DTC P0340/P0344/P0345/P0349—4.6L 3V AND 5.4L 3V | TSB 06-19-12

FORD:
2005-2006 Mustang
2004-2005 F-150
2005-2006 Expedition, F-Super Duty
2006 Explorer
2007 Explorer Sport Trac

LINCOLN:
2005-2006 Navigator

MERCURY:
2006 Mountaineer

This article supersedes TSB **06-2-9** to add a production fix date for Expedition and Navagator and service parts updated.

ISSUE

Some 2005-2006 F-Super Duty and Expedition/Navigator vehicles built prior to 12/14/2005 and 2004-2005 F-150 vehicles, equipped with 5.4L 3V engine, and 2005-2006 Mustang GT vehicles, equipped with 4.6L 3V engine, may exhibit a diagnostic trouble code (DTC) P0340 and/or P0344; or 2006 Explorer 4dr/Mountaineer and 2007 Explorer Sport Trac vehicles equipped with a 4.6L 3V engine may exhibit a DTC P0345 and/or P0349. This may be due to a malfunctioning diode or open phase connection in the generator.

ACTION

Perform a generator frequency test to diagnose cause of concern. Do not replace the generator unless a frequency test indicates a fault. This TSB provides step-by-step directions for performing a generator frequency test using the WDS oscilloscope function.

SERVICE PROCEDURE

NOTE
USING THE OSCILLOSCOPE TO MEASURE PEAK-TO-PEAK VOLTAGE IS NOT A GOOD INDICATOR OF A FAULTY GENERATOR.

NOTE
ENSURE THERE IS NO BATTERY CHARGER CONNECTED TO THE VEHICLE.

1. Ensure the connections to the battery terminals, engine grounds, and generator B+ are clean and secure.
2. Attach WDS battery cable clamps to battery/battery cables.
3. Turn on WDS.
4. Select the Toolbox Icon, (upper left of WDS screen).
5. Select Oscilloscope and then click OK.
6. Select Channel 1, Auto, Generator Ripple.
7. Select Calculations, Channel 1, Frequency.
8. Select Calculations again.
9. Push the RUN/STOP button. A waveform should display on the screen.
10. Start the vehicle and leave at idle (engine speed less than 800 RPM).
11. Turn on vehicle loads (high beams, blower set on high, heated seats, defroster, etc).
12. Examine the frequency reading on WDS.

NOTE
WDS CAN CALCULATE THE FREQUENCY AUTOMATICALLY. THE CALCULATED FREQUENCY IS LOCATED ON THE LOWER LEFT AREA OF THE OSCILLOSCOPE SCREEN. SOMETIMES THE FREQUENCY CANNOT BE CALCULATED BECAUSE THE WDS CANNOT RECOGNIZE AND MEASURE PEAK VALUES. IF THE WDS CANNOT CALCULATE THE FREQUENCY, IT WILL DISPLAY “INVALID” WHERE THE FREQUENCY READING SHOULD BE. THIS IS NORMAL IF THE RIPPLE VOLTAGE IS TOO LOW.

NOTE: The information in Technical Service Bulletins is intended for use by trained, professional technicians with the knowledge, tools, and equipment to do the job properly and safely. It informs these technicians of conditions that may occur on some vehicles, or provides information that could assist in proper vehicle service. The procedures should not be performed by “do-it-yourselfers”. Do not assume that a condition described affects your car or truck. Contact a Ford, Lincoln, or Mercury dealership to determine whether the Bulletin applies to your vehicle. Warranty Policy and Extended Service Plan documentation determine Warranty and/or Extended Service Plan coverage unless stated otherwise in the TSB article.The information in this Technical Service Bulletin (TSB) was current at the time of printing. Ford Motor Company reserves the right to supercede this information with updates.The most recent information is available through Ford Motor Company’s on-line technical resources.

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13. For a proper visible wave pattern, adjust the voltage scale and time scale until a good wave pattern is visible. Typically, a setting of 1mS/div and 100mV/div is a good starting point and can be adjusted as necessary.

14. Run vehicle until signal is steady. Then select the “RUN/STOP” button to freeze the waveform.

15. Determine if the generator is faulty based on frequency measurement:

NOTE
FREQUENCY IS DEPENDENT ON ENGINE RPM. PERFORM ALL TESTS AT IDLE OR FREQUENCY READINGS WILL BE INACCURATE.

a. Compare the WDS saved waveform to the sample waveforms in Figure 1. If measured ripple frequency is lower than 500 Hz, then generator is faulty and should be replaced. If generator is not faulty proceed to Step 16.

b. If frequency calculation cannot be made by WDS, it can be calculated manually. See MANUALLY CALCULATE FREQUENCY. If calculated ripple frequency is lower than 500 Hz, then generator is faulty and should be replaced. If generator is not faulty proceed to Step 16.

MANUALLY CALCULATE FREQUENCY

- Count the number of complete voltage dips over a given range of divisions on the scope trace
- Divide the number of voltage dips by the number of divisions to get the average voltage dips/division
- Divide the value in Step 2 by the time scale (e.g. 1mS/div = .001 sec/division) to get frequency

NOTE
THIS METHOD OF CALCULATING FREQUENCY IS SLIGHTLY DIFFERENT THAN THE METHOD USED BY WDS, SO THE FREQUENCY MEASUREMENT VS. CALCULATED MAY BE SLIGHTLY DIFFERENT.

16. If the frequency test does not indicate a fault with the generator, proceed with normal Powertrain Controls/Emissions Diagnosis (PC/ED) diagnostics for the DTC. For F-Super Duty vehicles only, if the DTCs are still present after diagnostics, reprogram the powertrain control module (PCM) to the latest calibration using WDS release B38.11 and higher or B39.2 and higher. Calibration files may also be obtained at www.motorcraft.com. This new calibration is not included in the B39 CD. (DO NOT REPROGRAM EXPEDITION/NAVIGATOR, F-150, MUSTANG, EXPLORER, MOUNTAINEER OR EXPLORER SPORT TRAC).

PART NUMBER	PART NAME
5L7Z-10346-CA	Generator - Standard Duty - Expedition/Navigator
7L7Z-10346-B	Generator - Heavy Duty - Expedition/Navigator
7L3Z-10346-A	Generator - F-150
6C3Z-10346-AA	Generator - F-Super Duty
7R3Z-10346-B	Generator - Mustang
6L2Z-10346-AA	Generator - Explorer/Mountaineer
6L2Z-10346-A	Generator - Explorer Sport Trac

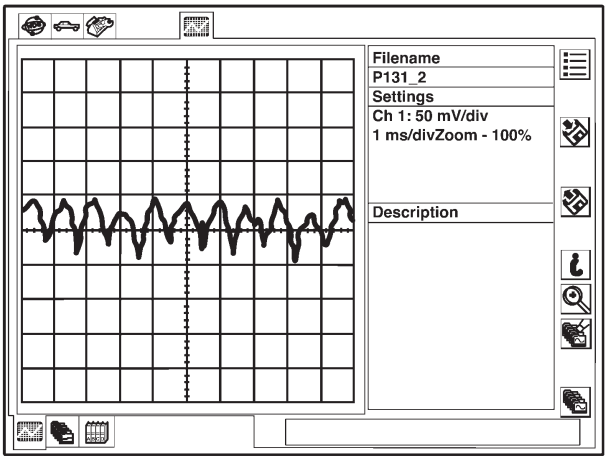
WARRANTY STATUS: Eligible Under Provisions Of New Vehicle Limited Warranty Coverage

OPERATION	DESCRIPTION	TIME
061912A	2005-2006 Expedition/Navigator 5.4L 3V: Diagnose Generator Using WDS, If Generator Is Found Defective Replace Generator (Do Not Use With 10346A, 10200A)	0.8 Hr.
061912B	2005-2006 Super Duty, 2004-2005 F150 5.4L 3V: Diagnose Generator Using WDS, If Generator Is Found Defective Replace Generator (Do Not Use With 10346A, 10200A)	0.9 Hr.
061912C	2005-2006 Super Duty, 5.4L 3V: Diagnose Generator Using WDS, If Generator Is Found To Be Functioning Properly Reprogram The Powertrain Control Module (Do Not Use With 10346A, 10200A, 12650D, 12650D84)	0.6 Hr.

061912D	2005-2006 Mustang 4.6L 3V: Diagnose Generator Using WDS, If Generator Is Found Defective Replace Generator (Do Not Use With 10346A, 10200A, 9926A, 12650D, 12650D84)	0.8 Hr.	**DEALER CODING** BASIC PART NO. 10346	 CONDITION CODE 42
061912E	2006 Explorer/Mountaineer/2007 Explorer Sport Trac 4.6L 3V: Diagnose Generator Using WDS, If Generator Is Found Defective Replace Generator. (Do Not Use With 10346A, 10200A, 9926A, 12650D, 12650D84)	1.1 Hrs.		

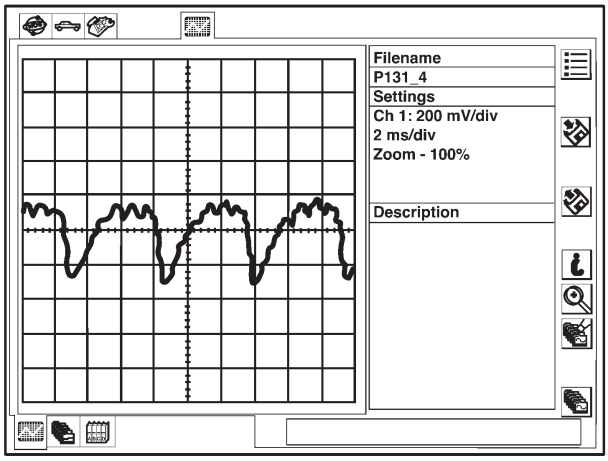
TABLE 1: SAMPLE WDS SCOPE TRACES OF GENERATOR WAVE PATTERNS

TRACE #1: GOOD GENERATOR, IDLE



A GOOD GENERATOR TRACE WILL HAVE A FREQUENCY EQUAL TO OR GREATER THAN 1 kHz

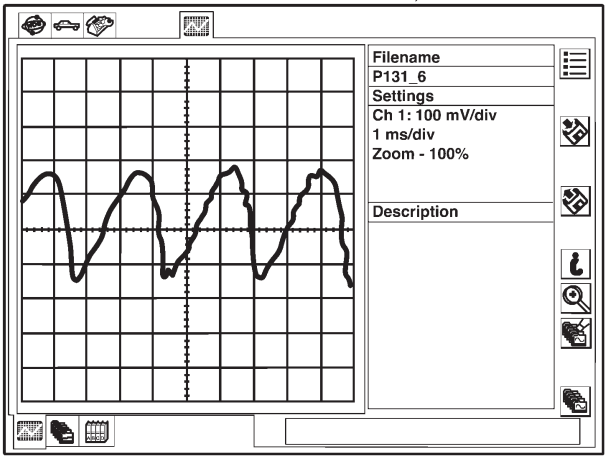
TRACE #2: BAD DIODE, IDLE



BAD DIODE TRACE WILL LOOK LIKE THIS WITH FREQUENCY MUCH LOWER THAN 1kHz

TRACE #3: BAD

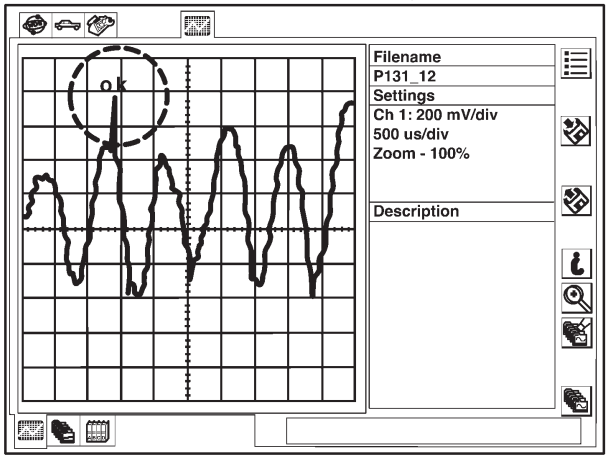
STATOR CONNECTION, IDLE



BAD STATOR CONNECTION TRACE WILL LOOK LIKE THIS WITH FREQUENCY MUCH LOWER THAN 1kHz

TRACE #4: GOOD GENERATOR

LOOSE BATTERY CABLES, IDLE



THIS GENERATOR IS GOOD. INSPECT AND CORRECT CONNECTIONS TO THE BATTERY AND GENERATOR.

NOTE: SPIKE ON WAVEFORM IS NORMAL AND NOT A DEFECTIVE DIODE

TB-8259-B

Figure 1 - Article 06-19-12