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2017 Ford F-250 Super Duty Service and Repair Manual

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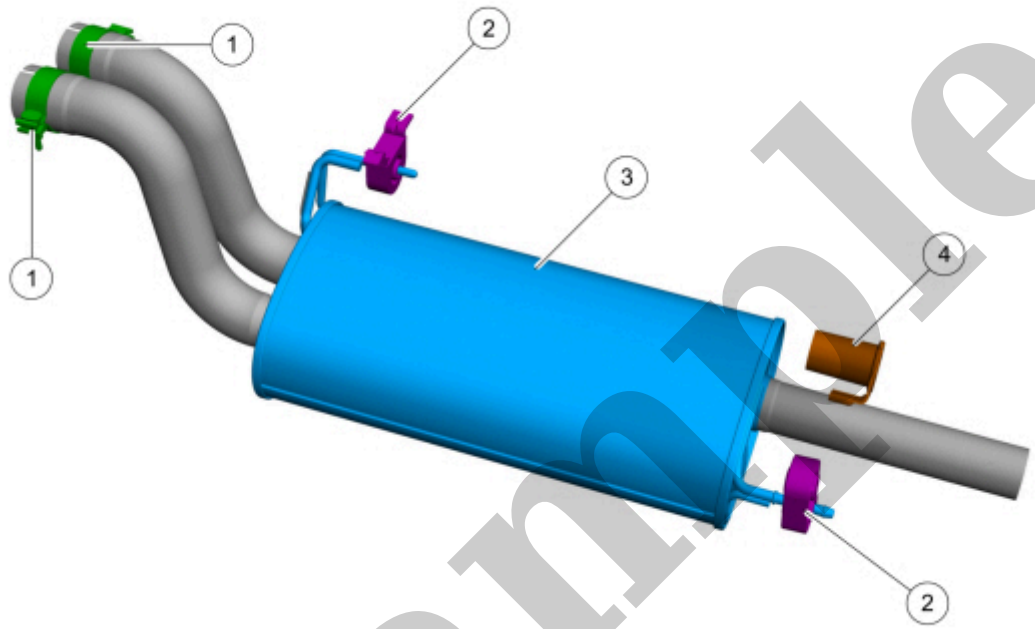
Exhaust intermediate pipe

Item	Description
1	Exhaust clamp
2	Resonator



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Muffler assembly

Item	Description
1	Clamps
2	Isolators
3	Muffler
4	Damper

Exhaust System - Tremor - Overview

309-00C Exhaust System - 3.5L EcoBoost (BM)	*2022 F-150*
Description and Operation	***Procedure revision date: 09/30/2020***

Exhaust System - Tremor - Overview

Overview

The exhaust system provides an exit for exhaust gases and reduces engine noise by passing exhaust gases through the catalytic converters and a muffler assembly.

The exhaust system consists of:

- Two catalytic converters (one integrated into the exhaust Y-pipe)
- An intermediate muffler inlet pipe assembly
- A muffler assembly
- Dual exhaust tailpipe
- Exhaust isolators/hangers mounted on the vehicle frame

The catalytic converter plays a major role in the emission control system by operating as a gas reactor. Its function is to speed the heat-producing chemical reaction of components in the exhaust gases to reduce air pollutants.

The catalyst material inside the catalytic converter consists of a ceramic substrate.

The catalytic converter is designed to provide a long life. No maintenance is necessary.

Sound insulators and shields, attached to the underbody, protect the vehicle from exhaust system heat and should be inspected at regular intervals to make sure they are not dented or out of position. If a sound insulator and shield is damaged or shows evidence of deterioration, install a new insulator and shield. The sound insulators and shields for the muffler, muffler pipe and catalytic converter pipe are installed separately.

Catalyst System

309-00C Exhaust System - 3.5L EcoBoost (BM)	***2022 F-150***
Diagnosis and Testing	***Procedure revision date: 01/5/2022***

Catalyst System

Diagnostic Trouble Code (DTC) Chart

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices.

REFER to: Diagnostic Methods

(100-00 General Information, Description and Operation).

Diagnostic Trouble Code Chart

Module	DTC (diagnostic trouble code)	Description	Action
PCM (powertrain control module)	P0420:00	Catalyst System Efficiency Below Threshold (Bank 1): No Sub Type Information	GO to Pinpoint Test HF
PCM (powertrain control module)	P0430:00	Catalyst System Efficiency Below Threshold (Bank 2): No Sub Type Information	GO to Pinpoint Test HF

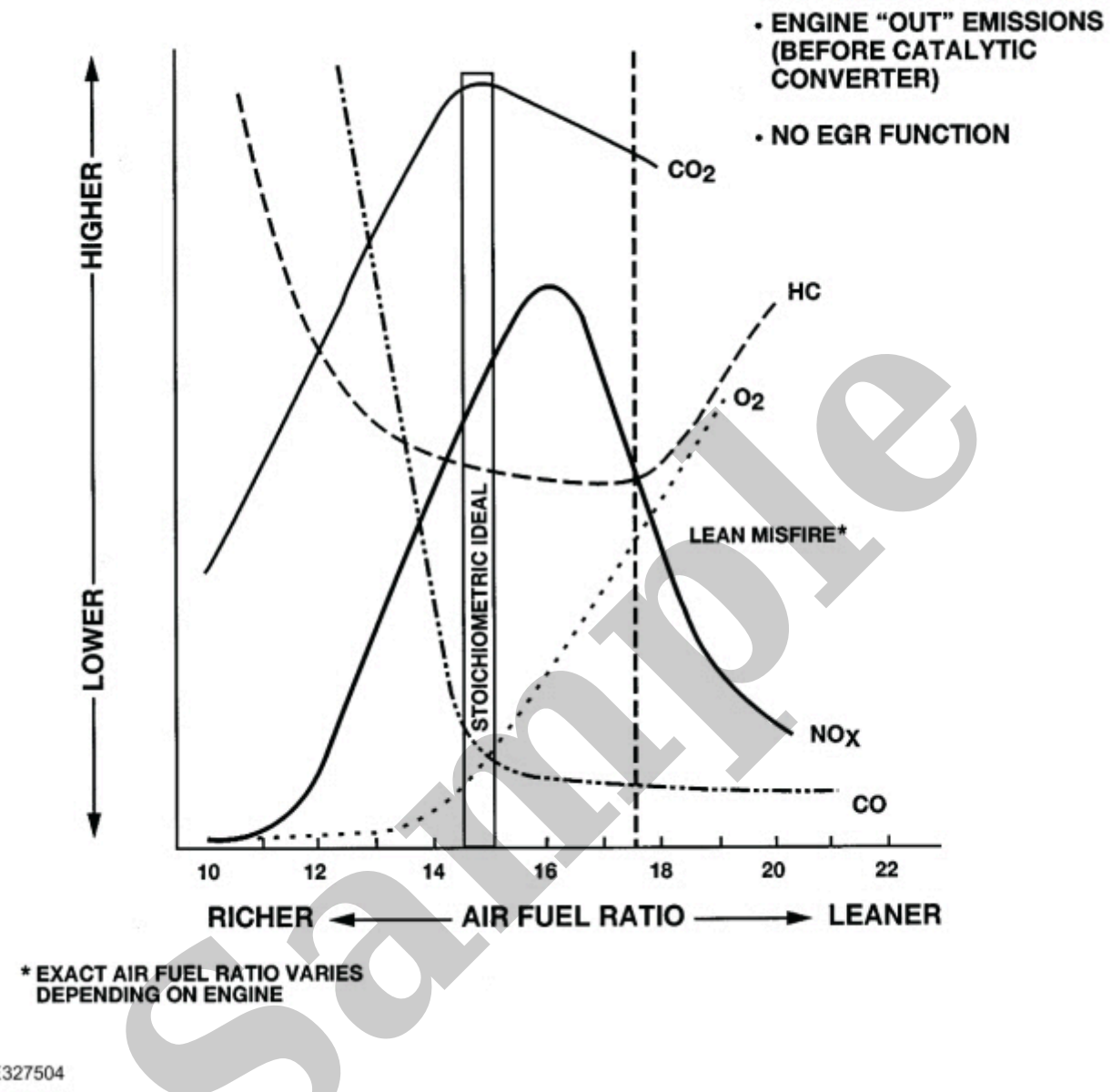
Global Customer Symptom Code (GCSC) Chart

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices.

REFER to: Diagnostic Methods

(100-00 General Information, Description and Operation).

Global Customer Symptom Code Chart



Verifying an excessive grams per mile (gpm) indication using a parts per million (ppm) reading.

For excessive vehicle gas readings, compare the actual gpm reading to the gas cutpoint level needed to pass testing. This gives an indication of how much the ppm reading has to be reduced (if the actual reading is twice the cutpoint, the baseline reading has to be cut in half or more).

Example:

- The actual HC (hydrocarbon) produced by a vehicle is 1.6 gpm. The cutpoint for HC (hydrocarbon) in this example is 0.8 gpm. The actual reading is twice the cutpoint.
- The HC (hydrocarbon) reading obtained for the same vehicle during the baseline drive averages 440 ppm. In order for this vehicle to pass the inspection/maintenance test, the HC (hydrocarbon) reading

Possible Sources

- HO2S (heated oxygen sensor) 2WD (two-wheel drive) 4WD (four-wheel drive) circuitry concern
- Exhaust system concern
-
- Contaminated oil
- Base engine concern
- Fuel injector
- Turbocharger
- HO2S (heated oxygen sensor)

Pinpoint Test Steps available in the on-line Workshop Manual.

Aftertreatment components consist of some or all of the following components: Catalytic Converters, Gasoline Particulate Filters, Diesel Particulate Filters, Selective Catalytic Reduction Catalysts, Exhaust Gas Heat Exchanger.

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices.

REFER to: Diagnostic Methods

(100-00 General Information, Description and Operation).

Symptom Chart

Condition	Actions
Lack of power - vehicle performance complaint	• GO to Pinpoint Test A
Odour from vehicle - possible sign of smoke	• GO to Pinpoint Test B
Surface rust or degradation of surface treatment	• GO to Pinpoint Test C
Noise such as buzzing, drumming, thumping, ringing or hissing coming from exhaust system	• GO to Pinpoint Test D

Pinpoint Tests

PINPOINT TEST A : LACK OF POWER

NOTE

Aftertreatment components consist of some or all of the following: Catalytic Converters, Gasoline Particulate Filters, Diesel Particulate Filters, Selective Catalytic Reduction Catalysts.

Normal Operation and Fault Conditions

REFER to: Exhaust System - Overview(309-00B Exhaust System - 3.3L Duratec-V6, Description and Operation).

Possible Sources

- Exhaust pipe pinched or crushed
- Damaged aftertreatment components
- Loose obstruction in exhaust

NOTE

Aftertreatment components consist of some or all of the following: Catalytic Converters, Gasoline Particulate Filters, Diesel Particulate Filters, Selective Catalytic Reduction Catalysts.

Normal Operation and Fault Conditions

REFER to: Exhaust System - Overview(309-00B Exhaust System - 3.3L Duratec-V6, Description and Operation).

Possible Sources

- Damaged or contaminated aftertreatment components
- Incorrect fuel or fuel with excessive sulfur content in fuel
- Rich fuel conditions
- Misfire conditions

Visual Inspection and Pre-checks

- Inspect for loose, damaged, contaminated or incorrect components.

B1 CHECK FOR DAMAGED AFTERTREATMENT COMPONENTS ASSOCIATED SENSORS

- Inspect the aftertreatment components and associated components for damage.

Have the aftertreatment components or associated electronic sensors incurred damage?

Yes	INSTALL a new aftertreatment components as necessary.

No	GO to B2

B2 CHECK FOR INCORRECT FUEL OR FUEL WITH A HIGH SULFUR CONTENT

- Check the residual fuel in the fuel tank for incorrect fuel or fuel that contains a high sulfur content.

Does the fuel tank contain incorrect fuel or fuel high in sulfur content?

Yes	Drain the fuel tank and flush the fuel system. Refill the fuel system with fuel containing the correct level of sulfur.

No	GO to B3

C2 CHECK FOR CORRECT PCM (POWERTRAIN CONTROL MODULE) OPERATION

- Using a diagnostic scan tool, perform the PCM self-test.

Are the powertrain controls operating correctly?

Yes	The condition may be intermittent. Advise the customer no repair is required.
No	Correct and fix any powertrain control issues. Using a diagnostic scan tool, perform the PCM self-test. Test and confirm the issue has been resolved.

PINPOINT TEST D : NOISE FROM EXHAUST SYSTEM

NOTE

Aftertreatment components consist of some or all of the following: Catalytic Converters, Gasoline Particulate Filters, Diesel Particulate Filters, Selective Catalytic Reduction Catalysts.

Normal Operation and Fault Conditions

REFER to: Exhaust System - Overview(309-00B Exhaust System - 3.3L Duratec-V6, Description and Operation).

Possible Sources

- Loose or damaged heat shield(s)
- Loose or damaged exhaust isolators(s)
- Damaged exhaust isolator hanger bracket
- Loose or damaged aftertreatment components or mufflers
- Exhaust system leak
- Catalytic converter/exhaust system
- Exhaust system grounded to chassis
- Damaged or worn exhaust system
- Misaligned exhaust system
- Strain on the exhaust system

Visual Inspection and Pre-checks

- Inspect for loose, damaged, contaminated or incorrect components.

D1 CHECK THE EXHAUST SYSTEM FASTENERS

Was the exhaust noise seen to originate from contact between the exhaust system and the surrounding components/vehicle body?

Yes	Ensure the exhaust system is installed correctly on the exhaust hangers and isolators. INSTALL new components as necessary.

No	GO to D5

D5 CHECK THE EXHAUST SYSTEM FOR INTERNAL DAMAGE

- Using a soft hammer or rubber mallet, lightly tap the resonators, mufflers, aftertreatment components and exhaust pipework, listening for loose internal baffling or internal damage.

Was noise such as rattling, clanging or twanging heard within the exhaust components?

Yes	The exhaust component likely has internal damage. INSTALL new components as necessary.

No	GO to D6

D6 CHECK THE EXHAUST SYSTEM FOR LEAKS

- With the engine running, visually inspect the exhaust components and pipework for leaks.

Were leaks found?

Yes	INSTALL new components as necessary.

No	GO to D7

D7 CHECK FOR COOL DOWN PINGING

- Run the engine and bring the exhaust system to operating temperature.
- KOEO (key on, engine off)
- While allowing the engine to cool, listen the exhaust system during coold down to attempt to isolate the noise complaint.