FINAL REPORT NUMBER 201UI-MGA-07-03

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

DAIMLERCHRYSLER AG
2007 Dodge Sprinter, MPV
NHTSA No. C70309

MGA RESEARCH CORPORATION
446 Executive Drive
Troy, Michigan 48083

Test Dates: September 21-25, 2007
Report Date: January 28, 2008

FINAL REPORT

PREPARED FOR:

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
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16. Abstract A compliance test series was conducted on the subject 2007 Dodge Sprinter, MPV, NHTSA No. C70309, 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 September 21-25, 2007. Test failures identified were as follows: None The data recorded indicates that the 2007 Dodge Sprinter, MPV, tested appears to comply with the upper interior requirements of FMVSS 201.			
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TABLE OF CONTENTS

LIST OF TABLES

1.0 PURPOSE OF COMPLIANCE TEST

The purpose of this head impact compliance test was to determine whether the subject, a 2007 Dodge Sprinter, MPV, meets the performance requirements of FMVSS 201, Occupant Protection in Interior Impact - Upper Interior Head Impact Protection.

Tests were conducted on September 21-25, 2007, on a 2007 Dodge Sprinter, MPV, manufactured by DaimlerChrysler AG.

All tests were conducted in accordance with the U. S. Department of Transportation, National Highway Traffic Safety Administration's Laboratory Test Procedure TP-201U-01 dated April 3, 1998 and the corresponding MGA Research Corporation's FMVSS 201U procedure number MGATP201U_FRAME#2 dated July 1, 2005.

All tests were conducted at MGA Research Corporation in Troy, Michigan and were performed by MGA engineers and technicians. The FMVSS 201U impactor test machine was used to conduct the testing. Target locations were determined by using a Coordinate Measurement Machine in conjunction with the MGA EZ-Target™ program and MGA procedure MGATP201U_Test Series dated July 1, 2005.

2.0 COMPLIANCE TEST DATA SUMMARY

The 2007 Dodge Sprinter, MPV, was equipped with A, B, Other (O), and rear-pillars, an adjustable seat belt anchorage on each B-pillar, grab handles located on the side rail above the front driver and passenger doors, an assist handle located on the driver side B-pillar, an overhead console along the upper roof, and an overhead air conditioning unit located in the center of the roof.

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

AP1	BP1	FH2	SR3-2
AP2	BP2	SR1	UR1@BP1
AP3	OP2	SR2B	UR2@Rear of SR3-1

The 2007 Dodge Sprinter, MPV tested appears to comply with the upper interior performance criteria for FMVSS 201. The HIC(d) measured using the Part 572L (Free Motion Headform) was below 1000 for each tested component.

TABLE 2-1

SUMMARY TABLE OF TEST RESULTS

VEH. MOD YR/MAKE/MODEL/BODY: 2007 Dodge Sprinter, MPV

VEH. NHTSA NO.: C70309 VIN: WD8PE746775129409 COLOR: Silver

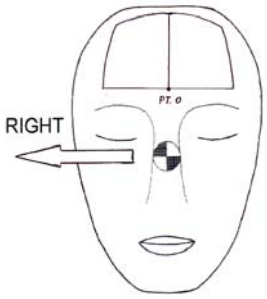
VEH. BUILD DATE: October, 2006 TEST DATES: September 21-25, 2007

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Helen A. Kaleto, Louis Campbell

TARGET	VEHICLE SIDE	HORIZONTAL ANGLE (deg)	VERTICAL ANGLE (deg)	VELOCITY (kph)	HIC(d)	FMH HIC	IMPACT ON FMH (mm)	
							Above	Left/Right
AP1	Right	111	30	24.0	782	815	15	16 Left
AP2	Left	201	32	23.2	440	362	5	4 Left
AP3	Right	154	29	23.9	518	466	5	1 Right
BP1	Right	90	11	23.7	588	559	31	12 Right
BP2	Left	270	0	23.8	694	699	8	0
OP2	Left	270	-10	23.4	613	592	15	27 Left
FH2	Left	180	50	23.7	399	308	41	5 Left
SR1	Left	270	5	23.1	808	851	12	16 Right
SR2B	Left	270	0	23.5	336	225	12	8 Left
SR3-2	Left	270	25	23.3	638	625	18	3 Left
UR1@BPR	Left	270	50	23.4	375	277	32	6 Right
UR2@Rear of SR3-1	Left	270	50	23.5	527	478	38	0

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



POST TEST COMMENTS:

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

AP2 Left: A-Pillar trim displaced.

AP3 Right: A-Pillar displacement.

BP2 Left: Slight cracking on D-ring trim.

FH2 Left: Windshield broke.

SR2B Left: Headliner deformation.

SR3-2 Left; Slight headliner deformation.

REMARKS: SR2B Right was impacted. The air hose came off during the test. The NHTSA representative was notified immediately. MGA was instructed to impact SR2B Left.

The targets listed were impacted in the following order:

Left: AP2, SR1, FH2, BP2, UR1@BP1, UR2@Rear of SR3-1, OP2, SR3-2

Right: AP1, AP3, BP1

Left: SR2B

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

RECORDED BY: Louis Campbell DATE: September 25, 2007

APPROVED BY: Helen A. Kaleto

TABLE 2-2

GENERAL TEST AND VEHICLE PARAMETER DATA

VEH. MOD YR/MAKE/MODEL/BODY: 2007 Dodge Sprinter, MPV

VEH. NHTSA NO.: C70309 VIN: WD8PE746775129409 COLOR: Silver

VEH. BUILD DATE: October, 2006 TEST DATES: September 21-25, 2007

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Helen A. Kaleto, Louis Campbell

INTERIOR TRIM INFORMATION: A, B, Other (O), and rear-pillars, an adjustable seat belt anchorage on each B-pillar, grab handles located on the side rail above the front driver and passenger doors, an assist handle located on the driver side B-pillar, an overhead console along the upper roof, and an overhead air conditioning unit located in the center of the roof.

SUNROOF INFORMATION:

Installed:	_____	Yes	__X__	No
Operation:	_____	Electric	____	Manual

SIDE RAIL CURTAIN AIRBAG INFORMATION:

Installed:	___	Yes	__X__	No

ROLL-BAR INFORMATION:

Installed:	_____	Yes	__X__	No
Padded:	_____	Yes	__X__	No
Braces:	_____	Yes	__X__	No

GENERAL INFORMATION:

Date Received: 08/02/2007; Odometer Reading 167 miles

DATA FROM VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured By: DaimlerChrysler AG

Date of Manufacture: 10/2006; VIN: WD8PE746775129409

GVWR: 3878 kg; GAWR FRONT: 1801 kg;

GAWR REAR: 2431 kg

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load:

FRONT: 320 kPa REAR: 480 kPa

Recommended Tire Size: LT245/75R16

Recommended Cold Tire Pressure:

FRONT: 320 kPa REAR: 480 kPa

Size of Tire on Test Vehicle: LT245/75R16

Type of Spare Tire: LT245/75R16; Space Saver:___; Standard X

VEHICLE CAPACITY DATA:

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

Number of Occupants: Front 2; Rear 8; TOTAL 10

VEHICLE CAPACITY WEIGHT:

Vehicle Capacity Weight (VCW) = 1324 kg

No. of Occupants x 68 kg = 680 kg

Rated Cargo/Luggage Weight (RCLW) = 644 kg (difference)

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

Right Front =	625.0 kg	Right Rear =	625.0 kg
Left Front =	696.5 kg	Left Rear =	597.0 kg
TOTAL FRONT =	1321.5 kg	TOTAL REAR =	1222.0 kg
% Total Weight =	52.0 %	% Total Weight =	48.0 %

TOTAL DELIVERED WEIGHT = 2543.5 kg

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Delivered Weight =	2543.5 kg
Max. Test Cargo/Luggage Weight =	133.0 kg
Target Test Weight =	2676.5 kg

WEIGHT OF TEST VEHICLE FULLY LOADED:

Right Front =	610.5 kg	Right Rear =	706.0 kg
Left Front =	683.5 kg	Left Rear =	676.5 kg
TOTAL FRONT =	1294.0 kg	TOTAL REAR =	1382.5 kg
% Total Weight =	48.3 %	% Total Weight =	51.7 %

TOTAL TEST WEIGHT = 2676.5 kg

Weight of ballast secured in vehicle's cargo area = 133.0 kg

TEST VEHICLE ATTITUDE:

AS DELIVERED: Right Front 891 mm; Left Front 888 mm;
Right Rear 896 mm; Left Rear 904 mm;
Pitch Angle at Right Door Sill = 0.5 Rear is higher
Pitch Angle at Left Door Sill = 0.6 Rear is higher
Roll Angle at Front Bumper = 0.1 Right is higher
Roll Angle at Rear Bumper = 0.2 Left is higher

FULLY LOADED: Right Front 891 mm; Left Front 888 mm;
Right Rear 886 mm; Left Rear 896 mm;
Pitch Angle at Right Door Sill = 0.4 Rear is higher
Pitch Angle at Left Door Sill = 0.4 Rear is higher
Roll Angle at Front Bumper = 0.1 Right is higher
Roll Angle at Rear Bumper = 0.1 Left is higher

AS TARGETED: Right Front 1025 mm; Left Front 1013 mm;
Right Rear 1020 mm; Left Rear 1024 mm;
Pitch Angle at Right Door Sill = 0.5 Rear is higher
Pitch Angle at Left Door Sill = 0.6 Rear is higher
Roll Angle at Front Bumper = 0.1 Right is higher
Roll Angle at Rear Bumper = 0.2 Left is higher

AS TESTED ON RIGHT SIDE:
Pitch Angle at Right Door Sill = 0.5 Rear is higher
Pitch Angle at Left Door Sill = 0.6 Rear is higher
Roll Angle at Front Bumper = 0.1 Right is higher
Roll Angle at Rear Bumper = 0.2 Left is higher

AS TESTED ON LEFT SIDE:
Pitch Angle at Right Door Sill = 0.5 Rear is higher
Pitch Angle at Left Door Sill = 0.6 Rear is higher
Roll Angle at Front Bumper = 0.1 Right is higher
Roll Angle at Rear Bumper = 0.2 Left is higher

VEHICLE WHEELBASE = 3658 mm

REMARKS: The seat travel distance was measured to be 262 mm for the driver front seat and 262 mm for the passenger front seat.

RECORDED BY: Louis Campbell DATE: September 19, 2007

APPROVED BY: Helen A. Kaleto

TABLE 2-3

HORIZONTAL IMPACT ANGLE RANGE FOR A AND B PILLARS

VEH. MOD YR/MAKE/MODEL/BODY: 2007 Dodge Sprinter, MPV

VEH. NHTSA NO.: C70309 VIN: WD8PE746775129409 COLOR: Silver

VEH. BUILD DATE: October, 2006 TEST DATES: September 21-25, 2007

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Helen A. Kaleto, Louis Campbell

HORIZONTAL IMPACT ANGLE RANGE FOR A AND B PILLARS

	HORIZONTAL ANGLE SPECIFIED RANGE	MINIMUM HORIZONTAL ANGLE	MAXIMUM HORIZONTAL ANGLE
A-PILLAR	L 195º-255º	L 201.2º	L 249.0º
	R 105º-165º	R 110.9º	R 158.2º
B-PILLAR	L 195º-345º	L 210.7º	L 283.5º
	R 15º-165º	R 74.7º	R 149.0º

AS DETERMINED USING THE PROCEDURES SPECIFIED IN S8.13.4.1

REMARKS:

RECORDED BY: Louis Campbell DATE: September 19, 2007

APPROVED BY: Helen A. Kaleto

TABLE 2-4

VERTICAL IMPACT ANGLE RANGES

VEH. MOD YR/MAKE/MODEL/BODY: 2007 Dodge Sprinter, MPV

VEH. NHTSA NO.: C70309 VIN: WD8PE746775129409 COLOR: Silver

VEH. BUILD DATE: October, 2006 TEST DATES: September 21-25, 2007

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Helen A. Kaleto, Louis Campbell

VERTICAL IMPACT ANGLE RANGES

		VERTICAL ANGLE SPECIFIED RANGE	MINIMUM VERTICAL ANGLE	MAXIMUM VERTICAL ANGLE
FRONT HEADER	FH1	L 0º-50º	L 0º	L 50º
		R 0º-50º	R 0º	R 50º
	FH2	L 0º-50º	L 0º	L 50º
		R 0º-50º	R 0º	R 50º
SIDE RAIL	SR1	L 0º-50º	L 0º	L 5º
		R 0º-50º	R 0º	R 5º
	SR2A	L 0º-50º	L 0º	L 11º
		R 0º-50º	R 0º	R 10º
	SR2B	L 0º-50º	L 0º	L 0º
		R 0º-50º	R 0º	R 15º
	SR3-1	L 0º-50º	L 0º	L 45º
		R 0º-50º	R 0º	R 22º
	SR3-2	L 0º-50º	L 0º	L 25º
		R 0º-50º	R 0º	R 17º
REAR HEADER	RH	L 0º-50º	L 0º	L 50º
		R 0º-50º	R 0º	R 50º
A-PILLAR	AP1	L -5º-50º	L -5º	L 32º
		R -5º-50º	R -5º	R 30º

		VERTICAL ANGLE SPECIFIED RANGE	MINIMUM VERTICAL ANGLE	MAXIMUM VERTICAL ANGLE
	AP2	L -5º-50º	L -5º	L 32º
		R -5º-50º	R -5º	R 31º
	AP3	L -5º-50º	L -5º	L 50º
		R -5º-50º	R -5º	R 29º
B-PILLAR	BP1	L -10º-50º	L -10º	L 38º
		R -10º-50º	R -10º	R 11º
	BP2*	L 0º-50º	L 0º	L 0º
		R 0º-50º	R 0º	R 0º
	BP3	L -10º-50º	L -10º	L -10º
		R -10º-50º	R -10º	R -10º
	BP4	L -10º-50º	L -10º	L -10º
		R -10º-50º	R -10º	R -7º
OTHER PILLAR	OP1	L -10º-50º	L -10º	L 22º
		R -10º-50º	R -10º	R 13º
	OP2	L -10º-50º	L -10º	L -10º
		R -10º-50º	R -10º	R -10º
REAR PILLAR	RP1	L -10º-50º	L -10º	L Exempt
		R -10º-50º	R -10º	R Exempt
	RP2	L 0º-50º	L -10º	L Exempt
		R 0º-50º	R -10º	R Exempt
SLIDING DOOR	SD	R 0º-50º	R -10º	R 14º
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	24º
UPPER ROOF 5		0º-50º	0º	50º
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: Louis Campbell DATE: September 19, 2007

APPROVED BY: Helen A. Kaleto

TABLE 2-5

TARGET MEASUREMENTS

VEH. MOD YR/MAKE/MODEL/BODY: 2007 Dodge Sprinter, MPV

VEH. NHTSA NO.: C70309 VIN: WD8PE746775129409 COLOR: Silver

VEH. BUILD DATE: October, 2006 TEST DATES: September 21-25, 2007

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Helen A. Kaleto, Louis Campbell

Measurement	Description	Left Side	Right Side
M	Seat Fore/Aft Travel (Front seats)	262 mm	262 mm
Tº	Horizontal < {CG-F1 (Left Seat) to (Right A-Pillar)}	111.0º	--
A1º	360º - Tº	249.0º	--
Wº	Horizontal < {CG-2 (Left Seat) to (Left A-Pillar)}	201.2º	--
A2º	A2º = Wº	201.2º	--
Uº	Horizontal < {CG-2 (Left Seat) to (Left B-Pillar)}	283.5º	--
B1º	B1º = Uº	283.5º	--
Vº	Horizontal < {CG-R (Left Seat) to (Left B-Pillar)}	210.7º	--
B2º	B2º = Vº	210.7º	--
Wº (right)	Horizontal < {CG-F2 (Right Seat) to (Right A-Pillar)}	--	158.2º
A1º (right)	A1º (right) = Wº (right)	--	158.2º
T º (right)	Horizontal < {CG-F1 (Right Seat) to (Left A-Pillar)}	--	249.1º
A2º (right)	360º-Tº (right)	--	110.9º
V º (right)	Horizontal < {CG-R (Right Seat) to (Right B-Pillar)}	--	149.0º
B1º (right)	B1º (right) = Vº (right)	--	149.0º
U º (right)	Horizontal < {CG-F2 (Right Seat) to (Right B-Pillar)}	--	74.7º
B2º (right)	B2º (right) = Uº (right)	--	74.7 º
J	A-Pillar {(Plane 3) - (Plane 5)}	565.2 mm	567.6 mm
J/2	J ÷ 2	282.6 mm	283.8 mm
D1	Upper Roof {(Plane A) - (Plane B)}	4243.4 mm	
D1/2	D1 ÷ 2	2121.7 mm	
D2	Upper Roof {(Plane C) - (Plane D)}	1660.0 mm	

Measurement	Description	Left Side	Right Side
D2/2	D2 ÷ 2	830.0 mm	
.35D1	.35 x D1	1485.2 mm	
.35D2	.35 x D2	581.0 mm	
N	B-Pillar {(BPR) - (lowest point on daylight opening forward of B-Pillar)}	806.2 mm	799.3 mm
N/2	B-Pillar {(BP3) - (lowest point on daylight opening forward of B-Pillar)}	403.1 mm	399.7 mm
N/4	B-Pillar {(BP4) - (lowest point on daylight opening forward of B-Pillar)}	201.6 mm	199.8 mm
Q	O-Pillar (Plane 13 – Plane 14)	750.2 mm	760.4 mm
Q/2	Q / 2	375.1 mm	380.2 mm
D	R-Pillar (Point 7 – Point M)	1600.0 mm	1600.0 mm
3D/7	3*D / 7	685.7 mm	685.7 mm
MM	MM/2 (Right Side Only)	0	699.1 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	2092.0	-490.1	586.0	2091.9	489.9	585.7
2nd Row	3012.2	-566.5	498.2	3012.1	369.6	497.9
3rd Row	4728.2	-535.1	502.2	4728.1	533.0	501.9

SgRP Locations (vehicle coordinates)						
	Left (mm)			Right (mm)		
	x	y	z	x	y	z
Front	980.0	-490.0	540.0	980.0	490.0	540.0
2nd Row	1900.0	-566.0	450.0	1900.0	370.0	450.0
3rd Row	3616.0	-534.0	450.0	3616.0	534.0	450.0

CG Locations (world coordinates)						
	Left (mm)			Right (mm)		
	x	y	z	x	y	z
CGF1	1990.0	-490.1	1246.0	1989.9	489.9	1245.7
CGF2	2252.0	-490.1	1246.0	2251.9	489.9	1245.7
CGR-2nd Row	3172.2	-566.5	1158.2	3172.1	369.6	1157.9
3rd Row	4888.2	-535.1	1162.2	4888.1	533.0	1161.9

REFERENCE FOR VEHICLE COORDINATE SYSTEM (measured in millimeters):

Driver side upper door striker bolt hole (x, y, z) = 1175.5, -911, 574.9

Passenger side upper door striker bolt hole (x, y, z) = 1175.5, 911, 574.9

Passenger side rear outboard seat box top of stud (x, y, z) = 1185, 679, -7.8

REMARKS:

RECORDED BY: Louis Campbell DATE: September 19, 2007

APPROVED BY: Helen A. Kaleto

TABLE 2-6

SUMMARY OF TARGETING RESULTS

VEH. MOD YR/MAKE/MODEL/BODY: 2007 Dodge Sprinter, MPV

VEH. NHTSA NO.: C70309 VIN: WD8PE746775129409 COLOR: Silver

VEH. BUILD DATE: October, 2006 TEST DATES: September 21-25, 2007

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Helen A. Kaleto, Louis Campbell

SUMMARY OF TARGETING RESULTS								
Target	**Location (mm)**			**Horizontal Angle (deg)**	**Vertical Angle (deg)**	**Relocation (Yes/No)**	**Extension (# of 25 mm Spheres)**	**Impact (Yes/No)**
	x	**y**	**z**					
A-Pillar Left Side								
AP1	629.3	-750.6	1448.9	--	--	Yes	--	--
REL	636.8	-756.7	1425.5	249	3	--	1	No
AP2	559.0	-769.0	1361.8	201	32	No	--	Yes
AP3	365.2	-789.6	1167.7	201	50	No	--	No
A-Pillar Right Side								
AP1	629.4	748.2	1449.5	--	--	Yes	--	--
REL	635.6	752.1	1425.8	111	30	--	1	Yes
AP2	559.5	766.1	1362.6	158	31	No	--	No
AP3	364.2	786.6	1166.9	154	29	No	--	Yes
B-Pillar Left Side								
BP1	1316.5	-655.0	1564.6	--	--	Yes	--	--
REL	1351.1	-671.7	1530.4	270	38	--	2	No
BP2	1272.8	-757.5	1224.8	270	0	No	--	Yes
BP3	1208.4	-784.9	1162.4	284	-10	No	--	No
BP4	1488.9	-933.6	959.8	--	--	Yes	--	-
REL	1409.8	-860.8	1150.3	260	-10	--	9	No
B-Pillar Right Side								
BP1	1267.9	652.0	1559.1	--	--	Yes	--	--
REL	1235.4	670.3	1525.3	90	11	--	2	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					
BP2	1269.9	756.7	1225.4	90	0	No	--	No
BP3	1210.1	781.8	1160.5	270	-10	No	--	No
BP4	1379.6	787.5	961.7	149	-7	No	--	No
Other Pillar Left Side								
OPR	2835.4	-729.1	1582.9			No	--	No
OP1	2835.4	-729.1	1582.9	270	22	No	--	No
OP2	2838.4	-849.8	1208.4	--	--	Yes	--	--
REL	2785.1	-851.3	1206.7	270	-10	--	3	Yes
Other Pillar Right Side								
OPR	2858.7	713.9	1594.5			No	--	No
OP1	2858.7	713.9	1594.5	90	13	No	--	No
OP2	2861.9	851.4	1219.8	--	--	Yes	--	--
REL	2898.8	851.2	1222.0	90	-10	--	2	No
Rear Pillar Left Side								
RP1	4314.3	-706.6	1610.8	Target exempt from testing per S6.3(b).				No
RP2	4264.9	-851.1	1461.7	Target exempt from testing per S6.3(b).				No
Rear Pillar Right Side								
RP1	4315.8	700.5	1615.4	Target exempt from testing per S6.3(b).				No
RP2	4260.9	846.3	1466.2	Target exempt from testing per S6.3(b).				No
Front Header Left Side								
FH1	534.5	-633.9	1441.2	180	50	No	--	No
FH2	501.5	-489.1	1439.7	180	50	No	--	Yes
Front Header Right Side								
FH1	531.5	631.9	1440.2	180	50	No	--	No
FH2	503.5	491.1	1436.7	180	50	No	--	No
Side Rail Left Side								
SR1	779.7	-725.6	1551.2	--	--	Yes	--	--
REL	845.1	-678.3	1496.6	270	5	--	4	Yes

SUMMARY OF TARGETING RESULTS								
Target	**Location (mm)**			**Horizontal Angle (deg)**	**Vertical Angle (deg)**	**Relocation (Yes/No)**	**Extension (# of 25 mm Spheres)**	**Impact (Yes/No)**
	x	**y**	**z**					
SR2A	930.0	-711.2	1532.5	--	--	Yes	--	--
REL	897.4	-684.2	1504.7	270	11	--	2	No
SR2B	1016.8	-724.6	1576.6	--	--	Yes	--	--
REL	1021.8	-742.0	1530.8	270	0	--	2	Yes
SR3-1	1466.2	-726.4	1518.6	270	45	No	--	No
SR3-2	2984.7	-746.9	1563.2	270	25	No	--	Yes
Side Rail Right Side								
SR1	779.0	724.1	1547.1	--	--	Yes	--	--
REL	849.0	674.2	1493.7	90	5	--	4	No
SR2A	929.4	709.2	1532.1	--	--	Yes	--	--
REL	904.2	683.0	1504.3	90	10	--	2	No
SR2B	968.4	725.7	1564.1	--	--	Yes	--	--
REL	1014.0	742.3	1506.1	90	15	--	3	No
SR3-1	1418.2	688.9	1512.5	90	22	No	--	No
SR3-2	3007.9	743.4	1567.8	90	17	No	--	No
Rear Header Left Side								
RH	4438.4	-535.6	1631.6	Target exempt from testing per S6.3(b).				No
Rear Header Right Side								
RH	4433.7	532.4	1635.0	Target exempt from testing per S6.3(b).				No
Sliding Door Right Side								
SD	2058.5	705.6	1574.8	270	14	No	--	No
Upper Roof Left Side								
UR1@BP1	1301.0	-416.1	1611.6	270	50	No	--	Yes
UR2@Rear of SR3-1	1826.1	-570.1	1611.7	270	50	No	--	Yes
UR3@OP1	2845.3	-557.6	1618.8	270	50	No	--	No
Upper Roof Right Side								
UR4@Rear of BPR	1293.9	559.4	1602.1	90	24	No	--	No
UR5@Rear of OPR	2871.8	556.6	1624.1	90	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**					
UR6@Rear Side Rail	3445.9	548.8	1629.9	90	50	No	--	No

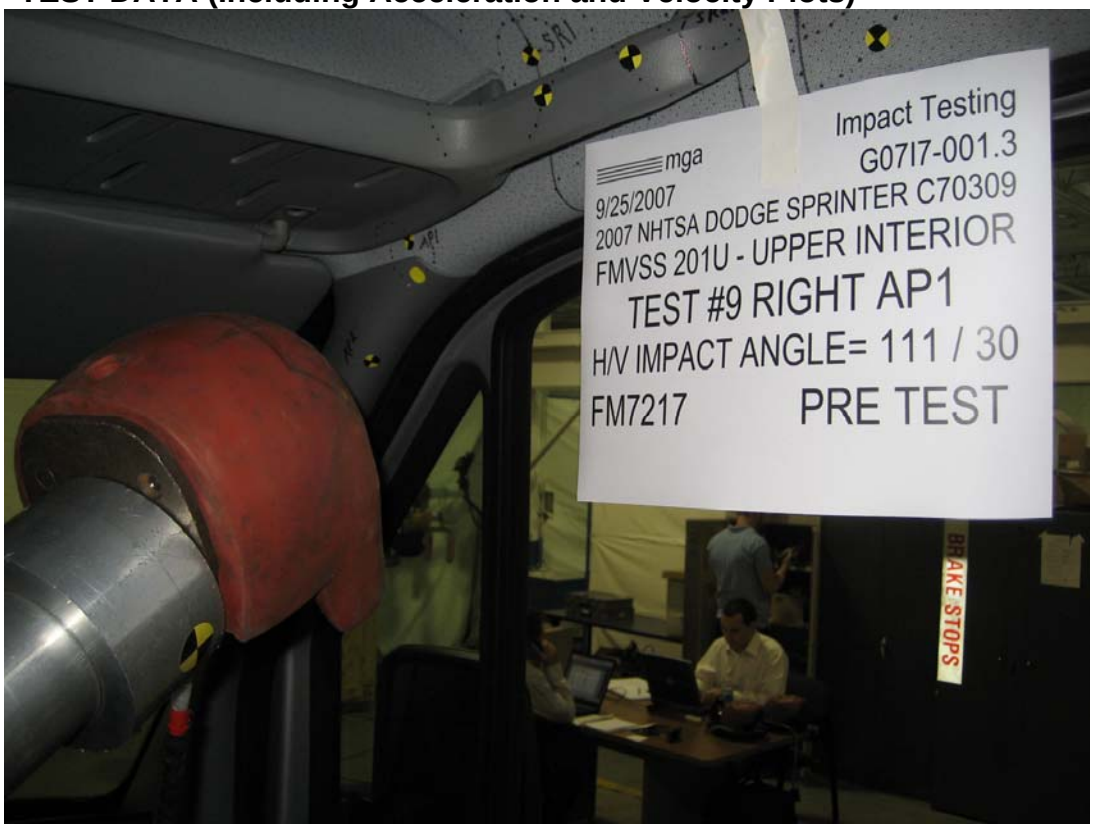
As determined using the Procedures specified in S10.1-10.13.

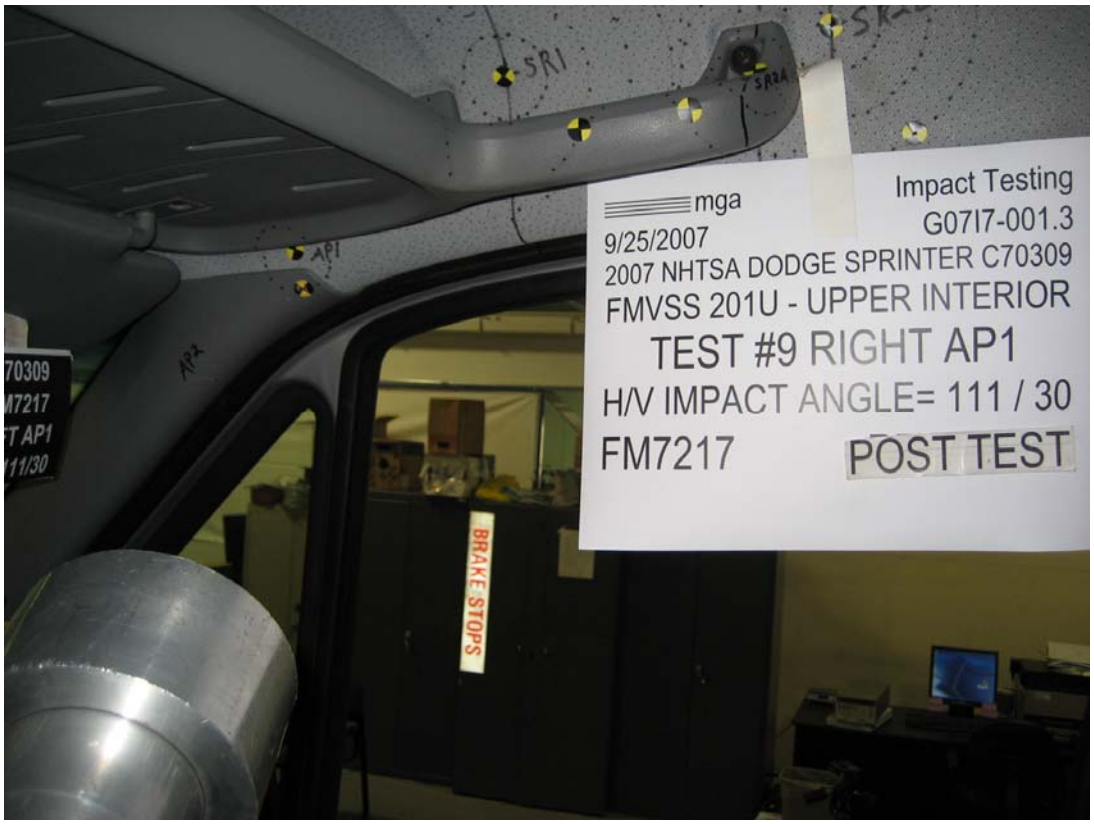
REMARKS:

RECORDED BY: Louis Campbell DATE: September 19, 2007

APPROVED BY: Helen A. Kaleto

3.0 TEST DATA (Including Acceleration and Velocity Plots)




SR1
SR2A
AP1
AP2
BRAKE STOPS
mga
Impact Testing
9/25/2007
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #9 RIGHT AP1
H/V IMPACT ANGLE= 111 / 30
FM7217
POST TEST


mga
Impact Testing
9/25/2007
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #9 RIGHT AP1
H/V IMPACT ANGLE= 111 / 30
FM7217
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G07I7-001.3 VEHICLE YR/MAKE/MODEL:2007/NHTSA/Dodge Sprinter C70309

GENERAL TEST PARAMETERS:

Test Number:#9

Target (Vehicle Side): AP1 Right

Temperature:21C

MGA Test Reference No.:FM7217

Humidity:55%

Approach Horizontal Angles:111º

Time of Test:10:25:32 AM

Approach Vertical Angles:30º

FMH Serial No:[038]

Additional Description: 1 Relocation

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
782	815	6.4	24.0	15	16 Left

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J14103	-94.598	1.33	1.32
Y	6	J36197	110.692	1.80	1.89
Z	7	J36353	99.391	1.84	1.83

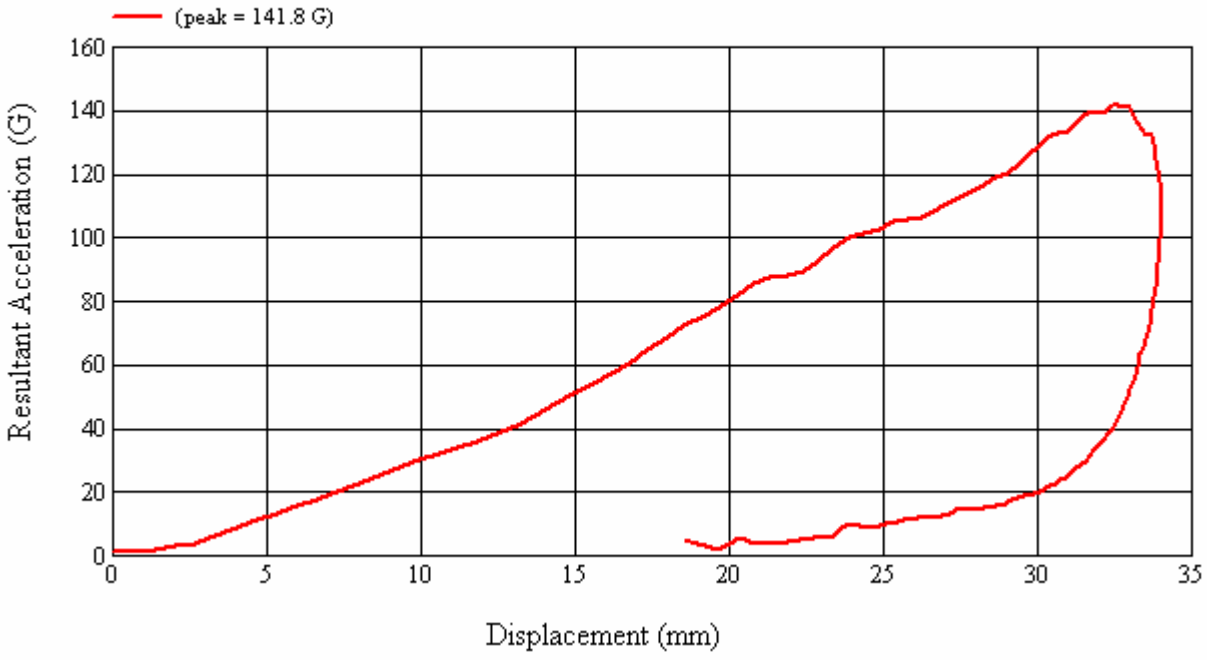
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

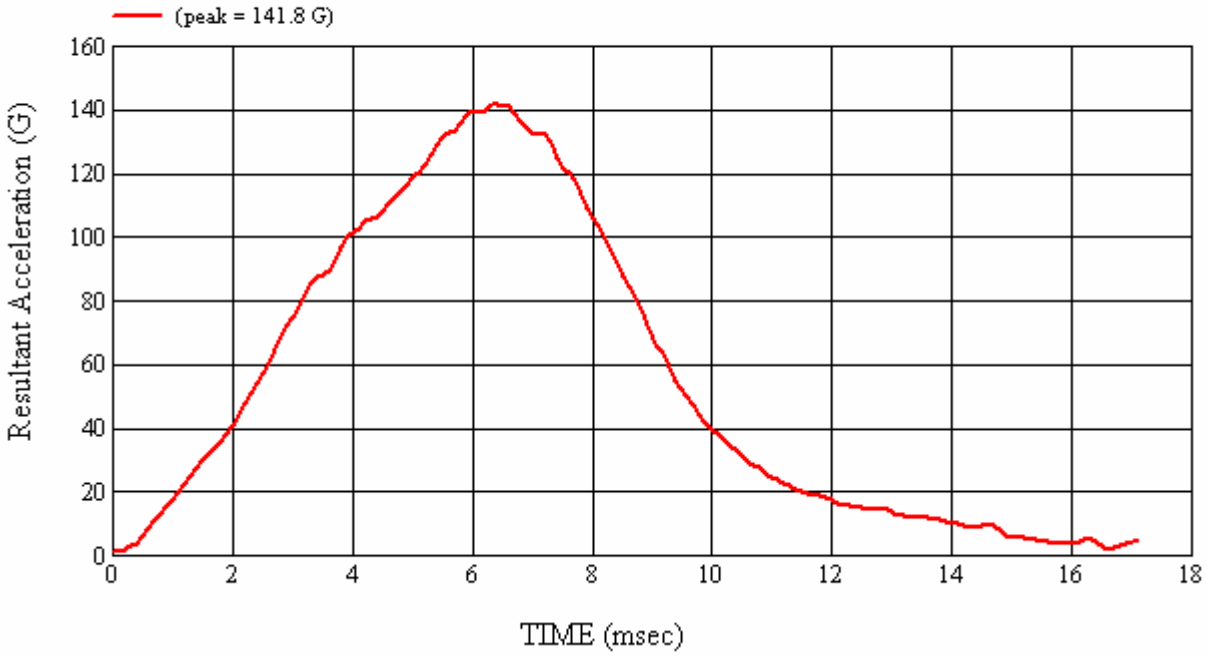
No visible damage.

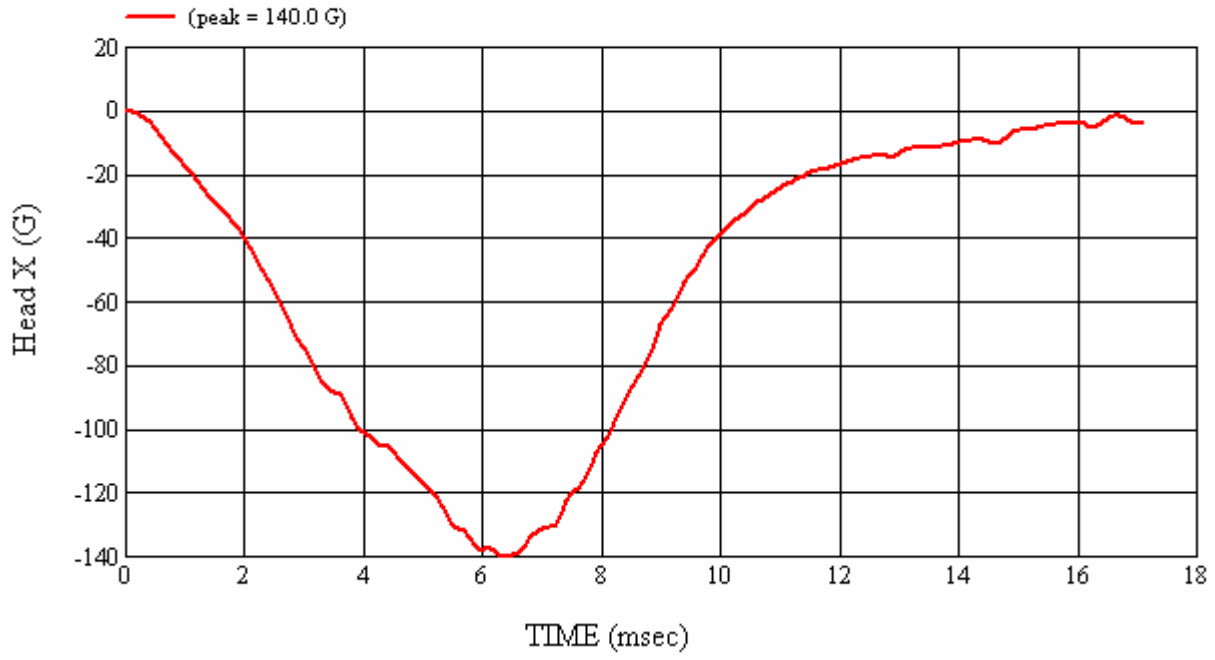
Recorded By: Travis Campbell Approved By*: Helen A. Kalafut Date: 9/25/2007

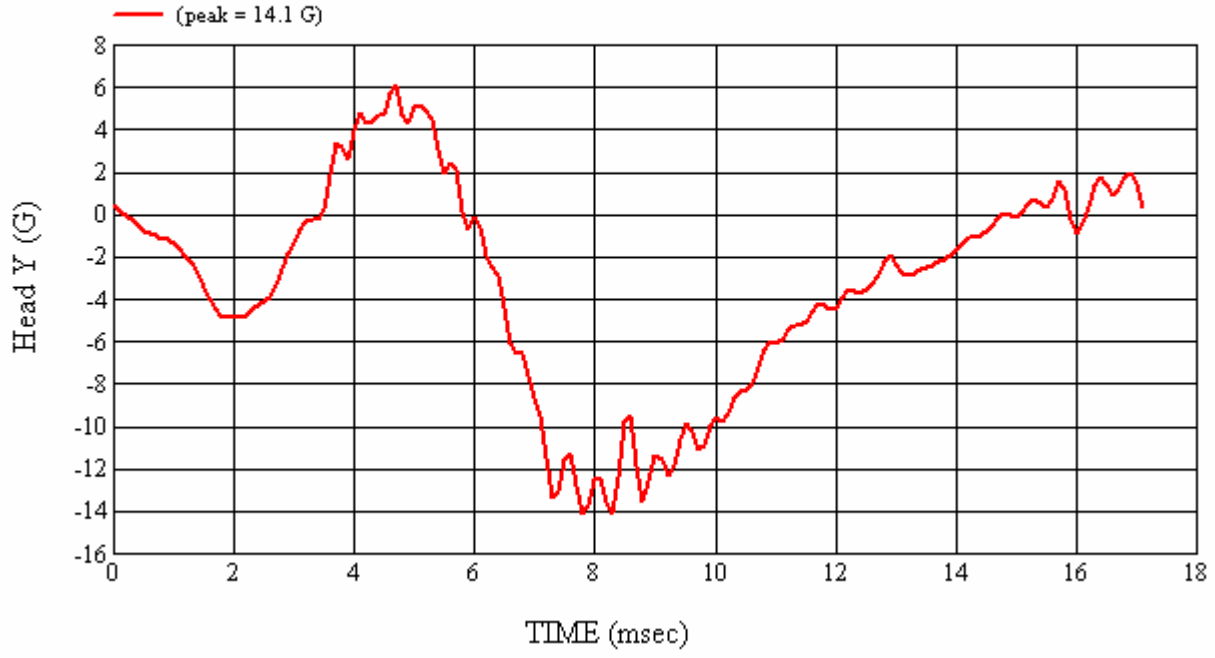
*Only necessary for NHTSA (Government) Compliance testing.

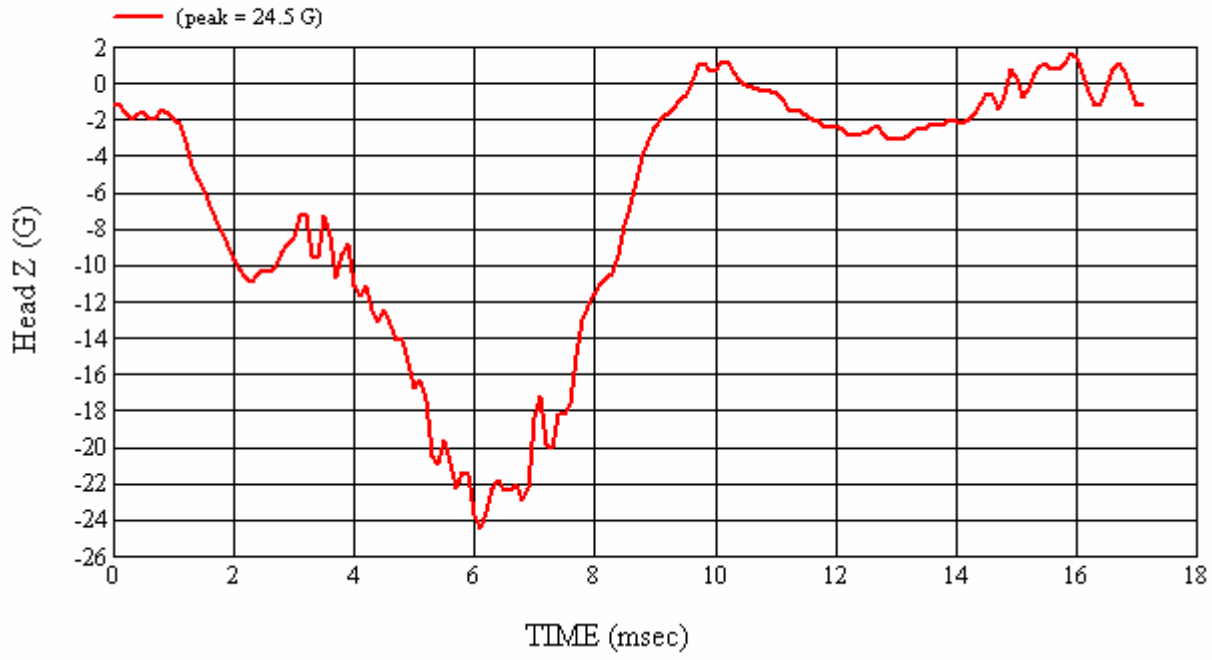
MGA Test #: FM7217 Target Location: AP1, Right Side Test Date: 9/25/2007

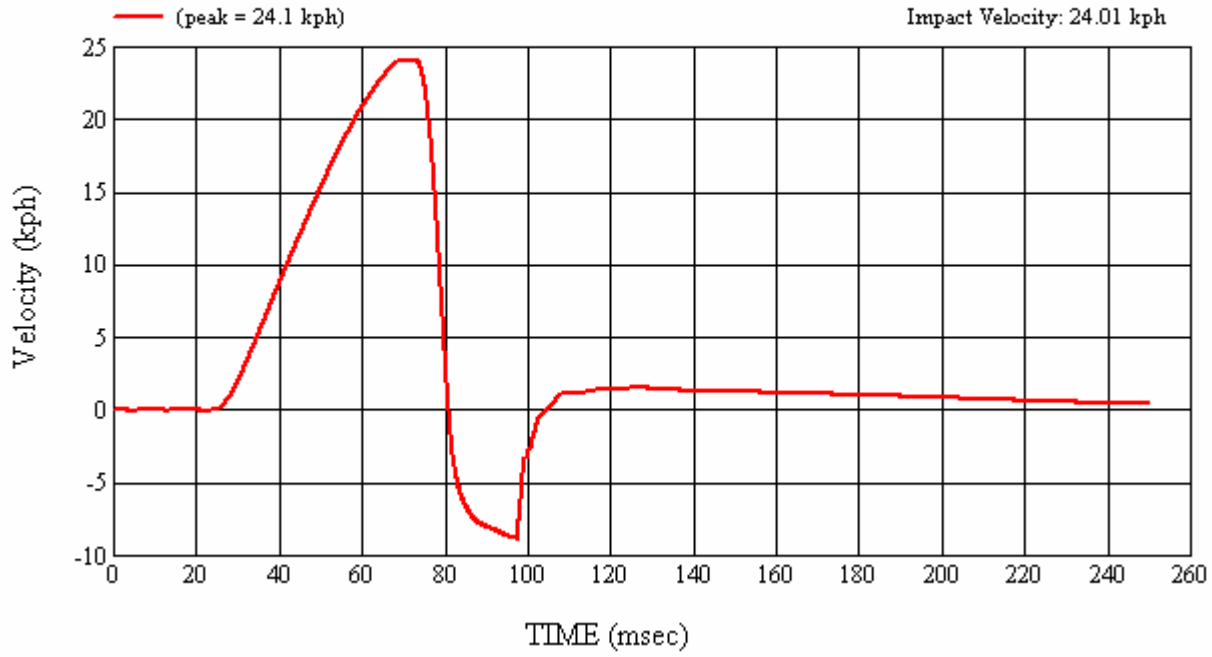


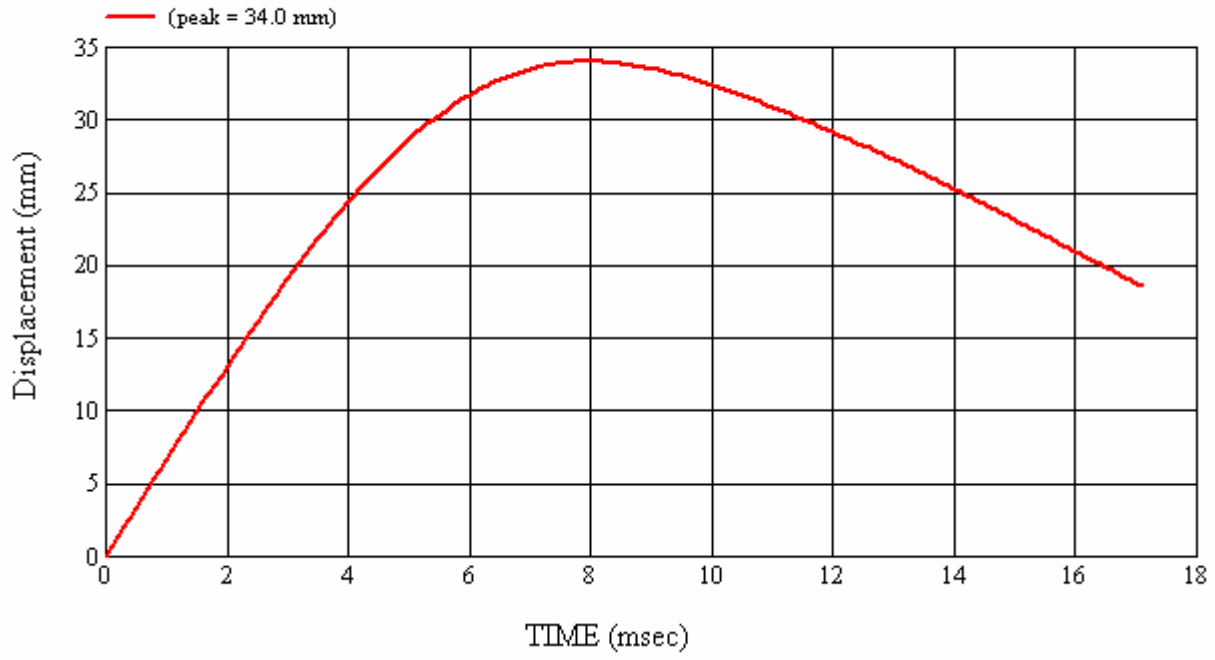



(peak = 140.0 G)
Head X (G)
20
0
-20
-40
-60
-80
-100
-120
-140
0
2
4
6
8
10
12
14
16
18
TIME (msec)


(peak = 14.1 G)
Head Y (G)
8
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
0
2
4
6
8
10
12
14
16
18
TIME (msec)


(peak = 24.5 G)
Head Z (G)
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
0
2
4
6
8
10
12
14
16
18
TIME (msec)


(peak = 24.1 kph)
Impact Velocity: 24.01 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 = 34.0 mm)
Displacement (mm)
35
30
25
20
15
10
5
0
0
2
4
6
8
10
12
14
16
18
TIME (msec)


mga
9/21/2007
Impact Testing
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #1 LEFT AP2
H/V IMPACT ANGLE= 201 / 32
FM7209
PRE TEST


mga
9/21/2007
Impact Testing
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #1 LEFT AP2
H/V IMPACT ANGLE= 201 / 32
FM7209
POST-TEST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9/21/2007
Impact Testing
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #1 LEFT AP2
H/V IMPACT ANGLE= 201 / 32
FM7209
POST-TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G07I7-001.3 VEHICLE YR/MAKE/MODEL:2007/NHTSA/Dodge Sprinter C70309

GENERAL TEST PARAMETERS:

Test Number:#1

Target (Vehicle Side): AP2 Left

Temperature:21C

MGA Test Reference No.:FM7209

Humidity:57%

Approach Horizontal Angles:201º

Time of Test:2:34:19 PM

Approach Vertical Angles:32º

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
440	362	12.2	23.2	5	4 Left

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J22664	-94.161	1.32	1.32
Y	6	J35919	97.442	1.89	1.89
Z	7	J35924	93.891	1.84	1.83

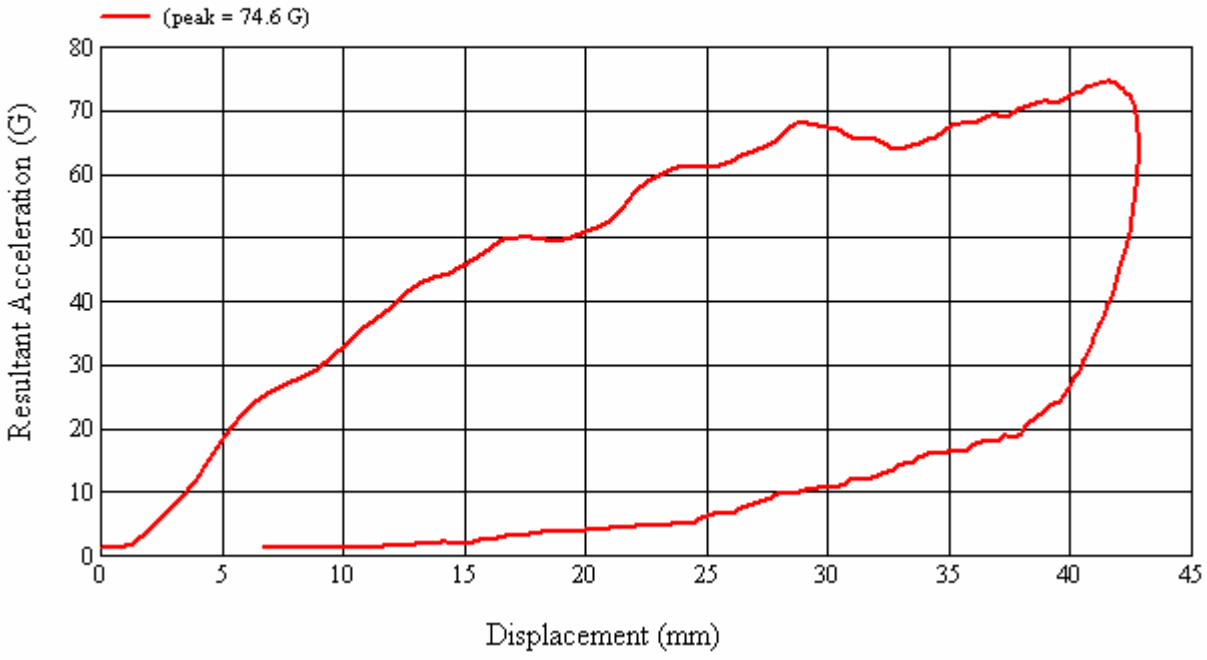
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

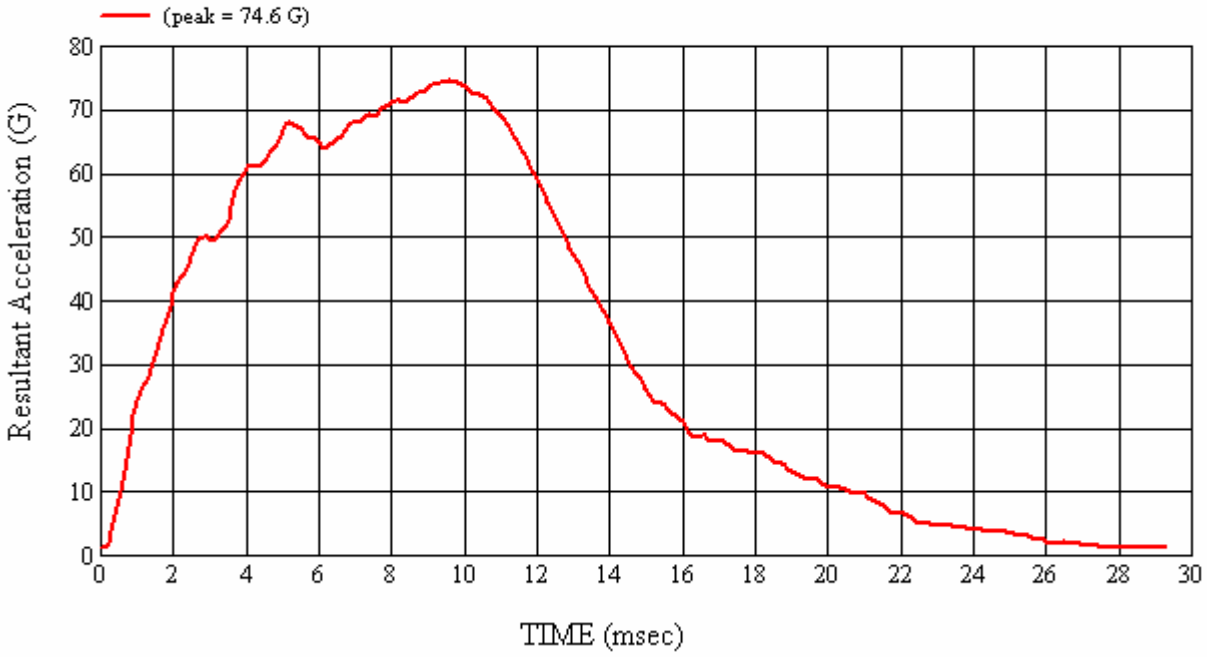
A pillar trim displaced.

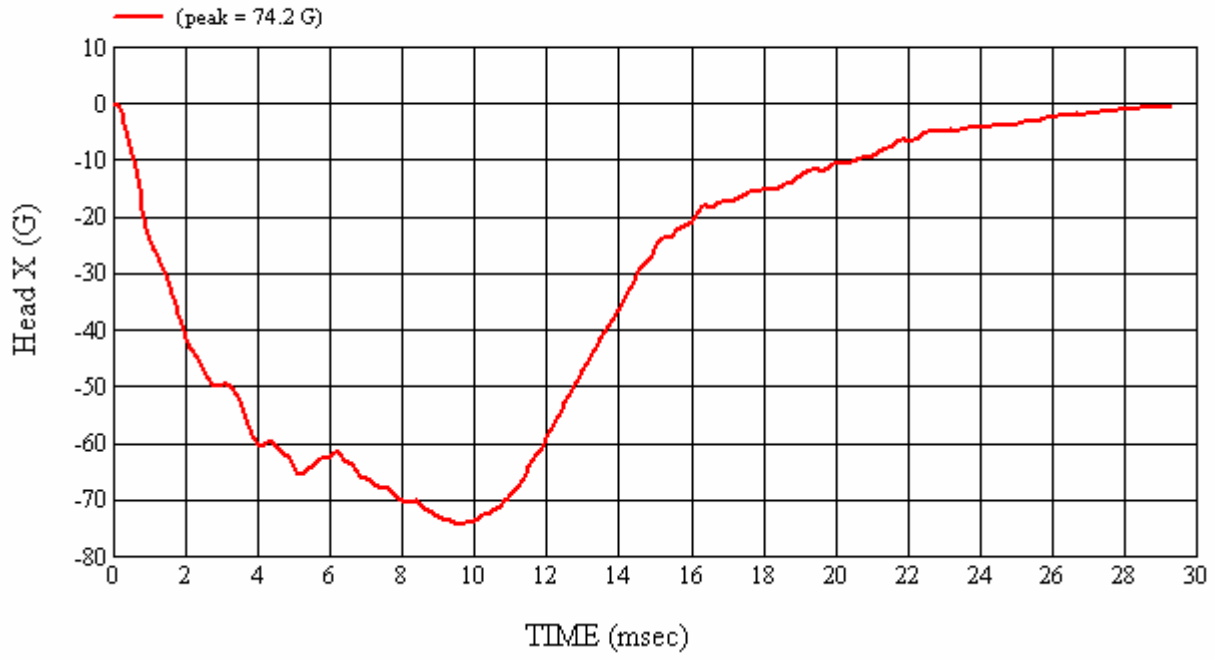
Recorded By: _____ Approved By*: _____ Date: 9/21/2007

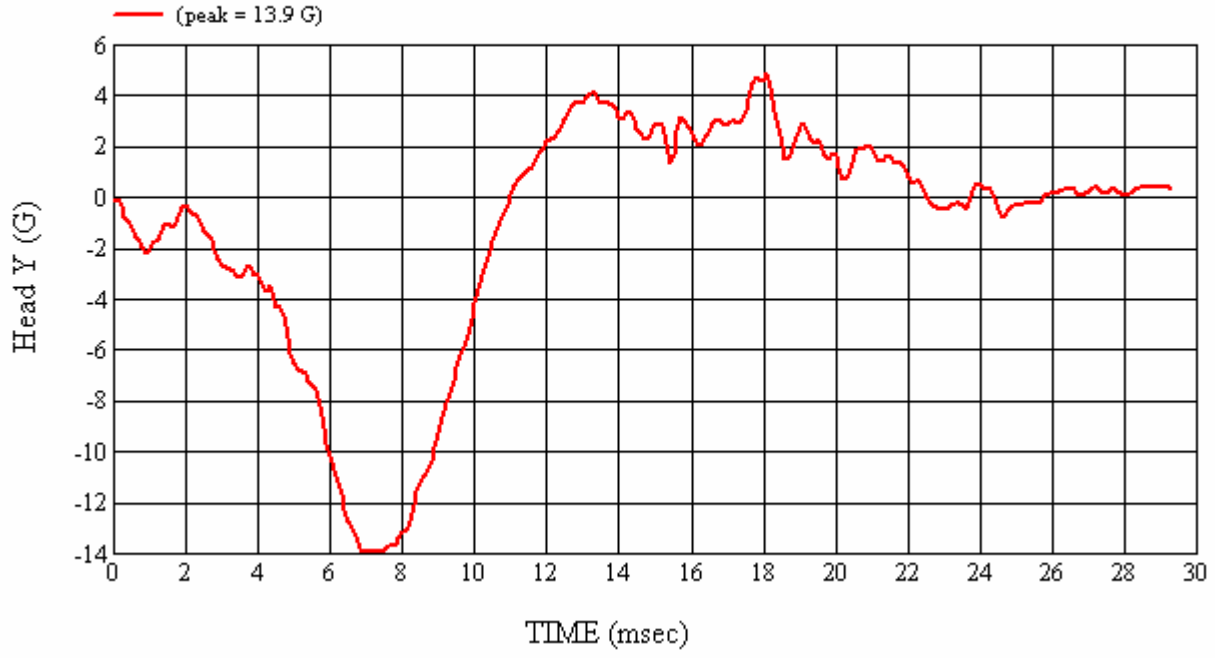
*Only necessary for NHTSA (Government) Compliance testing.

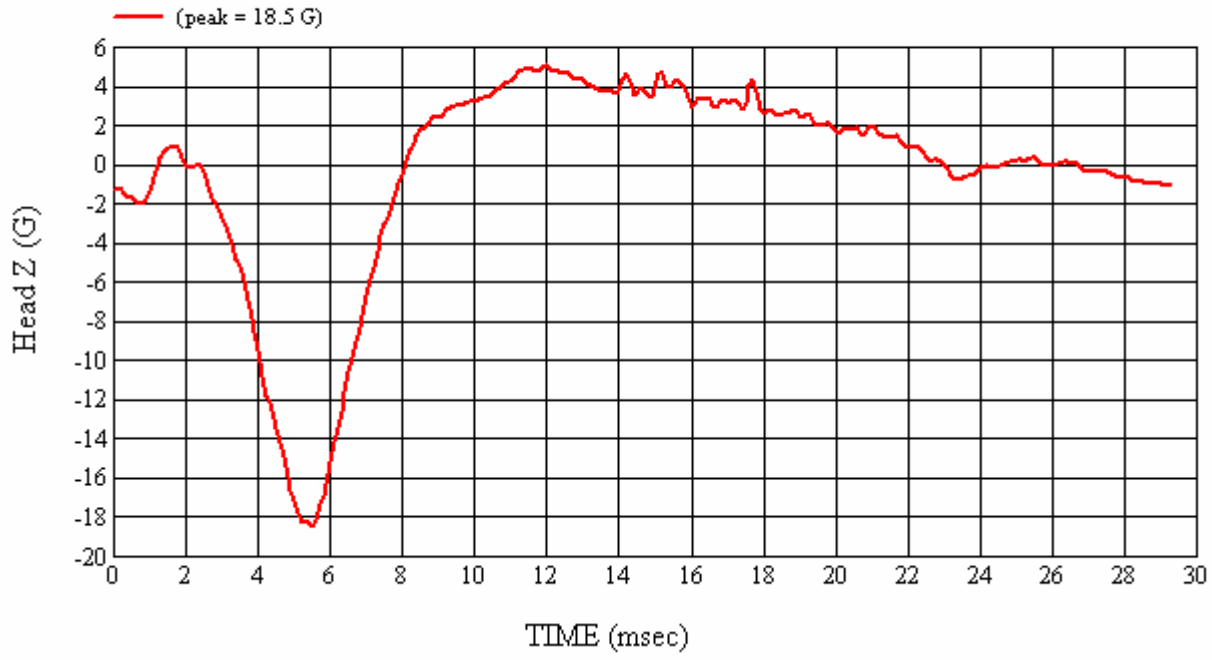
MGA Test #: FM7209 Target Location: AP2, Left Side Test Date: 9/21/2007

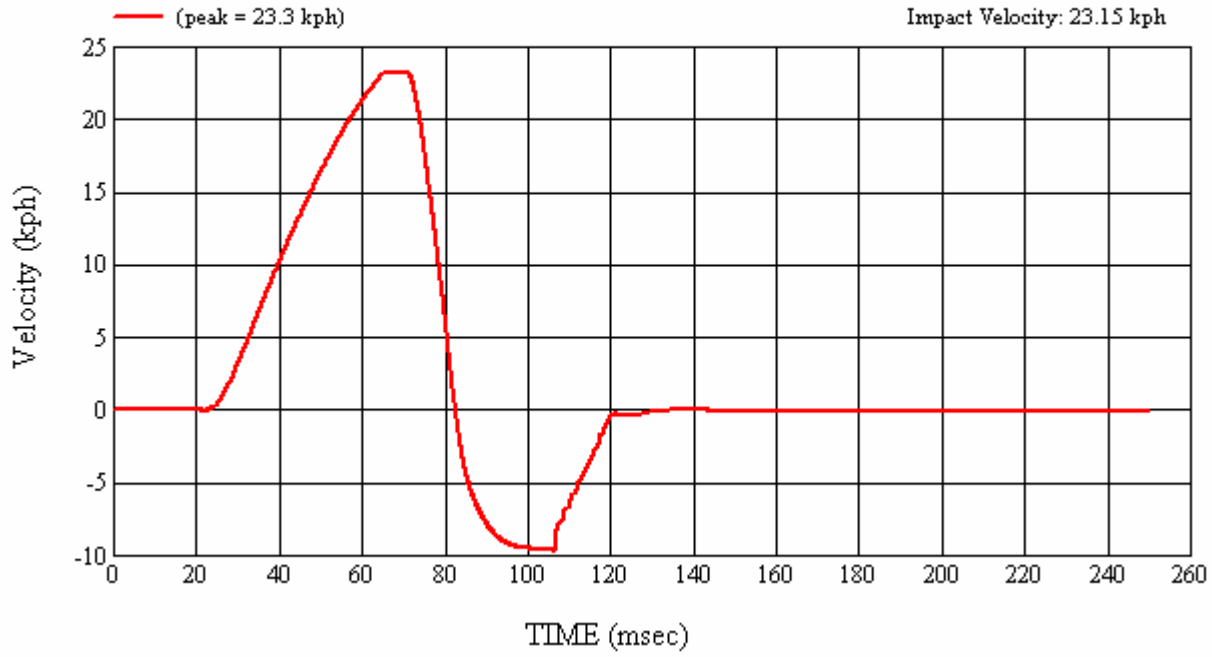


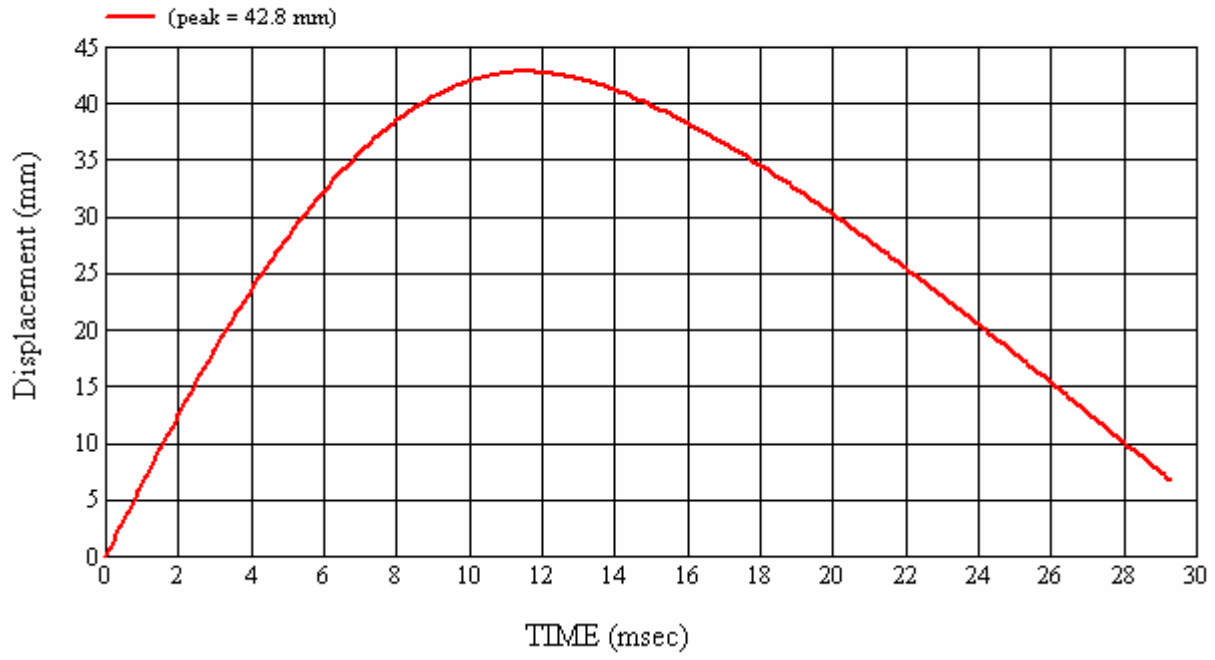



(peak = 74.2 G)
Head X (G)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
TIME (msec)


(peak = 13.9 G)
Head Y (G)
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
TIME (msec)

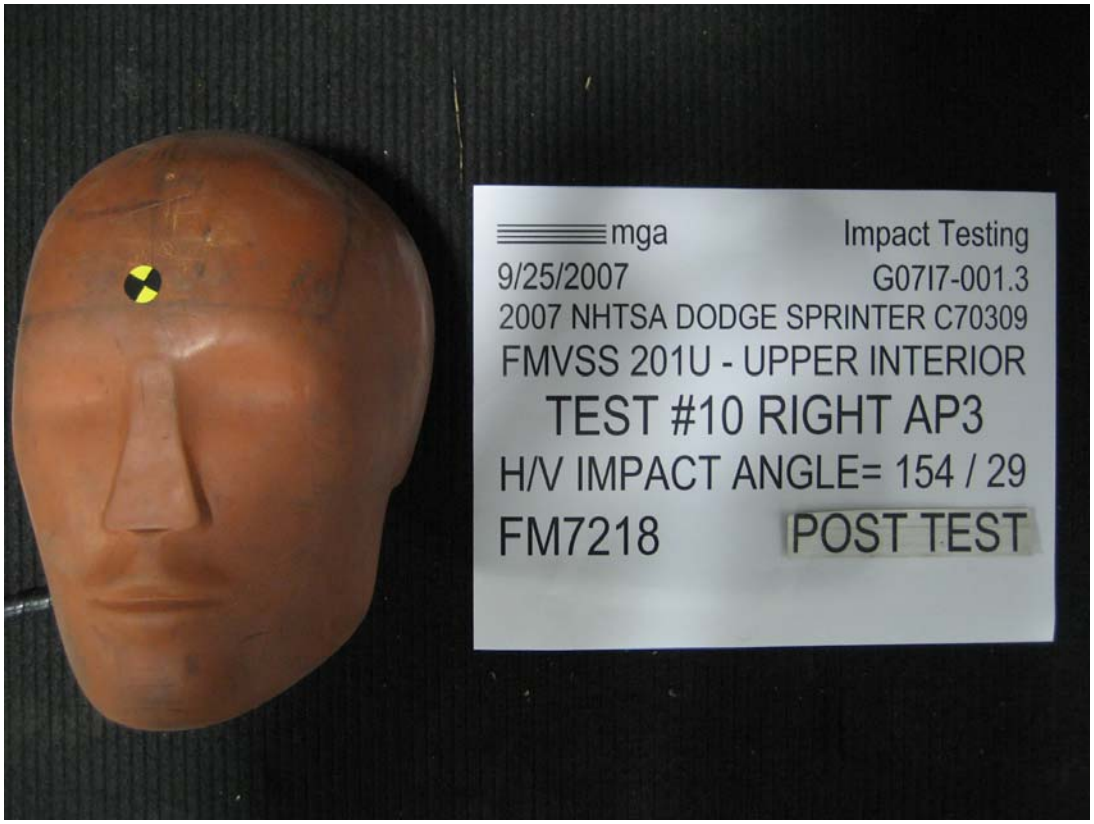

(peak = 18.5 G)
Head Z (G)
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
TIME (msec)


(peak = 23.3 kph)
Impact Velocity: 23.15 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 = 42.8 mm)
Displacement (mm)
0
5
10
15
20
25
30
35
40
45
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
TIME (msec)


mga
Impact Testing
9/25/2007
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #10 RIGHT AP3
H/V IMPACT ANGLE= 154 / 29
FM7218
PRE TEST


mga
Impact Testing
9/25/2007
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #10 RIGHT AP3
H/V IMPACT ANGLE= 154 / 29
FM7218
POST TEST
C70309
FM7218
RIGHT AP3
H/V 154/29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Impact Testing
9/25/2007
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #10 RIGHT AP3
H/V IMPACT ANGLE= 154 / 29
FM7218
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G07I7-001.3 VEHICLE YR/MAKE/MODEL:2007/NHTSA/Dodge Sprinter C70309

GENERAL TEST PARAMETERS:

Test Number:#10

Target (Vehicle Side): AP3 Right

Temperature:21C

MGA Test Reference No.:FM7218

Humidity:56%

Approach Horizontal Angles:154º

Time of Test:11:21:49 AM

Approach Vertical Angles:29º

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
518	466	11.3	23.9	5	1 Right

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J22664	-94.161	1.32	1.32
Y	6	J35919	97.442	1.89	1.89
Z	7	J35924	93.891	1.83	1.83

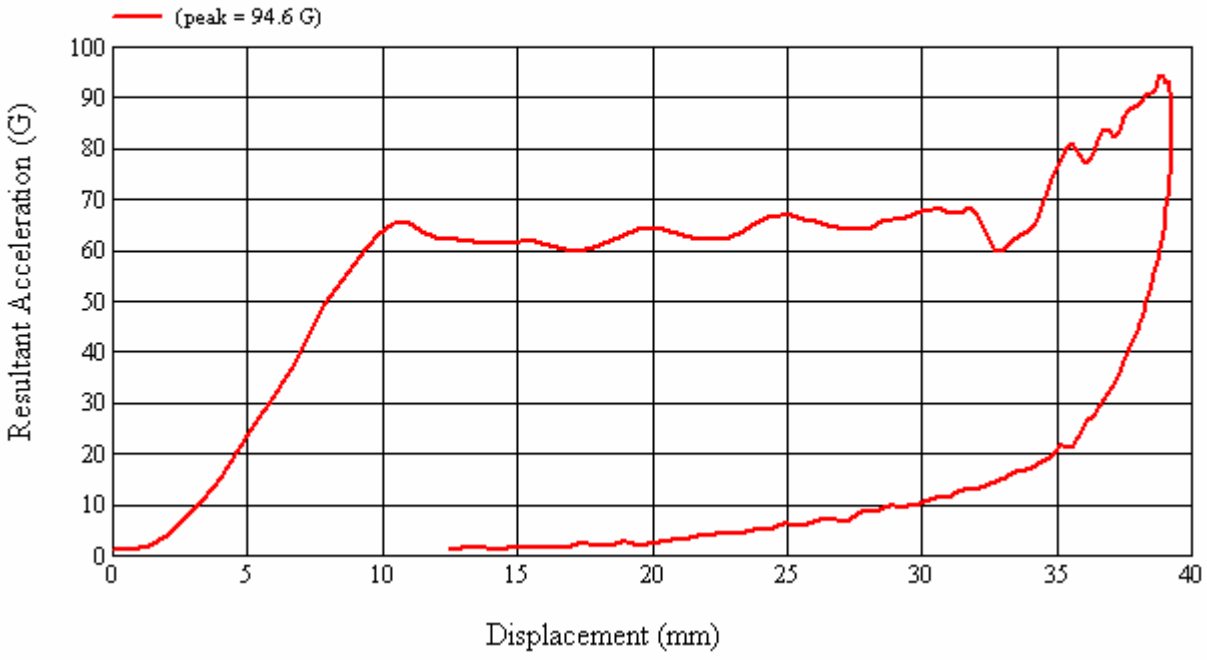
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

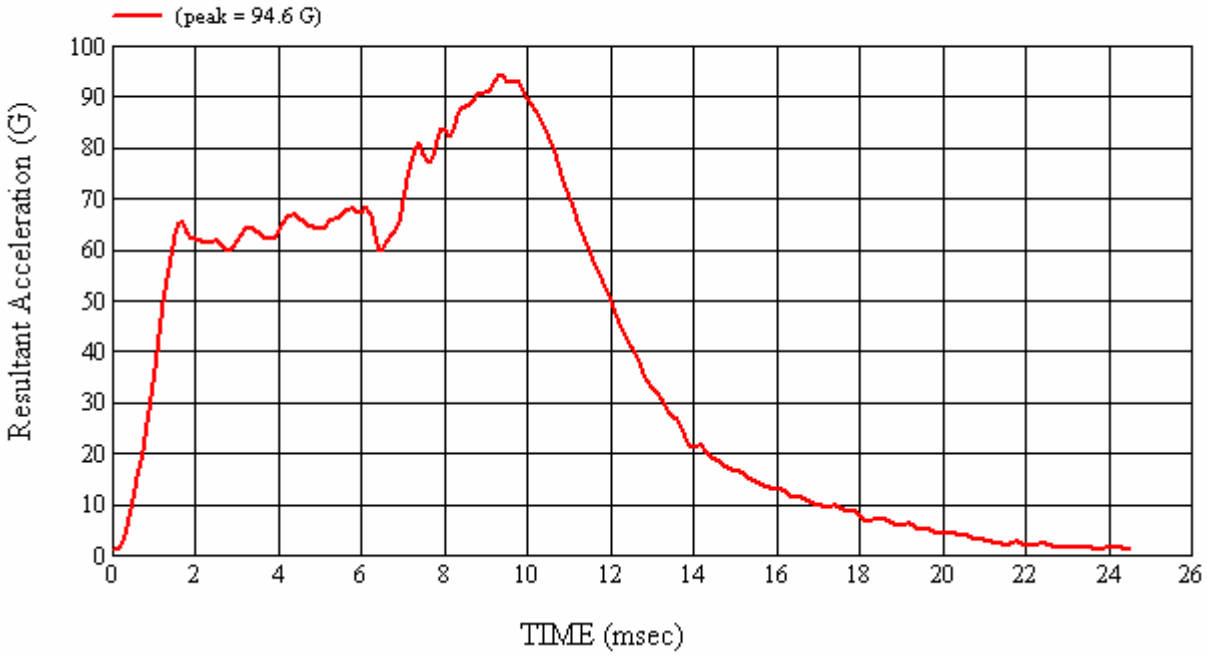
A-pillar displacement.

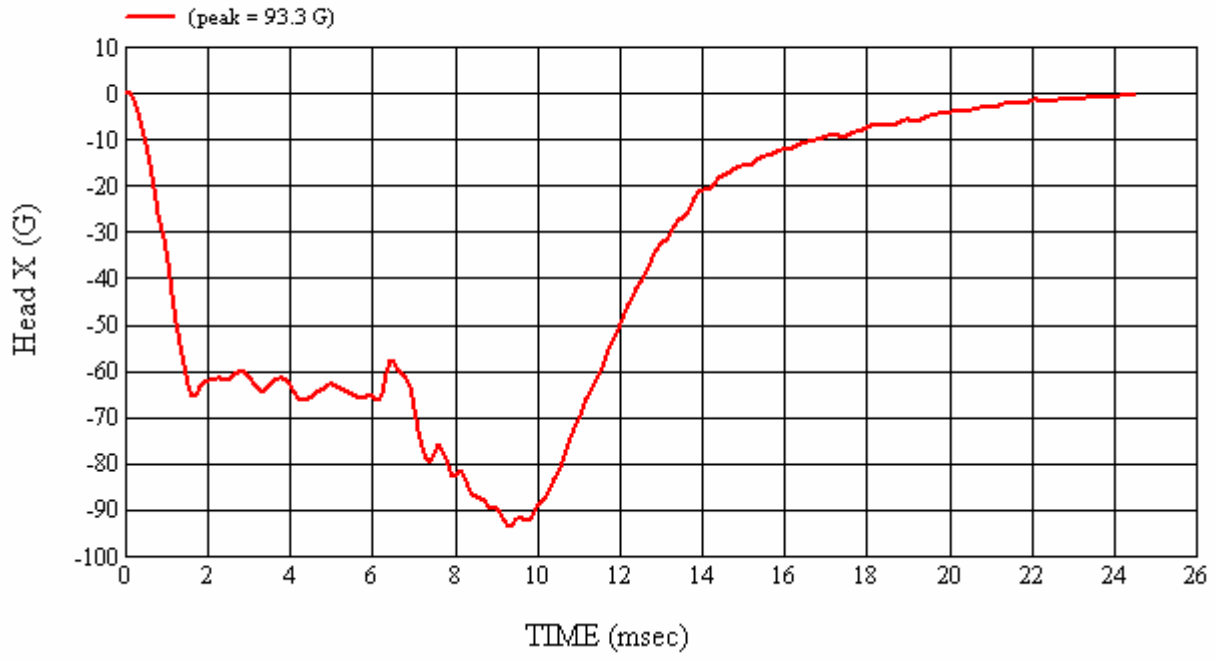
Recorded By: Travis Campbell Approved By*: Helen A. Kaleto Date: 9/25/2007

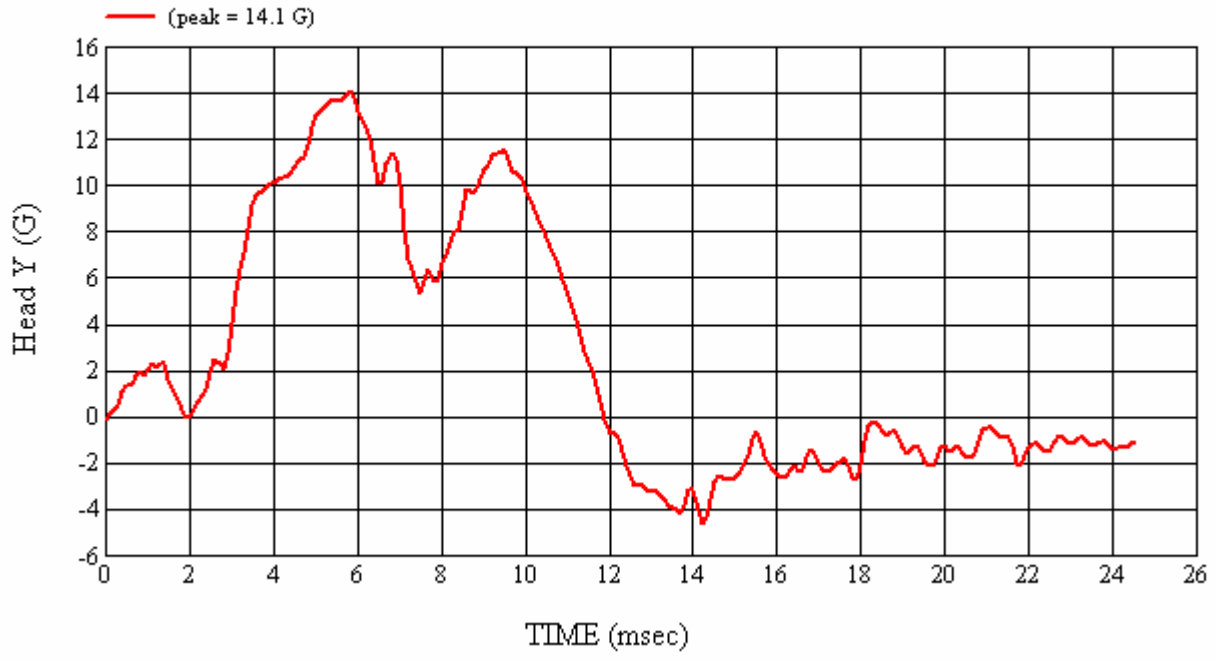
*Only necessary for NHTSA (Government) Compliance testing.

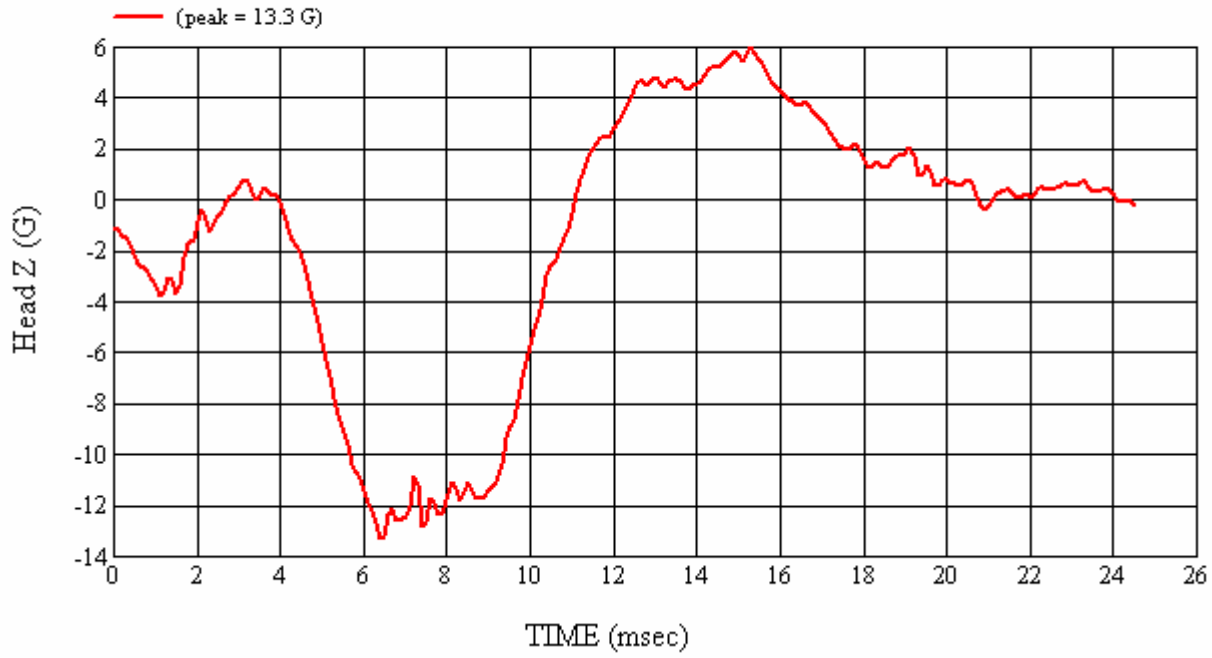
MGA Test #: FM7218 Target Location: AP3, Right Side Test Date: 9/25/2007

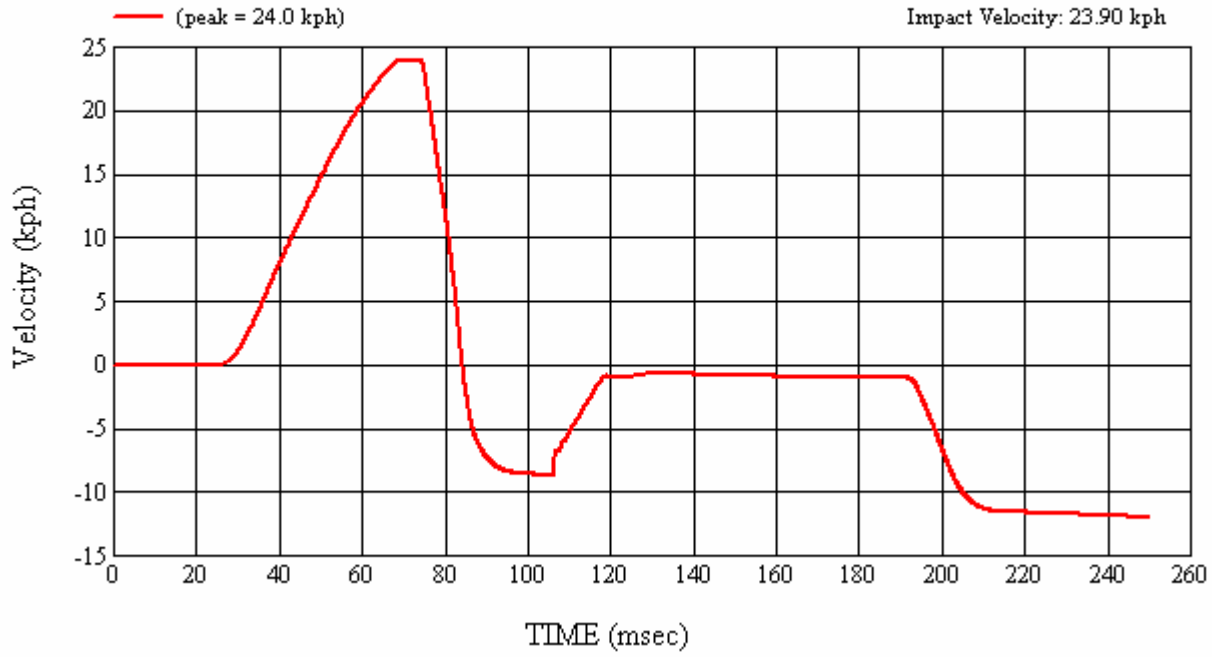


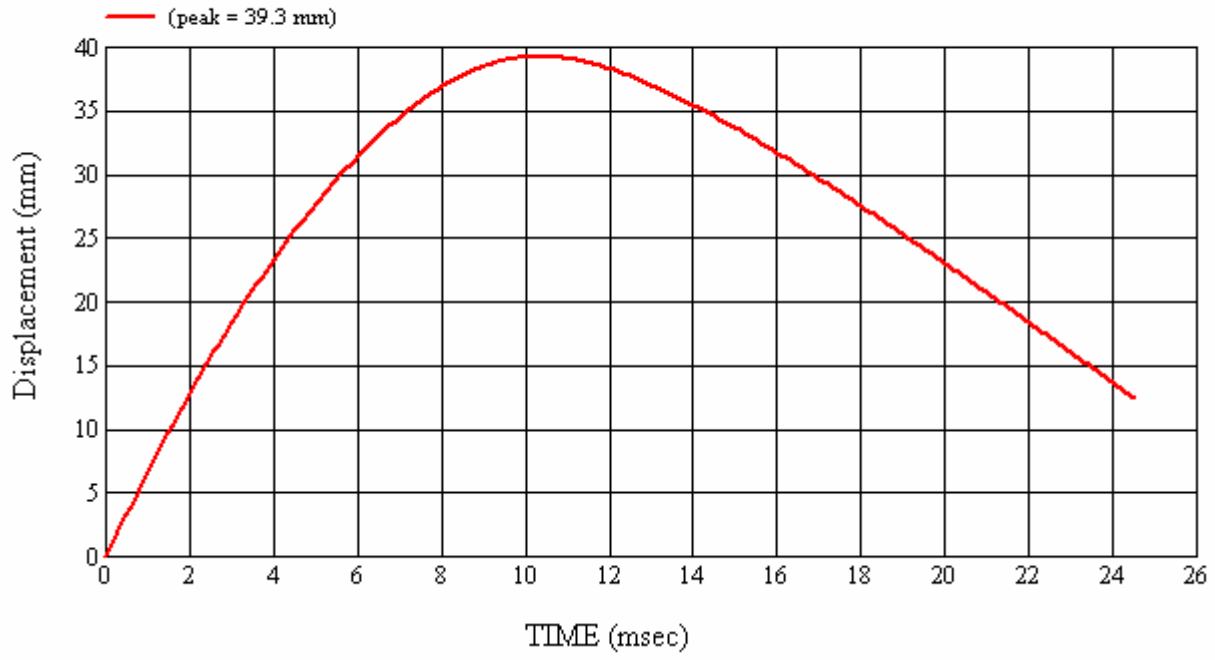


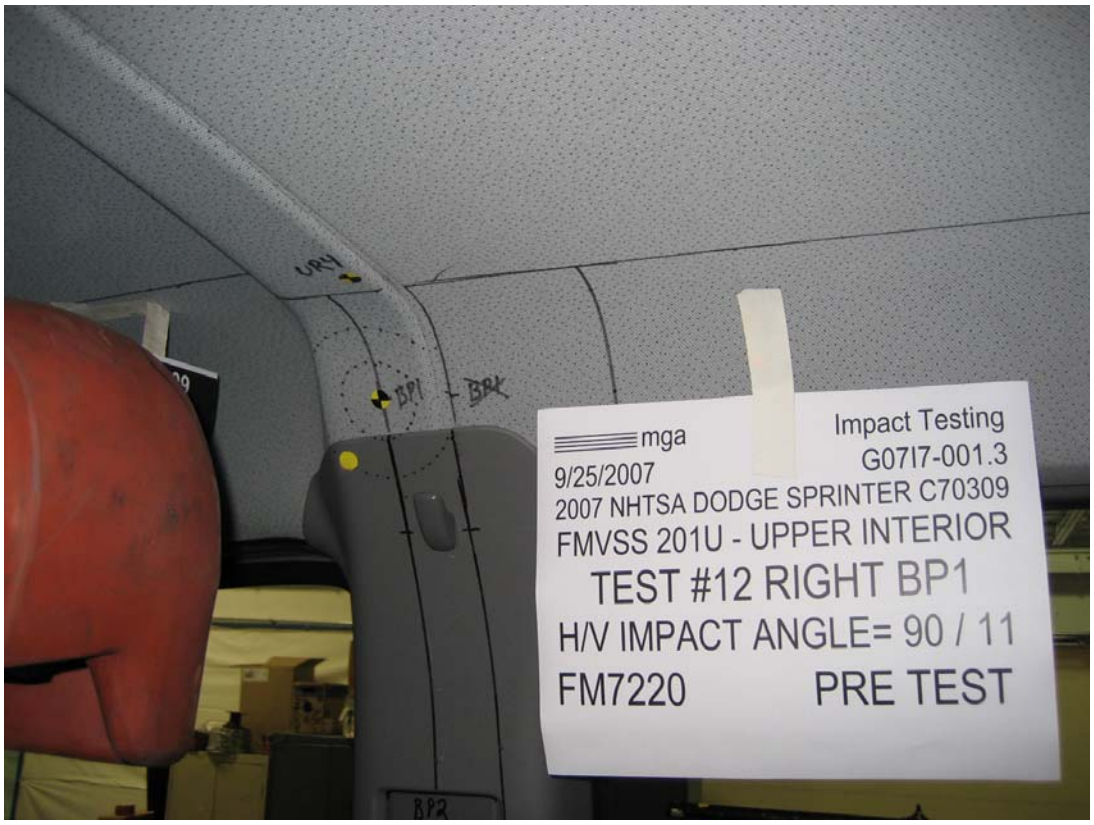

(peak = 93.3 G)
Head X (G)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
0
2
4
6
8
10
12
14
16
18
20
22
24
26
TIME (msec)

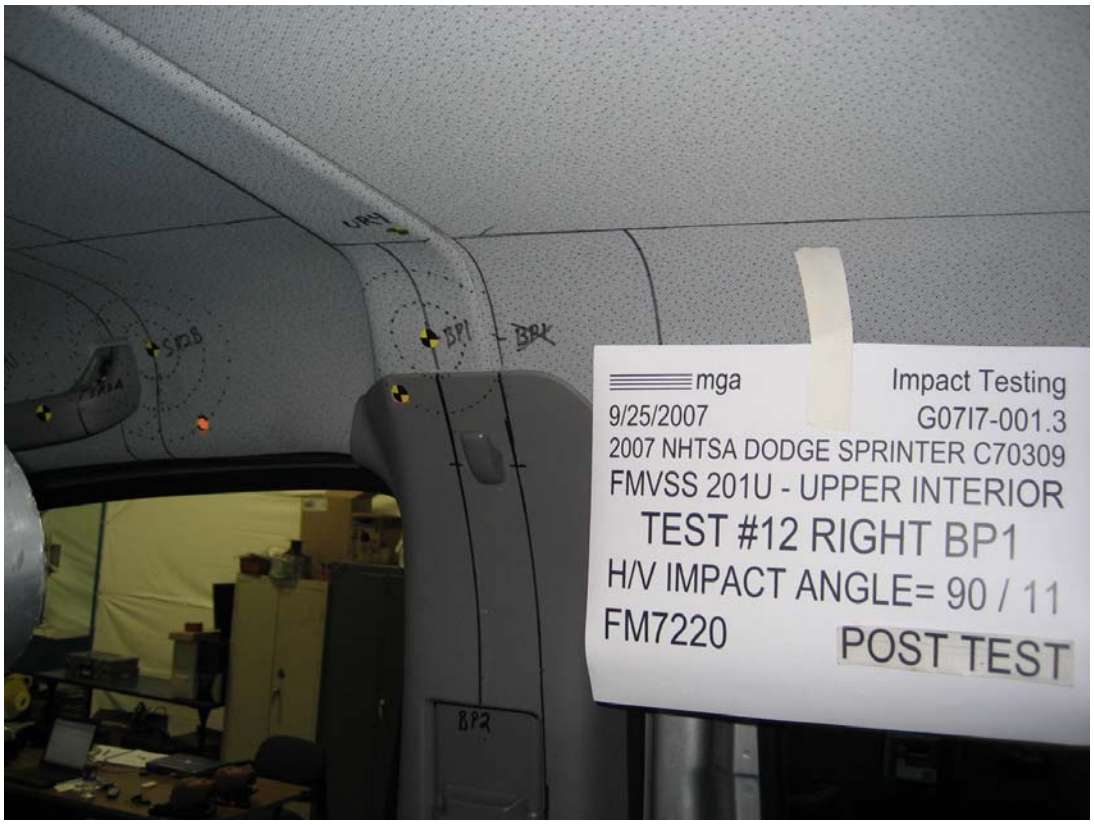

(peak = 14.1 G)
Head Y (G)
16
14
12
10
8
6
4
2
0
-2
-4
-6
0
2
4
6
8
10
12
14
16
18
20
22
24
26
TIME (msec)


(peak = 13.3 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
24
26
TIME (msec)


(peak = 24.0 kph)
Impact Velocity: 23.90 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 = 39.3 mm)
Displacement (mm)
0
5
10
15
20
25
30
35
40
0
2
4
6
8
10
12
14
16
18
20
22
24
26
TIME (msec)


mga
Impact Testing
9/25/2007
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #12 RIGHT BP1
H/V IMPACT ANGLE= 90 / 11
FM7220
PRE TEST


mga
Impact Testing
9/25/2007
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #12 RIGHT BP1
H/V IMPACT ANGLE= 90 / 11
FM7220
POST TEST
BP1
BP2


mga
Impact Testing
9/25/2007
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #12 RIGHT BP1
H/V IMPACT ANGLE= 90 / 11
FM7220
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G07I7-001.3 VEHICLE YR/MAKE/MODEL:2007/NHTSA/Dodge Sprinter C70309

GENERAL TEST PARAMETERS:

Test Number:#12

Target (Vehicle Side): BP1 Right

Temperature:21C

MGA Test Reference No.:FM7220

Humidity:59%

Approach Horizontal Angles:90º

Time of Test:1:31:39 PM

Approach Vertical Angles:11º

FMH Serial No:[038]

Additional Description: 2 Relocations

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
588	559	8.7	23.7	31	12 Right

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J14103	-94.598	1.33	1.32
Y	6	J36197	110.692	1.88	1.89
Z	7	J36353	99.391	1.83	1.83

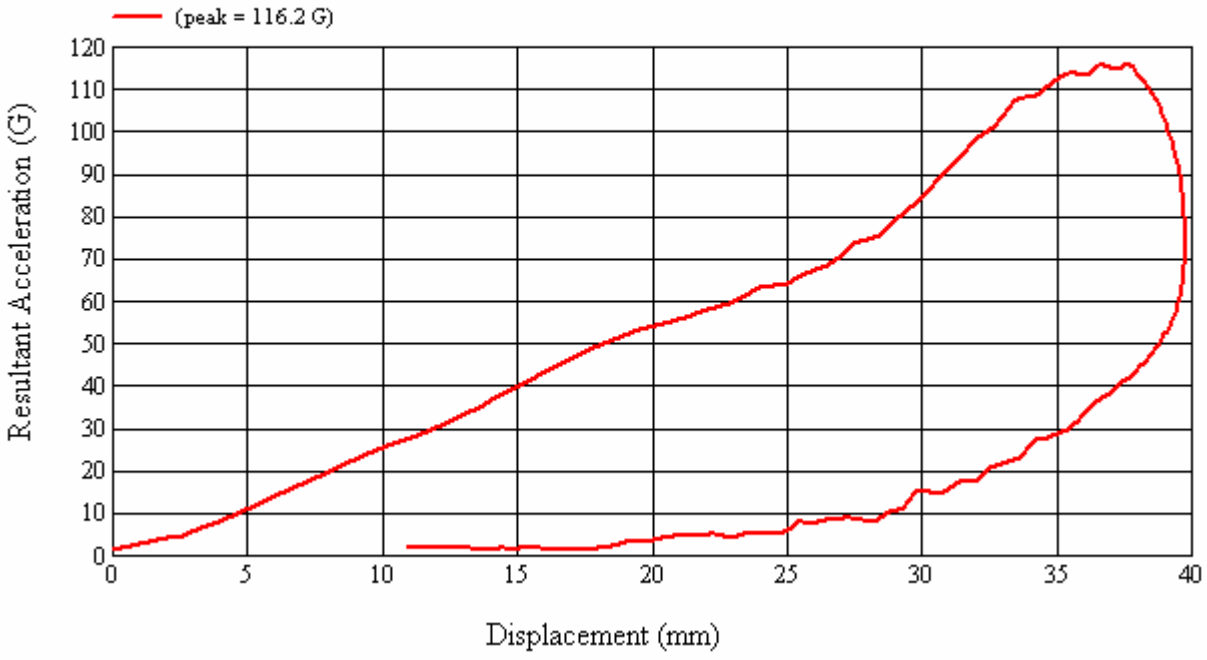
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

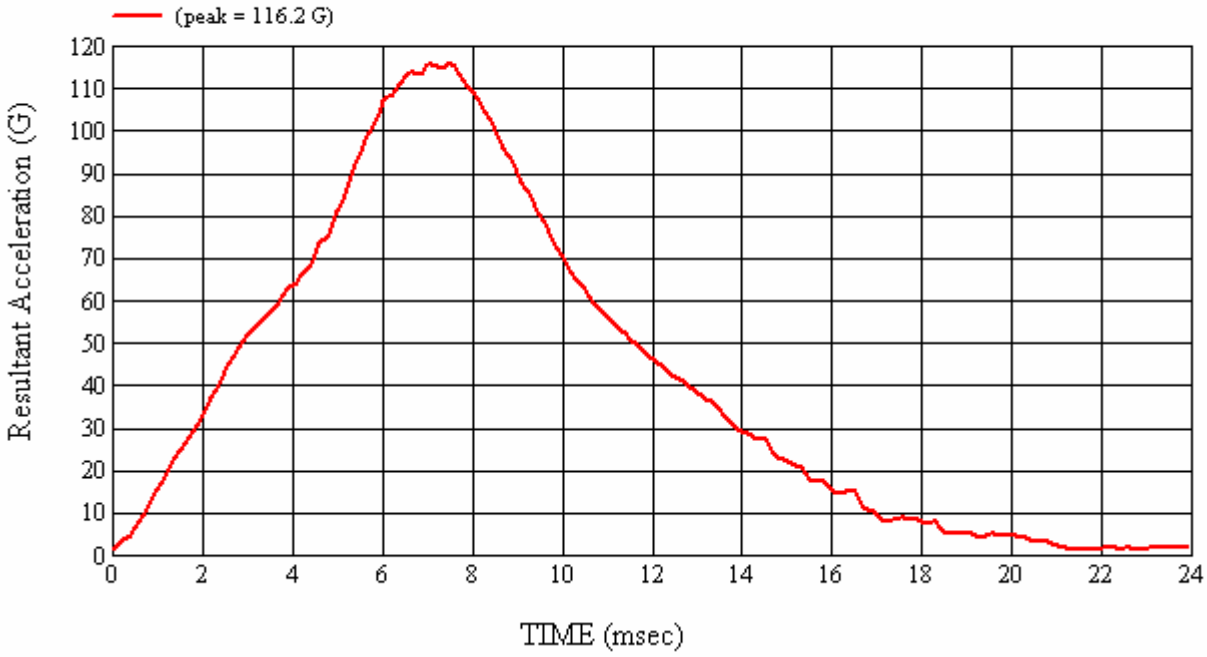
No visible damage.

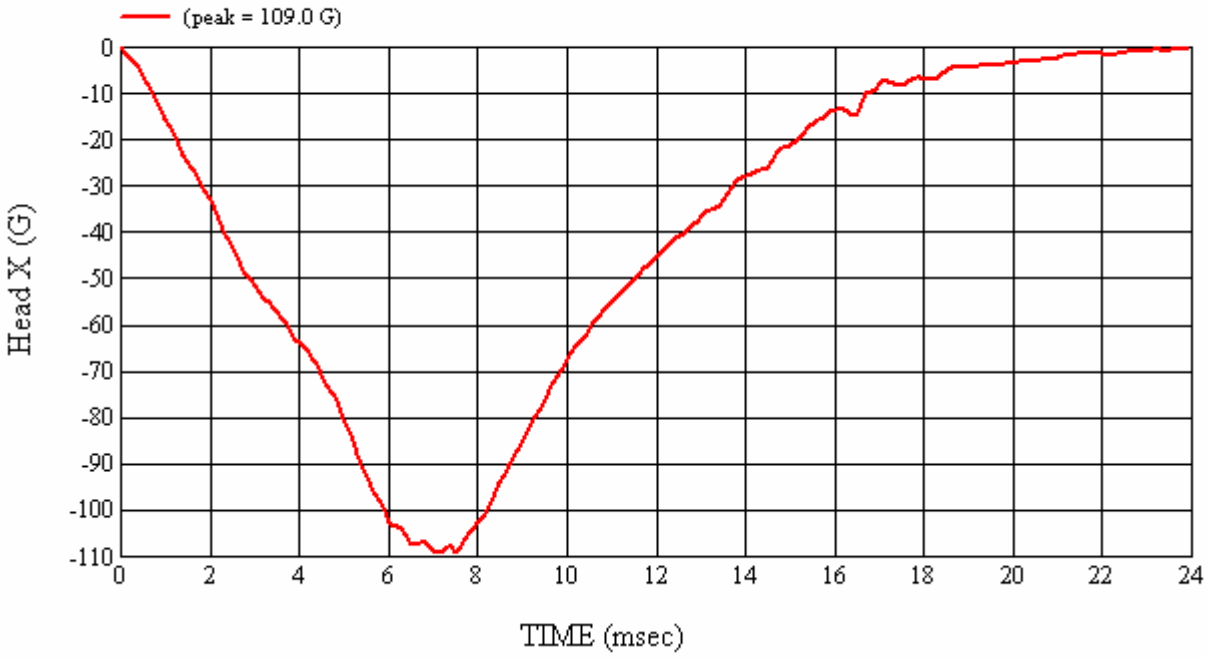
Recorded By: Travis Campbell Approved By*: Helen A. Kaleto Date: 9/25/2007

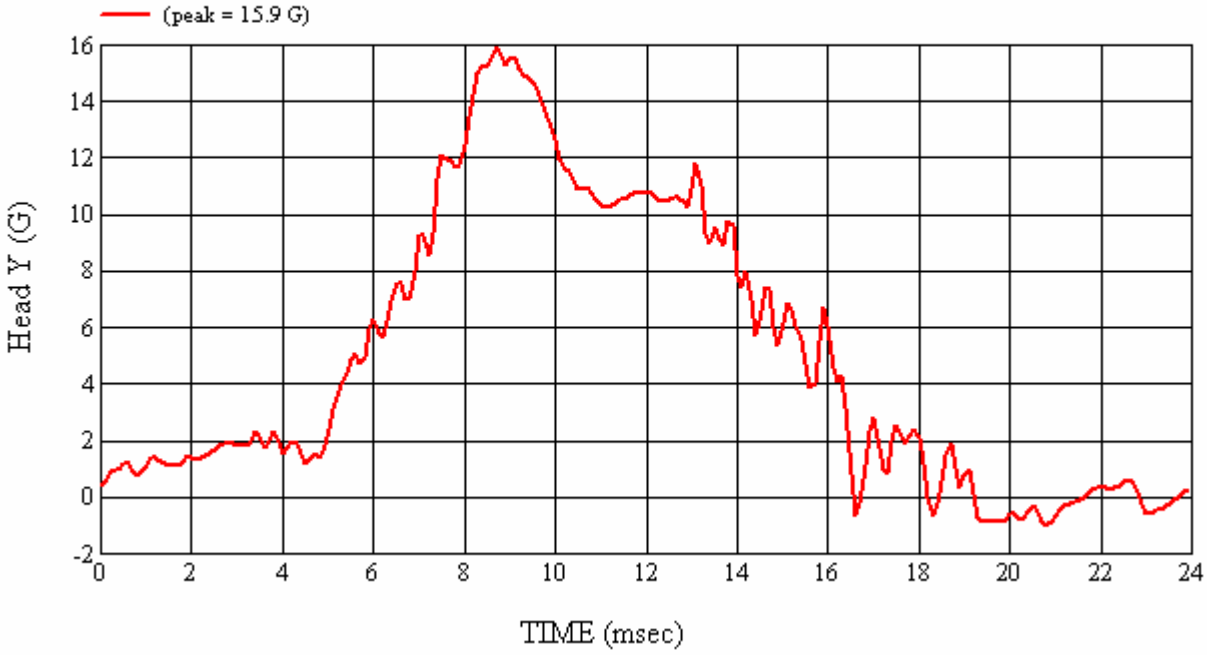
*Only necessary for NHTSA (Government) Compliance testing.

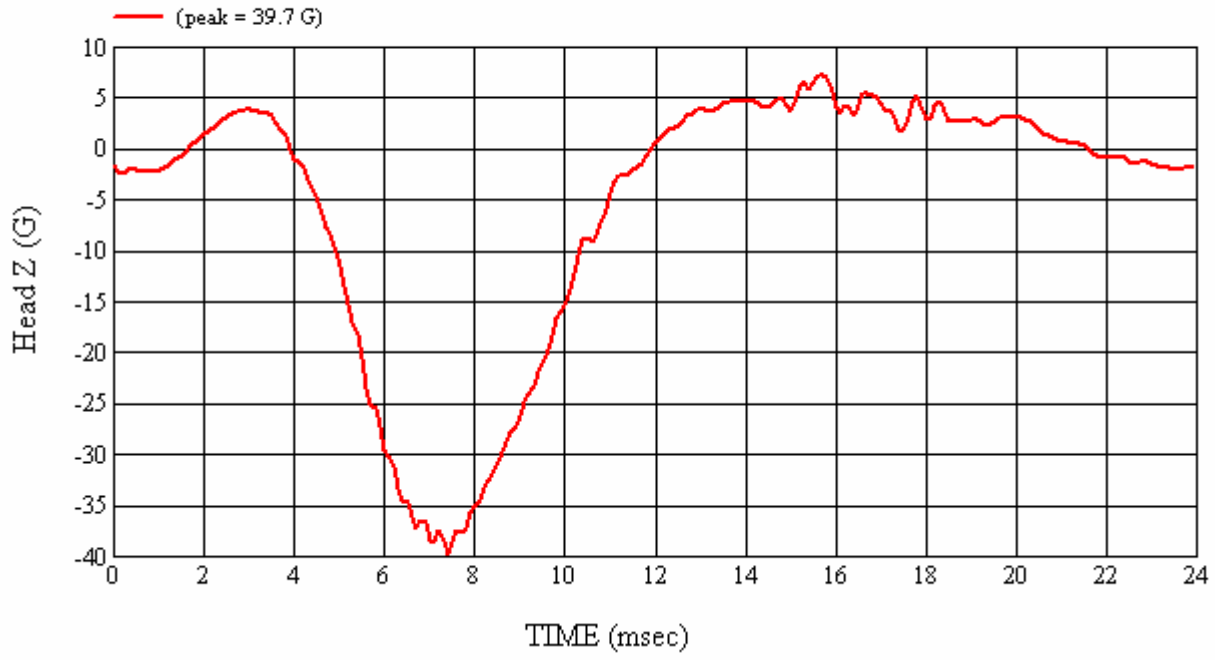
MGA Test #: FM7220 Target Location: BP1, Right Side Test Date: 9/25/2007

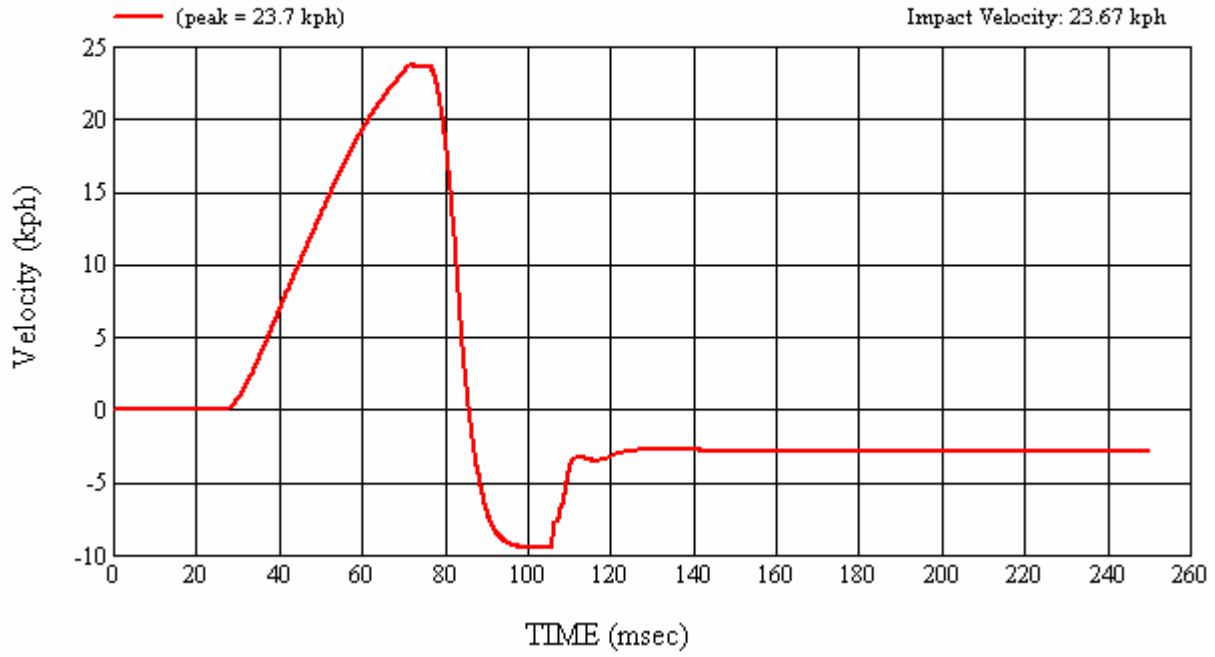


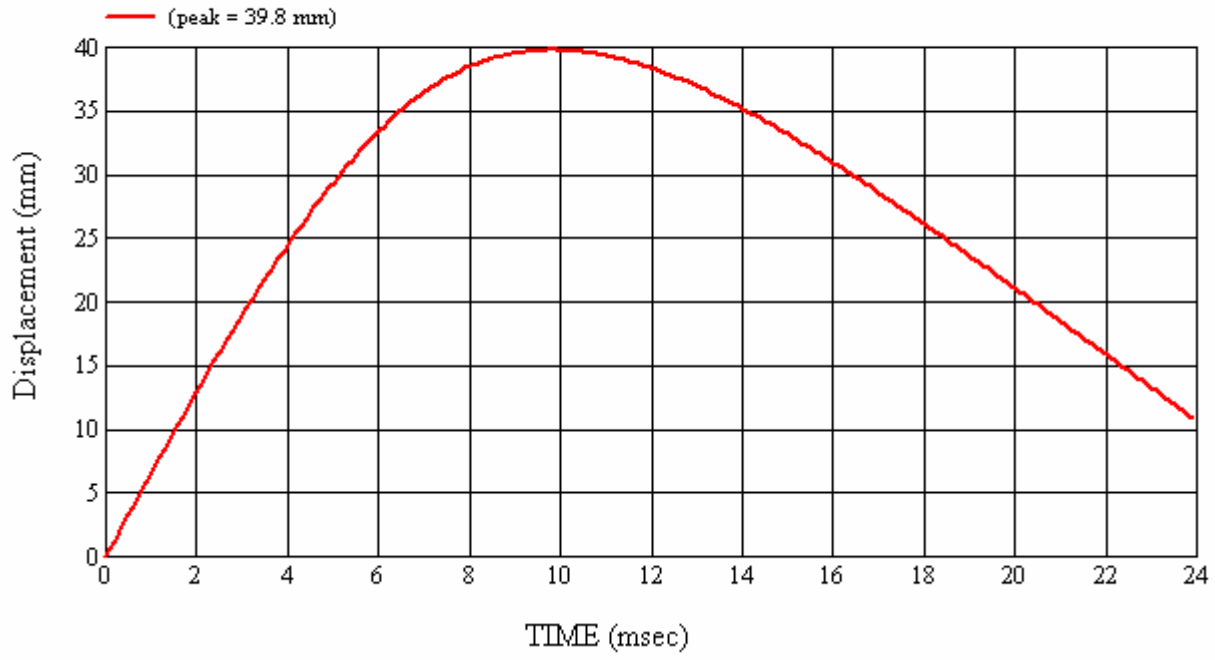



(peak = 109.0 G)
Head X (G)
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)


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

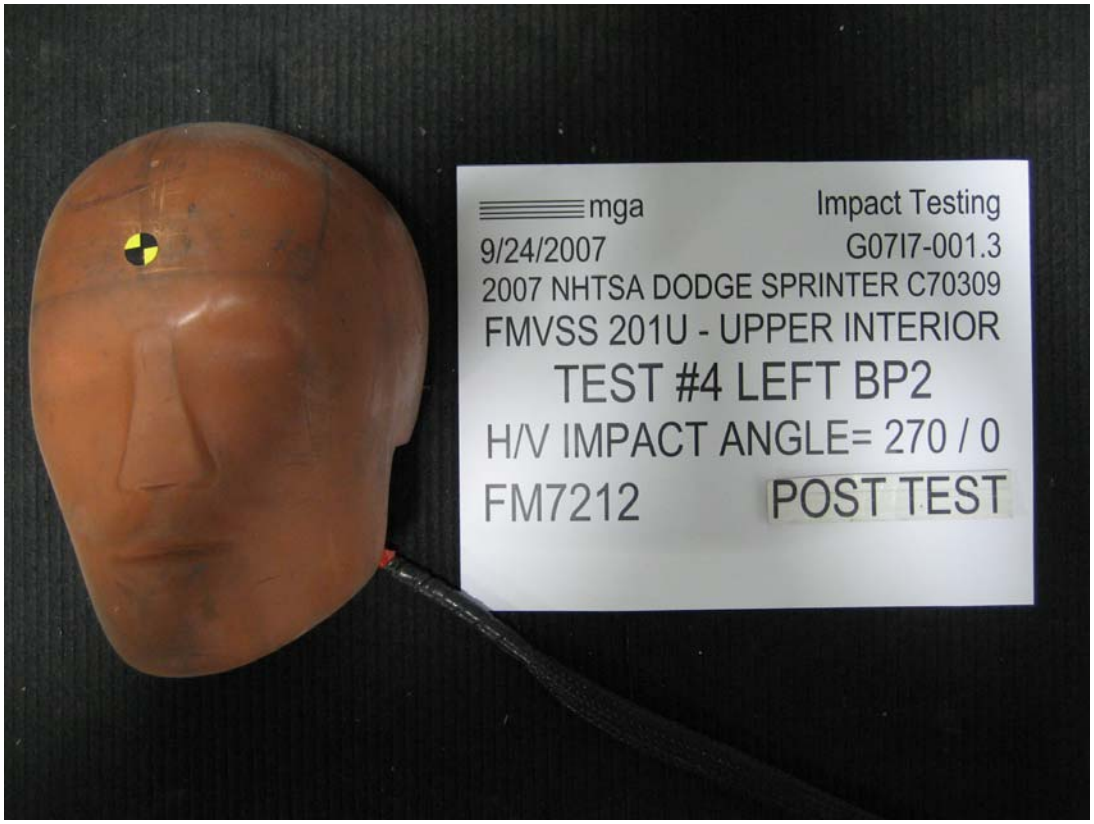

(peak = 39.7 G)
Head Z (G)
10
5
0
-5
-10
-15
-20
-25
-30
-35
-40
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)


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


(peak = 39.8 mm)
Displacement (mm)
0
5
10
15
20
25
30
35
40
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (msec)


mga
Impact Testing
9/24/2007
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #4 LEFT BP2
H/V IMPACT ANGLE= 270 / 0
FM7212
PRE TEST
C70309
FM7212
LEFT BP2
H/V 270/0


mga
Impact Testing
9/24/2007
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #4 LEFT BP2
H/V IMPACT ANGLE= 270 / 0
FM7212
POST TEST
C70309
FM7212
LEFT BP2
H/V 270/0


mga
Impact Testing
9/24/2007
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #4 LEFT BP2
H/V IMPACT ANGLE= 270 / 0
FM7212
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G07I7-001.3 VEHICLE YR/MAKE/MODEL:2007/NHTSA/Dodge Sprinter C70309

GENERAL TEST PARAMETERS:

Test Number:#4

Target (Vehicle Side): BP2 Left

Temperature:21C

MGA Test Reference No.:FM7212

Humidity:44%

Approach Horizontal Angles:270º

Time of Test:10:14:29 AM

Approach Vertical Angles:0º

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
694	699	8.5	23.8	8	0

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J22664	-94.161	1.33	1.32
Y	6	J35919	97.442	1.89	1.89
Z	7	J35924	93.891	1.83	1.83

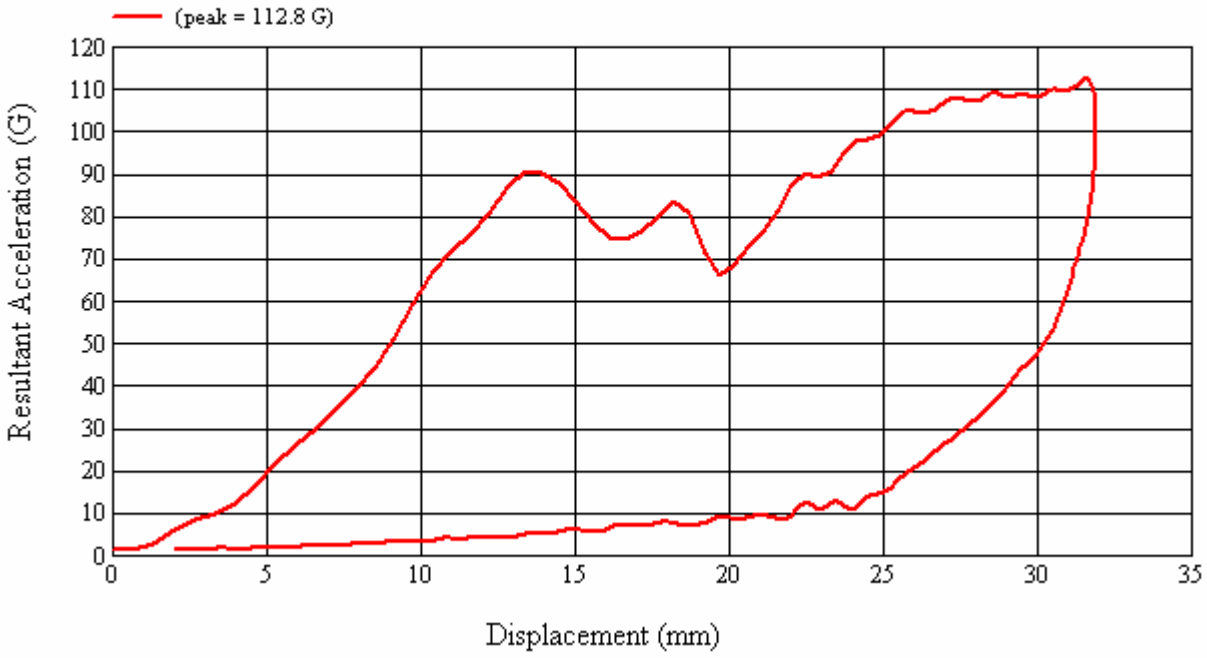
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

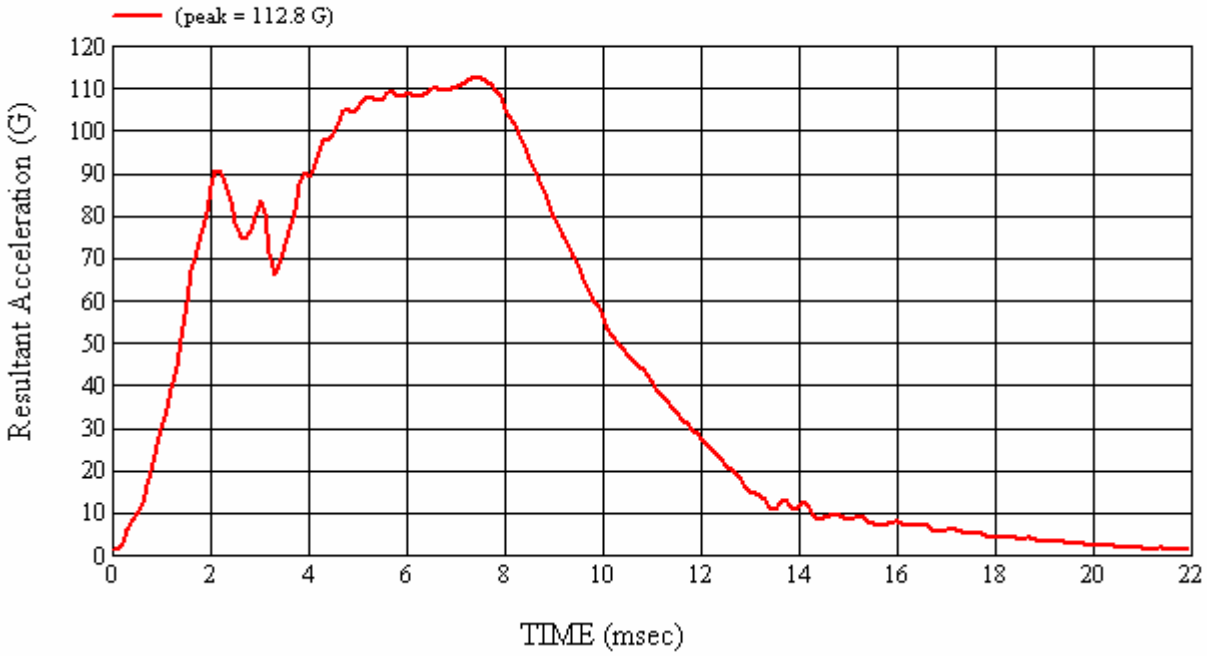
Slight cracking on D-ring trim.

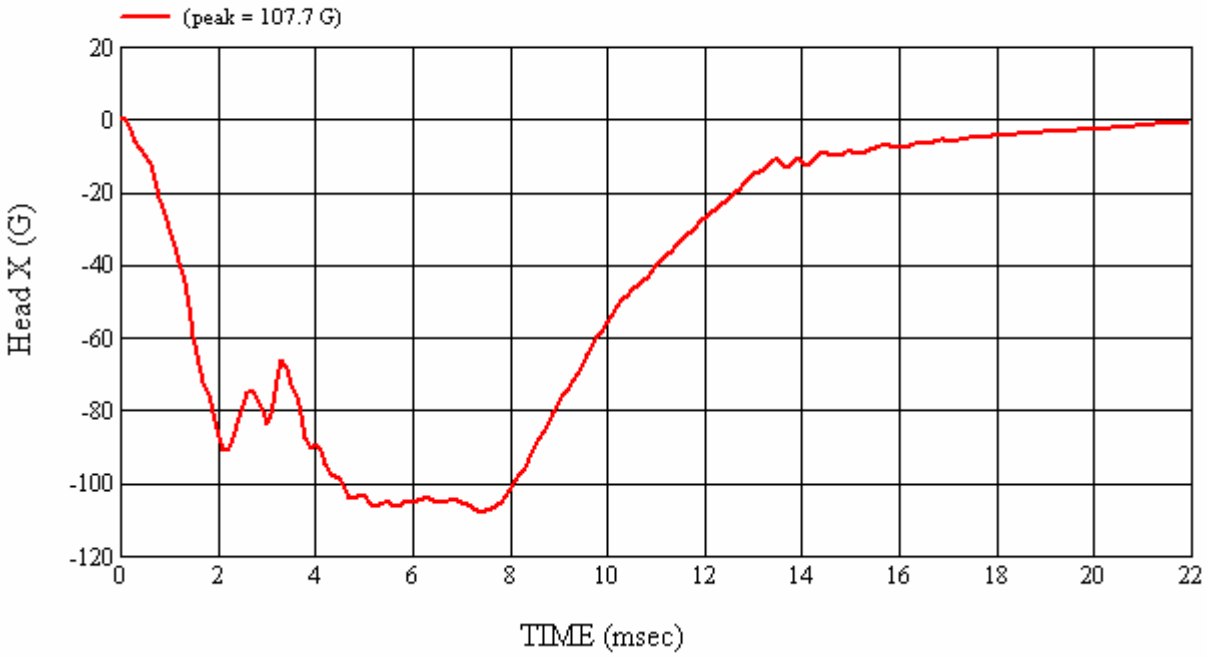
Recorded By: _____ Approved By*: _____ Date: 9/24/2007

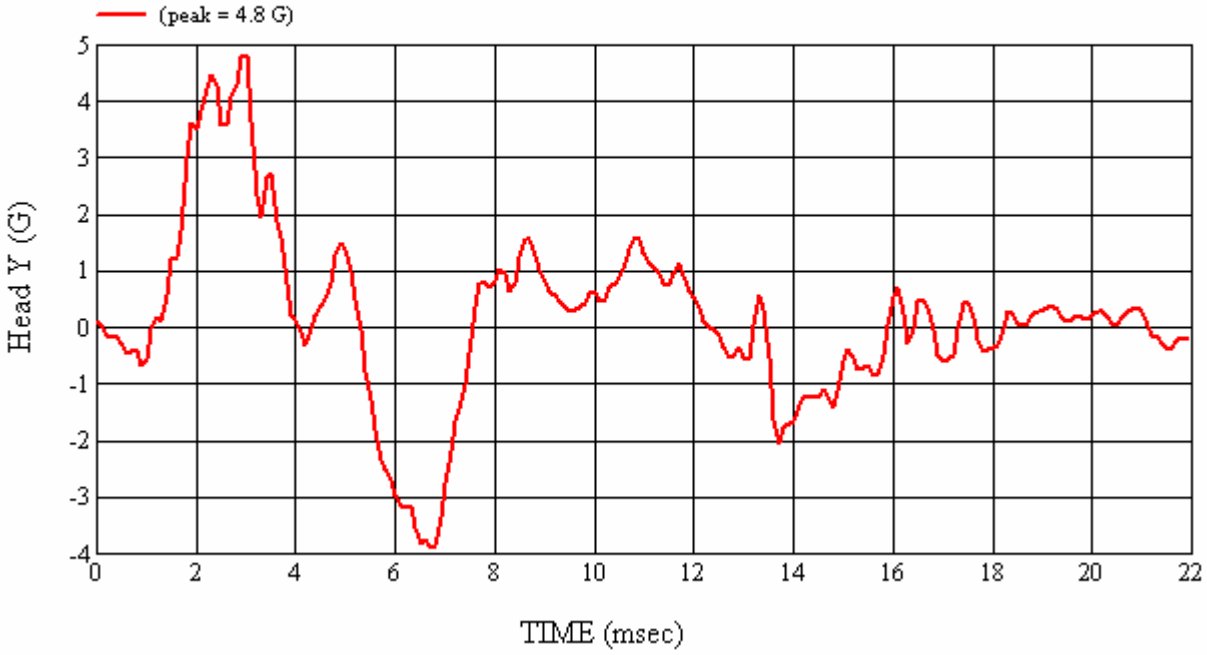
*Only necessary for NHTSA (Government) Compliance testing.

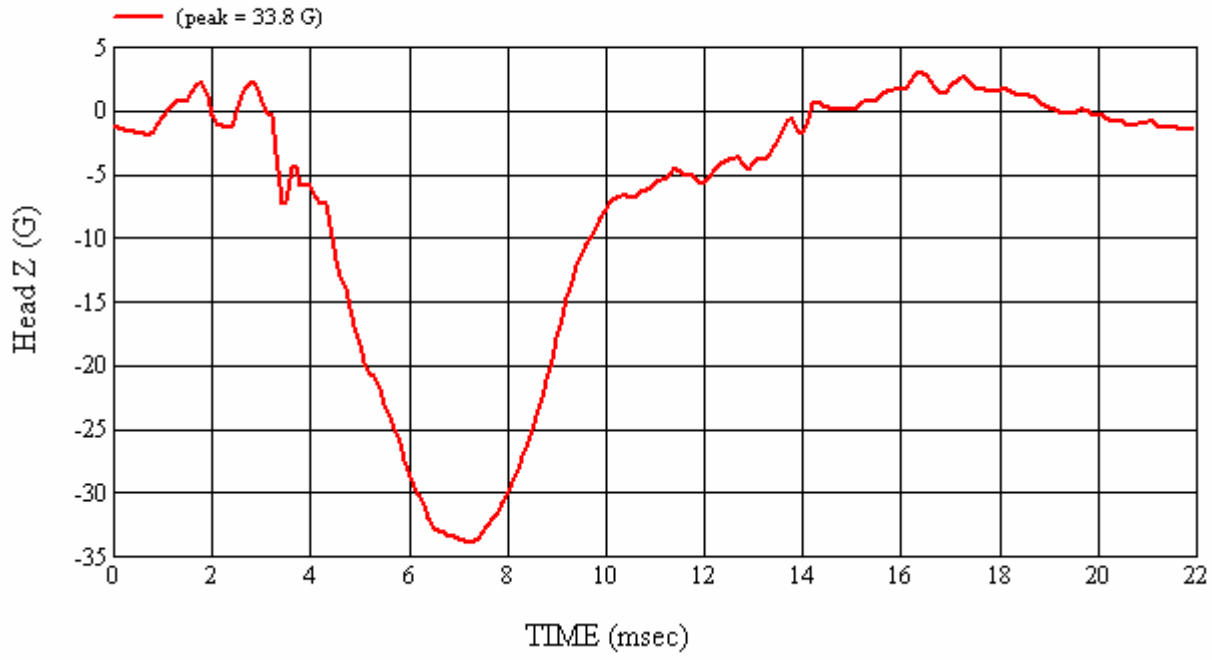
MGA Test #: FM7212 Target Location: BP2, Left Side Test Date: 9/24/2007

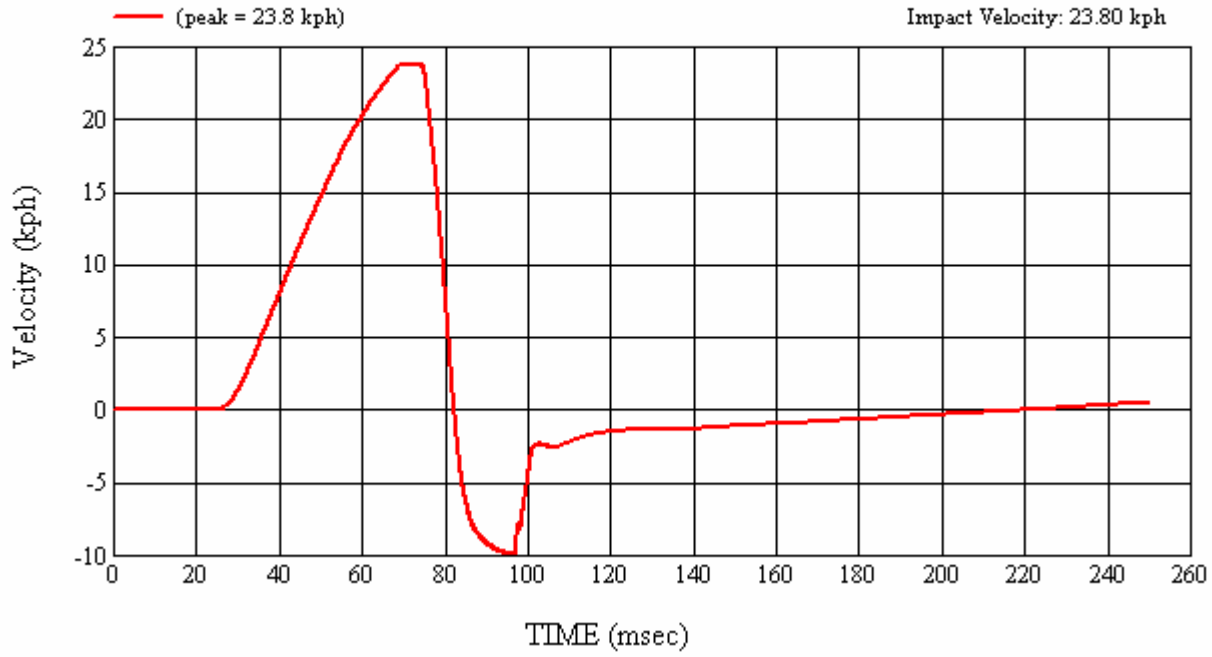


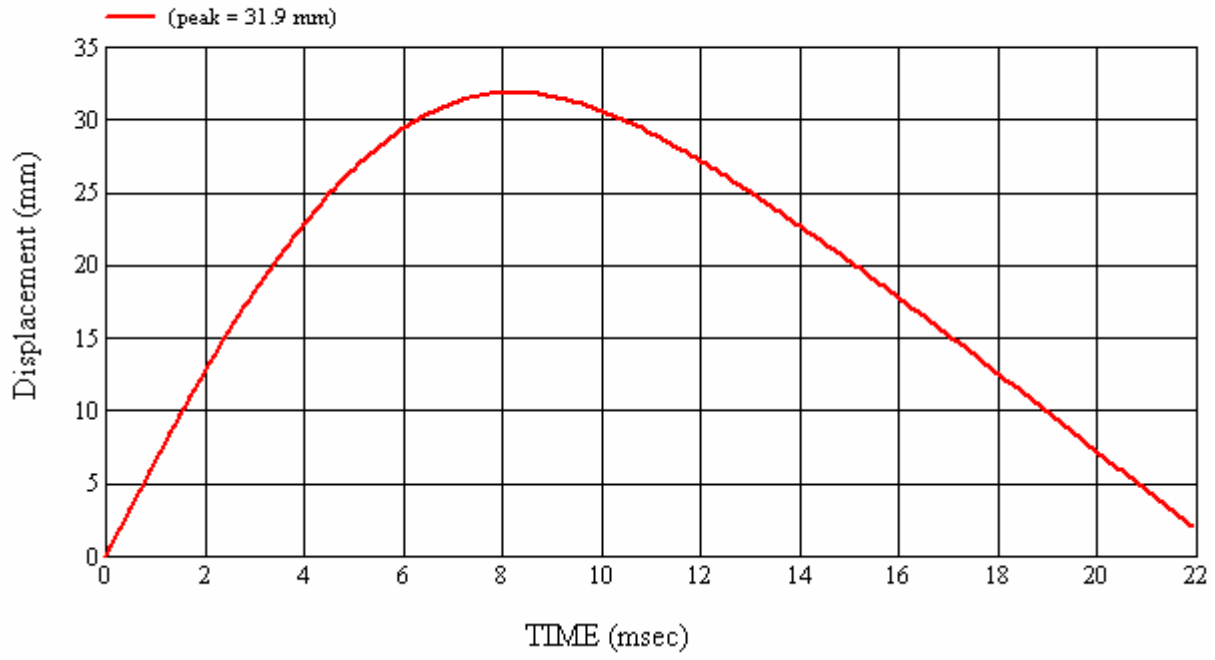



(peak = 107.7 G)
Head X (G)
20
0
-20
-40
-60
-80
-100
-120
0
2
4
6
8
10
12
14
16
18
20
22
TIME (msec)


(peak = 4.8 G)
Head Y (G)
5
4
3
2
1
0
-1
-2
-3
-4
0
2
4
6
8
10
12
14
16
18
20
22
TIME (msec)

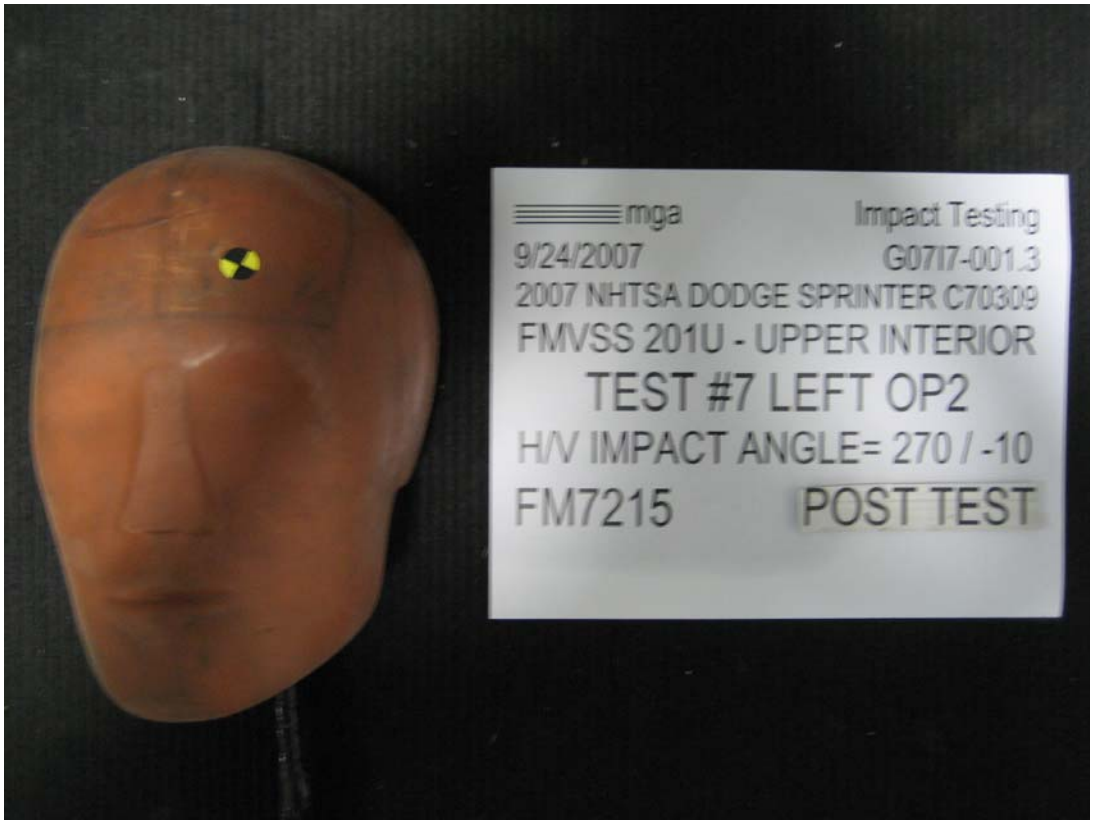

(peak = 33.8 G)
Head Z (G)
5
0
-5
-10
-15
-20
-25
-30
-35
0
2
4
6
8
10
12
14
16
18
20
22
TIME (msec)


(peak = 23.8 kph)
Impact Velocity: 23.80 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 = 31.9 mm)
Displacement (mm)
35
30
25
20
15
10
5
0
0
2
4
6
8
10
12
14
16
18
20
22
TIME (msec)


OP2
mga
Impact Testing
9/24/2007
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #7 LEFT OP2
H/V IMPACT ANGLE= 270 / -10
FM7215
PRE TEST


C70309
FM7215
LEFT OP2
H/V 270/-10
OP2
mga
Impact Testing
9/24/2007
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #7 LEFT OP2
H/V IMPACT ANGLE= 270 / -10
FM7215
POST TEST


mga
Impact Testing
9/24/2007
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #7 LEFT OP2
H/V IMPACT ANGLE= 270 / -10
FM7215
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G07I7-001.3 VEHICLE YR/MAKE/MODEL:2007/NHTSA/Dodge Sprinter C70309

GENERAL TEST PARAMETERS:

Target (Vehicle Side): OP2 Left

MGA Test Reference No.:FM7215

Approach Horizontal Angles:270º

Approach Vertical Angles:-10º

Additional Description: 3 Relocations

Test Number:#7

Temperature:21C

Humidity:54%

Time of Test:2:34:08 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
613	592	5.4	23.4	15	27 Left

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J22664	-94.161	1.33	1.32
Y	6	J35919	97.442	1.89	1.88
Z	7	J35924	93.891	1.83	1.83

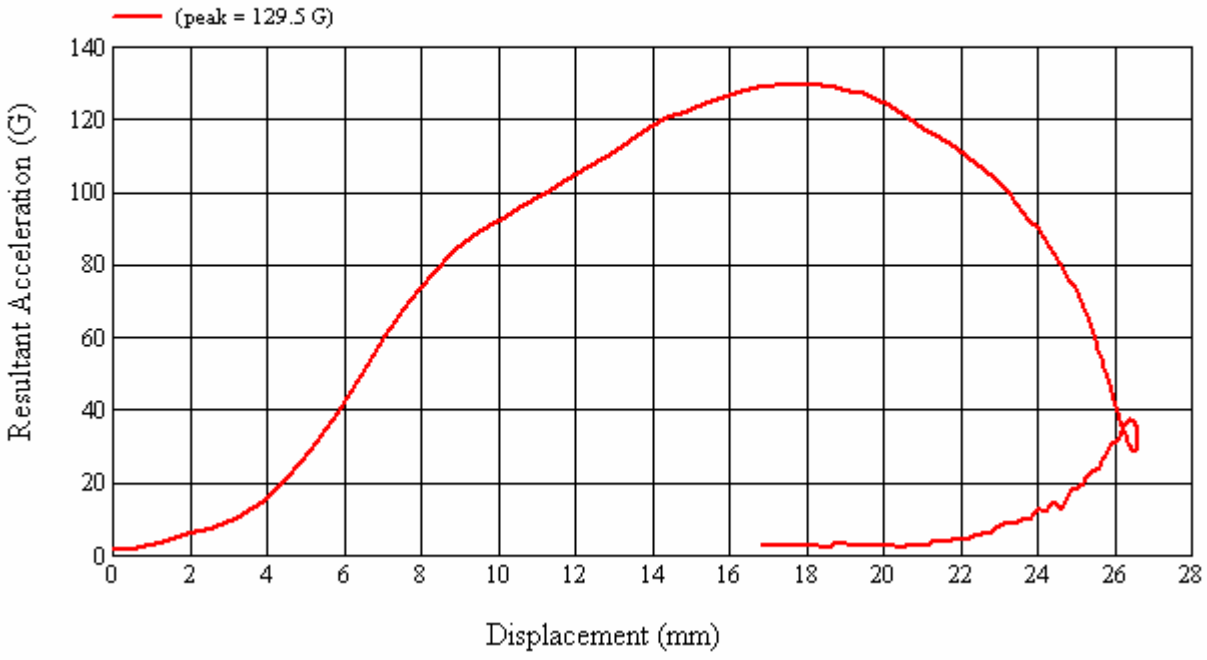
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

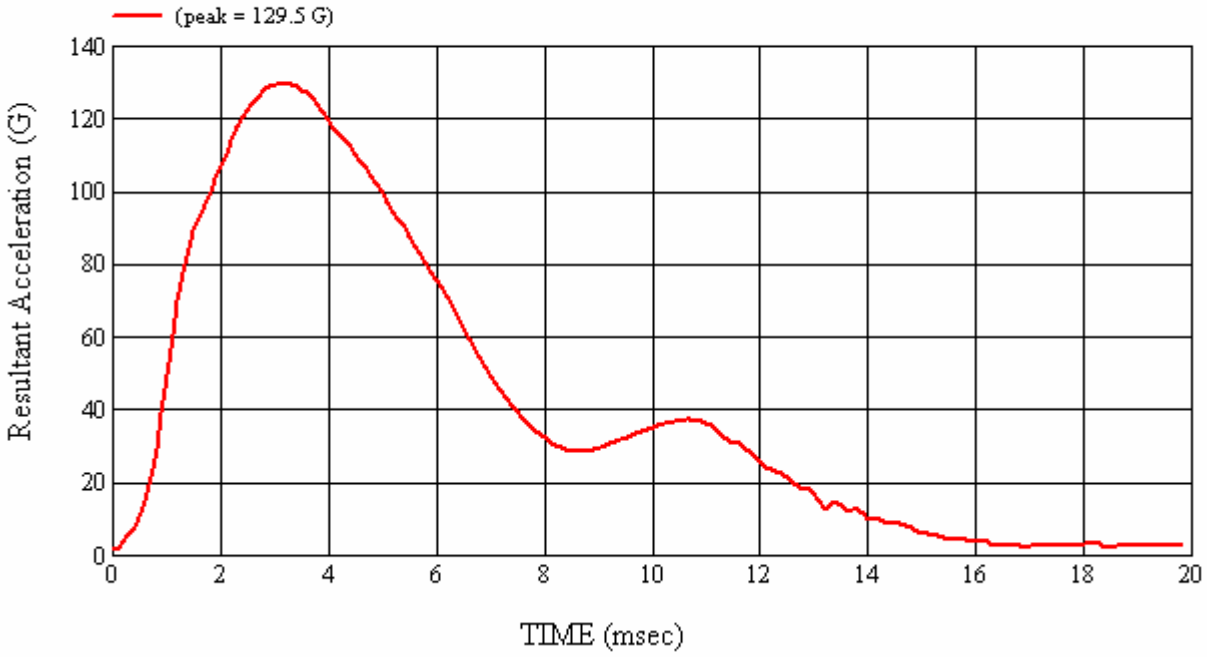
No visible damage.

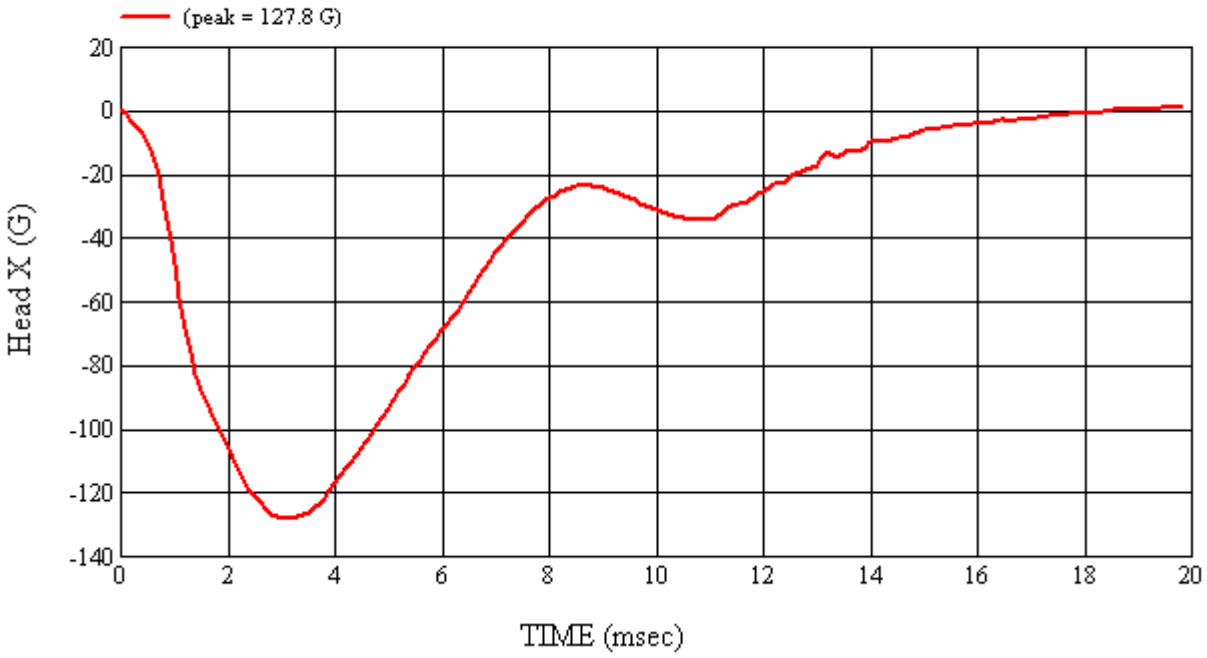
Recorded By: _____ Approved By*: _____ Date: 9/24/2007

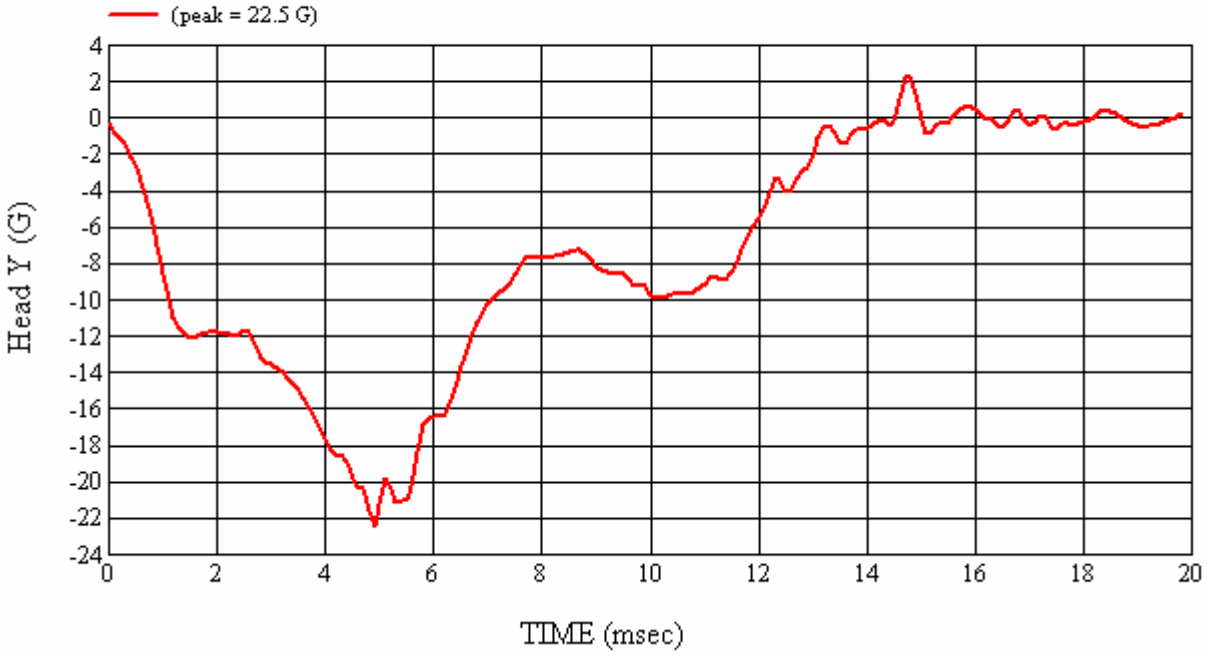
*Only necessary for NHTSA (Government) Compliance testing.

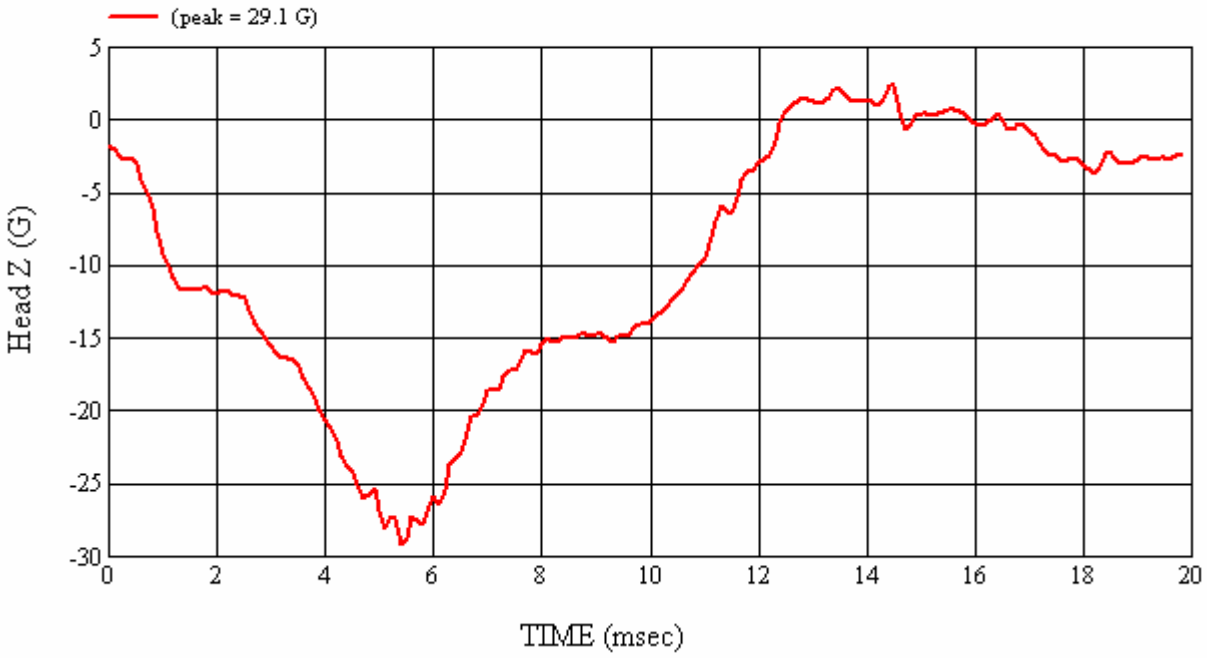
MGA Test #: FM7215 Target Location: OP2, Left Side Test Date: 9/24/2007

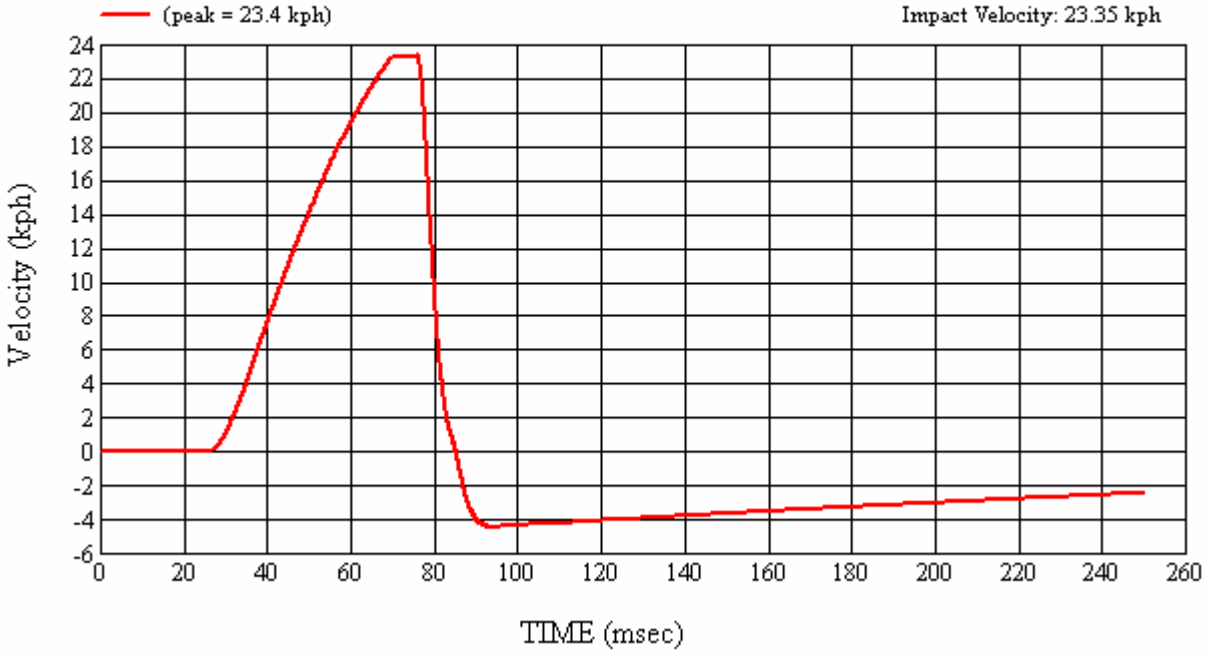


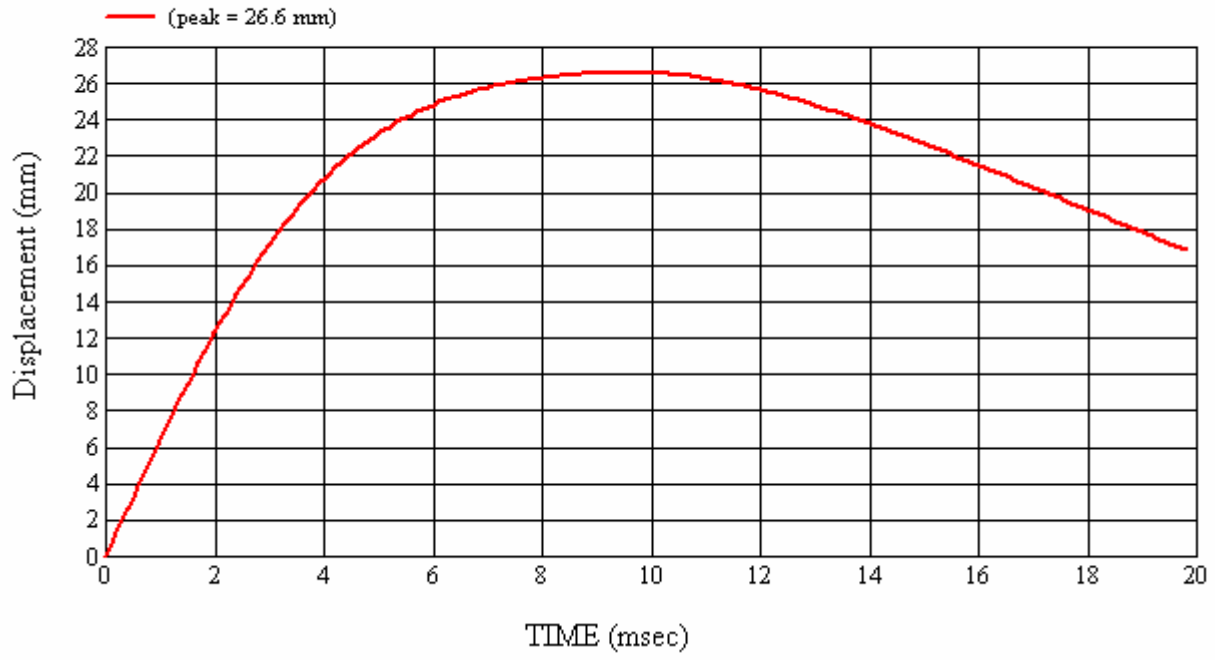


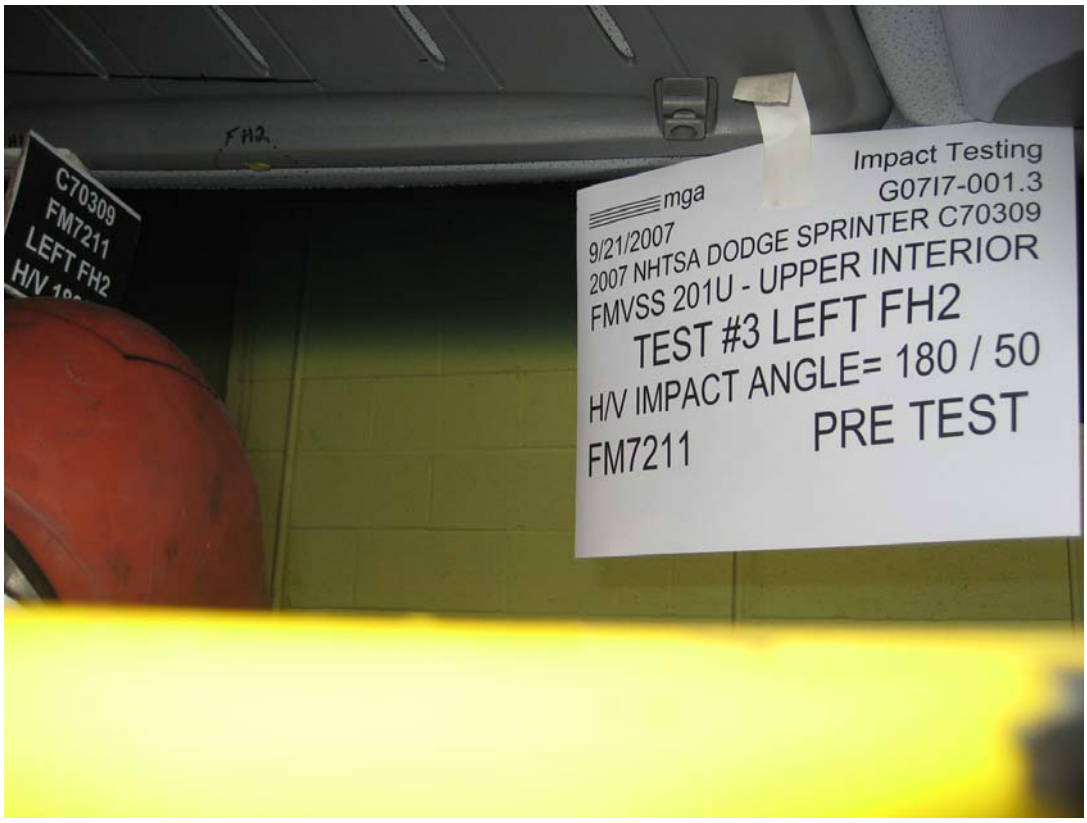

(peak = 127.8 G)
Head X (G)
20
0
-20
-40
-60
-80
-100
-120
-140
0
2
4
6
8
10
12
14
16
18
20
TIME (msec)


(peak = 22.5 G)
Head Y (G)
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
0
2
4
6
8
10
12
14
16
18
20
TIME (msec)

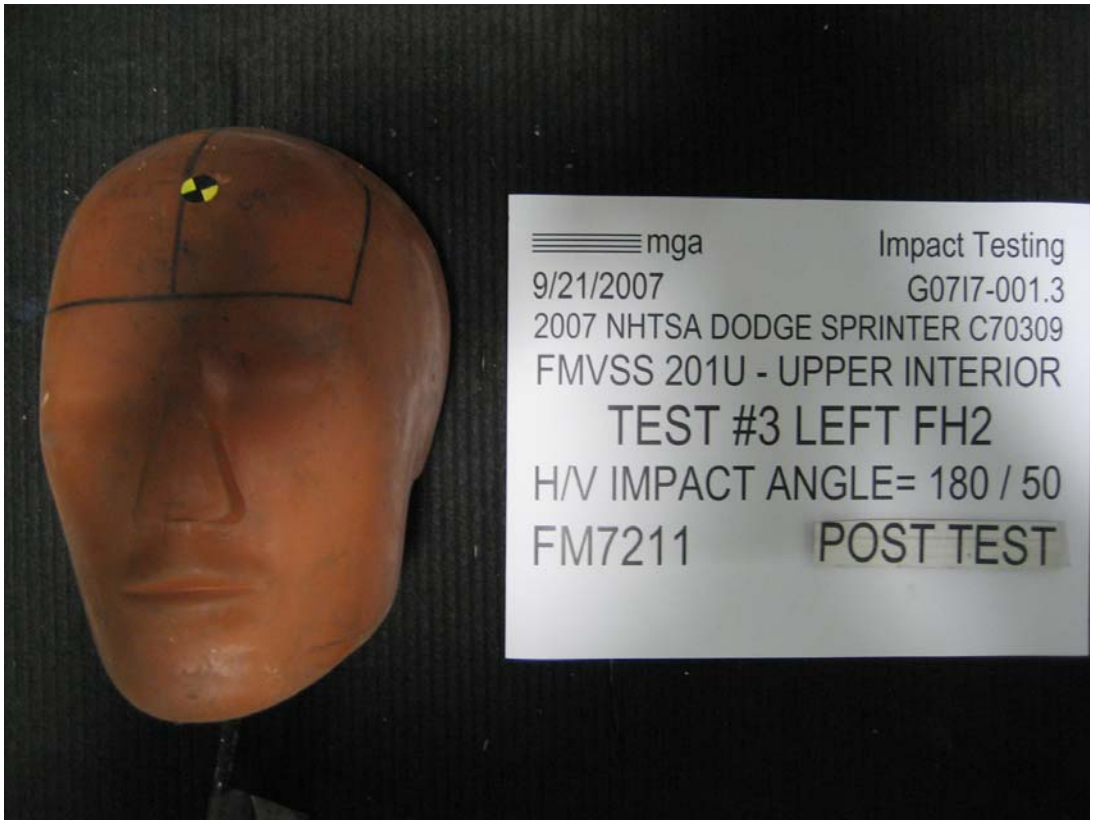

(peak = 29.1 G)
Head Z (G)
5
0
-5
-10
-15
-20
-25
-30
0
2
4
6
8
10
12
14
16
18
20
TIME (msec)


(peak = 23.4 kph)
Impact Velocity: 23.35 kph
Velocity (kph)
24
22
20
18
16
14
12
10
8
6
4
2
0
-2
-4
-6
0
20
40
60
80
100
120
140
160
180
200
220
240
260
TIME (msec)


(peak = 26.6 mm)
Displacement (mm)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
0
2
4
6
8
10
12
14
16
18
20
TIME (msec)


C70309
FM7211
LEFT FH2
mga
Impact Testing
G07I7-001.3
9/21/2007
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #3 LEFT FH2
H/V IMPACT ANGLE= 180 / 50
FM7211
PRE TEST


C70309
FM7211
LEFT FH2
H/V 180/50
mga
Impact Testing
G07I7-001.3
9/21/2007
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #3 LEFT FH2
H/V IMPACT ANGLE= 180 / 50
FM7211
POST TEST


mga
Impact Testing
9/21/2007
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #3 LEFT FH2
H/V IMPACT ANGLE= 180 / 50
FM7211
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G07I7-001.3 VEHICLE YR/MAKE/MODEL:2007/NHTSA/Dodge Sprinter C70309

GENERAL TEST PARAMETERS:

Test Number:#3

Target (Vehicle Side): FH2 Left

Temperature:21C

MGA Test Reference No.:FM7211

Humidity:63%

Approach Horizontal Angles:180º

Time of Test:5:12:28 PM

Approach Vertical Angles:50º

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
399	308	8.1	23.7	41	5 Left

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J14103	-94.598	1.32	1.32
Y	6	J36197	110.692	1.89	1.89
Z	7	J36353	99.391	1.83	1.83

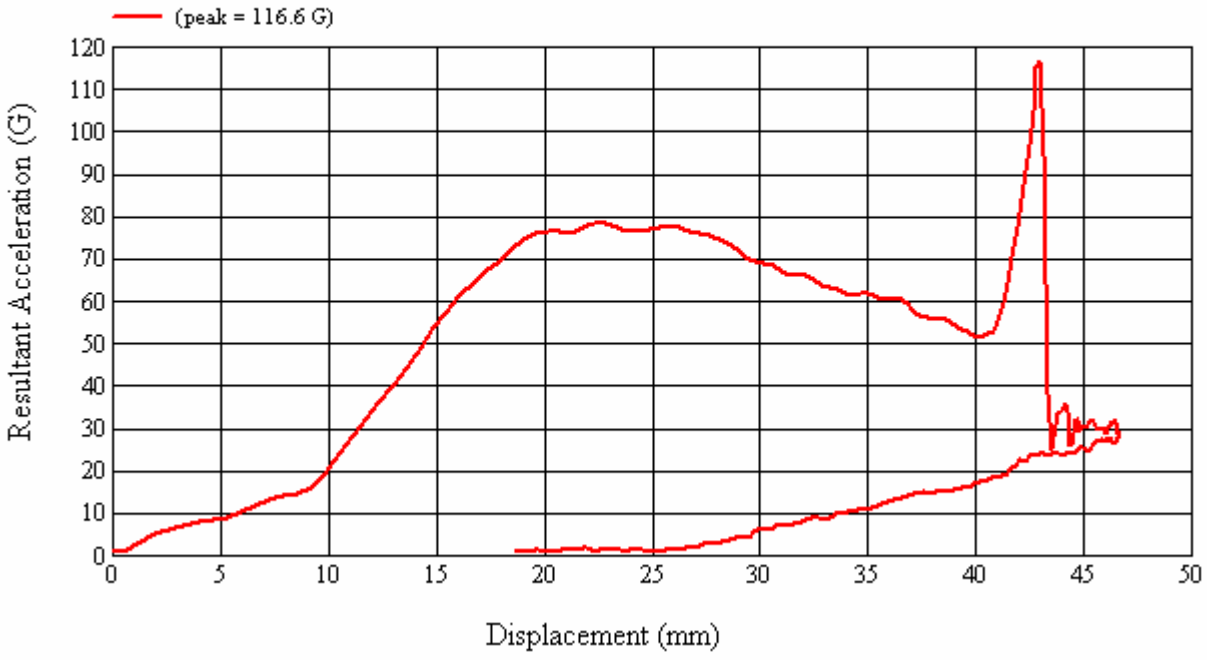
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

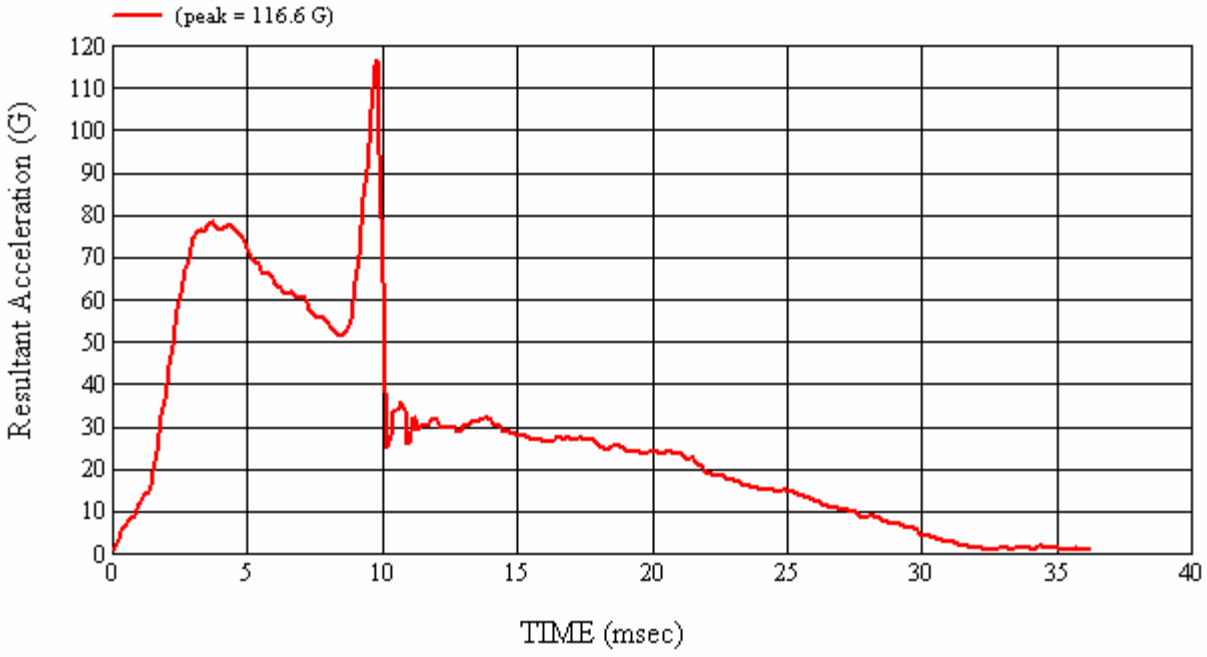
Windshield broke.

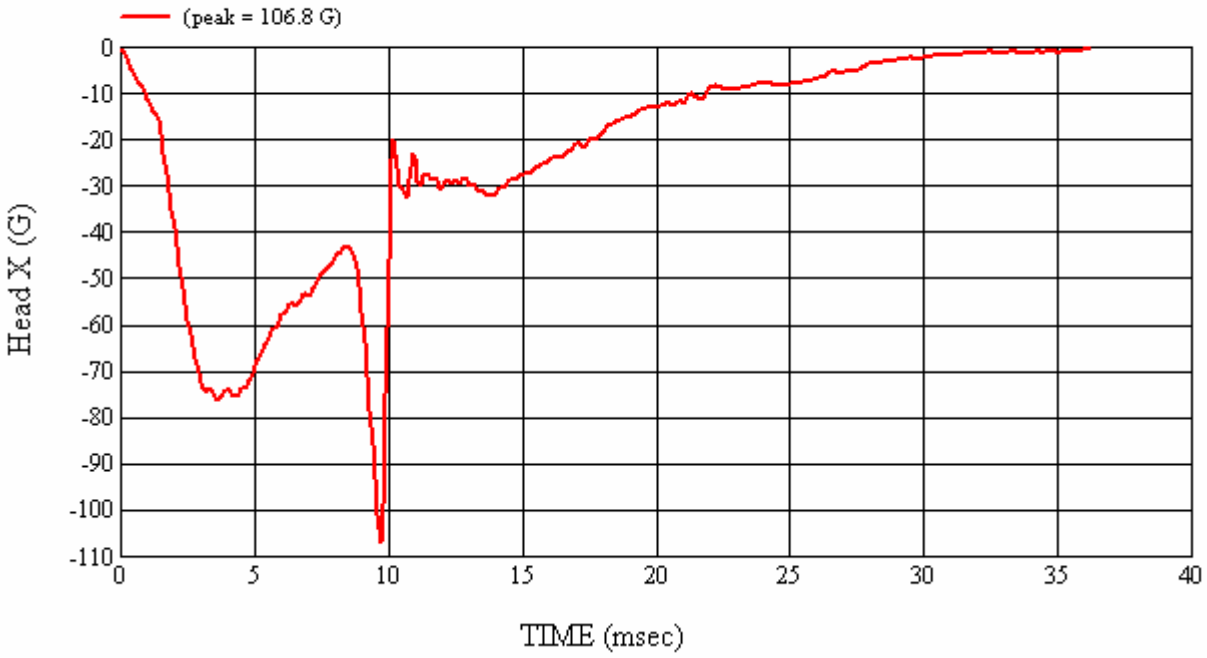
Recorded By: _____ Approved By*: _____ Date: 9/21/2007

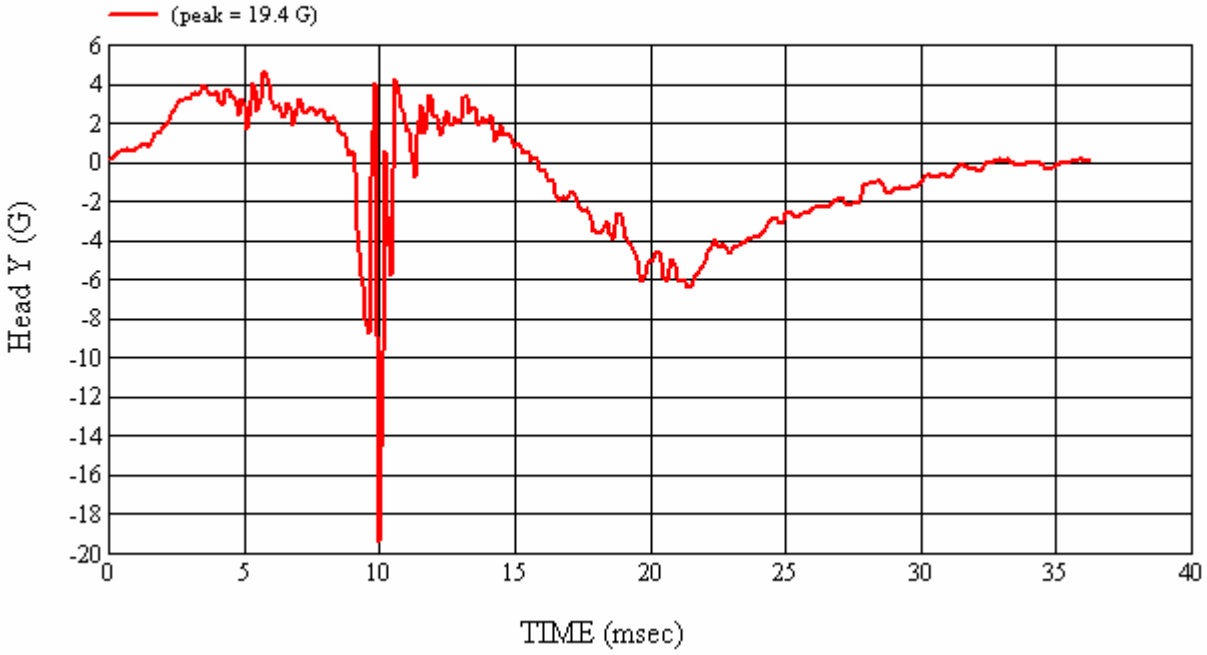
*Only necessary for NHTSA (Government) Compliance testing.

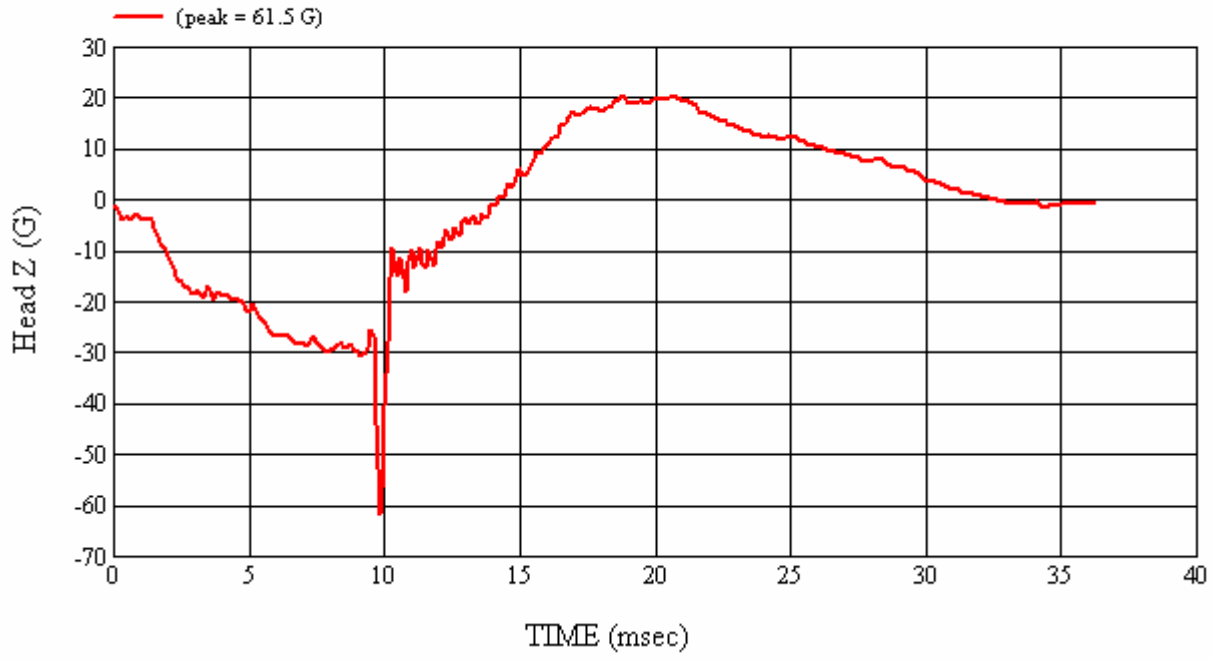
MGA Test #: FM7211 Target Location: FH2, Left Side Test Date: 9/21/2007

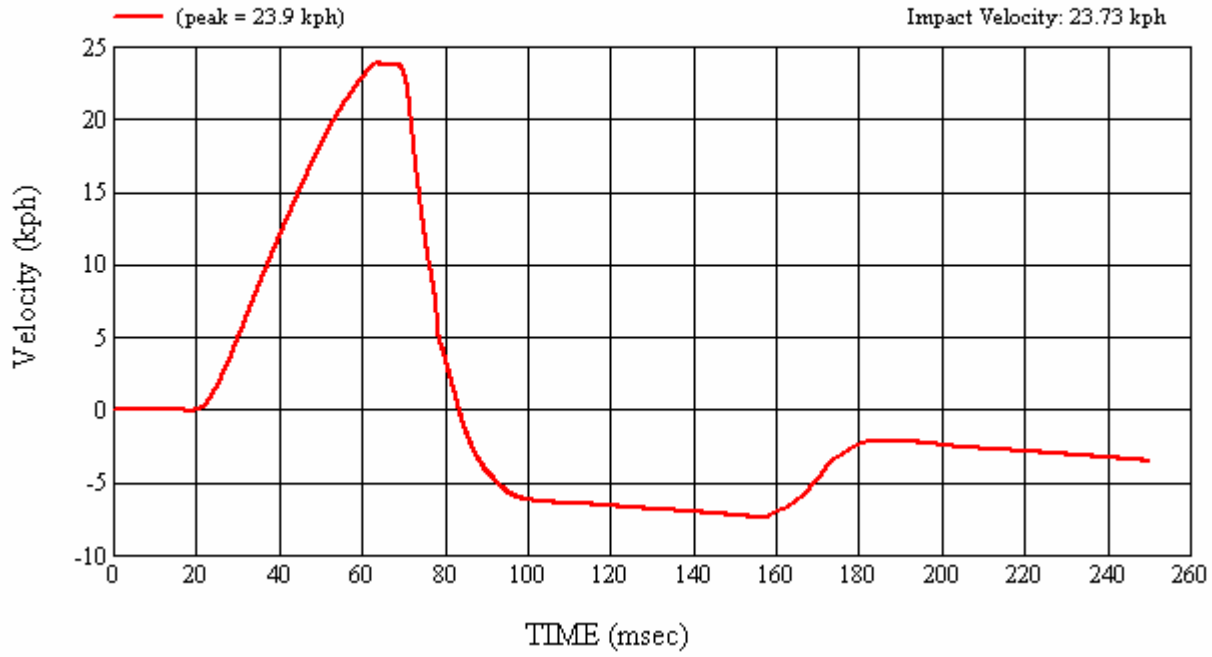


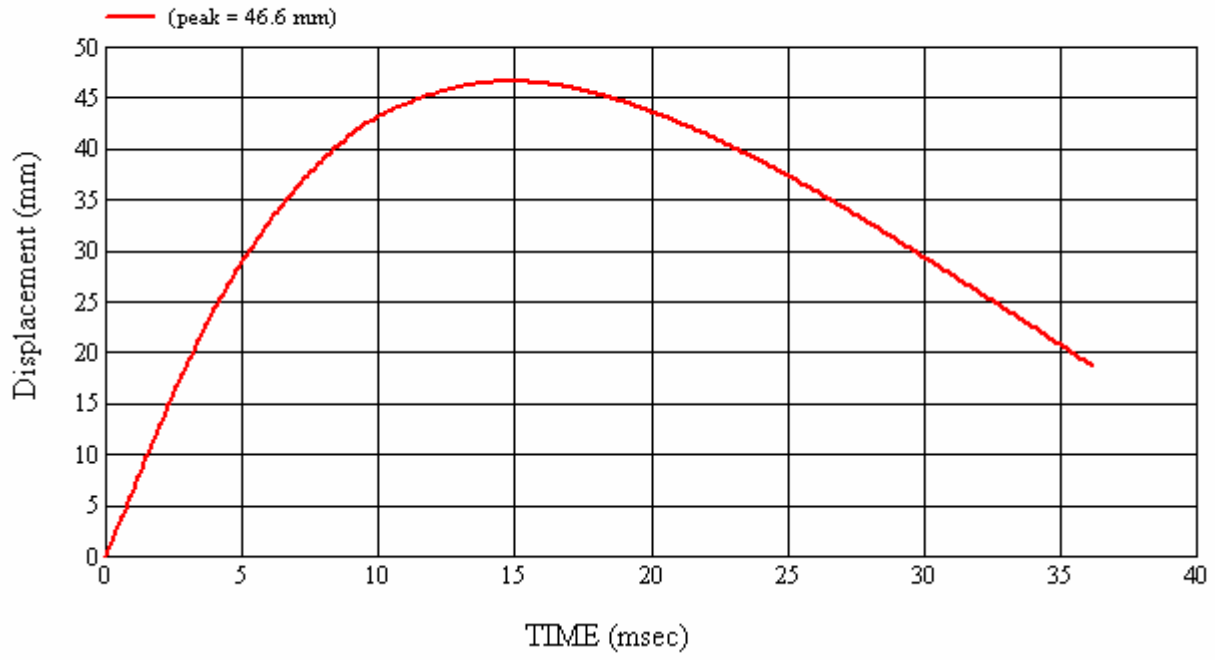


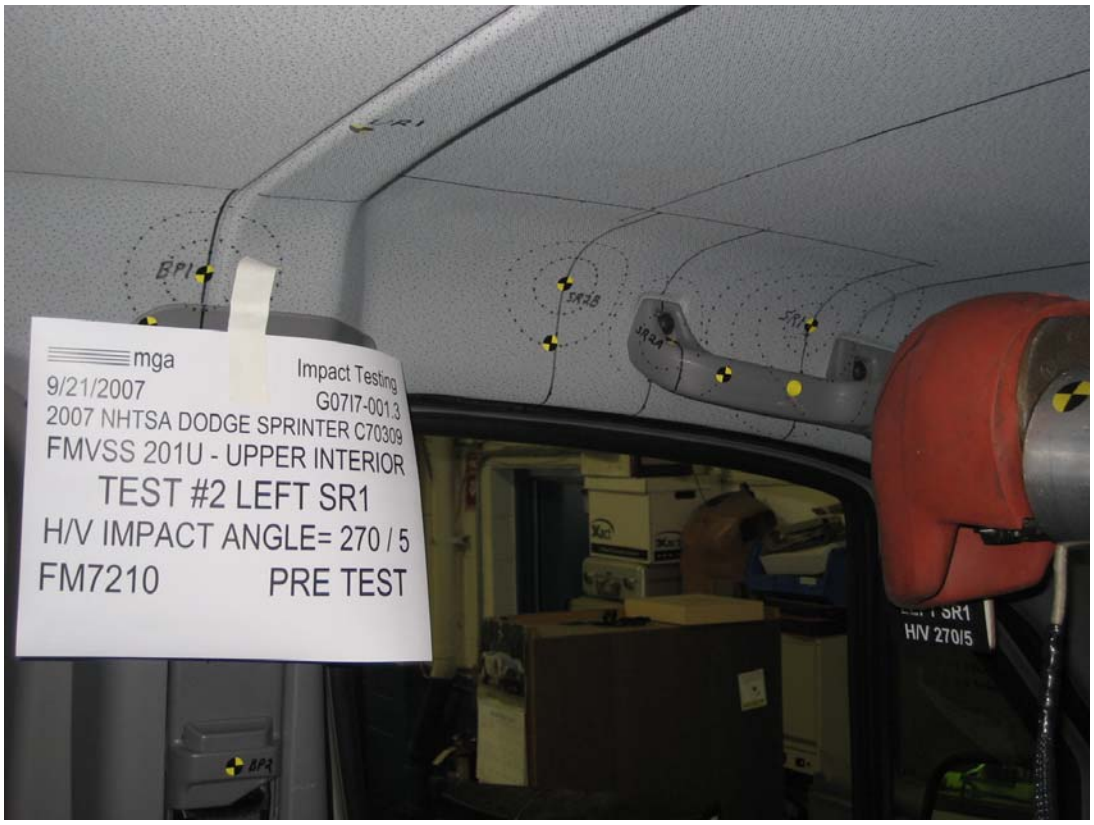

(peak = 106.8 G)
Head X (G)
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
-100
-110
0
5
10
15
20
25
30
35
40
TIME (msec)

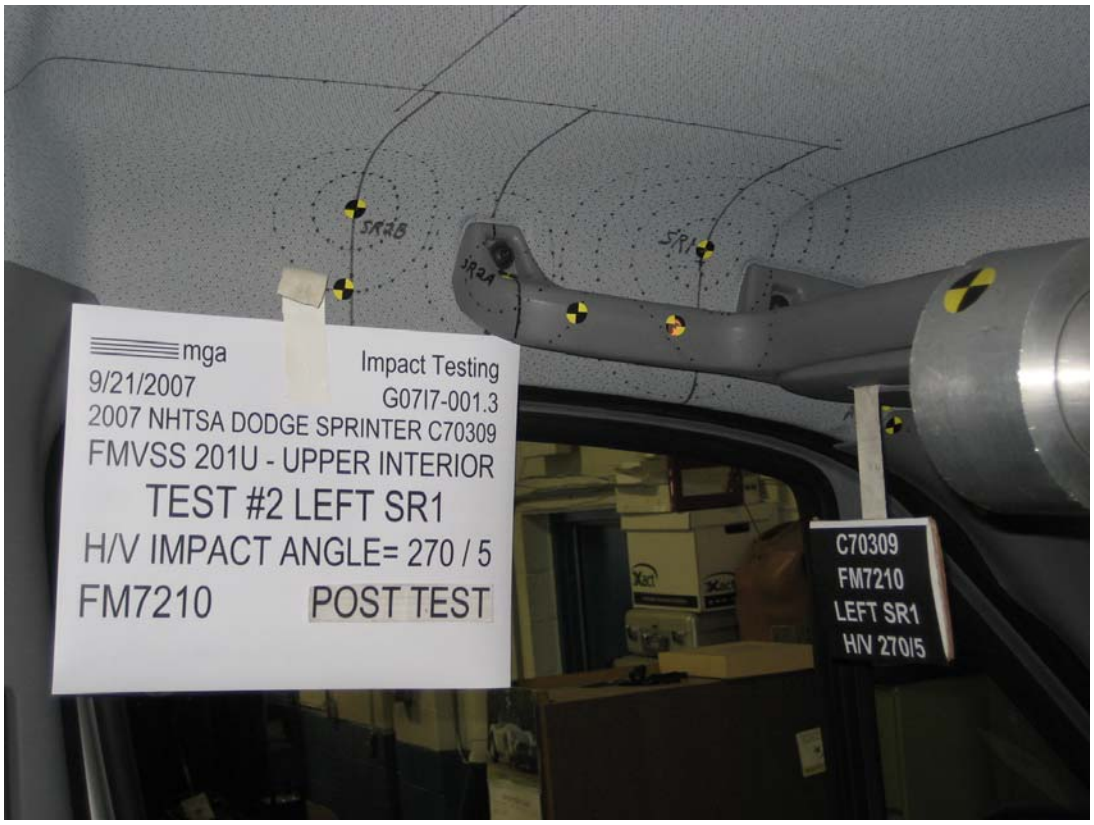

(peak = 19.4 G)
Head Y (G)
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
0
5
10
15
20
25
30
35
40
TIME (msec)


(peak = 61.5 G)
Head Z (G)
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
5
10
15
20
25
30
35
40
TIME (msec)


(peak = 23.9 kph)
Impact Velocity: 23.73 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 = 46.6 mm)
Displacement (mm)
TIME (msec)
0
5
10
15
20
25
30
35
40
45
50


mga
Impact Testing
9/21/2007
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #2 LEFT SR1
H/V IMPACT ANGLE= 270 / 5
FM7210
PRE TEST
H/V 270/5


SR3B
SR2A
SR1
mga
Impact Testing
9/21/2007
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #2 LEFT SR1
H/V IMPACT ANGLE= 270 / 5
FM7210
POST TEST
C70309
FM7210
LEFT SR1
H/V 270/5


mga
Impact Testing
9/21/2007
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #2 LEFT SR1
H/V IMPACT ANGLE= 270 / 5
FM7210
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G07I7-001.3 VEHICLE YR/MAKE/MODEL:2007/NHTSA/Dodge Sprinter C70309

GENERAL TEST PARAMETERS:

Test Number:#2

Target (Vehicle Side): SR1 Left

Temperature:21C

MGA Test Reference No.:FM7210

Humidity:63%

Approach Horizontal Angles:270º

Time of Test:4:04:19 PM

Approach Vertical Angles:5º

FMH Serial No:[037]

Additional Description: 4 Relocations

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
808	851	7	23.1	12	16 Right

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J22696	-100.013	1.33	1.33
Y	6	J35791	91.856	1.91	1.89
Z	7	J35800	97.996	1.83	1.83

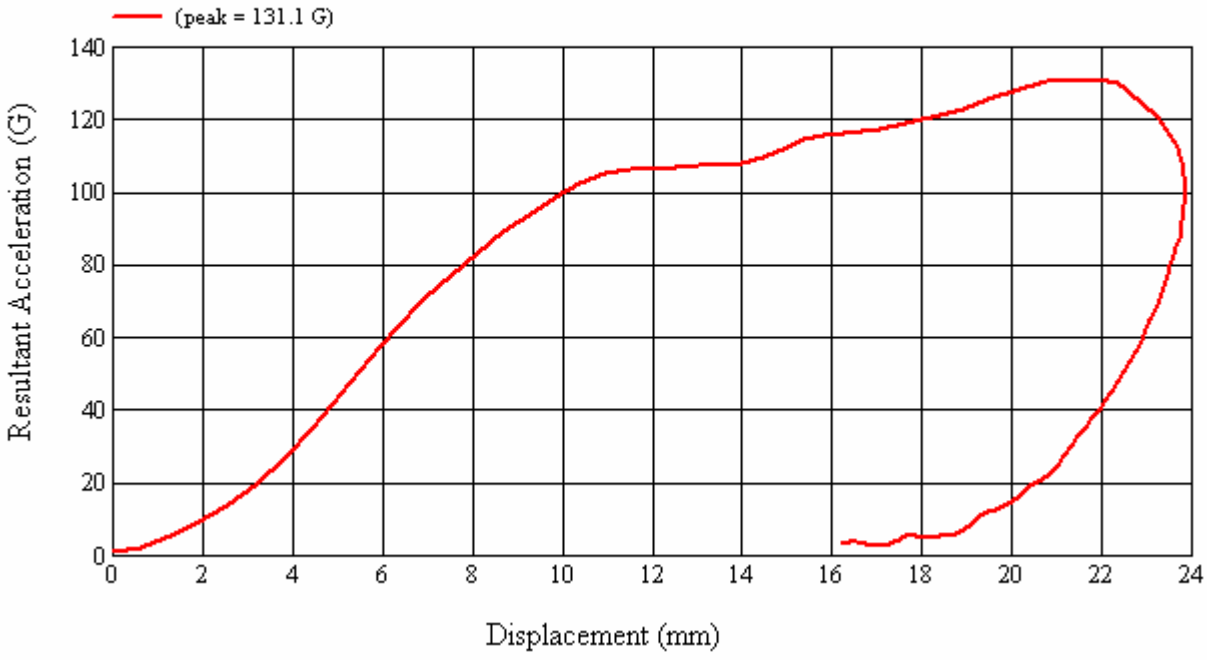
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

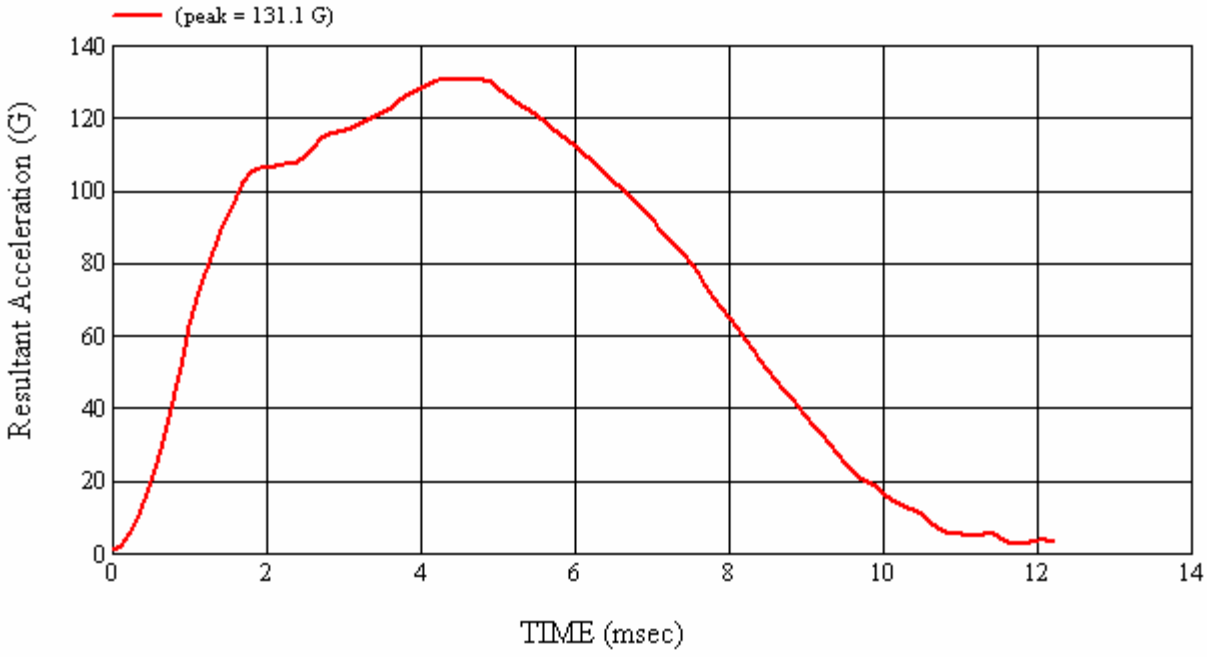
No visible damage.

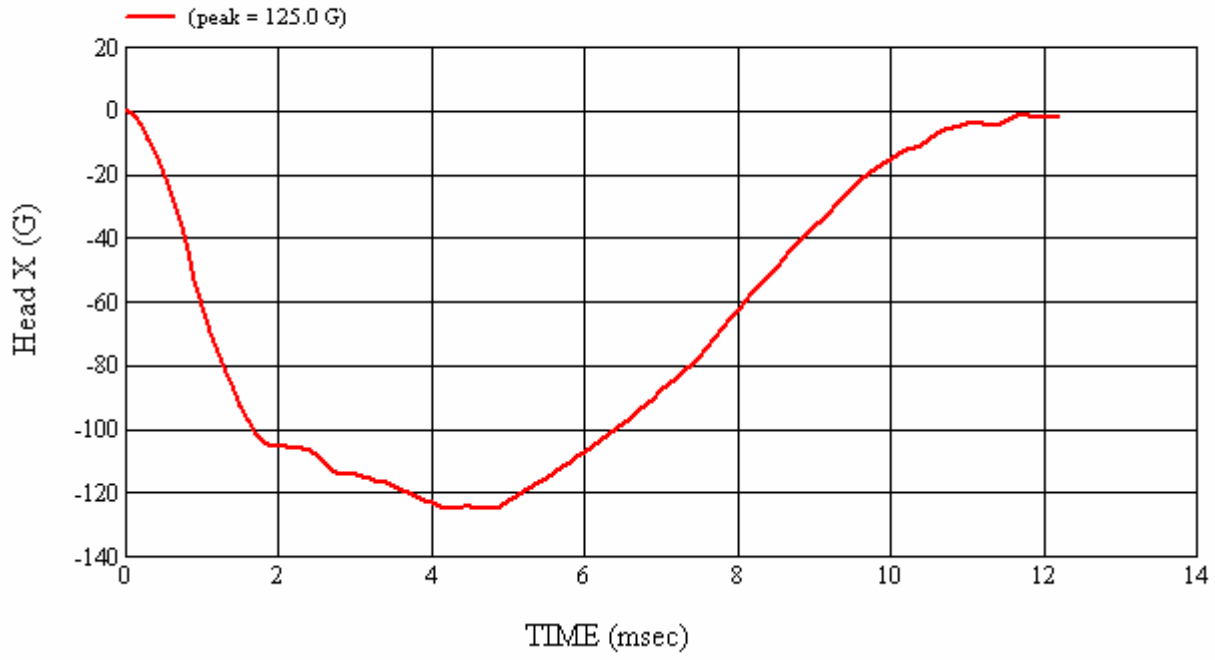
Recorded By: _____ Approved By*: _____ Date: 9/21/2007

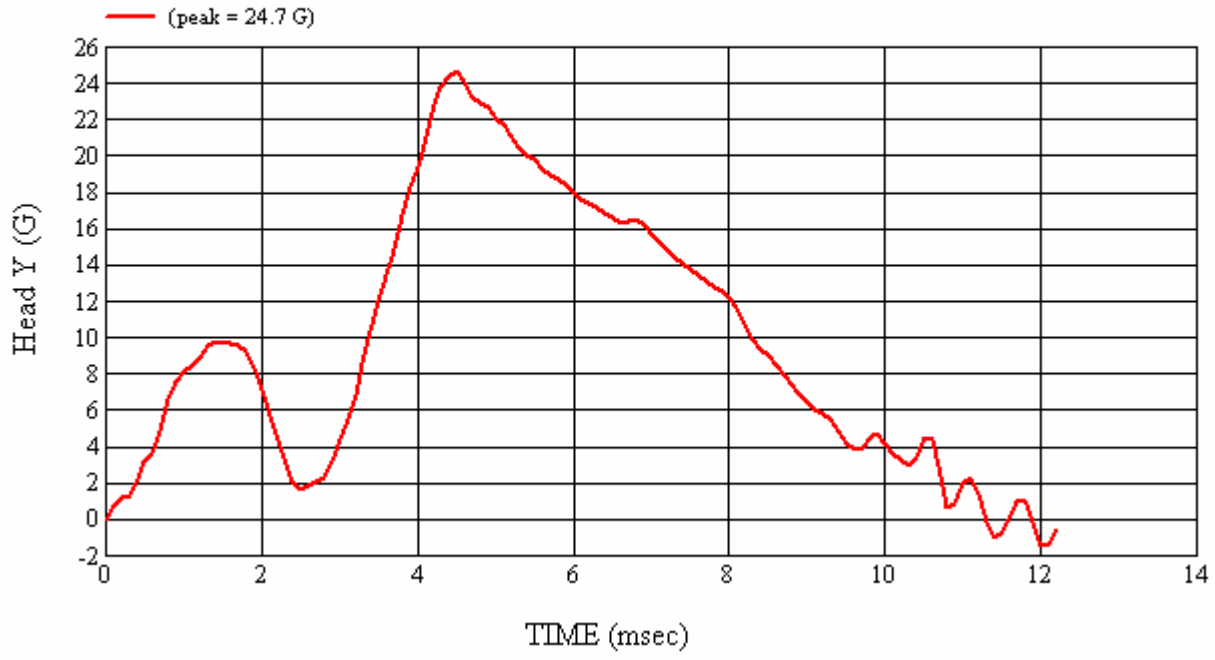
*Only necessary for NHTSA (Government) Compliance testing.

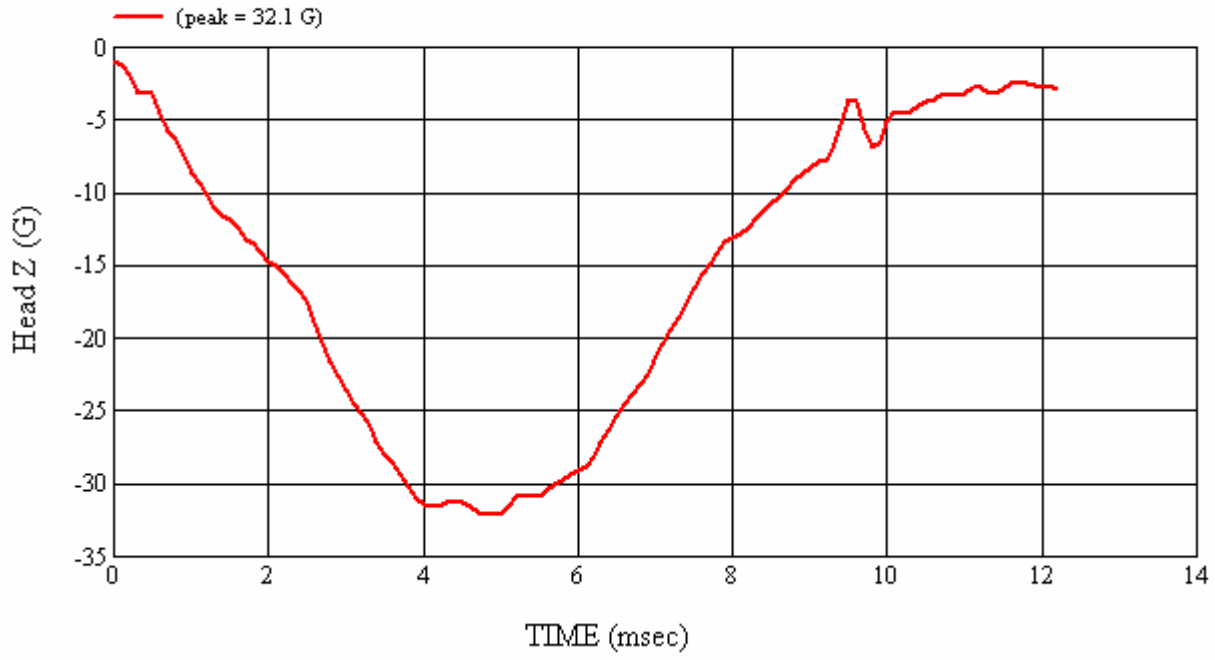
MGA Test #: FM7210 Target Location: SR1, Left Side Test Date: 9/21/2007

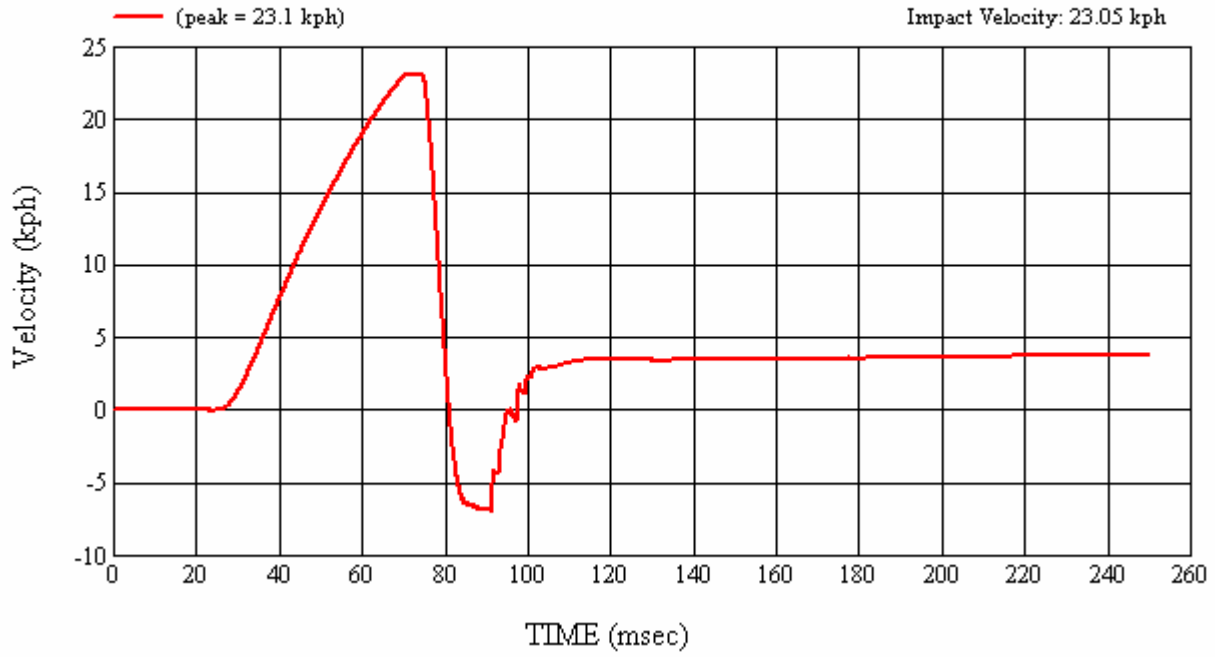


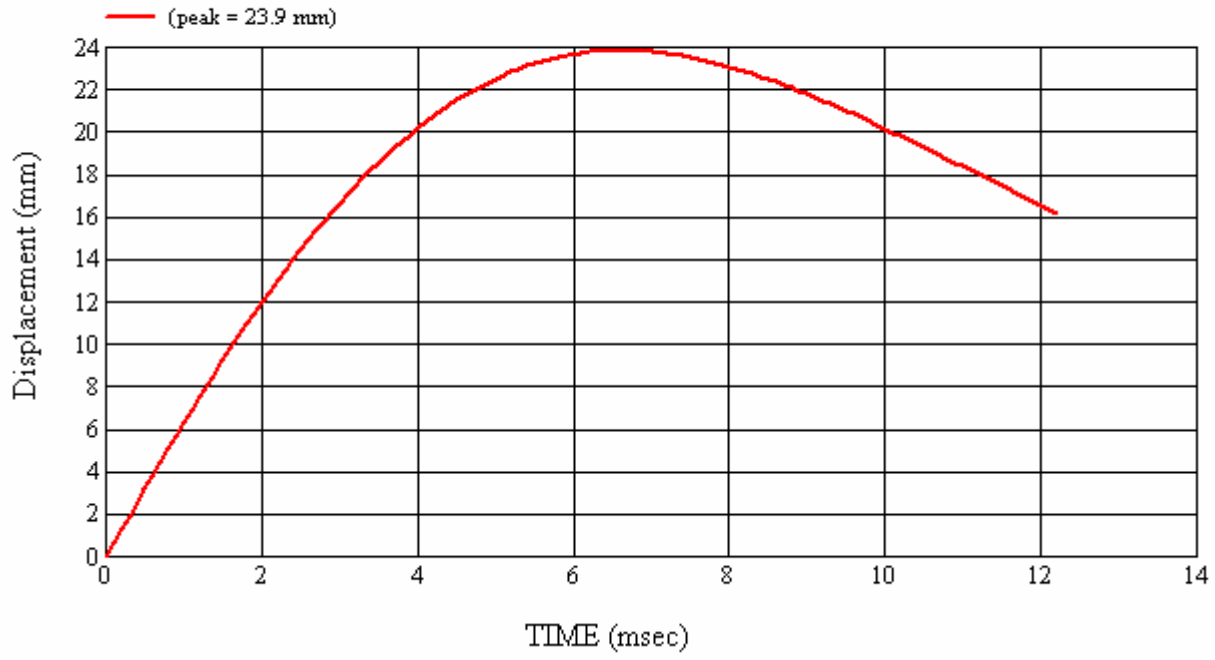



(peak = 125.0 G)
Head X (G)
20
0
-20
-40
-60
-80
-100
-120
-140
0
2
4
6
8
10
12
14
TIME (msec)


(peak = 24.7 G)
Head Y (G)
26
24
22
20
18
16
14
12
10
8
6
4
2
0
-2
0
2
4
6
8
10
12
14
TIME (msec)

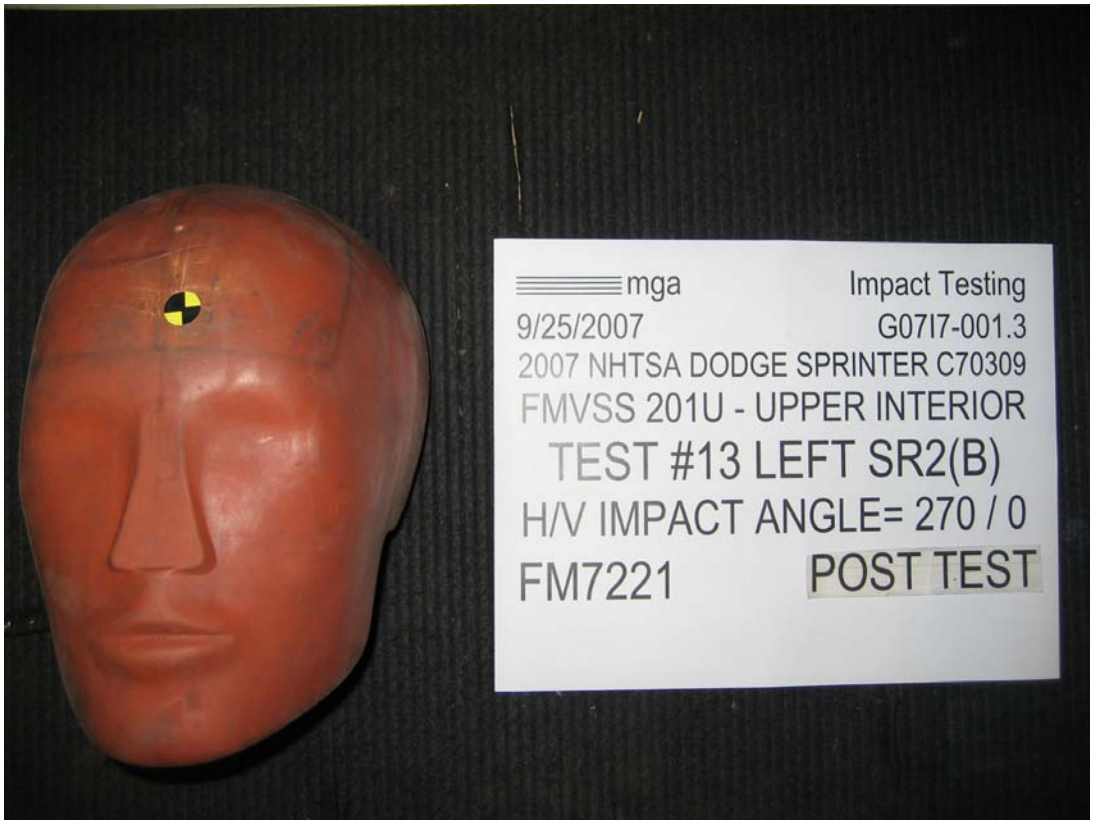

(peak = 32.1 G)
Head Z (G)
0
-5
-10
-15
-20
-25
-30
-35
0
2
4
6
8
10
12
14
TIME (msec)


(peak = 23.1 kph)
Impact Velocity: 23.05 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 = 23.9 mm)
Displacement (mm)
TIME (msec)
0
2
4
6
8
10
12
14
16
18
20
22
24


C70309
FM7221
LEFT SR2B
H/V 270/0
mga
9/25/2007
Impact Testing
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #13 LEFT SR2(B)
H/V IMPACT ANGLE= 270 / 0
FM7221
PRE TEST


C70309
FM7221
LEFT SR2B
H/V 270/0
mga
9/25/2007
Impact Testing
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #13 LEFT SR2(B)
H/V IMPACT ANGLE= 270 / 0
FM7221
POST TEST


mga
Impact Testing
9/25/2007
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #13 LEFT SR2(B)
H/V IMPACT ANGLE= 270 / 0
FM7221
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G07I7-001.3 VEHICLE YR/MAKE/MODEL:2007/NHTSA/Dodge Sprinter C70309

GENERAL TEST PARAMETERS:

Test Number:#13

Target (Vehicle Side): SR2B Left

Temperature:21C

MGA Test Reference No.:FM7221

Humidity:63%

Approach Horizontal Angles:270º

Time of Test:3:21:49 PM

Approach Vertical Angles:0º

FMH Serial No:[035]

Additional Description: 2 Relocations

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
336	225	13.5	23.5	12	8 Left

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J22664	-94.161	1.32	1.32
Y	6	J35919	97.442	1.89	1.89
Z	7	J35924	93.891	1.83	1.83

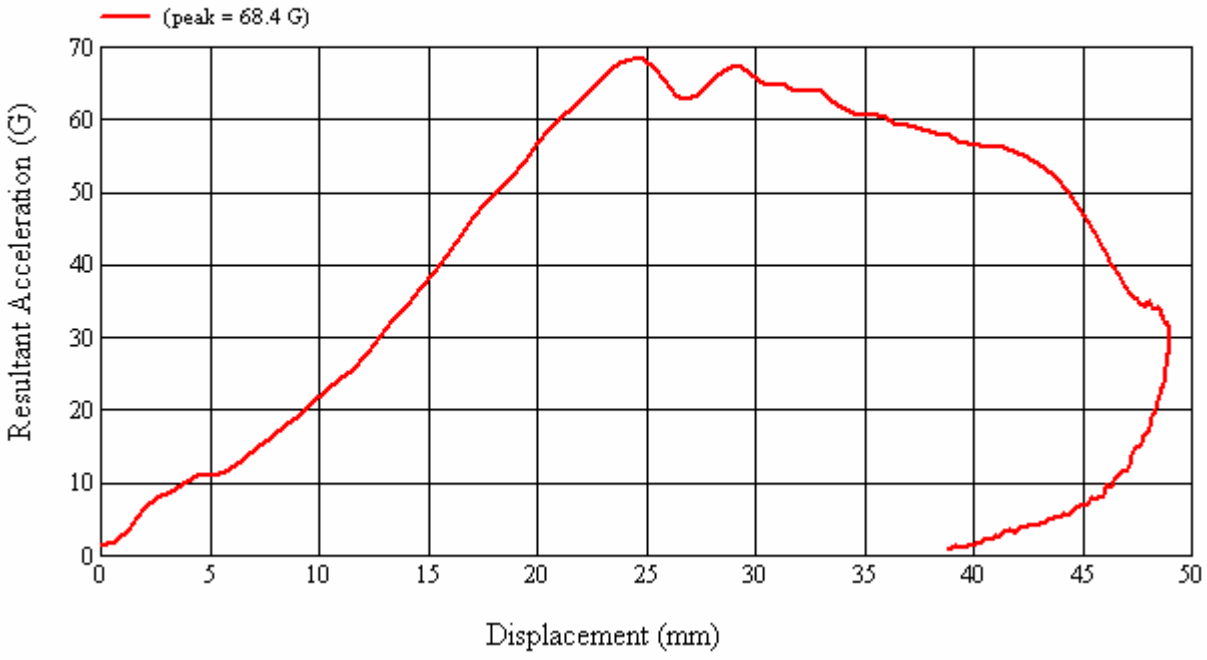
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

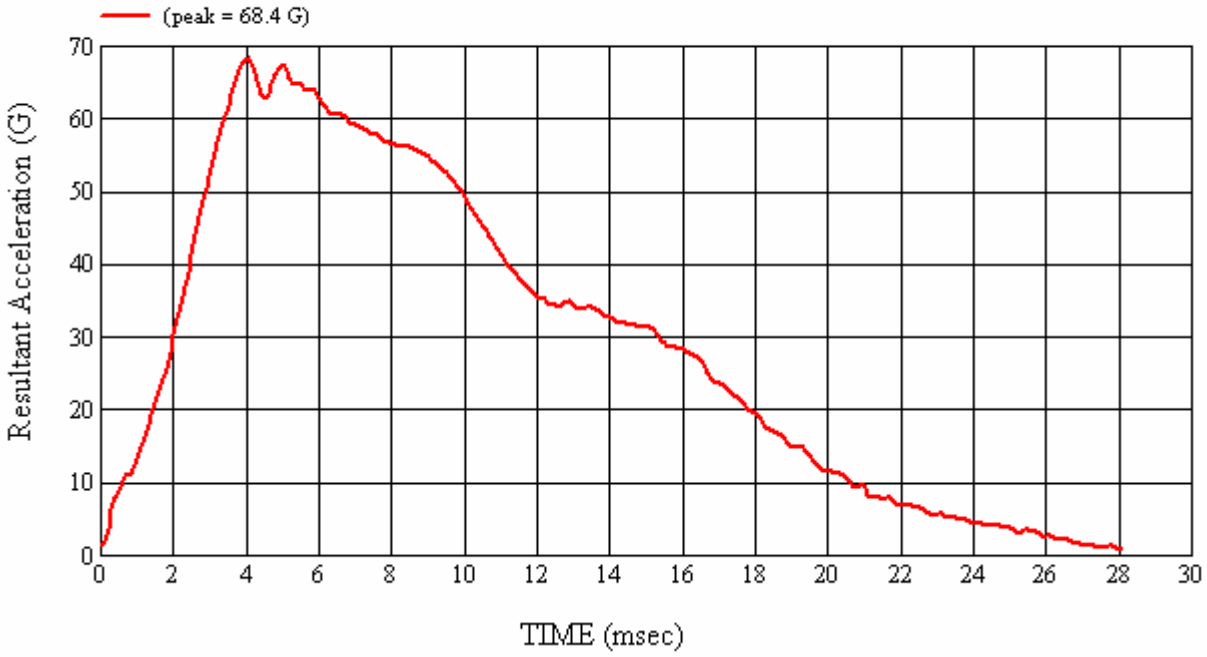
Headliner deformation.

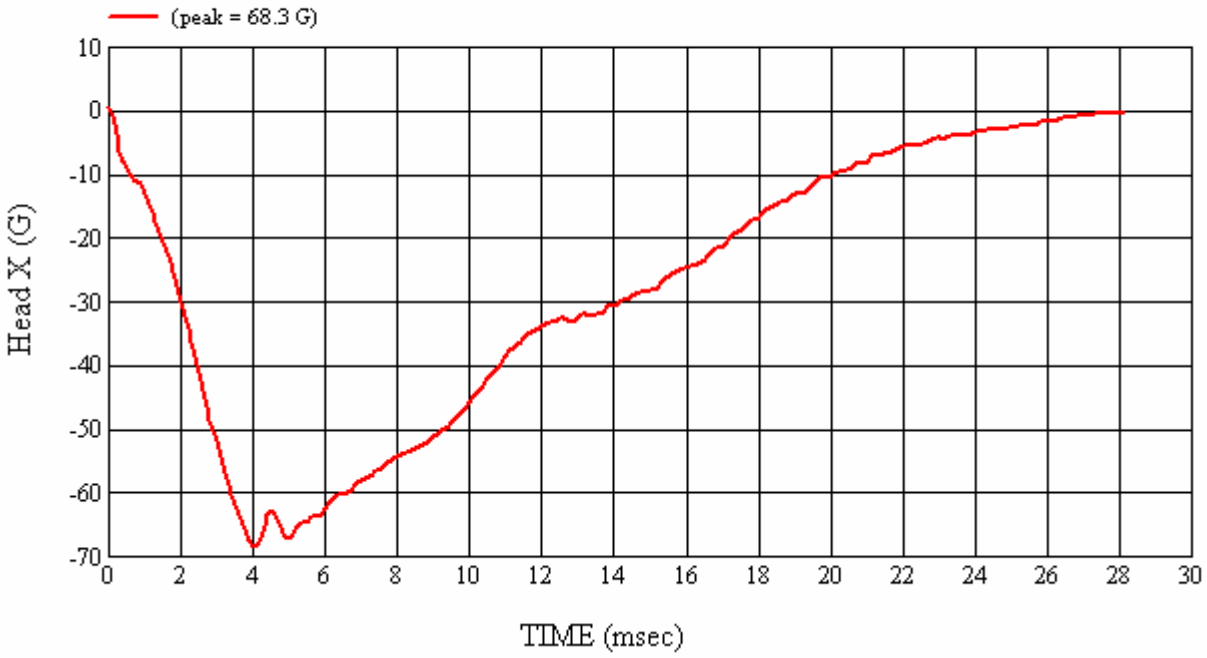
Recorded By: Travis Campbell Approved By*: Helen A. Kaleto Date: 9/25/2007

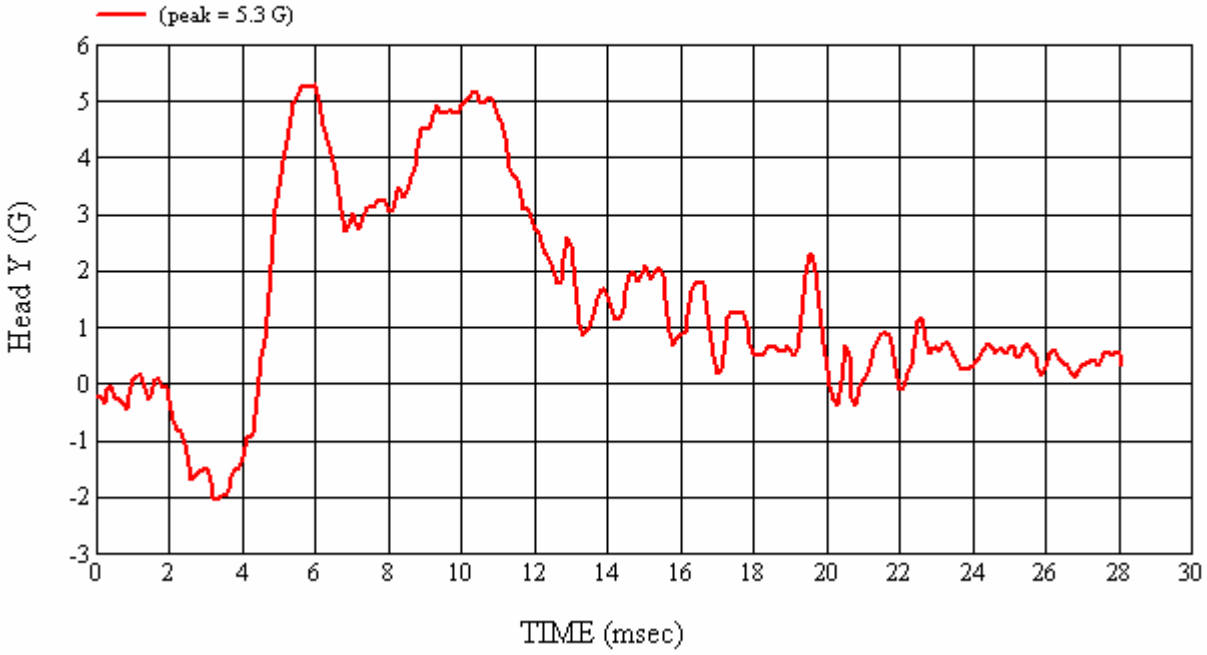
*Only necessary for NHTSA (Government) Compliance testing.

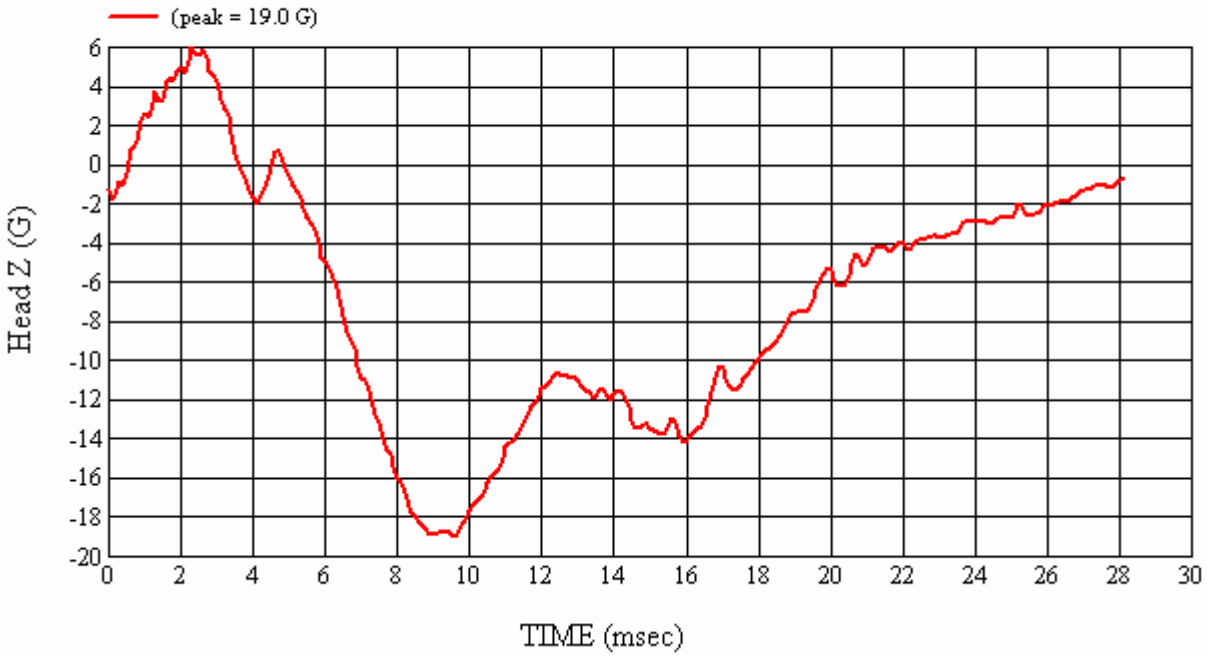
MGA Test #: FM7221 Target Location: SR2B, Left Side Test Date: 9/25/2007

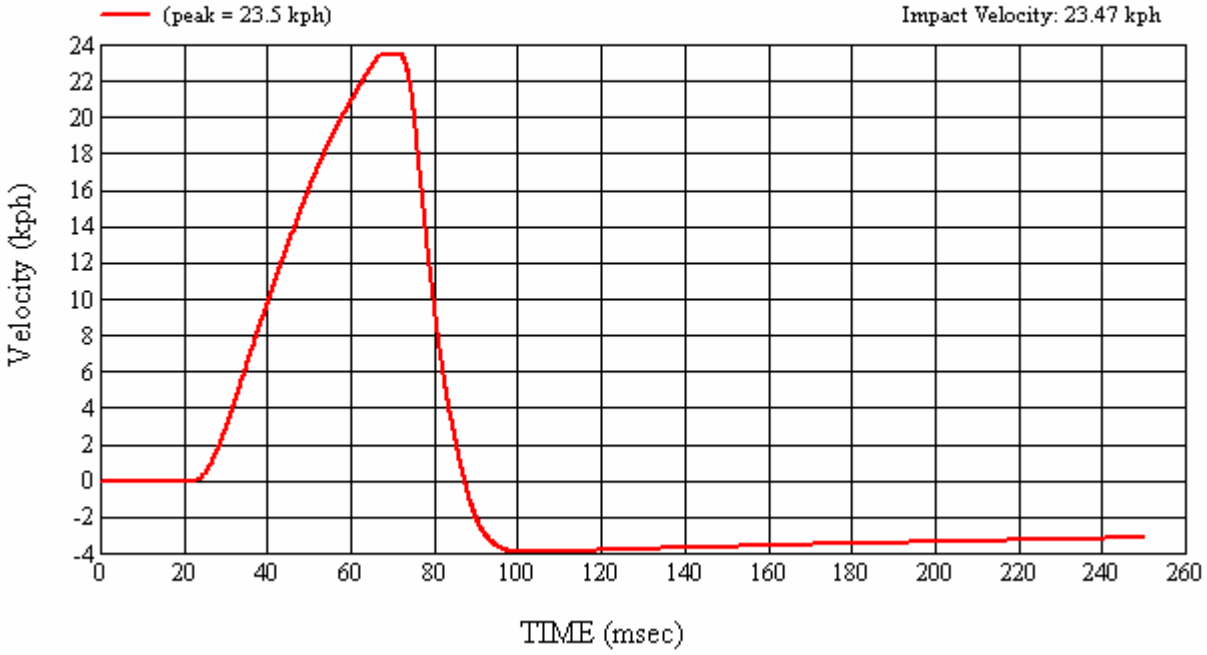


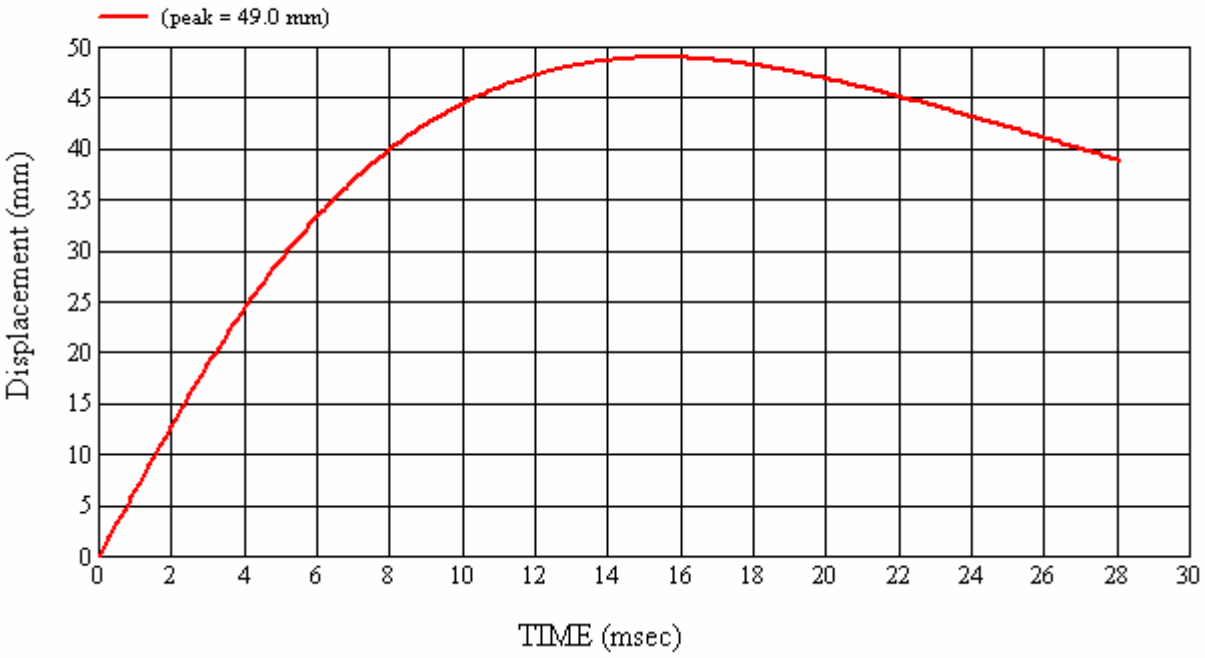



(peak = 68.3 G)
Head X (G)
10
0
-10
-20
-30
-40
-50
-60
-70
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
TIME (msec)

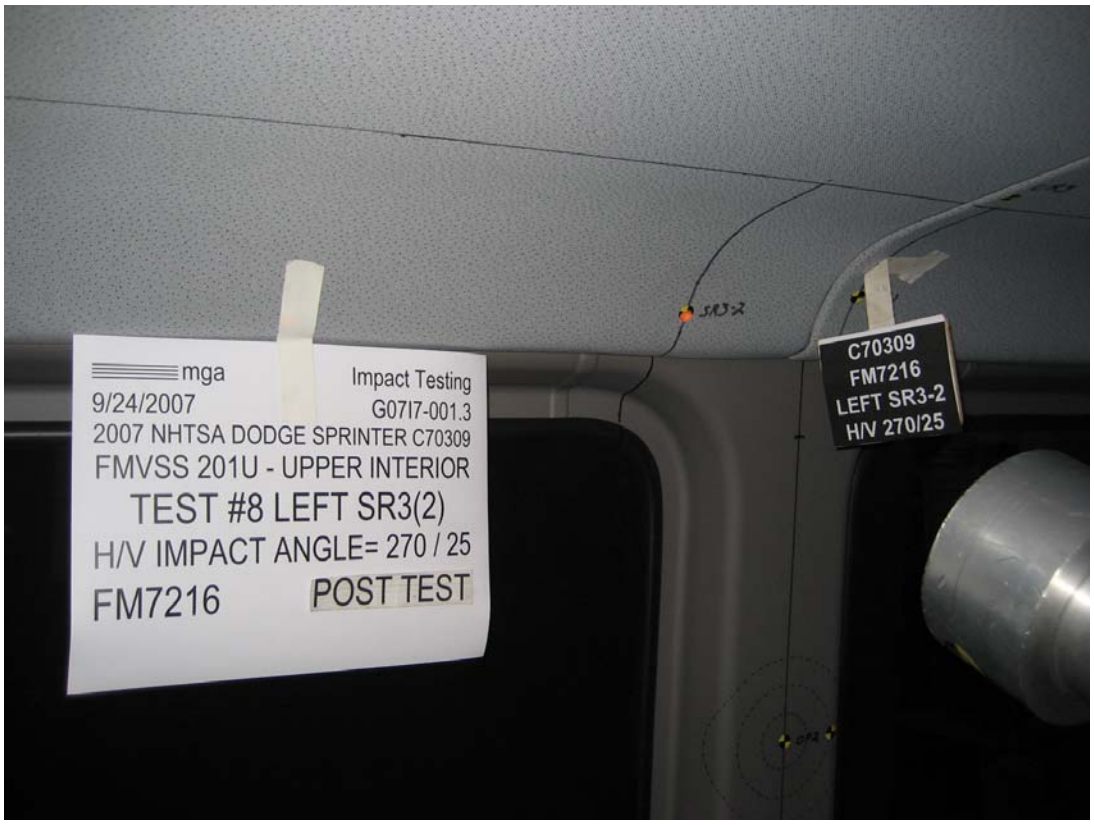

(peak = 5.3 G)
Head Y (G)
6
5
4
3
2
1
0
-1
-2
-3
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
TIME (msec)


(peak = 19.0 G)
Head Z (G)
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
TIME (msec)


(peak = 23.5 kph)
Impact Velocity: 23.47 kph
Velocity (kph)
24
22
20
18
16
14
12
10
8
6
4
2
0
-2
-4
0
20
40
60
80
100
120
140
160
180
200
220
240
260
TIME (msec)


(peak = 49.0 mm)
Displacement (mm)
0
5
10
15
20
25
30
35
40
45
50
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
TIME (msec)


mga
Impact Testing
9/24/2007
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #8 LEFT SR3(2)
H/V IMPACT ANGLE= 270 / 25
FM7216
PRE TEST


mga
Impact Testing
9/24/2007
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #8 LEFT SR3(2)
H/V IMPACT ANGLE= 270 / 25
FM7216
POST TEST
C70309
FM7216
LEFT SR3-2
H/V 270/25


mga
Impact Testing
9/24/2007
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #8 LEFT SR3(2)
H/V IMPACT ANGLE= 270 / 25
FM7216
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G07I7-001.3 VEHICLE YR/MAKE/MODEL:2007/NHTSA/Dodge Sprinter C70309

GENERAL TEST PARAMETERS:

Test Number:#8

Target (Vehicle Side): SR3-2 Left

Temperature:21C

MGA Test Reference No.:FM7216

Humidity:54%

Approach Horizontal Angles:270º

Time of Test:3:47:38 PM

Approach Vertical Angles:25º

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
638	625	4.4	23.3	18	3 Left

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J22696	-100.013	1.33	1.32
Y	6	J35791	91.856	1.92	1.89
Z	7	J35800	97.996	1.83	1.83

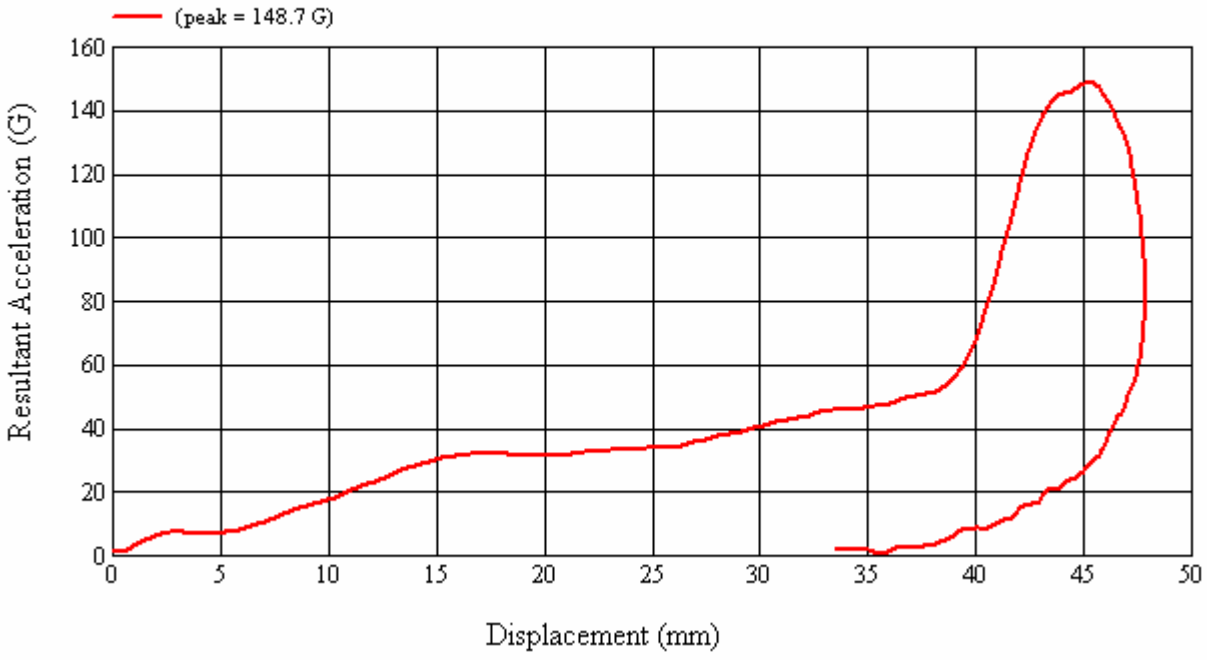
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

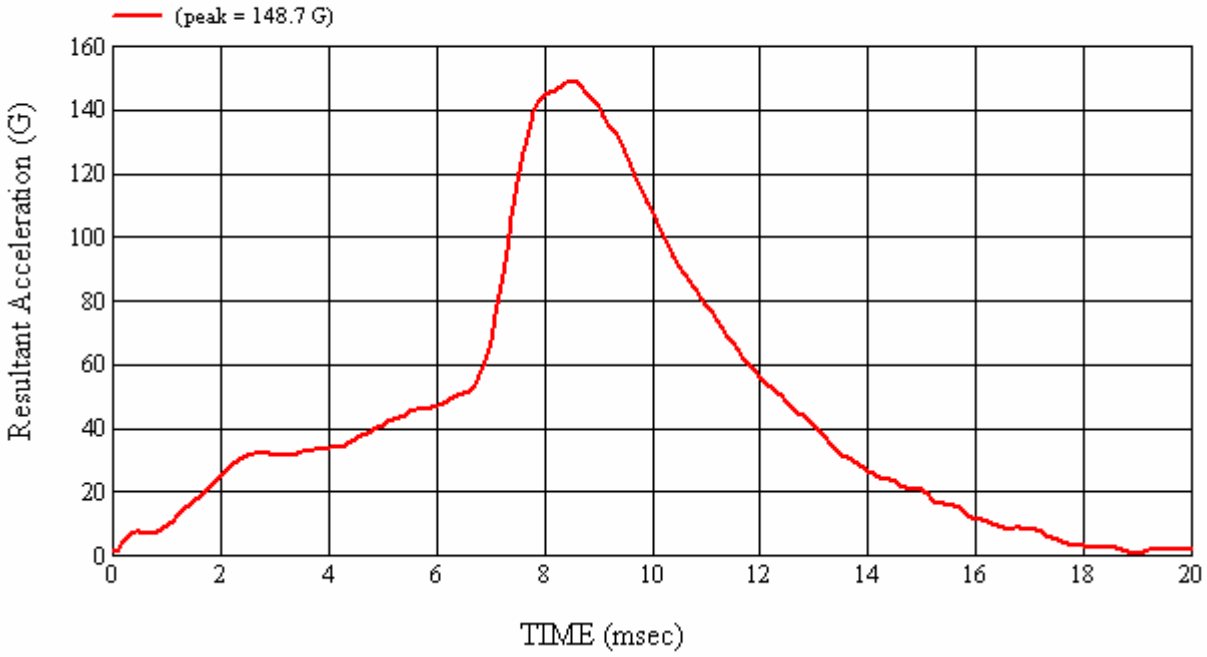
Slight headliner deformation.

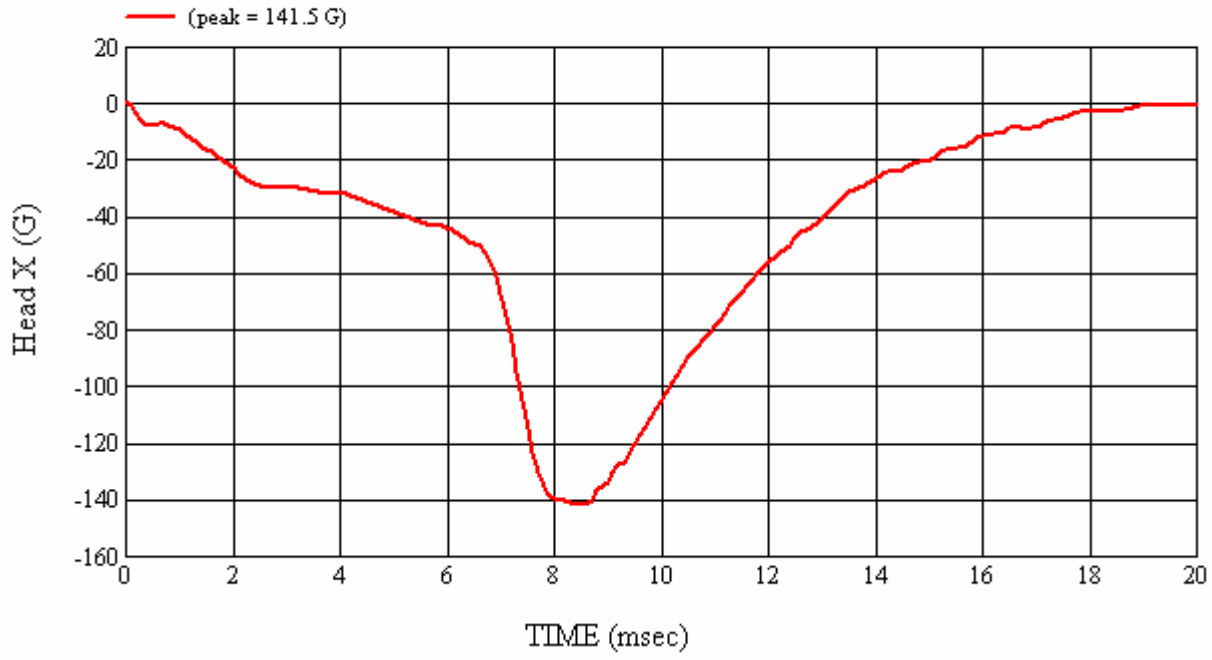
Recorded By: _____ Approved By*: _____ Date: 9/24/2007

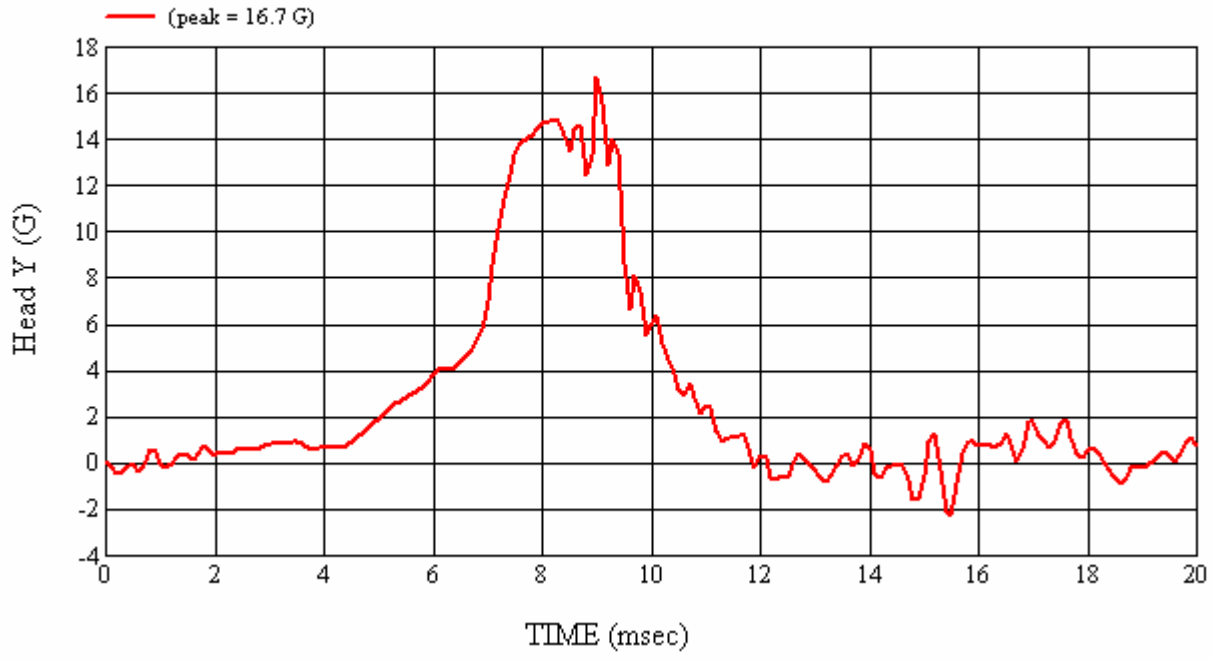
*Only necessary for NHTSA (Government) Compliance testing.

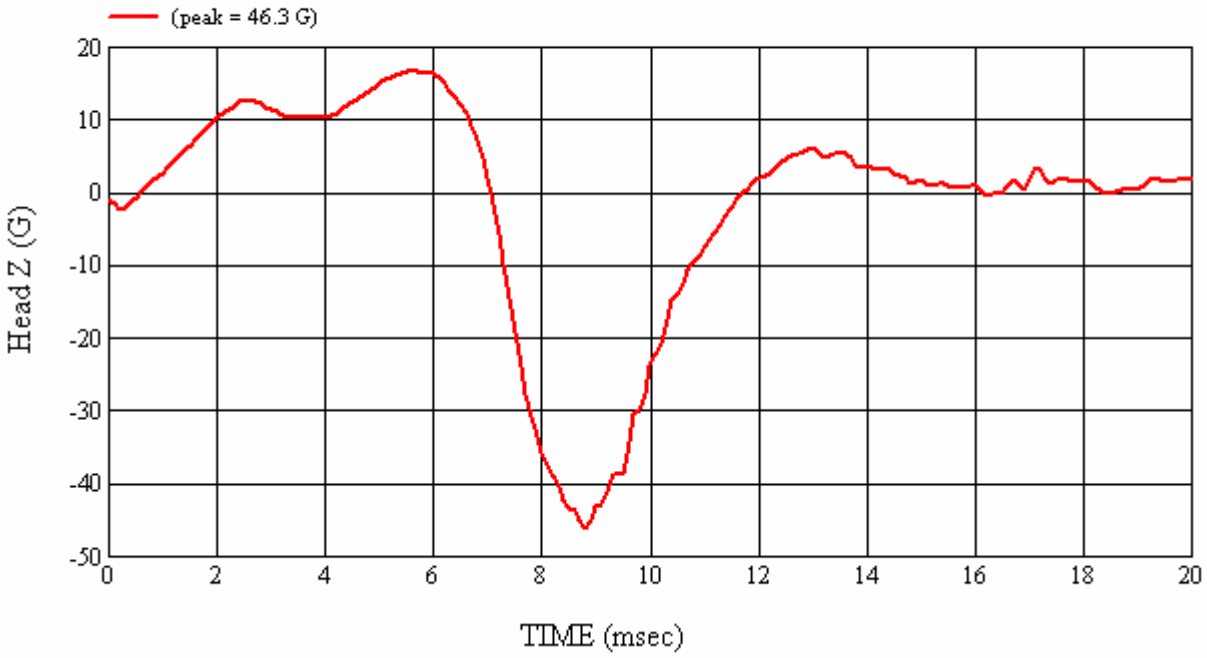
MGA Test #: FM7216 Target Location: SR3-2, Left Side Test Date: 9/24/2007

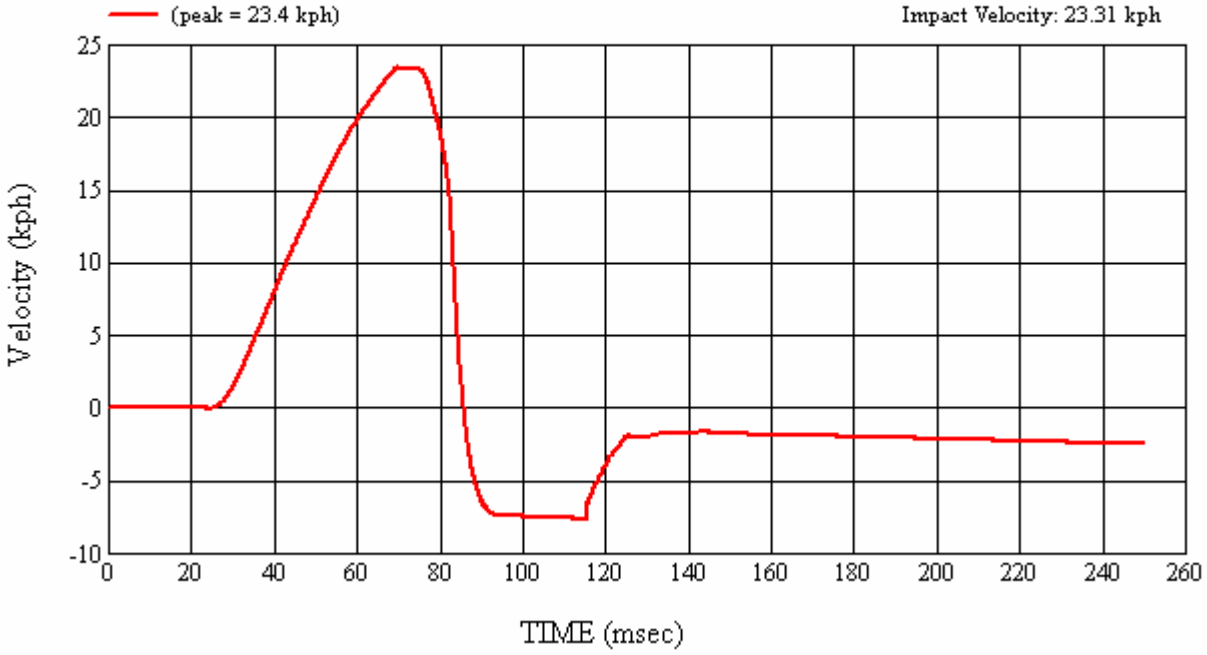


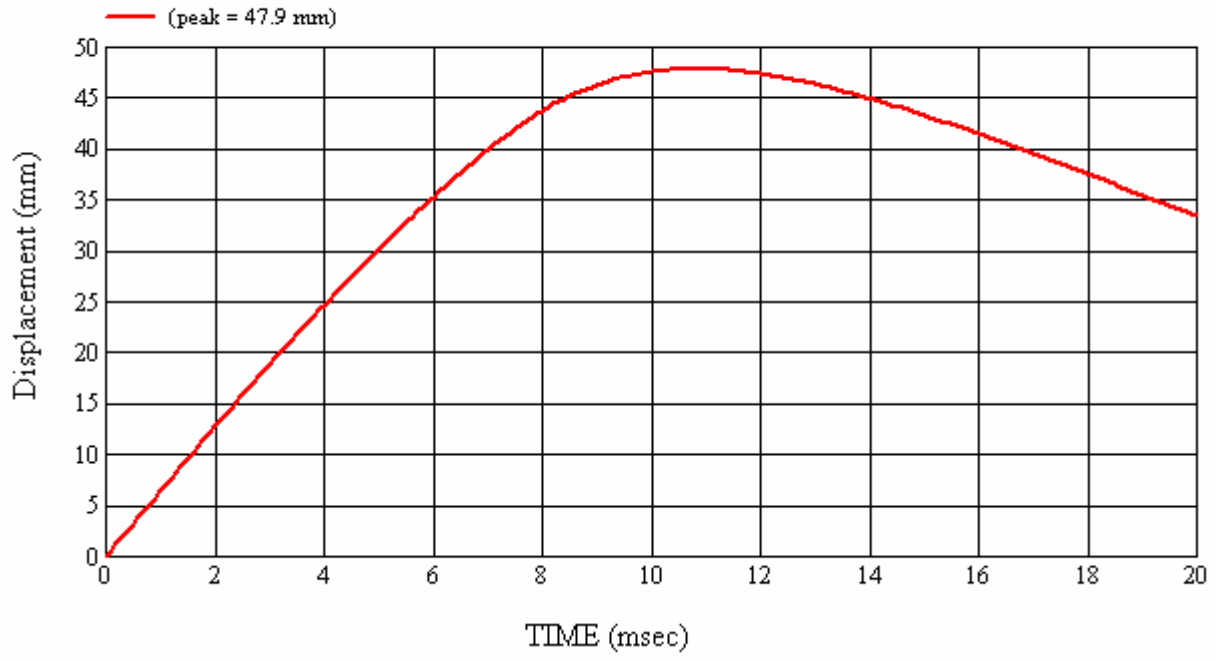



(peak = 141.5 G)
Head X (G)
20
0
-20
-40
-60
-80
-100
-120
-140
-160
0
2
4
6
8
10
12
14
16
18
20
TIME (msec)


(peak = 16.7 G)
Head Y (G)
18
16
14
12
10
8
6
4
2
0
-2
-4
0
2
4
6
8
10
12
14
16
18
20
TIME (msec)


(peak = 46.3 G)
Head Z (G)
20
10
0
-10
-20
-30
-40
-50
0
2
4
6
8
10
12
14
16
18
20
TIME (msec)


(peak = 23.4 kph)
Impact Velocity: 23.31 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 = 47.9 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)


C70309
FM7213
LEFT UR1@BP1
H/V 270/50
mga
Impact Testing
9/24/2007
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #5 LEFT UR1
H/V IMPACT ANGLE= 270 / 50
FM7213
PRE TEST


C70309
FM7213
LEFT UR1@BP
H/V 270/50
mga
9/24/2007
Impact Testing
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #5 LEFT UR1
H/V IMPACT ANGLE= 270 / 50
FM7213
POST TEST


mga
Impact Testing
9/24/2007
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #5 LEFT UR1
H/V IMPACT ANGLE= 270 / 50
FM7213
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G07I7-001.3 VEHICLE YR/MAKE/MODEL:2007/NHTSA/Dodge Sprinter C70309

GENERAL TEST PARAMETERS:

Test Number:#5

Target (Vehicle Side): UR1 Left

Temperature:21C

MGA Test Reference No.:FM7213

Humidity:47%

Approach Horizontal Angles:270º

Time of Test:11:02:27 AM

Approach Vertical Angles:50º

FMH Serial No:[037]

Additional Description: @ BP1

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
375	277	8.4	23.4	32	6 Right

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J22696	-100.013	1.33	1.33
Y	6	J35791	91.856	1.91	1.89
Z	7	J35800	97.996	1.84	1.83

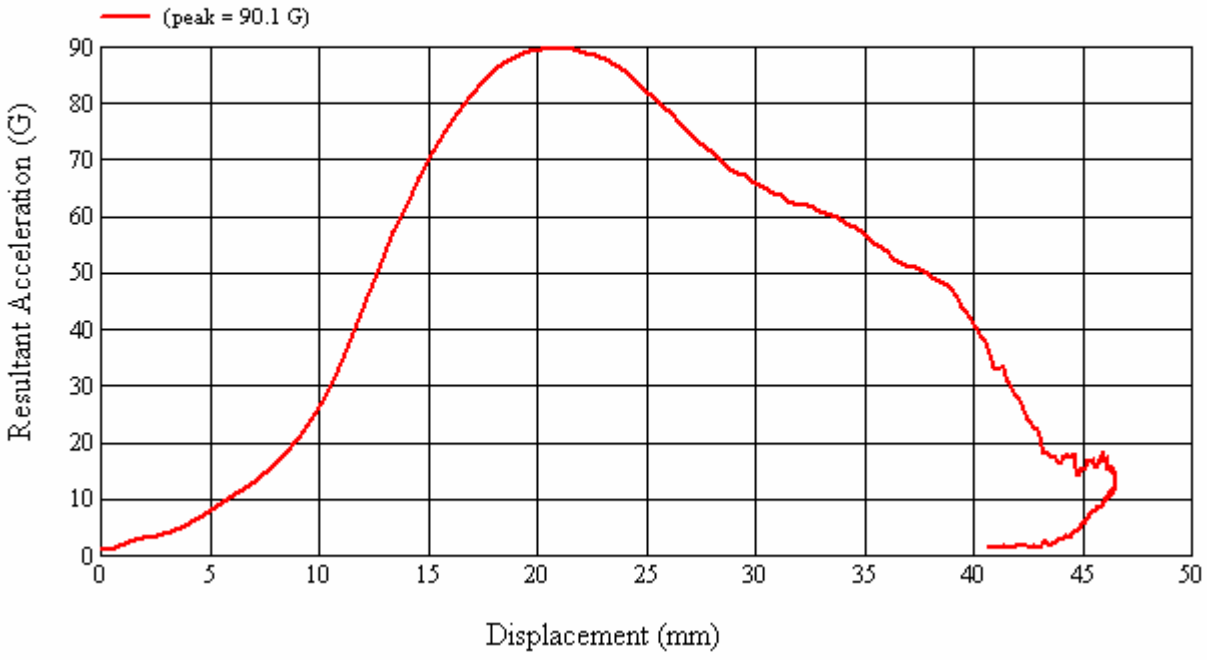
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

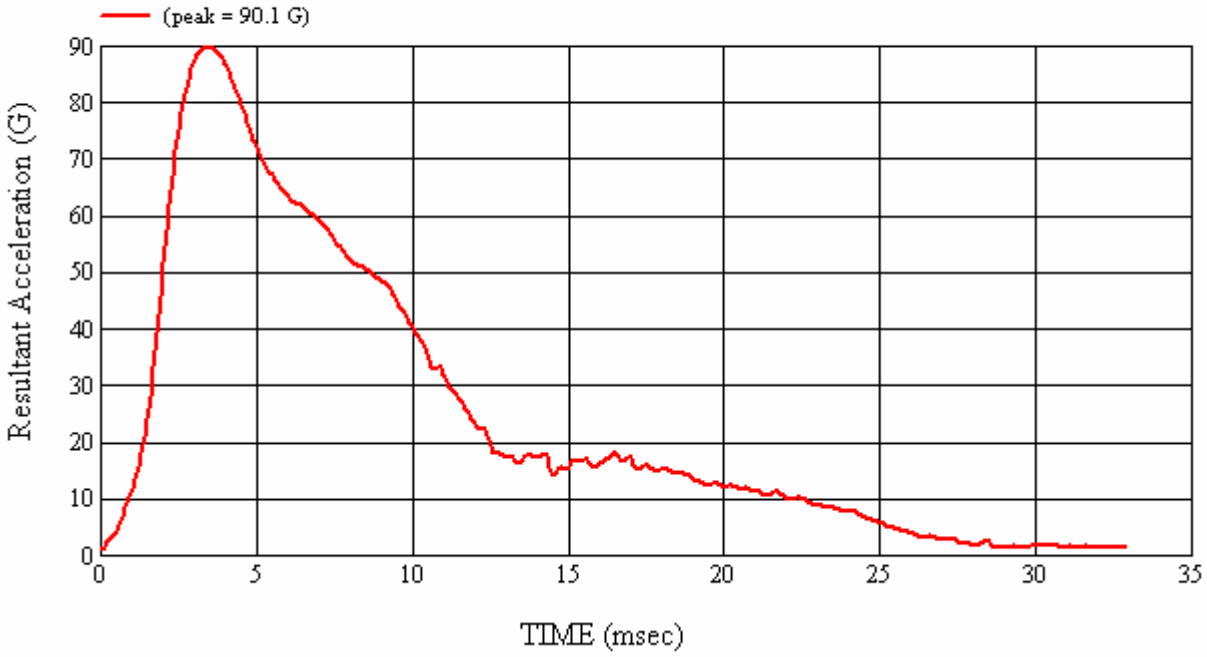
No visible damage.

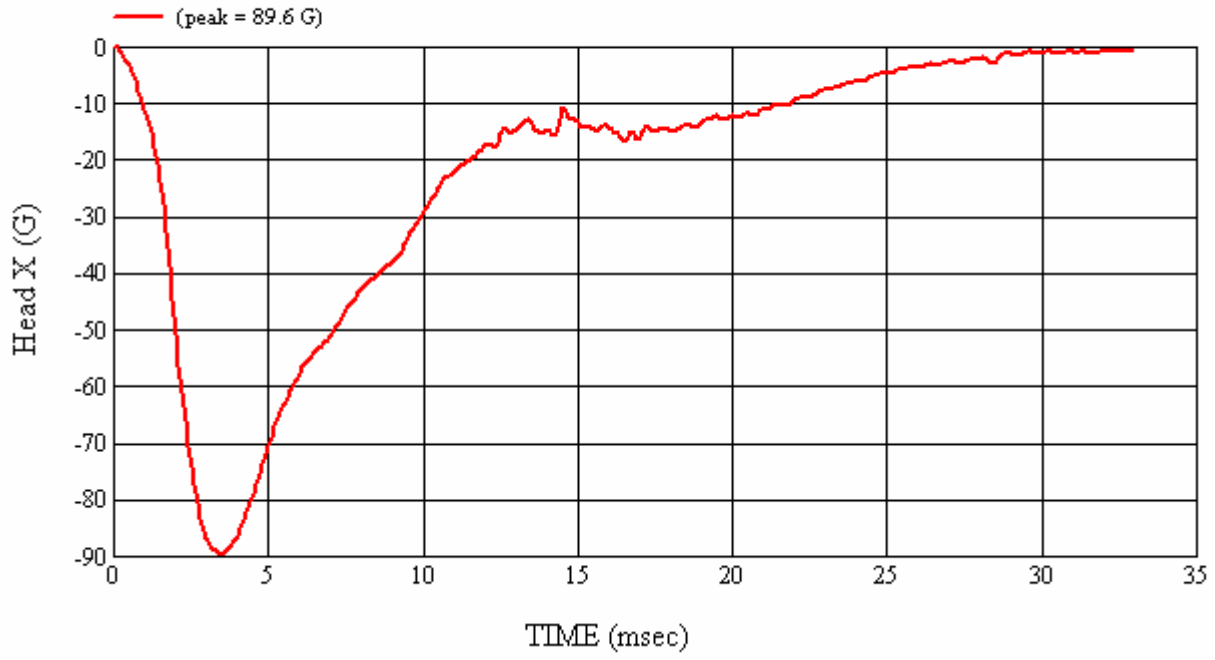
Recorded By: _____ Approved By*: _____ Date: 9/24/2007

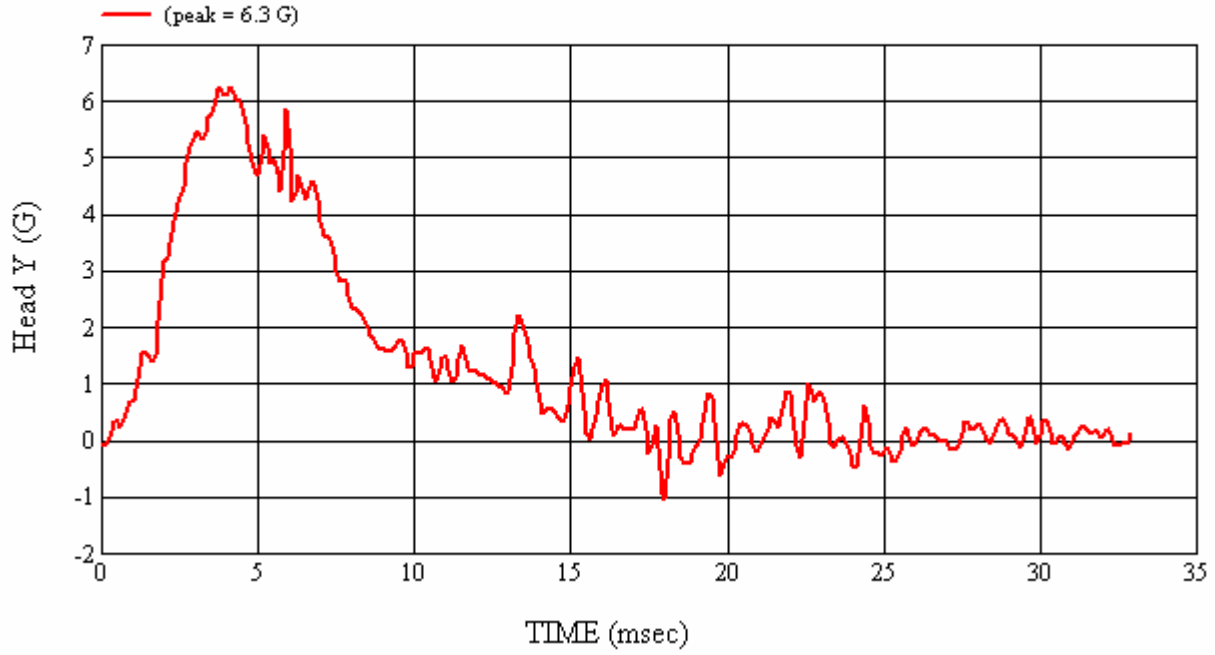
*Only necessary for NHTSA (Government) Compliance testing.

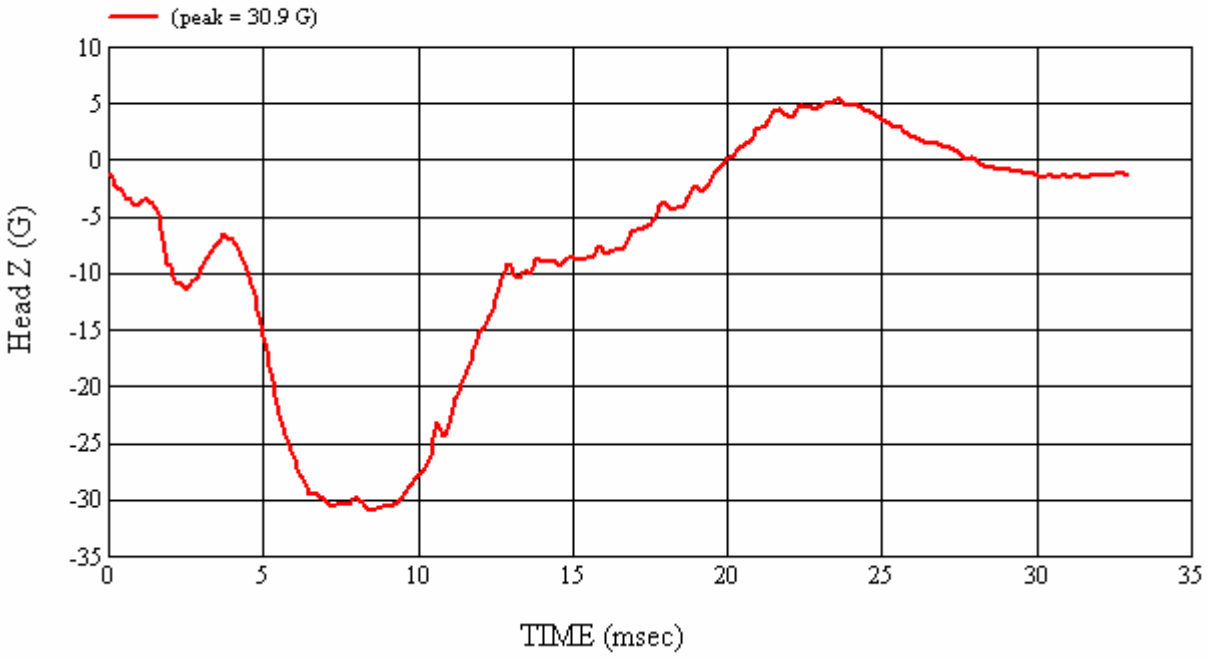
MGA Test #: FM7213 Target Location: UR1, Left Side Test Date: 9/24/2007

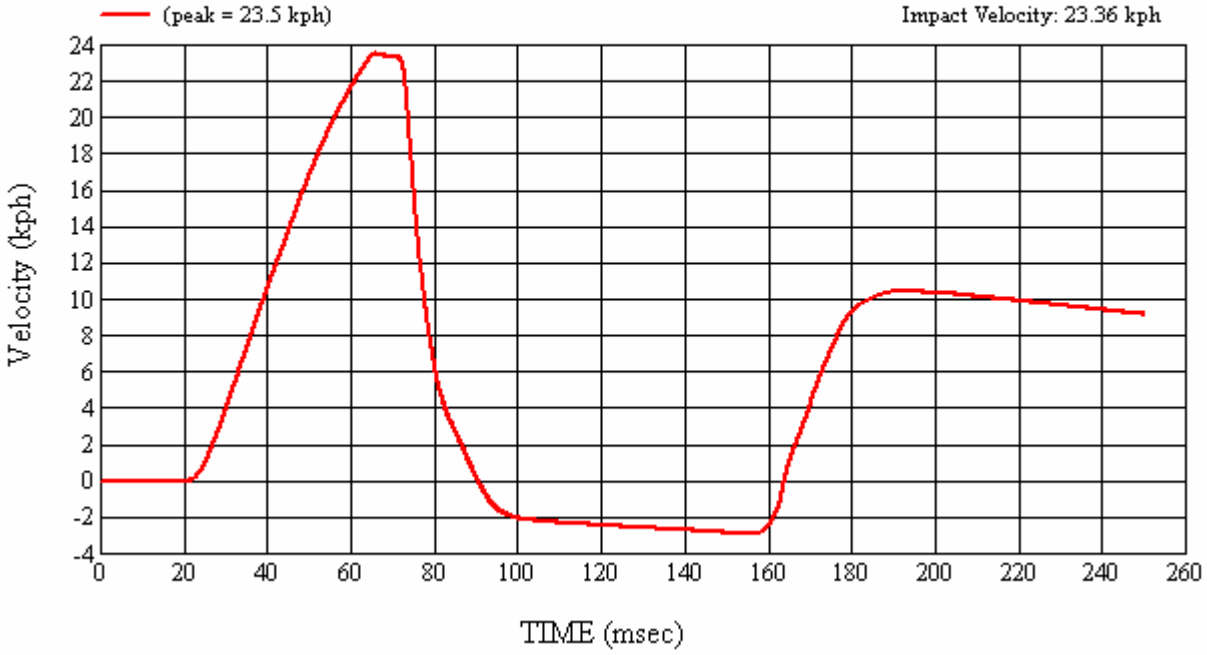


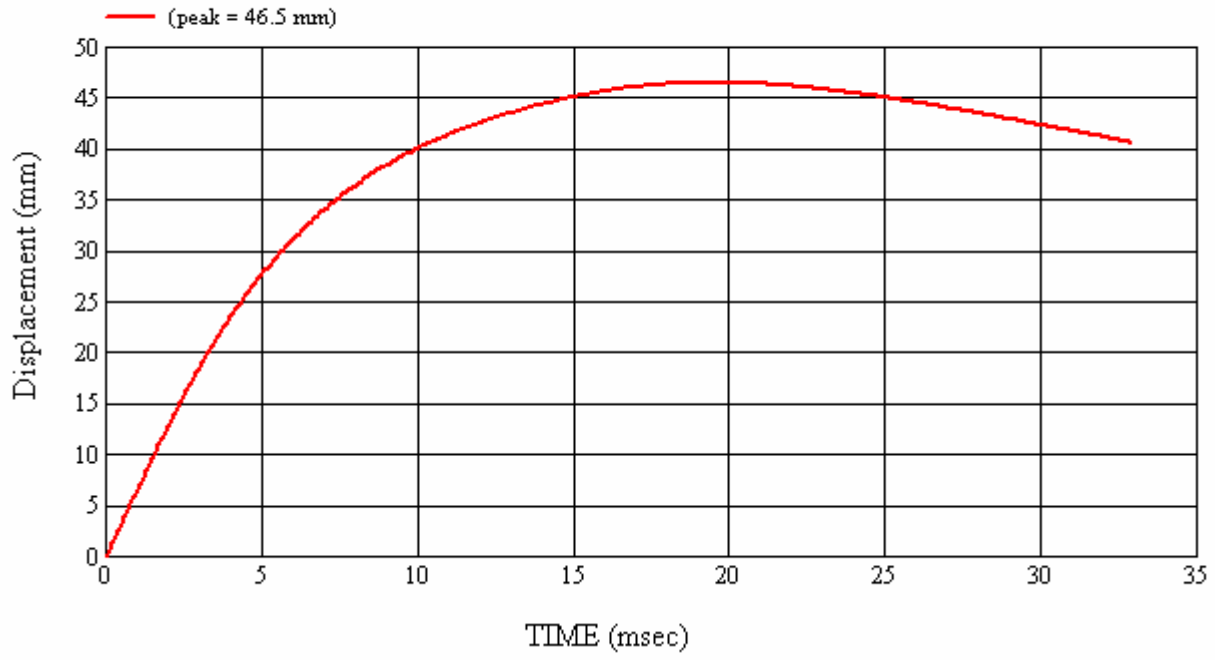


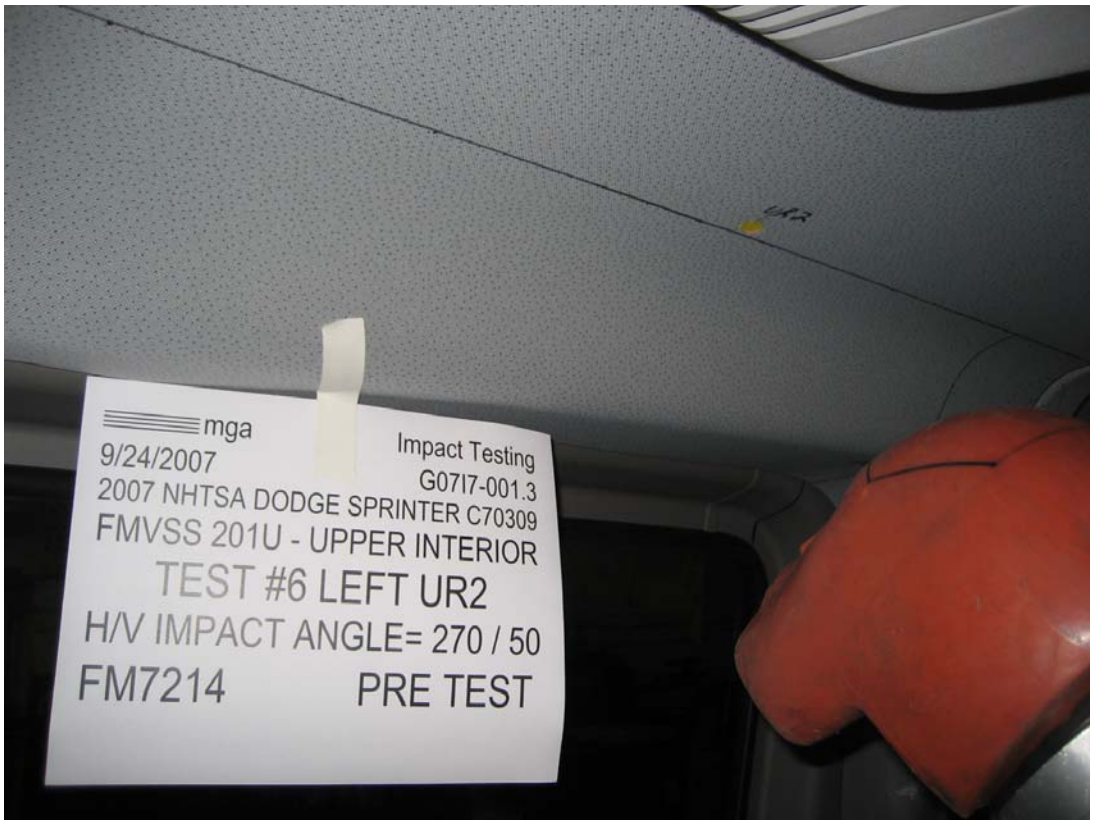

(peak = 89.6 G)
Head X (G)
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
0
5
10
15
20
25
30
35
TIME (msec)

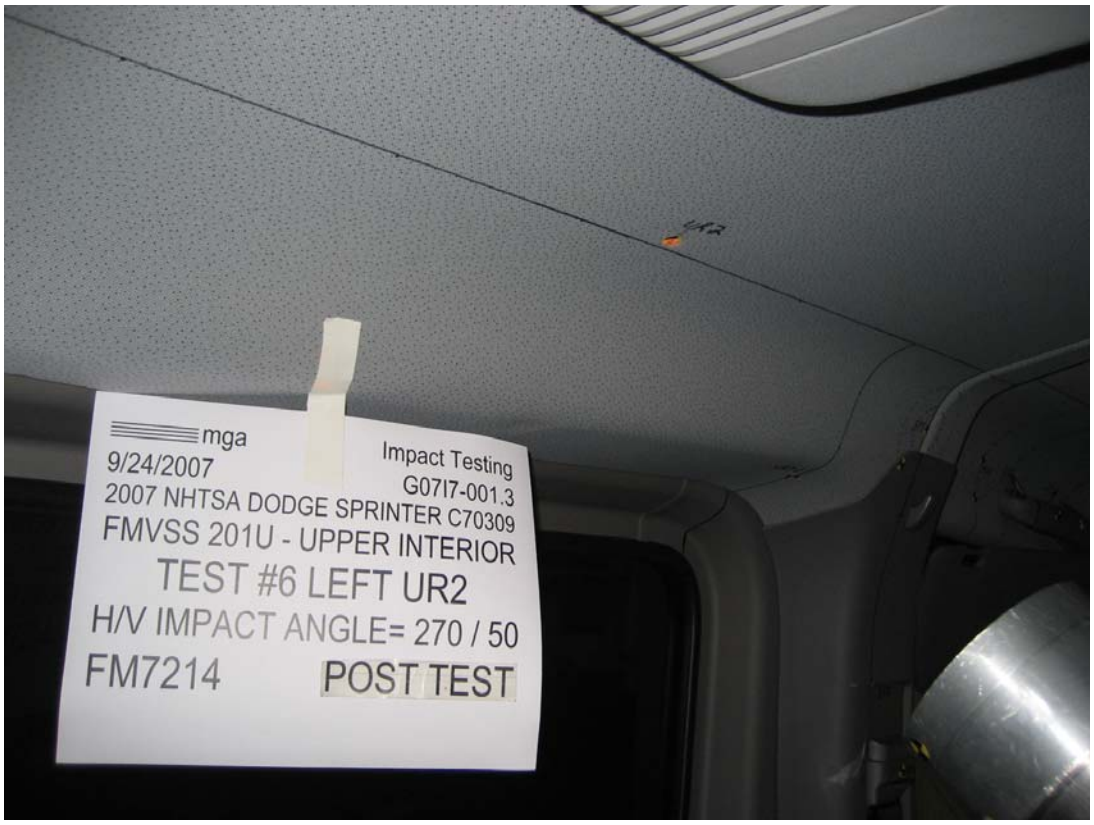

(peak = 6.3 G)
Head Y (G)
7
6
5
4
3
2
1
0
-1
-2
0
5
10
15
20
25
30
35
TIME (msec)


(peak = 30.9 G)
Head Z (G)
10
5
0
-5
-10
-15
-20
-25
-30
-35
0
5
10
15
20
25
30
35
TIME (msec)


(peak = 23.5 kph)
Impact Velocity: 23.36 kph
Velocity (kph)
24
22
20
18
16
14
12
10
8
6
4
2
0
-2
-4
0
20
40
60
80
100
120
140
160
180
200
220
240
260
TIME (msec)


(peak = 46.5 mm)
Displacement (mm)
TIME (msec)
0
5
10
15
20
25
30
35
40
45
50


mga
9/24/2007
Impact Testing
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #6 LEFT UR2
H/V IMPACT ANGLE= 270 / 50
FM7214
PRE TEST


mga
Impact Testing
9/24/2007
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #6 LEFT UR2
H/V IMPACT ANGLE= 270 / 50
FM7214
POST TEST


mga
Impact Testing
9/24/2007
G07I7-001.3
2007 NHTSA DODGE SPRINTER C70309
FMVSS 201U - UPPER INTERIOR
TEST #6 LEFT UR2
H/V IMPACT ANGLE= 270 / 50
FM7214
POST TEST

SUMMARY OF FMVSS 201U TEST

JOB/NHTSA NO: G07I7-001.3 VEHICLE YR/MAKE/MODEL:2007/NHTSA/Dodge Sprinter C70309

GENERAL TEST PARAMETERS:

Target (Vehicle Side): UR2 Left

MGA Test Reference No.:FM7214

Approach Horizontal Angles:270º

Approach Vertical Angles:50º

Additional Description: @ Rear of SR3-1

Test Number:#6

Temperature:21C

Humidity:48%

Time of Test:11:44:27 AM

FMH Serial No:[038]

TEST RESULTS:

HIC(d)	HIC	Δt (msec)	Velocity (kph)	Impact location on FMH (mm)	
				Above Pt. O	Left/Right Pt. O
527	478	6	23.5	38	0

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

Axis	Channel	Serial No.	DLR Value	ΔV Pre-Test	ΔV Post-Test
X	5	J14103	-94.598	1.32	1.32
Y	6	J36197	110.692	1.85	1.89
Z	7	J36353	99.391	1.83	1.83

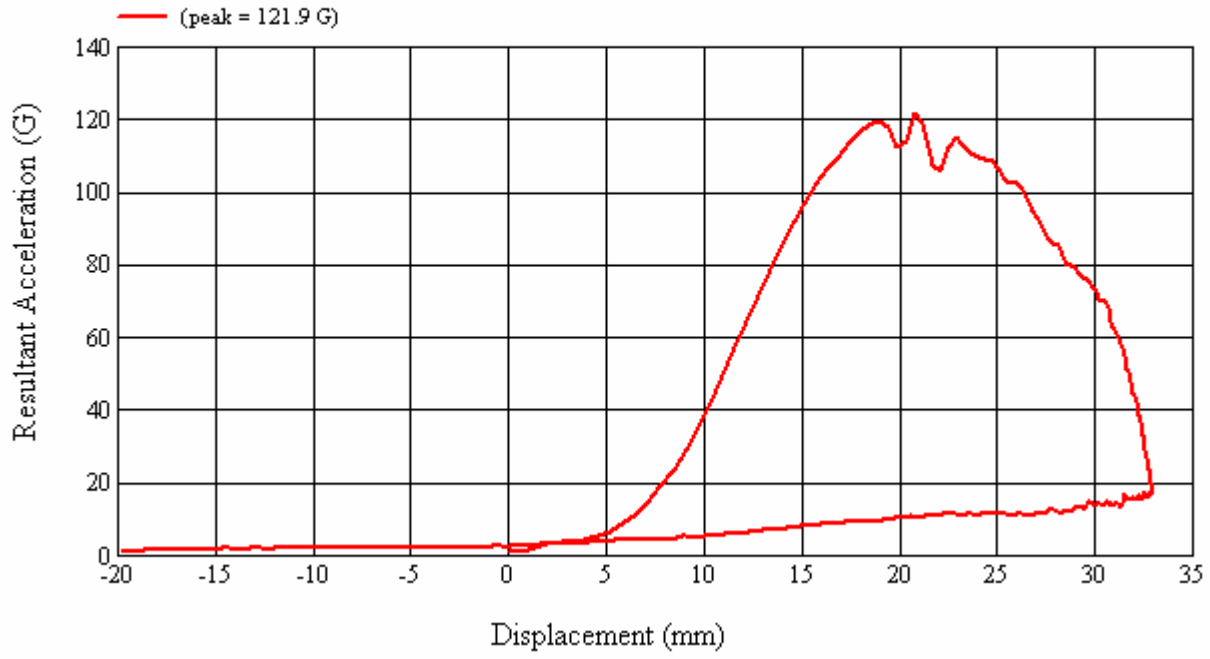
REMARKS (Summary of test, damage, non-compliance, invalid test, etc.):

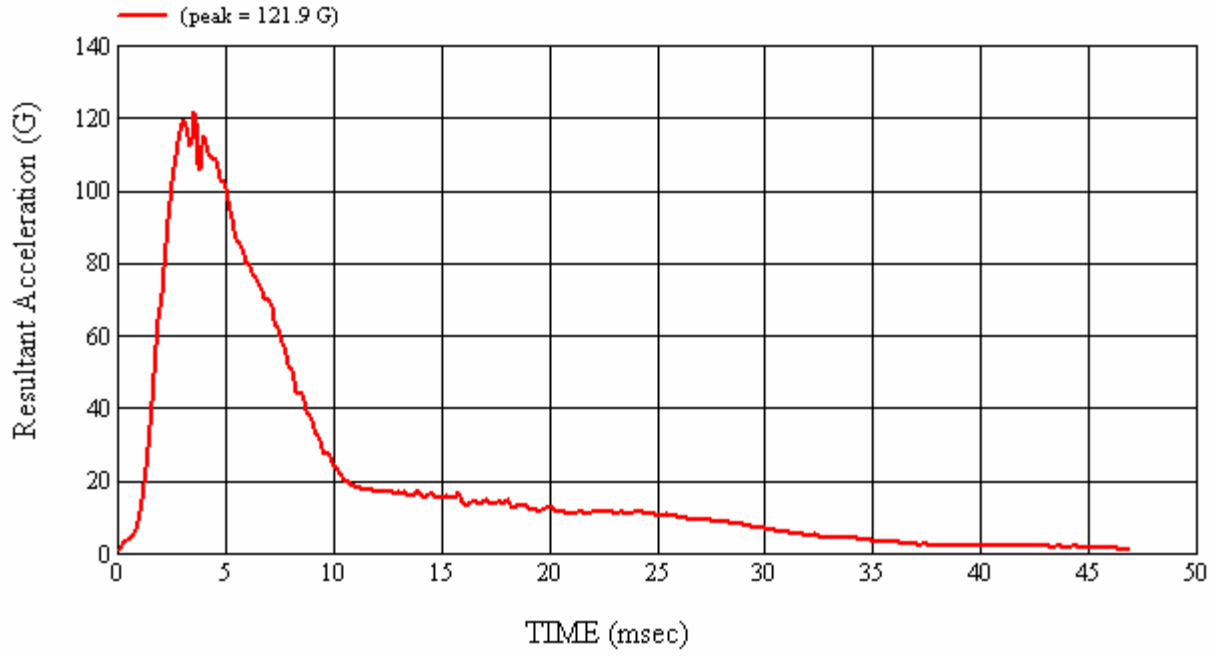
No visible damage.

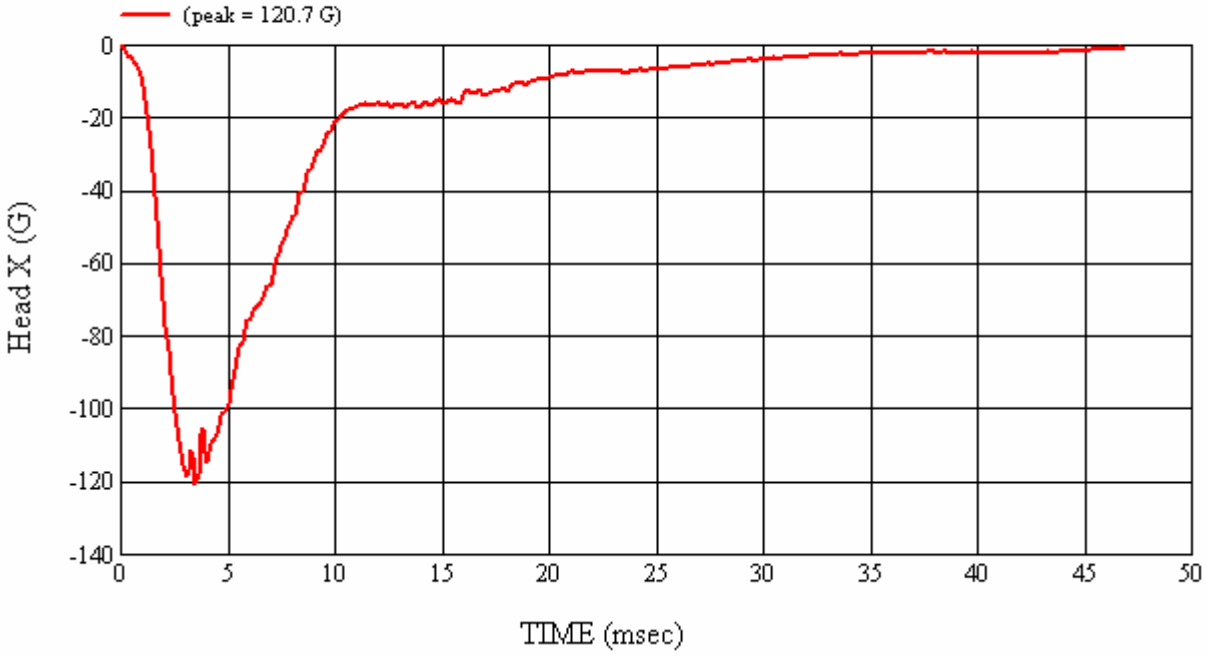
Recorded By: _____ Approved By*: _____ Date: 9/24/2007

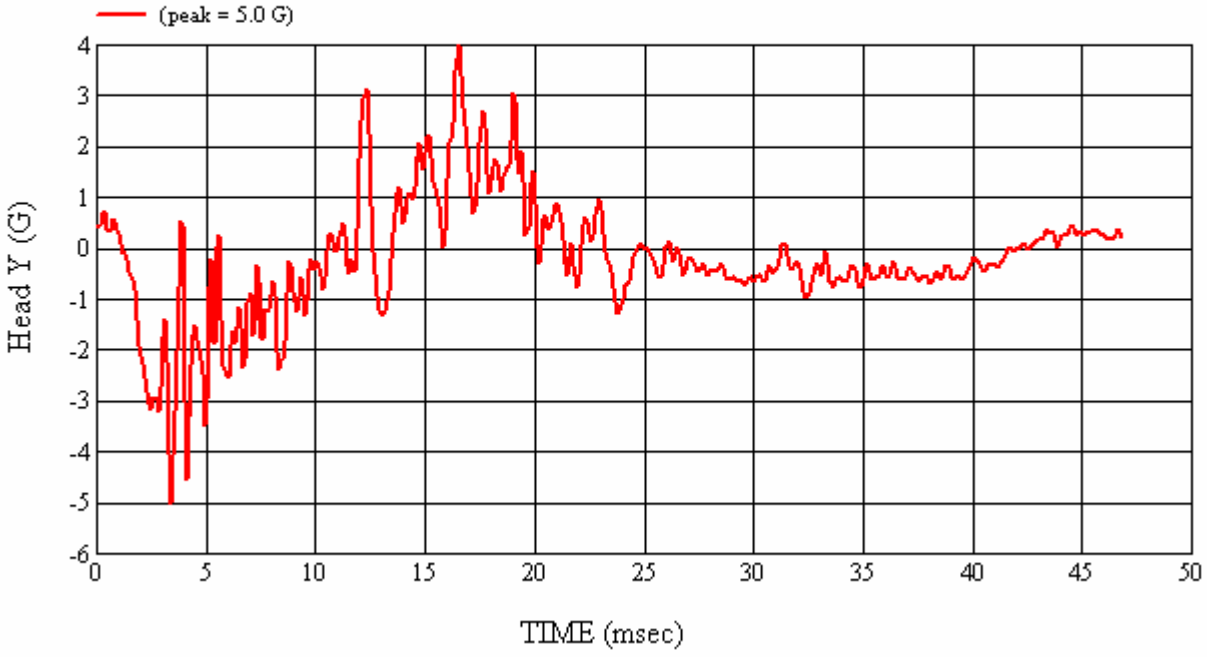
*Only necessary for NHTSA (Government) Compliance testing.

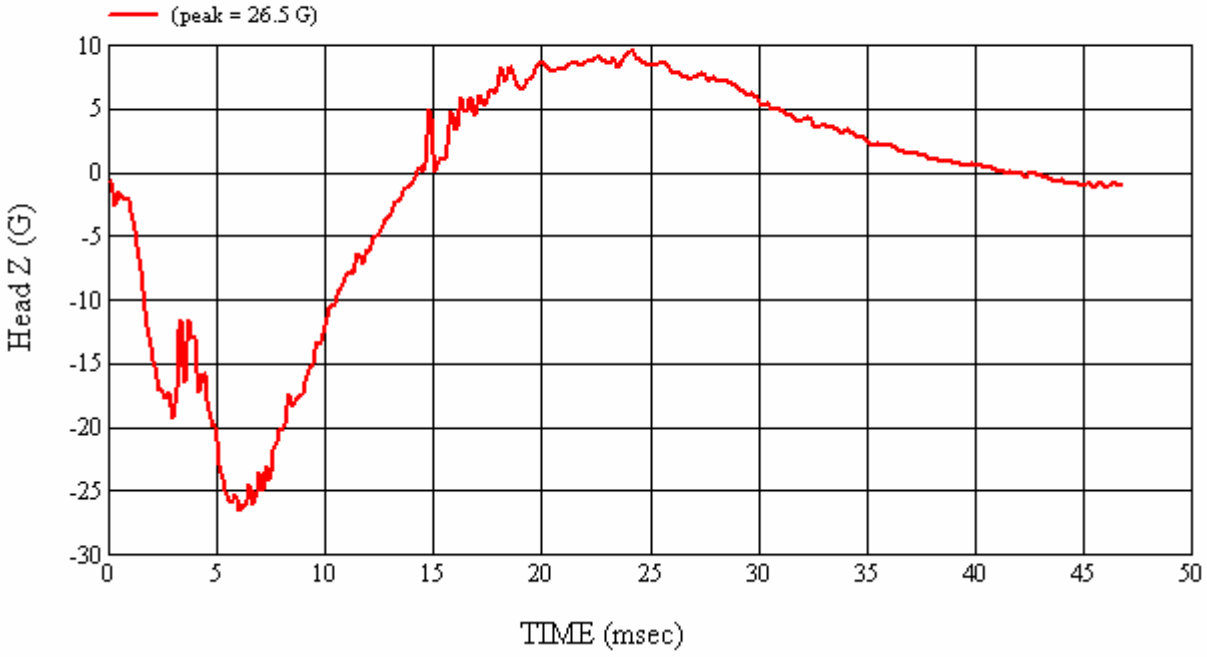
MGA Test #: FM7214 Target Location: UR2, Left Side Test Date: 9/24/2007

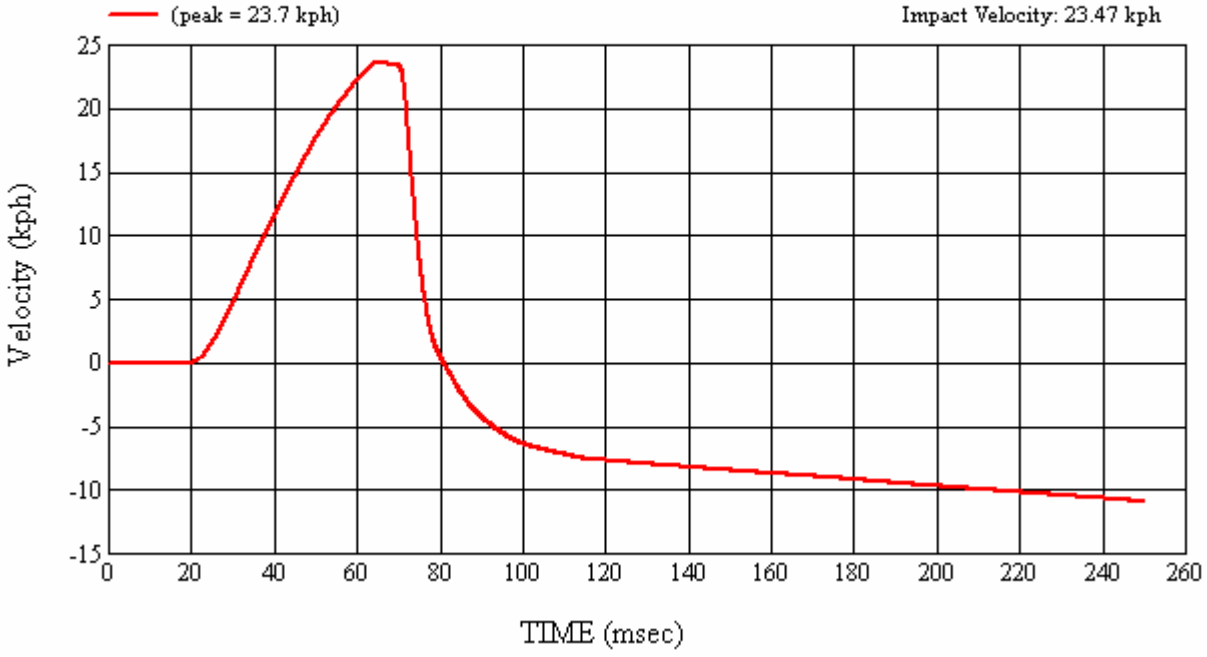


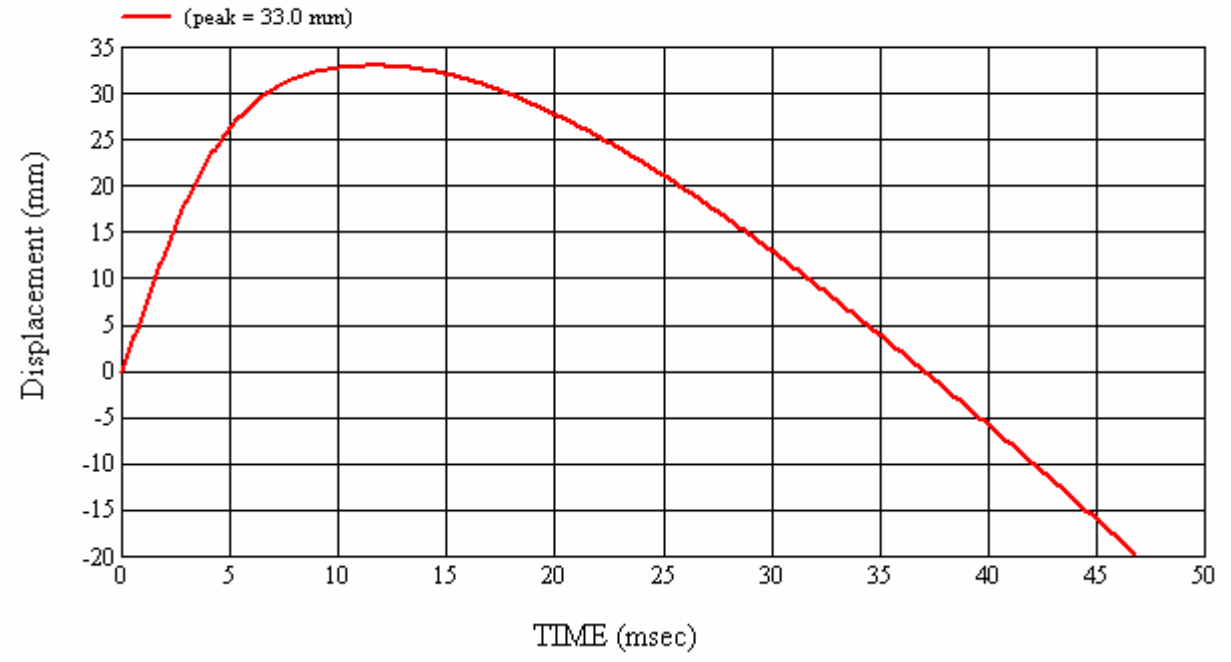



(peak = 120.7 G)
Head X (G)
0
-20
-40
-60
-80
-100
-120
-140
0
5
10
15
20
25
30
35
40
45
50
TIME (msec)


(peak = 5.0 G)
Head Y (G)
4
3
2
1
0
-1
-2
-3
-4
-5
-6
0
5
10
15
20
25
30
35
40
45
50
TIME (msec)


(peak = 26.5 G)
Head Z (G)
10
5
0
-5
-10
-15
-20
-25
-30
0
5
10
15
20
25
30
35
40
45
50
TIME (msec)


(peak = 23.7 kph)
Impact Velocity: 23.47 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 = 33.0 mm)
Displacement (mm)
35
30
25
20
15
10
5
0
-5
-10
-15
-20
0
5
10
15
20
25
30
35
40
45
50
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
*Digital Inclinometer	Macklanburg-Duncan	PRO 360 MGA00048	Set Angle of FMH/Targeting	0.1°	Annual
FMVSS 201U Test Frame (includes the propulsion control system, actuator, test frame, and DAS)	MGA Research Corp.	MGA-100-FMH	Test System	N/A	N/A
Free Motion Headforms	UTAMA UTAMA UTAMA	035 037 038	Test Device	N/A	Pre and Post-Test Series
High Speed Video	Redlake	HGLE	Record Event	N/A	N/A
*FARO™	Faro Technologies	S08059801273	Targeting	0.1 mm	Annual
Measuring Devices: - Tape Measure - Plumb Bobs - Digital Protractor	 Stanley N/A Macklanburg-Duncan	 TPM729 -- MGA00048	 Measurement Targeting FMH setup Horizontal Measurement	 1 mm N/A 0.5°	Annual
*Temperature Recorder	Dickson	FH125	Record Temperature and Humidity	± 1°C ± 1% RH	Annual

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

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

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

TABLE 4-2 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	9/20/2007	10.08	25.0	39.0	241.6	2.4	Yes
Post	#035	9/27/2007	10.08	21.0	60.0	240.5	3.8	Yes
Pre	#037	9/20/2007	9.96	25.0	37.0	240.8	13.1	Yes
Post	#037	9/27/2007	9.96	21.0	60.0	257.5	2.6	Yes
Pre	#038	9/20/2007	9.90	25.0	36.0	272.9	14.3	Yes
Post	#038	9/27/2007	9.90	21.0	60.0	262.6	8.7	Yes

HEAD DROP TEST SUMMARY
PART 572L

HEADFORM SERIAL NUMBER: 035	CALIBRATION DATE: 9/20/2007 CALIBRATION TIME: 9:13:38 AM	
TEST PARAMETER	**SPECIFICATION**	**TEST RESULTS**
Weight	9.90 to 10.10 lbs.	10.08
Temperature	19° C to 26° C	25
Relative Humidity	10% to 70%	39
Peak Resultant Acceleration	225 G's to 275 G's	241.6
Peak Lateral Acceleration	15 G's Maximum	2.4
Unimodal Acceleration Curve	YES	YES

FMH INSTRUMENTATION

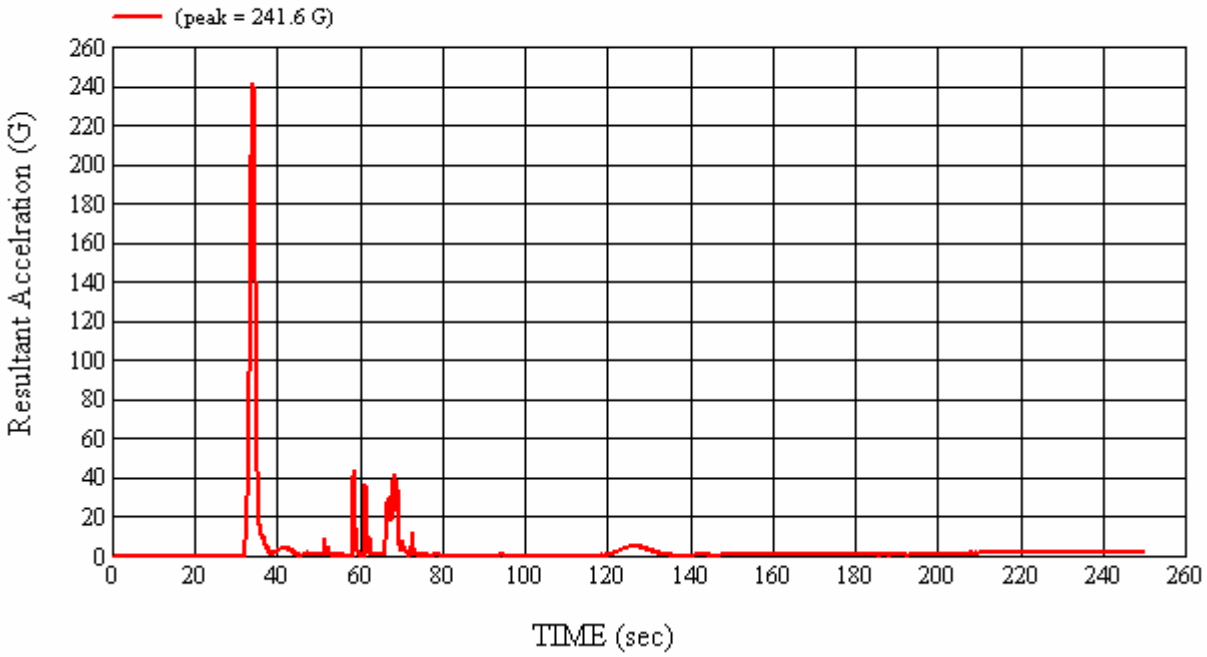
HEAD ACCELEROMETERS

Channel Number	Manufacturer	Model Number	Serial Number	Date of Last Calibration	Date of Next Calibration
1	ENDEVCO	7264-2000	J22664	04/30/07	10/30/07
2	ENDEVCO	7264-2000	J35919	04/30/07	10/30/07
3	ENDEVCO	7264-2000	J35924	04/30/07	10/30/07

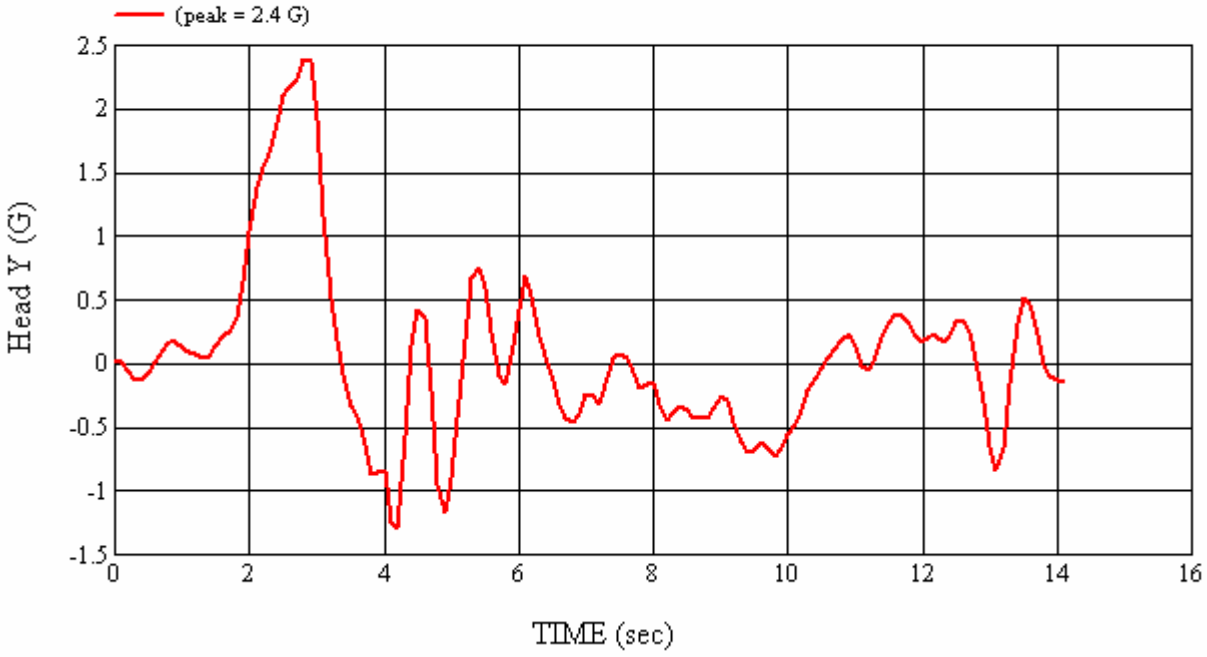
REMARKS:

RECORDED BY: _____ DATE: 9/20/2007

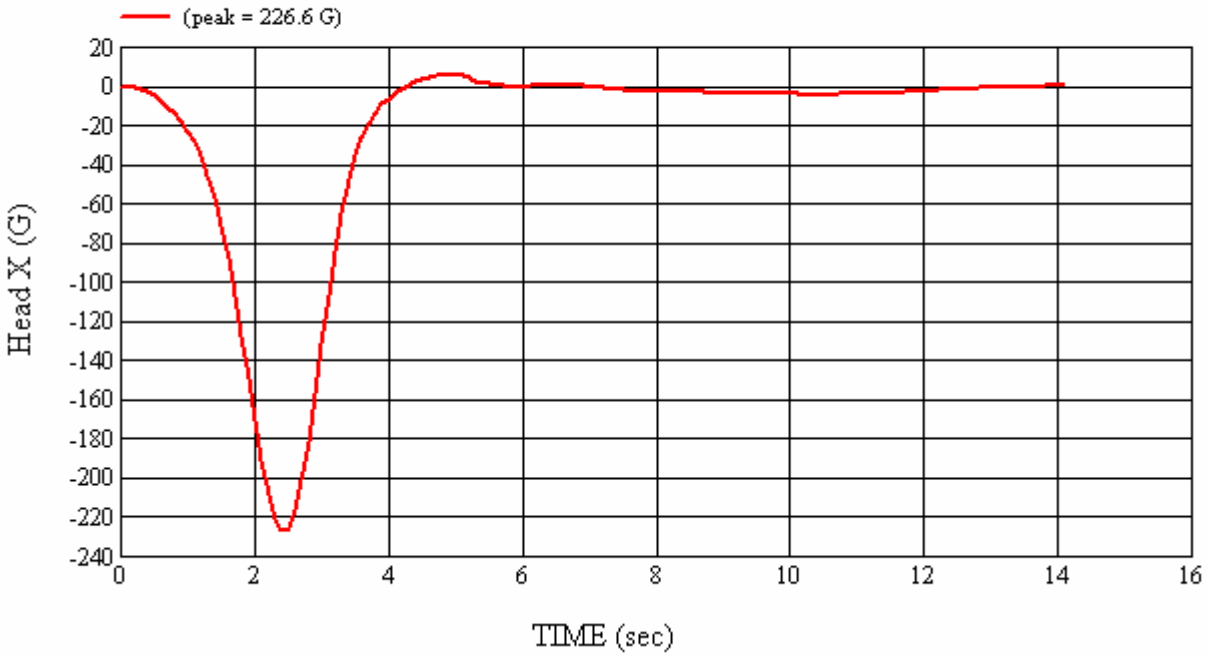
APPROVED BY: _____



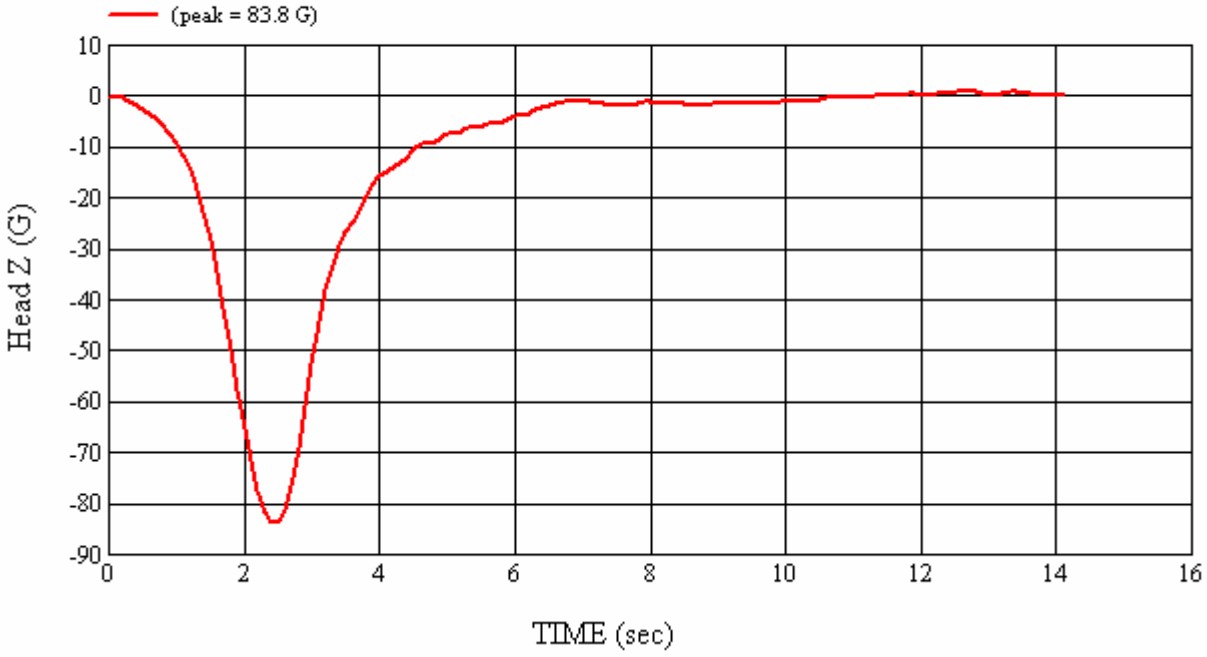
Head 035 (Pre) Calibration #H35011



Head 035 (Pre) Calibration #H35011



Head 035 (Pre) Calibration #H35011



Head 035 (Pre) Calibration #H35011

HEAD DROP TEST SUMMARY
PART 572L

HEADFORM SERIAL NUMBER: 035	CALIBRATION DATE: 9/27/2007 CALIBRATION TIME: 9:26:06 AM	
TEST PARAMETER	**SPECIFICATION**	**TEST RESULTS**
Weight	9.90 to 10.10 lbs.	10.08
Temperature	19° C to 26° C	21
Relative Humidity	10% to 70%	60
Peak Resultant Acceleration	225 G's to 275 G's	240.5
Peak Lateral Acceleration	15 G's Maximum	3.8
Unimodal Acceleration Curve	YES	YES

FMH INSTRUMENTATION

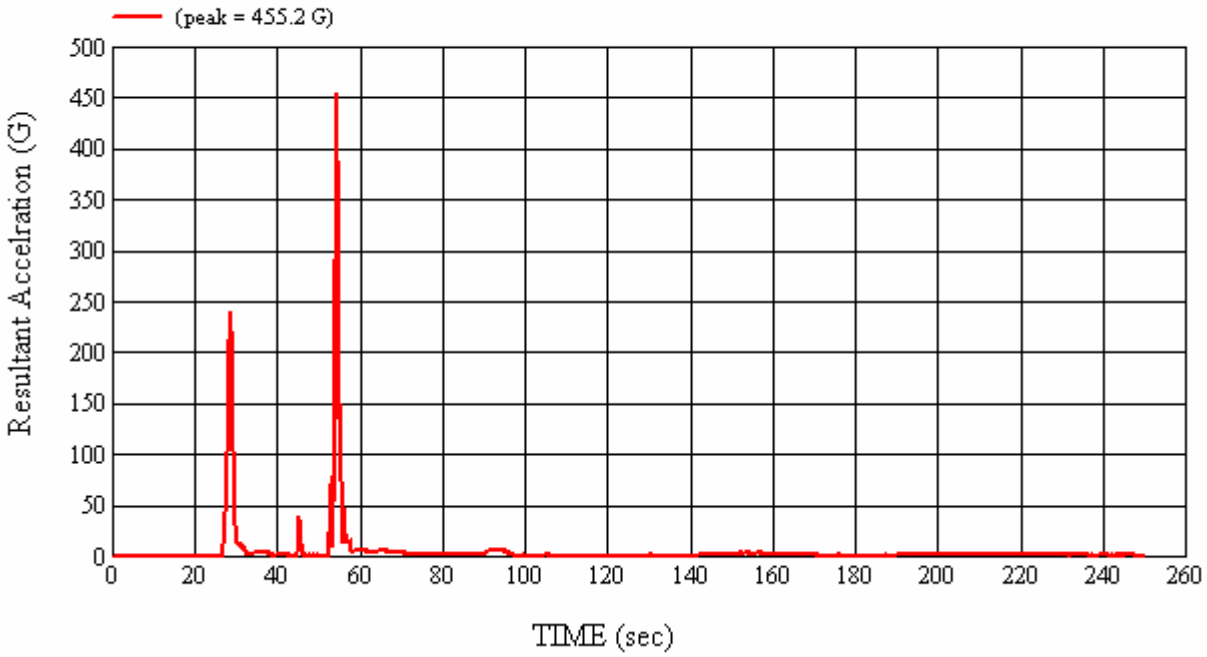
HEAD ACCELEROMETERS

Channel Number	Manufacturer	Model Number	Serial Number	Date of Last Calibration	Date of Next Calibration
1	ENDEVCO	7264-2000	J22664	04/30/07	10/30/07
2	ENDEVCO	7264-2000	J35919	04/30/07	10/30/07
3	ENDEVCO	7264-2000	J35924	04/30/07	10/30/07

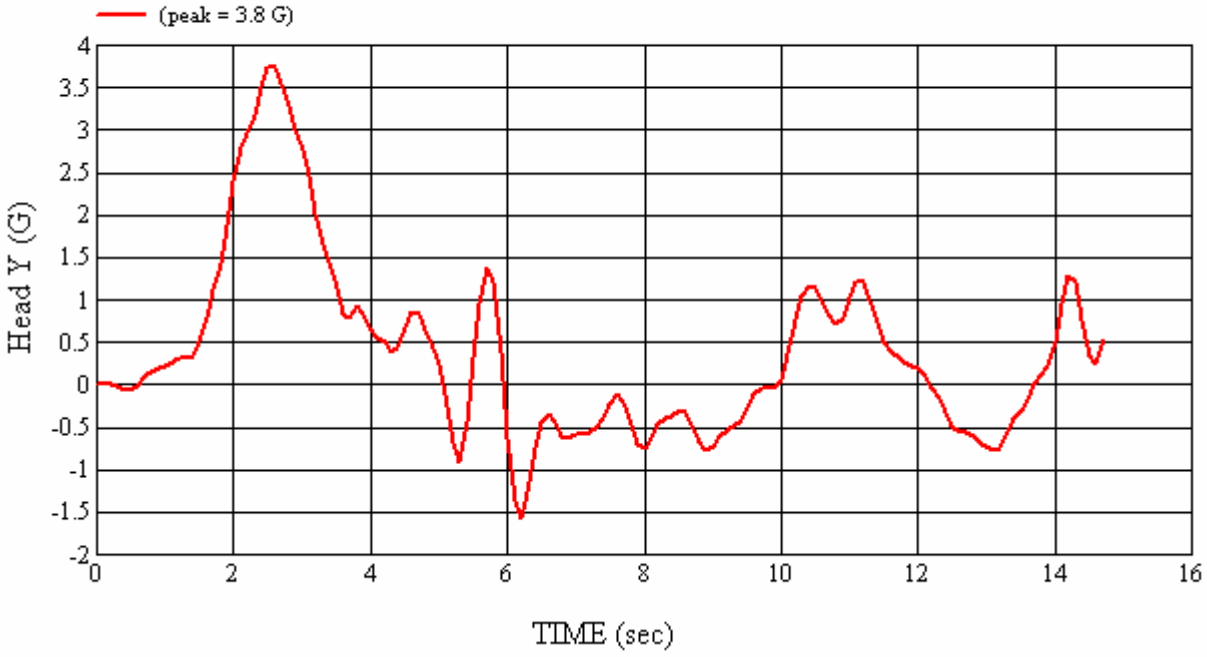
REMARKS:

RECORDED BY: Travis Campbell DATE: 9/27/2007

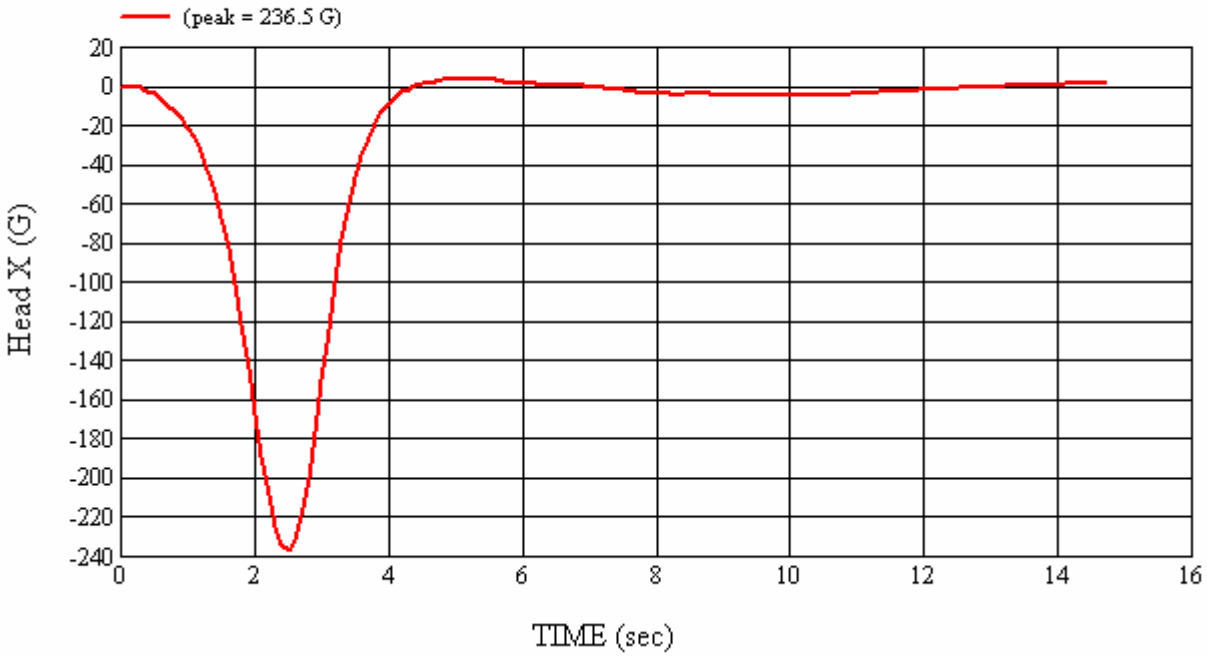
APPROVED BY: Helen A. Kaleto



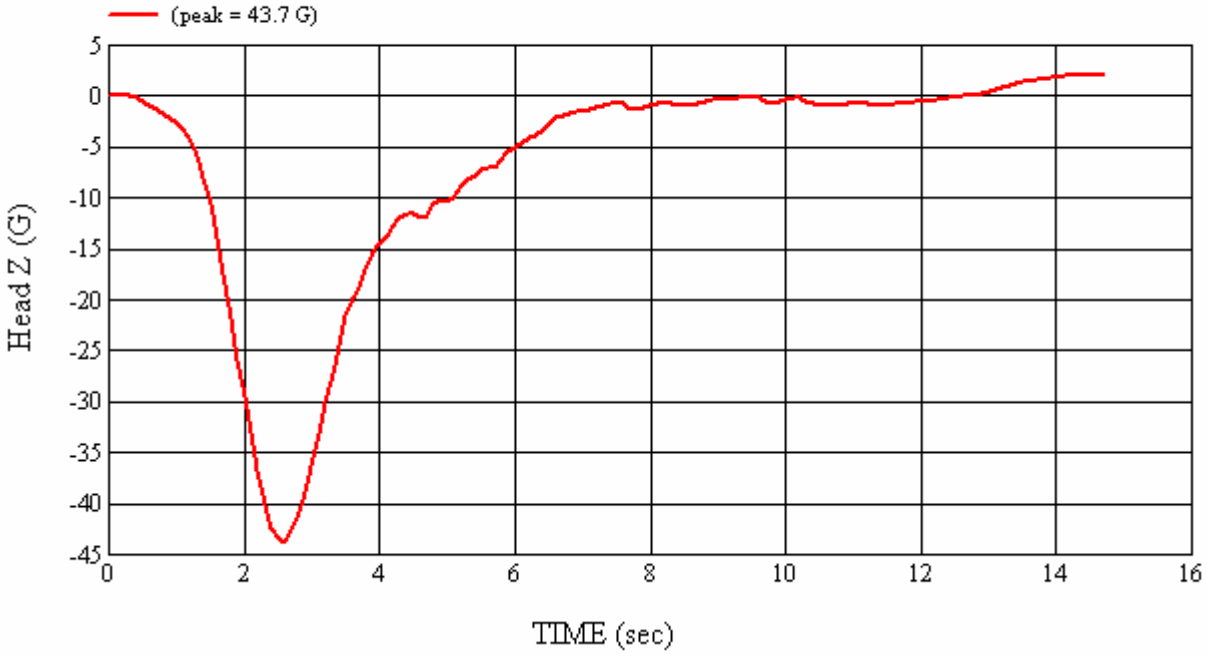
Head 035 (Post) Calibration #H35012



Head 035 (Post) Calibration #H35012



Head 035 (Post) Calibration #H35012



Head 035 (Post) Calibration #H35012

HEAD DROP TEST SUMMARY
PART 572L

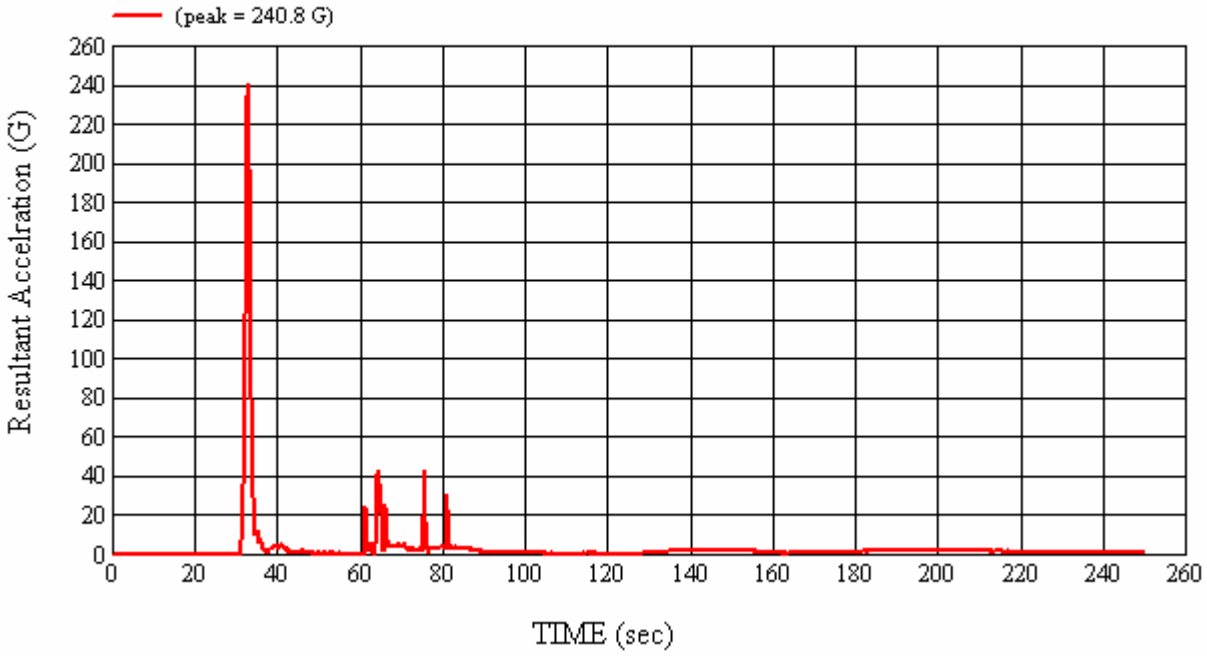
HEADFORM SERIAL NUMBER: 037	CALIBRATION DATE: 9/20/2007 CALIBRATION TIME: 9:35:12 AM	
TEST PARAMETER	**SPECIFICATION**	**TEST RESULTS**
Weight	9.90 to 10.10 lbs.	9.96
Temperature	19° C to 26° C	25
Relative Humidity	10% to 70%	37
Peak Resultant Acceleration	225 G's to 275 G's	240.8
Peak Lateral Acceleration	15 G's Maximum	13.1
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	J22696	04/30/07	10/30/07
2	ENDEVCO	7264-2000	J35791	04/30/07	10/30/07
3	ENDEVCO	7264-2000	J35800	04/30/07	10/30/07

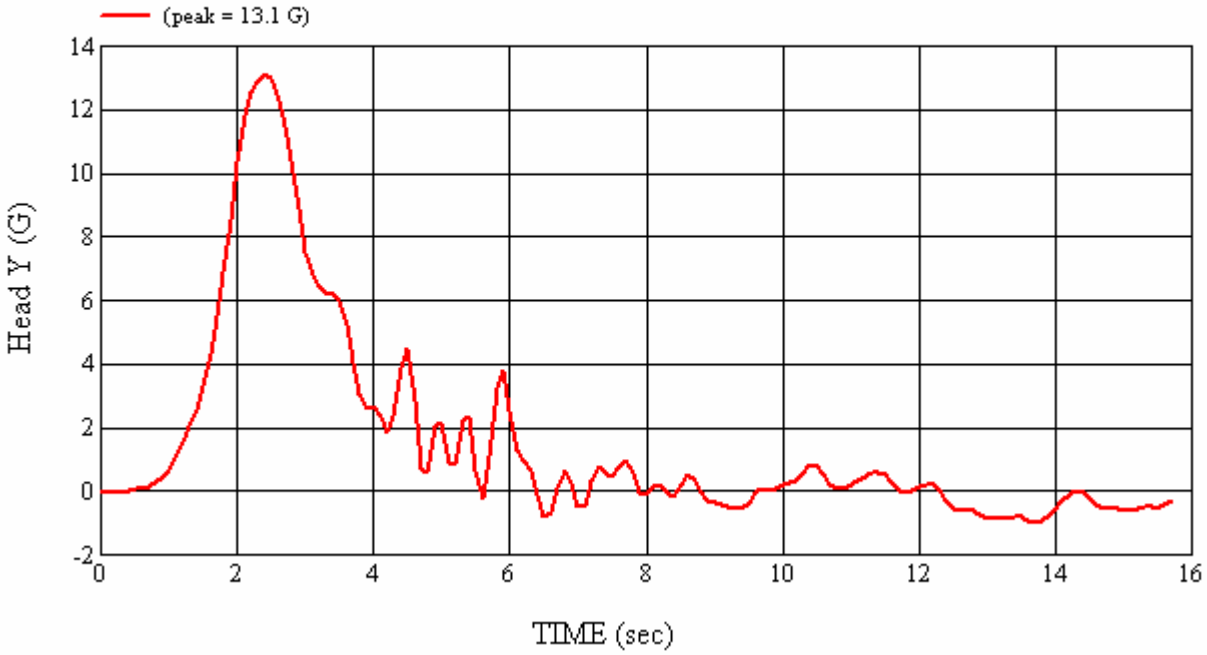
REMARKS:

RECORDED BY: _____ DATE: 9/20/2007

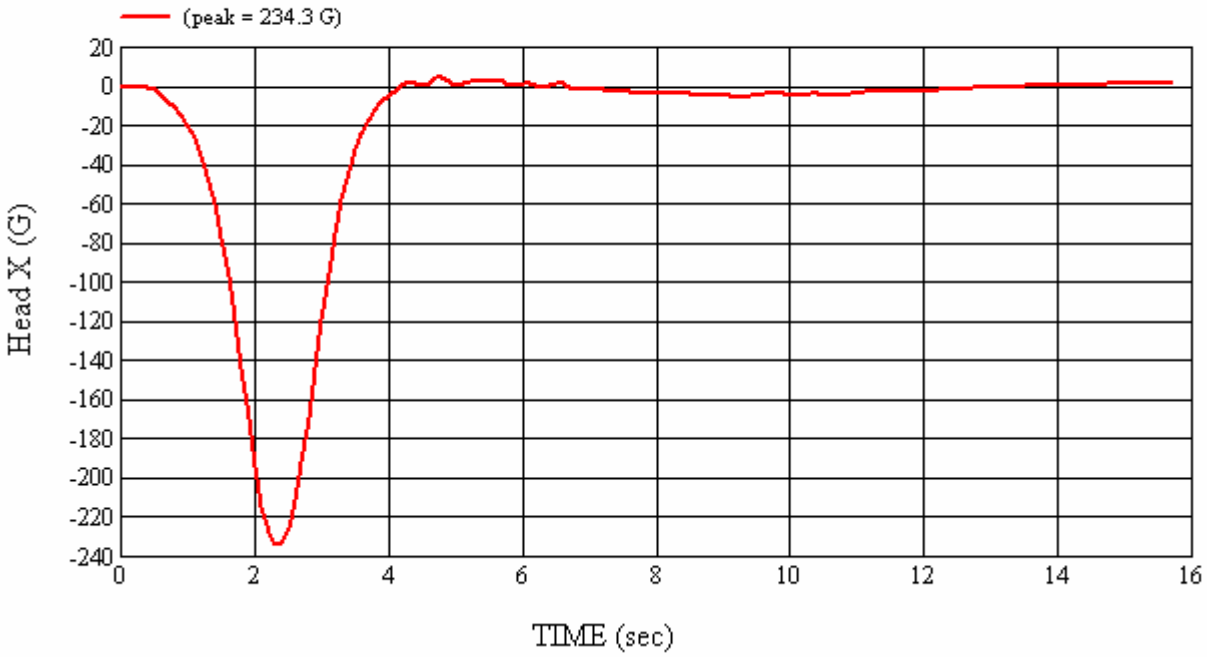
APPROVED BY: _____



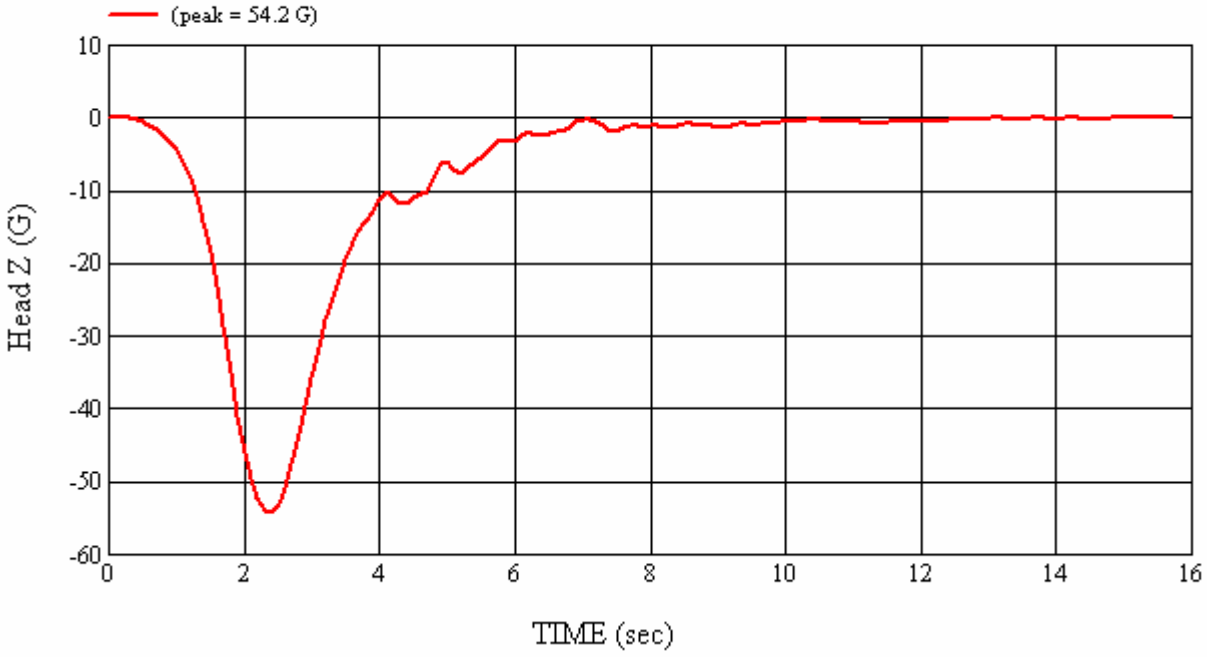
Head 037 (Pre) Calibration #H37015



Head 037 (Pre) Calibration #H37015



Head 037 (Pre) Calibration #H37015



Head 037 (Pre) Calibration #H37015

HEAD DROP TEST SUMMARY
PART 572L

HEADFORM SERIAL NUMBER: 037	CALIBRATION DATE: 9/27/2007 CALIBRATION TIME: 9:44:14 AM	
TEST PARAMETER	**SPECIFICATION**	**TEST RESULTS**
Weight	9.90 to 10.10 lbs.	9.96
Temperature	19° C to 26° C	21
Relative Humidity	10% to 70%	60
Peak Resultant Acceleration	225 G's to 275 G's	257.5
Peak Lateral Acceleration	15 G's Maximum	2.6
Unimodal Acceleration Curve	YES	YES

FMH INSTRUMENTATION

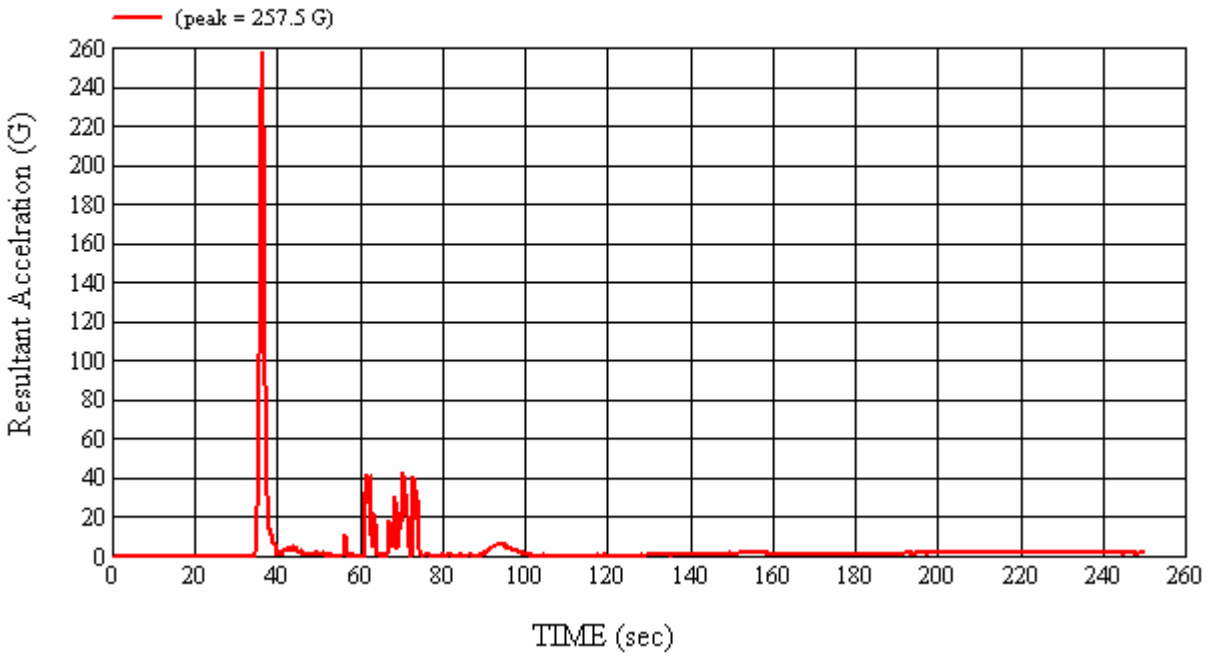
HEAD ACCELEROMETERS

Channel Number	Manufacturer	Model Number	Serial Number	Date of Last Calibration	Date of Next Calibration
1	ENDEVCO	7264-2000	J22696	04/30/07	10/30/07
2	ENDEVCO	7264-2000	J35791	04/30/07	10/30/07
3	ENDEVCO	7264-2000	J35800	04/30/07	10/30/07

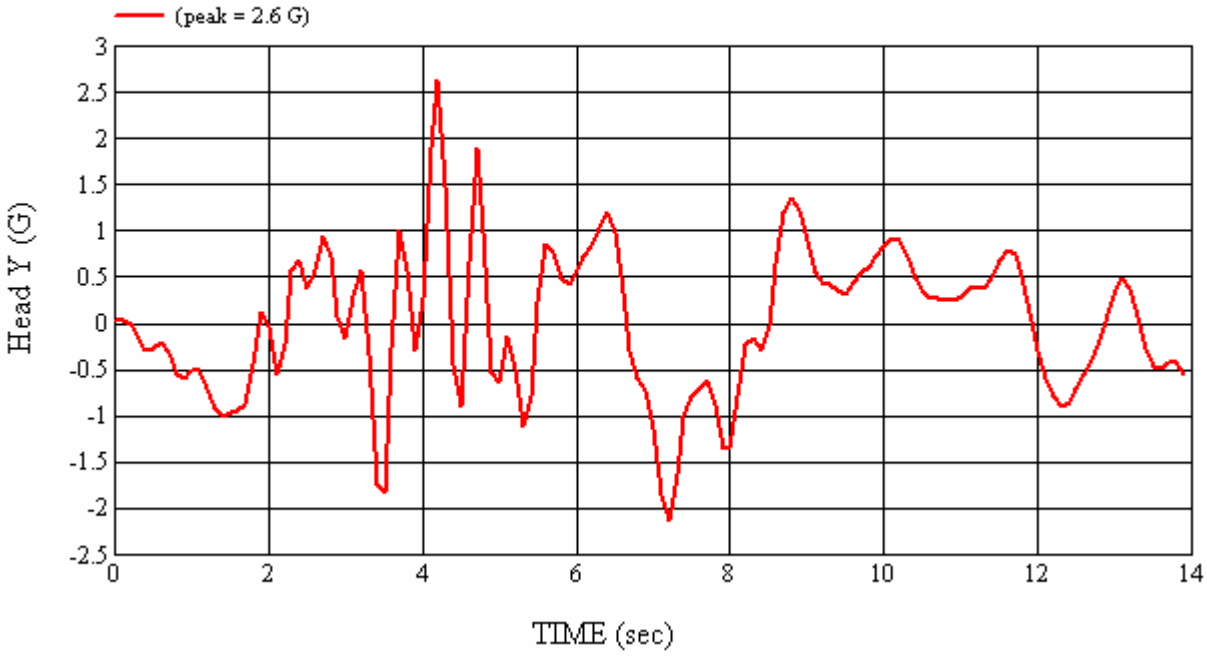
REMARKS:

RECORDED BY: Kaitlin Campbell DATE: 9/27/2007

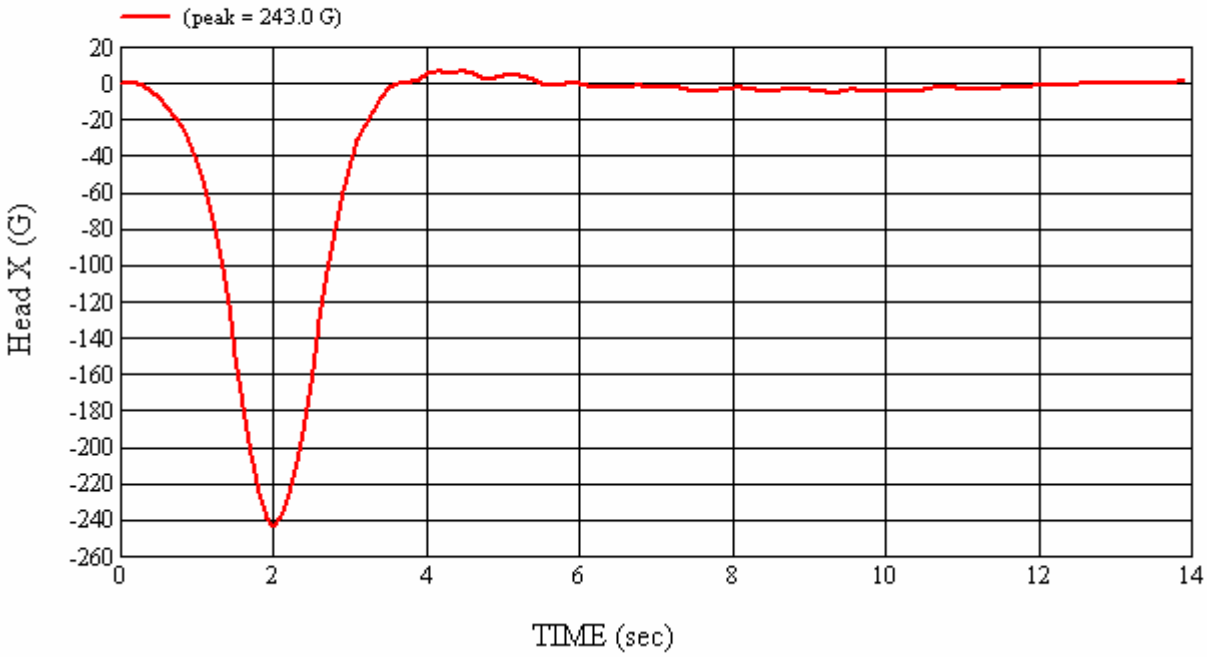
APPROVED BY: Helen A. Kalesto



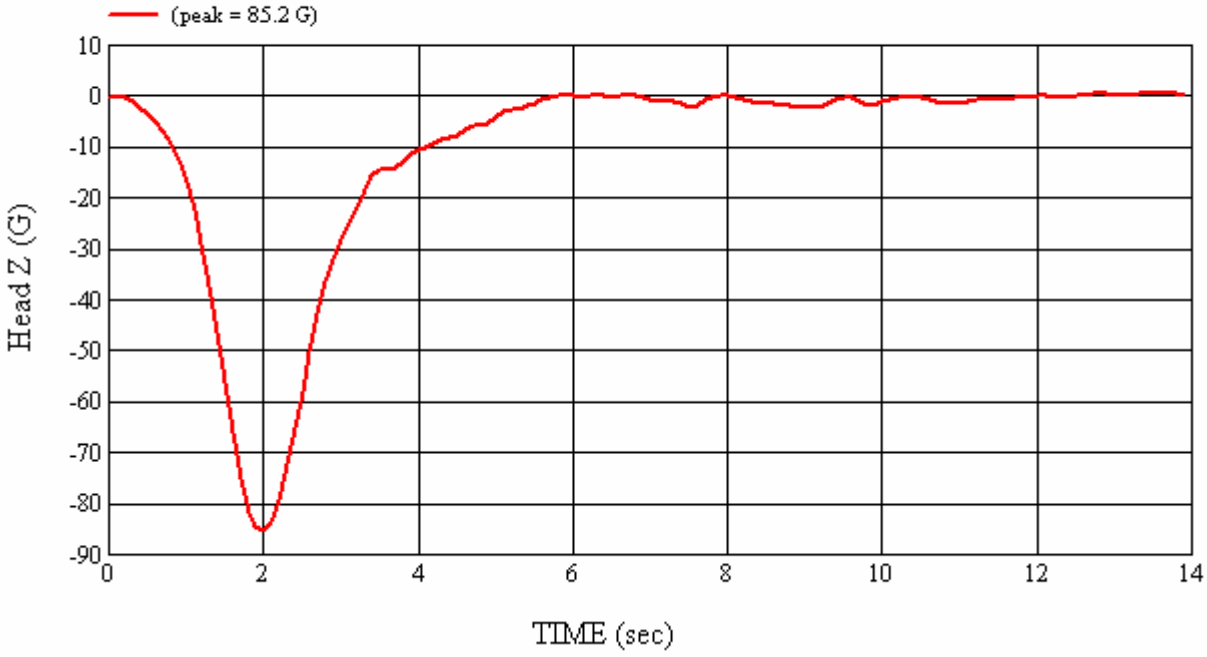
Head 037 (Post) Calibration #H37016



Head 037 (Post) Calibration #H37016



Head 037 (Post) Calibration #H37016



Head 037 (Post) Calibration #H37016

HEAD DROP TEST SUMMARY
PART 572L

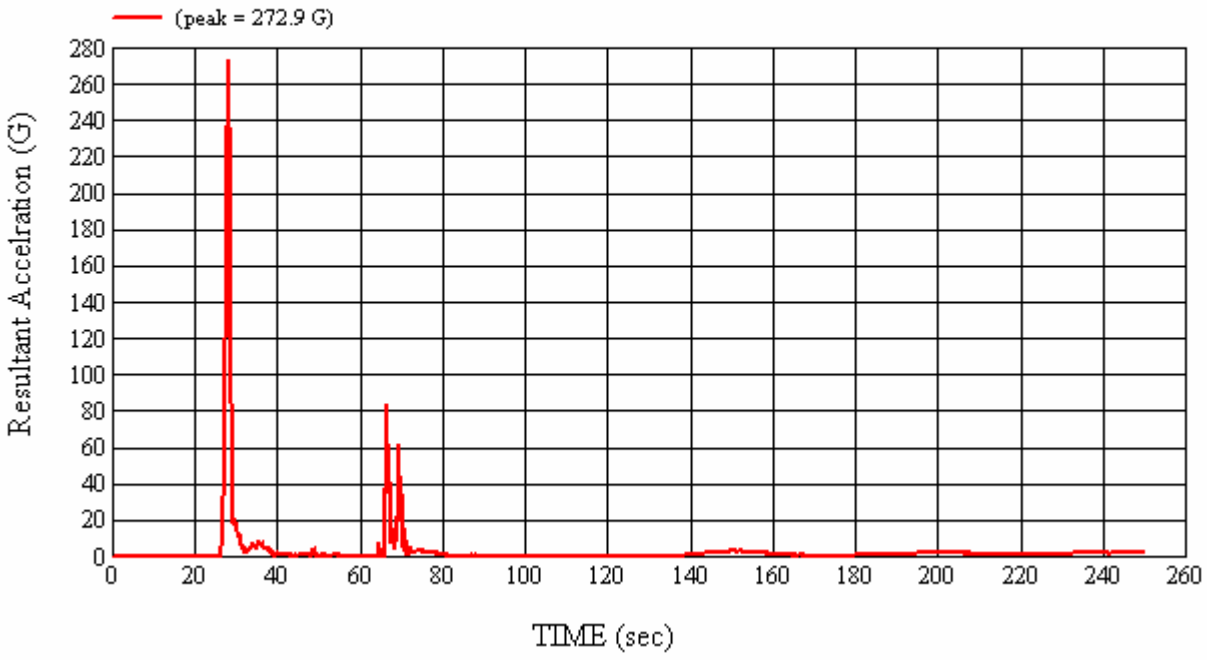
HEADFORM SERIAL NUMBER: 038	CALIBRATION DATE: 9/20/2007 CALIBRATION TIME: 9:52:10 AM	
TEST PARAMETER	**SPECIFICATION**	**TEST RESULTS**
Weight	9.90 to 10.10 lbs.	9.90
Temperature	19° C to 26° C	25
Relative Humidity	10% to 70%	36
Peak Resultant Acceleration	225 G's to 275 G's	272.9
Peak Lateral Acceleration	15 G's Maximum	14.3
Unimodal Acceleration Curve	YES	YES

FMH INSTRUMENTATION					
HEAD ACCELEROMETERS					
Channel Number	**Manufacturer**	**Model Number**	**Serial Number**	**Date of Last Calibration**	**Date of Next Calibration**
1	ENDEVCO	7264-2000	J14103	04/30/07	10/30/07
2	ENDEVCO	7264-2000	J36197	04/30/07	10/30/07
3	ENDEVCO	7264-2000	J36353	04/30/07	10/30/07

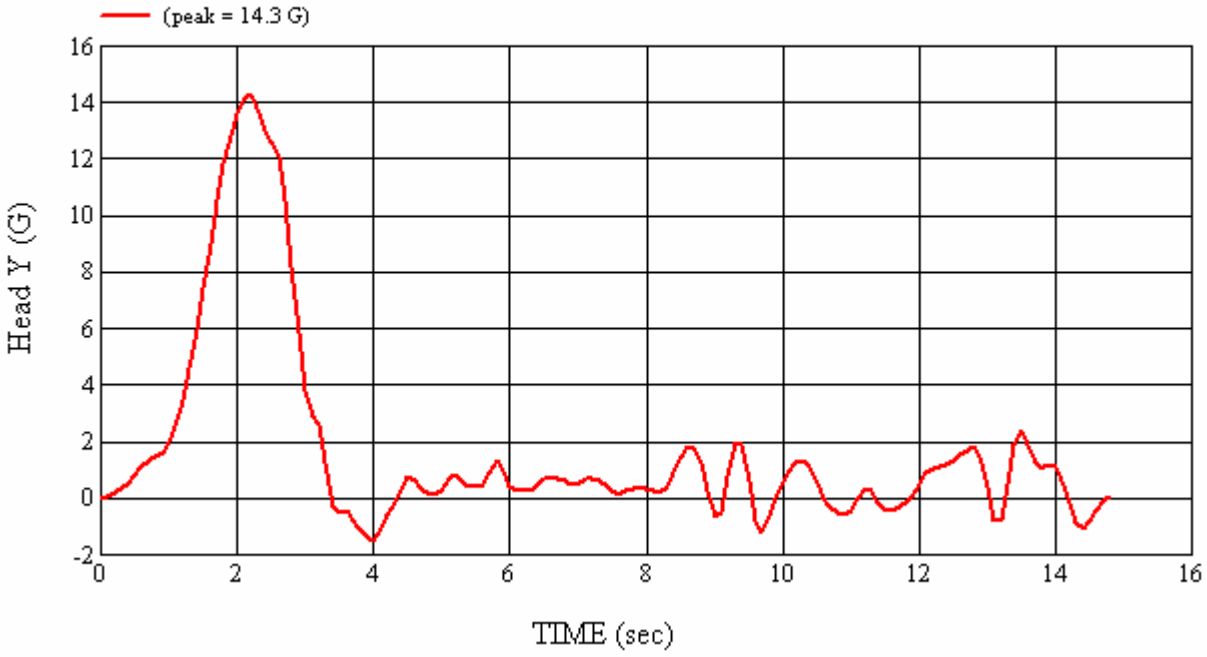
REMARKS:

RECORDED BY: _____ DATE: 9/20/2007

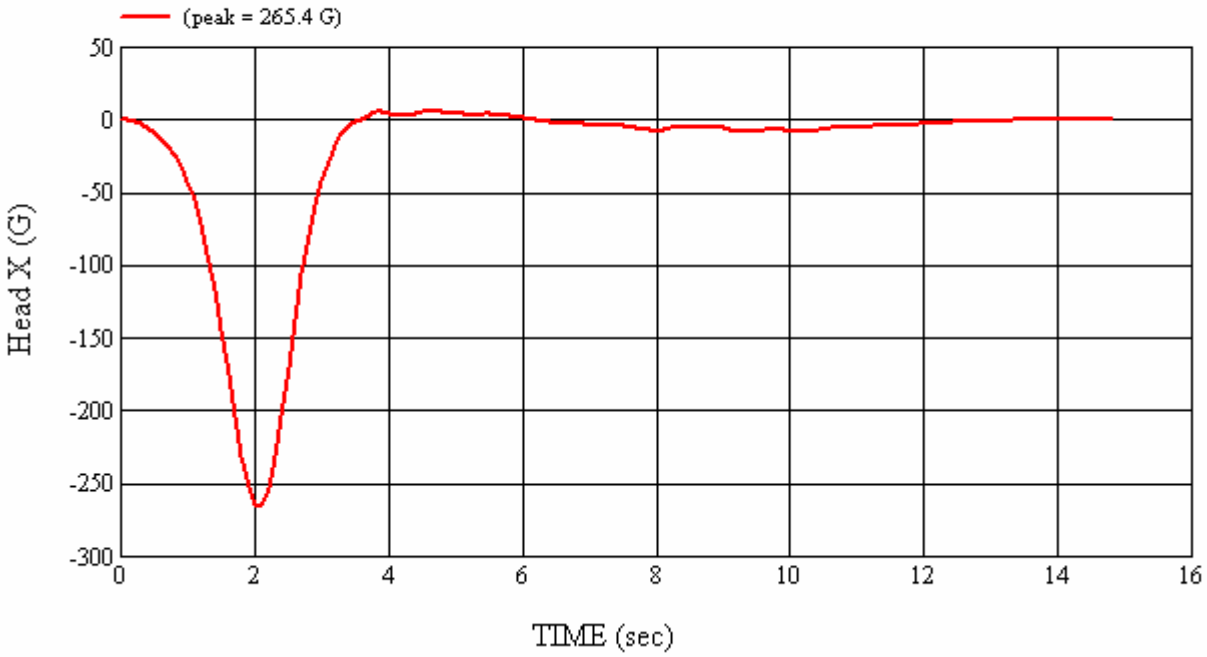
APPROVED BY: _____



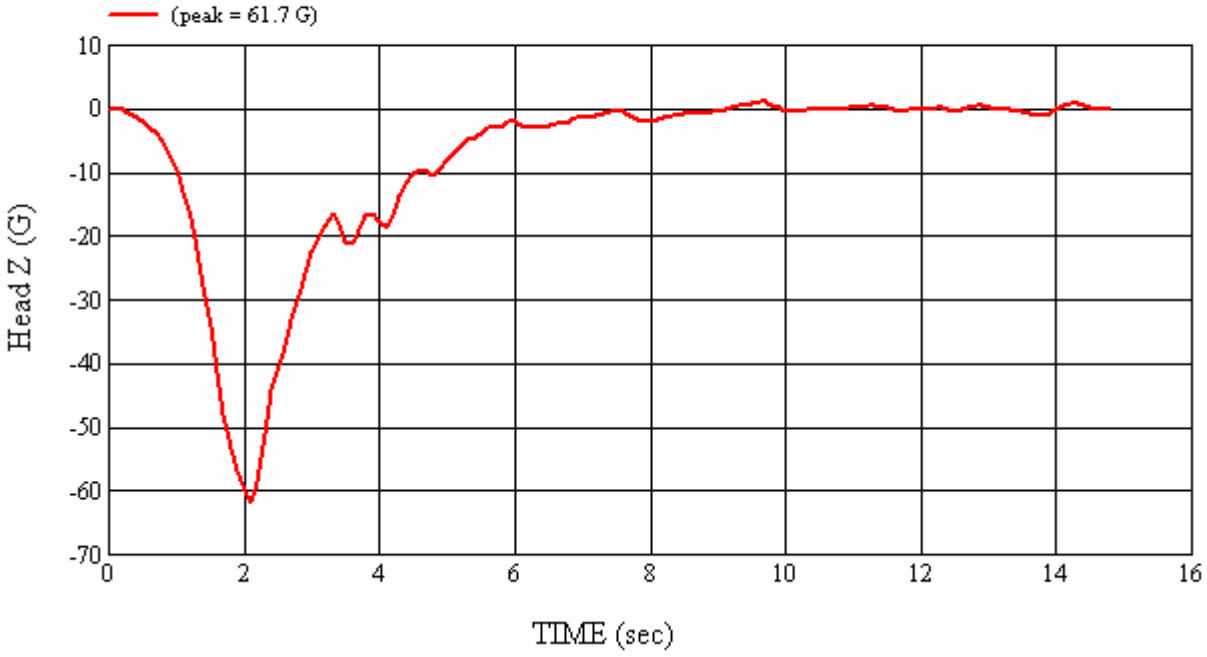
Head 038 (Pre) Calibration #H38015



Head 038 (Pre) Calibration #H38015



Head 038 (Pre) Calibration #H38015



Head 038 (Pre) Calibration #H38015

HEAD DROP TEST SUMMARY
PART 572L

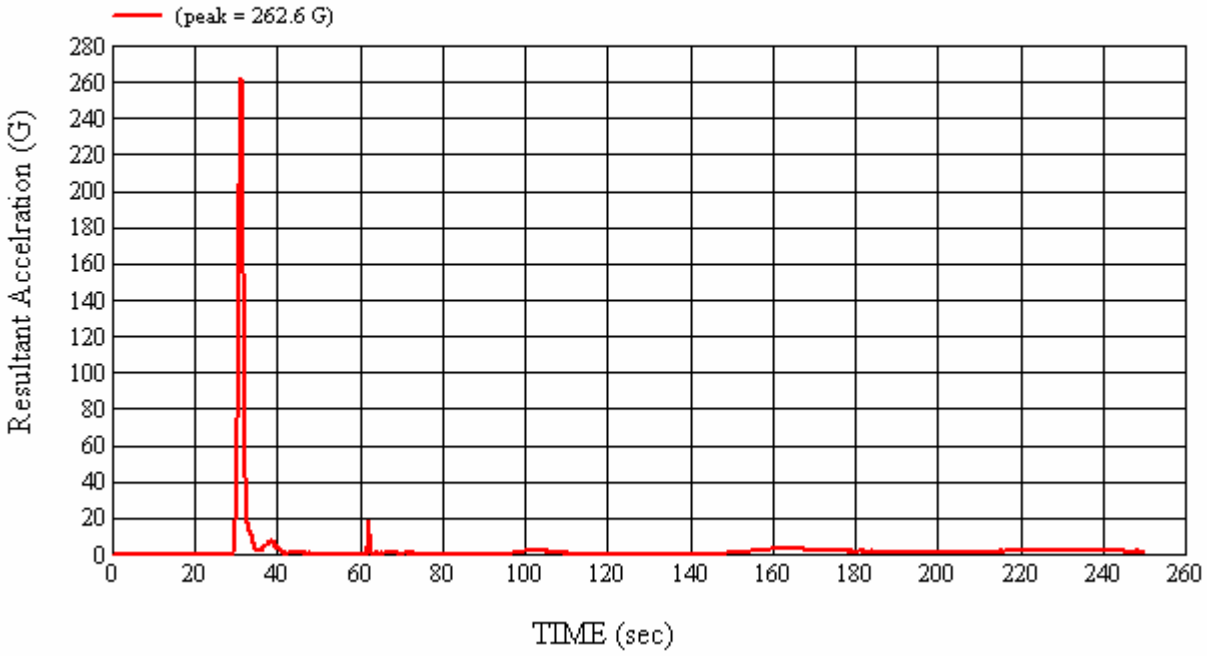
HEADFORM SERIAL NUMBER: 038	CALIBRATION DATE: 9/27/2007 CALIBRATION TIME: 10:56:45 AM	
TEST PARAMETER	**SPECIFICATION**	**TEST RESULTS**
Weight	9.90 to 10.10 lbs.	9.90
Temperature	19° C to 26° C	21
Relative Humidity	10% to 70%	60
Peak Resultant Acceleration	225 G's to 275 G's	262.6
Peak Lateral Acceleration	15 G's Maximum	8.7
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	J14103	04/30/07	10/30/07
2	ENDEVCO	7264-2000	J36197	04/30/07	10/30/07
3	ENDEVCO	7264-2000	J36353	04/30/07	10/30/07

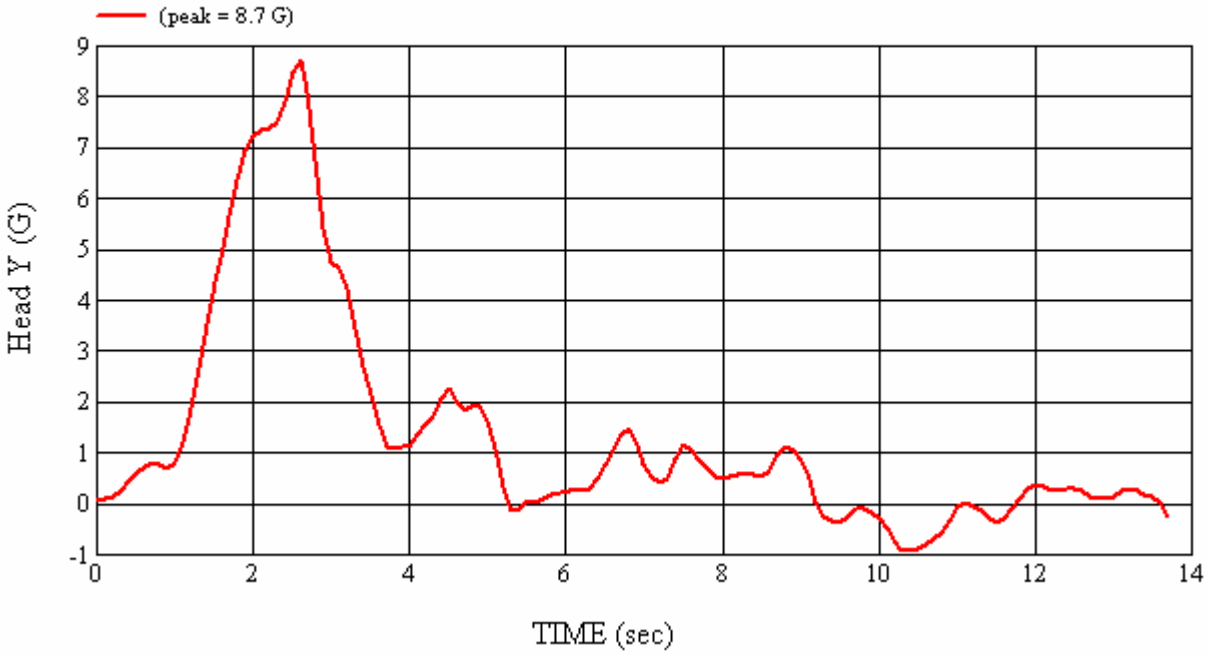
REMARKS:

RECORDED BY: Janis Campbell DATE: 9/27/2007

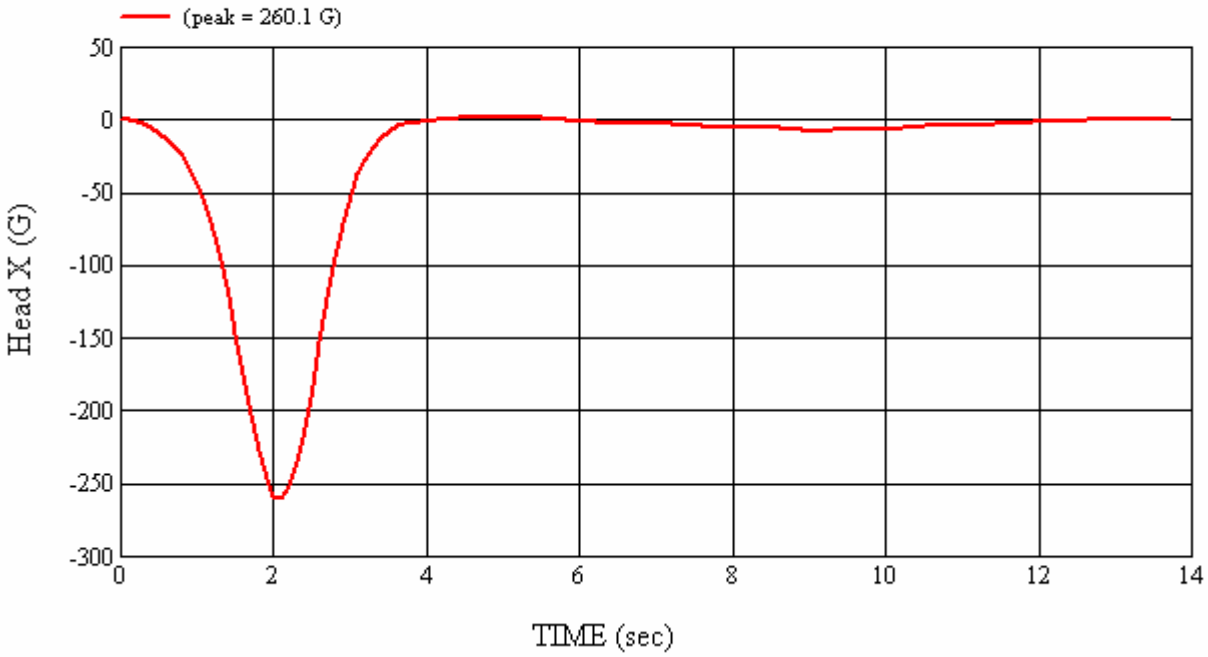
APPROVED BY: Eileen A. Kaleto



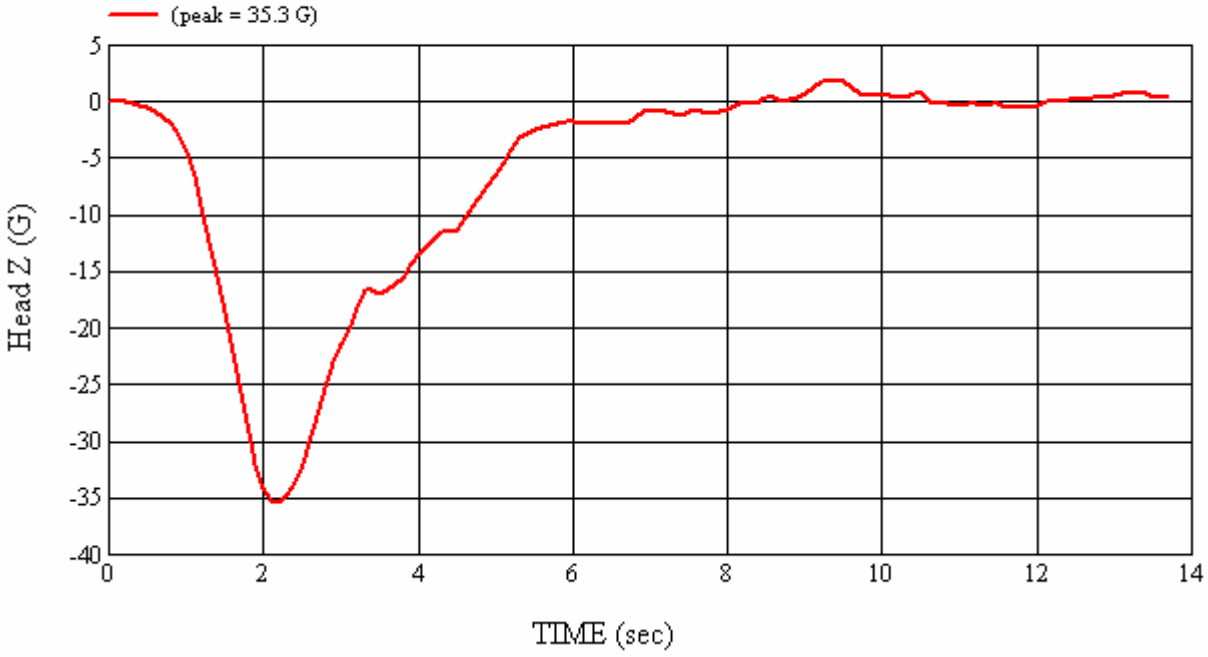
Head 038 (Post) Calibration #H38016



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

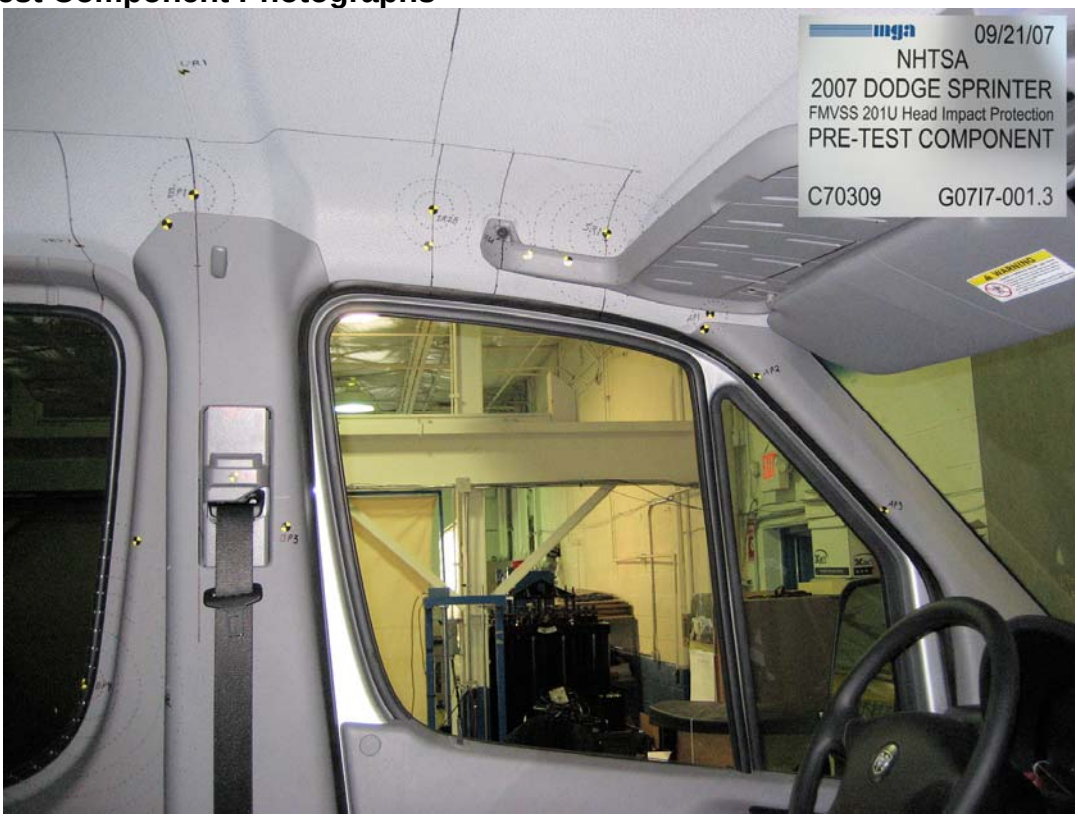
As Delivered – ¾ Front View From Left Side

As- Delivered – Rear View From Right Side

As Delivered – Vehicle's Certification Label

As Delivered – Vehicle's Tire Information Label

Pre-Test Component Photographs




09/21/07
NHTSA
2007 DODGE SPRINTER
FMVSS 201U Head Impact Protection
PRE-TEST COMPONENT
C70309
G07I7-001.3


09/21/07
NHTSA
2007 DODGE SPRINTER
FMVSS 201U Head Impact Protection
PRE-TEST COMPONENT
C70309
G07I7-001.3

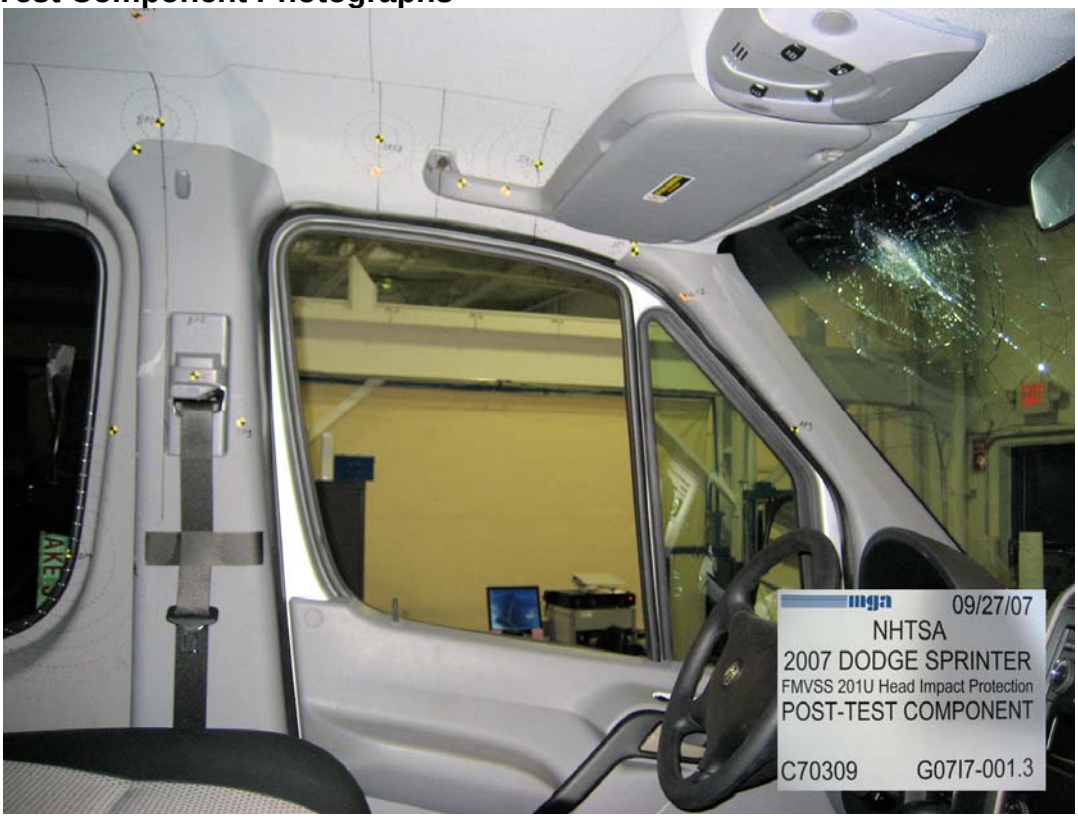

09/21/07
NHTSA
2007 DODGE SPRINTER
FMVSS 201U Head Impact Protection
PRE-TEST COMPONENT
C70309 G07I7-001.3


09/21/07
NHTSA
2007 DODGE SPRINTER
FMVSS 201U Head Impact Protection
PRE-TEST COMPONENT
C70309 G07I7-001.3


mga
09/21/07
NHTSA
2007 DODGE SPRINTER
FMVSS 201U Head Impact Protection
PRE-TEST COMPONENT
C70309
G07I7-001.3


mga
09/21/07
NHTSA
2007 DODGE SPRINTER
FMVSS 201U Head Impact Protection
PRE-TEST COMPONENT
C70309
G07I7-001.3

Post-Test Component Photographs




09/27/07
NHTSA
2007 DODGE SPRINTER
FMVSS 201U Head Impact Protection
POST-TEST COMPONENT
C70309
G07I7-001.3


09/27/07
NHTSA
2007 DODGE SPRINTER
FMVSS 201U Head Impact Protection
POST-TEST COMPONENT
C70309
G07I7-001.3


mga
09/27/07
NHTSA
2007 DODGE SPRINTER
FMVSS 201U Head Impact Protection
POST-TEST COMPONENT
C70309
G07I7-001.3


mga
09/27/07
NHTSA
2007 DODGE SPRINTER
FMVSS 201U Head Impact Protection
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C70309
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09/27/07
NHTSA
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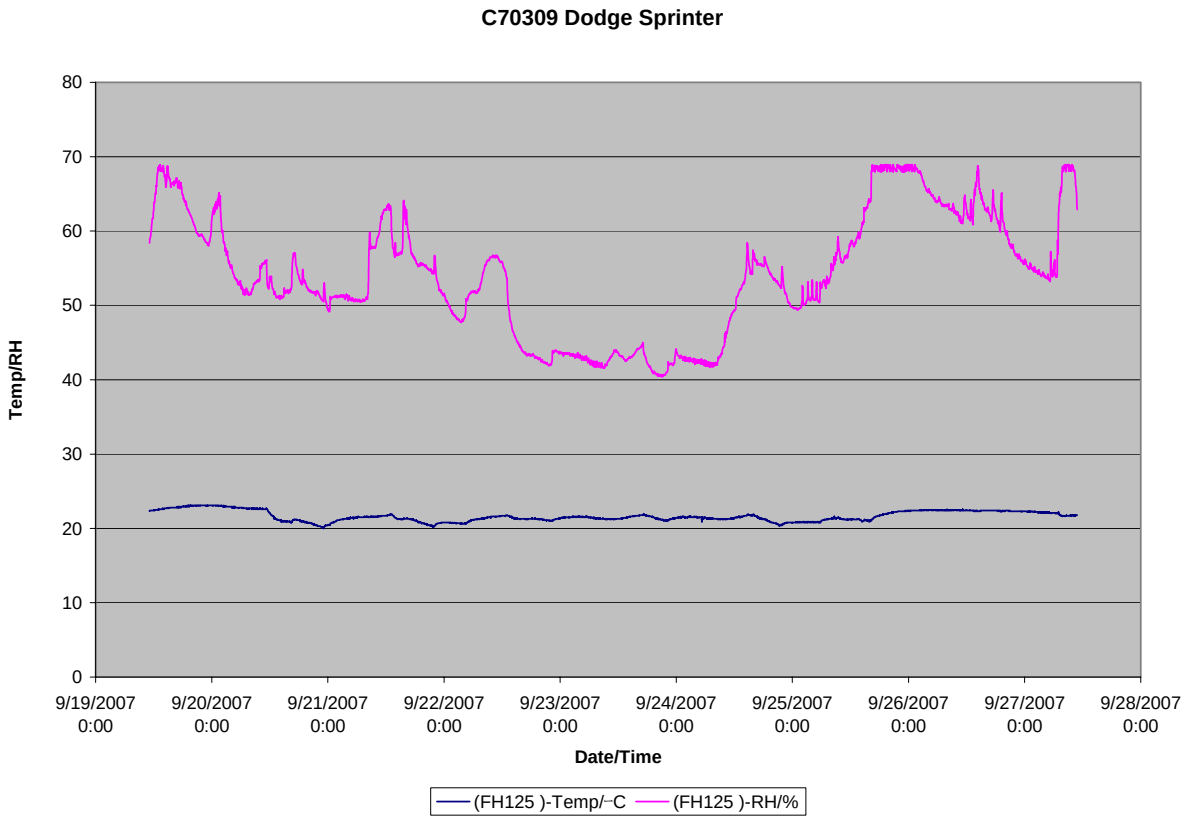
C70309
G07I7-001.3


09/27/07
NHTSA
2007 DODGE SPRINTER
FMVSS 201U Head Impact Protection
POST-TEST COMPONENT
C70309
G07I7-001.3

Appendix A - Temperature Trace



Appendix B - Calibration Certificates

Interim Certification Document

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

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

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

Measurement Standards Traceability

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

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

Certification Results

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

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

Instrument condition as received **Instrument condition outgoing**

Inoperative Within specifications

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

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

125 Technology Park
Lake Mary, FL 32746
USA

FARO®

LABORATORY ACCREDITATION BUREAU
ISO/IEC 17025 Accredited

Revised: November 22, 2006

f:\control\records\05manufa\partspecVXH08-0495.eps Rev1 RevDate: 12/08/04

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

Certificate of Calibration

MGA Research
446 Executive Drive
Troy, MI 48083

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

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

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

As Found Condition: **In Tolerance**

As Left Condition: **In Tolerance**

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

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

Results:

Units
Decimal Deg.

Tolerance
± 0.1°

As Found Readings

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

Reference Level Check: Within +/- 0.1 degrees

As Left Readings

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

Reference Level Check: Within +/- 0.1 degrees

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

issued: 9.26.06
Shannon Kubicek
Calibration Technician

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

9/27/06

Certificate of Instrument Calibration and Testing

Customer Instrument

Dickson Model Number: FH125

Serial Number: 06018122

Calibration Technician Dan Gawel

Calibration Date: 05/01/2007

Calibration Standards

ACCREDITED Cert # 1621.01

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

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

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

Calibration Procedure P1130

The customer instrument was compared to the calibration standard. Drifts and faults were determined, and any necessary mechanical or electronic adjustments were taken. The Dickson calibration system conforms to the requirements of MIL-STD-45662A, ANSI/NCSL Z540, and ISO 17025 as appropriate. Recalibration of the customer instrument is recommended within 6-12 months after the unit is placed into service. Any number of factors may cause the calibration item to drift before the recomended interval has expired.
This certificate only relates to this specific unit.

Environmental Conditions

72 °F 41 %RH

Calibration Standard Reading	Customer Instrument Reading	Unit Specification
Humidity (%RH)	Humidity (%RH)	Humidity
14.9	16.6	± 2% RH
67.8	68.5	± 2% RH
85.3	86.4	± 3% RH
Temperature °F (°C)	Temperature °F (°C)	Temperature
12.8 (-10.7)	13.1 (-10.5)	± 1.8 ° F (± 1.0 ° C)
73.3 (22.9)	73.2 (22.9)	
112.3 (44.6)	112.1 (44.5)	

The FH125 has an ISO/IEC 17025 required NIST Technical note 1297, Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results, estimated measurement uncertainty at 95% CL (K=2) of ±0.7°F and ±1 1 %RH

FOR YOUR NEXT CALIBRATION NO PHONE CALLS REQUIRED

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

That's all there is to it!

1. Purchase Order #: _____
   Name: _____
   Phone: _____
   Model #: FH125
   Serial #: 06018122

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

2. ☐ 1-Point Deluxe NIST Calibration $149.00
   ☐ 3-Point Deluxe NIST Calibration $199.00
   ☐ 3-Point Ultima Deluxe A2LA NIST $299.00 (with incoming reading)
   ☐ N995 - User selectable NIST Temperature points $50.00 each
   (to be selected in addition to one of the above calibration options)
   ☐ N997- Next Day Service $50.00 (Not available for ULTIMA service)

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

Returned UPS 2nd Day unless otherwise requested

4. Ship To: _____

Bill To: _____

Charges/Pens
(Order now and receive them with your calibrated unit)

	Order No.	Qty.	Price Ea.
☐ 6 Red Pens	P222	____	$36 pk
☐ 3 Red/3 Blue Pens	P246	____	$36 pk
☐ Charts* (60 per box)	C_ _ _	____	$24 box

*Please fill in the chart order number. For a listing of available charts got to www.dicksonweb.com, click on "product search" and select the product type, "Parts ,Accessories."

Prices are subject to change

Let Dickson remind you the next time your unit is due for calibration. Register for our FREE Calibration Club now at www.dicksonweb.com

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

5/5/07

ULTIMA (Data as Received)

Customer Instrument

Dickson Model Number: FH125

Serial Number: 06018122

Calibration Technician Dan Gawel

Calibration Date: 05/01/2007

Unit was received in working condition, or received repairs not related to it's calibration or accuracy.

Calibration Procedure P1130

The customer instrument was compared to the calibration standard. The Dickson calibration system conforms to the requirements of MIL-STD-45662A and ANSI/NCSL Z540, and ISO 17025 as appropriate. Recalibration of the customer instrument is recommended within 6-12 months after the unit is placed into service.

Environmental Conditions

72 °F 41 %RH

Calibration Standard Reading	Customer Instrument Reading	Unit Specification
Humidity (%RH)	Humidity (%RH)	Humidity
16.4	18.8	± 2% RH
62.4	58.3	± 2% RH
84	79	± 3% RH
Temperature °F	Temperature °F	Temperature
13.1	13.9	± 1.8 °F (± 1.0 °C)
71.3	71	
110.5	110.8	

FOR YOUR NEXT CALIBRATION NO PHONE CALLS REQUIRED

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

That's all there is to it!

1. Purchase Order #: _____
   Name: _____
   Phone: _____
   Model #: FH125
   Serial #: 06018122

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

2. ☐ 1-Point Deluxe NIST Calibration $149.00
   ☐ 3-Point Deluxe NIST Calibration $199.00
   ☐ 3-Point Ultima Deluxe A2LA NIST $299.00 (with incoming reading)
   ☐ N995 - User selectable NIST Temperature points $50.00 each
   (to be selected in addition to one of the above calibration options)
   ☐ N997- Next Day Service $50.00 (Not available for ULTIMA service)

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

Returned UPS 2nd Day unless otherwise requested

4. Ship To: _____

Bill To: _____

Charges/Pens
(Order now and receive them with your calibrated unit)

	Order No	Qty	Price Ea
☐ 6 Red Pens	P222	____	$36 pk
☐ 3 Red/3 Blue Pens	P246	____	$36 pk
☐ Charts* (60 per box)	C_ _ _	____	$24 box

*Please fill in the chart order number. For a listing of available charts got to www dicksonweb com, click on "product search" and select the product type, "Parts ,Accessories."

Prices are subject to change

Let Dickson remind you the next time your unit is due for calibration. Register for our FREE Calibration Club now at www.dicksonweb.com

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

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

Certificate of Calibration

MGA Research
446 Executive Drive
Troy, MI 48083

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

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

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

As Found Condition: **In Tolerance**

As Left Condition: **In Tolerance**

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

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

Results:
Tolerance used: ± 0.02

Units: lbs — **TI Division/Increment:** 0.01

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

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

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

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

7/24/07

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

Certificate of Calibration

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

calibration cert. 1448.01

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

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

shift test
N/A
PADS

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

Tests performed: ☑ Repeatability ☑ Linearity ☐ Sensitivity ☑ Discrimination

Page 1 of 2

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

☑ Scale Certified ☐ Scale Rejected

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

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

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

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

Tape Measure Calibration Certificate

Reference Steel Rule
Brand: JOHNSON LEVEL & TOOL
S/N: MGA 00122
Calibration Date: 9.21.06

Subject Tape Measure
Brand: STANLEY
S/N: TAM 729
Calibration Date: 1.2.07

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

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

Date: 1.2.07 Performed By: [signature]

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.

OK 1/3/07

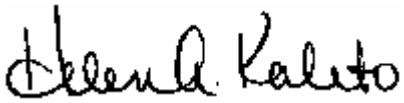
mga research corporation

CALIBRATION CERTIFICATE

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

Test Reference Number:	A0712
New DLR (100k **, Units:G):**	94.2
StdDeviation (%)	0.496
% Difference in DLR (New vs. Old):	-1.807
Temperature (°F):	74
Humidity (%):	36

Performed By: 

Approved By: 

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is ±3.7%. All certification data and equipment are on file for inspection at your request. Best uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor k=2.

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CALIBRATION CERTIFICATE

Sensor Information	Reference Sensor Information
Name: 2000 G Accelerometer	**Name:** *Reference Accelerometer*
Model: 7264-2000	**Model:** *301M09/484B*
S/N: J35919	**S/N:** *862/247*
Capacity: 2000 G	**Capacity:** *170 G*
Calibration Date: 4/30/2007	**Calibration Date:** *7/27/2006*
	Calibrated By: *Chuck DiMaggio*

Test Reference Number:	A0712
New DLR (100k **, Units:G):**	97.4
StdDeviation (%)	0.299
% Difference in DLR (New vs. Old):	-1.589
Temperature (°F):	74
Humidity (%):	36

Performed By:

Approved By:

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CALIBRATION CERTIFICATE

Sensor Information	Reference Sensor Information
Name: 2000 G Accelerometer	**Name:** *Reference Accelerometer*
Model: 7264-2000	**Model:** *301M09/484B*
S/N: J35924	**S/N:** *862/247*
Capacity: 2000 G	**Capacity:** *170 G*
Calibration Date: 4/30/2007	**Calibration Date:** *7/27/2006*
	Calibrated By: *Chuck DiMaggio*

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

Performed By:

Approved By:

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CALIBRATION CERTIFICATE

Sensor Information	Reference Sensor Information
Name: 2000 G Accelerometer	**Name:** *Reference Accelerometer*
Model: 7264-2000	**Model:** *301M09/484B*
S/N: J22696	**S/N:** *862/247*
Capacity: 2000 G	**Capacity:** *170 G*
Calibration Date: 4/30/2007	**Calibration Date:** *7/27/2006*
	Calibrated By: *Chuck DiMaggio*

Test Reference Number: A0713

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

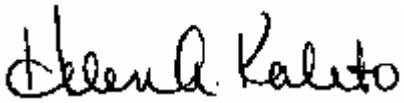
StdDeviation (%) 0.559

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

Temperature (°F): 74

Humidity (%): 36

Performed By: 

Approved By: 

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is ±3.7%. All certification data and equipment are on file for inspection at your request. Best uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor k=2.

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CALIBRATION CERTIFICATE

Sensor Information	Reference Sensor Information
Name: 2000 G Accelerometer	**Name:** *Reference Accelerometer*
Model: 7264-2000	**Model:** *301M09/484B*
S/N: J35791	**S/N:** *862/247*
Capacity: 2000 G	**Capacity:** *170 G*
Calibration Date: 4/30/2007	**Calibration Date:** *7/27/2006*
	Calibrated By: *Chuck DiMaggio*

Test Reference Number: A0713

New DLR (100k **, Units:G):** 91.9

StdDeviation (%) 0.194

% Difference in DLR (New vs. Old): 1.127

Temperature (^{o}F): 74

Humidity (%): 36

Performed By:

Approved By:

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is ±3.7%. All certification data and equipment are on file for inspection at your request. Best uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor k=2.

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CALIBRATION CERTIFICATE

Sensor Information	Reference Sensor Information
Name: 2000 G Accelerometer	**Name:** *Reference Accelerometer*
Model: 7264-2000	**Model:** *301M09/484B*
S/N: J35800	**S/N:** *862/247*
Capacity: 2000 G	**Capacity:** *170 G*
Calibration Date: 4/30/2007	**Calibration Date:** *7/27/2006*
	Calibrated By: *Chuck DiMaggio*

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

Performed By:

Approved By:

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is ±3.7%. All certification data and equipment are on file for inspection at your request. Best uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor k=2.

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CALIBRATION CERTIFICATE

Sensor Information	Reference Sensor Information
Name: 2000 G Accelerometer	**Name:** *Reference Accelerometer*
Model: 7264-2000	**Model:** *301M09/484B*
S/N: J14103	**S/N:** *862/247*
Capacity: 2000 G	**Capacity:** *170 G*
Calibration Date: 4/30/2007	**Calibration Date:** *7/27/2006*
	Calibrated By: *Chuck DiMaggio*

Test Reference Number: A0713

New DLR (100k **, Units:G):** 94.6

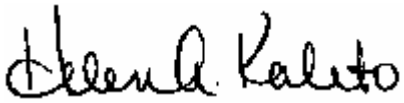
StdDeviation (%) 0.172

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

Temperature (°F): 74

Humidity (%): 36

Performed By: 

Approved By: 

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is ±3.7%. All certification data and equipment are on file for inspection at your request. Best uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor k=2.

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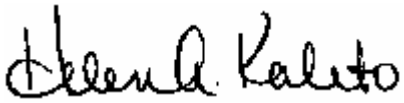
CALIBRATION CERTIFICATE

Sensor Information	Reference Sensor Information
Name: 2000 G Accelerometer	**Name:** *Reference Accelerometer*
Model: 7264-2000	**Model:** *301M09/484B*
S/N: J36197	**S/N:** *862/247*
Capacity: 2000 G	**Capacity:** *170 G*
Calibration Date: 4/30/2007	**Calibration Date:** *7/27/2006*
	Calibrated By: *Chuck DiMaggio*

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

Performed By: 

Approved By: 

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is ±3.7%. All certification data and equipment are on file for inspection at your request. Best uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor k=2.

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CALIBRATION CERTIFICATE

Sensor Information	Reference Sensor Information
Name: 2000 G Accelerometer	**Name:** *Reference Accelerometer*
Model: 7264-2000	**Model:** *301M09/484B*
S/N: J36353	**S/N:** *862/247*
Capacity: 2000 G	**Capacity:** *170 G*
Calibration Date: 4/30/2007	**Calibration Date:** *7/27/2006*
	Calibrated By: *Chuck DiMaggio*

Test Reference Number:	A0713
New DLR (100k **, Units:G):**	99.4
StdDeviation (%)	0.346
% Difference in DLR (New vs. Old):	1.014
Temperature (°F):	74
Humidity (%):	36

Performed By:

Approved By:

All calibrations are traceable to the National Institute of Standards and Technology. Estimated uncertainty of the measurement is ±3.7%. All certification data and equipment are on file for inspection at your request. Best uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor k=2.

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~ Calibration Certificate ~

Per ISO 16063-21

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

Serial Number: 862/2470 (MGA00739)

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

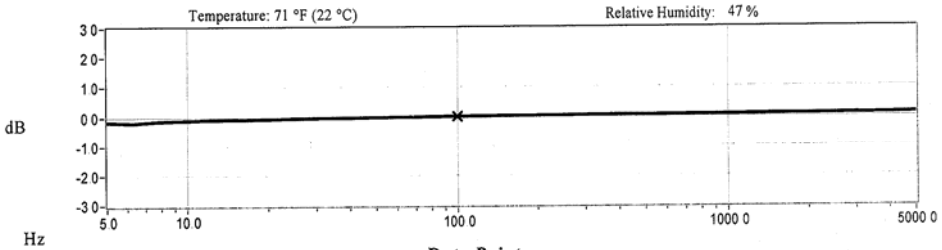
Manufacturer: PCB

ACS-10

Calibration Data

Sensitivity @ 100.0 Hz	**31.36 mV/g**	Output Bias	8 6	VDC
	(3.20 mV/m/s²)	Transverse Sensitivity	3 0	%

Sensitivity Plot



Data Points

Frequency (Hz)	Dev. (%)	Frequency (Hz)	Dev. (%)	Frequency (Hz)	Dev (%)
5.0	-2 0	REF. FREQ.	0.0	5000.0	1 2
10 0	-1.3	300.0	0.4		
15.0	-1.0	500 0	0.5		
30.0	-0.5	1000.0	0.6		
50.0	-0 3	3000.0	1.0		

Mounting Surface: Stainless Steel w/Silicone Grease Coating Fastener: Stud Mount Fixture Orientation: Vertical
Acceleration Level (rms)[1]: 10.0 g (98 1 m/s²)
[1]The acceleration level may be limited by shaker displacement at low frequencies If the listed level cannot be obtained, the calibration system uses the following formula to set the vibration amplitude: Acceleration Level (g) = 0 010 x (freq)²
[2]The gravitational constant used for calculations by the calibration system is; 1 g = 9 80665 m/s²

Condition of Unit

As Found: In Tolerance, No Adjustment Necessary

As Left: In Tolerance

Notes

1. Calibration is NIST Traceable thru Project 822/274086 and PTB Traceable thru Project 1060
2. This certificate shall not be reproduced, except in full, without written approval from PCB Piezotronics, Inc
3. Calibration is performed in compliance with ISO 9001, ISO 10012-1, ANSI/NCSL Z540-1-1994 and ISO 17025
4. See Manufacturer's Specification Sheet for a detailed listing of performance specifications
5. Measurement uncertainty (95% confidence level with coverage factor of 2) for frequency ranges tested during calibration are as follows: 5-9 Hz; +/- 2.0%, 10-99 Hz; +/- 1.5%, 100-1999 Hz; +/- 1.0%, 2-10 kHz; +/- 2.5%.

Technician: Chuck DiMaggio CD Date: 07/23/07

ACCREDITED
Cert No 1862 01

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

7/24/07

CAL3 - 3268027234 03

PAGE 1 of 1

~Certificate of Calibration~

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

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

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

As Received: In tolerance, no adjustment required.

As Left: In tolerance.

Special Notes:

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

ACCREDITED
Cert. No. 1862.01

PCB PIEZOTRONICS

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

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

Page 1 of 1