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## 1993 FORD Scorpio Sedan OEM Service and Repair Workshop Manual

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| | |
|---|---|
| **No** | The system is operating correctly at this time. The DTC (diagnostic trouble code) may have been set due to high network traffic or an intermittent fault condition. |

**K2 CHECK THE ELECTRIC POWERTRAIN COOLANT LEVEL**

- Verify the electric powertrain coolant level.

**Is the electric powertrain coolant level OK?**

| | |
|---|---|
| **Yes** | CARRY OUT the cooling system bleed procedure.<br>REFER to: Cooling System Filling and Bleeding<br>(303-03F Electric Powertrain Cooling - 3.5L V6 PowerBoost (CN), General Procedures). |

| | |
|---|---|
| **No** | DIAGNOSE the electric powertrain cooling concern.<br>REFER to: Electric Powertrain Cooling<br>(303-03F Electric Powertrain Cooling - 3.5L V6 PowerBoost (CN), Diagnosis and Testing). |

**K3 CHECK FOR ANY COOLING SYSTEM CONCERNS**

- Check the electric powertrain cooling system for and repair:
  - contaminated coolant
  - internal or external coolant leaks
  - blockage of the radiator
  - restricted motor electronics cooling system hoses

**Are there any cooling system concerns?**

| | |
|---|---|
| **Yes** | DIAGNOSE the electric powertrain cooling concern.<br>REFER to: Electric Powertrain Cooling<br>(303-03F Electric Powertrain Cooling - 3.5L V6 PowerBoost (CN), Diagnosis and Testing). |

| | |
|---|---|
| **No** | GO to K4 |

**K4 CLEAR AND CHECK THE INVERTER SYSTEM CONTROLLER (ISC) DIAGNOSTIC TROUBLE CODES (DTCS)**

- Inverter System Controller (ISC) calibration

**L1 REPROGRAM OR UPDATE THE CALIBRATION**

- Reprogram or update the calibration.
- Reprogram the vehicle identification (VID) block (use as built data).

**Was the programming of the Inverter System Controller (ISC) successful?**

| | |
|---|---|
| **Yes** | GO to L2 |

| | |
|---|---|
| **No** | 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, ENSURE the 12V Maintainer is installed on the vehicle, check CAN (controller area network) connections, then attempt to reflash.<br>REFER to: Module Programming<br>(418-01A Module Configuration, General Procedures). |

**L2 CLEAR AND CHECK THE INVERTER SYSTEM CONTROLLER (ISC) DIAGNOSTIC TROUBLE CODES (DTCS)**

- Using a diagnostic scan tool, clear the Inverter System Controller (ISC) diagnostic trouble codes (DTCs).
- Using a diagnostic scan tool, carry out the Inverter System Controller (ISC) self-test.

**Is DTC (diagnostic trouble code) P064F:00 present in the Inverter System Controller (ISC)?**

| | |
|---|---|
| **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, It is necessary to seek additional help. REFER to the Service Repair And Technical Assistance Process. A vehicle data recorder (VDR) or similar recorder may also be useful. |

| | |
|---|---|
| **No** | The system is operating correctly at this time. The DTC (diagnostic trouble code) may have been set due to high network traffic or an intermittent fault condition. |

**PINPOINT TEST M : P06A9**

**PINPOINT TEST N : P06B8**

**NOTE**

The Inverter System Controller (ISC) is referred to as the SOBDMC (Secondary On-Board Diagnostic Control Module C) in the scan tool.

**Normal Operation and Fault Conditions**

REFER to: Electric Powertrain Control - Component Location(303-14F Electric Powertrain Control - 3.5L V6 PowerBoost (CN), Description and Operation).

**DTC Fault Trigger Conditions**

| DTC (diagnostic trouble code) | Description | Fault Trigger Condition |
|---|---|---|
| SOBDMC (secondary on-board diagnostic control module C) P06B8:00 | Internal Control Module Non-Volatile Random Access Memory (NVRAM) Error: No Sub Type Information | This DTC (diagnostic trouble code) sets when an internal error occurs. |

**Possible Sources**

- Inverter System Controller (ISC)
- Inverter System Controller (ISC) calibration

**N1 VERIFY THE INVERTER SYSTEM CONTROLLER (ISC) CALIBRATION LEVEL**

- Verify the Inverter System Controller (ISC) is at the latest calibration level.

**Is the Inverter System Controller (ISC) at the latest calibration level?**

| | |
|---|---|
| **Yes** | GO to N2 |

| | |
|---|---|
| **No** | UPDATE the Inverter System Controller (ISC) to the latest calibration level. |

**N2 CLEAR AND CHECK THE INVERTER SYSTEM CONTROLLER (ISC) DIAGNOSTIC TROUBLE CODES (DTCS)**

- Using a diagnostic scan tool, clear the Inverter System Controller (ISC) diagnostic trouble codes (DTCs).
- Using a diagnostic scan tool, carry out the Inverter System Controller (ISC) self-test.

**Is DTC (diagnostic trouble code) P06B8:00 present in the Inverter System Controller (ISC)?**

**O1 CHECK FOR LOW VOLTAGE BECM (BATTERY ENERGY CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)**

**NOTE**

Turn the ignition OFF for 15 seconds before carrying out the self-test or clearing DTCs.

**NOTE**

DTC P0887 may set as a result of a low 12 volt battery concern.

**NOTE**

DTCs P0562 and U3003 may set in addition to DTC P0887. Diagnose all other DTCs before entering this pinpoint test.

- Ignition ON.
- Using a diagnostic scan tool, check for diagnostic trouble codes (DTCs) in all modules.

**Are any low voltage diagnostic trouble codes (DTCs) present in any module?**

| | |
|---|---|
| **Yes** | DIAGNOSE any low voltage diagnostic trouble codes (DTCs), REFER to the appropriate diagnosis and testing section. |

| | |
|---|---|
| **No** | GO to O2 |

**O2 CHECK FOR LOW VOLTAGE INVERTER SYSTEM CONTROLLER (ISC) DIAGNOSTIC TROUBLE CODES (DTCS)**

**NOTE**

They key cycle is very important, the DTC will not clear unless a key cycle is completed.

- Ignition OFF.
- Wait 15 seconds.
- Ignition ON.
- Using a diagnostic scan tool, clear the Inverter System Controller (ISC) diagnostic trouble codes (DTCs).
- Using a diagnostic scan tool, carry out the Inverter System Controller (ISC) self-test.

| | |
|---|---|
| **Yes** | GO to O5 |

| | |
|---|---|
| **No** | REPAIR the open circuit. |

**O5 CHECK RELAY CONTROL CIRCUIT FOR A SHORT TO GROUND**

- Measure:

| Positive Lead | Measurement / Action | Negative Lead |
|---|---|---|
| C1458A-K3 | Ω | Ground |

**Is the resistance greater than 10K ohms?**

| | |
|---|---|
| **Yes** | GO to O6 |

| | |
|---|---|
| **No** | REPAIR the short circuit. |

**O6 CHECK THE RELAY CONTROL FOR A SHORT TO VOLTAGE**

- Ignition ON.
- Measure:

| Positive Lead | Measurement / Action | Negative Lead |
|---|---|---|
| C1458A-K3 | V | Ground |

**Is any voltage present?**

| | |
|---|---|
| **Yes** | REPAIR the short circuit. |

| | |
|---|---|
| **No** | REPAIR the open circuit. |

**O9 CHECK THE INVERTER SYSTEM CONTROLLER (ISC) VPWR CIRCUIT FOR AN OPEN**

- Ignition OFF.
- Measure:

| Positive Lead | Measurement / Action | Negative Lead |
|---|---|---|
| C1035C-54 | Ω | C1458A-M2 |

**Is the resistance less than 5 ohms?**

| | |
|---|---|
| **Yes** | GO to O10 |

| | |
|---|---|
| **No** | REPAIR the open circuit. |

**O10 CHECK THE INVERTER SYSTEM CONTROLLER (ISC) CIRCUIT FOR A SHORT TO VOLTAGE**

- Disconnect BCMC (body control module C)  C1035B .
- Measure:

| Positive Lead | Measurement / Action | Negative Lead |
|---|---|---|
| C1035B-8 | Ω | C1458A-K2 |

**Is the resistance less than 5 ohms?**

| | |
|---|---|
| **Yes** | GO to O13 |

| | |
|---|---|
| **No** | REPAIR the open circuit. |

**O13 CHECK THE INVERTER SYSTEM CONTROLLER (ISC) ISP-R CIRCUIT FOR A SHORT TO VOLTAGE**

- Ignition ON.
- Measure:

| Positive Lead | Measurement / Action | Negative Lead |
|---|---|---|
| C1458A-K2 | V | Ground |

**Is any voltage present?**

| | |
|---|---|
| **Yes** | REPAIR the short circuit. |

| | |
|---|---|
| **No** | GO to O14 |

**O14 CHECK THE INVERTER SYSTEM CONTROLLER (ISC) ISP-R CIRCUIT FOR VOLTAGE**

- Ignition OFF.

The Inverter System Controller (ISC) is referred to as the SOBDMC (Secondary On-Board Diagnostic Control Module C) in the scan tool.

**Normal Operation and Fault Conditions**

REFER to: Electric Powertrain Control - Component Location(303-14F Electric Powertrain Control - 3.5L V6 PowerBoost (CN), Description and Operation).

**DTC Fault Trigger Conditions**

| DTC (diagnostic trouble code) | Description | Fault Trigger Condition |
|---|---|---|
| SOBDMC (secondary on-board diagnostic control module C) P0A1A:06 | Generator Control Module: Algorithm Based Failures | This DTC (diagnostic trouble code) sets when the generator torque exceeds the calibrated threshold. |

**Possible Sources**

- Inverter System Controller (ISC) calibration
- Inverter System Controller (ISC)

**P1 CARRY OUT THE BECM (BATTERY ENERGY CONTROL MODULE) SELF-TEST**

- Ignition ON.
- Using a diagnostic scan tool, carry out the BECM (battery energy control module) self-test and record any diagnostic trouble codes (DTCs).

**Are there any BECM (battery energy control module) diagnostic trouble codes (DTCs) present?**

| | |
|---|---|
| **Yes** | DIAGNOSE all BECM (battery energy control module) diagnostic trouble codes (DTCs). REFER to: High Voltage Battery, Mounting and Cables - Electric (414-03A High Voltage Battery, Mounting and Cables, Diagnosis and Testing). |

| | |
|---|---|
| **No** | GO to P2 |

**P2 CARRY OUT THE INVERTER SYSTEM CONTROLLER (ISC) SELF-TEST**

- Ignition ON.
- Using a diagnostic scan tool, carry out the Inverter System Controller (ISC) self-test and record any diagnostic trouble codes (DTCs).

**Are there any Inverter System Controller (ISC) diagnostic trouble codes (DTCs) other than P0A1A:06 present?**

and

Access the SOBDMC (secondary on-board diagnostic control module C) and monitor the GTQ_OUT (Generator Torque from AC Source) (Nm) PID (parameter identification)

- While monitoring the PID (parameter identification) s, road test the vehicle under load (above 4000 RPM (revolutions per minute) )

  REFER to: Road Testing Vehicle(307-01B Automatic Transmission - 10-Speed Automatic Transmission – 10R80 MHT, Diagnosis and Testing).

**Are the generator torque command and generator torque out PID (parameter identification) readings separated by greater than 18 lb.ft ( 25 Nm) ONLY above 4000 RPM (revolutions per minute) ?**

| | |
|---|---|
| **Yes** | INSTALL a new hybrid drive unit.<br>REFER to: Hybrid Drive Unit<br>(303-01F Electric Motor - 3.5L V6 PowerBoost (CN), Removal and Installation).<br>CLEAR the Inverter System Controller (ISC) diagnostic trouble codes (DTCs). REPEAT the self-test. |

| | |
|---|---|
| **No** | 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 Inverter System Controller (ISC).<br>REFER to: Inverter System Controller [SOBDMC]<br>(303-14F Electric Powertrain Control - 3.5L V6 PowerBoost (CN), Removal and Installation). |

**PINPOINT TEST Q : P0A1D:08**

**NOTE**

The Inverter System Controller (ISC) is referred to as the SOBDMC (Secondary On-Board Diagnostic Control Module C) in the scan tool.

**Normal Operation and Fault Conditions**

REFER to: Electric Powertrain Control - Component Location(303-14F Electric Powertrain Control - 3.5L V6 PowerBoost (CN), Description and Operation).

**DTC Fault Trigger Conditions**