REPORT NUMBER: 222-MGA-2007-001

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

MID BUS INC.
2006 MID BUS GUIDE DW SCHOOL BUS
NHTSA No.: C60901

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

Final Report Date: April 9, 2007

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
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Technical Report Documentation Page

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15. Supplementary Notes			
16. Abstract Compliance tests were conducted on the subject 2006 Mid Bus Guide DW School Bus, NHTSA No. C60901, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-222-03 for the determination of FMVSS 222 compliance. Test Failure: See Section 2, Test Data Summary.			
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SECTION 1
PURPOSE OF COMPLIANCE TEST

Tests were conducted on a 2006 Mid Bus Guide DW School Bus, NHTSA No. C60901, 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 January through March 2007. All tests were conducted by MGA Research Corporation at the Wisconsin Operations. The test vehicle, 2006 Mid Bus Guide DW School Bus, NHTSA No. C60901, did not appear to meet all the requirements of FMVSS 222. The test failure is listed below.

Failure 1

FMVSS Requirement: Paragraph S5.2.3(a*): "The restraining barrier force/deflection curve shall fall within the zone specified in Figure 1."*

The forward deflection of the left side retraining barrier exceeded the maximum allowable force of 10,675 N before absorbing 1,356 Joules of energy. The energy absorbed was 1,239 Joules. When the force vs. deflection data was plotted, it fell out of the specified corridor listed in 49 CFR 571.222 Figure 1. The test was stopped at 295 mm to avoid equipment damage.

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. 2 and 7 were measured in accordance with Section 12.1 of OVSC TP-222-03. As shown in Data Sheet 2 for Seat Nos. 2 and 7, the seat back area is greater than ninety percent of the seat bench width multiplied by 508.

Restraining barriers positions and projected rear surface areas of Barrier Nos. 1 and 9 were measured in accordance with OVSC TP-222-03. As shown in Data Sheet 6 for Barrier Nos. 1 and 9, the projected perimeters of the seats fall completely within the perimeters of the restraining barriers.

SECTION 2 (CONTINUED)

TEST DATA SUMMARY

SEAT CUSHION RETENTION

Seat Nos. 4 and 5 were tested in accordance with Section 12.3 of OVSC TP-222-03. Seat cushion weight was 3.4 kg for both S4 and S5. The maximum force reached for S4 and S5 was 172.0 N. For S4, the lower time limit boundary (t1) was approximately 2.0 seconds with an approximate load duration of 5.5 seconds. For S5, the lower time limit boundary (t1) was approximately 1.5 seconds with an approximate load duration of 6 seconds. As shown in Data Sheet 3, the seat cushions tested complied with all requirements.

SEAT BACK FORCE/DEFLECTION TEST - FORWARD

Seat Nos. 7 and 8 were tested in accordance with Section 12.4 of OVSC TP-222-03. Seat bench width was determined to be 1,005 mm for S7 and 998 mm for S8. “W” was calculated to be 3 for S7 and S8. The seating reference point (SRP) was 475 mm above the bus floor. The deflection of the seat back at conclusion of lower loading bar loading at 1557 W N load was 68.2 mm for S7 and 67.7 mm for S8. The allowable maximum deflection without moving the seat back to within 102 mm of another seat or restraining barrier 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 1,356 joules for S7 and 1,356 joules for S8. As shown on Data Sheet No. 4, Seat Nos. 7 and 8 met the force deflection forward requirements. See Plots 3, 4, 5, and 6.

SEAT BACK FORCE/DEFLECTION TEST - REARWARD

Seat Nos. 3 and 6 were tested in accordance with Section 12.4 of OVSC TP-222-03. Seat bench width was determined to be 994 mm for S3 and 1,000 mm for S6. “W” was calculated to be 3 for S3 and S6. The seating reference point (SRP) was 475 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 14.0 mm/sec for S3 and 2.1 mm/sec for S6. The location of the loading bar was 343 mm above the SRP for both seats. 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 1,469 joules for S3 and 1,346 joules for S6. The minimum required area under the force versus deflection curve of the loading bar was 316 W or 948 joules for S3 and S6. 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 both S3 and S6. See Plots 7 and 8.

RESTRAINING BARRIER FORCE/DEFLECTION TEST - FORWARD

Both front restraining barriers (B1, and B9) were tested in accordance with Section 12.4 of OVSC TP-222-03. Seat bench width of the aft seats was determined to be 1,003 mm for B1 and 1,008 for B9. “W” was calculated to be 3 for B1 and B9. The SRP was 475 mm above the bus floor. The deflection of the restraining barrier at the conclusion of the lower loading bar loading at 1557W was 84.3 mm for B1 and 96.8 mm for B9. The allowable maximum deflection without moving the restraining barriers to within interference of a seat or door was 356 mm. The stroke rate of the upper loading bar was determined by the test engineer from test data 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 load of 10675 N was exceeded for B1 and when the maximum deflection of 356 mm was reached for B9. The area under the force versus deflection curve of the upper loading bar was 1,239 joules for B1 and 1,647 joules for B9. The minimum required area under the force versus deflection curve of the upper loading bar was 452 W or 1,356 joules for B1 and 1,356 joules for B9. As shown in Data Sheet 7, the tested area under the force versus deflection curves for the upper loading bar on B1 does not comply with the requirements for the area under the force versus deflection curve. As shown in Data Sheet 7 the force vs. deflection trace for B9 does fall within the limits specified in Figure 1 of FMVSS 222.

SECTION 2 (CONTINUED)
TEST DATA SUMMARY

KNEE FORM IMPACT ZONE TESTS

Seat No. S2 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. S2 was 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.

ADMINISTRATIVE DATA SHEET

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS** NHTSA No.: **C60901**
Test Lab: **MGA RESEARCH CORPORATION** Test Date: **10/07/06**

INCOMPLETE VEHICLE (IF APPLICABLE)

Manufacturer:	CHEVROLET MOTOR DIVISION
Model:	CSD-7450-C-063336
VIN:	1GBJG31U461237309
Build Date:	4/06
Certification Date:	

COMPLETED VEHICLE (SCHOOL BUS)

Manufacturer:	MID BUS INC.
Make/Model:	CHEVROLET / MID BUS GUIDE
VIN:	1GBJG31U461237309
NHTSA No.:	C60901
Color:	Yellow
GVWR:	5,579 kg / 12,300 lbs
Build Date:	9/06
Certification Date:	4/06

DATES

Vehicle Receipt:	10/06/2006
Start of Compliance Test:	1/15/2007
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: 10/07/2006

GENERAL TEST DATA SHEET

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Test Lab:	**MGA RESEARCH CORPORATION**	Test Date:	**1/15/2007**

SCHOOL BUS IDENTIFICATION

Model Year/Mfr./Make/Model:	2006/MID BUS/GUIDE/DW
Passenger Capacity:	(1 Driver, 27 Passengers)
NHTSA No.:	C60901
VIN:	1GBJG31U461237309
Conventional or Forward Control:	Conventional
GVWR (Certification Label) FRONT:	1, 951 kg / 4,300 lbs
GVWR (Certification Label) REAR:	3,901 kg / 8,600 lbs
GVWR (Certification Label) TOTAL:	5,579 kg / 12,300 lbs

TEST CONDITIONS

Date(s) of Test:	1/15/2007 – 3/14/2007
Ambient Temperature (°C):	21
Required Temperature Range:	0°C to 32°C

SEAT IDENTIFICATION

Seat Manufacturer:	MID BUS INC.
Model Name & Number:	
Description of Seats:	Seat frames are constructed of 25.4 mm square welded tubing. The seat back has a 0.75 mm steel pan welded to the tubing and is covered with 20 mm foam on the front surface, 30 mm foam over 45 mm Styrofoam on the rear surface. The 45 mm Styrofoam is also covered by 10 mm foam in the knee impact areas. The seat cushion is constructed of 12mm plywood with 120 mm tapering to 75 mm poly foam pad. The seat back and seat cushion are wrapped with 0.6 mm vinyl.

SECTION 3
COMPLIANCE TEST DATA

The following data sheets document the results of testing on the 2006 Mid Bus Guide DW School Bus, NHTSA No. C60901.

DATA SHEET 1

SEAT TO SEAT/BARRIER SPACING

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS** NHTSA No.: **C60901**
Test Lab: **MGA RESEARCH CORPORATION** Test Date: **1/15/2007**

SEAT NUMBER	MEASUREMENT OF SPACING FROM SRP FORWARD TO SEAT/BARIER (mm)	REQMT ≤ 610 MM (≤ 24") CLASS 1 BUSES ONLY PASS/FAIL
1	**467**	**PASS**
2	**573**	**PASS**
3	**565**	**PASS**
4	**570**	**PASS**
5	**475**	**PASS**
6	**450**	**PASS**
7	**465**	**PASS**
8	**473**	**PASS**
9	**443**	**PASS**

COMMENTS: NONE

Recorded By:_____

Approved By: Michael Janosz DATE: 1/15/2007

DATA SHEET 2

SEAT BACK HEIGHT & FRONT SURFACE AREA TEST

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Test Lab:	**MGA RESEARCH CORPORATION**	Test Date:	**1/15/2007**

SEAT NUMBER: S2

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

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 = 817 mm; width, b = 985 mm

   Height, c = 155 mm; height, d = 353 mm

   Area = ½ (a+b) x d + (c x b) = 470,728 mm^2

3. Measure the seat cushion width - W1 = 1,010 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 x W1 x 508 mm = 461,772 mm^2

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

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: The measurement method was modified as shown above to accommodate the shape of this particular seat back shape.

Recorded By:_____

Approved By: Michael Janosz DATE: 1/15/2007

DATA SHEET 2 (CONTINUED)

SEAT BACK HEIGHT & FRONT SURFACE AREA TEST

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Test Lab:	**MGA RESEARCH CORPORATION**	Test Date:	**1/15/2007**

SEAT NUMBER: S7

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

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 = 810 mm; width, b = 995 mm

   Height, c = 160 mm; height, d = 348 mm

   Area = ½ (a+b) x d + (c x b) = 473,270 mm^2

3. Measure the seat cushion width - W1 = 1,005 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 x W1 x 508 mm = 459,486 mm^2

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

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: The measurement method was modified as shown above to accommodate the shape of this particular seat back shape.

Recorded By:_____

Approved By:_____ DATE: 1/15/2007

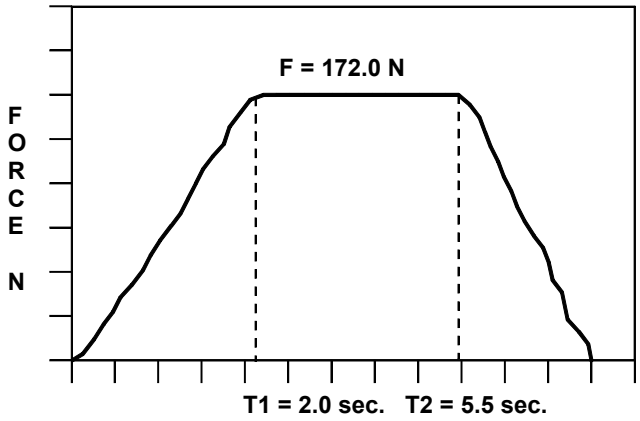
DATA SHEET 3

SEAT CUSHION RETENTION TEST

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Test Lab:	**MGA RESEARCH CORPORATION**	Test Date:	**1/16/2007**

SEAT NUMBER: S4

1. Cushion Weight/Mass = 3.4 kg
2. Cushion Weight x 5 = F = 167.0 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)	**PASS**

DESCRIBE SEAT CUSHION ATTACHMENTS: 2 half shell clamps on front of seat and 2 pivoting latch on rear.

Comments: None

Recorded By:_____

Approved By:_____ DATE: 1/16/2007

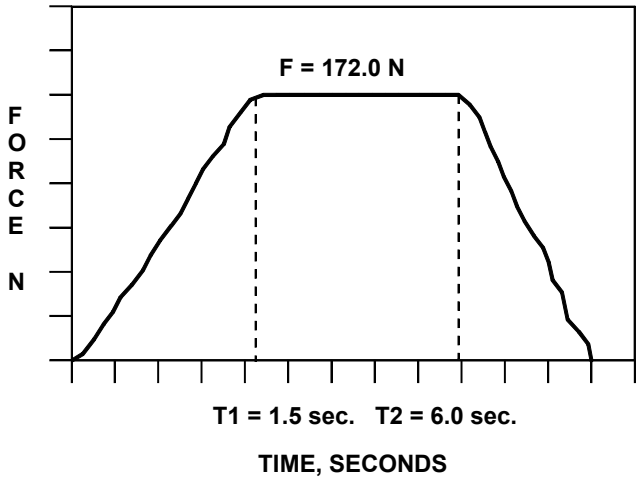
DATA SHEET 3 (CONTINUED)

SEAT CUSHION RETENTION TEST

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Test Lab:	**MGA RESEARCH CORPORATION**	Test Date:	**1/16/2007**

SEAT NUMBER: S5

1. Cushion Weight/Mass = 3.4 kg
2. Cushion Weight x 5 = F = 167.0 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)	**PASS**

DESCRIBE SEAT CUSHION ATTACHMENTS: 2 half shell clamps on front of seat and 2 pivoting latch on rear.

Comments: None

Recorded By:_____

Approved By:_____ DATE: 1/16/2007

DATA SHEET 4

SEAT BACK FORCE DEFLECTION TEST - FORWARD

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Test Lab:	**MGA RESEARCH CORPORATION**	Test Date:	**2/19/2007**

SEAT NUMBER: S7

1. Seat Bench Width = 1,005 mm
   W = (Seat Bench Width)/381 mm (round to nearest whole number) = (3)
   Seat Reference Point (SRP) location is: (Description of location as supplied by the COTR): 475 mm Above Floor, 135 mm forward from the front of seat back.
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 = 900 mm
   Seat Back width at SRP = 1,000 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) = 68.2 mm, at start of upper bar loading 68.2 mm, at end of upper bar loading 68.2 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 of 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 = 800 mm. Width of seat back at 406 mm above SRP = 900 mm.
8. Reason for stopping seat back deflection:
   ___ Reached deflection determined in Item 6 above (if less than 356 mm)
   _X_ Reached 356 mm maximum allowed deflection (Actual deflection was 361 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?	**PASS**

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

12. Include a deflection vs. time plot for the upper loading bar.
13. The area within the force vs. deflection curve = 1,810 joules
14. 452W = 1,356 joules (S5.1.3.4)

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

Comments: None

Recorded By:_____

Approved By:_____ DATE: 2/19/2007

DATA SHEET 4 (CONTINUED)

SEAT BACK FORCE DEFLECTION TEST - FORWARD

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Test Lab:	**MGA RESEARCH CORPORATION**	Test Date:	**2/19/2007**

SEAT NUMBER: S8

1. Seat Bench Width = 998 mm
   W = (Seat Bench Width)/381 mm (round to nearest whole number) = (3)
   Seat Reference Point (SRP) location is: (Description of location as supplied by the COTR: 475 mm Above Floor, 135 mm forward from the front of seat back.
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 = 900 mm
   Seat Back width at SRP = 1,000 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) = 67.7 mm, at start of upper bar loading 67.7 mm, at end of upper bar loading 67.7 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 of 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 = 800 mm. Width of seat back at 406 mm above SRP = 904 mm.
8. Reason for stopping seat back deflection:
   ___ Reached deflection determined in Item 6 above (if less than 356 mm)
   _X_ Reached 356 mm maximum allowed deflection (Actual deflection was 361 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 MID BUS GUIDE DW SCHOOL BUS** NHTSA No.: **C60901**
Test Lab: **MGA RESEARCH CORPORATION** Test Date: **2/19/2007**

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

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

12. Include a deflection vs. time plot for the upper loading bar.
13. The area within the force vs. deflection curve = 2,270 joules
14. 452W = 1,356 joules (S5.1.3.4)

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

Comments: None

Recorded By:_____

Approved By:_____ DATE: 2/19/2007

DATA SHEET 5

SEAT BACK FORCE DEFLECTION TEST – REARWARD

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Test Lab:	**MGA RESEARCH CORPORATION**	Test Date:	**2/22/2007**

SEAT NUMBER: S3

1. Seat Bench Width = 994 mm
   W = (Seat Bench Width)/381 mm (round to nearest whole number) = (3)
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 = 835 mm
   Width of seat back at 343 mm above SRP = 935 mm
3. Deflection of seat back at 222 N preload = 15 mm
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 = 14.0 mm/sec
6. Reason for stopping deflection:
   ___ Reached deflection determined in Item 4 above (if less than 254 mm)
   _X_ Reached 254 mm maximum allowed deflection (Actual deflection was 257 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.

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

9. Include a deflection vs. time plot for the upper loading bar.
10. 316W = 948 joules
11. The area within the force vs. deflection curve = 1,469 joules

DATA SHEET 5 (CONTINUED)

SEAT BACK FORCE DEFLECTION TEST – REARWARD

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS** NHTSA No.: **C60901**
Test Lab: **MGA RESEARCH CORPORATION** Test Date: **2/22/2007**

		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: 2/22/07

DATA SHEET 5 (CONTINUED)

SEAT BACK FORCE DEFLECTION TEST – REARWARD

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Test Lab:	**MGA RESEARCH CORPORATION**	Test Date:	**2/20/2007**

SEAT NUMBER: S6

1. Seat Bench Width = 1,000 mm
   W = (Seat Bench Width)/381 mm (round to nearest whole number) = (3)
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 = 830 mm
   Width of seat back at 343 mm above SRP = 930 mm
3. Deflection of seat back at 222 N preload = 12 mm
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 = 2.1 mm/sec
6. Reason for stopping deflection:
   ___ Reached deflection determined in Item 4 above (if less than 254 mm)
   _X_ Reached 254 mm maximum allowed deflection (Actual deflection was 257 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.

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

9. Include a deflection vs. time plot for the upper loading bar.
10. 316W = 948 joules
11. The area within the force vs. deflection curve = 1,346 joules

DATA SHEET 5 (CONTINUED)

SEAT BACK FORCE DEFLECTION TEST – REARWARD

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS** NHTSA No.: **C60901**
Test Lab: **MGA RESEARCH CORPORATION** Test Date: **2/20/2007**

		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: 2/20/2007

DATA SHEET 6

RESTRAINING BARRIER POSITION AND PROJECTED REAR SURFACE AREA

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Test Lab:	**MGA RESEARCH CORPORATION**	Test Date:	**2/20/2007**

SEAT NUMBER: B1

1. Measure distance T from SRP of seat immediately aft of barrier in a horizontal longitudinal line forward to barrier. T= 467 mm.

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

3. Measure distance D at top (t) and bottom (b) of barrier.

   D_t = 78 mm D_b = 0 mm

4. Measure distance C at top (t) and bottom (b) of barrier.

   C_t = 84 mm C_b = 0 mm

		PASS/FAIL
5.	Is D_t equal to or less than C_t?	**PASS**

		PASS/FAIL
6.	Is D_b equal to or less than C_b?	**PASS**

7. Measure distance E at top of barrier and bottom of barrier.

   E_t = 768 mm E_b = 969 mm

8. Measure distance A at top of seat back and bottom of seat.

   A_t = 751 mm A_b = 969 mm

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

		PASS/FAIL
10.	Is distance $E_b + D_b$ equal to or greater than distance $A_b + C_b$	**PASS**

11. Measure distance U at inboard (i) and outboard (o) side of barrier.

    U_i = 350 mm U_o = 330 mm

12. Measure distance V at inboard (i) and outboard (o) sides of seat.

    V_i = 440 mm V_o = 440 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 = 770 mm S_o = 790 mm

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

    W_i = 630 mm W_o = 630 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 x A) = 565,740 mm^2

20. Compute area (E x S) = 700,050 mm^2

		PASS/FAIL
21.	Is (W x A) equal to or less than (E x S)?	**PASS**

Comments: None

Recorded By:_____

Approved By:_____ DATE: 2/20/2007

DATA SHEET 6 (CONTINUED)

RESTRAINING BARRIER POSITION AND PROJECTED REAR SURFACE AREA

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS** NHTSA No.: **C60901**
Test Lab: **MGA RESEARCH CORPORATION** Test Date: **2/20/2007**

SEAT NUMBER: B9

1. Measure distance T from SRP of seat immediately aft of barrier in a horizontal longitudinal line forward to barrier. T= 443 mm.

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

3. Measure distance D at top (t) and bottom (b) of barrier.
   D_t = 92 mm D_b = 0 mm
4. Measure distance C at top (t) and bottom (b) of barrier.
   C_t = 92 mm C_b = 0 mm

		PASS/FAIL
5.	Is D_t equal to or less than C_t?	**PASS**

		PASS/FAIL
6.	Is D_b equal to or less than C_b?	**PASS**

7. Measure distance E at top of barrier and bottom of barrier.
   E_t = 810 mm E_b = 1,005 mm
8. Measure distance A at top of seat back and bottom of seat.
   A_t = 805 mm A_b = 998 mm

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

		PASS/FAIL
10.	Is distance $E_b + D_b$ equal to or greater than distance $A_b + C_b$	**PASS**

11. Measure distance U at inboard (i) and outboard (o) side of barrier.
    U_i = 355 mm U_o = 360 mm
12. Measure distance V at inboard (i) and outboard (o) sides of seat.
    V_i = 425 mm V_o = 425 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 = 775 mm

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

W_i = 628 mm W_o = 626 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 x A) = 565,241 mm^2

20. Compute area (E x S) = 705,581 mm^2

		PASS/FAIL
21.	Is (W x A) equal to or less than (E x S)?	**PASS**

Comments: None

Recorded By:_____

Approved By: Michael Janosz DATE: 2/20/2007

DATA SHEET 7

RESTRAINING BARRIER FORCE/DEFLECTION TEST

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Test Lab:	**MGA RESEARCH CORPORATION**	Test Date:	**2/22/2007**

BARRIER IDENTIFICATION: B1

1. Seat cushion width of seat immediately rearward of restraining barrier = 1,003 mm
   W = (Seat Cushion Width)/381 mm (round to nearest whole number) = (3)
2. Location of SRP of seat rearward of restraining barrier is: (Description of location as supplied by the manufacturer): 475 mm Above Floor, 135 mm forward from the front of seat back.
3. Location of lower loading bar is 0 mm above/below the SRP.
   (Requirement: between 102 mm above and 102 mm below the SRP) (S5.1.3.1)
   Length of loading bar = 900 mm
   Width of barrier at SRP = 1,000 mm
4. Include the x-y plot of force vs. time for the lower loading bar.
5. Deflection of the barrier at the conclusion of lower bar loading (1557W position) = 84.3 mm.
6. Maximum deflection allowed without moving the restraining barrier to within interference of door operation = 356 mm (must be 356 mm or less).
7. Barrier movement rate selected by the test engineer = 14.4 mm/sec
8. Location of upper loading bar is in a horizontal plane 406 mm above the SRP.
   (Requirement: 406 mm) (S5.1.3.3)
   Length of loading bar = 800 mm
   Width of Barrier at 406 mm above the SRP = 898 mm
9. Reason for stopping restraining barrier deflection:
   ___ Reached 356 mm maximum
   ___ Separation was about to occur
   ___ Interference with door operation
   _X_ Exceeded maximum load of 10675
10. Maximum deflection of barrier back 295 mm.
    (Requirement: maximum allowed is 356 mm) (S5.2.3(b))

DATA SHEET 7 (CONTINUED)

RESTRAINING BARRIER FORCE/DEFLECTION TEST

		PASS/FAIL
11.	Does the restraining barrier interfere with the normal operation of the door. (S5.2.3 (c))	**PASS**

		PASS/FAIL
12.	Did any separation of barrier component or the separation of the barrier from the vehicle occur? (S5.1.3 (d) & (e))	**PASS**

13. Include the x-y plot of force vs. deflection for the upper loading bar with boundaries of Figure 14 (OVSC TP-222-3) superimposed.

		PASS/FAIL
14.	Does the forward force vs. deflection trace of the barrier back lie within the unshaded area? (S5.2.3(a))	**FAIL**

15. Include a deflection vs. time plot for the upper loading bar.
16. The area within the force vs. deflection curve = 1,239 joules
17. 452W = 1,356 joules (S5.2.3) (S5.1.3.4)

		PASS/FAIL
18.	Is item 16 greater than item 17?	**FAIL**

Comments: None

Recorded By:_____

Approved By:_____ DATE: 2/22/2007

DATA SHEET 7 (CONTINUED)

RESTRAINING BARRIER FORCE/DEFLECTION TEST

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Test Lab:	**MGA RESEARCH CORPORATION**	Test Date:	**2/21/2007**

BARRIER IDENTIFICATION: B9

1. Seat cushion width of seat immediately rearward of restraining barrier = 1,008 mm
   W = (Seat Cushion Width)/381 mm (round to nearest whole number) = (3)
2. Location of SRP of seat rearward of restraining barrier is: (Description of location as supplied by the manufacturer): 475 mm Above Floor, 135 mm forward from the front of seat back.
3. Location of lower loading bar is 0 mm above/below the SRP.
   (Requirement: between 102 mm above and 102 mm below the SRP) (S5.1.3.1)
   Length of lower loading bar = 900 mm
   Width of barrier at SRP = 1,000 mm
4. Include the x-y plot of force vs. time for the lower loading bar.
5. Deflection of the barrier at the conclusion of lower bar loading (1557W position) = 96.8 mm.
6. Maximum deflection allowed without moving the restraining barrier to within interference of door operation = 356 mm (must be 356 mm or less).
7. Barrier movement rate selected by the test engineer = 14.4 mm/sec
8. Location of upper loading bar is in a horizontal plane 406 mm above the SRP.
   (Requirement: 406 mm) (S5.1.3.3)
   Length of loading bar = 800 mm
   Width of Barrier at 406 mm above the SRP = 900 mm
9. Reason for stopping restraining barrier deflection:
   _X_ Reached 356 mm maximum
   ___ Separation was about to occur
   ___ Interference with door operation
   ___ Exceeded maximum load of 10675
10. Maximum deflection of barrier back 361 mm.
    (Requirement: maximum allowed is 356 mm) (S5.2.3(b))

DATA SHEET 7 (CONTINUED)

RESTRAINING BARRIER FORCE/DEFLECTION TEST

		PASS/FAIL
11.	Does the restraining barrier interfere with the normal operation of the door. (S5.2.3 (c))	**PASS**

		PASS/FAIL
12.	Did any separation of barrier component or the separation of the barrier from the vehicle occur? (S5.1.3 (d) & (e))	**PASS**

13. Include the x-y plot of force vs. deflection for the upper loading bar with boundaries of Figure 14 (OVSC TP-222-3) superimposed.

		PASS/FAIL
14.	Does the forward force vs. deflection trace of the barrier back lie within the unshaded area? (S5.2.3(a))	**PASS**

15. Include a deflection vs. time plot for the upper loading bar.

16. The area within the force vs. deflection curve = 1,647 joules

17. 452W = 1,356 joules (S5.2.3) (S5.1.3.4)

		PASS/FAIL
18.	Is item 16 greater than item 17?	**PASS**

Comments: None

Recorded By:_____

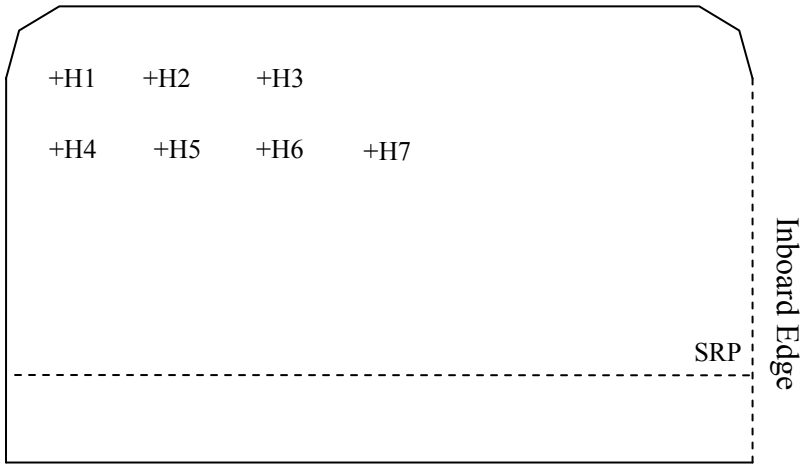
Approved By:_____ DATE: 2/21/2007

DATA SHEET 8

HEAD FORM IMPACT CONTACT AREA AND ENERGY REQUIREMENTS

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Test Lab:	**MGA RESEARCH CORPORATION**	Test Date:	**2/27/2007**

SEAT NUMBER: S2



SEAT BACK REAR SURFACE

NOTE: SHADED AREA IS NONCONTACTABLE 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 H1, H2, H3, H4, H5, H6, and H7 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 8 (CONTINUED)

HEAD FORM IMPACT CONTACT AREA AND ENERGY REQUIREMENTS

4. Complete the following table:

(1)	(2)			(3)	(4)*	(5)	(6)	(7)
Head Impact & Test #	Location (a)			Speed Trap Impact Velocity** mps	Derived Velocity mps	Contact Area (CA) mm^2	CA ≥ 1935 mm^2	
	X	Y	Angle				Yes-Pass	No-Fail
H1	810	450	0	1.56	1.39	4,340	PASS	
H2	700	450	0	1.56	2.00	4,510	PASS	
H3	590	450	0	1.55	1.85	4,340	PASS	
H4	810	320	0	1.57	1.56	3,580	PASS	
H5	700	320	0	1.56	1.56	3,230	PASS	
H6	590	320	0	1.58	1.69	3,270	PASS	
H7	480	320	0	1.57	1.51	2,810	PASS	

* 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 at the seat.

Recorded By:_____

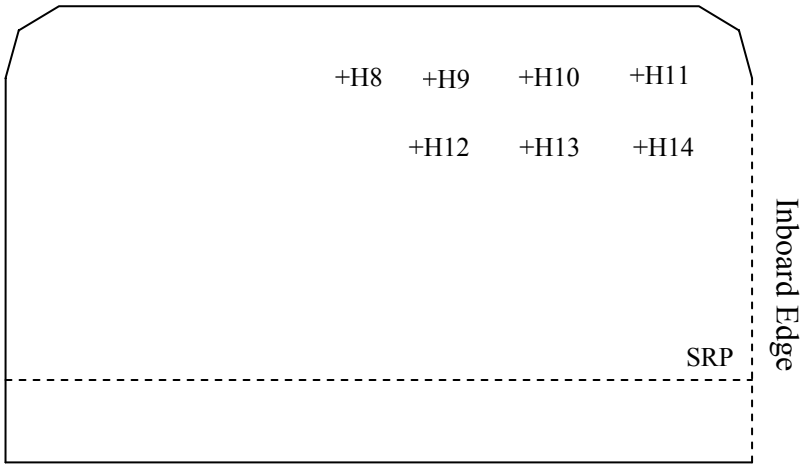
Approved By:_____ DATE: 2/27/2007

DATA SHEET 8 (CONTINUED)

HEAD FORM IMPACT CONTACT AREA AND ENERGY REQUIREMENTS

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Test Lab:	**MGA RESEARCH CORPORATION**	Test Date:	**2/26/2007**

SEAT NUMBER: S2



SEAT BACK REAR SURFACE

NOTE: SHADED AREA IS NONCONTACTABLE 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 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 8 (CONTINUED)

HEAD FORM IMPACT CONTACT AREA AND ENERGY REQUIREMENTS

4. Complete the following table:

(1)	(2)			(3)	(4)*	(5)	(6)	(7)		(8)	
Head impact & Test #	Location (a)			Speed Trap Impact Velocity ** mps	Derived Velocity ** mps	Max HIC	Engy Reqd Joules	Column 5 < 1000		Column 6 > 4.5 joules	
	X	Y	Angle					Yes-Pass	No-Fail	Yes-Pass	No-Fail
H8	480	450	0	6.65	6.46	119	5.36	PASS		PASS	
H9	370	450	0	6.62	6.61	113	5.62	PASS		PASS	
H10	260	450	0	6.64	6.41	106	8.34	PASS		PASS	
H11	150	450	0	6.62	6.80	127	6.31	PASS		PASS	
H12	370	320	0	6.62	6.56	125	13.03	PASS		PASS	
H13	260	320	0	6.62	6.64	129	14.52	PASS		PASS	
H14	150	320	0	6.63	6.58	125	10.53	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 at the seat.

Recorded By:_____

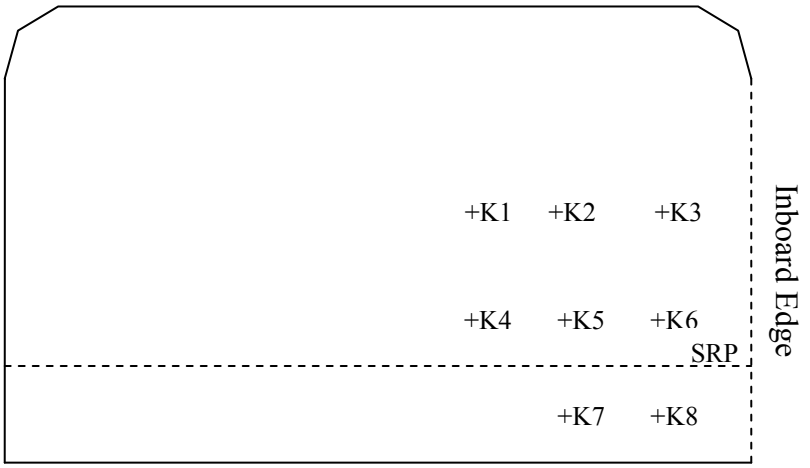
Approved By:_____ DATE: 2/26/2007

DATA SHEET 9

KNEE FORM IMPACT TEST

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Test Lab:	**MGA RESEARCH CORPORATION**	Test Date:	**2/26/2007**

SEAT NUMBER: S2



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 9 (CONTINUED)

KNEE FORM IMPACT TEST

4. Complete the following table:

(1)	(2)			(3)	(4)*	(5)	(6)	(7)		(8)	
Knee impact & Test #	Location (a)			Speed Trap Impact Velocity ** mps	Derived Velocity ** mps	Cont. Area mm^2	Resist Force (N)	Column 5 > 1935 mm^2		Column 6 < 2669N	
	X	Y	Angle					Yes-Pass	No-Fail	Yes-Pass	No-Fail
K1	380	250	0	4.80	4.35	3,070	1,453	PASS		PASS	
K2	230	250	0	4.82	4.81	3,270	1,717	PASS		PASS	
K3	80	250	0	4.81	4.76	3,140	2,158	PASS		PASS	
K4	380	100	0	4.86	4.83	3,260	1,506	PASS		PASS	
K5	230	100	0	4.82	4.60		1,584			PASS	
K6	80	100	0	4.80	4.80		2,287			PASS	
K7	230	-50	0	4.83	4.78		1,480			PASS	
K8	80	-50	0	4.84	4.98		2,237			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 at the seat.

Recorded By:_____

Approved By:_____ DATE: 2/26/2007

SECTION 4

INSTRUMENTATION AND EQUIPMENT LIST

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS** NHTSA No.: **C60901**
Test Lab: **MGA RESEARCH CORPORATION** Test Date: **1/15/2007**

Equipment	Description	Model/Serial No.	Cal. Date	Next Cal. Date
Computer	HP	Vectra / US03263612	---	---
Test Fixture	MGA	TF2003	---	---
A/D Interface	Metrabyte	DAS-1802	---	---
Load Cell	Interface	1210AF-SK / 62736	1/29/07	7/24/07
Load Cell	Interface	1210AF / 137778	11/3/06	5/3/07
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 5
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Procedure:	**FMVSS 222**	Test Date:	**1/15/2007**

Left Side View of School Bus

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Procedure:	**FMVSS 222**	Test Date:	**1/15/2007**

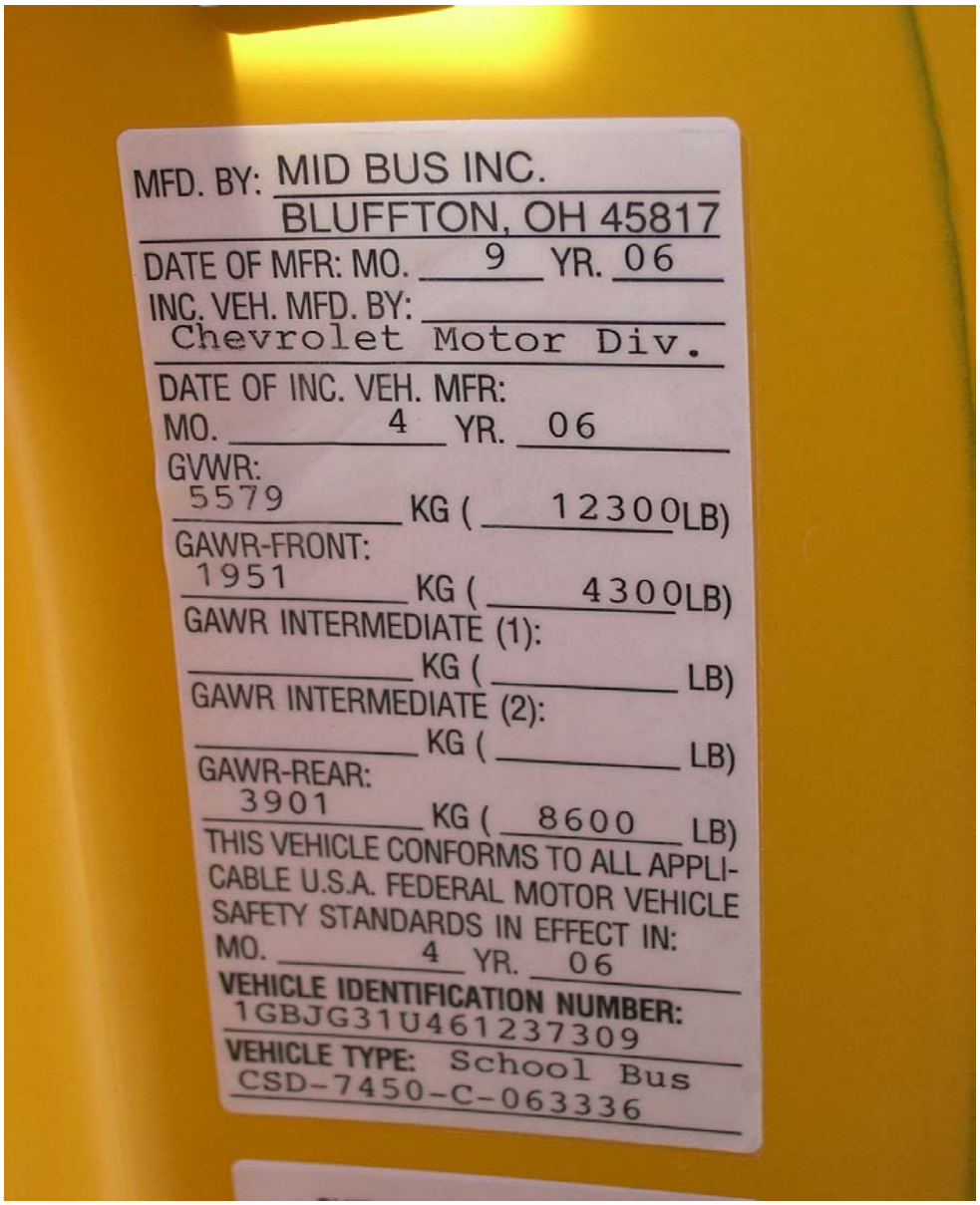
Right Side View of School Bus

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Procedure:	**FMVSS 222**	Test Date:	**1/15/2007**

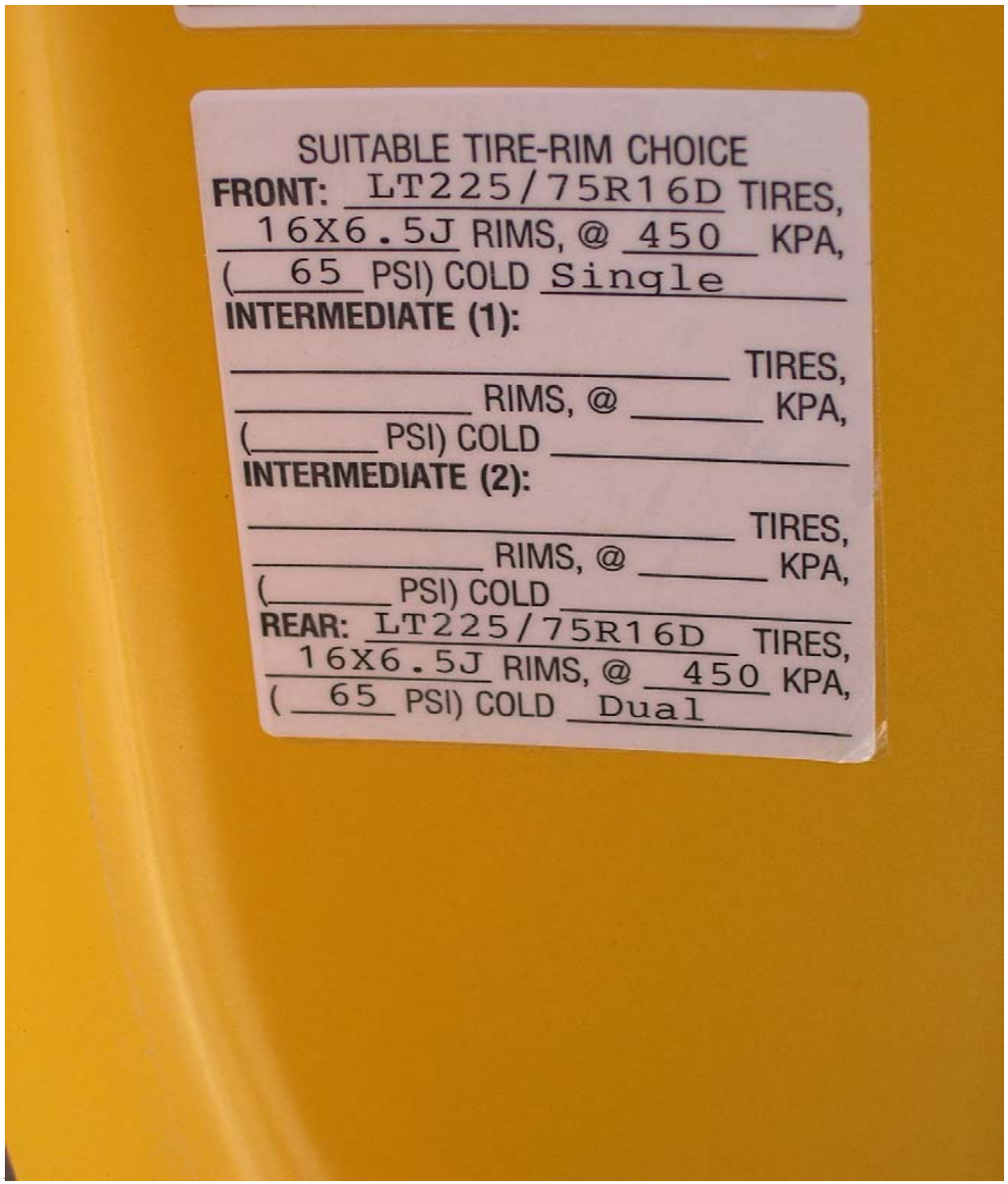
¾ Front View From Left Side of School Bus

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Procedure:	**FMVSS 222**	Test Date:	**1/15/2007**

¾ Rear View From Right Side of School Bus



Certification Label



Tire Placard

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Procedure:	**FMVSS 222**	Test Date:	**1/15/2007**

Vehicle Interior View From Front to Rear

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Procedure:	**FMVSS 222**	Test Date:	**1/15/2007**

Vehicle Interior View From Rear to Front

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Procedure:	**FMVSS 222**	Test Date:	**1/15/2007**

Pre-Test of Seat Cushion S4

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Procedure:	**FMVSS 222**	Test Date:	**1/15/2007**

Post-Test of Seat Cushion S4

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Procedure:	**FMVSS 222**	Test Date:	**1/15/2007**

Pre-Test of Seat Cushion S5

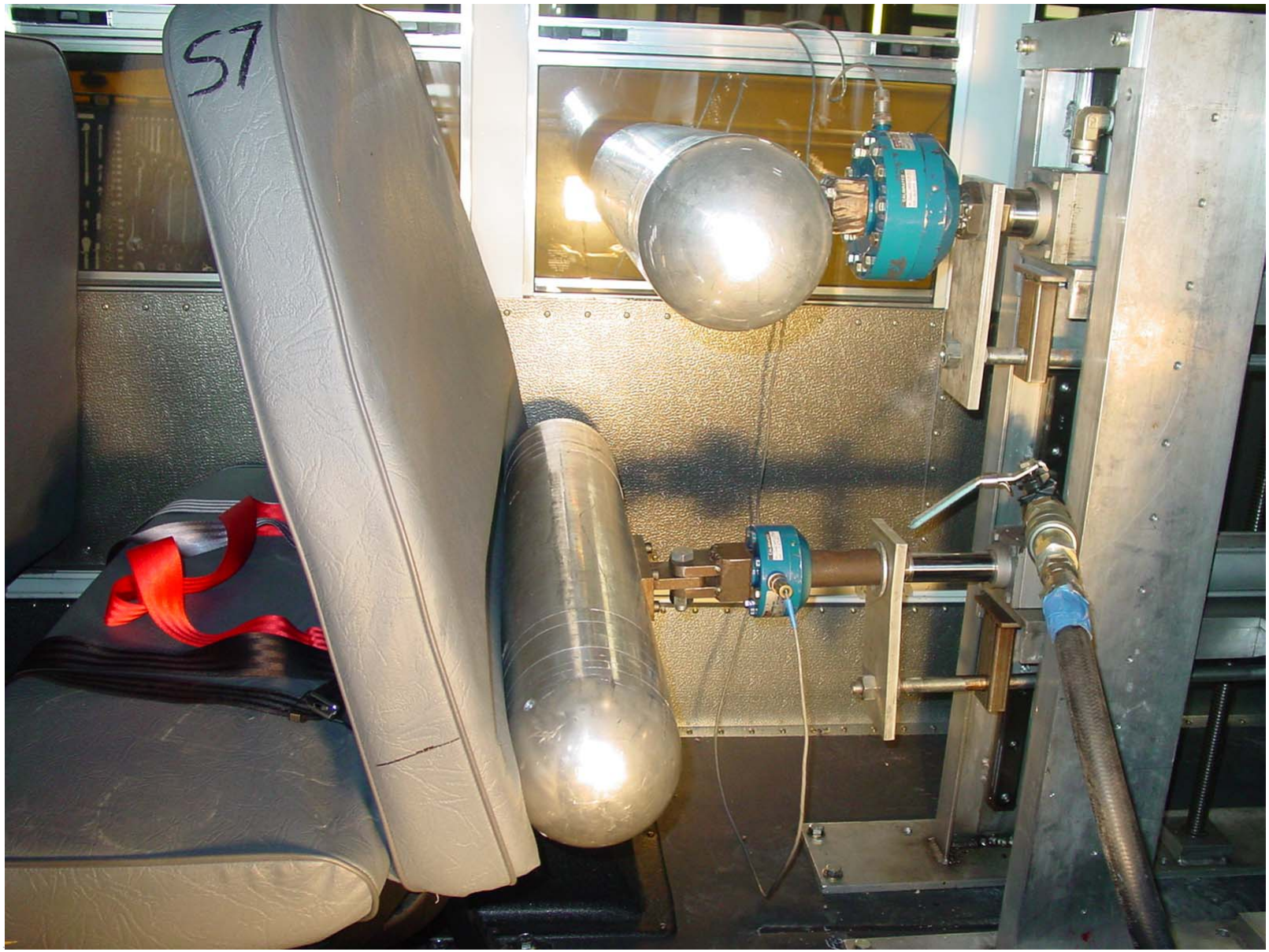
Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS** NHTSA No.: **C60901**
Procedure: **FMVSS 222** Test Date: **1/15/2007**

Post-Test of Seat Cushion S5

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Procedure:	**FMVSS 222**	Test Date:	**1/15/2007**

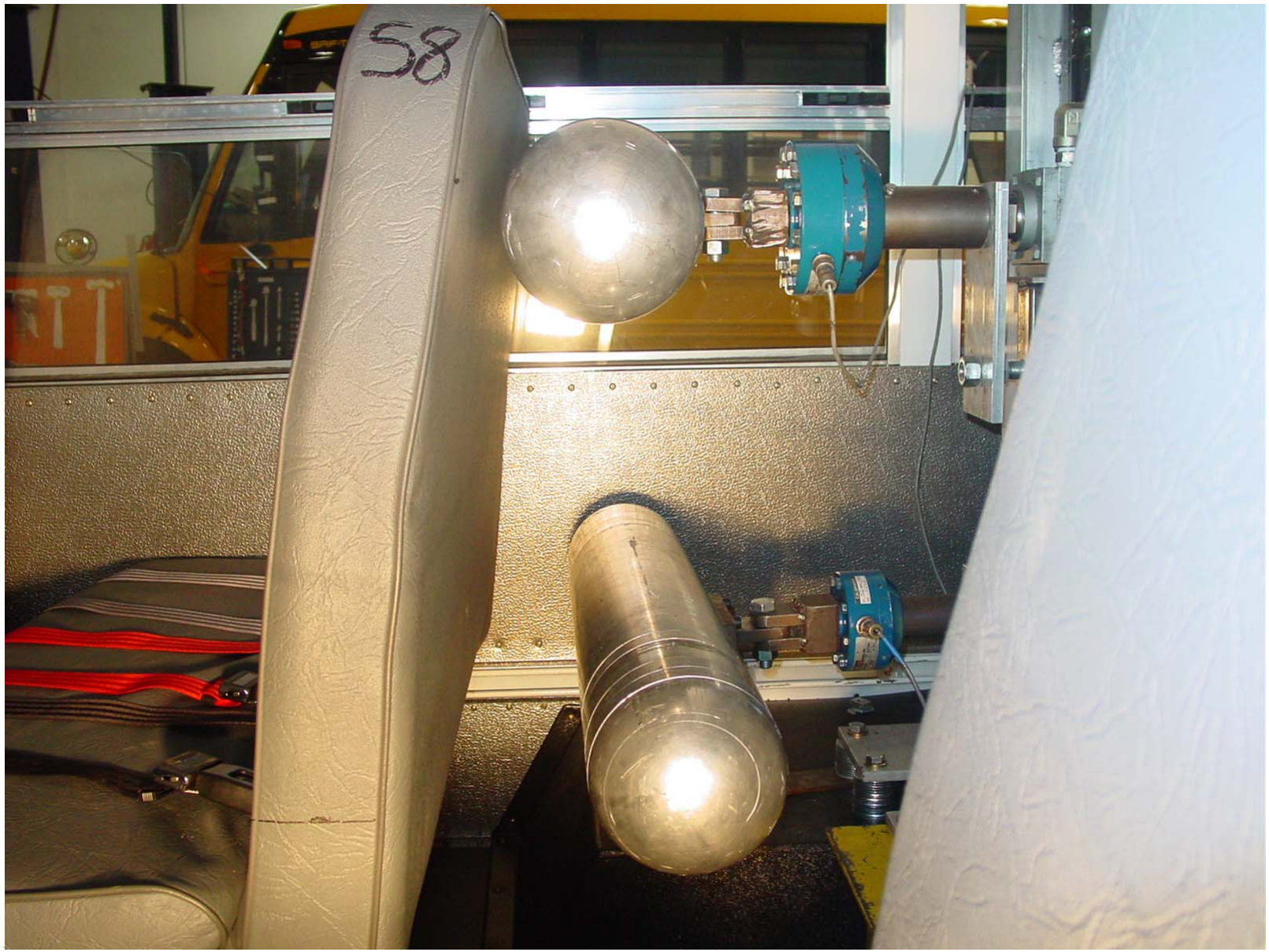
Pre-Test of Seat Back S7 Force Deflection Forward Test

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Procedure:	**FMVSS 222**	Test Date:	**1/15/2007**



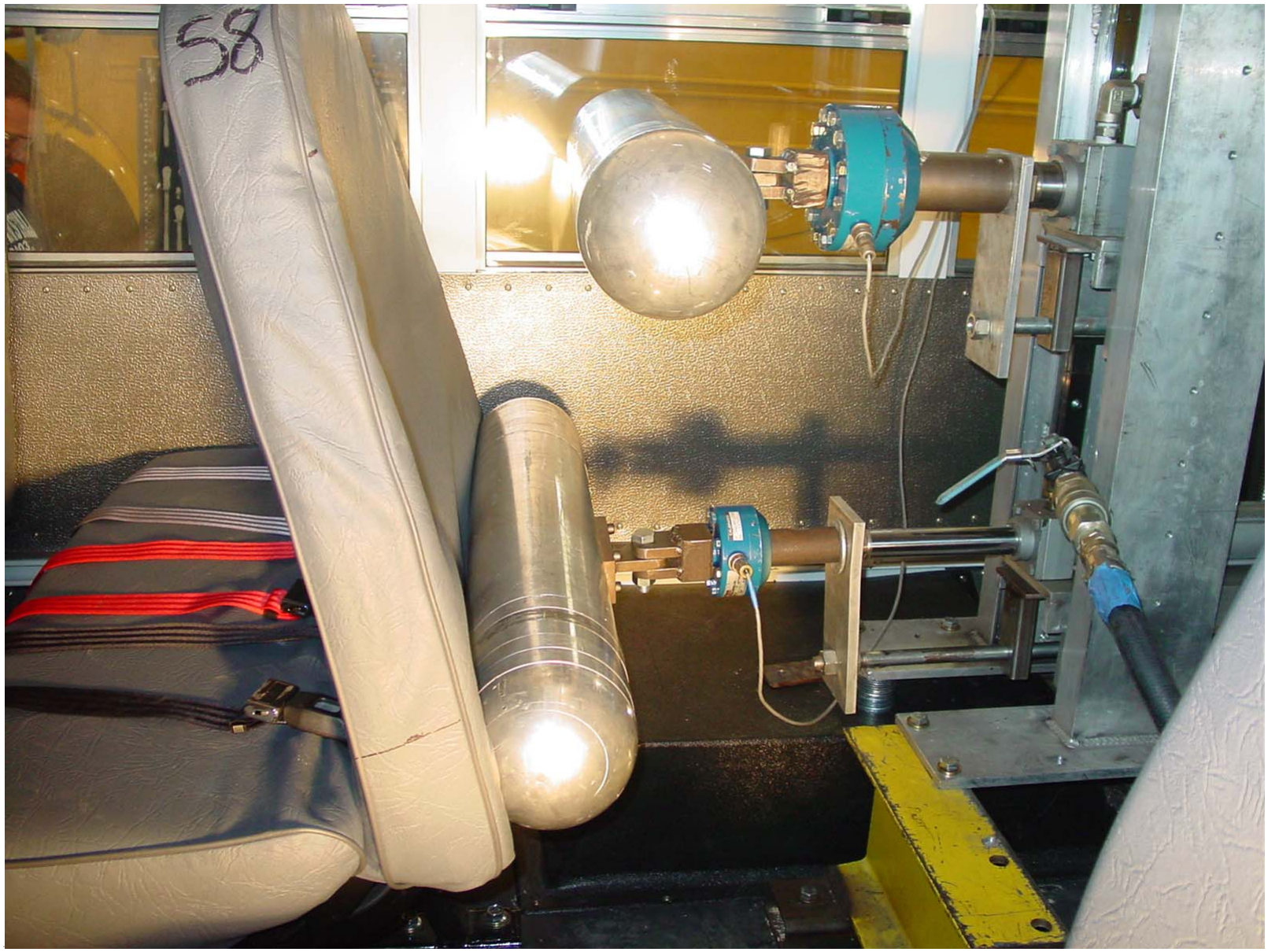
Post-Test of Seat Back S7 Force Deflection Forward Test

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Procedure:	**FMVSS 222**	Test Date:	**1/15/2007**



Pre-Test of Seat Back S8 Force Deflection Forward Test

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Procedure:	**FMVSS 222**	Test Date:	**1/15/2007**

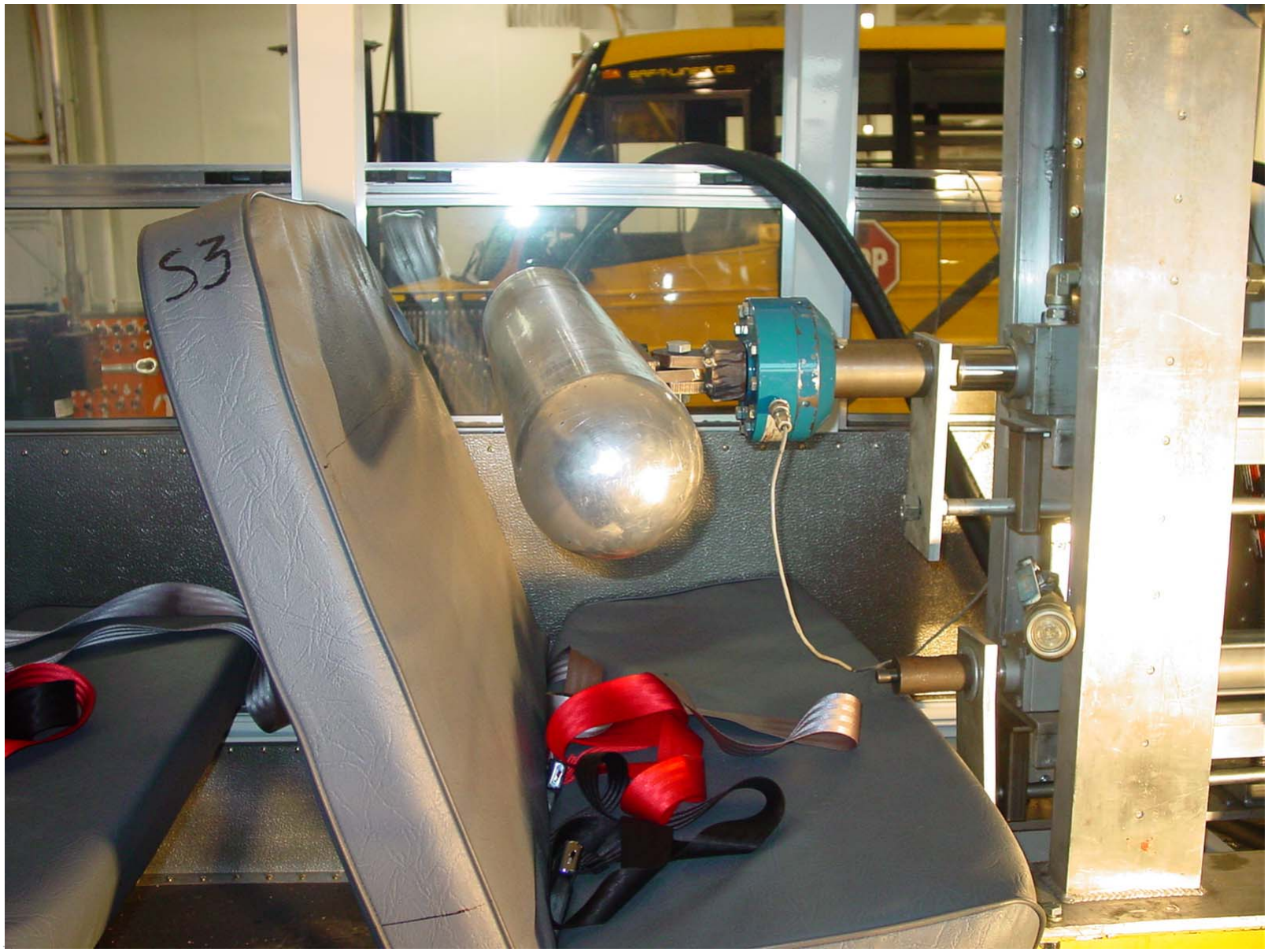


Post-Test of Seat Back S8 Force Deflection Forward Test

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Procedure:	**FMVSS 222**	Test Date:	**1/15/2007**

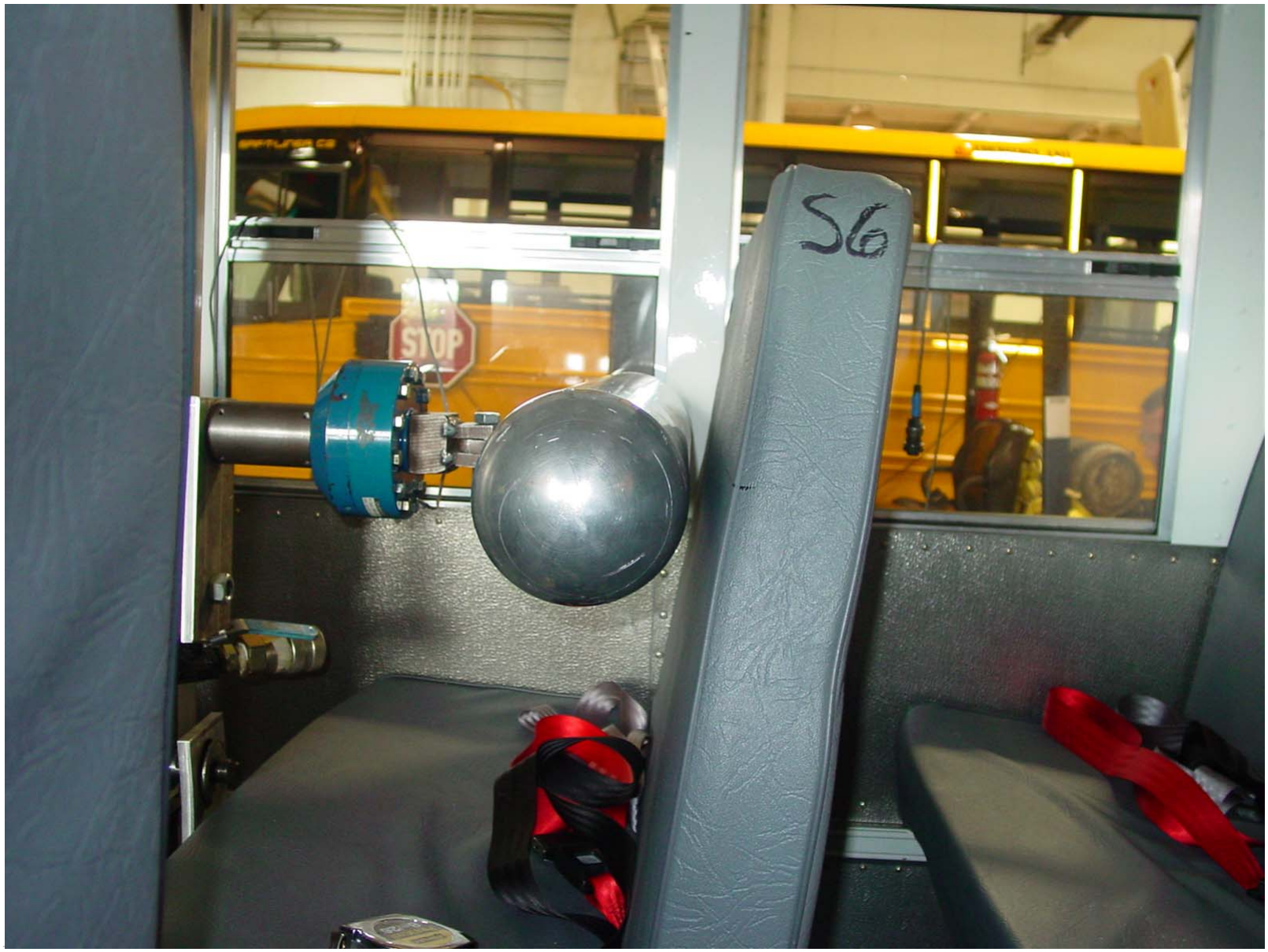
Pre-Test of Seat Back S3 Force Deflection Rearward Test

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Procedure:	**FMVSS 222**	Test Date:	**1/15/2007**



Post-Test of Seat Back S3 Force Deflection Rearward Test

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Procedure:	**FMVSS 222**	Test Date:	**1/15/2007**

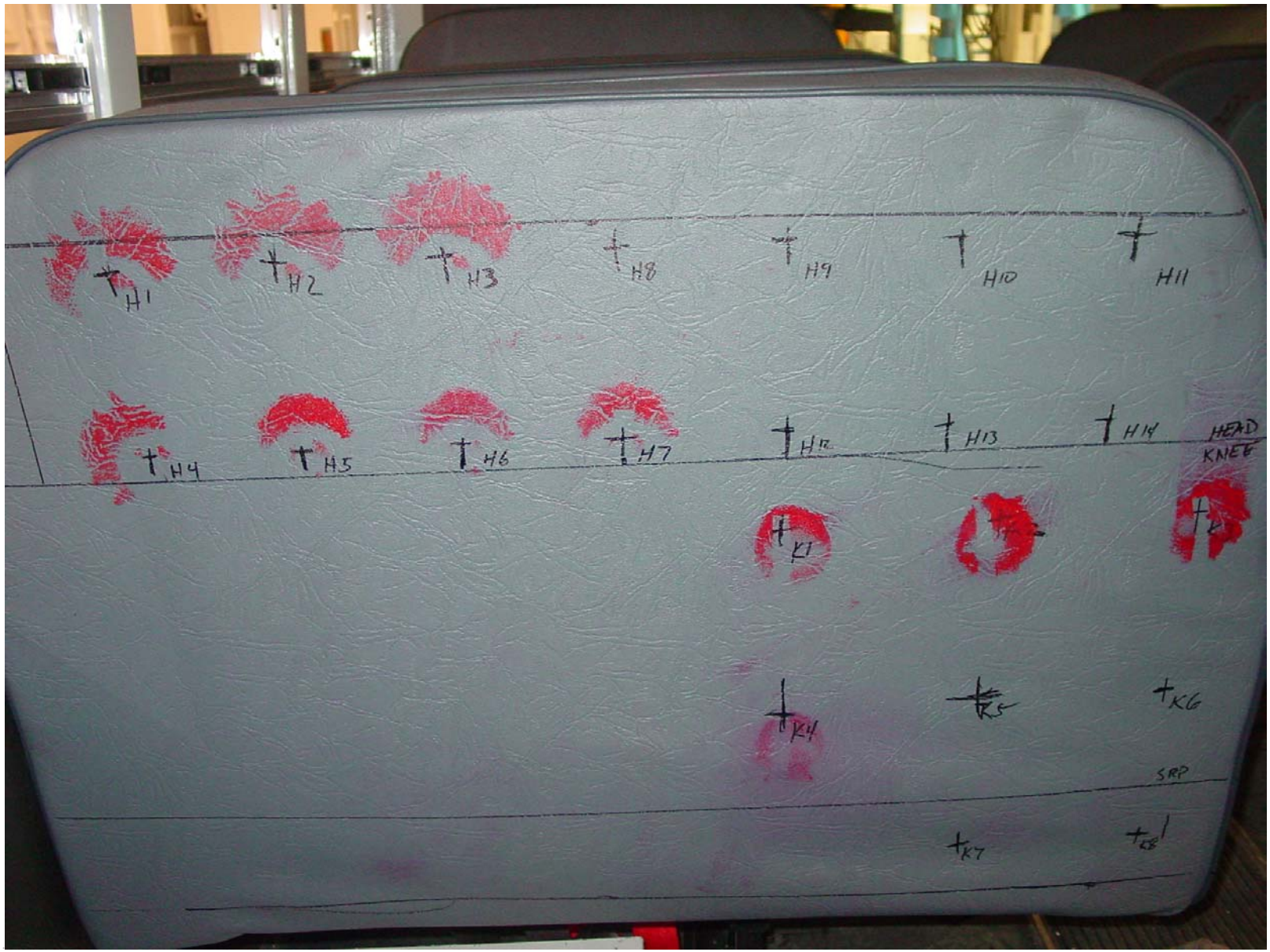


Pre-Test of Seat Back S6 Force Deflection Rearward Test

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Procedure:	**FMVSS 222**	Test Date:	**1/15/2007**

Post-Test of Seat Back S6 Force Deflection Rearward Test

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Procedure:	**FMVSS 222**	Test Date:	**1/15/2007**

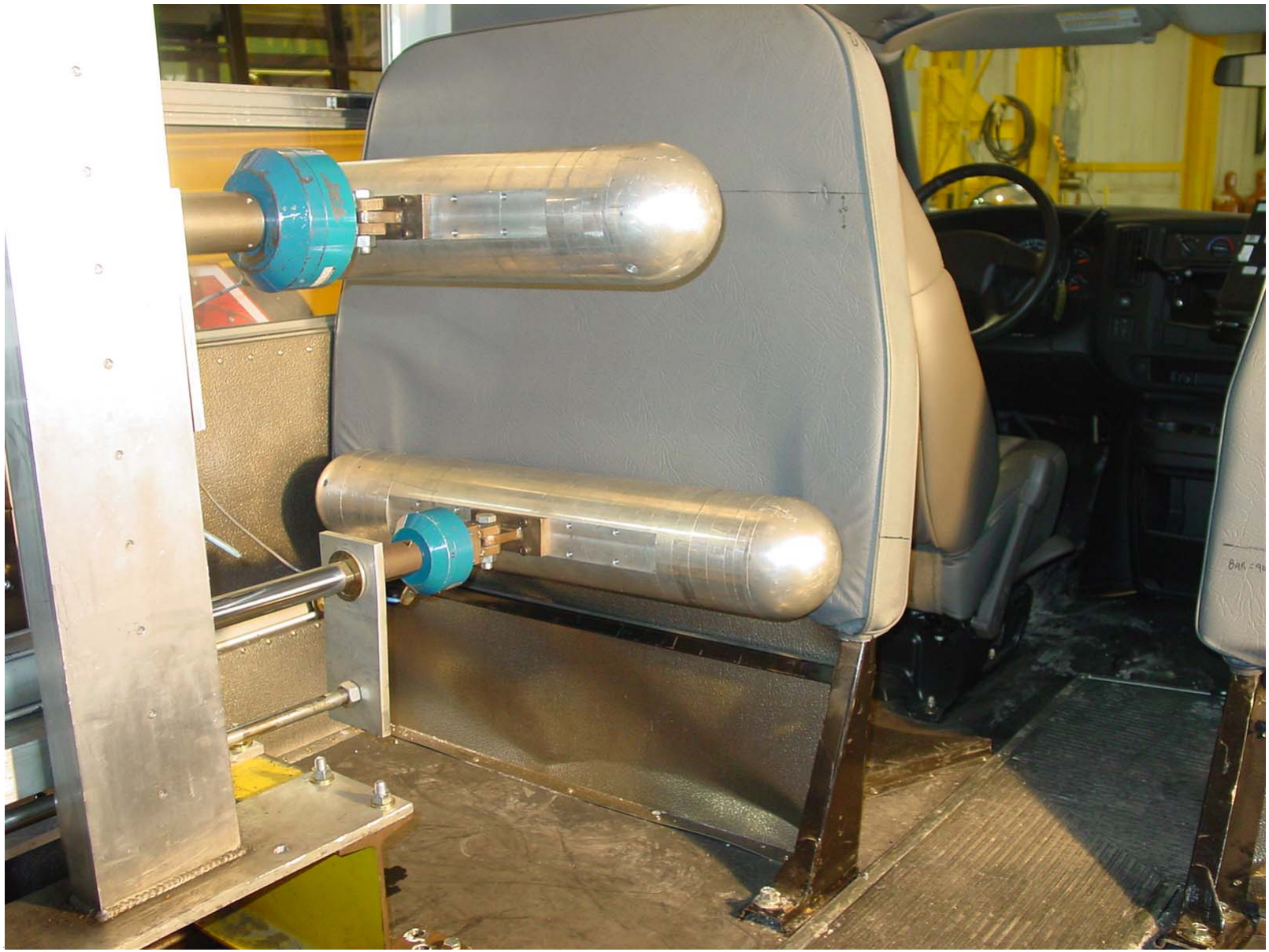


Post-Test of Head and Knee Impact Locations on Seat S2

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Procedure:	**FMVSS 222**	Test Date:	**1/15/2007**

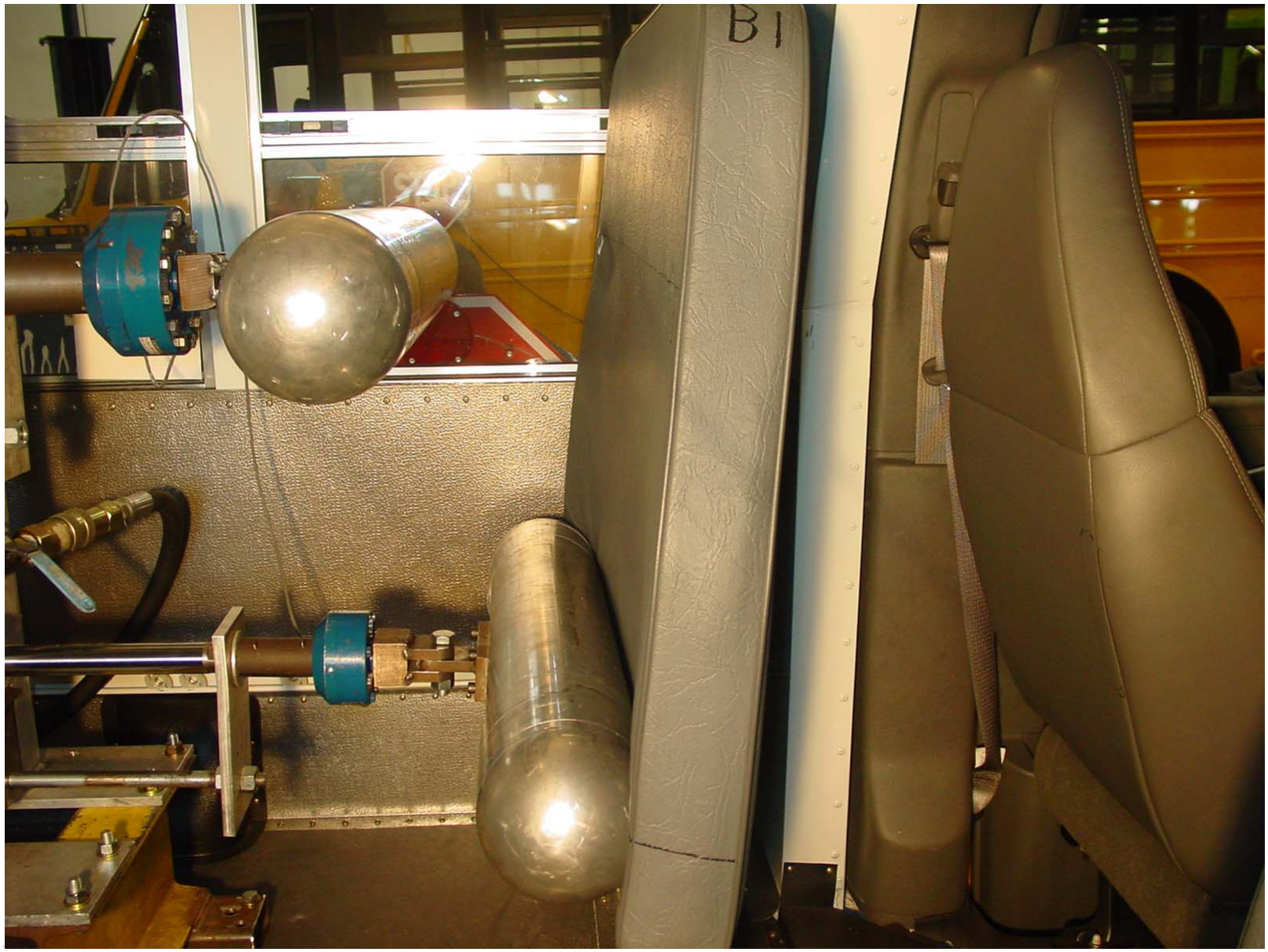
Pre-Test of Barrier B1 Force Deflection Forward Test

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Procedure:	**FMVSS 222**	Test Date:	**1/15/2007**



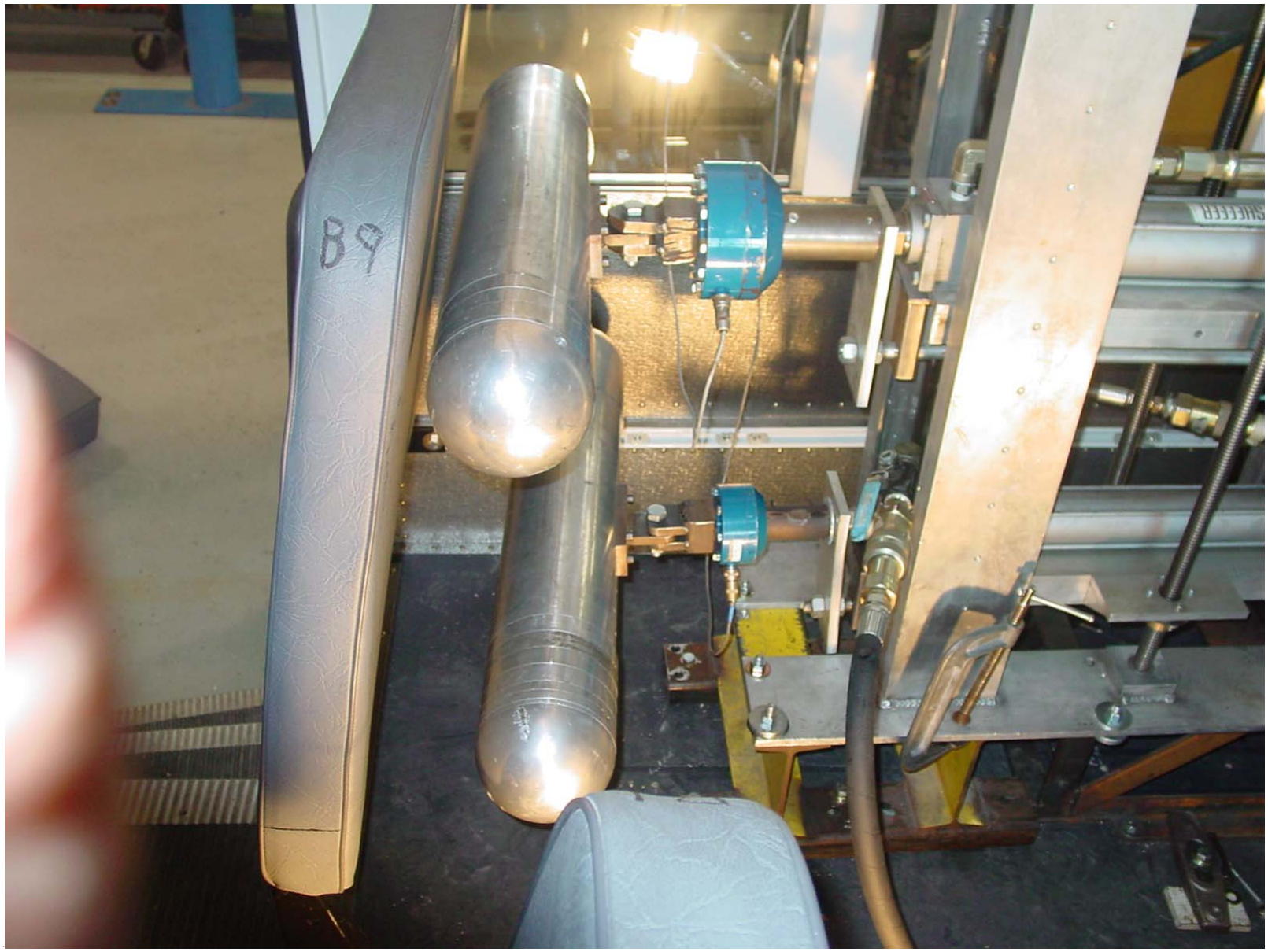
Post-Test of Barrier B1 Force Deflection Forward Test

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Procedure:	**FMVSS 222**	Test Date:	**1/15/2007**



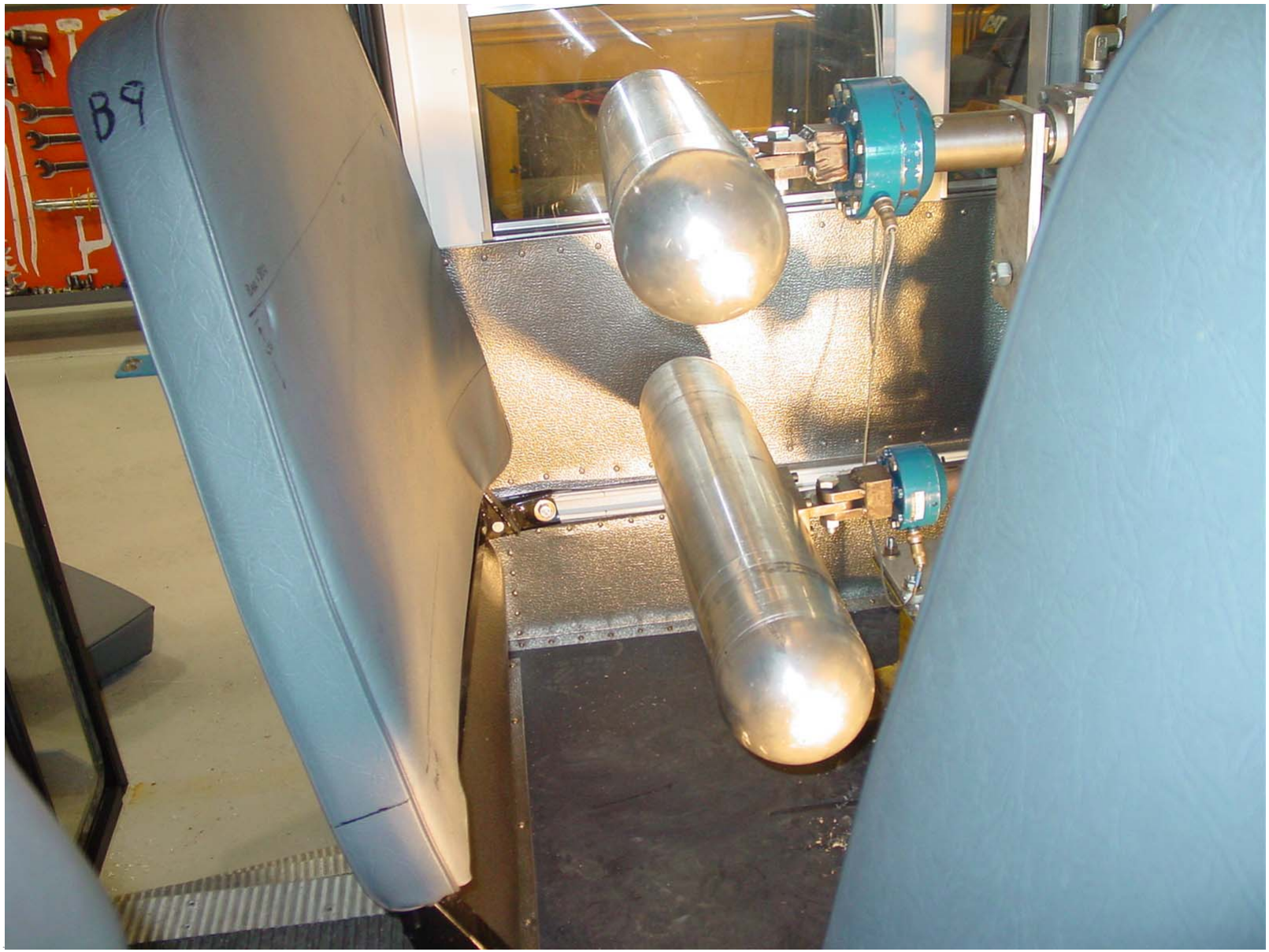
Post-Test of Barrier B1 Force Deflection Forward Test View 2

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Procedure:	**FMVSS 222**	Test Date:	**1/15/2007**



Pre-Test of Barrier B9 Force Deflection Forward Test

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Procedure:	**FMVSS 222**	Test Date:	**1/15/2007**



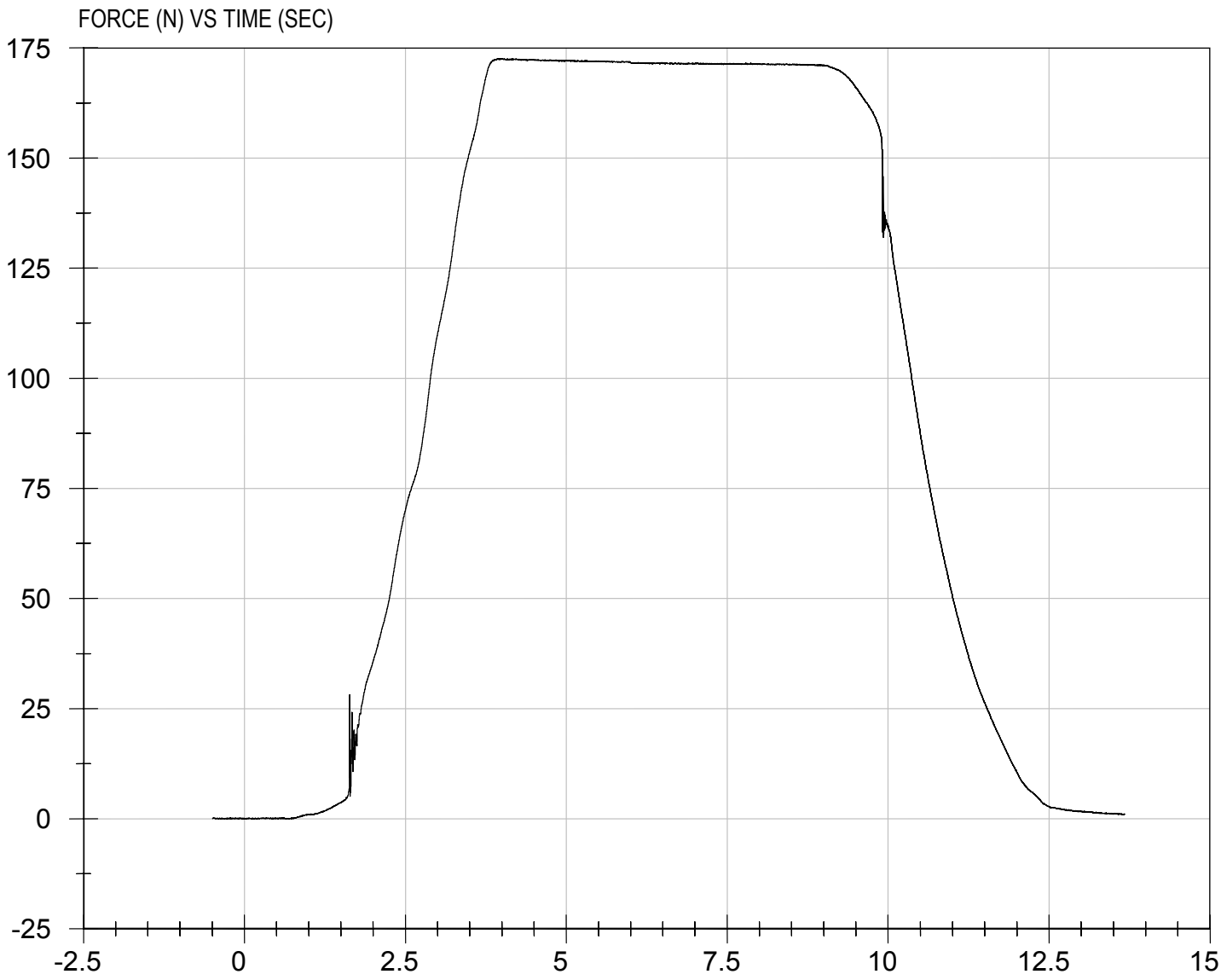
Post-Test of Barrier B9 Force Deflection Forward Test

SECTION 6

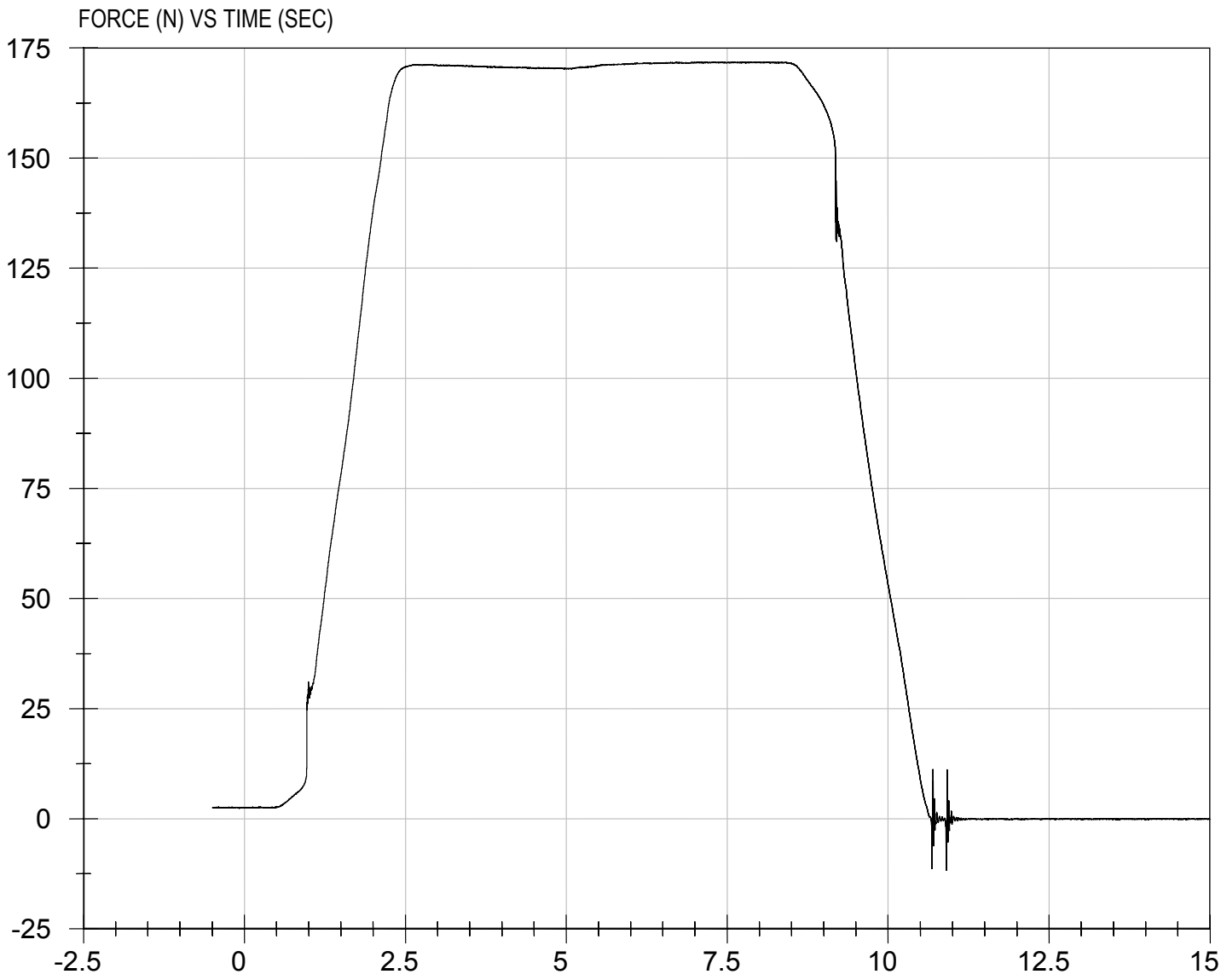
TEST PLOTS

TABLE OF TEST PLOTS

Test Desc: Seat Cushion Retention
Test Date: 1/16/2007
Component ID: MID BUS S4
NHTSA #: C60901

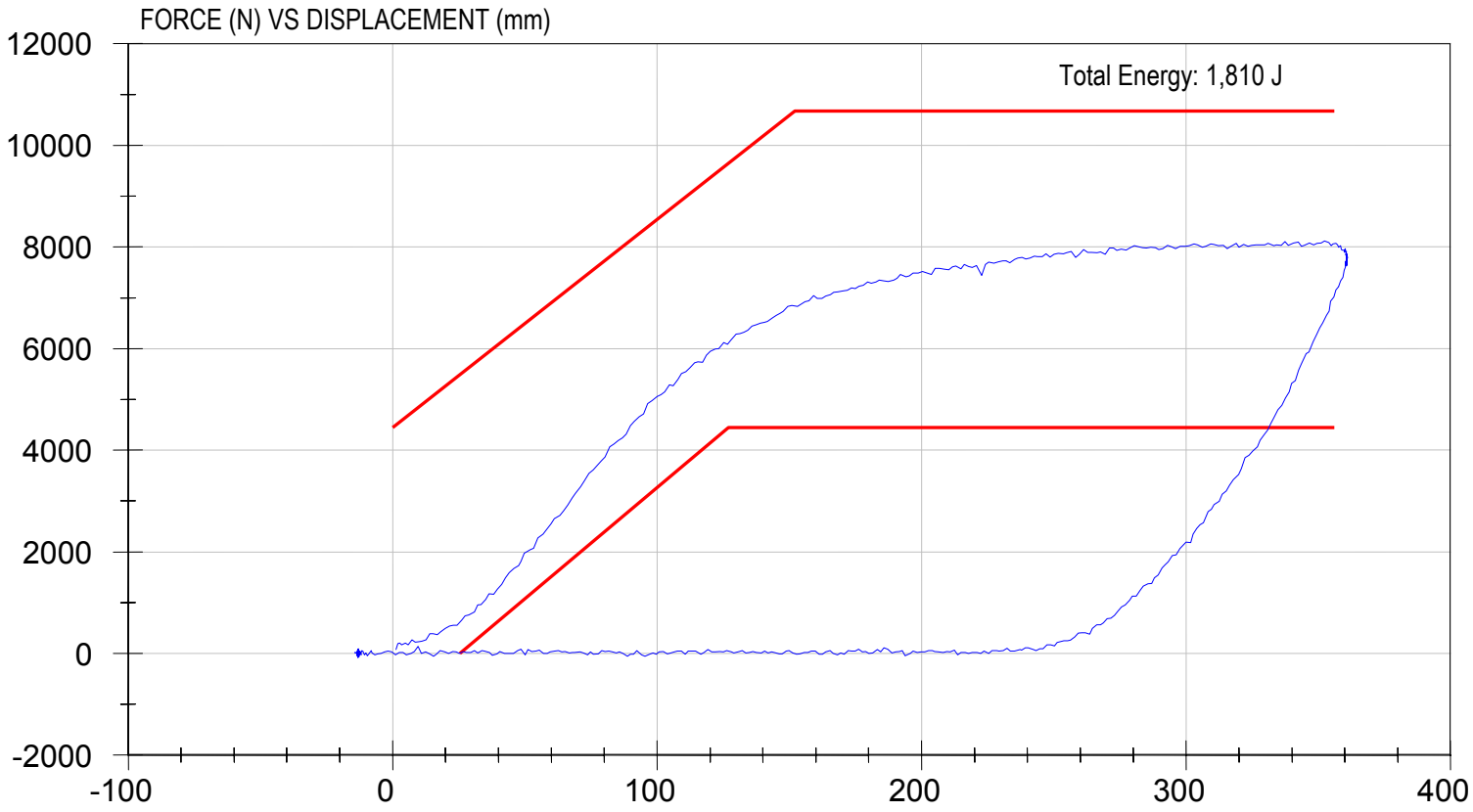


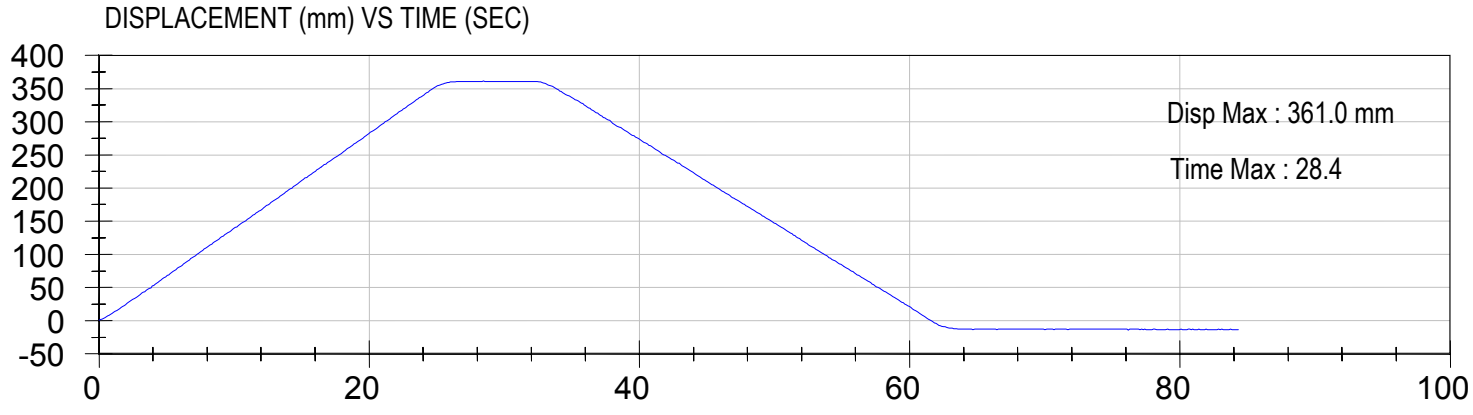
Test Desc: Seat Cushion Retention
Test Date: 1/16/2007
Component ID: MID BUS S5
NHTSA #: C60901

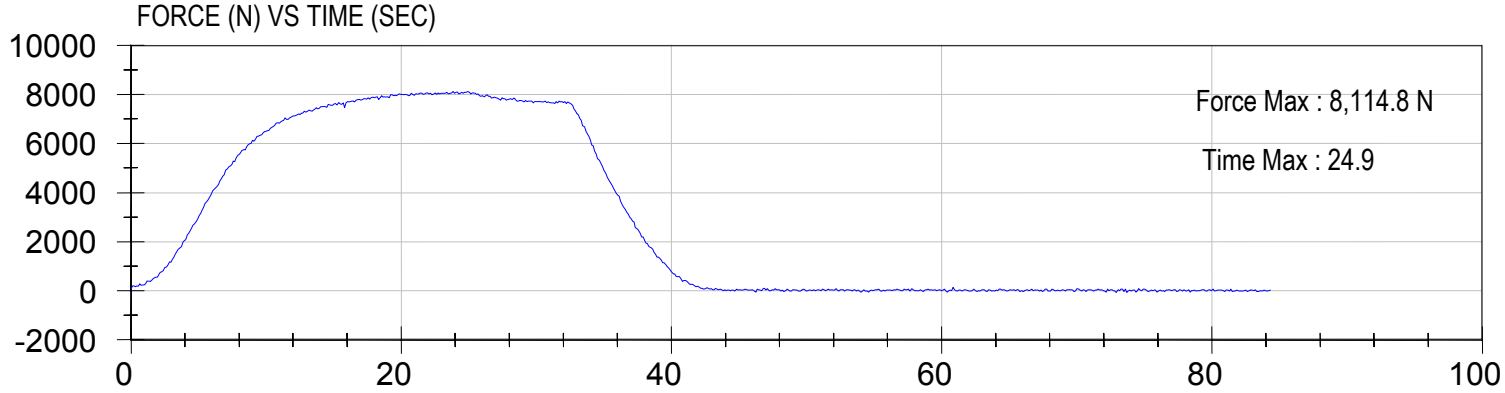


Test Desc: Seat Back Forward Deflection (Upper)
Component ID: MID BUS S7

Test Date: 2/19/2007
NHTSA #: C60901

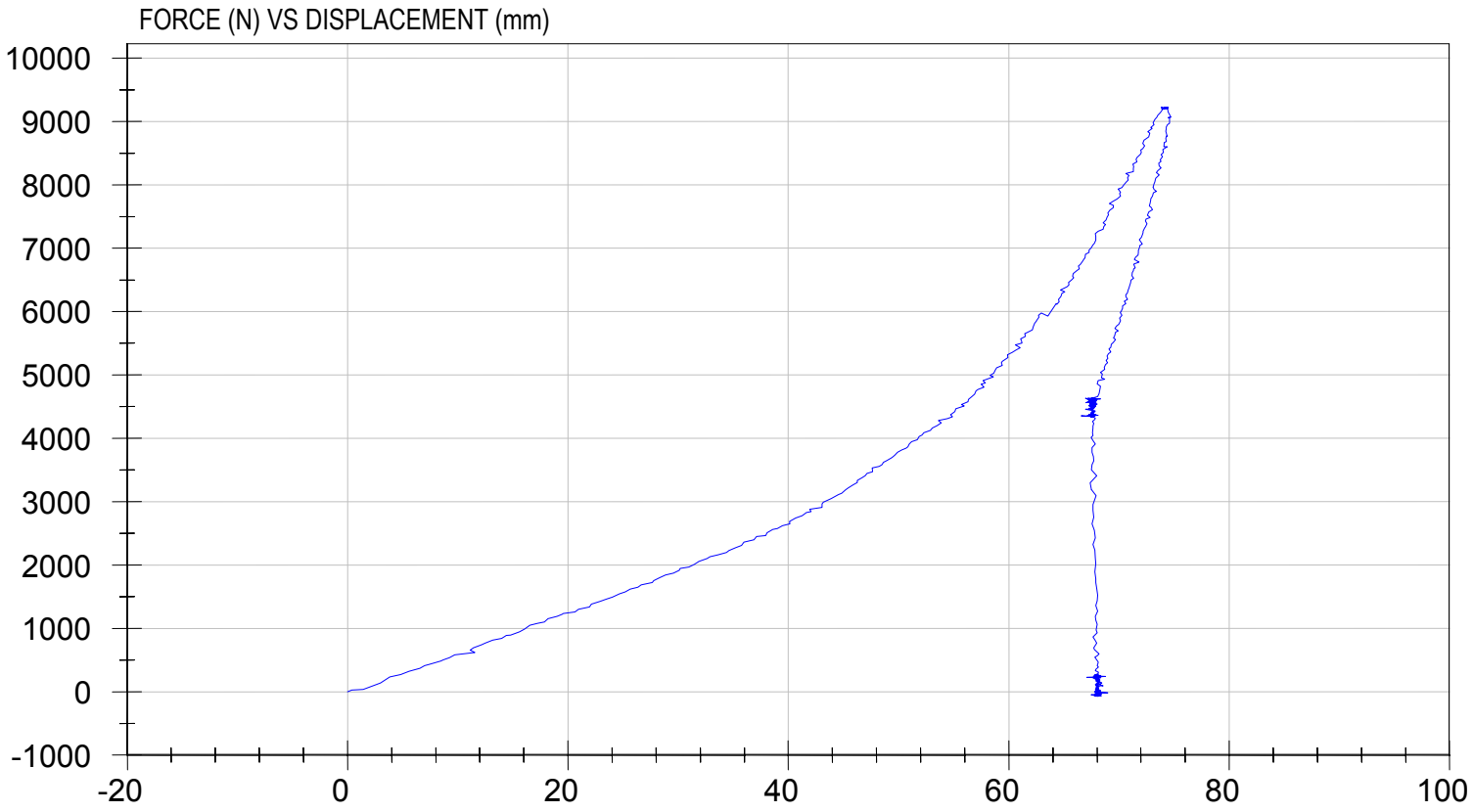


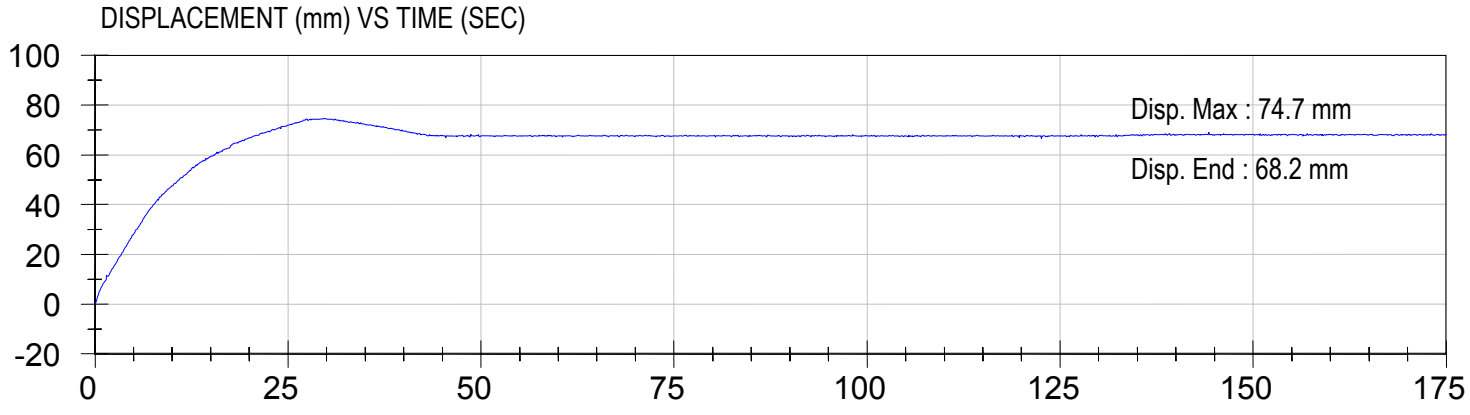


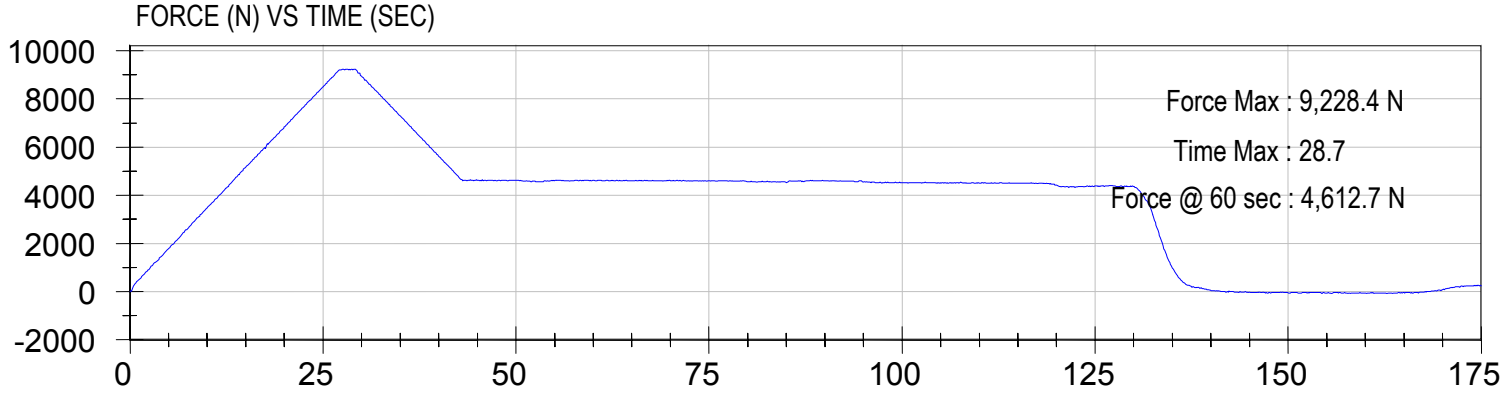


Test Desc: Seat Back Forward Deflection (Lower)
Component ID: MID BUS S7

Test Date: 2/19/2007
NHTSA #: C60901

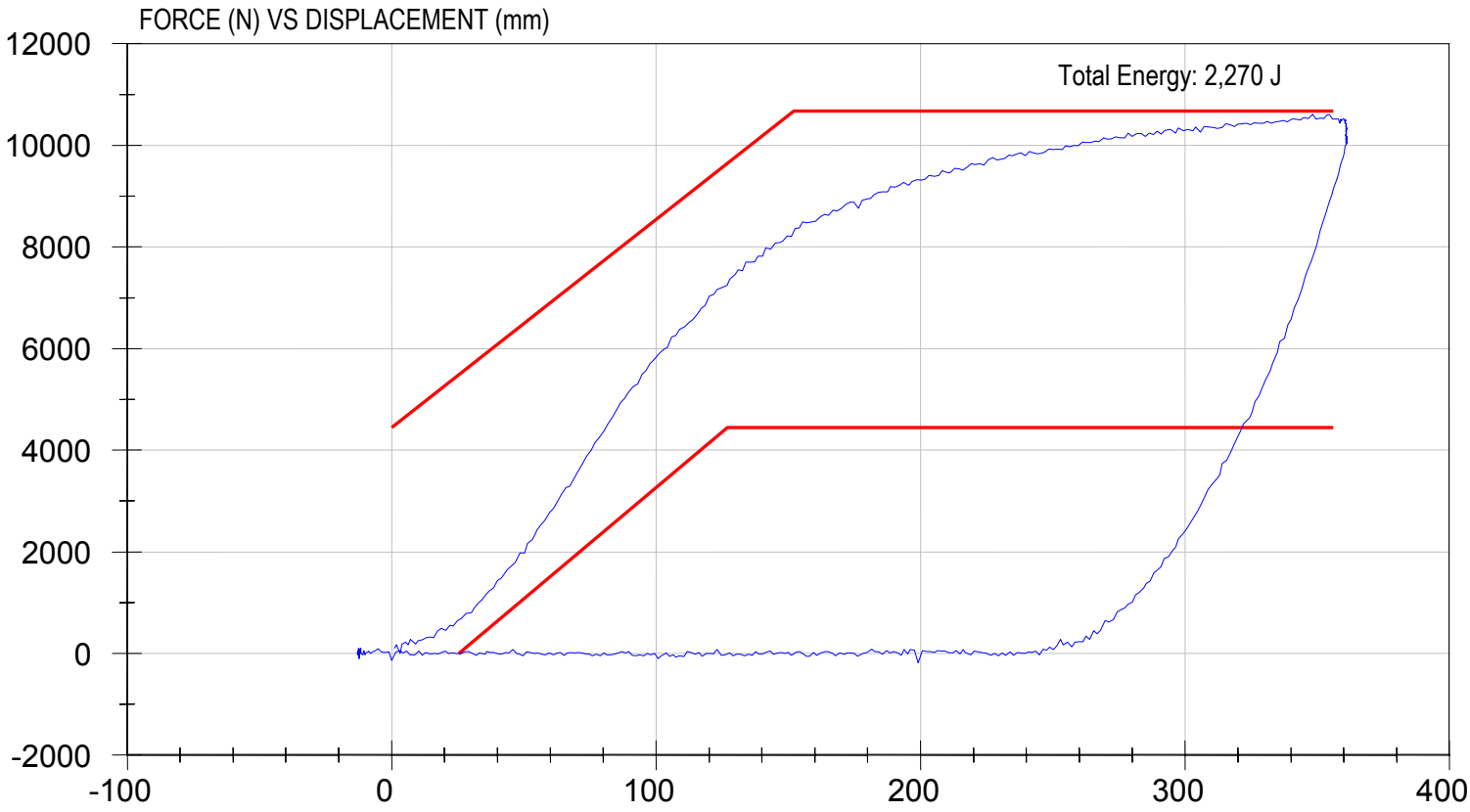


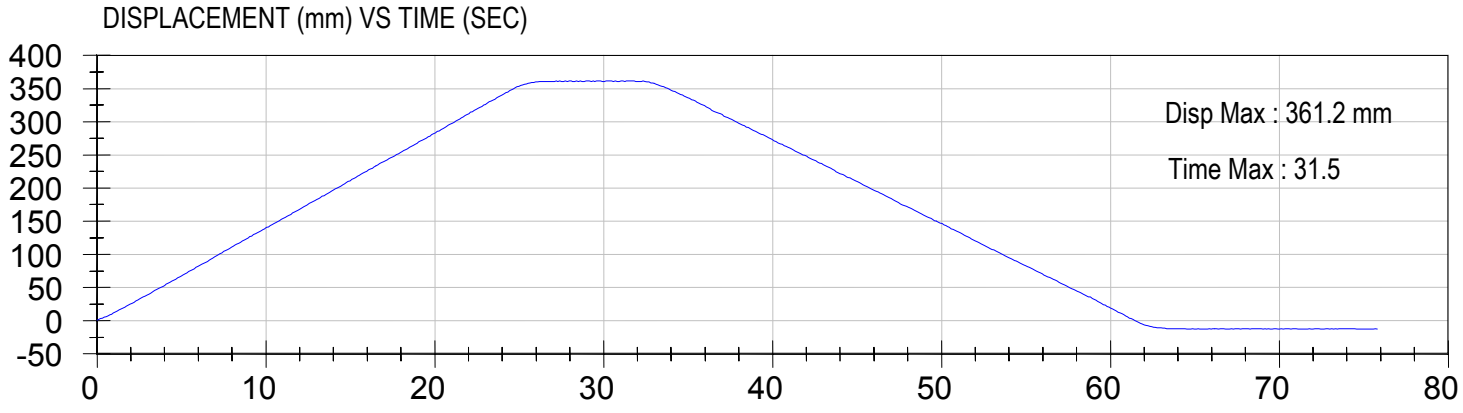


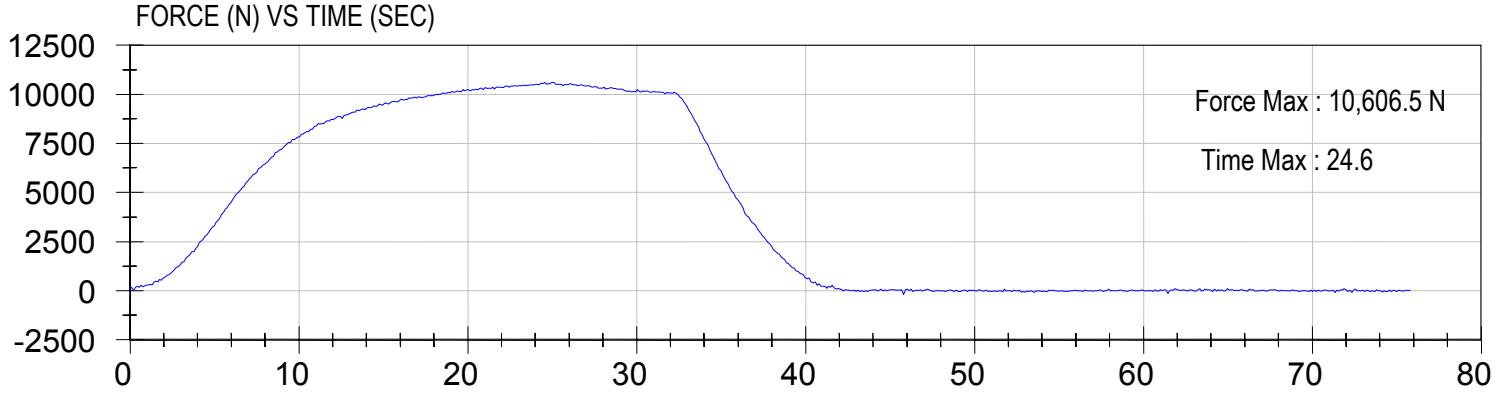


Test Desc: Seat Back Forward Deflection (Upper)
Component ID: MID BUS S8

Test Date: 2/19/2007
NHTSA #: C60901



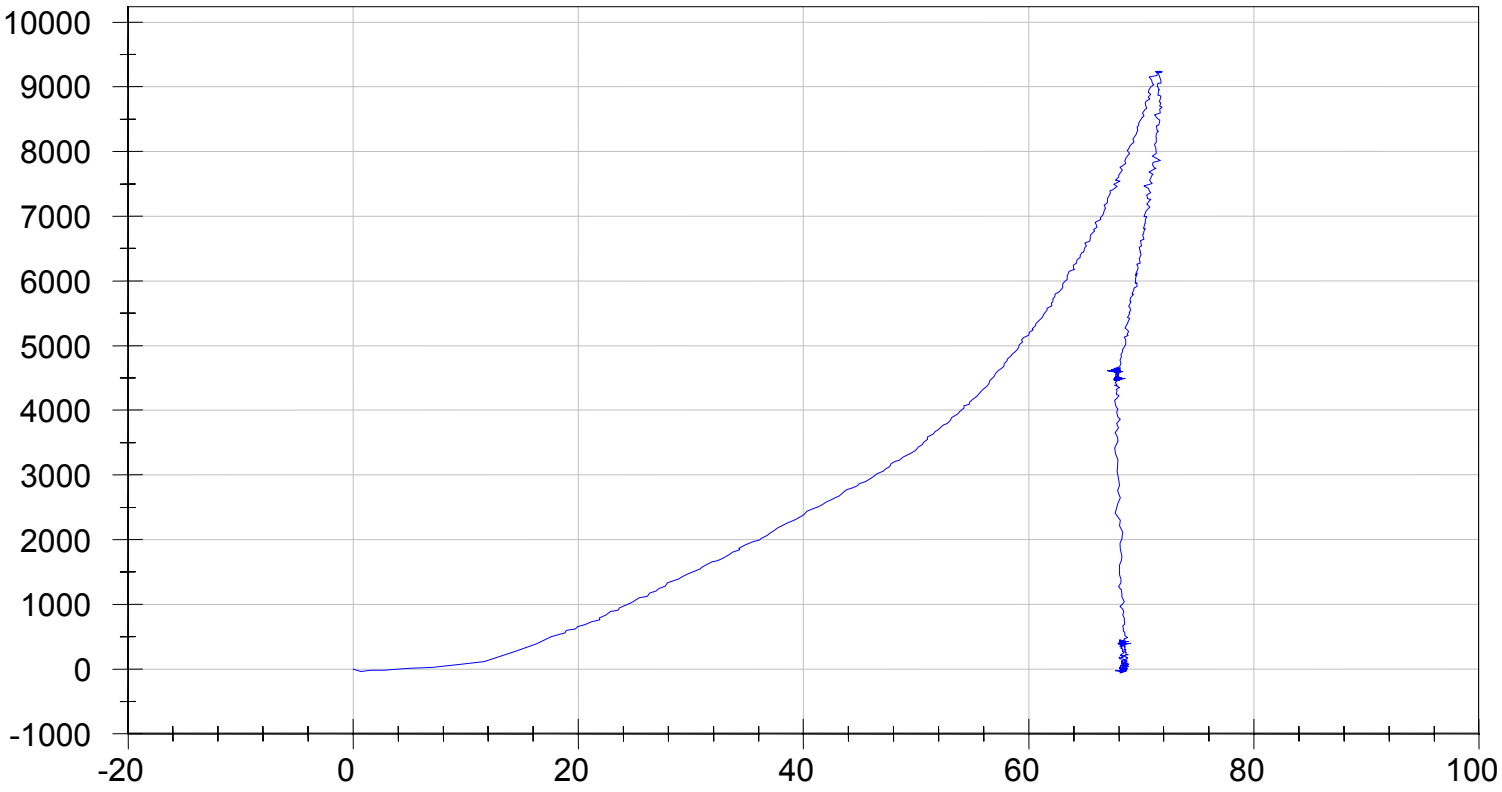




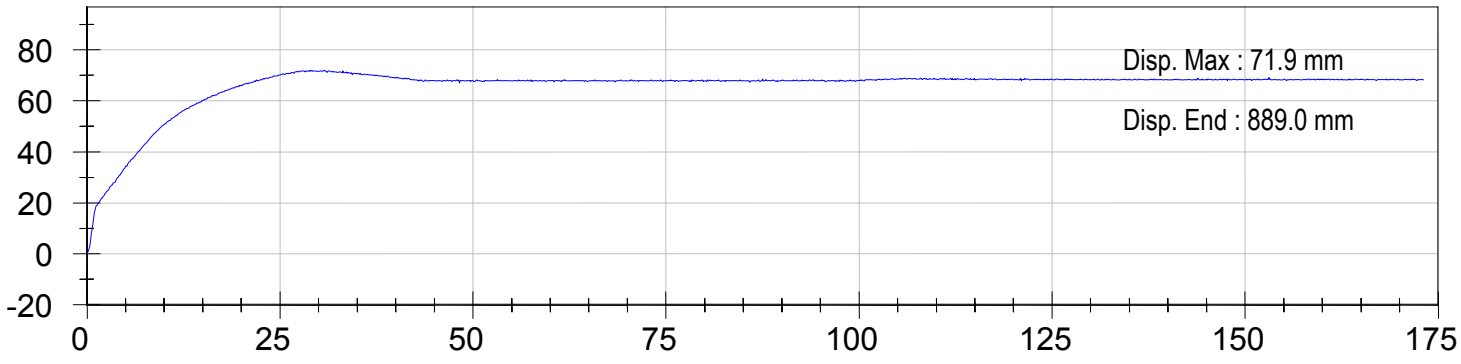
Test Desc: Seat Back Forward Deflection (Lower)
Component ID: MID BUS S8

Test Date: 2/19/2007
NHTSA #: C60901

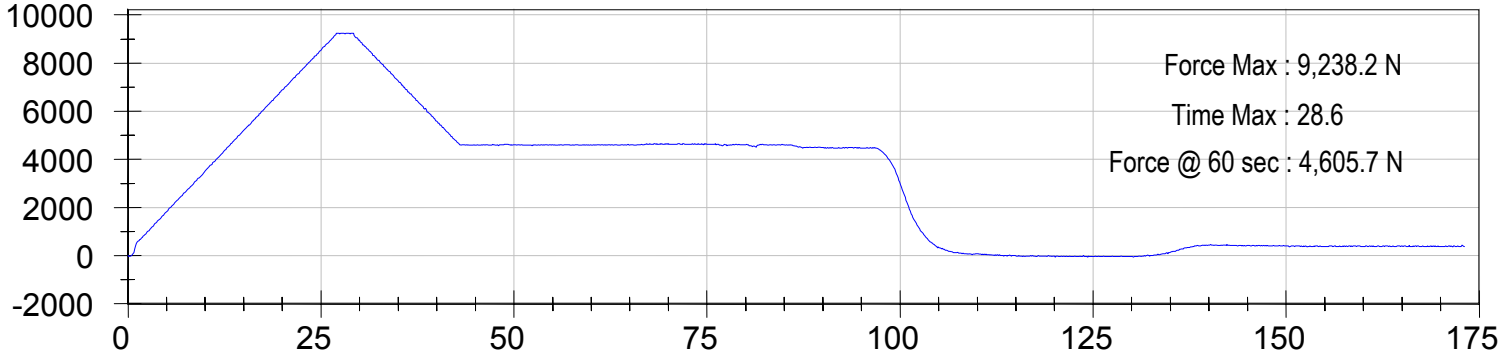
FORCE (N) VS DISPLACEMENT (mm)



DISPLACEMENT (mm) VS TIME (SEC)

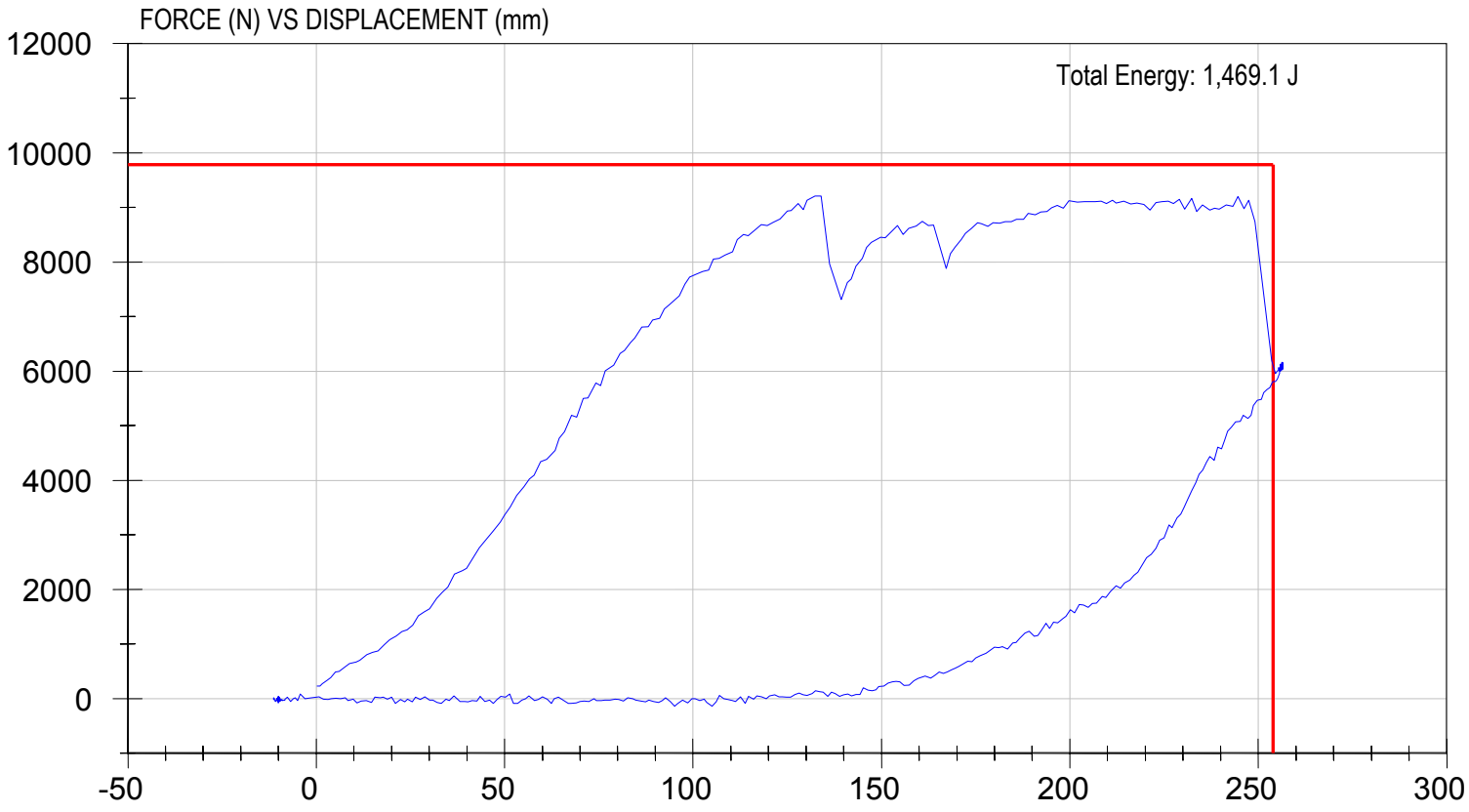


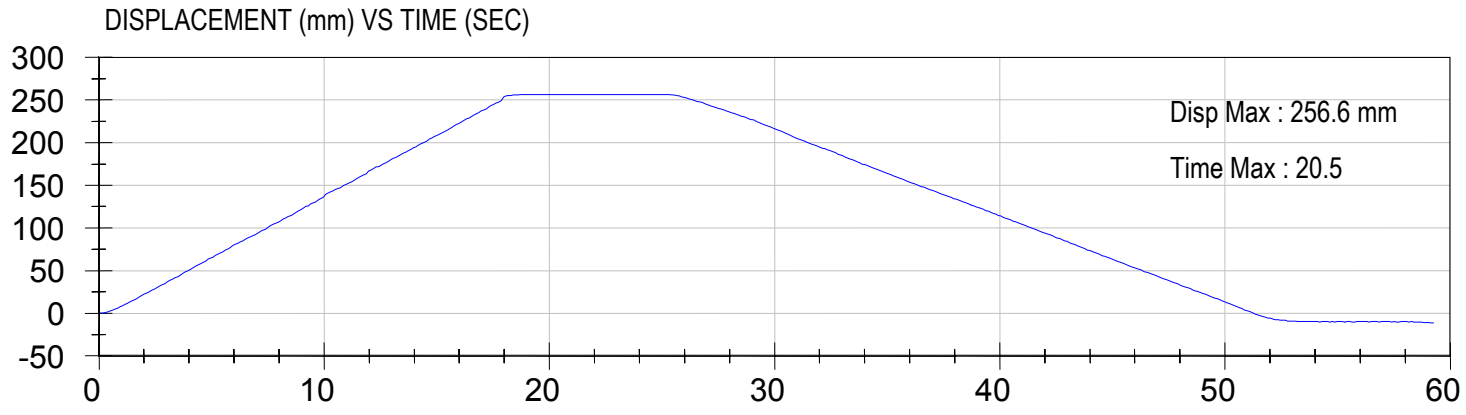
FORCE (N) VS TIME (SEC)

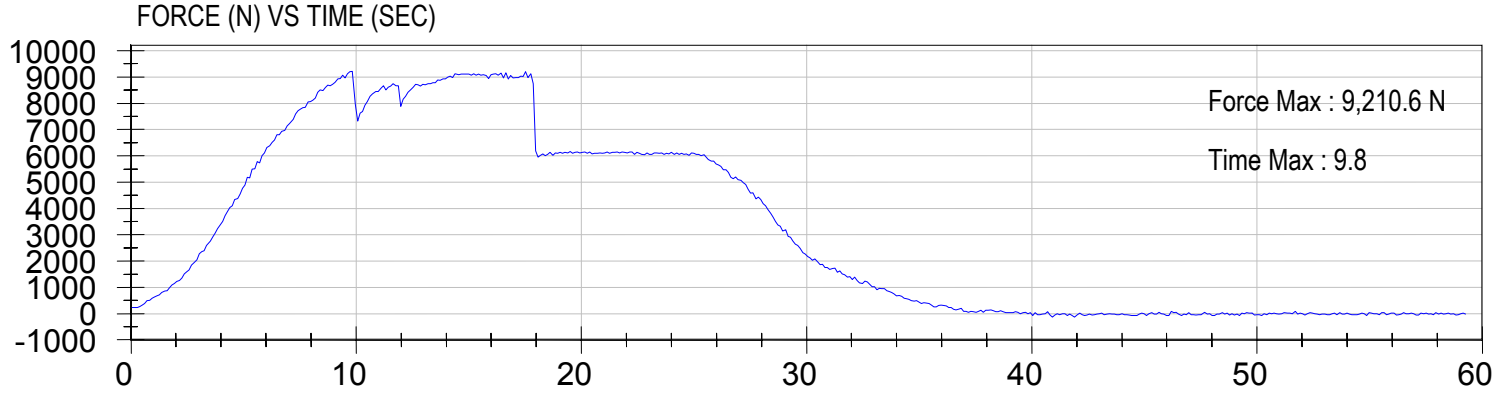


Test Desc: Seat Back Rearward Deflection
Component ID: MID BUS S3

Test Date: 2/22/2007
NHTSA #: C60901

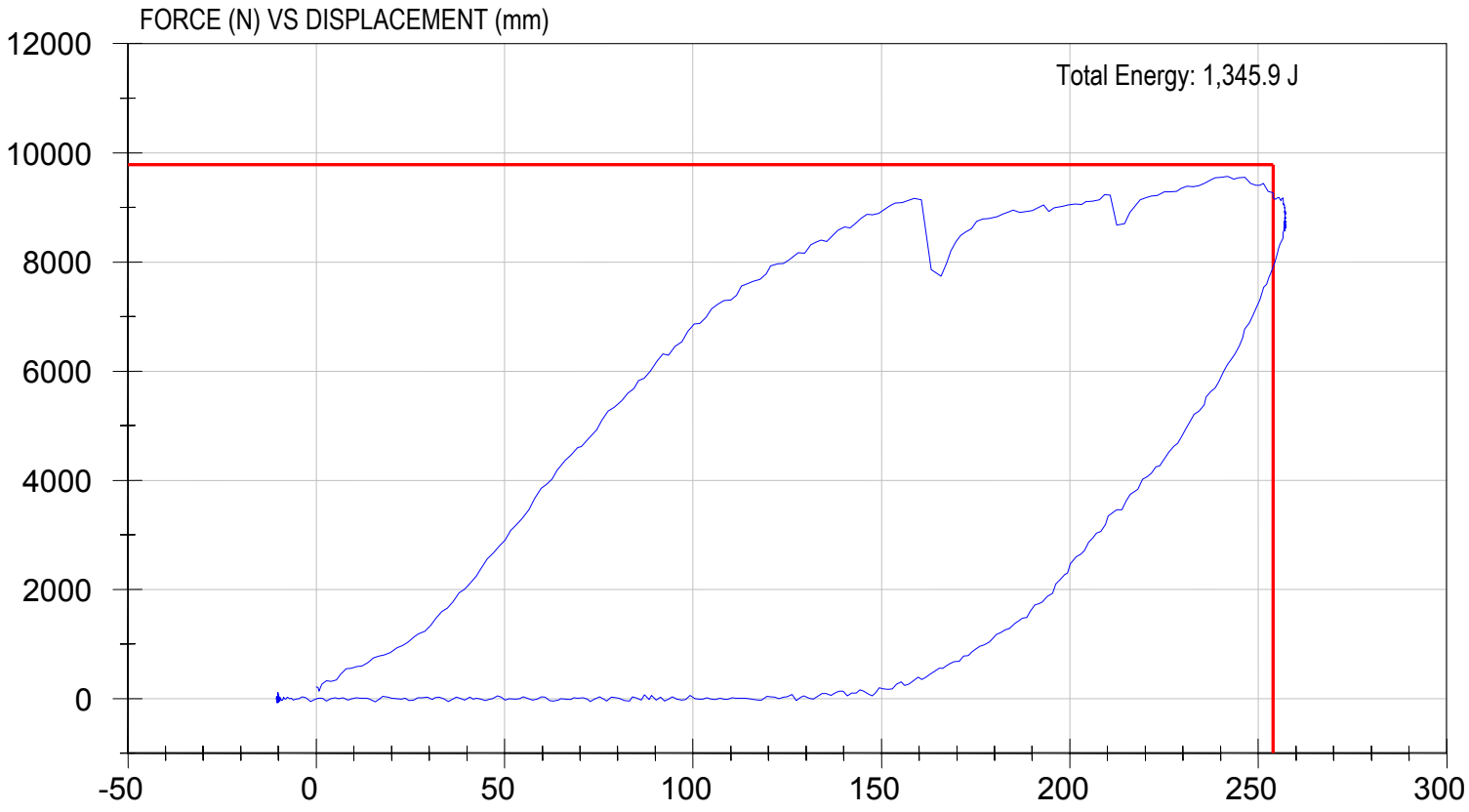


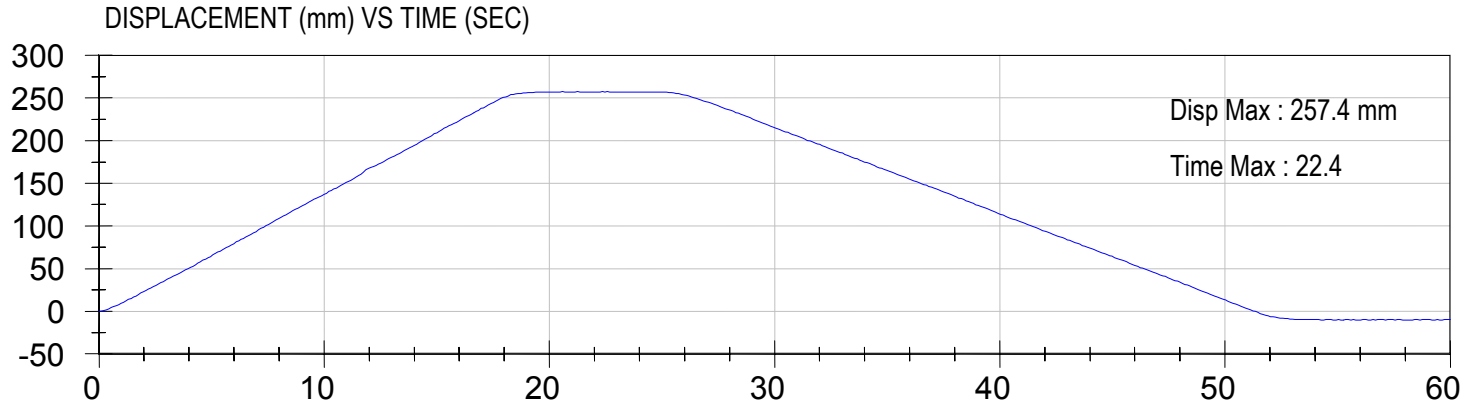


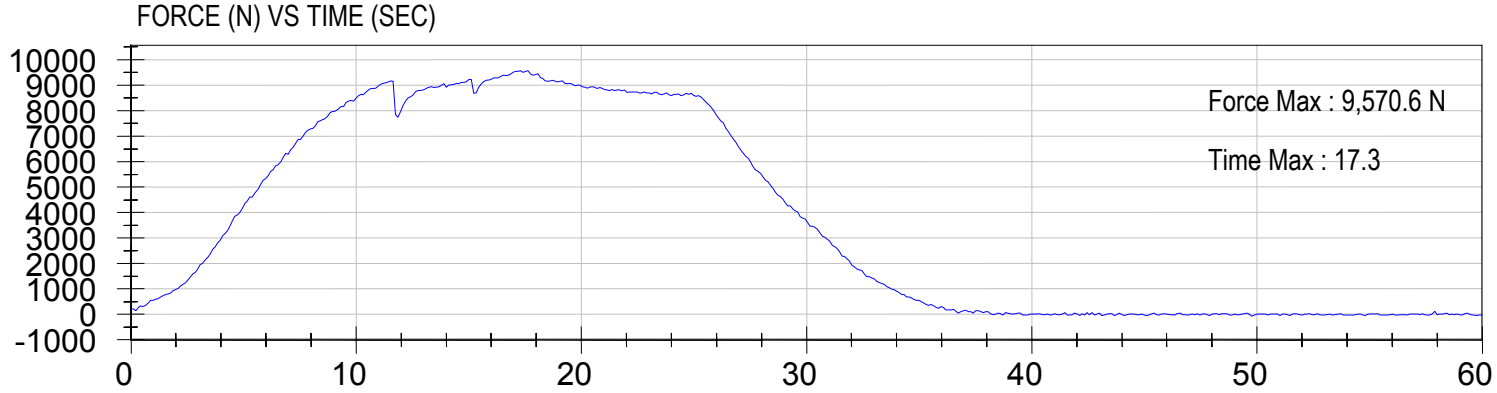


Test Desc: Seat Back Rearward Deflection
Component ID: MD BUS S6

Test Date: 2/20/2007
NHTSA #: C60901

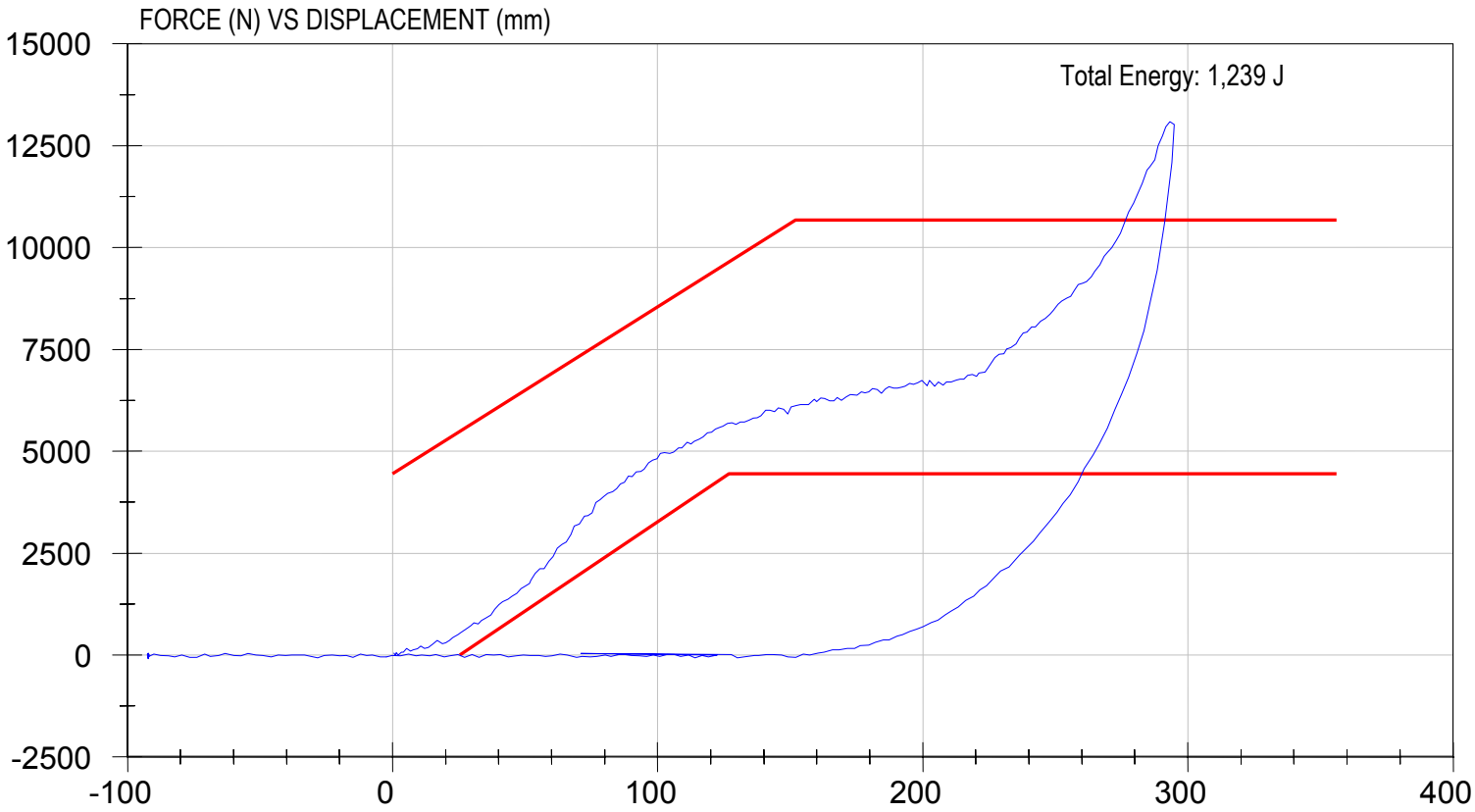


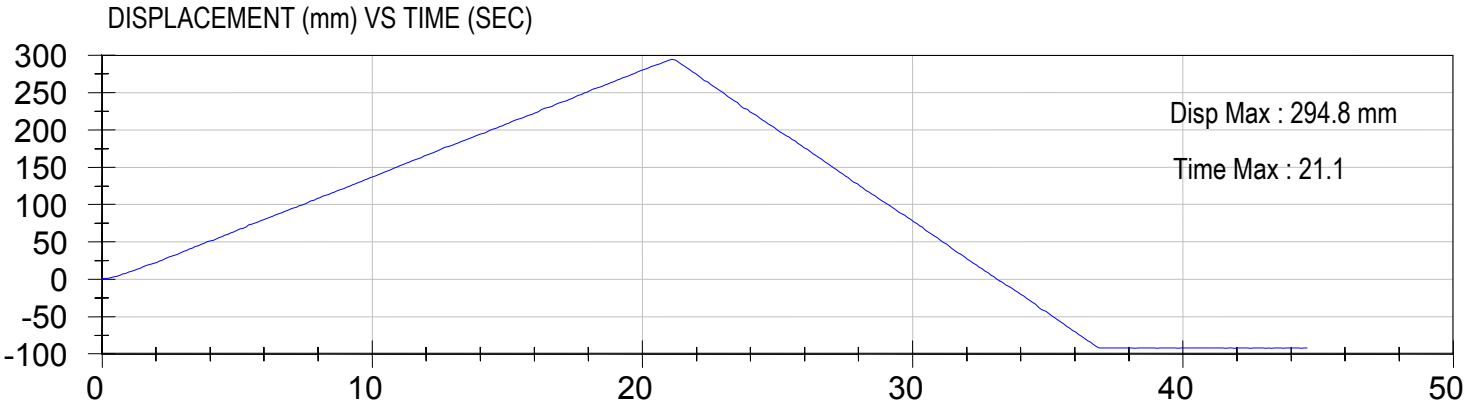


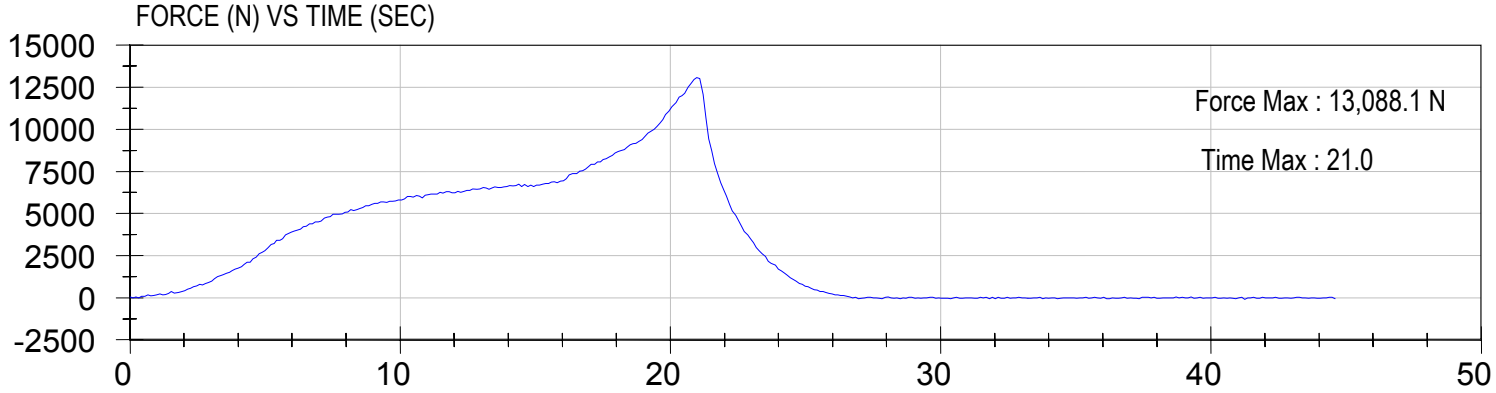


Test Desc: Barrier Forward Deflection (Upper)
Component ID: MID BUS B1

Test Date: 2/22/2007
NHTSA #: C60901



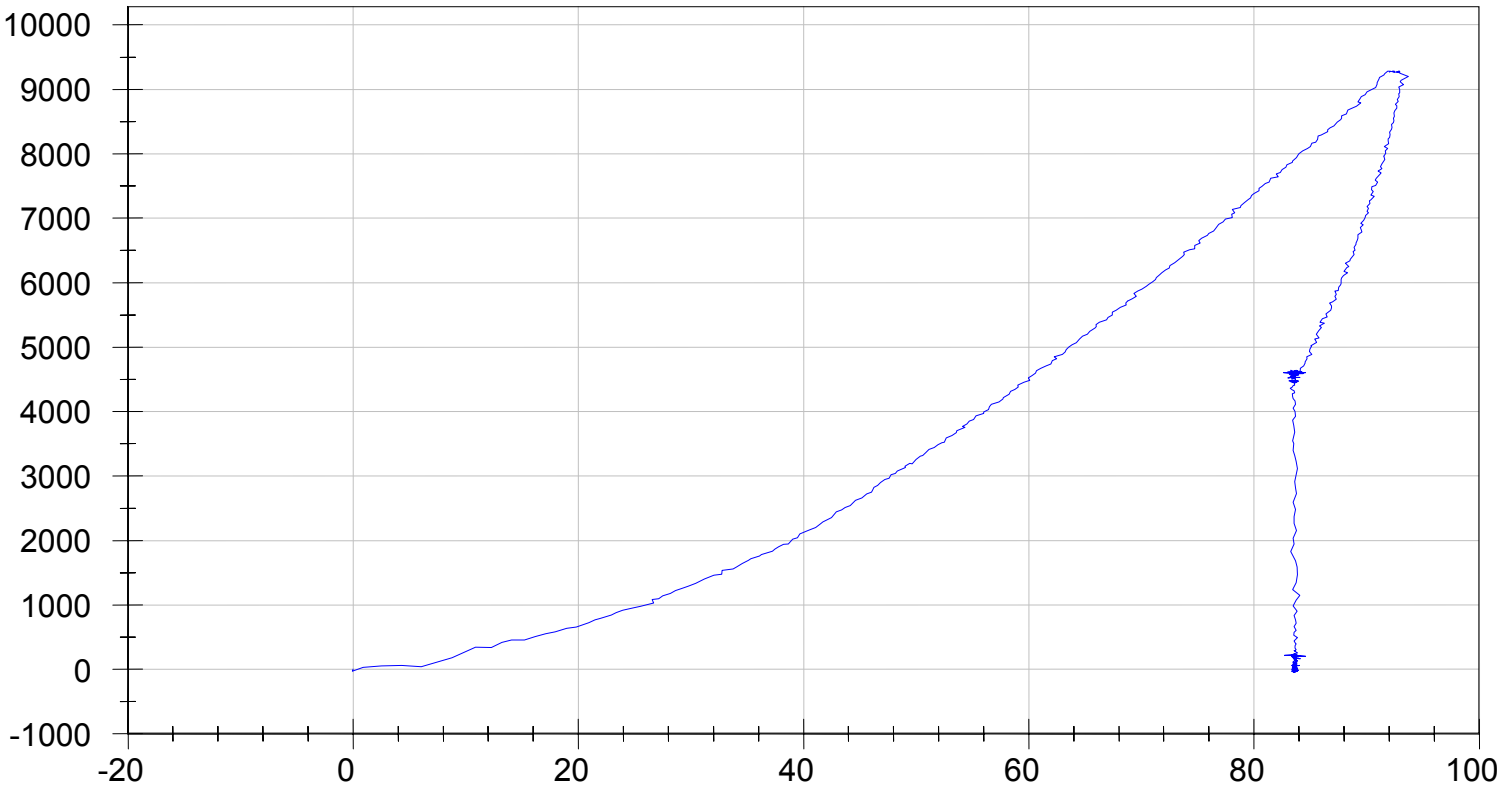




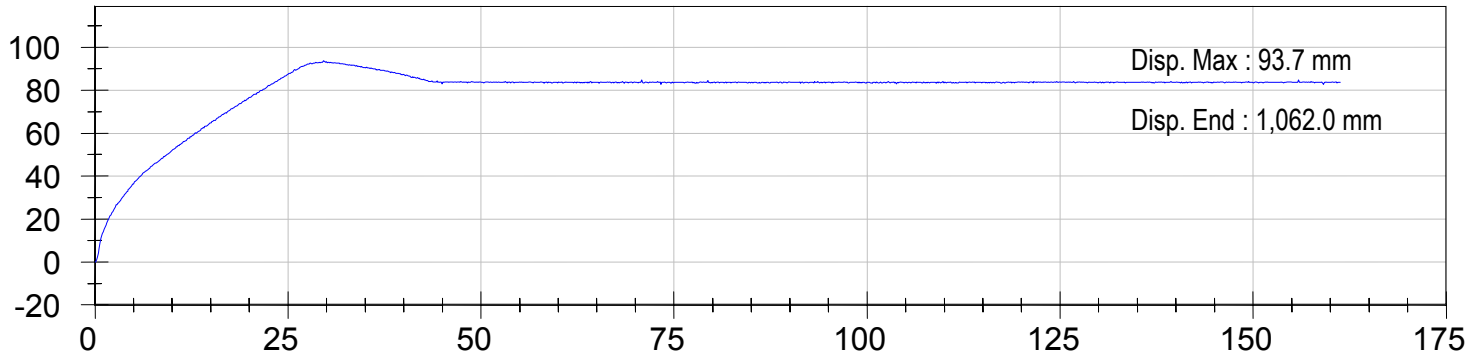
Test Desc: Barrier Forward Deflection (Lower)
Component ID: MID BUS B1

Test Date: 2/22/2007
NHTSA #: C60901

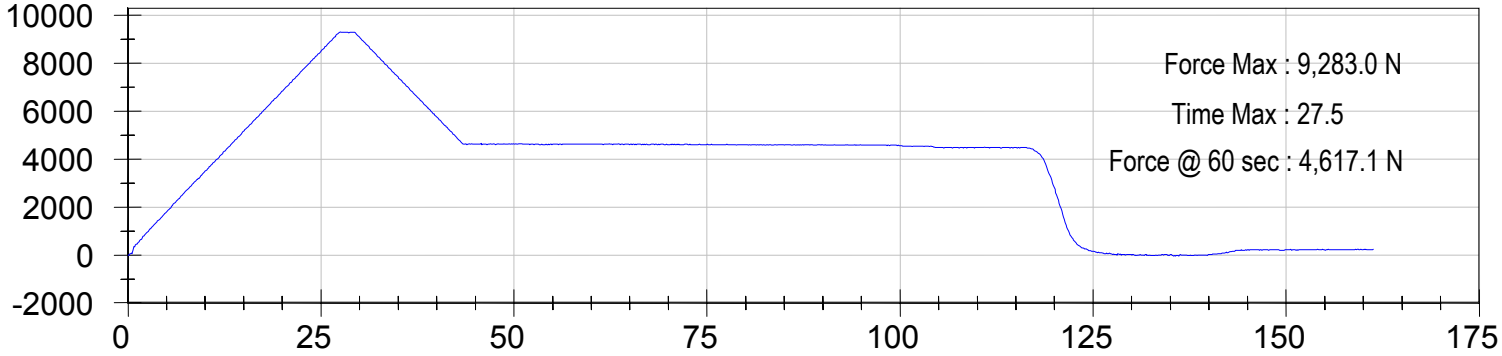
FORCE (N) VS DISPLACEMENT (mm)



DISPLACEMENT (mm) VS TIME (SEC)

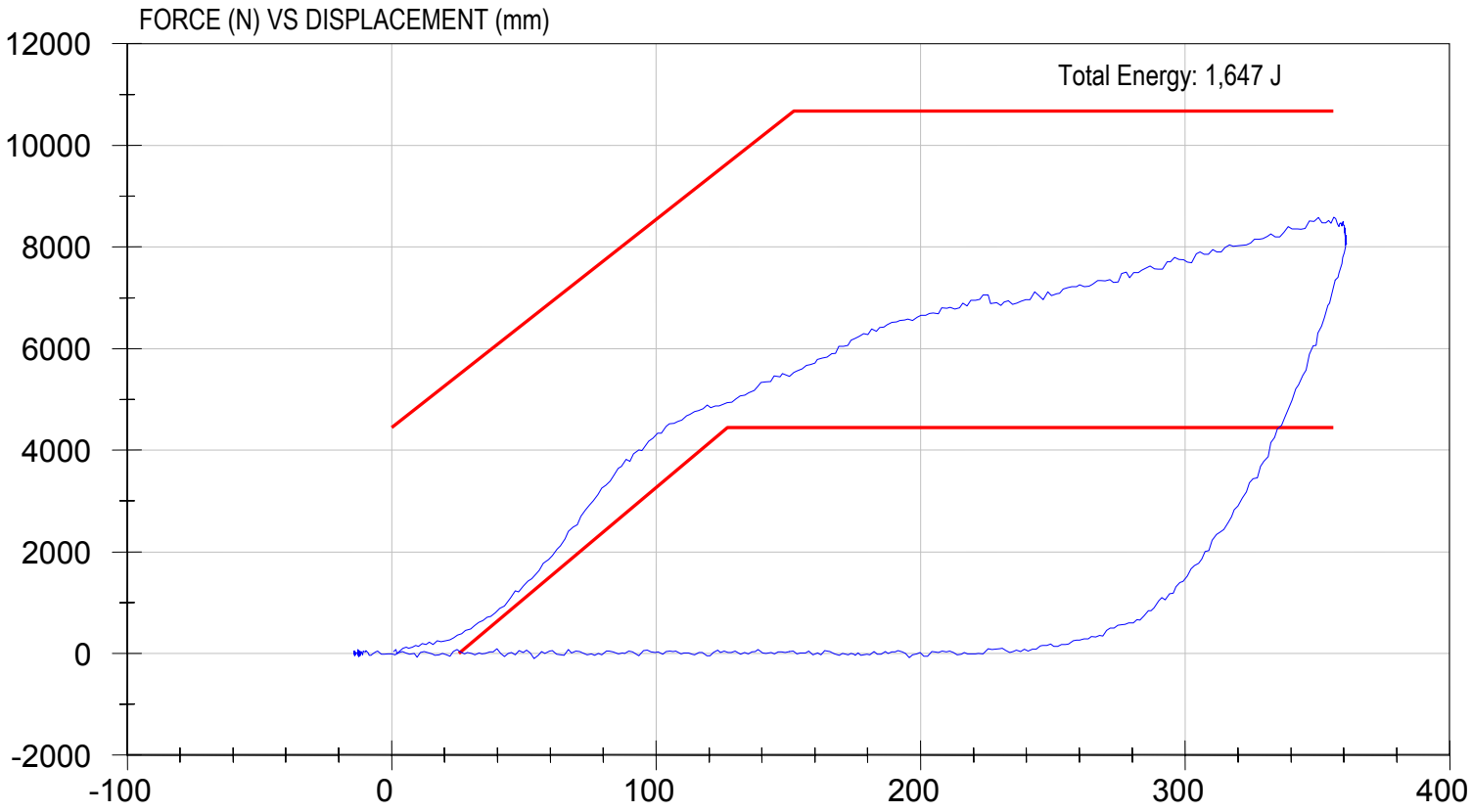


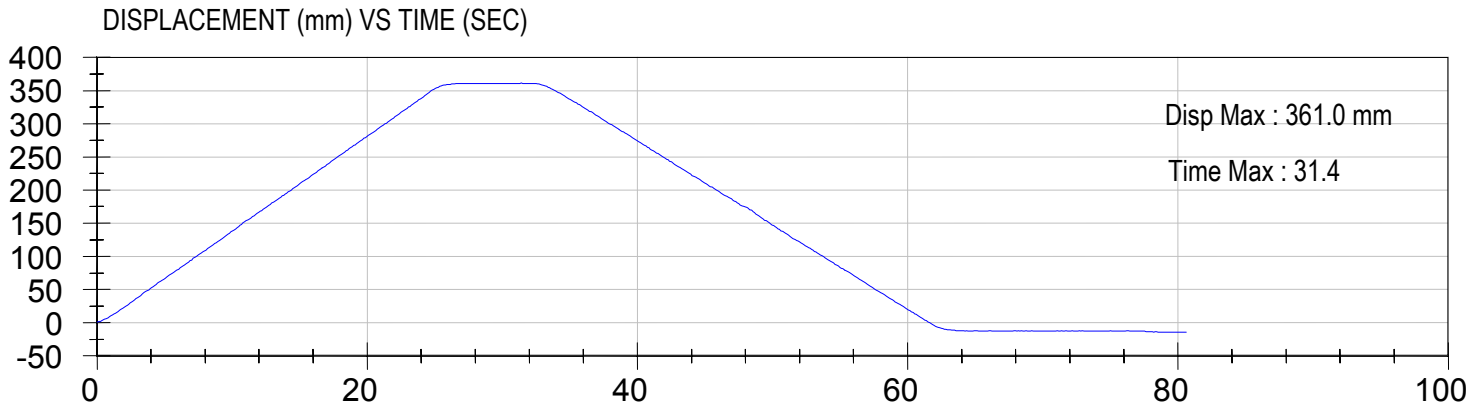
FORCE (N) VS TIME (SEC)

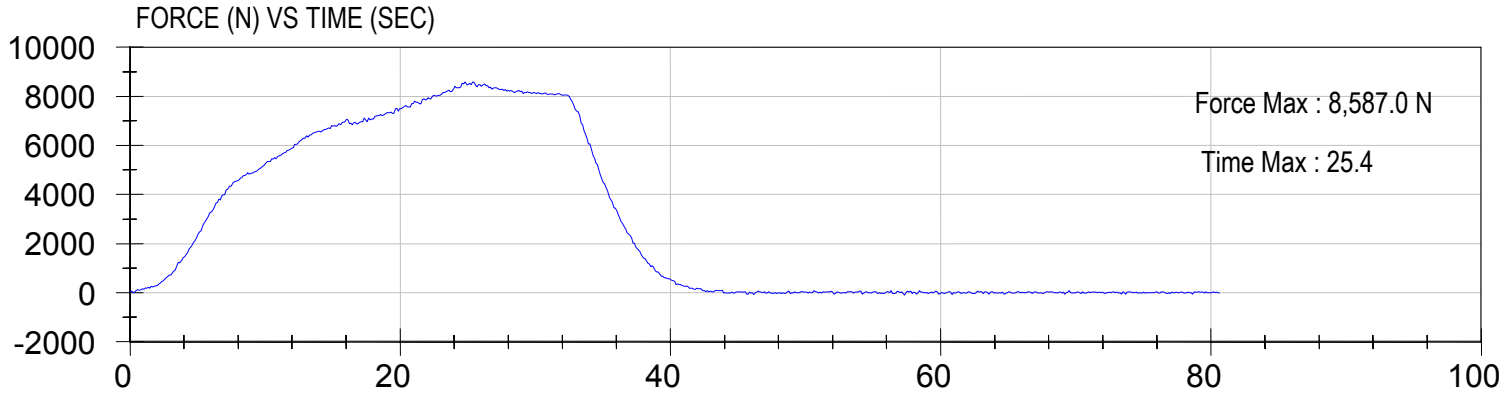


Test Desc: Barrier Forward Deflection (Upper)
Component ID: MID BUS B9

Test Date: 2/21/2007
NHTSA #: C60901



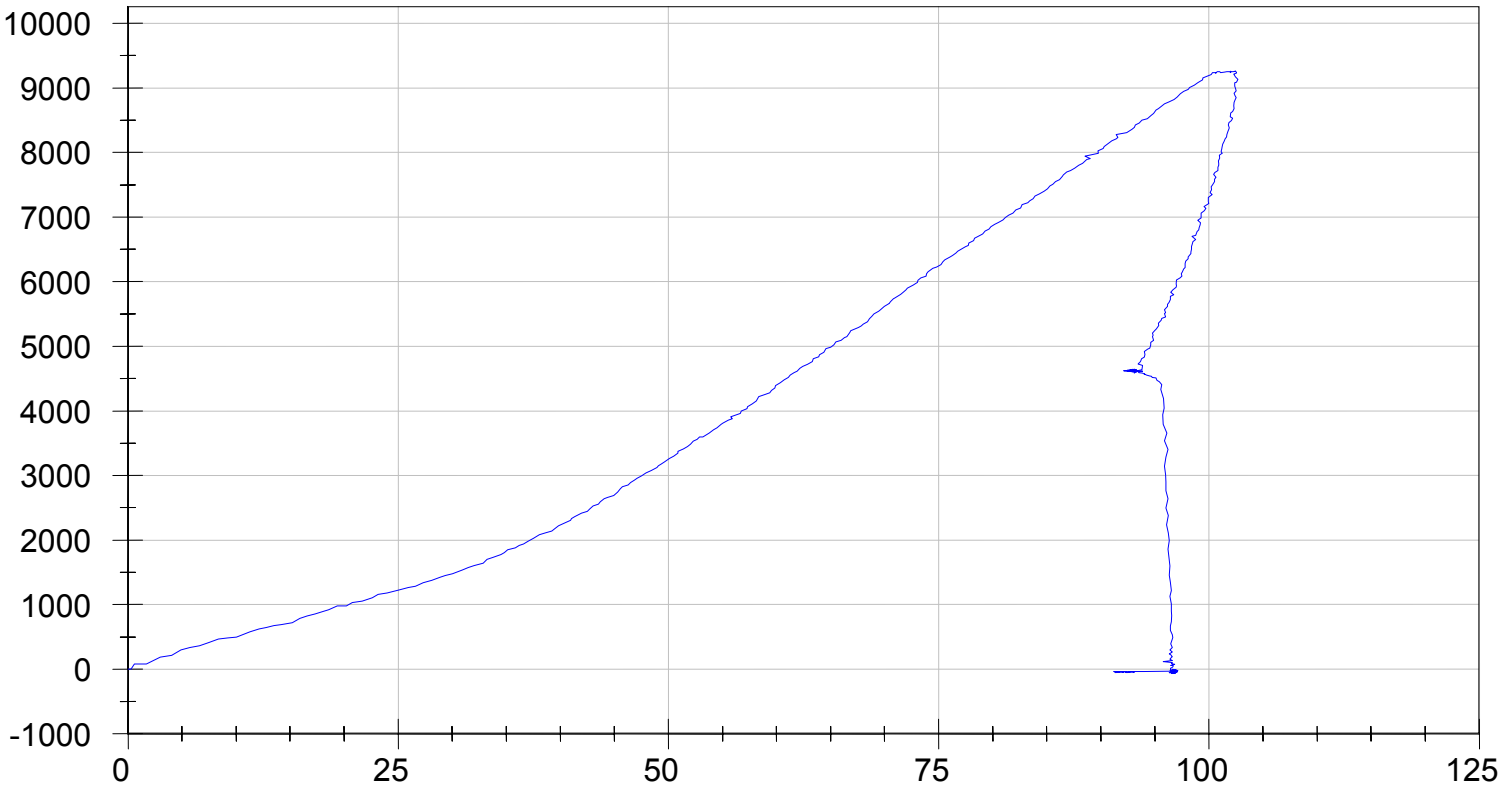




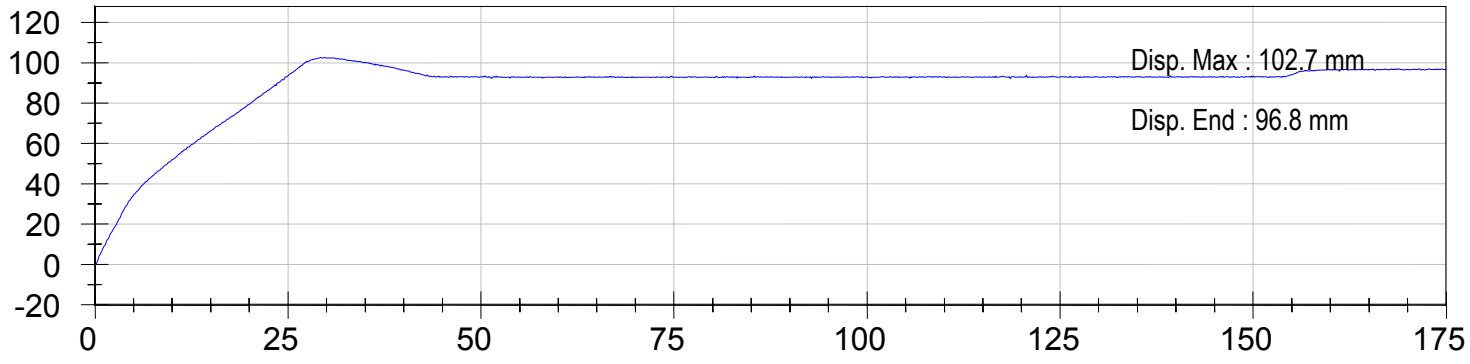
Test Desc: Barrier Forward Deflection (Lower)
Component ID: MID BUS B9

Test Date: 2/21/2007
NHTSA #: C60901

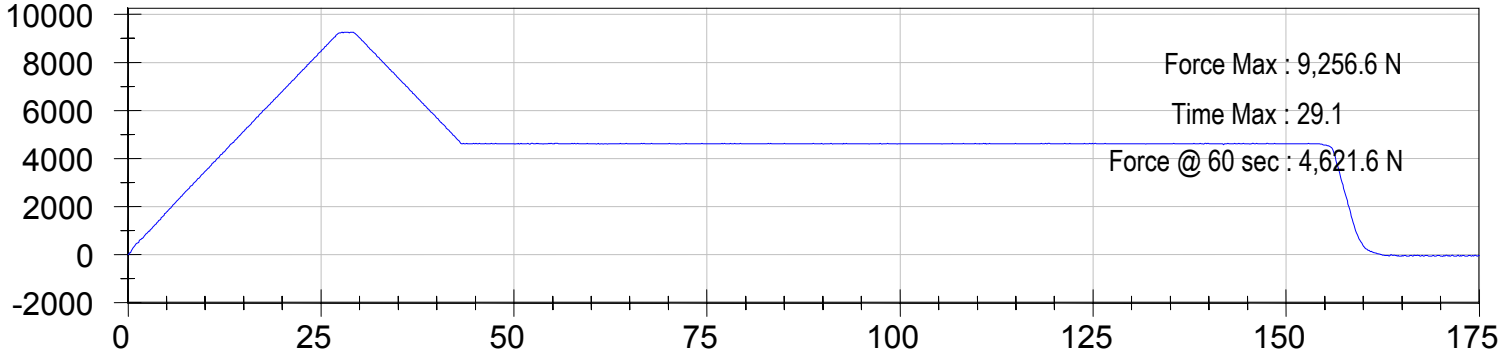
FORCE (N) VS DISPLACEMENT (mm)



DISPLACEMENT (mm) VS TIME (SEC)



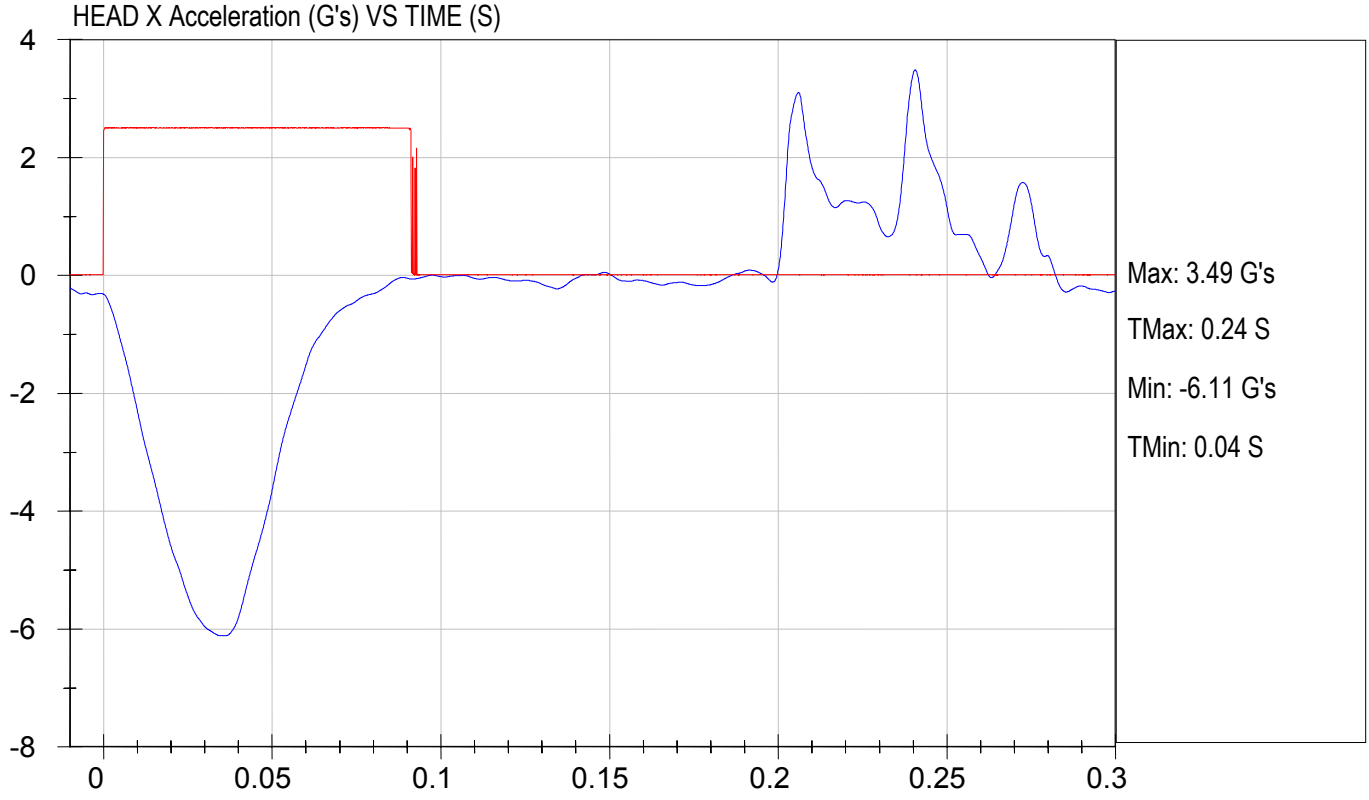
FORCE (N) VS TIME (SEC)



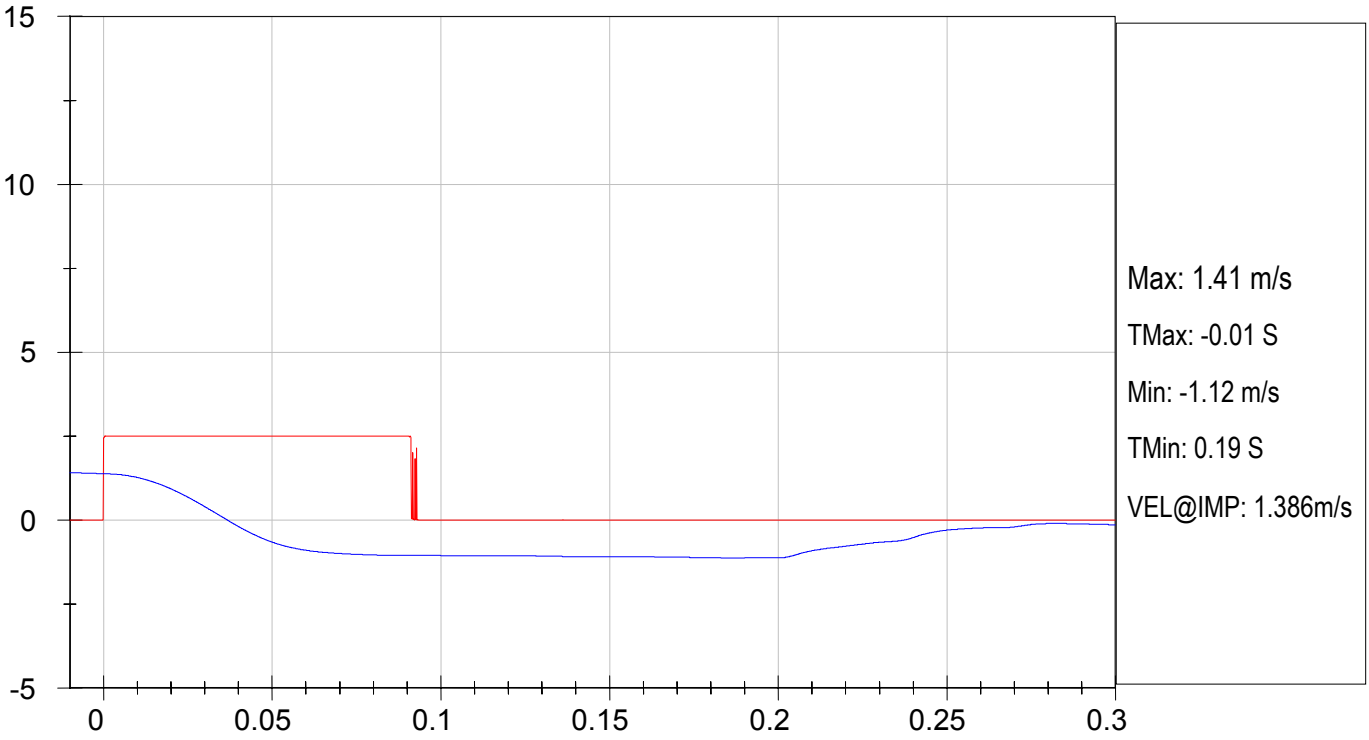
Test Desc: Head Form Impact (1.5 m/s)
Component ID: MID BUS S2; Location H1

Test Date: 2/27/2007
NHTSA #: C60901

HEAD X Acceleration (G's) VS TIME (S)



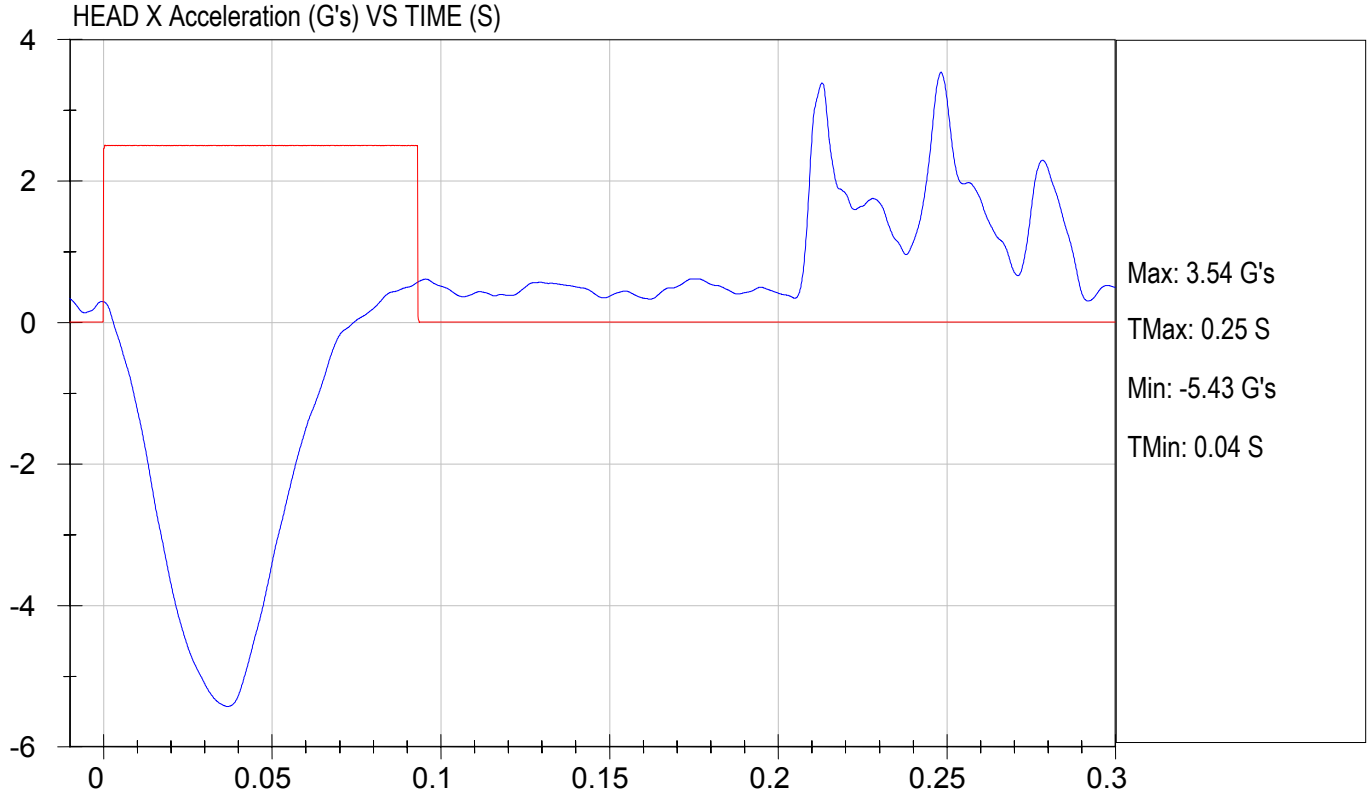
VELOCITY X (m/s) VS TIME (S)



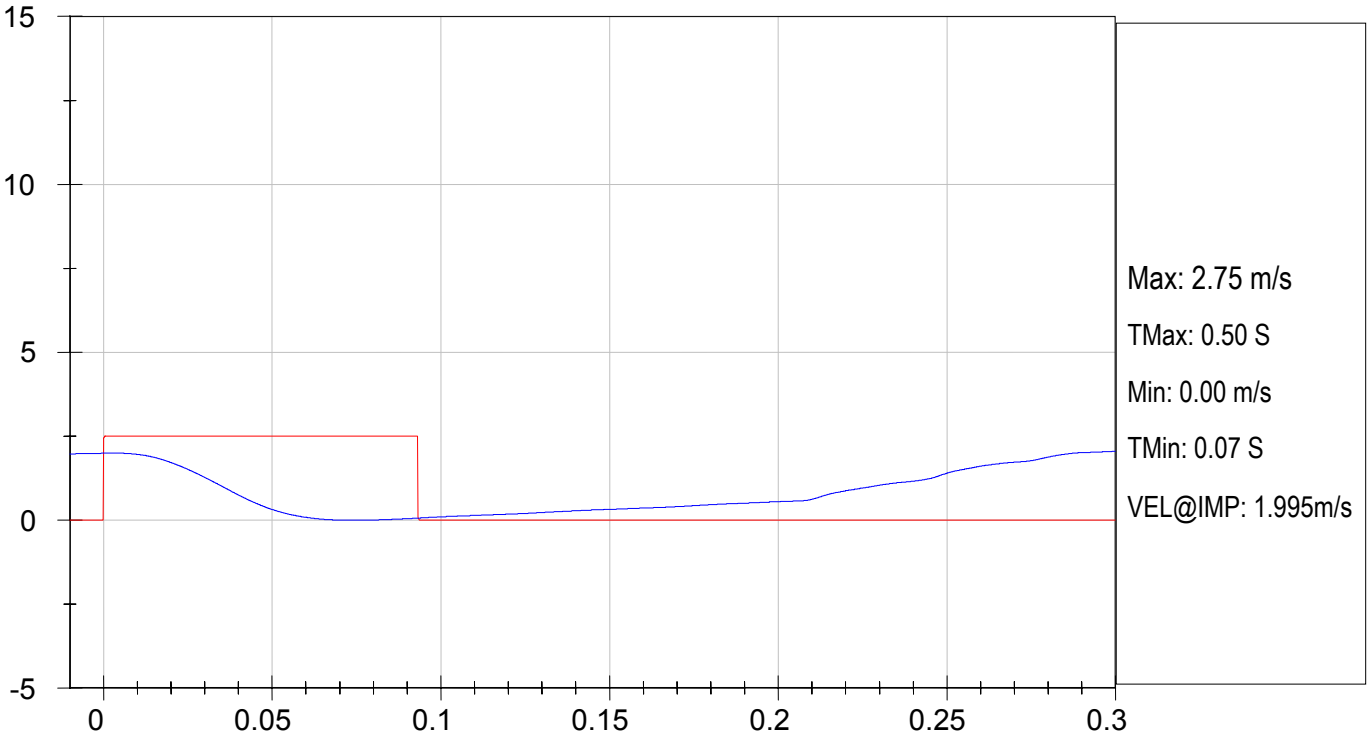
Test Desc: Head Form Impact (1.5 m/s)
Component ID: MID BUS S2; Location H2

Test Date: 2/27/2007
NHTSA #: C60901

HEAD X Acceleration (G's) VS TIME (S)



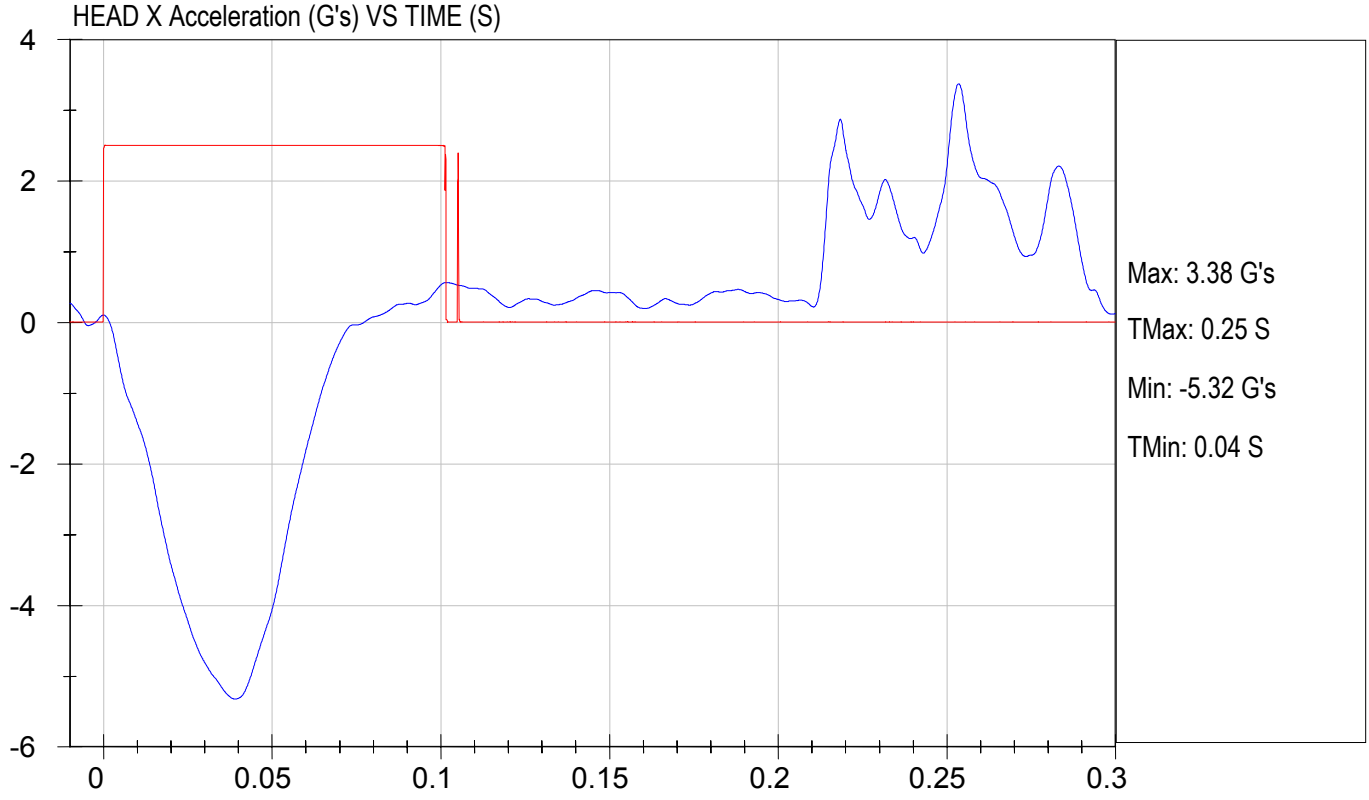
VELOCITY X (m/s) VS TIME (S)



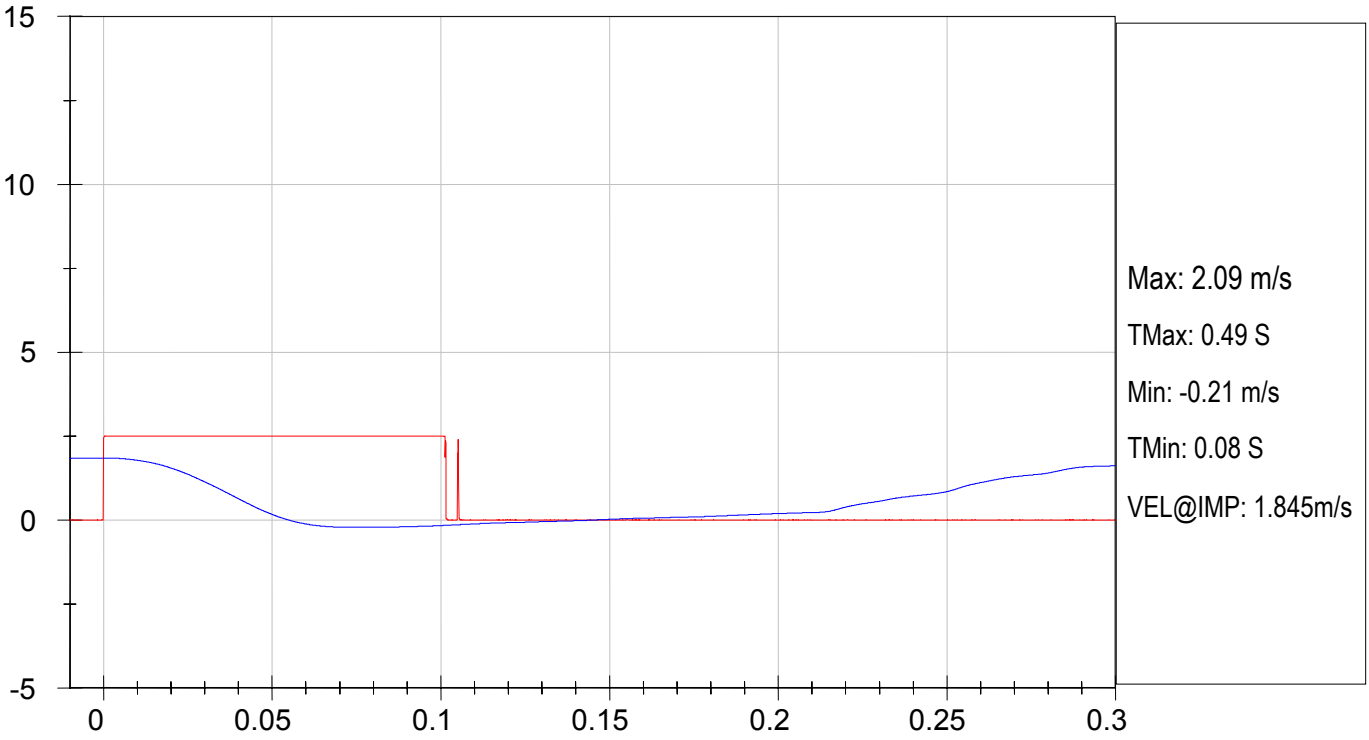
Test Desc: Head Form Impact (1.5 m/s)
Component ID: MID BUS S2; Location H3

Test Date: 2/27/2007
NHTSA #: C60901

HEAD X Acceleration (G's) VS TIME (S)



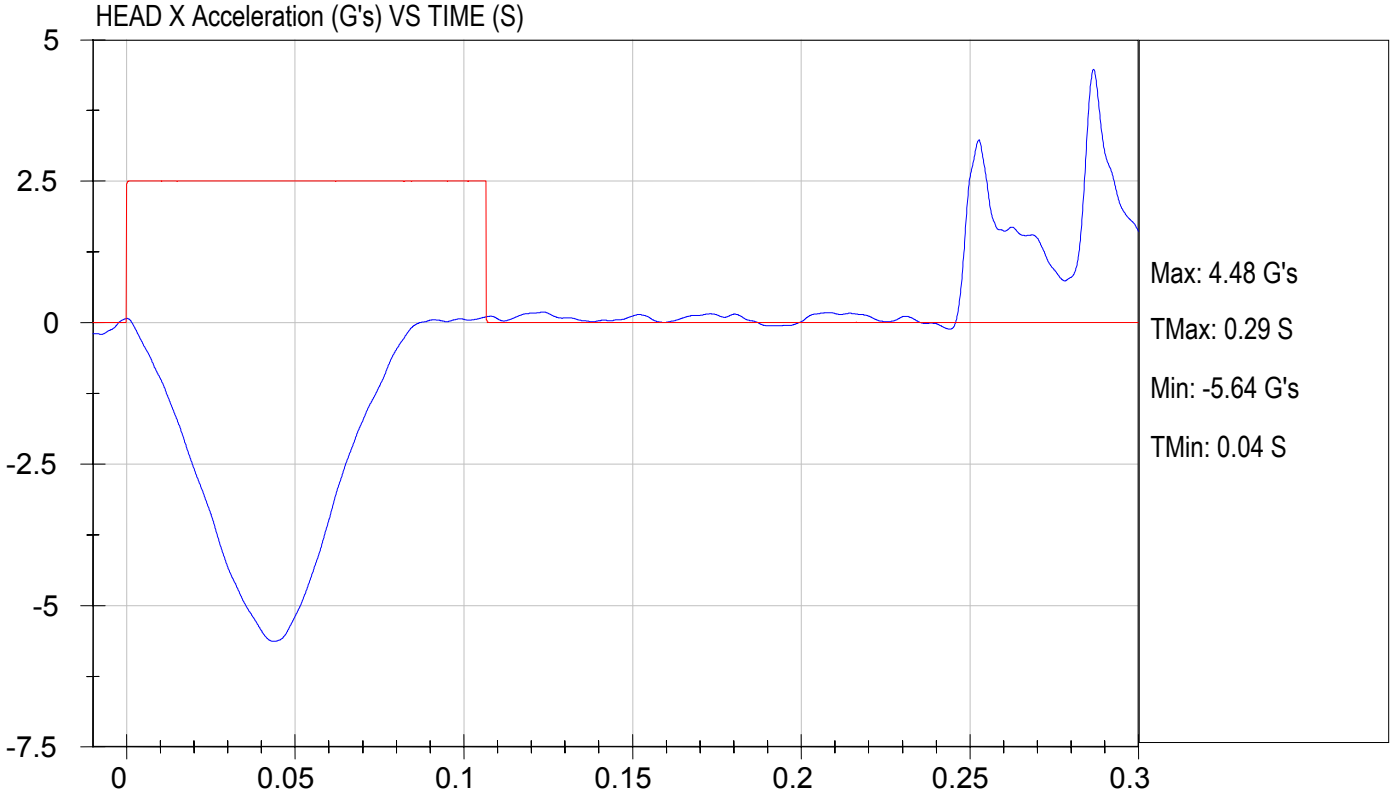
VELOCITY X (m/s) VS TIME (S)



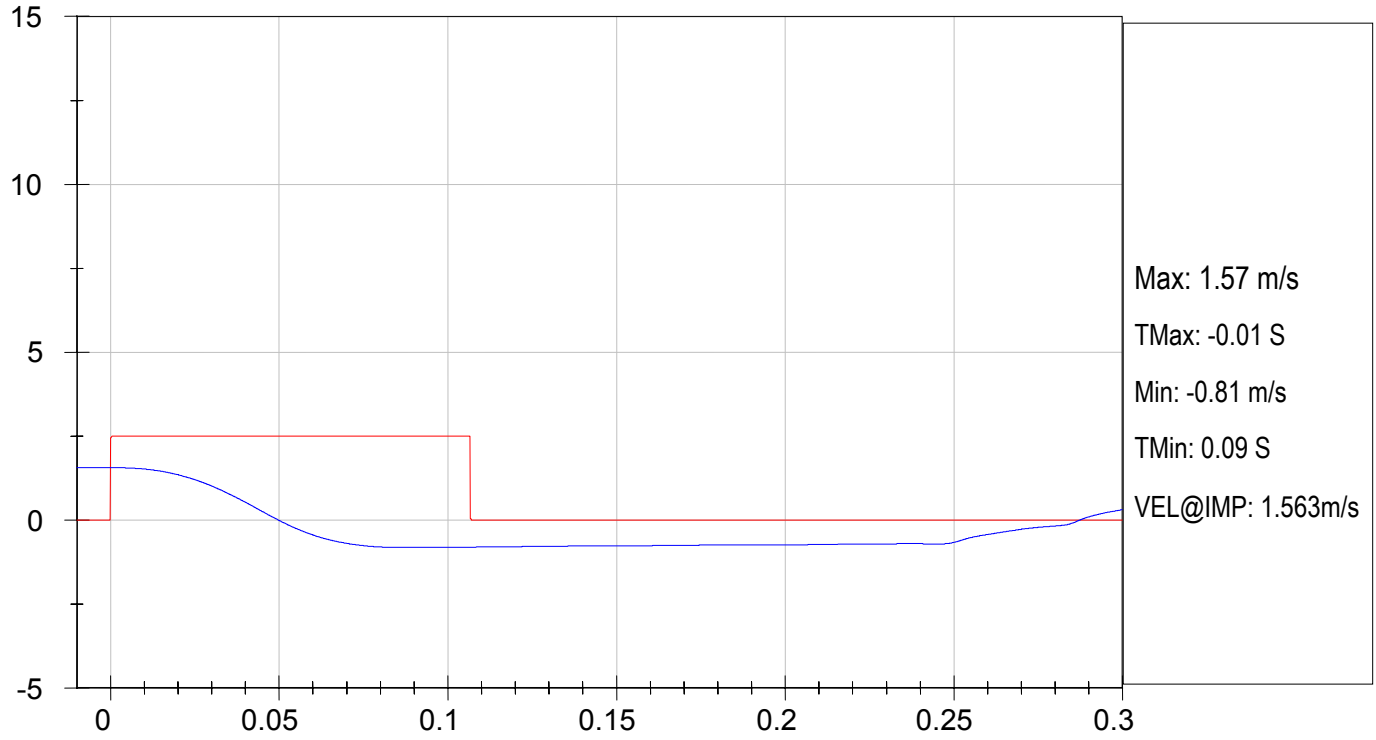
Test Desc: Head Form Impact (1.5 m/s)
Component ID: MID BUS S2, Location H4

Test Date: 2/27/2007
NHTSA #: C60901

HEAD X Acceleration (G's) VS TIME (S)



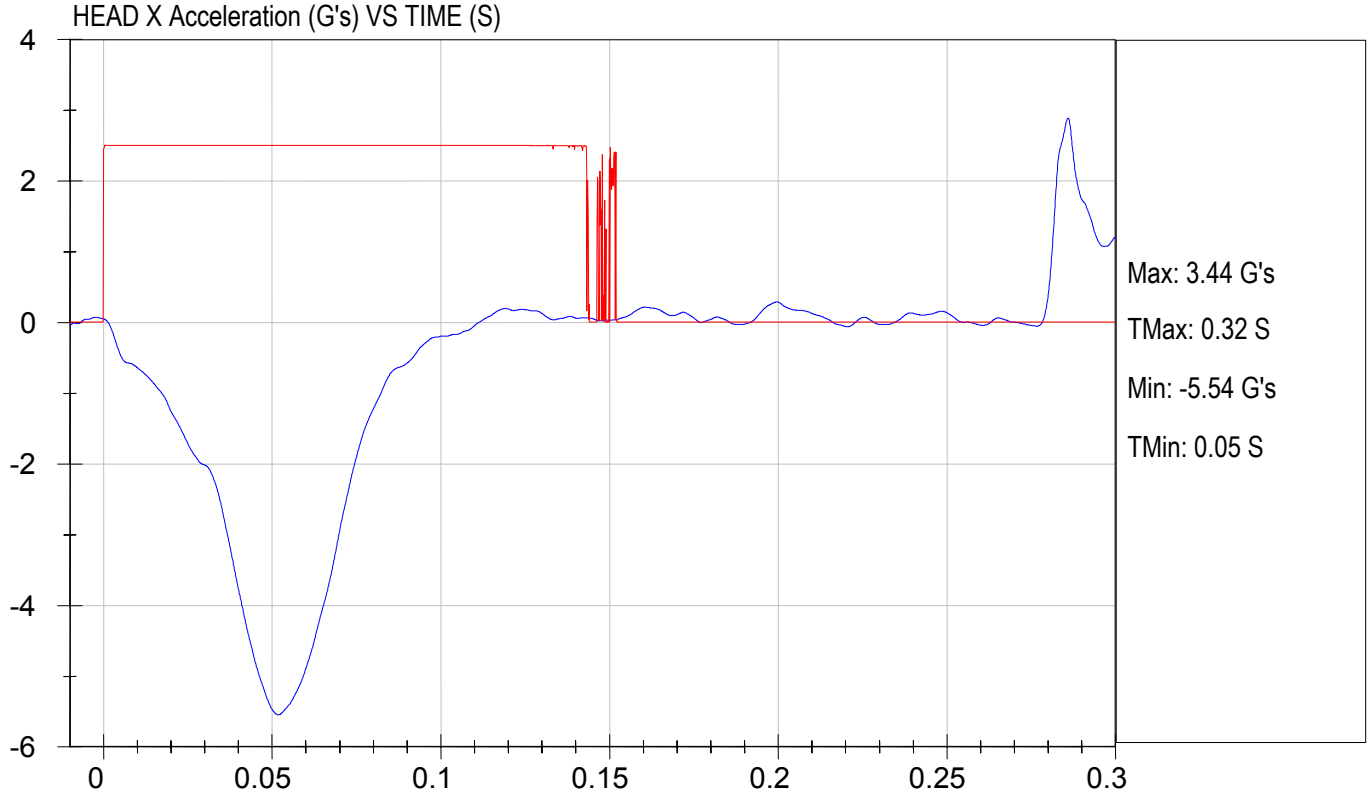
VELOCITY X (m/s) VS TIME (S)



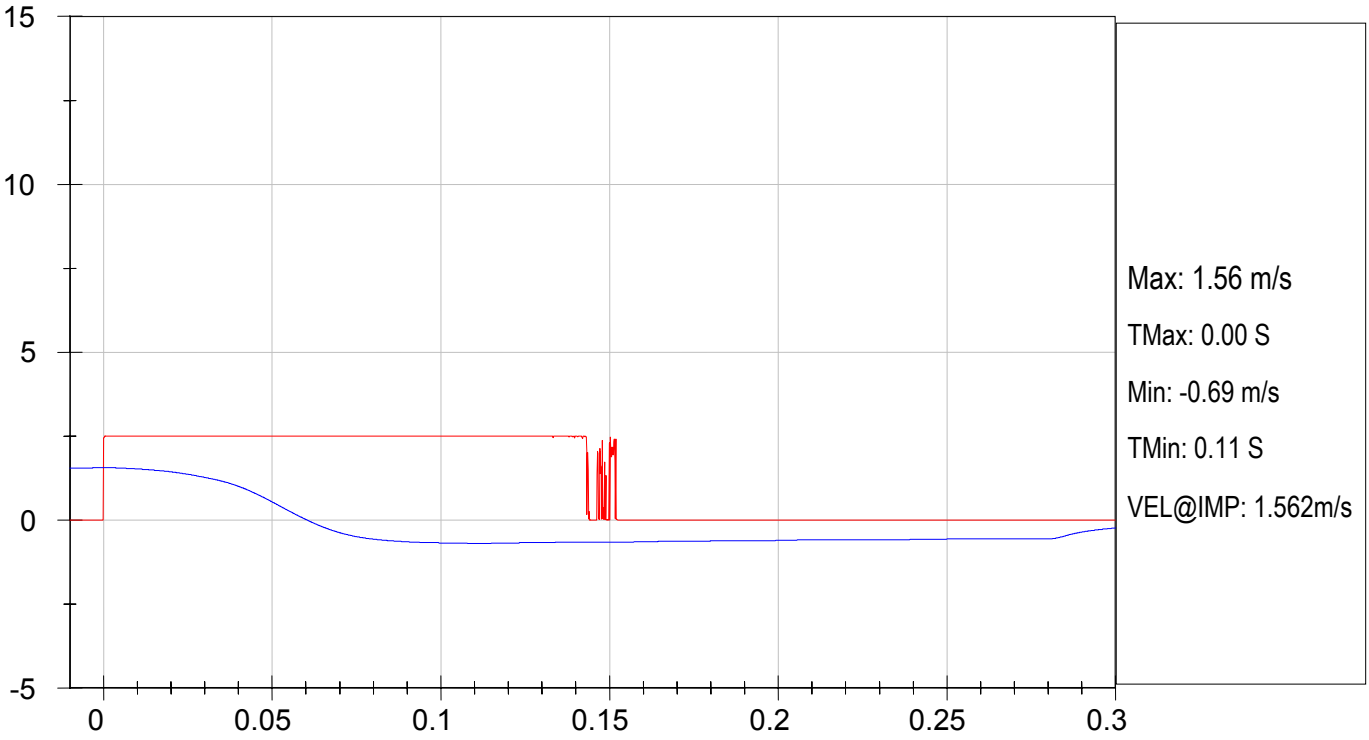
Test Desc: Head Form Impact (1.5 m/s)
Component ID: MID BUS S2, Location H5

Test Date: 2/27/2007
NHTSA #: C60901

HEAD X Acceleration (G's) VS TIME (S)



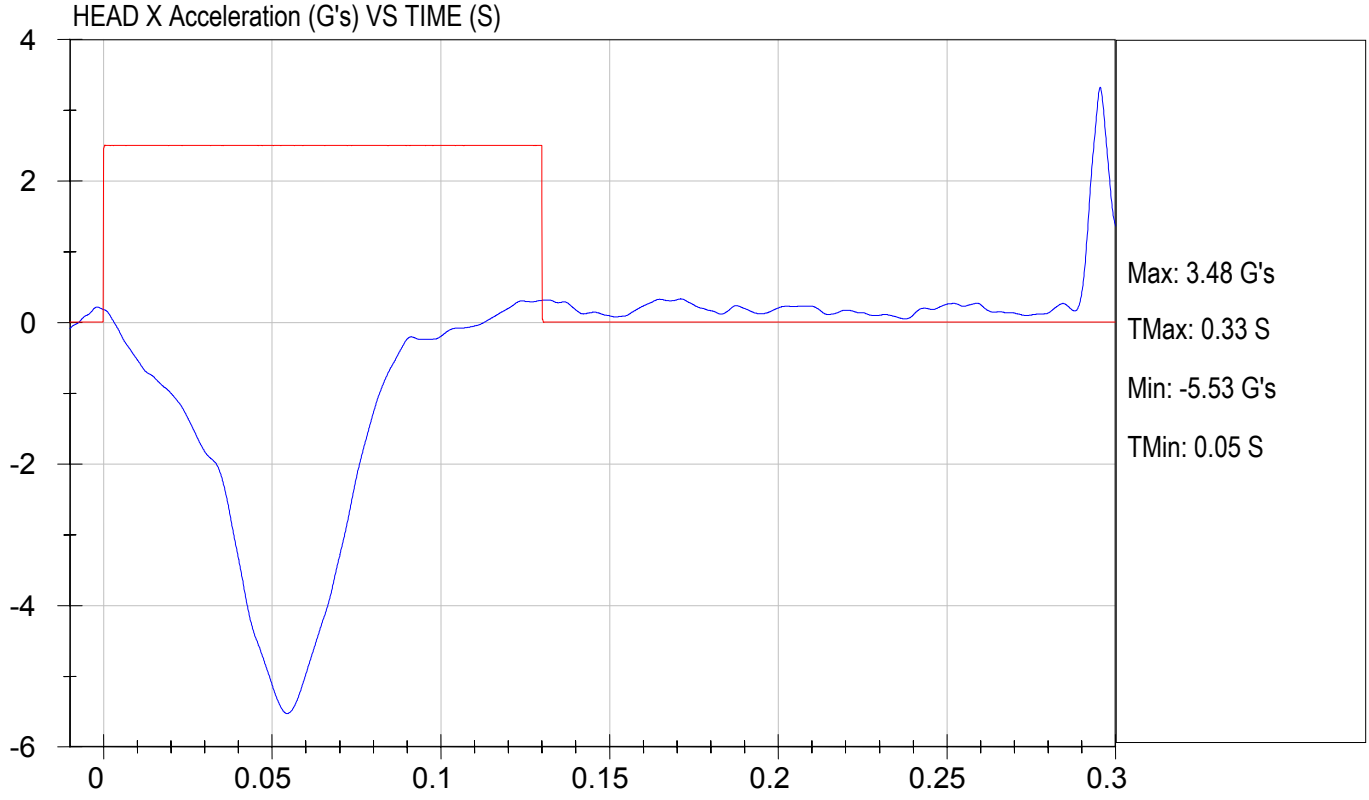
VELOCITY X (m/s) VS TIME (S)



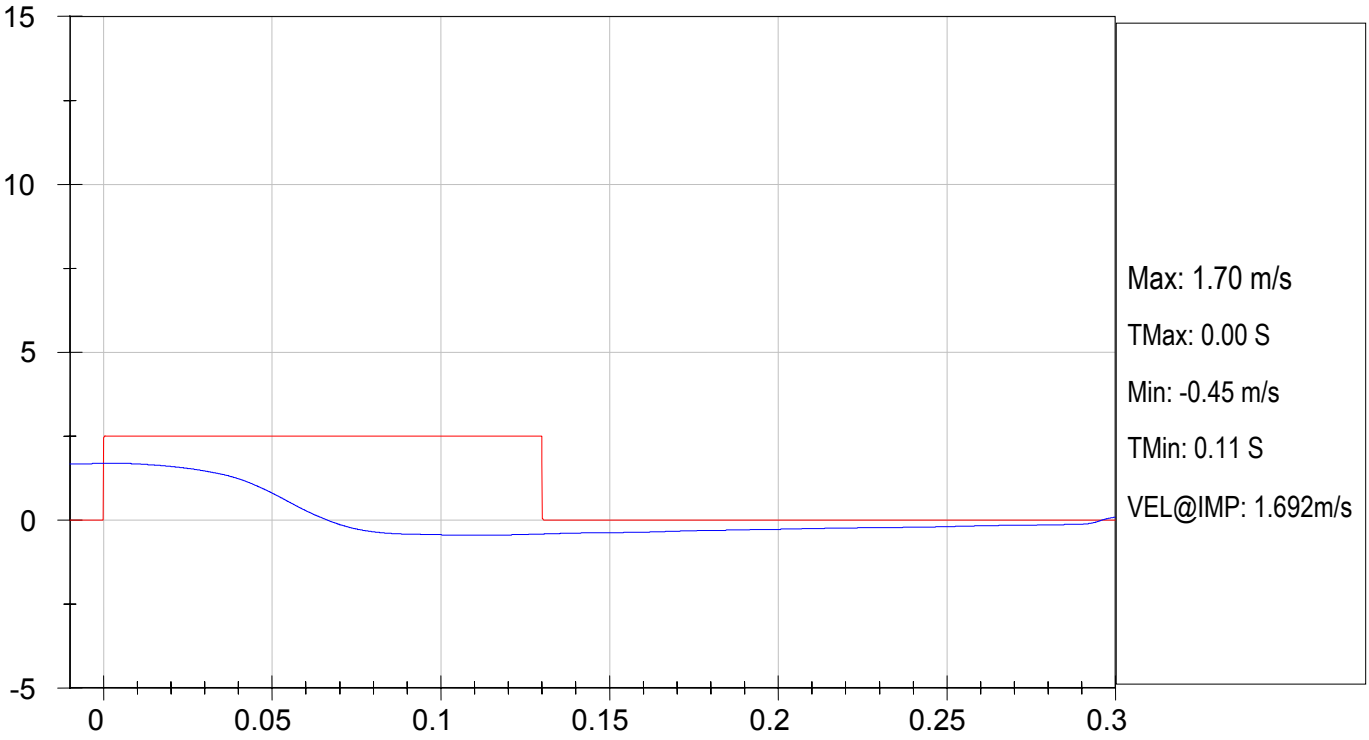
Test Desc: Head Form Impact (1.5 m/s)
Component ID: MID BUS S2; Location H6

Test Date: 2/27/2007
NHTSA #: C60901

HEAD X Acceleration (G's) VS TIME (S)



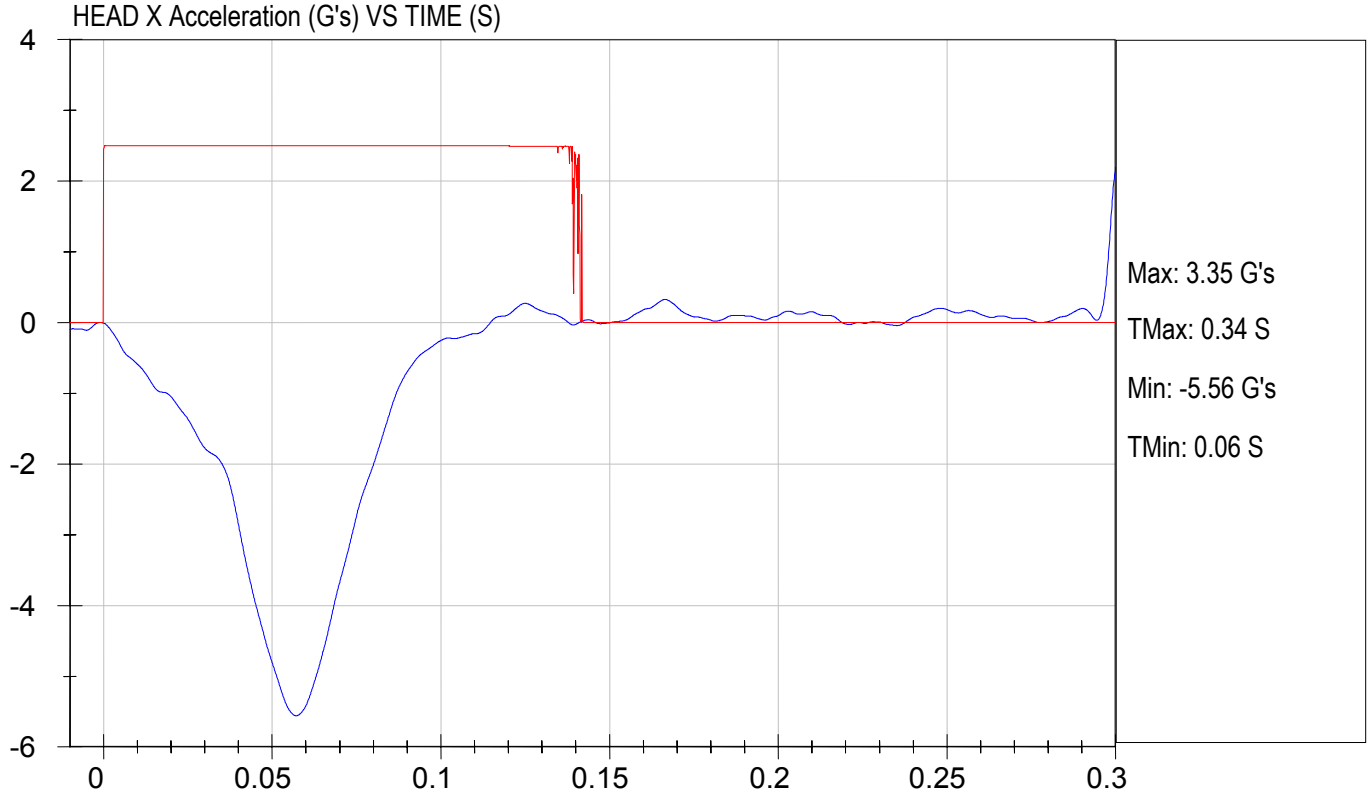
VELOCITY X (m/s) VS TIME (S)



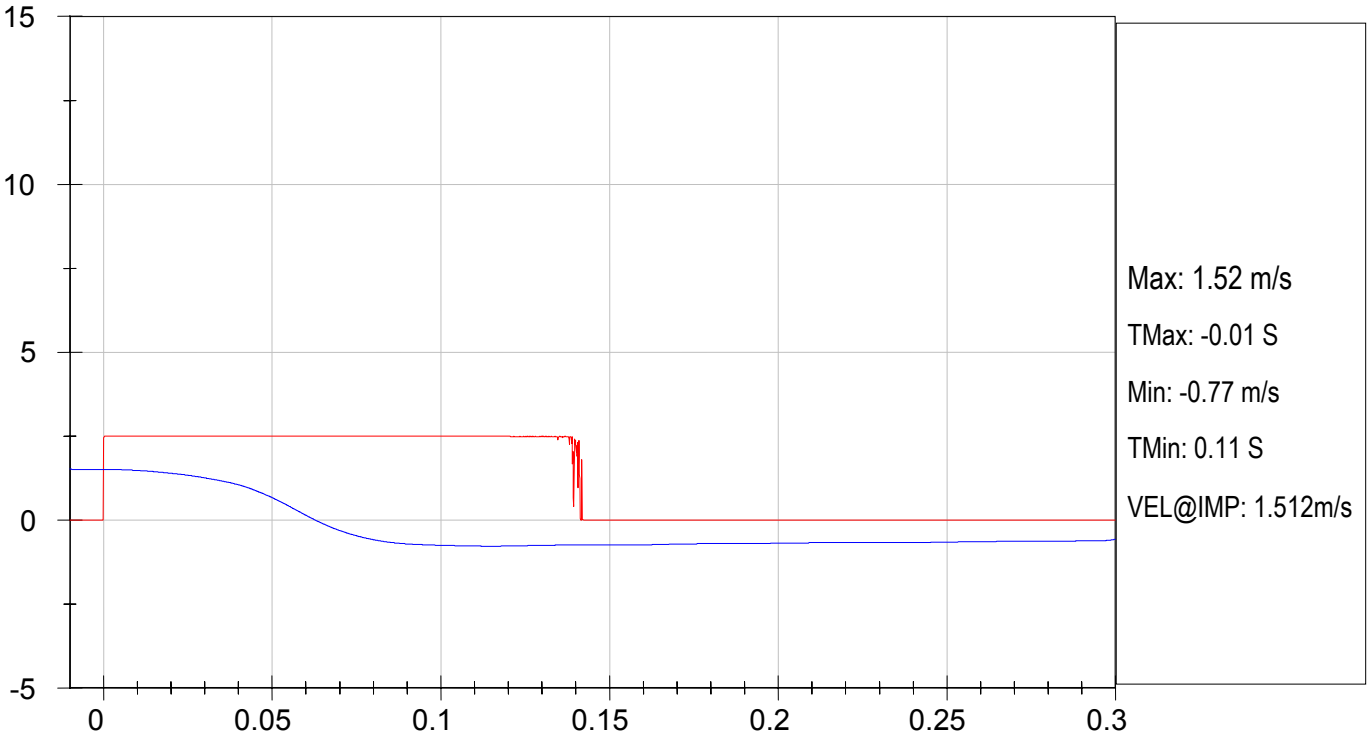
Test Desc: Head Form Impact (1.5 m/s)
Component ID: MID BUS S2: Location H7

Test Date: 2/27/2007
NHTSA #: C60901

HEAD X Acceleration (G's) VS TIME (S)



VELOCITY X (m/s) VS TIME (S)

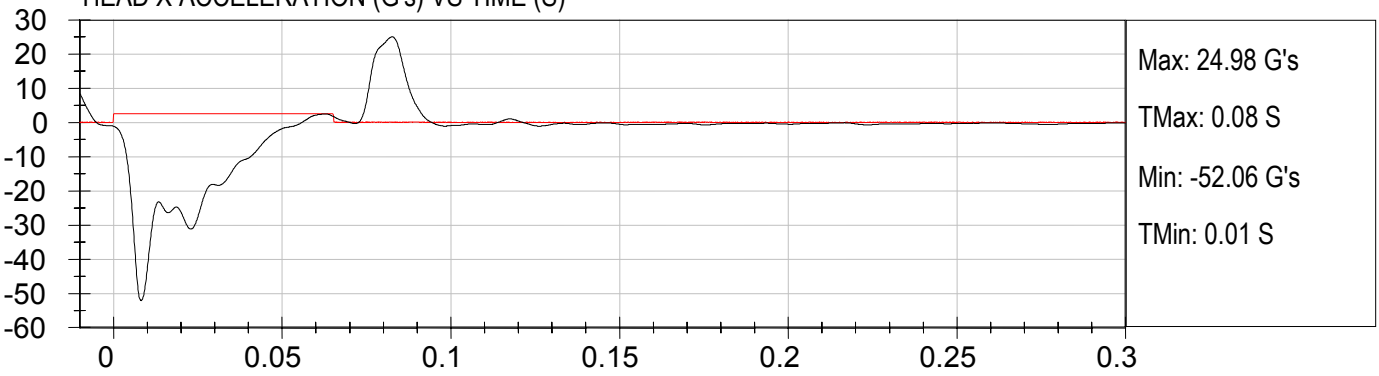


Test Desc: Head Form Impact (6.69 m/s)
Component ID: MID BUS S2; Location H8

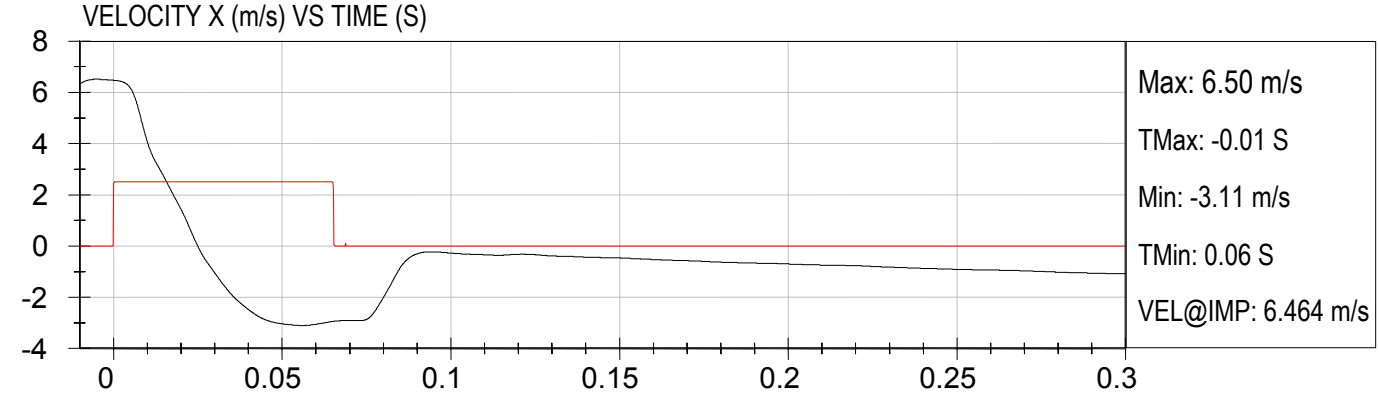
Test Date: 2/26/2007
NHTSA#: C60901

HEAD X ACCELERATION (G's) VS TIME (S)

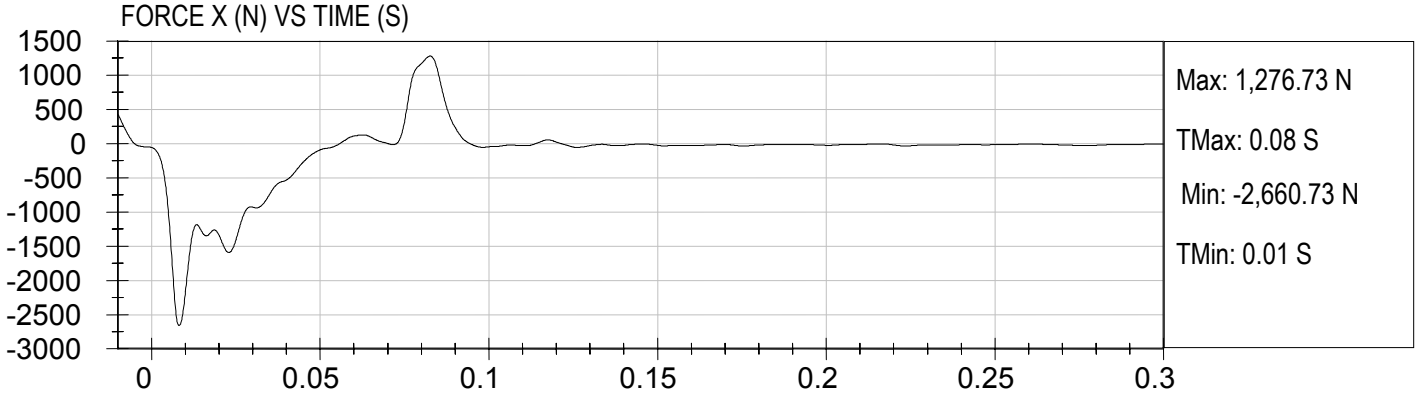
Hic: 118.63 T1: 4.80 ms T2: 33.60 ms



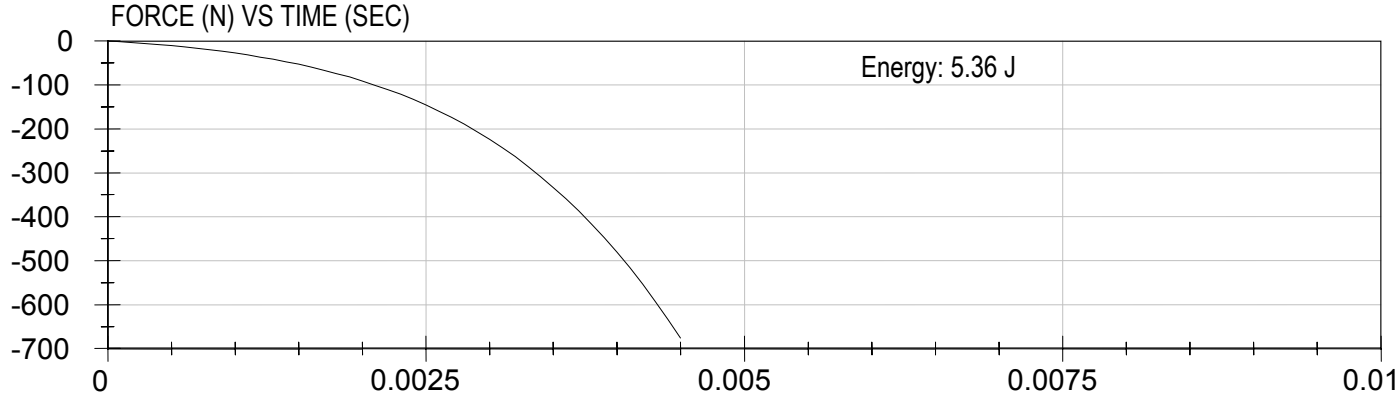
VELOCITY X (m/s) VS TIME (S)



FORCE X (N) VS TIME (S)



FORCE (N) VS TIME (SEC)



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

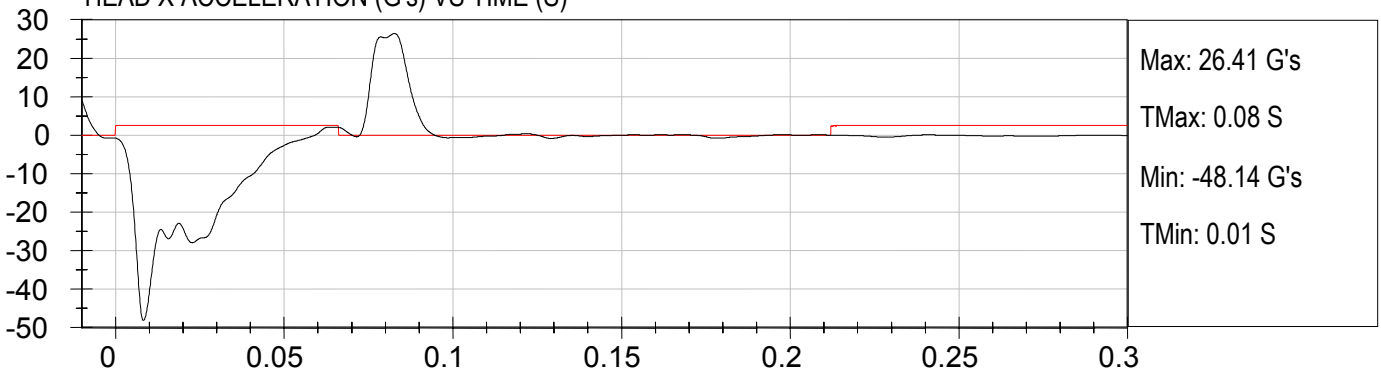
Component ID: MID BUS S2; Location H9

Test Date: 2/26/2007

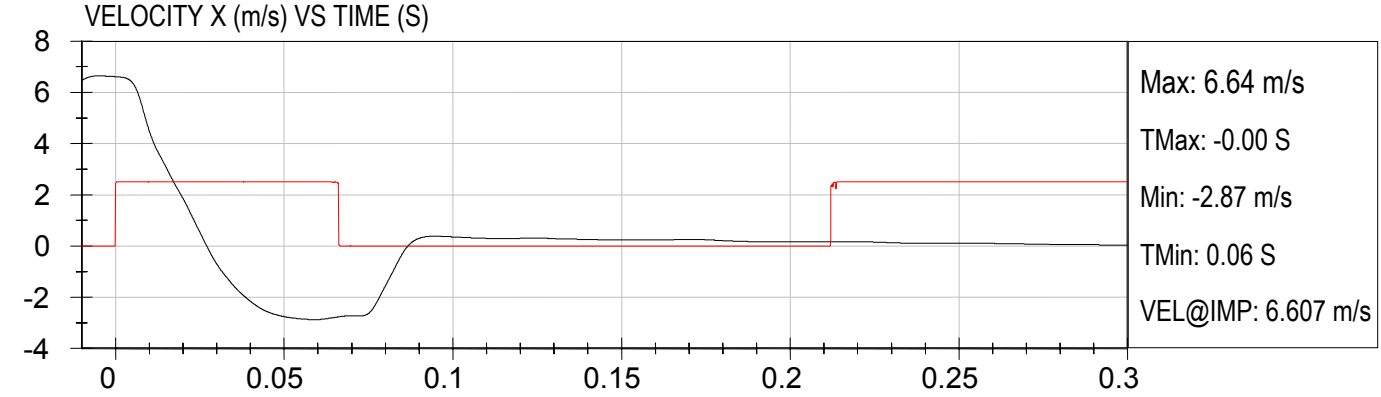
NHTSA#: C60901

Hic: 113.18 T1: 5.10 ms T2: 32.80 ms

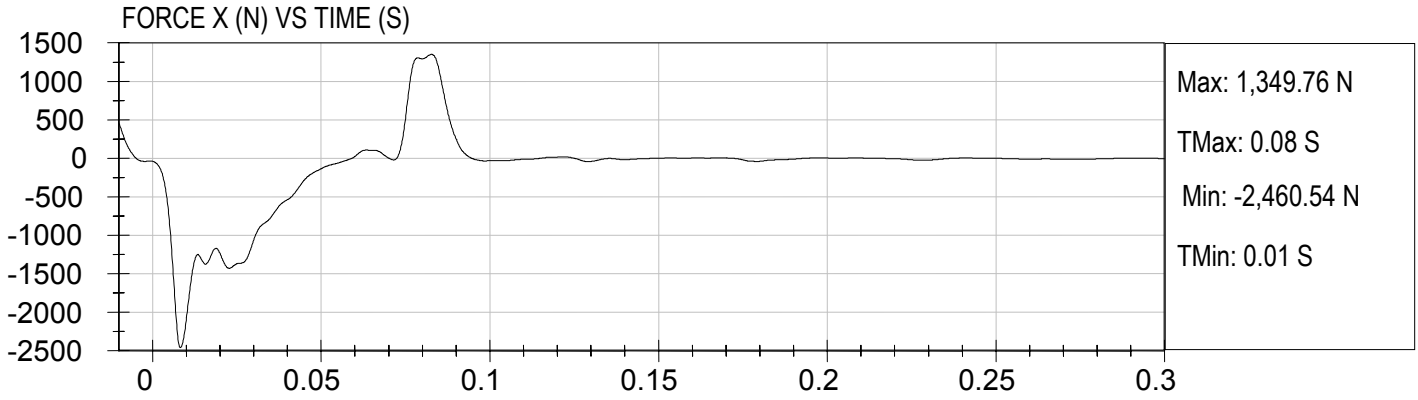
HEAD X ACCELERATION (G's) VS TIME (S)



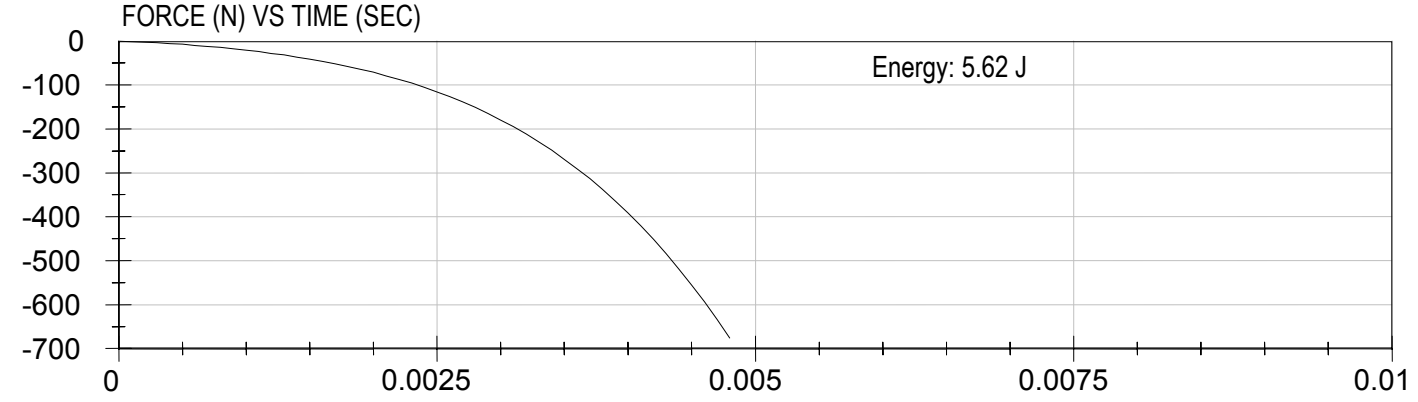
VELOCITY X (m/s) VS TIME (S)



FORCE X (N) VS TIME (S)



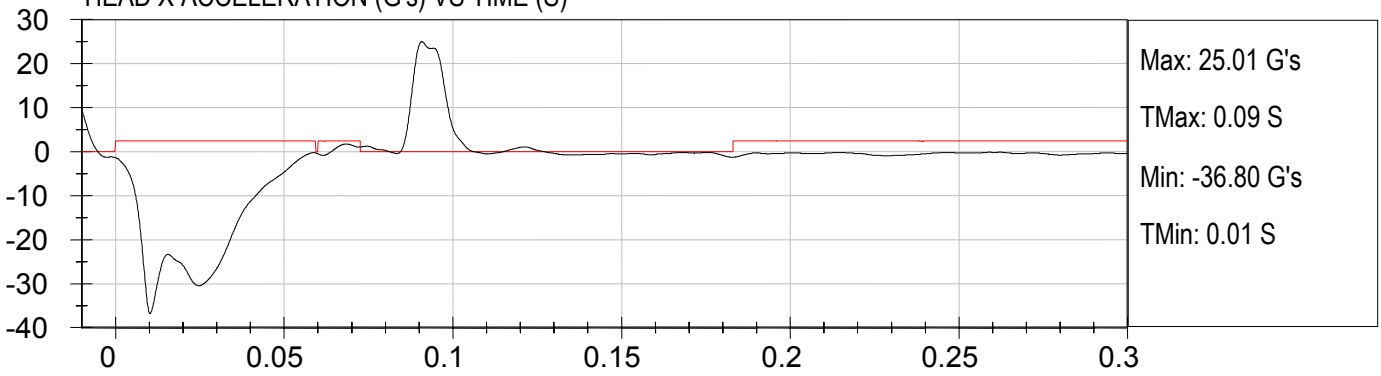
FORCE (N) VS TIME (SEC)



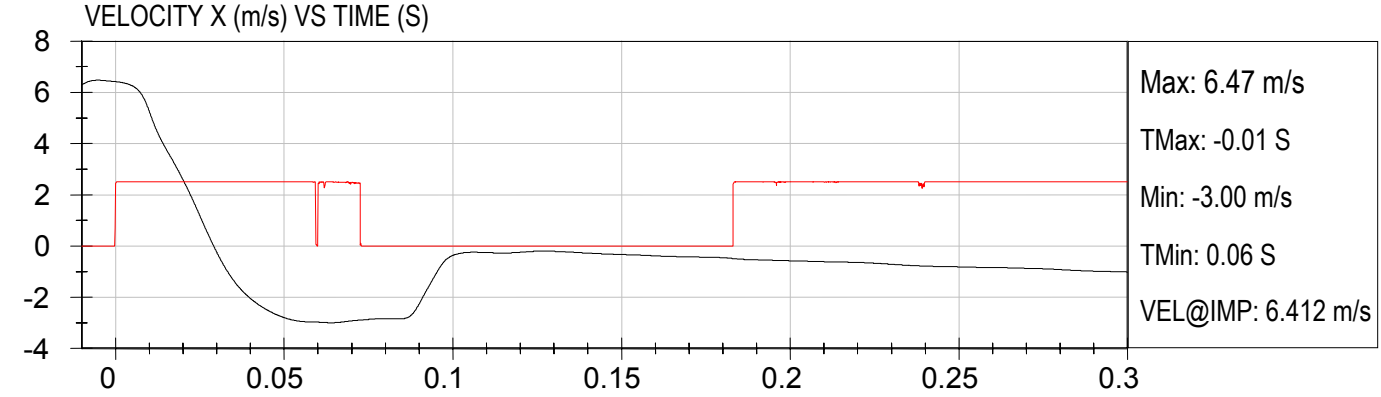
Test Desc: Head Form Impact (6.69 m/s)
Component ID: MID BUS S2; Location H10
Test Date: 2/26/2007
NHTSA#: C60901

Hic: 105.69 T1: 7.10 ms T2: 36.30 ms

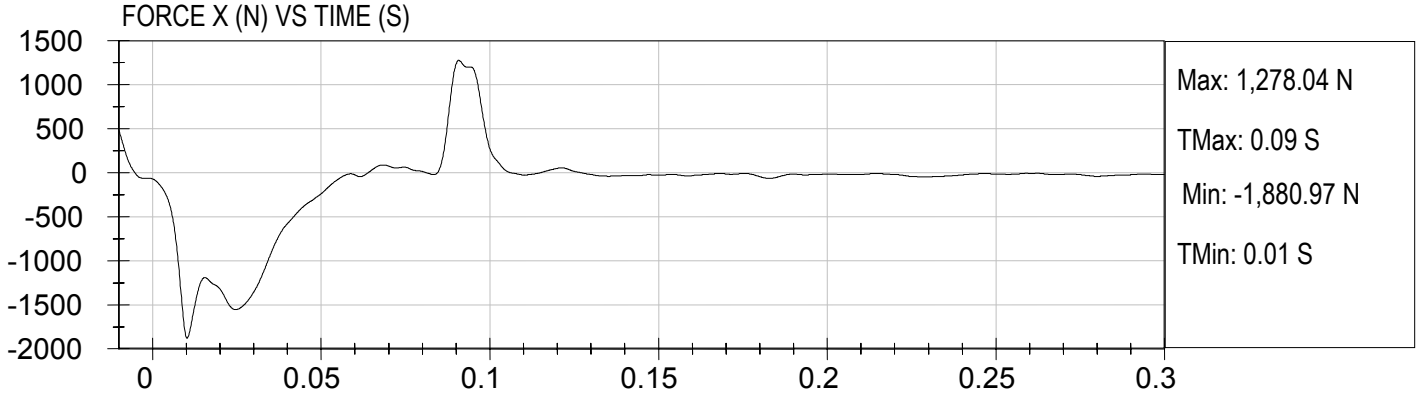
HEAD X ACCELERATION (G's) VS TIME (S)



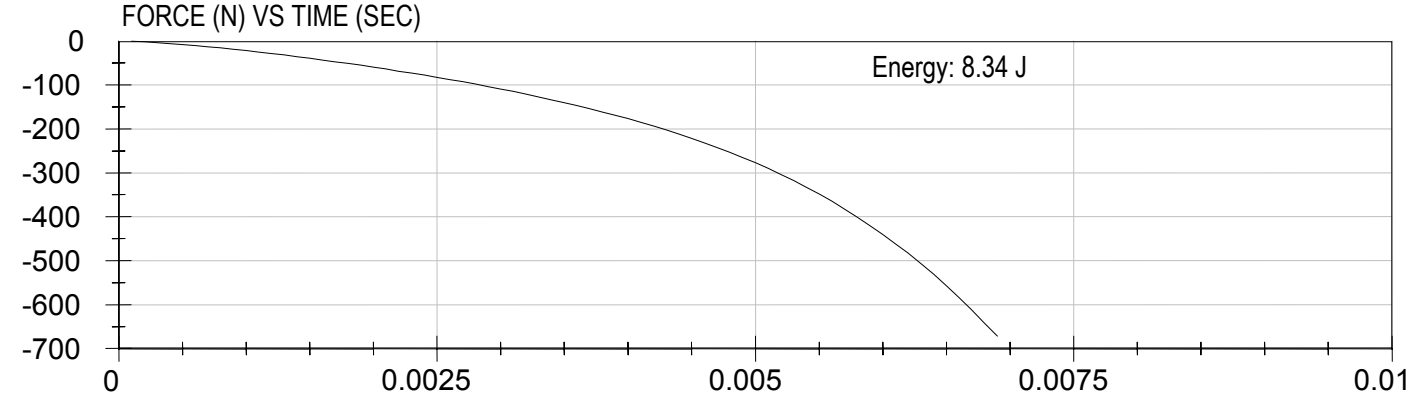
VELOCITY X (m/s) VS TIME (S)



FORCE X (N) VS TIME (S)



FORCE (N) VS TIME (SEC)

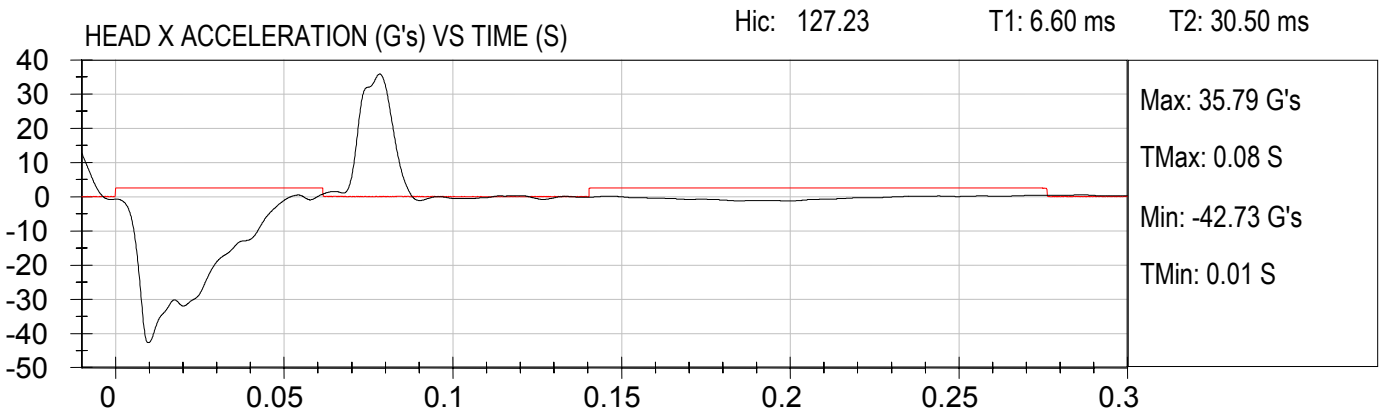


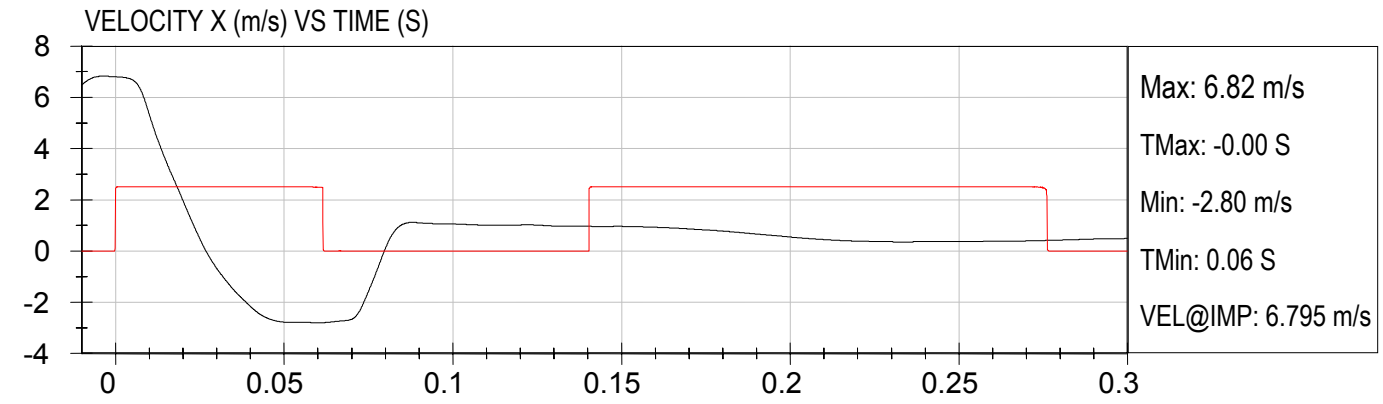
Test Desc: Head Form Impact (6.69 m/s)

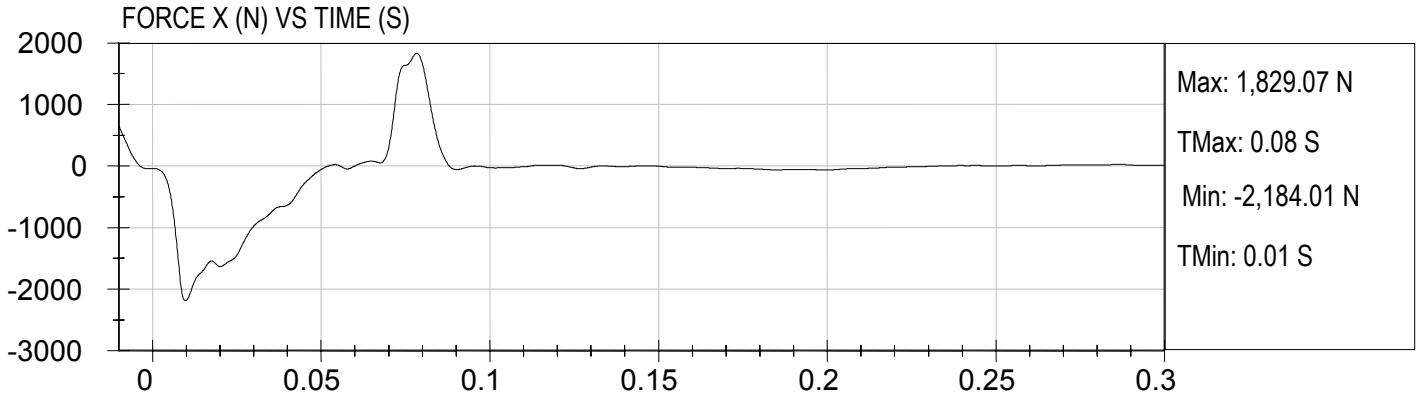
Component ID: MID BUS S2; Location H11

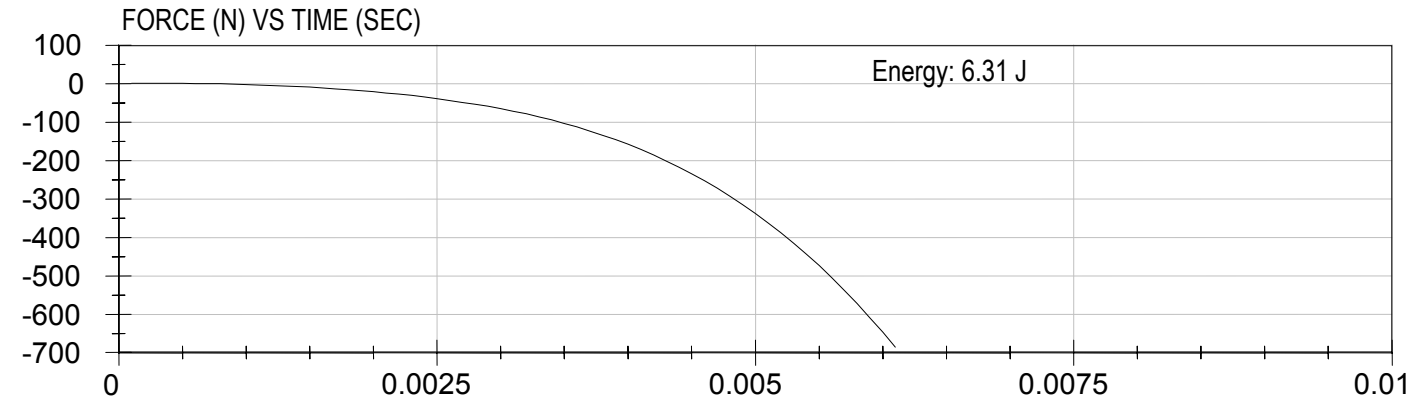
Test Date: 2/26/2007

NHTSA#: C60901









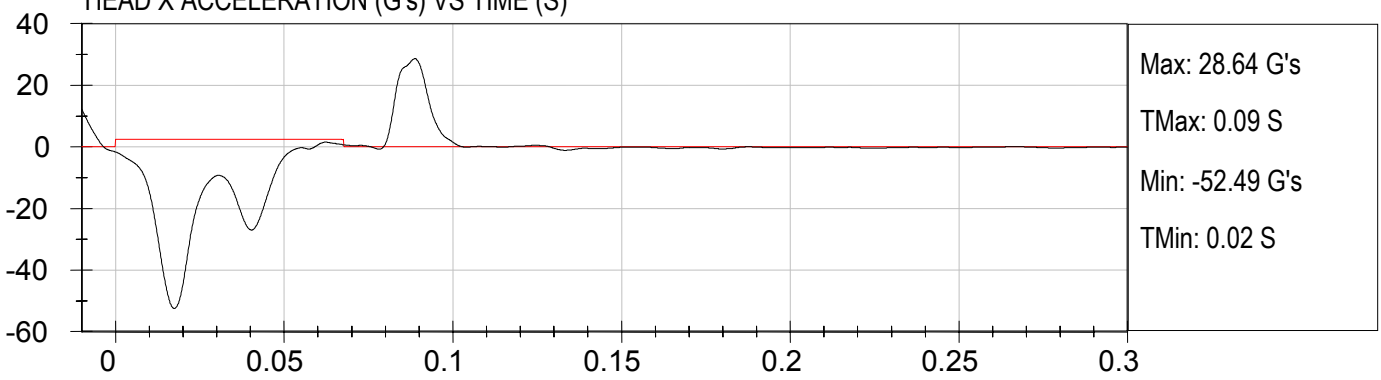
Test Desc: Head Form Impact (6.69 m/s)

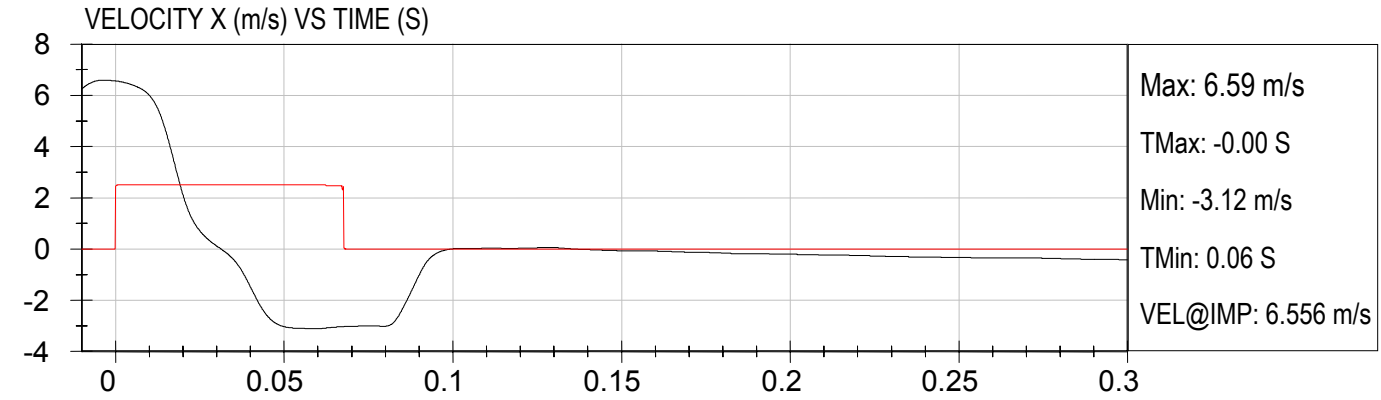
Component ID: MID BUS S2; Location H12

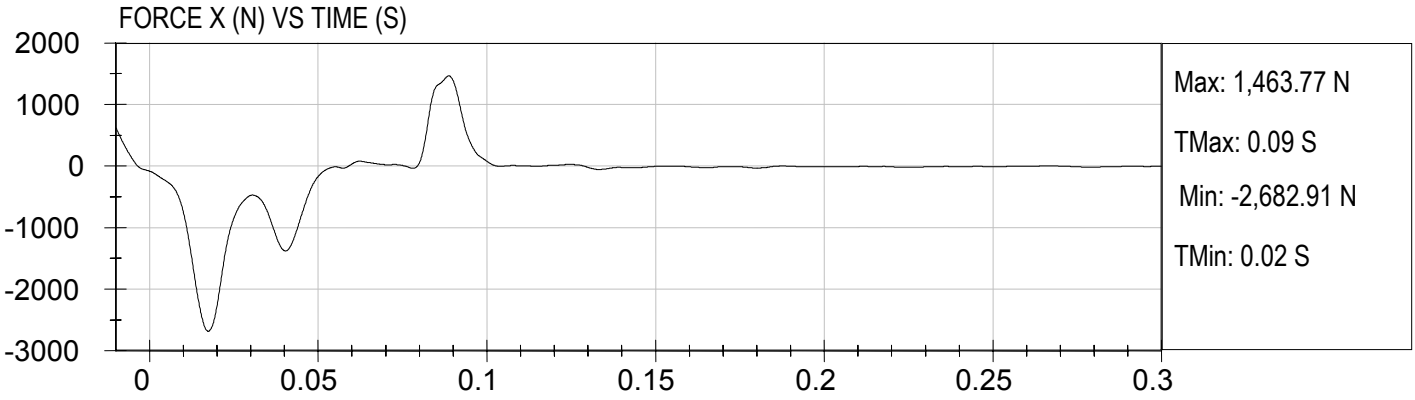
Test Date: 2/26/2007

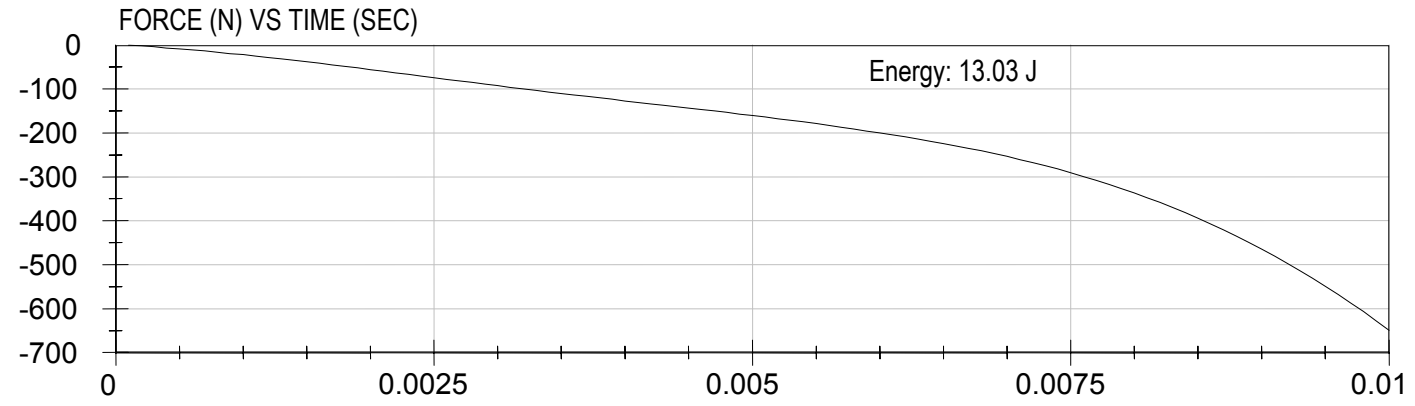
NHTSA#: C60901

Hic: 124.75 T1: 11.90 ms T2: 22.90 ms





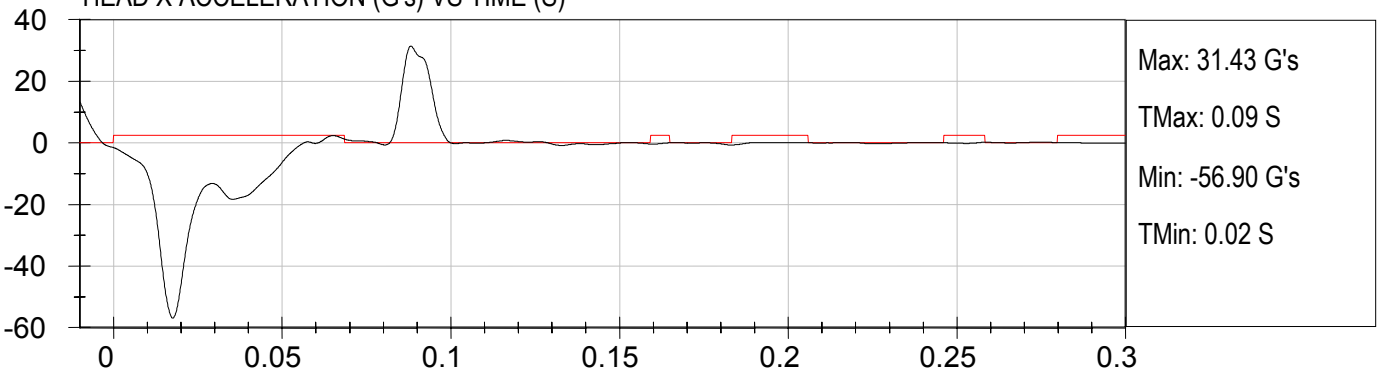




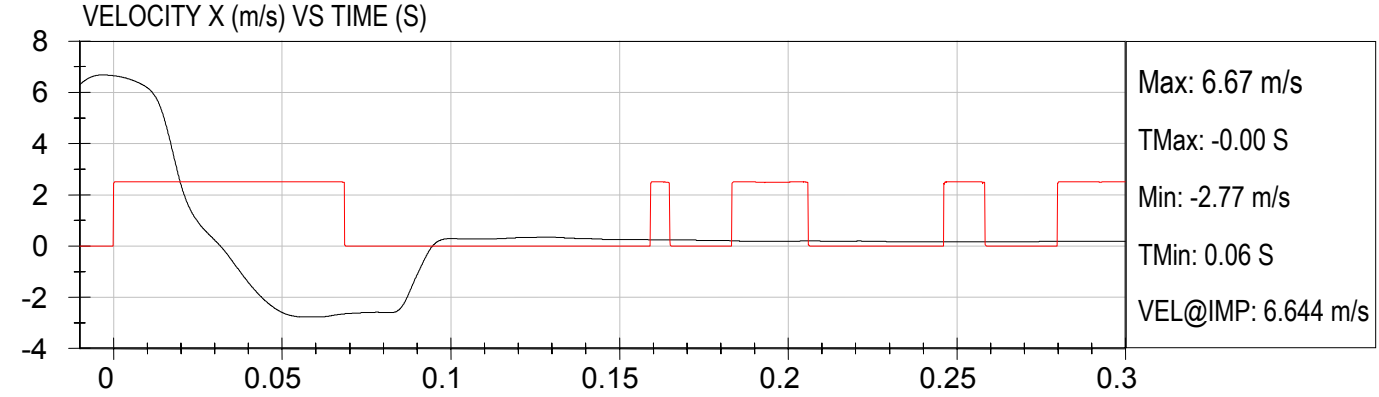
Test Desc: Head Form Impact (6.69 m/s)
Component ID: MID BUS S2; Location H13
Test Date: 2/26/2007
NHTSA#: C60901

Hic: 129.42 T1: 13.10 ms T2: 22.80 ms

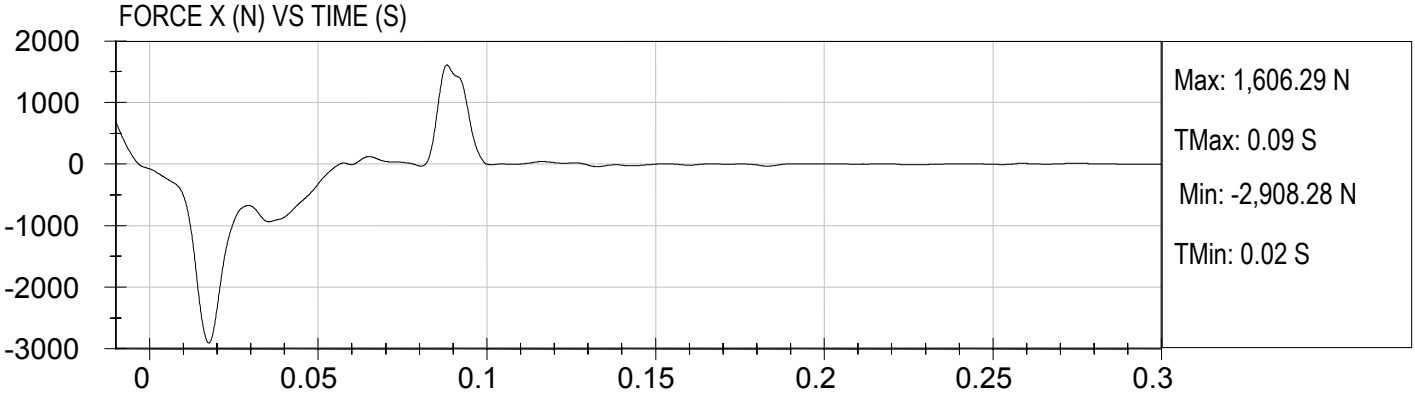
HEAD X ACCELERATION (G's) VS TIME (S)



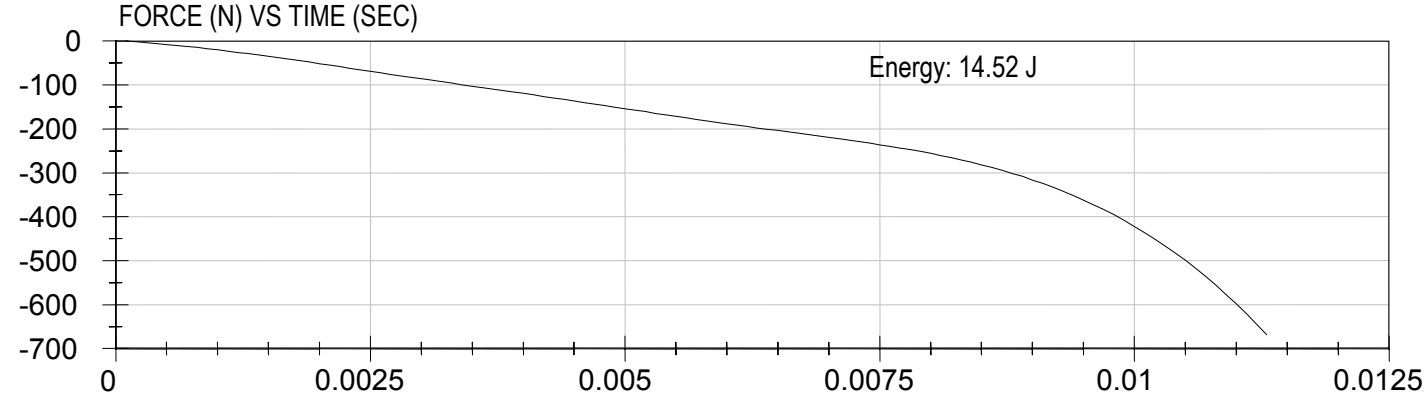
VELOCITY X (m/s) VS TIME (S)



FORCE X (N) VS TIME (S)



FORCE (N) VS TIME (SEC)



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

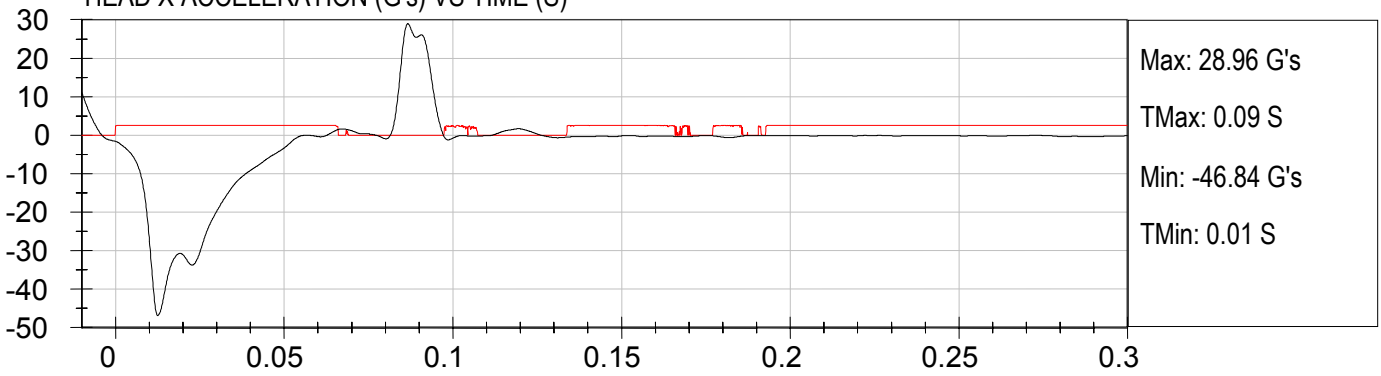
Component ID: MID BUS S2; Location H14

Test Date: 2/26/2007

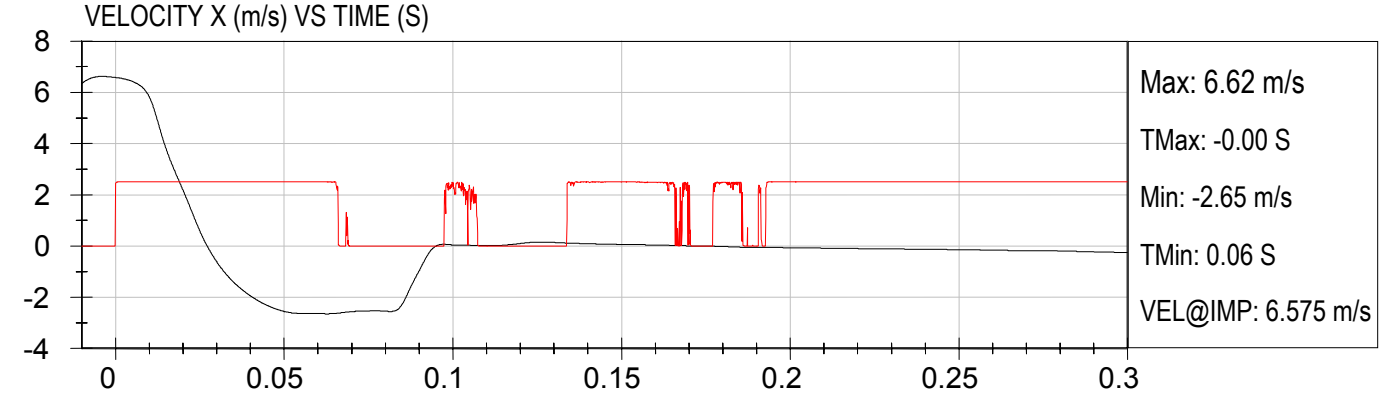
NHTSA#: C60901

Hic: 124.71 T1: 9.20 ms T2: 30.30 ms

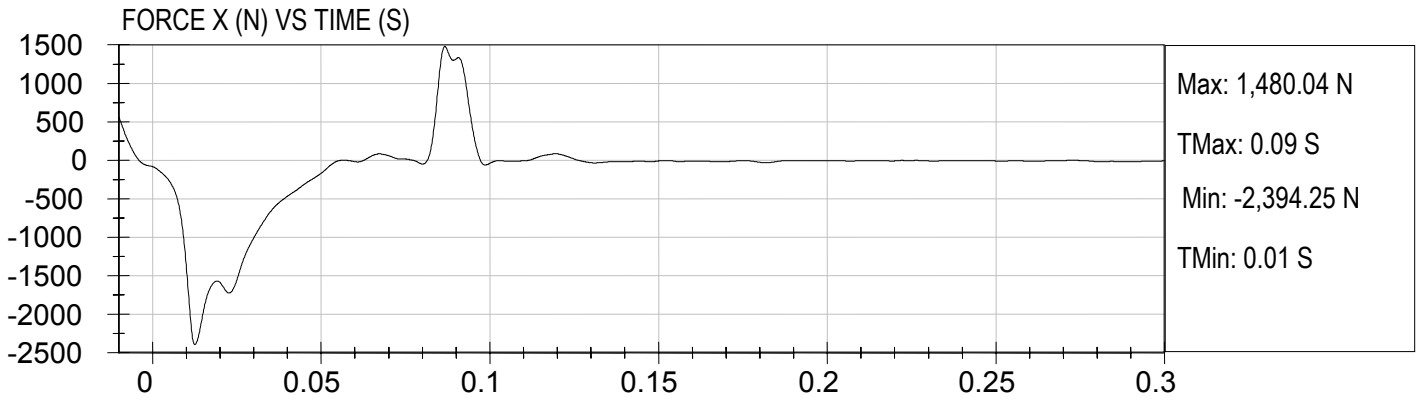
HEAD X ACCELERATION (G's) VS TIME (S)



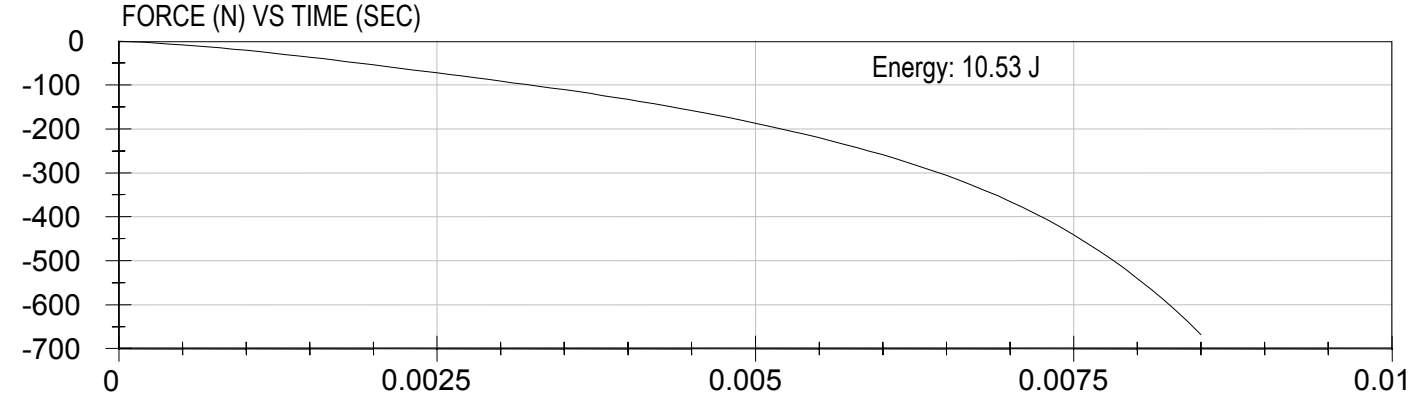
VELOCITY X (m/s) VS TIME (S)



FORCE X (N) VS TIME (S)



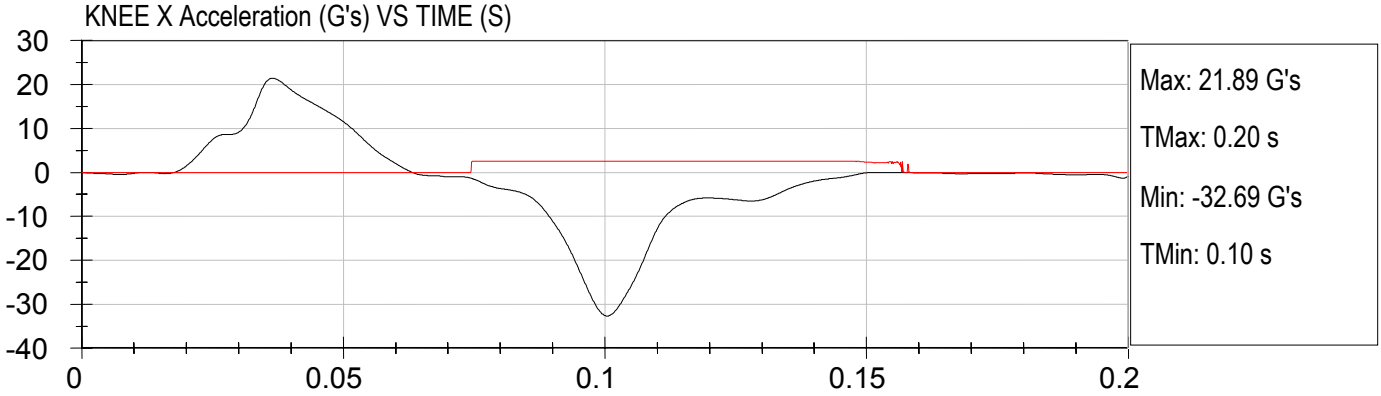
FORCE (N) VS TIME (SEC)



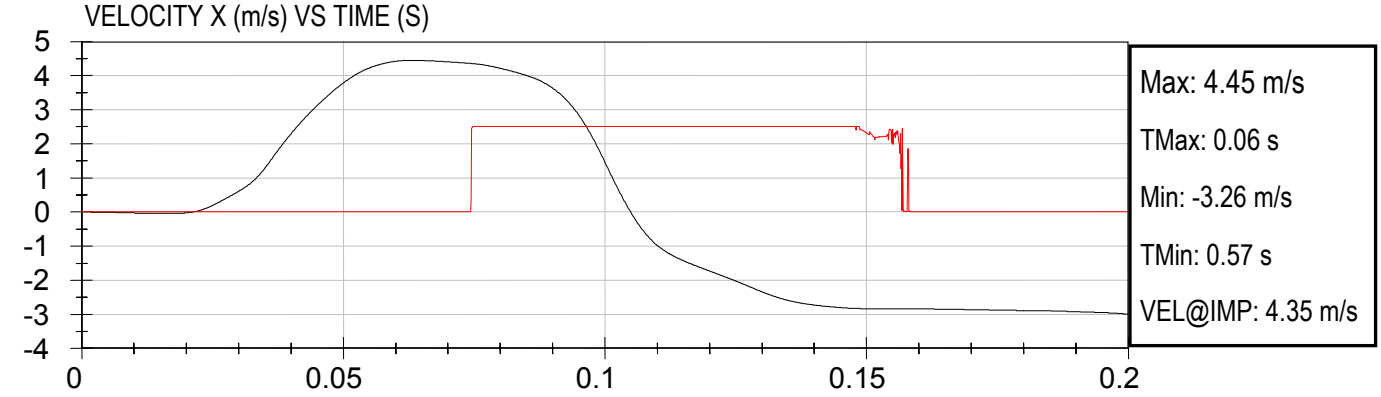
Test Desc: Knee Form Impact
Component ID: MID BUS S2; Location K1

Test Date: 2/27/2007
NHTSA #: C60901

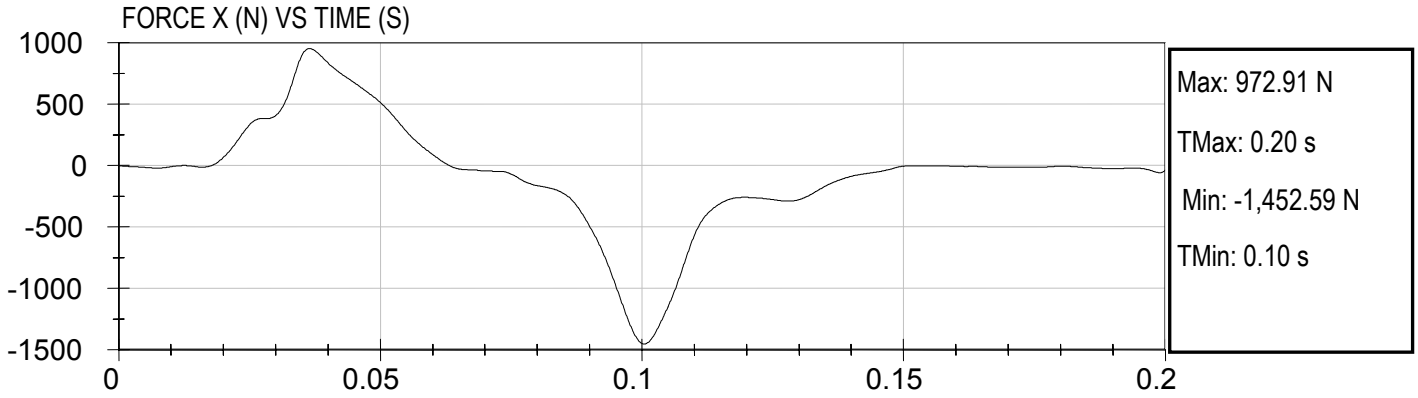
KNEE X Acceleration (G's) VS TIME (S)



VELOCITY X (m/s) VS TIME (S)

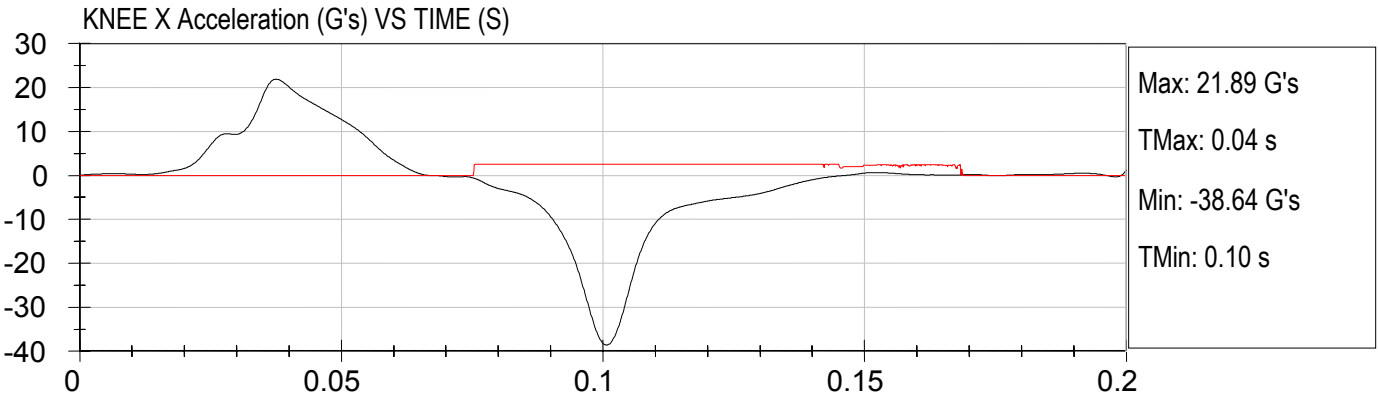


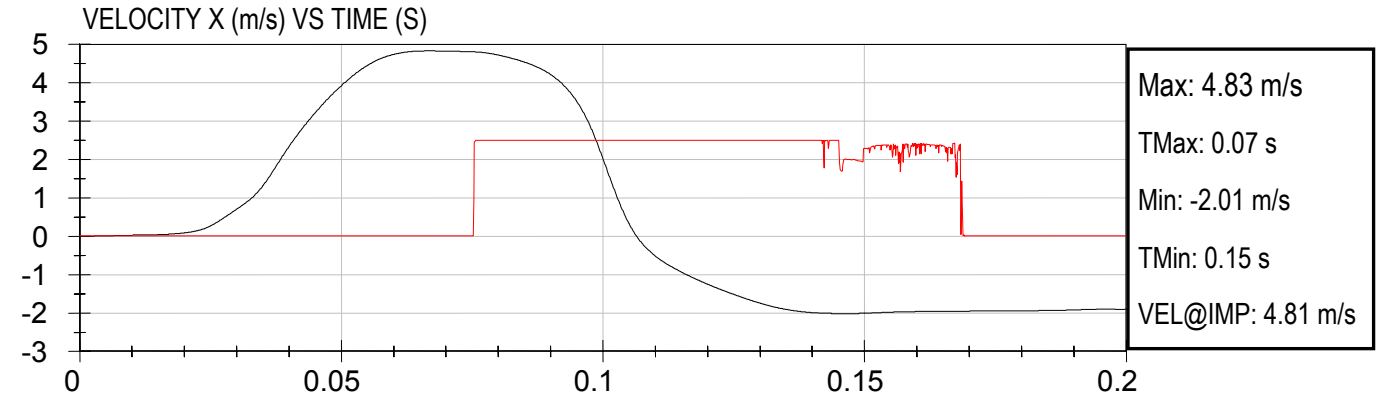
FORCE X (N) VS TIME (S)

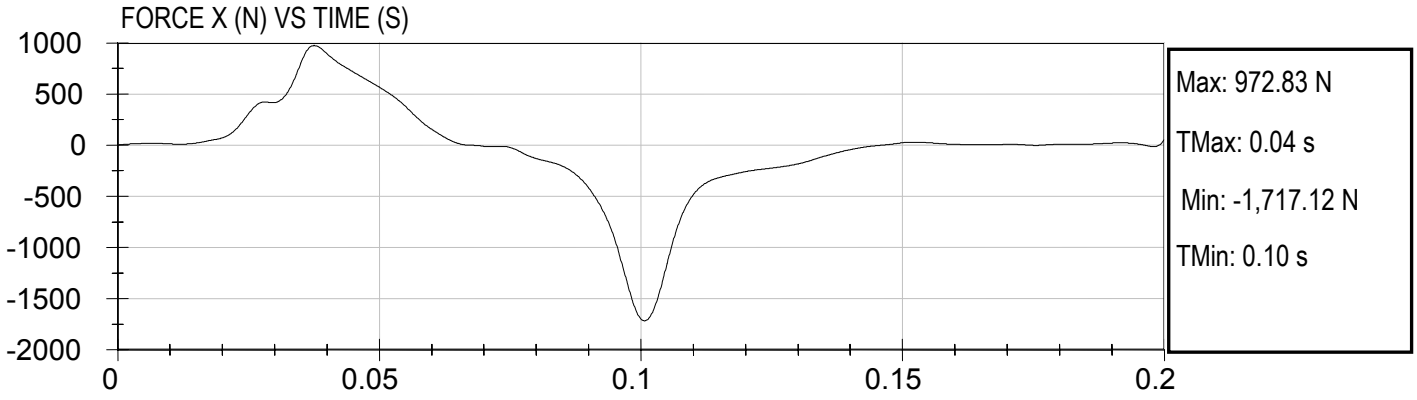


Test Desc: Knee Form Impact
Component ID: MID BUS S2; Location K2

Test Date: 2/27/2007
NHTSA #: C60901

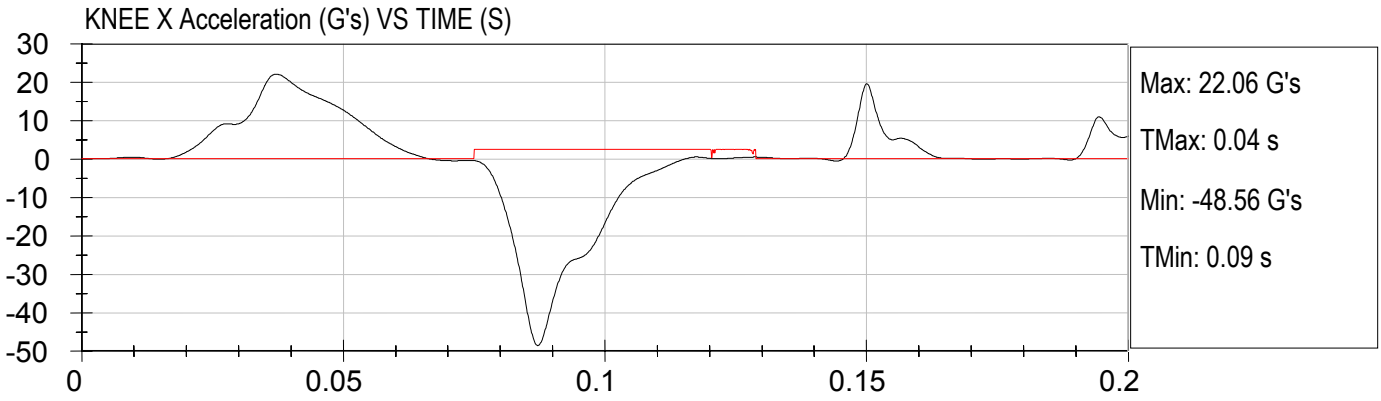


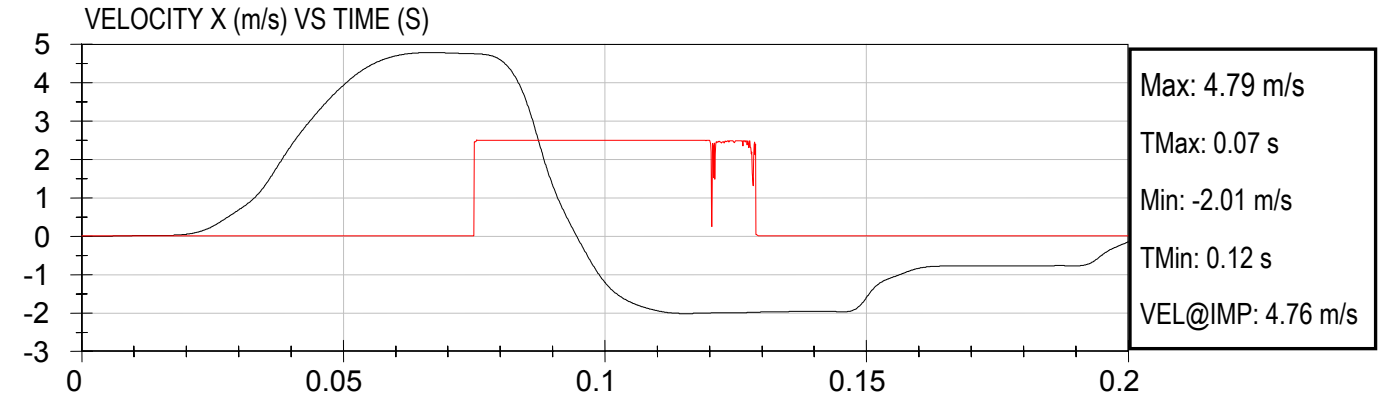


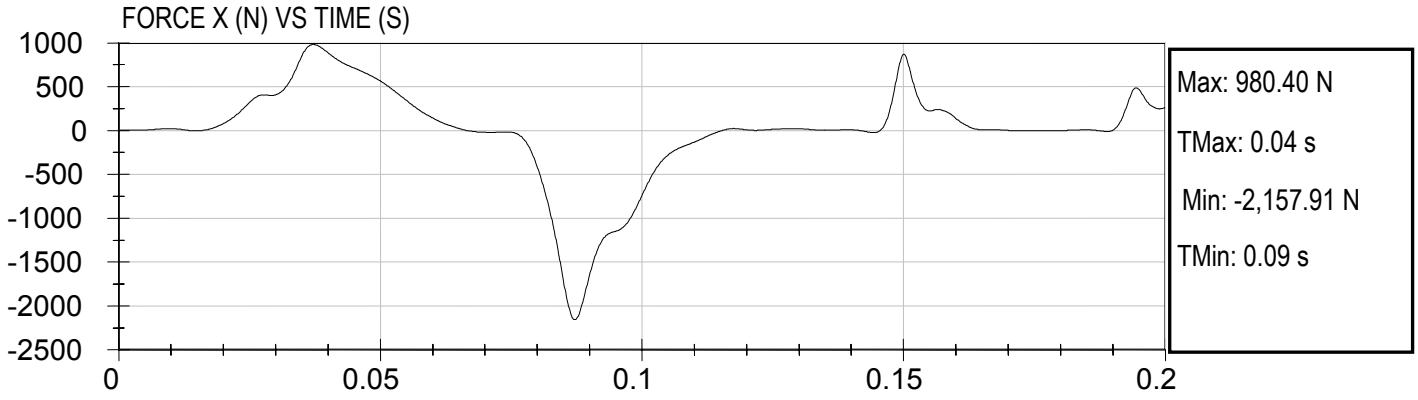


Test Desc: Knee Form Impact
Component ID: MID BUS S2; Location K3

Test Date: 2/27/2007
NHTSA #: C60901



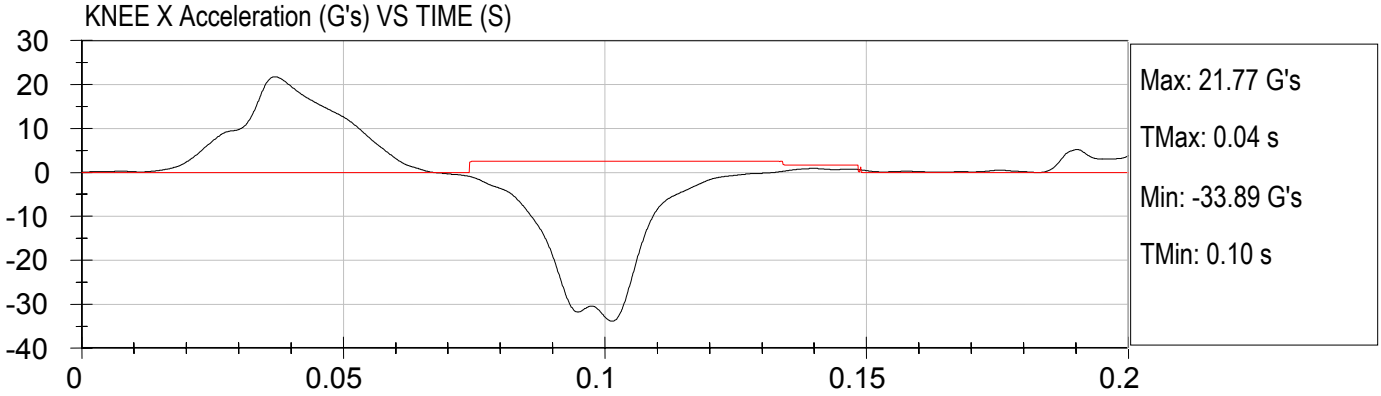




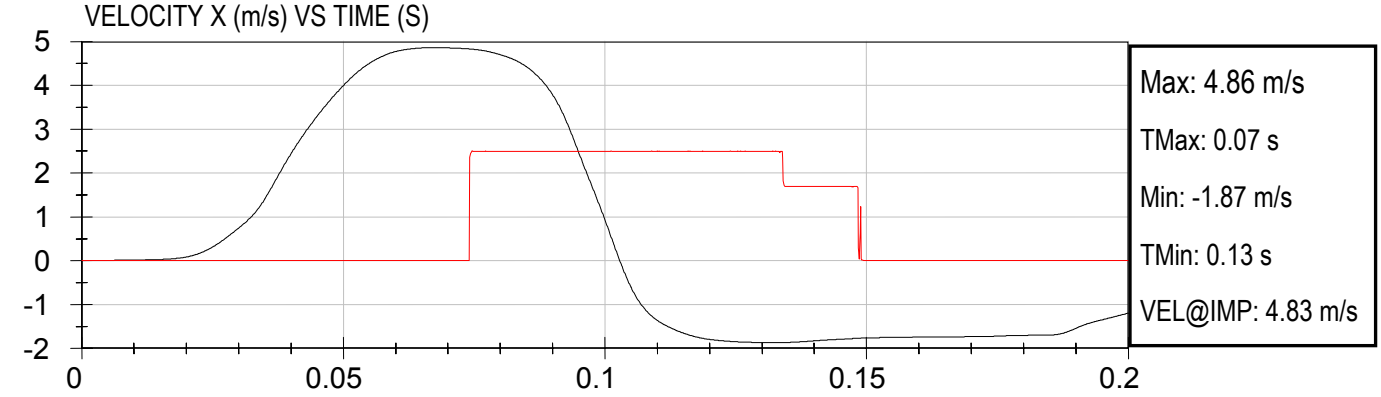
Test Desc: Knee Form Impact
Component ID: MID BUS S2; Location K4

Test Date: 2/27/2007
NHTSA #: C60901

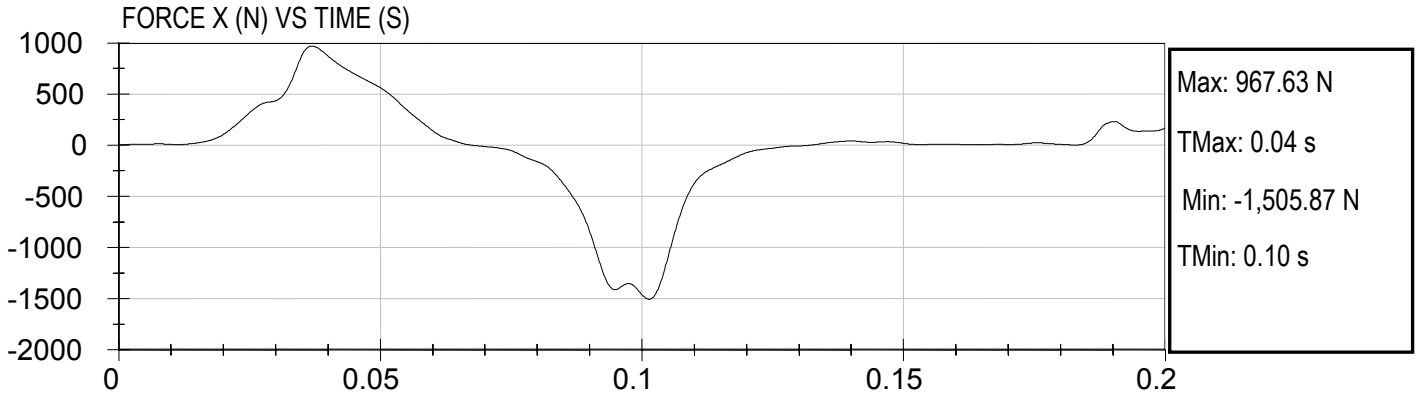
KNEE X Acceleration (G's) VS TIME (S)



VELOCITY X (m/s) VS TIME (S)



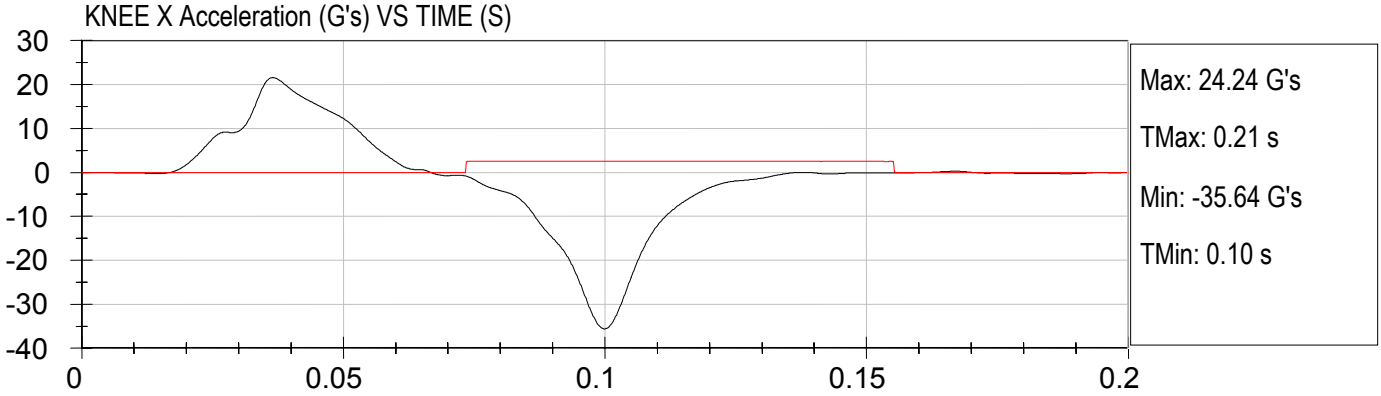
FORCE X (N) VS TIME (S)



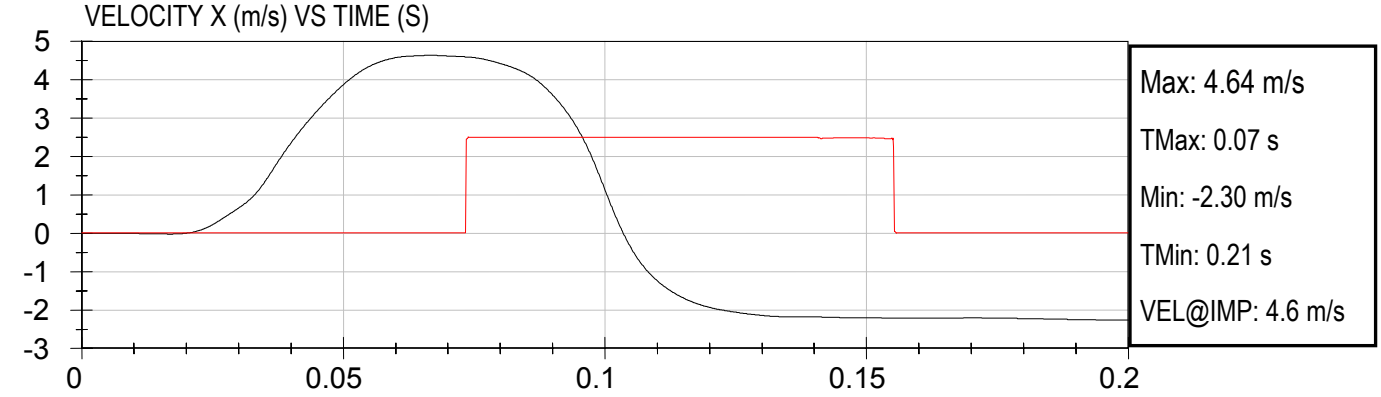
Test Desc: Knee Form Impact
Component ID: MID BUS S2; Location K5

Test Date: 2/27/2007
NHTSA #: C60901

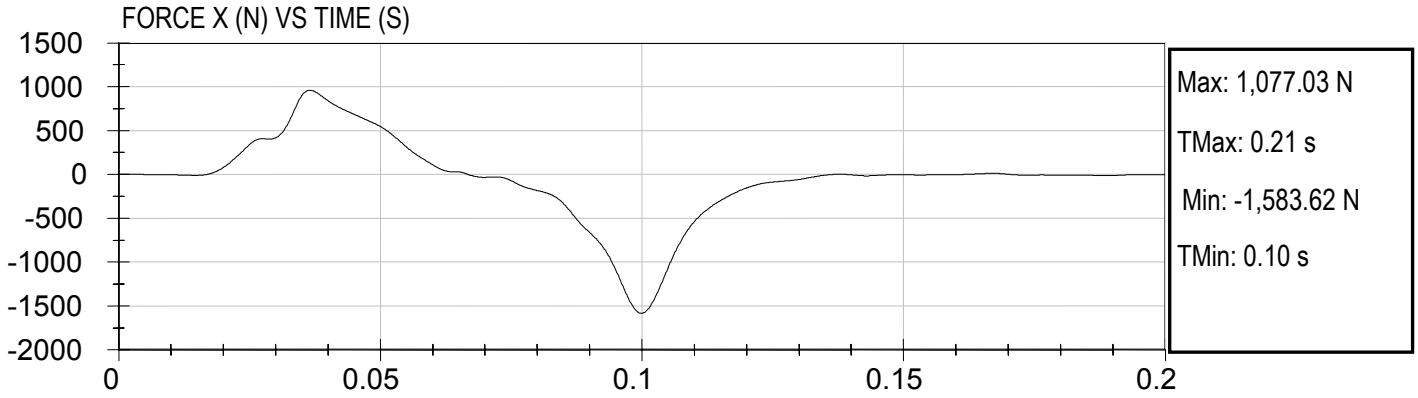
KNEE X Acceleration (G's) VS TIME (S)



VELOCITY X (m/s) VS TIME (S)



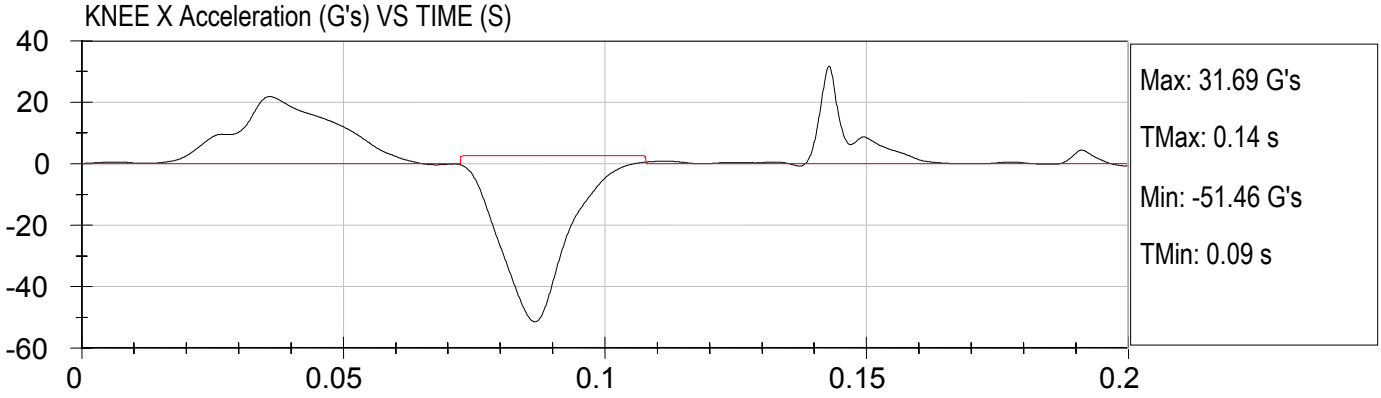
FORCE X (N) VS TIME (S)



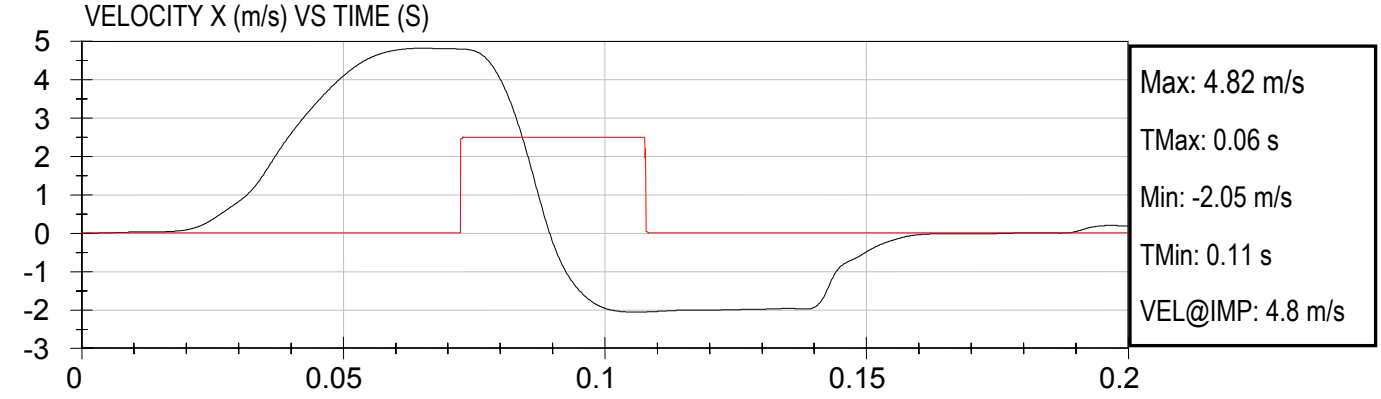
Test Desc: Knee Form Impact
Component ID: MID BUS S2; Location K6

Test Date: 2/27/2007
NHTSA #: C60901

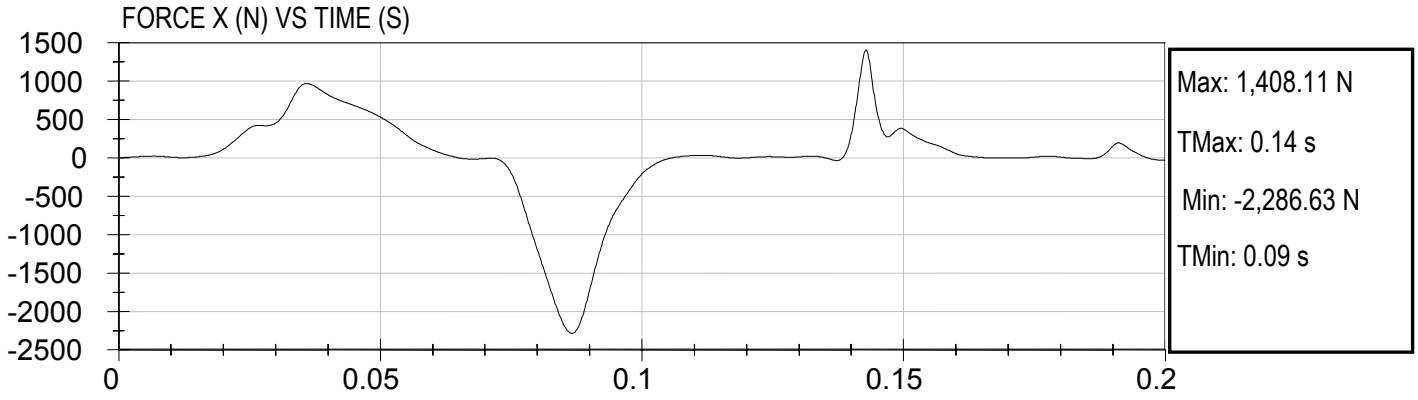
KNEE X Acceleration (G's) VS TIME (S)



VELOCITY X (m/s) VS TIME (S)



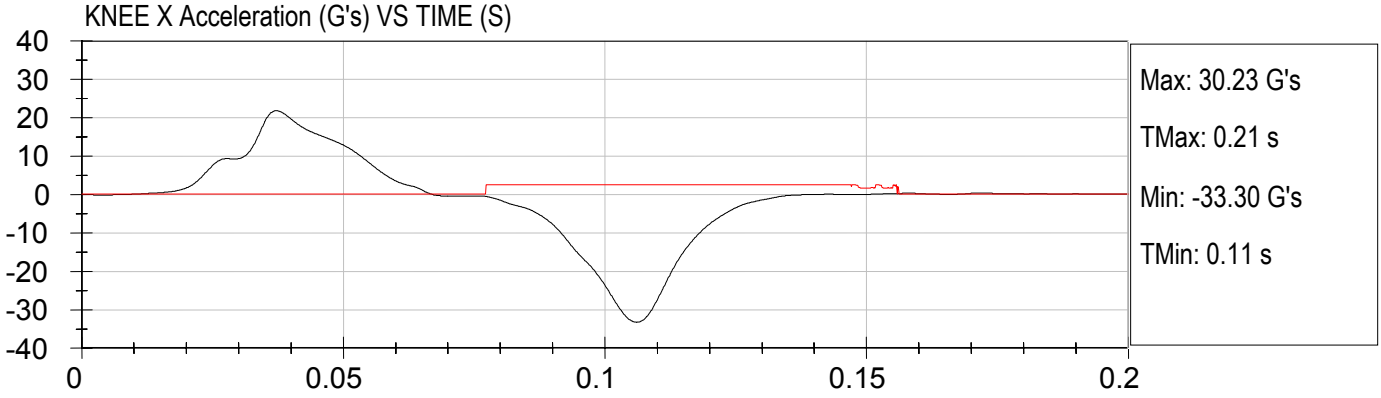
FORCE X (N) VS TIME (S)



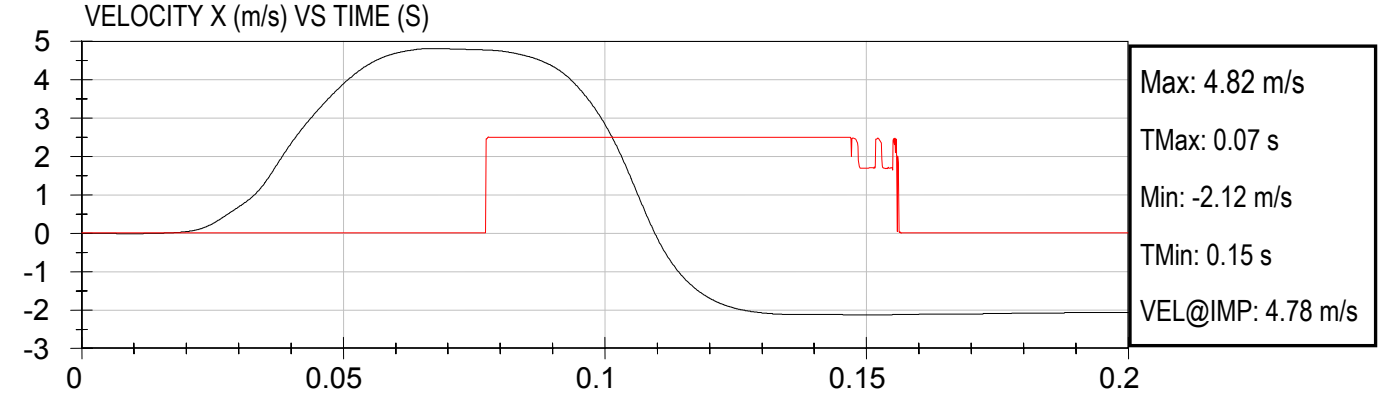
Test Desc: Knee Form Impact
Component ID: MID BUS S2; Location K7

Test Date: 2/27/2007
NHTSA #: C60901

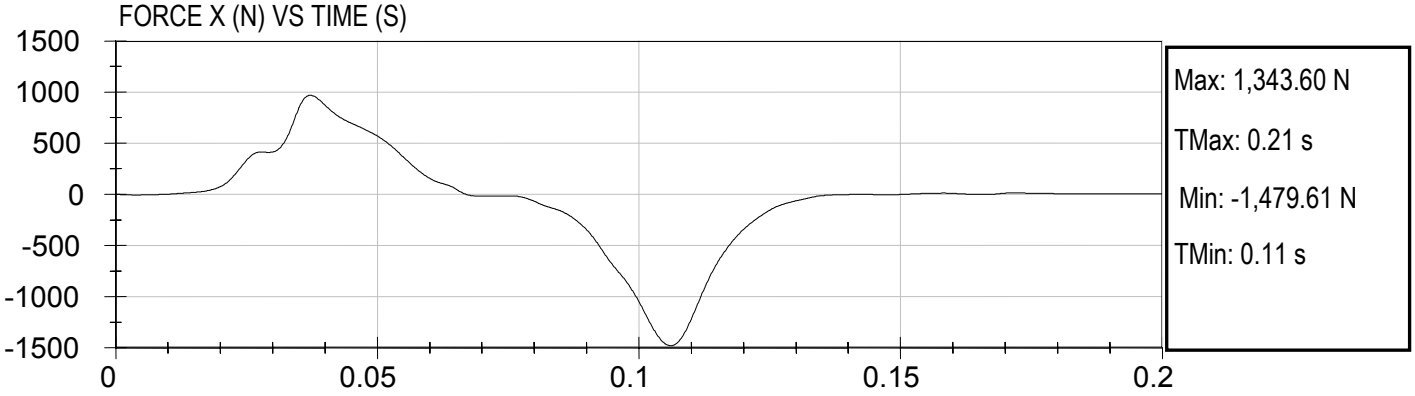
KNEE X Acceleration (G's) VS TIME (S)



VELOCITY X (m/s) VS TIME (S)



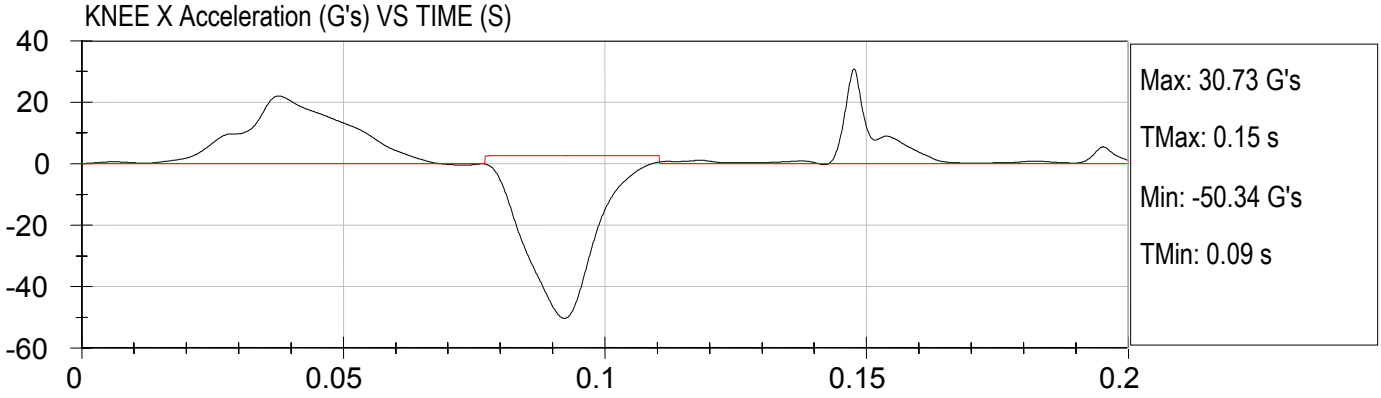
FORCE X (N) VS TIME (S)



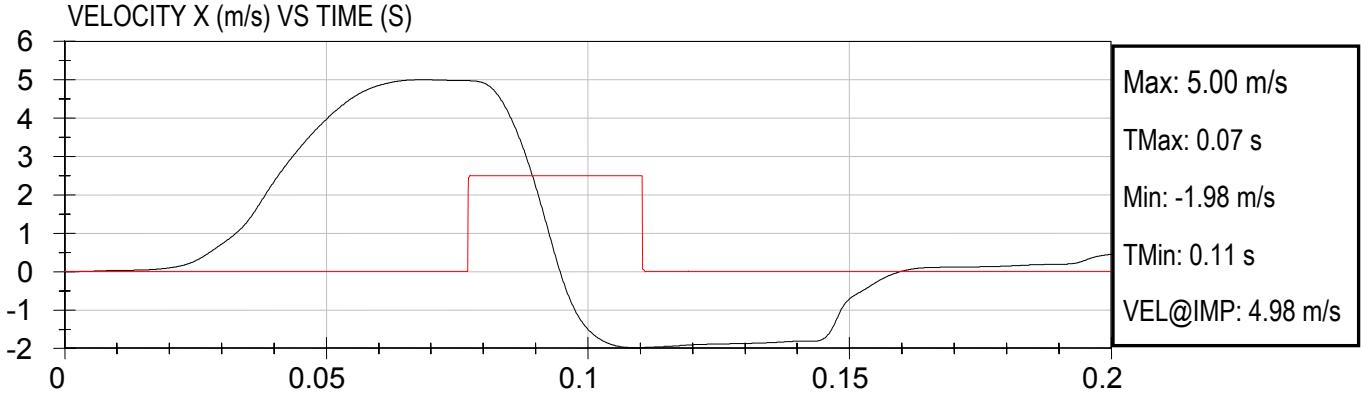
Test Desc: Knee Form Impact
Component ID: MID BUS S2; Location K8

Test Date: 2/27/2007
NHTSA #: C60901

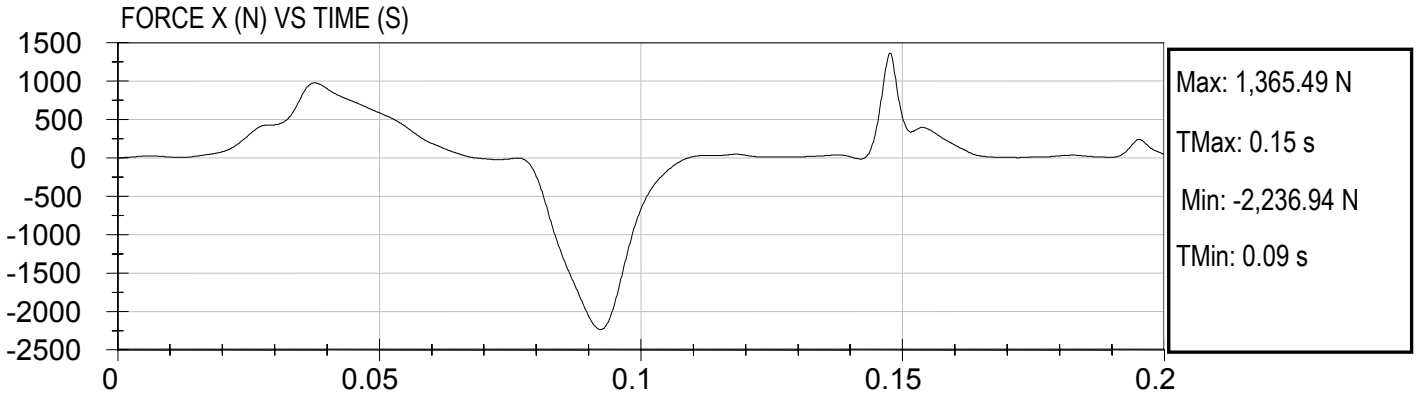
KNEE X Acceleration (G's) VS TIME (S)



VELOCITY X (m/s) VS TIME (S)



FORCE X (N) VS TIME (S)

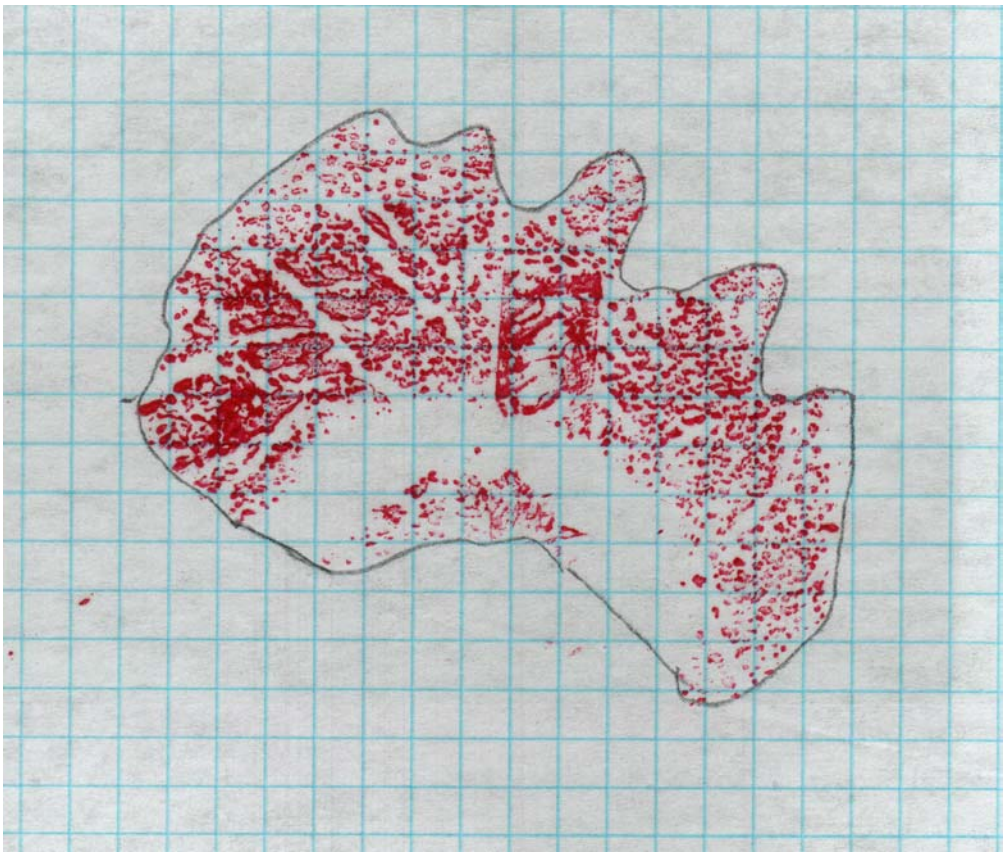


SECTION 7

WELT CONTACT POINTS

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Test Lab:	**MGA RESEARCH CORPORATION**	Test Date:	**2/27/2007**

H1 / SEAT S2



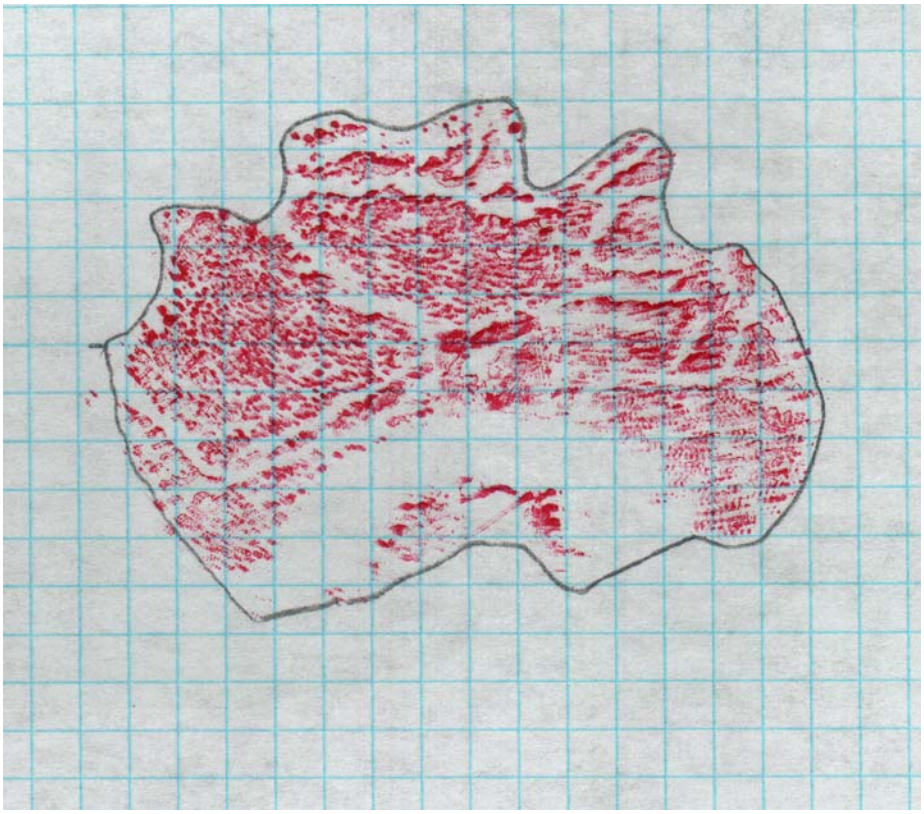
H1 MID BUS 43.4 cm^2

SECTION 7 (CONTINUED)

WELT CONTACT POINTS

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Test Lab:	**MGA RESEARCH CORPORATION**	Test Date:	**2/27/2007**

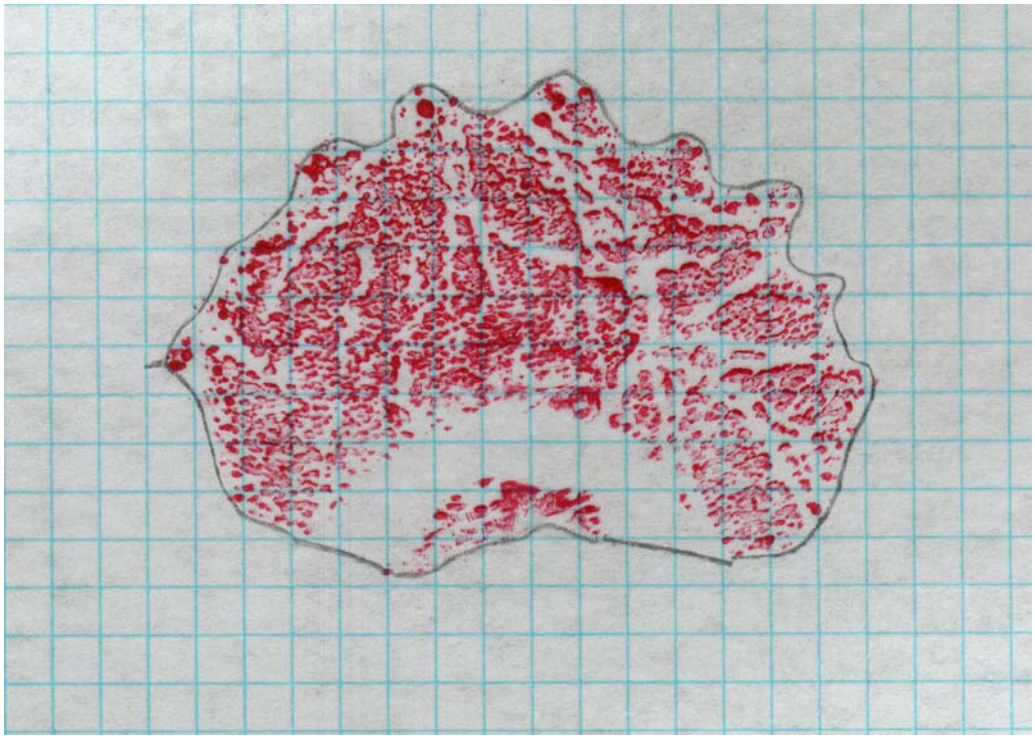
H2 / SEAT S2



H2 MID BUS 45.1 cm^2

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS** NHTSA No.: **C60901**
Test Lab: **MGA RESEARCH CORPORATION** Test Date: **2/27/2007**

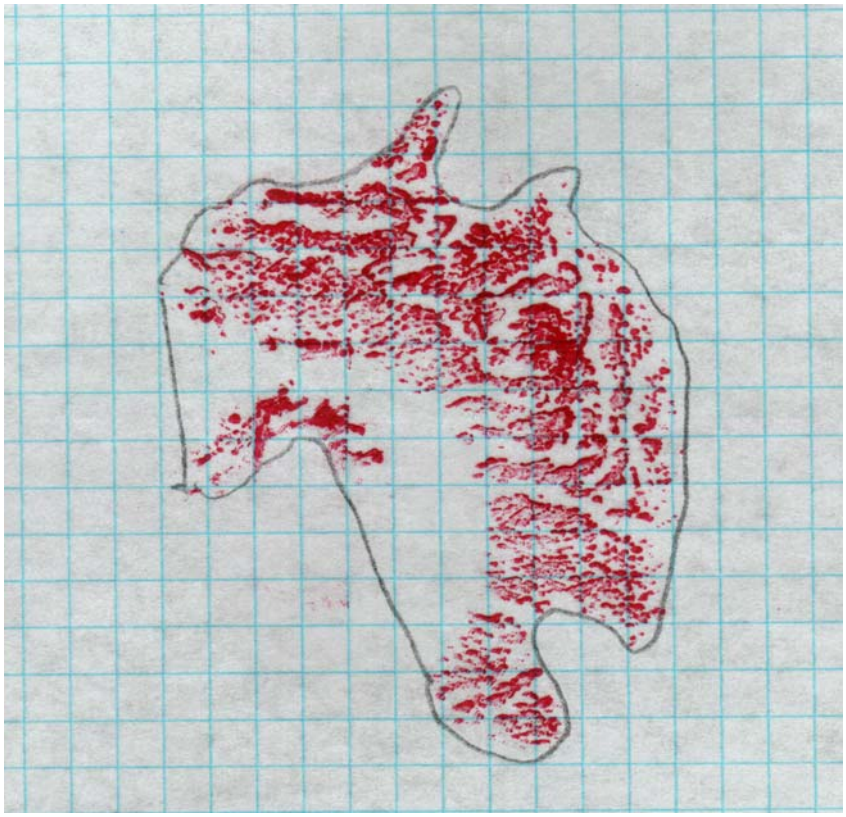
H3 / SEAT S2



H3 MID BUS 43.4 cm^2

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS** NHTSA No.: **C60901**
Test Lab: **MGA RESEARCH CORPORATION** Test Date: **2/27/2007**

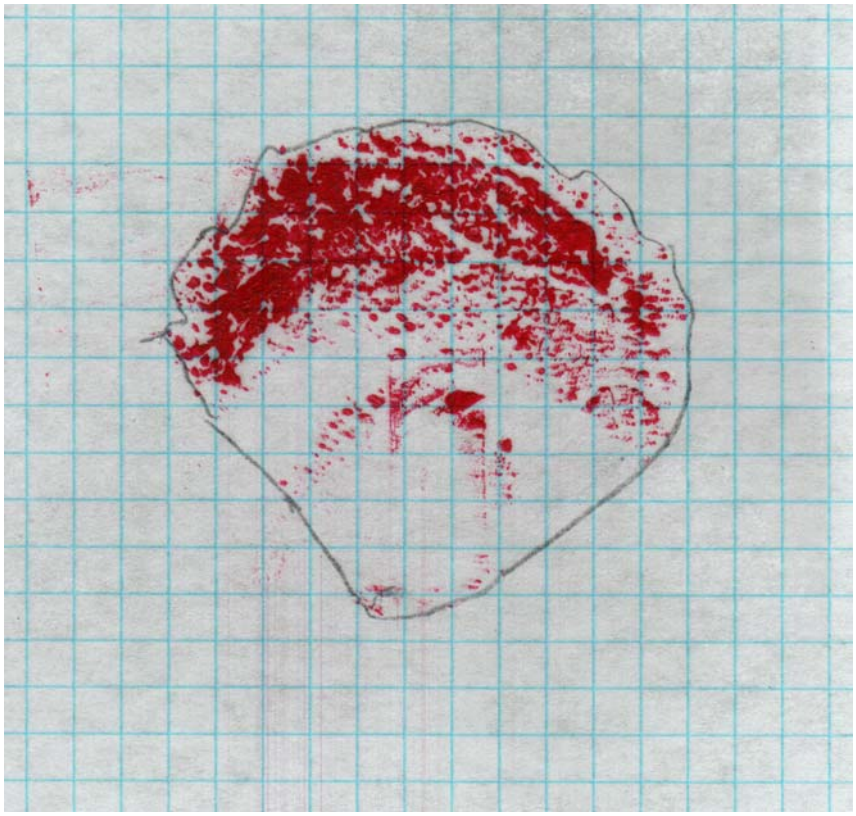
H4 / SEAT S2



H4 MID BUS 35.8 cm^2

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS** NHTSA No.: **C60901**
Test Lab: **MGA RESEARCH CORPORATION** Test Date: **2/27/2007**

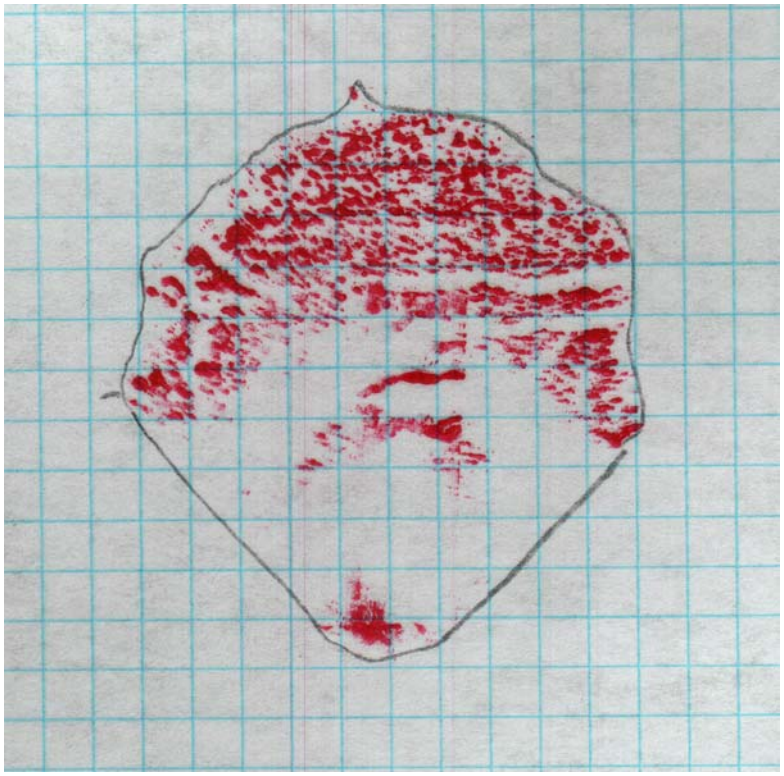
H5 / SEAT S2



H5 MID BUS 32.3 cm^2

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS** NHTSA No.: **C60901**
Test Lab: **MGA RESEARCH CORPORATION** Test Date: **2/27/2007**

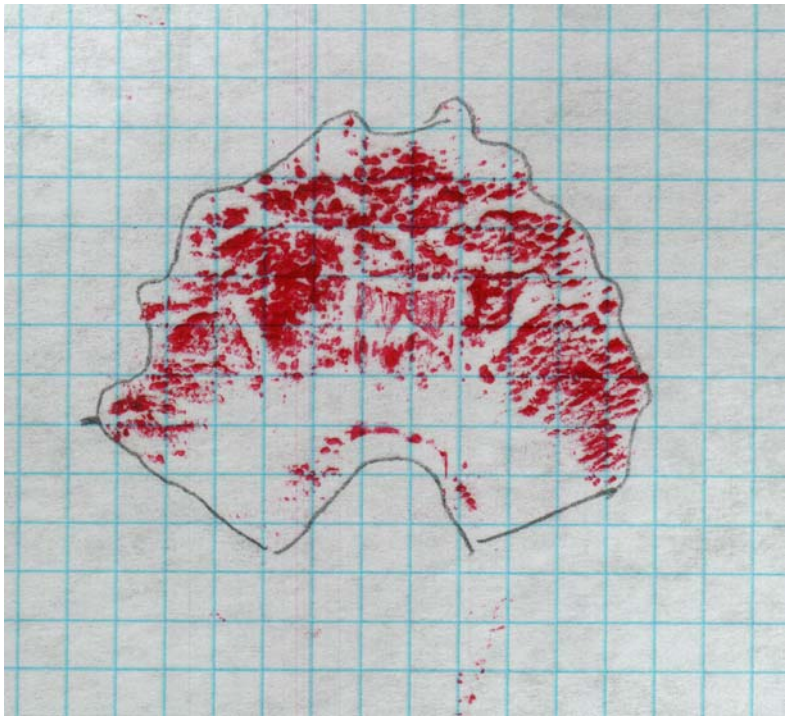
H6 / SEAT S2



H6 MID BUS 32.7 cm^2

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS** NHTSA No.: **C60901**
Test Lab: **MGA RESEARCH CORPORATION** Test Date: **2/27/2007**

H7 / SEAT S2



H7 MID BUS 28.1 cm^2

SECTION 7 (CONTINUED)

WELT CONTACT POINTS

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Test Lab:	**MGA RESEARCH CORPORATION**	Test Date:	**2/27/2007**

K1 / SEAT S2

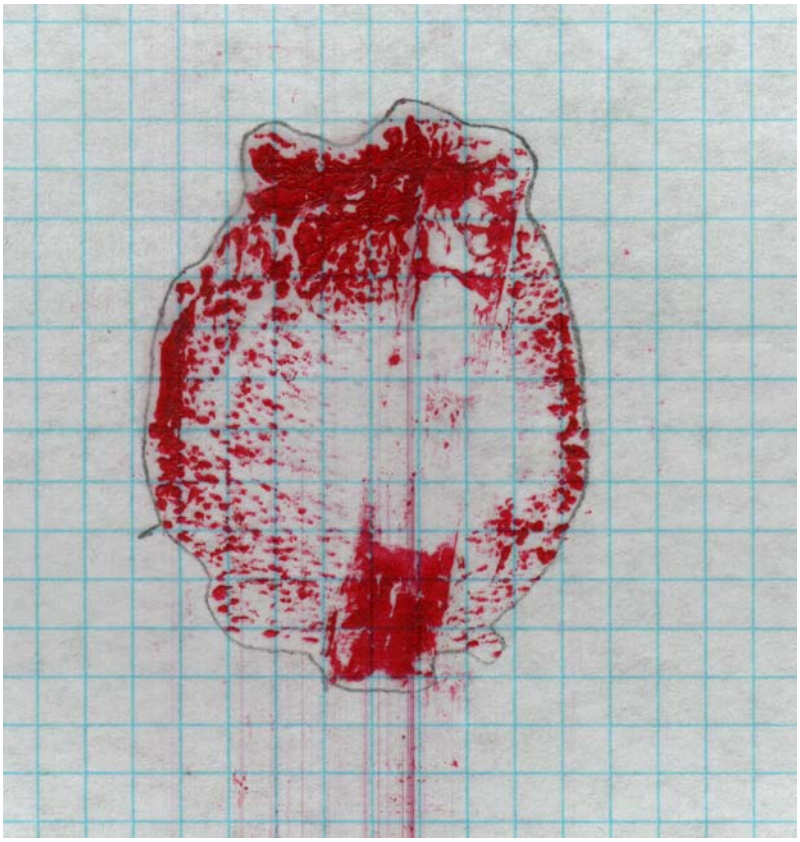
K1 MID BUS 30.7 cm^2

SECTION 7 (CONTINUED)

WELT CONTACT POINTS

Test Vehicle:	**2006 MID BUS GUIDE DW SCHOOL BUS**	NHTSA No.:	**C60901**
Test Lab:	**MGA RESEARCH CORPORATION**	Test Date:	**2/27/2007**

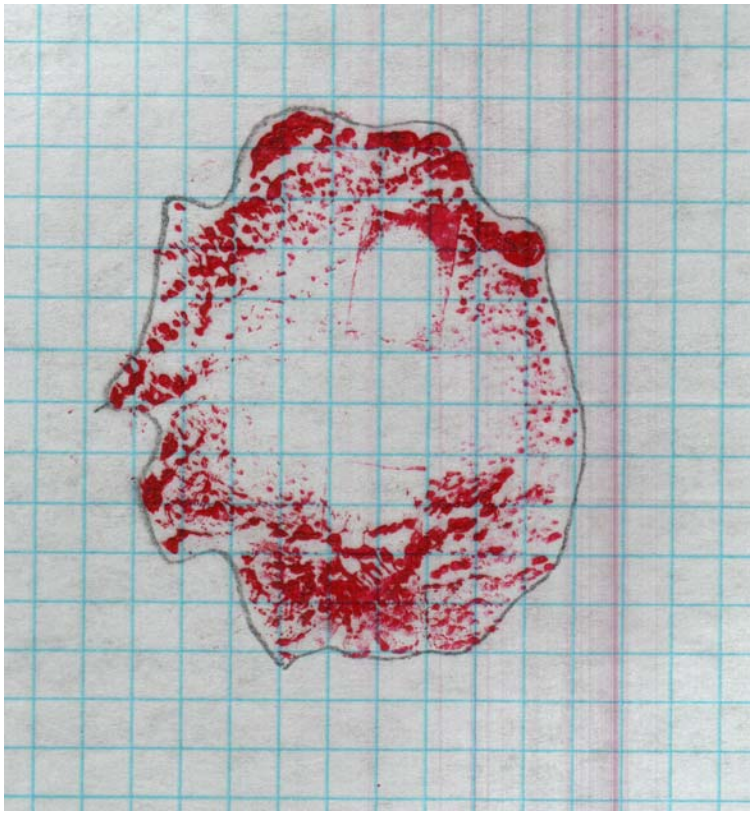
K2 / SEAT S2



K2 MID BUS 32.7 cm^2

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS** NHTSA No.: **C60901**
Test Lab: **MGA RESEARCH CORPORATION** Test Date: **2/27/2007**

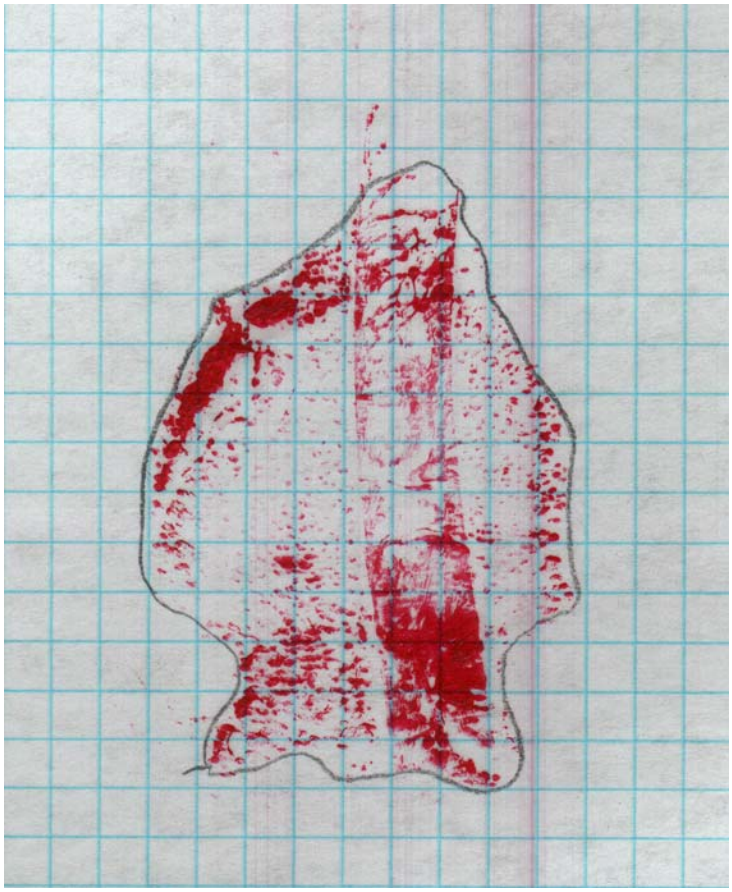
K3 / SEAT S2



K3 MID BUS 31.4 cm^2

Test Vehicle: **2006 MID BUS GUIDE DW SCHOOL BUS** NHTSA No.: **C60901**
Test Lab: **MGA RESEARCH CORPORATION** Test Date: **2/27/2007**

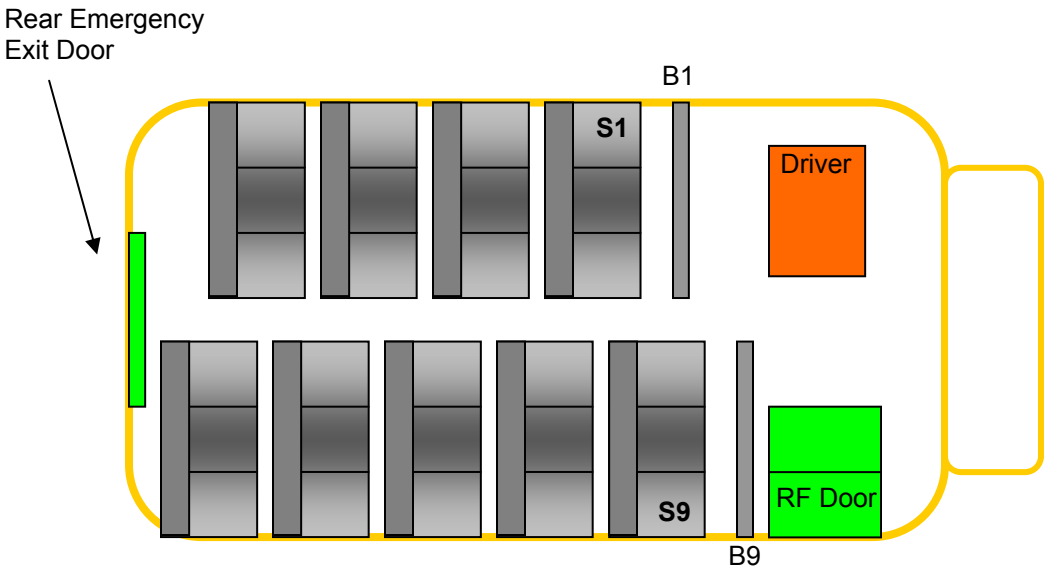
K4 / SEAT S2



K4 MID BUS 32.6 cm^2

SECTION 8

BUS FLOOR PLAN



SECTION 9

LABORATORY NOTICE OF TEST FAILURE

LABORATORY NOTICE OF TEST FAILURE TO OVSC

Test Procedure:	FMVSS 222	Test Date:	February 23, 2007
Test Vehicle:	2006 MID BUS GUIDE	Test Lab:	MGA Research Corp.
NHTSA No.:	C60901	Project Engineer:	Eric Peschman
Contract No.:	DTNH22-02-D-01057	Delivery Order No.:	005
MFR.:	MID BUS INC.	VIN:	1GBJG31U4612373309
Build Date:	9/06		

TEST FAILURE DESCRIPTION

The forward deflection of the left side retraining barrier exceeded the maximum allowable force of 10,675 N before absorbing 1,356 Joules of energy. The energy absorbed was 1,239 Joules. When the force vs. deflection data was plotted, it fell out of the specified corridor listed in 49 CFR 571.222 Figure 1. The test was stopped at 295 mm to avoid equipment damage.

FMVSS REQUIREMENTS DESCRIPTION

Paragraph S5.2.3 (a): "The restraining barrier force/deflection curve shall fall within the zone specified in figure 1."

Remarks: No remarks.

Notification to NHTSA (COTR): Brian Smith

Date: February 23, 2007

By: