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## 2021 Ford F-250 Super Duty Service and Repair Manual

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## Exhaust Gas Recirculation (EGR) System

|                                                             |                                            |
|-------------------------------------------------------------|--------------------------------------------|
| <b>303-08C Engine Emission Control - 3.5L EcoBoost (BM)</b> | <b>2022 F-150</b>                          |
| <b>Diagnosis and Testing</b>                                | <b>Procedure revision date: 10/10/2022</b> |

### Exhaust Gas Recirculation (EGR) 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) | P0401:00                      | EGR A Flow Insufficient Detected: No Sub Type Information        | <a href="#">GO to Pinpoint Test HE</a> |
| PCM (powertrain control module) | P0402:00                      | EGR A Flow Excessive Detected: No Sub Type Information           | <a href="#">GO to Pinpoint Test HE</a> |
| PCM (powertrain control module) | P0404:00                      | EGR A Control Circuit Range/Performance: No Sub Type Information | <a href="#">GO to Pinpoint Test KD</a> |
| PCM (powertrain control module) | P0405:00                      | EGR Sensor A Circuit Low: No Sub Type Information                | <a href="#">GO to Pinpoint Test KD</a> |

|                                 |          |                                                                      |                                        |
|---------------------------------|----------|----------------------------------------------------------------------|----------------------------------------|
| PCM (powertrain control module) | P139B:00 | EGR Sensor C Upstream Hose Off Or Plugged: No Sub Type Information   | <a href="#">GO to Pinpoint Test HE</a> |
| PCM (powertrain control module) | P139C:00 | EGR Sensor C Downstream Hose Off Or Plugged: No Sub Type Information | <a href="#">GO to Pinpoint Test HE</a> |
| PCM (powertrain control module) | P1408:00 | EGR Flow Out Of Self Test Range: No Sub Type Information             | <a href="#">GO to Pinpoint Test HE</a> |
| PCM (powertrain control module) | P2457:00 | EGR Cooler A Efficiency Below Threshold: No Sub Type Information     | <a href="#">GO to Pinpoint Test HE</a> |

### 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                                 |
|--------------------------------------------------------------------------|----------------------------------------|
| Start/Run/Move > Running > Failed Emissions Testing > Catalyst           | <a href="#">GO to Pinpoint Test DS</a> |
| Start/Run/Move > Running > Failed Emissions Testing > Catalyst           | <a href="#">GO to Pinpoint Test DT</a> |
| Start/Run/Move > Running > Failed Emissions Testing > Catalyst           | <a href="#">GO to Pinpoint Test HE</a> |
| Start/Run/Move > Running > Failed Emissions Testing > Catalyst           | <a href="#">GO to Pinpoint Test KD</a> |
| Driving Performance > Lack/Loss of Power > Acceleration > Always         | <a href="#">GO to Pinpoint Test HE</a> |
| Driving Performance > Lack/Loss of Power > Acceleration > Always         | <a href="#">GO to Pinpoint Test KD</a> |
| Driving Performance > Lack/Loss of Power > Cruise/ Steady Speed > Always | <a href="#">GO to Pinpoint Test HE</a> |
| Driving Performance > Lack/Loss of Power > Cruise/ Steady Speed > Always | <a href="#">GO to Pinpoint Test KD</a> |

|                             |                  |                                                                                                                                                                                                                                                  |
|-----------------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| control module)<br>P041D:00 | Type Information | 2 temperature is less than a calibrated limit for a specified amount of time. When the EGRT (exhaust gas recirculation temperature) bank 1, sensor 2 is greater than a calibrated threshold, an increment counter advances for that drive cycle. |
|-----------------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

#### Possible Sources

- EGR (exhaust gas recirculation) cooler system concern
- EGRT (exhaust gas recirculation temperature) sensor circuitry concern
- EGRT (exhaust gas recirculation temperature) sensor

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

### PINPOINT TEST DT : EXHAUST PRESSURE SENSOR

#### Normal Operation and Fault Conditions

Refer to the DTC (diagnostic trouble code) Fault Trigger Conditions.

#### DTC Fault Trigger Conditions

| DTC (diagnostic trouble code)               | Description                                                                    | Fault Trigger Condition                                                                                                                                                                                                                                                                    |
|---------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PCM (powertrain control module)<br>P0471:00 | Exhaust Pressure Sensor 'A' Circuit Range/Performance: No Sub Type Information | Sets when the PCM (powertrain control module) detects the exhaust pressure sensor signal is not within a calibrated value. The exhaust pressure sensor reading should be greater than the BARO (barometric pressure) sensor reading by a calibrated threshold while the engine is running. |
| PCM (powertrain control module)<br>P0472:00 | Exhaust Pressure Sensor 'A' Circuit Low: No Sub Type Information               | Sets when the PCM (powertrain control module) detects the exhaust pressure sensor signal is less than the PCM (powertrain control module) self test minimum.                                                                                                                               |
| PCM (powertrain control module)<br>P0473:00 | Exhaust Pressure Sensor 'A' Circuit High: No Sub Type Information              | Sets when the PCM (powertrain control module) detects the exhaust pressure sensor signal is greater than the self test maximum.                                                                                                                                                            |

#### Possible Sources

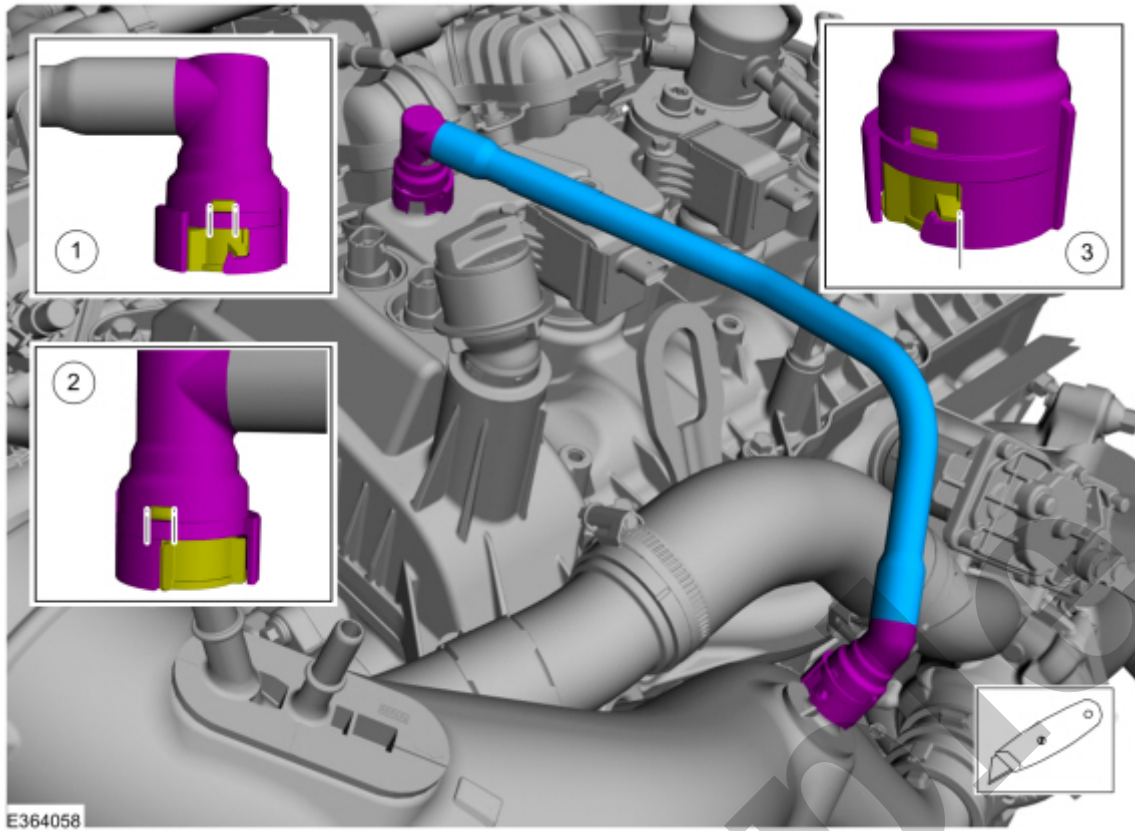
|                                                |                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------------------------|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| module)<br>P044C:00                            |                                                                           | monitor checks the differential pressure feedback EGR sensor signal to the PCM (powertrain control module) for low voltage.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| PCM<br>(powertrain control module)<br>P044D:00 | EGR Sensor 'C'<br>Circuit High: No Sub Type Information                   | Sets when PCM (powertrain control module) detects the average voltage to the PCM (powertrain control module) exceeds the maximum calibrated value. The EGR (exhaust gas recirculation) monitor checks the differential pressure feedback EGR (exhaust gas recirculation) sensor signal to the PCM (powertrain control module) for high voltage.                                                                                                                                                                                                                                                                                                                       |
| PCM<br>(powertrain control module)<br>P139A:00 | EGR Sensor 'C'<br>Hoses Reversed: No Sub Type Information                 | Sets when PCM (powertrain control module) detects the differential pressure indicated by the sensor exceeds a maximum threshold or falls below a minimum threshold. At idle, the EGR (exhaust gas recirculation) monitor commands the EGR valve closed and checks the differential pressure across the EGR tube orifice which should be zero to indicate the hoses are connected and not restricted. Look for signs of water or icing in the hose. Verify the hose connection and routing. Check the differential pressure feedback EGR (exhaust gas recirculation) sensor for correct mounting and function.                                                         |
| PCM<br>(powertrain control module)<br>P139B:00 | EGR Sensor 'C'<br>Upstream Hose Off or Plugged: No Sub Type Information   | Sets when PCM (powertrain control module) detects the differential pressure indicated by the sensor exceeds a maximum threshold or falls below a minimum threshold. At idle, the EGR (exhaust gas recirculation) monitor commands the EGR (exhaust gas recirculation) valve closed and checks the differential pressure across the EGR (exhaust gas recirculation) tube orifice which should be zero to indicate the hoses are connected and not restricted. Look for signs of water or icing in the hose. Verify the hose connection and routing. Check the differential pressure feedback EGR (exhaust gas recirculation) sensor for correct mounting and function. |
| PCM<br>(powertrain control module)<br>P139C:00 | EGR Sensor 'C'<br>Downstream Hose Off or Plugged: No Sub Type Information | Sets when PCM (powertrain control module) detects the differential pressure indicated by the sensor exceeds a maximum threshold or falls below a minimum threshold. At idle, the EGR (exhaust gas recirculation) monitor commands the EGR (exhaust gas recirculation) valve closed and checks the differential pressure across the EGR (exhaust gas recirculation) tube orifice which should be zero to indicate the hoses are connected and not restricted. Look for signs of water or icing in the hose. Verify the hose connection and routing. Check the differential                                                                                             |

|                                                   |                                                                     |                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| control module)<br>P0404:00                       |                                                                     |                                                                                                                                                                                                                                                                                                                                                         |
| PCM<br>(powertrain<br>control module)<br>P0405:00 | EGR Sensor 'A' Circuit Low:<br>No Sub Type Information              | Sets when the PCM (powertrain control module) detects the average voltage to the PCM (powertrain control module) drops to a voltage less than the minimum calibrated value. The EGR (exhaust gas recirculation) monitor checks the EGR (exhaust gas recirculation) valve position sensor signal to the PCM (powertrain control module) for low voltage. |
| PCM<br>(powertrain<br>control module)<br>P0406:00 | EGR Sensor 'A' Circuit High:<br>No Sub Type Information             | Sets when the PCM (powertrain control module) detects the average voltage to the PCM (powertrain control module) exceeds the maximum calibrated value. The EGR (exhaust gas recirculation) monitor checks the EGR (exhaust gas recirculation) valve position sensor signal to the PCM (powertrain control module) for high voltage.                     |
| PCM<br>(powertrain<br>control module)<br>P04FA:00 | EGR 'A' Control<br>Temperature Too High: No<br>Sub Type Information | Sets when the PCM (powertrain control module) detects the EGR (exhaust gas recirculation) valve position and speed of position is greater than a specified limit.                                                                                                                                                                                       |

#### Possible Sources

- EGR (exhaust gas recirculation) valve circuitry concern
- MAP (manifold absolute pressure) sensor
- MAF (mass air flow) sensor
- EGR (exhaust gas recirculation) valve
- PCM (powertrain control module) (12A650)

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

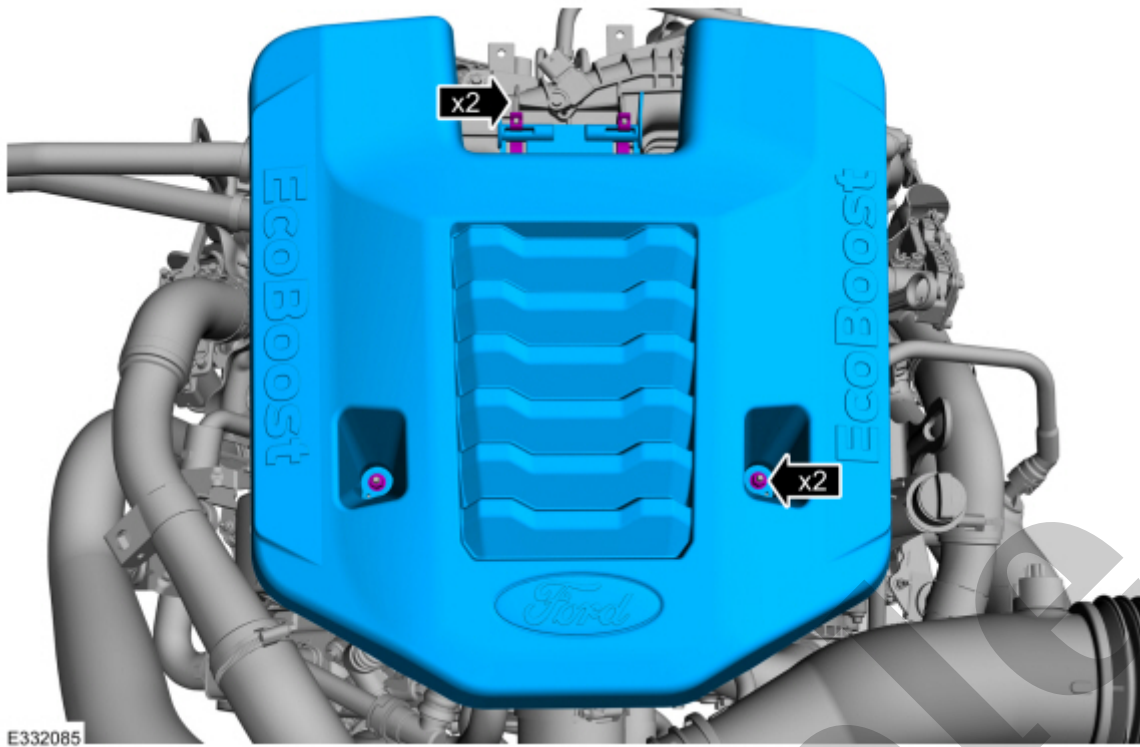


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## Installation

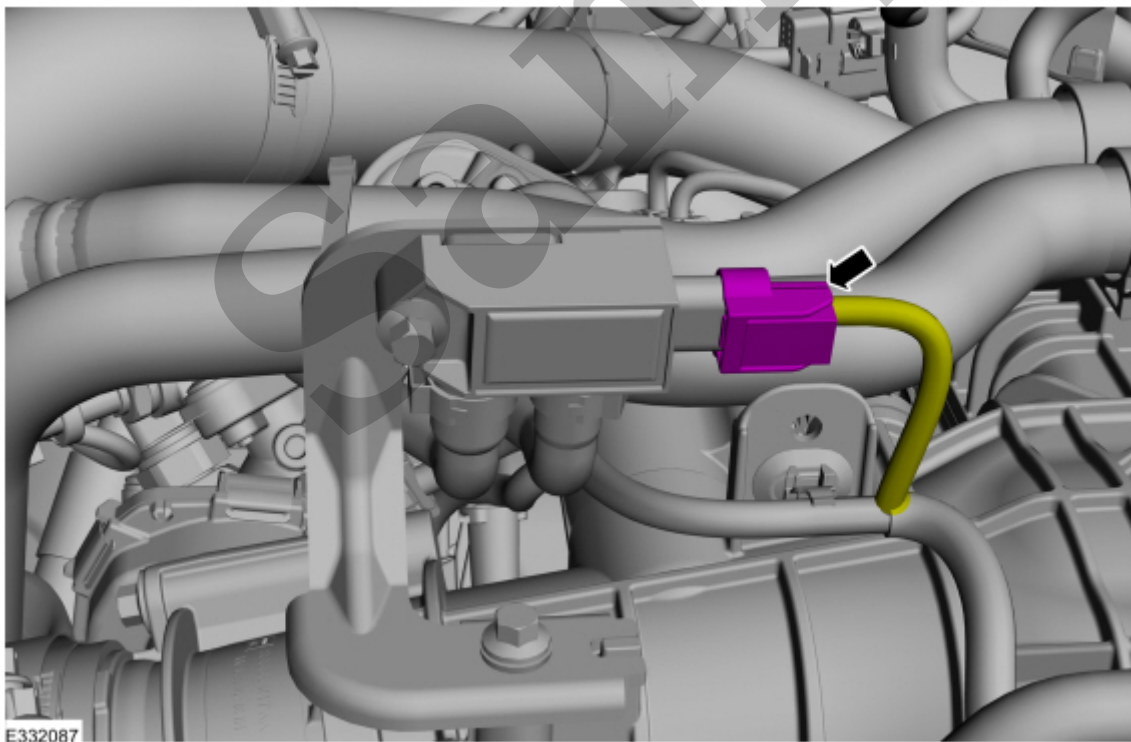
1. Inspect the turbocharger or engine air intake system components and clean, if necessary.

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2. Disconnect the electrical connector and position aside the wiring harness.



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# Exhaust Gas Recirculation (EGR) Back Pressure Sensor

|                                                      |                                     |
|------------------------------------------------------|-------------------------------------|
| 303-08C Engine Emission Control - 3.5L EcoBoost (BM) | 2022 F-150                          |
| Removal and Installation                             | Procedure revision date: 09/23/2020 |

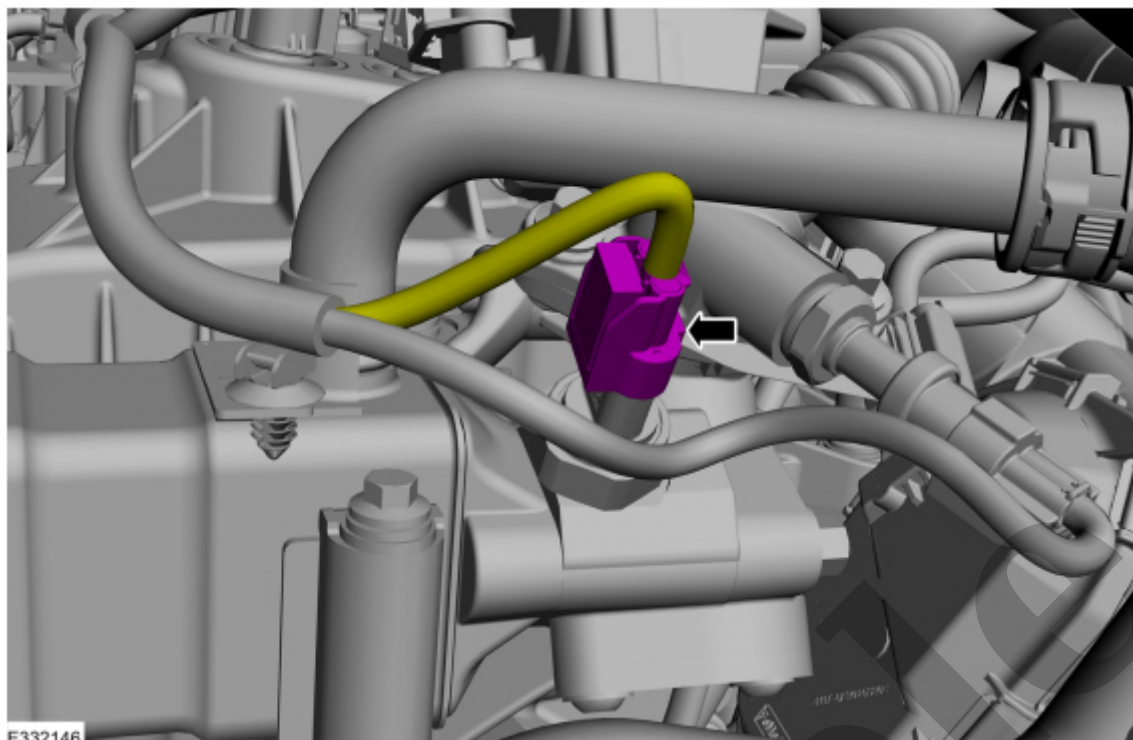
## Exhaust Gas Recirculation (EGR) Back Pressure Sensor

### Removal

#### NOTE

Removal steps in this procedure may contain installation details.

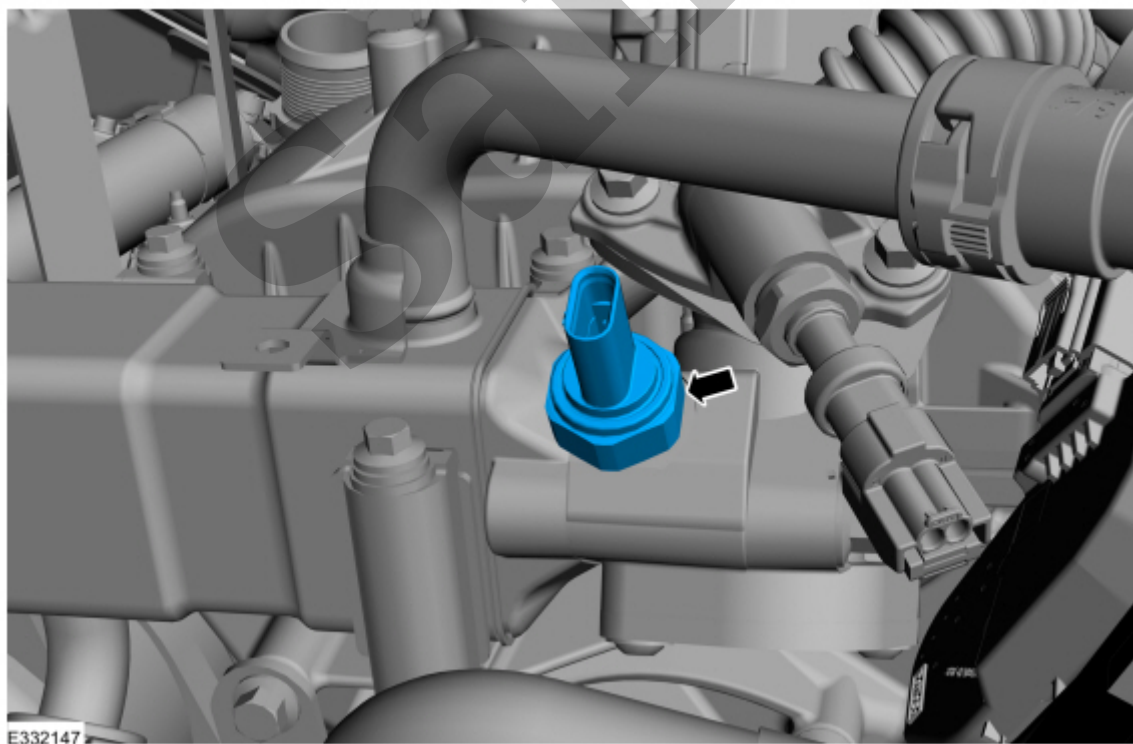
1. Remove the engine appearance cover retainers, release the engine appearance cover from the rear retainers and then remove the engine appearance cover.



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5. Remove the EGR (exhaust gas recirculation) back pressure sensor.

**Torque** : 97 lb.in (11 Nm)



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