REPORT NUMBER: 222-MGA-2009-001

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

IC CORPORATION
2009 IC CORPORATION RE300
NHTSA NO.: C90900

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


FINAL REPORT DATE: JANUARY 7, 2009

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
Compliance tests were conducted on the subject 2009 IC Corporation RE300 School Bus, NHTSA No. C90900, 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

Compliance Testing
Safety Engineering
FMVSS 222
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<tr>
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Tests were conducted on a 2009 IC Corporation RE300 School Bus, NHTSA No.: C90900, 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.: DTNH22-08-D-00075.
SECTION 2
TEST DATA SUMMARY

The passenger seating and crash protection tests were conducted during October through November 2008. All tests were conducted by MGA Research Corporation at the Wisconsin Operations. The test vehicle, 2009 IC Corporation RE300 School Bus, NHTSA No.: C90900, appears 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 24 were measured in accordance with Section 12.1 of OVSC TP-222-03. As shown in Data Sheet 2 for Seat Nos. 1 and 24, the seat back area is greater than ninety percent of the seat bench width multiplied by 508.

Restraining barriers positions and projected rear surface areas of Barrier Nos. 1 and 24 were measured in accordance with OVSC TP-222-03. As shown in Data Sheet 6 for Barrier Nos. 1 and 24, the projected perimeters of the seats fall completely within the perimeters of the restraining barriers.

SEAT CUSHION RETENTION

Seat Nos. 21 and 22 were tested in accordance with Section 12.3 of OVSC TP-222-03. Seat cushion weight was 4.9 kg for both S21 and S22. The maximum force reached for S21 was 240 N and 240 N for S22. For both S21 and S22, the lower time limit boundary (t1) was approximately 2.5 seconds with an approximate load duration of 5.0 seconds. As shown in Data Sheet 3, the seat cushions tested complied with all requirements.
SECTION 2 (CONTINUED)
TEST DATA SUMMARY

SEAT BACK FORCE/DEFLECTION TEST - FORWARD

Seat Nos. 1, 6, 7, and 23 were tested in accordance with Section 12.4 of OVSC TP-222-03. Seat bench width was determined to be 980 mm for S1, S6, S7, and S23. “W” was calculated to be 3 for S1, S6, S7, and S23. The seating reference point (SRP) was 465 mm above the bus floor. The deflection of the seat back at conclusion of lower loading bar loading at 1557 W N load was 48.8 mm for S1, 62.0 mm for S6, 84.0 mm for S7 and 50.0 mm for S23. 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 14.2 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, S6, S7 and S23. As shown on Data Sheet No. 4, S1, S6, S7, and S23 met the force deflection forward requirements.

SEAT BACK FORCE/DEFLECTION TEST - REARWARD

Seat Nos. 19 and 20 were tested in accordance with Section 12.4 of OVSC TP-222-03. Seat bench width was determined to be 980 mm for S20 and 980 for S19. “W” was calculated to be 3 for both seats. The seating reference point (SRP) was 465 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 10.1 mm/sec for both S19 and S20. 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 1,285 joules for S20 and 1,372 joules for S19. The minimum required area under the force versus deflection curve of the loading bar was 316 W or 948 joules for both seats. As shown in Data Sheet No. 5, S20 and S19 met the force deflection rearward requirements.
SECTION 2 (CONTINUED)
TEST DATA SUMMARY

RESTRAINING BARRIER FORCE/DEFLECTION TEST - FORWARD

Both front restraining barriers (B1 and B24) were tested in accordance with Section 12.4 of OVSC TP-222-03. Seat bench width of the aft seats was determined to be 988 mm for B1 and 980 for B24. “W” was calculated to be 3 for B1 and B24. The SRP was 465 mm above the bus floor. The deflection of the restraining barrier at the conclusion of the lower loading bar loading at 1557W was 91.0 mm for B1 and 71.0 mm for B24. The allowable maximum deflection without moving the restraining barriers to within interference of a seat or door was 356 mm. The stroke rate of the upper loading bar was determined by the test engineer from test data to be 14.2 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 and B24. The area under the force versus deflection curve of the upper loading bar was 2,428 joules for B1 and 2,284 joules for B24. The minimum required area under the force versus deflection curve of the upper loading bar was 452 W or 1,356 joules for B1 and 1,356 joules for B24. As shown in Data Sheet 7 the force vs. deflection trace for B1 and B24 does fall within the limits specified in Figure 1 of FMVSS 222.

KNEE FORM IMPACT ZONE TESTS

Seat No. S2 was tested in accordance with Section 12.7 of OVSC TP-222-03. The mass of the knee form was 4.53 kg. All knee form contact area criteria and impact energy criteria were met for the seat.

HEAD FORM IMPACT ZONE TESTS

Seat No. S2 was tested in accordance with Section 12.6 of OVSC TP-222-03. The mass of the head form was 5.21 kg. All head form contact area criteria was met for the seat. The impact energy criteria and head injury criteria for all impact locations were met.
## INCOMPLETE VEHICLE (IF APPLICABLE)

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Manufacturer</td>
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<tr>
<td>Model</td>
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<tr>
<td>Build Date</td>
<td></td>
</tr>
<tr>
<td>Certification Date</td>
<td></td>
</tr>
</tbody>
</table>

## COMPLETED VEHICLE (SCHOOL BUS)

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<th>Field</th>
<th>Value</th>
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<td>IC CORPORATION</td>
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<tr>
<td>Make/Model</td>
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<td>NHTSA No.</td>
<td>C90900</td>
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<td>Color</td>
<td>Yellow</td>
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<tr>
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<td>14,424 kg / 31,800 lbs</td>
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<tr>
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<td>04/08</td>
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## DATES

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<td>Vehicle Receipt</td>
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<tr>
<td>Completion of Compliance Test</td>
<td>11/13/2008</td>
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## COMPLIANCE TEST:
All tests were performed in accordance with the references outlined in TP-222-03.

Recorded By: [Signature]
Approved By: [Signature] Date: 10/27/2008
**GENERAL TEST DATA SHEET**

**Test Vehicle:** 2009 IC CORPORATION RE300 SCHOOL BUS  
**NHTSA No.:** C90900

**Test Lab:** MGA RESEARCH CORPORATION  
**Test Dates:** 10/27/08 – 11/13/08

### SCHOOL BUS IDENTIFICATION

<table>
<thead>
<tr>
<th>Model Year/Mfr./Make/Model:</th>
<th>2009/IC Corporation RE300</th>
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<tr>
<td>Passenger Capacity:</td>
<td>(1 Driver, 72 Passengers)</td>
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<tr>
<td>NHTSA No.:</td>
<td>C90900</td>
</tr>
<tr>
<td>VIN:</td>
<td>4DRBWAAN29A083456</td>
</tr>
<tr>
<td>Conventional or Forward Control:</td>
<td>Forward Control</td>
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<tr>
<td>GVWR (Certification Label) FRONT:</td>
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<tr>
<td>GVWR (Certification Label) REAR:</td>
<td>5,443 kg / 12,000 lbs</td>
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### TEST CONDITIONS

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<th>Date(s) of Test:</th>
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<tr>
<td>Ambient Temperature (°C):</td>
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<tr>
<td>Required Temperature Range:</td>
<td>0°C to 32°C</td>
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</table>

### SEAT IDENTIFICATION

<table>
<thead>
<tr>
<th>Seat Manufacturer:</th>
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<tr>
<td>Model Name &amp; Number:</td>
<td></td>
</tr>
<tr>
<td>Description of Seats:</td>
<td>Seat frames are constructed of 1 inch square and rounded welded steel tubing. The seat back has a 22 gauge (0.03 inches) steel pan welded to the tubing and is covered with 20 mm of soft foam. The outer main uprights of the seat back frame are covered by 36 mm Styrofoam and 7 mm of thick soft foam. The seat cushion is constructed of 12 mm plywood and foam pad. The seat back and cushion are wrapped with 0.5 mm of vinyl.</td>
</tr>
</tbody>
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SECTION 3
COMPLIANCE TEST DATA

The following data sheets document the results of testing on the 2009 IC Corporation RE300 School Bus, NHTSA No. C90900.
### DATA SHEET 1
SEAT TO SEAT/BARRIER SPACING

**Test Vehicle:** 2009 IC CORPORATION RE300 SCHOOL BUS  
**NHTSA No.:** C90900

**Test Lab:** MGA RESEARCH CORPORATION  
**Test Dates:** 10/27/08 – 11/13/08

<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>
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<td>14</td>
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<td>PASS</td>
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<tr>
<td>15</td>
<td>459</td>
<td>PASS</td>
</tr>
<tr>
<td>16</td>
<td>474</td>
<td>PASS</td>
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<tr>
<td>17</td>
<td>459</td>
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<td>18</td>
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<td>19</td>
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<td>22</td>
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<td>23</td>
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<td>PASS</td>
</tr>
<tr>
<td>24</td>
<td>449</td>
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**COMMENTS:** None

**Recorded By:**  
**Approved By:** Michael Janow  
**Date:** 10/27/2008
## DATA SHEET 2
### SEAT BACK HEIGHT & FRONT SURFACE AREA TEST

**Test Vehicle:** 2009 IC CORPORATION RE300 SCHOOL BUS  
**NHTSA No.:** C90900  
**Test Lab:** MGA RESEARCH CORPORATION  
**Test Dates:** 10/27/08 – 11/13/08

**SEAT NUMBER: S1**

<table>
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<th>PASS/FAIL</th>
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<tbody>
<tr>
<td>1.</td>
<td>Is the seat back height at least 508 mm vertically above the SRP? (S5.1.2)</td>
<td><strong>PASS</strong></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 = 867 mm; width, b = 962 mm;  
   - radius = 100 mm  
   - Area = \( \frac{1}{2} \times (a+b) \times 508\text{ mm} = 464,566 \text{ mm}^2 - \ast 2,520 \text{ mm}^2 = 462,046 \text{ mm}^2 \) |   |
| 3. | Measure the seat cushion width - W1 = 973 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: \( 0.9 \times W1 \times 508\text{ mm} = 444,855 \text{ mm}^2 \) |   |
| 5. | Is item 2 greater than item 4? (S5.1.2) | **PASS** |

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

**COMMENTS:** * Denotes area outside of radius.

**Recorded By:**  
**Approved By:** Michael Jaworski  
**Date:** 10/25/2008
DATA SHEET 2 (CONTINUED)
SEAT BACK HEIGHT & FRONT SURFACE AREA TEST

SEAT NUMBER: S24

<table>
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<tbody>
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<td>1.</td>
<td>Is the seat back height at least 508 mm vertically above the SRP? (S5.1.2)</td>
<td>PASS</td>
</tr>
<tr>
<td>2.</td>
<td>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 = 857) mm; width, (b = 970) mm; radius = 100 mm Area = (\frac{1}{2} (a+b) \times 508) mm = 464,058 mm(^2) – (* 2,464) mm(^2) = 461,594 mm(^2)</td>
<td>PASS</td>
</tr>
<tr>
<td>3.</td>
<td>Measure the seat cushion width - (W_1 = 973) 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).</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Calculate the following: (0.9 \times W_1 \times 508) mm = 444,855 mm(^2)</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Is item 2 greater than item 4? (S5.1.2)</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: * Denotes area outside of radius.

Recorded By: [Signature]
Approved By: [Signature] Date: 10/25/2008
DATA SHEET 3
SEAT CUSHION RETENTION TEST

Test Vehicle: 2009 IC CORPORATION RE300 SCHOOL BUS  NHTSA No.: C90900
Test Lab: MGA RESEARCH CORPORATION  Test Dates: 10/27/08 – 11/13/08

SEAT NUMBER: S21

1. Cushion Weight/Mass = 4.9 kg
2. Cushion Weight x 5 = F = 240 N  (S5.1.5)
3. Complete the following force/time graph:

\[ F = 240 \text{ N} \]
\[ T1 = 2.5 \text{ sec.} \quad T2 = 5.0 \text{ sec.} \]

F must be 5 x Cushion Weight; t1 and t2 must be according to the following expressions:
T1 => 1 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)

<table>
<thead>
<tr>
<th>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 half shell clamps on front of seat and one half shell clamp on rear.

COMMENTS: None

Recorded By: [Signature]

Approved By: [Signature]  Date: 10/27/2008
SEAT NUMBER:  S22

1. Cushion Weight/Mass = 4.9 kg
2. Cushion Weight x 5 = F = 240 N (S5.1.5)
3. Complete the following force/time graph:

\[
\begin{align*}
F \text{ must be } 5 \times \text{Cushion Weight; } t_1 \text{ and } t_2 \text{ must be according to the following expressions:} \\
T_1 &\geq 1 \text{ sec., } <5 \text{ sec., } \text{t}_2 = \text{t}_1 + 5 \text{ sec., } + 0 \text{ sec. and } -0.10 \text{ sec.}
\end{align*}
\]

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

DESCRIBE SEAT CUSHION ATTACHMENTS: Two half shell clamps on front of seat and one half shell clamp on rear.

COMMENTS: None

Recorded By: [Signature]

Approved By: [Signature]  Date: 10/27/2008
DATA SHEET 4
SEAT BACK FORCE DEFLECTION TEST - FORWARD

Test Vehicle: 2009 IC CORPORATION RE300 SCHOOL BUS  NHTSA No.: C90900
Test Lab: MGA RESEARCH CORPORATION  Test Dates: 10/27/08 – 11/13/08

SEAT NUMBER: S1

1. Seat Bench Width = 980 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: 465 mm Above Floor, 137 mm forward from the front of seat back.

2. Location of lower loading bar is 0 mm above the SRP.
   (Requirement: Between 102 mm above and 102 mm below the SRP) (S5.1.3.1)
   Length of lower loading bar = 848 mm
   Seat Back width at SRP = 950 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) = 48 mm, at start of upper bar loading 48 mm, at end of upper bar loading
   48 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 = 14.2 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 = 788 mm. Width of
   seat back at 406 mm above SRP = 880 mm.

8. Reason for stopping seat back deflection:
   ____ Reached deflection determined in Item 6 above (if less than 356 mm)
   _X_ Reached 356 mm maximum allowed deflection (Actual deflection was 360 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

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<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 = 1,923 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)</td>
<td>PASS</td>
</tr>
</tbody>
</table>

**COMMENTS:** None

**Recorded By:** [Signature]

**Approved By:** [Signature]  
**Date:** 10/31/2008
DATA SHEET 4 (CONTINUED)
SEAT BACK FORCE DEFLECTION TEST – FORWARD

SEAT NUMBER: S6

1. Seat Bench Width = 980 mm
   \[ W = \left(\text{Seat Bench Width}\right)/381 \text{ mm} \] (round to nearest whole number) = (3)
   Seat Reference Point (SRP) location is: (Description of location as supplied by the COTR: 465 mm Above Floor, 137 mm forward from the front of seat back.

2. Location of lower loading bar is 0 mm above the SRP.
   (Requirement: Between 102 mm above and 102 mm below the SRP) (S5.1.3.1)
   Length of lower loading bar = 848 mm
   Seat Back width at SRP = 950 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) = 62 mm, at start of upper bar loading 62 mm, at end of upper bar loading 62 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 = 14.2 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 = 788 mm. Width of seat back at 406 mm above SRP = 880 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 354 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>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. 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. 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. Include a deflection vs. time plot for the upper loading bar.</td>
<td></td>
</tr>
<tr>
<td>13. The area within the force vs. deflection curve = 2,164 joules</td>
<td></td>
</tr>
<tr>
<td>14. 452W = 1,356 joules (S5.1.3.4)</td>
<td></td>
</tr>
<tr>
<td>15. Is item 13 greater than or equal to item 14? (S5.1.3.4)</td>
<td>PASS</td>
</tr>
</tbody>
</table>

**COMMENTS:** Electronic data for this test was lost. A graph approximating the force deflection curve was created from test equipment readings that were announced by the test engineer in the video coverage.

**Recorded By:** [Signature]

**Approved By:** [Signature]  Date: 10/31/2008
SEAT NUMBER: S7

1. Seat Bench Width = 980 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): 465 mm Above Floor, 137 mm forward from the front of seat back.

2. Location of lower loading bar is 0 mm above the SRP.
   (Requirement: Between 102 mm above and 102 mm below the SRP) (S5.1.3.1)
   Length of lower loading bar = 850 mm
   Seat Back width at SRP = 950 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) = 84 mm, at start of upper bar loading 84 mm, at end of upper bar loading 84 mm.

5. Maximum deflection allowed without moving the seat back to within 102 mm of another seat or restraining barrier = 356 mm (must be 356 mm or less) (S5.1.3)

6. Seat back movement rate selected by the test engineer = 14.2 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 = 788 mm. Width of seat back at 406 mm above SRP = 890 mm.

8. Reason for stopping seat back deflection:
   ___ Reached deflection determined in Item 6 above (if less than 356 mm)
   \[ X \] Reached 356 mm maximum allowed deflection (Actual deflection was 359 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. Is the seat in its final deflected position within 102 mm of the next seat or barrier?</td>
<td></td>
<td><strong>PASS</strong></td>
</tr>
<tr>
<td>11. Does the forward force vs. deflection trace of the seat back lie within the corridor? (S5.1.3)</td>
<td></td>
<td><strong>PASS</strong></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 = 2,299 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. Is item 13 greater than or equal to item 14? (S5.1.3.4)</td>
<td></td>
<td><strong>PASS</strong></td>
</tr>
</tbody>
</table>

**COMMENTS:** None

**Recorded By:** [Signature]

**Approved By:** [Signature]  Date: 10/30/2008
DATA SHEET 4 (CONTINUED)
SEAT BACK FORCE DEFLECTION TEST - FORWARD

SEAT NUMBER: S23

1. Seat Bench Width = 980 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: 465 mm Above Floor, 137 mm forward from the front of seat back.

2. Location of lower loading bar is 0 mm above the SRP.
   (Requirement: Between 102 mm above and 102 mm below the SRP) (S5.1.3.1)
   Length of lower loading bar = 848 mm
   Seat Back width at SRP = 950 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) = 50 mm, at start of upper bar loading 50 mm, at end of upper bar loading 50 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 = 14.2 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 = 788 mm. Width of seat back at 406 mm above SRP = 880 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 364 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 = 1,901 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)</td>
<td>PASS</td>
</tr>
</tbody>
</table>

COMMENTS: None

Recorded By: [Signature]

Approved By: [Signature]  Date: 11/10/2008
DATA SHEET 5
SEAT BACK FORCE DEFLECTION TEST – REARWARD

Test Vehicle: 2009 IC CORPORATION RE300 SCHOOL BUS  NHTSA No.: C90900
Test Lab: MGA RESEARCH CORPORATION  Test Dates: 10/27/08 – 11/13/08

SEAT NUMBER: S20

1. Seat Bench Width = 980 mm
   \[ W = \frac{\text{Seat Bench Width}}{381} \text{ mm} \] (round to nearest whole number) = (3)

2. Location of the loading bar is in a horizontal plane 343 mm above the SRP of the test seat. (Requirement: 343 mm above the SRP) (S5.1.4.1)
   - Length of loading bar = 800 mm
   - Width of seat back at 343 mm above SRP = 900 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 = 10.1 mm/sec

6. Reason for stopping deflection:
   - _ Reached deflection determined in Item 4 above (if less than 254 mm)
   - X Reached 254 mm maximum allowed deflection (Actual deflection was 260 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></th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. Does the force vs. deflection plot lie within the boundaries of Figure 18 (OVSC TP-222-03)?</td>
<td>PASS</td>
</tr>
</tbody>
</table>

8. Include a deflection vs. time plot for the upper loading bar.
9. 316W = 948 joules
10. The area within the force vs. deflection curve = 1,285 joules

<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: Michael Janyj
Approved By: Michael Janyj Date: 11/11/2008
1. Seat Bench Width = 980 mm  
   \[ W = \frac{(\text{Seat Bench Width})}{381 \text{ mm (round to nearest whole number)}} = (3) \]

2. Location of the loading bar is in a horizontal plane 343 mm above the SRP of the test seat. (Requirement: 343 mm above the SRP) (S5.1.4.1)  
   Length of loading bar = 800 mm  
   Width of seat back at 343 mm above SRP = 900 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 = 10.1 mm/sec

6. Reason for stopping deflection:  
   ____ Reached deflection determined in Item 4 above (if less than 254 mm)  
   ___ Reached 254 mm maximum allowed deflection (Actual deflection was 260 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.

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

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

10. 316W = 948 joules

11. The area within the force vs. deflection curve = 1,372 joules

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

**COMMENTS:** None

Recorded By: _______________  
Approved By: _______________ Date: 11/11/2008
### DATA SHEET 6

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

**Test Vehicle:** 2009 IC CORPORATION RE300 SCHOOL BUS  
**NHTSA No.:** C90900  
**Test Lab:** MGA RESEARCH CORPORATION  
**Test Dates:** 10/27/08 – 11/13/08

**SEAT NUMBER: B1**

1. Measure distance $T$ from SRP of seat immediately aft of barrier in a horizontal longitudinal line forward to barrier. $T = 470$ 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.
   $D_t = 71$ mm  
   $D_b = 3$ mm

4. Measure distance $C$ at top (t) and bottom (b) of seat back.
   $C_t = 78$ mm  
   $C_b = 4$ mm

<table>
<thead>
<tr>
<th></th>
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<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.
   $E_t = 884$ mm  
   $E_b = 973$ mm

8. Measure distance $A$ at top of seat back and bottom of seat.
   $A_t = 870$ mm  
   $A_b = 972$ 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.
    $U_i = 265$ mm  
    $U_o = 265$ mm

12. Measure distance $V$ at inboard (i) and outboard (o) sides of seat.
    $V_i = 296$ mm  
    $V_o = 296$ mm
<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.  
   \[ S_i = 770 \text{ mm} \quad S_o = 770 \text{ mm} \]

16. Measure distance \( W \) at inboard (I) and outboard (O) sides of seat.  
   \[ W_i = 729 \text{ mm} \quad W_o = 727 \text{ mm} \]

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 \((W \times A) = 670,488 \text{ mm}^2\)

20. Compute area \((E \times S) = 715,330 \text{ mm}^2\)

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

COMMENTS: None

Recorded By: [Signature]

Approved By: [Signature]        Date: 10/25/2008
**DATA SHEET 6 (CONTINUED)**  
**RESTRAINING BARRIER POSITION AND PROJECTED REAR SURFACE AREA**

**BARRIER NUMBER: B24**

1. Measure distance T from SRP of seat immediately aft of barrier in a horizontal longitudinal line forward to barrier. \( T = 449 \text{ mm} \).

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

3. Measure distance D at top (t) and bottom (b) of barrier.  
\( D_t = 92 \text{ mm} \)  
\( D_b = 9 \text{ mm} \)

4. Measure distance C at top (t) and bottom (b) of seat back.  
\( C_t = 92 \text{ mm} \)  
\( C_b = 9 \text{ mm} \)

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

7. Measure distance E at top of barrier and bottom of barrier.  
\( E_t = 877 \text{ mm} \)  
\( E_b = 976 \text{ mm} \)

8. Measure distance A at top of seat back and bottom of seat.  
\( A_t = 870 \text{ mm} \)  
\( A_b = 971 \text{ mm} \)

<table>
<thead>
<tr>
<th></th>
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<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><strong>PASS</strong></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><strong>PASS</strong></td>
</tr>
</tbody>
</table>

11. Measure distance U at inboard (i) and outboard (o) side of barrier.  
\( U_i = 242 \text{ mm} \)  
\( U_o = 244 \text{ mm} \)

12. Measure distance V at inboard (i) and outboard (o) sides of seat.  
\( V_i = 324 \text{ mm} \)  
\( V_o = 323 \text{ mm} \)
## DATA SHEET 6 (CONTINUED)
### RESTRAINING BARRIER POSITION AND PROJECTED REAR SURFACE AREA

<table>
<thead>
<tr>
<th></th>
<th>PASS/FAIL</th>
<th></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>

<table>
<thead>
<tr>
<th></th>
<th>PASS/FAIL</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>15.</td>
<td>Measure distance $S$ at inboard (I) and outboard (o) side of barrier.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$S_I = 760$ mm</td>
<td>$S_o = 766$ mm</td>
</tr>
<tr>
<td>16.</td>
<td>Measure distance $W$ at inboard (i) and outboard (o) sides of seat.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$W_i = 676$ mm</td>
<td>$W_o = 680$ mm</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>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>PASS/FAIL</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>19.</td>
<td>Compute area $(W \times A) = 624,438$ mm$^2$</td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>Compute area $(E \times S) = 707,301$ 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:**

**Approved By:** Michael Jaworski  
**Date:** 10/26/2008
DATA SHEET 7
RESTRAINING BARRIER FORCE/DEFLECTION TEST

Test Vehicle: 2009 IC CORPORATION RE300 SCHOOL BUS  NHTSA No.: C90900
Test Lab: MGA RESEARCH CORPORATION  Test Dates: 10/27/08 – 11/13/08

BARRIER IDENTIFICATION: B1

1. Seat cushion width of seat immediately rearward of restraining barrier = 988 mm
   \[ W = \frac{\text{Seat Cushion Width}}{381} \text{ mm (round to nearest whole number)} = (3) \]

2. Location of SRP of seat rearward of restraining barrier is: (Description of location as supplied by the manufacturer): 465 mm Above Floor, 137 mm forward from the front of seat back.

3. Location of lower loading bar is 0 mm above/below the SRP.
   (Requirement: between 102 mm above and 102 mm below the SRP) (S5.1.3.1)
   Length of loading bar = 850 mm
   Width of barrier at SRP = 950 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) = 91 mm.

6. Maximum deflection allowed without moving the restraining barrier to within interference of door operation = 356 mm (must be 356 mm or less).

7. Barrier movement rate selected by the test engineer = 14.2 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 = 788 mm
   Width ofBarrier at 406 mm above the SRP = 880 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 10675

10. Maximum deflection of barrier back 356 mm.
    (Requirement: maximum allowed is 356 mm) (S5.2.3(b))
11. Does the restraining barrier interfere with the normal operation of the door. (S5.2.3 (c))  
   PASS

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

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

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

15. Include a deflection vs. time plot for the upper loading bar.
16. The area within the force vs. deflection curve = 2,428 joules
17. 452W = 1,356 joules (S5.2.3) (S5.1.3.4)

18. Is item 16 greater than item 17?  
   PASS

 COMMENTS: None

 Recorded By: [Signature]

 Approved By: [Signature]  Date: 11/5/2008
BARRIER IDENTIFICATION: B24

1. Seat cushion width of seat immediately rearward of restraining barrier = 980 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): 465 mm Above Floor, 137 mm forward from the front of seat back.

3. Location of lower loading bar is 0 mm above/below the SRP.
   (Requirement: between 102 mm above and 102 mm below the SRP) (S5.1.3.1)
   Length of lower loading bar = 850 mm
   Width of barrier at SRP = 950 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) = 71 mm.

6. Maximum deflection allowed without moving the restraining barrier to within interference of door operation = 356 mm (must be 356 mm or less).

7. Barrier movement rate selected by the test engineer = 14.2 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 = 788 mm
   Width of Barrier at 406 mm above the SRP = 880 mm

9. Reason for stopping restraining barrier deflection:
   
   **X** Reached 356 mm maximum
   ____ Separation was about to occur
   ____ Interference with door operation
   ____ Exceeded maximum load of 10675

10. Maximum deflection of barrier back 364 mm.
    (Requirement: maximum allowed is 356 mm) (S5.2.3(b))
### DATA SHEET 7 (CONTINUED)

#### RESTRaining BARRIER FORCE/DEFLECTION TEST

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.</td>
<td>Does the restraining barrier interfere with the normal operation of the door. (S5.2.3 (c))</td>
<td>PASS</td>
</tr>
<tr>
<td>12.</td>
<td>Did any separation of barrier component or the separation of the barrier from the vehicle occur? (S5.1.3 (d) &amp; (e))</td>
<td>PASS</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.</td>
<td>Does the forward force vs. deflection trace of the barrier back lie within the unshaded area? (S5.2.3(a))</td>
<td>PASS</td>
</tr>
</tbody>
</table>

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

16. The area within the force vs. deflection curve = 2,284 joules

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

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>PASS/FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.</td>
<td>Is item 16 greater than item 17?</td>
<td>PASS</td>
</tr>
</tbody>
</table>

### COMMENTS:
None

Recorded By: [Signature]

Approved By: [Signature] Date: 11/10/2008
DATA SHEET 8
HEAD FORM IMPACT CONTACT AREA AND ENERGY REQUIREMENTS

Test Vehicle: 2009 IC CORPORATION RE300 SCHOOL BUS  NHTSA No.: C90900
Test Lab: MGA RESEARCH CORPORATION  Test Dates: 10/27/08 – 11/13/08

SEAT NUMBER: S2

SEAT BACK REAR SURFACE

NOTE: SHADED AREA IS NONCONTACTABLE SURFACE

1. Locate x-y reference point on sketch above for head form impact locations. (Label the positive and negative directions, if applicable)
2. Identify head form impact location on sketch by placing H1, H2, H3, H4, H5, H6, and H7 in the appropriate location.
3. Define and mark on graphic above, the plane of reference for head form impact angle:
   $0^\circ$ = 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></td>
<td>X</td>
<td>Y</td>
<td>Angle</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H1</td>
<td>-802</td>
<td>459</td>
<td>0</td>
<td>1.58</td>
<td>---</td>
<td>5,560</td>
<td>PASS</td>
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<tr>
<td>H2</td>
<td>-637</td>
<td>436</td>
<td>0</td>
<td>1.46</td>
<td>2.55</td>
<td>4,650</td>
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</tr>
<tr>
<td>H3</td>
<td>-469</td>
<td>452</td>
<td>0</td>
<td>1.58</td>
<td>1.60</td>
<td>4,550</td>
<td>PASS</td>
</tr>
<tr>
<td>H4</td>
<td>-724</td>
<td>372</td>
<td>0</td>
<td>1.56</td>
<td>2.11</td>
<td>4,610</td>
<td>PASS</td>
</tr>
<tr>
<td>H5</td>
<td>-521</td>
<td>387</td>
<td>0</td>
<td>1.54</td>
<td>1.42</td>
<td>3,670</td>
<td>PASS</td>
</tr>
<tr>
<td>H6</td>
<td>-809</td>
<td>305</td>
<td>0</td>
<td>1.54</td>
<td>2.30</td>
<td>2,050</td>
<td>PASS</td>
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<tr>
<td>H7</td>
<td>-639</td>
<td>314</td>
<td>0</td>
<td>1.65</td>
<td>2.32</td>
<td>3,650</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:  
(a) All measurements are referenced to the point where the horizontal plane through the SRP intersects the vertical line tangent to the inboard edge at the seat.

(b) While the speed for H2 was below the specified range a lower speed represents worst case and the seat still exceeded the minimum requirements of contact area.

Recorded By: [Signature]

Approved By: [Signature]  Date: 10/28/2008
DATA SHEET 8 (CONTINUED)
HEAD FORM IMPACT CONTACT AREA AND ENERGY REQUIREMENTS

SEAT NUMBER: S2

NOTE: SHADED AREA IS NONCONTACTABLE SURFACE

1. Locate x-y reference point on sketch above for head form impact locations. (Label the positive and negative directions, if applicable)
2. Identify head form impact location on sketch by placing H8, H9, H10, H11, H12, 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 Seat
   - Y = Measured Vertically from the SRP
**DATA SHEET 8 (CONTINUED)**

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

4. Complete the following table:

<table>
<thead>
<tr>
<th>Location (a)</th>
<th>Speed Trap Impact Velocity ** mps</th>
<th>Derived Velocity ** mps</th>
<th>Max HIC</th>
<th>Engy Reqd Joules</th>
<th>Column 5 &lt; 1000</th>
<th>Column 6 &gt; 4.5 joules</th>
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</thead>
<tbody>
<tr>
<td>X Y Angle</td>
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<td></td>
<td></td>
<td></td>
<td>Yes-Pass</td>
<td>No-Fail</td>
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<tr>
<td>H8</td>
<td>-268 419 0 6.90</td>
<td>5.81</td>
<td>116.3</td>
<td>4.59</td>
<td>PASS</td>
<td>PASS</td>
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<tr>
<td>H9***</td>
<td>114 317 0 6.73</td>
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<td>140.3</td>
<td>6.28</td>
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<td>PASS</td>
</tr>
<tr>
<td>H10</td>
<td>-365 380 0 6.74</td>
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<td>121.2</td>
<td>13.69</td>
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<td>PASS</td>
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<tr>
<td>H11</td>
<td>-466 317 0 6.70</td>
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<td>145.4</td>
<td>17.71</td>
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<td>PASS</td>
</tr>
<tr>
<td>H12</td>
<td>-271 311 0 6.49</td>
<td>6.50</td>
<td>109.3</td>
<td>18.00</td>
<td>PASS</td>
<td>PASS</td>
</tr>
<tr>
<td>H13</td>
<td>-149 441 0 6.43</td>
<td>6.29</td>
<td>125.8</td>
<td>6.97</td>
<td>PASS</td>
<td>PASS</td>
</tr>
<tr>
<td>H14***</td>
<td>824 324 0 6.63</td>
<td>5.96</td>
<td>195.8</td>
<td>4.94</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

***Head impact 9 and head impact 14 were performed on Seat 3.

5. Attach acceleration versus time plots for each impact.

6. Integrate the acceleration versus time plots and attach plots of the results that show velocity versus time.

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

COMMENTS: None

Recorded By: [Signature]

Approved By: [Signature] Date: 10/29/2008
SEAT NUMBER: S2

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>
</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>K1</td>
<td>-644</td>
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<td>3700</td>
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<td>K3</td>
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<td>4.77</td>
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<td>K4</td>
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<td>0</td>
<td>4.80</td>
<td>4.95</td>
<td>2820</td>
<td>1968</td>
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<td>K5</td>
<td>-736</td>
<td>117</td>
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<td>4.83</td>
<td>4.65</td>
<td>2750</td>
<td>1506</td>
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<td>K6</td>
<td>-52</td>
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<tr>
<td>K8</td>
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<td>4.94</td>
<td>4.99</td>
<td>3940</td>
<td>2340</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 at the seat.

COMMENTS: None

Recorded By: 

Approved By: 

Date: 10/28/2008
## SECTION 4
### INSTRUMENTATION AND EQUIPMENT LIST

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Description</th>
<th>Model/Serial No.</th>
<th>Cal. Date</th>
<th>Next Cal. Date</th>
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<tbody>
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<td>Interface</td>
<td>1210AF-SK / 62736</td>
<td>10/28/08</td>
<td>04/28/09</td>
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<td>Load Cell</td>
<td>Interface</td>
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<td>10/23/08</td>
<td>04/23/09</td>
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<td>Inclinometer</td>
<td>Digital Protractor</td>
<td>Pro 360 / Comp Lab / 001</td>
<td>Daily</td>
<td>Daily</td>
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<td>Stanley Powerlock / 337</td>
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<td>05/11/09</td>
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<td>Camera</td>
<td>Sony DSC-575</td>
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<td>Sokkia Corp. Planix5 007319</td>
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<td>Daily</td>
<td>Daily</td>
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<td>11/23/08</td>
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<tr>
<td>1</td>
<td>Left Side View of School Bus</td>
<td>39</td>
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<tr>
<td>2</td>
<td>Right Side View of School Bus</td>
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<td>3</td>
<td>¾ Front View From Left Side of School Bus</td>
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<tr>
<td>4</td>
<td>¾ Rear View From Right Side of School Bus</td>
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<td>5</td>
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<td>6</td>
<td>Vehicle Interior View From Front to Rear</td>
<td>44</td>
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<td>7</td>
<td>Vehicle Interior View From Rear to Front</td>
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<td>8</td>
<td>Pre-Test of Seat Cushion Retention Set Up View 1</td>
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<td>Pre-Test of Seat Back S1 Force Deflection Forward Test</td>
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<td>Pre-Test of Seat Back S20 Force Deflection Rearward Test</td>
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<td>20</td>
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<td>58</td>
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<tr>
<td>21</td>
<td>Post-Test of Barrier B1 Force Deflection Forward Test</td>
<td>59</td>
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<td>Pre-Test of Barrier B24 Force Deflection Forward Test</td>
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<td>Post-Test of Barrier B24 Force Deflection Forward Test</td>
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</table>
Test Vehicle: 2009 IC CORPORATION RE300 SCHOOL BUS
Test Lab: MGA RESEARCH CORPORATION
NHTSA No.: C90900
Test Dates: 10/25/08 – 11/13/08

Left Side View of School Bus
¾ Rear View From Right Side of School Bus
Test Vehicle: 2009 IC CORPORATION RE300 SCHOOL BUS
Test Lab: MGA RESEARCH CORPORATION
NHTSA No.: C90900
Test Dates: 10/25/08 – 11/13/08

Certification Label
Test Vehicle: 2009 IC CORPORATION RE300 SCHOOL BUS
Test Lab: MGA RESEARCH CORPORATION
NHTSA No.: C90900
Test Dates: 10/25/08 – 11/13/08

Pre-Test of Seat Cushion Retention Set Up View 1
Pre-Test of Seat Cushion Retention Set Up View 2
Test Vehicle: 2009 IC CORPORATION RE300 SCHOOL BUS
Test Lab: MGA RESEARCH CORPORATION
NHTSA No.: C90900
Test Dates: 10/25/08 – 11/13/08

Pre-Test of Seat Back S1 Force Deflection Forward Test
Pre-Test of Seat Back S6 Force Deflection Forward Test
Post-Test of Seat Back S6 Force Deflection Forward Test
Pre-Test of Seat Back S7 Force Deflection Forward Test
Post-Test of Seat Back S7 Force Deflection Forward Test
Test Vehicle: 2009 IC CORPORATION RE300 SCHOOL BUS
Test Lab: MGA RESEARCH CORPORATION
NHTSA No.: C90900
Test Dates: 10/25/08 – 11/13/08

Pre-Test of Seat Back S23 Force Deflection Forward Test
Post-Test of Seat Back S23 Force Deflection Forward Test
Pre-Test of Seat Back S20 Force Deflection Rearward Test
Test Vehicle:
2009 IC CORPORATION RE300 SCHOOL BUS

NHTSA No.:
C90900

Test Dates:
10/25/08 – 11/13/08

Test Lab:
MGA RESEARCH CORPORATION

Post-Test of Seat Back S20 Force Deflection Rearward Test
Pre-Test of Seat Back S19 Force Deflection Rearward Test
Post-Test of Head and Knee Impact Locations on Seat S2
Test Vehicle: 2009 IC CORPORATION RE300 SCHOOL BUS  
Test Lab: MGA RESEARCH CORPORATION  
NHTSA No.: C90900  
Test Dates: 10/25/08 – 11/13/08

Post-Test of Barrier B1 Force Deflection Forward Test
Pre-Test of Barrier B24 Force Deflection Forward Test
Test Vehicle: 2009 IC CORPORATION RE300 SCHOOL BUS
NHTSA No.: C90900
Test Dates: 10/25/08 – 11/13/08
Test Lab: MGA RESEARCH CORPORATION

Post-Test of Barrier B24 Force Deflection Forward Test
# SECTION 6
## TEST PLOTS

### 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 S21</td>
<td>63</td>
</tr>
<tr>
<td>2</td>
<td>Seat Cushion Retention Seat S22</td>
<td>63</td>
</tr>
<tr>
<td>3</td>
<td>Seat Back Forward Deflection Seat S1 (Upper)</td>
<td>64</td>
</tr>
<tr>
<td>4</td>
<td>Seat Back Forward Deflection Seat S1 (Lower)</td>
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<td>Seat Back Forward Deflection Seat S6 (Lower)</td>
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<tr>
<td>7</td>
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**Displacement (mm) vs Time (sec)**

Test Description: FMVSS 222 Forward Seat Back Deflection (Upper)
Component ID: IC Corporation RE300
Seat No.: S1

Test Date: 10/31/2008
NHTSA No.: C90900

Maximum: 360 mm @ 27 sec
Minimum: 0 mm @ 0 sec

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

Test Description: FMVSS 222 Forward Seat Back Deflection (Upper)
Component ID: IC Corporation RE300
Seat No.: S1

Test Date: 10/31/2008
NHTSA No.: C90900

Maximum: 7179 N @ 10 sec
Minimum: 10 N @ 43 sec
Force (N) vs Displacement (mm)

Test Description: FMVSS 222 Forward Seat Back Deflection (Upper)
Component ID: IC Corporation RE300
Seat No.: S1
Energy: 1923 J

Maximum: 779 N @ 139 mm
Minimum: 10 N @ 244 mm
**Displacement (mm) vs Time (sec)**

Test Description: FMVSS 222 Forward Seat Back Deflection (Lower)
Component ID: IC Corporation RE300
Seat No.: S1

- Maximum: 54.5 mm @ 25.4 sec
- Minimum: 0.2 mm @ 0.0 sec

---

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

Test Description: FMVSS 222 Forward Seat Back Deflection (Lower)
Component ID: IC Corporation RE300
Seat No.: S1

- Maximum: 9363 N @ 22.1 sec
- Minimum: 12 N @ 0.0 sec
Force (N) vs Displacement (mm)

Test Description: FMVSS 222 Forward Seat Back Deflection (Lower)
Component ID: IC Corporation RE300
Seat No.: S1
Energy: 154 J

Maximum: 9363 N @ 54.1 mm
Maximum: 12 N @ 0.2 mm
 Force (N) vs Displacement (mm)

Test Description: FMVSS 222 Forward Seat Back Deflection (Upper)
Component ID: IC Corporation RE300
Seat No.: S6
Energy: 2,164 J

Maximun: 8400 N @ 200 mm  
Minimum: 0 N @ 204 mm

Displacement (mm)
Force (N) vs Displacement (mm)

Test Description: FMVSS 222 Forward Seat Back Deflection (Lower)
Component ID: IC Corporation RE300
Seat No.: S6
Energy: 2246 J

Maximum: 9493 N @ 71 mm  Minimum: 10 N @ 0 mm

Test Date: 10/31/2008
NHTSA No.: C90900
**Displacement (mm) vs Time (sec)**

Test Description: FMVSS 222 Forward Seat Back Deflection (Upper)
Component ID: IC Corporation RE300
Seat No.: S7

**Test Date:** 10/30/2008  
**NHTSA No.:** C90900

Maximum: 359 mm @ 26.6 sec  
Maximum: 0 mm @ 0.0 sec

---

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

Test Description: FMVSS 222 Forward Seat Back Deflection (Upper)
Component ID: IC Corporation RE300
Seat No.: S7

**Test Date:** 10/30/2008  
**NHTSA No.:** C90900

Maximum: 8139 N @ 19.9 sec  
Maximum: -2 N @ 51.2 sec
**Displacement (mm) vs Time (sec)**

Test Description: FMVSS 222 Forward Seat Back Deflection (Lower)
Component ID: IC Corporation RE300
Seat No.: S7

Test Date: 10/30/2008
NHTSA No.: C90900

Maximum: 102 mm @ 25.2 sec  
Minimum: 0 mm @ 0.2 sec

---

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

Test Description: FMVSS 222 Forward Seat Back Deflection (Lower)
Component ID: IC Corporation RE300
Seat No.: S7

Test Date: 10/30/2008
NHTSA No.: C90900

Maximum: 9355 N @ 23.0 sec  
Minimum: 9 N @ 0.0 sec

---

73
Displacement (mm) vs Time (sec)

Test Description: FMVSS 222 Forward Seat Back Deflection (Upper)
Component ID: IC Corporation RE300
Seat No.: S23

Test Date: 11/10/2008
NHTSA No.: C90900

Maximum: 364 mm @ 28 sec
Minimum: 0 mm @ 0 sec

Force (N) vs Time (sec)

Test Description: FMVSS 222 Forward Seat Back Deflection (Upper)
Component ID: IC Corporation RE300
Seat No.: S23

Test Date: 11/10/2008
NHTSA No.: C90900

Maximum: 7073 N @ 13 sec
Minimum: 7 N @ 44 sec
Force (N) vs Displacement (mm)

Test Description: FMVSS 222 Forward Seat Back Deflection (Upper)
Component ID: IC Corporation RE300
Seat No.: S23
Energy: 1,901 J

Maximum: 7073 N @ 175 mm
Minimum: -7 N @ 241 mm
Force (N) vs Displacement (mm)

Test Description: FMVSS 222 Forward Seat Back Deflection (Lower)
Component ID: IC Corporation RE300
Seat No.: S23
Energy: 106 J

Maximum: 9362 N @ 55.0 mm   Maximum: 11 N @ 0.1 mm
Displacement (mm) vs Time (sec)
Test Description: FMVSS 222 Rearward Seat Back Deflection
Component ID: IC Corporation RE300
Seat No.: S20
Test Date: 11/11/2008
NHTSA No.: C90900

Maximum: 260 mm @ 29 sec
Minimum: 0 mm @ 0 sec

Force (N) vs Time (sec)
Test Description: FMVSS 222 Rearward Seat Back Deflection
Component ID: IC Corporation RE300
Seat No.: S20
Test Date: 11/11/2008
NHTSA No.: C90900

Maximum: 7897 N @ 26 sec
Minimum: 7 N @ 50 sec
Force (N) vs Displacement (mm)

Test Description: FMVSS 222 Rearward Seat Back Deflection
Component ID: IC Corporation RE300
Seat No.: S19
Energy: 1,372 J

Maximum: 8397 N @ 258 mm
Minimum: 10 N @ 86 mm
**Force (N) vs Displacement (mm)**

Test Description: FMVSS 222 Forward Barrier Deflection (Upper)
Component ID: IC Corporation RE300
Barrier No.: 1
Energy: 2,428 J

---

Maximum: 10297 N @ 354 mm  
Minimum: -10 N @ 131 mm

---

Test Date: 11/5/2008  
NHTSA No.: C90900
**Force (N) vs Displacement (mm)**

Test Description: FMVSS 222 Forward Barrier Deflection (Lower)
Component ID: IC Corporation RE300
Barrier No.: 1
Energy: 336 J

Test Date: 11/5/2008
NHTSA No.: C90900

Maximum: 9400 N @ 98 mm
Minimum: 10 N @ 0 mm

Displacement (mm)
Force (N) vs Displacement (mm)

Test Description: FMVSS 222 Forward Barrier Deflection (Upper)
Component ID: IC Corporation RE300
Barrier No.: 24
Energy: 2,284 J

Test Date: 11/10/2008
NHTSA No.: C90900

Maximum: 9494 N @ 302 mm
Minimum: 14 N @ 162 mm
Displacement (mm) vs Time (sec)

Test Description: FMVSS 222 Forward Barrier Deflection (Lower)
Component ID: IC Corporation RE300
Barrier No.: 24

Test Date: 11/10/2008
NHTSA No.: C90900

Minimum: 0 mm @ 0.0 sec
Maximum: 76 mm @ 25.2 sec

Force (N) vs Time (sec)

Test Description: FMVSS 222 Forward Barrier Deflection (Lower)
Component ID: IC Corporation RE300
Barrier No.: 24

Test Date: 11/10/2008
NHTSA No.: C90900

Minimum: 10 N @ 0.0 sec
Maximum: 9377 N @ 23.3 sec
Force (N) vs Displacement (mm)

Test Description: FMVSS 222 Forward Barrier Deflection (Lower)
Component ID: IC Corporation RE300
Barrier No.: 24
Energy: 211 J

Minimum: 9777 N @ 76 mm
Maximum: 10 N @ 0 mm

Test Date: 11/10/2008
NHTSA No.: C90900
FMVSS 222 HEAD FORM IMPACTS (1.5 m/s)  
Test Date: 10-28-2008
Component ID: IC Corporation RE 300
NHTSA #: C90900
Location: H1

HEAD X Acceleration (G's) VS TIME (S)
Max: 6.51 G's  
TMax: 0.02 S  
Min: -5.61 G's  
TMin: 0.12 S

HIC 36: 1.55  
T1: -0.10 S  
T2: 35.90 S

VELOCITY X (m/s) VS TIME (S)
Max: 35.47 m/s  
TMax: 5.02 S  
Min: 0.07 m/s  
TMin: -0.01 S  
VEL@IMP: 0m/s

91
FMVSS 222 HEAD FORM IMPACTS (1.5 m/s) Test Date: 10-28-2008
Component ID: IC Corporation RE 300 NHTSA #: C90900
Location: H2

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

Max: 3.53 G's
TMax: 0.21 S
Min: -7.32 G's
TMin: 0.04 S

HIC 36: 3.09 T1: 23.60 S T2: 59.60 S

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

Max: 0.66 m/s
TMax: -0.01 S
Min: -47.03 m/s
TMin: 4.94 S
VEL@IMP: 0.55m/s
FMVSS 222 HEAD FORM IMPACTS (1.5 m/s)
Component ID: IC Corporation RE 300
NHTSA #: C90900

Test Date: 10-28-2008
Location: H3

HEAD X Acceleration (G's) VS TIME (S)
Max: 4.37 G's
TMax: 0.21 S
Min: -5.96 G's
TMin: 0.04 S
HIC 36: 1.73 T1: 28.30 S T2: 64.30 S

VELOCITY X (m/s) VS TIME (S)
Max: 4.61 m/s
TMax: 4.94 S
Min: -0.66 m/s
TMin: 0.09 S
VEL@IMP: 1.595 m/s
FMVSS 222 HEAD FORM IMPACTS (1.5 m/s)
Component ID: IC Corporation RE 300
NHTSA #: C90900
Test Date: 10-28-2008
Location: H4

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

- Max: 5.13 G's
- Tmax: 0.21 S
- Min: -5.06 G's
- Tmin: 0.05 S

**VELX VS TIME (S)**

- Max: 27.85 m/s
- Tmax: 4.95 S
- Min: 0.30 m/s
- Tmin: 0.09 S

VEL@IMP: 2.111 m/s
FMVSS 222 HEAD FORM IMPACTS (1.5 m/s)  
Component ID: IC Corporation RE 300  
NHTSA #: C90900  
Test Date: 10-28-2008  
Location: H6

HEAD X Acceleration (G's) VS TIME (S)  
Max: 3.82 G's  
TMax: 0.21 S  
Min: -7.84 G's  
TMin: 0.03 S

VELOCTITY X (m/s) VS TIME (S)  
Max: 19.31 m/s  
TMax: 4.93 S  
Min: 0.23 m/s  
TMin: 0.06 S  
VEL@IMP: 2.225m/s
FMVSS 222 HEAD FORM IMPACTS (1.5 m/s)  
Test Date: 10-28-2008  
Location: H7

Component ID: IC Corporation RE 300  
NHTSA #: C90900

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

Max: 3.88 G's  
TMax: 0.32 S  
Min: -4.26 G's  
TMin: 0.06 S

VELOCIT Y X (m/s) VS TIME (S)

Max: 37.47 m/s  
TMax: 4.93 S  
Min: 0.86 m/s  
TMin: 0.10 S  
VEL@IMP: 2.317m/s
FMVSS 222 HEAD FORM IMPACT (6.69 m/s)  Test Date: 10-29-2008
Component ID: IC Corporation RE 300
NHTSA#: C90900
Location: H8

Max: 50.28 G's
TMax: 0.10 S
Min: -42.71 G's
TMin: 0.01 S

Max: 5.94 m/s
TMax: -0.01 S
Min: -61.43 m/s
TMin: 4.96 S
VEL@IMP: 5.805 m/s

Max: 2,569.71 N
TMax: 0.10 S
Min: -2,182.70 N
TMin: 0.01 S

Energy: 4.59 J
FMVSS 222 HEAD FORM IMPACT (6.69 m/s)  Test Date: 10-28-2008
Component ID: IC Corporation RE 300
Location: H9
NHTSA#: C90900

HEAD X ACCELERATION (G's) VS TIME (S)
Max: 31.20 G's  Tmax: 0.08 S
Min: -50.95 G's  Tmin: 0.01 S
Hic: 140.32  T1: 5.20 ms  T2: 24.20 ms

VELOCITY X (m/s) VS TIME (S)
Max: 6.70 m/s  Tmax: 4.97 S
Min: -2.54 m/s  Tmin: 0.05 S
VEL@IMP: 6.464 m/s

FORCE X (N) VS TIME (S)
Max: 1,594.56 N  Tmax: 0.08 S
Min: -2,603.94 N  Tmin: 0.01 S

Energy: 6.28 J
FMVSS 222 HEAD FORM IMPACT (6.69 m/s)  Test Date: 10-29-2008
Component ID: IC Corporation RE 300
Location: H10
NHTSA#: C90900

Max: 65.78 G's  Tmax: 0.10 S
Min: -50.38 G's  Tmin: 0.02 S

Max: 11.43 m/s  Tmax: 4.96 S
Min: -2.89 m/s  Tmin: 0.06 S

Max: 3,361.94 N  Tmax: 0.10 S
Min: -2,574.91 N  Tmin: 0.02 S

Energy: 14.95 J
FMVSS 222 HEAD FORM IMPACT (6.69 m/s)  Test Date: 10-29-2008
Component ID: IC Corporation RE 300
NHTSA#: C90900
Location: H11

**HEAD X ACCELERATION (G's) VS TIME (S)**
- Max: 54.36 G's
- Tmax: 0.10 S
- Min: -57.81 G's
- Tmin: 0.02 S

**VELOCITY X (m/s) VS TIME (S)**
- Max: 6.14 m/s
- Tmax: -0.01 S
- Min: -21.37 m/s
- Tmin: 4.97 S
- Vel@IMP: 6.054 m/s

**FORCE X (N) VS TIME (S)**
- Max: 2,778.35 N
- Tmax: 0.10 S
- Min: -2,954.64 N
- Tmin: 0.02 S

**ENERGY: 17.71 J**
FMVSS 222 HEAD FORM IMPACT (6.69 m/s)  Test Date: 10-29-2008
Component ID: IC Corporation RE 300
NHTSA#: C90900
Location: H12

Max: 53.71 G's
TMax: 0.10 S
Min: -52.88 G's
TMin: 0.02 S

Max: 16.59 m/s
TMax: 4.96 S
Min: -2.59 m/s
TMin: 0.06 S
VEL@IMP: 6.509 m/s

Max: 2,745.06 N
TMax: 0.10 S
Min: -2,702.75 N
TMin: 0.02 S

Energy: 17.96 J
FMVSS 222 HEAD FORM IMPACT (6.69 m/s)  Test Date: 10-29-2008
Component ID: IC Corporation RE 300  Location: H13
NHTSA#: C90900

Max: 28.52 G's  Tmax: 0.09 S  Min: -48.44 G's  Tmin: 0.01 S

Max: 6.35 m/s  Tmax: -0.01 S  Min: -9.50 m/s  Tmin: 4.96 S  VEL@IMP: 6.287 m/s

Max: 1,457.77 N  Tmax: 0.09 S  Min: -2,476.02 N  Tmin: 0.01 S

Energy: 6.97 J
FMVSS 222 HEAD FORM IMPACT (6.69 m/s)  Test Date: 10-29-2008
Component ID: IC Corporation RE 300
NHTSA#: C90900
Location: H14

HEAD X ACCELERATION (G's) VS TIME (S)
Max: 31.77 G's
TMax: 0.10 S
Min: -56.18 G's
TMin: 0.02 S

VELOCITY X (m/s) VS TIME (S)
Max: 6.28 m/s
TMax: -0.01 S
Min: -7.01 m/s
TMin: 4.96 S
VEL@IMP: 6.216 m/s

FORCE X (N) VS TIME (S)
Max: 1,623.55 N
TMax: 0.10 S
Min: -2,871.26 N
TMin: 0.02 S

ENERGY: 13.69 J
FMVSS 222 KNEE FORM IMPACTS
COMPONENT ID: IC Corporation RE 300
NHTSA #: C90900

Test Date: 10-27-2008
LOCATION: K1

Knee X Acceleration (G's) VS TIME (S)
Max: 21.67 G's
TMax: 0.04 s
Min: -48.29 G's
TMin: 0.09 s

VELOCITY X (m/s) VS TIME (S)
Max: 4.69 m/s
TMax: 0.07 s
Min: -6.23 m/s
TMin: 5.02 s
VEL@IMP: 4.66 m/s

FORCE X (N) VS TIME (S)
Max: 963.16 N
TMax: 0.04 s
Min: -2,145.97 N
TMin: 0.09 s
FMVSS 222 KNEE FORM IMPACTS

COMPONENT ID: IC Corporation RE 300
NHTSA #: C90900
LOCATION: K2

Test Date: 10-27-2008

Knee X Acceleration (G's) VS TIME (S)
Max: 21.60 G's
TMax: 0.04 s
Min: -28.17 G's
TMin: 0.10 s

VELOCITY X (m/s) VS TIME (S)
Max: 4.71 m/s
TMax: 0.07 s
Min: -1.95 m/s
TMin: 5.02 s
VEL@IMP: 4.65 m/s

FORCE X (N) VS TIME (S)
Max: 960.03 N
TMax: 0.04 s
Min: -1,251.93 N
TMin: 0.10 s
FMVSS 222 KNEE FORM IMPACTS
COMPONENT ID: IC Corporation RE 300
NHTSA #: C90900

Test Date: 10-27-2008
LOCATION: K3

Knee X Acceleration (G’s) VS TIME (S)
Max: 21.58 G’s
TMax: 0.04 s
Min: -35.31 G’s
TMin: 0.10 s

VELOCITY X (m/s) VS TIME (S)
Max: 4.82 m/s
TMax: 0.07 s
Min: -1.72 m/s
TMin: 0.15 s
VEL@IMP: 4.77 m/s

FORCE X (N) VS TIME (S)
Max: 959.01 N
TMax: 0.04 s
Min: -1,569.11 N
TMin: 0.10 s
FMVSS 222 KNEE FORM IMPACTS
COMPONENT ID: IC Corporation RE 300
NHTSA #: C90900
LOCATION: K5

Test Date: 10-27-2008

Knee X Acceleration (G's) VS TIME (S)
Max: 25.36 G's
TMax: 0.22 s
Min: -33.88 G's
TMin: 0.10 s

VELOCITY X (m/s) VS TIME (S)
Max: 4.71 m/s
TMax: 0.07 s
Min: -16.25 m/s
TMin: 5.02 s
VEL@IMP: 4.65 m/s

FORCE X (N) VS TIME (S)
Max: 1,126.99 N
TMax: 0.22 s
Min: -1,505.70 N
TMin: 0.10 s
Knee X Acceleration (G's) VS TIME (S)

Max: 21.91 G's
TMax: 0.04 s
Min: -30.57 G's
TMin: 0.09 s

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

Max: 13.79 m/s
TMax: 5.02 s
Min: -0.67 m/s
TMin: 0.14 s
VEL@IMP: 4.99 m/s

FORCE X (N) VS TIME (S)

Max: 973.58 N
TMax: 0.04 s
Min: -1,358.49 N
TMin: 0.09 s
FMVSS 222 KNEE FORM IMPACTS
COMPONENT ID: IC Corporation RE 300
NHTSA #: C90900
LOCATION: K8
Test Date: 10-28-2008

Knee X Acceleration (G's) VS TIME (S)
- Max: 28.96 G's
- Tmax: 0.14 s
- Min: -52.66 G's
- Tmin: 0.08 s

VELOCITY X (m/s) VS TIME (S)
- Max: 11.51 m/s
- Tmax: 5.02 s
- Min: -1.55 m/s
- Tmin: 0.10 s
- Vel@Imp: 4.99 m/s

FORCE X (N) VS TIME (S)
- Max: 1,287.11 N
- Tmax: 0.14 s
- Min: -2,340.26 N
- Tmin: 0.08 s
SECTION 7
WELT CONTACT POINTS

H1 / SEAT S2

H1 IC RE300 55.6 cm²
SECTION 7 (CONTINUED)
WELT CONTACT POINTS

H2 / SEAT S2

H2 IC RE300 46.5 cm²
SECTION 7 (CONTINUED)
WELT CONTACT POINTS

H3 / SEAT S2

H3 IC RE300 45.5 cm²
SECTION 7 (CONTINUED)
WELT CONTACT POINTS

H4 / SEAT S2

H4 IC RE300 46.1 cm²
SECTION 7 (CONTINUED)
WELT CONTACT POINTS

H5 / SEAT S2

H5 IC RE300 36.7 cm²
SECTION 7 (CONTINUED)
WELT CONTACT POINTS

H6 / SEAT S2

H6 IC RE300 20.5 cm²
H7 / SEAT S2

H7 IC RE300 36.5 cm²
SECTION 7 (CONTINUED)
WELT CONTACT POINTS

K1 / SEAT S2

K1 IC RE300 37.0 cm²
SECTION 7 (CONTINUED)
WELT CONTACT POINTS

K2 / SEAT S2

K2 IC RE300 20.8 cm²
SECTION 7 (CONTINUED)
WELT CONTACT POINTS

K3 / SEAT S2

K3 IC RE300 23.4 cm²
SECTION 7 (CONTINUED)
WELT CONTACT POINTS

K4 / SEAT S2

K4 IC RE300 28.2 cm$^2$
SECTION 7 (CONTINUED)
WELT CONTACT POINTS

K5 / SEAT S2

K5 IC RE300 27.5 cm²
SECTION 7 (CONTINUED)
WELT CONTACT POINTS

K6 / SEAT S2

K6 IC RE300 36.2 cm²
SECTION 7 (CONTINUED)
WELT CONTACT POINTS

K7 / SEAT S2

K7 IC RE300 29.9 cm²
SECTION 7 (CONTINUED)
WELT CONTACT POINTS

K8 / SEAT S2

K8 IC RE300 39.4 cm²