

JB: Secondary Ignition (COP)

← [JB: Introduction](#)

JB1 CHECK FOR DTCS

Are DTCS P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308, P0309, P0310, or P050B present?

Yes	No
For DTCS P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308, P0309, P0310 or P0316, GO to JB3 . For DTC P050B, GO to JB15 .	For symptoms without DTCS, GO to JB2 . For all other DTCS, GO to Section 4, Diagnostic Trouble Code (DTC) Charts and Descriptions .

JB2 VISUAL INSPECTION OF THE IGNITION SYSTEM

- Visually inspect the engine compartment to make sure all coils are properly and securely connected.
- Examine all the wiring harnesses and connectors for damaged, burned, or overheated insulation, and loose or broken conditions.
- Make sure the vehicle battery is in good condition and all of the accessories are turned off.

Is a concern present?

Yes	No
REPAIR as necessary. CLEAR the DTCS. REPEAT the self-test.	GO to JB3 .

JB3 DTC P0301 THROUGH P0310: MISFIRE ON CYLINDERS 1 THROUGH 10

Are DTCS P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308, P0309, or P0310 present?

Yes	No
For Edge, Explorer 4.6L, Explorer Sport Trac 4.6L, F-Super Duty 6.8L, Fusion, Milan, MKX, Mountaineer 4.6L, and Mustang 5.4L, GO to JB4 .	GO to JB8 .

For Escape/Mariner 3.0L, Flex, MKS, Sable, Taurus, and Taurus X, GO to JB5 . For all others, GO to JB7 .	
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JB4 CHECK SPARK DURATION RELATIVENESS

- Access the PCM and monitor the SPKDUR_1, SPKDUR_2, SPKDUR_3, SPKDUR_4 and SPKDUR_5 PIDs.
- Access the PCM and monitor the SPKDUR_6, SPKDUR_7, SPKDUR_8, SPKDUR_9 and SPKDUR_10 PIDs.

Are the PIDs relative to each other?

Yes	No
GO to JB12 .	INSPECT the coil boot(s) for the missing cylinder (s). INSTALL a new coil boot(s) if necessary. REFER to the Workshop Manual Section 303-07, Engine Ignition, Spark Plugs, and INSPECT the spark plug(s) for the missing cylinder(s). MEASURE the resistance of the spark plug(s). INSTALL a new spark plug(s) if the resistance is lower than 2,000 ohms or higher than 20,000 ohms. If the coil boot(s) and spark plugs are OK, INSTALL a new COP(s) for the missing cylinders. CLEAR the DTCs. REPEAT the self-test.

JB5 CHECK FOR BANK 1 OR BANK 2 MISFIRE DTCS

Note: DTCs P0301, P0302, P0303 apply to bank 1 and DTCs P0304, P0305, P0306 apply to bank 2 on 6 cylinder engines.

Are DTCs P0301, P0302 or P0303 present?

Yes	No
GO to JB6 .	GO to JB7 .

JB6 CONFIRM COMPONENTS FOR CYLINDER MISFIRE

- Remove the suspect coil (as determined from the table) for the appropriate DTC. For additional information, refer to the Workshop Manual Section 303-07, Engine Ignition, Coil On Plug removal.
- Remove the suspect spark plug (as determined from the table) for the appropriate DTC. For additional information, refer to the Workshop Manual Section 303-07, Engine Ignition, Spark Plug removal.
- Remove the suspect fuel injector (as determined from the table) for the appropriate DTC. For additional information, refer to the Workshop Manual Section 303-04, Fuel Charging and Controls, Fuel Rail removal.
- Remove opposite bank coil. For additional information, refer to the Workshop Manual Section 303-07,

Engine Ignition, Coil On Plug removal.

- Remove the opposite bank spark plug. For additional information, refer to the Workshop Manual Section 303-07, Engine Ignition, Spark Plug removal.
- Remove the opposite bank fuel injector. For additional information, refer to the Workshop Manual Section 303-04, Fuel Charging and Controls, Fuel Rail removal.
- Install removed components from bank 1 on the opposite cylinder in bank 2 and install the components removed from bank 2 in bank 1.
- Make sure the vehicle is correctly reassembled.
- Drive the vehicle to determine if the misfire is still present.
- Carry out the KOER self-test.

Does the misfire move from the suspect cylinder in bank 1 to the opposite cylinder in bank 2?

Yes	No
GO to JB7 .	GO to JB12 .

JB7 CHECK FOR SPARK AT THE CYLINDER(S) INDICATED BY THE DTC(S)

- Ignition OFF.
- Remove the fuel pump fuse to disable the fuel pump.
- Disconnect the ignition coil(s) from the spark plug(s).
- Connect the Air Gap spark tester 303-D037 (D81P-6666-A) or its equivalent to the suspect coil.
- Observe the spark tester while cranking the engine.

Is a bluish-white spark present?

Yes	No
GO to JB10 .	INSPECT the coil boot(s) for the missing cylinder (s). INSTALL a new coil boot(s) if necessary. REFER to the Workshop Manual Section 303-07, Engine Ignition, Spark Plugs, and INSPECT the spark plug(s) for the missing cylinder(s). MEASURE the resistance of the spark plug(s). INSTALL a new spark plug(s) if the resistance is lower than 2,000 ohms or higher than 20,000 ohms. GO to JB9 .

JB8 CHECK FOR SPARK AT ALL CYLINDERS

- Ignition OFF.
- Disconnect the ignition coil(s) from the spark plug(s).
- Connect the Air Gap spark tester 303-D037 (D81P-6666-A) or its equivalent to the suspect coil.
- Observe the spark tester at each cylinder while cranking the engine.

Is a bluish-white spark consistent between all cylinders?

Yes	No
GO to JB10 .	INSPECT the coil boot(s) for the missing cylinder (s). INSTALL a new coil boot(s) if necessary. REFER to the Workshop Manual Section 303-07, Engine Ignition, Spark Plugs, and INSPECT the spark plug(s) for the missing cylinder(s). MEASURE the resistance of the spark plug(s). INSTALL a new spark plug(s) if the resistance is

lower than 2,000 ohms or higher than 20,000 ohms. RECORD the cylinder(s) with inconsistent spark.

GO to [JB9](#).

JB9 CHECK THE SECONDARY COIL RESISTANCE FOR THE MISSING CYLINDERS

- Ignition OFF.
- Suspect coil connector disconnected.
- Measure resistance between: Suspect coil connector, IGN START/RUN, component side and ignition coil spring, located in the ignition coil boot.

Is the resistance between 5,000 and 6,000 ohms?

Yes	No
GO to Pinpoint Test Z .	INSTALL a new COP. CLEAR the DTCs. REPEAT the self-test.

JB10 CHECK THE SPARK PLUGS

Note: To determine the condition of the spark plugs, refer to the Workshop Manual Section 303-00, Engine and carry out the Spark Plug Inspection.

- Ignition OFF.
- Remove and inspect the plugs for damage, wear, carbon tracking or deposits and proper plug gap.

Are the plugs OK?

Yes	No
GO to JB11 .	REPAIR the plug(s). ADJUST the gap or INSTALL a new spark plug(s) as necessary. REFER to the Workshop Manual Section 303-07, Engine Ignition. CLEAR the DTCs. REPEAT the self-test.

JB11 CHECK THE SPARK PLUG RESISTANCE

- Measure the spark plug resistance.

Is the resistance between 2,000 and 20,000 ohms?

Yes	No
For Edge, Explorer 4.6L, Explorer Sport Trac 4.6L, F-Super Duty 6.8L, Fusion,	INSTALL a new spark plug. REFER to the Workshop Manual Section 303-07, Engine Ignition.

Milan, MKX, Mountaineer 4.6L, and Mustang 5.4L, GO to JB16 . For all others, GO to JB12 .	CLEAR the DTCs. REPEAT the self-test.
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JB12 TEST DIRECTION FOR SYMPTOM CHARTS

Were you directed to this pinpoint test from Section 3?

Yes	No
RETURN to Section 3 , Symptom Charts for further direction.	GO to JB13 .

JB13 TEST DIRECTION FOR PINPOINT TEST HD

Were you directed to this pinpoint test from pinpoint test step HD6?

Yes	No
GO to HD7 .	GO to JB14 .

JB14 TEST DIRECTION FOR PINPOINT TEST A

Were you directed to this pinpoint test from pinpoint test step A9?

Yes	No
GO to A10 .	The concern is intermittent. GO to Pinpoint Test Z .

JB15 DTC P050B: COLD START PERFORMANCE

Are any other codes besides P050B present?

Yes	No
REPAIR all other powertrain related diagnostic trouble codes (DTCs) first.	GO to JB16 .

JB16 CHECK THE SPARK CAPTURE CIRCUIT

- Access the PCM and monitor the IGNPCM_F PID.

Is a concern indicated?

Yes	No
GO to JB18 .	GO to JB17 .

JB17 CHECK THE IGNITION TIMING PID

- Access the PCM and monitor the IGNX_F PIDs.

Is a concern indicated?

Yes	No
Visually INSPECT the COP harness for damage, exposed wiring, water contamination, corrosion, and correct assembly. REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test.	GO to JB18 .

JB18 CHECK FOR CORRECT PCM OPERATION

- Disconnect all the PCM connectors.
- Visually inspect for:
 - pushed out pins
 - corrosion
- Connect all the PCM connectors and make sure they seat correctly.
- Carry out the PCM self-test and verify the concern is still present.

Is the concern still present?

Yes	No
INSTALL a new PCM. REFER to Section 2, Flash Electrically Erasable Programmable Read Only Memory (EEPROM) , Programming the VID Block for a Replacement PCM.	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.
