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1997 FORD Mondeo Hatchback OEM Service and Repair Workshop Manual

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and active command the parameter to Battery Cooling - Request Coolant Flow Through Chiller (Maximum Coolant flow)
- Wait for 5 minutes.
- Record the coolant inlet temperature PID (parameter identification) value.

Did the recorded coolant inlet temperature values indicate a drop of 3°C (6°F) or greater?

Yes	System is operating properly at this time. 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, CHECK with customer to determine if vehicle was exposed to extreme high ambient temperatures.
No	Verify high voltage battery coolant cooler fins are cold to touch. If not, REFER to: Climate Control System - Electric, Vehicles With: Dual Automatic Temperature Control (DATC) (412-00 Climate Control System - General Information, Diagnosis and Testing). (pinpoint test AG). If high voltage battery coolant cooler is cold check for high voltage battery coolant pump operation, GO to Pinpoint Test AH If ok check for high voltage battery coolant proportional valve Diagnostic Trouble Codes (DTCs) in the SOBDMC (secondary on-board diagnostic control module C) . If present, REFER to: Rear Electric Drive Assembly (302-02 Rear Electric Drive Assembly, Diagnosis and Testing). If not present, INSTALL a new high voltage battery coolant proportional valve. REFER to: High Voltage Battery Coolant Diverter Valve (302-03A Electrified Drivetrain Cooling, Removal and Installation). Test the vehicle for normal operation.

PINPOINT TEST L : P0A7F:00

Normal Operation and Fault Conditions

The BECM (battery energy control module) monitors the health high voltage battery pack modules by monitoring voltage levels during various operation conditions. The High voltage Battery cells are continuously being discharged and charged that results in a reduction of battery cell life and an end of life counter begins to increment. If the end of life detection counter is greater than or equal to a calibrated

- Inspect G127.
- Inspect G401.

Are the connections clean and tight?

Yes	Using a scan tool perform the high voltage battery capacity relearn routine to clear the DTC (diagnostic trouble code) . If the DTC (diagnostic trouble code) returns 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 high voltage battery. REFER to: High Voltage Battery - Electric (414-03A High Voltage Battery, Mounting and Cables, Removal and Installation).

No	Repair the connections. Using a scan tool perform the high voltage battery capacity relearn routine to clear the DTC (diagnostic trouble code) .

PINPOINT TEST M : P0A7D:00, P0DE6:00

Normal Operation and Fault Conditions

The BECM (battery energy control module) monitors the high voltage battery state-of-charge. When voltage drops to a low level, the vehicle will shut down and/or will not start/re-start until the voltage level has been increased to a nominal level. This condition may occur if the vehicle has been stored or ignition left in accessory mode for an extended period of time. The stop safely hazard (red triangle) warning indicator will illuminate and the vehicle will shut down and not re-start.

DTC Fault Trigger Conditions

DTC (diagnostic trouble code)	Description	Fault Trigger Condition
BECM (battery energy control module) P0A7D:00	Hybrid/EV Battery Pack State of Charge Low: No Sub Type Information	Sets when the ignition switch is first turned to the ON position, or when the ignition switch is in the START position and the high voltage battery State of Charge (SOC) of the battery pack is lower than a calibrated threshold.
BECM (battery energy control	Hybrid/EV Battery Pack Cell Voltage	Sets if an instantaneous module cell voltage is discharged below a calibrated threshold for 10 seconds (contactors closed) or 90

Yes	Concern not present at this time.

No	If the HEV_BAT_MIN_V is greater than 1.45 volts and/or BAT_PACK_VOLT greater than 235.0 volts CONNECT a known good EVSE (Electric Vehicle Supply Equipment) to the vehicle charge port to charge the high voltage battery. If a high voltage battery charging system fault exists preventing charging of the high voltage battery, REFER to: High Voltage Battery Charging System - Electric (414-03B High Voltage Battery Charging System, Diagnosis and Testing). If the HEV_BAT_MIN_V is less than or equal to 1.45 volts and/or BAT_PACK_VOLT less than or equal to 235.0 volts it is necessary to seek additional help. REFER to the Service Repair And Technical Assistance Process.

PINPOINT TEST N : HIGH VOLTAGE BATTERY TEMPERATURE SENSOR FAULTS

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 running or OFF, the BECM (battery energy control module) monitors the high voltage battery internal temperature by taking an average of ten temperature thermistors. If the difference between the measurement reading of one temperature sensor and the average reading of the remaining temperature sensors exceeds a calibrated threshold a DTC (diagnostic trouble code) sets. The BECM (battery energy control module) uses temperature information to control and maintain high voltage battery temperature. An individual temperature sensor failure will not set a MIL (malfunction indicator lamp) or affect vehicle performance. If three or more individual temperature sensor faults are detected the MIL (malfunction indicator lamp) and wrench indicator will be illuminated and vehicle power will be limited. **DTC Fault Trigger Conditions**

DTC (diagnostic trouble code)	Description	Fault Trigger Condition
BECM (battery energy control module) P0A9C:00	Hybrid/EV Battery Temperature Sensor 'A' Circuit Range/Performance: No Sub Type Information	Sets if BECM (battery energy control module) senses the difference of the thermistor measurement is beyond the average range of the remaining thermistors.
BECM (battery energy control	Hybrid/EV Battery Temperature Sensor 'A' Circuit Low: No Sub Type Information	Sets if BECM (battery energy control module) senses a short to voltage in the thermistor circuitry.

module) P0AE9:00	Range/Performance: No Sub Type Information	beyond the average range of the remaining thermistors.
BECM (battery energy control module) P0AEA:00	Hybrid/EV Battery Temperature Sensor 'D' Circuit Low: No Sub Type Information	Sets if BECM (battery energy control module) senses a short to voltage in the thermistor circuitry.
BECM (battery energy control module) P0AEB:00	Hybrid/EV Battery Temperature Sensor 'D' Circuit High: No Sub Type Information	Sets if BECM (battery energy control module) senses an open in the thermistor circuitry.
BECM (battery energy control module) P0BC3:00	Hybrid/EV Battery Temperature Sensor 'E' Circuit Range/Performance: No Sub Type Information	Sets if BECM (battery energy control module) senses the difference of the thermistor measurement is beyond the average range of the remaining thermistors.
BECM (battery energy control module) P0BC4:00	Hybrid/EV Battery Temperature Sensor 'E' Circuit Low: No Sub Type Information	Sets if BECM (battery energy control module) senses a short to voltage in the thermistor circuitry.
BECM (battery energy control module) P0BC5:00	Hybrid/EV Battery Temperature Sensor 'E' Circuit High: No Sub Type Information	Sets if BECM (battery energy control module) senses an open in the thermistor circuitry.
BECM (battery energy control module) P0C34:00	Hybrid/EV Battery Temperature Sensor 'F' Circuit Range/Performance: No Sub Type Information	Sets if BECM (battery energy control module) senses the difference of the thermistor measurement is beyond the average range of the remaining thermistors.
BECM (battery energy control module) P0C35:00	Hybrid/EV Battery Temperature Sensor 'F' Circuit Low: No Sub Type Information	Sets if BECM (battery energy control module) senses a short to voltage in the thermistor circuitry.
BECM (battery energy control	Hybrid/EV Battery Temperature Sensor 'F' Circuit High: No Sub Type Information	Sets if BECM (battery energy control module) senses an open in the thermistor circuitry.

module) P0C8A:00		
BECM (battery energy control module) P0C8B:00	Hybrid/EV Battery Temperature Sensor 'I' Circuit High: No Sub Type Information	Sets if BECM (battery energy control module) senses an open in the thermistor circuitry.
BECM (battery energy control module) P0C8E:00	Hybrid/EV Battery Temperature Sensor 'J' Circuit Range/Performance: No Sub Type Information	Sets if BECM (battery energy control module) senses the difference of the thermistor measurement is beyond the average range of the remaining thermistors.
BECM (battery energy control module) P0C8F:00	Hybrid/EV Battery Temperature Sensor 'J' Circuit Low: No Sub Type Information	Sets if BECM (battery energy control module) senses a short to voltage in the thermistor circuitry.
BECM (battery energy control module) P0C90:00	Hybrid/EV Battery Temperature Sensor 'J' Circuit High: No Sub Type Information	Sets if BECM (battery energy control module) senses an open in the thermistor circuitry.
BECM (battery energy control module) P0ECA:00	Hybrid/EV Battery Temperature Sensor System - Multiple Sensor Correlation: No Sub Type Information	This DTC (diagnostic trouble code) sets when the BECM (battery energy control module) detects 3 or more battery temperature thermistor faults. Address all other Diagnostic Trouble Codes (DTCs) first.
BECM (battery energy control module) P1A39:00	Hybrid/EV Battery Temperature Sensor System - Multiple Sensor Correlation: No Sub Type Information	This DTC (diagnostic trouble code) sets when the difference between the minimum and maximum valid thermistor measurement is greater than 40°C. This DTC (diagnostic trouble code) does not result in illuminating the MIL (malfunction indicator lamp) and does not affect vehicle performance.

Possible Sources

- BECM (battery energy control module)
- High voltage battery modules
- High voltage battery

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

N3 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.
  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:
  Temperature Sensor A

Positive Lead	Measurement / Action	Negative Lead
C4816D-1	Ω	C4816D-7

Temperature Sensor B

Positive Lead	Measurement / Action	Negative Lead
C4816D-2	Ω	C4816D-7

Temperature Sensor C

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

Positive Lead	Measurement / Action	Negative Lead
C4816D-11	Ω	C4816D-14

Temperature Sensor J

Positive Lead	Measurement / Action	Negative Lead
NOTE 4P base battery pack only. C4816D-12	Ω	C4816D-14
NOTE 5P extended range battery pack only. C4816D-13	Ω	C4816D-14

- Temperature sensor B - C4801
- Temperature sensor C - C4804
- Temperature sensor D - C4807
- Temperature sensor E - C4806
- Temperature sensor F - C4808
- Temperature sensor G - C4805
- Temperature sensor H - C4803
- Temperature sensor I - C4802
- Temperature sensor J - C4809

5P Battery Pack

- Temperature sensor A - C4709
- Temperature sensor B - C4701
- Temperature sensor C - C4704
- Temperature sensor D - C4705
- Temperature sensor E - C4706
- Temperature sensor F - C4708
- Temperature sensor G - C4705
- Temperature sensor H - C4703
- Temperature sensor I - C4702
- Temperature sensor J - C4709

- Measure:

  Temperature Sensor A

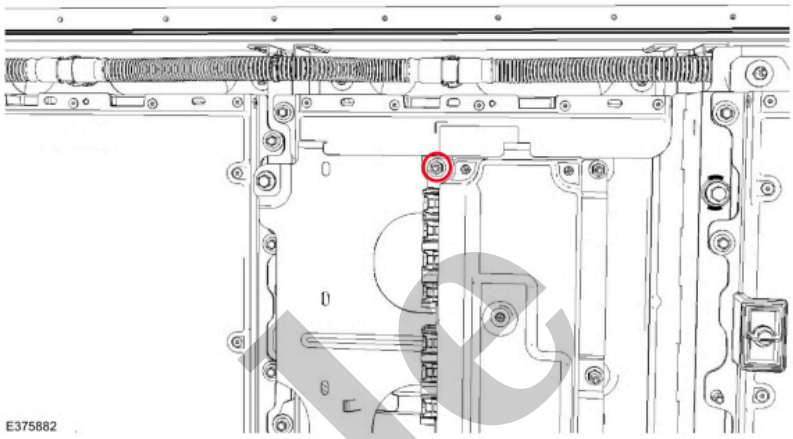
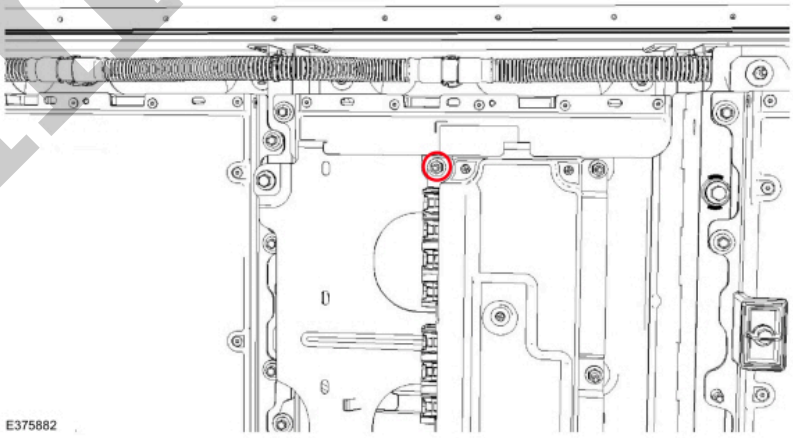
  NOTE

  Only test the temperature sensors that are indicating a fault.

  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

Positive Lead	Measurement / Action	Negative Lead
C4816D-2	Ω	 CASE GROUND
C4816D-7	Ω	 CASE GROUND

Temperature Sensor C

NOTE