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2024 Ford Escape Service and Repair Manual

Go to manual page

PCM (powertrain control module)	P0243:00	Turbocharger/Supercharger Wastegate Actuator A: No Sub Type Information	GO to Pinpoint Test HN
PCM (powertrain control module)	P0247:00	Turbocharger/Supercharger Wastegate Actuator B: No Sub Type Information	GO to Pinpoint Test HN
PCM (powertrain control module)	P0299:00	Turbocharger/Supercharger A Underboost Condition: No Sub Type Information	GO to Pinpoint Test HN
PCM (powertrain control module)	P25B3:00	Turbocharger/Supercharger Wastegate A Stuck Open: No Sub Type Information	GO to Pinpoint Test HN
PCM (powertrain control module)	P25B4:00	Turbocharger/Supercharger Wastegate A Stuck Closed: No Sub Type Information	GO to Pinpoint Test HN
PCM (powertrain control module)	P25B5:00	Turbocharger/Supercharger Wastegate B Stuck Open: No Sub Type Information	GO to Pinpoint Test HN
PCM (powertrain control module)	P25B6:00	Turbocharger/Supercharger Wastegate B Stuck Closed: No Sub Type Information	GO to Pinpoint Test HN
PCM (powertrain control module)	P2AB7:00	Wastegate Position Sensor A Circuit: No Sub Type Information	GO to Pinpoint Test HN
PCM (powertrain control module)	P2AB8:00	Wastegate Position Sensor A Circuit Low: No Sub Type Information	GO to Pinpoint Test HN
PCM (powertrain control module)	P2AB9:00	Wastegate Position Sensor A Circuit High: No Sub Type Information	GO to Pinpoint Test HN
PCM (powertrain control module)	P2ABA:00	Wastegate Position Sensor B Circuit: No Sub Type Information	GO to Pinpoint Test HN

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) P0034:00	Turbocharger/Supercharger Bypass Valve 'A' Control Circuit Low: No Sub Type Information	Sets when the PCM (powertrain control module) detects an open circuit or a short to ground from the turbocharger bypass valve (TCBY) circuit. This DTC (diagnostic trouble code) only sets when the valve is commanded closed.
PCM (powertrain control module) P0035:00	Turbocharger/Supercharger Bypass Valve 'A' Control Circuit High: No Sub Type Information	Sets when the PCM (powertrain control module) detects high voltage from the turbocharger bypass valve (TCBY) circuit. This DTC (diagnostic trouble code) only sets when the valve is commanded open.
PCM (powertrain control module) P0234:00	Turbocharger/Supercharger 'A' Overboost Condition: No Sub Type Information	This DTC (diagnostic trouble code) sets when the turbocharger system TCBP PID (parameter identification) value is greater than a calibrated threshold, or the turbocharger system TCBP PID (parameter identification) value is greater than the turbocharger boost pressure (TCBP) desired value for a calibrated length of time. Check tubing for restrictions, cracks and incorrect fitting connections. Check the turbocharger wastegate regulating valve solenoid for correct operation.
PCM (powertrain control module) P0243:00	Turbocharger/Supercharger Wastegate Actuator 'A': No Sub Type Information	Sets when the PCM (powertrain control module) detects the TCWGM1+ and TCWGM1- circuits are reversed. Verify the TCWGM1+ and TCWGM1- circuit positions are correct in the harness connector.
PCM (powertrain	Turbocharger/Supercharger Wastegate Actuator 'B': No Sub	Sets when the PCM (powertrain control module) detects the TCWGM2+ and TCWGM2- circuits are

control module) P2AB7:00		less than a calibrated threshold.
PCM (powertrain control module) P2AB8:00	Wastegate Position Sensor 'A' Circuit Low: No Sub Type Information	Sets when the PCM (powertrain control module) detects the turbocharger wastegate position 1 sensor is out of self-test range low.
PCM (powertrain control module) P2AB9:00	Wastegate Position Sensor 'A' Circuit High: No Sub Type Information	Sets when the PCM (powertrain control module) detects the turbocharger wastegate position 1 sensor is out of self-test range high.
PCM (powertrain control module) P2ABA:00	Wastegate Position Sensor 'B' Circuit: No Sub Type Information	Sets when the PCM (powertrain control module) detects the TCWP2 circuit voltage is greater than or less than a calibrated threshold.
PCM (powertrain control module) P2ABB:00	Wastegate Position Sensor 'B' Circuit Low: No Sub Type Information	Sets when the PCM (powertrain control module) detects the turbocharger wastegate position 2 sensor is out of self-test range low.
PCM (powertrain control module) P2ABC:00	Wastegate Position Sensor 'B' Circuit High: No Sub Type Information	Sets when the PCM (powertrain control module) detects the turbocharger wastegate position 2 sensor is out of self-test range high.
PCM (powertrain control module) P2ABD:00	Turbocharger/Supercharger Wastegate Actuator 'A' Driver Current/Temperature Too High: No Sub Type Information	Sets when the PCM (powertrain control module) detects the turbocharger wastegate motor 1 driver current is greater than a calibrated threshold.

Turbocharger

303-04G Fuel Charging and Controls - Turbocharger - 3.5L EcoBoost (BM)	***2022 F-150***
Diagnosis and Testing	***Procedure revision date: 05/13/2022***

Turbocharger

Pinpoint Tests

PINPOINT TEST A : BLUE SMOKE FROM EXHAUST

Possible Sources

- Oil leak
- Air cleaner
- Air intake
- Crankcase ventilation system
- Internal engine damage
- Turbocharger

A1 CHECK THE EXHAUST

Yes	CLEAN, REPAIR or REPLACE the crankcase ventilation components. Refer to the section 303-08 for the procedure.

No	GO to A5

A5 CHECK THE AIR INTAKE PIPES AND HOSES FOR EXCESSIVE OIL

NOTE

It is normal for a small amount of combustion gas to pass into the crankcase. This gas is scavenged into the air intake system through the positive crankcase ventilation system, which incorporates a crankcase vent oil separator. Some engine oil, in the form of a vapor, is carried into the air intake system with the blow-by gases (this engine oil also contributes to valve seat durability). This means that oil will collect inside the air intake components and the turbocharger. This is not an indication that the turbocharger oil seal has failed. The turbocharger oil seal will generally not fail unless the bearings fail first, which will cause the turbocharger to become noisy or seize. Do not install a new turbocharger due to oil inside the intake.

- Inspect the inside of the air intake pipes and hoses for excessive oil.

Is excessive oil noticeable?

Yes	GO to A6

No	Diagnose internal engine damage. REFER to the 303-00 Diagnosis and Testing procedure for the engine being diagnosed. Follow the pinpoint test to diagnose blue smoke.

A6 CHECK THE TURBOCHARGER

- Remove the air cleaner outlet pipe and CAC (charge air cooler) intake pipe. Refer to the section 303-12 for the procedure.
- Inspect the compressor wheel for damage.
- Check that the turbine shaft spins free.
- Check for contact marks between the compressor wheel and the housing.

Is the turbocharger damaged?

No	The turbocharger is not the source of the noise. Diagnose an engine noise. REFER to the 303-00 Diagnosis and Testing procedure for the engine being diagnosed. Follow the pinpoint test to diagnose engine noise.

B3 CHECK THE AIR INTAKE SYSTEM

- Check the air intake system, air cleaner and CAC (charge air cooler) components, ducts, pipes and hoses. Check that all components are installed correctly and tight. Check that all components are aligned correctly. Check for damage that could cause an air-intake leak resulting in a noise from the turbocharger(s). For additional information, refer to the 303-12 Intake Air Distribution and Filtering section for the engine being diagnosed.

Does the air intake system have any leaks?

Yes	Repair as necessary. For additional information, refer to the 303-12 Intake Air Distribution and Filtering section for the engine being diagnosed.

No	GO to Pinpoint Test C Check the turbocharger(s) for damage that could result in a noise.

PINPOINT TEST C : LOSS OF POWER

Possible Sources

- Air cleaner
- Air intake
- Exhaust restricted
- Turbocharger
- Internal engine damage

C1 CHECK FOR PCM (POWERTRAIN CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Carry out the PCM (powertrain control module) KOEO (key on, engine off) and KOER (key on, engine running) self-tests.

Are any Diagnostic Trouble Codes (DTCs) present?

Yes	REFER to the Master DTC Chart to diagnose the DTC (diagnostic trouble code) present.

No	GO to C5

C5 CHECK THE WASTEGATE

- Check the wastegate for damage. Check to be sure the wastegate linkage moves freely.

Is the wastegate, wastegate actuator or linkage damaged?

Yes	REPAIR as necessary. Refer to the 303-04 Turbocharger section for the engine being diagnosed.

No	GO to C6

C6 CHECK THE TURBOCHARGER

- Remove the air cleaner outlet pipe and CAC (charge air cooler) intake pipe. Refer to the section 303-12 for the procedure.
- Inspect the compressor wheel for damage.
- Check that the turbine shaft spins free.
- Check for contact marks between the compressor wheel and the housing.

Is the turbocharger damaged?

Yes	INSTALL a new turbocharger. REFER to the Turbocharger Removal and Installation procedure in this section.

No	Diagnose internal engine damage. REFER to the 303-00 Diagnosis and Testing procedure for the engine being diagnosed. Follow the pinpoint test to diagnose loss of power, poor idling, runs rough.

PINPOINT TEST D : EXTERNAL OIL LEAKS

Possible Sources

- Oil supply tube
- Oil return tube

No	GO to D2

D2 CHECK THE OIL RETURN TUBE

- Visually inspect the oil return tube for traces of oil. Check the engine and the turbocharger ends. Check for oil running down from other areas of the tube or the engine to locate the source of the leak. Check the oil return tube gaskets and seals.

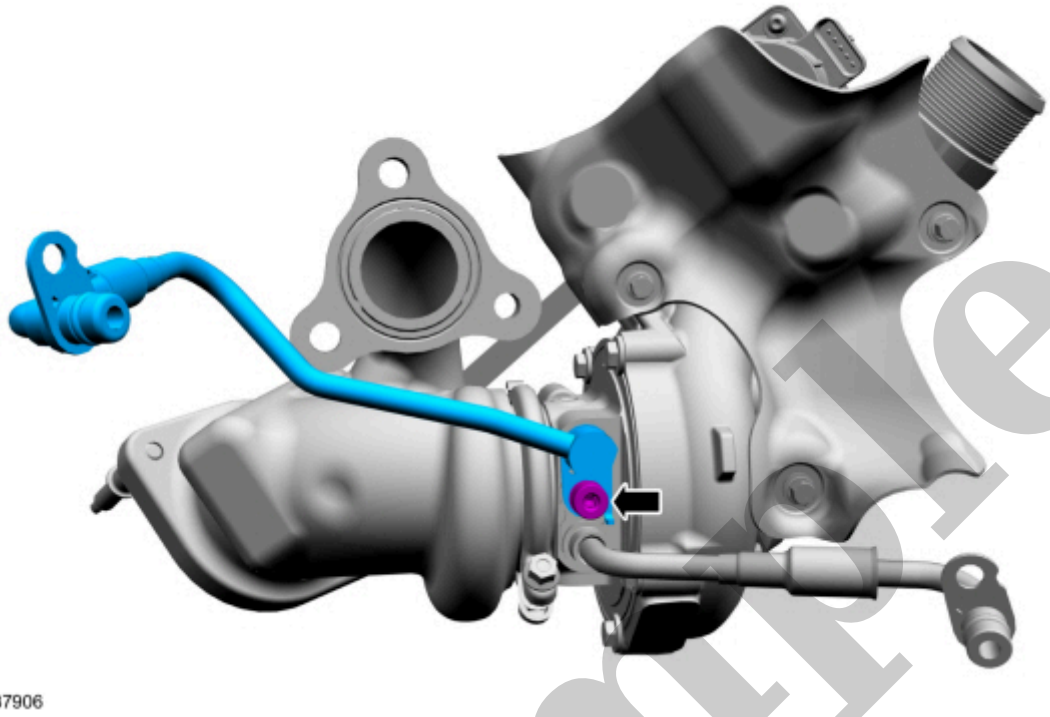
Is the oil return tube leaking oil?

Yes	INSTALL a new turbocharger oil return tube. REFER to the Turbocharger Oil Return Tube Removal and Installation procedure in this section.

No	CARRY OUT an oil leak inspection. REFER to the Oil Leak Inspection procedure in the 303-00 section for the engine being diagnosed. Check for an engine oil leak.

If the 2 piece turbocharger cooling tubes are separated or the rubber gasket is leaking, then the rubber gasket must be replaced.

Remove the turbocharger coolant tube bolt, then remove the turbocharger coolant tube.



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

3. 1. Remove and discard the turbocharger coolant tube O-ring seal.

   2. **NOTICE**

      Do not use a metal brush, damage to sealing area will result in leaks.

      Use brake cleaner and a nylon brush to clean. Clean the turbocharger coolant tube sealing surfaces. Inspect the sealing surfaces for debris or damage and make sure the retaining bracket is not bent, check for squareness of the O-ring area. Install new components if necessary.