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

FORD MOTOR CO.
2006 FORD FIVE HUNDRED, PASSENGER CAR
NHTSA NO. C60200

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

AUGUST 17, 2006

FINAL REPORT

PREPARED FOR

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NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
400 SEVENTH STREET, SW
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NHTSA No. C60200

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SECTION 1
PURPOSE OF COMPLIANCE TEST

1.0 PURPOSE OF COMPLIANCE TEST

A 2006 Ford Five Hundred 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 26 June 1996 and General Testing Laboratories, Inc. (GTL) Test Procedure, TP-104-08A dated 4 April 1997.

1.1 The test vehicle was a 2006 Ford Five Hundred Passenger Car. Nomenclature applicable to the test vehicle are:

A. **Vehicle Identification Number:** 1FAP23106G104130

B. **NHTSA No.:** C60200

C. **Manufacturer:** FORD MOTOR COMPANY

D. **Manufacture Date:** 07/05

1.2 TEST DATE

The test vehicle was subjected to FMVSS No. 104 testing on June 16, 2006.
SECTION 2

COMPLIANCE TEST PROCEDURE AND SUMMARY OF RESULTS

2.0 GENERAL

The 2006 Ford Five Hundred 4-door passenger car, NHTSA No. C60200 was subjected to FMVSS No. 104 tests on June 16, 2006. 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 2006 Ford Five Hundred.
SUMMARY OF DATA
FMVSS 104, WINDSHIELD WIPING AND WASHING SYSTEMS

VEH. MOD YR/MAKE/MODEL/BODY: 2006 FORD FIVE HUNDRED PASSENGER CAR
VEH. NHTSA NO: C60200; VIN: 1FAFP23106G104130
VEH. BUILD DATE: 07/05 TEST DATE: JUNE 16, 2006
TEST LABORATORY: GENERAL TESTING LABORATORIES
OBSERVERS: GRANT FARRAND, JIMMY LATANE

WIPER TYPE: 2 SPEED ELECTRIC WITH DELAY
WASHER TYPE: HIGH PRESSURE ELECTRIC

WINDSHIELD AREAS: A = 1029.8 in²  B = 693.7 in²  C = 225.4 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>WIPE AREA</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>WASHER CAPABILITY</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

RECORDED BY: G. FARRAND DATE: 08/03/06
APPROVED BY: D. MESSICK
FREQUENCY TEST DATA
FMVSS 104 – WINDSHIELD WIPER SYSTEM

VEH. MOD YR/MAKE/MODEL/BODY: 2006 FORD FIVE HUNDRED PASSENGER CAR
VEH. NHTSA NO: C60200; VIN: 1FAFP23106G104130
VEH. BUILD DATE: 07/05; TEST DATE: JUNE 16, 2006
TEST LABORATORY: GENERAL TESTING LABORATORIES
OBSERVERS: GRANT FARRAND, JIMMY LATANE

Water Hardness: 7.0 grains/gallon (12 max.); Date Certified: 04/26/06
Water Spray Flow Rate: 65.0 in³/min. (specified range = 50 to 100 in³/min.)
Ambient Air Temp.: 80 ºF (50-100ºF); Water Temp.: 72 ºF (100ºF max.)
Manufacturer’s Recommended Engine Idle Speed: 750 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>750 (idle ± 50 rpm)</td>
<td>216</td>
<td>72</td>
</tr>
<tr>
<td>2nd 3 minutes</td>
<td>2000 (2000 rpm ± 50 rpm)</td>
<td>220</td>
<td>73</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>750 (idle ± 50 rpm)</td>
<td>146</td>
<td>48.7</td>
</tr>
<tr>
<td>2nd 3 minutes</td>
<td>2000 (2000 rpm ± 50 rpm)</td>
<td>148</td>
<td>49.3</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: G. FARRAND DATE: 06/16/06
APPROVED BY: D. MESSICK
WIPED AREA TEST DATA
FMVSS 104 – WINDSHIELD WIPER SYSTEM

VEH. MOD YR/MAKE/MODEL/BODY: 2006 FORD FIVE HUNDRED PASSENGER CAR
VEH. NHTSA NO: C60200; VIN: 1FAFP23106G104130
VEH. BUILD DATE: 07/05; TEST DATE: JUNE 16, 2006
TEST LABORATORY: GENERAL TESTING LABORATORIES
OBSERVERS: GRANT FARRAND, JIMMY LATANE

Air Temperature in test area = 80 ºF (specified range of 50 to 100ºF)

Air Velocity at windshield = .5 mph (specified range of 0 to 1 mph)

Engine speed = 750 rpm (manufacturer’s recommended idle ± 50 rpm)

Temperature of water spray = 72 ºF (100º F maximum)

Water spray flow rate = 65 in³/min. (specified range of 50 to 100 in³/min.)

Windshield wiper frequency = 72 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>95.9%</td>
<td>80%</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>99.5%</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: G. FARRAND DATE: 08/03/06
APPROVED BY: D. MESSICK
CAPABILITY TEST DATA
FMVSS 104 – WINDSHIELD WASHER SYSTEM

VEH. MOD YR/MAKE/MODEL/BODY: 2006 FORD FIVE HUNDRED PASSENGER CAR
VEH. NHTSA NO: C60200; VIN: 1FAFP23106G104130
VEH. BUILD DATE: 07/05; TEST DATE: JUNE 16, 2006
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 = 78 °F (specified range of 70 to 80°F)
Air Velocity at windshield = .5 mph (specified range of 0 to 1 mph)
Engine speed = 750 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 X No

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>97.9</td>
<td>97.9</td>
<td>97.9</td>
<td>75%</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>99.9</td>
<td>99.9</td>
<td>99.9</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: G. FARRAND DATE: 08/03/06
APPROVED BY: D MESSICK
## 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>04/06</td>
<td>04/07</td>
</tr>
<tr>
<td>TEMPERATURE READOUT</td>
<td>OMEGA</td>
<td>43P</td>
<td>04/06</td>
<td>04/07</td>
</tr>
<tr>
<td>TEMPERATURE RECORDER</td>
<td>OMEGA</td>
<td>CT91</td>
<td>04/06</td>
<td>04/07</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>AIR VELOCITY METER</td>
<td>OMEGA</td>
<td>HHF-616</td>
<td>04/06</td>
<td>04/07</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>04/06</td>
<td>04/07</td>
</tr>
<tr>
<td>TACHOMETER</td>
<td>MONARCH</td>
<td>ACT-3</td>
<td>04/06</td>
<td>04/07</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
2006 FORD FIVE HUNDRED
NHTSA NO. C60200
FMVSS NO. 104

FIGURE 5.1
RIGHT SIDE VIEW OF VEHICLE
2006 FORD FIVE HUNDRED
NHTSA NO. C60200
FMVSS NO. 104

FIGURE 5.3
¾ FRONTAL VIEW FROM LEFT SIDE OF VEHICLE
MFD. BY FORD MOTOR CO.

DATE: 07/05
FRONT GAWR: 1145KG/2525LB
REAR GAWR: 1066KG/2350LB
GVWR: 2177KG/4800LB

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY, BUMPER, AND THEFT PREVENTION STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

VIN: 1FAFP23106G104130 TYPE: Passenger Car
MAXIMUM LOAD = OCCUPANTS + LUGGAGE = 430KG/950LB
OCCUPANTS = 5 TOTAL: 2 FRONT, 3 REAR

TIRE (FR): P215/60R17
(RR): P215/60R17
PRESSURE (FR): 220 kPa/32 PSI COLD
(RR): 220 kPa/32 PSI COLD

RIMS (FR): 17X7.0
( RR): 17X7.0

1FAFP23106G104130

TRAILER TOWING - SEE OWNER GUIDE
EXT PNT: G2
INT TR: TR

FIGURE 5.5
VEHICLE CERTIFICATION LABEL
<table>
<thead>
<tr>
<th>SEATING CAPACITY</th>
<th>TOTAL: 5</th>
<th>FRONT: 2</th>
<th>REAR: 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORIGINAL TIRE SIZE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FRONT</td>
<td>P215/60R17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>REAR</td>
<td>P215/60R17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPARE TIRE SIZE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T135/90D17</td>
<td></td>
<td></td>
<td>415 KPA, 60 PSI</td>
</tr>
<tr>
<td>COLD TIRE INFLATION PRESSURE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FRONT</td>
<td></td>
<td></td>
<td>220 KPA, 32 PSI</td>
</tr>
<tr>
<td>REAR</td>
<td></td>
<td></td>
<td>220 KPA, 32 PSI</td>
</tr>
</tbody>
</table>

The combined weight of occupants and cargo should never exceed 43 kg or 950 lbs.
FIGURE 5.8
EQUIPMENT SET-UP
2006 FORD FIVE HUNDRED
NHTSA NO. C60200
FMVSS NO. 104

FIGURE 5.9
WIPE AREA TEST
2006 FORD FIVE HUNDRED
NHTSA NO. C60200
FMVSS NO. 104

FIGURE 5.13
CAPABILITY TEST #2 IN PROGRESS
SECTION 6
OWNER’S MANUAL INFORMATION
Driver Controls

MULTI-FUNCTION LEVER

Windshield wiper: For intermittent operation, move control up one position.
Adjust the rotary control to the desired speed setting.

Mist function: To activate mist, push control down from the OFF position and release to get one wipe.

For normal or low speed wiper operation, move control up two positions from OFF.
For high speed wiper operation, move control up three positions from OFF.

Windshield washer: Pull the end of the stalk towards you:
• briefly: causes a single swipe of the wipers without washer fluid.
• a quick pull and hold: the wipers will swipe three times with washer fluid.
• a long pull and hold: the wipers and washer fluid will be activated for up to ten seconds.
Maintenance and Specifications

WINDSHIELD WASHER FLUID

Add fluid to fill the reservoir if the level is low. In very cold weather, do not fill the reservoir completely.

Only use a washer fluid that meets Ford specification WSB-M8B16-A2. Do not use any special washer fluid such as windshield water repellent type fluid or bug wash. They may cause squeaking, chatter noise, streaking and smearing. Refer to Lubricant specifications in this chapter.

State or local regulations on volatile organic compounds may restrict the use of methanol, a common windshield washer antifreeze additive. Washer fluids containing non-methanol antifreeze agents should be used only if they provide cold weather protection without damaging the vehicle's paint finish, wiper blades or washer system.

⚠️ If you operate your vehicle in temperatures below 40°F (4.5°C), use washer fluid with antifreeze protection. Failure to use washer fluid with antifreeze protection in cold weather could result in impaired windshield vision and increase the risk of injury or accident.

Note: Do not put washer fluid in the engine coolant reservoir. Washer fluid placed in the cooling system may harm engine and cooling system components.

CHANGING THE WIPER BLADES

1. Pull the wiper arm away from the vehicle. Turn the blade 90 degrees from the wiper arm and remove it from the arm.

2. Attach the new wiper to the wiper arm by turning it 90 degrees it into place.

Replace wiper blades at least once per year for optimum performance. Poor wiper quality can be improved by cleaning the wiper blades and the windshield, refer to Windows and wiper blades in the Cleaning chapter.