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2017 Ford F-150 Service and Repair Manual

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Exhaust System

309-00C Exhaust System - 3.5L EcoBoost (BM)	2022 F-150
Diagnosis and Testing	Procedure revision date: 10/12/2020

Exhaust System

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

Customer Symptom	Action
Fit/Finish/Body > Paint/Finish > Exhaust > Corrosion/Rust	GO to Pinpoint Test C
Start/Run/Move > Noise > Exhaust > Always	GO to Pinpoint Test D
Driving Performance > Lack/Loss of Power > Acceleration > Always	GO to Pinpoint Test A
Safe & Secure > Smoke/Odor > Exhaust > Hot	GO to Pinpoint Test B

Symptom Chart(s)

Symptom Chart - Exhaust System

NOTE

- Restricted exhaust (possible frozen condensate in mufflers or exhaust actuator valves)

Visual Inspection and Pre-checks

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

A1 CHECK THE EXHAUST SYSTEM FOR SIGNS OF DAMAGE

- Inspect the exhausts system aftertreatment components and associated sensors for damage.

Is damage to the aftertreatment components and associated sensors found?

Yes	INSTALL new components as necessary.
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No	GO to A2
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A2 CHECK THE EXHAUST SYSTEM FOR OBSTRUCTIONS OR RESTRICTED FLOW

- Inspect the exhausts system pipework for pinched or crushed components.

Is any flow restricting damage to the exhaust components seen?

Yes	INSTALL new components as necessary.
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No	The condition may be intermittent. Advise the customer no repair is required.
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PINPOINT TEST B : ODOUR FROM VEHICLE

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

PINPOINT TEST C : SURFACE RUST OR DEGRADATION OF SURFACE TREATMENT

NOTE

Surface rust is a characteristic of materials used on exhaust systems. Exposure to heat or road salt may result in surface rust.

Normal Operation and Fault Conditions

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

Possible Sources

- Perforated catalytic converter/exhaust system

Visual Inspection and Pre-checks

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

C1 CHECK THE EXHAUST SYSTEM FOR PERFORATIONS, RUST OR DAMAGE

- Visually inspect the exhaust system, paying specific attention to joints, bends, low points and check for rust, perforations or surface degradation.

Are perforations, rust or damage present?

Yes	INSTALL new components as necessary.
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No	GO to C2
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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.
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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.
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Were exhaust system isolators and hanger brackets found to be in correct alignment and in good condition?

Yes

GO to [D3](#)

No

INSTALL new components as necessary.

D3 CHECK FOR MISSING OR DAMAGED EXHAUST HEAT SHIELDS

- Check for noise originating from missing or damaged exhaust heat shields.

Were the exhaust heat shields found to be present and in correct alignment?

Yes

GO to [D4](#)

No

INSTALL new components as necessary.

D4 CHECK THE EXHAUST SYSTEM FOR ALIGNMENT

- Manually move the exhaust system to simulate the bouncing action of the vehicle, checking for exhaust-to-body contact whilst the exhaust system is moving.

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?



Catalytic Converter LH - Raptor

309-00C Exhaust System - 3.5L EcoBoost (BM)	2022 F-150
Removal and Installation	Procedure revision date: 06/24/2021

Catalytic Converter LH - Raptor

Removal

NOTE

If the catalytic converter is not being replaced, the HO2S and the catalyst monitor sensor do not need to be removed from the catalytic converter. Disconnecting the electrical connectors is still necessary.

NOTE

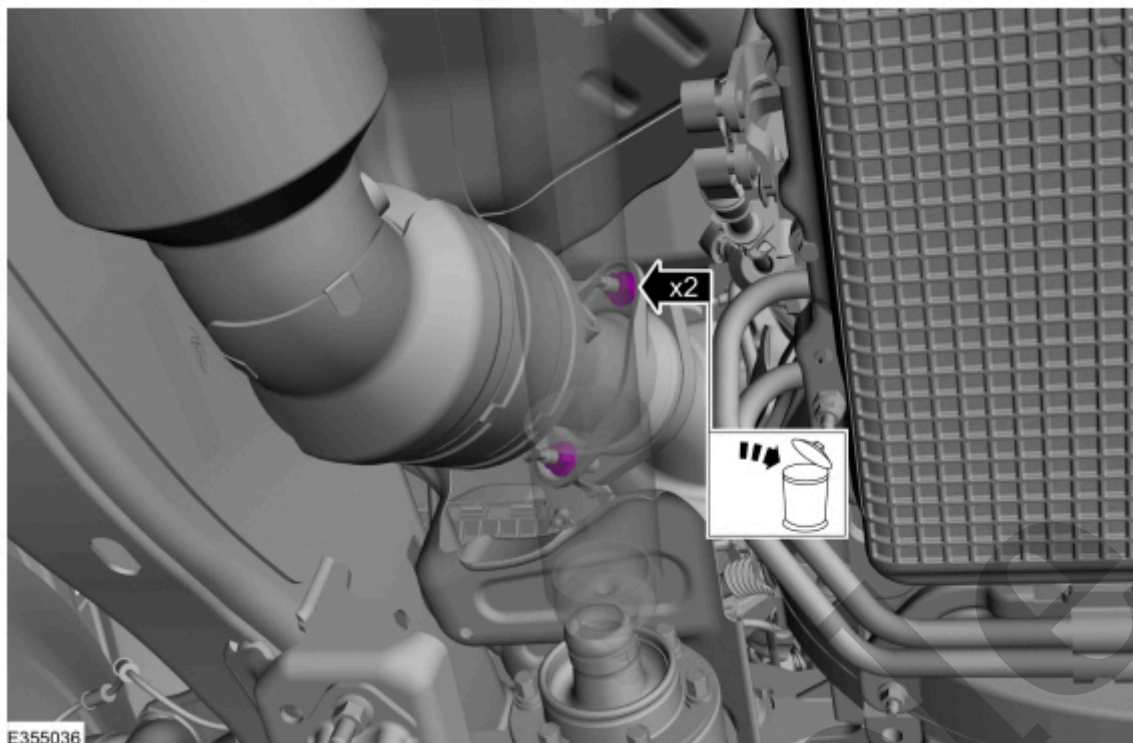
The exhaust crossover pipe dual catalytic converter is a 2-piece assembly. The LH (left-hand) and RH (right-hand) converters can be serviced separately as needed.

1. With the vehicle in NEUTRAL, position it on a hoist.

Refer to: [Jacking and Lifting - Overview](#)(100-02 Jacking and Lifting, Description and Operation).

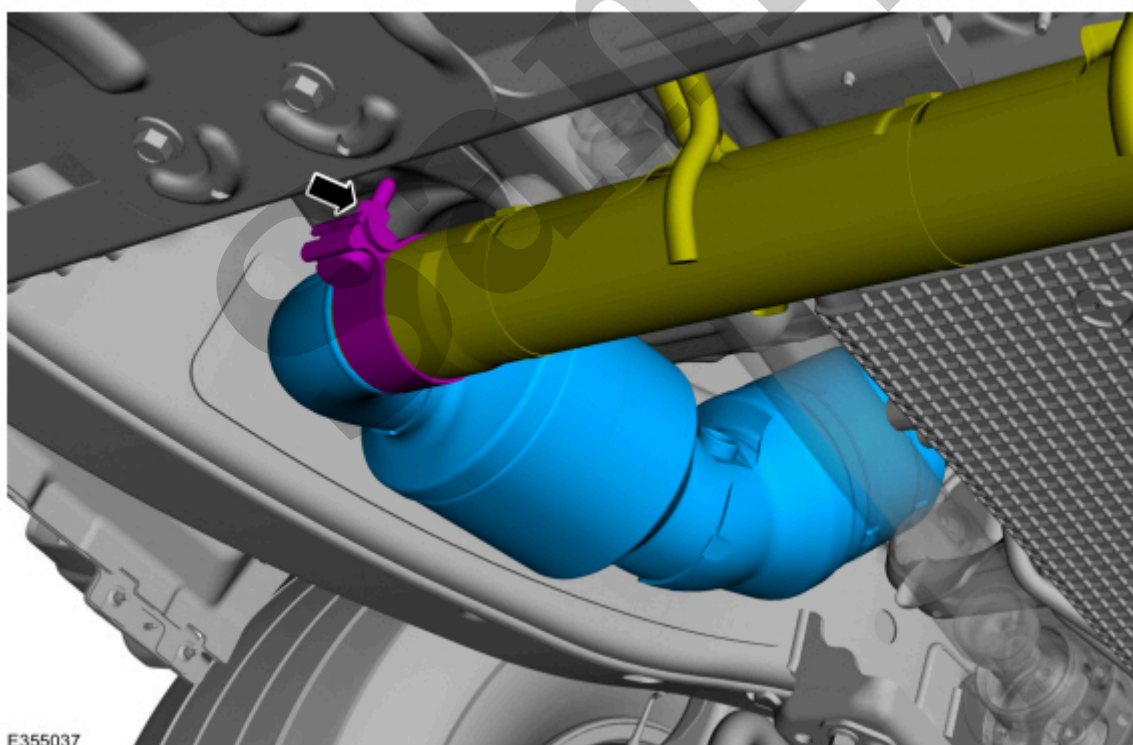
2. If equipped.

Remove the underbody shield.



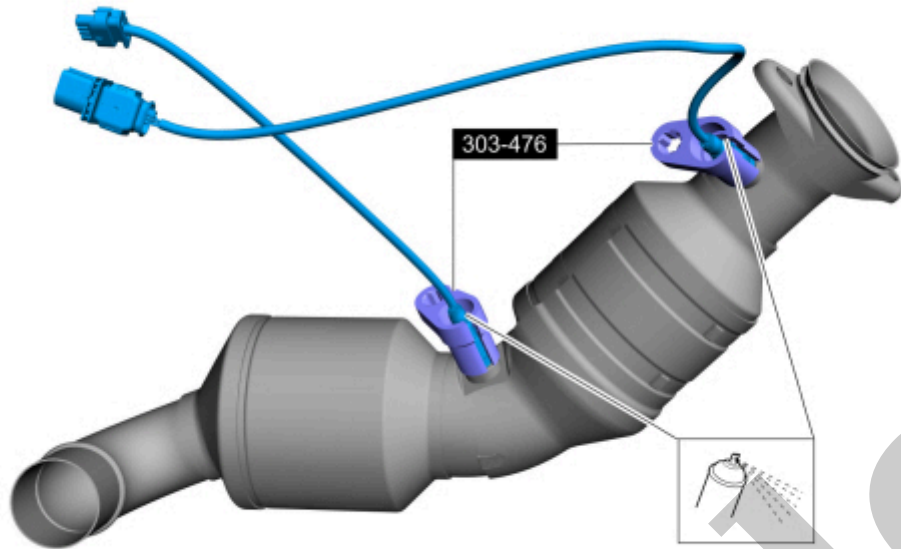
[Click here to learn about symbols, color coding, and icons used in this manual.](#)

5. Loosen the clamp and remove the LH (left-hand) catalytic converter.



[Click here to learn about symbols, color coding, and icons used in this manual.](#)

6. Remove and discard the gasket.



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Installation

1. Clean all exhaust connections before reassembly.

2. NOTE

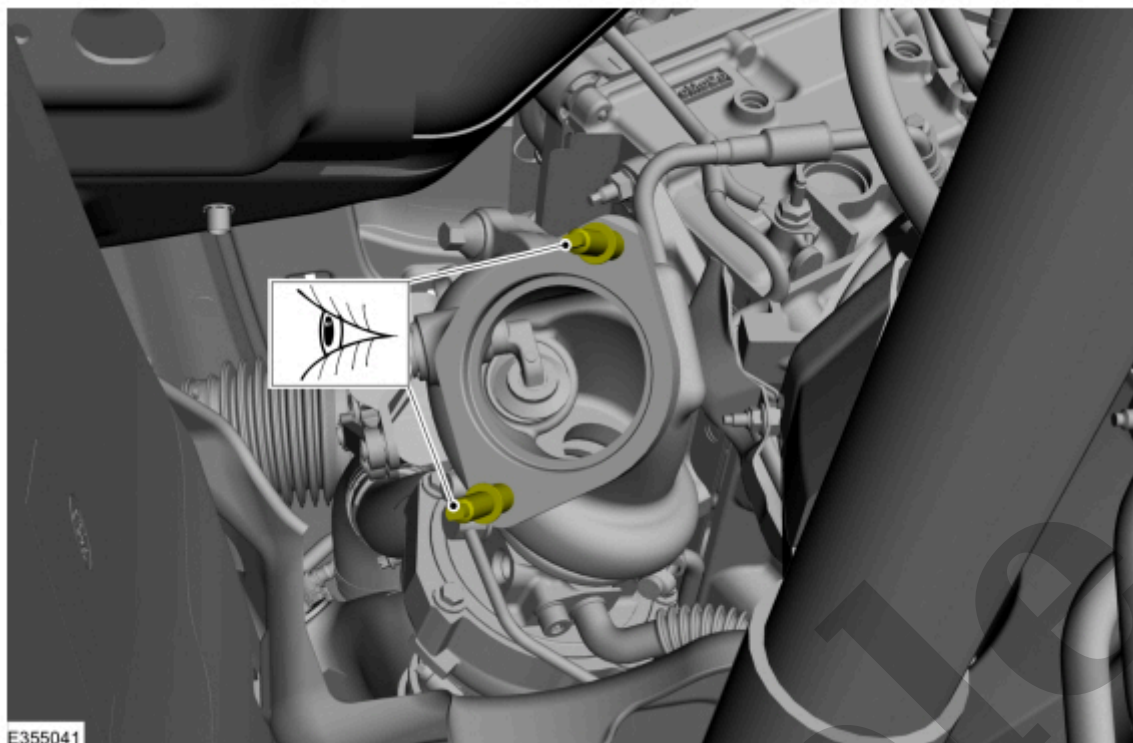
This step is only required if you are replacing with new components.

Apply anti-seize to thread of sensor. Using the special tool, install the HO2S (heated oxygen sensor) and the catalyst monitor sensors.

Use Special Service Tool : 303-476 (T94P-9472-A) Socket, Exhaust Gas Oxygen Sensor

Material : Motorcraft® High Temperature Nickel Anti-Seize Lubricant / XL-2

Torque : 35 lb.ft (48 Nm)



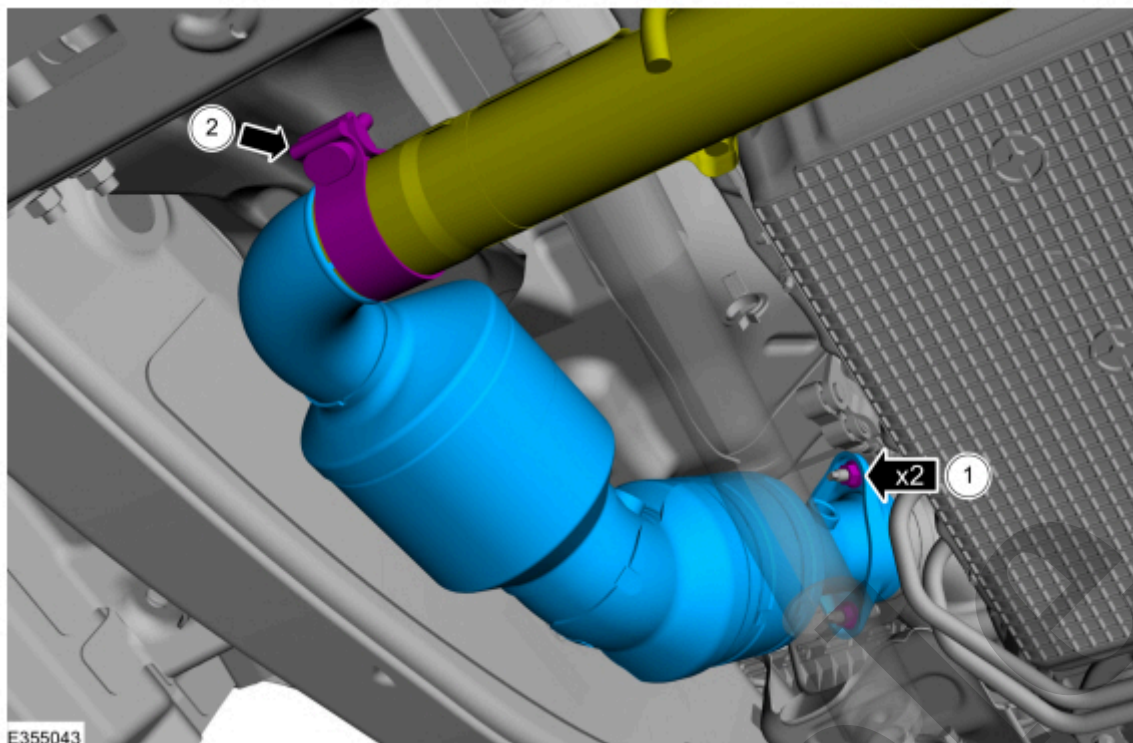
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4. **NOTE**

Make sure that new gasket is installed.

Install the new gasket.



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6. **NOTE**

Evenly tighten the LH (left-hand) catalytic converter nuts.

Tighten the LH (left-hand) catalytic converter nuts.

Torque : 30 lb.ft (40 Nm)