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2004 FORD Mondeo Hatchback OEM Service and Repair Workshop Manual

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20C (68F) - 30C (86F)	24,253 ohms - 37,340 ohms
30C (86F) - 40C (104F)	16,113 ohms - 24,253 ohms
40C (104F) - 50C (122F)	10,926 ohms - 16,113 ohms

Is the resistance value correct for the temperature?

Yes	CHECK OASIS (Online Automotive Service Information System) for any applicable service articles: TSB (Technical Service Bulletin) , GSB (General Service Bulletin) , SSM (special service message) or FSA (Field Service Action) . If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, INSTALL a new BECM (battery energy control module) . REFER to: Battery Energy Control Module (BECM) - Electric (414-03A High Voltage Battery, Mounting and Cables, Removal and Installation).

No	INSTALL a new high voltage battery coolant temperature sensor. REFER to: High Voltage Battery Coolant Temperature Sensor - Electric (414-03A High Voltage Battery, Mounting and Cables, Removal and Installation).

PINPOINT TEST V : P0ABB:00, P0ABC:00, P0ABD:00

Refer to Wiring Diagrams Cell 12for schematic and connector information.
Normal Operation and Fault Conditions The BECM (battery energy control module) monitors battery pack voltage at various points inside the high voltage battery. If a difference between the voltage measurements exceed a calibrated range or if a circuit fault is detected with one or more of the voltage measurements the following Diagnostic Trouble Codes (DTCs) will set. . **DTC Fault Trigger Conditions**

DTC (diagnostic trouble code)	Description	Fault Trigger Condition
BECM (battery energy control module) P0ABB:00	Hybrid/EV Battery Pack 'A' Voltage Sense 'A' Circuit Range/Performance: No Sub Type Information	Sets when BECM (battery energy control module) detects the difference between the positive voltage measurement from the sum of the high voltage battery cells and the cell array is greater than a calibrated threshold for a calibrated amount of time.

No	If Diagnostic Trouble Codes (DTCs) P0ABB:00, P0ABC:00, and/or P0ABD:00 did not repeat the concern is not present at this time. If Diagnostic Trouble Codes (DTCs) P0ABB:00, P0ABC:00, and/or P0ABD:00 repeat, GO to V2

V2 INSTALL A NEW BECM (BATTERY ENERGY CONTROL MODULE)

- Ignition OFF.
- Depower the high voltage battery system (if not previously performed).
  REFER to: High Voltage System De-energizing - Electric(414-03A High Voltage Battery, Mounting and Cables, General Procedures).
- INSTALL a new BECM (battery energy control module) .
  REFER to: Battery Energy Control Module (BECM) - Electric(414-03A High Voltage Battery, Mounting and Cables, Removal and Installation).
- Repower the high voltage system.
  REFER to: High Voltage System De-energizing - Electric(414-03A High Voltage Battery, Mounting and Cables, General Procedures).
- Ignition ON.
- Using a diagnostic scan tool, clear the BECM (battery energy control module) Diagnostic Trouble Codes (DTCs).
- Operate the system performing at least 2 ignition cycles.
- Using a diagnostic scan tool, perform BECM (battery energy control module) self-test.

Is DTC (diagnostic trouble code) P0ABB:00, P0ABC:00 or P0ABD:00 retrieved?

Yes	INSTALL a new high voltage battery. REFER to: High Voltage Battery - Electric (414-03A High Voltage Battery, Mounting and Cables, Removal and Installation).

No	The concern was caused by an inoperative BECM (battery energy control module) . The system is now operating correctly.

PINPOINT TEST W : P0AC0:00, P0AC1:00, P0AC2:00, P0AC3:00, P0B0F:00, P0B13:00

Refer to Wiring Diagrams Cell 12for schematic and connector information.
Normal Operation and Fault Conditions The BECM (battery energy control module) measures current flow through the contactors using a current sensor mounted within the high voltage battery junction box.

WARNING

To prevent the risk of high-voltage shock, always follow precisely all warnings and service instructions, including instructions to depower the system. The high-voltage system utilizes approximately 450 volts DC, provided through high-voltage cables to its components and modules. The high-voltage cables and wiring are identified by orange harness tape or orange wire covering. All high-voltage components are marked with high-voltage warning labels with a high-voltage symbol. Failure to follow these instructions may result in serious personal injury or death.

NOTICE

Use the correct probe adapter(s) from the Flex Probe Kit when taking measurements. Failure to use the correct probe adapter(s) may damage the connector.

NOTE

If SOBDMC DTC P1A10:00 is present the ignition must be turned OFF for a minimum for 5 minutes after clearing all continuous DTC's to reset it prior to performing the next pinpoint test step.

W1 RETRIEVE THE BECM (BATTERY ENERGY CONTROL MODULE) DTCS

- Ignition ON.
- Using the scan tool, clear the BECM (battery energy control module) Diagnostic Trouble Codes (DTCs).
- Using a diagnostic scan tool, perform BECM (battery energy control module) self-test.

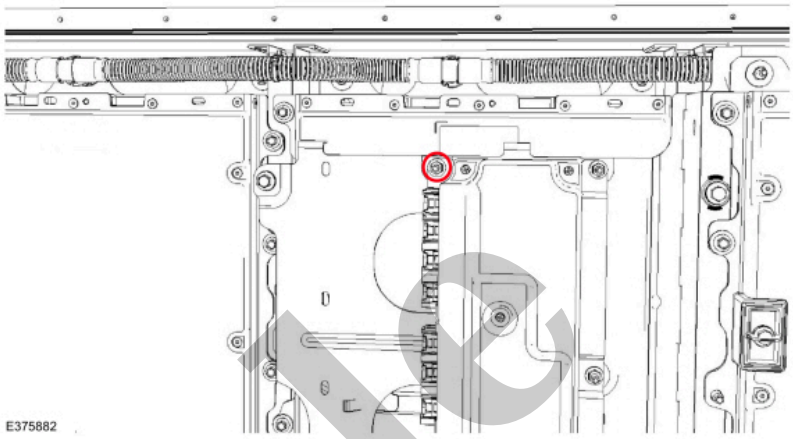
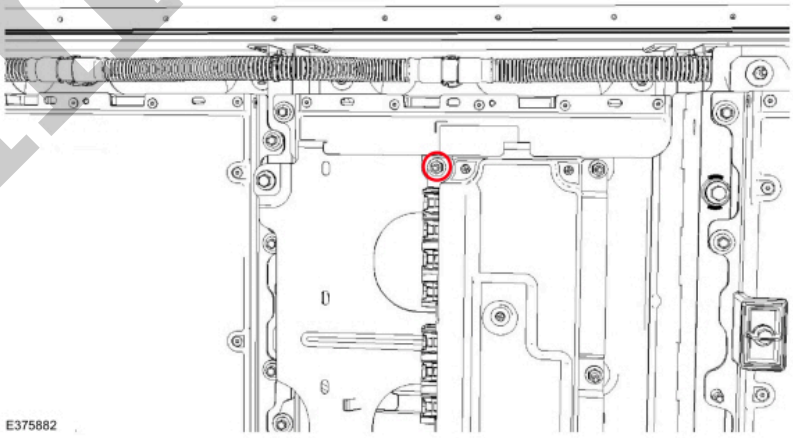
Is DTC (diagnostic trouble code) P0AC0:00, P0AC1:00, P0AC2:00, P0AC3:00, P0B0F:00, and/or P0B13:00 present?

Yes	GO to W2

No	The concern is not present at this time.

W2 CHECK CURRENT SENSOR CIRCUITS FOR A SHORT TO CASE GROUND

NOTICE

Positive Lead	Measurement / Action	Negative Lead
C4815E-1	Ω	 CASE GROUND
C4815E-2	Ω	 CASE GROUND

	Re-install the high voltage battery cover and the high voltage battery. Repower the high voltage system. REFER to: High Voltage System De-energizing - Electric (414-03A High Voltage Battery, Mounting and Cables, General Procedures). Clear the BECM (battery energy control module) DTC's. Repeat the self-test.

W3 CHECK CURRENT SENSOR CIRCUITS FOR AN OPEN

- Measure:

Positive Lead	Measurement / Action	Negative Lead
C4815E-1	Ω	C4816C-1
C4815E-4	Ω	C4816C-2
C4815E-3	Ω	C4816C-3
C4815E-2	Ω	C4816C-4

Are the resistances of the circuits less than 3 ohms?

Yes	GO to W4

No	INSTALL a new wiring harness. REFER to: High Voltage Battery Wiring Harness - Electric (414-03A High Voltage Battery, Mounting and Cables, Removal and Installation). Re-install the high voltage battery cover and the high voltage battery. Repower the high voltage system. REFER to: High Voltage System De-energizing - Electric (414-03A High Voltage Battery, Mounting and Cables, General Procedures). Clear the BECM (battery energy control module)

	(414-03A High Voltage Battery, Mounting and Cables, Removal and Installation).

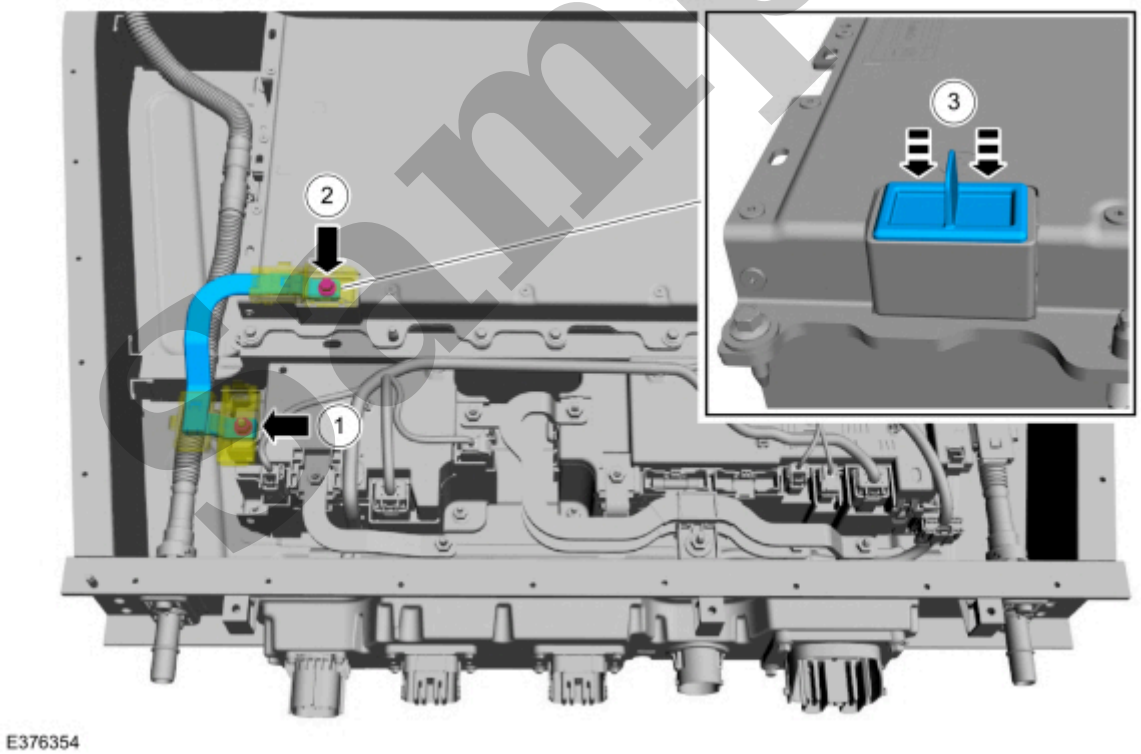
No	INSTALL a new wiring harness. REFER to: High Voltage Battery Wiring Harness - Electric (414-03A High Voltage Battery, Mounting and Cables, Removal and Installation). Re-install the high voltage battery cover and the high voltage battery. Repower the high voltage system. REFER to: High Voltage System De-energizing - Electric (414-03A High Voltage Battery, Mounting and Cables, General Procedures). Clear the BECM (battery energy control module) DTC's. Repeat the self-test.

PINPOINT TEST X : P0AD9:00, P0ADB:00, P0ADC:00

Refer to Wiring Diagrams Cell 12for schematic and connector information.
Normal Operation and Fault Conditions When the ignition is turned on, the BECM (battery energy control module) makes various vehicle checks. If these checks are normal, the BECM (battery energy control module) sends a signal to the contactor to close which will supply power to the high-voltage vehicle systems. The BECM (battery energy control module) monitors the high voltage contactor control circuits for overcurrent, undercurrent, and open circuit faults. If a fault is detected the BECM (battery energy control module) will set a DTC (diagnostic trouble code) . The stop safely hazard (red triangle) warning indicator illuminates and the vehicle will shut down and/or not start. **DTC Fault Trigger Conditions**

DTC (diagnostic trouble code)	Description	Fault Trigger Condition
BECM (battery energy control module) P0AD9:00	Hybrid/EV Battery Positive Contactor Control Circuit/Open GM: No Sub Type Information	Sets when BECM (battery energy control module) senses the positive contactor control circuit is faulted.
BECM (battery energy control module) P0ADB:00	Hybrid/EV Battery Positive Contactor 'A' Control Circuit Low: No Sub Type Information	Sets if BECM (battery energy control module) senses undercurrent on the positive contactor control circuit.
BECM (battery energy control module) P0ADC:00	Hybrid/EV Battery Positive Contactor 'A' Control Circuit High: No Sub Type Information	Sets if BECM (battery energy control module) senses overcurrent on the positive contactor control circuit.

X2 CHECK CONTACTOR CIRCUITS FOR A SHORT TO CASE GROUND

- Ignition OFF.
- Depower the high voltage system.
  REFER to: High Voltage System De-energizing - Electric(414-03A High Voltage Battery, Mounting and Cables, General Procedures).
- Remove the high voltage battery.
  REFER to: High Voltage Battery - Electric(414-03A High Voltage Battery, Mounting and Cables, Removal and Installation).
- Remove the high voltage battery cover.
  REFER to: High Voltage Battery Cover - Electric(414-03A High Voltage Battery, Mounting and Cables, Removal and Installation).
- Disconnect all the BECM (battery energy control module) connectors in sequence.
  REFER to: Battery Energy Control Module (BECM) - Electric(414-03A High Voltage Battery, Mounting and Cables, Removal and Installation).
- Depower the high voltage battery junction box by removing the displayed buss bar and install a safety cap on the battery module connection.
- 

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- Disconnect High Voltage Battery Junction Box C4815G .
- Measure:

NOTE

Yes	GO to X5

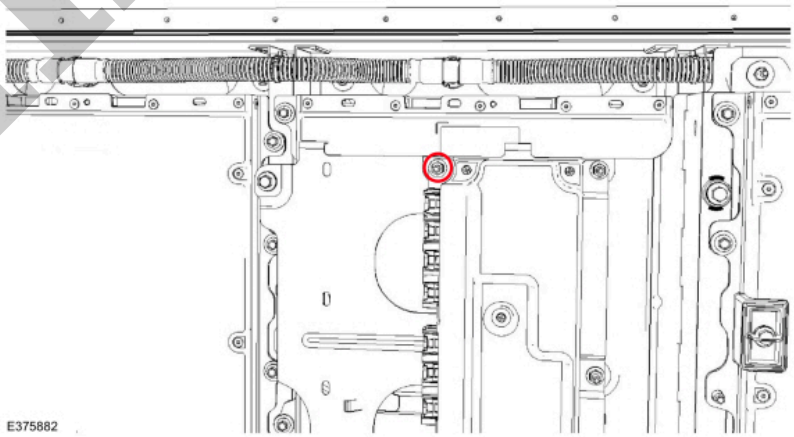
No	GO to X3

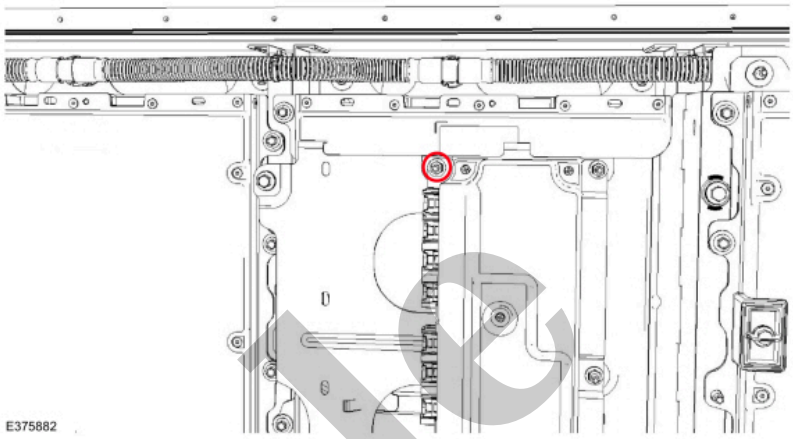
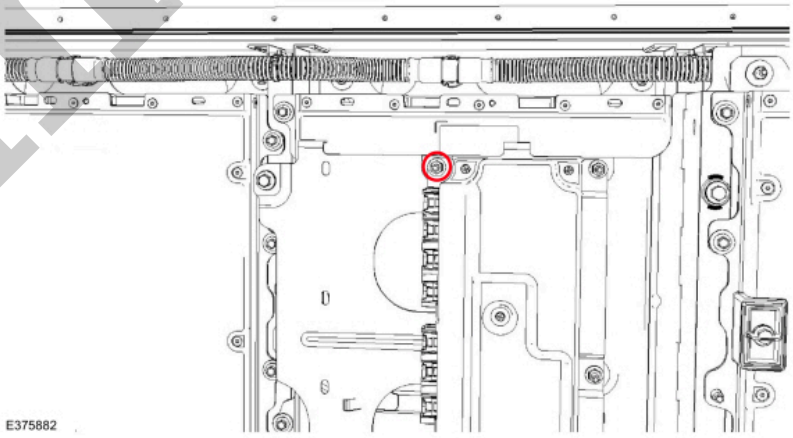
X3 CONFIRM THE LOCATION OF THE GROUNDED CIRCUIT

- Disconnect BECM (battery energy control module) low voltage inline C4239 .
- Measure:

NOTE

Any of the BECM (battery energy control module) bracket mounting nuts or high voltage battery pack case can be utilized for case ground.

Positive Lead	Measurement / Action	Negative Lead
C4815G-4	Ω	 CASE GROUND

Positive Lead	Measurement / Action	Negative Lead
C4815G-4	Ω	 CASE GROUND
C4815G-3	Ω	 CASE GROUND

Is the resistance greater than 10,000 ohms?

Yes	INSTALL a new wiring harness. REFER to: High Voltage Battery Wiring Harness - Electric (414-03A High Voltage Battery, Mounting and Cables, Removal and Installation).