

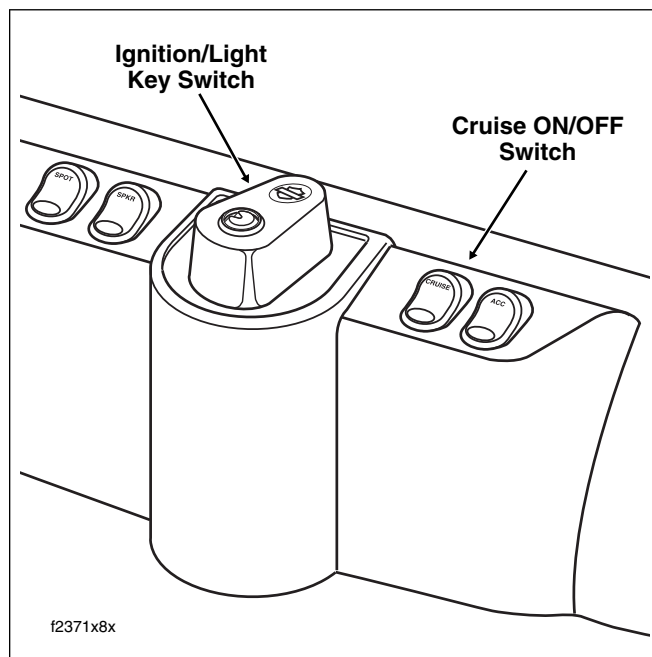
## GENERAL

The Cruise Control system provides automatic vehicle speed control. The electronics and stepper motor are contained in a control module mounted under the left side cover. The stepper motor actuates the cruise control cable through a gear train and ribbon reel.

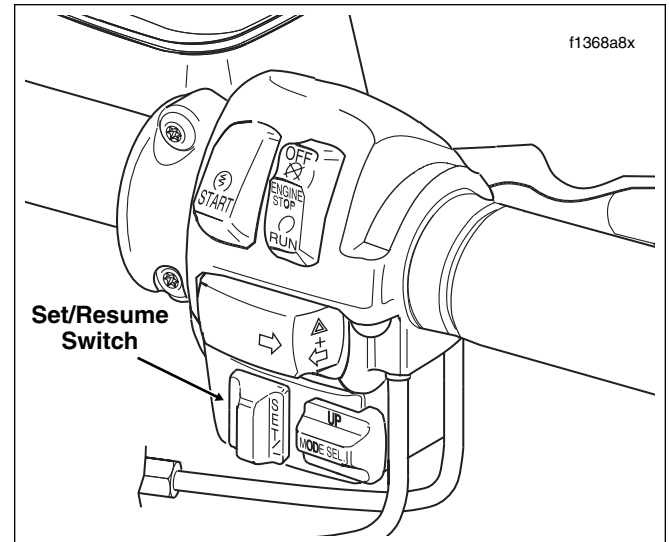
## SYSTEM OPERATION

To engage and disengage the cruise control system, proceed as follows:

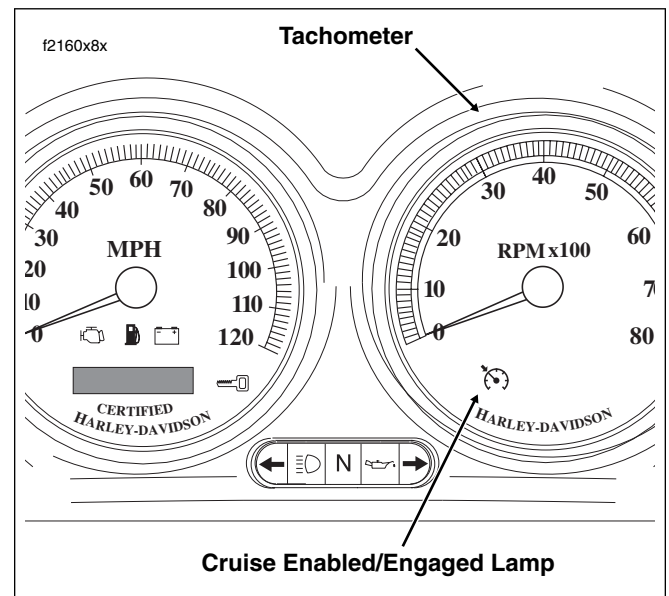
1. While riding in fourth or fifth gear, turn the Cruise ON/OFF Switch to the ON position. See [Figure 7-1](#). The switch is located on the fairing cap of FLHTCU models, the instrument nacelle of FLTR models, and the left handlebar lower switch housing on FLHRC models. The Cruise Enabled/Engaged lamp in the tachometer face (speedometer on FLHRC models) turns red to indicate that the system is activated. See [Figure 7-3](#). A red lamp in the switch on both FLHTCU and FLTR models also indicates this condition to the rider.
2. Power (12 vdc) is supplied to the cruise control module through a 15 amp fuse located in the fuse block mounted under the left side cover.
3. With the motorcycle traveling at the desired “cruise” speed (30 mph/48 km/h to 85 mph/137 km/h), momentarily push the Cruise SET/RESUME switch to SET. See [Figure 7-2](#).



**Figure 7-1. Fairing Cap (FLHTCU)**



**Figure 7-2. Right Handlebar Switch Assembly (FLTR, FLHTCU)**



**Figure 7-3. Instrument Panel (FLHTCU)**

The cruise control module “reads” the vehicle speed sensor (VSS) output to establish the desired vehicle speed. The module then sends a signal to the stepper motor which drives the ribbon reel to take up the slack in the cruise cable. The Cruise Enabled/Engaged lamp in the tachometer face (speedometer on FLHRC models) turns from red to green to indicate that the cruising speed is locked in. See [Figure 7-3](#).

4. The cruise control module monitors both the engine RPM and the VSS output speed signal. The module signals the stepper motor to open or close the throttle to keep the speedometer output speed signal constant. The engine RPM is monitored to detect engine

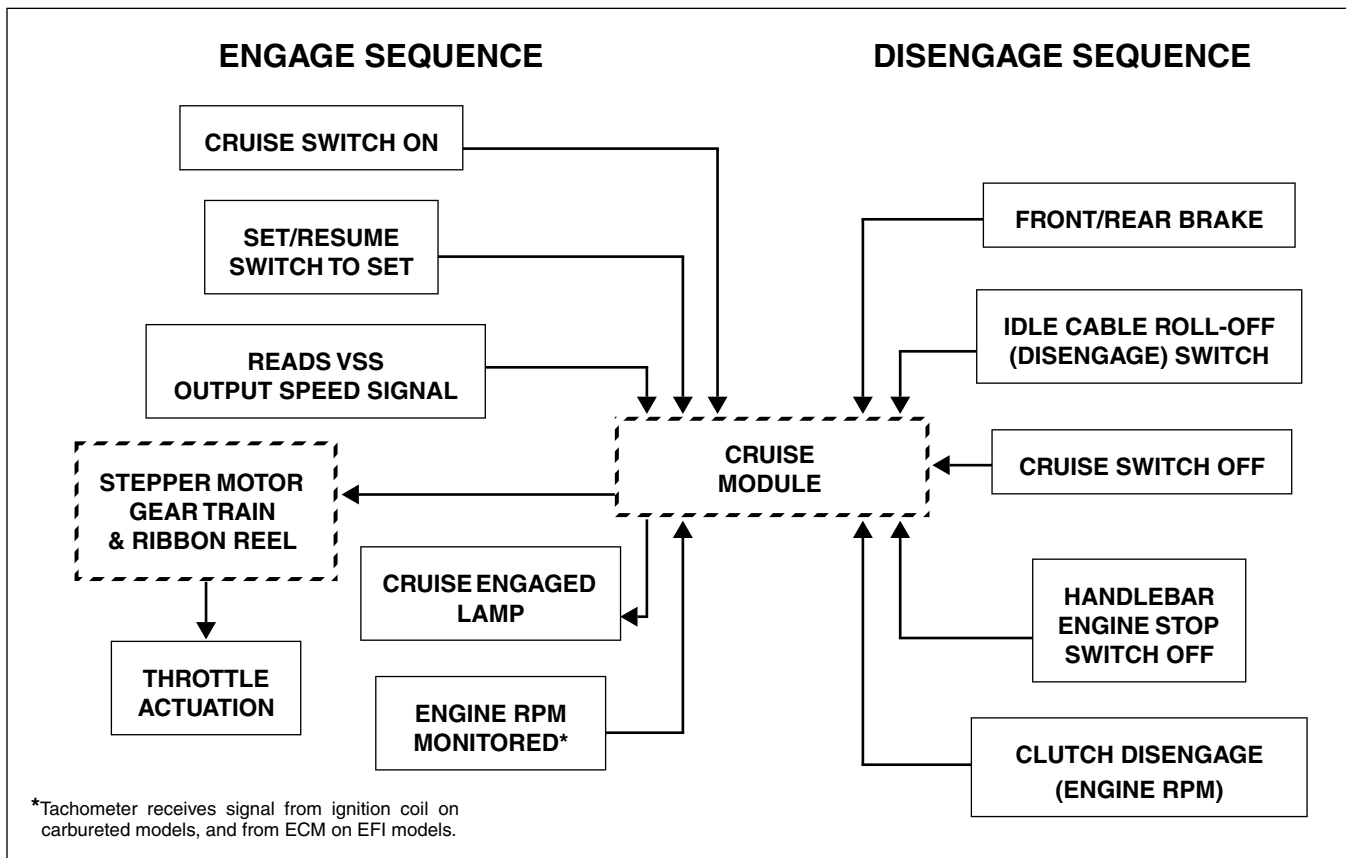


Figure 7-4. Cruise System Diagram

overspeed, a condition which automatically causes cruise disengagement.

5. The cruise control automatically disengages (stepper motor drives cruise cable to the full-out position) whenever the cruise control module receives one of the following inputs:

- a. Front or rear brake is applied.
- b. Throttle is "rolled back" or closed, thereby actuating idle cable roll-off (disengage) switch.
- c. Motorcycle clutch is disengaged (module senses too great an increase in RPM).
- d. Cruise ON/OFF Switch placed in the OFF position. The switch is located on the fairing cap of FLHTCU models, the instrument nacelle of FLTR models, and the left handlebar lower switch housing on FLHRC models. The green Cruise Enabled/Engaged lamp in the tachometer face (speedometer on FLHRC models) is extinguished to indicate that the system is deactivated. The red lamp in the fairing cap switch of FLHTCU models and the instrument nacelle switch of FLTR models is also extinguished.
- e. Handlebar mounted Engine Stop Switch placed in the OFF position. (This removes tachometer input signal which results in module disengagement.)

- f. Handlebar mounted Cruise SET/RESUME switch is pushed to SET and held in that position until vehicle speed drops below 30 mph (48 km/h).

#### NOTE

*If the vehicle speed is above 30 mph (48 km/h) when the Cruise SET/RESUME Switch is released, then the cruise system automatically re-engages.*

## TROUBLESHOOTING

The cruise module circuitry provides on-board diagnostics to help isolate any problems that might occur with the cruise system.

If the cruise is inoperative or fails to set, begin troubleshooting with [7.2 CRUISE INOPERATIVE DIAGNOSTICS](#). If the cruise seems to disengage or drop out for no apparent reason, then see [7.3 CRUISE DROPOUT DIAGNOSTICS](#).

In the diagnostic mode, the Cruise Enabled/Engaged lamp is employed as a test indicator. The lamp is in the tachometer face (speedometer on FLHRC models). See [Figure 7-3](#).

## GENERAL

Perform the following diagnostic procedures in the order presented. If the test sequence is not followed precisely, the diagnostic mode may not be exited at conclusion of the diagnostic routine and the test indicator (Cruise Engaged Lamp) may continue to flash while the engine is running.

## INOPERATIVE DIAGNOSTICS

Refer to [Table 7-2](#). All diagnostic steps are listed in table format. Follow the numbered steps to test the system. Compare the system behavior to CORRECT FUNCTION or INCORRECT FUNCTION columns and advance to the next step listed.

### Diagnostic Notes

The diagnostic notes below provides supplementary information for [Table 7-2](#).

1. If the cruise engaged lamp does not illuminate at all, check for one or more of the following conditions:
  - a. SET/RESUME switch faulty or not wired correctly.
  - b. Broken or pinched wire to SET switch or cruise module.
  - c. Cruise engaged lamp burned out or miswired. Lamp is turned on by module supplied ground.
  - d. Main 10-place connector not plugged into cruise module.
  - e. Faulty cruise main switch and associated wiring.
  - f. No module ground at Terminal E of 10-place module connector.
  - g. Brake light on constantly.
  - h. Throttle cables too tight.
  - i. Bad cruise control fuse.
2. Repeat step 1. If the cruise engaged lamp still does not illuminate, see [7.4 CRUISE CHART A: INITIAL DIAGNOSTICS](#). For cruise module connector wire color locations and functions, refer to [Table 7-1](#). Repair any problems and recheck by repeating step 1.

**Table 7-1. Cruise Module Connector [17A]**

TERMINAL	WIRE COLOR	FUNCTION AND CONNECTION
A	Red/Green	ON/OFF switch enable
B	Blue/Black	SET input from SET/RESUME switch
C	White/Blue	RESUME input from SET/RESUME switch
D	Violet/Yellow	Idle cable disengage switch (12 vdc from 15 amp fuse)
E	Black	Cruise module ground
F	Orange/Violet	12 vdc power from 15 amp fuse
G	Red/Blue	Disengage from brake relay (12 vdc)
H	Blue/Orange	Tachometer input
J	Green/Red	12 vdc from "CRUISE" indicator in instrument panel (module provides ground)
K	White/Green	Vehicle speed signal input

Table 7-2. Cruise Inoperative Diagnostics

NO.	ACTION	CORRECT FUNCTION	INCORRECT FUNCTION
<p style="text-align: center;"><i>NOTE</i></p> <p><i>For best results, be sure that throttle cables are properly adjusted. If roll-off switch is <b>not</b> continually closed, inaccurate results will occur.</i></p>			
1	Enter the diagnostic mode: With the fairing cap Cruise ON/OFF Switch at ON, and the handlebar mounted Cruise SET/RESUME Switch <b>held</b> at SET, turn the Ignition/Light Key Switch to IGNITION.	The cruise engaged lamp will illuminate and remain on as long as the Cruise SET/RESUME switch is held in the SET position.  <b>Continue with Step 2.</b>	If the cruise engaged lamp remains illuminated after the switch is released, then either the switch or related wiring is shorted. See Diagnostic Note 1 for possible causes.  <b>Continue with steps listed under Diagnostic Note 2.</b>
2	Push the handlebar mounted Cruise SET/RESUME Switch to RES(UME) and hold in this position.	The cruise engaged lamp will illuminate and remain on as long as the SET/RESUME Switch is held in the RES(UME) position.  <b>Continue with Step 3.</b>	If the cruise engaged lamp does not illuminate at all, check for one or more of the following conditions: <ul style="list-style-type: none"> <li>● RES(UME) switch not wired correctly.</li> <li>● Broken or pinched wire to RES(UME) switch or cruise module.</li> </ul> Continue with <a href="#">7.5 CRUISE CHART B: RESUME SWITCH</a> .
3	Next, turn the throttle grip tightly closed to check the throttle grip switch.	The cruise engaged lamp will illuminate when the switch is closed, and then be extinguished when the throttle grip returns to its free position.  <b>Continue with Step 4.</b>	If the cruise engaged lamp does not illuminate at all, check for one or more of the following conditions: <ul style="list-style-type: none"> <li>● Throttle grip switch not wired correctly.</li> <li>● Broken or pinched wire to throttle grip switch or cruise module.</li> <li>● Throttle grip switch not working correctly.</li> </ul> Continue with <a href="#">7.11 CRUISE CHART G: THROTTLE SWITCH</a> .
4	Apply the brake hand lever.	The cruise engaged lamp will illuminate and remain on until the brake lever is released.  <b>Continue with Step 5.</b>	If the cruise engaged lamp does not illuminate at all, check for one or more of the following conditions: <ul style="list-style-type: none"> <li>● Front brake switch not wired correctly.</li> <li>● Broken or pinched wire to front brake switch or cruise module.</li> <li>● Front brake switch not working properly.</li> </ul> See <a href="#">7.9 CRUISE CHART F-1: BRAKE LIGHTS ON</a> (constant brake light input) or <a href="#">7.10 CRUISE CHART F-2: BRAKE LIGHTS OFF</a> (no front and/or rear brake lights).
5	Press and hold the brake foot pedal for at least 5 seconds.	The cruise engaged lamp will illuminate. After depressing and holding the brake foot pedal for 5 seconds, the lamp will be extinguished. Release the brake pedal and the cruise module will momentarily pull the throttle open slightly and then release.  <b>Continue with Step 6.</b>	The cruise engaged lamp will not illuminate if any of the following conditions exist: <ul style="list-style-type: none"> <li>● Rear brake switch not wired correctly.</li> <li>● Broken or pinched wire to rear brake switch or cruise control module.</li> <li>● Rear brake switch not working properly.</li> </ul> The throttle will not open if the following conditions exist: <ul style="list-style-type: none"> <li>● Cables not adjusted properly.</li> <li>● Faulty cruise control module.</li> </ul> See <a href="#">7.9 CRUISE CHART F-1: BRAKE LIGHTS ON</a> (constant brake light input) or <a href="#">7.10 CRUISE CHART F-2: BRAKE LIGHTS OFF</a> (no front and/or rear brake lights).

**Table 7-2. Cruise Inoperative Diagnostics**

NO.	ACTION	CORRECT FUNCTION	INCORRECT FUNCTION
6	Rotate rear wheel.	<p>The cruise engaged lamp will flash on and off indicating that the vehicle speed signal is wired properly and working correctly.</p> <p><b>Continue with Step 7.</b></p>	<p>The cruise engaged lamp will not illuminate if any of the following conditions exist:</p> <ul style="list-style-type: none"> <li>● Vehicle speed signal not wired correctly.</li> <li>● Broken or pinched wire to speedometer.</li> <li>● Speedometer not working properly.</li> <li>● Vehicle speed signal wiring disconnected.</li> </ul> <p>See <a href="#">7.12 CRUISE CHART H: SPEEDOMETER INPUT</a>.</p>
7	Turn the fairing cap Cruise ON/OFF Switch and the Ignition/Light Key Switch to OFF. Disconnect spark plug wires.	<b>Continue with Step 8.</b>	
8	Press SET/RESUME Switch to RES(UME), and hold.	<b>Continue with Step 9.</b>	
9	While holding SET/RESUME Switch at RES(UME), turn Ignition/Light Key Switch to ON and crank engine. (If weak battery or poor connections result in low system voltage, Diagnostic Mode may be aborted.)	<p>The cruise engaged lamp flashes with RPM input.</p> <p><b>Continue with Step 10.</b></p>	<p>The cruise engaged lamp does not flash with RPM input.</p> <p>See <a href="#">7.13 CRUISE CHART I: TACHOMETER INPUT</a>.</p>
10	While continuing to hold SET/RESUME Switch at RES(UME), turn fairing cap Cruise ON/OFF Switch to ON. Release SET/RESUME Switch.	<p>Cruise engaged lamp blinks twice.</p> <p>NOTE: Lamp may go on for three seconds if RPM signal was above cranking speed.</p> <p><b>DIAGNOSTIC ROUTINE EXITED</b></p>	
11	To restart or repeat the diagnostic sequence, return to step 1.		

## GENERAL

To check for diagnostic codes, see [DROPOUT DIAGNOSTICS](#) below. If other problems are experienced, such as harsh cruise engagement or speed loss, see [Table 7-4](#).

## DROPOUT DIAGNOSTICS

The last eight diagnostic codes for cruise disengagement are stored in memory.

- To enter the diagnostic mode, turn the engine off and proceed as follows:
  - Turn the fairing cap Cruise ON/OFF switch to OFF. The light in the rocker switch is extinguished to indicate this condition to the operator.
  - Push the Cruise SET/RESUME Switch on the right handlebar to SET and hold.
  - Turn the Ignition/Light Key Switch to IGNITION, but do not start the engine.
  - Release the Cruise SET/RESUME Switch from the SET position while observing the behavior of the Cruise Enabled/Engaged Lamp on the tachometer gauge (speedometer on FLHRC models).
- The system transmits the most recent cruise dropout code. Each dropout code consists of 3 digits and is sent out as a series of flashes.
- The lamp will begin by flashing one or more times to indicate the first digit of the dropout code. The length of time the lamp is illuminated and the length of time in which it is off are each about 1/4 second in duration. Simply count the number of times the lamp flashes in order to retrieve the first digit of the dropout code.
- Following transmission of the first digit, there is a one second pause in which the lamp is off. The lamp will then flash one or more times to indicate the second digit of the dropout code. Count the number of times the lamp flashes to retrieve the second digit. See [Figure 7-5](#).
- Following transmission of the second digit, there is a another one second pause in which the lamp is off. The lamp will then flash one or more times to indicate the third digit of the dropout code. Again, count the number of times the lamp flashes to retrieve the third digit.
- Write down the dropout code on a piece of paper. To identify the reason for cruise disengagement see [Table 7-3](#). The last column of the table suggests the appropriate corrective action.
- To verify the dropout code, toggle the Cruise SET/RESUME Switch to RESUME. The transmission of the most recent dropout code is repeated. To continue with the next code, simply toggle the Cruise Switch to SET. All subsequent codes are sent in the same manner as the first, after which the operator may repeat the code or move on to the next in the series.
- After the eighth (or oldest) dropout code is flashed, the Cruise Engaged Lamp remains illuminated to indicate that the end of the dropout code buffer has been reached.
- To start the sequence at the beginning, that is, with transmission of the most recent dropout code, momentarily push the Cruise SET/RESUME Switch to SET.
- To exit the diagnostic mode, turn the Ignition/Light Key Switch to OFF.

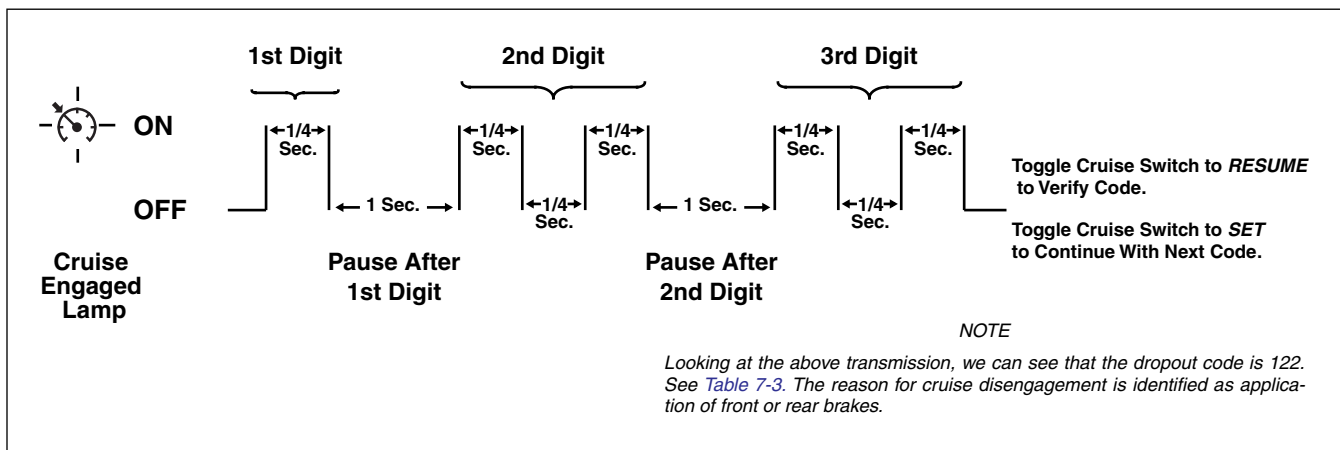


Figure 7-5. Cruise Engaged Lamp Dropout Code Timing Diagram

**Table 7-3. Cruise Dropout Code Key**

CODE	CONDITION	ACTION
		NOTE While performing instructions under applicable flow chart, wiggle connectors and wires to identify intermittents.
111	Initial State or Cleared Memory (No Codes Recorded)	-
112	Throttle Roll Off	7.11 CRUISE CHART G: THROTTLE SWITCH
113	Fairing Cap Cruise Switch Turned OFF	7.8 CRUISE CHART E: CRUISE ENABLE
121	Short in Wiring Between Set/Resume	7.4 CRUISE CHART A: INITIAL DIAGNOSTICS or 7.5 CRUISE CHART B: RESUME SWITCH
122	Application of Front or Rear Brakes <i>NOTE</i> May require inspection of brake levers or front brake light switch mounting.	7.9 CRUISE CHART F-1: BRAKE LIGHTS ON
211	Coast (S/C Button Engaged) Interval Longer than 6 Seconds	7.4 CRUISE CHART A: INITIAL DIAGNOSTICS
212	Speed Drops Below 30 MPH While in Coast (S/C Button Engaged)	7.4 CRUISE CHART A: INITIAL DIAGNOSTICS or 7.12 CRUISE CHART H: SPEEDOMETER INPUT
213	Speed Drops Below 26 MPH or Exceeds 90 MPH	7.12 CRUISE CHART H: SPEEDOMETER INPUT
221	Speed Drops 15 MPH Below Set Speed (Such as When Climbing a Steep Hill)	7.12 CRUISE CHART H: SPEEDOMETER INPUT
222	Speed Decreases Greater than 20 MPH per Second	7.12 CRUISE CHART H: SPEEDOMETER INPUT
223	Vehicle Speed Sensor Input	7.12 CRUISE CHART H: SPEEDOMETER INPUT
231	Over 5000 RPM	7.13 CRUISE CHART I: TACHOMETER INPUT
232	Loss of Tachometer Signal	7.13 CRUISE CHART I: TACHOMETER INPUT
242	High Rate of Change of RPM Detected (Such as When Clutch is Pulled In or Contact is Made With Ice Patch or Slippery Surface)	7.13 CRUISE CHART I: TACHOMETER INPUT
311	Internal Failure	Replace cruise module. See the Touring Models Service Manual.
312		
313		
321		
323		
331		
332		
333		
341	Low Voltage	7.7 CRUISE CHART D: CRUISE POWER
342	Internal Failure	Replace cruise module. See the Touring Models Service Manual.
343		
351		
352		
353		
361		
362		
363		
371		
423		
432		
777		

**Table 7-4. Other Malfunctions**

CONDITION	SYMPTOM	CHECK FOR
Harsh engagement	Cruise control opens throttle abruptly or harshly	Check for a cruise cable that is too tight. See CABLE LASH INITIALIZATION in the Touring Models Service Manual.
Speed variation	Loses speed	<ul style="list-style-type: none"><li>● Cruise cable too loose. See CABLE LASH INITIALIZATION in the Touring Models Service Manual.</li><li>● Set switch held too long.</li></ul>
	Gains speed	<ul style="list-style-type: none"><li>● Cruise cable too tight. See CABLE LASH INITIALIZATION in the Touring Models Service Manual.</li></ul>
	Speed surges	<ul style="list-style-type: none"><li>● Intermittent vehicle speed signal.</li><li>● Intermittent speedometer.</li><li>● Defective cruise module. See CRUISE MODULE, REMOVAL/INSTALLATION, in the Touring Models Service Manual.</li></ul> <p><i>NOTE</i> <i>Check for surging with cruise control turned OFF. If surging is still present, a lean fuel mixture may be the cause.</i></p>



## DIAGNOSTICS

## Test 7.4 (Part 1 of 2)

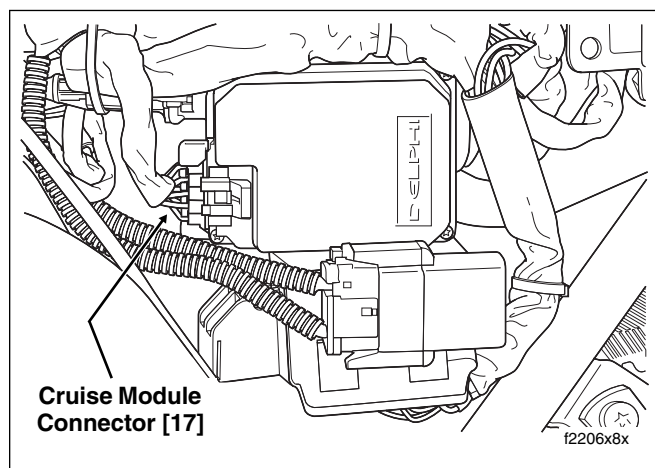
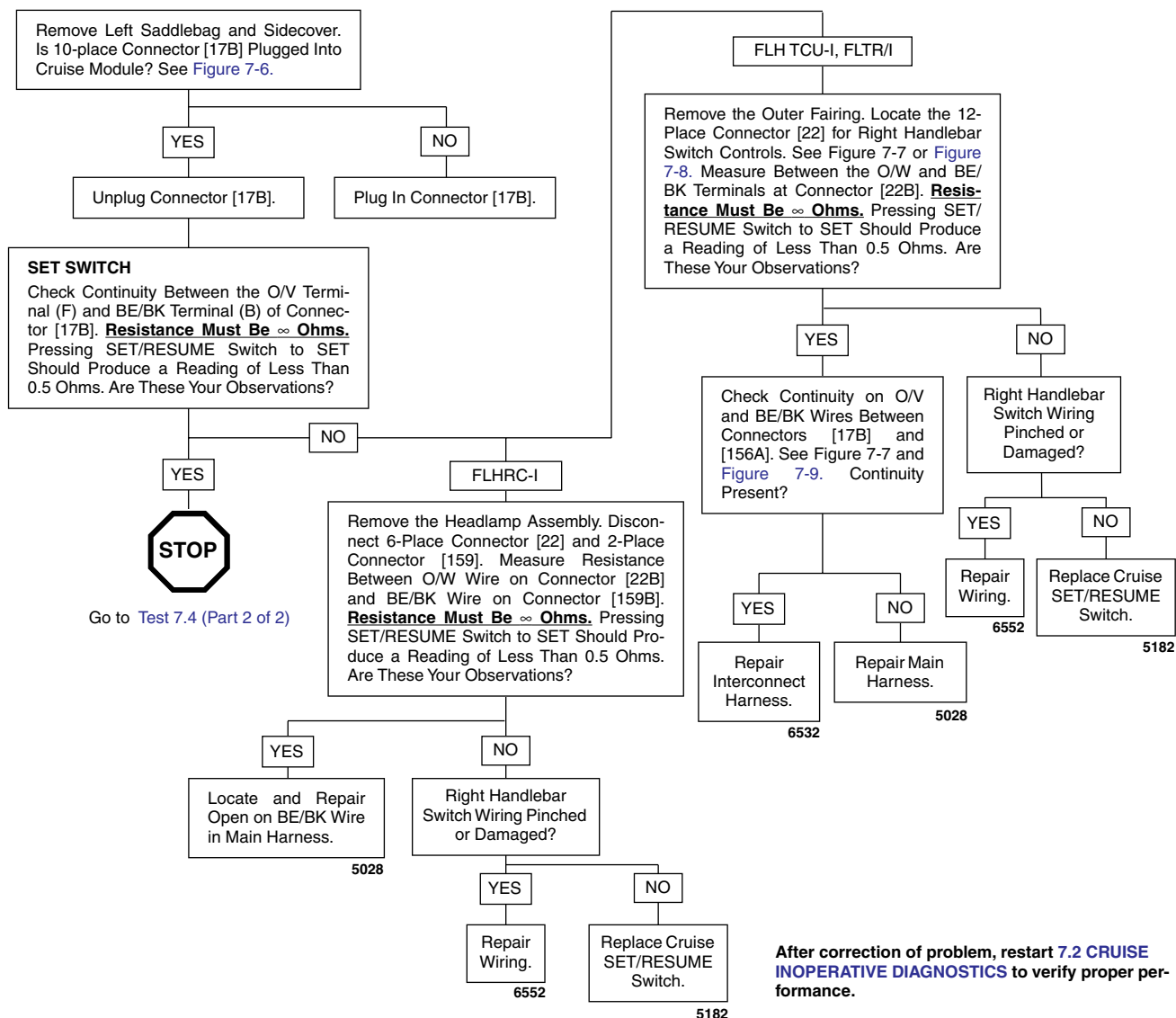
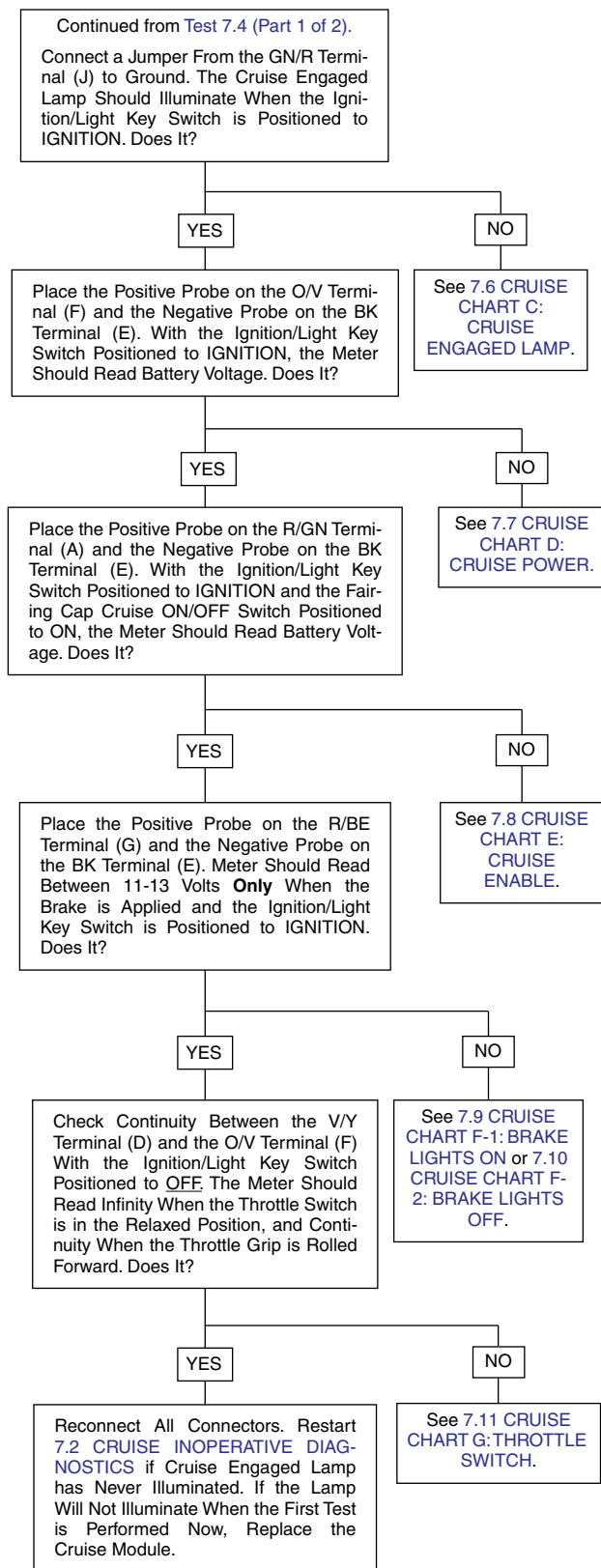


Figure 7-6. Left Side Cover Removed

## Test 7.4 (Part 2 of 2)

### INITIAL DIAGNOSTICS



6635

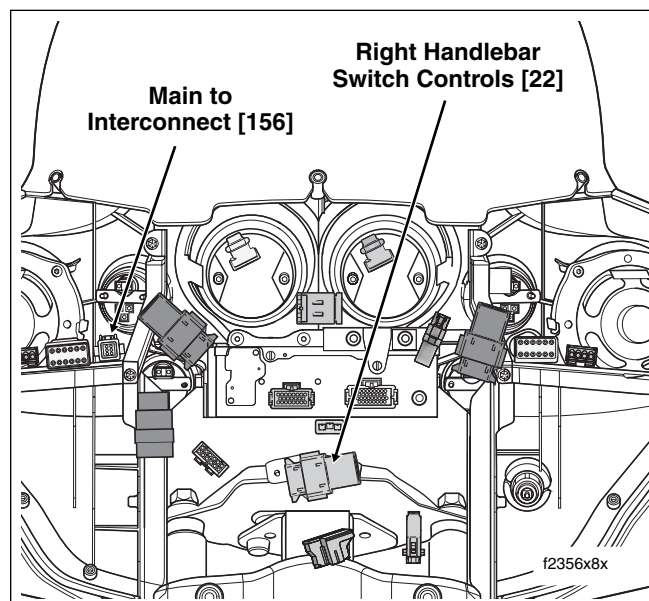


Figure 7-7. Outer Fairing Removed (FLHTC/U)

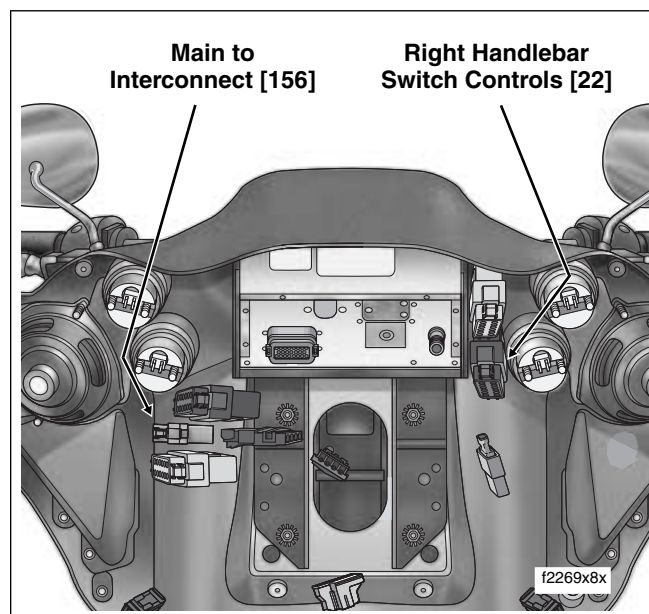
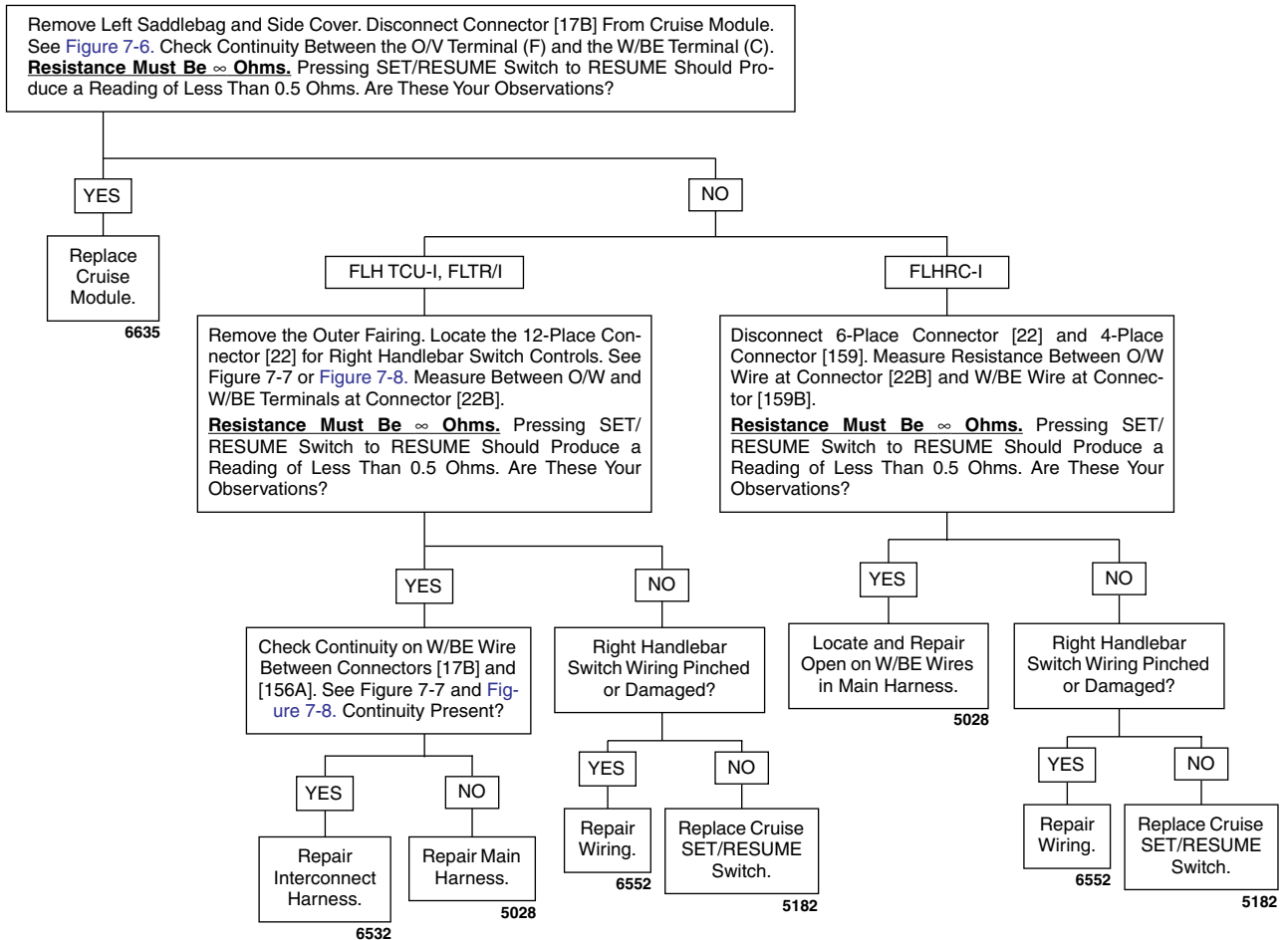


Figure 7-8. Outer Fairing Removed (FLTR)

## DIAGNOSTICS

## Test 7.5

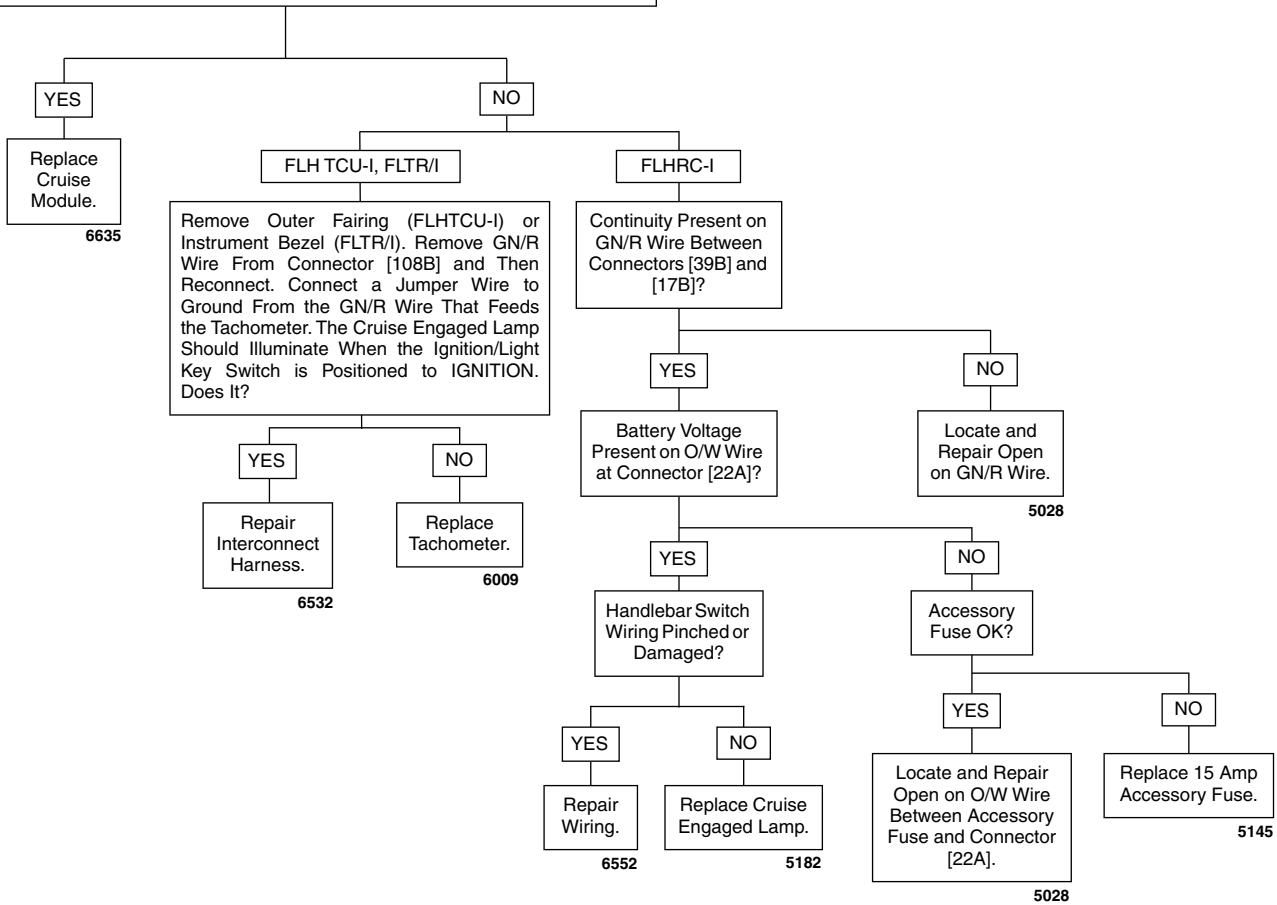


After correction of problem, restart 7.2 CRUISE INOPERATIVE DIAGNOSTICS to verify proper performance.

## DIAGNOSTICS

## Test 7.6

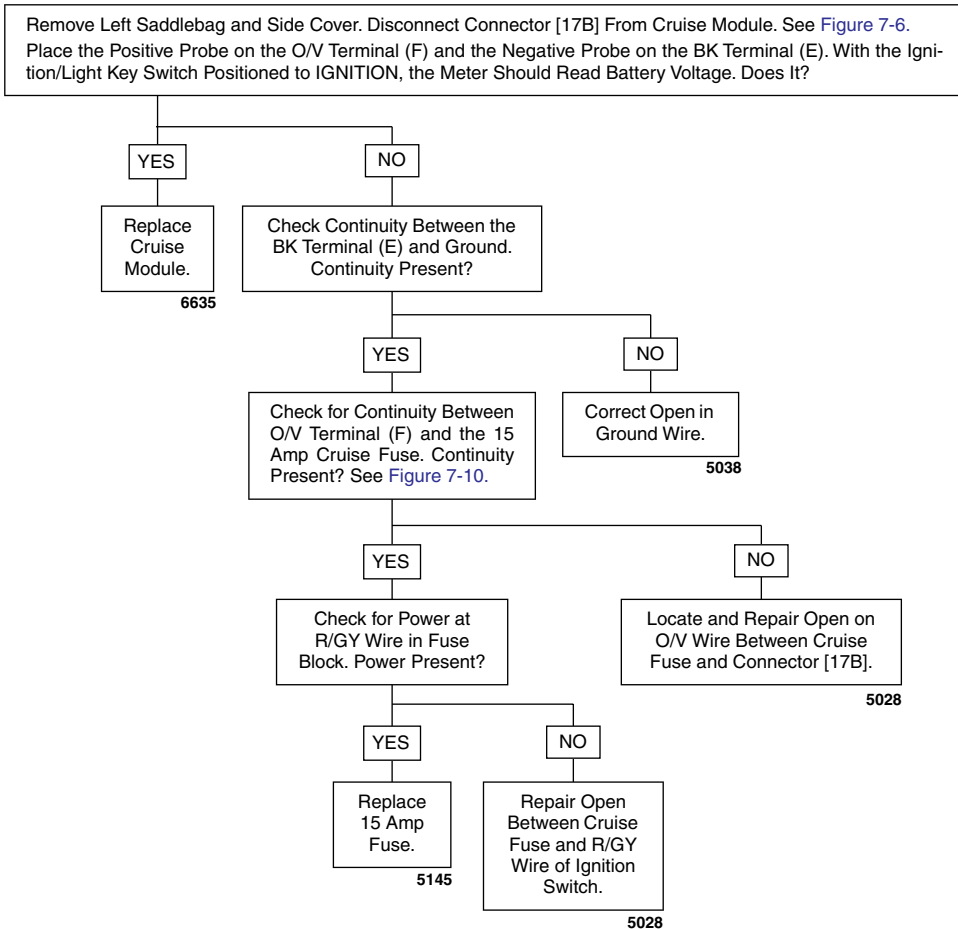
Remove Left Saddlebag and Side Cover. Disconnect Connector [17B] From Cruise Module. See [Figure 7-6](#). Connect a Jumper From the GN/R Terminal (J) to Ground. The Cruise Engaged Lamp Should Illuminate When the Ignition/Light Key Switch is Positioned to IGNITION. Does it?



After correction of problem, restart [7.2 CRUISE INOPERATIVE DIAGNOSTICS](#) to verify proper performance.

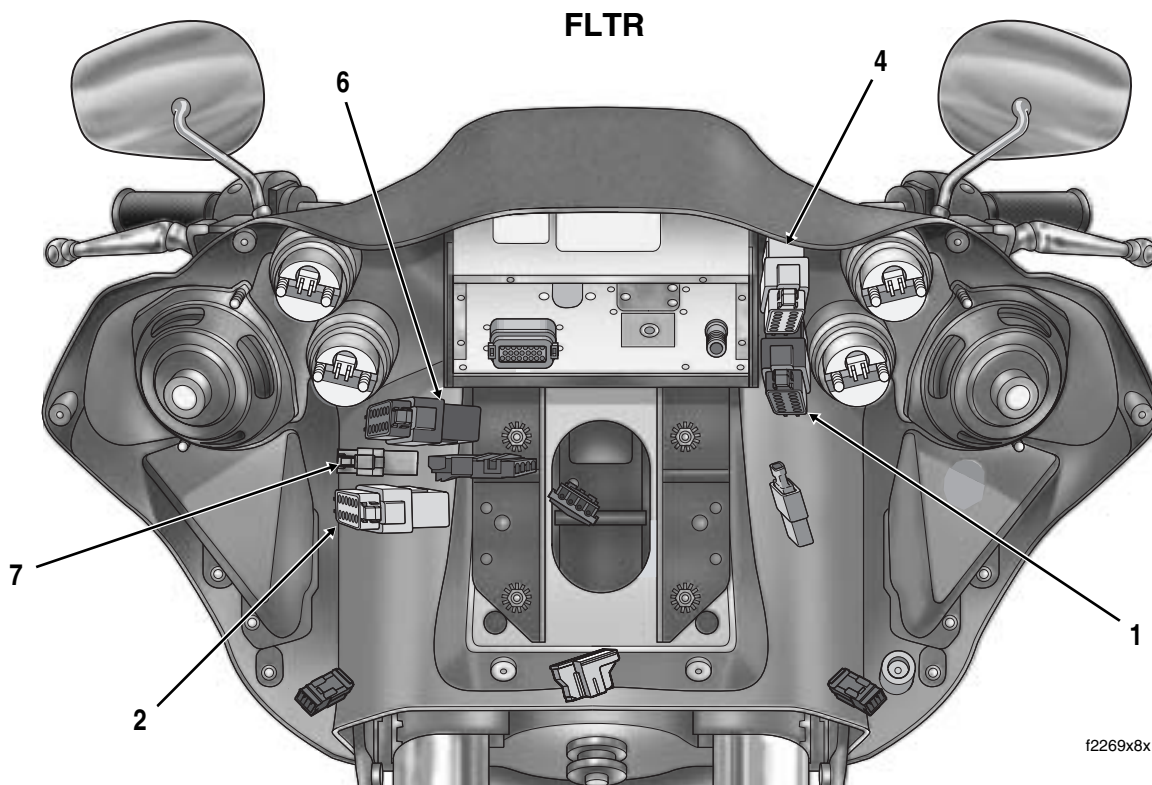
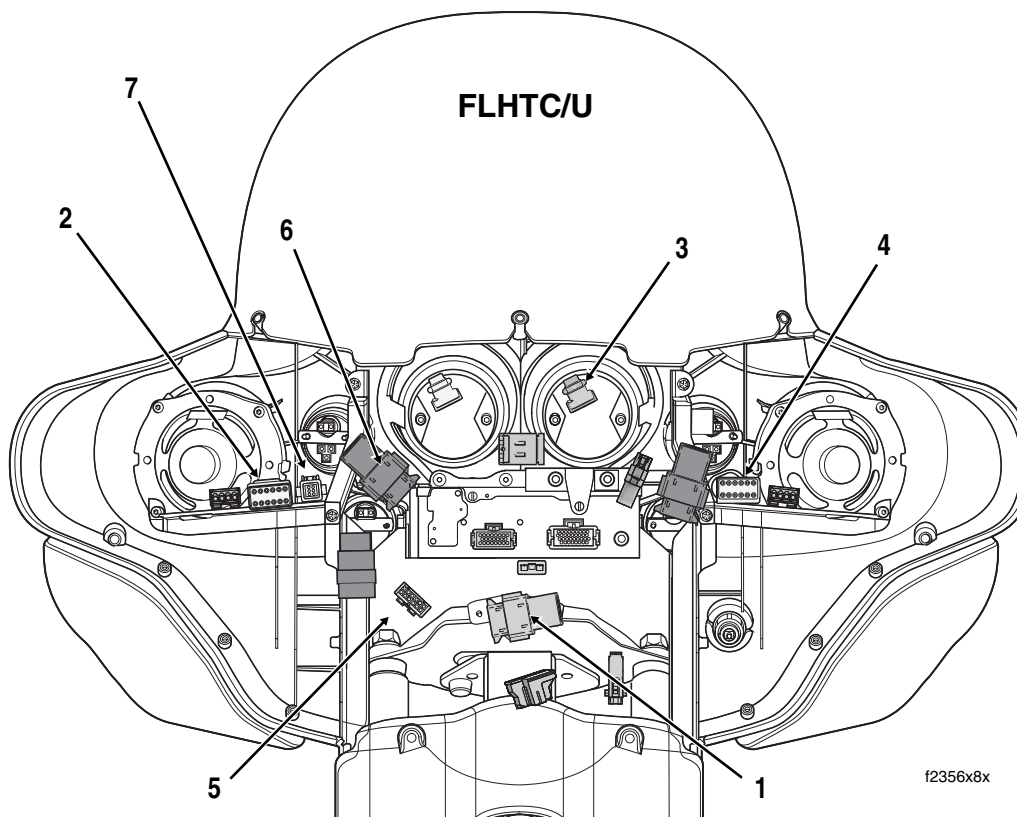
## DIAGNOSTICS

## Test 7.7



After correction of problem, restart [7.2 CRUISE INOPERATIVE DIAGNOSTICS](#) to verify proper performance.

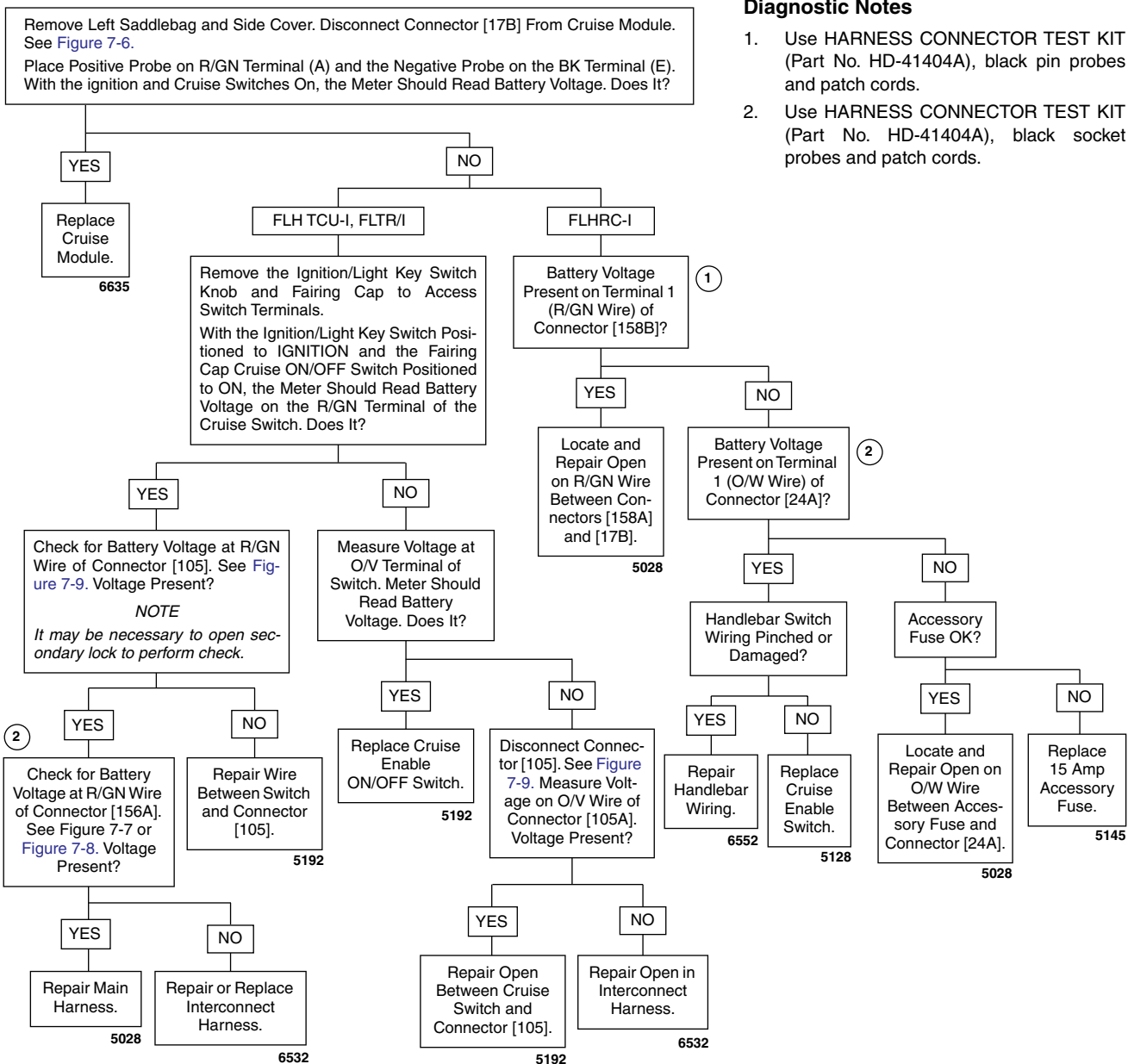
- |   |                                       |
|---|---------------------------------------|
| 1. Right Handlebar Switch Controls [22] | 5. Fairing Cap [105]                  |
| 2. Main to Interconnect Harness [2]     | 6. Main to Interconnect Harness [1]   |
| 3. Speedometer Gauge [39]               | 7. Main to Interconnect Harness [156] |
| 4. Left Handlebar Switch Controls [24]  |                                       |



**Figure 7-9. Outer Fairing Removed**

## DIAGNOSTICS

## Test 7.8



## Diagnostic Notes

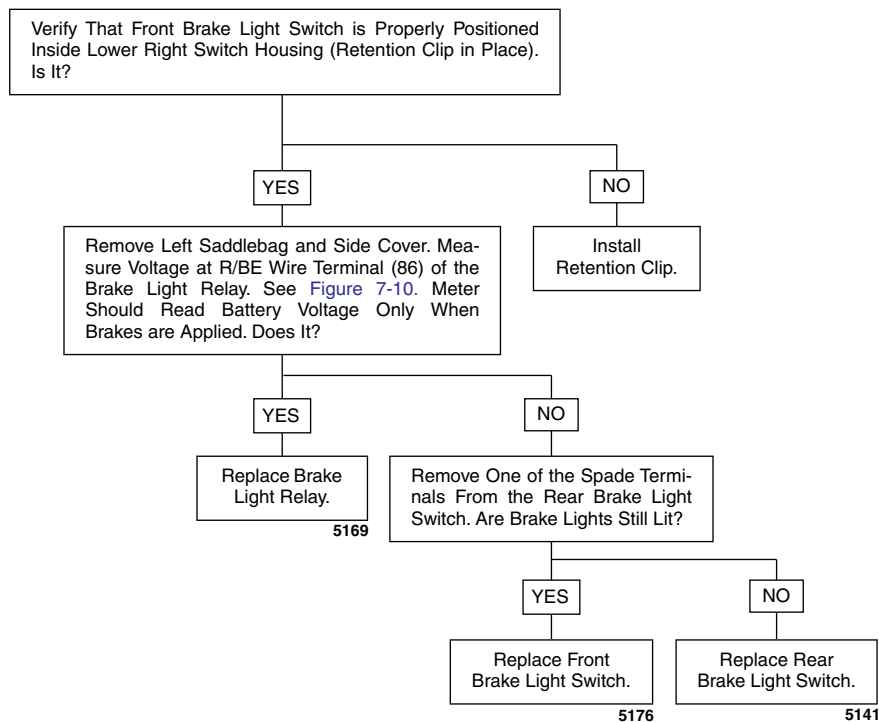
1. Use HARNESS CONNECTOR TEST KIT (Part No. HD-41404A), black pin probes and patch cords.
2. Use HARNESS CONNECTOR TEST KIT (Part No. HD-41404A), black socket probes and patch cords.

After correction of problem, restart [7.2 CRUISE INOPERATIVE DIAGNOSTICS](#) to verify proper performance.

## DIAGNOSTICS

## Test 7.9

## CONSTANT BRAKE LIGHT INPUT



After correction of problem, restart [7.2 CRUISE INOPERATIVE DIAGNOSTICS](#) to verify proper performance.

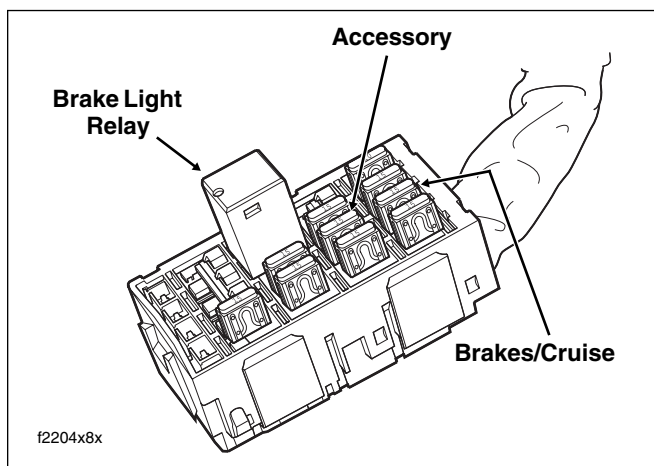


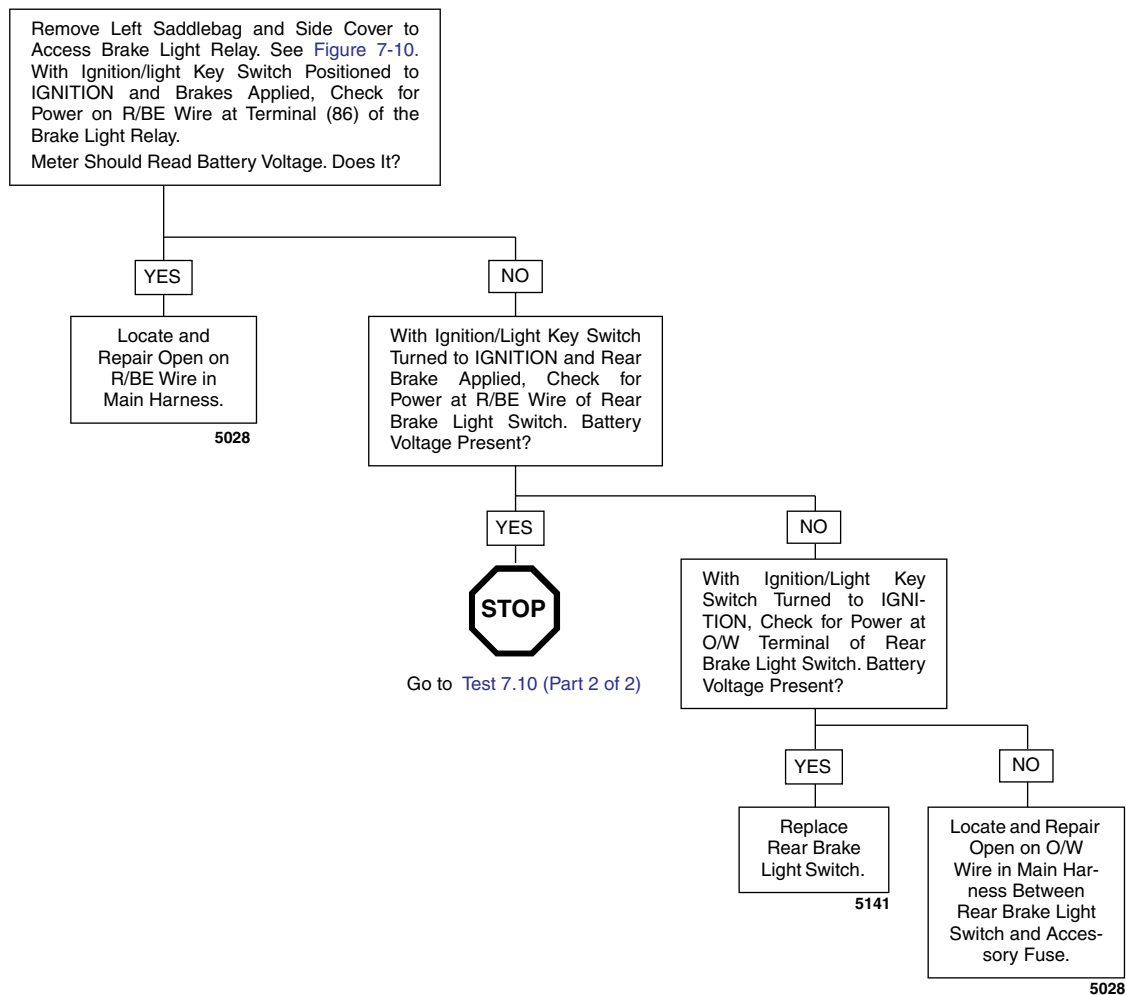
Figure 7-10. Fuse Block (FLHTCU-I)



## DIAGNOSTICS

### Test 7.10 (Part 1 of 2)

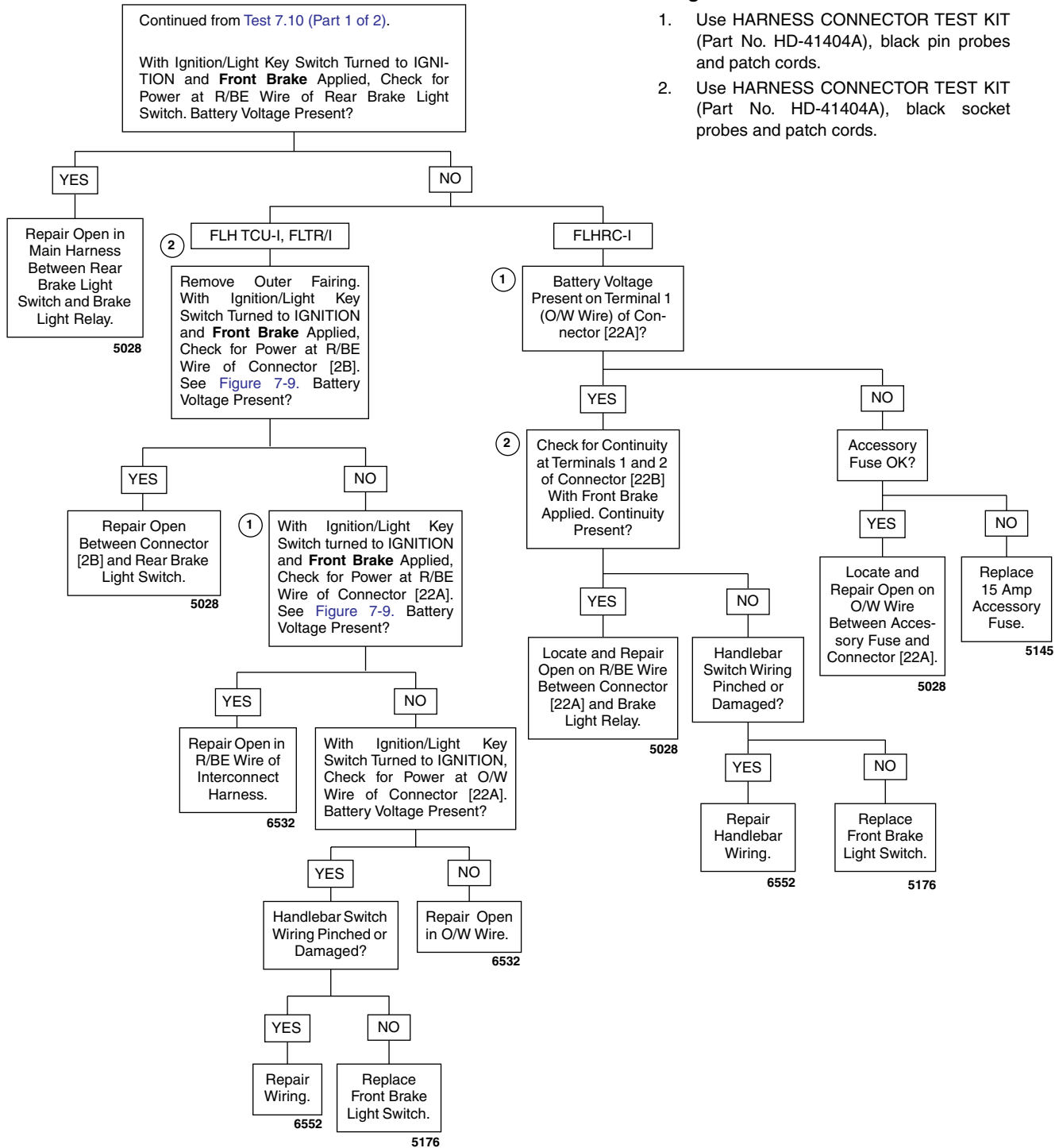
#### NO FRONT AND/OR REAR BRAKE LIGHTS



After correction of problem, restart [7.2 CRUISE INOPERATIVE DIAGNOSTICS](#) to verify proper performance.

## Test 7.10 (Part 2 of 2)

### NO FRONT AND/OR REAR BRAKE LIGHTS



#### Diagnostic Notes

1. Use HARNESS CONNECTOR TEST KIT (Part No. HD-41404A), black pin probes and patch cords.
2. Use HARNESS CONNECTOR TEST KIT (Part No. HD-41404A), black socket probes and patch cords.

After correction of problem, restart [7.2 CRUISE INOPERATIVE DIAGNOSTICS](#) to verify proper performance.

## DIAGNOSTICS

## Test 7.11

**THROTTLE SWITCH**

Remove Left Saddlebag and Side Cover. Disconnect Connector [17B] From Cruise Module. See [Figure 7-11](#).

With the Ignition/Light Key Switch Positioned to **OFF**, Check Continuity Between the V/Y Terminal (D) and the O/V Terminal (F). The Meter Should Read Infinity When the Throttle Switch is in the Relaxed Position and Continuity When the Throttle Grip is Rolled Forward. Are These Your Observations?

YES

NO

Restart [7.2 CRUISE INOPERATIVE DIAGNOSTICS](#) to Verify That Problem is Corrected. If the Cruise Engaged Lamp Will Not Illuminate When This Step is Performed Now, Replace The Cruise Module.

6635

Adjust the Idle Throttle Cable and Retest for Continuity. Continuity Present?

YES

NO

System OK.

Check for Continuity Directly at Throttle Switch. Continuity Should Only be Present When the Throttle is Rolled Forward Under Pressure. Is It?

YES

NO

Battery Voltage Present on O/V Throttle Switch Terminal [75D]?

Replace Idle Throttle Cable.

2241

YES

NO

Locate and Repair Open on Y/V Wire in Main Harness.

Locate and Repair Open on O/V Throttle Switch Wires in Main Harness.

5028

5028

After correction of problem, restart [7.2 CRUISE INOPERATIVE DIAGNOSTICS](#) to verify proper performance.

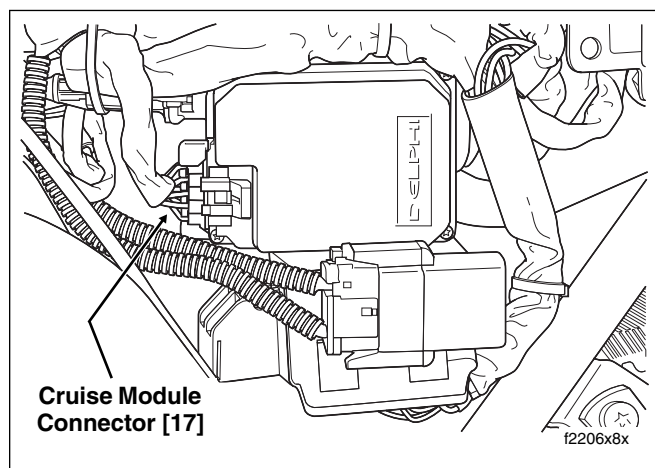


Figure 7-11. Left Side Cover Removed

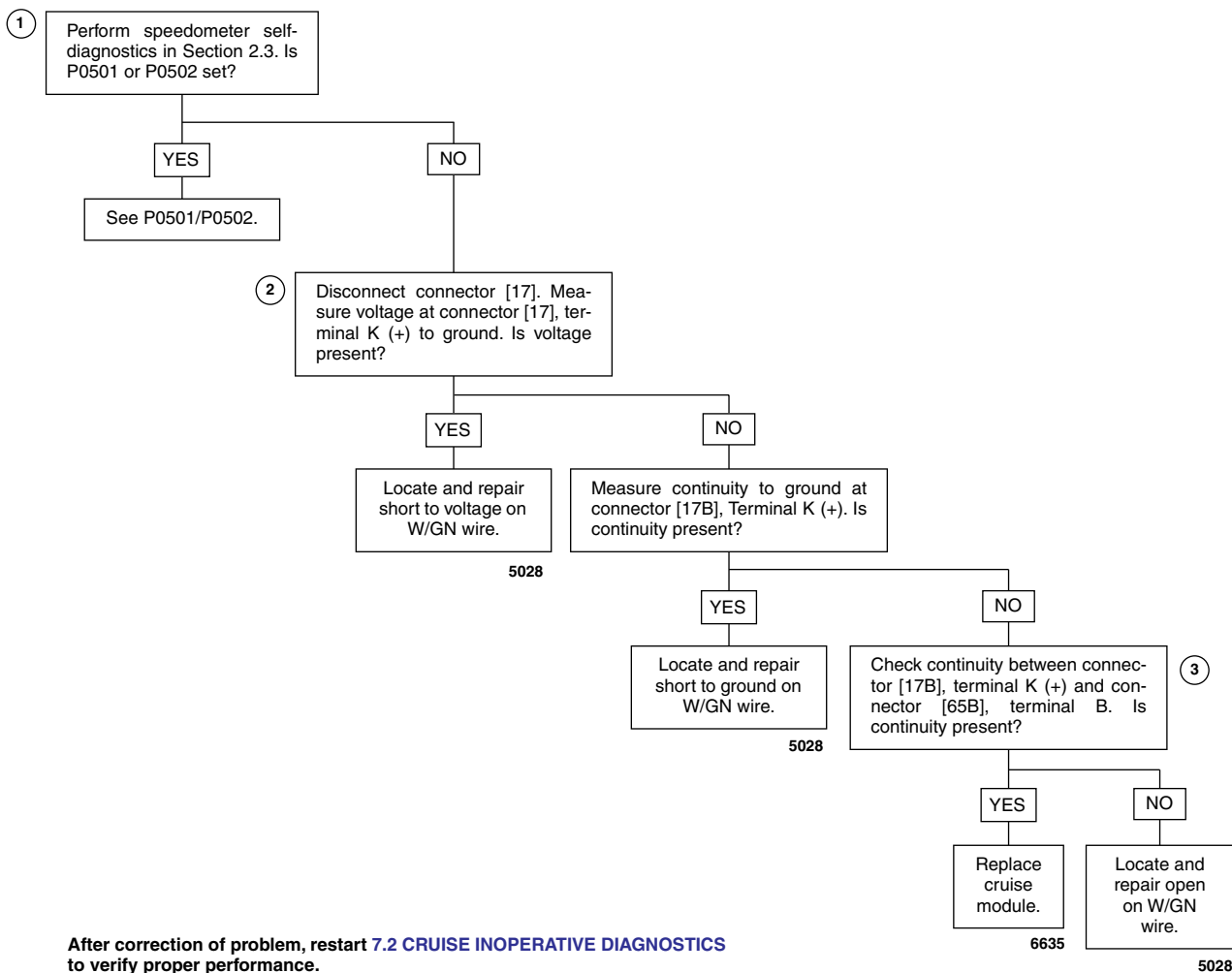
## DIAGNOSTICS

### Diagnostic Notes

1. To enable Diagnostic Mode, see [2.3 SPEEDOMETER SELF DIAGNOSTICS](#).

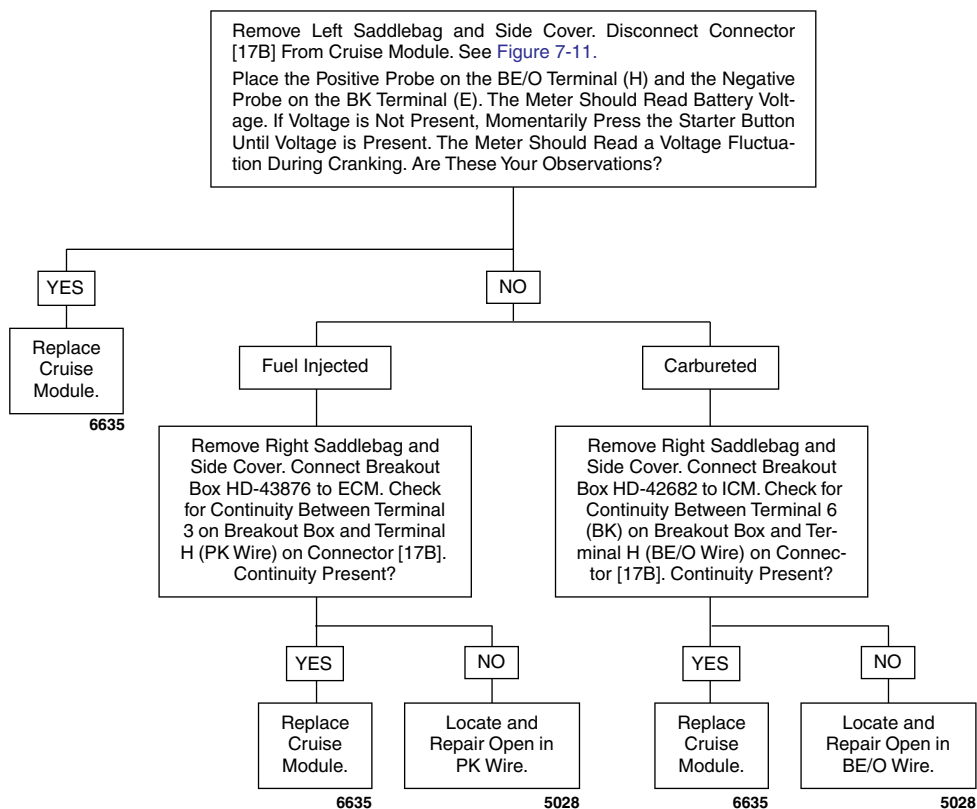
2. Use HARNESS CONNECTOR TEST KIT (Part No. HD-41404A), gray pin probe and patch cord.
3. Use HARNESS CONNECTOR TEST KIT (Part No. HD-41404A), black pin probe and patch cord.

### Test 7.12



## DIAGNOSTICS

## Test 7.13



After correction of problem, restart [7.2 CRUISE INOPERATIVE DIAGNOSTICS](#) to verify proper performance.

