

Computers and Control Systems: Pinpoint Tests

Test JB: Secondary Ignition (COP)

PINPOINT TEST JB: SECONDARY IGNITION (COP)

Secondary Ignition (COP)

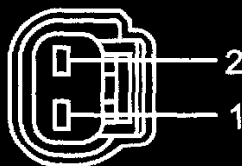
JB

⚠ 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



A0077505

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

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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	
	<ul style="list-style-type: none"> Are DTCs P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308, P0309, P0310, or P050B present? 	<p>Yes For DTCs P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308, P0309 or P0310, GO to JB3. For DTC P050B, GO to JB14.</p> <p>No For symptoms without DTCs, GO to JB2. For all other DTCs, GO to DTC Charts, Diagnostic Trouble Code (DTC) Charts and Descriptions.</p>
JB2	VISUAL INSPECTION OF THE IGNITION SYSTEM	
	<ul style="list-style-type: none"> 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? 	<p>Yes REPAIR as necessary. CLEAR the DTCs. REPEAT the self-test.</p> <p>No GO to JB3.</p>
JB3	DTC P0301 THROUGH P0310: MISFIRE ON CYLINDERS 1 THROUGH 10	
	<ul style="list-style-type: none"> Are DTCs P0300, P0301, P0302, P0303, P0304, P0305, P0306, P0307, P0308, P0309, or P0310 present? 	<p>Yes GO to JB4.</p> <p>No GO to JB7.</p>

Coil On Plug (COP) Connector And JB1-JB3

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Test Step		Results / Action to Take
JB4	CHECK VEHICLE LINE	
	<ul style="list-style-type: none"> Is this a Fusion, Milan, Zephyr or Explorer 4.6L? 	Yes GO to JB5 . No GO to JB6 .
JB5	CHECK SPARK DURATION RELATIVENESS	
	<ul style="list-style-type: none"> 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)	
	<ul style="list-style-type: none"> 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 .

JB4-JB6

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Test Step		Results / Action to Take
JB7	CHECK FOR SPARK AT ALL CYLINDERS	
	<ul style="list-style-type: none"> • 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? 	<p>Yes GO to JB9.</p> <p>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.</p> <p>GO to JB8.</p>
JB8	CHECK THE SECONDARY COIL RESISTANCE FOR THE MISSING CYLINDERS	
	<ul style="list-style-type: none"> • 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? 	<p>Yes GO to Pinpoint Test Z.</p> <p>No INSTALL a new COP. CLEAR the DTCs. REPEAT the self-test.</p>
JB9	CHECK THE SPARK PLUGS	
	<ul style="list-style-type: none"> • Key in OFF position. • Remove and inspect the plugs for damage, wear, carbon deposits, and proper plug gap. • Are the plugs OK? 	<p>Yes GO to JB10.</p> <p>No REPAIR the plug(s). ADJUST the gap or INSTALL a new spark CLEAR the DTCs. REPEAT the self-test.</p>

JB7-JB9

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Test Step		Results / Action to Take
JB10	CHECK THE SPARK PLUG RESISTANCE <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> Access the PCM and monitor the IGNPCM_F PID. Is a fault indicated? 	Yes GO to JB17 . No GO to JB16 .

JB10-JB15

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Test Step		Results / Action to Take
JB16	CHECK THE IGNITION TIMING PID	
	<ul style="list-style-type: none"> • Access the PCM and monitor the IGNX_F PIDs. • Is a concern indicated? 	<p>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.</p> <p>No GO to JB17.</p>
JB17	CHECK FOR CORRECT PCM OPERATION	
	<ul style="list-style-type: none"> • Disconnect all the PCM connectors. • Visually inspect for: <ul style="list-style-type: none"> — 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? 	<p>Yes INSTALL a new PCM. REFER to Diagnostic Methods, Flash Electrically Erasable Programmable Read Only Memory (EEPROM).</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.</p>

JB16-JB17