This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers’ names or products are mentioned it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared by: _____________________________  Date: April 16, 2007
James Hansen, Project Engineer

Reviewed by: _____________________________  Date: April 16, 2007
Michael Janovicz, Program Manager

FINAL REPORT ACCEPTED BY:

______________________________
Date of Acceptance

April 16, 2007
Compliance tests were conducted on the subject 2006 Corbeil School Bus, NHTSA No. C60902, 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: None
<table>
<thead>
<tr>
<th>Section</th>
<th>Page No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Purpose of Compliance Test</td>
</tr>
<tr>
<td>2</td>
<td>Test Data Summary</td>
</tr>
<tr>
<td>3</td>
<td>Compliance Test Data</td>
</tr>
<tr>
<td></td>
<td>Data Sheet 1 - Seat to Seat/Barrier Spacing</td>
</tr>
<tr>
<td></td>
<td>Data Sheet 2 - Seat Back Height &amp; Front Surface Area Test</td>
</tr>
<tr>
<td></td>
<td>Data Sheet 3 - Seat Cushion Retention Test</td>
</tr>
<tr>
<td></td>
<td>Data Sheet 4 - Seat Back Force Deflection Test - Forward</td>
</tr>
<tr>
<td></td>
<td>Data Sheet 5 - Seat Back Force Deflection Test - Rearward</td>
</tr>
<tr>
<td></td>
<td>Data Sheet 6 - Restraining Barrier Position and Projected Rear Surface Area</td>
</tr>
<tr>
<td></td>
<td>Data Sheet 7 - Head Form Impact Contact Area and Energy Requirements</td>
</tr>
<tr>
<td></td>
<td>Data Sheet 8 - Knee Form Impact Test</td>
</tr>
<tr>
<td></td>
<td>Data Sheet 9 - Seat Belt Assembly Anchorages</td>
</tr>
<tr>
<td>4</td>
<td>TP-222-03 (Appendix B FMVSS 208, Occupant Crash Protection for Class 2 School Buses)</td>
</tr>
<tr>
<td></td>
<td>Data Sheet B1 - Seat Belt Check</td>
</tr>
<tr>
<td></td>
<td>Data Sheet B2 - Seat Belt Warning System Check</td>
</tr>
<tr>
<td>5</td>
<td>Instrumentation and Equipment List</td>
</tr>
<tr>
<td>6</td>
<td>Photographs</td>
</tr>
<tr>
<td>7</td>
<td>Test Plots</td>
</tr>
<tr>
<td>8</td>
<td>Welt Contact Points</td>
</tr>
<tr>
<td>9</td>
<td>Bus Floor Plan</td>
</tr>
</tbody>
</table>
SECTION 1
PURPOSE OF COMPLIANCE TEST

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

This program is sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-02-D-01057.
SECTION 2
TEST DATA SUMMARY

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

LINEAR AND AREA MEASUREMENTS

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

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

SEAT CUSHION RETENTION

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

SEAT BACK FORCE/DEFLECTION TEST - FORWARD

Seat Nos. 1 and 4 were tested in accordance with Section 12.4 of OVSC TP-222-03. Please note that S4 was tested in the S2 location. Seat bench width was determined to be 765 for both seats. “W” was calculated to be 2 for S1 and S4. The seating reference point (SRP) was 512 mm above the bus floor. The deflection of the seat back at conclusion of lower loading bar loading at 1557 W N load was 43.7 mm for S1 and 49.7 mm for S4. The allowable maximum deflection without moving the seat back to within 102 mm of another seat or restraining barrier
was 356 mm. The stroke rate of the upper loading bar was determined by the test engineer to be 14.4 mm/sec. The location of the upper loading bar was 406 mm above the SRP. The tests were stopped when the maximum deflection of 356 mm was reached. The minimum required area under the force versus deflection curve of the upper loading bar was 452 W or 904 joules for both seats. As shown on Data Sheet No. 4, Seat Nos. 1 and 4 met the force deflection forward requirements. See Plots 3, 4, 5, and 6.

SEAT BACK FORCE/DEFLECTION TEST - REARWARD

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

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

KNEE FORM IMPACT ZONE TESTS

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

HEAD FORM IMPACT ZONE TESTS

Seat No. S9 and the bulkhead were tested in accordance with Section 12.6 of OVSC TP-222-03. The mass of the head form was 5.21 kg. All head form contact area criteria was met for the seat. The impact energy criteria and head injury criteria for all impact locations were met.
SECTION 2 (CONTINUED)
TEST DATA SUMMARY

SEAT BELT ANCHORAGES

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

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Ford Motor Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>754-NY-20-00WC-EMC</td>
</tr>
<tr>
<td>VIN</td>
<td>1FDSE35L66DA60778</td>
</tr>
<tr>
<td>Build Date</td>
<td>04/06</td>
</tr>
<tr>
<td>Certification Date</td>
<td></td>
</tr>
</tbody>
</table>

### COMPLETED VEHICLE (SCHOOL BUS)

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Les Enterprises Michel Corbeil Inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make/Model</td>
<td>FORD / CORBEIL</td>
</tr>
<tr>
<td>VIN</td>
<td>1FDSE35L66DA60778</td>
</tr>
<tr>
<td>NHTSA No.</td>
<td>C60902</td>
</tr>
<tr>
<td>Color</td>
<td>Yellow</td>
</tr>
<tr>
<td>GVWR</td>
<td>4,355 kg / 9,600 lbs</td>
</tr>
<tr>
<td>Build Date</td>
<td>06/29/2006</td>
</tr>
<tr>
<td>Certification Date</td>
<td>06/29/2006</td>
</tr>
</tbody>
</table>

### DATES

<table>
<thead>
<tr>
<th>Description</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start of Compliance Test</td>
<td>11/1/2006</td>
</tr>
<tr>
<td>Completion of Compliance Test</td>
<td>3/14/2007</td>
</tr>
</tbody>
</table>

### COMPLIANCE TEST:
All tests were performed in accordance with the references outlined in TP-222-03.

Recorded By: [Signature]

Approved By: [Signature]  DATE: 9/27/2006
**GENERAL TEST DATA SHEET**

**Test Vehicle:** 2006 CORBEIL SCHOOL BUS  
**Test Lab:** MGA RESEARCH CORPORATION  
**NHTSA No.:** C60902  
**Test Date:** 11/1/2006

### SCHOOL BUS IDENTIFICATION

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

### TEST CONDITIONS

<table>
<thead>
<tr>
<th>Date(s) of Test:</th>
<th>11/1/2006 – 3/14/2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient Temperature (°C):</td>
<td>21</td>
</tr>
<tr>
<td>Required Temperature Range:</td>
<td>0°C to 32°C</td>
</tr>
</tbody>
</table>

### SEAT IDENTIFICATION

<table>
<thead>
<tr>
<th>Seat Manufacturer:</th>
<th>Les Enterprises Michel Corbeil Inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model Name &amp; Number:</td>
<td>Seat frames are constructed of 25.4 mm square and round welded tubing. The seat back has 5 mm plywood attached to the tubing and is covered with 32 mm medium density foam on the front and rear surfaces. At the knee bolsters, there is 42 mm Styrofoam covered by 12 mm foam. The seat cushion is constructed of 12 mm plywood with 125 mm foam. The seat back and seat cushion are wrapped with 0.65 mm vinyl.</td>
</tr>
</tbody>
</table>

---

6
SECTION 3
COMPLIANCE TEST DATA

The following data sheets document the results of testing on the 2006 Corbeil School Bus, NHTSA No. C60902.
# DATA SHEET 1
## SEAT TO SEAT/BARRIER SPACING

**Test Vehicle:** 2006 CORBEIL SCHOOL BUS  
**NHTSA No.:** C60902  
**Test Lab:** MGA RESEARCH CORPORATION  
**Test Date:** 11/1/2006

<table>
<thead>
<tr>
<th>SEAT NUMBER</th>
<th>MEASUREMENT OF SPACING FROM SRP FORWARD TO SEAT/BARRIER (mm)</th>
<th>REQMT ≤ 610 MM (≤ 24&quot;) CLASS 1 BUSES ONLY</th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>500</td>
<td></td>
<td>PASS</td>
</tr>
<tr>
<td>2</td>
<td>480</td>
<td></td>
<td>PASS</td>
</tr>
<tr>
<td>3</td>
<td>470</td>
<td></td>
<td>PASS</td>
</tr>
<tr>
<td>4</td>
<td>465</td>
<td></td>
<td>PASS</td>
</tr>
<tr>
<td>5</td>
<td>420</td>
<td></td>
<td>PASS</td>
</tr>
<tr>
<td>6</td>
<td>420</td>
<td></td>
<td>PASS</td>
</tr>
<tr>
<td>7</td>
<td>460</td>
<td></td>
<td>PASS</td>
</tr>
<tr>
<td>8</td>
<td>485</td>
<td></td>
<td>PASS</td>
</tr>
<tr>
<td>9</td>
<td>490</td>
<td></td>
<td>PASS</td>
</tr>
<tr>
<td>10</td>
<td>490</td>
<td></td>
<td>PASS</td>
</tr>
</tbody>
</table>

**COMMENTS:** NONE

Recorded By: 

Approved By: Michael [Signature]  
**DATE:** 11/1/2006
DATA SHEET 2
SEAT BACK HEIGHT & FRONT SURFACE AREA TEST

Test Vehicle: 2006 CORBEIL SCHOOL BUS  
NHTSA No.: C60902
Test Lab: MGA RESEARCH CORPORATION  
Test Date: 11/1/2006

SEAT NUMBER: S1

<table>
<thead>
<tr>
<th></th>
<th>PASS/FAIL</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Is the seat back height at least 508 mm vertically above the SRP? (S5.1.2)</td>
<td>PASS</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:
   \[
   \text{Width, } a = 650 \text{ mm}; \quad \text{width, } b = 740 \text{ mm}; \quad \text{radius} = 0 \text{ mm} \\
   \text{Area} = \frac{1}{2} (a+b) \times 508 \text{ mm} = 353,060 \text{ mm}^2 - 0 \text{ mm}^2 = 353,060 \text{ mm}^2
   \]

3. Measure the seat cushion width - \( W_1 = 765 \text{ mm} \)
   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 \( W_1 \).

4. Calculate the following: \( 0.9 \times W_1 \times 508 \text{ mm} = 349,758 \text{ mm}^2 \)

<table>
<thead>
<tr>
<th></th>
<th>PASS/FAIL</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Is item 2 greater than item 4? (S5.1.2)</td>
<td>PASS</td>
<td></td>
</tr>
</tbody>
</table>

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

Comments: None

Recorded By: ________________________________

Approved By: _____________________________  DATE: 11/1/2006
DATA SHEET 2 (CONTINUED)
SEAT BACK HEIGHT & FRONT SURFACE AREA TEST

Test Vehicle: 2006 CORBEIL SCHOOL BUS  NHTSA No.: C60902
Test Lab: MGA RESEARCH CORPORATION  Test Date: 11/1/2006

SEAT NUMBER: S3

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Is the seat back height at least 508 mm vertically above the SRP? (S5.1.2)</td>
<td></td>
<td>PASS</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, a = 660 mm; width, b = 740 mm; radius = 0 mm
   - Area = $\frac{1}{2} (a+b) \times 508 \text{ mm} = 355,600 \text{ mm}^2 - 0 \text{ mm}^2 = 355,600 \text{ mm}^2$

3. Measure the seat cushion width - W1 = 760 mm
   If the seat cushion is not rectangular, measure the cushion at the forward most edge and the rearward most edge, average the widths, and use the average width as W1.

4. Calculate the following: $0.9 \times W1 \times 508 \text{ mm} = 347,472 \text{ mm}^2$

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>Is item 2 greater than item 4? (S5.1.2)</td>
<td></td>
<td>PASS</td>
</tr>
</tbody>
</table>

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

Comments: None

Recorded By: ____________________________

Approved By: ____________________________  DATE: 11/1/2006
SEAT NUMBER: S7

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

\[
F = 165.0 \text{ N}
\]

\[
T1 = 2.0 \text{ sec.} \quad T2 = 5.0 \text{ sec.}
\]

F must be 5 x Cushion Weight; t1 and t2 must be according to the following expressions:

\[
T1 => 1 \text{ sec., }<5 \text{ sec., } t2 = t1 + 5 \text{ sec., } + 0 \text{ sec. and } -0.10 \text{ sec.}
\]

<table>
<thead>
<tr>
<th>4. Did seat cushion separate from the seat structure at any attachment point? (S5.1.5)</th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>PASS</td>
<td></td>
</tr>
</tbody>
</table>

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

Comments: None

Recorded By: ____________________________

Approved By: ____________________________  DATE: 1/10/2007
SEAT NUMBER: S10

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

```
<table>
<thead>
<tr>
<th>TIME, SECONDS</th>
<th>FORCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1 = 2.0 sec.</td>
<td>F = 162.0 N</td>
</tr>
<tr>
<td>T2 = 5.5 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.

4. Did seat cushion separate from the seat structure at any attachment point? (S5.1.5) 
   PASS

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

Comments: None

Recorded By: ______________________________

Approved By: ______________________________ DATE: 1/10/2007
DATA SHEET 4
SEAT BACK FORCE DEFLECTION TEST - FORWARD

Test Vehicle: 2006 CORBEIL SCHOOL BUS  NHTSA No.: C60902
Test Lab: MGA RESEARCH CORPORATION  Test Date: 11/1/2006

SEAT NUMBER: S1

1. Seat Bench Width = 765 mm
   \[ W = \frac{\text{Seat Bench Width}}{381} \text{ mm (round to nearest whole number)} = (2) \]
   Seat Reference Point (SRP) location is: (Description of location as supplied by the COTR: 512 mm Above Floor, -265 mm from front aisle bolt.

2. Location of lower loading bar is 0 mm above the SRP.
   (Requirement: Between 102 mm above and 102 mm below the SRP) (S5.1.3.1)
   Length of lower loading bar = 635 mm
   Seat Back width at SRP = 745 mm

3. Include x-y plot of Force vs. Time for the lower loading bar.

4. Deflection of the seat back at conclusion of lower bar loading (1557 W Newtons position) = 43.7 mm, at start of upper bar loading 43.7 mm, at end of upper bar loading 43.7 mm.

5. Maximum deflection allowed without moving the seat back to within 102 mm of another seat or restraining barrier = 356 mm (must be 356 mm 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 = 585 mm. Width of seat back at 406 mm above SRP = 685 mm.

8. Reason for stopping seat back deflection:
   ___ Reached deflection determined in Item 6 above (if less than 356 mm)
   ___ Reached 356 mm maximum allowed deflection (Actual deflection was 356 mm)
   ___ Separation was about to occur

9. Include the x-y plot of force vs. deflection for the upper loading bar with boundaries of Figure 14 (OVSC TP-222-3) superimposed.
## SEAT BACK FORCE DEFLECTION TEST – FORWARD

**Test Vehicle:** 2006 CORBEIL SCHOOL BUS  
**NHTSA No.:** C60902  
**Test Lab:** MGA RESEARCH CORPORATION  
**Test Date:** 11/1/2006

<table>
<thead>
<tr>
<th></th>
<th>PASS/FAIL</th>
<th></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?</td>
<td>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)</td>
<td>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 = 1,312 joules</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>$452W = 904$ 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)</td>
<td>PASS</td>
</tr>
</tbody>
</table>

**Comments:** None

**Recorded By:**  

**Approved By:** Michael Jankot  
**DATE:** 11/1/2006
SEAT BACK FORCE DEFLECTION TEST - FORWARD

Test Vehicle: 2006 CORBEIL SCHOOL BUS
Test Lab: MGA RESEARCH CORPORATION
NHTSA No.: C60902
Test Date: 11/1/2006

SEAT NUMBER: S4, in S2 Location

1. Seat Bench Width = 765 mm
   \( W = \frac{(\text{Seat Bench Width})}{381 \text{ mm}} \) (round to nearest whole number) = (2)
   Seat Reference Point (SRP) location is: (Description of location as supplied by the COTR): 512 mm Above Floor, -265 mm from front aisle bolt.

2. Location of lower loading bar is 0 mm above the SRP.
   (Requirement: Between 102 mm above and 102 mm below the SRP) (S5.1.3.1)
   Length of lower loading bar = 635 mm
   Seat Back width at SRP = 745 mm

3. Include x-y plot of Force vs. Time for the lower loading bar.

4. Deflection of the seat back at conclusion of lower bar loading (1557 W Newtons position) = 49.7 mm, at start of upper bar loading 49.7 mm, at end of upper bar loading 49.7 mm.

5. Maximum deflection allowed without moving the seat back to within 102 mm of another seat or restraining barrier = 356 mm (must be 356 mm 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 = 585 mm. Width of seat back at 406 mm above SRP = 685 mm.

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

9. Include the x-y plot of force vs. deflection for the upper loading bar with boundaries of Figure 14 (OVSC TP-222-3) superimposed.
### DATA SHEET 4 (CONTINUED)

#### SEAT BACK FORCE DEFLECTION TEST - FORWARD

<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?</td>
<td>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)</td>
<td>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 = 1,341 joules
14. $452W = 904$ 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)</td>
<td>PASS</td>
</tr>
</tbody>
</table>

Comments: None

Recorded By: ____________________________

Approved By: ____________________________  DATE: 11/1/2006
DATA SHEET 5
SEAT BACK FORCE DEFLECTION TEST – REARWARD

Test Vehicle: 2006 CORBEIL SCHOOL BUS  NHTSA No.: C60902
Test Lab: MGA RESEARCH CORPORATION  Test Date: 11/1/2006

SEAT NUMBER: S3

1. Seat Bench Width = 760 mm
   \[ W = \frac{\text{Seat Bench Width}}{381 \text{ mm}} \text{ (round to nearest whole number)} = (2) \]

2. Location of the loading bar is in a horizontal plane 343 mm above the SRP of the test seat. (Requirement: 343 mm above the SRP) (S5.1.4.1)
   - Length of loading bar = 595 mm
   - Width of seat back at 343 mm above SRP = 696 mm

3. Deflection of seat back at 222 N preload = 17 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 = 14.4 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 256 mm)
   - ____ Separation was about to occur

7. Include the x-y plot of force vs. deflection for the loading bar with boundaries of Figure 18 (OVSC TP-222-3) superimposed.

<table>
<thead>
<tr>
<th>8.</th>
<th>Does the force vs. deflection plot lie within the boundaries of Figure 18 (OVSC TP-222-03)?</th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Does the force vs. deflection plot lie within the boundaries of Figure 18 (OVSC TP-222-03)?</td>
<td>PASS</td>
</tr>
</tbody>
</table>

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

10. 316W = 632 joules

11. The area within the force vs. deflection curve = 922 joules
# SEAT BACK FORCE DEFLECTION TEST – REARWARD

**Test Vehicle:** 2006 CORBEIL SCHOOL BUS  
**NHTSA No.:** C60902  
**Test Lab:** MGA RESEARCH CORPORATION  
**Test Date:** 11/1/2006

<table>
<thead>
<tr>
<th></th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>12. Is item 11 greater than or equal to item 10? (S5.1.4.2)</td>
<td>PASS</td>
</tr>
</tbody>
</table>

**Comments:** None

**Recorded By:**

**Approved By:** Michael Jamroz  
**DATE:** 11/1/2006
DATA SHEET 6
RESTRAINING BARRIER POSITION AND PROJECTED REAR SURFACE AREA

Test Vehicle: 2006 CORBEIL SCHOOL BUS  NHTSA No.: C60902
Test Lab: MGA RESEARCH CORPORATION  Test Date: 11/1/2006

SEAT NUMBER: B1
1. Measure distance T from SRP of seat immediately aft of barrier in a horizontal longitudinal line forward to barrier.  T= 500 mm.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Is distance T equal to or less than 610 mm? (S5.2)</td>
</tr>
</tbody>
</table>

3. Measure distance D at top (t) and bottom (b) of barrier.
   \[ D_t = 35 \text{ mm} \quad D_b = 0 \text{ mm} \]

4. Measure distance C at top (t) and bottom (b) of barrier.
   \[ C_t = 35 \text{ mm} \quad C_b = 0 \text{ mm} \]

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>Is ( D_t ) equal to or less than ( C_t )?</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>Is ( D_b ) equal to or less than ( C_b )?</td>
</tr>
</tbody>
</table>

7. Measure distance E at top of barrier and bottom of barrier.
   \[ E_t = 672 \text{ mm} \quad E_b = 753 \text{ mm} \]

8. Measure distance A at top of seat back and bottom of seat.
   \[ A_t = 665 \text{ mm} \quad A_b = 750 \text{ mm} \]

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></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 )?</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></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 )</td>
</tr>
</tbody>
</table>

11. Measure distance U at inboard (i) and outboard (o) side of barrier.
    \[ U_i = 350 \text{ mm} \quad U_o = 350 \text{ mm} \]

12. Measure distance V at inboard (i) and outboard (o) sides of seat.
    \[ V_i = 350 \text{ mm} \quad V_o = 350 \text{ mm} \]
### DATA SHEET 6 (CONTINUED)
#### RESTRAINING BARRIER POSITION AND PROJECTED REAR SURFACE AREA

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.</td>
<td>Is $U_i$ equal to or less than $V_i$?</td>
<td>PASS</td>
</tr>
<tr>
<td>14.</td>
<td>Is $U_o$ equal to or less than $V_o$?</td>
<td>PASS</td>
</tr>
<tr>
<td>15.</td>
<td>Measure distance $S$ at inboard (I) and outboard (O) side of barrier. $S_i = 780$ mm $S_o = 783$ mm</td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Measure distance $W$ at inboard (I) and outboard (O) sides of seat. $W_i = 775$ mm $W_o = 775$ mm</td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>Is $S_i + U_i$ equal to or greater than $W_i + V_i$?</td>
<td>PASS</td>
</tr>
<tr>
<td>18.</td>
<td>Is $S_o + U_o$ equal to or greater than $W_o + V_o$?</td>
<td>PASS</td>
</tr>
<tr>
<td>19.</td>
<td>Compute area $(W \times A) = 548,313$ mm$^2$</td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>Compute area $(E \times S) = 556,819$ mm$^2$</td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>Is $(W \times A)$ equal to or less than $(E \times S)$?</td>
<td>PASS</td>
</tr>
</tbody>
</table>

**Comments:** None

**Recorded By:** [Signature]

**Approved By:** [Signature]  **DATE:** 11/1/2006
DATA SHEET 6 (CONTINUED)
RESTRAINING BARRIER POSITION AND PROJECTED REAR SURFACE AREA

Test Vehicle:  **2006 CORBEIL SCHOOL BUS**  
Test Lab:  **MGA RESEARCH CORPORATION**  
NHTSA No.:  **C60902**  
Test Date:  **11/1/2006**

**SEAT NUMBER: B10**

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

<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)</td>
<td>PASS</td>
</tr>
</tbody>
</table>

3. Measure distance D at top (t) and bottom (b) of barrier.
   
   \[ D_t = 45 \text{ mm} \quad D_b = 0 \text{ mm} \]

4. Measure distance C at top (t) and bottom (b) of barrier.
   
   \[ C_t = 50 \text{ mm} \quad C_b = 0 \text{ mm} \]

<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 )?</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 )?</td>
<td>PASS</td>
</tr>
</tbody>
</table>

7. Measure distance E at top of barrier and bottom of barrier.
   
   \[ E_t = 675 \text{ mm} \quad E_b = 750 \text{ mm} \]

8. Measure distance A at top of seat back and bottom of seat.
   
   \[ A_t = 665 \text{ mm} \quad A_b = 750 \text{ mm} \]

<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 )?</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 )</td>
<td>PASS</td>
</tr>
</tbody>
</table>

11. Measure distance U at inboard (i) and outboard (o) side of barrier.
   
   \[ U_i = 350 \text{ mm} \quad U_o = 345 \text{ mm} \]

12. Measure distance V at inboard (i) and outboard (o) sides of seat.
   
   \[ V_i = 350 \text{ mm} \quad V_o = 350 \text{ mm} \]
**DATA SHEET 6 (CONTINUED)**

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

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.</td>
<td>Is $U_i$ equal to or less than $V_i$?</td>
<td>PASS</td>
</tr>
<tr>
<td>14.</td>
<td>Is $U_o$ equal to or less than $V_o$?</td>
<td>PASS</td>
</tr>
</tbody>
</table>

15. Measure distance $S$ at inboard (I) and outboard (o) side of barrier.
   $S_I = 780$ mm $S_o = 780$ mm

16. Measure distance $W$ at inboard (i) and outboard (o) sides of seat.
   $W_I = 760$ mm $W_o = 760$ mm

17. Is $S_I + U_i$ equal to or greater than $W_I + V_i$? PASS

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

19. Compute area $(W \times A) = 537,700 \text{ mm}^2$
20. Compute area $(E \times S) = 555,750 \text{ mm}^2$

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

Comments: None

Recorded By:__________________________
Approved By:__________________________ DATE: 11/1/2006
1. Locate x-y reference point on sketch above for head form impact locations. (Label the positive and negative directions, if applicable)

2. Identify head form impact location on sketch by placing H1, H2, H3, H4, H5, and H6 in the appropriate location.

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

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>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X</td>
<td>Y</td>
<td>Angle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H1</td>
<td>588</td>
<td>510</td>
<td>0</td>
<td>1.56</td>
<td>1.74</td>
</tr>
<tr>
<td>H2</td>
<td>488</td>
<td>510</td>
<td>0</td>
<td>1.55</td>
<td>1.98</td>
</tr>
<tr>
<td>H3</td>
<td>588</td>
<td>360</td>
<td>0</td>
<td>1.56</td>
<td>1.56</td>
</tr>
<tr>
<td>H4</td>
<td>488</td>
<td>360</td>
<td>0</td>
<td>1.56</td>
<td>1.35</td>
</tr>
<tr>
<td>H5</td>
<td>388</td>
<td>360</td>
<td>0</td>
<td>1.56</td>
<td>1.45</td>
</tr>
<tr>
<td>H6</td>
<td>388</td>
<td>510</td>
<td>0</td>
<td>1.56</td>
<td>1.78</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:  (a) All measurements are referenced to the point where the horizontal plane through the SRP intersects the vertical line tangent to the inboard edge of the seat.

Recorded By: ____________________________

Approved By: ____________________________ DATE: 1/8/2007
1. Locate x-y reference point on sketch above for head form impact locations. (Label the positive and negative directions, if applicable)

2. Identify head form impact location on sketch by placing H7, H8, H9, H10, H11, H12, H13, and H14 in the appropriate location.

3. Define and mark on graphic above, the plane of reference for head form impact angle:
   - $0^\circ = \text{Parallel With Floor, (+) is Up, (-) is Down}$
   - X = From Inboard Edge of Seat
   - Y = Measured Vertically from the SRP
DATA SHEET 7 (CONTINUED)
HEAD FORM IMPACT CONTACT AREA AND ENERGY REQUIREMENTS

4. Complete the following table:

<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>Enyg Reqd Joules</th>
<th>Column 5 &lt; 1000</th>
<th>Column 6 &gt; 4.5 joules</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>H7</td>
<td>288 510 0</td>
<td>6.62</td>
<td>6.61</td>
<td>149</td>
<td>5.08</td>
<td>PASS</td>
<td>PASS</td>
</tr>
<tr>
<td>H8</td>
<td>188 510 0</td>
<td>6.63</td>
<td>6.99</td>
<td>148</td>
<td>5.82</td>
<td>PASS</td>
<td>PASS</td>
</tr>
<tr>
<td>H9</td>
<td>88 510 0</td>
<td>6.66</td>
<td>6.92</td>
<td>140</td>
<td>5.79</td>
<td>PASS</td>
<td>PASS</td>
</tr>
<tr>
<td>H10</td>
<td>288 360 0</td>
<td>6.69</td>
<td>7.16</td>
<td>132</td>
<td>11.06</td>
<td>PASS</td>
<td>PASS</td>
</tr>
<tr>
<td>H11</td>
<td>188 360 0</td>
<td>6.69</td>
<td>6.90</td>
<td>151</td>
<td>8.30</td>
<td>PASS</td>
<td>PASS</td>
</tr>
<tr>
<td>H12</td>
<td>88 360 0</td>
<td>6.66</td>
<td>6.43</td>
<td>188</td>
<td>4.74</td>
<td>PASS</td>
<td>PASS</td>
</tr>
<tr>
<td>H13</td>
<td>500 788 0</td>
<td>6.61</td>
<td>6.76</td>
<td>427</td>
<td>8.17</td>
<td>PASS</td>
<td>PASS</td>
</tr>
<tr>
<td>H14</td>
<td>575 703 0</td>
<td>6.63</td>
<td>6.55</td>
<td>272</td>
<td>6.80</td>
<td>PASS</td>
<td>PASS</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: (a) All measurements are referenced to the point where the horizontal plane through the SRP intersects the vertical line tangent to the inboard edge of the seat.
H13 and H14 were located on the padded bulkhead above B1.

Recorded By: ____________________________

Approved By: ____________________________ DATE: 1/8/2007
SEAT NUMBER: S9

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:
   - $0^\circ = \text{Parallel With Floor, (+) is Up, (-) is Down}$
   - $X = \text{From Inboard Edge of the Seat}$
   - $Y = \text{Measured Vertically from the SRP}$
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</td>
<td>Y</td>
<td>Angle</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K1</td>
<td>100</td>
<td>240</td>
<td>0</td>
<td>4.87</td>
<td>4.76</td>
<td>2,910</td>
<td>2,506</td>
</tr>
<tr>
<td>K2</td>
<td>250</td>
<td>240</td>
<td>0</td>
<td>4.86</td>
<td>4.72</td>
<td>2,860</td>
<td>1,709</td>
</tr>
<tr>
<td>K3</td>
<td>400</td>
<td>240</td>
<td>0</td>
<td>4.87</td>
<td>4.53</td>
<td>2,790</td>
<td>1,798</td>
</tr>
<tr>
<td>K4</td>
<td>100</td>
<td>120</td>
<td>0</td>
<td>4.87</td>
<td>4.70</td>
<td>3,030</td>
<td>2,291</td>
</tr>
<tr>
<td>K5</td>
<td>250</td>
<td>120</td>
<td>0</td>
<td>4.79</td>
<td>4.65</td>
<td></td>
<td>1,813</td>
</tr>
<tr>
<td>K6</td>
<td>400</td>
<td>120</td>
<td>0</td>
<td>4.79</td>
<td>4.59</td>
<td></td>
<td>1,832</td>
</tr>
<tr>
<td>K7</td>
<td>100</td>
<td>-28</td>
<td>0</td>
<td>4.83</td>
<td>4.72</td>
<td></td>
<td>2,420</td>
</tr>
<tr>
<td>K8</td>
<td>250</td>
<td>-28</td>
<td>0</td>
<td>4.86</td>
<td>4.52</td>
<td></td>
<td>2,146</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: (a) All measurements are referenced to the point where the horizontal plane through the SRP intersects the vertical line tangent to the inboard edge of the seat.

Recorded By: ________________________________

Approved By: ________________________________  DATE: 1/8/2007
DATA SHEET 9
SEAT BELT ASSEMBLY ANCHORAGES

Test Vehicle: 2006 CORBEIL SCHOOL BUS  
Test Lab: MGA RESEARCH CORPORATION  
NHTSA No.: C60902  
Test Date: 1/12/2007

SEAT LOCATION: S5

<table>
<thead>
<tr>
<th>Seat Location</th>
<th>Seating Location</th>
<th>Anchor Type</th>
<th>Measured Spacing (mm) *</th>
<th>Measured Angle **</th>
<th>Load Application Angle (degrees)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left</td>
<td>S5</td>
<td>Left</td>
<td>200</td>
<td>65°</td>
<td>11°</td>
</tr>
<tr>
<td>Right</td>
<td>S5</td>
<td>Left</td>
<td>200</td>
<td>65°</td>
<td>11°</td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>Seat Location</th>
<th>Seating Location</th>
<th>Required Load (N)</th>
<th>Actual Max. Test Load (N)</th>
<th>PASS/FAIL</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>S5</td>
<td>Left</td>
<td>22,000</td>
<td>21,790</td>
<td>PASS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Right</td>
<td>22,000</td>
<td>21,800</td>
<td>PASS</td>
<td></td>
</tr>
</tbody>
</table>

Comments: None

Recorded By: ____________________________  
Approved By: Michael  
DATE: 1/12/2007
DATA SHEET B1 - SEAT BELT CHECK

Test Vehicle: 2006 CORBEIL SCHOOL BUS  
NHTSA No.: C60902  
Test Lab: MGA RESEARCH CORPORATION  
Test Date: 1/08/2007  

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

### Belt Type (Type 1 or 2 Required)

<table>
<thead>
<tr>
<th>Seat No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSP #1 Inboard</td>
<td>Type 1</td>
<td>Type 1</td>
<td>Type 1</td>
<td>Type 1</td>
<td>Type 1</td>
<td>Type 1</td>
<td>Type 1</td>
<td>Type 1</td>
<td>Type 1</td>
<td></td>
</tr>
<tr>
<td>DSP #2 Outboard</td>
<td>Type 1</td>
<td>Type 1</td>
<td>Type 1</td>
<td>Type 1</td>
<td>Type 1</td>
<td>Type 1</td>
<td>Type 1</td>
<td>Type 1</td>
<td>Type 1</td>
<td></td>
</tr>
</tbody>
</table>

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

### Retractor Type (Manual, ALR, ELR)

<table>
<thead>
<tr>
<th>Seat No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
</table>

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

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

<table>
<thead>
<tr>
<th>Seat No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSP #1 Inboard</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
</tr>
</tbody>
</table>
5. Latch plate and buckle must not pass through conduit or guide between seat cushion and seat back at each passenger DSP. (571.208 S7.4.6)
   Pass: latch plate and/or buckle will not fit through conduit or guide
   Fail: latch plate and/or buckle will fit through conduit or guide

<table>
<thead>
<tr>
<th>Seat No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSP #1</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
</tr>
</tbody>
</table>

6. Either the latch plate, buckle, or webbing must stay on top or above the seat when the seat belt is unbuckled and the remaining two parts must stay accessible at each passenger DSP. (571.208 S7.4.6)
   Pass: the seat belt meets the above requirements
   Fail: the seat belt does not meet the above requirements

<table>
<thead>
<tr>
<th>Seat No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSP #1</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
<td>Pass</td>
</tr>
</tbody>
</table>

7. Seat belt fit test dummies

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Serial Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>50% 6-Year old Child</td>
<td>FTSS</td>
</tr>
<tr>
<td>5% Adult Female</td>
<td>FTSS</td>
</tr>
<tr>
<td>50% Adult Male</td>
<td>FTSS</td>
</tr>
<tr>
<td>95% Adult Male</td>
<td>Denton</td>
</tr>
</tbody>
</table>
8. Seat belt must fit persons whose dimensions range from those of a 50th percentile 6-year old child to those of a 95th percentile adult male. (571.208 S7.1.1)

Two seats checked

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

<table>
<thead>
<tr>
<th>Seat Number</th>
<th>S6</th>
<th>S10</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSP #1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50% C</td>
<td>Pass</td>
<td>Pass</td>
</tr>
<tr>
<td>95% AM</td>
<td>Pass</td>
<td>Pass</td>
</tr>
<tr>
<td>DSP #2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50% C</td>
<td>Pass</td>
<td>Pass</td>
</tr>
<tr>
<td>95% AM</td>
<td>Pass</td>
<td>Pass</td>
</tr>
</tbody>
</table>

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

Belt Type                        2
Automatic Restraint              No
Type of Automatic Restraint (if applicable)  
Pass: snug fitting seat belt  Fail: loose fitting seat belt

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5% AF</td>
<td>Pass</td>
</tr>
<tr>
<td>95% AM</td>
<td>Pass</td>
</tr>
</tbody>
</table>

Comments: None

Recorded By: ________________________________

Approved By: ________________________________ DATE: 1/08/2007
DATA SHEET B2
SEAT BELT WARNING SYSTEM CHECK

Test Vehicle: 2006 CORBEIL SCHOOL BUS  
NHTSA No.: C60902
Test Lab: MGA RESEARCH CORPORATION  
Test Date: 1/08/2007

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

<table>
<thead>
<tr>
<th>S7.3 (a)(1)</th>
<th>Belt stowed &amp; key on or start</th>
<th>Item 8: Stays On</th>
<th>60 seconds minimum</th>
<th>Item 4: 6</th>
<th>4 to 8 seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>S7.3 (a)(2)</td>
<td>Belt latched &amp; key on or start</td>
<td>Item 12: 0</td>
<td>4 to 8 seconds</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Belt stowed &amp; key on or start</td>
<td>Item 8: Stays On</td>
<td>4 to 8 seconds</td>
<td>Item 4: 6</td>
<td>4 to 8 seconds</td>
</tr>
</tbody>
</table>

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

Comments: None

Recorded By: __________________________

Approved By: __________________________ DATE: 1/08/2007
## SECTION 5
### INSTRUMENTATION AND EQUIPMENT LIST

**Test Vehicle:** 2006 CORBEIL SCHOOL BUS  
**NHTSA No.:** C60902  
**Test Lab:** MGA RESEARCH CORPORATION  
**Test Date:** 11/1/2006

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Description</th>
<th>Model/Serial No.</th>
<th>Cal. Date</th>
<th>Next Cal. Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer</td>
<td>HP</td>
<td>Vectra / US03263612</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Test Fixture</td>
<td>MGA</td>
<td>TF2003</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>A/D Interface</td>
<td>Metrabyte</td>
<td>DAS-1802</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Load Cell Interface</td>
<td></td>
<td>1210AF-SK / 62736</td>
<td>7/13/06</td>
<td>1/13/07</td>
</tr>
<tr>
<td>Load Cell Interface</td>
<td></td>
<td>1210AF / 137778</td>
<td>5/8/06</td>
<td>11/8/06</td>
</tr>
<tr>
<td>Inclinometer</td>
<td>Digital Protractor</td>
<td>Pro 360 / Comp Lab</td>
<td>10/4/06</td>
<td>4/4/07</td>
</tr>
<tr>
<td>Steel Tape</td>
<td>Stanley</td>
<td>Powerlock / 278</td>
<td>9/26/06</td>
<td>3/26/07</td>
</tr>
<tr>
<td>Impact Fixture</td>
<td>MGA</td>
<td>IF2003A</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Camera</td>
<td>Sony</td>
<td>DSC-S75</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Planimeter</td>
<td>Sokkia Corp.</td>
<td>Planix5 007319</td>
<td>11/22/06</td>
<td>5/22/07</td>
</tr>
<tr>
<td>Accelerometer</td>
<td>Endevco</td>
<td>7264-2000 / W04807</td>
<td>10/4/06</td>
<td>4/4/07</td>
</tr>
<tr>
<td>Linear Motion Transducer</td>
<td>Ametek</td>
<td>P-25A / 1202-19366</td>
<td>10/30/06</td>
<td>4/30/07</td>
</tr>
<tr>
<td>Linear Motion Transducer</td>
<td>Ametek</td>
<td>P25A / 21954</td>
<td>10/30/06</td>
<td>4/30/07</td>
</tr>
</tbody>
</table>
# SECTION 6
## PHOTOGRAPHS

### TABLE OF PHOTOGRAPHS

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Left Side View of School Bus</td>
<td>36</td>
</tr>
<tr>
<td>2</td>
<td>Right Side View of School Bus</td>
<td>37</td>
</tr>
<tr>
<td>3</td>
<td>¾ Front View From Left Side of School Bus</td>
<td>38</td>
</tr>
<tr>
<td>4</td>
<td>¾ Rear View From Right Side of School Bus</td>
<td>39</td>
</tr>
<tr>
<td>5</td>
<td>Certification Label</td>
<td>40</td>
</tr>
<tr>
<td>6</td>
<td>Incomplete Vehicle Label</td>
<td>41</td>
</tr>
<tr>
<td>7</td>
<td>Tire Placard</td>
<td>42</td>
</tr>
<tr>
<td>8</td>
<td>Vehicle Interior View From Front to Rear</td>
<td>43</td>
</tr>
<tr>
<td>9</td>
<td>Vehicle Interior View From Rear to Front</td>
<td>44</td>
</tr>
<tr>
<td>10</td>
<td>Pre-Test of Seat Cushion S7</td>
<td>45</td>
</tr>
<tr>
<td>11</td>
<td>Post-Test of Seat Cushion S7</td>
<td>46</td>
</tr>
<tr>
<td>12</td>
<td>Pre-Test of Seat Cushion S10</td>
<td>47</td>
</tr>
<tr>
<td>13</td>
<td>Post-Test of Seat Cushion S10</td>
<td>48</td>
</tr>
<tr>
<td>14</td>
<td>Pre-Test of Seat Back S1 Force Deflection Forward Test</td>
<td>49</td>
</tr>
<tr>
<td>15</td>
<td>Post-Test of Seat Back S1 Force Deflection Forward Test</td>
<td>50</td>
</tr>
<tr>
<td>16</td>
<td>Pre-Test of Seat Back S4 Force Deflection Forward Test (In S2 Location)</td>
<td>51</td>
</tr>
<tr>
<td>17</td>
<td>Post-Test of Seat Back S4 Force Deflection Forward Test (In S2 Location)</td>
<td>52</td>
</tr>
<tr>
<td>18</td>
<td>Pre-Test of Seat Back S3 Force Deflection Rearward Test</td>
<td>53</td>
</tr>
<tr>
<td>19</td>
<td>Post-Test of Seat Back S3 Force Deflection Rearward Test</td>
<td>54</td>
</tr>
<tr>
<td>20</td>
<td>Post-Test of Head and Knee Impact Locations on Seat S9</td>
<td>55</td>
</tr>
<tr>
<td>21</td>
<td>Post-Test of Head Impact Locations on Bulkhead</td>
<td>56</td>
</tr>
<tr>
<td>22</td>
<td>Pre-Test Seat Belt Assembly Anchorage on Seat S5</td>
<td>57</td>
</tr>
<tr>
<td>23</td>
<td>Post-Test Seat Belt Assembly Anchorage on Seat S5</td>
<td>58</td>
</tr>
</tbody>
</table>
Test Vehicle: 2006 CORBEIL SCHOOL BUS
Procedure: FMVSS 222
NHTSA No.: C60902
Test Date: 11/01/2006

Left Side View of School Bus
Test Vehicle: 2006 CORBEIL SCHOOL BUS
Procedure: FMVSS 222
NHTSA No.: C60902
Test Date: 11/01/2006

Right Side View of School Bus
Test Vehicle: 2006 CORBEIL SCHOOL BUS  
Procedure: FMVSS 222  
NHTSA No.: C60902  
Test Date: 11/01/2006

¾ Front View From Left Side of School Bus
Test Vehicle: 2006 CORBEIL SCHOOL BUS
NHTSA No.: C60902

Procedure: FMVSS 222
Test Date: 11/01/2006

¾ Rear View From Right Side of School Bus
Test Vehicle: 2006 CORBEIL SCHOOL BUS
NHTSA No.: C60902
Procedure: FMVSS 222
Test Date: 11/01/2006
Test Vehicle: 2006 CORBEIL SCHOOL BUS
Procedure: FMVSS 222
NHTSA No.: C60902
Test Date: 11/01/2006

Incomplete Vehicle Label

INCOMPLETE VEHICLE MFD. BY FORD MOTOR COMPANY
DATE: 04/06
FRONT GAWR: 3550LB/1610KG
WITH LT245/75R16
16x7.0K
AT 380 kPa/55 PSI COLD
VIN: 1FDSE35L66DA60778

REAR GAWR: 6084LB/2760KG
WITH LT245/75R16
16x7.0K
AT 550 kPa/80 PSI COLD

Equipped with the Ford
School Bus Prep Pkg

EXT PNT: BY RC: 44 DSO: 6E414
WC INT TR TP/PS R AXLE TR SPR
138 AE Y 56 T LL66 R05
MADE IN U.S.A.
ULN 5U5A-3520472-AA
Test Vehicle: 2006 CORBEIL SCHOOL BUS
Procedure: FMVSS 222
NHTSA No.: C60902
Test Date: 11/01/2006

Tire Placard
Test Vehicle: 2006 CORBEIL SCHOOL BUS
Procedure: FMVSS 222
NHTSA No.: C60902
Test Date: 11/01/2006

Vehicle Interior View From Front to Rear
Test Vehicle: 2006 CORBEIL SCHOOL BUS
Procedure: FMVSS 222
NHTSA No.: C60902
Test Date: 11/01/2006

Vehicle Interior View From Rear to Front
Test Vehicle: 2006 CORBEIL SCHOOL BUS
Procedure: FMVSS 222
NHTSA No.: C60902
Test Date: 11/01/2006

Pre-Test of Seat Cushion S7
Post-Test of Seat Cushion S7
Pre-Test of Seat Cushion S10
Test Vehicle: 2006 CORBEIL SCHOOL BUS
Procedure: FMVSS 222
NHTSA No.: C60902
Test Date: 11/01/2006

Post-Test of Seat Cushion S10
Pre-Test of Seat Back S1 Force Deflection Forward Test
Post-Test of Seat Back S1 Force Deflection Forward Test
Test Vehicle: 2006 CORBEIL SCHOOL BUS
Procedure: FMVSS 222
NHTSA No.: C60902
Test Date: 11/01/2006

Pre-Test of Seat Back S4 Force Deflection Forward Test (In S2 Location)
Test Vehicle: 2006 CORBEIL SCHOOL BUS
Procedure: FMVSS 222
NHTSA No.: C60902
Test Date: 11/01/2006

Post-Test of Seat Back S4 Force Deflection Forward Test (In S2 Location)
Test Vehicle: 2006 CORBEIL SCHOOL BUS
Procedure: FMVSS 222
NHTSA No.: C60902
Test Date: 11/01/2006

Pre-Test of Seat Back S3 Force Deflection Rearward Test
Post-Test of Seat Back S3 Force Deflection Rearward Test
Test Vehicle: 2006 CORBEIL SCHOOL BUS
Procedure: FMVSS 222
NHTSA No.: C60902
Test Date: 11/01/2006

Post-Test of Head and Knee Impact Locations on Seat S9
Test Vehicle: 2006 CORBEIL SCHOOL BUS
Procedure: FMVSS 222
NHTSA No.: C60902
Test Date: 11/01/2006

Post-Test of Head Impact Locations on Bulkhead
Test Vehicle: 2006 CORBEIL SCHOOL BUS
Procedure: FMVSS 222
NHTSA No.: C60902
Test Date: 11/01/2006

Pre-Test Seat Belt Assembly Anchorage on Seat S5
Post-Test Seat Belt Assembly Anchorage on Seat S5
# TABLE OF TEST PLOTS

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Seat Cushion Retention Seat S7</td>
<td>60</td>
</tr>
<tr>
<td>2</td>
<td>Seat Cushion Retention Seat S10</td>
<td>61</td>
</tr>
<tr>
<td>3</td>
<td>Seat Back Forward Deflection Seat S1 (Upper)</td>
<td>62</td>
</tr>
<tr>
<td>4</td>
<td>Seat Back Forward Deflection Seat S1 (Lower)</td>
<td>63</td>
</tr>
<tr>
<td>5</td>
<td>Seat Back Forward Deflection Seat S4 (Upper) (In S2 Location)</td>
<td>64</td>
</tr>
<tr>
<td>6</td>
<td>Seat Back Forward Deflection Seat S4 (Lower) (In S2 Location)</td>
<td>65</td>
</tr>
<tr>
<td>7</td>
<td>Seat Back Rearward Deflection S3</td>
<td>66</td>
</tr>
<tr>
<td>8</td>
<td>FMVSS 210 Lap Belt Load S5</td>
<td>67</td>
</tr>
<tr>
<td>9</td>
<td>H1 Head Form Impact (1.5 m/s)</td>
<td>68</td>
</tr>
<tr>
<td>10</td>
<td>H2 Head Form Impact (1.5 m/s)</td>
<td>69</td>
</tr>
<tr>
<td>11</td>
<td>H3 Head Form Impact (1.5 m/s)</td>
<td>70</td>
</tr>
<tr>
<td>12</td>
<td>H4 Head Form Impact (1.5 m/s)</td>
<td>71</td>
</tr>
<tr>
<td>13</td>
<td>H5 Head Form Impact (1.5 m/s)</td>
<td>72</td>
</tr>
<tr>
<td>14</td>
<td>H6 Head Form Impact (1.5 m/s)</td>
<td>73</td>
</tr>
<tr>
<td>15</td>
<td>H7 Head Form Impact (6.69 m/s)</td>
<td>74</td>
</tr>
<tr>
<td>16</td>
<td>H8 Head Form Impact (6.69 m/s)</td>
<td>75</td>
</tr>
<tr>
<td>17</td>
<td>H9 Head Form Impact (6.69 m/s)</td>
<td>76</td>
</tr>
<tr>
<td>18</td>
<td>H10 Head Form Impact (6.69 m/s)</td>
<td>77</td>
</tr>
<tr>
<td>19</td>
<td>H11 Head Form Impact (6.69 m/s)</td>
<td>78</td>
</tr>
<tr>
<td>20</td>
<td>H12 Head Form Impact (6.69 m/s)</td>
<td>79</td>
</tr>
<tr>
<td>21</td>
<td>H13 Head Form Impact (6.69 m/s)</td>
<td>80</td>
</tr>
<tr>
<td>22</td>
<td>H14 Head Form Impact (6.69 m/s)</td>
<td>81</td>
</tr>
<tr>
<td>23</td>
<td>K1 Knee Form Impact</td>
<td>82</td>
</tr>
<tr>
<td>24</td>
<td>K2 Knee Form Impact</td>
<td>83</td>
</tr>
<tr>
<td>25</td>
<td>K3 Knee Form Impact</td>
<td>84</td>
</tr>
<tr>
<td>26</td>
<td>K4 Knee Form Impact</td>
<td>85</td>
</tr>
<tr>
<td>27</td>
<td>K5 Knee Form Impact</td>
<td>86</td>
</tr>
<tr>
<td>28</td>
<td>K6 Knee Form Impact</td>
<td>87</td>
</tr>
<tr>
<td>29</td>
<td>K7 Knee Form Impact</td>
<td>88</td>
</tr>
<tr>
<td>30</td>
<td>K8 Knee Form Impact</td>
<td>89</td>
</tr>
</tbody>
</table>
Test Desc: Seat Cushion Retention
Component ID: CORBEIL S7
NHTSA #: C60902

Force (N) vs. Time (sec)
Test Desc: Seat Cushion Retention
Component ID: CORBEIL S10
NHTSA #: C60902

Test Date: 1/10/2007

Force (N) vs. Time (sec)
Test Desc: Seat Back Forward Deflection (Upper)  
Component ID: CORBEIL S1  
Test Date: 11/14/2006  
NHTSA #: C60902

**FORCE (N) VS DISPLACEMENT (mm)**

- Total Energy: 1,312 J

**DISPLACEMENT (mm) VS TIME (SEC)**

- Disp Max : 355.9 mm
- Time Max : 29.7 S

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

- Force Max : 5,061.9 N
- Time Max : 21.0 S
Test Desc: Seat Back Forward Deflection (Lower)  
Test Date: 11/14/2006  
Component ID: CORBEIL S1  
NHTSA #: C60902

FORCE (N) VS DISPLACEMENT (mm)

DISPLACEMENT (mm) VS TIME (SEC)
Disp. Max : 50.5 mm  
Disp. End : 43.7 mm

FORCE (N) VS TIME (SEC)
Force Max : 6,125.4 N  
Time Max : 17.8 S  
Force @ 60 sec : 2,862.6 N
Test Desc: Seat Back Forward Deflection (Upper)  
Component ID: CORBEIL S4, in S2 Location  
Test Date: 11/14/2006  
NHTSA #: C60902

FORCE (N) VS DISPLACEMENT (mm)
- Total Energy: 1,341 J

DISPLACEMENT (mm) VS TIME (SEC)
- Disp Max: 356.0 mm
- Time Max: 28.0 S

FORCE (N) VS TIME (SEC)
- Force Max: 5,100.5 N
- Time Max: 16.2 S
Test Desc: Seat Back Forward Deflection (Lower)
Component ID: CORBEIL S4, in S2 Location
Test Date: 11/14/2006
NHTSA #: C60902

DISPLACEMENT (mm) VS TIME (SEC)
Disp. Max : 57.5 mm
Disp. End : 49.7 mm

FORCE (N) VS TIME (SEC)
Force Max : 6,067.3 N
Time Max : 19.2 S
Force @ 60 sec : 2,936.6 N
Test Desc: Seat Back Rearward Deflection
Component ID: CORBEIL S3

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

Total Energy: 922.3 J

Disp Max : 256.6 mm
Time Max : 22.0 S

Force Max : 5,568.4 N
Time Max : 14.2 S
Test Desc: Head Form Impact (1.5 m/s)  
Component ID: CORBEIL S9, Location H1  
NHTSA#: C60902  

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

Max: 4.97 G's  
TMax: 0.17 S  
Min: -7.11 G's  
TMin: 0.03 S

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

Max: 1.74 m/s  
TMax: 0.00 S  
Min: -0.66 m/s  
TMin: 0.07 S  
VEL@IMP: 1.743 m/s
Test Desc: Head Form Impact (1.5 m/s)  
Test Date: 1/8/2007  
Component ID: CORBEIL S9, Location H2  
NHTSA#: C60902

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

Max: 5.56 G's  
TMax: 0.18 S  
Min: -6.24 G's  
TMin: 0.04 S

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

Max: 2.37 m/s  
TMax: 0.34 S  
Min: -0.16 m/s  
TMin: 0.07 S  
VEL@IMP: 1.979m/s
Test Desc: Head Form Impact (1.5 m/s)  
Test Date: 1/8/2007
Component ID: CORBEIL S9, Location H3
NHTSA#: C60902

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

Max: 3.93 G's  
TMax: 0.22 S  
Min: -7.81 G's  
TMin: 0.04 S

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

Max: 1.57 m/s  
TMax: -0.01 S  
Min: -0.84 m/s  
TMin: 0.08 S  
VEL@IMP: 1.557m/s
Test Desc: Head Form Impact (1.5 m/s)
Component ID: CORBEIL S9, Location H4
NHTSA#: C60902

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

- Max: 4.87 G's
- Tmax: 0.22 S
- Min: -6.81 G's
- Tmin: 0.04 S

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

- Max: 1.38 m/s
- Tmax: -0.01 S
- Min: -1.31 m/s
- Tmin: 0.18 S
- Vel@Imp: 1.346 m/s
Test Desc: Head Form Impact (1.5 m/s)  
Component ID: CORBEIL S9, Location H5  
NHTSA#: C60902

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

- Max: 4.50 G's
- Tmax: 0.22 S
- Min: -6.83 G's
- Tmin: 0.04 S

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

- Max: 1.47 m/s
- Tmax: -0.01 S
- Min: -1.26 m/s
- Tmin: 0.09 S
- VEL@IMP: 1.45 m/s
Test Desc: Head Form Impact (1.5 m/s)  
Test Date: 1/8/2007
Component ID: CORBEIL S9, Location H6
NHTSA#: C60902

HEAD X Acceleration (G’s) VS TIME (S)

Max: 5.46 G’s  
TMax: 0.18 S
Min: -5.93 G’s  
TMin: 0.04 S

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

Max: 1.78 m/s  
TMax: 0.00 S
Min: -0.44 m/s  
TMin: 0.08 S
VEL@IMP: 1.777 m/s
**Test Desc:** Head Form Impact (6.69 m/s)  
**Test Date:** 1/5/2007  
**Component ID:** CORBEIL S9, Location H7  
**NHTSA #:** C60902

### Head X Acceleration (G's) vs Time (S)

- **Max:** 37.25 G's  
- **TMax:** 0.07 S  
- **Min:** -53.75 G's  
- **TMin:** 0.01 S  
- **Hic:** 148.75  
- **T1:** 4.90 ms  
- **T2:** 35.50 ms

### Velocity X (m/s) vs Time (S)

- **Max:** 6.64 m/s  
- **TMax:** -0.01 S  
- **Min:** -3.54 m/s  
- **TMin:** 0.05 S  
- **VEL@IMP:** 6.612 m/s

### Force X (N) vs Time (S)

- **Max:** 1,903.99 N  
- **TMax:** 0.07 S  
- **Min:** -2,747.02 N  
- **TMin:** 0.01 S

### Energy

- **Energy:** 5.08 J
Test Desc: Head Form Impact (6.69 m/s)  
Component ID: CORBEIL S9, Location H8  
NHTSA#: C60902

Max: 49.16 G's  
TMax: 0.07 S  
Min: -46.48 G's  
TMin: 0.01 S

Max: 7.00 m/s  
TMax: -0.01 S  
Min: -3.10 m/s  
TMin: 0.05 S  
VEL@IMP: 6.989 m/s

Max: 2,512.39 N  
TMax: 0.07 S  
Min: -2,375.61 N  
TMin: 0.01 S

Energy: 5.82 J
Test Desc: Head Form Impact (6.69 m/s)  Test Date: 1/5/2007
Component ID: CORBEIL S9, Location H9
NHTSA#: C60902

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

Max: 39.16 G's
TMax: 0.07 S
Min: -36.20 G's
TMin: 0.01 S

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

Max: 6.93 m/s
TMax: -0.01 S
Min: -3.46 m/s
TMin: 0.05 S
VEL@IMP: 6.924 m/s

FORCE X (N) VS TIME (S)

Max: 2,001.39 N
TMax: 0.07 S
Min: -1,850.13 N
TMin: 0.01 S

Energy: 5.79 J
Test Desc: Head Form Impact (6.69 m/s)  Test Date: 1/5/2007
Component ID: CORBEIL S9, Location H10  NHTSA#: C60902

Max: 38.74 G's  Tmax: 0.07 S  Min: -47.06 G's  Tmin: 0.01 S
Max: 7.16 m/s  Tmax: -0.00 S  Min: -2.99 m/s  Tmin: 0.05 S  VEL@IMP: 7.158 m/s
Max: 1,980.24 N  Tmax: 0.07 S  Min: -2,405.19 N  Tmin: 0.01 S
Energy: 11.06 J
Test Desc: Head Form Impact (6.69 m/s)  
Component ID: CORBEIL S9, Location H11  
NHTSA#: C60902

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

Max: 37.94 G's  
TMax: 0.07 S  
Min: -59.11 G's  
TMin: 0.01 S

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

Max: 6.93 m/s  
TMax: -0.01 S  
Min: -3.19 m/s  
TMin: 0.05 S  
VEL@IMP: 6.9 m/s

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

Max: 1,939.05 N  
TMax: 0.07 S  
Min: -3,021.32 N  
TMin: 0.01 S

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

Energy: 8.30 J
Test Date: 1/5/2007
Component ID: CORBEIL S9, Location H12
NHTSA#: C60902

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

- Max: 45.53 G's
- Tmax: 0.07 S
- Min: -65.32 G's
- Tmin: 0.01 S

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

- Max: 6.52 m/s
- Tmax: -0.01 S
- Min: -9.38 m/s
- Tmin: 1.00 S

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

- Max: 2,326.90 N
- Tmax: 0.07 S
- Min: -3,338.58 N
- Tmin: 0.01 S

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

- Energy: 4.74 J
Test Desc: Head Form Impact (6.69 m/s)  
Test Date: 1/8/2007  
Component ID: CORBEIL Bulkhead, Location H13  
NHTSA#: C60902

### Head X Acceleration (G's) vs Time (S)

- **Max:** 42.11 G's
- **TMax:** 0.07 S
- **Min:** -79.52 G's
- **TMin:** 0.01 S

### Velocity X (m/s) vs Time (S)

- **Max:** 6.82 m/s
- **TMax:** -0.01 S
- **Min:** -3.56 m/s
- **TMin:** 0.03 S
- **VEL@IMP:** 6.763 m/s

### Force X (N) vs Time (S)

- **Max:** 2,152.35 N
- **TMax:** 0.07 S
- **Min:** -4,064.32 N
- **TMin:** 0.01 S

### Energy

- **Energy:** 8.17 J
Test Desc: Knee Form Impact
Component ID: CORBEIL S9, Location K1
NHTSA #: C60902
Test Date: 1/8/2007

**KNEE X Acceleration (G's) VS TIME (S)**
- Max: 21.86 G's
- Tmax: 0.04 s
- Min: -56.39 G's
- Tmin: 0.09 s

**VELOCITY X (m/s) VS TIME (S)**
- Max: 5.06 m/s
- Tmax: 4.45 s
- Min: -1.69 m/s
- Tmin: 0.12 s
- Vel@Imp: 4.76 m/s

**FORCE X (N) VS TIME (S)**
- Max: 971.57 N
- Tmax: 0.04 s
- Min: -2,505.90 N
- Tmin: 0.09 s
Test Desc: Knee Form Impact
Component ID: CORBEIL S9, Location K2
NHTSA #: C60902

Test Date: 1/8/2007

KNEE X Acceleration (G's) VS TIME (S)
Max: 22.75 G's
TMax: 0.19 s
Min: -38.46 G's
TMin: 0.09 s

VELOCITY X (m/s) VS TIME (S)
Max: 4.72 m/s
TMax: 0.07 s
Min: -2.44 m/s
TMin: 0.13 s
VEL@IMP: 4.72 m/s

FORCE X (N) VS TIME (S)
Max: 1,010.82 N
TMax: 0.19 s
Min: -1,709.11 N
TMin: 0.09 s
Test Desc: Knee Form Impact
Component ID: CORBEIL S9, Location K3
NHTSA #: C60902

Test Date: 1/8/2007

**KNEE X Acceleration (G's) VS TIME (S)**
- Max: 25.46 G's
- Tmax: 0.15 s
- Min: -40.46 G's
- Tmin: 0.09 s

**VELOCITY X (m/s) VS TIME (S)**
- Max: 4.55 m/s
- Tmax: 0.07 s
- Min: -3.10 m/s
- Tmin: 0.15 s
- Vel@Imp: 4.53 m/s

**FORCE X (N) VS TIME (S)**
- Max: 1,131.57 N
- Tmax: 0.15 s
- Min: -1,798.06 N
- Tmin: 0.09 s
Test Desc: Knee Form Impact
Component ID: CORBEIL S9, Location K4
Test Date: 1/8/2007
NHTSA #: C60902

KNEE X Acceleration (G's) VS TIME (S)
- Max: 21.98 G's
- Tmax: 0.04 s
- Min: -51.55 G's
- Tmin: 0.09 s

VELOCITY X (m/s) VS TIME (S)
- Max: 4.71 m/s
- Tmax: 0.07 s
- Min: -1.97 m/s
- Tmin: 0.12 s
- Vel@Imp: 4.7 m/s

FORCE X (N) VS TIME (S)
- Max: 976.65 N
- Tmax: 0.04 s
- Min: -2,290.70 N
- Tmin: 0.09 s
Test Desc: Knee Form Impact
Component ID: CORBEIL S9, Location K5
NHTSA #: C60902

Test Date: 1/8/2007

KNEE X Acceleration (G's) VS TIME (S)
Max: 26.90 G's
TMax: 0.15 s
Min: -40.79 G's
TMin: 0.10 s

VELOCITY X (m/s) VS TIME (S)
Max: 4.69 m/s
TMax: 0.07 s
Min: -2.77 m/s
TMin: 0.15 s
VEL@IMP: 4.65 m/s

FORCE X (N) VS TIME (S)
Max: 1,195.29 N
TMax: 0.15 s
Min: -1,812.58 N
TMin: 0.10 s
Test Desc: Knee Form Impact  
Component ID: CORBEIL S9, Location K6  
NHTSA #: C60902  
Test Date: 1/8/2007

KNEE X Acceleration (G's) VS TIME (S)
Max: 29.07 G's  
TMax: 0.15 s  
Min: -41.23 G's  
TMin: 0.10 s

VELOCITY X (m/s) VS TIME (S)
Max: 4.62 m/s  
TMax: 0.07 s  
Min: -2.95 m/s  
TMin: 0.15 s  
VEL@IMP: 4.59 m/s

FORCE X (N) VS TIME (S)
Max: 1,291.93 N  
TMax: 0.15 s  
Min: -1,832.11 N  
TMin: 0.10 s
Test Desc: Knee Form Impact
Component ID: CORBEIL S9, Location K7
Test Date: 1/8/2007
NHTSA #: C60902

KNEE X Acceleration (G's) VS TIME (S)
Max: 24.04 G's
TMax: 0.15 s
Min: -54.45 G's
TMin: 0.09 s

VELOCITY X (m/s) VS TIME (S)
Max: 4.74 m/s
TMax: 0.07 s
Min: -1.97 m/s
TMin: 0.11 s
VEL@IMP: 4.72 m/s

FORCE X (N) VS TIME (S)
Max: 1,068.22 N
TMax: 0.15 s
Min: -2,419.54 N
TMin: 0.09 s
Test Desc: Knee Form Impact
Component ID: CORBEIL S9, Location K8
NHTSA #: C60902

Test Date: 1/8/2007

KNEE X Acceleration (G's) VS TIME (S)
Max: 31.05 G's
TMax: 0.15 s
Min: -48.29 G's
TMin: 0.09 s

VELOCITY X (m/s) VS TIME (S)
Max: 4.58 m/s
TMax: 0.07 s
Min: -2.76 m/s
TMin: 0.14 s
VEL@IMP: 4.52 m/s

FORCE X (N) VS TIME (S)
Max: 1,379.64 N
TMax: 0.15 s
Min: -2,145.76 N
TMin: 0.09 s
SECTION 8
WELT CONTACT POINTS

Test Vehicle: 2006 CORBEIL SCHOOL BUS
NHTSA No.: C60902
Test Lab: MGA RESEARCH CORPORATION
Test Date: 1/8/2007

H1 / SEAT S9

H1 CORBEIL 50.1 cm²
H2 / SEAT S9

H2 CORBEIL 52.6 cm$^2$
SECTION 8 (CONTINUED)
WELT CONTACT POINTS

Test Vehicle: 2006 CORBEIL SCHOOL BUS  
NHTSA No.: C60902
Test Lab: MGA RESEARCH CORPORATION  
Test Date: 1/8/2007

H3 / SEAT S9

H3 CORBEIL 46.6 cm²
H4 / SEAT S9

H4 CORBEIL 44.9 cm²
SECTION 8 (CONTINUED)
WELT CONTACT POINTS

Test Vehicle: 2006 CORBEIL SCHOOL BUS  
NHTSA No.: C60902
Test Lab: MGA RESEARCH CORPORATION  
Test Date: 1/8/2007

H5 / SEAT S9

H5 CORBEIL 44.0 cm²
SECTION 8 (CONTINUED)
WELT CONTACT POINTS

Test Vehicle: 2006 CORBEIL SCHOOL BUS
Test Lab: MGA RESEARCH CORPORATION
NHTSA No.: C60902
Test Date: 1/8/2007

H6 / SEAT S9

H6 CORBEIL 49.7 cm²
SECTION 8 (CONTINUED)
WELT CONTACT POINTS

Test Vehicle: 2006 CORBEIL SCHOOL BUS  
NHTSA No.: C60902
Test Lab: MGA RESEARCH CORPORATION  
Test Date: 1/8/2007

K1 / SEAT S9

K1 CORBEIL 29.1 cm²
SECTION 8 (CONTINUED)
WELT CONTACT POINTS

Test Vehicle: 2006 CORBEIL SCHOOL BUS
Test Lab: MGA RESEARCH CORPORATION
NHTSA No.: C60902
Test Date: 1/8/2007

K2 / SEAT S9

K2 CORBEIL 28.6 cm²
SECTION 8 (CONTINUED)
WELT CONTACT POINTS

Test Vehicle: 2006 CORBEIL SCHOOL BUS  
NHTSA No.: C60902
Test Lab: MGA RESEARCH CORPORATION  
Test Date: 1/8/20077

K3 / SEAT S9

K3 CORBEIL 27.9 cm²
SECTION 8 (CONTINUED)
WELT CONTACT POINTS

Test Vehicle: 2006 CORBEIL SCHOOL BUS
Test Lab: MGA RESEARCH CORPORATION
NHTSA No.: C60902
Test Date: 1/8/2007

K4 / SEAT S9

K4  CORBEIL 30.3 cm²