SAFETY COMPLIANCE TESTING FOR
FMVSS NO. 104
WINDSHIELD WIPING AND WASHING SYSTEMS

TOYOTA MOTOR CORPORATION
2004 TOYOTA PRIUS, PASSENGER CAR
NHTSA NO. C45107

GENERAL TESTING LABORATORIES, INC.
1623 LEEDSTOWN ROAD
COLONIAL BEACH, VIRGINIA 22443

SEPTEMBER 14, 2004
FINAL REPORT
PREPARED FOR
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Compliance tests were conducted on the subject 2004 Toyota Prius Passenger Car in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-104-08 for the determination of FMVSS 104 compliance. Test failures identified were as follows:

NONE

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SECTION 1

PURPOSE OF COMPLIANCE TEST

1.0 PURPOSE OF COMPLIANCE TEST

A 2004 Toyota Prius Passenger Car was subjected to Federal Motor Vehicle Safety Standard (FMVSS) No. 104 testing to determine if the vehicle was in compliance with the requirements of the standard. All tests were conducted in accordance with NHTSA, Office of Vehicle Safety Compliance (OVSC) Laboratory Procedure, TP-104-08 dated 28 June 1996 and General Testing Laboratories, Inc. (GTL) Test Procedure, TP-104-08A dated 4 April 1997.

1.1 The test vehicle was a 2004 Toyota Prius Passenger Car. Nomenclature applicable to the test vehicle are:

A. **Vehicle Identification Number:** JTDKB20U040041316

B. **NHTSA No.:** C45107

C. **Manufacturer:** TOYOTA MOTOR CORPORATION

D. **Manufacture Date:** 01/04

1.2 TEST DATE

The test vehicle was subjected to FMVSS No. 104 testing on August 23, 2004.
SECTION 2

COMPLIANCE TEST PROCEDURE AND SUMMARY OF RESULTS

2.0 GENERAL

The 2004 Toyota Prius 4-door passenger car, NHTSA No. C45107 was subjected to FMVSS No. 104 tests on August 23, 2004. The selected portions of FMVSS No. 104 tests used were as amplified in the following subparagraphs. The test vehicle was positioned in the test system with three water spray nozzles suspended in line with the center of the longitudinal axis of the windshield and horizontal left/right center of the windshield to provide an even distribution of spray to the entire windshield. The height of the nozzles was approximately 22 inches above the glazing surface.

2.1 WIPER FREQUENCY TEST

The wiper frequency test was performed with the engine operating and with a minimum of 50 cubic inches per minute of water from the spray nozzles. The wiper frequency was measured at the low and high wiper speed settings with the engine operating at idle RPM and 2,000 RPM.

2.2 WIPED AREA TEST

The test was conducted with the windshield wiper system operating at the high speed setting, engine at idle RPM and the spray nozzles spraying water at a minimum of 50 cubic inches per minute. The wiper blade wipe pattern was outlined on the glazing surface and then transferred to a windshield pattern. The wiped area was determined for areas A, B and C from the windshield pattern.

2.3 CAPABILITY TEST

The windshield glazing surface was coated with a mixture of water and fine grade test dust. Within 15 seconds following application of the water-dust mixture, the windshield wiper and washing system was activated in the high speed mode for ten complete cycles. The vehicle's engine was operating at idle RPM. The cleared areas of the windshield were marked on the inside windshield surface. After ten complete cycles the system was deactivated and the wiped area transferred to a windshield pattern.

The glazing surface was cleaned and dried. The water dust mixture was re-applied and the test repeated.

The windshield patterns were used subsequently to determine the cleared area percentages.

2.4 SUMMARY OF RESULTS

Based on the test performed, the test vehicle's windshield wiping and washing system appears to meet the requirements of FMVSS 104.
SECTION 3

COMPLIANCE TEST DATA

3.0 TEST RESULTS

The following data sheets document the results of testing on the 2004 Toyota Prius.
SUMMARY OF DATA
FMVSS 104, WINDSHIELD WIPING AND WASHING SYSTEMS

VEH. MOD YR/MAKE/MODEL/BODY: 2004 TOYOTA PRIUS PASSENGER CAR
VEH. NHTSA NO: C45107; VIN: JTDKB20U040
VEH. BUILD DATE: 01/04 TEST DATE: AUGUST 23, 2004
TEST LABORATORY: GENERAL TESTING LABORATORIES
OBSERVERS: GRANT FARRAND, JIMMY LATANE

WIPER TYPE: __ 2 SPEED ELECTRIC WITH DELAY

WASHER TYPE: _HIGH PRESSURE ELECTRIC PUMP_

WINDSHIELD AREAS: A = 1143.8 in² B = 847.2 in² C = 280.8 in²

MANUFACTURER'S WINDSHIELD PATTERN USED: Yes _X_ No ___

ACCESSIBILITY:
(1) Washer Control Accessible: Yes _X_ No ___
(2) Wiper Control Accessible: Yes _X_ No ___
(3) Washer Reservoir Filler Accessible: Yes _X_ No ___

DESCRIBE UNUSUAL FEATURES OF WIPING AND WASHING SYSTEMS: NONE

PERFORMANCE:

<table>
<thead>
<tr>
<th>TEST</th>
<th>PASS</th>
<th>FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>WIPER FREQUENCY</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>WIPED AREA</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>WASHER CAPABILITY</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

RECORDED BY: ___________________- DATE: 08/23/04
APPROVED BY: ___________________
**FREQUENCY TEST DATA**

**FMVSS 104 – WINDSHIELD WIPER SYSTEM**

VEH. MOD YR/MAKE/MODEL/BODY: 2004 TOYOTA PRIUS PASSENGER CAR

VEH. NHTSA NO: C45107; VIN: JTDKB2U0440\_

VEH. BUILD DATE: 01/04; TEST DATE: AUGUST 23, 2004

TEST LABORATORY: GENERAL TESTING LABORATORIES

OBSERVERS: GRANT FARRAND, JIMMY LATANE

Water Hardness: 7.0 grains/gallon (12 max.); Date Certified: 02/23/04

Water Spray Flow Rate: 70.7 in³/min. (specified range = 50 to 100 in³/min.)

Ambient Air Temp.: 72 °F (50-100°F); Water Temp.: 72 °F (100°F max.)

Manufacturer's Recommended Engine Idle Speed: 0-1000* rpm (Note: * Computer controlled gas/electric hybrid vehicle. Engine only runs when needed)

**RUN 1, MAXIMUM WIPER FREQUENCY TEST:**

<table>
<thead>
<tr>
<th>TIME</th>
<th>ENGINE SPEED</th>
<th>TOTAL CYCLES</th>
<th>AVG. CYCLES/MIN. (45 MINIMUM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st 3 minutes</td>
<td>0-1000</td>
<td>212</td>
<td>70.6</td>
</tr>
<tr>
<td></td>
<td>(Idle ± 50 rpm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd 3 minutes</td>
<td>1200-2000</td>
<td>210</td>
<td>70.0</td>
</tr>
<tr>
<td></td>
<td>(2000 rpm ± 50 rpm)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Frequency at least 45 cycles/minute regardless of engine speed: Yes _X_ No __

**RUN 2, LOWER WIPER FREQUENCY TEST:**

<table>
<thead>
<tr>
<th>TIME</th>
<th>ENGINE SPEED</th>
<th>TOTAL CYCLES</th>
<th>AVG. CYCLES/MIN. (20 MINIMUM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st 3 minutes</td>
<td>0-1000</td>
<td>140</td>
<td>46.6</td>
</tr>
<tr>
<td></td>
<td>(Idle ± 50 rpm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd 3 minutes</td>
<td>1200-2000</td>
<td>140</td>
<td>46.6</td>
</tr>
<tr>
<td></td>
<td>(2000 rpm ± 50 rpm)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Highest and lower frequency differ by at least 15 cycles/minute, and lower frequency is at least 20 cycles/minute regardless of engine speed: Yes _X_ No __

**REMARKS:**

RECORDED BY: [Signature]    DATE: 08/23/04

APPROVED BY: [Signature]
**WIPED AREA TEST DATA**  
FMVSS 104 – WINDSHIELD WIPER SYSTEM

**VEH. MOD YR/MAKE/MODEL/BODY:** 2004 TOYOTA PRIUS PASSENGER CAR  
**VEH. NHTSA NO:** C46107; **VIN:** JTDBKB20U640002  
**VEH. BUILD DATE:** 01/04; **TEST DATE:** AUGUST 23, 2004  
**TEST LABORATORY:** GENERAL TESTING LABORATORIES  
**OBSERVERS:** GRANT FARRAND, JIMMY LATANE

Air Temperature in test area = **72** °F (specified range of 50 to 100°F)  
Air Velocity at windshield = **1.0** mph (specified range of 0 to 1 mph)  
Engine speed = **0** rpm (manufacturer's recommended idle ± 50 rpm)  
Temperature of water spray = **72** °F (100°F maximum)  
Water spray flow rate = **70.7** in³/min. (specified range of 50 to 100 in³/min.)  
Windshield wiper frequency = **70.6** cycles/min. (45 cpm minimum)

**TEST RESULTS:**

<table>
<thead>
<tr>
<th>WINDSHIELD AREA</th>
<th>ACTUAL</th>
<th>REQUIRED</th>
<th>PASS</th>
<th>FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>89.5%</td>
<td>80%</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>94.1%</td>
<td>94%</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>100%</td>
<td>99%</td>
<td>X</td>
<td></td>
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</table>

**REMARKS:**

**RECORDED BY:** [Signature]  
**DATE:** 08/23/04  
**APPROVED BY:** [Signature]
CAPABILITY TEST DATA
FMVSS 104 – WINDSHIELD WASHER SYSTEM

VEH. MOD YR/MAKE/MODEL/BODY: 2004 TOYOTA PRIUS PASSENGER CAR
VEH. NHTSA NO: C45107; VIN: JTDKB20U04013075
VEH. BUILD DATE: 01/04; TEST DATE: AUGUST 23, 2004
TEST LABORATORY: GENERAL TESTING LABORATORIES
OBSERVERS: GRANT FARRAND, JIMMY LATANE

Air Temperature in test area = 72°F (specified range of 70 to 80°F)
Washer reservoir fluid temperature = 72°F (specified range of 70 to 80°F)
Air Velocity at windshield = 1.0 mph (specified range of 0 to 1 mph)
Engine speed = 0 rpm (manufacturer's recommended idle ± 50 rpm)
Number of windshield washer nozzles on the vehicle = 8

Windshield washer system activation coordinated with components of the wiper system:
Yes  X  No

TEST RESULTS:

<table>
<thead>
<tr>
<th>CLEARING AREA PERCENTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>WINDSHIELD AREA</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>A</td>
</tr>
<tr>
<td>B</td>
</tr>
<tr>
<td>C</td>
</tr>
</tbody>
</table>

*NOTE FOR REFERENCE ONLY: SAE 942b, revised Jul72, recommends capability to clear 80% of the total wash area and 90% of the wash area included in AREA C.

REMARKS:

RECORDED BY: [Signature]  DATE: 08/23/04
APPROVED BY: [Signature]
### TABLE 1 - INSTRUMENTATION & 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>
</tr>
</thead>
<tbody>
<tr>
<td>TIMER</td>
<td>ACCU-SPLIT</td>
<td>ACT2</td>
<td>07/04</td>
<td>07/05</td>
</tr>
<tr>
<td>TEMPERATURE READOUT</td>
<td>OMEGA</td>
<td>43P</td>
<td>03/04</td>
<td>03/05</td>
</tr>
<tr>
<td>TEMPERATURE RECORDER</td>
<td>OMEGA</td>
<td>CT91</td>
<td>03/04</td>
<td>03/05</td>
</tr>
<tr>
<td>SPRAY SYSTEM</td>
<td>GTL</td>
<td>N/A</td>
<td>BEFORE USE</td>
<td>BEFORE USE</td>
</tr>
<tr>
<td>ANEMOMETER</td>
<td>HASTINGS</td>
<td>RM-1, 46</td>
<td>05/04</td>
<td>05/05</td>
</tr>
<tr>
<td>CYCLE COUNTER</td>
<td>GTL</td>
<td>GTL</td>
<td>BEFORE USE</td>
<td>BEFORE USE</td>
</tr>
<tr>
<td>SOFT WATER</td>
<td>N/A</td>
<td>N/A</td>
<td>02/04</td>
<td>02/05</td>
</tr>
<tr>
<td>TACHOMETER</td>
<td>MONARCH</td>
<td>ACT-3</td>
<td>07/04</td>
<td>07/05</td>
</tr>
<tr>
<td>TEST DUST</td>
<td>AC</td>
<td>GM FINE</td>
<td>CALIBRATED DUST</td>
<td>CALIBRATED BY VENDOR*</td>
</tr>
<tr>
<td>EVENT RECORDER</td>
<td>COMPUTER</td>
<td>GEO1</td>
<td>BEFORE USE</td>
<td>BEFORE USE</td>
</tr>
</tbody>
</table>

*AC Inspection #503, Batch #1943, Measured with particle size roller analyzer.
SECTION 5
PHOTOGRAPHS
SECTION 5

OWNER'S MANUAL INFORMATION
Key slot light

For easy access to the key slot, the key slot light comes on while the interior light is on.

Windshield wipers and washer

To turn on the windshield wipers, move the lever to the desired setting.
The hybrid system must be in the "IGN-ON" mode.

<table>
<thead>
<tr>
<th>Lever position</th>
<th>Speed setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position 1</td>
<td>Intermittent</td>
</tr>
<tr>
<td>Position 2</td>
<td>Slow</td>
</tr>
<tr>
<td>Position 3</td>
<td>Fast</td>
</tr>
</tbody>
</table>

For a single sweep of the windshield, push the lever up and release it.

Twist the interval adjuster upward to increase the wiping time interval between sweeps, and downward to decrease it.

The wiper lever must be in the "INT" position.

To squirt washer fluid, pull the lever toward you and release it.
If the windshield wipers are off, they will operate a couple of times after the washer squirts.

For instructions on adding washer fluid, see "Adding washer fluid" on page 302.

In freezing weather, warm the windshield with the defroster before using the washer. This will help prevent the washer fluid from freezing on your windshield, which can block your vision.

NOTICE
Do not operate the wipers if the windshield is dry. It may scratch the glass.