

6.0L—BUILT ON OR BEFORE 9/29/2003 DTCS P006A, P132B, P0401 OR P0402—LACKS POWER, SURGE, OR FLUTTER AFTER FIELD SERVICE ACTION 06E17

TSB 09-15-6

FORD:

2003-2004 Excursion, F-Super Duty

This article supersedes TSB **06-24-6** to update the Service Procedure.

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, P132B, P0401 or P0402 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. This inferred EP strategy does not use the Exhaust Back Pressure (EBP) sensors input, although the EBP sensor must remain connected to the tube and the wiring harness.

ACTION

Follow the Service Procedure steps to correct the condition.

SERVICE PROCEDURE

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.

1. Does the vehicle have any aftermarket parts or modifications (intake system, air filter, MAF, turbocharger, and/or programmer)?
 - a. Yes - Go to Step 2.
 - b. No - Go to Step 3.

The vehicle may be able to complete the Turbo Learn procedure with the aftermarket modifications present, however, drivability concerns may be present when the vehicle is driven.

2. Remove the aftermarket parts, reinstall the factory OEM parts and then 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 = 6 or higher (Mature), Go to Step 5.
 - b. VGTLRN_OK = NO or VGTVP_LE = 5 or less (Not Mature), perform the turbo learn procedure under the Turbo Learn heading and recheck. If the learn still won't mature, go to Step 4.

Checking and/or clearing DTCs will reset the VGTLRN_OK PID to NO and the VGTLRN_LE PID to 2.

4. Using IDS datalogger, is the VGTLRN_CNC pid = YES?
 - a. YES - Means the conditions are NOT correct. The conditions must be correct in order for the learn to complete. Verify the conditions and complete the Learn Procedure before proceeding 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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REQUIRED PARAMETERS:

- Engine Oil Temp (EOT) between 120-250° F (49-121° C).
- Idle speed between 570-780 RPM and steady.
- Vehicle Speed Sensor (VSS) reading less than 2 MPH (3 km/h).
- Accelerator Pedal Position (APP) sensor below 1.5%.
- EGR is commanded off (EGRDC = 0) and EGRVP less than 1.2 volts.
- No Hard Fault DTCs.

- b. No - VGTLRN_CNC = NO. The learn parameters are correct and the vehicle should enter the learn. Allow to complete the Turbo Learn and proceed to Step 6. If the vehicle still won't learn, go to Step 5.

5. Using IDS, check for DTCs. Is the vehicle setting any codes?
 - a. If no codes, go to Step 6.
 - b. For P132B go to Step 7.
 - c. For P006A only go to Step 7.
 - d. For P0401 or P0402 only or P006A with a P0401 or P0402 DTC, go to Step 10.
 - e. For other codes, do not continue with this procedure and follow the appropriate Powertrain Controls/Emissions Diagnosis (PC/ED) pinpoint test (PPT).
6. Perform the 6.0L Performance diagnostic sheet in the PC/ED, Section 4, with particular attention to the following:
 - a. Verify the MAP/BARO correlation. Are they within 1.5 psi (10.3 kPa) of each other with key on engine off (KOEO)? If not, follow 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/o-ring 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 Manifold Gauge Pressure (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 PC/ED PPT test E2 for the appropriate MAP sensor diagnostic and repair. The MAP sensor should also hold the pressure applied to it until released.

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. Verify fuel pressure as per the Fuel System Delivery Test.
 - e. Verify no exhaust restrictions as per the Exhaust Restriction Test.
 - f. 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 BY DISCONNECTING BOTH BATTERIES FOR 5 MINUTES AND THEN THE TURBO LEARN PROCEDURE UNDER THE TURBO LEARN HEADING WILL NEED TO BE PERFORMED.

7. Smoke test the intake and exhaust systems.
 - 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 by disconnecting both batteries for 5 minutes and the turbo learn procedure under the Turbo Learn heading will need to be performed.
 - (2) If no leaks are found, go to Step 8.
- 8. Perform PC/ED led PPT KA to verify turbo operation.
 - a. If KA passes, go to Step 9.
 - b. If KA fails, follow the repair procedure as directed by the pinpoint test step.

NOTE

IF ANY LEAKS ARE REPAIRED OR PARTS REPLACED THE KAM MUST BE CLEARED BY DISCONNECTING BOTH BATTERIES FOR 5 MINUTES AND THE TURBO LEARN PROCEDURE UNDER THE TURBO LEARN HEADING WILL NEED TO BE PERFORMED.

- 9. Verify the MAF reads correctly per the following test:
 - a. Before running the MAF test make sure:
 - (1) EOT greater than 185° F (85° C).
 - (2) EGRDC commanded (taking active command) = 0%.
 - b. Run four (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.
 - (1) 650 RPM VGTDC = 0%.
 - (2) 650 RPM VGTDC = 85%.
 - (3) 1200 RPM VGTDC = 0%.

- (4) 1200 RPM VGTDC = 85%.

NOTE

USE OF NON-OEM (AFTERMARKET) AIR INTAKE SYSTEMS AND AIR FILTERS, ESPECIALLY OIL IMPREGNATED MEDIA FILTERS, MAY RESULT IN MAF SENSORS BECOMING CONTAMINATED OR DAMAGED. THESE TYPES OF FAILURES ARE NOT A WARRANTABLE CONDITION.

- c. Compare the voltage to Figures 1 and 2. Reading is outside of MAF limits and/or recorded value is lower than limits, possible causes are:
 - (1) MAF sensor.
 - (2) Air leak between MAF sensor and turbo.
 - (3) Aftermarket Air Intake system and/or Air Filter.
 - (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 are:
 - (1) MAF sensor.
 - (2) Air Leak in the charge air cooler (CAC) system.
 - (3) Dirty Air Filter.
 - (4) Aftermarket Air Intake System and/or Air Filter.
- e. Verify the MAP/BARO correlation. Are they within 1.5 psi (10.3 kPa) of each other? If not, follow PC/ED PPT test E2 for the appropriate 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.
 - (1) If not, follow PC/ED PPT test E2 for the appropriate diagnostic and repair.
 - (2) If ok, go to step 11.

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10. Is the vehicle setting a P006A code along with the P0401 or P0402?
- P0401 faults are associated with CAC system leaks, restricted air filter, intake or exhaust leaks, MAF sensor, turbocharger, EGR valve, and EGR Cooler.
 - P0402 faults are associated with un-metered intake leaks, MAF, Turbo, and EGR valve.
- a. 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.
- b. No: Follow the PPT for the EGR code being set. Perform PPT KA.

If you have arrived at this step and the VGTLRN_OK = no, go back and do Step 4 before proceeding.

11. The PCM uses MAF as a primary input for turbocharger and exhaust pressure control to calculate air flow for the EGR monitor. Using IDS datalogger, check max boost pressure and MAF volts on a road test.
- a. 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 - Go to Step 11b.
- b. Is the MAF is getting close to 4.5 volts and boost pressure is low?
- (1) Yes - Then that is the max MGP the PCM will allow. If boost is low at a high MAF range, active command the VGTDC during a test drive and monitor if boost pressure changes.
- (a) Yes - Go to Step 9.
- (b) 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.
- (2) No - Go to Step 11c.

- c. Is the boost higher than 26 psi?
- (1) Yes - Go to Step 8 of this procedure.
- (2) No - Vehicle operating properly.

TURBO LEARN PROCEDURE:

NOTE

THE VGTDC WILL BE COMMANDED TO VARIOUS LEVELS DURING THE LEARN PROCESS CAUSING CHARACTERISTIC TURBO SPOOLING NOISE. THIS NOISE IS NORMAL.

12. Clear the KAM by disconnecting both batteries for 5 minutes.
13. Reconnect both batteries.
14. Start the vehicle and let the vehicle idle. If the conditions below are correct, the learn will occur automatically.

NOTE

DURING VEHICLE IDLING, 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. THE REQUIRED CONDITIONS ARE:

- EOT between 120-250° F (49-121° C).
- Idle speed between 570 to 780 RPM.
- VSS reading less than 2 MPH (3 Km/h).
- APP below 1.5%.
- EGR is commanded off (EGRDC = 0).
- No hard fault DTCs.

NOTE

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
IMPORTANT: Warranty coverage limits/policies are not altered by a TSB. Warranty coverage limits are determined by the identified causal part.

OPERATION	DESCRIPTION	TIME	DEALER CODING	CONDITION
MT091506	Use SLTS Operations If Available; Claim Additional Diagnosis Or Labor Performed As Actual Time	Actual Time	BASIC PART NO. RECAL	CODE 04

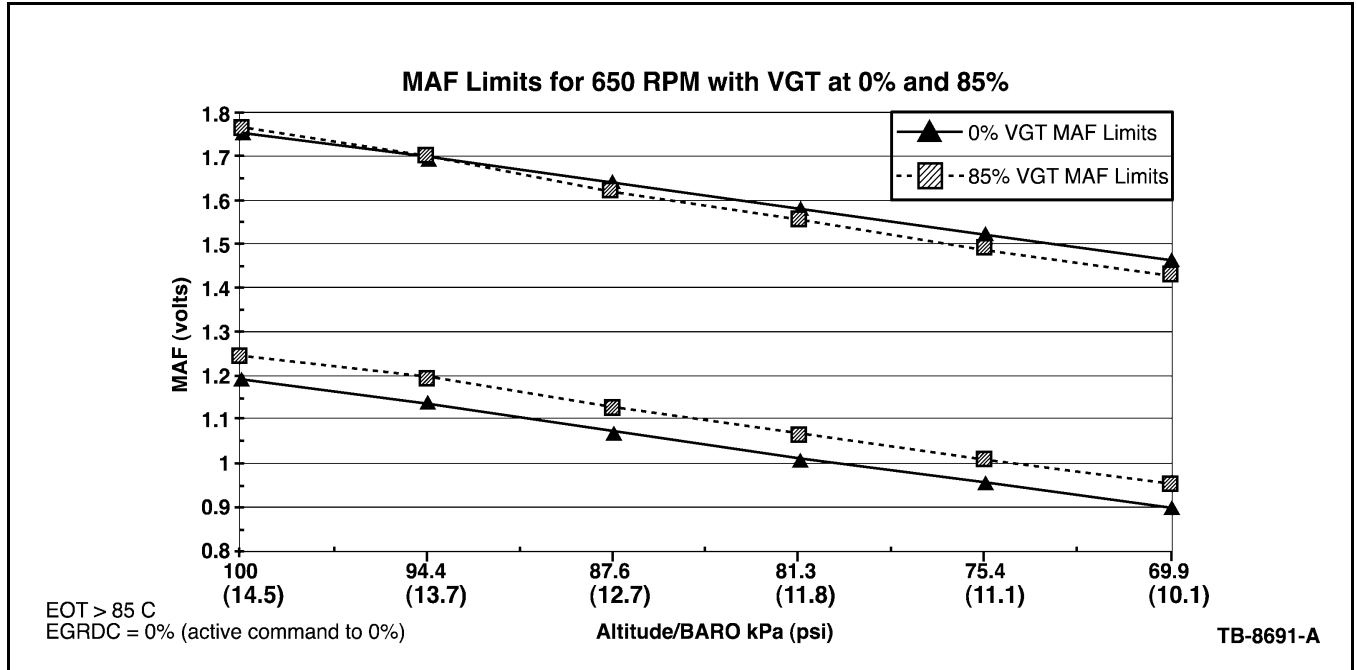


Figure 1 - Article 09-15-6

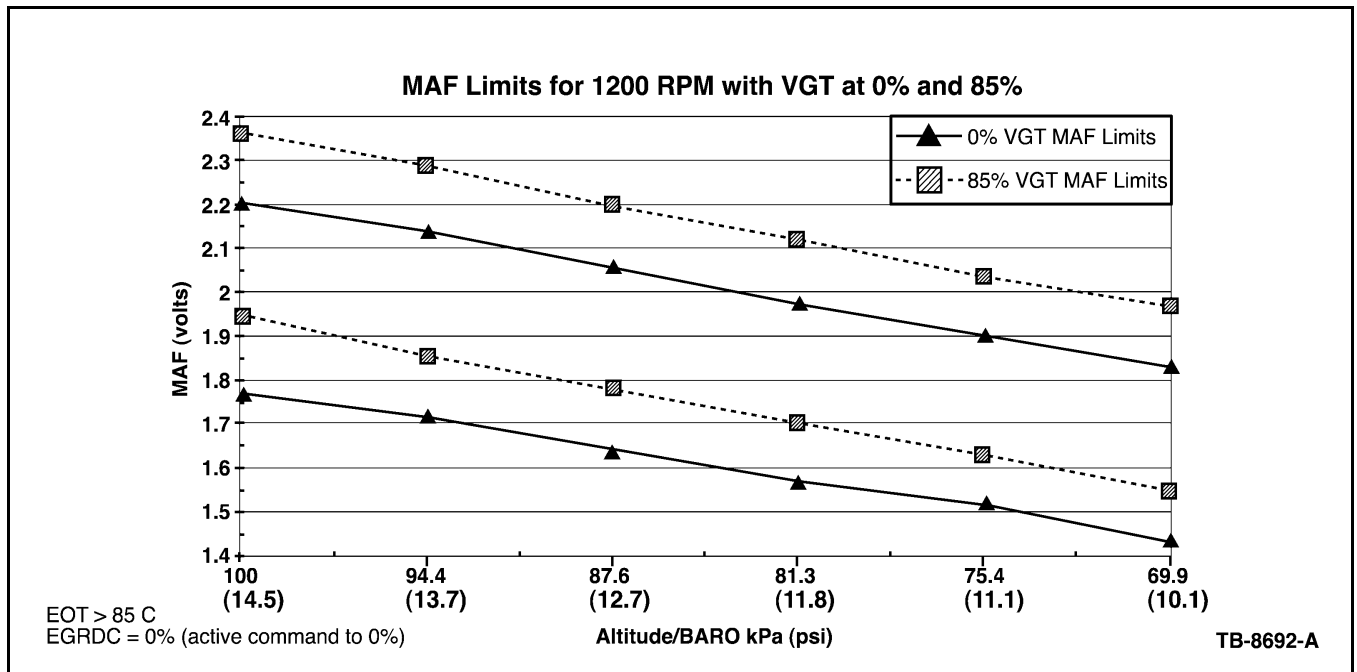


Figure 2 - Article 09-15-6