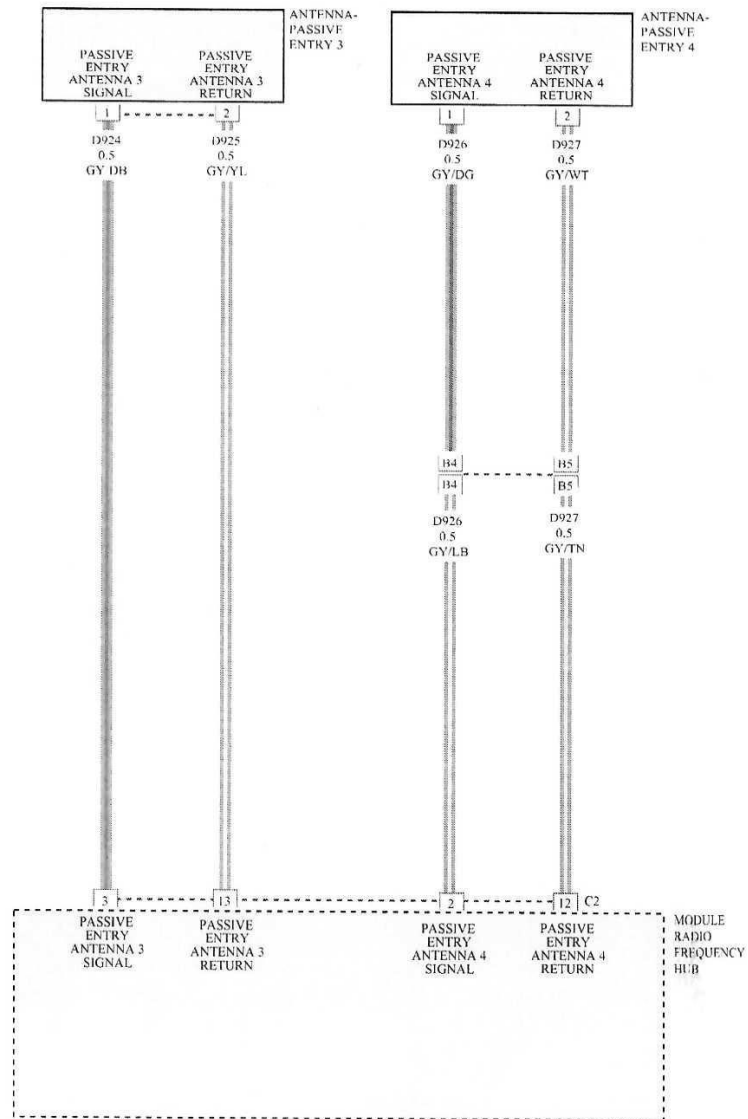


28 - DTC-Based Diagnostics / MODULE, Radio Frequency (RF Hub) / Diagnosis and Testing

B1A74-01-PASSIVE ENTRY ANTENNA 4 - GENERAL ELECTRICAL FAILURE





Theory of Operation

The Passive Entry (PE) antenna units allow the transmitter within the Radio Frequency Hub (also known as the RF Hub) to communicate via Low Frequency (LF) radio transmission with a Frequency Operated Button with Integrated Key (FOBIK) that is located inside the vehicle or, at most, about 2 meters (6.5 feet) horizontally in all directions around the outside of the vehicle. The RF Hub uses communication through the antenna units to wake up and challenge a FOBIK that is within range in order to authenticate whether that FOBIK is valid (programmed) to the vehicle. The RF Hub communicates with the FOBIK using Frequency-Shift Keying (FSK) modulation.

Each antenna unit has two dedicated connections to the RF Hub. One connection is the LF antenna output circuit, while the other connection is the LF antenna return circuit. These circuits to each antenna unit are a twisted pair to help reduce the potential for induced electrical interference. The RF Hub microcontroller monitors all of the antenna units and will store a Diagnostic Trouble Code (DTC) for any fault that it detects.

The hard wired inputs and outputs of the antenna units may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. However, the most reliable, efficient, and accurate means to diagnose the antenna units requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

When Monitored and Set Conditions

When Monitored: This diagnostic runs one time during an ignition cycle when the following conditions are met:

- The Bus is awake.
- Every Passive Entry or Keyless Go action.
- Battery voltage between 10.0 – 16.0 volts.

Set Conditions:

- The Passive Entry Antenna 4 is faulty, out of range, linear factor is too high or low and no other antennas have a short to battery or a short to ground condition.

Default Actions:

- Limitation of the Passive functionality (Keyless Go, Passive entry, etc.).
- EVIC message: "Service Keyless System".

Possible Causes
PASSIVE ENTRY ANTENNA 4 SIGNAL CIRCUIT SHORTED TO GROUND
PASSIVE ENTRY ANTENNA 4 RETURN CIRCUIT SHORTED TO GROUND
PASSIVE ENTRY ANTENNA 4 SIGNAL CIRCUIT SHORTED TO VOLTAGE
PASSIVE ENTRY ANTENNA 4 RETURN CIRCUIT SHORTED TO VOLTAGE
PASSIVE ENTRY ANTENNA 4 SIGNAL CIRCUIT OPEN
PASSIVE ENTRY ANTENNA 4 RETURN CIRCUIT OPEN

Possible Causes
PASSIVE ENTRY ANTENNA 4 SIGNAL CIRCUIT SHORTED TO THE (D927) PASSIVE ENTRY ANTENNA 4 RETURN CIRCUIT
PASSIVE ENTRY ANTENNA 4
RADIO FREQUENCY HUB (RF HUB) MODULE

1. CHECK FOR AN ACTIVE DTC

1. With the scan tool, read Radio Frequency Hub (RF HUB) DTCs and record on the repair order.
2. With the scan tool, erase DTCs.
3. Using the recorded Environmental Data, along with the When Monitored and Set Conditions above, operate the vehicle in the conditions that set the DTC.
4. With the scan tool, read RF HUB DTCs.

Did the DTC return?

Yes

- Go To 2

No

- The condition or conditions that originally set this DTC are not present at this time. Using the wiring diagrams as a guide, check all related splices and connectors for signs of water intrusion, corrosion, pushed out or bent terminals, and correct pin tension and repair as necessary. If no problems are found, test complete.

2. CHECK THE (D926) PASSIVE ENTRY ANTENNA 4 SIGNAL CIRCUIT FOR A SHORT TO VOLTAGE

1. Turn the ignition off.
2. Disconnect the Radio Frequency Hub C2 harness connector.
3. Turn the ignition on.

NOTE: To Turn the ignition on the Passive Entry Keyless Go (PEKG)/Keyless Ignition Node (KIN) system when the RF Hub C2 connector is disconnected, use the rounded end of the FOBIK to press the Stop/Start button.

4. Measure the voltage between ground and the (D926) Passive Entry Antenna 4 Signal circuit at the Radio Frequency Hub C2 harness connector.

Is there any voltage present?

Yes

- Repair the (D926) Passive Entry Antenna 4 Signal circuit for a short to voltage.

No

- Go To 3

3. CHECK THE (D927) PASSIVE ENTRY ANTENNA 4 RETURN CIRCUIT FOR A SHORT TO VOLTAGE

1. Measure the voltage between ground and the (D927) Passive Entry Antenna 4 Return circuit at the Radio Frequency Hub C2 harness connector.

Is there any voltage present?**Yes**

- Repair the (D927) Passive Entry Antenna 4 Return circuit for a short to voltage.

No

- Go To 4

4. CHECK THE (D926) PASSIVE ENTRY ANTENNA 4 SIGNAL CIRCUIT FOR A SHORT TO GROUND

1. Turn the ignition off.
2. Disconnect the RF Hub Module C2 harness connector.
3. Check for continuity between ground and the (D926) Passive Entry Antenna 4 Signal circuit at the Radio Frequency Hub C2 harness connector.

Is there continuity between ground and the (D926) Passive Entry Antenna 4 Signal circuit?**Yes**

- Repair the (D926) Passive Entry Antenna 4 Signal circuit for a short to ground.

No

- Go To 5

5. CHECK THE (D927) PASSIVE ENTRY ANTENNA 4 RETURN CIRCUIT FOR A SHORT TO GROUND

- 1.

Check for continuity between ground and the (D927) Passive Entry Antenna 4 Return circuit at the Radio Frequency Hub C2 harness connector.

Is there continuity between ground and the (D927) Passive Entry Antenna 4 Return circuit?

Yes

- Repair the (D927) Passive Entry Antenna 4 Return circuit for a short to ground.

No

- Go To 6

6. CHECK THE (D926) PASSIVE ENTRY ANTENNA 4 SIGNAL CIRCUIT FOR AN OPEN

1. Measure the resistance of the (D926) Passive Entry Antenna 4 Signal circuit between the RF HUB C2 connector and the Passive Entry Antenna 4 connector.

Is the resistance below 2.0 Ohms?

Yes

- Go To 7

No

- Repair the (D926) Passive Entry Antenna 4 Signal circuit for an open.

7. CHECK THE (D927) PASSIVE ENTRY ANTENNA 4 RETURN CIRCUIT FOR AN OPEN

1. Measure the resistance of the (D927) Passive Entry Antenna 4 Return circuit between the RF HUB C2 connector and the Passive Entry Antenna 4 connector.

Is the resistance below 2.0 Ohms?

Yes

- Go To 8

No

- Repair the (D927) Passive Entry Antenna 4 Return circuit for an open.

8. CHECK THE (D926) PASSIVE ENTRY ANTENNA 4 SIGNAL CIRCUIT FOR A SHORT TO THE (D927) PASSIVE ENTRY ANTENNA 4 RETURN CIRCUIT

1. Check for continuity between the (D926) Passive Entry Antenna 4 Signal circuit and the (D927) Passive Entry Antenna 4 Return circuit at the RF Hub C2 harness connector.

Is there continuity between the (D926) Passive Entry Antenna 4 Signal circuit and the (D927) Passive Entry Antenna 4 Return circuit?

Yes

- Repair the (D926) Passive Entry Antenna 4 Signal circuit for a short to the (D927) Passive Entry Antenna 4 Return circuit.

No

- Go To 9

9. CHECK THE PASSIVE ENTRY ANTENNA 4 AND RF HUB

1. Replace the Passive Entry Antenna 4 in accordance with Service Information. (Refer to 08 - Electrical/Power Locks/ANTENNA, Passive Entry/Removal).
2. Turn the ignition on.
3. Using the scan tool, record and erase the DTCs.
4. With the scan tool, read the Active DTCs.

Does the scan tool display this DTC as active?

Yes

- Replace the RF Hub in accordance with the Service Information. (Refer to 08 - Electrical/8E - Electronic Control Modules/MODULE, Radio Frequency (RF Hub) - Removal).

No

- Test complete.