

## Computers and Control Systems: Pinpoint Tests

### Test JF: Integrated Ignition Coil on Plug Coil A Through J Failure

PINPOINT TEST JF: INTEGRATED IGNITION COIL ON PLUG COIL A THROUGH J FAILURE

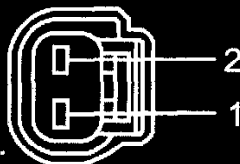
## Integrated Ignition Coil On Plug Coil A Through J Failure

**JF**

This pinpoint test is intended to diagnose the following:

- ignition coils (12A366)
- ignition coil harness
- powertrain control module (PCM) (12A650)

## Coil On Plug (COP) Connector



A0077505

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

### IGNITION COIL TO CYLINDER CORRELATION

Vehicle	Related DTC	Cylinder Number	Ignition Coil	Coil Driver (CD)	PCM Pin
4-Cylinder Applications	P0351	1	A	A	E1
	P0352	2	B	D	E12
	P0353	3	C	B	E24

(Continued)

Coil On Plug (COP) Connector And Table

# Integrated Ignition Coil On Plug Coil A Through J Failure

# JF

## IGNITION COIL TO CYLINDER CORRELATION

Vehicle	Related DTC	Cylinder Number	Ignition Coil	Coil Driver (CD)	PCM Pin
	P0354	4	D	C	E35
Fusion, Milan, 2.3L	P0351	1	A	A	E17
	P0352	2	B	D	E11
	P0353	3	C	B	E12
	P0354	4	D	C	E16
Five Hundred, Freestyle, Montego	P0351	1	A	A	E1
	P0352	2	B	C	E12
	P0353	3	C	E	E24
	P0354	4	D	B	E35
	P0355	5	E	D	E38
	P0356	6	F	F	E39
Fusion, Milan, Zephyr, 3.0L	P0351	1	A	A	E17
	P0352	2	B	C	E16
	P0353	3	C	E	E15
	P0354	4	D	B	E12
	P0355	5	E	D	E11
	P0356	6	F	F	E10
Escape 3.0L, Mariner	P0351	1	A	A	E1
	P0352	2	B	C	E12
	P0353	3	C	E	E24
	P0354	4	D	B	E35
	P0355	5	E	D	E36
	P0356	6	F	F	E22
Taurus	P0351	1	A	A	26
	P0352	2	B	C	78
	P0353	3	C	E	79
	P0354	4	D	B	52
	P0355	5	E	D	2
	P0356	6	F	F	82
LS	P0351	1	A	A	E58
	P0352	2	B	D	E59
	P0353	3	C	F	E60
	P0354	4	D	C	E48
	P0355	5	E	B	E12
	P0356	6	F	E	E22
	P0357	7	G	G	E30
	P0358	8	H	H	E38

(Continued)

Table

# Integrated Ignition Coil On Plug Coil A Through J Failure

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## IGNITION COIL TO CYLINDER CORRELATION

Vehicle	Related DTC	Cylinder Number	Ignition Coil	Coil Driver (CD)	PCM Pin
Explorer, Mountaineer 4.6L, Crown Victoria, Grand Marquis	P0351	1	A	A	E1
	P0352	2	B	D	E12
	P0353	3	C	B	E24
	P0354	4	D	G	E35
	P0355	5	E	F	E38
	P0356	6	F	E	E39
	P0357	7	G	C	E42
	P0358	8	H	H	E43
F-150, Mark LT	P0351	1	A	A	E17
	P0352	2	B	D	E11
	P0353	3	C	B	E12
	P0354	4	D	G	E14
	P0355	5	E	F	E10
	P0356	6	F	E	E15
	P0357	7	G	C	E16
	P0358	8	H	H	E9
Expedition, Navigator, E-Series, Mustang 4.6L, F-Super Duty 5.4L	P0351	1	A	A	E35
	P0352	2	B	D	E1
	P0353	3	C	B	E24
	P0354	4	D	G	E23
	P0355	5	E	F	E34
	P0356	6	F	E	E46
	P0357	7	G	C	E12
	P0358	8	H	H	E11
Ford GT	P0351	1	A	A	75
	P0352	2	B	D	101
	P0353	3	C	B	74
	P0354	4	D	G	100
	P0355	5	E	F	73
	P0356	6	F	E	99
	P0357	7	G	C	72
	P0358	8	H	H	98
E-Series, F-Superduty 6.8L	P0351	1	A	A	E17
	P0352	2	B	E	E11
	P0353	3	C	G	E12
	P0354	4	D	I	E14

(Continued)

Table

# Integrated Ignition Coil On Plug Coil A Through J Failure

# JF

## IGNITION COIL TO CYLINDER CORRELATION

Vehicle	Related DTC	Cylinder Number	Ignition Coil	Coil Driver (CD)	PCM Pin
	P0355	5	E	C	E10
	P0356	6	F	B	E15
	P0357	7	G	F	E16
	P0358	8	H	H	E9
	P0359	9	I	J	E13
	P0360	10	J	D	E8
Town Car	P0351	1	A	A	E1
	P0352	2	B	D	E12
	P0353	3	C	B	E24
	P0354	4	D	G	E35
	P0355	5	E	F	E38
	P0356	6	F	E	E39
	P0357	7	G	C	E42
	P0358	8	H	H	E43

Test Step		Results / Action to Take
<b>JF1</b>	<b>DETERMINE WHICH COIL IS NOT FIRING PROPERLY</b>	<p><b>Yes</b> GO to <b>JF2</b>.</p> <p><b>No</b> REPEAT the test step to obtain the required information.</p>
	<p><b>Note:</b> Electronic ignition engine timing is entirely controlled by the PCM. Electronic ignition timing is NOT adjustable. Do not attempt to check base timing. You will receive false readings.</p> <ul style="list-style-type: none"> <li>Determine which coil is not firing properly using the information from Pinpoint Test JB or a DTC and the table at the beginning of this pinpoint test.</li> <li>Record the suspect cylinder, coil and PCM pin number from the table.</li> <li><b>Is the suspect cylinder number, coil driver and PCM pin number recorded?</b></li> </ul>	
<b>JF2</b>	<b>CHECK THE FUNCTIONALITY OF THE SUSPECT COIL DRIVER CIRCUIT</b>	<p><b>Yes</b> GO to <b>JF3</b>.</p> <p><b>No</b> GO to <b>JF4</b>.</p>
	<ul style="list-style-type: none"> <li>Suspect coil connector disconnected.</li> <li>Connect a non-powered test lamp between the IGN START/RUN and suspect coil driver, harness side.</li> <li>Disable the fuel pump by disconnecting the inertia fuel shutoff switch.</li> <li>Observe the test lamp while cranking the engine.</li> <li><b>Is the test lamp blinking consistently?</b></li> </ul>	

Table And JF1-JF2

# Integrated Ignition Coil On Plug Coil A Through J Failure

## JF

Test Step		Results / Action to Take				
<b>JF3</b>	<b>CHECK THE FUNCTIONALITY OF THE SUSPECT COIL</b>					
	<ul style="list-style-type: none"> <li>Key in OFF position.</li> <li>Carry out a visual inspection. Closely inspect the coil case and boot for carbon tracking, cracks and torn or improperly installed boots.</li> <li>Remove the suspect COP from the spark plug.</li> <li>Connect the Air Gap spark tester 303-DO37 (D81P-6666-A) or its equivalent in series between the suspect coil tower and the spark plug wire.</li> <li>Suspect coil connector connected.</li> <li>Observe the spark tester while cranking the engine.</li> <li><b>Is a bluish-white spark present?</b></li> </ul>	<p><b>Yes</b> GO to Pinpoint Test Z.</p> <p><b>No</b> INSTALL a new suspect coil. If necessary, INSTALL a new spark plug. CLEAR the DTCs. REPEAT the self-test.</p>				
<b>JF4</b>	<b>CHECK THE IGN START/RUN VOLTAGE TO THE SUSPECT COIL</b>					
	<ul style="list-style-type: none"> <li>Key ON, engine OFF.</li> <li>Suspect coil connector disconnected.</li> <li>Measure the voltage between:</li> </ul> <table border="1"> <tr> <td>( + ) COP Connector, Harness Side</td> <td>( - ) Vehicle Battery</td> </tr> <tr> <td>IGN START/RUN</td> <td>Negative terminal</td> </tr> </table> <ul style="list-style-type: none"> <li><b>Is the voltage greater than 10 V?</b></li> </ul>	( + ) COP Connector, Harness Side	( - ) Vehicle Battery	IGN START/RUN	Negative terminal	<p><b>Yes</b> GO to JF6.</p> <p><b>No</b> GO to JF5.</p>
( + ) COP Connector, Harness Side	( - ) Vehicle Battery					
IGN START/RUN	Negative terminal					
<b>JF5</b>	<b>DETERMINE THE VEHICLE BEING DIAGNOSED</b>					
	<ul style="list-style-type: none"> <li><b>Are you diagnosing an LS, Crown Victoria, Grand Marquis, Mustang or Town Car?</b></li> </ul>	<p><b>Yes</b> GO to B8.</p> <p><b>No</b> REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.</p>				
<b>JF6</b>	<b>CHECK THE SUSPECT COIL DRIVER CIRCUIT FOR AN OPEN IN THE HARNESS</b>					
	<ul style="list-style-type: none"> <li>Key in OFF position.</li> <li>PCM connector disconnected.</li> <li>Suspect coil connector disconnected.</li> <li>Measure the resistance between:</li> </ul> <table border="1"> <tr> <td>( + ) PCM Connector, Harness Side</td> <td>( - ) COP Connector, Harness Side</td> </tr> <tr> <td>Suspect coil driver</td> <td>COP</td> </tr> </table> <ul style="list-style-type: none"> <li><b>Is the resistance less than 5 ohms?</b></li> </ul>	( + ) PCM Connector, Harness Side	( - ) COP Connector, Harness Side	Suspect coil driver	COP	<p><b>Yes</b> GO to JF7.</p> <p><b>No</b> REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.</p>
( + ) PCM Connector, Harness Side	( - ) COP Connector, Harness Side					
Suspect coil driver	COP					

JF3-JF6

# Integrated Ignition Coil On Plug Coil A Through J Failure

## JF

Test Step		Results / Action to Take				
<b>JF7</b>	<b>CHECK THE SUSPECT COIL DRIVER CIRCUIT FOR A SHORT TO VOLTAGE IN THE HARNESS</b> <ul style="list-style-type: none"> <li>Key ON, engine OFF.</li> <li>Measure the voltage between: <table border="1"> <tr> <td>( + ) PCM Connector, Harness Side</td> <td>( - ) Vehicle Battery</td> </tr> <tr> <td>Suspect coil driver</td> <td>Negative terminal</td> </tr> </table> </li> <li>Is the voltage less than 1 V?</li> </ul>	( + ) PCM Connector, Harness Side	( - ) Vehicle Battery	Suspect coil driver	Negative terminal	<b>Yes</b> GO to <b>JF8</b> .  <b>No</b> REPAIR the short circuit to PWR. CLEAR the DTCs. REPEAT the self-test.
( + ) PCM Connector, Harness Side	( - ) Vehicle Battery					
Suspect coil driver	Negative terminal					
<b>JF8</b>	<b>CHECK THE SUSPECT COIL DRIVER CIRCUIT FOR A SHORT TO GROUND IN THE HARNESS</b> <ul style="list-style-type: none"> <li>Key in OFF position.</li> <li>Measure the resistance between: <table border="1"> <tr> <td>( + ) PCM Connector, Harness Side</td> <td>( - ) Vehicle Battery</td> </tr> <tr> <td>Suspect coil driver</td> <td>Negative terminal</td> </tr> </table> </li> <li>Is the resistance greater than 10K ohms?</li> </ul>	( + ) PCM Connector, Harness Side	( - ) Vehicle Battery	Suspect coil driver	Negative terminal	<b>Yes</b> GO to <b>JF10</b> .  <b>No</b> REPAIR the short circuit to GND. CLEAR the DTCs. REPEAT the self-test. If the concern or DTC is still present, GO to <b>JF9</b> .
( + ) PCM Connector, Harness Side	( - ) Vehicle Battery					
Suspect coil driver	Negative terminal					
<b>JF9</b>	<b>CHECK THE SUSPECT COIL FOR DAMAGE</b> <ul style="list-style-type: none"> <li>PCM connector connected.</li> <li>Connect the Air Gap spark tester 303-DO37 (D81P-6666-A) or its equivalent in series between the suspect coil tower and the spark plug wire.</li> <li>Locate and activate the fuel inertia switch to disable fuel pump.</li> <li>Observe the spark tester while cranking the engine.</li> <li>Is a bluish-white spark present?</li> </ul>	<b>Yes</b> If necessary, INSTALL a new spark plug. CLEAR the DTCs. REPEAT the self-test.  <b>No</b> INSTALL a new suspect coil. CLEAR the DTCs. REPEAT the self-test.				
<b>JF10</b>	<b>CHECK FOR CORRECT PCM OPERATION</b> <ul style="list-style-type: none"> <li>Disconnect all the PCM connectors.</li> <li>Visually inspect for: <ul style="list-style-type: none"> <li>pushed out pins.</li> <li>corrosion.</li> </ul> </li> <li>Connect all the PCM connectors and make sure they seat correctly.</li> <li>Carry out the PCM self-test and verify the concern is still present.</li> <li>Is the concern still present?</li> </ul>	<b>Yes</b> INSTALL a new PCM. REFER to Diagnostic Methods, Flash Electrically Erasable Programmable Read Only Memory (EEPROM).  <b>No</b> The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.				

JF7-JF10