

GENERAL

MAP Sensor

See [Figure 4-24](#). The manifold absolute pressure sensor (MAP sensor) is supplied 5 volts from the ignition control module and sends a signal back to the ignition control module. This signal varies in accordance with engine vacuum and atmospheric barometric pressure. Changes in barometric pressure are influenced by weather and altitude.

Table 4-15. Code Description

DTC	DESCRIPTION
P0106	MAP sensor rate-of-change error
P0107	MAP sensor failed open/low
P0108	MAP sensor failed high



Figure 4-24. MAP Sensor

DIAGNOSTICS

Diagnostic Tips

- DTC P0106 will set if the MAP sensor signal fluctuates faster than normal operation.
- With the MAP sensor disconnected, the ignition control module should recognize a low voltage. If low voltage is observed, the ignition control module and harness are not at fault.
- Gently place a jumper wire across MAP Sensor connector [80B] Terminals B and C using HARNESS CONNECTOR TEST KIT (Part No. HD-41404), gray male probes and patch cord. With the jumper in place, the ignition control module should recognize a high voltage.
- MAP sensor output check. Using the VACUUM PUMP (Part No. HD-23738A), apply a vacuum to the pressure port of the MAP sensor. The signal voltage should lower as the vacuum is applied.

Diagnostic Notes

The reference numbers below correlate with the circled numbers on the Test 4.13 flow charts.

1. Connect BREAKOUT BOX (Part No. HD-42682) between wire harness and ignition control module. See [4.6 BREAKOUT BOX: ICM](#).
2. Use HARNESS CONNECTOR TEST KIT (Part No. HD-41404), gray pin probes and patch cords.

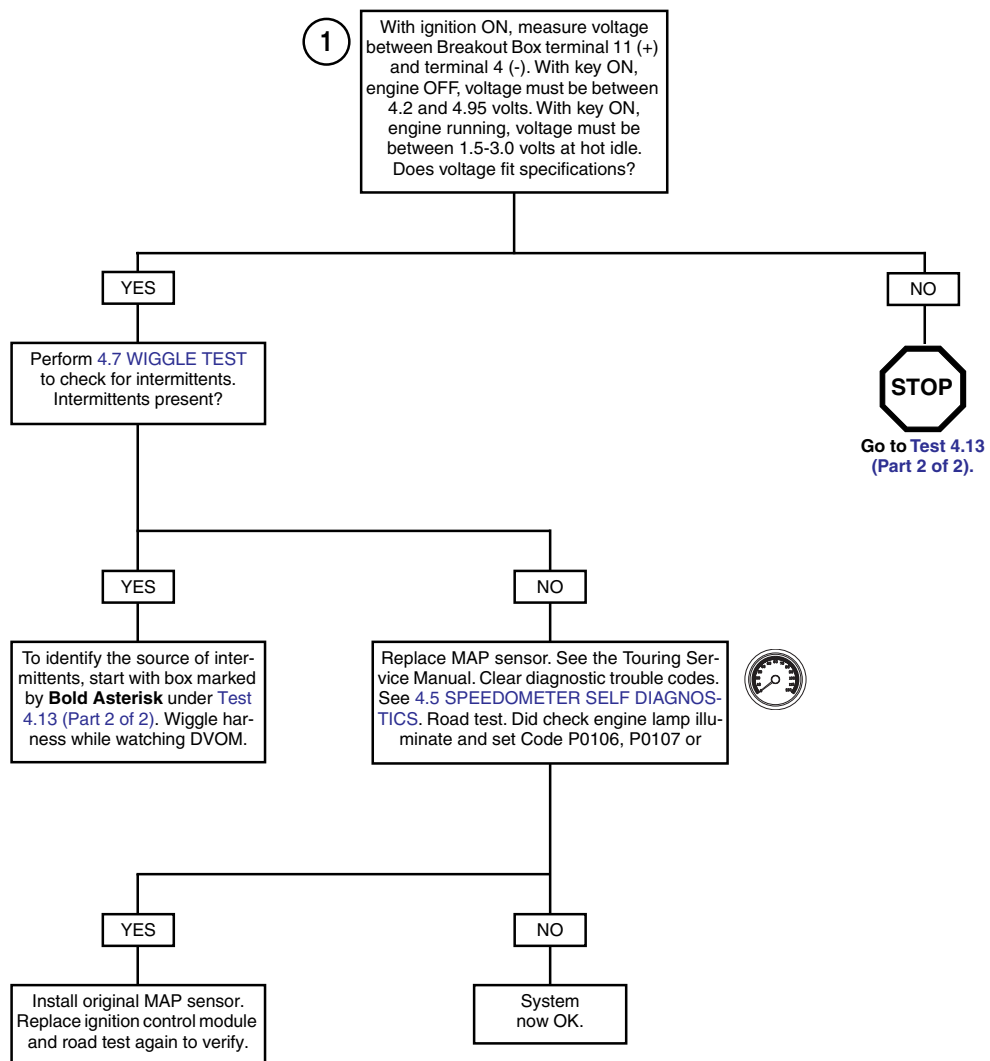


Table 4-16. Wire Harness Connectors in Figure 4-25.

NO.	DESCRIPTION	TYPE	LOCATION
[10]	Ignition Control Module	12-Place Deutsch	Under Right Side Cover
[80]	Manifold Absolute Pressure Sensor (MAP)	3 - Place Packard	Top of Intake Manifold

Test 4.13 (Part 1 of 2)

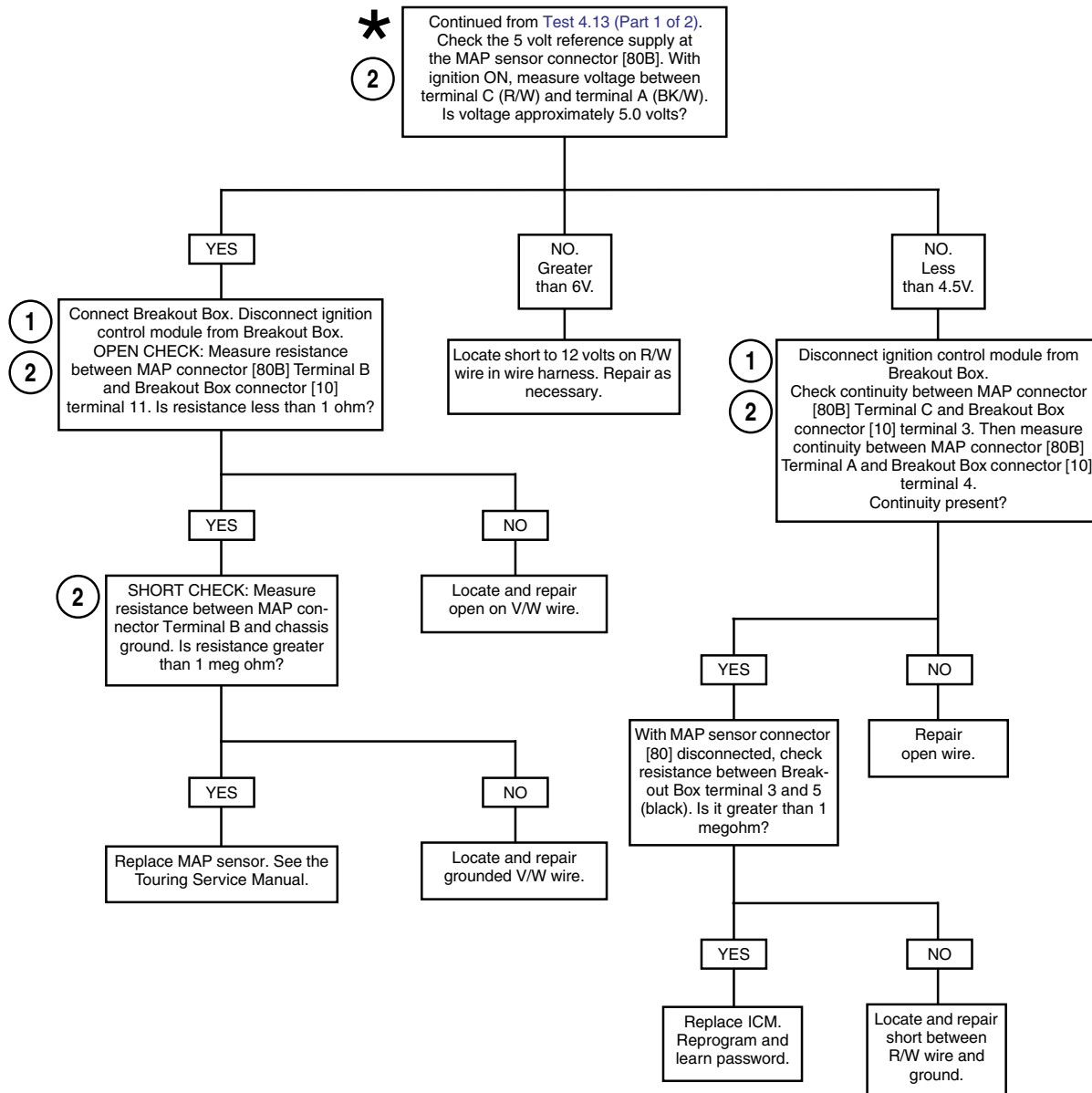
MAP SENSOR: DTC P0106, P0107, P0108



Clear codes using speedometer self diagnostics. See 4.5 SPEEDOMETER SELF DIAGNOSTICS. Confirm proper operation with no check engine lamp.



At some point in the flow chart you may be instructed to jump directly to a box with the bold asterisk. Disregard the asterisk (but not the instruction box) if your normal progression through the chart brings you to this location.

Test 4.13 (Part 2 of 2)**MAP SENSOR: DTC P0106, P0107, P0108**

Clear codes using speedometer self diagnostics.
See **4.5 SPEEDOMETER SELF DIAGNOSTICS**.
Confirm proper operation with no check engine lamp.



At some point in the flow chart you may be instructed to jump directly to a box with the bold asterisk. Disregard the asterisk (but not the instruction box) if your normal progression through the chart brings you to this location.

GENERAL

Battery Voltage

The ignition control module monitors battery positive voltage. The normal operating range is between 8-16 volts while engine is running.

NOTE

When either a diagnostic trouble code P0562 or P0563 is set, the battery icon in the speedometer will illuminate.

- A DTC P0562 is set if the ignition module detects battery positive voltage less than 8 volts while the engine is running.
- A DTC P0563 is set if the ignition module detects battery positive voltage greater than 16 volts.
- Low voltage generally indicates a loose wire, corroded connections and/or a charging system problem.
- A high voltage condition may be caused by a faulty voltage regulator.

Table 4-17. Code Description

DTC	DESCRIPTION
P0562	battery voltage low
P0563	battery voltage high

DIAGNOSTICS

Diagnostic Notes

The reference numbers below correlate with the circled numbers on the Test 4.14 flow charts.

1. Was battery allowed to discharge? Was battery drawn down by a starting problem?
 - a. **Yes.** Charge battery.
 - b. **No.** See charging system troubleshooting.
2. Connect BREAKOUT BOX (Part No. HD-42682) between wire harness and ignition control module. See [4.6 BREAKOUT BOX: ICM](#).
3. The ignition control module is monitoring voltage at ignition control module connector [10] (black) Pin 1.
4. This checks for voltage drops in the ignition control module circuit.
 - a. Place (+) probe to battery positive terminal.
 - b. Place (-) probe to terminal 1 on Breakout Box.
5. Remove Breakout Box at ICM, reconnect ICM. Insert Breakout Box at connector [22] (BK). On FLHR/S models (6-place connector), install Breakout Box adapters (HD-42962).

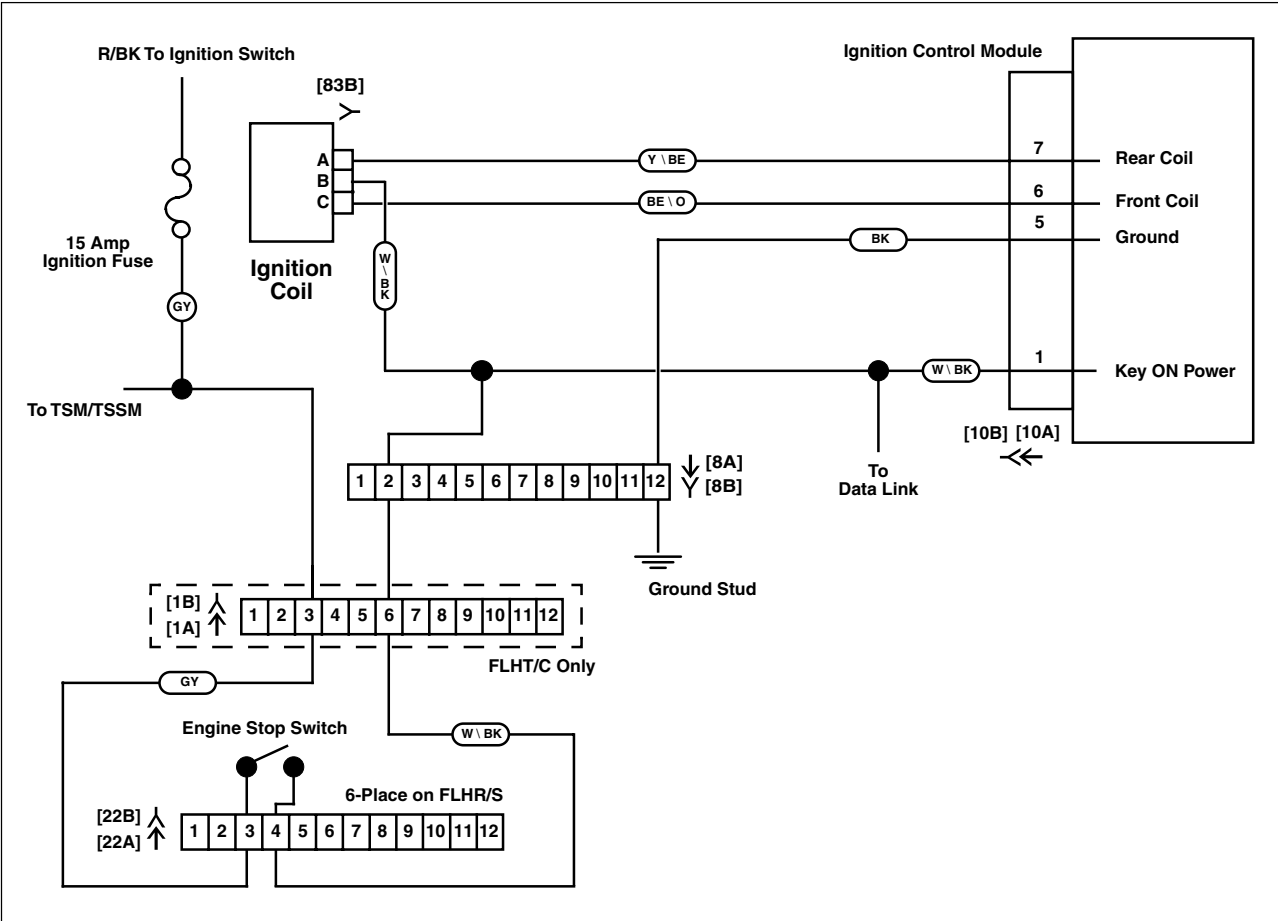


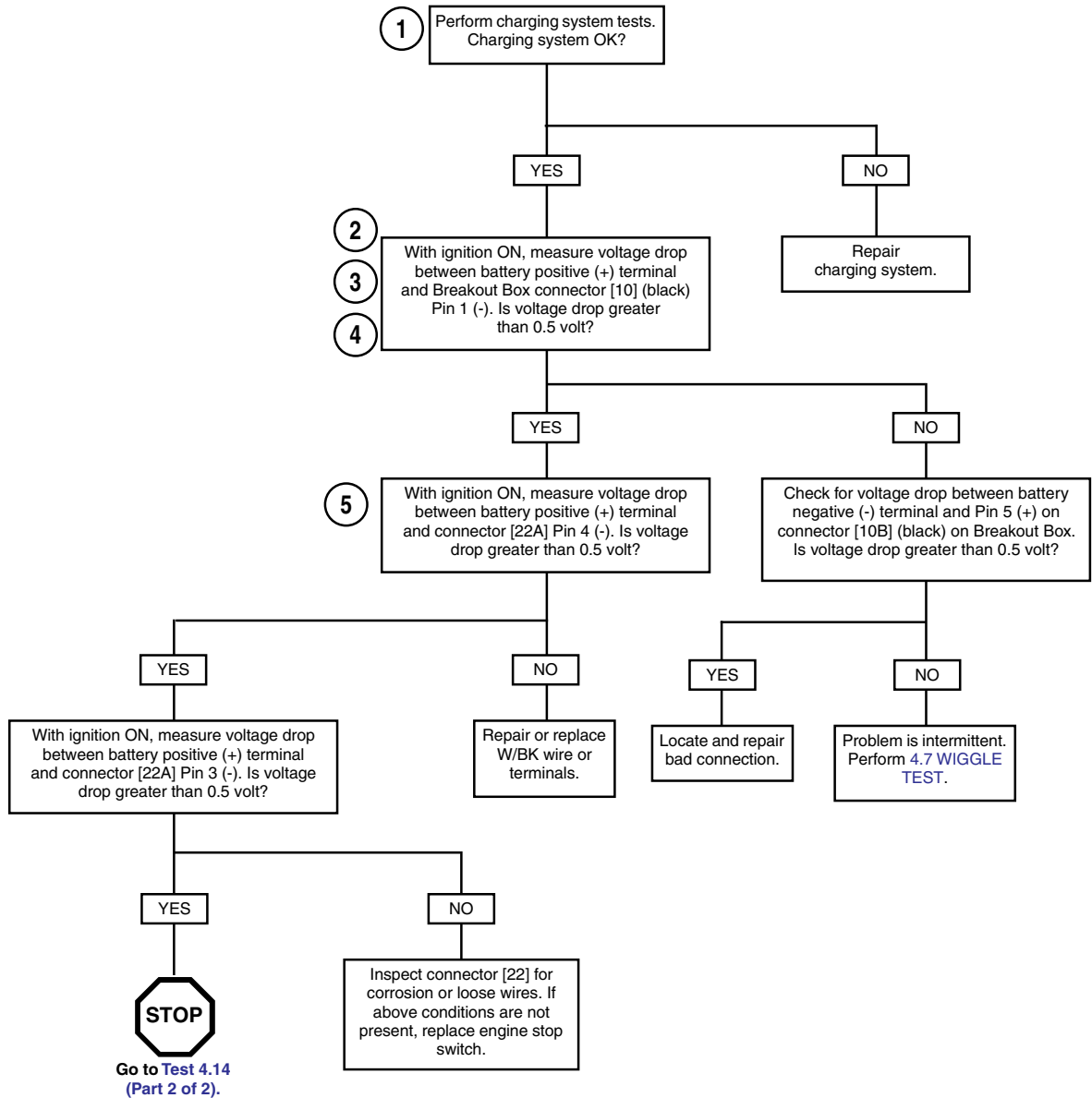
Figure 4-26. Battery Voltage Circuit

Table 4-18. Wire Harness Connectors in Figure 4-26.

NO.	DESCRIPTION	MODEL	TYPE	LOCATION
[1]	Main to Interconnect Harness	FLHT/C	12-Place Deutsch	Inner Fairing- Right Fairing Bracket
[8]	Ignition Harness	All	12-Place Deutsch	Under Right Side Cover
[10]	Ignition Control Module	All	12-Place Deutsch (Black)	Under Right Side Cover
[22]	Interconnect to Right Handlebar Switch Controls	FLHT/C	12-Place Deutsch	Inner Fairing- Right Fairing Support Brace
		FLHR/S	6-Place Deutsch	Inside Headlamp Nacelle
[83]	Ignition Coil	All	3 - Place Packard	Below Fuel Tank (Left Side)

Test 4.14 (Part 1 of 2)

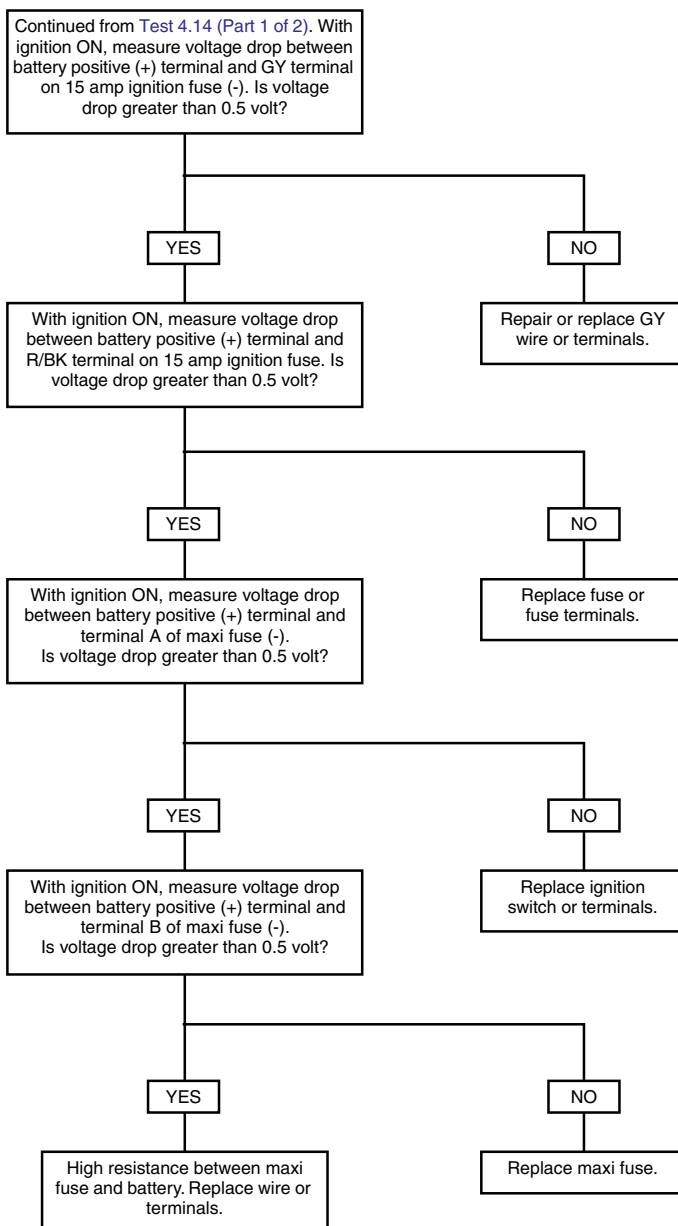
BATTERY VOLTAGE: DTC P0562, P0563



Clear codes using speedometer self diagnostics. See 4.5 SPEEDOMETER SELF DIAGNOSTICS. Confirm proper operation with no check engine lamp.

Test 4.14 (Part 2 of 2)

BATTERY VOLTAGE: DTC P0562, P0563



Clear codes using speedometer self diagnostics.
See 4.5 SPEEDOMETER SELF DIAGNOSTICS.
Confirm proper operation with no check engine lamp.

GENERAL

Password Problem

The ICM and TSM/TSSM exchange passwords during operation. An incorrect password or missing password will set a diagnostic code.

NOTE

If the TSM/TSSM is not connected to the wiring harness, the vehicle will not start.

Table 4-19. Code Description

DTC	DESCRIPTION
P1009	Incorrect password
P1010	Missing password

DIAGNOSTICS

Diagnostic Notes

The reference numbers below correlate with the circled numbers on the Test 4.15 flow charts.

1. DTC P1009 may be set if a recent ICM or TSM/TSSM replacement did not follow the correct password assignment procedure. See [3.24 PASSWORD LEARN](#) for details.
2. Use HARNESS CONNECTOR TEST KIT (Part No. HD-41404), black socket probes and patch cord.
3. Connect BREAKOUT BOX (Part No. HD-42682) between wire harness and ICM. See [4.6 BREAKOUT BOX: ICM](#).
4. See the Touring Service Manual for TSM/TSSM replacement. See [PASSWORD LEARNING](#) under [3.24 PASSWORD LEARN](#) for the password learning procedure.



Figure 4-27. TSM/TSSM

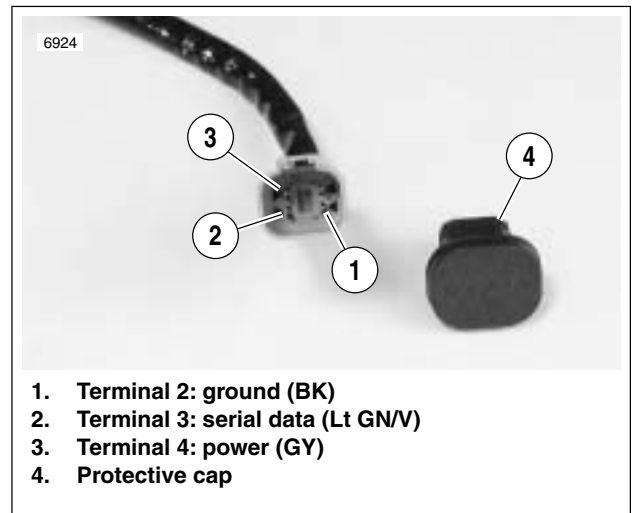


Figure 4-28. Data Link Connector

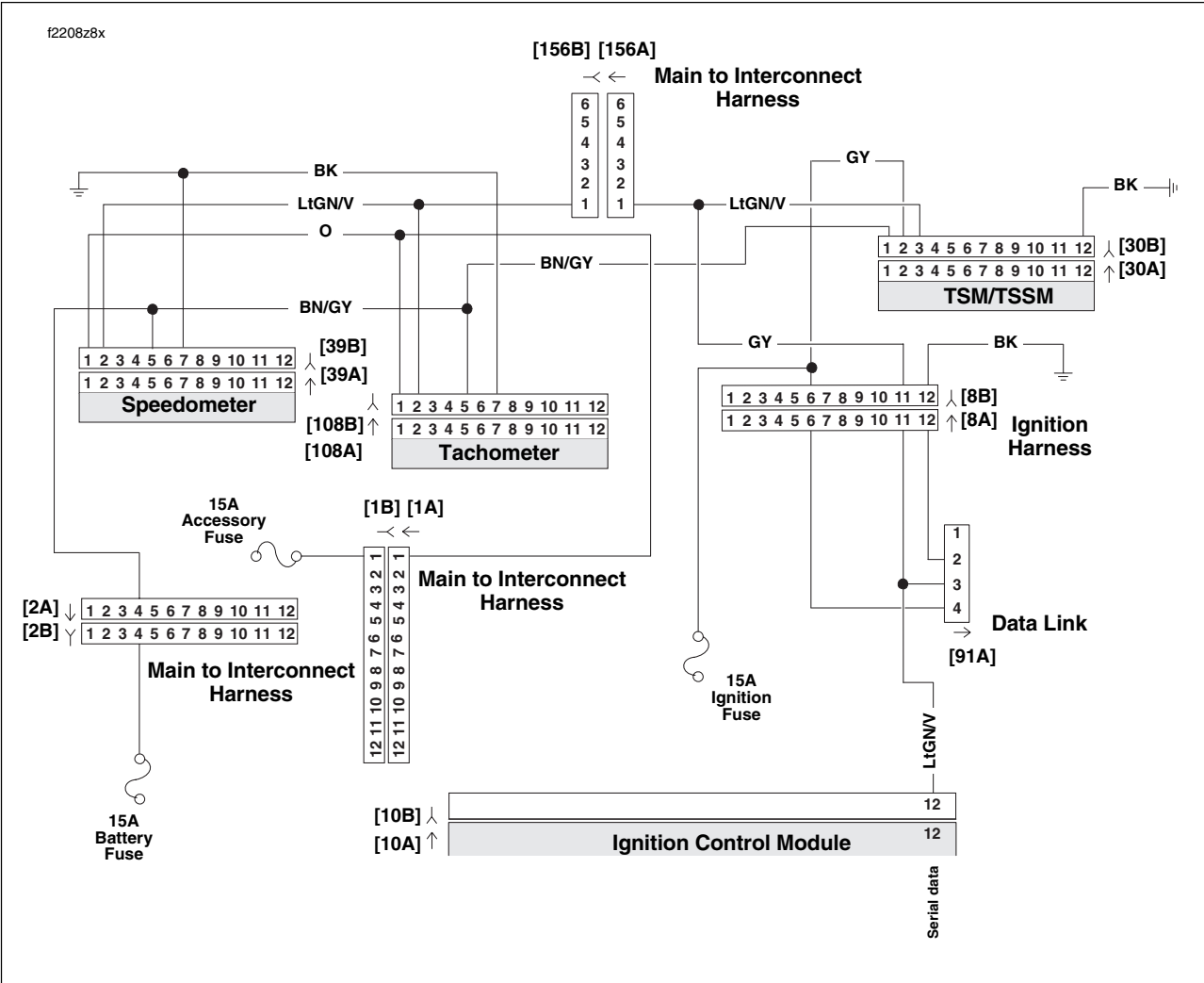


Figure 4-29. Serial Data Circuit (FLHT/C)

Table 4-20. Wire Harness Connectors in Figure 4-29.

NO.	DESCRIPTION	TYPE	LOCATION
[1]	Main to Interconnect Harness	12-Place Deutsch (Black)	Inner Fairing - Right Radio Support Bracket
[2]	Main to Interconnect Harness	12-Place Deutsch (Gray)	Inner Fairing - Right Fairing Support Brace
[8]	Ignition Harness	12-Place Deutsch	Under Right Side Cover
[10]	Ignition Control Module	12-Place Deutsch	Under Right Side Cover
[30]	Turn Signal/Security Module	12-Place Deutsch	Cavity in Crossmember at Rear of Battery Box (Under Seat)
[39]	Speedometer	12-Place Packard	Inner Fairing (Back of Speedometer)
[91]	Data Link	4-Place Deutsch	Under Right Side Cover
[108]	Tachometer	12-Place Packard	Inner Fairing (Back of Tachometer)
[156]	Main to Interconnect Harness	6-Place Deutsch	Inner Fairing - Right Fairing Support Brace

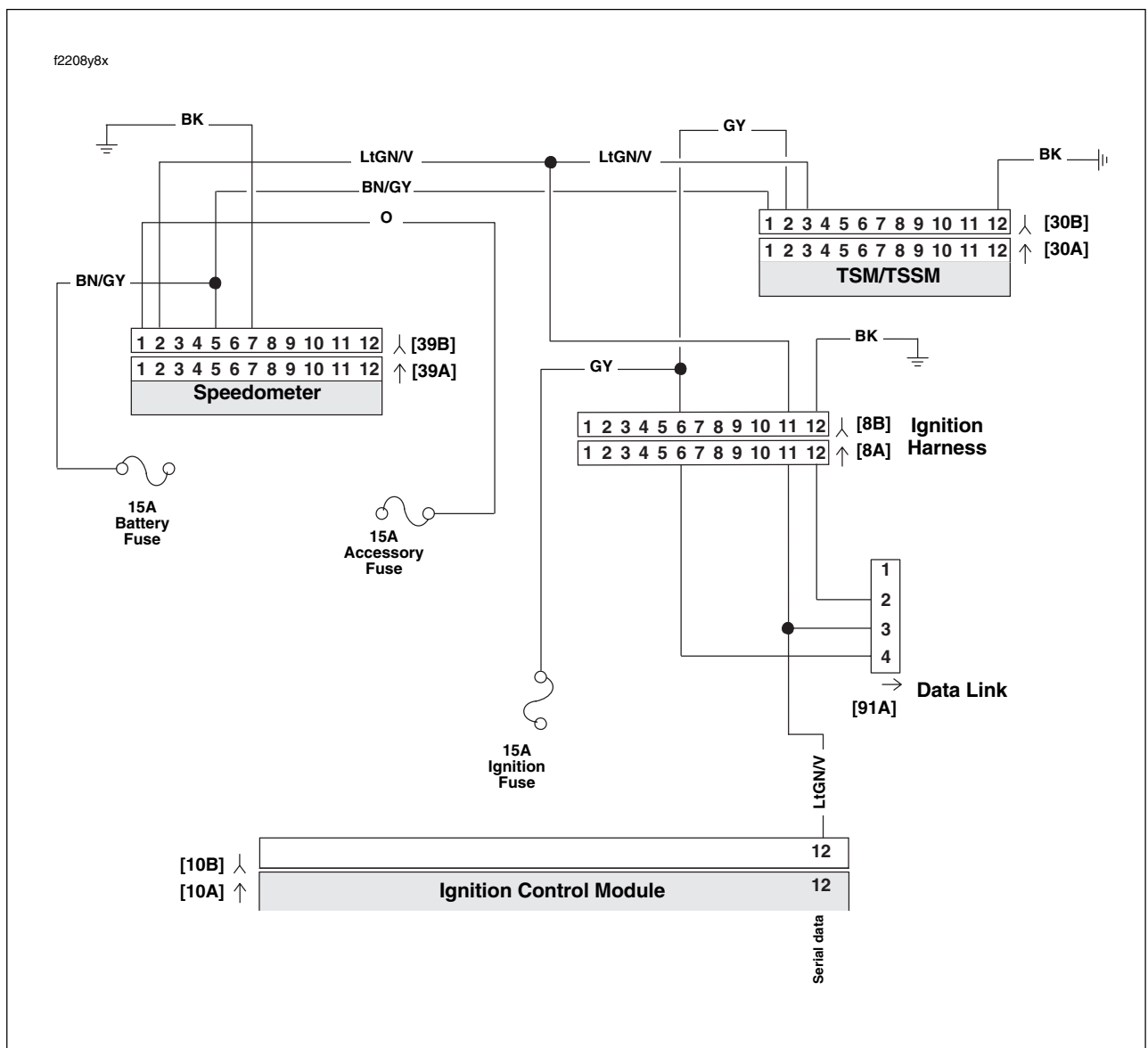


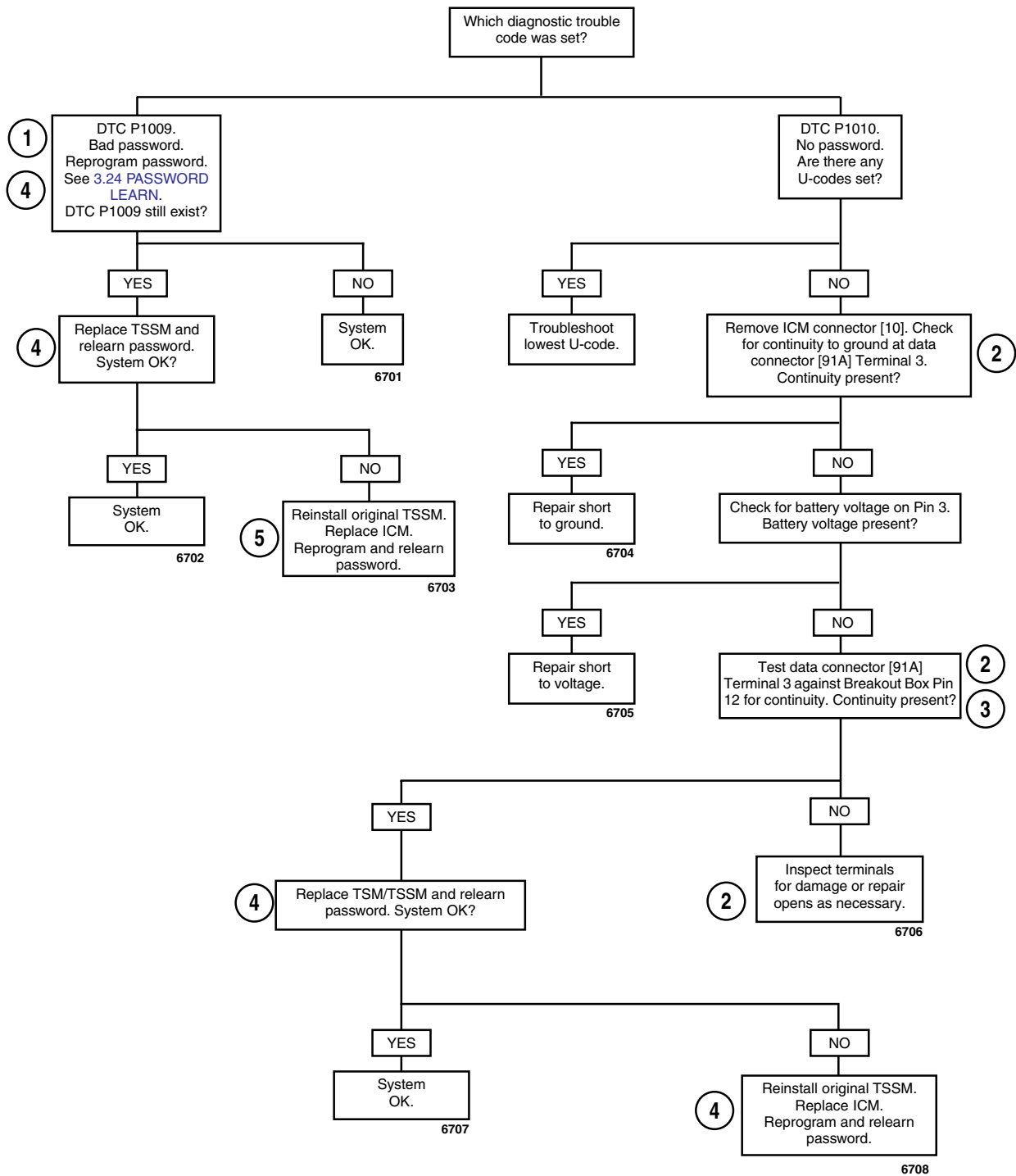
Figure 4-30. Serial Data Circuit (FLHR/S)

Table 4-21. Wire Harness Connectors in Figure 4-30.

NO.	DESCRIPTION	TYPE	LOCATION
[8]	Ignition Harness	12-Place Deutsch	Under Right Side Cover
[10]	Ignition Control Module	12-Place Deutsch	Under Right Side Cover
[30]	Turn Signal/Security Module	12-Place Deutsch	Cavity in Crossmember at Rear of Battery Box (Under Seat)
[39]	Speedometer	12-Place Packard	Under Console (Back of Speedometer)
[91]	Data Link	4-Place Deutsch	Under Right Side Cover

Test 4.15

PASSWORD PROBLEM: DTC P1009, P1010



Clear codes using speedometer self diagnostics.
See 4.5 SPEEDOMETER SELF DIAGNOSTICS.
Confirm proper operation with no check engine lamp.

GENERAL

Ignition Coil

Ignition coil codes will set if the ignition coil primary voltage is out of range. This could occur if there is an open coil or loss of power to the coil. If front and rear codes are set simultaneously, it is likely a coil power failure or a coil failure.

The coil receives power from the engine run/stop switch. The ignition control module is responsible for turning on the coils by providing the ground to activate the coils, which in turn powers the coils.

Table 4-22. Code Description

DTC	DESCRIPTION
P1351	Front ignition coil open/low
P1352	Front ignition coil high/shorted
P1354	Rear ignition coil open/low
P1355	Rear ignition coil high/shorted

DIAGNOSTICS

Diagnostic Notes

The reference numbers below correlate with the circled numbers on the Test 4.16 flow charts.

1. Use HARNESS CONNECTOR TEST KIT (Part No. HD-41404), gray pin probes and patch cord.

CAUTION

Gently connect test lamp to connector [83B]. Forcefully inserting test lamp will result in ignition connector terminal damage.

2. See [Figure 4-31](#). Plug IGNITION COIL CIRCUIT TEST ADAPTER (Part No. HD-44687) and FUEL INJECTOR TEST LAMP (Part No. HD-34730-2C) into Breakout Box. Note that cranking the engine with test lamp in place of the ignition coil can sometimes cause a DTC P1351, P1352, P1354 or P1355. This condition is normal and does not by itself indicate a malfunction. Codes must be cleared if this condition occurs.
3. Connect BREAKOUT BOX (Part No. HD-42682) between wire harness and ICM. See [4.6 BREAKOUT BOX: ICM](#).



Figure 4-31. Ignition Coil Circuit Test

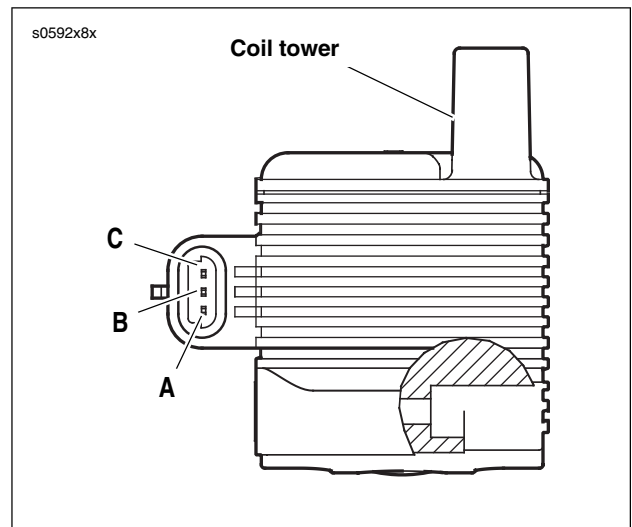


Figure 4-32. Ignition Coil Connector Terminals

4. Use HARNESS CONNECTOR TEST KIT (Part No. HD-41404), gray socket probes and patch cord.

Table 4-23. Coil Terminal Description

TERMINAL	DESCRIPTION	WIRE COLOR
A	Rear coil	Y/BE
B	Power	W/BK
C	Front coil	BE/O

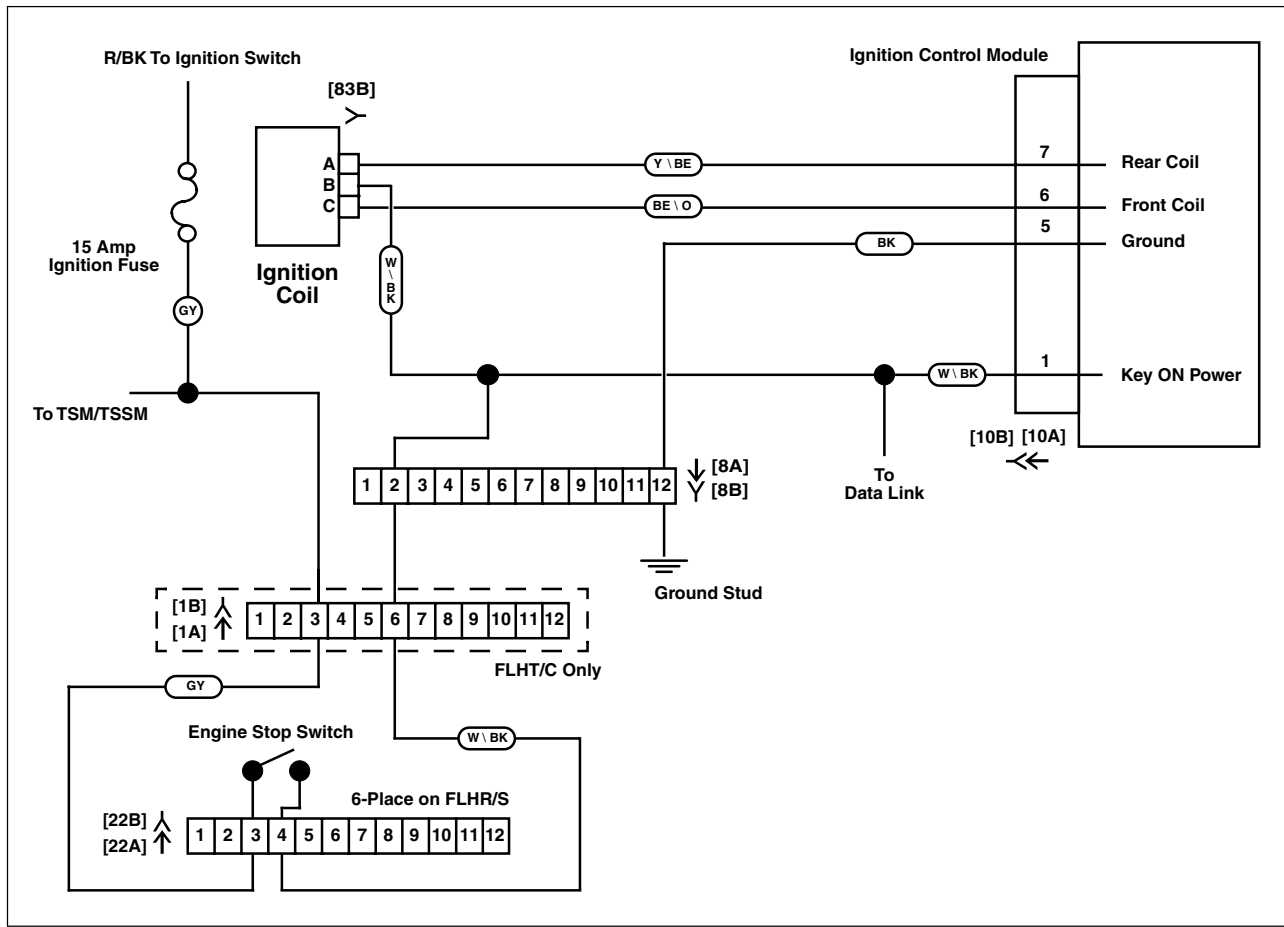


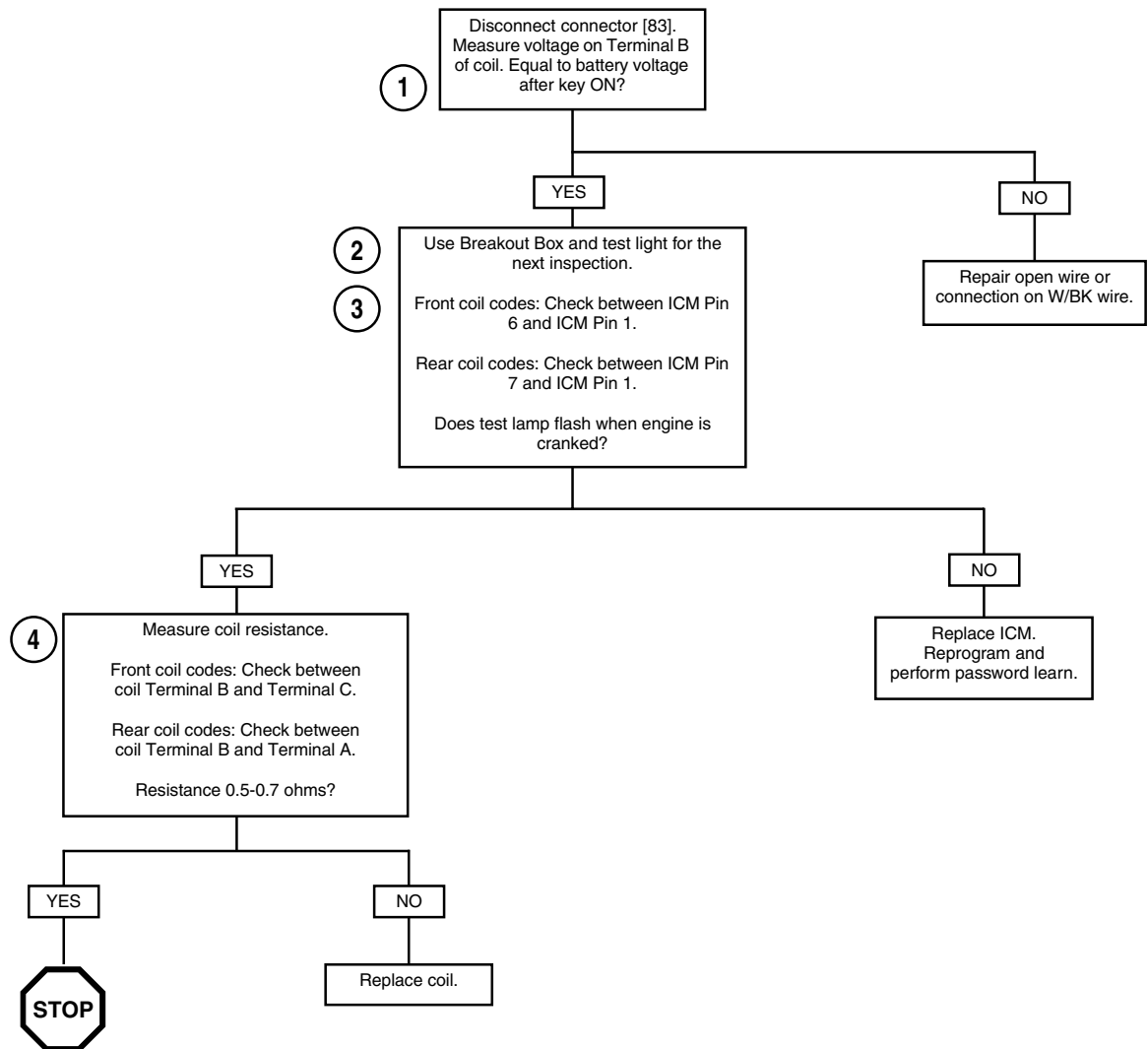
Figure 4-33. Battery Voltage Circuit

Table 4-24. Wire Harness Connectors in Figure 4-33.

NO.	DESCRIPTION	MODEL	TYPE	LOCATION
[1]	Main to Interconnect Harness	FLHT/C	12-Place Deutsch	Inner Fairing- Right Fairing Bracket
[8]	Ignition Harness	All	12-Place Deutsch	Under Right Side Cover
[10]	Ignition Control Module	All	12-Place Deutsch (Black)	Under Right Side Cover
[22]	Interconnect to Right Handlebar Switch Controls	FLHT/C	12-Place Deutsch	Inner Fairing- Right Fairing Support Brace
		FLHR/S	6-Place Deutsch	Inside Headlamp Nacelle
[83]	Ignition Coil	All	3 - Place Packard	Below Fuel Tank (Left Side)

Test 4.16 (Part 1 of 2)

IGNITION COIL: DTC P1351, P1352, P1354, P1355



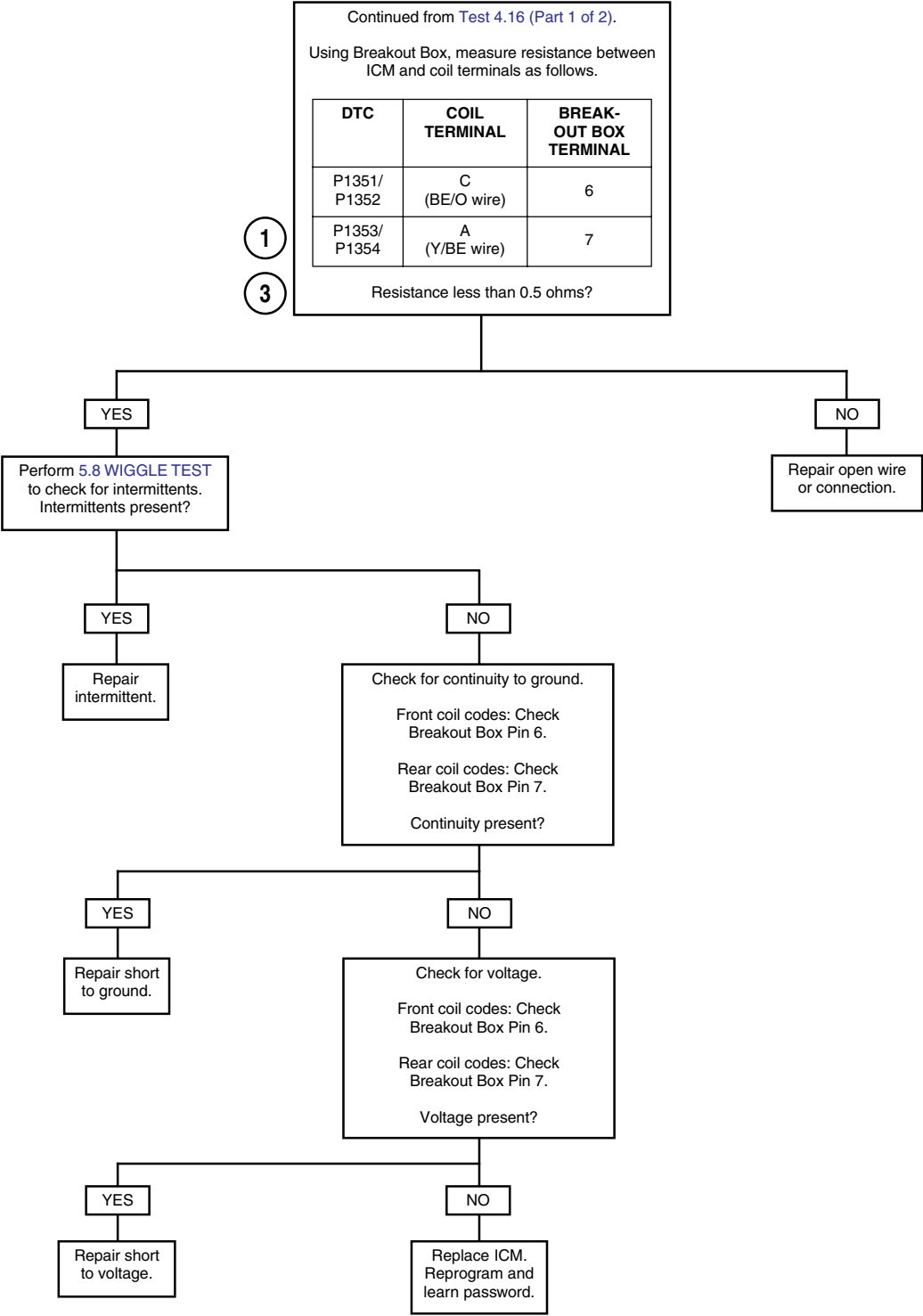
Go to [Test 4.16 \(Part 2 of 2\)](#).



Clear codes using speedometer self diagnostics. See [4.5 SPEEDOMETER SELF DIAGNOSTICS](#). Confirm proper operation with no check engine lamp.

Test 4.16 (Part 2 of 2)

IGNITION COIL: DTC P1351, P1352, P1354, P1355



Clear codes using speedometer self diagnostics. See [4.5 SPEEDOMETER SELF DIAGNOSTICS](#). Confirm proper operation with no check engine lamp.

GENERAL

Crank Position Sensor

See [Figure 4-34](#). A DTC P0373, P0374 will set if the crankshaft position sensor (CKP) signal is weak or absent.

Table 4-25. Code Description

DTC	DESCRIPTION
P0373	Crankshaft position sensor intermittent
P0374	Crankshaft position sensor not detected or cannot synchronize

DIAGNOSTICS

Diagnostic Notes

1. Connect BREAKOUT BOX (Part No. HD-42682) to ignition control module wire harness only, leaving ignition control module disconnected. See [4.6 BREAKOUT BOX: ICM](#).
2. One megohm is very high resistance. Some meters will read infinity, OL, etc.
3. Use HARNESS CONNECTOR TEST KIT (Part No. D-41404), brown socket probes and patch cords.
4. For testing purposes, install sensor without running wiring along normal path. Disconnect and route wiring properly if system is now OK.

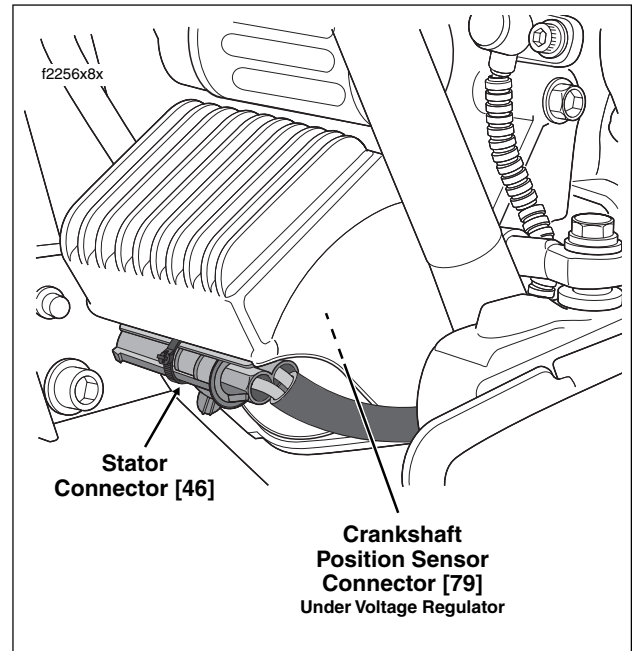


Figure 4-34. Voltage Regulator (Left Side View)

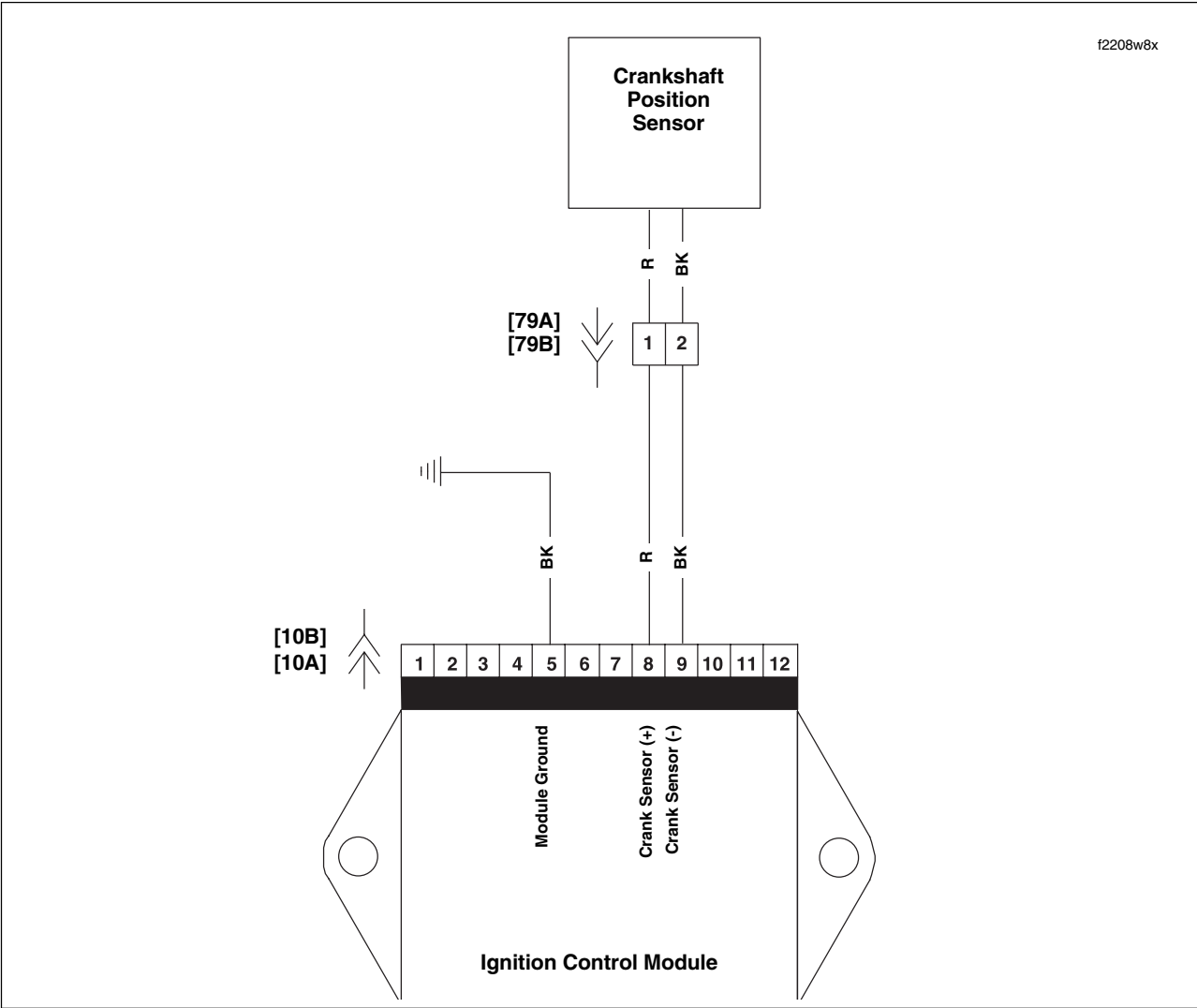


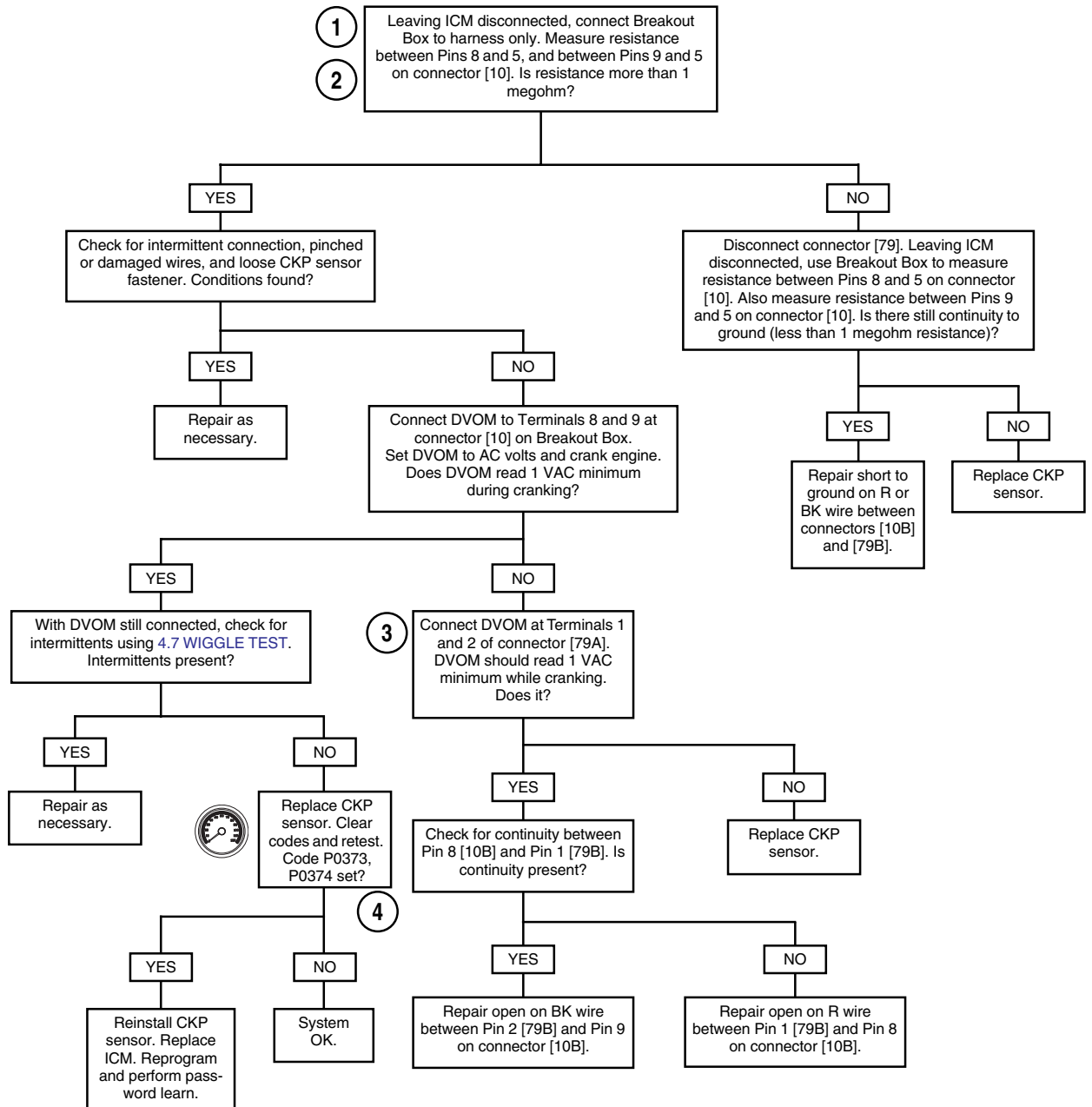
Figure 4-35. Ignition Circuit

Table 4-26. Wire Harness Connectors in [Figure 4-35](#).

NO.	DESCRIPTION	TYPE	LOCATION
[10]	Ignition Control Module	12-Place Deutsch	Under Right Side Cover
[79]	Crankshaft Position Sensor	2 - Place Mini-Deutsch	Bottom of Voltage Regulator

Test 4.17

CRANK POSITION SENSOR: DTC P0373, P0374



Clear codes using speedometer self diagnostics. See **4.5 SPEEDOMETER SELF DIAGNOSTICS**. Confirm proper operation with no check engine lamp.

GENERAL

Vehicle Speed Sensor

See [Figure 4-36](#). The vehicle speed sensor is powered and monitored by the ICM. The ICM processes the vehicle speed signal and transmits this signal to the TSM/TSSM and speedometer through serial data.

NOTE

When the vehicle speed signal is greater than 0, the closed loop idle speed control is inhibited.

Table 4-27. Code Description

DTC	DESCRIPTION
P0501	VSS sensor low
P0502	VSS sensor high/open

DIAGNOSTICS

Diagnostic Notes

The reference numbers below correlate with the circled numbers on the Test 4.18 flow charts.

1. The speedometer has a built-in diagnostic mode. See [4.5 SPEEDOMETER SELF DIAGNOSTICS](#).
2. Use HARNESS CONNECTOR TEST KIT (Part No. HD-41404), black pin probe and patch cord.
3. Connect BREAKOUT BOX (Part No. HD-42682) between wire harness and ICM. See [4.6 BREAKOUT BOX: ICM](#).
4. Jack up motorcycle and rotate rear wheel with transmission in neutral.



Figure 4-36. Vehicle Speed Sensor Location

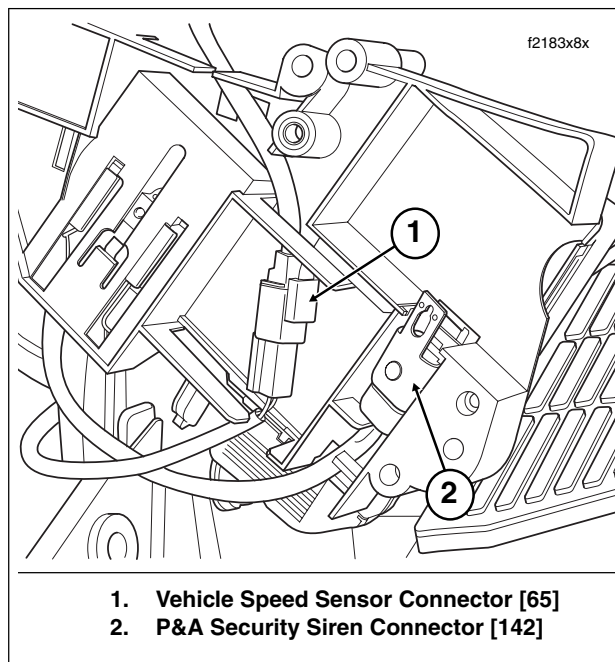


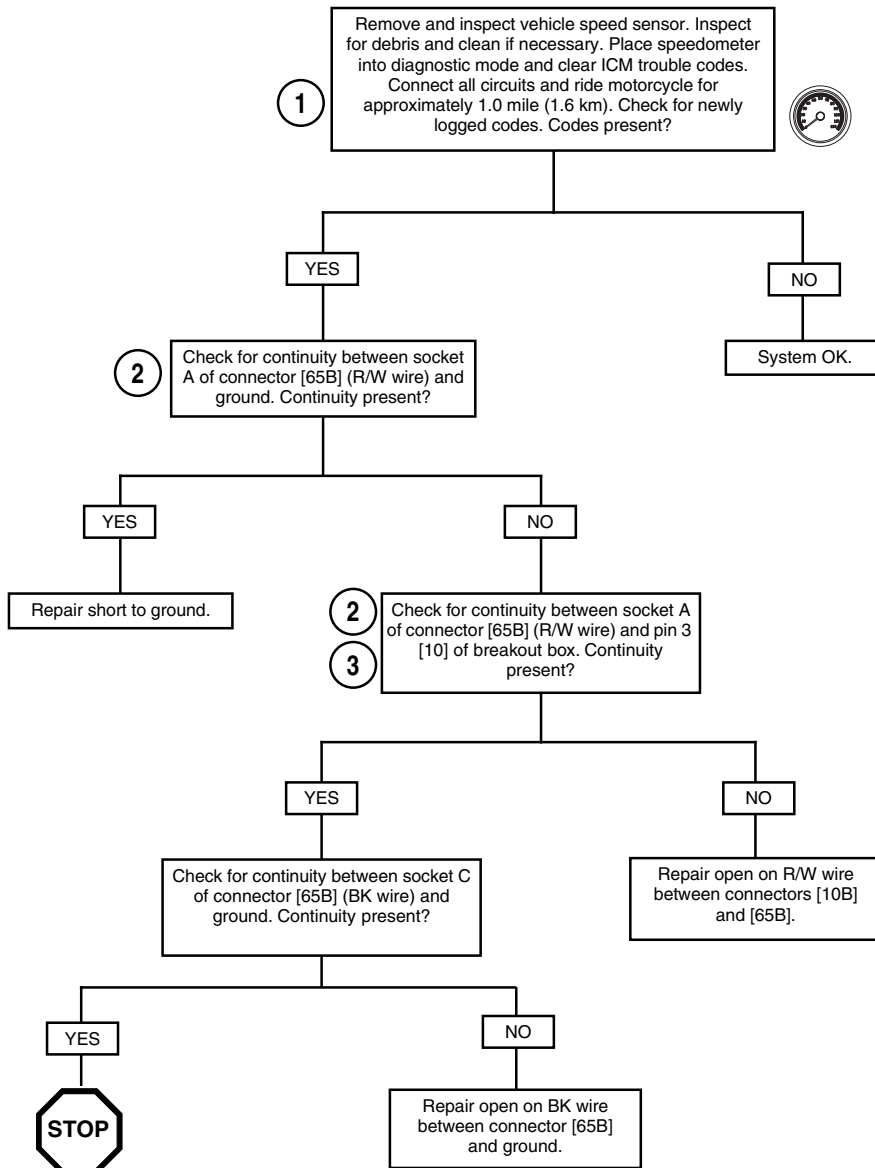
Figure 4-37. Electrical Bracket (Inboard Side)



NO.	DESCRIPTION	TYPE	LOCATION
[10]	Ignition Control Module	12-Place Deutsch	Under Right Side Cover
[65]	Vehicle Speed Sensor	3 - Place Deutsch	Under Right Side Cover (Behind Electrical Bracket)

Test 4.18 (Part 1 of 2)

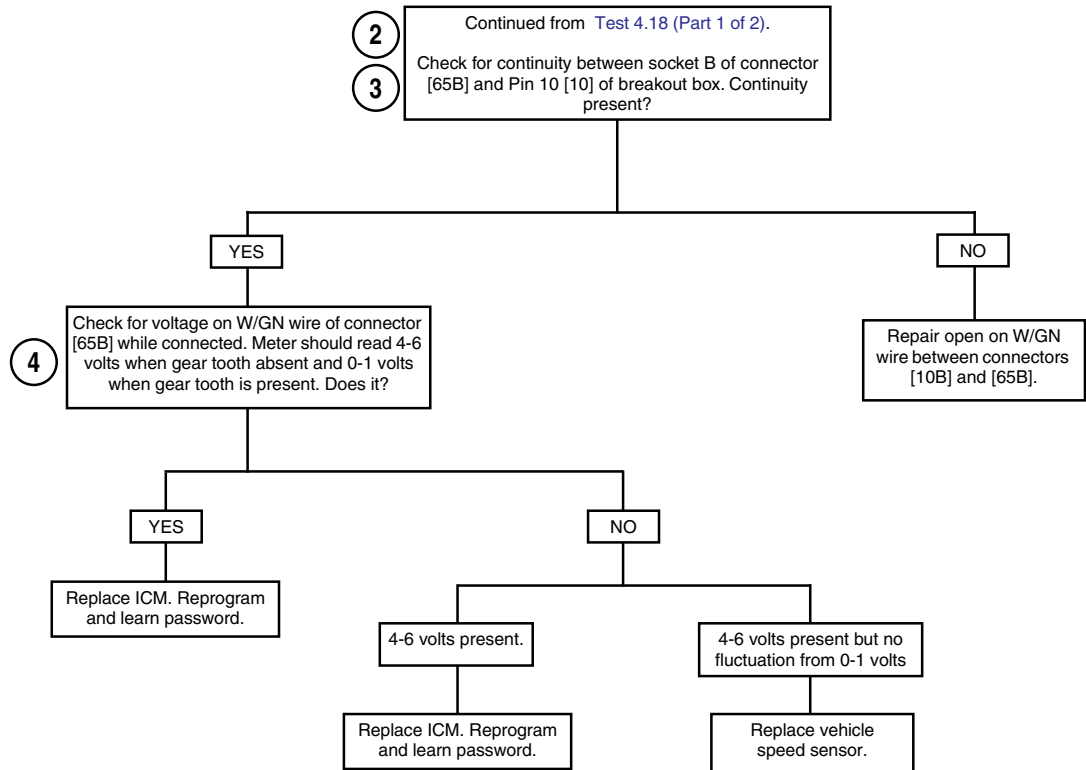
VEHICLE SPEED SENSOR: DTC P0501, P0502



Go to. [Test 4.18 \(Part 2 of 2\)](#)



Clear codes using speedometer self diagnostics. See [4.5 SPEEDOMETER SELF DIAGNOSTICS](#). Confirm proper operation with no check engine lamp.

Test 4.18 (Part 2 of 2)**VEHICLE SPEED SENSOR: DTC P0501, P0502**

GENERAL

ICM Failure

All of the following codes indicate an internal failure which requires replacement of the ignition control module. See the Touring Service Manual for replacement procedures.

- DTC P0602 - Calibration memory error
- DTC P0603 - EE PROM failure
- DTC P0604 - RAM failure
- DTC P0605 - Program memory error
- DTC P0607 - A to D converter error

DIAGNOSTICS

DTC P0607 Test

1. Power down the vehicle.
2. Clear codes using speedometer self-diagnostics.
3. Replace ICM if codes reappear.

DTC P0602, P0603, P0604, P0605 Test

1. Power down the vehicle.
2. Clear codes.
3. Using Digital Technician, reprogram ICM using the correct calibration. See your dealer.
4. Restart vehicle. If code reappears, replace ICM. Reprogram and perform password learn.

GENERAL

Loss of TSM/TSSM Serial Data

The serial data connector provides a means for the ICM and TSM/TSSM to communicate their current status. When all operating parameters on the serial data link are within specifications, a state of health message is sent between the components. A DTC U1064 indicates that the TSM/TSSM is not receiving this state of health message.

Table 4-29. Code Description

DTC	DESCRIPTION
U1064	Loss of TSM/TSSM serial data



Figure 4-39. TSM/TSSM

DIAGNOSTICS

Diagnostic Notes

The reference numbers below correlate with the circled numbers on the Test 4.20 flow chart.

1. Connect BREAKOUT BOX (Part No. HD-42682) as follows:
 - a. Mate black socket housing on Breakout Box with speedometer connector [39] using SPEEDOMETER HARNESS ADAPTER (Part No. HD-46601).
 - b. Mate black pin housing on Breakout Box with speedometer harness connector [39B] using SPEEDOMETER HARNESS ADAPTER (Part No. HD-46601).
 - c. Mate gray socket housing on Breakout Box with TSM/TSSM connector [30A].
 - d. Mate gray pin housing on Breakout Box with harness connector [30B].

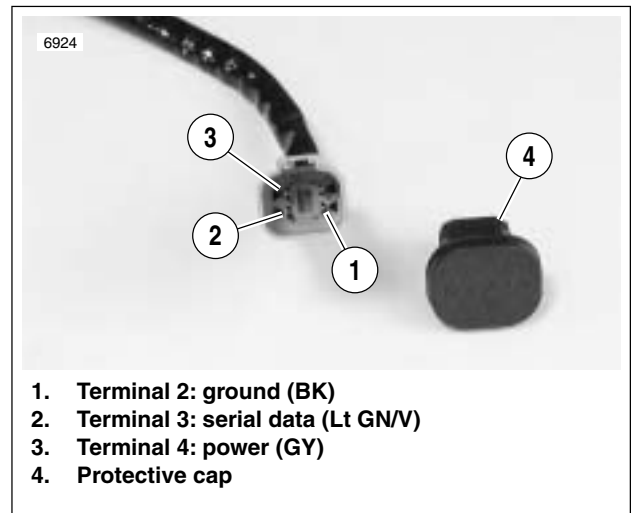


Figure 4-40. Data Link Connector

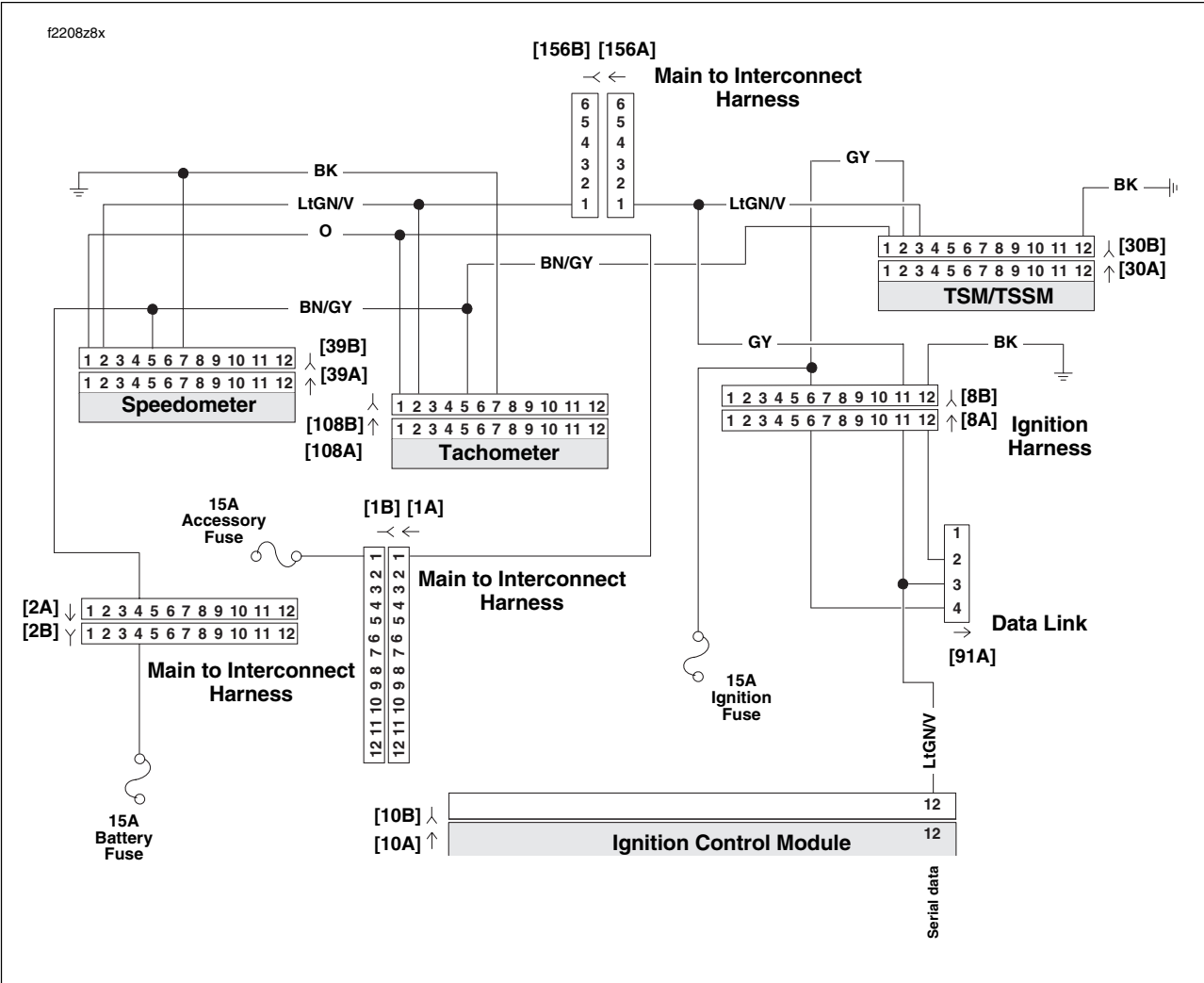


Figure 4-41. Serial Data Circuit (FLHT/C)

Table 4-30. Wire Harness Connectors in Figure 4-41.

NO.	DESCRIPTION	TYPE	LOCATION
[1]	Main to Interconnect Harness	12-Place Deutsch (Black)	Inner Fairing - Right Radio Support Bracket
[2]	Main to Interconnect Harness	12-Place Deutsch (Gray)	Inner Fairing - Right Fairing Support Brace
[8]	Ignition Harness	12-Place Deutsch	Under Right Side Cover
[10]	Ignition Control Module	12-Place Deutsch	Under Right Side Cover
[30]	Turn Signal/Security Module	12-Place Deutsch	Cavity in Crossmember at Rear of Battery Box (Under Seat)
[39]	Speedometer	12-Place Packard	Inner Fairing (Back of Speedometer)
[91]	Data Link	4-Place Deutsch	Under Right Side Cover
[108]	Tachometer	12-Place Packard	Inner Fairing (Back of Tachometer)
[156]	Main to Interconnect Harness	6-Place Deutsch	Inner Fairing - Right Fairing Support Brace

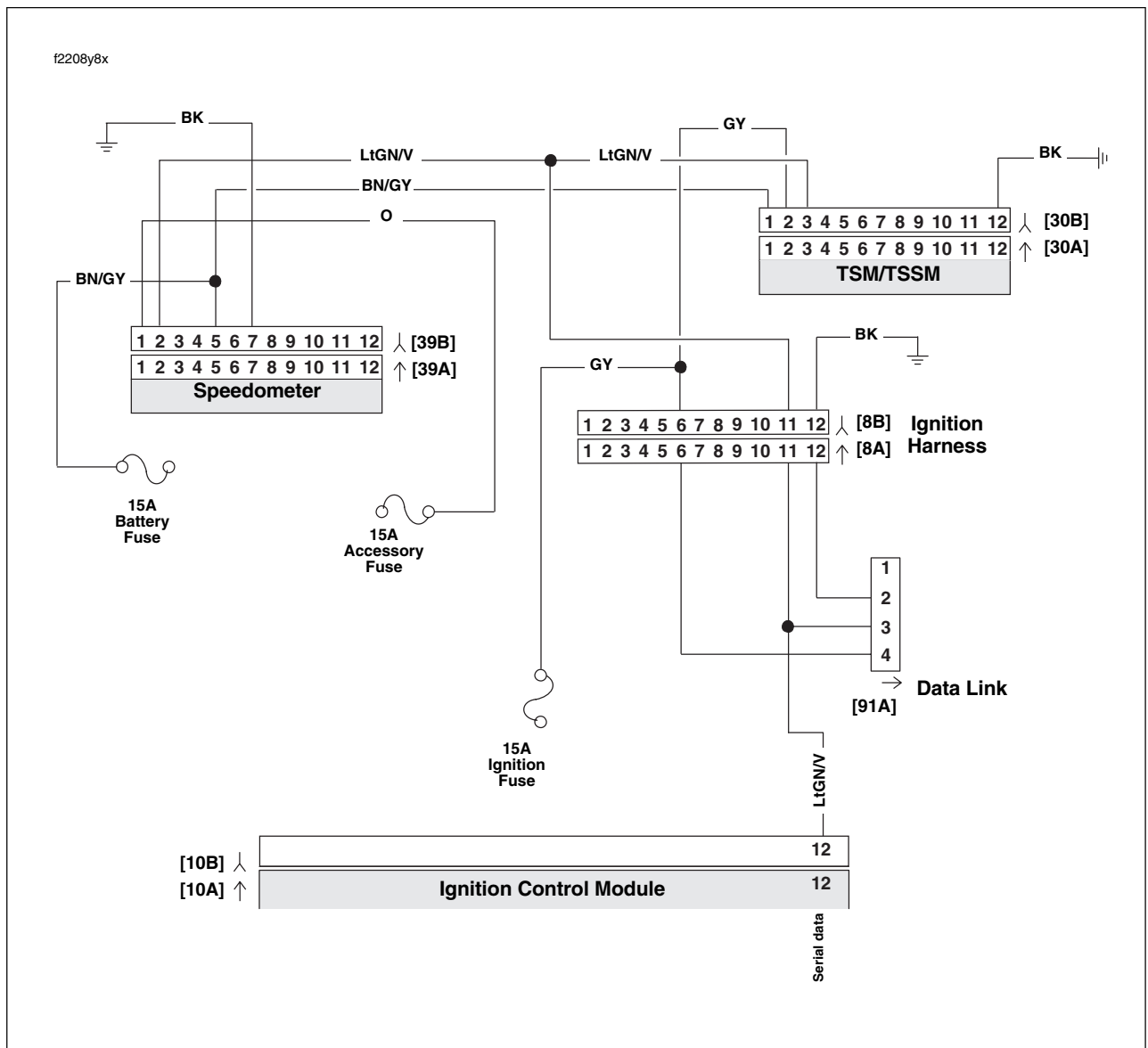


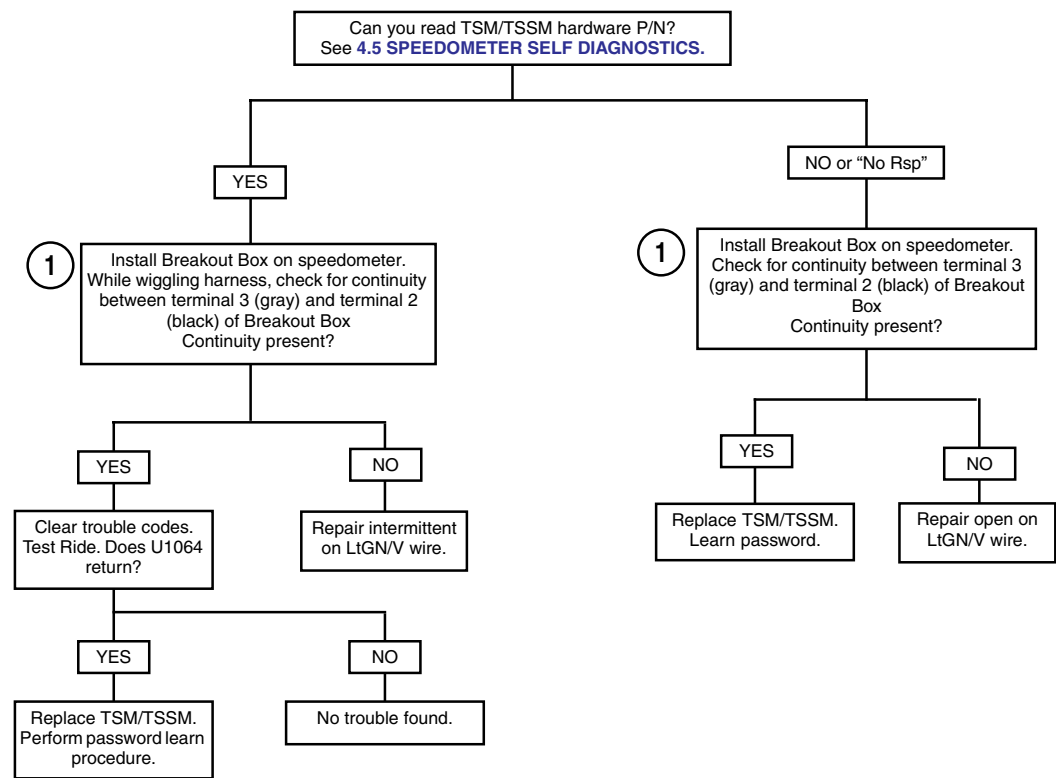
Figure 4-42. Serial Data Circuit (FLHR/S)

Table 4-31. Wire Harness Connectors in Figure 4-42.

NO.	DESCRIPTION	TYPE	LOCATION
[8]	Ignition Harness	12-Place Deutsch	Under Right Side Cover
[10]	Ignition Control Module	12-Place Deutsch	Under Right Side Cover
[30]	Turn Signal/Security Module	12-Place Deutsch	Cavity in Crossmember at Rear of Battery Box (Under Seat)
[39]	Speedometer	12-Place Packard	Under Console (Back of Speedometer)
[91]	Data Link	4-Place Deutsch	Under Right Side Cover

Test 4.20

LOSS OF TSM/TSSM SERIAL DATA: DTC U1064



Clear codes using speedometer self diagnostics.
See 4.5 SPEEDOMETER SELF DIAGNOSTICS.
Confirm proper operation with no check engine
lamp.

GENERAL

Loss of Speedometer Serial Data

The serial data connector provides a means for the speedometer, ICM and TSM/TSSM to communicate their current status. When all operating parameters on the serial data link are within specifications, a state of health message is sent between the components. A DTC U1097 indicates that the speedometer is not capable of sending this state of health message.

Table 4-32. Code Description

DTC	DESCRIPTION
U1097	Loss of all speedometer serial data (state of health)

DIAGNOSTICS

Diagnostic Notes

The reference numbers below correlate with the circled numbers on the 4.21 flow chart.

1. Connect BREAKOUT BOX (Part No. HD-42682) between wire harness and speedometer using SPEEDOMETER HARNESS ADAPTER (Part No. HD-46601). See [2.5 BREAKOUT BOX: SPEEDOMETER](#).
2. Connect BREAKOUT BOX (Part No. HD-42682) (black) as follows:
 - a. Mate black socket housing on Breakout Box with speedometer connector [39A] (at the back of the speedometer) using INSTRUMENT HARNESS ADAPTERS (Part No. HD-46601).
 - b. Mate black pin housing on Breakout Box with wire harness connector [39B] using INSTRUMENT HARNESS ADAPTERS (Part No. HD-46601).

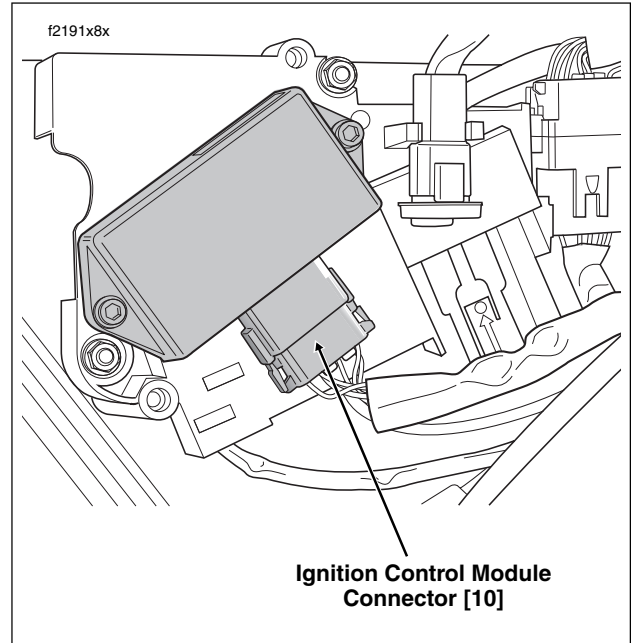


Figure 4-43. Electrical Bracket (Under Right Side Cover)

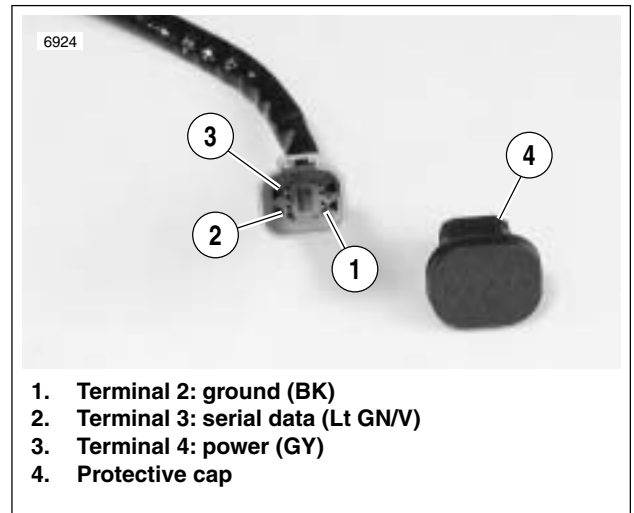


Figure 4-44. Data Link Connector

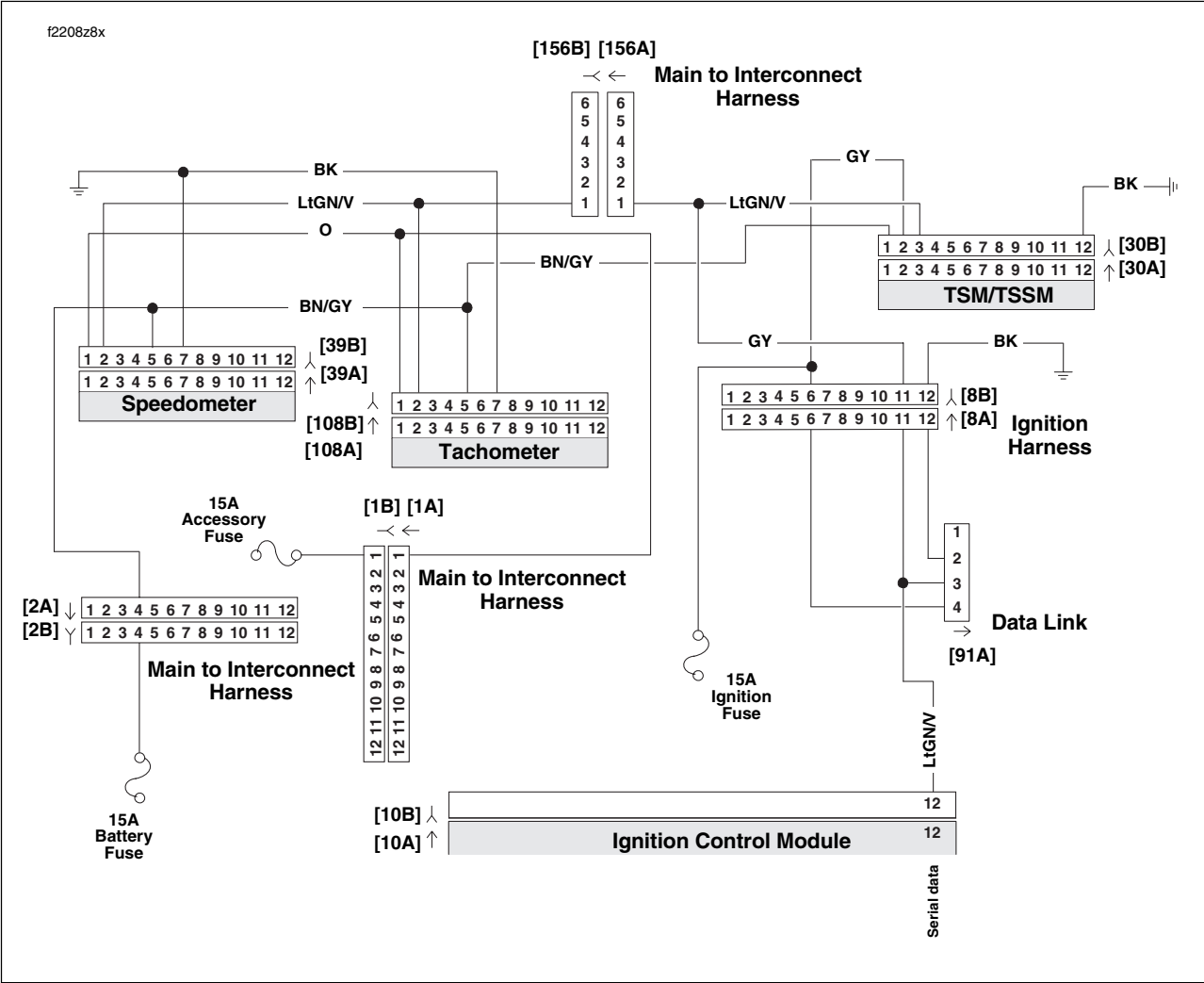


Figure 4-45. Serial Data Circuit (FLHT/C)

Table 4-33. Wire Harness Connectors in Figure 4-45.

NO.	DESCRIPTION	TYPE	LOCATION
[1]	Main to Interconnect Harness	12-Place Deutsch (Black)	Inner Fairing - Right Radio Support Bracket
[2]	Main to Interconnect Harness	12-Place Deutsch (Gray)	Inner Fairing - Right Fairing Support Brace
[8]	Ignition Harness	12-Place Deutsch	Under Right Side Cover
[10]	Ignition Control Module	12-Place Deutsch	Under Right Side Cover
[30]	Turn Signal/Security Module	12-Place Deutsch	Cavity in Crossmember at Rear of Battery Box (Under Seat)
[39]	Speedometer	12-Place Packard	Inner Fairing (Back of Speedometer)
[91]	Data Link	4-Place Deutsch	Under Right Side Cover
[108]	Tachometer	12-Place Packard	Inner Fairing (Back of Tachometer)
[156]	Main to Interconnect Harness	6-Place Deutsch	Inner Fairing - Right Fairing Support Brace

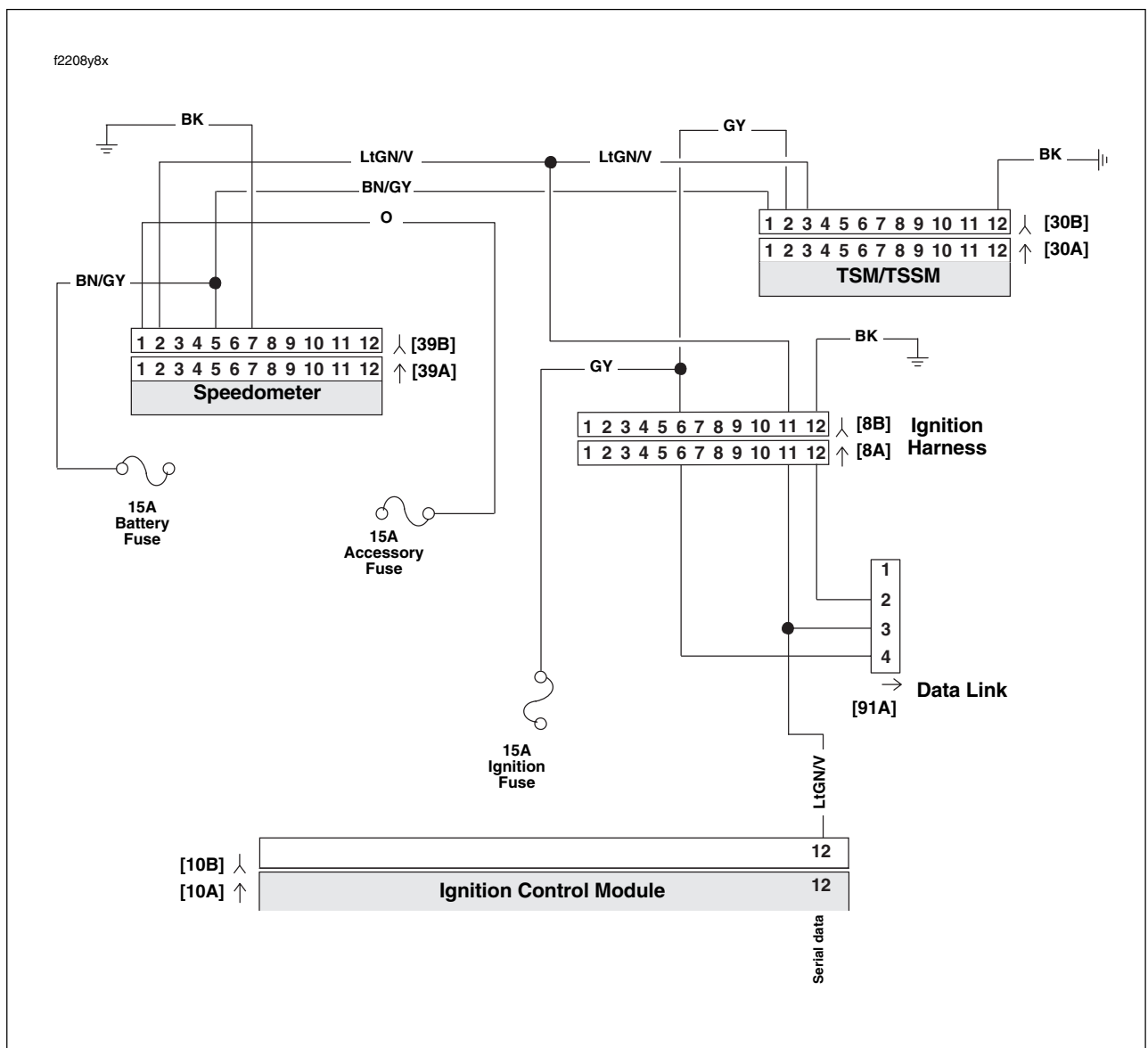


Figure 4-46. Serial Data Circuit (FLHR/S)

Table 4-34. Wire Harness Connectors in Figure 4-46.

NO.	DESCRIPTION	TYPE	LOCATION
[8]	Ignition Harness	12-Place Deutsch	Under Right Side Cover
[10]	Ignition Control Module	12-Place Deutsch	Under Right Side Cover
[30]	Turn Signal/Security Module	12-Place Deutsch	Cavity in Crossmember at Rear of Battery Box (Under Seat)
[39]	Speedometer	12-Place Packard	Under Console (Back of Speedometer)
[91]	Data Link	4-Place Deutsch	Under Right Side Cover

Test 4.21

LOSS OF SPEEDOMETER SERIAL DATA:
DTC U1097