REPORT NO. 111-KAR-08-005

SAFETY COMPLIANCE TESTING
FOR FMVSS 111

REARVIEW MIRRORS
(Other Than School Buses)

2009 TOYOTA COROLLA LE
4-DOOR SEDAN

NHTSA NO: C95103

PREPARED BY:
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AUGUST 27, 2008

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
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This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, under Contract DTNH22-06-C-00034.

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Date:  August 27, 2008

FINAL REPORT ACCEPTED BY:

Accepted By:  

Acceptance Date:  September 12, 2008
## Abstract

Compliance tests were conducted on the subject 2009 Toyota Corolla LE 4-Door Sedan on August 1, 2008 through August 27, 2008 in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP111V-00 for the determination of FMVSS 111 compliance. There were no apparent test failures.
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<td>Force vs. Displacement and Displacement vs. Time -45°/90°</td>
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<td>B-4</td>
<td>Force vs. Displacement and Displacement vs. Time -45°/45°</td>
</tr>
<tr>
<td>B-5</td>
<td>Force vs. Displacement and Displacement vs. Time 45°/45°</td>
</tr>
<tr>
<td>B-6</td>
<td>Force vs. Displacement and Displacement vs. Time 45°/45°</td>
</tr>
<tr>
<td>B-7</td>
<td>Force vs. Displacement and Displacement vs. Time -45°/-45°</td>
</tr>
</tbody>
</table>
1. PURPOSE OF COMPLIANCE TEST

Tests were conducted on a 2009 Toyota Corolla LE 4-Door Sedan, manufactured by Toyota Motor Company, to determine compliance with FMVSS 111, “Rearview Mirrors (Other than School Buses)”. The purpose of this standard is to reduce the number of deaths and injuries that occur when the driver of a motor vehicle does not have a clear and reasonably unobstructed view to the rear.

All tests were conducted based on the current National Highway Traffic Safety Administration (NHTSA), Office of Vehicle Safety Compliance (OVSC) Laboratory Procedures, TP111V-00, dated October 28, 1999, and corresponding KARCO Engineering test procedure KTP-111, dated April 18, 2001. Detailed procedures for receiving, inspecting, testing and reporting of test results are described in the test procedures and are not repeated in this report.

This report is organized in sections containing pertinent test information and data tables as follows:

Section 1  Purpose of Compliance Test
Section 2  Compliance Test Procedure and Data Summary
Section 3  Test Results
Appendix A  Photographs
Appendix B  Data Plots
Appendix C  Test Equipment List and Calibration Information
Appendix D  Eylipsipe Location Supplied By Manufacturer
2. COMPLIANCE TEST PROCEDURE AND DATA SUMMARY

A 2009 Toyota Corolla LE 4-Door Sedan was subjected to FMVSS 111 compliance testing. The tests were conducted at KARCO Engineering LLC. in Adelanto, California on August 1, 2008 though August 27, 2008. Summary data is shown on page 24, Data Sheet No. 8. The following tests were performed:

- Inspection
- Mounting Adequacy Test
- Field-of-View Test, Inside Rearview Mirror
- Field-of-View Test, Driver's Side Outside Mirror
- Reflectance Test
- Breakaway Test
- Unit Magnification and Convex Mirror Tests

The tests were conducted per the FMVSS 111 test procedure. The significant aspects of the test procedure are described in the following paragraphs.

A. INSPECTION

Inspect the installation of the inside and outside rearview mirrors.

B. MOUNTING ADEQUACY TEST – ALL REARVIEW MIRRORS

B.1 INSIDE MIRROR (S5.1.2)

Determine that the mirror is securely mounted and determine the positive and negative angles of adjustment for both the vertical and horizontal directions.

B.2 OUTSIDE MIRROR(S) (S5.2.2 and S5.3)

Determine that the mirror(s) is (are) securely mounted. Determine that the driver's side mirror can be tilted in both horizontal and vertical directions from the driver's seated position. Determine that the passenger's side mirror is capable of adjustment by tilting in both the horizontal and vertical directions. Determine the positive and negative angles of adjustment for both horizontal and vertical directions for all outside mirrors. Determine that all outside mirrors are free of sharp points or edges that could contribute to pedestrian injury.
C. FIELD-OF-VIEW TEST – INSIDE REARVIEW MIRROR
   C.1 REQUIREMENTS (S5.1.1)
   The mirror shall provide a field of view with an included horizontal angle measured from the projected eye point of at least 20 degrees, and sufficient vertical angle to provide a view of a level road surface extending to the horizon beginning at a point not greater than 61m (200 feet) to the rear of the vehicle when the vehicle is occupied by the driver and four passengers or the designated occupant capacity, if less. The line of sight may be partially obscured by seated occupants or by head restraints.

   Each car whose inside mirror does not meet the field of view requirements of S5.1.1 shall have an outside mirror of unit magnification or a convex mirror installed on the passenger’s side. (S5.3)

D. FIELD-OF-VIEW TEST, DRIVER’S SIDE OUTSIDE REARVIEW MIRROR
   D.1 REQUIREMENTS (S5.2)
   Each passenger car shall have an outside mirror of unit magnification. The mirror shall provide the driver a view of a level road surface extending to the horizon from a line, perpendicular to a longitudinal plane tangent to the driver’s side of the vehicle at the widest point, extending 2.4 meters (8 feet) out from the tangent plane 10.7 meters (35 feet) behind the driver’s eyes, with the seat in the rearmost position. The line of sight may be partially obscured by rear body or fender contours. (S5.2.1)

   Neither the mirror nor the mounting shall protrude farther than the widest part of the vehicle body except to the extent necessary to produce a field of view meeting or exceeding the requirements of S5.2.1. The mirror shall not be obscured by the un-wiped portion of the windshield. (S5.2.2)

E. REFLECTANCE TEST – ALL MIRRORS
   E.1 REQUIREMENT (S11)
   All single reflectance mirrors shall have an average reflectance of at least 35 percent. If a mirror is capable of multiple reflectance levels, the minimum reflectance level in the day mode shall be at least 35 percent and the minimum reflectance level in the night mode shall be at least 4 percent. The average reflectance of any mirror required by this standard shall be determined in accordance with SAE Recommended Practice J964, OCT 84.

F. BREAKAWAY TEST – INSIDE REARVIEW MIRROR
   F.1 REQUIREMENTS (S5.1.2)
   If the mirror is in the head impact area, the mounting shall deflect, collapse, or break away without leaving sharp edges when the reflective surface of the mirror is subjected to a force of 400 N (90 lb) in any forward direction that is not more than 45 degrees from the longitudinal direction.
G. UNIT MAGNIFICATION AND CONVEX MIRROR TESTS

G.1 REQUIREMENTS FOR PASSENGER CARS (S5.3 and S5.4)

The driver's side rearview mirror and the inside rearview mirror shall be unit magnification. If the field-of-view requirements are not met with the inside rearview mirror then the passenger's side rearview mirror is required. It can be either unit magnification or convex.

If the passenger's side mirror is convex, the average radius of curvature shall be not less than 889 mm (35 inches) and not more than 1651 millimeters (65 inches) and shall not deviate from the average by more than plus or minus 12.5 percent. The convex mirror shall have permanently and indelibly marked at the lower edge of the mirror's reflective surface in letters not less than 4.8 mm (3/16 inch) nor more than 6.4 mm (0.25 inch) high the words, "Objects in Mirror Are Closer Than They Appear."
3. TEST DATA

The results of FMVSS 111 compliance tests that were conducted on the 2009 Toyota Corolla LE 4-Door Sedan on August 1, 2008 through August 27, 2008 to determine compliance with FMVSS 111, “Rearview Mirrors (other than School Buses)” are presented in this section.
## TEST VEHICLE ATTITUDES (mm)

<table>
<thead>
<tr>
<th>ATTITUDE</th>
<th>LF</th>
<th>RF</th>
<th>LR</th>
<th>RR</th>
</tr>
</thead>
<tbody>
<tr>
<td>As Delivered</td>
<td>688</td>
<td>686</td>
<td>713</td>
<td>714</td>
</tr>
<tr>
<td>As Tested</td>
<td>666</td>
<td>663</td>
<td>662</td>
<td>663</td>
</tr>
<tr>
<td>Rearview Mirror</td>
<td>1249</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Vehicle Information

<table>
<thead>
<tr>
<th>Year</th>
<th>Make</th>
<th>Model</th>
<th>Body Style</th>
<th>NHTSA No.</th>
<th>VIN</th>
<th>Test Date</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>Toyota</td>
<td>Corolla LE</td>
<td>4-Door Sedan</td>
<td>C95103</td>
<td>JTDBL40E29J001449</td>
<td>08/01/08</td>
<td>85°F</td>
</tr>
</tbody>
</table>

**Legend:**  
LE = Left Eye; RE = Right Eye; P = Neck Pivot Point, SRP = Seating Reference Point

**Coordinate System:**  
- X = Longitudinal Dimension  
- Y = Lateral Dimension  
- Z = Vertical Dimension

Positive Values are as follows:  
- X = Forward of Reference Point  
- Y = Outboard of Reference Point (to driver's side)  
- Z = Above Reference Point

Provide Reference Point or Body Fiduciary Point that dimensions below are measured from. (Point should be usable by laboratory personnel, i.e., center of an anchorage bolt, door jam latch, etc.).

<table>
<thead>
<tr>
<th>COORDINATES</th>
<th>LEFT SIDE MIRROR</th>
<th>INSIDE MIRROR</th>
<th>RIGHT SIDE MIRROR</th>
<th>SRP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P1 LE1 RE1</td>
<td>P2 LE2 RE2</td>
<td>P3 LE3 RE3</td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>99.4 113</td>
<td>113.9 91</td>
<td>N/A N/A</td>
<td></td>
</tr>
<tr>
<td>Y</td>
<td>390.9 454.2</td>
<td>406 466.9</td>
<td>N/A N/A</td>
<td></td>
</tr>
<tr>
<td>Z</td>
<td>406.9 406.9</td>
<td>406.8 407</td>
<td>N/A N/A</td>
<td></td>
</tr>
</tbody>
</table>

**Mirror Mfr., Model and Part No.**  
murakami corp. mirror assy  
87940-12c60  
87940-12d80

**SRP Travel and Eye Ellipse**  
Reference Point – Upper Tightening Hole of B Pillar Striker on Driver Side. (See Page 4 of appendix D)
### Data Sheet No. 1… (Continued)

<table>
<thead>
<tr>
<th>Date of Inspection/Identification:</th>
<th>08/01/08</th>
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</thead>
<tbody>
<tr>
<td>Types of Rearview Mirrors:</td>
<td></td>
</tr>
<tr>
<td>Inside Rearview--</td>
<td>Unit Magnification</td>
</tr>
<tr>
<td>Driver’ Side Outside--</td>
<td>Unit Magnification</td>
</tr>
<tr>
<td>Passenger’s Side Outside--</td>
<td>Convex</td>
</tr>
<tr>
<td>Location and Description of Fiducial Marks:</td>
<td>See Previous Page</td>
</tr>
<tr>
<td>Maximum Number of Occupants:</td>
<td>7</td>
</tr>
</tbody>
</table>

**RESULTS OR RECEIVING INSPECTION:**

- PASS - X
- FAIL - 
- CONDITIONAL - 

**CONDITIONS:**

**DISPOSITION/ACTION:**

**REMARKS:**

**RECORDED BY:** JONATHAN WILLIAMS | DATE: 08/27/08

**APPROVED BY:** MICHAEL L. DUNLAP | DATE: 08/27/08
# DATA SHEET NO. 2

## MOUNTING AND TILTING ADEQUACY TEST

### Vehicle Information

<table>
<thead>
<tr>
<th>Year</th>
<th>Make</th>
<th>Model</th>
<th>Body Style</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>Toyota</td>
<td>Corolla LE</td>
<td>4-Door Sedan</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>NHTSA No</th>
<th>VIN</th>
<th>Test Date</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>C95103</td>
<td>JTDBL40E29J001449</td>
<td>08/01/08</td>
<td>65°F</td>
</tr>
</tbody>
</table>

### Mirror Mounting Provides a Stable Support

<table>
<thead>
<tr>
<th>Test Item</th>
<th>Pass</th>
<th>Fail</th>
<th>Conditional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inside Rearview Mirror</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Driver Side Outside Mirror</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passenger Side Outside Mirror</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Outside Mirrors Free of Sharp Points or Edges

<table>
<thead>
<tr>
<th>Test Item</th>
<th>Pass</th>
<th>Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver Side Outside Mirror</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Passenger Side Outside Mirror</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

### Mirror Is Adjustable Vertically & Horizontally

<table>
<thead>
<tr>
<th>Test Item</th>
<th>Pass</th>
<th>Fail</th>
<th>Conditional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inside Rearview Mirror</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Driver Side Outside Mirror</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passenger Side Outside Mirror</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Driver’s Outside Mirror Adjustable from the Driver’s Seated Position

<table>
<thead>
<tr>
<th>Test Item</th>
<th>Pass</th>
<th>Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver Side Outside Mirror</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

### Mirror Adjustment Angle

<table>
<thead>
<tr>
<th>Test Item</th>
<th>V+</th>
<th>V-</th>
<th>H+</th>
<th>H-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inside Rearview Mirror</td>
<td>34°</td>
<td>-59.7°</td>
<td>52°</td>
<td>-58°</td>
</tr>
<tr>
<td>Driver Side Outside Mirror</td>
<td>14.2°</td>
<td>-4.6°</td>
<td>13°</td>
<td>-4°</td>
</tr>
<tr>
<td>Passenger Side Outside Mirror</td>
<td>114.2°</td>
<td>-4.7°</td>
<td>33°</td>
<td>-19°</td>
</tr>
</tbody>
</table>

### Mirror Provides a View to the Rear Along Both Sides of the Vehicle

<table>
<thead>
<tr>
<th>Test Item</th>
<th>Pass</th>
<th>Fail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver Side Outside Mirror</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Passenger Side Outside Mirror</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

**Test Status:** PASSED — X FAILED —

**Recorded By:** JONATHAN WILLIAMS  
**Date:** 08/27/08

**Approved By:** MICHAEL L. DUNLAP  
**Date:** 08/27/08
DATA SHEET NO. 3
FIELD OF VIEW TEST - INSIDE REARVIEW MIRROR

Vehicle Information

<table>
<thead>
<tr>
<th>Year</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make</td>
<td>Toyota</td>
</tr>
<tr>
<td>Model</td>
<td>Corolla LE</td>
</tr>
<tr>
<td>Body Style</td>
<td>4-Door Sedan</td>
</tr>
<tr>
<td>NHTSA No.</td>
<td>C95103</td>
</tr>
<tr>
<td>VIN</td>
<td>JTDBL40E29J001449</td>
</tr>
<tr>
<td>Test Date</td>
<td>08/01/08</td>
</tr>
<tr>
<td>Temperature</td>
<td>85°F</td>
</tr>
</tbody>
</table>

E  Distance from center of mirror to projected eye point location = 660.0 mm
A  Distance from rear of vehicle to projected eye point location = 3301.0 mm
X1 Distance from rear of vehicle to field of view grid = 8417.0 mm
Z1 Vertical distance to lowest point of field of view at distance X1 = 295.0 mm
Z2 Height of center of mirror = 1249.0 mm
X2 Distance from rear of vehicle where the road surface is first visible

\[ X2 = \frac{Z2 \times X1 + Z1 \times A}{Z2 - Z1} \]

(S111 REQUIREMENT = 61m maximum)

\[ 12040.5 \text{ mm (12.04 m)} \]

<table>
<thead>
<tr>
<th>EYE LOCATION</th>
<th>MONOCULAR DATA (ALR &amp; ARL ARE ANGLES)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>YL (mm)</td>
</tr>
<tr>
<td>LEFT EYE POINT</td>
<td>YLL =2043</td>
</tr>
<tr>
<td>RIGHT EYE POINT</td>
<td>YLR =2808</td>
</tr>
</tbody>
</table>

CALCULATED HORIZONTAL AMBINOCULAR VIEW ANGLE (AB)

\[ \text{ANGLE AB} = \text{ANGLE ALR} + \text{ANGLE ARL} \]

\[ \text{ALR} = \text{TAN} - \frac{1}{[\text{YLR}/(X1 + A)]} \quad \text{ARL} = \text{TAN} - \frac{1}{[\text{YRL}/(X1 + A)]} \]

\[ \text{ANGLE AB} = 27.8° \quad (\text{S111 REQUIREMENT} = 20 \text{ degrees minimum}) \]

TEST STATUS: PASSED — x FAILED —
DATA SHEET NO. 3... (Continued)

INSIDE REARVIEW MIRROR FIELD OF VIEW
TEST GRID AND MARKER SETUP

TOP VIEW

LEFT SIDE VIEW

GROUND LINE

TOP OF REAR WINDOW AT CENTER

E

X1

YRL

ARL

ALR

AB

X2

YLR

Z2

Z1
DATA SHEET NO. 3… (Continued)

DRIVER SIDE MIRROR (S5.2)

MIRROR OBSCURED BY UNWIPED PORTION OF WINDSHIELD
YES _____ NO ___X___

HEIGHT OF TARGET DISC ON MIRROR
___1031 mm___

DISTANCE OF TARGET DISC ON MIRROR FROM VEHICLE TANGENT PLANE
___12 mm___

TARGET DISC LOCATION RELATIVE TO VEHICLE TANGENT PLANE ___INBOARD___
(Inboard or Outboard)

ENTIRE TRIANGULAR TEST TARGET AREA ON SCREEN VISIBLE
YES ___X___ NO _____

MIRROR PROTRUDES BEYOND VEHICLE TANGENT PLANE
YES ___X___ NO _____

PROTRUSION REQUIRED TO MEET FIELD OF VIEW REQUIREMENT
YES ___X___ NO _____

TEST STATUS: PASSED — ___X___ FAILED —

PASSENGER SIDE MIRROR (S5.3 or MFG. OPTION)

PASSENGER SIDE MIRROR TYPE (convex or unit magnification) ___CONVEX___

REMARKS:

VEHICLE ATTITUDE AND GROUND LEVEL WERE RAISED 4” (101.6) TO PERFORM THE TEST.

RECORDED BY: JONATHAN WILLIAMS DATE: 08/27/08

APPROVED BY: MICHAEL L. DUNLAP DATE: 08/27/08
DATA SHEET NO. 3... (Continued)
DATA SHEET NO. 3... (Continued)

DRIVER SIDE OUTSIDE MIRROR TARGET DISC LOCATION WITH X AND H DIMENSIONS

![Diagram of driver side outside mirror target disc location with X and H dimensions.]

2.4 m (8')

DRIVER SIDE OUTSIDE MIRROR REQUIRED FIELD OF VIEW TRIANGLE

![Diagram of driver side outside mirror required field of view triangle.]

PLANE TANGENT TO WIDEST POINT OF VEHICLE AND PARALLEL TO VEHICLE CENTERLINE

\[ X = \text{distance center of target on mirror reflecting surface is inboard from tangent plane} \]

\[ H = \text{height of center of target on mirror reflecting surface above ground plane} \]

NOTE: TO BE CONSTRUCTED ON WHITE SCREEN OF SUITABLE SIZE.

BLACK TAPE OUTLINING FIELD OF VIEW

TARGET MARKING CORNERS OF FIELD OF VIEW
DATA SHEET NO. 4  
REFLECTANCE TEST

Vehicle Information

<table>
<thead>
<tr>
<th>Year</th>
<th>Make</th>
<th>Model</th>
<th>Body Style</th>
<th>NHTSA No</th>
<th>VIN</th>
<th>Test Date</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>Toyota</td>
<td>Corolla LE</td>
<td>4-Door Sedan</td>
<td>C95103</td>
<td>JTDBL40E29J001449</td>
<td>08/12/08</td>
<td>70°F</td>
</tr>
</tbody>
</table>

DESCRIPTION OF TEST APPARATUS:  THE APPARATUS CONSISTS OF AN INCANDESCENT TUNGSTEN FILAMENT LAMP OPERATING AT A NOMINAL COLOR TEMPERATURE OF 2,856 K, COLLIMATING OPTICS, A SAMPLE HOLDER POSITIONED AT 25°, A SILICON PHOTOCELL, AND A FLUKE 45 DUAL DISPLAY MULTIMETER (CALIBRATION DUE DATE 3-26-08). REFLECTANCE TESTS ARE CONDUCTED IN A 4’X6’ WOODEN CABINET PAINTED FLAT BLACK. FOR CONVEX MIRROR A 6” INTEGRATING SPHERE WAS INCORPORATED INTO THE RECEIVER.

MIRROR DESCRIPTION:  INTERIOR DAY/NIGHT REARVIEW MIRROR

VOLTAGE READING FROM CALIBRATION (Average Value):  \[282.0 \text{ mV}\]

VOLTAGE READING FROM LIGHT REFLECTED BY DAY MIRROR (Average Value):  \[270.0 \text{ mV}\]

<table>
<thead>
<tr>
<th>REFLECTOMETER VOLTAGE READINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAY MIRROR</td>
</tr>
<tr>
<td>TEST NO. 1</td>
</tr>
<tr>
<td>TEST NO. 2</td>
</tr>
<tr>
<td>TEST NO. 3</td>
</tr>
<tr>
<td>TEST NO. 4</td>
</tr>
<tr>
<td>TEST NO. 5</td>
</tr>
</tbody>
</table>

REFLECTANCE (Day) = Voltage (Refl)/Voltage (Cal) = \[0.957\] \times 100 = \[95.7\] percent  
(Min. Required = 35%)

VOLTAGE READING FROM CALIBRATION (Average Value) = \[282 \text{ mV}\]

VOLTAGE READING FROM LIGHT REFLECTED BY NIGHT MIRROR (Average Value):  \[194.4 \text{ mV}\]

REFLECTANCE (Night) = Voltage (Refl)/Voltage (Cal) = \[0.689\] \times 100 = \[68.9\] percent  
(Min. Required = 4%)

NOTE: If meter reading directly in percent is used, record only percent.
MIRROR DESCRIPTION: DRIVER SIDE OUTSIDE MIRROR.

VOLTAGE READING FROM CALIBRATION (Average Value): 283.0 mV

VOLTAGE READING FROM LIGHT REFLECTED BY DAY MIRROR (Average Value): 261.0 mV

<table>
<thead>
<tr>
<th>REFLECTOMETER VOLTAGE READINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEST NO. 1</td>
</tr>
<tr>
<td>TEST NO. 2</td>
</tr>
<tr>
<td>TEST NO. 3</td>
</tr>
<tr>
<td>TEST NO. 4</td>
</tr>
<tr>
<td>TEST NO. 5</td>
</tr>
</tbody>
</table>

REFLECTANCE (Day) = Voltage (Refl)/Voltage (Cal) = 0.922 x 100 = 92.2 percent  
(Min. Required = 35%)

NOTE: If meter reading directly in percent is used, record only percent

TEST STATUS: PASSED — X FAILED —
DATA SHEET NO. 4... (Continued)

MIRROR DESCRIPTION: **PASSENGER SIDE OUTSIDE MIRROR.**

VOLTAGE READING FROM CALIBRATION (Average Value): **342 mV**

VOLTAGE READING FROM LIGHT REFLECTED BY DAY MIRROR (Average Value): **341 mV**

<table>
<thead>
<tr>
<th>REFLECTOMETER VOLTAGE READINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEST NO. 1</td>
</tr>
<tr>
<td>341 mV</td>
</tr>
<tr>
<td>TEST NO. 2</td>
</tr>
<tr>
<td>341 mV</td>
</tr>
<tr>
<td>TEST NO. 3</td>
</tr>
<tr>
<td>341 mV</td>
</tr>
<tr>
<td>TEST NO. 4</td>
</tr>
<tr>
<td>341 mV</td>
</tr>
<tr>
<td>TEST NO. 5</td>
</tr>
<tr>
<td>341 mV</td>
</tr>
</tbody>
</table>

**REFLECTANCE (Day) = Voltage (Refl)/Voltage (Cal) = 0.997** x 100 = **99.7** percent

**REFERANCE MIRROR VALUE 93.4 X 99.7** (reflectance value) = **93.1%**

(Min. Required = 35%)

NOTE: If meter reading directly in percent is used, record only percent

<table>
<thead>
<tr>
<th>TEST STATUS:</th>
<th>PASSED —</th>
<th>N/A</th>
<th>FAILED —</th>
</tr>
</thead>
</table>

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111-KAR-08-005
**DATA SHEET NO. 5**  
**BREAKAWAY TEST - INSIDE REARVIEW MIRROR**

### Vehicle Information

<table>
<thead>
<tr>
<th>Year</th>
<th>Make</th>
<th>Model</th>
<th>Body Style</th>
<th>NHTSA No</th>
<th>VIN</th>
<th>Test Date</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>Toyota</td>
<td>Corolla LE</td>
<td>4-Door Sedan</td>
<td>C95103</td>
<td>JTDBL40E29J001449</td>
<td>08/27/08</td>
<td>63°F</td>
</tr>
</tbody>
</table>

**MOUNTING OF MIRROR (INSIDE) DESCRIPTION:** **TAB GLUED TO WINDSHIELD. MIRROR BASE SLIPS OVER BASE AND HELD IN PLACE WITH LOCKING SCREW.**

(Requirement: the mirror shall deflect, collapse or break away when it is subjected to a force of 400 N or less)

<table>
<thead>
<tr>
<th>TEST NO.</th>
<th>LOAD DIRECTION VERTICAL/HORIZONTAL</th>
<th>MAXIMUM FORCE (N)</th>
<th>DISPLACEMENT (MM)</th>
<th>PASS</th>
<th>FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0-90 DEGREES</td>
<td>96.8</td>
<td>10.9</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>+45/90 DEGREES</td>
<td>234.1</td>
<td>51.0</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>-45/90 DEGREES</td>
<td>140.9</td>
<td>13.9</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>-45/+45 DEGREES</td>
<td>82.0</td>
<td>22.0</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>+45/+45 DEGREES</td>
<td>92.3</td>
<td>29.0</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>+45/-45 DEGREES</td>
<td>82.6</td>
<td>21.3</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>-45/-45 DEGREES</td>
<td>135.9</td>
<td>51.3</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

**REMARKS:**
BREAKAWAY TEST - INSIDE REARVIEW MIRROR FAILURE TYPE – DESCRIPTION:

FAILURE TYPE – DESCRIPTION:

NONE

TEST STATUS: PASSED — X FAILED —

REMARKS:

RECORDED BY: JONATHAN WILLIAMS DATE: 08/27/08

APPROVED BY: MICHAEL L. DUNLAP DATE: 08/27/08
DATA SHEET NO. 6
UNIT MAGNIFICATION AND CONVEX MIRROR TESTS

Vehicle Information

<table>
<thead>
<tr>
<th>Year:</th>
<th>2009</th>
<th>Make</th>
<th>Toyota</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model:</td>
<td>Corolla LE</td>
<td>Body Style</td>
<td>4-Door Sedan</td>
</tr>
<tr>
<td>NHTSA No:</td>
<td>C95103</td>
<td>VIN</td>
<td>JTDBL40E29J001449</td>
</tr>
<tr>
<td>Test Date:</td>
<td>08/13/08</td>
<td>Temperature:</td>
<td>70°F</td>
</tr>
</tbody>
</table>

DRIVER’S SIDE & INSIDE REARVIEW MIRRORS:

<table>
<thead>
<tr>
<th>DRIVER SIDE MIRROR</th>
<th>TEST POSITION</th>
<th>DIAL READINGS</th>
<th>INSIDE MIRROR</th>
<th>TEST POSITION</th>
<th>DIAL READINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td></td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2</td>
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</tr>
<tr>
<td>3</td>
<td>0</td>
<td></td>
<td>3</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td></td>
<td>4</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td></td>
<td>5</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>6</td>
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<tr>
<td>10</td>
<td>0</td>
<td></td>
<td>10</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

All dial indicator readings for unit magnification mirrors must be zero.
## DATA SHEET NO. 6... (Continued)

**UNIT MAGNIFICATION AND CONVEX MIRROR TESTS**

**PASSENGER SIDE REARVIEW MIRROR:**

**CONVERSION TABLE FROM SPHEROMETER DIAL READING TO RADIUS OF CURVATURE**

<table>
<thead>
<tr>
<th>TEST POSITION</th>
<th>DIAL READINGS (inches) Passenger</th>
<th>RADIUS OF CURVATURE (mm)</th>
<th>DEVIATION BETWEEN THE AVERAGE RADIUS OF CURVATURE AND THE TEST POSITION RADIUS OF CURVATURE (mm)</th>
<th>PERCENT DEVIATION FROM THE AVERAGE RADIUS OF CURVATURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.0051</td>
<td>1374.2</td>
<td>23.8</td>
<td>1.7</td>
</tr>
<tr>
<td>2</td>
<td>0.0051</td>
<td>1400.1</td>
<td>2.1</td>
<td>0.2</td>
</tr>
<tr>
<td>3</td>
<td>0.0054</td>
<td>1323.4</td>
<td>74.6</td>
<td>5.3</td>
</tr>
<tr>
<td>4</td>
<td>0.0048</td>
<td>1488.4</td>
<td>90.4</td>
<td>6.5</td>
</tr>
<tr>
<td>5</td>
<td>0.0053</td>
<td>1348.8</td>
<td>49.2</td>
<td>3.5</td>
</tr>
<tr>
<td>6</td>
<td>0.0049</td>
<td>1458.6</td>
<td>60.6</td>
<td>4.3</td>
</tr>
<tr>
<td>7</td>
<td>0.0053</td>
<td>1348.8</td>
<td>49.2</td>
<td>3.5</td>
</tr>
<tr>
<td>8</td>
<td>0.0048</td>
<td>1488.4</td>
<td>90.4</td>
<td>6.5</td>
</tr>
<tr>
<td>9</td>
<td>0.0053</td>
<td>1348.8</td>
<td>49.5</td>
<td>3.5</td>
</tr>
<tr>
<td>10</td>
<td>0.0051</td>
<td>1400.1</td>
<td>2.1</td>
<td>0.2</td>
</tr>
<tr>
<td><strong>Average Radius of Curvature</strong></td>
<td><strong>1398</strong></td>
<td></td>
<td><strong>Greatest Percent Deviation</strong></td>
<td><strong>6.5</strong></td>
</tr>
</tbody>
</table>

**REMARKS:**
DATA SHEET NO. 6... (Continued)

UNIT MAGNIFICATION AND CONVEX MIRROR TESTS

PASSENGER’S SIDE REARVIEW MIRROR

IF CONVEX, ARE THERE ANY DISCONTINUITIES IN THE SLOPE OF THE MIRROR SURFACE

YES ___ NO X ___

IF CONVEX, ARE THE WORDS, “OBJECTS IN THE MIRROR ARE CLOSER THAN THEY APPEAR” PRESENT

YES X ___ NO ____

IF CONVEX, MEASURE LETTER HEIGHT OF WORDS

_____ 5.0 ____ mm

IF CONVEX, LETTERS ARE NOT < 4.8 mm OR > 6.4 mm HIGH

YES ___ X ___ NO ____

IF CONVEX, RADIUS OF CURVATURE NOT < 889 mm OR > 1651 mm

YES ___ X ___ NO ____

IF CONVEX, THE GREATEST PERCENT DEVIATION FROM AVERAGE RADIUS OF CURVATURE IS ± 12.5 %

YES ___ X ___ NO ____

IF UNIT MAGNIFICATION, ALL DIAL READINGS ARE ZERO ± 0.

YES ___ X ___ NO ____

NOTE: PASSENGER MIRROR NOT REQUIRED

TEST STATUS: PASSED — X FAILED —

RECORDED BY: JONATHAN WILLIAMS DATE: 08/27/08

APPROVED BY: MICHAEL L. DUNLAP DATE: 08/27/08
DATA SHEET NO. 7
MIRROR REFLECTIVE SURFACE AREA TEST

**Vehicle Information**

<table>
<thead>
<tr>
<th>Year:</th>
<th>Make</th>
<th>Model:</th>
<th>Body Style</th>
<th>VIN:</th>
<th>NHTSA No:</th>
<th>Test Date:</th>
<th>Temperature:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>Toyota</td>
<td>Corolla LE</td>
<td>4-Door Sedan</td>
<td>JTDBL40E29J001449</td>
<td>C95103</td>
<td>08/19/08</td>
<td>70°F</td>
</tr>
</tbody>
</table>

MPVs, TRUCKS & BUSES (OTHER THAN SCHOOL BUSES)

DATA TABLE FOR SURFACE AREA

<table>
<thead>
<tr>
<th>MIRRORS</th>
<th>AREA (cm²)</th>
<th>REQUIREMENT</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outside Driver’s Side</td>
<td>187 cm²</td>
<td>126 cm²</td>
<td>323 cm²</td>
</tr>
<tr>
<td>Outside Passenger Side</td>
<td>183 cm²</td>
<td>126 cm²</td>
<td>323 cm²</td>
</tr>
</tbody>
</table>

MIRRORS LOCATED SO AS TO PROVIDE DRIVER A VIEW TO THE REAR:

- LEFT SIDE: YES [X] NO ___
- RIGHT SIDE: YES [X] NO ___

TEST STATUS: PASSED — N/A FAILED —

REMARKS:

RECORDED BY: JONATHAN WILLIAMS DATE: 08/27/08
APPROVED BY: MICHAEL L. DUNLAP DATE: 08/27/08
## Vehicle Information

<table>
<thead>
<tr>
<th>Year:</th>
<th>2009</th>
<th>Make</th>
<th>Toyota</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model:</td>
<td>Corolla LE</td>
<td>Body Style</td>
<td>4-Door Sedan</td>
</tr>
<tr>
<td>NHTSA No:</td>
<td>C95103</td>
<td>VIN</td>
<td>JTDBL40E29J001449</td>
</tr>
<tr>
<td>Test Date:</td>
<td>08/27/08</td>
<td>Temperature:</td>
<td>N/A</td>
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</tbody>
</table>

## PASSENGER VEHICLE TESTING:

<table>
<thead>
<tr>
<th>OUTSIDE DRIVER SIDE MIRROR</th>
<th>PASS</th>
<th>FAIL</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>STABLE SUPPORT</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DOES NOT PROTRUDE BEYOND VEHICLE BODY</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOT OBSCURED BY UNWIPED PORTION OF WINDSHIELD</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADJUSTABLE BY TILTING</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADJUSTABLE FROM DRIVER SEAT</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FREE OF SHARP EDGES</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FIELD-OF-VIEW</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>REFLECTANCE</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UNIT MAGNIFICATION</td>
<td>X</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>INSIDE REARVIEW MIRROR</th>
<th>PASS</th>
<th>FAIL</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>STABLE SUPPORT</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADJUSTABLE BY TILTING</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FIELD-OF-VIEW</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>REFLECTANCE</td>
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<td></td>
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</tr>
<tr>
<td>BREAK AWAY</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UNIT MAGNIFICATION</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OUTSIDE PASSENGER MIRROR*</th>
<th>PASS</th>
<th>FAIL</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>STABLE SUPPORT</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADJUSTABLE BY TILTING</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FREE OF SHARP EDGES</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UNIT OR CONVEX</td>
<td>Convex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LABELING</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>REFLECTANCE</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* MIRROR NOT REQUIRED
APPENDIX A

PHOTOGRAPHS
2009 TOYOTA COROLLA LE
NHTSA NO. C95103
FMVSS NO. 111

FIGURE 1: LEFT FRONT ¾ VIEW
2009 TOYOTA COROLLA LE
NHTSA NO. C95103
FMVSS NO. 111

FIGURE 3: RIGHT REAR ¾ VIEW
MFD. BY: TOYOTA MOTOR CORPORATION 01/08
GVWR 3840LB GAWR FR 2090LB RR 1850LB
THIS VEHICLE CONFORMS TO ALL APPLICABLE
FEDERAL MOTOR VEHICLE SAFETY, BUMPER, AND
THEFT PREVENTION STANDARDS IN EFFECT ON
THE DATE OF MANUFACTURE SHOWN ABOVE.
JTDBL40E29J001449 PASS. CAR
C/TR: 779/FB16 ZRE142L-AEPDKA
A/MT: -05A/U341E MADE IN JAPAN
796 A
<table>
<thead>
<tr>
<th>TIRE</th>
<th>SIZE</th>
<th>COLD TIRE PRESSURE</th>
<th>PRESSION DE GONFLAGE À FROID</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRONT</td>
<td>P195/65R15</td>
<td>210kPa, 30PSI</td>
<td>210kPa, 30PSI</td>
</tr>
<tr>
<td>REAR</td>
<td>P195/65R15</td>
<td>210kPa, 30PSI</td>
<td>210kPa, 30PSI</td>
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<tr>
<td>SPARE</td>
<td>T135/70R16</td>
<td>420kPa, 60PSI</td>
<td>420kPa, 60PSI</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>PNEUS</th>
<th>DIMENSION</th>
<th>PRESSION DE GONFLAGE À FROID</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVANT</td>
<td>P195/65R15</td>
<td>210kPa, 30PSI</td>
</tr>
<tr>
<td>ARRIÈRE</td>
<td>P195/65R15</td>
<td>210kPa, 30PSI</td>
</tr>
<tr>
<td>SECOURS</td>
<td>T135/70R16</td>
<td>420kPa, 60PSI</td>
</tr>
</tbody>
</table>

Le poids total des occupants et du chargement ne doit jamais être supérieur à 370 kg ou 825 lb.

The combined weight of occupants and cargo should never exceed 370 kg or 825 lbs.

SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION

Pour de plus amples informations, voir le manuel du propriétaire.
FIGURE 7: DRIVER SIDE REARVIEW MIRROR AND MOUNTING
2009 TOYOTA COROLLA LE
NHTSA NO. C95103
FMVSS NO. 111

FIGURE 8: PASSENGER SIDE REARVIEW MIRROR AND MOUNTING
2009 TOYOTA COROLLA LE
NHTSA NO. C95103
FMVSS NO. 111

FIGURE 9: INSIDE REARVIEW MIRROR AND MOUNTING
2009 TOYOTA COROLLA LE
NHTSA NO. C95103
FMVSS NO. 111
FIGURE 11: CAMERA SET-UP FOR PHOTOGRAPHING REFERENCE BOARD
2009 TOYOTA COROLLA LE  FIGURE 12: OVERALL SET-UP AND INSTRUMENTATION FOR MIRROR BREAK-AWAY TEST
NHTSA NO. C95103
FMVSS NO. 111
FIGURE 15: MIRROR SET-UP FOR AREA MEASUREMENT
2009 TOYOTA COROLLA LE
NHTSA NO. C95103
FMVSS NO. 111

FIGURE 17: REFERENCE BOARD FOR INSIDE MIRROR, LEFT EYE
FIGURE 19: REFERENCE BOARD FOR INSIDE MIRROR, RIGHT EYE

2009 TOYOTA COROLLA LE
NHTSA NO. C95103
FMVSS NO. 111
2009 TOYOTA COROLLA LE
NHTSA NO. C95103
FMVSS NO. 111

FIGURE 20: LEFT EYE FIELD OF VIEW TEST (DRIVER SIDE MIRROR)
FIGURE 21: RIGHT EYE FIELD OF VIEW TEST (DRIVER SIDE MIRROR)
FIGURE 22: REFERENCE BOARD FOR DRIVER SIDE MIRROR
### Curve Description

<table>
<thead>
<tr>
<th>Force vs. Displacement</th>
<th>CURNO</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>FIL</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Displacement vs. Time</th>
<th>CURNO</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>002</td>
<td>FIL</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Units</th>
<th>Peak Force</th>
<th>Displacement</th>
<th>Filter (Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newtons</td>
<td>96.8</td>
<td>9.5</td>
<td>1</td>
</tr>
</tbody>
</table>

Test Program: 2008 FMVSS 111 Rearview Mirrors  
Test No.: 1  
Test Vehicle: 2009 Toyota Corolla  
No.: C95103  
Test Date: 8/27/08  
Load Direction: 0 / 90
<table>
<thead>
<tr>
<th>Curve Description</th>
<th>CURNO</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Force vs. Displacement</td>
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<td>FIL</td>
</tr>
<tr>
<td>Displacement vs. Time</td>
<td>002</td>
<td>FIL</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Units</th>
<th>Peak Force</th>
<th>Displacement</th>
<th>Filter (Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newtons</td>
<td>234.1</td>
<td>48.4</td>
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</table>

Test Program: 2008 FMVSS 111 Rearview Mirrors  Test No.: 2  
Test Vehicle: 2009 Toyota Corolla  No.: C95103

Load Direction: +45 / 90  
Test Date: 8/25/08
Displacement- mm

<table>
<thead>
<tr>
<th>Curve Description</th>
<th>CURNO</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Force vs. Displacement</td>
<td>001</td>
<td>FIL</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Units</th>
<th>Peak Force</th>
<th>Displacement</th>
<th>Filter (Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newtons</td>
<td>140.9</td>
<td>11.4</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Curve Description</th>
<th>CURNO</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displacement vs. Time</td>
<td>002</td>
<td>FIL</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Units</th>
<th>Max</th>
<th>Time</th>
<th>Displ. Rate (mm/min.)</th>
<th>Filter (Hz)</th>
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</thead>
<tbody>
<tr>
<td>MM</td>
<td>13.9</td>
<td>20.4</td>
<td>36.6</td>
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</tbody>
</table>

Test Program: 2008 FMVSS 111 Rearview Mirrors   Test No.: 3
Test Vehicle: 2009 Toyota Corolla   No.: C95103
Load Direction: -45 / 90
Test Date: 8/25/08
Test Program: 2008 FMVSS 111 Rearview Mirrors  Test No.: 5
Test Vehicle: 2009 Toyota Corolla  No.: C95103
Load Direction: +45 / +45
Test Date: 8/27/08
Test Program: 2008 FMVSS 111 Rearview Mirrors    Test No.: 6
Test Vehicle: 2009 Toyota Corolla No.: C95103
Load Direction: +45 / -45
Test Date: 8/27/08
<table>
<thead>
<tr>
<th>Curve Description</th>
<th>CURNO</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Force vs. Displacement</td>
<td>001</td>
<td>FIL</td>
</tr>
<tr>
<td>Displacement vs. Time</td>
<td>002</td>
<td>FIL</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Units</th>
<th>Peak Force</th>
<th>Displacement</th>
<th>Filter (Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newtons</td>
<td>135.9</td>
<td>50.3</td>
<td>1</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Units</th>
<th>Max</th>
<th>Time</th>
<th>Displ. Rate (mm/min.)</th>
<th>Filter (Hz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MM</td>
<td>51.3</td>
<td>65.0</td>
<td>47.0</td>
<td>1</td>
</tr>
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</table>

Test Program: 2008 FMVSS 111 Rearview Mirrors  Test No.: 7
Test Vehicle: 2009 Toyota Corolla  No.: C95103
Load Direction: -45 / -45
Test Date: 8/27/08
APPENDIX C

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION
<table>
<thead>
<tr>
<th>Description</th>
<th>Manufacturer</th>
<th>Model No.</th>
<th>Serial No.</th>
<th>Limit</th>
<th>Accuracy</th>
<th>Cal. Date</th>
<th>Due Cal.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydraulic Pump</td>
<td>Lincoln</td>
<td>T-3825-C</td>
<td>2460952</td>
<td>8 gpm @ 2700 psi</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Computer</td>
<td>Panasonic</td>
<td>CF-71</td>
<td>8IMA01852</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>TDAS</td>
<td>DTS</td>
<td>TDAS</td>
<td>DM0103</td>
<td>N/A</td>
<td>SAE J211</td>
<td>11/28/07</td>
<td>11/27/08</td>
</tr>
<tr>
<td>Load Cell</td>
<td>Lebow</td>
<td>3167</td>
<td>1573</td>
<td>667 N</td>
<td>± 1.0%</td>
<td>6/20/08</td>
<td>6/20/09</td>
</tr>
<tr>
<td>Displacement Xdcr.</td>
<td>Celesco</td>
<td>PTX101-0030</td>
<td>J0654652</td>
<td>76 CM</td>
<td>± 1.0%</td>
<td>7/1/08</td>
<td>7/1/09</td>
</tr>
</tbody>
</table>

2008 FMVSS 111 Rearview Mirrors
Test Equipment List
8/25/08
2009 Toyota Corolla
APPENDIX D

EYELIPSE LOCATIONS SUPPLIED BY MANUFACTURER
VEHICLE INFORMATION / TEST SPECIFICATIONS
FMVSS No. 111

Vehicle Make/Model/Year: ______________Toyota Corolla 2009________________

Driver’s Eye Reference Points:

Coordinate System:
   X = Longitudinal Dimension
   Y = Lateral Dimension
   Z = Vertical Dimension

Positive Values are as follows:
   X = Forward of Reference Point
   Y = Outboard of Reference Point (to driver’s side)
   Z = Above Reference Point

Provide Reference/Body Fiducial Point that dimensions below are measured from. **Point must be easily accessible and usable by test laboratory personnel, i.e. seat track mounting bolt, seat belt anchorage bolt, door latch at B pillar striker.** (Provide sketch of reference point if necessary.)

Reference Point: Upper tightening hole of B pillar striker on driver side.

Reference Point
## Prism type mirror (NUMMI)

<table>
<thead>
<tr>
<th>COORDINATES</th>
<th>LEFT SIDE MIRROR</th>
<th>INSIDE MIRROR</th>
<th>RIGHT SIDE MIRROR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LE1 (left eye)</td>
<td>RE1 (right eye)</td>
<td>LE2</td>
</tr>
<tr>
<td>X</td>
<td>99.6</td>
<td>114.0</td>
<td>113.7</td>
</tr>
<tr>
<td>Y</td>
<td>391.3</td>
<td>454.7</td>
<td>405.7</td>
</tr>
<tr>
<td>Z</td>
<td>406.8</td>
<td>406.7</td>
<td>406.8</td>
</tr>
</tbody>
</table>

Mirror Mfr., MAGNA DONNELY

<table>
<thead>
<tr>
<th>Model</th>
<th>MIRROR ASSY OUTER RR VIEW, LH</th>
<th>MIRROR ASSY INNER RR VIEW</th>
<th>MIRROR ASSY OUTER RR VIEW, RH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part No.</td>
<td>87940-02870</td>
<td>87940-02A80</td>
<td>87910-02890</td>
</tr>
<tr>
<td></td>
<td>87940-02B30</td>
<td>87810-06080</td>
<td>87910-02B00</td>
</tr>
<tr>
<td></td>
<td>87940-02B40</td>
<td></td>
<td>87910-02B40</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>87910-02B50</td>
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</tbody>
</table>
**EC type mirror (NUMMI)**

<table>
<thead>
<tr>
<th>COORDINATES</th>
<th>LEFT SIDE MIRROR</th>
<th>INSIDE MIRROR</th>
<th>RIGHT SIDE MIRROR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LE1 (left eye)</td>
<td>RE1 (right eye)</td>
<td>LE2</td>
</tr>
<tr>
<td><strong>X</strong></td>
<td>99.6</td>
<td>114.0</td>
<td>113.4</td>
</tr>
<tr>
<td><strong>Y</strong></td>
<td>391.3</td>
<td>454.7</td>
<td>403.7</td>
</tr>
<tr>
<td><strong>Z</strong></td>
<td>406.8</td>
<td>406.7</td>
<td>406.9</td>
</tr>
</tbody>
</table>

- **Mirror Mfr.**
  - MAGNA DONNELLY
  - GENTEX
  - MAGNA DONNELLY

- **Model**
  - MIRROR ASSY OUTER RR VIEW, LH
  - MIRROR ASSY INNER RR VIEW
  - MIRROR ASSY OUTER RR VIEW, RH

- **Part No.**
  - 87940-02870
  - 87940-02A80
  - 87940-02B30
  - 87940-02B40
  - 87810-02130
  - 87910-02890
  - 87910-02B00
  - 87910-02B40
  - 87910-02B50
# Prism type mirror (TMC)

<table>
<thead>
<tr>
<th>COORDINATES</th>
<th>LEFT SIDE MIRROR</th>
<th>INSIDE MIRROR</th>
<th>RIGHT SIDE MIRROR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LE1 (left eye)</td>
<td>RE1 (right eye)</td>
<td>LE2</td>
</tr>
<tr>
<td>X</td>
<td>99.4</td>
<td>113.0</td>
<td>113.9</td>
</tr>
<tr>
<td>Y</td>
<td>390.9</td>
<td>454.2</td>
<td>406.0</td>
</tr>
<tr>
<td>Z</td>
<td>406.9</td>
<td>406.8</td>
<td>406.8</td>
</tr>
</tbody>
</table>

Mirror Mfr., MURAKAMI CORP.

<table>
<thead>
<tr>
<th>Model</th>
<th>MIRROR ASSY OUTER RR VIEW, LH</th>
<th>MIRROR ASSY INNER RR VIEW</th>
<th>MIRROR ASSY OUTER RR VIEW, RH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part No.</td>
<td>87940-12C60 87940-12D80</td>
<td>87810-60191</td>
<td>87910-12C40 87910-12D60</td>
</tr>
</tbody>
</table>