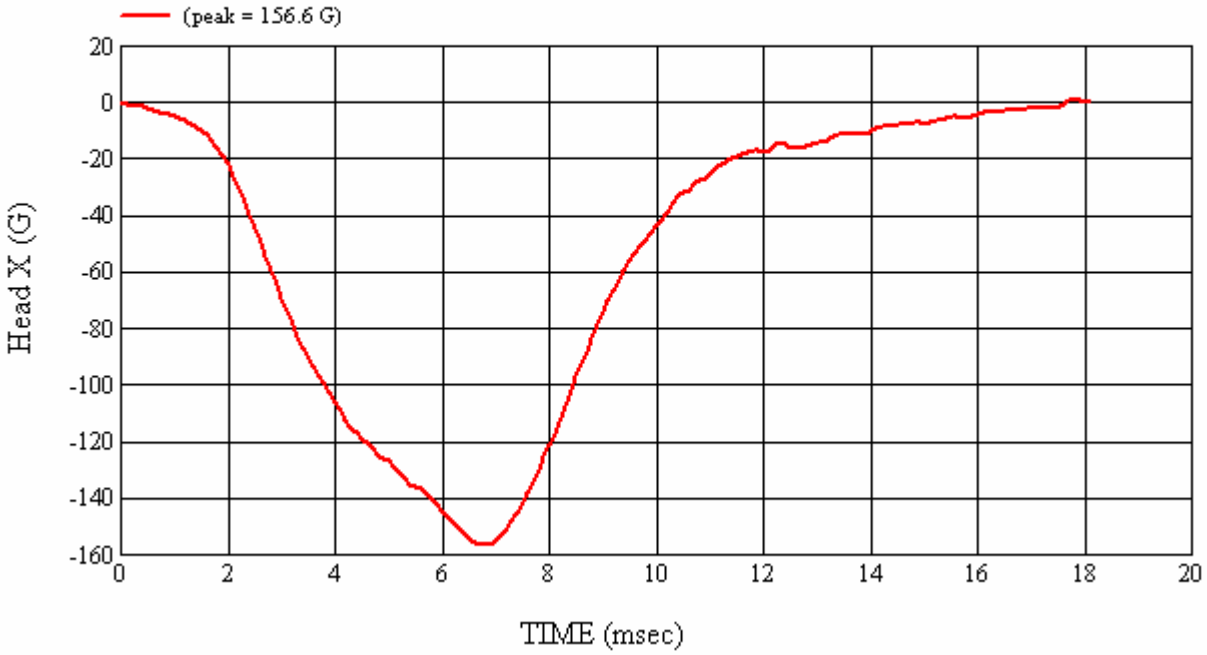
Recorded By: Travis Campbell Approved By*: Steven A. Kaleto Date: 7/26/2007

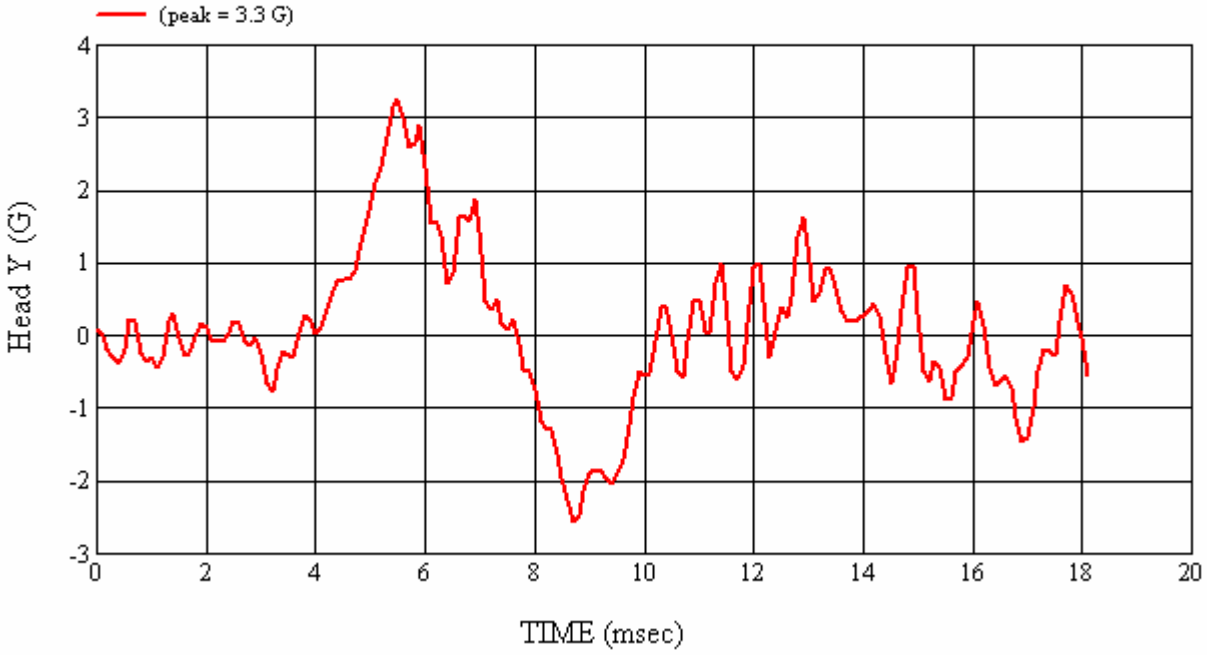
*Only necessary for NHTSA (Government) Compliance testing.

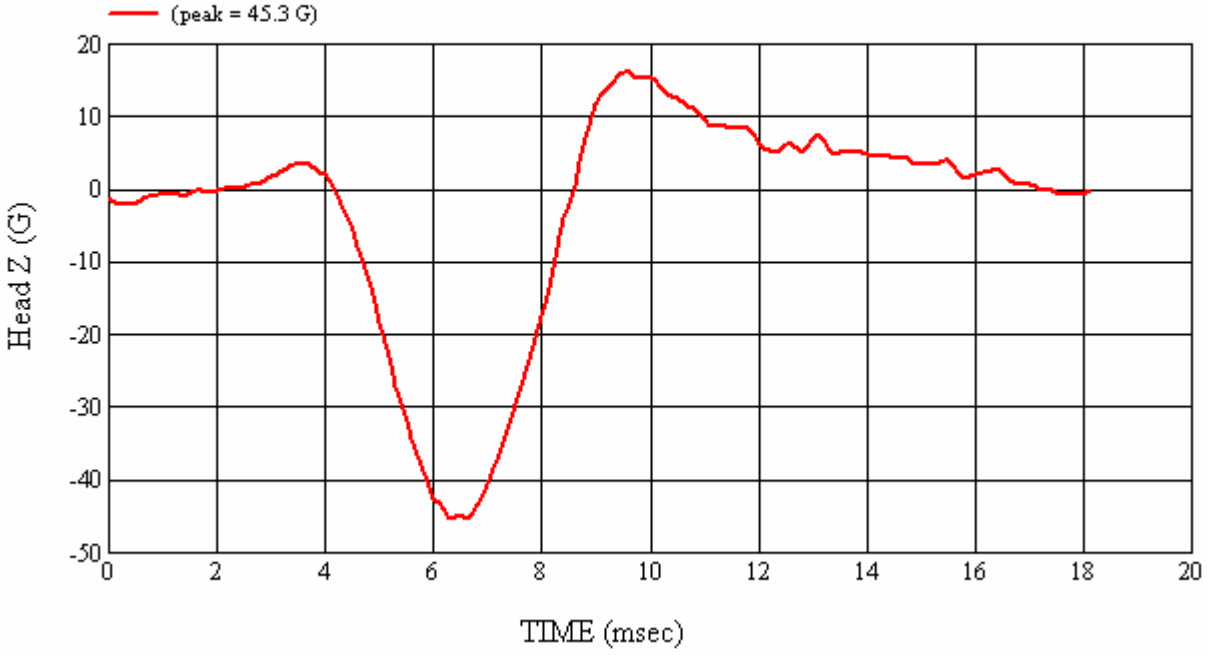
MGA Test #: FM7140 Target Location: UR5, Right Side Test Date: 7/26/2007

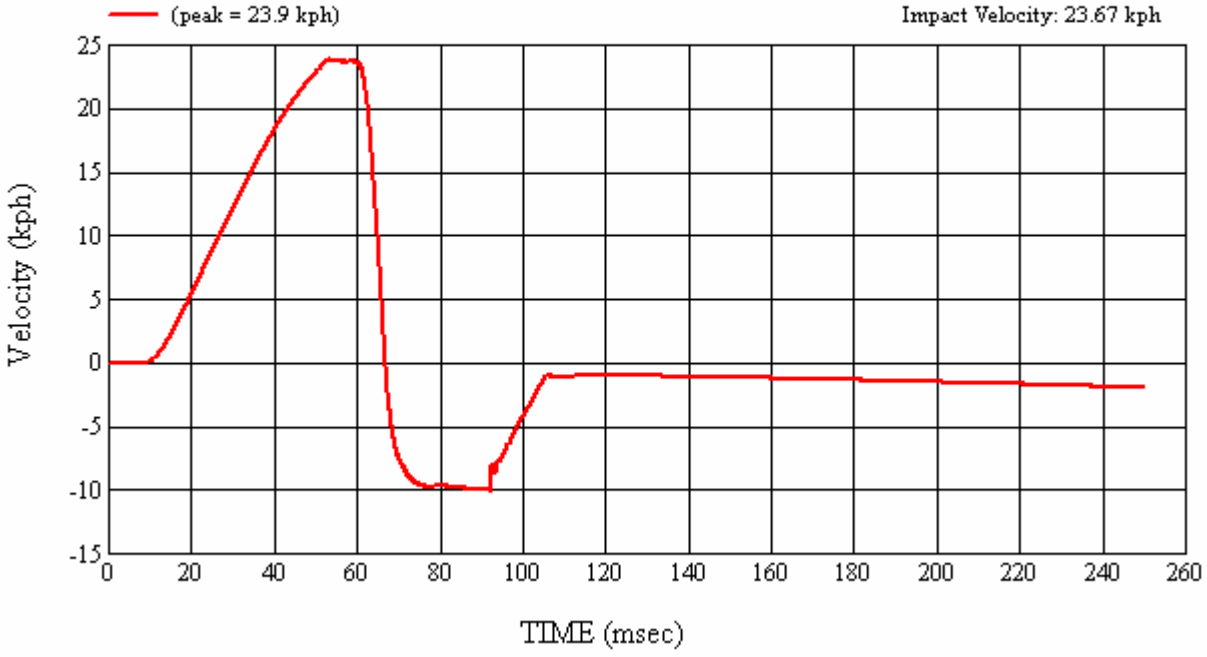


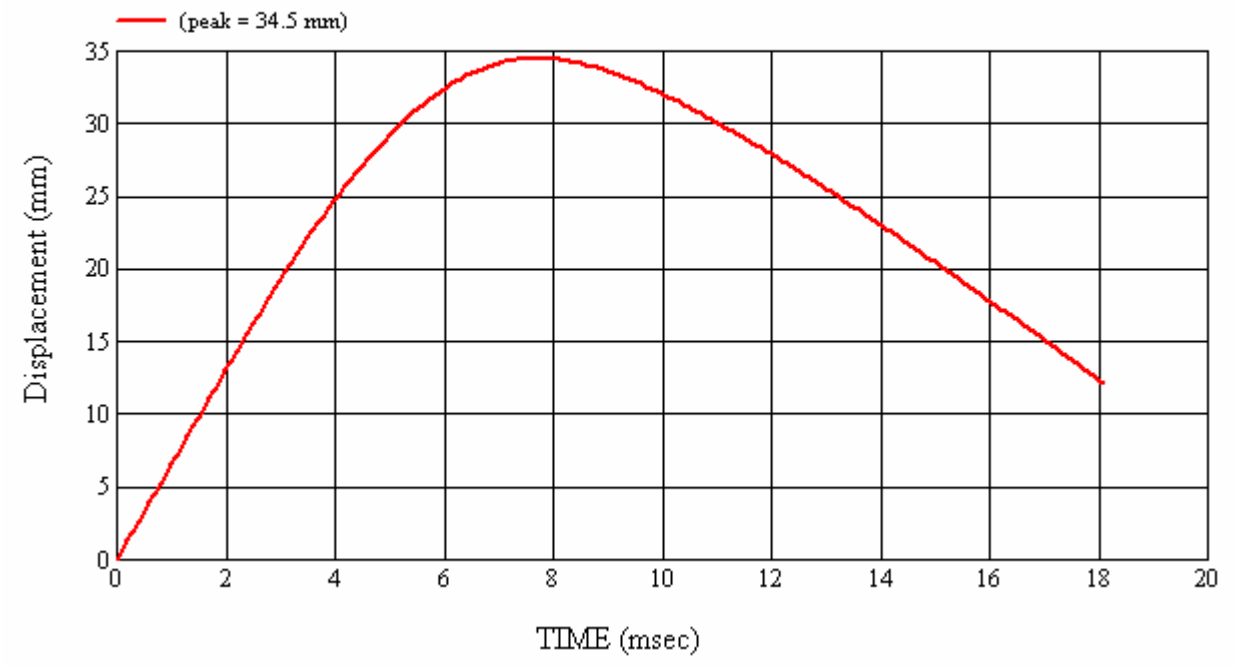



(peak = 156.6 G)
Head X (G)
20
0
-20
-40
-60
-80
-100
-120
-140
-160
0
2
4
6
8
10
12
14
16
18
20
TIME (msec)


(peak = 3.3 G)
Head Y (G)
4
3
2
1
0
-1
-2
-3
0
2
4
6
8
10
12
14
16
18
20
TIME (msec)


(peak = 45.3 G)
Head Z (G)
20
10
0
-10
-20
-30
-40
-50
0
2
4
6
8
10
12
14
16
18
20
TIME (msec)


(peak = 23.9 kph)
Impact Velocity: 23.67 kph
Velocity (kph)
25
20
15
10
5
0
-5
-10
-15
0
20
40
60
80
100
120
140
160
180
200
220
240
260
TIME (msec)


(peak = 34.5 mm)
Displacement (mm)
TIME (msec)
0
5
10
15
20
25
30
35
0
2
4
6
8
10
12
14
16
18
20

4.0 TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

The following section lists the test equipment for the compliance 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 66ºF and 78ºF (19ºC - 26ºC) is included in Appendix A. Calibration certificates can be found in Appendix B.

TABLE 4-1 LIST OF ITEMS USED

ITEM	MANUFACTURER NAME	MODEL #	FUNCTION OF ITEM	ACCURACY	CAL. INTERNAL
Head Drop Tower (includes test frame and DAS)	MGA Research Corp.	MGA-100-DC	FMH Calibration	N/A	N/A
Accelerometers	Endevco	7264-2000	Acceleration Data	±0.5%	6 months
*Digital Inclinometer	Macklanburg-Duncan	PRO 360 (MGA00048)	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 UTAMA	035 036 037 038	Test Device	N/A	Pre and Post-Test Series
High Speed Video	Redlake	HGLE	Record Event	N/A	N/A
*FARO™	Faro Technologies	S08059801273	Targeting	0.1 mm	Annual
Measuring Devices: - Tape Measure - Plumb Bobs - Digital Protractor	 Stanley N/A Macklanburg-Duncan	 TPM745 -- MGA00048	 Measurement Targeting FMH setup Horizontal Measurement	 1 mm N/A 0.5°	Annual
*Temperature Recorder	Dickson	FH125	Record Temperature and Humidity	± 1°C ± 1% RH	Annual

ITEM	MANUFACTURER NAME	MODEL #	FUNCTION OF ITEM	ACCURACY	CAL. INTERNAL
* Scale	Detecto	MGA00081	Weigh FMH Head	± 0.01 lb	Annual
*Vehicle Scale	Sterling Scale Co.	26032389	Weighing Vehicle	± .5 kg	Annual

Each headform was calibrated by an engineer after the headform had soaked in an environment of 66ºF to 78ºF (19ºC to 26ºC) for a period of at least four hours.

Each headform was found to comply with the performance criteria under Part 572L for pre and post-test calibrations. That is, the peak resultant acceleration was between 225 and 275 G's, the peak lateral acceleration was less than 15 G's, the headform weighed between 9.9 and 10.1 lbs., the pulse was determined to be unimodal, and there was no major damage to the headform.

TABLE 4-2 DATA SUMMARY TABLE

FMH Serial #		Headform Calibration Date	Weight (lbs)	Temp (ºC)	% Humidity	Peak Resultant Acceleration (G's)	Peak Lateral Acceleration (G's)	Unimodal
Pre	#035	7/24/2007	10.08	24.0	33.0	229.8	5.7	Yes
Post	#035	7/27/2007	10.08	25.0	48.0	243.5	3.9	Yes
Pre	#036	7/24/2007	9.97	24.0	34.0	268.9	11.4	Yes
Post	#036	7/27/2007	9.97	25.0	48.0	265.5	6.7	Yes
Pre	#037	7/24/2007	9.96	24.0	34.0	247.0	3.8	Yes
Post	#037	7/27/2007	9.96	25.0	48.0	233.3	11.4	Yes
Pre	#038	7/24/2007	9.90	24.0	35.0	262.0	6.6	Yes
Post	#038	7/27/2007	9.90	25.0	48.0	258.3	7.9	Yes

4.1 Pre-Test Calibration

HEAD DROP TEST SUMMARY
PART 572L

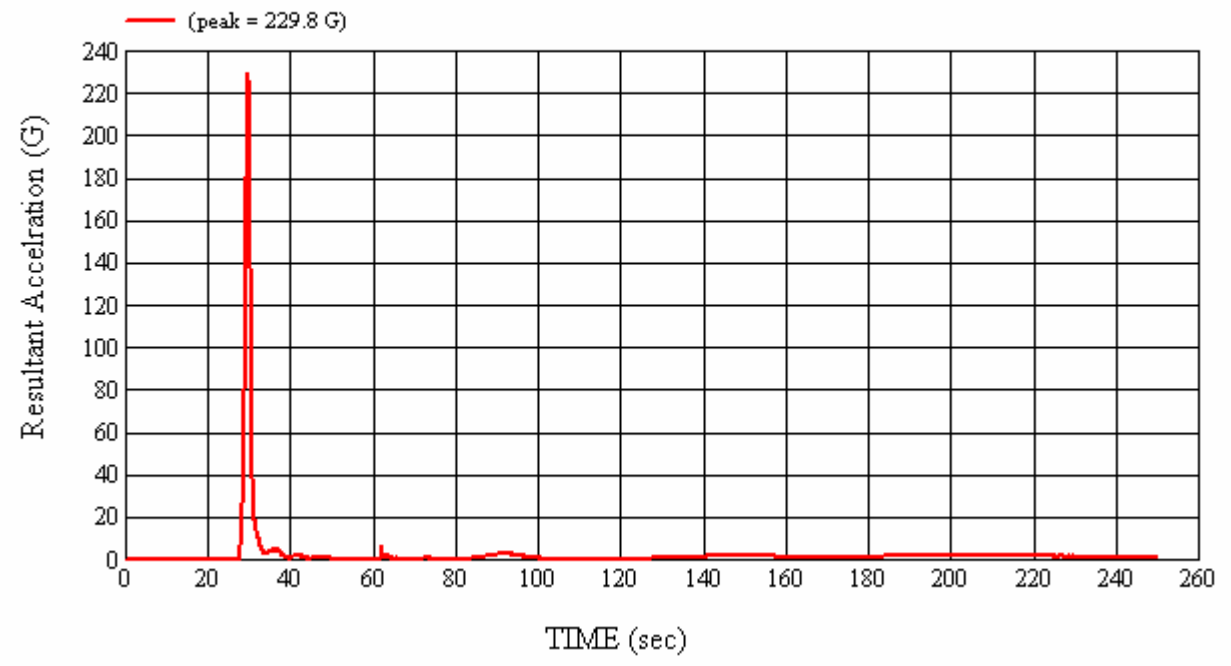
HEADFORM SERIAL NUMBER: 035	CALIBRATION DATE: 7/24/2007 CALIBRATION TIME: 8:30:06 AM	
TEST PARAMETER	**SPECIFICATION**	**TEST RESULTS**
Weight	9.90 to 10.10 lbs.	10.08
Temperature	19° C to 26° C	24
Relative Humidity	10% to 70%	33
Peak Resultant Acceleration	225 G's to 275 G's	229.8
Peak Lateral Acceleration	15 G's Maximum	5.7
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	J22664	04/30/07	10/30/07
2	ENDEVCO	7264-2000	J35919	04/30/07	10/30/07
3	ENDEVCO	7264-2000	J35924	04/30/07	10/30/07

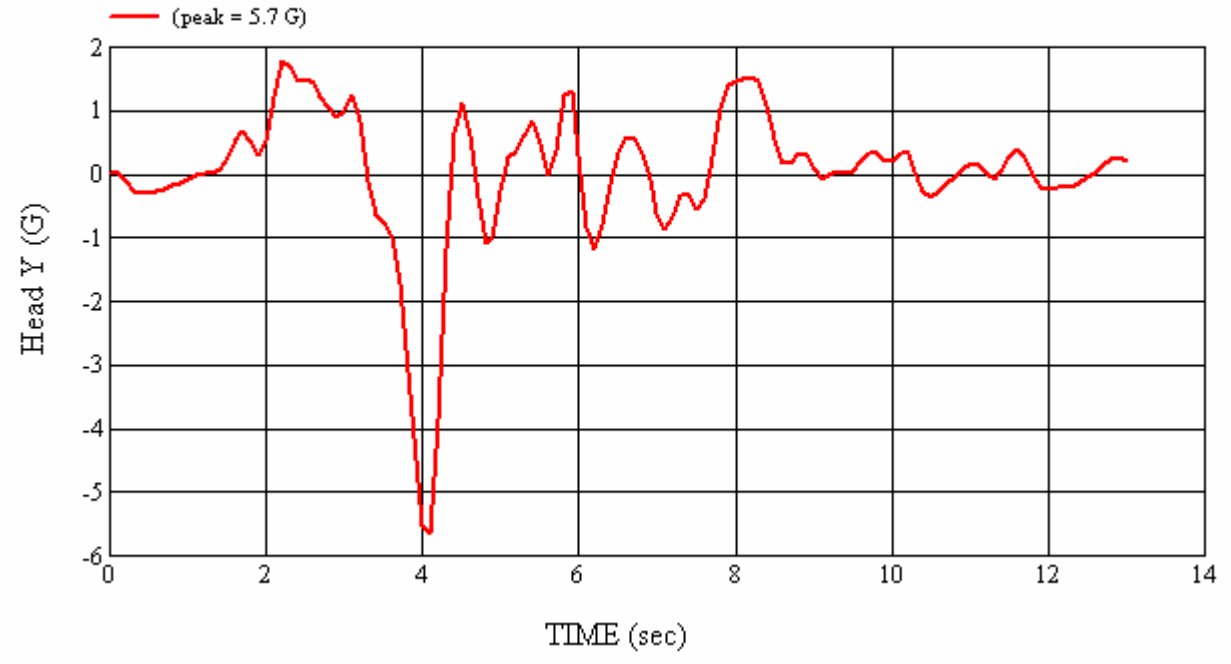
REMARKS:

RECORDED BY: Kevin Campbell DATE: 7/24/2007

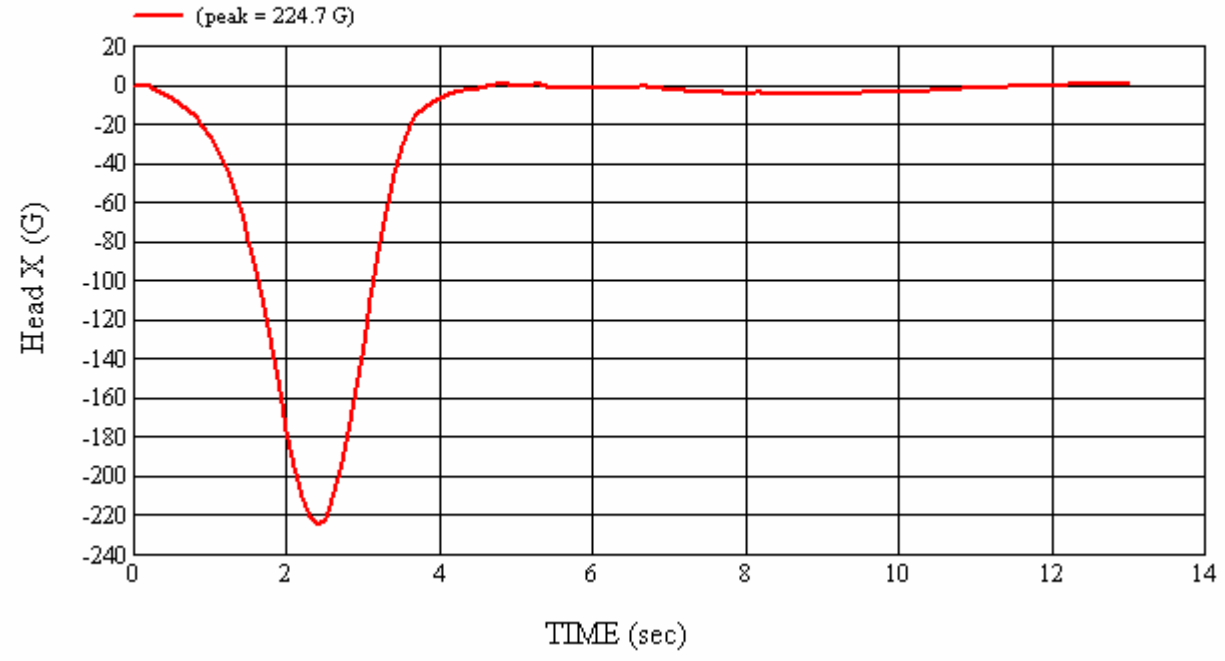
APPROVED BY: Helen A. Kaleto



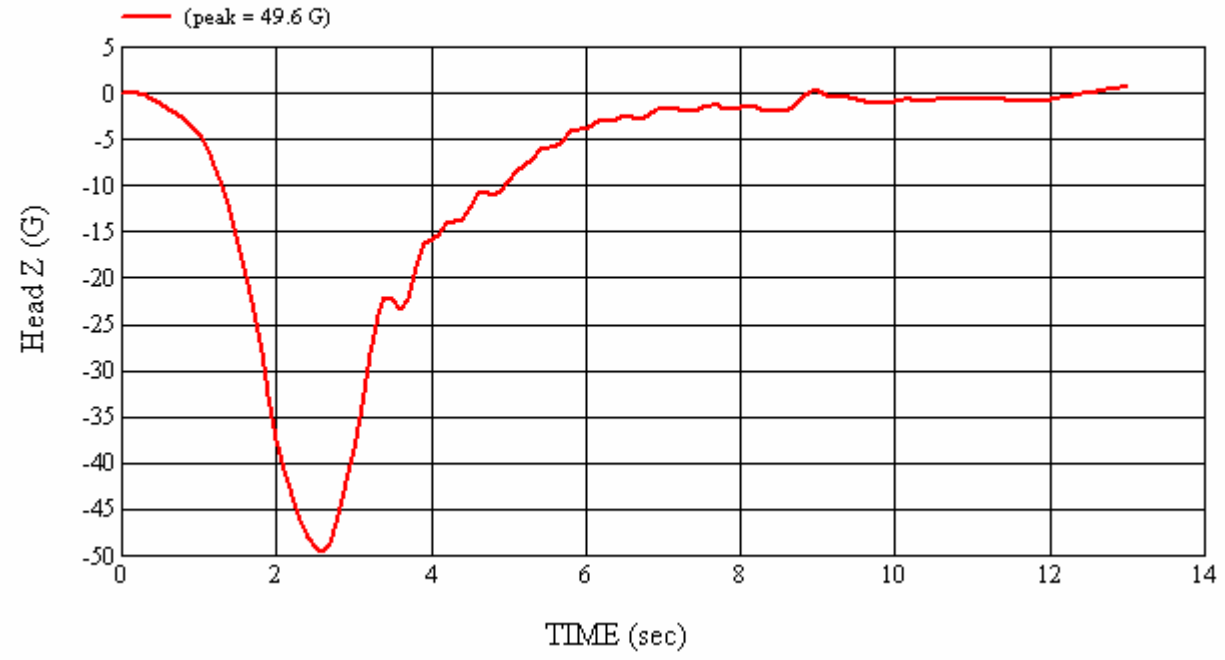
Head 035 (Pre) Calibration #H35001



Head 035 (Pre) Calibration #H35001



Head 035 (Pre) Calibration #H35001



Head 035 (Pre) Calibration #H35001

4.2 Post-Test Calibration

HEAD DROP TEST SUMMARY
PART 572L

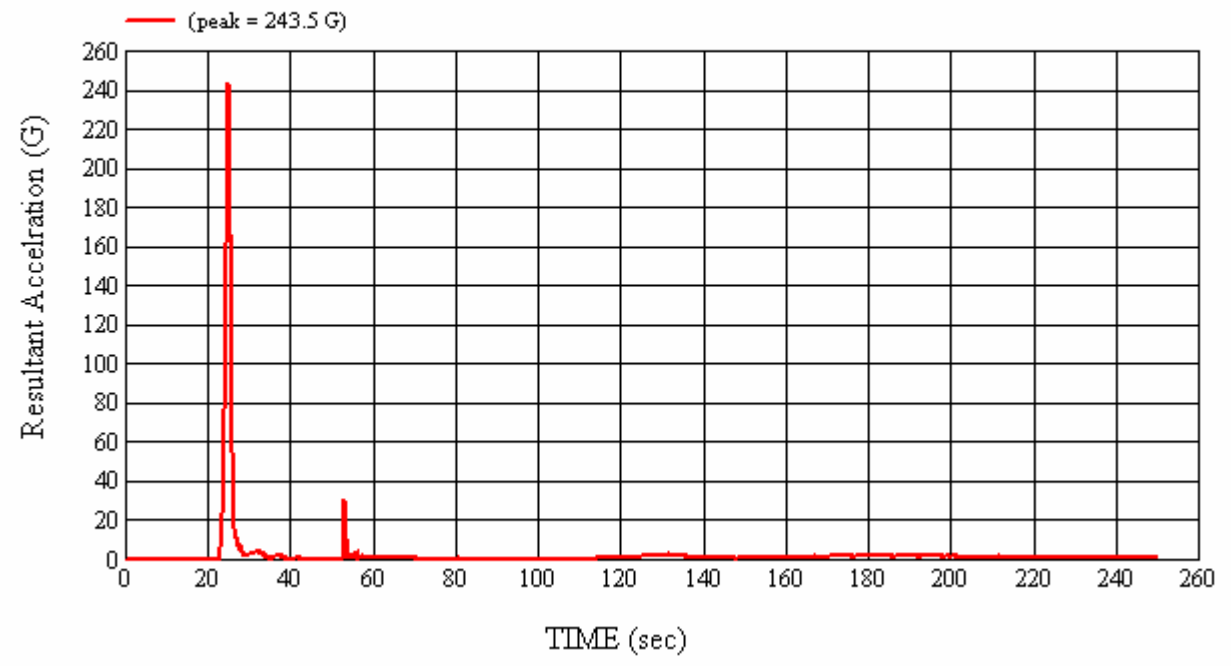
HEADFORM SERIAL NUMBER: 035	CALIBRATION DATE: 7/27/2007 CALIBRATION TIME: 3:17:21 PM	
TEST PARAMETER	**SPECIFICATION**	**TEST RESULTS**
Weight	9.90 to 10.10 lbs.	10.08
Temperature	19° C to 26° C	25
Relative Humidity	10% to 70%	48
Peak Resultant Acceleration	225 G's to 275 G's	243.5
Peak Lateral Acceleration	15 G's Maximum	3.9
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	J22664	04/30/07	10/30/07
2	ENDEVCO	7264-2000	J35919	04/30/07	10/30/07
3	ENDEVCO	7264-2000	J35924	04/30/07	10/30/07

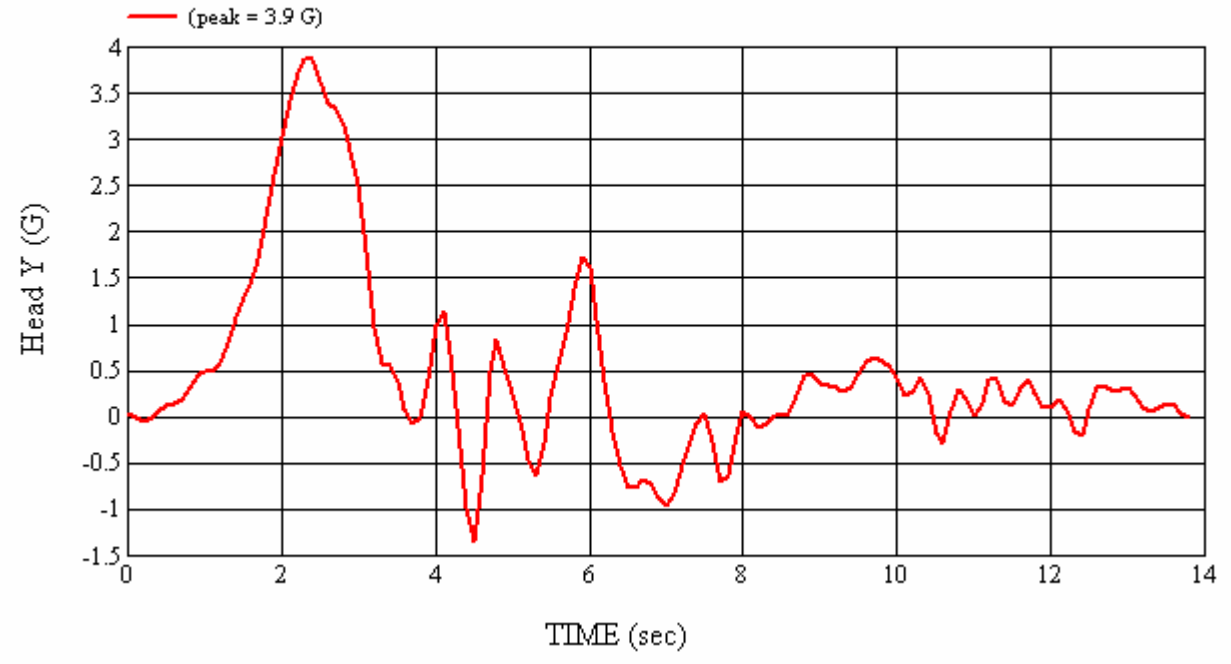
REMARKS:

RECORDED BY: Kevin Campbell DATE: 7/27/2007

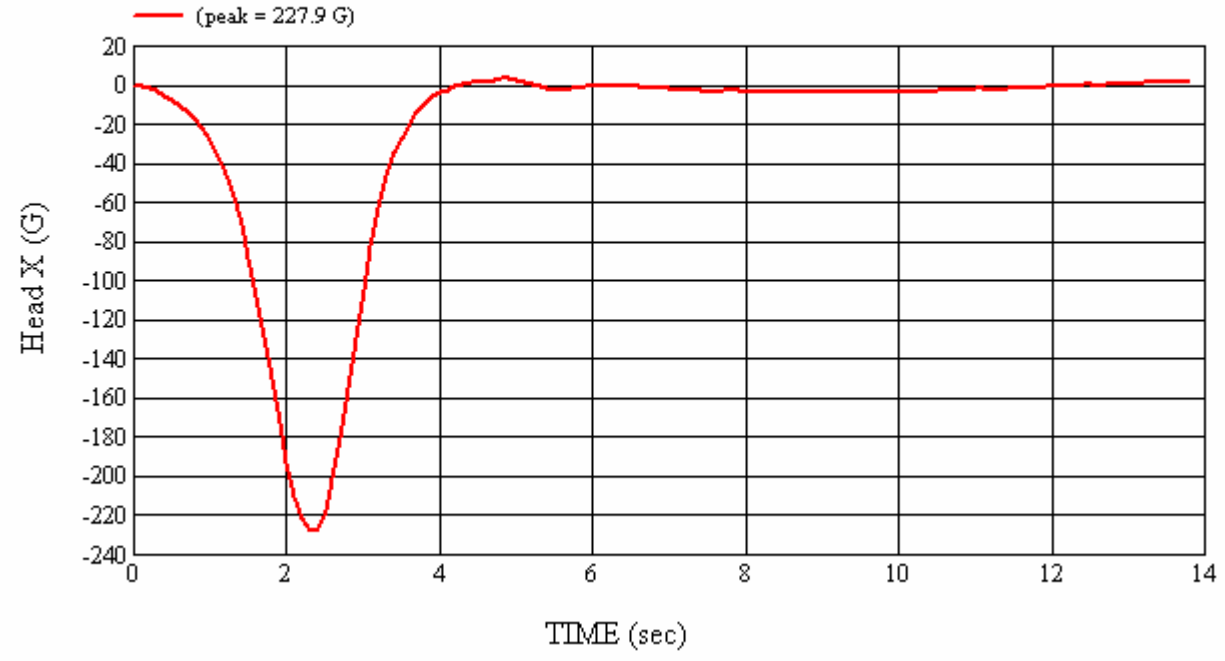
APPROVED BY: Helen A. Kaleto



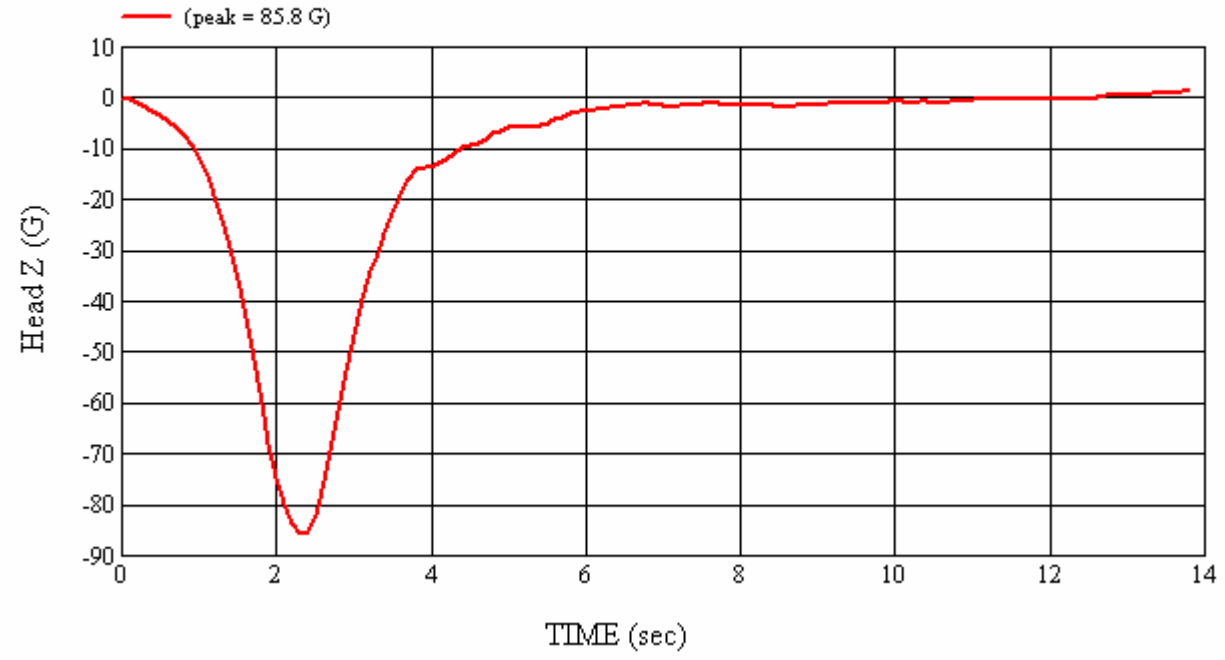
Head 035 (Post) Calibration #H35002



Head 035 (Post) Calibration #H35002



Head 035 (Post) Calibration #H35002



Head 035 (Post) Calibration #H35002

4.3 Pre-Test Calibration

HEAD DROP TEST SUMMARY
PART 572L

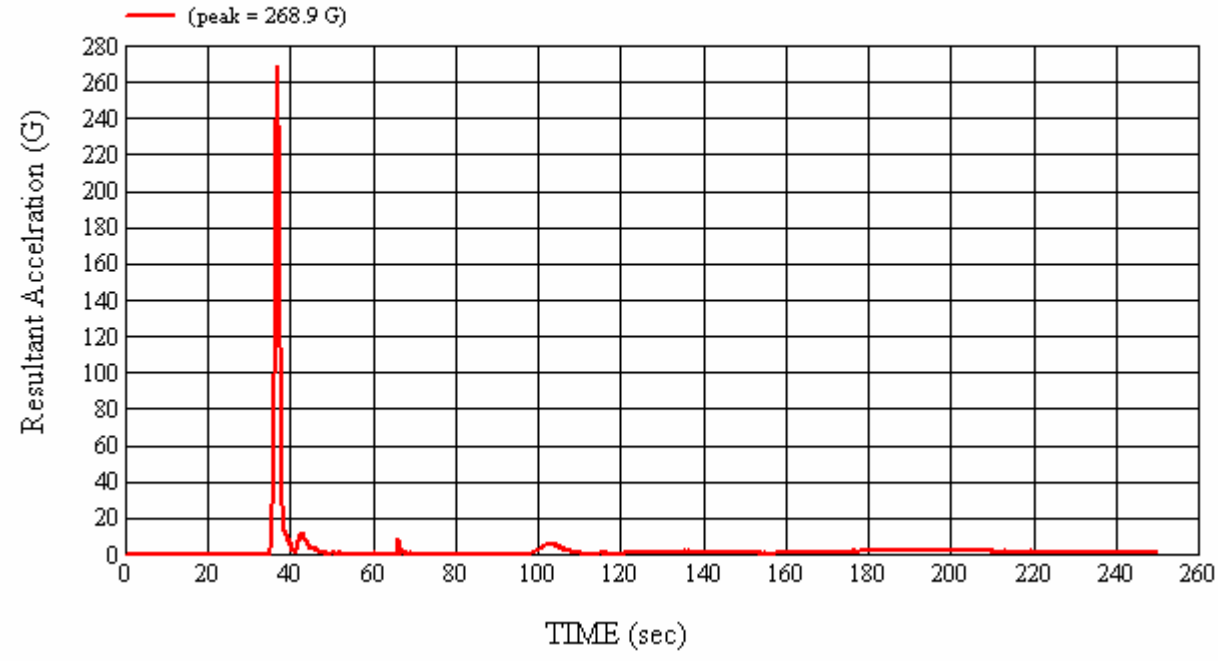
HEADFORM SERIAL NUMBER: 036	CALIBRATION DATE: 7/24/2007 CALIBRATION TIME: 8:47:58 AM	
TEST PARAMETER	**SPECIFICATION**	**TEST RESULTS**
Weight	9.90 to 10.10 lbs.	9.97
Temperature	19° C to 26° C	24
Relative Humidity	10% to 70%	34
Peak Resultant Acceleration	225 G's to 275 G's	268.9
Peak Lateral Acceleration	15 G's Maximum	11.4
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	J21969	04/30/07	10/30/07
2	ENDEVCO	7264-2000	J35916	04/30/07	10/30/07
3	ENDEVCO	7264-2000	J35918	04/30/07	10/30/07

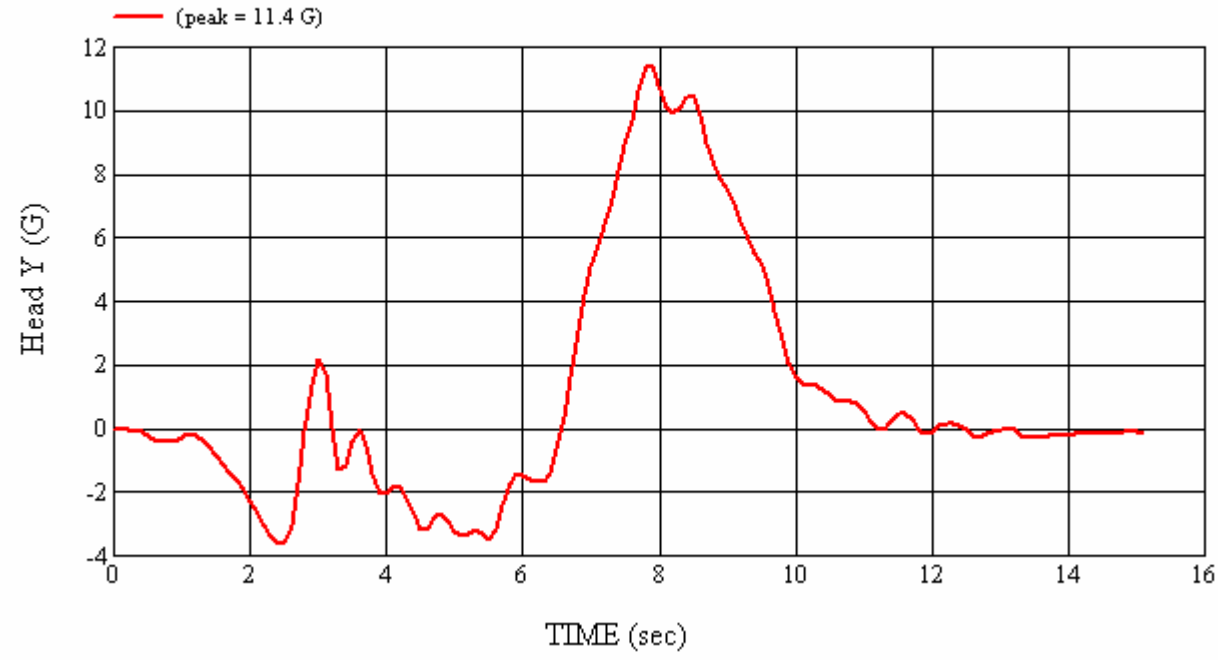
REMARKS:

RECORDED BY: Kevin Campbell DATE: 7/24/2007

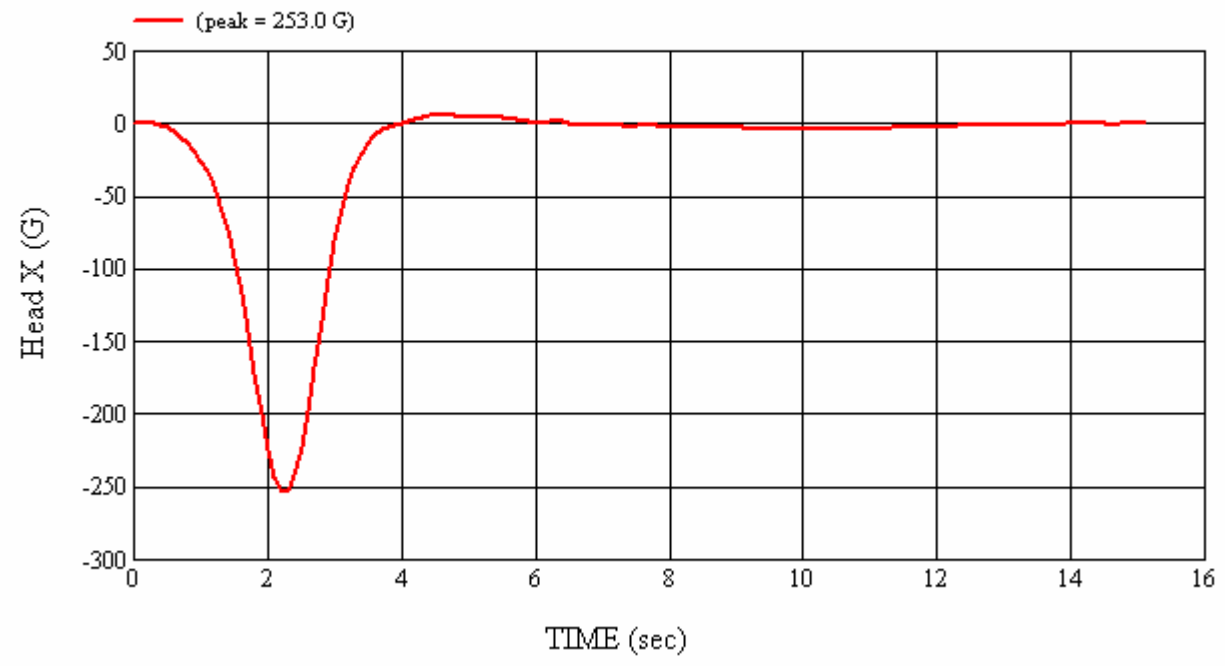
APPROVED BY: Helen A. Kaleto



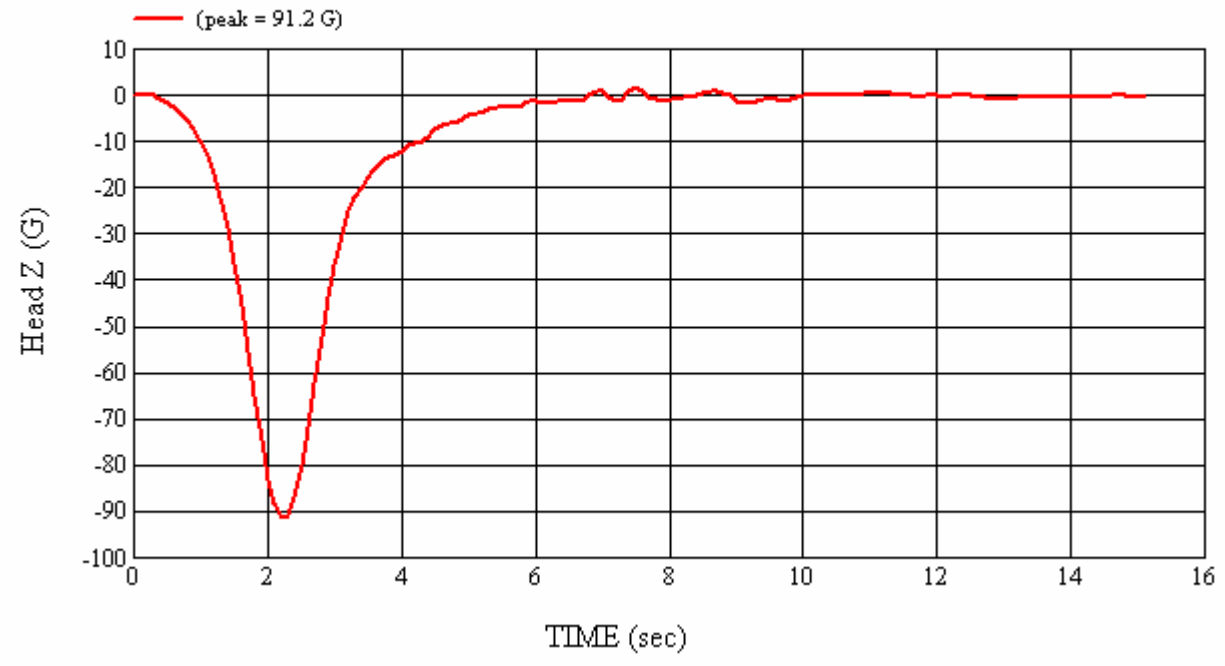
Head 036 (Pre) Calibration #H36007



Head 036 (Pre) Calibration #H36007



Head 036 (Pre) Calibration #H36007



Head 036 (Pre) Calibration #H36007

4.4 Post-Test Calibration

HEAD DROP TEST SUMMARY
PART 572L

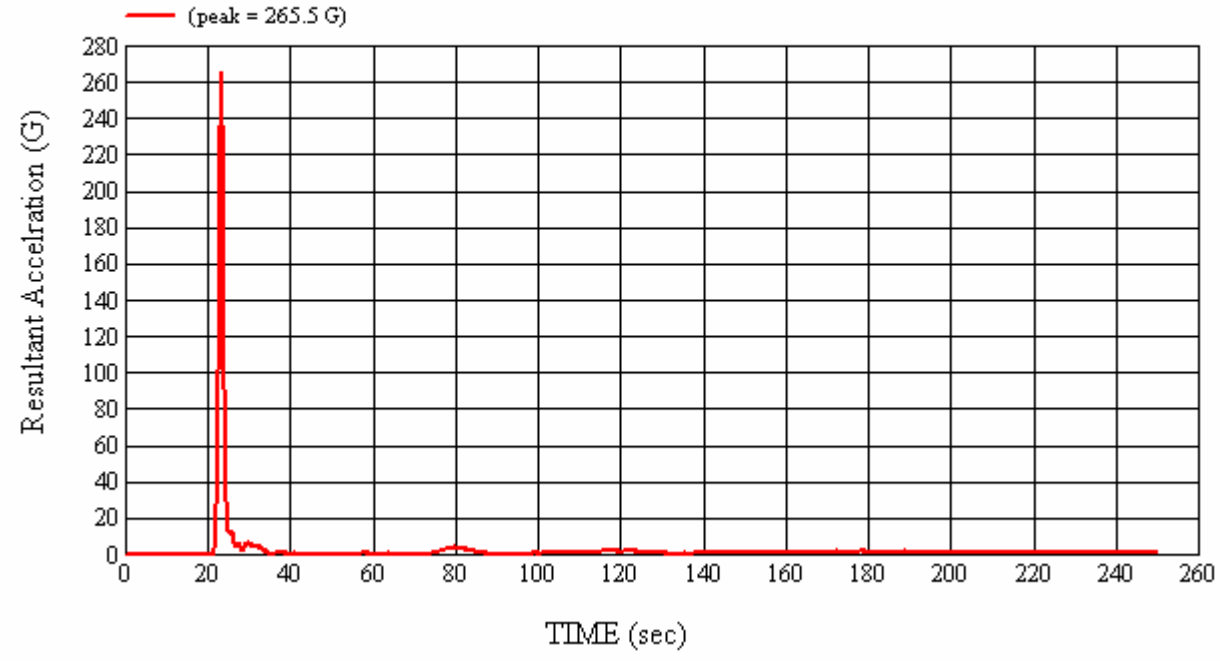
HEADFORM SERIAL NUMBER: 036	CALIBRATION DATE: 7/27/2007 CALIBRATION TIME: 3:30:35 PM	
TEST PARAMETER	**SPECIFICATION**	**TEST RESULTS**
Weight	9.90 to 10.10 lbs.	9.97
Temperature	19° C to 26° C	25
Relative Humidity	10% to 70%	48
Peak Resultant Acceleration	225 G's to 275 G's	265.5
Peak Lateral Acceleration	15 G's Maximum	6.7
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	J21969	04/30/07	10/30/07
2	ENDEVCO	7264-2000	J35916	04/30/07	10/30/07
3	ENDEVCO	7264-2000	J35918	04/30/07	10/30/07

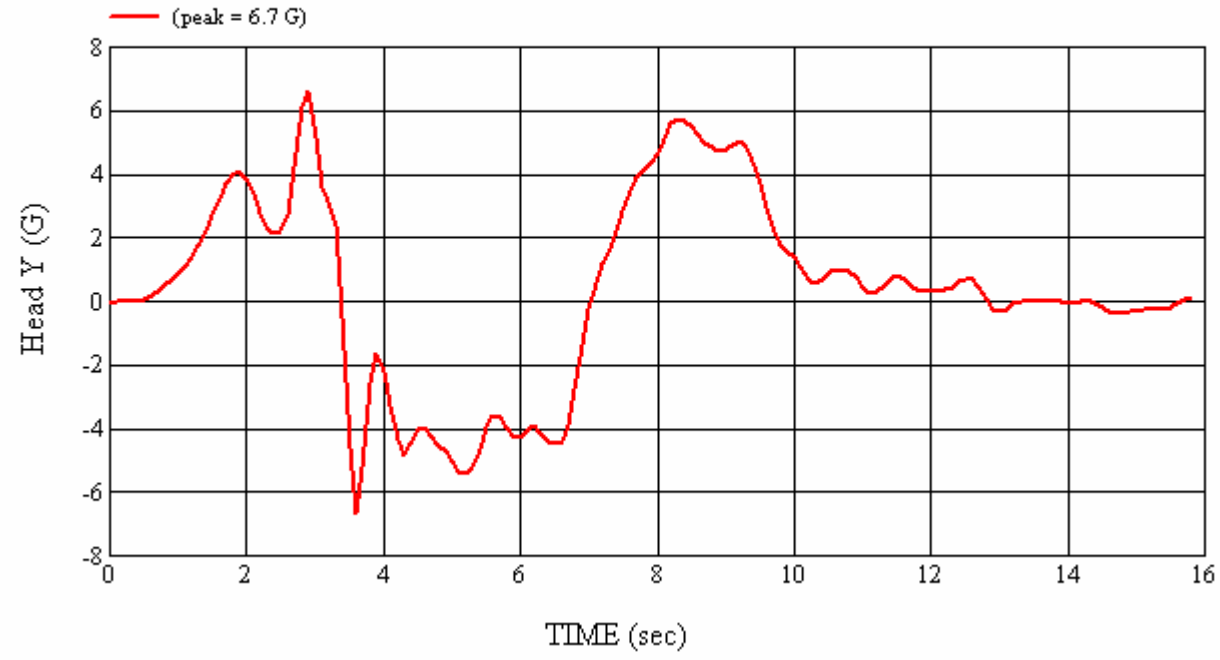
REMARKS:

RECORDED BY: Kaitlin Campbell DATE: 7/27/2007

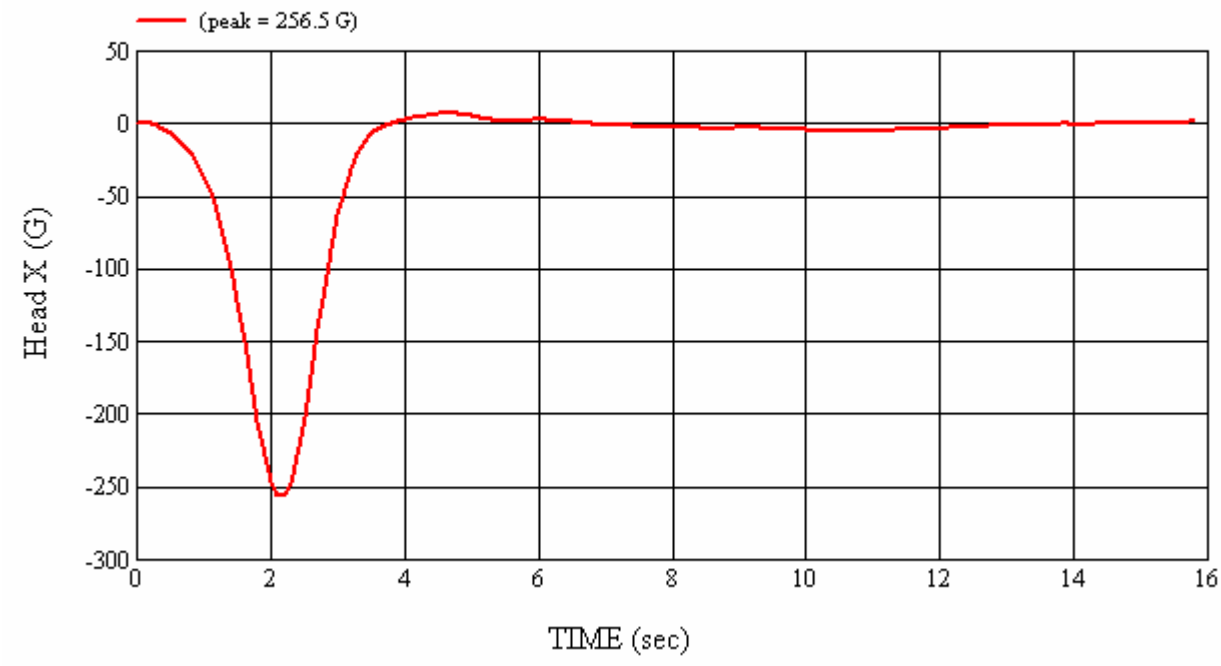
APPROVED BY: Helen A. Kalata



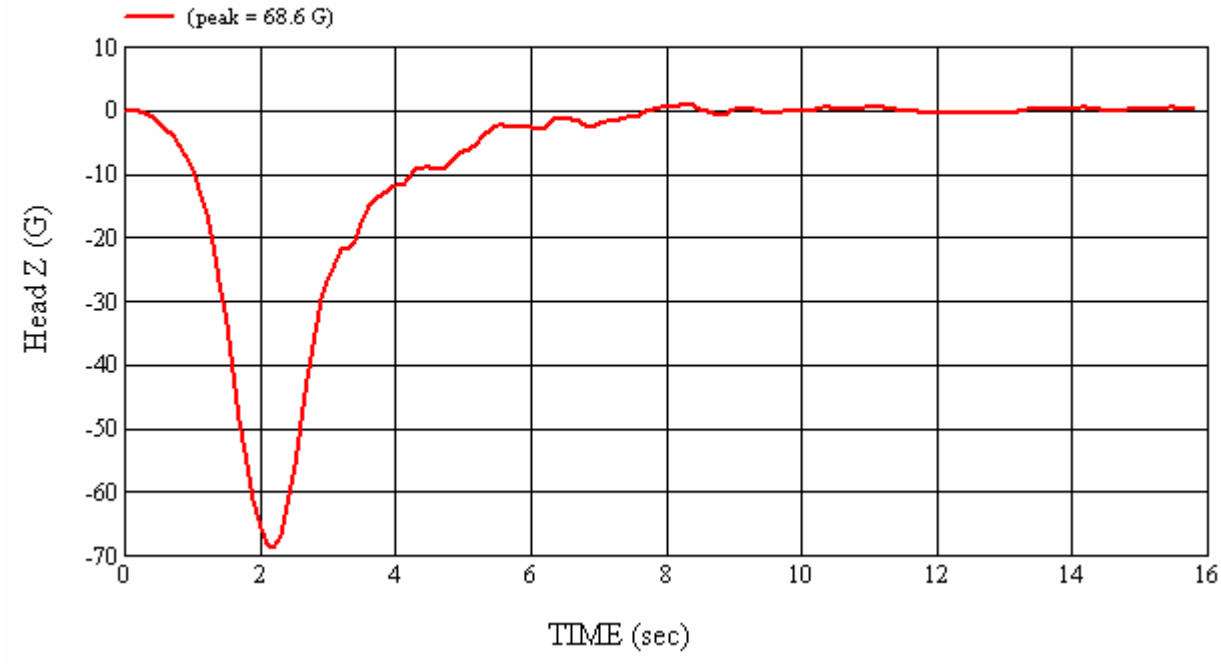
Head 036 (Post) Calibration #H36008



Head 036 (Post) Calibration #H36008



Head 036 (Post) Calibration #H36008



Head 036 (Post) Calibration #H36008

4.5 Pre-Test Calibration

HEAD DROP TEST SUMMARY
PART 572L

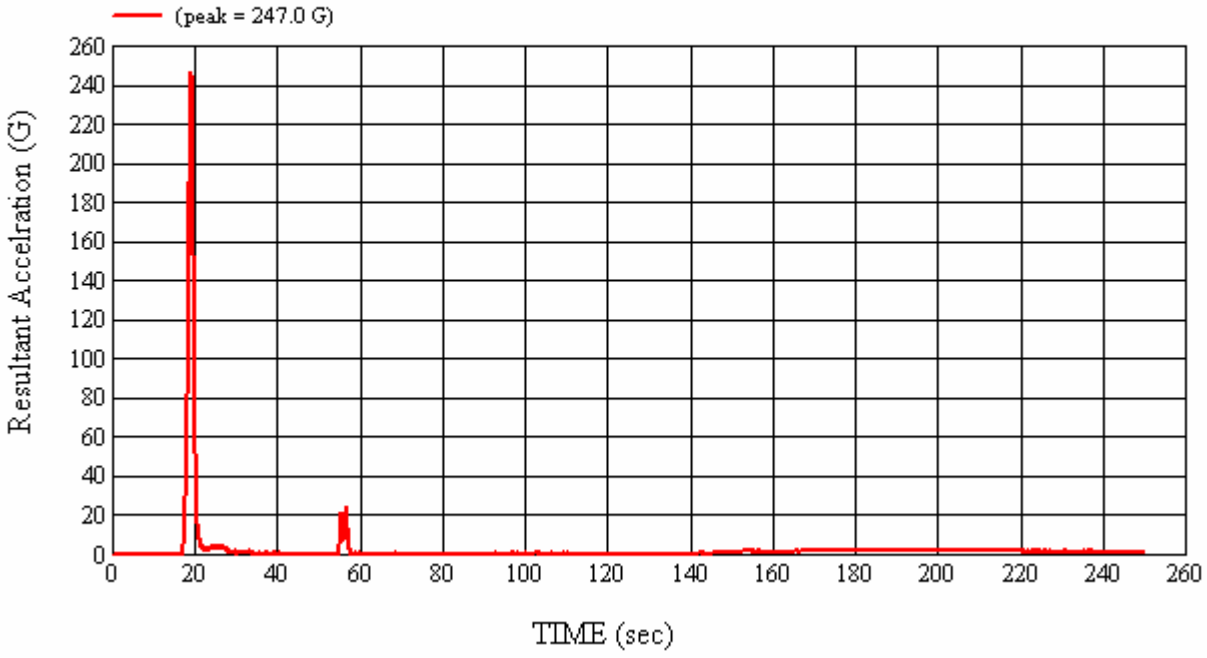
HEADFORM SERIAL NUMBER: 037	CALIBRATION DATE: 7/24/2007 CALIBRATION TIME: 8:58:43 AM	
TEST PARAMETER	**SPECIFICATION**	**TEST RESULTS**
Weight	9.90 to 10.10 lbs.	9.96
Temperature	19° C to 26° C	24
Relative Humidity	10% to 70%	34
Peak Resultant Acceleration	225 G's to 275 G's	247.0
Peak Lateral Acceleration	15 G's Maximum	3.8
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	J22696	04/30/07	10/30/07
2	ENDEVCO	7264-2000	J35791	04/30/07	10/30/07
3	ENDEVCO	7264-2000	J35800	04/30/07	10/30/07

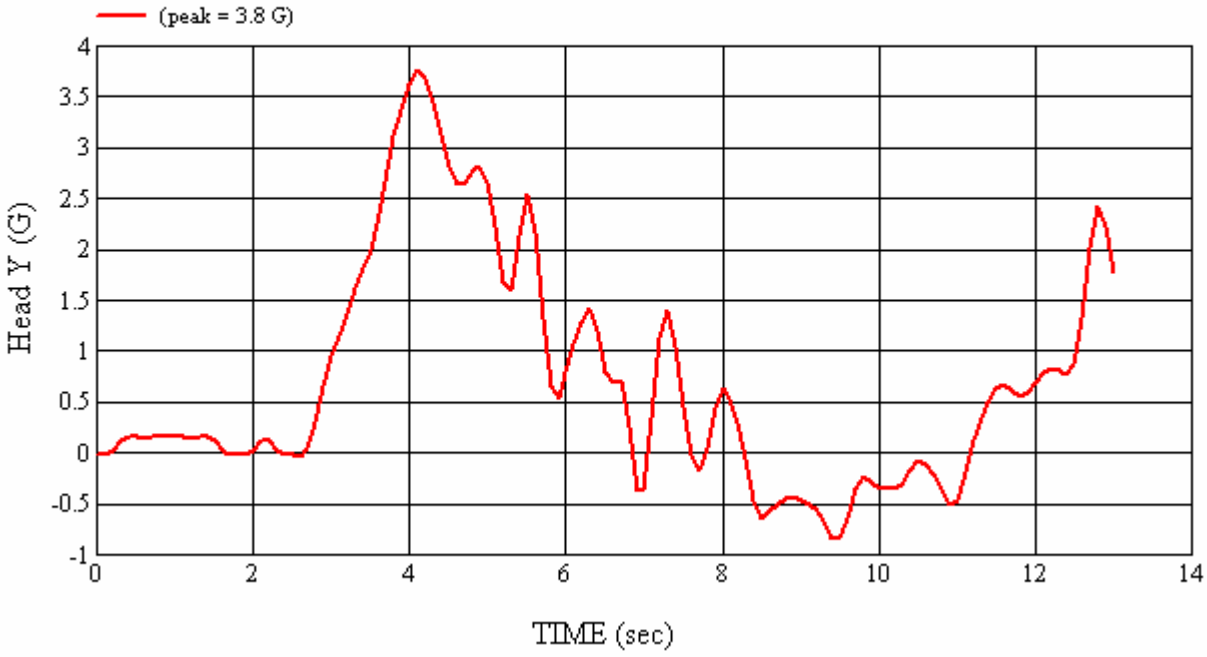
REMARKS:

RECORDED BY: Kevin Campbell DATE: 7/24/2007

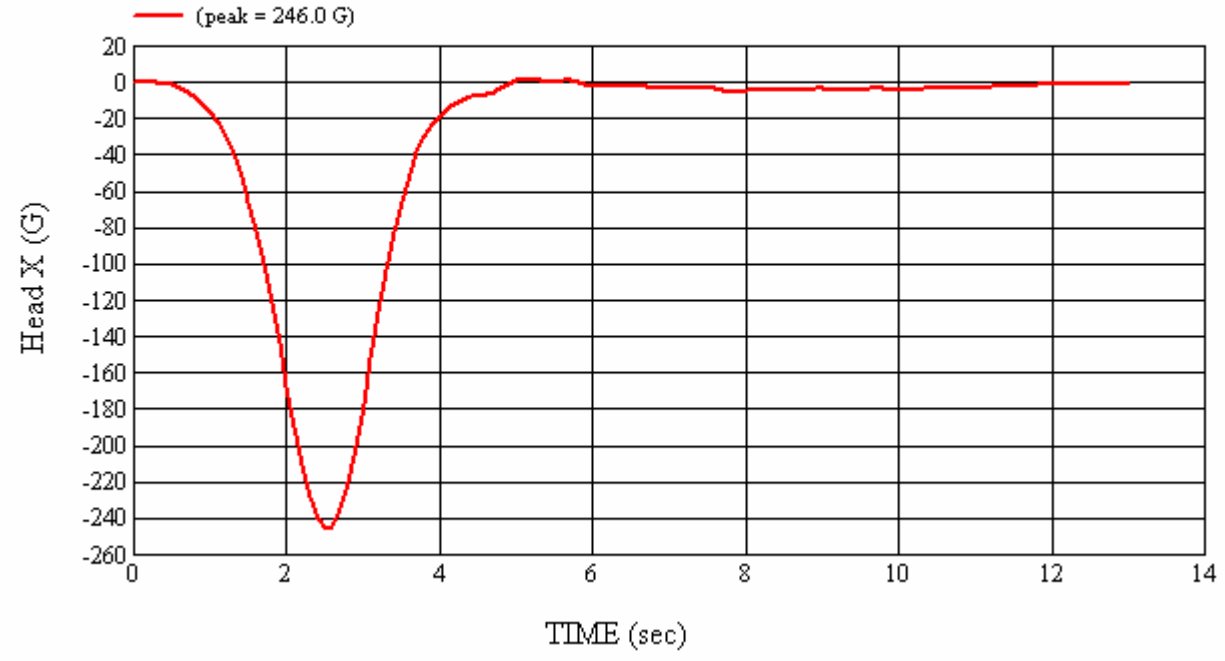
APPROVED BY: Helen A. Kaleto



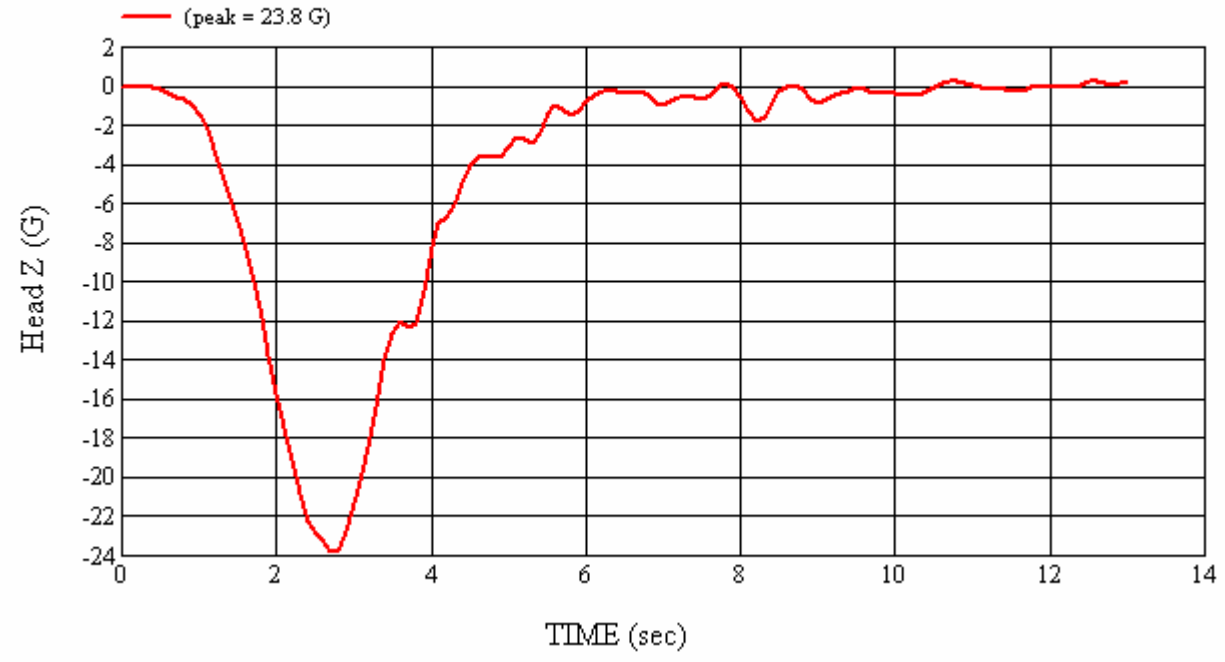
Head 037 (Pre) Calibration #H37005



Head 037 (Pre) Calibration #H37005



Head 037 (Pre) Calibration #H37005



Head 037 (Pre) Calibration #H37005

4.6 Post-Test Calibration

HEAD DROP TEST SUMMARY
PART 572L

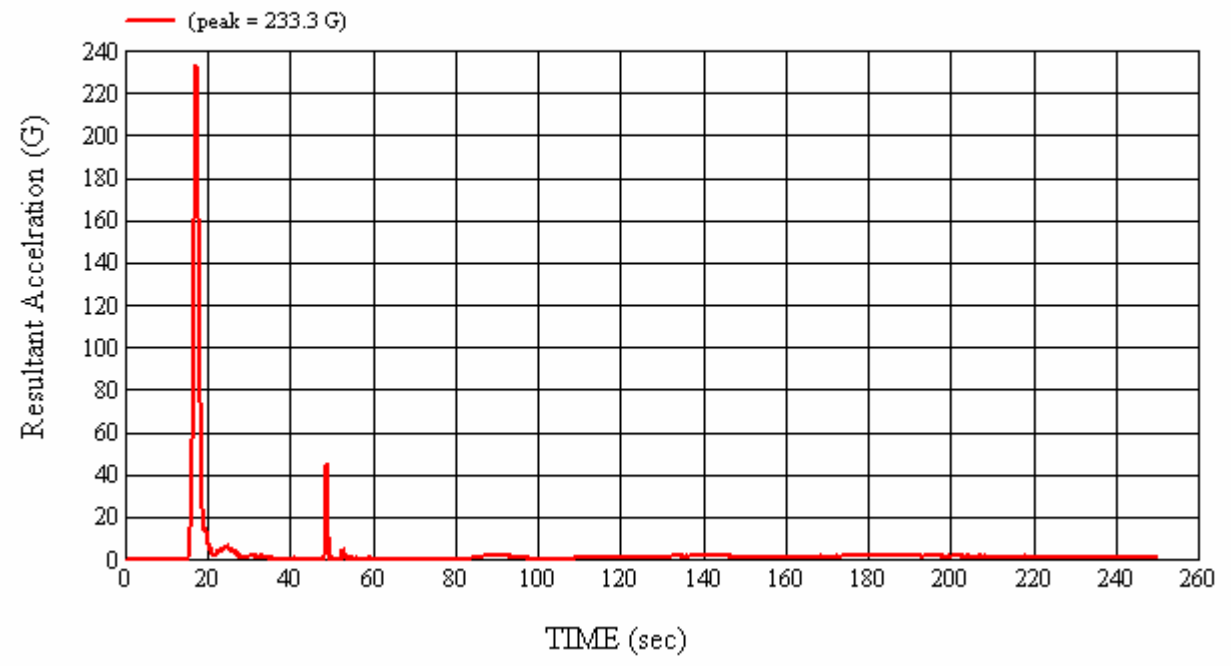
HEADFORM SERIAL NUMBER: 037	CALIBRATION DATE: 7/27/2007 CALIBRATION TIME: 3:52:14 PM	
TEST PARAMETER	**SPECIFICATION**	**TEST RESULTS**
Weight	9.90 to 10.10 lbs.	9.96
Temperature	19° C to 26° C	25
Relative Humidity	10% to 70%	48
Peak Resultant Acceleration	225 G's to 275 G's	233.3
Peak Lateral Acceleration	15 G's Maximum	11.4
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	J22696	04/30/07	10/30/07
2	ENDEVCO	7264-2000	J35791	04/30/07	10/30/07
3	ENDEVCO	7264-2000	J35800	04/30/07	10/30/07

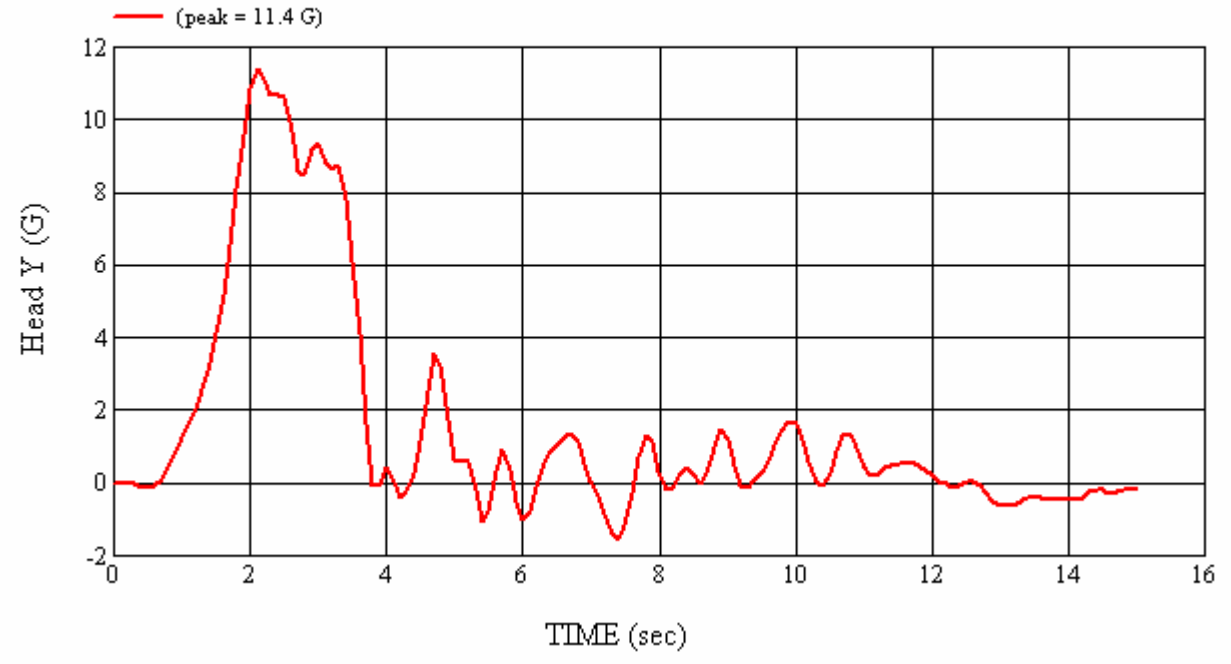
REMARKS:

RECORDED BY: Kevin Campbell DATE: 7/27/2007

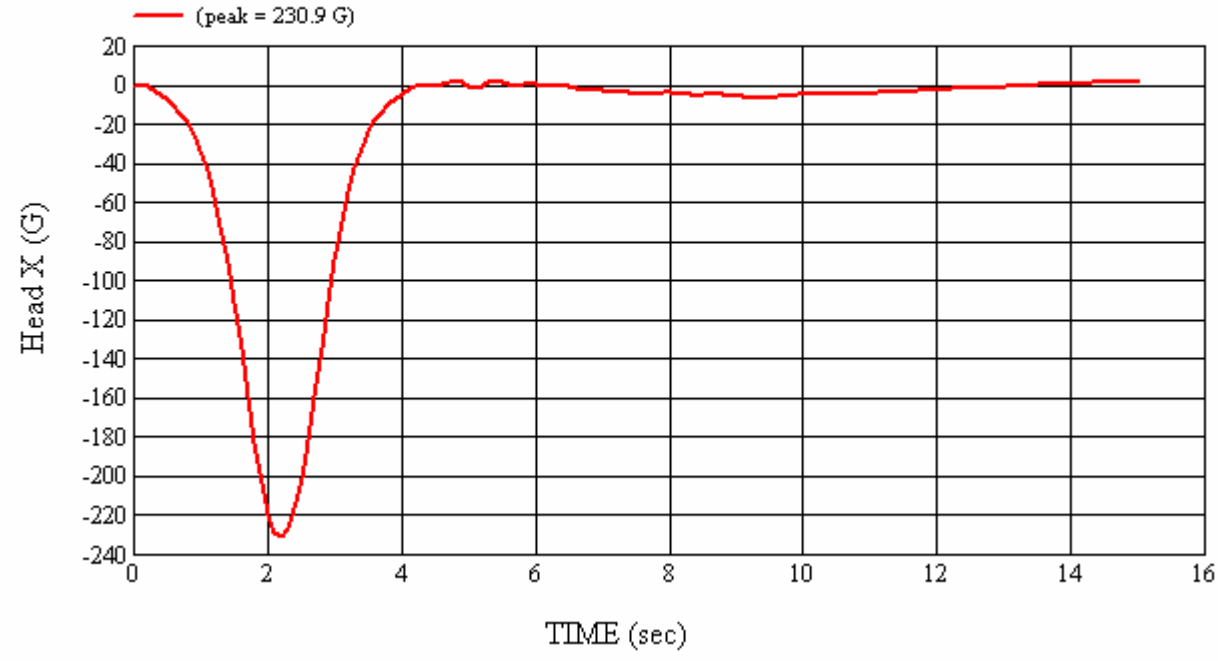
APPROVED BY: Helen A. Kaleto



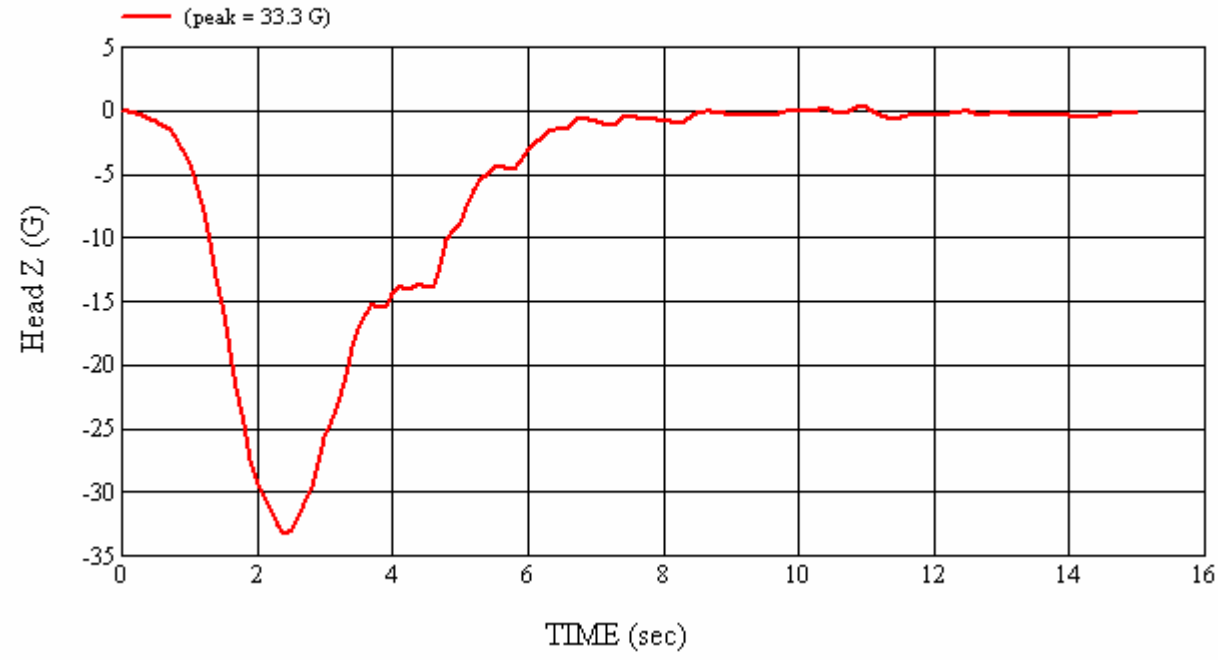
Head 037 (Post) Calibration #H37006



Head 037 (Post) Calibration #H37006



Head 037 (Post) Calibration #H37006



Head 037 (Post) Calibration #H37006

4.7 Pre-Test Calibration

HEAD DROP TEST SUMMARY
PART 572L

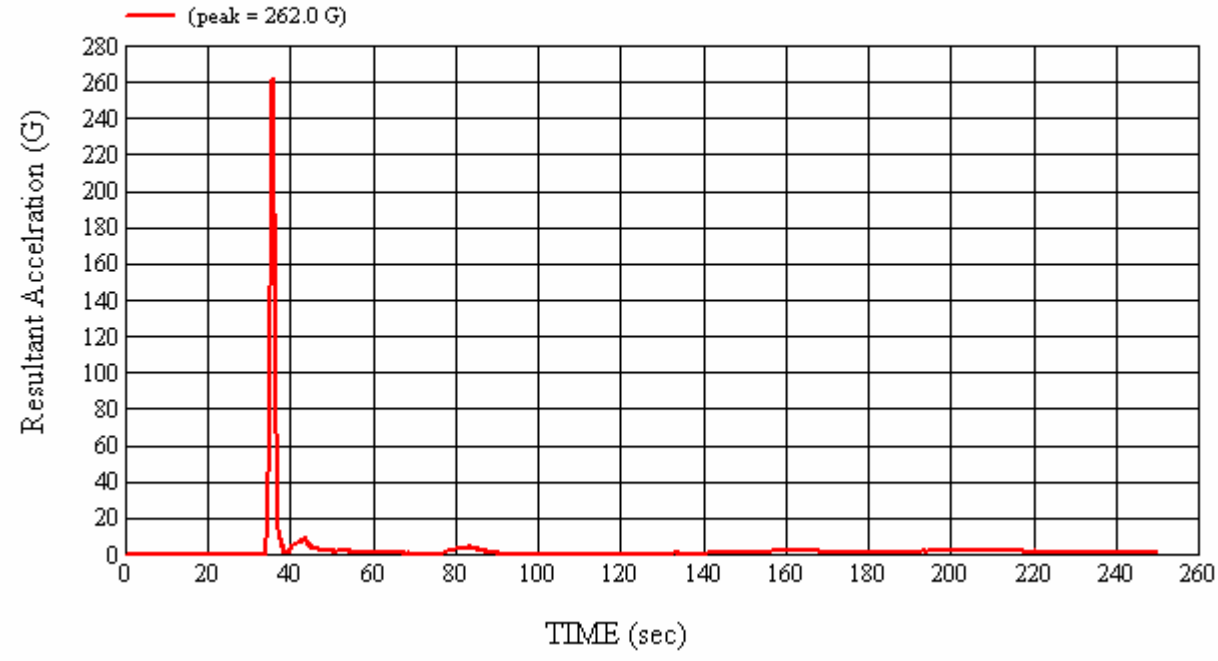
HEADFORM SERIAL NUMBER: 038	CALIBRATION DATE: 7/24/2007 CALIBRATION TIME: 9:29:25 AM	
TEST PARAMETER	**SPECIFICATION**	**TEST RESULTS**
Weight	9.90 to 10.10 lbs.	9.90
Temperature	19° C to 26° C	24
Relative Humidity	10% to 70%	35
Peak Resultant Acceleration	225 G's to 275 G's	262.0
Peak Lateral Acceleration	15 G's Maximum	6.6
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	J14103	04/30/07	10/30/07
2	ENDEVCO	7264-2000	J36197	04/30/07	10/30/07
3	ENDEVCO	7264-2000	J36353	04/30/07	10/30/07

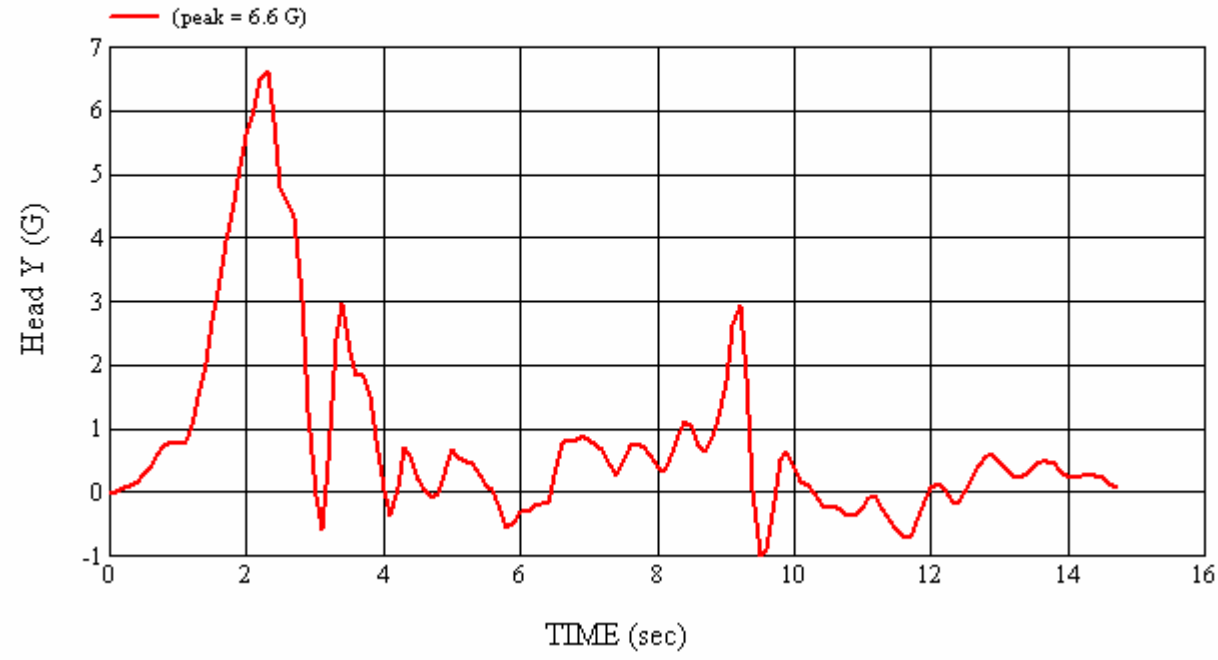
REMARKS:

RECORDED BY: Kevin Campbell DATE: 7/24/2007

APPROVED BY: Helen A. Kaleto



Head 038 (Pre) Calibration #H38005



Head 038 (Pre) Calibration #H38005

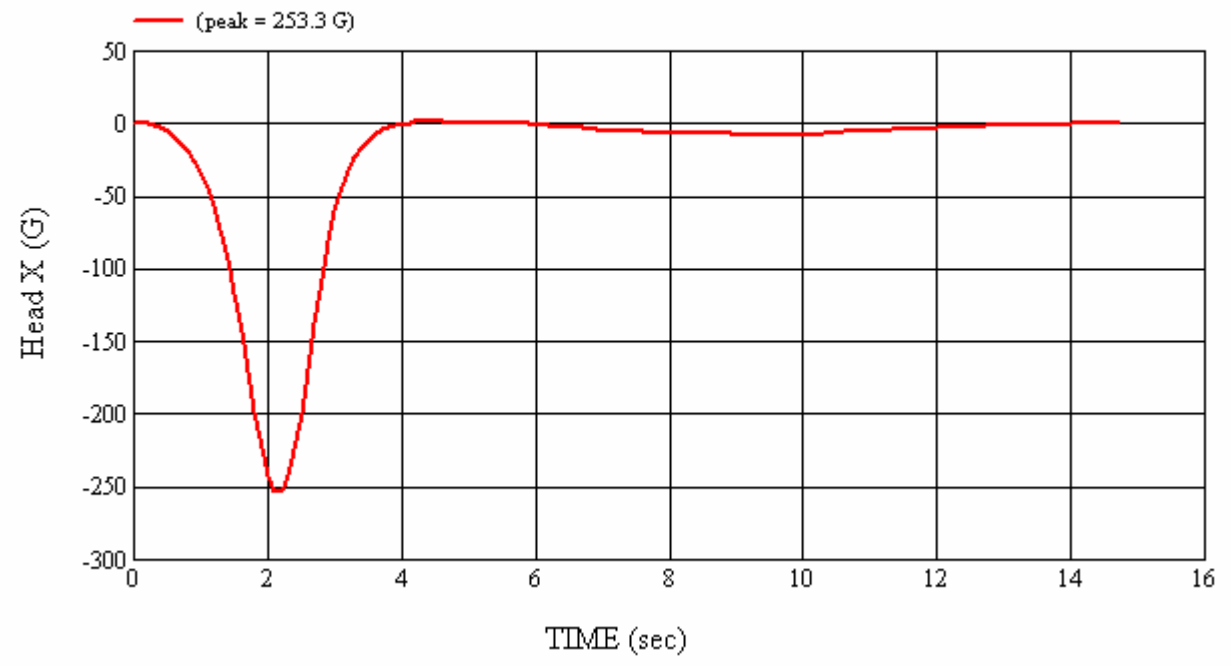
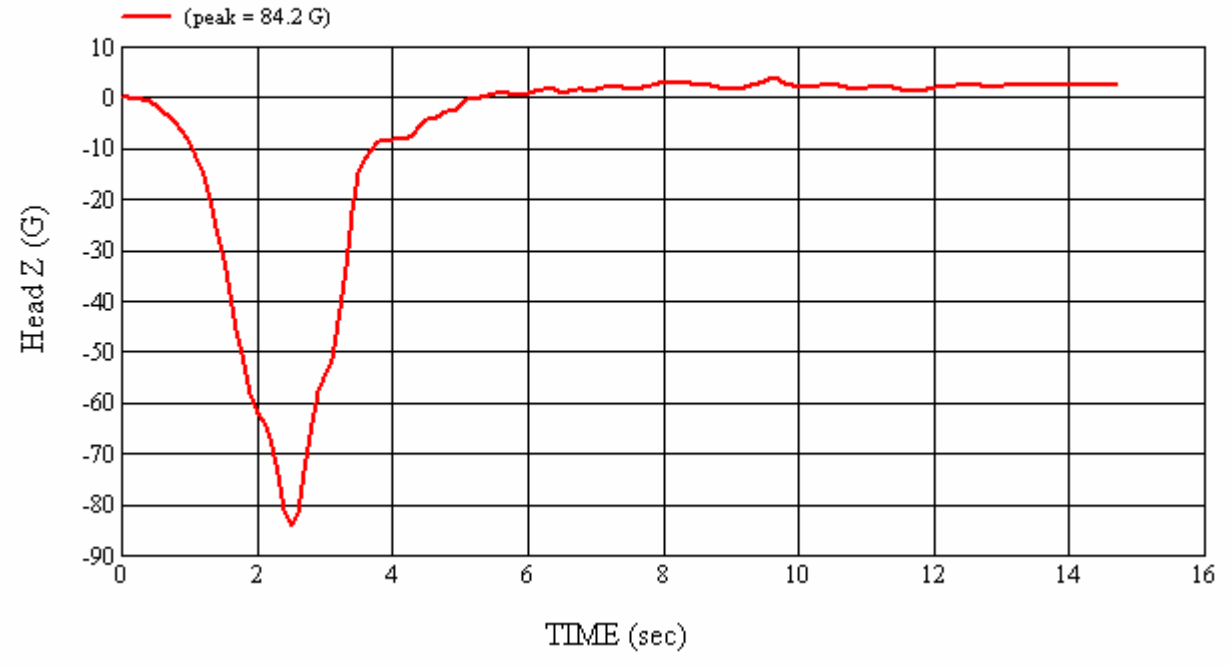


Figure 111 Head 038 (Pre) Calibration #H38005



Head 038 (Pre) Calibration #H38005

4.8 Post-Test Calibration

HEAD DROP TEST SUMMARY
PART 572L

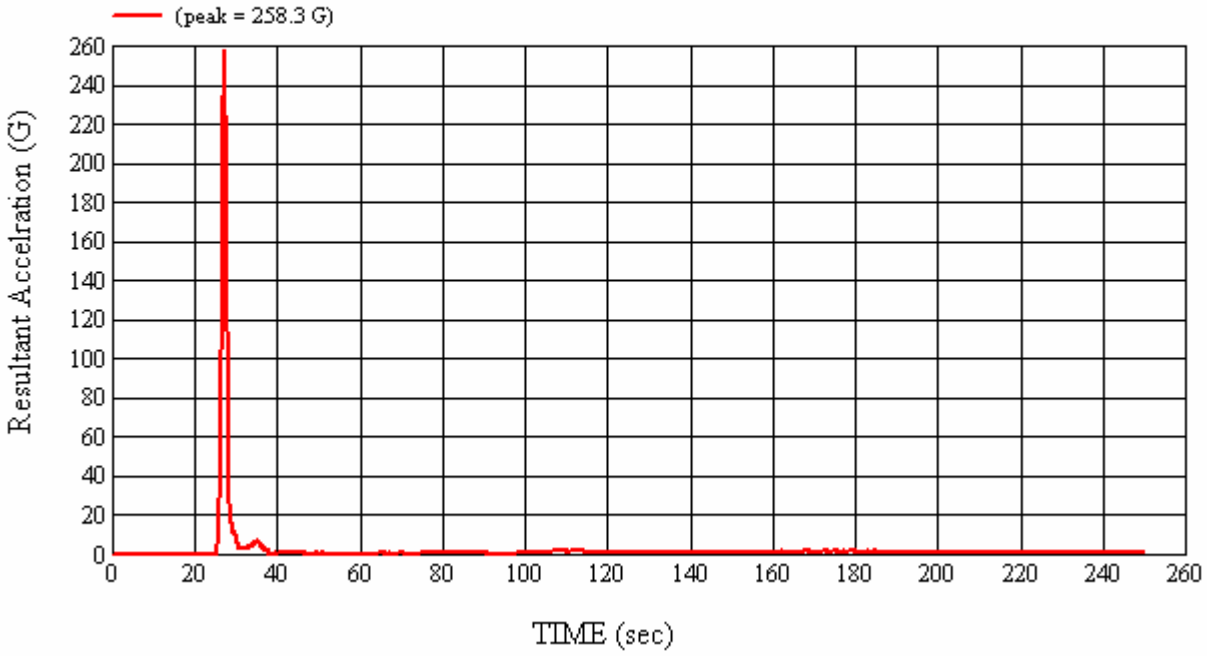
HEADFORM SERIAL NUMBER: 038	CALIBRATION DATE: 7/27/2007 CALIBRATION TIME: 4:06:30 PM	
TEST PARAMETER	**SPECIFICATION**	**TEST RESULTS**
Weight	9.90 to 10.10 lbs.	9.90
Temperature	19° C to 26° C	25
Relative Humidity	10% to 70%	48
Peak Resultant Acceleration	225 G's to 275 G's	258.3
Peak Lateral Acceleration	15 G's Maximum	7.9
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	J14103	04/30/07	10/30/07
2	ENDEVCO	7264-2000	J36197	04/30/07	10/30/07
3	ENDEVCO	7264-2000	J36353	04/30/07	10/30/07

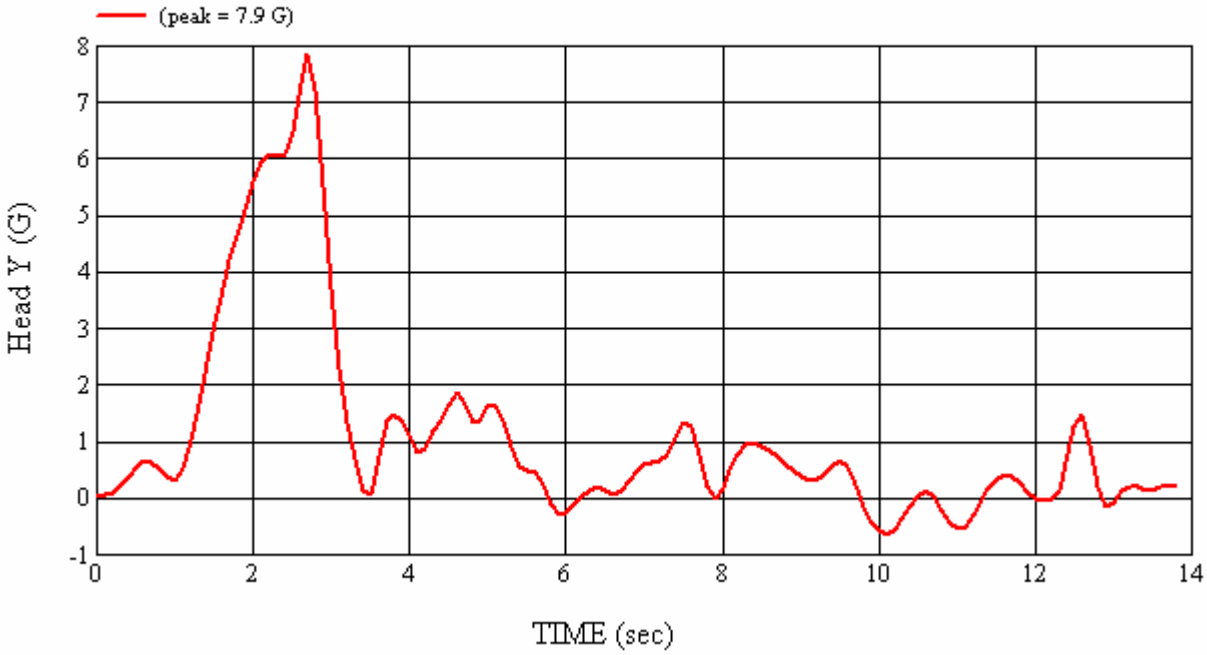
REMARKS:

RECORDED BY: Kevin Campbell DATE: 7/27/2007

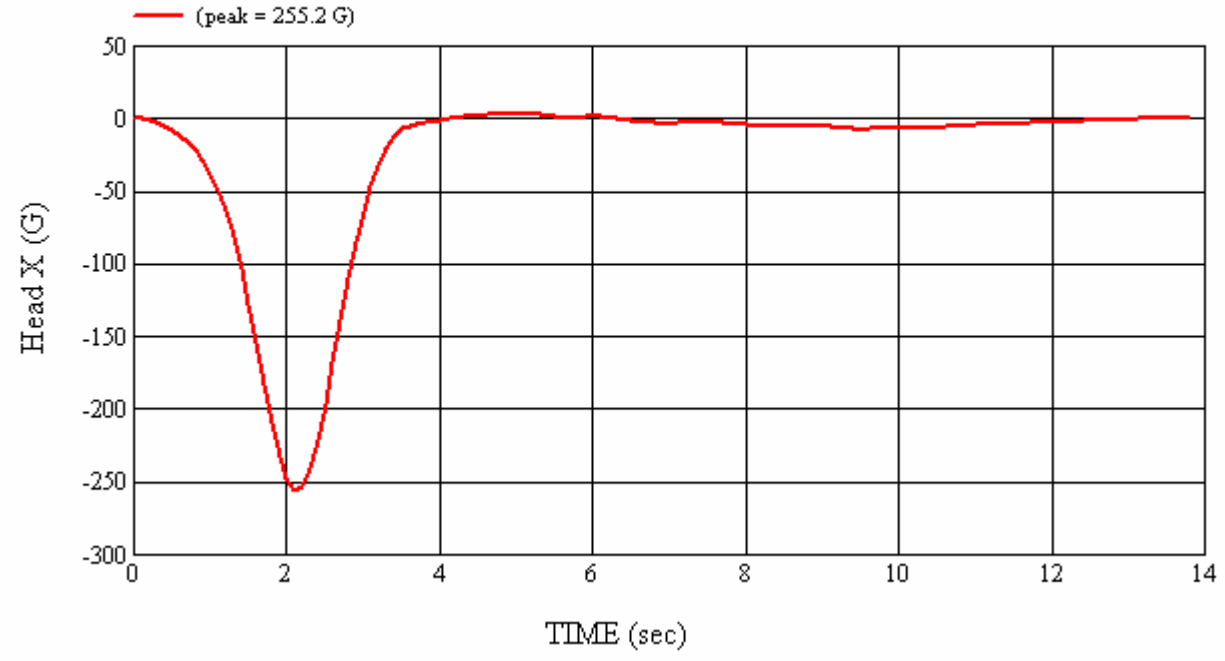
APPROVED BY: Helen A. Kaleto



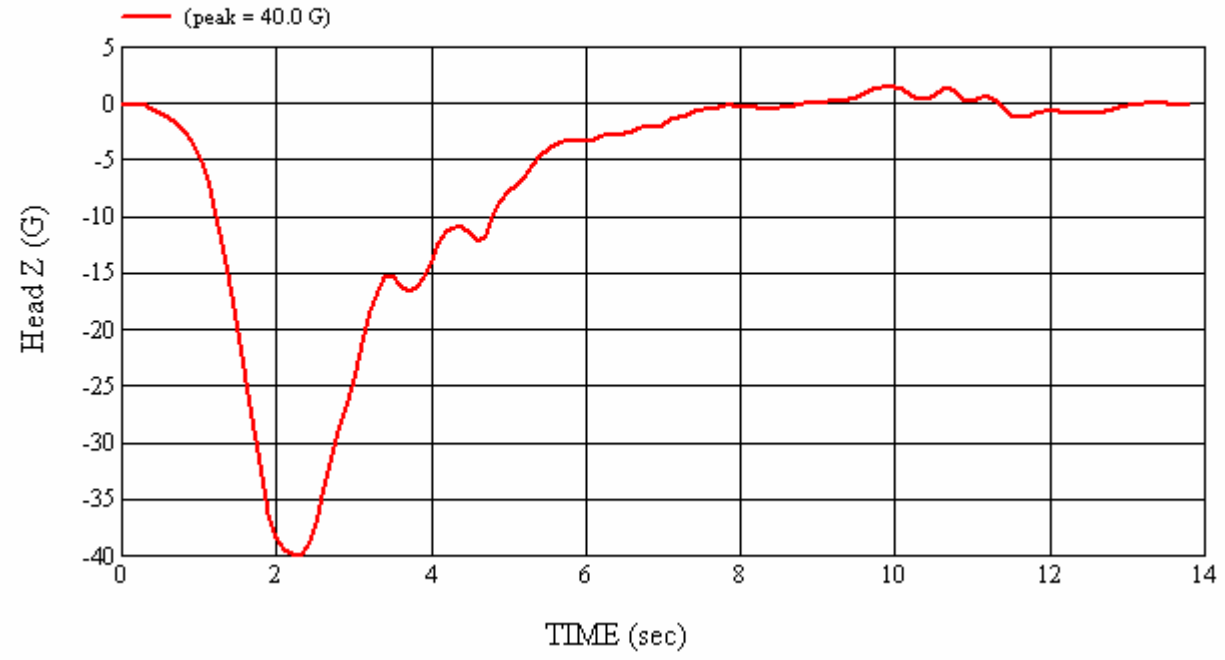
Head 038 (Post) Calibration #H38006



Head 038 (Post) Calibration #H38006



Head 038 (Post) Calibration #H38006

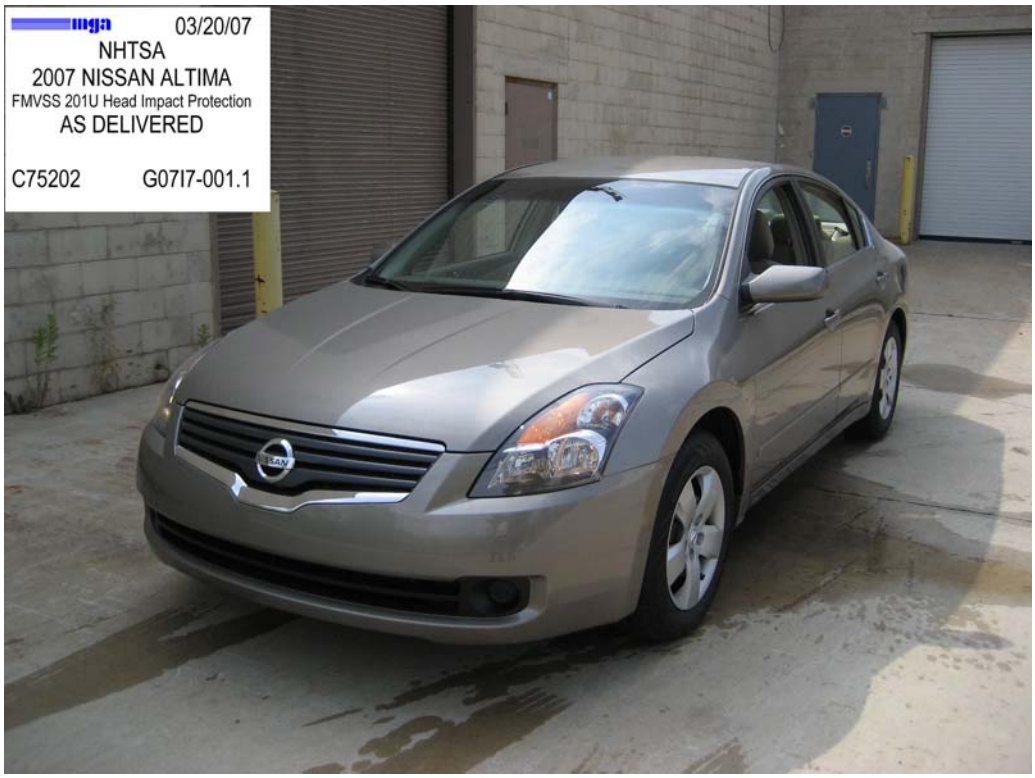


Head 038 (Post) Calibration #H38006

5.0 PHOTOGRAPHS

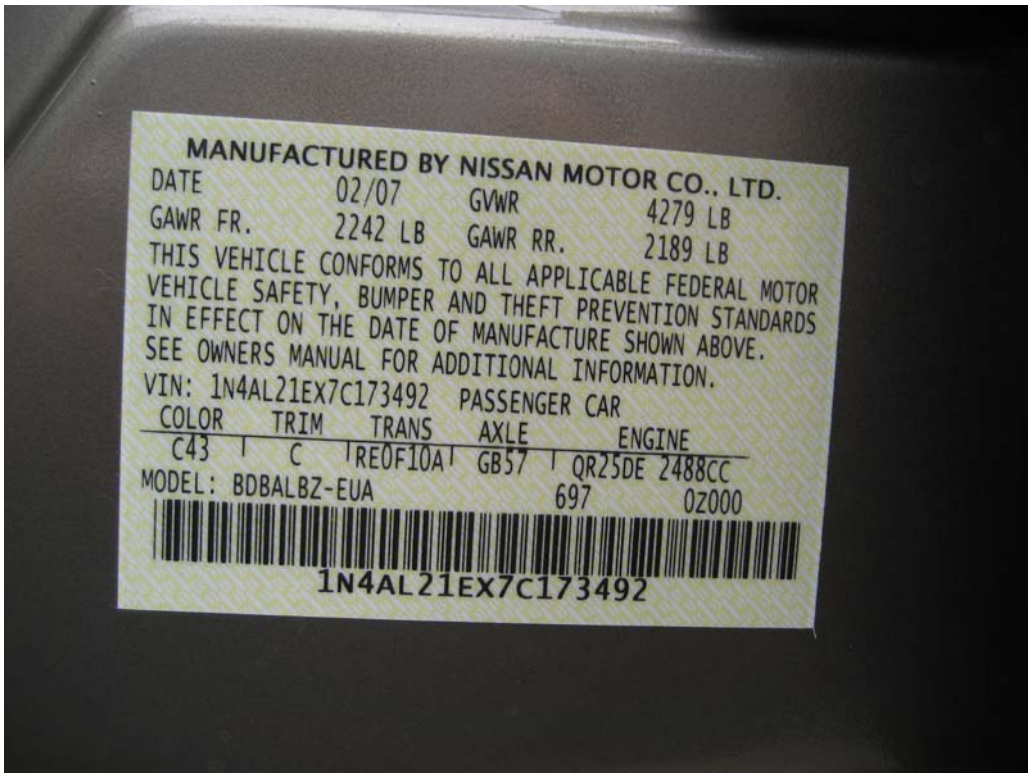
As Delivered – Left Side View

As Delivered – Right Side View



As Delivered – ¾ Front View From Left Side

As- Delivered – Rear View From Right Side



As Delivered – Vehicle's Certification Label

As Delivered – Vehicle's Tire Information Label

Pre-Test Component Photographs


mga
07/24/07
NHTSA
2007 NISSAN ALTIMA
FMVSS 201U Head Impact Protection
PRE-TEST COMPONENT
C75202
G07I7-001.1


mga
07/24/07
NHTSA
2007 NISSAN ALTIMA
FMVSS 201U Head Impact Protection
PRE-TEST COMPONENT
C75202
G07I7-001.1

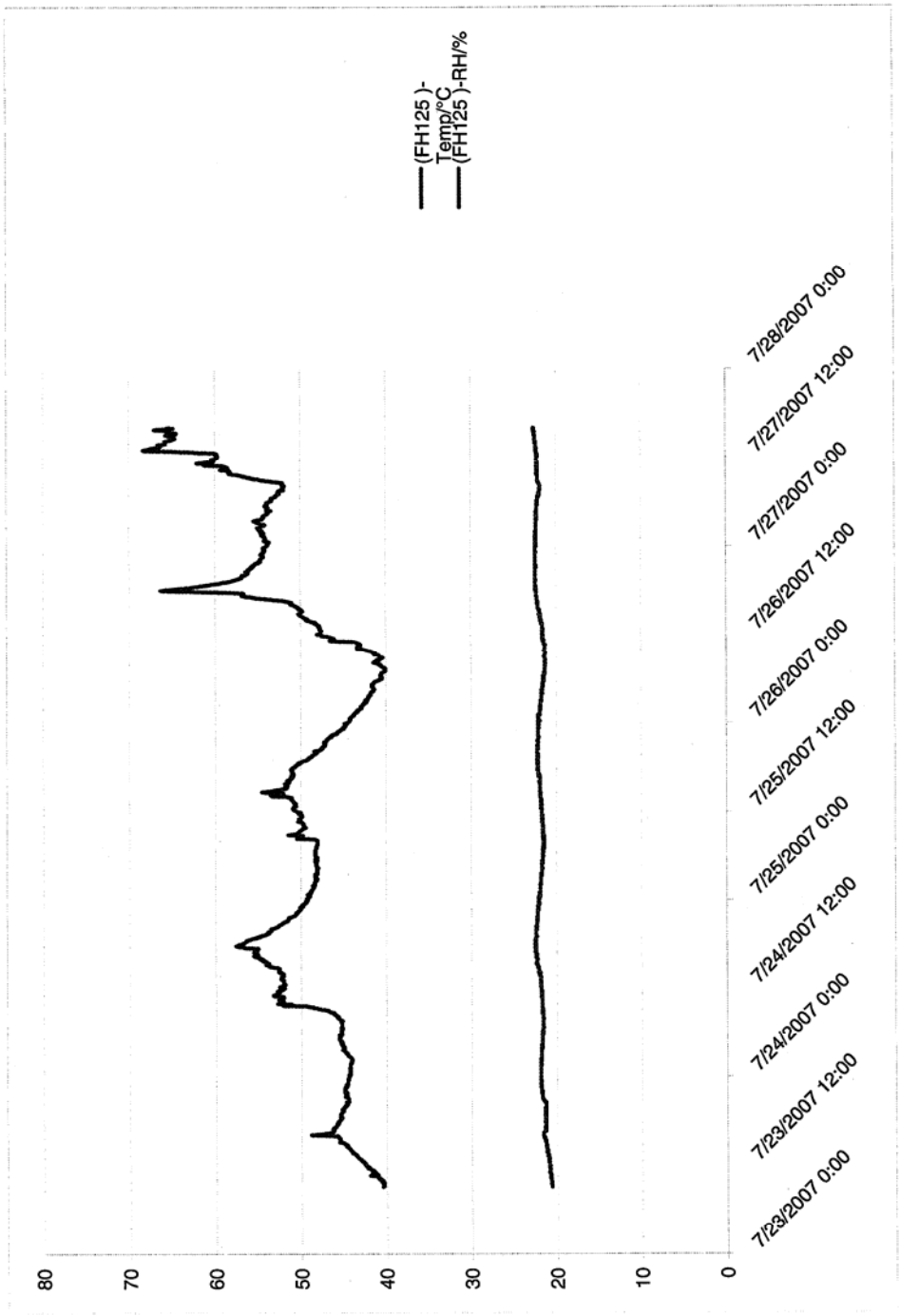

07/24/07
NHTSA
2007 NISSAN ALTIMA
FMVSS 201U Head Impact Protection
PRE-TEST COMPONENT
C75202
G07I7-001.1
BRAKE STOP

Post-Test Component Photographs


07/26/07
NHTSA
2007 NISSAN ALTIMA
FMVSS 201U Head Impact Protection
POST-TEST COMPONENT
C75202
G07I7-001.1


07/26/07
NHTSA
2007 NISSAN ALTIMA
FMVSS 201U Head Impact Protection
POST-TEST COMPONENT
C75202
G07I7-001.1

Appendix A - Temperature Trace



Appendix B - Calibration Certificates

Interim Certification Document

art Description: Silver — Certification Date: 12/20/06 — Serial#: S08-05-98-01273

Single Point 2 Sigma: S08-05 +/-.076mm (+/-.0030") — Certificate#: S0127339071

Linear Displacement 2 Sigma: S08-05 +/-.108mm (+/-.0042") — Temperature: See attached data

Measurement Standards Traceability

Ball Bar Kit	Asset Number: 606	Calibration Date: 11/30/06	*SI Traceability: NPL-LL0101/0501
10mm Step Gauge, Mitutoyo	Asset Number: 773	Calibration Date: 04/03/06	*SI Traceability: NIST-821/267216-02
Code No.: 515-744		Calibration Date: 04/03/06	*SI Traceability: UKAS-174978
Measuring range: 1.5m			

*The artifact above has been calibrated with a device traceable to the International System of Units (SI) through a National Metrological Institute (NMI) or through an ISO17025 Accredited Laboratory. Expanded measurement uncertainty is 3.9 + 5.9X micrometers, where X=measured value in meters. Uncertainty is expressed at approximately the 95% Level of Confidence using k=2.00.

Certification Results

A basic four quadrant certification included with all FARO Arms and comprised of: 2 vertical level single point repeatability test in 4 quadrants with 5 repeats from 4 directions	PASSED
Step Gauge Test in 4 quadrants, 3 orientations per quadrant	PASSED
3 Length, 3 position free ball bar test in 4 quadrants	PASSED

Calibration and certification conforms to procedures developed in accordance with ASME B89.4.22-200X.

Instrument condition as received — **Instrument condition outgoing**

Inoperative — Within specifications

Technician: Harry Van Horn — Date: 12/20/06

FARO Technologies, Inc.
PH1:1-800-736-2771
PH2:407-333-9911
FAX:407-333-8056
L-A-B Cert Number: L1147

125 Technology Park
Lake Mary, FL 32746
USA

FARO®

LABORATORY ACCREDITATION BUREAU
ISO/IEC 17025 Accredited

Revised: November 22, 2006

f:\control\records\05manufa\partspec\XH08-0495.eps Rev1 RevDate: 12/08/04

MetroCal inc.
#0513.01
4700 Barden Court S.E. • Kentwood, MI 49512 • Telephone: 616.698.3124 • Fax: 616.698.2364

Certificate of Calibration

MGA Research
446 Executive Drive
Troy, MI 48083

Order Number: **51186**
Report Number: **060926810**
Page: **1 of 1**

Gauge Number: **MGA00048**
Gauge Desc: **Digital Protractor**
Manufacturer: **N/A**
Model Number: **Pro 360**
Serial Number: **N/A**

Customer PO: **07-06-0081**
Last Calibration: **8/29/05**
Calibration Date: **9/26/06**
Next Calibration: **9/26/07**

As Found Condition: **In Tolerance**

As Left Condition: **In Tolerance**

MetroCal Inc. maintains reference standards of measurement which are traceable to the National Institute of Standards and Technology, or other authorized National Standards. Calibration was performed in accordance with MetroCal Proc. No. CP045 and complies with the ANSI/NCSL Z540-1 and ISO/IEC 17025 Standards. Results shall not be reproduced except in full without the written approval of MetroCal, Inc. Results relate only to the item(s) calibrated. Any number of factors may cause the calibration Item to drift out of calibration before the recommended interval has expired. Statements of compliance made using simple acceptance rule.

Standard Used	Cal Date	Due Date	Traceable No.	Calibration Procedure Uncertainty Expressed at 95% confidence (K=2)
Gage Blk Set ID# 105	6/14/06	6/14/07	821/271641-05	0.0015 Decimal Deg.
DoAll Sine Bar ID#1879	12/6/05	12/6/06	821/270003-04 & 3600042619	

Results:

As Found Readings

Units	Nominal	Actual	Deviation
Decimal Deg.	5.0	5.0	0.0
	10.0	10.0	0.0
	20.0	20.0	0.0
Tolerance	30.0	30.1	0.1
± 0.1°	40.0	40.0	0.0

Reference Level Check: Within +/- 0.1 degrees

As Left Readings

Nominal	Actual	Deviation
5.0	5.0	0.0
10.0	10.0	0.0
20.0	20.0	0.0
30.0	30.1	0.1
40.0	40.0	0.0

Reference Level Check: Within +/- 0.1 degrees

Comments: Environmental conditions during calibraiton: 68 deg. F., 37 % RH.

issued: 9.26.06
Shannon Kubicek
Calibration Technician

☐ Checked box indicate this calibration was performed at the customers facility.

9/27/06

MICHIGAN OPERATIONS
DATE: 2/7/04
SUPERCEDES: MGATPTMC.5

DOC. NO.: MGATPTMC
REVISION NO.: 6
PAGE 3 OF 3

Tape Measure Calibration Certificate

Reference Steel Rule
Brand: JOHNSON
S/N: M6A00122
Calibration Date: 9.21.06

Subject Tape Measure
Brand: STANLEY
S/N: TPM 7455
Calibration Date: 5.30.07

Reference in (mm)	Subject Tape Measure	Difference	Reference in (mm)	Subject Tape Measure	Difference
0 (0)	0	0	18 (450)	18	0
1 (25)	1	0	19 (475)	19	0
2 (50)	2	0	20 (500)	20	0
3 (75)	3	0	21 (525)	21	0
4 (100)	4	0	22 (550)	22	0
5 (125)	5	0	23 (575)	23	0
6 (150)	6	0	24 (600)	24	0
7 (175)	7	0	25 (625)	25	0
8 (200)	8	0	26 (650)	26	0
9 (225)	9	0	27 (675)	27	0
10 (250)	10	0	28 (700)	28	0
11 (275)	11	0	29 (725)	29	0
12 (300)	12	0	30 (750)	30	0
13 (325)	13	0	31 (775)	31	0
14 (350)	14	0	32 (800)	32	0
15 (375)	15	0	33 (825)	33	0
16 (400)	16	0	34 (850)	34	0
17 (425)	17	0	35 (875)	35	0

If all differences are ± 1/32 of an inch (1 mm), then the tape measure is acceptable.
Pass X Fail ____ Maximum Difference = 0

Date: 3.30.07 Performed By: RJ Smith

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is ± 0.2%. 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.

QA 3/30/07

Certificate of Instrument Calibration and Testing

Customer Instrument

Dickson Model Number: FH125

Serial Number: 06163263

Calibration Technician *Dan Gawel*

Calibration Date: 08/17/2006

Calibration Standards

General Eastern: Model # M3
Ser. # 0850800 / 2360502
Accuracy: ± .4% FS RH and ± .4 °F
Certified April, 2006

Azonix Model # A1011 Ser. # T2513-9027
RTD Platinum Probe Ser. # 496013 Accuracy: ± .2 °F
Certified April, 2006

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/NCSL Z540, 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 recomended interval has expired.
This certificate only relates to this specific unit.

Environmental Conditions

72 °F 41 %RH

Calibration Standard Reading	Customer Instrument Reading	Unit Specification
Humidity (%RH)	Humidity (%RH)	Humidity
		± 2% RH
50.8	50.4	± 2% RH
		± 3% RH
Temperature °F	Temperature °F	Temperature
		± 1.8 ° F (± 1.0 ° C)
74.9	74.9	

FOR YOUR NEXT CALIBRATION NO PHONE CALLS REQUIRE

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 #: FH125
   Serial #: 06163263

A 3-pt Deluxe NIST will be performed unless otherwise requested

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)

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 got to www.dicksonweb.com, click on "product search" and select the product type, "Parts Accessories."

Prices are subject to change

3. Please return via:
   ☐ Ground Freight*
   ☐ 2nd Day Air*
   ☐ Next Day Air*
   ***Charges added at factory**

Returned UPS 2nd Day unless otherwise requested

4. Ship To: _____

Bill To: _____

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

Page 1 of 1

8/24/06

MetroCal inc
#0512.01
4700 Barden Court S.E. • Kentwood, MI 49512 • Telephone: 616.698.3124 • Fax: 616.698.2364

Certificate of Calibration

MGA Research
446 Executive Drive
Troy, MI 48083

Order Number: 55304
Certificate Number: 070709906
Page: 1 of 1

Gauge Number: MGA00081
Gauge Desc: 0 to 20.00lb x 0.01lb Digital Scale
Manufacturer: Detecto
Model Number: AP-20
Serial Number: E33603-0213

Customer PO: N/A
Last Calibration: 7/7/06
Calibration Date: 7/9/07
Next Calibration: 7/9/08

As Found Condition: In Tolerance

As Left Condition: In Tolerance

MetroCal Inc. maintains reference standards of measurement which traceable to the National Institute of Standards and Technology, or other authorized National Standards. Calibration was performed in accordance with MetroCal's Procedure No CP-042 and the relevant sections of the manufacturers manual. This Calibration complies with the ISO/IEC 17025 and ANSI/NCSL Z540-1 Standards. Results shall not be reproduced except in full without the written approval of MetroCal Inc. Results relate only to the item(s) calibrated. Any number of factors may cause the calibration item to drift out of calibration before the recommended interval has expired. Statements of compliance made using simple acceptance rule.

Standard Used	Cal. Date	Due Date	Traceable No.	Calibration Procedure Uncertainty Expressed at 95% confidence , (K=2)
Dead Weight Set ID#2463	8/10/06	8/10/08	MI-04-06-8325	+/-0.001% of Load

Results:
Tolerance used: ± 0.02

Units: lbs TI Division/Increment: 0.01

	As Found				As Left		
Weight Test	Nominal	Indication	Deviation		Nominal	Indication	Deviation
0-25% fs	5.00	5.00	0.00		5.00	5.00	0.00
26-50% fs	10.00	9.99	-0.01		10.00	9.99	-0.01
51-75% fs	15.00	14.99	-0.01		15.00	14.99	-0.01
76-100% fs	20.00	19.99	-0.01		20.00	19.99	-0.01
Beam 2							
0-25% fs							
26-50% fs							
51-75% fs							
76-100% fs							
Beam 3							
0-25% fs							
26-50% fs							
51-75% fs							
76-100% fs							
Shift Test:	Pass			Shift Test:	Pass		
Half Load Test:	Pass			Half Load Test:	Pass		

Comments: Environmental conditions during calibration: 87 deg F., 47 % RH

Chad Rosema issued: 7/9/07
Chad Rosema/bjk
Calibration Technician

☐ Checked box indicate this calibration was performed at the customers facility

7/24/07

Sterling Scale Co., Inc.
20950 Boening St.
Southfield, MI 48075

Certificate of Calibration

F410/12-3
Rev. Date 11/23/05

calibration cert. 1448.01

Customer: MGA Research ***Cert#*** O7-3173 ***Temp/Humidity:*** 78/40
Location of Calibration: 2839 Elliott Troy MI 48083
Calibration Date: 7/17/2007 ***Cal Due:*** Jul-08 ***Condition of Item:*** GOOD
Equipment Make: SW Scales ***Model:*** SW Deluxe ***Serial/ID:*** 26032389 ***Capacity:*** 8800x1lb

Applied Test Wt	*Before Adustment*	*Tolerance*	*In-Tolerance Y/N*	*After Adjustment*	*In-Tolerance Y/N*	*Unc*
LF 0lb	0lb	1lb	y	0lb	y	0.5
LF 50lb	50lb	1lb	y	50lb	y	0.5
LF 1000lb	1000lb	2lb	y	1000lb	y	0.5
LF 2200lb	2199lb	2lb	y	2199lb	y	0.5
LR 0lb	0lb	1lb	y	0lb	y	0.5
LR 50lb	50lb	1lb	y	50lb	y	0.5
LR 1000lb	1000lb	2lb	y	1000lb	y	0.5
LR 2200lb	2200lb	2lb	y	2200lb	y	0.5

shift test
N/A
PADS

	Platform #1	***Platform #2***	***Platform #3***
	☑ Pass	☐ Pass	☐ Pass
	☐ Fail	☐ Fail	☐ Fail

Tests performed: ☑ Repeatability ☑ Linearity ☐ Sensitivity ☑ Discrimination

Page 1 of 2

Technician COMMENTS/ weights used The scale is accurate and working fine. The scale holds a good zero,also the system is in a storage trunk. Sterling House Weights

☑ Scale Certified ☐ Scale Rejected

Sterling Scale Service Rep: Larry V. **Date:** 7/17/2007 1 of 1

The above item has been calibrated using the relevant EPO or OEM procedures utilizing test weights
Traceable to International Systems of Units (SI), through the Michigan Department of Agriculture.
Test numbers on file. Expanded uncertainty(k=2) confidence level of 95% as reported.
Results relate only to items listed.
The reported uncertainty is valid only for the environment in which it is determined.
Any number of factors may cause the item to drift out of calibration before recommended interval has expired
This report shall not be reproduced, except in full without approval of the laboratory
Tolerances followed are maintenance/acceptance per HB 44 or as detremined by the customer

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CALIBRATION CERTIFICATE

Sensor Information	Reference Sensor Information
Name: 2000 G Accelerometer	**Name:** *Reference Accelerometer*
Model: 7264-2000	**Model:** *301M09/484B*
S/N: J22664	**S/N:** *862/247*
Capacity: 2000 G	**Capacity:** *170 G*
Calibration Date: 4/30/2007	**Calibration Date:** *7/27/2006*
	Calibrated By: *Chuck DiMaggio*

Test Reference Number: A0712

New DLR (100k **, Units:G):** 94.2

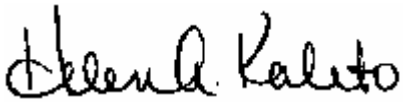
StdDeviation (%) 0.496

% Difference in DLR (New vs. Old): -1.807

Temperature (°F): 74

Humidity (%): 36

Performed By: 

Approved By: 

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is ±3.7%. 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:** *Reference Accelerometer*
Model: 7264-2000	**Model:** *301M09/484B*
S/N: J35919	**S/N:** *862/247*
Capacity: 2000 G	**Capacity:** *170 G*
Calibration Date: 4/30/2007	**Calibration Date:** *7/27/2006*
	Calibrated By: *Chuck DiMaggio*

Test Reference Number: A0712

New DLR (100k **, Units:G):** 97.4

StdDeviation (%) 0.299

% Difference in DLR (New vs. Old): -1.589

Temperature (^{o}F): 74

Humidity (%): 36

Performed By:

Approved By:

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is ±3.7%. 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:** *Reference Accelerometer*
Model: 7264-2000	**Model:** *301M09/484B*
S/N: J35924	**S/N:** *862/247*
Capacity: 2000 G	**Capacity:** *170 G*
Calibration Date: 4/30/2007	**Calibration Date:** *7/27/2006*
	Calibrated By: *Chuck DiMaggio*

Test Reference Number:	A0712
New DLR (100k **, Units:G):**	93.9
StdDeviation (%)	0.188
% Difference in DLR (New vs. Old):	0.228
Temperature (^{o}F):	74
Humidity (%):	36

Performed By: 

Approved By: 

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CALIBRATION CERTIFICATE

Sensor Information	Reference Sensor Information
Name: 2000 G Accelerometer	**Name:** *Reference Accelerometer*
Model: 7264-2000	**Model:** *301M09/484B*
S/N: J21969	**S/N:** *862/247*
Capacity: 2000 G	**Capacity:** *170 G*
Calibration Date: 4/30/2007	**Calibration Date:** *7/27/2006*
	Calibrated By: *Chuck DiMaggio*

Test Reference Number:	A0712
New DLR (100k **, Units:G):**	90.9
StdDeviation (%)	0.113
% Difference in DLR (New vs. Old):	-0.839
Temperature (^{o}F):	74
Humidity (%):	36

Performed By:

Approved By:

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is ±3.7%. 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:** *Reference Accelerometer*
Model: 7264-2000	**Model:** *301M09/484B*
S/N: J35916	**S/N:** *862/247*
Capacity: 2000 G	**Capacity:** *170 G*
Calibration Date: 4/30/2007	**Calibration Date:** *7/27/2006*
	Calibrated By: *Chuck DiMaggio*

Test Reference Number:	A0712
New DLR (100k **, Units:G):**	103.2
StdDeviation (%)	0.19
% Difference in DLR (New vs. Old):	0.033
Temperature (^{o}F):	74
Humidity (%):	36

Performed By: 

Approved By: 

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is ±3.7%. 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:** *Reference Accelerometer*
Model: 7264-2000	**Model:** *301M09/484B*
S/N: J35918	**S/N:** *862/247*
Capacity: 2000 G	**Capacity:** *170 G*
Calibration Date: 4/30/2007	**Calibration Date:** *7/27/2006*
	Calibrated By: *Chuck DiMaggio*

Test Reference Number:	A0712
New DLR (100k **, Units:G):**	99.4
StdDeviation (%)	0.149
% Difference in DLR (New vs. Old):	-1.369
Temperature (°F):	74
Humidity (%):	36

Performed By:

Approved By:

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is ±3.7%. 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:** *Reference Accelerometer*
Model: 7264-2000	**Model:** *301M09/484B*
S/N: J22696	**S/N:** *862/247*
Capacity: 2000 G	**Capacity:** *170 G*
Calibration Date: 4/30/2007	**Calibration Date:** *7/27/2006*
	Calibrated By: *Chuck DiMaggio*

Test Reference Number: A0713

New DLR (100k **, Units:G):** 100.0

StdDeviation (%) 0.559

% Difference in DLR (New vs. Old): -1.242

Temperature (^{o}F): 74

Humidity (%): 36

Performed By:

Approved By:

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is ±3.7%. 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:** *Reference Accelerometer*
Model: 7264-2000	**Model:** *301M09/484B*
S/N: J35791	**S/N:** *862/247*
Capacity: 2000 G	**Capacity:** *170 G*
Calibration Date: 4/30/2007	**Calibration Date:** *7/27/2006*
	Calibrated By: *Chuck DiMaggio*

Test Reference Number:	A0713
New DLR (100k **, Units:G):**	91.9
StdDeviation (%)	0.194
% Difference in DLR (New vs. Old):	1.127
Temperature (^{o}F):	74
Humidity (%):	36

Performed By: 

Approved By: 

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is ±3.7%. 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:** *Reference Accelerometer*
Model: 7264-2000	**Model:** *301M09/484B*
S/N: J35800	**S/N:** *862/247*
Capacity: 2000 G	**Capacity:** *170 G*
Calibration Date: 4/30/2007	**Calibration Date:** *7/27/2006*
	Calibrated By: *Chuck DiMaggio*

Test Reference Number:	A0713
New DLR (100k **, Units:G):**	98.0
StdDeviation (%)	0.78
% Difference in DLR (New vs. Old):	-1.192
Temperature (^{o}F):	74
Humidity (%):	36

Performed By: 

Approved By: 

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is ±3.7%. 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:** *Reference Accelerometer*
Model: 7264-2000	**Model:** *301M09/484B*
S/N: J14103	**S/N:** *862/247*
Capacity: 2000 G	**Capacity:** *170 G*
Calibration Date: 4/30/2007	**Calibration Date:** *7/27/2006*
	Calibrated By: *Chuck DiMaggio*

Test Reference Number:	A0713
New DLR (100k **, Units:G):**	94.6
StdDeviation (%)	0.172
% Difference in DLR (New vs. Old):	1.175
Temperature (^{o}F):	74
Humidity (%):	36

Performed By: 

Approved By: 

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is ±3.7%. 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:** *Reference Accelerometer*
Model: 7264-2000	**Model:** *301M09/484B*
S/N: J36197	**S/N:** *862/247*
Capacity: 2000 G	**Capacity:** *170 G*
Calibration Date: 4/30/2007	**Calibration Date:** *7/27/2006*
	Calibrated By: *Chuck DiMaggio*

Test Reference Number:	A0713
New DLR (100k **, Units:G):**	110.7
StdDeviation (%)	0.159
% Difference in DLR (New vs. Old):	0.612
Temperature (^{o}F):	74
Humidity (%):	36

Performed By: 

Approved By: 

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is ±3.7%. 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:** *Reference Accelerometer*
Model: 7264-2000	**Model:** *301M09/484B*
S/N: J36353	**S/N:** *862/247*
Capacity: 2000 G	**Capacity:** *170 G*
Calibration Date: 4/30/2007	**Calibration Date:** *7/27/2006*
	Calibrated By: *Chuck DiMaggio*

Test Reference Number: A0713

New DLR (100k **, Units:G):** 99.4

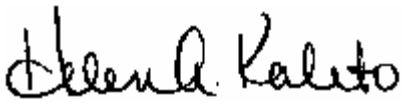
StdDeviation (%) 0.346

% Difference in DLR (New vs. Old): 1.014

Temperature (°F): 74

Humidity (%): 36

Performed By: 

Approved By: 

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is ±3.7%. 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 ~

Per ISO 16063-21

Model Number: 301M09/484B (394M17 SYSTEM)

Serial Number: 862/2470

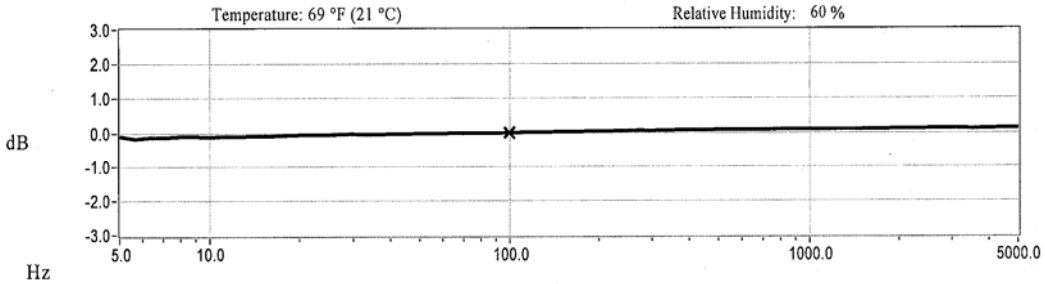
Description: ICP® Accelerometer Method: Back-to-Back Comparison Calibration

Manufacturer: PCB

Calibration Data

Sensitivity @ 100.0 Hz	**31.03**	**mV/g**	Output Bias	8.6	VDC
	(3.16	**mV/m/s²)**	Transverse Sensitivity	3.0	%

Sensitivity Plot



Data Points

Frequency (Hz)	Dev. (%)	Frequency (Hz)	Dev. (%)	Frequency (Hz)	Dev. (%)
5.0	-1.2	REF. FREQ.	0.0	5000.0	1.5
10.0	-1.4	300.0	0.6		
15.0	-1.0	500.0	0.9		
30.0	-0.4	1000.0	1.0		
50.0	-0.3	3000.0	1.4		

Mounting Surface: Stainless Steel w/Silicone Grease Coating Fastener: Stud Mount Fixture Orientation: Vertical
Acceleration Level (rms)[1]: 10.0 g (98.1 m/s²)²

[1]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 (freq)².

[2]The gravitational constant used for calculations by the calibration system is; 1 g = 9.80665 m/s².

Condition of Unit

As Found: In Tolerance, No Adjustment Necessary

As Left: In Tolerance

Notes

1. Calibration is NIST Traceable thru Project 822/271196 and PTB Traceable thru Project 5399.
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/NCSL 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 7/27/06 Date: 07/27/06

ACCREDITED
Cert No 1862.01

PCB PIEZOTRONICS INC.
VIBRATION DIVISION
3425 Walden Avenue · Depew, NY 14043
TEL: 888-684-0013 · FAX: 716-685-3886 · www.pcb.com

PAGE 1 of 1

cal3 - 3236847234.40

~Certificate of Calibration~

Model Number: 484B
Serial Number: 2470
Description: Signal Conditioner
Test Procedure: AT-106-1
Temperature: 70° F

PCB Control #: QC214/QC184/QC198/CA514
Calibration Date: 07/22/2006
Recalibration Date:
Calibration Technician: James Higbee 2b 7/27/06
Relative Humidity: 58%

Volts	*Current (mA)*	*Gain**
24.0	3.9	1.000

As Received: In tolerance, no adjustment required.

As Left: In tolerance.

Special Notes:

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%.

ACCREDITED
Cert. No. 1862.01

PCB PIEZOTRONICS

3425 Walden Avenue Depew, New York, USA 14043-2495

For any questions concerning this certificate, please call PCB at (716) 684-0001 and ask for an application engineer.