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2005 FORD Mondeo Hatchback OEM Service and Repair Workshop Manual

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	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.

No	INSTALL a new high voltage battery connector assembly. REFER to: High Voltage Battery Connector Assembly - 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

AA5 CHECK CONTACTOR CIRCUITS FOR AN OPEN

- Measure:

Measuremnt A

Positive Lead	Measurement / Action	Negative Lead
C4815G-4	Ω	C144-8 (male side)

Measurment B

Positive Lead	Measurement / Action	Negative Lead
C4815G-2	Ω	C4816C-10

Are the resistances less than 3 ohms?

Yes	GO to AA8

- Measure:

Positive Lead	Measurement / Action	Negative Lead
C4815G-2	Ω	C4240-10 (female side)

Is the resistance less than 3 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). 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.

No	INSTALL a new high voltage battery connector assembly. REFER to: High Voltage Battery Connector Assembly - 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

AA8 CHECK CONTACTOR CIRCUITS FOR BEING SHORTED TOGETHER

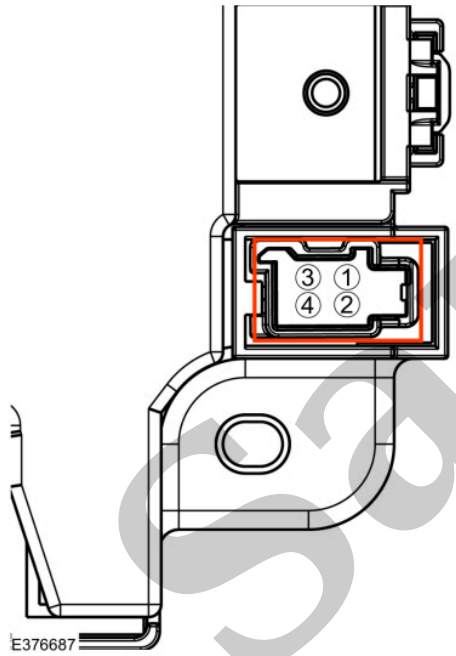
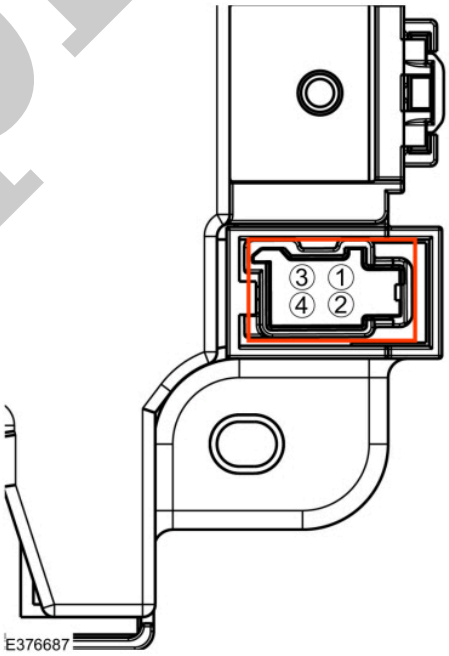
- Measure:

Positive Lead	Measurement / Action	Negative Lead
C4815G-2	Ω	C4815G-4

	(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

AA10 CHECK THE CONTACTOR COIL RESISTANCE

- Measure:

Positive Lead	Measurement / Action	Negative Lead
 C4815G-2 (component side)	Ω	 C4815G-4 (component side)

Is the resistance between 37.4 - 45.8 ohms?

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

- Using a diagnostic 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 and record the Diagnostic Trouble Codes (DTCs).

Is DTC (diagnostic trouble code) P0AFB:00 and/or P0C30:00 present?

Yes	If other Diagnostic Trouble Codes (DTCs) are present REFER to the BECM (battery energy control module) DTC (diagnostic trouble code) chart and diagnose the Diagnostic Trouble Codes (DTCs) first. If other Diagnostic Trouble Codes (DTCs) are NOT present, 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	Attempt to duplicate the concern by performing a road test.

PINPOINT TEST AC : P0AFD:00

Refer to Wiring Diagrams Cell 12for schematic and connector information.

Normal Operation and Fault Conditions With the ignition in the ON position and the engine ON or OFF, the BECM (battery energy control module) monitors and maintains the high voltage battery temperature in a specific range. A coolant temperature sensor is mounted in the high voltage battery coolant inlet hose that monitors coolant inlet temperature along with thermistors inside the high voltage battery cell arrays that monitor temperature. The high voltage battery is not designed to operate in temperatures below -40°C (-40°F). **DTC Fault Trigger Conditions**

DTC (diagnostic trouble code)	Description	Fault Trigger Condition
BECM (battery energy control module) P0AFD:00	Hybrid/EV Battery Pack Temperature Too Low: No Sub Type Information	Fault code sets if BECM (battery energy control module) detects a thermistor within the battery senses temperature inside the battery is -40°C (-40°F).

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

Is DTC (diagnostic trouble code) PADF:00 present?

Yes	GO to AC2

No	The concern was the result of external environmental temperatures or an intermittent thermistor or thermistor circuit fault. Consult with customer to determine if vehicle was exposed to extreme cold ambient air temperatures.

AC2 MONITOR AND RECORD THE HIGH VOLTAGE BATTERY CELL THERMISTOR TEMPERATURE VALUES

- Ignition ON.
- Using the scan tool, select Toolbox; All; BECM battery health tool.
- MONITOR and CAPTURE the 10 thermistor temperature values.

Are 3 or more thermistor temperature values out of range and/or displaying a fault?

Yes	GO to AC3

No	The concern may be an interminent fault condition. Attempt to duplicate the concern and repeat the pinpoint test step.

AC3 MEASURE THE FAULTED THERMISTOR RESISTANCE FROM BECM (BATTERY ENERGY CONTROL MODULE)

- 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.

Positive Lead	Measurement / Action	Negative Lead
NOTE 4P base battery pack only. C4816D-5	Ω	C4816D-7
NOTE 5P extended range battery pack only. C4816D-6	Ω	C4816D-7

Temperature Sensor F

Positive Lead	Measurement / Action	Negative Lead
C4816D-8	Ω	C4816D-14

Temperature Sensor G

Positive Lead	Measurement / Action	Negative Lead
C4816D-9	Ω	C4816D-14

Temperature Sensor H

Positive Lead	Measurement / Action	Negative Lead
C4816D-10	Ω	C4816D-14

Temperature Sensor I

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	GO to AC4

AC4 CONNECT THE MIDTRONICS XMB-9640 TO THE SUSPECT HIGH VOLTAGE BATTERY MODULES

NOTE

During testing if it is determined that more than 5 modules for standard range (4P) battery and 6 modules for extended range (5P) battery require replacement INSTALL a new high voltage battery pack.

- Remove all of the accessible buss bars for high voltage battery pack and place safety caps over the exposed connections.
  REFER to: High Voltage Battery Module - Electric (414-03 High Voltage Battery, Mounting and Cables) .
- **NOTE**

  Access to modules no. 3, 4 or 5 electrical connectors requires removal of modules 6, 7 and 8. If faulted these modules should be tested last.

  IDENTIFY the suspect modules from pinpoint test step AC2.
- **NOTE**

  The following steps must be repeated for each suspect module.

  DISCONNECT the suspect cell module electrical connector.
- CONNECT the Midtronics XMB-9640 to one of the suspect modules.
- Turn on the Midtronics XMB-9640 and select module diagnostics the follow the on screen instructions to connect and monitor the cell voltage values for the suspect module.

Is the temperature value within 10°F (6°C) of the ambient temperature?

REFER to: Fifth Row Upper High Voltage Battery Module - Electric, Vehicles With: Standard Range Battery
(414-03A High Voltage Battery, Mounting and Cables, Removal and Installation).
REFER to: Fifth Row Upper High Voltage Battery Module - Electric, Vehicles With: Extended Range Battery
(414-03A High Voltage Battery, Mounting and Cables, Removal and Installation).
REFER to: Sixth Row High Voltage Battery Module - Electric, Vehicles With: Standard Range Battery
(414-03A High Voltage Battery, Mounting and Cables, Removal and Installation).
REFER to: Sixth Row High Voltage Battery Module - Electric, Vehicles With: Extended Range Battery
(414-03A High Voltage Battery, Mounting and Cables, Removal and Installation).
REFER to: Sixth Row Upper High Voltage Battery Module - Electric, Vehicles With: Standard Range Battery
(414-03A High Voltage Battery, Mounting and Cables, Removal and Installation).
REFER to: Sixth Row Upper High Voltage Battery Module - Electric, Vehicles With: Extended Range Battery
(414-03A High Voltage Battery, Mounting and Cables, Removal and Installation).

PINPOINT TEST AD : P0B3B:00, P0B40:00, P0B45:00, P0B4A:00, P0B4F:00, P0B54:00, P0B59:00, P0B5E:00

Refer to Wiring Diagrams Cell 12for schematic and connector information.
Normal Operation and Fault Conditions The BECM (battery energy control module) monitors voltage of the high voltage battery cell voltages. The BECM (battery energy control module) measures individual battery cells within the battery and monitors them for circuit faults. If the BECM (battery energy control module) senses a fault the (red triangle) warning indicator, MIL (malfunction indicator lamp) are both illuminated and the vehicle will shut down and/or not start. For the cell module location, REFER to: High Voltage Battery, Mounting and Cables - Electric - Component Location
(414-03A High Voltage Battery, Mounting and Cables, Description and Operation).

- **Standard range (4P) Batery Pack Cell ID:**
- Module 1 - Cell 1-10
- Module 2 - Cell 11-20
- Module 3 - Cell 21-30
- Module 4 - Cell 31-40
- Module 5 - Cell 41-50
- Module 6 - Cell 51-60
- Module 7 - Cell 61-70

module) P0B54:00	Type Information	faulted within the cell range 61-72.
BECM (battery energy control module) P0B59:00	Hybrid/EV Battery Voltage Sense 'G' Circuit: No Sub Type Information	Sets when BECM (battery energy control module) detects two or more cell voltage measurements are faulted within the cell range 73-84.
BECM (battery energy control module) P0B5E:00	Hybrid/EV Battery Voltage Sense 'H' Circuit: No Sub Type Information	Sets when BECM (battery energy control module) detects two or more cell voltage measurements are faulted within the cell range 85-90 (4P battery pack) 85-96 (5P battery pack).

Possible Sources

- Wiring, terminals or connectors
- High voltage battery module
- BECM (battery energy control module)

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.

AD1 CHECK BECM (BATTERY ENERGY CONTROL MODULE) DTCS