

**REPORT NUMBER: 222-MGA-2007-002**

**SAFETY COMPLIANCE TESTING FOR  
FMVSS NO. 222  
SCHOOL BUS PASSENGER SEATING AND CRASH PROTECTION**

**LES ENTERPRISES MICHEL CORBEIL INC.  
2006 CORBEIL SCHOOL BUS  
NHTSA NO.: C60902**

**PREPARED BY:  
MGA RESEARCH CORPORATION  
5000 WARREN ROAD  
BURLINGTON, WI 53105**




**Final Report Date: April 16, 2007**

**FINAL REPORT**

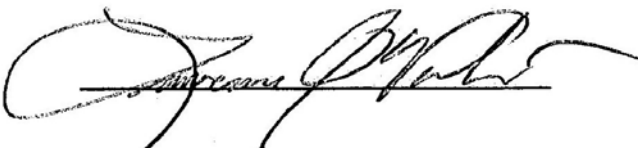
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## TABLE OF CONTENTS

<u>Section</u>		<u>Page No</u>
1	Purpose of Compliance Test	1
2	Test Data Summary	2
3	Compliance Test Data	7
	Data Sheet 1 - Seat to Seat/Barrier Spacing	8
	Data Sheet 2 - Seat Back Height & Front Surface Area Test	9
	Data Sheet 3 - Seat Cushion Retention Test	11
	Data Sheet 4 - Seat Back Force Deflection Test - Forward	13
	Data Sheet 5 - Seat Back Force Deflection Test - Rearward	17
	Data Sheet 6 - Restraining Barrier Position and Projected Rear Surface Area	19
	Data Sheet 7 - Head Form Impact Contact Area and Energy Requirements	23
	Data Sheet 8 - Knee Form Impact Test	27
	Data Sheet 9 - Seat Belt Assembly Anchorages	29
4	TP-222-03 (Appendix B FMVSS 208, Occupant Crash Protection for Class 2 School Buses)	30
	Data Sheet B1 - Seat Belt Check	30
	Data Sheet B2 - Seat Belt Warning System Check	33
5	Instrumentation and Equipment List	34
6	Photographs	35
7	Test Plots	59
8	Welt Contact Points	90
9	Bus Floor Plan	100

**SECTION 1**  
**PURPOSE OF COMPLIANCE TEST**

Tests were conducted on a 2006 Corbeil School Bus, NHTSA No. C60902, in accordance with the specifications of the Office of Vehicle Safety Compliance (OVSC) Test Procedures TP-222-03 to determine compliance to the requirements of Federal Motor Vehicle Safety Standards (FMVSS) 222, "School Bus Passenger Seating and Crash Protection".

This program is sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-02-D-01057.

## **SECTION 2**

### **TEST DATA SUMMARY**

The passenger seating and crash protection tests were conducted during November 2006 through March 2007. All tests were conducted by MGA Research Corporation at the Wisconsin Operations. The test vehicle, 2006 Corbeil School Bus, NHTSA No. C60902, appeared to meet all the requirements of FMVSS 222.

#### LINEAR AND AREA MEASUREMENTS

Seat to seat/barrier spacing was checked on all seats and found to be 610 mm or less as shown on Data Sheet 1.

The seat back height and front surface area of Seat Nos. 1 and 3 were measured in accordance with Section 12.1 of OVSC TP-222-03. As shown in Data Sheet 2 for Seat Nos. 1 and 3, the seat back area is greater than ninety percent of the seat bench width multiplied by 508.

#### SEAT CUSHION RETENTION

Seat Nos. 7 and 10 were tested in accordance with Section 12.3 of OVSC TP-222-03. Seat cushion weight was 3.3 kg for both S7 and S10. The maximum force reached for S7 was 165.0 N for S7 and 162.0 N for S10. For S7, the lower time limit boundary (t1) was approximately 2.0 seconds with an approximate load duration of 5.0 seconds. For S10, the lower time limit boundary (t1) was approximately 2.0 seconds with an approximate load duration of 5.5 seconds. As shown in Data Sheet 3, the seat cushions tested complied with all requirements.

#### SEAT BACK FORCE/DEFLECTION TEST - FORWARD

Seat Nos. 1 and 4 were tested in accordance with Section 12.4 of OVSC TP-222-03. Please note that S4 was tested in the S2 location. Seat bench width was determined to be 765 for both seats. "W" was calculated to be 2 for S1 and S4. The seating reference point (SRP) was 512 mm above the bus floor. The deflection of the seat back at conclusion of lower loading bar loading at 1557 W N load was 43.7 mm for S1 and 49.7 mm for S4. The allowable maximum deflection without moving the seat back to within 102 mm of another seat or restraining barrier

## **SECTION 2 (CONTINUED)**

### **TEST DATA SUMMARY**

was 356 mm. The stroke rate of the upper loading bar was determined by the test engineer to be 14.4 mm/sec. The location of the upper loading bar was 406 mm above the SRP. The tests were stopped when the maximum deflection of 356 mm was reached. The minimum required area under the force versus deflection curve of the upper loading bar was 452 W or 904 joules for both seats. As shown on Data Sheet No. 4, Seat Nos. 1 and 4 met the force deflection forward requirements. See Plots 3, 4, 5, and 6.

#### SEAT BACK FORCE/DEFLECTION TEST - REARWARD

Seat No. 3 was tested in accordance with Section 12.4 of OVSC TP-222-03. Seat bench width was determined to be 760 mm for S3. "W" was calculated to be 2. The seating reference point (SRP) was 512 mm above the bus floor. The allowable maximum deflection without moving the seat back to within 102 mm of another seat or restraining barrier was 254 mm. The stroke rate of the upper loading bar was determined by the test engineer to be 14.4 mm/sec for S3. The location of the loading bar was 343 mm above the SRP. The test was stopped when the maximum deflection of the seat back of 254 mm was achieved.

The area under the force versus deflection curve of the loading bar was 922 joules for S3. The minimum required area under the force versus deflection curve of the loading bar was 316 W or 632 joules for S3. As shown in Data Sheet No. 5, the tested areas under the force versus deflection curves for the loading bar comply with the requirements for S3. See Plot 7.

#### KNEE FORM IMPACT ZONE TESTS

Seat No. S9 was tested in accordance with Section 12.7 of OVSC TP-222-03. The mass of the knee form was 4.53 kg. All knee form contact area criteria and impact energy criteria were met for the seat.

#### HEAD FORM IMPACT ZONE TESTS

Seat No. S9 and the bulkhead were tested in accordance with Section 12.6 of OVSC TP-222-03. The mass of the head form was 5.21 kg. All head form contact area criteria was met for the seat. The impact energy criteria and head injury criteria for all impact locations were met.

## **SECTION 2 (CONTINUED)**

### **TEST DATA SUMMARY**

#### SEAT BELT ANCHORAGES

Seat belt anchorage for seat location S5 was tested in accordance with Appendix A of OVSC TP-222-03. Seat belt anchorages and specially made high strength webbing straps were used to conduct the test. The seat belt anchor points met the required load of 22,000 N for each of the seating positions being tested. See Plot 8.



### ADMINISTRATIVE DATA SHEET

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
 Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
 Test Date: **9/27/2006**

#### INCOMPLETE VEHICLE (IF APPLICABLE)

Manufacturer:	Ford Motor Company
Model:	754-NY-20-00WC-EMC
VIN:	1FDSE35L66DA60778
Build Date:	04/06
Certification Date:	

#### COMPLETED VEHICLE (SCHOOL BUS)

Manufacturer:	Les Entreprises Michel Corbeil Inc.
Make/Model:	FORD / CORBEIL
VIN:	1FDSE35L66DA60778
NHTSA No.:	C60902
Color:	Yellow
GVWR:	4,355 kg / 9,600 lbs
Build Date:	06/29/2006
Certification Date:	06/29/2006


#### DATES

Vehicle Receipt:	9/27/2006
Start of Compliance Test:	11/1/2006
Completion of Compliance Test:	3/14/2007

**COMPLIANCE TEST:**

All tests were performed in accordance with the references outlined in TP-222-03.

Recorded By: 

Approved By: 

DATE: 9/27/2006

## GENERAL TEST DATA SHEET

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
 Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
 Test Date: **11/1/2006**

### SCHOOL BUS IDENTIFICATION

Model Year/Mfr./Make/Model:	2006 CORBEIL
Passenger Capacity:	(1 Driver, 20 Passengers)
NHTSA No.:	C60902
VIN:	1FDSE35L66DA60778
Conventional or Forward Control:	Conventional
GVWR (Certification Label) FRONT:	1,610 kg / 3,500 lbs
GVWR (Certification Label) REAR:	2,760 kg / 6,084 lbs
GVWR (Certification Label) TOTAL:	4,355 kg / 9,600 lbs

### TEST CONDITIONS

Date(s) of Test:	11/1/2006 – 3/14/2007
Ambient Temperature (°C):	21
Required Temperature Range:	0°C to 32°C

### SEAT IDENTIFICATION

Seat Manufacturer:	Les Entreprises Michel Corbeil Inc.
Model Name & Number:	
Description of Seats:	Seat frames are constructed of 25.4 mm square and round welded tubing. The seat back has 5 mm plywood attached to the tubing and is covered with 32 mm medium density foam on the front and rear surfaces. At the knee bolsters, there is 42 mm Styrofoam covered by 12 mm foam. The seat cushion is constructed of 12 mm plywood with 125 mm foam. The seat back and seat cushion are wrapped with 0.65 mm vinyl.

**SECTION 3**  
**COMPLIANCE TEST DATA**

The following data sheets document the results of testing on the 2006 Corbeil School Bus, NHTSA No. C60902.

**DATA SHEET 1**  
**SEAT TO SEAT/BARRIER SPACING**


Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
Test Date: **11/1/2006**

SEAT NUMBER	MEASUREMENT OF SPACING FROM SRP FORWARD TO SEAT/BARRIER (mm)	REQMT $\leq$ 610 MM ( $\leq$ 24") CLASS 1 BUSES ONLY
		PASS/FAIL
1	500	PASS
2	480	PASS
3	470	PASS
4	465	PASS
5	420	PASS
6	420	PASS
7	460	PASS
8	485	PASS
9	490	PASS
10	490	PASS

COMMENTS: NONE

Recorded By: 

Approved By: 

DATE: 11/1/2006

**DATA SHEET 2**  
**SEAT BACK HEIGHT & FRONT SURFACE AREA TEST**

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
 Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
 Test Date: **11/1/2006**

**SEAT NUMBER: S1**

		<b>PASS/FAIL</b>
1.	Is the seat back height at least 508 mm vertically above the SRP? (S5.1.2)	<b>PASS</b>

2. Measure the seat back front projected area in a vertical plane bound by horizontal planes through the SRP and 508 mm above the SRP according to the following procedure:

Width, a = 650 mm; width, b = 740 mm; radius = 0 mm

Area =  $\frac{1}{2}(a+b) \times 508 \text{ mm} = 353,060 \text{ mm}^2 - 0 \text{ mm}^2 = 353,060 \text{ mm}^2$


3. Measure the seat cushion width - W1 = 765 mm  
 If the seat cushion is not rectangular, measure the cushion at the forward most edge and the rearward most edge, average the widths, and use the average width as W1.
4. Calculate the following:  $0.9 \times W1 \times 508 \text{ mm} = 349,758 \text{ mm}^2$

		<b>PASS/FAIL</b>
5.	Is item 2 greater than item 4? (S5.1.2)	<b>PASS</b>

NOTE: For a seat back or a seat cushion that has a nonsymmetrical shape or has a large radius at the corner, the above described measuring method must be modified as required to obtain accurate area measurements.

Comments: None

Recorded By: 

Approved By: 

DATE: 11/1/2006

**DATA SHEET 2 (CONTINUED)**  
**SEAT BACK HEIGHT & FRONT SURFACE AREA TEST**

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
 Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
 Test Date: **11/1/2006**

**SEAT NUMBER: S3**

		<b>PASS/FAIL</b>
1.	Is the seat back height at least 508 mm vertically above the SRP? (S5.1.2)	<b>PASS</b>

2. Measure the seat back front projected area in a vertical plane bound by horizontal planes through the SRP and 508 mm above the SRP according to the following procedure:

Width, a = 660 mm; width, b = 740 mm; radius = 0 mm

Area =  $\frac{1}{2} (a+b) \times 508 \text{ mm} = 355,600 \text{ mm}^2 - 0 \text{ mm}^2 = 355,600 \text{ mm}^2$


3. Measure the seat cushion width - W1 = 760 mm  
 If the seat cushion is not rectangular, measure the cushion at the forward most edge and the rearward most edge, average the widths, and use the average width as W1.
4. Calculate the following:  $0.9 \times W1 \times 508 \text{ mm} = 347,472 \text{ mm}^2$

		<b>PASS/FAIL</b>
5.	Is item 2 greater than item 4? (S5.1.2)	<b>PASS</b>

NOTE: For a seat back or a seat cushion that has a nonsymmetrical shape or has a large radius at the corner, the above described measuring method must be modified as required to obtain accurate area measurements.

Comments: None

Recorded By: 

Approved By: 

DATE: 11/1/2006

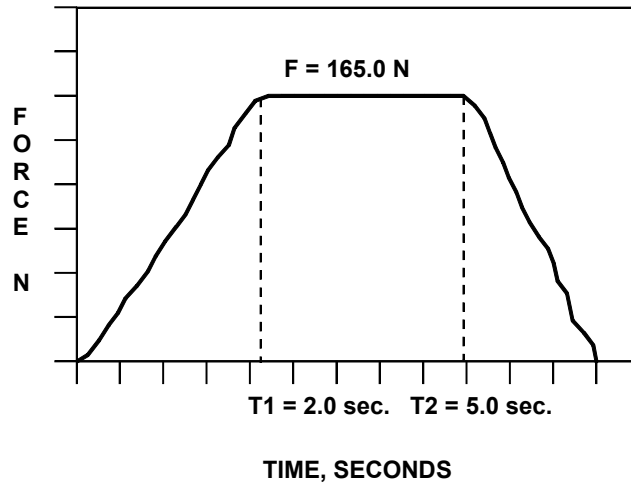
**DATA SHEET 3**  
**SEAT CUSHION RETENTION TEST**

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
Test Date: **1/10/2007**

**SEAT NUMBER: S7**

1. Cushion Weight/Mass = 3.3 kg
2. Cushion Weight x 5 = F = 162.0 N (S5.1.5)
3. Complete the following force/time graph:



F must be 5 x Cushion Weight; t1 and t2 must be according to the following expressions:  
T1 => 1 sec., < 5 sec., t2 = t1 + 5 sec., + 0 sec. and -0.10 sec.

		PASS/FAIL
4.	Did seat cushion separate from the seat structure at any attachment point? (S5.1.5)	<b>PASS</b>

DESCRIBE SEAT CUSHION ATTACHMENTS: Two steel retaining bands on the front; one pivoting latch in the rear.

Comments: None

Recorded By: \_\_\_\_\_

Approved By: \_\_\_\_\_

DATE: 1/10/2007

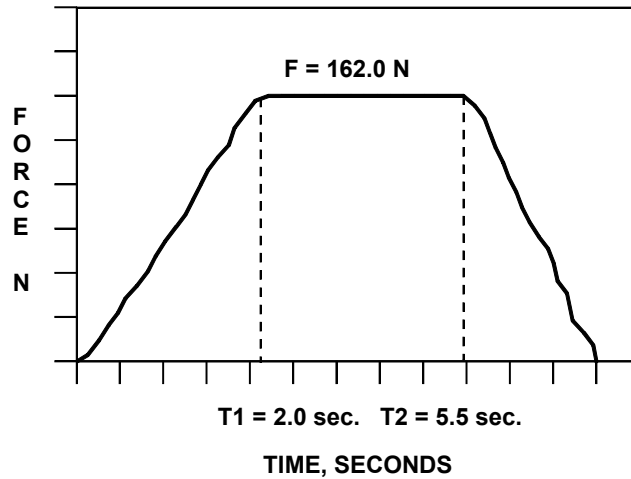
**DATA SHEET 3 (CONTINUED)**  
**SEAT CUSHION RETENTION TEST**

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
 Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
 Test Date: **1/10/2007**

**SEAT NUMBER: S10**

1. Cushion Weight/Mass = 3.3 kg
2. Cushion Weight x 5 = F = 162.0 N (S5.1.5)
3. Complete the following force/time graph:



F must be 5 x Cushion Weight; t1 and t2 must be according to the following expressions:  
 $T1 \geq 1 \text{ sec.}, < 5 \text{ sec.}, t2 = t1 + 5 \text{ sec.}, + 0 \text{ sec. and } -0.10 \text{ sec.}$

		PASS/FAIL
4.	Did seat cushion separate from the seat structure at any attachment point? (S5.1.5)	<b>PASS</b>

DESCRIBE SEAT CUSHION ATTACHMENTS: Two steel retaining bands on the front; one pivoting latch in the rear.

Comments: None

Recorded By: \_\_\_\_\_

Approved By: \_\_\_\_\_

DATE: 1/10/2007



**DATA SHEET 4**  
**SEAT BACK FORCE DEFLECTION TEST - FORWARD**

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
Test Date: **11/1/2006**

**SEAT NUMBER: S1**

1. Seat Bench Width = 765 mm  
 $W = (\text{Seat Bench Width})/381 \text{ mm (round to nearest whole number)} = (2)$   
Seat Reference Point (SRP) location is: (Description of location as supplied by the COTR: 512 mm Above Floor, -265 mm from front aisle bolt.
2. Location of lower loading bar is 0 mm above the SRP.  
(Requirement: Between 102 mm above and 102 mm below the SRP) (S5.1.3.1)  
Length of lower loading bar = 635 mm  
Seat Back width at SRP = 745 mm
3. Include x-y plot of Force vs. Time for the lower loading bar.
4. Deflection of the seat back at conclusion of lower bar loading (1557 W Newtons position) = 43.7 mm, at start of upper bar loading 43.7 mm, at end of upper bar loading 43.7 mm.
5. Maximum deflection allowed without moving the seat back to within 102 mm of another seat or restraining barrier = 356 mm (must be 356 mm or less) (S5.1.3)
6. Seat back movement rate selected by the test engineer = 14.4 mm/sec
7. Location of upper loading bar is in a horizontal plane 406 mm above the SRP.  
(Requirement: 406 mm) (S5.1.3.3). Length of upper loading bar = 585 mm. Width of seat back at 406 mm above SRP = 685 mm.
8. Reason for stopping seat back deflection:  
 Reached deflection determined in Item 6 above (if less than 356 mm)  
 Reached 356 mm maximum allowed deflection (Actual deflection was 356 mm)  
 Separation was about to occur
9. Include the x-y plot of force vs. deflection for the upper loading bar with boundaries of Figure 14 (OVSC TP-222-3) superimposed.

**DATA SHEET 4 (CONTINUED)**  
**SEAT BACK FORCE DEFLECTION TEST – FORWARD**

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
 Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
 Test Date: **11/1/2006**

		PASS/FAIL
10.	Is the seat in its final deflected position within 102 mm of the next seat or barrier?	<b>PASS</b>


		PASS/FAIL
11.	Does the forward force vs. deflection trace of the seat back lie within the corridor? (S5.1.3)	<b>PASS</b>

- 12. Include a deflection vs. time plot for the upper loading bar.
- 13. The area within the force vs. deflection curve = 1,312 joules
- 14. 452W = 904 joules (S5.1.3.4)

		PASS/FAIL
15.	Is item 13 greater than or equal to item 14? (S5.1.3.4)	<b>PASS</b>

Comments: None

Recorded By: 

Approved By: 

DATE: 11/1/2006

**DATA SHEET 4 (CONTINUED)**  
**SEAT BACK FORCE DEFLECTION TEST - FORWARD**

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
Test Date: **11/1/2006**

**SEAT NUMBER: S4, in S2 Location**

1. Seat Bench Width = 765 mm  
W = (Seat Bench Width)/381 mm (round to nearest whole number) = (2)  
Seat Reference Point (SRP) location is: (Description of location as supplied by the COTR): 512 mm Above Floor, -265 mm from front aisle bolt.
2. Location of lower loading bar is 0 mm above the SRP.  
(Requirement: Between 102 mm above and 102 mm below the SRP) (S5.1.3.1)  
Length of lower loading bar = 635 mm  
Seat Back width at SRP = 745 mm
3. Include x-y plot of Force vs. Time for the lower loading bar.
4. Deflection of the seat back at conclusion of lower bar loading (1557 W Newtons position) = 49.7 mm, at start of upper bar loading 49.7 mm, at end of upper bar loading 49.7 mm.
5. Maximum deflection allowed without moving the seat back to within 102 mm of another seat or restraining barrier = 356 mm (must be 356 mm or less) (S5.1.3)
6. Seat back movement rate selected by the test engineer = 14.4 mm/sec
7. Location of upper loading bar is in a horizontal plane 406 mm above the SRP.  
(Requirement: 406 mm) (S5.1.3.3). Length of upper loading bar = 585 mm. Width of seat back at 406 mm above SRP = 685 mm.
8. Reason for stopping seat back deflection:  
 Reached deflection determined in Item 6 above (if less than 356 mm)  
 Reached 356 mm maximum allowed deflection (Actual deflection was 356 mm)  
 Separation was about to occur
9. Include the x-y plot of force vs. deflection for the upper loading bar with boundaries of Figure 14 (OVSC TP-222-3) superimposed.

**DATA SHEET 4 (CONTINUED)**  
**SEAT BACK FORCE DEFLECTION TEST - FORWARD**

		PASS/FAIL
10.	Is the seat in its final deflected position within 102 mm of the next seat or barrier?	<b>PASS</b>


		PASS/FAIL
11.	Does the forward force vs. deflection trace of the seat back lie within the corridor? (S5.1.3)	<b>PASS</b>

- 12. Include a deflection vs. time plot for the upper loading bar.
- 13. The area within the force vs. deflection curve = 1,341 joules
- 14. 452W = 904 joules (S5.1.3.4)

		PASS/FAIL
15.	Is item 13 greater than or equal to item 14? (S5.1.3.4)	<b>PASS</b>

Comments: None

Recorded By: 

Approved By: 

DATE: 11/1/2006

**DATA SHEET 5**  
**SEAT BACK FORCE DEFLECTION TEST – REARWARD**

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
 Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
 Test Date: **11/1/2006**

**SEAT NUMBER: S3**

1. Seat Bench Width = 760 mm  
 $W = (\text{Seat Bench Width})/381 \text{ mm (round to nearest whole number)} = (2)$
2. Location of the loading bar is in a horizontal plane 343 mm above the SRP of the test seat. (Requirement: 343 mm above the SRP) (S5.1.4.1)  
 Length of loading bar = 595 mm  
 Width of seat back at 343 mm above SRP = 696 mm
3. Deflection of seat back at 222 N preload = 17mm
4. Maximum deflection allowed without moving the seat back to within 102 mm of another seat = 254 mm (maximum allowed = 254 mm) (S5.1.4)
5. Seat back movement rate selected by the test engineer = 14.4 mm/sec
6. Reason for stopping deflection:  
 Reached deflection determined in Item 4 above (if less than 254 mm)  
 Reached 254 mm maximum allowed deflection (Actual deflection was 256 mm)  
 Separation was about to occur
7. Include the x-y plot of force vs. deflection for the loading bar with boundaries of Figure 18 (OVSC TP-222-3) superimposed.

		<b>PASS/FAIL</b>
8.	Does the force vs. deflection plot lie within the boundaries of Figure 18 (OVSC TP-222-03)?	<b>PASS</b>

9. Include a deflection vs. time plot for the upper loading bar.
10. 316W = 632 joules
11. The area within the force vs. deflection curve = 922 joules

**DATA SHEET 5 (CONTINUED)**  
**SEAT BACK FORCE DEFLECTION TEST – REARWARD**


Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
Test Date: **11/1/2006**

		PASS/FAIL
12.	Is item 11 greater than or equal to item 10? (S5.1.4.2)	PASS

Comments: None

Recorded By:  \_\_\_\_\_

Approved By:  \_\_\_\_\_

DATE: 11/1/2006

## DATA SHEET 6

### RESTRAINING BARRIER POSITION AND PROJECTED REAR SURFACE AREA

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
 Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
 Test Date: **11/1/2006**

**SEAT NUMBER: B1**

1. Measure distance T from SRP of seat immediately aft of barrier in a horizontal longitudinal line forward to barrier. T = 500 mm.

		PASS/FAIL
2.	Is distance T equal to or less than 610 mm? (S5.2)	<b>PASS</b>

3. Measure distance D at top (t) and bottom (b) of barrier.  
 $D_t = 35 \text{ mm}$                        $D_b = 0 \text{ mm}$
4. Measure distance C at top (t) and bottom (b) of barrier.  
 $C_t = 35 \text{ mm}$                        $C_b = 0 \text{ mm}$

		PASS/FAIL
5.	Is $D_t$ equal to or less than $C_t$ ?	<b>PASS</b>

		PASS/FAIL
6.	Is $D_b$ equal to or less than $C_b$ ?	<b>PASS</b>

7. Measure distance E at top of barrier and bottom of barrier.  
 $E_t = 672 \text{ mm}$                        $E_b = 753 \text{ mm}$
8. Measure distance A at top of seat back and bottom of seat.  
 $A_t = 665 \text{ mm}$                        $A_b = 750 \text{ mm}$

		PASS/FAIL
9.	Is distance $E_t + D_t$ equal to or greater than distance $A_t + C_t$ ?	<b>PASS</b>

		PASS/FAIL
10.	Is distance $E_b + D_b$ equal to or greater than distance $A_b + C_b$ ?	<b>PASS</b>

11. Measure distance U at inboard (i) and outboard (o) side of barrier.  
 $U_i = 350 \text{ mm}$                        $U_o = 350 \text{ mm}$
12. Measure distance V at inboard (i) and outboard (o) sides of seat.  
 $V_i = 350 \text{ mm}$                        $V_o = 350 \text{ mm}$

**DATA SHEET 6 (CONTINUED)**  
**RESTRAINING BARRIER POSITION AND PROJECTED REAR SURFACE AREA**

		PASS/FAIL
13.	Is $U_i$ equal to or less than $V_i$ ?	PASS

		PASS/FAIL
14.	Is $U_o$ equal to or less than $V_o$ ?	PASS

15. Measure distance S at inboard (I) and outboard (o) side of barrier.

$S_i = 780$  mm                       $S_o = 783$  mm

16. Measure distance W at inboard (i) and outboard (o) sides of seat.

$W_i = 775$  mm                       $W_o = 775$  mm

		PASS/FAIL
17.	Is $S_i + U_i$ equal to or greater than $W_i + V_i$ ?	PASS

		PASS/FAIL
18.	Is $S_o + U_o$ equal to or greater than $W_o + V_o$ ?	PASS


19. Compute area ( $W \times A$ ) = 548,313 mm<sup>2</sup>

20. Compute area ( $E \times S$ ) = 556,819 mm<sup>2</sup>

		PASS/FAIL
21.	Is ( $W \times A$ ) equal to or less than ( $E \times S$ )?	PASS

Comments: None

Recorded By: 

Approved By: 

DATE: 11/1/2006



**DATA SHEET 6 (CONTINUED)**

**RESTRAINING BARRIER POSITION AND PROJECTED REAR SURFACE AREA**

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
 Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
 Test Date: **11/1/2006**

**SEAT NUMBER: B10**

1. Measure distance T from SRP of seat immediately aft of barrier in a horizontal longitudinal line forward to barrier. T= 490 mm.

		PASS/FAIL
2.	Is distance T equal to or less than 610 mm? (S5.2)	<b>PASS</b>

3. Measure distance D at top (t) and bottom (b) of barrier.  
 $D_t = 45 \text{ mm}$                        $D_b = 0 \text{ mm}$
4. Measure distance C at top (t) and bottom (b) of barrier.  
 $C_t = 50 \text{ mm}$                        $C_b = 0 \text{ mm}$

		PASS/FAIL
5.	Is $D_t$ equal to or less than $C_t$ ?	<b>PASS</b>

		PASS/FAIL
6.	Is $D_b$ equal to or less than $C_b$ ?	<b>PASS</b>

7. Measure distance E at top of barrier and bottom of barrier.  
 $E_t = 675 \text{ mm}$                        $E_b = 750 \text{ mm}$
8. Measure distance A at top of seat back and bottom of seat.  
 $A_t = 665 \text{ mm}$                        $A_b = 750 \text{ mm}$

		PASS/FAIL
9.	Is distance $E_t + D_t$ equal to or greater than distance $A_t + C_t$ ?	<b>PASS</b>

		PASS/FAIL
10.	Is distance $E_b + D_b$ equal to or greater than distance $A_b + C_b$ ?	<b>PASS</b>

11. Measure distance U at inboard (i) and outboard (o) side of barrier.  
 $U_i = 350 \text{ mm}$                        $U_o = 345 \text{ mm}$
12. Measure distance V at inboard (i) and outboard (o) sides of seat.  
 $V_i = 350 \text{ mm}$                        $V_o = 350 \text{ mm}$

**DATA SHEET 6 (CONTINUED)**  
**RESTRAINING BARRIER POSITION AND PROJECTED REAR SURFACE AREA**

		PASS/FAIL
13.	Is $U_i$ equal to or less than $V_i$ ?	PASS

		PASS/FAIL
14.	Is $U_o$ equal to or less than $V_o$ ?	PASS

15. Measure distance S at inboard (i) and outboard (o) side of barrier.  
 $S_i = 780 \text{ mm}$                        $S_o = 780 \text{ mm}$

16. Measure distance W at inboard (i) and outboard (o) sides of seat.  
 $W_i = 760 \text{ mm}$                        $W_o = 760 \text{ mm}$

		PASS/FAIL
17.	Is $S_i + U_i$ equal to or greater than $W_i + V_i$ ?	PASS

		PASS/FAIL
18.	Is $S_o + U_o$ equal to or greater than $W_o + V_o$ ?	PASS


19. Compute area ( $W \times A$ ) = 537,700 mm<sup>2</sup>

20. Compute area ( $E \times S$ ) = 555,750 mm<sup>2</sup>

		PASS/FAIL
21.	Is ( $W \times A$ ) equal to or less than ( $E \times S$ )?	PASS

Comments: None

Recorded By: 

Approved By: 

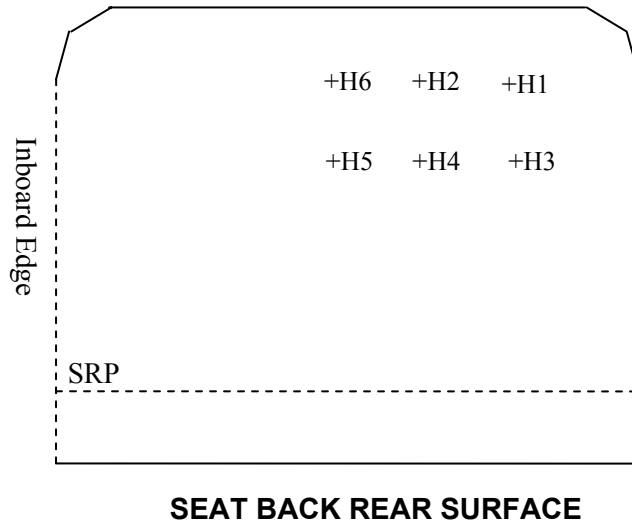
DATE: 11/1/2006

**DATA SHEET 7**  
**HEAD FORM IMPACT CONTACT AREA AND ENERGY REQUIREMENTS**

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
Test Date: **1/8/2007**

**SEAT NUMBER: S9**



1. Locate x-y reference point on sketch above for head form impact locations. (Label the positive and negative directions, if applicable)
2. Identify head form impact location on sketch by placing H1, H2, H3, H4, H5, and H6 in the appropriate location.
3. Define and mark on graphic above, the plane of reference for head form impact angle:  
0° = Parallel With Floor, (+) is Up, (-) is Down  
X = From Inboard Edge of Seat  
Y = Measured Vertically from the SRP

**DATA SHEET 7 (CONTINUED)**  
**HEAD FORM IMPACT CONTACT AREA AND ENERGY REQUIREMENTS**

4. Complete the following table:

(1) Head Impact & Test #	(2) Location (a)			(3) Speed Trap Impact Velocity** mps	(4)* Derived Velocity mps	(5) Contact Area (CA) mm <sup>2</sup>	(6) CA ≥ 1935 mm <sup>2</sup>		(7)
	X	Y	Angle				Yes- Pass	No- Fail	
H1	588	510	0	1.56	1.74	5,010	<b>PASS</b>		
H2	488	510	0	1.55	1.98	5,260	<b>PASS</b>		
H3	588	360	0	1.56	1.56	4,660	<b>PASS</b>		
H4	488	360	0	1.56	1.35	4,490	<b>PASS</b>		
H5	388	360	0	1.56	1.45	4,400	<b>PASS</b>		
H6	388	510	0	1.56	1.78	4,970	<b>PASS</b>		


\* Contact Velocity from Item 7 below

\*\* Velocity Range = 1.52 mps, +0.08, -0 mps

5. Attach Contact Area Prints.
6. Attach acceleration versus time plots for each impact.
7. Integrate the acceleration versus time plots and attach plots of the results that show velocity versus time.

Comments: (a) All measurements are referenced to the point where the horizontal plane through the SRP intersects the vertical line tangent to the inboard edge of the seat.

Recorded By: 

Approved By: 

DATE: 1/8/2007

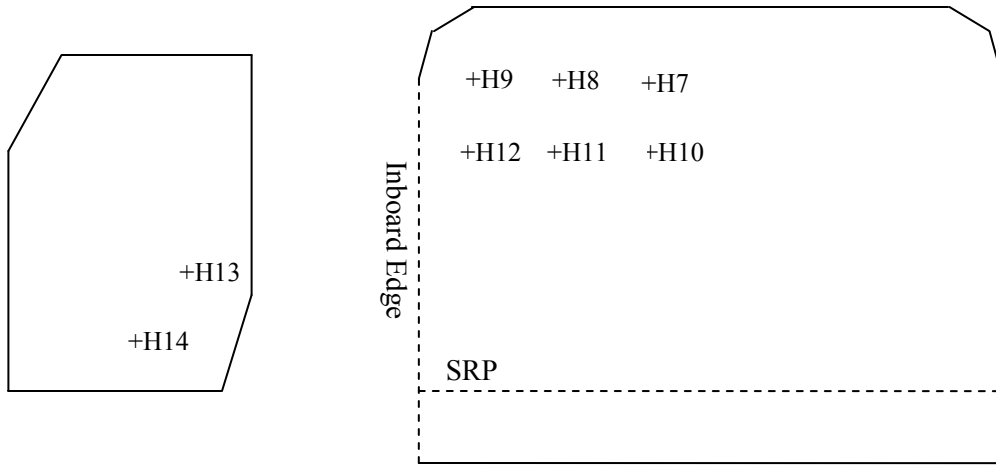
**DATA SHEET 7 (CONTINUED)**

**HEAD FORM IMPACT CONTACT AREA AND ENERGY REQUIREMENTS**

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
Test Date: **1/8/2007**

**SEAT NUMBER: S9 AND BULKHEAD**



**PADDED BULKHEAD ABOVE B1 / SEAT BACK REAR SURFACE**

1. Locate x-y reference point on sketch above for head form impact locations. (Label the positive and negative directions, if applicable)
2. Identify head form impact location on sketch by placing H7, H8, H9, H10, H11, H12, H13, and H14 in the appropriate location.
3. Define and mark on graphic above, the plane of reference for head form impact angle:  
0° = Parallel With Floor, (+) is Up, (-) is Down  
X = From Inboard Edge of Seat  
Y = Measured Vertically from the SRP

**DATA SHEET 7 (CONTINUED)**  
**HEAD FORM IMPACT CONTACT AREA AND ENERGY REQUIREMENTS**

4. Complete the following table:

(1) Head impact & Test #	(2)			(3) Speed Trap Impact Velocity ** mps	(4)* Derived Velocity ** mps	(5) Max HIC	(6) Engy Reqd Joules	(7)		(8)	
	Location (a)							Column 5 < 1000		Column 6 > 4.5 joules	
	X	Y	Angle					Yes- Pass	No- Fail	Yes- Pass	No- Fail
H7	288	510	0	6.62	6.61	149	5.08	PASS		PASS	
H8	188	510	0	6.63	6.99	148	5.82	PASS		PASS	
H9	88	510	0	6.66	6.92	140	5.79	PASS		PASS	
H10	288	360	0	6.69	7.16	132	11.06	PASS		PASS	
H11	188	360	0	6.69	6.90	151	8.30	PASS		PASS	
H12	88	360	0	6.66	6.43	188	4.74	PASS		PASS	
H13	500	788	0	6.61	6.76	427	8.17	PASS		PASS	
H14	575	703	0	6.63	6.55	272	6.80	PASS		PASS	

\* Impact velocity from item No. 6 below


\*\* Impact velocity range = 6.69 mps, +0, -0.08 mps

5. Attach acceleration versus time plots for each impact.
6. Integrate the acceleration versus time plots and attach plots of the results that show velocity versus time.

Comments: (a) All measurements are referenced to the point where the horizontal plane through the SRP intersects the vertical line tangent to the inboard edge of the seat.

H13 and H14 were located on the padded bulkhead above B1.

Recorded By: 

Approved By: 

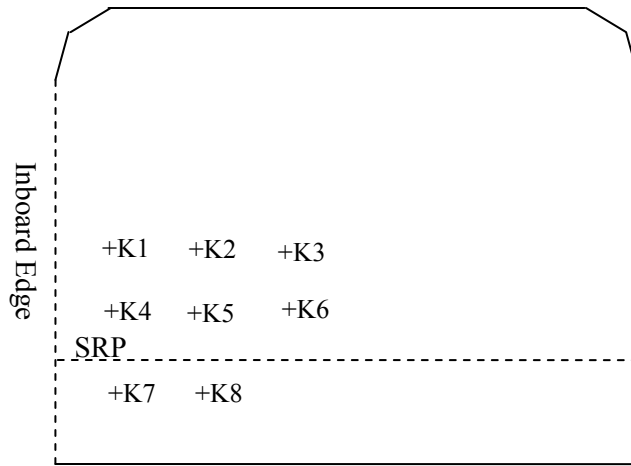
DATE: 1/8/2007

**DATA SHEET 8**  
**KNEE FORM IMPACT TEST**

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
Test Date: **1/8/2007**

**SEAT NUMBER: S9**



**SEAT BACK REAR SURFACE**

1. Locate x-y reference point on sketch above for knee form impact locations. (Label the positive and negative directions, if applicable)
2. Identify knee form impact location on sketch by placing K1, K2, K3, K4, K5, K6, K7, and K8 in the appropriate location.
3. Define the plane of reference for knee form impact angle:  
0° = Parallel With Floor, (+) is Up, (-) is Down  
X = From Inboard Edge of the Seat  
Y = Measured Vertically from the SRP

**DATA SHEET 8 (CONTINUED)**  
**KNEE FORM IMPACT TEST**

4. Complete the following table:

(1) Knee impact & Test #	(2)			(3) Speed Trap Impact Velocity ** mps	(4)* Derived Velocity ** mps	(5) Cont. Area mm <sup>2</sup>	(6) Resist Force (N)	(7)		(8)	
	Location (a)							Column 5 > 1935 mm <sup>2</sup>	Column 6 < 2669N		
	X	Y	Angle					Yes- Pass	No- Fail	Yes- Pass	No- Fail
K1	100	240	0	4.87	4.76	2,910	2,506	PASS		PASS	
K2	250	240	0	4.86	4.72	2,860	1,709	PASS		PASS	
K3	400	240	0	4.87	4.53	2,790	1,798	PASS		PASS	
K4	100	120	0	4.87	4.70	3,030	2,291	PASS		PASS	
K5	250	120	0	4.79	4.65		1,813			PASS	
K6	400	120	0	4.79	4.59		1,832			PASS	
K7	100	-28	0	4.83	4.72		2,420			PASS	
K8	250	-28	0	4.86	4.52		2,146			PASS	


\* Impact velocity from item No. 7 below

\*\* Impact velocity range = 4.86 mps, +0.08, -0 mps for contact area, +0, -0.08 mps for force

5. Attach Contact Area Prints for K1, K2, K3 and K4.
6. Attach acceleration versus time plots for each impact.
7. Integrate the acceleration versus time plots and attach plots of the results that show velocity versus time for each impact K1 through K8.
8. Attach force vs. time plots for K5, K6, K7 and K8.

Comments: (a) All measurements are referenced to the point where the horizontal plane through the SRP intersects the vertical line tangent to the inboard edge of the seat.

Recorded By: 

Approved By: 

DATE: 1/8/2007



**DATA SHEET 9**  
**SEAT BELT ASSEMBLY ANCHORAGES**

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
Test Date: **1/12/2007**

**SEAT LOCATION: S5**

		<b>PASS/FAIL</b>
1.	Are all seat belt assembly anchorages designed for forward-facing occupant position?	<b>PASS</b>

Seat Location	Seating Location	Anchor Type	Measured Spacing (mm) *	Measured Angle **	Load Application Angle (degrees)	
					Side View Horizontal Load Angle	Plan View From Vehicle Center Line
S5	Left	1	200	65°	11°	0°
	Right	1	200	65°	11°	0°


\* The spacing for an individual seat belt assembly anchorage shall be at least 165mm apart as measured between the vertical center lines of the bolt holes.

\*\* Specified angle range above horizontal to be 20° to 75°

Seat Location	Seating Location	Required Load (N)	Actual Max. Test Load (N)	PASS/FAIL	Comment
S5	Left	22,000	21,790	<b>PASS</b>	
	Right	22,000	21,800	<b>PASS</b>	

Comments: None

Recorded By: 

Approved By: 

DATE: 1/12/2007

**SECTION 4**

**TP-222-03 (APPENDIX B FMVSS 208, OCCUPANT CRASH PROTECTION FOR  
CLASS 2 SCHOOL BUSES)**

**DATA SHEET B1 - SEAT BELT CHECK**

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
 Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
 Test Date: **1/08/2007**

1. No. of designated seating positions (DSP): 21
2. Type of seat belt at each passenger DSP (571.208 S4.1.2.1, S4.1.2.2, S4.1.2.3)

Belt Type (Type 1 or 2 Required)										
Seat No.	1	2	3	4	5	6	7	8	9	10
DSP #1 Inboard	Type 1	Type 1	Type 1	Type 1	Type 1	Type 1	Type 1	Type 1	Type 1	Type 1
DSP #2 Outboard	Type 1	Type 1	Type 1	Type 1	Type 1	Type 1	Type 1	Type 1	Type 1	Type 1

3. Type of retractor at each passenger DSP: (571.208 S7.1.1.2)

Retractor Type (Manual, ALR, ELR)										
Seat No.	1	2	3	4	5	6	7	8	9	10
DSP #1 Inboard	Manual	Manual	Manual	Manual	Manual	Manual	Manual	Manual	Manual	Manual
DSP #2 Outboard	Manual	Manual	Manual	Manual	Manual	Manual	Manual	Manual	Manual	Manual

4. Single point, push-button, accessible latch release at each passenger DSP  
(571.208 S7.2(c))

Pass: single point push-button      Fail: not single point push-button

Seat No.	1	2	3	4	5	6	7	8	9	10
DSP #1 Inboard	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
DSP #2 Outboard	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass

**DATA SHEET B1 (CONTINUED)**

**SEAT BELT CHECK**

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
 Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
 Test Date: **1/08/2007**

5. Latch plate and buckle must not pass through conduit or guide between seat cushion and seat back at each passenger DSP. (571.208 S7.4.6)

Pass: latch plate and/or buckle will not fit through conduit or guide

Fail: latch plate and/or buckle will fit through conduit or guide

Seat No.	1	2	3	4	5	6	7	8	9	10
DSP #1	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
DSP #2	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass

6. Either the latch plate, buckle, or webbing must stay on top or above the seat when the seat belt is unbuckled and the remaining two parts must stay accessible at each passenger DSP. (571.208 S7.4.6)

Pass: the seat belt meets the above requirements

Fail: the seat belt does not meet the above requirements

Seat No.	1	2	3	4	5	6	7	8	9	10
DSP #1	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
DSP #2	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass

7. Seat belt fit test dummies

		Manufacturer	Serial Number
7.1	50% 6-Year old Child	FTSS	153
7.2	5% Adult Female	FTSS	507
7.3	50% Adult Male	FTSS	312
7.4	95% Adult Male	Denton	050

**DATA SHEET B1 (CONTINUED)**

**SEAT BELT CHECK**

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
 Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
 Test Date: **1/08/2007**

8. Seat belt must fit persons whose dimensions range from those of a 50<sup>th</sup> percentile 6-year old child to those of a 95<sup>th</sup> percentile adult male. (571.208 S7.1.1)

Two seats checked

Pass: snug fitting seat belt      Fail: loose fitting seat belt

Seat Number		S6	S10
DSP #1	50% C	Pass	Pass
	95% AM	Pass	Pass
DSP #2	50% C	Pass	Pass
	95% AM	Pass	Pass

9. Driver's Seat (Not part of FMVSS 222)


Belt Type	2
Automatic Restraint	No
Type of Automatic Restraint (if applicable)	

Pass: snug fitting seat belt      Fail: loose fitting seat belt

5% AF	Pass
95% AM	Pass

Comments: None

Recorded By: 

Approved By: 

DATE: 1/08/2007

**DATA SHEET B2**  
**SEAT BELT WARNING SYSTEM CHECK**

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
Test Date: **1/08/2007**

- |   |     |   |
|---|-----|---|
| X | 1.  | The occupant is in the driver's seat.   |
| X | 2.  | The seat belt is in the stowed position.  |
| X | 3.  | The key is in the "on" or "start" position.   |
| X | 4.  | The time duration of the audible signal beginning with key "on" or "start" is<br>Seconds: 6     |
| X | 5.  | The occupant is in the driver's seat.   |
| X | 6.  | The seat belt is in the stowed position.  |
| X | 7.  | The key is in the "on" or "start" position.   |
| X | 8.  | The time duration of the warning light beginning with key "on" or "start" is<br>Seconds: 6      |
| X | 9.  | The occupant is in the driver's seat.   |
| X | 10. | The seat belt is in the latched position and with at least 4 inches of belt webbing extended.   |
| X | 11. | The key is in the "on" or "start" position.   |
| X | 12. | The time duration of the warning light beginning with key "on" or "start" is<br>Seconds: 6      |
| X | 13. | Complete the following table with the data from 4, 8, and 12 to determine which option is used. |
| X | 14. | Record exactly the wording of the visual seat belt warning system:                              |
| X |     | Symbol  |

		Warning light	Warning light specification	Audible signal	Audible signal specification*
S7.3 (a)(1)	Belt stowed & key on or start	Item 8: Stays On	60 seconds minimum	Item 4: 6	4 to 8 seconds
S7.3 (a)(2)	Belt latched & key on or start	Item 12: 0	4 to 8 seconds		
	Belt stowed & key on or start	Item 8: Stays On	4 to 8 seconds	Item 4: 6	4 to 8 seconds

\* 49 USCS @ 30124 does NOT allow an audible signal to operate for more than 8 seconds. A voluntary audible signal after the 4 to 8 second required signal may be provided. It must be differentiated from the required signal (5/25/2001 legal interpretation to Longacre and Associates).

Comments: None

Recorded By: 

Approved By: 

DATE: 1/08/2007

**SECTION 5**  
**INSTRUMENTATION AND EQUIPMENT LIST**

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
Test Date: **11/1/2006**

Equipment	Description	Model/Serial No.	Cal. Date	Next Cal. Date
Computer	HP	Vectra / US03263612	---	---
Test Fixture	MGA	TF2003	---	---
A/D Interface	Metabyte	DAS-1802	---	---
Load Cell	Interface	1210AF-SK / 62736	7/13/06	1/13/07
Load Cell	Interface	1210AF / 137778	5/8/06	11/8/06
Inclinometer	Digital Protractor	Pro 360 / Comp Lab	10/4/06	4/4/07
Steel Tape	Stanley	Powerlock / 278	9/26/06	3/26/07
Impact Fixture	MGA	IF2003A	---	---
Camera	Sony	DSC-S75	---	---
Planimeter	Sokkia Corp.	Planix5 007319	11/22/06	5/22/07
Accelerometer	Endevco	7264-2000 / W04807	10/4/06	4/4/07
Linear Motion Transducer	Ametek	P-25A / 1202- 19366	10/30/06	4/30/07
Linear Motion Transducer	Ametek	P25A / 21954	10/30/06	4/30/07

**SECTION 6  
PHOTOGRAPHS**

**TABLE OF PHOTOGRAPHS**

<u>No.</u>		<u>Page No.</u>
1	Left Side View of School Bus	36
2	Right Side View of School Bus	37
3	¼ Front View From Left Side of School Bus	38
4	¼ Rear View From Right Side of School Bus	39
5	Certification Label	40
6	Incomplete Vehicle Label	41
7	Tire Placard	42
8	Vehicle Interior View From Front to Rear	43
9	Vehicle Interior View From Rear to Front	44
10	Pre-Test of Seat Cushion S7	45
11	Post-Test of Seat Cushion S7	46
12	Pre-Test of Seat Cushion S10	47
13	Post-Test of Seat Cushion S10	48
14	Pre-Test of Seat Back S1 Force Deflection Forward Test	49
15	Post-Test of Seat Back S1 Force Deflection Forward Test	50
16	Pre-Test of Seat Back S4 Force Deflection Forward Test (In S2 Location)	51
17	Post-Test of Seat Back S4 Force Deflection Forward Test (In S2 Location)	52
18	Pre-Test of Seat Back S3 Force Deflection Rearward Test	53
19	Post-Test of Seat Back S3 Force Deflection Rearward Test	54
20	Post-Test of Head and Knee Impact Locations on Seat S9	55
21	Post-Test of Head Impact Locations on Bulkhead	56
22	Pre-Test Seat Belt Assembly Anchorage on Seat S5	57
23	Post-Test Seat Belt Assembly Anchorage on Seat S5	58



Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Procedure: **FMVSS 222**

NHTSA No.: **C60902**  
Test Date: **11/01/2006**



Left Side View of School Bus



Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Procedure: **FMVSS 222**

NHTSA No.: **C60902**  
Test Date: **11/01/2006**



Right Side View of School Bus



Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Procedure: **FMVSS 222**

NHTSA No.: **C60902**  
Test Date: **11/01/2006**



¾ Front View From Left Side of School Bus



Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Procedure: **FMVSS 222**

NHTSA No.: **C60902**  
Test Date: **11/01/2006**



3/4 Rear View From Right Side of School Bus

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Procedure: **FMVSS 222**

NHTSA No.: **C60902**  
Test Date: **11/01/2006**

MFD.BY  
**Les Enterprises Michel Corbeil Inc.**

DATE OF MANUFACTURE 06/29/2006

INCOMPLETE VEHICLE MANUFACTURED BY:  
FORD

DATE INC. VEH. MFD. 04/01/2006

GVWR 9,600.00

GVWR FRONT 3,550.00Lbs WITH RIMS

LT245/75R16E TIRES, 16 X 7.0K

@ 55.00 PSI COLD

GVWR REAR 6,084.00Lbs WITH RIMS

LT245/75R16E TIRES, 16 X 7.0K

@ 80.00 PSI COLD

THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S  
FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN  
EFFECT IN 06/29/2006

VEHICLE IDENTIFICATION NUMBER:  
1FDSE35L66DA60778

VEHICLE TYPE SCHOOL BUS

MODEL 754-NY-20-00WC-EMC

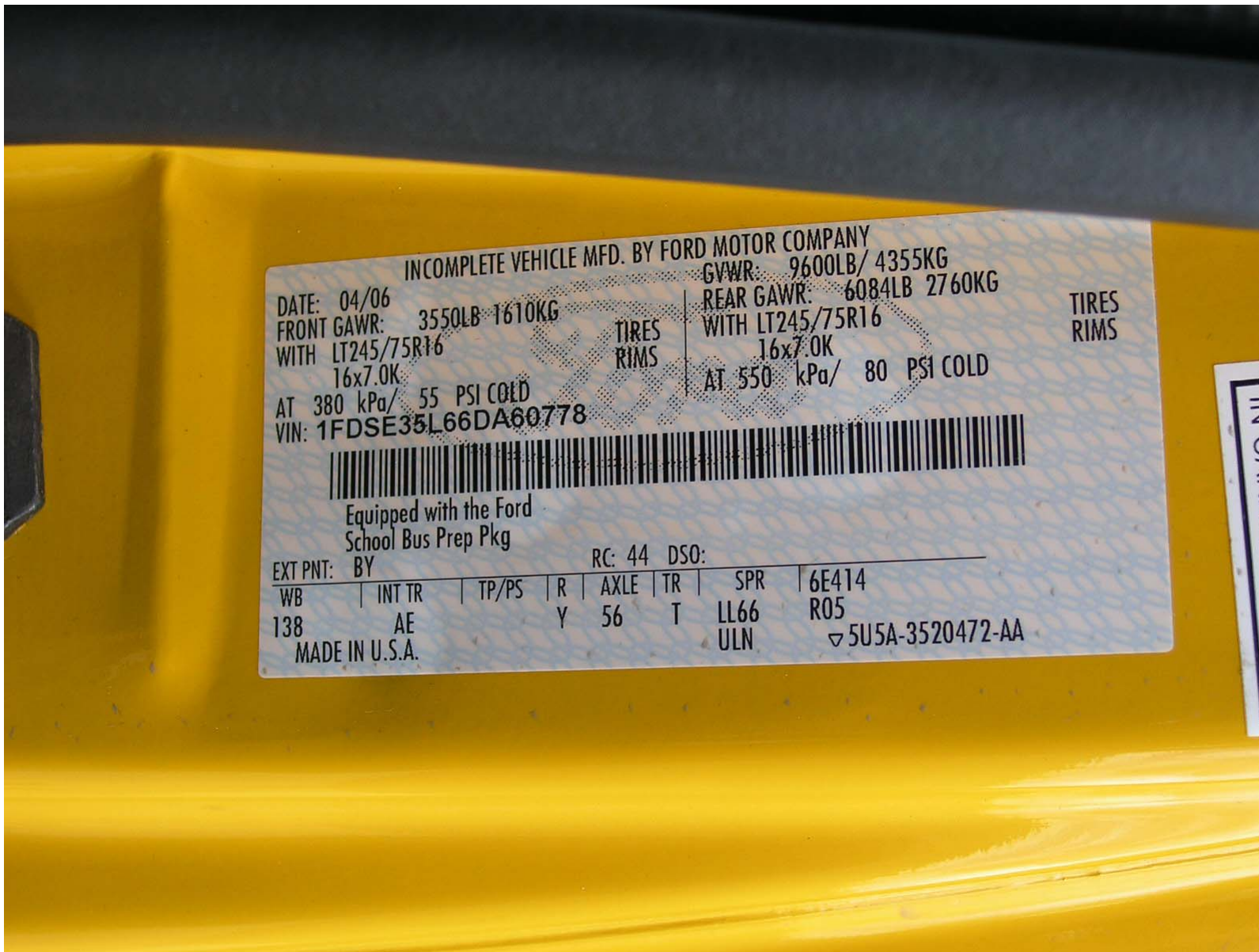
SERIAL GO-63959





Test Vehicle: 2006 CORBEIL SCHOOL BUS  
Procedure: FMVSS 222

NHTSA No.: C60902  
Test Date: 11/01/2006



Incomplete Vehicle Label

Test Vehicle: 2006 CORBEIL SCHOOL BUS  
Procedure: FMVSS 222

NHTSA No.: C60902  
Test Date: 11/01/2006



Tire Placard



Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Procedure: **FMVSS 222**

NHTSA No.: **C60902**  
Test Date: **11/01/2006**



Vehicle Interior View From Front to Rear

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Procedure: **FMVSS 222**

NHTSA No.: **C60902**  
Test Date: **11/01/2006**

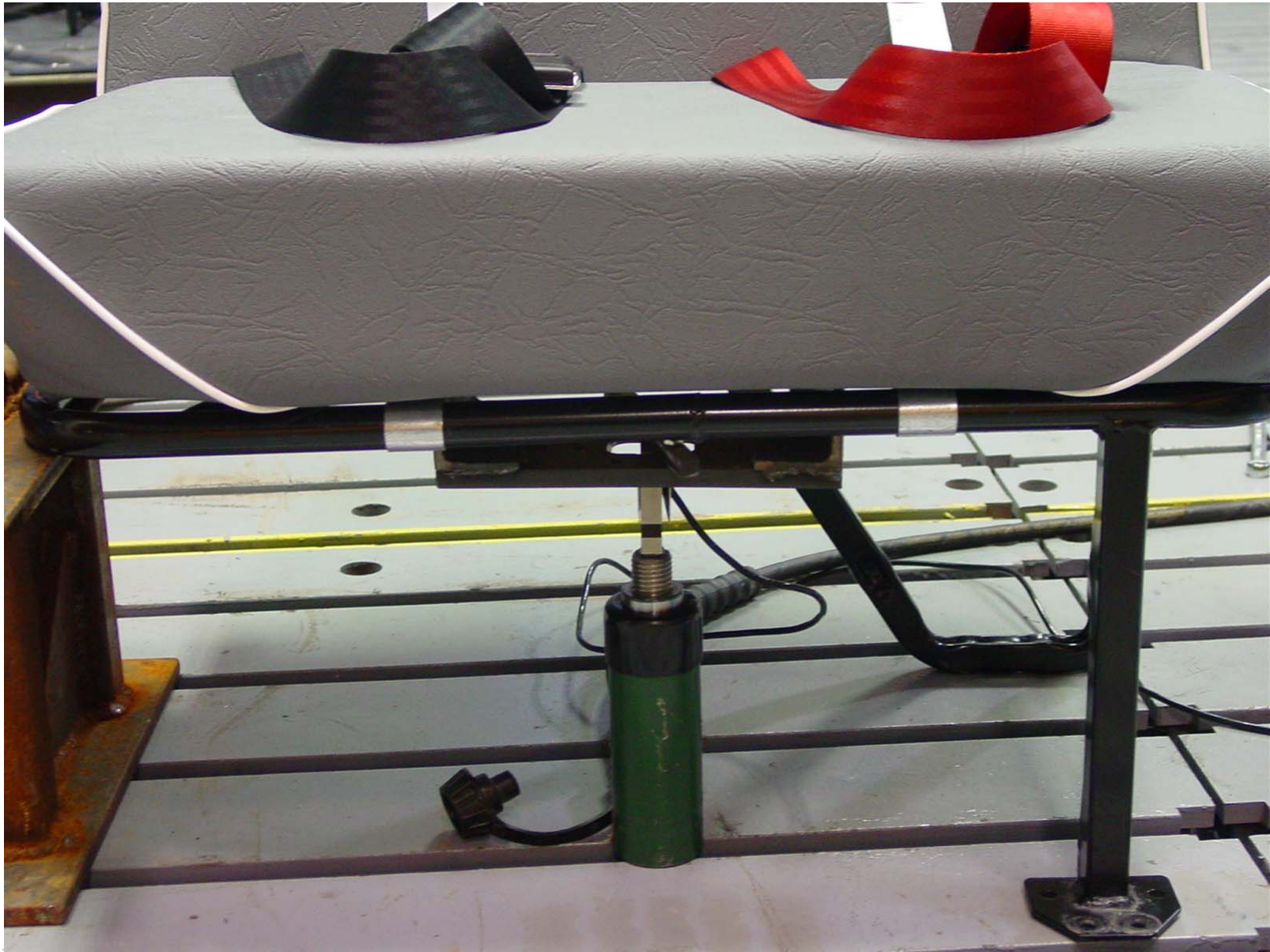


Vehicle Interior View From Rear to Front



Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Procedure: **FMVSS 222**

NHTSA No.: **C60902**  
Test Date: **11/01/2006**



45

Pre-Test of Seat Cushion S7

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Procedure: **FMVSS 222**

NHTSA No.: **C60902**  
Test Date: **11/01/2006**



Post-Test of Seat Cushion S7



Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Procedure: **FMVSS 222**

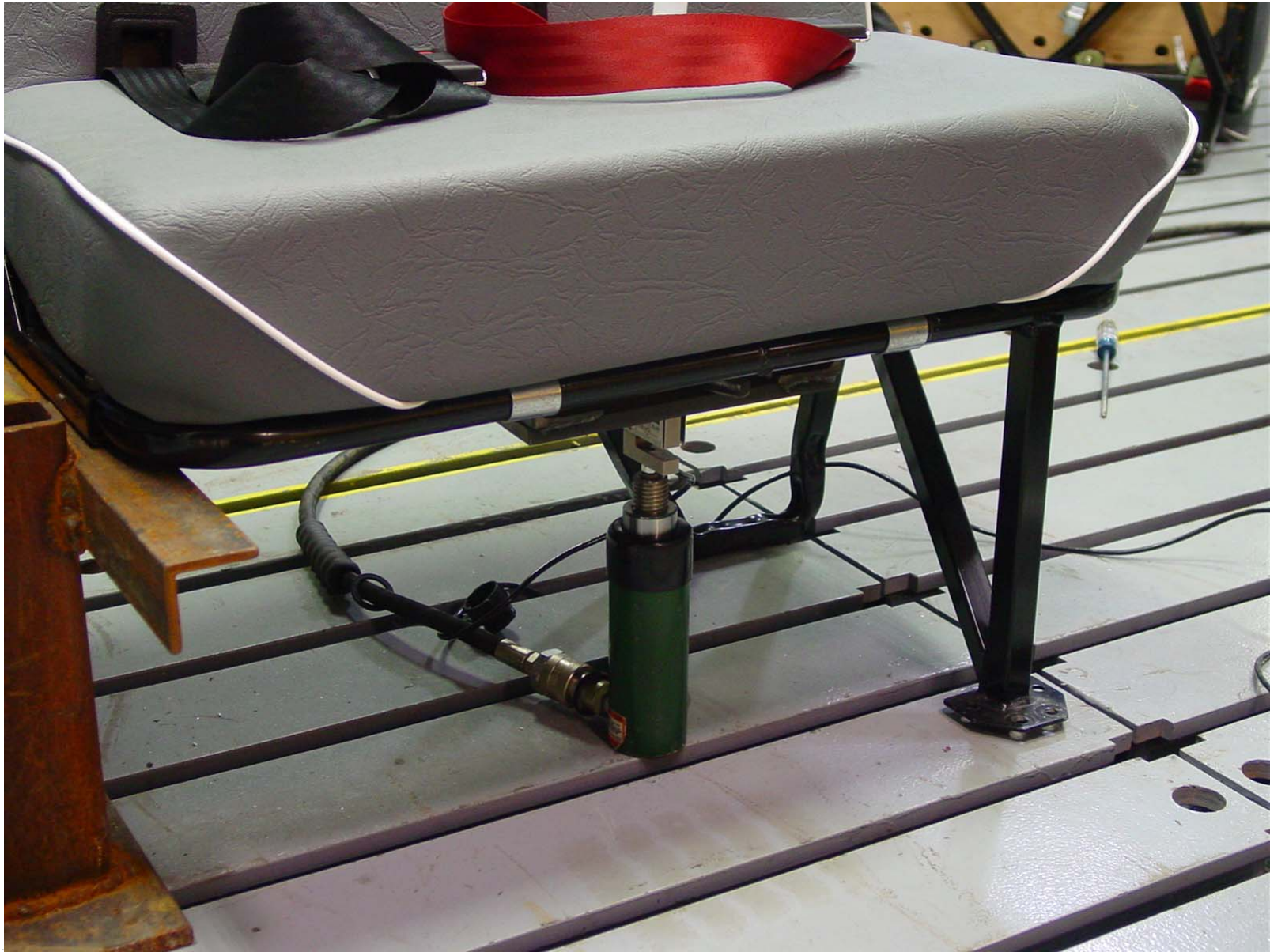
NHTSA No.: **C60902**  
Test Date: **11/01/2006**



Pre-Test of Seat Cushion S10

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Procedure: **FMVSS 222**

NHTSA No.: **C60902**  
Test Date: **11/01/2006**



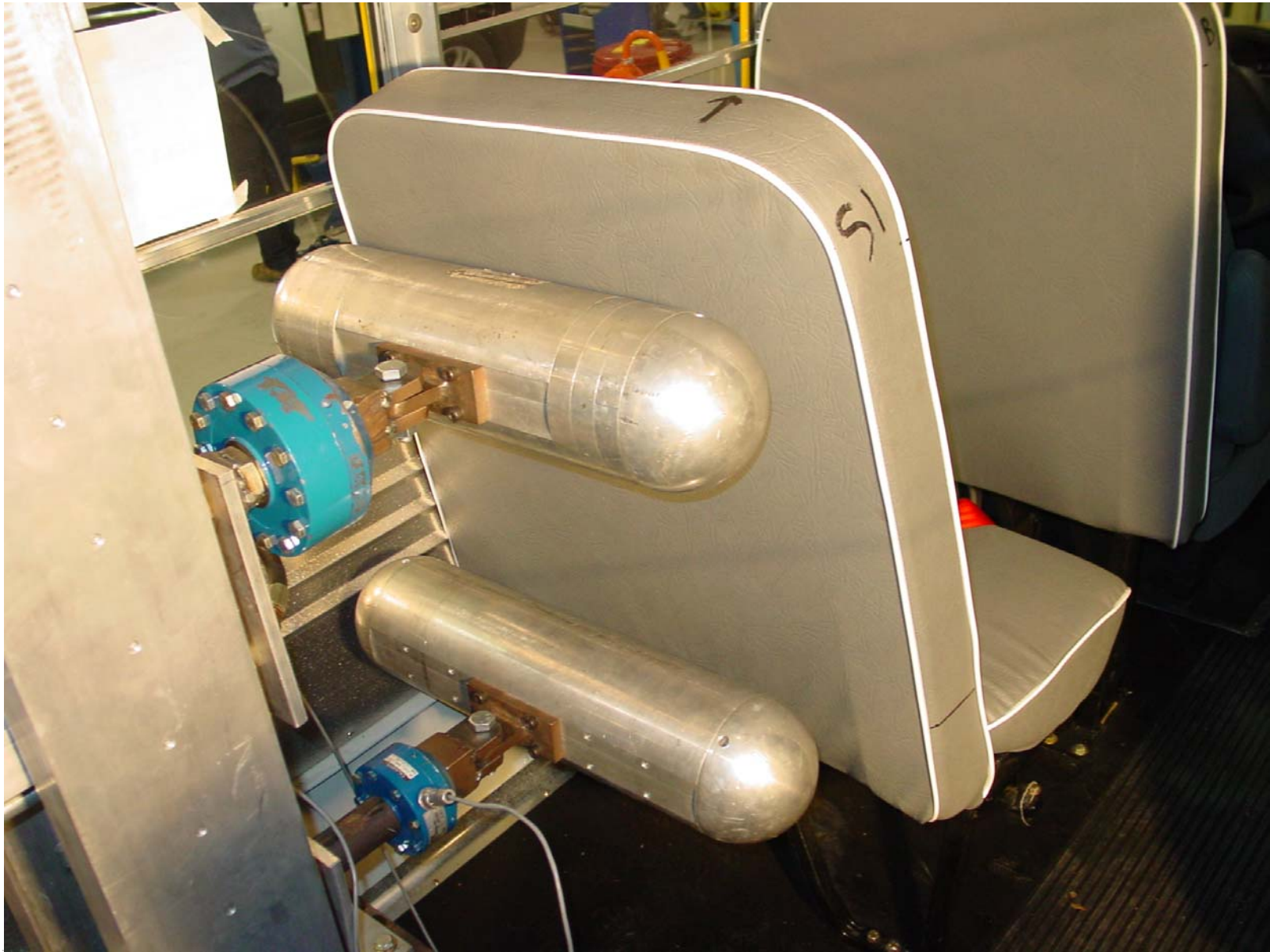
48

Post-Test of Seat Cushion S10



Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Procedure: **FMVSS 222**

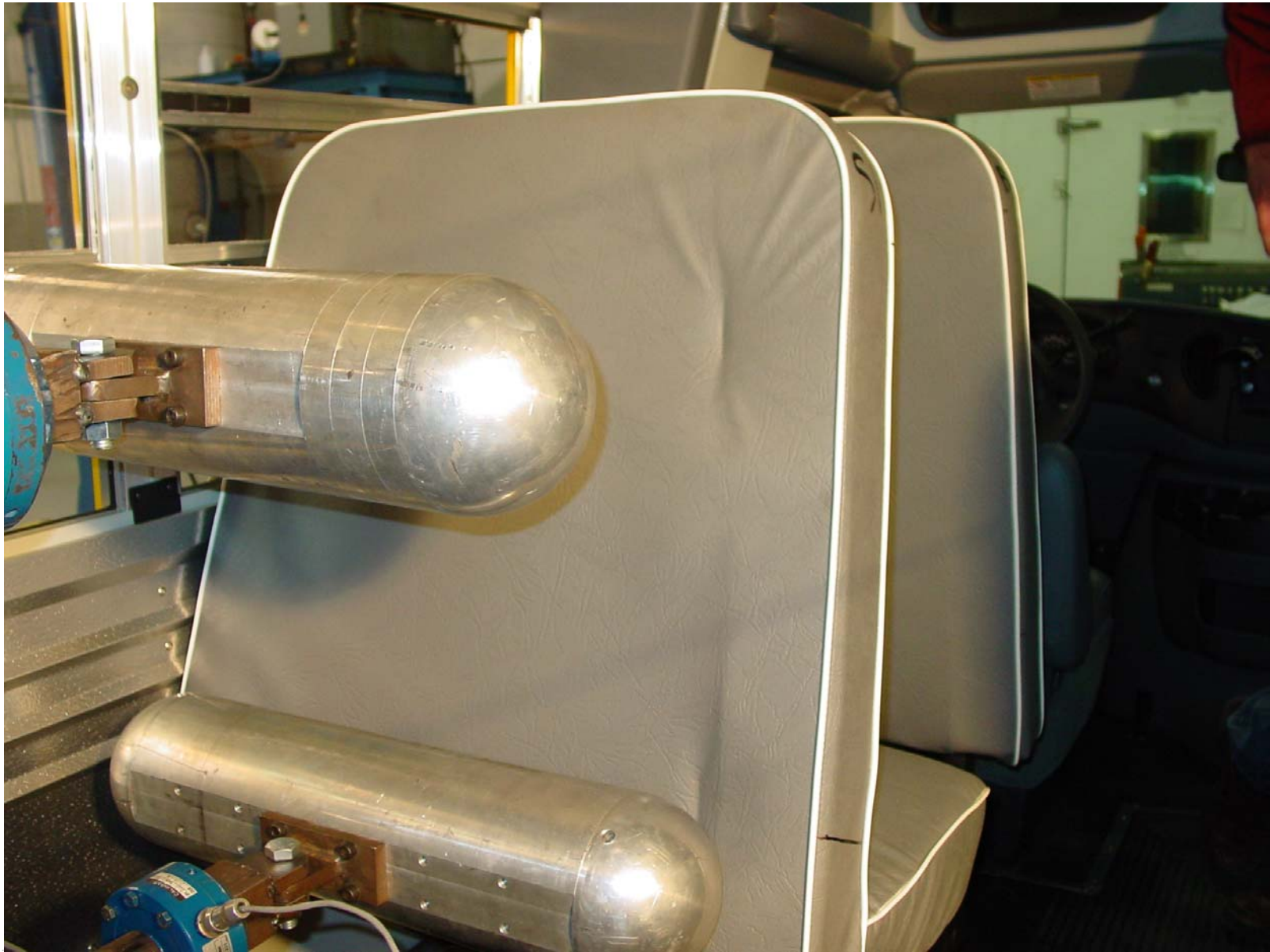
NHTSA No.: **C60902**  
Test Date: **11/01/2006**



Pre-Test of Seat Back S1 Force Deflection Forward Test

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Procedure: **FMVSS 222**

NHTSA No.: **C60902**  
Test Date: **11/01/2006**



Post-Test of Seat Back S1 Force Deflection Forward Test



Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Procedure: **FMVSS 222**

NHTSA No.: **C60902**  
Test Date: **11/01/2006**

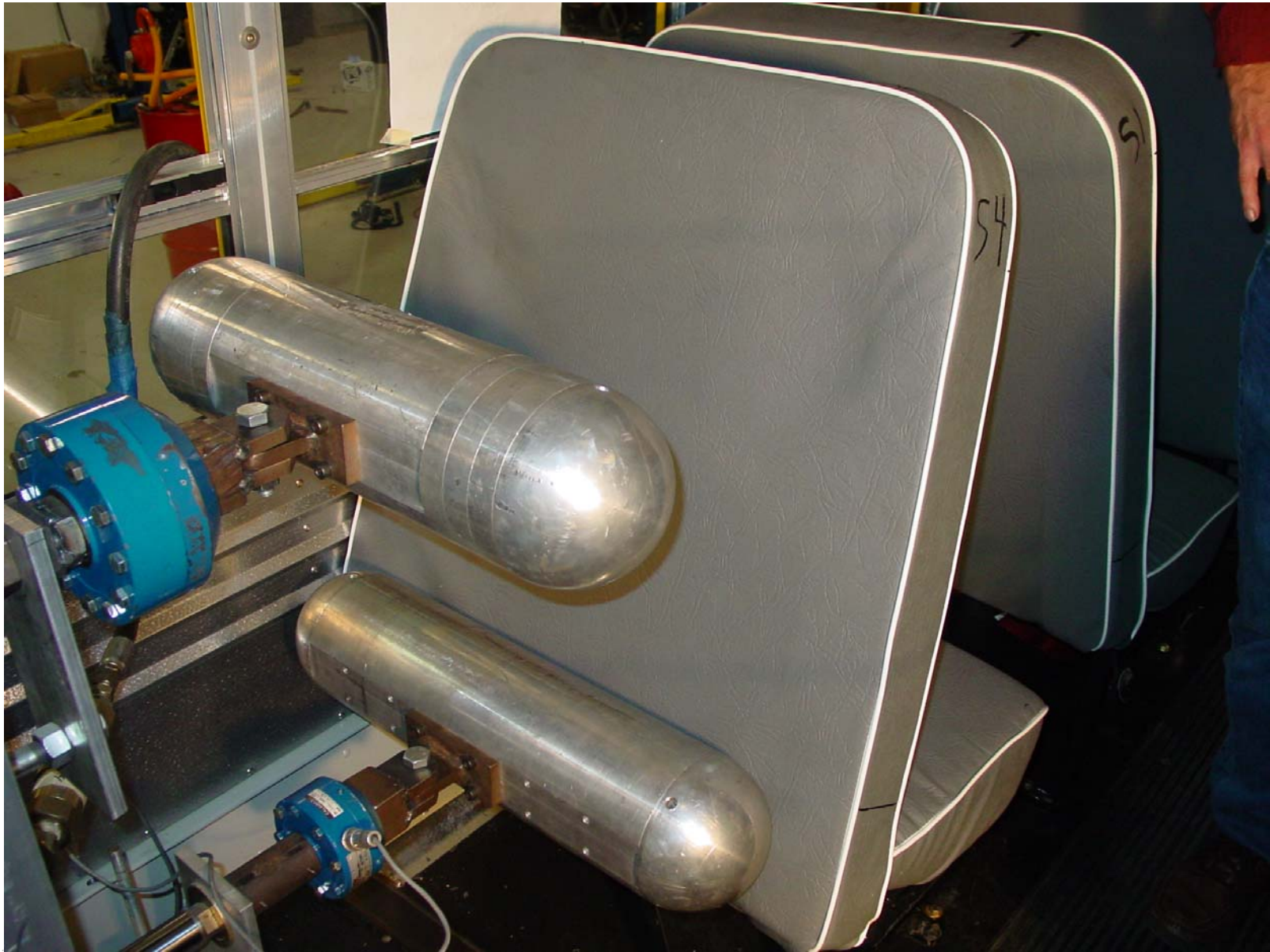


51

Pre-Test of Seat Back S4 Force Deflection Forward Test (In S2 Location)

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Procedure: **FMVSS 222**

NHTSA No.: **C60902**  
Test Date: **11/01/2006**



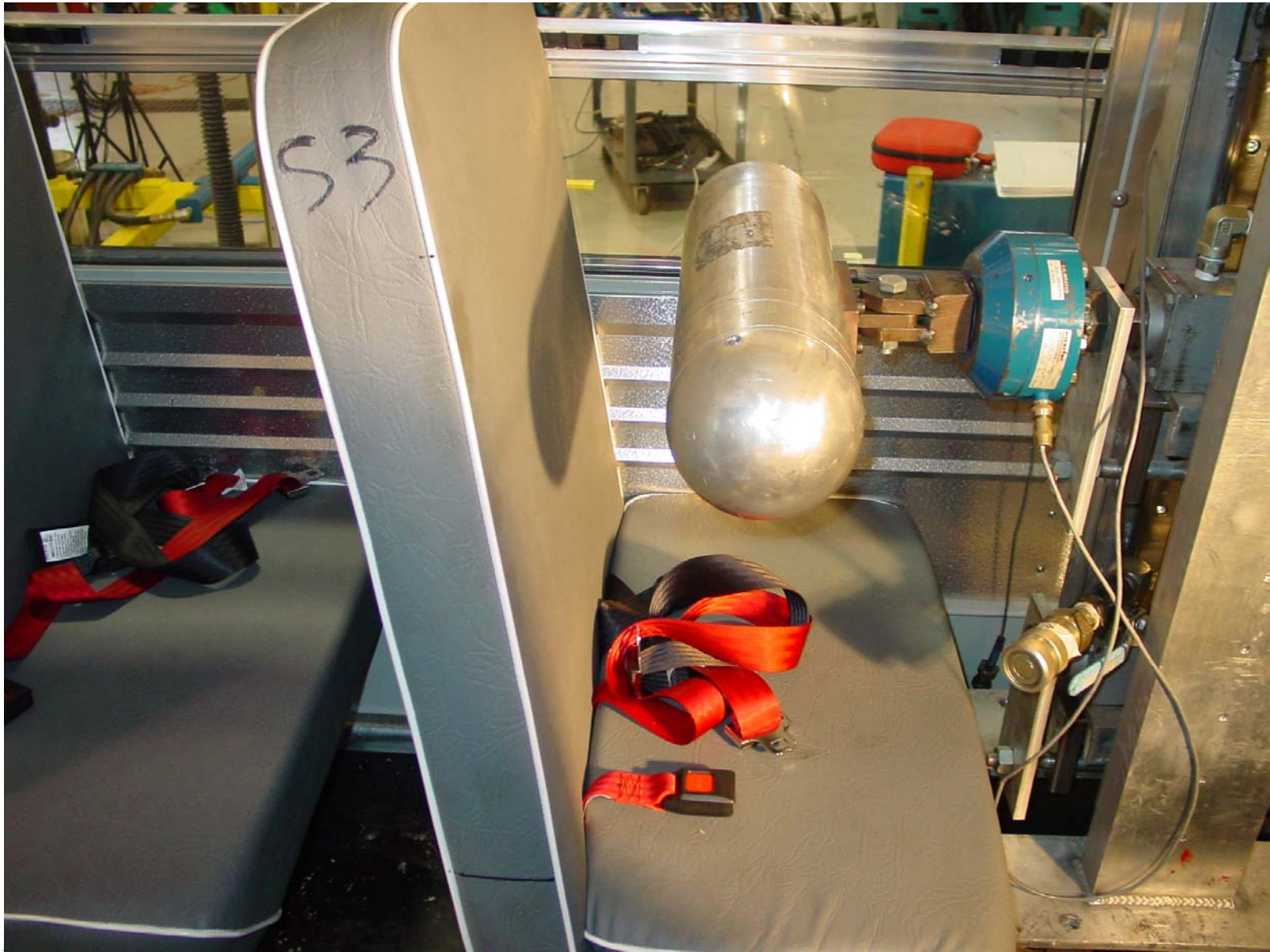
52

Post-Test of Seat Back S4 Force Deflection Forward Test (In S2 Location)



Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Procedure: **FMVSS 222**

NHTSA No.: **C60902**  
Test Date: **11/01/2006**



Pre-Test of Seat Back S3 Force Deflection Rearward Test

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Procedure: **FMVSS 222**

NHTSA No.: **C60902**  
Test Date: **11/01/2006**

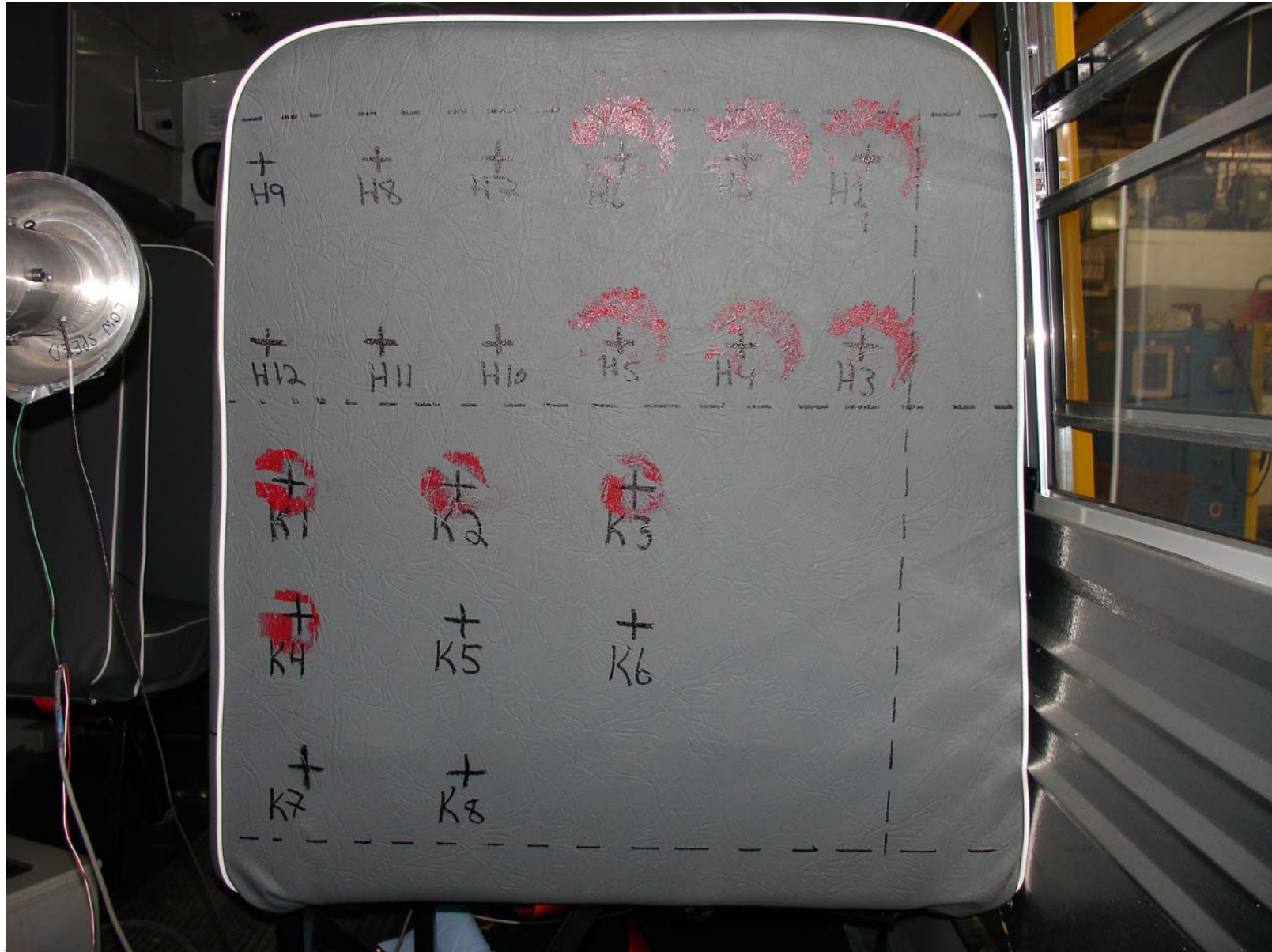


Post-Test of Seat Back S3 Force Deflection Rearward Test



Test Vehicle: 2006 CORBEIL SCHOOL BUS  
Procedure: FMVSS 222

NHTSA No.: C60902  
Test Date: 11/01/2006



Post-Test of Head and Knee Impact Locations on Seat S9

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Procedure: **FMVSS 222**

NHTSA No.: **C60902**  
Test Date: **11/01/2006**

56



Post-Test of Head Impact Locations on Bulkhead



Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Procedure: **FMVSS 222**

NHTSA No.: **C60902**  
Test Date: **11/01/2006**

57



Pre-Test Seat Belt Assembly Anchorage on Seat S5

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Procedure: **FMVSS 222**

NHTSA No.: **C60902**  
Test Date: **11/01/2006**



Post-Test Seat Belt Assembly Anchorage on Seat S5

**SECTION 7**  
**TEST PLOTS**

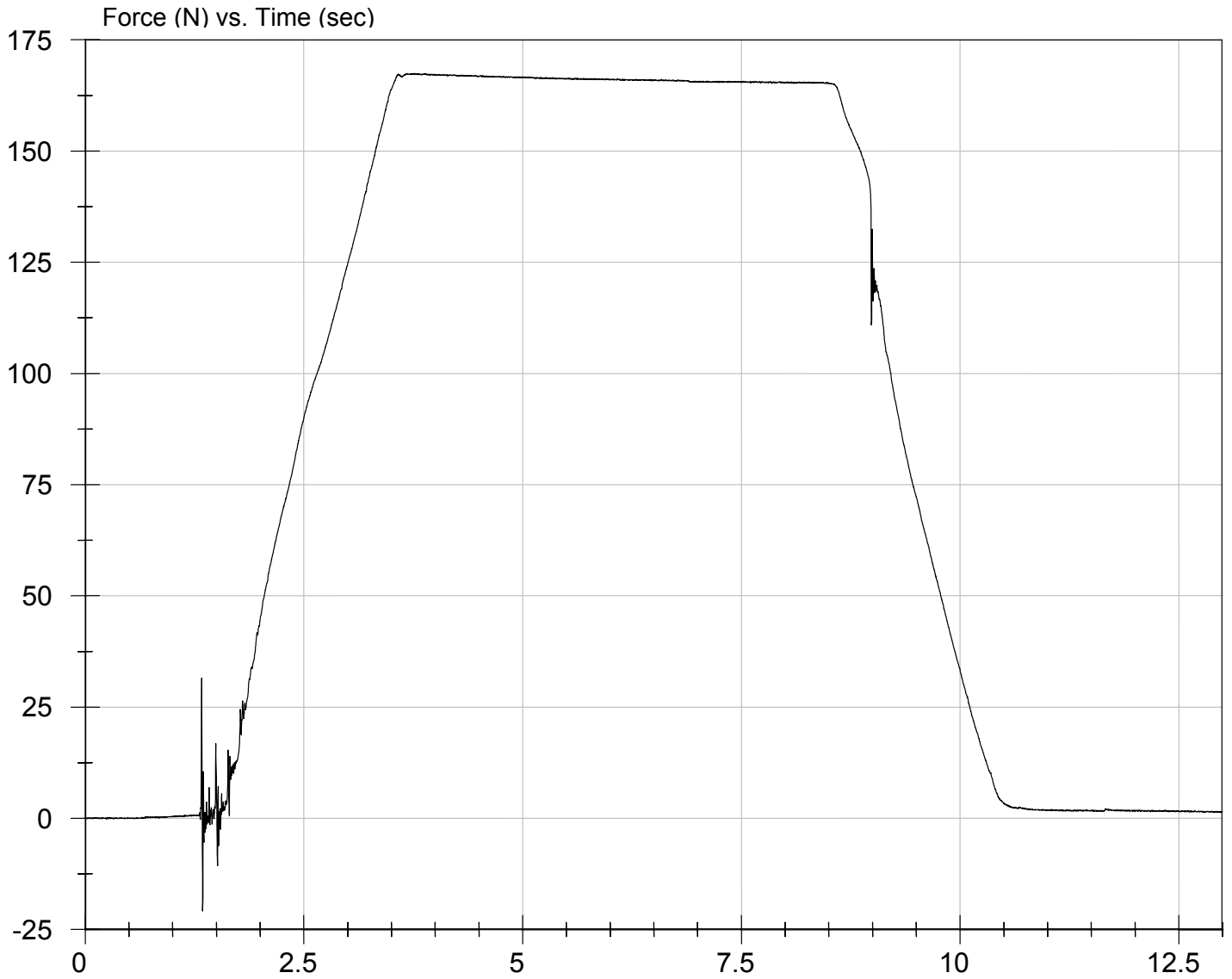
**TABLE OF TEST PLOTS**

<u>No.</u>		<u>Page No.</u>
1	Seat Cushion Retention Seat S7	60
2	Seat Cushion Retention Seat S10	61
3	Seat Back Forward Deflection Seat S1 (Upper)	62
4	Seat Back Forward Deflection Seat S1 (Lower)	63
5	Seat Back Forward Deflection Seat S4 (Upper) (In S2 Location)	64
6	Seat Back Forward Deflection Seat S4 (Lower) (In S2 Location)	65
7	Seat Back Rearward Deflection S3	66
8	FMVSS 210 Lap Belt Load S5	67
9	H1 Head Form Impact (1.5 m/s)	68
10	H2 Head Form Impact (1.5 m/s)	69
11	H3 Head Form Impact (1.5 m/s)	70
12	H4 Head Form Impact (1.5 m/s)	71
13	H5 Head Form Impact (1.5 m/s)	72
14	H6 Head Form Impact (1.5 m/s)	73
15	H7 Head Form Impact (6.69 m/s)	74
16	H8 Head Form Impact (6.69 m/s)	75
17	H9 Head Form Impact (6.69 m/s)	76
18	H10 Head Form Impact (6.69 m/s)	77
19	H11 Head Form Impact (6.69 m/s)	78
20	H12 Head Form Impact (6.69 m/s)	79
21	H13 Head Form Impact (6.69 m/s)	80
22	H14 Head Form Impact (6.69 m/s)	81
23	K1 Knee Form Impact	82
24	K2 Knee Form Impact	83
25	K3 Knee Form Impact	84
26	K4 Knee Form Impact	85
27	K5 Knee Form Impact	86
28	K6 Knee Form Impact	87
29	K7 Knee Form Impact	88
30	K8 Knee Form Impact	89



Test Desc: Seat Cushion Retention  
Component ID: CORBEIL S7

Test Date: 1/10/2007  
NHTSA #: C60902

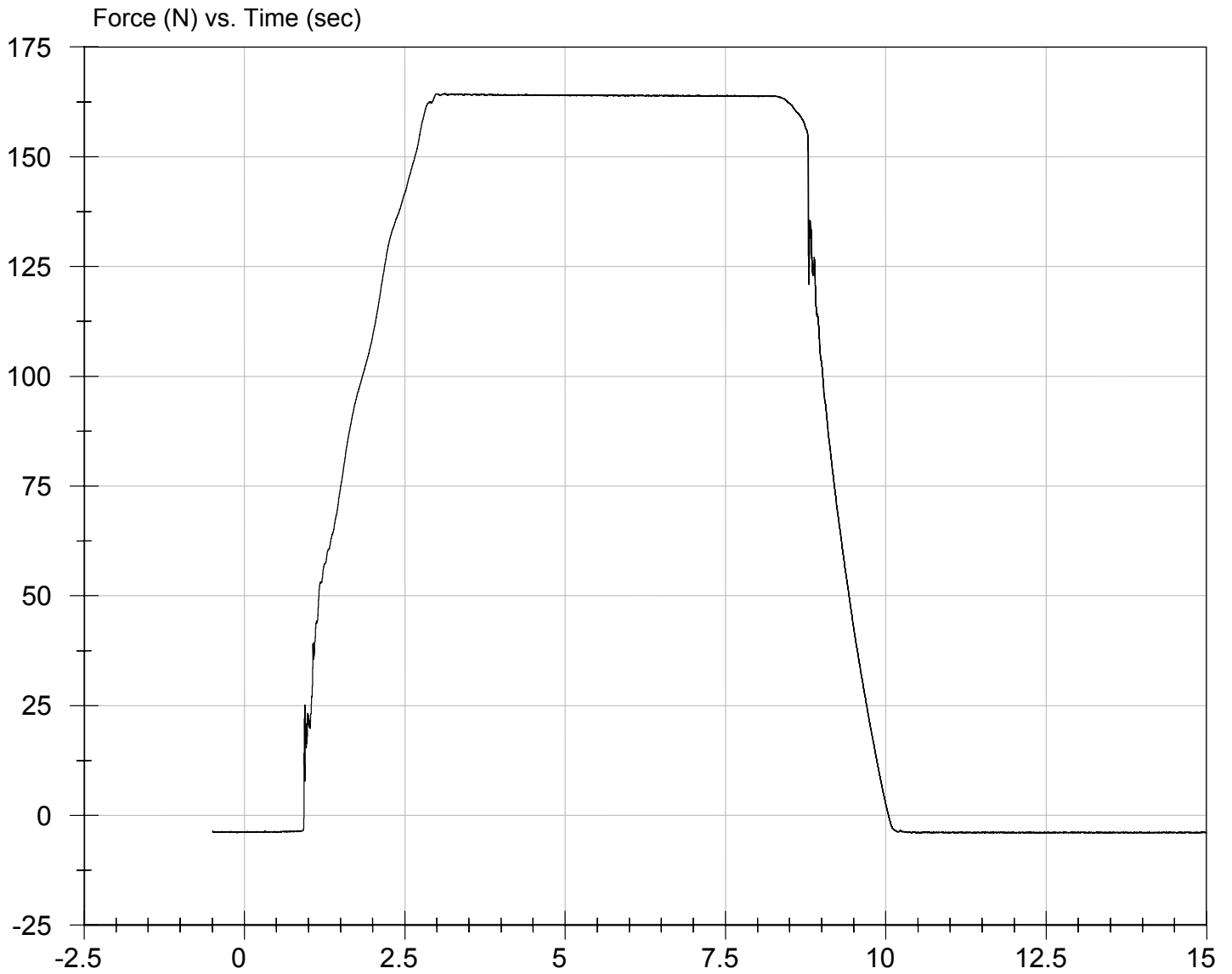






Test Desc: .Seat Cushion Retention  
Component ID: CORBEIL S10

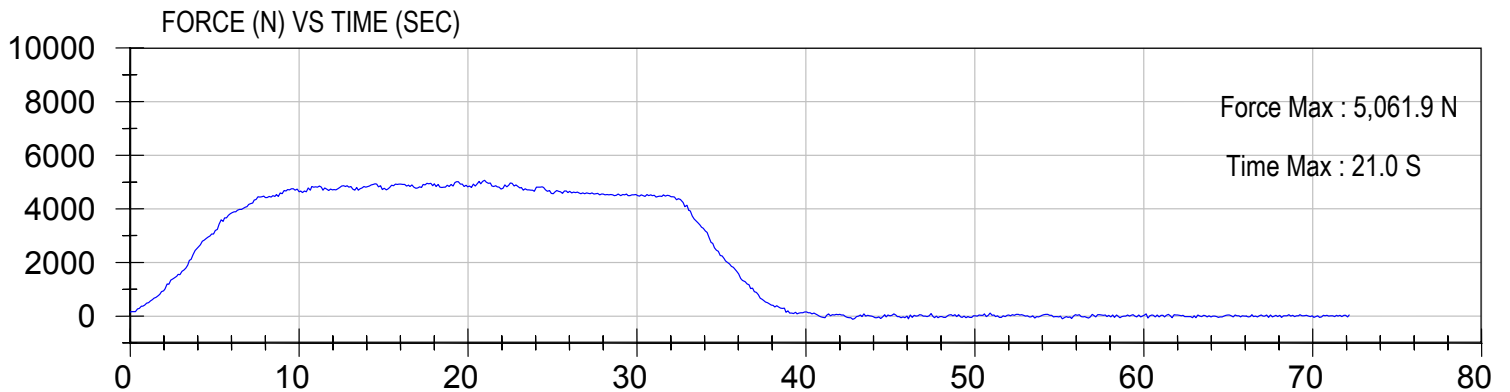
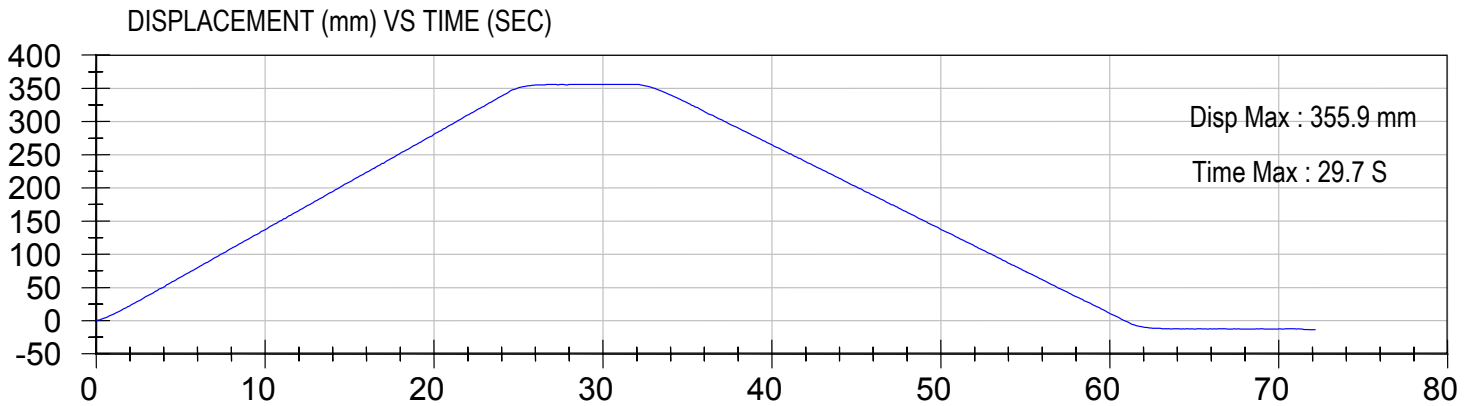
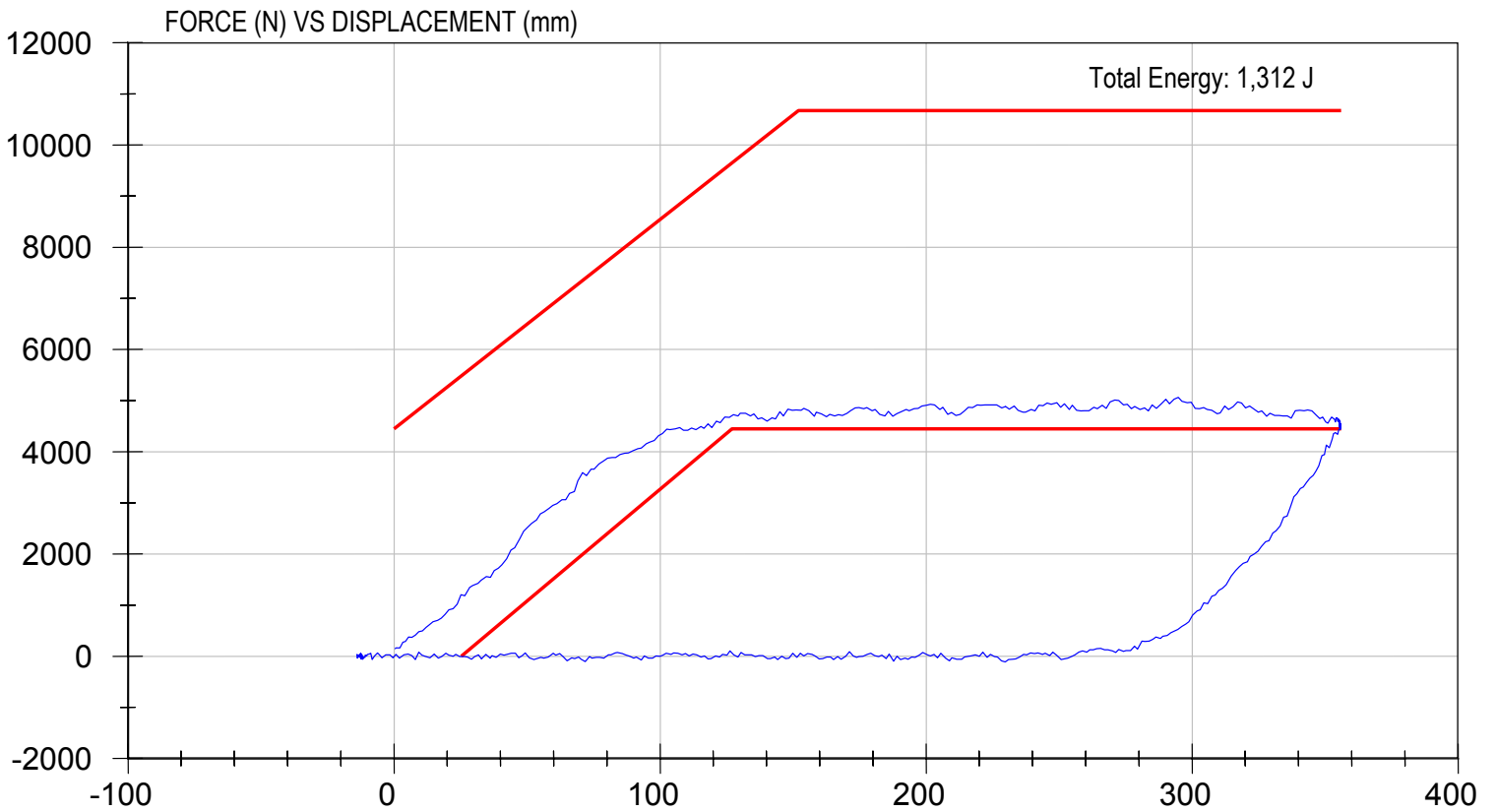
Test Date: 1/10/2007  
NHTSA #: .C60902

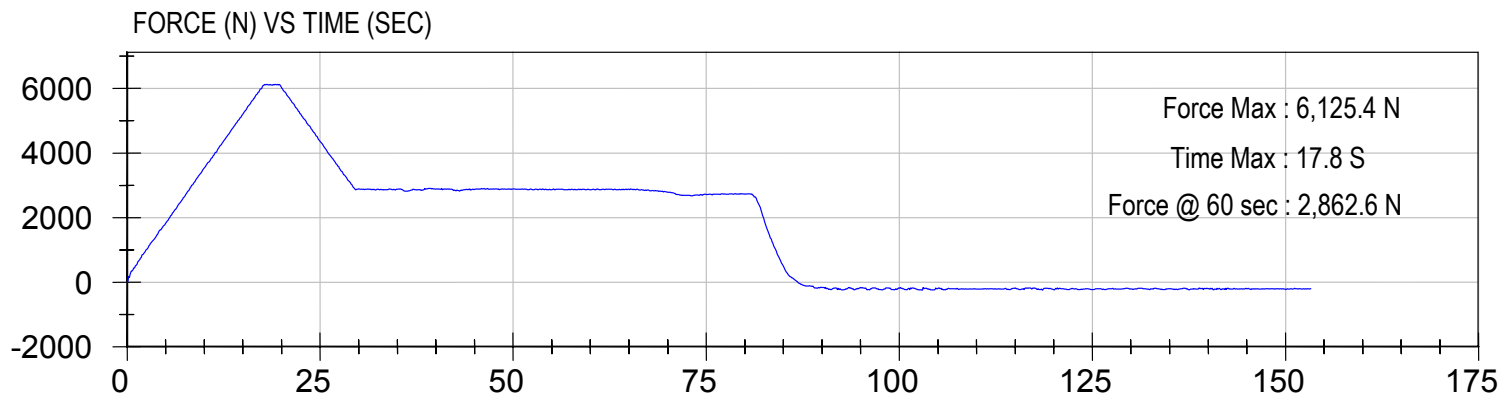
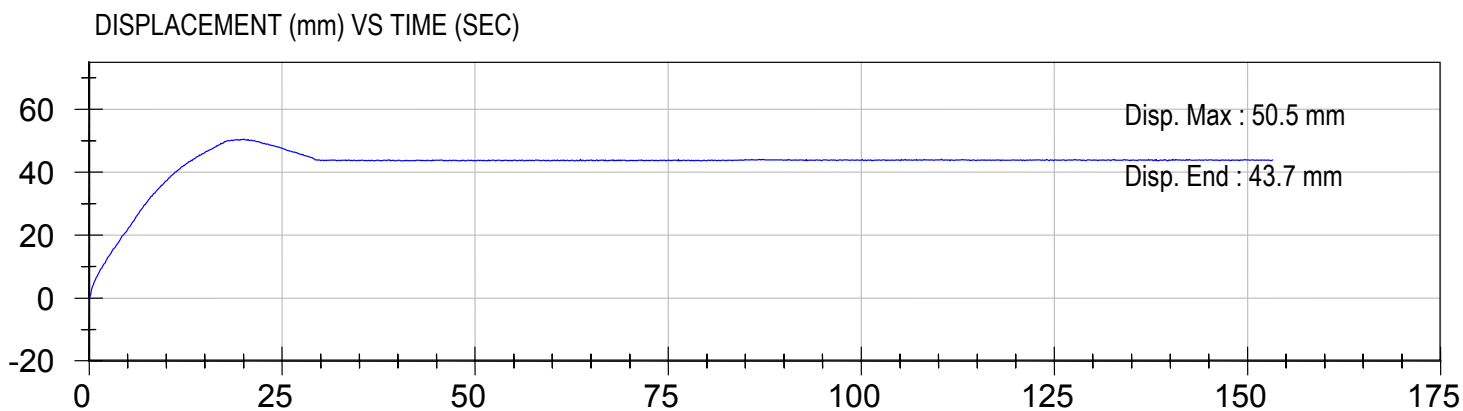
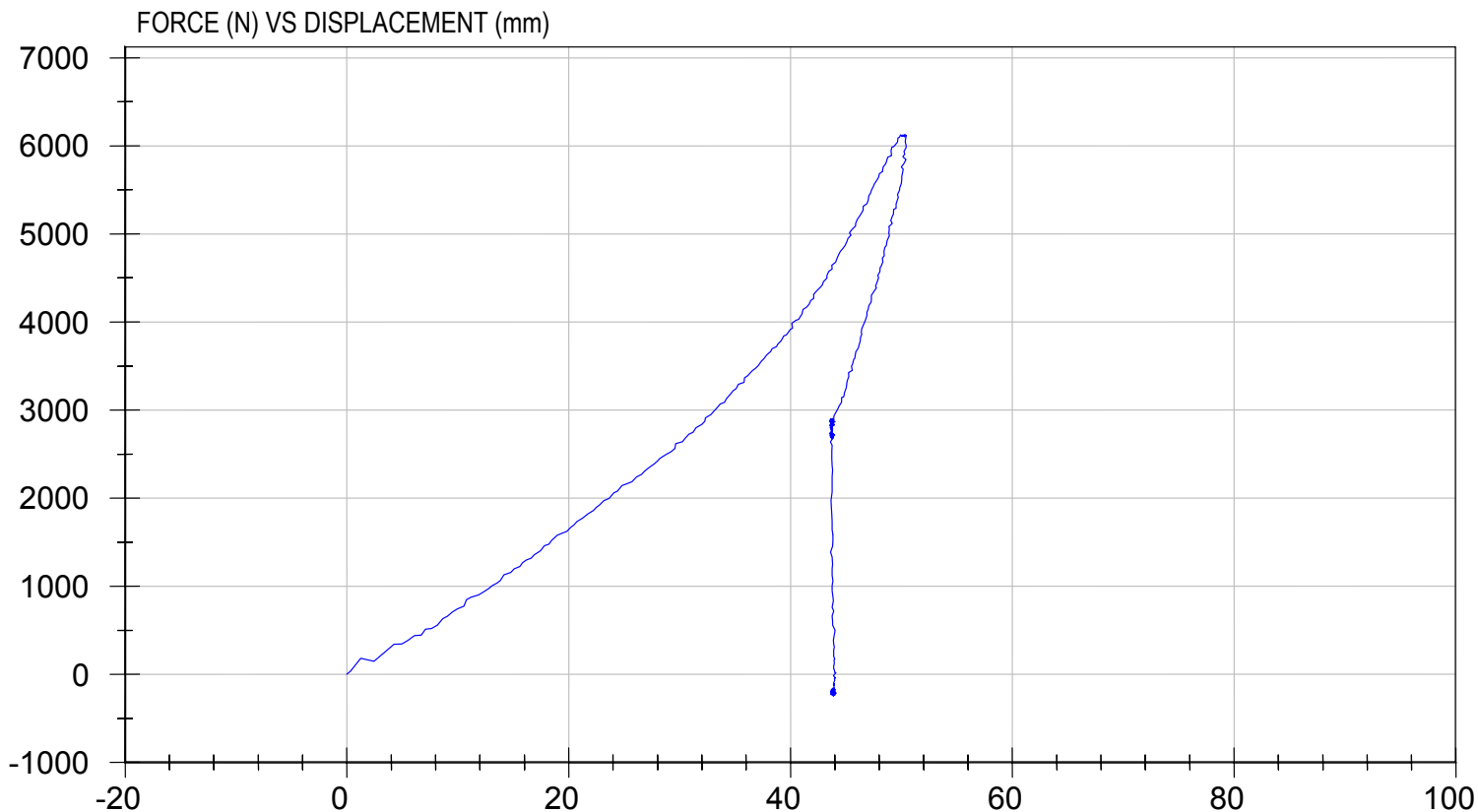


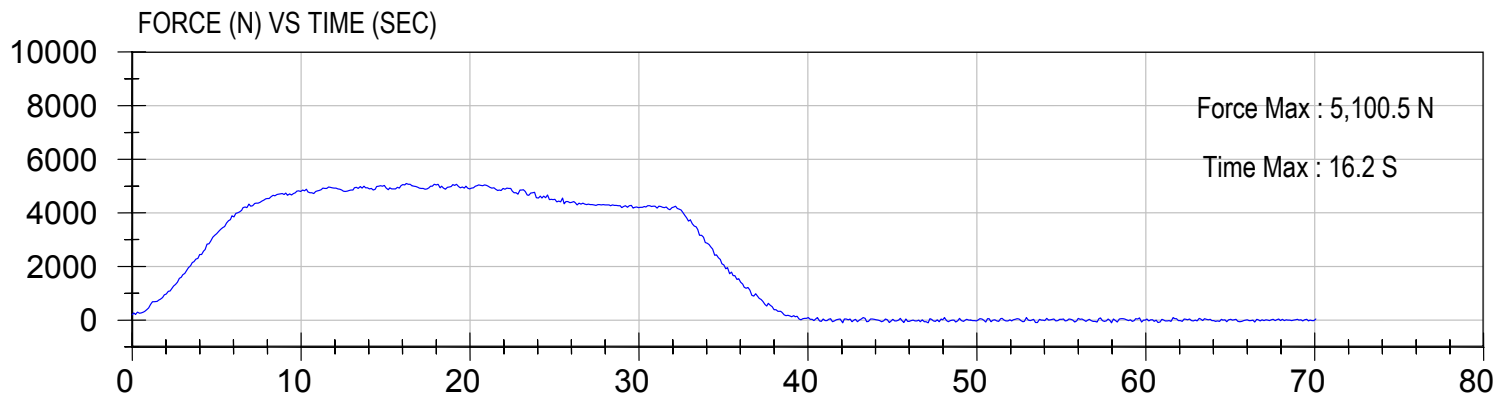
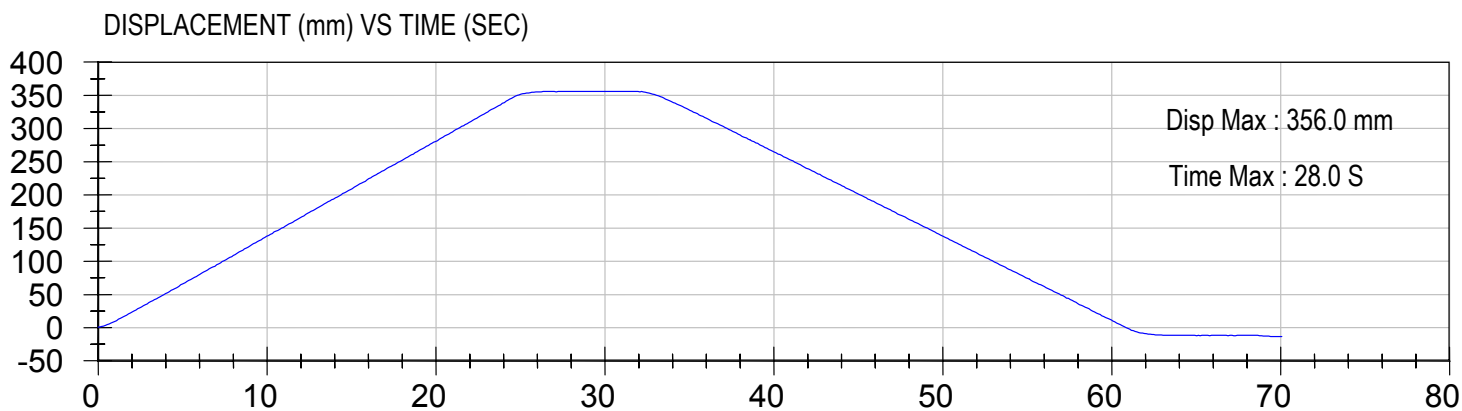
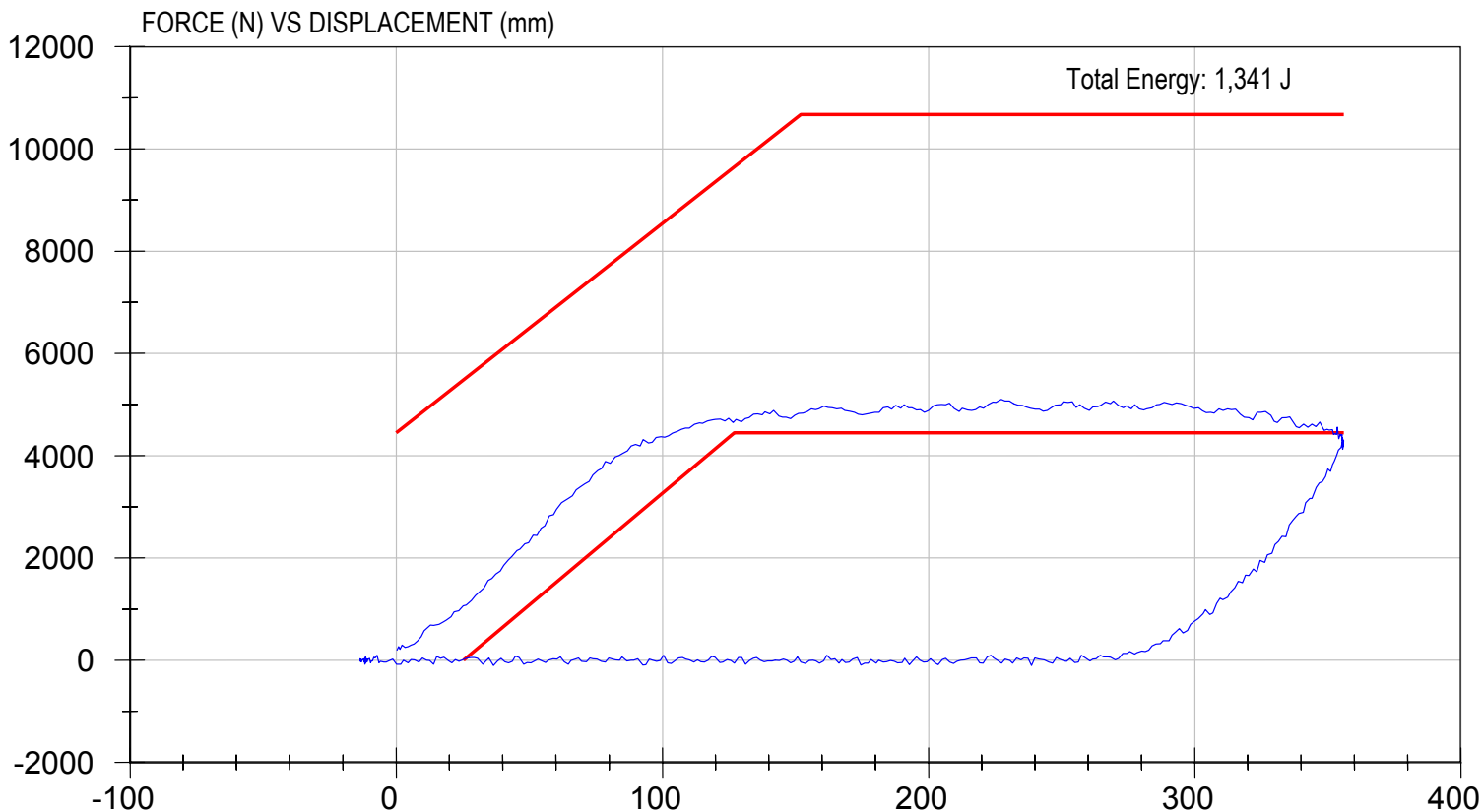


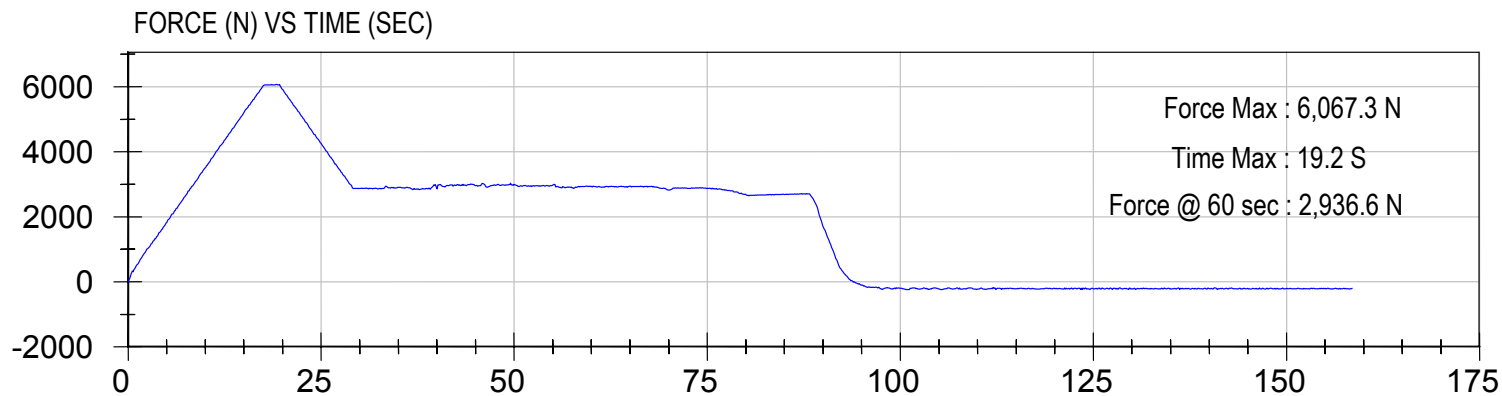
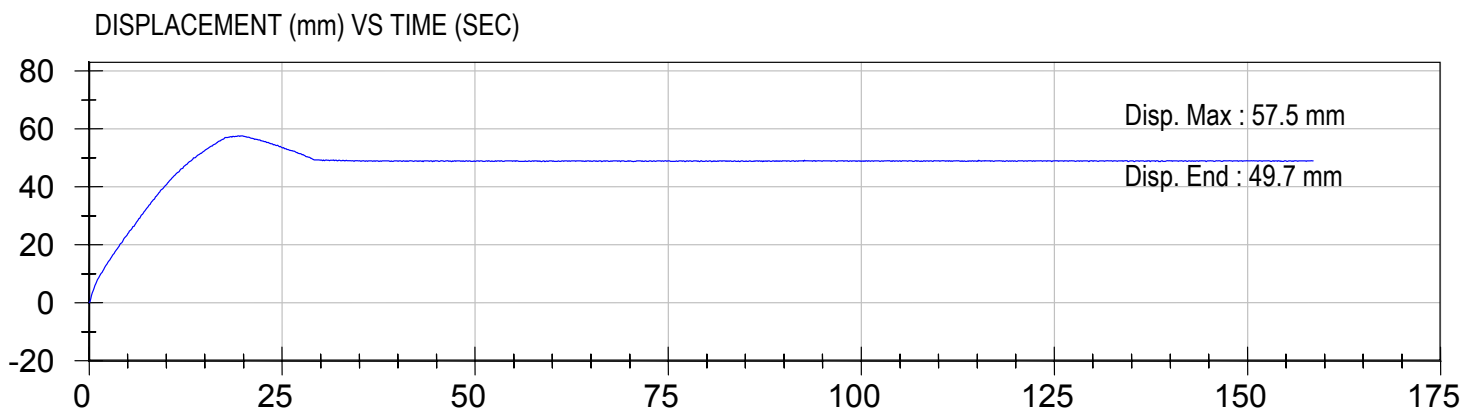
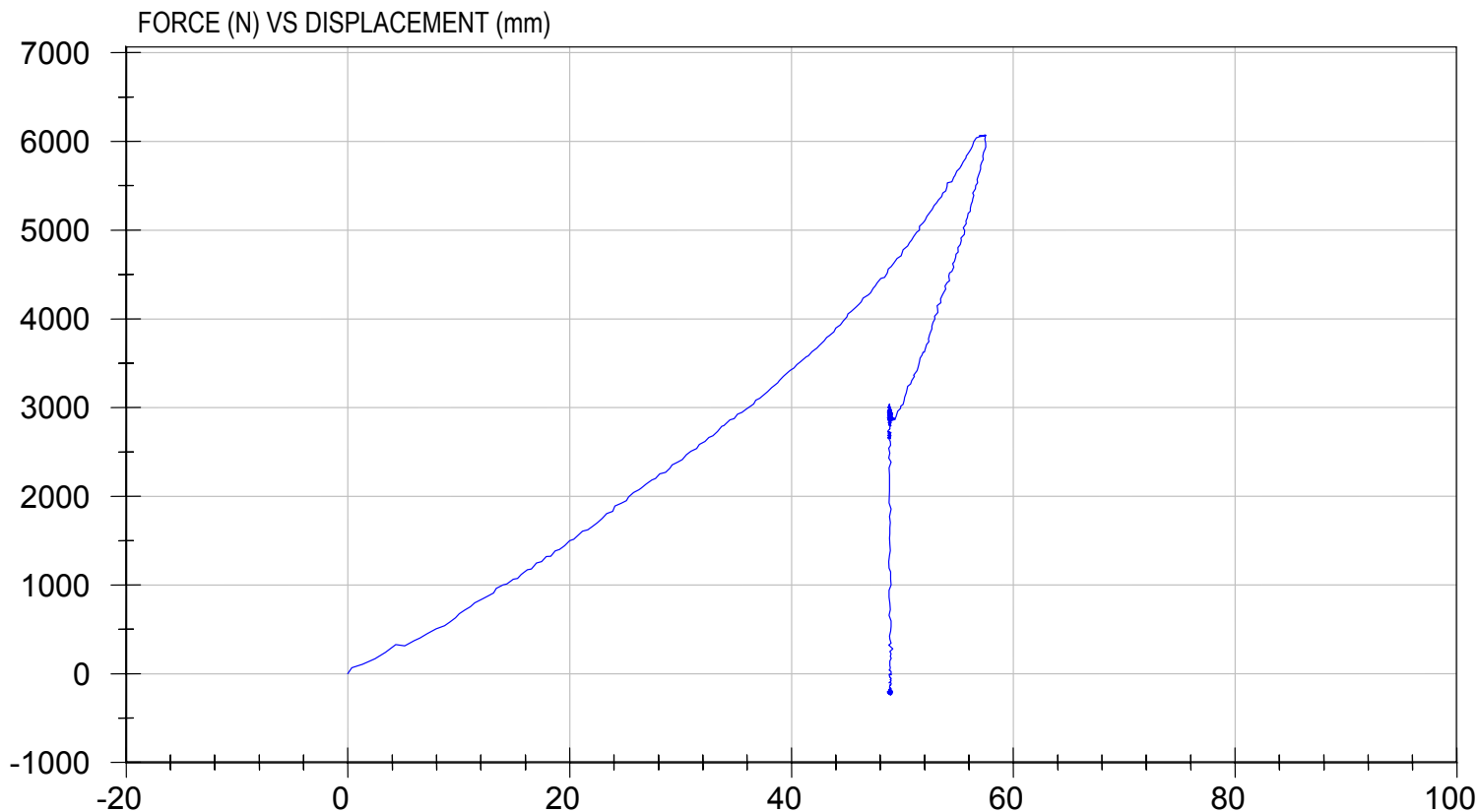
Test Desc: Seat Back Forward Deflection (Upper)  
Component ID: CORBEIL S1

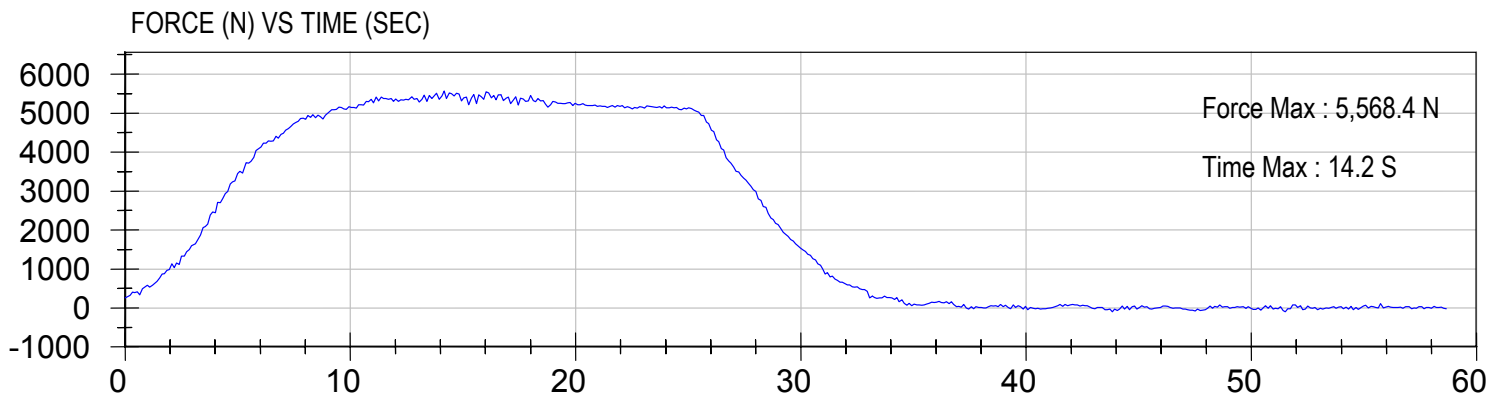
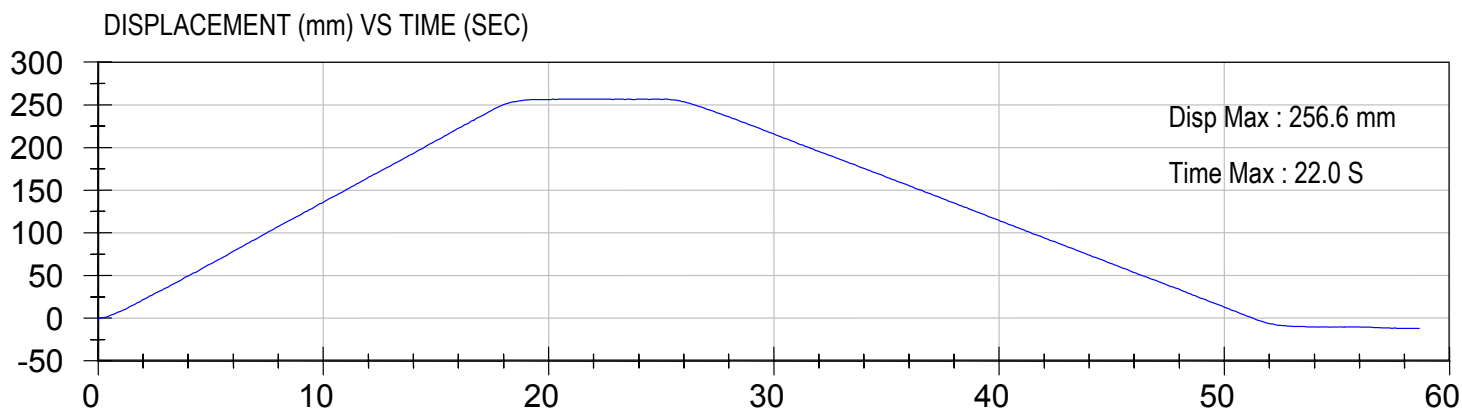
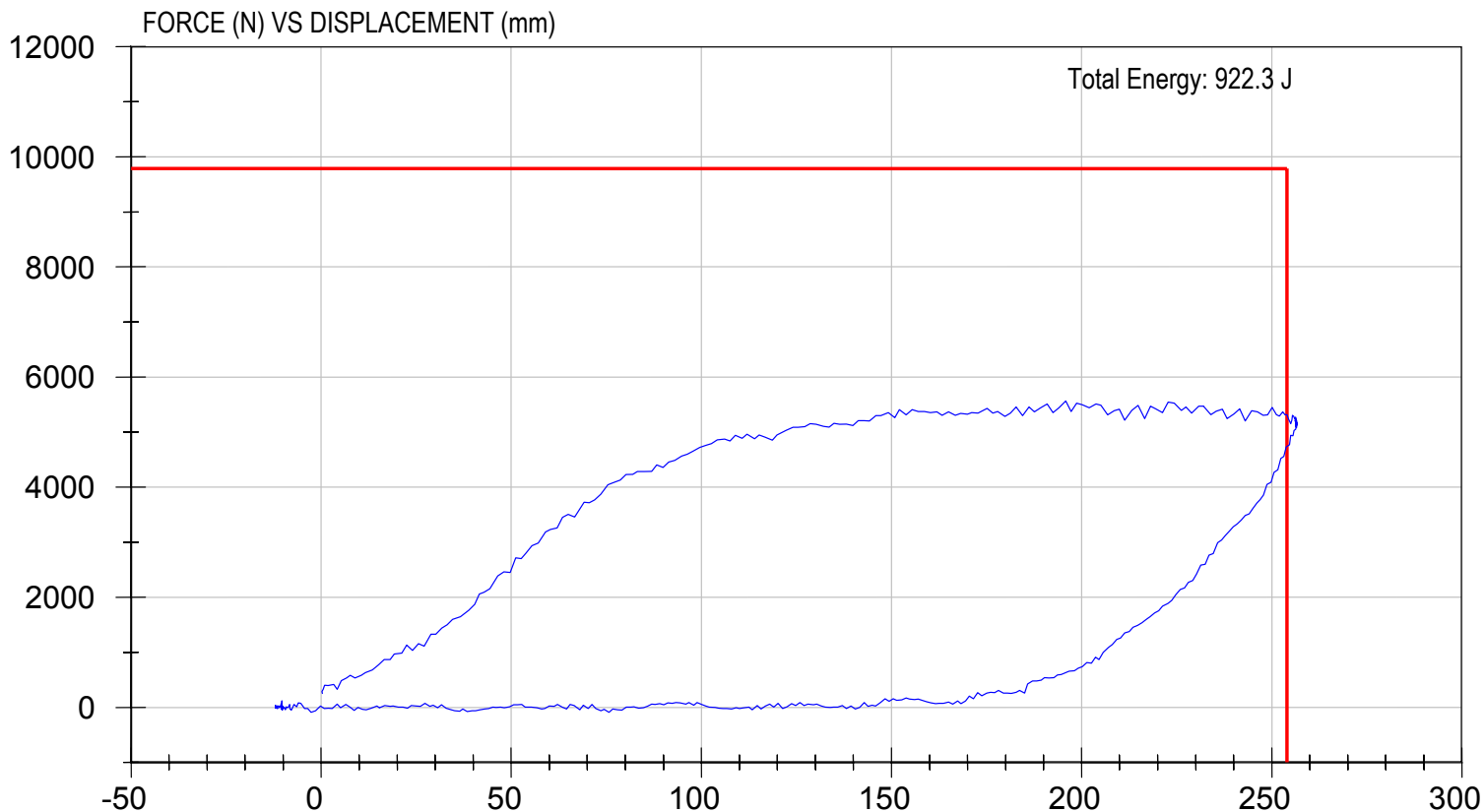
Test Date: 11/14/2006  
NHTSA #: C60902













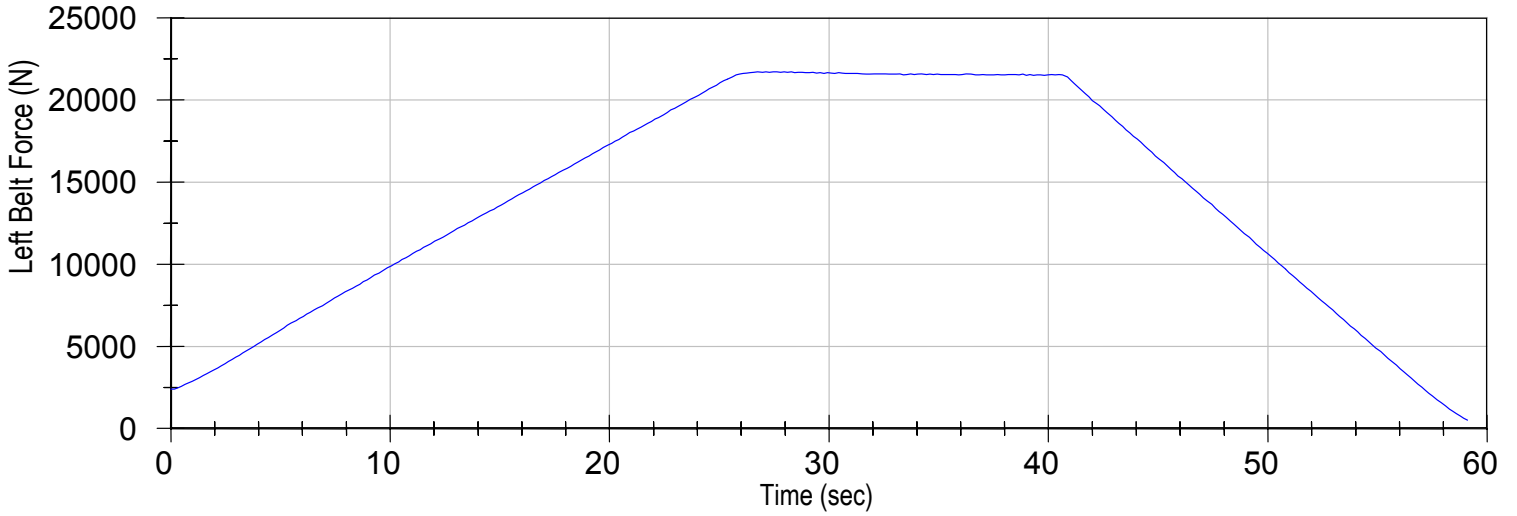
Test Desc: FMVSS 210 Lap Belt Load

Component ID: CORBEIL S5

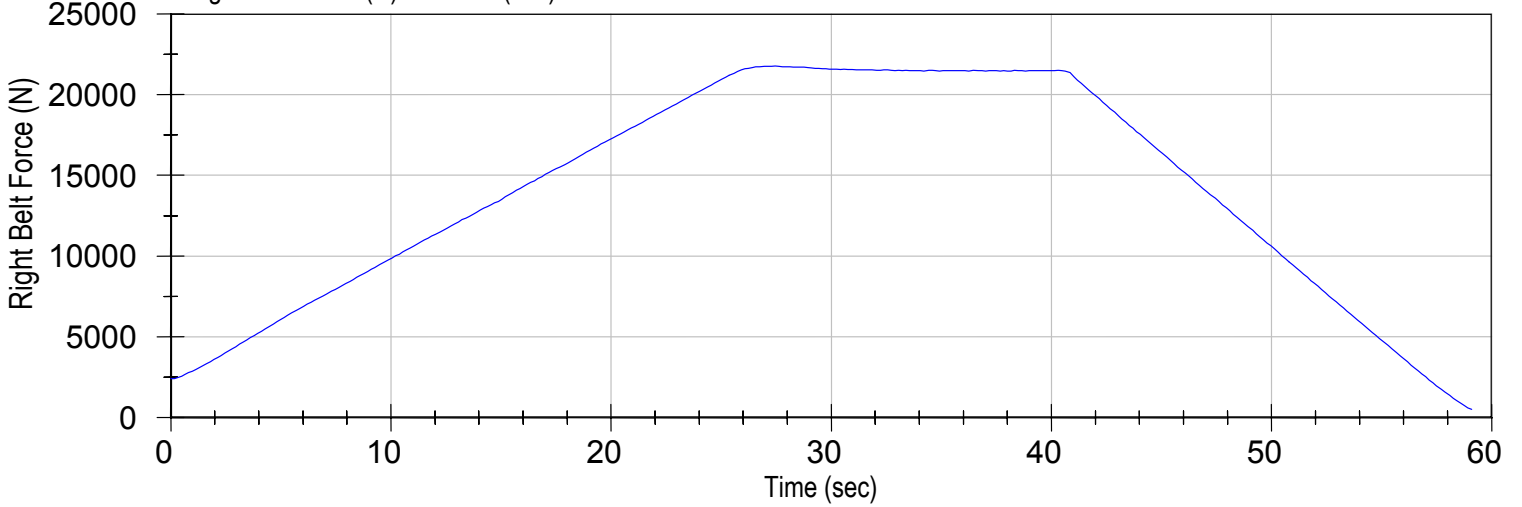
Test Date: 1/12/2007

NHTSA No: C60902

Left Belt Force (N) vs. Time (sec)



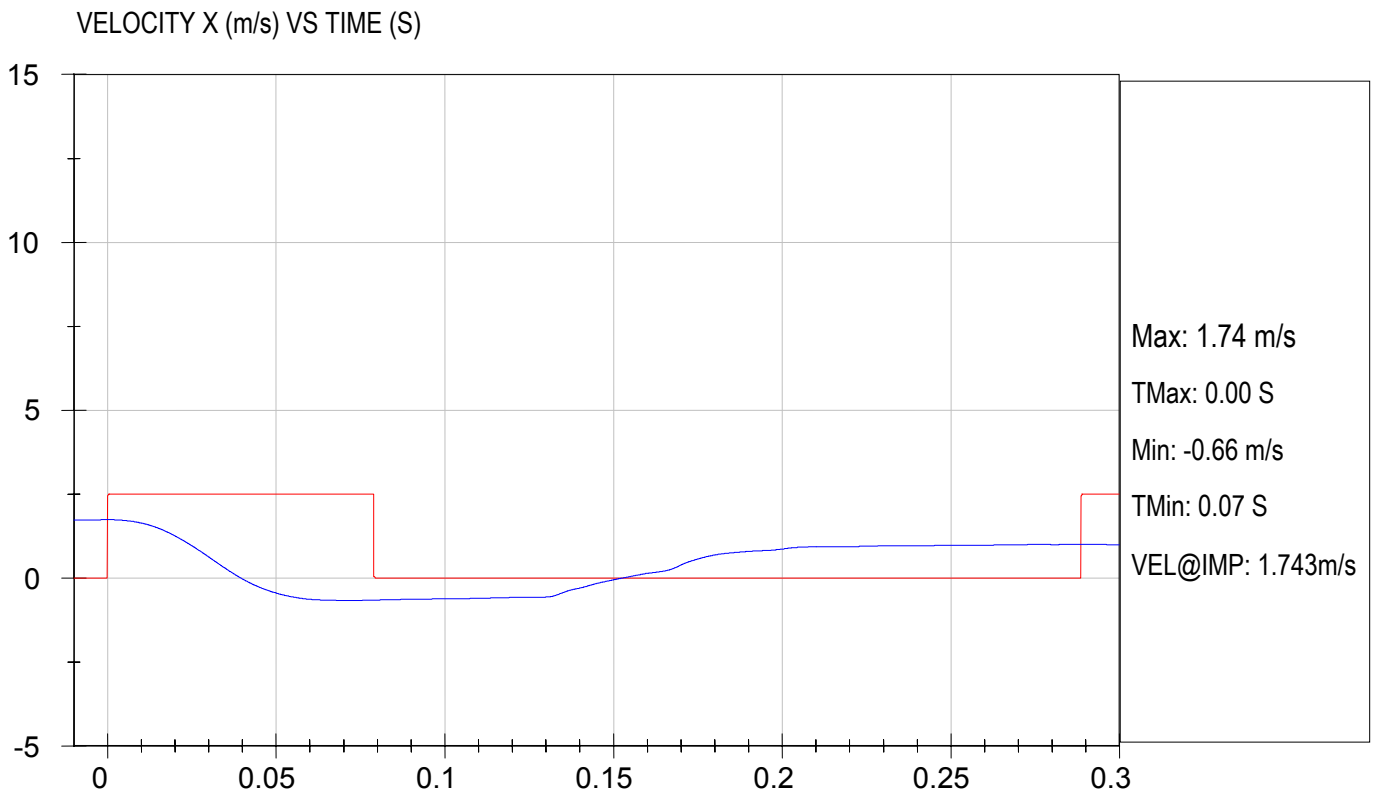
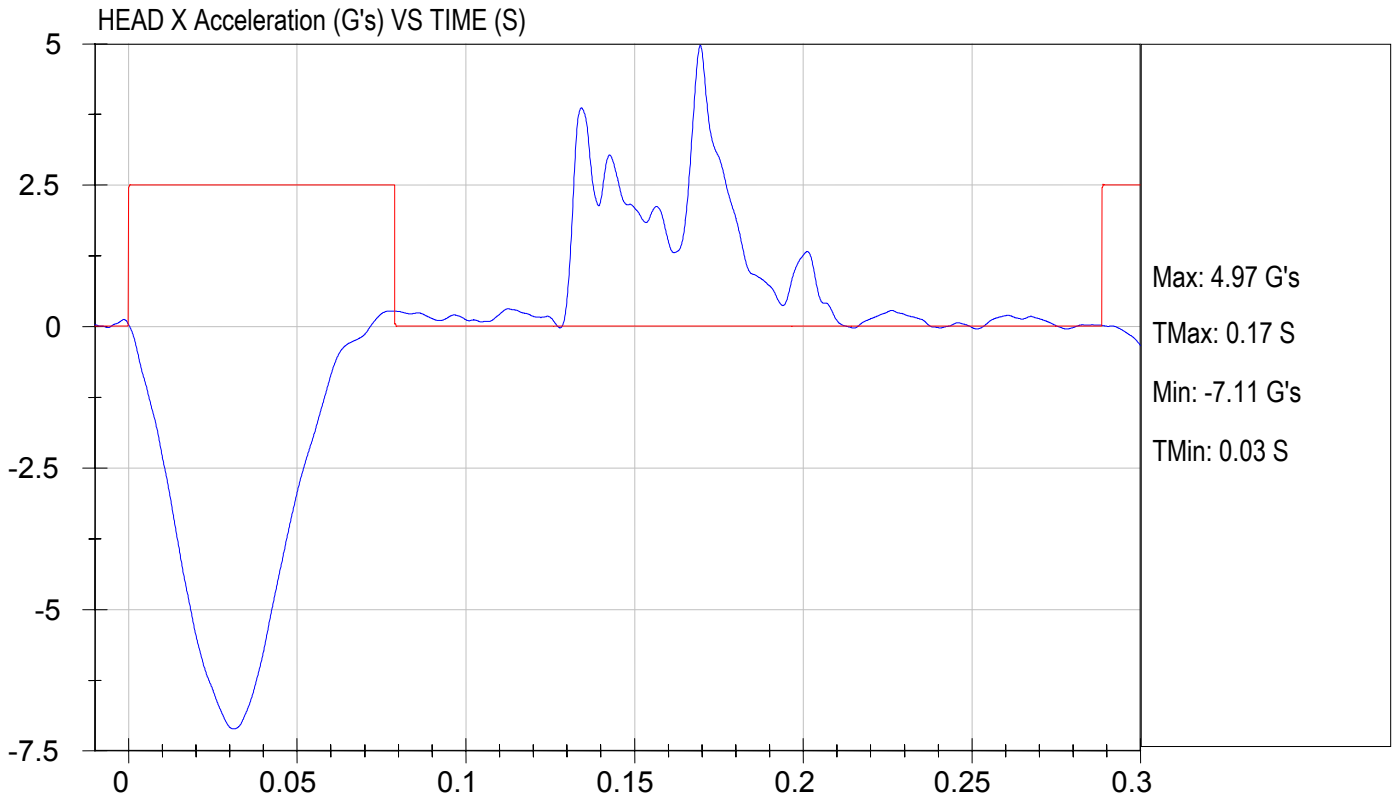
Right Belt Force (N) vs. Time (sec)





Test Desc: Head Form Impact (1.5 m/s)  
Component ID: CORBEIL S9, Location H1

Test Date: 1/8/2007  
NHTSA#: C60902

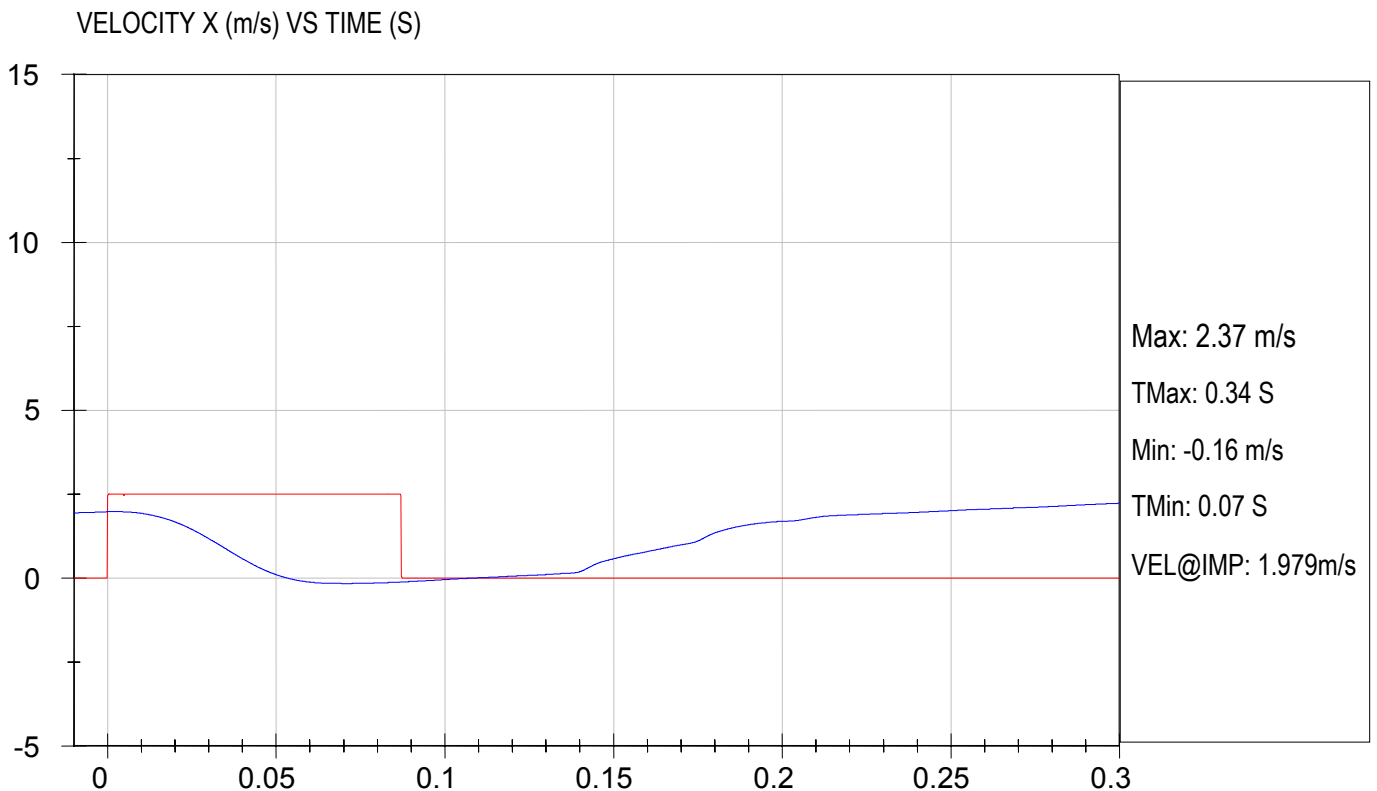
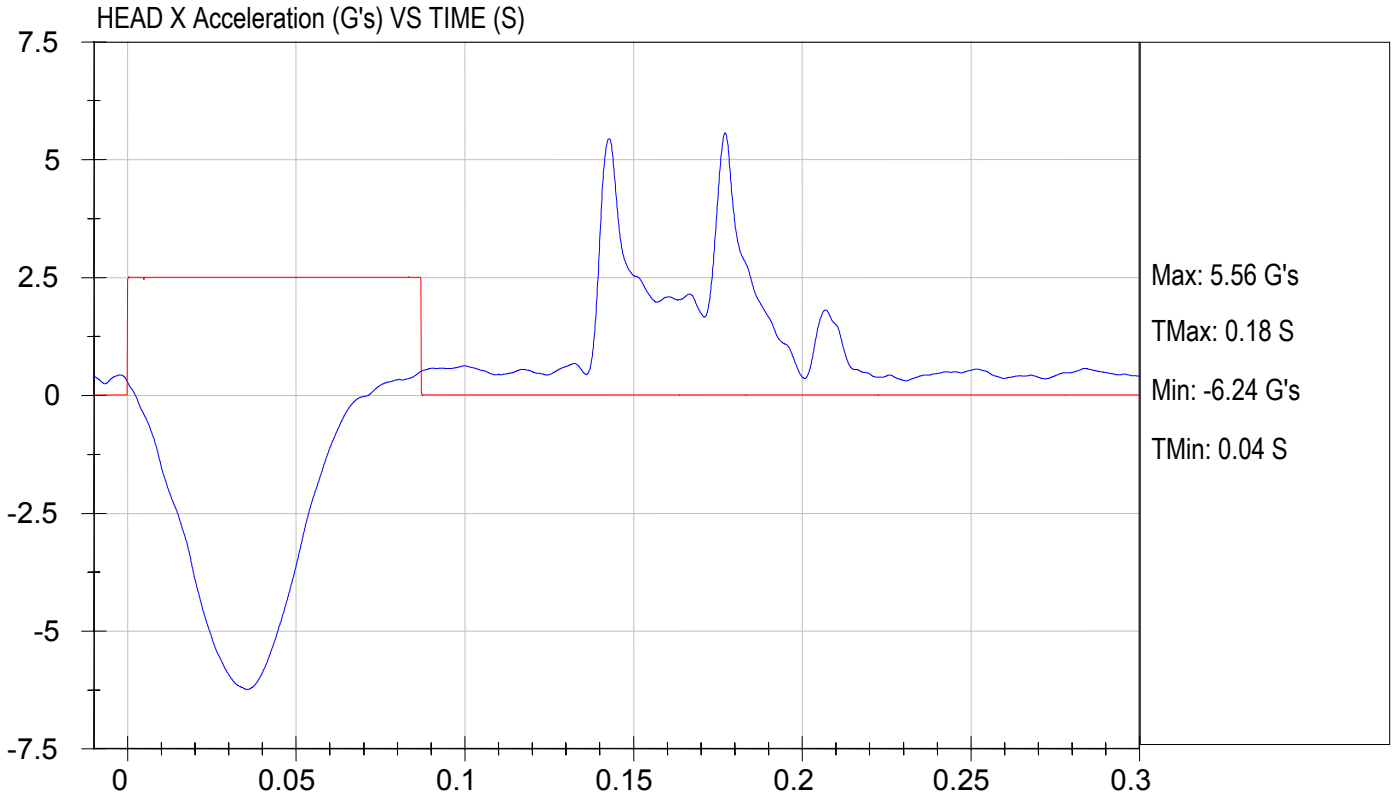






Test Desc: Head Form Impact (1.5 m/s)  
Component ID: CORBEIL S9, Location H2

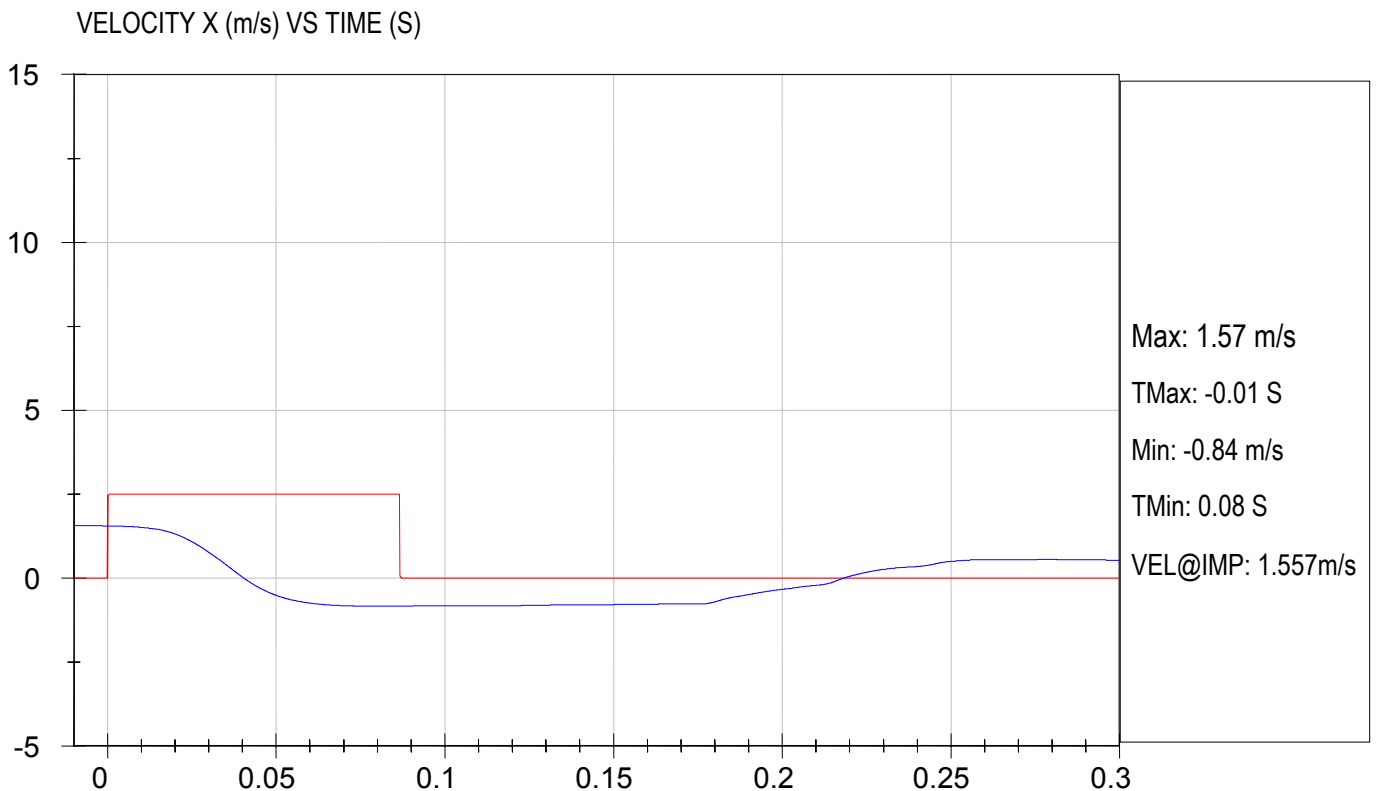
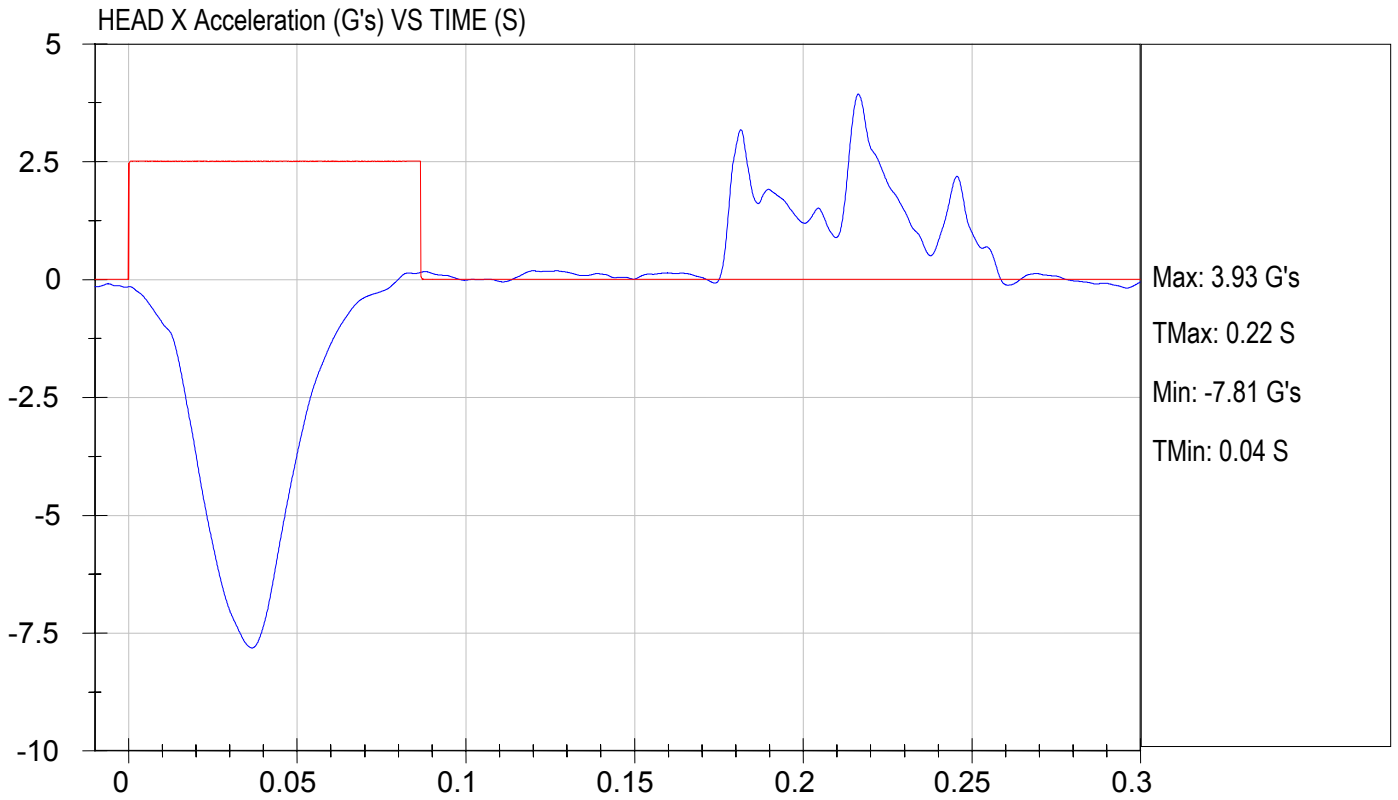
Test Date: 1/8/2007  
NHTSA#: C60902





Test Desc: Head Form Impact (1.5 m/s)  
Component ID: CORBEIL S9, Location H3

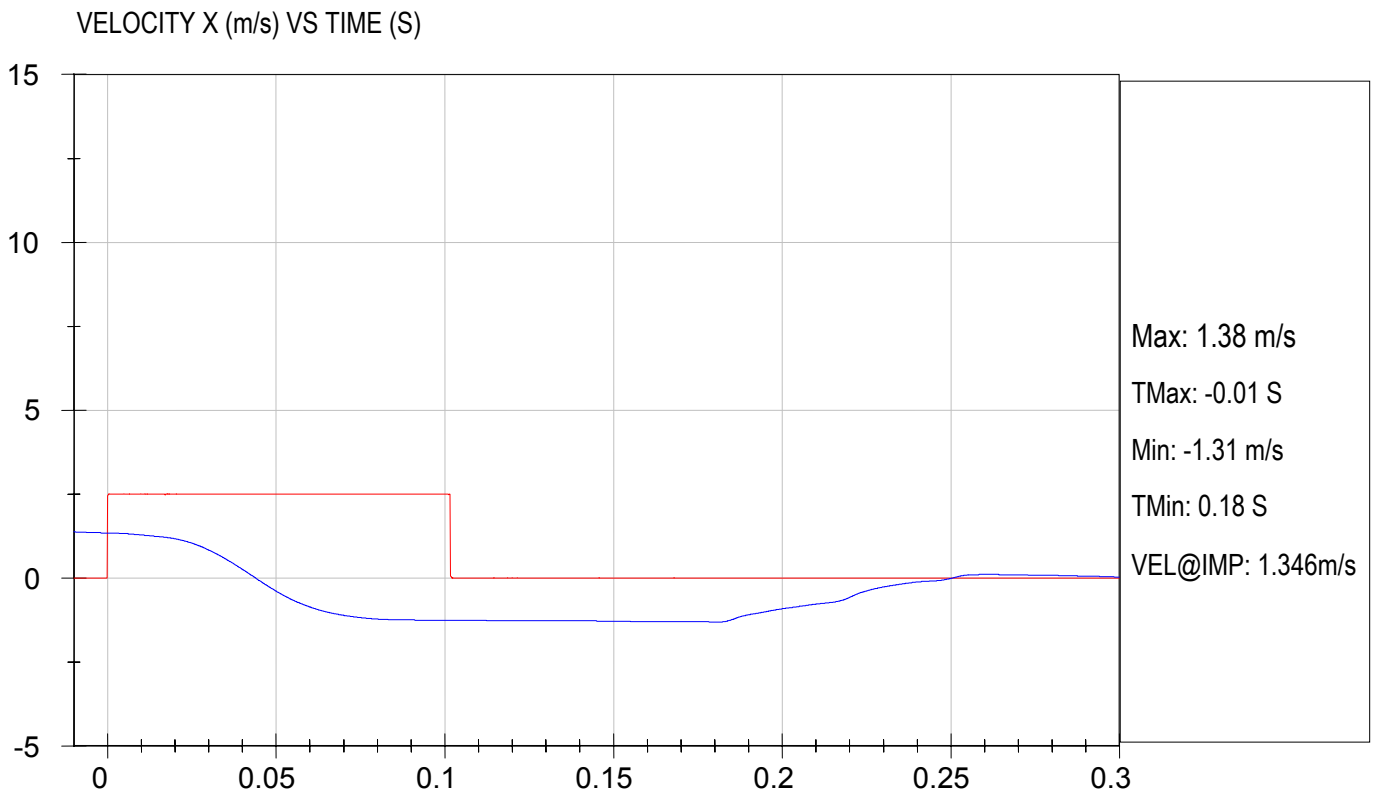
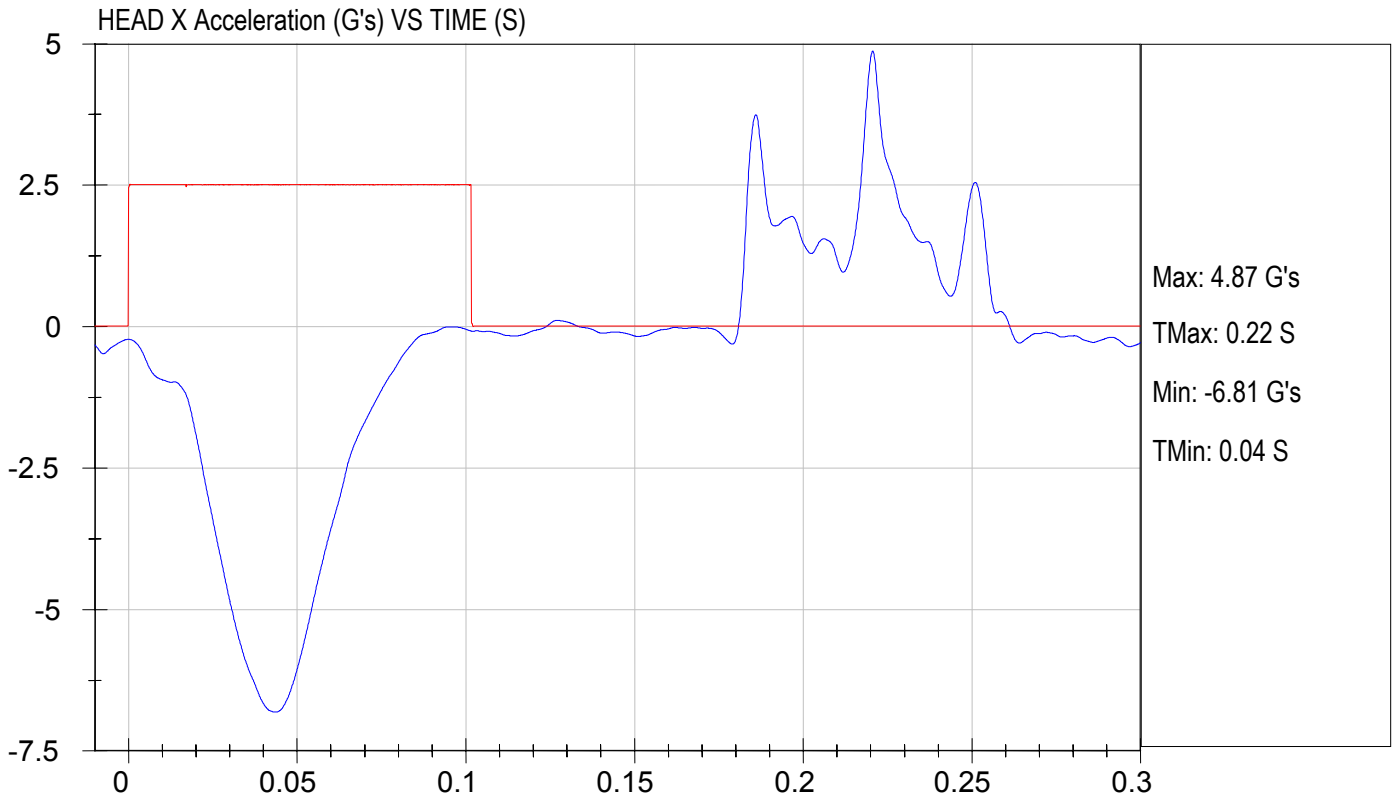
Test Date: 1/8/2007  
NHTSA#: C60902





Test Desc: Head Form Impact (1.5 m/s)  
Component ID: CORBEIL S9, Location H4

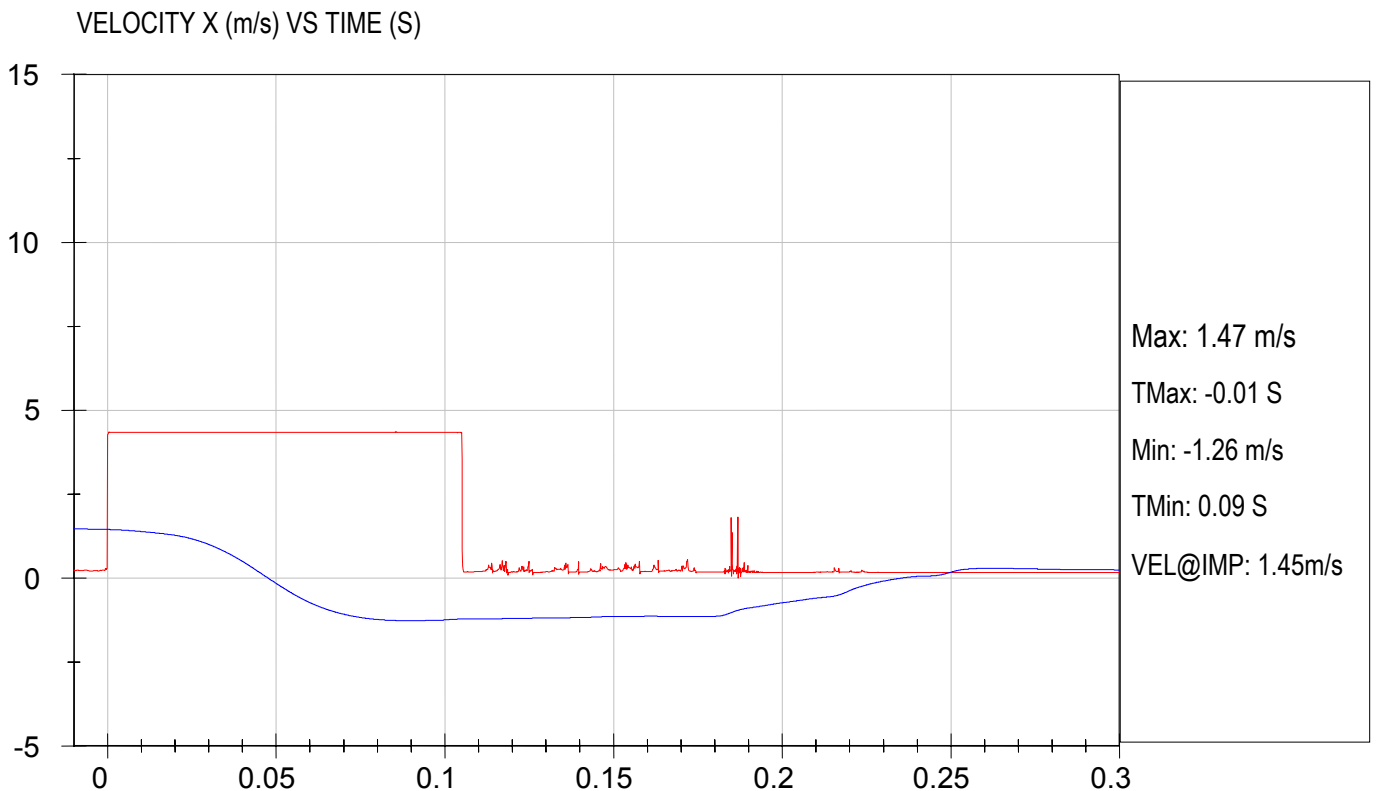
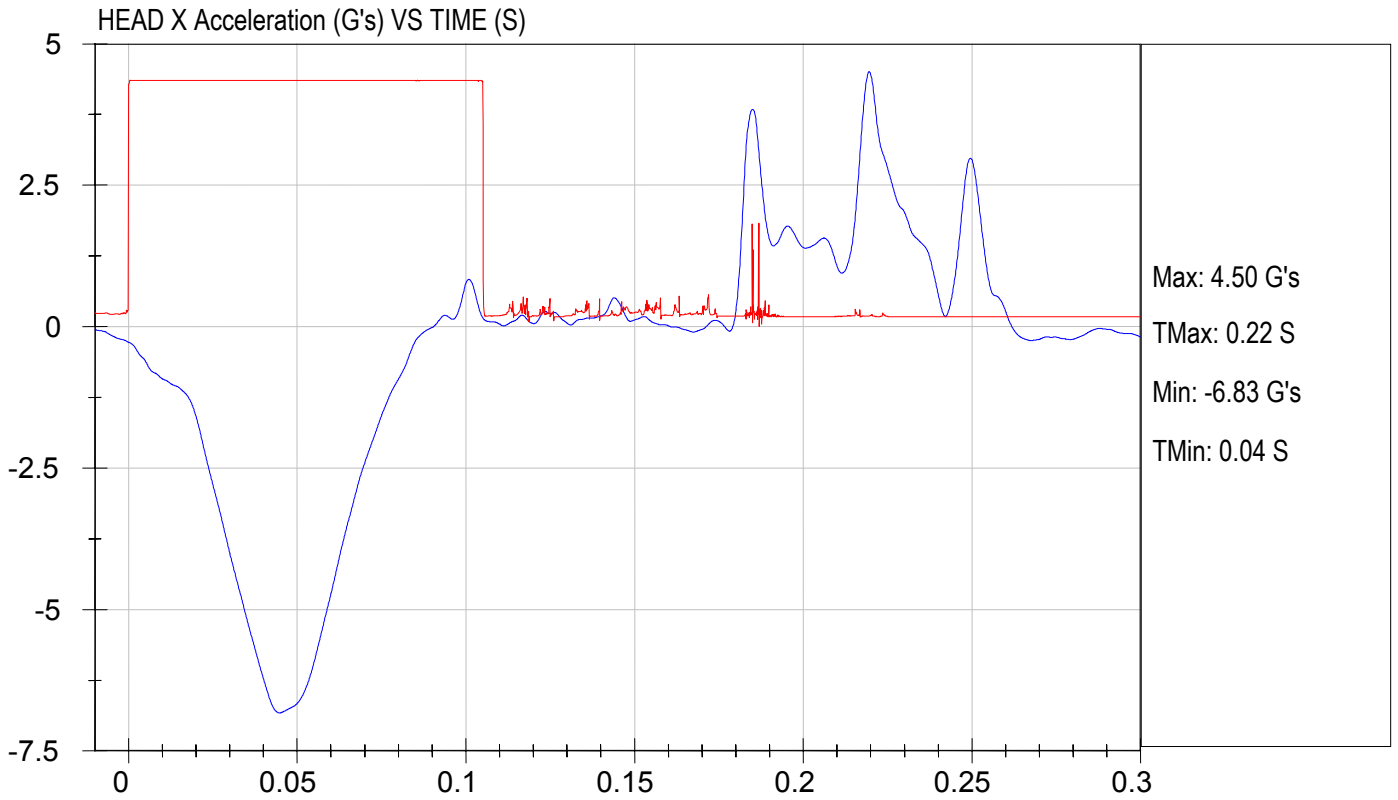
Test Date: 1/8/2007  
NHTSA#: C60902





Test Desc: Head Form Impact (1.5 m/s)  
Component ID: CORBEIL S9, Location H5

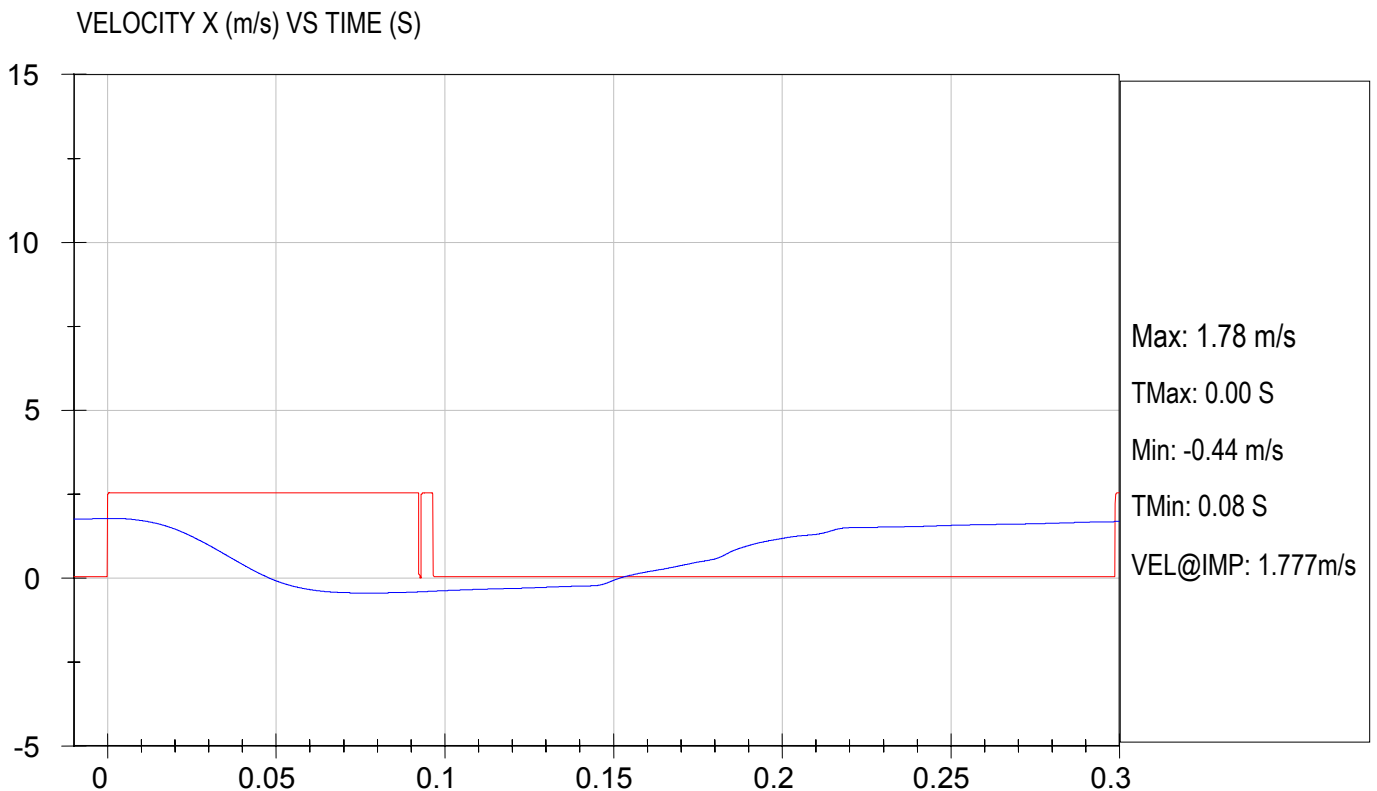
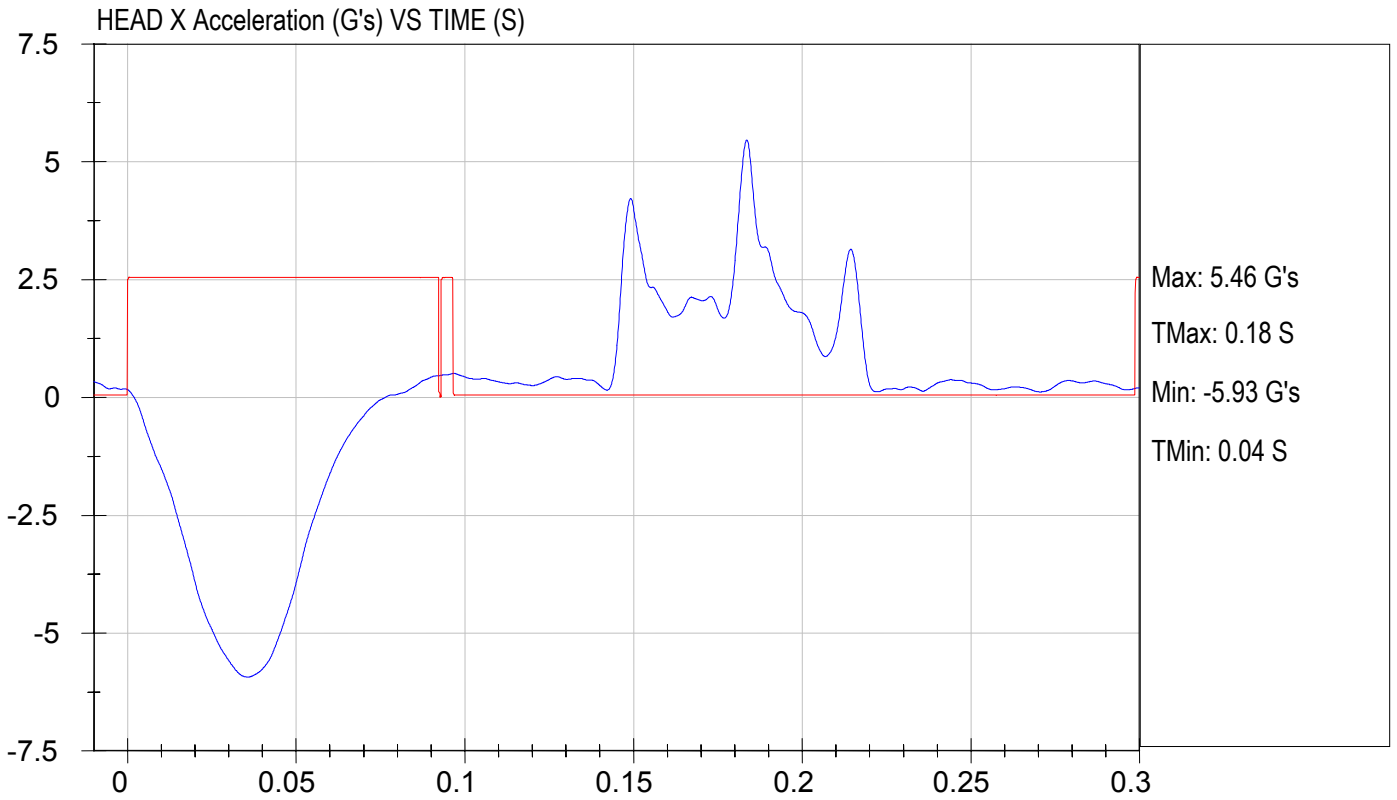
Test Date: 1/8/2007  
NHTSA#: C60902





Test Desc: Head Form Impact (1.5 m/s)  
Component ID: CORBEIL S9, Location H6

Test Date: 1/8/2007  
NHTSA#: C60902

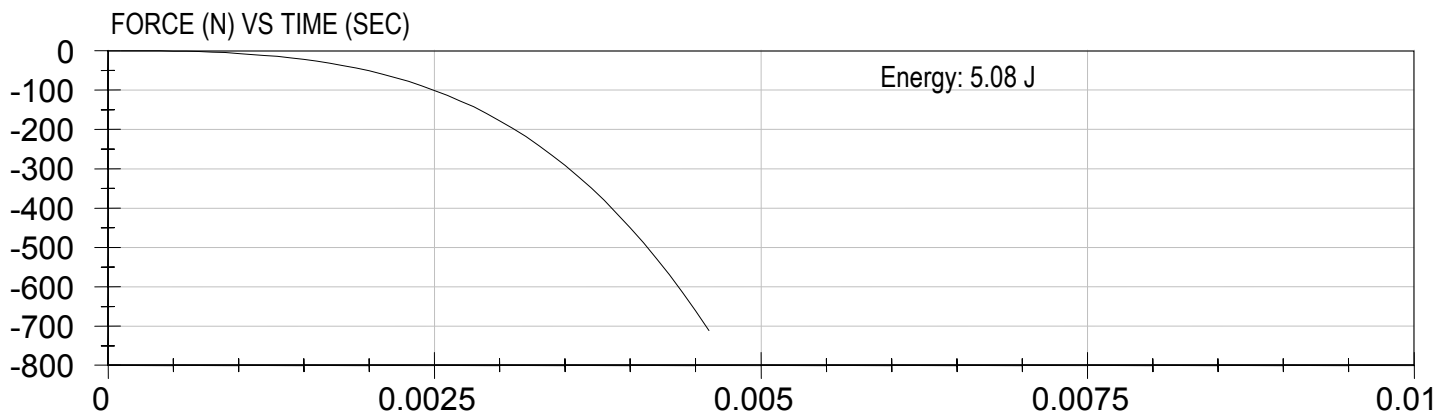
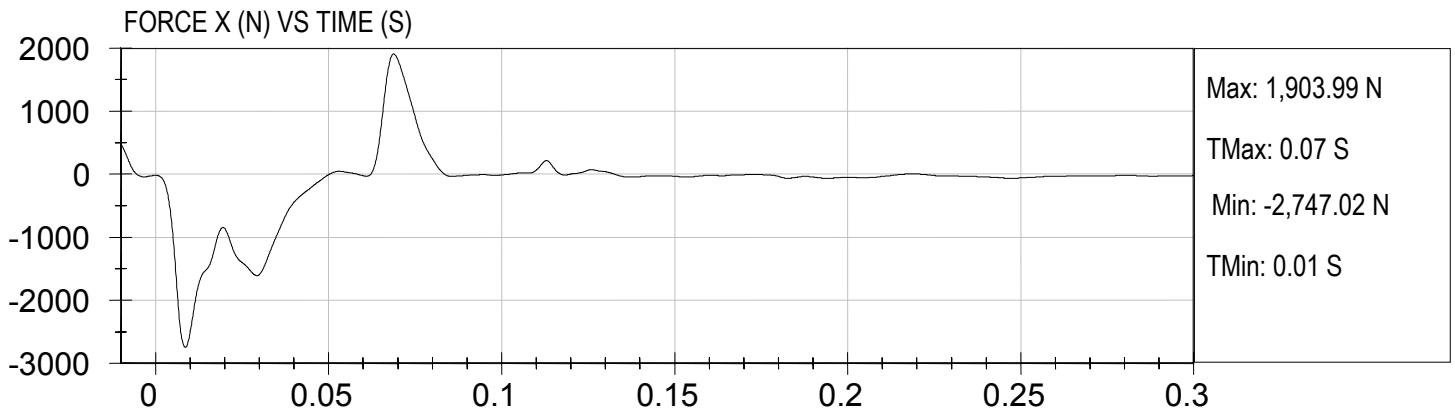
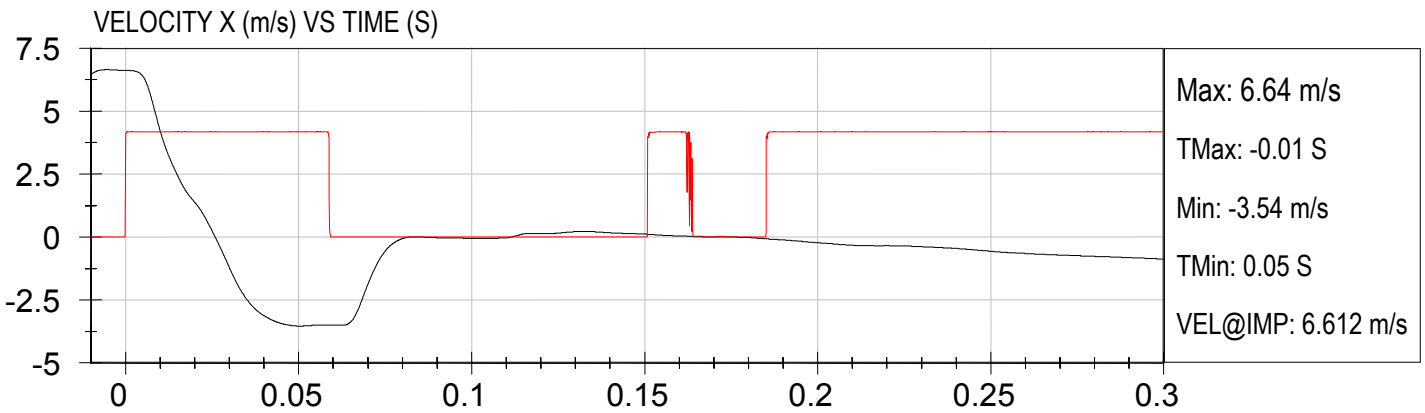
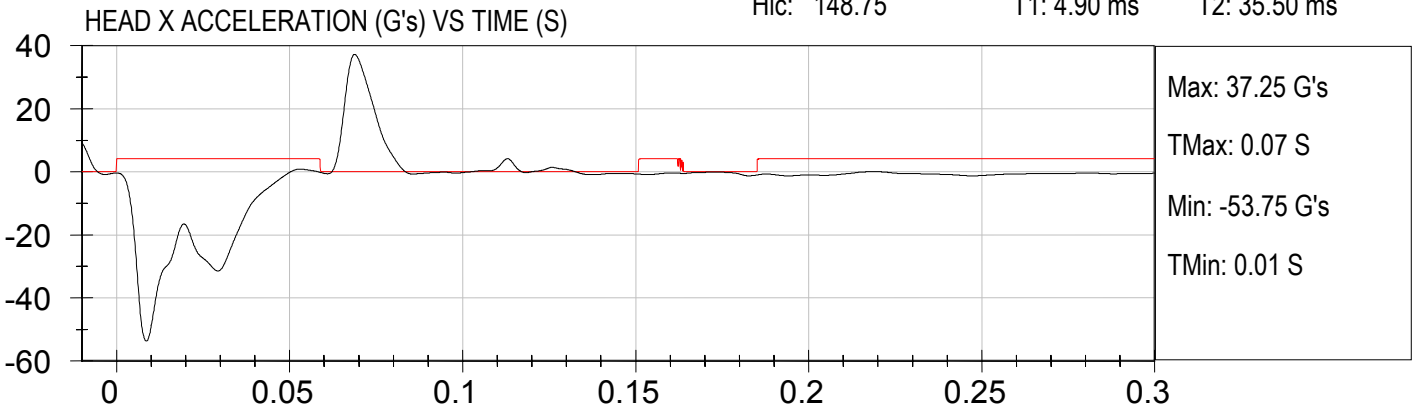




Test Desc: Head Form Impact (6.69 m/s)  
Component ID: CORBEIL S9, Location H7

Test Date: 1/5/2007  
NHTSA#: C60902

Hic: 148.75      T1: 4.90 ms      T2: 35.50 ms





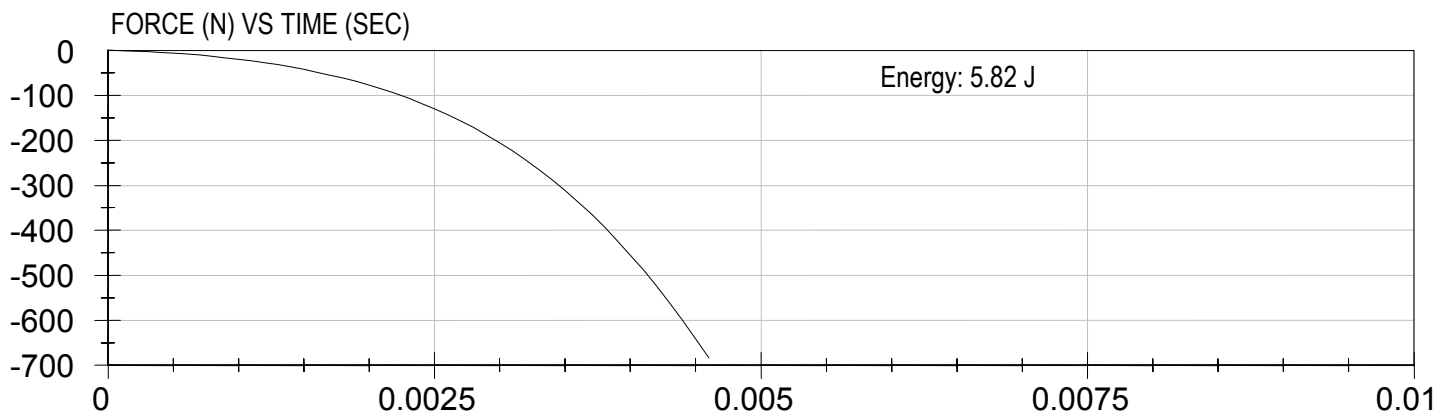
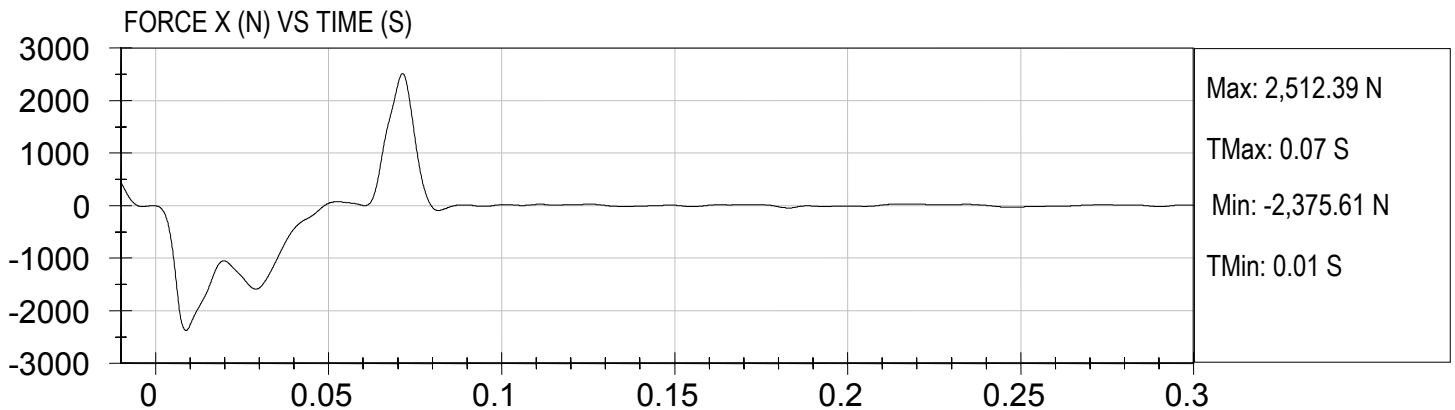
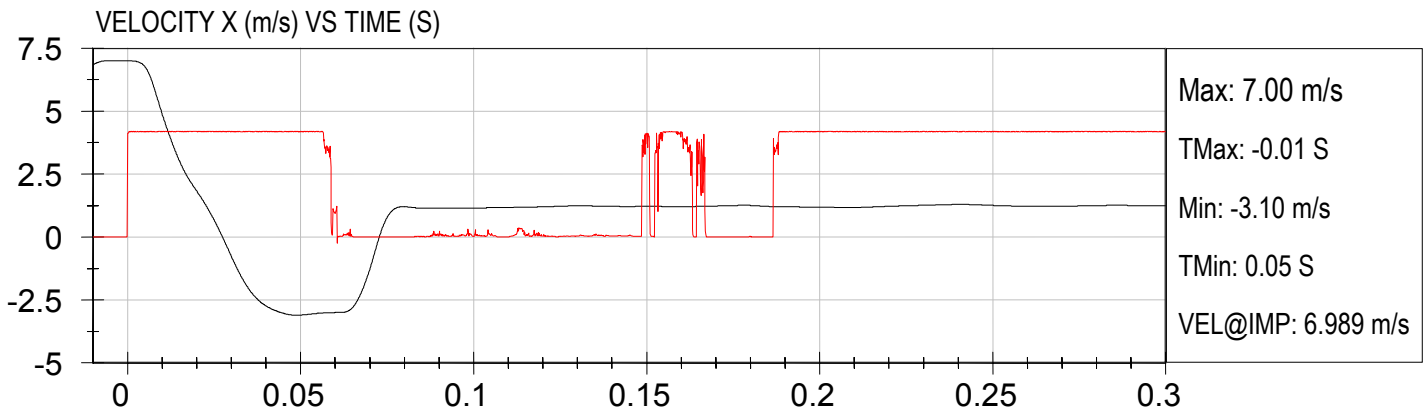
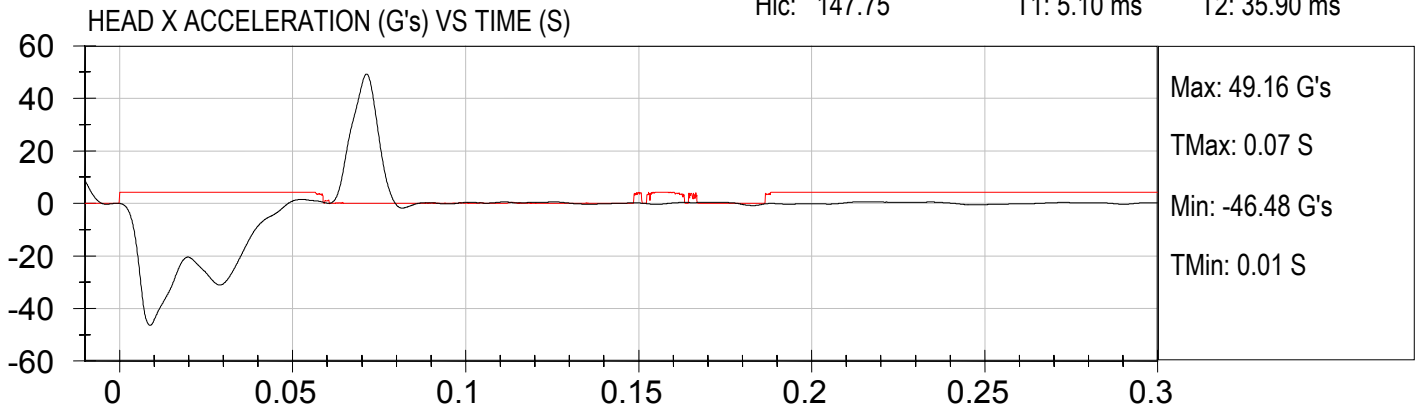
Test Desc: Head Form Impact (6.69 m/s)  
Component ID: CORBEIL S9, Location H8

Test Date: 1/5/2007  
NHTSA#: C60902

Hic: 147.75

T1: 5.10 ms

T2: 35.90 ms

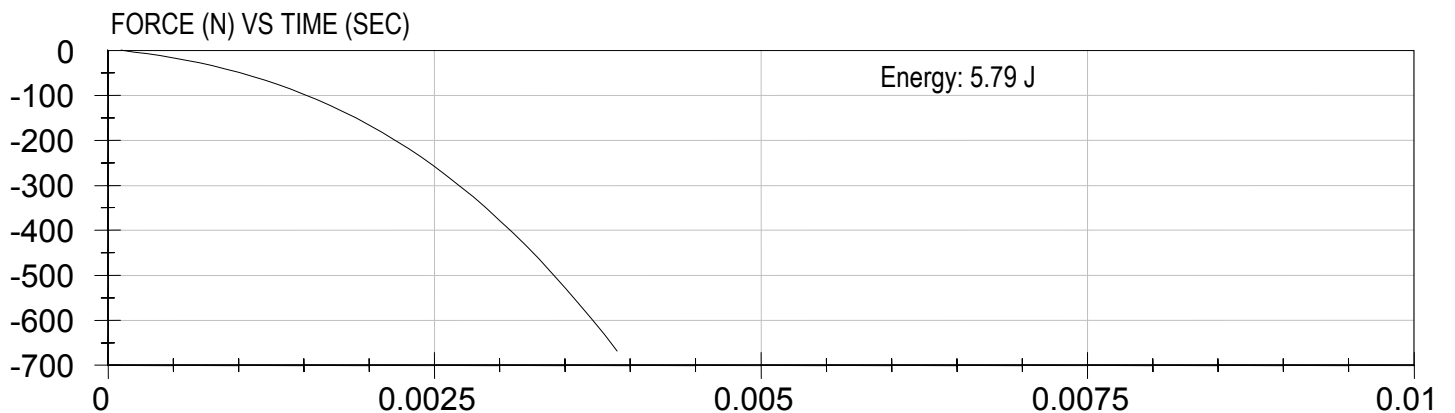
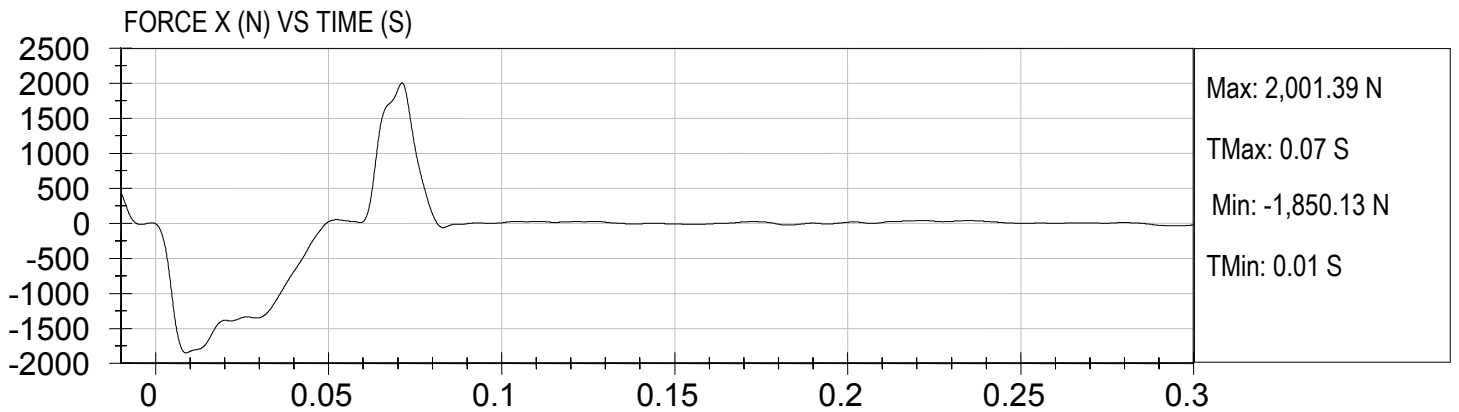
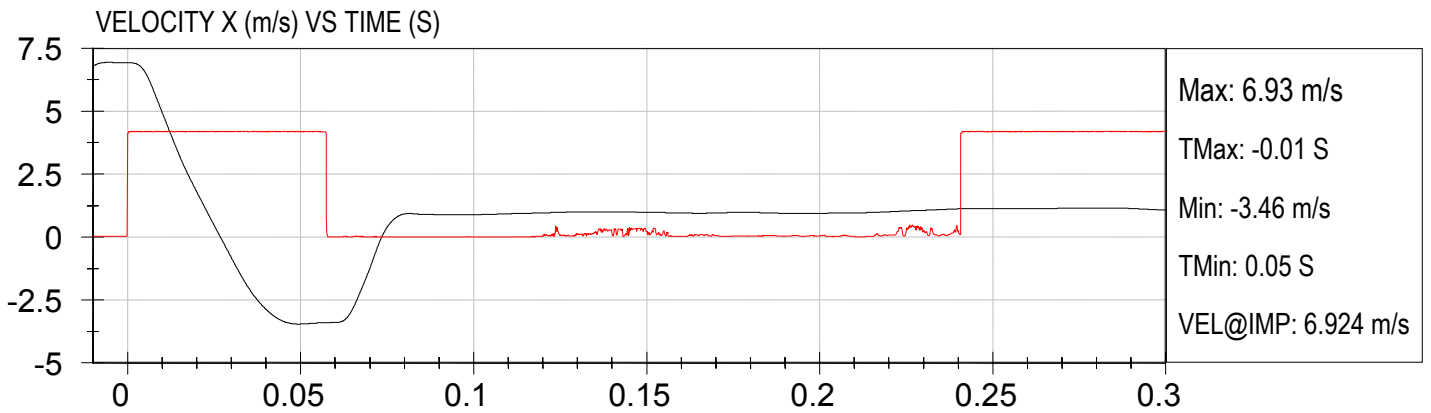
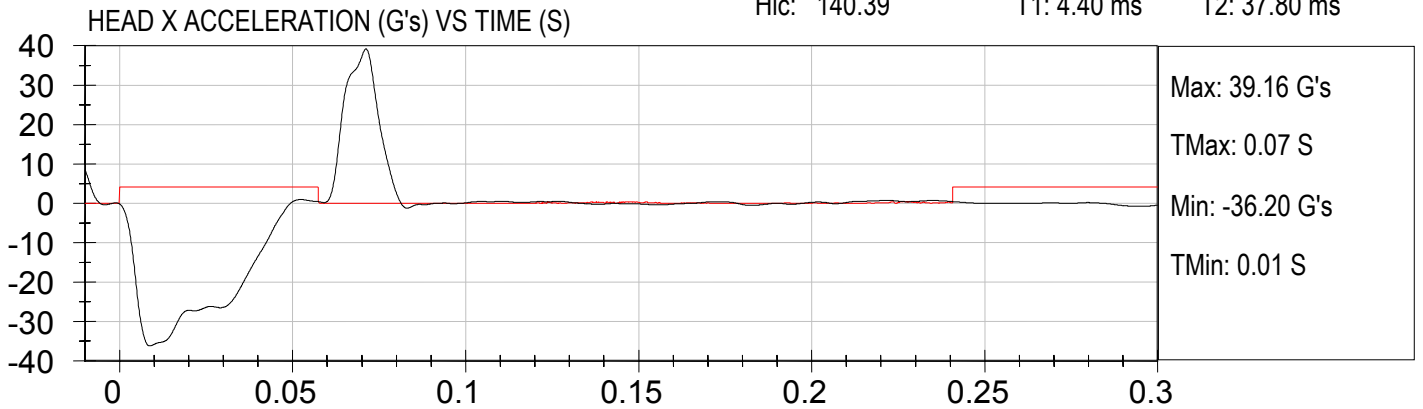




Test Desc: Head Form Impact (6.69 m/s)  
Component ID: CORBEIL S9, Location H9

Test Date: 1/5/2007  
NHTSA#: C60902

Hic: 140.39 T1: 4.40 ms T2: 37.80 ms



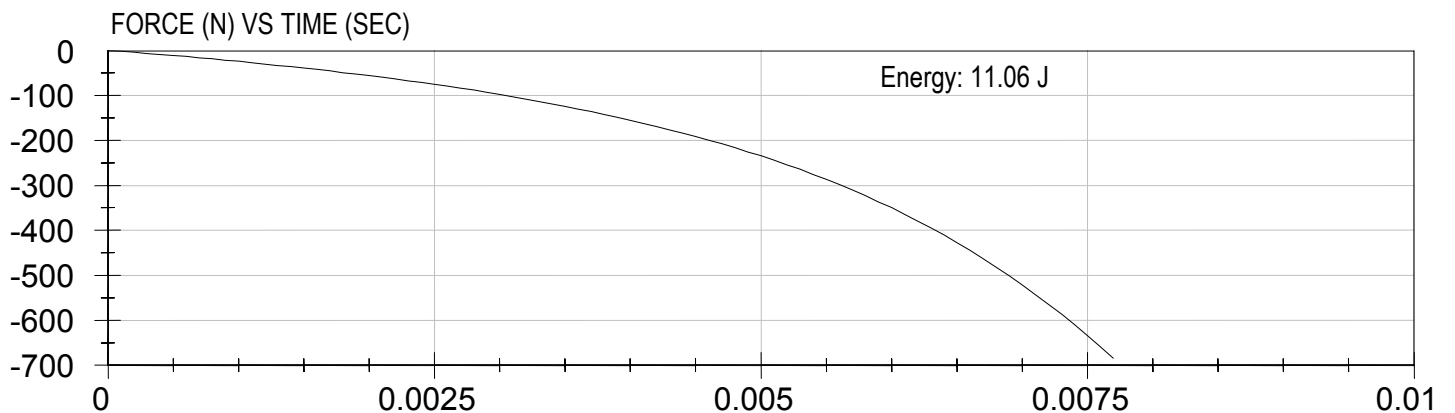
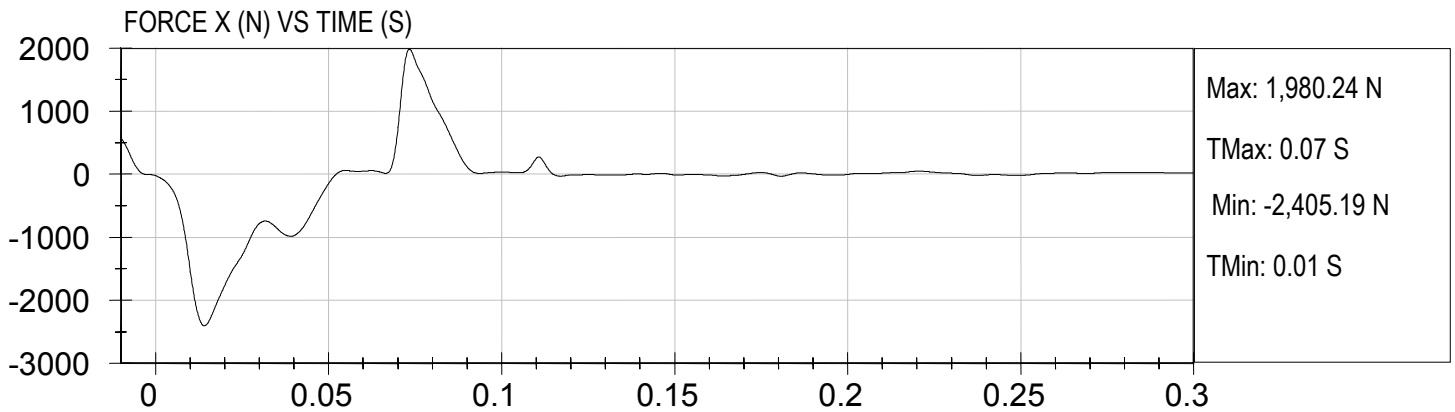
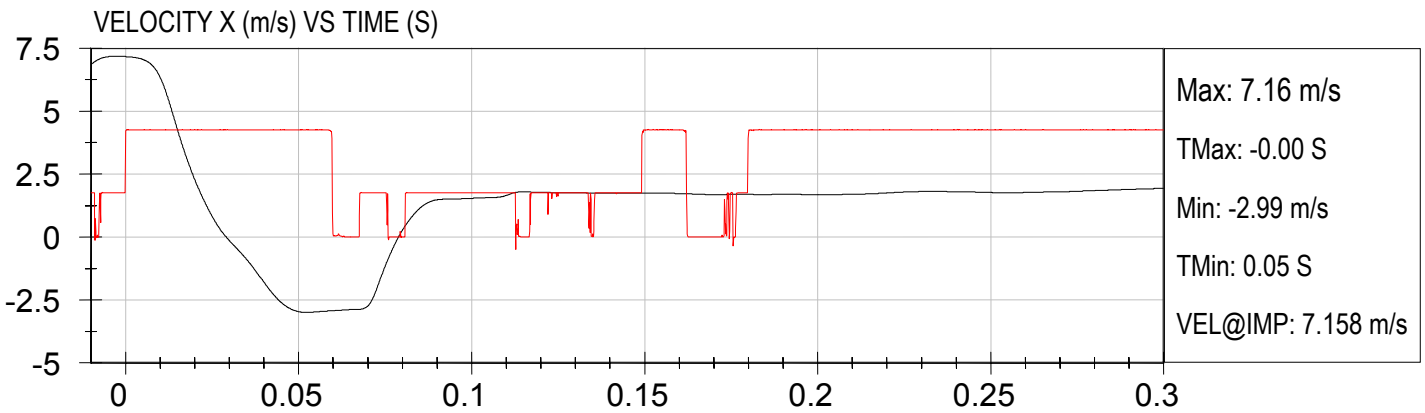
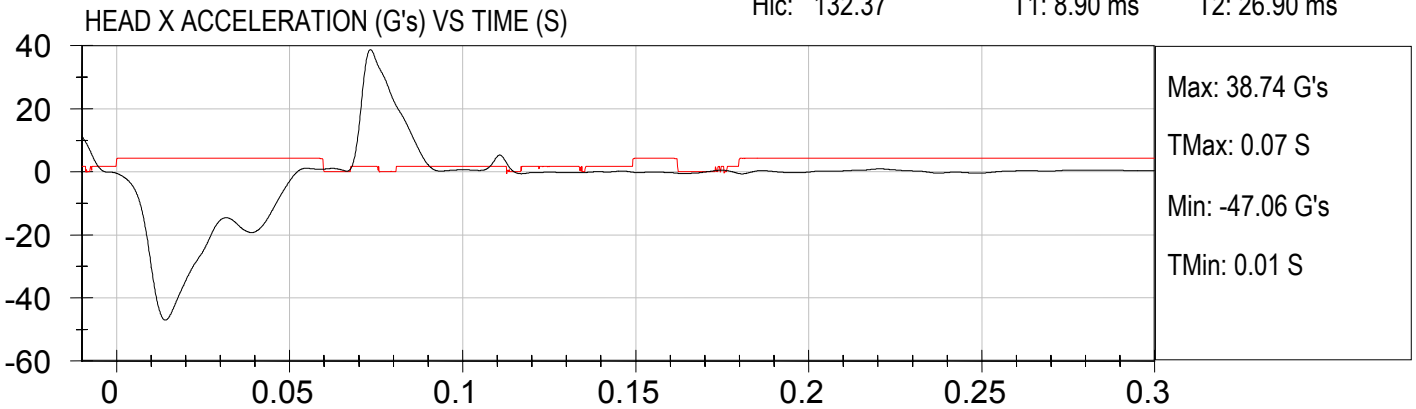




Test Desc: Head Form Impact (6.69 m/s)  
Component ID: CORBEIL S9, Location H10

Test Date: 1/5/2007  
NHTSA#: C60902

Hic: 132.37      T1: 8.90 ms      T2: 26.90 ms

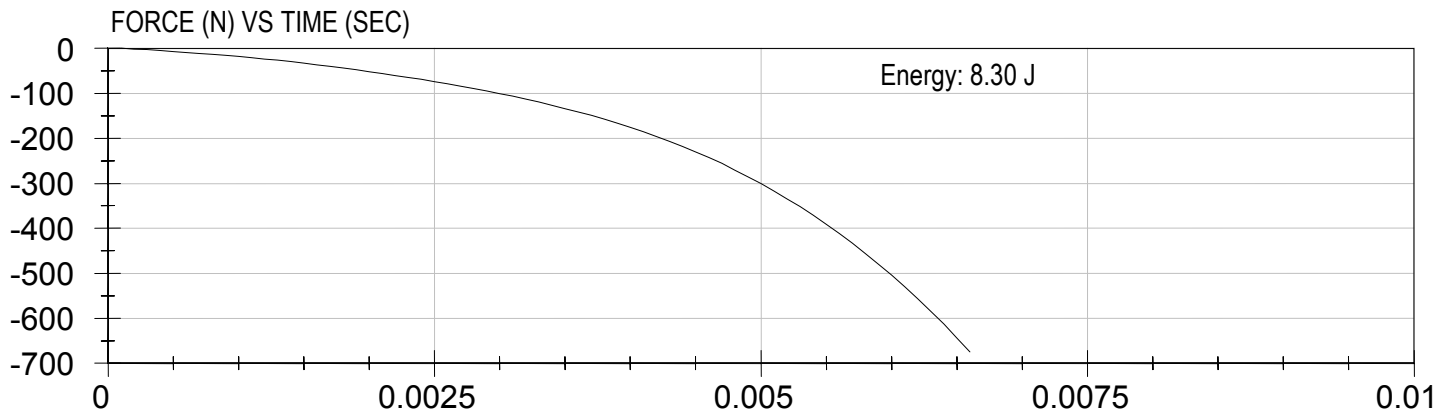
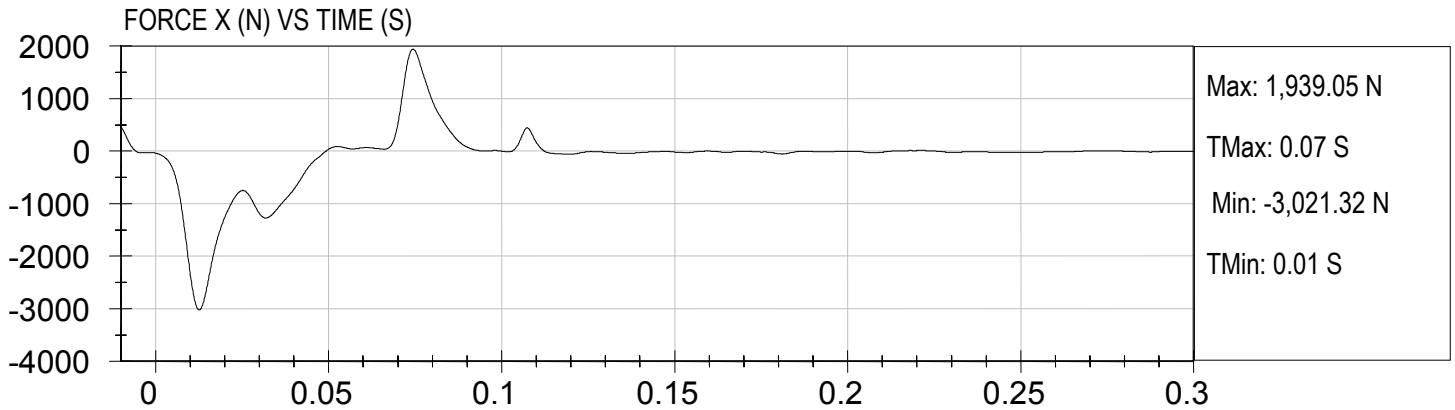
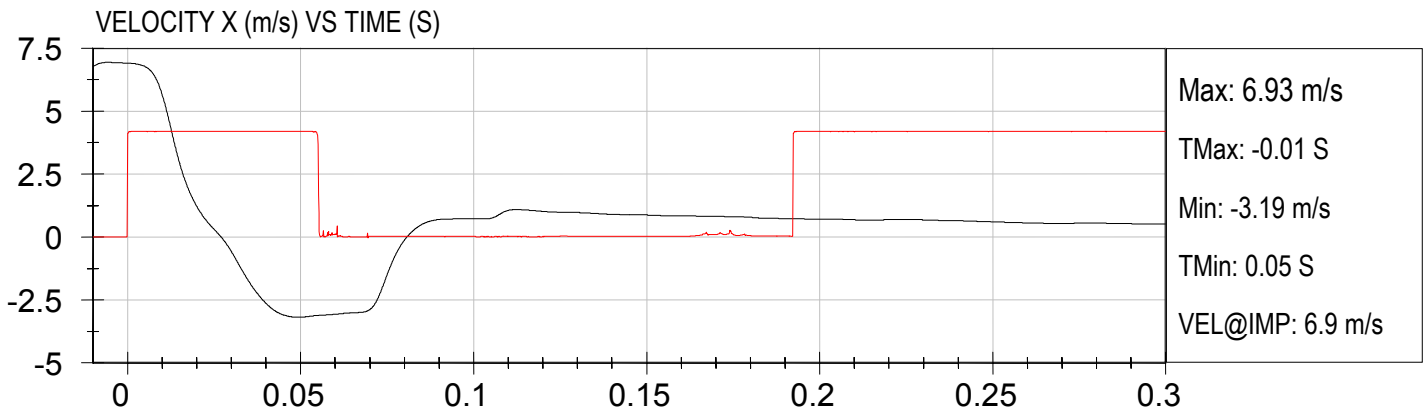
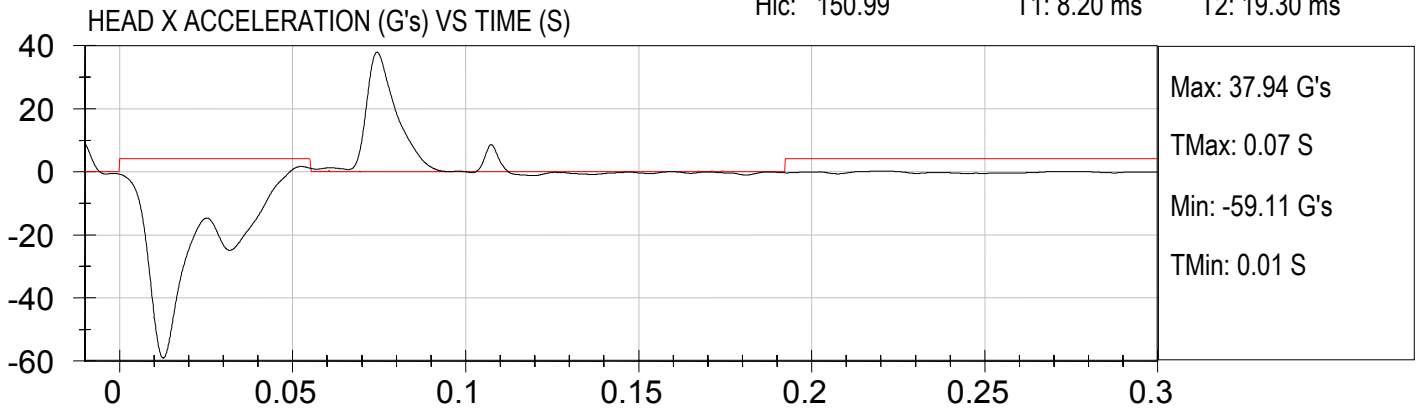




Test Desc: Head Form Impact (6.69 m/s)  
Component ID: CORBEIL S9, Location H11

Test Date: 1/5/2007  
NHTSA#: C60902

Hic: 150.99      T1: 8.20 ms      T2: 19.30 ms

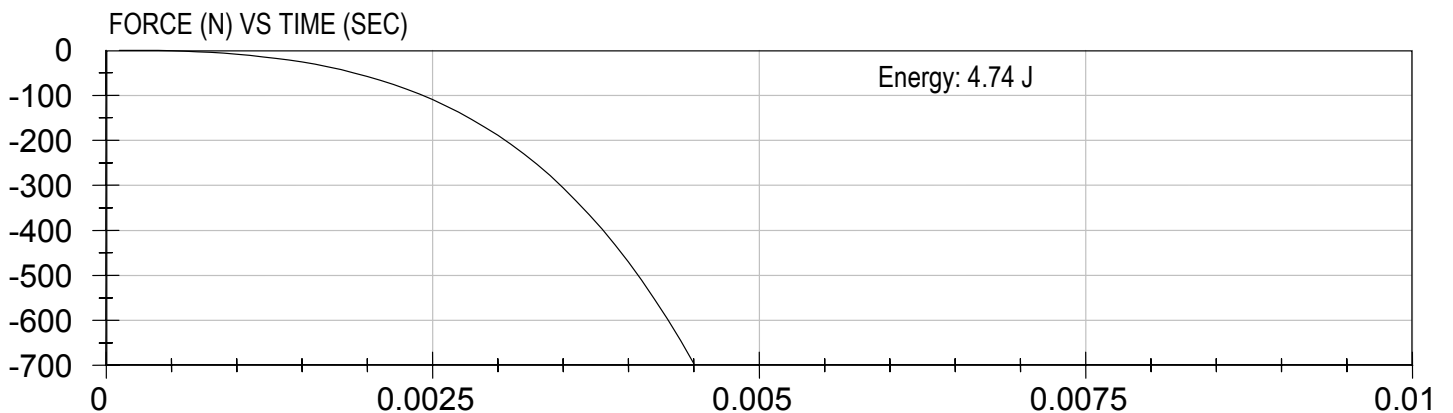
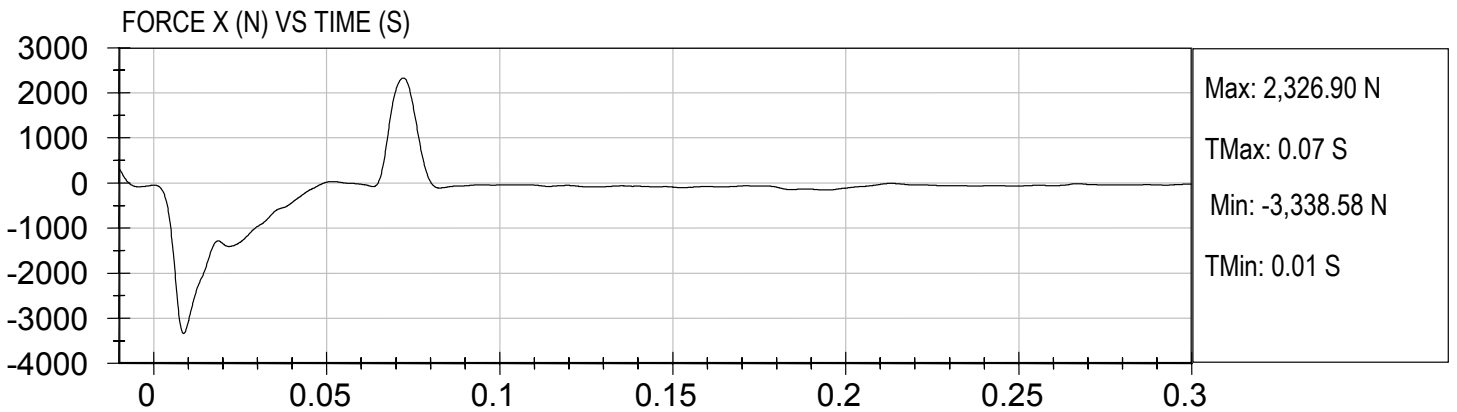
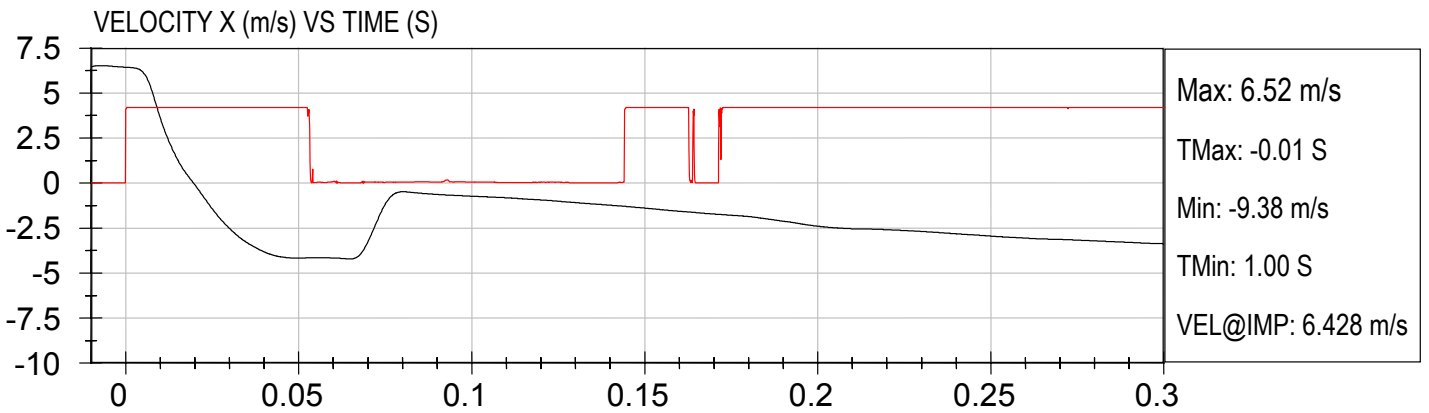
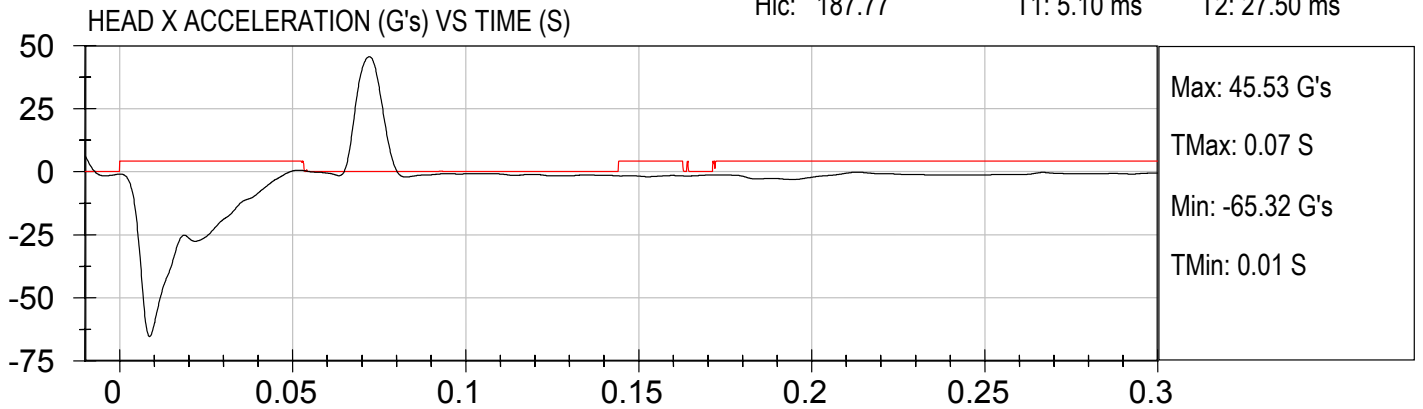




Test Desc: Head Form Impact (6.69 m/s)  
Component ID: CORBEIL S9, Location H12

Test Date: 1/5/2007  
NHTSA#: C60902

Hic: 187.77      T1: 5.10 ms      T2: 27.50 ms



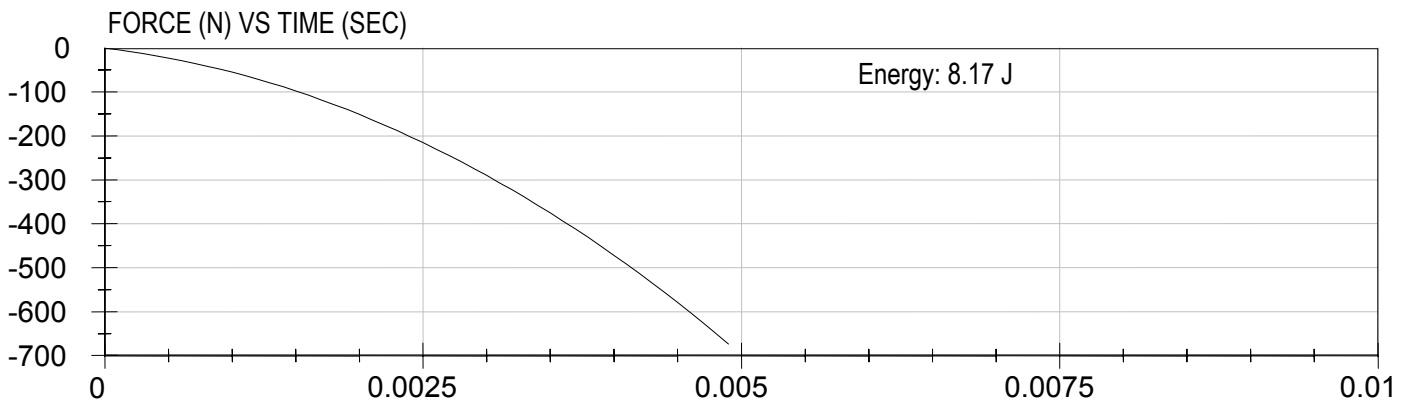
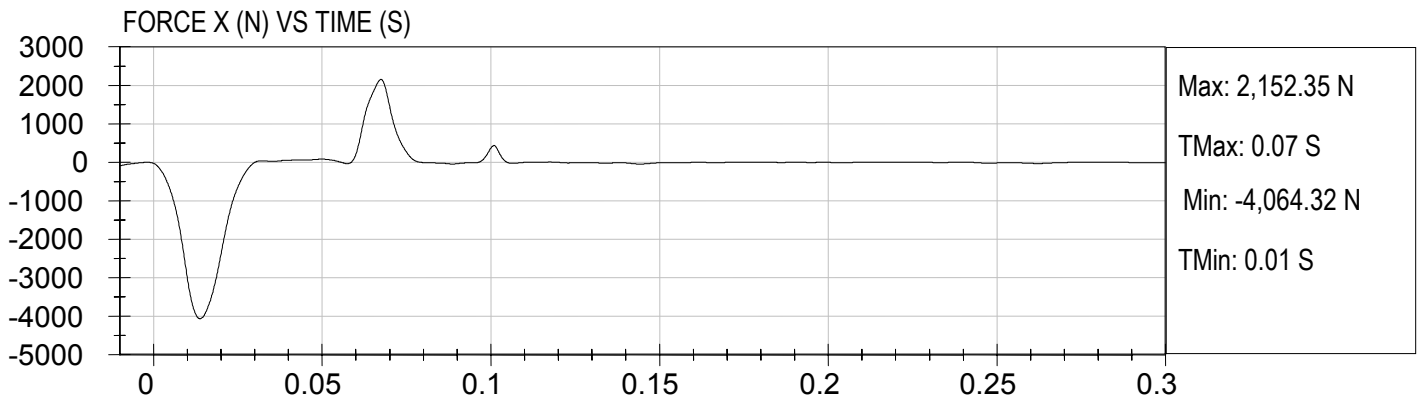
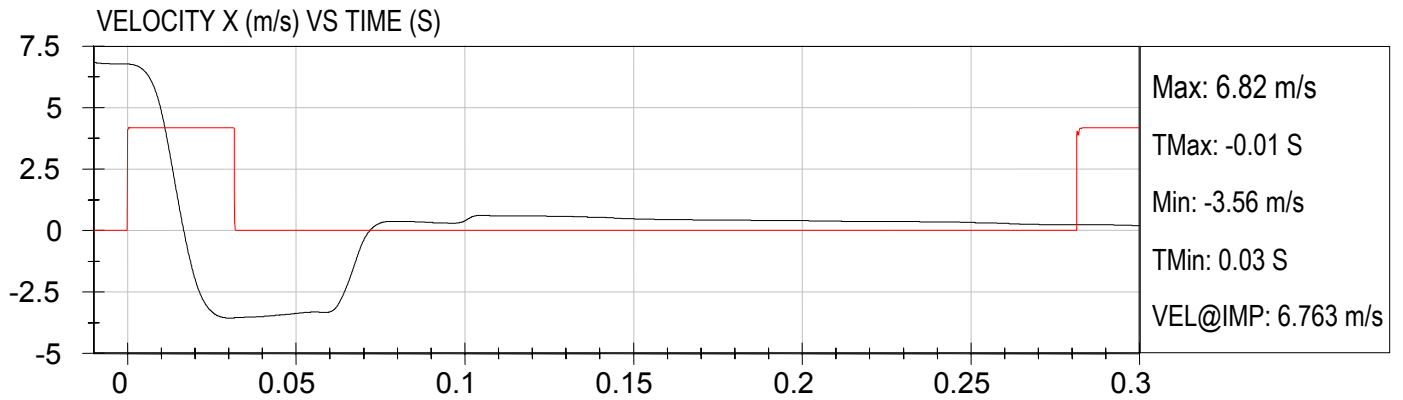
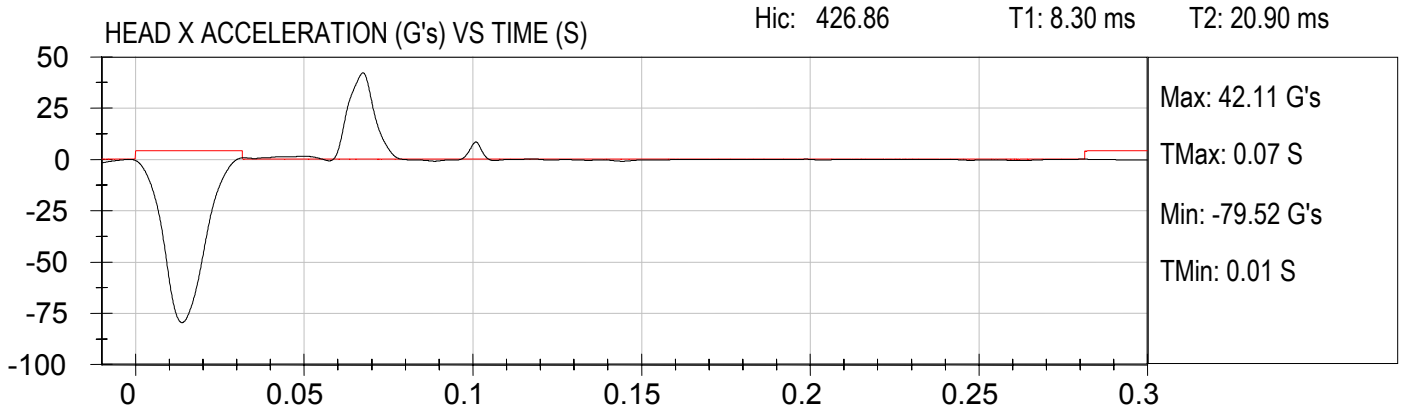


Test Desc: Head Form Impact (6.69 m/s)

Test Date: 1/8/2007

Component ID: CORBEIL Bulkhead, Location H13

NHTSA#: C60902



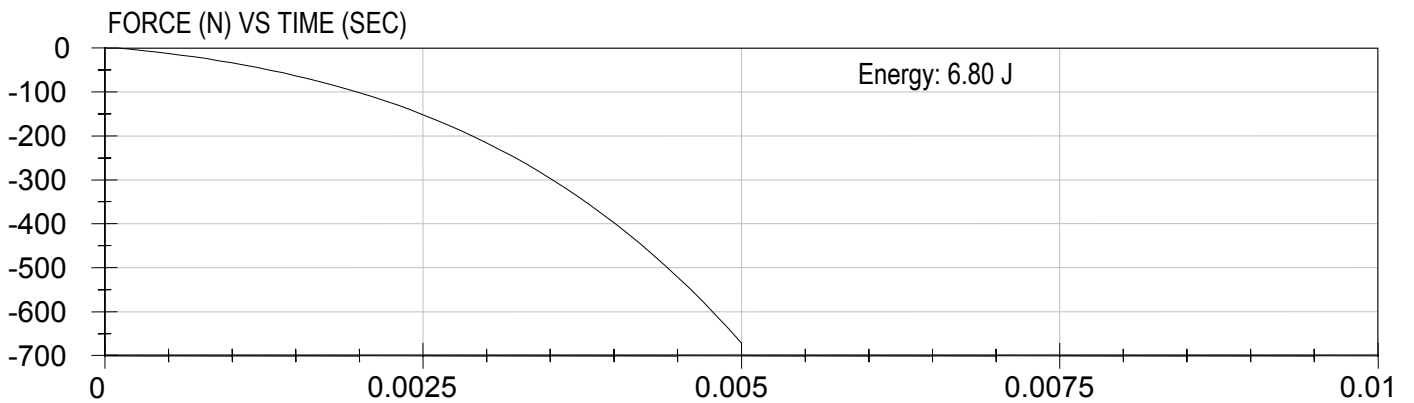
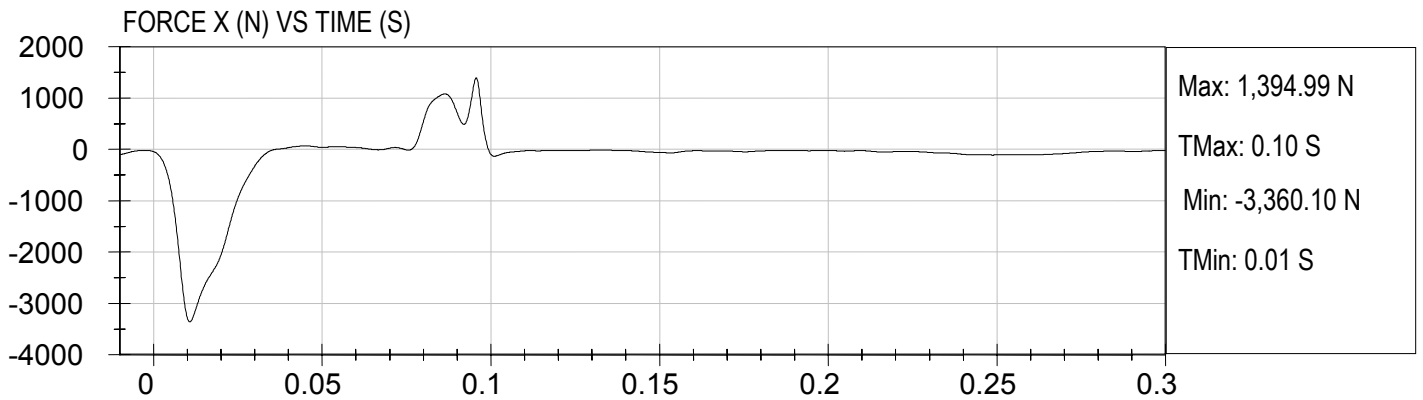
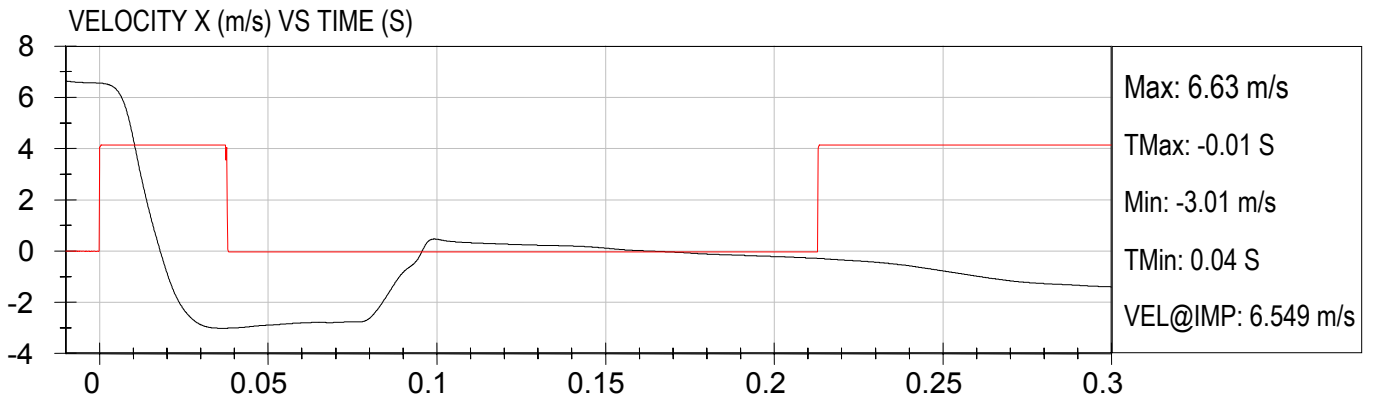
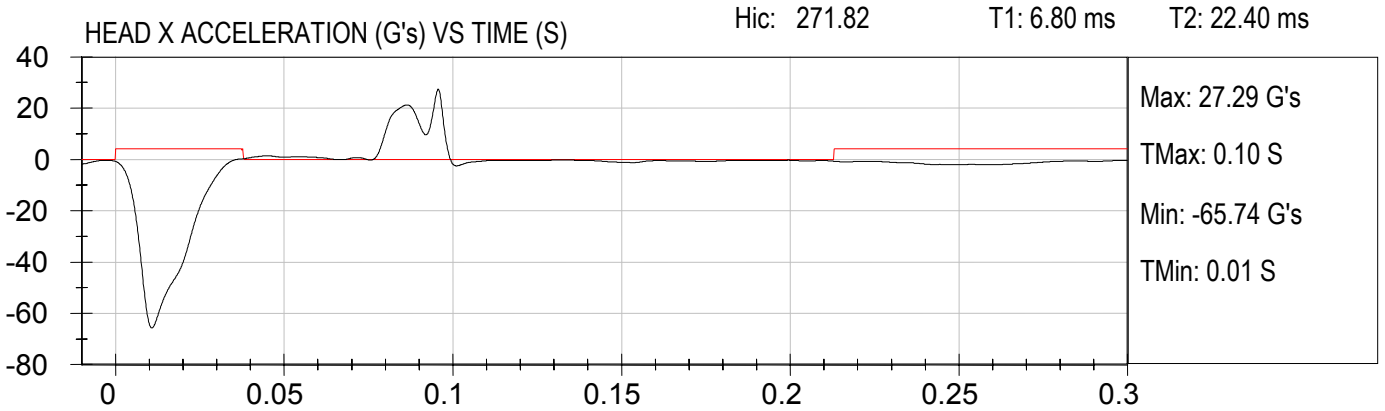


Test Desc: Head Form Impact (6.69 m/s)

Test Date: 1/8/2007

Component ID: CORBEIL Bulkhead, Location H14

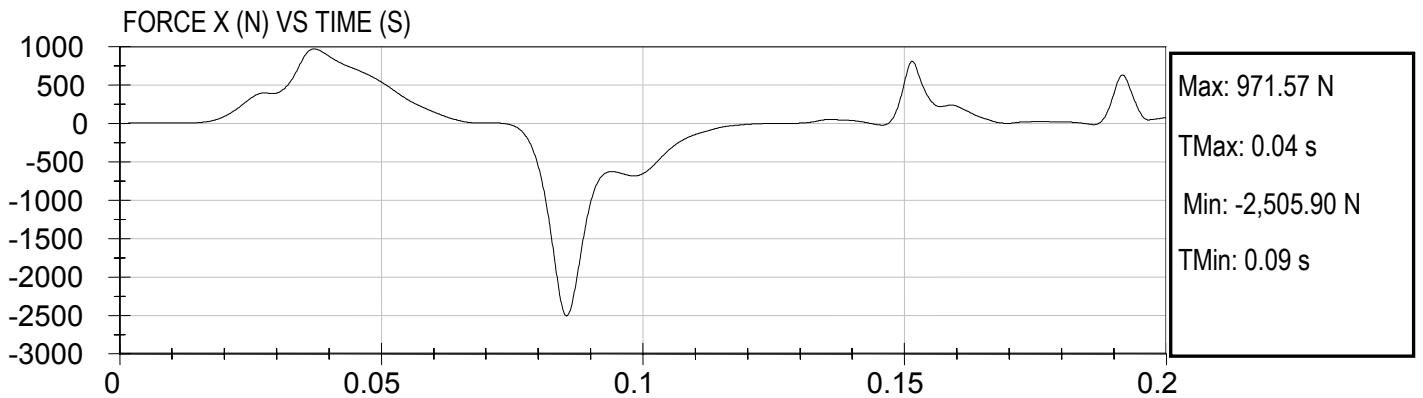
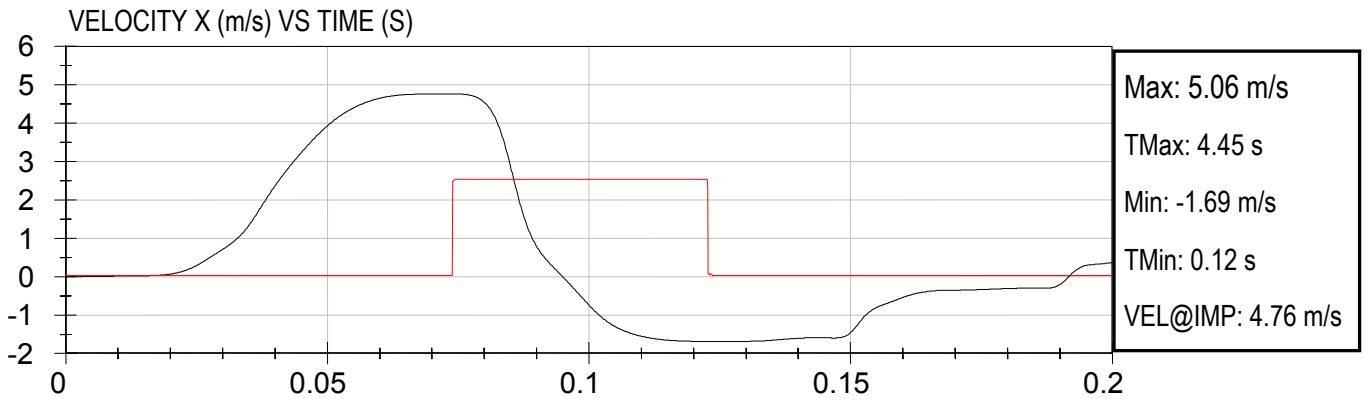
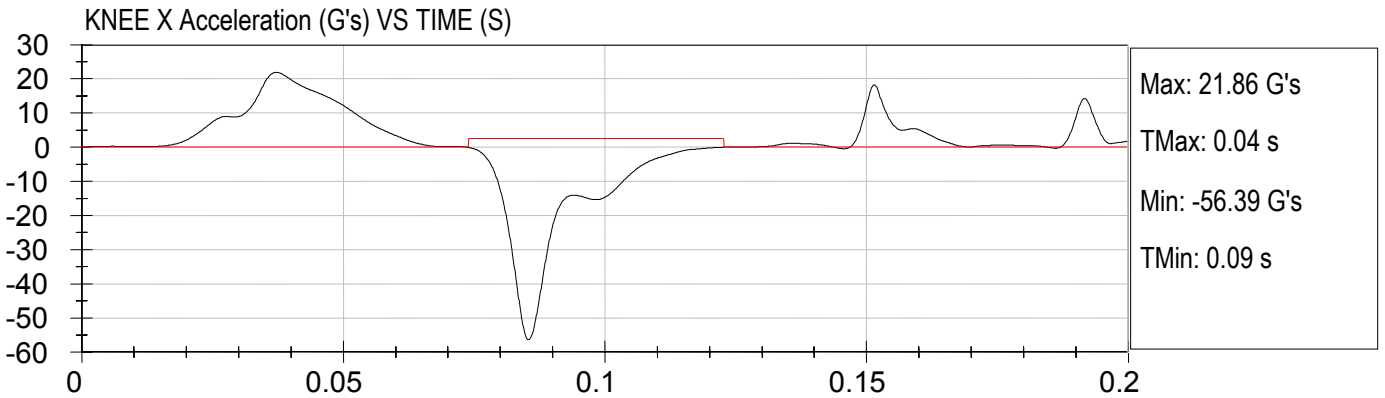
NHTSA#: C60902





Test Desc: Knee Form Impact  
Component ID: CORBEIL S9, Location K1

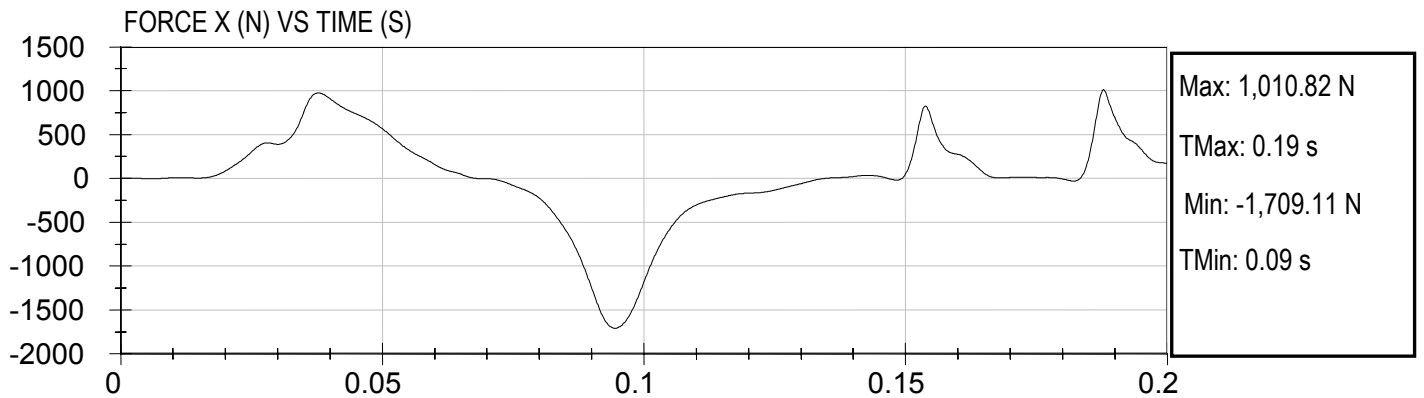
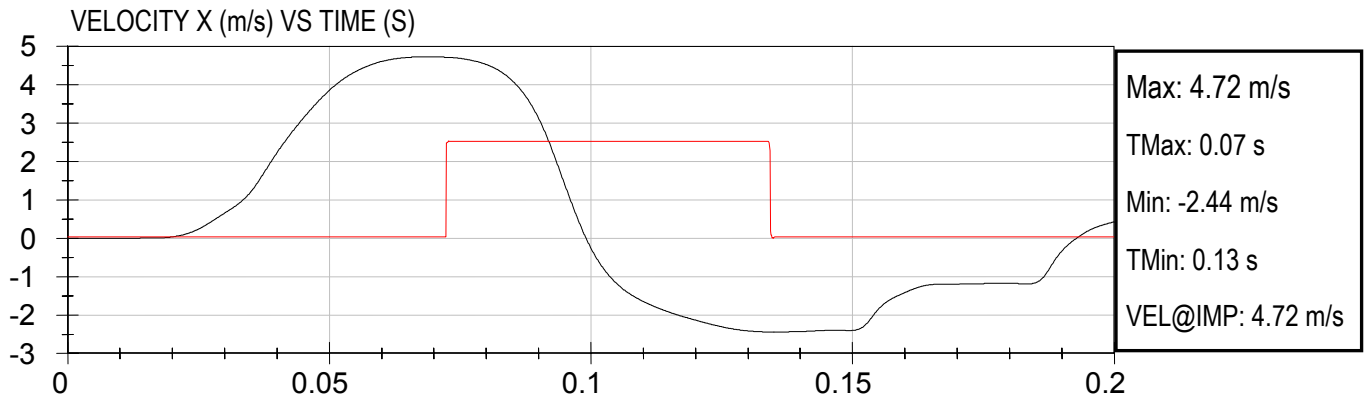
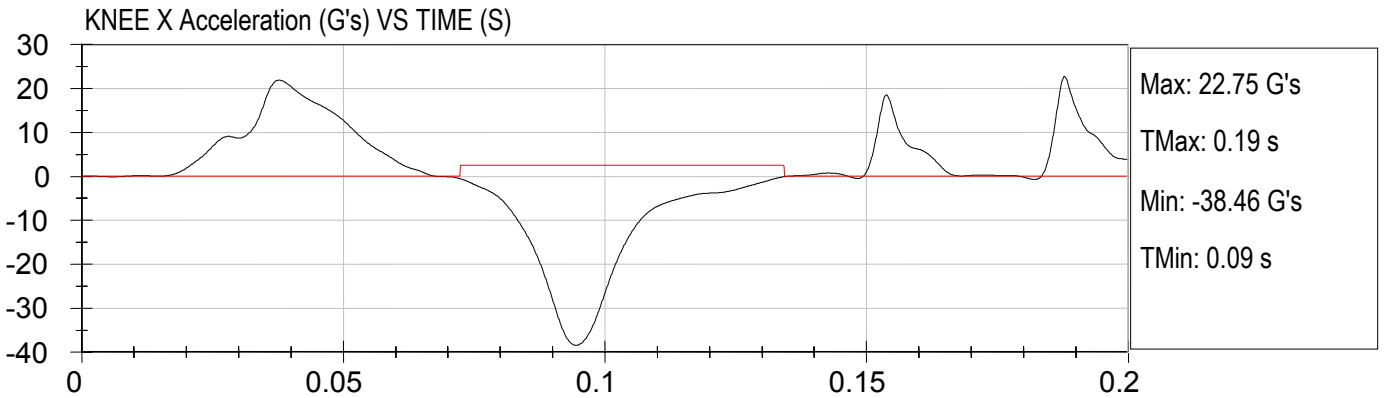
Test Date: 1/8/2007  
NHTSA #: C60902





Test Desc: Knee Form Impact  
Component ID: CORBEIL S9, Location K2

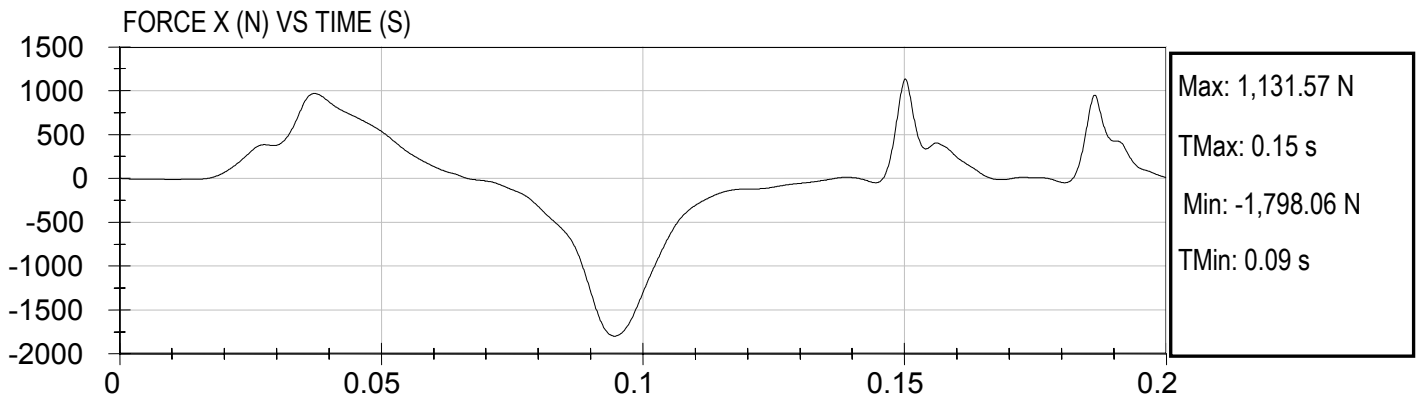
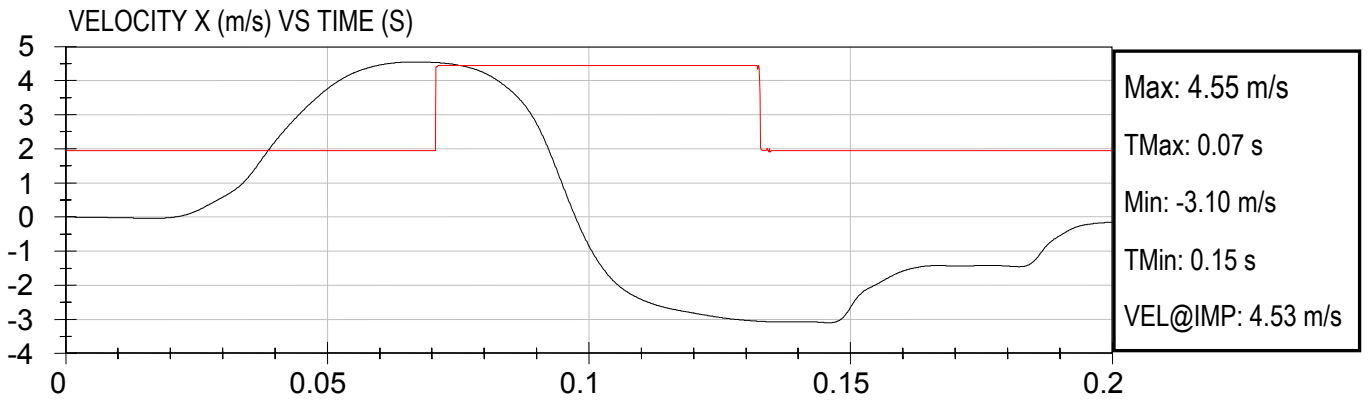
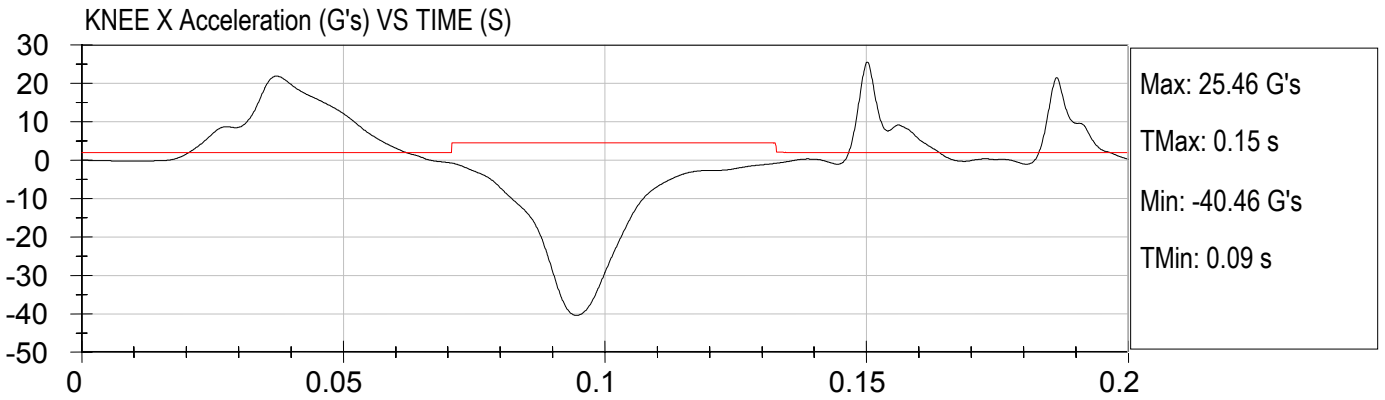
Test Date: 1/8/2007  
NHTSA #: C60902





Test Desc: Knee Form Impact  
Component ID: CORBEIL S9, Location K3

Test Date: 1/8/2007  
NHTSA #: C60902

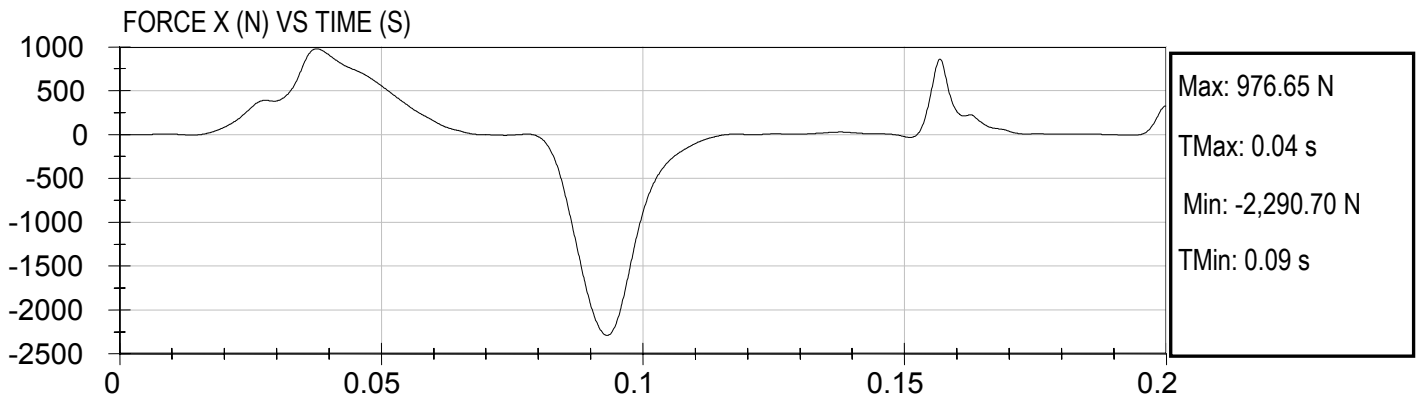
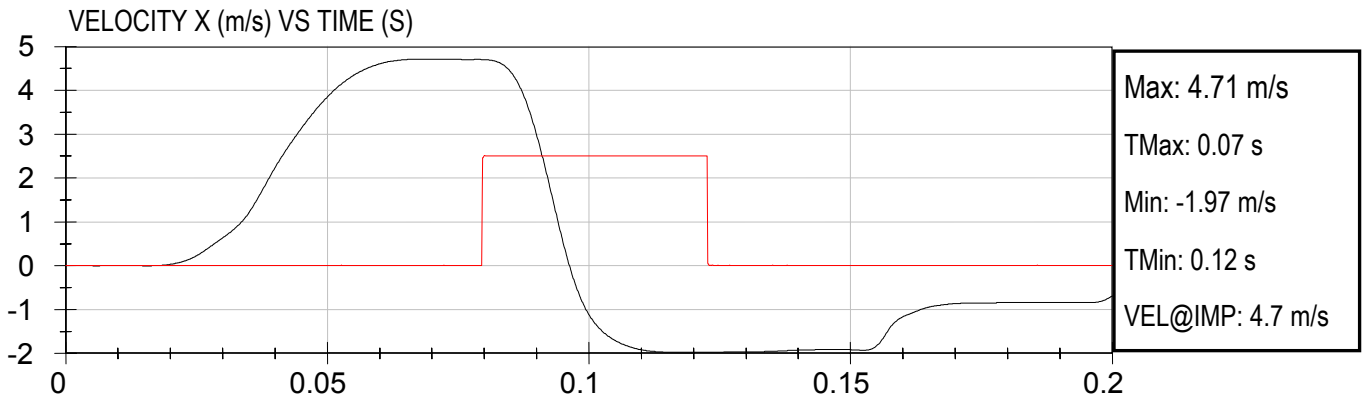
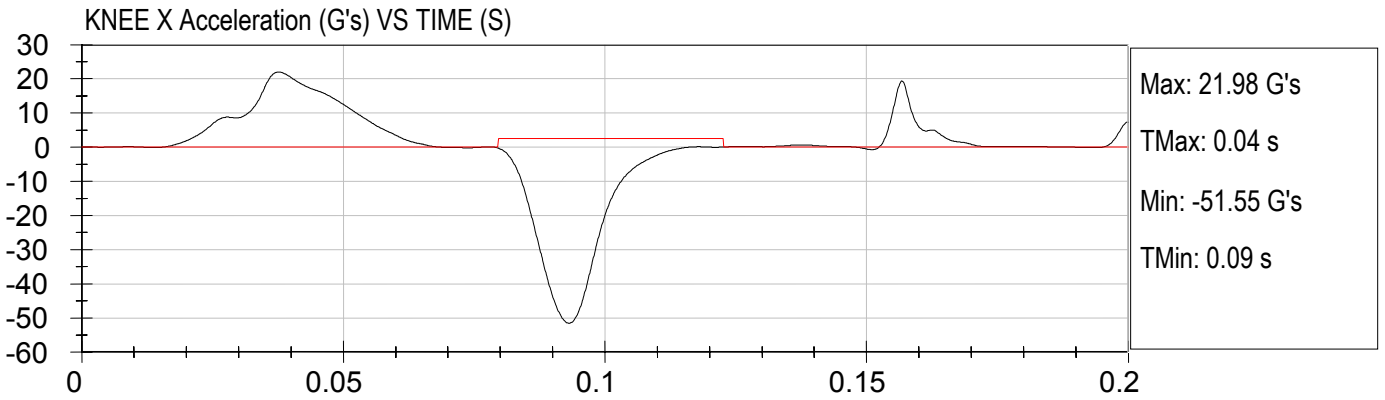






Test Desc: Knee Form Impact  
Component ID: CORBEIL S9, Location K4

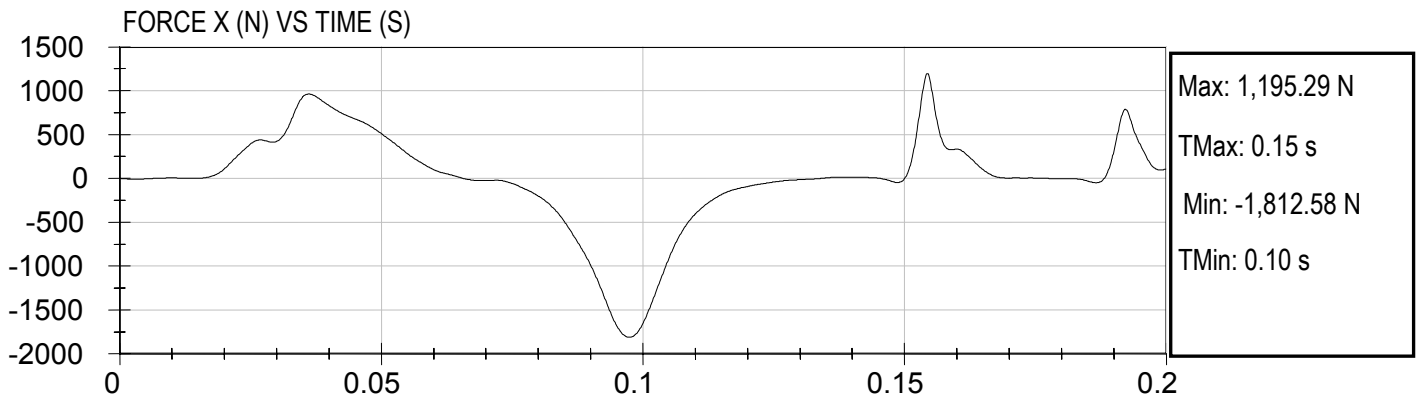
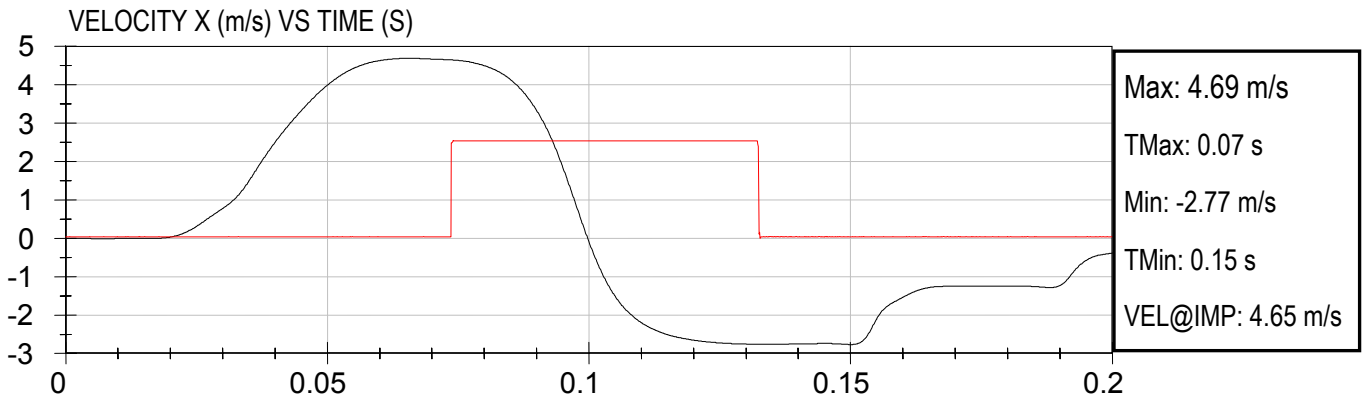
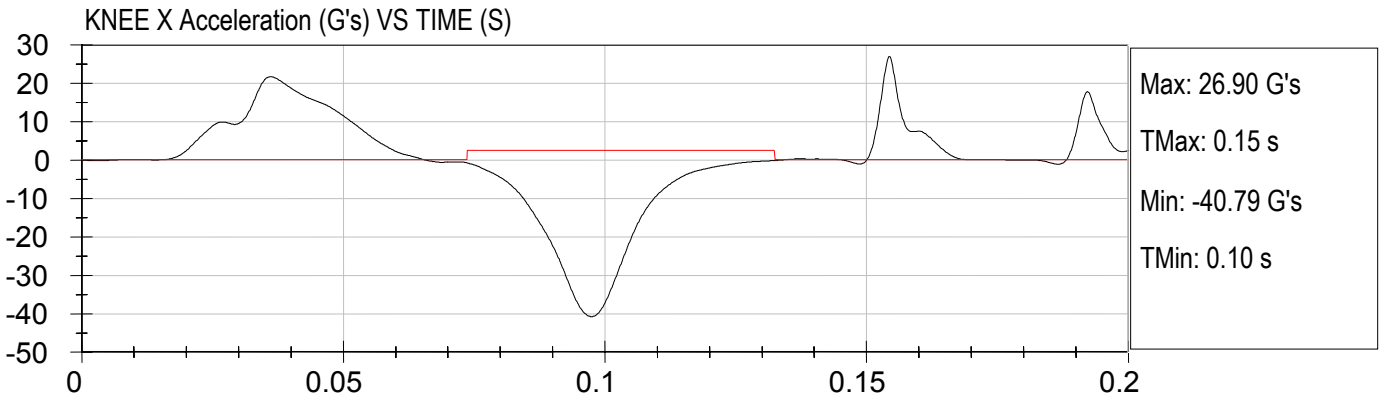
Test Date: 1/8/2007  
NHTSA #: C60902





Test Desc: Knee Form Impact  
Component ID: CORBEIL S9, Location K5

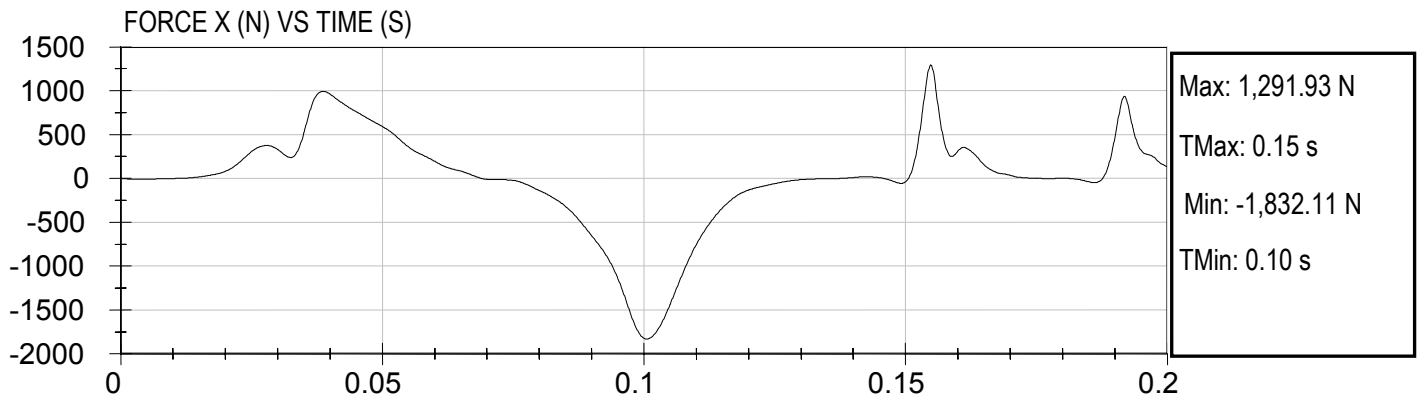
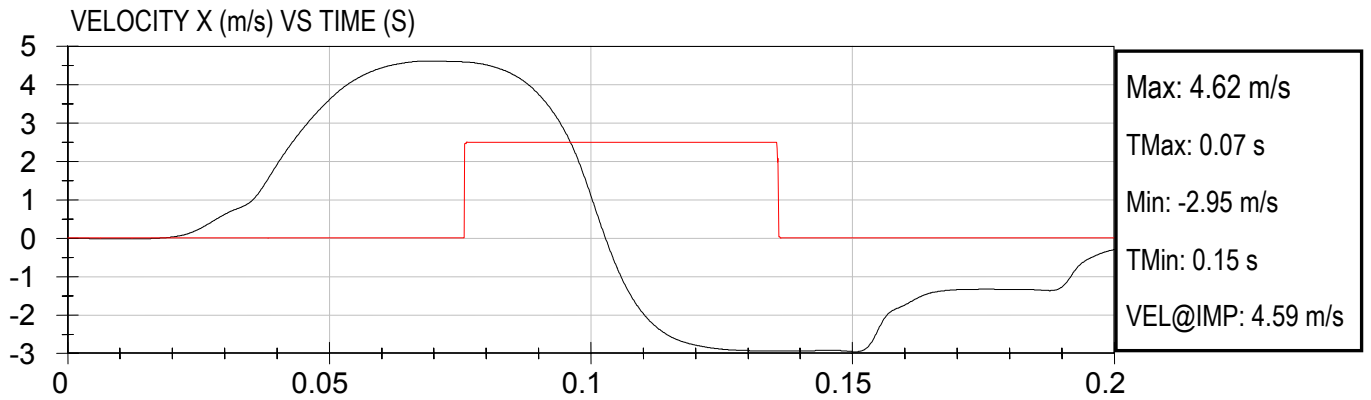
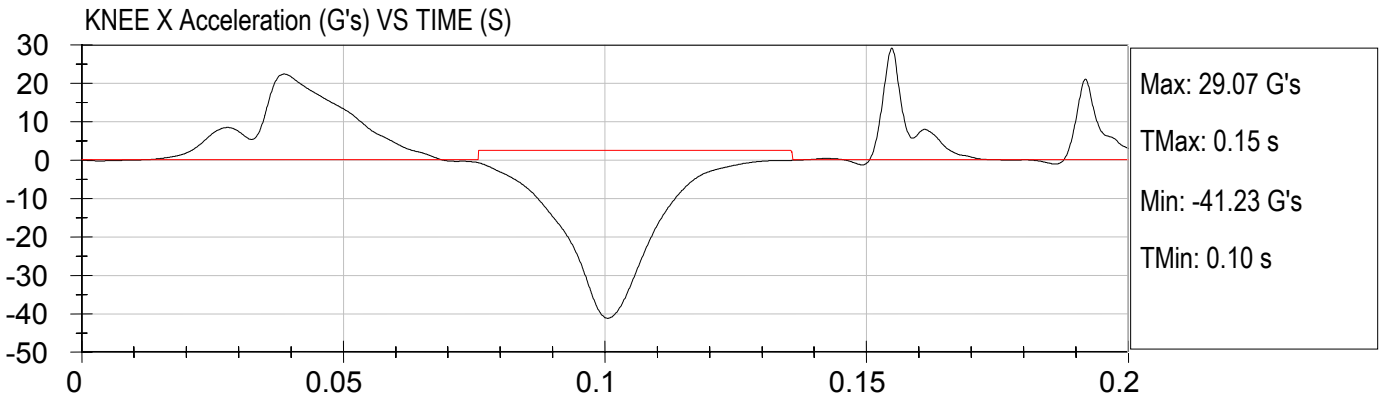
Test Date: 1/8/2007  
NHTSA #: C60902





Test Desc: Knee Form Impact  
Component ID: CORBEIL S9, Location K6

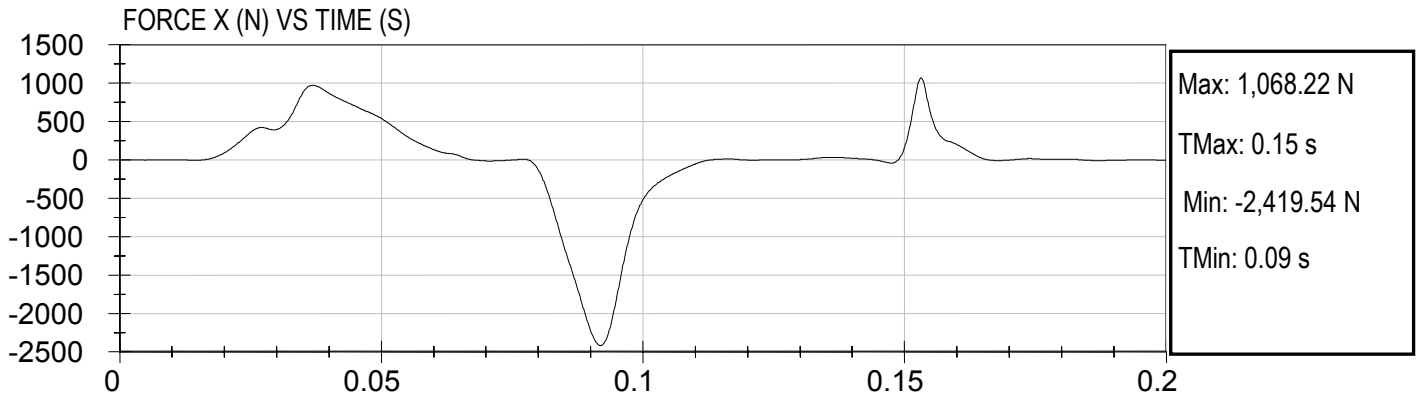
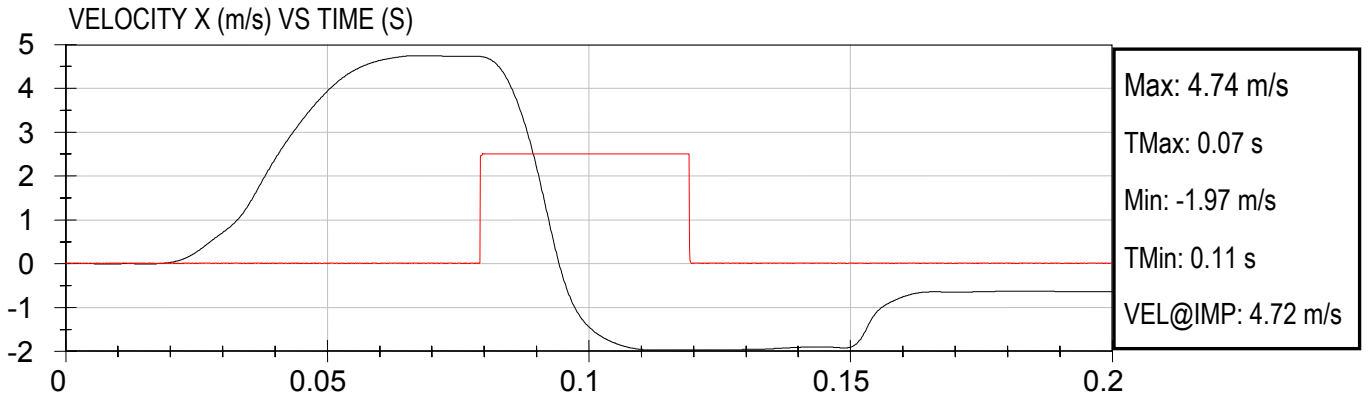
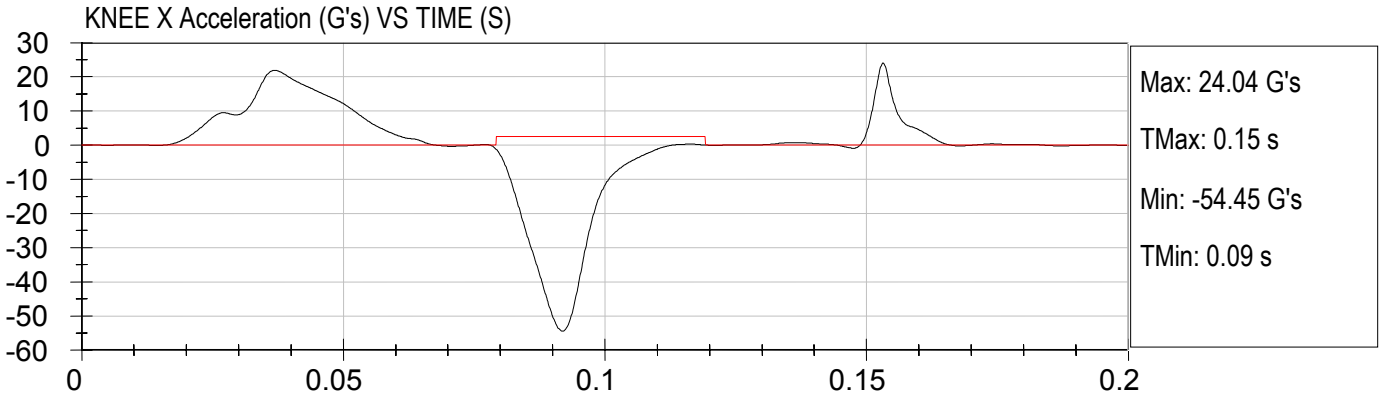
Test Date: 1/8/2007  
NHTSA #: C60902





Test Desc: Knee Form Impact  
Component ID: CORBEIL S9, Location K7

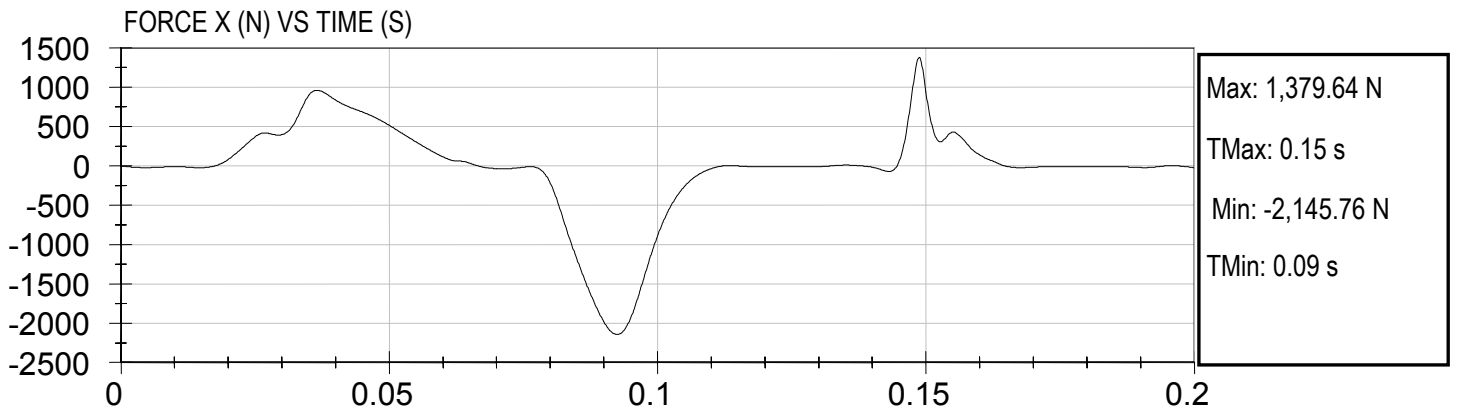
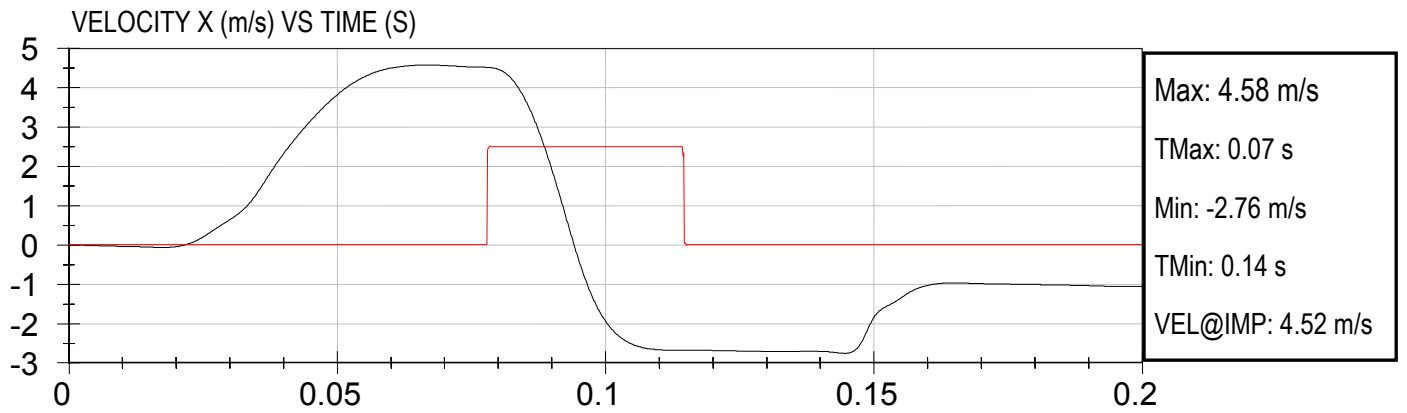
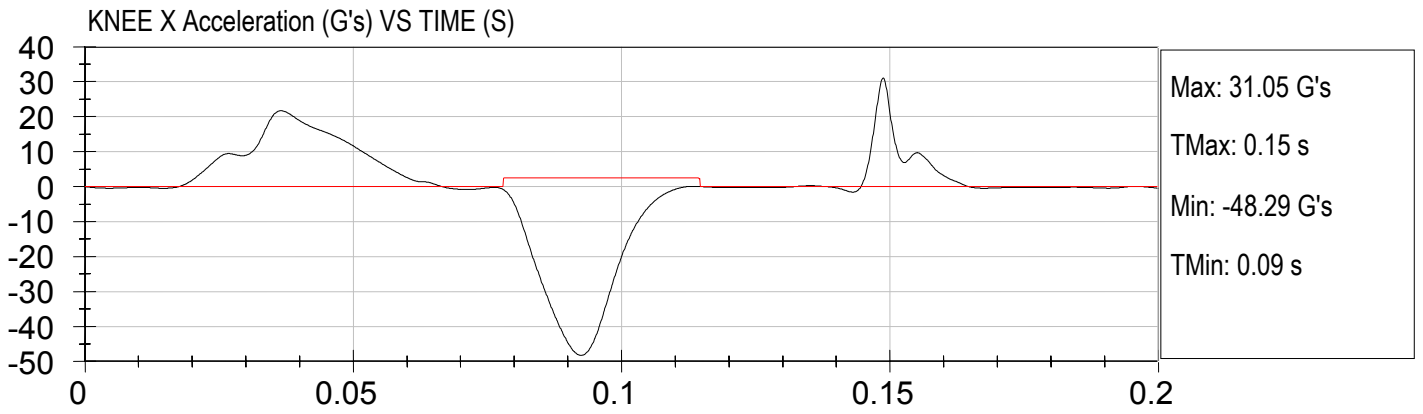
Test Date: 1/8/2007  
NHTSA #: C60902





Test Desc: Knee Form Impact  
Component ID: CORBEIL S9, Location K8

Test Date: 1/8/2007  
NHTSA #: C60902





**SECTION 8**  
**WELT CONTACT POINTS**

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
Test Date: **1/8/2007**

**H1 / SEAT S9**



**H1 CORBEIL 50.1 cm<sup>2</sup>**

**SECTION 8 (CONTINUED)**  
**WELT CONTACT POINTS**

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
Test Date: **1/8/2007**

**H2 / SEAT S9**



**H2 CORBEIL 52.6 cm<sup>2</sup>**

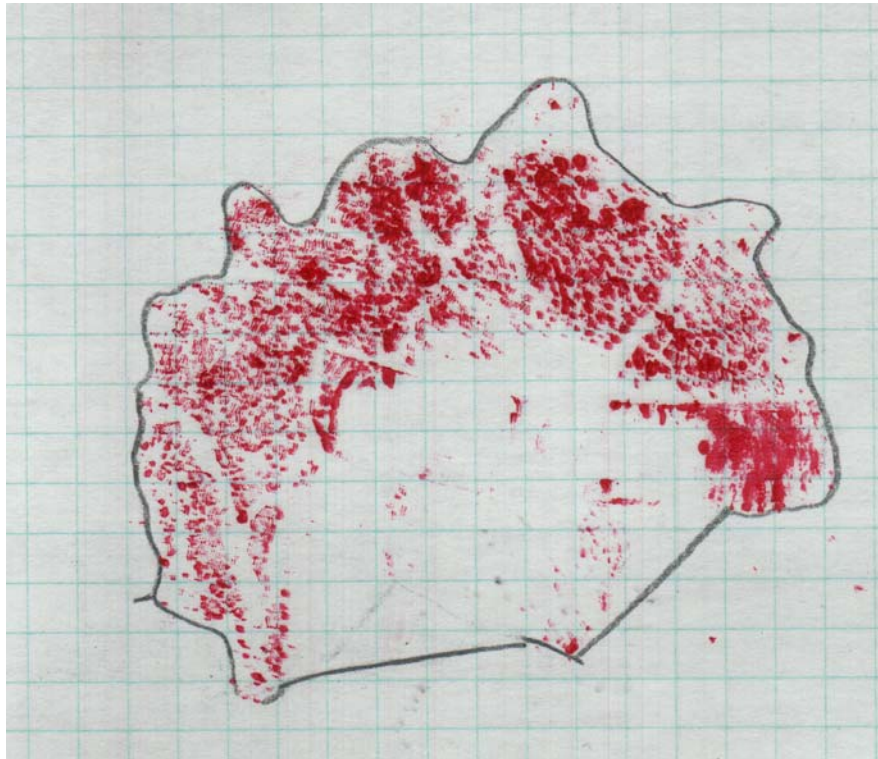
**SECTION 8 (CONTINUED)**

**WELT CONTACT POINTS**

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
Test Date: **1/8/2007**

**H3 / SEAT S9**



**H3 CORBEIL 46.6 cm<sup>2</sup>**

**SECTION 8 (CONTINUED)**  
**WELT CONTACT POINTS**

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
Test Date: **1/8/2007**

**H4 / SEAT S9**



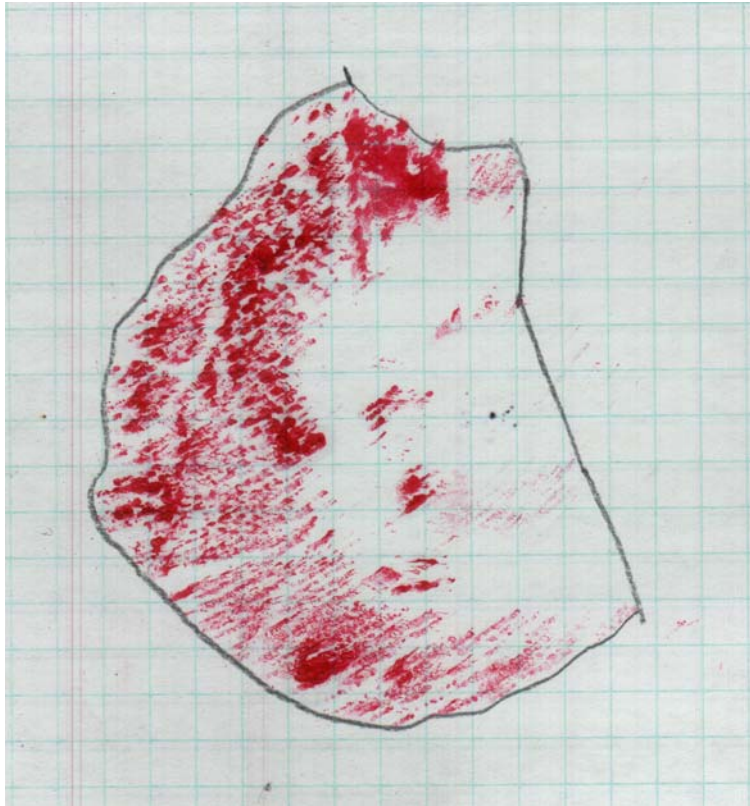
**H4 CORBEIL 44.9 cm<sup>2</sup>**

**SECTION 8 (CONTINUED)**  
**WELT CONTACT POINTS**

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
Test Date: **1/8/2007**

**H5 / SEAT S9**



**H5 CORBEIL 44.0 cm<sup>2</sup>**

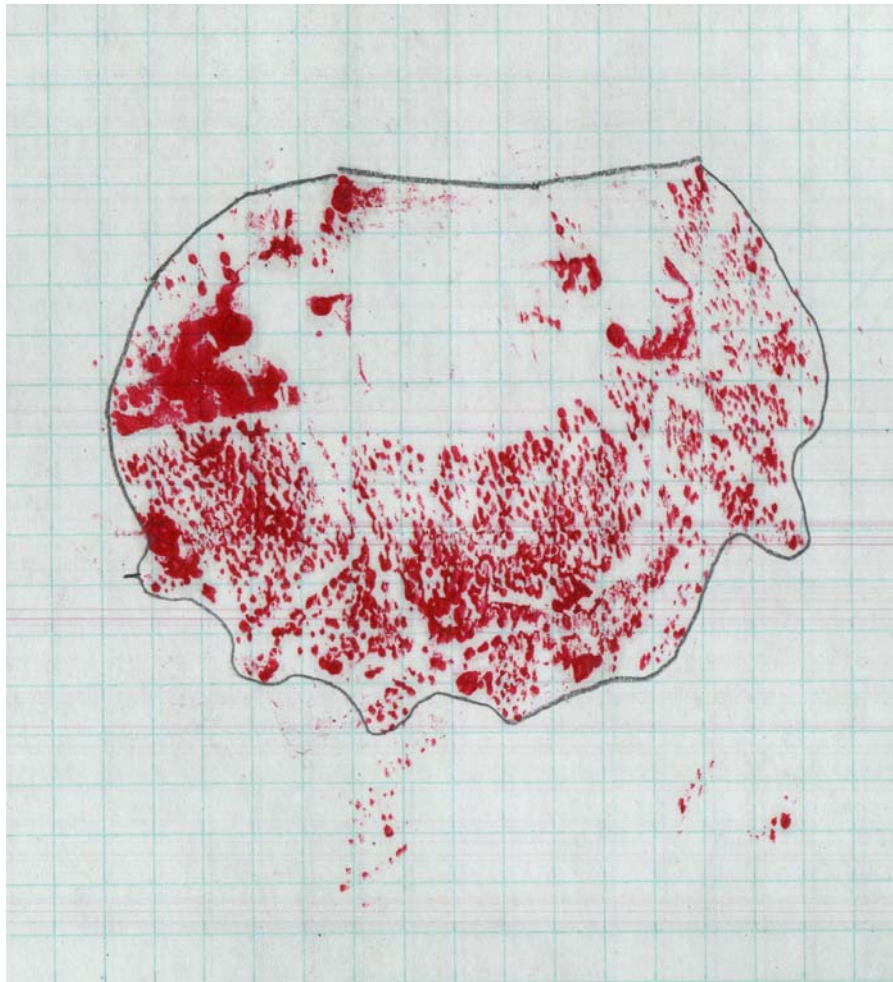


**SECTION 8 (CONTINUED)**  
**WELT CONTACT POINTS**

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
Test Date: **1/8/2007**

**H6 / SEAT S9**



**H6 CORBEIL 49.7 cm<sup>2</sup>**

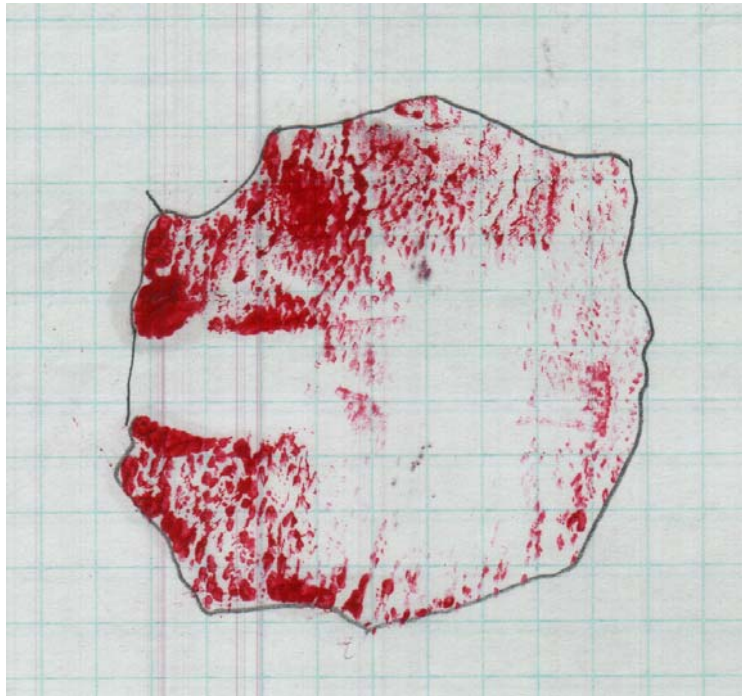


**SECTION 8 (CONTINUED)**  
**WELT CONTACT POINTS**

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
Test Date: **1/8/2007**

**K1 / SEAT S9**



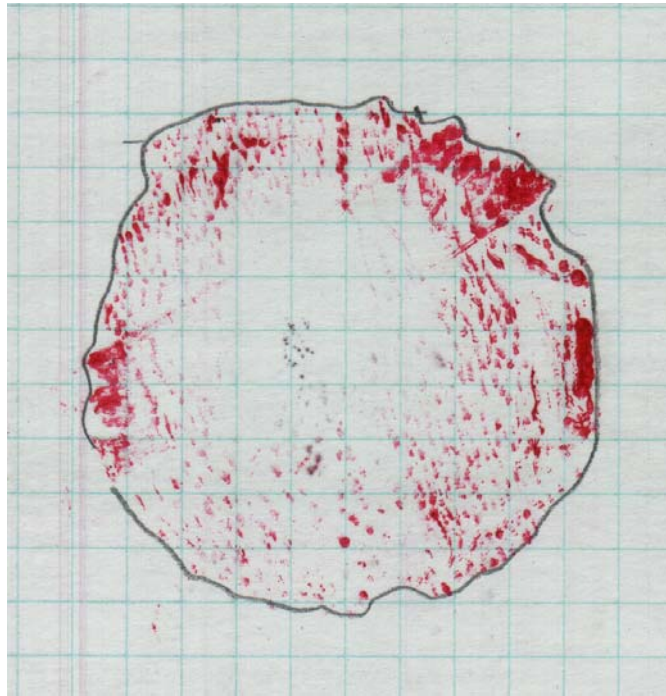
**K1 CORBEIL 29.1 cm<sup>2</sup>**

**SECTION 8 (CONTINUED)**  
**WELT CONTACT POINTS**

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
Test Date: **1/8/2007**

**K2 / SEAT S9**



**K2 CORBEIL 28.6 cm<sup>2</sup>**

**SECTION 8 (CONTINUED)**  
**WELT CONTACT POINTS**

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
Test Date: **1/8/2007**

**K3 / SEAT S9**



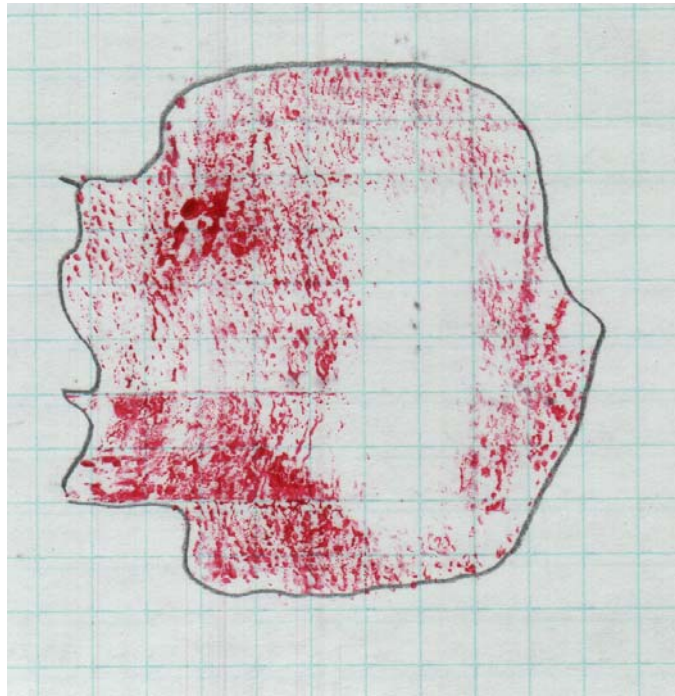
**K3 CORBEIL 27.9 cm<sup>2</sup>**

**SECTION 8 (CONTINUED)**  
**WELT CONTACT POINTS**

Test Vehicle: **2006 CORBEIL SCHOOL BUS**  
Test Lab: **MGA RESEARCH CORPORATION**

NHTSA No.: **C60902**  
Test Date: **1/8/2007**

**K4 / SEAT S9**



**K4 CORBEIL 30.3 cm<sup>2</sup>**

**SECTION 9  
BUS FLOOR PLAN**

