Your Ultimate Source for OEM Repair Manuals

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.

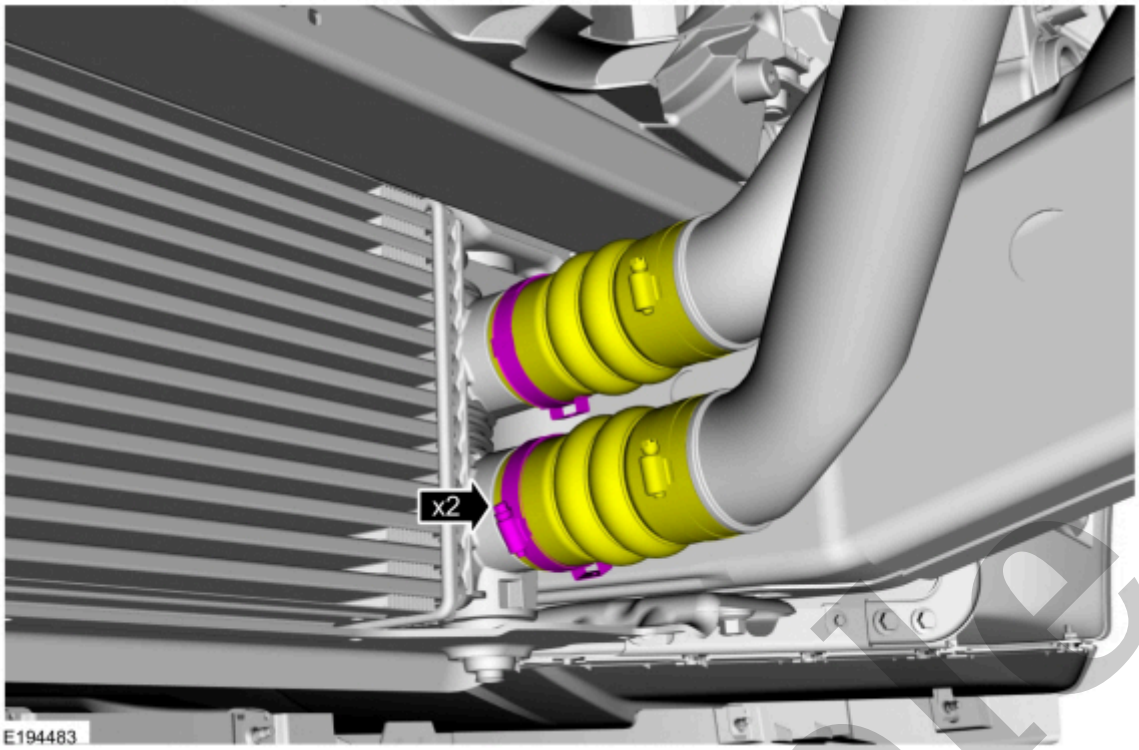
2018 Ford Special Service Police Sedan Service and Repair Manual

Go to manual page

Click here to learn about symbols, color coding, and icons used in this manual.

Installation

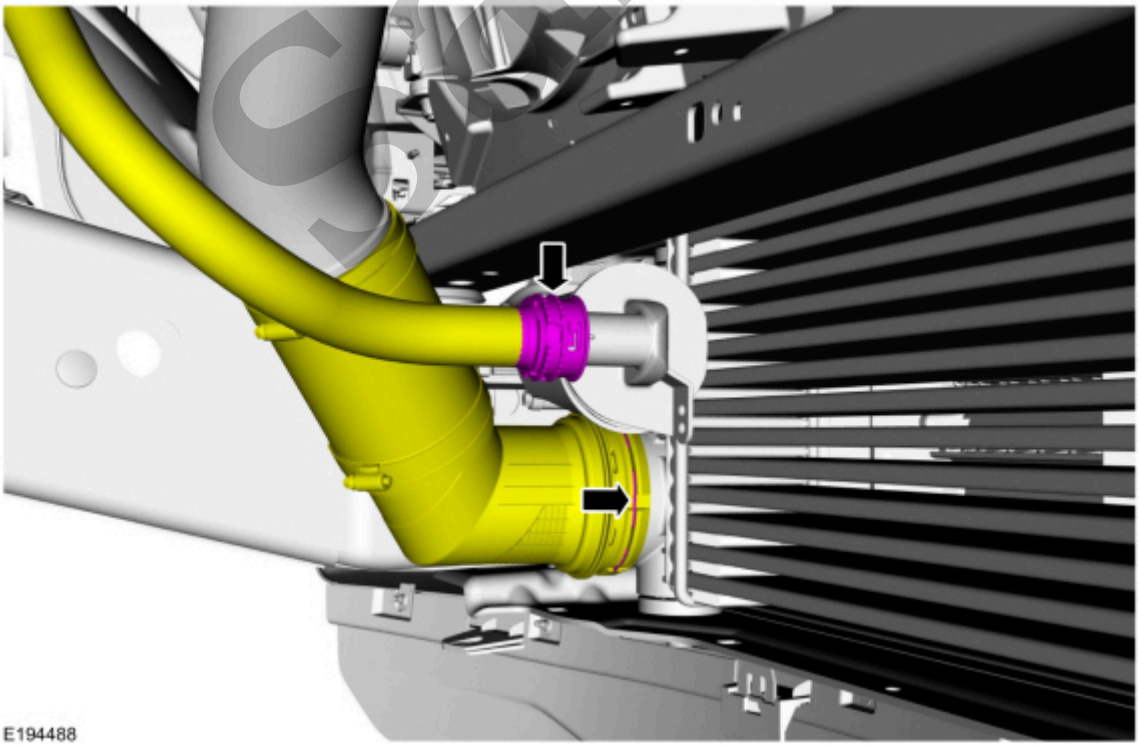
1. Inspect the turbocharger or engine air intake system components and clean, if necessary.
2. To install, reverse the removal procedure.



Click here to learn about symbols, color coding, and icons used in this manual.

3. Disconnect and position the CAC (charge air cooler) outlet pipe from the CAC and the quick connect coupling at the turbocharger bypass valve.

   Refer to: Quick Release Coupling(310-00A Fuel System - General Information - 2.7L EcoBoost (238kW/324PS), General Procedures).



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

E208113

Click here to learn about symbols, color coding, and icons used in this manual.

7. 1. Remove the bolt from the turbocharger bypass valve.

   2. Rotate the turbocharger bypass valve and remove from the CAC (charge air cooler) .

      Torque : 62 lb.in (7 Nm)

Intake Air Distribution and Filtering - Overview

303-12B Intake Air Distribution and Filtering - 3.3L Duratec-V6	***2022 F-150***
Description and Operation	***Procedure revision date: 10/13/2014***

Intake Air Distribution and Filtering - Overview

Overview

The air intake system cleans intake air with a replaceable, dry-type engine Air Cleaner (ACL) element made of treated, pleated paper. A new Air Cleaner (ACL) element must be installed periodically as scheduled. Engine performance and fuel economy are adversely affected when maximum restriction of the Air Cleaner (ACL) element is reached.

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.

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.

Manifold Absolute Pressure Temperature (MAPT) Sensor

The MAP (manifold absolute pressure) sensor is located on the intake manifold and measures the intake manifold pressure. The PCM (powertrain control module) uses this information to determine the air charge

Intake Air Flow

303-12B Intake Air Distribution and Filtering - 3.3L Duratec-V6	***2022 F-150***
Diagnosis and Testing	***Procedure revision date: 10/30/2020***

Intake Air Flow

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)	P0111:00	Intake Air Temperature Sensor 1 Circuit Range/Performance (Bank 1): No Sub Type Information	GO to Pinpoint Test DA
PCM (powertrain control module)	P0112:00	Intake Air Temperature Sensor 1 Circuit Low (Bank 1): No Sub Type Information	GO to Pinpoint Test DA
PCM (powertrain control module)	P0113:00	Intake Air Temperature Sensor 1 Circuit High (Bank 1): No Sub Type Information	GO to Pinpoint Test DA
PCM (powertrain control module)	P0505:00	Idle Control System: No Sub Type Information	GO to Pinpoint Test HU

Driving Performance > Runs Rough > All Running Modes > Always	GO to Pinpoint Test DA
Driving Performance > Idle Quality > Fast > Always	GO to Pinpoint Test HU
Driving Performance > Idle Quality > Slow > Always	GO to Pinpoint Test HU
Driving Performance > Idle Quality > Slow Return > Always	GO to Pinpoint Test HU
Driving Performance > Idle Quality > Rough > Always	GO to Pinpoint Test DA
Driving Performance > Stalls/Quits > Deceleration > Always	GO to Pinpoint Test HU
Driving Performance > Lack/Loss of Power > Acceleration > Always	GO to Pinpoint Test HU
Driving Performance > Lack/Loss of Power > Cruise/ Steady Speed > Always	GO to Pinpoint Test HU
Driving Performance > Hesitates/Stumble > Acceleration > Always	GO to Pinpoint Test DA
Driving Performance > Engine Surge > At Idle > Always	GO to Pinpoint Test DA
Driving Performance > Engine Surge > Cruise/ Steady Speed > Always	GO to Pinpoint Test HU

Pinpoint Tests

PINPOINT TEST DA : INTAKE AIR TEMPERATURE (IAT) SENSOR

Normal Operation and Fault Conditions

control module) P0113:00	1): No Sub Type Information	than the self-test maximum. An IAT (intake air temperature) sensor PID (parameter identification) reading greater than self-test maximum with the ignition ON engine OFF or during any engine operating mode indicates a concern is present.

Possible Sources

- MAPT (manifold absolute pressure and temperature) sensor circuitry concern
- MAPT (manifold absolute pressure and temperature) sensor (9F479)
- PCM (powertrain control module) (12A650)

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

PINPOINT TEST HU : INTAKE AIR SYSTEMS

Normal Operation and Fault Conditions

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

The IMRC (intake manifold runner control) sensor values should change when the IMRC (intake manifold runner control) is commanded open or closed.

DTC Fault Trigger Conditions

DTC (diagnostic trouble code)	Description	Fault Trigger Condition
PCM (powertrain control module) P0505:00	Idle Control System: No Sub Type Information	Sets when the PCM (powertrain control module) detects the desired RPM (revolutions per minute) could not be reached or controlled during the KOER (key on, engine running) self-test. This DTC (diagnostic trouble code) may be accompanied by other Diagnostic Trouble Codes (DTCs). Diagnose other Diagnostic Trouble Codes (DTCs) first. If no other Diagnostic Trouble Codes (DTCs) are present, inspect the intake air system for air restrictions, vacuum leaks, and damage. If no concerns are present, clear the DTC (diagnostic trouble code) and carry out the KOER (key on, engine running) , self-test.
PCM (powertrain control	Idle Control System - RPM Lower Than Expected: No	Sets when the PCM (powertrain control module) detects the engine idle speed is less than the desired RPM (revolutions per minute) . This DTC (diagnostic trouble code) may be accompanied by other Diagnostic Trouble Codes (DTCs). Diagnose other Diagnostic Trouble Codes (DTCs)

		coolant temperature is below 37.8°C (100°F). Allow the vehicle to soak for 2 to 3 hours if necessary for the engine coolant temperature to fall below 37.8°C (100°F). Start the engine without touching the accelerator pedal and allow the engine to idle for 6 minutes in park. If no Diagnostic Trouble Codes (DTCs) are present and the MIL (malfunction indicator lamp) is not illuminated after idling for 6 minutes, carry out the KOER (key on, engine running) , self-test to confirm that no Diagnostic Trouble Codes (DTCs) are present and the repair is complete.
PCM (powertrain control module) P050E:00	Cold Start Engine Exhaust Temperature Too Low: No Sub Type Information	Sets when the PCM (powertrain control module) detects the catalyst temperature ratio exceeds the calibrated value and the MIL (malfunction indicator lamp) illuminates. The PCM (powertrain control module) calculates the actual catalyst warm up temperature during a cold start. The PCM (powertrain control module) then compares the actual catalyst temperature to the expected catalyst temperature model. The difference between the actual and expected temperatures is a ratio. This DTC sets when this ratio exceeds the calibrated value and the malfunction indicator lamp (MIL) illuminates. Disregard the freeze frame data. Freeze frame data does not apply to the cold start monitor. This DTC (diagnostic trouble code) is informational only and may be accompanied by other Diagnostic Trouble Codes (DTCs). Diagnose other Diagnostic Trouble Codes (DTCs) first. If no other Diagnostic Trouble Codes (DTCs) are present, inspect the intake air system for air restrictions, vacuum leaks, and damage. If no concerns are present, clear the Diagnostic Trouble Codes (DTCs) and verify the engine coolant temperature is below 37.8°C (100°F). Allow the vehicle to soak for 2 to 3 hours if necessary for the engine coolant temperature to fall below 37.8°C (100°F). Start the engine without touching the accelerator pedal and allow the engine to idle for 6 minutes in park. If no Diagnostic Trouble Codes (DTCs) are present and the MIL (malfunction indicator lamp) is not illuminated after idling for 6 minutes, carry out the KOER (key on, engine running) , self-test to confirm that no Diagnostic Trouble Codes (DTCs) are present and the repair is complete.
PCM (powertrain control module) P115E:00	Throttle Actuator Control Throttle Body Air Flow Trim at Max Limit: No Sub	Sets when the PCM (powertrain control module) detects the maximum allowed compensation is reached and is no longer able to compensate for buildup. Install a new throttle body. Refer to the appropriate 303-04 section, Fuel Charging and Controls.