Computers and Control Systems: Pinpoint Tests
Test JB: Secondary Ignition (COP)
PINPOINT TEST JB: SECONDARY IGNITION (COP)

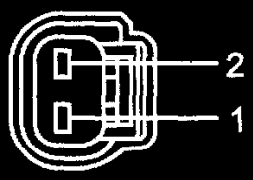
Secondary Ignition (COP)	JB

⚠ CAUTION: A malfunctioning ignition system may cause high catalyst temperatures. Check the components next to the catalyst and muffler for heat damage.

This pinpoint test is intended to diagnose the following:

- spark plugs (12405)
- secondary side of the coil

Coil On Plug (COP) Connector



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Vehicle	Connector	Pin	Circuit
Escape, Five Hundred, Focus, Ford GT, Freestyle, Fusion, LS, Mariner, Milan, Montego, Zephyr	A	2	IGN START/RUN
All other vehicles	A	1	IGN START/RUN

Caution And Coil On Plug (COP) Connector

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Vehicle	Firing Order for Coil On Plug Applications
BASE, 4-cylinder applications	1 3 4 2
Escape 3.0L, Five Hundred, Freestyle, Mariner, Montego, Fusion, Milan, Zephyr	1 4 2 5 3 6
LS	1 5 4 2 6 3 7 8
BASE, 8-cylinder applications	1 3 7 2 6 5 4 8
BASE, 10-cylinder applications	1 6 5 10 2 7 3 8 4 9

Test Step		Results / Action to Take
JB1	**CHECK FOR DTCS**	
	• **Are DTCs P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308, P0309, P0310, or P050B present?**	**Yes** For DTCs P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308, P0309 or P0310, GO to **JB3**. For DTC P050B, GO to **JB14**. **No** For symptoms without DTCs, GO to **JB2**. For all other DTCs, GO to DTC Charts, 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** REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test. **No** GO to **JB3**.
JB3	**DTC P0301 THROUGH P0310: MISFIRE ON CYLINDERS 1 THROUGH 10**	
	• **Are DTCs P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308, P0309, or P0310 present?**	**Yes** GO to **JB4**. **No** GO to **JB7**.

Coil On Plug (COP) Connector And JB1-JB3

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Test Step	Results / Action to Take
JB4 CHECK VEHICLE LINE	
• **Is this a Fusion, Milan, Zephyr or Explorer 4.6L?**	**Yes** GO to **JB5**. **No** GO to **JB6**.
JB5 CHECK SPARK DURATION RELATIVENESS	
• Monitor the spark duration PIDs. • **Are the PIDs relative to each other?**	**Yes** GO to **JB11**. **No** INSPECT the coil boot(s) for the missing cylinder(s). INSTALL a new coil boot(s) if necessary. 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.
JB6 CHECK FOR SPARK AT THE CYLINDER(S) INDICATED BY THE DTC(S)	
• Locate and activate the fuel inertia switch 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. • If a worldwide diagnostic system (WDS) or equivalent diagnostic tool is available, use the scope function to verify that the coil is the problem. • Observe the spark tester while cranking the engine. • **Is a bluish-white spark present?**	**Yes** GO to **JB9**. **No** INSPECT the coil boot(s) for the missing cylinder(s). INSTALL a new coil boot(s) if necessary. 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 **JB8**.

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Test Step	Results / Action to Take
JB7 CHECK FOR SPARK AT ALL CYLINDERS • Key in OFF position. • Locate and activate the fuel inertia switch 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 at each cylinder while cranking the engine. • **Is a bluish-white spark consistent between all cylinders?**	**Yes** GO to **JB9**. **No** INSPECT the coil boot(s) for the missing cylinder(s). INSTALL a new coil boot(s) if necessary. 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. REFER to Ignition System. GO to **JB8**.
JB8 CHECK THE SECONDARY COIL RESISTANCE FOR THE MISSING CYLINDERS • Key in OFF position. • Suspect coil connector disconnected. • Measure resistance between: Suspect COP 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** GO to Pinpoint Test Z. **No** INSTALL a new COP. CLEAR the DTCs. REPEAT the self-test.
JB9 CHECK THE SPARK PLUGS • Key in OFF position. • Remove and inspect the plugs for damage, wear, carbon deposits, and proper plug gap. • **Are the plugs OK?**	**Yes** GO to **JB10**. **No** REPAIR the plug(s). ADJUST the gap or INSTALL a new spark CLEAR the DTCs. REPEAT the self-test.

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Test Step	Results / Action to Take
JB10 CHECK THE SPARK PLUG RESISTANCE	
• Measure the spark plug resistance. • **Is the resistance between 2,000 and 20,000 ohms?**	**Yes** For Explorer 4.6L, Fusion, Milan, Zephyr GO to **JB15**. For all others, GO to **JB11**. **No** INSTALL a new spark plug. CLEAR the DTCs. REPEAT the self-test.
JB11 TEST DIRECTION FOR SYMPTOM CHARTS	
• **Were you directed to this pinpoint test from** Symptom Charts**?**	**Yes** The concern is elsewhere. RETURN to Symptom Charts for further direction. **No** GO to **JB12**.
JB12 TEST DIRECTION FOR PINPOINT TEST HD	
• **Were you directed to this pinpoint test from pinpoint test step HD5?**	**Yes** GO to **HD7**. **No** GO to **JB13**.
JB13 TEST DIRECTION FOR PINPOINT TEST A	
• **Were you directed to this pinpoint test from pinpoint test step A8?**	**Yes** GO to **A9**. **No** The concern is intermittent. GO to Pinpoint Test Z.
JB14 DTC P050B: COLD START PERFORMANCE	
• **Are any other codes besides P050B present?**	**Yes** REPAIR all other powertrain related diagnostic trouble codes (DTCs) first. **No** GO to **JB15**.
JB15 CHECK THE SPARK CAPTURE CIRCUIT	
• Access the PCM and monitor the IGNPCM_F PID. • **Is a fault indicated?**	**Yes** GO to **JB17**. **No** GO to **JB16**.

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Test Step	Results / Action to Take
JB16 CHECK THE IGNITION TIMING PID	
• Access the PCM and monitor the IGNX_F PIDs. • **Is a concern indicated?**	**Yes** 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. **No** GO to **JB17**.
JB17 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** INSTALL a new PCM. REFER to Diagnostic Methods, Flash Electrically Erasable Programmable Read Only Memory (EEPROM). **No** The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.