SAFETY COMPLIANCE TESTING FOR FMVSS 202a
"Head Restraints"

TOYOTA MOTOR MANUFACTURING
2009 Toyota Venza
NHTSA No. C95108

MGA RESEARCH CORPORATION
446 Executive Drive
Troy, Michigan 48083

Test Dates: July 21 - 31, 2009
Report Date: September 9, 2009

FINAL REPORT

Prepared For:

U.S DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Enforcement
Office of Vehicle Safety Compliance (Rm W45-304)
1200 New Jersey Avenue, SE
Washington, DC 20590
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Prepared By:  
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Approved By:  
P. Michael Miller II, Vice President

9/18/2009

FINAL REPORT ACCEPTANCE BY OVSC:

Edward E. Chan

MGA File #: G09Q7-004.2
A compliance test was conducted on the subject 2009 Toyota Venza, NHTSA No. C95108, in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-202aS-00S-00 for the determination of FMVSS 202a compliance. The test was conducted at MGA Research Corporation in Troy, Michigan on July 21 - 31, 2009. Test failures identified were as follows:

NONE

The data recorded indicates that the 2009 Toyota Venza tested appears to meet the requirements of FMVSS 202a.
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6.9.12 2\textsuperscript{nd} Row LH Test Photo #2
6.9.13 2\textsuperscript{nd} Row LH Test Photo #3
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6.9.17 2\textsuperscript{nd} Row LH Test Photo #7
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MGA File #: G09Q7-004.2
1.0 PURPOSE AND PROCEDURE

**Purpose:** The purpose of testing was to determine whether head restraints equipped in vehicles supplied by the National Highway Traffic Safety Administration meet the requirements of Federal Motor Vehicle Safety Standard Number 202a, entitled “Head Restraints”.

**Test Procedures:** The “MGA Research Corporation Testing Procedures for FMVSS 202a, submitted to and approved by the National Highway Transportation Safety Administration, contains the specific procedures used to conduct the testing.

This procedure shall not be interpreted to conflict with any portion of NHTSA TP-202aS-00, FMVSS 202a nor any amendment thereof within the applicable contract.

2.0 DATA SUMMARY

Summary data is provided below. Data for the configuration and the location of seating position tested provided in Section 5.0. Photographs are found in Section 6.0 and test plots are found in Section 7.0. The data recorded indicates that the 2009 Toyota Venza tested appears to meet the requirements of FMVSS 202a.

<table>
<thead>
<tr>
<th>MGA Test #</th>
<th>Test Type</th>
<th>Seat Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES9552</td>
<td>Dimensional Measurements</td>
<td>Front LH 8-Way Power (Cloth)</td>
</tr>
<tr>
<td>ES9553</td>
<td>Dimensional Measurements</td>
<td>Front RH 2-Way Manual (Cloth)</td>
</tr>
<tr>
<td>ES9554</td>
<td>Dimensional Measurements</td>
<td>2nd Row LH 40% (Cloth)</td>
</tr>
<tr>
<td>ES9555</td>
<td>Dimensional Measurements</td>
<td>2nd Row RH 60% (Cloth)</td>
</tr>
<tr>
<td>DS9211</td>
<td>Energy Absorption</td>
<td>Front RH 2-Way Manual (Cloth)</td>
</tr>
<tr>
<td>DS9212</td>
<td>Energy Absorption</td>
<td>2nd Row RH 60% (Cloth)</td>
</tr>
<tr>
<td>ES9588</td>
<td>Height Retention</td>
<td>Front RH 2-Way Manual (Cloth)</td>
</tr>
<tr>
<td>ES9595</td>
<td>Height Retention</td>
<td>2nd Row RH 60% (Cloth)</td>
</tr>
<tr>
<td>ES9589</td>
<td>Backset Retention, Displacement and Strength</td>
<td>Front LH 8-Way Power (Cloth)</td>
</tr>
<tr>
<td>ES9596</td>
<td>Backset Retention, Displacement and Strength</td>
<td>2nd Row LH 40% (Cloth)</td>
</tr>
</tbody>
</table>
3.0 TEST VEHICLE INFORMATION

Table 2. General Test and Vehicle Parameter Data

<table>
<thead>
<tr>
<th>VEH. MOD YR/MAKE/MODEL/BODY</th>
<th>2009 Toyota Venza</th>
</tr>
</thead>
<tbody>
<tr>
<td>VEH. NHTSA NO.</td>
<td>C95108</td>
</tr>
<tr>
<td>VIN</td>
<td>4T3ZK11A89U007432</td>
</tr>
<tr>
<td>COLOR</td>
<td>Blue</td>
</tr>
<tr>
<td>VEH. BUILD DATE</td>
<td>02/09</td>
</tr>
<tr>
<td>TEST DATE</td>
<td>July 21 - 31, 2009</td>
</tr>
<tr>
<td>TEST LABORATORY</td>
<td>MGA Research Corporation</td>
</tr>
<tr>
<td>OBSERVERS</td>
<td>Chris Collins, Helen Kaleto, Dave Maier</td>
</tr>
</tbody>
</table>

GENERAL INFORMATION:

DATA FROM VEHICLE’S CERTIFICATION LABEL:

Vehicle Manufactured By: Toyota Motor Manufacturing
Date of Manufacture: 02/09   VIN: 4T3ZK11A89U007432
GVWR: 5,095 lbs   GAWR FRONT: 3,090 lbs   GAWR REAR: 2,800 lbs

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load:
FRONT: 32 psi   REAR: 32 psi
Recommended Tire Size: P245/50R20
Recommended Cold Tire Pressure:
FRONT: 32 psi   REAR: 32 psi
Recommended Tire Size: P245/50R20
Size of Spare Tire: T165/90D18

VEHICLE CAPACITY DATA:

Type of Front Seats:    Bench ___; Bucket __X__; Split Bench ___
Number of Occupants:   Front 2__; Middle 0__; Rear 3__; TOTAL 5__.

MGA File #: G09Q7-004.2
## Test Equipment Used for Testing

<table>
<thead>
<tr>
<th>Test Equipment Used for Testing</th>
<th>Calibration Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGA Hydraulic Test Frame (20a)</td>
<td>N/A</td>
</tr>
<tr>
<td>Hydraulic Pump</td>
<td>N/A</td>
</tr>
<tr>
<td>MGA Data Acquisition System (20a)</td>
<td>12/31/2009</td>
</tr>
<tr>
<td>Inclinometer (Digital) - MGA00575</td>
<td>11/5/2009</td>
</tr>
<tr>
<td>Accelerometer - P47818, P47963</td>
<td>9/2/2009</td>
</tr>
<tr>
<td>LVDT’s - H1, H3, T1, T3</td>
<td>9/9/2009</td>
</tr>
<tr>
<td>Load Cells - 500 lbs - 143138, 143538, 145489</td>
<td>9/4/2009</td>
</tr>
</tbody>
</table>
5.0 DATA

Table 3. S5.2.1-5.2.4 Dimensional Measurement

<table>
<thead>
<tr>
<th>MGA Test #</th>
<th>Average H-Point (Reference Point)</th>
<th>S4.2.1 – Average Height (mm) (Req’t&gt;800 R/S at 1 adj. / No adjustments below 750)</th>
<th>S4.2.3-Average Backset (mm) Req’t&lt;55</th>
<th>S4.2.2-Width (mm) Req’t&gt;170</th>
<th>S4.2.4- Gaps Did Cylinder Pass Through? (Yes/No) Req’t = No</th>
</tr>
</thead>
<tbody>
<tr>
<td>X (mm)</td>
<td>Z (mm)</td>
<td>H1</td>
<td>H2</td>
<td>H3</td>
<td>H4</td>
</tr>
<tr>
<td>ES9552</td>
<td>-174</td>
<td>837</td>
<td>816</td>
<td>798</td>
<td>778</td>
</tr>
<tr>
<td>ES9553</td>
<td>-167</td>
<td>844</td>
<td>823</td>
<td>804</td>
<td>785</td>
</tr>
<tr>
<td>ES9554</td>
<td>-5</td>
<td>814</td>
<td>794</td>
<td>775</td>
<td>759</td>
</tr>
<tr>
<td>ES9555</td>
<td>-14</td>
<td>810</td>
<td>790</td>
<td>771</td>
<td>752</td>
</tr>
</tbody>
</table>

Table 4. S5.2.5 Energy Absorption

<table>
<thead>
<tr>
<th>MGA Test #</th>
<th>Impact Angle (θh)</th>
<th>Impact Velocity (kph)</th>
<th>Accel 1 (g’s)</th>
<th>Accel 2 (g’s)</th>
<th>Post-Test Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Peak</td>
<td>3msec Clip Req’t&lt;80</td>
<td>Peak</td>
</tr>
<tr>
<td>DS9211</td>
<td>0.0</td>
<td>24.0</td>
<td>25.4</td>
<td>20.9</td>
<td>26.1</td>
</tr>
<tr>
<td>DS9212</td>
<td>0.0</td>
<td>24.1</td>
<td>35.8</td>
<td>33.9</td>
<td>35.9</td>
</tr>
</tbody>
</table>

Table 5. S5.2.6 Height Retention

<table>
<thead>
<tr>
<th>MGA Test #</th>
<th>Initial Displacement at 50 N (mm) Req’t &lt; 25</th>
<th>Max. Load (N) Req’t=500 N (Hold 5 Sec.)</th>
<th>Height Retention (mm) Req’t &lt; 13</th>
<th>Post-Test Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES9588</td>
<td>12.1</td>
<td>504</td>
<td>6.9</td>
<td>• The H/R successfully completed the load profile.</td>
</tr>
<tr>
<td>ES9595</td>
<td>7.2</td>
<td>504</td>
<td>3.6</td>
<td>• The H/R successfully completed the load profile.</td>
</tr>
</tbody>
</table>

Table 6. S5.2.7 Backset Retention, Displacement and Strength

<table>
<thead>
<tr>
<th>MGA Test #</th>
<th>H/R Type</th>
<th>H/R Test Position</th>
<th>Displaced Torso Angle (deg)</th>
<th>Initial Headform Disp. at 37 Nm (mm) Req’t&lt;25</th>
<th>Headform Disp. at 373 Nm (mm) Req’t&lt;102</th>
<th>Backset Retention (mm) Req’t&lt;13</th>
<th>Max Load Applied through Headform (N) Req’t&gt;890</th>
<th>Headform Loading Axis Distance (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ES9589</td>
<td>2-Way</td>
<td>H2 (816)</td>
<td>28.6</td>
<td>15.1</td>
<td>-27.3</td>
<td>7.9</td>
<td>901</td>
<td>743</td>
</tr>
<tr>
<td>ES9596</td>
<td></td>
<td></td>
<td>27.8</td>
<td>11</td>
<td>22.1</td>
<td>4.8</td>
<td>901</td>
<td>706</td>
</tr>
</tbody>
</table>
DATA SHEET 1

SUMMARY OF RESULTS

VEH. MOD YR/MAKE/MODEL/BODY STYLE: 2009 Toyota Venza

VEH. NHTSA NO.: C95108; VIN: 4T3ZK11A89U007432

VEH. BUILD DATE: 02/09; TEST DATE: 7/22/2009

TEST LABORATORY: MGA Research

OBSERVERS: Chris Collins, David Maier, Helen Kaleto

---

A. VISUAL INSPECTION OF TEST VEHICLE

Upon receipt for completeness, function, and discrepancies or damage which might influence the testing.

RESULTS:

B. DIMENSIONAL REQUIREMENTS PASS FAIL

<table>
<thead>
<tr>
<th></th>
<th>PASS</th>
<th>FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver's Side</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Passenger's Side</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Rear Designated Seating Positions</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

C. OWNER'S MANUAL PASS FAIL

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

D. REMOVABILITY PASS FAIL X N/A

<table>
<thead>
<tr>
<th></th>
<th>PASS</th>
<th>FAIL</th>
<th>X N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver's Side</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passenger's Side</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rear Designated Seating Positions</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

E. NON-USE POSITION PASS FAIL X N/A

<table>
<thead>
<tr>
<th></th>
<th>PASS</th>
<th>FAIL</th>
<th>X N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rear Designated Seating Positions</td>
<td>NA</td>
<td>NA</td>
<td></td>
</tr>
</tbody>
</table>

F. ENERGY ABSORPTION TEST PASS FAIL

<table>
<thead>
<tr>
<th></th>
<th>PASS</th>
<th>FAIL</th>
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<tr>
<td>Driver's Side</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Passenger's Side</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Rear Designated Seating Positions</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>----------------------------------</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>G. HEIGHT RETENTION TEST</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Driver's Side</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Passenger's Side</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Rear Designated Seating Positions</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>H. BACKSET RETENTION TEST</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Driver's Side</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Passenger's Side</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Rear Designated Seating Positions</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

RECORDED BY: Chris Collins
DATE: 7/22/2009

APPROVED BY: Helen Kaleto
DATA SHEET 2a

DIMENSIONAL REQUIREMENTS FOR ADJUSTABLE HEAD RESTRAINTS

VEH. NHTSA NO.: C95108   TEST DATE: 7/21/2009

Seat Location: Driver 8 Way Power (Cloth)

Height Measurement

SAE J826 three-dimensional manikin torso angle: 20.7
Striker to H-Point (mm): NA  Striker to H-Point angle: NA

Position the head restraint in the highest position of vertical adjustment.

**Height, Hh (mm): 837 mm**

X PASS ___ FAIL

Hh > or = 800 mm for front seats.

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere.

Position the head restraint in the lowest position of vertical adjustment.

**Height, Hl (mm): 778 mm**

X PASS ___ FAIL

Hl > or = 750 mm for front seats and rear seats with head restraints.

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere.

Width Measurement

If the manikin is moved between the Height measurement and the Width measurement, re-record the torso angle, striker to H-Point distance and angle.

Position the head restraint in the highest position of vertical adjustment.

Width is measured 65 mm below the measured Height, Hh.

Height, Hw (= Hh – 65): 772 mm

**Width, W (mm): 212 mm**

X PASS ___ FAIL

Width must be greater than or equal to 170 mm. If a vehicle has a front center designated seating position the front outboard head restraints must be greater than or equal to 254 mm.
Backset Measurement (Front Head Restraints Only)

Position the HRMD and record the following measurements.

HRMD torso angle: 20.7°

Striker to H-Point (mm): NA  
Striker to H-Point angle: NA

Position the head restraint at a height greater than or equal to 750 mm and less than or equal to 800 mm for front head restraints. Exception: head restraint with lowest position higher than 600 mm, adjust to lowest position.

**Backset, B (mm):** 5 mm  
仪式  PASS  FAIL

Backset must be less than or equal to 55 mm.

Gap Measurement

Position the head restraint in the lowest position of vertical adjustment.

Number of gaps within the gap measurement zone: 3

Least dimension of each gap (measured with a steel tape): NA

Size of each gap (as measured with the spherical head form): NA

**Gap Size:** The 25mm cylinder did not pass through the gap. 仪式  PASS  FAIL

Gaps must be less than or equal to 60 mm.

REMARKS:

RECORDED BY: Chris Collins   DATE: 7/21/2009

APPROVED BY: Helen Kaleto

MGA File #: G09Q7-004.2
DATA SHEET 2b

DIMENSIONAL REQUIREMENTS FOR ADJUSTABLE HEAD RESTRAINTS

VEH. NHTSA NO.: C95108   TEST DATE: 7/22/2009

Seat Location: Passenger 2 Way Manual (Cloth)

Height Measurement

SAE J826 three-dimensional manikin torso angle: 20.7

Striker to H-Point (mm): NA   Striker to H-Point angle: NA

Position the head restraint in the highest position of vertical adjustment.

Height, Hh (mm): 844 mm

\[ Hh > or = 800 \text{ mm for front seats.} \]

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere.

Position the head restraint in the lowest position of vertical adjustment.

Height, Hl (mm): 785 mm

\[ Hl > or = 750 \text{ mm for front seats and rear seats with head restraints.} \]

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere.

Width Measurement

If the manikin is moved between the Height measurement and the Width measurement, re-record the torso angle, striker to H-Point distance and angle.

Position the head restraint in the highest position of vertical adjustment.

Width is measured 65 mm below the measured Height, Hh.

Height, Hw (= Hh – 65): 779 mm

Width, W (mm): 210 mm

\[ Width > or = 200 \text{ mm and } \leq 250 \text{ mm.} \]

Width must be greater than or equal to 170 mm. If a vehicle has a front center designated seating position the front outboard head restraints must be greater than or equal to 254 mm.
Backset Measurement (Front Head Restraints Only)

Position the HRMD and record the following measurements.

HRMD torso angle: 20.7°

Striker to H-Point (mm): NA  Striker to H-Point angle: NA

Position the head restraint at a height greater than or equal to 750 mm and less than or equal to 800 mm for front head restraints. Exception: head restraint with lowest position higher than 800 mm, adjust to lowest position.

**Backset, B (mm): 29 mm**  \( \text{X PASS} \quad \text{FAIL} \)

Backset must be less than or equal to 55 mm.

Gap Measurement

Position the head restraint in the lowest position of vertical adjustment.

Number of gaps within the gap measurement zone: 3

Least dimension of each gap (measured with a steel tape): NA

Size of each gap (as measured with the spherical head form): NA

**Gap Size:** The 25mm cylinder did not pass through the gap.  \( \text{X PASS} \quad \text{FAIL} \)

Gaps must be less than or equal to 60 mm.

REMARKS:

RECORDED BY: Chris Collins  DATE: 7/22/2009

APPROVED BY: Helen Kaleto
DATA SHEET 2c

DIMENSIONAL REQUIREMENTS FOR ADJUSTABLE HEAD RESTRAINTS

VEH. NHTSA NO.: C95108  TEST DATE: 7/22/2009

Seat Location: 2nd Row LH 40% (Cloth)

Height Measurement

SAE J826 three-dimensional manikin torso angle: 25.7°

Striker to H-Point (mm): NA  Striker to H-Point angle: NA

Position the head restraint in the highest position of vertical adjustment.

Height, Hh (mm): 814 mm  X  PASS  ___ FAIL

Hh > or = 800 mm for front seats.

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere.

Position the head restraint in the lowest position of vertical adjustment.

Height, HI (mm): 759 mm  X  PASS  ___ FAIL

HI > or = 750 mm for front seats and rear seats with head restraints.

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere.

Width Measurement

If the manikin is moved between the Height measurement and the Width measurement, re-record the torso angle, striker to H-Point distance and angle.

Position the head restraint in the highest position of vertical adjustment.

Width is measured 65 mm below the measured Height, Hh.

Height, Hw (= Hh – 65): 779 mm

Width, W (mm): 192 mm  X  PASS  ___ FAIL

Width must be greater than of equal to 170 mm. If a vehicle has a front center designated seating position the front outboard head restraints must be greater than or equal to 254 mm.
**Backset Measurement (Front Head Restraints Only)**

Position the HRMD and record the following measurements.

HRMD torso angle: 25.7°

Striker to H-Point (mm): NA  
Striker to H-Point angle: NA

Position the head restraint at a height greater than or equal to 750 mm and less than or equal to 800 mm for front head restraints. Exception: head restraint with lowest position higher than 800 mm, adjust to lowest position.

**Backset, B (mm): NA**  
| PASS | FAIL | NA |

Backset must be less than or equal to 55 mm.

**Gap Measurement**

Position the head restraint in the lowest position of vertical adjustment.

Number of gaps within the gap measurement zone: 3

Least dimension of each gap (measured with a steel tape): NA

Size of each gap (as measured with the spherical head form): NA

**Gap Size:** The 25mm cylinder did not pass through the gap.  
| PASS | FAIL |

Gaps must be less than or equal to 60 mm.

**REMARKS:**

RECORDED BY: Chris Collins  
DATE: 7/22/2009

APPROVED BY: Helen Kaleto
DATA SHEET 2d

DIMENSIONAL REQUIREMENTS FOR ADJUSTABLE HEAD RESTRAINTS

VEH. NHTSA NO.: C95108 TEST DATE: 7/22/2009

Seat Location: 2nd Row RH 60% (Cloth)

**Height Measurement**

SAE J826 three-dimensional manikin torso angle: 26.0°

Striker to H-Point (mm): NA Striker to H-Point angle: NA

Position the head restraint in the highest position of vertical adjustment.

**Height, Hh (mm): 810 mm**

\[ \_X\text{ PASS} \quad _\_\text{FAIL} \]

\[ Hh > or = 800 \text{ mm for front seats.} \]

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere.

Position the head restraint in the lowest position of vertical adjustment.

**Height, Hl (mm): 752 mm**

\[ \_X\text{ PASS} \quad _\_\text{FAIL} \]

\[ Hl > or = 750 \text{ mm for front seats and rear seats with head restraints.} \]

If the head restraint is less than the required height, check for passage of the 25 mm diameter sphere.

**Width Measurement**

If the manikin is moved between the Height measurement and the Width measurement, re-record the torso angle, striker to H-Point distance and angle.

Position the head restraint in the highest position of vertical adjustment.

Width is measured 65 mm below the measured Height, Hh.

Height, Hw (= Hh – 65): 779 mm

**Width, W (mm): 193 mm**

\[ \_X\text{ PASS} \quad _\_\text{FAIL} \]

Width must be greater than or equal to 170 mm. If a vehicle has a front center designated seating position the front outboard head restraints must be greater than or equal to 254 mm.
Backset Measurement (Front Head Restraints Only)

Position the HRMD and record the following measurements.

HRMD torso angle: 26.0°

Striker to H-Point (mm): NA  Striker to H-Point angle: NA

Position the head restraint at a height greater than or equal to 750 mm and less than or equal to 800 mm for front head restraints. Exception: head restraint with lowest position higher than 800 mm, adjust to lowest position.

Backset, B (mm): NA  ___PASS  ___FAIL  X NA

Backset must be less than or equal to 55 mm.

Gap Measurement

Position the head restraint in the lowest position of vertical adjustment.

Number of gaps within the gap measurement zone: 3

Least dimension of each gap (measured with a steel tape): NA

Size of each gap (as measured with the spherical head form): NA

Gap Size: The 25mm cylinder did not pass through the gap.  X PASS  ___FAIL

Gaps must be less than or equal to 60 mm.

REMARKS:

RECORDED BY: Chris Collins  DATE: 7/22/2009

APPROVED BY: Helen Kaleto

MGA File #: G09Q7-004.2
DATA SHEET 3
OWNER’S MANUAL

VEH. NHTSA NO.: C95108      TEST DATE: 7/22/2009

Emphasize that all occupants should place their head restraint in a proper position prior to operating the vehicle in order to prevent the risk of serious injury.

X PASS   FAIL

Description of the head restraint system and identification of which seats are equipped.

X PASS   FAIL

If the head restraint is removable, instructions on how to properly remove and reinstall using a deliberate action distinct from any act necessary for adjustment.

X PASS   FAIL

Warning that all head restraints must be reinstalled properly to protect occupants.

X PASS   FAIL

Describe the adjustment of the head restraints and/or seat back to achieve proper head restraint position relative the head. The description must include the following:

1) a presentation and explanation of the main components of the vehicle’s head restraints

2) the basic requirements for proper head restraint operation, including an explanation of the actions that may affect the proper functioning of the head restraints.

3) the basic requirements for proper positioning of a head restraint in relation to an occupant’s head position, including information regarding the proper positioning of the center of gravity of an occupant’s head in relation to the head restraint.

X PASS   FAIL

Include copies of relevant pages from the owner’s manual in the final report.

REMARKS:

RECORDED BY: Chris Collins      DATE: 7/22/2009
APPROVED BY: Helen Kaleto
DATA SHEET 4

REMOVABILITY

VEH. NHTSA NO.: C95108  TEST DATE: 7/22/2009

Are the head restraints removable?  X YES  NO

If removable, does removal REQUIRE an action distinct from actions to adjust the head restraint?  X YES (PASS)  NO (FAIL)

Description of action(s) for head restraint adjustment:

Vertical Adjustment (front and rear outboard seats)
1. Up- Pull the head restraint up
2. Down- Push the head restraint down while pressing the lock release button.

Vertical Adjustment (rear center seat)
1. Down
2. Up
Push the head restraint up or down while pressing the lock release button.

Description of distinct action for removal:
Pull the head restraint up while pressing the lock release button.

REMARKS:

RECORDED BY: Chris Collins DATE: 7/22/2009

APPROVED BY: Helen Kaleto
DATA SHEET 6a

ENERGY ABSORPTION TEST

VEH. NHTSA NO.: C95108        TEST DATE: 7/30/2009

Seat Location: Passenger 2 Way Manual (Cloth)  Type of head restraint: 2 way adjustable

635 mm Height Measurement for lower boundary of the impact zone

SAE J826 three-dimensional manikin torso angle: 20.7°

Striker to H-Point (mm): NA        Striker to H-Point angle: NA

Accelerometer identification: P47818, P47963  Accelerometer type/brand: Endevco 2000G

Last calibration date: 3/2/2009

Head form vertical angle (-2° - +2°): 0°

Distance between head form and target location (> or = 25 mm): 300mm

Impact velocity (23.6 kph ± 0.5 kph): 24.04 kph

Impact location: 635 mm above the h point and within 70 mm of the vertical centerline

Maximum deceleration (< or = 785 m/s² (80 g)): 20.9 g

X PASS    FAIL

REMARKS:

RECORDED BY: Chris Collins          DATE: 7/30/2009

APPROVED BY: Helen Kaleto

MGA File #: G09Q7-004.2
DATA SHEET 6b

ENERGY ABSORPTION TEST

VEH. NHTSA NO.: C95108 TEST DATE: 7/31/2009

Seat Location: 2nd Row RH 60% (Cloth) Type of head restraint: 2 way adjustable

635 mm Height Measurement for lower boundary of the impact zone

SAE J826 three-dimensional manikin torso angle: 26.0°

Striker to H-Point (mm): NA Striker to H-Point angle: NA

Accelerometer identification: P47818, P47963 Accelerometer type/brand: Endevco 2000G

Last calibration date: 3/2/2009

Head form vertical angle (-2° - +2°): 0°

Distance between head form and target location (> or = 25 mm): 300mm

Impact velocity (23.6 kph ± 0.5 kph): 24.04 kph

Impact location: 635 mm above the h point and within 70 mm of the vertical centerline

Maximum deceleration (< or = 785 m/s² (80 g)): 33.9 g ❄️PASS❄️ FAIL

REMARKS:

RECORDED BY: Chris Collins DATE: 7/31/2009

APPROVED BY: Helen Kaleto

MGA File #: G09Q7-004.2
DATA SHEET 7a

HEIGHT RETENTION TEST (ADJUSTABLE HEAD RERAINTS ONLY)

VEH. NHTSA NO.: C95108  TEST DATE: 7/30/2009

Seat Location: Passenger 2 Way Manual (Cloth)

Pre-test measurements
SAE J826 Manikin torso angle: 20.7°  Top of Head Restraint Height (mm): 844 mm
Striker to H-Point (mm): NA  Striker to H-Point angle: NA
Description of height retention lock: Spring loaded button catch.

Test measurements
Initial load (50 N ± 1 N): 50 N  Initial Displacement, D1 (mm): 12.1 mm
Initial Displacement (D1) < 25 mm  X PASS  _FAIL
Maximum load (495 N ± 5 N): 504 N  Maximum Displacement, D2 (mm): 55 mm
Return load (50 N ± 1 N): 50 N  Return Displacement, D3 (mm): 19 mm
Total displacement (D3-D1) < 13 mm: 6.9 mm  X PASS  _FAIL

REMARKS: HR test position was full up.

RECORDED BY: Chris Collins  DATE: 7/31/2009
APPROVED BY: Helen Kaleto
DATA SHEET 7b

HEIGHT RETENTION TEST (ADJUSTABLE HEAD RESTRAINTS ONLY)

VEH. NHTSA NO.: C95108  TEST DATE: 7/30/2009
Seat Location: 2nd Row RH 60% (Cloth)

Pre-test measurements
SAE J826 Manikin torso angle: 26.0°  Top of Head Restraint Height (mm): 810 mm
Striker to H-Point (mm): NA  Striker to H-Point angle: NA
Description of height retention lock: Spring loaded button catch.

Test measurements
Initial load (50 N ± 1 N): 50 N  Initial Displacement, D1 (mm): 7.2 mm
Initial Displacement (D1) < 25 mm  X PASS  ___FAIL
Maximum load (495 N ± 5 N): 504 N  Maximum Displacement, D2 (mm): 55 mm
Return load (50 N ± 1 N): 50 N  Return Displacement, D3 (mm): 19 mm
Total displacement (D3-D1) < 13 mm: 3.6 mm  X PASS  ___FAIL

REMARKS: HR test position was full up.

RECORDED BY: Chris Collins  DATE: 7/31/2009
APPROVED BY: Helen Kaleto
DATA SHEET 8a

BACKSET RETENTION TEST

VEH. NHTSA NO.: C95108
TEST DATE: 7/30/2009

Seat Location: Driver 8 Way Power (Cloth) Type of head restraint: 2 way adjustable

Pre-test measurements

SAE J826 Manikin torso angle: 20.7° Top of Head Restraint Height (mm): 837 mm
Striker to H-Point (mm): NA Striker to H-Point angle: NA

Displacement torso reference line

Test device back pan angle: 21°

Distance from the H-point to the initial location of the load (0.290 ± 0.013 m):

Initial load (N): 1,286 N Initial moment (373 ± 7.5 Nm): 373 Nm

Backset retention and strength

Distance from the H-point to the head form tangency point (m):

Initial load (N): 49.8 N Initial moment (37 ± 0.7 Nm): 37 Nm

Initial head form displacement, D1 (< or = 25 mm): 15.1 mm X PASS ____FAIL

Load range to generate a 373 ± 7.5 Nm rearward moment (N): 502 N

Actual load applied (N): 502 N Resultant moment (Nm): 373 Nm

Maximum Head form displacement, D2 (< or = 102 mm):-27.3 X PASS ____FAIL

Final head form displacement, D3 (mm): 23 mm measured at (37 ± 0.7 Nm)

Total displacement (D3-D1) < 13 mm: 7.9 mm X PASS ____FAIL

Maximum applied load (> or equal to 885 N): 901 N X PASS ____FAIL

REMARKS: HR test position was 1 notch below full up.

RECORDED BY: Chris Collins DATE: 9/14/2009

APPROVED BY: Helen Kaleto
DATA SHEET 8b
BACKSET RETENTION TEST

VEH. NHTSA NO.: C95108  TEST DATE: 7/31/2009

Seat Location: 2nd Row LH 40% (Cloth)  Type of head restraint: 2 way adjustable

Pre-test measurements

SAE J826 Manikin torso angle: 25.7°  Top of Head Restraint Height (mm): 814 mm
Striker to H-Point (mm): NA  Striker to H-Point angle: NA

Displacement torso reference line

Test device back pan angle: 25°

Distance from the H-point to the initial location of the load (0.290 ± 0.013m):

Initial load (N): 1,286 N  Initial moment (373 ± 7.5 Nm): 373 Nm

Backset retention and strength

Distance from the H-point to the head form tangency point (m):

Initial load (N): 52.4 N  Initial moment (37 ± 0.7 Nm): 37 Nm

Initial head form displacement, D1 (< or = 25 mm): 11.0 mm  X PASS  ___FAIL

Load range to generate a 373 ± 7.5 Nm rearward moment (N): 502 N

Actual load applied (N): 528 N  Resultant moment (Nm): 373 Nm

Maximum Head form displacement, D2 (< or = 102 mm): 22.1  X PASS  ___FAIL

Final head form displacement, D3 (mm): 15.8 mm  measured at (37 ± 0.7 Nm)

Total displacement (D3-D1) < 13 mm: 4.8 mm  X PASS  ___FAIL

Maximum applied load (> or equal to 885 N): 901 N  X PASS ___FAIL

REMARKS: HR test position was 1 notch below full up.

RECORDED BY: Chris Collins  DATE: 9/14/2009

APPROVED BY: Helen Kaleto
PHOTOGRAPHS

6.1 Front view
6.2 Rear view
6.3 Front left view
6.4 Front right view
6.5 Test vehicle's certification label
   6.5.1 Certification label photo #1
6.5.2 Tire information label photo #1
6.6 S5.2.1-5.2.4 Dimensional Measurements
6.6.1 Driver Test Photo #1
6.6.2 Driver Test Photo #2
6.6.3  Driver Test Photo #3
6.6.4 Driver Test Photo #4
6.6.5  Passenger Test Photo #1
6.6.6 Passenger Test Photo #2
6.6.7 Passenger Test Photo #3
6.6.8  2nd Row LH Test Photo #1
6.6.12  2nd Row RH Test Photo #2
6.6.13  2nd Row RH Test Photo #3
6.7  S5.2.5 Energy Absorption
6.7.1  Passenger Pre-Test Photo #1
6.7.2 Passenger Pre-Test Photo #2
6.7.3 Passenger Post-Test Photo #1
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6.7.5  2nd Row RH Pre-Test Photo #1
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6.7.8 2nd Row RH Post-Test Photo #2
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  6.8.1 Passenger Test Photo #1
6.8.2 Passenger Test Photo #2
6.8.3 Passenger Test Photo #3
6.8.4 Passenger Test Photo #4
6.8.5 Passenger Test Photo #5

7/30/2009
NHTSA 2009 TOYOTA VENZA
FRONT RH 2 WAY
MANUAL (CLOTH)
DTNH22-06-C-00030/0007
C95108
G09Q7-004.2/ES9588

LOAD = 500 N
6.8.6 Passenger Test Photo #6
6.8.7 Passenger Test Photo #7
6.8.8 Passenger Test Photo #8
6.8.9 2nd Row RH Test Photo #1
6.8.10  2nd Row RH Test Photo #2

MGA File #: G09Q7-004.2
6.8.11 2nd Row RH Test Photo #3
6.8.14  2nd Row RH Test Photo #6
6.8.15  2nd Row RH Test Photo #7
6.9 S5.2.7 Backset Retention, Displacement and Strength

6.9.1 Driver Test Photo #1
6.9.2 Driver Test Photo #2
6.9.3 Driver Test Photo #3
6.9.4 Driver Test Photo #4
6.9.5 Driver Test Photo #5
6.9.6 Driver Test Photo #6
6.9.7 Driver Test Photo #7
6.9.8 Driver Test Photo #8
6.9.9 Driver Test Photo #9
6.9.10 Driver Test Photo #10
6.9.11 2nd Row LH Test Photo #1
6.9.12  2nd Row LH Test Photo #2
6.9.13  2nd Row LH Test Photo #3
6.9.16  2nd Row LH Test Photo #6
6.9.18  2nd Row LH Test Photo #8

MGA File #: G09Q7-004.2
7.0 PLOTS

7.1.1 S5.2.5 Energy Absorption
7.1.2 S5.2.5 Energy Absorption

![Graph showing energy absorption](image-url)
7.2.1 S5.2.6 Height Retention

[Graph showing height retention data]

Max: 504.1 N @ 54.7 mm/Min: -19.0 N @ -4.2 mm

D2 = 54.8mm @ 500.0 N +/- 7.5N
Retention Disp = 6.9mm
D1 = 13.1mm @ 50.0 N +/- 0.7N

ES9508-B: RH Head Force (N) vs. RH Head Disp. (mm)
7.2.2 S5.2.6 Height Retention
Max: 22.4 mm @ 131.5 sec./Min: -6.9 mm @ 331.1 sec.

ES9595-B: RH 60% Head Disp. (mm) vs. Time (sec.)
7.3.1 S5.2.7 Backset Retention, Displacement and Strength
7.3.2 S5.2.7 Backset Retention, Displacement and Strength
8.0 REPORT OF VEHICLE CONDITION

REPORT OF VEHICLE CONDITION AT THE COMPLETION OF TESTING

CONTRACT No.: DTNH22-06-C-00030/0007 DATE: July 21 - 31, 2009

From: MGA Research Corporation, 446 Executive Drive, Troy, MI 48083
To: NHTSA, OVSC, NVS-220

The following vehicle has been subjected to compliance testing for FMVSS No. 202a

The vehicle was inspected upon arrival at the laboratory for the test and found to contain all of the equipment listed below. All variances have been reported within 2 working days of vehicle arrival, by letter, to the NHTSA Industrial Property Manager (NAD0-30), with a copy to the OVSC COTR. The vehicle is again inspected, after the above test has been conducted, and all changes are noted below. The final condition of the vehicle is also noted in detail.

VEH. MOD YR/MAKE/MODEL/BODY: 2009 Toyota Venza

VEH. NHTSA NO.: C95108 VIN: 4T3ZK11A89U007432
COLOR: Blue

ODOMETER READINGS: ARRIVAL 589 miles Date: 5/26/2009
COMPLETION 589 miles Date: 7/31/2009

ENGINE DATA: 6 Cylinders ___ Liters ____ Cubic Inches

TRANSMISSION DATA: X Automatic ___ Manual ____ No. of Speeds

FINAL DRIVE DATA: ____Rear Drive  X Front Drive ____ 4 Wheel Drive

CHECK APPROPRIATE BOXES FOR VEHICLE EQUIPMENT:

TEST LABORATORY: MGA Research Corporation

OBSERVERS: Chris Collins, Helen Kaleto, Dave Maier

<table>
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<th>X</th>
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<th>X</th>
<th>Traction Control</th>
<th>X</th>
<th>Clock</th>
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<tr>
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<td>Tinted Glass</td>
<td>N/A</td>
<td>All Wheel Drive</td>
<td>N/A</td>
<td>Roof Rack</td>
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<tr>
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<td>X</td>
<td>Speed Control</td>
<td>X</td>
<td>Console</td>
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<td>X</td>
<td>Rear Window Defroster</td>
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<td>X</td>
<td>Passenger Air Bag</td>
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<tr>
<td>X</td>
<td>Power Seat(s)</td>
<td>X</td>
<td>Tachometer</td>
<td>X</td>
<td>Front Disc Brakes</td>
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<tr>
<td>X</td>
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<td>X</td>
<td>Tilt Steering Wheel</td>
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<td>Rear Disc Brakes</td>
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<td>Antilock Brake System</td>
<td>X</td>
<td>AM/FM/Compact Disc</td>
<td>Other</td>
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</tr>
</tbody>
</table>
REMARKS:

Salvage only.

Equipment that is no longer on the test vehicle as noted on previous pages:

All equipment inventoried and placed in vehicle.

Explanation for equipment removal:

Roof removed and vehicle cut to accommodate test equipment.

Test Vehicle Condition:

Salvage only. Vehicle cut in half to complete testing.

RECORDED BY: Chris Collins, David Maier

DATE: September 3, 2009

APPROVED BY: Helen Kaleto
APPENDIX A
OWNERS MANUAL HEAD RESTRAINTS
1-3. Adjustable components (seats, mirrors, steering wheel)

Head restraints

► Front and rear outboard seats

Vertical adjustment

1. Up
   Pull the head restraint up.

2. Down
   Push the head restraint down while pressing the lock release button.

► Rear center seat

Vertical adjustment

1. Down
2. Up

Push the head restraint up or down while pressing the lock release button.

► Adjusting the height of the head restraints

Make sure that the head restraints are adjusted so that the center of the head restraint is closest to the top of your ears.
1-3. Adjustable components (seats, mirrors, steering wheel)

Adjusting the rear center seat head restraint
Always raise the head restraint one level from the stowed position when using.

Removing the head restraints
Pull the head restraint up while pressing the lock release button.

⚠️ CAUTION

Head restraint precautions
Observe the following precautions regarding the head restraints. Failure to do so may result in death or serious injury.

- Use the head restraints designed for each respective seat.
- Adjust the head restraints to the correct position at all times.
- After adjusting the head restraints, push down on them and make sure they are locked in position.
- Do not drive with the head restraints removed.
APPENDIX B
MANUFACTURER’S DATA (OVSC FORM-SRP)
SEAT REFERENCE POINT (SRP) AND TORSO ANGLE DATA
FMVSS No. 201, 202, 203, 207, 210 & 216
(All dimensions in inches)
* : We conducted this test based on FMVSS 202a Dynamic test in Front outboard designated seating position and Static test in Rear outboard designated seating position.

Model Year: 2009 / Make: TOYOTA / Model: Venza

Body Style: 5 Door MPV / Seat Style: Fr.: Separate Seat  Rr.: 6:4 Split Seat

<table>
<thead>
<tr>
<th>DIMENSION</th>
<th>FRONT, A1</th>
<th>REAR, A2</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>11.00&quot; (279.5 mm)</td>
<td>11.59&quot; (294.3 mm)</td>
</tr>
<tr>
<td>B</td>
<td>15.47&quot; (393 mm)</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>49.56&quot; (1258.9 mm)</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>9.62&quot; (244.4 mm)</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>21 degrees</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>25 degrees</td>
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</tbody>
</table>
SEATING REFERENCE POINT (SRP) AND TORSO ANGLE DATA
FMVSS No. 201, 202, 203, 207 & 210
(All dimensions in inches)
*: We conducted this test based on FMVSS 202a Dynamic test in Front outboard designated seating position and Static test in Rear outboard designated seating position.

Model Year: 2009 / Make: TOYOTA / Model: Venza


<table>
<thead>
<tr>
<th>B</th>
<th>15.47&quot; (393 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>59.56&quot; (1528.9 mm)</td>
</tr>
<tr>
<td>F*</td>
<td>Fr: 7.96&quot; (202.2 mm)   Rr: 8.35&quot; (212.2 mm)</td>
</tr>
<tr>
<td>G</td>
<td>23.12&quot; (587.2 mm)</td>
</tr>
<tr>
<td>H*</td>
<td>Fr: 38.28&quot; (972.2 mm)   Rr: 37.88&quot; (962.2 mm)</td>
</tr>
</tbody>
</table>

* Provide all dimensions needed to locate SRP.

FORM – SRP
**TEST VEHICLE SEAT INFORMATION**

FMVSS No. 201, 202, 203, 207 & 210

(All dimensions in inches)

*: We conducted this test based on FMVSS 202a Dynamic test in Front outboard designated seating position and Static test in Rear outboard designated seating position.

Model Year: 2009 / Make: TOYOTA / Model: Venza


![Diagram of seat information](image)

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<th>Rr.</th>
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<td>No data</td>
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<tr>
<td><strong>B1</strong></td>
<td>No data</td>
<td>No data</td>
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<tr>
<td><strong>C1</strong></td>
<td>LH</td>
<td>RH</td>
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<tr>
<td>MNL</td>
<td>1.77'' (45 mm)</td>
<td>3.36'' (86 mm)</td>
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<tr>
<td>PWR</td>
<td>3.46'' (88 mm)</td>
<td>4.02'' (102 mm)</td>
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<tr>
<td><strong>B2</strong></td>
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<td>No data</td>
</tr>
<tr>
<td><strong>C2</strong></td>
<td>40%</td>
<td>60%</td>
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<td></td>
<td>0.37'' (9.3 mm)</td>
<td>1.43'' (36.3 mm)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Weight of Hinged or Folding portion of seat</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fr.</td>
</tr>
<tr>
<td><strong>C1</strong></td>
<td>No data</td>
</tr>
<tr>
<td>PWR</td>
<td>28.7kg</td>
</tr>
<tr>
<td>PWR</td>
<td>28.9kg</td>
</tr>
</tbody>
</table>

**FORM - SRP**

MGA File #: G09Q7-004.2