FINAL REPORT NUMBER 201UI-MGA-11-06

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

FORD MOTOR COMPANY
2011 Ford Fiesta 4-Door Sedan S
NHTSA No. CB0204

MGA RESEARCH CORPORATION
446 Executive Drive
Troy, Michigan 48083

Test Dates: April 29-May 2, 2011
Report Date: May 5, 2011

FINAL REPORT

PREPARED FOR:

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
1200 New Jersey Avenue, SE
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Accepted By: _____

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15. Supplementary Notes			
16. Abstract A compliance test series was conducted on the subject 2011 Ford Fiesta 4-Door Sedan S, NHTSA No. CB0204, 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 April 29-May 2, 2011. Test failures identified were as follows: None The data recorded indicates that the 2011 Ford Fiesta 4-Door Sedan S 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 2011 Ford Fiesta 4-Door Sedan S, meets the performance requirements of FMVSS 201, Occupant Protection in Interior Impact - Upper Interior Head Impact Protection.

Tests were conducted on April 29-May 2, 2011 on a 2011 Ford Fiesta 4-Door Sedan S, 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 November 9, 2009.

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 November 9, 2009.

2.0 COMPLIANCE TEST DATA SUMMARY

The 2011 Ford Fiesta 4-Door Sedan S was equipped with A, B, O, and rear-pillars, and an adjustable seat belt anchorage on each B-pillar.

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	BP2	UR1@ SR1	UR4@SR3-1
AP2	BP4	UR2@SR2A	UR5@X3862
AP3	OP2	UR3@BP	UR6@RP

The 2011 Ford Fiesta 4-Door Sedan S 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: 2011 Ford Fiesta 4-Door Sedan S

VEH. NHTSA NO.: CB0204 VIN: 3FADP4AJ9BM137634 COLOR: Monterey Gray Met.

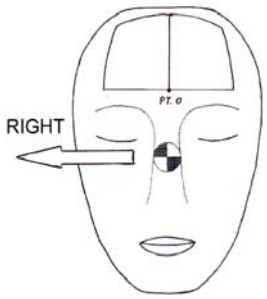
VEH. BUILD DATE: September, 2010 TEST DATES: April 29-May 2, 2011

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Helen Kaleto, Nathaniel Newth, Kevin McKenna, Sean Moran, Ryan Jones

TARGET	VEHICLE SIDE	HORIZONTAL ANGLE (deg)	VERTICAL ANGLE (deg)	VELOCITY (kph)	HIC(d)	FMH HIC	IMPACT ON FMH (mm)	
							Above	Left/Right
AP1	Right	118	50	19.0	680	681	9	6 Right
AP2	Left	199	50	19.1	548	506	25	2 Left
AP3	Right	160	48	18.9	559	520	30	7 Right
BP2	Right	90	10	23.9	599	574	14	3 Right
BP4	Left	270	-10	24.0	650	641	28	2 Right
OP2	Left	270	1	23.8	829	879	16	5 Right
UR1@SR1	Left	270	50	24.0	477	411	36	1 Right
UR2@SR2A	Right	90	50	24.1	488	426	33	4 Left
UR3@BP	Left	270	50	24.0	403	313	41	0
UR4@SR3-1	Right	90	50	24.1	509	455	33	2 Right
UR5@X3862	Left	270	50	23.8	721	736	43	2 Left
UR6@RP	Right	90	50	23.9	450	376	29	1 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: Dislodged trim.

AP3 Right: Dislodged trim.

OP2 Left: Dislodged trim

UR1 Left: Headliner deformation; dislodged headliner.

UR2 Right: Headliner deformation, dislodged headliner.

UR3 Left: Headliner deformation.

UR4 Right: Headliner deformation.

UR5 Left: Headliner deformation.

UR6 Right: Headliner deformation; dislodged headliner.

REMARKS:

The targets listed were impacted in the following order:

Left: OP2, UR5@X3862, BP4, UR3@BP, UR1@SR1, AP2

Right: UR6@RP, UR4@SR3-1, BP2, UR2@SR2A, AP1, AP3

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

RECORDED BY: Nathaniel Newth DATE: May 2, 2011

APPROVED BY: Helen A. Kaleto

TABLE 2-2

GENERAL TEST AND VEHICLE PARAMETER DATA

VEH. MOD YR/MAKE/MODEL/BODY: 2011 Ford Fiesta 4-Door Sedan S

VEH. NHTSA NO.: CB0204 VIN: 3FADP4AJ9BM137634 COLOR: Monterey Gray Met.

VEH. BUILD DATE: September, 2010 TEST DATES: April 29-May 2, 2011

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Helen Kaleto, Nathaniel Newth, Kevin McKenna, Sean Moran, Ryan Jones

INTERIOR TRIM INFORMATION: A, B, O, and rear-pillars, and an adjustable seat belt anchorage on each B-pillar.

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: January 5, 2011; Odometer Reading 106 miles

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured By: Ford Motor Company

Date of Manufacture: September, 2010; VIN: 3FADP4AJ9BM137634

GVWR: 1642 kg; GAWR FRONT: 839 kg;

GAWR REAR: 816 kg;

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load:

FRONT: 220 kPa REAR: 220 kPa

Recommended Tire Size: P185/60R15

Recommended Cold Tire Pressure:

FRONT: 220 kPa REAR: 220 kPa

Size of Tire on Test Vehicle: P185/60R15

Type of Spare Tire: T125/80D15; 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 =	328.5 kg	Right Rear =	239.5 kg
Left Front =	343.5 kg	Left Rear =	248.5 kg
TOTAL FRONT =	672.0 kg	TOTAL REAR =	488.0 kg
% Total Weight =	57.9 %	% Total Weight =	42.1 %

TOTAL DELIVERED WEIGHT = 1160.0 kg

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight = 1160.0 kg

Max. Test Cargo/Luggage Weight = 35.0 kg

Target Test Weight = 1195.0 kg

WEIGHT OF TEST VEHICLE FULLY LOADED:

Right Front =	324.5 kg	Right Rear =	261.0 kg
Left Front =	339.5 kg	Left Rear =	269.5 kg
TOTAL FRONT =	664.0 kg	TOTAL REAR =	530.5 kg
% Total Weight =	55.6 %	% Total Weight =	44.4 %

TOTAL TEST WEIGHT = 1194.5 kg

Weight of ballast secured in vehicle's cargo area = 34.5 kg

TEST VEHICLE ATTITUDE:

AS DELIVERED: Right Front 650 mm; Left Front 645 mm;
Right Rear 645 mm; Left Rear 642 mm;
Pitch Angle at Right Door Sill = 0.1 Rear is higher
Pitch Angle at Left Door Sill = 0.3 Rear is higher
Roll Angle at Front Bumper = 0.1 Left is higher
Roll Angle at Rear Bumper = 0.2 Right is higher

FULLY LOADED: Right Front 655 mm; Left Front 650 mm;
Right Rear 636 mm; Left Rear 634 mm;
Pitch Angle at Right Door Sill = 0.2 Front is higher
Pitch Angle at Left Door Sill = 0.1 Rear is higher
Roll Angle at Front Bumper = 0.0
Roll Angle at Rear Bumper = 0.1 Right is higher

AS TARGETED: Right Front 777 mm; Left Front 776 mm;
Right Rear 757 mm; Left Rear 757 mm;
Pitch Angle at Right Door Sill = 0.1 Rear is higher
Pitch Angle at Left Door Sill = 0.1 Rear is higher
Roll Angle at Front Bumper = 0.0
Roll Angle at Rear Bumper = 0.1 Right is higher

AS TESTED ON RIGHT SIDE:

Pitch Angle at Right Door Sill =	0.1 Rear is higher
Pitch Angle at Left Door Sill =	0.1 Rear is higher
Roll Angle at Front Bumper =	0.0
Roll Angle at Rear Bumper =	0.1 Right is higher

AS TESTED ON LEFT SIDE:

Pitch Angle at Right Door Sill =	0.1 Rear is higher
Pitch Angle at Left Door Sill =	0.1 Rear is higher
Roll Angle at Front Bumper =	0.0
Roll Angle at Rear Bumper =	0.1 Right is higher

VEHICLE WHEELBASE = 2491 mm

REMARKS: The seat travel distance was measured to be 231 mm for the driver front seat and 231 mm for the passenger front seat.

RECORDED BY: Nathaniel Newth DATE: April 19, 2011

APPROVED BY: Helen A. Kaleto

TABLE 2-3

HORIZONTAL IMPACT ANGLE RANGE FOR A AND B PILLARS

VEH. MOD YR/MAKE/MODEL/BODY: 2011 Ford Fiesta 4-Door Sedan S

VEH. NHTSA NO.: CB0204 VIN: 3FADP4AJ9BM137634 COLOR: Monterey Gray Met.

VEH. BUILD DATE: September, 2010 TEST DATES: April 29-May 2, 2011

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Helen Kaleto, Nathaniel Newth, Kevin McKenna, Sean Moran, Ryan Jones

HORIZONTAL IMPACT ANGLE RANGE FOR A AND B PILLARS

	HORIZONTAL ANGLE SPECIFIED RANGE	MINIMUM HORIZONTAL ANGLE	MAXIMUM HORIZONTAL ANGLE
A-PILLAR	L 195º-255º	L 199.0º	L 242.6º
	R 105º-165º	R 117.9º	R 160.8º
B-PILLAR	L 195º-345º	L 201.1º	L 277.2º
	R 15º-165º	R 83.6º	R 158.3º

AS DETERMINED USING THE PROCEDURES SPECIFIED IN S8.13.4.1

REMARKS:

RECORDED BY: Nathaniel Newth DATE: April 19, 2011

APPROVED BY: Helen A. Kaleto

TABLE 2-4

VERTICAL IMPACT ANGLE RANGES

VEH. MOD YR/MAKE/MODEL/BODY: 2011 Ford Fiesta 4-Door Sedan S

VEH. NHTSA NO.: CB0204 VIN: 3FADP4AJ9BM137634 COLOR: Monterey Gray Met.

VEH. BUILD DATE: September, 2010 TEST DATES: April 29-May 2, 2011

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Helen Kaleto, Nathaniel Newth, Kevin McKenna, Sean Moran, Ryan Jones

VERTICAL IMPACT ANGLE RANGES

			VERTICAL ANGLE SPECIFIED RANGE	MINIMUM VERTICAL ANGLE	MAXIMUM VERTICAL ANGLE
FRONT HEADER	FH1	L	0º-50º	0º	50º
		R	0º-50º	0º	50º
	FH2	L	0º-50º	0º	50º
		R	0º-50º	0º	50º
SIDE RAIL	SR1	L	0º-50º	0º	27º
		R	0º-50º	0º	27º
	SR2A	L	0º-50º	0º	9º
		R	0º-50º	0º	9º
	SR2B	L	0º-50º	0º	33º
		R	0º-50º	0º	33º
	SR3-1	L	0º-50º	0º	30º
		R	0º-50º	0º	30º
	SR3-2	L	0º-50º	0º	35º
		R	0º-50º	0º	35º
REAR HEADER	RH	L	0º-50º	0º	50º
		R	0º-50º	0º	50º

		VERTICAL ANGLE SPECIFIED RANGE	MINIMUM VERTICAL ANGLE	MAXIMUM VERTICAL ANGLE
A-PILLAR	AP1	L -5º-50º	L -5º	L 50º
		R -5º-50º	R -5º	R 50º
	AP2	L -5º-50º	L -5º	L 50º
		R -5º-50º	R -5º	R 50º
	AP3	L -5º-50º	L -5º	L 48º
		R -5º-50º	R -5º	R 48º
B-PILLAR	BP1	L -10º-50º	L -10º	L 12º
		R -10º-50º	R -10º	R 12º
	BP2*	L 0º-50º	L 0º	L 10º
		R 0º-50º	R 0º	R 10º
	BP3	L -10º-50º	L -10º	L 0º
		R -10º-50º	R -10º	R 0º
	BP4	L -10º-50º	L -10º	L -10º
		R -10º-50º	R -10º	R -10º
OTHER PILLAR	OP1	L -10º-50º	L -10º	L 20º
		R -10º-50º	R -10º	R 20º
	OP2	L -10º-50º	L -10º	L 1º
		R -10º-50º	R -10º	R 1º
REAR PILLAR	RP1	L -10º-50º	L -10º	L 18º
		R -10º-50º	R -10º	R 18º
	RP2	L -10º-50º	L -10º	L -3º
		R -10º-50º	R -10º	R -3º
UPPER ROOF 1		0º-50º	0º	50º
UPPER ROOF 2		0º-50º	0º	50º
UPPER ROOF 3		0º-50º	0º	50º
UPPER ROOF 4		0º-50º	0º	50º
UPPER ROOF 5		0º-50º	0º	50º

	VERTICAL ANGLE SPECIFIED RANGE	MINIMUM VERTICAL ANGLE	MAXIMUM VERTICAL ANGLE
UPPER ROOF 6	0º-50º	0º	50º

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

RECORDED BY: Nathaniel Newth DATE: April 19, 2011

APPROVED BY: Helen A. Kaleto

TABLE 2-5

TARGET MEASUREMENTS

VEH. MOD YR/MAKE/MODEL/BODY: 2011 Ford Fiesta 4-Door Sedan S

VEH. NHTSA NO.: CB0204 VIN: 3FADP4AJ9BM137634 COLOR: Monterey Gray Met.

VEH. BUILD DATE: September, 2010 TEST DATES: April 29-May 2, 2011

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Helen Kaleto, Nathaniel Newth, Kevin McKenna, Sean Moran, Ryan Jones

Measurement	Description	Left Side	Right Side
M	Seat Fore/Aft Travel (Front seats)	231 mm	231 mm
Tº	Horizontal < {CG-F1 (Left Seat) to (Right A-Pillar)}	117.4º	--
A1º	360º - Tº	242.6º	--
Wº	Horizontal < {CG-2 (Left Seat) to (Left A-Pillar)}	199.0º	--
A2º	A2º = Wº	199.0º	--
Uº	Horizontal < {CG-2 (Left Seat) to (Left B-Pillar)}	277.2º	--
B1º	B1º = Uº	277.2º	--
Vº	Horizontal < {CG-R (Left Seat) to (Left B-Pillar)}	201.1º	--
B2º	B2º = Vº	201.1º	--
Wº (right)	Horizontal < {CG-F2 (Right Seat) to (Right A-Pillar)}	--	160.8º
A1º (right)	A1º (right) = Wº (right)	--	160.8º
T º (right)	Horizontal < {CG-F1 (Right Seat) to (Left A-Pillar)}	--	242.1º
A2º (right)	360º-Tº (right)	--	117.9º
V º (right)	Horizontal < {CG-R (Right Seat) to (Right B-Pillar)}	--	158.3º
B1º (right)	B1º (right) = Vº (right)	--	158.3º
U º (right)	Horizontal < {CG-F2 (Right Seat) to (Right B-Pillar)}	--	83.6º
B2º (right)	B2º (right) = Uº (right)	--	83.6º
J	A-Pillar {(Plane 3) – (Plane 5)}	325.0 mm	329.8 mm
J/2	J ÷ 2	162.5 mm	164.9 mm
D1	Upper Roof {(Plane A) – (Plane B)}	1457.0 mm	
D1/2	D1 ÷ 2	728.5 mm	
D2	Upper Roof {(Plane C) – (Plane D)}	1120.0 mm	

Measurement	Description	Left Side	Right Side
D2/2	D2 ÷ 2	560.0 mm	
.35D1	.35 x D1	510.0 mm	
.35D2	.35 x D2	392.0 mm	
N	B-Pillar {(BPR) – (lowest point on daylight opening forward of B-Pillar)}	420.9 mm	417.2 mm
N/2	B-Pillar {(BP3) – (lowest point on daylight opening forward of B-Pillar)}	210.5 mm	208.6 mm
N/4	B-Pillar {(BP4) – (lowest point on daylight opening forward of B-Pillar)}	105.2 mm	104.3 mm
Q	O-Pillar (Plane 13- Plane 14)	332.5 mm	329.2 mm
164.6D	Q / 2	166.3 mm	164.6 mm
D	R-Pillar (Point 7 – Point M)	653.0 mm	653.0 mm
3D/7	3*D / 7	279.9 mm	279.9 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	3130.7	-335.0	695.0	3117.7	335.0	678.3
Rear	3874.7	-325.0	716.5	3874.7	325.0	716.5

SgRP Locations (vehicle coordinates)						
	Left (mm)			Right (mm)		
	x	y	z	x	y	z
Front	3130.7	-335.0	695.0	3117.7	335.0	678.3
Rear	3874.7	-325.0	716.5	3874.7	325.0	716.5

CG Locations (world coordinates)						
	Left (mm)			Right (mm)		
	x	y	z	X	y	z
CGF1	3059.7	-335.0	1355.0	3046.7	335.0	1338.3
CGF2	3290.7	-335.0	1355.0	3277.7	335.0	1338.3
CGR	4034.7	-325.0	1376.5	4034.7	325.0	1376.5

REFERENCE FOR VEHICLE COORDINATE SYSTEM (measured in millimeters):

Front driver door striker lower bolt hole (x, y, z) = 3232.0, -734.0, 819.0

Front passenger seat front inboard bolt hole (x, y, z) = 2746.0, 125.0, 475.0

Rear passenger door striker upper bolt hole (x, y, z) = 4176.0, 687.0, 1073.0

REMARKS:

RECORDED BY: Nathaniel Newth DATE: April 19, 2011

APPROVED BY: Helen A. Kaleto

TABLE 2-6

SUMMARY OF TARGETING RESULTS

VEH. MOD YR/MAKE/MODEL/BODY: 2011 Ford Fiesta 4-Door Sedan S

VEH. NHTSA NO.: CB0204 VIN: 3FADP4AJ9BM137634 COLOR: Monterey Gray Met.

VEH. BUILD DATE: September, 2010 TEST DATES: April 29-May 2, 2011

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Helen Kaleto, Nathaniel Newth, Kevin McKenna, Sean Moran, Ryan Jones

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	2870.0	-496.9	1488.7	--	--	Yes	--	--
REL	2911.1	-518.3	1449.2	242	50	--	3	No
AP2	2762.3	-547.7	1401.5	199	50	No	--	Yes
AP3	2553.6	-572.9	1327.0	199	48	No	--	No
A-Pillar Right Side								
AP1	2870.7	500.2	1493.3	--	--	Yes	--	--
REL	2911.9	522.1	1448.4	118	50	--	3	Yes
AP2	2775.9	551.0	1405.5	160	50	No	--	No
AP3	2557.8	576.1	1329.4	160	48	No	--	Yes
B-Pillar Left Side								
BP1	3370.9	-461.1	1518.7	270	12	No	--	No
BP2	3348.3	-550.8	1316.5	270	10	No	--	No
BP3	3311.1	-590.2	1309.1	--	--	Yes	--	--
REL	3286.5	-591.6	1308.7	270	0	--	1	No
BP4	3392.2	-633.7	1205.3	--	--	Yes	--	--
REL	3387.8	-624.0	1224.2	270	-10	--	1	Yes
B-Pillar Right Side								
BP1	3375.2	468.5	1515.0	90	12	No	--	No
BP2	3350.3	554.0	1315.6	90	10	No	--	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**					
BP3	3310.3	594.1	1307.1	--	--	Yes	--	--
REL	3284.3	595.4	1312.5	90	0	--	1	No
BP4	3395.3	635.9	1203.9	--	--	Yes	--	--
REL	3387.5	628.9	1224.3	90	-10	--	1	No
Other Pillar Left Side								
OP1	4034.3	-424.1	1507.0	--	--	Yes	--	--
REL	4056.5	-422.6	1496.4	270	20	--	1	No
OP2	4127.0	-570.2	1341.6	--	--	Yes	--	--
REL	4108.7	-559.8	1330.0	270	1	--	1	Yes
Other Pillar Right Side								
OP1	4035.0	426.5	1505.1	--	--	Yes	--	--
REL	4057.6	423.8	1499.9	90	20	--	1	No
OP2	4127.4	572.5	1339.6	--	--	Yes	--	--
REL	4107.5	561.3	1330.4	90	1	--	1	No
Rear Pillar Left Side								
RP1	4078.4	-464.2	1465.4	--	--	Yes	--	--
REL	4074.5	-477.2	1446.4	270	18	--	1	No
RP2	4387.4	-550.4	1316.3	--	--	Yes	--	--
REL	4340.9	-475.9	1403.7	270	-3	--	5	No
Rear Pillar Right Side								
RP1	4080.2	465.8	1467.6	--	--	Yes	--	--
REL	4077.1	480.2	1445.8	90	18	--	1	No
RP2	4384.1	552.6	1317.9	--	--	Yes	--	--
REL	4339.1	477.8	1404.4	90	-3	--	5	No
Front Header Left Side								
FH1	2814.3	-388.3	1492.0	180	50	No	--	No
FH2	2803.3	-237.1	1502.8	180	50	No	--	No
Front Header Right Side								
FH1	2815.0	388.5	1492.9	180	50	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**					
FH2	2804.2	242.4	1503.5	180	50	No	--	No
Side Rail Left Side								
SR1	3020.6	-480.0	1517.3	--	--	Yes	--	--
REL	3022.3	-501.6	1477.0	270	27	--	2	No
SR2A	3169.5	-471.4	1523.6	270	9	No	--	No
SR2B	3071.2	-476.9	1517.3	--	--	Yes	--	--
REL	3084.1	-501.1	1481.0	270	33	--	2	No
SR3-1	3520.8	-457.8	1511.8	270	30	No	--	No
SR3-2	4184.9	-477.1	1435.5	--	--	Yes	--	--
REL	4168.1	-483.6	1422.6	270	35	--	1	No
Side Rail Right Side								
SR1	3021.4	484.7	1518.0	--	--	Yes	--	--
REL	3024.2	506.1	1475.7	90	27	--	2	No
SR2A	3169.8	475.8	1525.4	90	9	No	--	No
SR2B	3074.8	484.4	1517.8	--	--	Yes	--	--
REL	3084.1	504.7	1480.2	90	33	--	2	No
SR3-1	3524.6	465.9	1510.0	90	30	No	--	No
SR3-2	4184.3	479.7	1435.4	--	--	Yes	--	--
REL	4168.7	487.9	1419.7	90	35	--	1	No
Rear Header Left Side								
RH	4063.8	-325.8	1517.5	0	50	No	--	No
Rear Header Right Side								
RH	4062.3	324.7	1517.9	0	50	No	--	No
Upper Roof Left Side								
UR1@SR1	2970.5	-354.8	1540.8	270	50	No	--	Yes
UR3@BP	3385.2	-343.9	1555.6	270	50	No	--	Yes
UR5@U3862	3862.1	-314.6	1563.6	270	50	No	--	Yes
Upper Roof Right Side								
UR2@SR2A	3173.4	344.6	1572.7	90	50	No	--	Yes

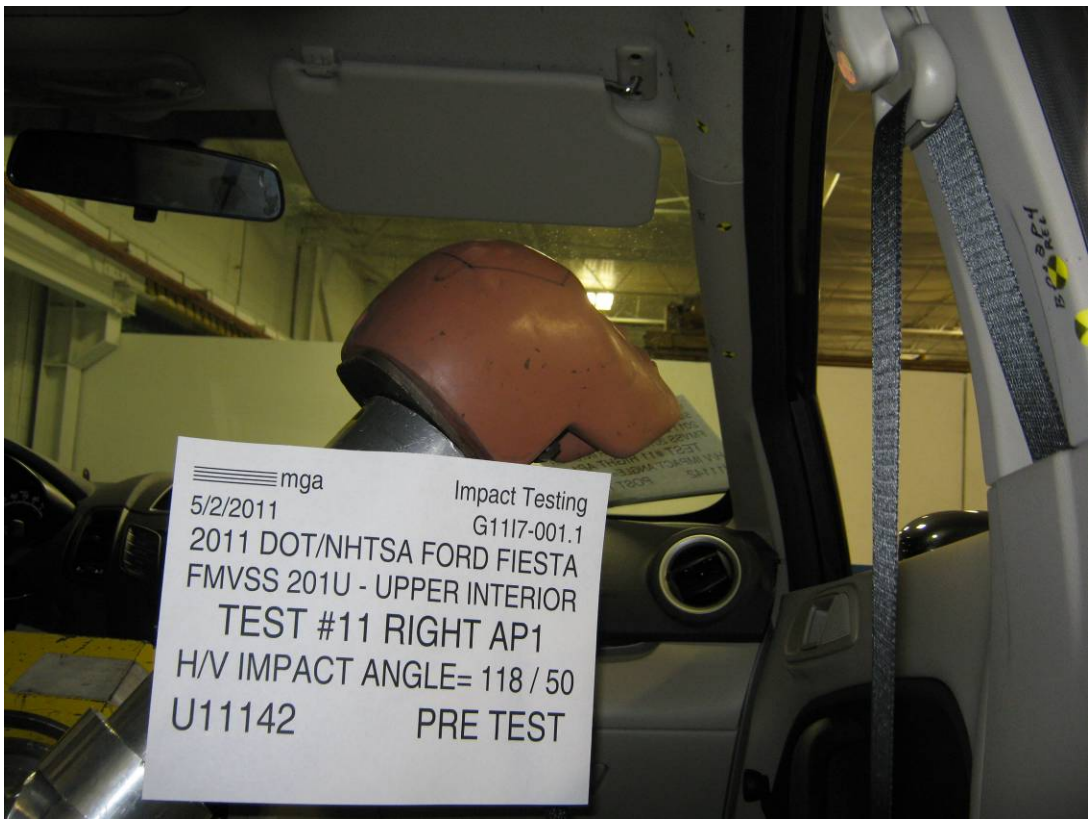
SUMMARY OF TARGETING RESULTS								
Target	**Location (mm)**			**Horizontal Angle (deg)**	**Vertical Angle (deg)**	**Relocation (Yes/No)**	**Extension (# of 25 mm Spheres)**	**Impact (Yes/No)**
	x	**y**	**z**					
UR4@SR3-1	3667.8	312.6	1578.8	90	50	No	--	Yes
UR6@RP	3962.3	317.2	1551.2	90	50	No	--	Yes

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

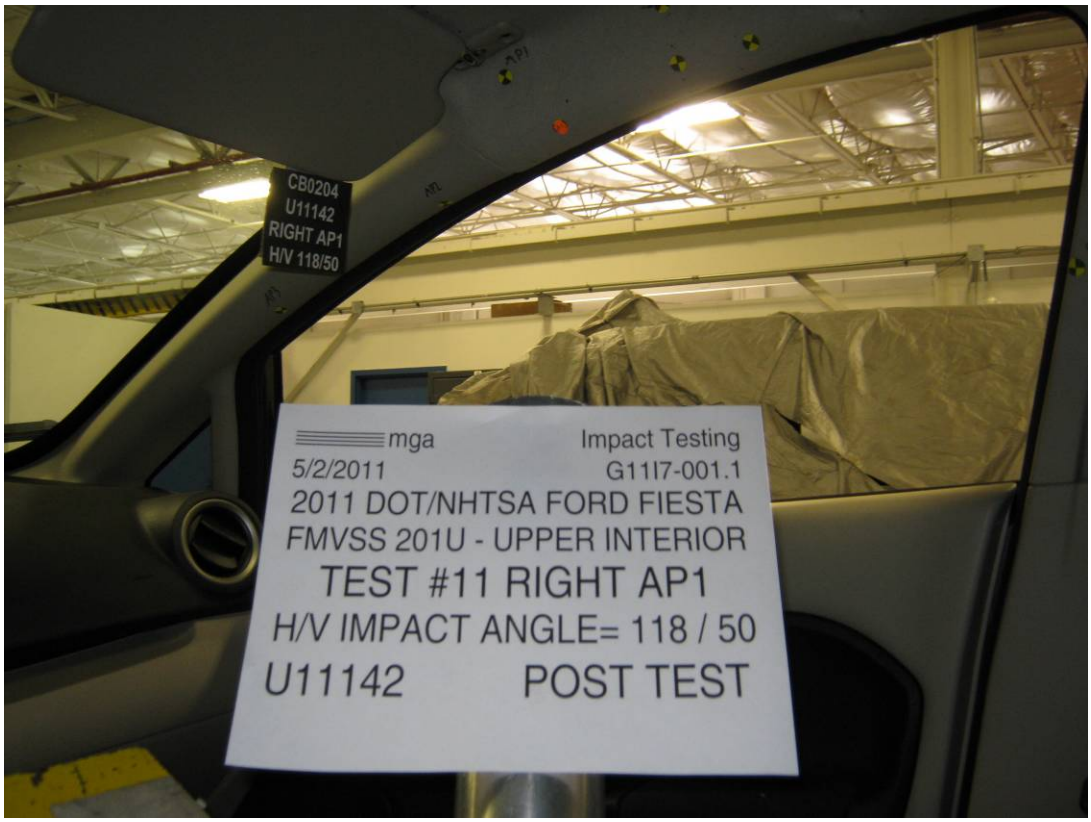
RECORDED BY: Nathaniel Newth DATE: April 19, 2011

APPROVED BY: Helen A. Kaleto

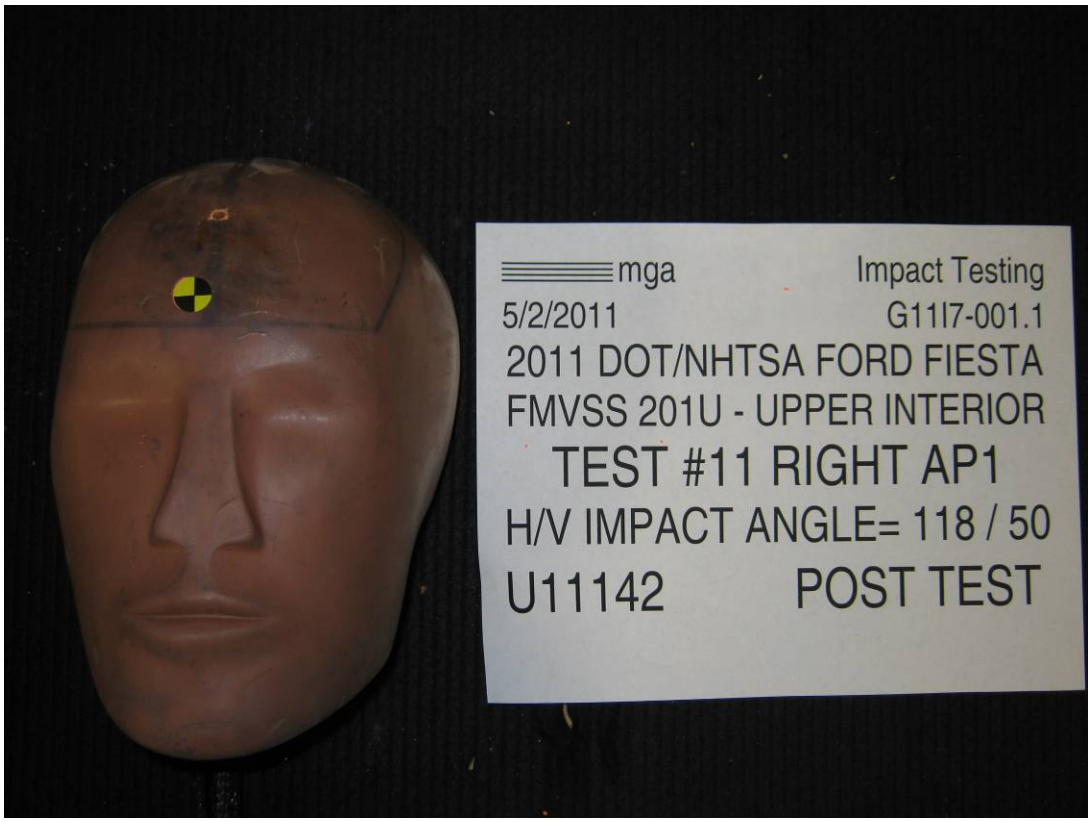
3.0 TEST DATA (Including Acceleration and Velocity Plots)




CB0204
U11142
RIGHT AP1
H/V 118/50
mga
Impact Testing
5/2/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #11 RIGHT AP1
H/V IMPACT ANGLE= 118 / 50
U11142
POST TEST


CB0204
U11142
RIGHT AP1
H/V 118/50
mga
Impact Testing
5/2/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #11 RIGHT AP1
H/V IMPACT ANGLE= 118 / 50
U11142
POST TEST


AP1
AP2


mga
Impact Testing
5/2/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #11 RIGHT AP1
H/V IMPACT ANGLE= 118 / 50
U11142
POST TEST

SUMMARY OF FMVSS 201U TEST118

JOB/NHTSA NO: G11I7-001.1 VEHICLE YR/MAKE/MODEL:2011/DOT/NHTSA/Ford Fiesta

GENERAL TEST PARAMETERS:

Test Number:#11

Target (Vehicle Side): AP1Right

Temperature:21.8C

MGA Test Reference No.:U11142

Humidity:27.6%

Approach Horizontal Angles:118º

Time of Test:3:16:25 PM

Approach Vertical Angles:50º

FMH Serial No:[037]

Additional Description:

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
680	681	6	19.0	9	6 Right

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J32177	-113.7	1.07	1.07
Y	6	J14103	93.9	0.85	0.85
Z	7	J35800	97.8	0.94	0.94

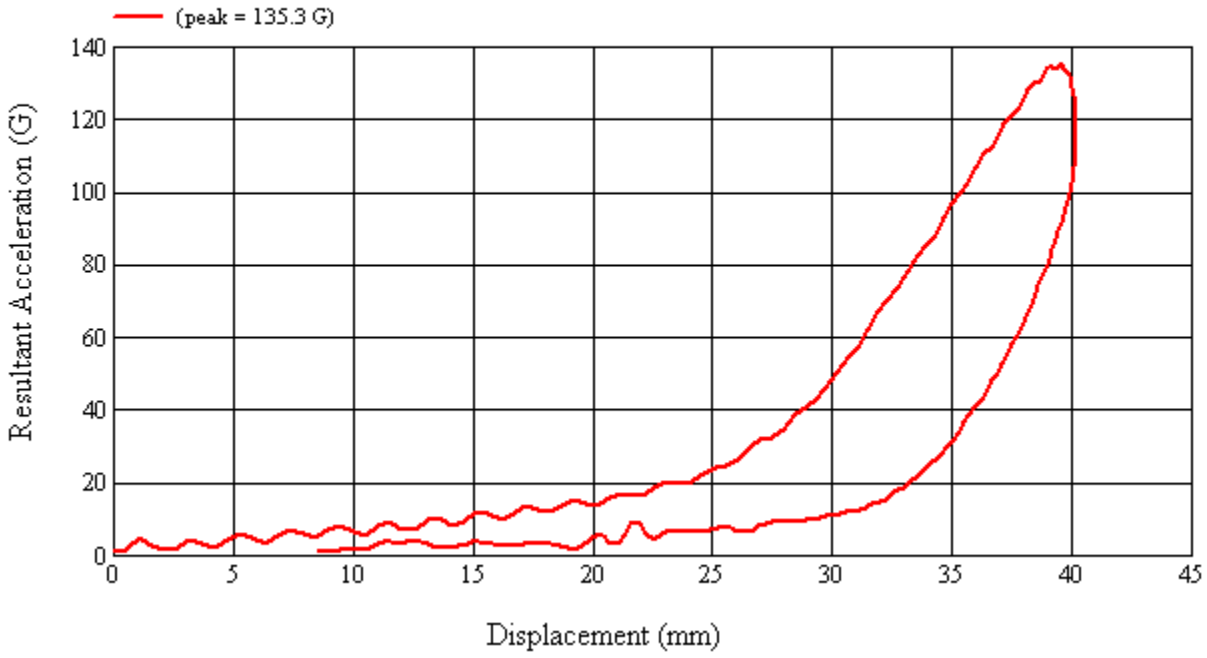
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

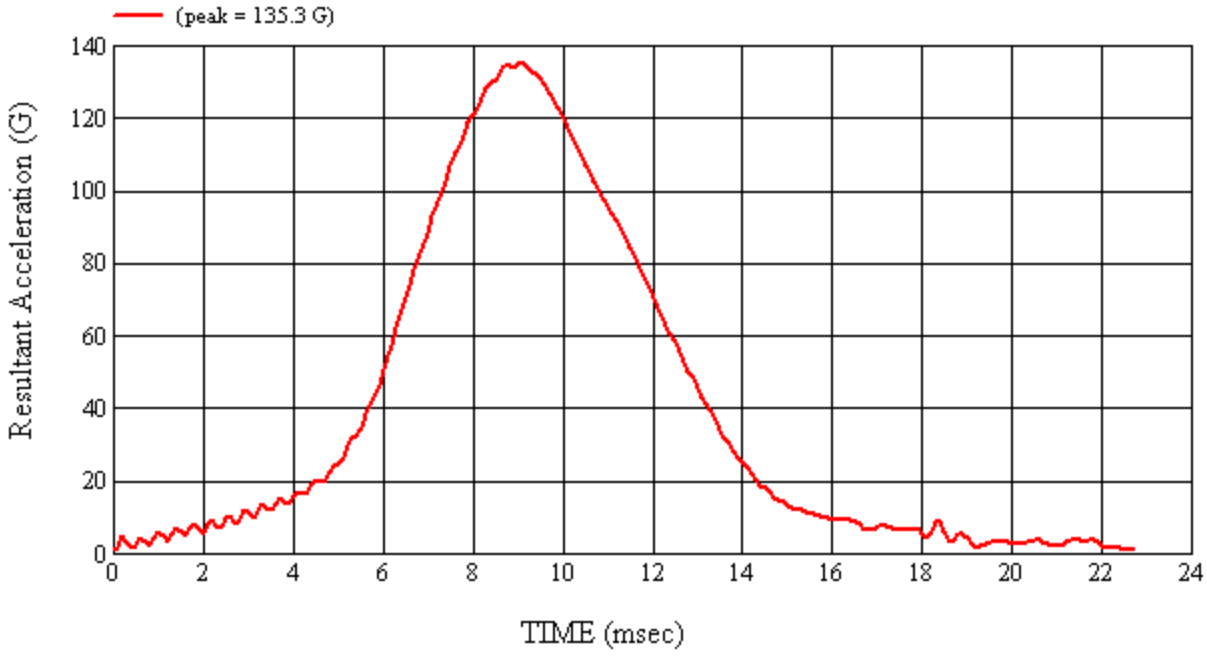
No visible damage

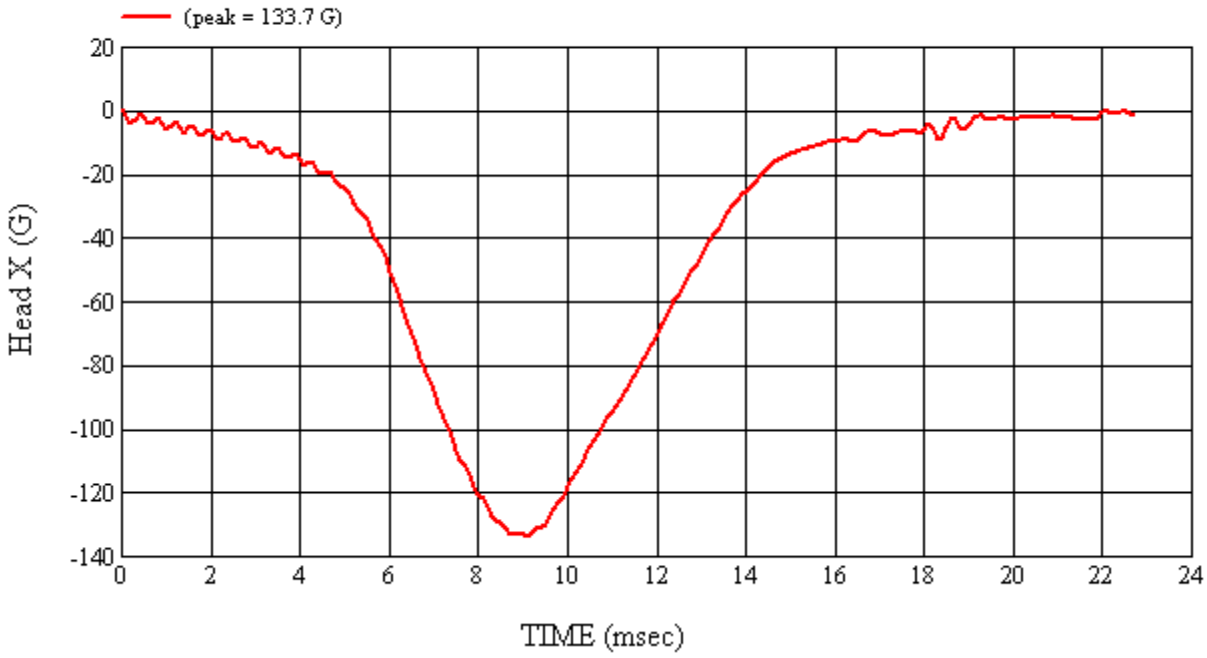
Recorded By: _____ Approved By*: _____ Date: 5/2/2011

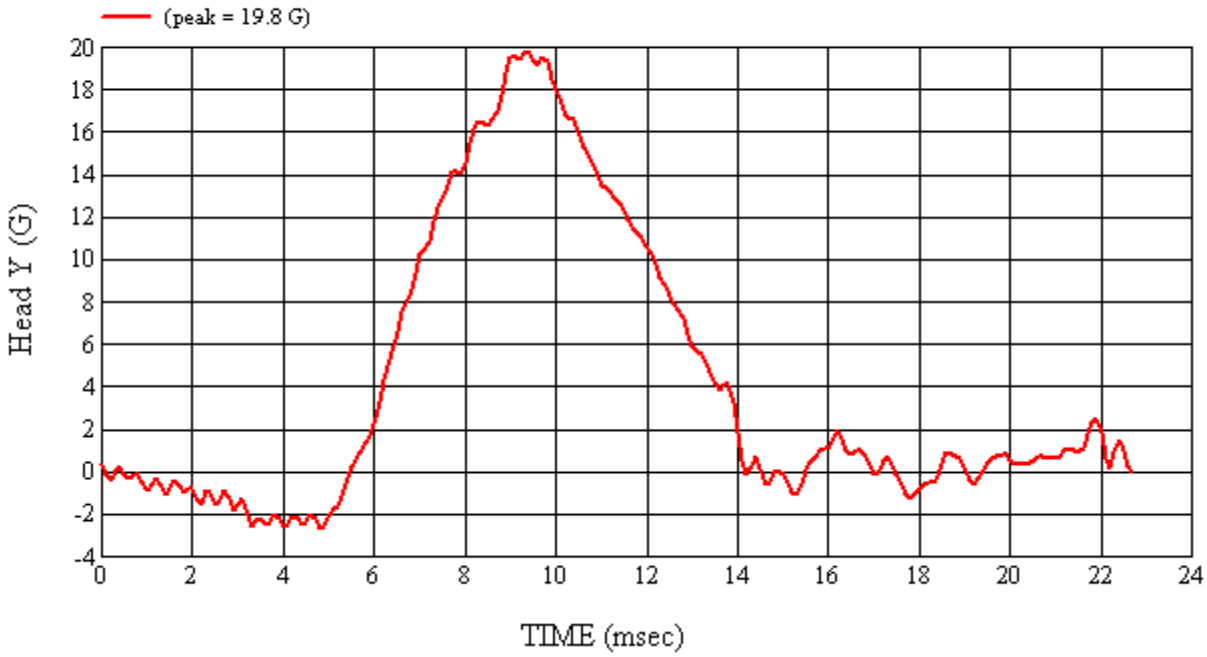
*Only necessary for NHTSA (Government) Compliance testing.

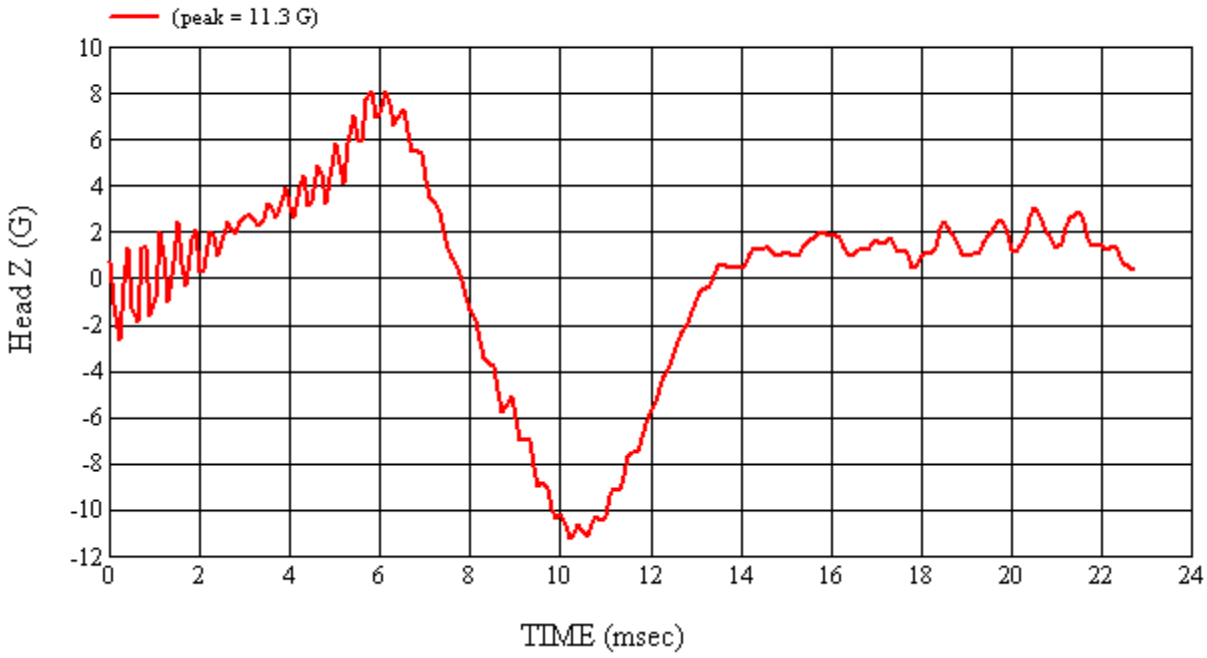
MGA Test #: U11142 Target Location: AP1, Right Side Test Date: 5/2/2011

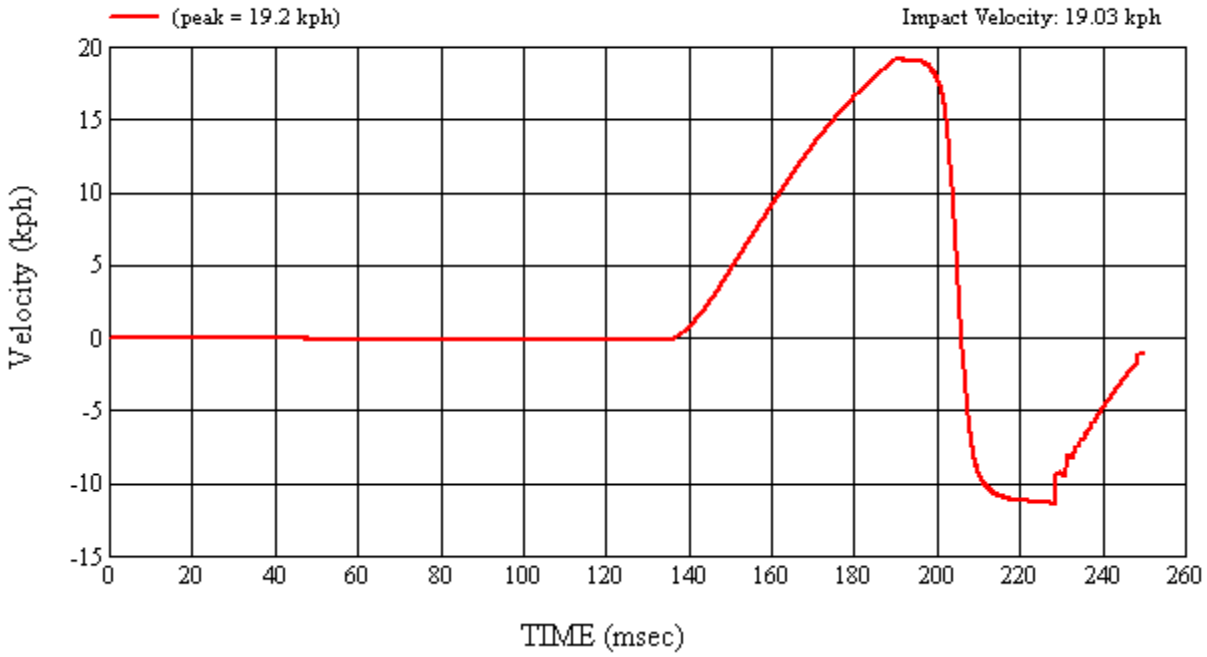


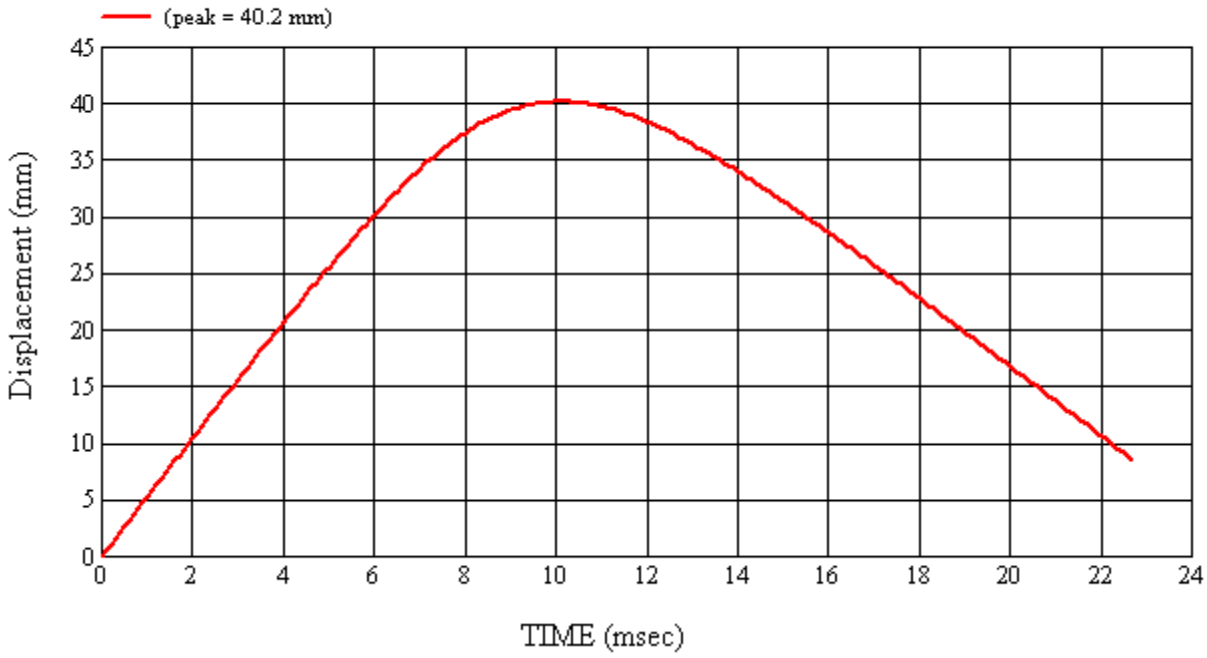



(peak = 133.7 G)
Head X (G)
20
0
-20
-40
-60
-80
-100
-120
-140
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)

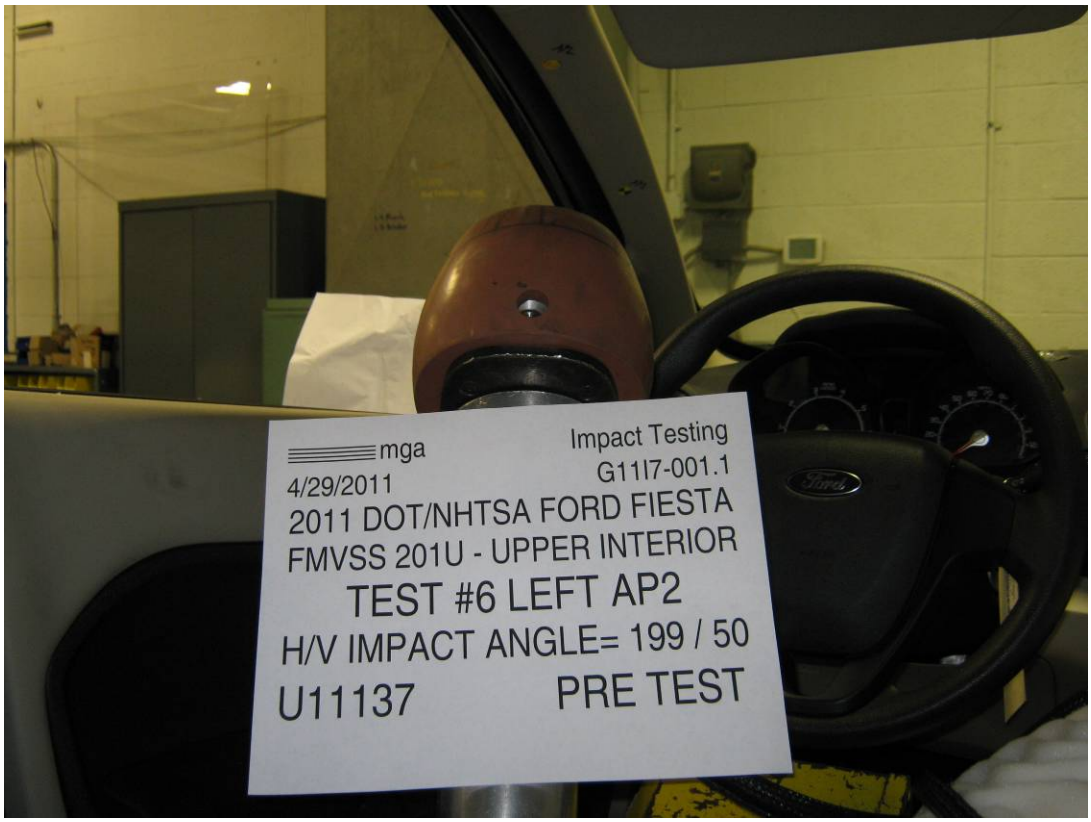

(peak = 19.8 G)
Head Y (G)
20
18
16
14
12
10
8
6
4
2
0
-2
-4
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)


(peak = 11.3 G)
Head Z (G)
10
8
6
4
2
0
-2
-4
-6
-8
-10
-12
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)


(peak = 19.2 kph)
Impact Velocity: 19.03 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 = 40.2 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
TIME (msec)


mga
Impact Testing
G11I7-001.1
4/29/2011
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #6 LEFT AP2
H/V IMPACT ANGLE= 199 / 50
U11137
PRE TEST


mga
Impact Testing
G11I7-001.1
4/29/2011
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #6 LEFT AP2
H/V IMPACT ANGLE= 199 / 50
U11137
PRE TEST


CB0204
U11137
LEFT AP2
mga
Impact Testing
4/29/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #6 LEFT AP2
H/V IMPACT ANGLE= 199 / 50
U11137
POST TEST


mga
Impact Testing
4/29/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #6 LEFT AP2
H/V IMPACT ANGLE= 199 / 50
U11137
POST TEST


AP2


mga
Impact Testing
4/29/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #6 LEFT AP2
H/V IMPACT ANGLE= 199 / 50
U11137
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G11I7-001.1 VEHICLE YR/MAKE/MODEL:2011/DOT/NHTSA/Ford Fiesta

GENERAL TEST PARAMETERS:

Target (Vehicle Side): AP2Left

MGA Test Reference No.:U11137

Approach Horizontal Angles:199º

Approach Vertical Angles:50º

Additional Description:

Test Number:#6

Temperature:22.6C

Humidity:32.8%

Time of Test:6:24:52 PM

FMH Serial No:[038]

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
548	506	6.1	19.1	25	2 Left

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J22700	-96.4	1.07	1.07
Y	6	J36197	108.7	0.85	0.85
Z	7	J36353	99.1	0.94	0.94

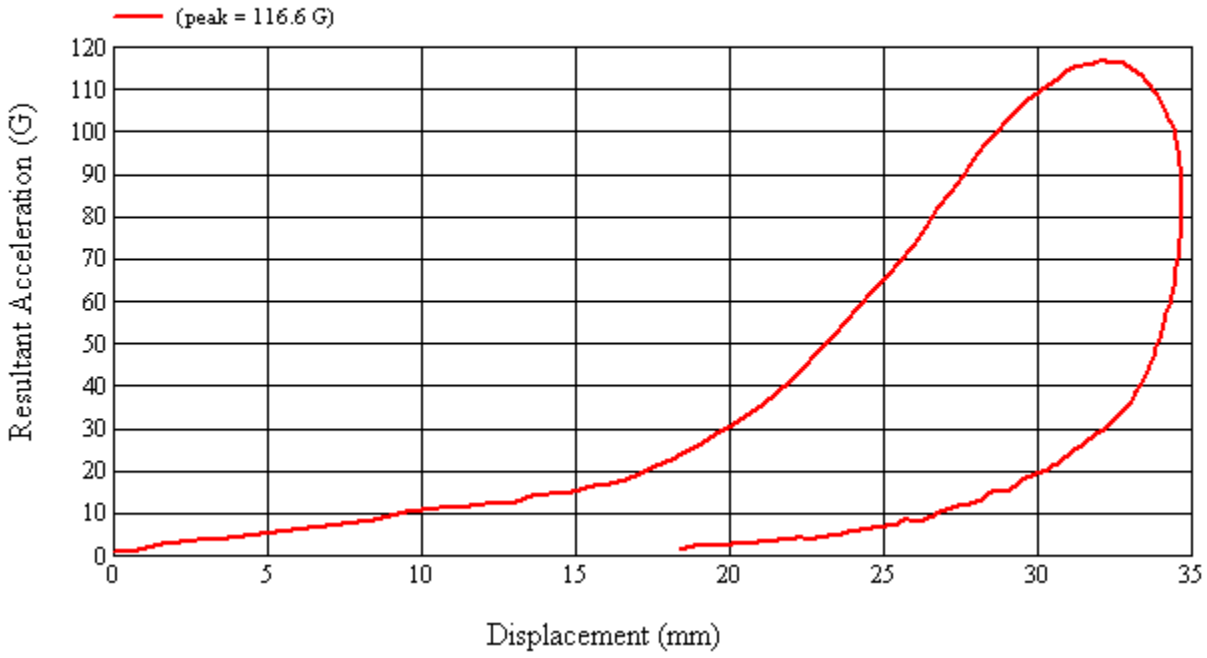
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

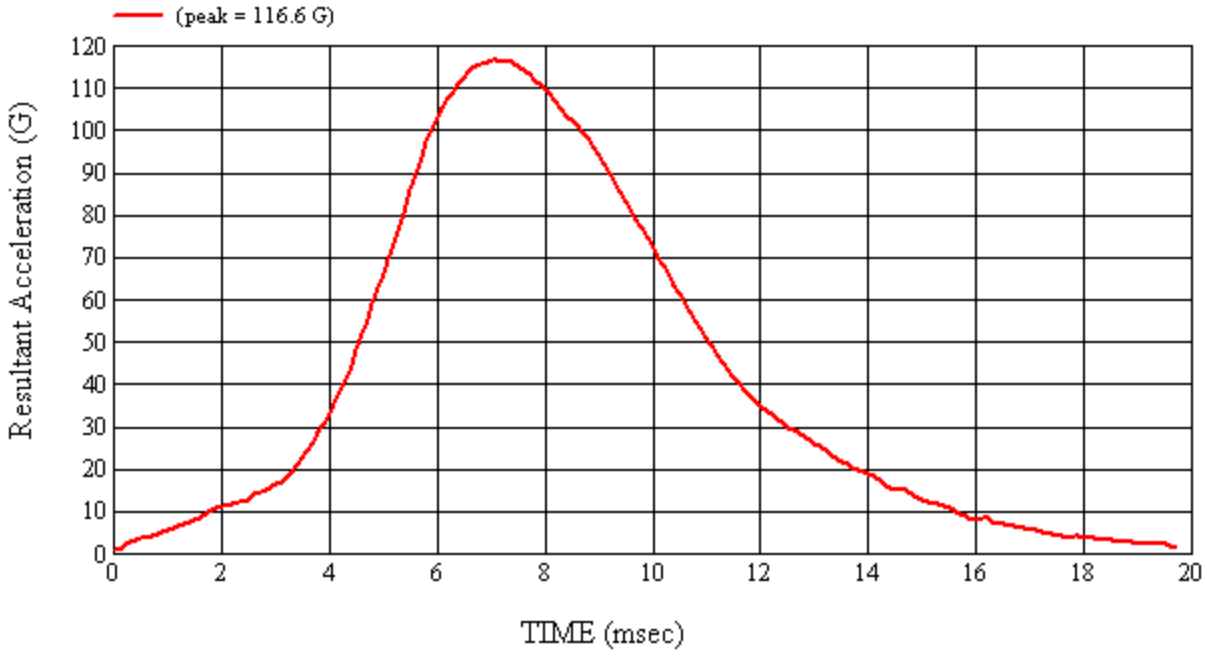
Dislodged trim

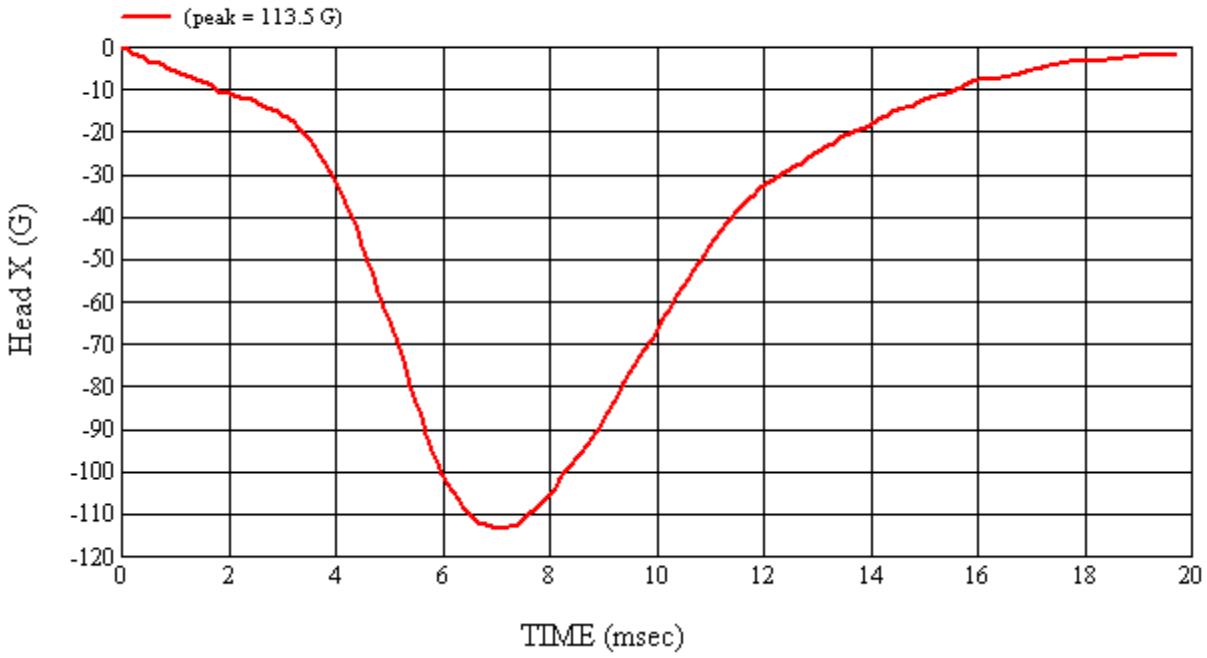
Recorded By: _____ Approved By*: _____ Date: 4/29/2011

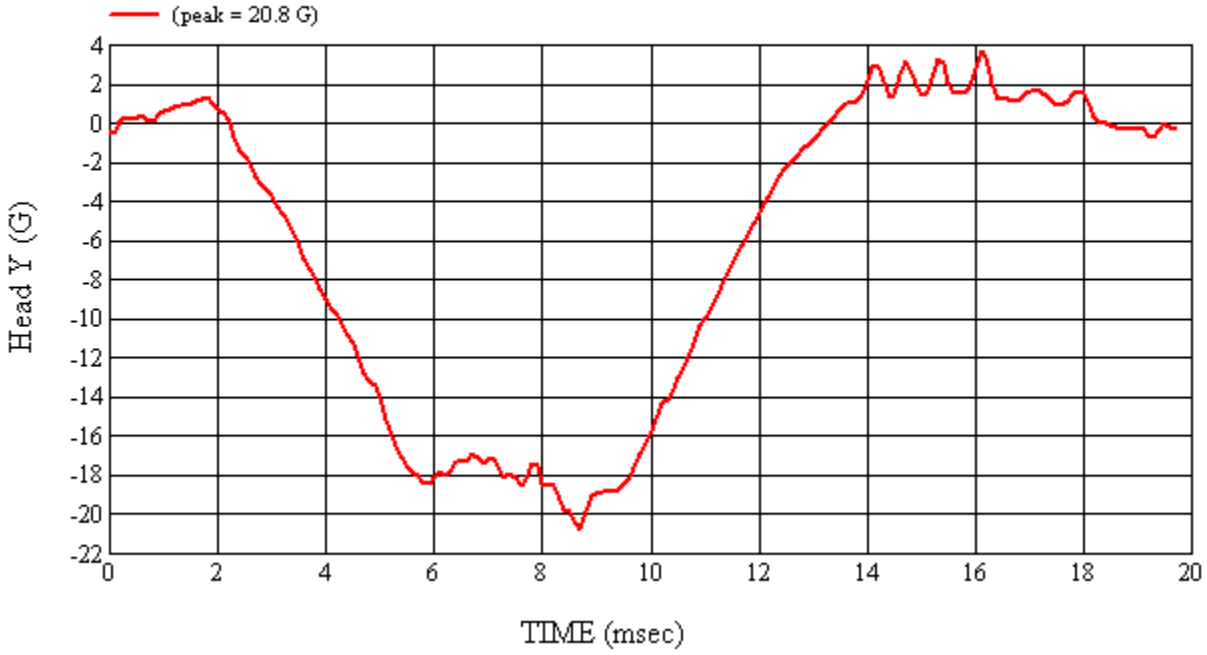
*Only necessary for NHTSA (Government) Compliance testing.

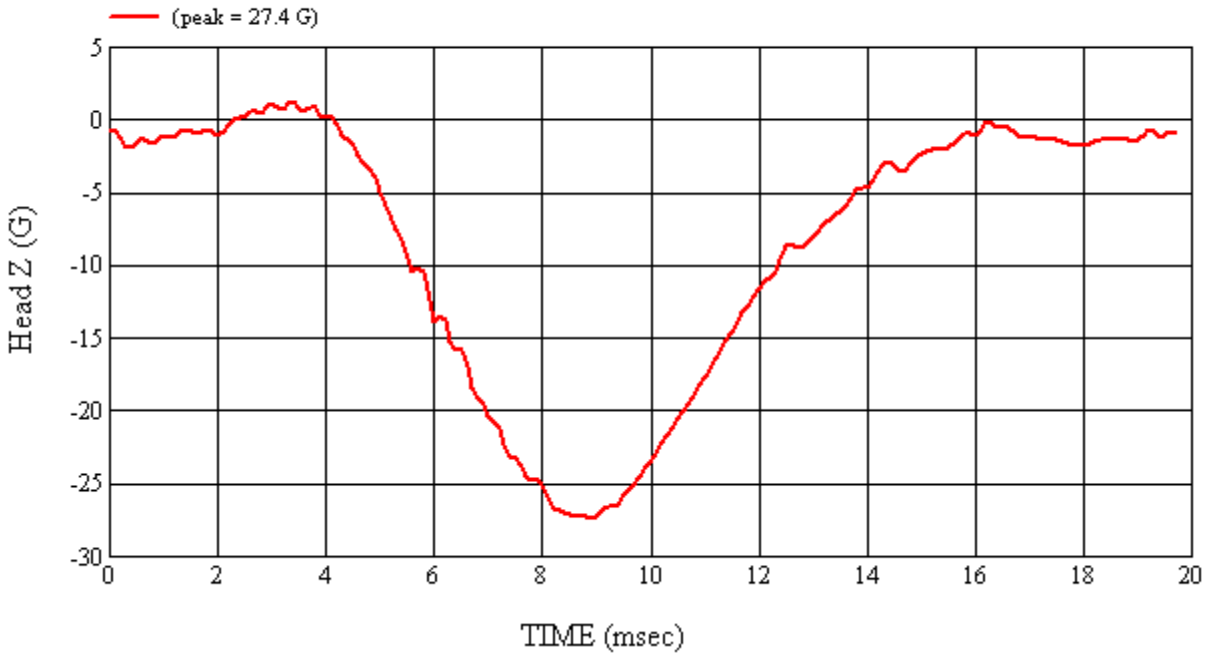
MGA Test #: U11137 Target Location: AP2, Left Side Test Date: 4/29/2011

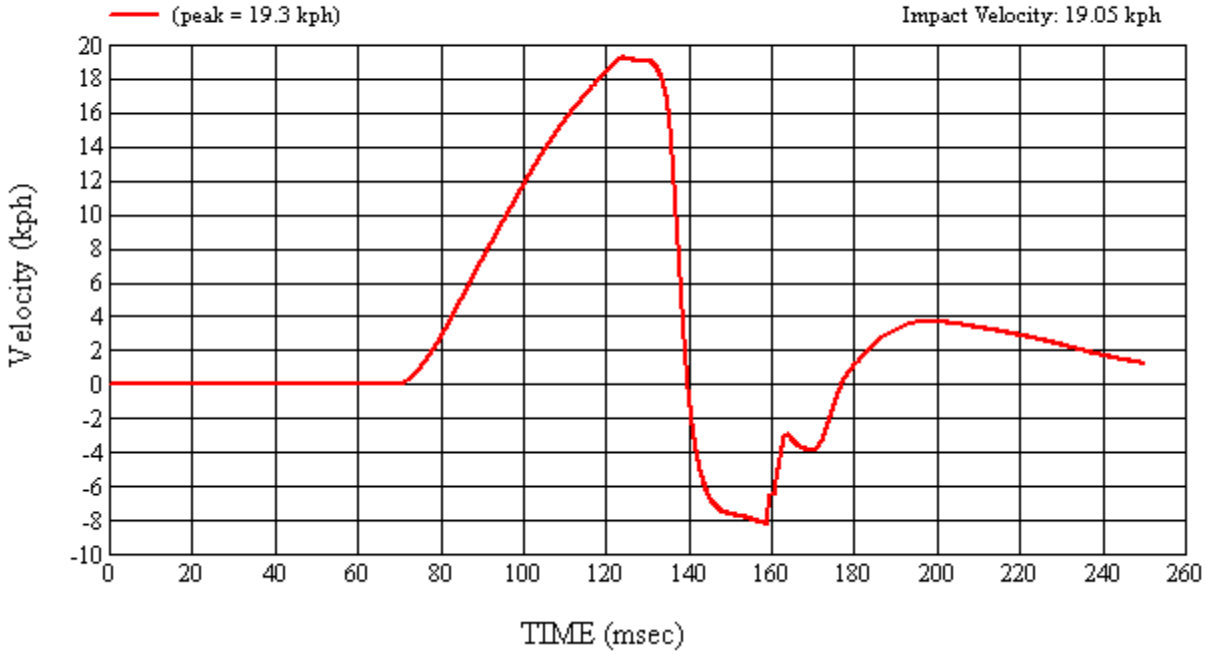


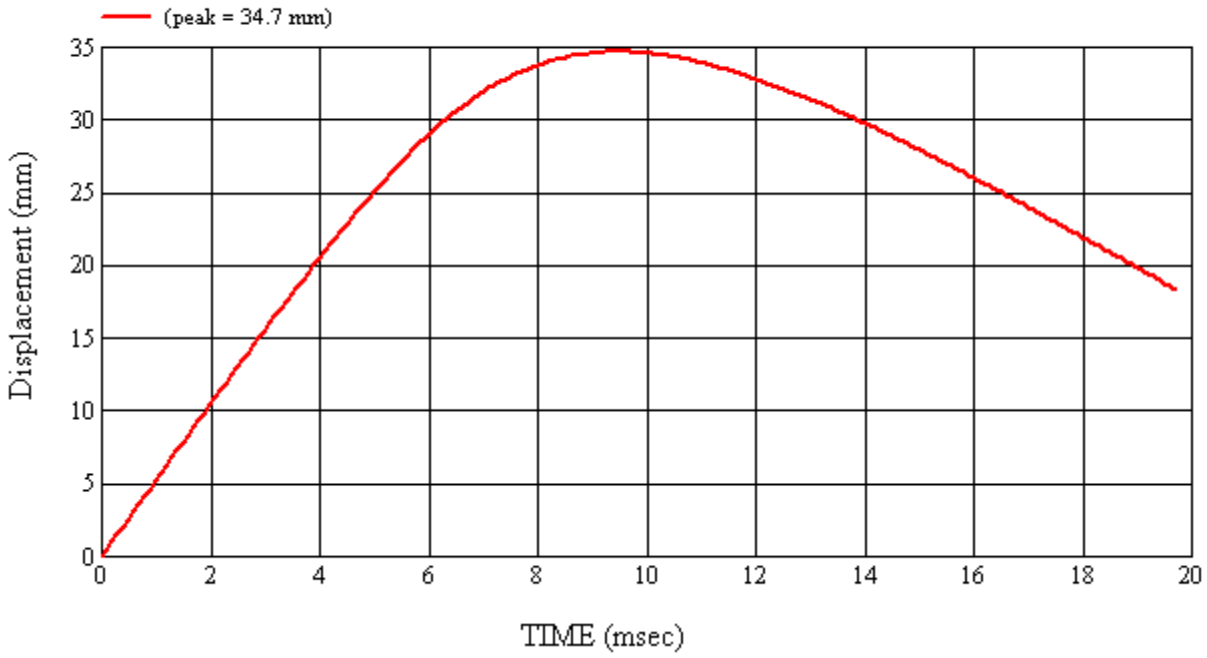


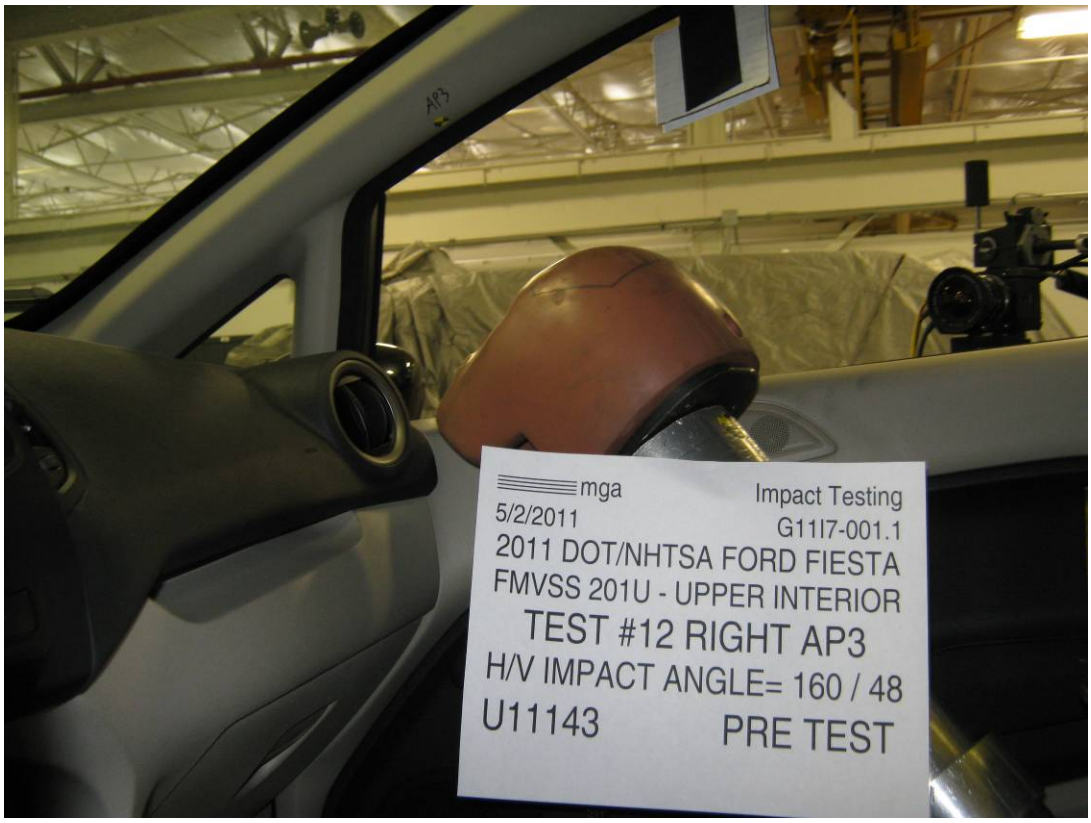

(peak = 113.5 G)
Head X (G)
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
0
2
4
6
8
10
12
14
16
18
20
TIME (msec)


(peak = 20.8 G)
Head Y (G)
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
0
2
4
6
8
10
12
14
16
18
20
TIME (msec)


(peak = 27.4 G)
Head Z (G)
5
0
-5
-10
-15
-20
-25
-30
0
2
4
6
8
10
12
14
16
18
20
TIME (msec)


(peak = 19.3 kph)
Impact Velocity: 19.05 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 = 34.7 mm)
Displacement (mm)
35
30
25
20
15
10
5
0
0
2
4
6
8
10
12
14
16
18
20
TIME (msec)


AP3
mga
Impact Testing
5/2/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #12 RIGHT AP3
H/V IMPACT ANGLE= 160 / 48
U11143
PRE TEST


AP3
mga
Impact Testing
5/2/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #12 RIGHT AP3
H/V IMPACT ANGLE= 160 / 48
U11143
PRE TEST


mga
5/2/2011
Impact Testing
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #12 RIGHT AP3
H/V IMPACT ANGLE= 160 / 48
U11143
POST TEST


mga
5/2/2011
Impact Testing
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #12 RIGHT AP3
H/V IMPACT ANGLE= 160 / 48
U11143
POST TEST


mga
Impact Testing
5/2/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #12 RIGHT AP3
H/V IMPACT ANGLE= 160 / 48
U11143
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G11I7-001.1 VEHICLE YR/MAKE/MODEL:2011/DOT/NHTSA/Ford Fiesta

GENERAL TEST PARAMETERS:

Target (Vehicle Side): AP3Right

MGA Test Reference No.:U11143

Approach Horizontal Angles:160º

Approach Vertical Angles:48º

Additional Description:

Test Number:#12

Temperature:21.1C

Humidity:23.9%

Time of Test:4:32:00 PM

FMH Serial No:[038]

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
559	520	5.9	18.9	30	7 Right

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J22700	-96.4	1.07	1.07
Y	6	J36197	108.7	0.85	0.85
Z	7	J36353	99.1	0.94	0.94

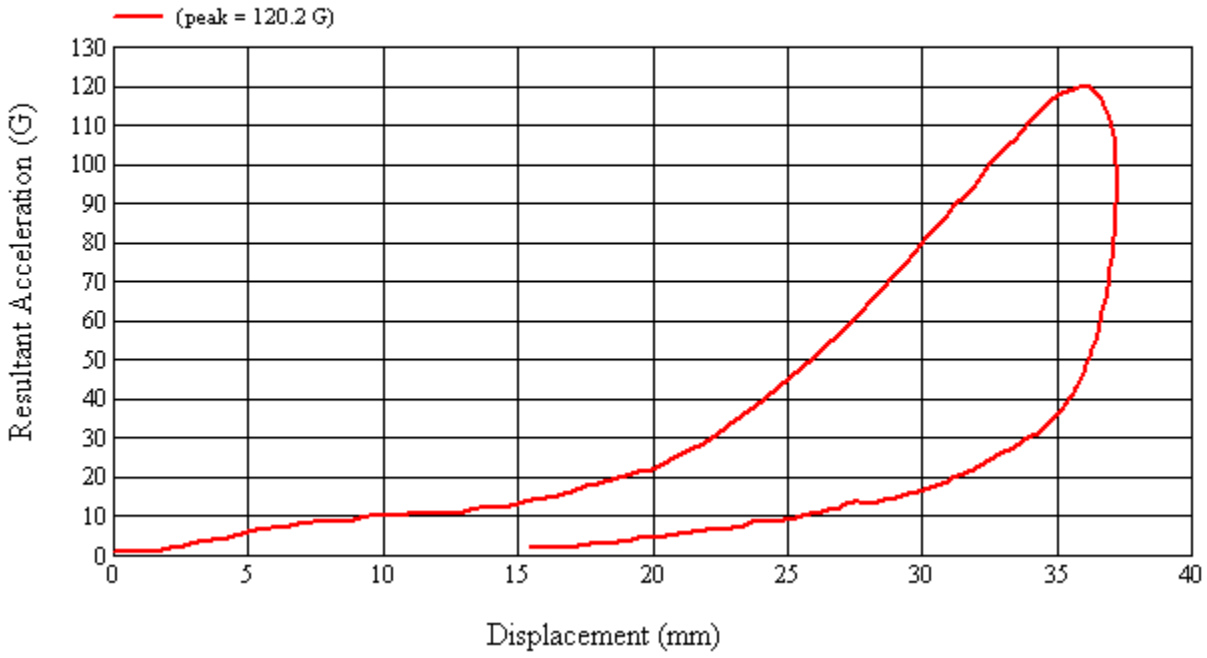
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

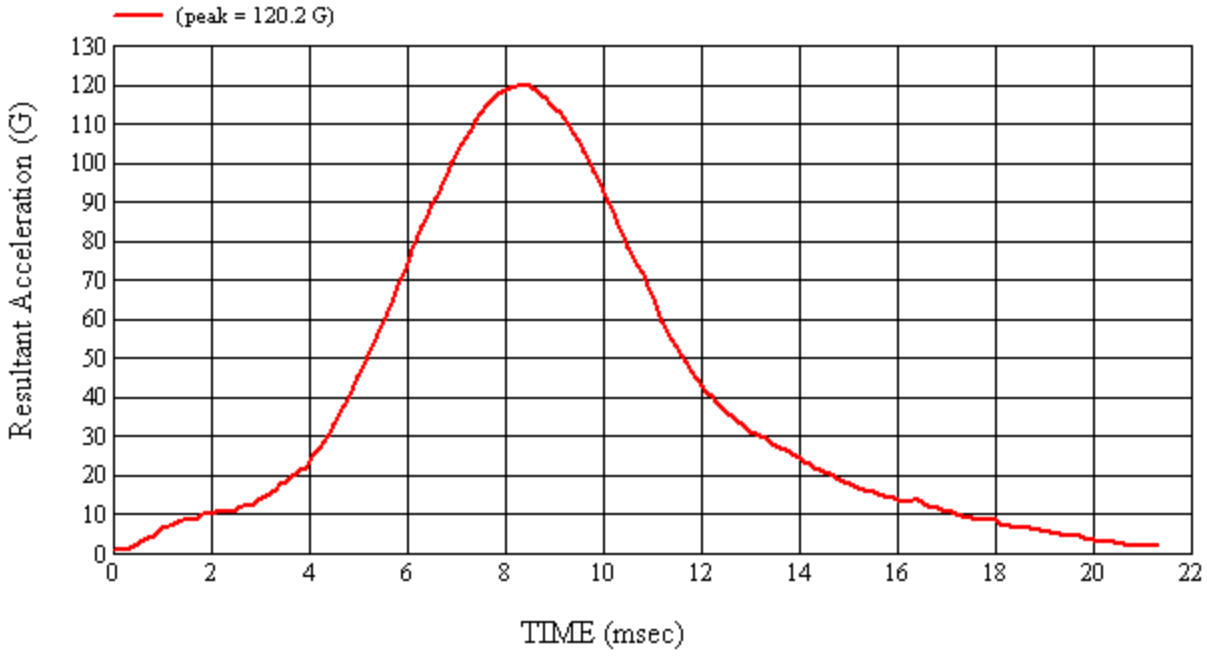
Dislodged trim

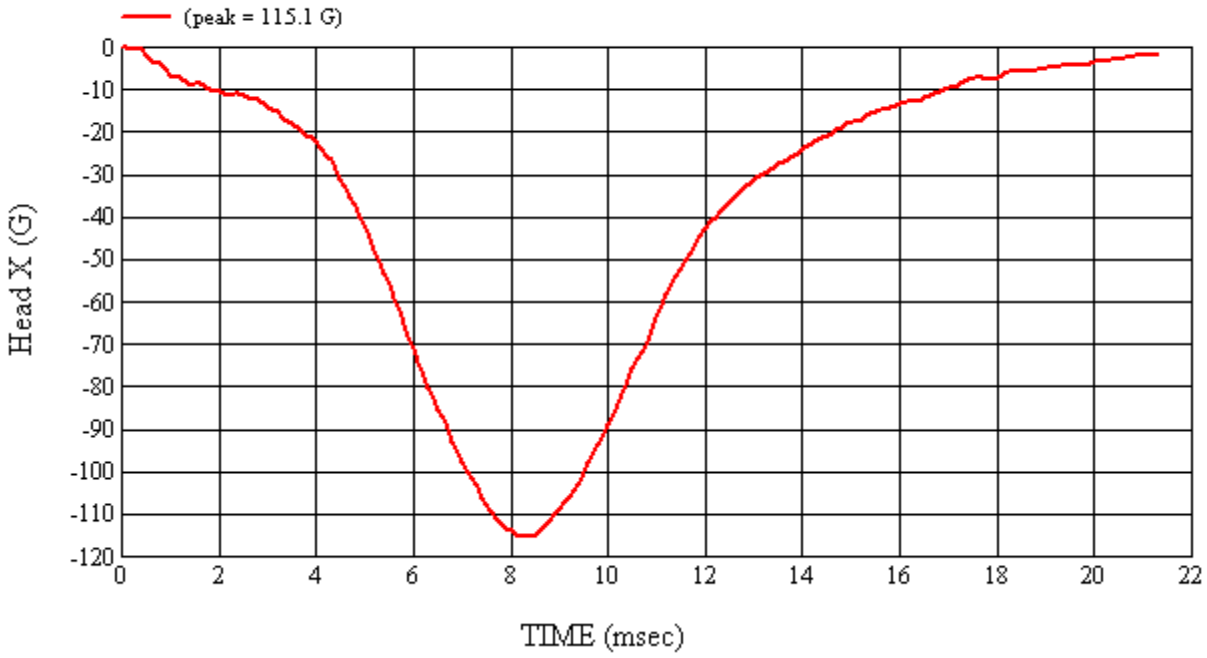
Recorded By: _____ Approved By*: _____ Date: 5/2/2011

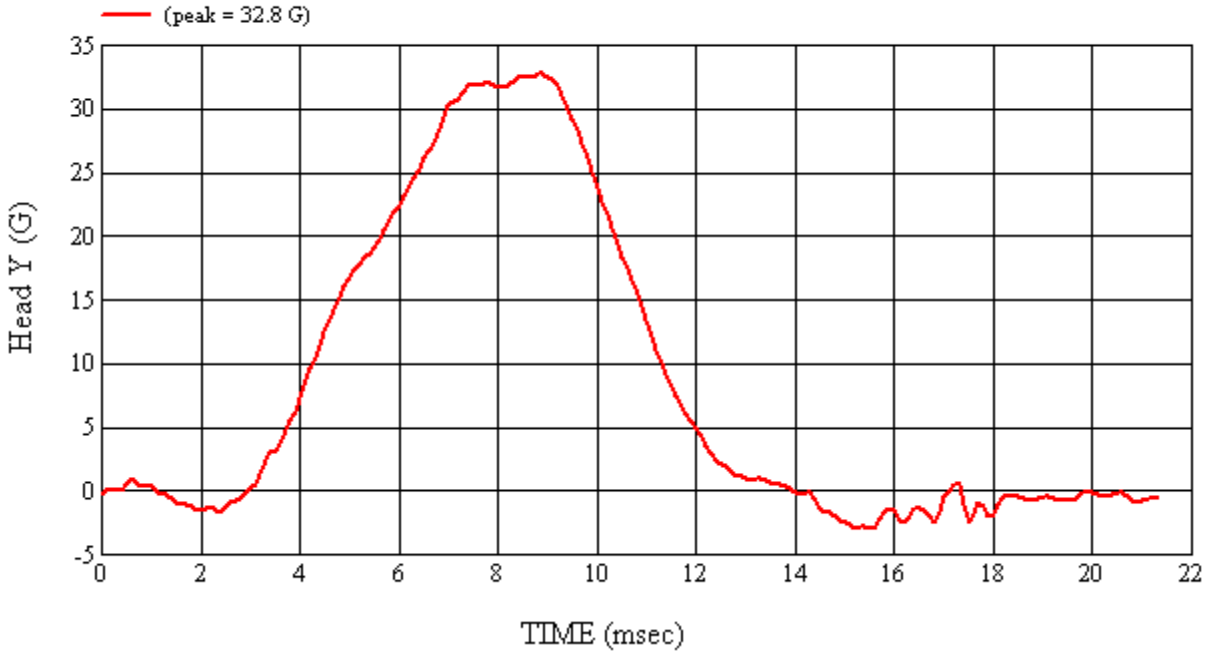
*Only necessary for NHTSA (Government) Compliance testing.

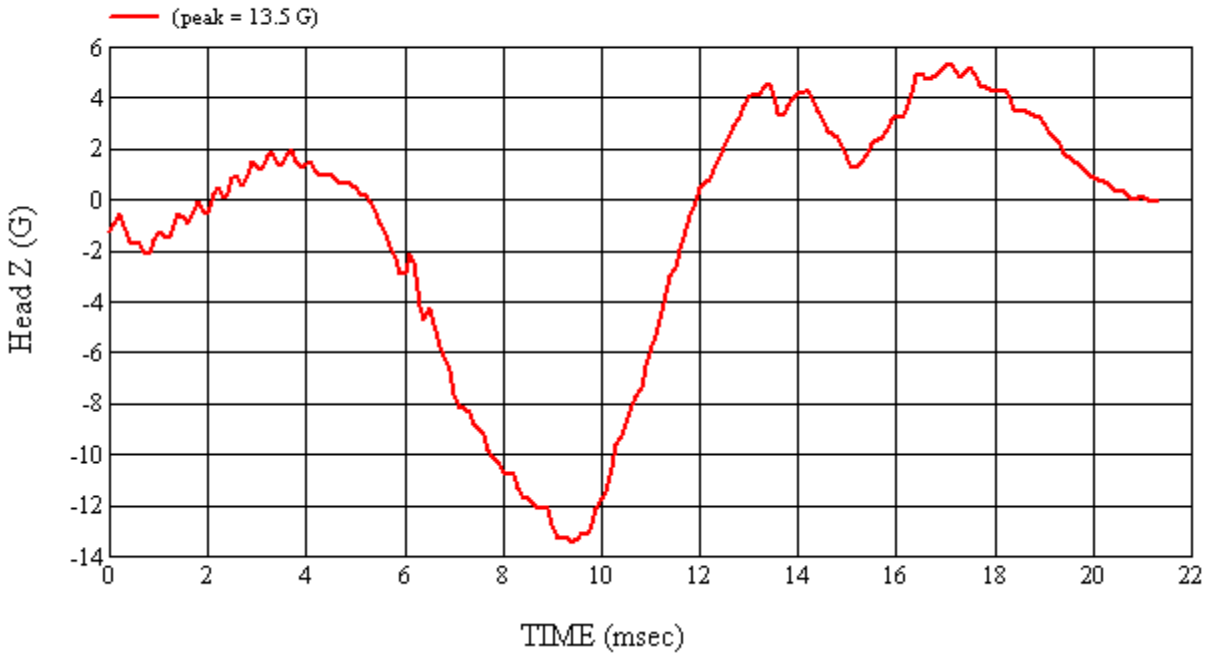
MGA Test #: U11143 Target Location: AP3, Right Side Test Date: 5/2/2011

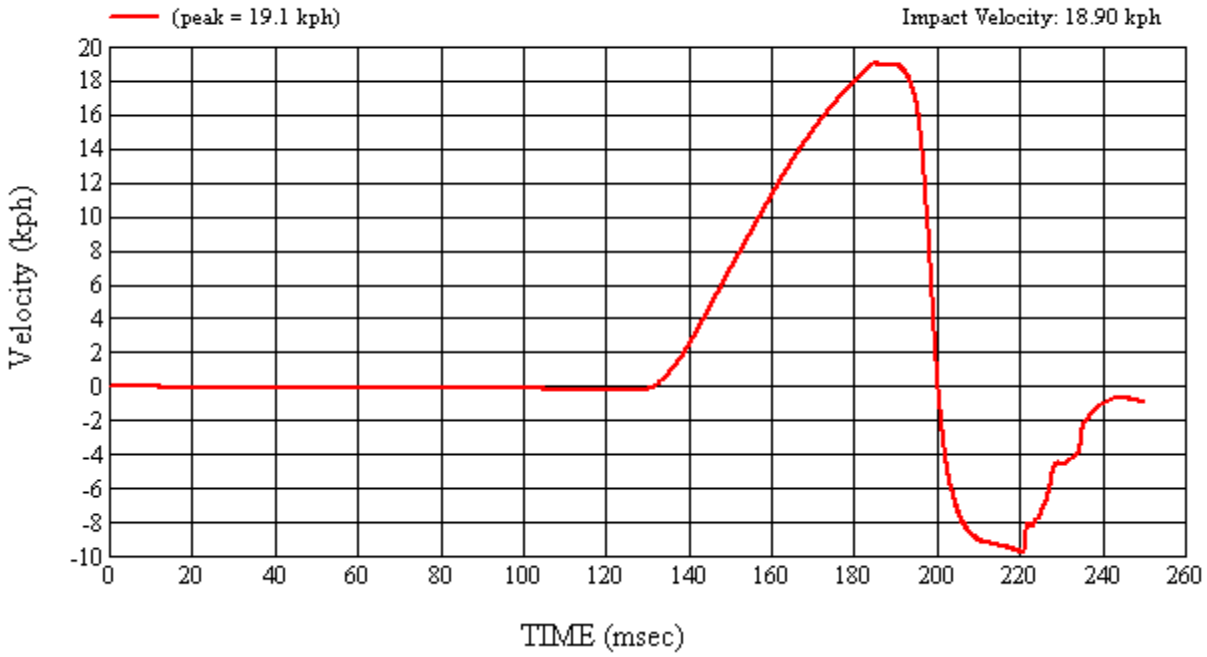


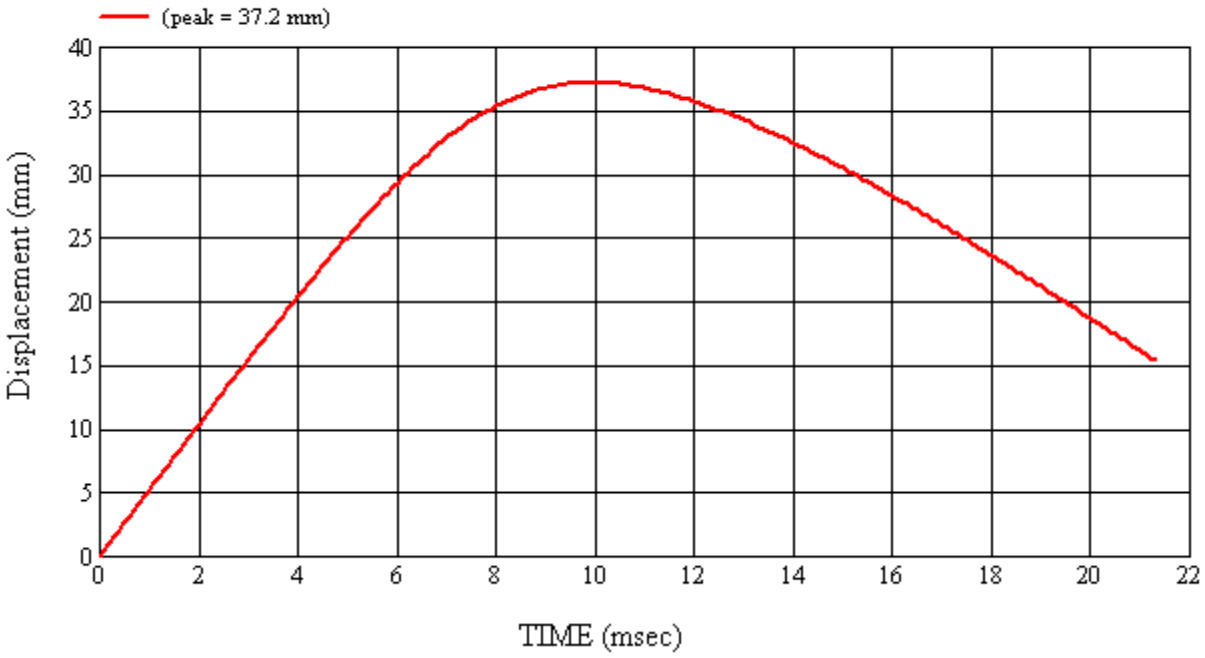


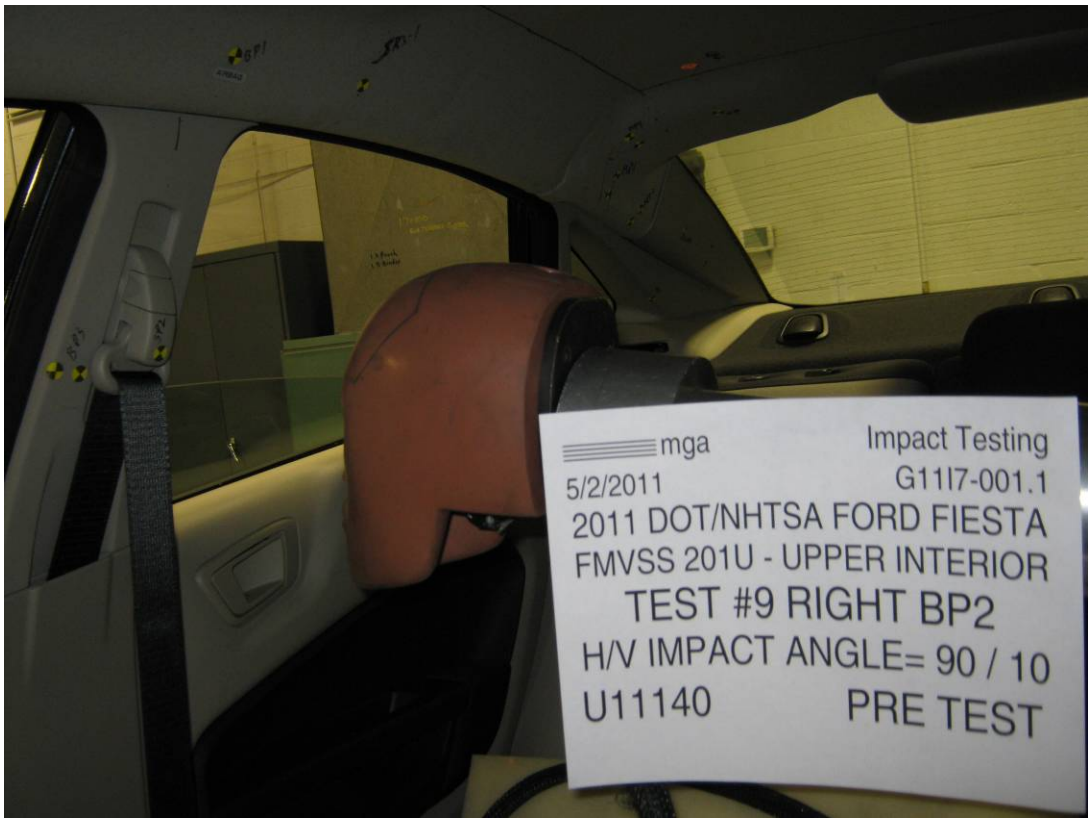

(peak = 115.1 G)
Head X (G)
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
0
2
4
6
8
10
12
14
16
18
20
22
TIME (msec)


(peak = 32.8 G)
Head Y (G)
35
30
25
20
15
10
5
0
-5
0
2
4
6
8
10
12
14
16
18
20
22
TIME (msec)


(peak = 13.5 G)
Head Z (G)
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
0
2
4
6
8
10
12
14
16
18
20
22
TIME (msec)


(peak = 19.1 kph)
Impact Velocity: 18.90 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)

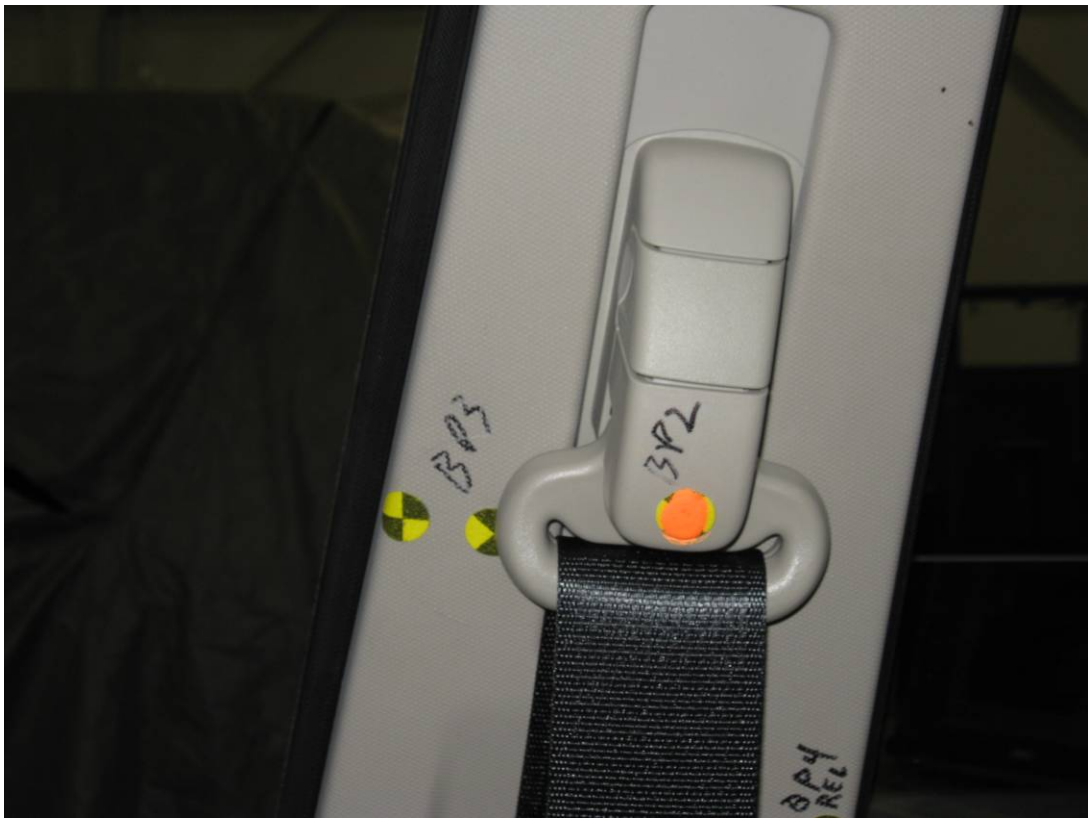

(peak = 37.2 mm)
Displacement (mm)
0
5
10
15
20
25
30
35
40
0
2
4
6
8
10
12
14
16
18
20
22
TIME (msec)


mga
Impact Testing
5/2/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #9 RIGHT BP2
H/V IMPACT ANGLE= 90 / 10
U11140
PRE TEST


mga
Impact Testing
5/2/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #9 RIGHT BP2
H/V IMPACT ANGLE= 90 / 10
U11140
PRE TEST


CB0204
U11140
RIGHT BP2
H/V 90/10
PALLITE VIII
mga
Impact Testing
5/2/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #9 RIGHT BP2
H/V IMPACT ANGLE= 90 / 10
U11140
POST TEST


mga
Impact Testing
5/2/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #9 RIGHT BP2
H/V IMPACT ANGLE= 90 / 10
U11140
POST TEST


BP2
BP4


mga
Impact Testing
5/2/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #9 RIGHT BP2
H/V IMPACT ANGLE= 90 / 10
U11140
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G11I7-001.1 VEHICLE YR/MAKE/MODEL:2011/DOT/NHTSA/Ford Fiesta

GENERAL TEST PARAMETERS:

Target (Vehicle Side): BP2Right

MGA Test Reference No.:U11140

Approach Horizontal Angles:90º

Approach Vertical Angles:10º

Additional Description:

Test Number:#9

Temperature:21.6C

Humidity:39.0%

Time of Test:12:28:37 PM

FMH Serial No:[038]

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
599	574	6.4	23.9	14	3 Right

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J22700	-96.4	1.07	1.07
Y	6	J36197	108.7	0.85	0.85
Z	7	J36353	99.1	0.94	0.94

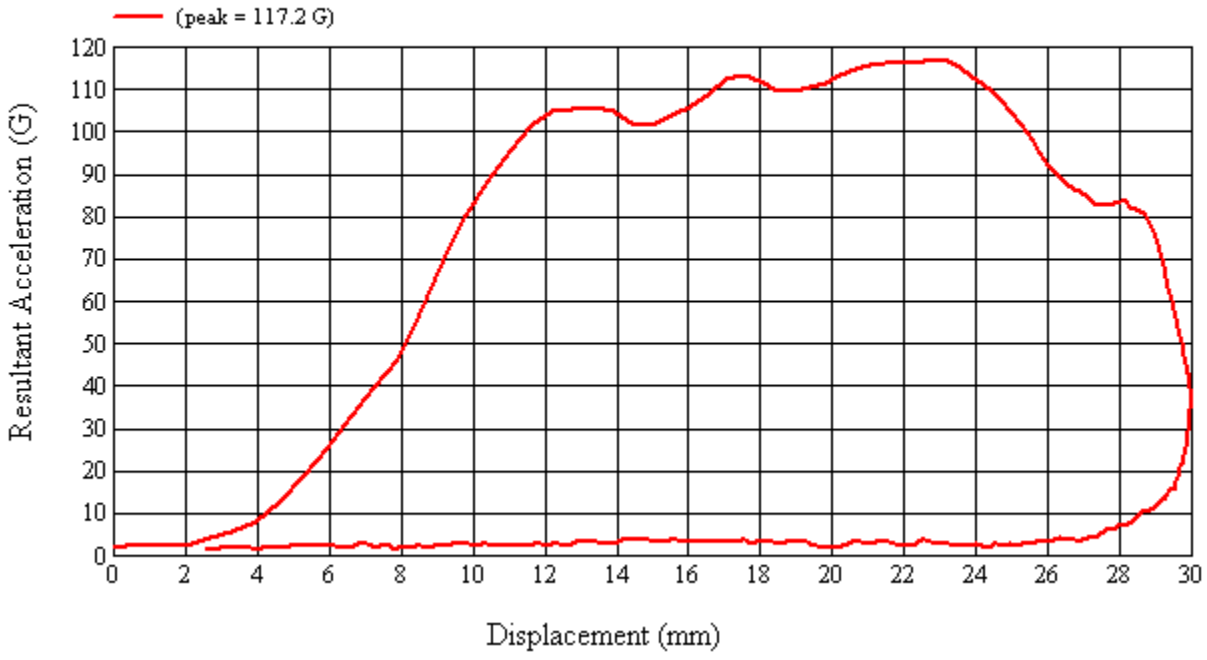
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

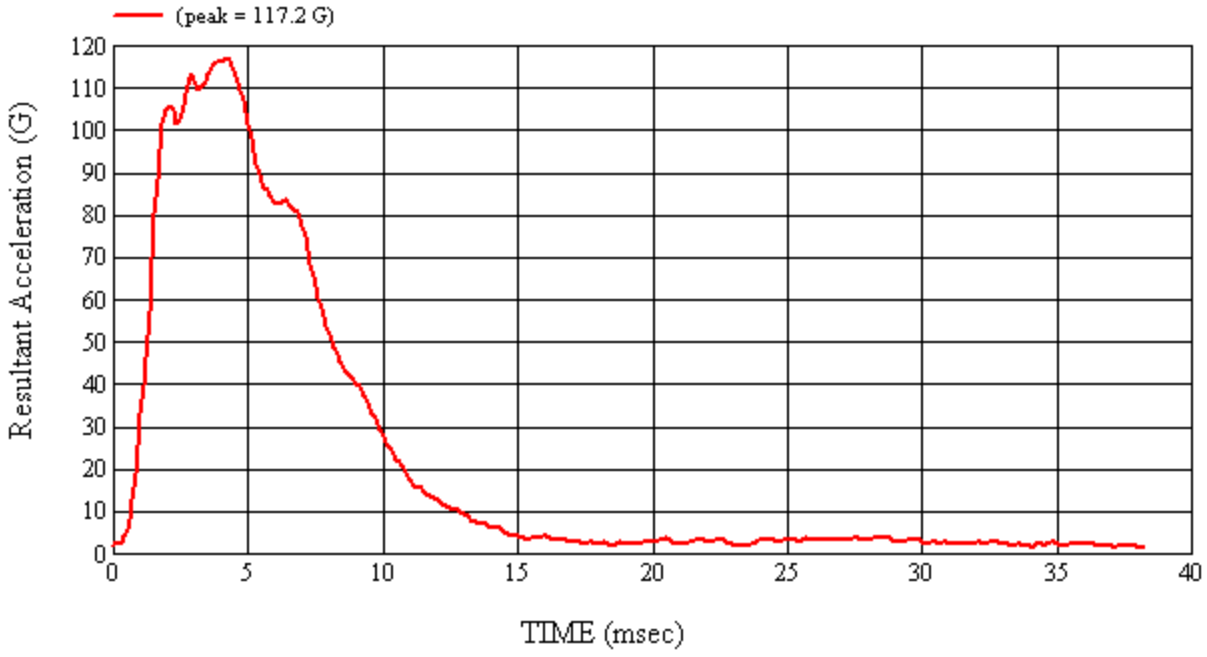
No visible damage

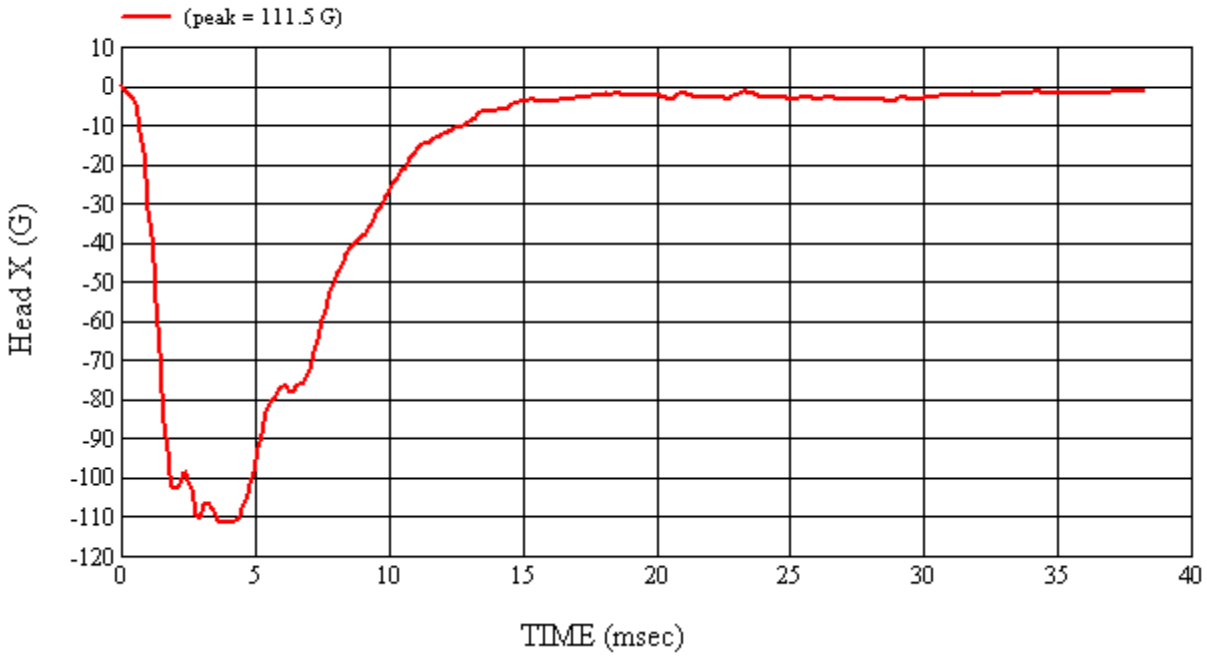
Recorded By:  Approved By*:  Date: 5/2/2011

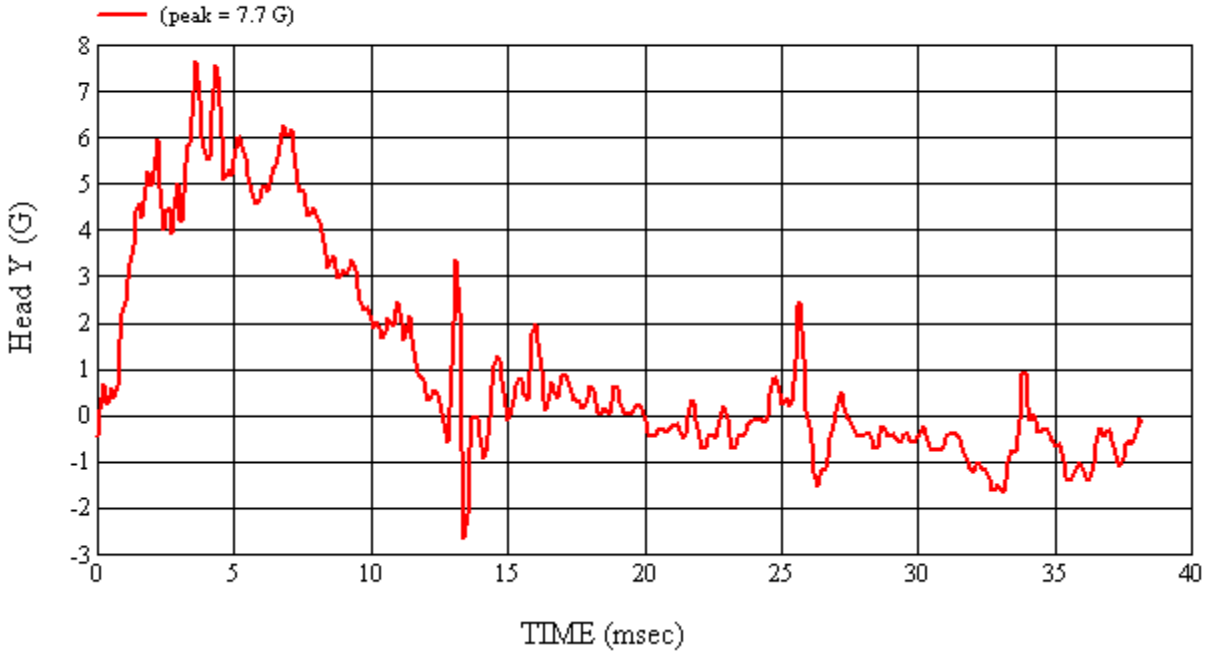
*Only necessary for NHTSA (Government) Compliance testing.

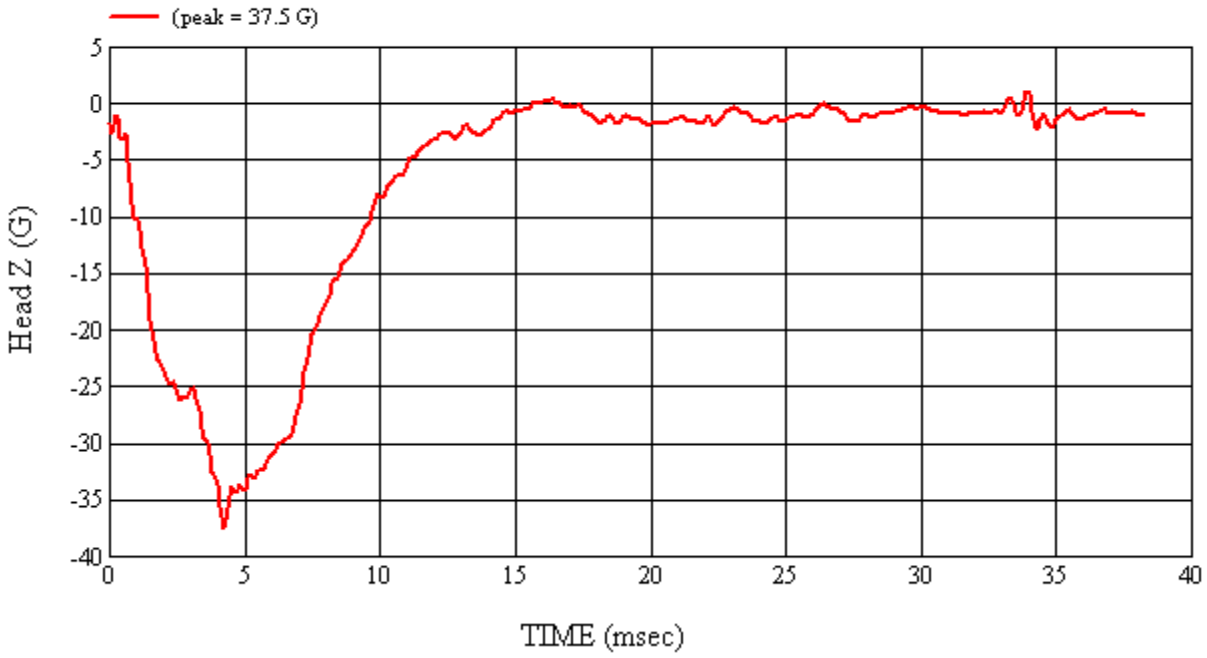
MGA Test #: U11140 Target Location: BP2, Right Side Test Date: 5/2/2011

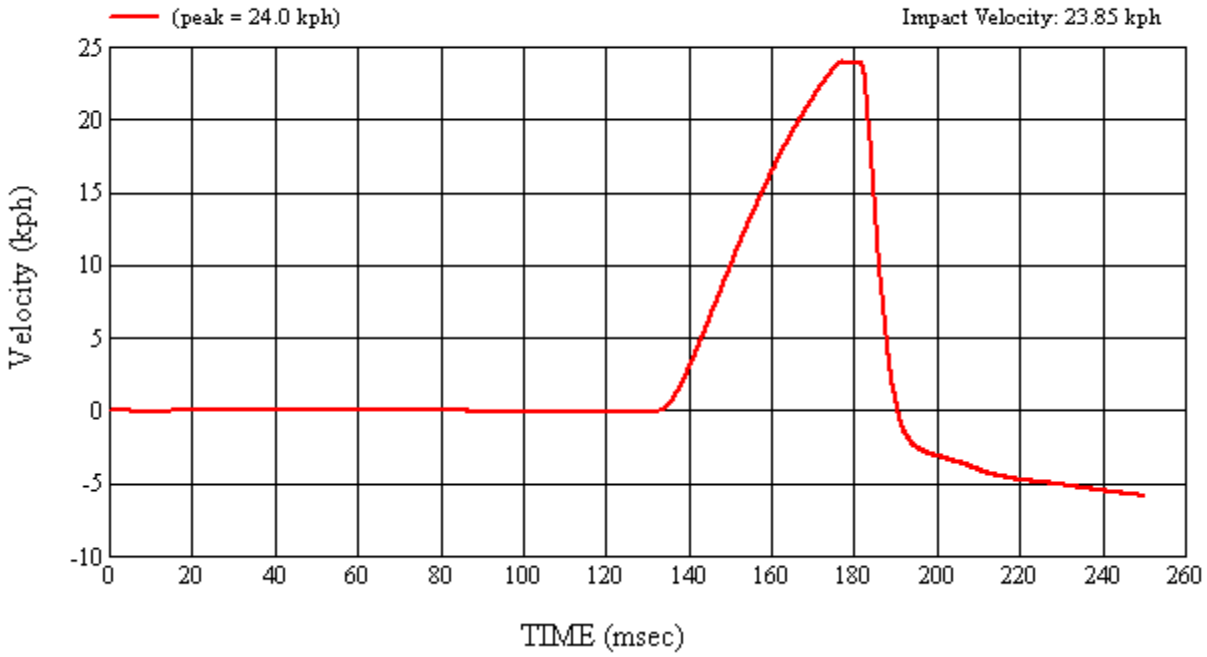


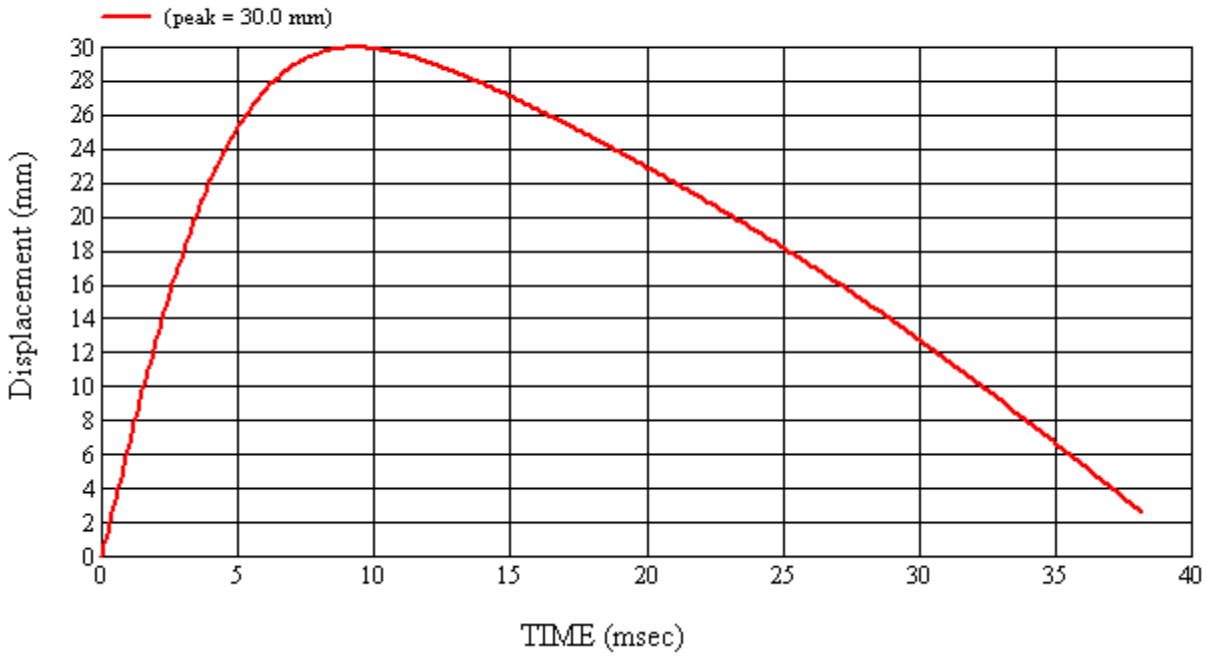



(peak = 111.5 G)
Head X (G)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
-120
0
5
10
15
20
25
30
35
40
TIME (msec)

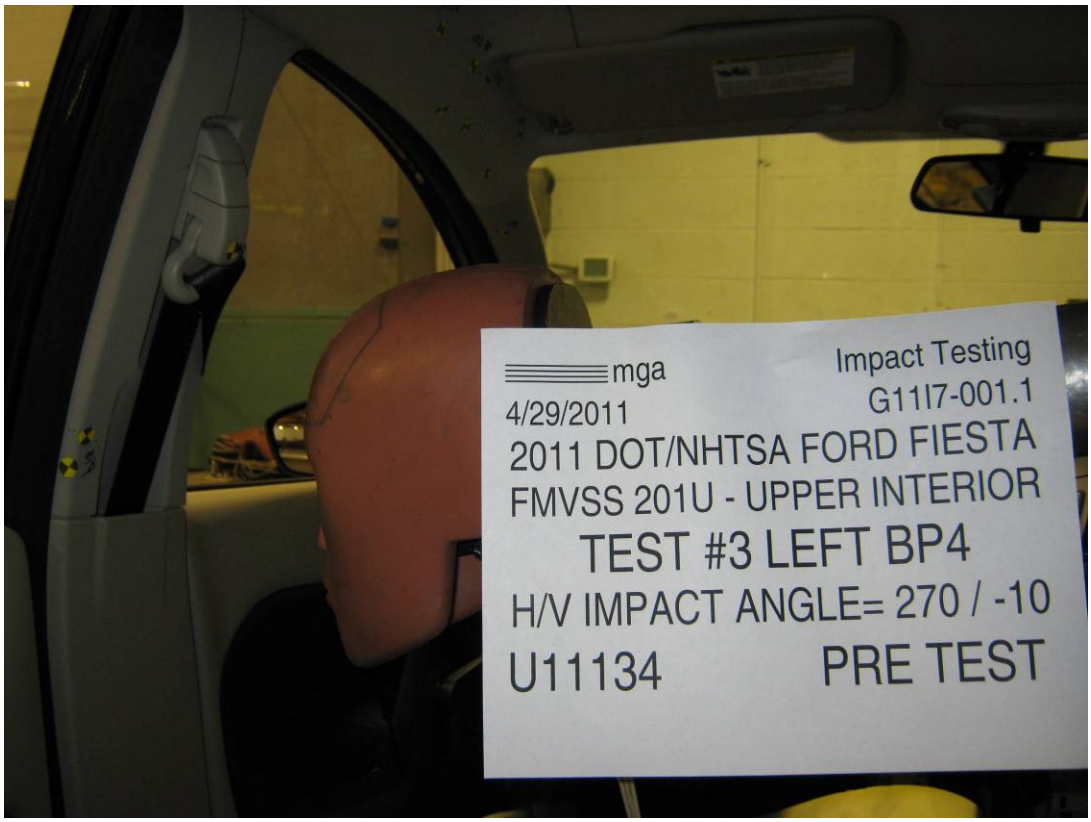

(peak = 7.7 G)
Head Y (G)
8
7
6
5
4
3
2
1
0
-1
-2
-3
0
5
10
15
20
25
30
35
40
TIME (msec)

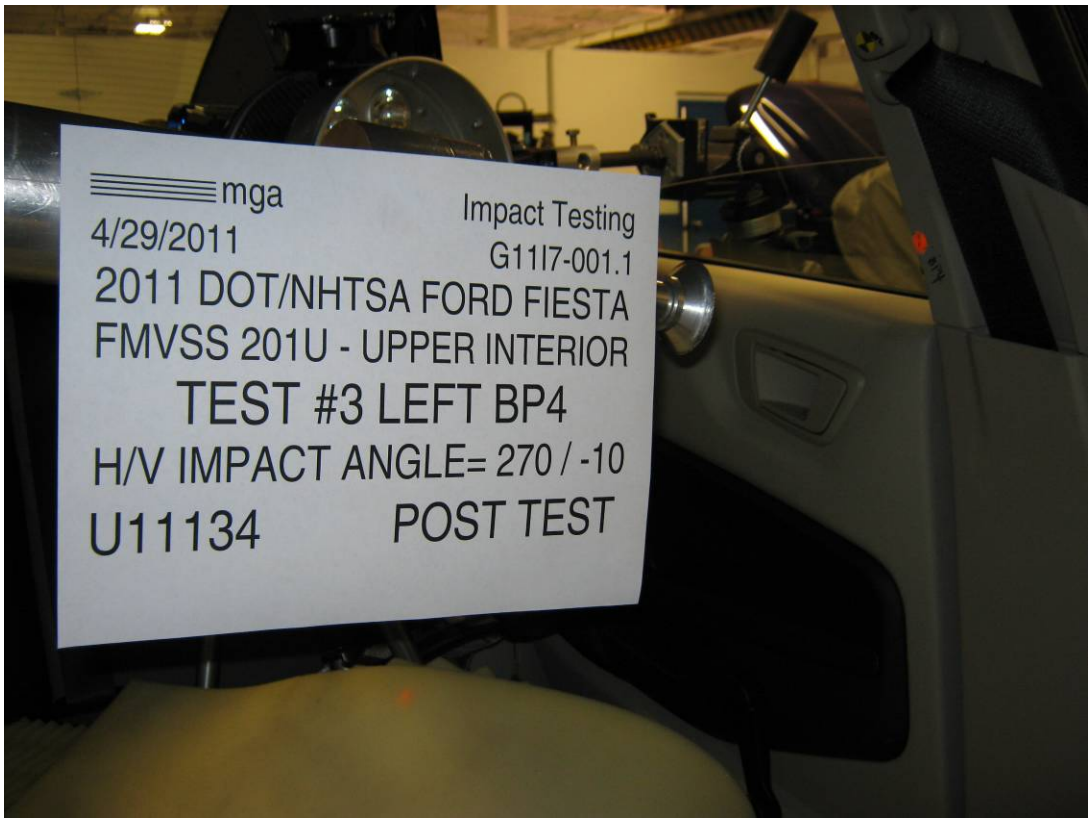

(peak = 37.5 G)
Head Z (G)
5
0
-5
-10
-15
-20
-25
-30
-35
-40
0
5
10
15
20
25
30
35
40
TIME (msec)

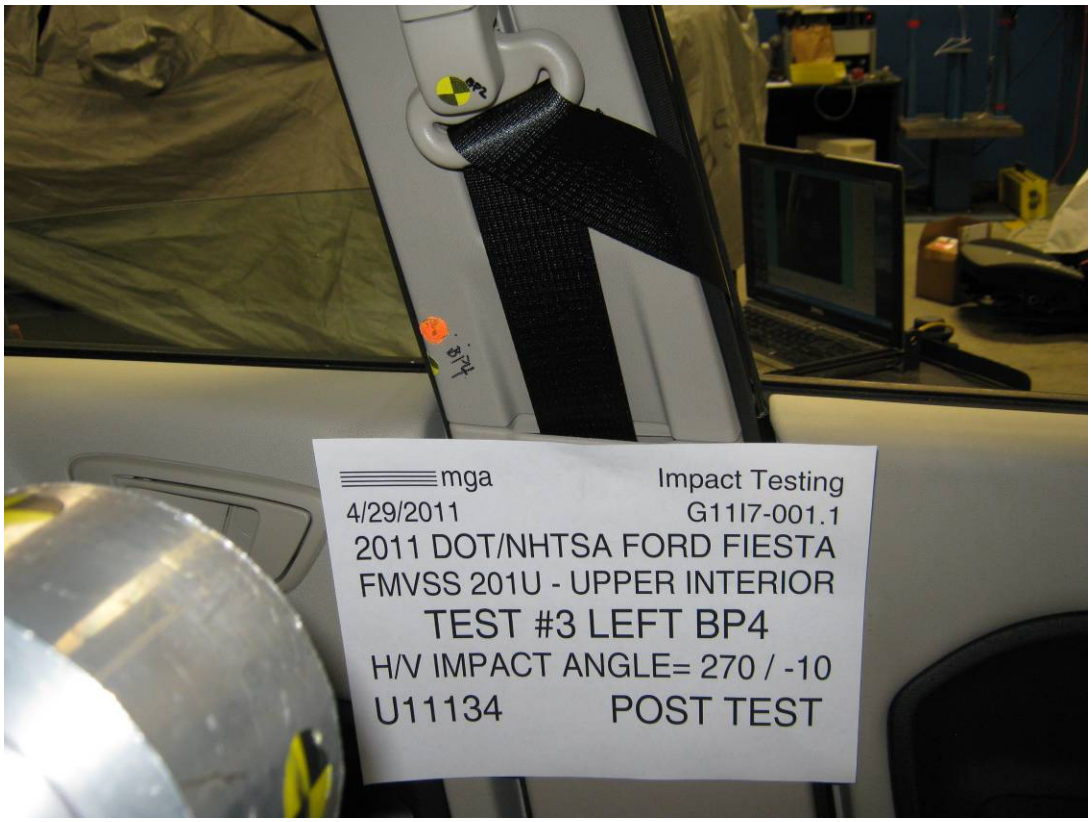

(peak = 24.0 kph)
Impact Velocity: 23.85 kph
Velocity (kph)
25
20
15
10
5
0
-5
-10
0
20
40
60
80
100
120
140
160
180
200
220
240
260
TIME (msec)

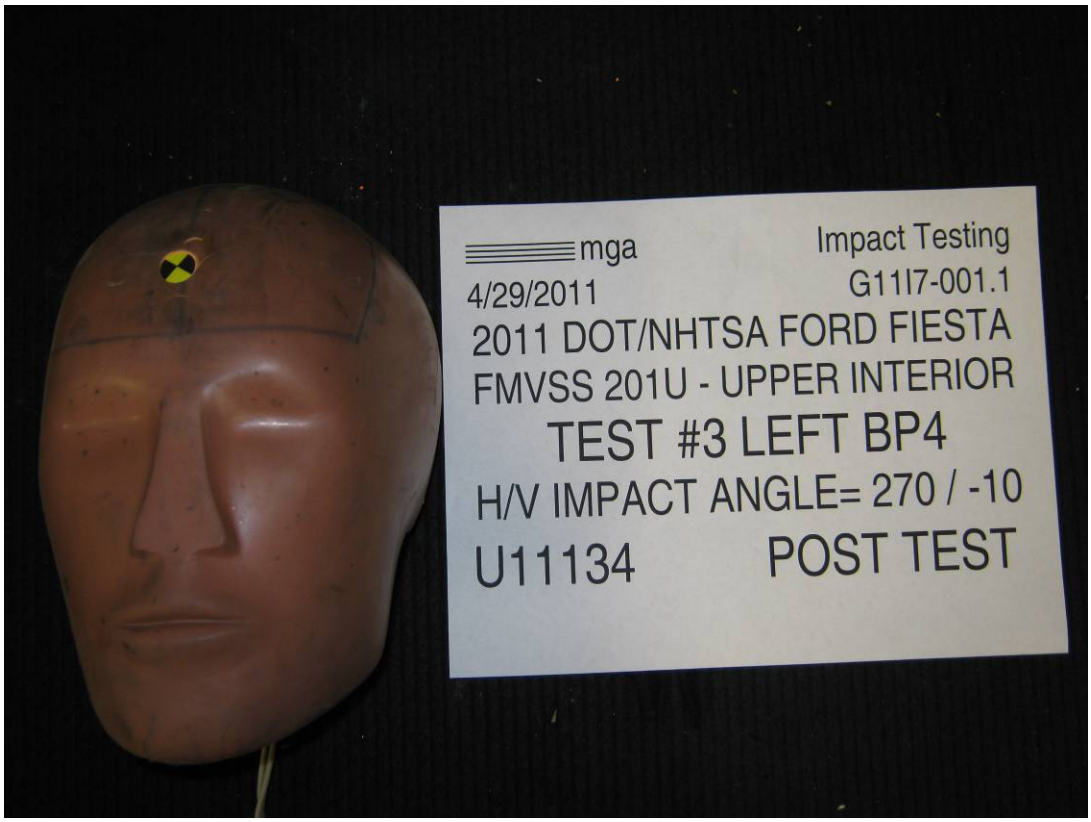

(peak = 30.0 mm)
Displacement (mm)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
0
5
10
15
20
25
30
35
40
TIME (msec)


mga
Impact Testing
4/29/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #3 LEFT BP4
H/V IMPACT ANGLE= 270 / -10
U11134
PRE TEST


mga
Impact Testing
4/29/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #3 LEFT BP4
H/V IMPACT ANGLE= 270 / -10
U11134
PRE TEST


mga
4/29/2011
Impact Testing
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #3 LEFT BP4
H/V IMPACT ANGLE= 270 / -10
U11134
POST TEST


mga
4/29/2011
Impact Testing
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #3 LEFT BP4
H/V IMPACT ANGLE= 270 / -10
U11134
POST TEST


mga
Impact Testing
4/29/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #3 LEFT BP4
H/V IMPACT ANGLE= 270 / -10
U11134
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G11I7-001.1 VEHICLE YR/MAKE/MODEL:2011/DOT/NHTSA/Ford Fiesta

GENERAL TEST PARAMETERS:

Test Number:#3

Target (Vehicle Side): BP4Left

Temperature:21.7C

MGA Test Reference No.:U11134

Humidity:33.0%

Approach Horizontal Angles:270º

Time of Test:2:45:16 PM

Approach Vertical Angles:-10º

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
650	641	9.3	24.0	28	2 Right

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J22700	-96.4	1.07	1.07
Y	6	J36197	108.7	0.85	0.85
Z	7	J36353	99.1	0.94	0.94

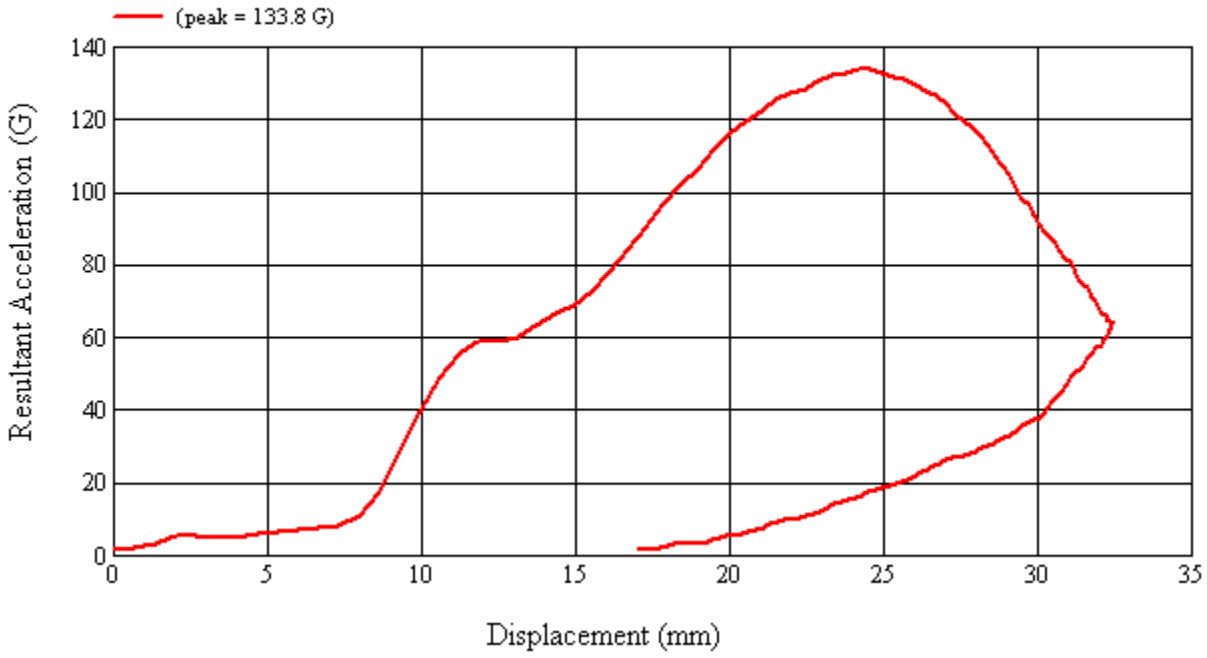
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

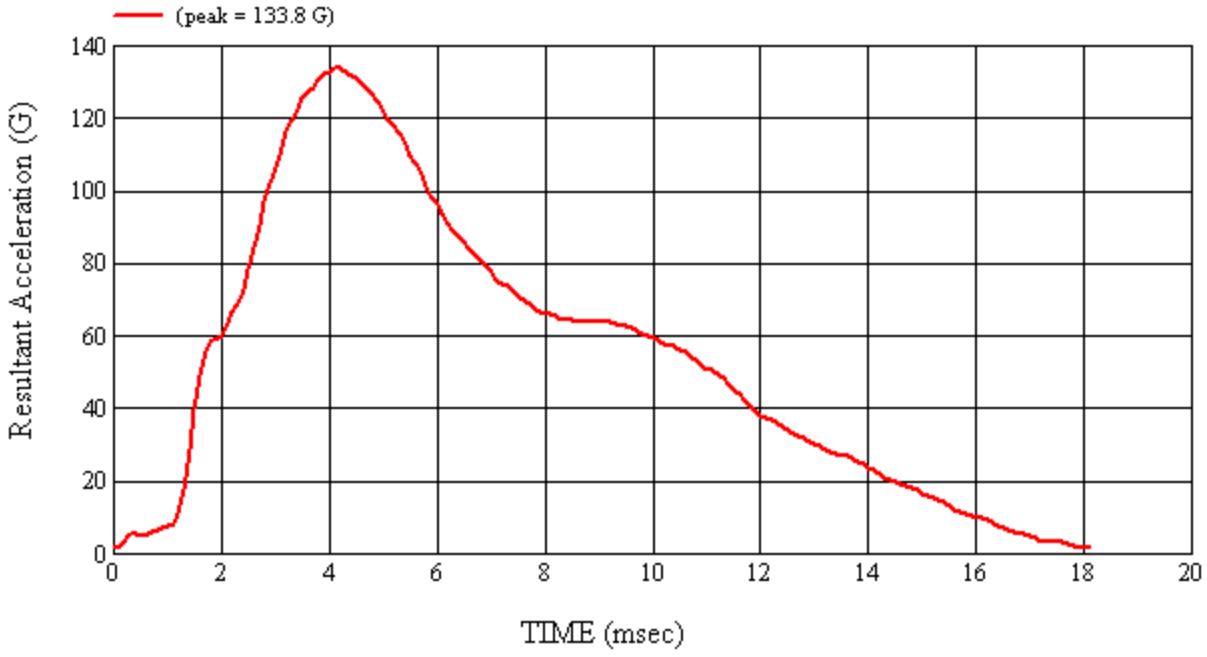
No visible damage

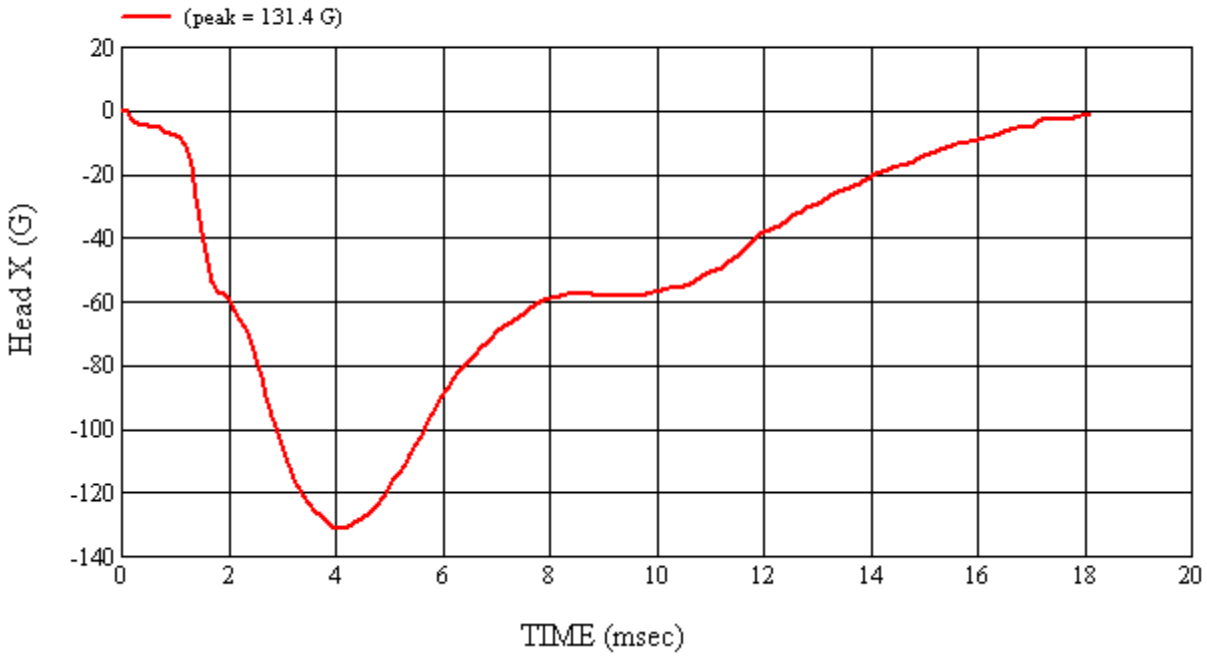
Recorded By: _____ Approved By*: _____ Date: 4/29/2011

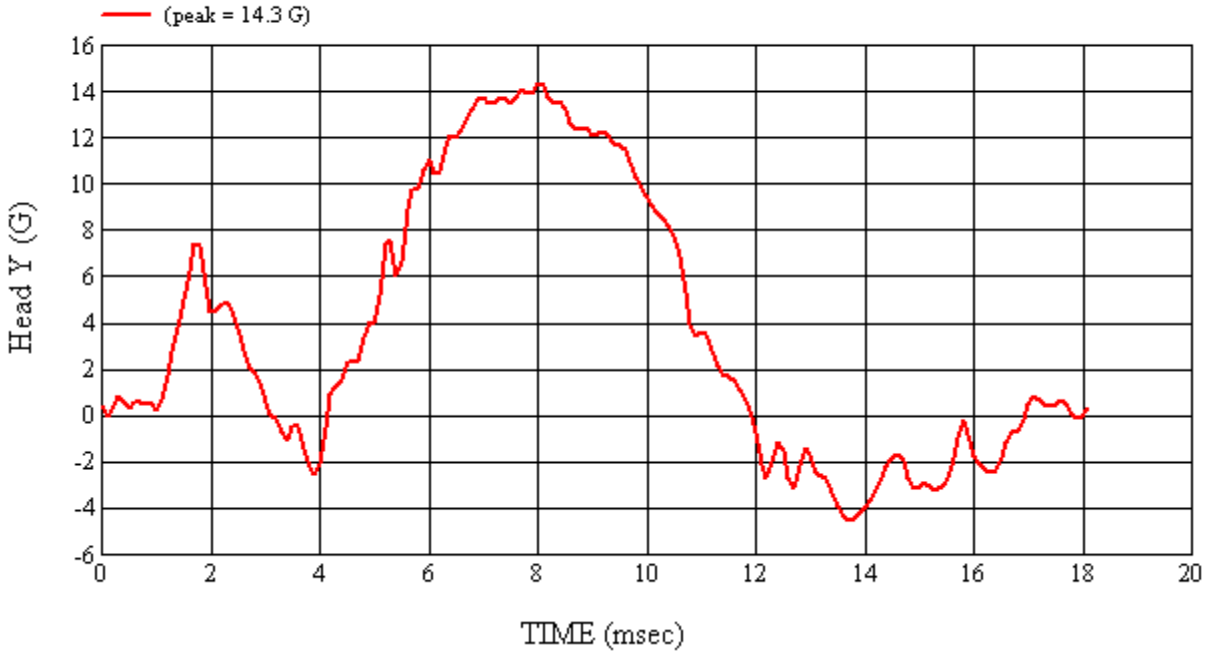
*Only necessary for NHTSA (Government) Compliance testing.

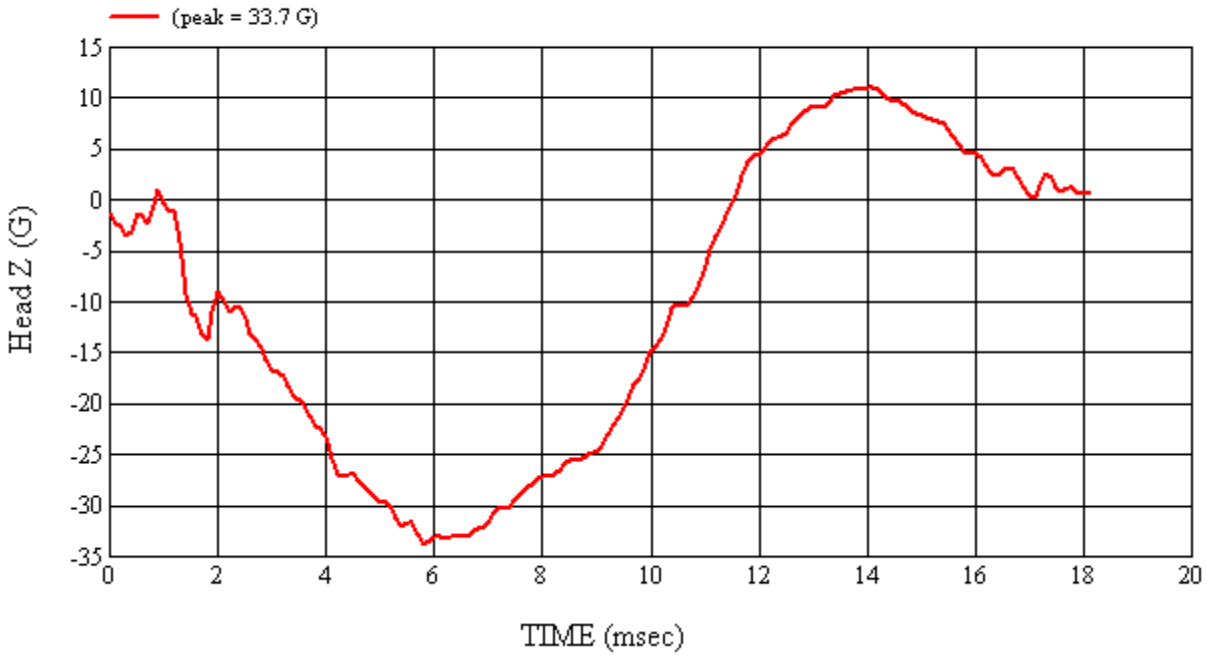
MGA Test #: U11134 Target Location: BP4, Left Side Test Date: 4/29/2011

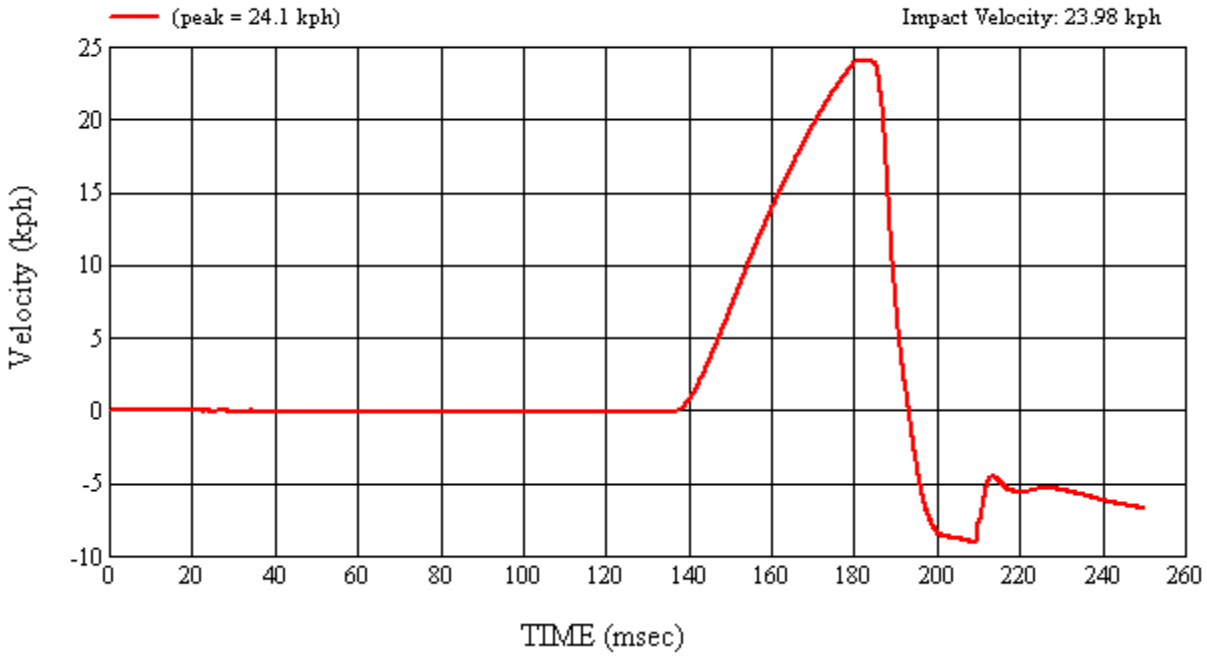





(peak = 131.4 G)
Head X (G)
20
0
-20
-40
-60
-80
-100
-120
-140
0
2
4
6
8
10
12
14
16
18
20
TIME (msec)


(peak = 14.3 G)
Head Y (G)
16
14
12
10
8
6
4
2
0
-2
-4
-6
0
2
4
6
8
10
12
14
16
18
20
TIME (msec)


(peak = 33.7 G)
Head Z (G)
15
10
5
0
-5
-10
-15
-20
-25
-30
-35
0
2
4
6
8
10
12
14
16
18
20
TIME (msec)


(peak = 24.1 kph)
Impact Velocity: 23.98 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)

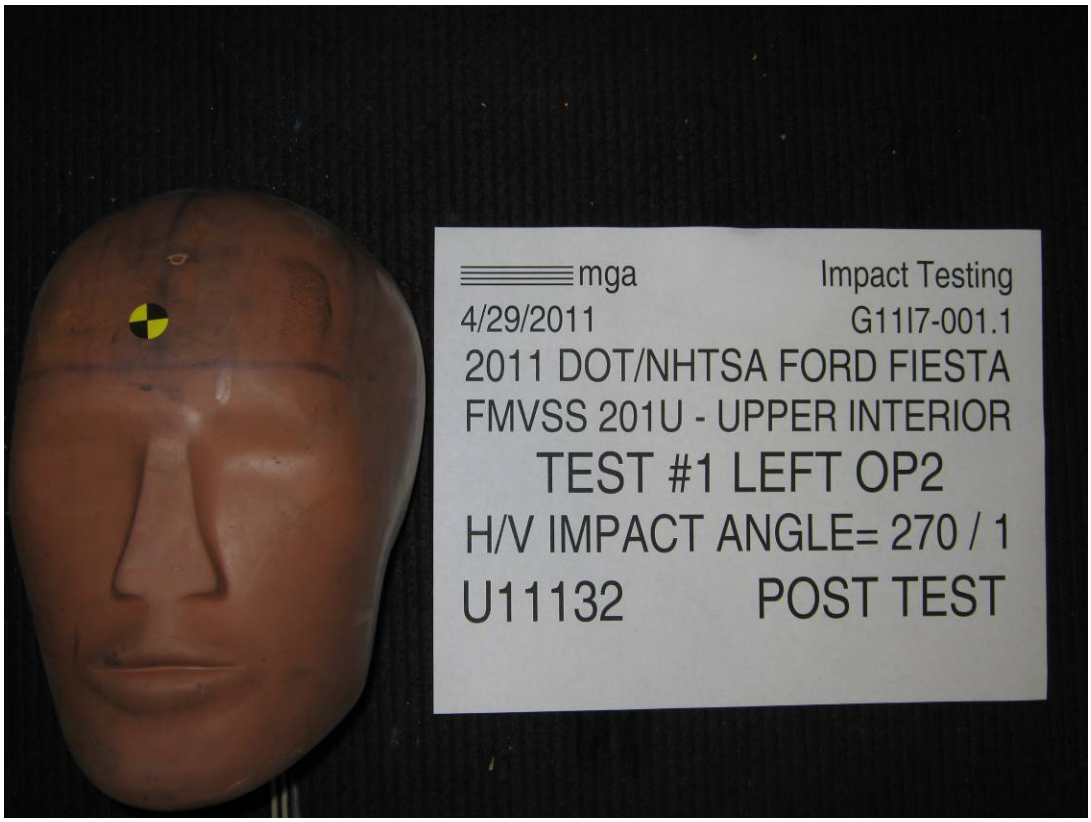

mga
Impact Testing
G11I7-001.1
4/29/2011
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #1 LEFT OP2
H/V IMPACT ANGLE= 270 / 1
U11132
PRE TEST


mga
Impact Testing
G11I7-001.1
4/29/2011
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #1 LEFT OP2
H/V IMPACT ANGLE= 270 / 1
U11132
PRE TEST


CB0204
U11132
LEFT OP2
H/V 270/1
mga
4/29/2011
Impact Testing
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #1 LEFT OP2
H/V IMPACT ANGLE= 270 / 1
U11132
POST TEST


CB0204
U11132
LEFT OP2
H/V 270/1
mga
4/29/2011
Impact Testing
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #1 LEFT OP2
H/V IMPACT ANGLE= 270 / 1
U11132
POST TEST


OP2
270/1


mga
Impact Testing
4/29/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #1 LEFT OP2
H/V IMPACT ANGLE= 270 / 1
U11132
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G11I7-001.1 VEHICLE YR/MAKE/MODEL:2011/DOT/NHTSA/Ford Fiesta

GENERAL TEST PARAMETERS:

Test Number:#1

Target (Vehicle Side): OP2Left

Temperature:22.0C

MGA Test Reference No.:U11132

Humidity:36.3%

Approach Horizontal Angles:270º

Time of Test:11:41:13 AM

Approach Vertical Angles:1º

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
829	879	5.8	23.8	16	5 Right

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J35919	-95.8	1.07	1.07
Y	6	J22664	94.2	0.85	0.85
Z	7	J35924	92.8	0.94	0.94

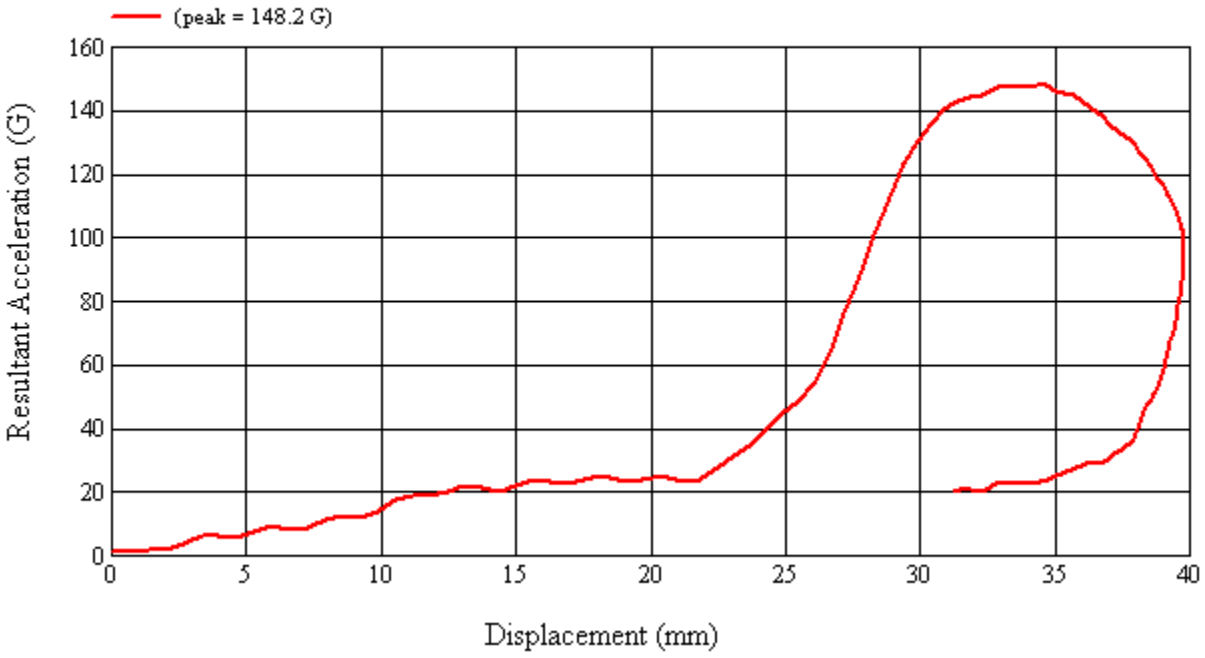
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

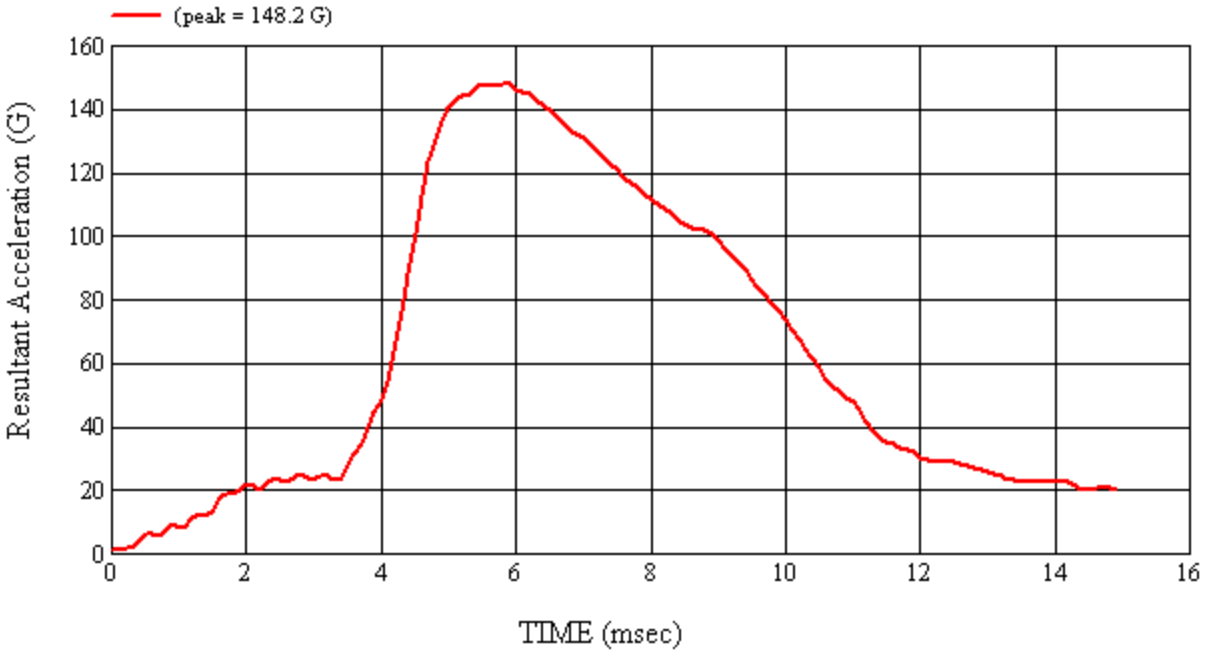
Dislodged trim

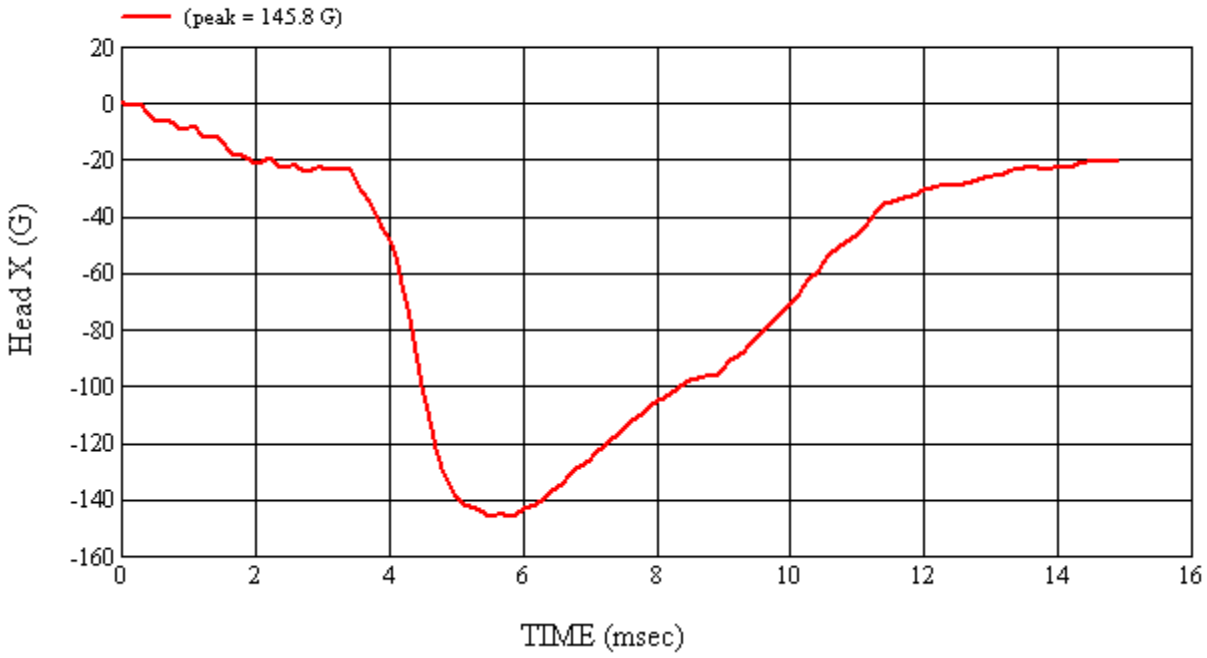
Recorded By: _____ Approved By*: _____ Date: 4/29/2011

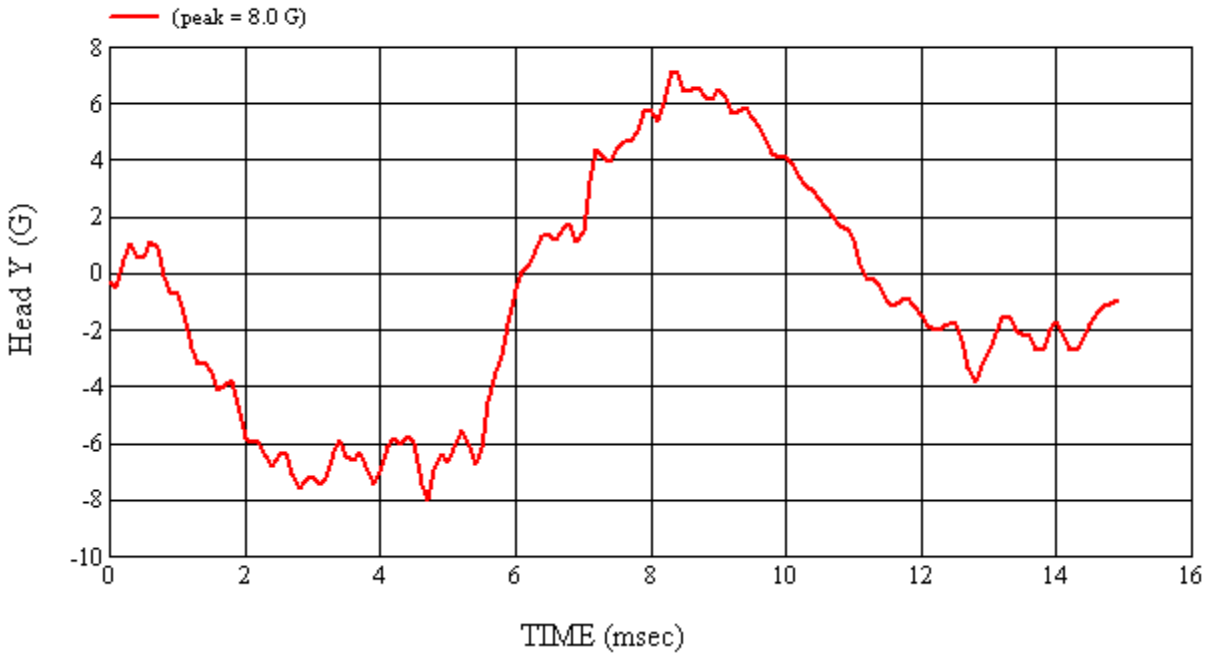
*Only necessary for NHTSA (Government) Compliance testing.

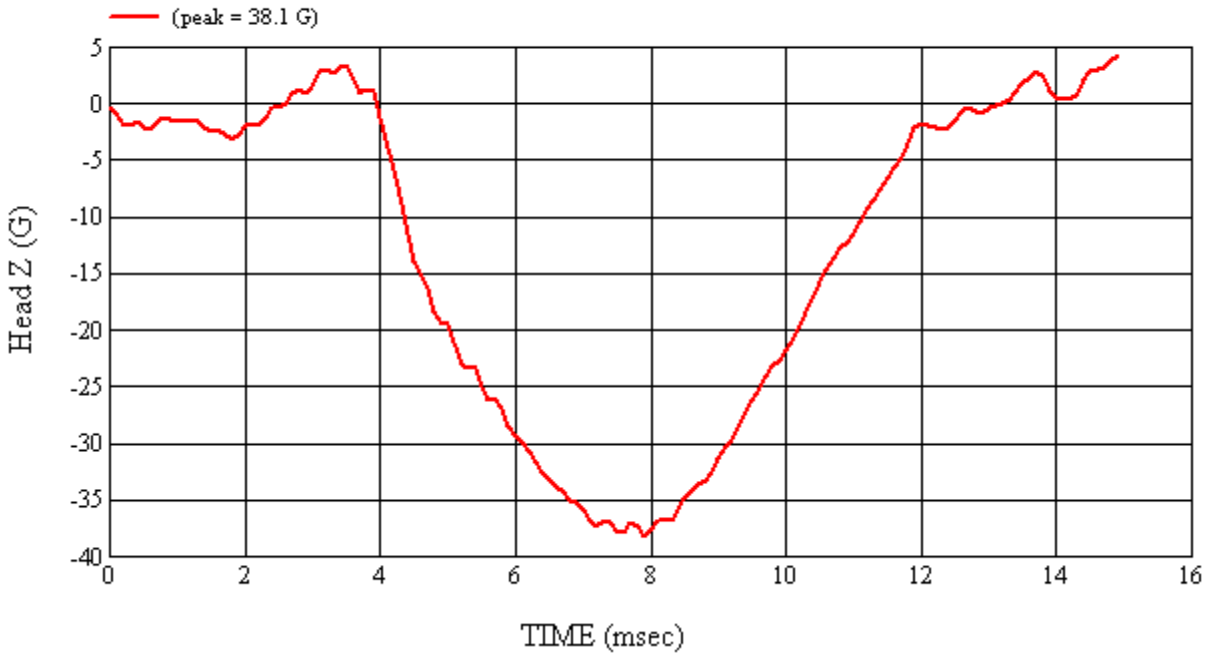
MGA Test #: U11132 Target Location: OP2, Left Side Test Date: 4/29/2011

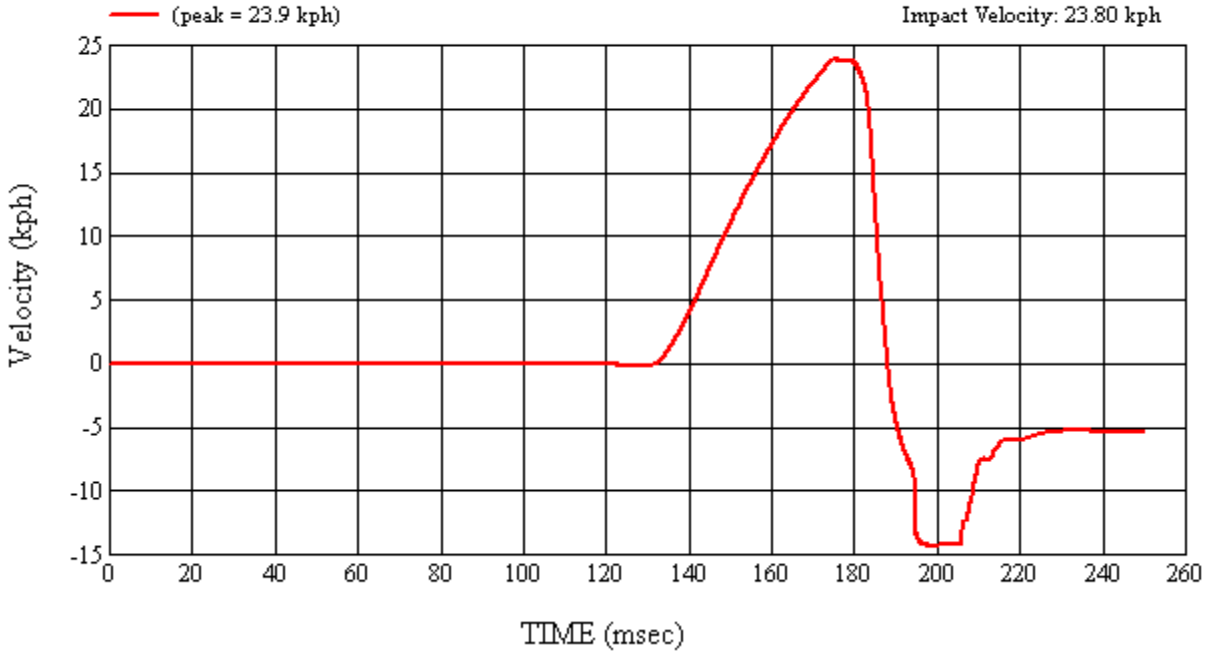


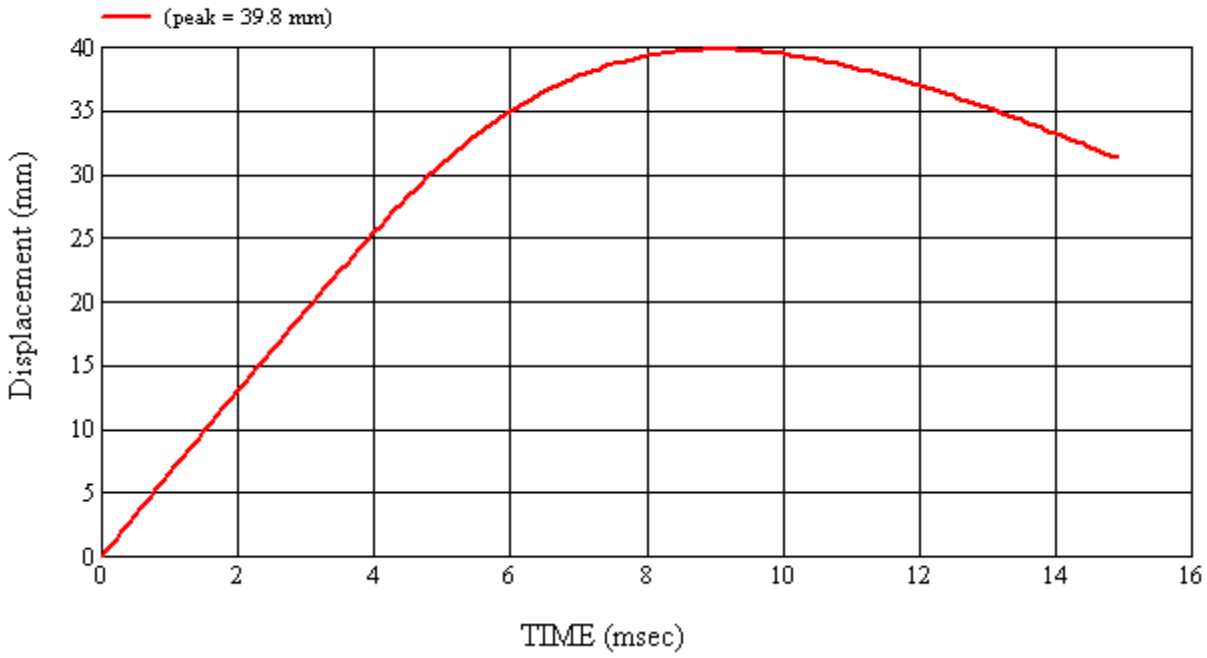



(peak = 145.8 G)
Head X (G)
20
0
-20
-40
-60
-80
-100
-120
-140
-160
0
2
4
6
8
10
12
14
16
TIME (msec)


(peak = 8.0 G)
Head Y (G)
8
6
4
2
0
-2
-4
-6
-8
-10
0
2
4
6
8
10
12
14
16
TIME (msec)

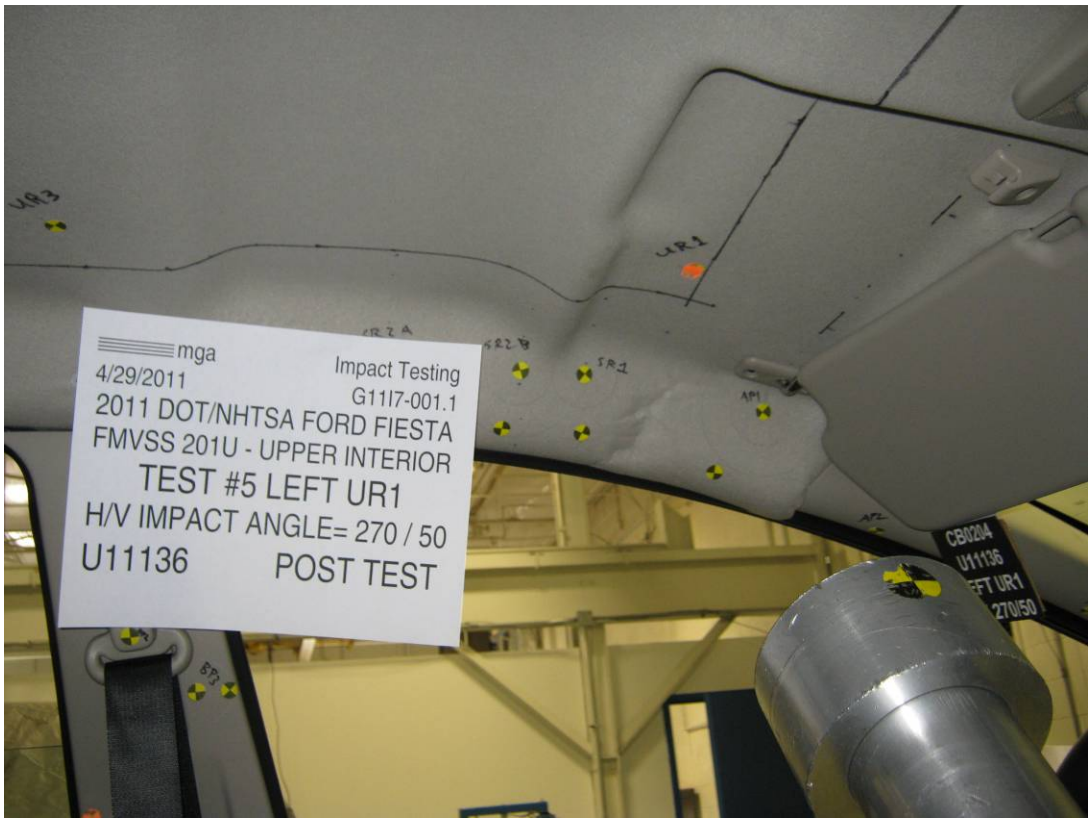

(peak = 38.1 G)
Head Z (G)
5
0
-5
-10
-15
-20
-25
-30
-35
-40
0
2
4
6
8
10
12
14
16
TIME (msec)


(peak = 23.9 kph)
Impact Velocity: 23.80 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)

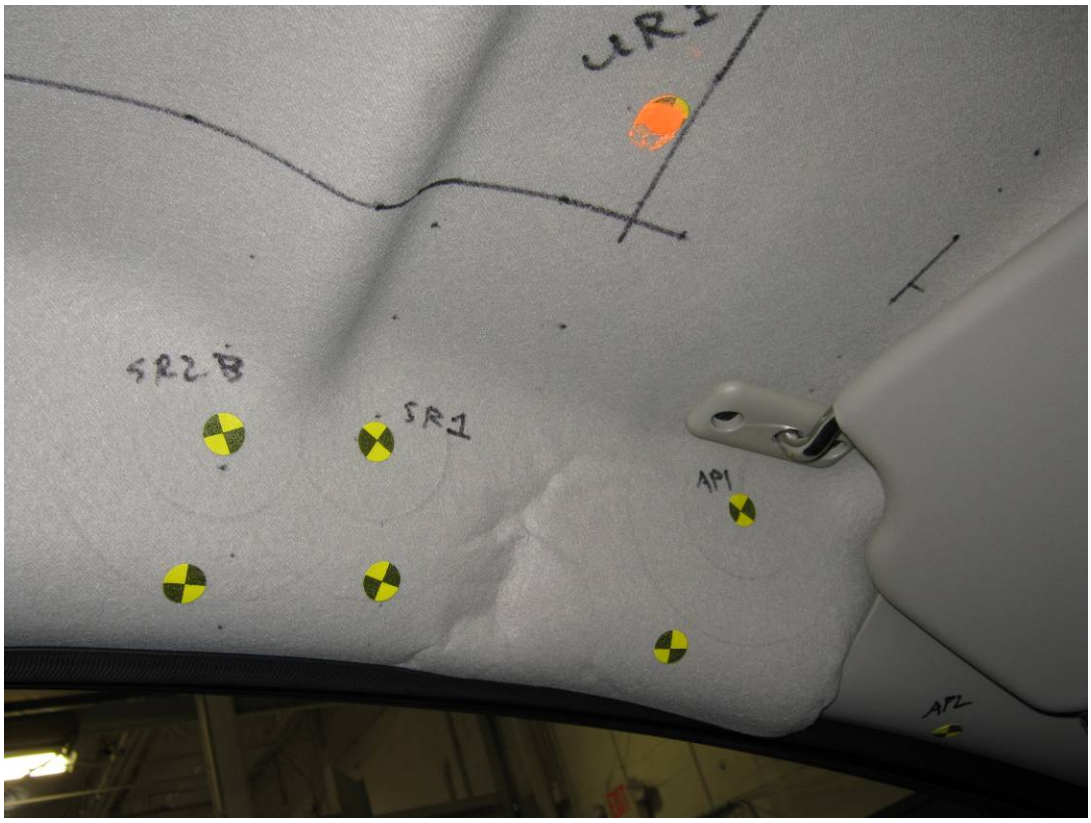

(peak = 39.8 mm)
Displacement (mm)
0
5
10
15
20
25
30
35
40
0
2
4
6
8
10
12
14
16
TIME (msec)

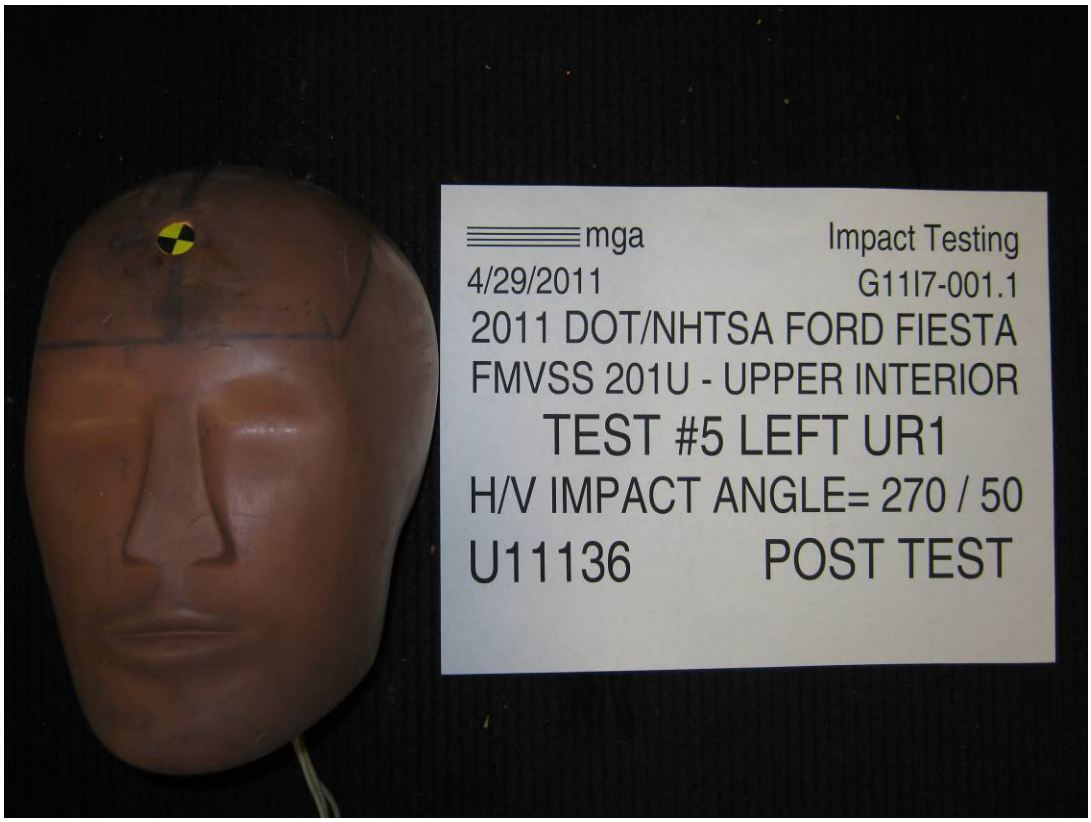

mga
Impact Testing
4/29/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #5 LEFT UR1
H/V IMPACT ANGLE= 270 / 50
U11136
PRE TEST


mga
Impact Testing
4/29/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #5 LEFT UR1
H/V IMPACT ANGLE= 270 / 50
U11136
PRE TEST


mga
4/29/2011
Impact Testing
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #5 LEFT UR1
H/V IMPACT ANGLE= 270 / 50
U11136
POST TEST


mga
4/29/2011
Impact Testing
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #5 LEFT UR1
H/V IMPACT ANGLE= 270 / 50
U11136
POST TEST


UR1
SR2B
SR1
AP1
AP2


mga
Impact Testing
4/29/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #5 LEFT UR1
H/V IMPACT ANGLE= 270 / 50
U11136
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G11I7-001.1 VEHICLE YR/MAKE/MODEL:2011/DOT/NHTSA/Ford Fiesta

GENERAL TEST PARAMETERS:

Target (Vehicle Side): UR1Left

MGA Test Reference No.:U11136

Approach Horizontal Angles:270º

Approach Vertical Angles:50º

Additional Description:@SR1

Test Number:#5

Temperature:22.3C

Humidity:34.6%

Time of Test:4:44:46 PM

FMH Serial No:[037]

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
477	411	7	24.0	36	1 Right

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J32177	-113.7	1.07	1.07
Y	6	J14103	93.9	0.85	0.85
Z	7	J35800	97.8	0.94	0.94

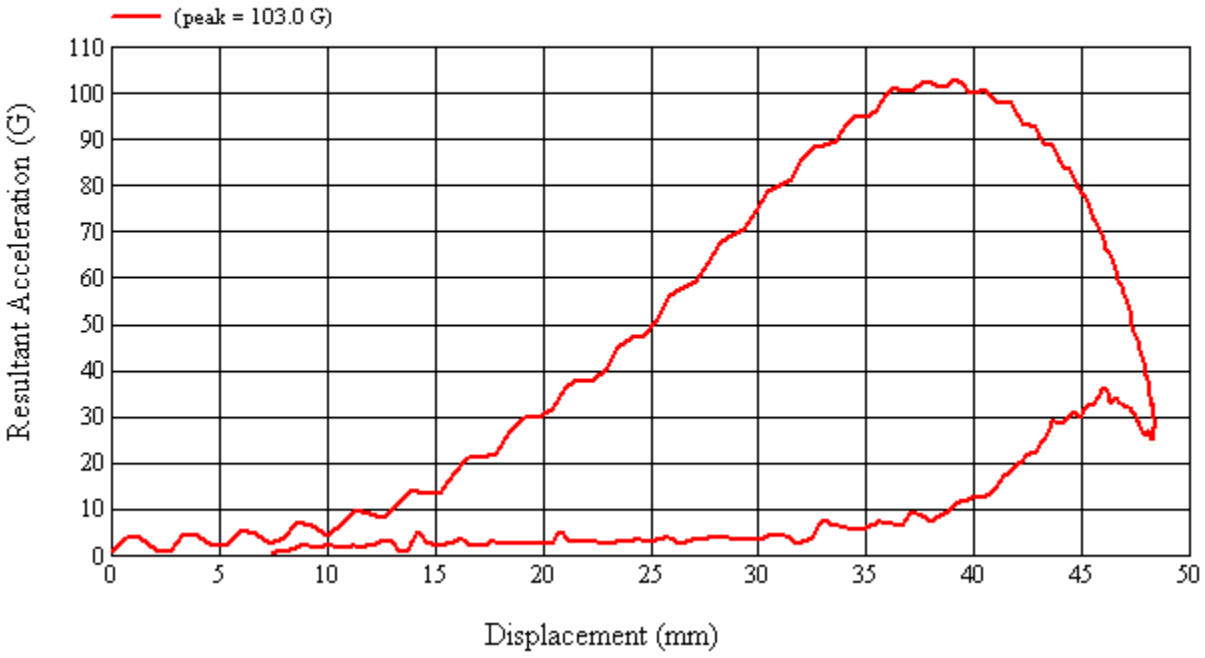
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

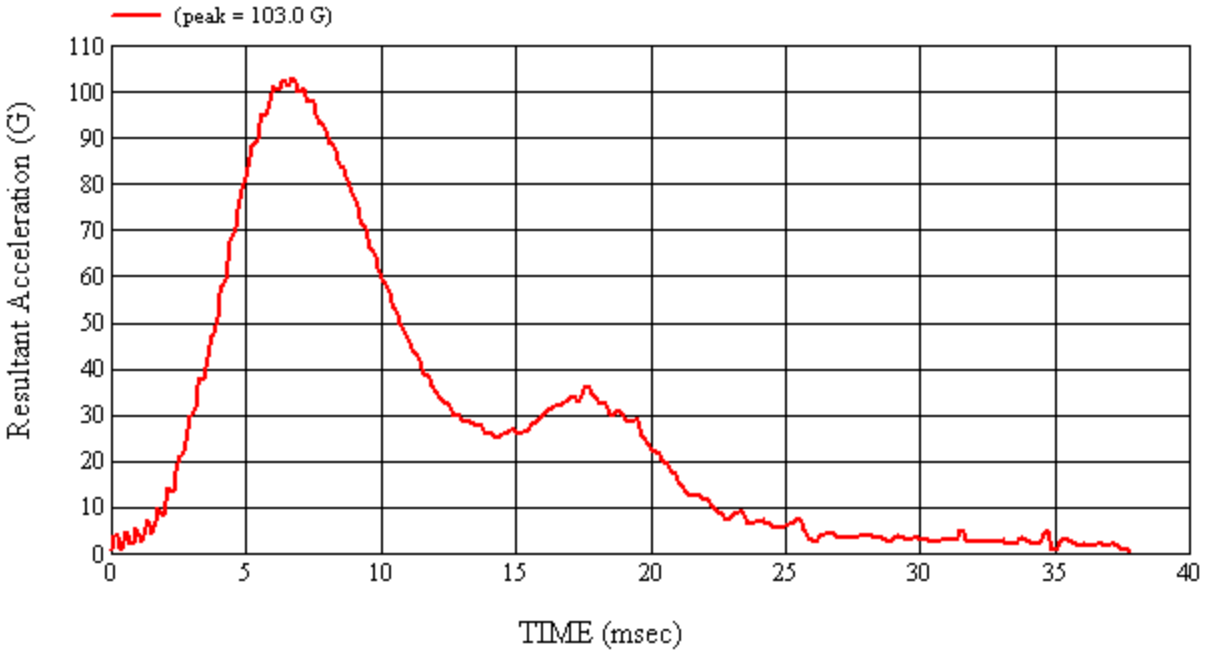
Headliner deformation, dislodged headliner

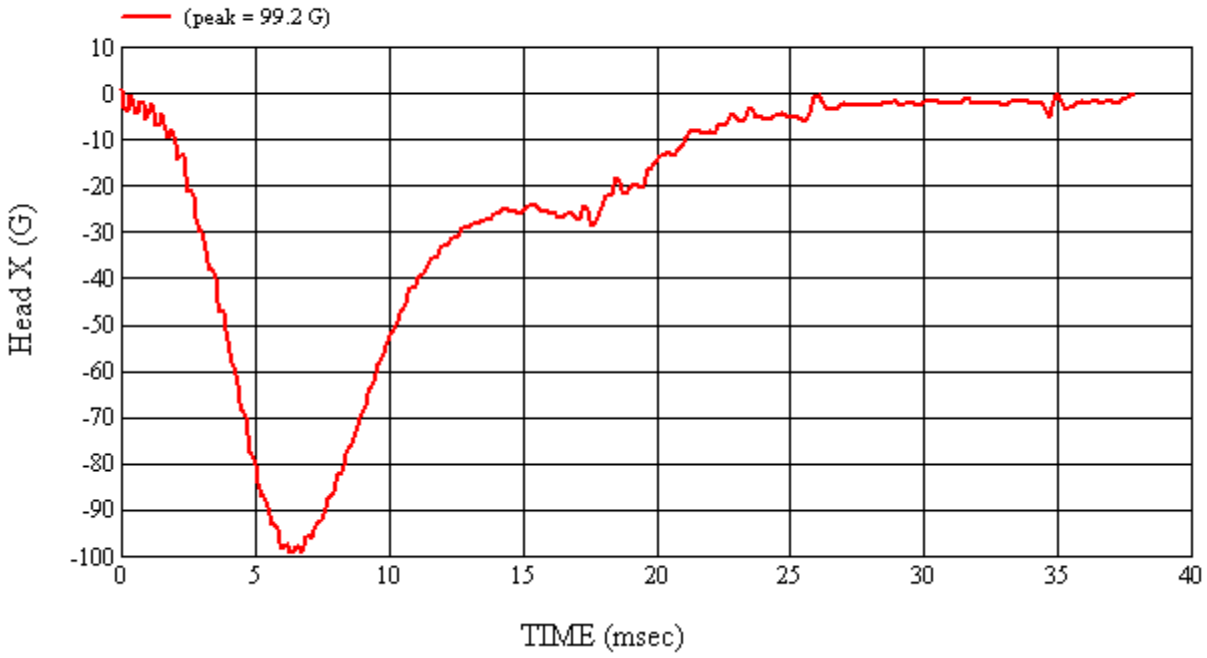
Recorded By: _____ Approved By*: _____ Date: 4/29/2011

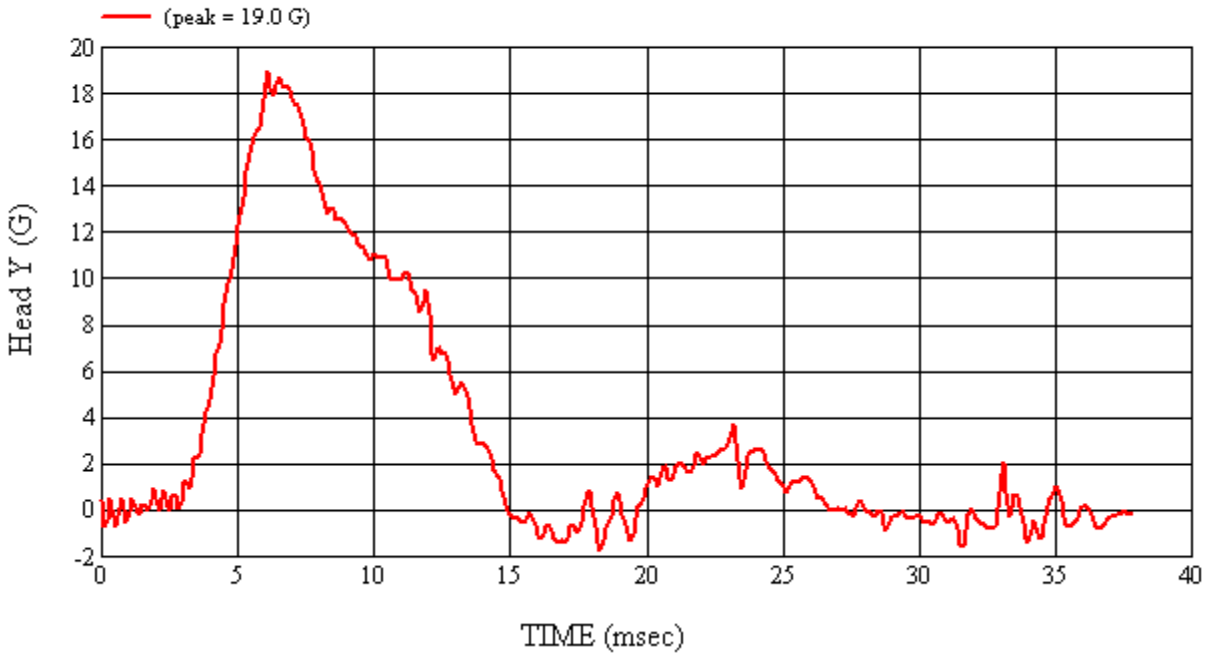
*Only necessary for NHTSA (Government) Compliance testing.

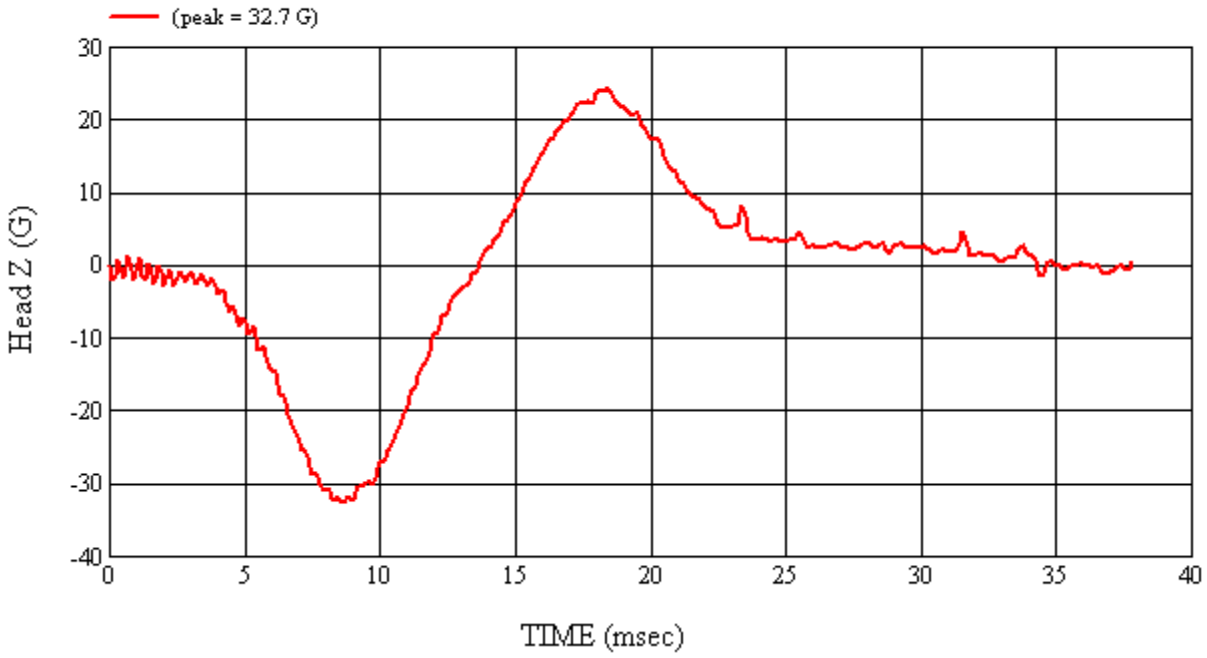
MGA Test #: U11136 Target Location: UR1, Left Side Test Date: 4/29/2011

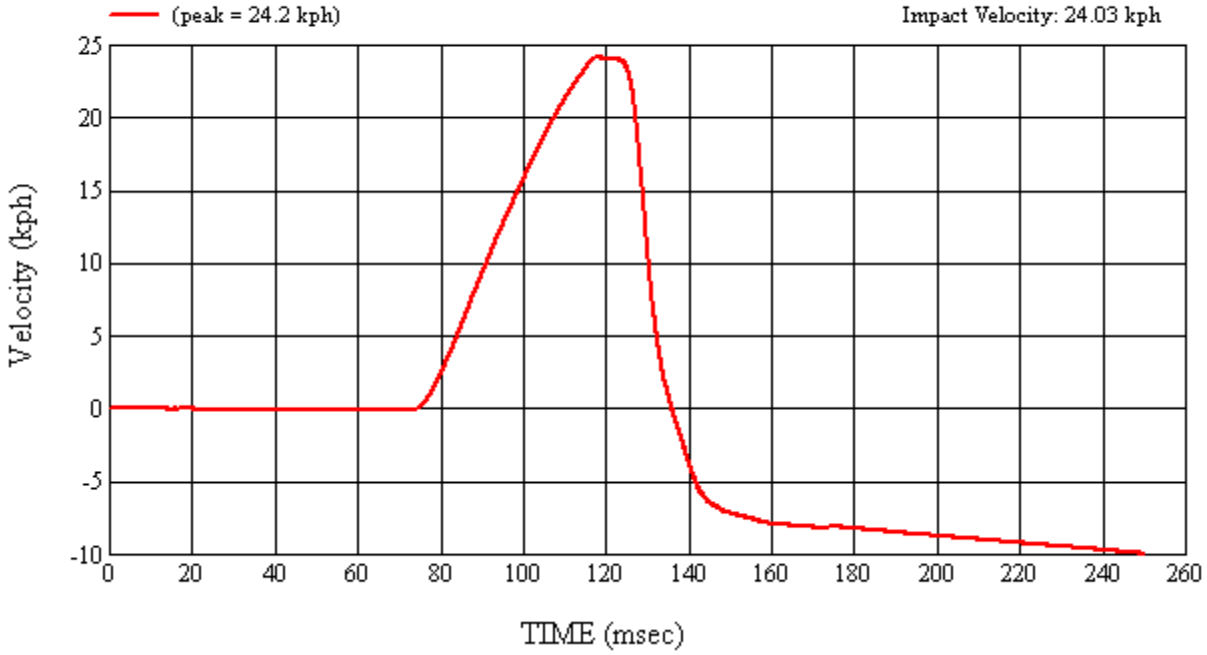


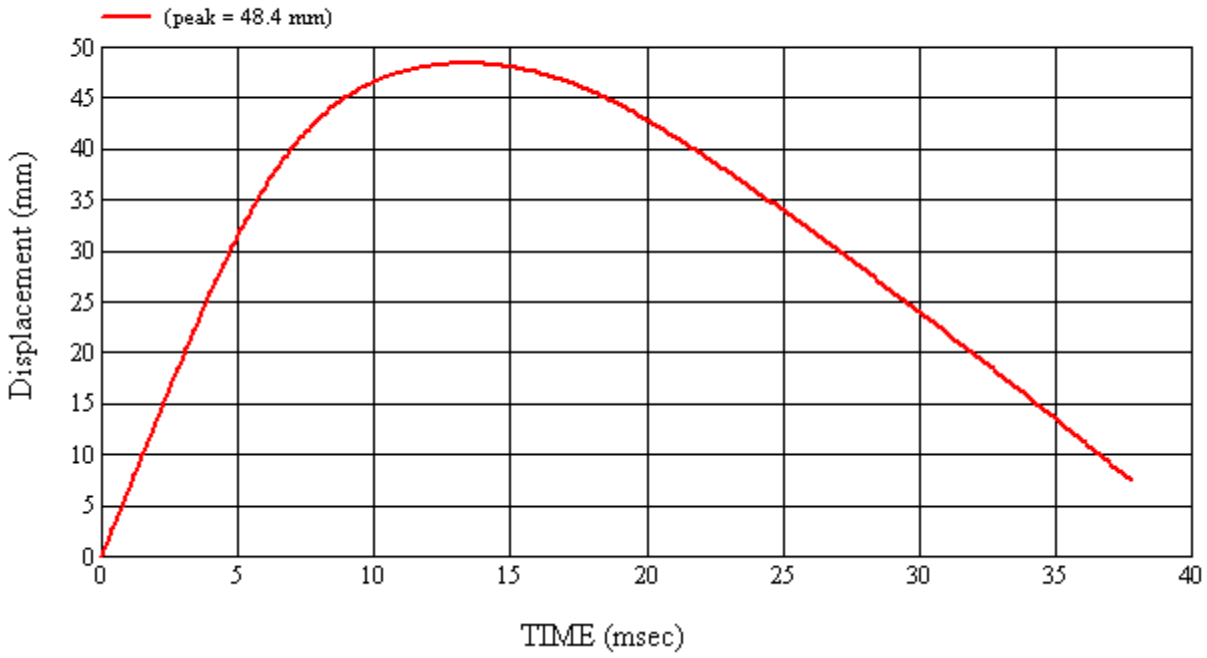



(peak = 99.2 G)
Head X (G)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
0
5
10
15
20
25
30
35
40
TIME (msec)


(peak = 19.0 G)
Head Y (G)
20
18
16
14
12
10
8
6
4
2
0
-2
0
5
10
15
20
25
30
35
40
TIME (msec)


(peak = 32.7 G)
Head Z (G)
30
20
10
0
-10
-20
-30
-40
0
5
10
15
20
25
30
35
40
TIME (msec)


(peak = 24.2 kph)
Impact Velocity: 24.03 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)

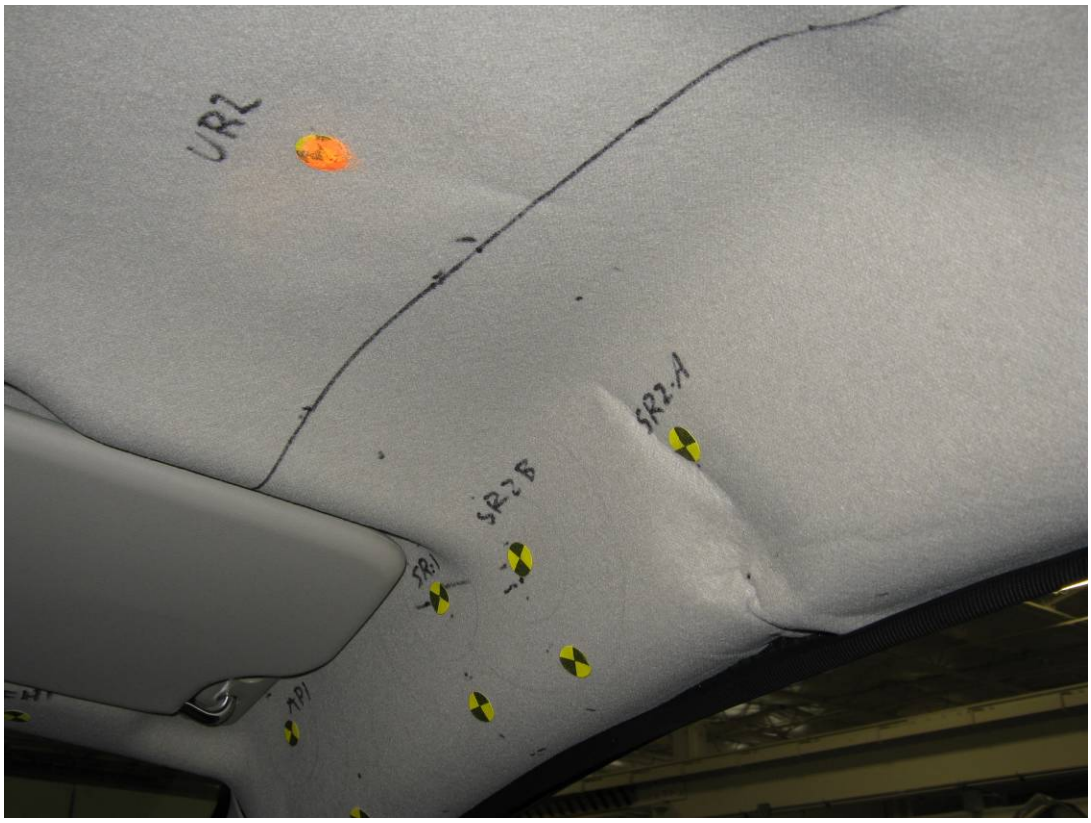

(peak = 48.4 mm)
Displacement (mm)
0
5
10
15
20
25
30
35
40
45
50
0
5
10
15
20
25
30
35
40
TIME (msec)


mga
Impact Testing
5/2/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #10 RIGHT UR2
H/V IMPACT ANGLE= 90 / 50
U11141
PRE TEST
PALLITE VIII


mga
Impact Testing
5/2/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #10 RIGHT UR2
H/V IMPACT ANGLE= 90 / 50
U11141
PRE TEST


CB0204
U11141
RIGHT UR2
H/V 90/50
mga
5/2/2011
Impact Testing
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #10 RIGHT UR2
H/V IMPACT ANGLE= 90 / 50
U11141
POST TEST


CB0204
U11141
mga
5/2/2011
Impact Testing
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #10 RIGHT UR2
H/V IMPACT ANGLE= 90 / 50
U11141
POST TEST


UR2
SR2-A
SR2-B
SR1
API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Impact Testing
5/2/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #10 RIGHT UR2
H/V IMPACT ANGLE= 90 / 50
U11141
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G11I7-001.1 VEHICLE YR/MAKE/MODEL:2011/DOT/NHTSA/Ford Fiesta

GENERAL TEST PARAMETERS:

Target (Vehicle Side): UR2Right

MGA Test Reference No.:U11141

Approach Horizontal Angles:90º

Approach Vertical Angles:50º

Additional Description:@SR2A

Test Number:#10

Temperature:21.6C

Humidity:34.2%

Time of Test:2:11:09 PM

FMH Serial No:[035]

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
488	426	7.2	24.1	33	4 Left

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J35919	-95.8	1.07	1.07
Y	6	J22664	94.2	0.85	0.85
Z	7	J35924	92.8	0.94	0.94

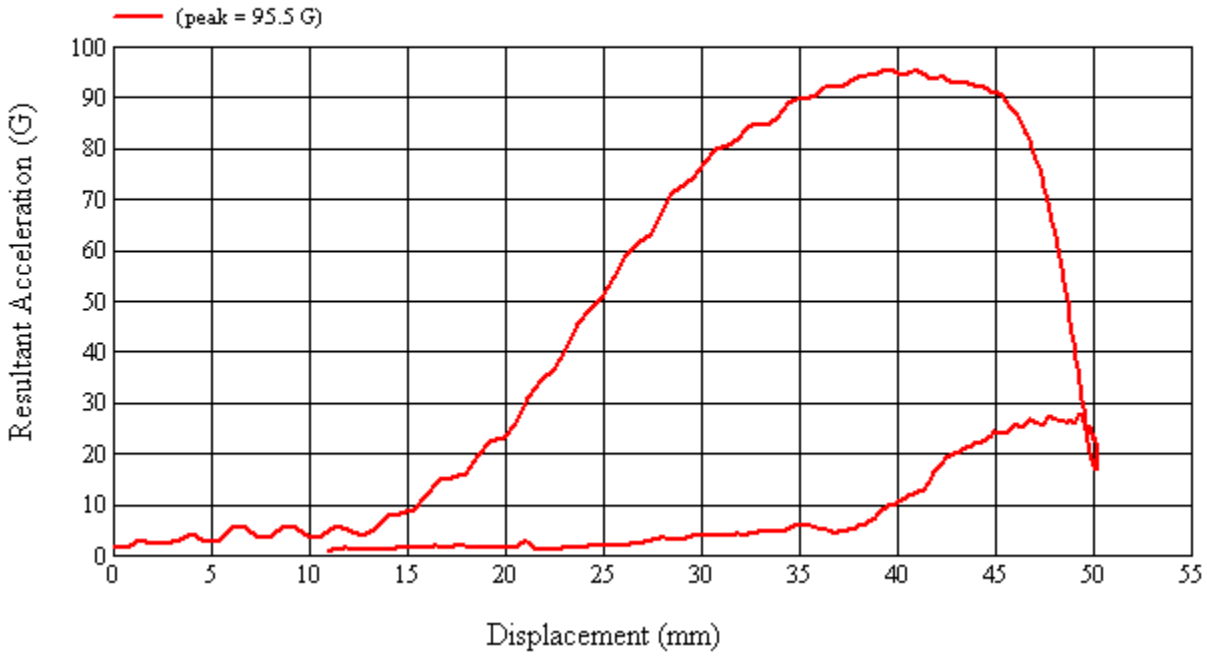
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

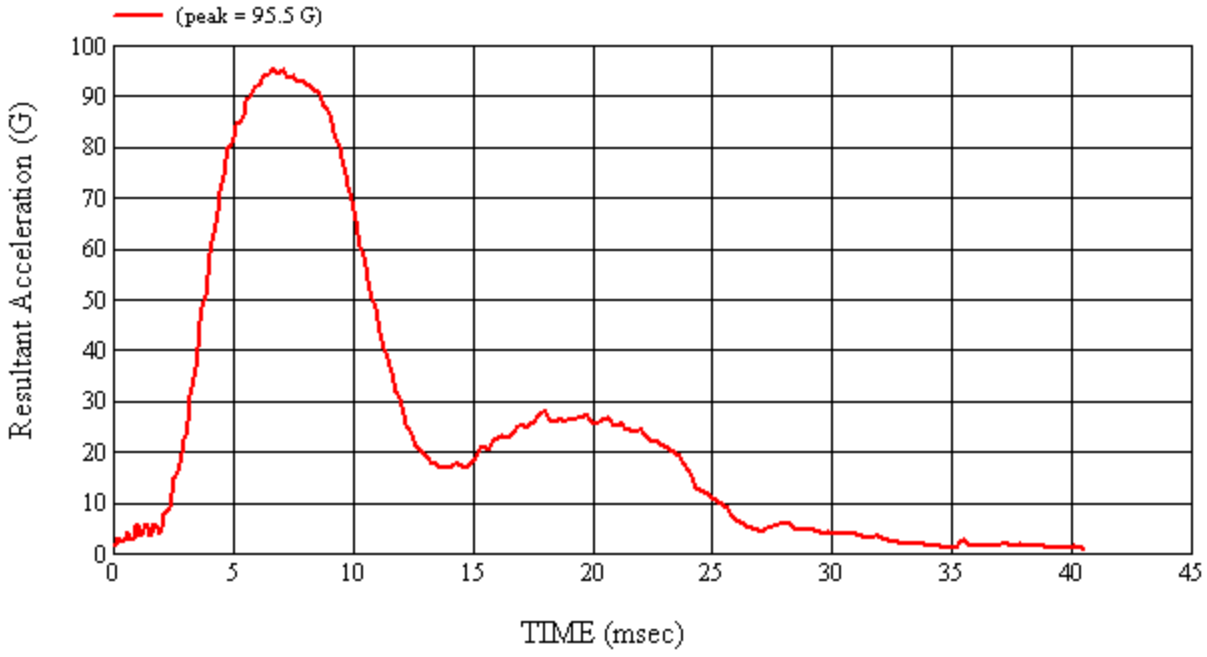
Headliner deformation; dislodged headliner.

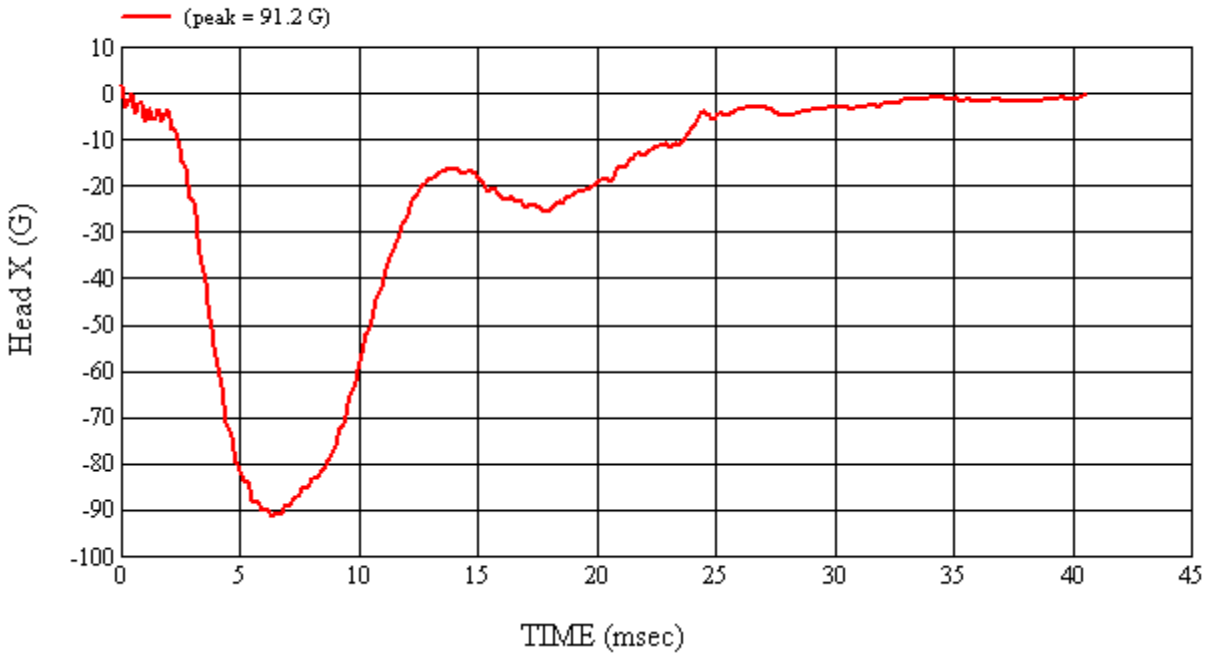
Recorded By: _____ Approved By*: _____ Date: 5/2/2011

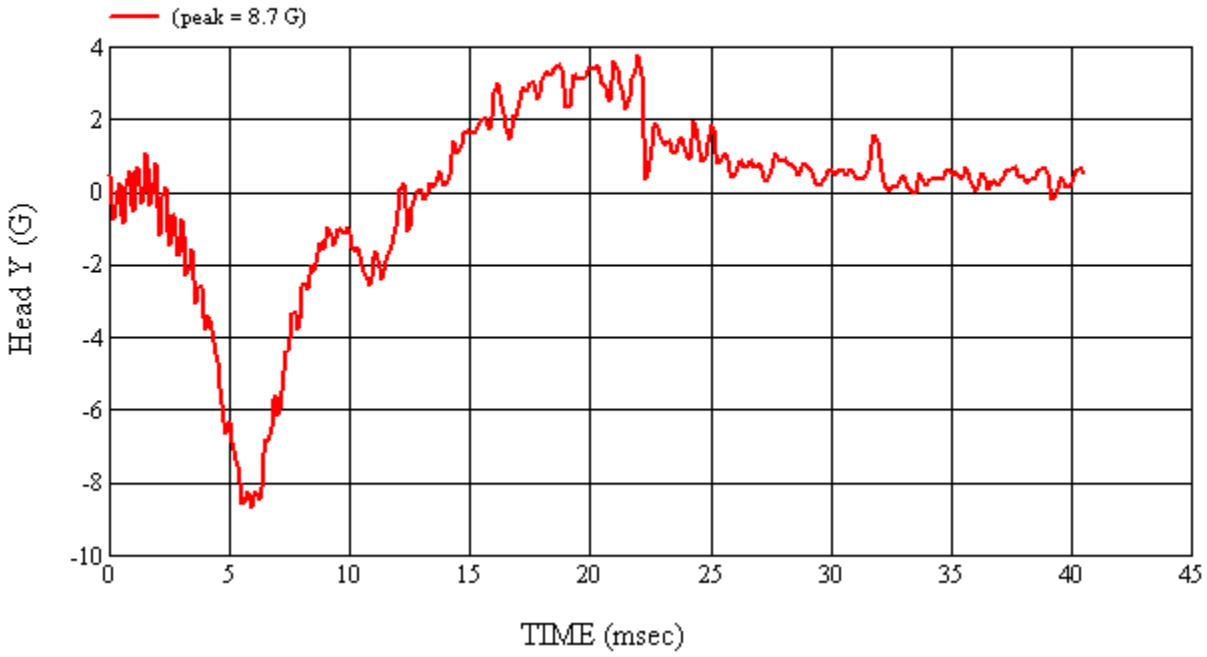
*Only necessary for NHTSA (Government) Compliance testing.

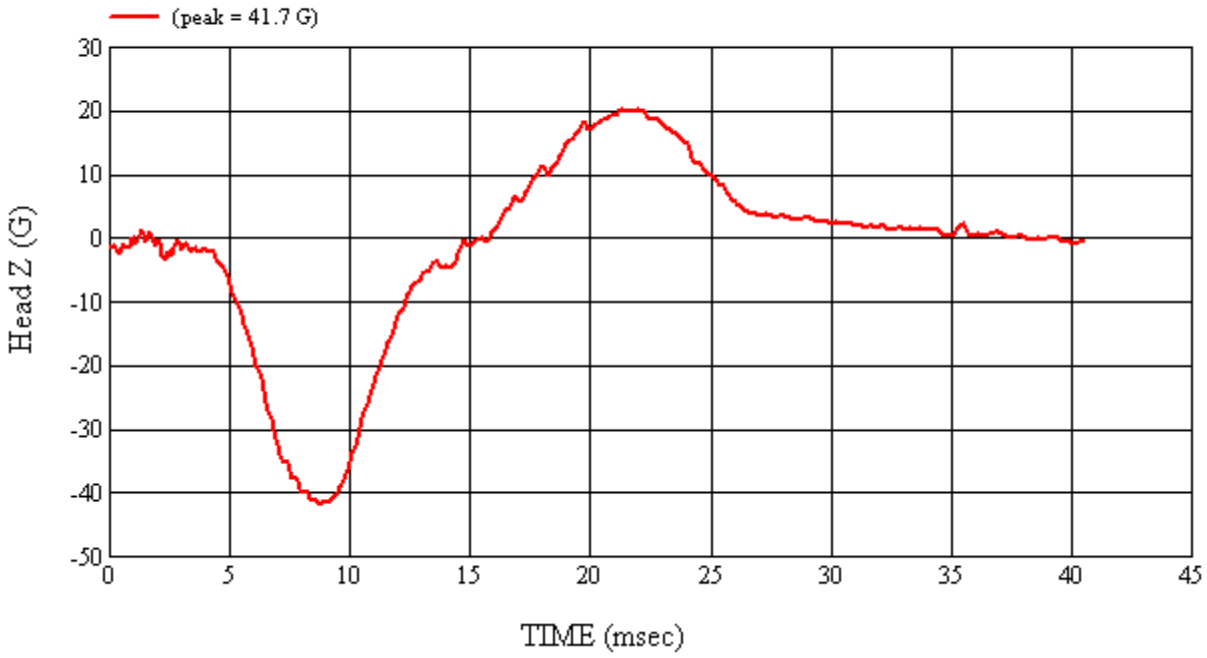
MGA Test #: U11141 Target Location: UR2, Right Side Test Date: 5/2/2011

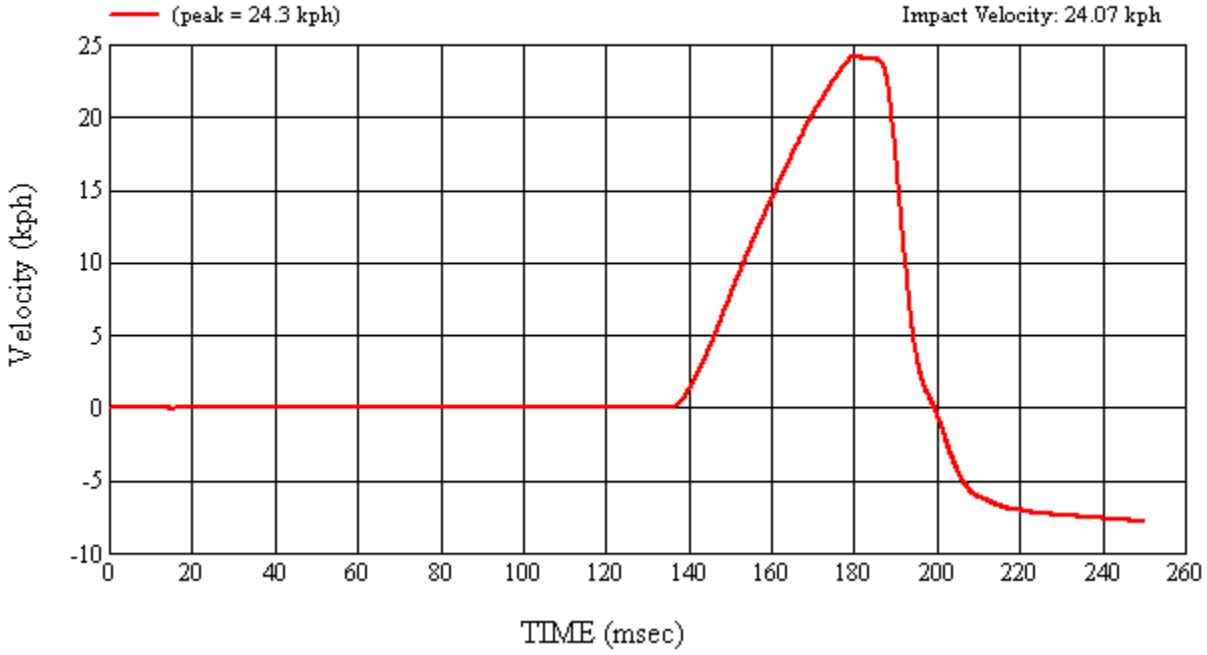


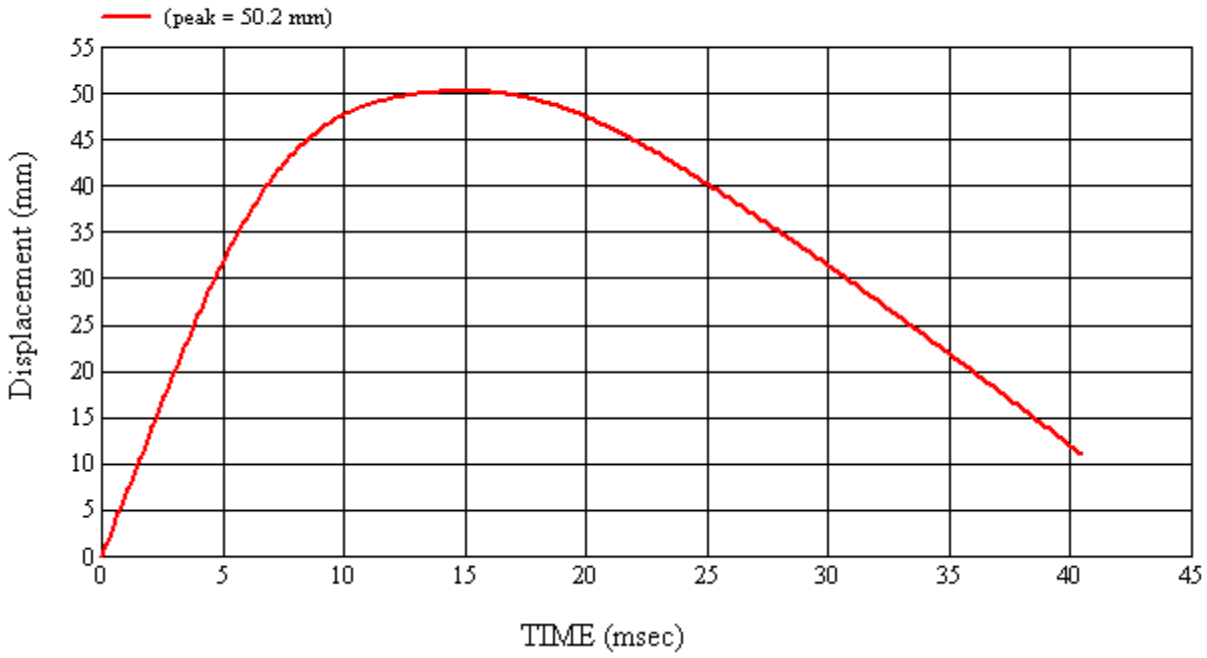



(peak = 91.2 G)
Head X (G)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
0
5
10
15
20
25
30
35
40
45
TIME (msec)


(peak = 8.7 G)
Head Y (G)
4
2
0
-2
-4
-6
-8
-10
0
5
10
15
20
25
30
35
40
45
TIME (msec)


(peak = 41.7 G)
Head Z (G)
30
20
10
0
-10
-20
-30
-40
-50
0
5
10
15
20
25
30
35
40
45
TIME (msec)


(peak = 24.3 kph)
Impact Velocity: 24.07 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)

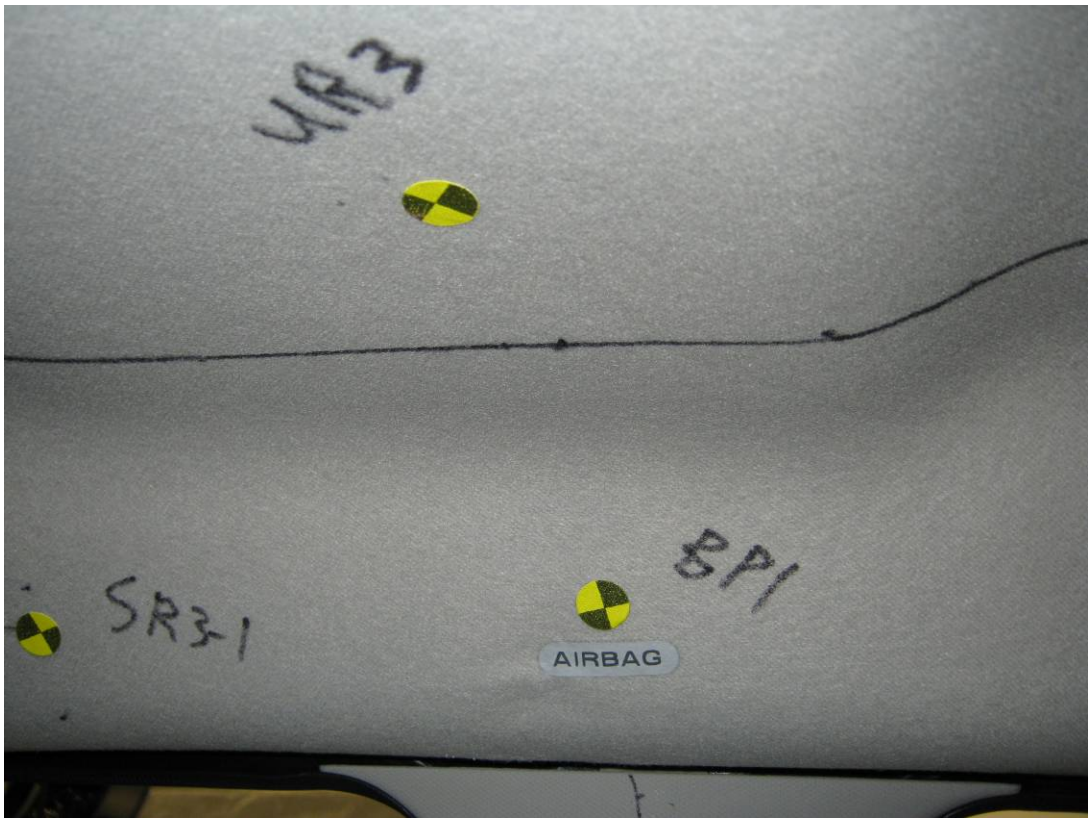

(peak = 50.2 mm)
Displacement (mm)
55
50
45
40
35
30
25
20
15
10
5
0
0
5
10
15
20
25
30
35
40
45
TIME (msec)


mga
Impact Testing
4/29/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #4 LEFT UR3
H/V IMPACT ANGLE= 270 / 50
U11135
PRE-TEST


SR3I
BPI
AIRBAG
SR2A
SR2B
APT
BPI
mga
Impact Testing
4/29/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #4 LEFT UR3
H/V IMPACT ANGLE= 270 / 50
U11135
PRE-TEST


mga
Impact Testing
4/29/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #4 LEFT UR3
H/V IMPACT ANGLE= 270 / 50
U11135
POST-TEST


SR3I
BPI
SR2A
SR2B
mga
Impact Testing
4/29/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #4 LEFT UR3
H/V IMPACT ANGLE= 270 / 50
U11135
POST-TEST



Note: Impact location on FMH estimated from high speed video.

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G11I7-001.1 VEHICLE YR/MAKE/MODEL:2011/DOT/NHTSA/Ford Fiesta

GENERAL TEST PARAMETERS:

Target (Vehicle Side): UR3Left

MGA Test Reference No.:U11135

Approach Horizontal Angles:270º

Approach Vertical Angles:50º

Additional Description:@BP

Test Number:#4

Temperature:21.1C

Humidity:35.5%

Time of Test:3:32:01 PM

FMH Serial No:[035]

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
403	313	17.4	24.0	41*	0*

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J35919	-95.8	1.07	1.07
Y	6	J22664	94.2	0.85	0.85
Z	7	J35924	92.8	0.94	0.94

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

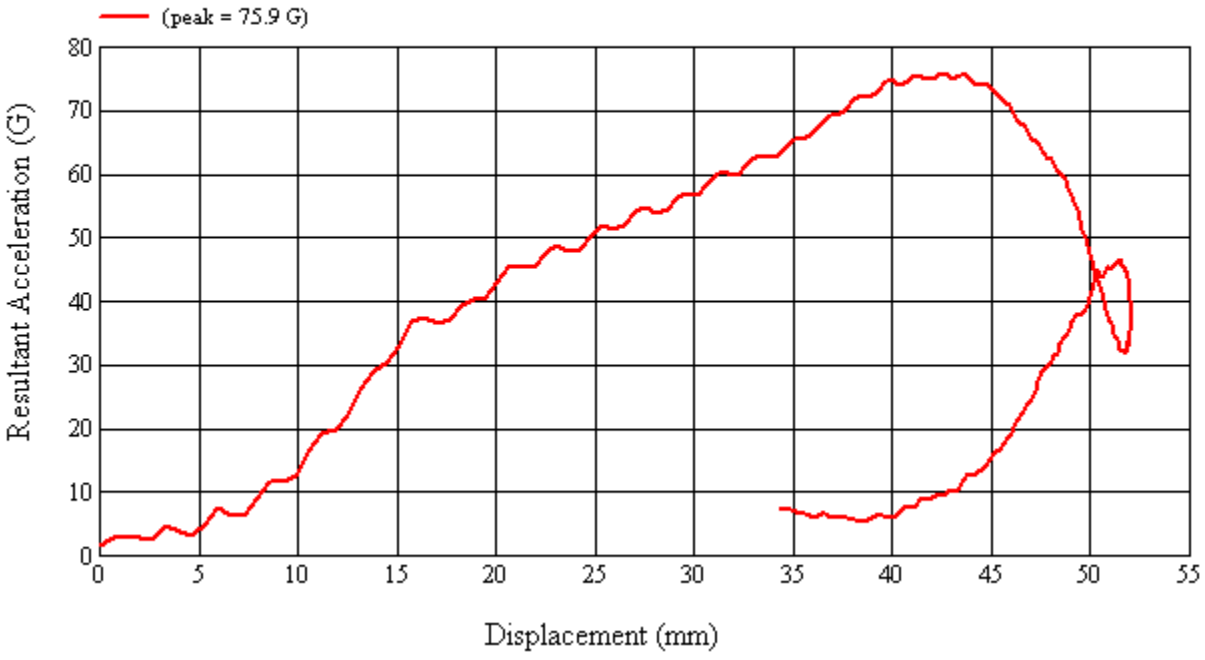
Headliner deformation

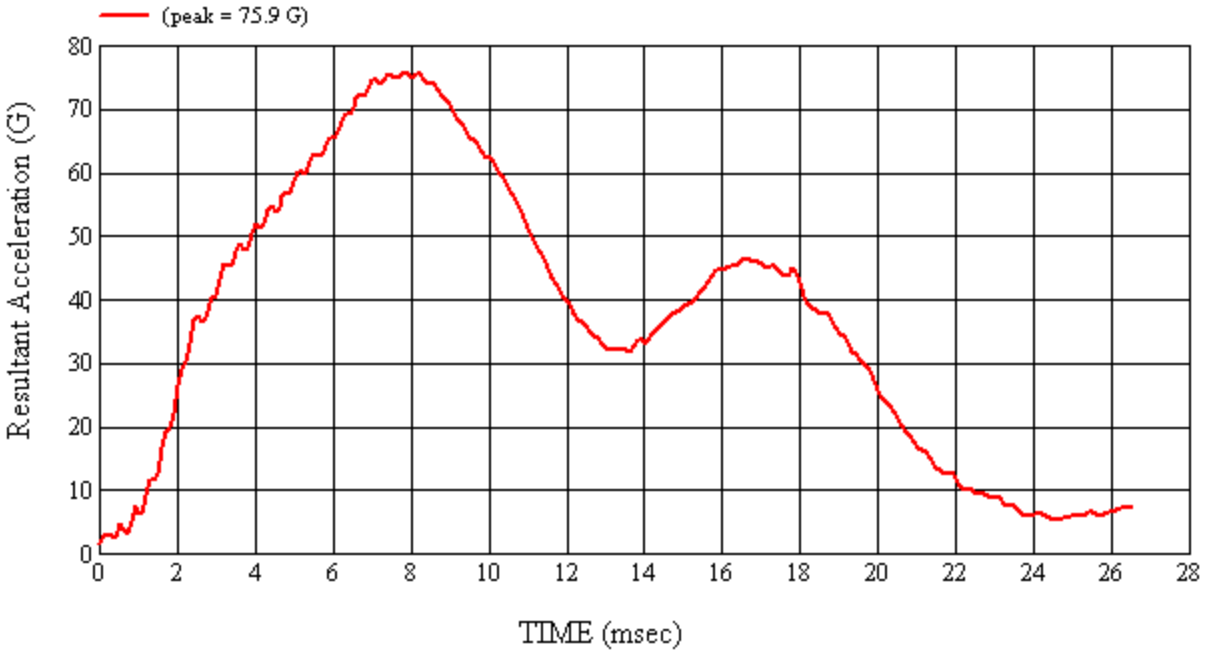
*Impact location on FMH estimated from high speed video.

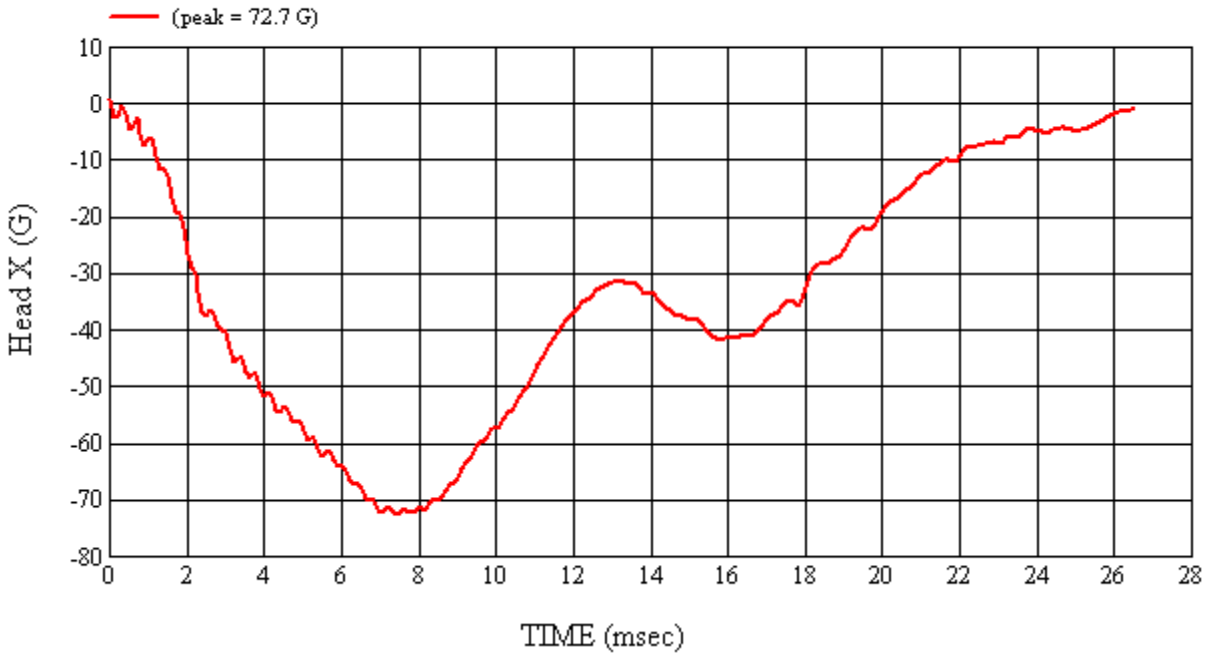
Recorded By: _____ Approved By*: _____ Date: 4/29/2011

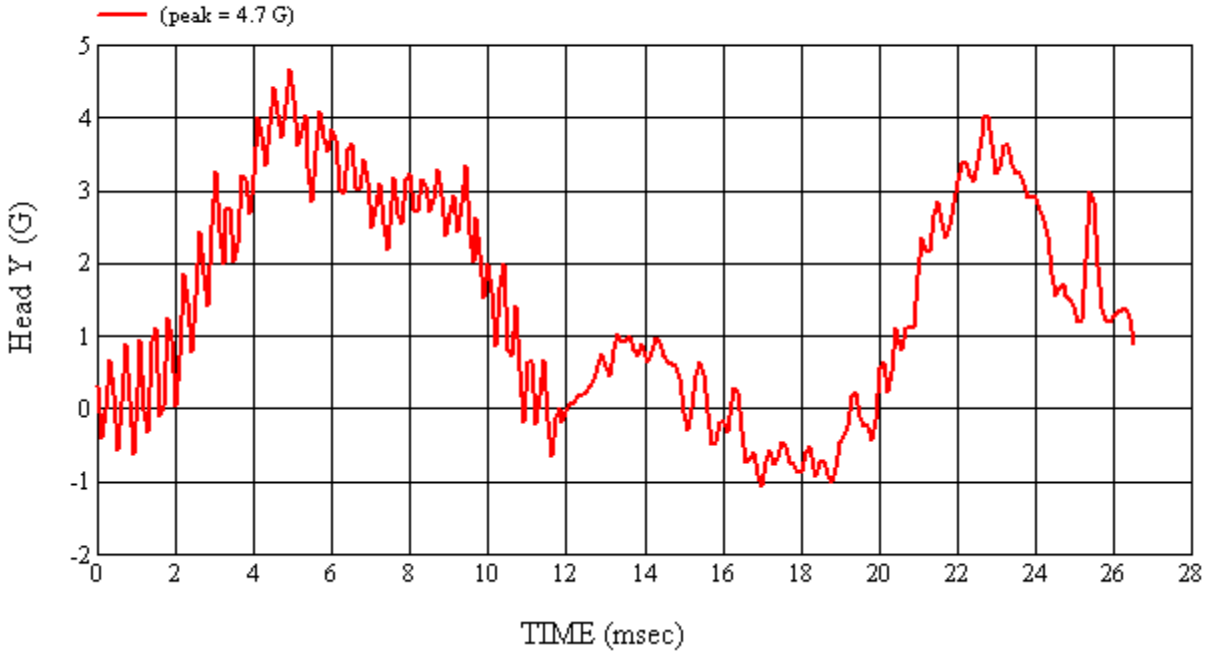
*Only necessary for NHTSA (Government) Compliance testing.

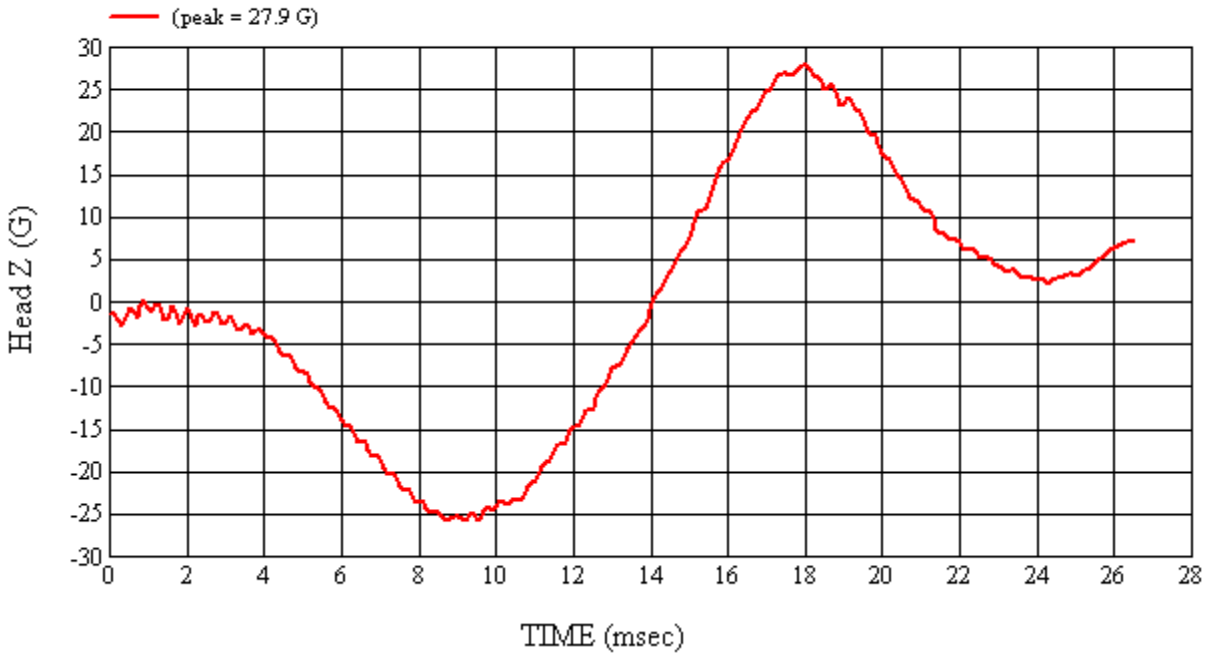
MGA Test #: U11135 Target Location: UR3, Left Side Test Date: 4/29/2011

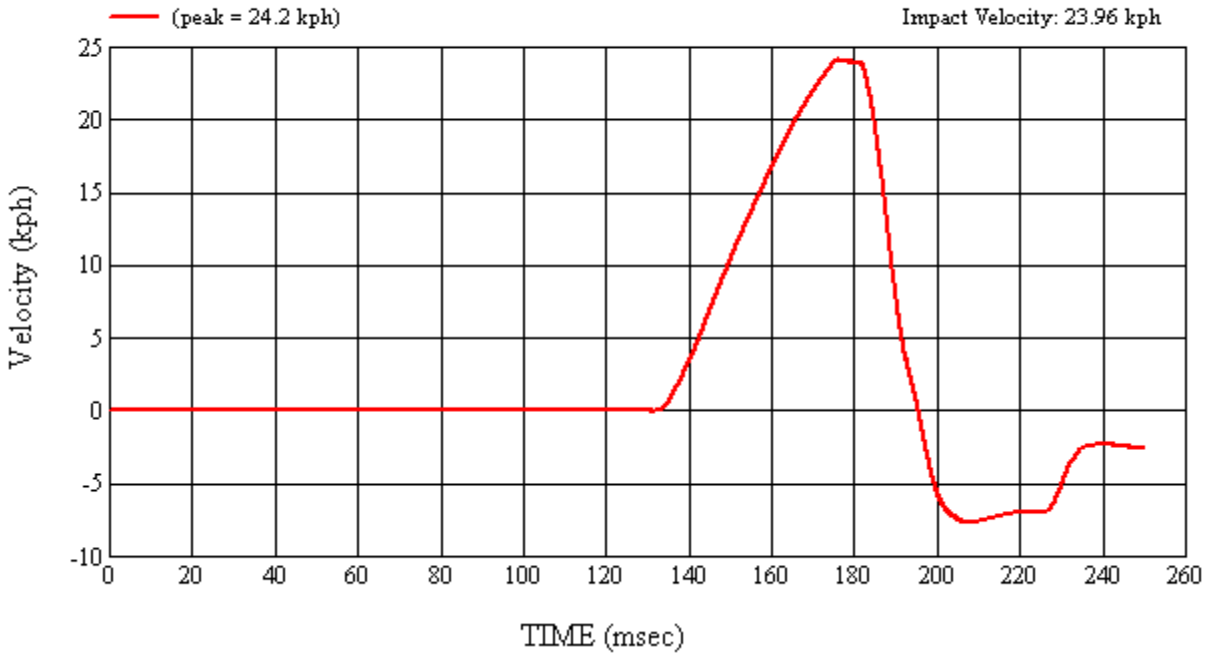


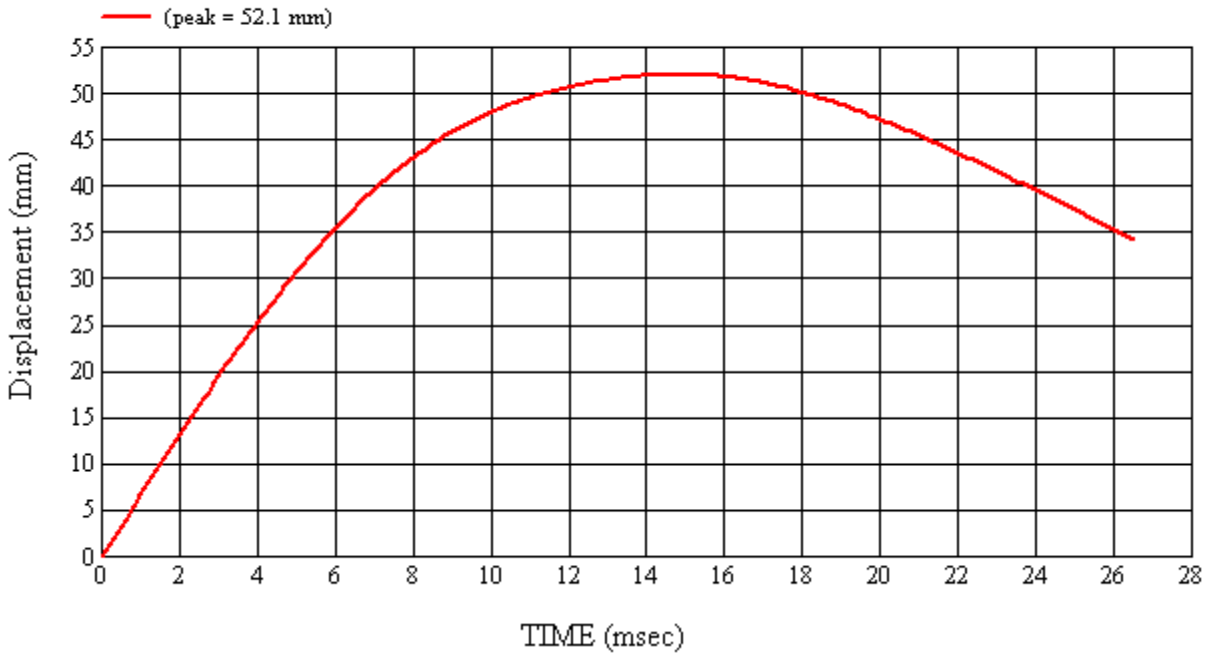



(peak = 72.7 G)
Head X (G)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
TIME (msec)


(peak = 4.7 G)
Head Y (G)
5
4
3
2
1
0
-1
-2
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
TIME (msec)


(peak = 27.9 G)
Head Z (G)
30
25
20
15
10
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 = 24.2 kph)
Impact Velocity: 23.96 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)

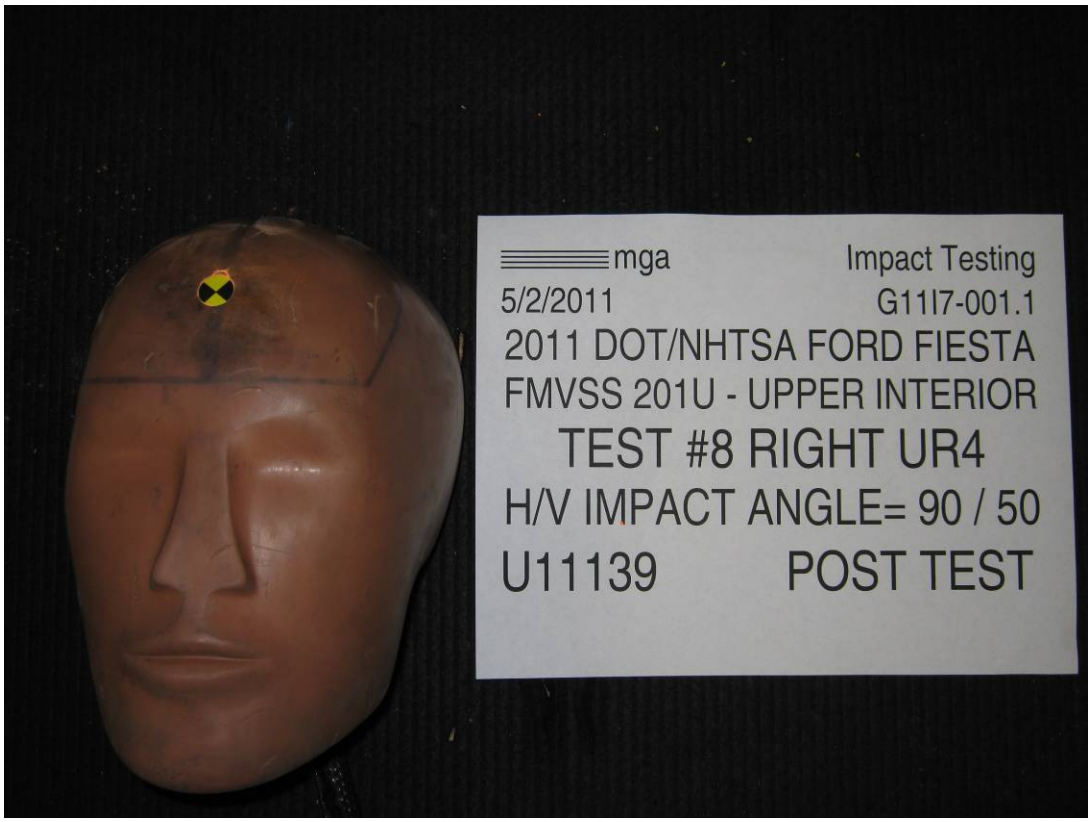

(peak = 52.1 mm)
Displacement (mm)
55
50
45
40
35
30
25
20
15
10
5
0
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
TIME (msec)


mga
Impact Testing
5/2/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #8 RIGHT UR4
H/V IMPACT ANGLE= 90 / 50
U11139
PRE TEST


mga
Impact Testing
5/2/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #8 RIGHT UR4
H/V IMPACT ANGLE= 90 / 50
U11139
PRE TEST


CB0204
U11139
RIGHT UR4
H/V 90/50
mga
Impact Testing
5/2/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #8 RIGHT UR4
H/V IMPACT ANGLE= 90 / 50
U11139
POST TEST


mga
Impact Testing
5/2/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #8 RIGHT UR4
H/V IMPACT ANGLE= 90 / 50
U11139
POST TEST


mga
Impact Testing
5/2/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #8 RIGHT UR4
H/V IMPACT ANGLE= 90 / 50
U11139
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G11I7-001.1 VEHICLE YR/MAKE/MODEL:2011/DOT/NHTSA/Ford Fiesta

GENERAL TEST PARAMETERS:

Target (Vehicle Side): UR4Right

MGA Test Reference No.:U11139

Approach Horizontal Angles:90º

Approach Vertical Angles:50º

Additional Description:@SR31

Test Number:#8

Temperature:21.6C

Humidity:39.0%

Time of Test:11:11:53 AM

FMH Serial No:[037]

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
509	455	8.6	24.1	33	2 Right

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J32177	-113.7	1.07	1.07
Y	6	J14103	93.9	0.85	0.85
Z	7	J35800	97.8	0.94	0.94

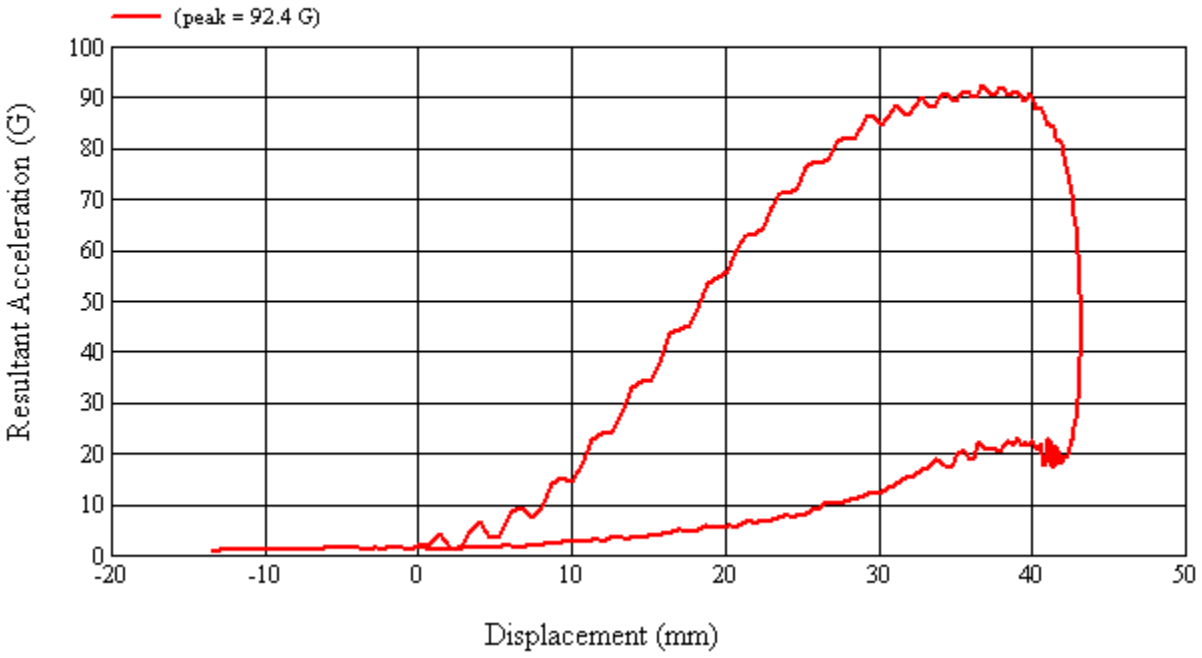
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

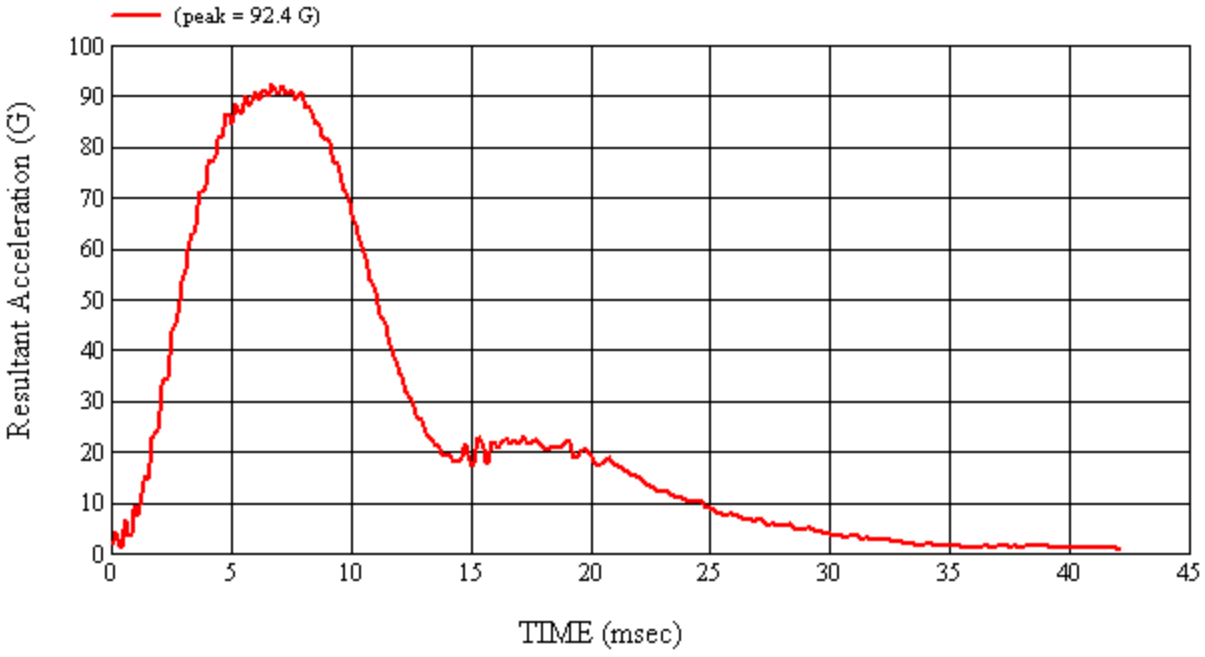
Headliner deformation

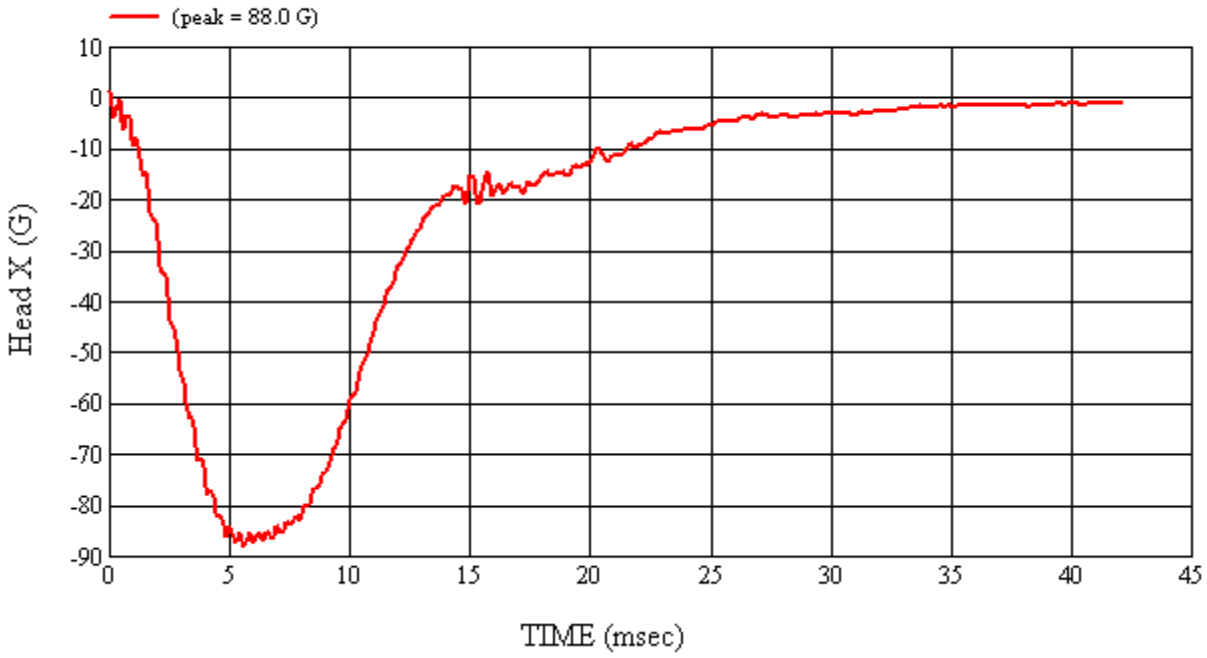
Recorded By: _____ Approved By*: _____ Date: 5/2/2011

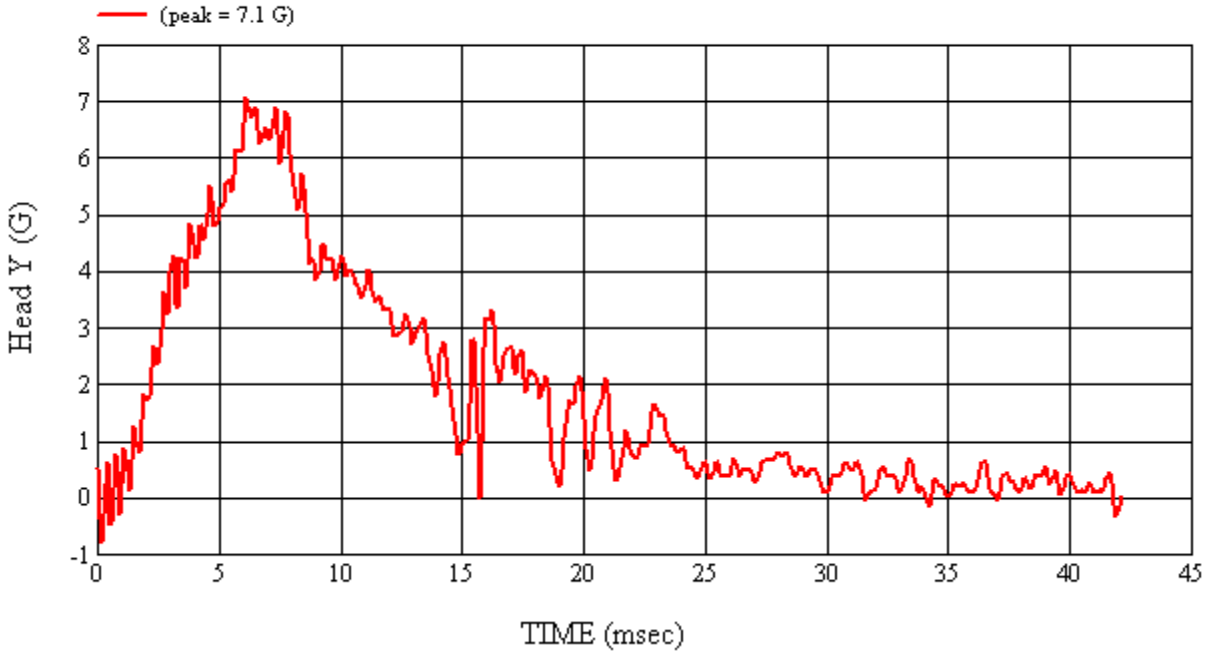
*Only necessary for NHTSA (Government) Compliance testing.

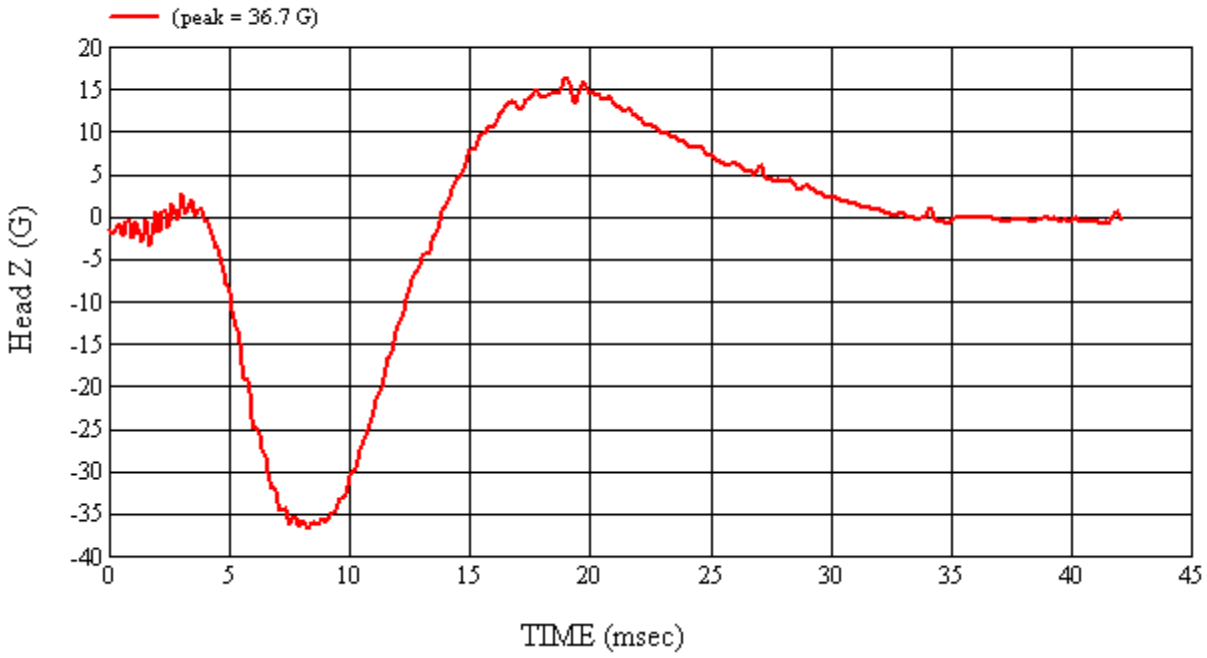
MGA Test #: U11139 Target Location: UR4, Right Side Test Date: 5/2/2011

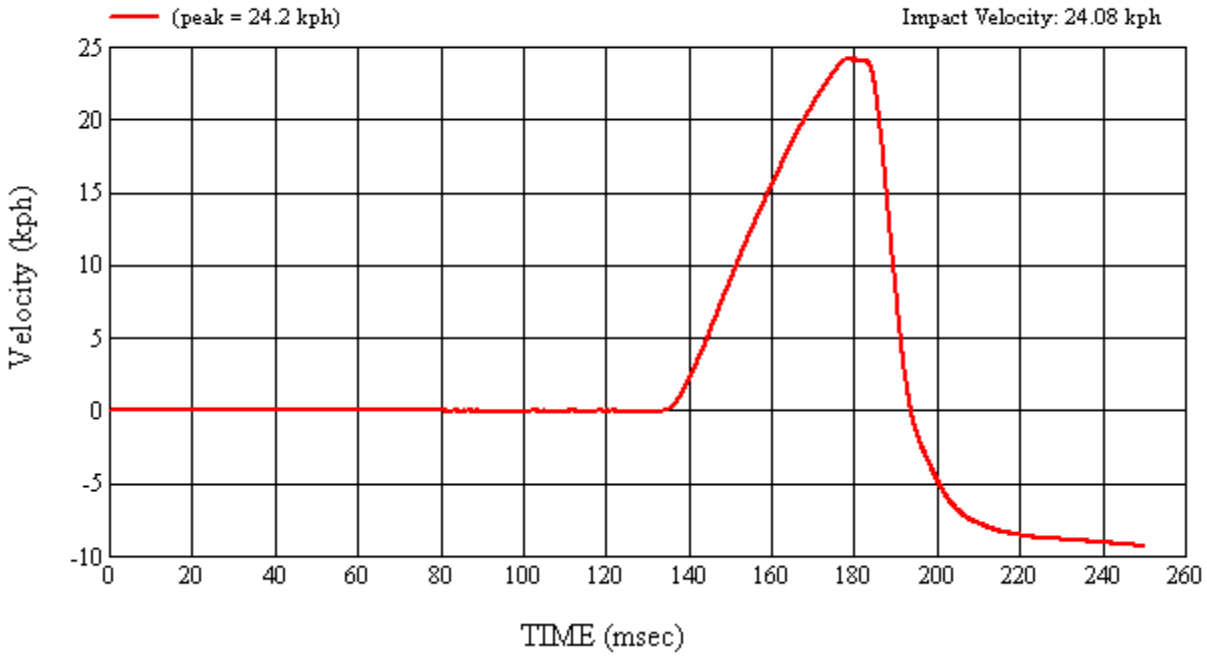


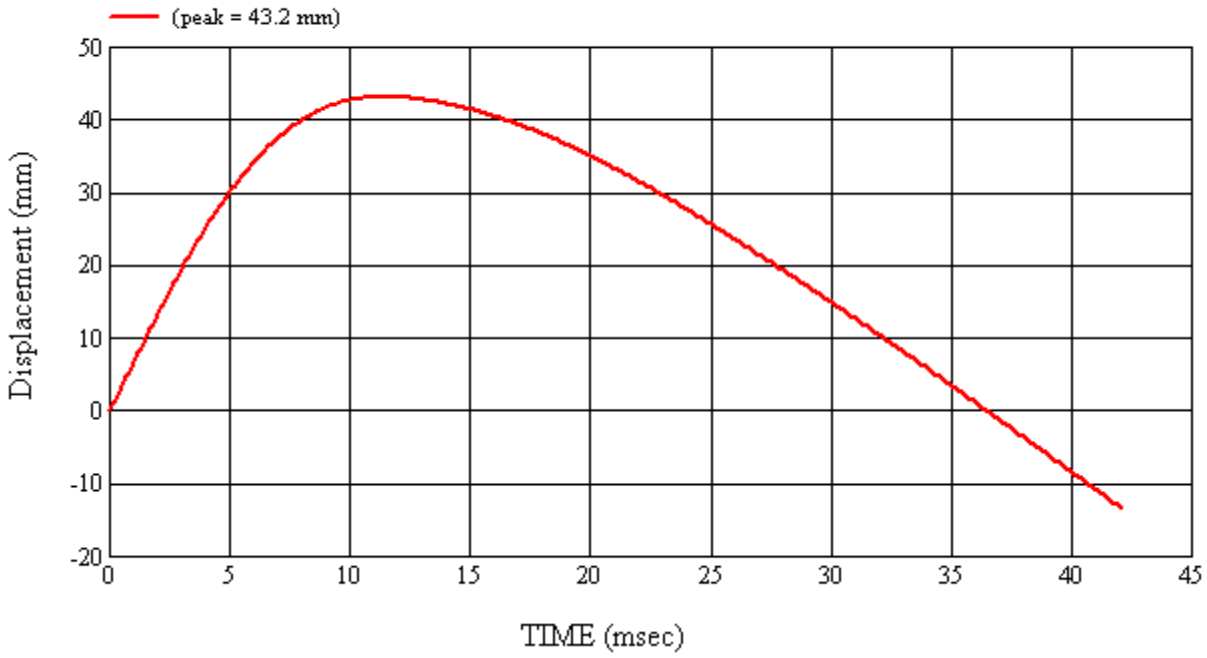



(peak = 88.0 G)
Head X (G)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
0
5
10
15
20
25
30
35
40
45
TIME (msec)


(peak = 7.1 G)
Head Y (G)
8
7
6
5
4
3
2
1
0
-1
0
5
10
15
20
25
30
35
40
45
TIME (msec)


(peak = 36.7 G)
Head Z (G)
20
15
10
5
0
-5
-10
-15
-20
-25
-30
-35
-40
0
5
10
15
20
25
30
35
40
45
TIME (msec)


(peak = 24.2 kph)
Impact Velocity: 24.08 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)

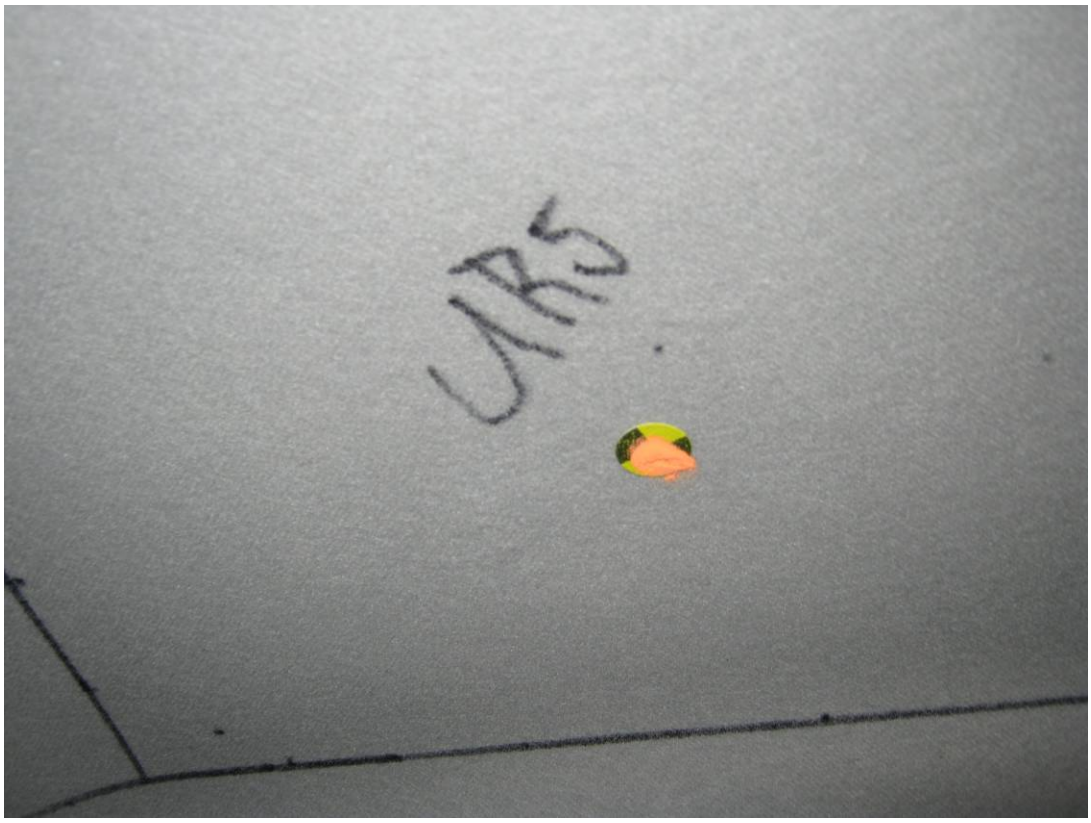

(peak = 43.2 mm)
Displacement (mm)
50
40
30
20
10
0
-10
-20
0
5
10
15
20
25
30
35
40
45
TIME (msec)


mga
Impact Testing
4/29/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #2 LEFT UR5
H/V IMPACT ANGLE= 270 / 50
U11133
PRE TEST


CB0204
U11133
LEFT UR5
H/V 270/50
mga
Impact Testing
4/29/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #2 LEFT UR5
H/V IMPACT ANGLE= 270 / 50
U11133
PRE TEST


10 TON
CB0204
U11133
LEFT UR5
H/V 270/50
mga
Impact Testing
4/29/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #2 LEFT UR5
H/V IMPACT ANGLE= 270 / 50
U11133
POST TEST


UR5
CB0204
U11133
LEFT UR5
H/V 270/50
mga
Impact Testing
4/29/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #2 LEFT UR5
H/V IMPACT ANGLE= 270 / 50
U11133
POST TEST


UR5


mga
Impact Testing
4/29/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #2 LEFT UR5
H/V IMPACT ANGLE= 270 / 50
U11133
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G11I7-001.1 VEHICLE YR/MAKE/MODEL:2011/DOT/NHTSA/Ford Fiesta

GENERAL TEST PARAMETERS:

Target (Vehicle Side): UR5Left

MGA Test Reference No.:U11133

Approach Horizontal Angles:270º

Approach Vertical Angles:50º

Additional Description:@X3862

Test Number:#2

Temperature:21.8C

Humidity:35.3%

Time of Test:12:41:15 PM

FMH Serial No:[037]

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
721	736	6	23.8	43	2 Left

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J32177	-113.7	1.07	1.07
Y	6	J14103	93.9	0.85	0.85
Z	7	J35800	97.8	0.94	0.94

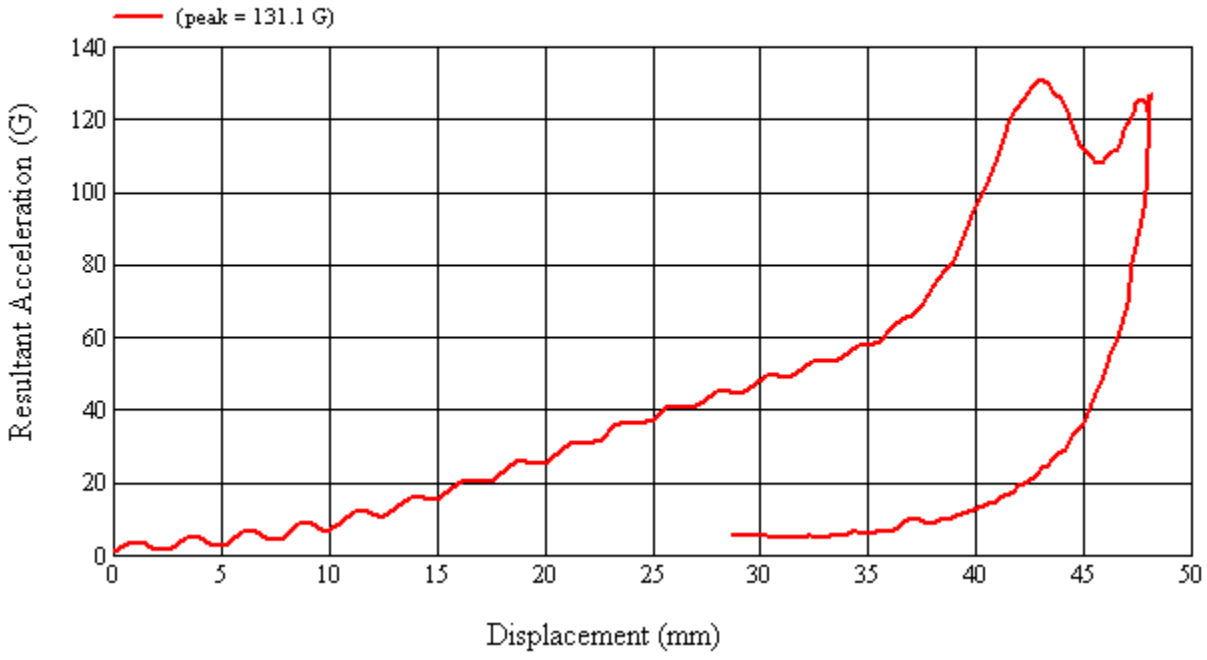
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

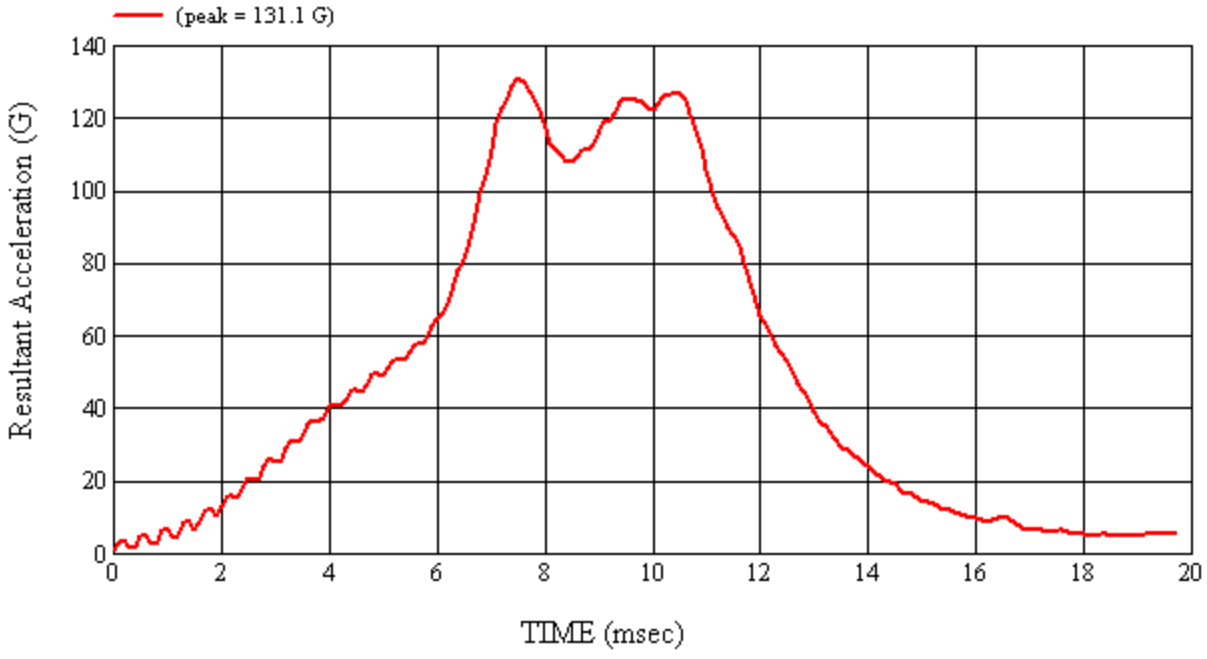
Headliner deformation

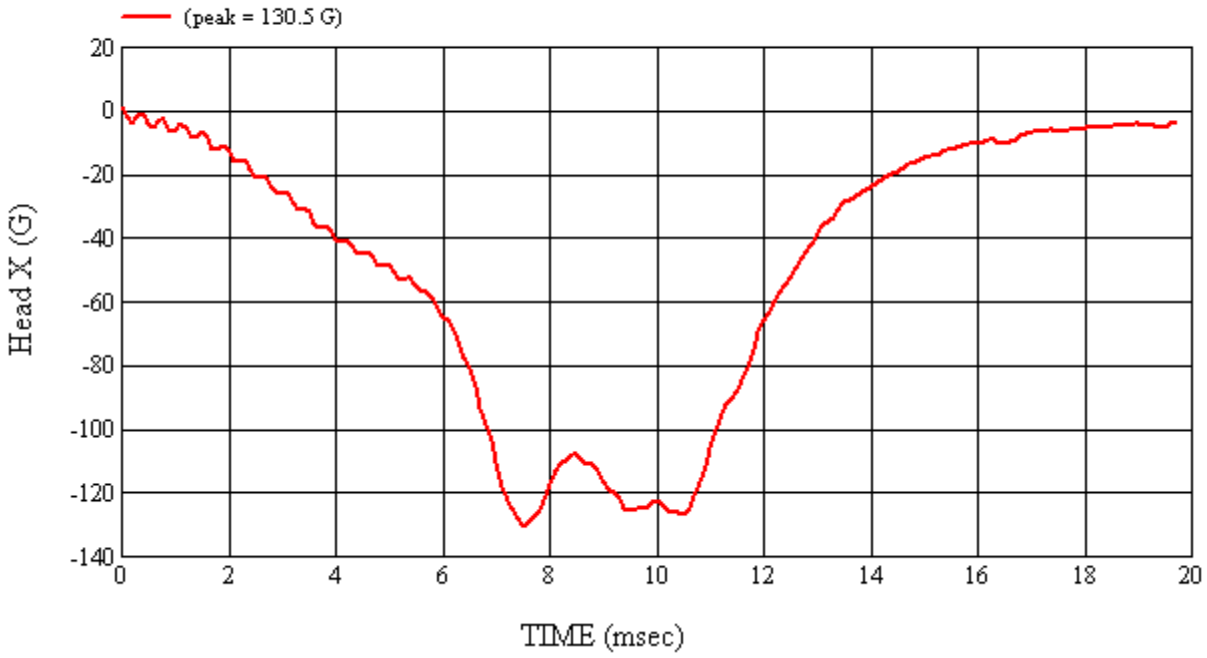
Recorded By: _____ Approved By*: _____ Date: 4/29/2011

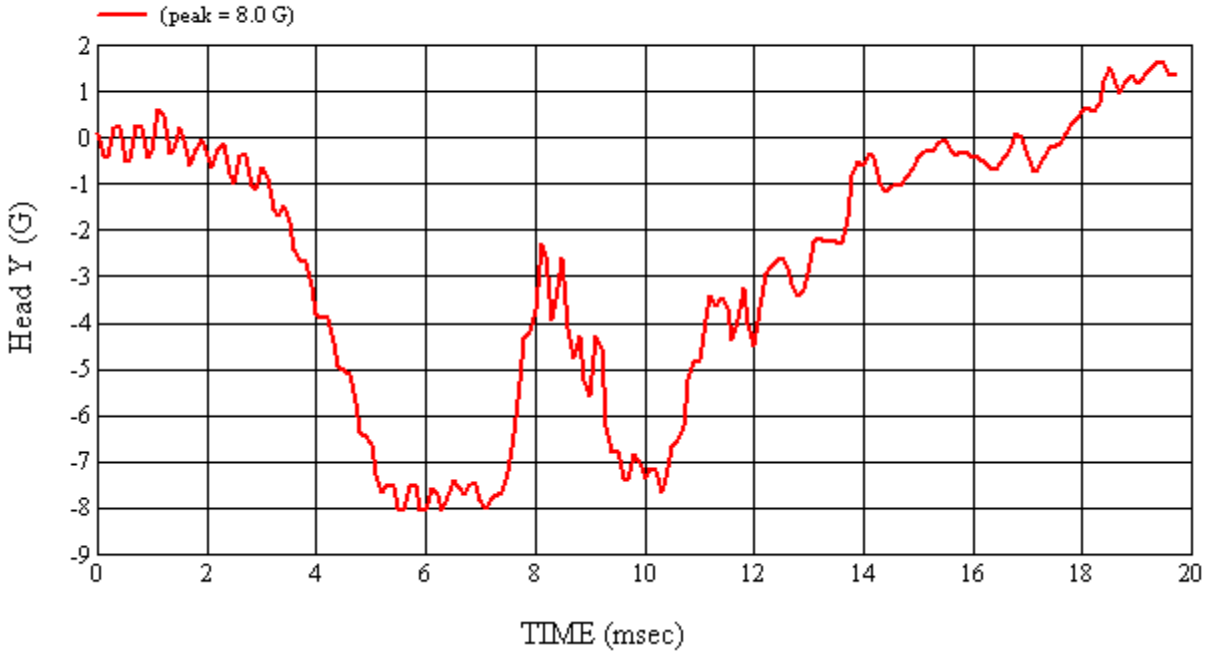
*Only necessary for NHTSA (Government) Compliance testing.

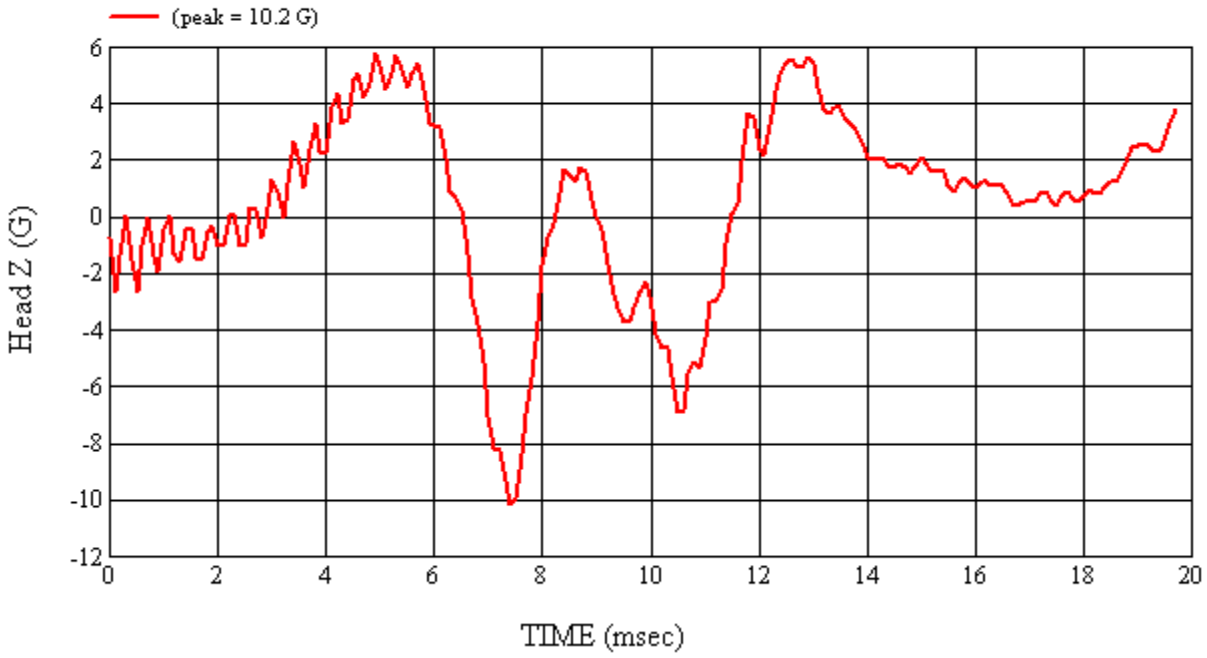
MGA Test #: U11133 Target Location: UR5, Left Side Test Date: 4/29/2011

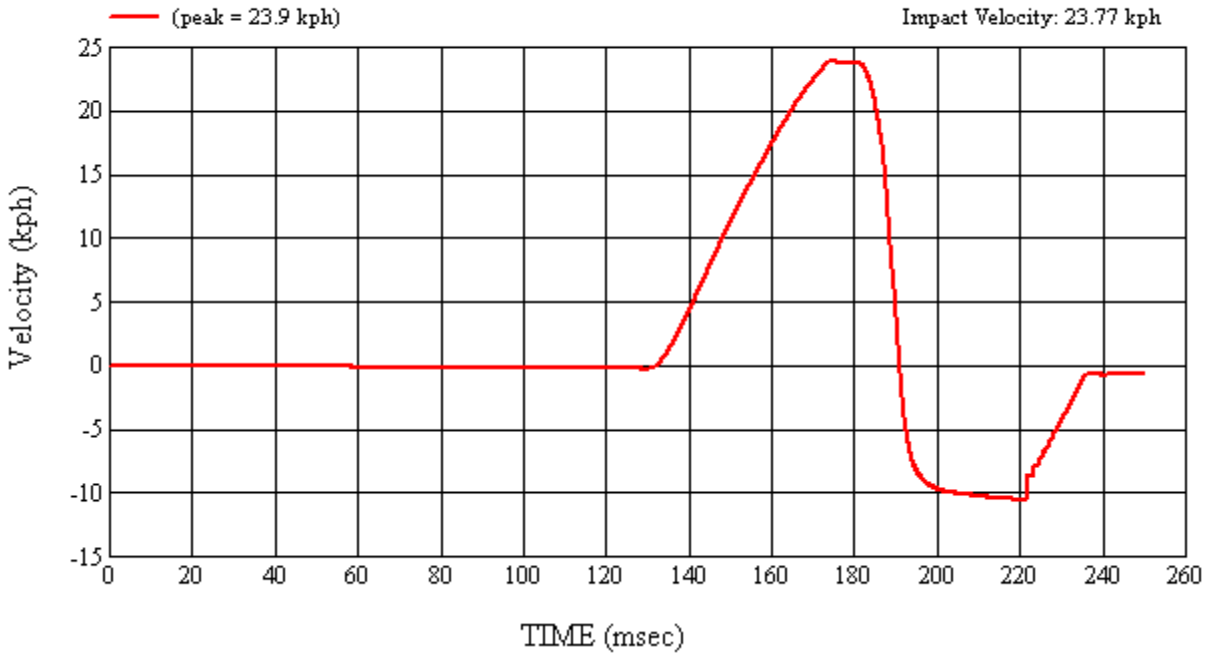


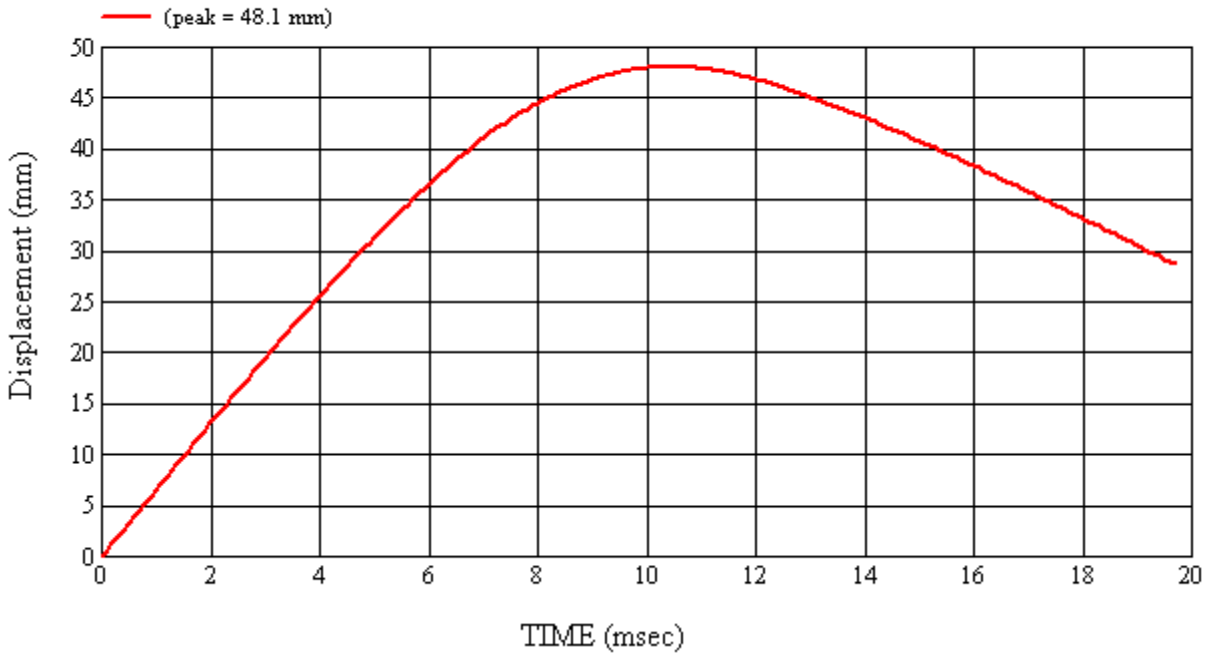



(peak = 130.5 G)
Head X (G)
20
0
-20
-40
-60
-80
-100
-120
-140
0
2
4
6
8
10
12
14
16
18
20
TIME (msec)

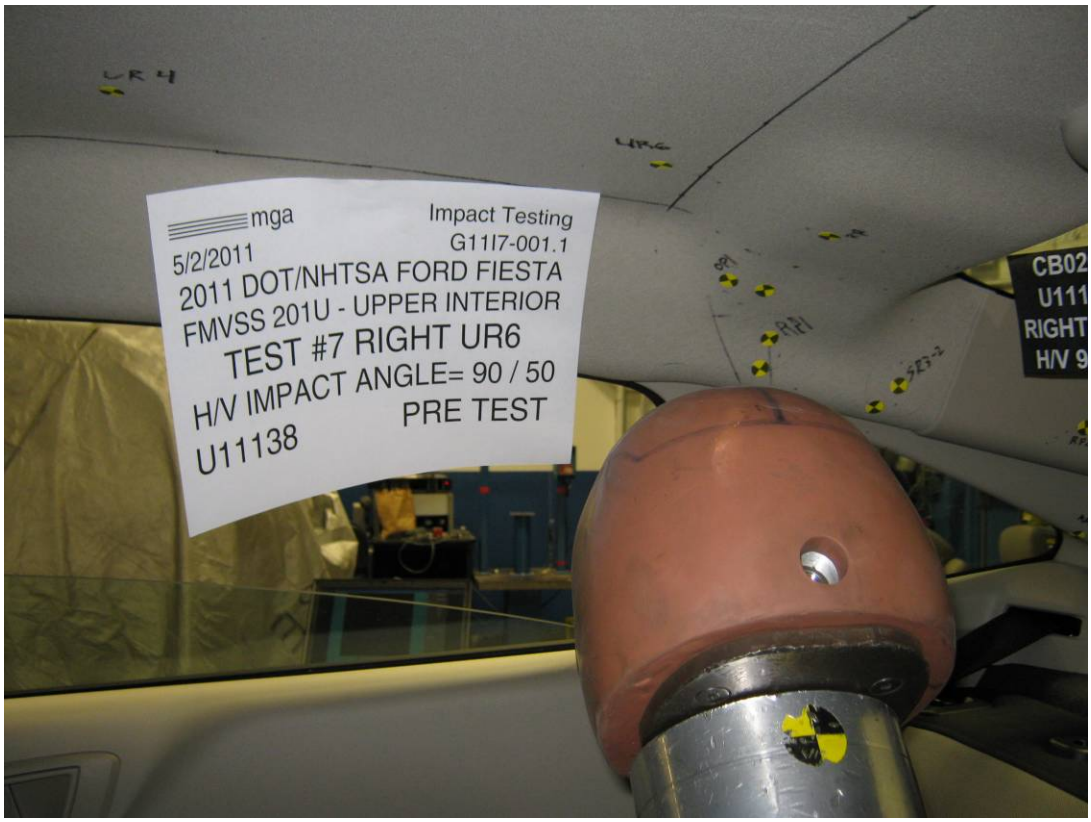

(peak = 8.0 G)
Head Y (G)
2
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
0
2
4
6
8
10
12
14
16
18
20
TIME (msec)


(peak = 10.2 G)
Head Z (G)
6
4
2
0
-2
-4
-6
-8
-10
-12
0
2
4
6
8
10
12
14
16
18
20
TIME (msec)


(peak = 23.9 kph)
Impact Velocity: 23.77 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 = 48.1 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
TIME (msec)


CB0204
U11138
mga
Impact Testing
G11I7-001.1
5/2/2011
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #7 RIGHT UR6
H/V IMPACT ANGLE= 90 / 50
U11138
PRE TEST


mga
Impact Testing
G11I7-001.1
5/2/2011
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #7 RIGHT UR6
H/V IMPACT ANGLE= 90 / 50
U11138
PRE TEST


CB0204
U11138
RIGHT UR6
H/V 90/50
mga
Impact Testing
G11I7-001.1
5/2/2011
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #7 RIGHT UR6
H/V IMPACT ANGLE= 90 / 50
U11138
POST TEST


mga
Impact Testing
G11I7-001.1
5/2/2011
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #7 RIGHT UR6
H/V IMPACT ANGLE= 90 / 50
U11138
POST TEST


UR6
RH
OPI
RPI
CB020


mga
Impact Testing
5/2/2011
G11I7-001.1
2011 DOT/NHTSA FORD FIESTA
FMVSS 201U - UPPER INTERIOR
TEST #7 RIGHT UR6
H/V IMPACT ANGLE= 90 / 50
U11138
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G11I7-001.1 VEHICLE YR/MAKE/MODEL:2011/DOT/NHTSA/Ford Fiesta

GENERAL TEST PARAMETERS:

Target (Vehicle Side): UR6Right

MGA Test Reference No.:U11138

Approach Horizontal Angles:90º

Approach Vertical Angles:50º

Additional Description:@RP

Test Number:#7

Temperature:21.6C

Humidity:38.4%

Time of Test:10:32:54 AM

FMH Serial No:[035]

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
450	376	10.9	23.9	29	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	-95.8	1.07	1.07
Y	6	J22664	94.2	0.85	0.85
Z	7	J35924	92.8	0.94	0.94

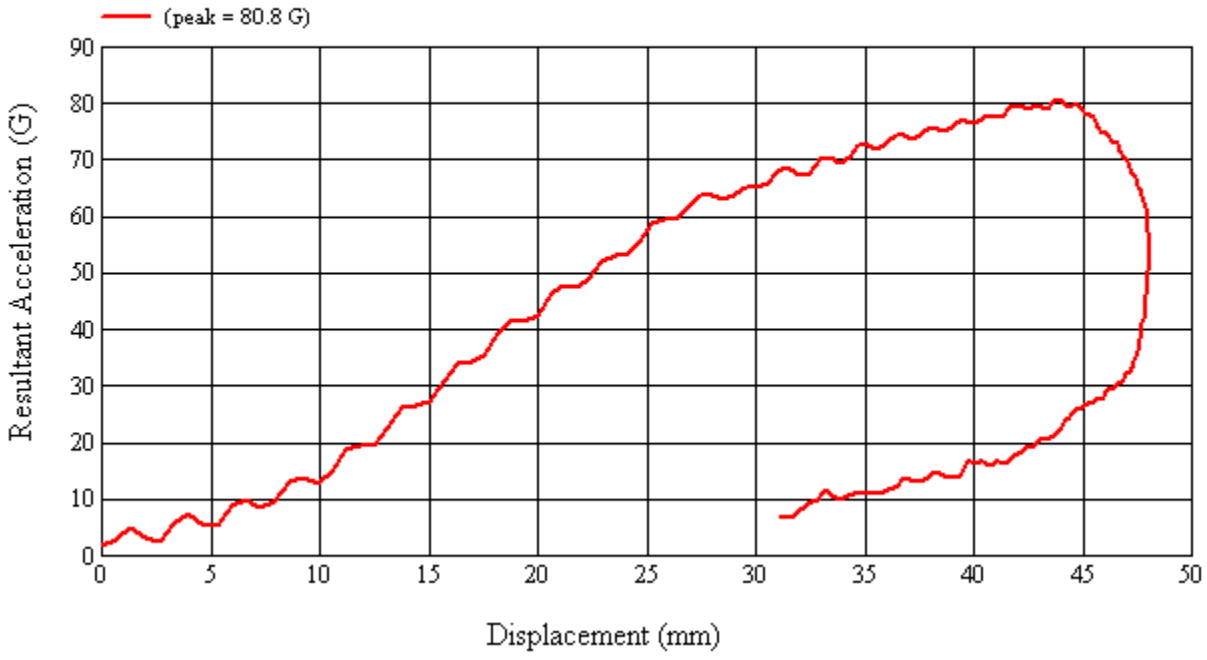
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

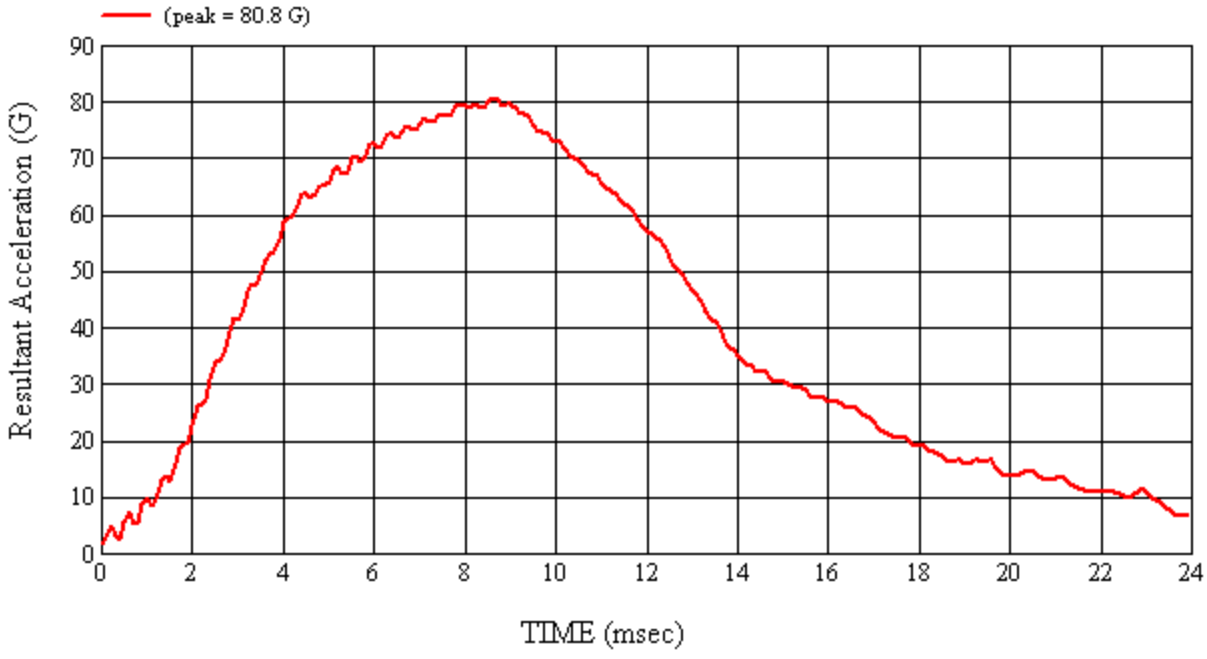
Headliner deformation, dislodged headliner

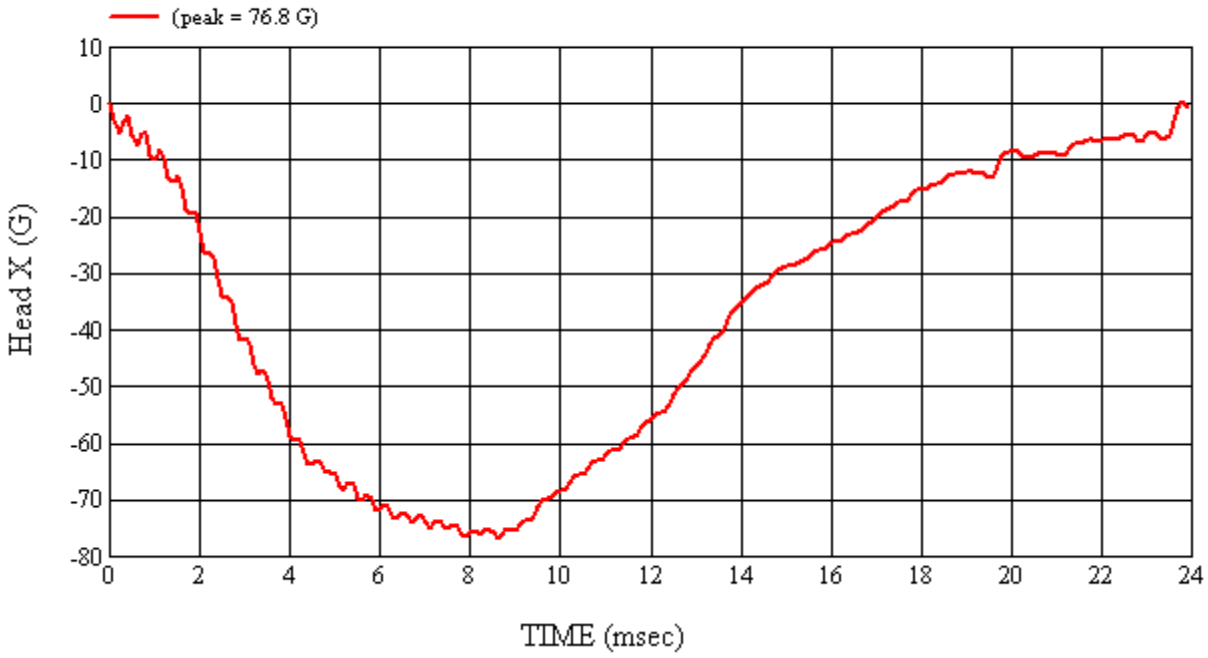
Recorded By: _____ Approved By*: _____ Date: 5/2/2011

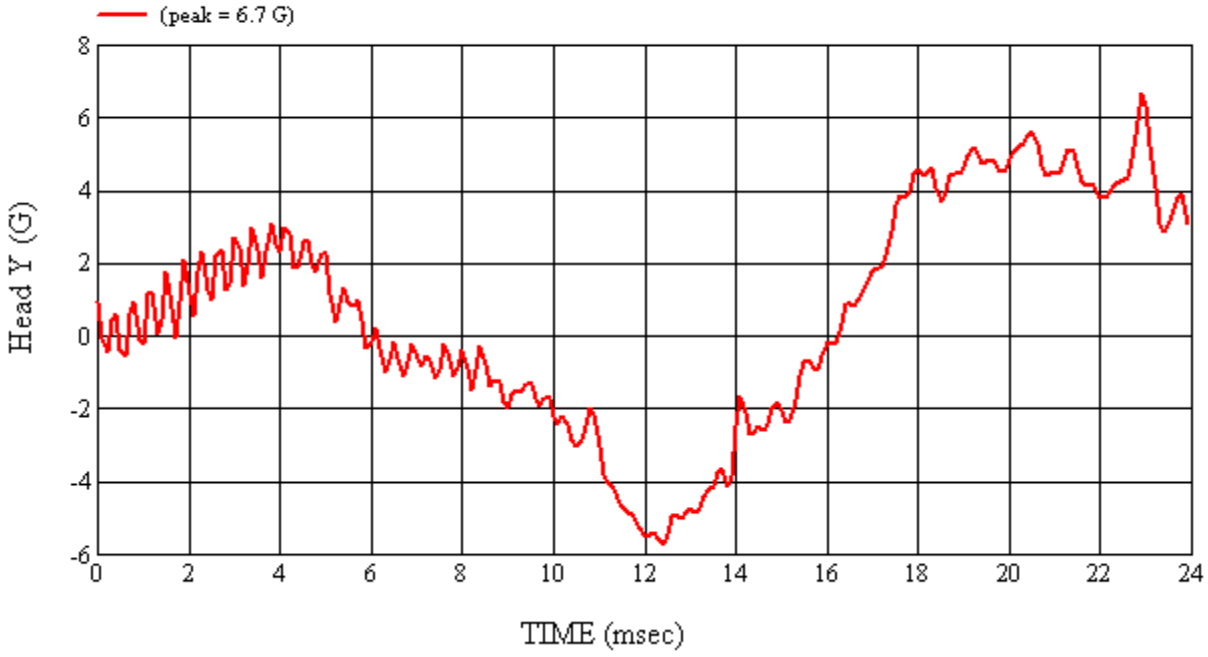
*Only necessary for NHTSA (Government) Compliance testing.

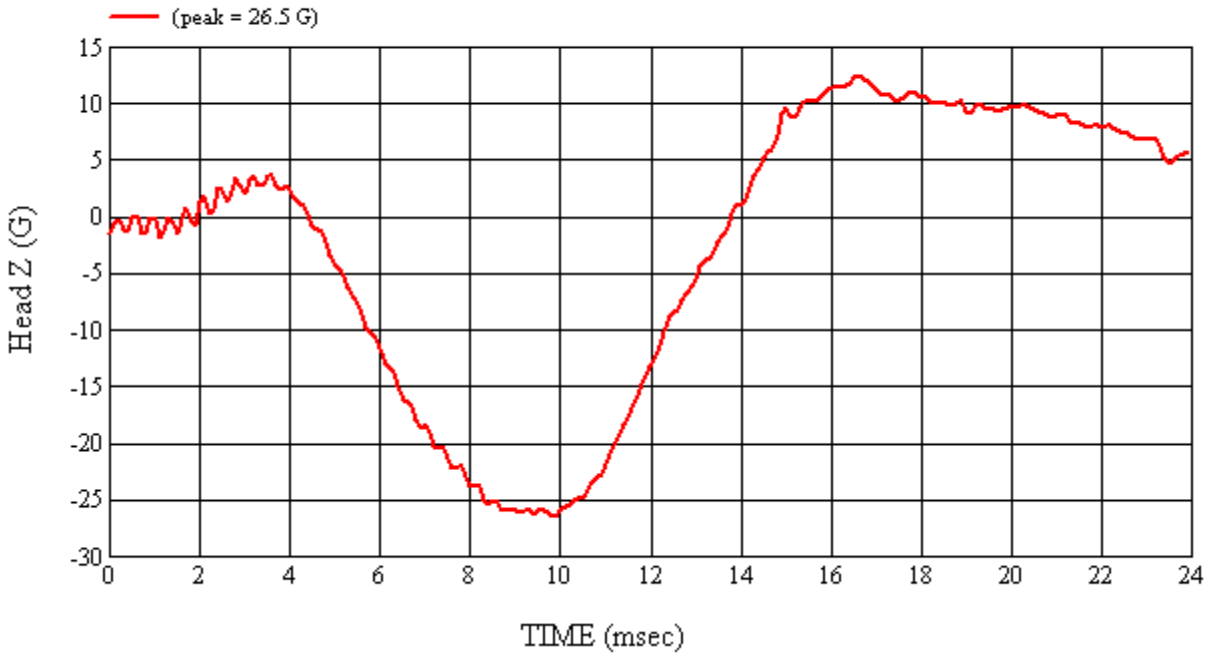
MGA Test #: U11138 Target Location: UR6, Right Side Test Date: 5/2/2011

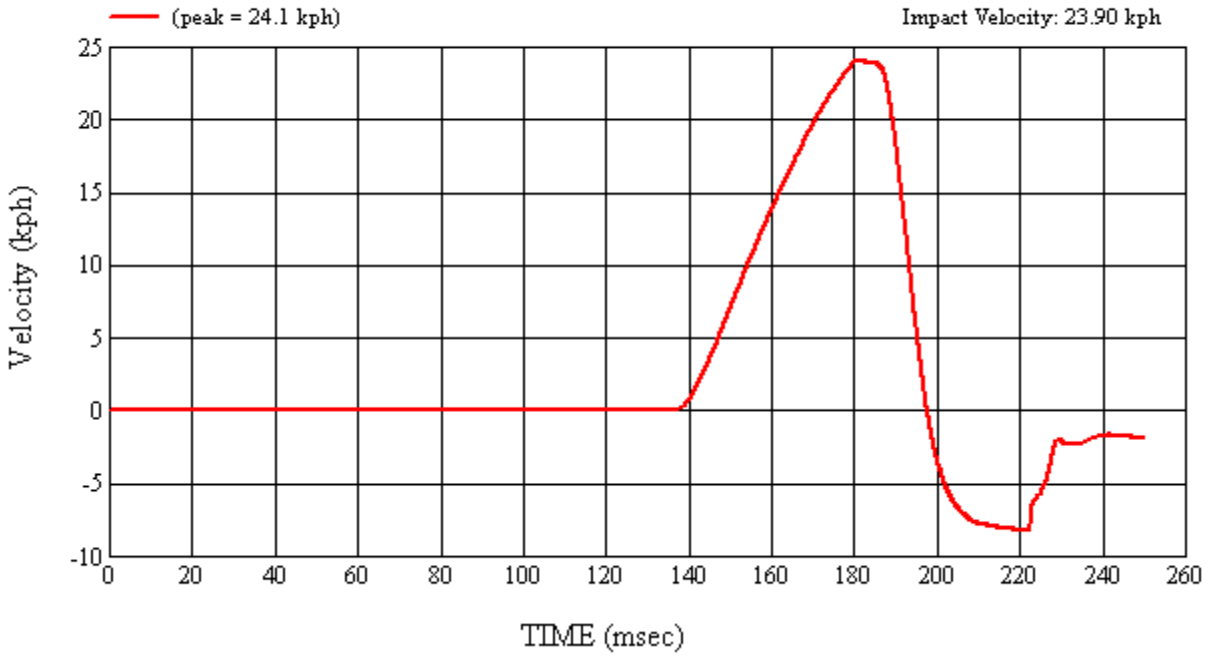


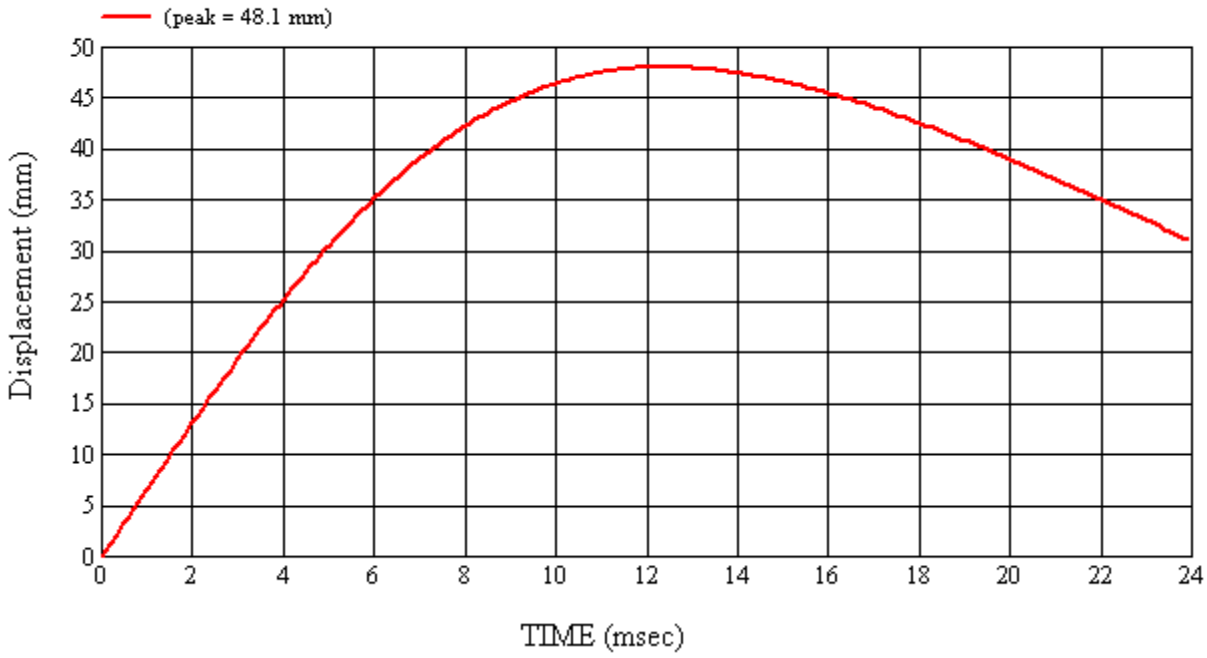



(peak = 76.8 G)
Head X (G)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)


(peak = 6.7 G)
Head Y (G)
8
6
4
2
0
-2
-4
-6
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)


(peak = 26.5 G)
Head Z (G)
15
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 = 24.1 kph)
Impact Velocity: 23.90 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 = 48.1 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)

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
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	Vision Research	Miro Ex4	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	 TPM992 -- MGA00712	 Measurement Targeting FMH setup Horizontal Measurement	 1 mm N/A 0.5°	Annual
*Temperature Recorder	Dickson	MGA00152	Record Temperature and Humidity	± 1°C ± 1% RH	Annual
* Scale	Detecto	MGA00783	Weigh FMH Head	± 0.01 lb	Annual
*Vehicle Scale	Intercomp	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	4/28/2011	9.90	20.7	37.1	249.0	5.7	Yes
Post	#035	5/3/2011	9.90	21.5	33.7	249.3	2.7	Yes
Pre	#037	4/28/2011	9.96	20.8	41.6	251.5	3.7	Yes
Post	#037	5/3/2011	9.96	21.3	35.9	264.5	4.1	Yes
Pre	#038	4/28/2011	9.90	21.0	38.5	258.6	8.2	Yes
Post	#038	5/3/2011	9.90	20.6	36.1	266.9	7.0	Yes

4-1 Pre-Test Calibration

HEAD DROP TEST SUMMARY
PART 572L

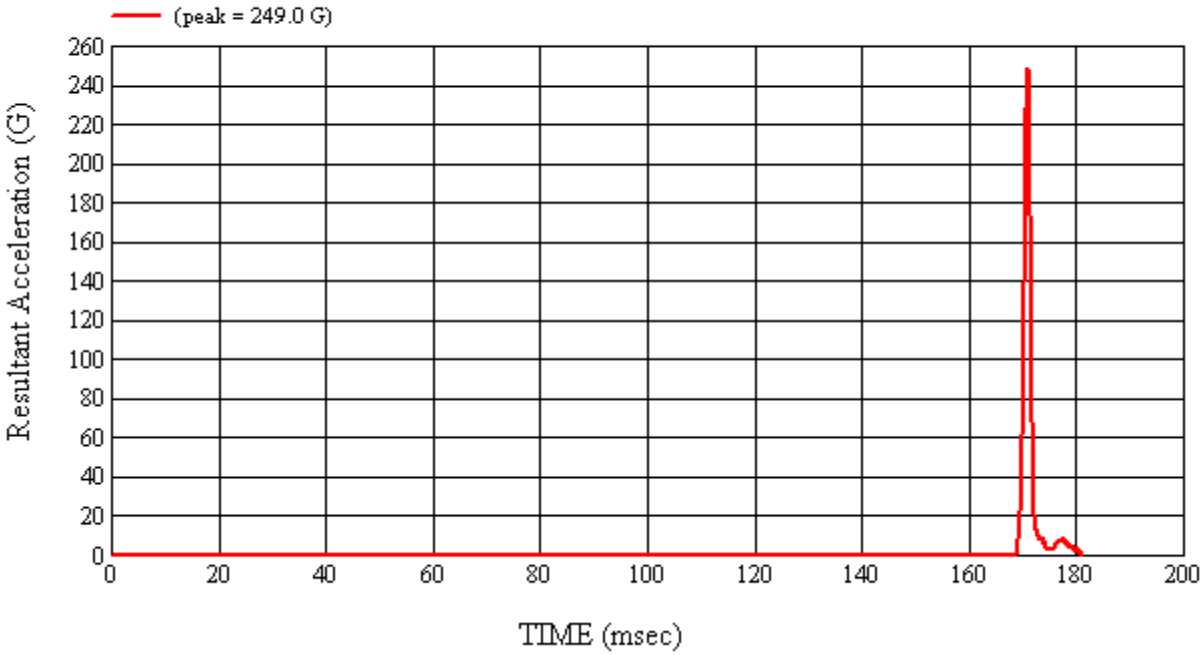
HEADFORM SERIAL NUMBER: 035	CALIBRATION DATE: 4/28/2011 CALIBRATION TIME: 1:23:22 PM	
TEST PARAMETER	**SPECIFICATION**	**TEST RESULTS**
Weight	9.90 to 10.10 lbs.	9.90
Temperature	19° C to 26° C	20.7
Relative Humidity	10% to 70%	37.1
Peak Resultant Acceleration	225 G's to 275 G's	249.0
Peak Lateral Acceleration	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	02/04/11	08/04/11
2	ENDEVCO	7264-2000	J22664	02/04/11	08/04/11
3	ENDEVCO	7264-2000	J35924	02/04/11	08/04/11

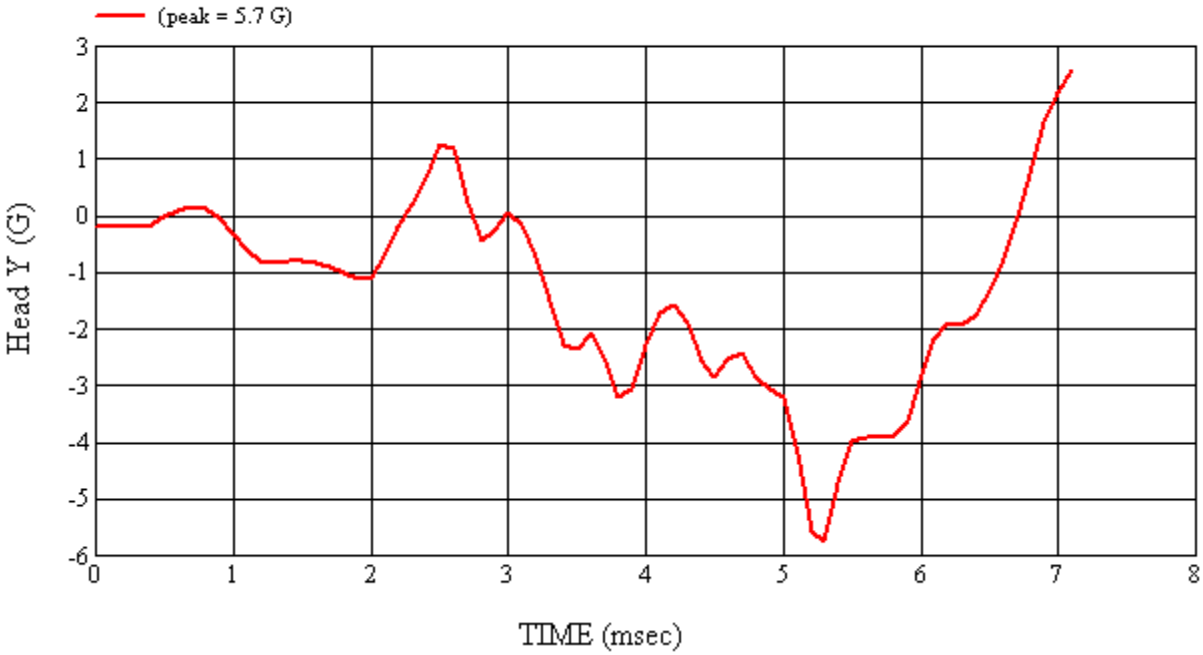
REMARKS:

RECORDED BY: _____ DATE: __4/28/2011____

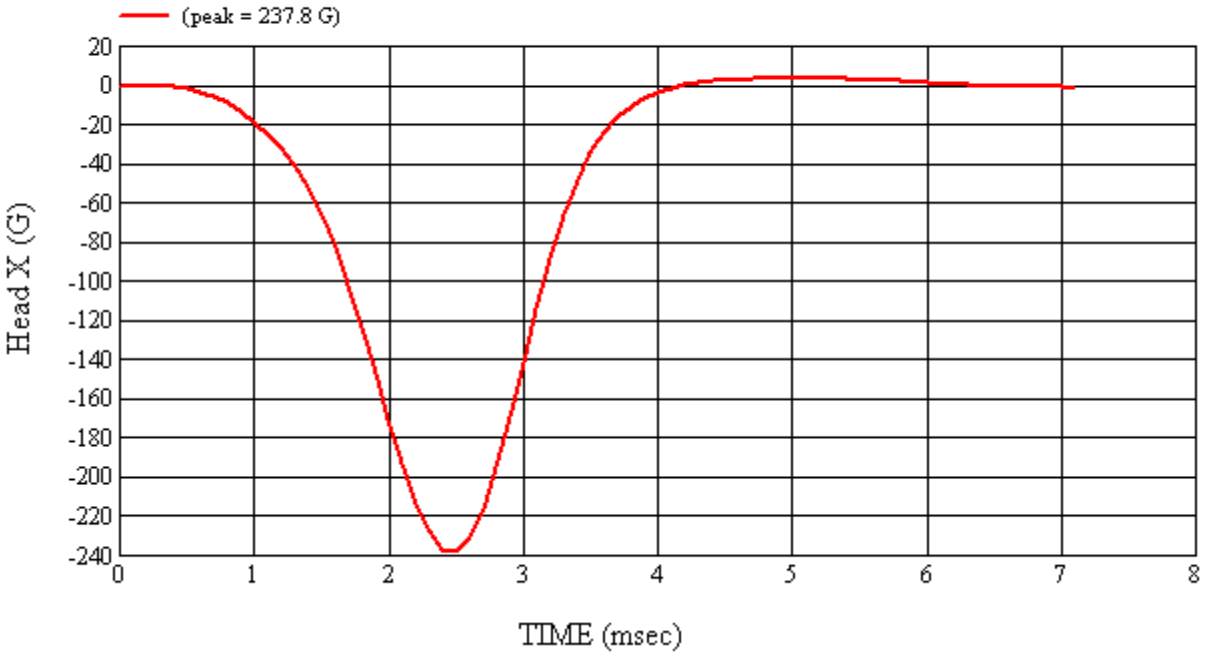
APPROVED BY: _____



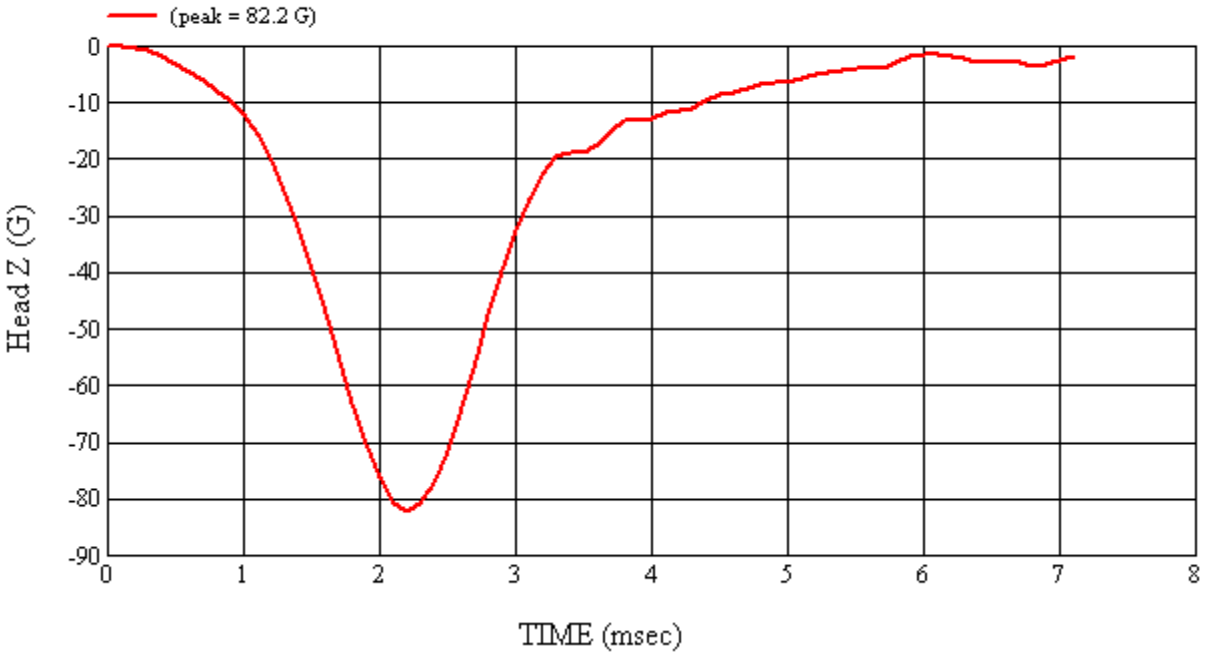
Head 035 (Pre) Calibration #H35015



Head 035 (Pre) Calibration #H35015



Head 035 (Pre) Calibration #H35015



Head 035 (Pre) Calibration #H35015

4-2 Post-Test Calibration

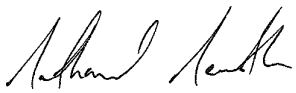
HEAD DROP TEST SUMMARY
PART 572L

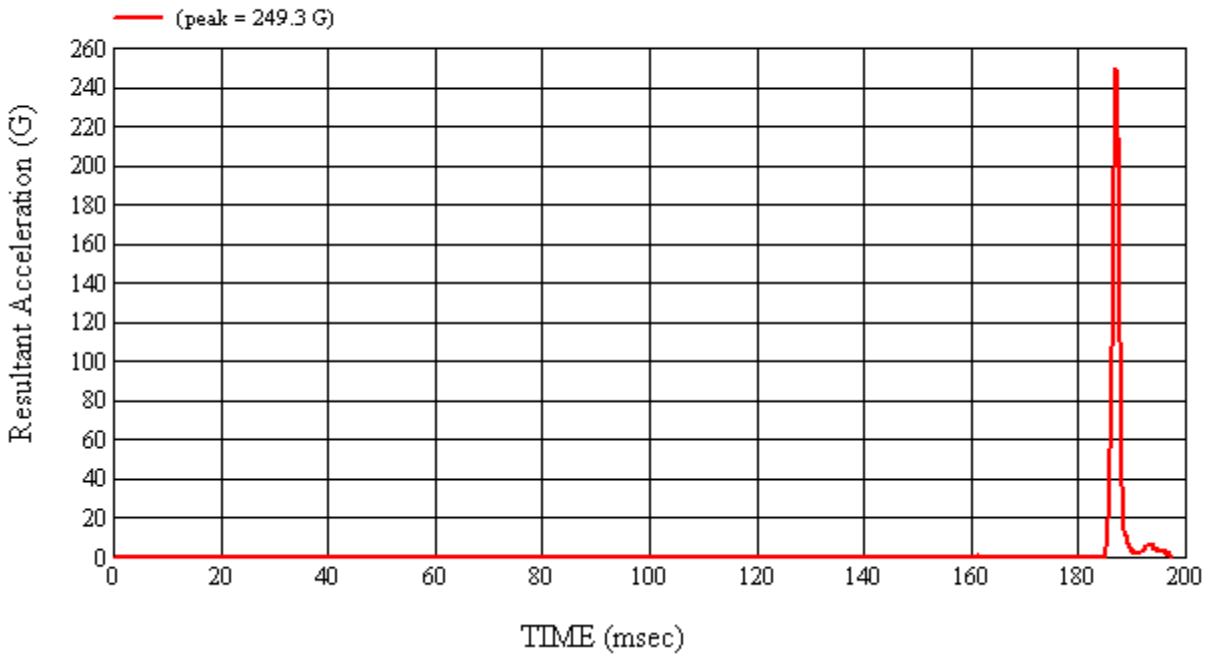
HEADFORM SERIAL NUMBER: 035	CALIBRATION DATE: 5/3/2011 CALIBRATION TIME: 10:36:40 AM	
TEST PARAMETER	**SPECIFICATION**	**TEST RESULTS**
Weight	9.90 to 10.10 lbs.	9.90
Temperature	19° C to 26° C	21.5
Relative Humidity	10% to 70%	33.7
Peak Resultant Acceleration	225 G's to 275 G's	249.3
Peak Lateral Acceleration	15 G's Maximum	2.7
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	02/04/11	08/04/11
2	ENDEVCO	7264-2000	J22664	02/04/11	08/04/11
3	ENDEVCO	7264-2000	J35924	02/04/11	08/04/11

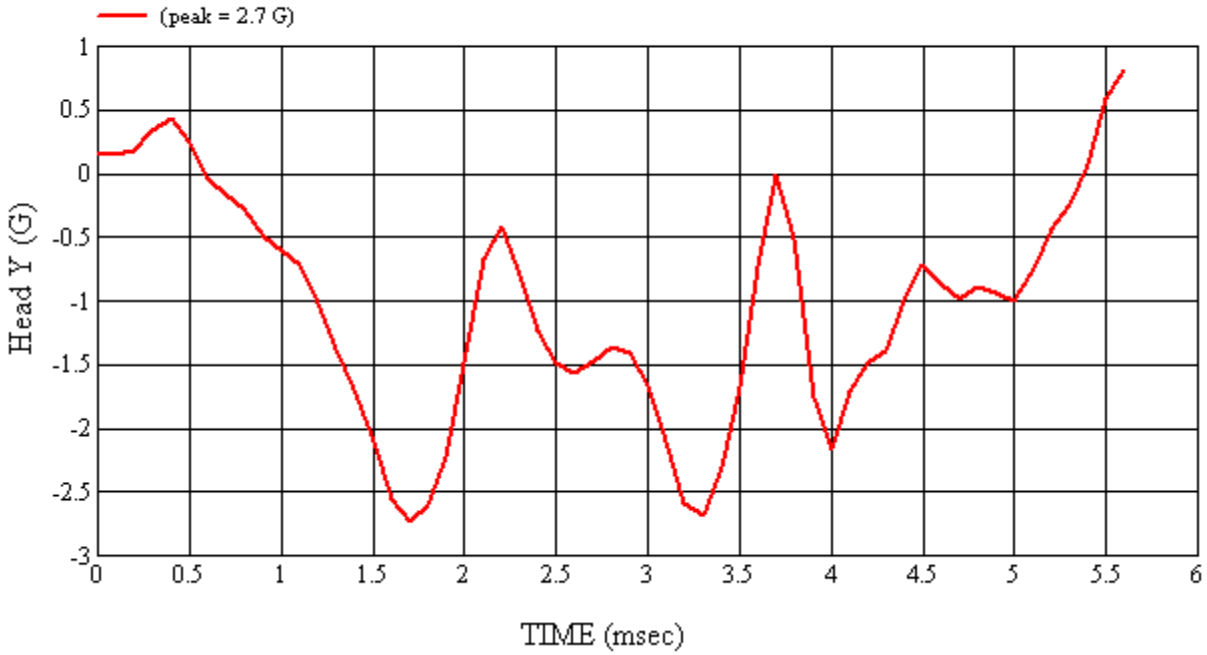
REMARKS:

RECORDED BY:  DATE: 5/3/2011

APPROVED BY: 



Head 035 (Post) Calibration #H35016



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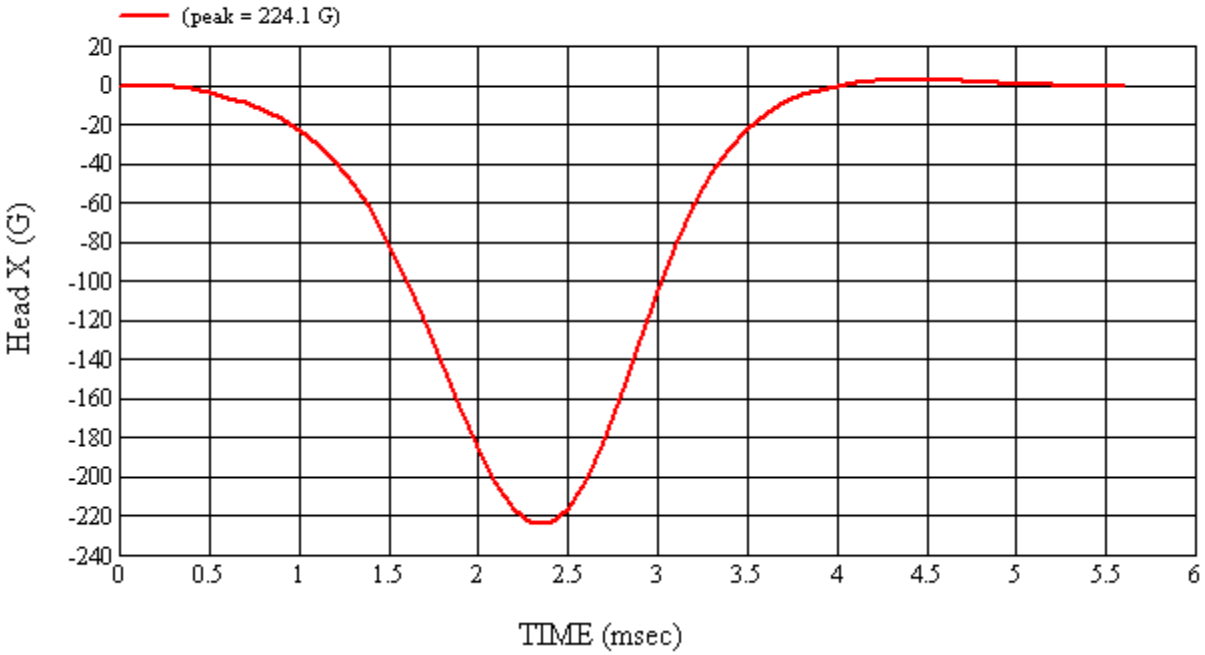

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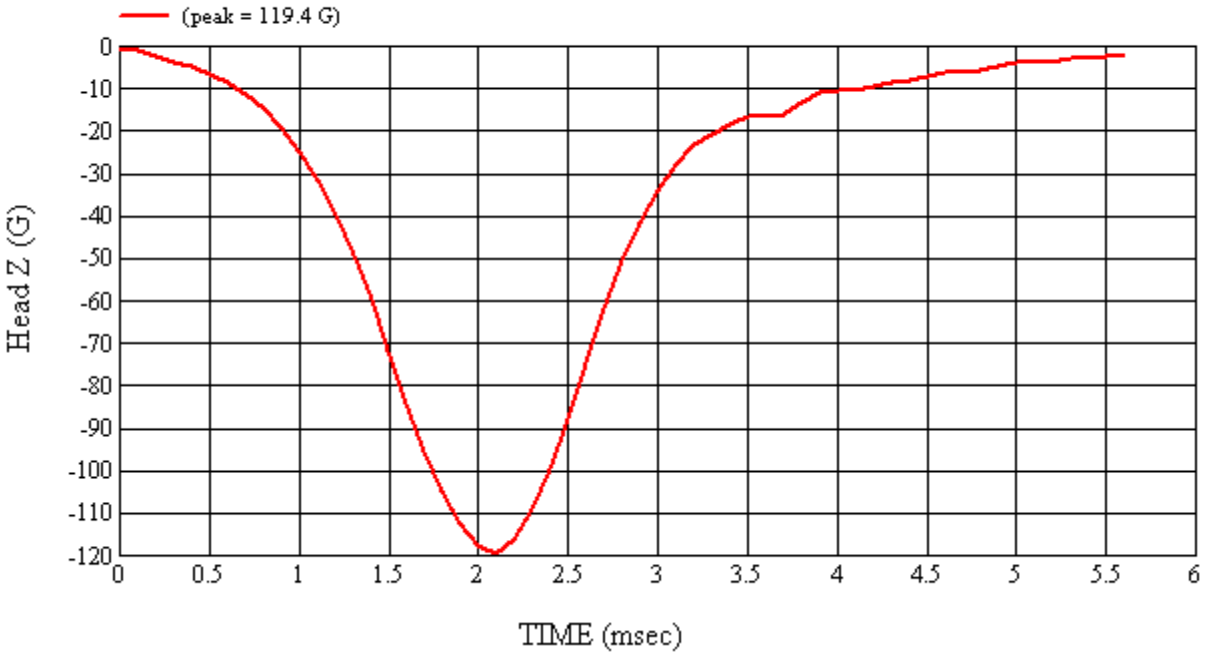


Head 035 (Post) Calibration #H35016

4-3 Pre-Test Calibration

HEAD DROP TEST SUMMARY
PART 572L

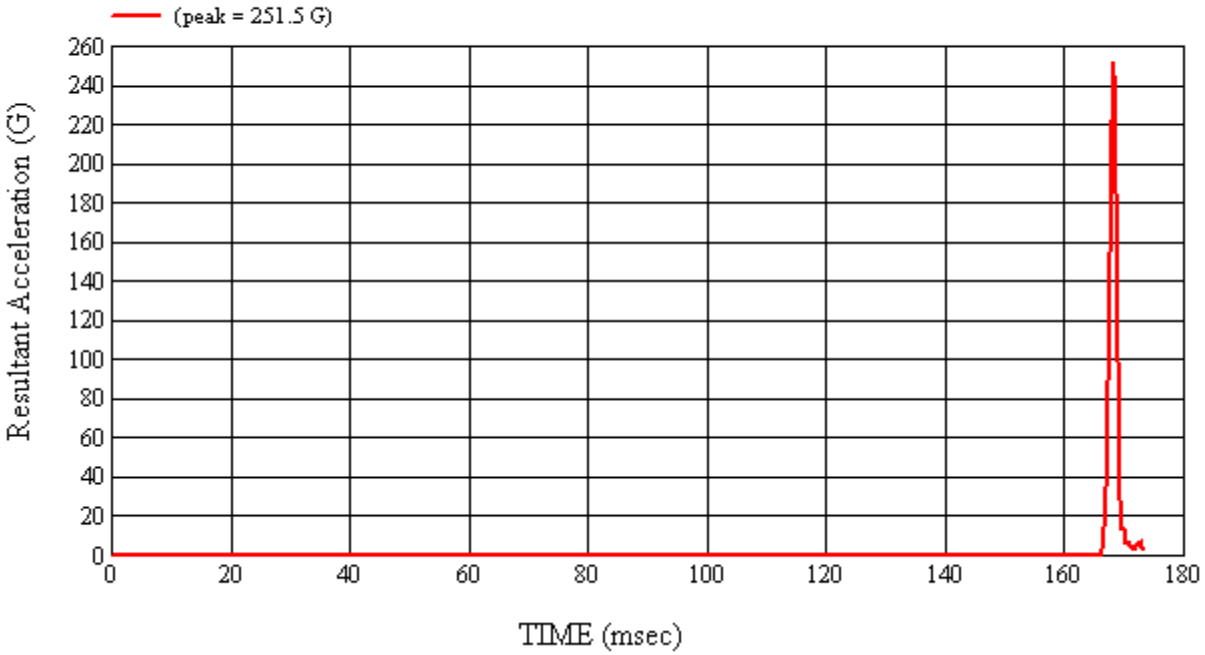
HEADFORM SERIAL NUMBER: 037	CALIBRATION DATE: 4/28/2011 CALIBRATION TIME: 1:39:46 PM	
TEST PARAMETER	**SPECIFICATION**	**TEST RESULTS**
Weight	9.90 to 10.10 lbs.	9.96
Temperature	19° C to 26° C	20.8
Relative Humidity	10% to 70%	41.6
Peak Resultant Acceleration	225 G's to 275 G's	251.5
Peak Lateral Acceleration	15 G's Maximum	3.7
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	J32177	02/04/11	08/04/11
2	ENDEVCO	7264-2000	J14103	02/04/11	08/04/11
3	ENDEVCO	7264-2000	J35800	02/04/11	08/04/11

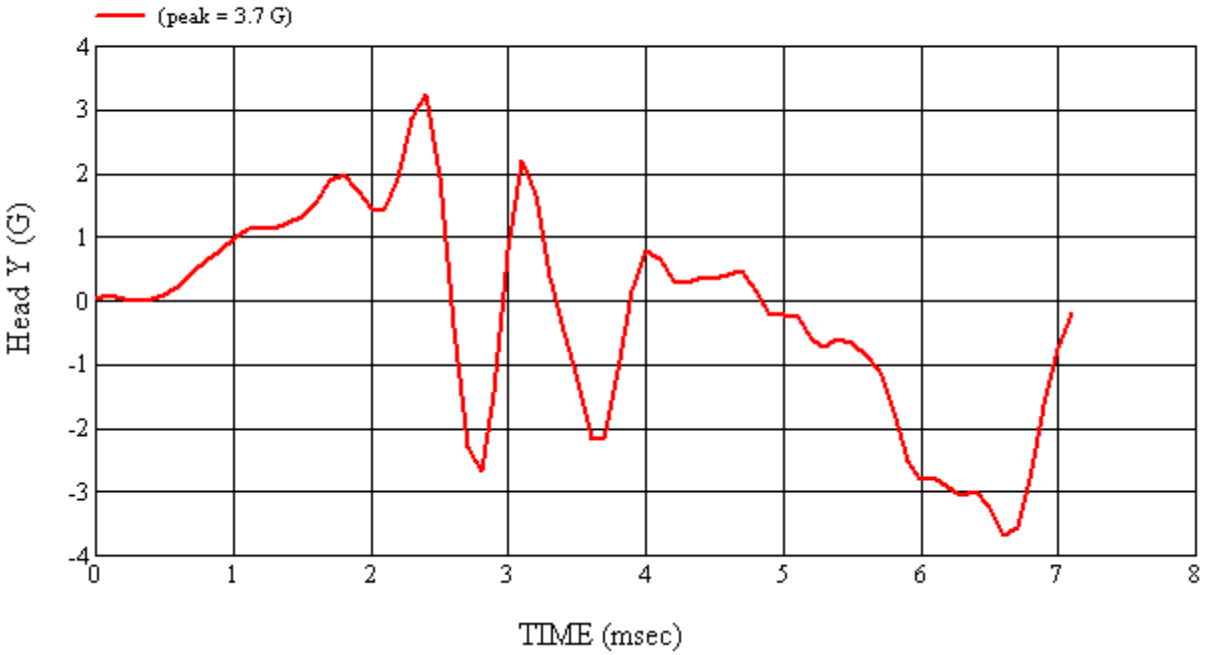
REMARKS:

RECORDED BY: _____ DATE: 4/28/2011

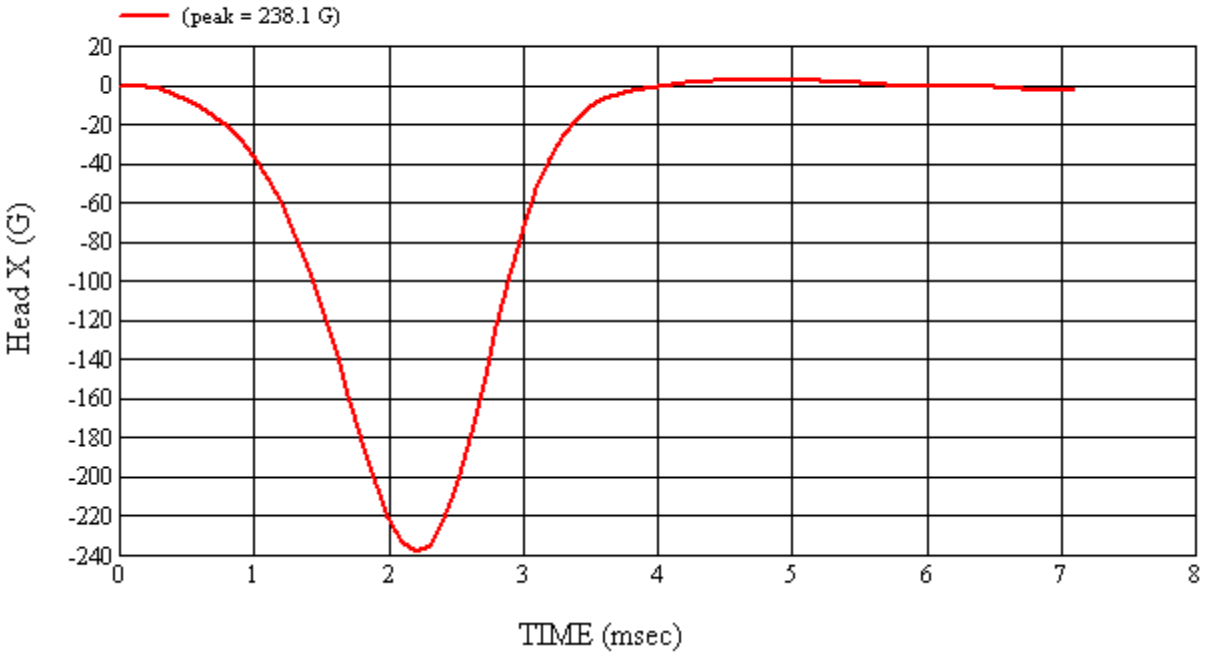
APPROVED BY: _____



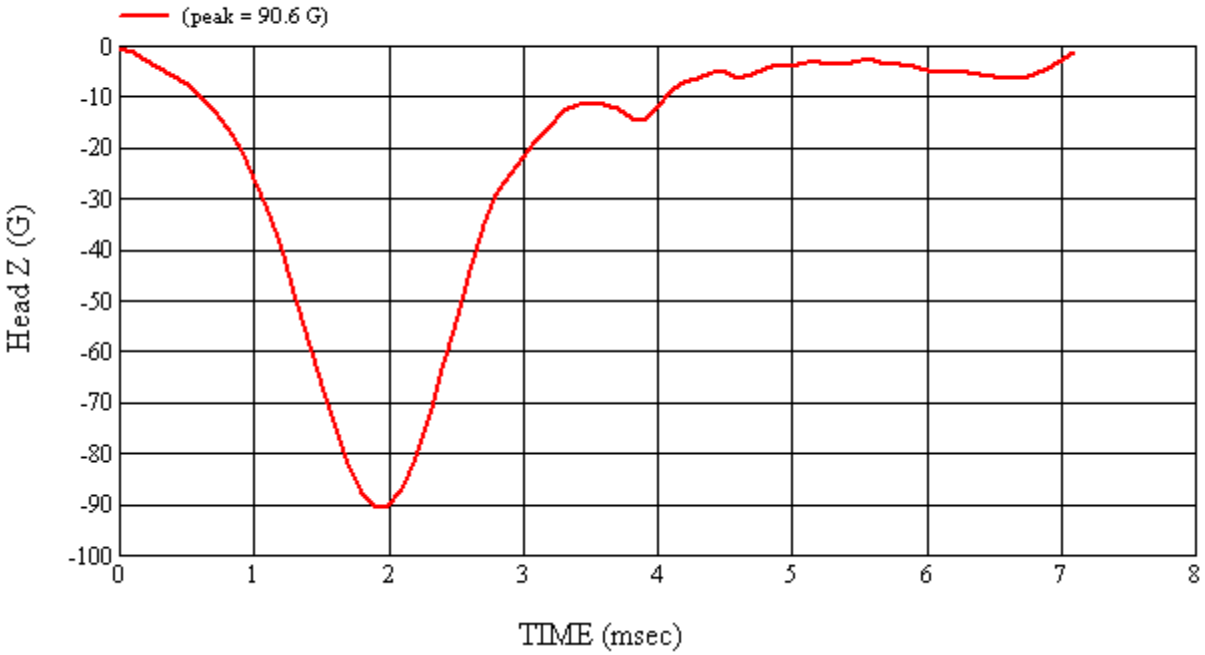
Head 037 (Pre) Calibration #H37015



Head 037 (Pre) Calibration #H37015



Head 037 (Pre) Calibration #H37015



Head 037 (Pre) Calibration #H37015

4-4 Post-Test Calibration

HEAD DROP TEST SUMMARY
PART 572L

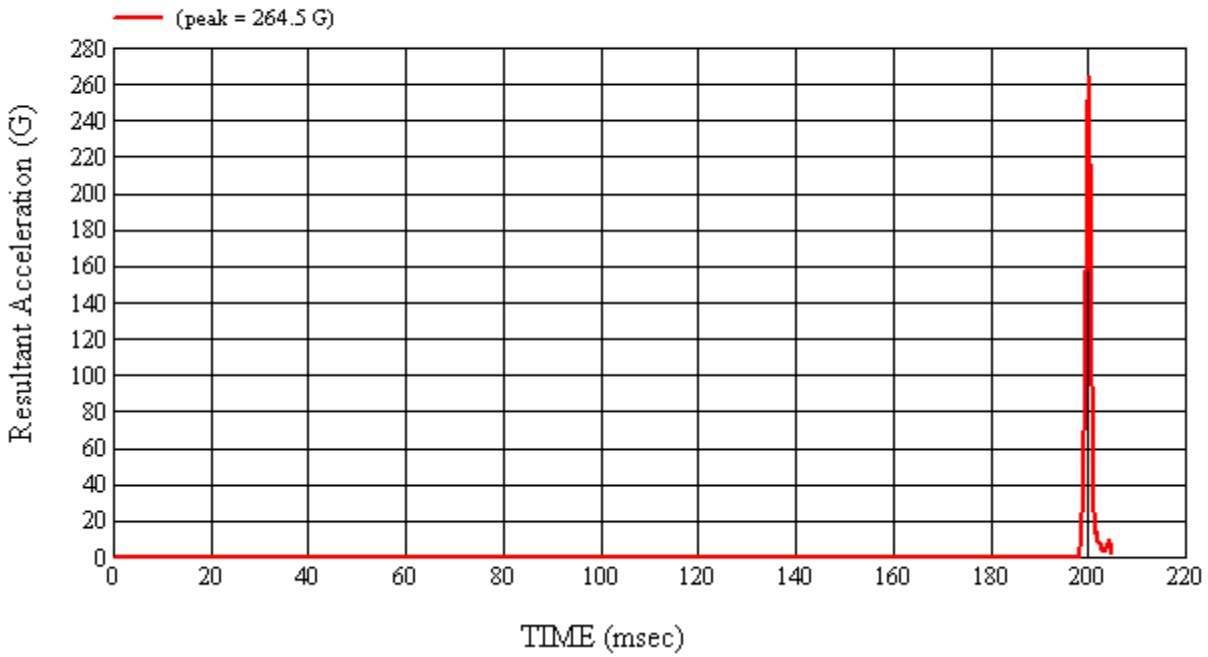
HEADFORM SERIAL NUMBER: 037	CALIBRATION DATE: 5/3/2011 CALIBRATION TIME: 11:21:55 AM	
TEST PARAMETER	**SPECIFICATION**	**TEST RESULTS**
Weight	9.90 to 10.10 lbs.	9.96
Temperature	19° C to 26° C	21.3
Relative Humidity	10% to 70%	35.9
Peak Resultant Acceleration	225 G's to 275 G's	264.5
Peak Lateral Acceleration	15 G's Maximum	4.1
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	J32177	02/04/11	08/04/11
2	ENDEVCO	7264-2000	J14103	02/04/11	08/04/11
3	ENDEVCO	7264-2000	J35800	02/04/11	08/04/11

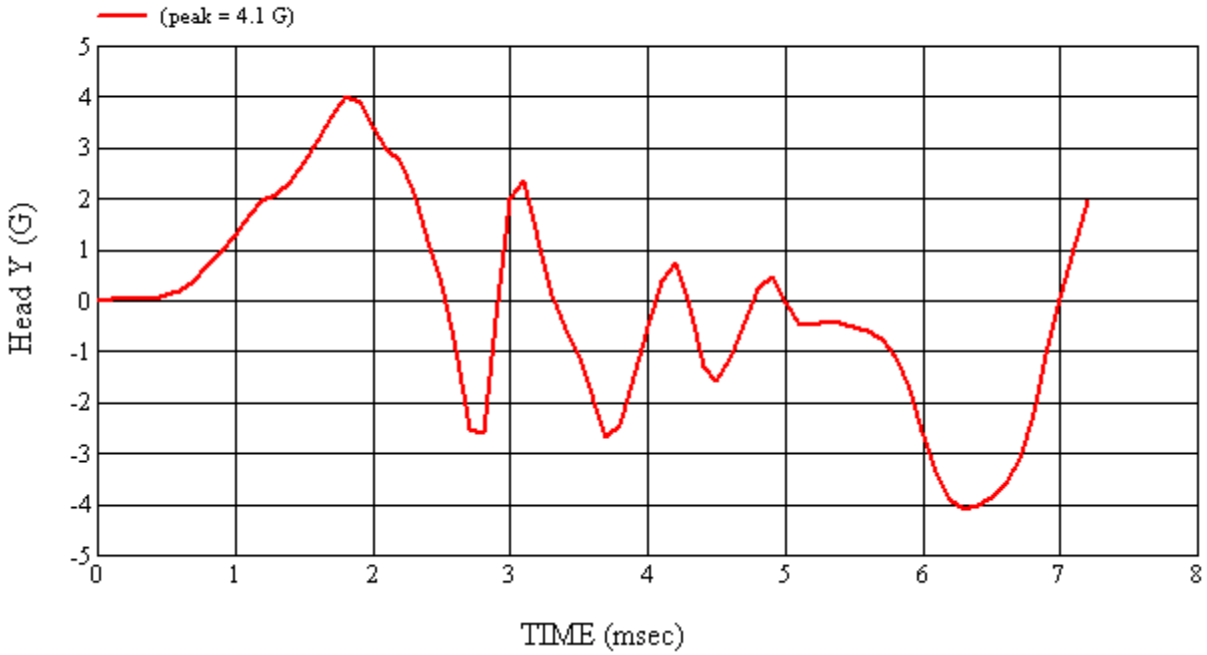
REMARKS:

RECORDED BY:  DATE: 5/3/2011

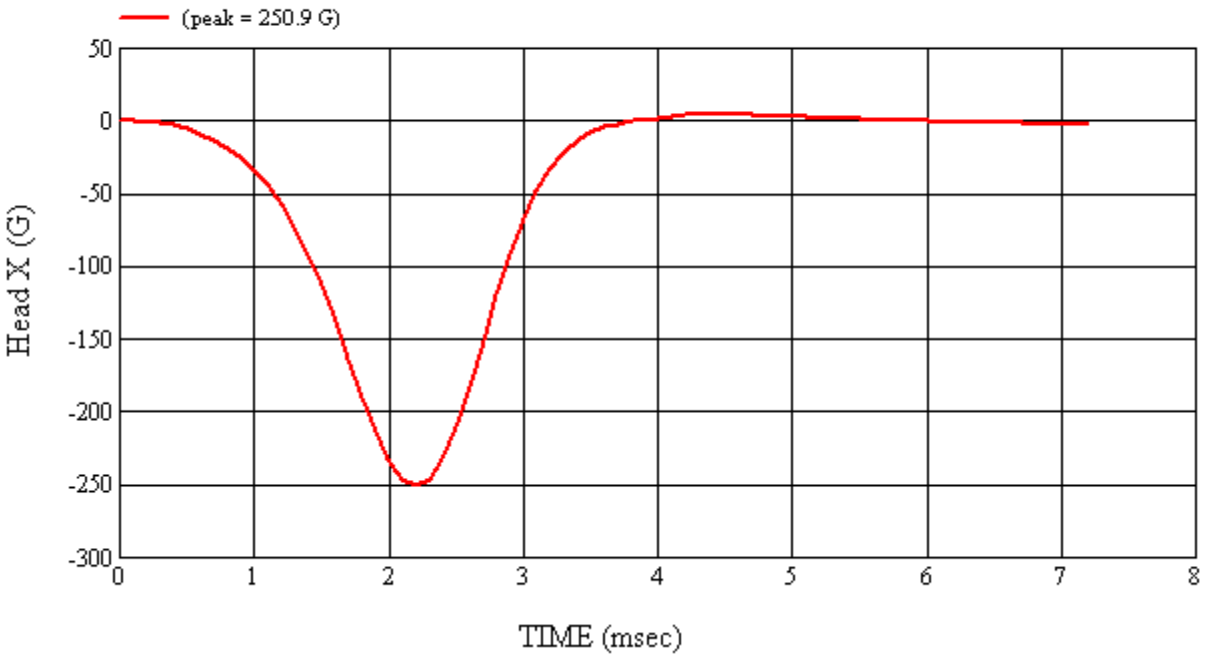
APPROVED BY: 



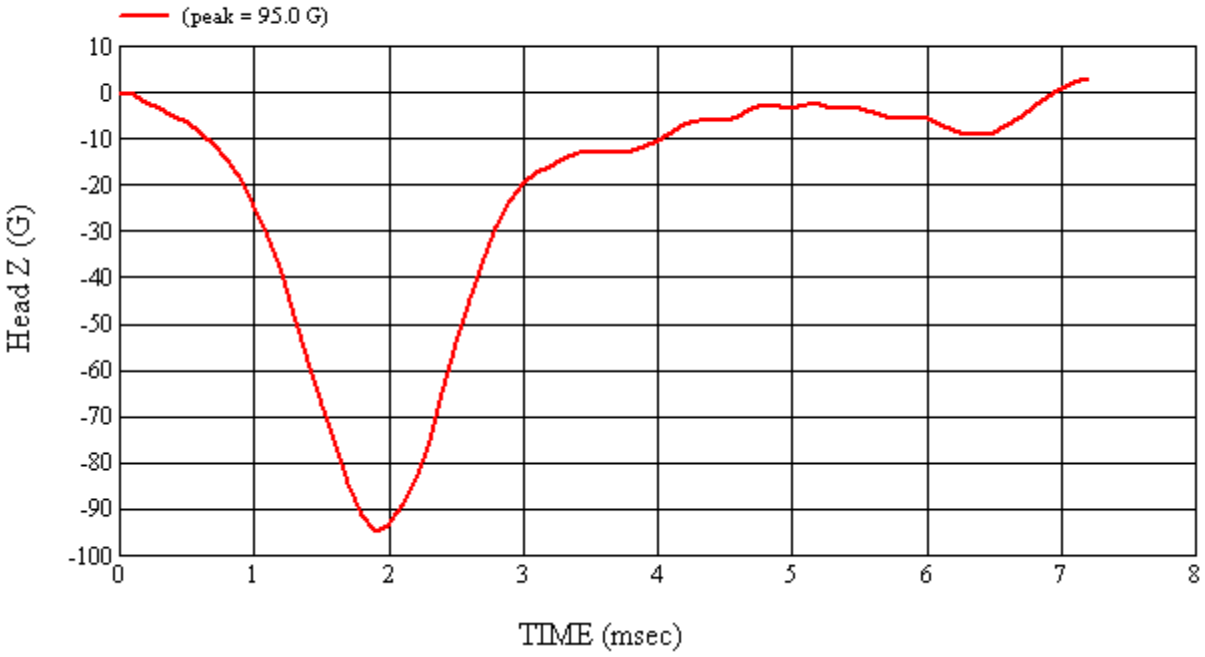
Head 037 (Post) Calibration #H37016



Head 037 (Post) Calibration #H37016



Head 037 (Post) Calibration #H37016



Head 037 (Post) Calibration #H37016

4-5 Pre-Test Calibration

HEAD DROP TEST SUMMARY
PART 572L

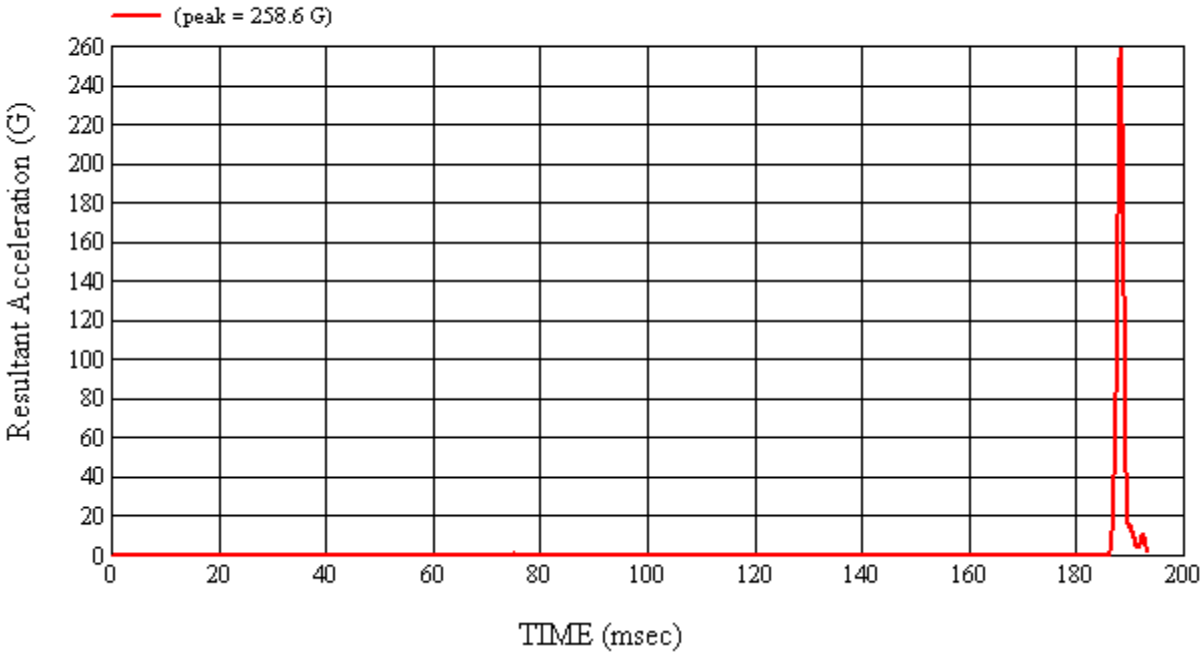
HEADFORM SERIAL NUMBER: 038	CALIBRATION DATE: 4/28/2011 CALIBRATION TIME: 2:06.46 AM	
TEST PARAMETER	**SPECIFICATION**	**TEST RESULTS**
Weight	9.90 to 10.10 lbs.	9.90
Temperature	19° C to 26° C	21.0
Relative Humidity	10% to 70%	38.5
Peak Resultant Acceleration	225 G's to 275 G's	258.6
Peak Lateral Acceleration	15 G's Maximum	8.2
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	02/07/11	08/07/11
2	ENDEVCO	7264-2000	J36197	02/07/11	08/07/11
3	ENDEVCO	7264-2000	J36353	02/07/11	08/07/11

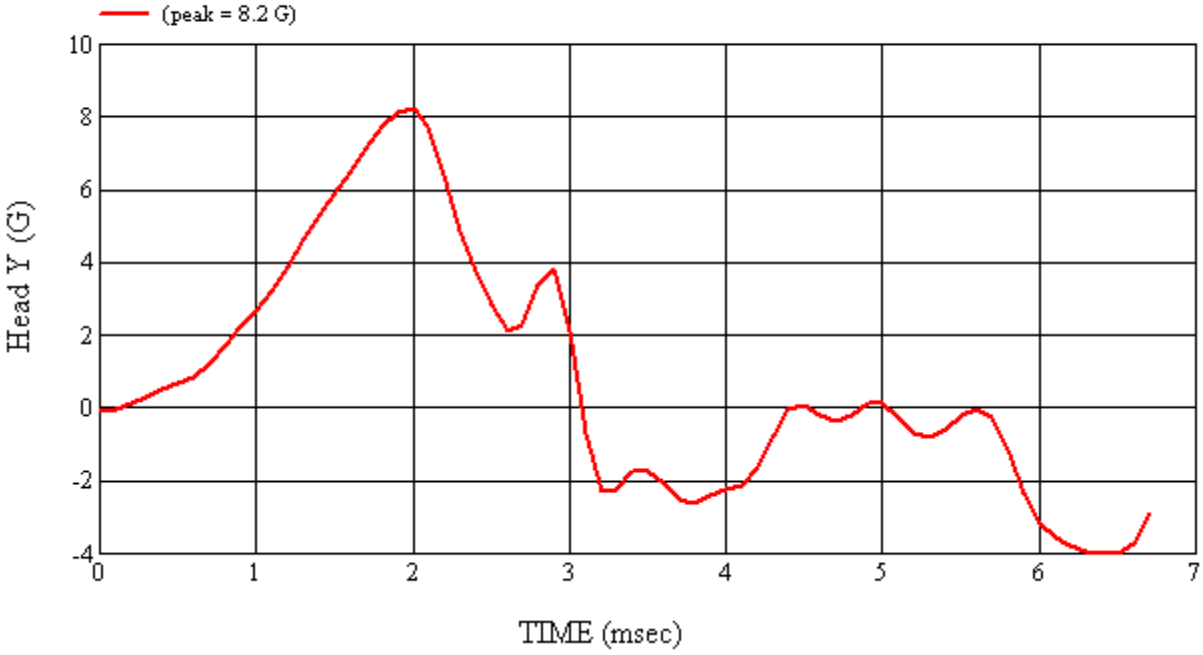
REMARKS:

RECORDED BY: _____ DATE: __4/28/2011____

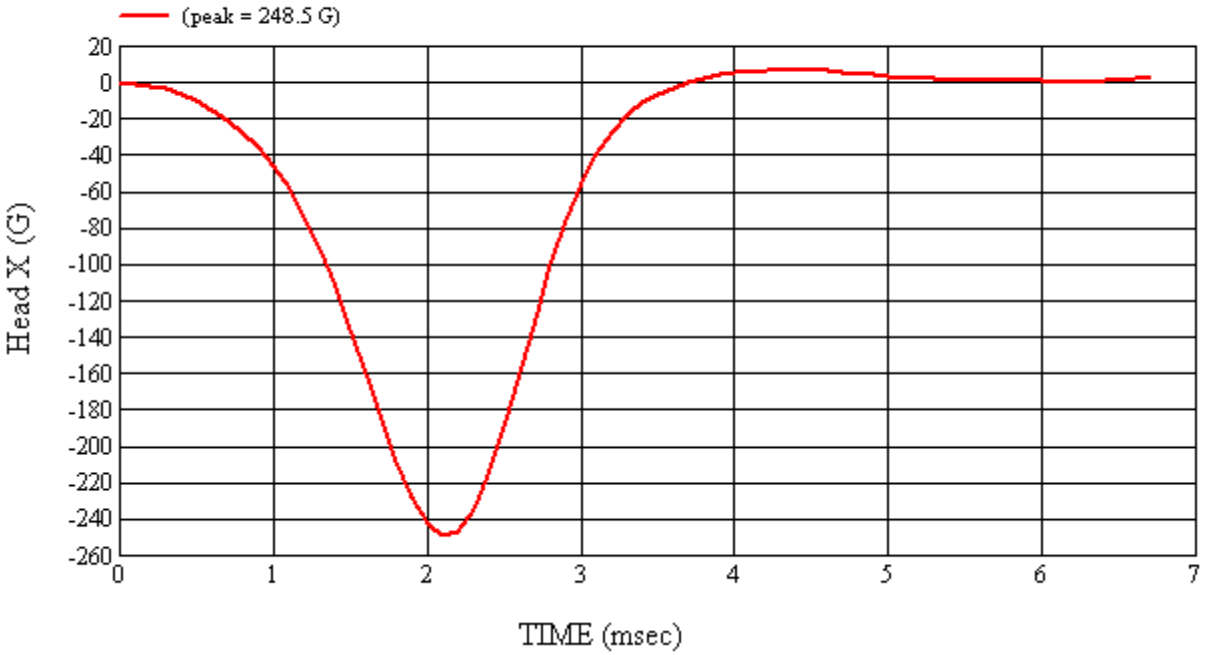
APPROVED BY: _____



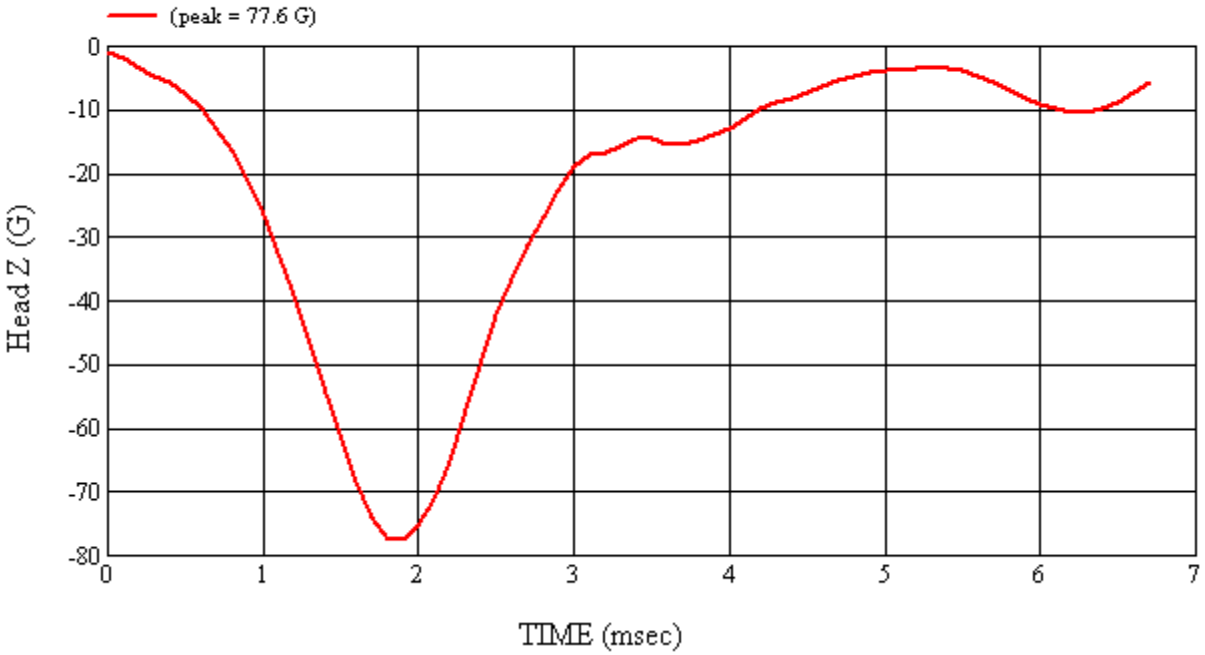
Head 038 (Pre) Calibration #H38015



Head 038 (Pre) Calibration #H38015



Head 038 (Pre) Calibration #H38015



Head 038 (Pre) Calibration #H38015

4-6 Post-Test Calibration

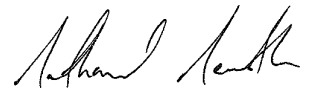
HEAD DROP TEST SUMMARY
PART 572L

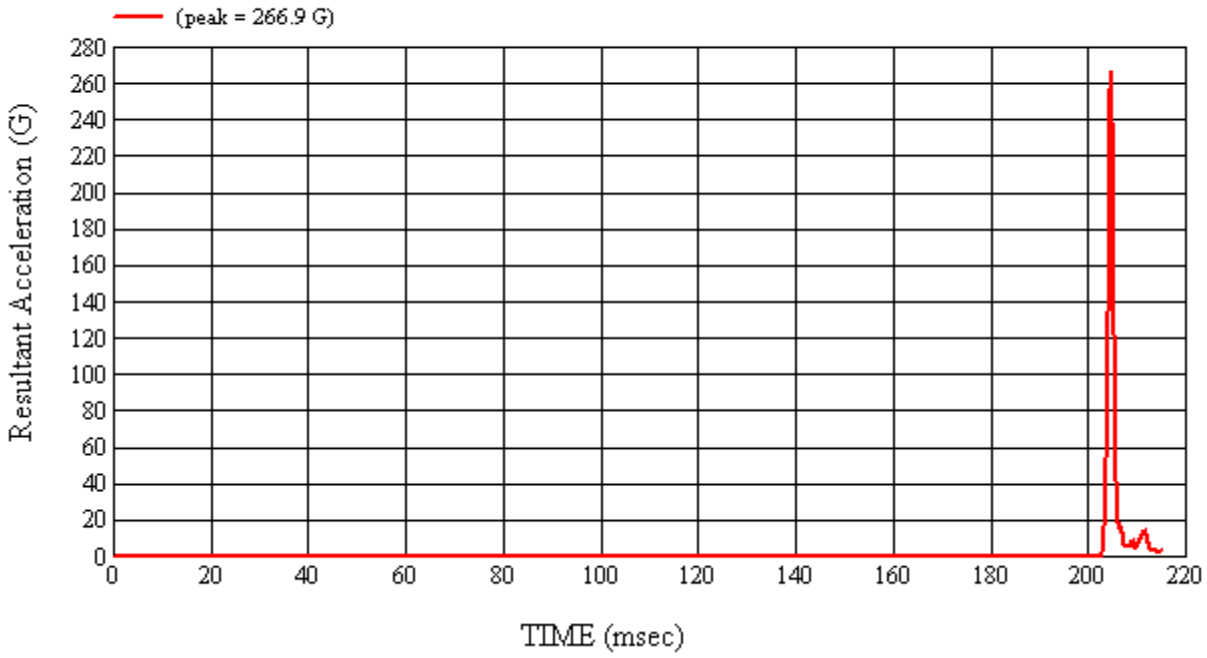
HEADFORM SERIAL NUMBER: 038	CALIBRATION DATE: 5/3/2011 CALIBRATION TIME: 11:54:06 AM	
TEST PARAMETER	**SPECIFICATION**	**TEST RESULTS**
Weight	9.90 to 10.10 lbs.	9.90
Temperature	19° C to 26° C	20.6
Relative Humidity	10% to 70%	36.1
Peak Resultant Acceleration	225 G's to 275 G's	266.9
Peak Lateral Acceleration	15 G's Maximum	7.0
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	02/07/11	08/07/11
2	ENDEVCO	7264-2000	J36197	02/07/11	08/07/11
3	ENDEVCO	7264-2000	J36353	02/07/11	08/07/11

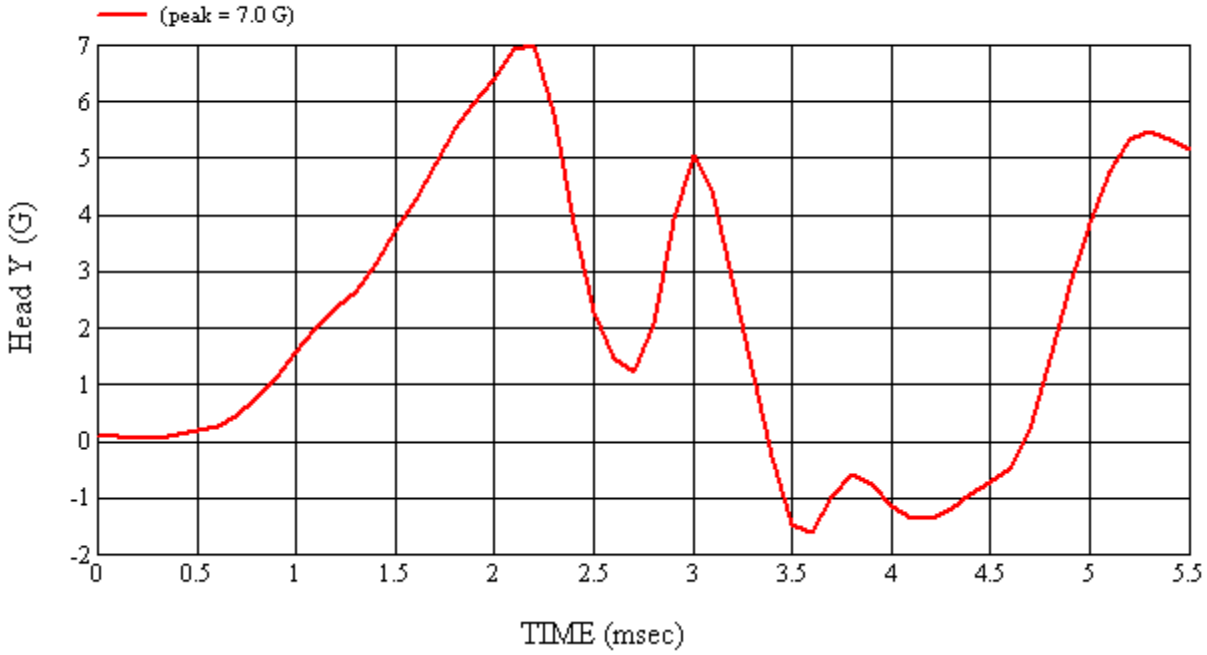
REMARKS:

RECORDED BY:  DATE: 5/3/2011

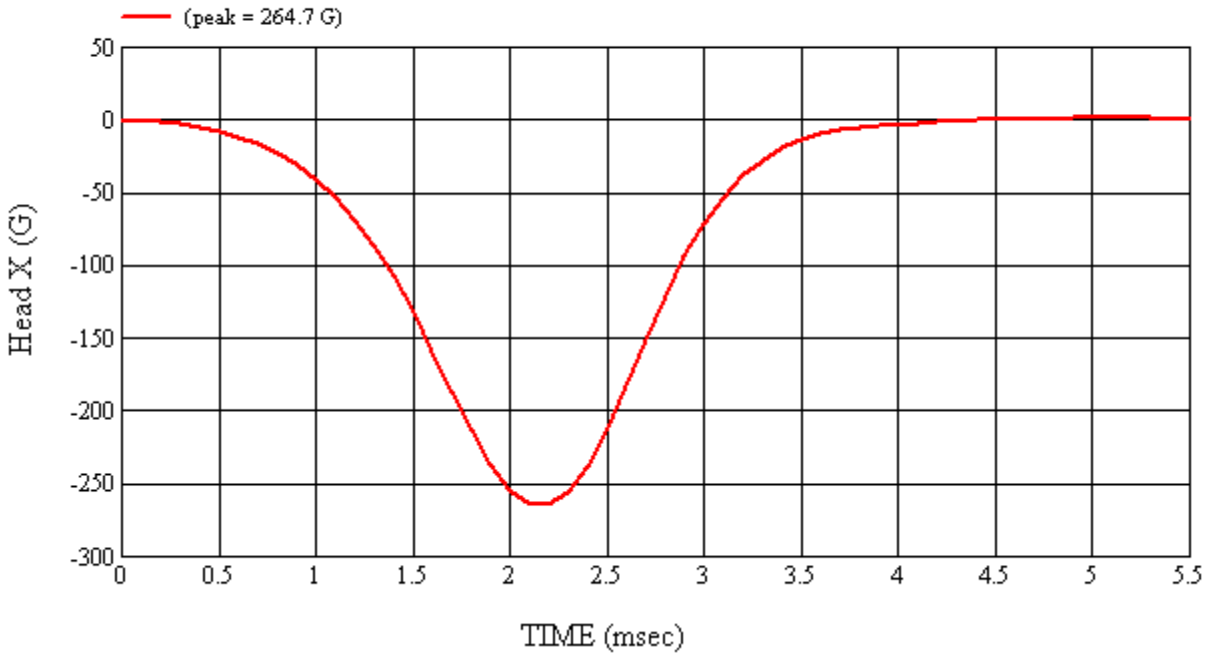
APPROVED BY: 



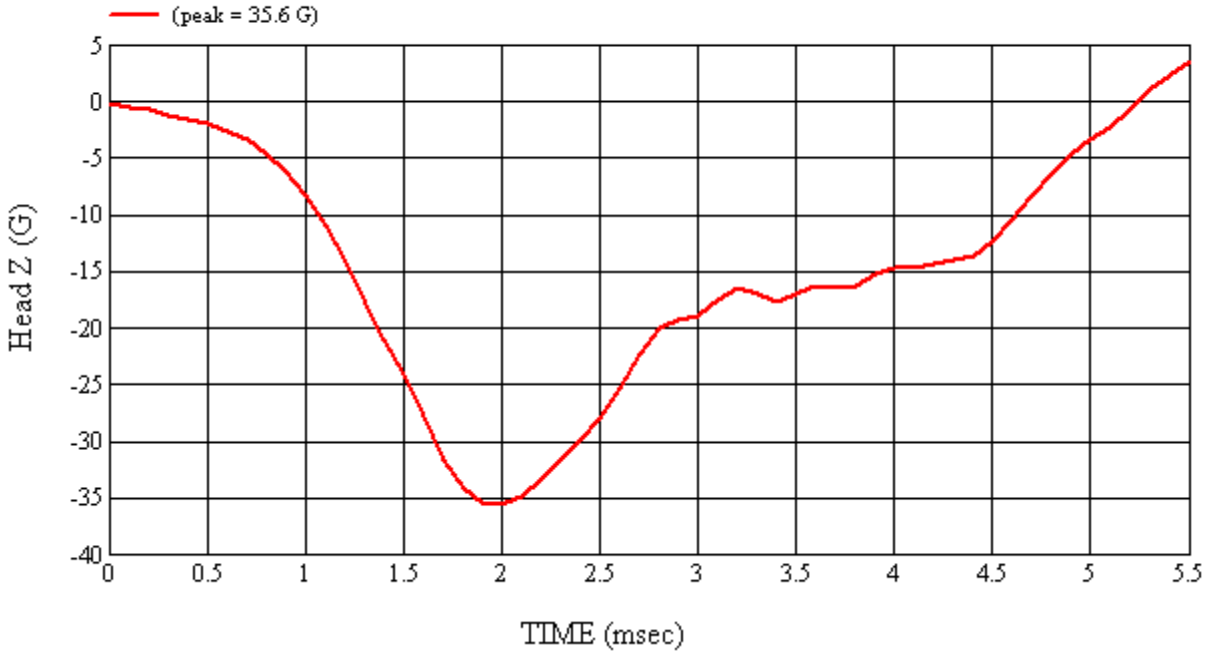
Head 038 (Post) Calibration #H38016



Head 038 (Post) Calibration #H38016



Head 038 (Post) Calibration #H38016



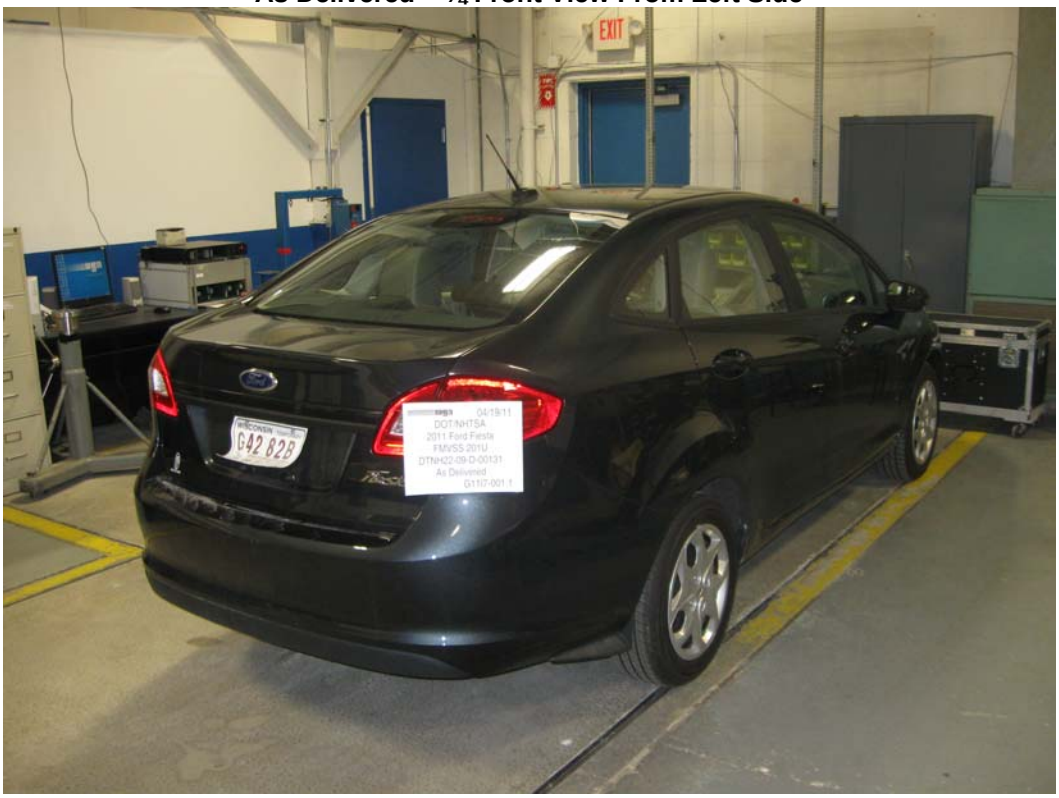
Head 038 (Post) Calibration #H38016

5.0 PHOTOGRAPHS

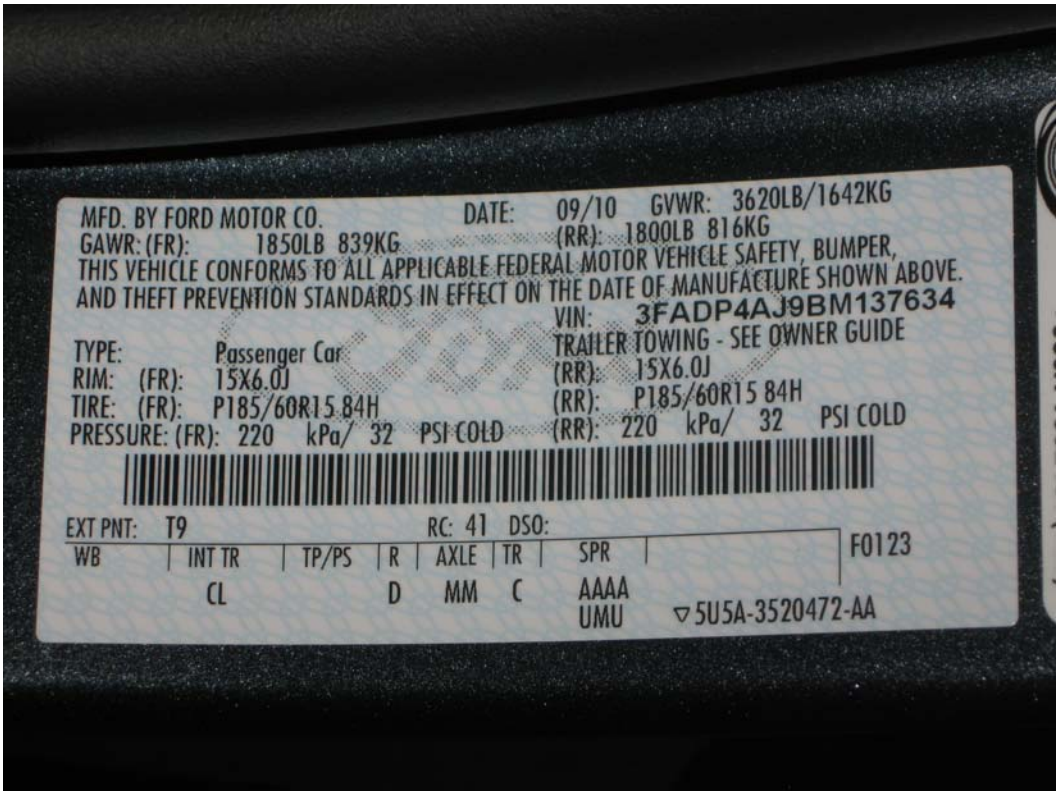
As Delivered – Left Side View

As Delivered – Right Side View

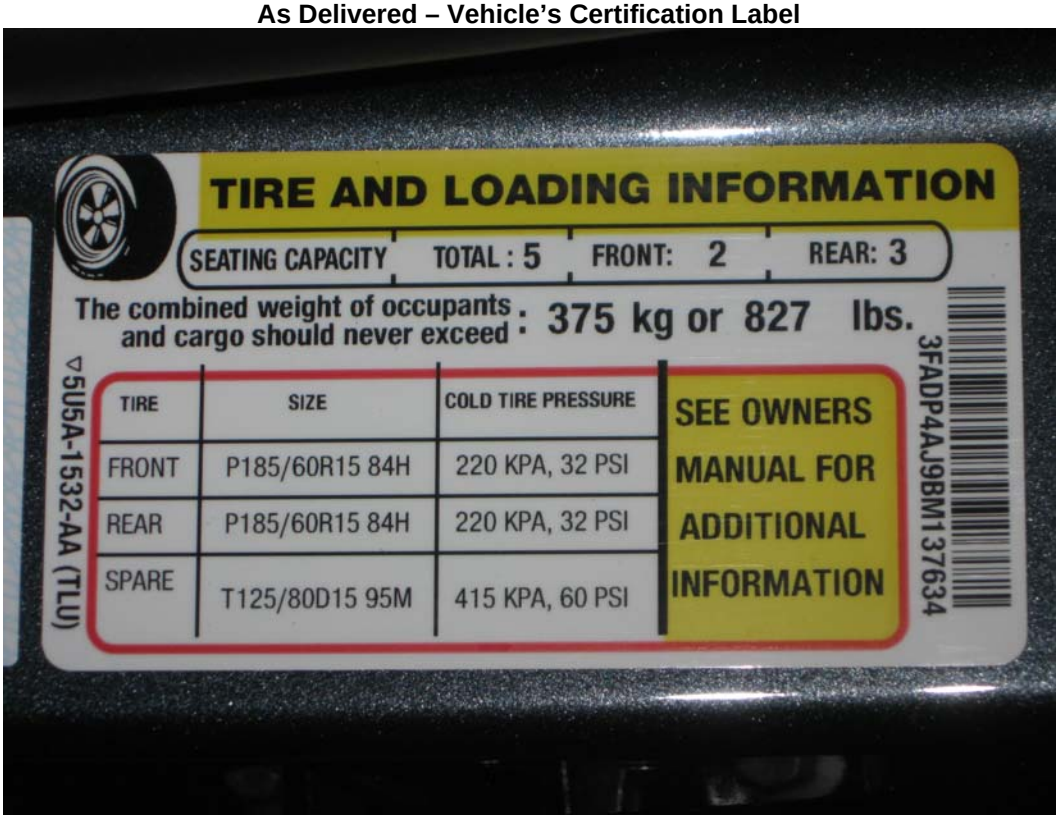
As Delivered – ¾ Front View From Left Side



As Delivered – ¾ Rear View From Right Side



As Delivered – Vehicle's Certification Label

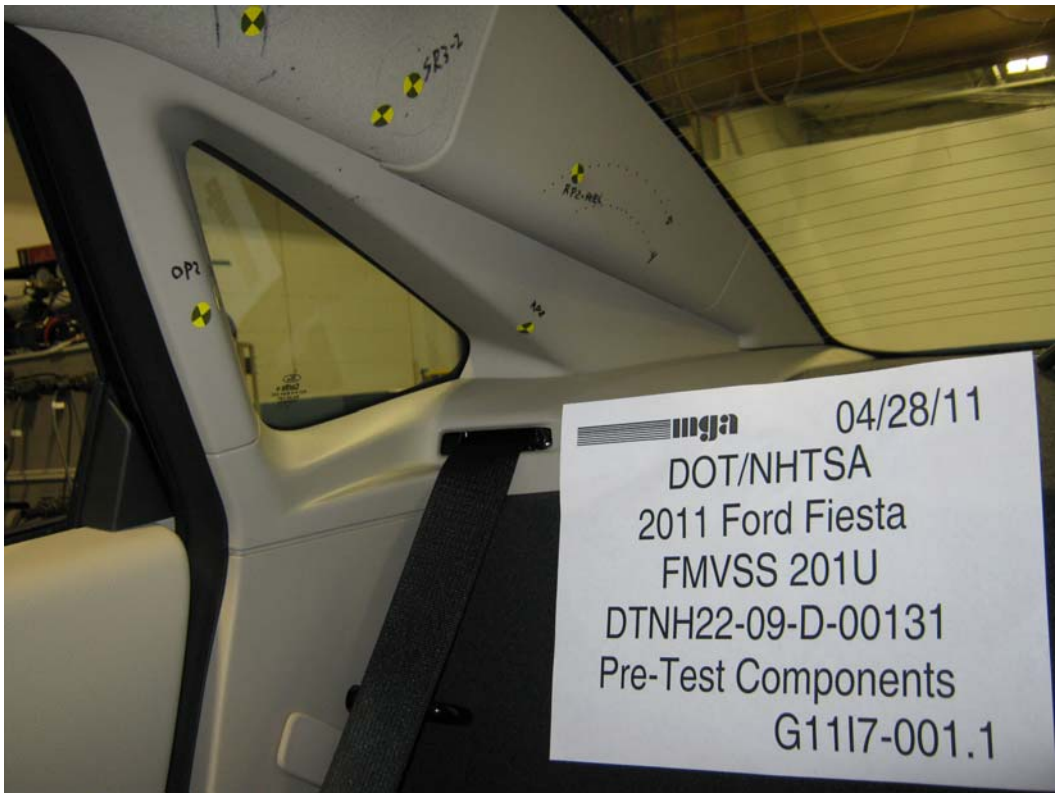


As Delivered – Vehicle's Tire Information Label

Pre-Test Component Photographs

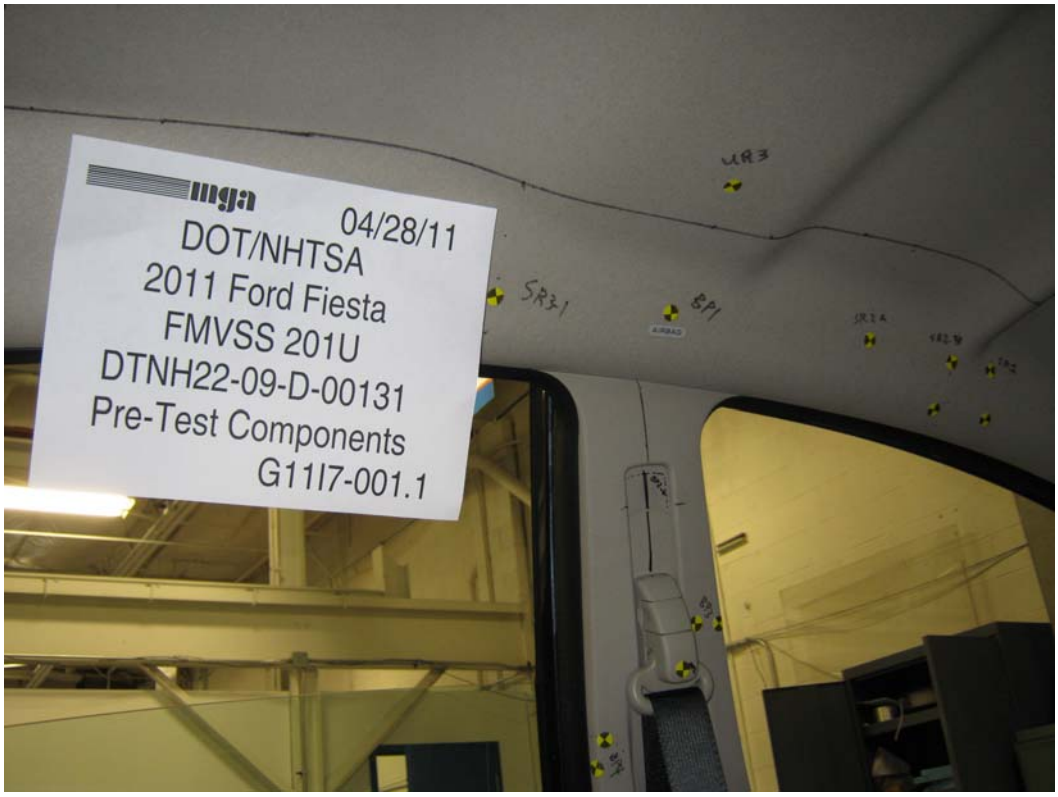

mga
04/28/11
DOT/NHTSA
2011 Ford Fiesta
FMVSS 201U
DTNH22-09-D-00131
Pre-Test Components
G11I7-001.1


mga
04/28/11
DOT/NHTSA
2011 Ford Fiesta
FMVSS 201U
DTNH22-09-D-00131
Pre-Test Components
G11I7-001.1


04/28/11
DOT/NHTSA
2011 Ford Fiesta
FMVSS 201U
DTNH22-09-D-00131
Pre-Test Components
G11I7-001.1


04/28/11
DOT/NHTSA
2011 Ford Fiesta
FMVSS 201U
DTNH22-09-D-00131
Pre-Test Components
G11I7-001.1


UR5
RH
OP1
RP1
SR3Z
RGL
OPZ
mga
04/28/11
DOT/NHTSA
2011 Ford Fiesta
FMVSS 201U
DTNH22-09-D-00131
Pre-Test Components
G11I7-001.1

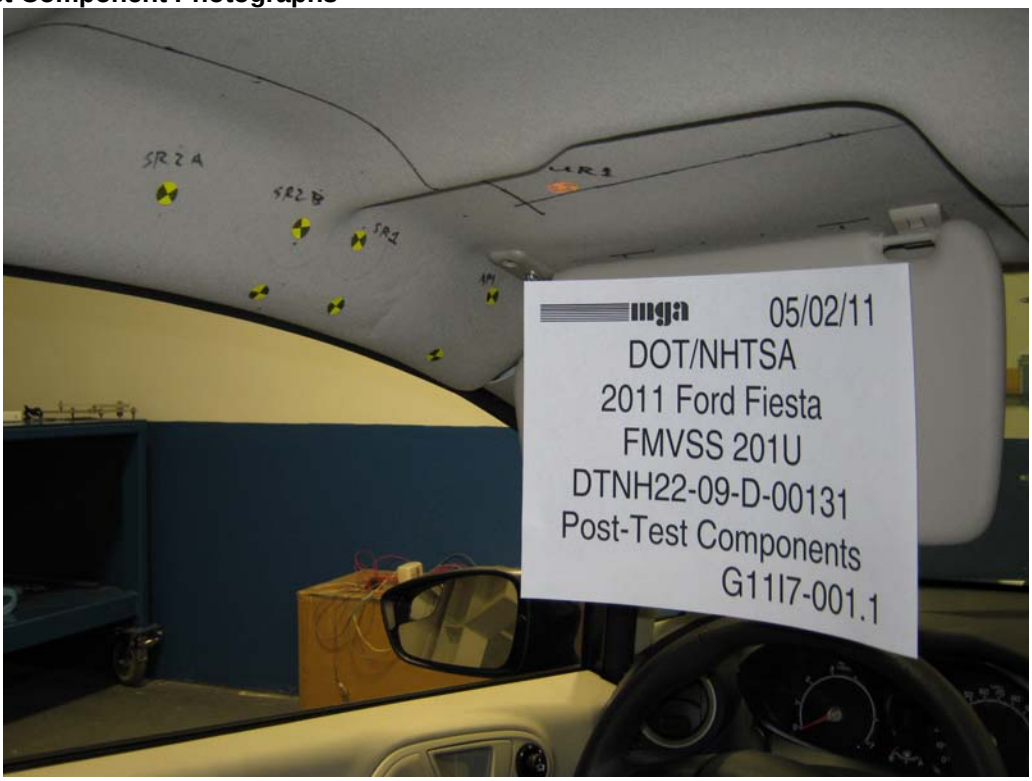

UR3
SR3I
BPI
mga
04/28/11
DOT/NHTSA
2011 Ford Fiesta
FMVSS 201U
DTNH22-09-D-00131
Pre-Test Components
G11I7-001.1


SR2A
SR2B
UR1
mga
04/28/11
DOT/NHTSA
2011 Ford Fiesta
FMVSS 201U
DTNH22-09-D-00131
Pre-Test Components
G11I7-001.1
EXIT


SR1
mga
04/28/11
DOT/NHTSA
2011 Ford Fiesta
FMVSS 201U
DTNH22-09-D-00131
Pre-Test Components
G11I7-001.1

…

Post-Test Component Photographs




mga
05/02/11
DOT/NHTSA
2011 Ford Fiesta
FMVSS 201U
DTNH22-09-D-00131
Post-Test Components
G11I7-001.1


mga
05/02/11
DOT/NHTSA
2011 Ford Fiesta
FMVSS 201U
DTNH22-09-D-00131
Post-Test Components
G11I7-001.1


mga
05/02/11
DOT/NHTSA
2011 Ford Fiesta
FMVSS 201U
DTNH22-09-D-00131
Post-Test Components
G11I7-001.1


mga
05/02/11
DOT/NHTSA
2011 Ford Fiesta
FMVSS 201U
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Post-Test Components
G11I7-001.1


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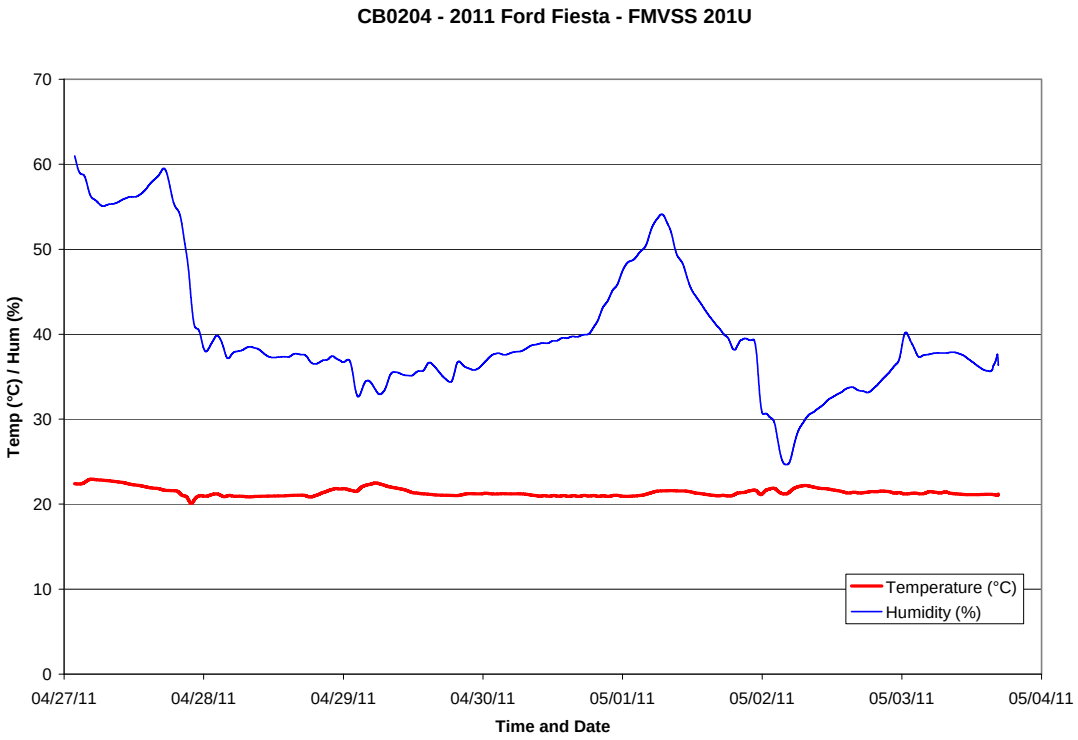
2011 Ford Fiesta
FMVSS 201U
DTNH22-09-D-00131
Post-Test Components
G11I7-001.1


mga
05/02/11
DOT/NHTSA
2011 Ford Fiesta
FMVSS 201U
DTNH22-09-D-00131
Post-Test Components
G11I7-001.1

Appendix A – Temperature Trace



Appendix B – Calibration Certificates

MGA Research Corporation-Calibration Certificate

ACCELEROMETER

Reference	
Name:	Accel Standard
Model #	352C03
Serial #:	95980
Capacity:	G's:250
Calibration Date:	9/14/2010
Calibrated By:	Modal Shop

Sensor	
Name:	MGA MI
Manufacturer	Endevco
Model #:	7264-2000
Serial #:	J35919
Capacity/Range: (G's)	2,000

Calibration Date:	2/4/2011
New DLR(Units:G'S) [1] 100K SHUNT	95.8
Linearity:[2]	0.99951
New vs Old Sensitivit (% Difference)	0.7
Temperature:	72 °F
Humidity:	20 %
Sensitivity (mV/V/G):	0.025975
Calibrated By:	Ryan Jones

Signature: _____

Approved by: Edward A. Kalata

1. Actual data of reference and sensor instruments is found in calibration files

2. Linearity is defined as 1- (Standard Deviation/ Mean)

All calibrations are traceable to the National Institute of Standards and Technology

Calibration uncertainty no greater than 4.0 % at the 95% confidence level.

MGA Research Corporation-Calibration Certificate

ACCELEROMETER

Reference	
Name:	Accel Standard
Model #	352C03
Serial #:	95980
Capacity:	G's:250
Calibration Date:	9/14/2010
Calibrated By:	Modal Shop

Sensor	
Name:	MGA MI
Manufacturer	Endevco
Model #:	7264-2000
Serial #:	J22664
Capacity/Range: (G's)	2,000

Calibration Date:	2/4/2011
New DLR(Units:G'S) [1] 100K SHUNT	94.2
Linearity:[2]	0.99938
New vs Old Sensitivit (% Difference)	1.2
Temperature:	72 ^{0}F
Humidity:	20 %
Sensitivity (mV/V/G):	0.026447
Calibrated By:	Ryan Jones

Signature: _____

Approved by: Helen A. Kalata

1. Actual data of reference and sensor instruments is found in calibration files

2. Linearity is defined as 1- (Standard Deviation/ Mean)

All calibrations are traceable to the National Institute of Standards and Technology

Calibration uncertainty no greater than 4.0 % at the 95% confidence level.

MGA Research Corporation-Calibration Certificate

ACCELEROMETER

Reference	
Name:	Accel Standard
Model #	352C03
Serial #:	95980
Capacity:	G's:250
Calibration Date:	9/14/2010
Calibrated By:	Modal Shop

Sensor	
Name:	MGA MI
Manufacturer	Endevco
Model #:	7264-2000
Serial #:	J35924
Capacity/Range: (G's)	2,000

Calibration Date:	2/4/2011
New DLR(Units:G'S) [1] 100K SHUNT	92.8
Linearity:[2]	0.99947
New vs Old Sensitivit (% Difference)	1.2
Temperature:	72 °F
Humidity:	20 %
Sensitivity (mV/V/G):	0.026824
Calibrated By:	Ryan Jones

Signature: _____

Approved by: Steven A. Kaleto

1. Actual data of reference and sensor instruments is found in calibration files

2. Linearity is defined as 1- (Standard Deviation/ Mean)

All calibrations are traceable to the National Institute of Standards and Technology

Calibration uncertainty no greater than 4.0 % at the 95% confidence level.

MGA Research Corporation-Calibration Certificate

ACCELEROMETER

Reference	
Name:	Accel Standard
Model #	352C03
Serial #:	95980
Capacity:	G's:250
Calibration Date:	9/14/2010
Calibrated By:	Modal Shop

Sensor	
Name:	MGA MI
Manufacturer	Endevco
Model #:	7264-2000
Serial #:	J32177
Capacity/Range: (G's)	2,000

Calibration Date:	2/4/2011
New DLR(Units:G'S) [1] 100K SHUNT	113.7
Linearity:[2]	0.9997
New vs Old Sensitivit (% Difference)	-0.2
Temperature:	72 °F
Humidity:	20 %
Sensitivity (mV/V/G):	0.021883
Calibrated By:	Ryan Jones

Signature: _____

Approved by: Helen A. Kaleto

1. Actual data of reference and sensor instruments is found in calibration files

2. Linearity is defined as 1- (Standard Deviation/ Mean)

All calibrations are traceable to the National Institute of Standards and Technology

Calibration uncertainty no greater than 4.0 % at the 95% confidence level.

MGA Research Corporation-Calibration Certificate

ACCELEROMETER

Reference	
Name:	Accel Standard
Model #	352C03
Serial #:	95980
Capacity:	G's:250
Calibration Date:	9/14/2010
Calibrated By:	Modal Shop

Sensor	
Name:	MGA MI
Manufacturer	Endevco
Model #:	7264-2000
Serial #:	J14103
Capacity/Range: (G's)	2,000

Calibration Date:	2/4/2011
New DLR(Units:G'S) [1] 100K SHUNT	93.9
Linearity:[2]	0.99955
New vs Old Sensitivit (% Difference)	-0.1
Temperature:	72 °F
Humidity:	20 %
Sensitivity (mV/V/G):	0.026479
Calibrated By:	Ryan Jones

Signature: _____

Approved by: Helen A. Kalata

1. Actual data of reference and sensor instruments is found in calibration files

2. Linearity is defined as 1- (Standard Deviation/ Mean)

All calibrations are traceable to the National Institute of Standards and Technology

Calibration uncertainty no greater than 4.0 % at the 95% confidence level.

MGA Research Corporation-Calibration Certificate

ACCELEROMETER

Reference	
Name:	Accel Standard
Model #	352C03
Serial #:	95980
Capacity:	G's:250
Calibration Date:	9/14/2010
Calibrated By:	Modal Shop

Sensor	
Name:	MGA MI
Manufacturer	Endevco
Model #:	7264-2000
Serial #:	J35800
Capacity/Range: (G's)	2,000

Calibration Date:	2/4/2011
New DLR(Units:G'S) [1] 100K SHUNT	97.8
Linearity:[2]	0.9995
New vs Old Sensitivit (% Difference)	0.6
Temperature:	72 °F
Humidity:	20 %
Sensitivity (mV/V/G):	0.025451
Calibrated By:	Ryan Jones

Signature: _____

Approved by: Edward A. Kaleto

1. Actual data of reference and sensor instruments is found in calibration files

2. Linearity is defined as 1- (Standard Deviation/ Mean)

All calibrations are traceable to the National Institute of Standards and Technology

Calibration uncertainty no greater than 4.0 % at the 95% confidence level.

MGA Research Corporation-Calibration Certificate

ACCELEROMETER

Reference	
Name:	Accel Standard
Model #	352C03
Serial #:	95980
Capacity:	G's:250
Calibration Date:	9/14/2010
Calibrated By:	Modal Shop

Sensor	
Name:	MGA MI
Manufacturer	Endevco
Model #:	7264-2000
Serial #:	J22700
Capacity/Range: (G's)	2,000

Calibration Date:	2/7/2011
New DLR(Units:G'S) [1] 100K SHUNT	96.4
Linearity: [2]	0.99966
New vs Old Sensitivit (% Difference)	0.5
Temperature:	70 °F
Humidity:	20 %
Sensitivity (mV/V/G):	0.025819
Calibrated By:	Chris Collins

Signature: Chris Collins

Approved by: Steven A. Kaletu

1. Actual data of reference and sensor instruments is found in calibration files

2. Linearity is defined as 1- (Standard Deviation/ Mean)

All calibrations are traceable to the National Institute of Standards and Technology

Calibration uncertainty no greater than 4.0 % at the 95% confidence level.

MGA Research Corporation-Calibration Certificate

ACCELEROMETER

Reference	
Name:	Accel Standard
Model #	352C03
Serial #:	95980
Capacity:	G's:250
Calibration Date:	9/14/2010
Calibrated By:	Modal Shop

Sensor	
Name:	MGA MI
Manufacturer	Endevco
Model #:	7264-2000
Serial #:	J36197
Capacity/Range: (G's)	2,000

Calibration Date:	2/7/2011
New DLR(Units:G'S) [1] 100K SHUNT	108.7
Linearity:[2]	0.99976
New vs Old Sensitivit (% Difference)	0.9
Temperature:	70 °F
Humidity:	20 %
Sensitivity (mV/V/G):	0.022869
Calibrated By:	Chris Collins

Signature: Chris Collins

Approved by: Helen A. Kaleto

1. Actual data of reference and sensor instruments is found in calibration files

2. Linearity is defined as 1- (Standard Deviation/ Mean)

All calibrations are traceable to the National Institute of Standards and Technology

Calibration uncertainty no greater than 4.0 % at the 95% confidence level.

MGA Research Corporation-Calibration Certificate

ACCELEROMETER

Reference	
Name:	Accel Standard
Model #	352C03
Serial #:	95980
Capacity:	G's:250
Calibration Date:	9/14/2010
Calibrated By:	Modal Shop

Sensor	
Name:	MGA MI
Manufacturer	Endevco
Model #:	7264-2000
Serial #:	J36353
Capacity/Range: (G's)	2,000

Calibration Date:	2/7/2011
New DLR(Units:G'S) [1] 100K SHUNT	99.1
Linearity:[2]	0.99988
New vs Old Sensitivit (% Difference)	0.9
Temperature:	70 °F
Humidity:	20 %
Sensitivity (mV/V/G):	0.025114
Calibrated By:	Chris Collins

Signature: Chris Collins

Approved by: Helen R. Kaleto

1. Actual data of reference and sensor instruments is found in calibration files

2. Linearity is defined as 1- (Standard Deviation/ Mean)

All calibrations are traceable to the National Institute of Standards and Technology

Calibration uncertainty no greater than 4.0 % at the 95% confidence level.

THE MODAL SHOP INC
3149 East Kemper Rd.
Cincinnati, OH 45241
Ph: 513-351-9919
Fax: 513-458-2172
www.modalshop.com

~Calibration Certificate~

Sensor Information
Model Number: 352C03
Serial Number: 95980
Manufacturer: PCB
ID Number:
Description: ICP® Accelerometer

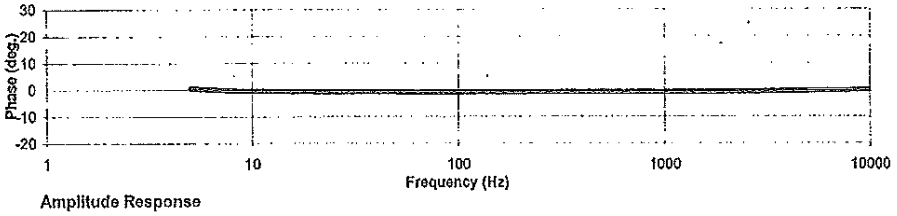
Calibration Data

Sensitivity @ 100 Hz:	9.94	mV/g
Phase @ 100 Hz:	-0.87	deg.
Test Level:	10.00	g

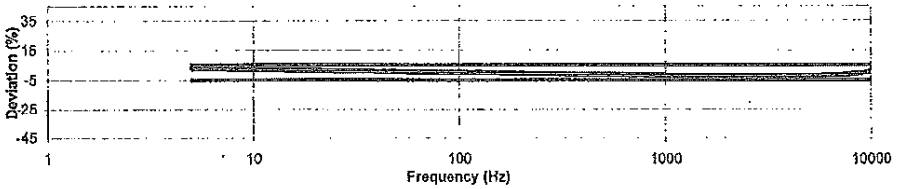
Transducer Specifications

Amp. Range:	± 500	g
Resolution:	0.0005	g
Resonant Freq:	≥ 50000	Hz
Temp. Range:	-54 to 121	°C
	-65 to 250	°F
Axis:	Uni-Axial	

Phase Response



Amplitude Response



Data Table

Freq. (Hz)	Deviation (%)	Phase (deg)
5	3.15	0.41
10	2.18	-0.36
30	0.99	-0.71
50	0.62	-0.68
100	0.00	-0.87
300	-0.88	-0.81
500	-1.29	-0.77
1000	-1.87	-0.77
2000	-2.45	-0.68
3000	-2.46	-0.61
4000	-2.59	-0.49
5000	-2.40	-0.40
6000	-2.09	-0.26
7000	-1.63	-0.23
8000	-1.10	-0.13
9000	-0.30	0.02
10000	0.76	-0.01

Notes
Results relate only to the items calibrated.
This certificate may not be reproduced except in full, without written permission.
Method: Calibration is performed in compliance with ISO 9001 and ISO 17025
This calibration was performed with TMS 9155C Calibration Workstation version 4.6.1
Calibration traceable to primary method which has been proficiency validated through interlaboratory comparison to NIST (project number 822/271196).
Back-to-Back Comparison Calibration per ISO16063-21 .
Procedure Used: PRD-P220
Measurement uncertainty (95% confidence level with coverage factor 2) for frequency ranges tested during calibration are as follows: 0.5-4.99 Hz; ± 3.00%, 5-9.99 Hz; ± 2.50%, 10-99 Hz; ± 1.70%, 100 Hz; ± 1.25%, 101-920 Hz; ± 1.40%, 921-5000 Hz; ± 1.70%, 5001-10,000 Hz; ± 2.20%, 10,001-15,000 Hz; ± 3.65%, 15,001-20,000 Hz; ± 4.75%.

Customer
MGA Research Corp.

User Notes

Unit Condition
As Found: In Tolerance
As Left: In Tolerance

Lab Conditions
Temperature: 73 (23) °F (°C)
Humidity: 32 %

Approval Information
Technician: Ed Devlin
Approval:

Cal Date: 9/14/2010
Due Date:

ACCREDITED

Cal ID: 15600 264901

THE MODAL SHOP INC
3149 East Kemper Rd.
Cincinnati, OH 45241
Ph: 513-351-9919
Fax: 513-458-2172
www.modalshop.com

~Calibration Certificate~

Sensor Information

Model Number	352C03
Serial Number	95980
Manufacturer	PCB
ID Number	

Note

This certificate may not be reproduced except in full, without written permission.

Standards and/or Equipment Used During Calibration

Description	Manufacturer	Model	Serial	Due Date
Data Aquisition Card	NI	4461	15004324	6/29/2011
Std Accelerometer	PCB	080A200	110553	12/8/2010
Air Bearing Shaker	PCB	396C11	603	n/a
Std Sig Conditioner	PCB	442A102	173	12/8/2010
SUT Signal Conditioner	PCB	443B101	379	9/19/2010
Power Amplifier	TMS	2100E21-C	1002	n/a

Technician: Ed Devlin Cal Date: 9/14/2010

Customer: MGA Research Corp. Due Date:

ACCREDITED

Cal ID: 16800 2849.01

Calibration Certificate

Part Description: Silver **Certification Date:** 10/19/2010 (M/d/yyyy) **Serial#:** S08-05-98-01273

Single Point - (Max-Min)/2 Specification: S08-05 .076mm (.0030") **Certificate#:** S0127340470

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

Measurement Standards Traceability

Ball Bar Kit	Asset Number: 1039	Calibration Due: 10/23/2010	*SI Traceability: METAS-L20100204RG1
Thermometer	Asset Number: TQ023	Calibration Due: 11/20/2010	*SI Traceability: A2LA-1001059862
Reference Sphere	Asset Number: 1241	Calibration Due: 11/21/2011	*SI Traceability: NIST-821/276660-08

The artifacts above have 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.
Measurement uncertainty is 3.9 + 3.0X micrometers, where X = length in meters.
Uncertainty is expressed at approximately a 95% Level of Confidence using k=2.00.

Calibration 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 conforms to procedures developed in accordance with ASME B89.4.22-2004. See attached data for measurement results.

Instrument condition as received:
Not Within Specification

Instrument condition outgoing:
Within specifications

Technician: Anthony Parker Date: 10/19/10

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

125 Technology Park
Lake Mary, FL 32746
USA

BMC 9/1/10

FARO®

Page 1 of 6

LABORATORY ACCREDITATION BUREAU
ISO/IEC 17025 Accredited

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

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

Tape Measure Calibration Certificate

Reference Steel Rule
Brand: SWANSON
S/N: MGA00799
Calibration Date: 1/15/2010

Subject Tape Measure
Brand: STANLEY
S/N: TPM 992
Calibration Date: 5/27/10

Reference (mm)	Subject Tape Measure	Difference	Reference (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: 5/27/10 Performed By: RJ Mill

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.

gary.hockin@midwayproducts.com

MetroCal Inc.

ACCREDITED
CALIBRATION 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: **69370**
Certificate Number: **100903801**
Page: **1 of 1**

Gauge Number: **MGA00712**
Gauge Desc: **Digital Protractor**
Manufacturer: **Mitutoyo**
Model Number: **950-315**
Serial Number: **06091641**

Customer PO: **N/A**
Last Calibration: **N/A**
Calibration Date: **9/3/10**
Next Calibration: **9/3/11**

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 Block Set	8/2/10	8/2/11	ID# 105	0.0015°
DoAll Sine Bar	1/21/10	1/21/11	ID# 1879	0.0015°

Results:

As Found Readings

Units	Nominal	Actual	Deviation
Decimal Deg.	5.00	5.0	0.00
	10.00	10.1	0.10
	20.00	20.0	0.00
Tolerance	30.00	30.0	0.00
± 0.1° Level	40.00	39.9	-0.10
± 0.2° Maximum Error			

Reference Level Check: Within ± 0.1 degrees

As Left Readings

Nominal	Actual	Deviation
5.00	5.0	0.00
10.00	10.1	0.10
20.00	20.0	0.00
30.00	30.0	0.00
40.00	39.9	-0.10

Reference Level Check: Within ± 0.1 degrees

Comments: Environmental conditions during calibration: 68 °F, 44% RH.
No adjustment required.

Shannon Kubicek
Calibration Technician

Issued: 9/3/10

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

@ 9/8/10

NovaStar SOLUTIONS

Calibration Certificate

ACCREDITED
CALIBRATION # 1277.01

Metrology Management Services
Remit to address:

35200 Plymouth Rd.
Livonia, MI 48150

Calibration Certificate #:
Z50918:1281429469

DICKSON FH125 TEMP/RH RECORDER

SERIAL NUMBER:	06163263
ASSET NUMBER:	Z50918
CUST. ASSET NUM:	MGA00152
PROCEDURE NAME:	1012
PROCEDURE REV:	A
CALIBRATED BY:	JOE McCONNAUGHHAY
CUSTOMER:	MGA RESEARCH CORP 446 EXECUTIVE DRIVE TROY, MI 48083
PRIMARY CONTACT:	THOMAS M. HUTTER

WORK ORDER: 1281429469

TEST RESULT:	PASS
PERFORMED ON:	8/10/2010
CAL DUE DATE:	8/10/2011
DATA TYPE:	FOUND-LEFT
TEMPERATURE:	21.00 °C
HUMIDITY:	43 %

This instrument has been processed and calibrated in accordance with the NovaStar Solutions Quality System Manual and is traceable to the National Institute of Standards and Technology (NIST), or to NIST accepted intrinsic standards of measurement, or derived by the ratio type of self-calibration techniques. The NovaStar Solutions quality system is accredited to ISO/IEC 17025:2005 and ANSI/NCSL Z540-1-1994.

The results reported herein apply only to the calibration of the item described above. No sampling plan was used for this calibration.

The ratio of the tolerance of the instrument or parameter being calibrated to the expanded uncertainty of the standard (TUR) is greater than 4:1 unless otherwise specified. Expanded uncertainties are expressed at the approximate 95% level of confidence using a K=2.
Due to any number of factors, the recommended due date on the item does not imply continuing conformance to specifications during the recommended interval.

For range and best measurement capability specifications for the standards used to perform this calibration, see the most recent calibration report maintained by this calibration laboratory (available upon request).

As Received Condition: IN TOLERANCE **As Returned Condition:** IN TOLERANCE

Action Taken: FULL CALIBRATION

REMARKS:

Standards Used

Asset #	Cert#	Description	Cal Date	Due Date
002326	002326:1264588323	VAISALA HMK-15 HUMIDITY SALTS	1/27/2010	1/27/2011
1914	1914:1262706187	FLUKE 1502A THERMOMETER READOUT	1/5/2010	1/5/2011
1915	1915:1264951189	HART SCIENTIFIC 5614 PRT	1/31/2010	1/31/2011
1917	1917:1263989036	VAISALA M170/HMP76 MEASUREMENT INDICATOR/PROBE	1/20/2010	1/20/2011

***** End of Certificate *****

8/13/2010

QA approved: mb **Date:** 8-11-10
Signature:

Asset Barcode:

MetroCal Inc.

ACCREDITED
CALIBRATION 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: 69370
Certificate Number: 100826804
Page: 1 of 1

Gauge Number: MGA00783
Gauge Desc: 0 to 20lb x 0.01lb Digital Scale
Manufacturer: Detecto
Model Number: AP-20
Serial Number: E10807-0187

Customer PO: N/A
Last Calibration: 8/14/09
Calibration Date: 8/26/10
Next Calibration: 8/26/11

As Found Condition: See Results

As Left Condition: See Results

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 CP042 and relevant sections of the manufacturer's manual. This calibration complies with 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	3/3/09	3/3/11	ID# 16992	+/-0.001% of Load
Weight Set	9/3/08	9/3/10	ID# 2463	+/-0.001% of Load

Results:
Tolerance used: Class III

Units: lbs — TI Division/Increment: 0.01

	As Found				As Left		
Weight Test	Nominal	Indication	Deviation		Nominal	Indication	Deviation
Zero	0.00	0.00	0.00		0.00	0.00	0.00
0-25% fs	5.00	5.01	0.01		5.00	5.01	0.01
26-50% fs	10.00	10.02	0.02		10.00	10.02	0.02
51-75% fs	15.00	15.02	0.02		15.00	15.02	0.02
76-100% fs	20.00	20.03	0.03		20.00	20.03	0.03
1/2 load test	10.00	10.02	0.02		10.00	10.02	0.02
return to zero	0.00	0.00	0.00		0.00	0.00	0.00
4 quad/Shift Test:	Pass			4 quad/Shift Test:	Pass		

Comments: Environmental conditions during calibration: 75 °F, 39 % RH.
The adapter that was sent in with the scale has loose components, be careful when using.
No adjustments required.

Shannon Kubicek
Calibration Technician

Issued: 8/26/10

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

@ 9/8/10

Sterling Scale Co., Inc.
20950 Boening St.
Southfield, MI 48076

Certificate of Calibration

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

calibration cert. 1448.01

Customer: MGA Research *Cert#* 10-6914 *Temp/Humidity:* ok
Location of Calibration: 2839 Elliot Rd Troy MI 48083
Calibration Date: 7/21/2010 *Due Date:* Jul-11 *Condition of Item:* Fair
Equipment Make: Intercomp *Model:* SW Deluxe *Serial Number* 26032389 *Capacity:* 2200 lb x 1 lb Per weigh pad
8800 lb x 1 lb Scale system total capacity

Applied Test Wt	*Before Adustment*	*Tolerance*	*In-Tolerance Y/N*	*After Adjustment*	*In-Tolerance Y/N*	*Unc*	
10 lb	9 lb	1 lb	y	n/a	y	0.002 lb	Right Rear Pad
100 lb	100 lb	1 lb	y	n/a	y	0.11 lb	
1000 lb	1000 lb	2 lb	y	n/a	y	0.14 lb	
10 lb	10 lb	1 lb	y	n/a	y	0.002 lb	Right Front Pad
100 lb	100 lb	1 lb	y	n/a	y	0.11 lb	
1000 lb	999 lb	2 lb	y	n/a	y	0.14 lb	

shift test
n/a

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

Tests performed: ☑ Repeatability ☑ Linearity ☐ Sensitivity ☑ Discrimination

Technician COMMENTS/ weights used: This scale is a wheel weigh system, there are a total of 4 wheel pads. Each pad has a capacity of 2200lb. A lb. All 4 pads together have a total capacity of 8800 lb. Scale passes tests sn on file

Page 2 of 2

☑ Scale Certified ☐ Scale Rejected

Sterling Scale Service Rep: E.Denny Date: 7/21/2010 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
Sterling Scale does not warranty calibration.