

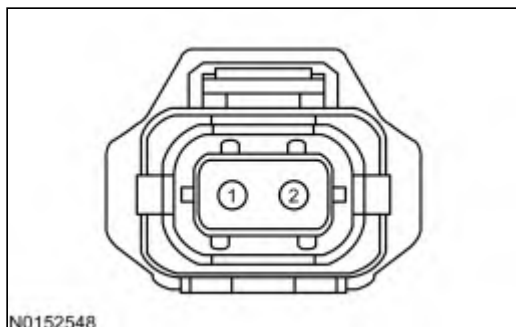
AB: Cold Start System

⚠ WARNING: Refer to the fuel system WARNING information at the beginning of Pinpoint Test HC.

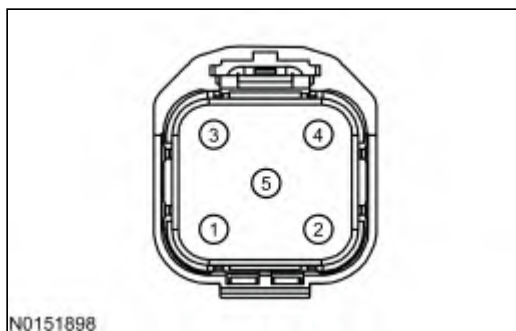
Failure to follow these instructions may result in personal injury.

This pinpoint test is intended to diagnose the following:

- fuel injector heaters
- fuel injector heater control module
- harness circuits: FIHC, FIHM, FIH1, FIH2, FIH3, GND, PWRGND, VBATT and VPWR

Fuel Injector Heater Assembly Connector

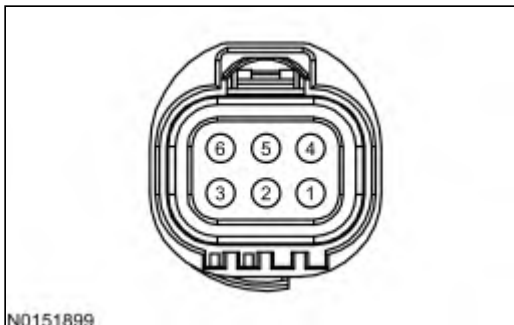
Pin	Circuit
2	GND (Ground)
1	FIH (Fuel Injector Heater)

Fuel Injector Heater Control-A Module Connector

Pin	Circuit
1	FIHM (Fuel Injection Heater Monitor)
2	FIHC (Fuel Injection Heater Control)

Pin	Circuit
3	PWRGND (Power Ground)
4	VPWR (Vehicle Power)
5	VBATT (Battery Voltage)

Fuel Injector Heater Control-B Module Connector



Vehicle	Connector	Pin	Circuit
Fusion	A	3 1 4 6	FIH4 FIH3 FIH2 FIH1
All other vehicles	A	4 1 3	FIH3 FIH2 FIH1

Powertrain Control Module (PCM) Connector

For PCM connector views or reference values, refer to Section 6, Reference Values.

Vehicle	Connector	Pin	Circuit
EcoSport 1.5L Manual Transmission	112 PIN	E12 E46	FIHM FIHC
Fusion	198 PIN	B28	FIHM
KA 1.0L	128 PIN	T13 E33	FIHM FIHC
KA 1.5L	198 PIN	E16	FIHC
Ranger	128 PIN	E13 E41	FIHM FIHC
All other vehicles	198 PIN	B28 E16	FIHM FIHC

AB1 CHECK FOR DTCS

Note: Diagnose any VPWR circuit concerns before entering this pinpoint test.

Are DTCs P1030, P1031, P1032, P1033, P1034, P1035, P1038, P1039, P103A or P103B present?

Yes	For DTCs P1038, P1039, P103A or P103B, GO to AB6 . For all others, GO to AB2 .
No	RETURN to Section 3, Symptom Charts for further direction.

AB2 CHECK THE VBATT CIRCUIT

- Ignition OFF.
- Fuel Injector Heater Control-A Module connector disconnected.
- Measure the voltage between:

(+) Fuel Injector Heater Control-A Module Connector, Harness Side	(-)
VBATT - Pin 5	Ground

Is the voltage greater than 10.5 V?

Yes	GO to AB3 .
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

AB3 CHECK FOR AN OPEN CIRCUIT

Note: Only the suspect fuel injector heater indicated by the DTC needs to be diagnosed.

- Fuel Injector Heater Control-B Module connector disconnected.
- Fuel Injector Heater Assembly connector disconnected.
- Measure the resistance between:

(+) Fuel Injector Heater Assembly Connector, Harness Side	(-) Fuel Injector Heater Control-B Module Connector, Harness Side
FIH - Pin 1	FIH

- Measure the resistance between:

(+) Fuel Injector Heater Assembly Connector, Harness Side	(-)
GND - Pin 2	Ground

Is the resistance less than 5 ohms?

Yes	GO to AB4 .
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

AB4 CHECK THE FIH FOR A SHORT TO GROUND

- Measure the resistance between:

(+) Fuel Injector Heater Assembly Connector, Harness Side	(-)
FIH - Pin 1	Ground

Is the resistance greater than 10K ohms?

Yes	GO to AB5 .
No	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.

AB5 CHECK THE CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition ON, engine OFF.
- Measure the voltage between:

(+) Fuel Injector Heater Assembly Connector, Harness Side	(-)
FIH - Pin 1	Ground

Is any voltage present?

Yes	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.
No	INSTALL a new Fuel Injector Heater assembly. REFER to the Workshop Manual Section 303-04, Electronic Engine Controls. Clear the PCM DTCs. REPEAT the self-test.

AB6 CHECK FOR VOLTAGE

- Ignition OFF.
- Fuel Injector Heater Control-A Module connector disconnected.
- Ignition ON, engine OFF.
- Measure the voltage between:

(+) Fuel Injector Heater Control-A Module Connector, Harness Side	(-)
VBATT - Pin 5	Ground
VPWR - Pin 4	Ground

Are the voltages greater than 10.5 V?

Yes	GO to AB7 .
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

AB7 CHECK THE PWRGND CIRCUIT FOR AN OPEN

- Ignition OFF.

- Measure the resistance between:

(+) Fuel Injector Heater Control-A Module Connector, Harness Side	(-)
PWRGND - Pin 3	Ground

Is the resistance less than 5 ohms?

Yes	GO to AB8 .
No	REPAIR the open circuit. CLEAR the DTCs. REPEAT the self-test.

AB8 CHECK THE CONTROL CIRCUITS FOR AN OPEN

- PCM connector disconnected.
- Measure the resistance between:

(+) Fuel Injector Heater Control-A Module Connector, Harness Side	(-) PCM Connector, Harness Side
FIHC - Pin 2	FIHC
FIHM - Pin 1	FIHM

Are the resistances less than 5 ohms?

Yes	GO to AB9 .
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

AB9 CHECK THE CONTROL CIRCUITS FOR A SHORT TO GROUND

- Measure the resistance between:

(+) Fuel Injector Heater Control-A Module Connector, Harness Side	(-)
FIHC - Pin 2	Ground
FIHM - Pin 1	Ground

Are the resistances greater than 10K ohms?

Yes	GO to AB10 .
No	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.

AB10 CHECK THE CONTROL CIRCUITS FOR A SHORT TO VOLTAGE

- Ignition ON, engine OFF.
- Measure the voltage between:

(+) Fuel Injector Heater Control-A Module Connector, Harness Side	(-)
FIHC - Pin 2	Ground

(+) Fuel Injector Heater Control-A Module Connector, Harness Side	(-)
FIHM - Pin 1	Ground

Is any voltage present?

Yes	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.
No	GO to AB11 .

AB11 CHECK FOR CORRECT FUEL INJECTOR HEATER CONTROL MODULE OPERATION

- Disconnect all the fuel injector heater control module connectors.
- Visually inspect for:
 - pushed out pins
 - corrosion
- Connect all the fuel injector control module connectors and make sure they seat correctly.
- Carry out the PCM self-test.

Is the concern still present?

Yes	INSTALL a new Fuel Injector Heater Control module. REFER to the Workshop Manual Section 303-04, Electronic Engine Controls. CLEAR the DTCs. REPEAT the self-test.
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.