

**6.0L—BUILT ON OR BEFORE 9/29/2003—DTCS P006A
OR P132B—LACKS POWER, SURGE, OR FLUTTER
AFTER FIELD SERVICE ACTION 06E17**

TSB 06-24-6

FORD:

2003-2004 Excursion, F-Super Duty

ISSUE

Some 2003-2004 F-Super Duty and Excursion vehicles equipped with the 6.0L engine built on or before 9/29/2003 may experience a P006A or P132B Diagnostic Trouble Code (DTC) with a lack of power condition, surge, or turbocharger flutter after performing Field Service Action (FSA) 06E17, or after recalibrating the vehicle with the inferred Exhaust Pressure (EP) strategy.

ACTION

This procedure is to be used only on vehicles that have received the inferred EP calibration update. There are a variety of reasons why a customer could experience a lacks power condition with the inferred EP calibration. These can include causes a person may not directly see as impacting the condition or codes set. For example; a Mass Air Flow (MAF) / Manifold Air Pressure (MAP) code can be related to a MAF sensor or a MAP sensor problem. However, those codes can be caused by other items such as: intake leaks, exhaust leaks, Exhaust Gas Recirculation (EGR) problems, and aftermarket modifications.

Care should be taken to follow the entire procedure outlined below. Skipping a step may lead to being unable to properly diagnose one of these other conditions setting a code.

SERVICE PROCEDURE

1. Does the vehicle have any aftermarket parts or modifications (intake system, air filter, MAF, turbocharger, and programmer)?
 - a. Yes: Go to Step 2
 - b. No: Go to Step 3
2. Remove the aftermarket parts and reinstall the factory OEM parts and perform the turbo learn procedure under the "Turbo Learn" heading.

3. Using IDS datalogger, has the Powertrain Control Module (PCM) learned the turbocharger strategy?
 - a. VGTLRN_OK =YES and VGTVP_LE greater than 5 (Mature)
 - (1) If the pid shows "Yes" go to Step 5
 - b. VGTLRN_OK = NO or VGTVP_LE less than 5 (Not Mature)
 - (1) If the pid shows "No" perform the turbo learn procedure under the "Turbo Learn" heading and recheck. If the learn still won't mature, go to Step 4.
4. Using IDS datalogger, is the VGTLRN_CNC pid = YES?
 - a. Yes: Verify the vehicle is within the learn "window", if not get into this "window" by verifying the following parameters:
 - (1) Engine Oil Temp (EOT) from 120-250° F (50-120° C)
 - (2) Idle speed from 570 to 780 rpm and steady
 - (3) Vehicle Speed Sensor (VSS) reading 0 MPH
 - (4) Accelerator Pedal Position (APP) sensor below 1.5%
 - (5) EGR is commanded off (EGR DC = 0) and EGR_VP less than 1.2 volts
 - (6) If codes are present go to Step 5
 - b. No: VGTLRN_CNC= NO. The learn parameters are correct and the vehicle should enter the learn. If the vehicle still won't learn, go to Step 5.

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 supersede this information with updates. The most recent information is available through Ford Motor Company's on-line technical resources.

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5. Using IDS, check for DTCs. Is the vehicle setting any codes?
 - a. No codes go to Step 6
 - b. For P132B go to Step 7
 - c. For P006A only go to Step 9
 - d. For any EGR codes only go to Step 10
 - e. For other codes, do not continue with this TSB and follow the appropriate PC/ED lead pinpoint test
6. Perform the 6.0L Performance diagnostic sheet in the Powertrain Controls/Emissions Diagnosis (PC/ED) Section 4, with particular attention to the following:
 - a. Verify the MAP/BARO correlation, are they within 1.0 psi (6.9 kPa) of each other key on engine off (KOEO)? If not, follow pin point test (PPT) H for the BARO sensor and PPT E for the MAP sensor.
 - b. Visually inspect for intake leaks at the air filter housing, breather tube and intake clamps.
 - c. Apply 25 psi (172 kPa) of regulated air pressure to the MAP sensor through the hose. Using IDS datalogger with the MAP and MGP PIDS, verify the MAP sensor is reading the proper pressure change and the MGP is being calculated properly by the PCM. If not, follow the appropriate MAP sensor PPT diagnostic and repair. The MAP sensor should also hold the pressure applied to it until released.
 - a. Verify the MAP hose and EBP tube are unrestricted.
 - b. Remove the intake tube from the turbo inlet. Hook up the smoke machine to the map hose and apply smoke into the intake.
 - c. KOEO active command the EGR valve open allowing the smoke to pass into the exhaust. When smoke starts coming out of the turbo inlet, block it off with the correct size plastic cover supplied with the smoke machine. When smoke starts coming out the tail pipe, block it off with the correct size cap supplied with the smoke machine.
 - d. Remove the EP sensor and hook up a pressure gauge to the port.
 - e. Remove the smoke machine from the map hose and apply shop air pressure to the intake through the map hose until the pressure gauge reads 25 psi (172 kPa).
 - f. Hold the pressure there and inspect for leaks in the charge air cooler and exhaust systems.
 - g. Repair any leaks found.
 - h. If no leaks are found, verify smoke is coming out of the blocked off turbocharger and exhaust, if no smoke, locate and repair restriction and re-smoke the vehicle.
 - (1) If any leaks are found and repaired, or parts replaced the KAM must be cleared and the turbo learn procedure under the "Turbo Learn" heading performed.
 - (2) If no leaks are found, go to Step 8.

NOTE

AFTER 5 SECONDS OF THE MAP PRESSURE BEING 1.5 PSI (10 KPA) ABOVE BARO, A P0069 CODE COULD SET AND THE MGP WILL DEFAULT TO 0. THE PRESSURE WILL NEED TO BE RELEASED AND THE CODE CLEARED TO CONTINUE DIAGNOSTICS..

- d. If no issues are found, go to Step 7

NOTE

IF ANY LEAKS ARE REPAIRED OR PARTS REPLACED THE KEEP ALIVE MEMORY (KAM) MUST BE CLEARED AND THE TURBO LEARN PROCEDURE UNDER THE "TURBO LEARN" HEADING PERFORMED.

7. Smoke test the intake and exhaust systems

8. Perform PC/ED led PPT KA to verify turbo operation.
 - a. If KA passes, go to Step 9.
 - b. If KA fails, refer to any applicable publications for repair.

NOTE

IF ANY LEAKS ARE REPAIRED OR PARTS REPLACED THE KAM MUST BE CLEARED AND THE TURBO LEARN PROCEDURE UNDER THE "TURBO LEARN" HEADING PERFORMED.

9. Verify the MAF reads correctly per the following test:

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- a. Run 4 tests to validate MAF. Take active command of the RPM and VGTDC pid per the following, and record the MAF voltage at each step.
 - b. Before running the MAF test make sure:
 - (1) EOT greater than 185° F (85° C)
 - (2) EGRDC commanded (taking active command) = 0%.
 - (3) 650RPM VGTDC=0%
 - (4) 650RPM VGTDC=85%
 - (5) 1200RPM VGTDC=0%
 - (6) 1200RPM VGTDC=85%
 - c. Compare the voltage to Figures 1 and 2. Outside of MAF limits and/or recorded value is lower than limits, possible causes:
 - (1) MAF sensor
 - (2) Air leak between MAF sensor and turbo
 - (3) Aftermarket Air Intake system
 - (4) Leaking EGR O-ring or gasket
 - (5) Exhaust restriction
 - d. Compare the voltage to Figures 1 and 2. Recorded value is higher than limits, possible causes:
 - (1) MAF sensor
 - (2) Air Leak in the charge air cooler (CAC) system
 - (3) Dirty Air Filter
 - (4) Aftermarket Air Intake System
 - e. Verify the MAP/BARO correlation. Are they within 1.0 psi (6.9 kPa) of each other? If not, follow the appropriate PPT diagnostic and repair.
 - f. Apply 25 psi (172 kPa) of regulated air pressure to the MAP sensor through the hose. Using IDS datalogger with the MAP and MGP PIDS, verify the MAP sensor is reading the proper pressure change and the MGP is being calculated properly by the PCM. If not, follow the appropriate MAP sensor PPT diagnostic and repair.
10. Is the vehicle setting a P006A code along with the P0401 or P0402?
 - a. P0401 faults are associated with CAC system leaks, restricted air filter, intake or exhaust leaks, MAF sensor, IAT 2, turbocharger, EGR valve, and EGR Cooler.
 - b. P0402 faults are associated with un-metered intake leaks, MAF, Turbo, IAT 2, and EGR valve.
 - (1) Yes: Follow the PPT for the EGR code being set. Verify the MAF sensor with the chart in Step 9. Perform PPT KA. If all tests pass, go to Step 7.
 - (2) No: Follow the PPT for the EGR code being set. Perform PPT KA.
 11. Using IDS datalogger, check max boost pressure and MAF volts on a road test.
 - a. The PCM uses MAF as the primary input for MGP. If the MAF is getting close to 4.5 volts, then that is the max MGP the PCM will allow. If boost is low at a high MAF range, active command the VGT_DC during a test drive. If you have arrived at this step and the VGTLRN_OK = no, go back and do Step 4 before proceeding.
 - b. Did boost pressure change?
 - (1) Yes: Go to Step 9
 - (2) No: Perform PPT KA to verify turbo operation and check for CAC leaks as well as for un-metered air leaks, refer to Step 7 for the smoke test. Also verify proper operation of the MAF, refer to the chart in Step 9.
 - c. Is the boost pressure and MAF volts low?
 - (1) Yes: Drop the catalytic converter and retest. If the vehicle runs normal now, inspect the exhaust system for restrictions and perform the turbo learn procedure under the "Turbo Learn" heading. If no change, perform PPT KA.
 - (2) No: Move to next step.
 - d. Is the boost higher than 26 psi?
 - (1) Yes: Perform PPT KA and go to Step 7 of this TSB.

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- (2) No: Vehicle should be operating properly. See note below.

NOTE

IF THE VEHICLE STILL WILL NOT LEARN AND IS SETTING NO CODES, HAS DRIVABILITY CONCERNS AND ALL TESTS PASS, OR IS SETTING CODES AND ALL TESTS PASS, BLANK PATH PROGRAM THE PCM AND PERFORM THE TURBO LEARN PROCEDURE UNDER THE "TURBO LEARN" HEADING.

TURBO LEARN PROCEDURE

NOTE

TO ENSURE THE VEHICLE HAS LEARNED, CLEAR THE KAM BY DISCONNECTING BOTH BATTERIES FOR 5 MIN. LET THE VEHICLE IDLE AND MONITOR PIDS VGTLRN OK AND VGTVP LE. ONCE THE PCM HAS LEARNED, THE VGTLRN OK PID WILL READ YES AND THE VGTVP LE WILL BE AT 6 OR HIGHER. IF NOT, MONITOR PID VGTLRN CNC. IF THE PID READS YES THEN THE CONDITIONS ARE NOT CORRECT FOR THE PCM TO LEARN. THOSE CONDITIONS ARE:

1. EOT from 120-250° F (50-120° C).
2. Idle speed from 570 to 780 rpm.
3. VSS reading 0 MPH.
4. APP below 1.5%.
5. EGR is commanded off (EGR DC = 0).
6. No hard fault DTCs.

NOTE

IF THE ABOVE CONDITIONS ARE NOT MET, THE PCM WILL NOT LEARN THE NEW VGT STRATEGY.

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

DEALER CODING

BASIC PART NO.
RECAL

CONDITION
CODE
04

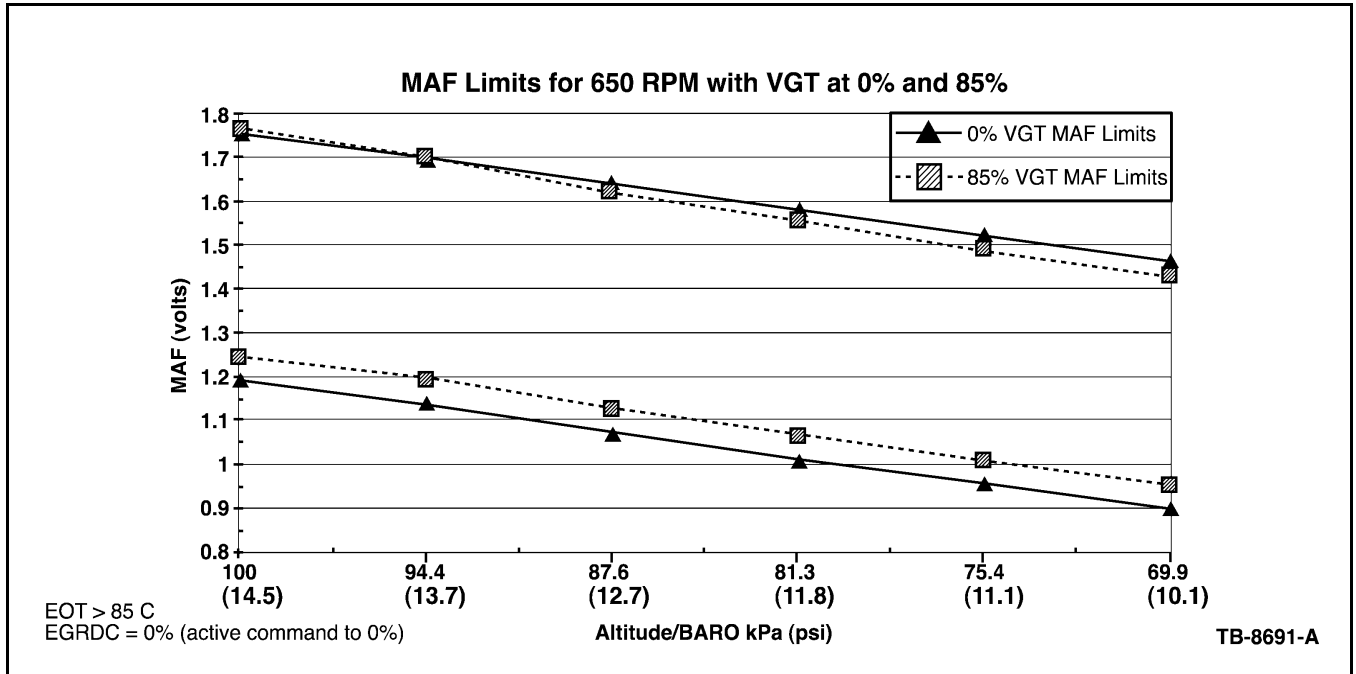


Figure 1 - Article 06-24-6

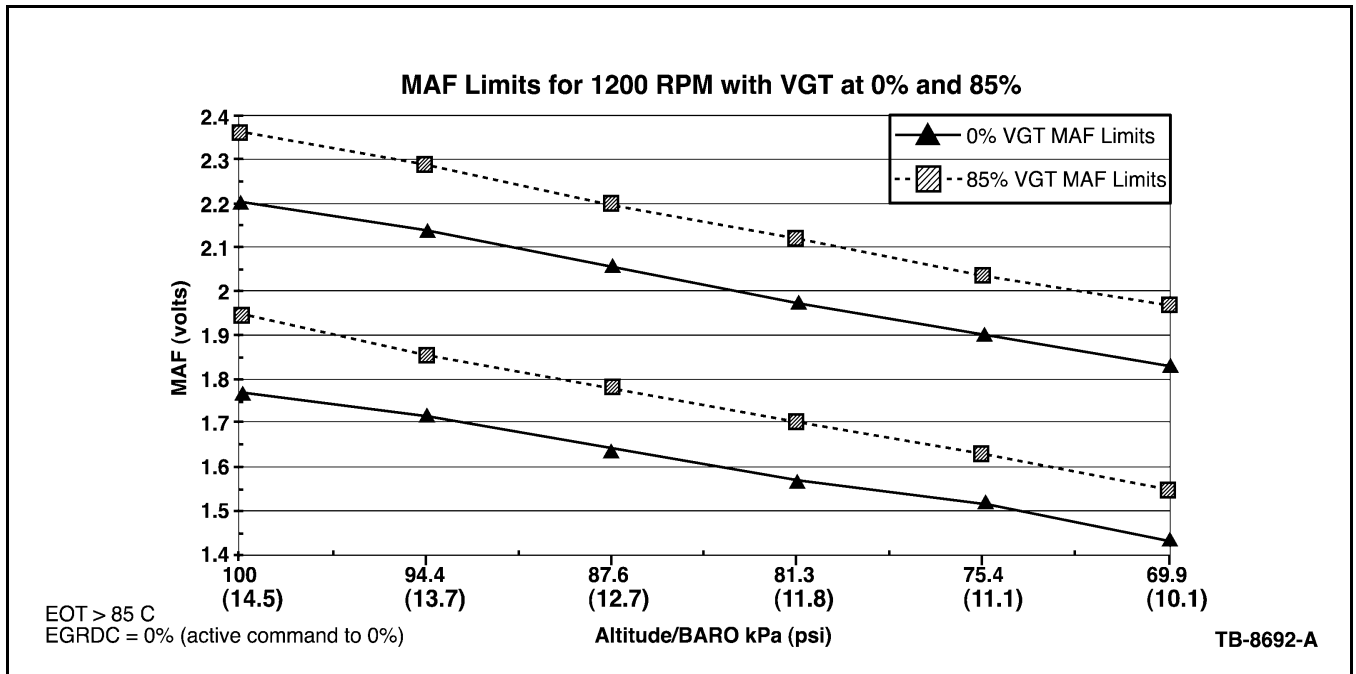


Figure 2 - Article 06-24-6