FINAL REPORT NUMBER 201UI-MGA-08-04

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

FORD MOTOR COMPANY
2008 Ford Focus, 4-Door Sedan
NHTSA No. C80208

MGA RESEARCH CORPORATION
446 Executive Drive
Troy, Michigan 48083

Test Dates: May 9-14, 2008
Report Date: May 30, 2008

FINAL REPORT

PREPARED FOR:

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
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16. Abstract A compliance test series was conducted on the subject 2008 Ford Focus, 4-Door Sedan, NHTSA No. C80208, 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 May 9-14, 2008. Test failures identified were as follows: None The data recorded indicates that the 2008 Ford Focus, 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 2008 Ford Focus, 4-Door Sedan, meets the performance requirements of FMVSS 201, Occupant Protection in Interior Impact - Upper Interior Head Impact Protection.

Tests were conducted on May 9-14, 2008 on a 2008 Ford Focus, 4-Door Sedan, manufactured by Ford Motor Company.

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 2008 Ford Focus, 4-Door Sedan, was equipped with A, B, O (Other), and rear-pillars, an adjustable seat belt anchorage on each B-pillar, and a fixed seat belt anchorage at the intersection of each rear pillar and upper seat back.

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	RP2	UR2@BPR
AP2	BP2	SR2A	UR3@Rear Side Rail
AP3	OP2	UR1@SR2A	UR6@Rear Coat Hook

The 2008 Ford Focus, 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: 2008 Ford Focus, 4-Door Sedan

VEH. NHTSA NO.: C80208 VIN: 1FAHP34N88W172541 COLOR: Vapor Silver

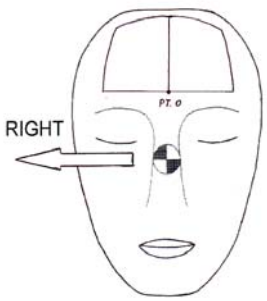
VEH. BUILD DATE: December, 2007 TEST DATES: May 9-14, 2008

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Helen A. Kaleto, Louis Campbell, Salvatore Pizzo

TARGET	VEHICLE SIDE	HORIZONTAL ANGLE (deg)	VERTICAL ANGLE (deg)	VELOCITY (kph)	HIC(d)	FMH HIC	IMPACT ON FMH (mm)	
							Above	Left/Right
AP1	Right	110	37	19.1	581	550	9	0
AP2	Left	201	49	19.0	353	247	10	7 Left
AP3	Right	159	45	18.9	466	397	18	1 Left
BP1	Right	90	22	19.0	543	500	41	1 Right
BP2	Left	270	13	23.2	789	826	4	5 Left
OP2	Left	270	7	23.1	672	670	5	6 Left
RP2	Right	76	13	18.6	288	161	5	10 Left
SR2A	Right	90	35	18.6	393	300	12	1 Right
UR1@SR2A	Left	270	43	23.3	667	664	40	4 Left
UR2@BPR	Left	270	40	24.3	774	806	42	2 Right
UR3@ Rear Side Rail	Left	270	40	23.4	667	663	42	7 Left
UR6@ Rear Coat Hook	Right	90	37	23.2	624	606	52	2 Left

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



POST TEST COMMENTS:

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

AP2 Left: A-pillar displacement.

AP3 Right: A-pillar displacement.

REMARKS:

The targets listed were impacted in the following order:

Left: AP2, UR1@SR2A, BP2, UR2@BPR, UR3@Rear Side Rail, OP2

Right: AP3, AP1, SR2A, BP1, UR6@Rear Coat Hook, RP2

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

RECORDED BY: Louis Campbell DATE: May 14, 2008

APPROVED BY: Helen A. Kaleto

TABLE 2-2

GENERAL TEST AND VEHICLE PARAMETER DATA

VEH. MOD YR/MAKE/MODEL/BODY: 2008 Ford Focus, 4-Door Sedan

VEH. NHTSA NO.: C80208 VIN: 1FAHP34N88W172541 COLOR: Vapor Silver

VEH. BUILD DATE: December, 2007 TEST DATES: May 9-14, 2008

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Helen A. Kaleto, Louis Campbell, Salvatore Pizzo

INTERIOR TRIM INFORMATION: A, B, O (Other), and rear-pillars, an adjustable seat belt anchorage on each B-pillar, and a fixed seat belt anchorage at the intersection of each rear pillar and upper seat back.

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: 03/03/08; Odometer Reading 737 miles

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured By: Ford Motor Company

Date of Manufacture: December, 2007; VIN: 1FAHP34N88W172541

GVWR: 1685 kg; GAWR FRONT: 896 kg;

GAWR REAR: 796 kg

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load:

FRONT: 220 kPa REAR: 220 kPa

Recommended Tire Size: P195/60R15

Recommended Cold Tire Pressure:

FRONT: 220 kPa REAR: 220 kPa

Size of Tire on Test Vehicle: P195/60R15

Type of Spare Tire: T125/80R15; 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) = 375 kg

No. of Occupants x 68 kg = 340 kg

Rated Cargo/Luggage Weight (RCLW) = 35 kg (difference)

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

Right Front =	353.5 kg	Right Rear =	255.5 kg
Left Front =	378.0 kg	Left Rear =	231.5 kg
TOTAL FRONT =	731.5 kg	TOTAL REAR =	487.0 kg
% Total Weight =	60.0 %	% Total Weight =	40.0 %

TOTAL DELIVERED WEIGHT = 1218.5 kg

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight = 1218.5 kg

Max. Test Cargo/Luggage Weight = 35.0 kg

Target Test Weight = 1253.5 kg

WEIGHT OF TEST VEHICLE FULLY LOADED:

Right Front =	351.0 kg	Right Rear =	274.0 kg
Left Front =	378.0 kg	Left Rear =	249.0 kg
TOTAL FRONT =	729.0 kg	TOTAL REAR =	523.0 kg
% Total Weight =	58.2 %	% Total Weight =	41.8 %

TOTAL TEST WEIGHT = 1252.0 kg

Weight of ballast secured in vehicle's cargo area = 35.0 kg

TEST VEHICLE ATTITUDE:

AS DELIVERED: Right Front 701 mm; Left Front 705 mm;
Right Rear 724 mm; Left Rear 726 mm;
Pitch Angle at Right Door Sill = 0.9 Rear is higher
Pitch Angle at Left Door Sill = 0.6 Rear is higher
Roll Angle at Front Bumper = 0.1 Right is higher
Roll Angle at Rear Bumper = 0.3 Right is higher

FULLY LOADED: Right Front 703 mm; Left Front 700 mm;
Right Rear 717 mm; Left Rear 718 mm;
Pitch Angle at Right Door Sill = 0.6 Rear is higher
Pitch Angle at Left Door Sill = 0.4 Rear is higher
Roll Angle at Front Bumper = 0.2 Right is higher
Roll Angle at Rear Bumper = 0.3 Right is higher

AS TARGETED: Right Front 852 mm; Left Front 841 mm;
Right Rear 861 mm; Left Rear 859 mm;
Pitch Angle at Right Door Sill = 0.6 Rear is higher
Pitch Angle at Left Door Sill = 0.4 Rear is higher
Roll Angle at Front Bumper = 0.2 Right is higher
Roll Angle at Rear Bumper = 0.3 Right is higher

AS TESTED ON RIGHT SIDE:

Pitch Angle at Right Door Sill =	0.6 Rear is higher
Pitch Angle at Left Door Sill =	0.4 Rear is higher
Roll Angle at Front Bumper =	0.2 Right is higher
Roll Angle at Rear Bumper =	0.3 Right is higher

AS TESTED ON LEFT SIDE:

Pitch Angle at Right Door Sill =	0.6 Rear is higher
Pitch Angle at Left Door Sill =	0.5 Rear is higher
Roll Angle at Front Bumper =	0.2 Right is higher
Roll Angle at Rear Bumper =	0.3 Right is higher

VEHICLE WHEELBASE = 2610 mm

REMARKS: The seat travel distance was measured to be 220 mm for the driver front seat and 220 mm for the passenger front seat.

RECORDED BY: Louis Campbell DATE: May 8, 2008

APPROVED BY: Helen A. Kaleto

TABLE 2-3

HORIZONTAL IMPACT ANGLE RANGE FOR A AND B PILLARS

VEH. MOD YR/MAKE/MODEL/BODY: 2008 Ford Focus, 4-Door Sedan

VEH. NHTSA NO.: C80208 VIN: 1FAHP34N88W172541 COLOR: Vapor Silver

VEH. BUILD DATE: December, 2007 TEST DATES: May 9-14, 2008

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Helen A. Kaleto, Louis Campbell, Salvatore Pizzo

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 200.7º	L 248.8º
	R 105º-165º	R 110.4º	R 159.4º
B-PILLAR	L 195º-345º	L 201.2º	L 277.5º
	R 15º-165º	R 82.3º	R 158.9º

AS DETERMINED USING THE PROCEDURES SPECIFIED IN S8.13.4.1

REMARKS:

RECORDED BY: Louis Campbell DATE: May 8, 2008

APPROVED BY: Helen A. Kaleto

TABLE 2-4

VERTICAL IMPACT ANGLE RANGES

VEH. MOD YR/MAKE/MODEL/BODY: 2008 Ford Focus, 4-Door Sedan

VEH. NHTSA NO.: C80208 VIN: 1FAHP34N88W172541 COLOR: Vapor Silver

VEH. BUILD DATE: December, 2007 TEST DATES: May 9-14, 2008

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Helen A. Kaleto, Louis Campbell, Salvatore Pizzo

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 22º
		R 0º-50º	R 0º	R 23º
	SR2A	L 0º-50º	L 0º	L 35º
		R 0º-50º	R 0º	R 35º
	SR2B	L 0º-50º	L 0º	L 22º
		R 0º-50º	R 0º	R 22º
	SR3-1	L 0º-50º	L 0º	L 24º
		R 0º-50º	R 0º	R 24º
	SR3-2	L 0º-50º	L 0º	L 23º
		R 0º-50º	R 0º	R 24º
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 41º
		R -5º-50º	R -5º	R 37º

		VERTICAL ANGLE SPECIFIED RANGE	MINIMUM VERTICAL ANGLE	MAXIMUM VERTICAL ANGLE
A-PILLAR	AP2	L -5º-50º	L -5º	L 49º
		R -5º-50º	R -5º	R 48º
	AP3	L -5º-50º	L -5º	L 48º
		R -5º-50º	R -5º	R 45º
B-PILLAR	BP1	L -10º-50º	L -10º	L 24º
		R -10º-50º	R -10º	R 22º
	BP2*	L 0º-50º	L 0º	L 13º
		R 0º-50º	R 0º	R 10º
	BP3	L 0º-50º	L 0º	L 13º
		R 0º-50º	R 0º	R 10º
	BP4	L -10º-50º	L -10º	L -10º
		R -10º-50º	R -10º	R -10º
OTHER-PILLAR	OP1	L -10º-50º	L -10º	L 34º
		R -10º-50º	R -10º	R 34º
	OP2	L -10º-50º	L -10º	L 7º
		R -10º-50º	R -10º	R 7º
REAR PILLAR	RP1	L -10º-50º	L -10º	L 29º
		R -10º-50º	R -10º	R 27º
	RP2	L -10º-50º	L -10º	L 12º
		R -10º-50º	R -10º	R 13º
UPPER ROOF 1		0º-50º	0º	43º
UPPER ROOF 2		0º-50º	0º	40º
UPPER ROOF 3		0º-50º	0º	40º
UPPER ROOF 4		0º-50º	0º	50º
UPPER ROOF 5		0º-50º	0º	48º
UPPER ROOF 6		0º-50º	0º	37º

As determined using the Procedures specified in S8.13.4.2. *Target BP2 is a seat belt anchorage location.
RECORDED BY: Louis Campbell DATE: May 8, 2008 APPROVED BY: Helen A. Kaleto

TABLE 2-5

TARGET MEASUREMENTS

VEH. MOD YR/MAKE/MODEL/BODY: 2008 Ford Focus, 4-Door Sedan

VEH. NHTSA NO.: C80208 VIN: 1FAHP34N88W172541 COLOR: Vapor Silver

VEH. BUILD DATE: December, 2007 TEST DATES: May 9-14, 2008

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Helen A. Kaleto, Louis Campbell, Salvatore Pizzo

Measurement	Description	Left Side	Right Side
M	Seat Fore/Aft Travel (Front seats)	220 mm	220 mm
Tº	Horizontal < {CG-F1 (Left Seat) to (Right A-Pillar)}	111.2º	--
A1º	360º - Tº	248.8º	--
Wº	Horizontal < {CG-2 (Left Seat) to (Left A-Pillar)}	200.7º	--
A2º	A2º = Wº	200.7º	--
Uº	Horizontal < {CG-2 (Left Seat) to (Left B-Pillar)}	277.5º	--
B1º	B1º = Uº	277.5º	--
Vº	Horizontal < {CG-R (Left Seat) to (Left B-Pillar)}	201.2º	--
B2º	B2º = Vº	201.2º	--
Wº (right)	Horizontal < {CG-F2 (Right Seat) to (Right A-Pillar)}	--	159.4º
A1º (right)	A1º (right) = Wº (right)	--	159.4º
T º (right)	Horizontal < {CG-F1 (Right Seat) to (Left A-Pillar)}	--	249.6º
A2º (right)	360º-Tº (right)	--	110.4º
V º (right)	Horizontal < {CG-R (Right Seat) to (Right B-Pillar)}	--	158.9º
B1º (right)	B1º (right) = Vº (right)	--	158.9º
U º (right)	Horizontal < {CG-F2 (Right Seat) to (Right B-Pillar)}	--	82.3º
B2º (right)	B2º (right) = Uº (right)	--	82.3º
J	A-Pillar {(Plane 3) – (Plane 5)}	321.6 mm	331.1 mm
J/2	J ÷ 2	160.8 mm	165.6 mm
D1	Upper Roof {(Plane A) – (Plane B)}	1580.9 mm	
D1/2	D1 ÷ 2	790.5 mm	
D2	Upper Roof {(Plane C) – (Plane D)}	1093.4 mm	

Measurement	Description	Left Side	Right Side
D2/2	D2 ÷ 2	546.7 mm	
.35D1	.35 x D1	553.3 mm	
.35D2	.35 x D2	382.7 mm	
N	B-Pillar {(BPR) – (lowest point on daylight opening forward of B-Pillar)}	455.3 mm	450.3 mm
N/2	B-Pillar {(BP3) – (lowest point on daylight opening forward of B-Pillar)}	227.7 mm	225.2 mm
N/4	B-Pillar {(BP4) – (lowest point on daylight opening forward of B-Pillar)}	113.8 mm	112.6 mm
Q	O-Pillar (Plane 13 – Plane 14)	386.5 mm	380.5 mm
Q/2	Q / 2	193.3 mm	190.3 mm
D	R-Pillar (Point 7 – Point M)	676.0 mm	679.0 mm
3D/7	3*D / 7	289.7 mm	291.0 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	-988.1	-350.6	-2254.1	-988.0	339.5	-2252.4
Rear	-215.9	-336.0	-2246.2	-215.9	324.1	-2244.6

SgRP Locations (vehicle coordinates)						
	Left (mm)			Right (mm)		
	x	y	z	x	y	z
Front	3103.9	-345.0	714.5	3103.9	345.0	714.5
Rear	3876.1	-330.0	712.0	3876.1	330.0	712.0

CG Locations (world coordinates)						
	Left (mm)			Right (mm)		
	x	y	z	x	y	z
CGF1	-1048.1	-350.6	-1594.1	-1048.0	339.5	-1592.4
CGF2	-828.1	-350.6	-1594.1	-828.0	339.5	-1592.4
CGR	-55.9	-336.0	-1586.2	-55.9	324.1	-1584.6

REFERENCE FOR VEHICLE COORDINATE SYSTEM (measured in millimeters):

Driver front upper door striker bolt hole right (x, y, z) = 3212.9, -736.6, 841.3

Passenger front upper door striker bolt hole (x, y, z) = 3212.9, 736.6, 841.3

Passenger front outboard seat bolt hole (x, y, z) = 2725.0, 592.6, 459.9

REMARKS:

RECORDED BY: Louis Campbell DATE: May 8, 2008

APPROVED BY: Helen A. Kaleto

TABLE 2-6

SUMMARY OF TARGETING RESULTS

VEH. MOD YR/MAKE/MODEL/BODY: 2008 Ford Focus, 4-Door Sedan

VEH. NHTSA NO.: C80208 VIN: 1FAHP34N88W172541 COLOR: Vapor Silver

VEH. BUILD DATE: December, 2007 TEST DATES: May 9-14, 2008

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Helen A. Kaleto, Louis Campbell, Salvatore Pizzo

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	2864.3	-495.7	1478.6	--	--	Yes	--	--
REL	2864.3	-508.6	1457.0	249	41	--	1	No
AP2	2741.7	-549.9	1392.9	201	49	No	--	Yes
AP3	2608.7	-579.6	1322.0	201	48	No	--	No
A-Pillar Right Side								
AP1	2860.3	496.6	1490.4	--	--	Yes	--	--
REL	2867.0	509.5	1458.6	110	37	--	1	Yes
AP2	2757.3	546.9	1404.7	159	48	No	--	No
AP3	2611.6	578.1	1328.9	159	45	No	--	Yes
B-Pillar Left Side								
BP1	3347.2	-430.6	1562.6	270	24	No	--	No
BP2	3315.6	-558.8	1297.7	270	13	No	--	Yes
BP3	3309.6	-554.6	1336.0	--	--	Yes	--	--
REL	3316.8	-554.7	1311.4	270	13	--	1	No
BP4	3347.7	-631.2	1222.7	201	-10	No	--	No
B-Pillar Right Side								
BP1	3348.9	441.2	1560.4	90	22	No	--	Yes
BP2	3317.0	563.1	1299.1	90	10	No	--	No
BP3	3311.9	558.3	1336.6	--	--	Yes	--	--

SUMMARY OF TARGETING RESULTS								
Target	**Location (mm)**			**Horizontal Angle (deg)**	**Vertical Angle (deg)**	**Relocation (Yes/No)**	**Extension (# of 25 mm Spheres)**	**Impact (Yes/No)**
	x	**y**	**z**					
REL	3317.6	558.4	1310.6	90	10	--	1	No
BP4	3348.0	632.6	1224.4	159	-10	No	No	No
Other Pillar Left Side								
OP1/OPR	4018.5	-413.8	1541.0	--	--	Yes	--	--
REL	3998.3	-405.7	1530.6	270	34	--	1	No
OP2	4114.2	-580.3	1346.2	--	--	Yes	--	--
REL	4087.9	-579.2	1343.7	270	7	--	1	Yes
Other Pillar Right Side								
OP1/OPR	4014.9	417.4	1541.8	--	--	Yes		--
REL	4000.7	406.3	1531.4	90	34	--	1	No
OP2	4112.4	581.5	1350.4	--	--	Yes	--	--
REL	4086.9	579.0	1351.0	90	7	--	1	No
Rear Pillar Left Side								
RP1	4132.1	-437.5	1477.9	315	29	No	--	No
RP2	4346.1	-562.7	1326.0	--	--	Yes	--	--
REL	4288.3	-537.9	1366.4	284	12	--	3	No
Rear Pillar Right Side								
RP1	4131.3	452.4	1477.2	45	27	No	--	No
RP2	4350.0	567.2	1325.2	--	--	Yes	--	--
REL	4291.7	541.7	1366.0	76	13	--	3	Yes
Front Header Left Side								
FH1	2796.8	-389.7	1501.8	180	50	No	--	No
FH2	2776.1	-240.9	1509.4	180	50	No	--	No
Front Header Right Side								
FH1	2793.5	388.7	1503.4	180	50	No	--	No
FH2	2774.4	239.6	1510.5	180	50	No	--	No
Side Rail Left Side								
SR1	3015.7	-457.0	1525.3	270	22	No	--	No

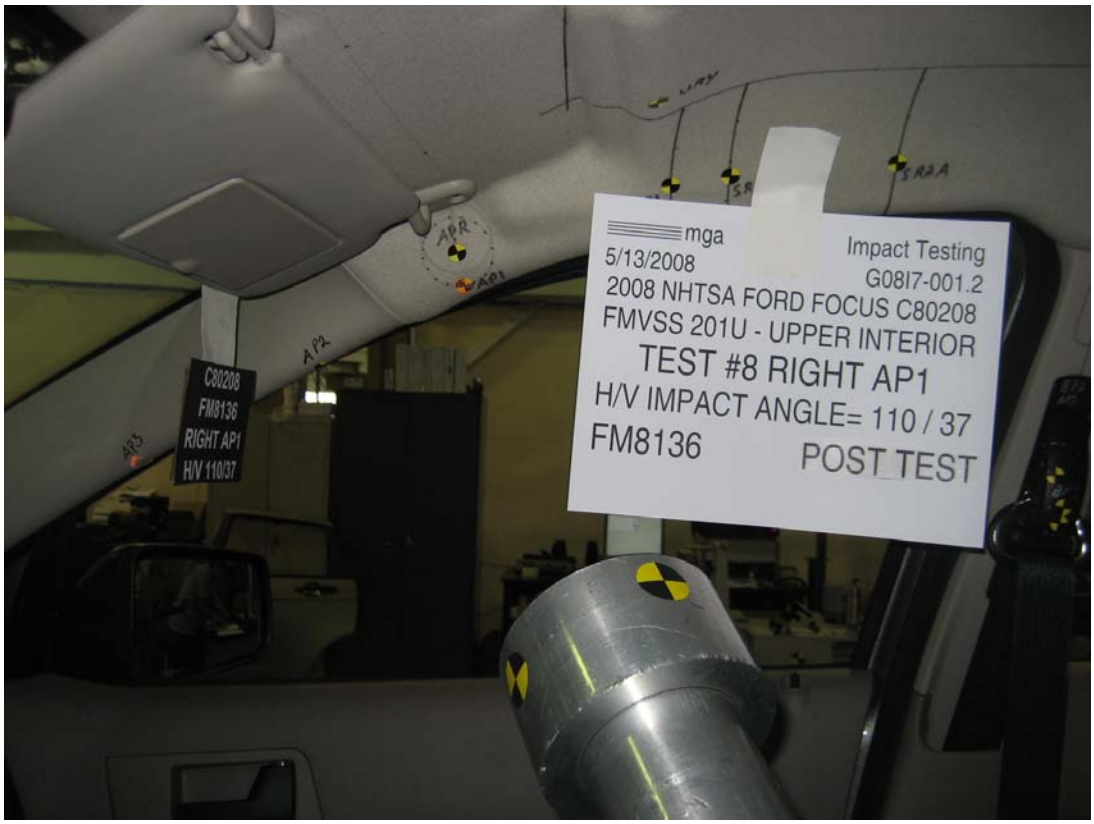
SUMMARY OF TARGETING RESULTS								
Target	**Location (mm)**			**Horizontal Angle (deg)**	**Vertical Angle (deg)**	**Relocation (Yes/No)**	**Extension (# of 25 mm Spheres)**	**Impact (Yes/No)**
	x	**y**	**z**					
SR2A	3165.6	-448.1	1542.6	270	35	No	--	No
SR2B	3047.5	-453.6	1531.5	270	22	No	--	No
SR3-1	3496.6	-445.1	1544.9	270	24	No	--	No
SR3-2	4168.0	-511.5	1425.7	--	--	Yes	--	--
REL	4166.6	-523.0	1408.8	270	23	--	1	No
Side Rail Right Side								
SR1	3010.0	464.6	1525.5	90	23	No	--	No
SR2A	3161.5	456.0	1542.3	90	35	No	--	Yes
SR2B	3048.1	461.2	1531.6	90	22	No	--	No
SR3-1	3498.0	453.0	1546.0	90	24	No	--	No
SR3-2	4163.4	515.0	1427.0	--	--	Yes	--	--
REL	4162.8	523.8	1413.2	90	24	--	1	No
Rear Header Left Side								
RH	4114.3	-328.1	1506.1	0	50	No	--	No
Rear Header Right Side								
RH	4116.5	332.3	1505.6	0	50	No	--	No
Upper Roof Left Side								
UR1@SR2A	3149.4	-357.4	1590.9	270	43	No	--	Yes
UR2@BPR	3346.9	-357.8	1596.3	270	40	No	--	Yes
UR3@Rear Side Rail	3746.2	-355.1	1590.3	270	40	No	--	Yes
Upper Roof Right Side								
UR4@SR1	2993.0	365.1	1547.3	90	50	No	--	No
UR5@SR3-1	3499.5	366.2	1577.0	90	48	No	--	No
UR6@Rear Coat Hook	3929.2	364.4	1574.3	90	37	No	--	Yes

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

RECORDED BY: Louis Campbell DATE: May 8, 2008

APPROVED BY: Helen A. Kaleto

3.0 TEST DATA (Including Acceleration and Velocity Plots)


C80208
FM8136
RIGHT AP1
H/V 110/37
mga
5/13/2008
Impact Testing
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #8 RIGHT AP1
H/V IMPACT ANGLE= 110 / 37
FM8136
POST TEST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5/13/2008
Impact Testing
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #8 RIGHT AP1
H/V IMPACT ANGLE= 110 / 37
FM8136
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G08I7-001.2 VEHICLE YR/MAKE/MODEL:2008/NHTSA/Ford Focus C80208

GENERAL TEST PARAMETERS:

Test Number:#8

Target (Vehicle Side): AP1Right

Temperature:23C

MGA Test Reference No.:FM8136

Humidity:46%

Approach Horizontal Angles:110º

Time of Test:2:46:36 PM

Approach Vertical Angles:37º

FMH Serial No:[037]

Additional Description:1 Relocation

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
581	550	4.1	19.1	9	0

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	AHTB2	-114.533	0.87	0.87
Y	6	J14103	92.424	1.52	1.52
Z	7	J35800	96.462	1.03	1.03

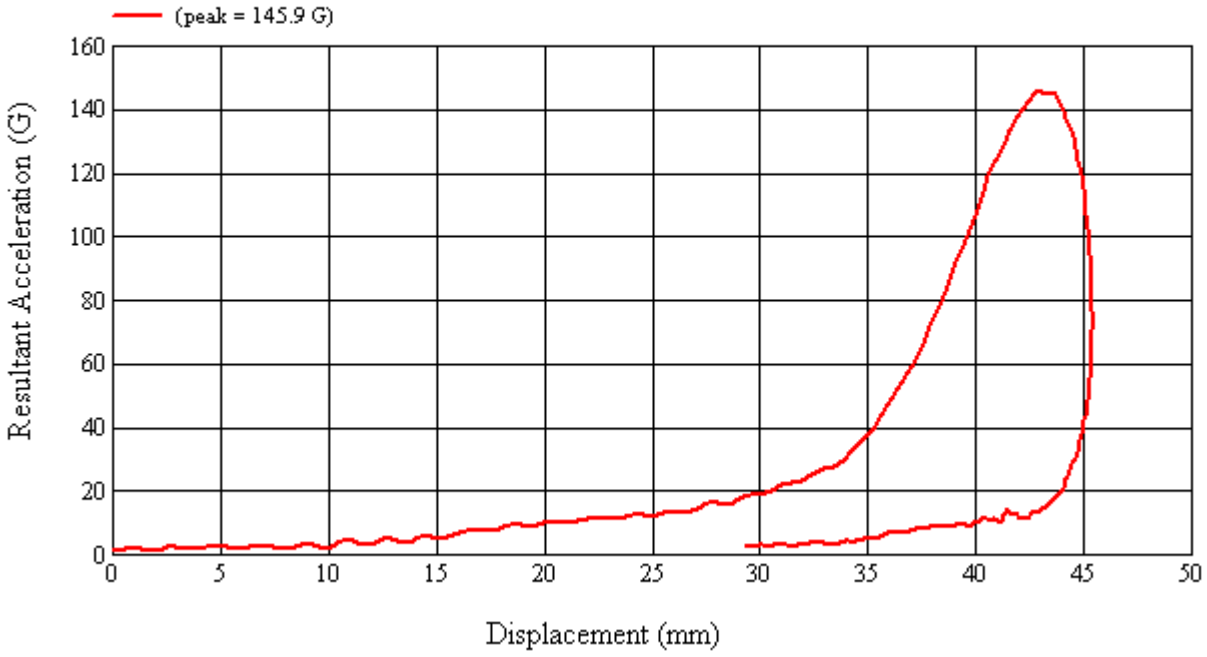
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

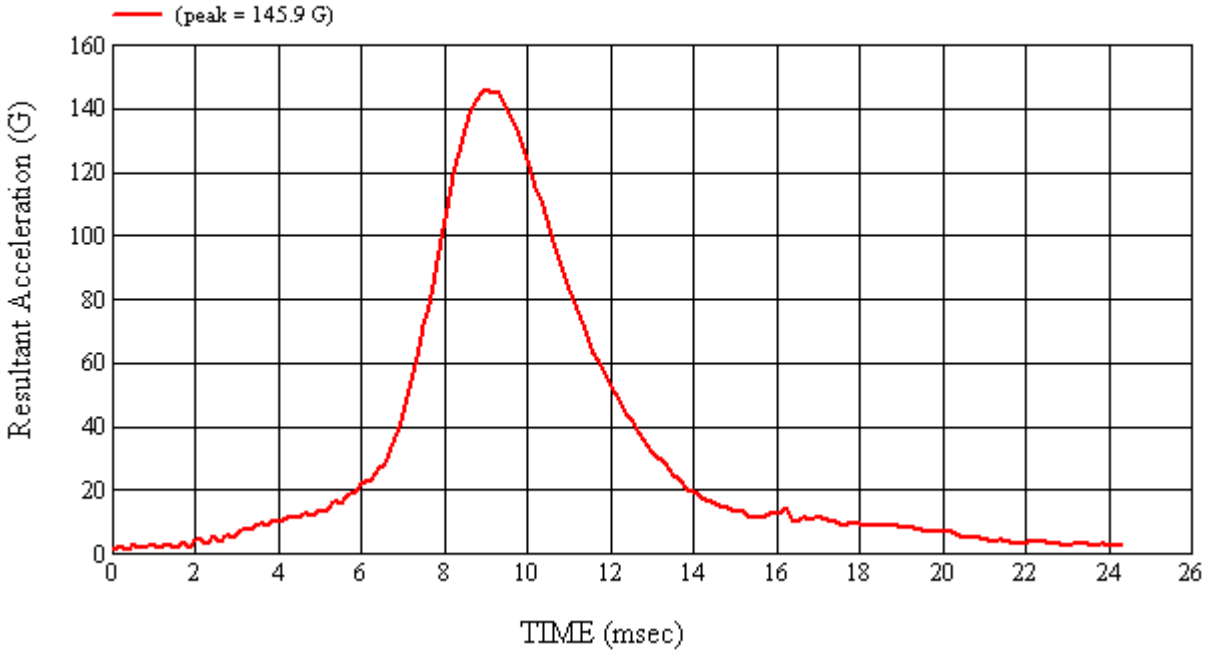
No visible damage.

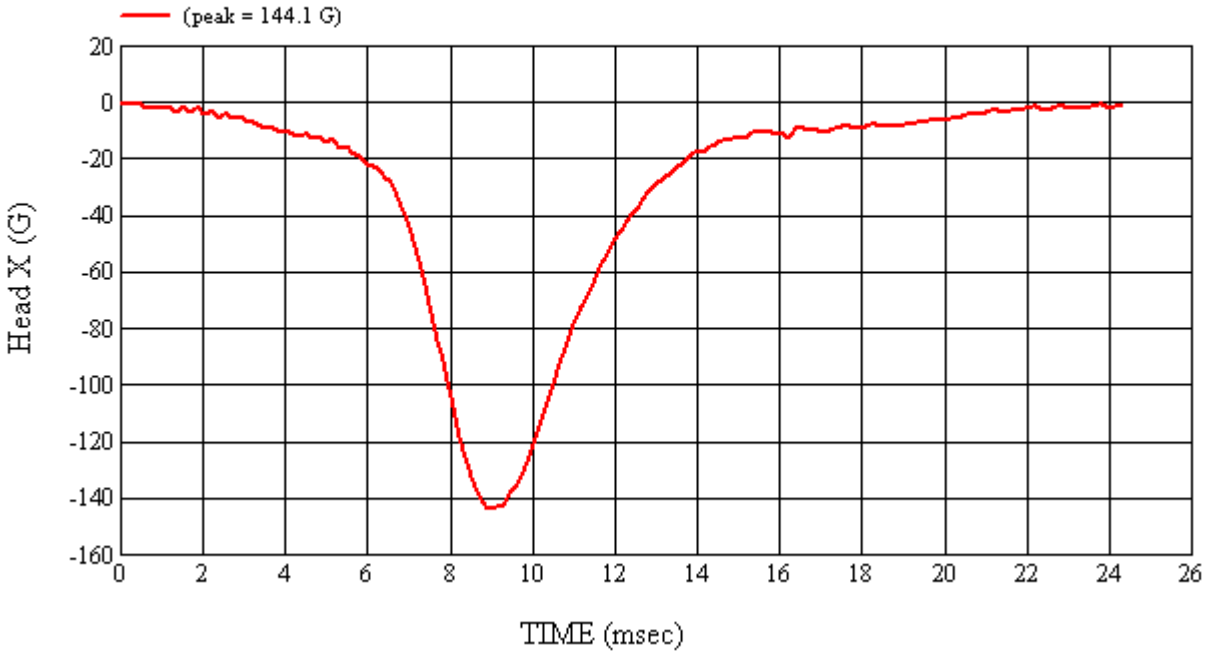
Recorded By: _____ Approved By*: _____ Date: 5/13/2008

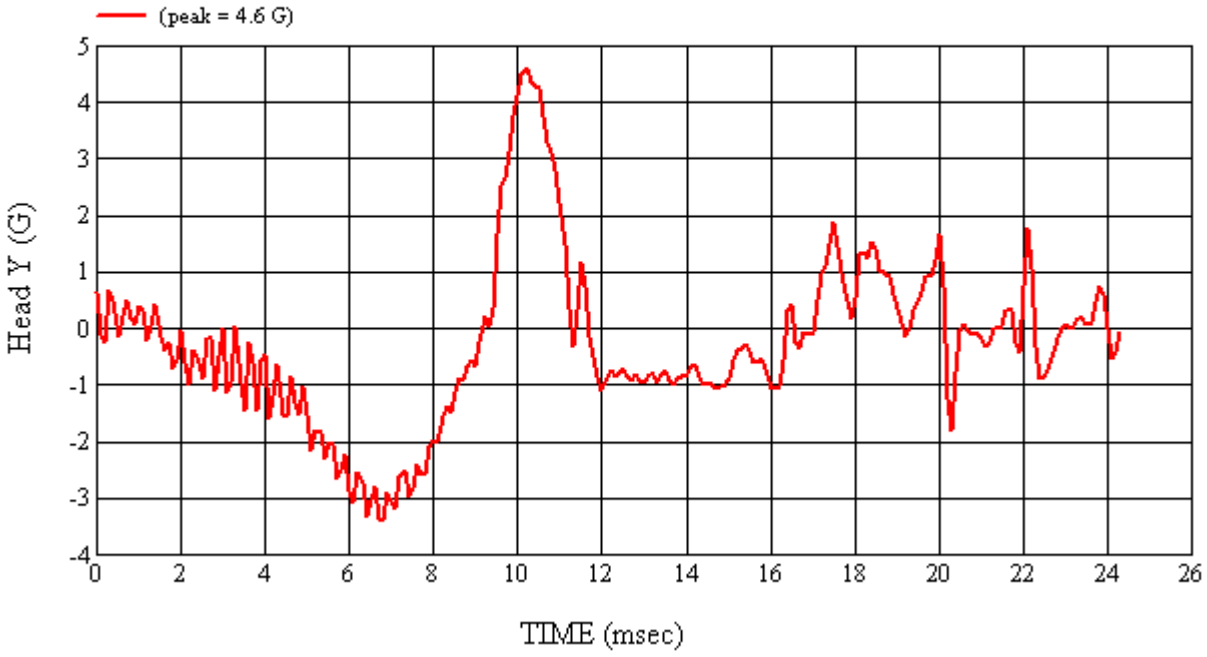
*Only necessary for NHTSA (Government) Compliance testing.

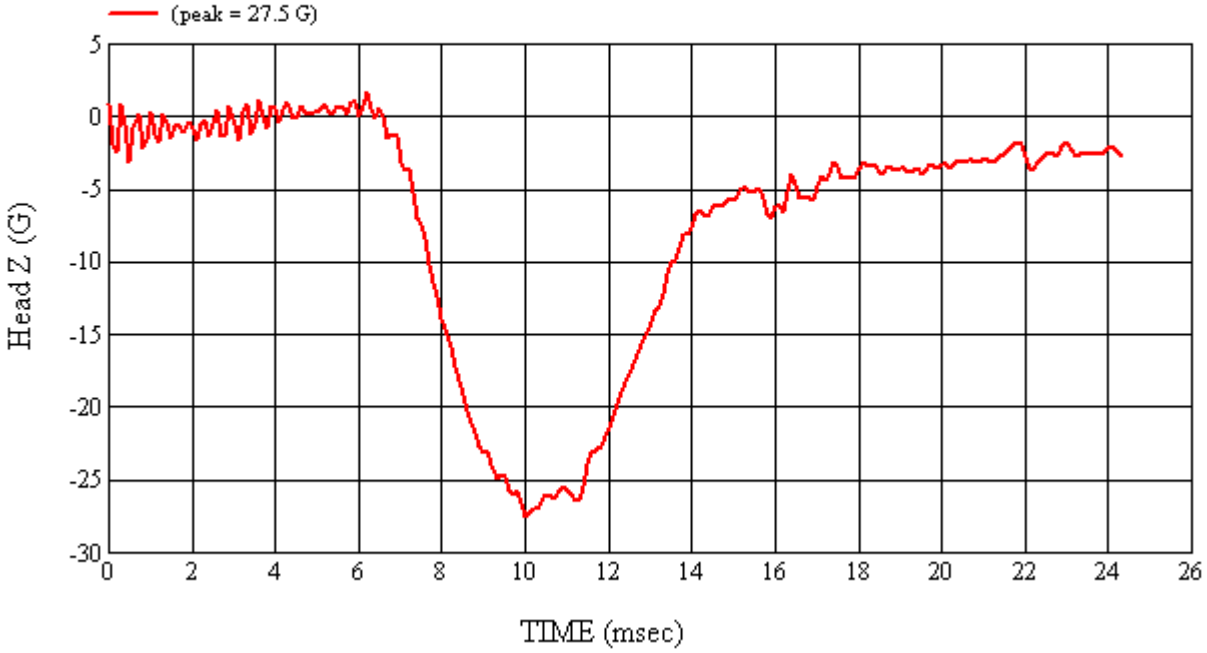
MGA Test #: FM8136 Target Location: AP1, Right Side Test Date: 5/13/2008

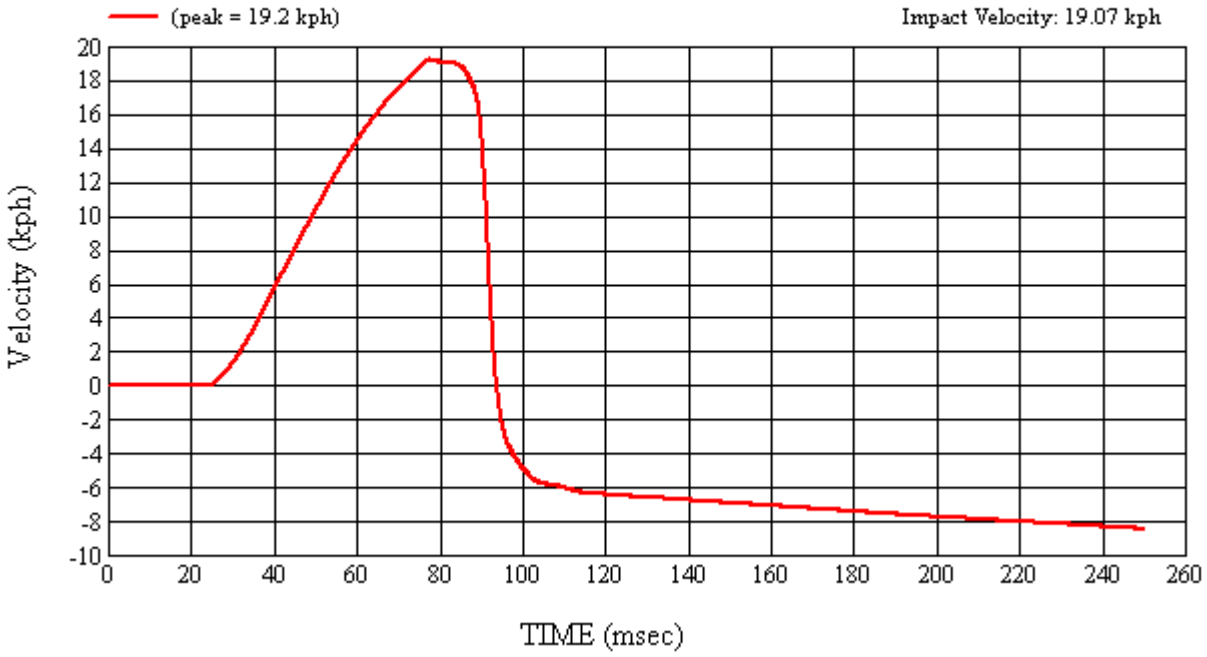


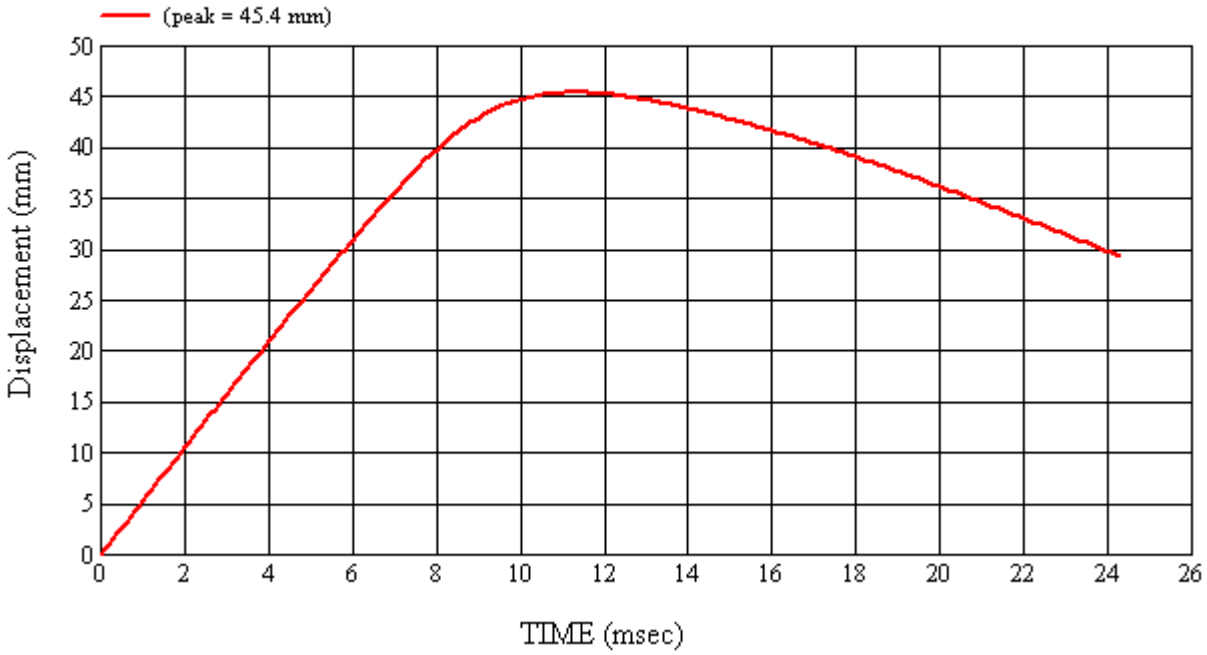


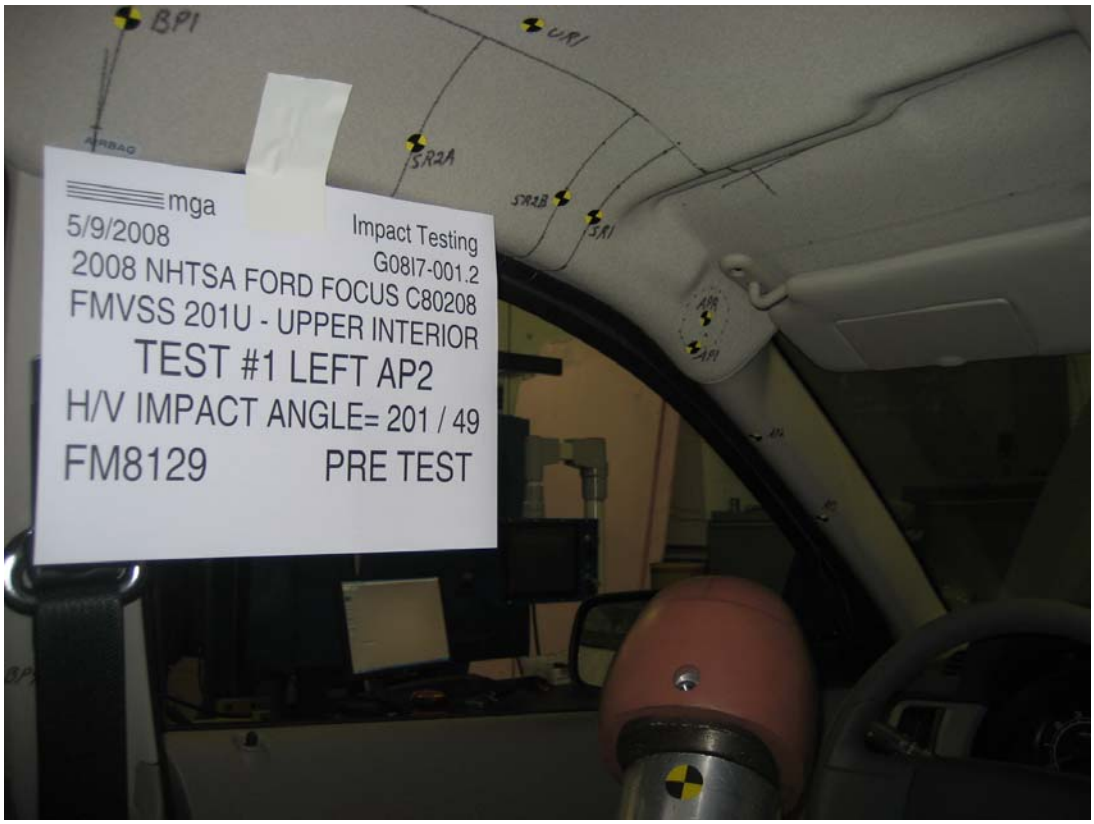

(peak = 144.1 G)
Head X (G)
20
0
-20
-40
-60
-80
-100
-120
-140
-160
0
2
4
6
8
10
12
14
16
18
20
22
24
26
TIME (msec)


(peak = 4.6 G)
Head Y (G)
5
4
3
2
1
0
-1
-2
-3
-4
0
2
4
6
8
10
12
14
16
18
20
22
24
26
TIME (msec)


(peak = 27.5 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
TIME (msec)


(peak = 19.2 kph)
Impact Velocity: 19.07 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 = 45.4 mm)
Displacement (mm)
0
5
10
15
20
25
30
35
40
45
50
0
2
4
6
8
10
12
14
16
18
20
22
24
26
TIME (msec)


BPI
URI
SR2A
SR2B
SR1
mga
5/9/2008
Impact Testing
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #1 LEFT AP2
H/V IMPACT ANGLE= 201 / 49
FM8129
PRE TEST


SR2A
SR2B
SR1
mga
5/9/2008
Impact Testing
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #1 LEFT AP2
H/V IMPACT ANGLE= 201 / 49
FM8129
POST TEST


mga
5/9/2008
Impact Testing
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #1 LEFT AP2
H/V IMPACT ANGLE= 201 / 49
FM8129
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G08I7-001.2 VEHICLE YR/MAKE/MODEL:2008/NHTSA/Ford Focus C80208

GENERAL TEST PARAMETERS:

Test Number:#1

Target (Vehicle Side): AP2Left

Temperature:22C

MGA Test Reference No.:FM8129

Humidity:44%

Approach Horizontal Angles:201º

Time of Test:2:46:00 PM

Approach Vertical Angles:49º

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
353	247	12.4	19.0	10	7 Left

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J35919	-95.844	0.87	0.87
Y	6	J22664	93.878	1.52	1.52
Z	7	J35924	92.621	1.03	1.03

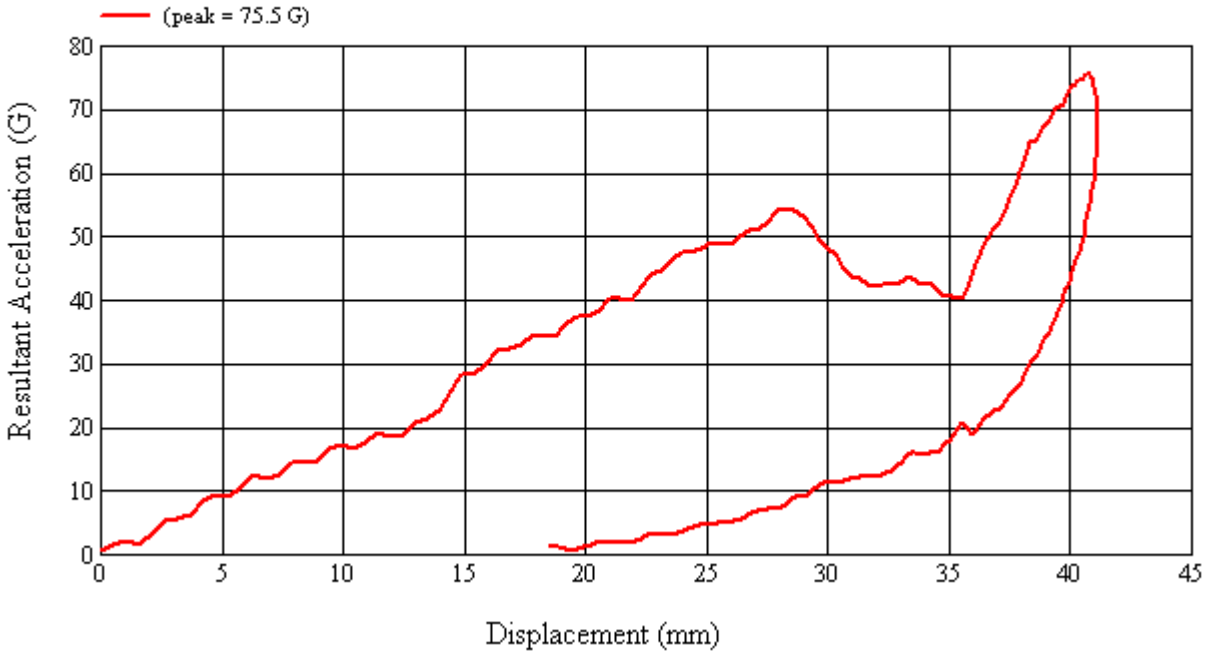
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

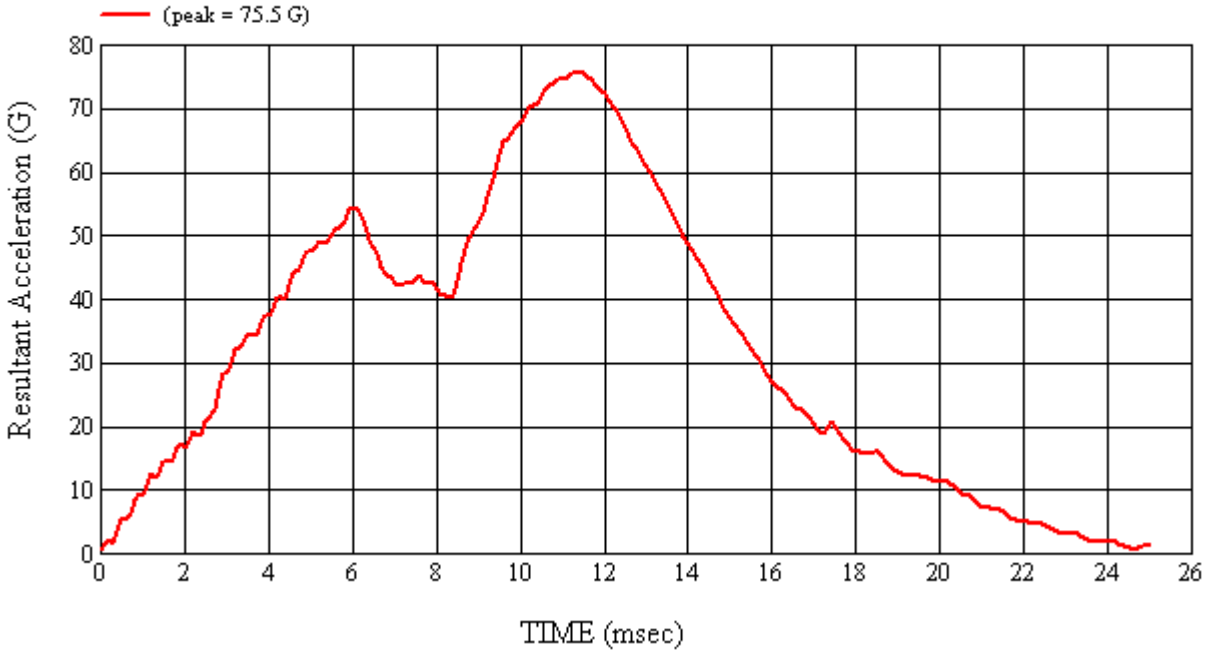
A-pillar displacement.

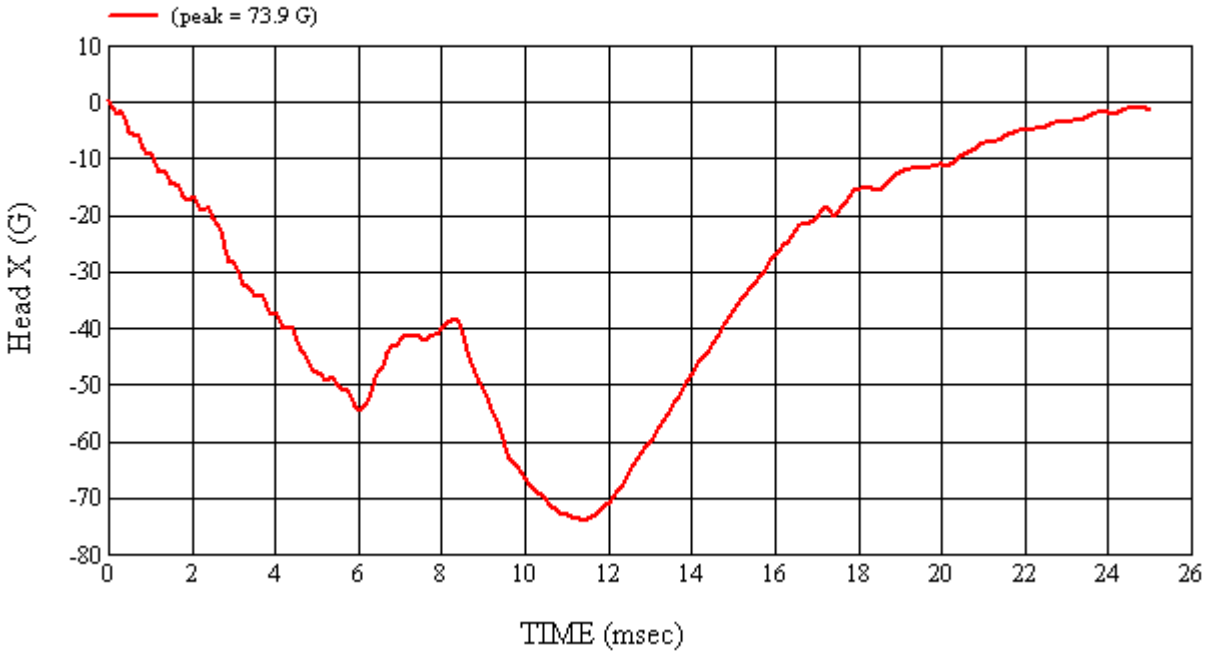
Recorded By: Travis Campbell Approved By*: Helen A. Kalafut Date: 5/9/2008

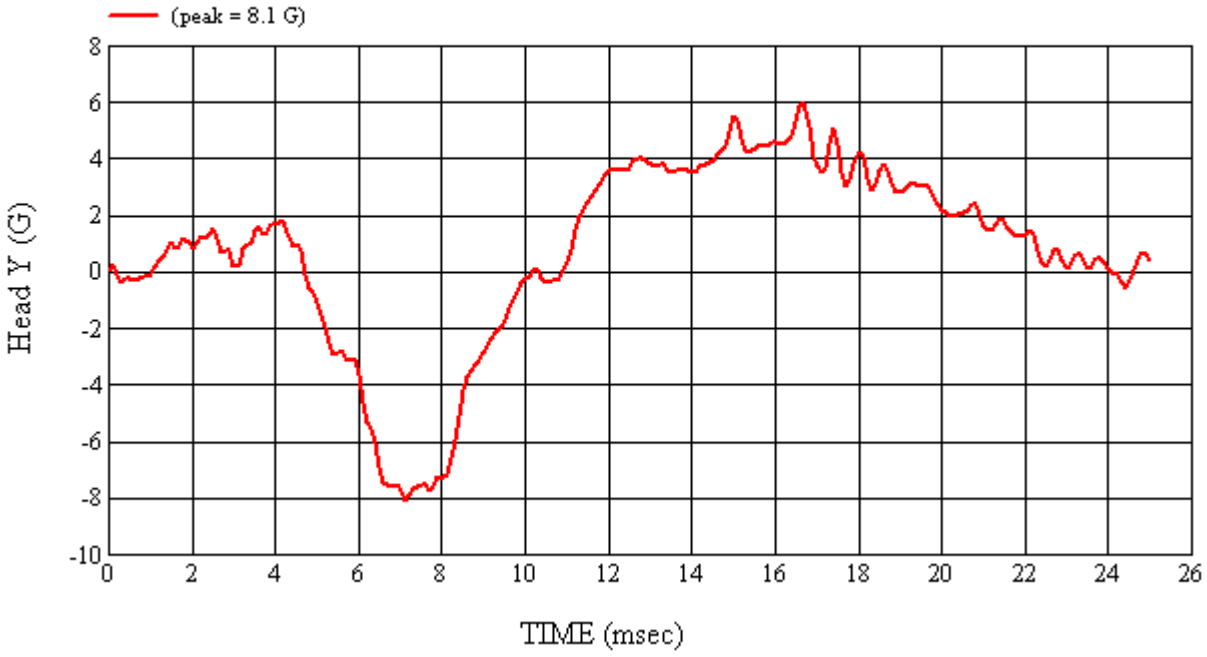
*Only necessary for NHTSA (Government) Compliance testing.

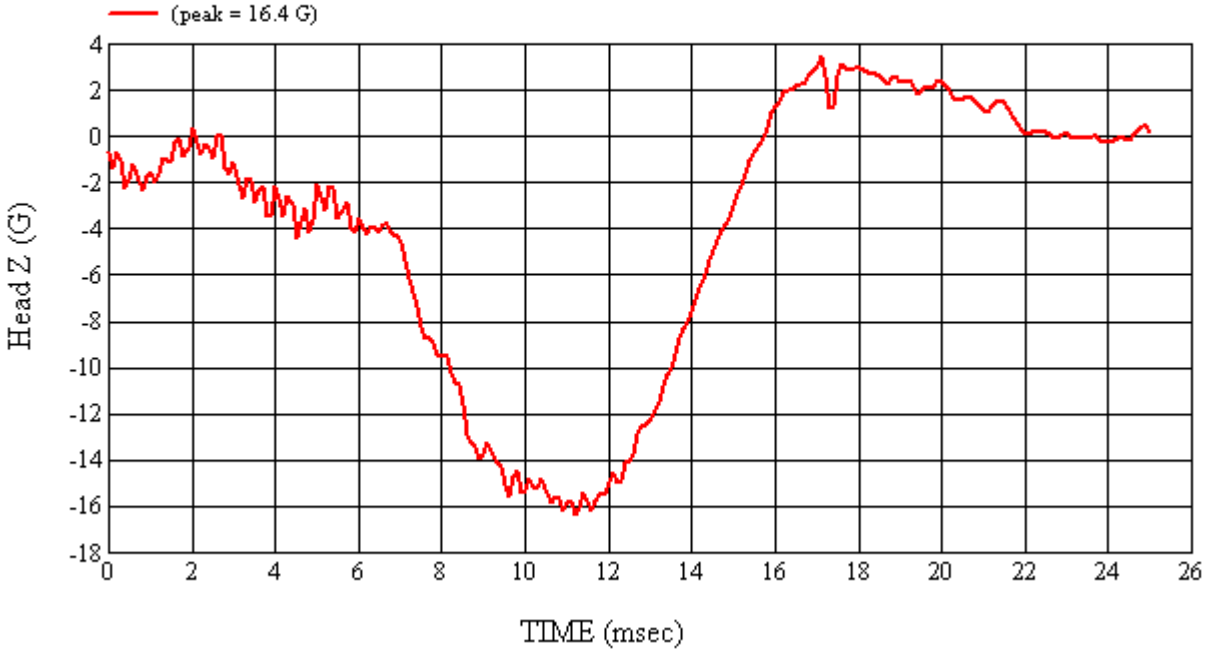
MGA Test #: FM8129 Target Location: AP2, Left Side Test Date: 5/9/2008

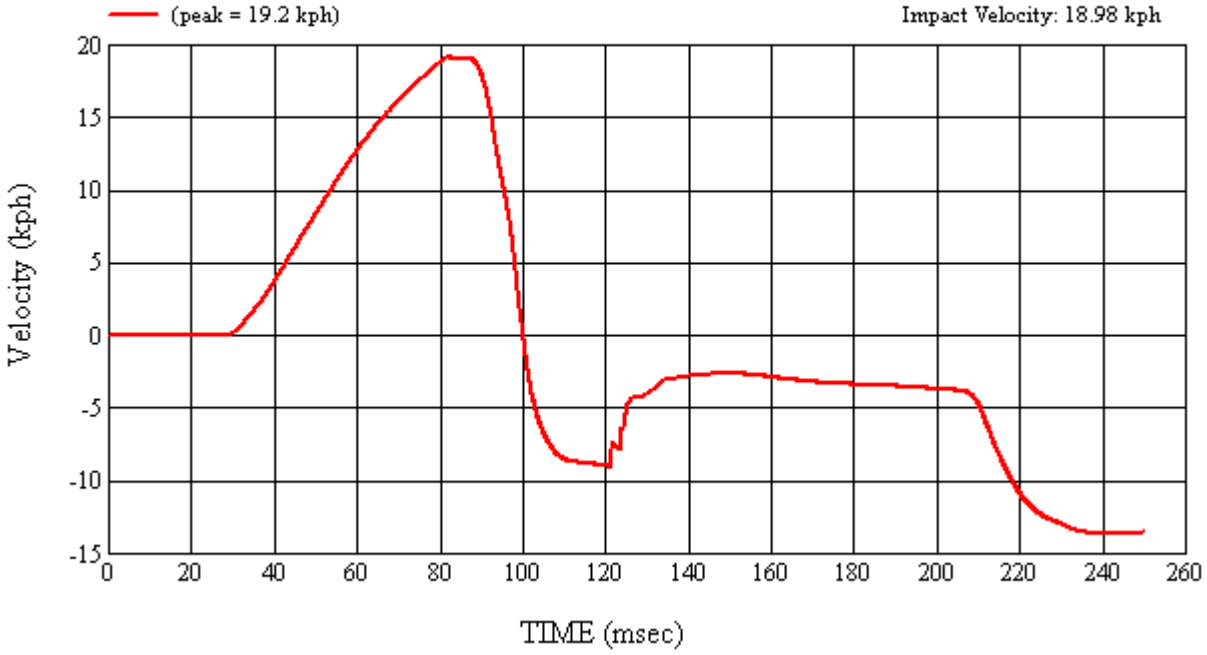


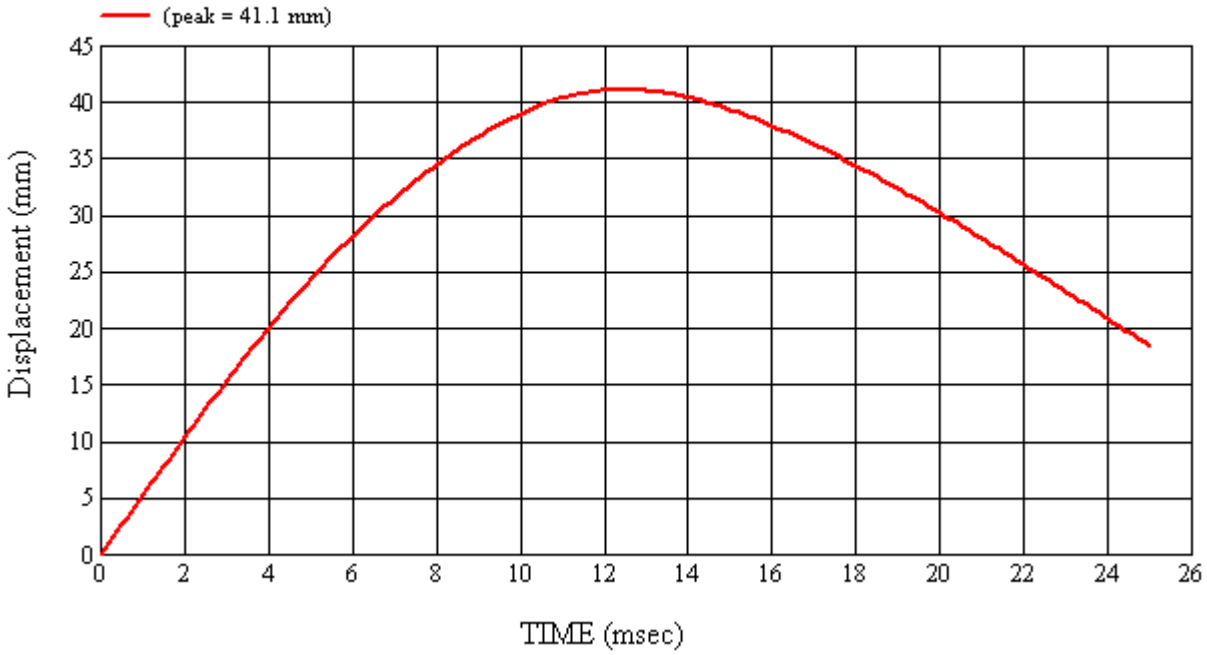



(peak = 73.9 G)
Head X (G)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
0
2
4
6
8
10
12
14
16
18
20
22
24
26
TIME (msec)


(peak = 8.1 G)
Head Y (G)
8
6
4
2
0
-2
-4
-6
-8
-10
0
2
4
6
8
10
12
14
16
18
20
22
24
26
TIME (msec)

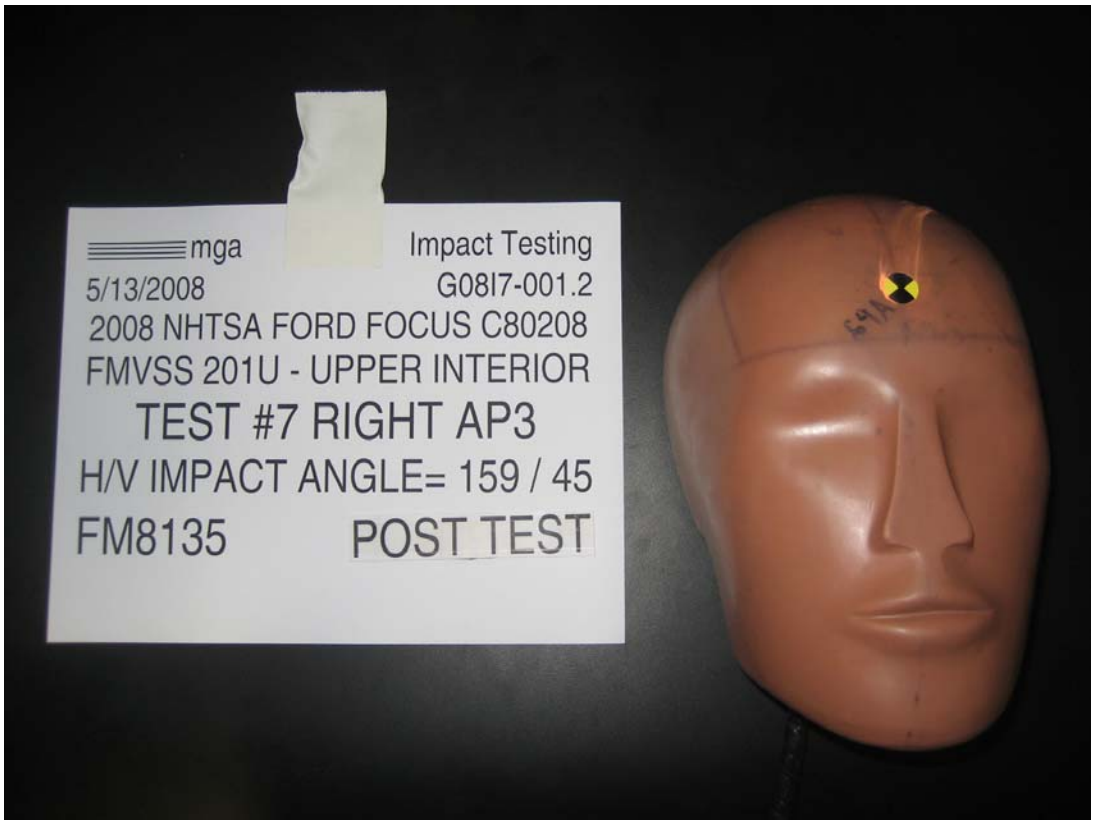

(peak = 16.4 G)
Head Z (G)
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
0
2
4
6
8
10
12
14
16
18
20
22
24
26
TIME (msec)


(peak = 19.2 kph)
Impact Velocity: 18.98 kph
Velocity (kph)
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 = 41.1 mm)
Displacement (mm)
0
5
10
15
20
25
30
35
40
45
0
2
4
6
8
10
12
14
16
18
20
22
24
26
TIME (msec)


mga
Impact Testing
5/13/2008
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #7 RIGHT AP3
H/V IMPACT ANGLE= 159 / 45
FM8135
PRE TEST
AP2
AP3


mga
Impact Testing
5/13/2008
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #7 RIGHT AP3
H/V IMPACT ANGLE= 159 / 45
FM8135
POST TEST


mga
Impact Testing
5/13/2008
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #7 RIGHT AP3
H/V IMPACT ANGLE= 159 / 45
FM8135
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G08I7-001.2 VEHICLE YR/MAKE/MODEL:2008/NHTSA/Ford Focus C80208

GENERAL TEST PARAMETERS:

Test Number:#7

Target (Vehicle Side): AP3Right

Temperature:22C

MGA Test Reference No.:FM8135

Humidity:48%

Approach Horizontal Angles:159º

Time of Test:11:06:42 AM

Approach Vertical Angles:45º

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
466	397	4.4	18.9	18	1 Left

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J35919	-95.844	0.87	0.87
Y	6	J22664	93.878	1.52	1.52
Z	7	J35924	92.621	1.03	1.03

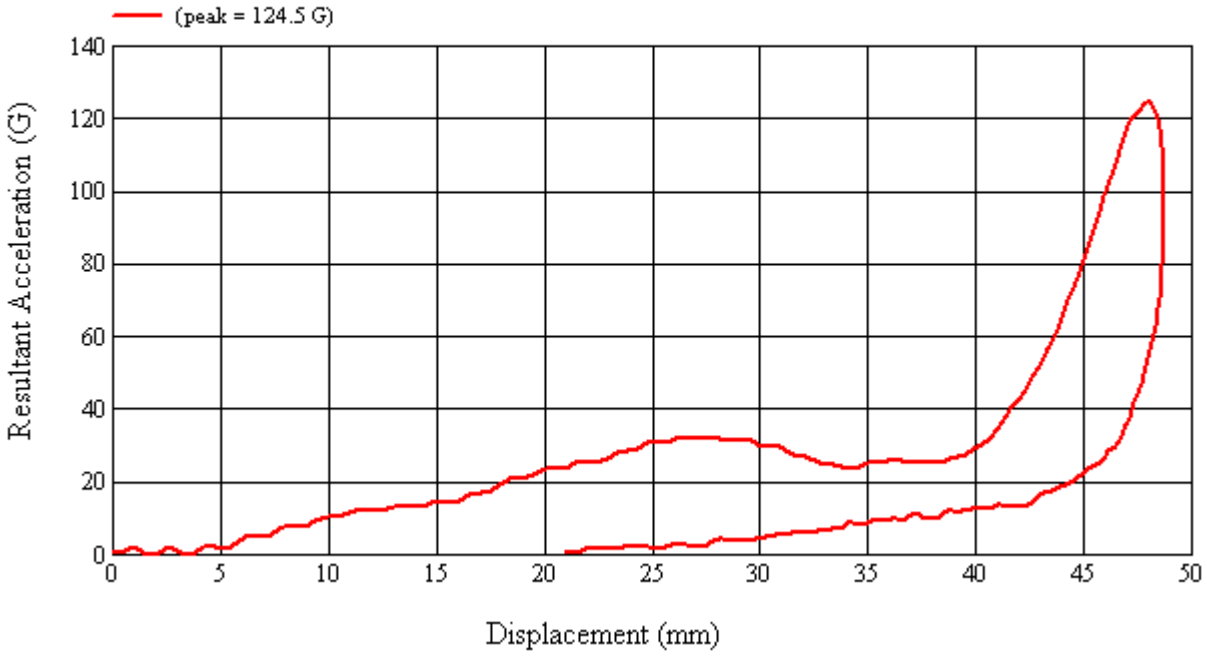
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

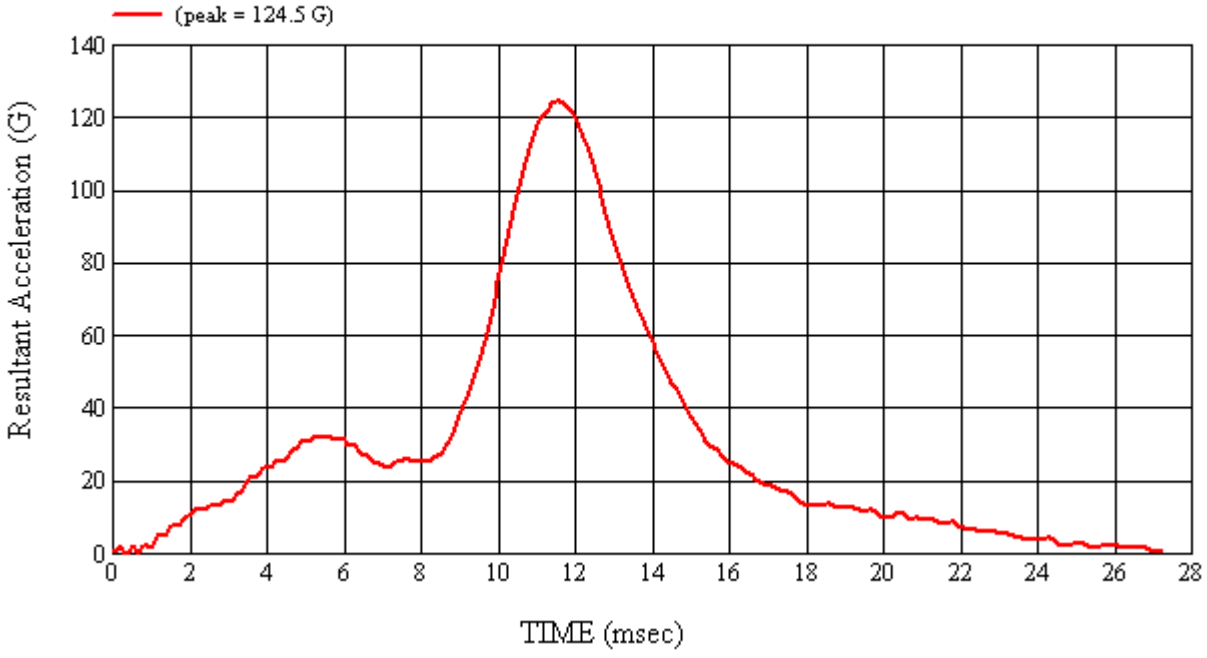
A-pillar displacement.

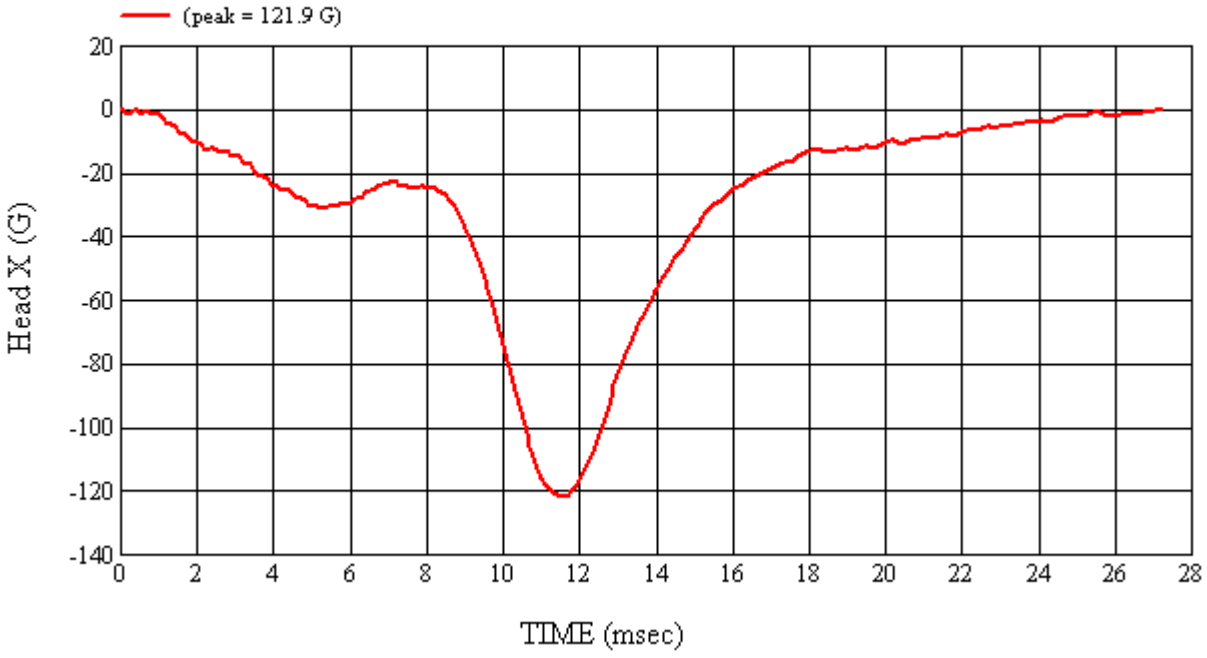
Recorded By: _____ Approved By*: _____ Date: 5/13/2008

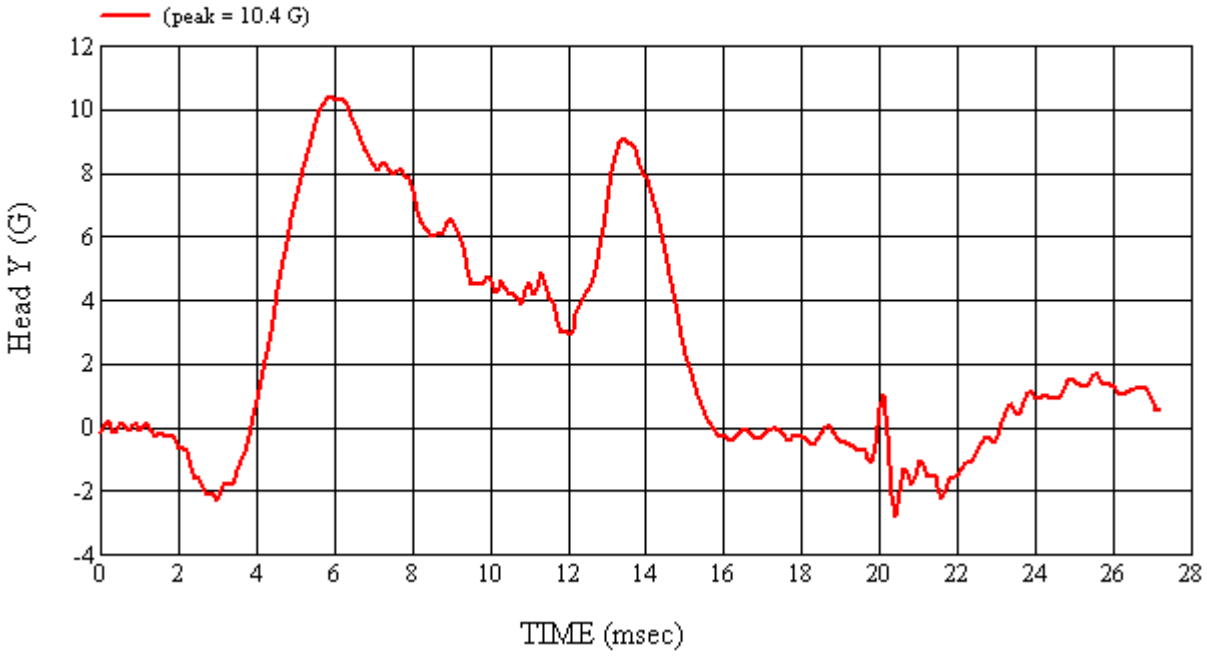
*Only necessary for NHTSA (Government) Compliance testing.

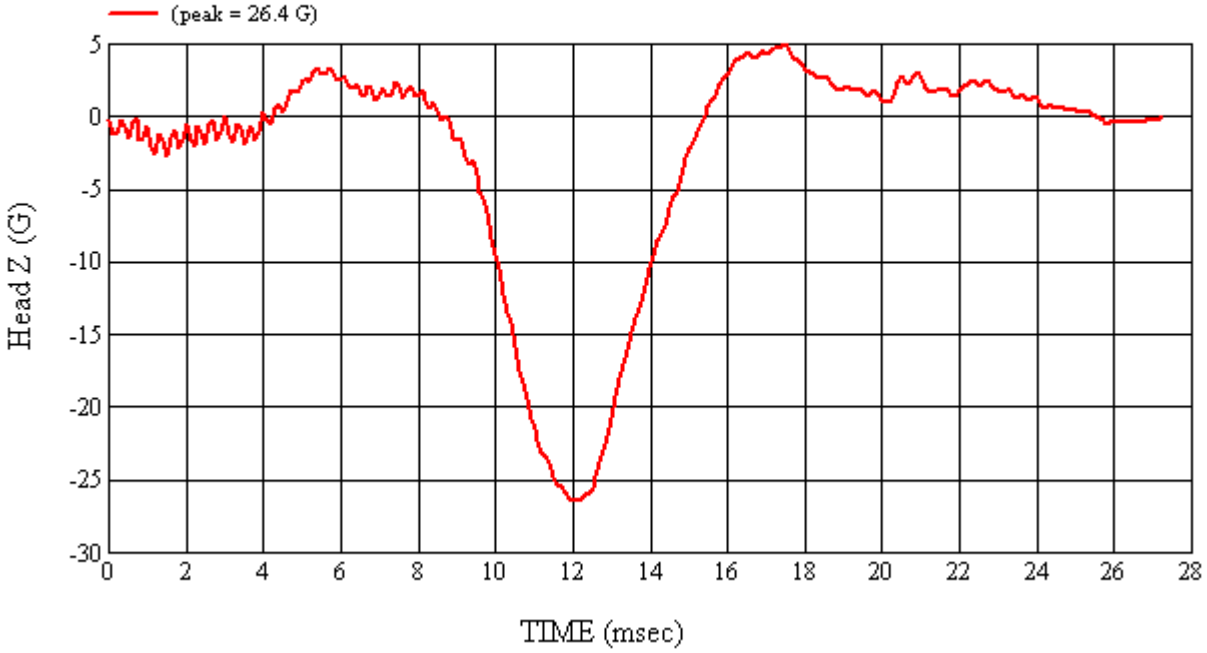
MGA Test #: FM8135 Target Location: AP3, Right Side Test Date: 5/13/2008

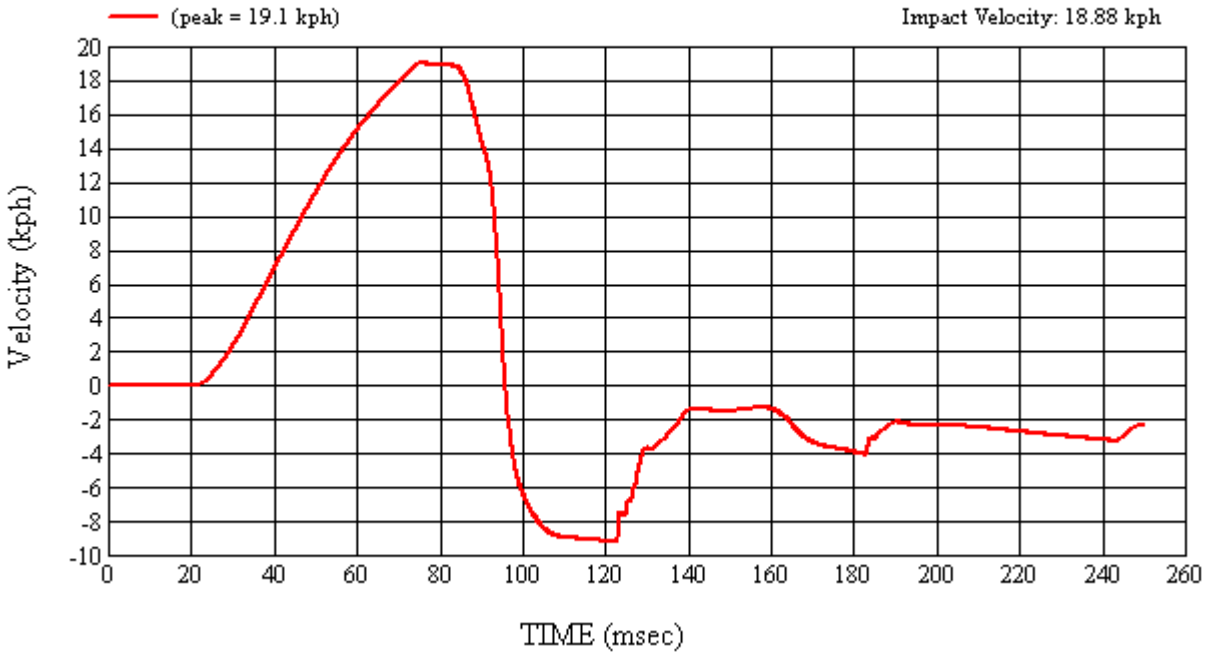


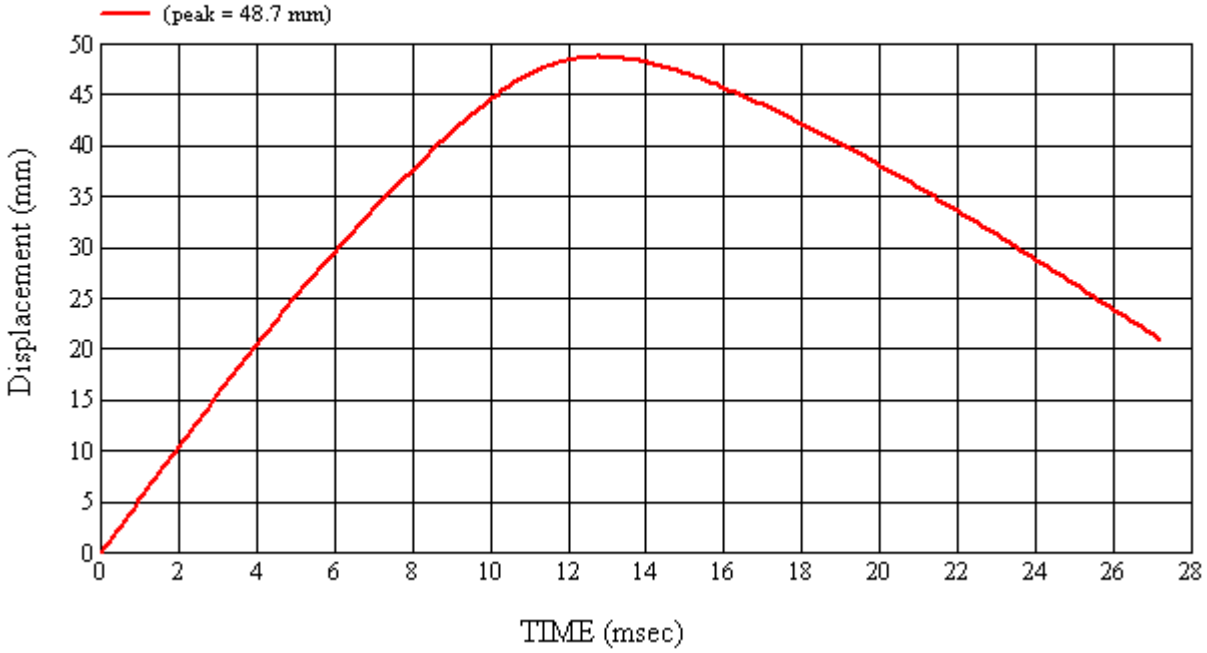



(peak = 121.9 G)
Head X (G)
20
0
-20
-40
-60
-80
-100
-120
-140
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
TIME (msec)


(peak = 10.4 G)
Head Y (G)
12
10
8
6
4
2
0
-2
-4
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
TIME (msec)


(peak = 26.4 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 = 19.1 kph)
Impact Velocity: 18.88 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 = 48.7 mm)
Displacement (mm)
0
5
10
15
20
25
30
35
40
45
50
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
TIME (msec)


mga
Impact Testing
5/13/2008
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #10 RIGHT BP1
H/V IMPACT ANGLE= 90 / 22
FM8138
PRE TEST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5/13/2008
Impact Testing
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #10 RIGHT BP1
H/V IMPACT ANGLE= 90 / 22
FM8138
POST TEST


mga
5/13/2008
Impact Testing
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #10 RIGHT BP1
H/V IMPACT ANGLE= 90 / 22
FM8138
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G08I7-001.2 VEHICLE YR/MAKE/MODEL:2008/NHTSA/Ford Focus C80208

GENERAL TEST PARAMETERS:

Test Number:#10

Target (Vehicle Side): BP1Right

Temperature:23C

MGA Test Reference No.:FM8138

Humidity:47%

Approach Horizontal Angles:90º

Time of Test:5:03:16 PM

Approach Vertical Angles:22º

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
543	500	5.6	19.0	41	1 Right

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J35919	-95.844	0.87	0.87
Y	6	J22664	93.878	1.52	1.52
Z	7	J35924	92.621	1.03	1.02

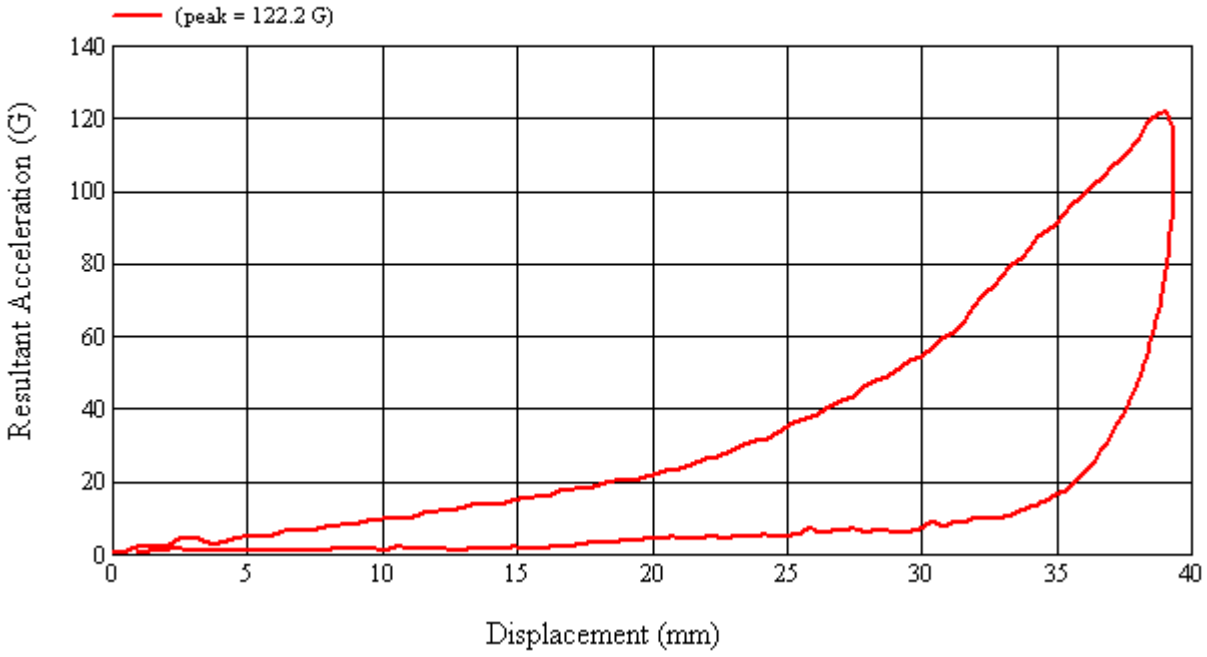
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

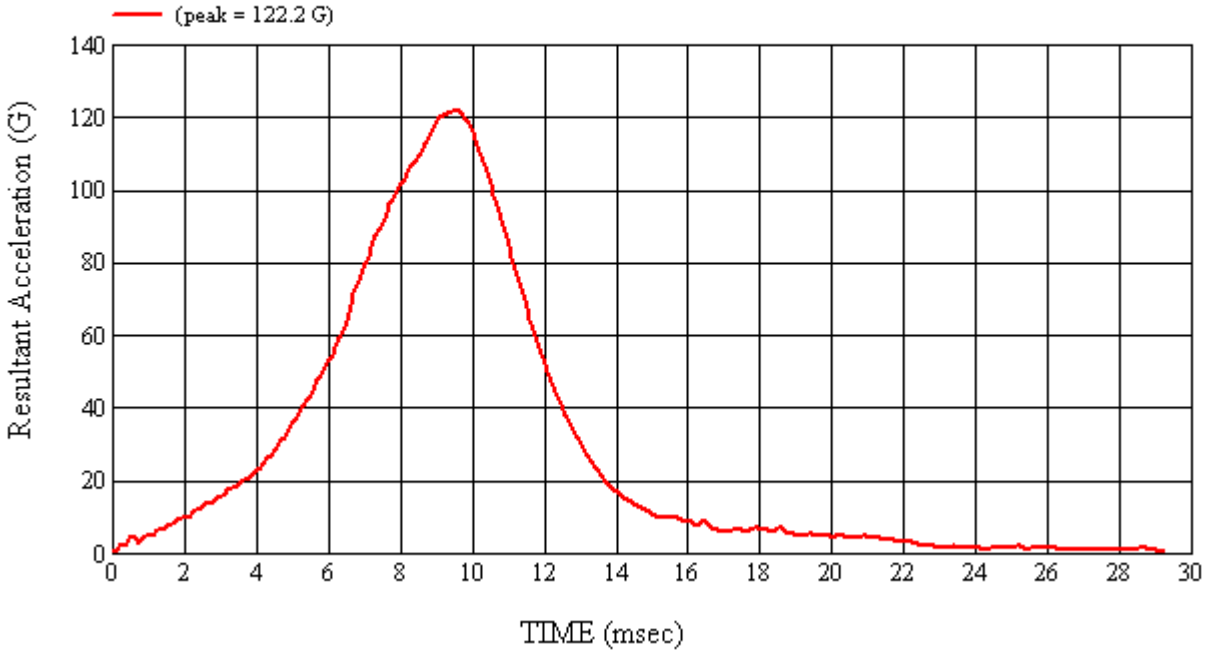
No visible damage.

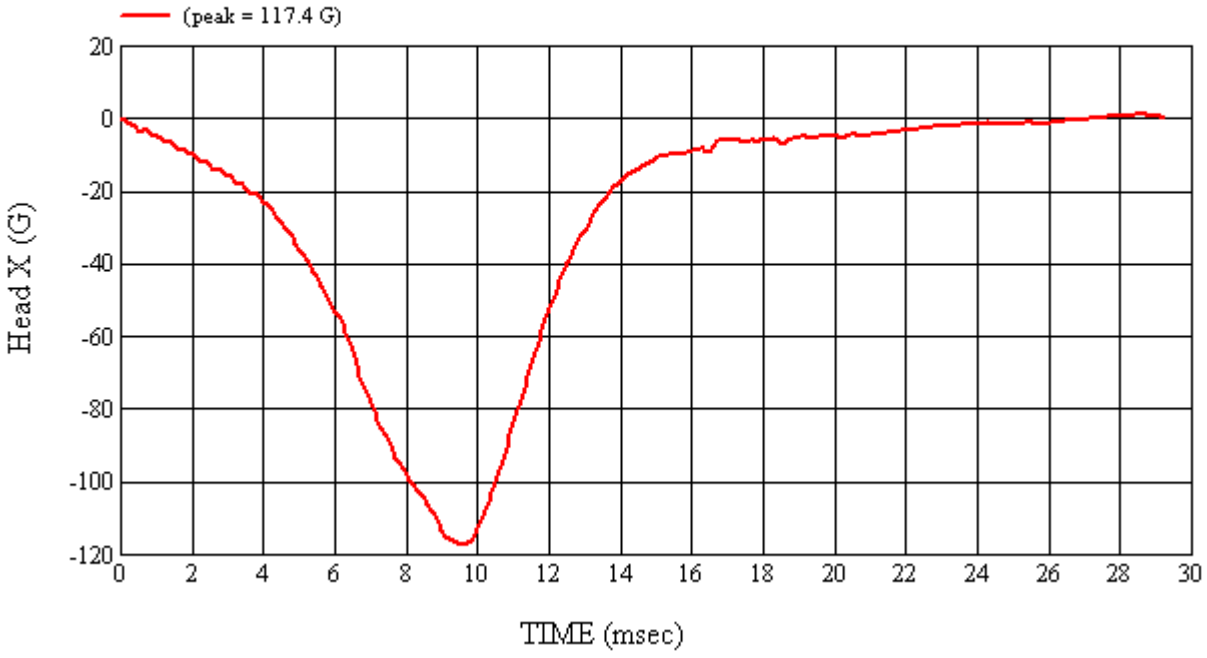
Recorded By: _____ Approved By*: _____ Date: 5/13/2008

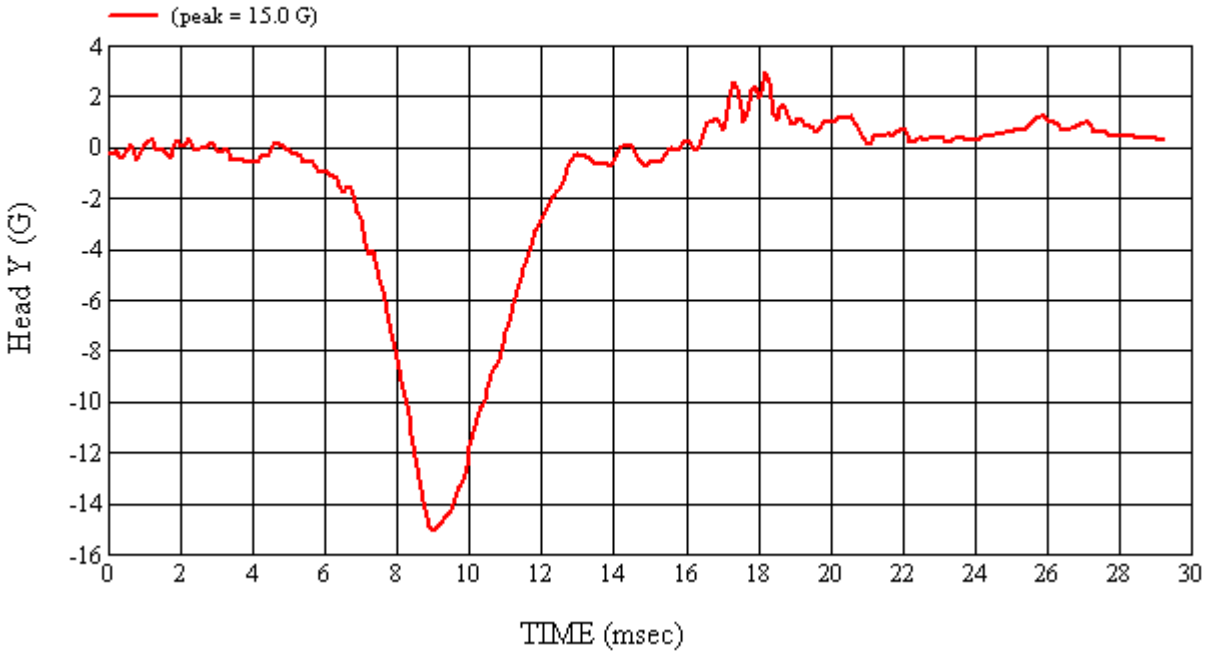
*Only necessary for NHTSA (Government) Compliance testing.

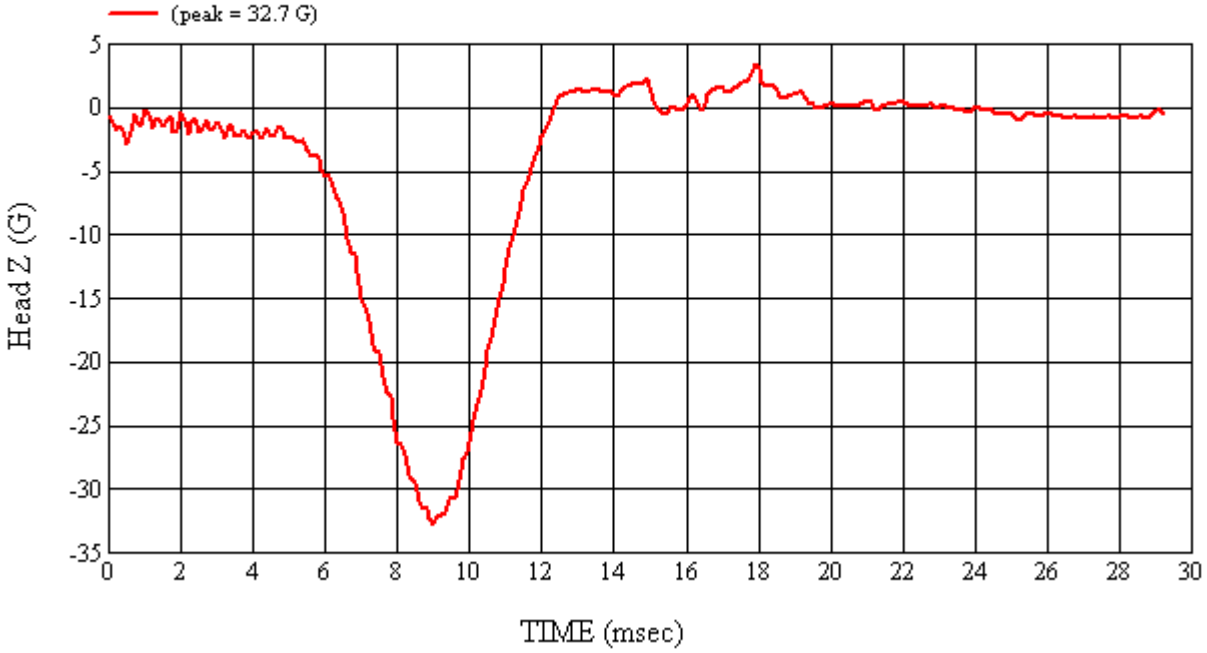
MGA Test #: FM8138 Target Location: BP1, Right Side Test Date: 5/13/2008

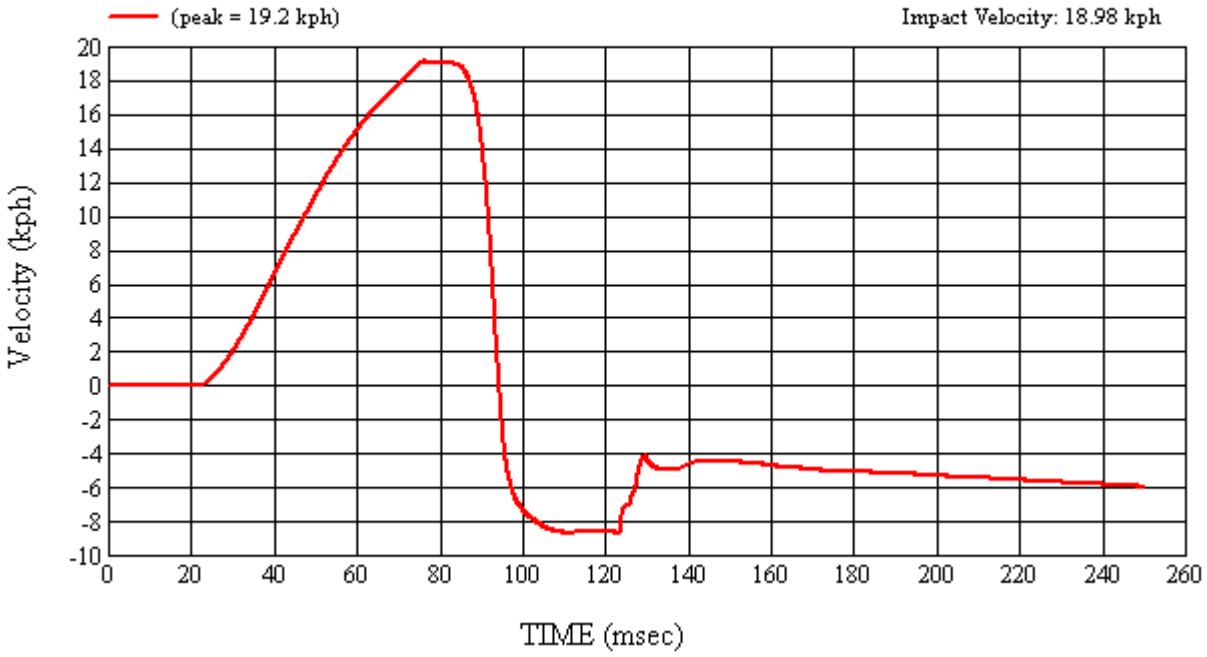


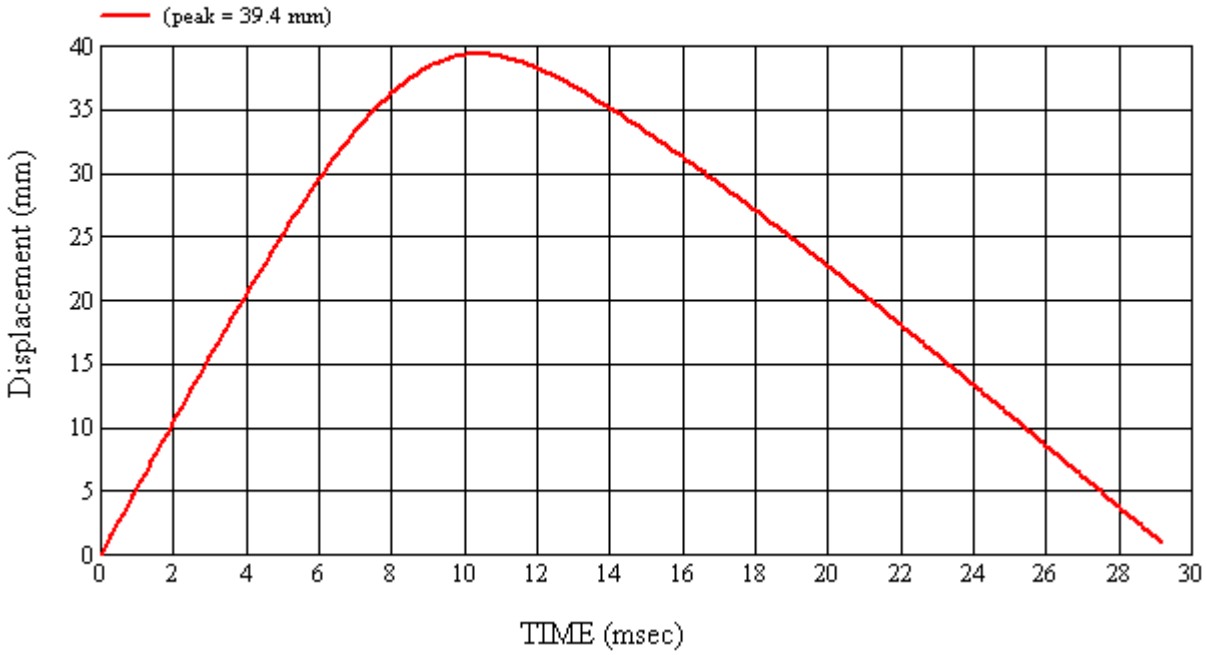


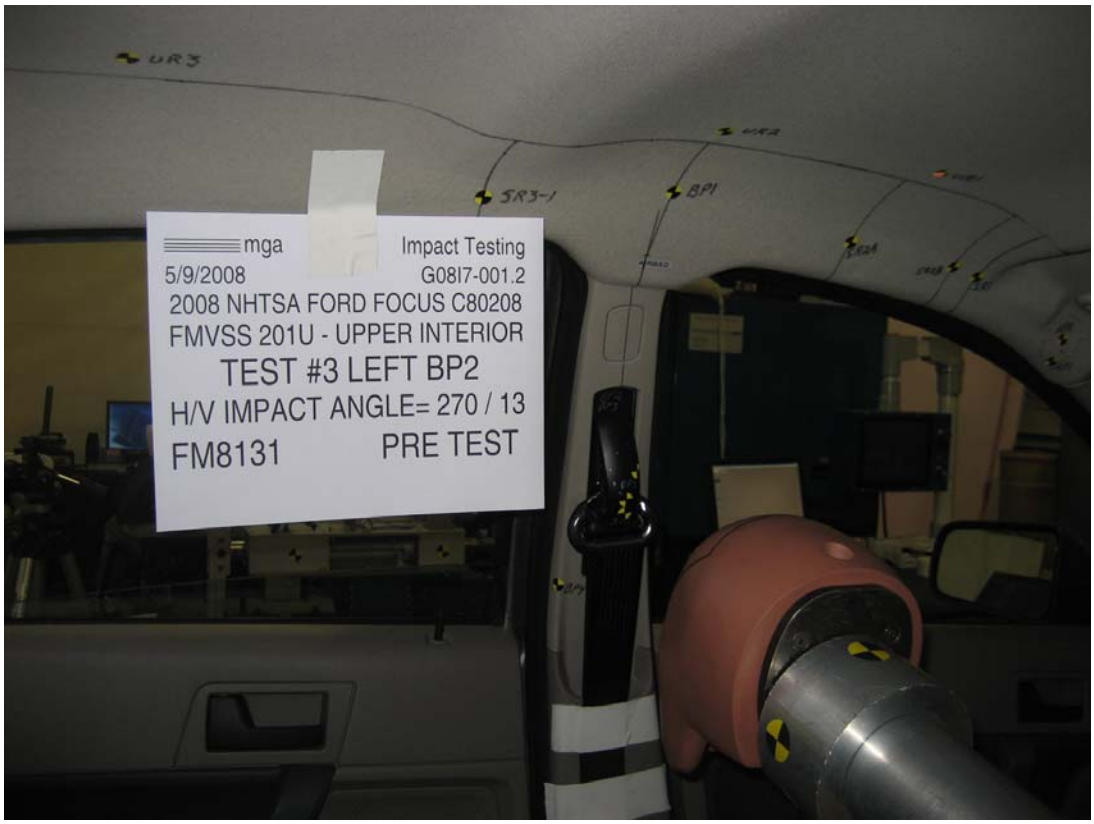

(peak = 117.4 G)
Head X (G)
20
0
-20
-40
-60
-80
-100
-120
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
TIME (msec)

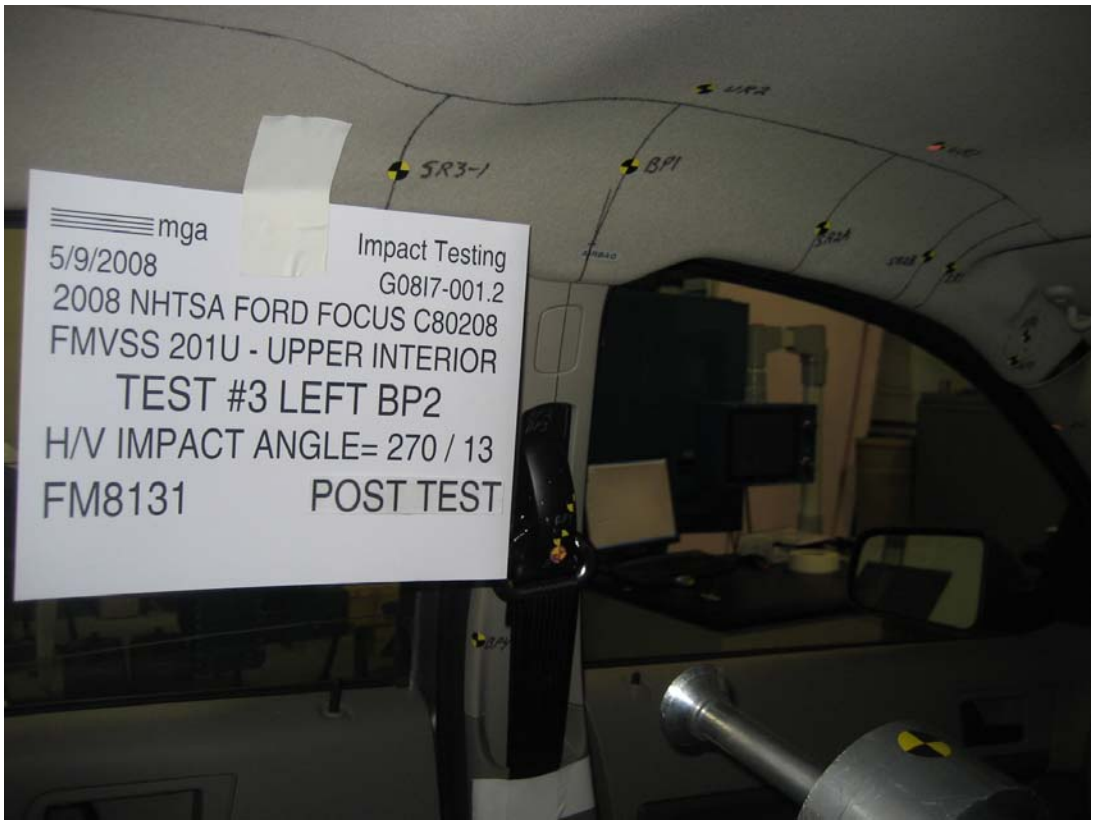

(peak = 15.0 G)
Head Y (G)
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
TIME (msec)


(peak = 32.7 G)
Head Z (G)
5
0
-5
-10
-15
-20
-25
-30
-35
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
TIME (msec)


(peak = 19.2 kph)
Impact Velocity: 18.98 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 = 39.4 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
28
30
TIME (msec)


UR3
SR3-1
BP1
mga
Impact Testing
5/9/2008
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #3 LEFT BP2
H/V IMPACT ANGLE= 270 / 13
FM8131
PRE TEST


mga
5/9/2008
Impact Testing
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #3 LEFT BP2
H/V IMPACT ANGLE= 270 / 13
FM8131
POST TEST


mga
5/9/2008
Impact Testing
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #3 LEFT BP2
H/V IMPACT ANGLE= 270 / 13
FM8131
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G08I7-001.2 VEHICLE YR/MAKE/MODEL:2008/NHTSA/Ford Focus C80208

GENERAL TEST PARAMETERS:

Test Number:#3

Target (Vehicle Side): BP2Left

Temperature:23C

MGA Test Reference No.:FM8131

Humidity:45%

Approach Horizontal Angles:270º

Time of Test:4:26:22 PM

Approach Vertical Angles:13º

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
789	826	4.1	23.2	4	5 Left

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J22700	-95.015	0.87	0.87
Y	6	J36197	108.737	1.52	1.52
Z	7	J36353	98.754	1.03	1.03

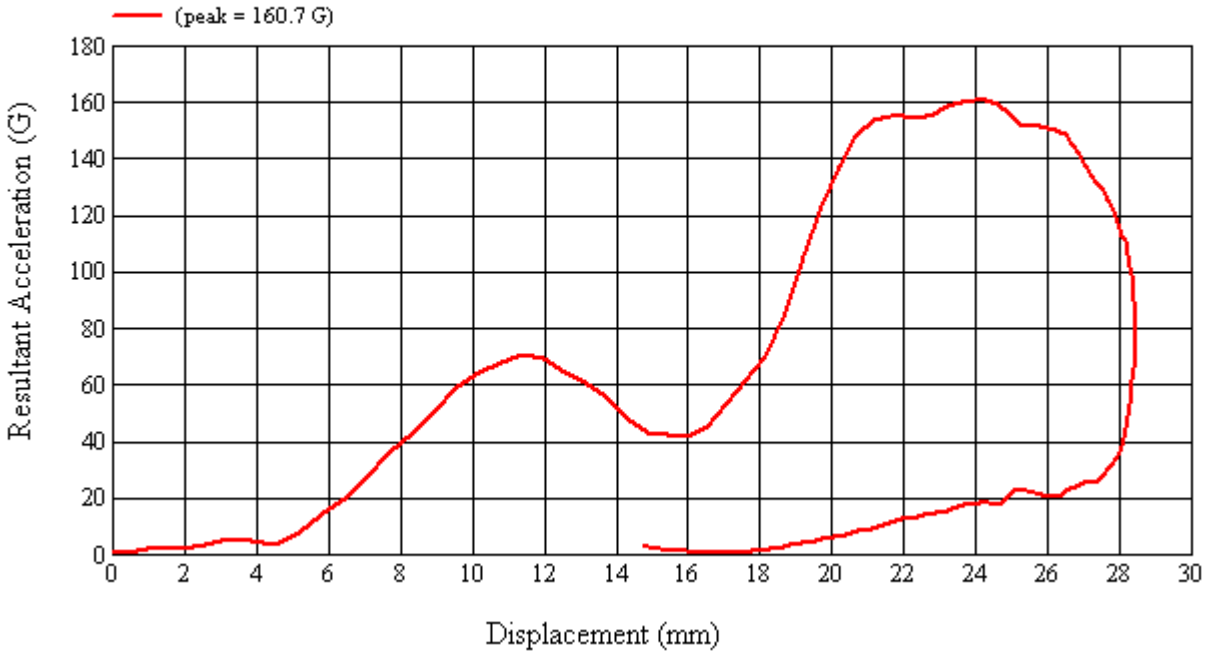
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

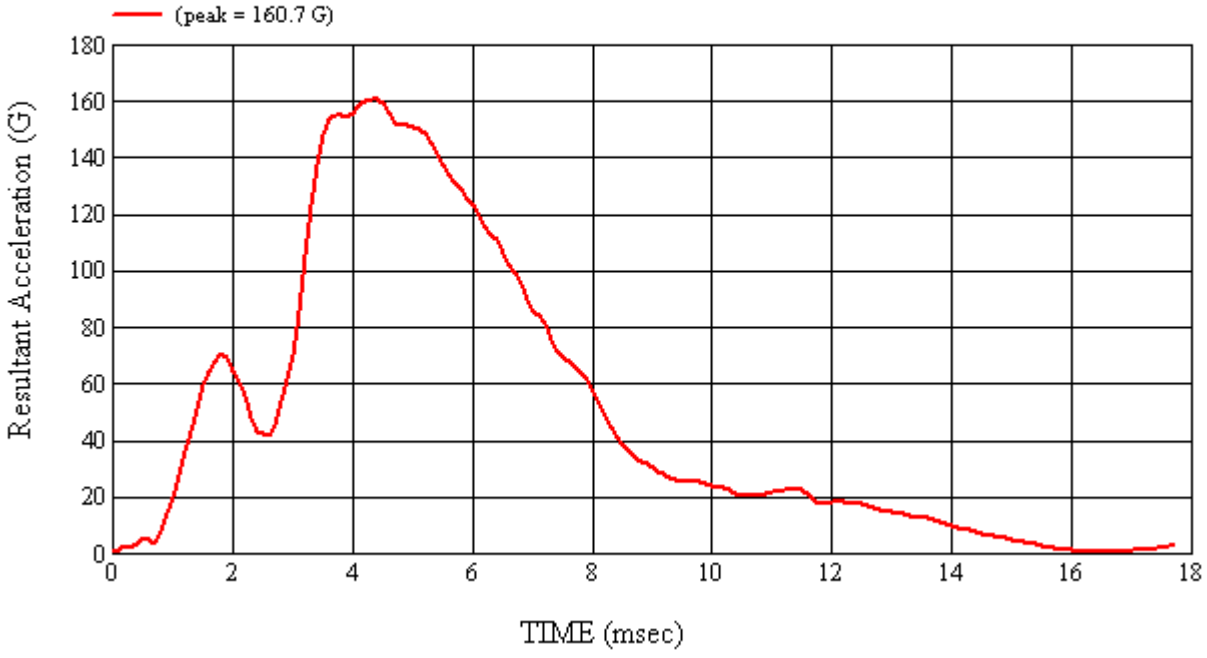
No visible damage.

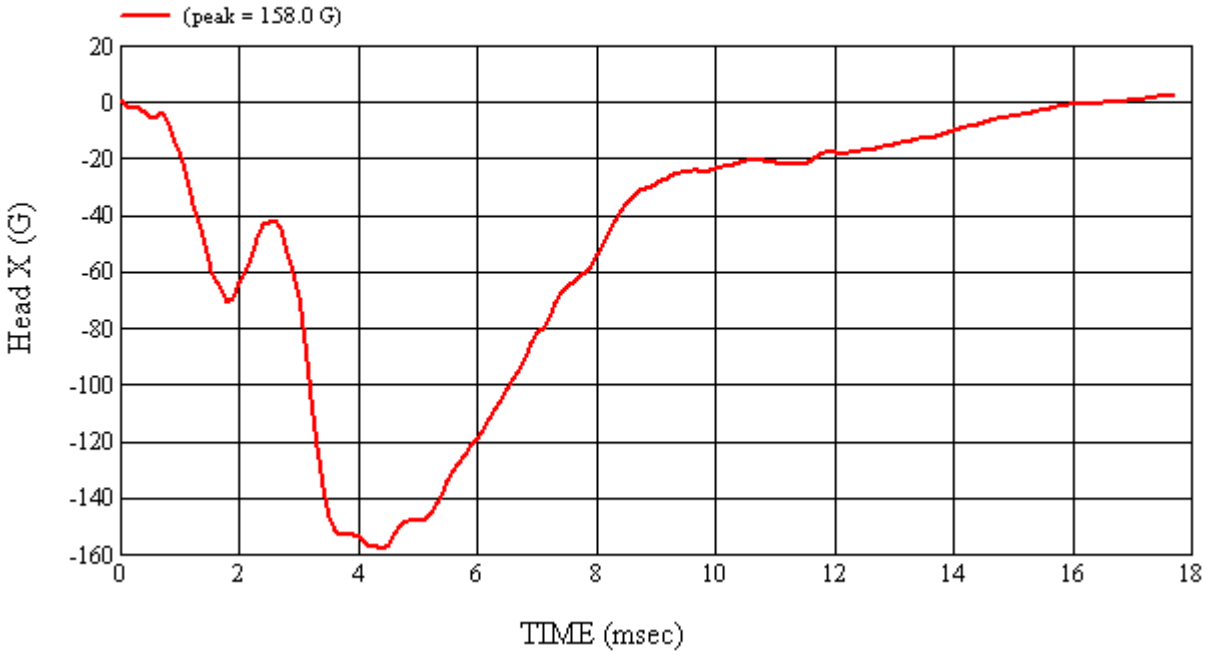
Recorded By: _____ Approved By*: _____ Date: 5/9/2008

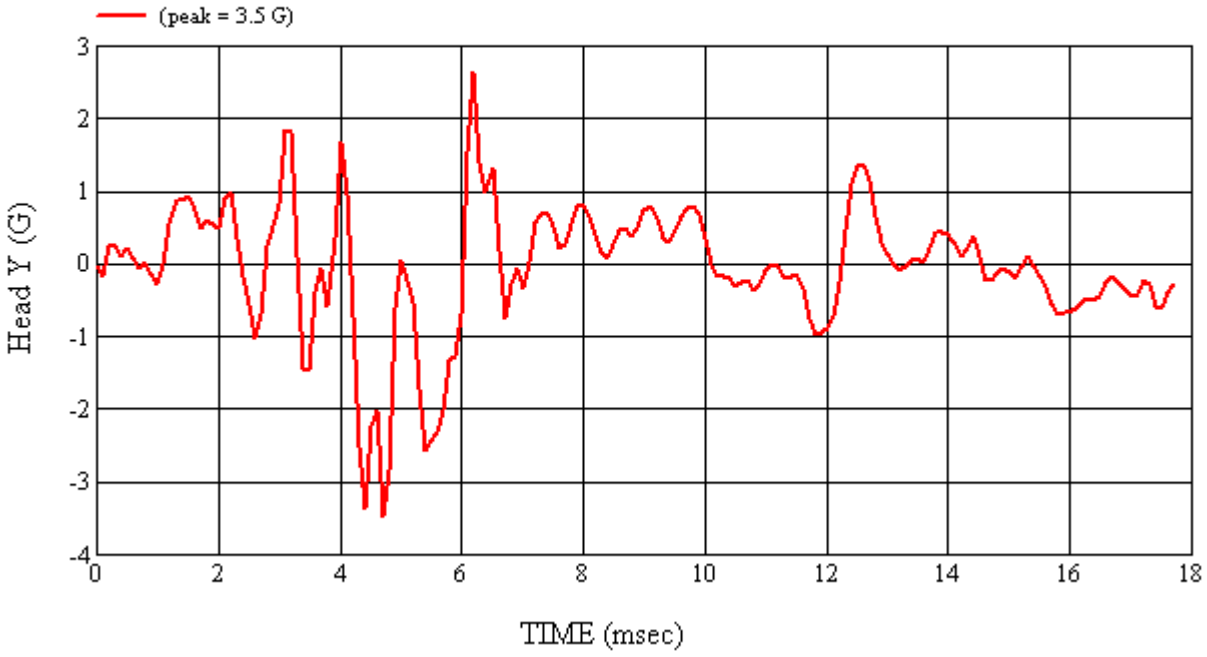
*Only necessary for NHTSA (Government) Compliance testing.

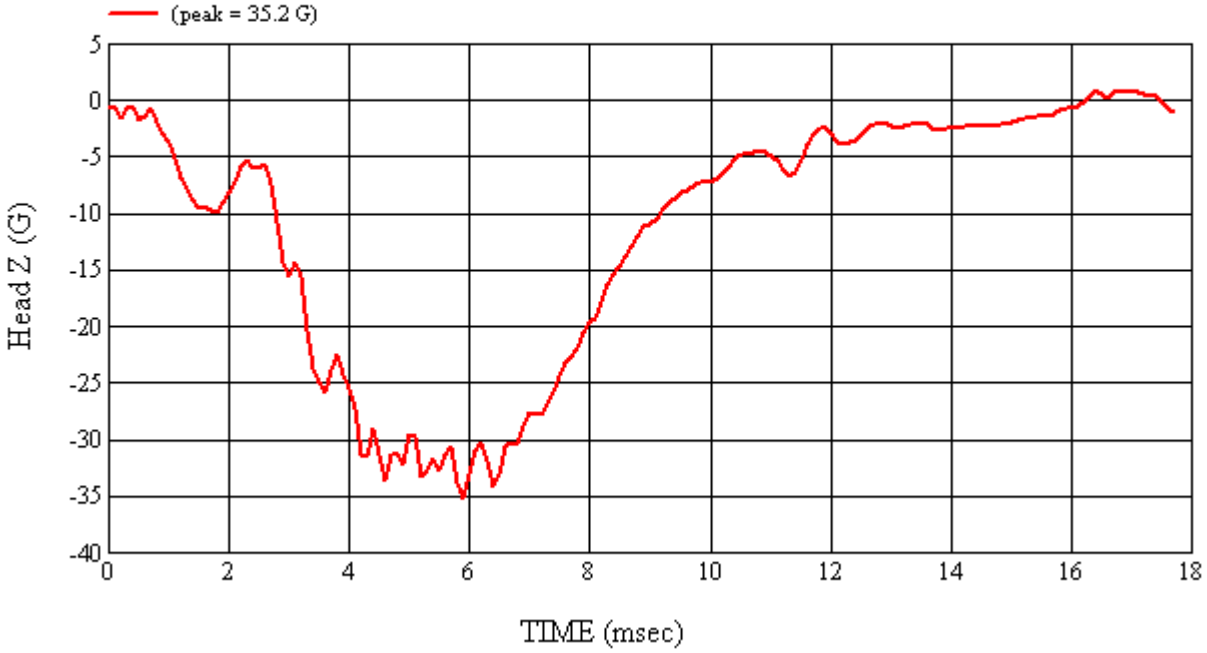
MGA Test #: FM8131 Target Location: BP2, Left Side Test Date: 5/9/2008

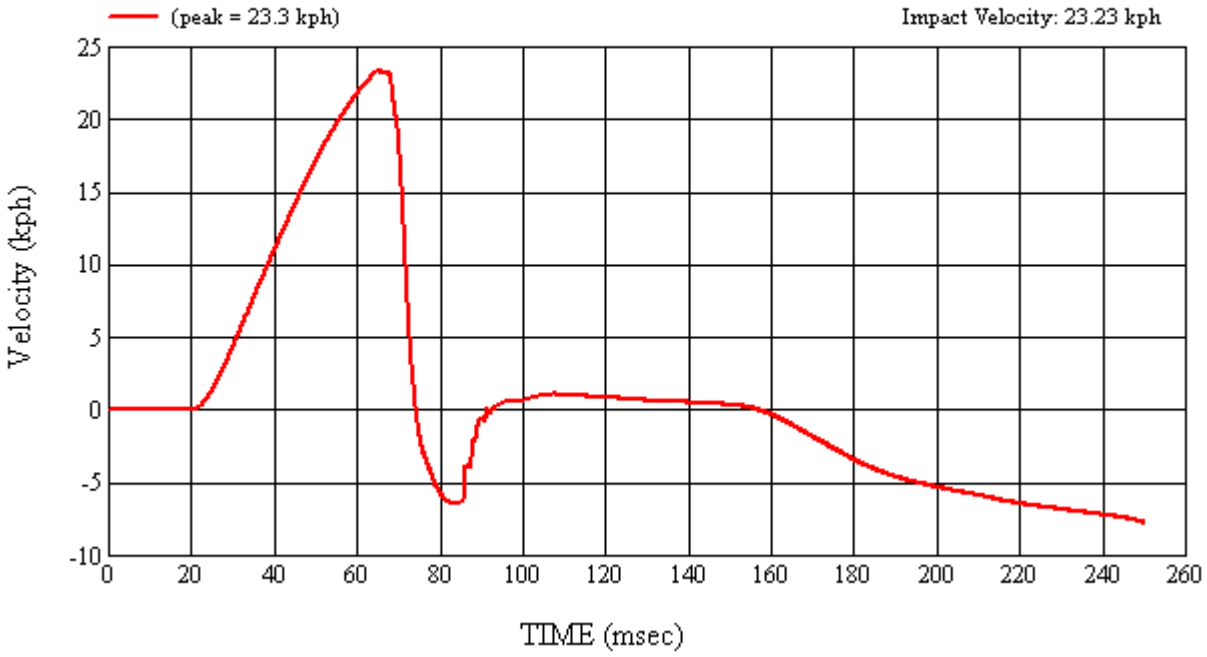


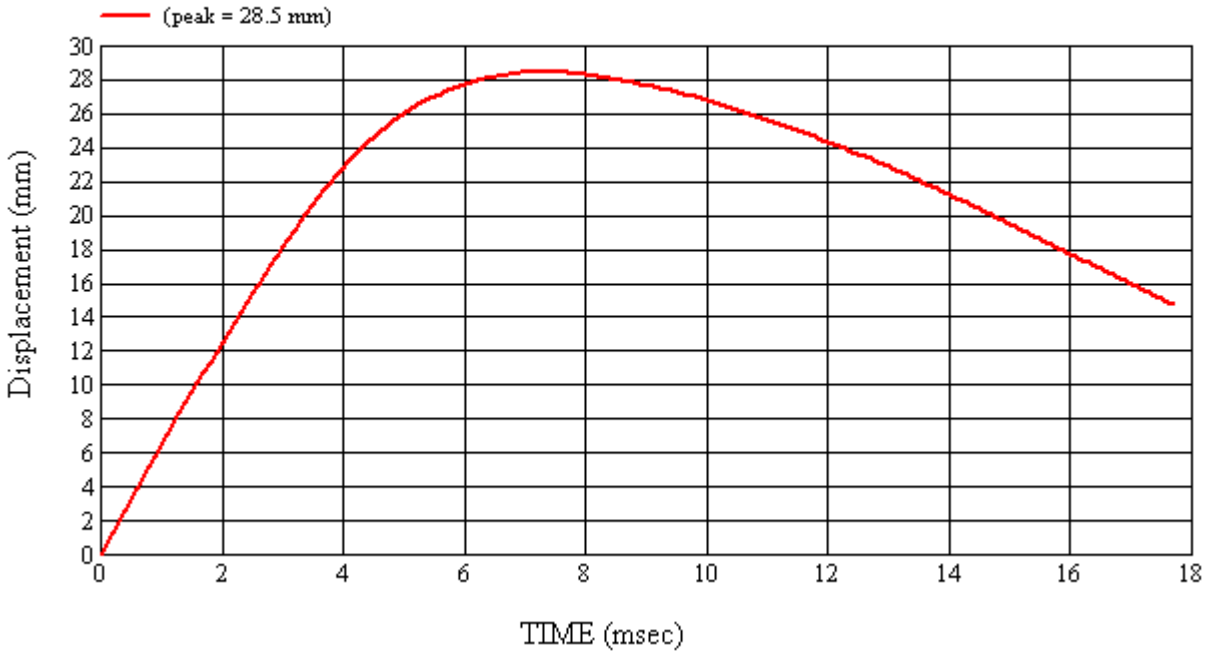



(peak = 158.0 G)
Head X (G)
20
0
-20
-40
-60
-80
-100
-120
-140
-160
0
2
4
6
8
10
12
14
16
18
TIME (msec)


(peak = 3.5 G)
Head Y (G)
3
2
1
0
-1
-2
-3
-4
0
2
4
6
8
10
12
14
16
18
TIME (msec)


(peak = 35.2 G)
Head Z (G)
5
0
-5
-10
-15
-20
-25
-30
-35
-40
0
2
4
6
8
10
12
14
16
18
TIME (msec)


(peak = 23.3 kph)
Impact Velocity: 23.23 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 = 28.5 mm)
Displacement (mm)
TIME (msec)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30


mga
Impact Testing
5/12/2008
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #6 LEFT OP2
H/V IMPACT ANGLE= 270 / 7
FM8134
PRE TEST


mga
Impact Testing
5/12/2008
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #6 LEFT OP2
H/V IMPACT ANGLE= 270 / 7
FM8134
POST TEST
C80208
FM8134


mga
Impact Testing
5/12/2008
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #6 LEFT OP2
H/V IMPACT ANGLE= 270 / 7
FM8134
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G08I7-001.2 VEHICLE YR/MAKE/MODEL:2008/NHTSA/Ford Focus C80208

GENERAL TEST PARAMETERS:

Test Number:#6

Target (Vehicle Side): OP2Left

Temperature:23C

MGA Test Reference No.:FM8134

Humidity:49%

Approach Horizontal Angles:270º

Time of Test:3:14:03 PM

Approach Vertical Angles:7º

FMH Serial No:[038]

Additional Description:1 Relocation

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
672	670	5.6	23.1	5	6 Left

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

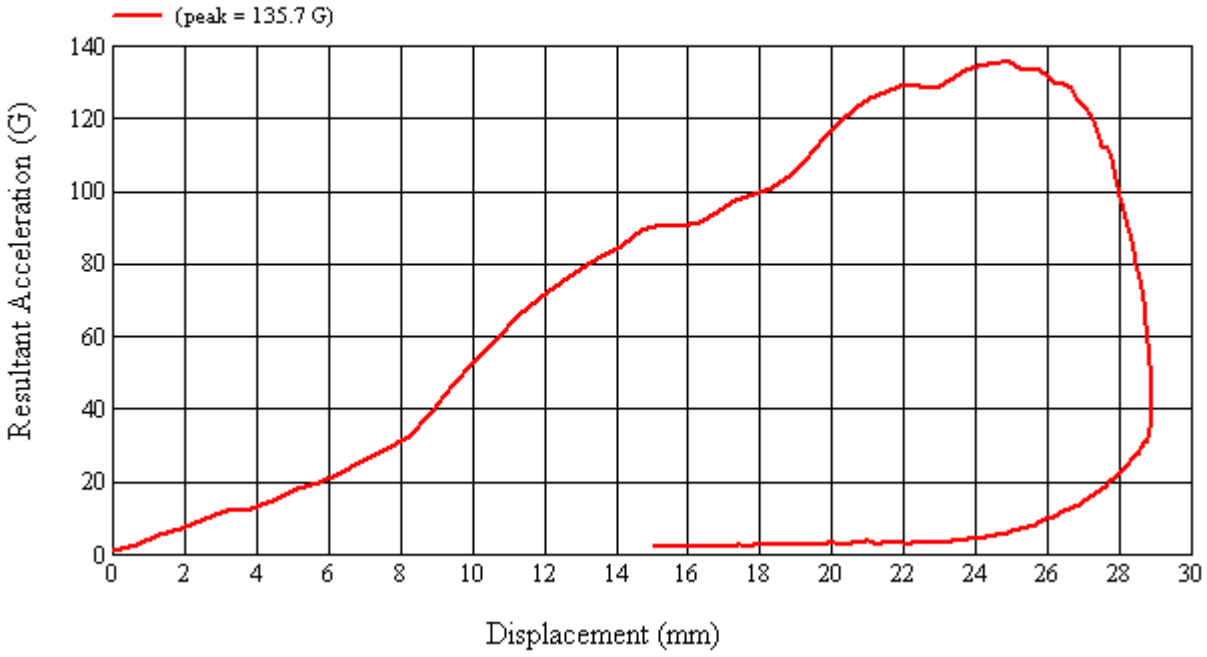
Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J22700	-95.015	0.87	0.87
Y	6	J36197	108.737	1.52	1.52
Z	7	J36353	98.754	1.03	1.03

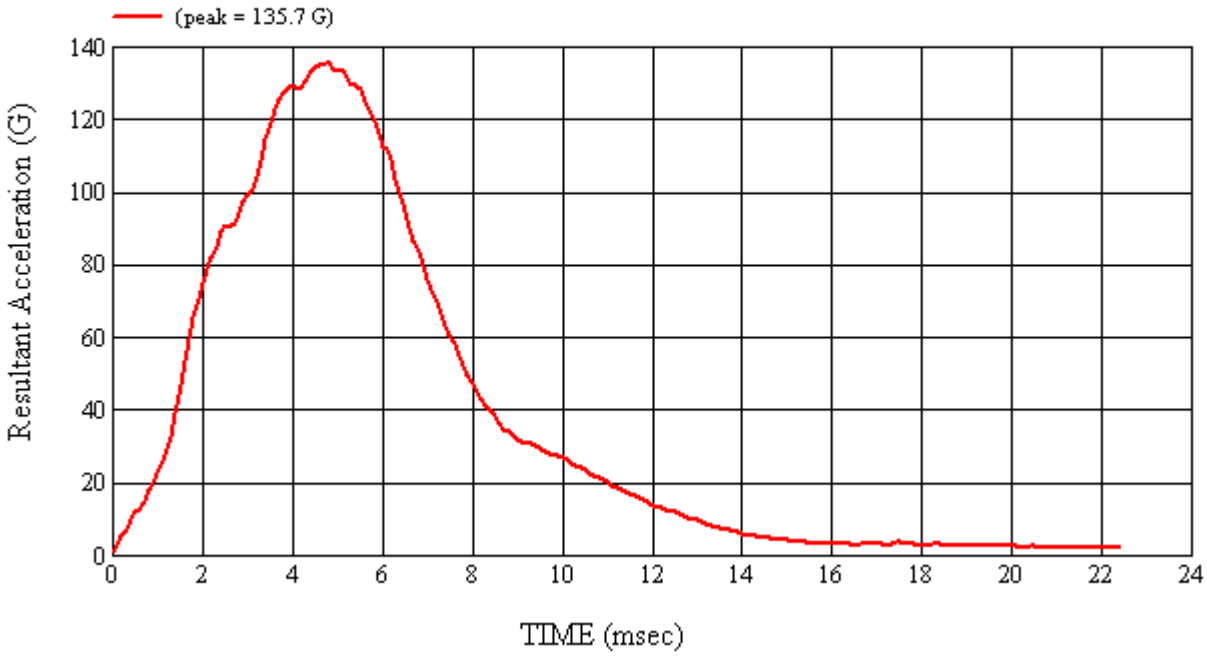
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

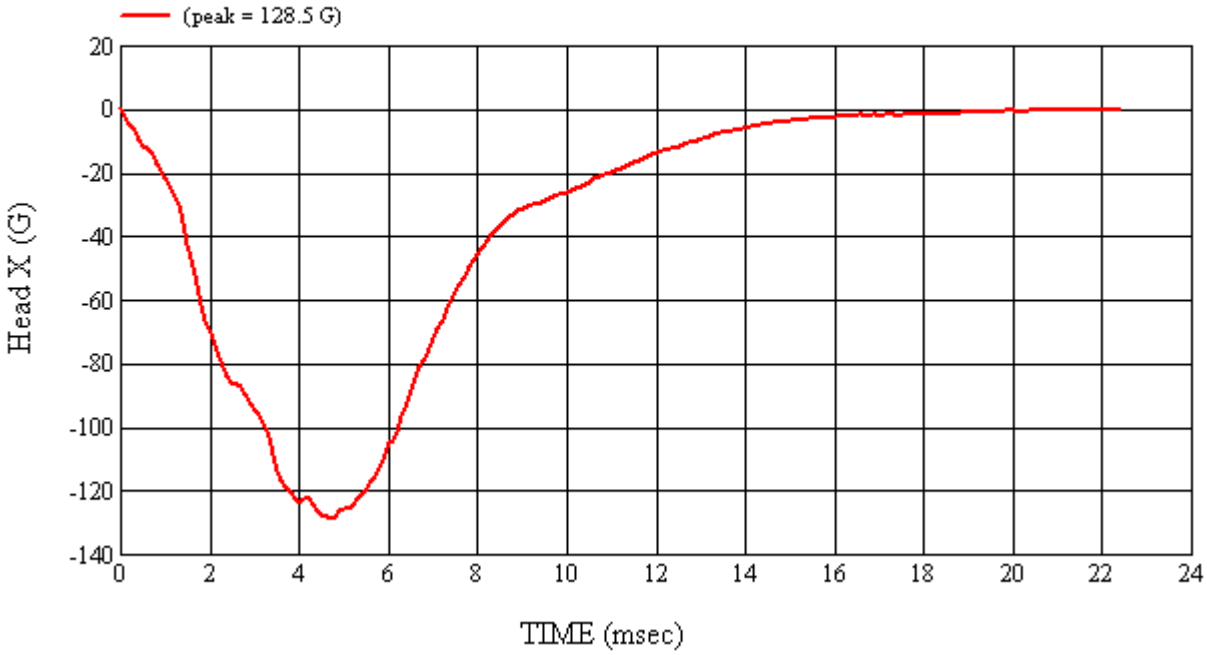
No visible damage.

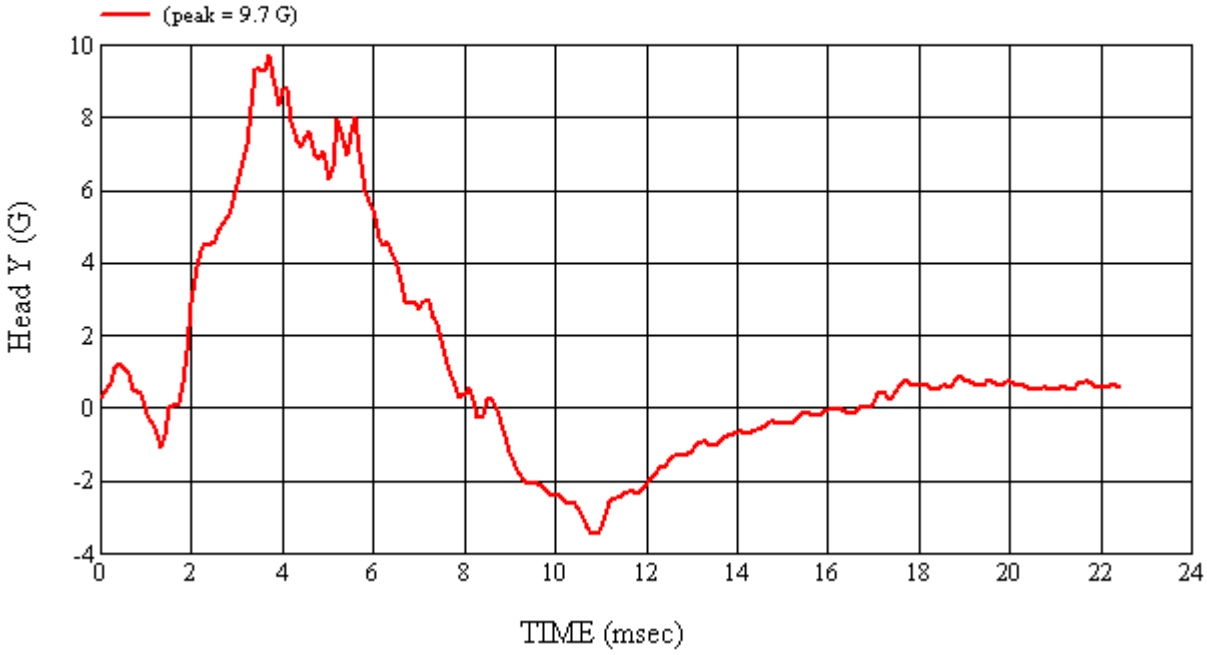
Recorded By: _____ Approved By*: _____ Date: 5/12/2008

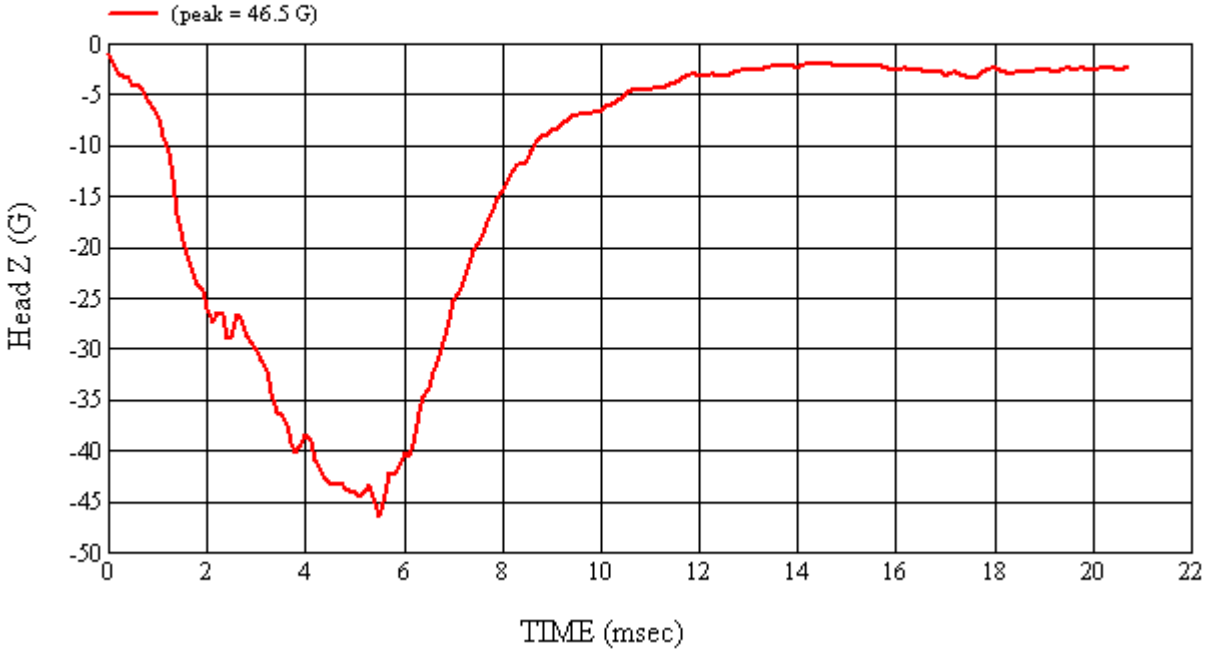
*Only necessary for NHTSA (Government) Compliance testing.

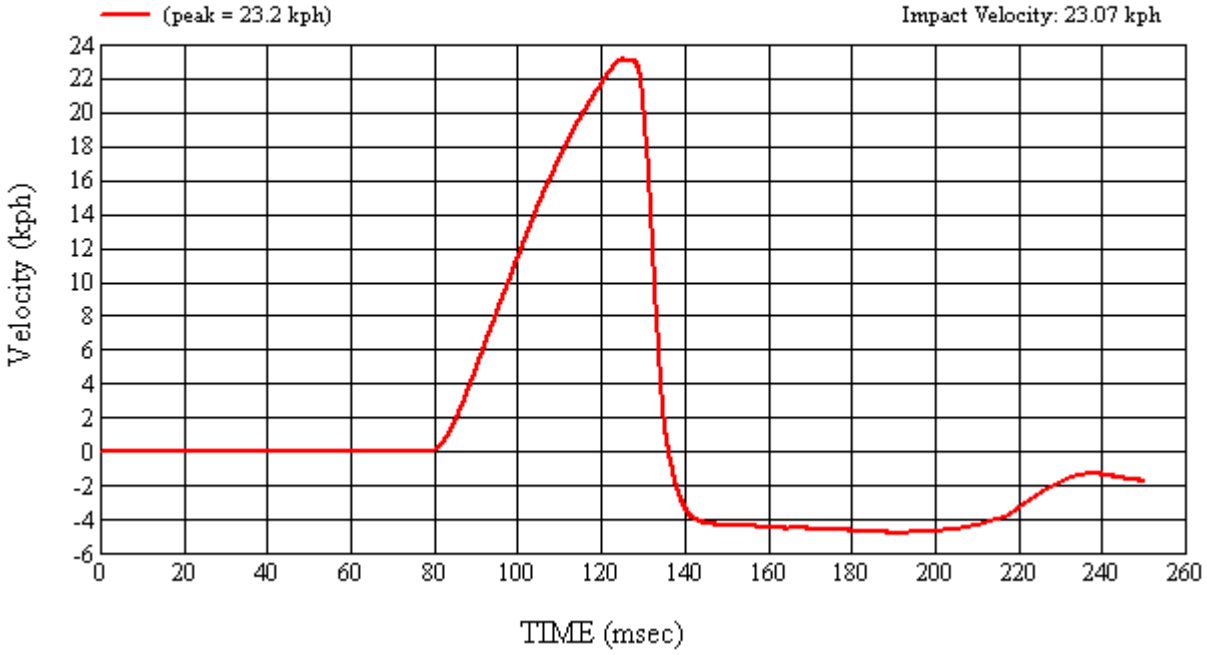

(peak = 135.7 G)
Resultant Acceleration (G)
Displacement (mm)
0
20
40
60
80
100
120
140
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30

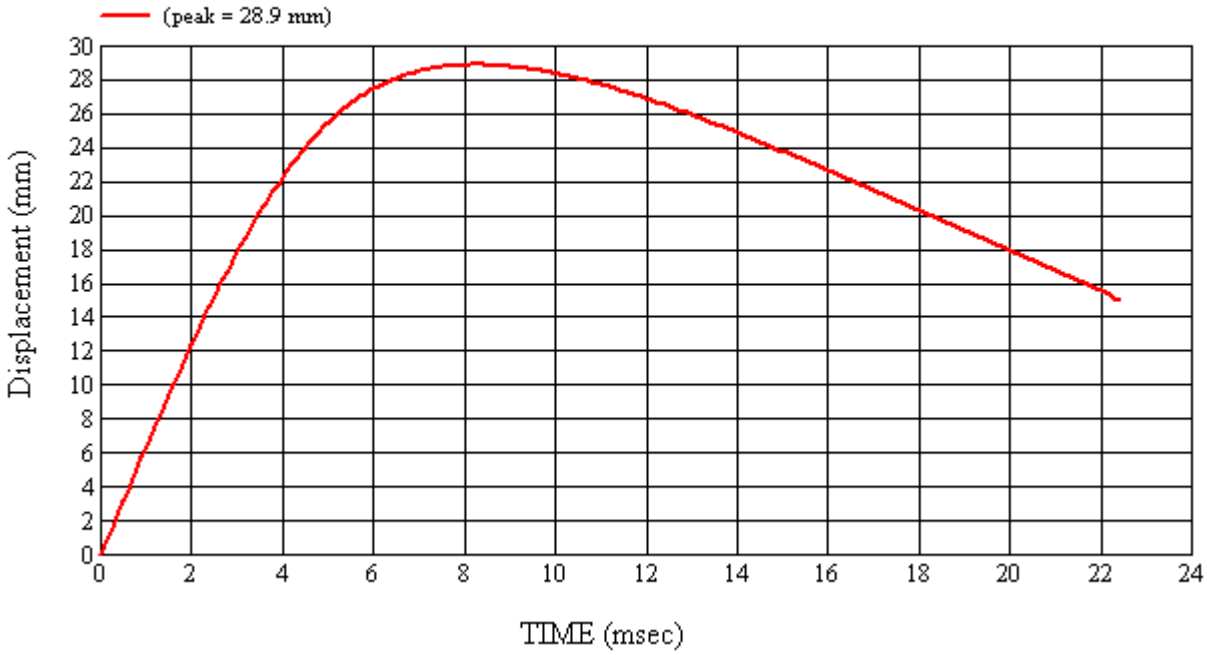

(peak = 135.7 G)
Resultant Acceleration (G)
TIME (msec)
0
20
40
60
80
100
120
140
0
2
4
6
8
10
12
14
16
18
20
22
24

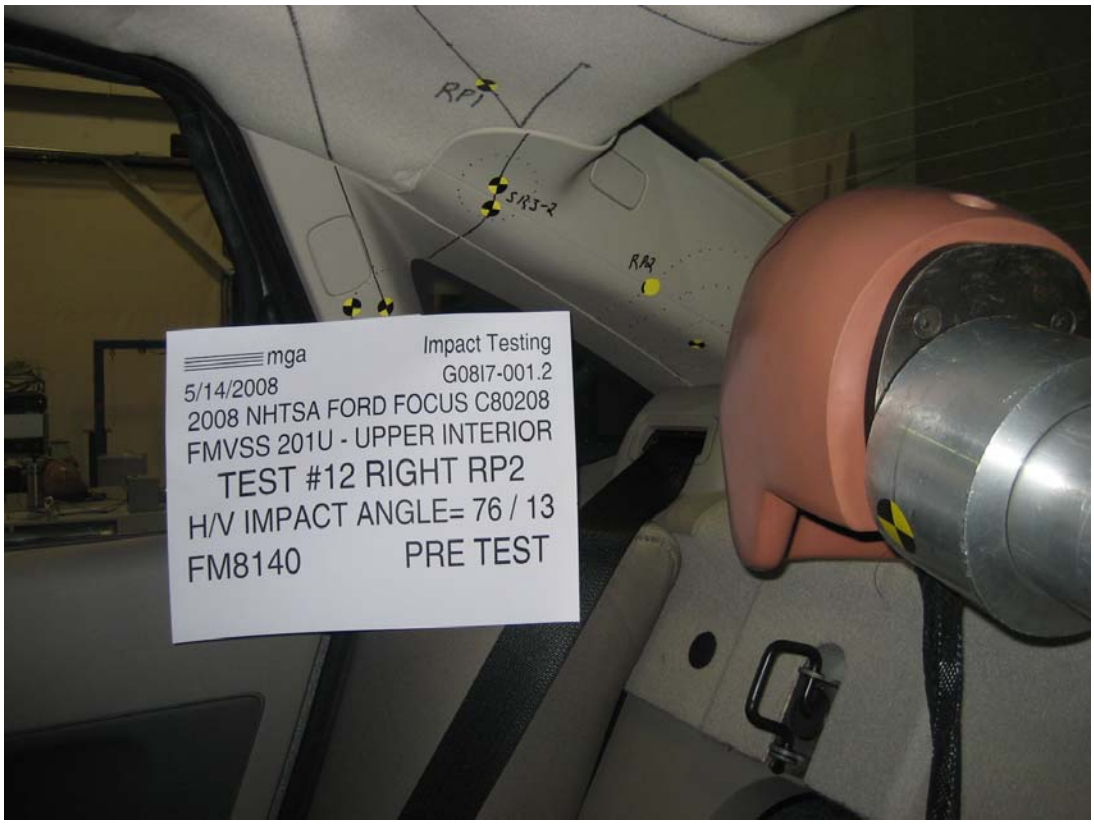

(peak = 128.5 G)
Head X (G)
20
0
-20
-40
-60
-80
-100
-120
-140
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)


(peak = 9.7 G)
Head Y (G)
10
8
6
4
2
0
-2
-4
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)

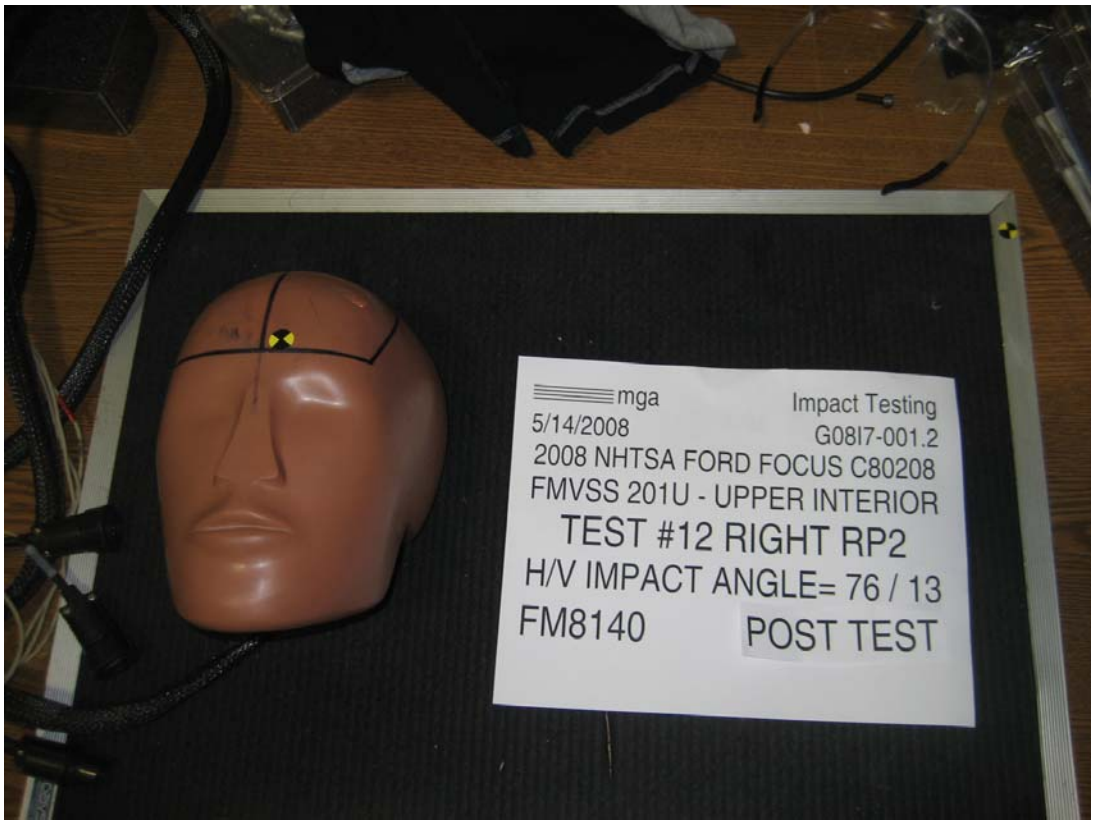

(peak = 46.5 G)
Head Z (G)
0
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
0
2
4
6
8
10
12
14
16
18
20
22
TIME (msec)


(peak = 23.2 kph)
Impact Velocity: 23.07 kph
Velocity (kph)
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 = 28.9 mm)
Displacement (mm)
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)


RP1
SRS-2
RA2
mga
Impact Testing
G08I7-001.2
5/14/2008
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #12 RIGHT RP2
H/V IMPACT ANGLE= 76 / 13
FM8140
PRE TEST


RH
RP1
SRS-2
RA1
C80208
FM8140
RIGHT RP2
H/V 76/13
mga
Impact Testing
5/14/2008
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #12 RIGHT RP2
H/V IMPACT ANGLE= 76 / 13
FM8140
POST TEST


mga
Impact Testing
5/14/2008
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #12 RIGHT RP2
H/V IMPACT ANGLE= 76 / 13
FM8140
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G08I7-001.2 VEHICLE YR/MAKE/MODEL:2008/NHTSA/Ford Focus C80208

GENERAL TEST PARAMETERS:

Test Number:#12

Target (Vehicle Side): RP2Right

Temperature:23C

MGA Test Reference No.:FM8140

Humidity:66%

Approach Horizontal Angles:76º

Time of Test:5:27:48 PM

Approach Vertical Angles:13º

FMH Serial No:[038]

Additional Description:3 Relocations

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
288	161	12.1	18.6	5	10 Left

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J22700	-95.015	0.87	0.87
Y	6	J36197	108.737	1.52	1.52
Z	7	J36353	98.754	1.03	1.03

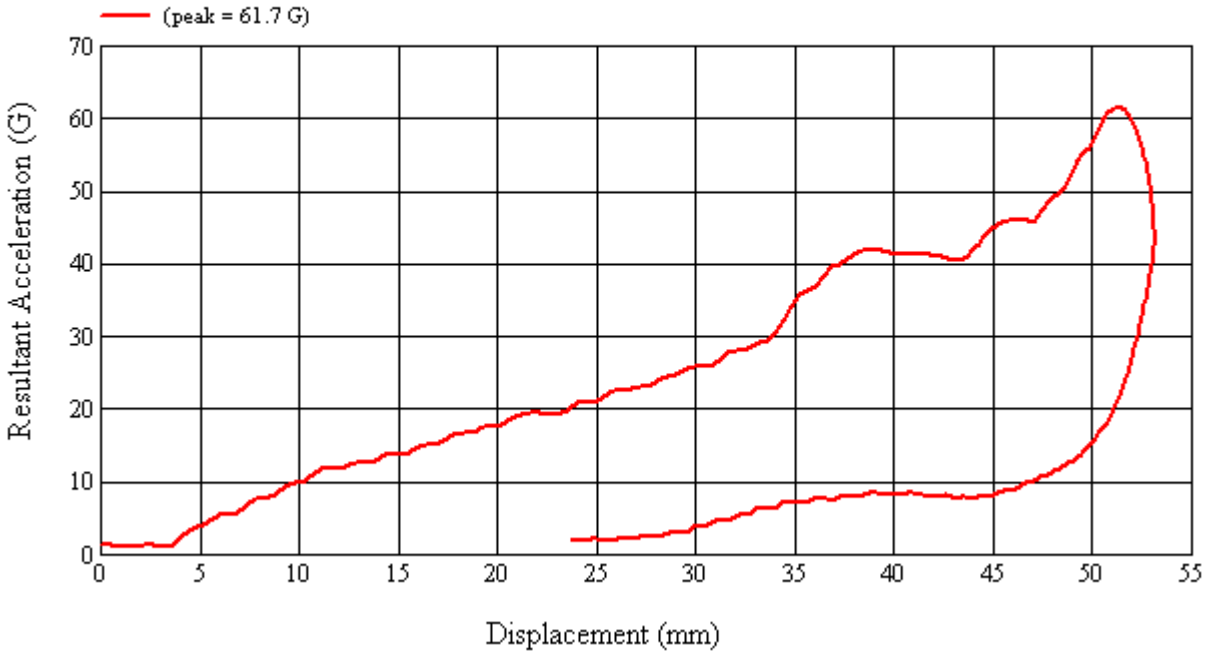
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

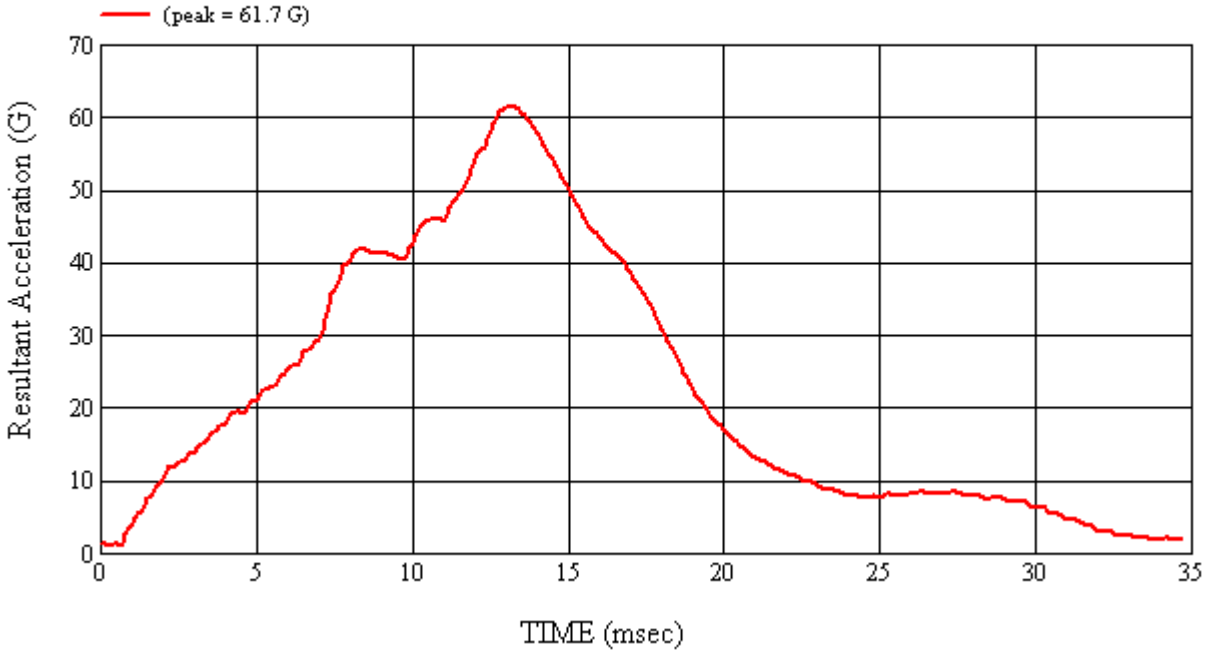
No visible damage.

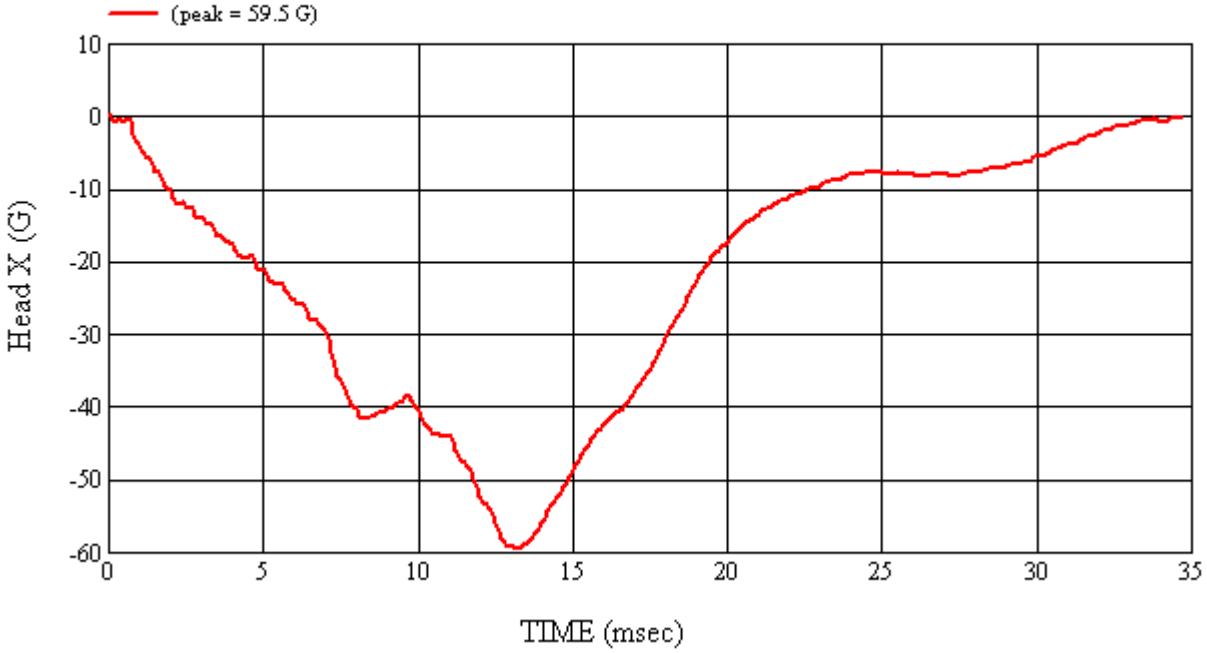
Recorded By: _____ Approved By*: _____ Date: 5/14/2008

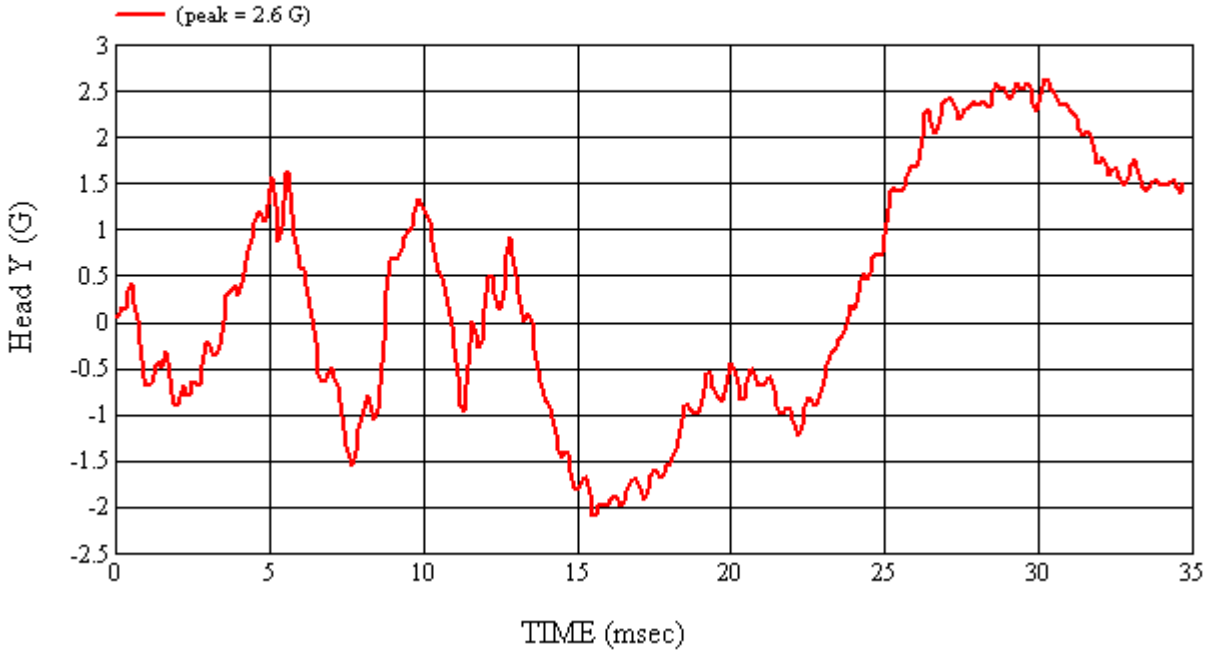
*Only necessary for NHTSA (Government) Compliance testing.

MGA Test #: FM8140 Target Location: RP2, Right Side Test Date: 5/14/2008

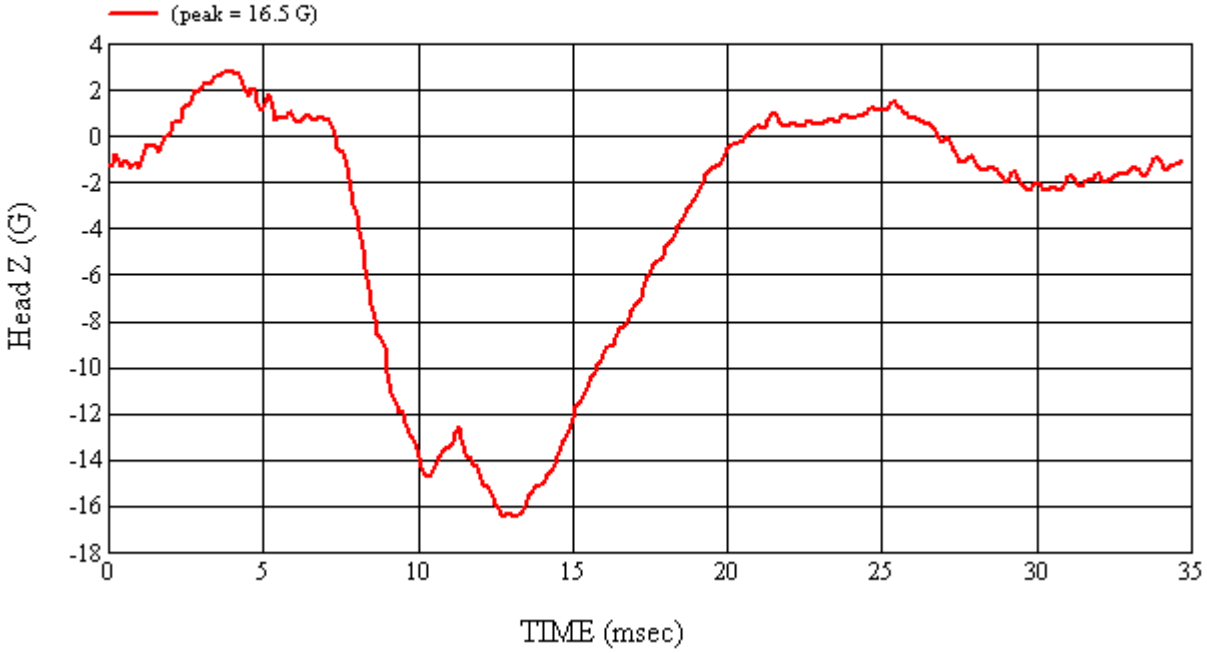


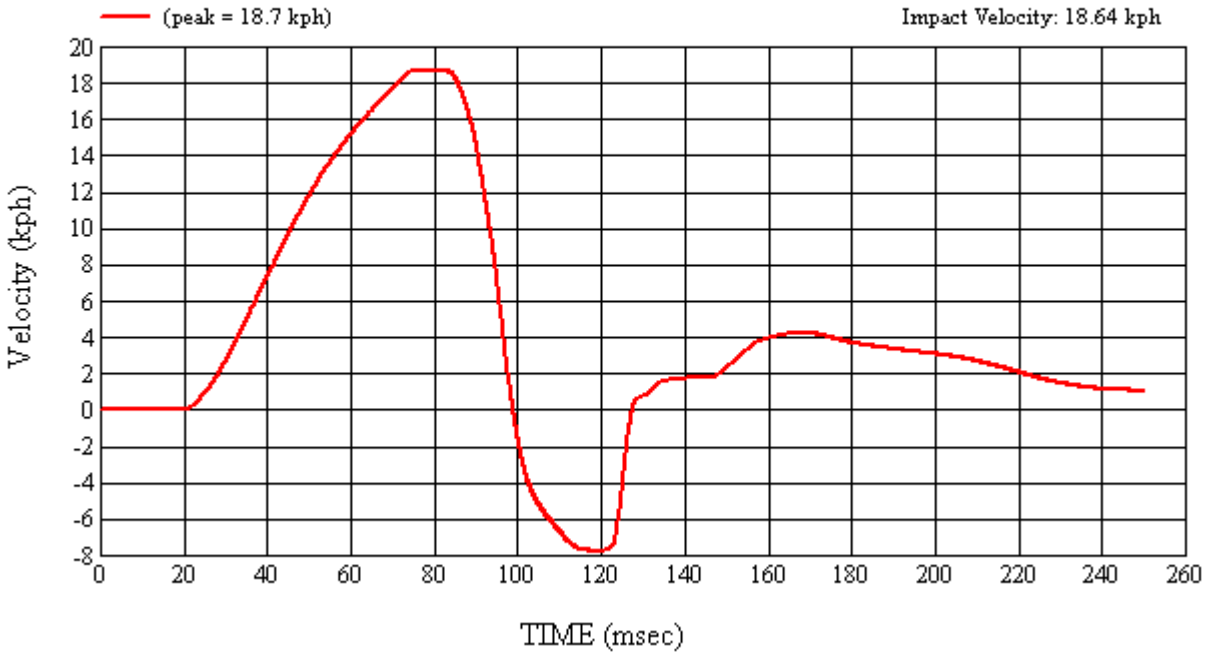


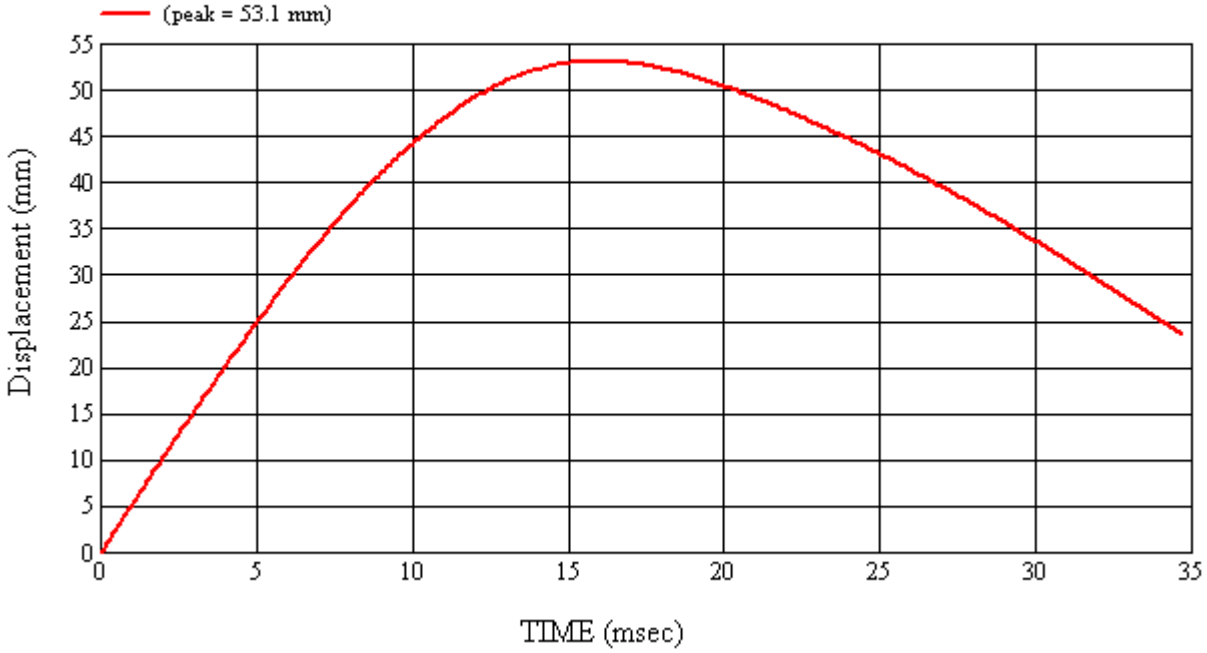

(peak = 59.5 G)
Head X (G)
10
0
-10
-20
-30
-40
-50
-60
0
5
10
15
20
25
30
35
TIME (msec)


(peak = 2.6 G)
Head Y (G)
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
0
5
10
15
20
25
30
35
TIME (msec)

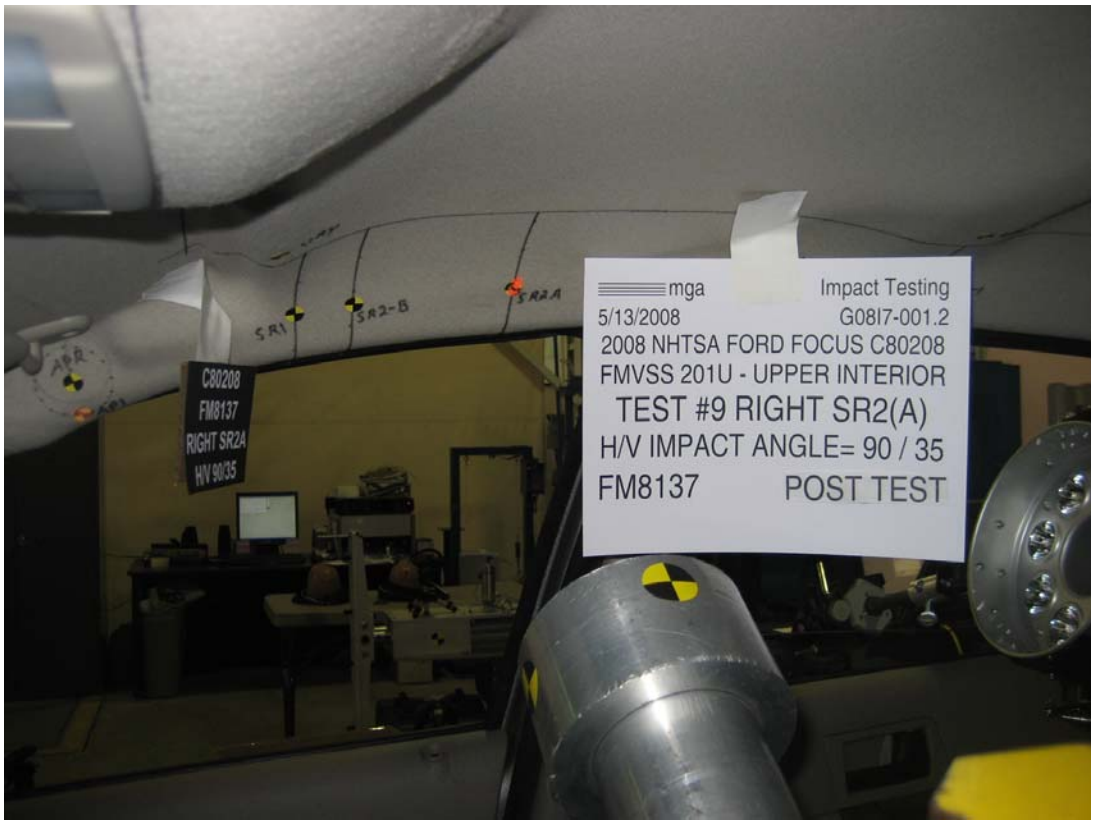
F

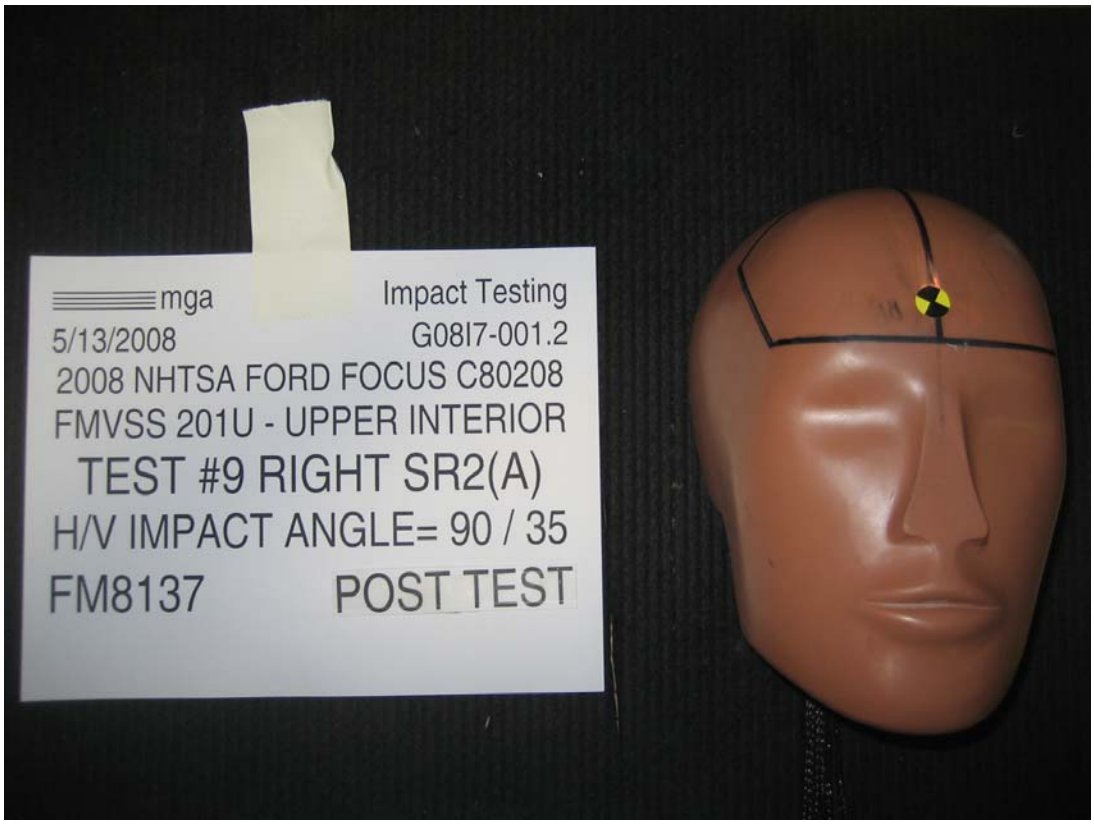

(peak = 16.5 G)
Head Z (G)
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
0
5
10
15
20
25
30
35
TIME (msec)


(peak = 18.7 kph)
Impact Velocity: 18.64 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 = 53.1 mm)
Displacement (mm)
55
50
45
40
35
30
25
20
15
10
5
0
0
5
10
15
20
25
30
35
TIME (msec)


SR1
SR2-B
SR2A
BP1
SR3-1
mga
Impact Testing
5/13/2008
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #9 RIGHT SR2(A)
H/V IMPACT ANGLE= 90 / 35
FM8137
PRE TEST


C80208
FM8137
RIGHT SR2A
H/V 90/35
mga
Impact Testing
5/13/2008
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #9 RIGHT SR2(A)
H/V IMPACT ANGLE= 90 / 35
FM8137
POST TEST


mga
Impact Testing
5/13/2008
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #9 RIGHT SR2(A)
H/V IMPACT ANGLE= 90 / 35
FM8137
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G08I7-001.2 VEHICLE YR/MAKE/MODEL:2008/NHTSA/Ford Focus C80208

GENERAL TEST PARAMETERS:

Test Number:#9

Target (Vehicle Side): SR2(a)Right

Temperature:23C

MGA Test Reference No.:FM8137

Humidity:47%

Approach Horizontal Angles:90º

Time of Test:3:36:54 PM

Approach Vertical Angles:35º

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
393	300	5.4	18.6	12	1 Right

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J22700	-95.015	0.87	0.87
Y	6	J36197	108.737	1.51	1.52
Z	7	J36353	98.754	1.03	1.03

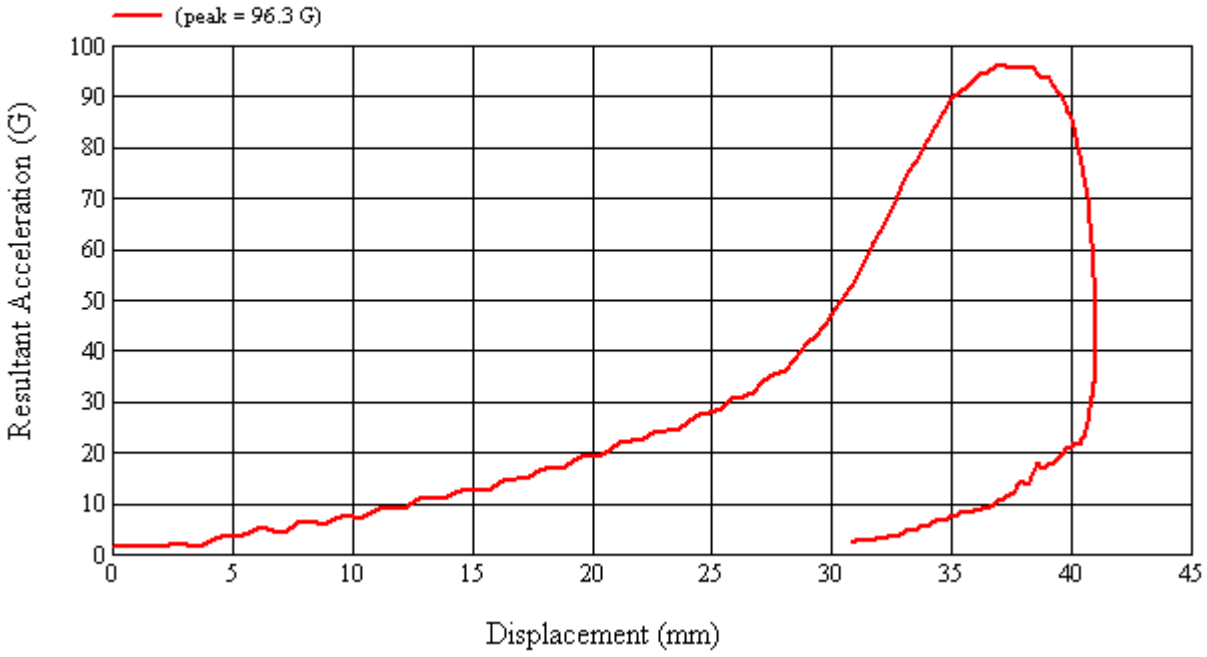
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

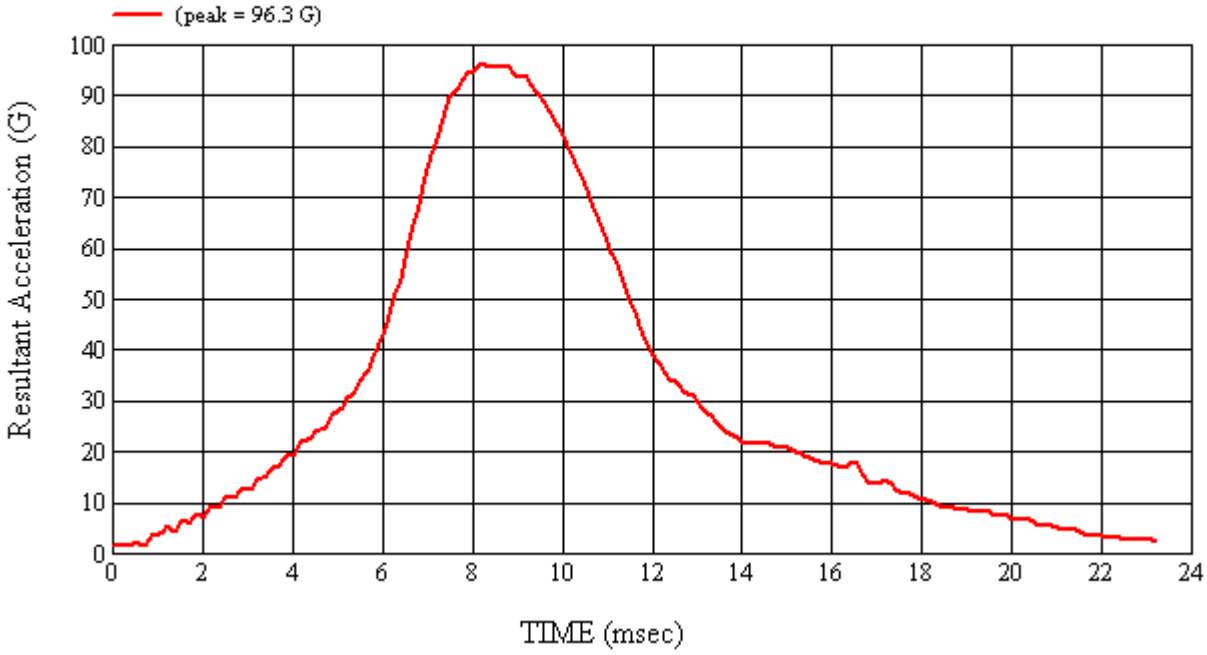
No visible damage.

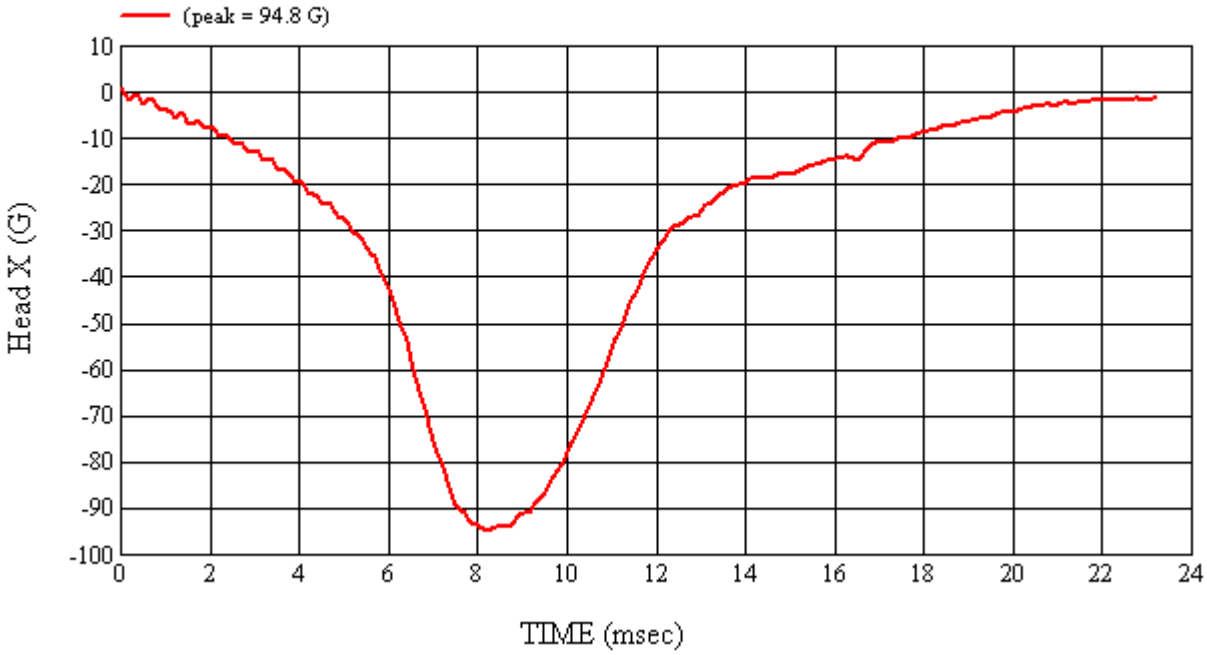
Recorded By: _____ Approved By*: _____ Date: 5/13/2008

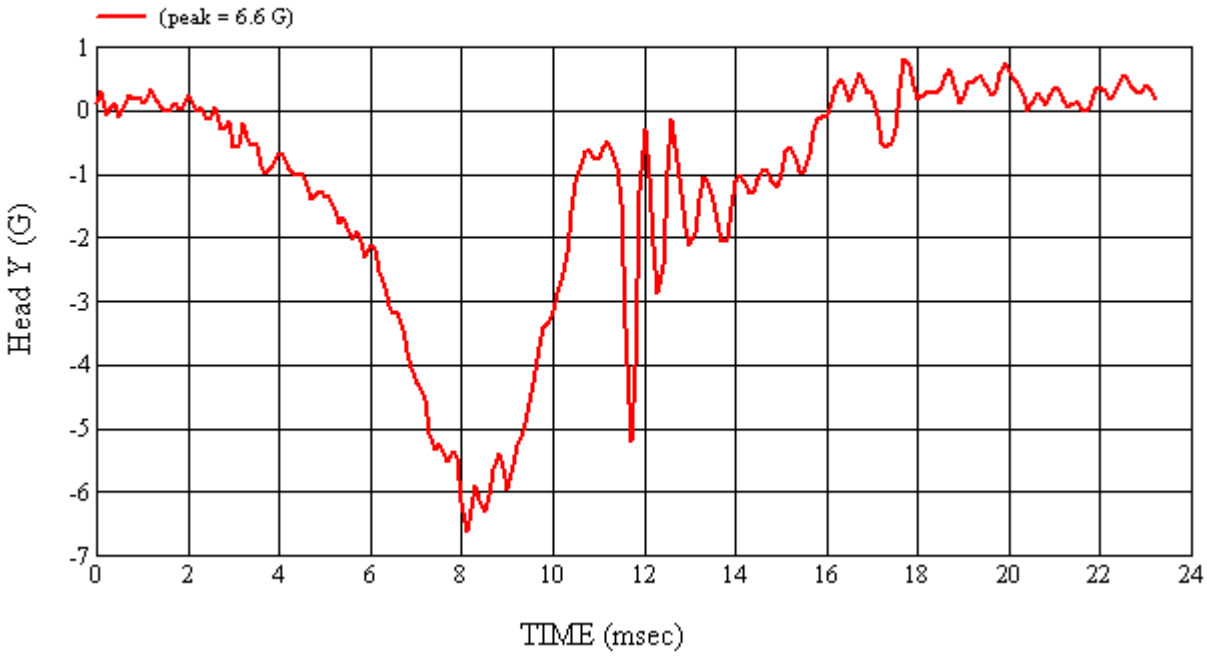
*Only necessary for NHTSA (Government) Compliance testing.

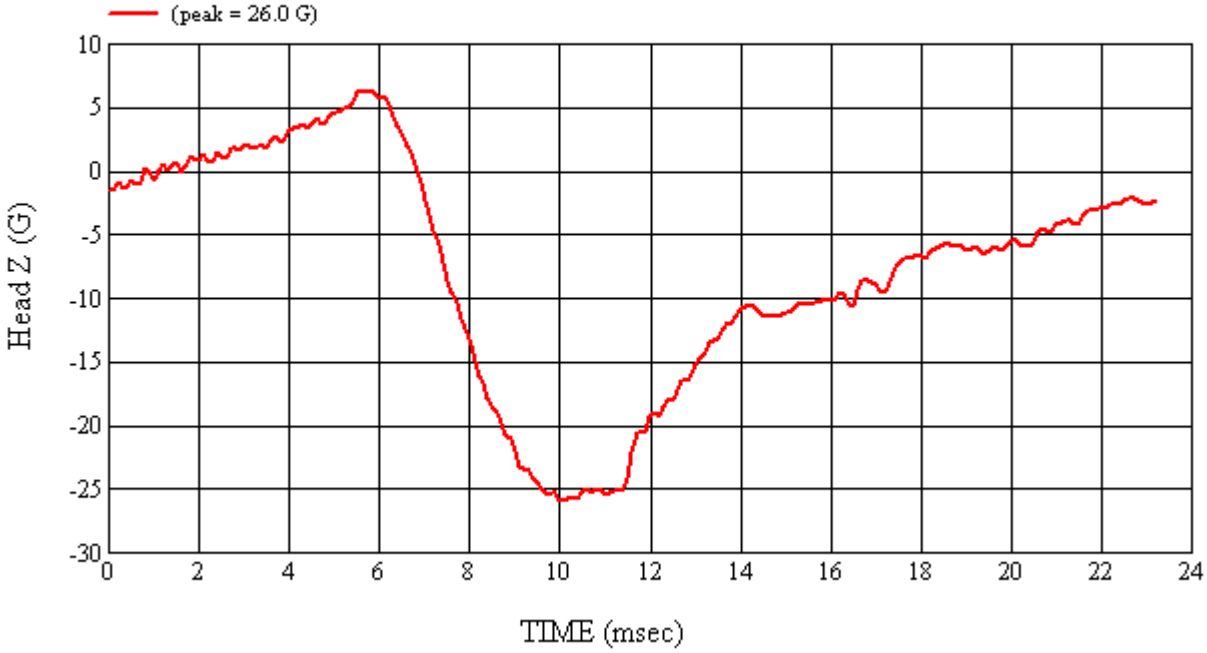
MGA Test #: FM8137 Target Location: SR2(a), Right Side Test Date: 5/13/2008

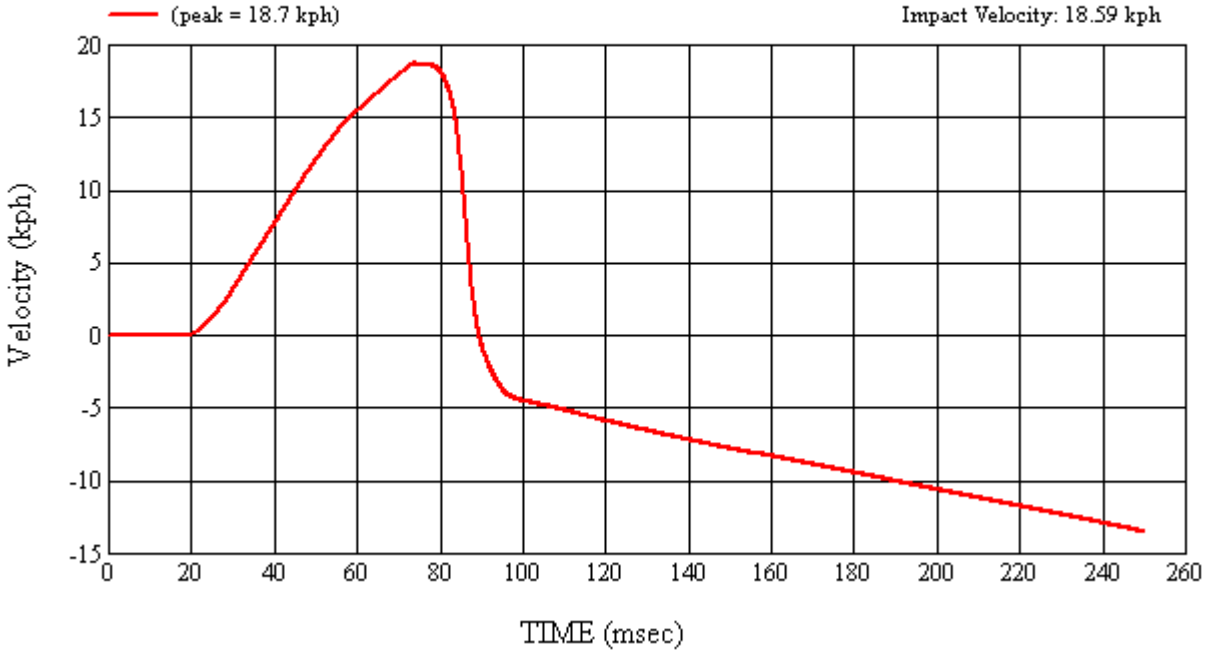


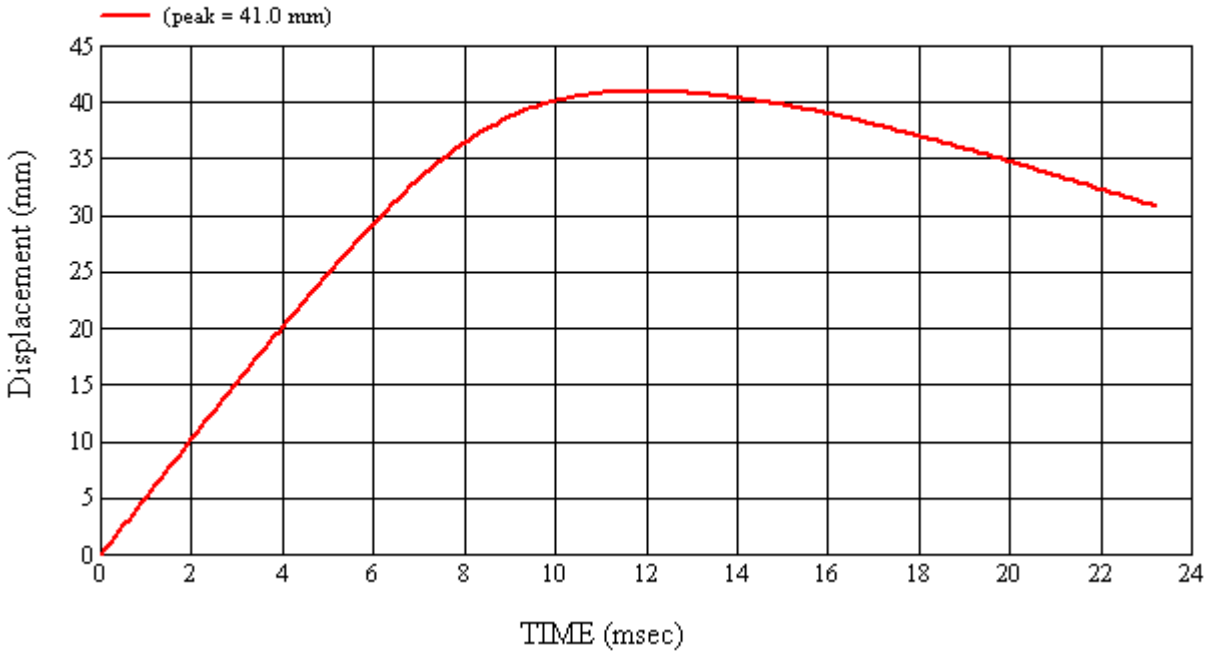



(peak = 94.8 G)
Head X (G)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)

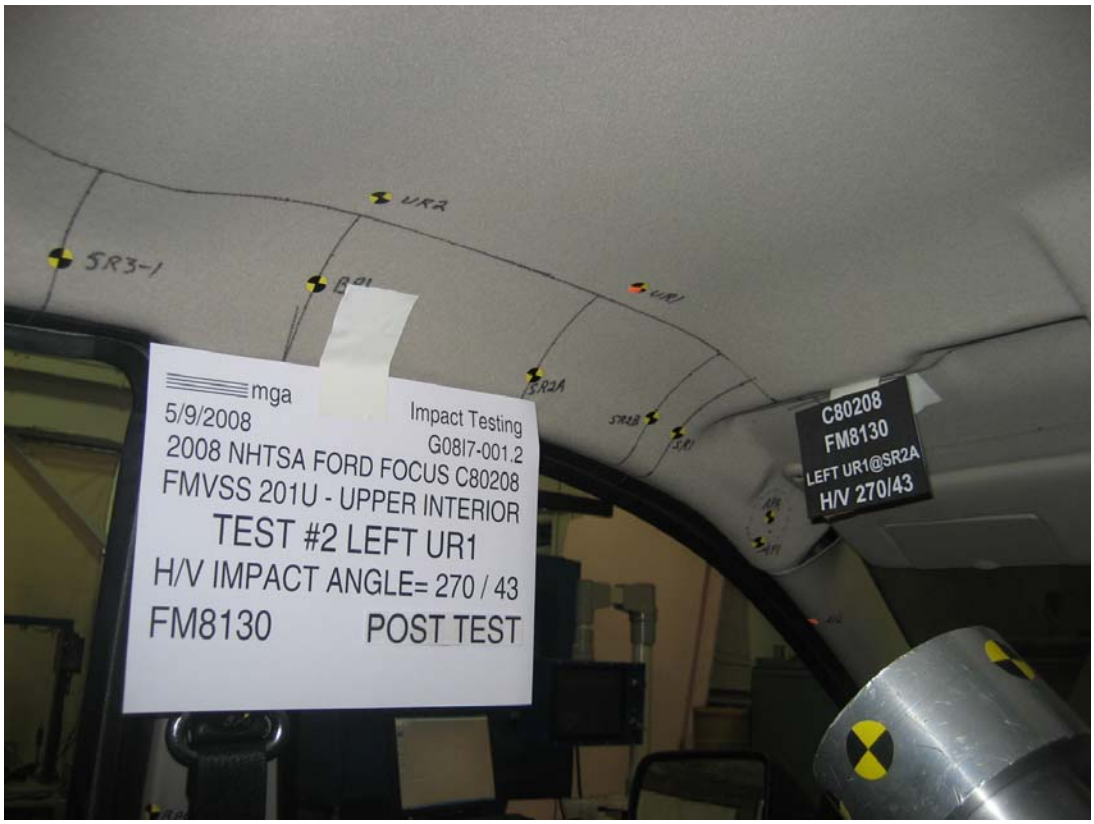

(peak = 6.6 G)
Head Y (G)
1
0
-1
-2
-3
-4
-5
-6
-7
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)

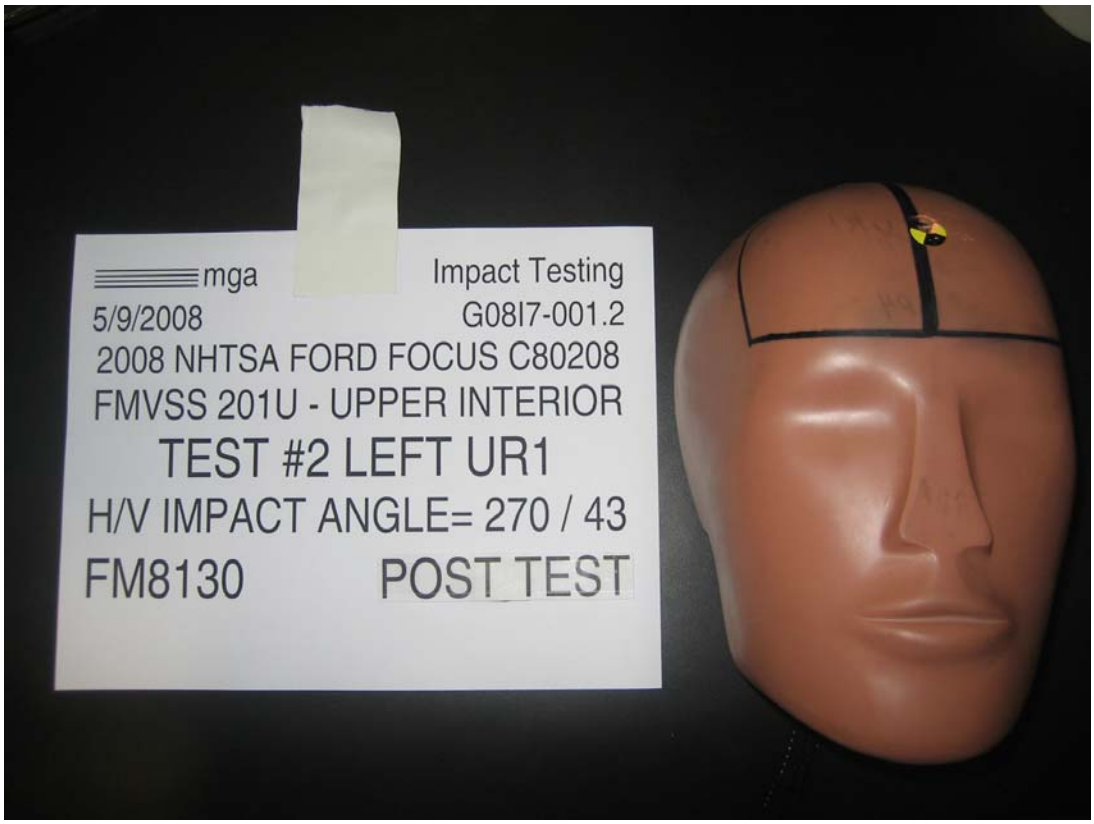

(peak = 26.0 G)
Head Z (G)
10
5
0
-5
-10
-15
-20
-25
-30
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)


(peak = 18.7 kph)
Impact Velocity: 18.59 kph
Velocity (kph)
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 = 41.0 mm)
Displacement (mm)
TIME (msec)
0
5
10
15
20
25
30
35
40
45
0
2
4
6
8
10
12
14
16
18
20
22
24


UR2
UR1
BP1
SR2A
mga
Impact Testing
5/9/2008
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #2 LEFT UR1
H/V IMPACT ANGLE= 270 / 43
FM8130
PRE TEST
C80208
FM8130
LEFT UR1@SR2A
H/V 270/43


UR2
SR3-1
UR1
SR2A
SR1
mga
5/9/2008
Impact Testing
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #2 LEFT UR1
H/V IMPACT ANGLE= 270 / 43
FM8130
POST TEST
C80208
FM8130
LEFT UR1@SR2A
H/V 270/43


mga
5/9/2008
Impact Testing
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #2 LEFT UR1
H/V IMPACT ANGLE= 270 / 43
FM8130
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G08I7-001.2 VEHICLE YR/MAKE/MODEL:2008/NHTSA/Ford Focus C80208

GENERAL TEST PARAMETERS:

Test Number:#2

Target (Vehicle Side): UR1Left

Temperature:23C

MGA Test Reference No.:FM8130

Humidity:45%

Approach Horizontal Angles:270º

Time of Test:3:39:03 PM

Approach Vertical Angles:43º

FMH Serial No:[037]

Additional Description:@ SR2A

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
667	664	6.3	23.3	40	4 Left

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	AHTB2	-114.533	0.87	0.87
Y	6	J14103	92.424	1.52	1.52
Z	7	J35800	96.462	1.03	1.03

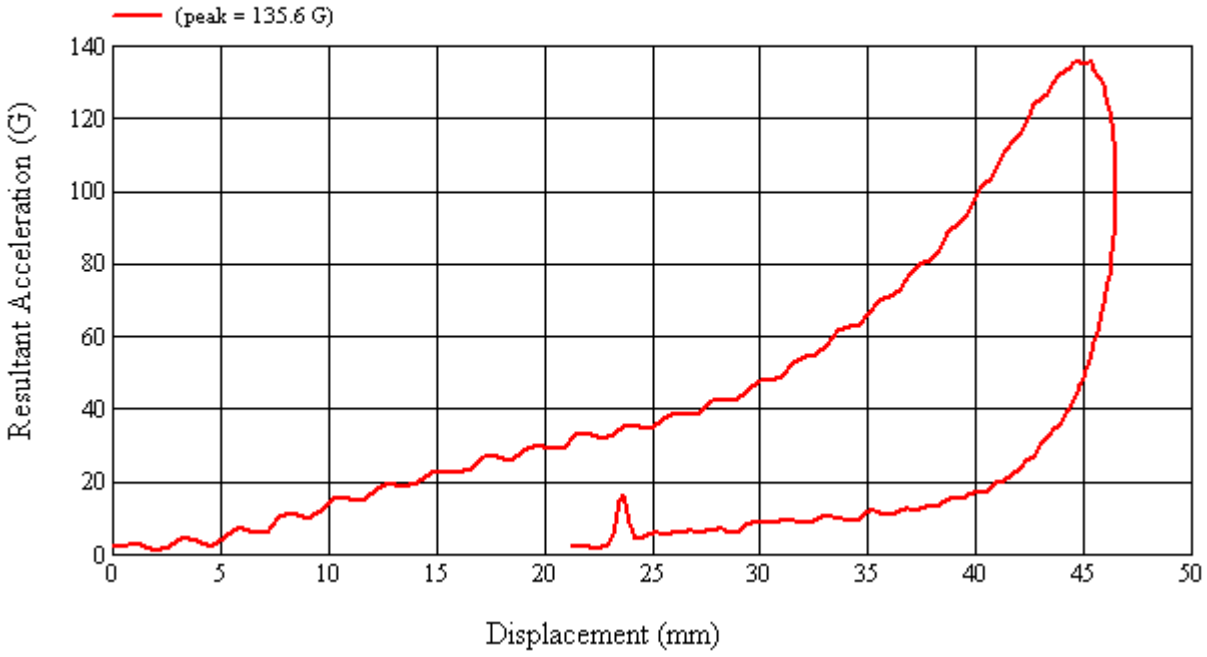
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

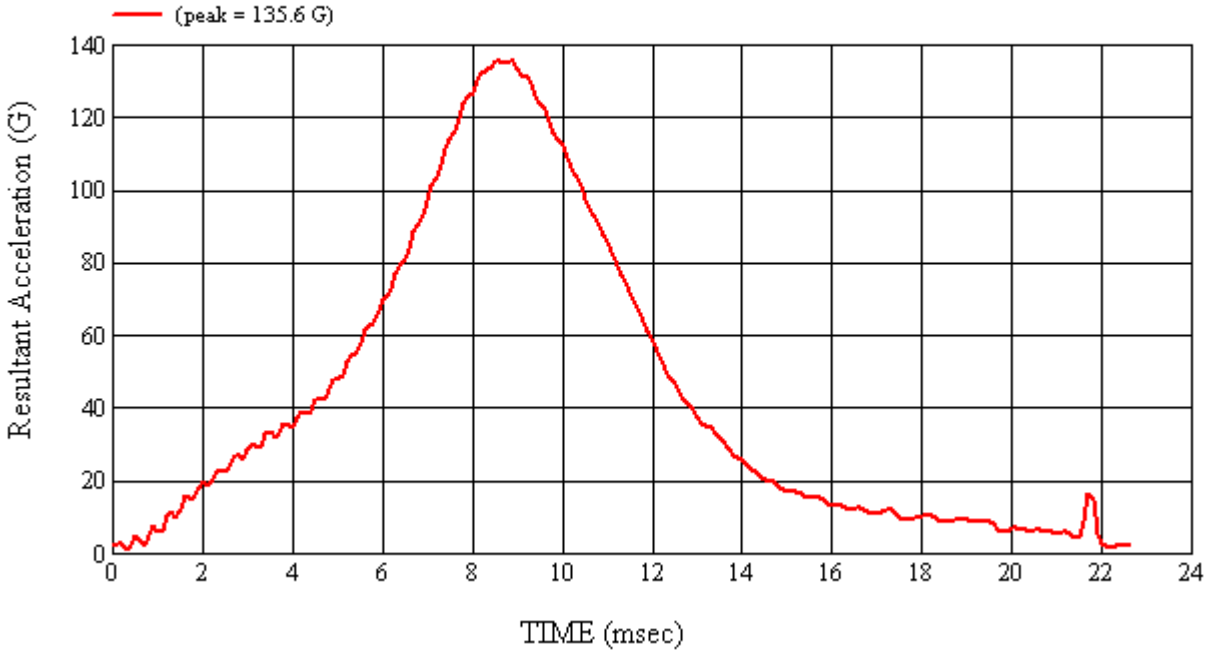
No visible damage.

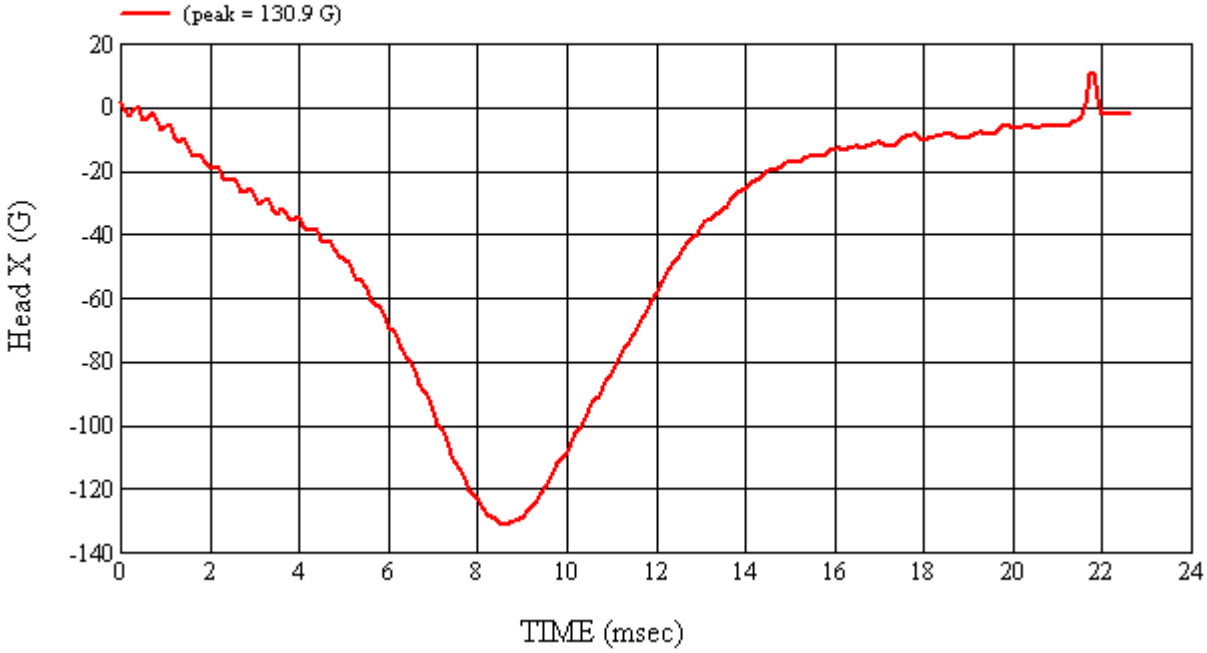
Recorded By: _____ Approved By*: _____ Date: 5/9/2008

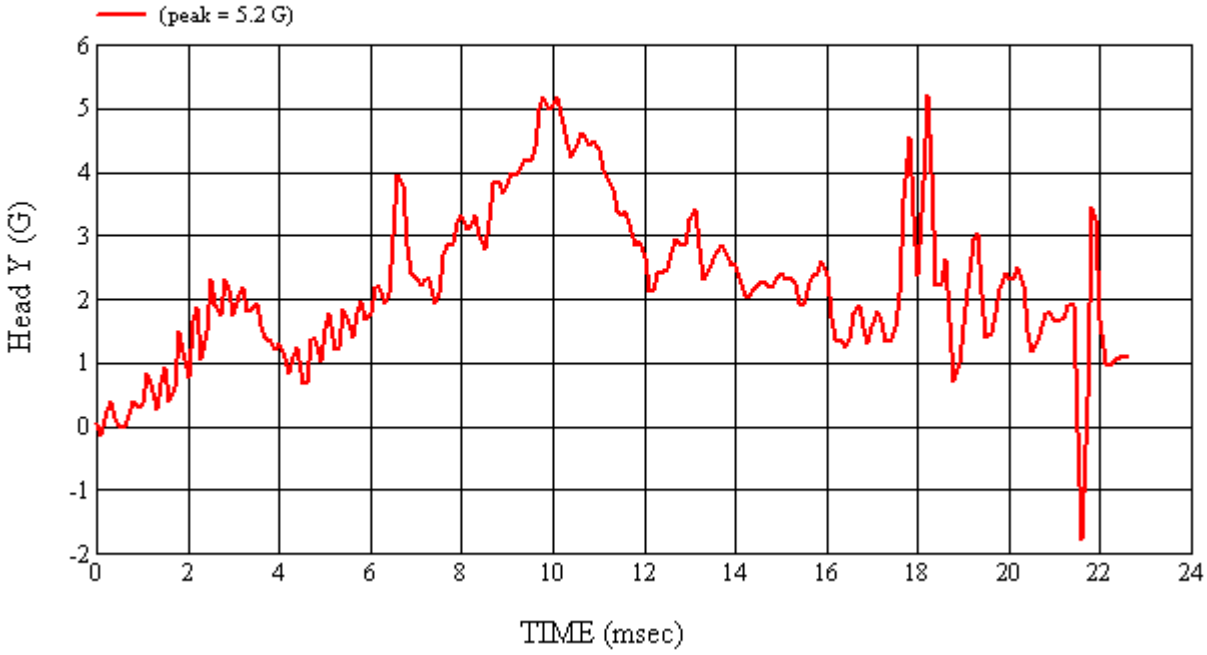
*Only necessary for NHTSA (Government) Compliance testing.

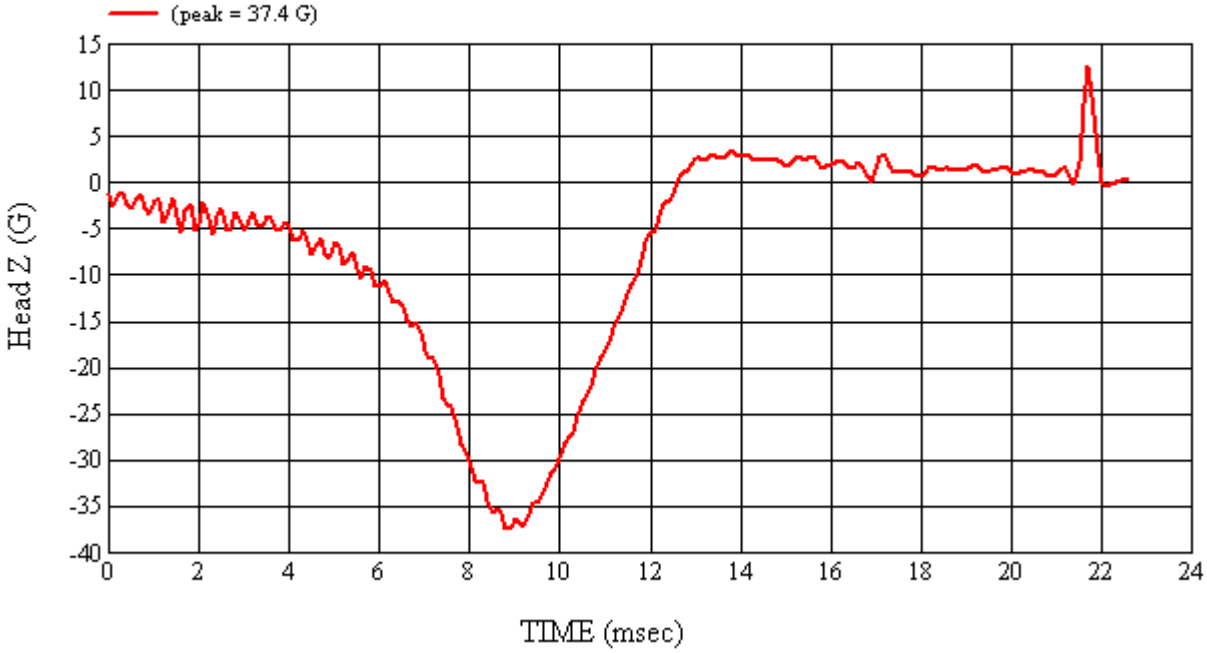
MGA Test #: FM8130 Target Location: UR1, Left Side Test Date: 5/9/2008

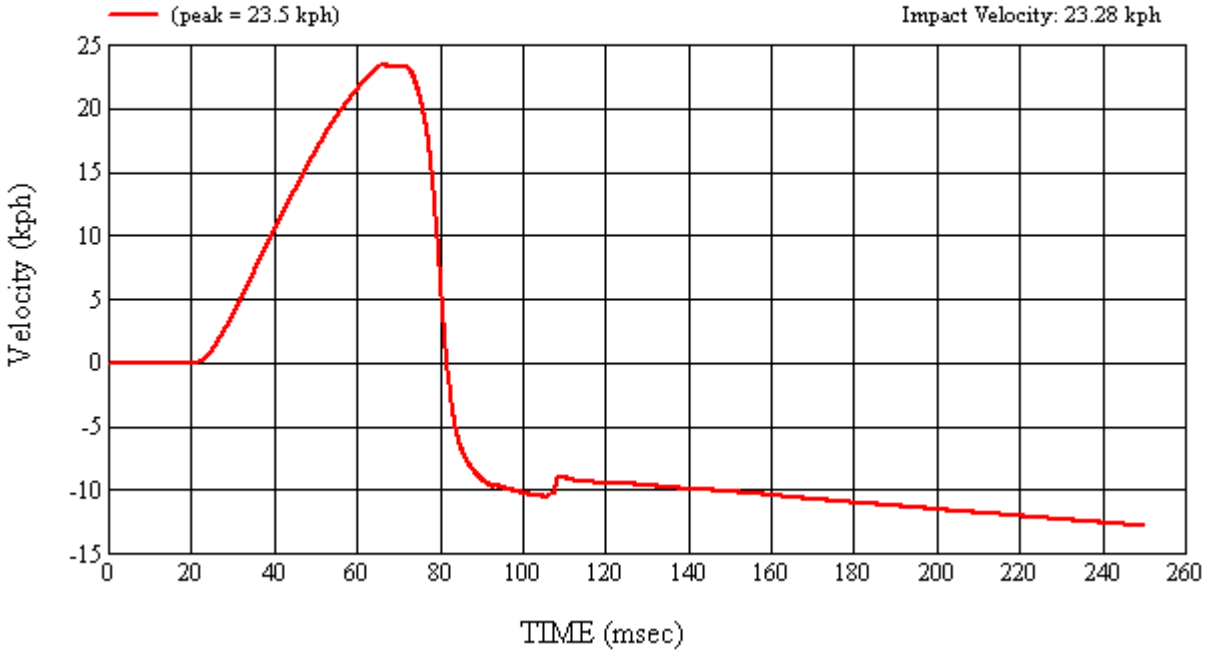


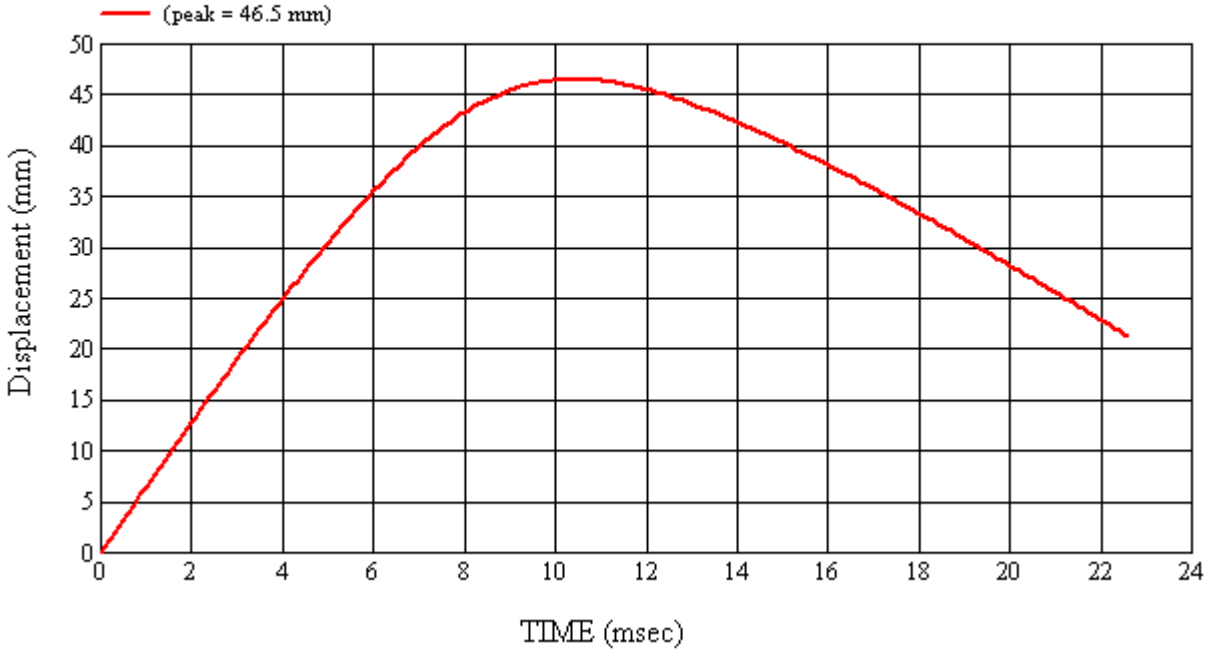



(peak = 130.9 G)
Head X (G)
20
0
-20
-40
-60
-80
-100
-120
-140
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)


(peak = 5.2 G)
Head Y (G)
6
5
4
3
2
1
0
-1
-2
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)


(peak = 37.4 G)
Head Z (G)
15
10
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 = 23.5 kph)
Impact Velocity: 23.28 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 = 46.5 mm)
Displacement (mm)
0
5
10
15
20
25
30
35
40
45
50
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)


UR3
UR2
5R3-1
BP1
mga
5/12/2008
Impact Testing
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #4 LEFT UR2
H/V IMPACT ANGLE= 270 / 40
FM8132
PRE TEST


mga
5/12/2008
Impact Testing
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #4 LEFT UR2
H/V IMPACT ANGLE= 270 / 40
FM8132
POST TEST
C80208
FM8132
LEFT UR2@BPR
H/V 270/40


mga
5/12/2008
Impact Testing
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #4 LEFT UR2
H/V IMPACT ANGLE= 270 / 40
FM8132
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G08I7-001.2 VEHICLE YR/MAKE/MODEL:2008/NHTSA/Ford Focus C80208

GENERAL TEST PARAMETERS:

Test Number:#4

Target (Vehicle Side): UR2Left

Temperature:23C

MGA Test Reference No.:FM8132

Humidity:49%

Approach Horizontal Angles:270º

Time of Test:10:15:31 AM

Approach Vertical Angles:40º

FMH Serial No:[035]

Additional Description:@ BPR

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
774	806	7.9	24.3	42	2 Right

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J35919	-95.844	0.87	0.87
Y	6	J22664	93.878	1.52	1.52
Z	7	J35924	92.621	1.03	1.03

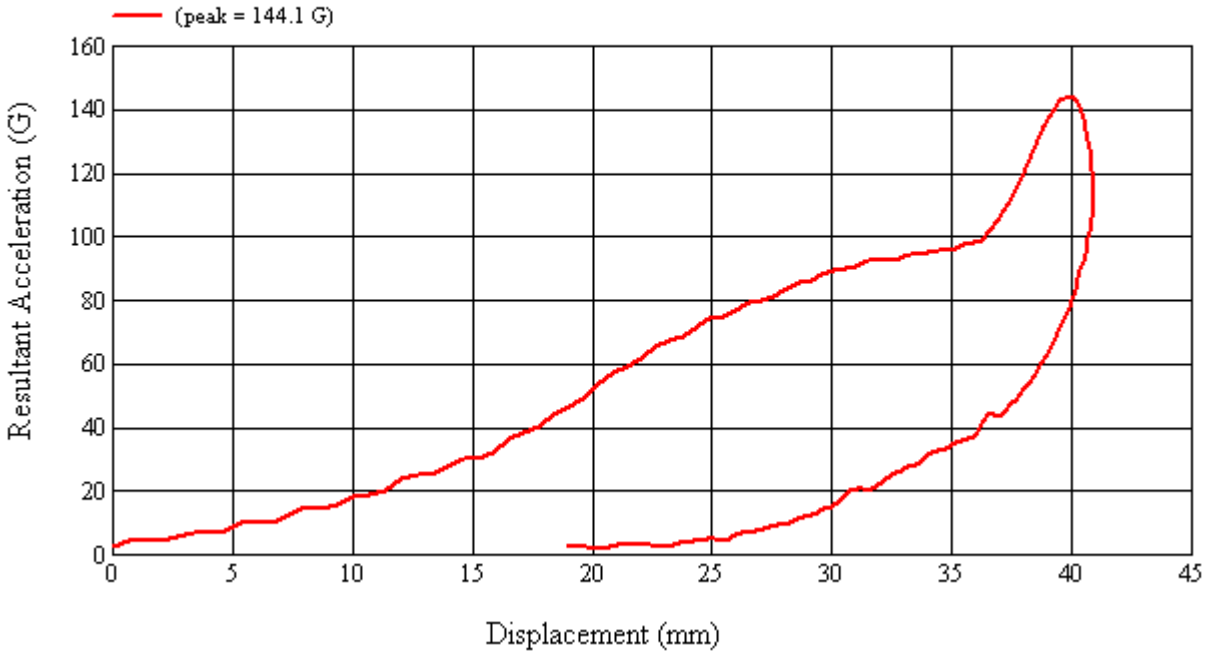
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

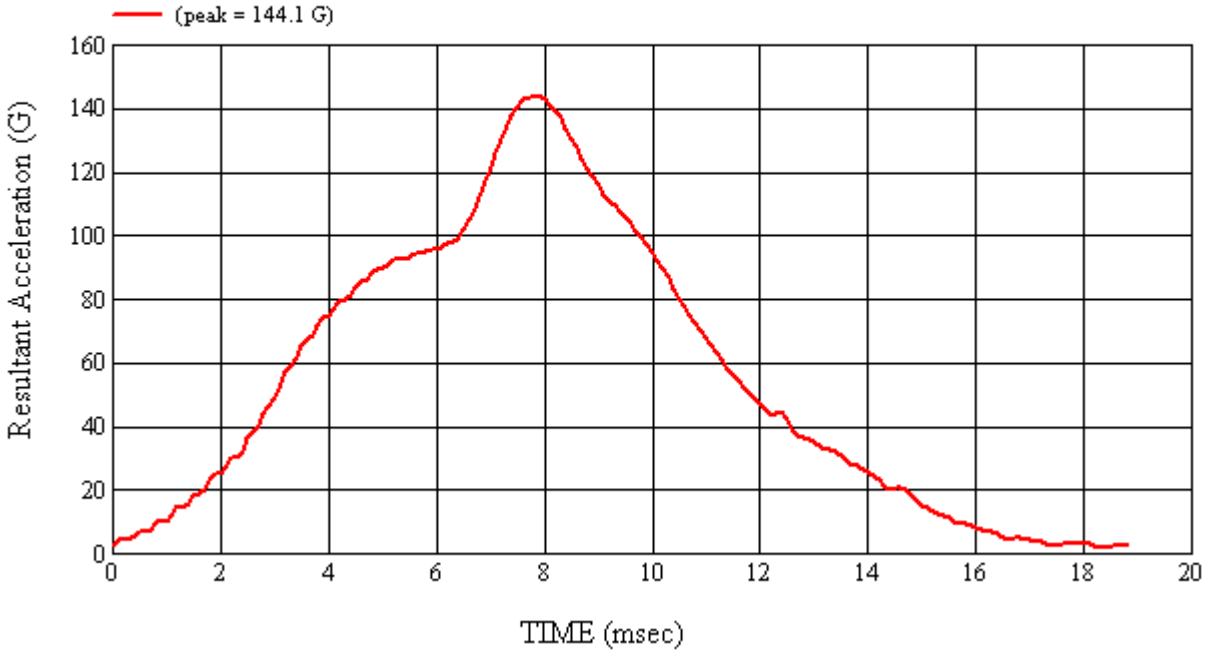
No visible damage.

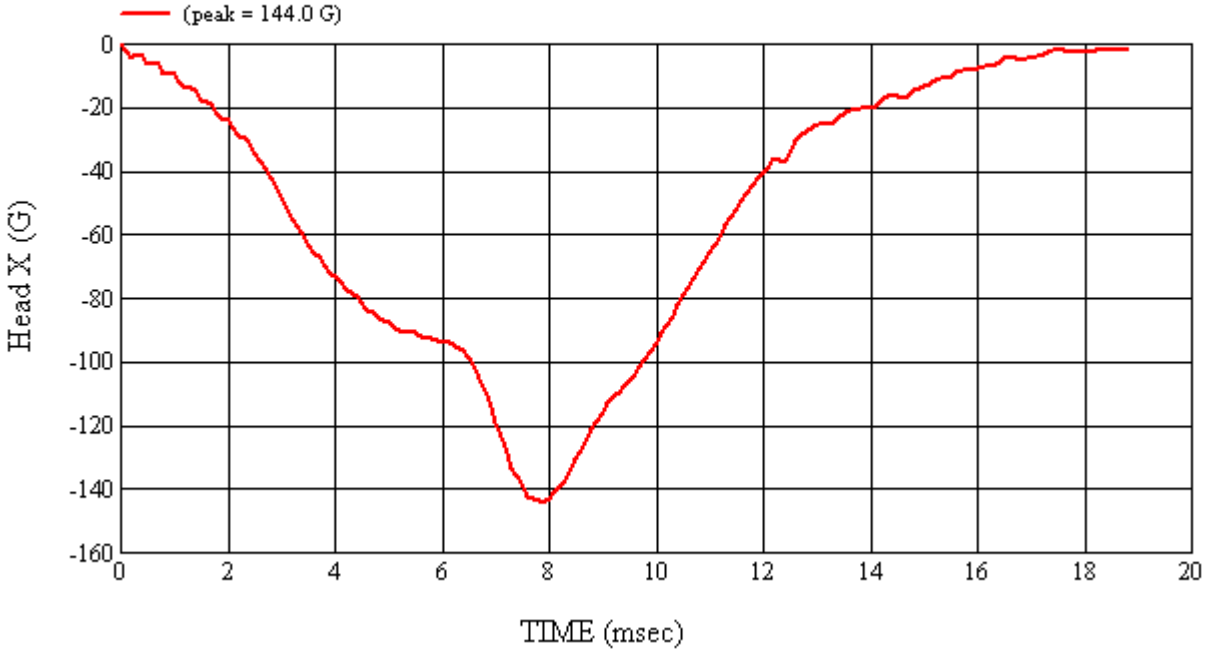
Recorded By: _____ Approved By*: _____ Date: 5/12/2008

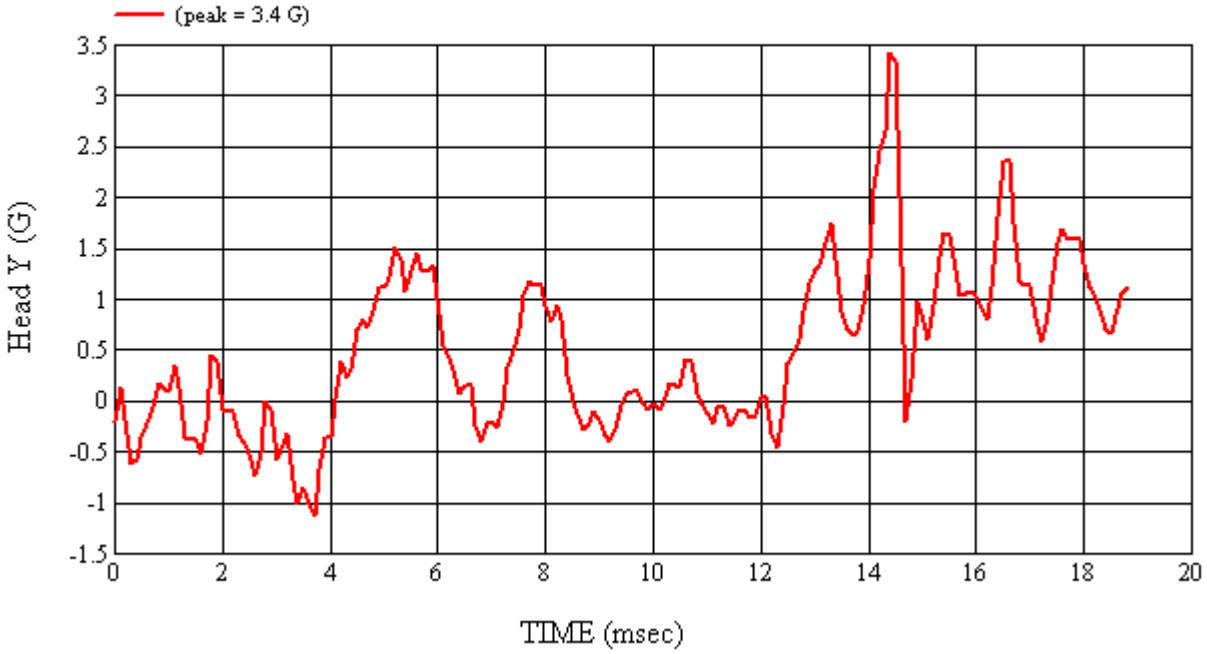
*Only necessary for NHTSA (Government) Compliance testing.

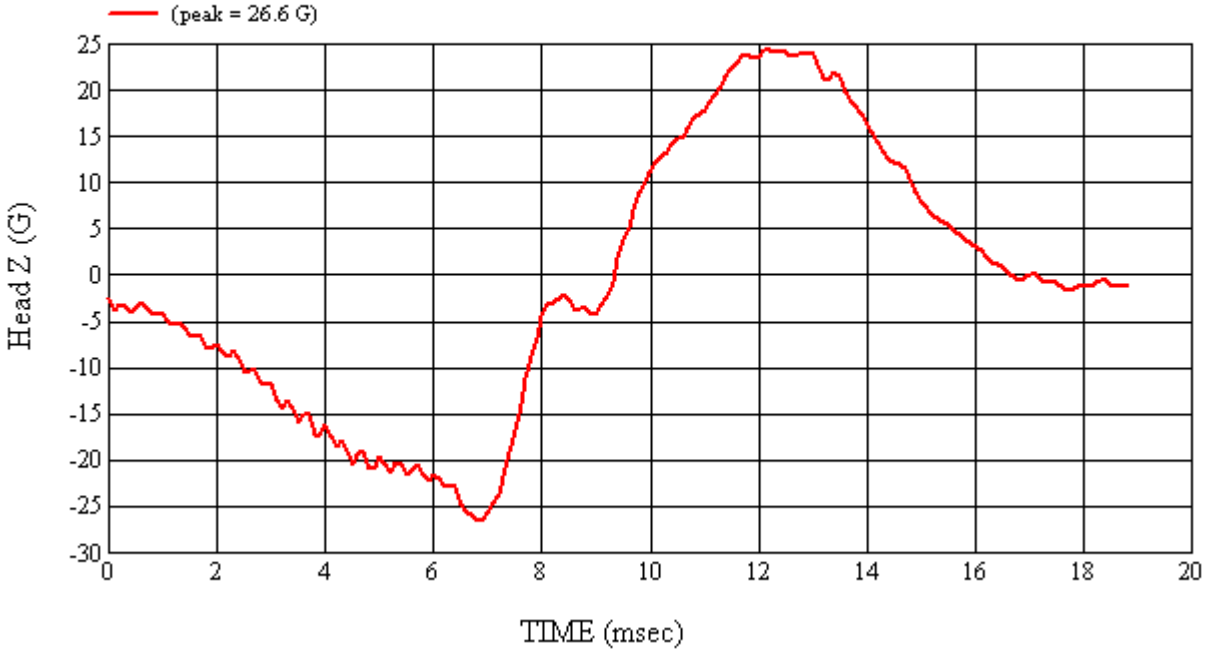
MGA Test #: FM8132 Target Location: UR2, Left Side Test Date: 5/12/2008

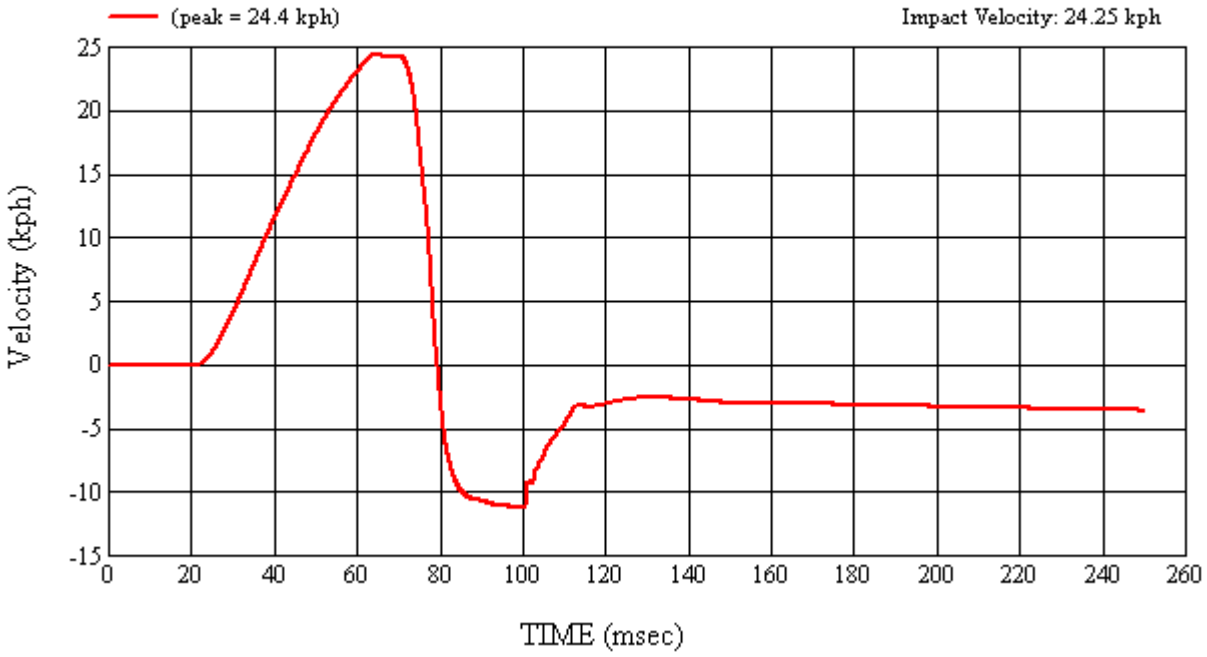


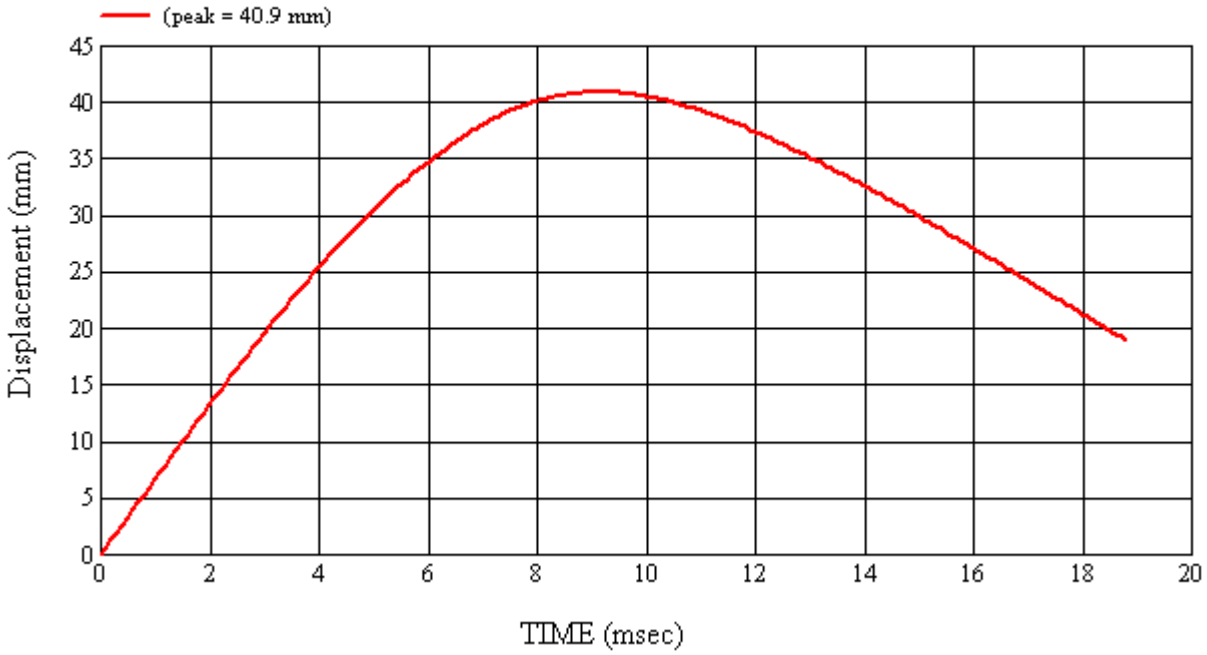



(peak = 144.0 G)
Head X (G)
0
-20
-40
-60
-80
-100
-120
-140
-160
0
2
4
6
8
10
12
14
16
18
20
TIME (msec)


(peak = 3.4 G)
Head Y (G)
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
0
2
4
6
8
10
12
14
16
18
20
TIME (msec)


(peak = 26.6 G)
Head Z (G)
25
20
15
10
5
0
-5
-10
-15
-20
-25
-30
0
2
4
6
8
10
12
14
16
18
20
TIME (msec)


(peak = 24.4 kph)
Impact Velocity: 24.25 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 = 40.9 mm)
Displacement (mm)
0
5
10
15
20
25
30
35
40
45
0
2
4
6
8
10
12
14
16
18
20
TIME (msec)


UR3
mga
Impact Testing
5/12/2008
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #5 LEFT UR3
H/V IMPACT ANGLE= 270 / 40
FM8133
PRE TEST


UR3
mga
5/12/2008
Impact Testing
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #5 LEFT UR3
H/V IMPACT ANGLE= 270 / 40
FM8133
POST TEST


mga
5/12/2008
Impact Testing
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #5 LEFT UR3
H/V IMPACT ANGLE= 270 / 40
FM8133
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G08I7-001.2 VEHICLE YR/MAKE/MODEL:2008/NHTSA/Ford Focus C80208

GENERAL TEST PARAMETERS:

Test Number:#5

Target (Vehicle Side): UR3Left

Temperature:23C

MGA Test Reference No.:FM8133

Humidity:48%

Approach Horizontal Angles:270º

Time of Test:2:00:13 PM

Approach Vertical Angles:40º

FMH Serial No:[037]

Additional Description:@ Rear side rail

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
667	663	7.4	23.4	42	7 Left

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	AHTB2	-114.533	0.87	0.87
Y	6	J14103	92.424	1.52	1.52
Z	7	J35800	96.462	1.03	1.03

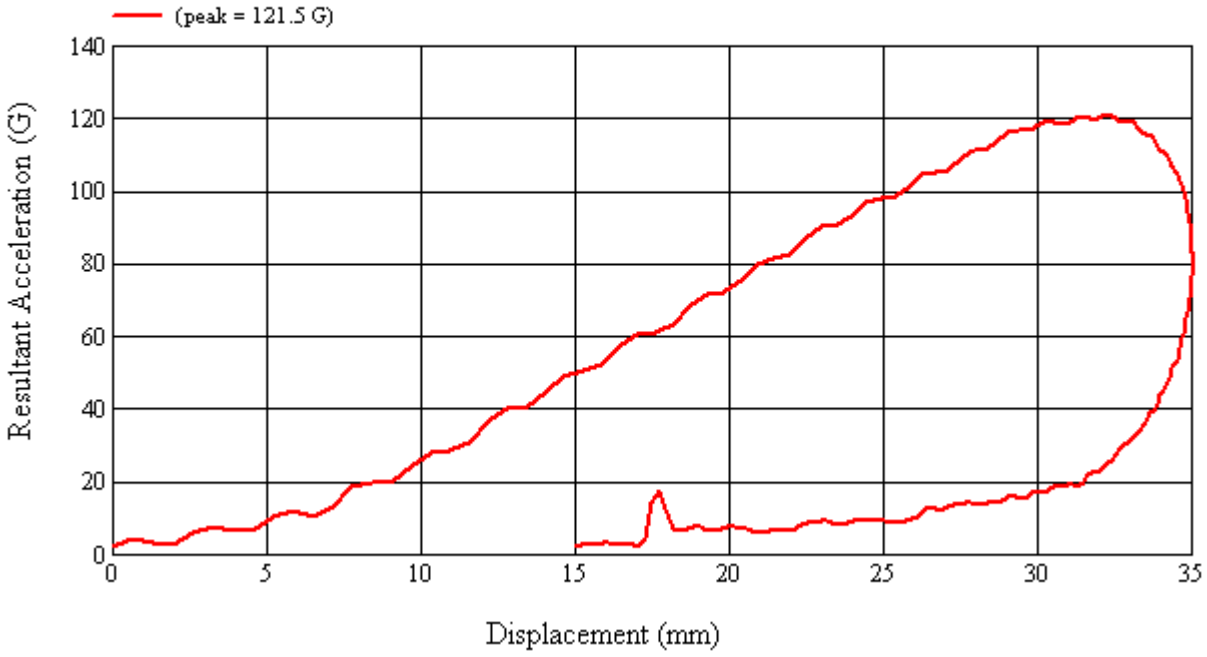
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

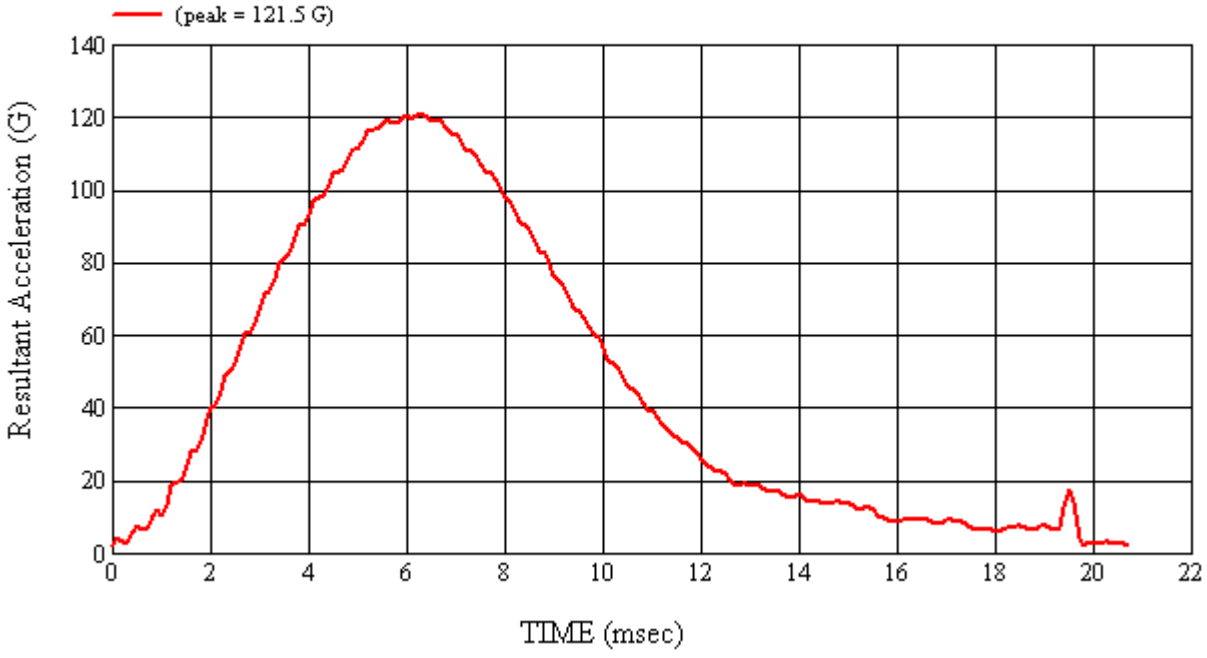
No visible damage.

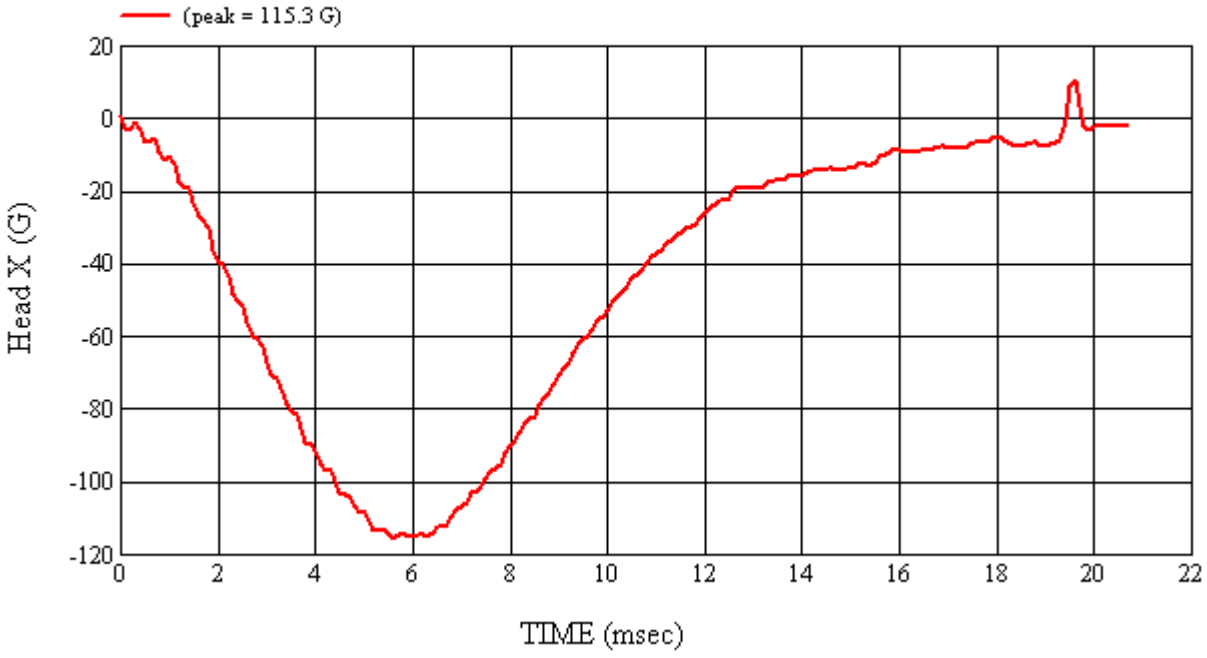
Recorded By: Travis Campbell Approved By*: Helen A. Kalafut Date: 5/12/2008

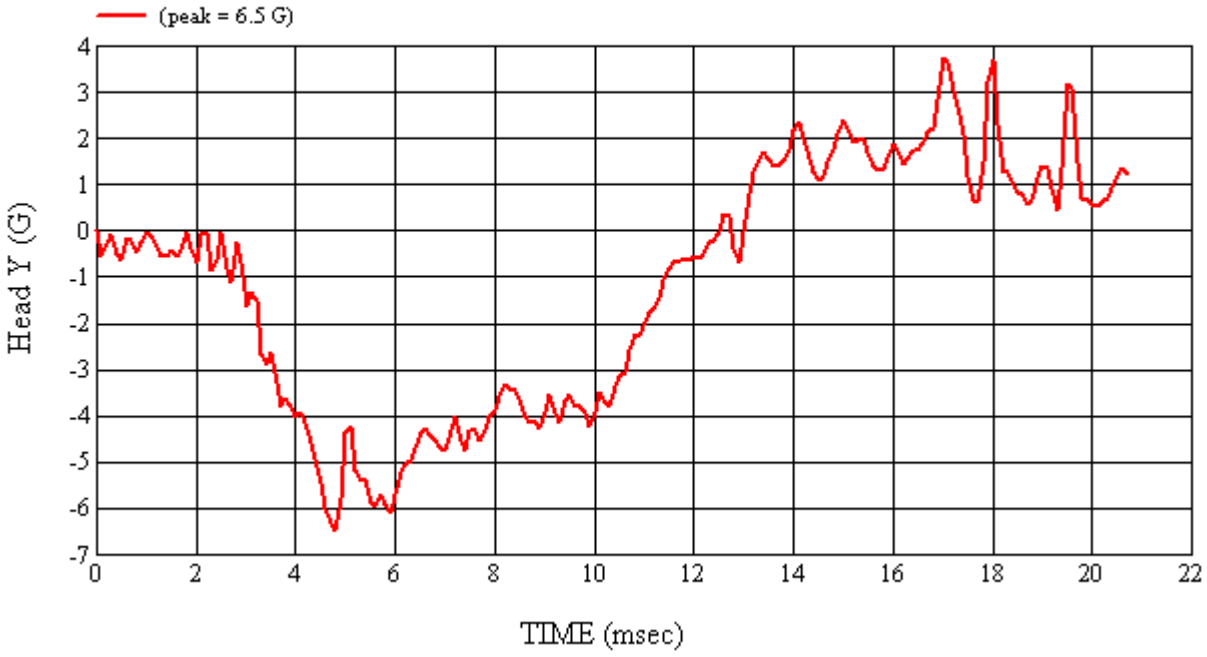
*Only necessary for NHTSA (Government) Compliance testing.

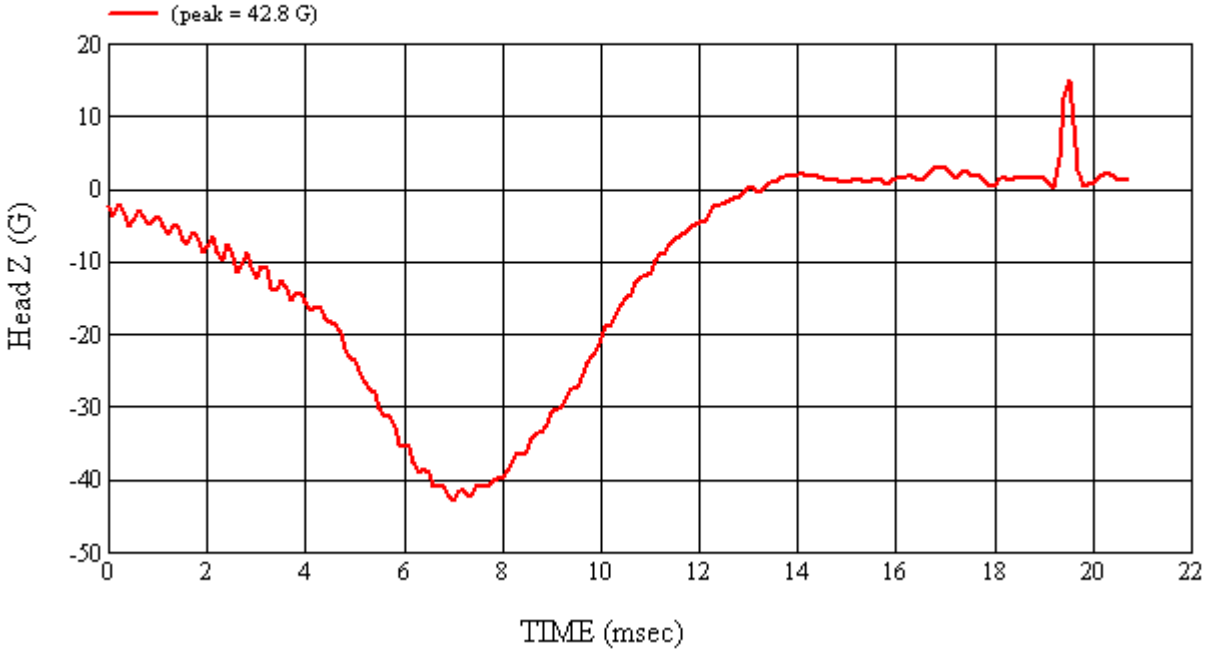
MGA Test #: FM8133 Target Location: UR3, Left Side Test Date: 5/12/2008

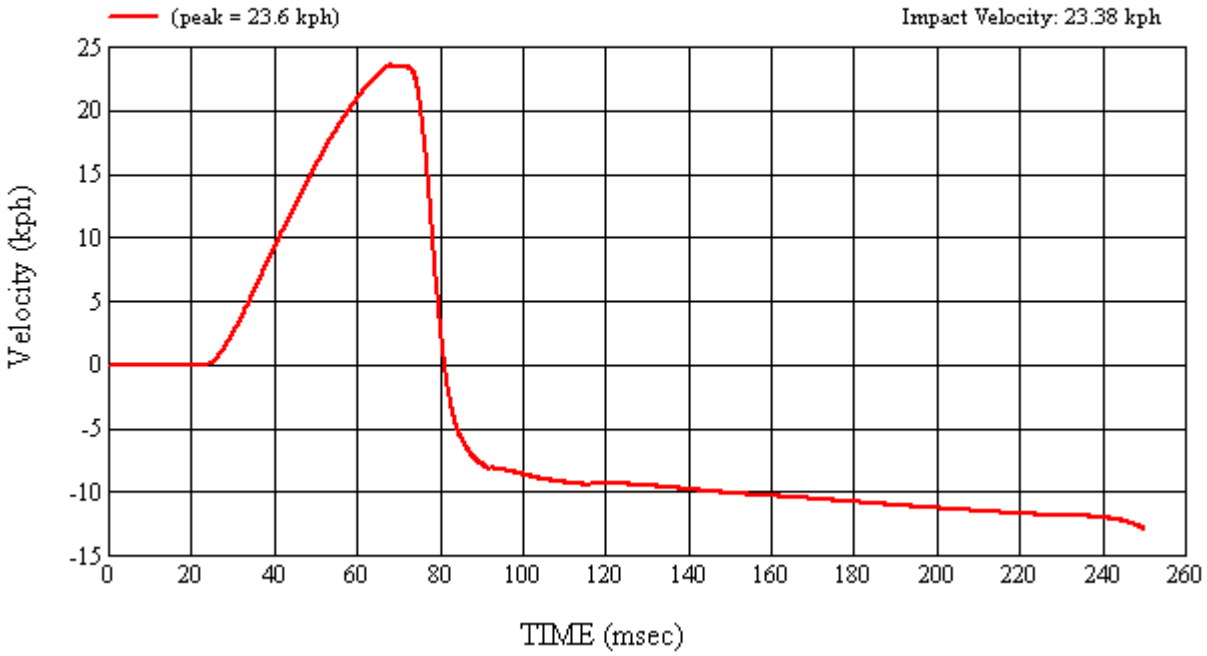


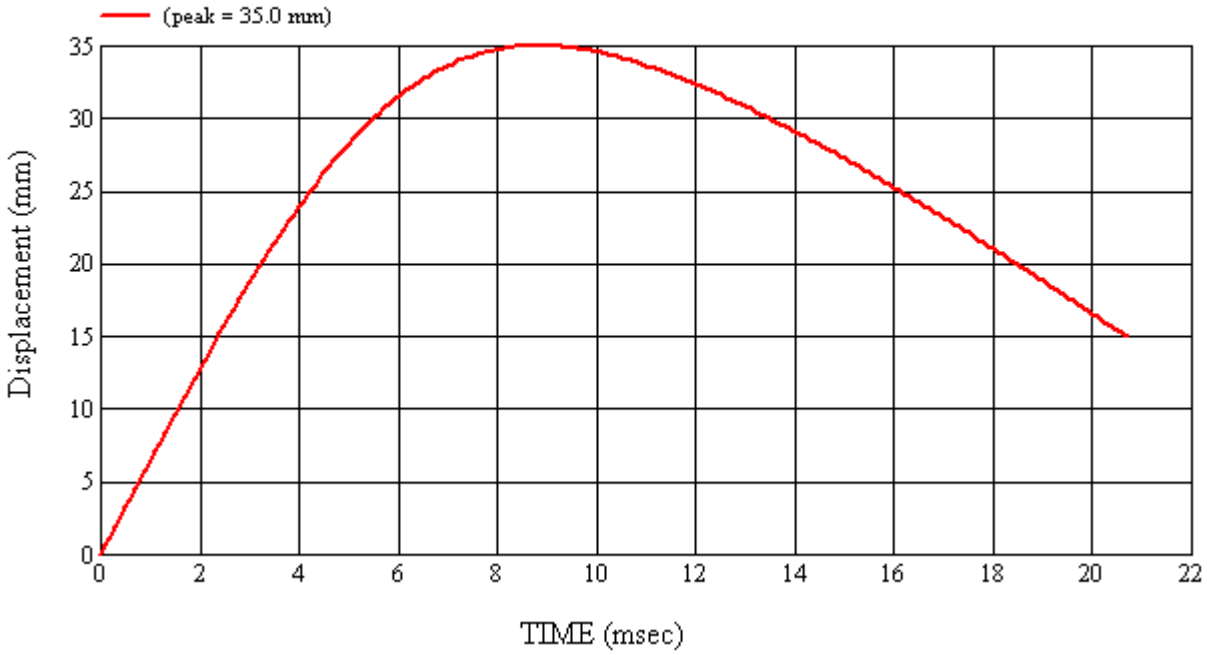



(peak = 115.3 G)
Head X (G)
20
0
-20
-40
-60
-80
-100
-120
0
2
4
6
8
10
12
14
16
18
20
22
TIME (msec)

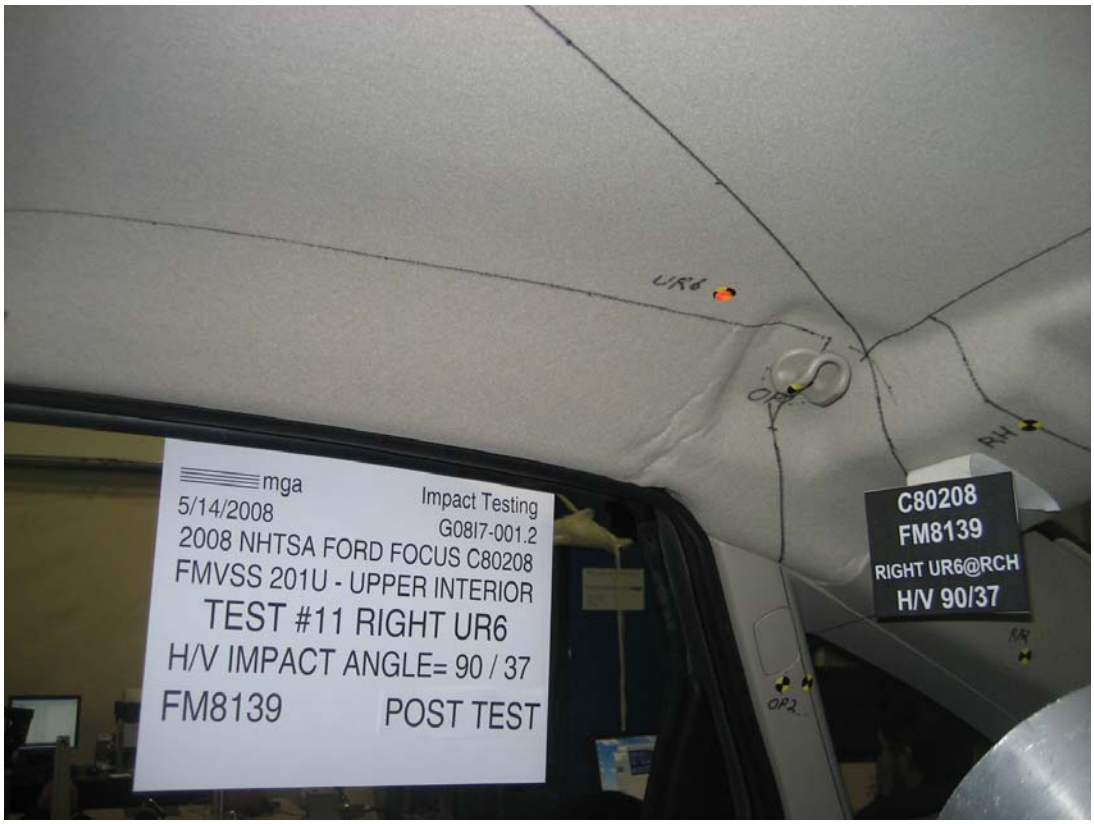

(peak = 6.5 G)
Head Y (G)
4
3
2
1
0
-1
-2
-3
-4
-5
-6
-7
0
2
4
6
8
10
12
14
16
18
20
22
TIME (msec)


(peak = 42.8 G)
Head Z (G)
20
10
0
-10
-20
-30
-40
-50
0
2
4
6
8
10
12
14
16
18
20
22
TIME (msec)


(peak = 23.6 kph)
Impact Velocity: 23.38 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 = 35.0 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)


UR5
SR3-1
UR6
mga
5/14/2008
Impact Testing
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #11 RIGHT UR6
H/V IMPACT ANGLE= 90 / 37
FM8139
PRE TEST


UR6
RH
mga
5/14/2008
Impact Testing
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #11 RIGHT UR6
H/V IMPACT ANGLE= 90 / 37
FM8139
POST TEST
C80208
FM8139
RIGHT UR6@RCH
H/V 90/37


mga
5/14/2008
Impact Testing
G08I7-001.2
2008 NHTSA FORD FOCUS C80208
FMVSS 201U - UPPER INTERIOR
TEST #11 RIGHT UR6
H/V IMPACT ANGLE= 90 / 37
FM8139
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G08I7-001.2 VEHICLE YR/MAKE/MODEL:2008/NHTSA/Ford Focus C80208

GENERAL TEST PARAMETERS:

Test Number:#11

Target (Vehicle Side): UR6Right

Temperature:23C

MGA Test Reference No.:FM8139

Humidity:64%

Approach Horizontal Angles:90º

Time of Test:3:55:13 PM

Approach Vertical Angles:37º

FMH Serial No:[035]

Additional Description:@ Rear coat hook

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
624	606	6.4	23.2	52	2 Left

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	AHTB2	-114.533	0.87	0.87
Y	6	J14103	92.424	1.52	1.52
Z	7	J35800	96.462	1.03	1.03

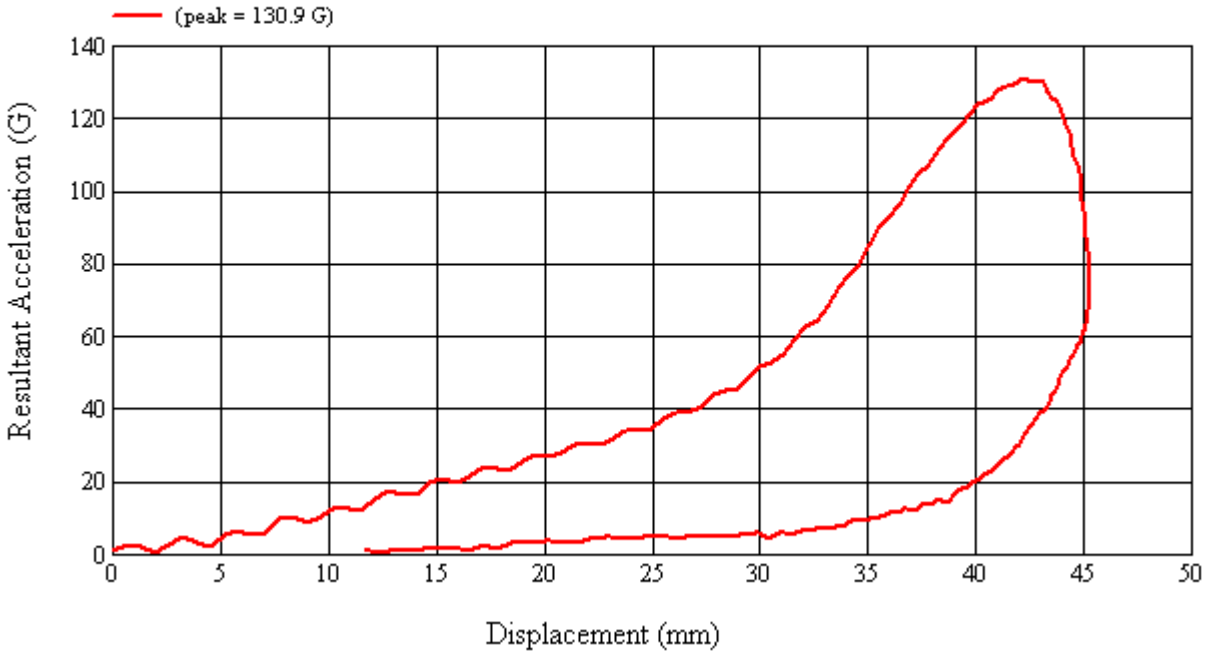
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

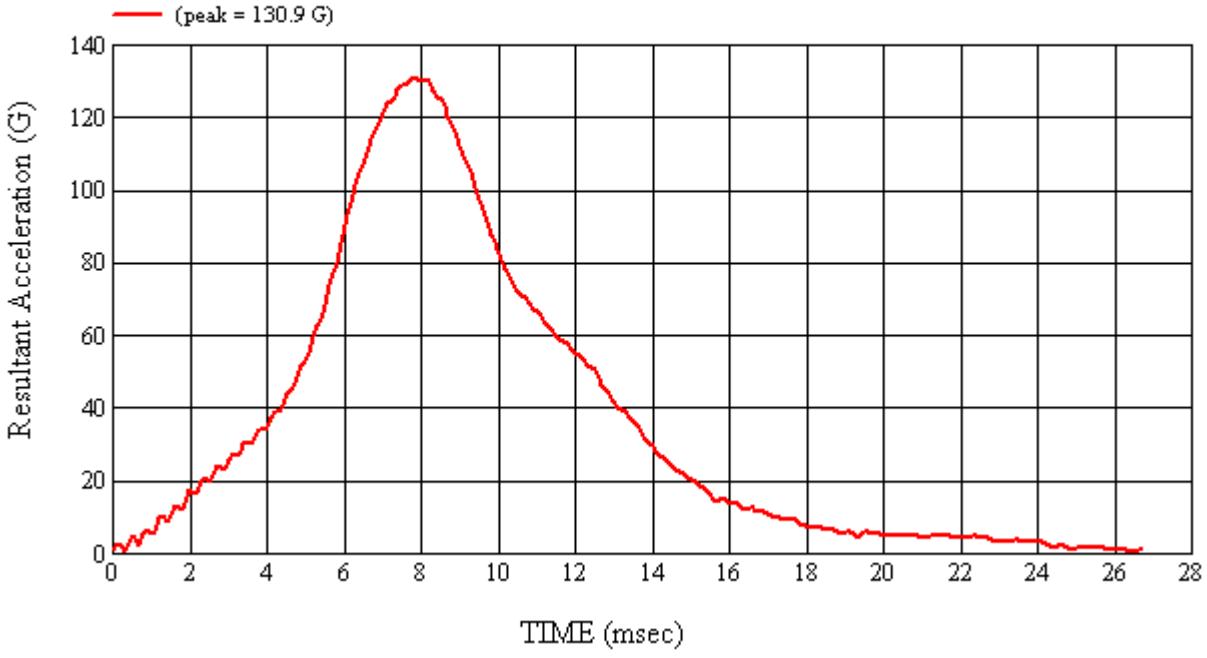
No visible damage.

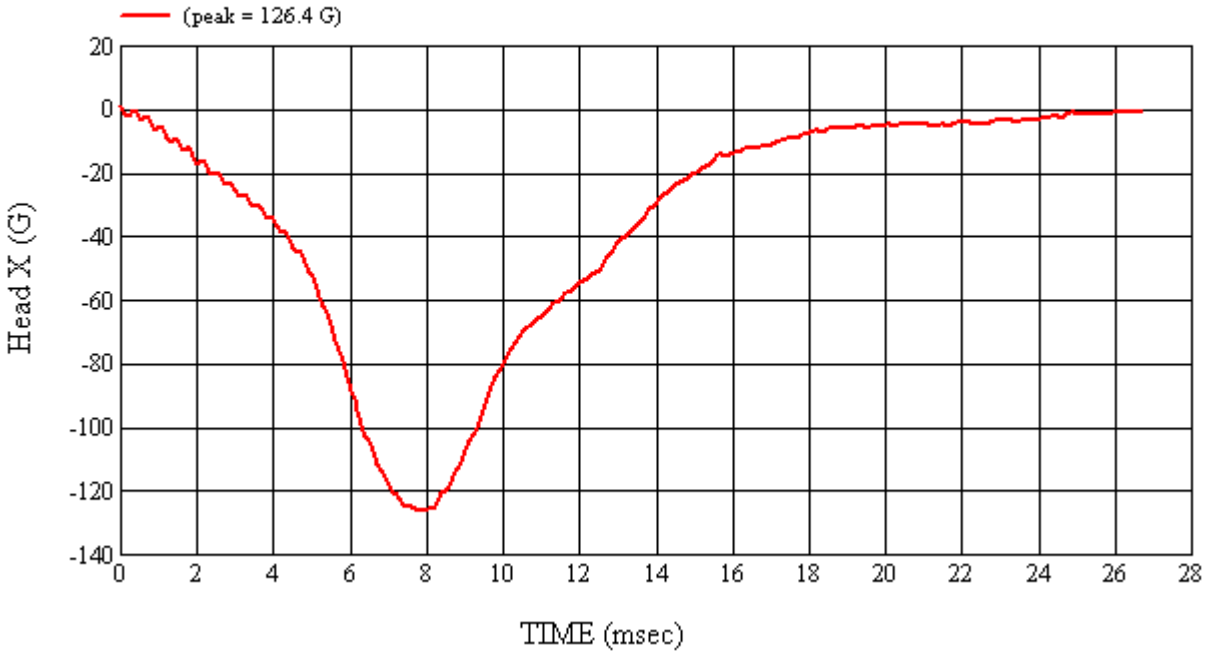
Recorded By: _____ Approved By*: _____ Date: 5/14/2008

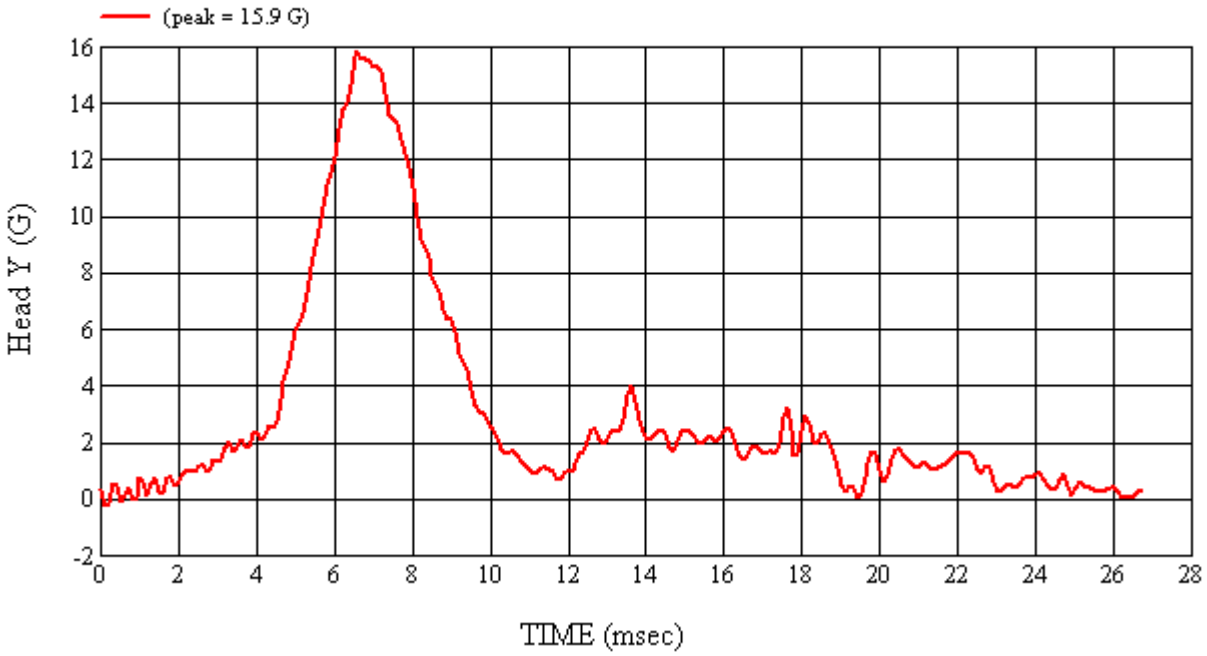
*Only necessary for NHTSA (Government) Compliance testing.

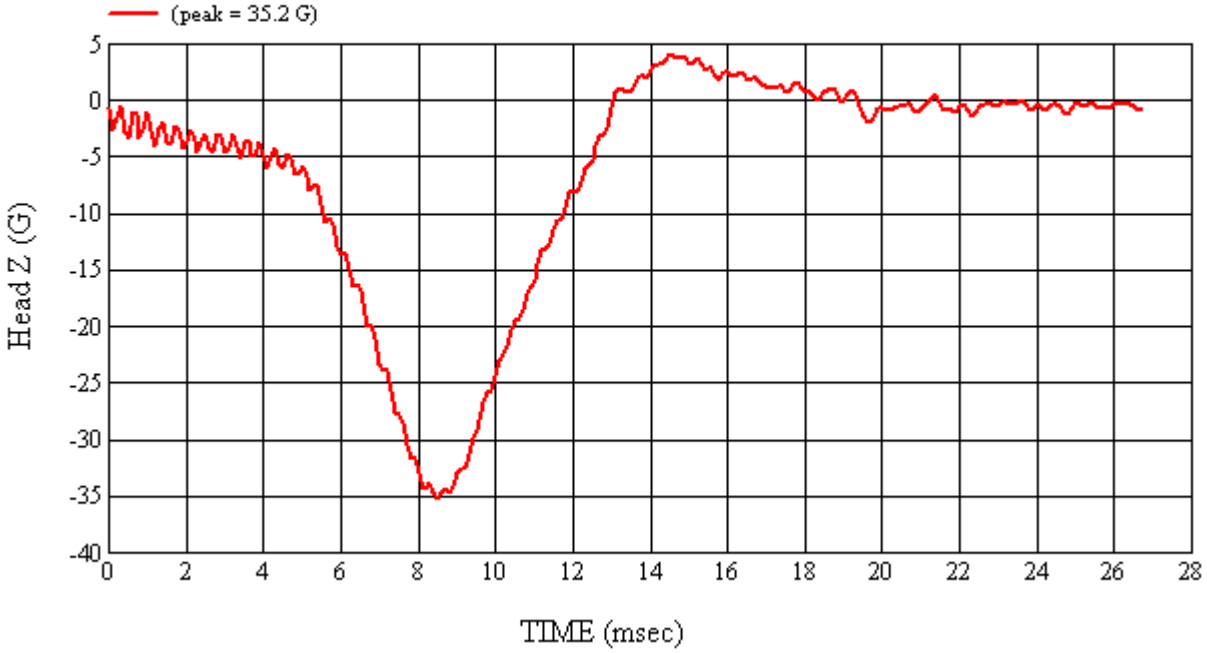
MGA Test #: FM8139 Target Location: UR6, Right Side Test Date: 5/14/2008

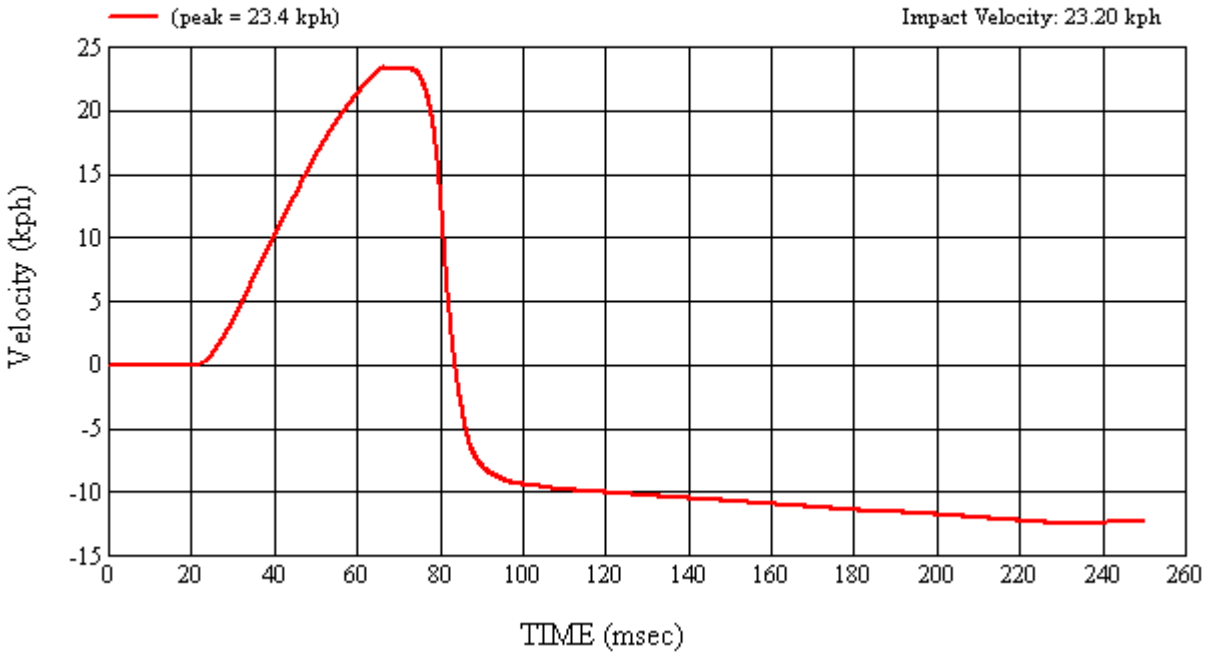


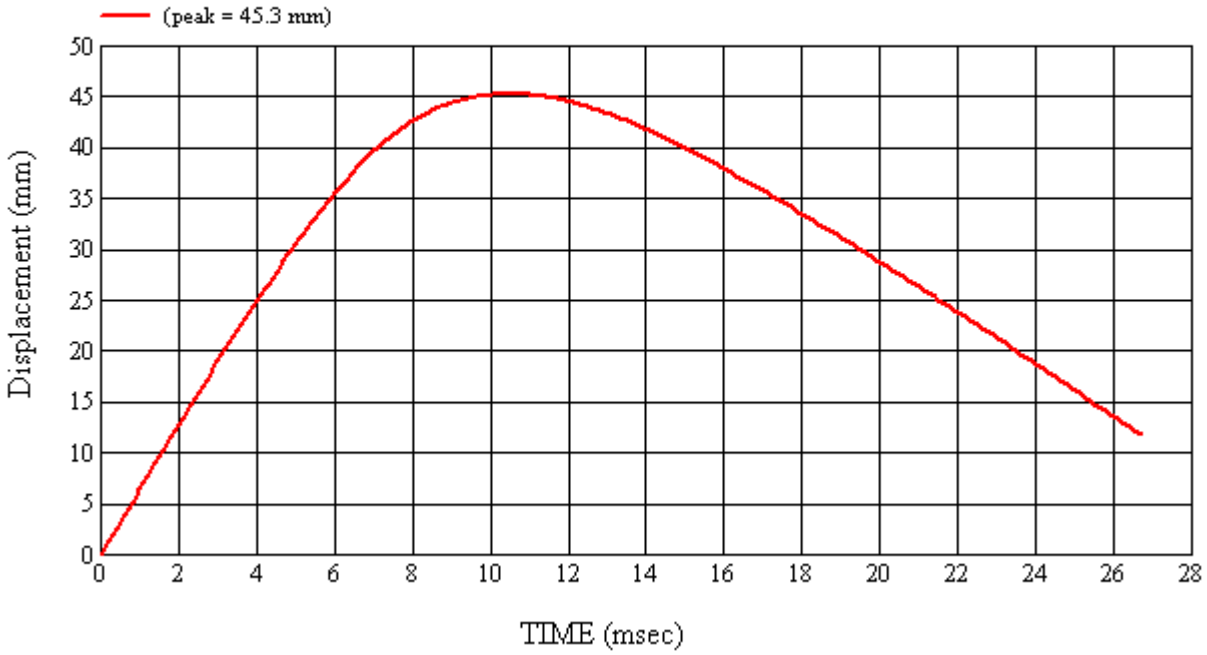



(peak = 126.4 G)
Head X (G)
20
0
-20
-40
-60
-80
-100
-120
-140
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
TIME (msec)


(peak = 15.9 G)
Head Y (G)
16
14
12
10
8
6
4
2
0
-2
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
TIME (msec)


(peak = 35.2 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
26
28
TIME (msec)


(peak = 23.4 kph)
Impact Velocity: 23.20 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 = 45.3 mm)
Displacement (mm)
TIME (msec)
0
5
10
15
20
25
30
35
40
45
50
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28

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	Mitutoyo	PRO 360 (MGA00049)	Set Angle of FMH/Targeting	0.1°	Annual
FMVSS 201U Test Frame (includes the propulsion control system, actuator, test frame, and DAS)	MGA Research Corp.	MGA-100-FMH	Test System	N/A	N/A
Free Motion Headforms	UTAMA UTAMA UTAMA	035 037 038	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 Mitutoyo	 TPM820 -- MGA00049	 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
* 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 FMH CALIBRATION SUMMARY

FMH Serial #		Headform Calibration Date	Weight (lbs)	Temp (ºC)	% Humidity	Peak Resultant Acceleration (G's)	Peak Lateral Acceleration (G's)	Unimodal
Pre	#035	5/9/2008	9.90	22.0	39.0	237.5	5.7	Yes
Post	#035	5/16/2008	9.90	22.0	29.0	238.6	3.3	Yes
Pre	#037	5/9/2008	9.96	22.0	39.0	250.4	10.7	Yes
Post	#037	5/16/2008	9.96	22.0	30.0	256.6	5.4	Yes
Pre	#038	5/9/2008	9.92	22.0	39.0	261.0	13.2	Yes
Post	#038	5/16/2008	9.92	22.0	31.0	256.1	5.9	Yes

4.1 Pre-Test Calibration

HEAD DROP TEST SUMMARY
PART 572L

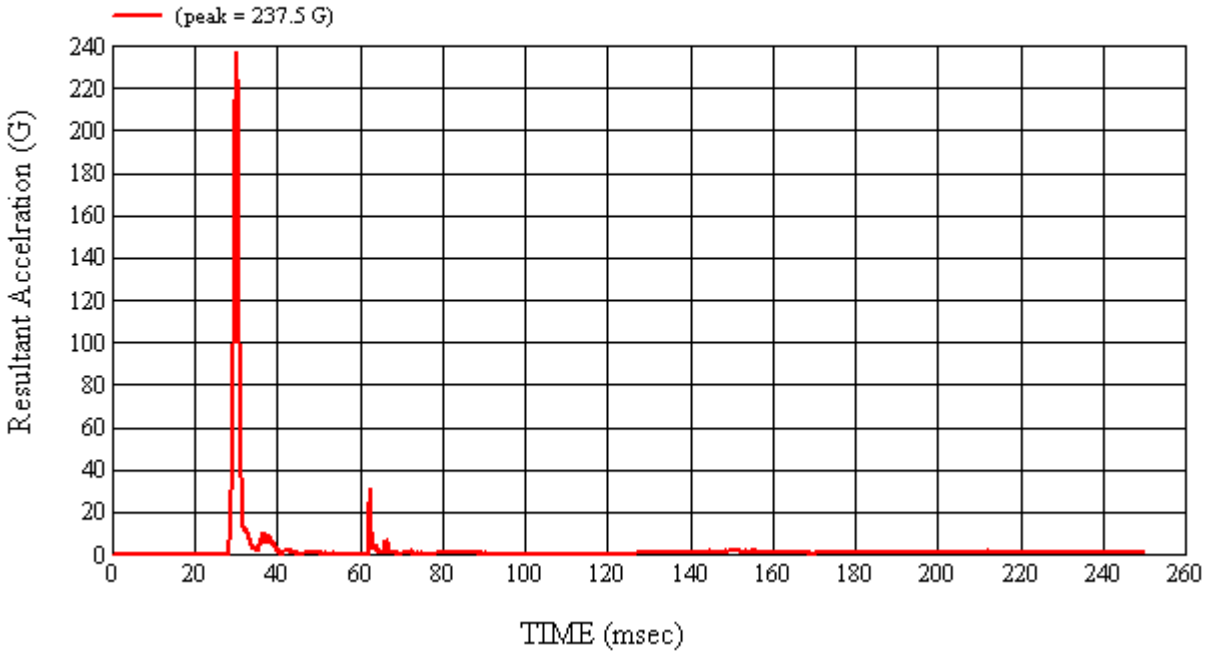
HEADFORM SERIAL NUMBER: 035	CALIBRATION DATE: 5/9/2008 CALIBRATION TIME: 8:53:35 AM	
TEST PARAMETER	**SPECIFICATION**	**TEST RESULTS**
Weight	9.90 to 10.10 lbs.	9.90
Temperature	19° C to 26° C	22
Relative Humidity	10% to 70%	39
Peak Resultant Acceleration	225 G's to 275 G's	237.5
Peak Lateral Acceleration	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	J35919	04/22/08	10/22/08
2	ENDEVCO	7264-2000	J22664	04/22/08	10/22/08
3	ENDEVCO	7264-2000	J35924	04/22/08	10/22/08

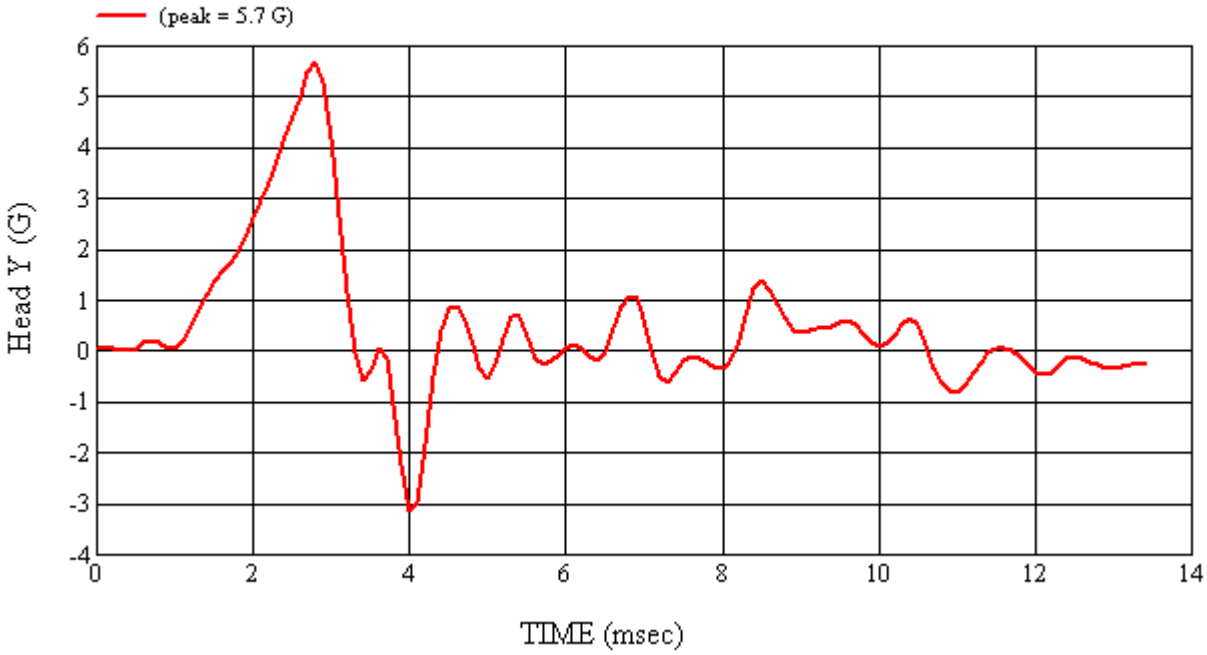
REMARKS:

RECORDED BY: Kevin Campbell DATE: 5/9/2008

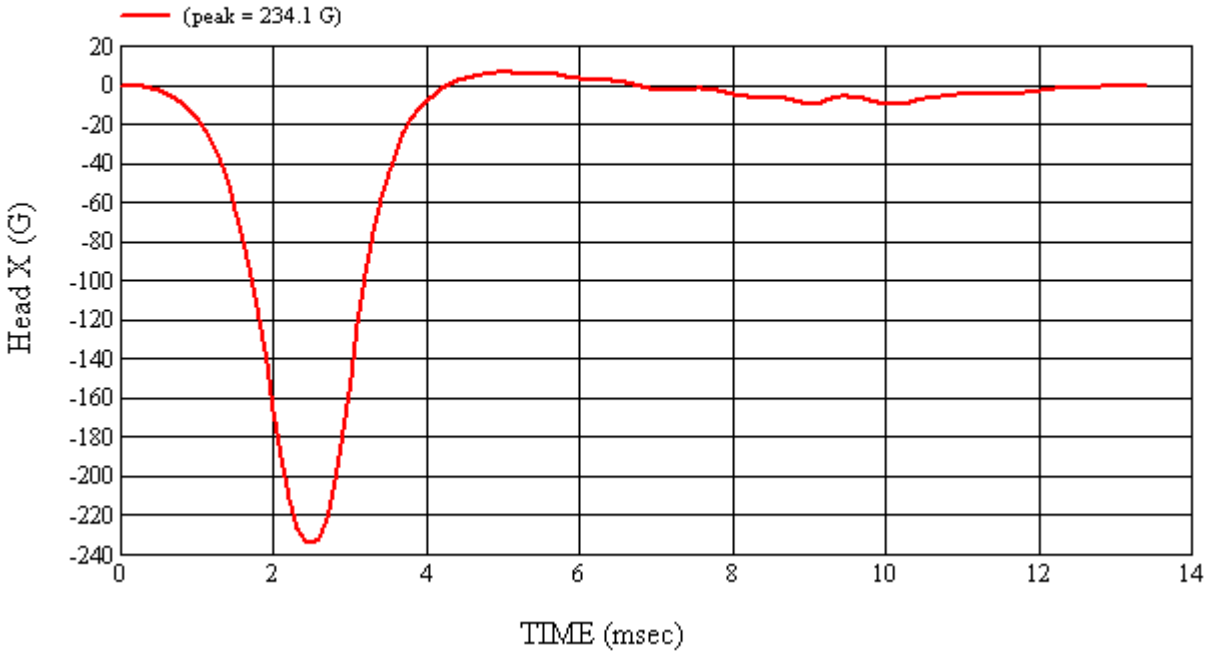
APPROVED BY: Helen A. Kalesto



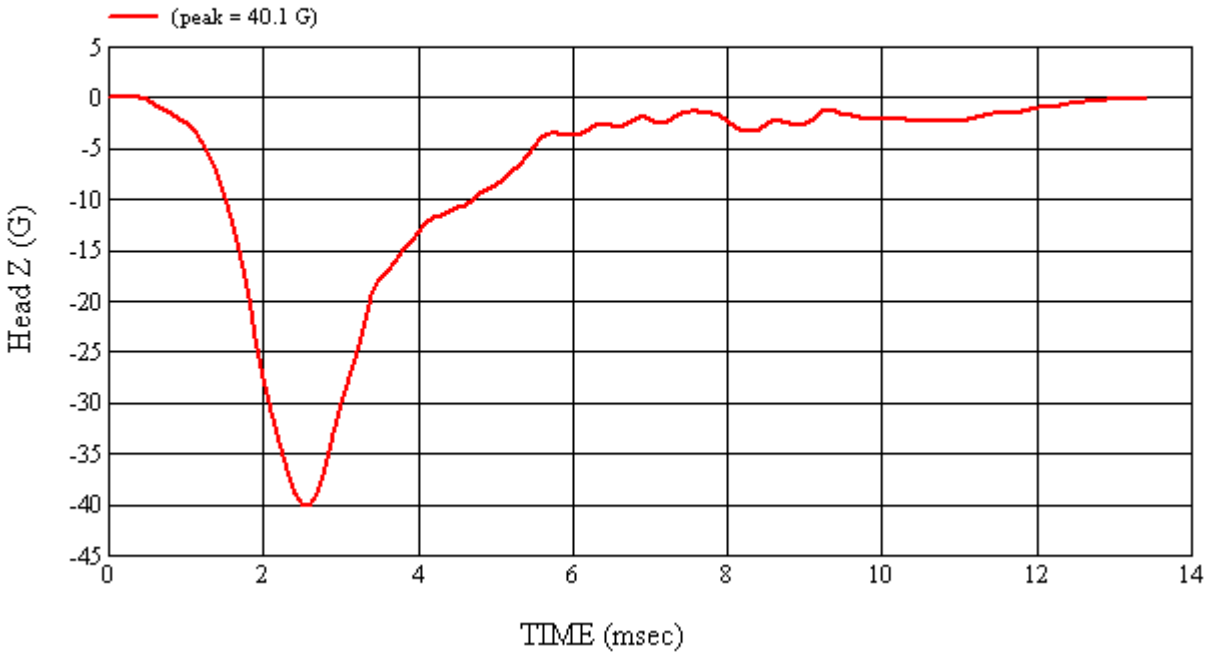
Head 035 (Pre) Calibration #H35016



Head 035 (Pre) Calibration #H35016



Head 035 (Pre) Calibration #H35016



Head 035 (Pre) Calibration #H35016

4.2 Post-Test Calibration

HEAD DROP TEST SUMMARY
PART 572L

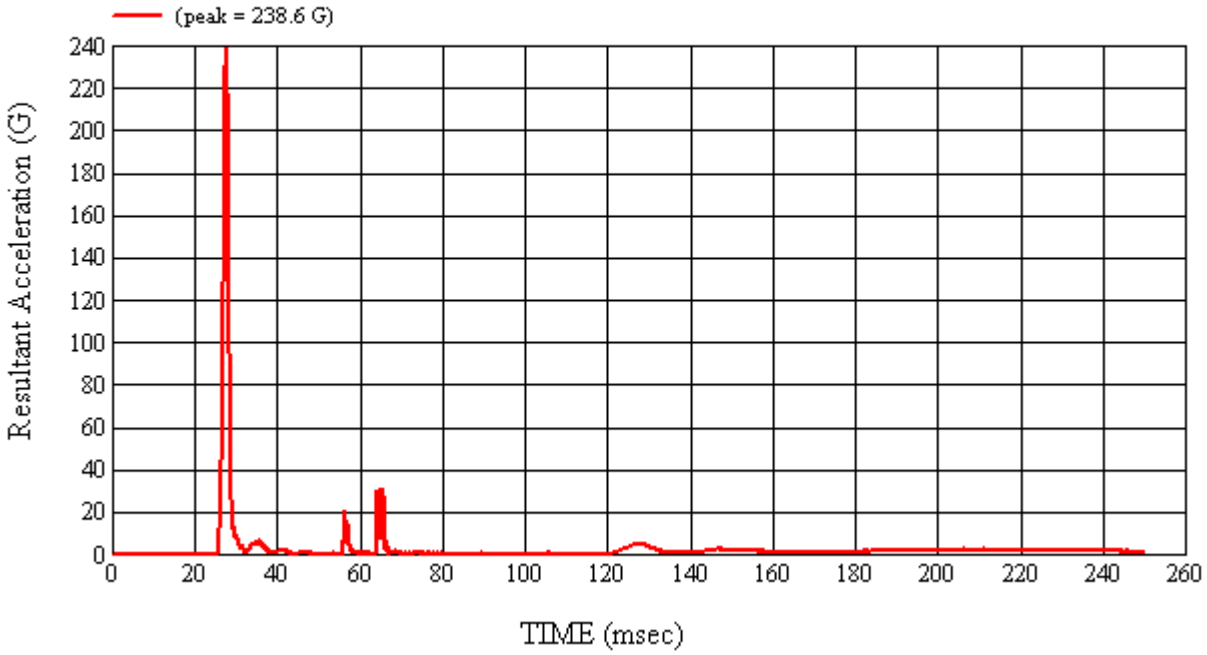
HEADFORM SERIAL NUMBER: 035	CALIBRATION DATE: 5/16/2008 CALIBRATION TIME: 2:13:11 PM	
TEST PARAMETER	**SPECIFICATION**	**TEST RESULTS**
Weight	9.90 to 10.10 lbs.	9.90
Temperature	19° C to 26° C	22
Relative Humidity	10% to 70%	29
Peak Resultant Acceleration	225 G's to 275 G's	238.6
Peak Lateral Acceleration	15 G's Maximum	3.3
Unimodal Acceleration Curve	YES	YES

FMH INSTRUMENTATION					
HEAD ACCELEROMETERS					
Channel Number	**Manufacturer**	**Model Number**	**Serial Number**	**Date of Last Calibration**	**Date of Next Calibration**
1	ENDEVCO	7264-2000	J35919	04/22/08	10/22/08
2	ENDEVCO	7264-2000	J22664	04/22/08	10/22/08
3	ENDEVCO	7264-2000	J35924	04/22/08	10/22/08

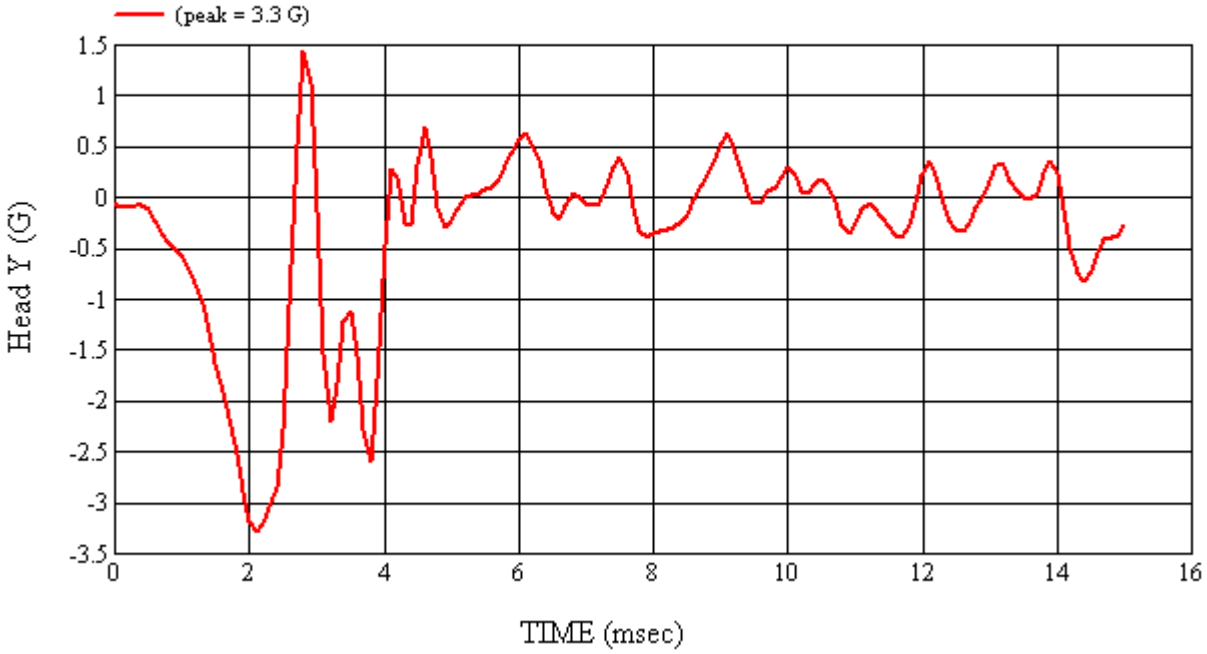
REMARKS:

RECORDED BY: Travis Campbell DATE: 5/16/2008

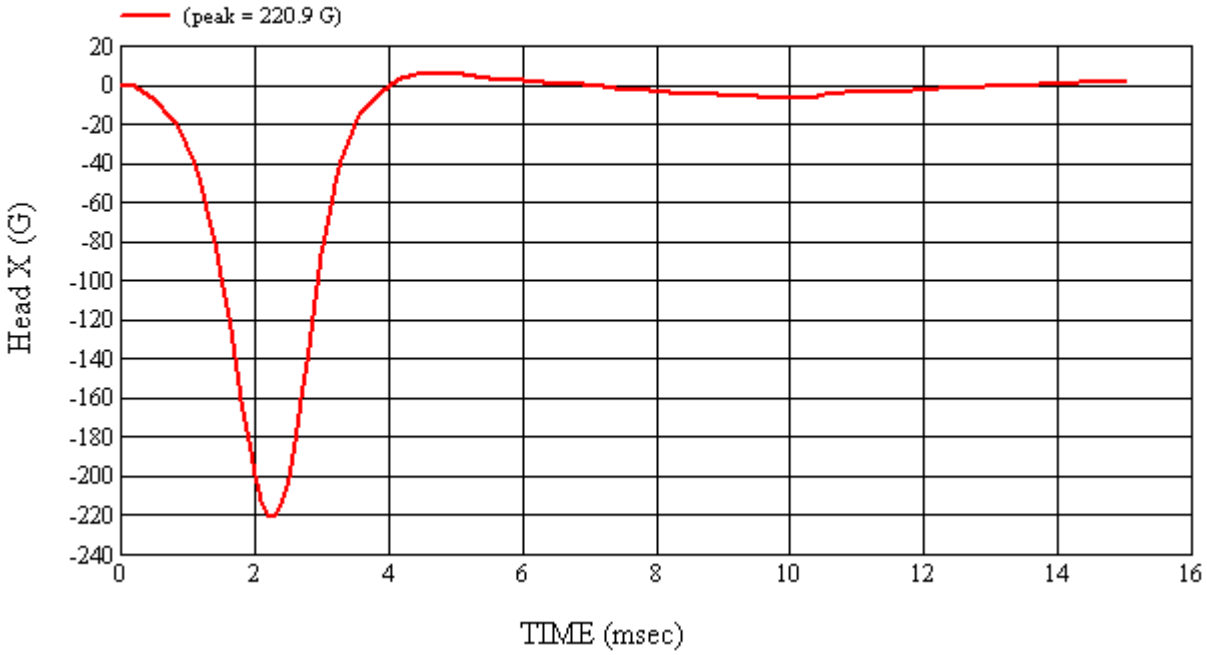
APPROVED BY: Helen A. Kalesto



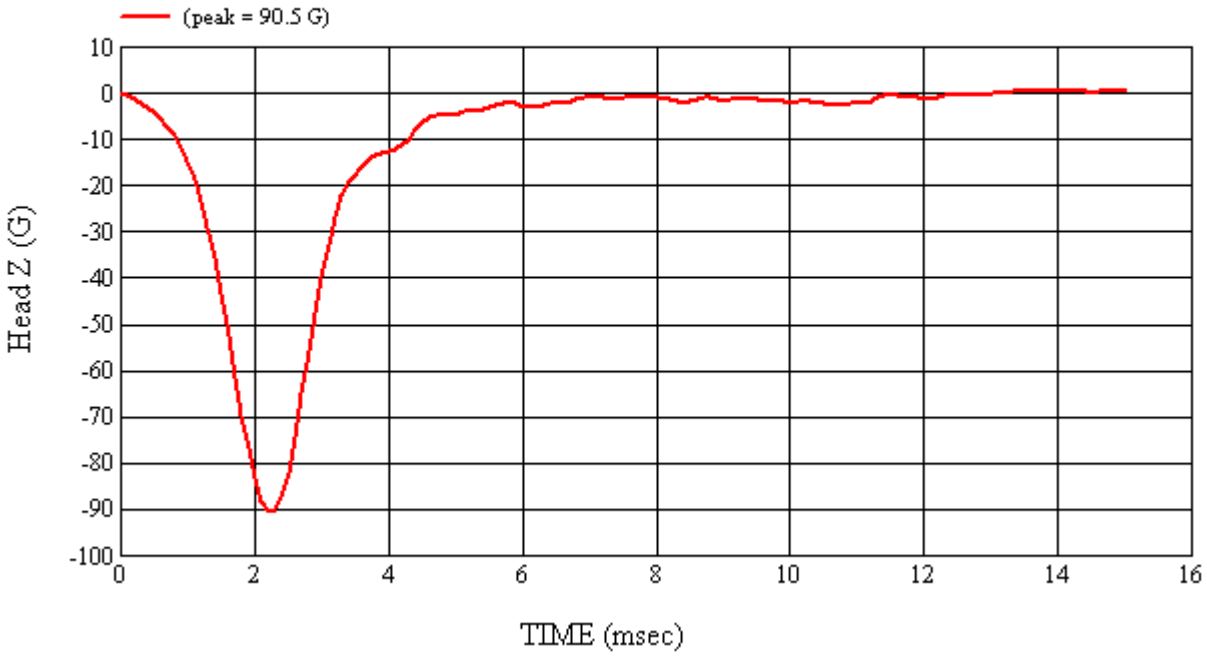
Head 035 (Post) Calibration #H35017



Head 035 (Post) Calibration #H35017



Head 035 (Post) Calibration #H35017



Head 035 (Post) Calibration #H35017

4.3 Pre-Test Calibration

HEAD DROP TEST SUMMARY
PART 572L

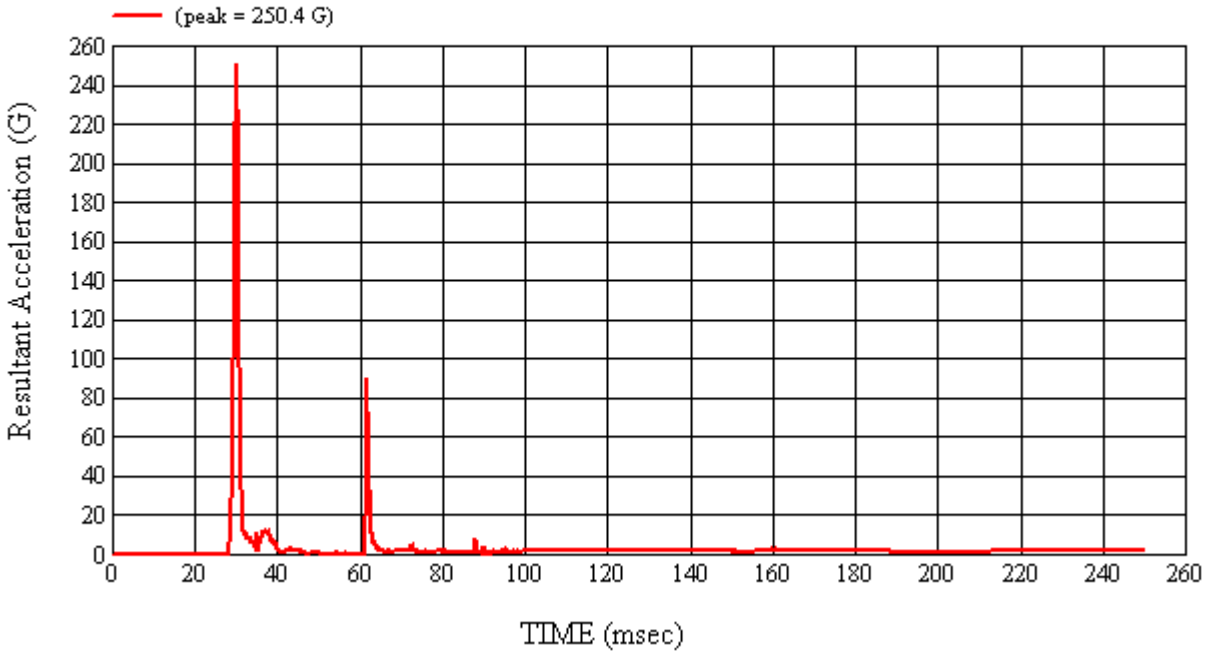
HEADFORM SERIAL NUMBER: 037	CALIBRATION DATE: 5/9/2008 CALIBRATION TIME: 9:08:55 AM	
TEST PARAMETER	**SPECIFICATION**	**TEST RESULTS**
Weight	9.90 to 10.10 lbs.	9.96
Temperature	19° C to 26° C	22
Relative Humidity	10% to 70%	39
Peak Resultant Acceleration	225 G's to 275 G's	250.4
Peak Lateral Acceleration	15 G's Maximum	10.7
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	AHTB2	04/22/08	10/22/08
2	ENDEVCO	7264-2000	J14103	04/22/08	10/22/08
3	ENDEVCO	7264-2000	J35800	04/22/08	10/22/08

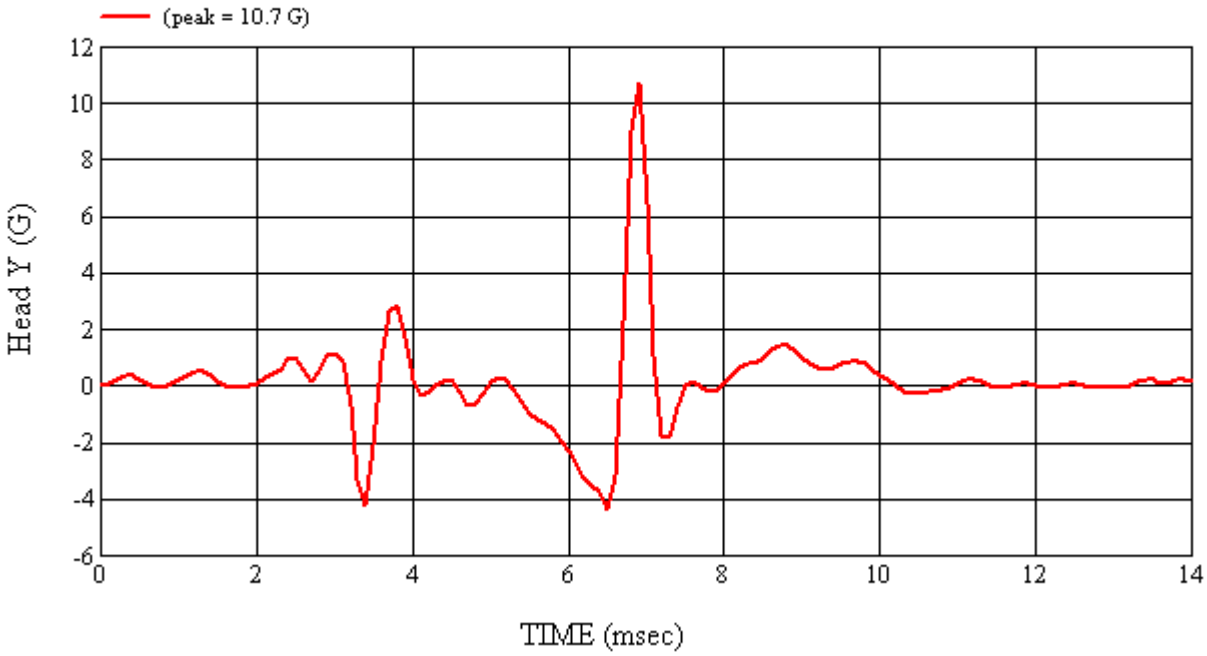
REMARKS:

RECORDED BY: Kevin Campbell DATE: 5/9/2008

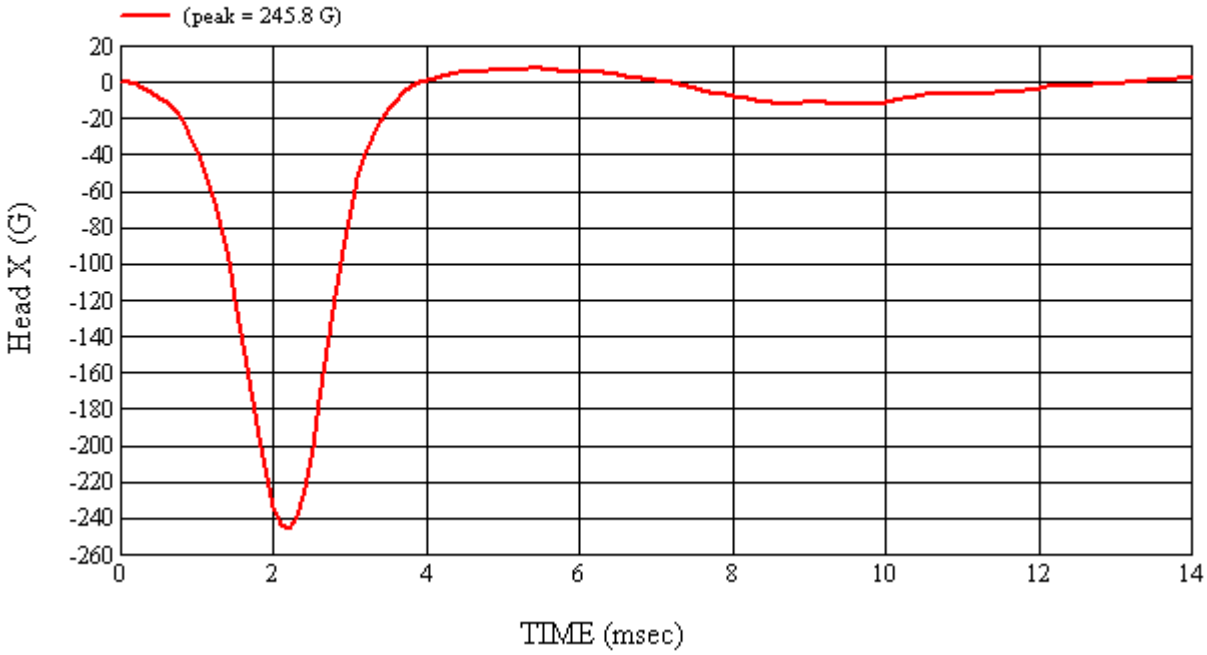
APPROVED BY: Helen A. Kalista



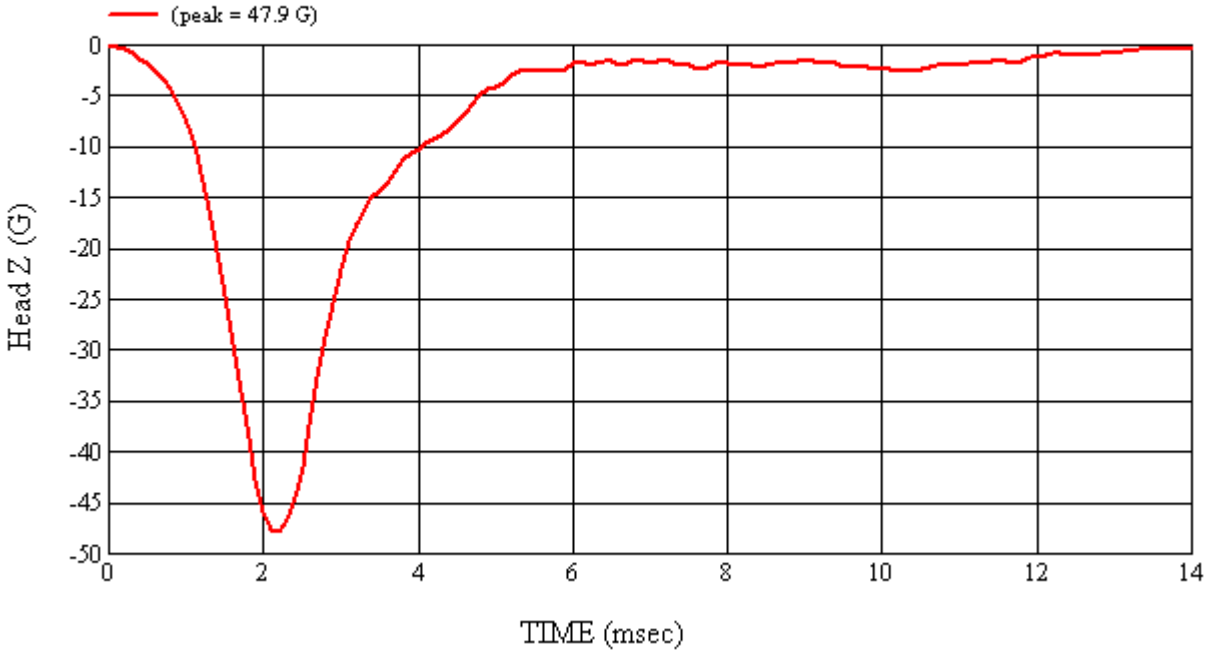
Head 037 (Pre) Calibration #H37013



Head 037 (Pre) Calibration #H37013



Head 037 (Pre) Calibration #H37013



Head 037 (Pre) Calibration #H37013

4.4 Post-Test Calibration

HEAD DROP TEST SUMMARY
PART 572L

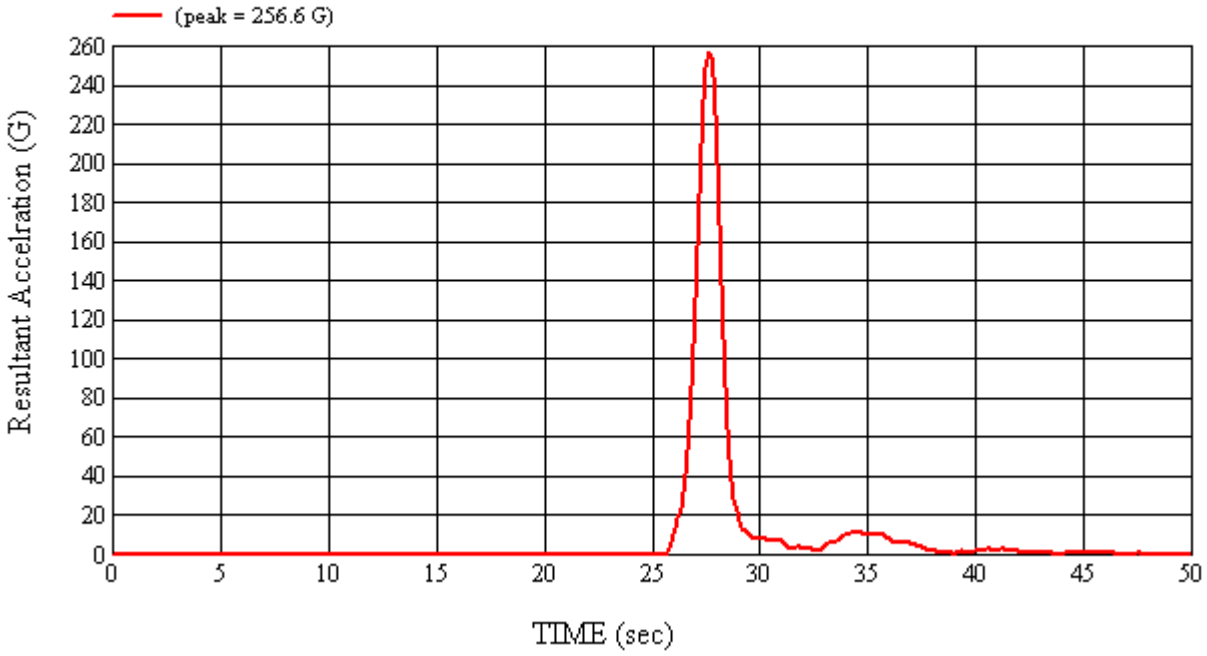
HEADFORM SERIAL NUMBER: 037	CALIBRATION DATE: 5/16/2008 CALIBRATION TIME: 2:58:01 PM	
TEST PARAMETER	**SPECIFICATION**	**TEST RESULTS**
Weight	9.90 to 10.10 lbs.	9.96
Temperature	19° C to 26° C	22
Relative Humidity	10% to 70%	30
Peak Resultant Acceleration	225 G's to 275 G's	256.6
Peak Lateral Acceleration	15 G's Maximum	5.4
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	AHTB2	04/22/08	10/22/08
2	ENDEVCO	7264-2000	J14103	04/22/08	10/22/08
3	ENDEVCO	7264-2000	J35800	04/22/08	10/22/08

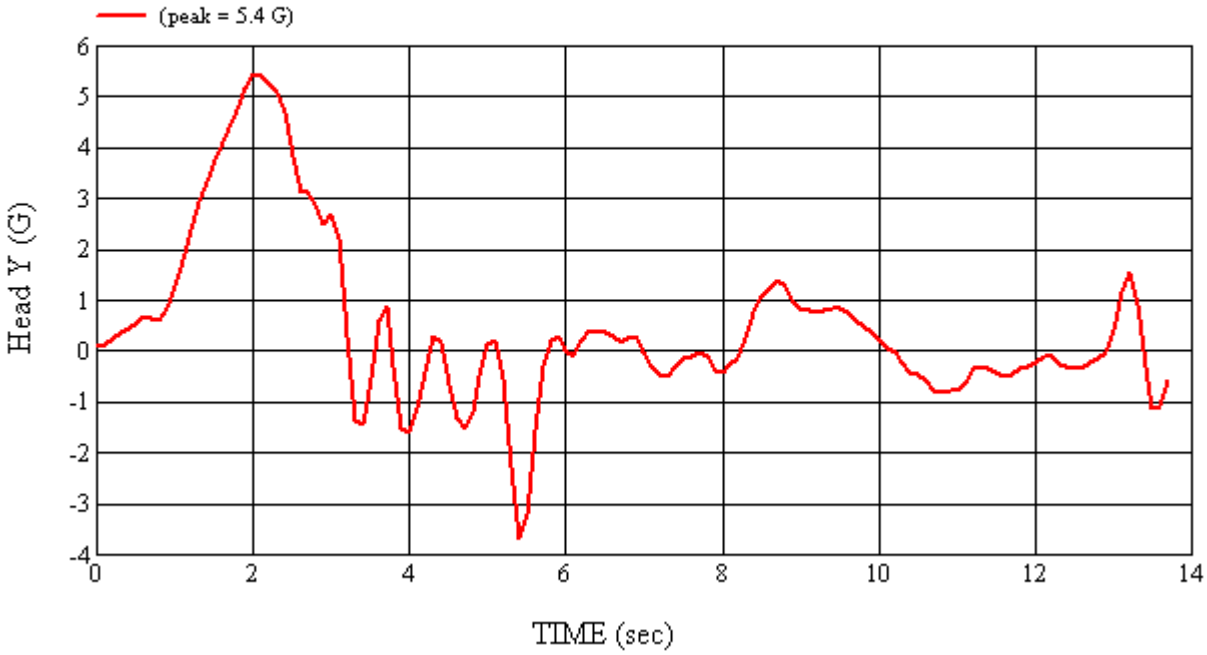
REMARKS:

RECORDED BY: Kevin Campbell DATE: 5/16/2008

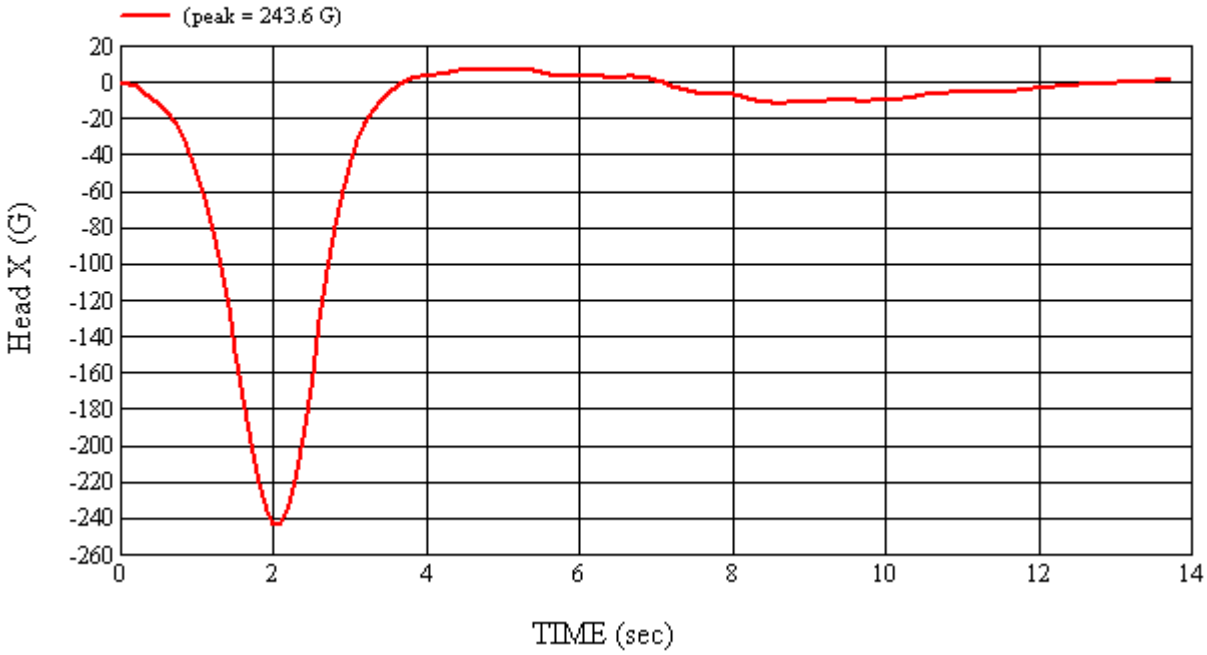
APPROVED BY: Helen A. Kaleto



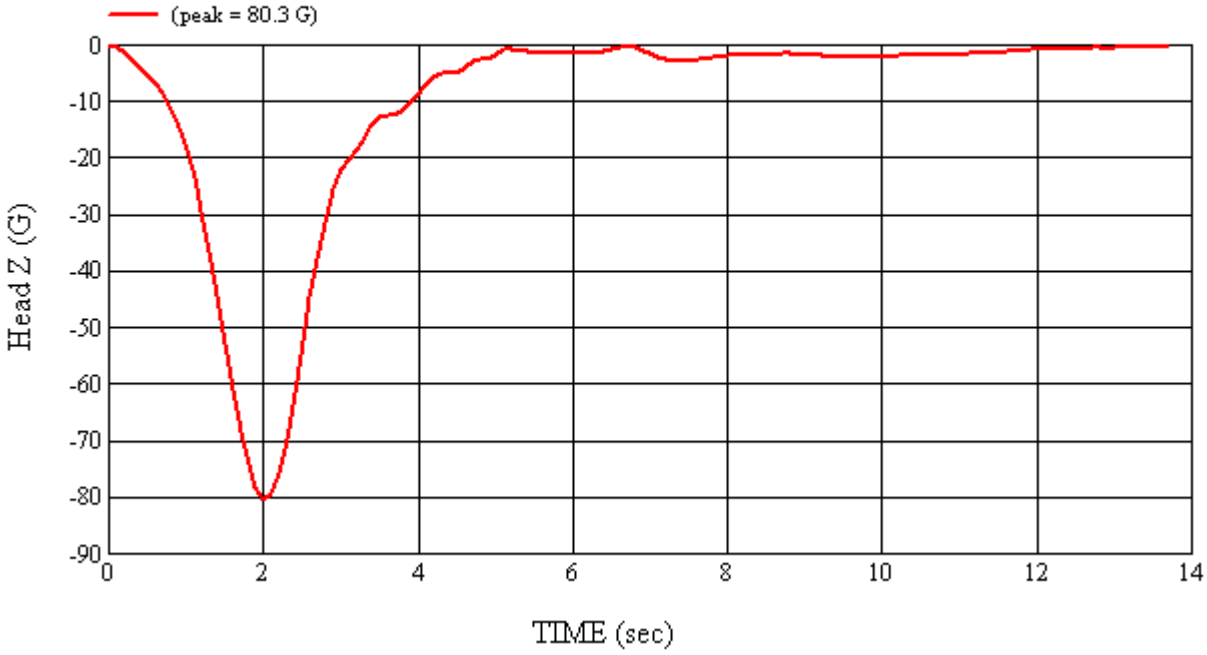
Head 037 (Pre) Calibration #H37014



Head 037 (Pre) Calibration #H37014



Head 037 (Pre) Calibration #H37014



Head 037 (Pre) Calibration #H37014

4.5 Pre-Test Calibration

HEAD DROP TEST SUMMARY
PART 572L

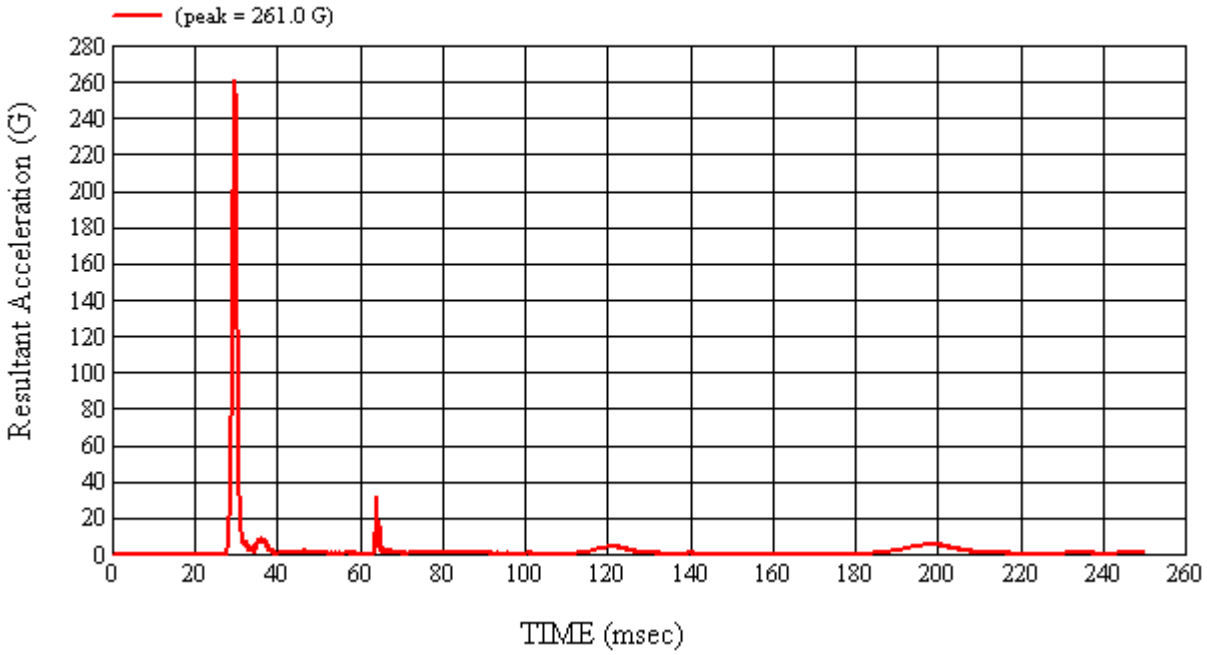
HEADFORM SERIAL NUMBER: 038	CALIBRATION DATE: 5/9/2008 CALIBRATION TIME: 9:26:09 AM	
TEST PARAMETER	**SPECIFICATION**	**TEST RESULTS**
Weight	9.90 to 10.10 lbs.	9.92
Temperature	19° C to 26° C	22
Relative Humidity	10% to 70%	39
Peak Resultant Acceleration	225 G's to 275 G's	261.0
Peak Lateral Acceleration	15 G's Maximum	13.2
Unimodal Acceleration Curve	YES	YES

FMH INSTRUMENTATION					
HEAD ACCELEROMETERS					
Channel Number	**Manufacturer**	**Model Number**	**Serial Number**	**Date of Last Calibration**	**Date of Next Calibration**
1	ENDEVCO	7264-2000	J22700	04/15/08	10/15/08
2	ENDEVCO	7264-2000	J36197	04/15/08	10/15/08
3	ENDEVCO	7264-2000	J36353	04/15/08	10/15/08

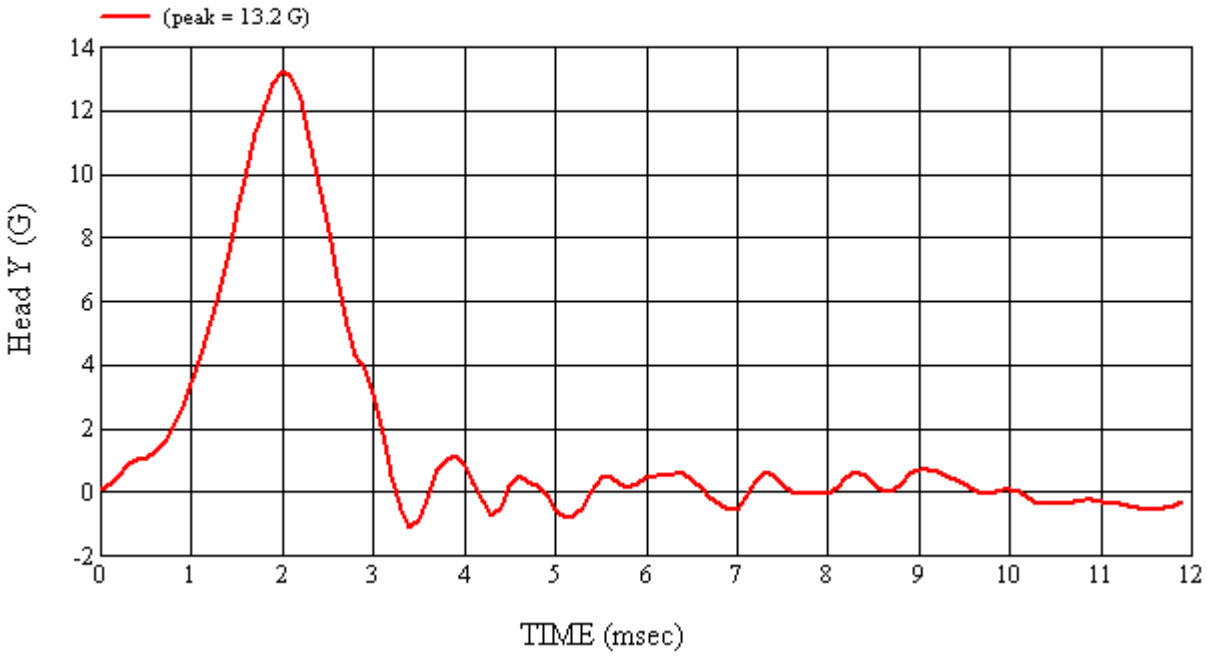
REMARKS:

RECORDED BY: Kevin Campbell DATE: 5/9/2008

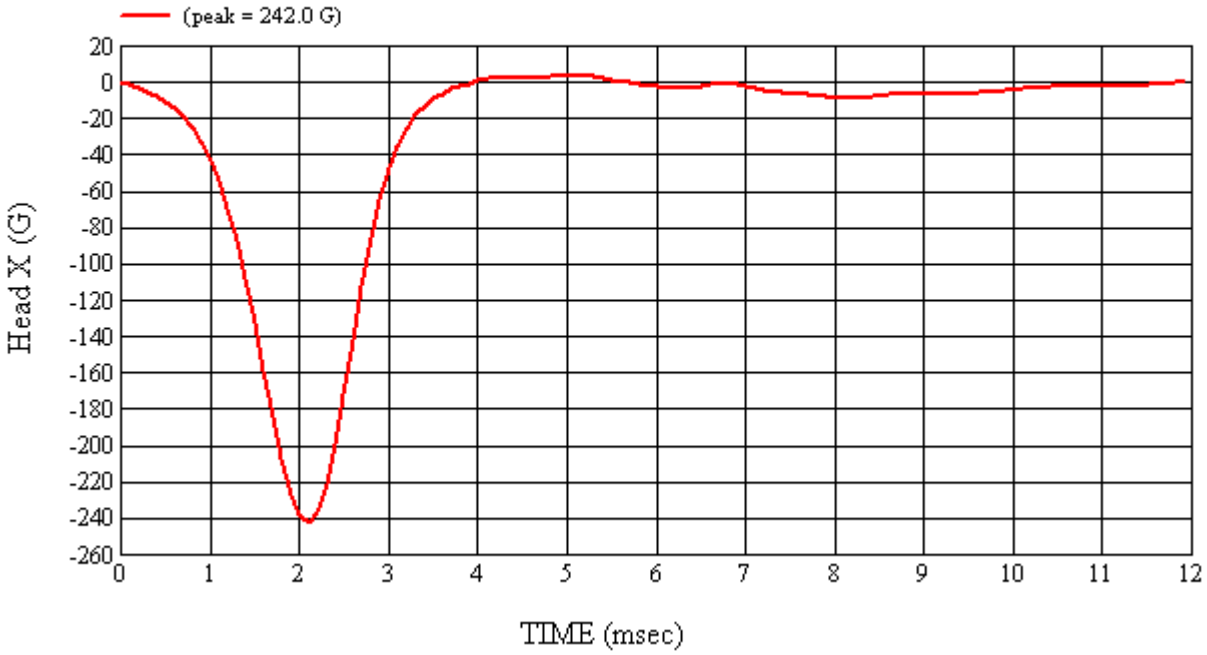
APPROVED BY: Helen A. Kaleto



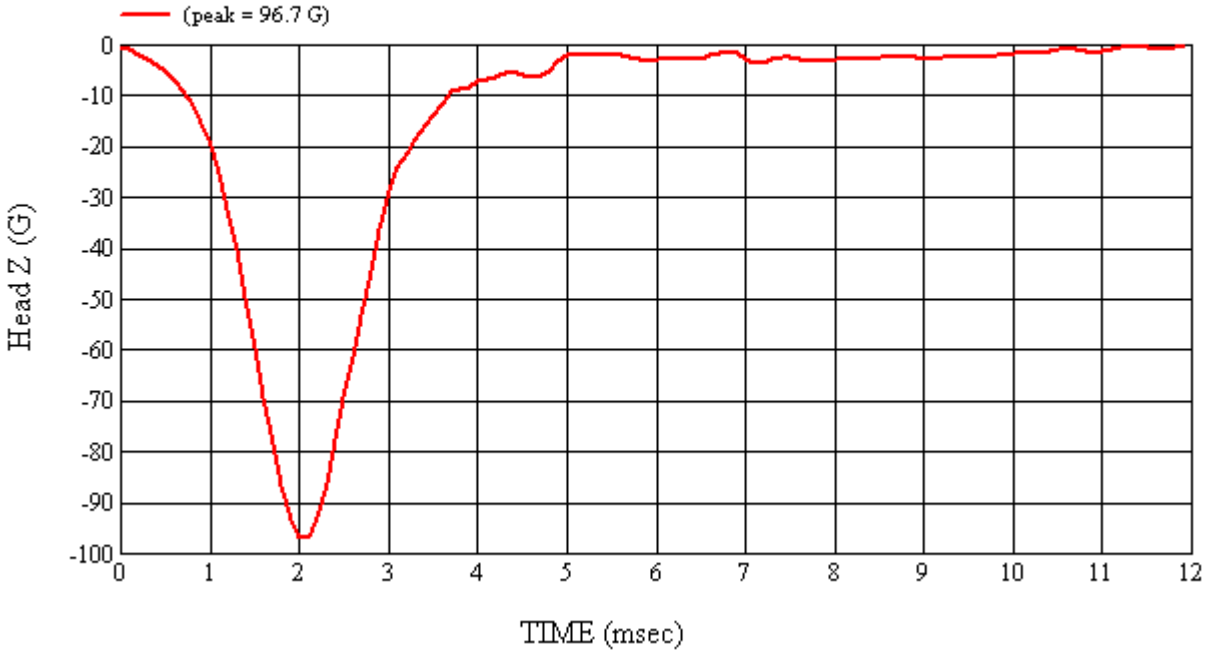
Head 038 (Pre) Calibration #H38013



Head 038 (Pre) Calibration #H38013



Head 038 (Pre) Calibration #H38013



Head 038 (Pre) Calibration #H38013

4.6 Post-Test Calibration

HEAD DROP TEST SUMMARY
PART 572L

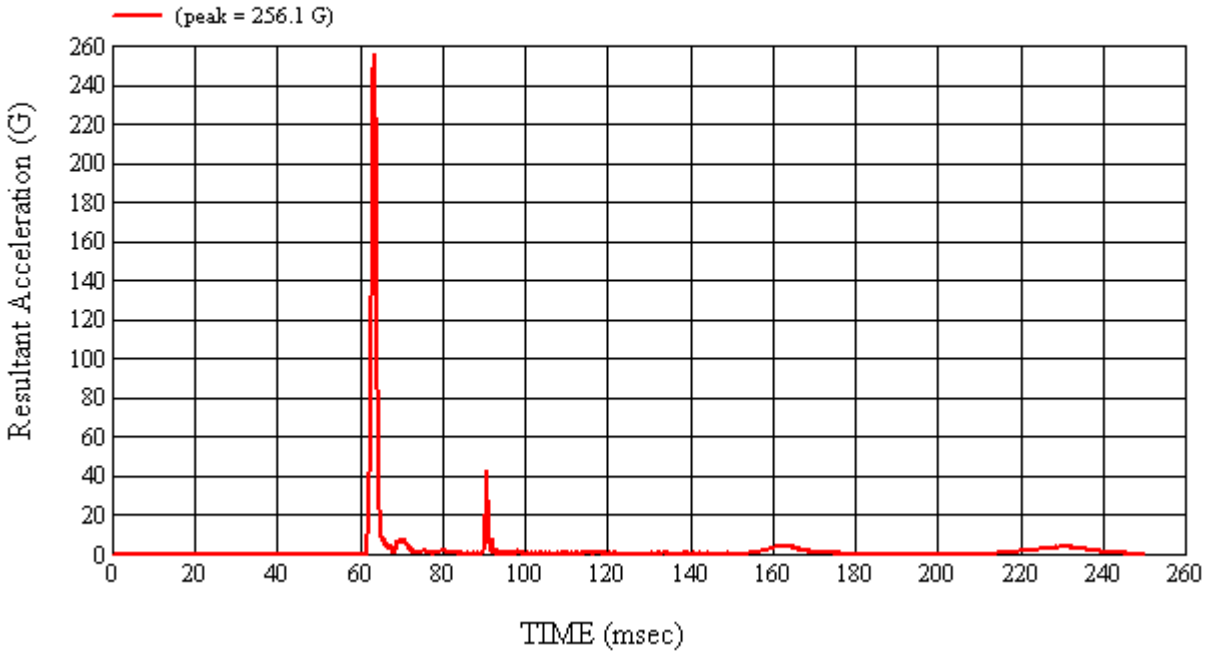
HEADFORM SERIAL NUMBER: 038	CALIBRATION DATE: 5/16/2008 CALIBRATION TIME: 3:25:41 PM	
TEST PARAMETER	**SPECIFICATION**	**TEST RESULTS**
Weight	9.90 to 10.10 lbs.	9.92
Temperature	19° C to 26° C	22
Relative Humidity	10% to 70%	31
Peak Resultant Acceleration	225 G's to 275 G's	256.1
Peak Lateral Acceleration	15 G's Maximum	5.9
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	J22700	04/15/08	10/15/08
2	ENDEVCO	7264-2000	J36197	04/15/08	10/15/08
3	ENDEVCO	7264-2000	J36353	04/15/08	10/15/08

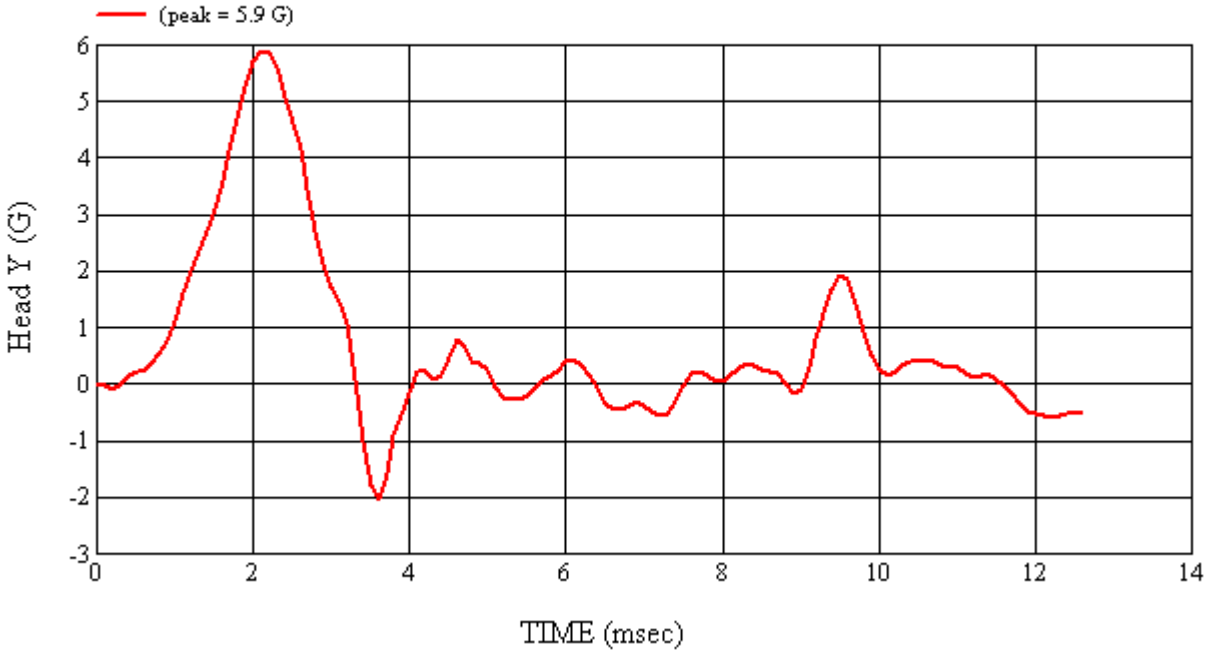
REMARKS:

RECORDED BY: Kevin Campbell DATE: 5/16/2008

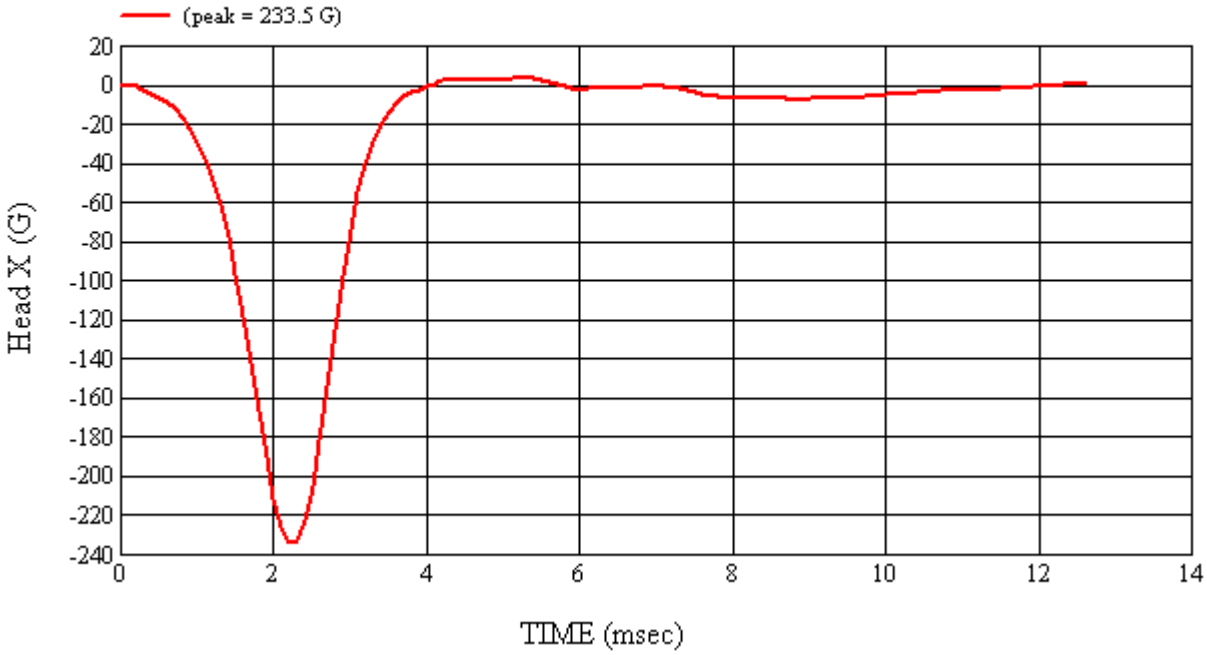
APPROVED BY: Helen A. Kaleto



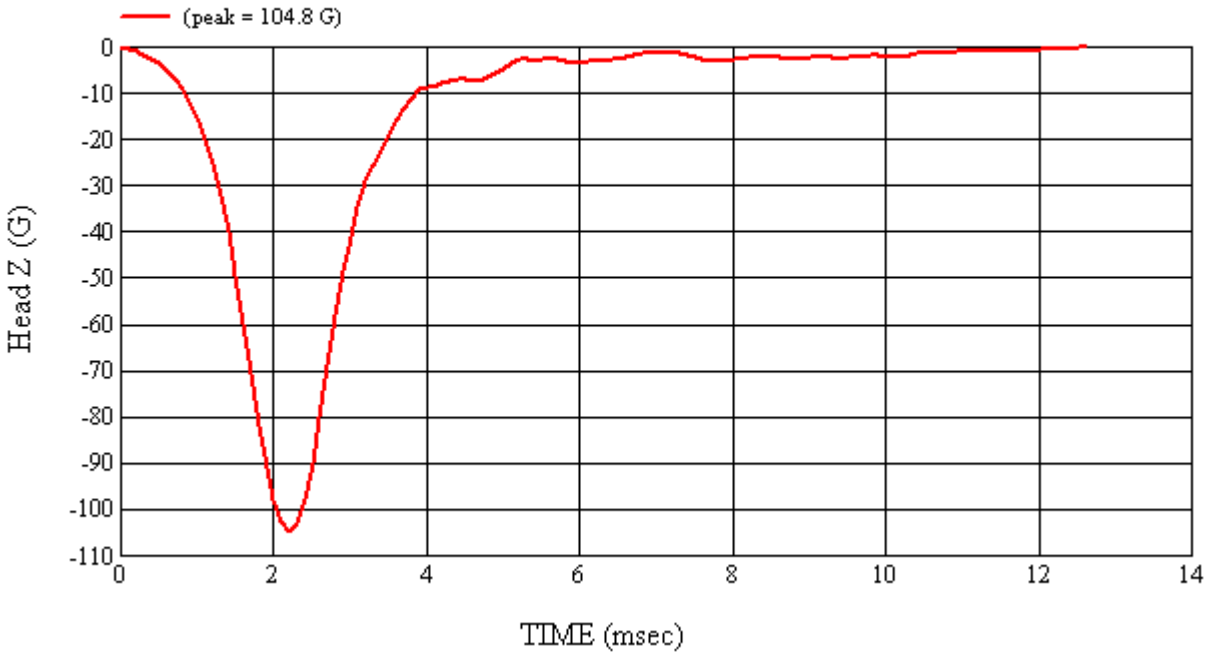
Head 038 (Post) Calibration #H38014



Head 038 (Post) Calibration #H38014



Head 038 (Post) Calibration #H38014



Head 038 (Post) Calibration #H38014

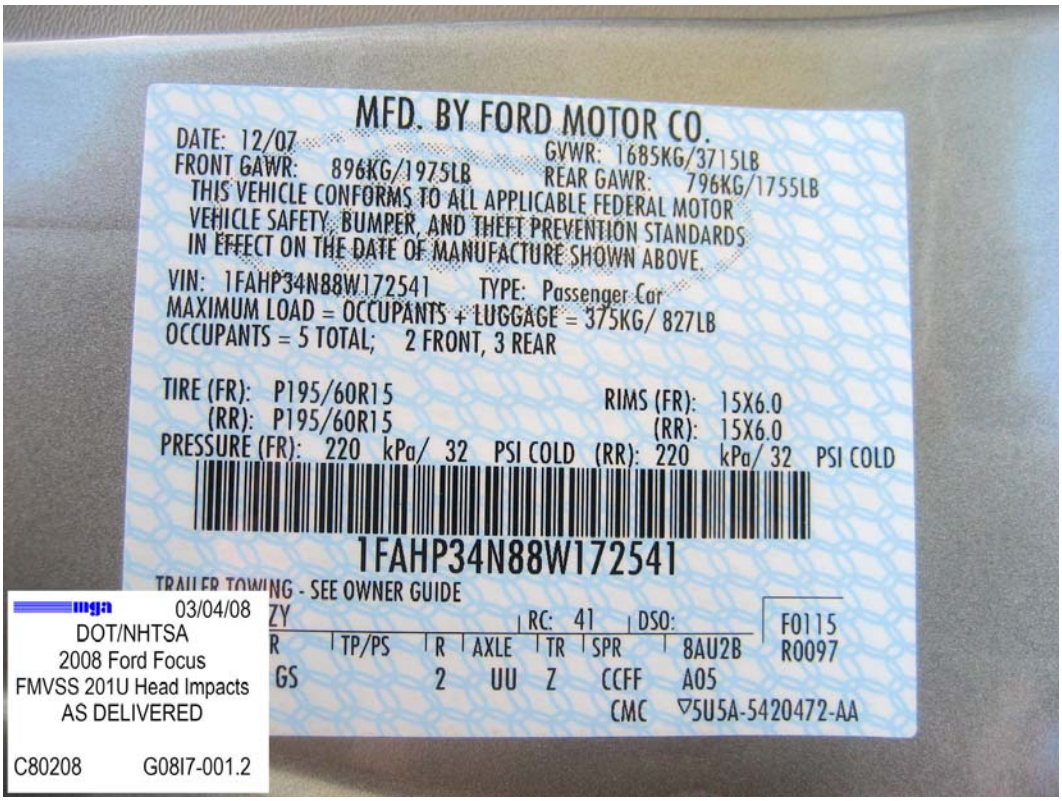
5.0 PHOTOGRAPHS

As Delivered – Left Side View

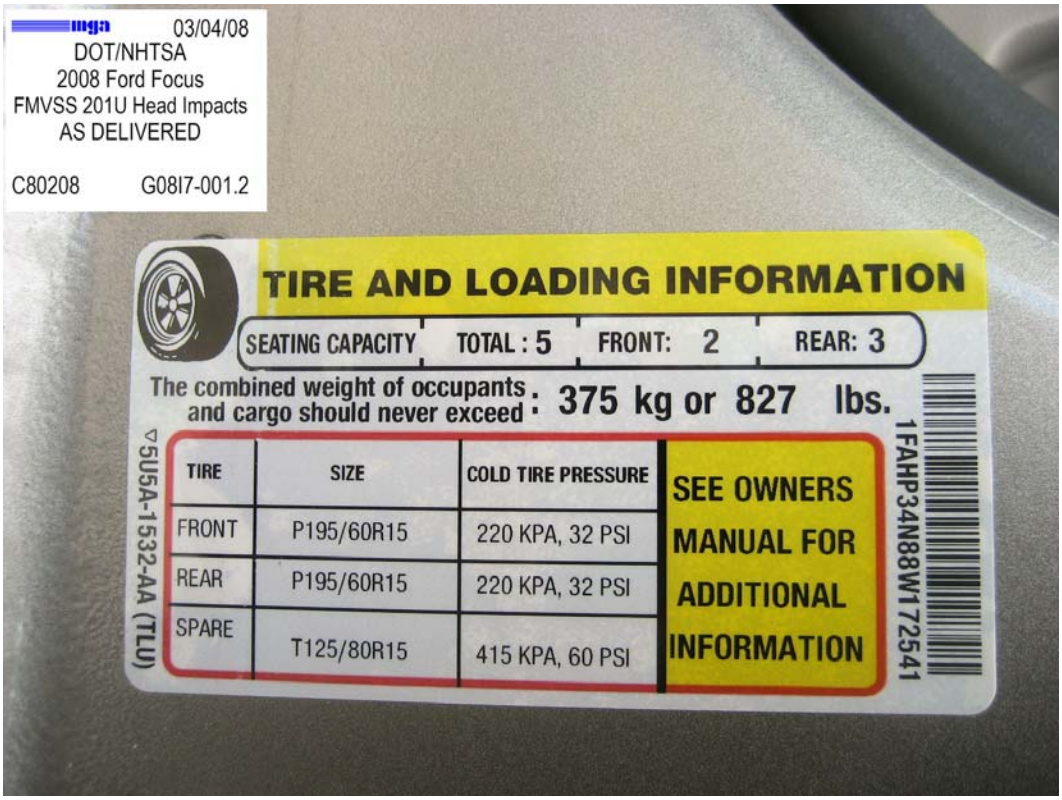
As Delivered – Right Side View

As Delivered – ¾ Front View From Left Side

As Delivered – Rear View From Right Side

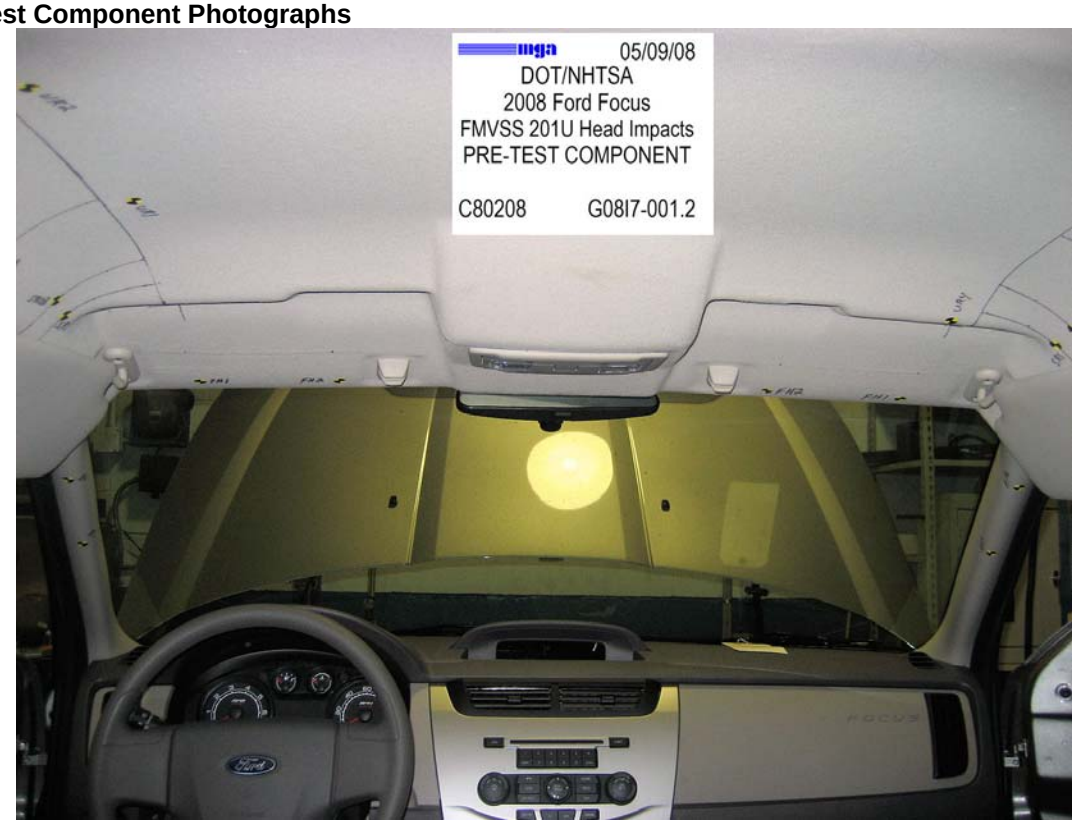


As Delivered – Vehicle's Certification Label



As Delivered – Vehicle's Tire Information Label

Pre-Test Component Photographs




mga
05/09/08
DOT/NHTSA
2008 Ford Focus
FMVSS 201U Head Impacts
PRE-TEST COMPONENT
C80208
G08I7-001.2


mga
05/09/08
DOT/NHTSA
2008 Ford Focus
FMVSS 201U Head Impacts
PRE-TEST COMPONENT
C80208
G08I7-001.2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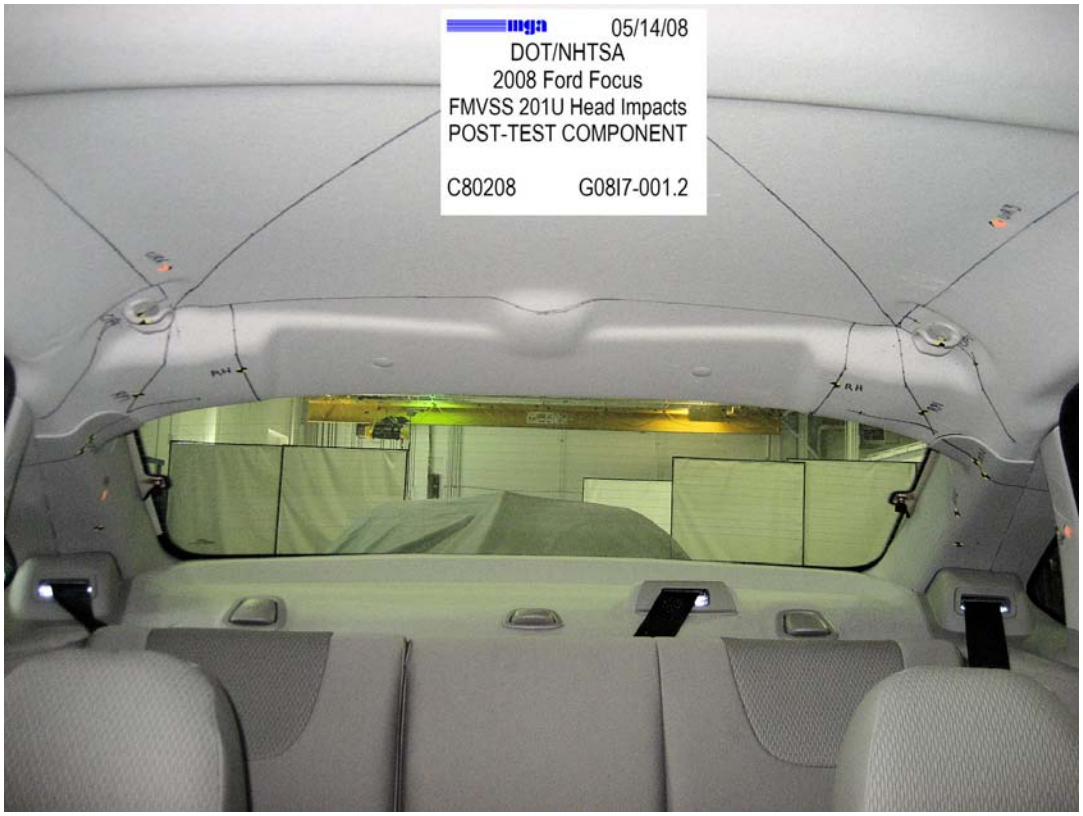
mga
05/09/08
DOT/NHTSA
2008 Ford Focus
FMVSS 201U Head Impacts
PRE-TEST COMPONENT
C80208
G08I7-001.2

Post-Test Component Photographs


05/14/08
DOT/NHTSA
2008 Ford Focus
FMVSS 201U Head Impacts
POST-TEST COMPONENT
C80208
G08I7-001.2

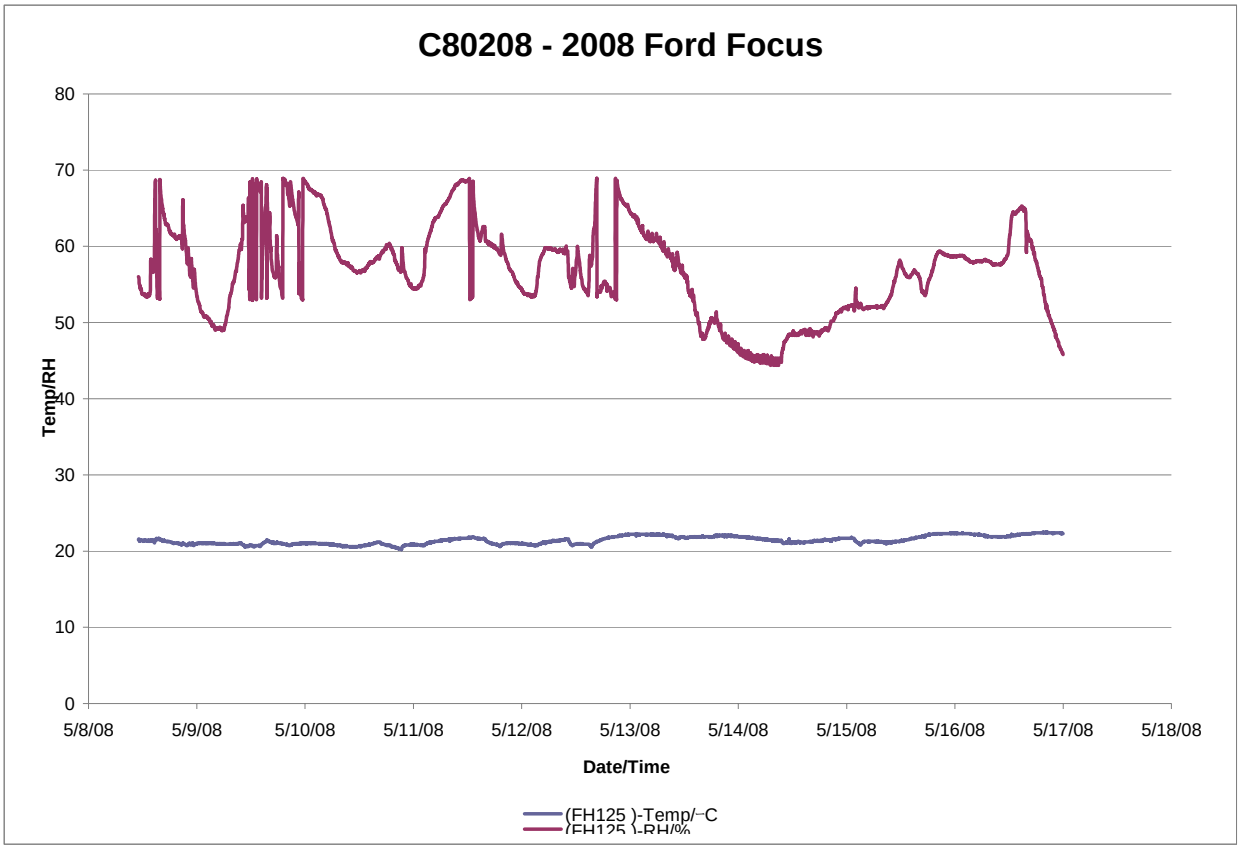

05/14/08
DOT/NHTSA
2008 Ford Focus
FMVSS 201U Head Impacts
POST-TEST COMPONENT
C80208
G08I7-001.2


05/14/08
DOT/NHTSA
2008 Ford Focus
FMVSS 201U Head Impacts
POST-TEST COMPONENT
C80208 G08I7-001.2


05/14/08
DOT/NHTSA
2008 Ford Focus
FMVSS 201U Head Impacts
POST-TEST COMPONENT
C80208 G08I7-001.2


mga
05/14/08
DOT/NHTSA
2008 Ford Focus
FMVSS 201U Head Impacts
POST-TEST COMPONENT
C80208
G08I7-001.2

Appendix A – Temperature Trace



Appendix B – Calibration Certificates

Calibration Certificate

Part Description: Silver **Certification Date:** 02/14/08 **Serial#:** S08-05-98-01273

Single Point (Max-Min/2) Specification: S08-05 +/-.076mm (+/-.0030") **Certificate#:** S0127339492

Volumetric (Max Deviation) Specification: S08-05 +/-.108mm (+/-.0042") **Temperature:** See attached data

Measurement Standards Traceability

Ball Bar Kit	Asset Number: 1041	Calibration Date: 12/10/07	*SI Traceability: L20071012MG1
Thermometer	Asset Number: 668	Calibration Date: 01/16/08	*SI Traceability: A2LA-3775260

*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 a 95% Level of Confidence using k=2.00.

Certification Results

3 Single Point Articulation Tests at <=20%, 20%-80% and >=80% range.	PASSED
1 Effective diameter sphere test.	PASSED
20 Volumetric ball bar tests in 4 quadrants and 2 orientations.	PASSED

Calibration and certification conforms to procedures developed in accordance with ASME B89.4.22-2004.

Instrument condition as received:
Within specifications

Instrument condition outgoing:
Within specifications

Technician: Neil Maclean Date: 2/14/08

FARO Technologies, Inc.
Michigan Regional Office
PH1:248-669-8620

FAX:248-669-8656
L-A-B Cert Number: L1147.01

46998 Magellan Drive
Wixom, MI 48393
USA

FARO®

LABORATORY ACCREDITATION BUREAU
ISO/IEC 17025 Accredited

MetroCal inc.
ACCREDITED #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: **56406**
Certificate Number: **070928600**
Page: **1 of 1**

Gauge Number: **MGA00049**
Gauge Desc: **Digital Protractor**
Manufacturer: **Mitutoyo**
Model Number: **Pro 360**
Serial Number: **N/A**

Customer PO: **A070372**
Last Calibration: **9/5/06**
Calibration Date: **9/28/07**
Next Calibration: **9/28/08**

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 Procedure 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# 24281	12/18/06	12/18/07	061218601	0.0015°
DoAll Sine Bar ID#1879	12/29/06	12/29/07	061229125	0.0015°

Results:

Units
Decimal Deg.

Tolerance
0-10° ± 0.1°
11-79° ± 0.2°
80-90° ± 0.1°

As Found Readings

Nominal	Actual	Deviation
5.00	5.0	0.00
10.00	10.0	0.00
20.00	20.0	0.00
30.00	30.0	0.00
40.00	40.0	0.00

Reference Level Check: Within ± 0.1 degrees

As Left Readings

Nominal	Actual	Deviation
5.00	5.0	0.00
10.00	10.0	0.00
20.00	20.0	0.00
30.00	30.0	0.00
40.00	40.0	0.00

Reference Level Check: Within ± 0.1 degrees

Comments: Environmental conditions during calibration: 68 °F, 43% RH.

Karen Shipley issued: 10/2/07
Karen Shipley/bjk
Calibration Technician

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

NA 10/8/07

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 LEVEL & TOOL
S/N: MGA00123
Calibration Date: 1/15/2008

Subject Tape Measure
Brand: STANLEY
S/N: TPM 820
Calibration Date: 3·1·2008

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: 3·1·2008 Performed By: M Miller

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 2/29/08

MetroCal inc.

Cert# 0513.01

4700 Barden Court SE, Kentwood MI 49512, Telephone: 616-698-3124, Fax: 616-698-2364, www.metrocal.com

Certificate of Calibration

MGA Research
446 Executive Drive
Troy, MI 48083

Order Number: **59556**
Certificate Number: **080506600**
Page: **1 of 1**

Gauge Number: **MGA00777**
Gauge Desc: **Digital Temperature/Humidity Recorder**
Manufacturer: **Dickson**
Model Number: **FH125**
Serial Number: **06018122**

Customer PO: **A070658**
Last Calibration: **N/A**
Calibration Date: **5/6/08**
Next Calibration: **5/6/09**

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 Procedure CP053 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 95% confidence, (K=2)
CL26 Calibrator ID# 10901	12/31/07	12/31/08	10901:1199107512	Calibrator System Unc.
Standard RTD Probe ID#4525	6/13/07	6/13/08	Cert# P143088	0.75 °F

Results:

As Found

Units	Standard RTD Reading	Actual Gage Reading	Error
°C	7.0	7.2	0.2
	21.9	22.3	0.4
Tolerance	33.6	33.2	-0.4
± 1.8°F (± 1°C)			

As Left

Standard RTD Reading	Actual Gage Reading	Error
7.0	7.2	0.2
21.9	22.3	0.4
33.6	33.2	-0.4

Comments: Environmental conditions during calibration: 71° F, 35% RH.
No adjustments required. Calibrated temperature only per client request.

Karen Shipley
Calibration Technician

Issued: 5/6/08

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

5/6/08

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#*** 07-3173 ***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

4/14/08

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#*** 07-3173 ***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*
RF 0lb	0lb	1lb	y	0lb	y	0.5
RF 50lb	50lb	1lb	y	50lb	y	0.5
RF 1000lb	1000lb	2lb	y	1000lb	y	0.5
RF 2200lb	2200lb	2lb	y	2200lb	y	0.5
RR 0lb	0lb	1lb	y	0lb	y	0.5
RR 50lb	50lb	1lb	y	50lb	y	0.5
RR 1000lb	1000lb	2lb	y	1000lb	y	0.5
RR 2200lb	2199lb	2lb	y	2199lb	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 2 of 2

Technician COMMENTS/ weights used: The scale is accurate and working fine. 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

4/14/08

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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: 4/22/2008	**Calibration Date:** *7/20/2007*
	Calibrated By: *Chuck DiMaggio*

Test Reference Number: A0807

New DLR (100k **, Units:G):** 95.8

StdDeviation (%) 0.819

% Difference in DLR (New vs. Old): -1.64

Temperature (°F): 72

Humidity (%): 24

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: J22664	**S/N:** *862/247*
Capacity: 2000 G	**Capacity:** *170 G*
Calibration Date: 4/22/2008	**Calibration Date:** *7/20/2007*
	Calibrated By: *Chuck DiMaggio*

Test Reference Number: A0807

New DLR (100k **, Units:G):** 93.9

StdDeviation (%) 1.153

% Difference in DLR (New vs. Old): -0.3

Temperature (°F): 72

Humidity (%): 24

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: 4/22/2008	**Calibration Date:** *7/20/2007*
	Calibrated By: *Chuck DiMaggio*

Test Reference Number: A0807

New DLR (100k **, Units:G):** 92.6

StdDeviation (%) 1.03

% Difference in DLR (New vs. Old): -1.352

Temperature (°F): 72

Humidity (%): 24

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: AHTB2	**S/N:** *862/247*
Capacity: 2000 G	**Capacity:** *170 G*
Calibration Date: 4/22/2008	**Calibration Date:** *7/20/2007*
	Calibrated By: *Chuck DiMaggio*

Test Reference Number: A0806

New DLR (100k **, Units:G):** 114.5

StdDeviation (%) 0.414

% Difference in DLR (New vs. Old): 0

Temperature (°F): 72

Humidity (%): 24

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: 4/22/2008	**Calibration Date:** *7/20/2007*
	Calibrated By: *Chuck DiMaggio*

Test Reference Number:	A0806
New DLR (100k **, Units:G):**	92.4
StdDeviation (%)	0.309
% Difference in DLR (New vs. Old):	-1.298
Temperature (°F):	72
Humidity (%):	24

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: 4/22/2008	**Calibration Date:** *7/20/2007*
	Calibrated By: *Chuck DiMaggio*

Test Reference Number: A0806

New DLR (100k **, Units:G):** 96.5

StdDeviation (%) 0.35

% Difference in DLR (New vs. Old): 0.045

Temperature (°F): 72

Humidity (%): 24

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: J22700	**S/N:** *862/247*
Capacity: 2000 G	**Capacity:** *170 G*
Calibration Date: 4/15/2008	**Calibration Date:** *7/20/2007*
	Calibrated By: *Chuck DiMaggio*

Test Reference Number: A0803

New DLR (100k **, Units:G):** 95.0

StdDeviation (%) 0.388

% Difference in DLR (New vs. Old): -1.175

Temperature (°F): 72

Humidity (%): 24

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: 4/15/2008	**Calibration Date:** *7/20/2007*
	Calibrated By: *Chuck DiMaggio*

Test Reference Number: A0803

New DLR (100k **, Units:G):** 108.7

StdDeviation (%) 0.547

% Difference in DLR (New vs. Old): -1.766

Temperature (°F): 72

Humidity (%): 24

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: 4/15/2008	**Calibration Date:** *7/20/2007*
	Calibrated By: *Chuck DiMaggio*

Test Reference Number: A0803

New DLR (100k **, Units:G):** 98.8

StdDeviation (%) 0.455

% Difference in DLR (New vs. Old): -0.641

Temperature (°F): 72

Humidity (%): 24

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 (MGA00739)

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

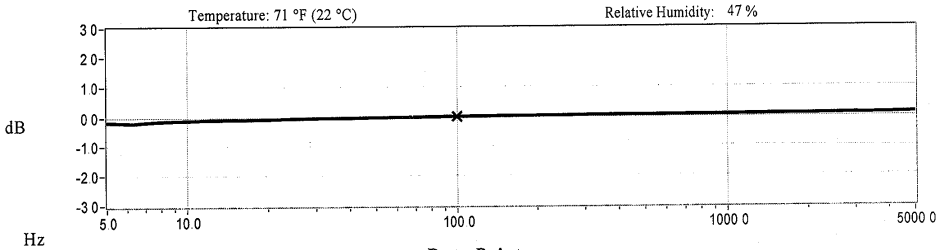
Manufacturer: PCB

ACS-10

Calibration Data

Sensitivity @ 100.0 Hz	**31.36 mV/g**	Output Bias	8.6	VDC
	(3.20 mV/m/s²)	Transverse Sensitivity	3.0	%

Sensitivity Plot



Data Points

Frequency (Hz)	Dev. (%)	Frequency (Hz)	Dev. (%)	Frequency (Hz)	Dev (%)
5.0	-2.0	REF. FREQ.	0.0	5000.0	1.2
10.0	-1.3	300.0	0.4		
15.0	-1.0	500.0	0.5		
30.0	-0.5	1000.0	0.6		
50.0	-0.3	3000.0	1.0		

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)

[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 822/274086 and PTB Traceable thru Project 1060.
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 Date: 07/23/07

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

7/24/07

CAL3 - 3268027234.03

PAGE 1 of 1

~Certificate of Calibration~

Model Number: 484B
Serial Number: 2470
Description: Signal Conditioner
Test Procedure: AT-106-1
Temperature: 71° F

PCB Control #: QC214/QC184/QC198/CA514
Calibration Date: 07/20/07
Recalibration Date:
Calibration Technician: James Higbee 2b
Relative Humidity: 51%

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

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