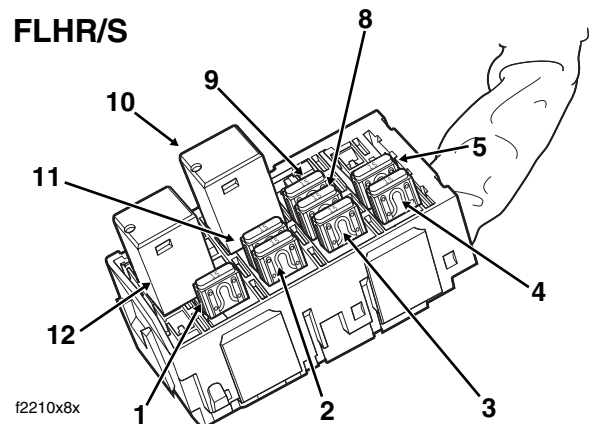


IGNITION	DATA
Spark timing advance	0°-50° BTDC (range)
Idle speed	1000 ± 50 RPM
Spark plug size	12 mm
Spark plug gap	0.038-0.043 in
	0.97-1.09 mm
Spark plug type	Harley-Davidson No. 6R12 (no substitute)
Ignition coil primary resistance	0.5-0.7 ohms
Ignition coil secondary resistance	5500-7500 ohms

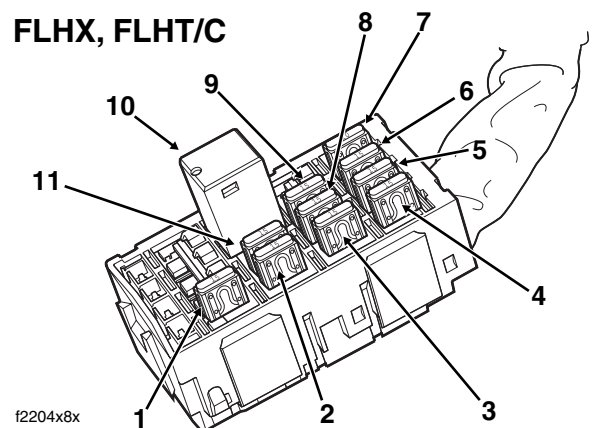
CIRCUIT	RATING (AMPERES)	COLOR
System Fuses		
Maxi-Fuse	40	Orange
Headlamp	15	Blue
Ignition	15	Blue
Lighting	15	Blue
Instruments	15	Blue
Brakes/Cruise	15	Blue
Radio Memory	15	Blue
Radio Power	10	Red
Accessory	15	Blue
Battery	15	Blue
P & A	15	Blue

System Fuse Block (Under Left Side Cover)

FLHR/S



FLHX, FLHT/C



- | | |
|------------------|-----------------------|
| 1. Headlamp | 7. Radio Power |
| 2. Ignition | 8. Accessory |
| 3. Lighting | 9. Battery |
| 4. Instruments | 10. Brake Light Relay |
| 5. Brakes/Cruise | 11. P&A |
| 6. Radio Memory | 12. Starter Relay |

Figure 4-1. Fuse Locations

SYSTEM PROBLEMS

All system problems fall into at least one of three general categories.

No Start

The engine cranks over freely, but will not start. This does not include situations where the engine will not crank, such as a bad starter, dead battery, etc. This condition assumes that all obvious checks (fuel in tank, etc.) have been made.

Poor Performance

The engine starts but there are performance problems. These problems may include poor fuel economy, rough idle, engine misfire, engine hesitation, severe spark knock, etc.

Check Engine Lamp

See [Figure 4-2](#). The check engine lamp indicates the ICM has determined a fault condition exists. There may also be starting or performance problems.

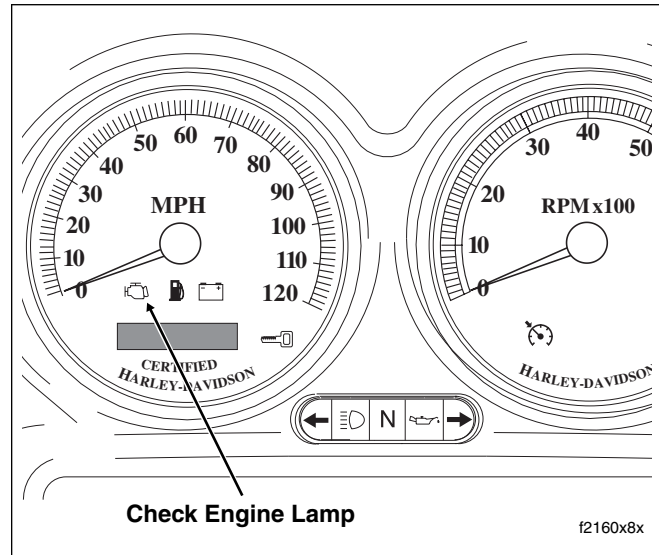


Figure 4-2. Speedometer

RESOLVING PROBLEMS

To resolve system problems, five basic steps are involved. In order of occurrence, they are:

1. Check for DTC's by observing check engine lamp. See [Section 4.3 CHECKING FOR TROUBLE CODES](#).
2. Retrieve DTC's using speedometer self diagnostics. See [Section 4.5 SPEEDOMETER SELF DIAGNOSTICS](#).
3. Diagnose system problems. This involves using special tools and the diagnostic flow charts in this section.
4. Correct problems through the replacement and/or repair of the affected components.
5. After repairs are performed, the work must be validated. This involves clearing the DTC's and confirming proper vehicle operation as indicated by the behavior of the check engine lamp.

CHECK ENGINE LAMP

To diagnose system problems, start by observing the behavior of the check engine lamp.

NOTE

- See [Figure 4-3](#). “Key ON” means that the ignition key is turned to ON and the engine stop switch is set to RUN (although the engine is **not** running).
 - When the ignition switch is turned ON, the check engine lamp will illuminate for approximately four seconds and then turn off.
 - If the check engine lamp is not illuminated at key ON or if it fails to turn OFF after the initial four second period, then see [Section 4.5 SPEEDOMETER SELF DIAGNOSTICS](#).
 - If the check engine lamp comes on late (after 20 seconds), the problem is likely a serial data bus failure. Test for codes using speedometer self diagnostics. See [Section 4.5 SPEEDOMETER SELF DIAGNOSTICS](#).
 - If the check engine lamp fails to turn OFF after the initial four second period, then a problem exists in the instrumentation. See [Section 4.5 SPEEDOMETER SELF DIAGNOSTICS](#).
1. When the lamp turns off after being illuminated for the first four second period, it will:
 - a. Remain off if there are no fault conditions or trouble codes currently detected by the ICM. See A of [Figure 4-4](#).
 - b. Come back on for an 8 second period if only historic codes exist. See B of [Figure 4-4](#).

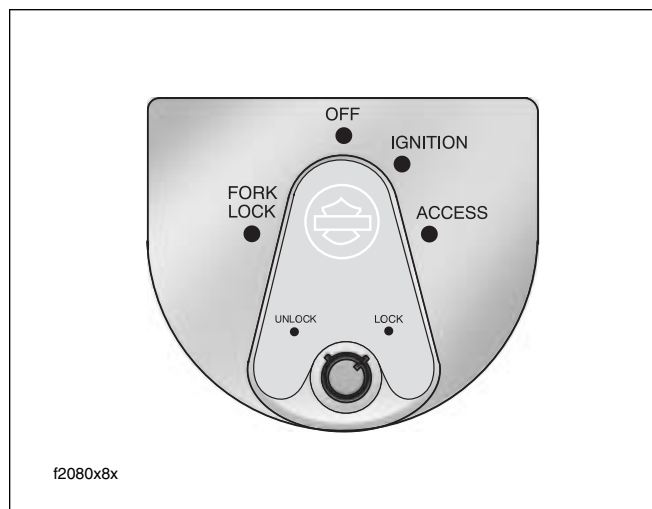


Figure 4-3. Ignition Switch (FLHX, FLHT/C)

- c. Come back on, and remain on, if a current trouble code exists. See C of [Figure 4-4](#).
2. See [CODE TYPES](#) which follows for a complete description of trouble code formats.

NOTE

Trouble codes relating to the ignition coil can only be fully diagnosed during actuation. For example, a problem with the ignition coil will be considered a current fault even after the problem is corrected, since the ICM will not know of its resolution until after the coil is exercised by vehicle start sequence. In this manner, there may sometimes be a false indication of the current trouble code.

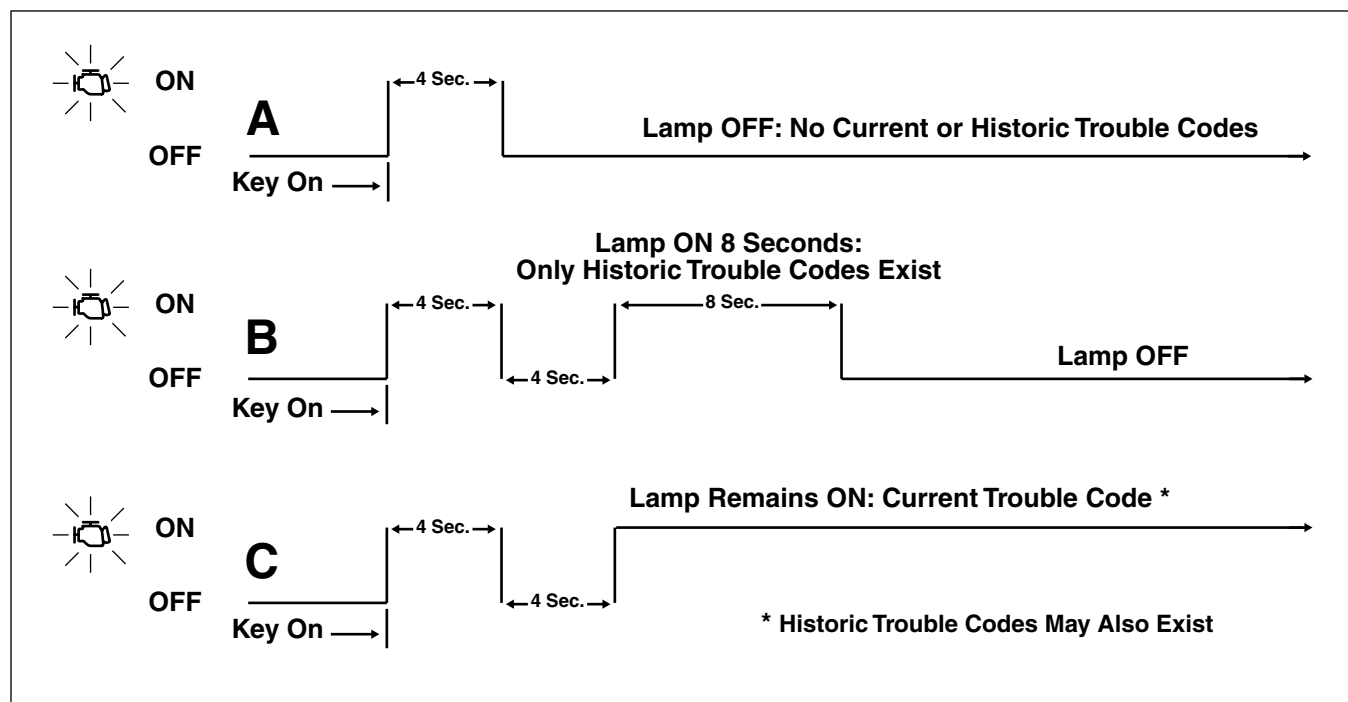


Figure 4-4. Check Engine Lamp Operation

CODE TYPES

There are two types of DTC's: current and historic. If a trouble code is stored, it can be read using the speedometer self diagnostics. See Section [4.5 SPEEDOMETER SELF DIAGNOSTICS](#).

All trouble codes reside in the memory of the ICM until cleared using the speedometer self diagnostics. See Section [4.5 SPEEDOMETER SELF DIAGNOSTICS](#).

A trouble code is also cleared after a total of 50 trips has elapsed. A trip consists of a start and run cycle, the run cycle lasting at least 30 seconds. After the 50 trip retention period, the trouble code is automatically erased from memory providing that no subsequent faults of the same type are detected in that period.

Current

Current trouble codes are those which presently disrupt motorcycle operation. See the appropriate flow charts for solutions.

Historic

If a particular problem happens to resolve itself, the active status is dropped and it becomes a historic fault rather than a current fault.

Historic trouble codes can only be retrieved using a computer based diagnostic package called DIGITAL TECHNICIAN (Part No. HD-44750).

Historic trouble codes are stored for a length of time to assist in the diagnosis of intermittent faults.

It is important to note that historic trouble codes may also be present whenever the system indicates the existence of a current fault. See [MULTIPLE DIAGNOSTIC TROUBLE CODES](#) if multiple trouble codes are found.

Diagnostic charts are designed for use with current trouble codes and as a result they frequently suggest wire repair or part replacement.

RETRIEVING DIAGNOSTIC TROUBLE CODES

The engine management system provides two levels of diagnostics.

- The most sophisticated mode employs a computer based diagnostic package called DIGITAL TECHNICIAN (Part No. HD-44750).
- The second mode requires using the speedometer self diagnostics. Speedometer, tachometer (if equipped), TSM/TSSM and ECM codes can be accessed and cleared. See Section [4.5 SPEEDOMETER SELF DIAGNOSTICS](#).

MULTIPLE DIAGNOSTIC TROUBLE CODES

While it is possible for more than one fault to occur and set more than one trouble code, there are several conditions which may result in **one** fault setting **multiple** trouble codes:

- Serial data codes (DTC U1016, U1064, U1097, U1255, U1300 and U1301) may be accompanied by other codes. **Always** correct the serial data codes before resolving the other codes.

For proper resolution to multiple trouble codes refer to diagnostic code priority chart ([Table 4-5.](#))

GENERAL

To locate faulty circuits or other system problems, follow the diagnostic flow charts in this section. For a systematic approach, always begin with **INITIAL DIAGNOSTICS** which follows. Read the general information and then work your way through the flow chart box by box.

Diagnostic Notes

If a numbered circle appears adjacent to a flow chart box, then more information is offered in the diagnostic notes. Many diagnostic notes contain supplemental information, descriptions of various diagnostic tools or references to other parts of the manual.

Circuit Diagram/Wire Harness Connector Table

When working through a flow chart, refer to the illustrations, the associated circuit diagram and the wire harness connector table as necessary. The wire harness connector table for each circuit diagram identifies the connector number, description, type and general location.

In order to perform most diagnostic routines, a Breakout Box and a DVOM are required. See Section **4.6 BREAKOUT BOX: ICM**.

To perform the circuit checks with any degree of efficiency, a familiarity with the various wire connectors is necessary.

Reprogramming ICM

Diagnostic charts frequently suggest ICM replacement. In the event an ICM needs to be replaced, it must be reprogrammed using a computer based diagnostic package called DIGITAL TECHNICIAN (Part No. HD-44750). See your dealer. Password learn procedure must also be performed. See Section **3.24 PASSWORD LEARN**.

INITIAL DIAGNOSTICS

General Information

The diagnostic check is an organized approach to identifying a problem caused by an electronic control system malfunction. If no problems are found after completion of the diagnostic check, a comparison of running parameters may be used to help locate intermittents and out-of-specification sensors. See **Table 4-1**.

Diagnostic Tips

- If Speedometer reads "BUS Er" with the ignition key turned ON (engine stop switch at RUN with the engine off), check data bus for an open or short to ground between data connector [91A] terminal 3 and ICM connector [10B] terminal 12, TSSM connector [30B] terminal 3, Speedometer connector [39B] terminal 2 or tachometer (if equipped) connector [108B] terminal 2.
- Check for an open diagnostic test terminal between data link connector [91A] terminal 3 and TSM/TSSM connector [30B] terminal 3. With ignition key turned ON, serial data bus voltage should be typically 0.6-0.8 volts. The range of acceptable voltage is 0-7.0 volts.

Diagnostic Notes

The reference numbers below correlate with the circled numbers on the diagnostic check flow charts. See **page 4-10**.

1. Compare engine behavior to symptoms tables in this section.
 - a. Starts hard. See **Table 4-2**.
 - b. Hesitates, stumbles, surges, misfires and/or sluggish performance. See **Table 4-3**.
 - c. Engine exhaust emits black smoke or fouls plugs. See **Table 4-4**.
2. Use HARNESS CONNECTOR TEST KIT (Part No. HD-41404A), black socket probes and patch cord.
3. Connect BREAKOUT BOX (Part No. HD-42682) to ICM. See Section **4.6 BREAKOUT BOX: ICM**.

All diagnostic codes are listed in **Table 4-5**.

See Section **3.9 INITIAL DIAGNOSTIC CHECK: TSM/TSSM** for any codes related to the turn signal module (TSM) or turn signal security module (TSSM).

See Section **2.5 BREAKOUT BOX: SPEEDOMETER** for any codes related to the speedometer.

Table 4-1. Typical Running Values

ITEM	MIN. VALUE	MAX. VALUE	HOT IDLE
MAP sensor	0.1 V (high vacuum)	4.96 V (atmospheric pressure)	1.5-3.0 V
RPM	0	5600	1000
Bank angle sensor	Run mode 0.45-1.1 V	Disable 1.8-3.2 V	Run mode 0.45-1.1 V

Table 4-2. Engine Starts Hard

SYMPTOM	SOLUTION
Battery discharged	See charging system troubleshooting in this section.
Spark plugs	4.12 MISFIRE.
Spark plug wires	4.12 MISFIRE
Ignition coil	4.12 MISFIRE.
Valve sticking	See Section 3 in Touring Service Manual.
Water or dirt in fuel system	Drain and refill with fresh fuel.

Table 4-3. Engine Performance Problems

SYMPTOM	SOLUTION
Manifold leak	Perform intake leak test. See 4.8 INTAKE LEAK TEST.
MAP sensor plugged or not operating properly	4.13 DTC P0106, P0107, P0108
Water or dirt in fuel system	Drain and refill with fresh fuel.
Spark plugs	4.12 MISFIRE.
EVAP hose disconnected from induction module (CA)	Connect.
Throttle plates not opening fully	See throttle cable adjustment in Touring Service Manual.

Table 4-4. Engine Exhaust Emits Black Smoke or Fouls Plugs

SYMPTOM	SOLUTION
Clogged air filter	See Section 1 in Touring Service Manual.

Table 4-5. Diagnostic Trouble Codes (DTC) and Fault Conditions

PRIORITY RANKING	DTC NO.	FAULT CONDITION	SOLUTION
1	P0605	Flash memory error	4.19 DTC P0602, P0603, P0604, P0605, P0607
2	P0603	EEPROM memory error	4.19 DTC P0602, P0603, P0604, P0605, P0607
3	P0602	Flash memory error	4.19 DTC P0602, P0603, P0604, P0605, P0607
4	P0604	RAM memory error	4.19 DTC P0602, P0603, P0604, P0605, P0607
5	P0607	A to D error	4.19 DTC P0602, P0603, P0604, P0605, P0607
6	“BUS Er”	Serial data bus shorted low/open/high	4.10 STARTS, THEN STALLS
7	U1300	Serial data shorted low	4.10 STARTS, THEN STALLS
8	U1301	Serial data shorted high	4.10 STARTS, THEN STALLS
9	U1064	Lost TSM/TSSM communication	4.20 DTC U1064
10	U1097	Lost speedometer communication	4.21 DTC U1097
11	U1255	Missing response at TSSM	4.20 DTC U1064
12	U1255	Missing response at speedometer	4.21 DTC U1097
13	P1009	TSM/TSSM disabled fuel due to bad password	4.15 DTC P1009, P1010
14	P1010	TSM/TSSM disabled fuel due to no password (starts then stalls)	4.15 DTC P1009, P1010
15	P0371	CKP sensor shorted low	4.17 DTC P0371, P0372, P0374
16	P0372	CKP sensor shorted high	4.17 DTC P0371, P0372, P0374
17	P0374	CKP sensor not detected/ cannot synchronize	4.17 DTC P0371, P0372, P0374
18	B1151	Sidecar BAS low	Sidecar DTC's apply only to Touring models equipped with sidecars. If these DTC's are present on non sidecar equipped motorcycles, the TSM/TSSM is not properly configured.
	B1152	Sidecar BAS high	
	B1153	Sidecar BAS out of range	
19	P0106	MAP sensor rate-of-change error	4.13 DTC P0106, P0107, P0108
20	P0107	MAP sensor failed open/low	4.13 DTC P0106, P0107, P0108
21	P0108	MAP sensor failed high	4.13 DTC P0106, P0107, P0108
22	P1351	Ignition coil driver front low/open	4.16 DTC P1351, P1352, P1354, P1355
23	P1354	Ignition coil driver rear low/open	4.16 DTC P1351, P1352, P1354, P1355
24	P1352	Ignition coil driver front high	4.16 DTC P1351, P1352, P1354, P1355
25	P1355	Ignition coil driver rear high	4.16 DTC P1351, P1352, P1354, P1355
26	P0562	System voltage low	4.14 DTC P0562, P0563
27	P0563	System voltage high	4.14 DTC P0562, P0563
28	P0501	VSS failed low	4.18 DTC P0501, P0502
29	P0502	VSS failed high/open	4.18 DTC P0501, P0502

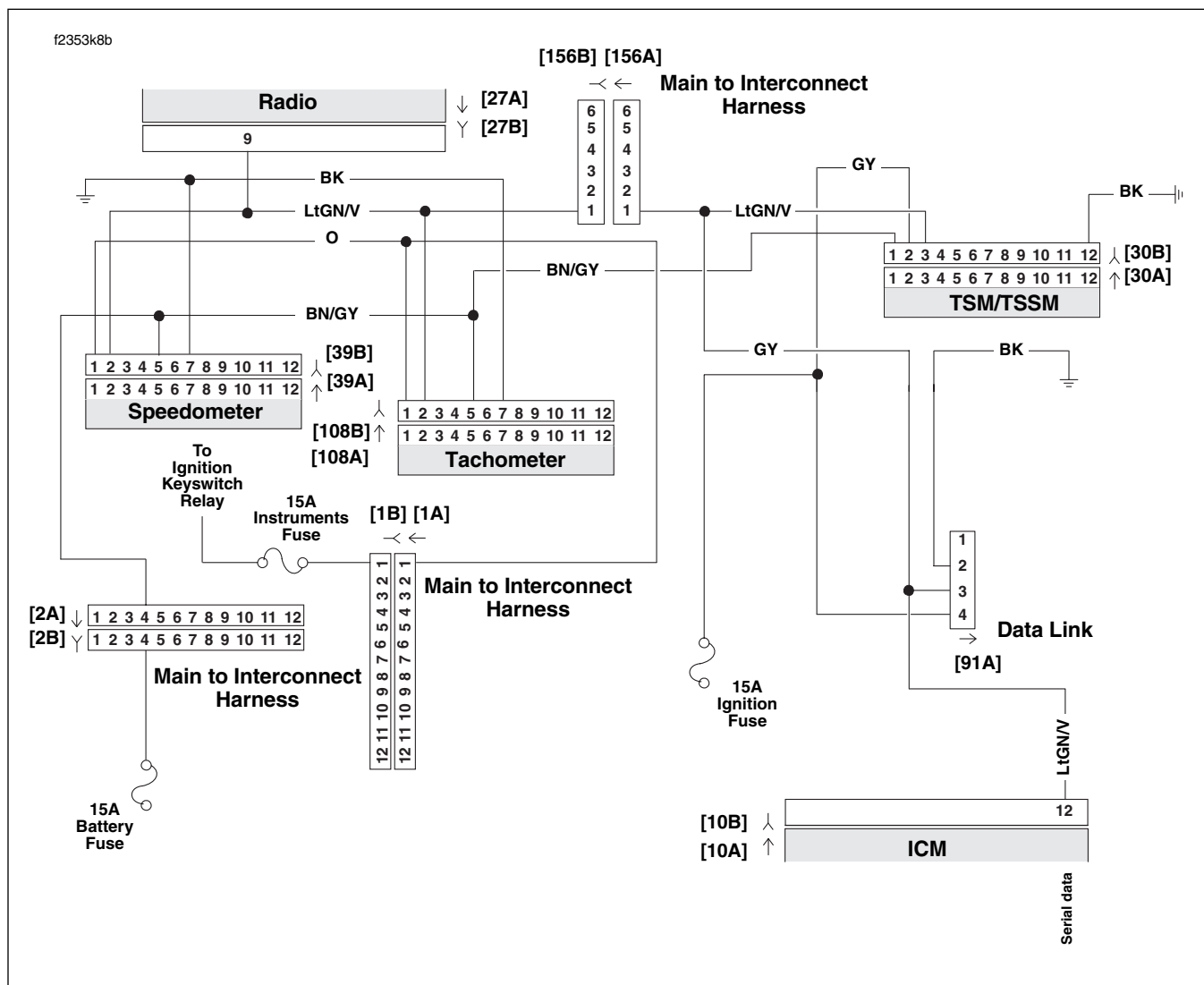


Figure 4-5. Diagnostic Check (FLHX, FLHT/C)

Table 4-6. Wire Harness Connectors in Figure 4-5.

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
[10]	ICM	12-Place Deutsch	Under Right Side Cover
[27]	Radio	23-Place Amp	Inner Fairing - Back of Radio (Right Side)
[30]	TSM/TSSM	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

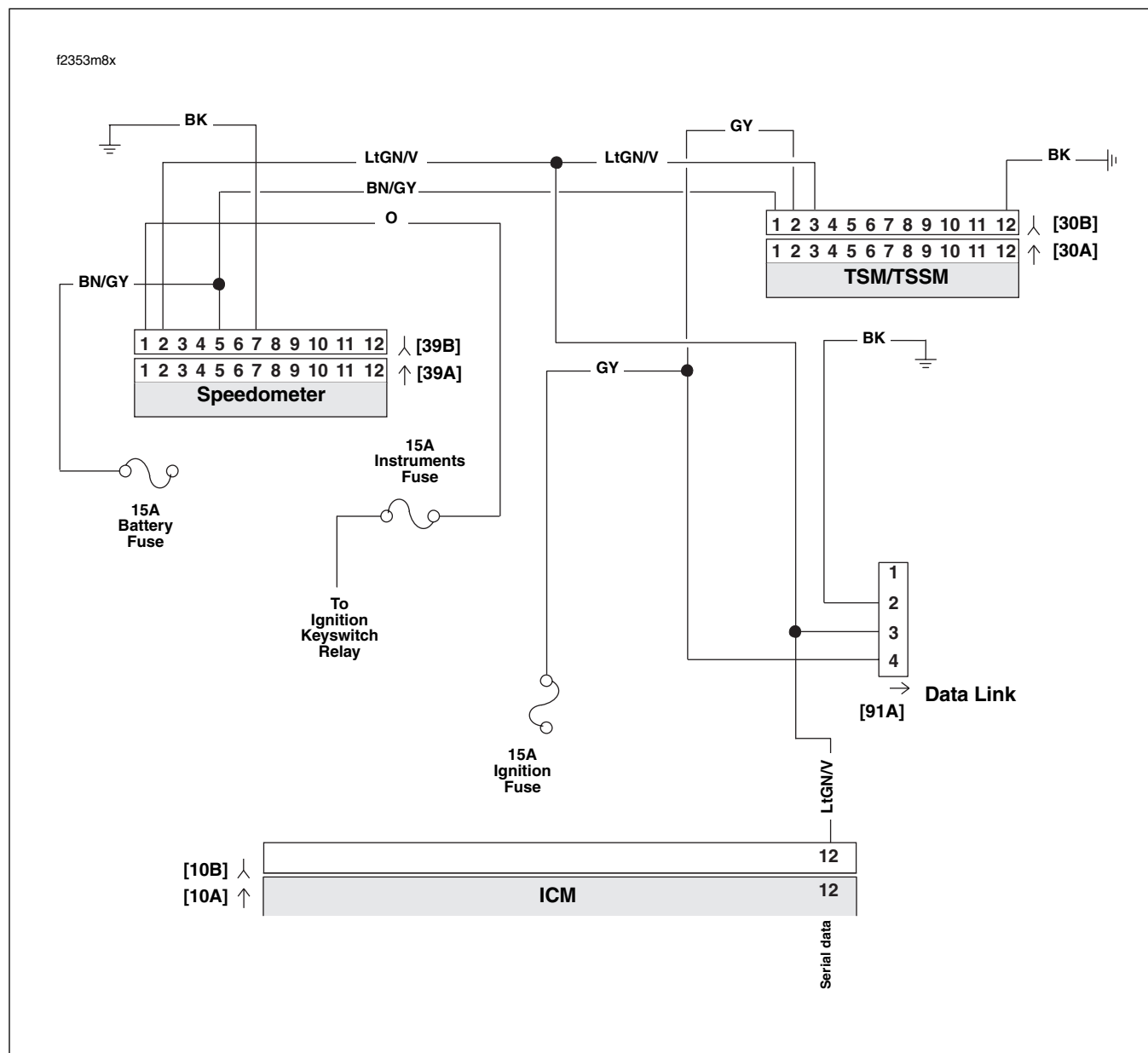
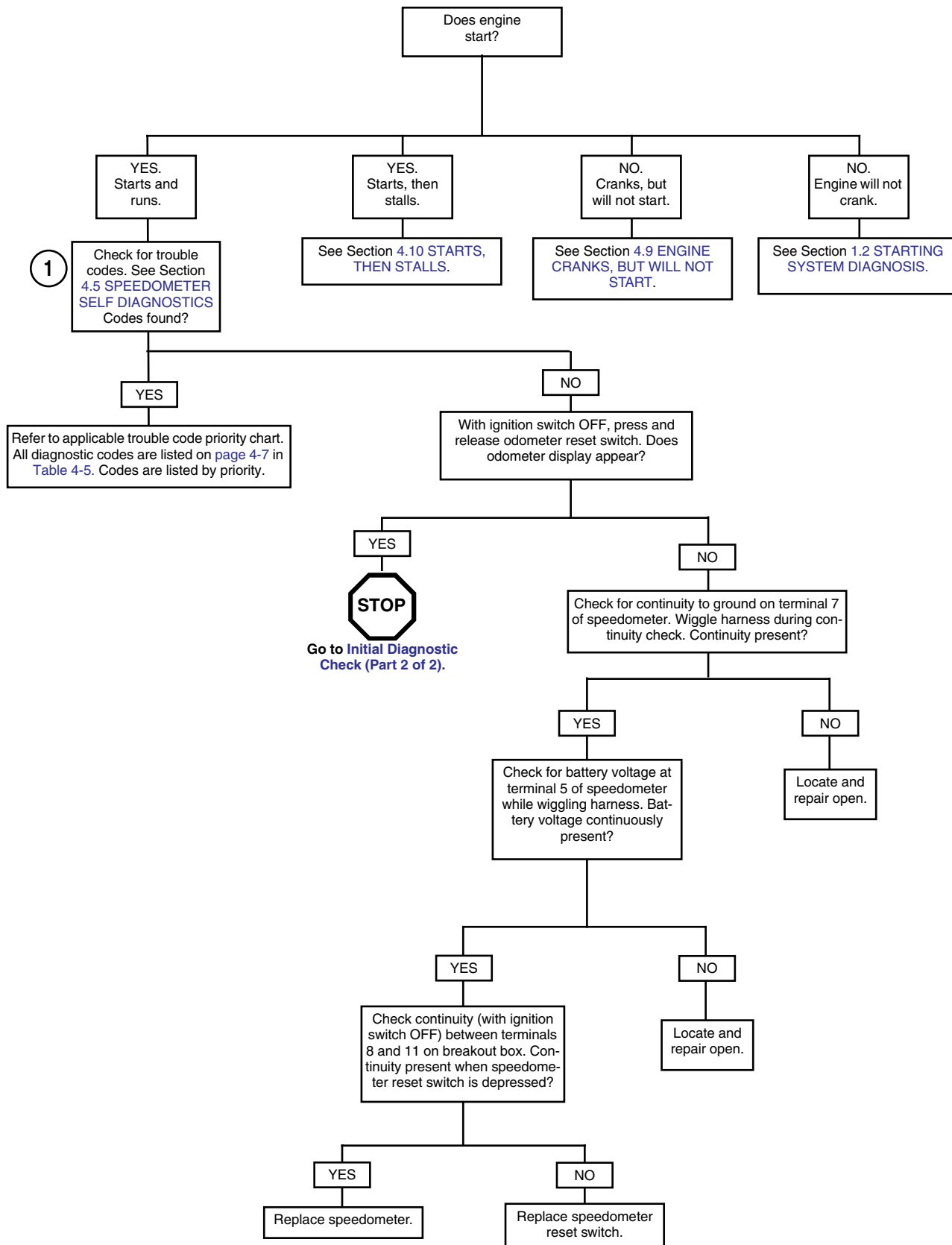


Figure 4-6. Diagnostic Check (FLHR/S)

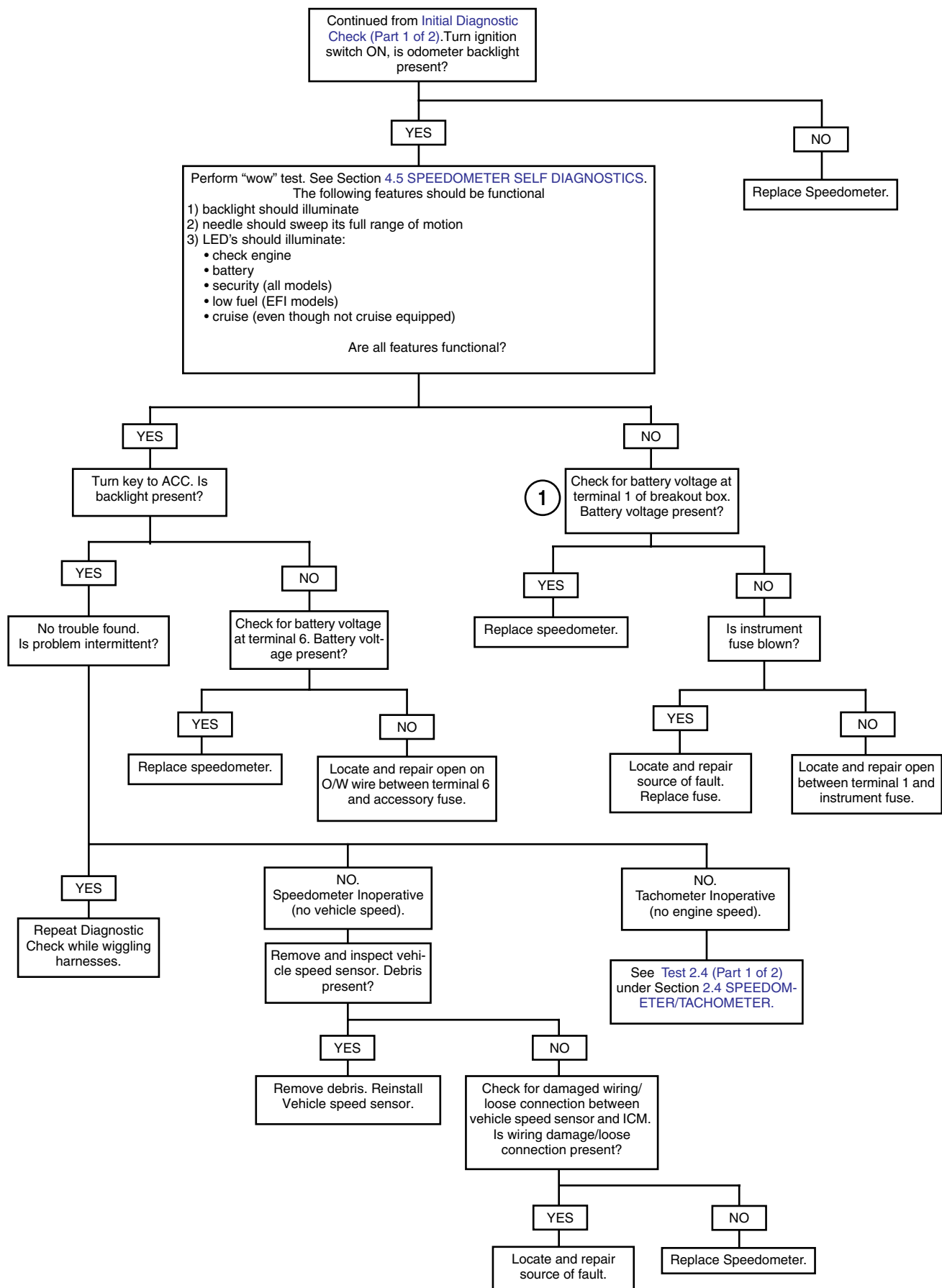
Table 4-7. Wire Harness Connectors in Figure 4-6.

NO.	DESCRIPTION	TYPE	LOCATION
[10]	ICM	12-Place Deutsch	Under Right Side Cover
[30]	TSM/TSSM	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

Initial Diagnostic Check (Part 1 of 2)



Initial Diagnostic Check (Part 2 of 2)



GENERAL

The speedometer is capable of displaying and clearing speedometer, tachometer, TSM/TSSM, and ICM/ECM trouble codes (diagnostic mode).

DIAGNOSTICS

Diagnostic Tips

- For a quick check of speedometer function, a “wow” test can be performed. Press and hold odometer reset switch then turn ignition switch ON. Release reset switch. Background lighting should illuminate, speedometer needle should sweep its full range of motion, and indicator lamps [battery, security, low fuel (EFI models) check engine and cruise] should illuminate. Some lamps may illuminate even though they do not apply to the vehicle. For example, the cruise lamp may illuminate even though the motorcycle may not be cruise equipped.
- If instrument module fails “wow” test, check for battery, ground, ignition, speedometer reset switch and accessory to speedometer. If any feature in the speedometer is non-functional, See Section 2.2 [INITIAL DIAGNOSTIC CHECK: SPEEDOMETER](#).

Diagnostic Notes

Use of speedometer self diagnostics assumes that DIGITAL TECHNICIAN (Part No. HD-44750) is **not** available.

The reference numbers below correlate with the circled numbers in the [Speedometer Self Diagnostics \(chart\)](#)

- To exit diagnostic mode, turn ignition switch OFF.
- To clear DTC's for selected module, press speedometer reset switch for more than 5 seconds when code is displayed. This procedure will clear all codes for selected module.

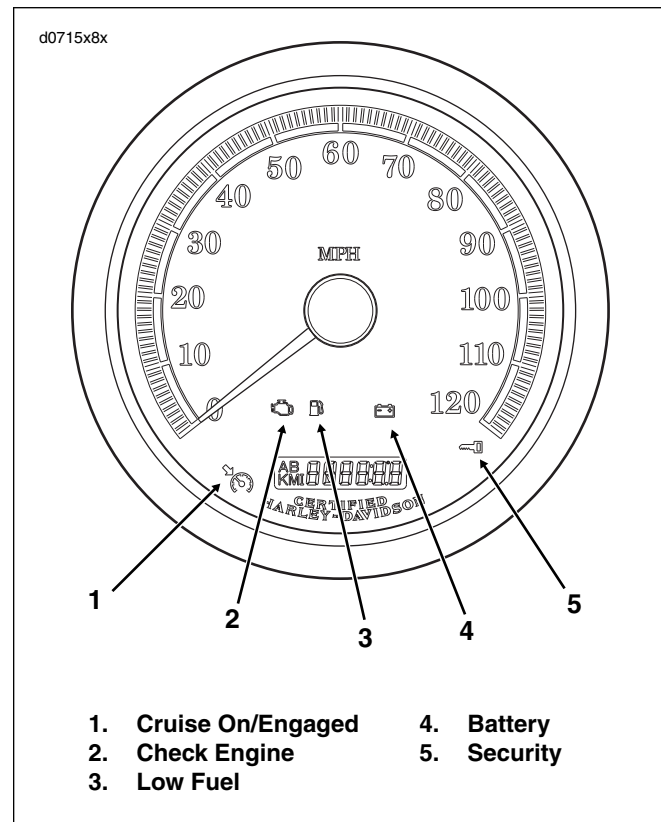


Figure 4-7. Speedometer (FLHR/S)

Speedometer Self Diagnostics (chart)

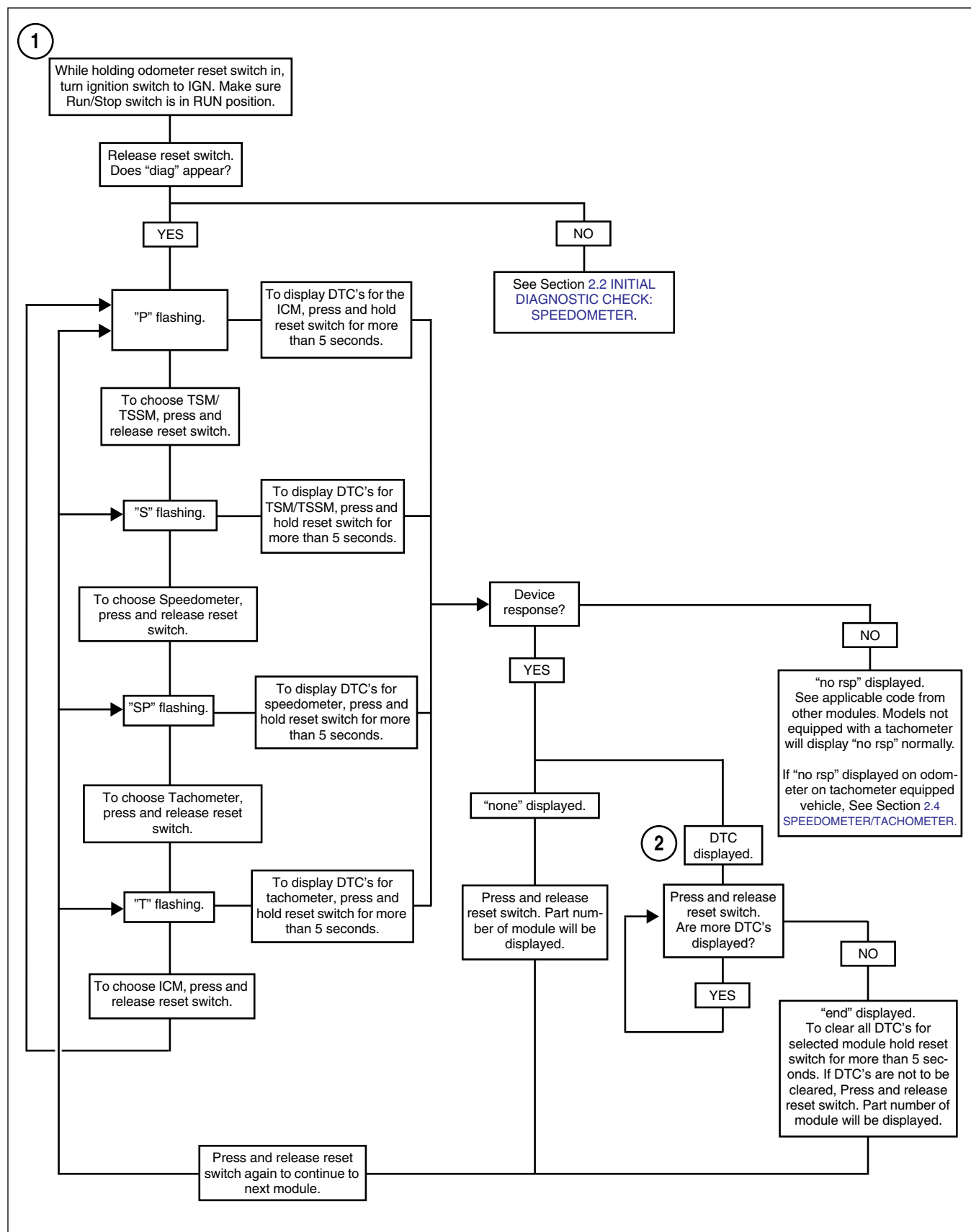


Figure 4-8. Speedometer Self Diagnostics

GENERAL

The BREAKOUT BOX (Part No. HD-42682) splices into the main harness. Used in conjunction with a DVOM, it allows circuit diagnosis of wiring harness and connections without having to probe with sharp objects.

INSTALLATION

1. Remove right saddlebag and side cover.
2. Depress latches on connector [10] to separate pin and socket halves.
3. Attach Breakout Box as follows:
 - a. Mate black socket housing on Breakout Box with ICM connector [10A].
 - b. Mate black pin housing on Breakout Box with harness connector [10B].

REMOVAL

1. Remove Breakout Box as follows:
 - a. Remove black socket housing on Breakout Box from ICM connector [10A].
 - b. Remove black pin housing on Breakout Box from harness connector [10B].
2. Mate pin and socket halves of ICM connector [10].
3. Install side cover and saddlebag.

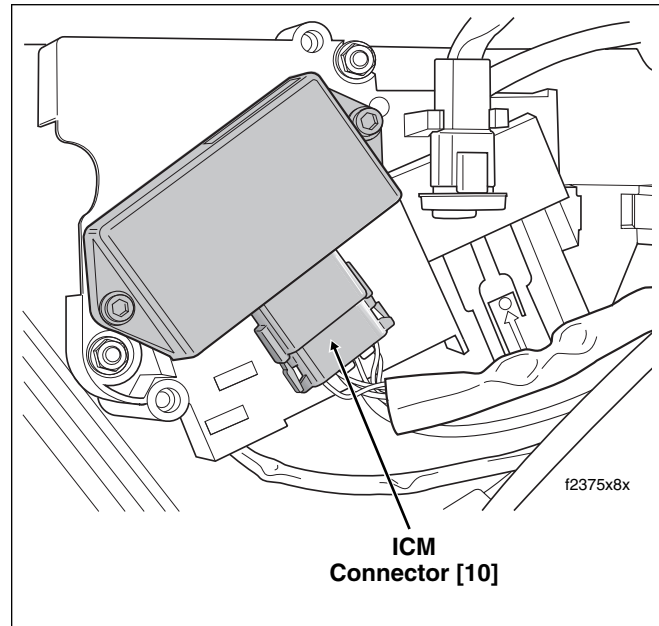


Figure 4-9. Electrical Bracket (Under Right Side Cover)

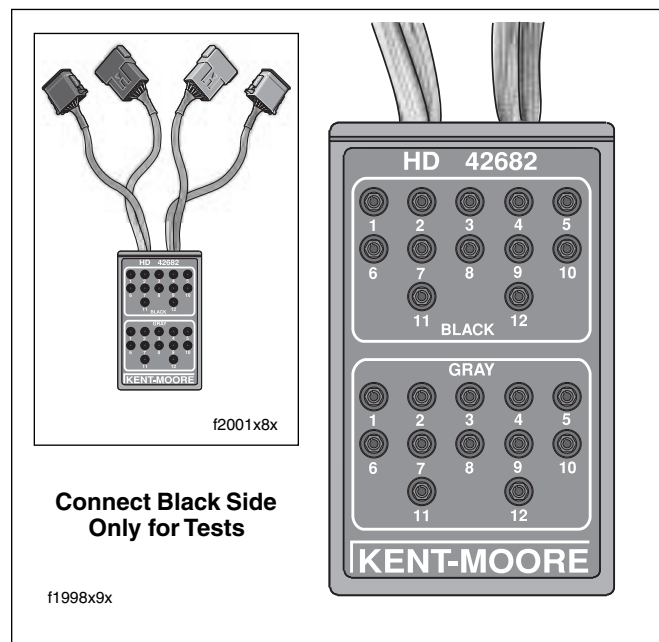


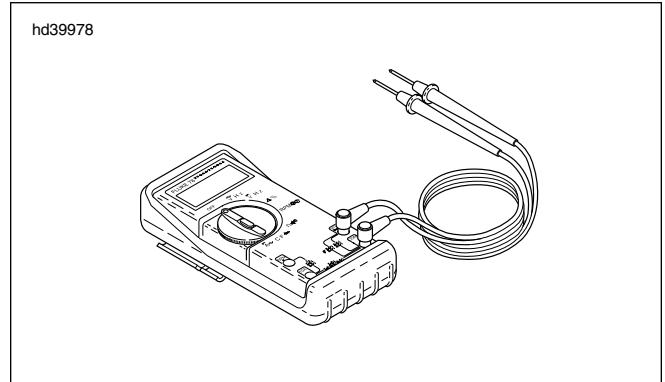
Figure 4-10. Breakout Box (Part No. HD-42682)

GENERAL

The wiggle test indicates the presence of intermittents in a wiring harness.

PROCEDURE

1. See [Figure 4-11](#). Connect DVOM (Part No. HD-39978) to wiring harness between the suspect connections. When diagnosing ignition module connections, a BREAKOUT BOX (Part No. HD-42682) may be used to simplify the procedure. See [Section 4.6 BREAKOUT BOX: ICM](#).
2. Set DVOM to read voltage changes.
3. Start motorcycle engine and run at idle.
4. Shake or wiggle harness to detect intermittents. If intermittents are present, radical voltage changes will register on the DVOM.



**Figure 4-11. Fluke 78 Multimeter (DVOM)
(Part No. HD-39978)**

GENERAL

WARNING

Propane is an extremely flammable liquid and vapor. Vapor may cause flash fire. Keep away from heat, sparks and flame. Keep container closed. Use only with adequate ventilation. Failure to follow this alert can result in death or serious injury.

WARNING

Read all directions and warnings on propane bottle. Failure to follow all directions and warnings on bottle could result in death or serious injury.

- To prevent false readings, keep airbox cover installed when performing test.
- Do not direct propane into air cleaner, false readings will result.

LEAK TESTER

Parts List

- Standard 14 oz. propane cylinder.
- Propane Enrichment Kit (HD-41417).
- 12 inches (304 mm) long-1/4 inch (6 mm) diameter copper tubing.

Tester Assembly

1. Cut rubber hose from kit to 18 inches (457 mm) in length.
2. See [Figure 4-12](#). Flatten one end of copper tube to form a nozzle.
3. Insert round side of copper tube into end of tubing.

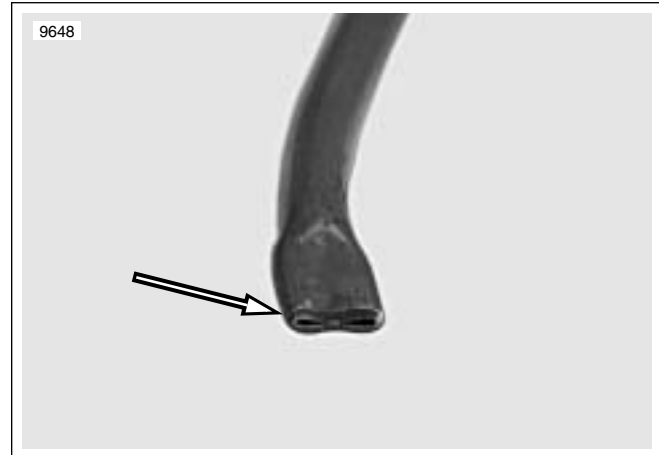
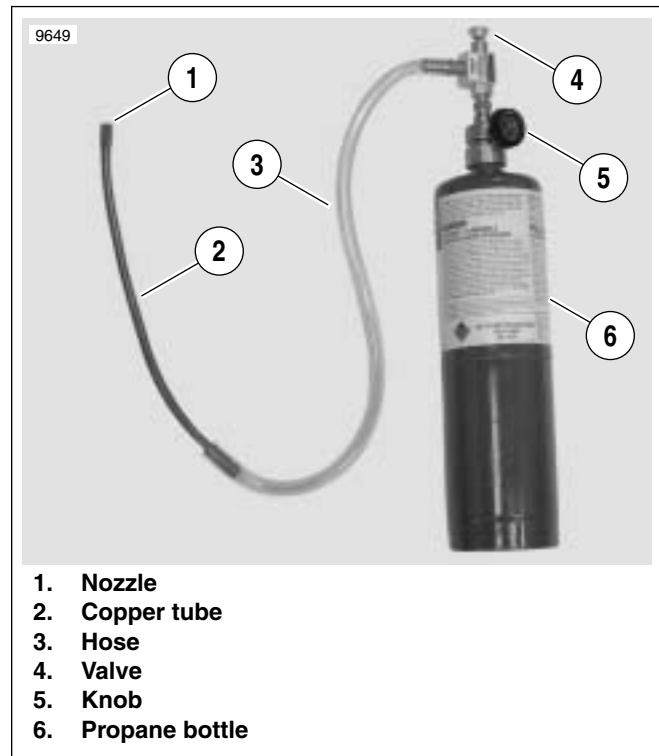


Figure 4-12. Nozzle



1. Nozzle
2. Copper tube
3. Hose
4. Valve
5. Knob
6. Propane bottle

Figure 4-13. Leak Tester

INTAKE LEAK TESTING

1. Start engine.
2. Warm engine to operating temperature.
3. See [Figure 4-13](#). Turn knob (5) counterclockwise to open propane bottle.

WARNING

Propane is an extremely flammable liquid and vapor. Vapor may cause flash fire. Keep away from heat, sparks and flame. Keep container closed. Use only with adequate ventilation.

NOTE

Do not direct propane stream toward front of engine. If propane enters air cleaner, a false reading will be obtained.

4. See [Figure 4-14](#). Aim nozzle toward possible sources of leak such as fuel injectors and intake tract.
5. See [Figure 4-13](#). Push valve (4) to release propane. Tone of engine will change when propane enters source of leak.



Figure 4-14. Checking for Leaks

GENERAL

If starter will not crank engine, the problem is not ignition related. Refer to SECTION 1-STARTING & CHARGING.

DIAGNOSTICS

Diagnostic Notes

The reference numbers below correlate with the circled numbers on the Test 4.9 flow charts.

1. Check for trouble codes. See [RETRIEVING DIAGNOSTIC TROUBLE CODES](#) under Section 4.3 [CHECKING FOR TROUBLE CODES](#).
2. Check the condition of the battery. Perform a voltage test and recharge if below 12.60V. Check battery connections and perform either a conductance test (using [ADVANCED BATTERY CONDUCTANCE AND ELECTRICAL SYSTEM ANALYZER, HD-48053](#)) or load test. Replace the battery if necessary.
3. Remove spark plug cable from spark plug.
 - a. Visually check condition of plug.
 - b. See [Figure 4-15](#). Attach cable to SPARK TESTER (Part No. HD-26792). Clip tester to cylinder head bolt.
 - c. While cranking engine, look for spark. Repeat procedure on other spark plug cables.

NOTE

Engine will not spark with both spark plugs removed. When checking for spark, use SPARK TESTER (Part No. HD-26792) with both plugs installed.

4. Use HARNESS CONNECTOR TEST KIT (Part No. HD-41404A) gray pin probes and patch cords.
5. See [Figure 4-16](#). 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. Clear codes afterward.
6. Connect BREAKOUT BOX (Part No. HD-42682). See Section [4.6 BREAKOUT BOX: ICM](#).
7. Use HARNESS CONNECTOR TEST KIT (Part No. HD-41404A), gray pin probe and patch cord.
8. Use HARNESS CONNECTOR TEST KIT (Part No. HD-41404A), brown socket probe and patch cord.

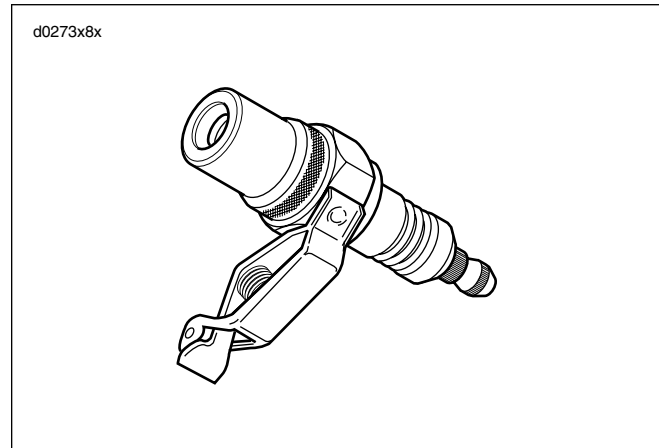


Figure 4-15. Spark Tester



Figure 4-16. Ignition Coil Circuit Test

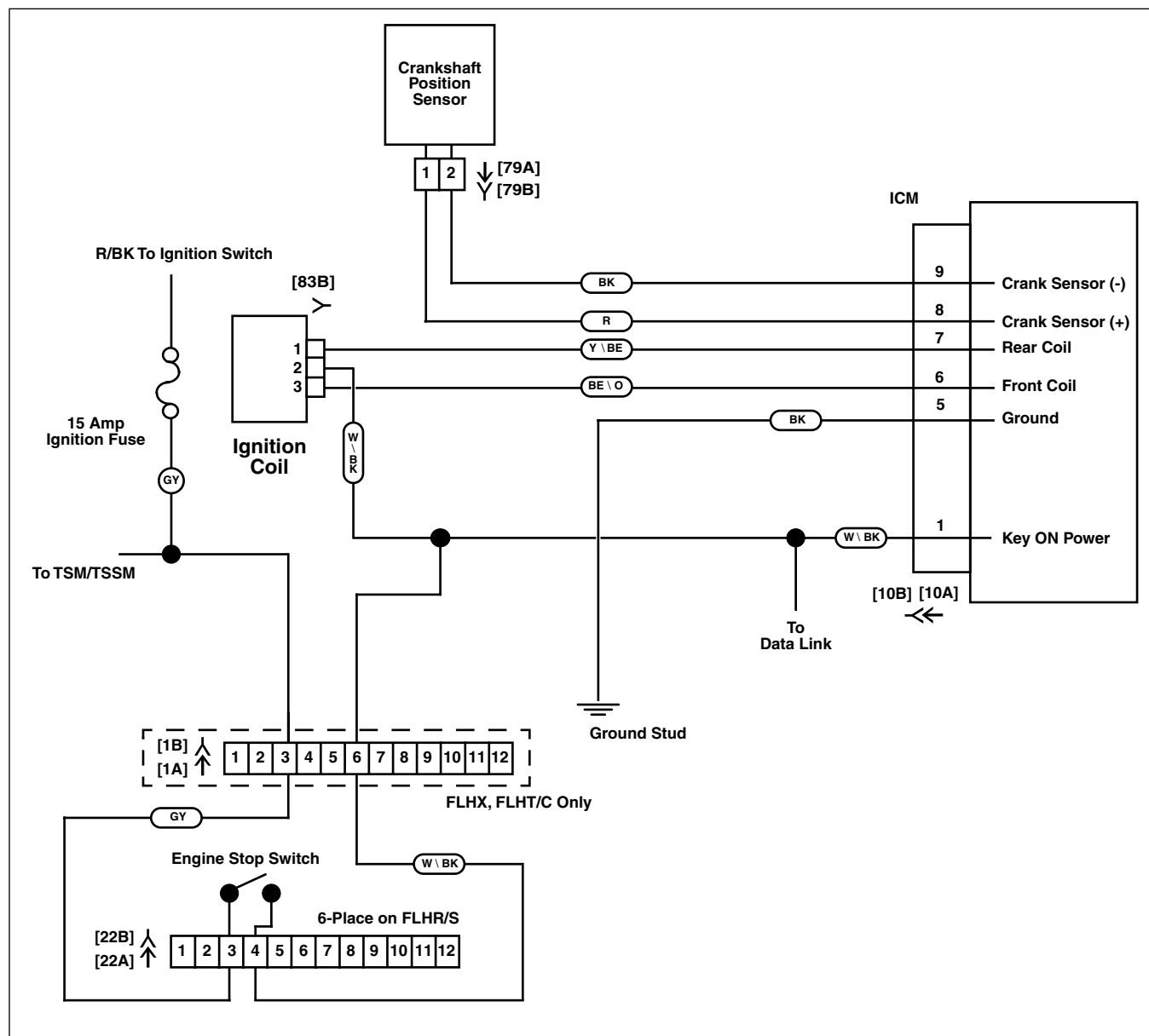


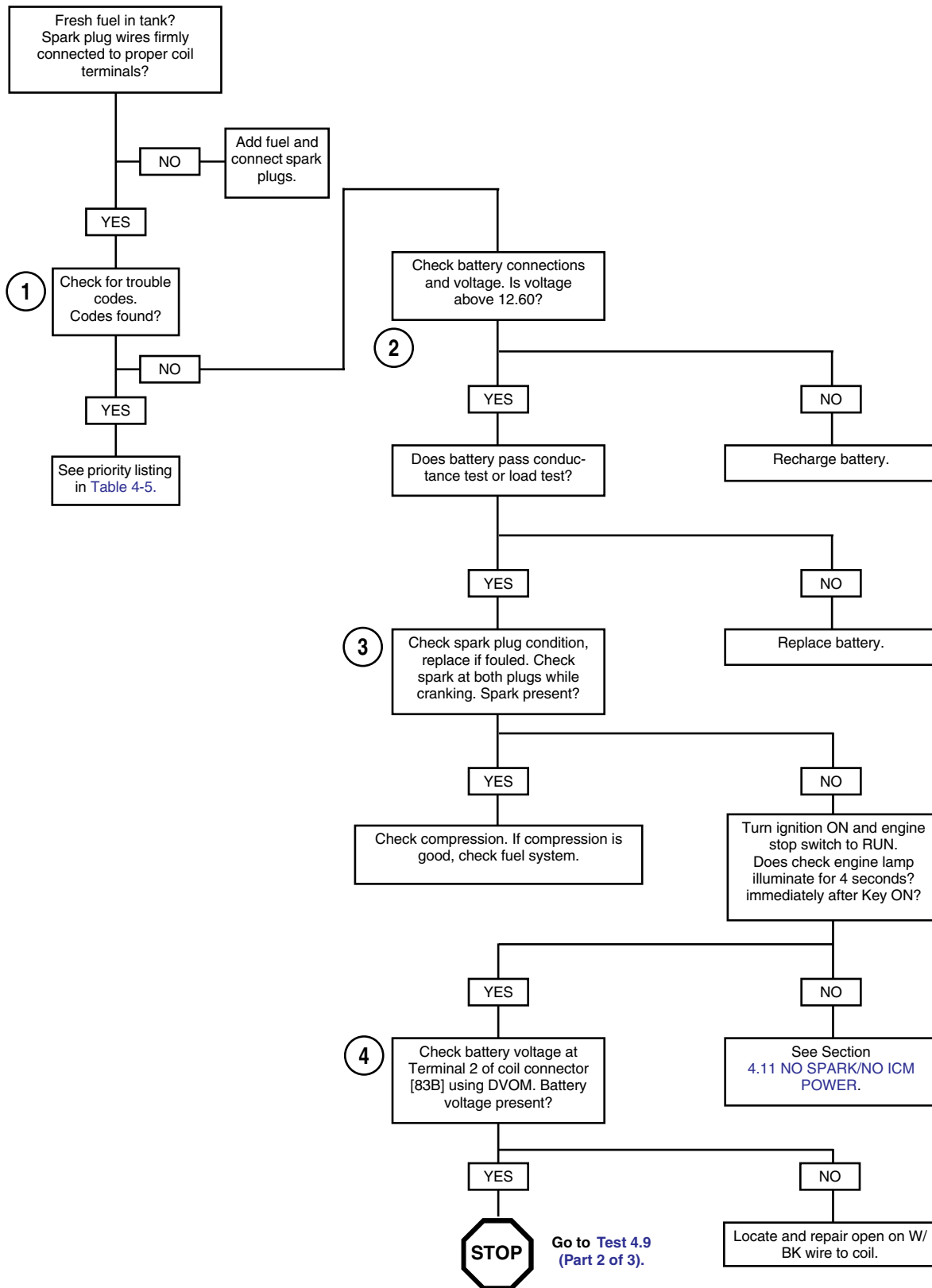
Figure 4-17. Ignition Circuit

Table 4-8. Wire Harness Connectors in Figure 4-17.

NO.	DESCRIPTION	MODEL	TYPE	LOCATION
[1]	Main to Interconnect Harness	FLHT/C	12-Place Deutsch (Black)	Inner Fairing - Right Radio Support Bracket
[10]	ICM	All	12-Place Deutsch (Black)	Under Right Side Cover
[22]	Interconnect to Right Handlebar Switch Controls	FLHT/C	12-Place Deutsch	Inner Fairing- Fork Stem Nut Lock Plate
		FLHR/S	6-Place Deutsch	Inside Headlamp Nacelle
[83]	Ignition Coil	All	3-Place Delphi	Below Fuel Tank (Left Side)

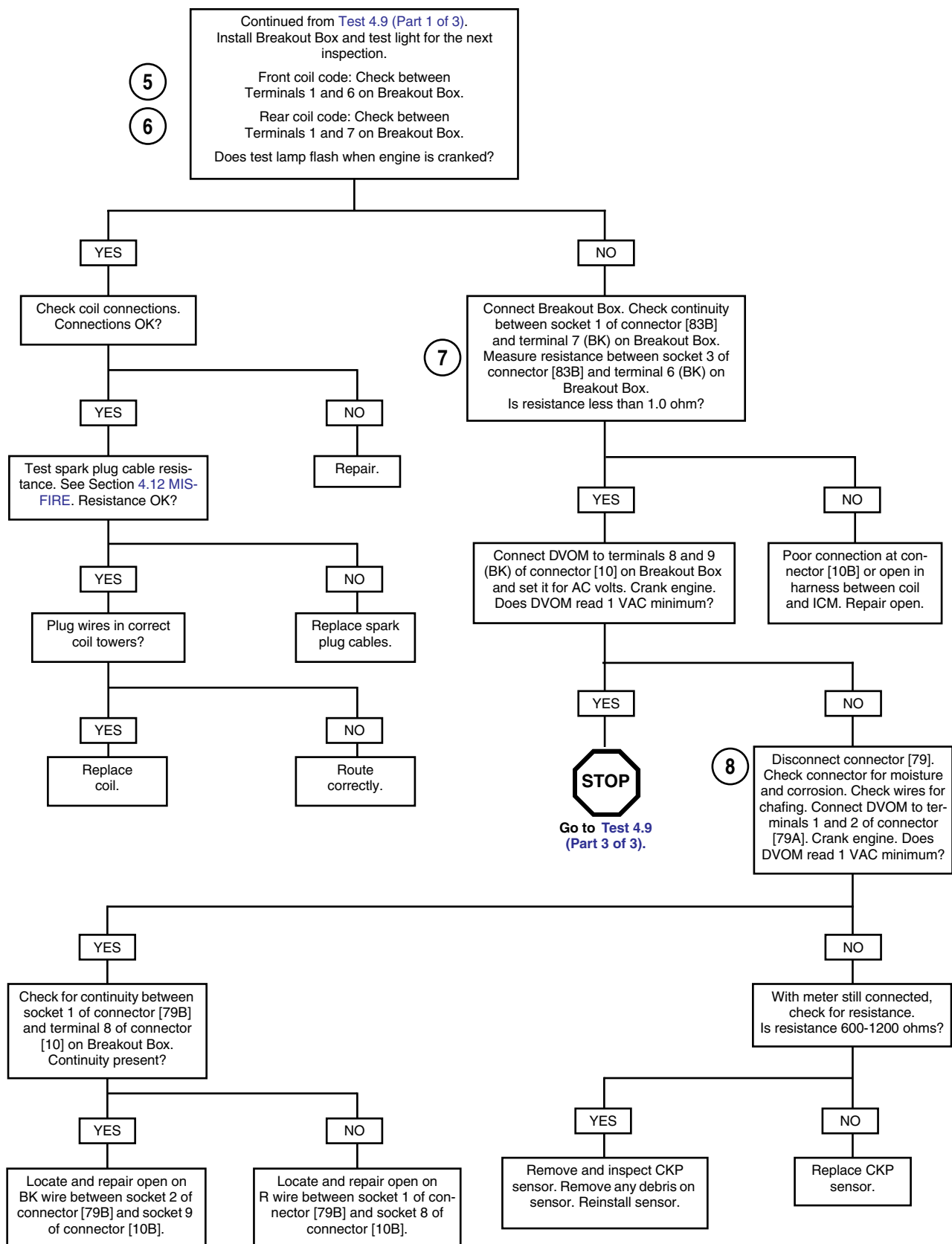
Test 4.9 (Part 1 of 3)

ENGINE CRANKS, BUT WILL NOT START



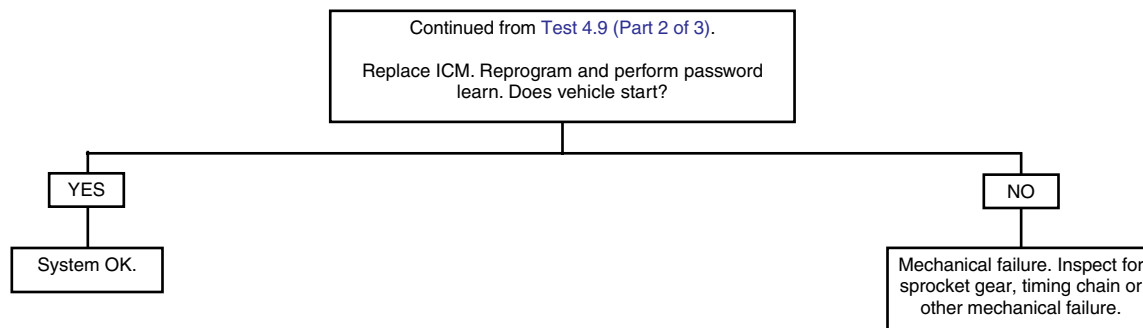
Test 4.9 (Part 2 of 3)

ENGINE CRANKS, BUT WILL NOT START



Test 4.9 (Part 3 of 3)

ENGINE CRANKS, BUT WILL NOT START



GENERAL

Diagnostic Trouble Codes U1300, U1301, P1009, P1010 or “BUS Er”

See [Figure 4-18](#). The typical serial data voltage range is 0 volts (inactive) to 7 volts (active). Due to the short pulse, voltages will be much lower on a DVOM. In analog mode, a DVOM reading serial data will show continuous voltage when active, typically 0.6-0.8 volts. The range for acceptable operations is 0-7.0 volts.

NOTE

Problems in the fuel system or idle air control system may also create this symptom.

Table 4-9. Code Description

DTC	DESCRIPTION
U1300	Serial data low
U1301	Serial data open/high

DIAGNOSTICS

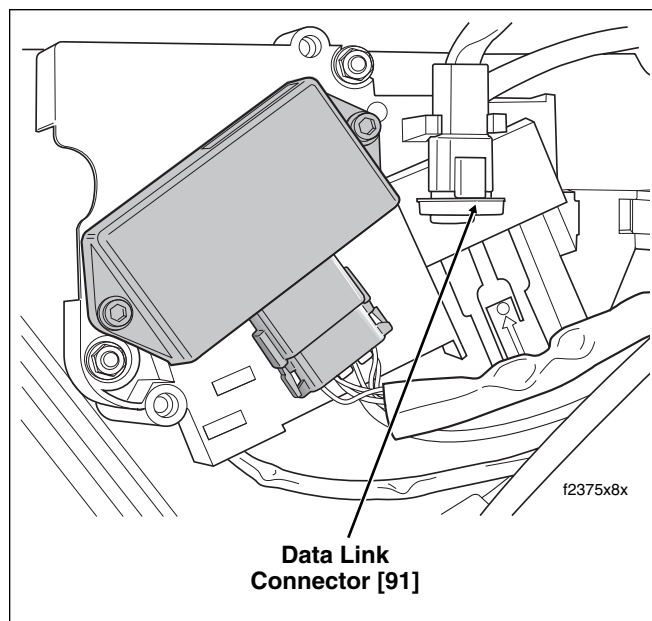
Diagnostic Tips

- If serial data is shorted, these codes will automatically trip the check engine light. The odometer will read “Bus Er” in this condition.
- DTC's P1009 and P1010 may accompany DTC's U1300 and U1301.

Diagnostic Notes

The reference numbers below correlate with the circled numbers on the Test 4.10 flow charts.

1. Check for trouble codes. See [RETRIEVING DIAGNOSTIC TROUBLE CODES](#) under Section 4.3 [CHECKING FOR TROUBLE CODES](#).
2. Connect BREAKOUT BOX (Part No. HD-42682) as follows:
 - a. Mate black socket housing on Breakout Box with ICM connector [10A].
 - b. Mate black pin housing on Breakout Box with harness connector [10B].
 - 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 4-18. Electrical Bracket (Under Right Side Cover)**

3. Use HARNESS CONNECTOR TEST KIT (Part No. HD-41404A), black socket probes and patch cord.
4. Historic code U1300 would have been set. Clear historic codes.

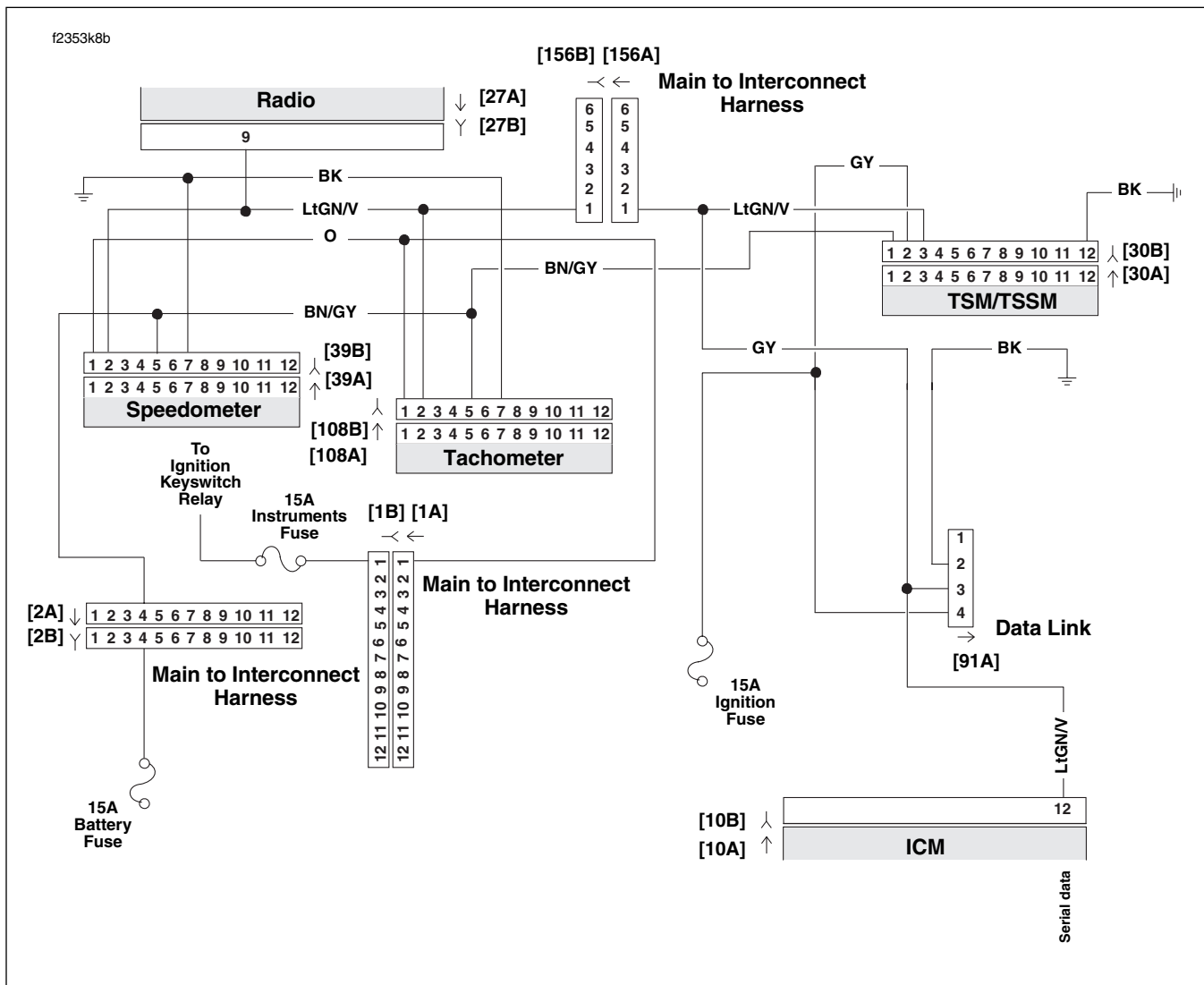


Figure 4-19. Serial Data Circuit (FLHX, FLHT/C)

Table 4-10. Wire Harness Connectors in Figure 4-19.

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
[10]	ICM	12-Place Deutsch	Under Right Side Cover
[27]	Radio	23-Place Amp	Inner Fairing - Back of Radio (Right Side)
[30]	TSM/TSSM	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

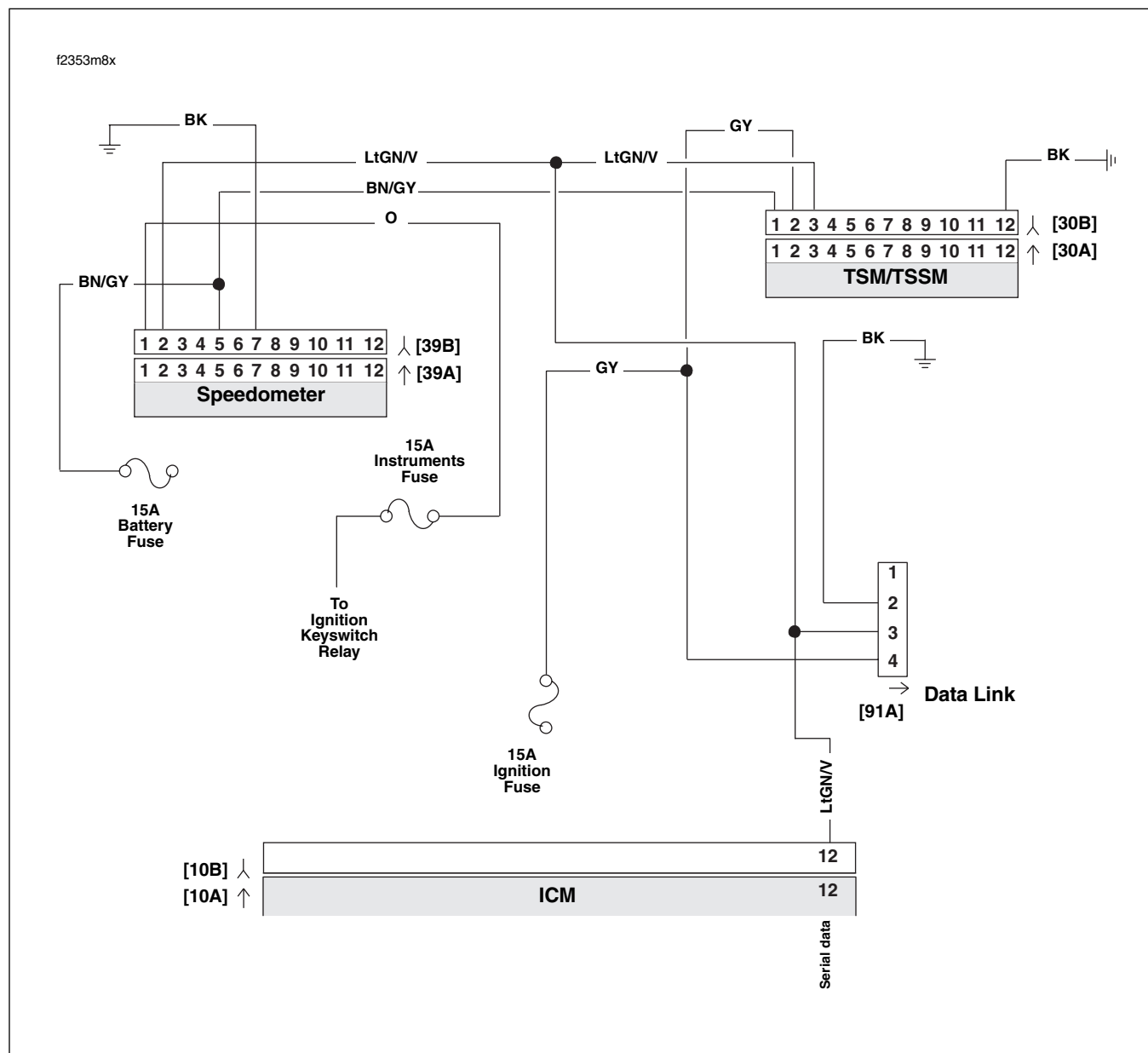


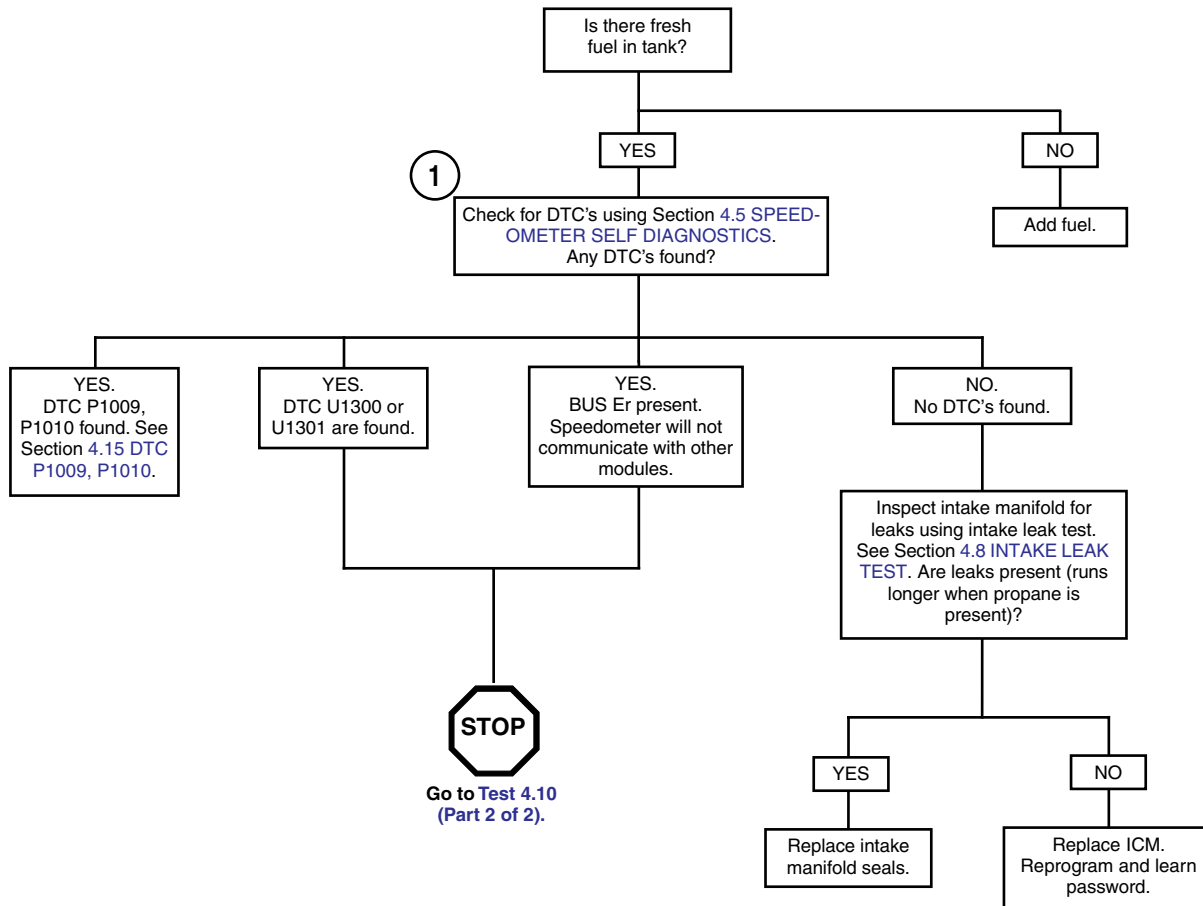
Figure 4-20. Serial Data Circuit (FLHR/S)

Table 4-11. Wire Harness Connectors in Figure 4-20.

NO.	DESCRIPTION	TYPE	LOCATION
[10]	ICM	12-Place Deutsch	Under Right Side Cover
[30]	TSM/TSSM	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 4.10 (Part 1 of 2)

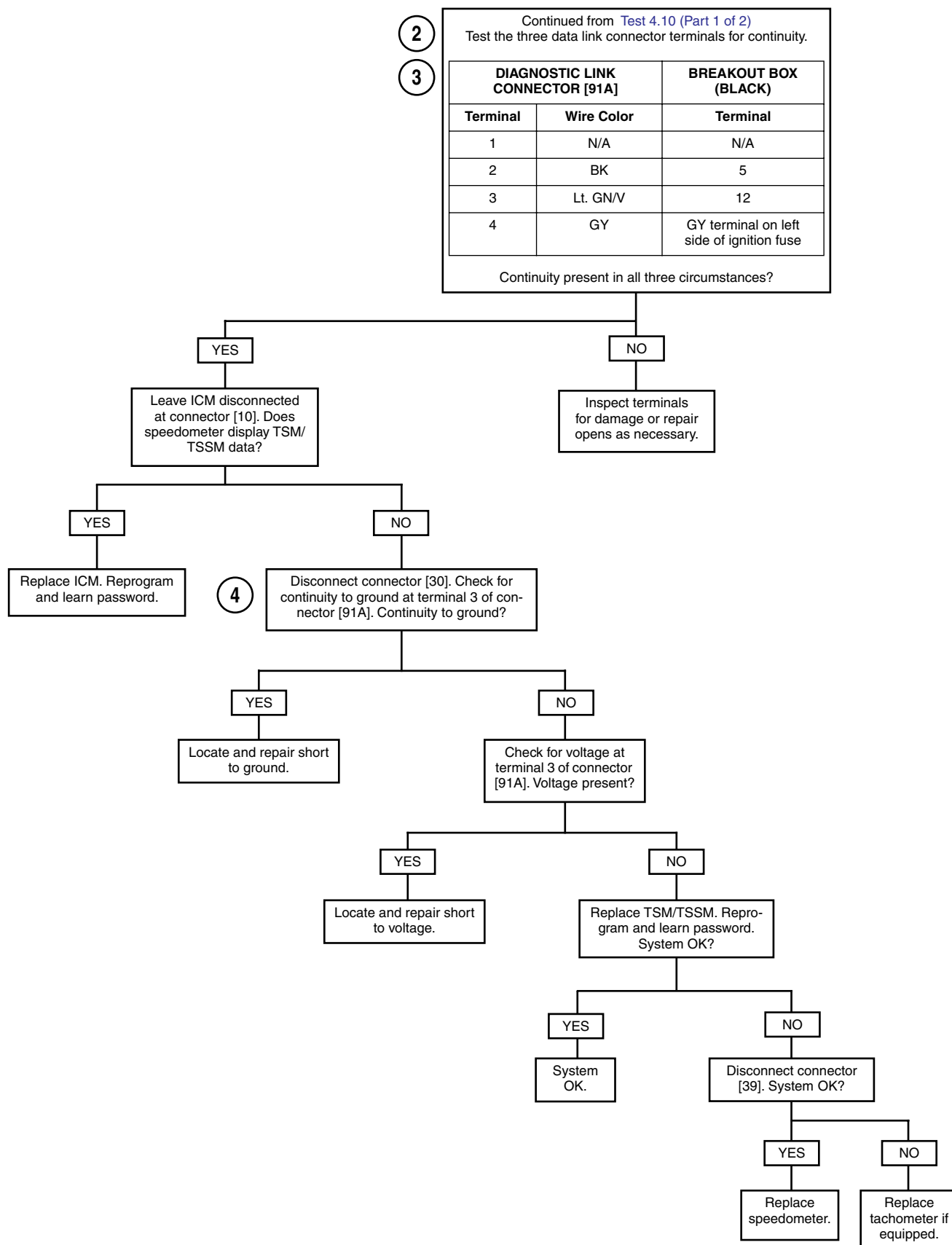
ASTARTS, THEN STALLS: DTC U1300, U1301, P1009, P1010 or “BUS Er”



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

Test 4.10 (Part 2 of 2)

STARTS, THEN STALLS: DTC U1300, U1301, P1009, P1010 or “BUS Er”



GENERAL

The ICM turns on when power is applied to Pin 1 of [10], the black connector. The ICM goes through an initialization sequence every time power is removed and re-applied to Pin 1. The only visible part of this sequence is the check engine lamp. Upon starting, the check engine lamp will illuminate for 4 seconds and then (if parameters are normal) go out.

DIAGNOSTICS

Diagnostic Notes

The reference numbers below correlate with the circled numbers on the Test 4.11 flow chart.

1. See FUSES in the Touring Service Manual.
2. Connect BREAKOUT BOX (Part No. HD-42682). See Section 4.6 BREAKOUT BOX: ICM.
3. Use HARNESS CONNECTOR TEST KIT (Part No. HD-4104), black pin probe and patch cord.
4. Remove headlamp assembly on FLHR/S models or outer fairing on FLHX, FLHT/C.

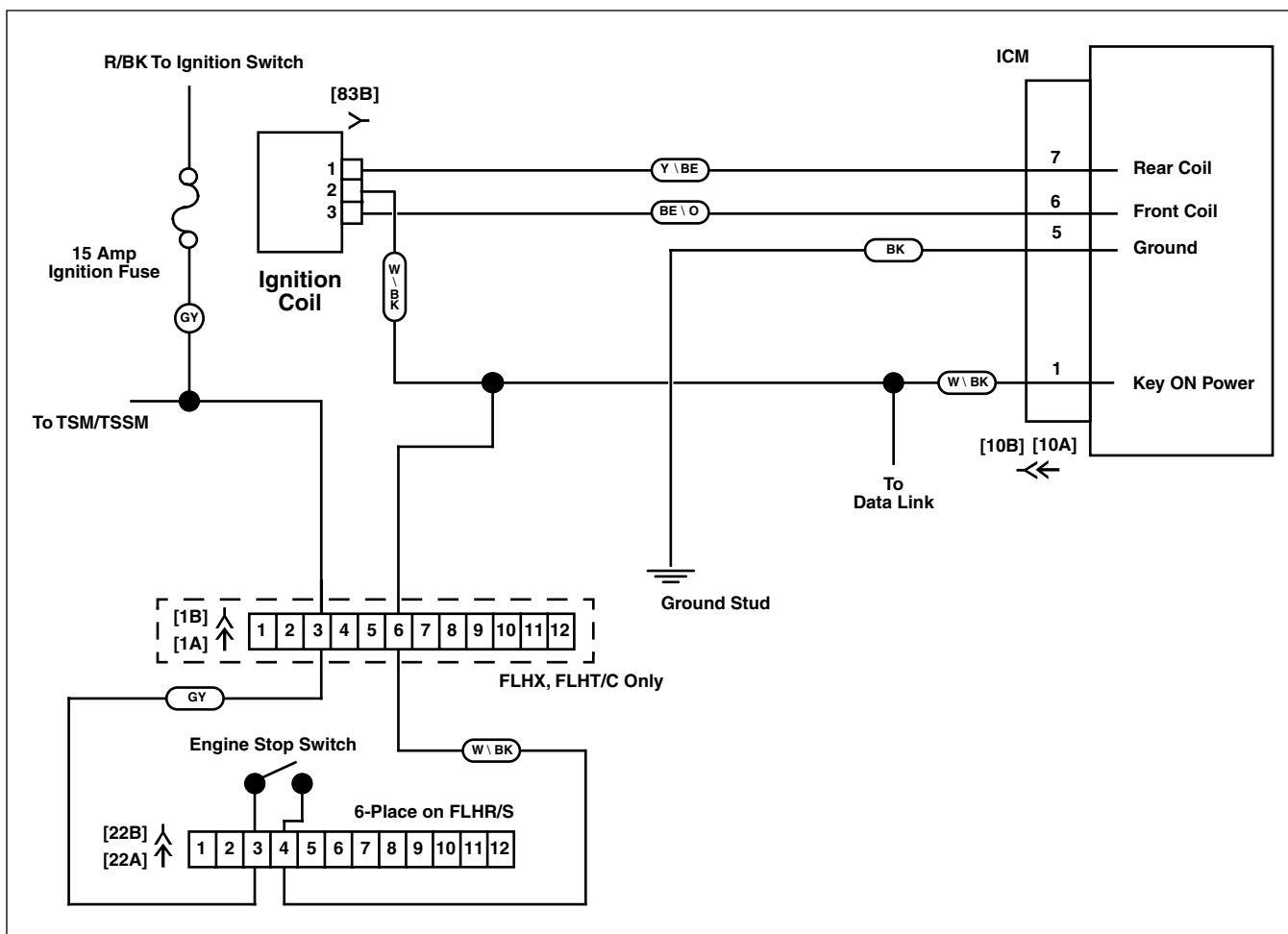
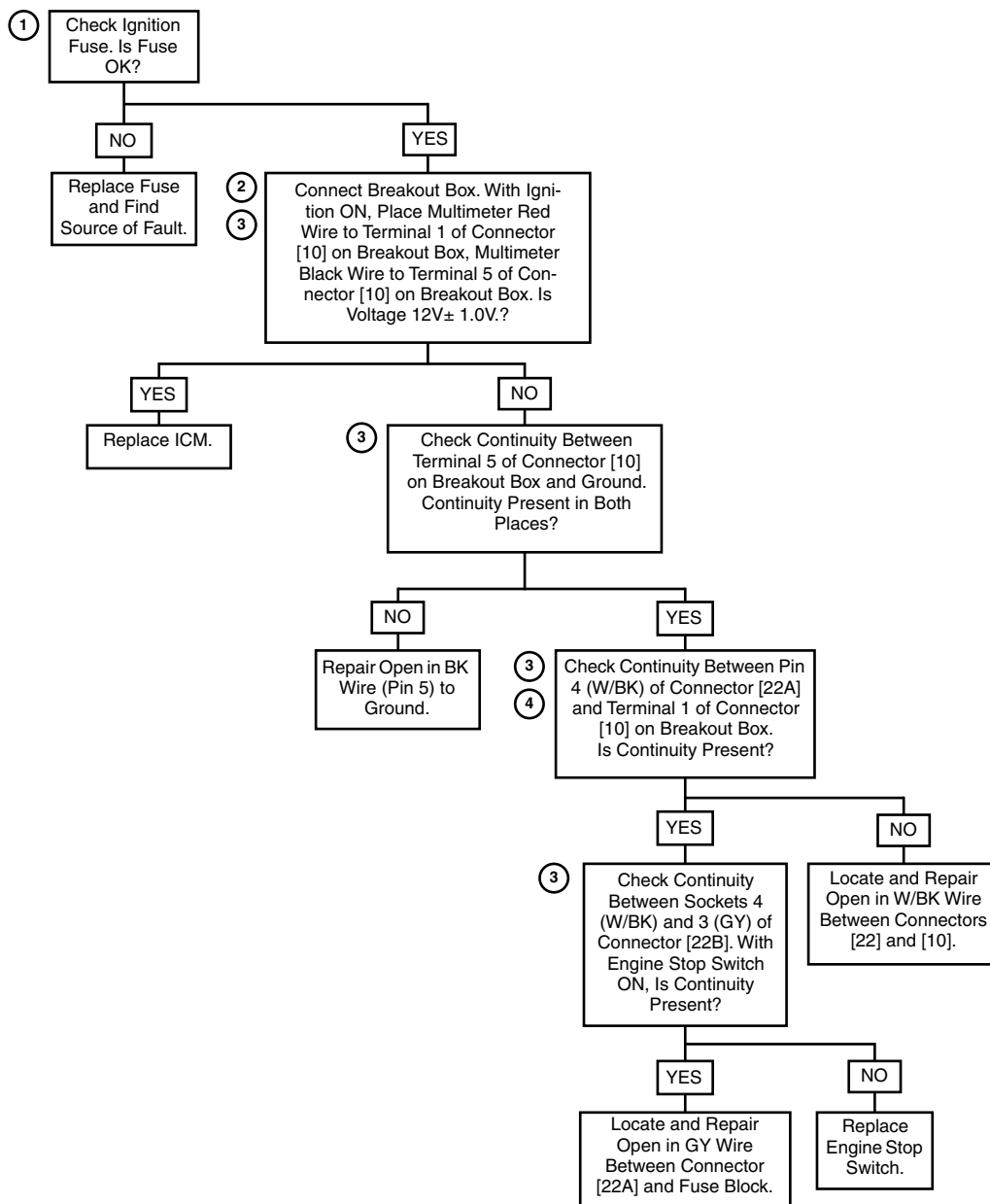


Figure 4-21. ICM Power Circuit

Test 4.11**NO SPARK/NO ICM POWER****Table 4-12. Wire Harness Connectors in Figure 4-21.**

NO.	DESCRIPTION	MODEL	TYPE	LOCATION
[1]	Main to Interconnect Harness	FLHT/C	12-Place Deutsch (Black)	Inner Fairing - Right Radio Support Bracket
[10]	ICM	All	12-Place Deutsch (Black)	Under Right Side Cover
[22]	Interconnect to Right Handlebar Switch Controls	FLHT/C	12-Place Deutsch	Inner Fairing- Fork Stem Nut Lock Plate
		FLHR/S	6-Place Deutsch	Inside Headlamp Nacelle

GENERAL

Misfire at Idle or Under Load

- Battery condition and connections may also cause misfires.
- Fuel system problems may also cause misfires. Refer to [Table 4-3](#).

DIAGNOSTICS

Diagnostic Notes

The reference numbers below correlate with the circled numbers on the [Test 4.12](#) flow chart.

WARNING

Any open spark around gasoline or other combustibles may result in fire or explosion. Thoroughly wipe up any spilt fuel and dispose of rags in a suitable manner. Inadequate safety precautions could result in death or serious injury.

1. See [Figure 4-22](#). Use the SPARK TESTER (Part No. HD-26792) to verify adequate secondary voltage (25,000 volts) at the spark plug.
 - a. Turn Ignition/Light Key Switch to IGNITION.
 - b. Remove spark plug cable from spark plug. Visually check plug condition.
 - c. Attach cable to SPARK TESTER. Clip tester to cylinder head bolt.
 - d. While cranking engine, watch for spark to jump tester gap on leads.

IMPORTANT NOTE

Spark will not be present when cranking with both spark plugs removed. When checking for spark, use SPARK TESTER with both spark plugs installed and one plug wire connected to SPARK TESTER.

- e. Reinstall and repeat procedure on other spark plug cable.
2. Perform spark plug cable resistance test.
 - a. Remove spark plug cable from spark plug and ignition coil. For best results, use a needle nose pliers for removal/installation on coil. Gently grasp cable as close to terminals as possible.
 - b. Using an ohmmeter, touch probes to terminals on each end plug wire.

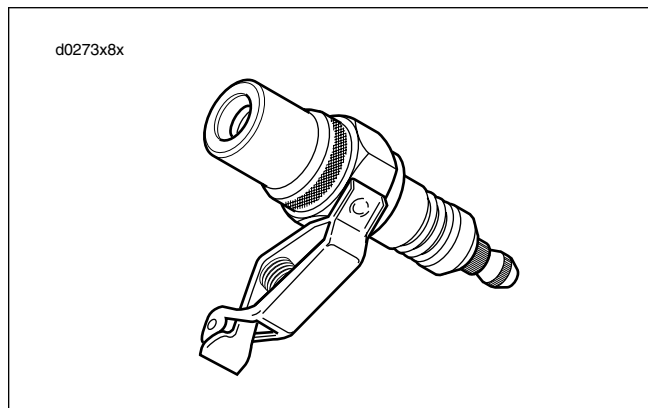


Figure 4-22. Spark Tester

- c. Compare resistance values to [Table 4-13](#). Replace cables not meeting specifications. Reinstall and repeat procedure on other spark plug cable.

Table 4-13. Spark Plug Cables

LOCATION	LENGTH	RESISTANCE
Front/Rear	20.2 inch (513 mm)	4975-11960

3. This test can also be performed by substituting a known good coil for one causing the no spark condition. The coil does not require full installation to be functional. Verify faulty coil by performing resistance test.
4. Use HARNESS CONNECTOR TEST KIT (Part No. HD-41404A), gray pin probe and patch cord to the coil connector [83B].
5. Inspect for corrosion at battery terminals, maxi fuse terminals, ignition fuse terminals GY and R/BK, right handlebar switch controls connector [22], and ignition coil connector [83].

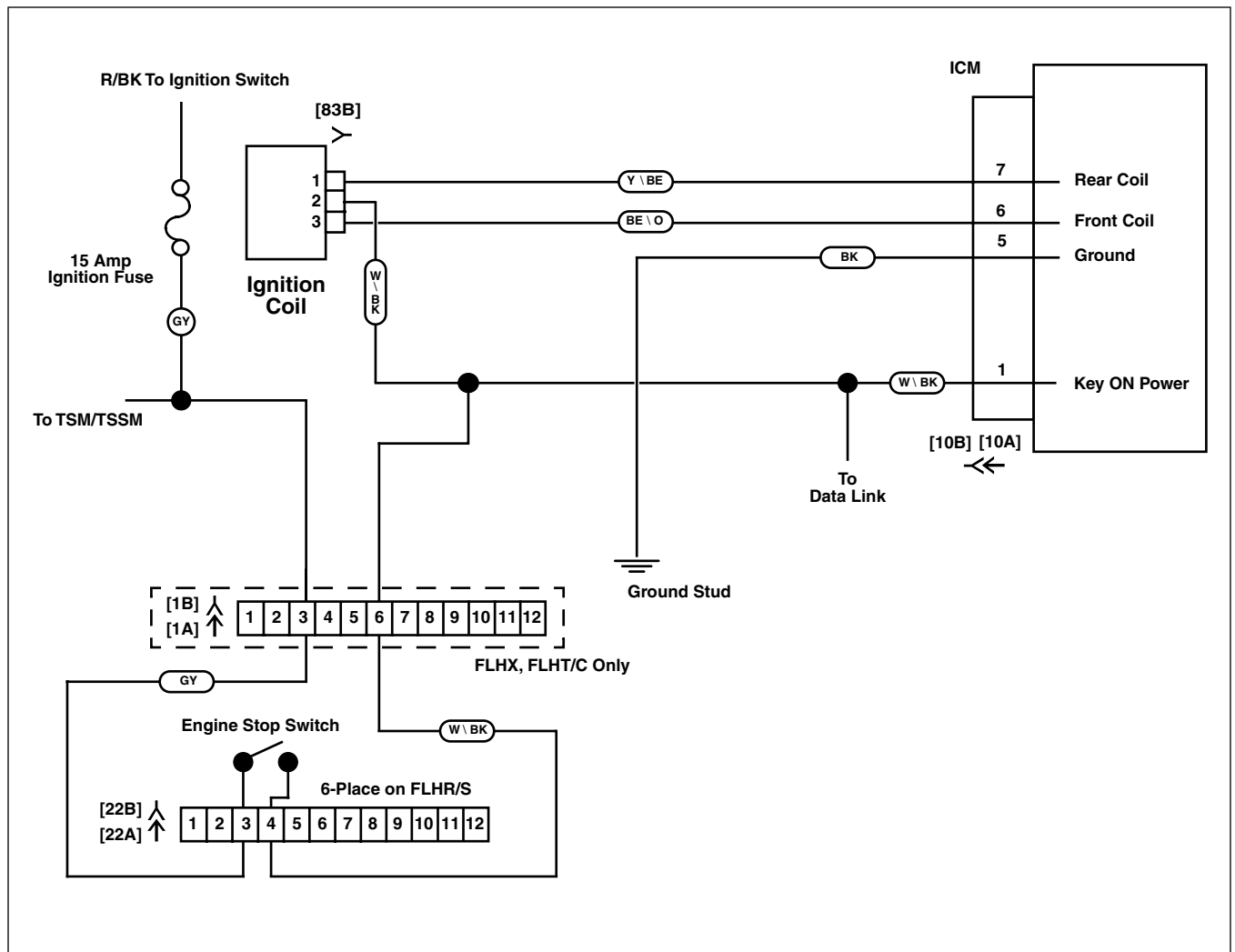


Figure 4-23. Ignition Coil Circuit

Table 4-14. Wire Harness Connectors in Figure 4-23.

NO.	DESCRIPTION	MODEL	TYPE	LOCATION
[1]	Main to Interconnect Harness	FLHT/C	12-Place Deutsch (Black)	Inner Fairing - Right Radio Support Bracket
[10]	ICM	All	12-Place Deutsch (Black)	Under Right Side Cover
[22]	Interconnect to Right Handlebar Switch Controls	FLHT/C	12-Place Deutsch	Inner Fairing- Fork Stem Nut Lock Plate
		FLHR/S	6-Place Deutsch	Inside Headlamp Nacelle
[83]	Ignition Coil	All	3-Place Delphi	Below Fuel Tank (Left Side)

Test 4.12

MISFIRE AT IDLE OR UNDER LOAD

