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

GIRARDIN MINIBUS, INC.
2008 GIRARDIN G5 MB-IV 200C SCHOOL BUS
NHTSA NO.: C80902

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

TEST DATES:  JUNE 10, 2009 – SEPTEMBER 14, 2010

FINAL REPORT DATE:  NOVEMBER 30, 2010

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
MAILCODE:  NVS-220
1200 NEW JERSEY AVENUE, S.E.
WASHINGTON, D.C.  20590
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Prepared by: Eric Peschman, Project Engineer
Date: November 30, 2010

Reviewed by: Michael Janovicz, Program Manager
Date: November 30, 2010

FINAL REPORT ACCEPTED BY:

Edward E. Chan

Date of Acceptance
Compliance tests were conducted on the subject 2008 Girardin G5 MB-IV 200C School Bus, NHTSA No.: C80902, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-222-04 for the determination of FMVSS 222 compliance.

Data Sheet 11 is omitted from this report as the vehicle is not equipped with safety belts.

Test Failure: See Section 2, Test Data Summary. See Section 9, Laboratory Notice of Test Failure.

Compliance Testing
Safety Engineering
FMVSS 222
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</tr>
</tbody>
</table>
SECTION 1
PURPOSE OF COMPLIANCE TEST

Tests were conducted on a 2008 Girardin G5 MB-IV 200C School Bus, NHTSA No.: C80902, in accordance with the specifications of the Office of Vehicle Safety Compliance (OVSC) Test Procedures TP-222-04 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.: DTNH22-08-D-00075.
The passenger seating and crash protection tests were conducted from June 10, 2009 through September 14, 2010. All tests were conducted by MGA Research Corporation at the Wisconsin Operations. The test vehicle, 2008 Girardin G5 MB-IV 200C School Bus NHTSA No.: C80902, does not appear to meet all the requirements of FMVSS 222. The test failures are listed below.

**FAILURE 1**
During the barrier force deflection test for Barrier No. B1, the test results appeared to fall outside of the force/deflection zone as specified in S5.2.3(a) and failed to absorb 1,356 joules (452W joules) of energy before it reached the displacement limit of 356 mm. The total energy absorbed was 1,224 Joules.

**FAILURE 2**
During the rearward force deflection test for Seat No. S4, the seat reached the maximum allowable deflection of 254 mm before it absorbed 948 joules (316W joules) of energy. The total energy absorbed was 882 Joules.
LINEAR AND AREA MEASUREMENTS
Seat to seat/barrier spacing was checked on all seats and found to be 590 mm or less as shown on Data Sheet No. 1.

The seat back height and front surface area of Seat Nos. S1 and S6 were measured in accordance with Section 12.1 of OVSC TP-222-04. As shown in Data Sheet No. 2 for S1 and S6, the seat back area is greater than ninety percent of the seat bench width multiplied by 508.

The restraining barrier position and projected rear surface area of Barrier Nos. B1 and B6 were measured in accordance with OVSC TP-222-04. As shown in Data Sheet No. 6 for B1 and B6, the projected perimeters of the seats fall completely within the perimeters of the restraining barriers.

SEAT CUSHION RETENTION
Seat Nos. S2 and S6 were tested in accordance with Section 12.3 of OVSC TP-222-04. Seat cushion weight was 3.4 kg for both S2 and S6. The maximum force reached for S2 was 173 N and 182 N for S6. For S2, the lower time limit boundary (t1) was approximately 4 seconds with approximate load duration of 11 seconds. For S6, the lower time limit boundary (t1) was approximately 2 seconds with approximate load duration of 7 seconds. As shown in Data Sheet No. 3, the seat cushions tested met all requirements.

SEAT BACK FORCE/DEFLECTION TEST - FORWARD
Seat Nos. S1 and S6 were tested in accordance with Section 12.4 of OVSC TP-222-04. Seat bench width was determined to be 987 mm for S1 and S6. “W” was calculated to be 3 for S1 and S6. The seating reference point (SRP) was 470 mm above the bus floor. The deflection of the seat back at conclusion of lower loading bar loading at 1557 W N load was 60 mm for S1 and S6. The allowable maximum deflection without moving the seat back to within 102 mm of another seat or restraining barrier was 356 mm for both seats. The stroke rate of the upper loading bar was determined by the test engineer to be 12.3 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 S1 and S6. As shown on Data Sheet No. 4, S1 and S6 met the force deflection forward requirements.
SECTION 2 (CONTINUED)
TEST DATA SUMMARY

SEAT BACK FORCE/DEFLECTION TEST - REARWARD
Seat No. S4 was tested in accordance with Section 12.4 of OVSC TP-222-04. Seat bench width was determined to be 987 mm. “W” was calculated to be 3. The seating reference point (SRP) was 470 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 8.8 mm/sec for S4. 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 882 joules for S4. The minimum required area under the force versus deflection curve of the loading bar was 316 W or 948 joule. As shown in Data Sheet No. 5, S4 did not meet the force deflection rearward requirements.

RESTRAINING BARRIER FORCE/DEFLECTION TEST - FORWARD
The left restraining Barrier No. B1 was tested in accordance with Section 12.4 of OVSC TP-222-04. Seat bench width of the aft seat was determined to be 987 mm. “W” was calculated to be 3 for B1. The SRP was 470 mm above the bus floor. The deflection of the restraining barrier at the conclusion of the lower loading bar loading at 1557W was 89 mm. The allowable maximum deflection without moving the restraining barrier 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 12.3 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 for B1. The area under the force versus deflection curve of the upper loading bar was 1,224 joules. The minimum required area under the force versus deflection curve of the upper loading bar was 452 W or 1,356 joules. As shown on Data Sheet No. 7, B1 did not meet the force deflection forward requirements.

KNEE FORM IMPACT ZONE TESTS
Seat No. S2 and Barrier No. B6 were tested in accordance with Section 12.7 of OVSC TP-222-04. The mass of the knee form was 4.53 kg. All knee form contact area criteria and impact energy criteria were met for Seat No. S2 and Barrier No. B6. Data from these tests are presented on Data Sheet No. 10.
HEAD FORM IMPACT ZONE TESTS
Seat No. S2 and Barrier No. B6 were tested in accordance with Section 12.6 of OVSC TP-222-04. The mass of the head form was 5.21 kg. All head form contact area, impact energy, and head injury criteria were met for Seat No. S2 and Barrier No. B6. Data from these tests are presented in Data Sheet No. 8 and Data Sheet No. 9.

WHEELCHAIR SECUREMENT ANCHORAGE AND DEVICE TESTS
Securement anchorages for wheelchair location W3.5 were tested in accordance with Appendix 3 of OVSC TP-222-04. Wheelchair location W3.5 is located behind Seat No. S3 on the driver’s side of the bus.

The webbing straps provided with the vehicle were replaced with high strength webbing while still using the original anchorage attachment hardware. The Type A and C anchor points, and Type D Upper Torso Restraint met the requirements for static loading. Data from these tests are presented in Data Sheet No. 12.
## ADMINISTRATIVE DATA SHEET

**Test Vehicle:** 2008 GIRARDIN G5 MB-IV 200C SCHOOL BUS  
**NHTSA No.:** C80902  
**Test Lab:** MGA RESEARCH CORPORATION  
**Test Dates:** 06/10/09 – 09/14/10

### INCOMPLETE VEHICLE (IF APPLICABLE)

| Manufacturer: | Ford Motor Company |
| Make/Model: | G5 MB-IV 200C |
| VIN: | 1FD4E45PX8DB40217 |
| Certification Date: | 05/08 |

### COMPLETED VEHICLE (SCHOOL BUS)

| Manufacturer: | Girardin Minibus Inc. |
| Make/Model: | Girardin G5 MB-IV 200C |
| VIN: | 1FD4E45PX8DB40217 |
| NHTSA No.: | C80902 |
| Color: | Yellow |
| GVWR: | 6,373 kg / 14,050 lb |
| Manufacture Date: | 06/08 |
| Certification Date: | 05/08 |

### DATES

| Vehicle Receipt: | 02/19/09 |
| Start of Compliance Test: | 06/10/09 |
| Completion of Compliance Test: | 09/14/10 |

Compliance Test: All tests were performed in accordance with the references outlined in TP-222-04.

Recorded By: 

Approved By: Michael Jones  
Date: 09/14/10
SCHOOL BUS IDENTIFICATION

<table>
<thead>
<tr>
<th>Model Year/Mfr./Make/Model:</th>
<th>2008 / Girardin G5 MB-IV 200C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger Capacity:</td>
<td>(1 Driver, 19 Passengers)</td>
</tr>
<tr>
<td>NHTSA No.:</td>
<td>C80902</td>
</tr>
<tr>
<td>VIN:</td>
<td>1FD4E45PX8DB40217</td>
</tr>
<tr>
<td>Conventional or Forward Control:</td>
<td>Conventional</td>
</tr>
<tr>
<td>GAWR (Certification Label) FRONT:</td>
<td>2,087 kg / 4,600 lb</td>
</tr>
<tr>
<td>GAWR (Certification Label) REAR:</td>
<td>4,309 kg / 9,500 lb</td>
</tr>
<tr>
<td>GVWR (Certification Label) TOTAL:</td>
<td>6,373 kg / 14,050 lb</td>
</tr>
</tbody>
</table>

TEST CONDITIONS

<table>
<thead>
<tr>
<th>Date(s) of Test:</th>
<th>06/10/09 – 09/14/10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient Temperature (°C):</td>
<td>21°C</td>
</tr>
<tr>
<td>Required Temperature Range (°C):</td>
<td>0°C to 32°C</td>
</tr>
</tbody>
</table>

SEAT IDENTIFICATION

<table>
<thead>
<tr>
<th>Seat Manufacturer:</th>
<th>The C.E. White Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model Name &amp; Number:</td>
<td></td>
</tr>
<tr>
<td>Description of Seats:</td>
<td>Seat frames are constructed of 1 inch round welded steel tubing. The seat back has a 22 gauge (0.03 inches) steel pan welded to the tubing and is covered with 30 mm of soft foam. The outer main uprights of the seat back frame are covered by 32 mm Styrofoam and 11 mm of thick soft foam. The seat cushion is constructed of 3/8&quot; particle board and foam pad. The seat back and cushion are wrapped with 0.5 mm of vinyl.</td>
</tr>
</tbody>
</table>
SECTION 3
COMPLIANCE TEST DATA

The following data sheets document the results of testing on the 2008 Girardin G5 MB-IV 200C School Bus, NHTSA No.: C80902.
# DATA SHEET 1

## SEAT TO SEAT/BARRIER SPACING

<table>
<thead>
<tr>
<th>Seat Number</th>
<th>Measurement of Spacing From SRP Forward to Seat/Barrier (mm)</th>
<th>Requirement ≤ 610 mm (≤ 24&quot;) Class 1 Buses Only</th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>578</td>
<td></td>
<td>PASS</td>
</tr>
<tr>
<td>S2</td>
<td>584</td>
<td></td>
<td>PASS</td>
</tr>
<tr>
<td>S3</td>
<td>590</td>
<td></td>
<td>PASS</td>
</tr>
<tr>
<td>S4</td>
<td>589</td>
<td></td>
<td>PASS</td>
</tr>
<tr>
<td>S5</td>
<td>580</td>
<td></td>
<td>PASS</td>
</tr>
<tr>
<td>S6</td>
<td>547</td>
<td></td>
<td>PASS</td>
</tr>
</tbody>
</table>

**Comments:** None

**Recorded By:**

**Approved By:**

**Date:** 06/10/09
# DATA SHEET 2

## SEAT BACK HEIGHT & FRONT SURFACE AREA TEST

**Test Vehicle:** 2008 GIRARDIN G5 MB-IV 200C SCHOOL BUS  
**NHTSA No.:** C80902  
**Test Lab:** MGA RESEARCH CORPORATION  
**Test Dates:** 06/10/09 – 09/14/10

### SEAT NUMBER: S1

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>Is the seat back height at least 508 mm vertically above the SRP?</strong> (S5.1.2) Yes – Pass; No – Fail</td>
<td><strong>PASS</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 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 1 = 872 mm; width 2 = 960 mm;  
   | Area = ½ (a+b) x 508 mm = 462,534 mm² – * 12,160 mm² = 453,168 mm² |   |
| 3. | **Measure the seat cushion width – W1 = 987 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 = 451,256 mm² |   |
| 5. | **Is item 2 greater than item 4? (S5.1.2) Yes – Pass; No – Fail** | **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:** * Denotes area of the trapezoid outside of radius.

**Recorded By:**  
**Approved By:** Michael  
**Date:** 06/11/09
DATA SHEET 2
SEAT BACK HEIGHT & FRONT SURFACE AREA TEST

Test Vehicle: 2008 GIRARDIN G5 MB-IV 200C SCHOOL BUS  
NHTSA No.: C80902  
Test Lab: MGA RESEARCH CORPORATION  
Test Dates: 06/10/09 – 09/14/10

SEAT NUMBER: S6

1. Is the seat back height at least 508 mm vertically above the SRP?  
   (S5.1.2) Yes – Pass; No – Fail  
   
   **PASS**

2. Measure the seat back front projected area in a vertical plane bound by horizontal lines through the SRP and 508 mm above the SRP according to the following procedure:
   Width 1 = 872 mm;  
   width 2 = 961 mm;  
   Area = \( \frac{1}{2} \times (a+b) \times 508 \text{ mm} = 465,582 \text{ mm}^2 \) – * 10,250 mm\(^2\) = 455,332 mm\(^2\)

3. Measure the seat cushion width – W1 = 987 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 = 451,256 mm\(^2\)

5. Is item 2 greater than item 4?  
   (S5.1.2) Yes – Pass; No – Fail  
   **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: * Denotes area outside of radius.

Recorded By:  
Approved By:  
Date: 06/11/09
DATA SHEET 3
SEAT CUSHION RETENTION TEST

Test Vehicle: 2008 GIRARDIN G5 MB-IV 200C SCHOOL BUS  NHTSA No.: C80902
Test Lab: MGA RESEARCH CORPORATION  Test Dates: 06/10/09 – 09/14/10

SEAT NUMBER: S2

1. Cushion Weight/Mass = 3.4 kg
2. Cushion Weight x 5 = F = 167 N (S5.1.5)
3. Complete the following force/time graph:

```
<table>
<thead>
<tr>
<th>TIME, SECONDS</th>
<th>FORCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1 = 4 sec.</td>
<td></td>
</tr>
<tr>
<td>T2 = 11 sec.</td>
<td></td>
</tr>
</tbody>
</table>
```

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/FALSE

4. Did seat cushion separate from the seat structure at any attachment point? (S5.1.5) Yes – Fail; No – Pass

PASS

Describe Seat Cushion Attachments: Two fixed clips at leading edge and two rotating clips at rear edge.

Comments: None

Recorded By: [Signature]
Approved By: [Signature]  Date: 06/12/09
DATA SHEET 3
SEAT CUSHION RETENTION TEST

Test Vehicle: 2008 GIRARDIN G5 MB-IV 200C MB-IV 200C SCHOOL BUS
NHTSA No.: C80902
Test Lab: MGA RESEARCH CORPORATION
Test Dates: 06/10/09 – 09/14/10

SEAT NUMBER: S6

1. Cushion Weight/Mass = 3.4 kg
2. Cushion Weight x 5 = F = 167 N (S5.1.5)
3. Complete the following force/time graph:

```
<table>
<thead>
<tr>
<th>T1 = 2 sec.</th>
<th>T2 = 7 sec.</th>
</tr>
</thead>
</table>

Applied F = 182 N
```

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.

<table>
<thead>
<tr>
<th></th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Did seat cushion separate from the seat structure at any attachment point? (S5.1.5) Yes – Fail; No – Pass</td>
<td>PASS</td>
</tr>
</tbody>
</table>

Describe Seat Cushion Attachments: Two fixed clips at leading edge and two rotating clips at rear edge.

Comments: None

Recorded By: [Signature]
Approved By: [Signature] Date: 06/12/09
1. Seat Bench Width = 987 mm
   \[ W = \frac{\text{Seat Bench Width}}{381} \text{ mm (round to nearest whole number)} = 3 \]
   Seat Reference Point (SRP) location is: (Description of location as supplied by the COTR): 470 mm Above Floor, 0 mm from center.

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 = 863 mm
   Seat Back width at SRP = 966 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) = 60 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 = 12.3 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 = 755 mm. Width of seat back at 406 mm above SRP = 860 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 363 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**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.</td>
<td>Is the seat in its final deflected position within 102 mm of the next seat or barrier? Yes – Fail; No – Pass</td>
<td>NO - PASS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.</td>
<td>Does the forward force vs. deflection trace of the seat back lie within the corridor? (S5.1.3) Yes – Pass; No – Fail</td>
<td>YES - PASS</td>
</tr>
</tbody>
</table>

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

13. The area within the force vs. deflection curve = 1,777 joules

14. \(452W = 1,356\) joules (S5.1.3.4)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.</td>
<td>Is item 13 greater than or equal to item 14? (S5.1.3.4) Yes – Pass; No – Fail</td>
<td>YES - PASS</td>
</tr>
</tbody>
</table>

Comments: None

Recorded By: [Signature]

Approved By: [Signature]  Date: 06/17/09
DATA SHEET 4
SEAT BACK FORCE DEFLECTION TEST – FORWARD

Test Vehicle: 2008 GIRARDIN G5 MB-IV 200C SCHOOL BUS  NHTSA No.: C80902
Test Lab: MGA RESEARCH CORPORATION  Test Dates: 06/10/09 – 09/14/10

SEAT NUMBER: S6

1. Seat Bench Width = 987 mm
   \[ W = \frac{\text{Seat Bench Width}}{381 \text{ mm}} \text{ (round to nearest whole number)} = (3) \]
   Seat Reference Point (SRP) location is: (Description of location as supplied by the COTR): 470 mm Above Floor, 0 mm center.

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 = 863 mm
   Seat Back width at SRP = 966 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) = 60 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 = 12.3 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 = 755 mm. Width of seat back at 406 mm above SRP = 860 mm.

8. Reason for stopping seat back deflection:
   \[ \_\_\_\_\_\_ \text{Reached deflection determined in Item 6 above (if less than 356 mm)} \]
   \[ \_\_\_\_\_\_ \text{Reached 356 mm maximum allowed deflection (Actual deflection was 363 mm)} \]
   \[ \_\_\_\_\_\_ \text{Separation was about to occur} \]

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.
<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Is the seat in its final deflected position within 102 mm of the next seat or barrier? Yes – Fail; No – Pass</td>
<td>NO - PASS</td>
</tr>
<tr>
<td>11</td>
<td>Does the forward force vs. deflection trace of the seat back lie within the corridor? (S5.1.3) Yes – Pass; No – Fail</td>
<td>YES - PASS</td>
</tr>
<tr>
<td>12</td>
<td>Include a deflection vs. time plot for the upper loading bar.</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>The area within the force vs. deflection curve = 1,641 joules</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>452W = 1,356 joules (S5.1.3.4)</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Is item 13 greater than or equal to item 14? (S5.1.3.4) Yes – Pass; No – Fail</td>
<td>PASS</td>
</tr>
</tbody>
</table>

Comments: None

Recorded By: [Signature]

Approved By: [Signature] Date: 06/17/09
SEAT BACK FORCE DEFLECTION TEST – REARWARD

Test Vehicle: 2008 GIRARDIN G5 MB-IV 200C SCHOOL BUS  NHTSA No.: C80902
Test Lab: MGA RESEARCH CORPORATION  Test Dates: 06/10/09 – 09/14/10

SEAT NUMBER: S4

1. Seat Bench Width = 987 mm
   \[ W = \frac{\text{Seat Bench Width}}{381 \text{ mm}} \text{ (round to nearest whole number)} = (3) \]
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 = 788 mm
   Width of seat back at 343 mm above SRP = 880 mm
3. Deflection of seat back at 222 N preload = 0 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 = 8.8 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
   ___ Force maximum
7. Include the x-y plot of force vs. deflection for the loading bar with boundaries of Figure 18 (OVSC TP-222-3) superimposed.
DATA SHEET 5 (CONTINUED)
SEAT BACK FORCE DEFLECTION TEST – REARWARD

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.</td>
<td>Does the force vs. deflection plot lie within the boundaries of Figure 18? (OVSC TP-222-04) Yes – Pass; No – Fail</td>
<td><strong>YES - PASS</strong></td>
</tr>
</tbody>
</table>

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 = 882 joules

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.</td>
<td>Is item 11 greater than or equal to item 10? (S5.1.4.2) Yes – Pass; No – Fail</td>
<td><strong>NO - FAIL</strong></td>
</tr>
</tbody>
</table>

Comments: Force reached the maximum force limit and entered the shaded region. Total energy absorbed by the seat falls below the minimum required.

Recorded By: [Signature]

Approved By: [Signature]    Date: 07/28/09
DATA SHEET 6
RESTRAINING BARRIER POSITION AND PROJECTED REAR SURFACE AREA

Test Vehicle: 2008 GIRARDIN G5 MB-IV 200C SCHOOL BUS
NHTSA No.: C80902
Test Lab: MGA RESEARCH CORPORATION
Test Dates: 06/10/09 – 09/14/10

BARRIER NUMBER: B1

1. Measure distance T from SRP of seat immediately aft of barrier in a horizontal longitudinal line forward to barrier. T = 578 mm.

2. Is distance T equal to or less than 610 mm? (S5.2) Yes – Pass; No – Fail
   \( T = 578 \text{ mm} \) \( \Rightarrow \text{PASS} \)

3. Measure distance D at top (t) and bottom (b) of barrier.
   \( D_t = 160 \text{ mm} \) \( D_b = 21 \text{ mm} \)

4. Measure distance C at top (t) and bottom (b) of seat back.
   \( C_t = 160 \text{ mm} \) \( C_b = 22 \text{ mm} \)

5. Is \( D_t \) equal to or less than \( C_t \)? Yes – Pass; No – Fail
   \( D_t = 160 \text{ mm} \) \( C_t = 160 \text{ mm} \) \( \Rightarrow \text{PASS} \)

6. Is \( D_b \) equal to or less than \( C_b \)? Yes – Pass; No – Fail
   \( D_b = 21 \text{ mm} \) \( C_b = 22 \text{ mm} \) \( \Rightarrow \text{PASS} \)

7. Measure distance E at top of barrier and bottom of barrier.
   \( E_t = 610 \text{ mm} \) \( E_b = 940 \text{ mm} \)

8. Measure distance A at top of seat back and bottom of seat.
   \( A_t = 590 \text{ mm} \) \( A_b = 939 \text{ mm} \)

9. Is distance \( E_t + D_t \) equal to or greater than distance \( A_t + C_t \)? Yes – Pass; No – Fail
   \( E_t = 610 \text{ mm} \) \( D_t = 160 \text{ mm} \) \( A_t = 590 \text{ mm} \) \( C_t = 160 \text{ mm} \) \( \Rightarrow \text{PASS} \)

10. Is distance \( E_b + D_b \) equal to or greater than distance \( A_b + C_b \)? Yes – Pass; No – Fail
    \( E_b = 940 \text{ mm} \) \( D_b = 21 \text{ mm} \) \( A_b = 939 \text{ mm} \) \( C_b = 22 \text{ mm} \) \( \Rightarrow \text{PASS} \)
11. Measure distance U at inboard (i) and outboard (o) side of barrier.
   \[ U_i = 333 \text{ mm} \quad U_o = 337 \text{ mm} \]

12. Measure distance V at inboard (i) and outboard (o) sides of seat.
   \[ V_i = 356 \text{ mm} \quad V_o = 350 \text{ mm} \]

13. Is \( U_i \) equal to or less than \( V_i \)? Yes – Pass; No – Fail

14. Is \( U_o \) equal to or less than \( V_o \)? Yes – Pass; No – Fail

15. Measure distance S at inboard (I) and outboard (o) side of barrier.
   \[ S_i = 620 \text{ mm} \quad S_o = 600 \text{ mm} \]

16. Measure distance W at inboard (i) and outboard (o) sides of seat.
   \[ W_i = 585 \text{ mm} \quad W_o = 585 \text{ mm} \]

17. Is \( S_i + U_i \) equal to or greater than \( W_i + V_i \)? Yes – Pass; No – Fail

18. Is \( S_o + U_o \) equal to or greater than \( W_o + V_o \)? Yes – Pass; No – Fail

19. Compute area \((W \times A) = 447,233 \text{ mm}^2\)

20. Compute area \((E \times S) = 472,750 \text{ mm}^2\)

21. Is \((W \times A)\) equal to or less than \((E \times S)\)? Yes – Pass; No – Fail

Comments: None

Recorded By: [Signature]

Approved By: [Signature]  Date: 06/10/09
1. Measure distance $T$ from SRP of seat immediately aft of barrier in a horizontal longitudinal line forward to barrier. $T = 547$ mm.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Is distance $T$ equal to or less than 610 mm? (S5.2) Yes – Pass; No – Fail</td>
<td>PASS</td>
</tr>
</tbody>
</table>

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

$$D_t = 140 \text{ mm} \quad D_b = 25 \text{ mm}$$

4. Measure distance $C$ at top ($t$) and bottom ($b$) of seat back.

$$C_t = 140 \text{ mm} \quad C_b = 26 \text{ mm}$$

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>Is $D_t$ equal to or less than $C_t$? Yes – Pass; No – Fail</td>
<td>PASS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>Is $D_b$ equal to or less than $C_b$? Yes – Pass; No – Fail</td>
<td>PASS</td>
</tr>
</tbody>
</table>

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

$$E_t = 625 \text{ mm} \quad E_b = 934 \text{ mm}$$

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

$$A_t = 625 \text{ mm} \quad A_b = 924 \text{ mm}$$

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.</td>
<td>Is distance $E_t + D_t$ equal to or greater than distance $A_t + C_t$? Yes – Pass; No – Fail</td>
<td>PASS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.</td>
<td>Is distance $E_b + D_b$ equal to or greater than distance $A_b + C_b$? Yes – Pass; No – Fail</td>
<td>PASS</td>
</tr>
</tbody>
</table>
11. Measure distance $U$ at inboard (i) and outboard (o) side of barrier.
   $U_i = 330$ mm $\quad U_o = 348$ mm

12. Measure distance $V$ at inboard (i) and outboard (o) sides of seat.
   $V_i = 340$ mm $\quad V_o = 350$ mm

<table>
<thead>
<tr>
<th></th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.</td>
<td>$U_i$ equal to or less than $V_i$? Yes – Pass; No – Fail</td>
</tr>
<tr>
<td>14.</td>
<td>$U_o$ equal to or less than $V_o$? Yes – Pass; No – Fail</td>
</tr>
</tbody>
</table>

15. Measure distance $S$ at inboard (I) and outboard (o) side of barrier.
   $S_i = 541$ mm $\quad S_o = 594$ mm

16. Measure distance $W$ at inboard (i) and outboard (o) sides of seat.
   $W_i = 490$ mm $\quad W_o = 590$ mm

<table>
<thead>
<tr>
<th></th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.</td>
<td>$S_i + U_i$ equal to or greater than $W_i + V_i$? Yes – Pass; No – Fail</td>
</tr>
<tr>
<td>18.</td>
<td>$S_o + U_o$ equal to or greater than $W_o + V_o$? Yes – Pass; No – Fail</td>
</tr>
</tbody>
</table>

19. Compute area $(W \times A) = 430,111$ mm$^2$

20. Compute area $(E \times S) = 442,366$ mm$^2$

<table>
<thead>
<tr>
<th></th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>21.</td>
<td>$(W \times A)$ equal to or less than $(E \times S)$? Yes – Pass; No – Fail</td>
</tr>
</tbody>
</table>

Comments: None

Recorded By: [Signature]

Approved By: [Signature] Date: 06/10/09
BARRIER NUMBER: B1

1. Seat cushion width of seat immediately rearward of restraining barrier = 987 mm
   \[ W = \text{(Seat Cushion Width)}/381 \text{ mm (round to nearest whole number)} = (3) \]
2. Location of SRP of seat rearward of restraining barrier is: (Description of location as supplied by the manufacturer): 470 mm Above Floor.
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 = 863 mm
   Width of barrier at SRP = 960 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) = 89 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 = 12.3 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 = 737 mm
   Width of Barrier at 406 mm above the SRP = 835 mm
9. Reason for stopping restraining barrier deflection:
   ___ Reached 356 mm maximum
   ___ Separation was about to occur
   ___ Interference with door operation
   ___ Exceeded maximum load of 10,675 N
10. Maximum deflection of barrier back 363 mm.
    (Requirement: maximum allowed is 356 mm) (S5.2.3(b))
**DATA SHEET 7 (CONTINUED)\n**

**RESTRAINING BARRIER FORCE/DEFLECTION TEST**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>11.</strong></td>
<td>Does the restraining barrier interfere with the normal operation of the door? (S5.2.3 (c)) Yes – Fail; No – Pass</td>
<td><strong>NO - PASS</strong></td>
</tr>
<tr>
<td><strong>12.</strong></td>
<td>Did any separation of barrier component or the separation of the barrier from the vehicle occur? (S5.2.3 (e)) Yes – Fail; No – Pass</td>
<td><strong>NO - PASS</strong></td>
</tr>
<tr>
<td></td>
<td><strong>13.</strong> Include the x-y plot of force vs. deflection for the upper loading bar with boundaries of Figure 14 (OVSC TP-222-3) superimposed.</td>
<td></td>
</tr>
<tr>
<td><strong>14.</strong></td>
<td>Does the forward force vs. deflection trace of the barrier back lie within the unshaded area? (S5.2.3(a)) Yes – Pass; No – Fail</td>
<td><strong>NO - FAIL</strong></td>
</tr>
<tr>
<td></td>
<td><strong>15.</strong> Include a deflection vs. time plot for the upper loading bar.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>16.</strong> The area within the force vs. deflection curve = 1,224 joules</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>17.</strong> $452W = 1,356$ joules (S5.2.3) (S5.1.3.4)</td>
<td></td>
</tr>
<tr>
<td><strong>18.</strong></td>
<td>Is item 16 greater than item 17? Yes – Pass; No – Fail</td>
<td><strong>NO - FAIL</strong></td>
</tr>
</tbody>
</table>

Comments:  Wall mount weldment began to tear.

Recorded By:  

Approved By:  Michael Jarvis  
Date: 06/17/09
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 H1, H2, H3, H4, and H5 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
4. Complete the following table:

<table>
<thead>
<tr>
<th>Head Impact &amp; Test #</th>
<th>Location (a)</th>
<th>Speed Trap Impact Velocity** mps</th>
<th>Derived Velocity mps</th>
<th>Contact Area (CA) mm²</th>
<th>CA ≥ 1935 mm²</th>
<th>Yes-PASS</th>
<th>No-FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>Y</td>
<td>Angle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H1</td>
<td>-663</td>
<td>422</td>
<td>0</td>
<td>1.57</td>
<td>1.59</td>
<td>4,550</td>
<td>PASS</td>
</tr>
<tr>
<td>H2</td>
<td>-533</td>
<td>424</td>
<td>0</td>
<td>1.58</td>
<td>1.52</td>
<td>4,640</td>
<td>PASS</td>
</tr>
<tr>
<td>H3</td>
<td>-785</td>
<td>422</td>
<td>0</td>
<td>1.57</td>
<td>1.53</td>
<td>5,710</td>
<td>PASS</td>
</tr>
<tr>
<td>H4</td>
<td>-602</td>
<td>334</td>
<td>0</td>
<td>1.58</td>
<td>1.33</td>
<td>4,180</td>
<td>PASS</td>
</tr>
<tr>
<td>H5</td>
<td>-474</td>
<td>338</td>
<td>0</td>
<td>1.57</td>
<td>1.60</td>
<td>3,810</td>
<td>PASS</td>
</tr>
</tbody>
</table>

* 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: 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. In the case of Seat No. S2, the inboard edge of the seat is on the right hand side of the seat as viewed from the rear.

Recorded By: [Signature]  
Approved By: [Signature]  
Date: 05/18/10
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, and H5 in the appropriate location.

3. Define and mark on graphic above, the plane of reference for head form impact angle:
   - $0^\circ = $ Parallel with Floor, (+) is Up, (-) is Down
   - X = From Inboard Edge of Barrier
   - Y = Measured Vertically from the SRP
4. Complete the following table:

<table>
<thead>
<tr>
<th>Head Impact &amp; Test #</th>
<th>Location (a)</th>
<th>Speed Trap Impact Velocity** mps</th>
<th>Derived Velocity mps</th>
<th>Contact Area (CA) mm²</th>
<th>CA ≥ 1935 mm²</th>
<th>Yes-PASS</th>
<th>No-FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>Y</td>
<td>Angle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H1 586</td>
<td>317</td>
<td>0</td>
<td>1.54</td>
<td>1.60</td>
<td>3,670</td>
<td>PASS</td>
<td></td>
</tr>
<tr>
<td>H2 710</td>
<td>319</td>
<td>0</td>
<td>1.55</td>
<td>1.69</td>
<td>4,570</td>
<td>PASS</td>
<td></td>
</tr>
<tr>
<td>H3 785</td>
<td>406</td>
<td>0</td>
<td>1.59</td>
<td>1.69</td>
<td>3,940</td>
<td>PASS</td>
<td></td>
</tr>
<tr>
<td>H4 530</td>
<td>403</td>
<td>0</td>
<td>1.57</td>
<td>1.59</td>
<td>4,050</td>
<td>PASS</td>
<td></td>
</tr>
<tr>
<td>H5 660</td>
<td>404</td>
<td>0</td>
<td>1.52</td>
<td>1.46</td>
<td>4,670</td>
<td>PASS</td>
<td></td>
</tr>
</tbody>
</table>

* 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: 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 barrier. In the case of Barrier No. B6, the inboard edge of the barrier is on the left hand side of the barrier as viewed from the rear.

Recorded By: [Signature]

Approved By: [Signature] Date: 09/09/10
SEAT NUMBER: S2

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 H8, H9, H10, H11, and H12 in the appropriate location.

3. Define and mark on graphic above, the plane of reference for head form impact angle:
   - $0^\circ$ = Parallel with Floor, (+) is Up, (-) is Down
   - X = From Inboard Edge of Seat
   - Y = Measured Vertically from the SRP
### HEAD FORM IMPACT ENERGY REQUIREMENT

4. Complete the following table:

<table>
<thead>
<tr>
<th>Head impact &amp; Test #</th>
<th>Location (a)</th>
<th>Speed Trap Impact Velocity ** mps</th>
<th>Derived Velocity ** mps</th>
<th>Max HIC</th>
<th>Energy Req'd Joules</th>
<th>Column 5 &lt; 1000</th>
<th>Column 6 &gt; 4.5 joules</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X</td>
<td>Y</td>
<td>Angle</td>
<td></td>
<td></td>
<td></td>
<td>Yes-PASS</td>
</tr>
<tr>
<td>H8</td>
<td>-409</td>
<td>420</td>
<td>0</td>
<td>6.62</td>
<td>6.46</td>
<td>135</td>
<td>7.87</td>
</tr>
<tr>
<td>H9</td>
<td>-281</td>
<td>419</td>
<td>0</td>
<td>6.69</td>
<td>6.72</td>
<td>148</td>
<td>7.21</td>
</tr>
<tr>
<td>H10</td>
<td>-155</td>
<td>419</td>
<td>0</td>
<td>6.67</td>
<td>6.60</td>
<td>146</td>
<td>7.25</td>
</tr>
<tr>
<td>H11</td>
<td>-346</td>
<td>335</td>
<td>0</td>
<td>6.63</td>
<td>6.45</td>
<td>105</td>
<td>18.63</td>
</tr>
<tr>
<td>H12</td>
<td>-220</td>
<td>330</td>
<td>0</td>
<td>6.61</td>
<td>6.43</td>
<td>102</td>
<td>20.78</td>
</tr>
</tbody>
</table>

* 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: 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. In the case of Seat No. S2, the inboard edge of the seat is on the right hand side of the seat as viewed from the rear.

Recorded By: [Signature]

Approved By: [Signature]          Date: 08/27/10
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, and H13 in the appropriate location.
3. Define and mark on graphic above, the plane of reference for head form impact angle:
   - $0^\circ$ = Parallel with Floor, (+) is Up, (-) is Down
   - X = From Inboard Edge of Barrier
   - Y = Measured Vertically from the SRP
4. Complete the following table:

<table>
<thead>
<tr>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)*</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
<th>(8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head impact &amp; Test #</td>
<td>Location (a)</td>
<td>Speed Trap Impact Velocity ** mps</td>
<td>Derived Velocity ** mps</td>
<td>Max HIC</td>
<td>Energy Req’d Joules</td>
<td>Column 5 &lt; 1000</td>
<td>Column 6 &gt; 4.5 joules</td>
</tr>
<tr>
<td>X</td>
<td>Y</td>
<td>Angle</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>H8</td>
<td>148</td>
<td>407</td>
<td>0</td>
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<td>6.53</td>
<td>94</td>
<td>7.24</td>
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<tr>
<td>H9</td>
<td>275</td>
<td>407</td>
<td>0</td>
<td>6.61</td>
<td>6.45</td>
<td>98</td>
<td>6.52</td>
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<tr>
<td>H10</td>
<td>401</td>
<td>407</td>
<td>0</td>
<td>6.67</td>
<td>6.49</td>
<td>119</td>
<td>7.49</td>
</tr>
<tr>
<td>H11</td>
<td>206</td>
<td>320</td>
<td>0</td>
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<td>6.56</td>
<td>108</td>
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<tr>
<td>H12</td>
<td>333</td>
<td>320</td>
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<td>112</td>
<td>14.07</td>
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<td>H13</td>
<td>460</td>
<td>321</td>
<td>0</td>
<td>6.61</td>
<td>6.54</td>
<td>107</td>
<td>19.47</td>
</tr>
</tbody>
</table>

* 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: 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 barrier. In the case of Barrier No. B6, the inboard edge of the barrier is on the left hand side of the barrier as viewed from the rear.

Recorded By: [Signature]

Approved By: [Signature] Date: 09/09/10
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:
   $0^\circ$ = Parallel with Floor, (+) is Up, (-) is Down
   X = From Inboard Edge of the Seat
   Y = Measured Vertically from the SRP
4. Complete the following table:

<table>
<thead>
<tr>
<th>Knee impact &amp; Test #</th>
<th>Location (a)</th>
<th>Speed Trap Impact Velocity ** mps</th>
<th>Derived Velocity ** mps</th>
<th>Cont. Area mm²</th>
<th>Resist Force (N)</th>
<th>Column 5 &gt; 1935 mm²</th>
<th>Column 6 &lt; 2669N</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>Y</td>
<td>Angle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K1</td>
<td>-493</td>
<td>247</td>
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<td>4.94</td>
<td>4.64</td>
<td>2,750</td>
<td>1,426</td>
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<tr>
<td>K2</td>
<td>-300</td>
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<td>0</td>
<td>4.90</td>
<td>4.60</td>
<td>2,890</td>
<td>1,383</td>
<td>PASS</td>
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<tr>
<td>K3</td>
<td>-110</td>
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<td>0</td>
<td>4.88</td>
<td>4.73</td>
<td>3,320</td>
<td>1,394</td>
<td>PASS</td>
</tr>
<tr>
<td>K4</td>
<td>-92</td>
<td>139</td>
<td>0</td>
<td>4.87</td>
<td>4.41</td>
<td>3,570</td>
<td>1,776</td>
<td>PASS</td>
</tr>
<tr>
<td>K5</td>
<td>-472</td>
<td>143</td>
<td>0</td>
<td>4.81</td>
<td>4.26</td>
<td>3,770</td>
<td>1,781</td>
<td>PASS</td>
</tr>
<tr>
<td>K6</td>
<td>-281</td>
<td>139</td>
<td>0</td>
<td>4.84</td>
<td>4.26</td>
<td>3,570</td>
<td>1,641</td>
<td>PASS</td>
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<tr>
<td>K7</td>
<td>-282</td>
<td>36</td>
<td>0</td>
<td>4.80</td>
<td>4.81</td>
<td>1,912</td>
<td></td>
<td>PASS</td>
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<tr>
<td>K8</td>
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<td>32</td>
<td>0</td>
<td>4.81</td>
<td>4.53</td>
<td>1,939</td>
<td></td>
<td>PASS</td>
</tr>
</tbody>
</table>

* 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: 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. In the case of Seat No. S2, the inboard edge of the seat is on the right hand side of the seat as viewed from the rear.

Recorded By: [Signature]

Approved By: [Signature] Date: 05/18/10
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:
   - $0^\circ = \text{Parallel with Floor, (+) is Up, (-) is Down}$
   - X = From Inboard Edge of the Barrier
   - Y = Measured Vertically from the SRP
4. Complete the following table:

<table>
<thead>
<tr>
<th>Knee impact &amp; Test #</th>
<th>Location (a)</th>
<th>Speed Trap Impact Velocity ** mps</th>
<th>Derived Velocity ** mps</th>
<th>Cont. Area mm²</th>
<th>Resist Force (N)</th>
<th>Column 5 &gt; 1935 mm²</th>
<th>Column 6 &lt; 2669N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X  Y  Angle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes- PASS</td>
<td>No- FAIL</td>
</tr>
<tr>
<td>K1</td>
<td>78  242  0</td>
<td>4.91</td>
<td>4.80</td>
<td>3,250</td>
<td>2,413</td>
<td>PASS</td>
<td></td>
</tr>
<tr>
<td>K2</td>
<td>264 244   0</td>
<td>4.87</td>
<td>4.77</td>
<td>3,320</td>
<td>1,350</td>
<td>PASS</td>
<td></td>
</tr>
<tr>
<td>K3</td>
<td>395 244   0</td>
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<td>4.67</td>
<td>2,450</td>
<td>1,474</td>
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<td></td>
</tr>
<tr>
<td>K4</td>
<td>534 240   0</td>
<td>4.90</td>
<td>4.69</td>
<td>2,830</td>
<td>1,061</td>
<td>PASS</td>
<td></td>
</tr>
<tr>
<td>K5</td>
<td>76  126   0</td>
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<td>4.70</td>
<td></td>
<td>1,549</td>
<td>PASS</td>
<td></td>
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<tr>
<td>K6</td>
<td>254 127   0</td>
<td>4.86</td>
<td>4.63</td>
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<td>1,656</td>
<td>PASS</td>
<td></td>
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<tr>
<td>K7</td>
<td>440 126   0</td>
<td>4.81</td>
<td>4.57</td>
<td></td>
<td>1,776</td>
<td>PASS</td>
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</tr>
<tr>
<td>K8</td>
<td>610 127   0</td>
<td>4.85</td>
<td>4.82</td>
<td></td>
<td>1,592</td>
<td>PASS</td>
<td></td>
</tr>
</tbody>
</table>

* 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: 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 barrier. In the case of Barrier No. B6, the inboard edge of the barrier is on the left hand side of the barrier as viewed from the rear.

Recorded By: [Signature]

Approved By: [Signature] Date: 09/09/10
### DATA SHEET 12

**WHEELCHAIR SECUREMENT ANCHORAGES AND DEVICES**

**WHEELCHAIR OCCUPANT RESTRAINT ANCHORAGES AND RESTRAINTS**

**Test Vehicle:** 2008 GIRARDIN G5 MB-IV 200C SCHOOL BUS  
**NHTSA No.:** C80902  
**Test Lab:** MGA RESEARCH CORPORATION  
**Test Dates:** 06/10/09 – 09/14/10

**WHEELCHAIR LOCATIONS: W3.5**

<table>
<thead>
<tr>
<th></th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Are all wheelchair securement and occupant restraint anchorages designed for forward wheelchair position? Yes – Pass; No – Fail</td>
</tr>
<tr>
<td>2.</td>
<td>Each wheelchair location shall have not less than four wheelchair securement anchorages (Type A or C) – two located in front of the wheelchair and two in the rear. Type C anchorage may be used in rear of the wheelchair only. Number of Type A anchorages in front of the wheelchair? (&gt;2 Pass;&lt;2 Fail)</td>
</tr>
</tbody>
</table>
| 3. | Number of anchorages behind the wheelchair?  
Type A _0_;  
Type C _2_;  
Total: 2  
(>2 Pass;<2 Fail) | PASS |
| 4. | Each wheelchair location shall have not less than two wheelchair occupant pelvis and upper torso restraint anchorage (Type B, C, or combination). The pelvic belt must not terminate at the wheelchair. Number of anchorages?  
Type B _0_;  
Type C _2_;  
Total: 2  
(>2 Pass;<2 Fail) | PASS |
| 5. | The wheelchair location has at least one Type D anchorage? 1  
Yes – Pass; No – Fail | PASS |
| 6. | The wheelchair securement device has means to limit movement of the wheelchair? Yes – Pass; No – Fail | PASS |
## WHEELCHAIR OCCUPANT RERAINT ANCHORAGES AND RESTRAINTS

<table>
<thead>
<tr>
<th>Wheelchair Location</th>
<th>Anchorage Location</th>
<th>Anchorage Type</th>
<th>Required Load (Newtons)</th>
<th>Actual Max. Test Load (Newtons)</th>
<th>PASS/FAIL</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>W3.5</td>
<td>LF</td>
<td>A</td>
<td>13,334</td>
<td>13,358</td>
<td>PASS</td>
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<tr>
<td></td>
<td>LR</td>
<td>C</td>
<td>26,668</td>
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<tr>
<td></td>
<td>Upper Torso</td>
<td>D</td>
<td>6,672</td>
<td>6,678</td>
<td>PASS</td>
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Comments: None

Recorded By: [Signature]

Approved By: [Signature]  Date: 09/14/10
## Section 4
### Instrumentation and Equipment List

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<tr>
<th>Equipment</th>
<th>Description</th>
<th>Model / Serial No.</th>
<th>Cal. Date</th>
<th>Cal. Due Date</th>
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<td>Load Cell</td>
<td>Interface</td>
<td>1210AF-5K / 62736</td>
<td>05/14/09</td>
<td>11/14/09</td>
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<tr>
<td>Load Cell</td>
<td>Interface</td>
<td>1210AF-5K / 62736</td>
<td>01/18/10</td>
<td>07/18/10</td>
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<td>Interface</td>
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<td>07/26/10</td>
<td>01/26/11</td>
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<tr>
<td>Load Cell</td>
<td>Interface</td>
<td>1210AF-25K-B / 137778</td>
<td>05/08/09</td>
<td>11/08/09</td>
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<td>Load Cell</td>
<td>Interface</td>
<td>1210AF-25K-B / 137778</td>
<td>12/08/09</td>
<td>06/08/10</td>
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<tr>
<td>Load Cell</td>
<td>Interface</td>
<td>1210AF-25K-B / 137778</td>
<td>06/21/10</td>
<td>12/21/10</td>
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<tr>
<td>Load Cell</td>
<td>PCB</td>
<td>1315-101-01A / 664</td>
<td>03/24/09</td>
<td>09/24/09</td>
</tr>
<tr>
<td>Load Cell</td>
<td>PCB</td>
<td>1315-101-01A / 664</td>
<td>03/24/10</td>
<td>09/24/10</td>
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<tr>
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<td>Ametek</td>
<td>P-40A / 9904-8664</td>
<td>12/23/09</td>
<td>06/23/10</td>
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<tr>
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<td>11/26/09</td>
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<td>Ametek</td>
<td>P25A / 1102-19183</td>
<td>08/10/10</td>
<td>02/10/11</td>
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<td>EGE-73B6Q-500JF / G30-N08</td>
<td>05/15/09</td>
<td>11/15/09</td>
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<td>Entran</td>
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<td>01/04/10</td>
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<td>05/24/10</td>
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<td>Powerlock / 184</td>
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## TABLE OF PHOTOGRAPHS

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<tr>
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<td>Left Side View of School Bus</td>
<td>42</td>
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<tr>
<td>2</td>
<td>Right Side View of School Bus</td>
<td>43</td>
</tr>
<tr>
<td>3</td>
<td>¾ Front View From Left Side of School Bus</td>
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<td>4</td>
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<td>5</td>
<td>¾ Rear View From Left Side of School Bus</td>
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<td>6</td>
<td>¾ Rear View From Right Side of School Bus</td>
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<td>Certification Label &amp; Tire Placard</td>
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<td>Incomplete Vehicle Label</td>
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<td>Vehicle Interior View From Front to Rear</td>
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<td>Vehicle Interior View From Rear to Front</td>
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<tr>
<td>11</td>
<td>Pre-Test of Seat Cushion Retention Set Up on Seat S2</td>
<td>52</td>
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<td>Pre-Test of Seat Cushion Retention Set Up on Seat S6</td>
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<td>Pre-Test of Seat Back S1 Force Deflection Forward Test</td>
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<td>Post-Test of Seat Back S1 Force Deflection Forward Test</td>
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<td>Post-Test of Seat Back S4 Force Deflection Rearward Test</td>
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<td>Post-Test of Barrier B1 Force Deflection Forward Test</td>
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<tr>
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<td>Pre-Test of Head and Knee Impact Locations on Seat S2</td>
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<td>Pre-Test Wheelchair Anchor A W3.5 (Left Front)</td>
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<td>Pre-Test Wheelchair Anchor C W3.5 (Left Rear)</td>
<td>66</td>
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Test Vehicle: 2008 Girardin G5 MB-IV 200C School Bus
Procedure: FMVSS 222
NHTSA No.: C80902
Test Dates: 06/10/09 – 09/14/10

Left Side View of School Bus
Test Vehicle: 2008 Girardin G5 MB-IV 200C School Bus
NHTSA No.: C80902
Procedure: FMVSS 222
Test Dates: 06/10/09 – 09/14/10

¾ Front View From Left Side of School Bus
Test Vehicle: 2008 Girardin G5 MB-IV 200C School Bus

NHTSA No.: C80902

Procedure: FMVSS 222

Test Dates: 06/10/09 – 09/14/10

% Front View From Right Side of School Bus
Test Vehicle: 2008 Girardin G5 MB-IV 200C School Bus
Procedure: FMVSS 222
NHTSA No.: C80902
Test Dates: 06/10/09 – 09/14/10

¾ Rear View From Left Side of School Bus
Test Vehicle: 2008 Girardin G5 MB-IV 200C School Bus

NHTSA No.: C80902

Procedure: FMVSS 222

Test Dates: 06/10/09 – 09/14/10

6 ¾ Rear View From Right Side of School Bus
Test Vehicle: 2008 Girardin G5 MB-IV 200C School Bus
Procedure: FMVSS 222
NHTSA No.: C80902
Test Dates: 06/10/09 – 09/14/10
Test Vehicle: 2008 Girardin G5 MB-IV 200C School Bus
Procedure: FMVSS 222
NHTSA No.: C80902
Test Dates: 06/10/09 – 09/14/10

Incomplete Vehicle Label
Test Vehicle: 2008 Girardin G5 MB-IV 200C School Bus
Procedure: FMVSS 222
NHTSA No.: C80902
Test Dates: 06/10/09 – 09/14/10

Vehicle Interior View From Front to Rear
Test Vehicle: 2008 Girardin G5 MB-IV 200C School Bus

NHTSA No.: C80902

Test Dates: 06/10/09 – 09/14/10

Procedure: FMVSS 222

Vehicle Interior View From Rear to Front
Test Vehicle: 2008 Girardin G5 MB-IV 200C School Bus
Procedure: FMVSS 222
NHTSA No.: C80902
Test Dates: 06/10/09 – 09/14/10

Pre-Test of Seat Cushion Retention Set Up on Seat S2
Pre-Test of Seat Cushion Retention Set Up on Seat S6
Test Vehicle: 2008 Girardin G5 MB-IV 200C School Bus
Procedure: FMVSS 222
NHTSA No.: C80902
Test Dates: 06/10/09 – 09/14/10

Pre-Test of Seat Back S1 Force Deflection Forward Test
Test Vehicle: 2008 Girardin G5 MB-IV 200C School Bus
Procedure: FMVSS 222
NHTSA No.: C80902
Test Dates: 06/10/09 – 09/14/10

Post-Test of Seat Back S1 Force Deflection Forward Test
Test Vehicle:
2008 Girardin G5 MB-IV 200C School Bus

NHTSA No.:
C80902

Test Dates:
06/10/09 – 09/14/10

Procedure:
FMVSS 222

Pre-Test of Seat Back S6 Force Deflection Forward Test
Test Vehicle: 2008 Girardin G5 MB-IV 200C School Bus

NHTSA No.: C8092

Test Dates: 06/10/09 – 09/14/10

Procedure: FMVSS 222

Pre-Test of Seat Back S4 Force Deflection Rearward Test
Test Vehicle: 2008 Girardin G5 MB-IV 200C School Bus  
NHTSA No.: C80902  
Procedure: FMVSS 222  
Test Dates: 06/10/09 – 09/14/10

Pre-Test of Barrier B1 Force Deflection Forward Test
Test Vehicle: 2008 Girardin G5 MB-IV 200C School Bus
Procedure: FMVSS 222
NHTSA No.: C80902
Test Dates: 06/10/09 – 09/14/10

Post-Test of Barrier B1 Force Deflection Forward Test
Pre-Test of Head and Knee Impact Locations on Seat S2
Test Vehicle: 2008 Girardin G5 MB-IV 200C School Bus

NHTSA No.: C80902

Test Dates: 06/10/09 – 09/14/10

Procedure: FMVSS 222

Pre-Test of Head and Knee Impact Locations on Barrier B6
Test Vehicle:
2008 Girardin G5 MB-IV 200C School Bus

NHTSA No.:
C80902

Procedure:
FMVSS 222

Test Dates:
06/10/09 – 09/14/10

Pre-Test Wheelchair Anchor A W1 (Left Front)
Test Vehicle: 2008 Girardin G5 MB-IV 200C School Bus
Procedure: FMVSS 222
NHTSA No.: C80902
Test Dates: 06/10/09 – 09/14/10
Test Vehicle:
2008 Girardin G5 MB-IV 200C School Bus

NHTSA No.:
C80902

Procedure:
FMVSS 222

Test Dates:
06/10/09 – 09/14/10

Pre-Test Wheelchair Anchor C W1 (Left Rear)
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Post-Test Wheelchair Anchor C W1 (Left Rear)
Test Vehicle:
2008 Girardin G5 MB-IV 200C School Bus

NHTSA No.:
C80902

Test Dates:
06/10/09 – 09/14/10

Procedure:
FMVSS 222

Pre-Test Wheelchair Shoulder Anchor D W1
Test Vehicle: 2008 Girardin G5 MB-IV 200C School Bus
Procedure: FMVSS 222
NHTSA No.: C80902
Test Dates: 06/10/09 – 09/14/10

Post-Test Wheelchair Shoulder Anchor D W1
## SECTION 6  
### TEST PLOTS

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**Force (N) vs Time (sec)**

- Maximum: 9356 N @ 33.2 sec
- Minimum: 0 N @ 0.0 sec

**Displacement (mm) vs Time (sec)**

- Maximum: 70 mm @ 35.1 sec
- Minimum: 0 mm @ 0.0 sec

---

**Seat Back Forward Deflection Seat S1 Lower Cylinder**
Seat Back Forward Deflection Seat S1 Upper Cylinder

Force (N) vs Time (sec)

- Maximum: 6652 N @ 32 sec
- Minimum: 7 N @ 55 sec

Displacement (mm) vs Time (sec)

- Maximum: 383 mm @ 36 sec
- Minimum: 0 mm @ 0 sec

Seat Back Forward Deflection Seat S1 Upper Cylinder
Seat Back Forward Deflection Seat S1 Upper Cylinder
Seat Back Forward Deflection Seat S6 Lower Cylinder

Force (N) vs Time (sec)

Maximum: 9366 N @ 29.8 sec  Minimum: 502 N @ 0.0 sec

Displacement (mm) vs Time (sec)

Maximum: 67 mm @ 32.5 sec  Minimum: 0 mm @ 0.0 sec

Seat Back Forward Deflection Seat S6 Lower Cylinder
Force (N) vs Time (sec)

Seat Back Forward Deflection Seat S6 Upper Cylinder

Displacement (mm) vs Time (sec)

Seat Back Forward Deflection Seat S6 Upper Cylinder
Force (N) vs Displacement (mm)

Maximum: 6252 N @ 325 mm
Minimum: -147 N @ 265 mm

Seat Back Forward Deflection Seat S6 Upper Cylinder
Seat Back Rearward Deflection Seat S4

Force (N) vs Displacement (mm)

Maximum: 6656 N @ 255 mm
Minimum: -24 N @ 146 mm

Energy Absorbed = 882J
Barrier Forward Deflection Barrier B1 Upper Cylinder

Force (N) vs Displacement (mm)

Maximum: 6088 N @ 345 mm
Minimum: 5 N @ 244 mm

Energy Absorbed = 1.224 J
FMVSS 222 HEAD FORM IMPACTS (1.5 m/s)
Test Date: 5-18-2010
Component ID: 2008 Girardin G5 MB-IV 200C
Location: S2 H1
NHTSA #: C80902

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

HIC 36: 2.44  T1: 20.30 S  T2: 52.40 S

Max: 0.26 G's  TMax: -0.01 S
Min: -7.16 G's  Tmin: 0.04 S

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

Max: 1.59 m/s  Tmax: 0.00 S
Min: -0.76 m/s  Tmin: 0.08 S
VEL@IMP: 1.593 m/s
FMVSS 222 HEAD FORM IMPACTS (1.5 m/s)
Test Date: 5-18-2010
Component ID: 2008 Girardin G5 MB-IV 200C
Location: S2 H2

Head X Acceleration (G's) VS TIME (S)
HIC 36: 2.56  T1: 20.50 S  T2: 54.70 S
Max: 0.10 G's  TMax: 0.00 S
Min: -7.05 G's  Tmin: 0.03 S

VELOCITY X (m/s) VS TIME (S)
Max: 1.53 m/s  TMax: -0.01 S
Min: -0.92 m/s  Tmin: 0.08 S
VEL@IMP: 1.519m/s
FMVSS 222 HEAD FORM IMPACTS (1.5 m/s)
Component ID: 2008 Girardin G5 MB-IV 200C
Location: S2 H3
Test Date: 5-18-2010
NHTSA #: C80902

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

Max: 0.11 G's
TMax: -0.00 S
Min: -7.72 G's
TMin: 0.04 S

HIC 36: 2.76
T1: 22.40 S
T2: 53.30 S

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

Max: 1.54 m/s
TMax: -0.01 S
Min: -0.92 m/s
TMin: 0.08 S
VEL@IMP: 1.533m/s
FMVSS 222 HEAD FORM IMPACTS (1.5 m/s)
Test Date: 5-18-2010
Component ID: 2008 Girardin G5 MB-IV 200C
Location: S2 H4
NHTSA #: C80902

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

- Max: -0.03 G's
- Tmax: 0.00 S
- Min: -5.50 G's
- Tmin: 0.06 S

HIC 36: 1.65
T1: 37.70 S
T2: 73.70 S

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

- Max: 1.35 m/s
- Tmax: -0.01 S
- Min: -1.32 m/s
- Tmin: 0.11 S
- Vel@Imp: 1.326 m/s
FMVSS 222 HEAD FORM IMPACTS (1.5 m/s)  
Component ID: 2008 Girardin G5 MB-IV 200C  
Location: S2 H5  
Test Date: 5-18-2010  
NHTSA #: C80902  

Head X Acceleration (G's) VS TIME (S)  
HIC 36: 1.18  
TMax: 37.60 S  
T2: 73.60 S  
Max: 0.23 G's  
TMax: -0.01 S  
Min: -4.67 G's  
TMin: 0.05 S

VELOCITY X (m/s) VS TIME (S)  
Max: 1.60 m/s  
TMax: 0.00 S  
Min: -0.73 m/s  
TMin: 0.11 S  
VEL@IMP: 1.603m/s
FMVSS 222 HEAD FORM IMPACTS (1.5 m/s)
Component ID: 2008 Girardin G5 MB-IV 200C
Location: B6 H1
Test Date: 8-30--2010
NHTSA #: C80902

**Head X Acceleration (G's) VS TIME (S)**
- Max: 0.23 G’s
- Tmax: 0.14 S
- Min: -5.35 G’s
- Tmin: 0.05 S

**VELOCITY X (m/s) VS TIME (S)**
- Max: 1.60 m/s
- Tmax: -0.00 S
- Min: -0.67 m/s
- Tmin: 0.11 S
- VEL@IMP: 1.604m/s
FMVSS 222 HEAD FORM IMPACTS (1.5 m/s)
Test Date: 8-31-2010
Component ID: 2008 Girardin G5 MB-IV 200C
Location: B6 H3
NHTSA #: C80902

Head X Acceleration (G's) VS TIME (S)
Max: 0.43 G's
TMax: 0.10 S
Min: -6.36 G's
TMin: 0.03 S

HIC 36: 1.65
T1: 14.90 S
T2: 50.90 S

VEL@IMP: 1.685 m/s

VELOCITY X (m/s) VS TIME (S)
Max: 1.69 m/s
TMax: -0.00 S
Min: -0.59 m/s
TMin: 0.08 S
VEL@IMP: 1.685 m/s
FMVSS 222 HEAD FORM IMPACTS (1.5 m/s)  
Test Date: 8-31-2010  
Component ID: 2008 Girardin G5 MB-IV 200C  
Location: B6 H4  
NHTSA #: C80902

**Head X Acceleration (G's) VS TIME (S)**

- Max: 0.33 G's
- Tmax: 0.12 S
- Min: -6.50 G's
- Tmin: 0.04 S

HIC: 1.90  
T1: 20.40 S  
T2: 54.30 S

**Velocity X (m/s) VS TIME (S)**

- Max: 1.60 m/s
- Tmax: -0.01 S
- Min: -0.70 m/s
- Tmin: 0.09 S

**VEL@IMP**: 1.592 m/s
FMVSS 222 HEAD FORM IMPACTS (1.5 m/s)
Test Date: 8-31-2010
Component ID: 2008 Girardin G5 MB-IV 200C
Location: B6 H5

Component ID: 2008 Girardin G5 MB-IV 200C
Location: B6 H5

Head X Acceleration (G's) VS TIME (S)
HIC 36: 2.34  T1: 20.90 S  T2: 55.80 S
Max: 0.16 G's  Tmax: 0.10 S
Min: -6.85 G's  Tmin: 0.04 S

VELOCITY X (m/s) VS TIME (S)
Max: 1.49 m/s  Tmax: -0.01 S
Min: -1.02 m/s  Tmin: 0.09 S
VEL@IMP: 1.46m/s
HEAD FORM IMPACT (6.69 m/s) Test Date: 5-18-2010
Component ID: 2008 Girardin G5 MB-IV 200C
Location: S2 H9
NHTSA#: C80902

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

Max: 51.63 G's
TMax: 0.06 S
Min: -57.33 G's
TMin: 0.01 S

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

Max: 6.78 m/s
TMax: -0.00 S
Min: -3.17 m/s
TMin: 0.05 S

VEL@IMP: 6.717 m/s

**FORCE X (N) VS TIME (S)**

Max: 2,638.59 N
TMax: 0.06 S
Min: -2,930.14 N
TMin: 0.01 S

**FORCE X (N) VS TIME (SEC)**

Energy: 7.21 J
HEAD FORM IMPACT (6.69 m/s) Test Date: 5-18-2010
Component ID: 2008 Girardin G5 MB-IV 200C Location: S2 H10
NHTSA#: C80902

**HEAD X ACCELERATION (G’s) VS TIME (S)**

- Max: 12.56 G’s
- Tmax: -0.01 S
- Min: -58.33 G’s
- Tmin: 0.01 S

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

- Max: 6.67 m/s
- Tmax: -0.00 S
- Min: -3.69 m/s
- Tmin: 0.05 S

**FORCE X (N) VS TIME (S)**

- Max: 641.87 N
- Tmax: -0.01 S
- Min: -2,981.32 N
- Tmin: 0.01 S

**FORCE (N) VS TIME (SEC)**

- Energy: 7.25 J
HEAD FORM IMPACT (6.69 m/s)  
Component ID: 2008 Girardin G5 MB-IV 200C  
Location: S2 H11  
NHTSA#: C80902

Max: 8.15 G's  
TMax: -0.01 S  
Min: -48.99 G's  
TMin: 0.02 S

Max: 6.53 m/s  
TMax: -0.01 S  
Min: -3.15 m/s  
TMin: 0.06 S  
VEL@IMP: 6.447 m/s

Max: 416.65 N  
TMax: -0.01 S  
Min: -2,503.81 N  
TMin: 0.02 S

Energy: 18.63 J
HEAD FORM IMPACT (6.69 m/s)  
Component ID: 2008 Girardin G5 MB-IV 200C  
Location: S2 H12  
NHTSA#: C80902

Test Date: 8-27-2010

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

Max: 5.96 G's  
TMax: -0.01 S  
Min: -38.53 G's  
TMin: 0.02 S

Hic: 101.89  
T1: 12.90 ms  
T2: 48.00 ms

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

Max: 6.51 m/s  
TMax: -0.00 S  
Min: -3.32 m/s  
TMin: 0.06 S

VEL@IMP: 6.428 m/s

FORCE X (N) VS TIME (S)

Max: 304.63 N  
TMax: -0.01 S  
Min: -1,969.33 N  
TMin: 0.02 S

Energy: 20.78 J
HEA D FORM IMPACT (6.69 m/s)  Test Date: 9-3-2010
Component ID: 2008 Girardin G5 MB-IV 200C
Location: B6 H8
NHTSA#: C80902

HEAD X ACCELERATION (G's) VS TIME (S)
Max: 14.35 G's
TMax: 0.08 S
Min: -67.58 G's
TMin: 0.01 S
Hic: 94.25  T1: 5.90 ms  T2: 45.60 ms

VELOCITY X (m/s) VS TIME (S)
Max: 6.56 m/s
TMax: -0.00 S
Min: -3.48 m/s
TMin: 0.07 S
VEL@IMP: 6.532 m/s

FORCE X (N) VS TIME (S)
Max: 733.43 N
TMax: 0.08 S
Min: -3,454.25 N
TMin: 0.01 S

ENERGY: 7.24 J
 HEAD FORM IMPACT (6.69 m/s)  
Component ID: 2008 Girardin G5 MB-IV 200C  
Location: B6 H10  
Test Date: 9-3-2010  
NHTSA#: C80902

**HEAD X ACCELERATION (G's) VS TIME (S)**  
Max: 3.90 G's  
TMax: -0.01 S  
Min: -77.82 G's  
TMin: 0.01 S

**VELOCITY X (m/s) VS TIME (S)**  
Max: 6.55 m/s  
TMax: -0.01 S  
Min: -2.70 m/s  
TMin: 0.06 S  
VEL@IMP: 6.488 m/s

**FORCE X (N) VS TIME (S)**  
Max: 199.20 N  
TMax: -0.01 S  
Min: -3,977.19 N  
TMin: 0.01 S

**ENERGY**  
Energy: 7.49 J
HEAD FORM IMPACT (6.69 m/s)  
Component ID: 2008 Girardin G5 MB-IV 200C  
Location: B6 H11  
Test Date: 9-9-2010  
NHTSA#: C80902

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

- Max: 5.36 G's
- Tmax: 0.08 S
- Min: -54.79 G's
- Tmin: 0.02 S

**Hic:** 108.39  
**T1:** 10.00 ms  
**T2:** 17.30 ms

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

- Max: 6.60 m/s
- Tmax: -0.01 S
- Min: -2.95 m/s
- Tmin: 0.07 S

**VEL@IMP:** 6.562 m/s

**ENERGY:** 12.53 J

**HIC:** 108.39  
**T1:** 10.00 ms  
**T2:** 17.30 ms

**FORCE X (N) VS TIME (S)**

- Max: 273.80 N
- Tmax: 0.08 S
- Min: -2,800.21 N
- Tmin: 0.02 S

**FORCE (N) VS TIME (SEC)**

Energy: 12.53 J
HEAD FORM IMPACT (6.69 m/s)  Test Date: 9-9-2010
Component ID: 2008 Girardin G5 MB-IV 200C
Location: B6 H12
NHTSA#: C80902

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

Max: 3.00 G's
TMax: 0.07 S
Min: -53.71 G's
TMin: 0.01 S

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

Max: 6.57 m/s
TMax: -0.01 S
Min: -2.58 m/s
TMin: 0.07 S
VEL@IMP: 6.492 m/s

FORCE X (N) VS TIME (S)

Max: 153.20 N
TMax: 0.07 S
Min: -2,745.19 N
TMin: 0.01 S

Energy: 14.07 J
HEAD FORM IMPACT (6.69 m/s)  
Component ID: 2008 Girardin G5 MB-IV 200C  
Location: B6 H13  
Test Date: 9-9-2010  
NHTSA#: C80902

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

- Max: 6.41 G's
- TM: -0.01 S
- Min: -54.5 G's
- TMin: 0.02 S

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

- Max: 6.56 m/s
- TM: -0.00 S
- Min: -2.84 m/s
- TMin: 0.07 S

### FORCE X (N) VS TIME (S)

- Max: 313.64 N
- TM: -0.01 S
- Min: -2,787.81 N
- TMin: 0.02 S

### ENERGY

- 19.47 J
FMVSS 222 KNEE FORM IMPACTS
Component ID: 2008 Girardin G5 MB-IV 200C
Location: S2 K1
Test Date: 5-18-2010
NHTSA #: C80902

Knee X Acceleration (G's) VS TIME (S)
Max: 24.06 G's
TMax: 0.03 s
Min: -32.10 G's
TMin: 0.10 s

VELOCITY X (m/s) VS TIME (S)
Max: 4.67 m/s
TMax: 0.06 s
Min: -2.73 m/s
TMin: 0.15 s
VEL@IMP: 4.64 m/s

FORCE X (N) VS TIME (S)
Max: 1,069.24 N
TMax: 0.03 s
Min: -1,426.40 N
TMin: 0.10 s
FMVSS 222 KNEE FORM IMPACTS
Component ID: 2008 Girardin G5 MB-IV 200C
Location: S2 K2

Test Date: 5-18-2010
NHTSA #: C80902

**Knee X Acceleration (G's) VS TIME (S)**
Max: 23.58 G's
TMax: 0.03 s
Min: -31.12 G's
TMin: 0.10 s

**VELOCITY X (m/s) VS TIME (S)**
Max: 4.63 m/s
TMax: 0.06 s
Min: -2.96 m/s
TMin: 0.14 s
VEL@IMP: 4.6 m/s

**FORCE X (N) VS TIME (S)**
Max: 1,047.70 N
TMax: 0.03 s
Min: -1,383.04 N
TMin: 0.10 s
**FMVSS 222 KNEE FORM IMPACTS**

Component ID: 2008 Girardin G5 MB-IV 200C  
Location: S2 K3  
Test Date: 5-18-2010  
NHTSA #: C80902

**Knee X Acceleration (G's) VS TIME (S)**
- Max: 23.95 G's  
- Tmax: 0.04 s  
- Min: -31.36 G's  
- Tmin: 0.09 s

**VELOCITY X (m/s) VS TIME (S)**
- Max: 4.75 m/s  
- Tmax: 0.06 s  
- Min: -2.24 m/s  
- Tmin: 0.12 s  
- VEL@IMP: 4.73 m/s

**FORCE X (N) VS TIME (S)**
- Max: 1,064.53 N  
- Tmax: 0.04 s  
- Min: -1,393.58 N  
- Tmin: 0.09 s
FMVSS 222 KNEE FORM IMPACTS
Component ID: 2008 Girardin G5 MB-IV 200C
Location: S2 K4
Test Date: 5-18-2010
NHTSA #: C80902

Knee X Acceleration (G's) VS TIME (S)
Max: 22.90 G's
TMax: 0.04 s
Min: -39.96 G's
TMin: 0.09 s

VELOCITY X (m/s) VS TIME (S)
Max: 4.46 m/s
TMax: 0.06 s
Min: -2.46 m/s
TMin: 0.14 s
VEL@IMP: 4.41 m/s

FORCE X (N) VS TIME (S)
Max: 1,017.52 N
TMax: 0.04 s
Min: -1,775.75 N
TMin: 0.09 s
FMVSS 222 KNEE FORM IMPACTS
Component ID: 2008 Girardin G5 MB-IV 200C
Location: S2 K5
Test Date: 5-18-2010
NHTSA #: C80902

Knee X Acceleration (G's) VS TIME (S)
Max: 22.14 G's
TMax: 0.03 s
Min: -40.07 G's
TMin: 0.10 s

VELOCITY X (m/s) VS TIME (S)
Max: 4.32 m/s
TMax: 0.06 s
Min: -2.91 m/s
TMin: 0.15 s
VEL@IMP: 4.26 m/s

FORCE X (N) VS TIME (S)
Max: 983.80 N
TMax: 0.03 s
Min: -1,780.53 N
TMin: 0.10 s
FVVSS 222 KNEE FORM IMPACTS
Component ID: 2008 Girardin G5 MB-IV 200C
Location: S2 K6

Test Date: 5-18-2010
NHTSA #: C80902

Knee X Acceleration (G's) VS TIME (S)
- Max: 22.61 G's
- Tmax: 0.04 s
- Min: -36.93 G's
- Tmin: 0.10 s

VELOCITY X (m/s) VS TIME (S)
- Max: 4.33 m/s
- Tmax: 0.07 s
- Min: -3.06 m/s
- Tmin: 0.15 s
- Vel@Imp: 4.26 m/s

FORCE X (N) VS TIME (S)
- Max: 1,004.57 N
- Tmax: 0.04 s
- Min: -1,641.01 N
- Tmin: 0.10 s
FMVSS 222 KNEE FORM IMPACTS
Component ID: 2008 Girardin G5 MB-IV 200C
Location: S2 K7

Test Date: 5-19-2010
NHTSA #: C80902

Knee X Acceleration (G's) VS TIME (S)
Max: 22.65 G's
TMax: 0.04 s
Min: -43.03 G's
TMin: 0.10 s

VELOCITY X (m/s) VS TIME (S)
Max: 4.82 m/s
TMax: 0.07 s
Min: -1.82 m/s
TMin: 0.14 s
VEL@IMP: 4.81 m/s

FORCE X (N) VS TIME (S)
Max: 1,006.56 N
TMax: 0.04 s
Min: -1,912.17 N
TMin: 0.10 s
FMVSS 222 KNEE FORM IMPACTS
Component ID: 2008 Girardin G5 MB-IV 200C
Location: S2 K8
Test Date: 5-19-2010
NHTSA #: C80902

Knee X Acceleration (G's) VS TIME (S)
Max: 22.98 G's
TMax: 0.03 s
Min: -43.62 G's
TMin: 0.09 s

VELOCITY X (m/s) VS TIME (S)
Max: 4.55 m/s
TMax: 0.07 s
Min: -2.06 m/s
TMin: 0.11 s
VEL@IMP: 4.53 m/s

FORCE X (N) VS TIME (S)
Max: 1,021.11 N
TMax: 0.03 s
Min: -1,938.50 N
TMin: 0.09 s
Knee X Acceleration (G's) VS TIME (S)

Max: 23.87 G's
TMax: 0.04 s
Min: -30.39 G's
TMin: 0.10 s

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

Max: 4.80 m/s
TMax: 0.06 s
Min: -2.44 m/s
TMin: 0.15 s
VEL@IMP: 4.77 m/s

FORCE X (N) VS TIME (S)

Max: 1,060.94 N
TMax: 0.04 s
Min: -1,350.38 N
TMin: 0.10 s
FMVSS 222 KNEE FORM IMPACTS
Component ID: 2008 Girardin G5 MB-IV 200C
Location: B6 K3

Test Date: 9-2-2010
NHTSA #: C80902

Knee X Acceleration (G's) VS TIME (S)
Max: 23.05 G's
TMax: 0.04 s
Min: -33.17 G's
TMin: 0.10 s

VELOCITY X (m/s) VS TIME (S)
Max: 4.71 m/s
TMax: 0.06 s
Min: -2.66 m/s
TMin: 0.16 s
VEL@IMP: 4.67 m/s

FORCE X (N) VS TIME (S)
Max: 1,024.32 N
TMax: 0.04 s
Min: -1,474.17 N
TMin: 0.10 s
FMVSS 222 KNEE FORM IMPACTS
Component ID: 2008 Girardin G5 MB-IV 200C
Location: B6 K4

Test Date: 9-2-2010
NHTSA #: C80902

Knee X Acceleration (G's) VS TIME (S)
Max: 23.40 G's
TMax: 0.03 s
Min: -32.88 G's
TMin: 0.10 s

VELOCITY X (m/s) VS TIME (S)
Max: 4.74 m/s
TMax: 0.06 s
Min: -2.36 m/s
TMin: 0.16 s
VEL@IMP: 4.69 m/s

FORCE X (N) VS TIME (S)
Max: 1,040.08 N
TMax: 0.03 s
Min: -1,460.98 N
TMin: 0.10 s
FMVSS 222 KNEE FORM IMPACTS
Component ID: 2008 Girardin G5 MB-IV 200C
Location: B6 K5
Test Date: 9-2-2010
NHTSA #: C80902

Knee X Acceleration (G's) VS TIME (S)
Max: 22.81 G's
TMax: 0.04 s
Min: -34.85 G's
TMin: 0.09 s

VELOCITY X (m/s) VS TIME (S)
Max: 4.73 m/s
TMax: 0.07 s
Min: -1.71 m/s
TMin: 0.15 s
VEL@IMP: 4.7 m/s

FORCE X (N) VS TIME (S)
Max: 1,013.77 N
TMax: 0.04 s
Min: -1,548.65 N
TMin: 0.09 s
FMVSS 222 KNEE FORM IMPACTS
Component ID: 2008 Girardin G5 MB-IV 200C
Location: B6 K6

Test Date: 9-2-2010
NHTSA #: C80902

Knee X Acceleration (G's) VS TIME (S)
Max: 23.63 G's
TMax: 0.03 s
Min: -37.27 G's
TMin: 0.10 s

VELOCITY X (m/s) VS TIME (S)
Max: 4.68 m/s
TMax: 0.06 s
Min: -2.00 m/s
TMin: 0.16 s
VEL@IMP: 4.63 m/s

FORCE X (N) VS TIME (S)
Max: 1,049.95 N
TMax: 0.03 s
Min: -1,656.38 N
TMin: 0.10 s
FMVSS 222 KNEE FORM IMPACTS
Component ID: 2008 Girardin G5 MB-IV 200C
Location: B6 K7
Test Date: 9-2-2010
NHTSA #: C80902

Knee X Acceleration (G's) VS TIME (S)
- Max: 23.14 G's
- Tmax: 0.04 s
- Min: -39.97 G's
- Tmin: 0.10 s

VELOCITY X (m/s) VS TIME (S)
- Max: 4.61 m/s
- Tmax: 0.06 s
- Min: -1.88 m/s
- Tmin: 0.16 s
- VEL@IMP: 4.57 m/s

FORCE X (N) VS TIME (S)
- Max: 1,028.31 N
- Tmax: 0.04 s
- Min: -1,776.15 N
- Tmin: 0.10 s
FMVSS 222 KNEE FORM IMPACTS
Component ID: 2008 Girardin G5 MB-IV 200C
Location: B6 K8

Test Date: 9-2-2010
NHTSA #: C80902

Knee X Acceleration (G's) VS TIME (S)
Max: 23.29 G's
TMax: 0.04 s
Min: -35.81 G's
TMin: 0.10 s

VELOCITY X (m/s) VS TIME (S)
Max: 4.83 m/s
TMax: 0.06 s
Min: -1.64 m/s
TMin: 0.14 s

FORCE X (N) VS TIME (S)
Max: 1,034.88 N
TMax: 0.04 s
Min: -1,591.55 N
TMin: 0.10 s

VEL@IMP: 4.82 m/s
Type A Anchorage W1 Left Front

Type C Anchorage W1 Left Rear

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Force (N) vs Time (sec)

Maximum: 6638 N @ 45.7 sec  Minimum: 10 N @ 0.3 sec

Type D Anchorage W1 Upper Torso
SECTION 7
WELT CONTACT POINTS

H1 / SEAT S2

H1 Girardin G5 MB-IV 200C 45.5 cm²
SECTION 7 (CONTINUED)
WELT CONTACT POINTS

H2 / SEAT S2

H2 Girardin G5 MB-IV 200C 46.4 cm²
H3 Girardin G5 MB-IV 200C 57.1 cm²
SECTION 7 (CONTINUED)
WELT CONTACT POINTS

H4 / SEAT S2

H4 Girardin G5 MB-IV 200C 41.8 cm$^2$
H5 Girardin G5 MB-IV 200C 38.1 cm²
H1 Girardin G5 MB-IV 200C 36.7 cm²
SECTION 7 (CONTINUED)
WELT CONTACT POINTS

H2 / BARRIER B6

H2 Girardin G5 MB-IV 200C 45.7 cm$^2$
H3 / BARRIER B6

H3 Girardin G5 MB-IV 200C 39.4 cm$^2$
SECTION 7 (CONTINUED)
WELT CONTACT POINTS

H4 / BARRIER B6

H4 Girardin G5 MB-IV 200C 40.5 cm²
H5 Girardin G5 MB-IV 200C 46.7 cm$^2$
K1 Girardin G5 MB-IV 200C 27.5 cm²
SECTION 7 (CONTINUED)
WELT CONTACT POINTS

K2 / SEAT S2

K2 Girardin G5 MB-IV 200C 28.9 cm²
SECTION 7 (CONTINUED)
WELT CONTACT POINTS

K3 / SEAT S2

K3 Girardin G5 MB-IV 200C 33.2 cm²
SECTION 7 (CONTINUED)
WELT CONTACT POINTS

K1 / BARRIER B6

K1 Girardin G5 MB-IV 200C 32.5 cm²
K2 Girardin G5 MB-IV 200C 33.2 cm$^2$
SECTION 7 (CONTINUED)
WELT CONTACT POINTS

K3 / BARRIER B6

K3 Girardin G5 MB-IV 200C 24.5 cm²
K4 Girardin G5 MB-IV 200C 28.3 cm$^2$
SECTION 9
LABORATORY NOTICE OF TEST FAILURE

LABORATORY NOTICE OF TEST FAILURE TO OVSC

| Test Procedure: | FMVSS 222 |
| Test Vehicle:   | Girardin G5 MB-IV 200C |
| NHTSA No.:      | C80902 |
| Contract No.:   | DTNH22-08-D-00075 |
| Manufacturer:   | Girardin |
| Manufacture Date: | 06/08 |
| Test Date:      | 06/17/09 |
| Test Lab:       | MGA Research Corp. |
| Project Engineer: | Eric Peschman |
| Delivery Order No.: | 1 |
| VIN:            | 1FD4E45PX8DB40217 |

TEST FAILURE DESCRIPTION

During the barrier force deflection test for Barrier No. B1, the test results appeared to fall outside of the force/deflection zone as specified in S5.2.3(a) and failed to absorb 1,356 joules (452W joules) of energy before it reached the displacement limit of 356 mm. The total energy absorbed was 1,224 Joules.

FMVSS REQUIREMENTS DESCRIPTION

Paragraph S5.2.3(a): “When force is applied to the restraining barrier in the same manner as specified in S5.1.3.1 through S5.3.1.4 for seating performance tests:

(a) The seat back force/deflection curve shall fall within the zone specified in Figure 1;”

(b) The restraining barrier deflection shall not exceed 356 mm;

Remarks: No remarks.

Notification to NHTSA (COTR):  Mike Rossey

Date: 06/17/09

By: Eric Peschman
LABORATORY NOTICE OF TEST FAILURE TO OVSC

<table>
<thead>
<tr>
<th>Test Procedure:</th>
<th>FMVSS 222</th>
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<td>Test Vehicle:</td>
<td>Girardin G5 MB-IV 200C</td>
</tr>
<tr>
<td>NHTSA No.:</td>
<td>C80902</td>
</tr>
<tr>
<td>Contract No.:</td>
<td>DTNH22-08-D-00075</td>
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<td>Manufacturer.:</td>
<td>Girardin</td>
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<td>1FD4E45PX8DB40217</td>
</tr>
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</table>

TEST FAILURE DESCRIPTION
During the rearward force deflection test for Seat No. S4, the seat reached the maximum allowable deflection of 254 mm before it absorbed 948 joules (316W joules) of energy. The total energy absorbed was 882 Joules.

FMVSS REQUIREMENTS DESCRIPTION

Paragraph S5.1.4 (b): “Seat back deflection shall not exceed 254 mm.”

Paragraph S5.1.4.2: “Apply additional force horizontally rearward through the loading bar until 316W joules (J) of energy had been absorbed in deflecting the seat back.”

Remarks: No remarks.

Notification to NHTSA (COTR): Lawrence Valvo

Date: 11/30/09

By: [Signature]