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2000 FORD Mondeo Hatchback OEM Service and Repair Workshop Manual

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- Access the BECM (battery energy control module) and monitor the LEAKRESCON (Leakage Resistance (Battery Contactors Open)) (Ohm) PID (parameter identification)

- **NOTE**

  For a severe leakage fault the Diagnostic Trouble Codes (DTCs) must be cleared or the vehicle may not start.

  Using a diagnostic scan tool, clear the BECM (battery energy control module) Diagnostic Trouble Codes (DTCs).

- **NOTE**

  For a severe leakage fault the ignition must be left OFF for a minimim of 1 minute or the Diagnostic Trouble Codes (DTC) may not repeat and the leakage PID values may not be valid.

  Ignition OFF for a minimum of 1 minute.

- **NOTE**

  Once the ignition is switched to ON the scan tool requires 10 seconds to re-establish the connection. Once the connection is established there will be 10 seconds of viewable data before the contactors open and the PID values default to a normal value of 1.6M ohms making it appear the vehicle fault is no longer present. This does not apply to a mild leakage fault.

  While viewing datalogger, switch the ignition ON and select continue.

Are LEAKRESPOS, LEAKRESNEG and LEAK_RES_OVERALL read less than 400,000 ohms for at least 10 seconds?

Yes	INSTALL new cabin coolant heater. REFER to: Cabin Coolant Heater - Electric (412-00 Climate Control System - General Information, Removal and Installation).

No	GO to S18

S18 ATTEMPT TO DUPLICTE THE CONCERN BY TURNING ON THE ELECTRIC A/C (AIR CONDITIONING) COMPRESSOR

- Start the vehicle. (Ready to drive indicator ON)

No	GO to S19

S19 ATTEMPT TO DUPLICTE THE CONCERN BY CONNECTING A KNOWN GOOD EVSE (120V OR 240V) TO THE VEHICLE CHARGE PORT

- CHECK the high votlage battery state of charte (SOC). If it is above 90% turn on electrical assesories and or climate control until it drops to less than 70%.
- Connect a known good EVSE (120V or 240V) to the vehicle charge port and charge the high voltage battery.
- Using a diagnostic scan tool, view BECM (battery energy control module) PIDs.
- Select the following BECM (battery energy control module) PIDs:
  - Access the BECM (battery energy control module) and monitor the LEAKRESPOS (Leakage Resistance (Bus +)) (Ohm) PID (parameter identification)
  - Access the BECM (battery energy control module) and monitor the LEAKRESNEG (Leakage Resistance (Bus -)) (Ohm) PID (parameter identification)
  - Access the BECM (battery energy control module) and monitor the LEAK_RES_OVERALL (Leakage Resistance (Overall)) (Ohm) PID (parameter identification)
  - Access the BECM (battery energy control module) and monitor the LEAKRESCON (Leakage Resistance (Battery Contactors Open)) (Ohm) PID (parameter identification)
- **NOTE**

  For a severe leakage fault the Diagnostic Trouble Codes (DTCs) must be cleared or the vehicle may not start.

  Using a diagnostic scan tool, clear the BECM (battery energy control module) Diagnostic Trouble Codes (DTCs).
- **NOTE**

  For a severe leakage fault the ignition must be left OFF for a minimim of 1 minute or the Diagnostic Trouble Codes (DTC) may not repeat and the leakage PID values may not be valid.

  Ignition OFF for a minimum of 1 minute.
- **NOTE**

  Once the ignition is switched to ON the scan tool requires 10 seconds to re-establish the connection. Once the connection is established there will be 10 seconds of viewable data before the contactors open and the PID values default to a normal value of 1.6M ohms

- Access the BECM (battery energy control module) and monitor the LEAKRESCON (Leakage Resistance (Battery Contactors Open)) (Ohm) PID (parameter identification)

- **NOTE**

  For a severe leakage fault the Diagnostic Trouble Codes (DTCs) must be cleared or the vehicle may not start.

  Using a diagnostic scan tool, clear the BECM (battery energy control module) Diagnostic Trouble Codes (DTCs).

- **NOTE**

  For a severe leakage fault the ignition must be left OFF for a minimim of 1 minute or the Diagnostic Trouble Codes (DTC) may not repeat and the leakage PID values may not be valid.

  Ignition OFF for a minimum of 1 minute.

- **NOTE**

  Once the ignition is switched to ON the scan tool requires 10 seconds to re-establish the connection. Once the connection is established there will be 10 seconds of viewable data before the contactors open and the PID values default to a normal value of 1.6M ohms making it appear the vehicle fault is no longer present. This does not apply to a mild leakage fault.

  While viewing datalogger, switch the ignition ON and select continue.

Are LEAKRESPOS, LEAKRESNEG and LEAK_RES_OVERALL read less than 400,000 ohms for at least 10 seconds?

Yes	INSTALL a new SOBDM (secondary on-board diagnostic control module A) . REFER to: Secondary On-Board Diagnostic Control Module A (SOBDM) - Electric (414-03B High Voltage Battery Charging System, Removal and Installation).

No	INSTALL a new GFM2 (generic function module 2) . REFER to: Secondary On-Board Diagnostic Control Module A (SOBDM) - Electric (414-03B High Voltage Battery Charging System, Removal and Installation).

S21 ATTEMPT TO DUPLICTE THE CONCERN BY CONNECTING A KNOWN GOOD EVSE (120V) APPLIANCE TO AN ELECTRICAL OUTLET IN THE FRUNK (CARGO COMPARTMENT)

	REFER to: Direct Current/Alternating Current (DC/AC) Inverter - Electric, Vehicles With: Pickup Bed Power Outlet (414-05 Voltage Converter/Inverter, Removal and Installation).
No	If the vehicle is quipped with dual inverters, GO to S22 If the vehicle is equipped with a singer inverter, the concern is not present at this time. DEPOWER the high voltage battery system. REFER to: High Voltage System De-energizing - Electric (414-03A High Voltage Battery, Mounting and Cables, General Procedures). INSPECT the high voltage system for any physical damage. INSPECT the high voltage cables between the high voltage battery, SOBDMC (secondary on-board diagnostic control module C) , ACCMB (Air Conditioining Compressor Control Module B) and electric compressor assembly (if equipped), GFM2 (generic function module 2) (if equipped), GFM3 (generic function module 3) (if equipped), SOBDMB (Secondary On-Board Diagnostic Control Module B (SOBDMB)) , ACCM (air conditioning control module) and electric compressor assembly, DCDC (direct current/direct current converter control module) , Cabin Coolant Heater, and SOBDM (secondary on-board diagnostic control module A) for chafing or damaged insulation. If damage is found, INSTALL a new high voltage battery cable. REFER to: High Voltage Battery Cables - Electric (414-03A High Voltage Battery, Mounting and Cables, Removal and Installation). If no damage is found review the P0AA6:00 freeze frame data and attempt to simulate the HEV_BATT_CUR PID (parameter identification) value and other vehicle operating conditions in an attempt to duplicate the concern.

S22 ATTEMPT TO DUPLICTE THE CONCERN BY CONNECTING A KNOWN GOOD EVSE (120V) APPLIANCE TO AN ELECTRICAL OUTLET IN THE BED (VEHICLES EQUIPPED WITH DUAL INVERTERS)

- Ignition ON.
- CONNECT an 120V or 220V appliance into an elecctrical outlet in the bed.
- Using a diagnostic scan tool, view BECM (battery energy control module) PIDs.
- Select the following BECM (battery energy control module) PIDs:
  - Access the BECM (battery energy control module) and monitor the LEAKRESPOS (Leakage Resistance (Bus +)) (Ohm) PID (parameter identification)
  - Access the BECM (battery energy control module) and monitor the LEAKRESNEG (Leakage Resistance (Bus -)) (Ohm) PID (parameter identification)

	INSPECT the high voltage system for any physical damage. INSPECT the high voltage cables between the high voltage battery, SOBDMC (secondary on-board diagnostic control module C), ACCMB (Air Conditioining Compressor Control Module B) and electric compressor assembly (if equipped), GFM2 (generic function module 2) (if equipped), GFM3 (generic function module 3) (if equipped), SOBDMB (Secondary On-Board Diagnostic Control Module B (SOBDMB)), ACCM (air conditioning control module) and electric compressor assembly, DCDC (direct current/direct current converter control module), Cabin Coolant Heater, and SOBDM (secondary on-board diagnostic control module A) for chafing or damaged insulation. If damage is found, INSTALL a new high voltage battery cable. REFER to: High Voltage Battery Cables - Electric (414-03A High Voltage Battery, Mounting and Cables, Removal and Installation). If no damage is found review the P0AA6:00 freeze frame data and attempt to simulate the HEV_BATT_CUR PID (parameter identification) value and other vehicle operating conditions in an attempt to duplicate the concern.

PINPOINT TEST T : P0AA7:00

Normal Operation and Fault Conditions

With the ignition in the ON position and the engine running or OFF (the engine must have run at least once after the ignition was cycled to ON), the BECM (battery energy control module) monitors the electrical isolation (leakage resistance) between the high-voltage system and the vehicle chassis. The BECM (battery energy control module) monitors the electrical isolation circuits for faults. If a fault is present DTC (diagnostic trouble code) P0AA7:00 sets.

DTC Fault Trigger Conditions

DTC (diagnostic trouble code)	Description	Fault Trigger Condition
BECM (battery energy control module) P0AA7:00	Hybrid/EV Battery Pack 'A' Voltage Isolation Sensor Circuit: No Sub Type Information	Sets when BECM (battery energy control module) senses the leakage detection circuit is faulted.

Possible Sources

- BECM (battery energy control module)

NOTE

module) P0C43:00	Range/Performance: No Sub Type Information	28°C (82°F) between high voltage battery coolant temperature and the high voltage battery pack temperature after a key off timer reading of greater than or equal to 6 hours.
BECM (battery energy control module) P0C44:00	Hybrid/EV Battery Pack Coolant Temperature Sensor 'A' Circuit Low: No Sub Type Information	Sets if BECM (battery energy control module) senses less than -47.27°C (-53.1°F) from the high voltage battery coolant temperature sensor for 10 seconds or more.
BECM (battery energy control module) P0C45:00	Hybrid/EV Battery Pack Coolant Temperature Sensor 'A' Circuit High: No Sub Type Information	Sets if BECM (battery energy control module) senses greater than 98.3°C (208.94°F) from the high voltage battery coolant temperature sensor for 10 seconds or more.

Possible Sources

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

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.

U1 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) P0C43:00, P0C44:00, and/or P0C45:00 present?

Yes	GO to U2

No	The concern is not present at this time.

Yes	REPAIR the affected circuit.

No	GO to U4

U4 CHECK THE COOLANT TEMPERATURE CIRCUITS FOR BEING SHORTED TO GROUND

- Ignition OFF.
- Measure:

Positive Lead	Measurement / Action	Negative Lead
C4456-1	Ω	Ground
C4456-2	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	GO to U5

No	REPAIR the affected circuit.

U5 CHECK THE COOLANT TEMPERATURE CIRCUITS FOR BEING SHORTED TOGETHER

- Measure:

Positive Lead	Measurement / Action	Negative Lead
C4456-1	Ω	C4456-2

C144-3 (male side)	Ω	C144-5 (male side)
C144-24 (male side)	Ω	C144-5 (male side)
C144-3 (male side)	Ω	C144-24 (male side)

Are the resistances greater than 10,000 ohms?

Yes	GO to U11

No	GO to U8

U8 CHECK THE COOLANT TEMPERATURE CIRCUITS INSIDE THE HIGH VOLTAGE BATTERY FOR BEING SHORTED TO CASE GROUND

- 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).
- Measure:

Positive Lead	Measurement / Action	Negative Lead

U9 CHECK THE COOLANT TEMPERATURE CIRCUITS INSIDE THE HIGH VOLTAGE BATTERY FOR BEING SHORTED TOGETHER

- Measure:

Positive Lead	Measurement / Action	Negative Lead
C4816B-11	Ω	C4816A-10

Is the resistance greater than 10,000 ohms?

Yes	GO to U10

No	INSTALL new wiring harness.

U10 CHECK THE COOLANT TEMPERATURE CIRCUITS INSIDE THE HIGH VOLTAGE BATTERY FOR BEING OPEN

- Measure:

Positive Lead	Measurement / Action	Negative Lead
C144-3 (male side)	Ω	C4816B-11
C144-24 (male side)	Ω	C4816A-10

Is the resistance less than 3 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