

FORD:
2003-2005 Excursion

2003-2007 F-Super Duty
2004-2009 E-350, E-450, E-550

This article supersedes TSBs **08-2-7** and **07-21-9** to update the Service Procedure and Part List.

ISSUE

Some 2003-2007 F-Super Duty, 2003-2005 Excursion and 2004-2008 E-Series vehicles equipped with a 6.0L engine may exhibit white smoke, black smoke, lacks power, exhaust odor, surges and/or exhaust gas recirculation (EGR) diagnostic trouble codes (DTCs) P0401, P0402, P0404, and/or P1335 as a result of excessive coking deposits un-combusted or incompletely combusted hydrocarbons. This procedure should be used only if one or more of the components listed below have already been identified as having an excessive coking condition.

ACTION

Follow the Service Procedure steps to correct the condition.

SERVICE PROCEDURE

NOTE

THE ROOT CAUSE OF THE COKING MUST BE CORRECTED OR THE COKING MAY REOCCUR.

After following normal Powertrain Controls/Emissions Diagnosis (PC/ED) diagnostics, use this procedure to identify the root cause of the excessive coking condition and if appropriate install an EGR Baffle. Just replacing the component with coking deposits and installing the EGR baffle will not correct the root cause, and coking will reoccur.

NOTE

SOME 2008 AND ALL 2009 6.0L E-SERIES VEHICLES HAVE THE EGR BAFFLE INSTALLED FROM THE FACTORY.

Service Tips:

Coking deposits are generally un-combusted or incompletely combusted hydrocarbons, commonly sourced from engine oil or diesel fuel. These deposits can form on system components such as the EGR valve, EGR cooler, exhaust back pressure (EBP) Sensor, EBP tube, intake manifold, turbo charger, catalytic converter and EGR throttle plate. Visual inspection alone cannot link the sources of coking deposits as either from engine oil or diesel fuel. Coking deposits can be identified as shiny black grease like sludge, hard flat black solid mass or thin light brown sticky layer.

Un-combusted deposits can be linked to delayed combustion events. Delayed combustion events can be a function of hard to ignite elements like poor quality fuel, excessive fuel, engine oil or excessive exhaust gas recirculation in the combustion chamber or a delayed injection event like calibration, wire chafe, injector mechanical issue. Un-combusted fuel is usually evident as fuel scented white exhaust smoke. Un-combusted fuel may create coking which impairs system functionality eventually leading to black exhaust smoke / poorly combusted fuel.

NOTE

VEHICLE PERFORMANCE ISSUES RELATED TO FUEL QUALITY, MAINTENANCE AND AFTERMARKET MODIFICATIONS ARE NOT COVERED BY FORD MOTOR COMPANY WARRANTY.

Complete all of the following steps. Devices such as the Catalyst, manifold absolute pressure (MAP) sensor and EBP sensor that fail the PC/ED pinpoint tests (PPT) must be replaced and not cleaned. Clean the Turbocharger using other applicable TSB's, the intake manifold and EBP tube. EGR valves that fail the Integrated Diagnostic System (IDS) - EGR Systems Test should be replaced not cleaned.

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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1. Follow PC/ED led diagnostics for any specific drivability issues and DTCs.
2. Check OASIS for open field service actions (FSAs) and complete them before continuing with this procedure.
3. Validate clean good fuel.
 - a. Use PC/ED, Section 4: Diagnostic Subroutines Performance Diagnostic Procedures / Sufficient Clean Fuel.
 - b. Use Motorcraft® Cetane Booster and Performance Improver (ULSD Compliant), or Motorcraft® Anti-Gel and Performance Improver (ULSD Compliant) to see if symptoms improve. Motorcraft® Cetane Booster and Performance Improver (ULSD Compliant) will typically reduce white smoke related to fuel quality within 20 miles of driving. Continued use of Motorcraft® Cetane Booster and Performance Improver (ULSD Compliant) will aid in the removal of fuel quality related coking deposits.
4. Review vehicle maintenance history/records. Refer to the Owner's Guide for recommended service intervals and oil grade/viscosity based on vehicle use and ambient temperature. Calculate engine operating hours versus odometer accumulation when selecting appropriate maintenance schedule. 2005 model year (MY) and forward are equipped with an hour meter as part of the odometer. Ensure the proper maintenance schedule and oil viscosity / grade is in use. Oil additives that thicken engine oil and poor maintenance can delay commanded injector response. Several oil changes with driving cycles may be required to flush the engine of residual additives and/or degraded oil.
5. Check for excessive oil carryover to air inlet system. Inspect turbo compressor inlet and outlet for oil.
 - a. Validate proper air intake flow. Check air filter minder by performing PC/ED Section 4: Diagnostic Subroutines / Performance Diagnostic Procedures / Intake Restriction. Excessive inlet restriction may cause oil carryover from crankcase vent.
 - b. Validate crankcase pressure by performing PC/ED Section 4: Diagnostic Subroutines / Performance Diagnostic Procedures / Crankcase Pressure Test. Repair base engine concern if pressures exceed specification.
 - c. Check Oil Level. Suggest oil level be set to the middle of the operating range on the dip stick after an oil change.
 - d. Validate no internal turbo oil leak by referring to Workshop Manual (WSM), Section 303-04D.
6. Ensure proper operation of engine cooling system and electronic fan clutch. Refer to WSM, Section 303-03 and Section 05, PPT AH of the PC/ED. Repair as necessary if any concerns are found.
7. Verify engine oil temperature (EOT) correlation with engine coolant temperature (ECT).
 - a. Drive vehicle at wide open throttle (WOT) / high load / maximum boost.
 - b. Observe ECT and EOT PID's on IDS Datalogger. EOT maximum temperature differential might occur at throttle tip-out.
 - c. If EOT exceeds ECT by 15 °F (8°C) , replace the oil cooler.
8. Ensure vehicle is latest calibration level; these calibrations include the following improvements which will effect component coking:
 - a. Shut off EGR after 5 minutes of idling to reduces the amount of hard to combust elements in the combustion chamber.
 - b. Injection timing improvements at 1100-1800 RPM (Typical range for power take-off (PTO) operation / Cold Ambient Protection Idle Kicker / Battery Charge Protect Idle Kicker).
 - c. Increased exhaust pressure / variable geometry turbocharger (VGT) Duty Cycle for Auxiliary Powertrain Control Module (APCM) or PTO commanded engine speeds. Maintains heat in the combustion chamber.
 - d. Higher engine temperature required for cold ambient idle kicker to switch off. Idle will remain elevated until driver input is observed by PCM. Maintains heat in the combustion chamber.

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- e. Improved EGR throttle plate self test. Better control of hard to combust elements.
9. Perform IDS Air Management Test. Verify EGR and turbo functionality. If turbo fails and are removing the turbo, verify the fat drain pipe is installed. Identify the fat drain pipe tube by its end configuration; the new larger tube has a wide inner shoulder and a tube OD larger than the O-ring groove bottom.
10. Inspect the EGR valve for the presence of wet oil. The installation of an EGR Baffle Kit can help reduce the wet oil from accumulating on the EGR valve. Follow 2008-2009 E-350 / E-450 WSM, Section 303-08 for installation.

NOTE

THE EGR BAFFLE KIT WILL NOT PREVENT EGR FAILURES DUE TO DRY SOOT BUILDUP ON THE VALVE. ONLY INSTALL THE EGR BAFFLE KIT IF THERE IS EVIDENCE OF WET OIL.

PART NUMBER	PART NAME
6C3Z-9P449-A	EGR Baffle Kit
PM-22-A	Motorcraft® Cetane Booster and Performance Improver (ULSD Compliant)
PM-23-A	Motorcraft® Anti-Gel and Performance Improver (ULSD Compliant)
4C3Z-9F452-A	EGR Valve (MY 2003-2004)
5C3Z-9F452-AA	EGR Valve (MY 2005-2009)

OTHER APPLICABLE ARTICLES: 08-16-13

WARRANTY STATUS: Eligible Under Provisions Of New Vehicle Limited Warranty Coverage And Emissions 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
MT082612	Use SLTS Operations If Available; Claim Additional Diagnosis Or Labor Performed As Actual Time	Actual Time

DEALER CODING

BASIC PART NO.
9F452

CONDITION
CODE
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