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2018 Ford Police Interceptor Utility Service and Repair Manual

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Intake Air Pressure and Temperature

303-12B Intake Air Distribution and Filtering - 3.3L Duratec-V6	***2022 F-150***
Diagnosis and Testing	***Procedure revision date: 11/3/2020***

Intake Air Pressure and Temperature

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)	P0106:00	Manifold Absolute Pressure/Barometric Pressure Sensor Circuit Range/Performance: No Sub Type Information	GO to Pinpoint Test DM
PCM (powertrain control module)	P0107:00	Manifold Absolute Pressure/Barometric Pressure Sensor Circuit Low: No Sub Type Information	GO to Pinpoint Test DM
PCM (powertrain control module)	P0108:00	Manifold Absolute Pressure/Barometric Pressure Sensor Circuit High: No Sub Type Information	GO to Pinpoint Test DM
PCM (powertrain control module)	P0109:00	Manifold Absolute Pressure/Barometric Pressure Sensor Circuit Intermittent: No Sub Type Information	GO to Pinpoint Test DM

Driving Performance > Stalls/Quits > Acceleration > Always	GO to Pinpoint Test DM
Driving Performance > Stalls/Quits > Cruise/ Steady Speed > Always	GO to Pinpoint Test DM
Driving Performance > Hesitates/Stumble > Cruise/ Steady Speed > Always	GO to Pinpoint Test DM
Driving Performance > Engine Surge > At Idle > Always	GO to Pinpoint Test DM
Driving Performance > Engine Surge > Acceleration > Always	GO to Pinpoint Test DM
Driving Performance > Engine Surge > Cruise/ Steady Speed > Always	GO to Pinpoint Test DM
Driving Performance > Engine Surge > Deceleration > Always	GO to Pinpoint Test DM

Pinpoint Tests

PINPOINT TEST DM : MANIFOLD PRESSURE SENSORS

NOTE

Refer to the appropriate Wiring Diagrams Cell for schematic and connector information

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) P0106:00	Manifold Absolute Pressure/Barometric Pressure Sensor Circuit Range/Performance: No Sub Type Information	Sets when the PCM (powertrain control module) detects the MAP (manifold absolute pressure) sensor input does not correlate with an inferred MAP (manifold absolute pressure) value. The inferred value is based on the MAF (mass air flow) sensor (if equipped). This DTC (diagnostic trouble code) may be accompanied by other Diagnostic Trouble Codes (DTCs). Check for other Diagnostic Trouble Codes (DTCs) and diagnose those first.
PCM (powertrain	Manifold Absolute Pressure/Barometric Pressure	Sets when the PCM (powertrain control module) detects the MAP (manifold absolute pressure) sensor operating

BARO SENSOR TRANSFER FUNCTION

Volts	Pressure in kPa	Pressure in psi	Pressure in in-Hg
0.3	7.6	1.1	2.2
0.5	12.7	1.84	3.8
2.64	60	8.7	17.7
4.54	115	16.68	34
4.75	120.3	17.45	35.5
4.8	121.6	17.66	35.9

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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) P2227:00	Barometric Pressure Sensor 'A' Circuit Range/Performance: No Sub Type Information	Sets when the PCM (powertrain control module) detects the barometric pressure (BARO) input does not correlate with an inferred barometric pressure calculation based on the MAP (manifold absolute pressure) or MAF (mass air flow) value. This DTC (diagnostic trouble code) is only operational between 1,000 feet below sea level to 15,000 feet above sea level, it should be disregarded if set outside the operational range.
PCM (powertrain control module) P2228:00	Barometric Pressure Sensor 'A' Circuit Low: No Sub Type Information	Sets when the PCM (powertrain control module) detects the BARO (barometric pressure) reading is abnormally low indicating an extreme high altitude. When the BARO (barometric pressure) signal is less than the calibrated threshold for greater than 100 ms, a concern is indicated. This DTC (diagnostic trouble code) is only operational between 1,000 feet below sea level to 15,000 feet above sea level, it should be disregarded if set outside the operational range.

Air Cleaner Outlet Pipe

303-12B Intake Air Distribution and Filtering - 3.3L Duratec-V6	***2022 F-150***
Removal and Installation	***Procedure revision date: 01/5/2021***

Air Cleaner Outlet Pipe

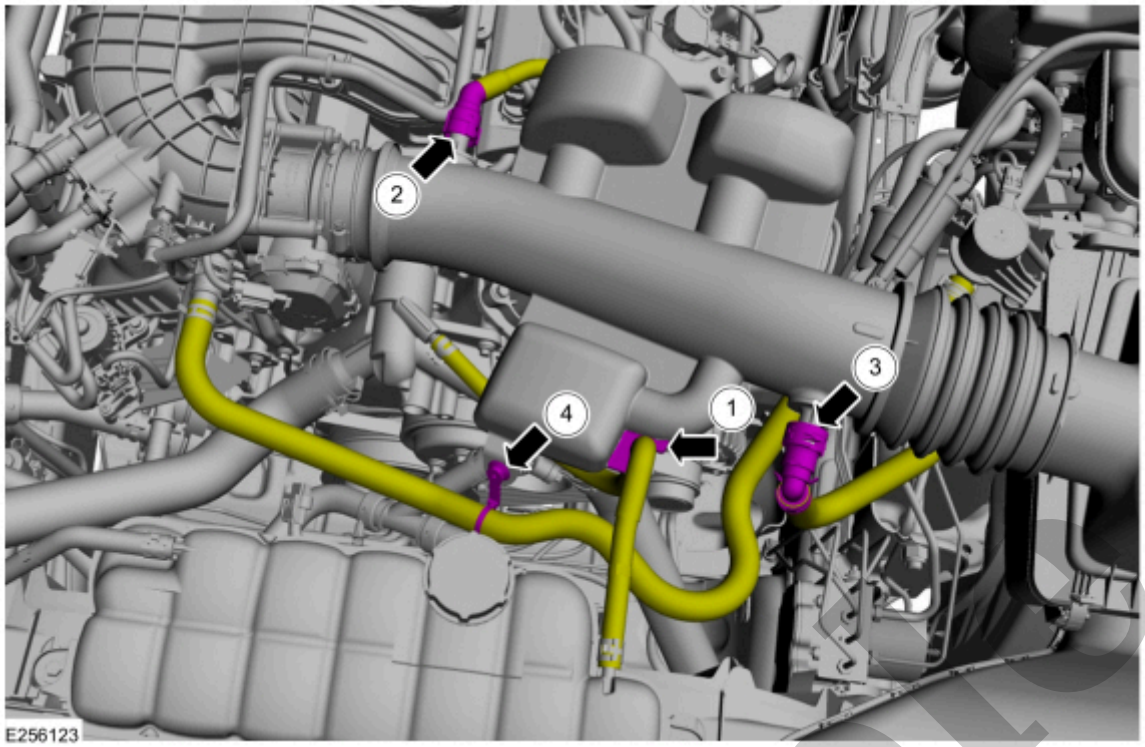
Removal

NOTE

Removal steps in this procedure may contain installation details.

1. Loosen the clamp and position the air cleaner outlet pipe aside.

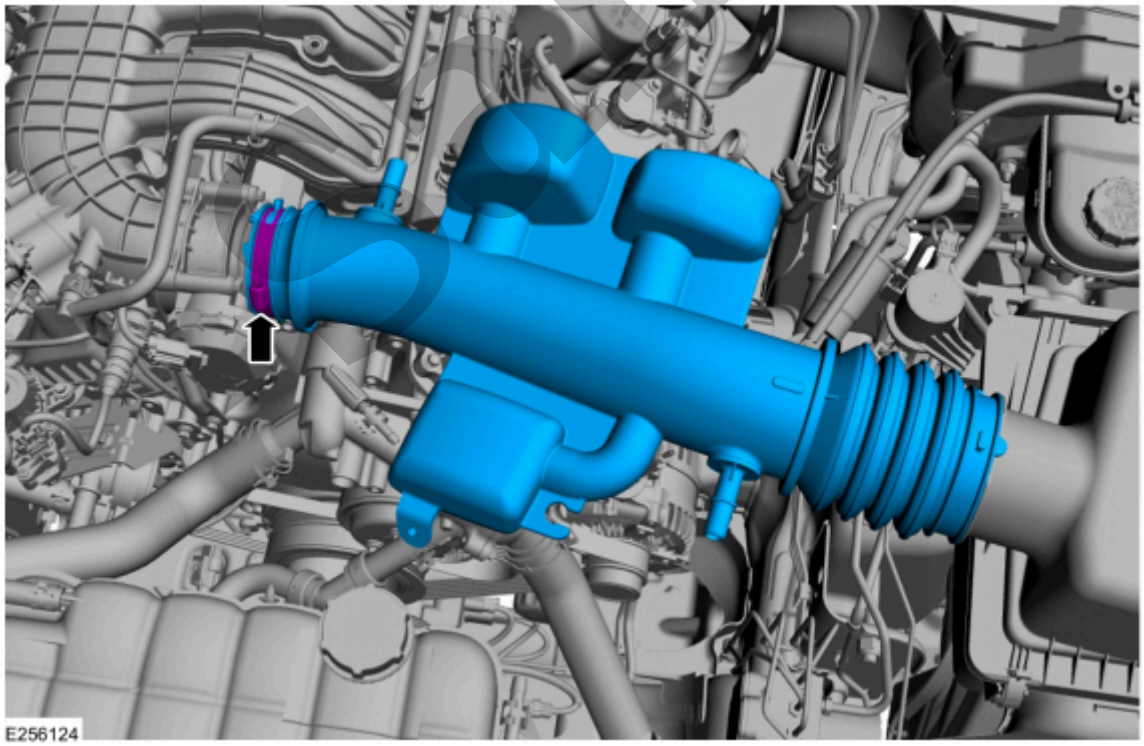
   Torque : 48 lb.in (5.4 Nm)



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

3. Loosen the clamp and remove the air cleaner outlet pipe.

   Torque : 48 lb.in (5.4 Nm)



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

Air Cleaner

303-12B Intake Air Distribution and Filtering - 3.3L Duratec-V6	***2022 F-150***
Removal and Installation	***Procedure revision date: 04/28/2020***

Air Cleaner

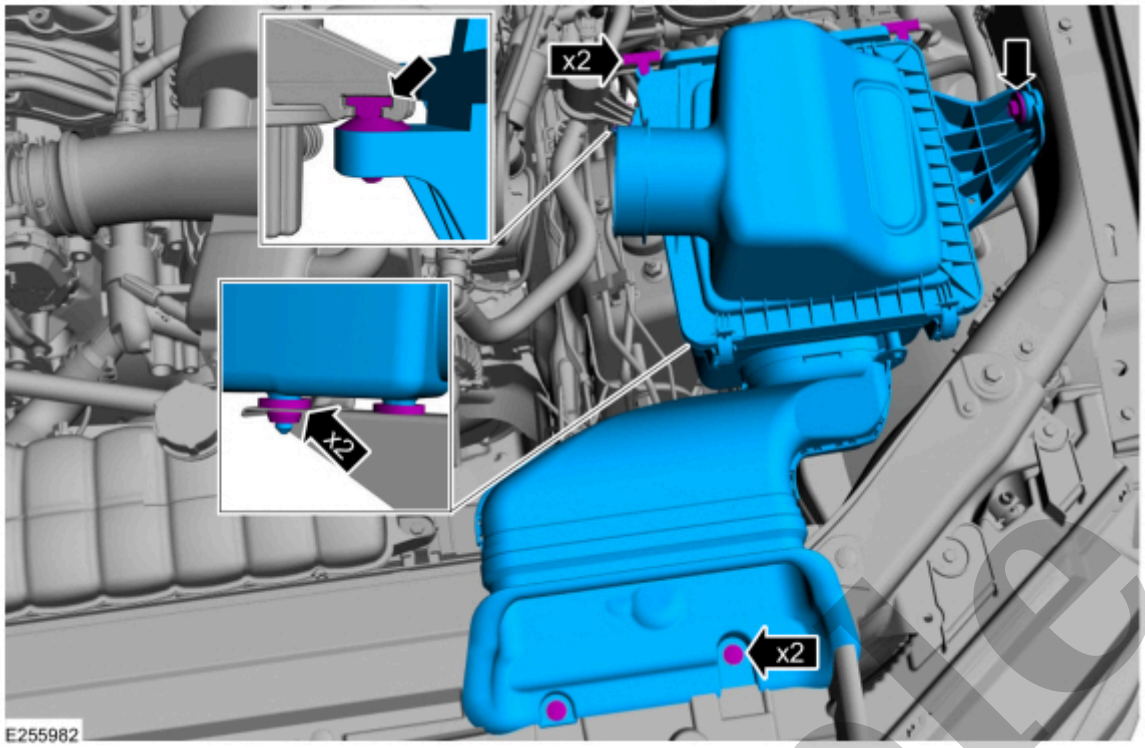
Removal

NOTE

Removal steps in this procedure may contain installation details.

1. Loosen the clamp and position the air cleaner outlet pipe aside.

   Torque : 48 lb.in (5.4 Nm)



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

Installation

1. To install, reverse the removal procedure.

2	Air cleaner outlet pipe
3	Air cleaner intake pipe
4	Air cleaner outlet pipe LH (left-hand)
5	CAC (charge air cooler) outlet pipe
6	CAC (charge air cooler)
7	CAC (charge air cooler) intake pipe LH (left-hand)
8	CAC (charge air cooler) intake pipe RH (right-hand)
9	Air cleaner outlet pipe RH (right-hand)

Intake Air Distribution and Filtering - System Operation and Component Description

303-12C Intake Air Distribution and Filtering - 3.5L EcoBoost (BM)	***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.

Intake Air Systems

The intake air system provides clean air to the engine, optimizes airflow, and reduces unwanted induction noise. The intake air system consists of an air cleaner assembly, resonator assemblies, and hoses. Some vehicles use a hydrocarbon filter trap to help reduce emissions by preventing fuel vapor from escaping into the atmosphere from the intake when the engine is OFF. It is typically located inside the intake air system. The hydrocarbon trap is part of the EVAP (evaporative emission) system. The intake air system also contains a IAT (intake air temperature) sensor that measures the intake air temperature. Intake air components can be separate components or part of the intake air housing. The function of a resonator is to reduce induction noise. The intake air components are connected to each other and to the throttle body assembly with hoses.