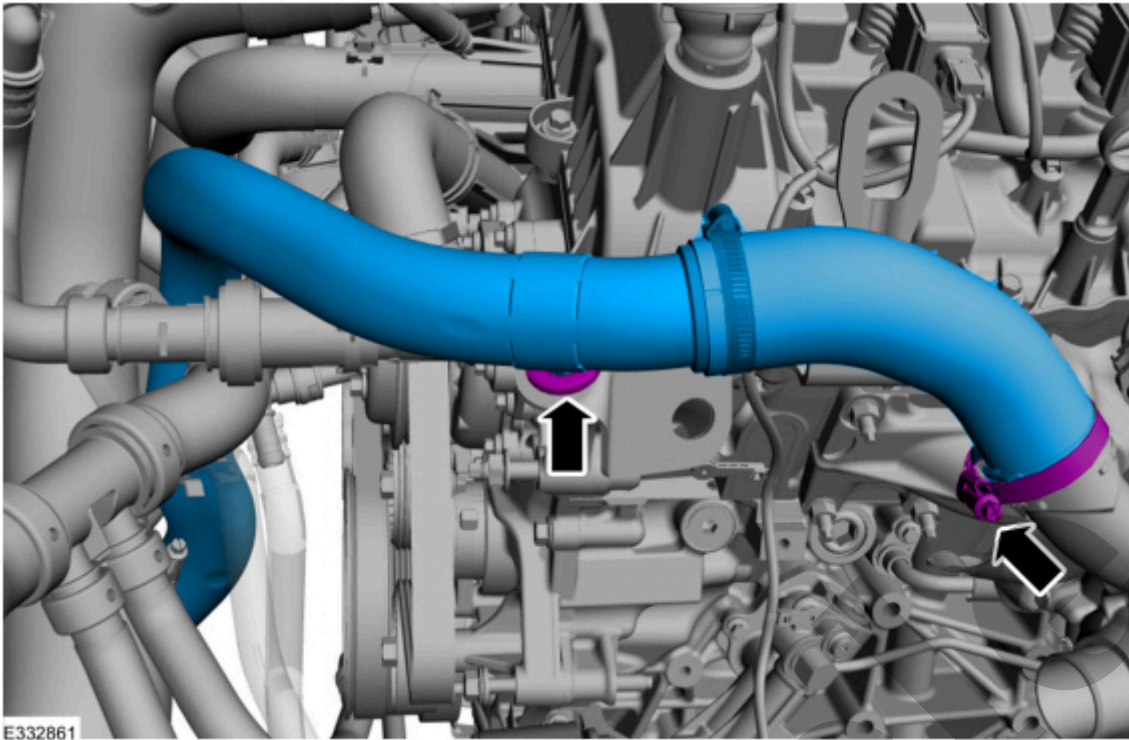


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FactoryManuals.net is a great resource for anyone who wants to save money on repairs by doing their own work. The manuals provide detailed instructions and diagrams that make it easy to understand how to fix a vehicle.

2018 Ford Fiesta Service and Repair Manual

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

Charge air cooler (CAC) intake pipe - Right side

6. Remove the air cleaner outlet pipe RH (right-hand) .

Refer to: [Air Cleaner Outlet Pipe RH\(303-12C Intake Air Distribution and Filtering - 3.5L EcoBoost \(BM\), Removal and Installation\).](#)

7. **NOTE**

The clamp can be accessed through the fender splash shield.

Loosen the clamps and remove the CAC (charge air cooler) intake pipe RH (right-hand) .

Torque : 48 lb.in (5.4 Nm)



Charge Air Cooler (CAC) Outlet Pipe

303-12D Intake Air Distribution and Filtering - 3.5L V6 PowerBoost (CN)	2022 F-150
Removal and Installation	Procedure revision date: 06/5/2020

Charge Air Cooler (CAC) Outlet Pipe

Removal

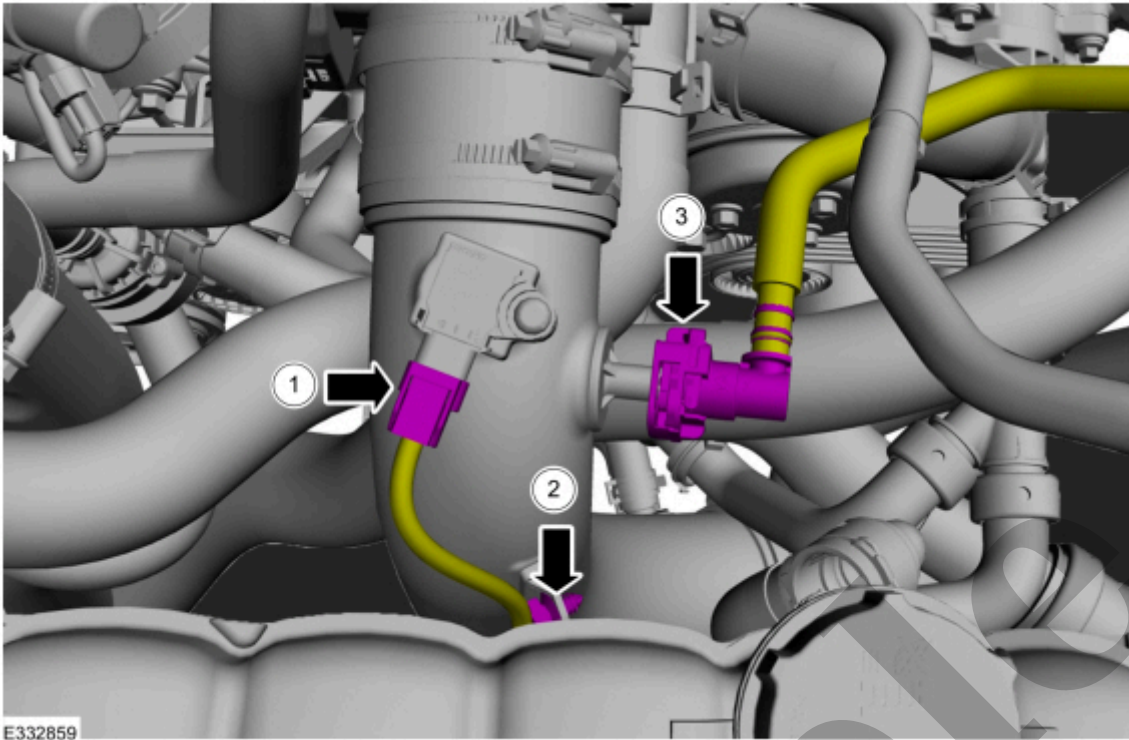
NOTICE

The turbocharger compressor vanes can be damaged by even the smallest particles. When removing any turbocharger or engine air intake system component, ensure that no debris enters the system. Failure to do so may result in damage to the turbocharger.

NOTE

Removal steps in this procedure may contain installation details.

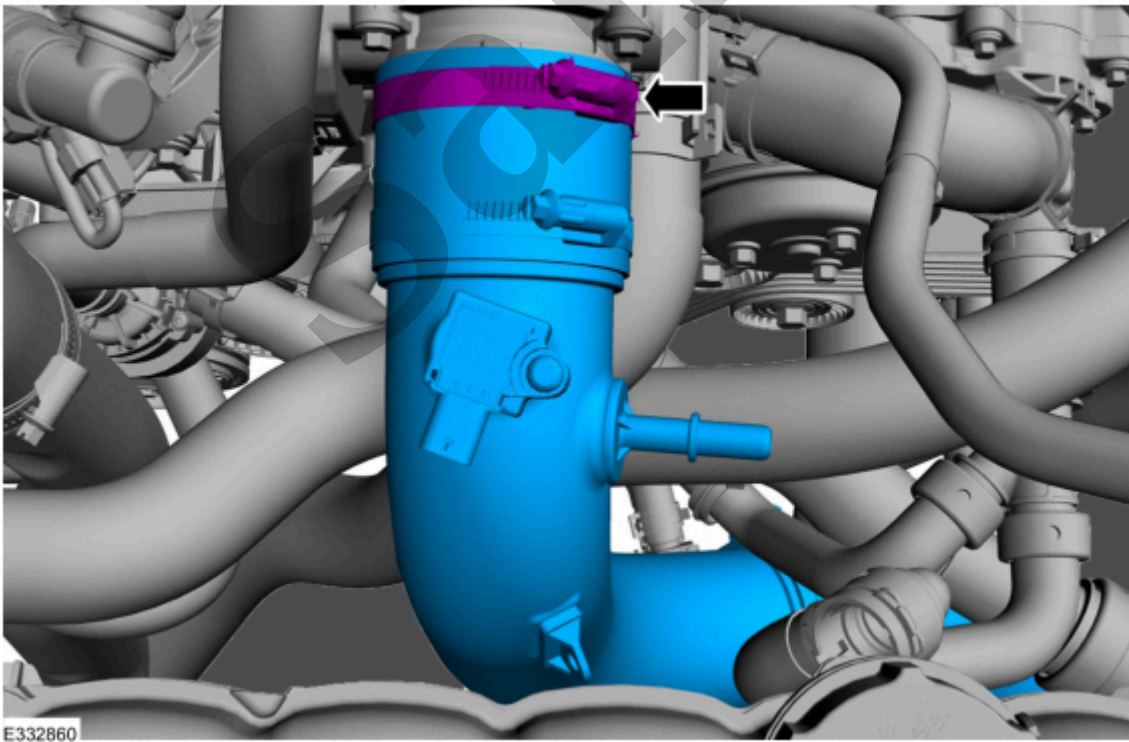
1. With the vehicle in NEUTRAL, position it on a hoist.
Refer to: [Jacking and Lifting - Overview](#)(100-02 Jacking and Lifting, Description and Operation).
2. Remove the air cleaner outlet pipe RH (right-hand) .
Refer to: [Air Cleaner Outlet Pipe RH](#)(303-12C Intake Air Distribution and Filtering - 3.5L EcoBoost (BM), Removal and Installation).
3. Release the clip and disconnect the CAC (charge air cooler) outlet pipe.



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

5. Loosen the clamp, disconnect and remove the CAC (charge air cooler) outlet pipe.

Torque : 48 lb.in (5.4 Nm)



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

Charge Air Cooler (CAC)

303-12D Intake Air Distribution and Filtering - 3.5L V6 PowerBoost (CN)	2022 F-150
Removal and Installation	Procedure revision date: 06/5/2020

Charge Air Cooler (CAC)

Removal

NOTICE

The turbocharger compressor vanes can be damaged by even the smallest particles. When removing any turbocharger or engine air intake system component, ensure that no debris enters the system. Failure to do so may result in damage to the turbocharger.

NOTE

Removal steps in this procedure may contain installation details.

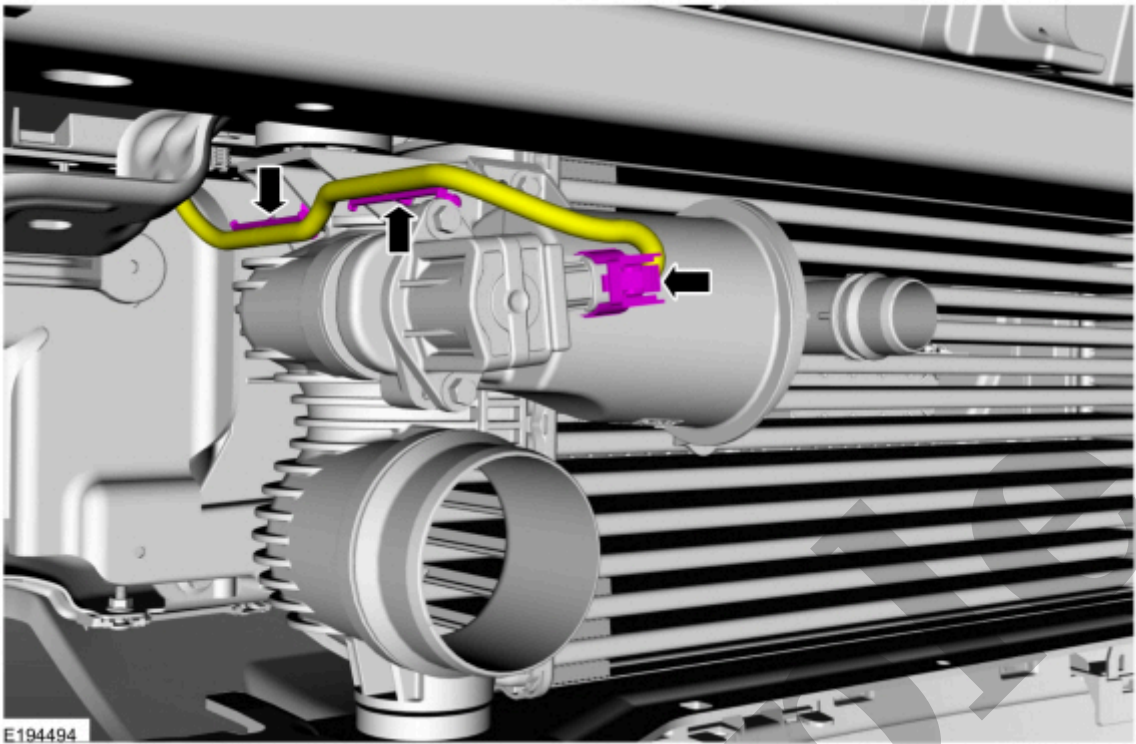
1. With the vehicle in NEUTRAL, position it on a hoist.

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

2. Loosen the intake pipe clamps and position the intake pipes aside.

Torque : 48 lb.in (5.4 Nm)

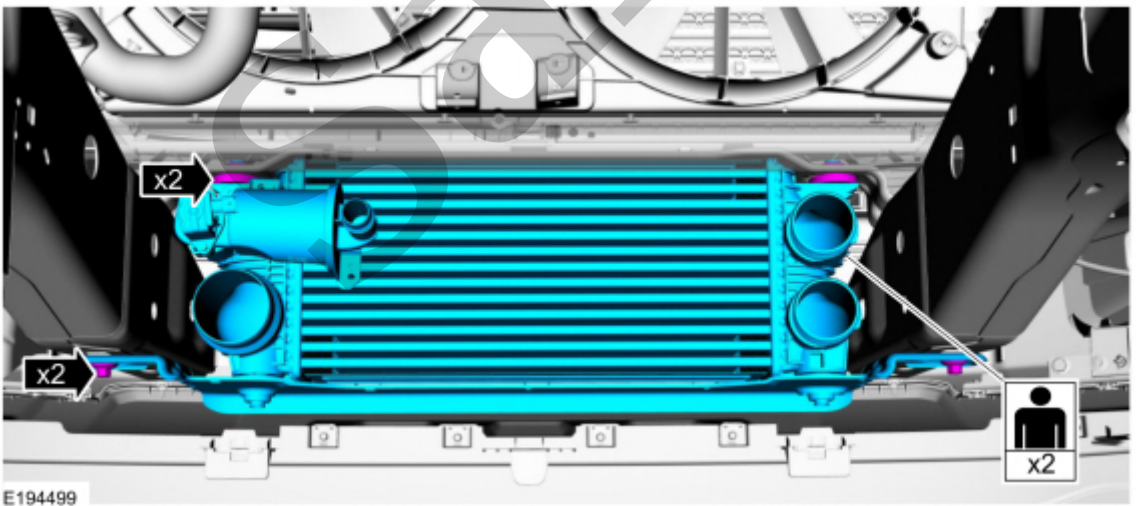
4. Disconnect the turbocharger bypass valve electrical connector and the harness pushpins.



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

5. Remove the bolts and the CAC (charge air cooler) and lower bracket.

Torque : 30 lb.ft (40 Nm)



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

Charge Air Cooler (CAC) Replacement

6. Remove the lower bracket from the CAC (charge air cooler) .

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

Installation

1. Inspect the turbocharger or engine air intake system components and clean, if necessary.
2. To install, reverse the removal procedure.

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Sample

Intake Air Distribution and Filtering - System Operation and Component Description

303-12E Intake Air Distribution and Filtering - 5.0L 32V Ti-VCT	2022 F-150
Description and Operation	Procedure revision date: 10/19/2020

Intake Air Distribution and Filtering - System Operation and Component Description

System Operation

Adaptive Airflow

Vehicles equipped with electronic throttle control (ETC) have an adaptive airflow strategy that allows the PCM (powertrain control module) to correct for changes in the airflow. During idle, the PCM (powertrain control module) monitors the throttle angle and airflow. If the airflow is determined to be less than expected, the PCM (powertrain control module) adjusts the throttle angle to compensate.

The PCM (powertrain control module) only learns the adaptive airflow when the vehicle is at idle and normal operating temperature and the airflow is less than a calibrated limit. Whenever the battery is disconnected or the KAM (keep alive memory) is reset, it is necessary for the PCM (powertrain control module) to learn the new value and not use the default value.

Cylinder Deactivation System

The cylinder deactivation system consists of an electric hydraulic positioning control solenoid for each cylinder equipped with cylinder deactivation, specifically designed rocker arms and uses engine oil pressure to activate and deactivate the affected cylinder. During operation at partial load, the cylinders can be deactivated hydraulically. This reduces fuel consumption and emissions. When only minimal engine load is required, the system stops the fuel injection and valve actuation. The connection between the camshaft and the intake and exhaust valves of each cylinder being deactivated is interrupted by applying oil pressure to a plunger inside the rocker arm which disengages the rocker arm. The PCM (powertrain control module) calculates the optimal cylinder deactivation timing using the engine speed, throttle position, and load condition.

The intake and exhaust valves remain closed and enclose the mixture in the combustion chamber. This causes a spring type effect which balances the forces acting inside the cylinder. The temperature in the

The throttle body system meters air to the engine during idle, part throttle, and WOT (wide open throttle) conditions. The throttle body system consists of single or dual bores with butterfly valve throttle plates and a TP (throttle position) sensor.

The major components of the throttle body assembly include the TP (throttle position) sensor and the throttle body housing assembly.

Features Of The Throttle Body Assembly Include:

- A preset stop to locate the WOT (wide open throttle) position.
- A throttle body mounted TP (throttle position) sensor.
- A coating sealant on the throttle bore and throttle plate makes the throttle body airflow tolerant to engine intake sludge accumulation. Some vehicles have a decal advising not to clean.
- A non adjustable stop screw for close plate idle airflow.

Component Description

Barometric Pressure (BARO) Sensor

A BARO sensor is mounted internally to the PCM. The BARO sensor measures the barometric pressure to estimate the exhaust back pressure.

Cylinder Deactivation Solenoid

The cylinder deactivation solenoid controls the flow of engine oil to the affected intake and exhaust rocker arms effectively activating and deactivating that cylinder when only minimal engine power is required.

Intake Air Temperature (IAT) Sensor

The IAT (intake air temperature) sensor is a thermistor device in which resistance changes with temperature. The resistance of a thermistor decreases as the temperature increases, and the resistance increases as the temperature decreases. The varying resistance affects the voltage drop across the sensor pins and provides electrical signals to the PCM (powertrain control module) corresponding to temperature.

Thermistor type sensors are considered passive sensors. A passive sensor is connected to a voltage divider network so that varying the resistance of the passive sensor causes a variation in total current flow. Voltage that is dropped across a fixed resistor in a series with the sensor resistor determines the voltage signal at the PCM (powertrain control module) . This voltage signal is equal to the reference voltage minus the voltage drop across the fixed resistor.

The IAT (intake air temperature) sensor provides air temperature information to the PCM (powertrain control module) . The PCM (powertrain control module) uses the air temperature information as a correction factor in the calculation of fuel, spark, and airflow.

The IAT (intake air temperature) sensor provides a quicker temperature change response time than the CHT (cylinder head temperature) or ECT (engine coolant temperature) sensor.

Intake Air Distribution and Filtering

303-12E Intake Air Distribution and Filtering - 5.0L 32V Ti-VCT	2022 F-150
Diagnosis and Testing	Procedure revision date: 10/30/2020

Intake Air Distribution and Filtering

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)	P3401:00	Cylinder 1 Deactivation/Intake Valve Control Circuit/Open: No Sub Type Information	GO to Pinpoint Test KH
PCM (powertrain control module)	P3402:00	Cylinder 1 Deactivation/Intake Valve Control Circuit Performance: No Sub Type Information	GO to Pinpoint Test KH
PCM (powertrain control module)	P3403:00	Cylinder 1 Deactivation/Intake Valve Control Circuit Low: No Sub Type Information	GO to Pinpoint Test KH
PCM (powertrain control module)	P3404:00	Cylinder 1 Deactivation/Intake Valve Control Circuit High: No Sub Type Information	GO to Pinpoint Test KH