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1996 FORD Scorpio Sedan OEM Service and Repair Workshop Manual

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C1458A-A2	Ω	C1458A-A3
C1458A-A2	Ω	C1458A-B3
C1458A-B2	Ω	C1458A-A3
C1458A-B2	Ω	C1458A-B3
C1458A-A3	Ω	C1458A-B3

Are the resistances greater than 10K ohms?

Yes	GO to X4

No	REPLACE the harness. CLEAR the diagnostic trouble codes (DTCs) and REPEAT the self-test.

X4 CHECK THE INVERTER SYSTEM CONTROLLER (ISC) CIRCUITS FOR A SHORT TO VOLTAGE

- Ignition ON.
- Measure and record:

Positive Lead	Measurement / Action	Negative Lead
C1458A-A1	V⎓	Ground

 C1280 pin 3, component side	Ω	 C1280 pin 4, component side

Is the resistance between 8 and 18 ohms?

Yes	GO to X6

No	INSTALL a new electric motor. REFER to: Hybrid Drive Unit (303-01F Electric Motor - 3.5L V6 PowerBoost (CN), Removal and Installation).

X6 CHECK THE TRANSMISSION SENSOR SPEED RESOLVER RESISTANCE

- Measure and record:

Positive Lead	Measurement / Action	Negative Lead
 C1280 pin 1, component side	Ω	 C1280 pin 5, component side

Is the resistance between 27 and 37 ohms?

PINPOINT TEST Y : P0A50:92

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) P0A50:92	Generator Position Sensor Circuit Overspeed: Performance Or Incorrect Operation	This DTC (diagnostic trouble code) sets when the generator speed is above the calibrated threshold for a period of time.

Possible Sources

- Transmission slips
- Electric Motor

Y1 READ THE PCM (POWERTRAIN CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Using a diagnostic scan tool, retrieve the PCM (powertrain control module) diagnostic trouble codes (DTCs).

Are any diagnostic trouble codes (DTCs) present?

Yes	DIAGNOSE all PCM (powertrain control module) diagnostic trouble codes (DTCs). REFER to: Electric Powertrain Control (303-14F Electric Powertrain Control - 3.5L V6 PowerBoost (CN), Diagnosis and Testing).

No	GO to Y2

Y2 CHECK FOR INVERTER SYSTEM CONTROLLER (ISC) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.

DTC (diagnostic trouble code)	Description	Fault Trigger Condition
SOBDMC (secondary on-board diagnostic control module C) P0A6F:00	Generator Phase U Current: No Sub Type Information	This DTC (diagnostic trouble code) sets when the U current sensor offset is greater than the calibrated threshold.
SOBDMC (secondary on-board diagnostic control module C) P0A72:00	Generator Phase V Current: No Sub Type Information	This DTC (diagnostic trouble code) sets when the V current sensor offset is greater than the calibrated threshold.
SOBDMC (secondary on-board diagnostic control module C) P0A75:00	Generator Phase W Current: No Sub Type Information	This DTC (diagnostic trouble code) sets when the W current sensor offset is greater than the calibrated threshold.

Possible Sources

- Inverter System Controller (ISC)

Z1 CHECK FOR 12V BATTERY VOLTAGE AND SYSTEM VOLTAGE LOW DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, carry out the self-test in all modules.

Is DTC U3003:16 or P0562:00 recorded in any module?

Yes	GO to Z2
No	GO to Z3

Z2 CHECK THE 12-VOLT BATTERY

- Carry out the 12-volt battery condition test.
  REFER to: Battery(414-01 Battery, Mounting and Cables, Diagnosis and Testing).

Did the 12-volt battery pass the condition test?

Yes	GO to Z3

SOBDMC (secondary on-board diagnostic control module C) P0A71:00	Generator Phase U Current High: No Sub Type Information	This DTC (diagnostic trouble code) sets when the U phase current is outside of the normal range.
SOBDMC (secondary on-board diagnostic control module C) P0A74:00	Generator Phase V Current High: No Sub Type Information	This DTC (diagnostic trouble code) sets when the V phase current is outside of the normal range.
SOBDMC (secondary on-board diagnostic control module C) P0A77:00	Generator Phase W Current High: No Sub Type Information	This DTC (diagnostic trouble code) sets when the W phase current is outside of the normal range.

Possible Sources

- Wiring, terminals or connectors
- Low Voltage wiring
- Other Inverter System Controller (ISC) diagnostic trouble codes (DTCs)
- Inverter System Controller (ISC) TRID block programming
- Inverter System Controller (ISC)

AA1 CHECK FOR 12V BATTERY VOLTAGE AND SYSTEM VOLTAGE LOW DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, carry out the self-test in all modules.

Is DTC U3003:16 or P0562:00 recorded in any module?

Yes	GO to AA2
No	GO to AA3

AA2 CHECK THE 12-VOLT BATTERY

- Carry out the 12-volt battery condition test.
  REFER to: Battery(414-01 Battery, Mounting and Cables, Diagnosis and Testing).

Did the 12-volt battery pass the condition test?

Yes	GO to AA3

No	DIAGNOSE all other Inverter System Controller (ISC) diagnostic trouble codes (DTCs). REFER to the DTC (diagnostic trouble code) chart in this section.

AA6 VISUAL INSPECTION OF THE HIGH VOLTAGE SYSTEM

- Ignition OFF.
- De-energize the high voltage system.
  REFER to: High Voltage System De-energizing - Full Hybrid Electric Vehicle (FHEV)(414-03A High Voltage Battery, Mounting and Cables, General Procedures).
- Remove the high voltage traction battery service disconnect plug.
- Visually inspect all the high voltage cables.
- Make sure all the high voltage connectors are correctly and securely connected.
- Examine all the high voltage cables and connectors for damaged, burned or overheated insulation and loose or broken connections.
- Make sure the high voltage DC (direct current) connector cover is correctly installed and it was not removed from the vehicle.

Is a concern present?

Yes	REPAIR as necessary. CLEAR the diagnostic trouble codes (DTCs) and REPEAT the self-test.

No	GO to AA7

AA7 CHECK THE ELECTRIC MOTOR CIRCUITS FOR AN OPEN

- Disconnect Electric Motor C1201 .
- Disconnect Inverter System Controller (ISC) C1458B .
- Measure and record:

Positive Lead	Measurement / Action	Negative Lead
C1458B-1	Ω	C1201-3

	CLEAR the diagnostic trouble codes (DTCs) and REPEAT the self-test.

AA9 CHECK THE ELECTRIC MOTOR CIRCUITS FOR SHORTED TOGETHER

- Measure and record:

Positive Lead	Measurement / Action	Negative Lead
C1201-1	Ω	C1201-2
C1201-1	Ω	C1201-3
C1201-2	Ω	C1201-3

Are the resistances greater than 10K ohms?

Yes	GO to AA10

No	REPAIR the short circuit. CLEAR the diagnostic trouble codes (DTCs) and REPEAT the self-test.

AA10 CHECK FOR CORRECT INVERTER SYSTEM CONTROLLER (ISC) OPERATION

- Ignition OFF.
- Disconnect and inspect all Inverter System Controller (ISC) connectors.
- Repair:
  - corrosion (install new connector or terminals – clean module pins)
  - damaged or bent pins – install new terminals/pins
  - pushed-out pins – install new pins as necessary
- Reconnect the Inverter System Controller (ISC) connectors. Make sure they seat and latch correctly.
- Connect Electric Motor C1201 .

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

Are any Inverter System Controller (ISC) diagnostic trouble codes (DTCs) other than P0A7A:96 present?

Yes	DIAGNOSE all other Inverter System Controller (ISC) diagnostic trouble codes (DTCs), REFER to the DTC (diagnostic trouble code) chart in this section.

No	For DTC (diagnostic trouble code) P0A7A:96 only GO to AB2

AB2 CLEAR AND READ THE INVERTER SYSTEM CONTROLLER (ISC) DIAGNOSTIC TROUBLE CODES (DTCS)

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

Is DTC (diagnostic trouble code) P0A7A the only DTC (diagnostic trouble code) read from 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, INSTALL a new Inverter System Controller (ISC). REFER to: Inverter System Controller [SOBDMC] (303-14F Electric Powertrain Control - 3.5L V6 PowerBoost (CN), Removal and Installation).

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 AC : P0BCD

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

- After a 6 hour cold soak and in the same location the vehicle was originally parked, run the Inverter System Controller (ISC) self-test.
- Ignition ON.
- Using a diagnostic scan tool, run the Inverter System Controller (ISC) self-test.

Is DTC (diagnostic trouble code) P0BCD present?

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 Inverter System Controller (ISC). REFER to: Inverter System Controller [SOBDMC] (303-14F Electric Powertrain Control - 3.5L V6 PowerBoost (CN), Removal and Installation).
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 AD : P0BCE, P0BCF

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) P0BCE:00	Generator Inverter Temperature Sensor 'A' Circuit Low: No Sub Type Information	This DTC (diagnostic trouble code) sets when the inverter temperature sensor voltage falls below the calibrated threshold.