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

GENERAL MOTORS CORP
2004 CHEVROLET MALIBU, PASSENGER CAR
NHTSA NO. C40102

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

JULY 30, 2004
FINAL REPORT
PREPARED FOR
U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
400 SEVENTH STREET, SW
ROOM 6111 (NVS-222)
WASHINGTON, D.C. 20590
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Prepared By: [Signature]
Approved By: [Signature]
Approval Date: 07/30/04

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By: [Signature]
Acceptance Date: 08/19/04
1. Report No. 104-GTL-04-004
2. Government Accession No. N/A
3. Recipient's Catalog No. N/A
5. Report Date July 30, 2004
6. Performing Organ. Code GTL
7. Author(s) Grant Farrand, Project Engineer Debbie Meslock, Project Manager
9. Performing Organization Name and Address General Testing Laboratories, Inc. 1623 Leadstown Road Colonial Beach, Va 22443
10. Work Unit No. (TRAIS) N/A
11. Contract or Grant No. DTNH22-01-C-11025
13. Type of Report and Period Covered Final Test Report July 14, 2004
14. Sponsoring Agency Code NVS-221
15. Supplementary Notes
16. Abstract Compliance tests were conducted on the subject 2004 Chevrolet Malibu 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
17. Key Words Compliance Testing Safety Engineering FMVSS 104
18. Distribution Statement Copies of this report are available from NHTSA Technical Information Services (TIS) Room 2336 (NPO-405) 400 7th St., S.W. Washington, DC 20590 Telephone No. (202) 366-4947
19. Security Classif. (of this report) UNCLASSIFIED
20. Security Classif. (of this page) UNCLASSIFIED
21. No. of Pages 32
22. Price

Form DOT F 1700.7 (8-72)
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SECTION 1
PURPOSE OF COMPLIANCE TEST

1.0 PURPOSE OF COMPLIANCE TEST

A 2004 Chevrolet Malibu 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 Chevrolet Malibu Passenger Car. Nomenclature applicable to the test vehicle are:

A. Vehicle Identification Number: 1G1ZT52814F125082

B. NHTSA No.: C40102

C. Manufacturer: GENERAL MOTORS CORPORATION

D. Manufacture Date: 10/03

1.2 TEST DATE

The test vehicle was subjected to FMVSS No. 104 testing on July 14, 2004.
SECTION 2

COMPLIANCE TEST PROCEDURE AND SUMMARY OF RESULTS

2.0 GENERAL

The 2004 Chevrolet Malibu 4-door passenger car, NHTSA No. C40102 was subjected to FMVSS No. 104 tests on July 14, 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 Chevrolet Malibu.
SUMMARY OF DATA
FMVSS 104, WINDSHIELD WIPING AND WASHING SYSTEMS

VEH. MOD YR/MAKE/MODEL/BODY: 2004 CHEVROLET MALIBU PASSENGER CAR
VEH. NHTSA NO: C40102; VIN: 1G1ZT52614F125082
VEH. BUILD DATE: 10/03; TEST DATE: JULY 14, 2004
TEST LABORATORY: GENERAL TESTING LABORATORIES
OBSERVERS: GRANT FARRAND, JIMMY LATANE

WIPER TYPE: 2 SPEED ELECTRIC WITH DELAY

WASHER TYPE: ELECTRIC PRESSURE PUMP

WINDSHIELD AREAS: A = 1034.3 in²  B = 721.5 in²  C = 238.0 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:

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>WIRED AREA</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>WASHER CAPABILITY</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

RECORDED BY: [Signature]  DATE: 07/16/04
APPROVED BY: [Signature]
FREQUENCY TEST DATA
FMVSS 104 – WINDSHIELD WIPER SYSTEM

VEH. MOD YR/MAKE/MODEL/BODY: 2004 CHEVROLET MALIBU PASSENGER CAR
VEH. NHTSA NO: C40102; VIN: 1G1ZT62814F125082
VEH. BUILD DATE: 10/03; TEST DATE: JULY 14, 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.: 78 °F (50-100°F); Water Temp.: 72 °F (100°F max.)
Manufacturer’s Recommended Engine Idle Speed: 850 rpm

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>850 (idle ± 50 rpm)</td>
<td>211</td>
<td>70.3</td>
</tr>
<tr>
<td>2nd 3 minutes</td>
<td>2000 (2000 rpm ± 50 rpm)</td>
<td>214</td>
<td>71.3</td>
</tr>
</tbody>
</table>

Frequency at least 45 cycles/minute regardless of engine speed: Yes ✗ 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. (45 MINIMUM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st 3 minutes</td>
<td>850 (idle ± 50 rpm)</td>
<td>140</td>
<td>46.6</td>
</tr>
<tr>
<td>2nd 3 minutes</td>
<td>2000 (2000 rpm ± 50 rpm)</td>
<td>135</td>
<td>45</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 ✗ No

REMARKS:

RECORDED BY: [Signature] DATE: 07/14/04
APPROVED BY: [Signature]
VEH. MOD YR/MAKE/MODEL/BODY: 2004 CHEVROLET MALIBU PASSENGER CAR
VEH. NHTSA NO: C40102; VIN: 1G1ZT562814F125082
VEH. BUILD DATE: 10/03; TEST DATE: JULY 14, 2004
TEST LABORATORY: GENERAL TESTING LABORATORIES
OBSERVERS: GRANT FARRAND, JIMMY LATANE

Air Temperature in test area = \(78\) °F (specified range of 50 to 100°F)
Air Velocity at windshield = \(0.2\) mph (specified range of 0 to 1 mph)
Engine speed = \(850\) rpm (manufacturer's recommended idle ± 50 rpm)
Temperature of water spray = \(74\) °F (100°F maximum)
Water spray flow rate = \(70.7\) in³/min. (specified range of 50 to 100 in³/min.)
Windshield wiper frequency = \(45\) 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>92.8%</td>
<td>80%</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>97.2%</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>
</tr>
</tbody>
</table>

REMARKS:

RECORDED BY: [Signature]   DATE: 07/18/04
APPROVED BY: [Signature]
CAPABILITY TEST DATA
FMVSS 104 — WINDSHIELD WASHER SYSTEM

VEH. MOD YR/MAKE/MODEL/BODY: 2004 CHEVROLET MALIBU PASSENGER CAR
VEH. NHTSA NO: C40102; VIN: 1G1ZT52814F125082
VEH. BUILD DATE: 10/03 ; TEST DATE: JULY 14, 2004
TEST LABORATORY: GENERAL TESTING LABORATORIES
OBSERVERS: GRANT FARRAND, JIMMY LATANE

Air Temperature in test area = 80°F (specified range of 70 to 80°F)
Washer reservoir fluid temperature = 75°F (specified range of 70 to 80°F)
Air Velocity at windshield = 2 mph (specified range of 0 to 1 mph)
Engine speed = 850 rpm (manufacturer's recommended idle ± 50 rpm)
Number of windshield washer nozzles on the vehicle = 2

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

TEST RESULTS:

<table>
<thead>
<tr>
<th>WINDSHIELD AREA</th>
<th>TEST 1</th>
<th>TEST 2</th>
<th>AVG</th>
<th>REQ'D*</th>
<th>PASS</th>
<th>FAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>92.8</td>
<td>92.0</td>
<td>92.45</td>
<td>75%</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>97.0</td>
<td>96.5</td>
<td>96.75</td>
<td>75%</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>75%</td>
<td>X</td>
<td></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: 07/16/04
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>
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<tr>
<td>TIMER</td>
<td>ACCU-SPLIT</td>
<td>ACT2</td>
<td>07/04</td>
<td>07/05</td>
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<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>
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<tr>
<td>SPRAY SYSTEM</td>
<td>GTL</td>
<td>N/A</td>
<td>BEFORE USE</td>
<td>BEFORE USE</td>
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<tr>
<td>ANEMOMETER</td>
<td>HASTINGS</td>
<td>RM-1, 48</td>
<td>05/04</td>
<td>05/05</td>
</tr>
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<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</td>
<td>CALIBRATED</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>DUST</td>
<td>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
2004 CHEVROLET MALIBU
NHTSA NO. C40102
FMVSS NO. 104

FIGURE 5.14
CAPABILITY TEST #2 – PRE-COATED WINDSHIELD
FIGURE 5.15
CAPABILITY TEST #2 - PATTERN
Headlamp High/Low-Beam Changer

To change the headlamps from low beam to high beam, push the turn signal/multifunction lever away from you.

When the high beams are on, a light on the instrument panel cluster also will be on if the ignition is in ON.

To change the headlamps from high beam to low beam, pull the turn signal lever toward you.

Headlamps On Reminder

If you open the driver's door and turn off the ignition while leaving the lamps on, you will hear a warning chime.

Flash-to-Pass Feature

This feature lets you use your high-beam headlamps momentarily to signal a driver in front of you that you want to pass.

To use it, pull the turn signal/multifunction lever toward you until the high-beam headlamps come on, then release the lever to turn them off.

Windshield Wipers

Use this lever located on the right side of the steering wheel to operate the windshield wipers.

〇 (Off): Move the lever to this position to turn off the windshield wipers.

 Interr (Intermittent): Move the lever to this position to choose a delayed wiping cycle. Turn the intermittent adjust bead down for a longer delay or up for a shorter delay. The wiper speed can only be manually adjusted when the lever is in this position.

Speed Sensitive Wipers): Move the lever to this position for speed sensitive operation. When you select this position, the delay will change with your vehicle's speed. The delay will decrease as you go faster and increase as you go slower.
(Low Speed): Move the lever up to the first setting past intermittent, for steady wiping at low speed.

(High Speed): Move the lever up to the second setting past intermittent, for wiping at high speed.

(Mist): Move the lever all the way down to this position for a single wiping cycle. Hold it there until the windshield wipers start, then let go. The windshield wipers will stop after one wipe. If you want more wipes, hold the lever down longer.

Remember that damaged wiper blades may prevent you from seeing well enough to drive safely. To avoid damage, be sure to clear ice and snow from the wiper blades before using them.

If they’re frozen to the windshield, carefully loosen or thaw them. If your blades do become damaged, get new blades or blade inserts.

Heavy snow or ice can overload your wiper motor.
A circuit breaker will stop the motor until it cools.
Clear away snow or ice to prevent an overload.
If the motor gets stuck, turn the wipers off, clear away the snow or ice, and then turn the wipers back on.

As an added safety feature, if the wipers are on for more than thirty seconds, the vehicle’s headlamps will turn off automatically. They will turn off when the wipers are turned off.

Windshield Washer
To wash your windshield, push in the button at the end of the stalk until the washers begin.

⚠️ CAUTION:

In freezing weather, do not use your washer until the windshield is warmed. Otherwise the washer fluid can form ice on the windshield, blocking your vision.

When you release the button, the washers will stop, but the wipers will continue to wipe for about three cycles and will either stop or will resume the speed you were using before.

Cruise Control
If your vehicle has cruise control, you can maintain a speed of about 25 mph (40 km/h) or more without keeping your foot on the accelerator. This can really help on long trips. Cruise control does not work at speeds below 25 mph (40 km/h).