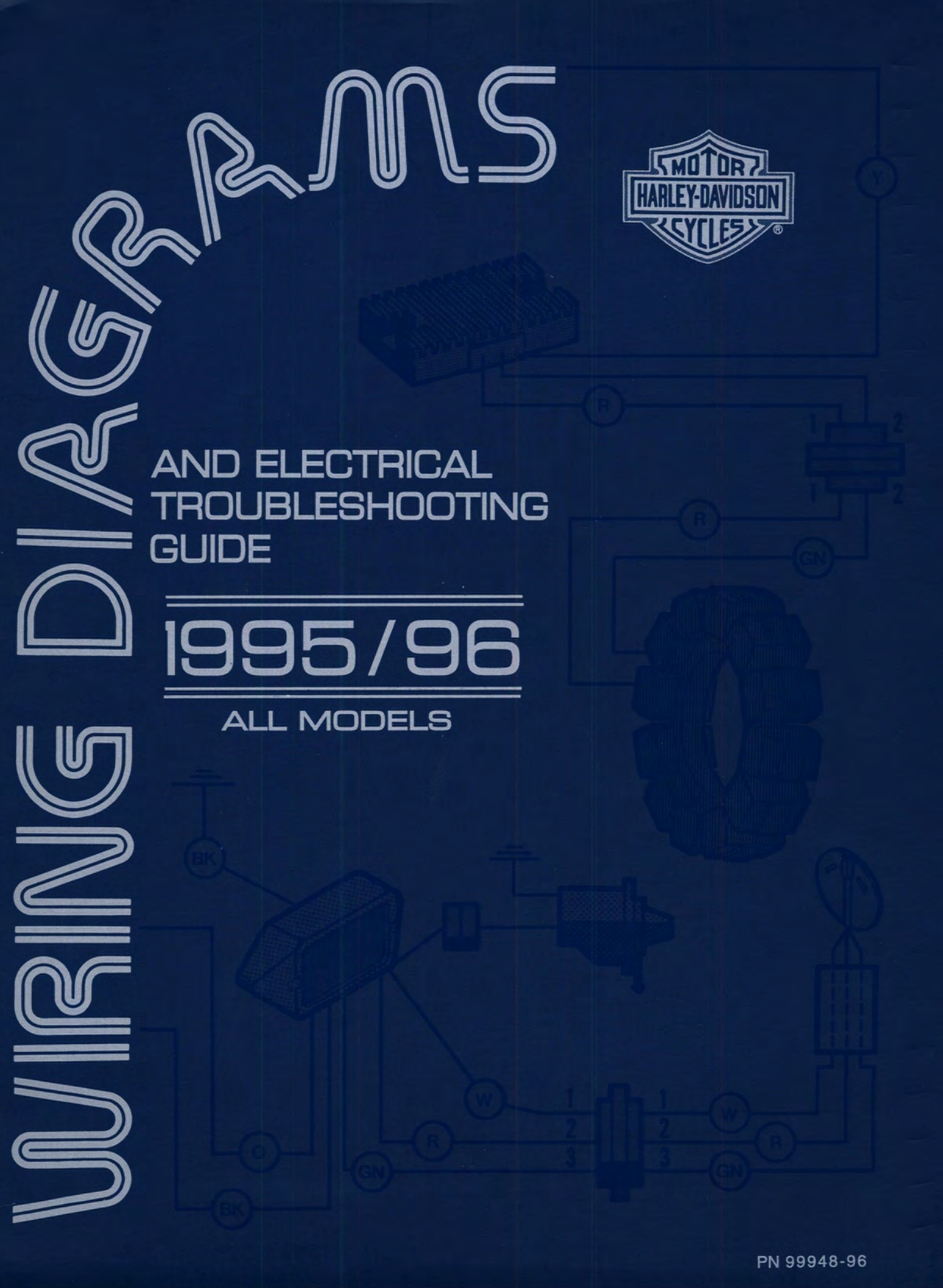
WIRING DIAGRAMS

HARLEY-DAVIDSON MOTOR CYCLES

AND ELECTRICAL TROUBLESHOOTING GUIDE

1995/96

ALL MODELS



PN 99948-96

ELECTRICAL WIRING DIAGRAMS AND TROUBLESHOOTING MANUAL FOR 1995-1996 MODEL HARLEY-DAVIDSON MOTORCYCLES AND SIDECARS

TABLE OF CONTENTS

CMI-3M-12/95

A. ELECTRICAL TROUBLESHOOTING - GENERAL

BATTERY

GENERAL

The battery is located on the left side of the motorcylce on XLH models and below the seat on FX, FXD and FL models. The battery stores electrical energy for the purposes of starting the motorcycle, operating accessories when the engine is not running, and providing additional current (above that generated by the alternator) when required. The battery will remain in good condition if the current draw is balanced by the current input.

⚠WARNING

Lead-acid motorcycle batteries contain sulfuric acid, which is highly corrosive and can cause severe chemical burns. Avoid contact with skin, eyes, and clothing. Always wear protective face shield, rubberized gloves, and protective clothing when working near batteries or electrolyte. Warning label (shown below) is located on top or back panel of all batteries. Never remove warning label from battery.

⚠ DANGER – EXPLOSIVE GASES

Cigarettes, flames, or sparks could cause battery to explode. Always shield eyes and face from battery. Do not charge without proper instruction and training. Securely connect cables to the proper terminals. Check vent tube to avoid any crimping or obstruction of the tube.

KEEP FILLING PLUGS TIGHT AND LEVEL

POISON – CAUSES SEVERE BURNS

Contains sulfuric acid. Avoid contact with skin, eyes, and clothing. In event of accident, flush with water and call a physician immediately.

KEEP OUT OF REACH OF CHILDREN

ANTIDOTE

EXTERNAL – Flush with water.

INTERNAL – Drink large quantities of milk or water, followed by milk of magnesia, vegetable oil, or beaten eggs. Call doctor immediately.

EYES – Flush eyes with water, and get immediate medical attention.

TESTING

1. Remove battery from motorcycle; see BATTERY, DISCONNECTION AND REMOVAL in Section 8 of the Service Manual. Place battery on a level surface.

2. Remove six battery cell filler caps.

⚠WARNING

Electrolyte is a sulfuric acid solution. Avoid spillage and contact with skin, eyes, and clothing. Wear protective face shield, rubberized gloves and protective clothing when working near batteries or electrolyte solution. See warning label on back panel or top of battery. Inadequate safety precautions may result in personal injury and/or property damage.

3. If electrolyte level in any battery cell is below upper level mark on battery case, add **distilled water** as required to bring electrolyte level up to that mark.

4. Fully charge battery (see BATTERY, MAINTENANCE AND CHARGING in Section 8 of the Service Manual), and allow battery to stand at least one hour before testing.

5. Check SPECIFIC GRAVITY of electrolyte in each battery cell using a HYDROMETER (Part No. HD-96910-35); if electrolyte temperature is not 80˚F (27˚C), adjust specific gravity readings for temperature differences – see NOTE below.

NOTE

When using a syringe hydrometer, read electrolyte level at bottom of meniscus (curved upper surface of fluid).

Specific gravity changes with temperature differences. When the temperature increases, specific gravity of a typical fluid decreases, and vice versa. If electrolyte temperature in battery is not 80˚F (27˚C), use the following formula to compute temperature-corrected specific gravity:

- *For each 10˚F (5.5˚C) above 80˚F (27˚C), add 0.004 to actual specific gravity reading.*
- *For each 10˚F (5.5˚C) below 80˚F (27˚C), subtract 0.004 from actual specific gravity reading.*

For example:

Electrolyte temperature	*100˚F (38 ˚C)*
Hydrometer reading	*1.272*
Adjustment for temperature	*+0.008*
Corrected specific gravity	*1.280*

The difference in temperature-corrected specific gravity values between the cell with the highest value and the cell with the lowest value must be less than 0.050 specific gravity In addition, a temperature-corrected specific gravity of at least 1.220 must exist in each cell of the fully charged battery. If battery does not meet both of these conditions, it should be replaced.

6. Install six battery cell filler caps.

⚠WARNING

Always turn battery load tester OFF before connecting or disconnecting tester cables at battery terminals. Connecting or disconnecting tester cables with load tester ON could cause a spark and a possible battery explosion. A battery explosion may rupture the battery case, spraying sulfuric acid onto the surrounding area and personnel; this may result in serious injury.

⚠CAUTION

- **Never load test a discharged battery; otherwise, battery might sustain permanent damage.**
- **Do not leave load tester switch turned ON for more than 20 seconds; otherwise, load tester and battery might overheat and sustain permanent damage.**

1. See Figure 1. Fully charge the battery before testing. Load battery to three times amp hour rating using the load tester. See the table below.

MODEL	LOAD
XLH, FX, FXD	19 amp/hr
FL	20 amp/hr

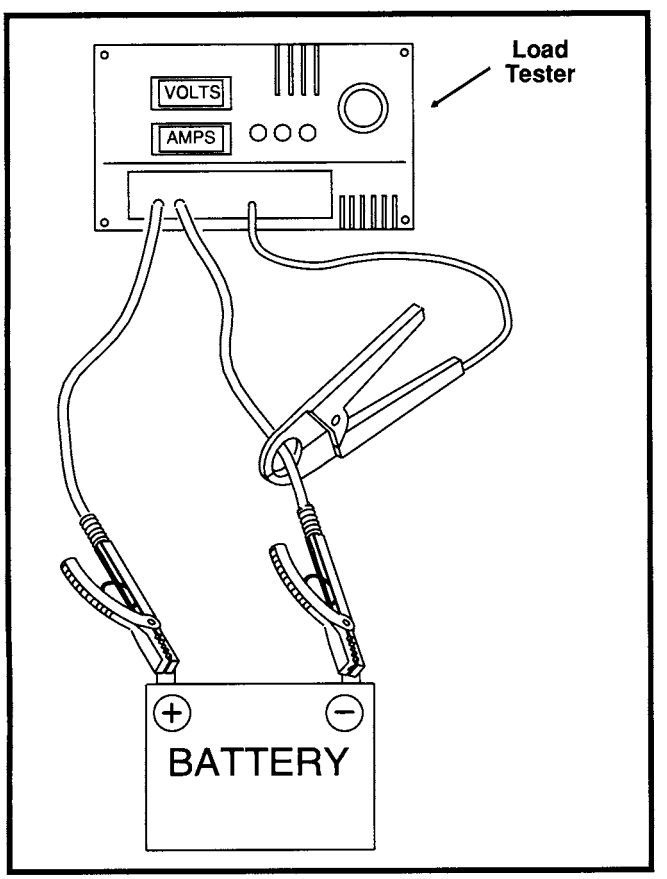


Figure 1. Battery Load Test

2. Connect tester leads to battery posts and place induction pickup over negative (black) cable. The Harley Davidson 20 amperes hour battery should be loaded to 60 amperes. Voltage reading after fifteen seconds should be 9.6 volts or more.
3. Install fully charged battery onto motorcycle; see BATTERY, INSTALLATION AND CONNECTION in Section 8 of the Service Manual.

CHARGING SYSTEM - CARBURETED

NOTE

For troubleshooting the charging system on fuel injected models, refer to page 183 of this document.

GENERAL

Alternator

The alternator consists of two main components: the rotor which is mounted on the engine sprocket shaft, and the stator, which is bolted to the engine crankcase.

Regulator

The regulator is a series regulator with shunt control. The circuit combines the functions of rectifying and regulating.

TROUBLESHOOTING

Special Tools	Torque Values
Ammeter Load tester Ohmmeter AC voltmeter	None

Preliminary Checks

When the charging system fails or does not charge at a satisfactory rate, it is recommended that the following checks be made:

BATTERY

Check for a weak or dead battery. See the BATTERY section. Battery must be fully charged in order to perform any electrical tests.

WIRING

Check for corroded or loose connections in the charging circuit. Refer to wiring diagrams at the back of this book.

Regulator Inspection

The regulator base must have a clean, tight connection for proper grounding. Check by using an ohmmeter with one lead on a known good ground, such as battery ground cable, and the other on the regulator base.

Connector plug at engine crankcase must be clean and tight.

Regulator Bleed Test

Be sure regulator is connected to battery. Unplug regulator connector at engine crankcase. Use a trouble light and touch one probe to a known good ground and the other to the regulator pins, one at a time. If light glows, replace regulator.

MILLIAMP DRAW TEST

NOTE

Be sure accessories are not wired so they stay on at all times. Check for this by connecting ammeter between negative battery terminal and battery.

See Figure 2. Connect ammeter between negative battery terminal and battery. With this arrangement, you will also pick up any regulator drain.

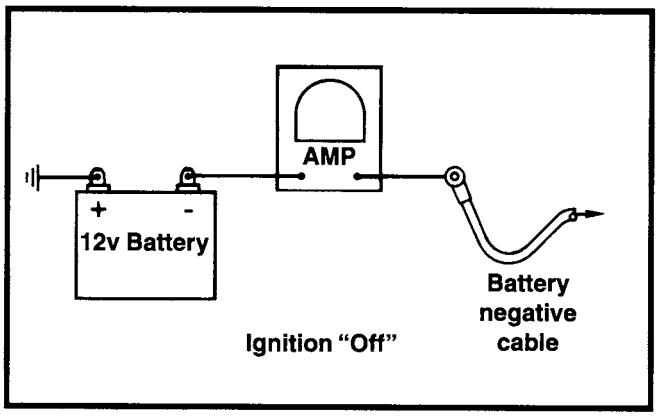


Figure 2. Milliamp Draw Test

The limits for these drains are listed in the tabulation below:

Any accessories must be considered and checked for excessive drain.

This condition could drain battery completely if vehicle is parked for a long time.

NOTE

A battery with surface discharge condition or over full could cause a static drain. Correct by lowering levels in cells and cleaning battery case.

MODEL	METER READING (milliamperes)
FLHTC	Less than 10 (radio memory)
FLTC Ultra & FLHTC Ultra	Less than 15 (radio & CB memory)
All models without radio	Less than 3 (regulator leakage)

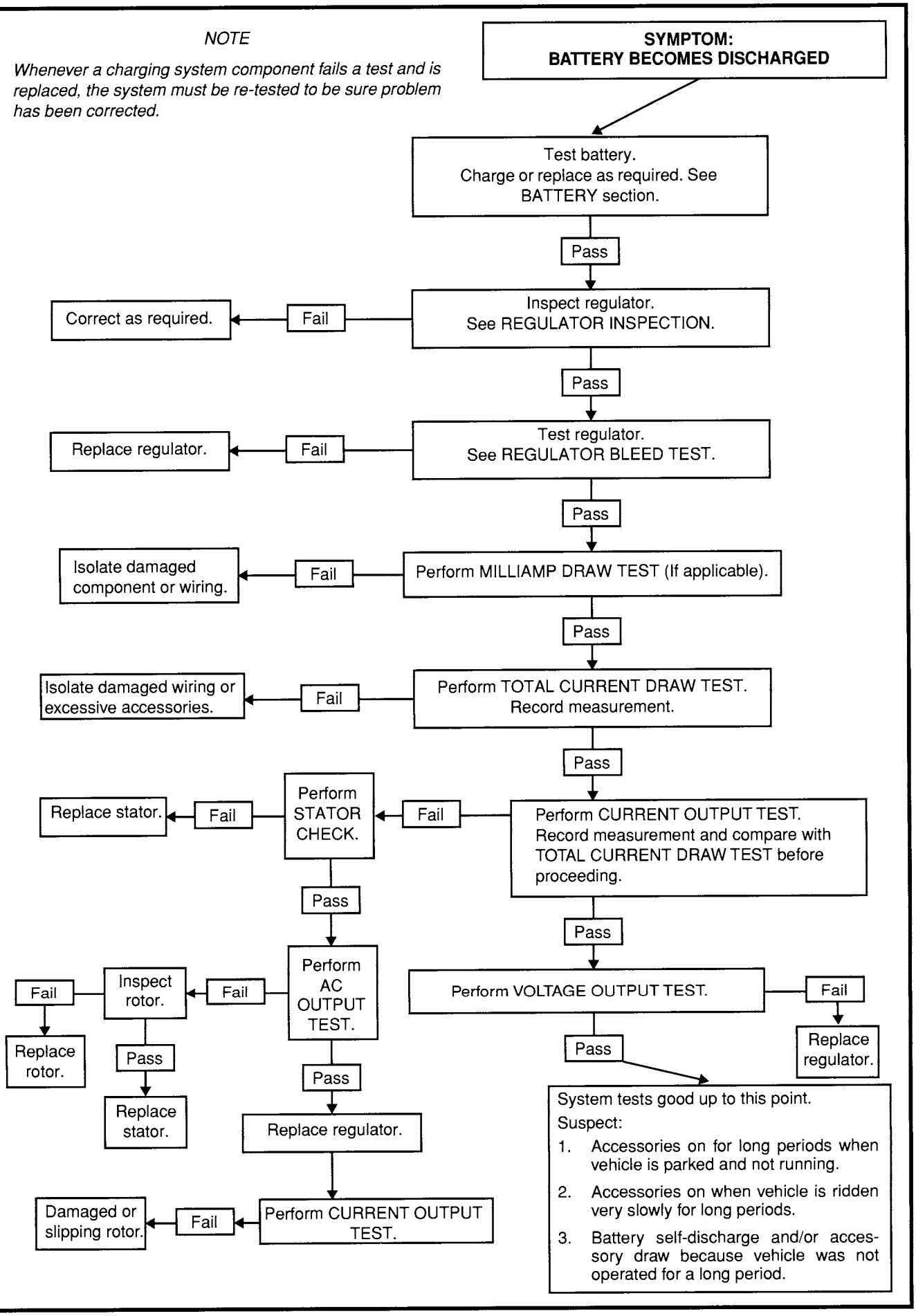
NOTE

Any reading that exceeds the above "Meter reading" values indicates excessive current draw. Check for bad radio, CB, regulator or a short in the interconnecting wiring. Isolate problem by disconnecting suspect components and observe change in meter reading.

CHARGING SYSTEM TROUBLESHOOTING - CARBURETED

NOTE

Whenever a charging system component fails a test and is replaced, the system must be re-tested to be sure problem has been corrected.



Charging System Tests - XLH Models

Total Current Draw Test

See Figure 3. If battery runs down during use, the current draw of the motorcycle components and accessories may exceed output of the charging system. To check for this condition, place load tester induction pickup or current probe pickup, over battery negative cable as shown below.

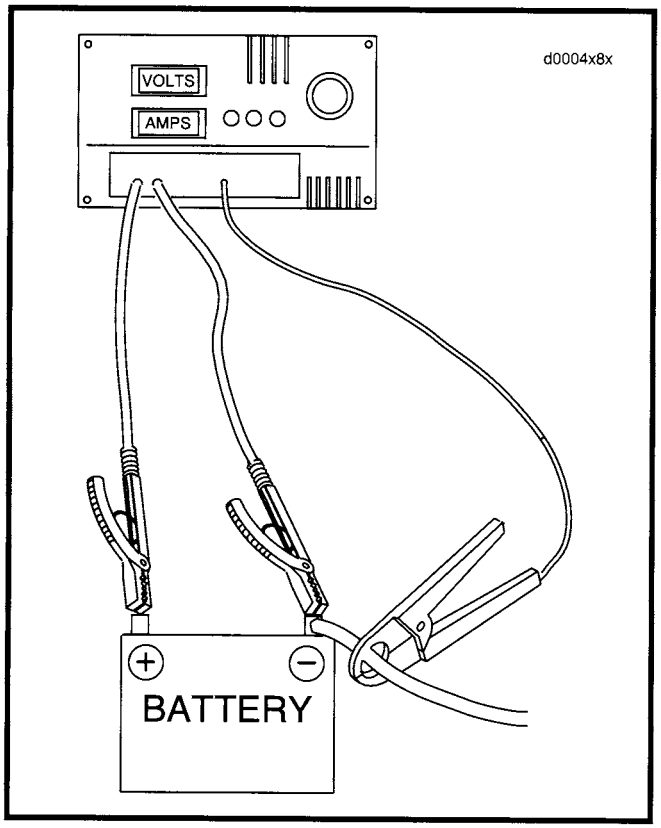


Figure 3. Check Current Draw (Ignition Switch On)

Disconnect the regulator from the stator at the connector in front of the crankcase and start the motorcycle. Start engine and run at 2000 rpm.

With ignition and all continuously running lights and accessories turned on (headlamp on high beam) read the total current draw. Compare this reading to the reading obtained in CURRENT AND VOLTAGE OUTPUT TEST. The current output should exceed current draw by 3.5 amps, minimum. If not, there may be too many accessories for the charging system to handle.

Reconnect the regulator after the test.

NOTE

Rider's habits may require output test at lower RPM.

Current and Voltage Output Test

1. Connect load tester negative and positive leads to battery terminals and place load tester induction pickup over positive regulator cable as shown in Figure 4.

2. Run the engine at 2,000 R.P.M. Increase the load as required to obtain a constant 13.0 volts.

3. The current output should be 19-23 amps. Make note of measurement.

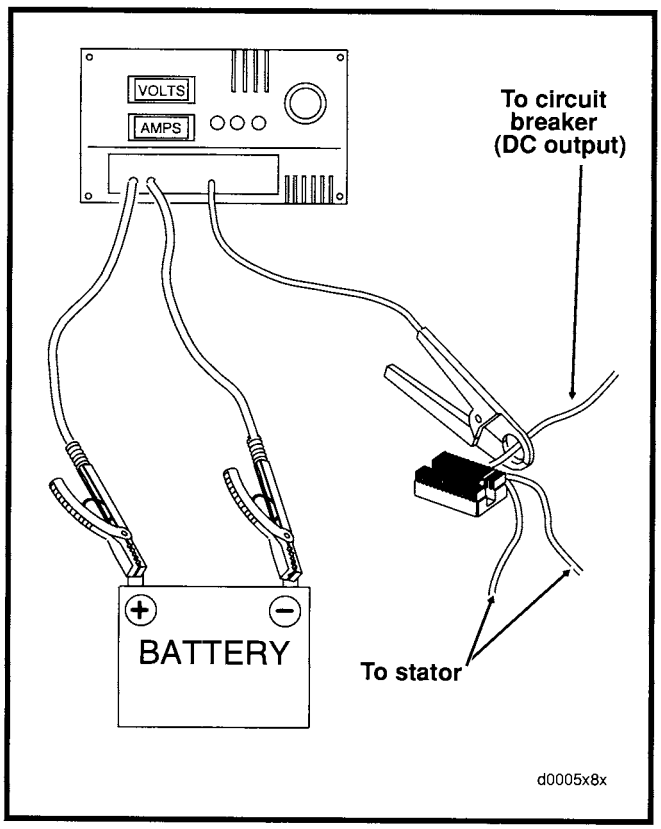


Figure 4. Current and Voltage Output Test

Voltage Output Test

See Figure 4. After removing the load, read the load tester voltage meter. Voltage to the battery must not be more than 15 volts. If voltage is higher, regulator is not functioning properly or connections are loose or dirty.

⚠CAUTION

Do not leave any load switch turned on for more than 20 seconds or overheating and tester damage are possible.

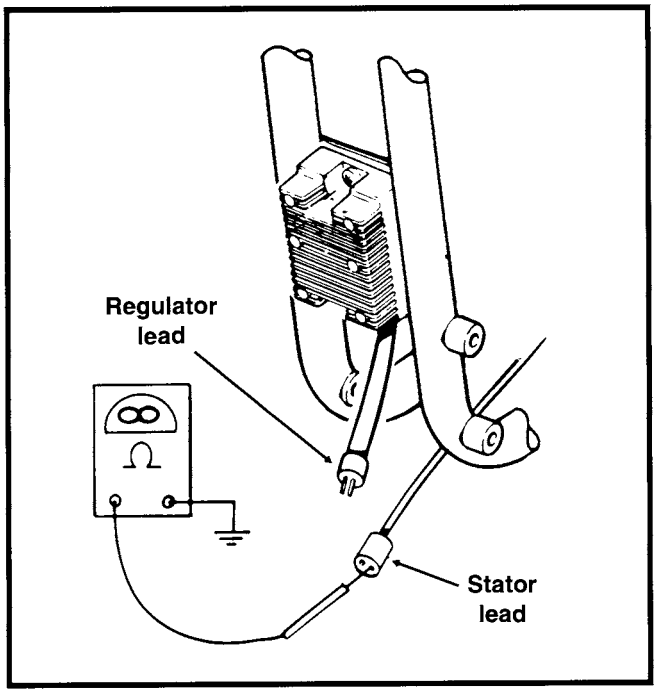


Figure 5. Test for Grounded Stator

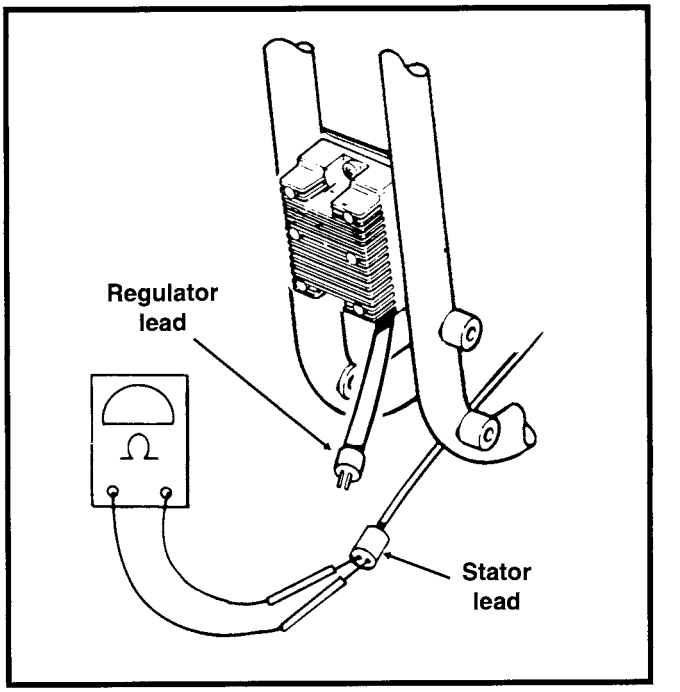


Figure 6. Check for Stator Resistance

Stator Check

1. To check for a grounded stator, turn off ignition and disconnect the regulator from the stator at the connector to the crankcase.

2. See Figure 5. Connect an ohmmeter on the RX1 scale between crankcase and either stator socket. There should be no continuity (∞ ohms) across either test point. Any other reading indicates a grounded stator which must be replaced.

3. See Figure 6. Check the resistance using an ohmmeter set on the RX1 scale. Resistance across the stator sockets or pins should be 0.2-0.4 ohms. If the resistance is lower, the stator is damaged and must be replaced.

AC Output Check

1. See Figure 7. To test AC output, disconnect the regulator and connect an AC voltmeter across both stator sockets. Run the engine at 2000 R.P.M. The AC output should be 38-52 volts AC.

2. If the output is below specifications, charging problem could be a faulty rotor or stator. If output is good, charging problem might be faulty regulator/rectifier. Replace as required.

3. Check the output again as described under CURRENT AND VOLTAGE OUTPUT TEST.

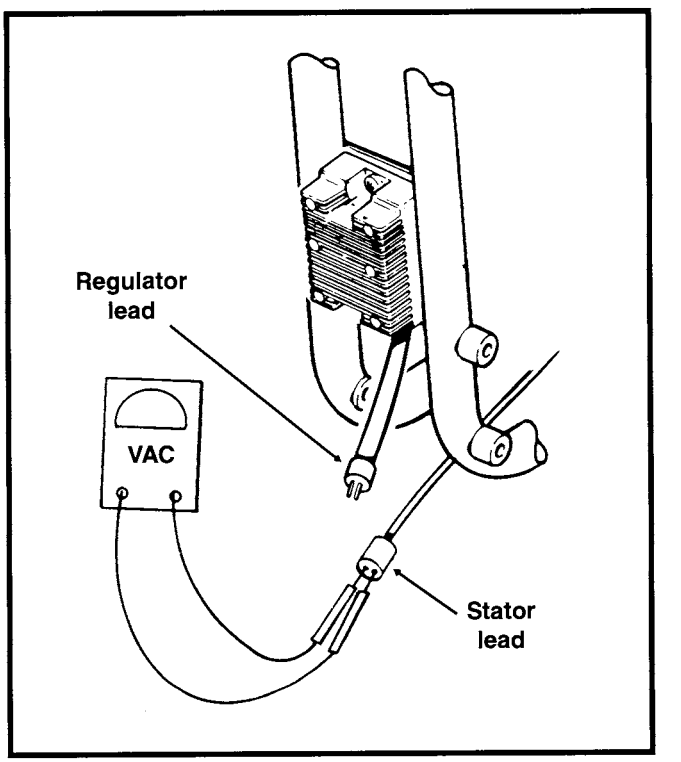


Figure 7. Check Stator AC Voltage Output

Charging System Tests - FX, FXD and FL Models

Total Current Draw Test

See Figure 8. If the battery runs down during use, the current draw of the motorcycle components and accessories may exceed the output of the charging system. To check for this condition, place load tester induction pickup or current probe pickup over battery negative cable as shown below. Disconnect regulator from stator. Start engine and run at 3000 rpm.

With ignition and all continuously running lights and accessories turned on (headlamp on high beam), read the total current draw. Compare this reading to the reading obtained in CURRENT OUTPUT TEST. The current output should exceed current draw by 3.5 amps, minimum. If not, there may be too many accessories for the charging system to handle. Reconnect regulator when test is complete.

NOTE

Rider's habits may require output test at lower RPM.

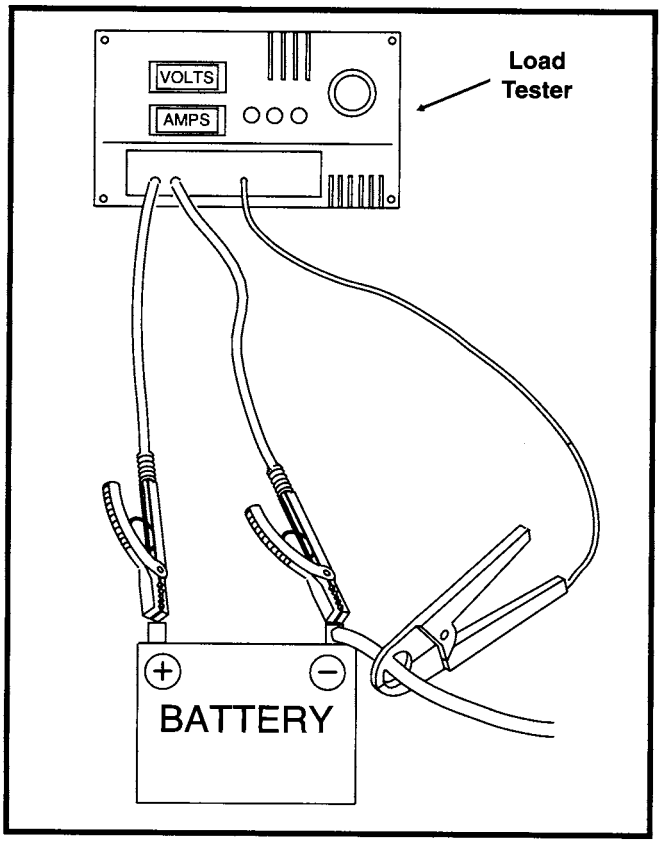


Figure 8. Check Current Draw (Ignition Switch On)

Current and Voltage Output Test

1. Connect load tester negative and positive leads to battery terminals and place load tester induction pickup over positive regulator cable as shown in Figure 10.

2. Run the engine at 3000 rpm and increase the load as required to obtain a constant 13.0 volts.

   See Figure 9. The current output should be 26-32 amperes. Make note of measurement.

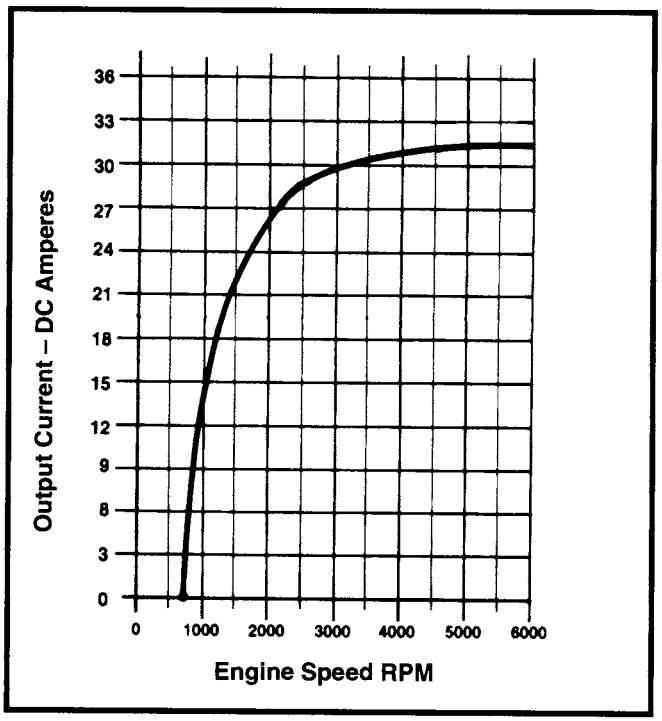


Figure 9. Current Output Curve

Voltage Output Test

See Figure 10. After removing the load, read the load tester voltage meter. Voltage to the battery must be less than 15 volts. If voltage is higher, regulator is not functioning properly or connections are loose or dirty.

⚠CAUTION

Do not leave any load switch turned on for more than 20 seconds or overheating and tester damage are possible.

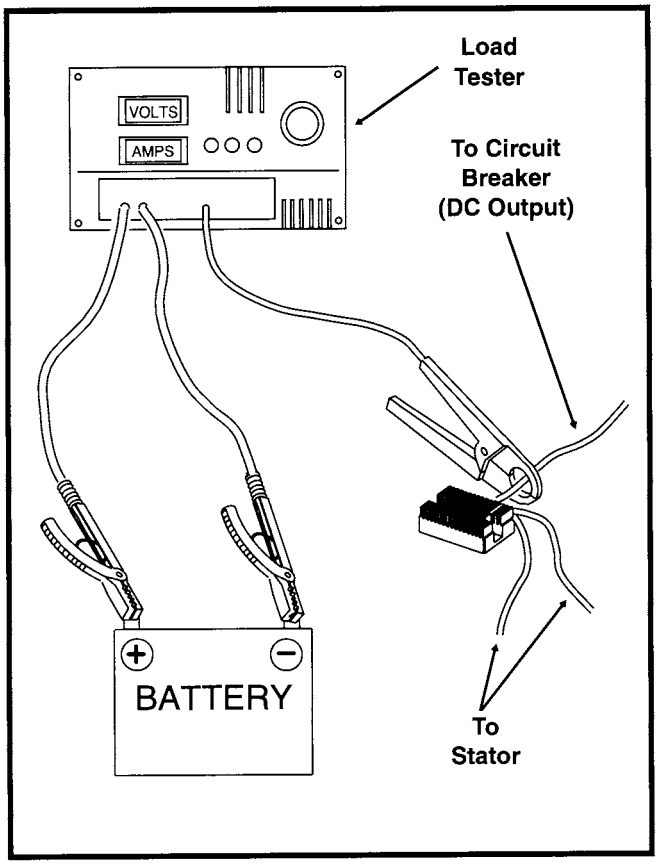


Figure 10. Current and Voltage Output Test

Stator Check

1. To check for a grounded stator, turn off ignition and disconnect the regulator from the stator at the terminal in the crankcase.
2. See Figure 11. Connect an ohmmeter on the RX1 scale between crankcase and either stator socket. There should be no continuity (∞ ohms) across either test point. Any other reading indicates a grounded stator which must be replaced.

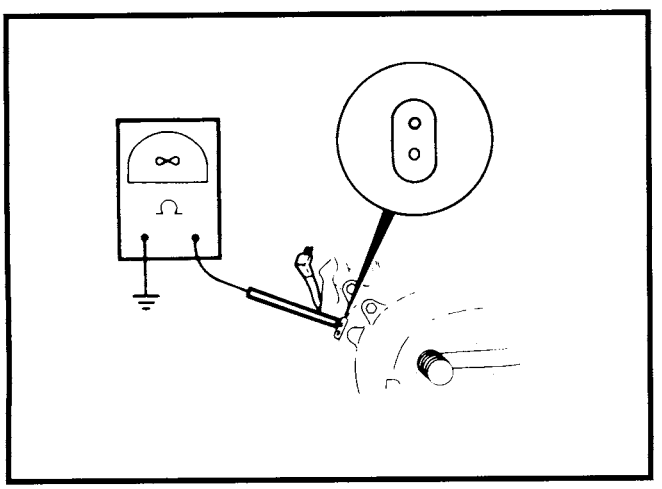


Figure 11. Test for Grounded Stator

3. See Figure 12. Check the resistance using an ohmmeter set on the RX1 scale. Resistance should be 0.1-0.2 ohms across the stator socket. If it is not, then the stator is damaged and must be replaced.

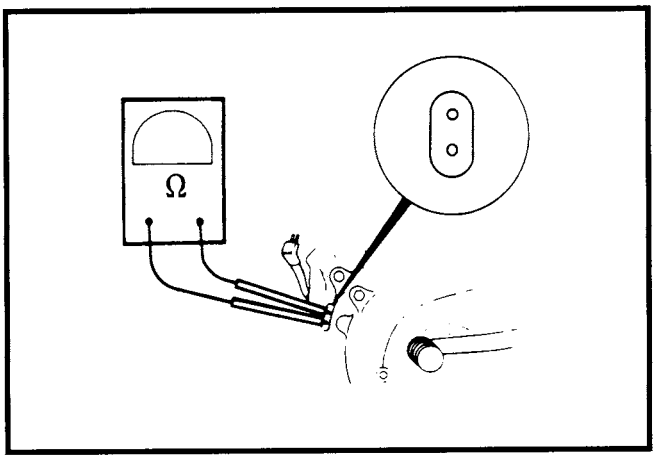


Figure 12. Check for Stator Resistance

AC Output Check

1. See Figure 13. To test AC output, disconnect the regulator and connect an AC voltmeter across both stator sockets. Run the engine at 2000 rpm. The AC output should be between 32-40 AC volts (16-20 per 1000 rpm).
2. If the output is below specifications, charging problem could be a faulty rotor or stator. Replace the rotor or stator as described under ALTERNATOR.
3. Check the output again as described under CHARGING SYSTEM OUTPUT TEST given earlier.

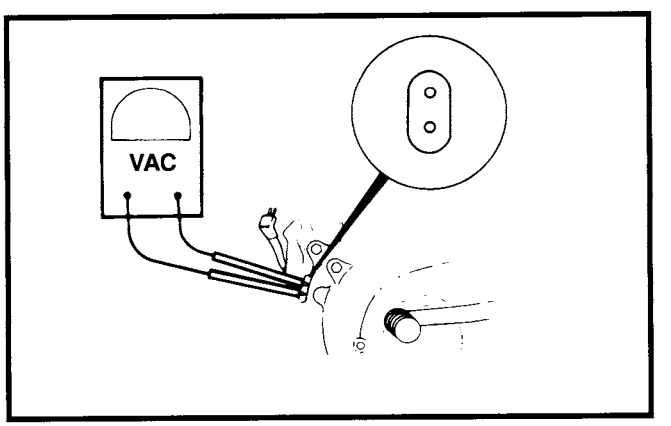


Figure 13. Check AC Output

CIGARETTE LIGHTER

All Ultra models are equipped with a cigarette lighter. The lighter is located on the left side of the inner fairing.

TROUBLESHOOTING

1. Ignition/light key switch must be ON or in ACCESSORY position for lighter operation.

2. If lighter does not work, substitute a known good lighter element.

3. If lighter is still inoperative, check for 12 vdc at center socket contact and ground at outer shell contact.

4. Refer to applicable Wiring Diagram at rear of manual if 12 vdc or ground are not present. Use voltage checks to isolate problem.

NOTES

CRUISE CONTROL (FLTCU AND FLHTCU)

HOW-IT-WORKS

The Cruise Control System is an electronic system that provides automatic vehicle speed control. See Figure 14.

The new control electronics and stepper motor are contained in one control module. The control module is mounted under the left side cover. The stepper motor actuates the cruise control cable through a gear train and ribbon reel. A 15 amp circuit breaker supplies 12 vdc to the module. The circuit breaker is located ahead of the steering head on all FLHTCU models and on the left instrument housing support on FLTCU models.

System Diagram and Operation

1. See Figure 15. To illustrate how the system works, the following steps explain how to engage, allow the cruise control to control speed and disengage the system.

2. While riding in fourth or fifth gear, turn CRUISE switch "ON". Power is supplied through a 15 ampere (amp) circuit breaker to the electronics module.

3. With motorcycle traveling at the desired "cruise" speed (30 mph or greater) momentarily press the "RESUME/SET" switch on right handlebar control downward.

4. The electronics module responds to the SET switch input by "reading" the speedometer reed switch input. The reed switch signal becomes the desired speed.

5. The electronics module sends a signal to the stepper motor. The stepper motor drives the ribbon reel to take up the slack in the cruise cable.

6. The electronics module monitors the engine rpm and the speedometer reed switch signal. The module signals the stepper motor to open or close the throttle to keep the speedometer reed switch signal constant. The engine rpm is monitored to detect engine – over speed which will cause cruise disengagement. (See next paragraph.)

7. The cruise control will disengage (stepper motor drives cruise cable to full out position) when the electronics module receives any of the following inputs:

   a. Front or rear brake is applied.

   b. Throttle is "rolled back" (closed) actuating cable switch.

   c. Motorcycle clutch disengaged, module senses too great an increase in rpm.

   d. Cruise ON/OFF switch turned OFF.

   e. Engine STOP switch turned OFF. (This removes tachometer input signal and module disengages.)

   f. The "RESUME/SET" switch is pressed down "SET" and held until speed drops below 30 mph (48 km/h). If switch is released with motorcycle speed above 30 mph (48 km/h), the system will re-engage.

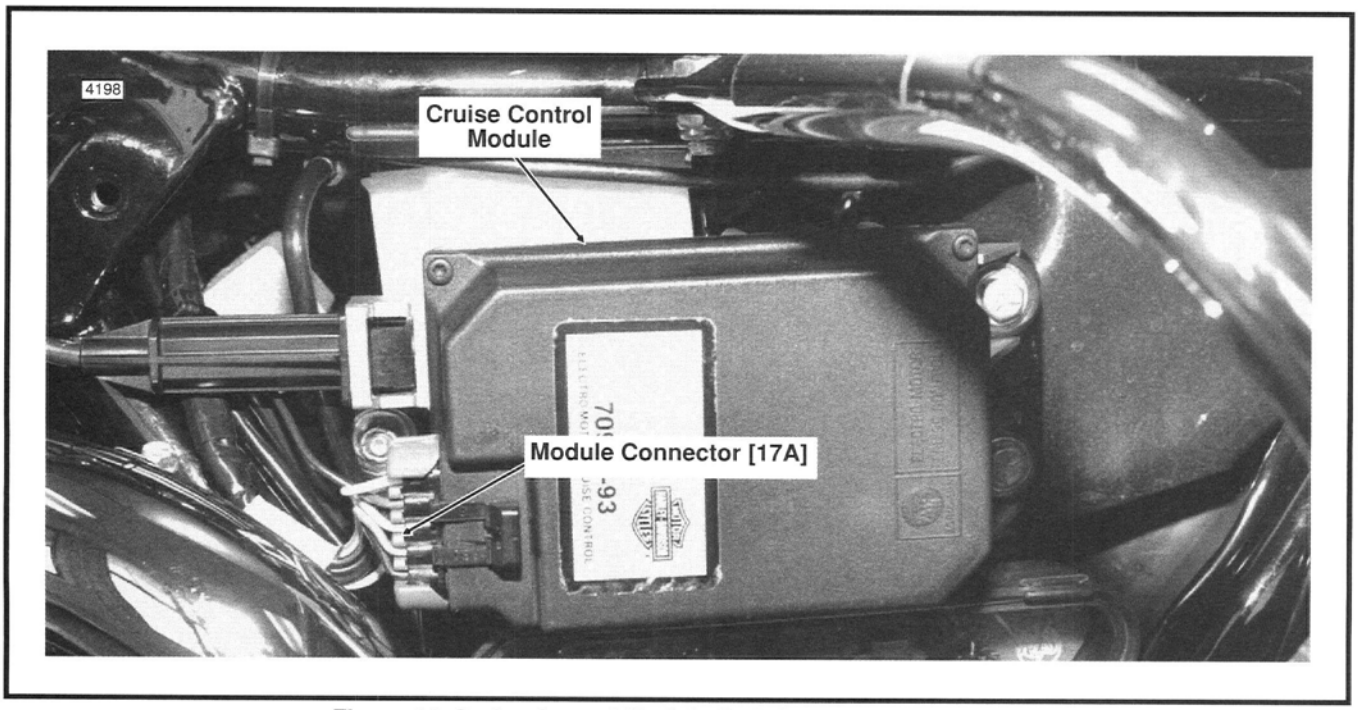


Figure 14. Cruise Control Module (Left Side Cover Removed)

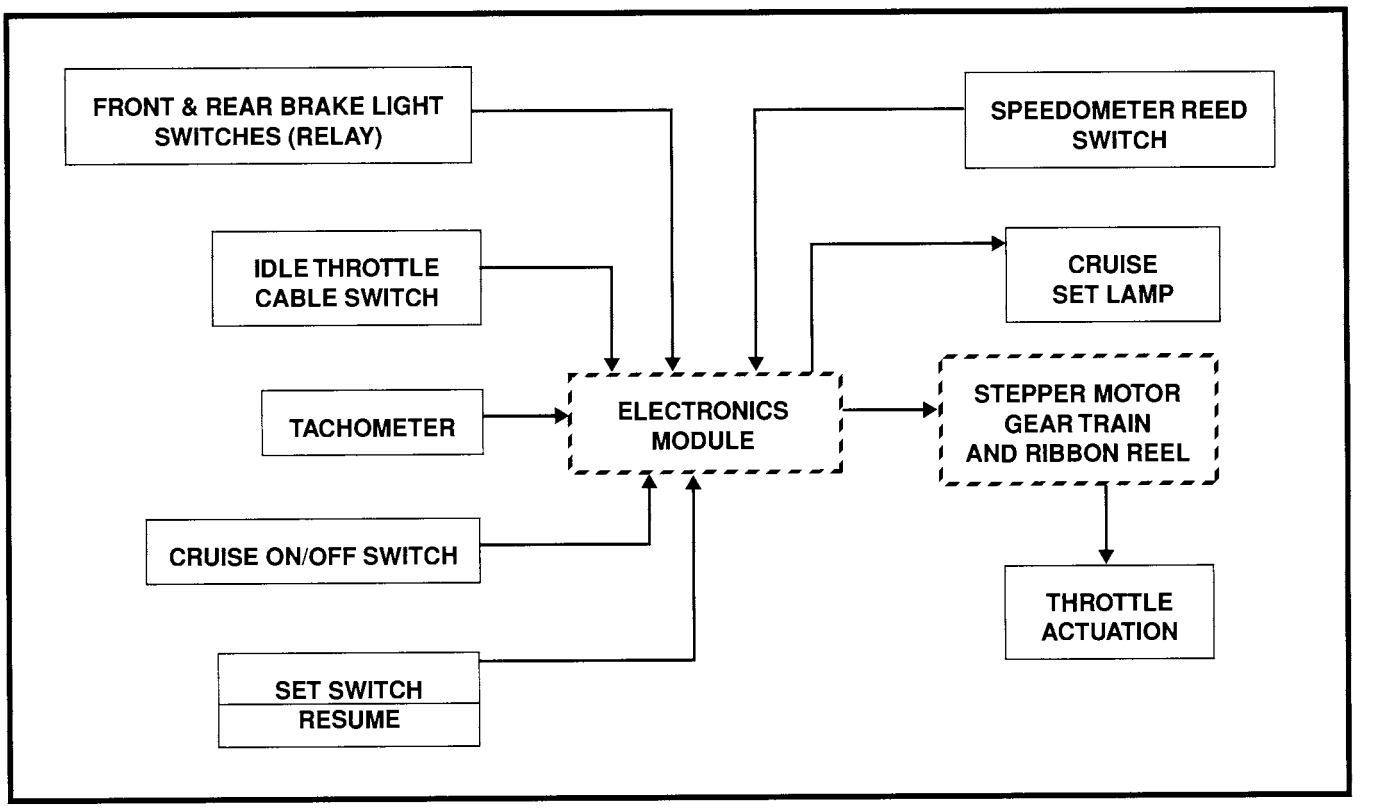


Figure 15. Cruise System Diagram

TROUBLESHOOTING

If the cruise is inoperative, the following switch diagnostic routine may help to isolate the problem. Also refer to the TROUBLESHOOTING CHARTS following the "Switch Diagnostic Sequence."

Switch Diagnostic Sequence

The following steps provide a diagnostic procedure that uses cruise system switches and the vehicle ignition switch to enable a diagnostic mode in the cruise module circuitry. The diagnostic mode or built-in test circuitry uses the green "CRUISE" indicator below the speedometer as a test indicator.

GENERAL TEST CONDITIONS

Perform the following procedures (steps) in the sequence given and actuate switches in the order specified.

NOTE

The diagnostic mode may be aborted and/or incorrect indications may be given if the test sequence is not followed (or if the engine is started).

1. To begin the diagnostic mode, turn the vehicle ignition switched OFF and the cruise main switch ON.
2. While holding the SET switch on, turn the vehicle ignition to the ON position.

CORRECT FUNCTION – The green cruise lamp will light and remain illuminated as long as the operator holds down the SET switch. If the lamp remains illuminated after the switch is released, either the switch or related wiring is shorted.

Continue at Step 3 if function is correct.

INCORRECT FUNCTION – The green cruise lamp will not light for any of the following reasons:

(a) SET/RES switch faulty or not wired correctly.
(b) Broken or pinched wire to SET switch or cruise module.
(c) Green cruise lamp burned out or miswired. Cruise 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.

NOTE

Repeat Steps 1 and 2. If cruise lamp still does not light, see "CHART A CRUISE TROUBLESHOOTING." See Table 1 for module connector wires and function. Repair any problems and recheck by repeating Steps 1 and 2.

Connector references such as "[17A]" refer to the connector identification used in the wiring diagrams at the back of this book.

TABLE 1. MODULE CONNECTOR [17A]

Terminal Letter*	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 circuit breaker)
E	black	Cruise module ground
F	orange/violet	12 vdc power from 15 amp circuit breaker
G	red/yellow	Disengage from brake relay (12 vdc)
H	pink	Tachometer input
J	green/red	12 vdc from "CRUISE" indicator in instrument panel (Module provides ground)
K	white/green	Speedometer reed switch
*** Letters are on sides of connector next to wires.**		

3. Press the RES switch upward.

   CORRECT FUNCTION – The green cruise lamp will light and remain illuminated as long as the operator holds the RES switch upward. Continue at Step 4 if function is correct.

   INCORRECT FUNCTION – The green cruise lamp will not illuminate for any of the following reasons:

   (a) RES switch not wired correctly.

   (b) Broken or pinched wire to RES switch or cruise module.

NOTE

Conditions (a) through (h) in Step 2 should not apply as long as Step 2 was successfully completed.

See "CHART B CRUISE TROUBLESHOOTING"

4. Next, turn the throttle grip tightly closed to check the throttle grip switch.

   CORRECT FUNCTION – The green cruise lamp should illuminate when the switch is closed and should be extinguished when the throttle grip returns to its free position. Continue at Step 5 if function is correct.

   INCORRECT FUNCTION – The green cruise lamp will not illuminate for any of the following reasons:

   (a) Throttle grip switch not wired correctly.

   (b) Broken or pinched wire to throttle grip switch or cruise module.

   (c) Throttle grip switch not working correctly.

See "CHART G CRUISE TROUBLESHOOTING"

5. Apply the brake hand lever.

   CORRECT FUNCTION – The green cruise lamp should light and remain illuminated until the brake is released. If function is correct, continue at Step 6.

   INCORRECT FUNCTION – The green cruise lamp will not illuminate for any of the following reasons:

   (a) Front brake switch or brake relay not wired correctly.

   (b) Broken or pinched wire to front brake switch or cruise model.

   (c) Front brake switch or brake relay not working properly.

   (d) All brake light bulbs are burned out or disconnected.

See "CHART F1 or F2 CRUISE TROUBLESHOOTING"

6. Press the brake foot pedal and keep it applied for at least 5 seconds.

   CORRECT FUNCTION – The green cruise lamp should illuminate. After holding the foot brake for 5 seconds, the lamp will be extinguished. Release the brake switch, and the cruise module will momentarily pull the throttle open approximately 20%. This throttle stroke is immediately aborted if the brake is applied. Continue at Step 7.

   INCORRECT FUNCTION – The green cruise lamp will not illuminate if reasons (a) through (c) exist. The throttle will not open if reasons (d) and (e) exist:

   (a) Rear brake switch or relay not wired correctly.

   (b) Broken or pinched wire to rear brake switch, brake relay or circuit model.

   (c) Rear brake switch not working properly.

NOTE

If cruise lamp illuminates, but throttle fails to open approximately 20%, refer to (d) and (e).

   (d) Cables not adjusted properly.

   (e) Bad cruise control module.

See "CHART F1 or F2 CRUISE TROUBLESHOOTING"

7. Roll the vehicle forward and backward to activate the reed switch in the speedometer.

   CORRECT FUNCTION – The green cruise lamp will flash on and off indicating that the reed switch is wired properly and working correctly. Continue at Step 8.

   INCORRECT FUNCTION – The green cruise lamp will not light for any of the following reasons:

   (a) Broken speedometer cable/drive.

   (b) Reed switch not wired correctly.

   (c) Broken or pinched wire to reed switch.

   (d) Reed switch not working properly.

   (e) Reed switch ground wire disconnected.

See "CHART H CRUISE TROUBLESHOOTING"

8. If the cruise main switch is turned off, the lamp will flash in response to the cam position sensor input. Since starting the engine would abort the diagnostic mode, simulate the cam position sensor input as described in steps A, B or C below:

   A. Carbureted models- Perform tachometer test using Speedometer Tester, HD-41354. See TACHOMETER TEST in this section, page 51.

   B. Carbureted models-

   (1) Turn main cruise switch off.

   (2) Disconnect 3-place connector [14] that connects cam position sensor to ignition module. Remove secondary lock.

   (3) Momentarily place screwdriver blade across black/white and green/white wire terminals of connector half connected to main wiring harness. Repeat this step 6-10 times. The ignition module ignores the first four sensor inputs.

   C. Fuel injected models- hook up the Scanalyzer as described under RETRIEVING TROUBLE CODES, page 125, and access the "Tach Test" routine under the Active Test Menu.

   The cruise lamp must flash on the fifth and subsequent sensor inputs.

   See "CHART I CRUISE TROUBLESHOOTING"

9. The switch diagnostic sequence may be repeated at any time by going to Step 1 or press SET switch twice to restart diagnostic sequence.

10. The cruise switch diagnostic sequence is designed to abort for any of the following reasons:

    (a) Engine is started.

    (b) Incorrect switching sequence is used.

11. Quit diagnostic mode by turning off ignition switch.

Other Malfunctions

HARSH ENGAGEMENT

If cruise control opens throttle abruptly or harshly, check for a cruise cable that is too tight. Refer to cruise cable adjustment in this section.

SPEED VARIATION

Loses Speed

Check for:

1. Cruise cable too loose.
2. Set switch held too long.

Gains Speed

Check for:

1. Cruise cable too tight.

Speed Surges

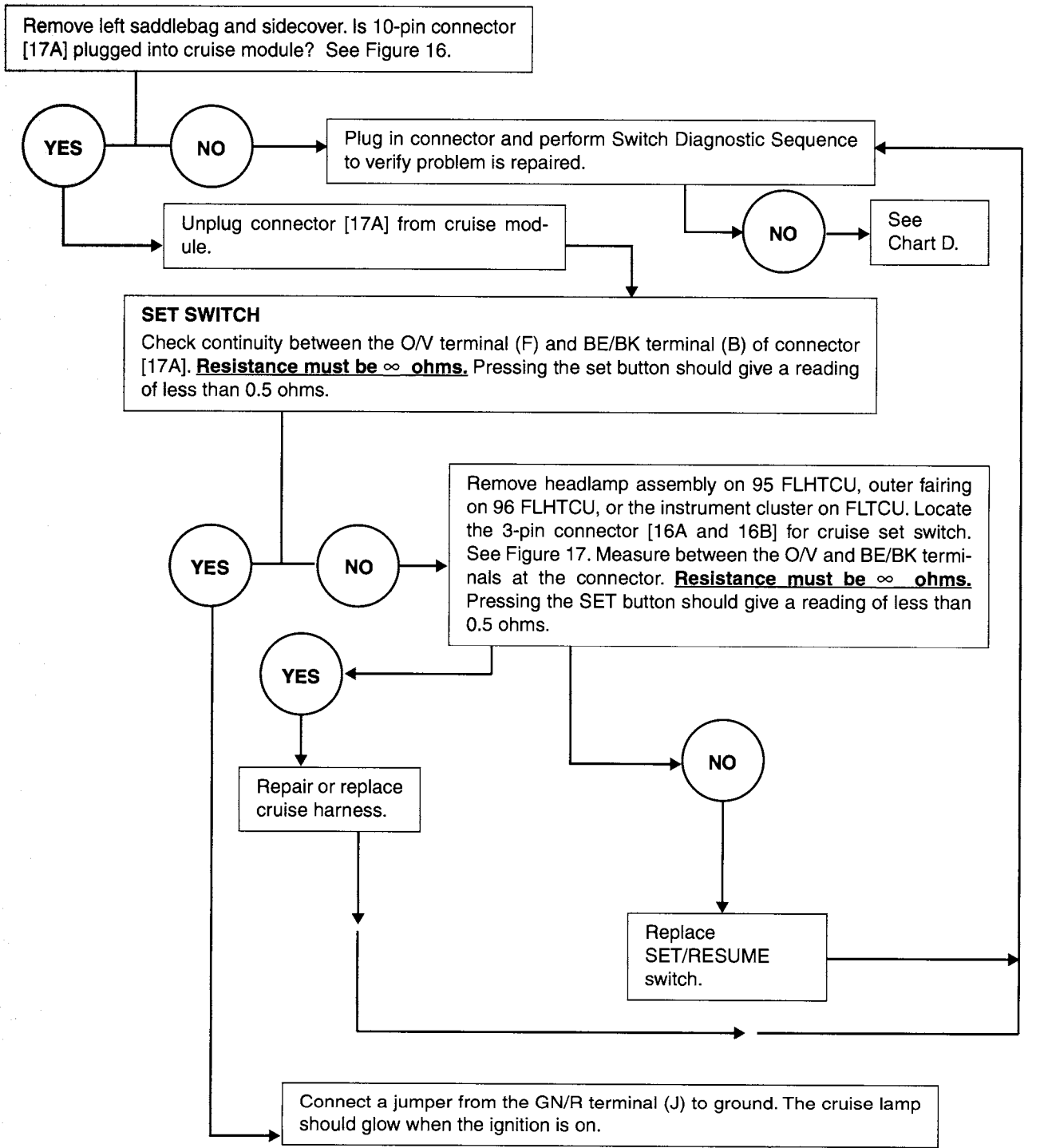
Check for:

1. Defective reed switch.
2. Poor ground at cruise module or reed switch.
3. Defective cruise module.

NOTE

Check for surging with cruise control turned "OFF." If surging is still present, a lean fuel mixture may be the cause.

CHART A CRUISE TROUBLESHOOTING



NOTE

See the Electrical Connector Location Tables starting on page 230 for the location of connectors not shown.

Continued on the next page

CHART A CRUISE TROUBLESHOOTING (Continued)

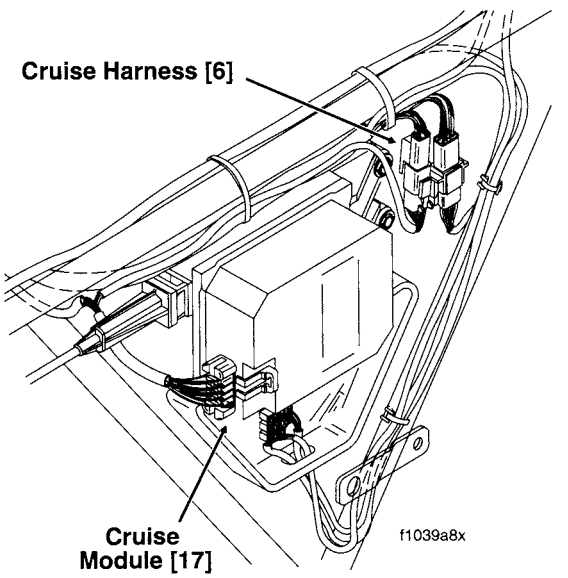


Figure 16. Left Side Cover Removed (FLHTCU, FLHTCU-I, FLTCU-I)

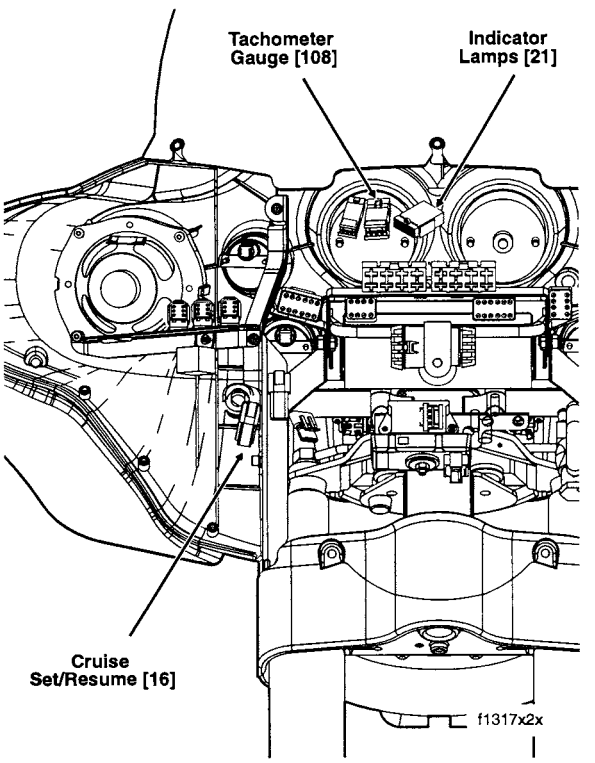


Figure 17. Outer Fairing Removed (1996 FLHTCU)

YES — NO → Refer to Chart C.

Place the positive probe on the O/V terminal (F) and the negative probe on the BK terminal (E). With the ignition on, the meter should read battery voltage.

YES — NO → Refer to Chart D.

Place the positive probe on the R/GN terminal (A) and the negative probe on the BK terminal (E). With the ignition and cruise switches on, the meter should read battery voltage.

YES — NO → Refer to Chart E.

Place the positive probe on the R/Y terminal (G) and the negative probe on the BK terminal (E). Meter should read between 11-13 volts **only** when the brake is applied and the ignition is on. If voltage is present and lamps don't light, check for opens in wiring to lamps or for burnt out lamps (all 3 lamps must have failed to make cruise inoperative).

YES — NO → Refer to Chart F-1 or F-2.

Check continuity between the V/Y terminal (D) and the O/V terminal (F) with the ignition switch **off**. The meter should read infinity when the throttle switch is in the relaxed position, and continuity when the throttle grip is rolled forward.

YES — NO → Refer to Chart G.

Restart Switch Diagnostic test sequence if cruise light has never illuminated. If the cruise light will not illuminate when the first step is performed now, replace the cruise module.

CHART B CRUISE TROUBLESHOOTING

RESUME SWITCH

Remove left saddlebag and sidecover. Disconnect connector [17A] from cruise module. See Figure 16. Check continuity between the O/V terminal (F) and the W/BE terminal (C). **Resistance must be ∞ ohms.** Pressing the SET button should give a reading of less than 0.5 ohms.

YES

NO

Remove headlamp assembly on 95 FLHTCU, outer fairing on 96 FLHTCU, or the instrument cluster on FLTCU. Locate the 3-pin connector [16A and 16B] for cruise set switch. See Figure 17. Measure between the O/V and W/BE terminals at the connector. **Resistance must be ∞ ohms.** Pressing the SET button should give a reading of less than 0.5 ohms.

Repeat Switch Diagnostic Sequence.

YES

NO

Repair or replace cruise harness.

Replace SET/RESUME switch.

NO failed

Replace Cruise Module.

NOTE

See the Electrical Connector Location Tables starting on page 230 for the location of connectors not shown.

CHART C CRUISE TROUBLESHOOTING

CRUISE LAMP

Remove left saddlebag and sidecover. Disconnect connector [17A] from cruise module. See Figure 16. Connect a jumper from the GN/R terminal (J) to ground. The cruise lamp should glow when the ignition is on.

NOTE

See the Electrical Connector Location Tables starting on page 230 for the location of connectors not shown.

YES

NO

Remove headlamp assembly on 95 FLHTCU or outer fairing on 96 FLHTCU. On FLTCU, remove two screws from the instrument cluster and raise cluster (do not disconnect all connectors from cluster). Remove GN/R wire from connector [21B] on FLTCU and 95 FLHTCU. Remove GN/R wire from connector [108B] on 96 FLHTCU. See Figure 17. Connect a jumper wire to ground from the GN/R wire that feeds the instrument cluster. The cruise lamp should glow when the ignition is on.

Repeat Switch Diagnostic Sequence.

YES

NO

Repair or replace cruise harness.

Replace bulb.

NO failed

Replace Cruise Module.

CHART D CRUISE TROUBLESHOOTING

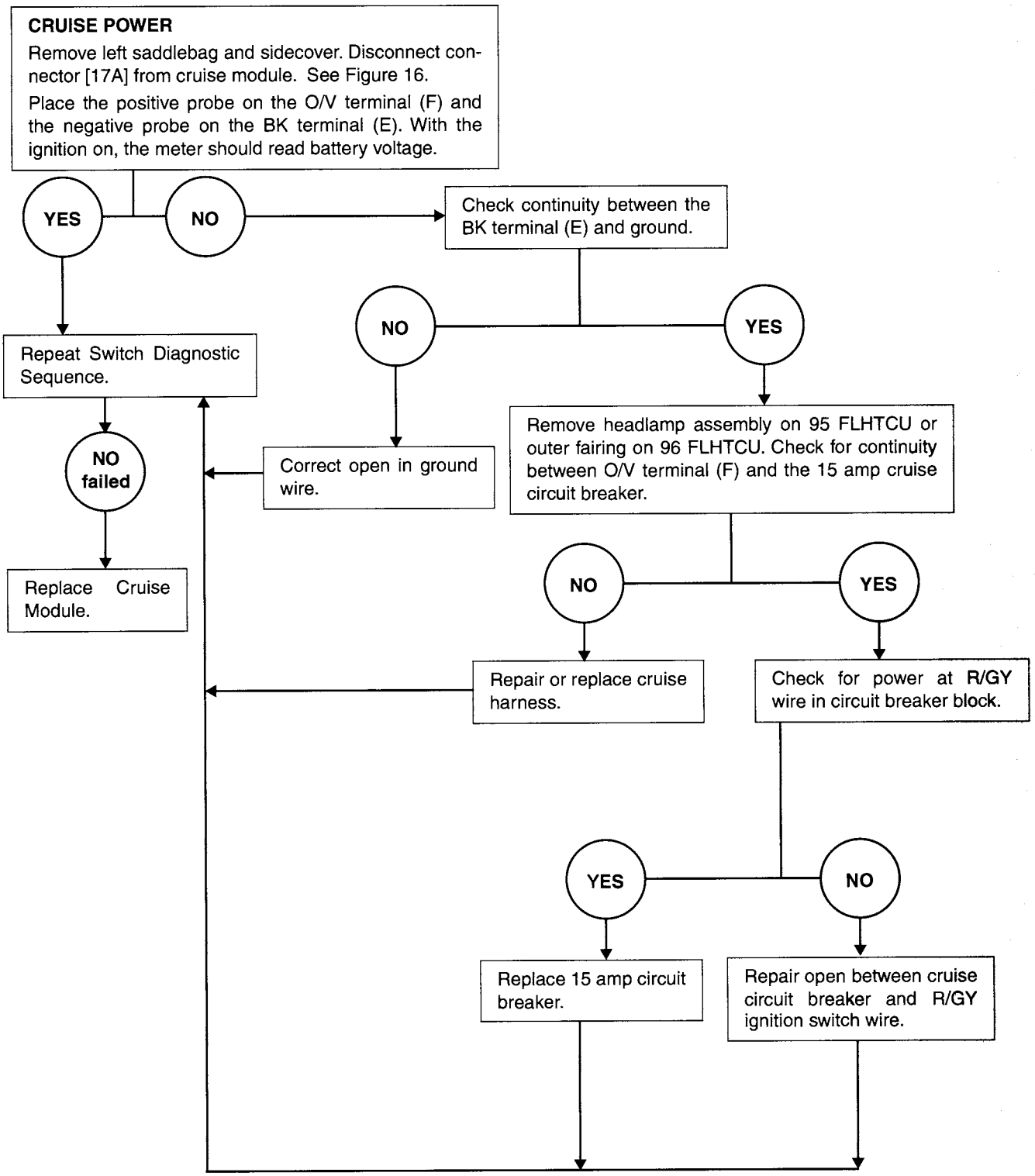


CHART E CRUISE TROUBLESHOOTING

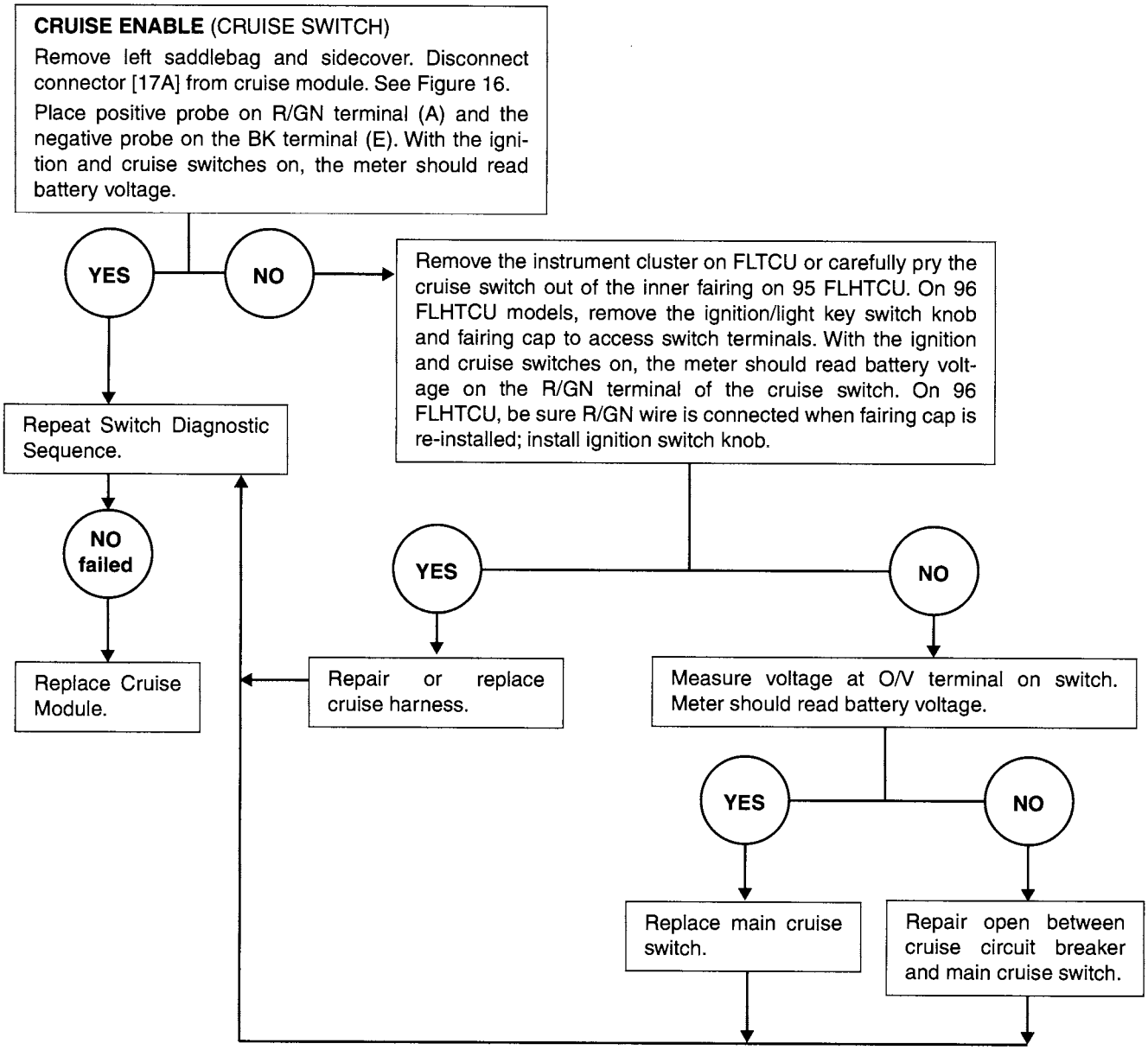


CHART F-1 CRUISE TROUBLESHOOTING

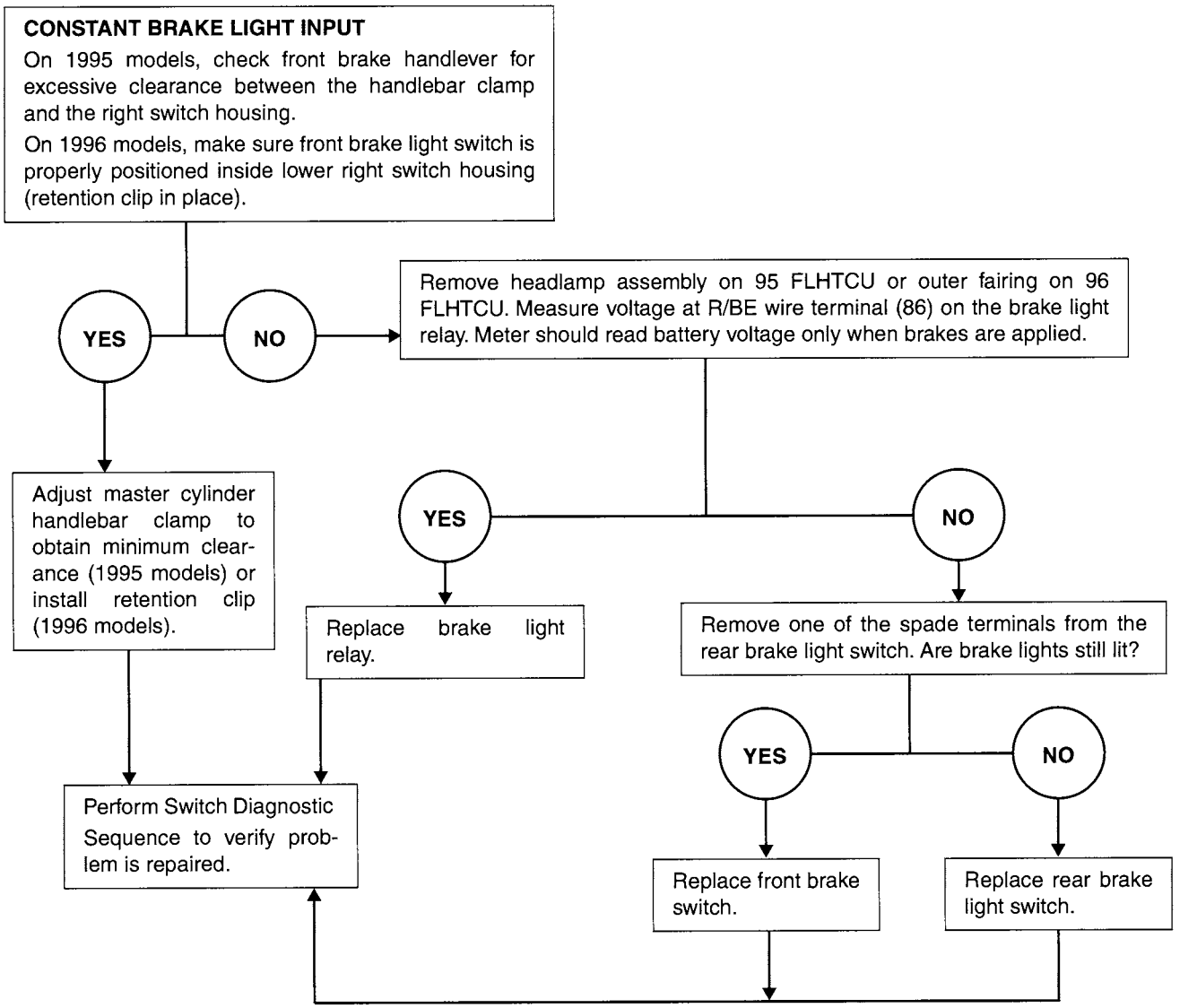


CHART F-2 CRUISE TROUBLESHOOTING

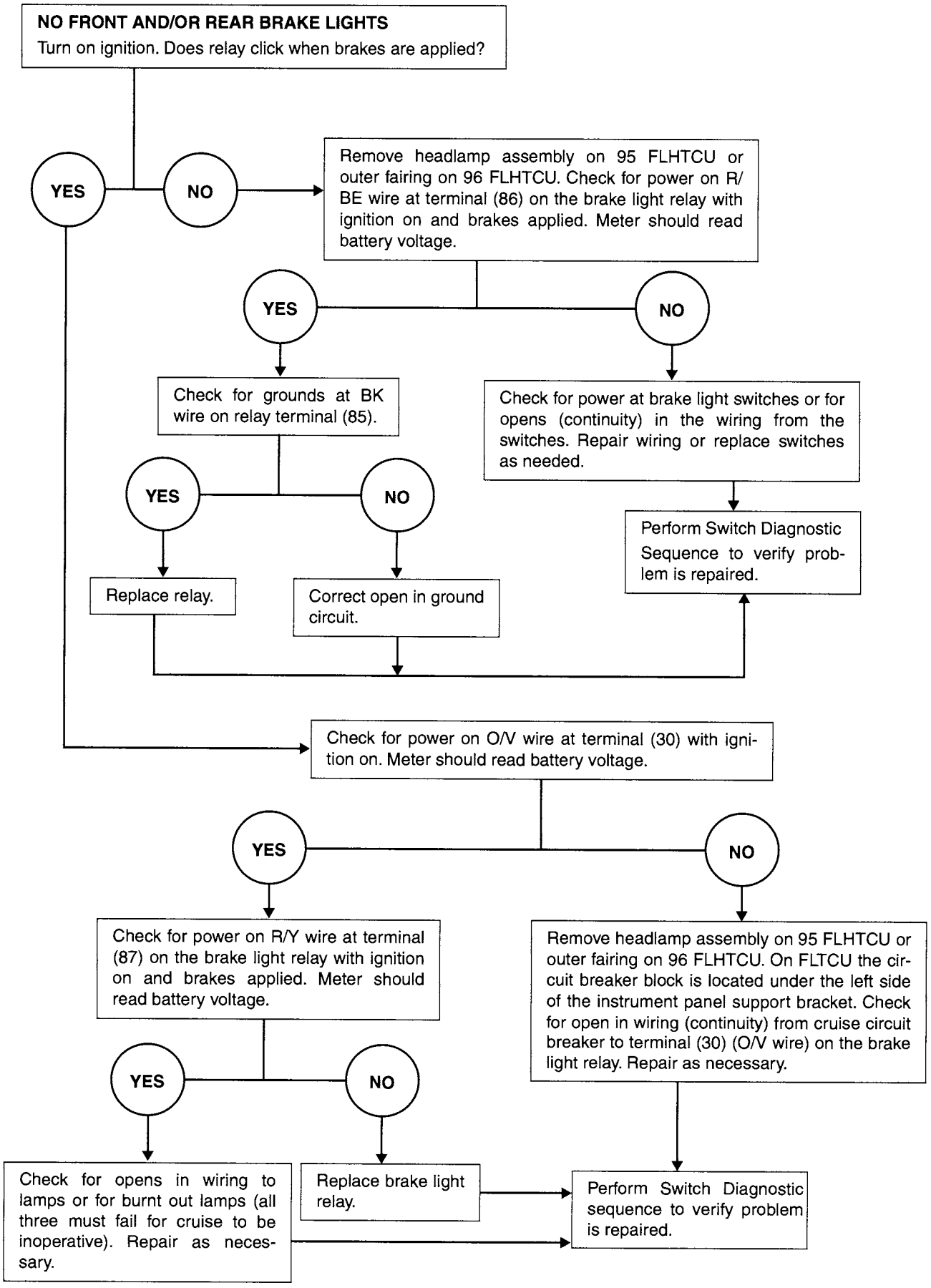


CHART G CRUISE TROUBLESHOOTING

THROTTLE SWITCH

Remove left saddlebag and sidecover. Disconnect connector [17A] from cruise module. See Figure 16.

Check continuity between the V/Y terminal (D) and the O/V terminal (F) with the ignition switch **off**. The meter should read infinity when the throttle switch is in the relaxed position, and continuity when the throttle grip is rolled forward.

YES / NO → Adjust the idle throttle cable and retest for continuity.

YES / NO

Restart test sequence. If the cruise light will not illuminate when this step is performed now, replace the cruise module.

Check for continuity directly at throttle switch. Continuity should only be present when the throttle is rolled forward under pressure.

YES / NO

Repair or replace the cruise harness.

Replace idle throttle cable.

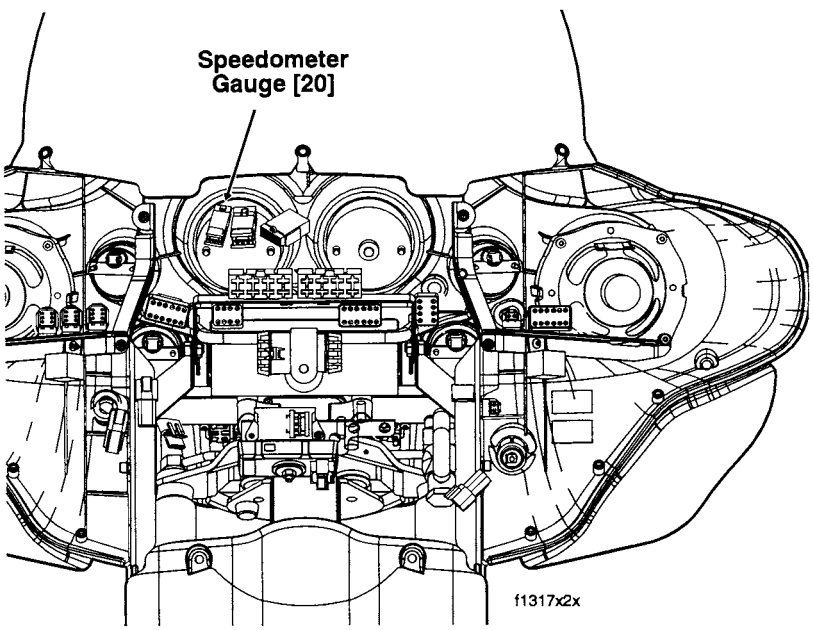


Figure 18. Outer Fairing Removed (1996 FLHTCU)

CHART H CRUISE TROUBLESHOOTING

SPEEDOMETER INPUT (REED SWITCH)
Remove left saddlebag and sidecover. Disconnect connector [17A] from cruise module. See Figure 19.
Check for continuity between the W/GN terminal (K) and BK terminal (E). The meter should alternate between continuity and infinity as the front wheel is rotated.

NOTE

See the Electrical Connector Location Tables starting on page 230 for the location of connectors not shown.

YES

NO

Remove headlamp assembly on 95 FLHTCU, the outer fairing on 96 FLHTCU, or the instrument cluster on FLTCU. Locate W/GN wire in connector [21A] on FLTCU and 95 FLHTCU. Locate W/GN wire in connector [20A] on 96 FLHTCU. See Figure 18. Check continuity between W/GN terminal (K) and either connector [21A] or [20A].

Repeat Switch Diagnostic Sequence. If the cruise light will not illuminate when this step is performed now, replace the cruise module

NO

YES

Repair or replace cruise harness or interconnect harness.

On FLTCU and 95 FLHTCU, check continuity between the black wire in connector [21A] and ground. On 96 FLHTCU, check continuity between the black wire in connector [20A] and ground.

YES

NO

On FLTCU and 95 FLHTCU, check continuity between W/GN wire in connector [21] and ground. On 96 FLHTCU, check continuity between W/GN wire in connector [20] and ground. The meter should alternate between continuity and infinity as the front wheel is rotated.

Repair open or loose connection to ground.

NO

On FLTCU and 95 FLHTCU, replace reed switch on back of speedometer. On 96 FLHTCU, replace speedometer.

CHART I CRUISE TROUBLESHOOTING

TACHOMETER INPUT

Remove left saddlebag and sidecover. Disconnect connector [17A] from cruise module. See Figure 19.

Place the positive probe on the PK terminal (H) and the negative probe on the BK terminal (E). The meter should read battery voltage. If voltage is not present, "bump" the starter until the voltage is present. The meter should read a voltage fluctuation during cranking.

NOTE

See the Electrical Connector Location Tables starting on page 230 for the location of connectors not shown.

YES

NO

Remove seat. Disconnect gray 8-place connector [8]. See Figure 20. Check for continuity between the PK terminal (H) and the PK wire in connector [8A]. Continuity present?

YES

Repeat Switch Diagnostic Sequence.

NO

NO failed

Replace Cruise Module.

Check continuity between PK terminal (H) and the PK wire in connector [6B]. See Figure 19. Continuity present?

YES

NO

Repair open in main wiring harness.

Repair or replace cruise harness.

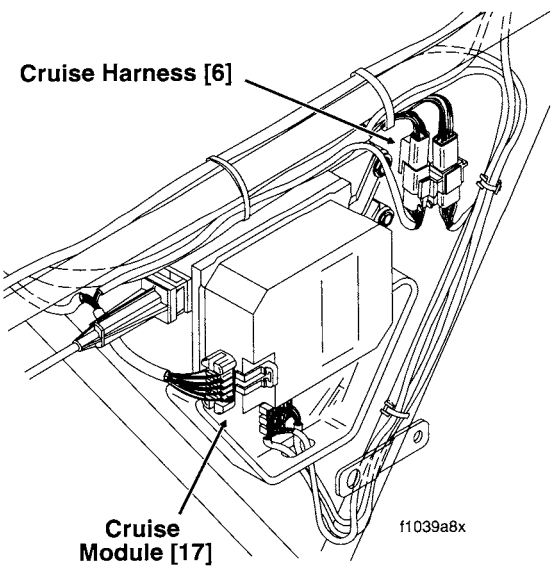


Figure 19. Left Side Cover Removed (FLHTCU, FLHTCU-I, FLTCU-I)

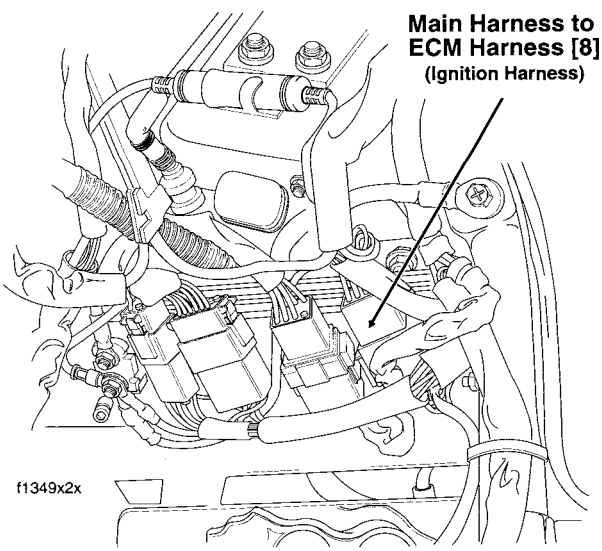


Figure 20. Seat Removed (FLHTC/U-I, FLTCU-I)

EVAPORATIVE EMISSIONS CONTROL SYSTEM CALIFORNIA MODELS ONLY

General (Figure 21)

Harley-Davidson motorcycles sold in the state of California are equipped with an evaporative (EVAP) emissions control system. The EVAP system prevents fuel hydrocarbon vapors from escaping into the atmosphere and is designed to meet the California Air Resource Board (CARB) regulations in effect at the time of manufacture.

The EVAP functions in the following manner:

- Hydrocarbon vapors in the fuel tank are directed through the vapor valve and stored in the charcoal canister. If the vehicle is tipped at an abnormal angle, the vapor valve closes to prevent liquid gasoline from leaking out of the fuel tank through the vent hose.

- When the engine is not running and the Ignition Switch is OFF or in the LOCK position, the air cleaner's solenoid-operated butterfly valve is closed to seal the inlet port of the air cleaner backplate. This prevents hydrocarbon vapors emanating from the carburetor throat and from the float bowl overflow (vent) hose from escaping into the atmosphere.

- When the Ignition Switch is ON, the hold-in winding of the air cleaner butterfly valve solenoid is energized with 12 volts DC current. The solenoid will open the butterfly valve when the pull-in winding is energized with 12 volts DC from the Start Switch. The hold-in winding keeps the butterfly valve open until the Ignition Switch is turned OFF.

- When the engine is running, carburetor venturi negative pressure (vacuum) slowly draws off the hydrocarbon vapors from the carbon canister through the canister-to-carburetor purge hose. These vapors pass through the carburetor and are burned as part of normal combustion in the engine. The long, nylon canister-to-air cleaner hose (canister clean air inlet hose) supplies the canister with fresh air from the air cleaner.

⚠WARNING

Verify that the evaporative emissions vent hoses do not contact hot exhaust or engine parts. The hoses contain flammable vapors that can be ignited if damaged, thereby resulting in serious personal injury and/or vehicle damage.

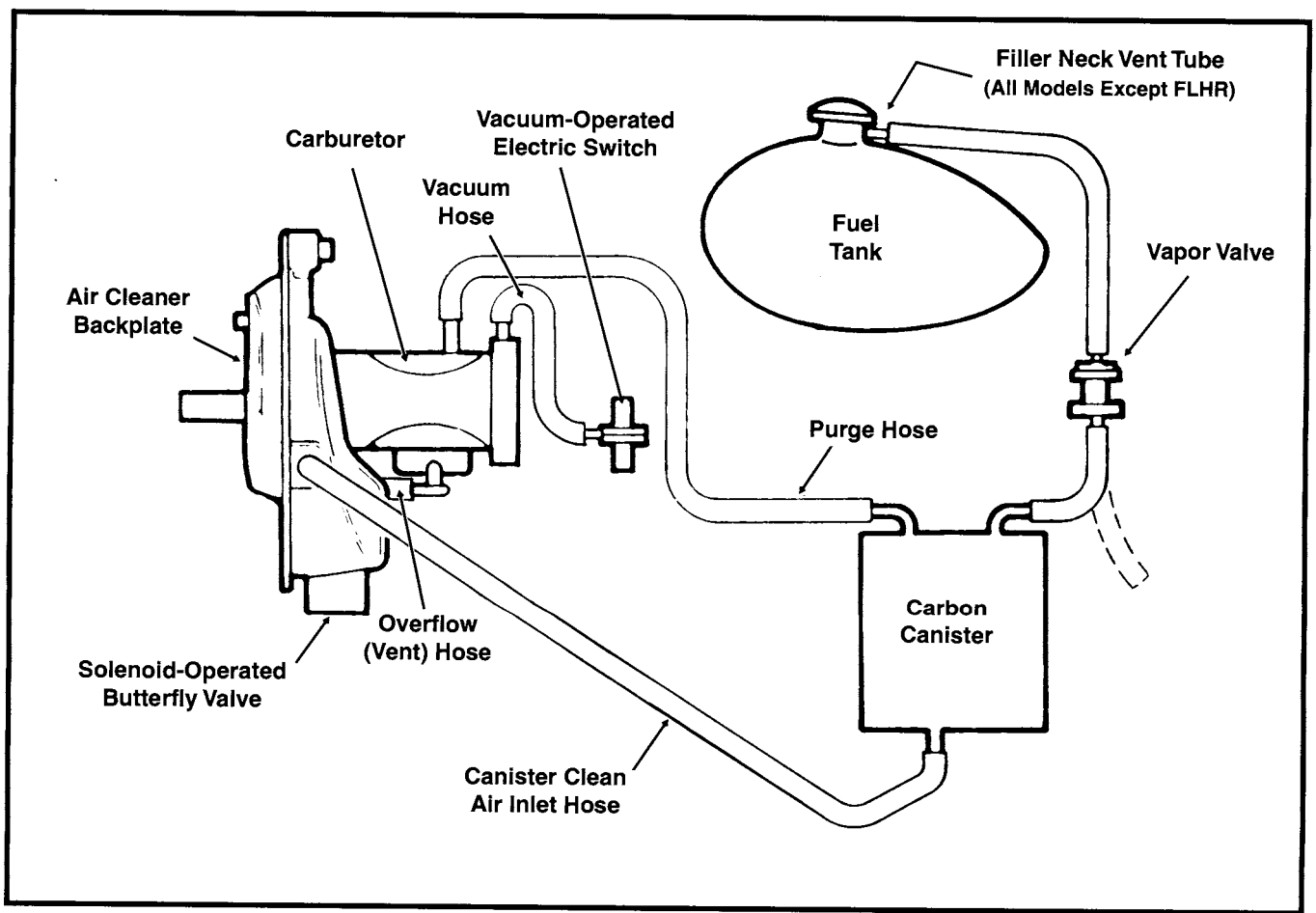


Figure 21. California Evaporative Emissions Control System Schematic

TROUBLESHOOTING

The EVAP system has been designed to operate with a minimum of maintenance. Check that all hoses are properly connected, are not pinched or kinked, and are routed properly. The solenoid troubleshooting procedure is shown in the following chart.

Troubleshooting Solenoid-Operated Butterfly Valve

Problem	Cause	Solution
1. Motorcycle acceleration is sluggish and top speed is approximately 40 mph (64 km/h).	1.1. Butterfly valve is not opening due to electrical malfunction.	1.1.1 Check that connector is connected. If unplugged, connect and check for proper operation by starting engine. If butterfly valve is still inoperative, proceed to 1.1.2. 1.1.2 Perform the SOLENOID ELECTRICAL TESTS which follow this troubleshooting chart.
	1.2 Rider started engine without using starter by coasting downhill and engaging clutch with transmission in gear. (Bump starting.)	1.2.1 Instruct rider to use starter or press start button momentarily with ignition switch ON before starting in the manner described in 1.2. Explain that the start switch input to the starter relay is also required to energize the pull-in winding and open the butterfly valve. **⚠WARNING** **Do not bump start with transmission in 1st gear or rear wheel may skid. Do not use more than 1/4 throttle or motorcycle may lurch forward. Both conditions can cause loss of vehicle control resulting in personal injury and/or property damage.**
	1.3. Butterfly valve is not opening or closing because mechanical linkage connecting butterfly valve to solenoid plunger is broken or missing. A broken solenoid spring will prevent butterfly valve closure.	1.3.1 Check that all linkage parts are properly assembled and functioning. A broken solenoid spring will require replacing the solenoid. See REMOVAL AND INSTALLATION, BUTTERFLY VALVE SOLENOID.

SOLENOID ELECTRICAL TESTS – AIR CLEANER BUTTERFLY VALVE

See Figure 22. Fabricate the required solenoid test harness as shown. The harness allows the following tests to performed without removing the air cleaner backplate.

Winding Resistance Test

1. Unplug 4-place connector (17) from solenoid.
2. See Figure 23. Connect the test harness to the solenoid as shown.
3. Use an ohmmeter to measure the resistance of the pull-in and hold-in windings. See the following table for probe placement instructions and resistance specifications.

Solenoid Winding Resistance Specifications

TEST	POSITIVE PROBE	NEGATIVE PROBE	WINDING RESISTANCE
Pull-in	Green	Black	4-6 Ohms
Hold-in	White/Black	Black	21-27 Ohms

4. If the resistance measurements are not within specification, the solenoid must be replaced. Refer to REMOVAL AND INSTALLATION, BUTTERFLY VALVE SOLENOID.
5. If winding resistance measurements are within specification, perform the following PULL-IN COIL TEST.

Pull-In Coil Test

1. See Figure 24. Connect a 12-volt battery to the solenoid test harness as shown. The butterfly valve must open.
2. If the butterfly valve opens, but does not open with solenoid connected to motorcycle harness, refer to applicable wiring diagram and check for the following:

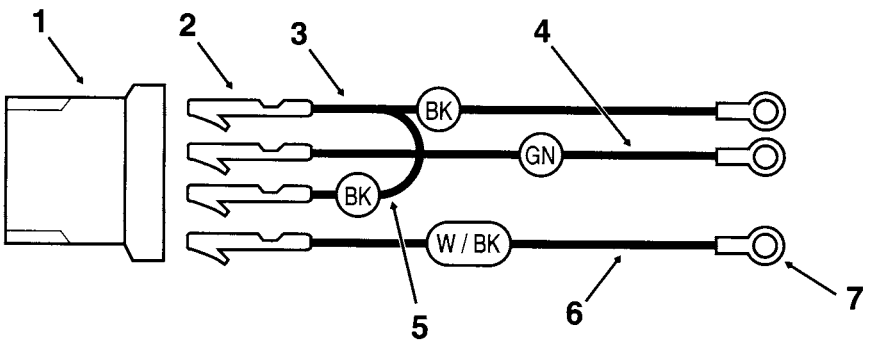
   A. A good ground (1 Ohm or less) at the BK wire in the 4-place mating connector (see Figure 23).

   B. Connect the positive probe of a voltmeter to the GN wire in the 4-place mating connector. Connect the negative probe to a good ground. Press the START switch and verify that 12 VDC is indicated on the voltmeter.

3. If a good ground and/or 12 VDC are not present in the above tests, use continuity or voltage tests to isolate and correct the problem.
4. If both a good ground and 12 VDC are measured in Steps 2A and 2B, check the hold-in coil.

Hold-In Coil Test

1. See Figure 25. Connect a 12-volt battery to the solenoid test harness as shown.



NOTE

The ring terminals (7) will ensure good connections for test probes. Blade or spade terminals may also be used.

1. **Socket housing, Part No. 70292-89**
2. **Socket terminal (4), Part No. 72038-71**
3. **Black (BK) 18 gauge wire, 6 in. (152 mm) long**
4. **Green (GN), 18 gauge wire, 6 in. (152 mm) long**
5. **Black (BK), 18 gauge wire, 6 in. (152 mm) long**
6. **White/Black stripe, 18 gauge wire, 6 in. (152 mm) long**
7. **Ring terminal, Part No. 9858 or similar (4)**

TEST HARNESS

Figure 22. Solenoid Test Harness

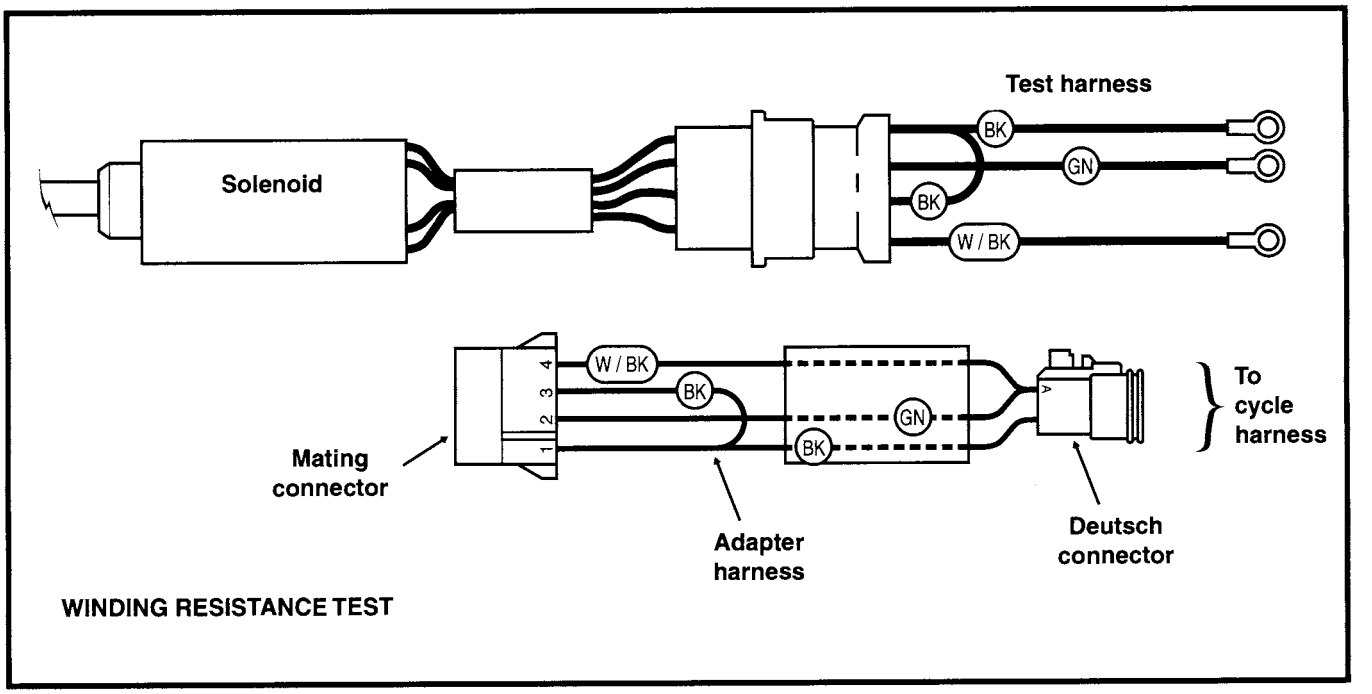


Figure 23. Resistance Test Hookup

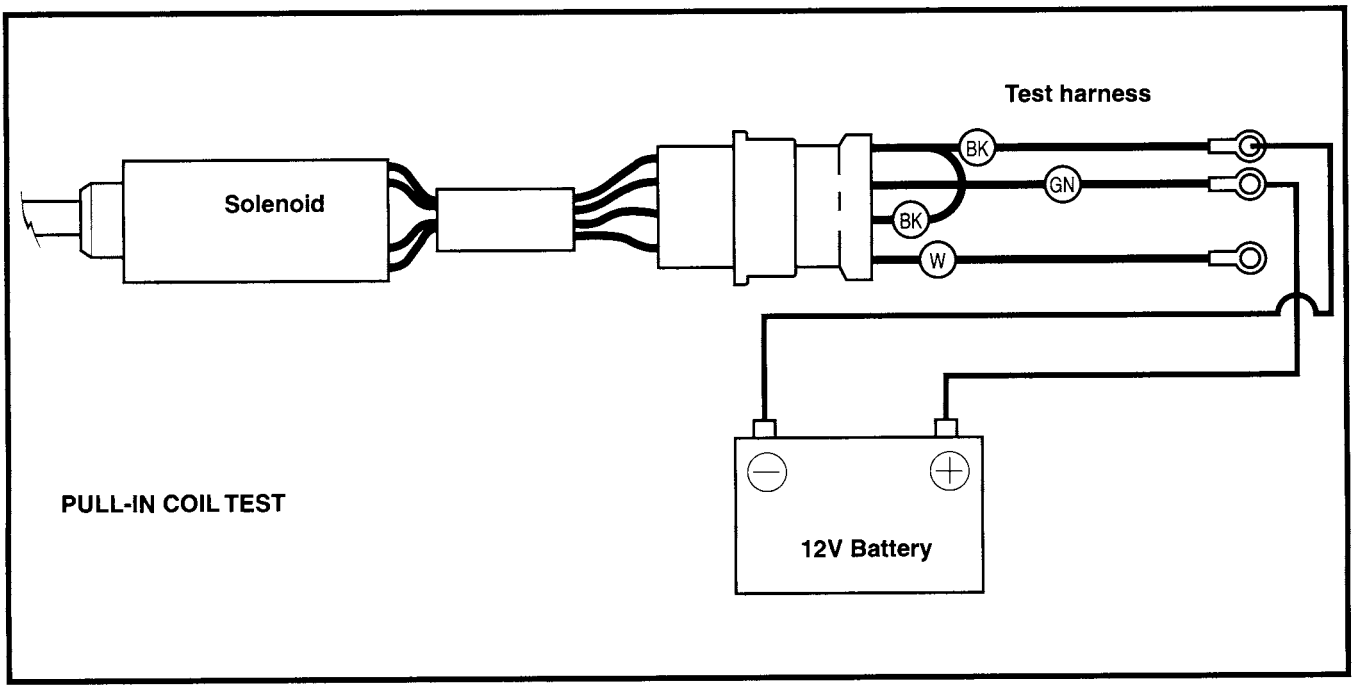


Figure 24. Pull-in Coil Test Hookup

2. Using a screwdriver, open the butterfly valve by gently pushing inward on the top side of the butterfly plate.

3. The butterfly valve must remain open with the hold-in coil energized.

4. Disconnect the negative battery cable. The butterfly valve should close.

5. If butterfly valve remains open in Step 3 and closes in Step 4, then the hold-in coil is functioning properly.

6. If butterfly valve does not remain open in Step 3, check that a good ground exists on the BK lead of the 4-place mating connector (see Figure 23).

7. If there is not a good ground at the BK lead, refer to the applicable wiring diagram and correct the high-resistance ground. Verify that the 3-place Deutsch connector of the adapter harness is properly mated with the main wiring harness.

8. Using a voltmeter, verify that the W/BK wire at the 4-place mating connector (see Figure 23) has 12VDC when the ignition/light switch is ON.

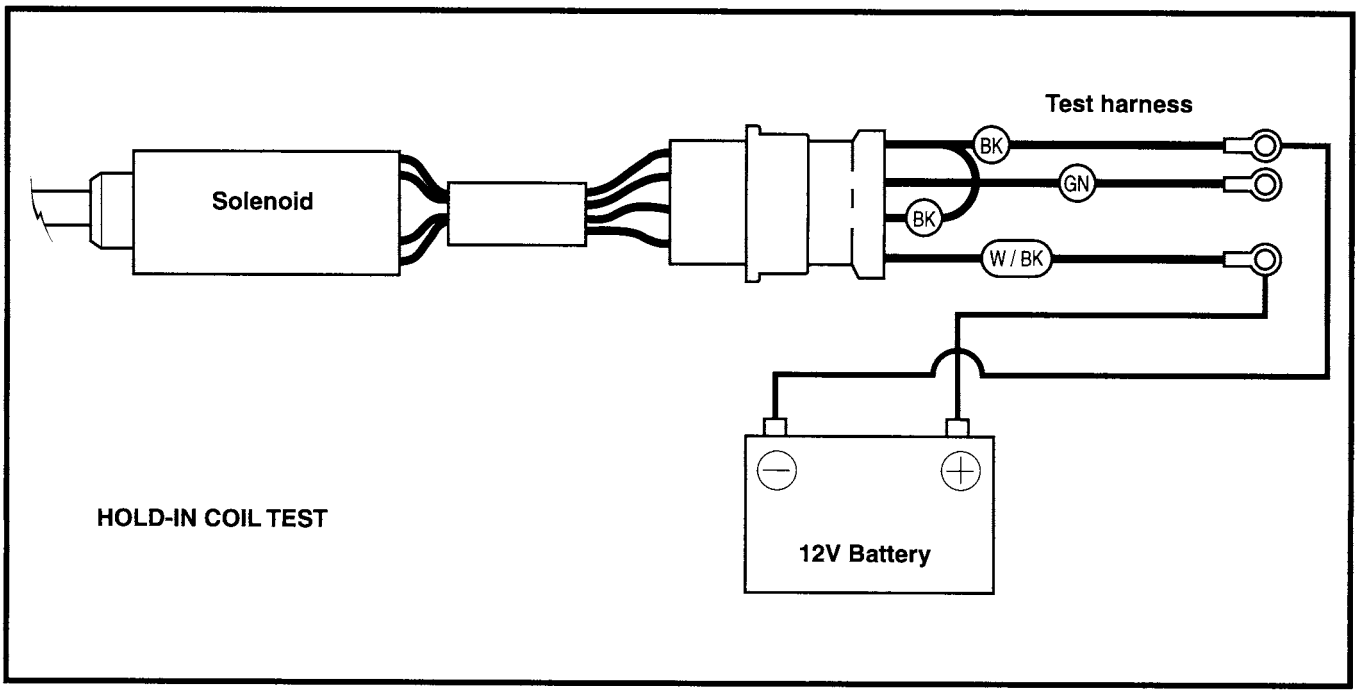


Figure 25. Hold-in Coil Test Hookup

9. If 12 VDC is not present when the ignition/light switch is ON, refer to the applicable wiring diagram and look for a broken wire, corroded connection or other malfunction causing the no power condition. Correct the problem as required.

10. If the solenoid is functioning properly, but butterfly valve is not opening and closing as it should, then refer to 1.3 in the table titled TROUBLESHOOTING SOLENOID-OPERATED BUTTERFLY VALVE.

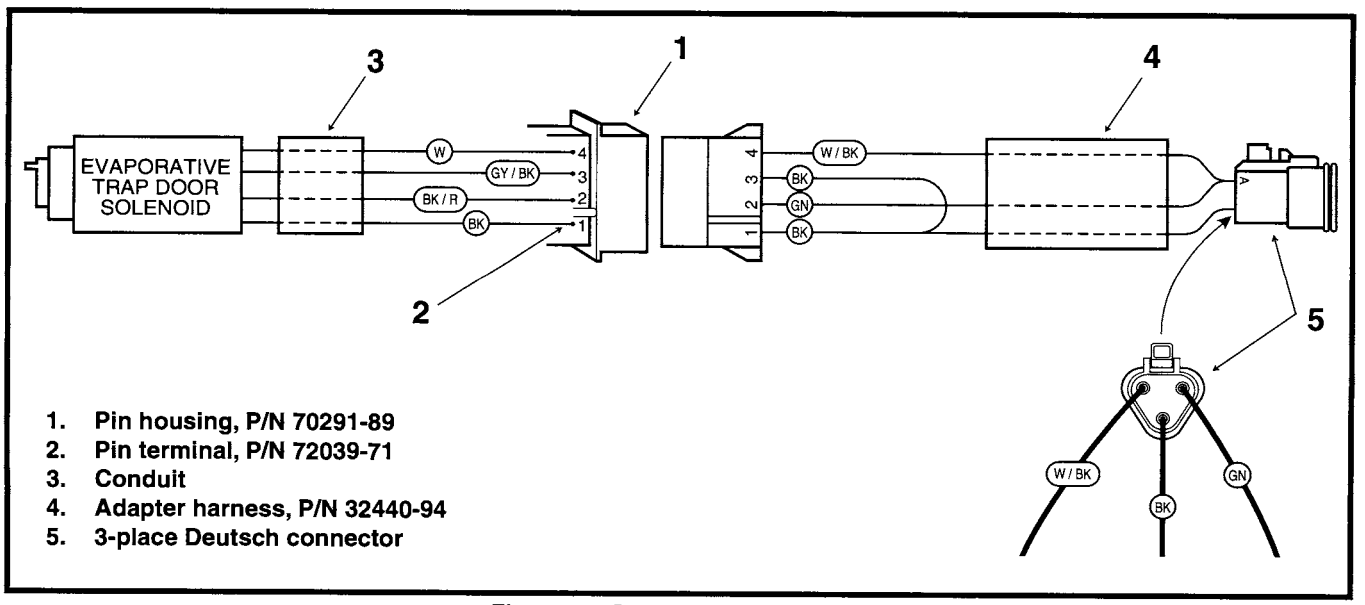
Electrical Connections

1. See Figure 26. Replacement solenoids do not include pin housing (1), pin terminals (2), and conduit (3).

2. Install pin terminals, Part No. 72039-71, on solenoid wires and reuse conduit and pin housing removed from old solenoid.

⚠CAUTION

Make certain solenoid wires are inserted in pin housing as shown in Figure 26.



1. **Pin housing, P/N 70291-89**
2. **Pin terminal, P/N 72039-71**
3. **Conduit**
4. **Adapter harness, P/N 32440-94**
5. **3-place Deutsch connector**

Figure 26. Solenoid Connections

HORN

1. If the horn does not sound or fails to function satisfactorily, check for the following conditions.

   - Discharged battery
   - Loose, frayed or damaged wiring leading to horn terminal

2. If battery has a satisfactory charge and wiring appears to be in good condition, check for the following:

   - Poor ground to frame through mounting hardware or ground wire (see Steps 3-6 below)
   - Inoperative horn switch (see Steps 3-6 below)

3. Disconnect the YELLOW/BLACK wire at the horn. Connect a voltmeter as follows:

   - Positive (+) lead to wire terminal
   - Negative (–) lead to ground

4. Turn ignition switch ON. Depress horn switch. If battery voltage is present, horn or horn grounding is faulty. If battery voltage is not present, either horn switch or wiring to horn is faulty.

5. Connect an ohmmeter across the horn terminals. The resistance measured must be 45-66 ohms. Replace horn if measured resistance is outside range given.

6. If the horn is faulty, then it must be replaced as an assembly. The horn is not repairable. If the horn switch is faulty, replace the switch according to the procedures outlined in Section 2 of the Service Manual.

IGNITION COIL - CARBURETED

GENERAL

The ignition coil is a pulse type transformer that transforms or steps up low battery voltage to the high voltage necessary to jump the electrode at the spark plug in the cylinder head. Internally the coil consists of primary and secondary windings with a laminated iron core and sealed in waterproof insulating compound. The ignition coil cannot be taken apart or repaired. If the ignition coil is faulty it must be replaced.

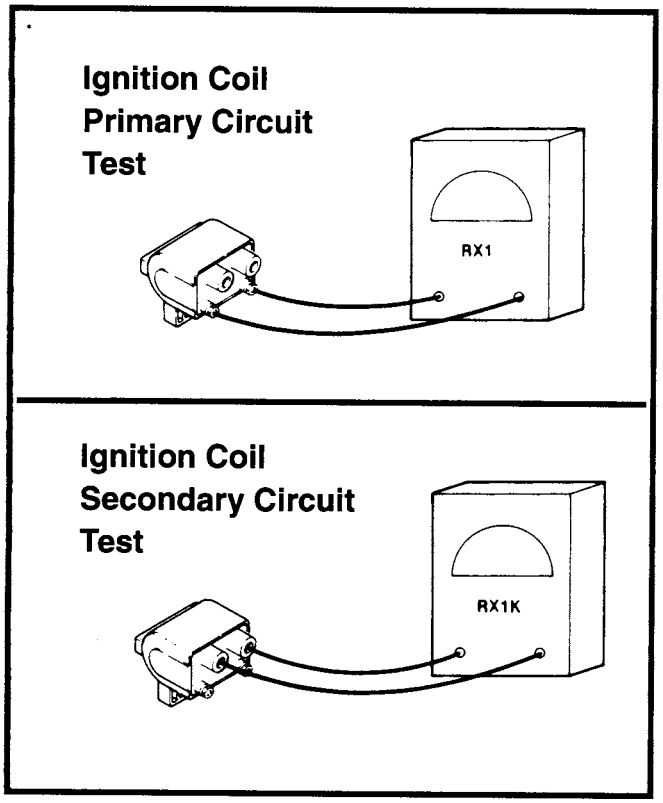


Figure 27. Test Ignition Coil

TROUBLESHOOTING

When engine will not start or when hard starting or missing indicates a faulty ignition system, follow the procedure listed under ignition system TROUBLESHOOTING. If condition persists, check primary and secondary resistance of ignition coil with an ohmmeter. See Figure 27. Resistances should be within the following limits: Primary resistance 2.5-3.1 ohms, secondary resistance 10,000-12,500 ohms. Check ignition coil with a coil tester.

If a coil tester is not available, temporarily substitute a new ignition coil by attaching it at any convenient point near old coil (coil will function without being securely grounded). Transfer terminal wires to new coil. See Wiring Diagram.

⚠CAUTION

Connect ignition coil wires as shown in Figure 30. Reversing polarity to the ignition control module will permanently damage the control module.

Attach new spark plug cables to coil and plugs. If ignition trouble is eliminated by the temporary installation of new coil, carefully inspect old coil for damaged cables and insulation. The insulation on cables may be cracked or otherwise damaged allowing high tension current to short to metal parts. This is most noticeable in wet weather or when motorcycle has been washed.

IGNITION KEY SWITCH/FORK LOCK ASSEMBLY - 1996 FL MODELS

TROUBLESHOOTING

Lock and Switch Functions

Replace the ignition switch knob if the key cannot be removed in the "Lock" or "Unlock" positions (Domestic models only).

NOTE

On International (HDI) models, replace the knob if the key cannot be removed in the "Fork Lock" or "Ignition" positions.

Perform continuity or voltage checks to determine operation of all switch functions. See Table 1 for electrical connections at each switch position.

For example, looking at the top row of the table, if 12 volts is obtained at both the R and BE/R wires with the Ignition Switch in the "Fork Lock" position, then that function is operating correctly.

If any switch function is not operating correctly, inspect the 4-place Packard connector for backed out terminals, improper mating, broken locks, improperly formed or damaged terminals and poor terminal-to-wire connections. Repair connections as necessary. Replace the ignition switch housing if all wires and connections are found in good condition.

Table 1. Ignition Switch Connections

Switch Position	Switch Leads Color Code			
	R	R/GY	R/BK	BE/R*
FORK LOCK	●			●
OFF	●			
IGNITION	●	●	●	
ACCESSORY	●	●		

* BE/W on some units.

If continuity or voltage checks show that the ignition switch is serviceable, then thoroughly inspect the wire harness for damage or poor connections.

⚠WARNING

DO NOT modify the ignition/light key switch wiring to circumvent the automatic-on headlamp feature. Poor visibility can result in personal injury and/or vehicle damage.

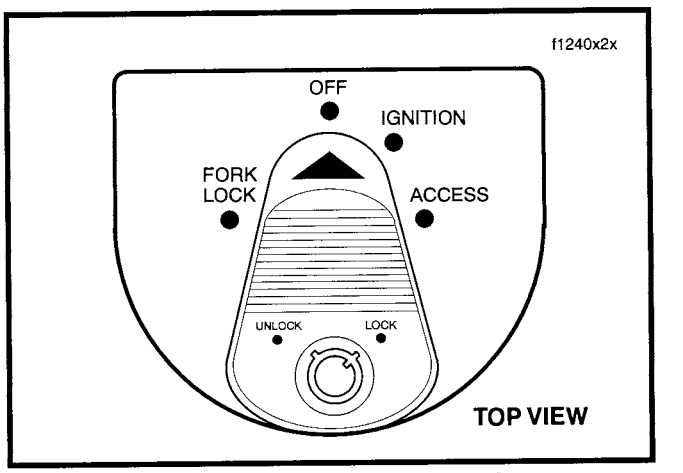


Figure 28. Ignition Switch Knob

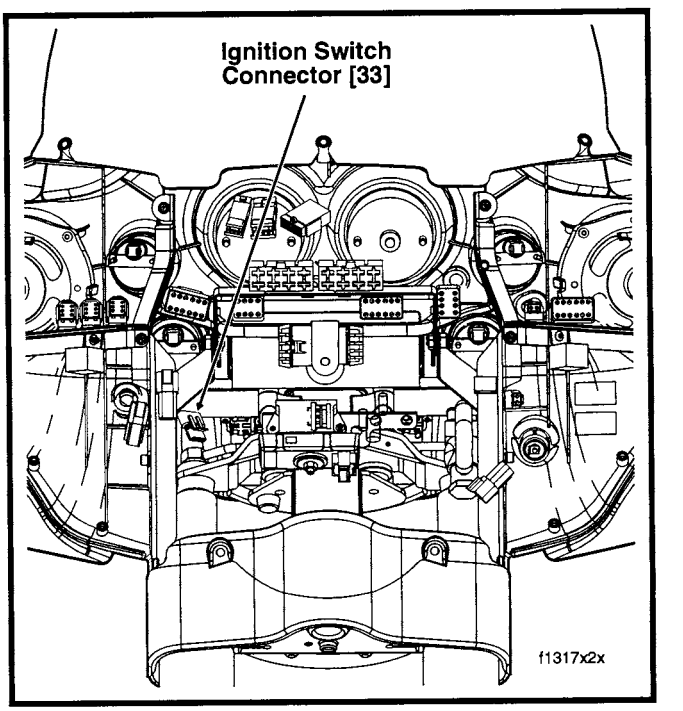


Figure 29. Ignition Switch Connector Location (1996 FLHT/C/U) - Outer Fairing Removed

IGNITION SYSTEM (Carbureted)

GENERAL (Figure 30)

The ignition system is a breakerless inductive discharge ignition system. It has two circuits, the primary circuit and the secondary circuit. The primary circuit consists of the battery, ignition switch, primary coil winding, ignition timer and associated wiring. The secondary circuit consists of the secondary coil, the spark plugs and associated wiring.

The computerized ignition system consists of three assemblies, the rotor and cam position sensor, the ignition module, and the vacuum operated electric switch (V.O.E.S.) The rotor and cam position sensor are located in the gearcase cover on the right side of the motorcycle. The ignition module is mounted as follows:

IGNITION MODULE LOCATION	
Model	**Location**
XLH	Under Left Side Cover
FX	Under Seat
FXD	Electrical Box
FL	Under Right Side Cover

The V.O.E.S. is located to the left of the intake manifold. The ignition module has two functions. First, it computes the spark advance for proper ignition firing. Second, it opens and closes the low voltage circuits between the battery and igni-

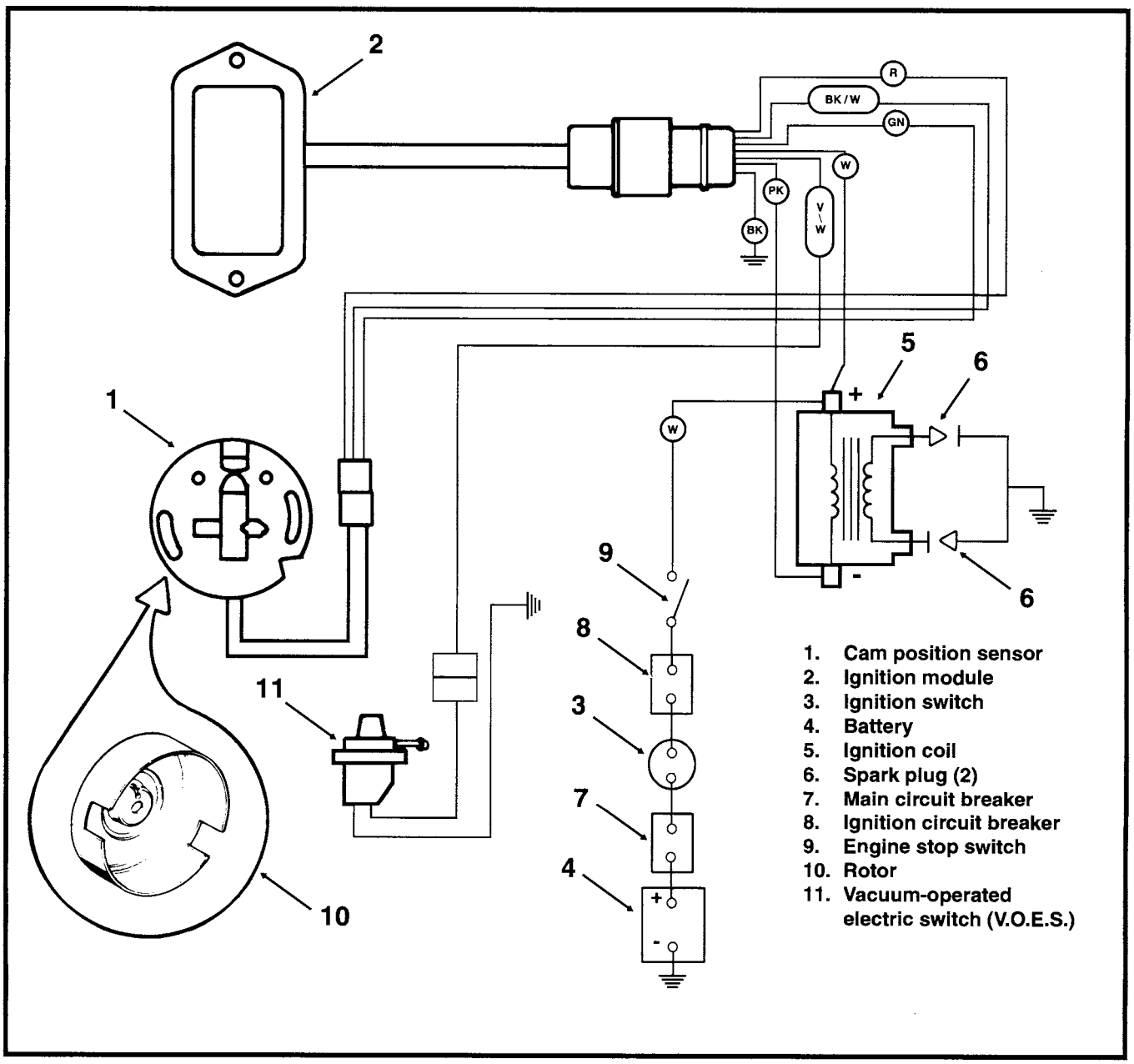


Figure 30. Ignition System Circuit (Simplified)

tion coil to produce high voltage discharge to the spark plugs.

The vacuum operated electric switch (V.O.E.S.) senses intake manifold vacuum through an opening in the carburetor body. The V.O.E.S. is connected to the carburetor with a vacuum hose. The switch is open under acceleration and high engine load conditions (low vacuum) and closed under low engine load conditions (high vacuum).

The ignition module is programmed with two spark advance curves to meet varying engine loads. The high vacuum curve selected for maximum spark advance under normal light load cruising conditions provides improved fuel economy and performance. The low vacuum curve (retarded spark) minimizes spark knock, while maintaining performance, under high load conditions (acceleration and highway driving).

The ignition module selects the proper curve when it receives an open or closed electrical signal from the V.O.E.S. This system ensures correct timing to suit starting, low and high speed requirements.

The ignition timer includes a rotor, cam position sensor, ignition module and a V.O.E.S. A single ignition coil fires both spark plugs at the same time, but one spark occurs with no effect during a non-compression stroke of one cylinder, while the other spark fires the combustible gasses in the other cylinder to produce the power stroke.

The rotor is bolted on to the camshaft and operates at one-half crankshaft speed. As the rotor turns, slots in its external edge break the magnetic field of a Hall-effect device mounted on the cam position sensor plate. The output of the Hall-effect device is a logic-type signal that corresponds to the timing information from the spinning rotor. This technique gives accurate timing information down to "0" speed.

On all 1340cc models, a vehicle attitude sensor is also provided at this location. See Figure 31. The sensor consists of a magnetic disc that rides in a V-shaped channel filled with fluid. If the vehicle is inclined at an angle that is equal to or less than 10° from the road surface, the disc moves up the channel to create an open circuit within the cam position sensor. The open circuit is immediately detected by the ignition module, which shuts off the ignition system. Once the sensor is tripped, the motorcycle must be uprighted before the engine can be restarted.

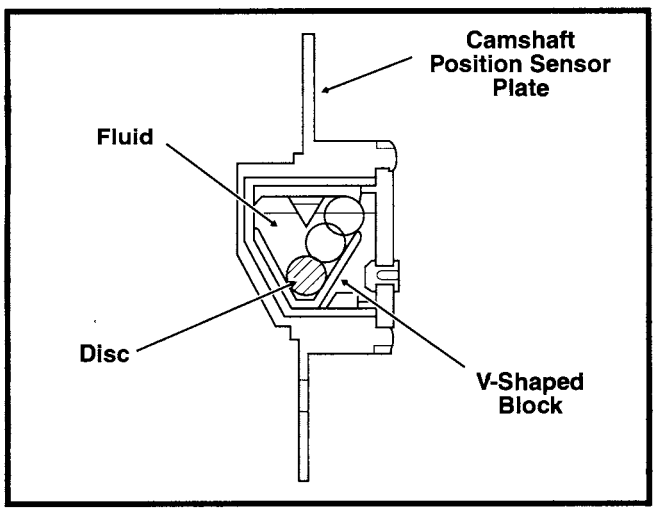


Figure 31. Vehicle Attitude Sensor - All 1340cc Models (Cross Sectional View)

The ignition system gives a spark near Top Dead Center (TDC) for starting. At rpm's and loads above this, operation is as follows:

XLH Models: The system produces a spark 5°-45° before TDC on 1995 domestic 883 models, 5°-40° before TDC on 1995 domestic 1200 models, and 0° to 45° before TDC on 1996 domestic models as well as 1995 and 1996 883 and 1200 HDI models.

FX, FXD and FL Models: The system gives a spark advance that varies between 0° and 35° (on 1995 domestic models) and 42.5° (on 1995 HDI and ALL 1996 models).

The whole timing program can be shifted by mechanical rotation of the cam position sensor. See Advance Timing.

The ignition module contains all of the solid state components used in the ignition system. The dwell time for the ignition coil is also calculated in the ignition module and is dependent upon engine speed. The programmed dwell is an added feature to keep battery drain to a minimum and yet gives adequate spark duration at all speeds. (The ignition module has added protection against transient voltages, continuous reverse voltage protection, and damage due to jump starts.) The system will operate down to 5.7 volts DC. The ignition module is fully enclosed in a polyurethane material to protect it from vibration, dust, water or oil. The unit is a non-repairable item. If it fails, it must be replaced.

TROUBLESHOOTING

When the engine will not start, or when hard starting or missing indicates a faulty ignition system, proceed with the following tests.

Check for Engine Spark

1. Disconnect spark plug cables from spark plugs. Check condition of plugs and cables. Clean or replace as necessary.

2. Insert a conductive adapter into spark plug cable nipple and establish a 3/16 in. (4.76 mm) gap between adapter and cylinder head. Turn on ignition and engine stop switches. Crank engine. Check to see if a spark is obtained across the gap. If a spark is obtained, the problem is not in the electronic system or coil. Check carburetion, choke and spark plugs.

3. If no spark is obtained, check battery voltage and battery connection condition. Battery voltage must be 11-13 vdc.

   Check specific gravity of battery electrolyte with hydrometer. Specific gravity must be 1.250 (temperature corrected) or higher. If voltage and specific gravity are low, charge battery.

4. Check to make sure that ignition module ground (black lead) is securely fastened to the frame and that the ground wire from the battery to the frame is in good condition. The ground bolt is located on the frame cross member above the starter. If there is still no spark at engine proceed to the tests under No Spark at Engine, page 37.

No Spark at Engine

To conduct all the procedures in the test (beginning on page 38 for XLH and FL models, page 42 for FX and FXD models), it is necessary to assemble a set of jumper wires as shown in Figure 32.

Cut two lengths of wire of ample length in order to reach from a good ground connection to the negative terminal of the coil primary. Use a known good condenser such as used in earlier breaker point ignition systems if a suitable capacitor is not readily available.

When conducting the spark tests (steps 3 and 5), use a spare plug and connect it to one of the plug wires or remove one of the engine spark plugs and lay it on the engine cylinder head with the plug wire connected. The spark is then checked jumping across the plug electrodes.

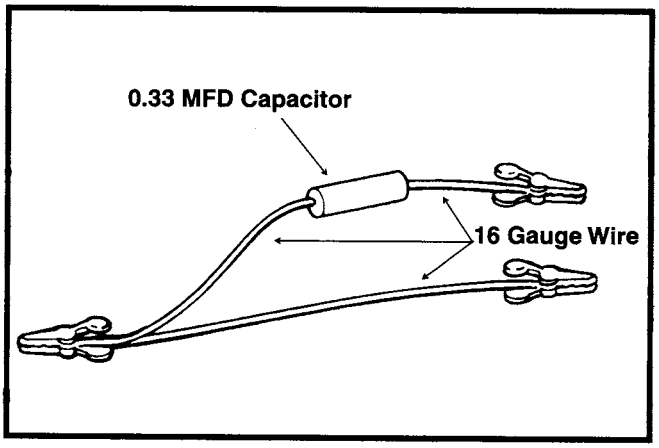


Figure 32. Test Jumper

XLH AND FL MODELS

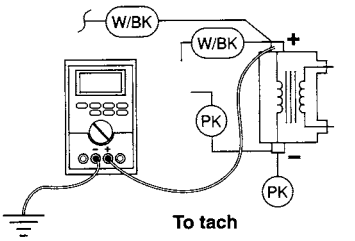
CONTINUOUS OR NO SPARK AT SPARK PLUG

1

A. Ignition switch on.

B. Multimeter red wire to white/black wire terminal, black wire to ground.

C. Meter should register 12V ± one volt.



No Power → Check Circuit breaker, loose wires, switches.

Yes

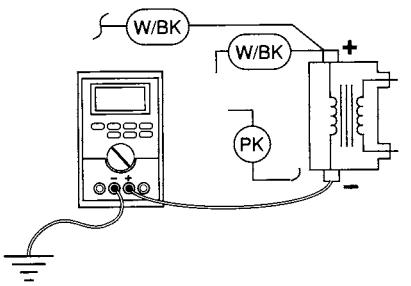
2

A. Remove pink (ignition module) wire from coil terminal.

B. Ignition switch on.

C. Multimeter red wire alternately to white/black wire terminal and to pink wire terminal.

D. Meter should register 12V ± one volt at both terminals.



No Power → Check coil resistance. See COIL later in this section. Resistance O.K. Check spark, Step 3.

Yes

3

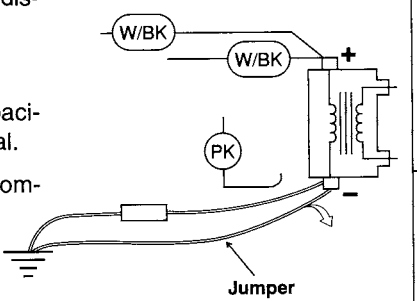
A. Pink (ignition module) wire disconnected.

B. Ignition switch on.

C. Jumper wire – connect capacitor wire to pink wire terminal.

D. Connect both wires to common ground.

E. Momentarily touch ground wire to pink wire terminal. When you remove the wire, there should be a spark at plug.



No Spark → Replace coil.

Yes

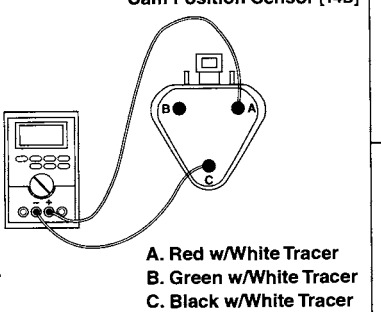
4

A. Reconnect pink wire to coil.

B. Ignition switch on.

C. Disconnect cam position sensor.

D. Connector from ignition module – multimeter red wire to red/white wire socket and multimeter black wire to black/white pin. Should register 12V ± one volt.



No Power → Check ignition module ground and power wire to ignition module for loose connections. See RESISTANCE TEST which follows. Check spark, Step 5.

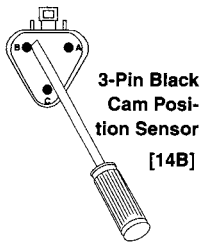
Yes

5

A. Ignition on.

B. Remove secondary lock. Momentarily place screwdriver across green/white and black/white connector pins. Since the ignition module ignores the first four sensor inputs, repeat this step six to ten times.

C. Strong evidence of spark at spark plug when screwdriver is removed. If there is a spark, sensor is suspect. Install known, good sensor and test again.



D. The cam position sensor can also be diagnosed using the Speedometer Tester, HD-41354. Proceed as follows:

Install test harness* between connectors [14A & B]. Turn tester power switch to ON, and place signal switch to the IN position. Plug tester into the test harness and turn ignition on. Press ENTER on keypad. Press motorcycle starter button. If no numbers register on the tester when starter button is pressed, cam position sensor is suspect. Install known, good cam position sensor and test again.

No Spark →

Check ignition module resistance. See IGNITION MODULE RESISTANCE TEST. Replace ignition module if resistance is bad.

** For more information on the Speedometer Tester, including instructions on fabricating the test harness, see SPEEDOMETER/ TACHOMETER PERFORMANCE CHECK.*

INTERMITTENT IGNITION PROBLEM – VIBRATION

A. Check battery connections.

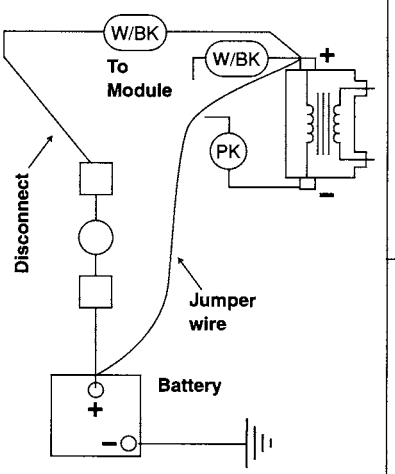
B. Leave white/black wire connected.

C. Connect 16 gauge jumper wire from battery positive terminal to white/black wire terminal of coil.

D. Operate vehicle to see if problem is eliminated.

NOTE

Vehicle no longer has an engine stop switch. Engine must be stopped by removing jumper wire.



Yes →

Problem is vibration, possibly loose connection in circuit.

INTERMITTENT IGNITION PROBLEM – TEMPERATURE

A. Remove outer timing cover.

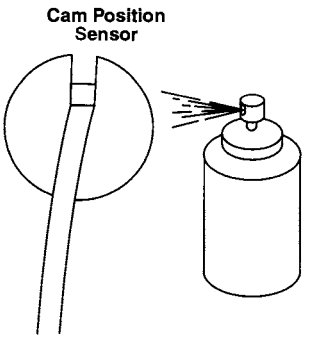
B. Remove inner timing cover and gasket.

C. Start engine.

D. Spray cam position sensor with refrigerant (obtainable at electronic supply houses) to see if engine stalls.

E. With engine hot, at operating temperature and cover off, apply heat (blow dryer) to nose of cam position sensor and see if engine stalls.

F. Apply heat to ignition module (blow dryer) and see if engine stalls.



Yes →

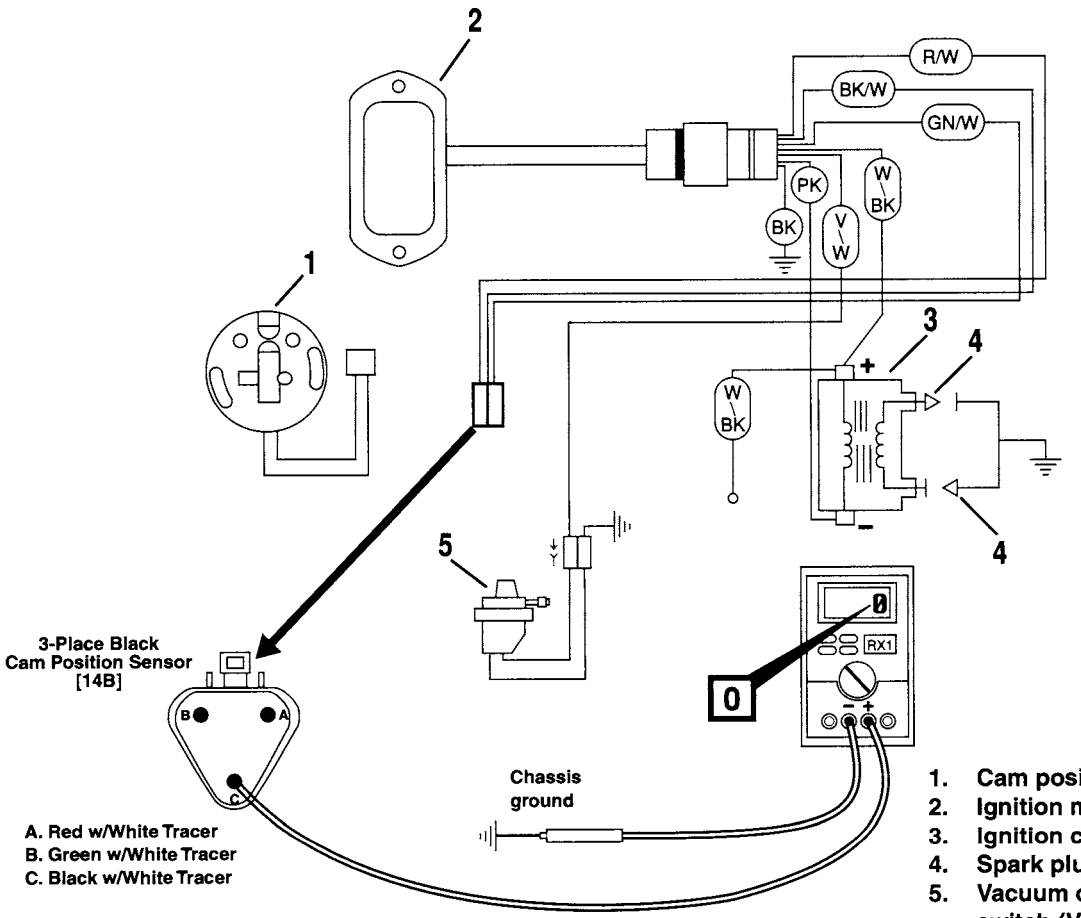
Problem is temperature sensitive cam position sensor or ignition module. Replace cam position sensor or ignition module.

Resistance Test (XLH and FL Models)

IGNITION RESISTANCE TEST

IGNITION MODULE

TEST	METER SETTING	PROBE 1	PROBE 2	METER READING
Check for grounds	RX1	To black/white wire on sensor connector [14B]	To chassis ground	Module 0-1 ohm → Good More than 1 ohm → Check harness for opens. See next page. If harness checks OK, replace ignition module.



1. Cam position sensor
2. Ignition module
3. Ignition coil
4. Spark plug (2)
5. Vacuum operated electric switch (V.O.E.S.)

NOTE

Simplified wiring diagram shown. Refer to Wiring Diagrams at the back of this book for detailed information.

⚠CAUTION

If a resistance test is performed on a "live" circuit, the multimeter will be damaged. Turn off the ignition and disconnect the battery before conducting a resistance test.

Resistance Test (XLH and FL Models)

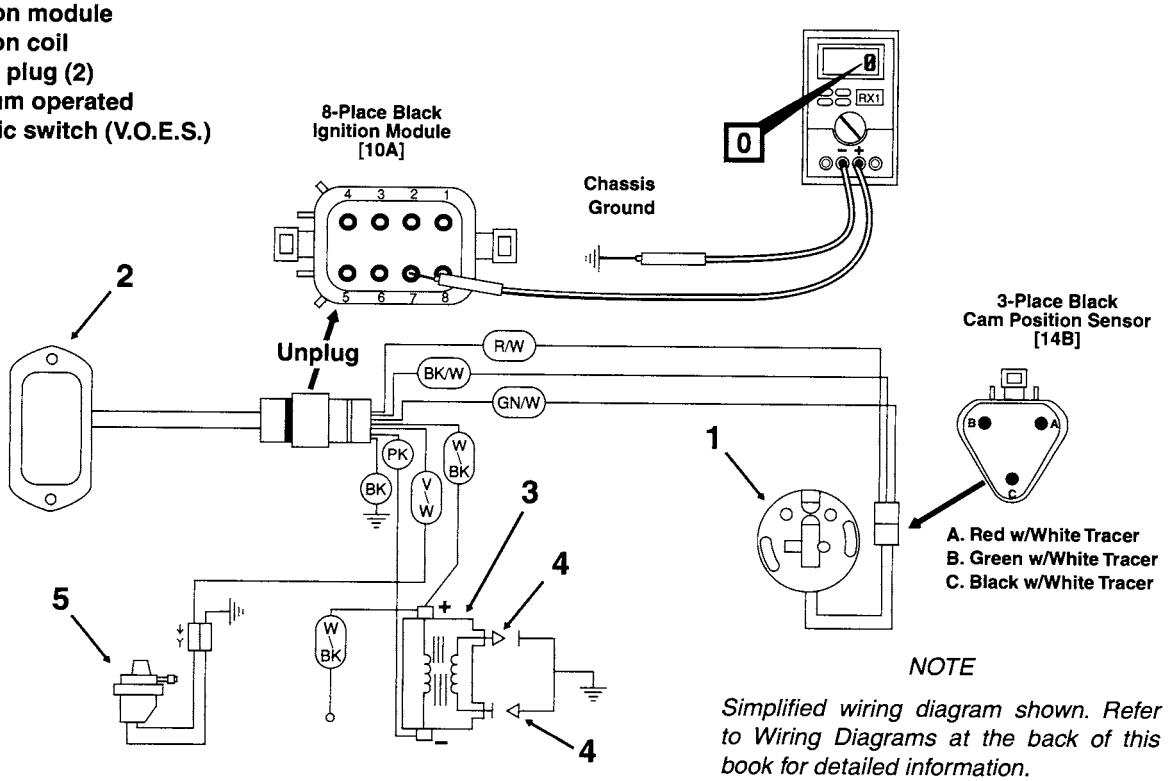
IGNITION MODULE HARNESS

TEST CONDITIONS: Engine stop switch on right handlebar must be in OFF position and 8-place ignition module connector and 3-place cam position sensor connector must be disconnected for these tests. Shake or wiggle the harness to detect any breaks in the wiring.

TEST	METER SETTING	PROBE 1	PROBE 2	METER READING
Check for grounds	RX1	To pin 7 on connector [10A].	To chassis ground	Harness → 0-1 ohm: Good; More than 1 ohm: Repair/clean ground connection.
Check for grounds	RX1	All pins except 7 on connector [10A]	To chassis ground	Harness → Infinity: Good; Any resistance: Locate and repair short to ground.
Continuity	RX1	All pins except 7 on connector [10A]	Opposite end of each of the 6 leads	Harness → 0-1 ohm: Good; More than 1 ohm: Repair broken wire or loose/dirty connection.

Connector [10A]								
Pin No.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Color Code	W/BK	BK/W	R/W	PK	GN/W	V/W	BK	open

1. **Cam position sensor**
2. **Ignition module**
3. **Ignition coil**
4. **Spark plug (2)**
5. **Vacuum operated electric switch (V.O.E.S.)**



NOTE

Simplified wiring diagram shown. Refer to Wiring Diagrams at the back of this book for detailed information.

FX AND FXD MODELS

CONTINUOUS OR NO SPARK AT SPARK PLUG

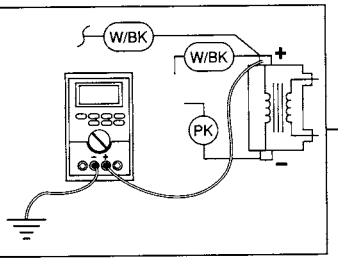
1

d0012x8x

A. Ignition switch on.

B. Multimeter red wire to white/black wire terminal, black wire to ground.

C. Meter should register 12V ± one volt.



No Power → Check Circuit breaker, loose wires, switches.

Yes

2

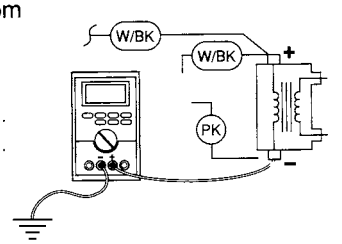
d0013x8x

A. Remove pink (module) wire from coil terminal.

B. Ignition switch on.

C. Multimeter red wire alternately white/black wire terminal and pink wire terminal.

D. Meter should register 12V ± one volt at both terminals



No Power → Check coil resistance. See COIL later in this section. Resistance O.K. Check spark step 3.

Yes

3

d0014x8x

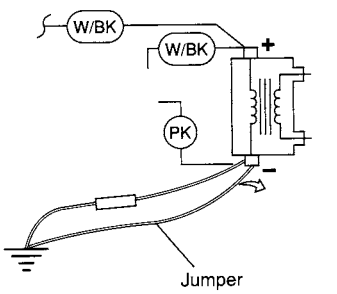
A. Pink (module) wire disconnected.

B. Ignition switch on.

C. Jumper wire – connect capacitor wire to pink wire terminal.

D Connect both wires to common ground.

E. Momentarily touch ground wire to pink wire terminal. When you remove the wire, there should be a spark at plug.



No Spark → Replace coil.

Yes

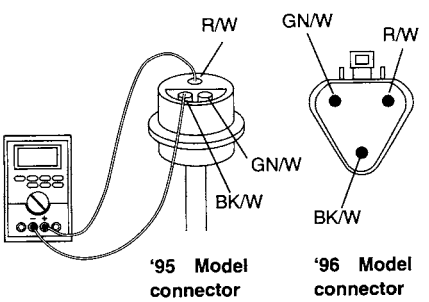
4

A. Reconnect pink wire to coil.

B. Ignition switch on.

C. Disconnect cam position sensor [14].

D. Connector from module-multimeter red wire to red/white wire socket and multimeter black wire to black/white pin (socket on '96 models). Should register 12V ± one volt.



No Power → Check module ground and power wire to module for loose connections. (See resistance test, following.) Check spark, step 5.

Yes

5

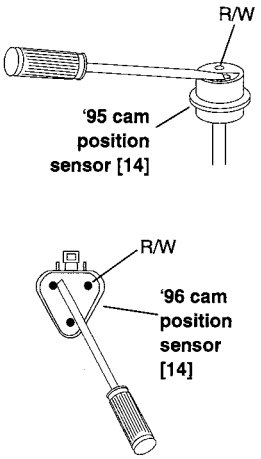
A. Test cam position sensor as follows: Remove secondary lock (on 1996 connectors). Turn ignition on and momentarily place screwdriver across black/white and green/white connector pins. Repeat six to ten times since ignition module ignores the first four sensor inputs.

B. Look for strong evidence of spark at spark plug when screwdriver is removed. If there is a spark, cam position sensor is suspect. Install known, good cam position sensor and test again.

The cam position sensor can also be diagnosed using the Speedometer Tester, HD-41354, as follows:

Install test harness* between connectors [14A & B]. Turn tester power switch to ON, and place signal switch to the IN position. Plug tester into the test harness and turn ignition on. Press ENTER on keypad. Press motorcycle starter button. If no numbers register on the tester when starter button is pressed, cam position sensor is suspect. Install known, good cam position sensor and test again.

**For more information on the Speedometer Tester, including instructions on fabricating test harness, see SPEEDOMETER PERFORMANCE CHECK.*



No Spark → Check module resistance. See Ignition Module Resistance Test. Replace module if resistance is bad.

INTERMITTENT IGNITION PROBLEM – VIBRATION

A. Check battery connections. Disconnect module ground (scrape paint, add star washer).

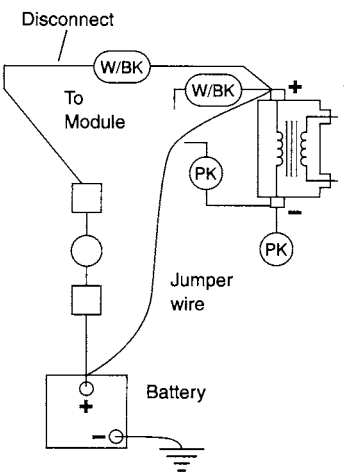
B. Disconnect white/black wire at coil terminal (not module feed).

C. Connect 16 ga. jumper wire from battery positive terminal to white/black wire terminal of coil.

D. Operate vehicle to see if problem is eliminated. If it is, wiggle wires and use voltage drop tests to identify broken primary circuit wires, poor connections, or defective switches or circuit breakers. If problem is not eliminated, look for broken wires or poor connections on ignition module and cam position sensor wiring.

NOTE

Vehicle no longer has an engine stop switch. Engine must be stopped by removing jumper wire.



Yes → Problem is vibration, possibly loose connection at safety switches in starter circuit.

INTERMITTENT IGNITION PROBLEM – TEMPERATURE

A. Remove outer timing cover.

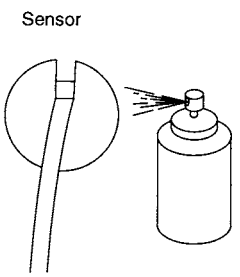
B. Remove inner timing cover and gasket.

C. Start-up vehicle.

D. Spray front of cam position sensor with coolant (obtainable at electronic supply houses) to see if engine stalls.

E. With engine hot, at operating temperature and cover off, apply heat (blow dryer) to front of cam position sensor and see if engine stalls.

F. Apply heat to module (blow dryer) and see if engine stalls.



Yes → Problem is temperature sensitive cam position sensor or ignition module. Replace sensor or ignition module.

Resistance Test (FX and FXD Models)

⚠CAUTION

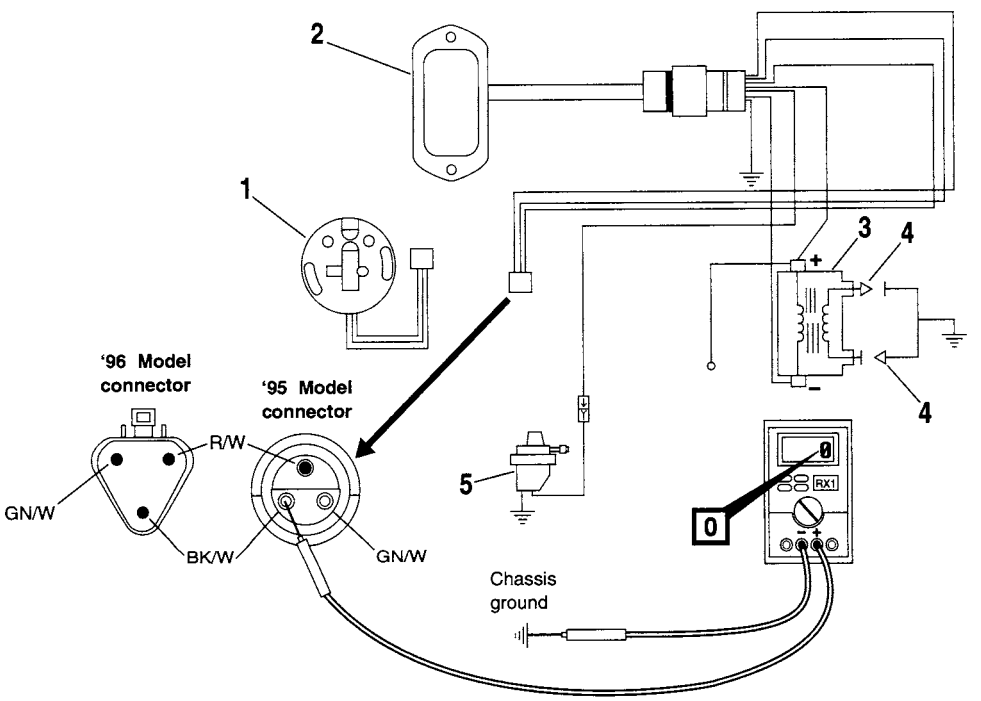
If a resistance test is performed on a "live" circuit, the multimeter will be damaged. Turn off the ignition and disconnect the battery before conducting a resistance test.

IGNITION RESISTANCE TEST

IGNITION MODULE

TEST	METER SETTING	PROBE 1	PROBE 2	METER READING
Check for grounds	RX1	To black/white harness	To chassis ground	**Module** **0-1 ohm** → **Good** **More than 1 ohm** → **Check harness for opens. See next page. If harness is good, replace ignition module.**

s0048x8x



NOTE

Simplified wiring diagram shown. Refer to WIRING DIAGRAM for more detail.

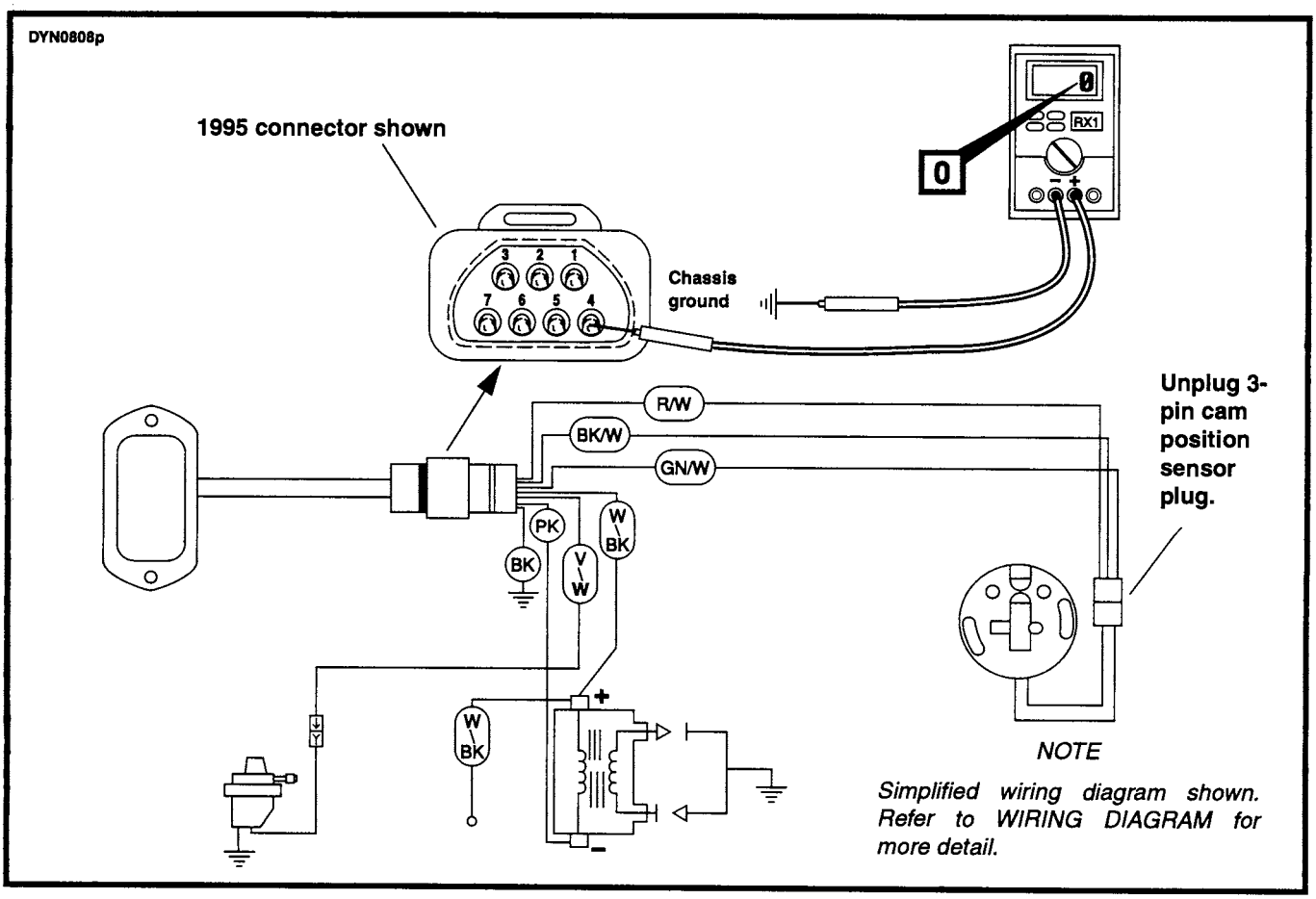
1. **Cam position sensor and 3-pin plug**
2. **Ignition module**
3. **Ignition coil**
4. **Spark plugs**
5. **Vacuum operated electric switch (V.O.E.S.)**

Ignition Resistance Test (FX and FXD Models)

IGNITION MODULE HARNESS

TEST CONDITIONS: **Engine Stop switch on right handlebar must be in "OFF" position, and 7-place (1995) or 8-place (1996), and cam position sensor 3-place connectors, must be unplugged for these tests. Shake or wiggle the harness to detect any breaks in the wiring.**

TEST	METER SETTING	PROBE 1	PROBE 2	METER READING
Check for grounds	RX1	To pin 4 in 7 pin connector (1995 Models) To pin 7 in 7 pin connector (1996)	To chassis ground	Harness 0-1 ohm — Good More than 1 ohm — Repair/clean ground connection.
Check for grounds	RX1	All pin terminals except 4 (1995) or pin 7 (1996)	To chassis ground	Harness Infinity — Good Any resistance — Locate and repair short to ground.
Continuity	RX1	All pin terminals except 4 (1995) or pin 7 (1996)	Opposite end of each of the 6 leads (refer to WIRING DIAGRAM)	Harness 0-1 ohm — Good More than 1 ohm — Repair broken wire or loose/dirty connection.



TROUBLESHOOTING (All Models)

Use the troubleshooting chart on the next page to diagnose and locate problems with malfunctioning or inoperative instruments and gauges. See Figure 33 for wire connections at rear of gauges. Refer to the applicable wiring diagram at the back of this manual for further assistance.

Fuel Gauges

THEORY OF OPERATION

See Figure 34. With the ignition switch on, the fuel gauge is connected to + 12 vdc. Current flows through the gauge and variable resistor in the fuel gauge sending unit to ground. The sending unit float controls the amount of resistance in the variable resistor.

FUEL GAUGE AND SENDER TEST

1. See the following chart and "ground" the applicable test point.
2. Turn on ignition switch. If gauge indicated FULL, gauge is functioning correctly. Proceed to step 3. If gauge did not indicate FULL, proceed to step 4.

GAUGE LOCATION	TEST POINT & LOCATION
Instrument panel	Yellow/white wire at sending unit connector under seat.

3. With the Multi-Meter, Part No. HD-35500A, set on the RXI scale, measure the resistance of the sending unit. Place one probe on the center terminal and the other probe on a good ground. The meter must indicate approximately 7-95 ohms on FLTCU and FLHT/C/U models, 27-60 ohms on FLHR and FXD models. If the fuel tank is full, then the reading should be approximately 7-14 ohms on FLTCU and FLHT/C/U models, 27-40 ohms on FLHR and FXD models. An empty tank should have a 74-95 ohm resistance on FLTCU and FLHT/C/U models, 240-260 ohm resistance on FLHR and FXD models. If a very high resistance or infinity is indicated on the meter, the sender may be "open" or not grounded. Verify that the sender and fuel tank are grounded by placing one probe of Multi-Meter on sender flange and the other probe on crankcase. Meter must indicate one ohm or less. Replace sender if one ohm or less was present. If a higher resistance is present, refer to applicable wiring diagram at rear of this manual and check sender ground circuit.
4. If gauge did not indicate FULL, use Multi-Meter (Part No. HD-35500A) to verify that 2-7 vdc is present at sender. If 2-7 vdc is not present, check for broken or disconnected wire or an open winding in fuel gauge. Replace gauge if winding is open.

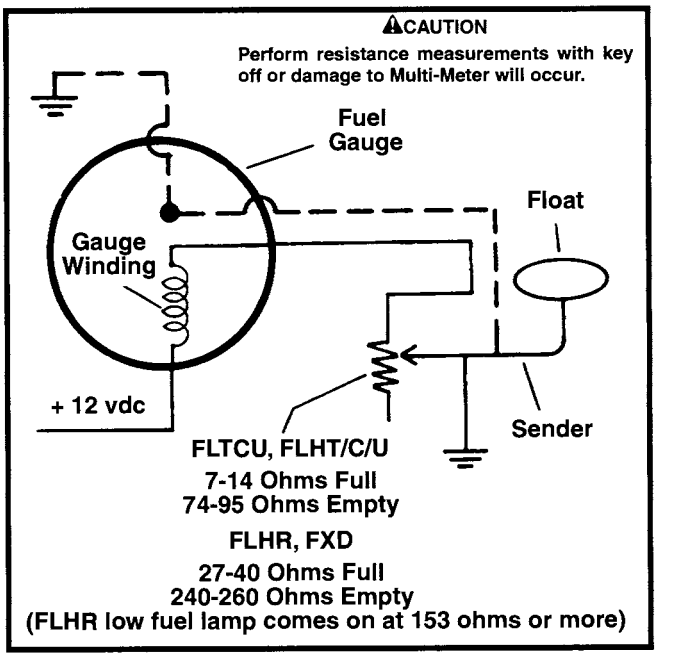


Figure 34. Fuel Gauge Schematic

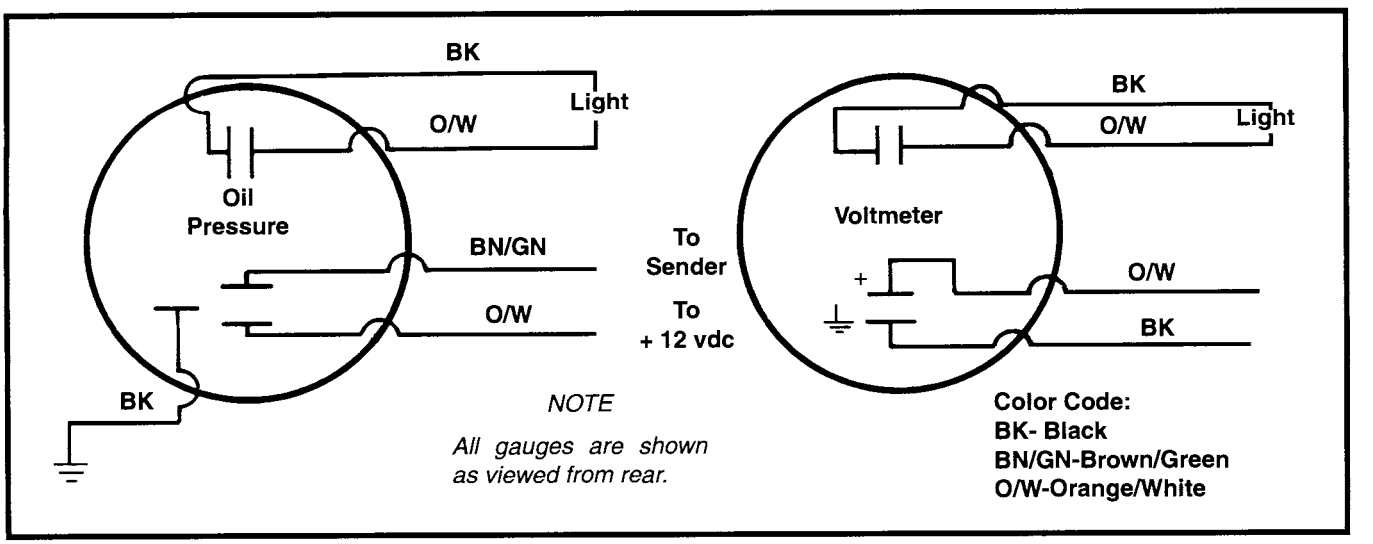


Figure 33. Connections for Gauges

Problem	Cause	Solution
AIR TEMP GAUGE		
1. Gauge inoperative.	1.1 Sensor not grounded or open between sensor and gauge.	1.1.1 Test for continuity between pin 1 and ground and pin 3 and gauge. Repair if open.
	1.2 Broken or disconnected power or ground wire to air temperature gauge.	1.2.1 Check for 12 vdc between pins 1 and 3 at connector [115A]. Replace gauge if voltage is present. Use voltage drop tests and continuity checks to isolate if voltage is not present.
	1.3 Malfunction in gauge or sensor.	1.3.1 Measure resistance between pins 1 and 3 at 65° to 85° F. Resistance should be 43-31 ohms. Replace sensor if out of range, replace gauge if within range.
OIL PRESSURE GAUGE AND INDICATOR LIGHT		**⚠CAUTION** **Running engine when OIL light stays on and gauge indicates low pressure will result in engine damage.**
2. Oil indicator light stays on with engine running above idle and/or gauge does not indicate.	2.1 No oil pressure due to lack of oil or inoperative oil pump.	2.1.1 Check oil level and add oil if low. Restart engine and verify that oil light goes off and gauge indicates pressure. If problem still exists, refer to OIL PUMP in Section 3.
	2.2 Contacts in pressure sender not opening to shutoff light. Variable resistor in sender is shorted to ground.	2.2.1 Verify that orange/white lead is connected to sender terminal WK. The brown/green lead must be connected to terminal G. If gauge indicates pressure but oil light stays lit – disconnect wire from terminal WK and place one ohmmeter probe on WK terminal and other probe on crankcase. **⚠CAUTION** **Always disconnect wire from terminal WK before checking with ohmmeter. The ohmmeter may be damaged if connected to 12 vdc.** Meter must read zero ohms. Start engine and run at fast idle- meter must read infinity. Replace sender if above meter readings were not obtained. If oil light functions correctly, but gauge does not, then proceed as follows: Remove lead from "G" terminal on sender. Turn ignition switch ON, gauge must read full scale 70 PSI. Ground lead to crankcase, gauge must read zero. Replace sender if above gauge readings were obtained. If gauge did not indicate above readings, then replace gauge.
VOLTMETER		
3. Meter inoperative.	3.1 Broken or disconnected leads to meter or open meter winding.	3.1.1 Check that 12 vdc is present at "±" terminal on voltmeter with ignition switch ON. With ignition switch OFF check ground terminal for continuity to ground. If 12 vdc is present and ground terminal grounded – replace meter. If 12 vdc is not present trace wiring until disconnected or broken wire is found and repaired. If ground terminal is not grounded refer to wiring diagram and repeat procedure given for 12 vdc lead.
LOW FUEL LAMP - FLHT Models Only		
4. Fuel low level lamp not on when fuel level low.	4.1 Lack of power.	4.1.1 Check for power (12 vdc or battery voltage) between pins 1 (positive) and 6 (negative) at low fuel module.
	4.2 No ground.	4.2.1 Check for continuity to ground on pin 6.
	4.3 Lamp defective or wiring broken.	4.3.1 Ground pin 2. If lamp comes on, then LED functional and wiring OK.
	4.4 Defective module, insufficient voltage to module.	4.4.1 LED should come on when voltage at pin 4 exceeds 3.7 vdc.

SPEEDOMETER (ELECTRONIC)

GENERAL

NOTE

The performance (proper operation and sweeping action) of the speedometer and tachometer can be evaluated using the Speedometer Tester (HD-41354). Before removing and replacing these instruments, see SPEEDOMETER/TACHOMETER PERFORMANCE CHECK.

See Figure 35. The electronic speedometer consists of a speed sensor, function switch and speedometer unit.

The Hall-Effect speed sensor circuitry is triggered by the teeth of the transmission mainshaft 4th gear on all 1340cc models, the mainshaft 5th gear on XLH models. The sensor output is a series of pulses that are interpreted by the speedometer circuitry to control the position of the speedometer needle and the odometer's liquid crystal display (LCD). The odometer mileage is permanently stored and is not lost when electrical power is turned off or disconnected.

By momentarily pressing the function switch, the user is able to toggle between the odometer and trip odometer displays.

To zero the trip odometer, depress and hold the function switch while the odometer display is visible. The trip odometer mileage will then appear for approximately 2-3 seconds, after which time the recorded figure is zeroed.

The odometer can display seven numbers to indicate a maximum of 999999.9 miles. The trip odometer can display five numbers for a maximum of 9999.9 miles.

NOTE

Circuitry in the speedometer also conditions the sensor input to provide an input to the turn signal canceler. The turn signal canceler input was supplied by the reed switch in mechanical speedometers.

TROUBLESHOOTING

See the Troubleshooting chart on the next page.

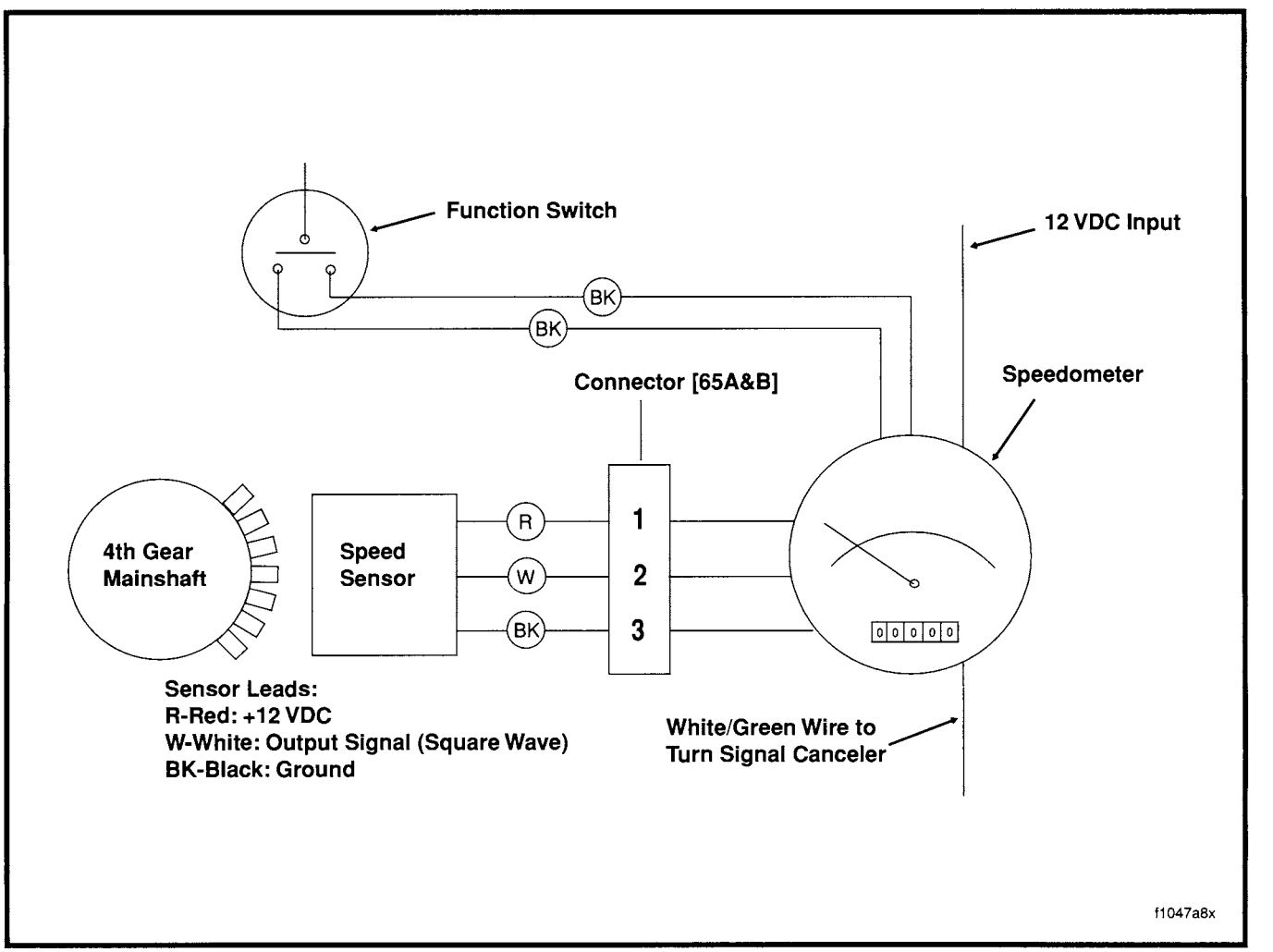


Figure 35. Electronic Speedometer

ELECTRONIC SPEEDOMETER TROUBLESHOOTING

PROBLEM	CAUSE	TEST	SOLUTION
Speedometer inoperative, no backlighting or odometer.	No power.	Check for 9-12VDC on the O/W wire in connector [20B].	Trace wiring to find open connection and correct.
	No ground.	Check for continuity to ground on the BK wire in connector [20B].	Trace wiring to find open connection and correct.
	Defective speedometer.		Replace speedometer.
Speedometer inoperative, but backlighting and odometer display are illuminated.	Sensor unplugged.	Inspect sensor connector.	Connect sensor.
	No power to sensor.	Check for 6-12VDC on R wire in connector [65B].	If voltage is not present, check for open wires or replace speedometer if wires are in good condition.
	No ground to sensor.	Check for continuity to ground on BK wire in connector [65B].	If continuity is not present, check for open wires or replace speedometer if wires are in good condition.
	No signal from sensor.	Check for voltage on W wire in connector [65B] while connected. Meter should read 6-12VDC when gear tooth absent and 0-1VDC when the gear tooth is present.	If voltage is not present, replace speed sensor. Sensor can also be tested with Speedometer Tester (HD-41354) and test harness. See Speedometer Sensor Test in Section 8.
Turn signals will not cancel.	Open in wiring to turn signal module.	Check for voltage on W/GN wire in connector [20B] while connected. Meter should alternate between 6-12VDC (from turn signal module) and 0-1VDC when rear wheel is rotated.	No voltage; trace wiring to find open connection and correct.
	No voltage from turn signal module.	Check for voltage on W/GN wire in connector [20B] while connected. Meter should alternate between 6-12VDC (from turn signal module) and 0-1VDC when rear wheel is rotated.	No voltage; replace turn signal module if wiring is not damaged.
	Speedometer is not creating signal to ground.	Check for voltage on W/GN wire in connector [20B] while connected. Meter should alternate between 6-12VDC (from turn signal module) and 0-1VDC when rear wheel is rotated.	Replace speedometer.
Erratic speedometer operation.	Poor connections.	Wiggle wires in an attempt to repeat the problem and identify the source. Inspect connections.	Correct loose connections.
	Defective speedometer.		Replace speedometer.
Function switch inoperative.	Switch contacts not closing circuit.	Remove console and cut function switch leads. Place jumper across switch leads. If switch functions can be triggered with jumper, speedometer is OK. If speedometer does not respond, see following.	Replace function switch.
	Defective speedometer.		Replace speedometer assembly.

SPEEDOMETER/TACHOMETER PERFORMANCE CHECK

GENERAL

The performance (proper operation and sweeping action) of the speedometer and tachometer (if equipped) can be evaluated with the Speedometer Tester, HD-41354. For the purpose of checking the speedometer operation, the tester generates a signal that simulates the input normally received from the speedometer sensor.

Similarly, when testing tachometer performance (on carbureted models only), the tester is used to send a frequency to the ignition module to simulate the signal received from the cam position sensor.

Finally, the signal generated by the Speedometer Tester can be employed to simulate engine running conditions for ignition system troubleshooting. See IGNITION SYSTEM for more information.

NOTE

Use the following procedures in conjunction with the manual supplied with the speedometer tester.

SPEEDOMETER TESTS
Electronic Speedometers Only

NOTE

See Figure 36. The speedometer tester does not verify the calibration of a speedometer nor will it verify the speedometer's function to support legal proceedings. It's purpose is to verify speedometer function when performing service diagnosis or repair, and to assist in determining if speedometer replacement is necessary.

Frequency Input Test

1. Disconnect the speedometer sensor connector [65] located under the seat (3-place Deutsch). Mate the Speedometer Tester and speedometer sensor [65B] connectors. See Figure 37.

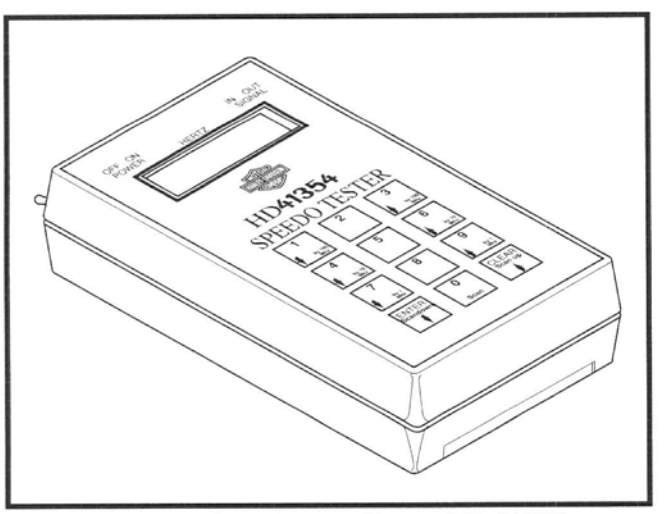


Figure 36. Speedometer Tester (HD-41354)

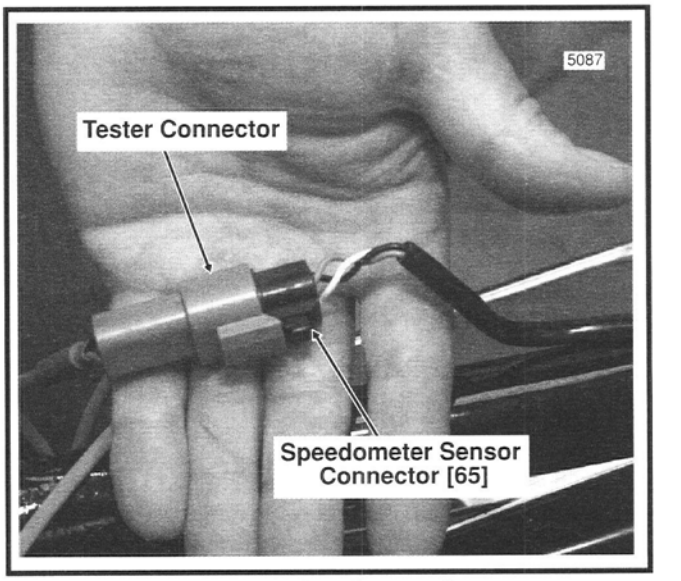


Figure 37. Test Connection

2. Place the Speedometer Tester Power Signal Switch in the "OUT" position. Place the Power Switch in the "ON" position. Turn the Ignition/Light Key Switch to "ON."

3. When the Speedometer Tester displays "P_ _ _1", press "1" on the keypad followed by the "ENTER" button. A series of three dashes is displayed on the tester LCD.

4. Refering to the appropriate table on page 52, enter a selected frequency and press the "ENTER" button again.

NOTE

If the entered frequency is 0 or more than 19,999, then the message "FAIL" will appear on the LCD display and the unit will return to the frequency select prompt.

5. Look at the needle of the speedometer gauge to verify that it corresponds to the speed printed at the top of the frequency column.

6. To change the frequency, press the "CLEAR" button on the keypad to cancel the operation, enter a new frequency and then press the "ENTER" button to begin.

NOTE

Speedometers are calibrated to be 0 to plus 4 mph (6.4 kph) fast. Certified speedometers (FLHP, FLHTP and 1996 FLHR models only) are calibrated to be plus or minus 2 mph (3.2 kph).

Needle Sweep Test

The sweep function of the Speedometer Tester moves the needle on the speedometer gauge through its full operating range. Observe the movement of the needle and take note of any hesitancy or sticking. Proceed as follows:

NOTE

If the Speedometer Tester was just used to perform the Operation Test, turn the Power Switch OFF and then ON to reset the device.

1. With the tester connected as described in Frequency Input Test, place the Speedometer Tester Power Switch in the "ON" position. Place the Power Signal Switch in the "OUT" position.
2. Turn the Ignition/Light Key Switch to "ON".
3. When the Speedometer Tester displays "P_ _ _1", press "0" on the keypad followed by the "ENTER" button. The tester will scan for two seconds and then put out 1 Hz.
4. Use the 2, 5, and 8 keys to select one of three ranges:

   LO (1-20 Hz)

   CEN (21-999 Hz)

   HI (1000-20,000 Hz)
5. Next, use the corresponding arrow keys to accelerate through the selected range. For example, keys 1 and 3 move through the LO range. As you move through the speed range, check for smooth needle movement. Replace any speedometer that sweeps erratically up or down.

Speedometer Sweep Test

THESE BUTTONS DECREASE BY		THESE BUTTONS INCREASE BY	
1	100	**3**	100
4	10	**6**	10
7	1	**9**	1

SPEEDOMETER SENSOR TEST
Electronic Speedometers Only

If the speedometer is inoperative, but the backlighting and odometer work, then the speedometer sensor may be faulty.

To test the speedometer sensor as described below, as well as the cam position sensor test using the tachometer tester (described in IGNITION SYSTEM), a test harness is required.

Fabricate the test harness by splicing together two Deutsch 3-place socket housings (72113-94BK) and one Deutsch 3-place pin housing (72103-94BK). See Figure 38. Use six inch lengths of 18 gage wire. Install the test harness at the cam position sensor connector [14].

To diagnose the speedometer sensor, first test for voltage to sensor by checking for 8-12 VDC on Red wire in connector [65B]. Then check for continuity to ground on Black wire in connector [65B]. The following test will only work if voltage and proper ground are present at speedometer sensor.

Install the test harness between the speedometer sensor connectors [65A & B]. Turn tester power switch to ON, and place signal switch in the IN position. Plug the speedometer tester into the test harness and turn the ignition ON. Press

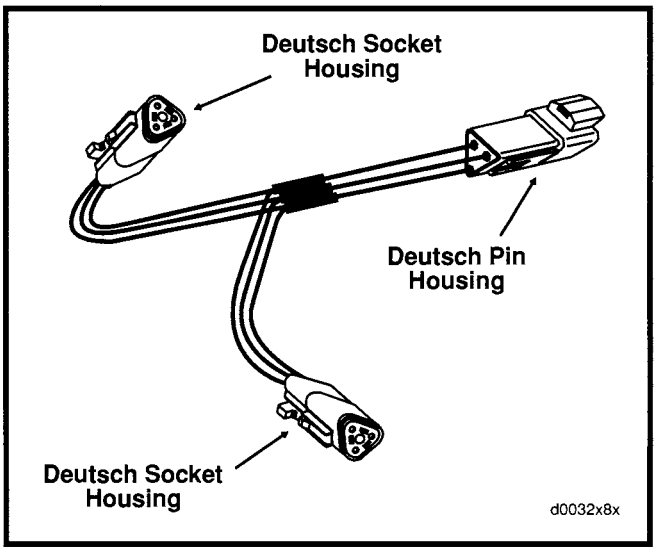


Figure 38. Test Harness

ENTER on the keypad. Rotate the motorcycle's rear wheel. The numbers on the speedometer tester readout should change with changes in wheel speed. If the readout doesn't change, the speedometer sensor is suspect. Install a known, good speedometer sensor and test again for proper operation.

TACHOMETER TEST
Carbureted Models Only

Operation Test

1. Connect the speedometer tester to the cam position sensor Deutsch socket housing [14B]. The tester frequency you enter will now travel to the ignition module and the module will open and close circuits to fire the spark plugs. This allows you to simulate engine running and generate tachometer readings.
2. Because tester frequency is in Hertz, and you will be interested in measuring rpm on the tachometer being tested, convert the tachometer reading you want to Hz, then enter the frequency just as you did in the speedometer operation test above.

   For example:

   2000 rpm (tachometer reading) ÷ **60**
   = **33.3** (enter 33 into tester)

   In this example, entering 33 Hz into the tester should result in an rpm reading of 2000 on the tachometer. Test the tachometer at several different rpm readings to verify proper operation.

Tachometer Accuracy Tolerances at 68-77° F (20-25° C)				
Indication (rpm)	2000	4000	6000	7500
Tolerance (rpm)	± 100	± 120	± 210	± 320

XLH MODELS

Model (units)	Tester Frequency (in Hz) Corresponding to:			
	20 mph (30 kph)	40 mph (60 kph)	60 mph (100 kph)	80 mph (130 kph)
883/1200 (Where applicable)				
Dom 1995	345/ 321	687/640	1026/955	1361/1268
HDI 1995	409/381	816/760	1353/1259	1750/1629
Swiss 1995	290/270	578/538	958/892	1240/1154
Japan & Canada 1995	322/300	641/597	1063/990	1375/1280
Grt. Brttn. 1995	439/408	874/814	1306/1216	1753/1613
Dom 1996	439/408	874/814	1306/1216	1733/1613
Swiss 1996	386/368	788/734	1178/1096	1562/1613
1200C* Dom 1996	408	814	1216	1613
1200C* HDI 1996	381	760	1259	1629
1200C* Grt. Brttn.1996	408	814	1216	1613
1200C* Swiss 1996	344	685	1136	1469

NOTE

Different numbers for 1995 and 1996 Models in chart above are due to HCR (High Contact Ratio) gears, which are new to domestic and Swiss models in 1996.

FX MODELS

Model (units)	Tester Frequency (in Hz) Corresponding to:			
	20 mph (30 kph)	40 mph (60 kph)	60 mph (100 kph)	80 mph (130 kph)
Domestic	431	859	1283	1702
HDI	402	802	1329	1719
Great Britain	431	859	1283	1702

Tachometer Sweep Test

Just as in the speedometer sweep test, variable frequency signals can be generated by the speedometer tester to help verify proper tachometer sweep operation. With the speedometer tester installed at the cam position sensor connector [14B], perform the tachometer sweep test following the speedometer sweep test steps already described.

FXD MODELS

Model (units)	Tester Frequency (in Hz) Corresponding to:			
	20 mph (30 kph)	40 mph (60 kph)	60 mph (100 kph)	80 mph (130 kph)
Domestic (mile)	362 ('95) 471 ('96)	721 ('95) 939 ('96)	1077 ('95) 1403 ('96)	1429 ('95) 1861 ('96)
Japan/Canada (kilo)	338 ('95)	673 ('95)	1115 ('95)	1443 ('95)
Great Britain (mile/kilo)	471 ('95 & '96)	939 ('95 & '96)	1403 ('95 & '96)	1861 ('95 & '96)
HDI* (kilo) *includes Japan & Canada for '96	440 ('95 & '96)	877 ('95 & '96)	1453 ('95 & '96)	1880 ('95 & '96)
Swiss (kilo)	408 ('95 & '96)	814 ('95 & '96)	1349 ('95 & '96)	1745 ('95 & '96)

NOTE

Different numbers for 1995 and 1996 Models are due to HCR (High Contact Ratio) gears, which are new to domestic models in 1996.

FLHR MODELS

Model (units)	Tester Frequency (in Hz) Corresponding to:			
	20 mph (30 kph)	40 mph (60 kph)	60 mph (100 kph)	80 mph (130 kph)
Domestic (mile)	464	925	1381	1833
Great Britain (mile/kilo)	464	925	1381	1833
Swiss 1995 (kilo)	402	801	1328	1719
Japan, Canada 1995 (kilo)	332	663	1098	1421
HDI* (kilo)	433	863	1431	1851

* Includes Japan (1996), Canada (1996) and Swiss (1996)

SOUND SYSTEM (FLHTC)

TROUBLESHOOTING SOUND SYSTEMS (NON-ULTRA)

Problem	Cause	Solution
1. No lights. No sound.	1.1 Fuse blown.	1.1.1 Check fuses. See table following this chart for additional fuse troubleshooting. Replace blown fuse with fuse that is equally rated.
	1.2 Faulty starter relay.	1.2.1 Replace starter relay.
	1.3 No power.	1.3.1 Check battery, main circuit breaker, ignition switch and wiring.
2. No switching or erratic behavior at control panel and/ or handlebar controls.	2.1 Minimal or below control voltage limit.	2.1.1 Reset radio by turning IGN OFF, then ON.
		2.1.2 Poor power or ground connections. Refer to wiring diagram and use multimeter to find source of problem. Refer to VOLTAGE DROP TESTING procedure that follows.
	2.2 Grounded handlebar switches or wiring.	2.2.1 Refer to the test procedure under Handlebar Switches later in this section.
3. Cannot obtain full volume.	3.1 Low voltage.	3.1.1 Charge battery. Check current draw and charging system output. Reduce load at idle by turning off unnecessary accessories. If current draw is excessive, eliminate one or two accessories to reduce load.
	3.2 Water in speaker grilles.	3.2.1 Blow water out of speaker grilles with compressed air.
4. No volume, intermittent volume, or unresponsive volume switch.	4.1 Intermittent AVC lead.	4.1.1 Check that AVC line (W/GN) from radio is connected to speedometer and reed switch is operating. See AVC test procedure given later in this section.
	4.2 Grounded handlebar switch or wiring.	4.2.1 See 2.2.1.
	4.3 Water in volume control.	4.3.1 Dry switch housing with compressed air. Spray switch with WD-40 lubricant.
	4.4 Water in DIN connector [48B].	4.4.1 Blow dry with compressed air.
	4.5 Worn volume control.	4.5.1 Replace volume control.
	4.6 Broken wire between volume control and radio.	4.6.1 See 2.2.1.
5 Distortion or poor performance.	5.1 Bass and volume set too high.	5.1.1 Adjust bass and volume controls to median settings.
	5.2 Incorrect speaker polarity.	5.2.1 Check that speakers are connected as follows: Left speaker, terminal near paint dot-W/O wire; common terminal-LT GN/W wire; Right speaker, terminal near paint dot-GY/R wire; common terminal-LT GN/BK wire.
	5.3 Speaker(s) not operating properly.	5.3.1 Refer to Chart A-1 for speaker inspection procedure.
6. Poor reception on AM or FM. Tape unit plays satisfactorily.	6.1 Antenna cable or mast shorted to ground or open.	6.1.1 Replace antenna or cable. See Antenna Tests later in this section.

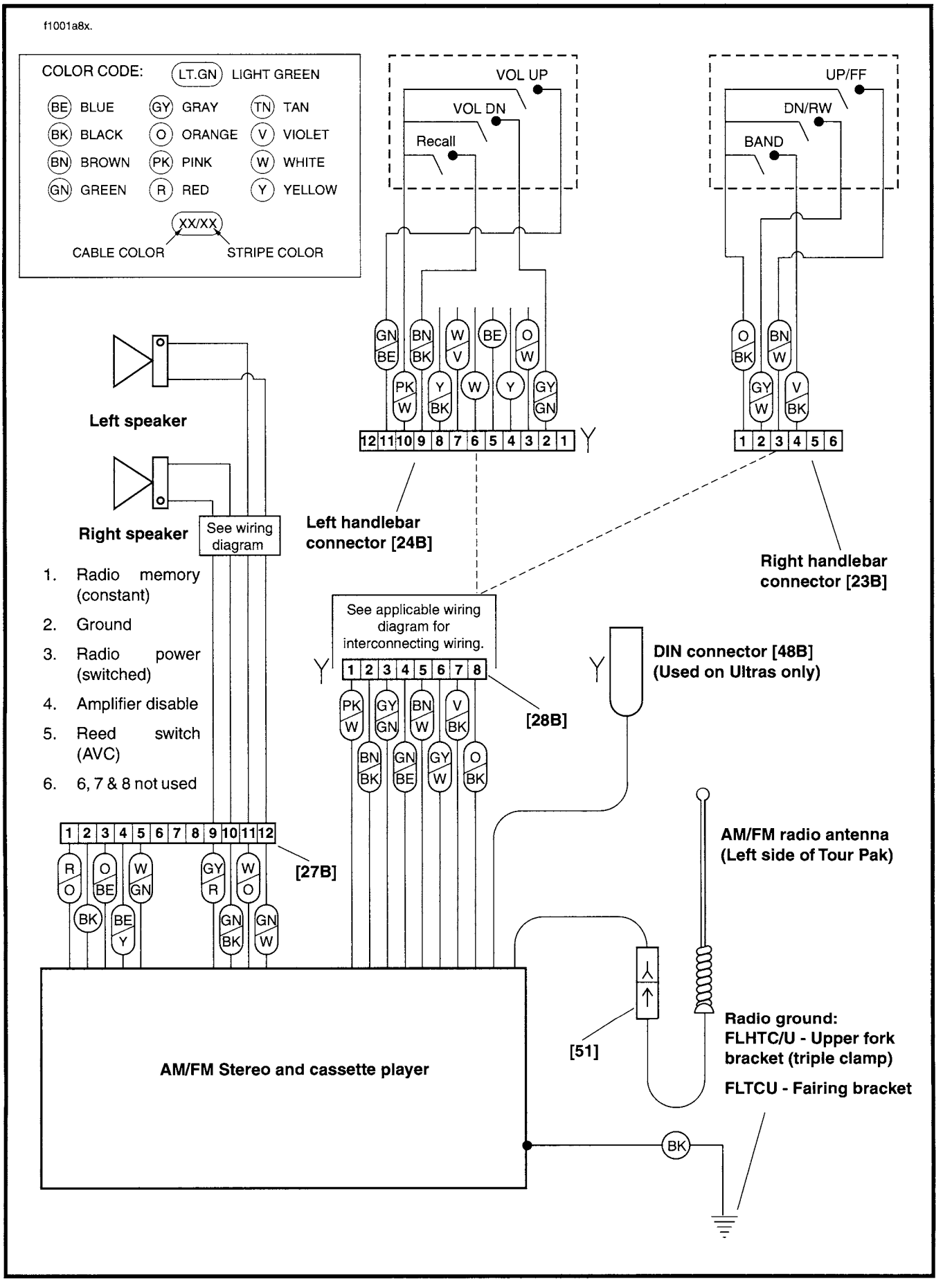


Figure 39. Wiring Diagram

Problem	Cause	Solution
7. Tape ingested or tape cartridge stuck.	7.1 Capstan or pinch roller dirty.	7.1.1 First try to eject. If unsuccessful, removal of lodged cassette should be attempted only if cassette is not completely seated. **⚠CAUTION** **If cassette is seated, the radio must be returned to the radio manufacturer. The cassette can only be removed by removing tape deck from radio chassis. If cassette is not seated, removal can be attempted by pulling on cassette while carefully trying to lift cassette from bottom with a small screwdriver. This must be performed very gently to avoid damage to cassette mechanism. If cassette is successfully removed, clean cassette deck thoroughly.**
	7.2 Loosely wound tape in deck or tape left in door for extended period then inserted.	7.2.1 If possible, eject cassette cartridge and if the ribbon is wrapped around the internal workings, gently pull on the ribbon so as to free it from the drive. **⚠CAUTION** **If tape is difficult to dislodge, do not force as damage to tape mechanism could result. Radio chassis should be returned to manufacturer for repairs. See Harley-Davidson dealer for instructions.**
8. Tape is ejected and display reads "FAIL'D".	8.1 Tape is too loosely wound.	8.1.1 Tighten tape and reinsert.
9. Battery drained when motorcycle is not operated for extended periods.	9.1 Radio memory and clock circuits constantly draw small amount of current.	9.1.1 Trickle charge, or disconnect battery occasionally, during periods that motorcycle remains idle. Refer to Charging System.
10. Radio picks up engine noise. Noise (signal frequency) changes with engine RPM.	10.1 Antenna shorted to ground or bad cable.	10.1.1 Check antenna following test procedures under Antenna Tests that follow this chart.
	10.2 Loose or defective spark plug wire or wires.	10.2.1 Clean coil tower and check ignition wire connections. Verify that spark plug cables are not routed next to antenna cable under fuel tank.
	10.3 Weak signal (usually AM).	10.3.1 Normal. Automatic Gain Circuit in radio increases gain to "pull-in" weak signal and also picks up ignition signal.

BLOWN FUSE SYMPTOM LIST - FLHTC/U and FLTCU

ULTRA MODELS FUSE/FILTER CIRCUIT BOARD

FUSE VALUE (AMP)	FUNCTION	SYMPTOM(S) IF FUSE IS BLOWN
5	pod power	No rear speakers and no back-lighting of pod controls.
3	CB power	CB won't turn on.
1	CB memory	CB inoperative, display erratic.

FLHTC

FUSE VALUE (AMP)	FUNCTION	SYMPTOM(S) IF FUSE IS BLOWN
10	radio power	Stereo radio is off, won't turn on, and no back-lighting on face of stereo.
1	radio constant	Radio display off, including orange backlight. All other backlighting on radio face is on (Bar and shield, etc.). Radio inoperative.

ULTRA MODELS

FUSE VALUE (AMP)	FUNCTION	SYMPTOM(S) IF FUSE IS BLOWN
10	radio power	1. Stereo radio is off, won't turn on, and no back-lighting on face of stereo. 2. Pod and rear speakers dead, no back-lighting on pod. 3. CB off, won't turn on.
1	radio constant	1. Radio display off, including orange backlight. All other backlighting on radio face is on (Bar and shield, etc.). Radio inoperative. 2. CB inoperative, display erratic.

VOLTAGE DROP TESTING

TEST THEORY

See Figure 40. A voltmeter (VM) connected across (in parallel with) a circuit component through which current is flowing will indicate the voltage drop across the component. The greater the resistance or current flow the higher the voltage drop. Voltage drop testing can detect very low resistance values in high current circuits. For example, the allowable voltage drop in a 12 vdc starter motor circuit, excluding solenoid and motor, is 0.2 vdc per 100 amperes (amps). The 0.2 vdc voltage drop indicates the maximum allowable resistance in the starting circuit is 0.002 ohm, a resistance value not measurable with common ohmmeters.

TYPICAL COMPONENT VOLTAGE DROPS

Switches, circuit breakers, connectors and electrical wires and cables must have low resistance and the voltage drop across them (VM reading) must not exceed 1 volt. Relay windings, lamps and other components that have internal resistance will have larger voltage drops, approximately 1-2 vdc.

SAMPLE TEST DIAGRAM (Figure 40)

Figure 40 shows a simple light circuit containing a 12 vdc battery, a single pole single throw switch, a lamp and interconnecting wiring. The voltmeter, as connected, is checking the

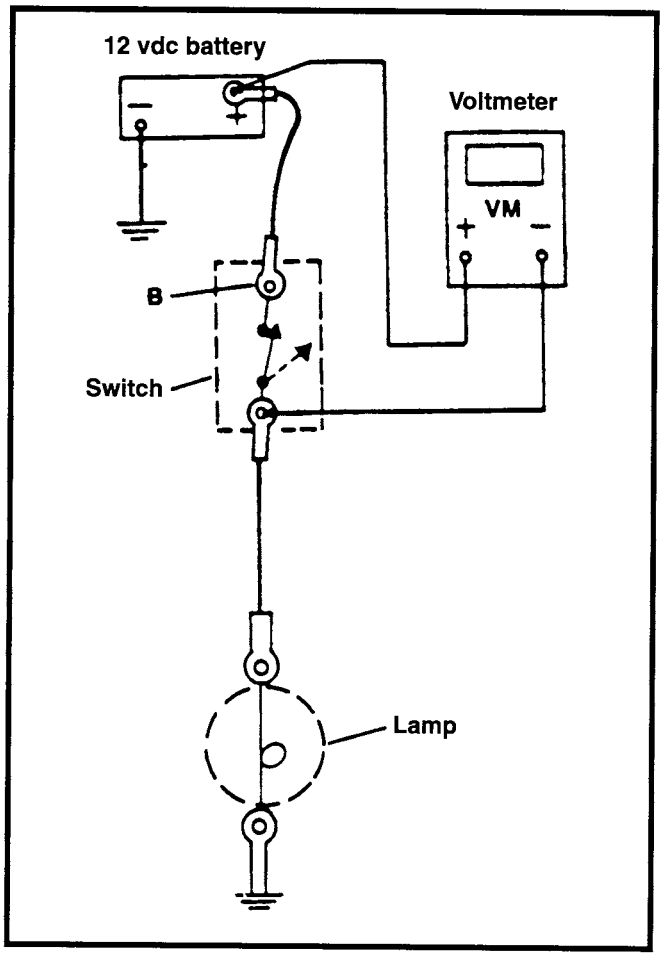


Figure 40. Sample Voltage Drop Test Connections

following connections for voltage drops: (1) the connection between the battery terminal and the cable terminal, (2) the connections between the wire terminal and the wire at both ends of the wire, (3) the connection between the switch terminal stud and wire terminal at "B" and (4) the contact resistance of the switch. If the VM reads 1 vdc or less, the switch and its input wire are OK. If the VM reading is greater than 1vdc, isolate the high resistance by moving the negative probe toward the positive battery connection, one connection at a time.

First move the negative probe to the switch input stud (B). If the voltage drops to 1 vdc or less, the switch contacts have high resistance and the switch must be replaced. If the VM reading remained greater than 1vdc, place the negative probe on the wire terminal at stud (B). If the VM reading decreased to 1 vdc or less, the connection at stud (B) is loose or corroded. If the VM reading remained greater than 1vdc, continue checking across the remaining connection points to isolate the problem.

Antenna Test (Figure 41)

A faulty antenna can cause poor reception. Check it in three steps after cleaning the mast. Step one: set your ohmmeter to the X 1 scale, and connect the leads as shown in the drawing. A reading of more than 2 ohms means you should replace the antenna or cable. If less than 2 ohms, proceed to Step 2. Using the same scale, connect the leads as shown. If the reading is greater than 2 ohms, replace the antenna or cable. If it's less than 2 ohms, proceed to Step 3. Set the meter to the X 1,000 scale, and connect the leads as shown. If the reading is not infinite, replace the antenna or cable. If replacement parts are necessary, retest after installation of new parts.

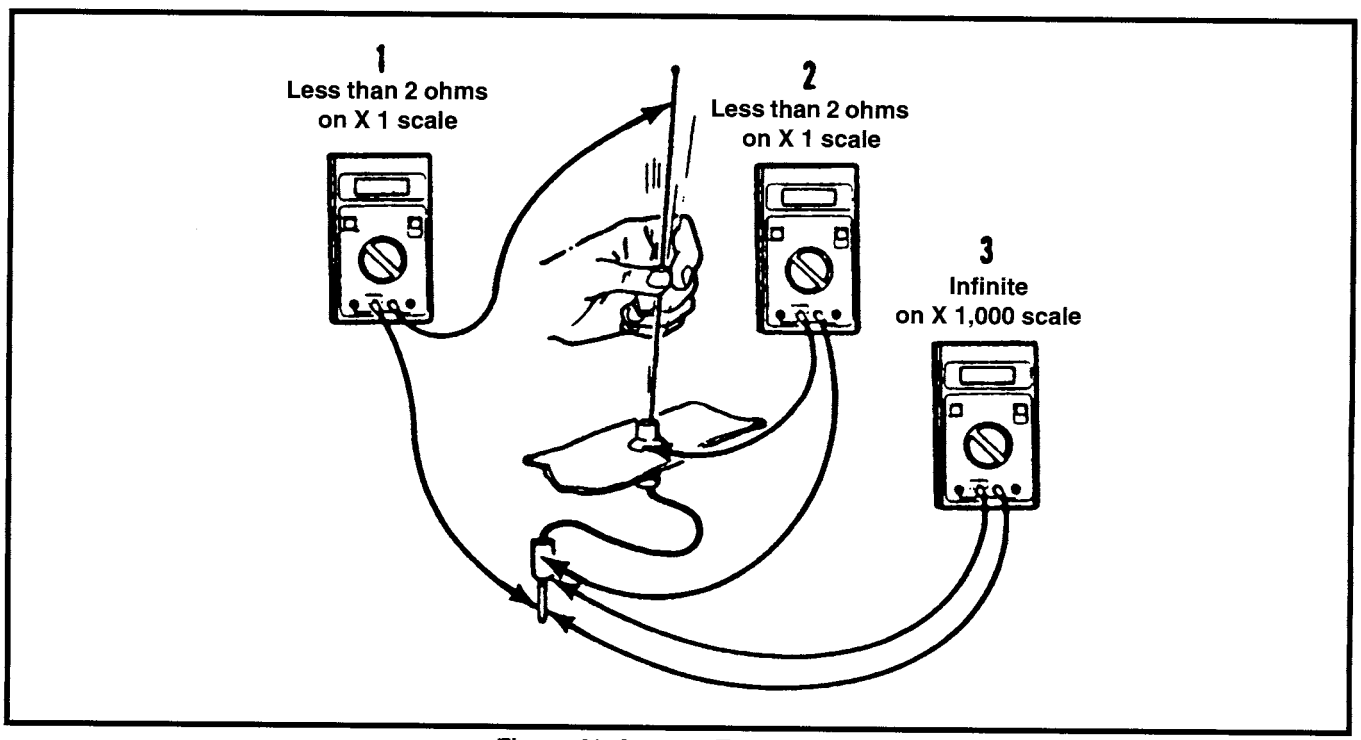


Figure 41. Antenna Test Hookup

Handlebar Switches

HANDLEBAR CONTROLS INOPERABLE OR ABNORMAL OPERATION

Inoperable or abnormal operation of handlebar controls may be caused by grounds or shorts (to + 12 vdc). The following tabulations give symptoms and identify where in the circuitry a ground or short may exist. Refer to Figure 39 to determine the switch and lead connections.

SYMPTOMS (With radio POWER ON) *NOTE: If wires 2-7 are grounded while radio power switch is OFF, the radio will not turn on.*	**GROUND ON WIRE (color code)**
VOL UP, VOL DN, RECALL do nothing; others okay.	PK/W
No switches work.	BN/BK
No switches work.	GY/GN
No switches work.	GN/BE
No switches work.	BN/W
No switches work.	GY/W
No switches work.	V/BK
BAND, UP, DN do nothing; others okay.	O/BK

SYMPTOMS (With radio POWER ON) (The following table describes symptoms that would result if 12 vdc were shorted to the handlebar control wires.)	**SHORT TO 12 vdc AT WIRE**
VOL UP, VOL DN, RECALL inoperative; all others okay.	PK/W
RECALL, DN tune, PRESET-1, POWER inoperative; others okay.	BN/BK
VOL DN, PRESET-2, SE-SC, UP tune inoperative; others okay.	GY/GN
VOL UP, PRESET-3, EJ, BAND inoperative; others okay.	GN/BE
Same as GN/BE.	V/BK
Same as GY/GN.	BN/W
Same as BN/BK.	GY/W
UP tune, DN tune, BAND inoperative; others okay.	O/BK

SWITCH CONTACTS

1. Refer to Figure 39. Disconnect connector halves [23B] and [24B].

NOTE

See Figure 39 for socket numbers of wire colors shown in Figures 42 and 43.

2. Refer to Figure 42, View A. With ohmmeter, place probes on pins (1) and (4) on connector [23B]. Push function switch straight inward. Meter should register zero ohms. A resistance reading significantly higher than zero indicates the switch contacts are not closing and the switch should be replaced. Release the switch control knob. The meter should now register infinite ohms. If the meter registers a reading other than infinite ohms, the contacts are not fully opening and the switch should be replaced.

3. Refer to Figure 42, View B and C. Place the meter probes on the pins and move the switch control knob in the direction shown. The meter should indicate zero ohms with the probes at appropriate connector pins. The meter should register infinite ohms when the switch knob is released.

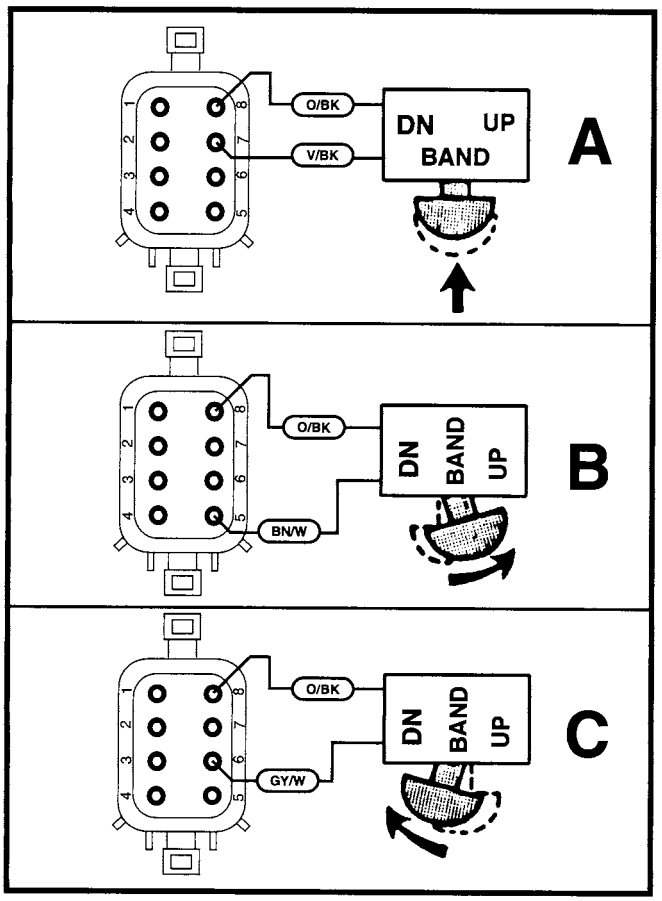


Figure 42. Function Switch Test

4. Refer to Figure 43, View D. Place ohmmeter probes on connector pins (1) and (3), and move volume control knob to position shown (DN position). Meter should register approximately zero ohms. Leave probes on pins (1) and (3), and move control knob to UP position. Meter should register infinite ohms. If meter readings vary significantly from the recommended readings, replace switch.

5. Refer to Figure 43, View E. Place ohmmeter probes on connector pins (1) and (4), and move volume control knob to position shown (UP position). Meter should show approximately zero ohms. Leave probes on pins (1) and (4), and move control knob to ON position. Meter should read infinite ohms. Release knob (let it return to center position). The meter should still read infinite ohms. If meter readings vary significantly from these values, check wiring and switch.

6. Refer to Figure 43, View F. Place ohmmeter probes on connector pins (1) and (2), and push knob in as shown (RECALL position). Meter should show approximately zero ohms. Leave probes on pins (1) and (2), and release knob. Ohmmeter should show infinite ohms. If meter readings vary significantly from these values, check wiring and switch.

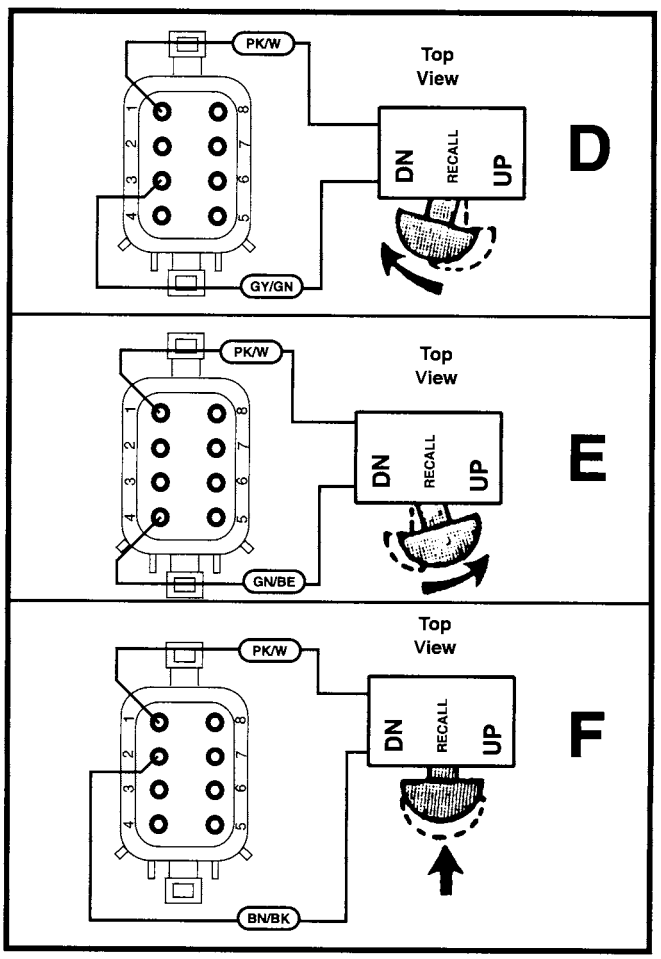


Figure 43. Volume Switch Test

Transient Signal Voltage

Refer to Figure 39. Disconnect connector [28]. Connect voltmeter black lead to vehicle ground. Turn ignition switch ON. Touch each pin of pin connector [28A] with red probe and watch for an indication of voltage on meter. There should be no voltage present at any of the pins. If a voltage is present, this is an indication of current flow into the radio control circuit from source other than radio chassis.

Automatic Volume Control (AVC)

If the Automatic Volume Control does not appear to be working, the problem may not be in the AVC. The AVC is triggered by a reed switch in the speedometer housing. Perform the AVC test and reed switch and associated wiring tests as follows:

AVC TEST

1. Disconnect the 12-pin connector [27B] and remove the W/GN wire from the connector. Reconnect the connector. Continue test at ALL MODELS step 2.
2. Measure the voltage on the W/GN wire with the ignition switch on. Meter should read 5 - 7 VDC. If voltage is not present, radio is defective and must be replaced.
3. Connect a jumper wire to the W/GN wire. "Drag" the jumper across a grounded surface. As the wire makes and breaks contact to ground, the volume should increase. If volume does not increase, radio is defective and must be replaced.

Reed Switch Test

1. See Figure 44. Connect one lead of ohmmeter to W/GN wire, at connector [27A], that connects speedometer reed switch to radio. See Figure 39 if necessary.
2. Connect other lead of ohmmeter to ground (crankcase).
3. Raise and block front wheel.
4. Rotate wheel and observe ohmmeter. The ohmmeter must fluctuate between zero ohms and infinity.
5. If ohmmeter does not fluctuate, either the reed switch is not operating or the other reed switch lead is not grounded.
6. Repeat Step 4 with ohmmeter probe at engine-to-frame ground (bolt above starter).
7. If ohmmeter does not fluctuate at any of the test locations and all ground connections are correct replace reed switch.

Speaker Impedance Check

With an ohmmeter set on the RX1 range, measure the impedance of the speaker voice coil. Place probes of ohmmeter on speaker terminals and observe reading. The ohmmeter reading must be 3-5 ohms. Replace speaker if any other reading is observed.

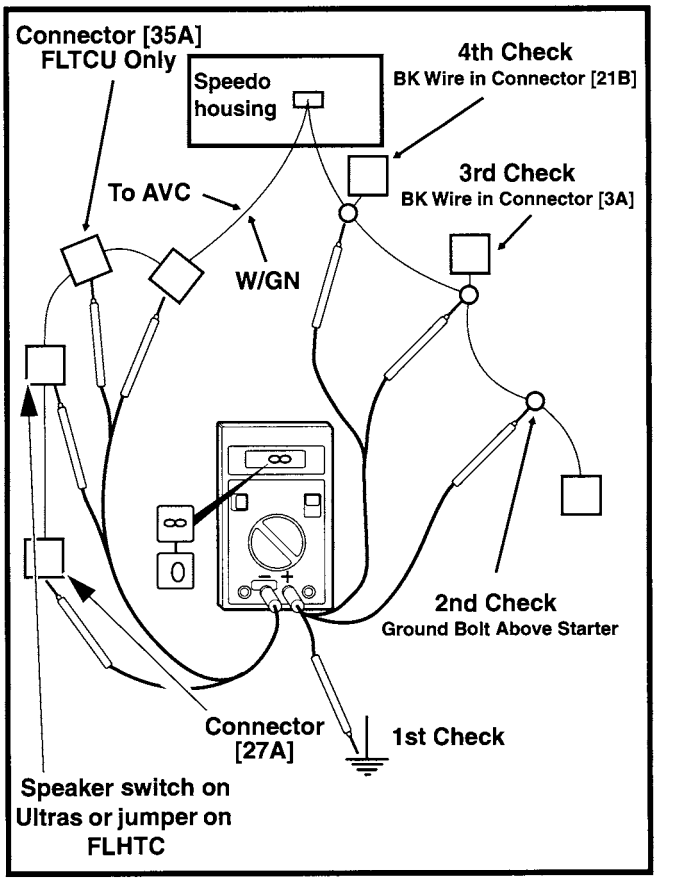


Figure 44. Reed Switch Test Connections

SOUND SYSTEM (FLTCU, FLHTCU) CB/INTERCOM/REAR SPEAKERS

The CB/Intercom/Rear Speakers system provides rider and passenger 2-way communication on the CB channels, "intercom" capability between rider and passenger and two rear speakers powered by an additional 20 watts per channel amplifier. The rear speakers' amplifier receives a low level audio signal from the sound system, i.e. AM, FM, WB or tape signal.

HOW-IT-WORKS

A simplified theory-of-operation for each control is given and finally the interaction between sound system, CB and intercom is covered.

Headsets/Speakers (FLHTCU) Or Speaker ON/OFF (FLTCU) Switch

This switch directs the sound system (stereo radio) output to the fairing speakers in the "ON" or "SPEAKERS" position. The automatic volume control (AVC) input to the radio is also connected to the speedometer reed switch output, allowing the volume of the radio to increase and decrease with the speed of the motorcycle.

In the "OFF" or "HEADSETS" position, the reed switch output is disconnected from the radio to disable the AVC in the HEADSET mode of operation.The amplifier disable (blue/yellow) wire to the radio is grounded, resulting in the front speakers being turned off. The headset speakers are turned on when the ground is removed from the headset disable wire (yellow/violet). This switches the low level stereo audio input carried by the 7 conductor DIN, (Deutsche Industrie-Normen; German Industrial Standards) cable from the radio to the headset speaker amplifier in the console pod. The left channel signal is carried on pin 3 and the right channel signal is on pin 1. The mute signal for the radio is carried on Pin 2 and the ground path of the DIN cable is carried on pin 6. The helmet speaker amplifier in the console pod powers the rider and passenger helmet speakers.The low level stereo audio signal from the radio is also supplied to the 40 watt amplifier of the rear speakers in both positions of the speaker switch. This 40 watt amplifier in the console pod supplies power to the rear speakers only. The headset amplifier only receives the stereo low level input when the switch is in the "OFF" or "HEADSETS" position. The headset amplifier receives the microphone inputs from the rider/passenger microphones when the intercom switch (VOX SENSITIVITY CONTROL) is on or when the PTT is pressed. (See Intercom ON/OFF switch).

In the "quiet-ride" mode (CB and intercom switched OFF, radio "ON" or "OFF"), the rider or passenger can communicate by pressing their PTT switches. Only one PTT switch needs to be activated. The Mute Check Circuit will sense the PTT switch closure and "Mute" the stereo if on. Both microphones will be active (ON).

CB CONTROLS AND OPERATION

CB ON/OFF and Volume

Full counterclockwise rotation of the control knob turns switch OFF. This removes the 12 vdc supplied through the 3 ampere (amp) fuse to the transceiver. Rotating clockwise until click is heard indicates "power on" condition for CB. At this time a channel number should be visible in the display. If no channel number is displayed, select a higher or lower channel, i.e., move channel selector switch forward or backward. Further rotation will continuously increase CB low level audio from the transceiver. This will increase volume at headset or fairing speakers (and also at rear speakers on late 1995 and later models).

Local/Distance (LO/DX) Switch

DX is the most sensitive position and should be used for listening to distant transmitters. DX operation is also very noisy. For quieter operation switch to LO.

Squelch

This control in conjunction with the LO/DX switch controls the required CB signal strength (or in-band noise) necessary to mute (shut-off radio while CB signal is being received).

VOX/Sens (Voice Operated Transmission/Sensitivity)

This control adjusts the "threshold" at which a voice (microphone) input will mute the radio. The least sensitive position of the control is full counterclockwise (CCW); most sensitive is full clockwise (CW). The control may also be turned OFF by turning CCW until a click is heard.

With switch in ON position, rider and passenger can converse simply by speaking into the microphone. The mute check circuit will recognize the voice actuated microphone input and send mute signals to the radio and rear speaker amplifier.

Muting requires a strong signal at the microphone. A microphone positioned further than 1/2 in. (12.7 mm) from mouth or very soft speech will not trigger mute.

NOTE

Music, wind or air flow when riding may cause muting. Adjust to lower sensitivity to prevent unwanted muting.

⚠WARNING

Always turn the CB off before increasing stereo volume. If the squelch is adjusted to receive an incoming signal, but the CB volume is turned down, no sound may be heard from the speakers. The reason for this is that the incoming CB signal, although unheard, mutes the stereo signal. Do not turn up the stereo volume, since adjusting the squelch or turning the CB off will cancel the mute function causing the stereo to "kick in" at a volume that may be damaging to the ear or so distracting as to cause loss of vehicle control, possibly resulting in personal injury and/or property damage. This situation may be particularly aggravating (and dangerous) if the helmet speakers are in use.

CB Channel Selector

A momentary 2-position switch that selects next higher channel when pressed forward and immediately released. The system will step rapidly up or down channels if moved forward or back and held in position.

CB Channel Display

Indicates channel number to which CB is tuned. CB memory, powered through 1 amp fuse, retains last channel, that is, if tuned to channel 19 and CB switch is turned OFF and then ON, channel 19 will return to display.

INTERACTION WITH RADIO, CB AND INTERCOM ON

To illustrate how the systems interact, the following explanations trace how the circuits react to signal inputs or rider/passenger control inputs.

Reception of CB Transmissions

Reception of a CB transmission with signal strength great enough to break squelch causes mute check circuit to send mute commands to rear speakers' amplifier and radio. If helmet speaker switch is in "Speaker" or "ON" position the CB transmission will be "inputted" to the radio via the DIN cable and will be heard from the fairing speakers (and also at rear speakers on late 1995 and later models) if the radio is ON. If switch is in "helmet speaker" or "OFF" position the low level CB transmission will be switched in the console pod to the helmet speaker amplifier and heard in the headset. When the mute check circuit senses the incoming CB transmission has ended, it cancels the mute signals to radio and rear speaker amplifier. Radio output is then restored to fairing speakers or headset and rear speakers.

PTT (Rider or Passenger) Switch Pressed With CB On

The mute check circuit senses the switch closure and sends mute commands to radio and rear speaker amplifier. Both microphones are active (ON) and the microphones input is transmitted by the transceiver. (The transmission is audible in the headsets.) Release of the PTT switch removes mute commands, radio output returns. PTT switches will energize Intercom even with CB/Intercom switches OFF. (See Helmet Speaker/Speaker switch.)

Intercom Input

If rider or passenger speak into their microphone, this voice actuated signal is detected by the mute check circuit and the circuit sends mute commands to the radio and rear speaker amplifier. The microphone input is amplified and sent to both headsets. After rider-passenger have completed their conversation and a 1 to 2 second delay has elapsed the mutes will be lifted and radio output is restored.

TROUBLESHOOTING

If difficulty with the CB/Intercom/Rear Speakers is encountered, refer to the Premium SOUND SYSTEM Manual, Harley-Davidson Part No. 99464-95A or Part No. 99464-96. The CONTROL INTERACTION table at the back of the book may be particularly useful. If problem persists, see the following Troubleshooting sections. The first troubleshooting section covers sound quality problems. The second troubleshooting section covers system and component malfunctions.

Sound Quality Troubleshooting, CB, Intercom and Rear Speakers

Problem	Cause	Solution
1. Excessive alternator hum (changes with engine speed.)	1.1 Poor (high resistance) ground connections.	1.1.1 Check the following ground connections. A "good" ground connection will not exceed 0.5 ohm resistance when checked with an ohmmeter. Clean and tighten connections as required. Check the ground connections in the order listed below. GROUND — LOCATION 1. Regulator — Between front frame downtubes (starter on EFI models). 2. Negative battery cable — Rear starter mounting bolt. 3. Fuse/filter panel ground — Measure continuity to ground from ground bolt above starter to Pin 2 (BK/GN wire) on the CB Power In connector [5] on the fuse/filter board. See Figure 45. Meter must indicate 0.5 ohms or less. 4. Antenna ground — Inside Tour-Pak, remove liner, tighten bolt at antenna mount and tighten bolt securing braided ground strap or loading coil bracket to Tour-Pak bottom. **⚠CAUTION** **Overtightening bolt at antenna mount or loading coil may result in parts damage.** 5. Antenna cable connector at transceiver — See Figure 46. Tighten cable ring at connector (1). 6. Sound System (radio) chassis ground — On FLHTC/U ground cable is grounded to top fork bracket or to fairing stud on FLTCU.
	1.2 Weak or discharged battery.	1.2.1 Charge battery and check if hum has been eliminated. (Most battery chargers will cause hum in system, so remove charger before checking.)
	1.3 Damaged fuse/filter.	1.3.1 Check for broken leads on filter capacitor. Replace fuse/filter board if leads are broken. Also check for broken wires in leads connected to board and/or sockets loose on pins.
	1.3 Damaged fuse/filter.	1.3.1 Check for broken leads on filter capacitor. Replace fuse/filter board if leads are broken. Also check for broken wires in leads connected to board and/or sockets loose on pins.
	1.4 Malfunction in fuel tank console panel (pod) circuitry.	1.4.1 Remove seat and left side cover. a. Disconnect DIN connector and connect one probe of ohmmeter to socket 6. See Figure 49. Continue at step b. below. b. Unplug 2-place Fuseboard to Pod connector [44] on fuse/filter board. See Figure 40. Connect the other ohmmeter probe to the black wire in connector. Ohmmeter must read 2.0 ohms minimum. If reading is less than 2.0 ohms, replace the console pod. See REMOVAL AND INSTALLATION.

Sound Quality Troubleshooting, CB, Intercom and Rear Speakers (Continued)

Problem	Cause	Solution
1. Excessive alternator hum (changes with engine speed).	1.5 Slight hum is normal with CB on and radio volume low.	1.5.1 Normal operation.
	1.6 High resistance in 50 amp circuit breaker.	1.6.1 Place jumper across circuit breaker. Replace circuit breaker if hum decreases.
	1.7 CB transceiver that causes hum.	1.7.1 Unplug both 8-place connectors at transceiver and note any change in hum intensity. Substitute a known good CB and note hum intensity. Replace transceiver if transceiver related hum is excessive.
2. Intercom signal or radio signal in helmet speaker is not satisfactory.	2.1 "Bad" helmet speaker.	2.1.1 Substitute known good helmet speaker. Replace helmet speaker if problem is solved.
	2.2 Poor fitting helmet speakers. Speakers must be centered over ear openings.	2.2.1 Adjust speaker or obtain new helmet designed for helmet speakers.
	2.3 Incorrect speaker input impedance, or one speaker with correct impedance and the other incorrect.	2.3.1 Both rider and passenger must have Harley-Davidson Part No. 77125- 88 (full face) or 77126-88 (open face) or 77147-91, 77147-91A or 77147-91B helmet speakers. **Don't mix "-88" with "-91" speakers.** Earlier H-D or after-market speakers may give poor performance.
	2.4 Moisture in rider or passenger helmet DIN connectors.	2.4.1 Dry both halves of connectors with compressed air or contact cleaner.

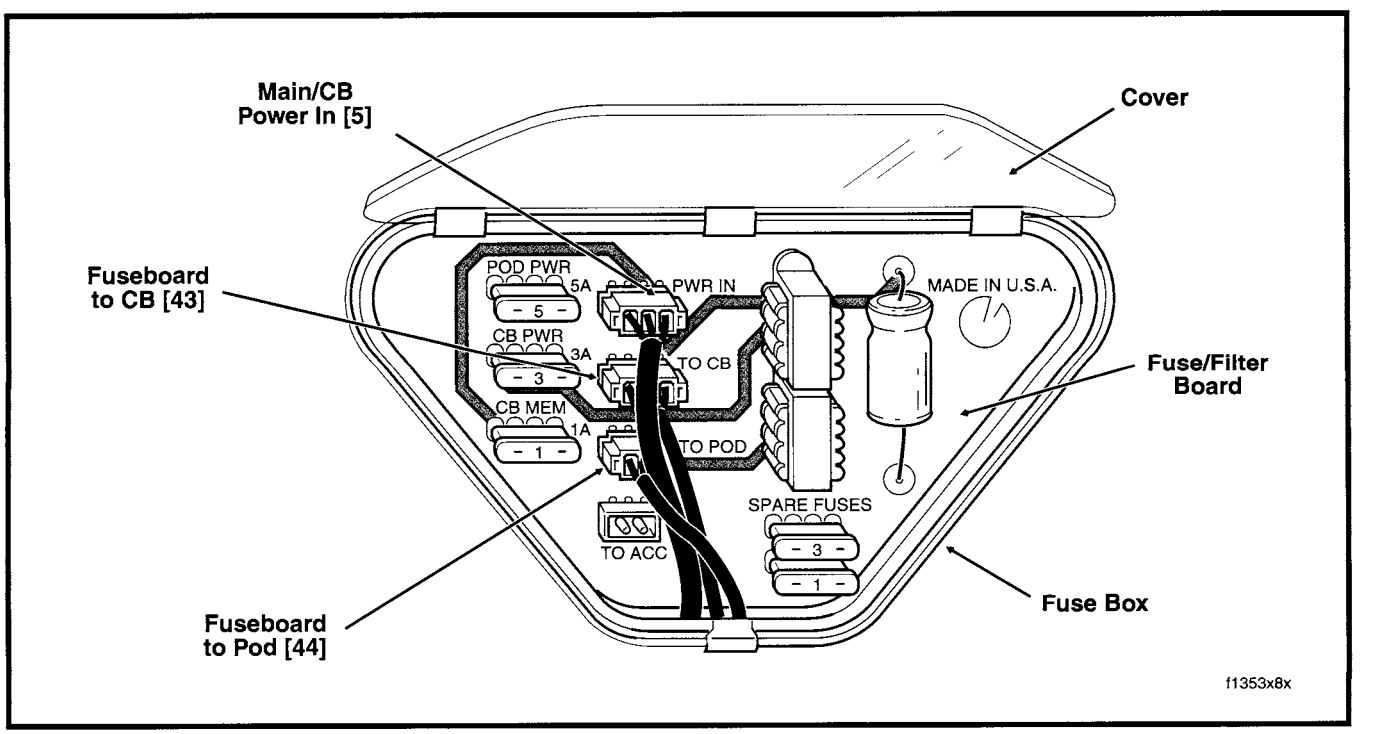
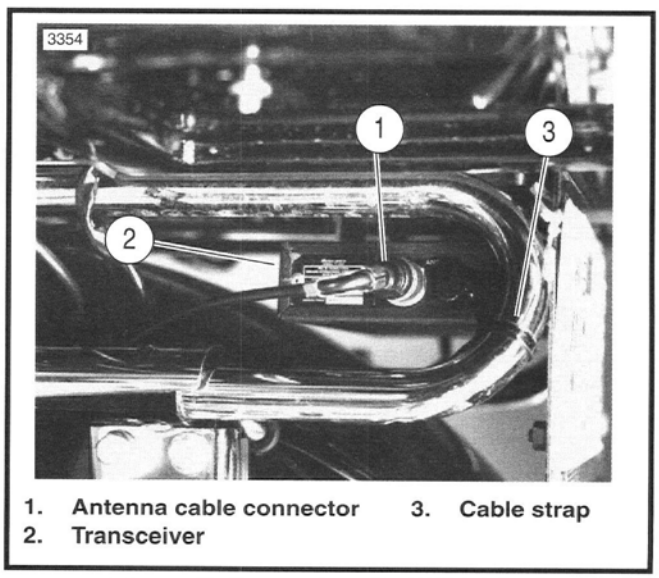


Figure 45. Fuse Box - Under Left Side Cover

Sound Quality Troubleshooting, CB, Intercom and Rear Speakers (Continued)

Problem	Cause	Solution
3. Static on CB transmit or receive.	3.1 "Poor" grounds at antenna. Loose antenna cable connector at transceiver.	3.1.1 Check integrity of grounds at the antenna, the Tour-Pak bottom and antenna input to CB. Tighten antenna cable connector at transceiver.
	3.2 Poor or broken antenna mast to loading coil connections.	3.2.1 See Figure 46. Remove antenna cable from transceiver under Tour-Pak. Using clip-on test leads, connect one lead of ohmmeter to center pin in antenna lead and other lead to antenna mast. Meter must read 1 ohm or less. Wiggle or flex mast while observing meter. If resistance is more than 1 ohm or varies when mast is wiggled, replace mast. Inspect connections at base of loading coil and at mounting bracket. *NOTE* *It is normal to observe a reading of less than one ohm between the center conductor and ground due to the configuration of the loading coil.*
4. Poor CB transmission.	4.1 Standing Wave Radio (SWR) too high.	4.1.1 Adjust antenna length. See ADJUSTMENT, SWR following this TROUBLESHOOTING.
5. Audio is muted by music, wind or airflow while riding.	5.1 "VOX/Sens" control set too sensitive.	5.1.1 Turn knob of "VOX/Sens" control counterclockwise until mute is lifted, then speak into mike and adjust "VOX/Sens" to required sensitivity.



1. Antenna cable connector **3. Cable strap**
2. Transceiver

Figure 46. Transceiver (Left Side View)

ADJUSTMENT/TESTING

SWR Adjustment

Standing wave ratio or SWR is a technical term for the procedure that checks how well the CB transmitter and antenna are matched. The SWR should be 2:1 or below on channel 20. A SWR of 1:1 is optimum.

To check SWR, a SWR meter or bridge is required. Your Harley-Davidson dealer will either have a SWR meter or direct you to a CB repair shop for a SWR check. Since the operating procedures for SWR meters vary, be sure you carefully follow the operating instructions for the SWR meter being used.

1. Locate motorcycle outdoors or in a building with a ceiling of 11 ft. (3.4 m) minimum above floor. Also, there must be 8 ft. (2.4 m) of radial clearance around motorcycle. Adjusting the SWR in an area with a low ceiling (less than 11 ft. (3.4 m)) and less than 8 ft. (2.4 m) radial clearance around motorcycle may result in an inaccurate adjustment.
2. See Figure 46. Remove the antenna cable (1) and connect the SWR meter to the transceiver. The SWR meter is connected in series with the antenna cable so the antenna will be connected to the SWR meter.
3. Check that the antenna braided ground strap or loading coil bracket in Tour-Pak is tight and antenna cable is tightly connected to loading coil in Tour-Pak.
4. Check that antenna mast is threaded securely on to base and set screw is tight.
5. Before measuring the SWR, the SWR meter must be calibrated. Follow the instructions for the meter being used. The following procedure is the general calibration most meter instructions specify.
6. With ignition and CB switches ON, the SWR meter set on "FWD", Channel 20 selected, press either PTT switches. Hold the PTT switch and rotate the calibration (CAL) control until the meter needle aligns with the "CAL" mark.
7. Release the PTT switch and move the FWD/REF switch to "REF" (reflected).
8. Press and hold either PTT switch. The meter reading is the SWR.

⚠CAUTION

Do not touch the antenna or meter during calibration or SWR measurement. Move CAL knob and then move your hand away from meter while calibrating. Do not press PTT switches with antenna and SWR meter disconnected. Transceiver damage could result.

9. If SWR is more than 3:1, remove antenna cable from transceiver under Tour-Pak. Using clip-on test leads, connect one lead of ohmmeter to center pin in antenna lead and other lead to antenna mast. Meter must read 1 ohm or less. Wiggle or flex mast while observing meter. If resistance is more than 1 ohm or varies when mast is wiggled, replace mast. Inspect connections at base of loading coil and at mounting bracket. If the SWR is less than 3:1, loosen antenna set screw and change mast length.

NOTE

It is normal to observe a reading of less than one ohm between the center conductor and ground due to the configuration of the loading coil.

10. Repeat Step 8. If SWR became higher, adjust antenna mast in opposite direction. Continue adjusting antenna until the minimum SWR is achieved. If you cannot obtain an SWR of 2:1 or less by adjusting the antenna length, make the mast shorter to improve the SWR. Remove mast and use grinder to shorten mast (grind in small increments).
11. After SWR is adjusted on channel 20, check SWR on channels 1 and 40. Adjust the mast length to obtain a balance between channels 1 and 40.

NOTE

Check the SWR if a luggage rack is installed on the Tour-Pak cover. Be sure that the Tour-Pak cover is closed when the check is performed. Accessories mounted on the Tour Pak may affect the SWR reading and broadcast range, so the luggage rack should be mounted as far forward as possible. The Ultra Tour-Pak chrome accent rail also can adversely affect SWR transmission.

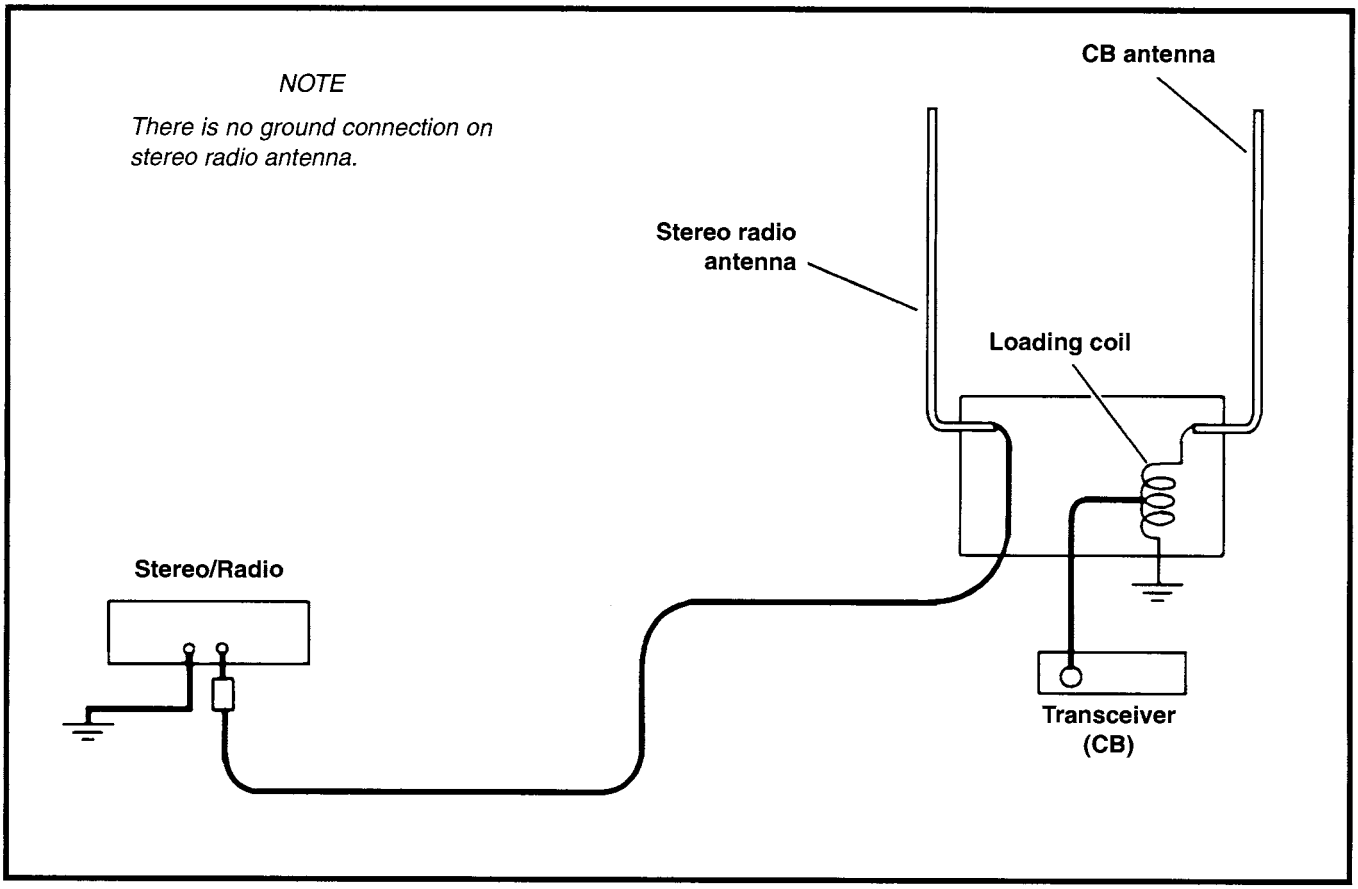


Figure 47. FLTC Ultra and FLHTC Ultra Antenna System

Ultra Antenna System Test (Figure 47)

A faulty antenna system can cause poor or no reception for the CB or stereo and poor or no transmit range for the CB. Check the antenna system by performing the following:

1. Remove antenna cable from transceiver under Tour-Pak. Using clip-on test leads, connect one lead of ohmmeter to center pin in antenna lead and other lead to antenna mast. Meter must read 1 ohm or less. Wiggle or flex mast while observing meter. If resistance is more than 1 ohm or varies when mast is wiggled, replace mast. Inspect connections at base of loading coil and at mounting bracket.

NOTE

It is normal to observe a reading of less than one ohm between the center conductor and ground due to the configuration of the loading coil.

2. Check SWR adjustment.

3. If CB antenna must be replaced, refer to CB LOADING COIL AND ANTENNA CABLE REMOVAL AND INSTALLATION given at the end of this section.

Troubleshooting – FLTC Ultra and FLHTC Ultra Sound Systems

HOW-TO-USE THIS TROUBLESHOOTING PROCEDURE

Begin at the "GENERAL TEST CONDITIONS" and then perform "PERFORMANCE CHECKS" until a non-performance (NO) directs you to one of the charts. The component being checked in the PERFORMANCE CHECKS is listed at the left side of the column in bold capital letters; e.g., "REAR VOLUME CONTROL". The final isolation of the problem and how to repair the problem is given in the charts.

CONNECTOR PIN AND SOCKET NUMBERING

NOTE

Connector references such as "[12A]" refer to the connector identification used in the wiring diagrams at the rear of this manual.

The 1995 and 1996 models have connectors that are numbered on the wire side of the connector. The only exception is the 3-place Deutsch connector that uses A, B, and C to identify the terminal locations. Refer to the "CONNECTOR AND WIRING" section at the end of this section for detailed instructions covering connector repair.

General Test Conditions

1. Stereo radio switch "ON", fairing speaker switch in "SPEAKERS/ON" position.
2. Intercom switch "ON", VOX (Voice-Operated Transmission) sensitivity control rotated to "MID" position.
3. CB switch "OFF", LO/DX switch in "DISTANT" position, squelch control rotated full counterclockwise to "MINIMUM" squelch position.
4. Rear amplifier volume control rotated to "MAX" position.

Performance Checks

This test must be performed from the beginning until a conclusion is drawn.

Adjust volume control on left handlebar for moderate level. Stereo audio should be present in all four speakers.

YES **NO – See Chart A**

REAR VOLUME CONTROL

Adjust rear amplifier volume control from max-rotation to minimum and back to maximum.

- Volume level for rear speakers should go down and up with the rotation of the control. At maximum, rear speakers volume should be slightly louder than the front speakers. At minimum, the speakers should be quiet. The rear volume control will not have any effect on the front speakers.

YES **NO – See Chart A-2**

FAIRING SPEAKER RELAY OPERATION

Change to "HEADSET/OFF" position of fairing speaker switch.

- Front speakers should be silent. Rear speakers should still play.

YES **NO – See Chart B-1**

OPERATOR HELMET AUDIO

Plug a stereo helmet headset, H-D Part No. 77147-91, 77147-91A or 77147-91B, into the operator's headset connector.

- Stereo audio should be present in the headset.

YES **NO – See Chart B-2**

HEADSET AUDIO SWITCHING

Change to "SPEAKER/ON" position of fairing speaker switch.

- Headset audio should turn off and the fairing speakers should play.

YES **NO – See Chart B-3**

INTERCOM OPERATION

Speak into microphone with microphone in close (1/2 in. or less) proximity to your lips.

- Your voice should mute out the stereo audio in the front and rear speakers, and you should hear your voice in only the headset speakers.

YES **NO – See Chart C-1**

INTERCOM OPERATION (cont'd)

Change to "HEADSET/OFF" position of fairing speaker switch. Speak into microphone.

- Your voice should mute out the stereo in the headset and the rear speakers. Your voice should be heard in the headset only.

YES **NO – See Chart C-1**

VOX SENS CONTROL

Rotate the VOX sensitivity (SENS) control to full clockwise and then full counterclockwise without turning switch off. Speak into the microphone at both extremes of the control.

- Your voice should mute out the stereo in the headset and the rear speakers at both extremes of the control. In the clockwise position, it should be easy to mute the stereo. In the counterclockwise position, it should be harder to mute the stereo, requiring you to speak louder.

YES **NO – Replace Console Pod (See REMOVAL/INSTALLATION given later in this section.)**

INTERCOM SWITCH

Turn off the intercom, by rotating the VOX sensitivity control full counterclockwise. Speak into the microphone.

- You should not hear your voice in the headset, and the stereo should not be muted out.

YES **NO – See Chart C-2**

PTT FUNCTION HELMET OPERATION

Press the PTT (Push to Talk) button on the rear speaker pod, and speak into the microphone while holding the button down. Check the PTT button on the left handlebar also.

- When the button is pressed down the stereo audio should mute out and stay muted until the button is released. Your voice should be heard in the headset as long as the button is held down. You should not hear your voice in the speakers.

YES **NO – See Chart C-3**

REAR HEADSET AUDIO

Change to "HEADSET/OFF" position of fairing speaker switch. Transfer the headset connector to the rear headset connector.

- Stereo audio should be heard in the headset.

YES **NO – See Chart B-2**

SPEAKER SWITCH TEST – REAR

Change to "SPEAKER/ON" position of fairing speaker switch.

- Stereo audio should not be heard in the headset, only in the speakers.

YES **NO – See Chart B-3**

PTT FUNCTION – REAR HEADSET

Press the PTT button, front and rear, and speak into the microphone.

- When the buttons are pressed down, the stereo audio should mute out and your voice should be heard in the headset. You should not hear anything in the speakers.

YES **NO – See Chart C-3**

TUNING BAND SWITCH FUNCTION

Check the Tuning/Band switches, front and rear, for proper function.

- Pushing the button left/forward will cause the radio to UP tune. Pushing the button right/backward will cause the radio to DN tune. Pushing the button in will cause the radio to change bands. (AM-FM-WB)

YES **NO – See Chart D-1**

CB POWER SWITCH

Turn ON the CB and rotate the volume control to one-fourth of its rotation.

- Stereo audio should be muted out as soon as the CB is turned on. CB display should light and either static or CB audio should be heard in the front speakers (and also at rear speakers on late 1995 and later models) depending on a signal being received.

YES **NO – See Chart E**

CB UP TUNE SWITCH

Move the CB tuning switch to the "UP" position. Check the display for proper function.

- If the switch is pushed forward and released, the display should increase by one channel. If the switch is held in the UP position, the display should continue to count up to channel 40 and back to channel 1. The display should show all 40 channels.

YES **NO – See Chart F-1**

CB DOWN TUNE SWITCH

Move the CB tuning switch to the "DOWN" position. Check the display for proper function.

- If the switch is pushed backward and released, the display should decrease by one channel. If the switch is held in the down position, the display should continue to count down through all 40 channels.

YES **NO – See Chart F-2**

CB SQUELCH CONTROL FUNCTION

Tune CB to a channel with radio traffic (someone talking). Rotate the squelch control to the full clockwise position.

- Stereo audio should return after a short delay and the CB audio should be muted out. Note: If the signal being received by the CB is very close, the CB audio may not be muted out.

YES **NO – See Chart F-3**

CB LO/DX SWITCH

Tune CB to a channel with no traffic. Slowly rotate squelch control counterclockwise until static is heard in the speakers. Switch to "LOCAL" position of LO/DX switch.

- CB audio (static) should be muted out and stereo audio should return. Note: CB audio may not mute out in the local position of the switch if there is someone transmitting nearby. This step is best done on a vacant channel.

YES **NO – See Chart F-4**

CB TRANSMISSION REAR PTT

Tune to a channel with traffic and check the transmit function of the CB radio. Press the rear PTT button and speak into the microphone.

- When the PTT button is pressed, the stereo audio should be muted.

YES **NO – See Chart F-5**

- Your voice should be heard in the headset. Your voice should not be heard in the speakers on the motorcycle.

NO **YES – See Chart I**

CB VOLUME

Check the CB volume control during reception of a signal.

- The volume should rise when the control is rotated clockwise and lower when the control is rotated counter-clockwise.

YES **NO – See Chart F-6**

CB TRANSMIT RECEIVE PASSENGER

Change to HEADSET position of fairing speaker switch. Check transmit and receive on CB.

- CB should transmit and receive.

YES **NO – See Chart H**

- Transmit and receive audio should be heard only in the headset.

YES **NO – See Chart B-2**

CB TRANSMIT RECEIVE RIDER

Transfer the headset to the front rider's headset connector. Check transmit and receive on CB.

- CB should transmit and receive.

YES **NO – See Chart H**

- Transmit and receive audio should be heard in the headset. No audio should be in the speakers.

YES **NO – See Chart B-2**

HAND-HELD MICROPHONE PTT FUNCTION

Change to "SPEAKERS/ON" position of fairing speaker switch. Remove the headset and connect a hand-held microphone, H-D Part No. 76215-88A. Check PTT function in the rider's headset connector and also in the passenger's headset connector.

- CB should transmit. You should not hear your transmitted voice in the speakers. CB audio should be heard in the front speakers (and also at rear speakers on late 1995 and later models) when receiving.

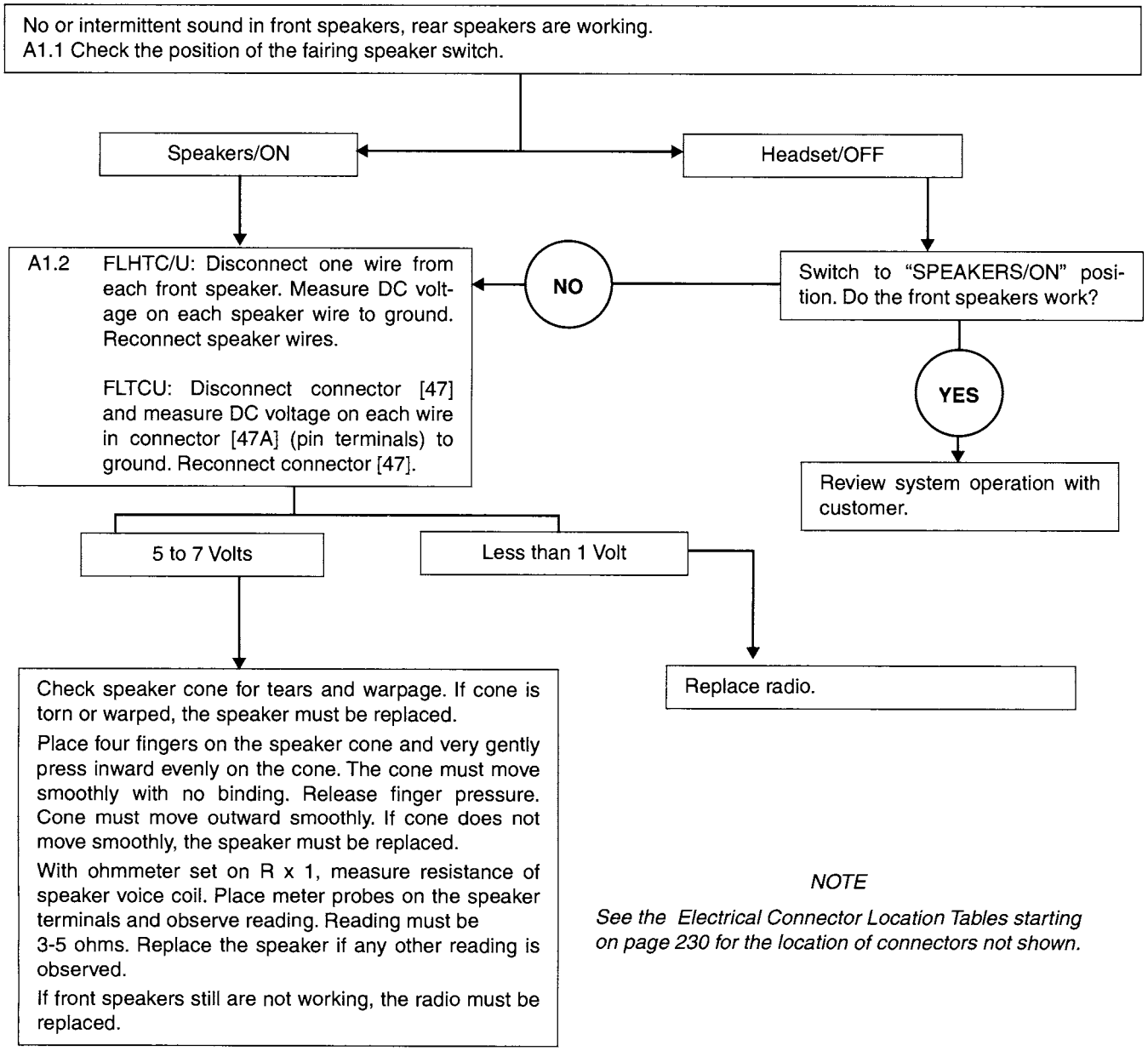
YES **NO – See Chart F-7**

CHART A

No sound or intermittent sound in speaker. (Select one of the following that best describes the problem.)

1. No sound in front speakers, rear speakers are working – See CHART A-1.
2. No sound in rear speakers, front speakers are working – See CHART A-2.
3. No sound in speakers, front and rear – See CHART A-3.
4. No sound in one speaker, others are working – See CHART A-4.

CHART A-1



NOTE

See the Electrical Connector Location Tables starting on page 230 for the location of connectors not shown.

CHART A-2

No or intermittent sound in rear speakers, front speakers are working.
A2.1 Check for backlighting in lettering around console pod switches.

YES

NO → With ignition switch ON, check for 12 vdc at connector [44] between the orange wire and black wires.If voltage is not present, check 5 amp "POD PWR" fuse. See Figure 45. Replace fuse if it is blown and check for short or current overload. Turn ignition switch OFF. With ohmmeter, check continuity to ground from black wire in connector [44] and ground bolt above starter. Meter must indicate 0 ohms. If fuse and ground are good, then proceed to Chart E.2.

A2.2 Check for disconnected DIN connector at radio, connector [48] or under seat at connector [49]. See Figure 50 and Figure 51. Are DIN connectors plugged into each other? If not, plug them in. Do the rear speakers work?

NO

YES → OK if rear speakers operate.

A2.3 Remove Volume/Tuning control assembly from the right rear speaker pod. Measure DC voltage on violet wire (positive) and light green wire (negative) in connector [53]. Reading must be 3.0-4.0 vdc.

YES

NO → Replace defective console pod.

A2.4 Check DC voltage on pink wire and light green wire in connector [53]. Reading will vary with position of rear volume control. Minimum voltage will be 1.1 - 1.2 vdc and maximum voltage will be 2.7 - 2.8 vdc. If voltage is not present or does not vary, replace passenger control circuit board, H-D P/N 77161-94A.

A2.5 Disconnect DIN cable connector [49] under seat at base of gas tank. Make all tests on DIN connector [49A]. See Figure 48. With ignition switch OFF, measure resistance on pins 1 and 3 to ground (pin 6). Readings must be 500-1500 ohms. With ignition switch ON, measure DC voltage on pin 2 to ground. With radio volume at minimum, readings must be 0.15-0.30 vdc. Switch fairing speaker switch to" HEADSET/OFF" position. Measure DC voltage on pin 2 with volume at maximum. Readings must be 3.5-4.0 vdc. Measure ac voltage on pins 1 and 3 to ground with volume at maximum. Readings will vary with audio signal that is supplied by radio. Typical readings will be 40-50 millivolts ac. Note: These readings check the radio signal supplied to the console pod amplifiers.

A2.6 Repeat Test A2.5 at radio DIN connector [48B] in the fairing.

NO ← YES → Replace defective console pod.

NO

YES → Replace DIN extension cable, H-D P/N 76292-95.

Replace radio chassis.

NOTE

See the Electrical Connector Location Tables starting on page 230 for the location of connectors not shown.

CHART A-3

No or intermittent sound in speakers front and rear.

Check fairing speaker switch position and rear volume control position. Make sure CB is turned OFF, and rotate squelch control full clockwise. Unplug microphone/headsets from the pod DIN sockets.

A3.1 Disconnect 8 pin connectors [55] and [56] from CB chassis under left side of Tour-Pak. Do the speakers work?

NO ← → YES → Replace CB Chassis.

A3.2 Disconnect connector [52] at base of gas tank. See Figure 51. Do the speakers work?

NO ← → YES → Handlebar and/or sidecar PTT switches may be shorted. See Chart C-3.

A3.3 Measure DC voltage on blue/yellow wire in connector [52B]. Voltage must be 10-12 vdc. Incorrect reading would be low (0 vdc).

YES ← → NO → Replace console pod.

A3.4 Disconnect DIN connector [49] at console pod under seat. Do the front speakers work?

NO ← → YES → Replace console pod.

A3.5 Disconnect DIN connector [48] at radio in fairing. Do the front speakers work?

NO ← → YES → Replace DIN extension cable, H-D P/N 76292-95.

A3.6 Check volume control for radio. Disconnect connector [28] at back of radio. See Figure 50. Use a jumper wire to short the following wires together.

SWITCH FUNCTION	SHORT THESE WIRES TOGETHER
Volume Up	[28B] - PK/W, GN/BE
Volume Down	[28B] - PK/W, GY/GN
Recall	[28B] - PK/W, BN/BK

Does the radio work in the front speakers?

Repair wiring between radio and left handlebar. ← YES ← → NO → See Chart A-1.

CHART A-4

No or intermittent sound in one speaker, all others are working. Which speaker is not working?

A4.1 Front Speakers

Follow chart A-1. Left speaker leads for test A1.2 are light green/white and white/orange. Right speaker leads are gray/red and light green/black.

A4.2 Rear Speakers

Follow Chart A-1. Left speaker leads for test A1-2 are brown and white/brown. Right speaker leads are green and white/green.

A4.3 For test A1.2. Left speaker is connector is [42B]. Right speaker is connector [41B].

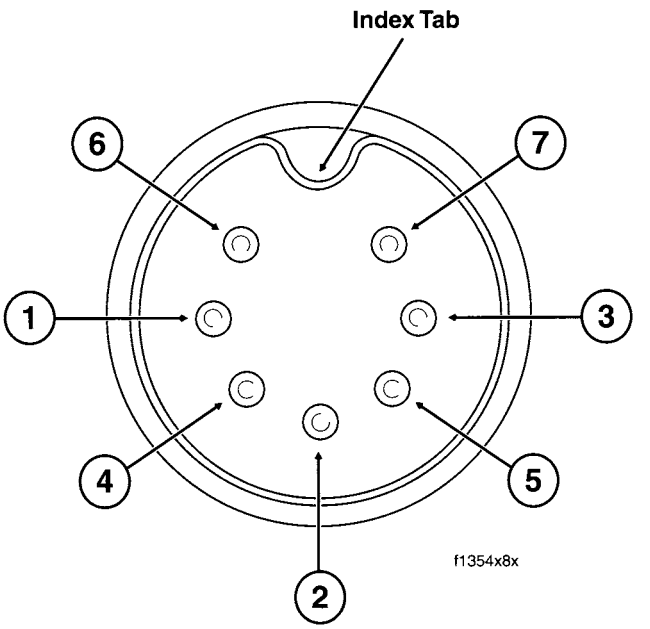


Figure 48. 7-Place DIN Connector (Pin Side)

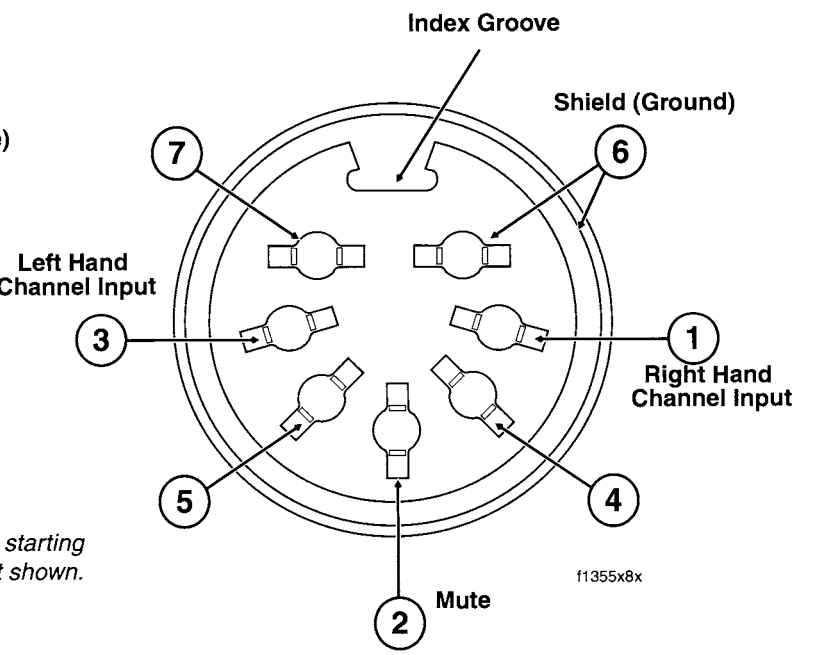


Figure 49. 7-Place DIN Connector (Socket Side)

NOTE

See the Electrical Connector Location Tables starting on page 230 for the location of connectors not shown.

CHART B-1

Front speakers play in "HEADSET/OFF" position of fairing speaker switch.

B1.1 Disconnect Interconnect to Radio Overlay connector [25] and check continuity to ground on blue/yellow wire in connector [25B]. See Figure 50. Meter must indicate 1.0 ohm or less.

NO → B1.2 Check continuity to ground on blue/yellow wire at speaker switch. Meter must indicate 1.0 ohm or less.

YES → Replace radio chassis.

NO → B1.3 Check continuity to ground on black/green wire at the speaker switch. Meter must indicate 1.0 ohm or less.

YES → Repair broken connection on blue/yellow wire between speaker switch and connector [25]. On FLTCU, check for broken connection at connector [35] also.

NO → Repair ground connection for speaker switch.

YES → Replace the speaker switch.

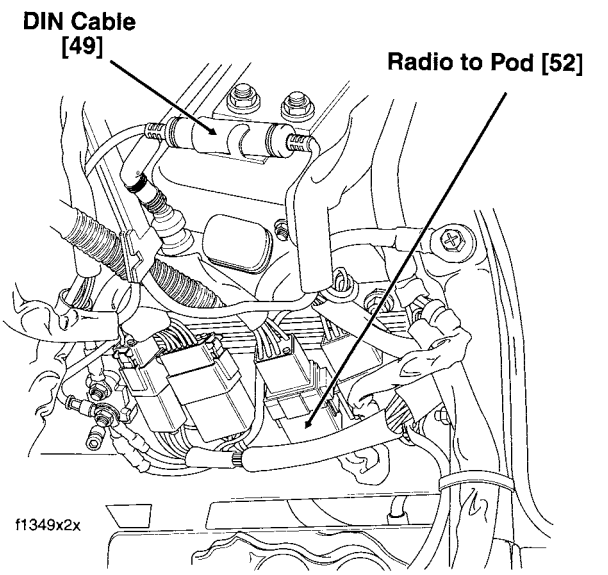


Figure 51. Seat Removed (FLHTC/U-I, FLTCU-I)

CHART B-2

No stereo audio in the headset with the fairing speaker switch in "HEADSET/OFF" position.

B2.1 Disconnect connector [52] under the seat. See Figure 51. Do the headsets work? Reconnect connector [52].

YES

NO

Replace bad console pod.

B2.2 Disconnect the yellow/violet wire from the speaker switch in the fairing. Do the headsets work?

NO

YES

Check for short to ground on yellow/violet wire at the speaker switch. If short is found, repair short. If no short is found, replace the speaker switch.

Check for short circuit to ground on the yellow/violet wire between the speaker switch and connector [52].

CHART B-3

Stereo audio is present in headsets with fairing speaker switch in the "SPEAKERS/ON" position.

B3.1 Unplug connector [52]. See Figure 51. Use a jumper wire and a large paper clip to connect the yellow/violet wire in connector [52B] to ground. Is stereo audio still present in the headset?

NO

YES

Replace bad console pod.

B3.2 Reconnect connector [52]. Use a jumper wire to connect the yellow/violet wire to ground at the fairing speaker switch.

Is stereo audio still present in the headsets?

Go to B1.3.

NO

YES

Repair open circuit in yellow/violet wire between speaker switch and connector [52].

CHART C-1

No intercom audio and/or intercom won't mute stereo audio.

- Check to be sure that the headset/microphone is known to be good.

C1.1 This test is for checking continuity on the mute enable to radio circuit.

- Make this test with the ignition switch off and unplug connectors [52] and 7 place DIN.

Diode Tester Method: See Figure 48. Place positive lead of meter on pin 2 of pod DIN plug [49A] and negative lead to white wire in connector [52B]. All models must measure 0.5-0.7 vdc voltage drop.

YES ← → NO → Replace console pod.

C1.2 This test is for checking the remainder of the mute circuit.

- Make this test with the ignition on and all connectors plugged in.

Measure DC voltage to ground at white wire in connector [52B]. (Positive meter lead on white wire, negative meter lead to ground.) Measurement must be 2.0-3.0 vdc. Monitor DC voltage while speaking into the microphone. DC voltage must drop to below 0.2 vdc.

YES ← → NO → Replace console pod.

C1.3 This test is for checking intercom audio/stereo audio in the headset.

- Make this test with ignition switch on and the headset plugged into the rear headset 7 PLC DIN connector. Use paper clips to probe the sockets in the front 7 place DIN connector. Touch meter probes to paper clips.

Intercom Audio Test: Perform this test with radio off. See Figure 49 to identify socket numbers in 7 place DIN. Measure AC voltage at 7 place DIN headset connector, Pins 3 and 6 or 5 and 6. Measurement should be zero until you speak into the microphone, then depending on how loudly you speak into the microphone, the measurement should be 0.6-2.0 vac (Note: A steady tone could give readings as high as 4.2 Vac).

Stereo Audio Test: With the fairing speaker switch in headset position, initial measurement will not be zero as in previous test, and should be adjusted with radio volume control to approximately 0.3 Vac. When you speak into the microphone, the voltage should rise (0.6-2.0 Vac) and then fall to zero when you stop talking, then return to 0.3 Vac after a short 2 second delay.

Replace headset. ← YES ← → NO → Replace console pod.

CHART C-2

Intercom will not turn off or on.

C2.1 Make this test with ignition switch on.

Diode Test Method: See Figure 49. Connect leads to pod headset DIN sockets 1 and 4. With intercom switch off, meter reading must be 0 vdc voltage drop. With intercom switch on, meter reading must be 0.25-0.3 vdc voltage drop.

Replace bad console pod. ← NO ← → YES → Microphone is defective and must be replaced.

CHART C-3

PTT does not mute stereo and activate intercom at handlebar or rear speaker pod.

C3.1 Measure DC voltage at blue/yellow wire in connector [52]. See Figure 51. Voltage measurement must be 10-12 vdc. Press both PTT switches, one at a time, and observe meter reading. Reading must be less than 0.5 vdc with PTT pressed.

NOTE: Pod is only defective if voltage levels do NOT measure 10-12 vdc when PTT is released and 0.5 vdc when depressed.

NO

YES → Console pod is defective and must be replaced.

C3.2 Check continuity between blue/yellow and light green wires of connector [52A], with connector [52] separated, and handlebar PTT switch pressed. Continuity must be less than 0.5 ohm.

NO

YES → Console pod is defective and must be replaced.

C3.3 Check continuity at connector [26A] Blue/Yellow and Light Green wires with PTT switch pressed. See Figure 52. Continuity?

NO → Replace PTT switch.

YES → Repair broken connection between [52A] and [26B].

CHART D

Radio tuning controls, handlebar or passenger, are inoperative or operate erratically.
• Verify normal radio function by using a large paper clip to simulate the handlebar switch functions.

D.1 Disconnect connector [28]. See Figure 52. Check right handlebar functions as noted below. For left handlebar functions, see A3.6

SWITCH FUNCTION	SHORT THESE WIRES TOGETHER
UP/FF	[28B] – O/BK, BN/W
DN/RW	[28B] – O/BK, GY/W
Band	[28B] – O/BK, V/BK

Does the radio function properly? Be sure to reconnect connector [28].

YES

NO → Replace radio chassis.

D.2 Disconnect connector [52]. See Figure 51. Check radio function at both handlebar controls. Does the function work properly?

YES

NO

D.3 Check continuity at following pin locations while activating the indicated switch in the indicated direction. A good reading for a switch that is not activated is infinity. When a switch is activated, 0.5 ohms or less is normal. Any reading that is found outside of these specifications is considered abnormal and repairs should be made as indicated.
Check the rear control at connector [52B].

SWITCH FUNCTION	POSITION	CONNECTOR	COLOR
UP/FF		[52B]	O/BK, BN/W
DN/RW		[52B]	O/BK, GY/W
BAND		[52B]	O/BK, V/BK

If readings are abnormal with resistance indicated above, when a switch is not activated, replace the rear passenger control board, H-D P/N 77161-94. If open circuit is found when switch is activated, go to D.5.

D.4 Unplug one handlebar connector at a time and check the opposite control for normal function. Left handlebar connector is [24] and right handlebar connector is [23]. See Figure 52. If problem is in connector [24], go to D.6. If problem is in connector [23], go to D.7.

D.5 Reconnect connector [52] and unplug connector [53] at rear passenger control board inside of right rear speaker housing. DO NOT PULL ON WIRING TO UNPLUG. PULL ON TABS ON EACH END OF CONNECTOR [53B]. PULLING ON WIRING MAY RESULT IN BROKEN WIRING. Repeat test D.1 at connector [53B]. If radio functions normally, replace rear passenger control board, H-D P/N 77161-94A. If wiring is broken causing open circuits, replace console pod.

D.6 Unplug connector [24] and perform test D.3 at connector [24B], using the following information:

SWITCH FUNCTION	POSITION	CONNECTOR	COLOR
Volume UP		[24B]	PK/W, GN/BE
Volume DN		[24B]	PK/W, GY/GN
RECALL		[24B]	PK/W, BN/BK

If readings are abnormal with high resistance, replace the volume switch. If readings are abnormal with low resistance, look for pinched wiring. If open circuit is found when switch is activated, inspect wiring for breaks. If wiring is OK, then replace the volume switch.

D.7 Unplug connector [23] and perform test D.3 at connector [23B] If readings are abnormal with high resistance, replace the tuning switch. If readings are abnormal with low resistance, look for pinched wiring. If an open circuit found when the switch is activated, inspect wiring for breaks. If wiring is OK. then replace the tuning switch.

NOTE

See the Electrical Connector Location Tables starting on page 230 for the location of connectors not shown.

CHART E

Note that there are two versions of E.1. The first version uses Tool HD-39448 to control the CB. See Figure 55 for test connections. If tool HD-39448 is not available, use the second version.

CB will not turn on. Make sure squelch control is rotated fully counterclockwise to obtain CB audio.

E.1

Version 1: (With HD-39448 tool) Install tool in place of pod by unplugging 8-pin connectors [55] and [56] at CB transceiver and connecting the tool. Turn on ignition switch and power switch on tool. The CB channel display should come on. If not, select another channel by depressing the channel selector switch. If the display is active, then replace the pod. If the display is not active, then proceed to test E.2.

Version 2: See Figure 56. Unplug 8-pin connectors [55] and [56] at CB transceiver under right side of Tour-Pak. Measure continuity of CB power switch on console pod. Use paper clips to probe the sockets in the 8 socket connector. Touch meter probes to the paper clips. Place one probe in R/W socket and the other probe in DK GN socket. Ohmmeter must read 0.5 ohm or less with switch ON and infinity with switch OFF.

YES

NO → Replace console pod.

E.2 Measure DC voltage at fuse filter CB Power In connector [5]. See Figure 53. With ignition switch on, place negative probe of voltmeter on Pin 2 and positive probe on Pin 1. Meter must read 12 vdc. Turn off ignition switch and meter should drop to zero.

YES

E.3.1 With ignition switch off, measure voltage at Pin 3 of the CB Power In connector [5]. Meter must read 12 vdc.

YES

NO → Check red/orange wire from CB Power In connector [5] to connector [2] and then to 1 amp fuse at fuse block. See Figure 53 and Figure 54. Repair broken connection(s) as necessary.

NOTE

If 1 amp fuse is blown, radio display would be out, but, radio back-lighting would be on, and radio would be inoperative.

NO → E.3.2 Check orange/blue wire from CB Power In connector [5] to connector [2] and then to 10 amp fuse at fuse block. See Figure 53 and Figure 54. Repair broken connection(s) as necessary.

NOTE

If 10 amp fuse is blown, radio would not turn ON.

YES

E.4 Measure continuity to ground from ground bolt (above starter) to Pin 2 on the CB Power In connector [5] on the fuse/filter board. See Figure 45. Meter must indicate 0.5 ohms or less.

YES

NO → Repair poor or broken ground connection.

E.5 Turn off ignition switch and check continuity from Pin 2 (black wire) on connector [43] to ground bolt (above starter). Meter must indicate 0.5 ohms or less.

YES

NO → Replace fuse board.

Continued on next page

NOTE

See the Electrical Connector Location Tables starting on page 230 for the location of connectors not shown.

Continued from previous page

E.6 Measure DC voltage at Fuseboard to CB connector [43] on fuse board. See Figure 45. Place negative probe on Pin 2 (black wire) and place positive probe on Pin 1 (red wire). Meter must indicate 12 vdc.

E.7 Turn ignition switch ON and measure DC voltage from Pin 2 (black wire) to Pin 3 (orange wire) on connector [43]. Meter must indicate 12 vdc.

YES

NO

E.8 Remove 1 amp CB memory fuse and check to see if it is blown. See Figure 45. If it is, check for short circuit or other reasons for current overload. Replace fuse after correcting problem. If fuse is good and radio is working normally, replace fuse board. If radio is not working, check 1 amp. fuse in fuse block.

YES

NO

Replace CB transceiver chassis.

E.9 Remove 3 amp PWR fuse to see if it is blown. If it is, see Figure 56 and remove 8-place connectors and check resistance of sockets R/W, DK GN and PK on connector [56B] to pin 6 of the 7 place pod DIN cable [49A], see Figure 48. The sockets in the 8-place connectors are too small for a probe, so insert a paper clip in the socket and touch paper clip with probe. Meter must indicate infinity or a very high resistance 1 megohm or more.

YES

NO

Replace console pod.

E.10 Check for short circuit on fuse board or other reason for current overload. Replace fuse after correcting problem.

Replace fuse/filter board.

YES

NO

NOTE

If no apparent cause can be found for the fuses blowing repeatedly, the CB transceiver chassis is bad and must be replaced.

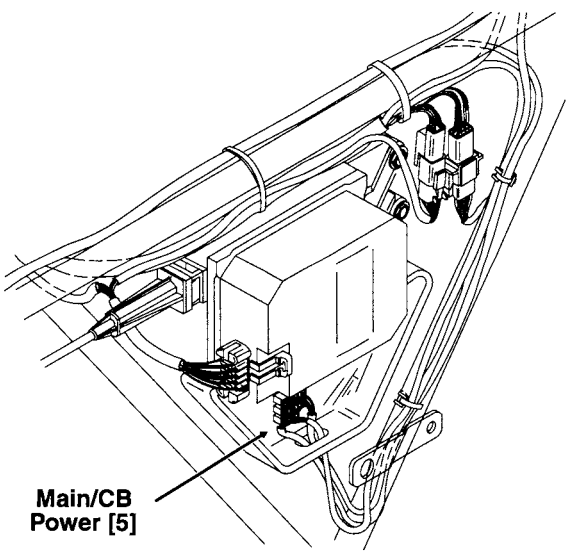


Figure 53. Left Side Cover Removed (FLHTCU, FLHTCU-I, FLTCU-I)

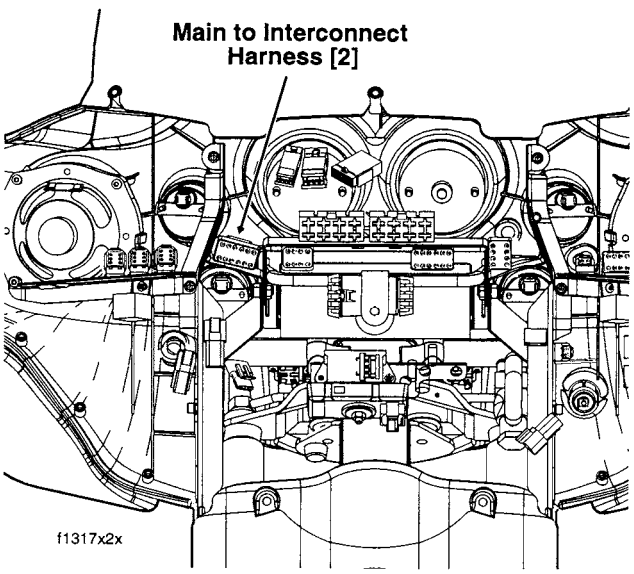


Figure 54. Outer Fairing Removed (1996 FLHTCU)

CHART F-1

Note that a procedure "With Tool HD-39448" and another procedure "Without Tool HD-39448" (using an ohmmeter) are given below. See Figure 55 for HD-39448 connections.

CB will not UP tune.

NOTE: If channel selector changes channels at random, with possible loss of display, check for blown 1 amp CB memory fuse located on fuse board. See Figure 45. Also check stereo for normal operation. If stereo is not working, check 1 amp fuse in fuse block in fairing.

Unplug 8-place connectors [55] and [56] at CB transceiver.

Without tool HD-39448.

See Figure 56. Measure continuity of UP tune switch at 8-place socket connector [56B] from console pod. Place paper clip probes in sockets BN and BK on console pod. Meter must indicate infinite ohms. Move the tuning switch to UP position and note reading. Meter must indicate 1.0 ohms or less.

- **YES** → Replace transceiver.
- **NO** → Replace console pod.

With tool HD-39448.

Connect microphone tool HD-39448 to transceiver. With IGNITION SWITCH "ON", press channel selector up switch. Channel should go up.

- **YES** → Replace console pod.
- **NO** → Replace transceiver.

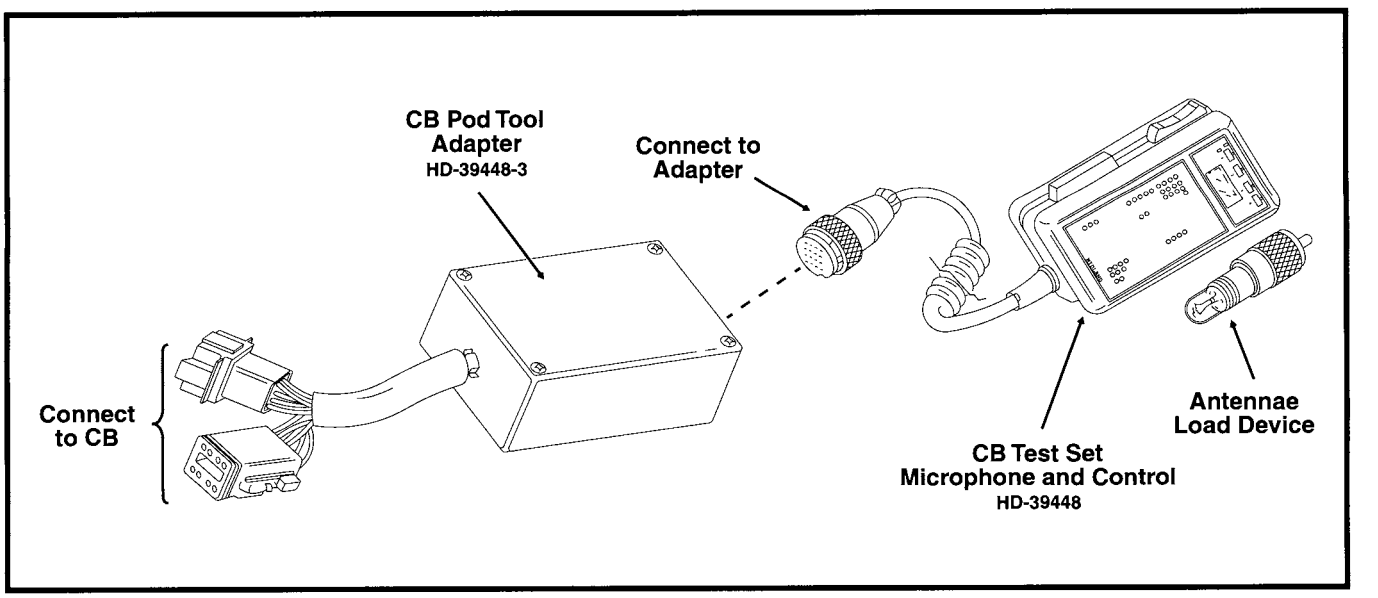


Figure 55. Test Connections for CB Tests

[56B]
1B. RED/WHT (+ 12V ON/OFF TO CB & DISPLAY)
2B. BLACK (UP/DOWN TUNE GROUND RETURN)
3B. GRAY/WHT (DISPLAY CLOCK)
4B. ORANGE/BLK (CB DOWN TUNE)
5B. DARK GREEN (+12V IGNITION FROM CB)
6B. PINK (CB LOCAL/DISTANCE)
7B. WHITE (DISPLAY DATA)
8B. BROWN (CB UP TUNE)

[55A]
1A. RED (MICROPHONE SIGNAL)
2A. BLACK (MICROPHONE SIGNAL GROUND)
3A. VIOLET (SQUELCH CONTROL)
4A. WHITE/GRN (DISPLAY ENABLE)
5A. BLUE/YEL (SQUELCH MUTE)
6A. LIGHT GREEN (CB AUDIO)
7A. YELLOW/BLACK (TRANSMIT ENABLE "PTT")
8A. NO CONNECTION (Seal pin installed.)

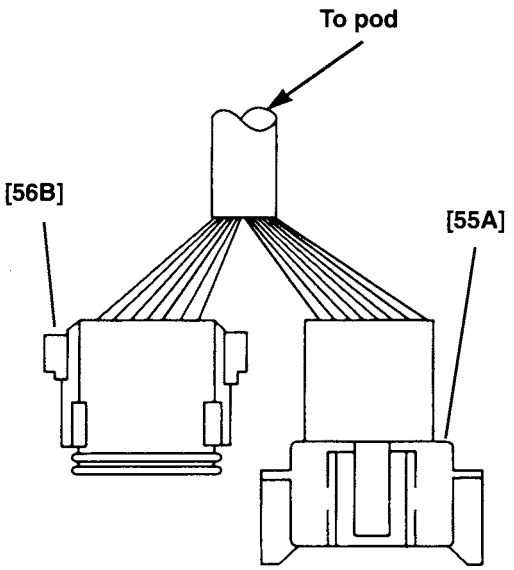


Figure 56. 8-Place Connectors and Console Pod DIN and Ground Connections

CHART F-2

Note that a procedure "With Tool HD-39448" and another procedure "Without Tool HD-39448" (using an ohmmeter) are given below. See Figure 55 for HD-39448 connections.

CB will not DN tune.
Unplug 8-pin connectors [55] and [56] at CB transceiver.

Without tool HD-39448.

See Figure 56. Measure continuity of DN tune switch at 8-place socket connector [56B] from console pod. Place paper clip probes in sockets O/BK and BK on console pod. Meter must indicate infinite ohms. Move the tuning switch to DN position and note reading. Meter must indicate 1.0 ohm or less.

YES → Replace transceiver.
NO → Replace console pod.

With tool HD-39448.

Connect microphone tool HD-39448 to transceiver. With IGNITION SWITCH "ON", press channel selector down switch. Channel should go down.

YES → Replace console pod.
NO → Replace transceiver.

CHART F-3

Note that a procedure "With Tool HD-39448" and another procedure "Without Tool HD-39448" (using an ohmmeter) are given below. See Figure 55 for HD-39448 connections.

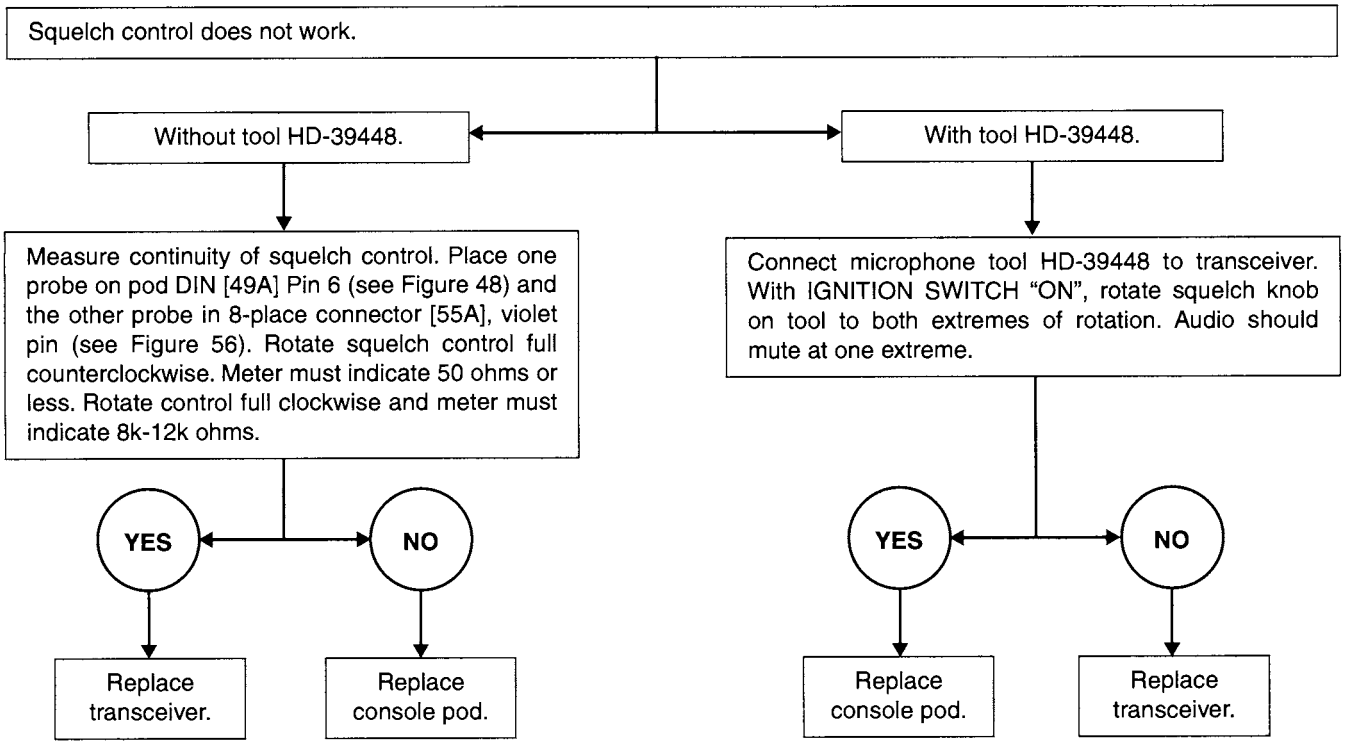


CHART F-4

Note that a procedure "With Tool HD-39448" and another procedure "Without Tool HD-39448" (using an ohmmeter) are given below. See Figure 55 for HD-39448 connections.

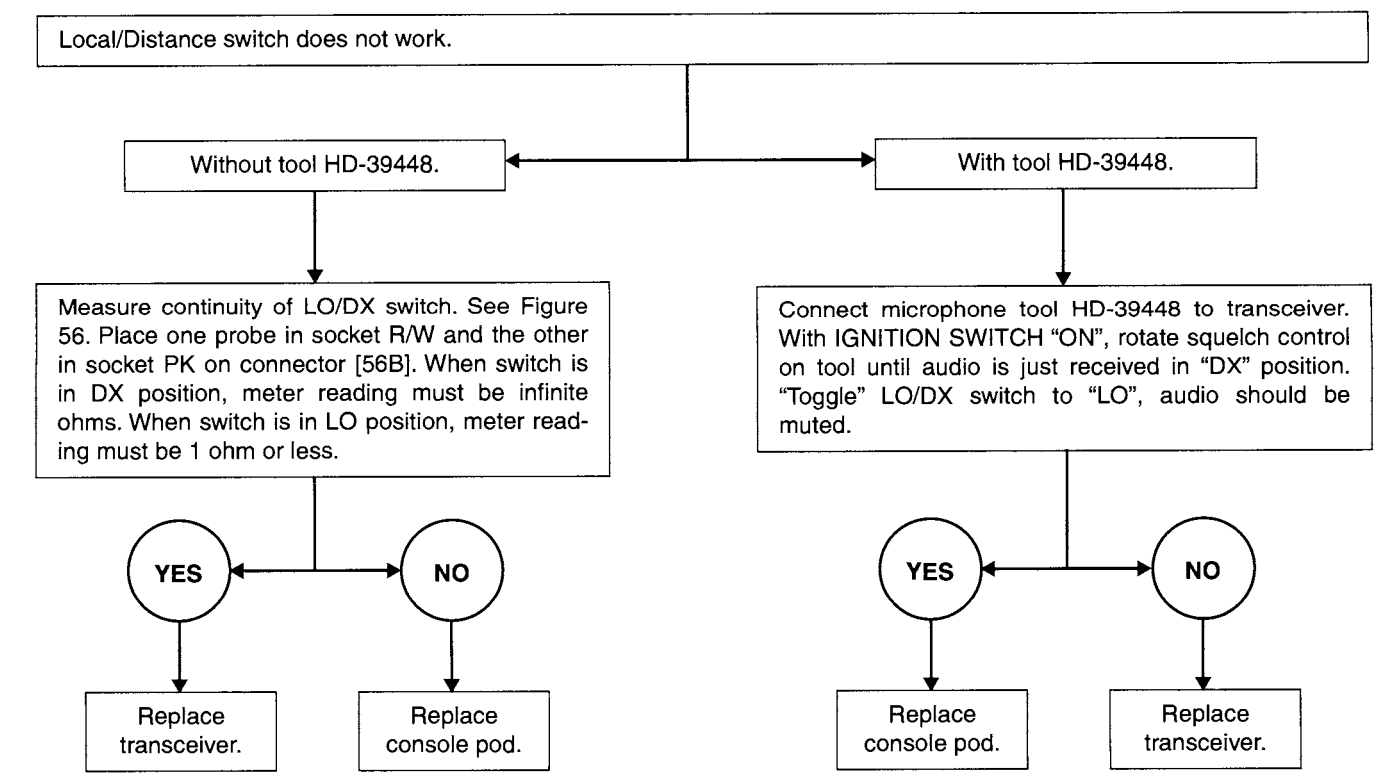


CHART F-5

PTT switches do not work.

Place meter in diode test mode. See Figure 49. Place meter probes between Y/BK pin (positive) on connector [55A] and headset DIN socket 6 (negative). Meter must indicate full scale voltage (open circuit). Press PTT switch and meter must indicate 0.5-0.7 vdc voltage drop.

CHART F-6

Note that a procedure "With Tool HD-39448" and another procedure "Without Tool HD-39448" (using an ohmmeter) are given-below. See Figure 55 for HD-39448 connections.

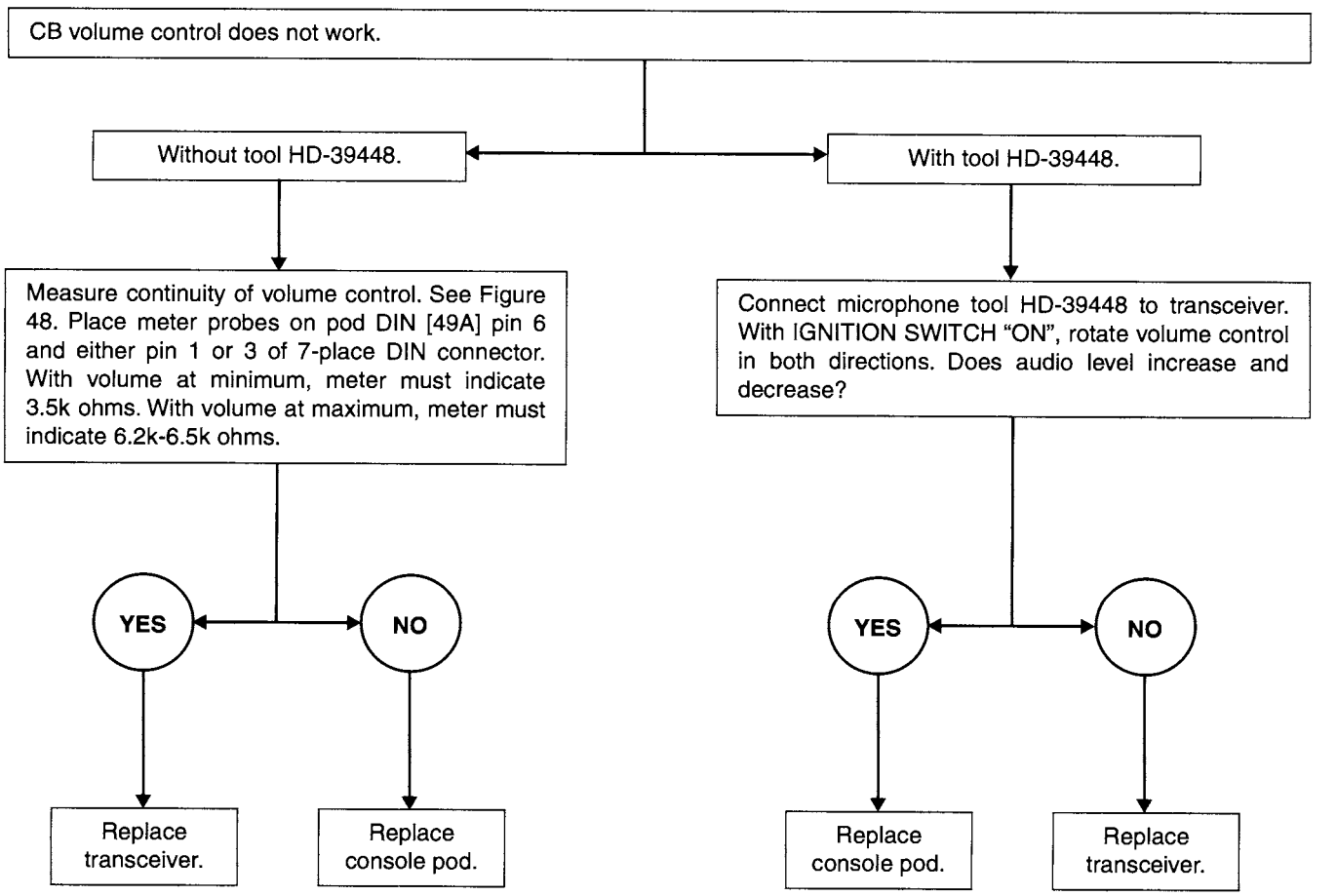


CHART F-7

PTT does not work on hand-held microphone.

See Figure 56. Unplug 8-place connectors [55] and [56] at CB transceiver, 7-place DIN connector [49], Fuseboard to Pod connector [44] at fuse/filter, and Radio to Pod connector [52]. See Figure 45 and Figure 57.

F7.1 Measure resistance between pod DIN socket 6 and socket 6 of 7 place DIN rider's headset connector. See Figure 49. Socket 6 is the top right socket in the connector. Meter must indicate 1.0 ohm or less.

YES ← → NO → Replace console pod.

F7.2 See Figure 56. Measure continuity of PTT switch to CB by using a diode tester. Place positive lead to Y/BK pin of the 8-place connector [55A], and place the negative lead to socket 7 of the 7 place DIN rider's headset connector. Meter must indicate 0.5 to 0.7 vdc voltage drop.

Replace transceiver. ← YES ← → NO → Replace console pod.

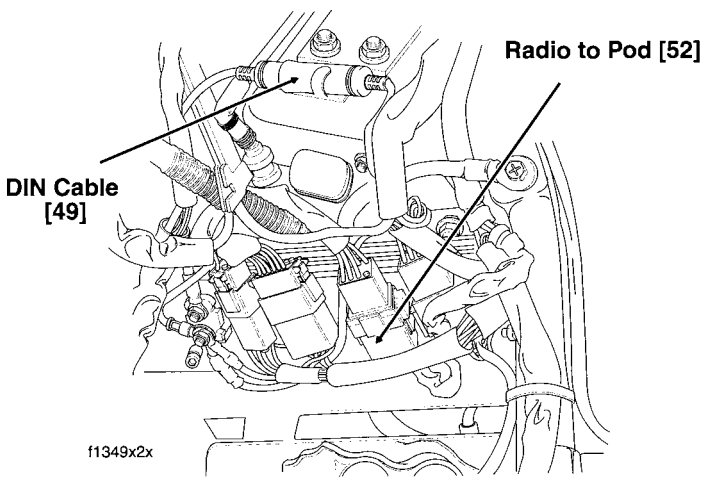


Figure 57. Seat Removed (FLHTC/U-I, FLTCU-I)

NOTE

See the Electrical Connector Location Tables starting on page 230 for the location of connectors not shown.

CHART G

NOTE

Chart G covers the TLE Ultra Sidecar audio system. Chart G follows Chart I. The TLE Ultra wiring diagram is contained in the Wiring Diagram Wall Chart, Part No. 99949-93 or 99949-94 and the Wiring Diagrams and Electrical Troubleshooting Guide, Part No. 99948-93 or 99948-94. To continue troubleshooting the sound systems of FLTC Ultra or FLHTC Ultra motorcycles, proceed to Chart H-1.

CHART H-1

CB will not receive.

H1.1 Make sure that the squelch control is rotated fully counterclockwise and the LO/DX switch is in the "DX" position. Rotate volume control to mid-position and tune CB to a channel with traffic or to a channel for testing using another CB nearby. Does the CB receive?

NO ← → **YES**

YES → Review control operation and interaction with customer.

NO

H1.2 Unplug 8-place connectors [55] and [56] from transceiver under right side of Tour-Pak. Plug in hand-held test adapter, Part No. HD-39448. See Figure 55 for HD-39448 connections. Repeat Test H1.1 above. Does CB receive?

NO ← → **YES** → Replace defective console pod.

NO

H1.3 Disconnect antenna from the CB and replace it with another antenna. If one is not available, then make a simple antenna out of a piece of 12 gauge stranded wire that is 9 feet long. Strip one inch of insulation from one end of wire. Twist wire strands together and then fold wire back on itself so that exposed wire is approximately 1/2 inch long. Insert this end of the wire into the antenna canter conductor hole. (Caution: **Do not transmit with this antenna in place!**) This antenna is for receive test only. Repeat test H1.1 above. Does the CB receive?

NO ← → **YES**

NO → Replace defective CB transceiver.

YES

H1.4
Perform CB Antenna System Test (Figure 47) given earlier in this section. If antenna checks OK, then replace defective antenna loading coil.

NOTE

See the Electrical Connector Location Tables starting on page 230 for the location of connectors not shown.

CHART H-2

CB will not transmit.

Perform troubleshooting given in Charts F-5 and F-7 before proceeding with H2.1. This will insure that the CB is receiving the command to transmit.

H2.1 Disconnect antenna connector from CB and replace it with a dummy load, that is, the lamp included with tool HD-39448.

The lamp acts as a load that allows that CB to be operated and provides a means of checking relative power output and modulation.

To use the load, screw the dummy load onto the antenna jack of the CB. Depress the PTT switch. If the CB is transmitting a carrier wave, the lamp should glow. Speaking into the microphone should cause the lamp to flicker. It should get brighter and dimmer depending on how loud your voice is. A change in lamp brilliance means the CB is modulating. Does the CB transmit and modulate?

YES → H2.2 Perform SWR adjustment procedure given earlier in this section.

NO → H2.3 Unplug the 8-pin connectors and plug in the hand-held test adapter HD-39448. Repeat Test H2.1 above. Does the CB transmit and modulate?

YES → Replace defective console pod.

NO → Replace defective transceiver.

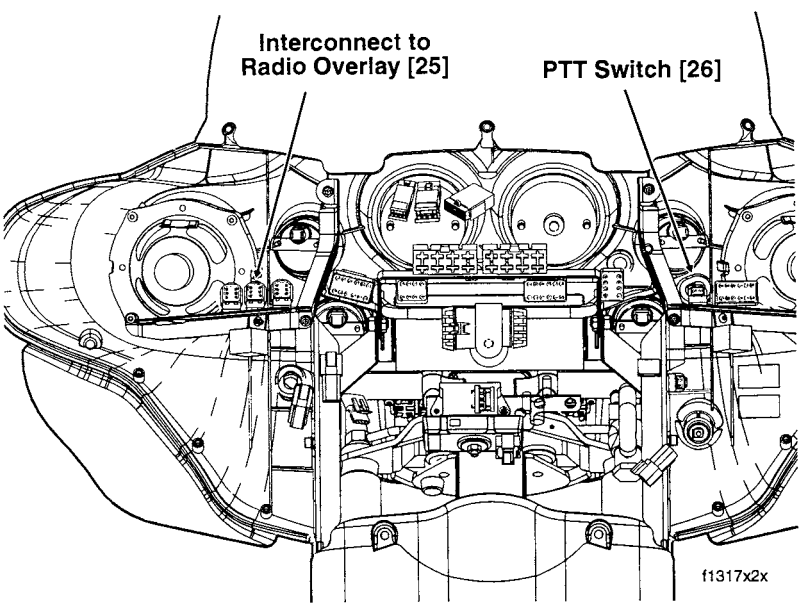


Figure 58. Outer Fairing Removed (1996 FLHTCU)

CHART I

Feedback or transmit voice in front, rear, or helmet speakers. (NOTE: Transmit voice in the helmet speakers is normal, squealing is unacceptable).

I1.1 Check antenna grounds as listed in CB Antenna System Test (Figure 47) given earlier in this section. In addition, remove, clean, and reinstall rear starter bolt to frame ground. Scrape paint from the frame before reconnecting the ground strap. Is the feedback still present?

YES

NO → OK

Define the origin of the feedback. Which set of speakers is the sound coming from?

FRONT | REAR | HELMET

Replace the pod.

I1.2 Remove headlamp assembly on 95 FLHTCU, outer fairing on 96 FLHTCU, or the instrument cluster on FLTCU. Change to the speakers/on position at the fairing speaker switch. Turn ignition switch and radio on. Do you have 8vdc on blue/yellow wire in connector [25A]? See Figure 58.

I1.4 Check the ground wire that comes from the right rear speaker pod and insure that it is grounded properly. If the ground is connected then replace the pod.

YES

NO

I1.3 Press PTT switch. Voltage should drop to 0.5-0.7 vdc.

Radio is defective or BE/Y wire is open. Correct open circuit.

YES

NO

Check for open connection at connector [25] and at diode between connector [25A] and connector [26B]. See Figure 58.

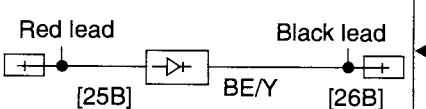
I1.5 If feedback in the front speakers still exists, the radio is defective and must be replaced.

Repair open.

YES

NO

Perform Diode Test:



Should read 0.5-0.7 vdc or the diode is defective and needs to be replaced.

TLE ULTRA SIDECAR AUDIO TROUBLESHOOTING

The following flow charts provide troubleshooting instructions for the TLE Ultra Sidecar Audio Systems. The following tabulation lists audio system problems and the chart number that contains the applicable troubleshooting instructions.

PROBLEM	CHART NUMBER
No or intermittent sound in sidecar speakers, other speakers working	G1
PTT inoperative in sidecar	G2
Sidecar tuning control inoperative	G3
VOX microphone inputs are heard at sidecar speakers	G4
PTT microphone inputs are heard at sidecar speakers	G5

NOTE

In the TLE Ultra Sidecar Audio wiring diagrams, the connectors are identified with an "SC" prefix; e.g., "[SC2-B]". Some of the Sidecar troubleshooting charts direct you to the ULTRA SOUND SYSTEM charts to complete the troubleshooting process.

CHART G1

No or intermittent sound in sidecar speakers, other speakers are operating.

G1.1 Check for disconnected DIN connectors. Check connector [SC-71] at sidecar amplifier located behind seat in sidecar and connector [SC-49] under seat on motorcycle. Are DIN connectors plugged into each other?

YES

NO

G1.2 Plug in DIN connectors. Do the sidecar speakers work?

NO

YES

OK

G1.3 Check that 2-pin power cord, connector [68B] is plugged into fuse/filter board under left side cover. Check 3-amp.CB power fuse. This fuse supplies both the CB power and the sidecar amplifier power. If 3-amp. fuse is blown, CB won't turn ON and sidecar speakers will be inoperative. If fuse is blown go to test E.7 and perform test at connector [68B].
Are connections made and fuse good?

YES

NO

G1.4 Plug connector [68B] into fuse/filter board or replace fuse with one of correct value if blown. Do the sidecar speakers work?

NO

YES

OK

G1.5 Measure DC voltage on orange wire at connector [SC-72]. Voltage must be 10-12 vdc when ignition switch is ON.

YES

NO

Check connections at [SC-72] and repair as necessary.

G1.6 Measure DC voltage on violet wire at connector [SC-72]. Connect meter ground to light green wire. Voltage must be 3.3-3.5 vdc.

YES

NO

Side car amplifier is defective and must be replaced.

G1.7 Measure DC voltage on pink wire at connector [SC-72]. Connect meter ground to light green wire. Voltage must be1.2-2.6 vdc depending on volume control position.

YES

NO

Check for broken connections at [SC-73]. If connections are OK, replace sidecar control board assembly.If wiring is broken, make repairs as needed.

G1.8 Disconnect DIN cable at sidecar amplifier, connector [SC-71]. See Figure 48. With ignition switch OFF, measure resistance from pin 6 to pins 1 and 3. Reading must be 500-1500 ohms. Measure ac voltage on pins 1 and 3 to pin 6 under the following conditions: With ignition switch ON, switch fairing speaker switch to "HEADSET/OFF" position and turn rear speaker volume control to minimum. Increase radio volume to maximum. Readings will vary with audio signal that is supplied by the radio. Typical readings will be 0.04 - 0.05 volts AC. If readings are normal, replace sidecar amplifier.

CHART G2

PTT inoperative in sidecar.

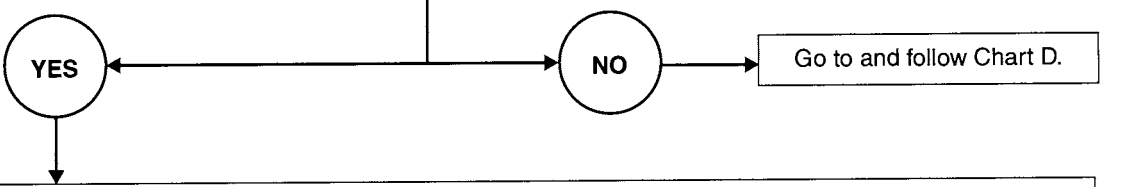
G2.1 Measure continuity between blue/yellow and light green wires at connector [SC-52A] with ignition switch OFF. Meter should indicate infinity. Press in VOLUME knob in sidecar to activate PTT switch. Meter must indicate 0.5 ohms or less. If meter readings are not as indicated above, check for broken wiring at connector [SC-73]. If wiring is broken, make repairs as necessary. If wiring is OK, replace sidecar VOLUME/TUNING control assembly.

CHART G3

Sidecar tuning control inoperative.

Check continuity of sidecar tuning control. Place meter probes on wires indicated below and move the switch in the indicated direction. A good reading in the activated (closed) position of the switch is 0.5 ohms or less. A good reading in the non-activated (open) position of the switch is infinity.

Do the controls on the right handlebar and the rear speaker pod work properly?



G3.1 Unplug connector [SC-52B]. Check sidecar control as outlined below:

CONTROL	CONNECTOR – COLORS	SWITCH POSITION	SWITCH FUNCTION
Sidecar	**[SC52B] – O/BK, BN/W**	**Left**	**UP/FF**
Sidecar	**[SC52B] – O/BK, GY/W**	**Right**	**DN/RW**
Sidecar	**[SC52B] – O/BK, V/BK**	**Inward**	**Band (AM-FM-WB)**

If readings are not normal, with high resistance, replace the VOLUME/TUNING control assembly. If readings are not normal, with low resistance, look for pinched wiring. If readings are not normal, with an open circuit, make repairs as needed. If no broken connections are found, replace the VOLUME/TUNING control assembly.

CHART G4

VOX (intercom-activated) microphone inputs or CB audio are heard at sidecar speakers.

G4.1 Measure dc voltage on white wire in connector [SC-72]. Use black wire for meter ground. Normal voltage is 2.0-3.0 vdc when intercom is not in use or CB is not receiving. (Stereo is playing in speakers.) When intercom is in use or CB is receiving, voltage should drop to 0.5 vdc.

Are voltage readings within specifications given above?

NO ← → YES → Replace sidecar amplifier.

G4.2 Repeat above test (G4.1) at connector [SC-52A].

YES ← → NO → Replace console pod.

G4.3 Repair wiring between connectors [SC-52A] and [SC-72].

CHART G5

PTT microphone inputs are heard at sidecar speakers.

G5.1 Disconnect DIN connector [SC-71] from sidecar amplifier. With ignition switch "ON", short pin 4 of (SC-71A) to the metal shell of connector [SC-71A]. Audio should mute at front and rear speakers.

YES / NO

G5.2 Reconnect DIN connector [SC-71A] to sidecar amplifier. With PTT switch pressed, check DC voltage to ground on speaker wires in connector [SC-72]. Wire colors are: BN, W/BN, DK GN and W/GN. Voltage should be zero volts. With PTT switch released, speaker wires should have a voltage of 5-7 vdc. If voltages are not as specified, replace sidecar amplifier.

G5.3 See Figure 48. Disconnect connector [SC-49A] and measure continuity between pin 5 of connector [SC-49A] and pin 4 of [SC-71A]. If continuity is not present, the sidecar interconnect harness, Part No. 88403-94 must be replaced.

SPARK PLUGS

GENERAL

Spark plugs must be checked at 5000 miles (8000 km) and replaced at 10,000 miles (16,000 km).

The number 5R6A plug is supplied as original equipment and is the only plug that should be used.

The resistor plug reduces radio interference created by the ignition system and will not affect performance or fuel economy.

INSPECTION (Figure 59)

Examine plugs as soon as they have been removed. The deposits on the plug base are an indication of the plug efficiency and are a guide to the general condition of rings, valves, carburetor and ignition system.

A. A wet black and shiny deposit on plug base, electrodes and ceramic insulator tip indicate an oil fouled plug. The condition may be caused by worn rings and pistons, loose valves or seals, weak battery or faulty ignition.

B. A dry fluffy or sooty black deposit indicates a too rich carburetor air-fuel mixture or long periods of engine idling. Excessive use of the enrichener may also cause this condition.

C. An overheated plug can be identified by a light brown, glassy deposit. This condition may be accompanied by cracks in the insulator or by erosion of the electrodes. This condition is caused by too lean an air-fuel mixture, a hot running engine, valves not seating or improper ignition timing. The glassy deposit on the spark plug is a conductor when hot and may cause high speed misfiring.

   A plug with eroded electrodes, heavy deposits or a cracked insulator should be replaced.

D. A plug with white, yellow or light tan to rusty brown powdery deposit indicates balanced combustion. The deposits may be cleaned off at regular intervals if desired.

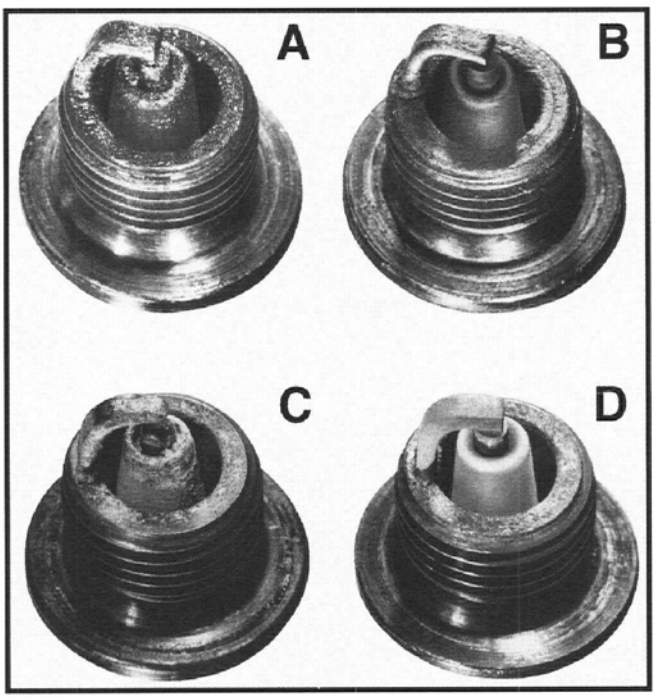


Figure 59. Types of Plug Base Deposits

ADJUSTMENT

Use only a wire-type gauge. Bend the outside electrode so only a slight drag on the gauge is felt when passing it between electrodes. Never make adjustments by bending the center electrode. Set gap on all plugs at 0.038-0.043 (0.97-1.09 mm).

INSTALLATION

1. Before installing spark plugs, check condition of threads in cylinder head and on plug. If necessary soften deposits with penetrating oil and clean out with a thread chaser.

2. Install spark plug finger tight and then torque to 18 to 22 ft-lbs (24-30 Nm).

3. Check engine idle speed, and adjust if necessary. Idle speeds and adjustment are listed in the FUEL section of the Service Manual.

SPARK PLUG CABLES

GENERAL

Resistor-type high-tension cables have a carbon-impregnated fabric core (instead of solid wire) for radio noise suppression and improved reliability of electronic components. Use the exact replacement cable for best results.

REMOVAL

⚠WARNING

Never disconnect a spark plug cable with the engine running. If you disconnect a spark plug cable with the engine running, you may receive a potentially fatal electric shock from the ignition system.

⚠CAUTION

When disconnecting each spark plug cable from its spark plug terminal, always grasp and pull on the rubber boot at the end of the cable assembly (as close as possible to the spark plug terminal). Do not pull on the cable portion itself. Pulling on the cable will damage the cable's carbon core.

Disconnect spark plug cables from ignition coil and spark plug terminals.

INSPECTION

Check cables for cracks or loose terminals.

Check spark plug cable resistance with an ohmmeter. Resistance must be 250-583 ohms per inch.

Replace cables that are worn or damaged, or that do not meet resistance specifications. Check cable boots/caps for cracks or tears. Also check for loose fit on ignition coil and spark plugs. Replace boots/caps if defects are noted.

INSTALLATION

Connect spark plug cables to ignition coil and spark plugs. Make sure boots/caps are secured properly; this will provide the necessary moisture-proof environment for the ignition coil and spark plug terminals.

STARTER SYSTEM

GENERAL

The starter is made up of an armature, field winding assembly, solenoid, drive assembly, idler gear, and drive housing.

The starter motor torque is increased through gear reduction. The gear reduction consists of the drive pinion on the armature, an idler gear, and a clutch gear in the drive housing. The idler gear is supported by rollers and the clutch gear is part of the overrunning clutch/drive assembly.

The overrunning clutch is the part which engages and drives the clutch ring gear. It also prevents the starter from overrunning. The field windings are connected in series with the armature through brushes and commutator segments.

The starter relay is a non-repairable part and must be replaced if it malfunctions.

Operation (Figure 60)

When the starter switch is pushed, the starter relay is activated and battery current flows into the pull-in winding and the hold-in winding, to ground.

The magnetic forces of the pull-in and hold-in windings in the solenoid, pull the plunger and cause it to shift to the left, so that the pinion gear is engaged with the clutch ring gear. At the same time, the main solenoid contacts are closed and battery current flows directly through the field windings to the armature and to ground. Simultaneously, the pull-in winding is opened.

The current continues flowing through the hold-in winding, keeping the main solenoid contacts closed. At this point the starter begins to crank the engine.

After the engine has started, the pinion gear turns freely on the pinion shaft through the action of the overrunning clutch which prevents the armature overrunning by the rotation of the clutch ring gear.

When the starter switch is released, the current of the hold-in winding is fed through the main solenoid contacts and the direction of the current in the pull-in winding is reversed. The solenoid plunger is returned to its original position by the return spring, disengaging the pinion gear from the clutch ring gear.

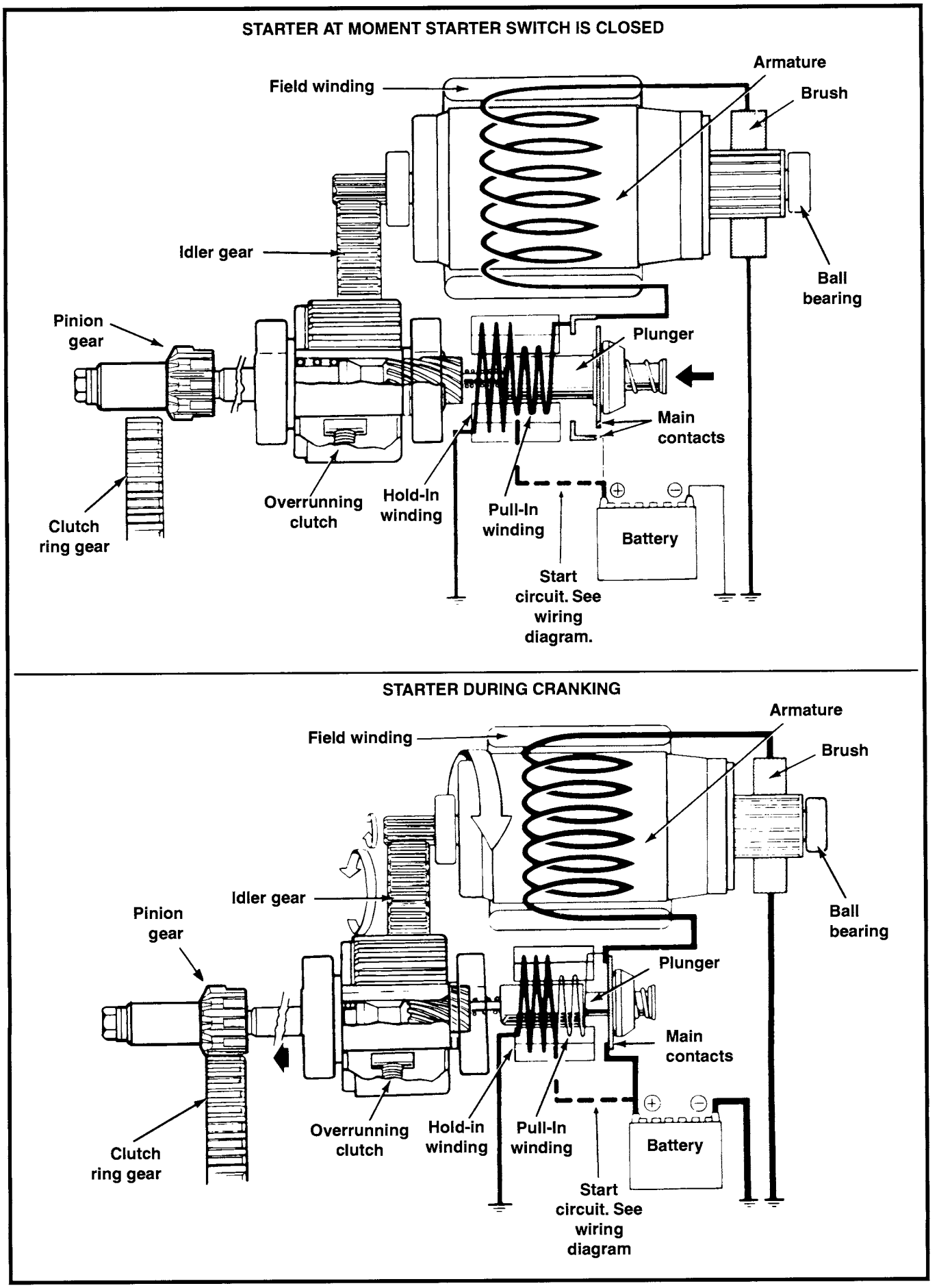
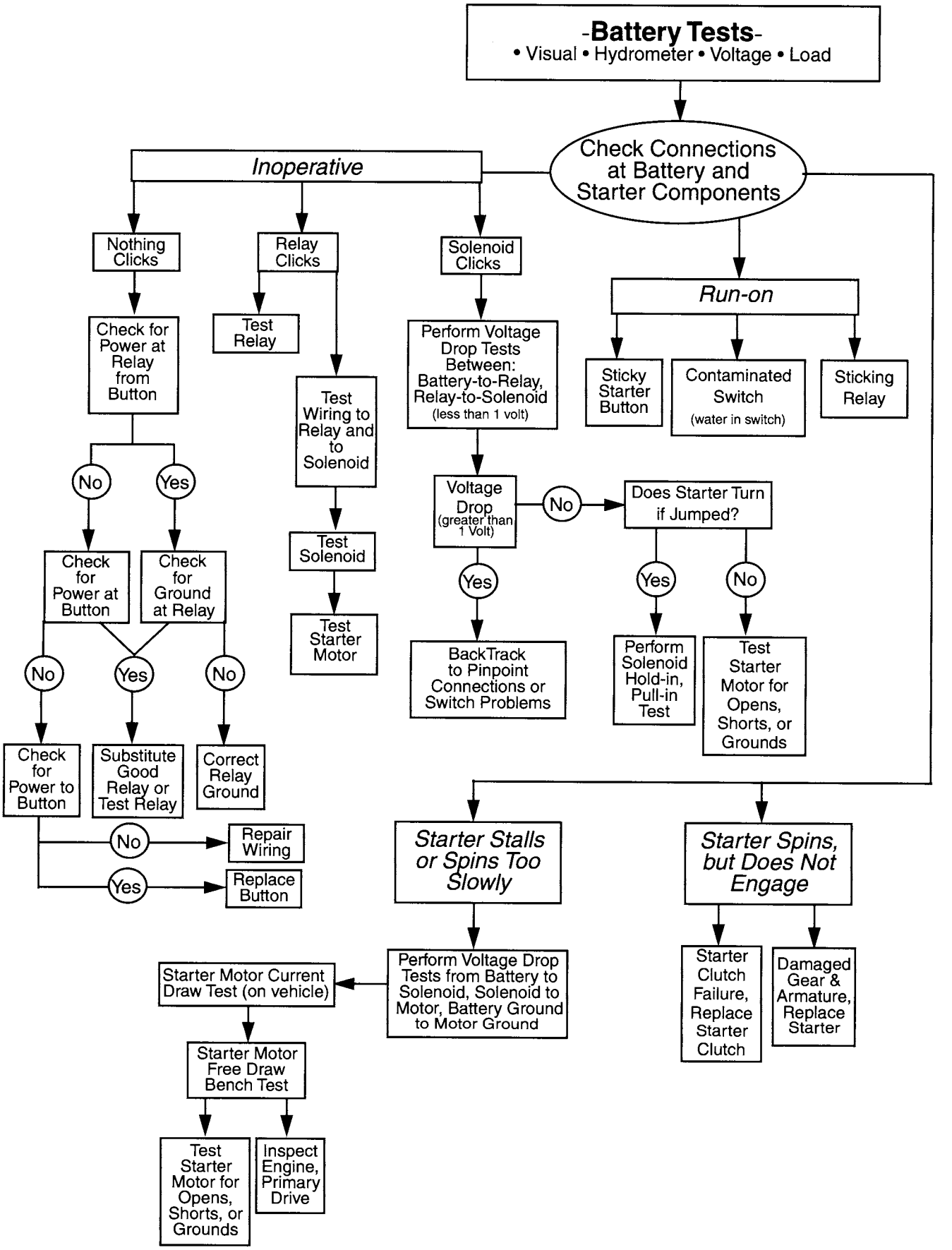


Figure 60. Starter Operation

STARTING SYSTEM DIAGNOSIS - XLH MODELS



STARTING SYSTEM DIAGNOSIS - FX, FXD, FL MODELS

— BATTERY TESTS —
• VISUAL • VOLTAGE • HYDROMETER • LOAD

Check Connections at Battery and Starter Components.

Continued on Next Page

INOPERATIVE

Solenoid Clicks.

Perform Voltage Drop Tests Between Battery and "50" Terminal on Solenoid. Less Than 2 Volts on FL Models, Less Than 1 Volt on All Other Models?

YES

(2) Perform Voltage Drop Tests from Battery (Pos. +) to Starter Motor "C" Terminal. Crank Engine. Is Voltage Greater than 1 Volt?

YES

(2) Perform Voltage Drop Tests from Battery (Pos. +) to Starter Motor "M" (Battery) Terminal. Crank Engine. Is Voltage Greater than 1 Volt?

YES

Repair Connection Between Battery and Starter.

NO

Repair or Replace Solenoid (Contacts).

NO

(2) Backtrack to Pinpoint Poor Connections or Relay Contact Problems Using Voltage Drop Tests.

NO

(2) Perform Voltage Drop Test Between Battery (Neg. -) and Starter Studs or Bolts. Is Voltage Greater than 1 Volt?

YES

Clean Ground Connections.

NO

Relay Clicks.

Test for Voltage at Solenoid Terminal. Is 12V Present When Starter Button is Pressed?

YES

(1) Does Starter Motor Turn if Jumped?

YES

Perform Solenoid Hold-in, Pull-in Tests. Solenoid OK?

YES

Mechanical Binding or Seal Binding on Jackshaft (Dirt or Corrosion).

NO

Replace Solenoid.

NO

Test Starter Motor for Opens, Shorts or Grounds.

NO

Test for Voltage to Relay. Is 12V Present on Relay Terminal 30?

YES

Test for Voltage from Relay. Is 12V Present on Relay Terminal 87 When Starter Button is Pressed?

YES

Repair Open on GN Wire Between Relay and Solenoid.

NO

Replace Starter Relay.

NO

Repair Open on R/GY Wire (FLT Models) or R/BK Wire (XL, FX, FXD Models) Feeding Terminal 30 on Starter Relay.

Nothing Clicks.

Check for Battery Voltage at Relay Terminal 86 From Starter Button. Battery Voltage Present?

YES

Check for Ground at Relay Terminal 85. Ground Present?

YES

Substitute Good Relay or Test Relay.

NO

Correct Relay Ground.

NO

Check for Battery Voltage from Starter Button (BK/R Wire at Connector [22], BK Wire on 95 FX). Battery Voltage Present With Starter Button Pressed?

YES

Repair Wiring From Starter Button to Relay.

NO

Check for Battery Voltage to Starter Button (W/BK Wire at Connector [22], W Wire on 95 FX). Battery Voltage Present?

YES

Replace Starter Button.

NO

Repair Wiring to Starter Button.

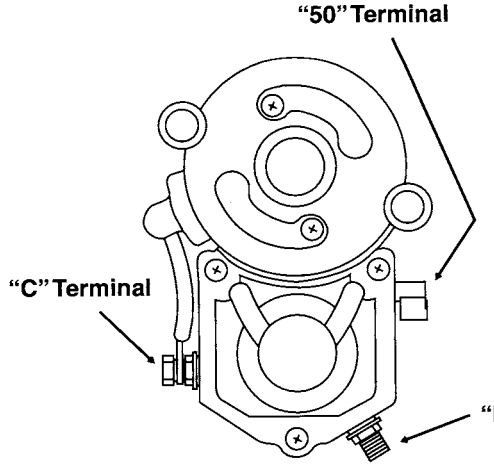
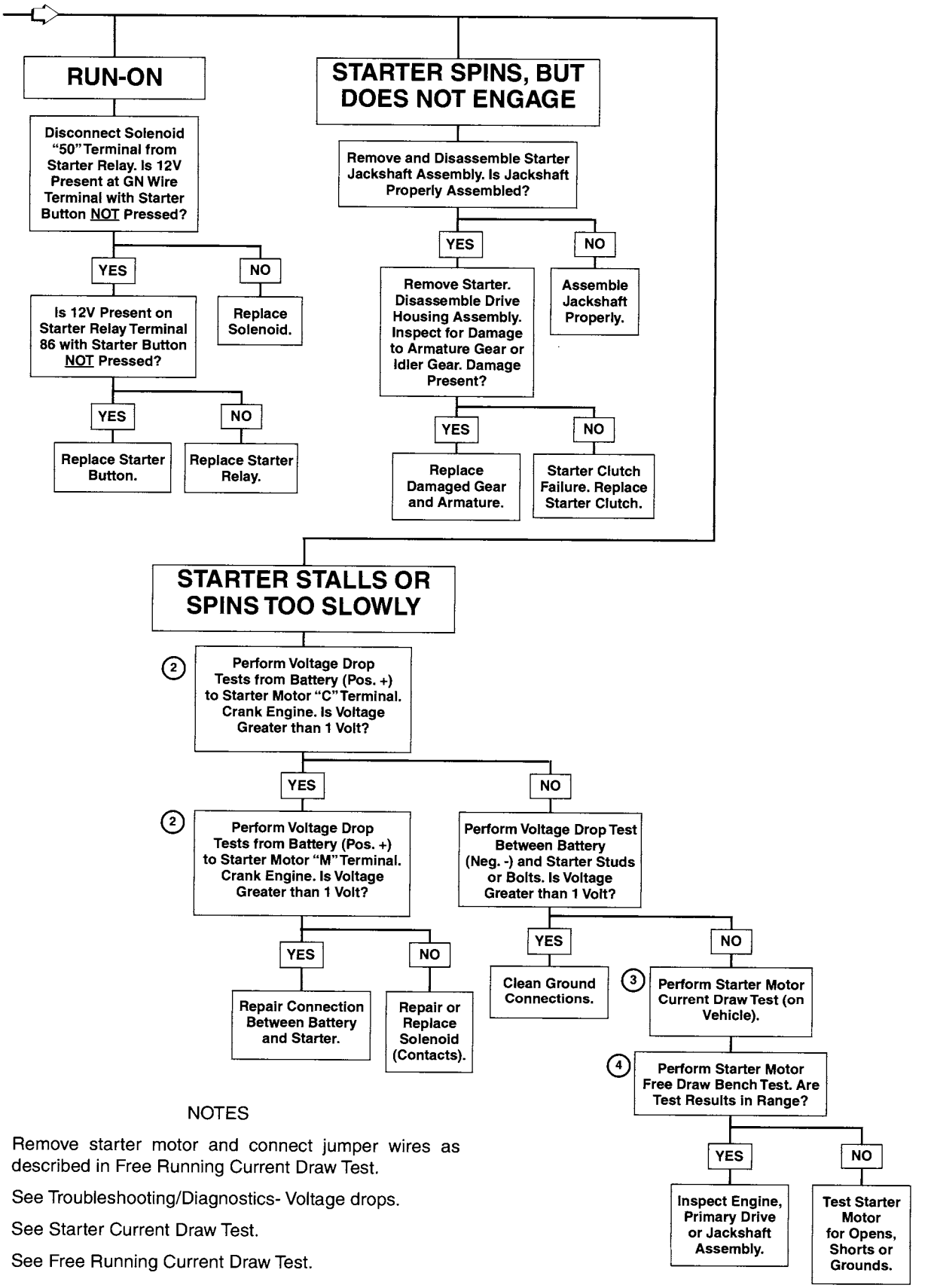


Figure 61. Electric Starter

Continued from Previous Page



NOTES

(1) Remove starter motor and connect jumper wires as described in Free Running Current Draw Test.

(2) See Troubleshooting/Diagnostics- Voltage drops.

(3) See Starter Current Draw Test.

(4) See Free Running Current Draw Test.

DIAGNOSTICS/TROUBLESHOOTING

GENERAL

Follow the STARTING SYSTEM DIAGNOSIS chart to diagnose starting system problems. The VOLTAGE DROPS procedure will help you to locate poor connections or components with excessive voltage drops. The TROUBLESHOOTING charts contain detailed procedures to solve and correct problems.

VOLTAGE DROPS

OBJECTIVE: To check the integrity of all wiring, switches, circuit breakers and connectors between the source and destination.

The voltage drop test measures the difference in potential or the actual voltage dropped between the source and destination.

1. See Figure A on the opposite page. Attach your red meter lead to the most positive part of the circuit, which in this case would be the positive post of the battery.
2. See Figure B. Attach the black meter lead to the final destination or component in the circuit (solenoid terminal from relay).
3. Activate the starter and observe the meter reading. The meter will read the voltage dropped or the difference in potential between the source and destination.
4. An ideal circuit's voltage drop would be 0 volts or no voltage dropped, meaning no difference in potential.
5. See Figure C. An open circuit should read 12 volts, displaying all the voltage dropped, and the entire difference in potential displayed on the meter.
6. Typically, a good circuit will drop less than 2 volts.
7. If the voltage drop is greater, back track through the connections until the source of the potential difference is found.

The benefit of doing it this way is speed.

A. Your readings aren't as sensitive to real battery voltage.

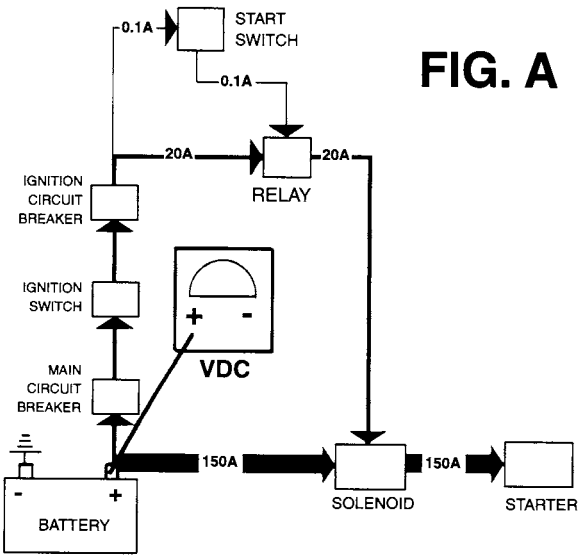
B. Your readings show the actual voltage dropped, not just the presence of voltage.

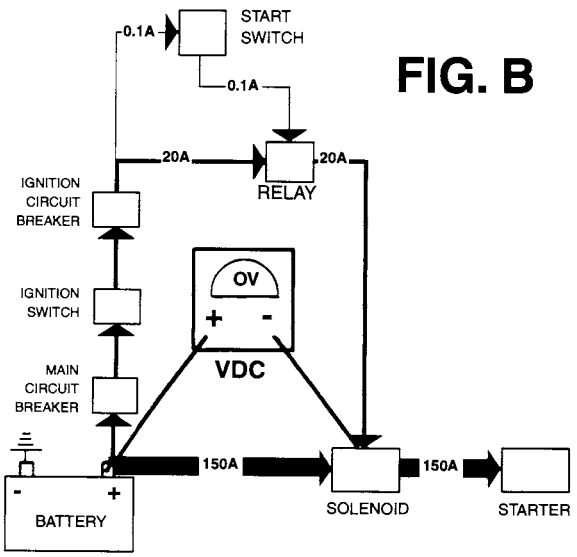
C. This tests the system as it is actually being used. It is more accurate and will display hard to find poor connections.

D. This approach can be used on lighting circuits, ignition circuits, etc. Start from most positive and go to most negative (the destination or component).

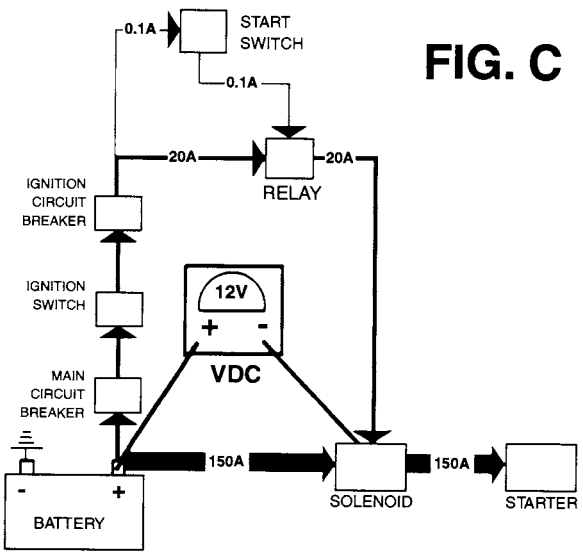
8. See Figure D. The negative or ground circuit can be checked as well. Place the negative lead on the most negative part of the circuit (or the negative battery post). Remember, there is nothing more negative than the negative post of the battery. Place the positive lead to the ground you wish to check.
9. Activate the circuit. This will allow you to read the potential difference or voltage dropped on the negative or ground circuit. This is very effective for identifying poor grounds due to powdered paint. Even the slightest connection may cause an ohmmeter to give a good reading. However, when sufficient current is passed through, the resistance caused by the powdered paint will cause a voltage drop, or potential difference in the ground circuit.

STARTING ACTIVATION CIRCUITS

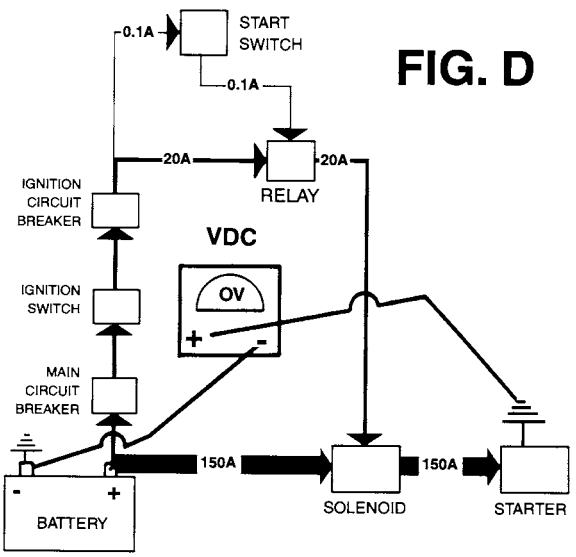




IDEAL CLOSED CIRCUIT



OPEN CIRCUIT



GROUND CIRCUIT

Typical Circuitry. Refer to wiring diagrams for specific vehicles.

TROUBLESHOOTING

PROBLEM	SOURCE OF PROBLEM	PROBABLE CAUSE	SOLUTION
1. Starter does not run, or runs at very low speeds.	1.1 Battery.	1.1.1 Voltage drop due to discharged battery.	1.1.1 Charge battery.
		1.1.2 Worn or defective battery.	1.1.2 Replace battery.
		1.1.3 Corroded battery terminal(s).	1.1.3 Clean and retighten.
	1.2 Wiring.	1.2.1 Poor or no connection at either battery positive or negative cable, at either end.	1.2.1 Repair or replace cable(s).
		1.2.2 Cracked or corroded battery cable ends.	1.2.2 Clean, tighten or replace cable(s) as needed.
		1.2.3 Open wire(s) or poor connection at handlebar switch or starter relay, especially relay ground wire.	1.2.3 Tighten connections or repair or replace wire(s).
	1.3 Handlebar start switch.	1.3.1 Poor switch contacts or open switch.	1.3.1 Replace switch.
	1.4 Starter relay.	1.4.1 Open coil winding.	1.4.1 Replace relay.
		1.4.2 Poor or no continuity at relay points.	1.4.2 Replace relay.
	1.5 Solenoid.	1.5.1 Poor contact condition caused by burnt contact.	1.5.1 Rebuild solenoid assembly. See NOTE below.
		1.5.2 Pull-in winding open or short-circuited.	1.5.2 Repair or replace solenoid assembly.
		1.5.3 Hold-in winding open or short circuited.	1.5.3 Repair or replace solenoid assembly.
	1.6 Starting motor.	1.6.1 Brushes worn below specification.	1.6.1 Replace brushes.
		1.6.2 Poor contact condition of brushes.	1.6.2 Check brush spring tension.
		1.6.3 Commutator burned.	1.6.3 Correct on lathe or replace armature.
		1.6.4 Commutator mica is too high.	1.6.4 Correct by undercutting.
		1.6.5 Field winding grounded.	1.6.5 Replace field winding.
		1.6.6 Armature winding grounded or short circuited.	1.6.6 Replace armature.
		1.6.7 Reduction gears damaged.	1.6.7 Replace reduction gears.
		1.6.8 Insufficient brush spring tension.	1.6.8 Replace brush spring.
		1.6.9 Lead wire disconnected between solenoid and field windings.	1.6.9 Repair or replace lead wire.
		1.6.10 Ball bearing sticks.	1.6.10 Replace bearing.
	1.7 Starter jackshaft assembly (1340cc models only).	1.7.1 Jackshaft binding or sticking.	1.7.1 Replace jackshaft bushing.
		1.7.2 Jackshaft binding at primary case seal because of corrosion.	1.7.2 Repair or replace jackshaft assembly.

NOTE

A solenoid repair kit is available from your Harley-Davidson dealer. Follow the repair procedure given in the Instruction Sheet included with the repair kit.

TROUBLESHOOTING (CONT)

PROBLEM	SOURCE OF PROBLEM	PROBABLE CAUSE	SOLUTION
2. Pinion does not engage with ring gear while starter is running/ engine cannot be cranked.	2.1 Battery.	2.1.1 Voltage drop because of discharged battery.	2.1.1 Charge battery.
		2.1.2 Worn or defective battery.	2.1.2 Replace battery.
		2.1.3 Corroded battery terminal(s).	2.1.3 Clean and retighten.
	2.2 Overrunning clutch.	2.2.1 Overrunning clutch malfunction (rollers or compression spring).	2.2.1 Replace overrunning clutch.
		2.2.2 Pinion teeth worn out.	2.2.2 Replace pinion.
		2.2.3 Pinion does not run in overrunning direction.	2.2.3 Replace overrunning clutch.
		2.2.4 Spline teeth do not slide properly.	2.2.4 Remove foreign materials, dirt, or replace overrunning clutch or pinion shaft.
		2.2.5 Reduction gears damaged.	2.2.5 Replace overrunning clutch and idler gear.
	2.3 Jackshaft assembly (1340cc models only).	2.3.1 Improper jackshaft parts assembly.	2.3.1 Disassemble and assemble parts properly.
	2.4 Ring gear.	2.4.1 Worn out teeth.	2.4.1 Replace pinion and clutch shell.
3. Starter does not stop running.	3.1 Right handlebar starting switch or starter relay.	3.1.1 Unopened contacts.	3.1.1 Replace starting switch or starter relay.
		3.1.2 Poor return caused by sticky switch or relay contacts.	3.1.2 Replace starting switch or starter relay.
	3.2 Solenoid.	3.2.1 Return spring worn.	3.2.1 Replace spring.
		3.2.2 Coil layer shorted.	3.2.2 Replace solenoid.
		3.2.3 Contact plate melted and stuck.	3.2.3 Repair solenoid.

TESTING

On-Motorcycle Tests

Special Tools	Torque Values
HD-35500A Continuity tester/ohmmeter HD-39617 Inductive amp probe or induction ammeter	None

Before removing the starter perform the following tests:

STARTER RELAY TEST

1. See Figure 62. Unplug the relay connector and substitute a new relay or perform the following test.

   The starter relay can be tested with the vehicle's 12 volt battery and a continuity tester or ohmmeter. Unplug the wires from the relay and connect the battery leads to the 86 and 85 terminals to energize the relay. Check for continuity between the 30 and 87 terminals. A good relay will show continuity. There will be continuity if the tester lamp is "on" or there is a zero ohm reading on the ohmmeter. A malfunctioning relay will not have continuity and must be replaced.

⚠CAUTION

The "85" terminal on the relay must be connected to the negative battery terminal to avoid damaging the diode connected across the relay winding.

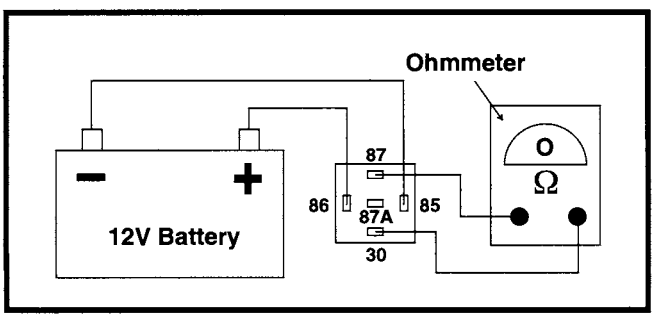


Figure 62. Starter Relay Test

STARTER CURRENT DRAW TEST (Figure 63)

Starter current draw should be checked with an induction ammeter before disconnecting the battery, under the following conditions:

- Engine temperature should be stable and at room temperature.
- Battery should be fully charged.

1. Be sure the transmission is in neutral. Disconnect the spark plug wires from spark plug terminals.
2. Clamp induction ammeter over the positive battery cable.
3. With the ignition ON, turn engine over by pressing starter switch while taking a reading on the ammeter. Disregard initial high current reading which is normal during time the engine is first turned over.

- Typical starter current draw will range between 160 and 180 amperes.

4. If starter current draw exceeds 200 amperes, the problem may be in the starter or starter drive and the starter must be removed and tested further. See STARTER, REMOVAL and FREE RUNNING CURRENT DRAW TEST.

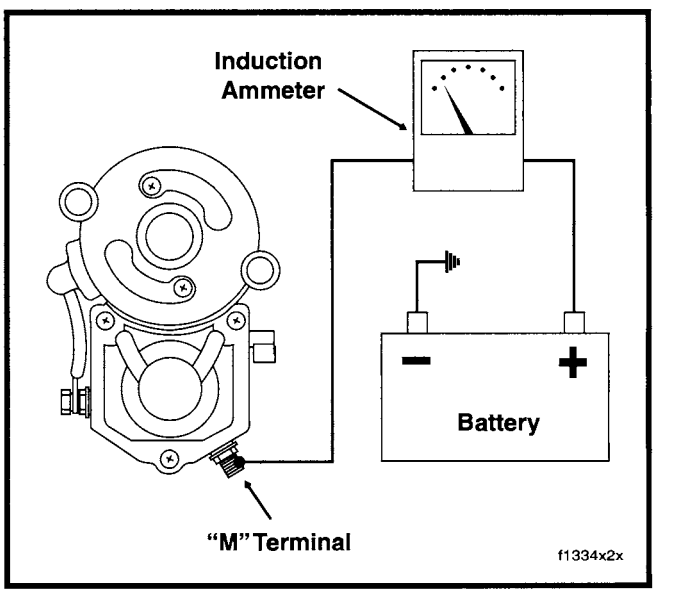


Figure 63. Starter Current Draw Test

TESTING ASSEMBLED STARTER

Starter Solenoid

⚠WARNING

Wear eye protection during this series of tests. These tests may produce flying sparks which could cause eye injury.

NOTE

Do not disassemble solenoid. Before testing, disconnect field wire from terminal "C", shown in Figure 64.

⚠CAUTION

Each test should be performed for only 3 to 5 seconds to prevent damage to solenoid.

NOTE

Perform the following tests in as rapid a sequence as possible.

Solenoid Pull-In (Figure 64)

Connect test leads from 12 volt battery as shown. Connect the test lead to the "50" terminal last. The starter shaft should extend strongly if the solenoid is working properly. If shaft does not extend, solenoid should be replaced.

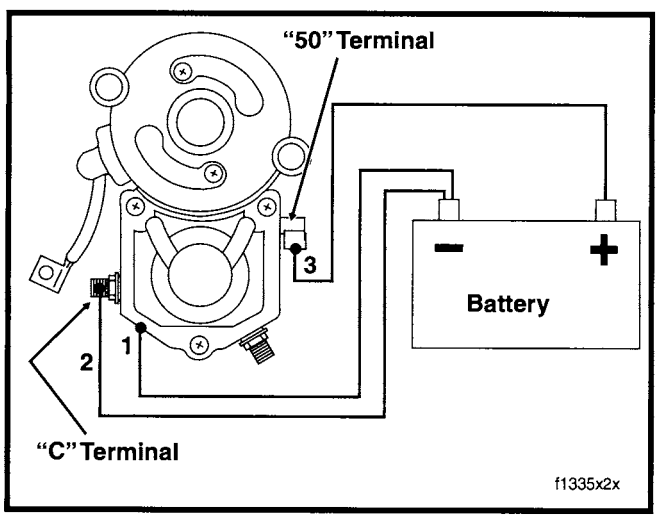


Figure 64. Pull-In Test

Solenoid Hold-In (Figure 65)

Keep test leads connected as in Pull-In Test. Begin with the starter shaft still extended. Disconnect "C" terminal test lead from the battery negative terminal and connect it to the battery positive terminal. If shaft does not remain in the extended position, replace solenoid.

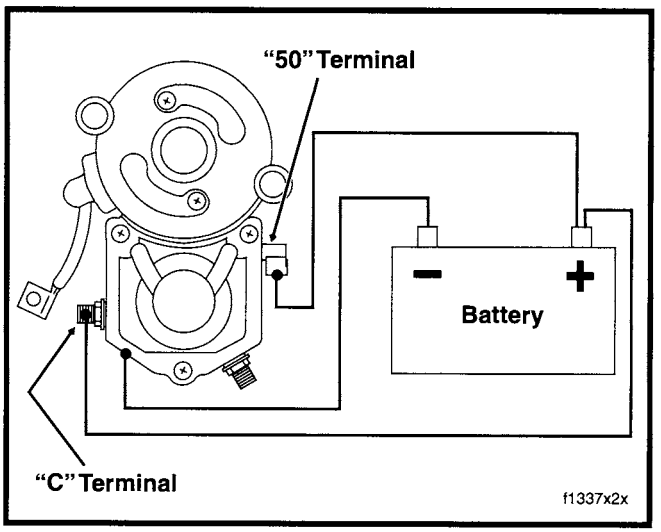


Figure 65. Hold-In Test

Solenoid Return (Figure 66)

Keep test leads connected as they were at the completion of the Hold-In Test. Disconnect the "50" terminal test lead. If shaft retracts, the solenoid is working properly. If the shaft does not retract, the solenoid should be replaced.

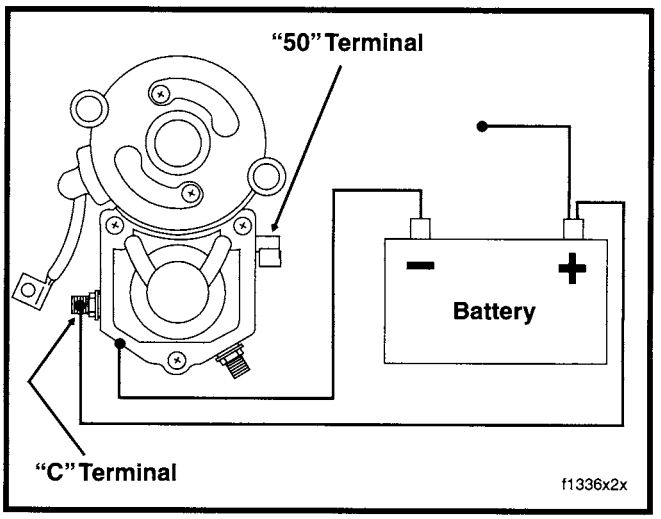


Figure 66. Return Test

Free Running Current Draw Test (Figure 66)

1. Place starter in vise, using a clean shop towel to prevent scratches or other damage.
2. Connect a heavy jumper cable (6 gauge minimum) to starter mounting flange.

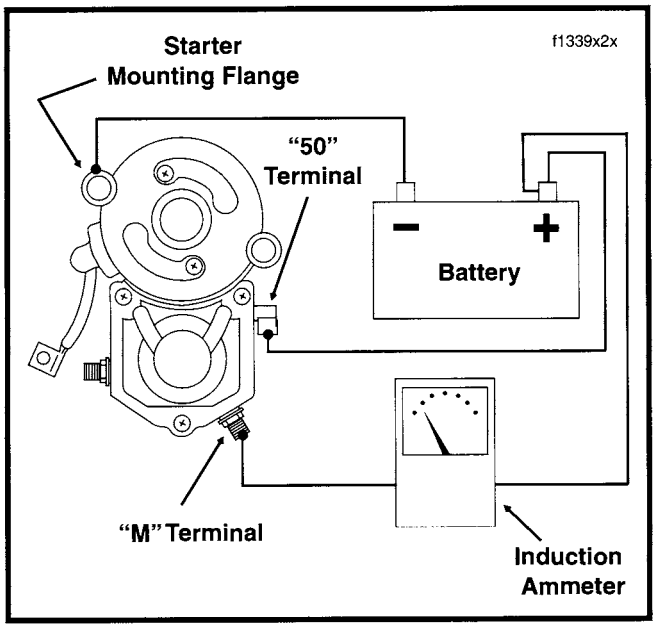


Figure 67. Free Running Current Draw Test

3. Connect other end to the negative (-) terminal of a fully charged battery.
4. Connect a heavy jumper cable (6 gauge minimum) to the positive (+) terminal of the battery.
5. Attach an inductive ammeter to positive cable and connect the other end of the positive cable to the "M" terminal of the starter solenoid. See Figure 67.
6. Use a smaller jumper cable (14 gauge) and connect to the positive (+) terminal of the battery.
7. Connect other end of small jumper cable to the solenoid "50" terminal.
8. Check ammeter reading. Ammeter should show 90 amps maximum. If reading is higher, disassemble starter for inspection.

NOTE

If starter current draw on vehicle was over 200 amps and the starter FREE RUNNING CURRENT DRAW TEST was within specification, there may be a problem with engine, primary drive or starter jackshaft.

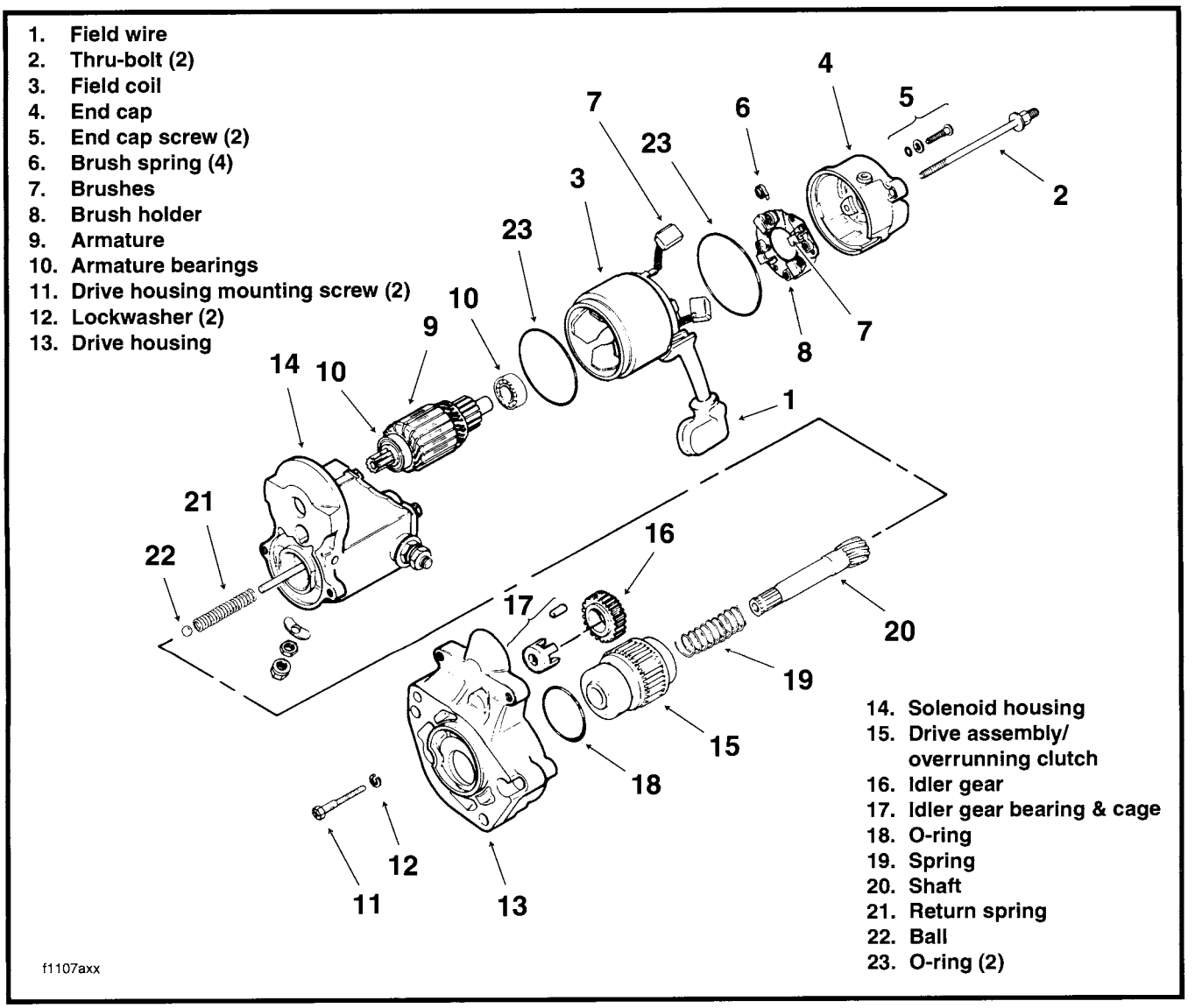


Figure 68. Starter

DISASSEMBLY, TESTING AND REPAIR

1. See Figures 68, 69. Disconnect field wire (1).

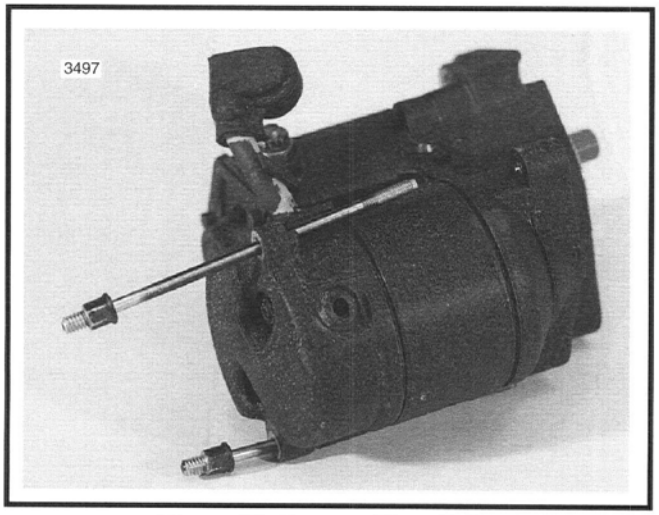


Figure 69. Remove Thru-Bolts

2. See Figures 68, 70. Remove thru-bolts (2). Remove field coil (3) and cap (4).

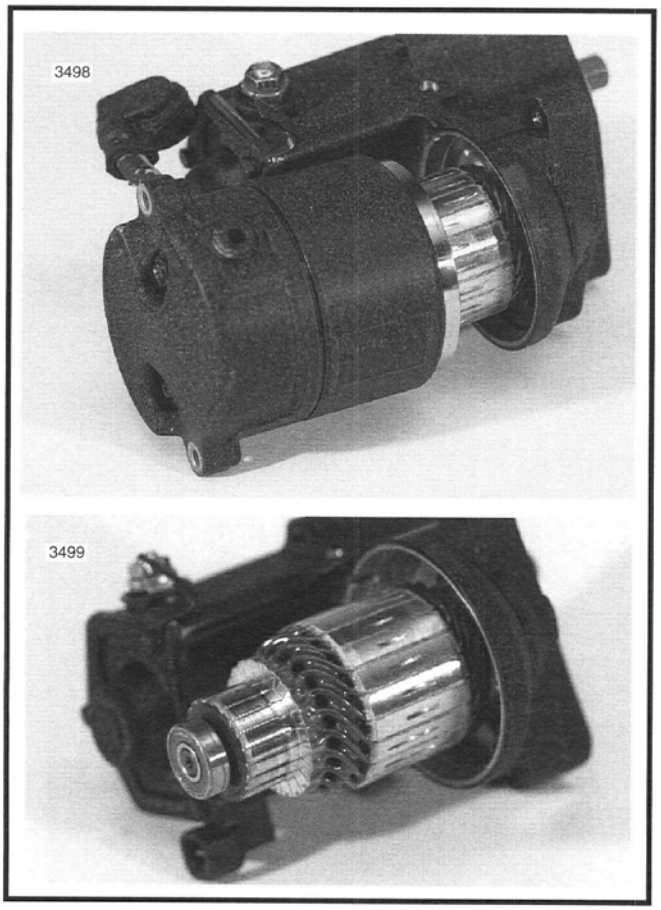


Figure 70. Remove Field Coil and Cap

3. See Figures 71 and 72. Remove the end cap screws (5) and cap (4).

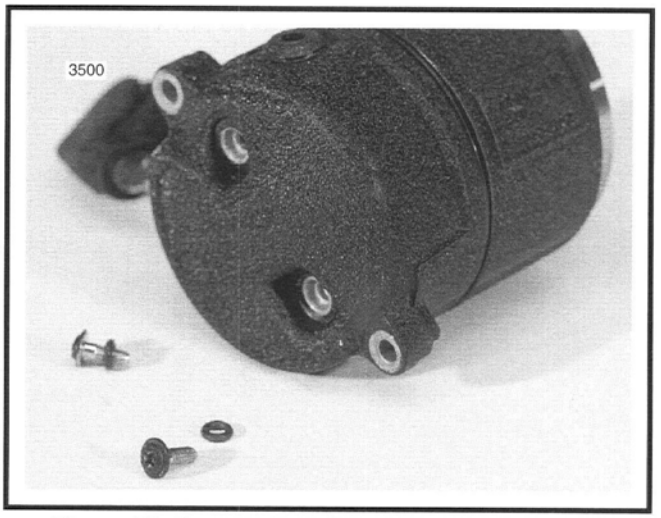


Figure 71. Remove End Capscrews and O-Rings

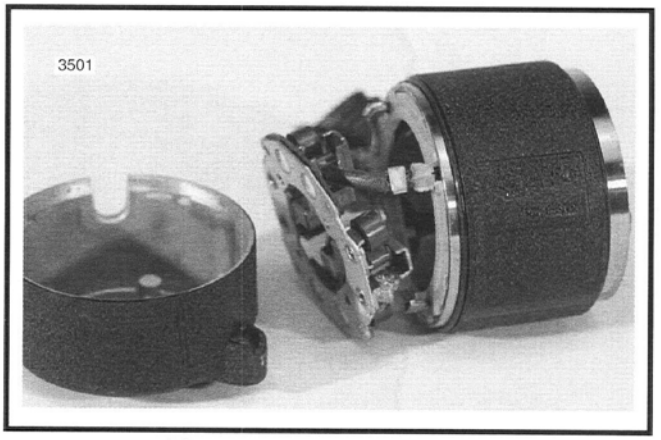


Figure 72. Remove End Cap

4. See Figures 68, 73. Disengage brush springs (6) and pull field coil brushes (7) out of brush holders (8).

Figure 73. Remove Brush Holder

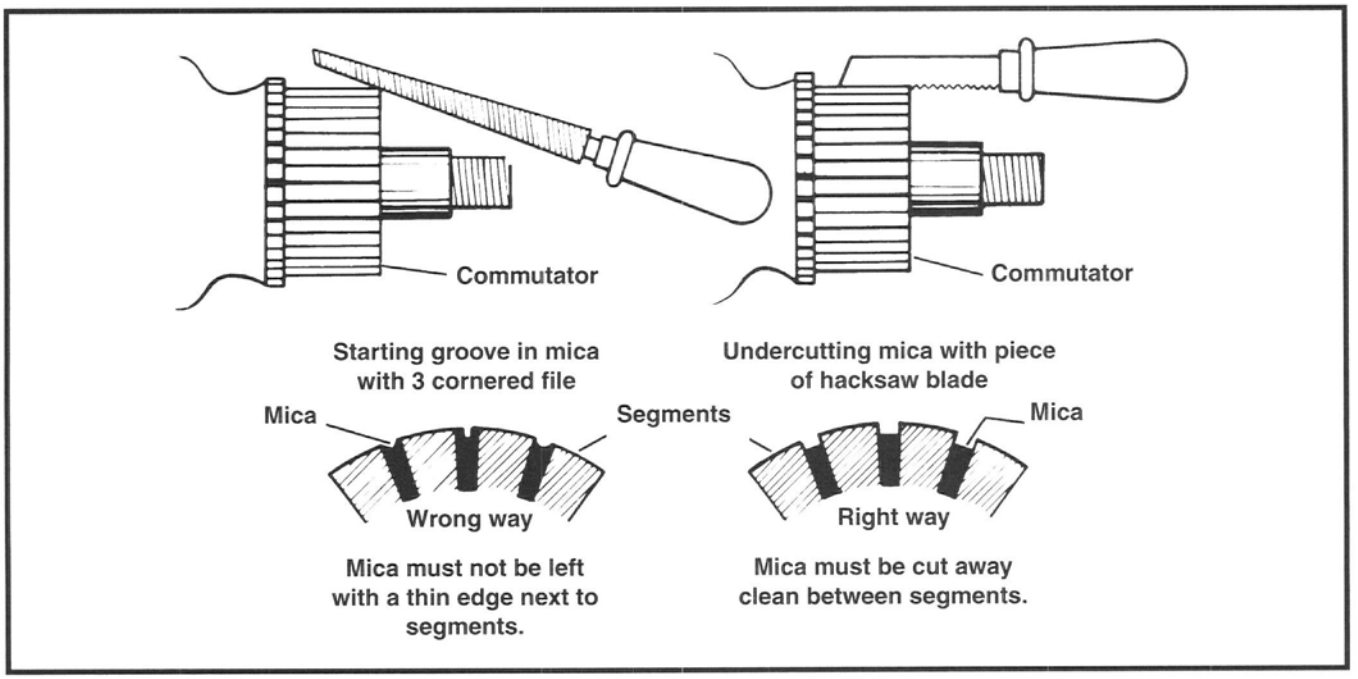


Figure 74. Undercutting the Mica Separators

5. Check the brush length. Brushes less than 0.433 inch (11 mm) long should be replaced.

NOTE

- *Replace brushes in sets of four only.*
- *Field coil and brush holder brushes are attached to field coil and brush holder. To replace brushes, replace field coil and brush holder.*

6. See Figure 68. Remove armature (9).

7. Place armature in lathe or truing stand and check runout of commutator. Commutators with more than 0.015 in. (0.38 mm) of runout should be replaced or machined on a lathe. Commutators should be replaced when diameter is less than 1.141 in. (29.98 mm).

8. Check depth of mica on commutator. If undercut is less than 0.008 in. (0.20 mm), use an undercutting machine to undercut the mica to 1/32 in. (0.79 mm) deep. The slots should then be cleaned to remove any dirt or copper dust.

9. See Figure 74. If an undercutting machine is not available, undercutting can be done satisfactorily using a thin hacksaw blade. After undercutting, lightly sand the armature with crocus cloth to remove any burrs.

⚠CAUTION

Do not use sandpaper or emery cloth on commutator. The abrasive grit may remain on commutator segments and could cause excessive brush wear.

10. See Figure 75. Check for SHORTED ARMATURE with a growler. Place armature on growler. Hold a thin steel strip (hacksaw blade) against armature core and slowly turn armature. A shorted armature will cause the steel strip to vibrate and be attracted to the core. Shorted armatures should be replaced.

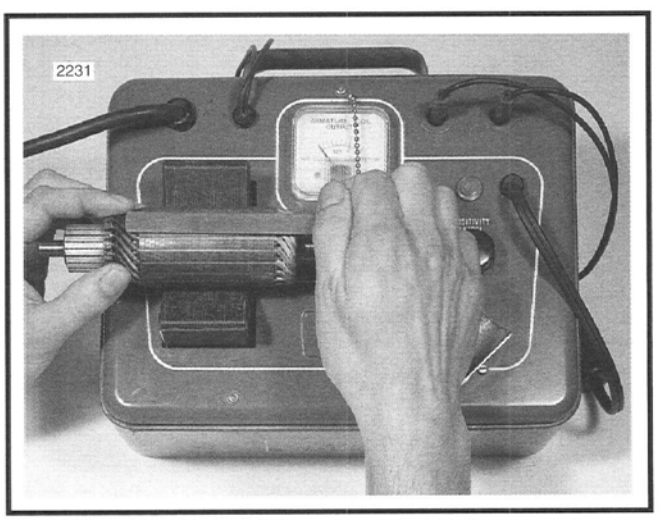


Figure 75. Shorted Armature Test Using Growler

11. See Figure 76. Check for a GROUNDED ARMATURE with an ohmmeter or continuity tester. Touch one probe to any commutator segment, and the other probe to the armature core. There should be no continuity (infinite ohms). If there is any continuity the armature is grounded and should be replaced.

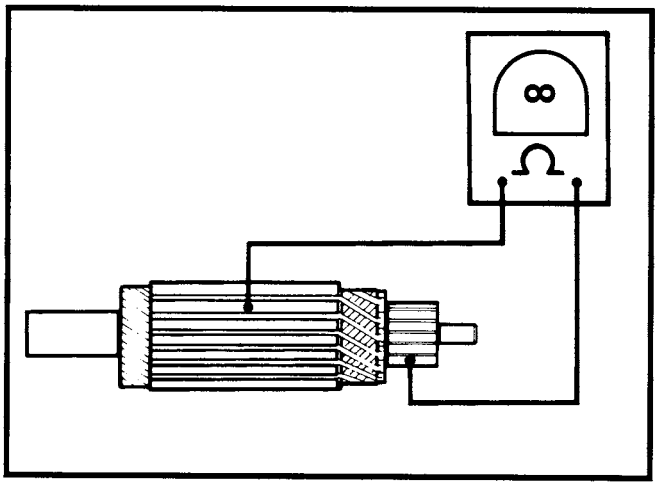


Figure 76. Grounded Armature Test

12. See Figure 77. Check for OPEN ARMATURE with an ohmmeter or continuity tester. Check for continuity between all commutator segments. There should be continuity (0 ohms) at all test points. No continuity at any test point indicates armature is open and should be replaced.

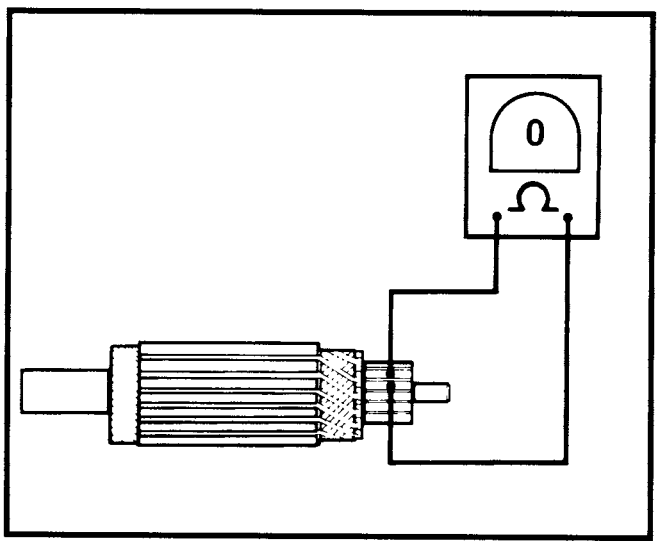


Figure 77. Armature Open Test

13. See Figure 78. Check for GROUNDED FIELD WINDING with an ohmmeter or continuity tester. Touch one probe to the frame, and the other probe to each of the brushes attached to the field winding. There should be no continuity (infinite ohms). If there is any continuity at either brush, the field winding(s) are grounded and the field frame should be replaced.

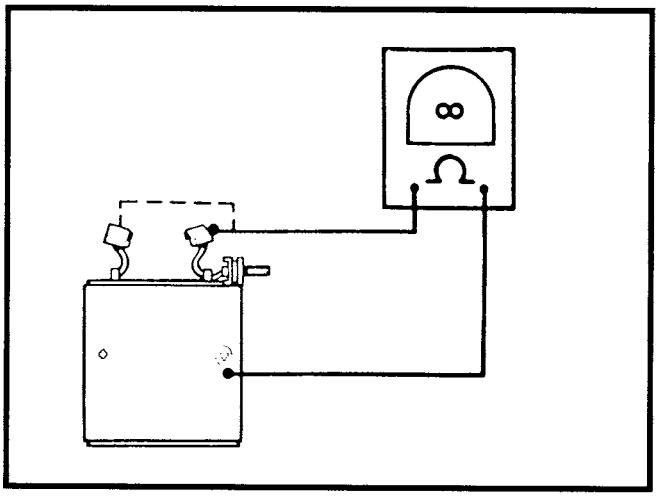


Figure 78. Grounded Field Test

14. See Figure 79. Check for OPEN FIELD WINDING with an ohmmeter or continuity tester. Touch one probe to the field wire, and the other probe to each of the brushes attached to the field coils. There should be continuity. If there is no continuity at either brush, the field winding(s) are open and the field frame should be replaced.

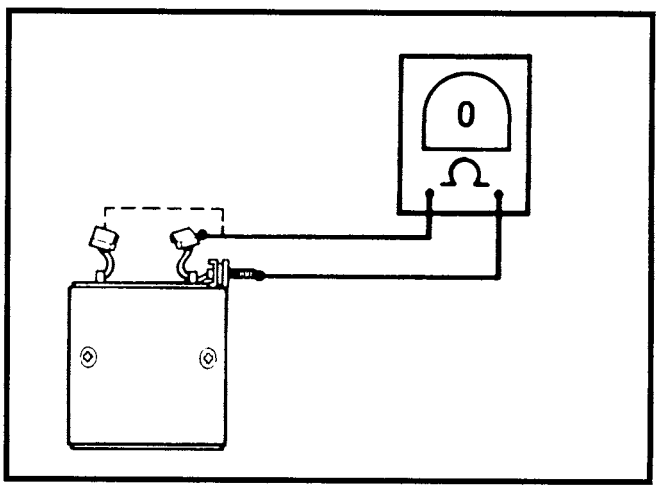


Figure 79. Open Field Test

15. See Figure 80. Test BRUSH HOLDER INSULATION with an ohmmeter or continuity tester. Touch one probe to holder plate and the other probe to each of the positive (insulated) brush holders. There should be no continuity (infinite ohms). If there is continuity at either brush holder, the brush holder assembly should be replaced. Touch one probe to the non-insulated brush holders and the other probe to the holder plate. If you measure any resistance, the brush holder must be replaced.

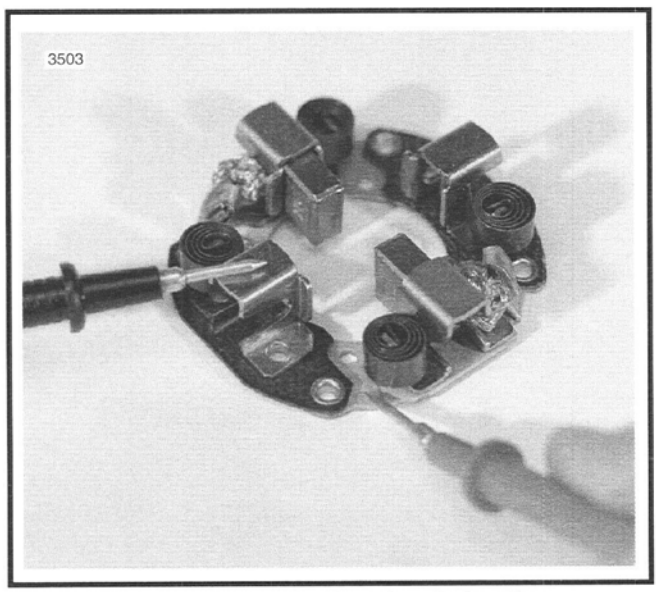


Figure 80. Brush Holder Insulation Test

16. See Figure 68. Check armature bearings (10) and replace if necessary.

NOTE

See Figure 68. Spring (21) and ball (22) are loose in shaft gear end.

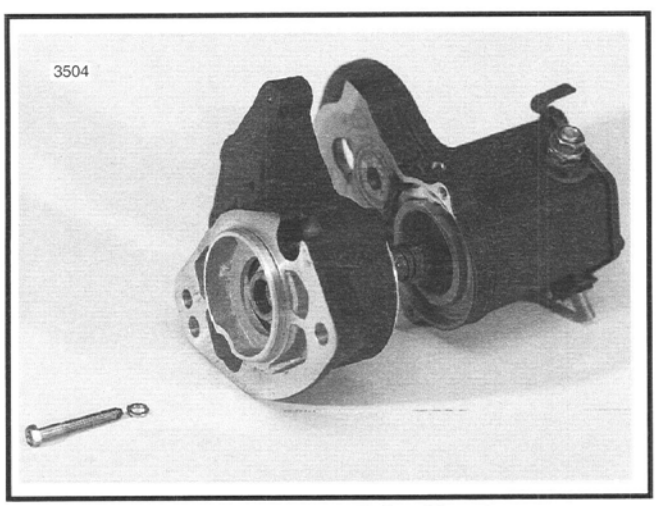


Figure 81. Remove Drive Housing

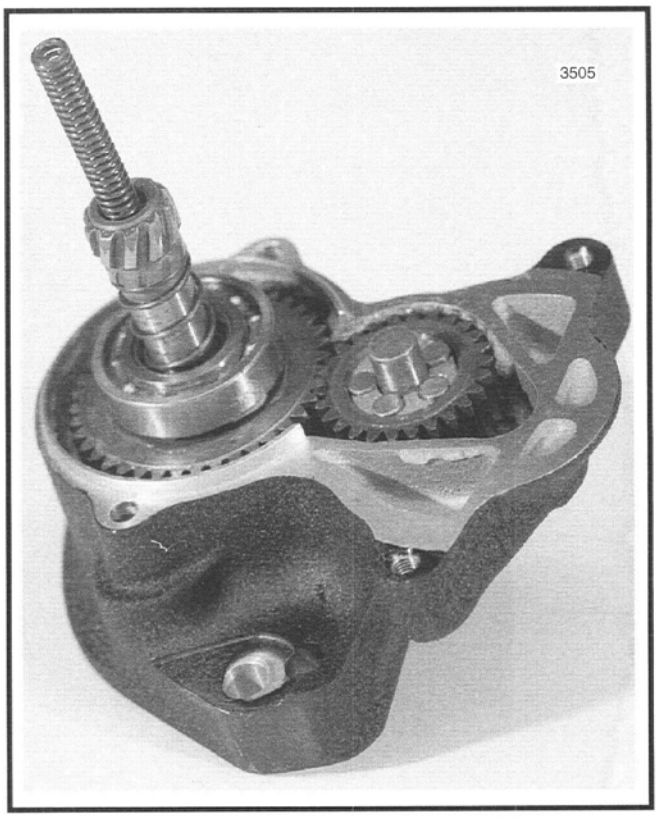


Figure 82. Drive Housing Assembly

17. See Figures 68, 81and 82. Remove the two drive housing mounting screws (11) and washers (12). Remove drive housing (13) from solenoid housing (14).

18. See Figures 68 and 83. Remove drive (15), idler gear (16) and idler gear bearing (17) from drive housing (13). O-ring (18) is in groove in drive housing.

19. Remove spring (19) and shaft (20).

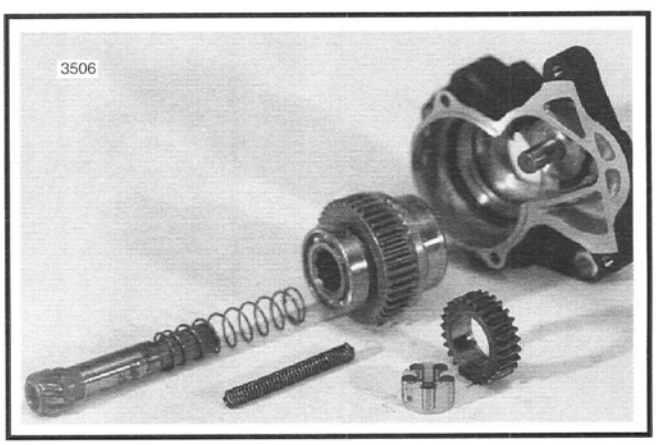


Figure 83. Clutch Assembly

ASSEMBLY (Figure 68)

1. See Figure 68. Replace O-rings (18, 23).

⚠CAUTION

Do not use solvents to clean drive assembly/overrunning clutch (15). It is lubricated and sealed. If you use a solvent to clean it, the lubricant will be washed out and the clutch will fail.

2. Clean, inspect and lubricate drive assembly components. Lubricate parts with high temperature grease such as LUBRIPLATE 110.

3. When installing drive assembly components, open end of idler bearing cage (17) faces toward solenoid.

4. When installing drive housing (13) to solenoid housing (14) use new O-ring (18). Be sure to install return spring (21) and ball (22).

5. Lubricate armature bearings (10) with high temperature grease such as LUBRIPLATE 110. Install armature (9) and field coil (3) to solenoid housing (14).

6. Replace brush springs (6), if necessary. Install brushes (7) and brush holder (8).

7. Install end cover (4) with screw (5).

8. Install thru-bolts (2).

9. Connect solenoid wire (1) to terminal.

NOTES

TURN SIGNAL MODULE - XLH AND FL MODELS

OPERATION

General

Both the turn signals and 4-way flashers are controlled by an electronic self-cancelling turn signal module. The turn signal module locations are as follows:

MODEL	LOCATION
XLH	Beneath seat on inner side of ignition module bracket.
FL	Upper right fork tube (1995) or below radio (1996).
FLHR	Under headlamp nacelle.

Steps 1 and 2 below explain the cancelling operation when a rider signals for a left turn; step 3 explains cancelling operation when a right turn is signalled.

1. Pressing and releasing the left turn signal switch causes a momentary 12 vdc to be applied to Pin 7. The module sends a series of 12 vdc pulses (Pin 5) to flash the left turn signal lamps (front and rear).
2. The module monitors the number of speedometer reed switch closures at Pin 3. The switch closures indicate vehicle distance traveled. When the number of switch closures equals a quantity preset in the self-cancelling module, the left turn signal is automatically canceled.
3. Pressing and releasing the right turn signal switch causes a momentary 12 vdc to be applied to Pin 6 and an output at Pin 4 identical to that just described for a left turn signal.

NOTE

If the handlebar switch is pressed and held, the turn signal will flash indefinately. Counting of reed switch closures begins only after the turn signal switch is released.

Manual or Rider Control

Turn signal may be cancelled by pressing the turn signal switch a second time. Pressing the left turn signal switch while the right turn signal lamps are flashing will cancel the right turn lamps and activate the left turn lamps (and vice versa).

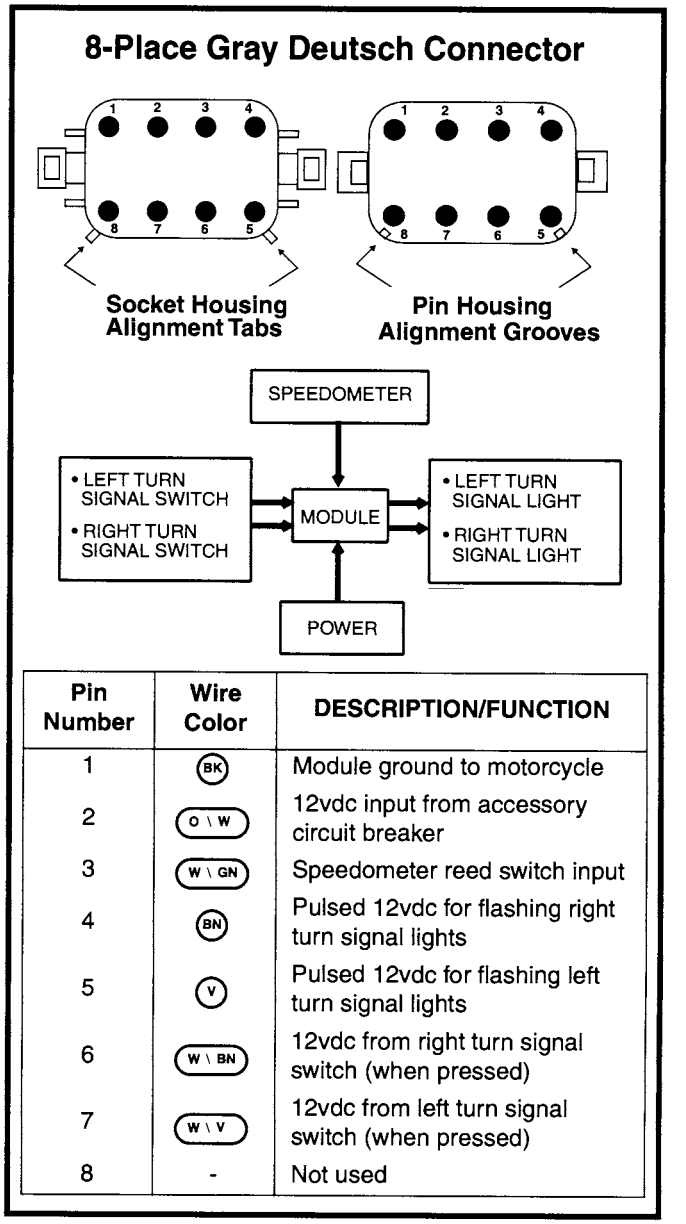
Hazard Flasher (4-Way)

To activate the hazard flashers, simultaneously press and hold both right and left turn signal switches for 1-1/2 seconds. To cancel hazard flashers, momentarily press and release right and left turn signal switches simultaneously.

PERFORMANCE CHECK

Remove the self-cancelling turn signal module if turn signals are not functioning. See REMOVAL in this section. Proceed with the following tests:

TEST #1 Check for 12 vdc at pin 2.



Pin Number	Wire Color	DESCRIPTION/FUNCTION
1	BK	Module ground to motorcycle
2	O \ W	12vdc input from accessory circuit breaker
3	W \ GN	Speedometer reed switch input
4	BN	Pulsed 12vdc for flashing right turn signal lights
5	V	Pulsed 12vdc for flashing left turn signal lights
6	W \ BN	12vdc from right turn signal switch (when pressed)
7	W \ V	12vdc from left turn signal switch (when pressed)
8	-	Not used

Figure 84. Turn Signal Module Pinout (1995-1996 XLH and 1995 FL Models)

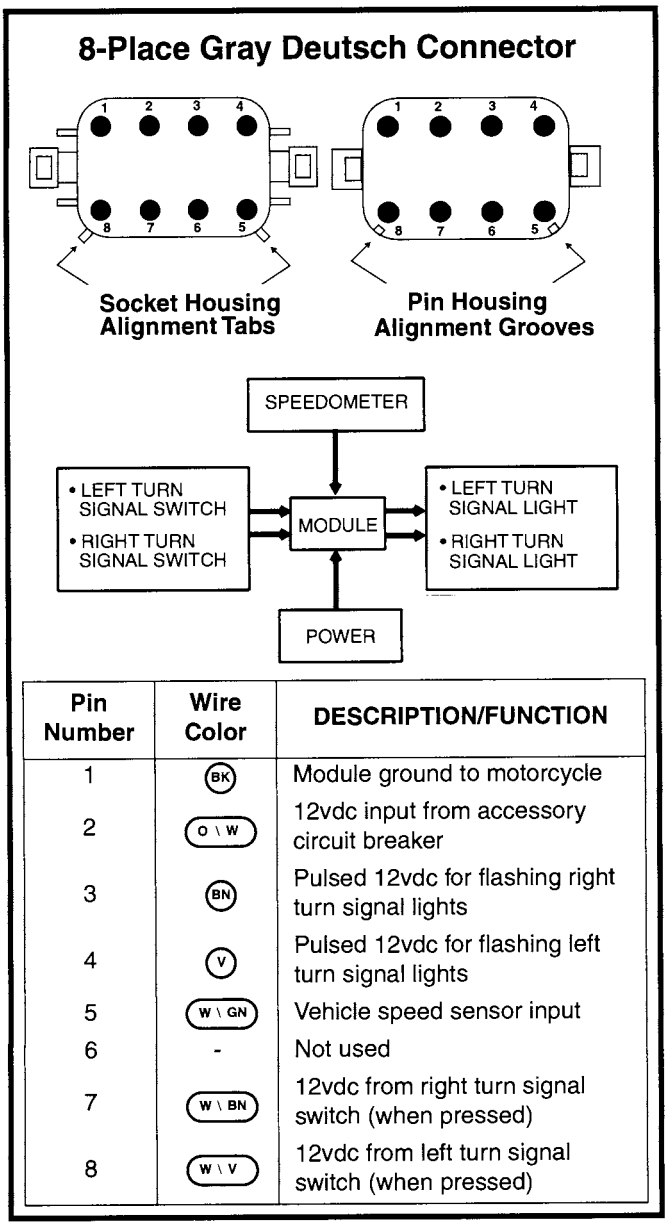
TEST #2 Check for ground at pin 1.

TEST #3 Place jumper wire between pins 2 and 4 (1995-1996 XLH, 1995 FL, 1996 FLT and 1996 FLHR models) or between pins 2 and 3 (1996 FLHT models). The right turn signal lamps (front and rear) should illuminate.

TEST #4 Place jumper wire between pins 2 and 5 on (1995-1996 XLH, 1995 FL, 1996 FLT and 1996 FLHR models) or between pins 2 and 4 (1996 FLHT models). The left turn signal lamps (front and rear) should illuminate.

⚠CAUTION

In the tests which follow, inadvertent use of a jumper wire on 1996 models will result in turn signal switch damage.



Pin Number	Wire Color	DESCRIPTION/FUNCTION
1	BK	Module ground to motorcycle
2	O \ W	12vdc input from accessory circuit breaker
3	BN	Pulsed 12vdc for flashing right turn signal lights
4	V	Pulsed 12vdc for flashing left turn signal lights
5	W \ GN	Vehicle speed sensor input
6	-	Not used
7	W \ BN	12vdc from right turn signal switch (when pressed)
8	W \ V	12vdc from left turn signal switch (when pressed)

Figure 85. Turn Signal Module Pinout (1996 FL Models)

TEST #5 On 1995-1996 XLH and 1995 FL models, place jumper wire between pins 4 and 6. With the right turn switch button depressed, both right lamps should illuminate. On 1996 FLHT models, check for 12 VDC at pin 7 with the right turn switch button depressed. On 1996 FLT and 1996 FLHR models, check for 12 VDC at pin 6 with the right turn switch button depressed.

TEST #6 On 1995-1996 XLH and 1995 FL models, place jumper wire between pins 5 and 7. With the left turn switch button depressed, both left lamps should illuminate. On 1996 FLHT models, check for 12 VDC at pin 8 with the left turn switch button depressed. On 1996 FLT and 1996 FLHR models, check for 12 VDC at pin 7 with the left turn switch button depressed.

If the system passes all six tests, then wiring and switches are OK - replace the turn signal module. If turn signals still do not work, see TROUBLESHOOTING.

NOTE

Distance test and time test described below can also be performed using the Speedometer Tester (HD-41354) as an input device.

DISTANCE TEST

Turn signals automatically cancel after the front wheel travels a certain distance at a specific speed. The turn signal module begins measuring the distance traveled upon release of the handlebar mounted turn signal switch button.

Turn signals will remain flashing for the following distances within the speed ranges specified:

Speed range #1	0-34 mph 0-56 km/h	221 ft. (0.04 mi.) 67 m
Speed range #2	35-44 mph 56-71 km/h	339 ft. (0.06 mi.) 103 m
Speed range #3	45-60 mph 72-97 km/h	680 ft. (0.14 mi.) 207 m
Speed range #4	61+ mph 98+ km/h	1051 ft. (0.20 mi.) 323 m

To check module operation, proceed as follows:

1. Operate the motorcycle at 15 mph (24 km/h), which is the midpoint of speed range #1.
2. Press and release right turn signal switch button. Closely monitor vehicle speed and odometer reading. Measure the distance traveled from the time the button is released to the time the turn signal cancels.
3. Repeat steps 1 and 2 for left turn.

NOTE

Since the odometer's smallest unit-of-measure for distance (0.1 mile) is larger than the distance you will be measuring for speed range #1 (0.04 mile), release the turn signal switch button when a number is completely centered on the odometer's tenths wheel and watch for the point where the tenths wheel has rotated 4/10 of the way toward the next number.

4. Repeat steps 2 and 3 for right and left turns at midpoint of speed ranges 2 through 4.
5. If the distances observed in Steps 1 through 4 are not correct, check the following:
   a. Turn signal module ground and module pin connections.
   b. Lamp grounds and lamp connections.
   c. Reed switch operation (vehicle speed sensor on FLHR), connections and grounds. See Troubleshooting.
   d. Replace module with one known to be good and repeat DISTANCE TEST.

NOTE

Turn signal module and turn signal lamps must have the same ground potential; grounds for both module and lamps must have good continuity to one another.

ALTERNATE TIME TEST

Another way of checking the turn signal module is to measure the length of time the directional operates at a constant vehicle speed. From the instant the turn signal switch button is released, measure the number of seconds that elapse before the turn signal cancels.

The approximate elapsed times at four constant speeds should be as follows:

CONSTANT SPEED	TURN SIGNAL ELAPSED TIME (in seconds)
25 mph (40 km/h)	5-7
38 mph (61 km/h)	5-7
52 mph (84 km/h)	8-10
65 mph (105 km/h)	10-12

RIDER PREFERENCE AND CONTROL

To extend the distance/time that turn signals flash, simply press and hold the turn signal switch button. Since the module does not begin to measure distance traveled and time elapsed until the switch button is released, the flashing sequence is prolonged.

To shorten the distance/time that turn signals flash, press the turn signal switch button a second time while the turn signals are still flashing. This procedure immediately cancels the turn signal.

TROUBLESHOOTING

See the following chart for troubleshooting procedures.

⚠CAUTION

Do not apply 12 vdc to self-cancelling module without pin 1 connected to ground or module will be damaged.

TROUBLESHOOTING

Problem	Cause	Solution
1. Right or left turn signals do not flash – front or rear lamp on inoperative side is lit, but does not flash. (signals on opposite side operate normally.)	1.1 Burned out bulb.	1.1.1 Replace bulb that does not light and check for normal operation.
	1.2 Broken lamp wire.	1.2.1 Repair broken wire.
	1.3 Loose lamp socket (where staked at housing).	1.3.1 Replace lamp.
	1.4 Poor ground.	1.4.1 Scrape paint or replace ground wires.
	1.5 Corroded contacts.	1.5.1 Clean bulb/socket. Apply grease to bulb contacts.
2. Turn signals on one side operate – other side inoperative.	2.1 Handlebar directional switch on inoperative side not functioning.	2.1.1 On 1995-1996 XLH and 1995 FL models, press directional switch with ignition switch ON and measure voltage at Pin 6 or 7 (See Figure 84 for applicable pin). On 1996 FL models, press directional switch with ignition switch ON and measure voltage at Pin 7 or 8 (See Figure 85 for applicable pin). With switch pressed and held, 12 vdc must be present at pin. Measure with positive probe at pin and negative probe connected to ground. If voltage is present go to 2.4.1.
	2.2 Broken or disconnected wire in directional switch circuit.	2.2.1 If no voltage is present, refer to Wiring Diagram and determine (using voltage or continuity checks) whether switch or wiring is faulty. Replace switch (See HANDLEBAR SWITCHES in Section 2) or repair wiring as needed.
	2.3 A possible combination of causes found in Problem 1.	2.3.1 See Problem 1. Solutions.
	2.4 Module malfunctioning.	2.4.1 If voltage was present in 2.1.1 and lamps and wires are good, but module does not generate pulses, module is bad and must be replaced.

Problem	Cause	Solution
3. Turn signals and hazard flashers are inoperative.	3.1 No power (12 vdc) at pin 2 of module due to "bad" accessory circuit breaker, starter relay (vehicles with radio only), ignition switch, main circuit breaker or the connecting wiring.	3.1.1 Refer to Wiring Diagram and check for 12 vdc on load side of accessory circuit breaker. Use voltage or continuity checks. Isolate the "bad" component or broken wire. Replace bad component or repair broken wire.
	3.2 Pin 1 of module not connected to ground.	3.2.1 Check for ground with ohmmeter. Clean and tighten ground connections or repair broken ground wires. **⚠CAUTION** **Operating module without pin 1 grounded will cause module to burn out.**
4. Turn signals do not cancel (all FL models except FLHR).	4.1 No reed switch signal at Pin 3 (1995 FLT and FLHT, and 1996 FLT models) or Pin 5 (1996 FLHT models) of module.	4.1.1 Check for speedometer reed switch input at Pin 3 (1995 FLT and FLHT, and 1996 FLT models) or Pin 5 (1996 FLHT models) of module. Connect ohmmeter to W/GN lead and ground. Spin front wheel or turn speedometer cable. Ohmmeter must alternate between '0' ohms and infinity. Check for broken wire or "bad" reed switch if above ohmmeter reading is not obtained. If reed switch signal is present, module is bad. *NOTE* *Reed switch signal is also used to control Sound System volume and cruise control speed on Ultra models.*
	4.2 Bad module.	4.2.1 Replace module.
5. Turn signals do not cancel on FLHR and XLH models.	5.1 Open in wiring to turn signal module	5.1.1 *Check for voltage on W/GN wire in connector [20B] while connected. Meter should alternate between 8-12VDC (from turn signal module) and 0-1 VDC when rear wheel is rotated. If no voltage is present, trace wiring to find open connection and correct it.
	5.2 No voltage from turn signal module	5.2.1 *Check for voltage on W/GN wire in connector [20B] while connected. Meter should alternate between 8-12VDC (from turn signal module) and 0-1 VDC when rear wheel is rotated. If no voltage is present, replace turn signal module.
	5.3 Speedometer is not creating signal to ground	5.3.1 Check for voltage on W/GN wire in connector [20B] while connected. Meter should alternate between 8-12VDC (from turn signal module) and 0-1 VDC when rear wheel is rotated. If vehicle speed signal is not present, see Troubleshooting Speedometer.

* These tests can be performed using the Speedometer Tester (HD-41354) to generate a speed signal without moving the rear wheel.

TURN SIGNAL MODULE - FX AND FXD MODELS

OPERATION

General

The turn signals and 4-way hazard flasher are controlled by an electronic module. The module contains computer chips and circuitry programmed to generate 12 VDC pulses for "flashing" the turn signal lamps.

The turn signal module locations are as follows:

MODEL	LOCATION
FX	Beneath fuel tank console on frame top tube.
FXD	Beneath seat on frame cross member.

Theory of Operation

The following example explains what happens when a rider signals for a left turn (1995 Model used for example).

1. Pressing the left turn signal switch causes a momentary 12 VDC pulse to be sent to pin 10 (in) on the module. The module responds to this signal by sending a series of 12 VDC pulses (pin 6, out) to flash left front and rear signal lamps.

2. The module monitors the number of vehicle speed sensor pulses ('96), or reed switch closures ('95) from the speedometer at pin 3. These pulses indicate distance traveled. When the number of pulses equals the quantity preset in the module program, the left signal is canceled.

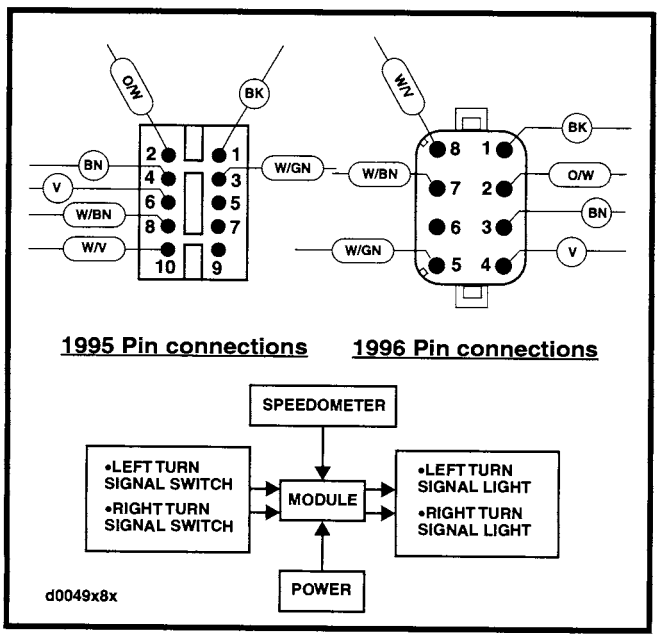


Figure 86. Turn Signal Module

3. Pressing the right turn signal switch causes a momentary 12 VDC pulse to be applied to pin 8 (in) and an output at pin 4 (out). The signal process is identical to that for a left turn.

⚠CAUTION

During troubleshooting, operating module without pin 1 grounded will cause module to burn out.

Turn Signal Canceller Pin Connections (1995 Models)

Pin No.	Description/Function
1	Module ground to motorcycle.
2	12 VDC input from accessory circuit breaker.
3	Vehicle speed sensor input ('96) or reed switch ('95) input (from speedometer)
4	Pulsed 12 VDC for flashing right signal lights.
5	Not used.
6	Pulsed 12 VDC for flashing left signal lights.
7	Not used.
8	12 VDC input from right switch.
9	Not used.
10	12 VDC input from left switch.

Turn Signal Canceller Pin Connections (1996 Models)

Pin No.	Description/Function
1	Module ground to motorcycle.
2	12 VDC input from accessory circuit breaker.
3	Pulsed 12 VDC for flashing right signal lights.
4	Pulsed 12 VDC for flashing left signal lights.
5	Vehicle speed sensor input (from speedometer)
6	Not used.
7	12 VDC input from right switch.
8	12 VDC input from left switch.

PERFORMANCE CHECK

If turn signals are not functioning, perform the following six tests.

1. Unplug module.
2. Check for 12 VDC at pin 2.
3. Check for ground at pin 1.

4. Place jumper wire between pins 2 and 4 (1995) or 3 (1996). The right turn lamps (front and rear) should illuminate.
5. Place jumper wire between pins 2 and 6 (1995) or 4 (1996). The left turn lamps (front and rear) should illuminate.

⚠CAUTION

In the following steps, do not use a jumper wire on 1996 models or turn signal switch will be damaged.

6. On 1995 models, place jumper wire between pins 4 and 8. With the right turn button depressed, both right lamps should illuminate. On 1996 models, check for 12 VDC at pin 7 with right turn button depressed.
7. On 1995 models, place jumper wire between pins 6 and 10 (1995). With the left turn button depressed, both left lamps should illuminate. On 1996 models, check for 12 VDC at pin 8 with left turn button depressed.
8. If module passed all six tests, it must be replaced. If turn signals still do not function, see TROUBLESHOOTING.
9. Check socket-to-pin fit at module (1995 models).

NOTE

Distance test and time test described below can also be performed using the speedometer tester (HD-41354) as an input device.

DISTANCE TEST

The turn signals cancel after the front wheel (1995) or rear wheel (1996), travels a certain distance. When the turn signal button is released, the turn signal module begins counting the distance, based on the information received from the speedometer.

The module recognizes 4 speed ranges and bases the distance it is activated on the speed ranges. The distances traveled, with turn signals flashing, are as follows:

Speed range 1	0-34 mph 0-56 km/h	221 ft. (0.04 mi) 67 m
Speed range 2	35-44 mph 56-71 km/h	339 ft. (0.06 mi) 103 m
Speed range 3	45-60 mph 72-97 km/h	680 ft. (0.13 mi) 207 m
Speed range 4	61+ mph 98+ km/h	1051 ft. (0.20 mi) 320 m

To check module operation, do the following:

1. Operate the motorcycle at the midpoint of speed range 1 (15 mph) (24 km/h).
2. Press and release the right turn button and closely monitor the vehicle speed and odometer reading at the time the button is released and at the time the turn signal cancels.

NOTE

Because the odometer's lowest indication is 1/10 of a mile, 0.04 mi. is 4/10 the distance between numbers on the tenth of a mile odometer wheel.

3. Repeat steps 1 and 2 for left turn and for right and left turns at midpoint of speed ranges 2 through 4.
4. If the distances observed in steps 1 through 3 are not correct, check the following:
   a. Turn signal module ground and module pin connections.
   b. Lamp grounds and lamp connections.
   c. Reed switch operation ('95) or vehicle speed sensor ('96), connections and grounds.
      - Use a voltmeter. Place red probe on the speedometer white/green wire and the other probe on a suitable ground.
      - Spin rear wheel. Voltmeter reading should vary from 8-12 VDC to less than 1 volt and back again.
   d. Replace module with known good module and repeat DISTANCE TEST.

NOTE

It is very important that the turn signal module and the turn signal lamps are at the same ground potential; that is, the grounds for both the module and the lamps must have good continuity to each other.

TIME TEST (ALTERNATE)

An alternate method of checking the module for correct operation is to measure the turn signal "ON" time at a constant speed. The approximate "ON" times at four constant speeds are as follows:

CONSTANT SPEED	TURN SIGNAL "ON" TIME (SECONDS)
25 mph (40 km/h)	5-7
38 mph (61 km/h)	5-7
52 mph (84 km/h)	8-10
65 mph (105 km/h)	10-12

Rider Preference

The module begins counting the instant the rider pushes the switch. If the rider prefers a longer distance with turn signals "ON", the button can be held in longer and released closer to the turning point. For a shorter distance (with turn signals "ON"), the button can be pressed a second time to cancel the turn signal.

TROUBLESHOOTING

⚠CAUTION

Do not apply 12 VDC to module with pin 1 not connected to ground. Module will be burned out.

See the chart on the following page for troubleshooting procedures.

TROUBLESHOOTING

Problem	Cause	Solution
1. Right or left turn signals do not flash. Front or rear lamp on inoperative side is lit, but does not flash. (Signals on other side operate normally.)	1.1 Burned out bulb.	1.1.1 Replace bulb that does not light and check for normal operation.
	1.2 Broken lamp wire.	1.2.1 Repair broken wire.
	1.3 Loose lamp socket (Where staked at housing).	1.3.1 Replace lamp.
	1.4 Poor ground.	1.4.1 Scrape paint or replace ground wires.
	1.5 Corroded contacts.	1.5.1 Clean bulb/socket. Apply grease to bulb contacts.
2. Turn signals on one side operate. Other side inoperative.	2.1 Handlebar directional switch on inoperative side not functioning.	2.1.1 . With ignition switch ON, press directional switch and measure voltage at pin 8 or 10 (1995) **or** pin 7 or 8 (1996). With switch pressed and held, 12 VDC must be present at pin. Measure with positive probe at pin and negative probe connected to ground. If voltage is present go to 2.4.1.
	2.2 Broken or disconnected wire in directional switch circuit.	2.2.1 If no voltage is present, refer to Wiring Diagram and determine (using voltage or continuity checks) whether switch or wiring is at fault. Replace switch (See HANDLEBAR SWITCHES in Section 2) or repair wiring as needed.
	2.3 A possible combination of causes found in Problem 1.	2.3.1 See Problem 1. Solutions.
	2.4 Module malfunctioning.	2.4.1 If voltage was present in 2.1.1 and lamps and wires are good, but module does not send pulses, module is damaged and must be replaced.
3. Turn signals and hazard flashers are inoperative.	3.1 No power (12 VDC) at pin 2 of module because of damaged accessory circuit breaker, starter relay, ignition switch, main circuit breaker or the connecting wiring.	3.1.1 Refer to Wiring Diagram and check for 12 VDC on load side of accessory circuit breaker. Use voltage or continuity checks. Isolate the damaged component or broken wire. Replace damaged component or repair broken wire.
	3.2 Pin 1 of module not connected to ground.	3.2.1 Check for ground with ohmmeter. Clean and tighten ground connections or repair broken ground wires.
4. Turn signals do not cancel.	4.1 No vehicle speed signal at pin 3 (1995) or pin 5 (1996) of module.	4.1.1 Check for vehicle speed switch input at pin 3 (1995) or pin 5 (1996) of module. Connect voltmeter to W/GN lead and ground. Turn ignition on. Spin front wheel or turn speedometer cable (1995 models) or spin rear wheel (1996 models). Voltmeter must alternate between 12 volts and 0-0.5 volts. Check for broken wire and proper speedometer function. If you get correct voltmeter reading and if vehicle speed signal is present, module is damaged and must be replaced.
	4.2 Damaged module.	4.2.1 Replace module.

VACUUM OPERATED ELECTRIC SWITCH (V.O.E.S.)

ADJUSTMENT/TESTING

Timing Mark Method

Verify engine ignition timing. See IGNITION SYSTEM, ADJUSTMENT/TESTING, IGNITION TIMING CHECK. Adjust ignition timing, if necessary, and then perform the following checks:

1. With the engine running at idle, disconnect V.O.E.S. vacuum hose from carburetor fitting.

2. Momentarily plug the open carburetor fitting. The ignition timing should retard (front cylinder advance timing mark disappears from view in timing inspection hole) and engine RPM should decrease.

3. Connect V.O.E.S. vacuum hose to carburetor fitting. Timing mark should reappear and engine speed should increase to previous RPM.

If speed does not first decrease and then increase as described, check V.O.E.S. ground wire and wire connection to ignition module. Replace V.O.E.S. if defective.

Ohmmeter and Vacuum Pump Method

The V.O.E.S. can also be checked using an ohmmeter and VACUUM PUMP (HD-23738).

1. Disconnect wire from V.O.E.S. to ignition module.
2. Disconnect V.O.E.S. ground wire from engine.
3. Remove V.O.E.S. from vehicle.
4. Insert probes of ohmmeter in socket terminals of 2-place Deutsch connector. Ohmmeter should indicate an open circuit (∞ ohms).
5. Connect hose of vacuum pump to V.O.E.S. vacuum fitting.
6. Slowly squeeze vacuum pump handle while observing vacuum gauge and ohmmeter readings.

   Ohmmeter should indicate switch closed (zero ohms) with an applied vacuum of 5.0-6.0 inches (127-152 mm) of mercury. If a vacuum reading of more than 6.0 inches (152 mm) mercury or less than 5.0 inches (127 mm) mercury is required to close the switch, then the unit must be replaced.
7. Refer to the latest Harley-Davidson Parts Catalog for the V.O.E.S. part number.

NOTE

*A **red** paint dab on the wire side of the hose nipple can be used to identify the correct V.O.E.S.*

B. ELECTRICAL TROUBLESHOOTING - FUEL INJECTED MODELS

INTRODUCTION

GENERAL

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., and assumes that all obvious checks are made- there is sufficient fuel in the tank, etc.

Poor Performance: The engine starts but there are performance problems, such as poor fuel economy, rough idle, engine misfire, engine hesitation, severe spark knock, etc.

Check Engine Lamp: The lamp indicates the existence of a fault condition. There may also be starting or performance problems.

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

- Checking for Trouble Codes (through observation of the Check Engine Lamp). See SECTION B-1.
- Retrieving Trouble Codes (with the Scanalyzer or Diagnostic Test Lamp). See SECTION B-2.
- Diagnosing System Problems (with the use of the Diagnostic Flow Charts, Scanalyzer and other special tools). See SECTIONS B-3 and B-4.
- Correcting Problems through replacement and/or repair (see SECTION 9C of the 1996 FLT Service Manual, REMOVAL/REPLACEMENT).
- Validating Repairs (clearing trouble codes and confirming proper vehicle operation without recurrence of the fault condition, as indicated by the behavior of the Check Engine Lamp).

B-1 CHECKING FOR TROUBLE CODES

CHECK ENGINE LAMP

To diagnose system problems, start by observing the behavior of the Check Engine Lamp. See Figure 87.

When the Ignition Switch is turned ON (Key ON) after being off for 10 seconds or more, the Check Engine Lamp will illuminate for approximately four seconds and then turn off.

NOTE

"Key ON" or Ignition Switch ON means that the Ignition/Light Key Switch is turned to IGNITION and the handlebar Engine Stop Switch is in the RUN position (although the engine is NOT running).

NOTE

If the Check Engine Lamp is not illuminated at Key ON or if it fails to go OFF after the initial four second ON period, then a problem exists in the lamp circuit. See CHARTS A-1 or A-2 in Section B-4, DIAGNOSING SYSTEM PROBLEMS.

When the lamp turns off after being illuminated for the first four second period, it will remain off if there are no fault conditions or trouble codes currently detected by the ECM. See A in Figure 88.

If the Check Engine Lamp stays off for only 4 seconds and then comes back on for an 8 second period, then a functional error is stored (although no current trouble code exists). See B in Figure 88. A functional error indicates an internal problem with the ECM (trouble codes 52 through 55) or with the crankshaft or camshaft sensors/timing (trouble code 56).

If the Check Engine Lamp remains on beyond the 8 second period, then a current trouble code exists. See C in Figure 88.

NOTE

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

If a particular problem happens to resolve itself, the active status is dropped and it becomes a "historic," rather than a "current" fault. Historic trouble codes are stored for a length of time to assist in the diagnosis of intermittent faults. The Check Engine Lamp will not indicate the existence of only historic trouble codes.

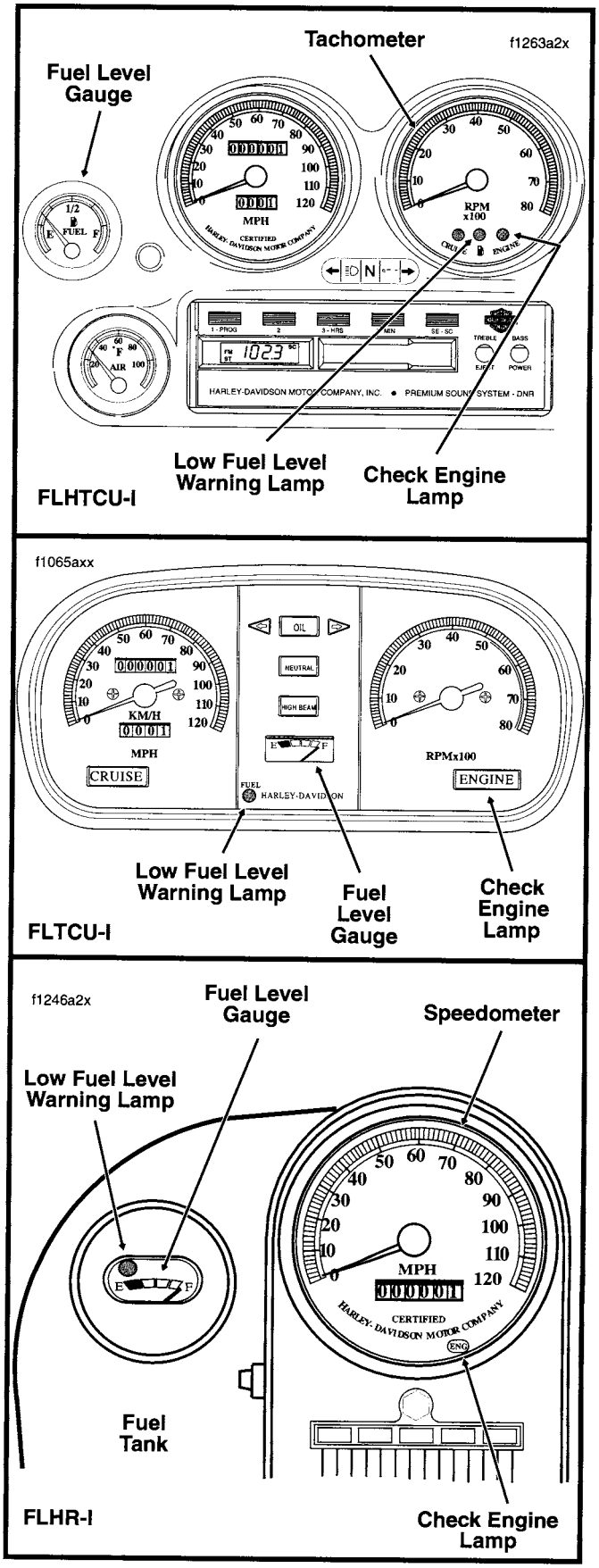


Figure 87. Instruments/Indicator Lamps

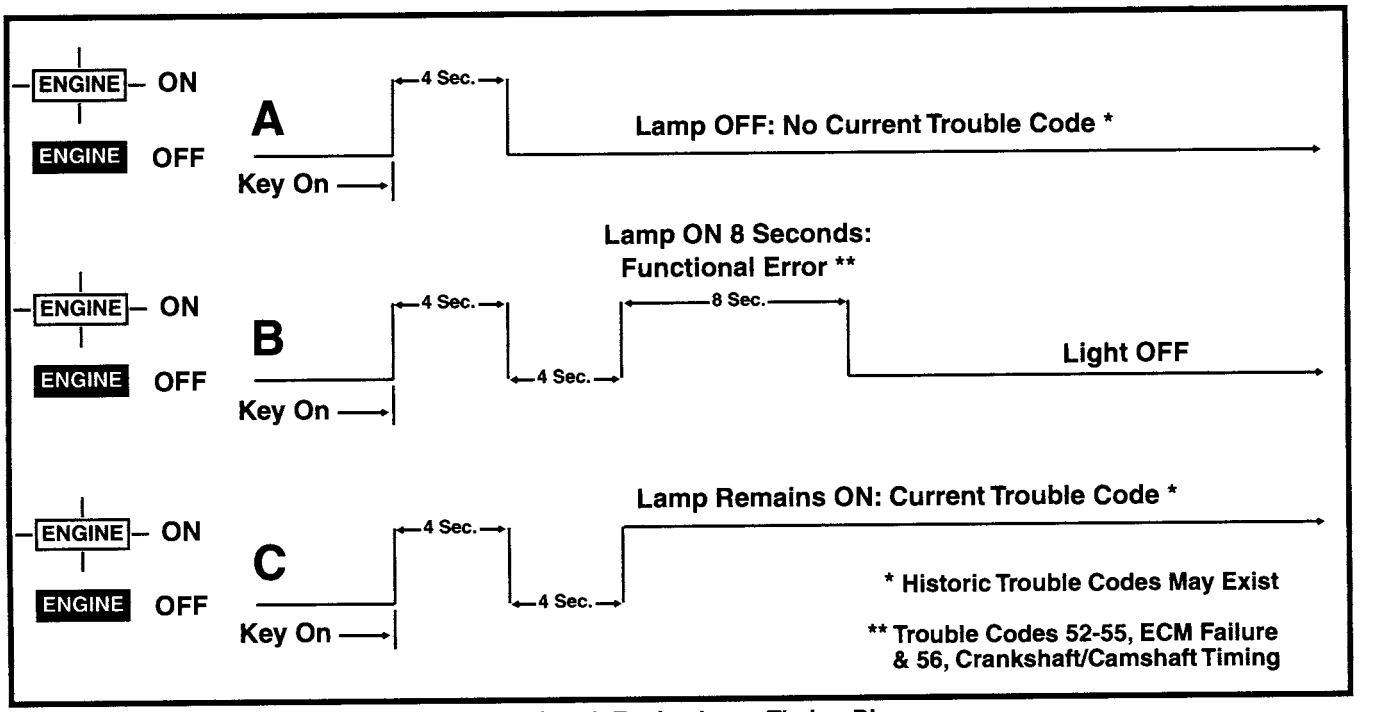


Figure 88. Check Engine Lamp Timing Diagram

While the trouble codes are stored (whether current, historic or functional), they can be read by either the Scanalyzer or the Diagnostic Test Lamp. All trouble codes reside in the memory of the ECM until the code is cleared by use of the Scanalyzer or a total of 20 trips has elapsed. A "trip" consists of a start and run cycle, the run cycle lasting at least 30 seconds. After the 20 trip retention period, the trouble code is automatically erased from memory (that is, assuming no subsequent faults of the same type are detected in that period).

IMPORTANT NOTE

It is important to note that historic trouble codes may also be present whenever the system indicates the existence of a CURRENT fault. Always refer to your authorized Harley-Davidson dealer if multiple trouble codes are found.

DATA LINK CONNECTOR

The behavior of the Check Engine Lamp as described under CHECKING FOR TROUBLE CODES indicates the existence of a fault condition. Turn the Ignition Switch to OFF and access the Data Link Connector as follows:

Side Cover Removal

NOTE

All vehicles feature quick-release fasteners to facilitate saddlebag removal and installation.

1. Raise lid of right side saddle bag. To free saddlebag from mounting brackets on saddlebag support and frame, grasp bail wire inside saddlebag and rotate each stud a full 1/4 turn in a counter-clockwise direction. Remove bail head studs with flat washers. Remove saddlebag.
2. Remove bolt to detach side cover from clip nut on flange of frame downtube.
3. Note the Data Link connector (pin side of 4-place Deutsch) on the front panel of the electrical bracket (see Figure 89). Push connector up to disengage small end of slot on attachment clip from T-stud on bracket. Lift connector off T-stud.
4. Remove rubber protective plug from open end of Data Link connector.

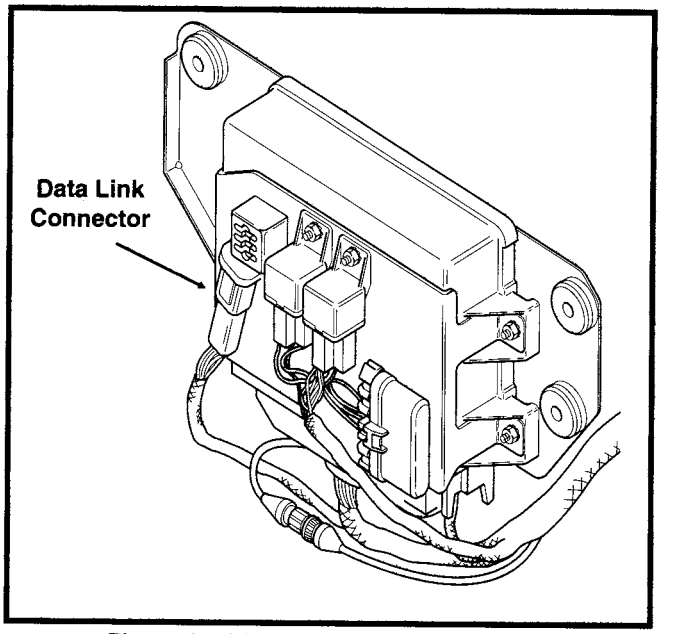


Figure 89. Electrical Bracket Assembly

DIAGNOSTIC TOOLS

The Electronic Fuel Injection (EFI) System provides two levels of system diagnostics. In the more sophisticated mode, a portable Scan Tool called a "Scanalyzer" (HD-41325) plugs into the Data Link Connector and facilitates the diagnosis of system problems through a direct interface with the ECM (see Figure 90). Through the use of a special programmable application cartridge, the Scanalyzer offers data displays and menu selections that allow for quick and easy retrieval of the data resident in memory.

The other diagnostic mode provides a Diagnostic Test Lamp (HD-41197) that is observed by the user (see Figure 91). The lamp blinks a code which correlates to a particular problem area. The same wiring harness provides for connection of either the Scanalyzer or the Diagnostic Test Lamp.

DIAGNOSTIC TEST LAMP

NOTE

Use of the Diagnostic Test Lamp assumes that the Scanalyzer (HD-41325) is not available.

1. Plug the Diagnostic Test Lamp (HD-41197) into the Data Link Connector.
2. Turn the Ignition Switch to ON (engine not running). The ECM enters the test lamp diagnostics mode.

NOTE

It may be necessary to remove and install the Diagnostic Test Lamp a couple of times in order to activate the test lamp diagnostics mode.

All trouble codes are sent out as a series of flashes. If the lamp is not activated, then no trouble codes exist.

See Figure 92. If the test lamp is activated, the transmission of a trouble code is always preceded by a series of rapid flashes (about 3 per second). This "intermission" is followed by a 2 second pause in which the lamp is off.

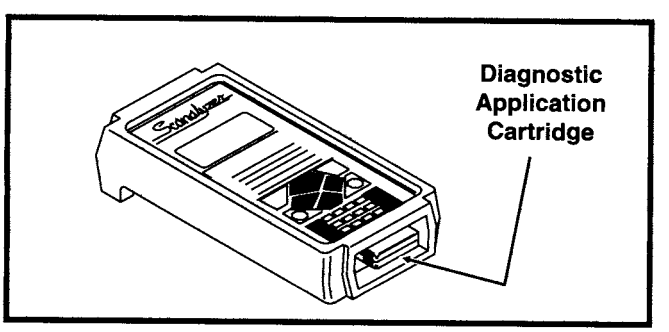


Figure 90. Scanalyzer (HD-41325)

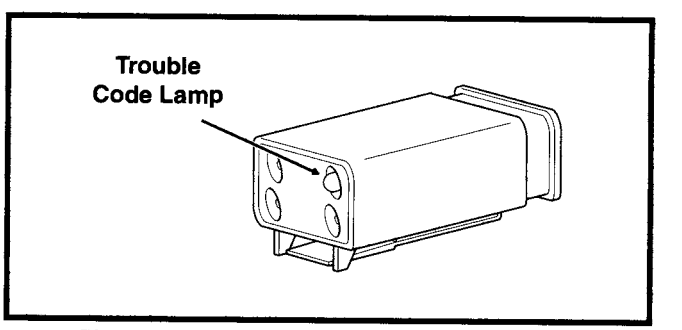


Figure 91. Diagnostic Test Lamp (HD-41197)

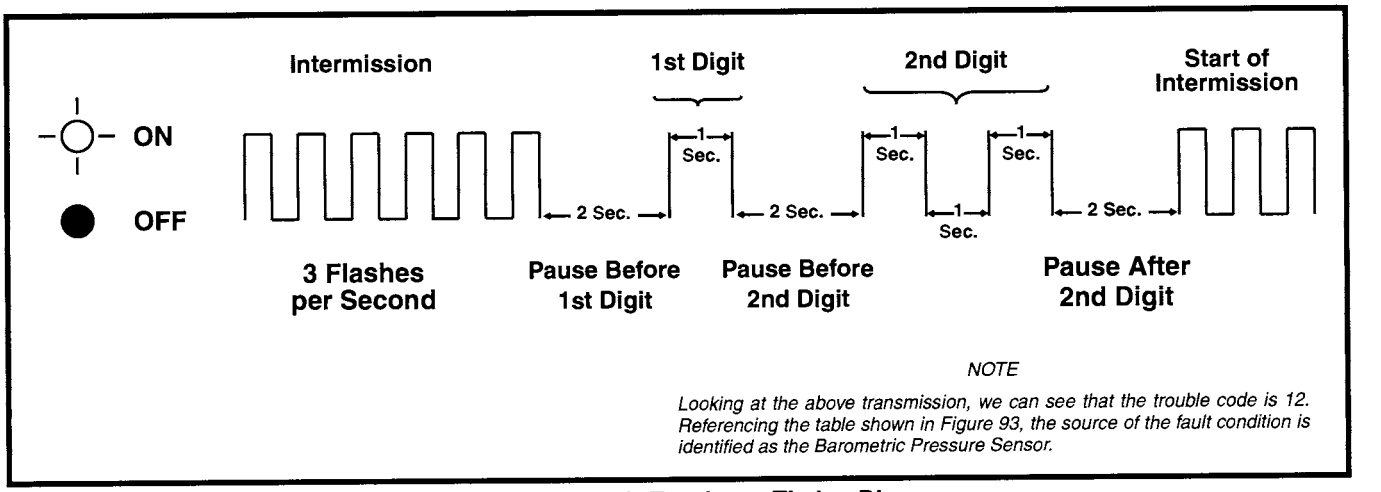


Figure 92. Diagnostic Test Lamp Timing Diagram

The lamp will then flash one or more times to indicate the first digit of the trouble code. The length of time the lamp is illuminated and the length of time in which it is off are each about 1 second in duration. Simply count the number of times the lamp flashes in order to retrieve the first digit of the trouble code.

3. Following transmission of the first digit, there is another 2 second pause in which the lamp is off. The lamp will then flash one or more times to indicate the second digit of the trouble code. Count the number of times the lamp flashes to retrieve the second digit.

   Following transmission of the second digit, there is a third 2 second pause in which the lamp is off. After the pause comes the intermission, which is followed by transmission of the next recorded trouble code. All subsequent codes are sent in the same manner, each separated from the next by the intermission.

4. Write down the trouble codes on a piece of paper. Once all codes have been sent, the data string is repeated. When you have recorded the same trouble code twice, it is an indication that the transmission has been restarted and that all trouble codes have been retrieved.

5. If trouble codes are present, reference the table shown in Figure 93 to identify the source of the fault condition and then see the applicable flow chart under SECTION B-4, DIAGNOSING SYSTEM PROBLEMS. If necessary, turn to Section 9C of the 1996 FLT Service Manual for removal and replacement procedures, as well as information on the location of all components.

   If trouble codes are NOT present, but starting or driveability problems are evident, see the Symptoms Chart under DIAGNOSTIC CHECK, page 137, and then refer to CHARTS A-1 thru C-2 for help in diagnosing system problems.

6. Turn the Ignition Switch to OFF. Unplug the Diagnostics Test Lamp from the Data Link Connector.

7. After correcting system problems, clear trouble codes. If the Scanalyzer is not available, perform 20 start and run cycles. To execute one run cycle, start the vehicle, let it run for at least 30 seconds and then turn the engine off for a minimum of 10 seconds.

IMPORTANT NOTE

Engine operation is disabled when trouble codes are retrieved using the Diagnostic Test Lamp. The test lamp plug must be removed from the Data Link Connector and the Ignition Switch turned to OFF for a minimum of 10 seconds before the engine can be started.

8. Install side cover. See Side Cover Installation, page 128.

9. Road test the vehicle and observe the Check Engine Lamp to confirm proper operation without the reoccurrence of trouble codes. See SECTION B-1, CHECKING FOR TROUBLE CODES.

SCANALYZER

1. Plug the Scanalyzer (HD-41325) into the Data Link Connector.

2. Turn the Ignition Switch to ON.

Trouble Code	Fault Condition		Applicable Flow Chart
11	Throttle Position Sensor		page 162
12	Barometric Pressure Sensor		page 164
14	Engine Temperature Sensor		page 166
15	Intake Air Temperature Sensor		page 168
16	Battery Positive Voltage		page 170
23	Front Injector		page 172
24	Front Ignition Coil		page 175
25	Rear Ignition Coil		page 175
32	Rear Injector		page 172
33	Fuel Pump Relay		page 178
52	ECM RAM Error	ECM Replacement Required	page 180
53	ECM ROM Error		
54	EEPROM Error		
55	Microprocessor Malfunction		
56	Crank Position Sensor/Cam Position Sensor Signal Error		page 181

Figure 93. Diagnostic Trouble Codes

3. Insert the diagnostic application cartridge into the Scanalyzer. During the next few seconds, the Scanalyzer sequences through a series of screens that reflect a power-on self test, the system copyright, and then an attempt at communications with the ECM. Once communications is established with the ECM, the Diagnostic Menu appears. See Figure 94.

   The Diagnostic Menu, which consists of seven items, is the primary system menu (main menu) through which all other secondary menus and displays are accessed. Since the screen may not be large enough to display all line items at any given time, use the up and down arrow keys to scroll through the list.

4. From the Diagnostic Menu, press the number "2" to access the Trouble Codes Menu. At this point, the unit allows the operator to display current trouble codes (by pressing the number "1"), display historic codes (number "2") or clear trouble codes (number "3"). Unlike the Diagnostic Test Lamp, note that the Scanalyzer does allow the operator to clear trouble codes from memory as well as differentiate between current and historic codes.

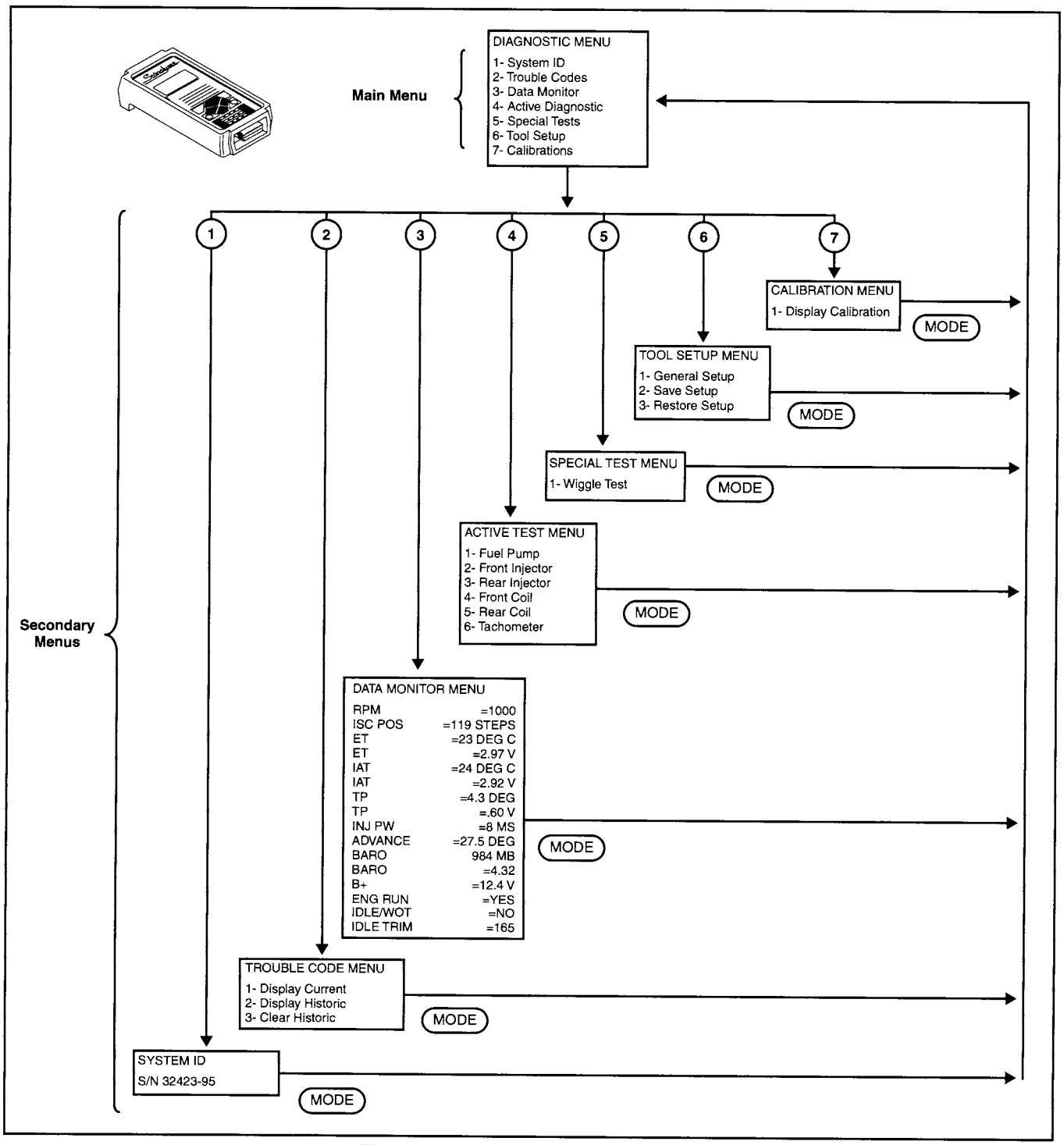


Figure 94. Scanalyzer Menu Selections

After reading trouble codes, simply press the Mode key to return to the Trouble Codes Menu. Press the Mode key again to return to the Diagnostic Menu. In this manner, regardless of where the operator is in the program, the Mode key need only be pressed once or twice to return to the main menu.

NOTE

For more detailed instructions, refer to the literature provided with the Scanalyzer.

5. Write down all trouble codes on a piece of paper. If a current trouble code exists, place it at the top of the list.

6. If trouble codes are present, reference the table shown in Figure 93 to identify the source of the fault condition and then see the applicable flow chart under SECTION B-4, DIAGNOSING SYSTEM PROBLEMS. A Scanalyzer icon appears at those points in the flow chart where use of the Scanalyzer would be most convenient or desirable. If necessary, turn to Section 9C of the 1996 FLT Service Manual for removal and replacement procedures, as well as information on the location of all components.

   If trouble codes are NOT present, but starting or driveability problems are evident, see the Symptoms Chart under DIAGNOSTIC CHECK, page 137, and then refer to CHARTS A-1 thru C-2 for help in diagnosing system problems.

7. After correcting system problems, clear trouble codes using the Trouble Codes Menu of the Scanalyzer.

NOTE

Trouble codes cannot be cleared while the engine is running. Turn the engine off, but leave the Ignition/Light Key Switch at IGNITION and return the handlebar Engine Stop Switch to RUN.

8. Turn the Ignition Switch to OFF. Unplug the Scanalyzer from the Data Link Connector.

9. Install side cover. See Side Cover Installation.

10. Road test the vehicle and observe the Check Engine Lamp to confirm proper operation without the reoccurrence of trouble codes. See SECTION B-1, CHECKING FOR TROUBLE CODES.

MULTIPLE TROUBLE CODES

The BARO, TP and CKP/CMP sensors are all connected to the same reference line (+5v Vref). If the line goes to ground or open, multiple trouble codes will be set, that is, trouble codes 11, 12 and 56.

Also, the fuel pump, fuel injectors and ignition coil all receive +12 volts from the fuel pump relay. If this line should go to ground or open, some or all trouble codes may be set, that is, codes 23, 24, 25, 32 and 33. Different combinations of these codes suggest a loss of power from the fuel pump relay to the respective device.

Start with the trouble code having the lowest numerical value and refer to the corresponding flow chart.

Side Cover Installation

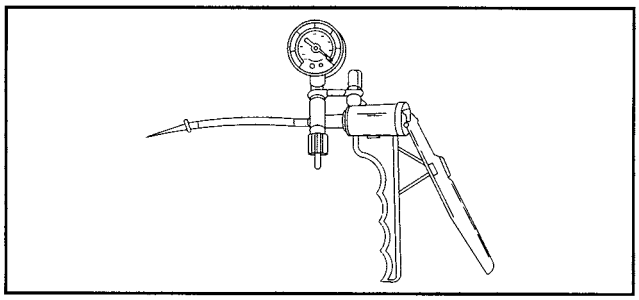
1. Install protective plug over pin side of Data Link Connector.

2. Place large end of slot on attachment clip over T-stud on front panel of electrical bracket. Push connector toward wire end to engage small end of slot.

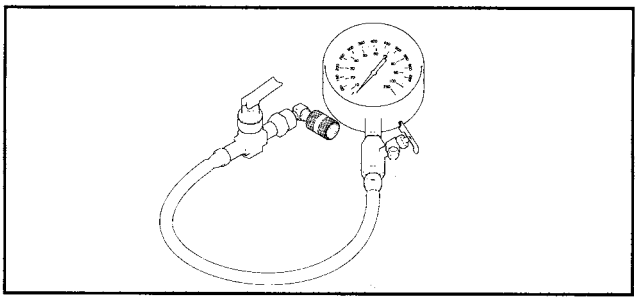
3. Install bolt to fasten side cover to clip nut on flange of frame downtube. Tighten bolt securely.

4. Position right side saddlebag on vehicle. Verify that molded rubber insert at bottom of saddlebag fits snugly on lower saddlebag support rail.

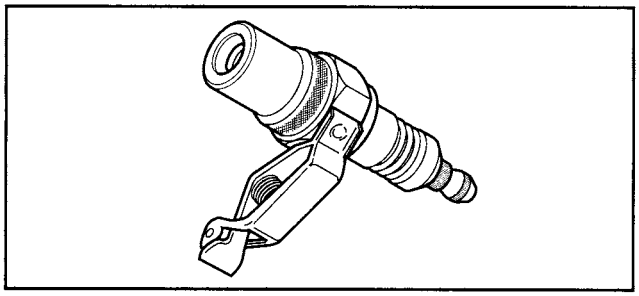
5. Place flat washers on bail head studs. With groove at end of stud held in a horizontal position, insert stud through holes in saddlebag and front mounting bracket. When groove engages wire form of spring plate on inboard side of bracket, turn stud clockwise a full 1/4 turn until it snaps in place. Install rear bail head stud in the same manner.



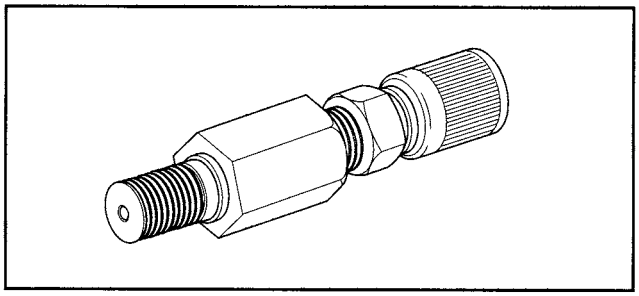
Part No. HD-23738A Mity-Vac Vacuum Gauge



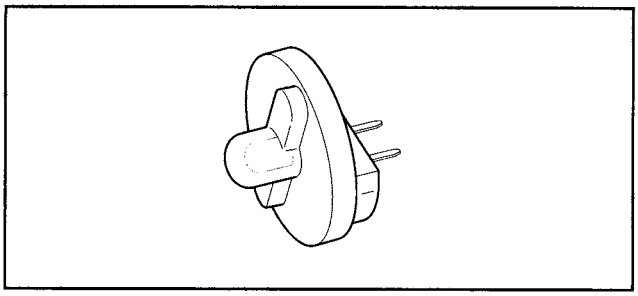
Part No. HD-41182 Fuel Pressure Gauge



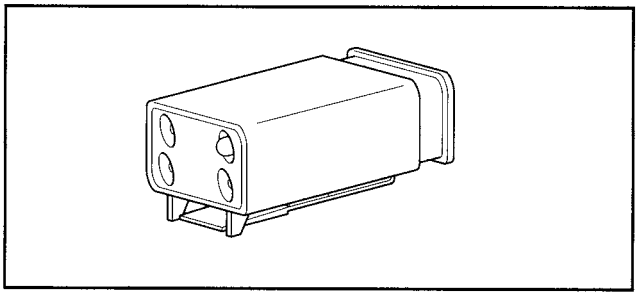
Part No. HD-26792 Spark Tester



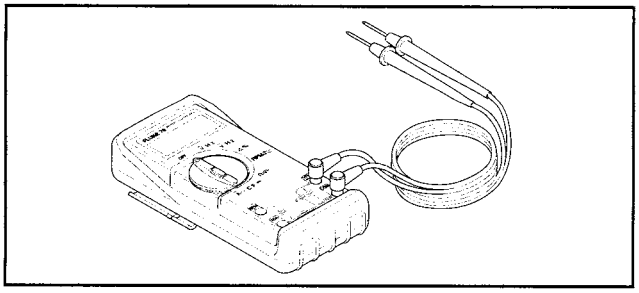
Part No. HD-41182-1 Fuel Pressure Gauge Adapter



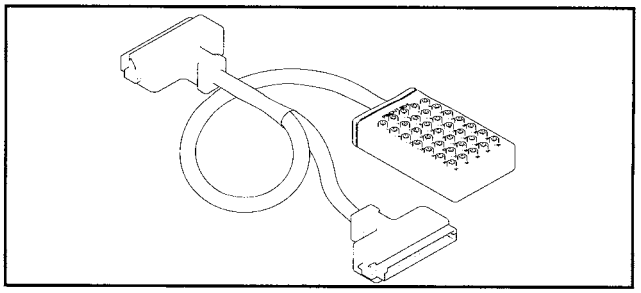
Part No. HD-34730-2C Fuel Injector Test Lamp



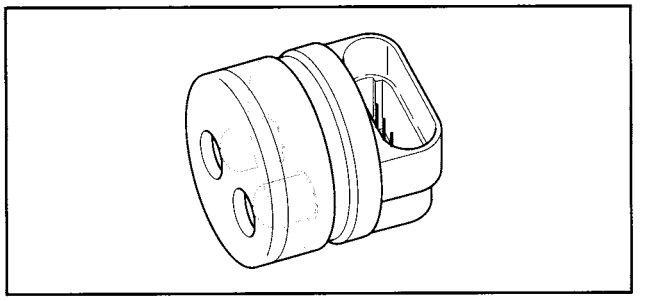
Part No. HD-41197 Diagnostic Test Lamp



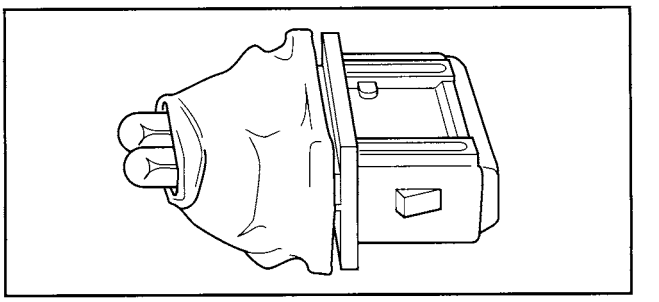
Part No. HD-39978 Fluke 78 Multimeter (DVOM)
Use with HD-41198.



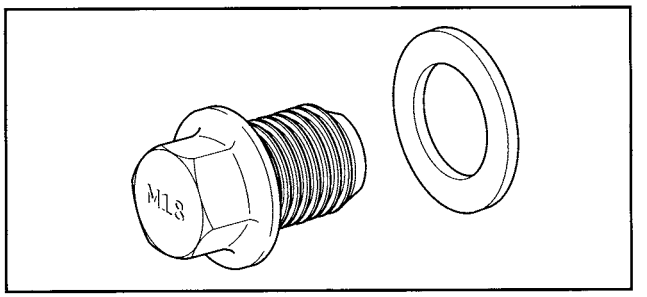
Part No. HD-41198 Breakout Box
Use with HD-39978.



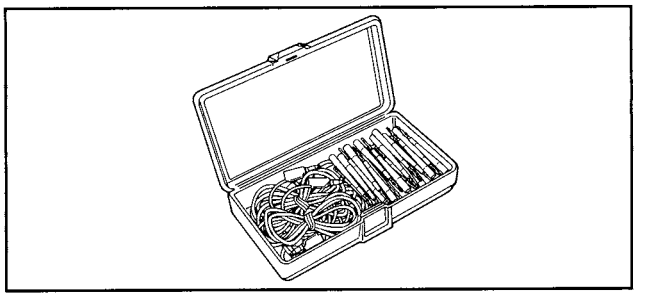
Part No. HD-41199-3 Idle Speed Control Actuator Test Lamp



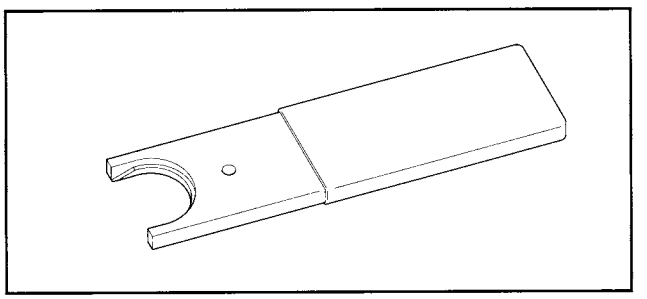
Part No. HD-41402 Ignition Coil Test Lamp



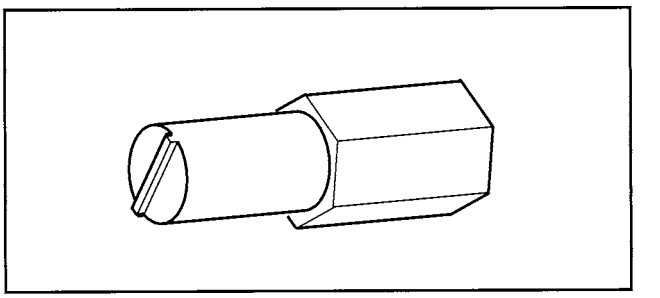
Part No. HD-41298 Fuel Tank Plugs



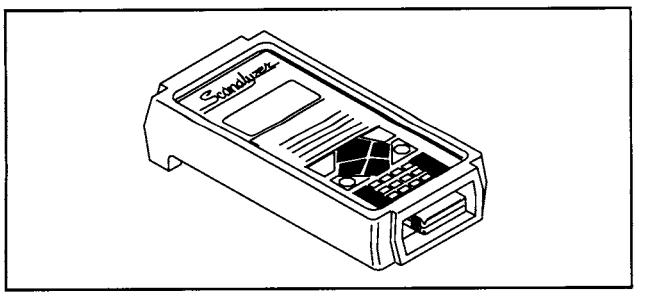
Part No. HD-41404 EFI Harness Connector Test Kit



Part No. HD-41320 Fuel Injector Remover



Part No. HD-41538 Check Valve Remover/Installer



Part No. HD-41325 Scanalyzer

TOOLS

Mity-Vac Vacuum Gauge (HD-23738A). A self-lubricating, maintenance-free, sealed, non-corrosive unit with a pumping rate of one cubic inch per stroke that easily attains a vacuum of 25 inches of mercury in just a few seconds. Used for testing the fuel pressure regulator and Barometric Pressure Sensor.

Spark Tester (HD-26792). Used to verify acceptable secondary voltage (25,000 volts) without removing the spark plug from the engine.

Fuel Injector Test Lamp (HD-34730-2C). Plugged directly into the injector harness connector, the test lamp flashes to confirm that voltage is being supplied to the fuel injector.

Fluke 78 Multimeter (HD-39978). Used with the Breakout Box to perform circuit diagnosis. Referred to as a "DVOM" throughout this document.

Fuel Pressure Gauge (HD-41182). Used with a special adapter, the gauge (0-100 PSI) allows for fuel injector and fuel system pressure diagnosis.

Fuel Pressure Gauge Adapter (HD-41182-1). The adapter allows the fuel pressure gauge to be attached to the external fuel supply line for fuel injector and fuel system pressure diagnosis.

Diagnostic Test Lamp (HD-41197). To assist the user in diagnosing system problems, the lamp blinks a code that correlates to a particular problem area. Plugged directly into the Data Link Connector, the lamp is only used if the Scanalyzer is not available.

Breakout Box (HD-41198). The unit plugs directly into the 35-place ECM connector to allow for circuit diagnosis of the wiring harness and connections without having to probe with sharp objects. Hooks in line so that the vehicle can be run during testing. Used with a DVOM, which is not included.

Idle Speed Control Actuator Test Lamp (HD-41199-3). Plugged directly into the harness connector, the test lamp flashes to confirm that proper voltage is being supplied to the ISC actuator.

Fuel Tank Plugs (HD-41298). Threaded plugs with nylon washers ensure that no leakage occurs when the fuel tank is removed for service.

Fuel Injector Remover (HD-41320). Enables the user to remove the fuel injectors from the induction module without damage to the plastic construction.

Scanalyzer (HD-41325). A portable unit that plugs directly into the Data Link Connector and facilitates the diagnosis of system problems through a direct interface with the ECM. Using a special programmable application cartridge, the Scanalyzer offers data displays and menu selections that allow for quick and easy retrieval of data and enables the user to perform a variety of diagnostic tests while monitoring inputs and outputs.

Ignition Coil Test Lamp (HD-41402). Plugged directly into the harness connector, the test lamp flashes to confirm that voltage is being supplied to the ignition coil.

EFI Harness Connector Test Kit (HD-41404). Includes jumper wires and probe connectors for use with a DVOM (not included) to test connector and wiring harness integrity.

Check Valve Remover/Installer (HD-41538). Used to remove and install the supply and/or return check valves in the in-tank fuel fittings.

B-4 DIAGNOSING SYSTEM PROBLEMS

GENERAL

To locate faulty circuits or other system problems, follow the diagnostic flow charts in this section. For a systematic approach, always begin with the **DIAGNOSTIC CHECK** on page 136. Read the General Information and then work your way through the chart box by box.

If a numbered circle appears adjacent to a 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 where information on the location and removal of components may be obtained.

The **Scanalyzer icon** appears at those points in the flow chart where the Scanalyzer may be used. If a number is printed next to the icon, then refer to the **Scanalyzer Notes**, which are similar to the Diagnostic Notes, but are restricted to information on the use of the Scanalyzer.

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 opposite each flow chart identifies the connector number, description, type and general location.

In order to perform most diagnostic routines, a Breakout Box (HD-41198) and a DVOM (HD-39978) are required. To perform the circuit checks with any degree of efficiency, a familiarity with the various wire connectors is also necessary.

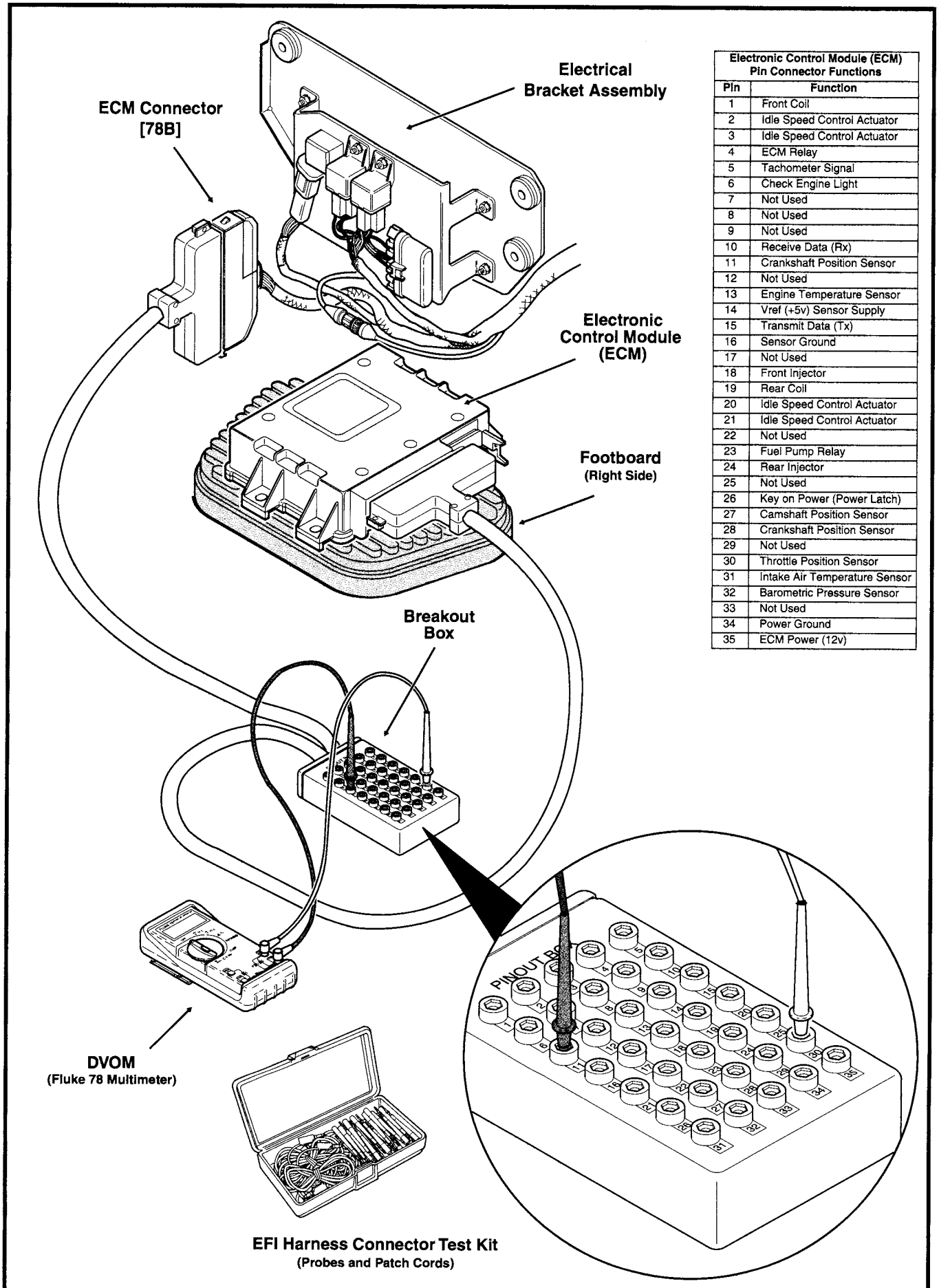
As an introduction to these topics, see Breakout Box Installation below and then refer to the following table in conjunction with Figure 96.

Breakout Box Installation

1. Raise lid of right side saddle bag. Grasp bail wire inside saddlebag and rotate each stud a full 1/4 turn in a

WIRE HARNESS CONNECTORS

No.	Description	Models	Type	Location	Probe
[1]	Main Harness to Interconnect	95 FLHTCU-I	12 - Place Deutsch	Fairing Crossbrace	Black
		96 FLHTC/U-I	12 - Place Deutsch	Inner Fairing - Front of Right Fairing Bracket	Black
		FLTCU-I	12 - Place Deutsch	Instrument Panel Support	Black
[8]	Main Harness to ECM Harness	All	8 - Place Deutsch (Gray)	Upper Frame Cross Member (Under Seat)	Black
[13]	Fuel Gauge Sending Unit	All	2 - Place Amp	Under Seat	Not Applicable
[14]	CMP Sensor	All	3 - Place Deutsch	Bottom Frame Cross Member (Right Side)	Black
[20]	Main Harness to Console	FLHR-I	12 - Place Deutsch	Under Left Side Cover	Black
[21]	Interconnect to Instruments	95 FLHTCU-I	6 - Place Amp	Above Fairing Crossbrace	Black Pin Only
		FLTCU-I	6 - Place Amp	Below Instrument Panel Support	Black Pin Only
[22]	Interconnect to Right Handlebar	95 FLHTCU-I	6 - Place Deutsch	Right Inner Fairing Bracket	Black
		96 FLHTC/U-I	6 - Place Deutsch	Inner Fairing - Top of Right Fairing Support Brace	Black
		FLTCU-I	6 - Place Deutsch	Instrument Panel Support	Black
		FLHR-I	6 - Place Deutsch	Behind Headlamp Assembly	Black
[78]	ECM	All	35 - Place Amp	Under Right Side Cover	Purple
[79]	CKP Sensor	All	3 - Place Conxall	Under Right Side Cover Below Electrical Bracket	Brown
[80]	BARO Sensor	All	3 - Place Amp	Under Right Side Cover Behind Electrical Bracket	Purple
[81]	ECM Harness to Sensor Harness	All	6 - Place Deutsch	Upper Frame Cross Member (Under Seat)	Black
[82]	ECM Harness to Sensor Harness	All	12 - Place Deutsch	Upper Frame Cross Member (Under Seat)	Black
[83]	Ignition Coil	All	3 - Place Amp	Below Fuel Tank	Purple
[84]	Front Injector	All	2 - Place Packard	Below Fuel Tank	Purple
[85]	Rear Injector	All	2 - Place Packard	Below Fuel Tank	Purple
[86]	Fuel Pump	All	1 - Place Amp	Under Seat	Not Applicable
[87]	ISC Actuator	All	4 - Place Packard	Below Fuel Tank	Gray
[88]	TP Sensor	All	3 - Place Packard	Below Fuel Tank	Gray
[89]	IAT Sensor	All	2 - Place Packard	Below Fuel Tank	Gray
[90]	ET Sensor	All	2 - Place Packard	Below Fuel Tank	Gray
[91]	Data Link	All	4 - Place Deutsch	Under Right Side Cover	Black
[108]	Interconnect to Tachometer	96 FLHTC/U-I	6 - Place Amp Multilock	Inner Fairing Between Tachometer and Speedometer	Not Applicable
-	Electrical Relays	All	-	Under Right Side Cover	Red
-	Breakout Box	-	-	-	Purple



Electronic Control Module (ECM) Pin Connector Functions	
Pin	Function
1	Front Coil
2	Idle Speed Control Actuator
3	Idle Speed Control Actuator
4	ECM Relay
5	Tachometer Signal
6	Check Engine Light
7	Not Used
8	Not Used
9	Not Used
10	Receive Data (Rx)
11	Crankshaft Position Sensor
12	Not Used
13	Engine Temperature Sensor
14	Vref (+5v) Sensor Supply
15	Transmit Data (Tx)
16	Sensor Ground
17	Not Used
18	Front Injector
19	Rear Coil
20	Idle Speed Control Actuator
21	Idle Speed Control Actuator
22	Not Used
23	Fuel Pump Relay
24	Rear Injector
25	Not Used
26	Key on Power (Power Latch)
27	Camshaft Position Sensor
28	Crankshaft Position Sensor
29	Not Used
30	Throttle Position Sensor
31	Intake Air Temperature Sensor
32	Barometric Pressure Sensor
33	Not Used
34	Power Ground
35	ECM Power (12v)

Figure 95. Breakout Box Installation

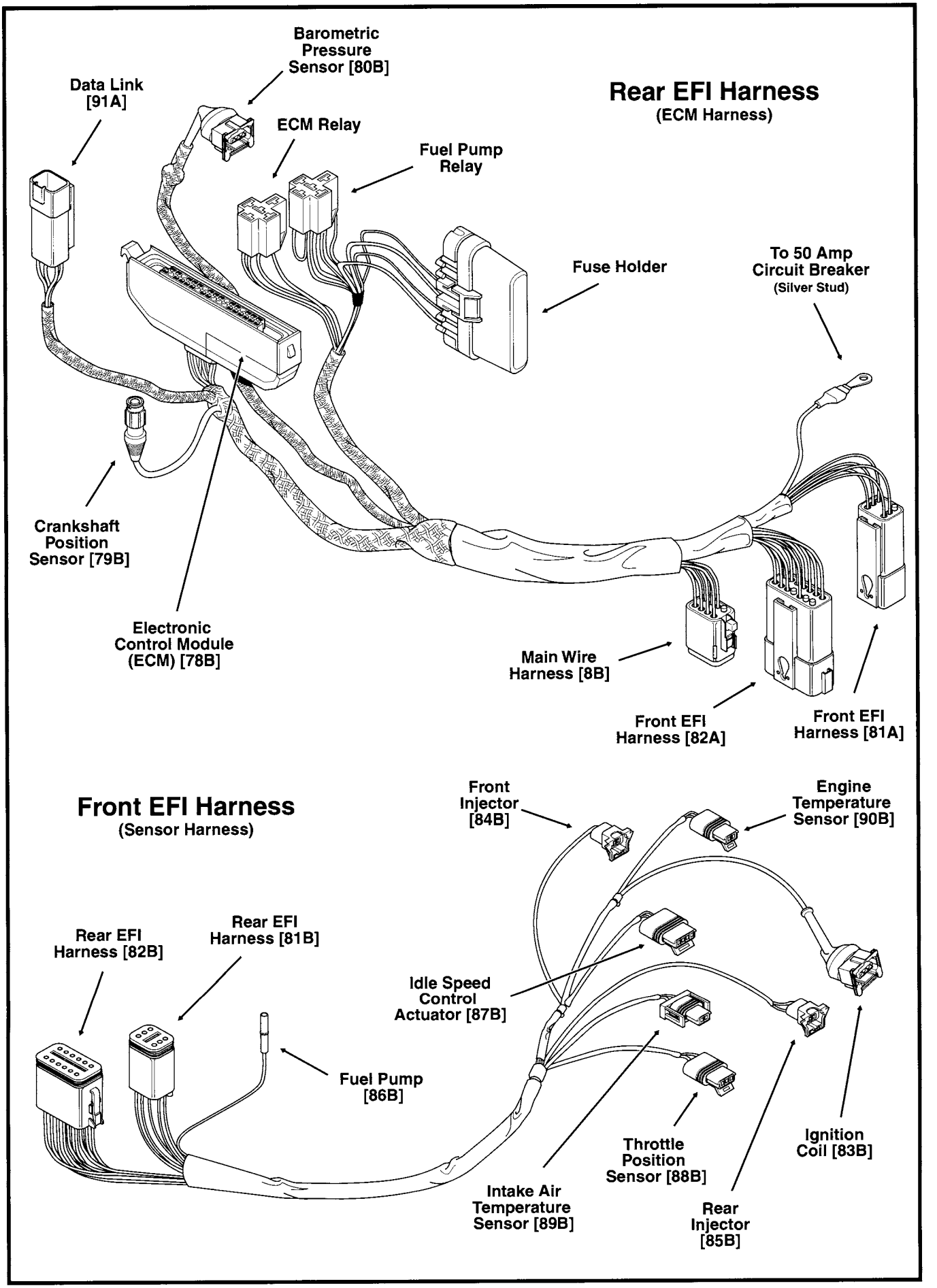


Figure 96. EFI Wire Harness Connectors

counter-clockwise direction. Remove bail head studs with flat washers. Remove saddlebag.

2. Remove bolt to detach side cover from clip nut on flange of frame downtube.

⚠CAUTION

Always remove ECM before disconnecting 35-place harness connector. Removing connector with ECM installed may result in pin damage.

3. Remove Keps nuts from four studs to free front panel bracket and ECM from face of rear panel bracket. Reinstall front panel, but leave Keps nuts loose.

4. Gently pull back spring lock on ECM to free locking tab on 35-place connector. Work side of connector free. Free hook on opposite side of connector from hinge on ECM.

5. Place ECM on right side footboard. Connect Breakout Box between rear EFI wire harness and ECM. See Figure 95.

⚠CAUTION

Do not disassemble the ECM connector or back probe wire leads to locate faulty circuits. Opening the sealed connector and/or piercing the wires will lead to corrosion and premature failure. Use a Breakout Box (HD-41198) with a DVOM (HD-39978) where necessary.

6. Wherever applicable, use the special probe tips and jumper wires provided with the EFI Harness Connector Test Kit (HD-41404). The probe tips, which are color coded for ease of identification, will prevent damage to the wire connector and Breakout Box terminals.

⚠CAUTION

To prevent damage to the connector terminals and/or probe tips, proceed as follows:

- **Use the proper color probe as shown in the table on page 132.**
- **Insert the probe tip straight into the cavity and keep the probe stable during testing.**
- **Do not wiggle or move the probe tip once it has been inserted into the terminal.**
- **Do not insert more than one probe tip into any single terminal.**

DIAGNOSTIC CHECK

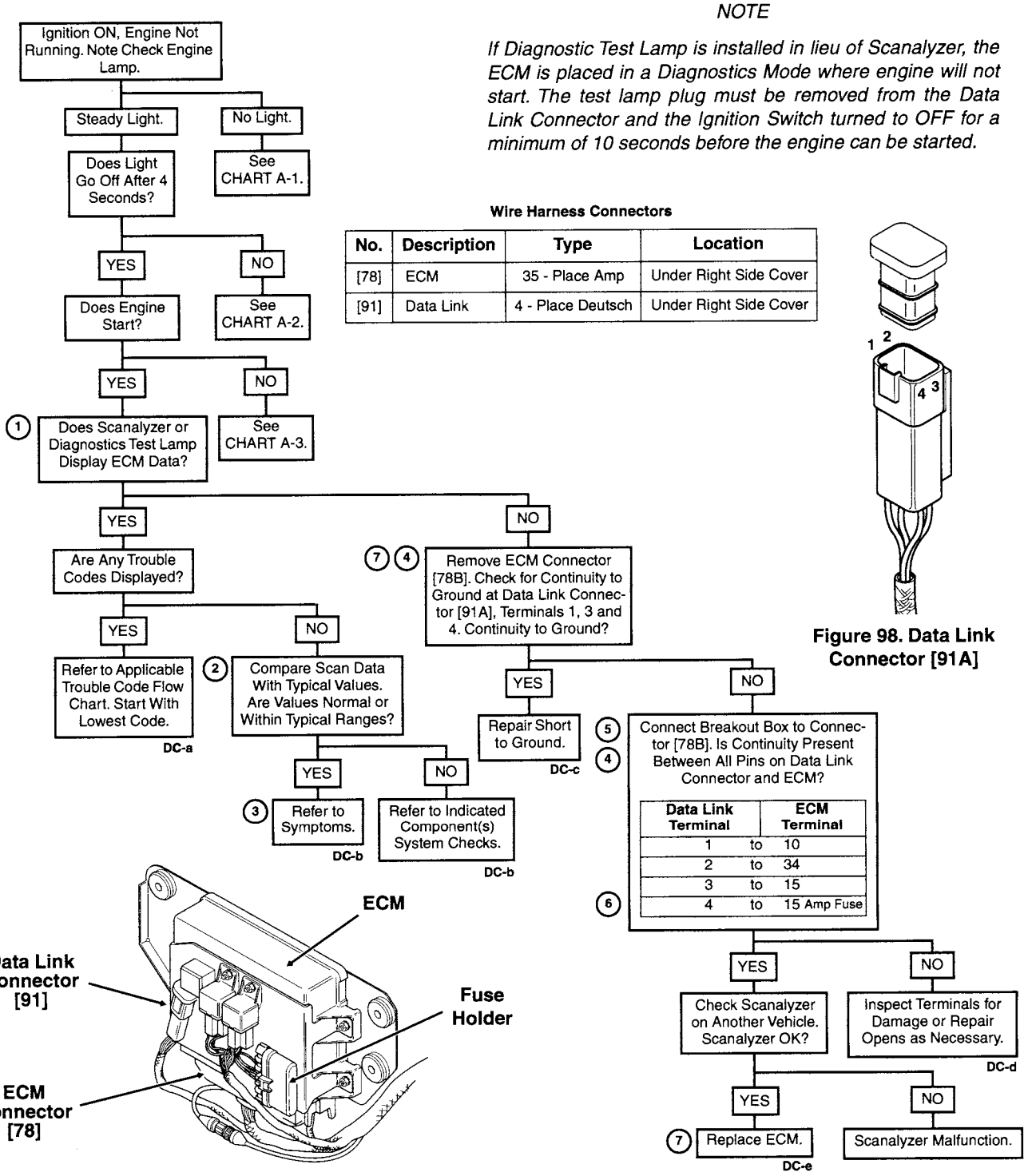
GENERAL

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 Scanalyzer parameters may be used to help locate intermittents and out-of-specification sensors. See TYPICAL SCAN VALUES table on page 137.

If the Scanalyzer is not working properly, check operation on another vehicle. If OK, check Data Link Connector for 12 volts and proper ground. If Scanalyzer reads "No Response" with the Ignition Switch turned to ON (Engine Stop Switch at RUN with the engine off), check serial data wire for an open or short to ground between Data Link terminal "1" and ECM. Also check for an open diagnostic test terminal between Data Link terminal "3" and ECM. With Ignition Switch turned to ON, Transmit Data line should have between 11-12 volts and Receive Data line between 5-6 volts.

NOTE

If Diagnostic Test Lamp is installed in lieu of Scanalyzer, the ECM is placed in a Diagnostics Mode where engine will not start. The test lamp plug must be removed from the Data Link Connector and the Ignition Switch turned to OFF for a minimum of 10 seconds before the engine can be started.



Wire Harness Connectors

No.	Description	Type	Location
[78]	ECM	35 - Place Amp	Under Right Side Cover
[91]	Data Link	4 - Place Deutsch	Under Right Side Cover

Figure 98. Data Link Connector [91A]

Figure 97. Electrical Bracket Assembly

DIAGNOSTIC NOTES

The reference numbers below correlate with those on the diagnostic flow chart.

(1) See Retrieving Trouble Codes, page 125.

(2) See Typical Scan Values Chart Below.

TYPICAL SCAN VALUES			
Component	**Minimum**	**Maximum**	**Default**
TP Sensor	0.2 - 0.5	4.5 - 4.95	None
Fuel Injectors	3 - 6 ms @ 950 RPM	16-21ms (WOT)	None
BARO Sensor	3 volts @ 13000 ft.	4 - 4.8 Volts @ Sea Level	4.8 v
ET Sensor	Ambient	125° C.+	IAT +1° C./400 Revs up to 75° C.
IAT Sensor	Ambient	55 - 70° C.	ET until 23° C.
VBatt	6.2 Volts DC	15.5 Volts DC	14.5 Volts
ISC Count	0 Steps	240 Steps	None
Spark Advance (While Running)	8°	44°	None
RPM	0	5500	None

(3) See Symptoms Chart Below.

SYMPTOMS	
Starts Hard	
Battery Discharged.	See Charging System Troubleshooting Chart on Page 184.
Spark Plugs.	See CHART C-2, Page 160.
Leaky Injector(s).	Remove air cleaner. See Air Cleaner, Removal, Page 9-101 of the 1996 FLT Service Manual. With throttle wide open, turn Key ON for 2 seconds and then OFF for 2 seconds five consecutive times. Replace the fuel injector if there is any evidence of raw fuel in the bores. See Fuel Injectors, Removal/ Installation, Page 9-117 of the 1996 FLT Service Manual.
Improper Fuel Pressure.	See CHART B-2, Fuel Pressure Test, Page 155.
Manifold Leak.	Spray Water Around Induction Module Seals While Idling Engine. If RPM Changes, Replace Seals.
Ignition Coil.	See CHART C-2, Page 160.
Plug Wires.	See CHART C-2, Page 160.
Valve Sticking.	See Section 3 of the Service Manual.
Water or Dirt in Fuel System.	Drain and Refill With Fresh Fuel.
ISC Inoperative or Improperly Adjusted.	See Air Cleaner Assembly, Warm-Slow Idle Speed Adjustment, Page 9-110 of the 1996 FLT Service Manual.

NOTE

International (HDI) fuel injected models have an idle RPM setting of 1150 +/- 50 RPM. If the vehicle fails an exhaust emission idle test, the cause is most likely low idle RPM. Correct as follows:

Warm the engine up to normal operating temperature by operating the vehicle for at least 15 kilometers. Engine temperature should be greater than 140 ° C, as read by a Scanalyzer. Set the idle speed to 1150 +/- 50 RPM using a quality tachometer, such as a Scanalyzer, or a hand held inductive type. (Follow the Warm-Slow Idle Speed Adjustment procedure on page 9-110 of the 1996 FLT Service Manual.) Verify correct idle speed after assembly. Operate the vehicle for 2 to 5 kilometers and recheck the idle speed. Repeat adjustment procedure as necessary.

SYMPTOMS (Cont.'d)	
Hesitates, Stumbles, Surges, Misfires and/or Sluggish Performance	
Manifold Leak.	Spray Water Around Induction Module Seals While Idling Engine. If RPM Changes, Replace Seals.
Improper TPS Adjustment.	See Throttle Position Sensor, Installation/Adjustment, Page 9-119 of the 1996 FLT Service Manual.
Improper Fuel Pressure.	See CHART B-2, Fuel Pressure Test, Page 155.
BARO Sensor Plugged or Not Operating Properly.	See TROUBLE CODE 12, Page 164.
Water or Dirt in Fuel System.	Drain and Refill With Fresh Fuel.
Spark Plugs.	See CHART C-2, Page 160.
EVAP Hose Disconnected From Induction Module (Calif. Models)	Connect.
Throttle Plates Not Opening Fully.	See Throttle Cable Adjustment in Section 2 of the Service Manual.
Engine Exhaust Emits Black Smoke or Fouls Plugs	
Clogged Air Filter.	See Air Cleaner, Page 9-109 of the 1996 FLT Service Manual.
Improper Fuel Pressure.	See CHART B-2, Fuel Pressure Test, Page 155.
Improper TPS Adjustment.	See Throttle Position Sensor, Installation/Adjustment, Page 9-120 of the 1996 FLT Service Manual.
Leaky Injector(s).	Remove air cleaner. See Air Cleaner, Removal, page 9-109 of the 1996 FLT Service Manual. With throttle wide open, turn Key ON for 2 seconds and then OFF for 2 seconds five consecutive times. Replace the fuel injector if there is any evidence of raw fuel in the bores. See Fuel Injectors, Removal/ Installation, Page 9-117.
BARO Sensor Plugged or Not Operating Properly.	See TROUBLE CODE 12, Page 164.

(4) Use Harness Connector Test Kit (HD-41404), black socket probe and patch cord.

(5) Connect Breakout Box (HD-41198) to rear EFI wire harness **only** (leave ECM disconnected). See Breakout Box Installation, page 132.

(6) Touch meter probe to contact at top of fuse. See Figure 99. If no power through the fuse, then fuse is blown. Probe the contact on the outboard side - if no power to the fuse, then look for a broken or damaged wire.

(7) See Electronic Control Module (ECM), Removal/Installation, page 9-81 of the 1996 FLT Service Manual.

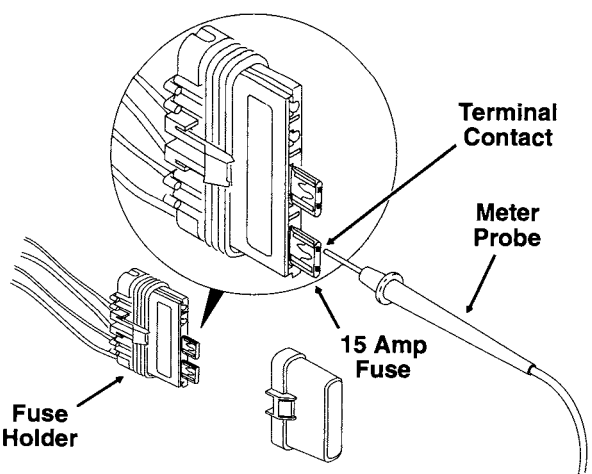


Figure 99. Probe 15 Amp Fuse

CHART A-1, NO CHECK ENGINE LAMP

GENERAL

When the Ignition Switch is turned to ON (Engine Stop Switch at RUN with the engine off), the Check Engine Lamp should illuminate for 4 seconds. Battery voltage is supplied to the lamp bulb. The lamp bulb is grounded by the ECM through the BK/Y wire. A lack of power to the ECM will cause the Check Engine Lamp to be inoperative and also create a no start situation.

DIAGNOSTIC TIPS

- Check for faulty lamp bulb.
- Check for open in BK/Y wire.

DIAGNOSTIC NOTES

The reference numbers below correlate with those on the diagnostic flow chart.

(1) Connect Breakout Box (HD-41198) between rear EFI wire harness and ECM. See Breakout Box Installation, page 132.

(2) Use Harness Connector Test Kit (HD-41404), purple pin probe and patch cord. Look for slot in socket terminal of Breakout Box to insert pin blade.

(3) Repair faulty ECM connection or replace ECM. If ECM requires replacement, see Electronic Control Module (ECM), Removal/Installation, page 9-81 of the 1996 FLT Service Manual.

(4) See Seat, Removal in Section 2 of the Service Manual.

(5) Use Harness Connector Test Kit (HD-41404), black socket probe and patch cord.

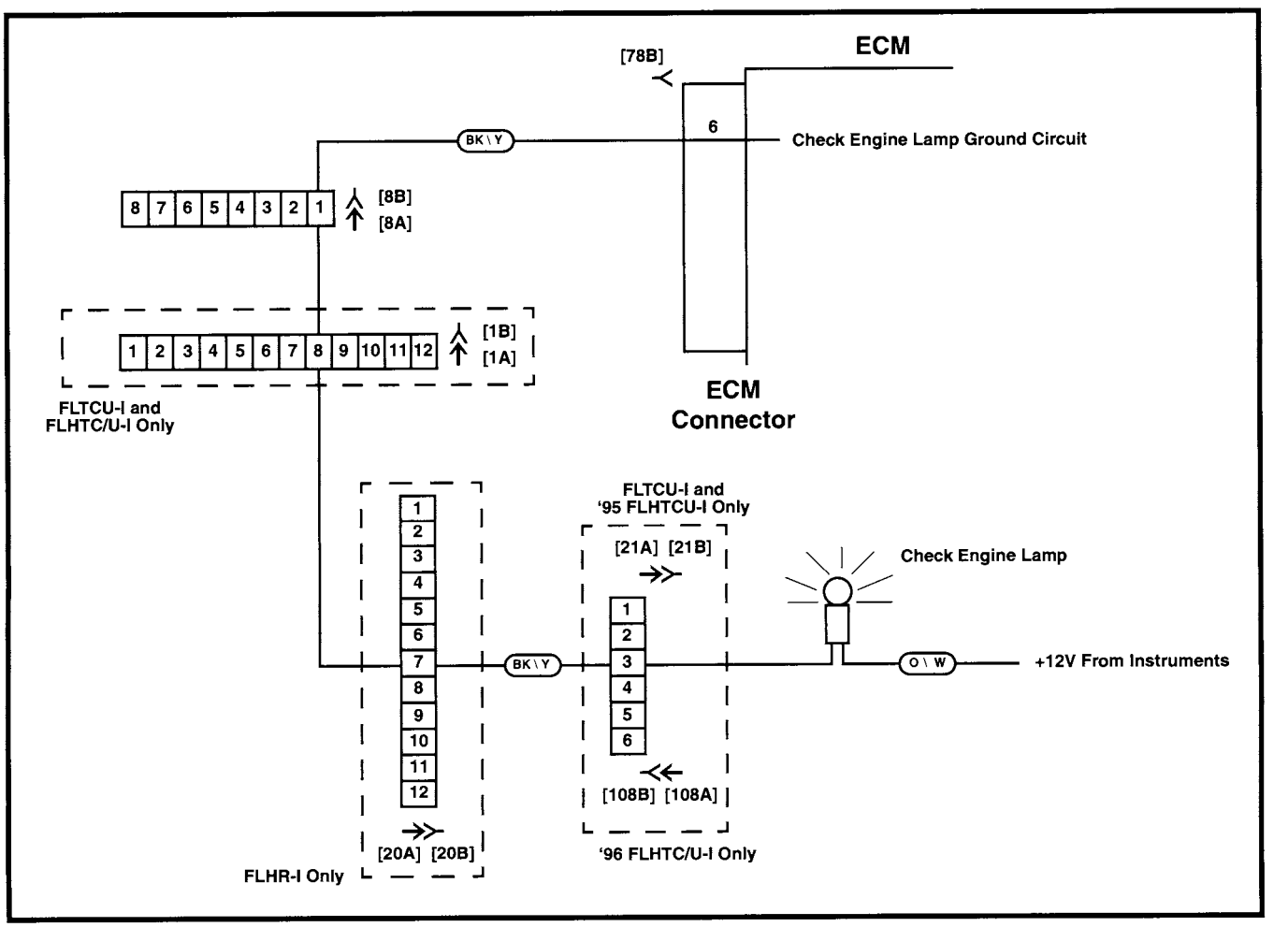
(6) Check continuity. If continuity present, then most likely short to voltage; if no continuity, then open.

(7) Remove instrument panel on FLTCU-I models; see Wiring Harnesses, FLTC Ultra, in Section 8. Remove headlamp assembly on 1995 FLHTCU-I models; see Headlamp, Removal in Section 8.

(8) Remove outer fairing on 1996 FLHTC/U-I models; see Upper Fairing/Windshield - 1996, Outer Fairing, Removal, in Section 2 of the 1996 FLT Service Manual.

(9) Use Harness Connector Test Kit (HD-41404), black pin probe and patch cord. Pin probe is a loose fit in connector [21B].

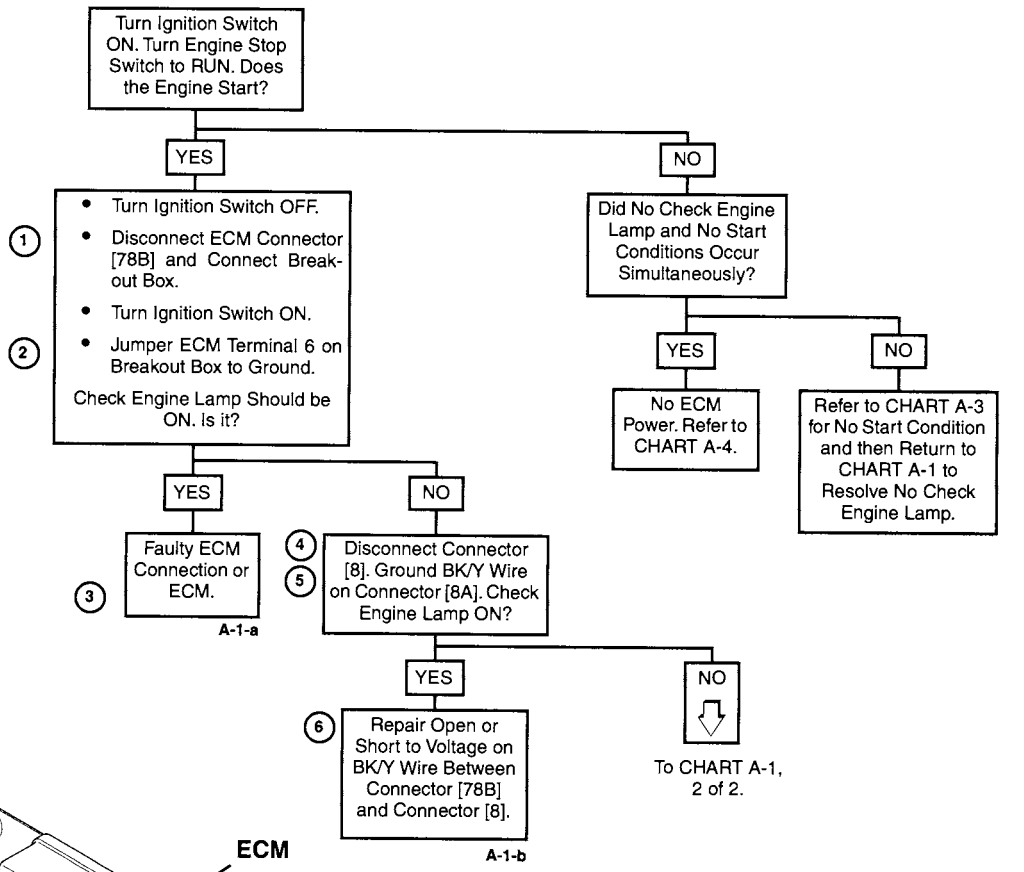
(10) Use Harness Connector Test Kit (HD-41404), black pin probe and patch cord.



Check Engine Lamp Circuit Diagram

Wire Harness Connectors

No.	Description	Models	Type	Location
[1]	Main Harness to Interconnect	95 FLHTCU-I	12 - Place Deutsch	Fairing Crossbrace
		96 FLHTC/U-I	12 - Place Deutsch	Inner Fairing - Front of Right Fairing Bracket
		FLTCU-I	12 - Place Deutsch	Instrument Panel Support
[8]	Main Harness to ECM Harness	All	8 - Place Deutsch (Gray)	Upper Frame Cross Member (Under Seat)
[20]	Main Harness to Console	FLHR-I	12 - Place Deutsch	Under Left Side Cover
[21]	Interconnect to Instruments	95 FLHTCU-I	6 - Place Amp	Above Fairing Crossbrace
		FLTCU-I	6 - Place Amp	Below Instrument Panel Support
[78]	ECM	All	35 - Place Amp	Under Right Side Cover
[108]	Interconnect to Tachometer	96 FLHTC/U-I	6 - Place Amp Multilock	Inner Fairing Between Tachometer and Speedometer



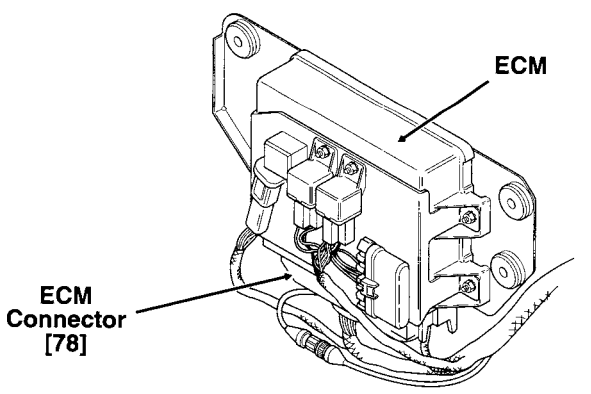


Figure 100. Electrical Bracket Assembly

Chart A-1, No Check Engine Lamp (2 of 2)

From CHART A-1, 1 of 2.

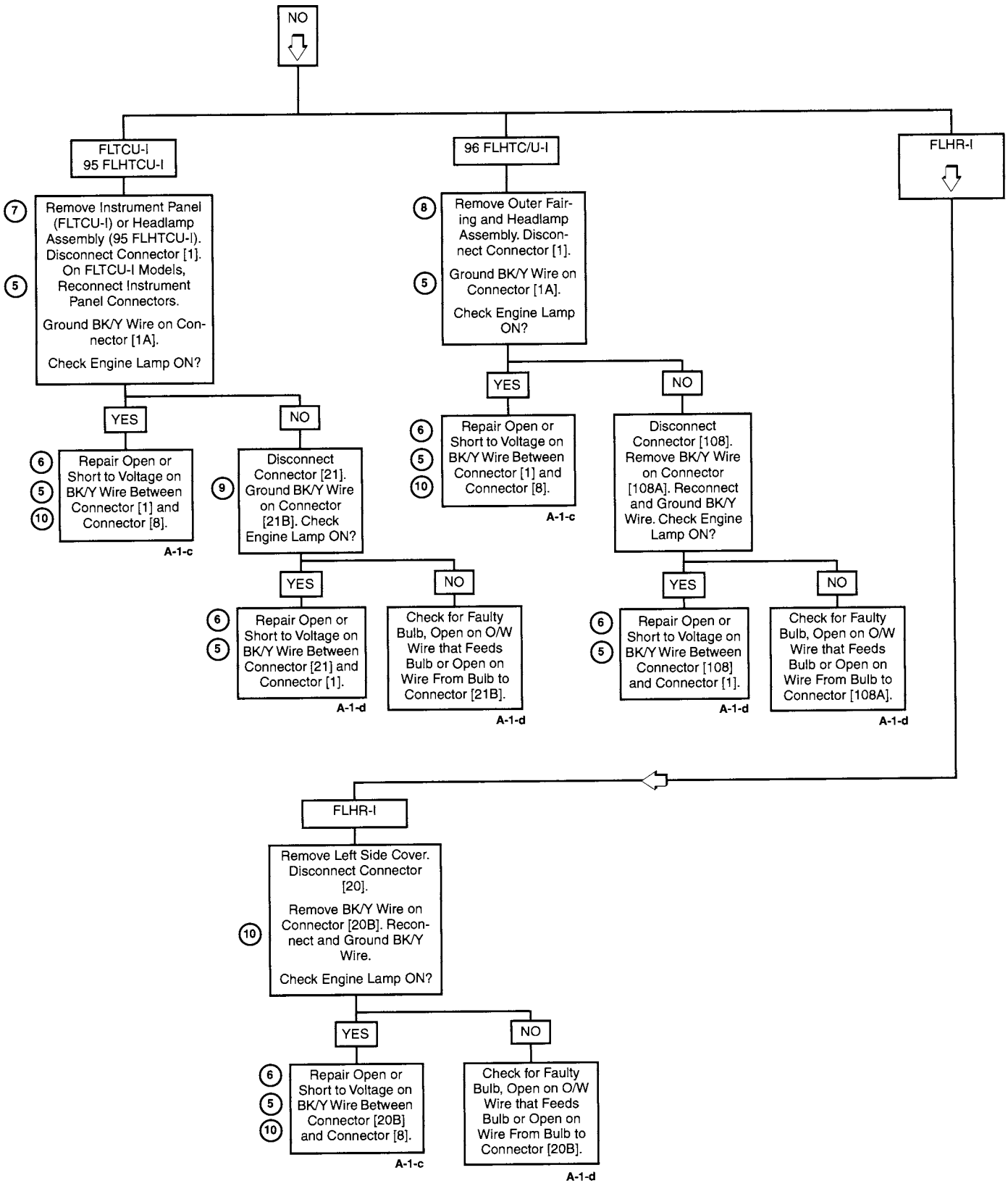


CHART A-2, CHECK ENGINE LAMP ON CONTINUOUSLY

The Check Engine Lamp should illuminate for 4 seconds when the Ignition Switch is turned to ON (with the Engine Stop Switch at RUN and the engine off). Following the initial period of illumination, the lamp should go off for 4 seconds. It may then come back on for an 8 second period (for a stored functional error) or remain on continuously (current error).

Battery voltage is supplied to the lamp bulb. The lamp bulb is grounded by the ECM through the BK/Y wire. A steady light may indicate a short to ground on the BK/Y wire.

DIAGNOSTIC NOTES

The reference numbers below correlate with those on the diagnostic flow chart.

① See Electronic Control Module (ECM), Removal, page 9-81 of the 1996 FLT Service Manual.

② If the lamp goes off when ECM connector is unplugged, BK/Y wire is not shorted to ground.

③ See Retrieving Trouble Codes, page 125.

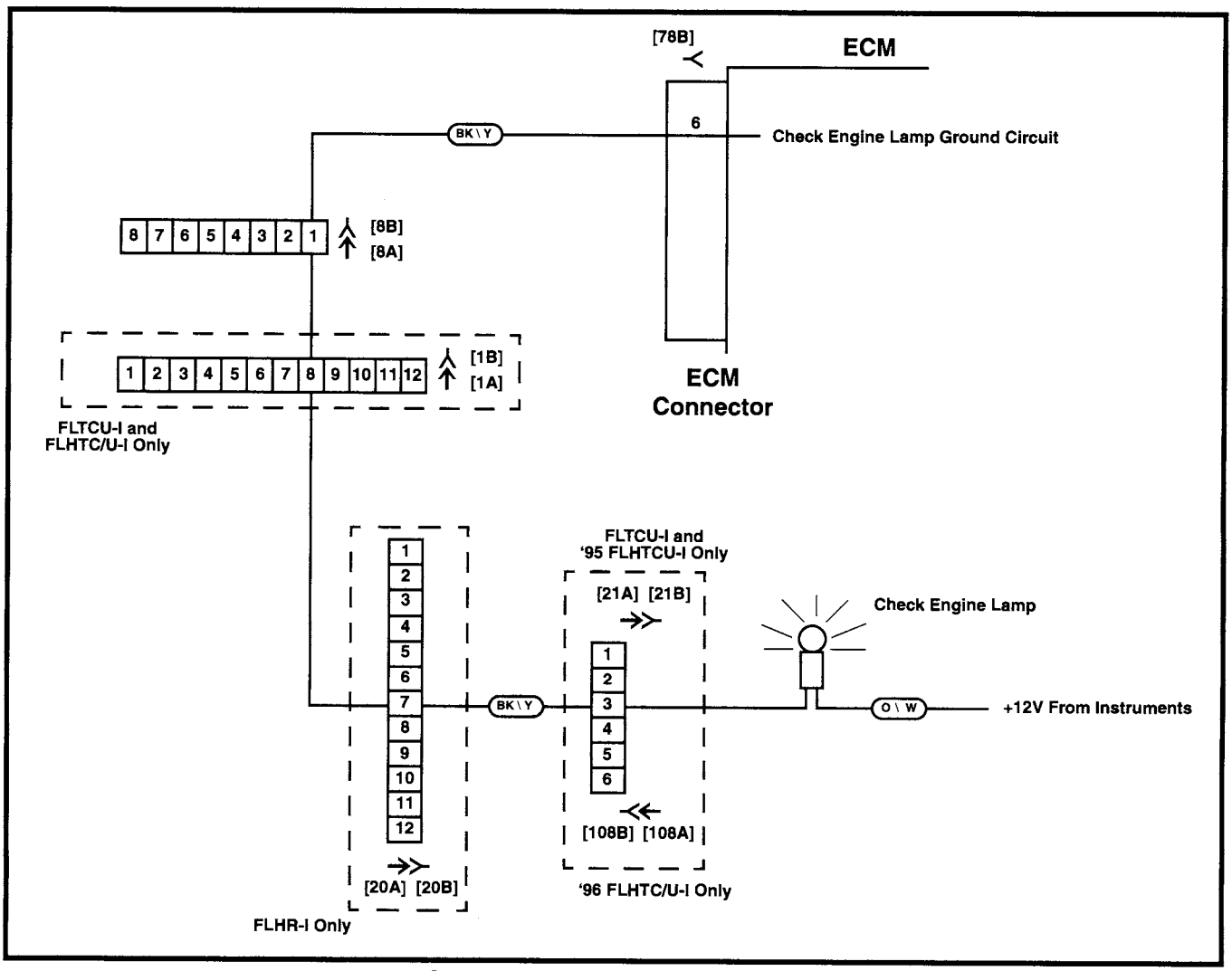
④ See Electronic Control Module (ECM), Removal/Installation, page 9-81 of the 1996 FLT Service Manual.

⑤ See Seat, Removal in Section 2 of the Service Manual.

⑥ Remove headlamp assembly on 1995 FLHTCU-I models; see Headlamp, Removal in Section 8. Remove outer fairing on 1996 FLHTC/U-I models; see Upper Fairing/Windshield - 1996, Outer Fairing, Removal, in Section 2. Remove instrument panel on FLTCU-I models; see Wiring Harnesses, FLTC Ultra, in Section 8.

⑦ Use Socket Terminal Remover, HD-39621-27.

⑧ Use special pick (Snap-On Tool TT600-3) as described under Amp Multilock Electrical Connectors in this document.



Check Engine Lamp Circuit Diagram

Chart A-2, Check Engine Lamp On Continuously

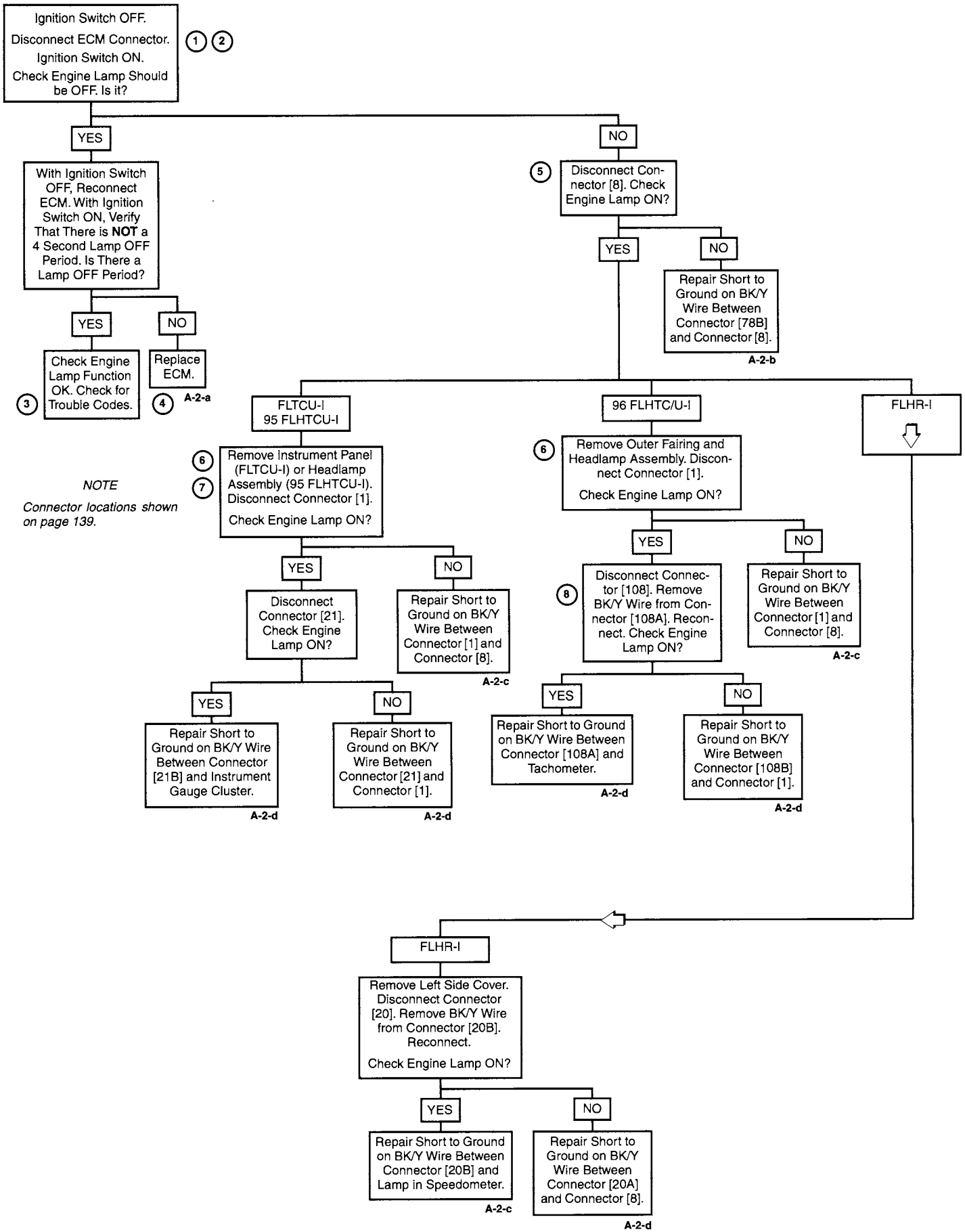


CHART A-3, ENGINE CRANKS BUT WILL NOT START

GENERAL

NOTE

If starter will not crank engine, the problem is ***not*** *EFI related. Refer to Section 5 of the Service Manual, Electric Starter.*

NOTE

Engine will not start if Diagnostics Test Lamp is installed or if Receive Data Line is grounded. Ignition/Light Key Switch must be turned to OFF for 10 seconds after test lamp is removed.

DIAGNOSTIC NOTES

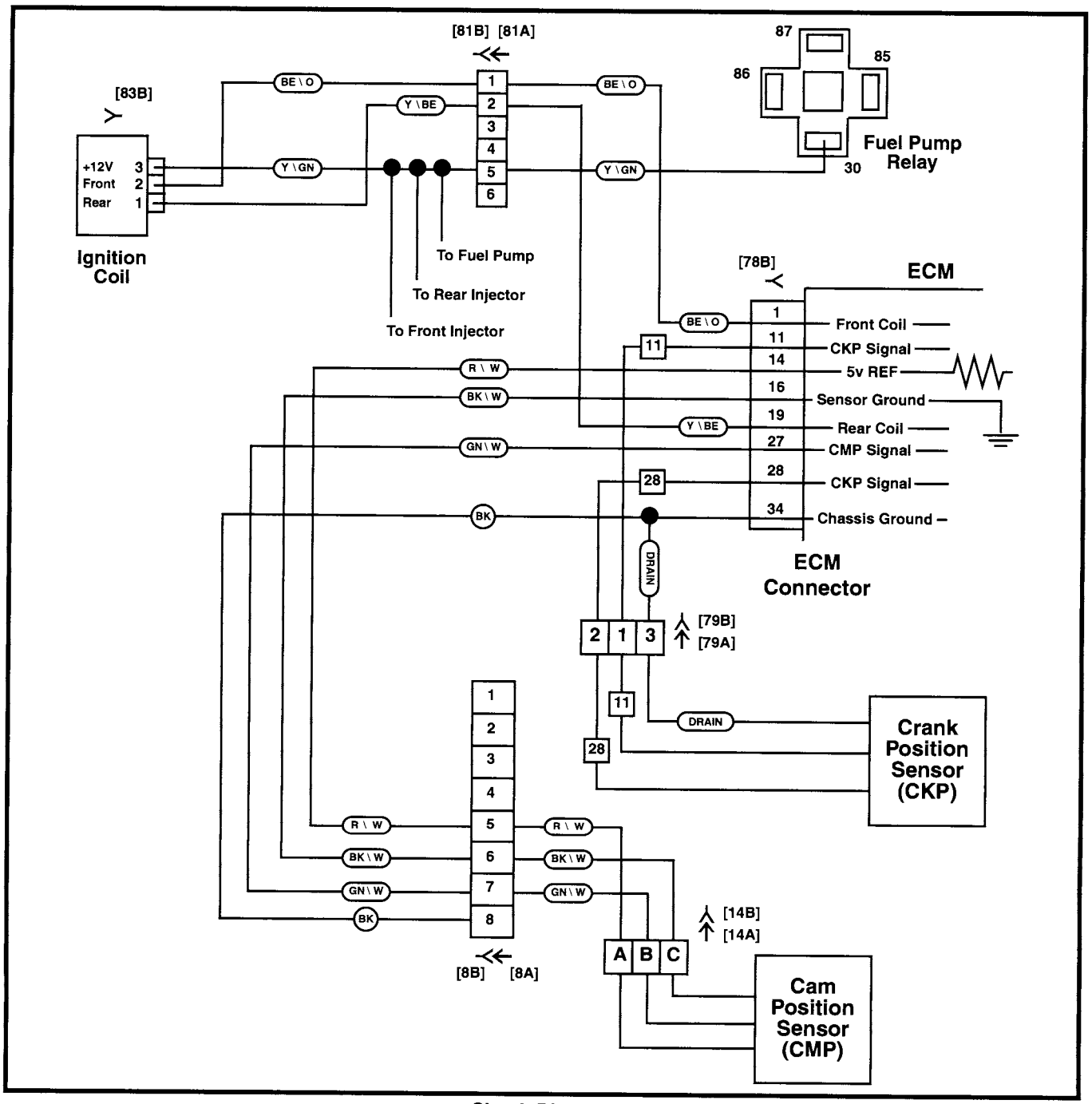
The reference numbers below correlate with those on the diagnostic flow chart.

(1) See Fuses, Removal/Installation, page 9-80 of the 1996 FLT Service Manual.

(2) See Retrieving Trouble Codes, page 125.

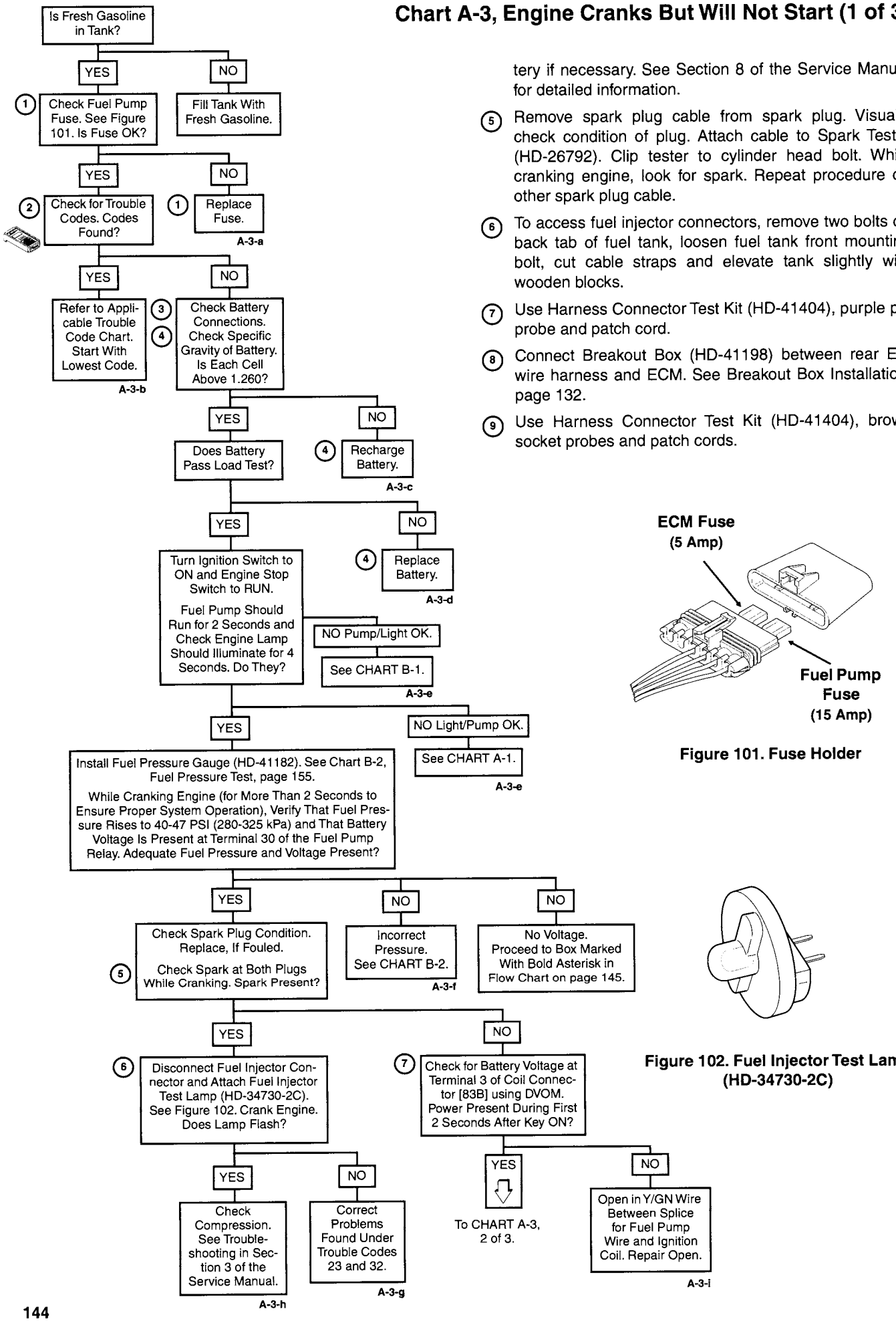
(3) See Seat, Removal in Section 2 of the Service Manual.

(4) Check the condition of the battery. Perform a hydrometer test and recharge if any cell is below 1.260. Check battery connections and perform load test. Replace the bat-



Circuit Diagram

Chart A-3, Engine Cranks But Will Not Start (1 of 3)



tery if necessary. See Section 8 of the Service Manual for detailed information.

5. Remove spark plug cable from spark plug. Visually check condition of plug. Attach cable to Spark Tester (HD-26792). Clip tester to cylinder head bolt. While cranking engine, look for spark. Repeat procedure on other spark plug cable.
6. To access fuel injector connectors, remove two bolts on back tab of fuel tank, loosen fuel tank front mounting bolt, cut cable straps and elevate tank slightly with wooden blocks.
7. Use Harness Connector Test Kit (HD-41404), purple pin probe and patch cord.
8. Connect Breakout Box (HD-41198) between rear EFI wire harness and ECM. See Breakout Box Installation, page 132.
9. Use Harness Connector Test Kit (HD-41404), brown socket probes and patch cords.

Figure 101. Fuse Holder

Figure 102. Fuel Injector Test Lamp (HD-34730-2C)

Chart A-3, Engine Cranks But Will Not Start (2 of 3)

From CHART A-3, 1 of 3.

YES

Install Coil Test Lamp (HD-41402). See Figure 103. Do Coil Test Lights Flash While Cranking Engine?

YES

Faulty Coil Connection, Spark Plug Wires or Coil.

Proceed as follows:

- Check Coil Connections.
- Test Spark Plug Cable Resistance. See Chart C-2, Spark Plug Cable Resistance Test, page 160.
- Check Coil by Substituting One Known To Be Good

OR

Check Coil Resistance. See Troubleshooting, page 177.

A-3-j

NO

(8) (7) Measure Resistance Between Ignition Coil Terminal 2 [83B] and ECM Pin 1 on Breakout Box, and Between Ignition Coil Terminal 1 [83B] and ECM Pin 19 on Breakout Box. Resistance Should be Less than 0.5 Ohm. Is it?

YES

* No Input Signals from Crank Position Sensor or Cam Position Sensor.

YES

Connect DVOM to ECM Pins 11 and 28 on Breakout Box and Set It for AC Volts. Crank Engine. Meter Should Read 1 VAC Minimum. Does it?

YES

To CHART A-3, 3 of 3.

NO

(9) Disconnect Connector [79] and Repeat Test on Terminals 1 and 2 on Connector [79A]. Meter Should Read 1 VAC Minimum. Does It?

YES

(10) Replace Crank Position Harness Connector (Service Harness Available).

A-3-l

NO

With Meter Still Connected, Check for Resistance. Should be Between 510-850 Ohms. Is it?

YES

Loose Sensor at Crankcase.

A-3-m

NO

(11) Replace Crank Position Sensor.

A-3-m

NO

Poor Connection at Connector [78] or [81] or Open in Harness Between Coil and ECM. Repair Open.

A-3-k

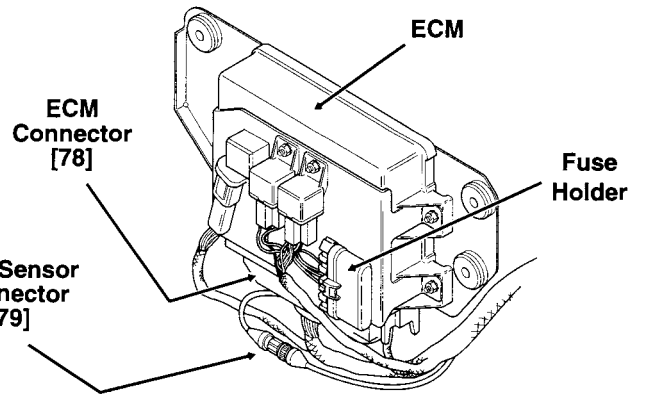


Figure 104. Electrical Bracket Assembly

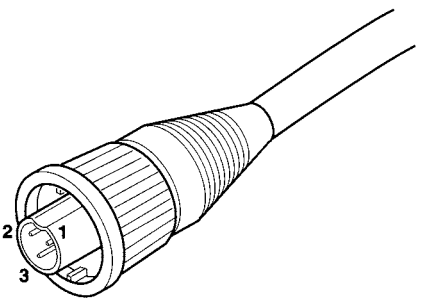


Figure 105. CKP Sensor Connector [79A]

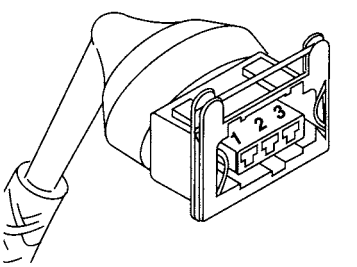


Figure 106. Ignition Coil Connector [83B]

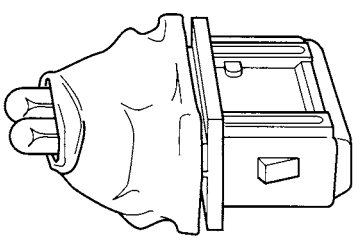


Figure 103. Ignition Coil Test Lamp (HD-41402)

Wire Harness Connectors

No.	Description	Type	Location
[14]	CMP Sensor	3 - Place Deutsch	Bottom Frame Cross Member (Right Side)
[78]	ECM	35 - Place Amp	Under Right Side Cover
[79]	CKP Sensor	3 - Place Conxall	Under Right Side Cover Below Electrical Bracket
[81]	ECM Harness to Sensor Harness	6 - Place Deutsch	Upper Frame Cross Member (Under Seat)
[83]	Ignition Coil	3 - Place Amp	Below Fuel Tank

Chart A-3, Engine Cranks But Will Not Start (3 of 3)

(10) See Crankshaft Position Sensor Harness Connector, Replacement, page 9-89 of the 1996 FLT Service Manual.

(11) See Crankshaft Position Sensor, Removal/Installation, page 9-88 of the 1996 FLT Service Manual.

(12) Use Harness Connector Test Kit (HD-41404), black pin probes and patch cords.

(13) In a no spark situation, the Camshaft Position Sensor (CMP Sensor) may be at fault. The CMP Sensor incorporates a Vehicle Attitude Sensor, which opens the CMP circuit if the vehicle is tipped sideways at an angle greater than 80°. Uprighting the vehicle will reset the CMP Sensor.

(14) See Camshaft Position Sensor, Removal/Installation, page 9-84 of the 1996 FLT Service Manual.

(15) See Electronic Control Module (ECM), Removal/Installation, page 9-81 of the 1996 FLT Service Manual.

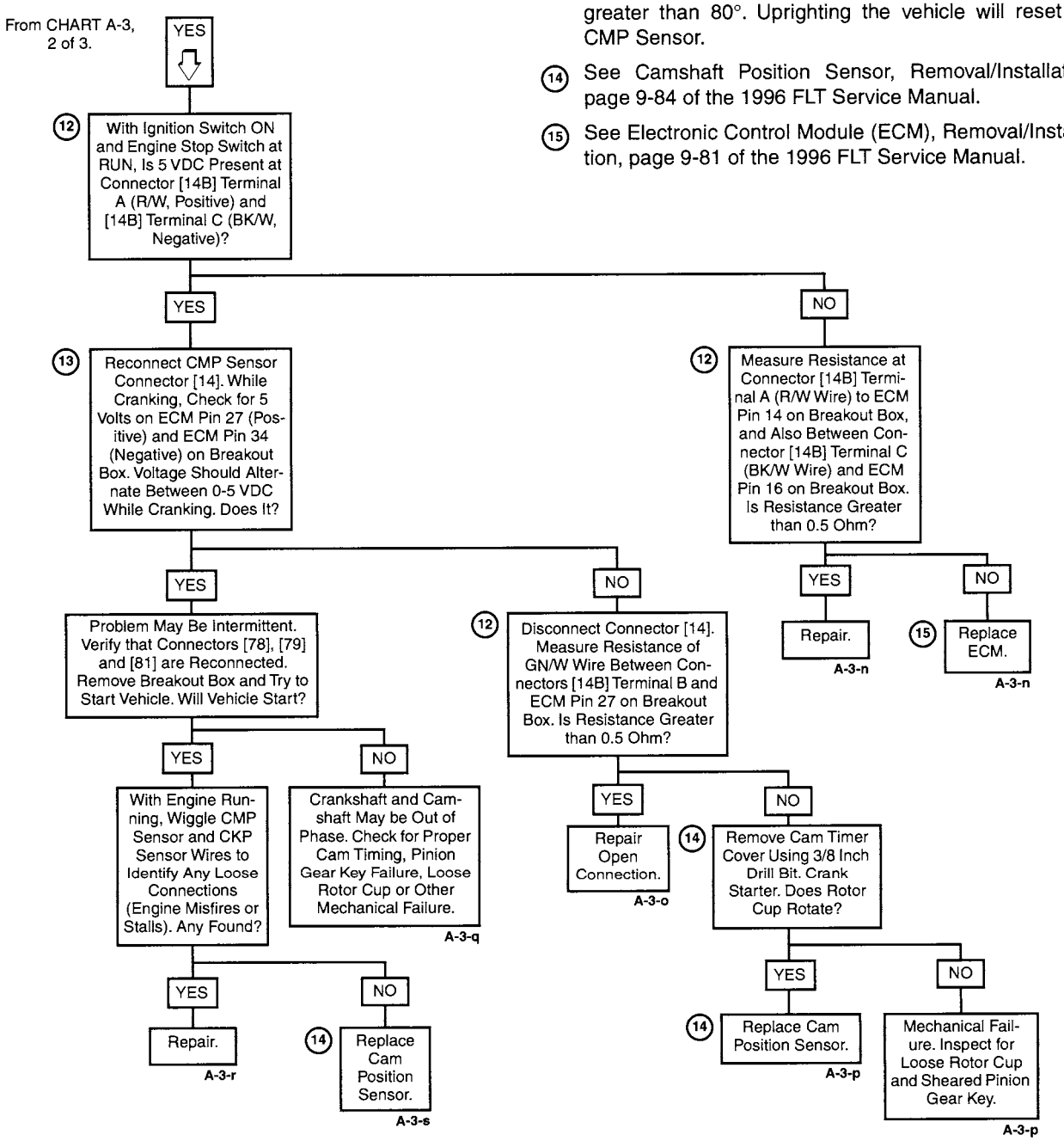


CHART A-4, NO ECM POWER

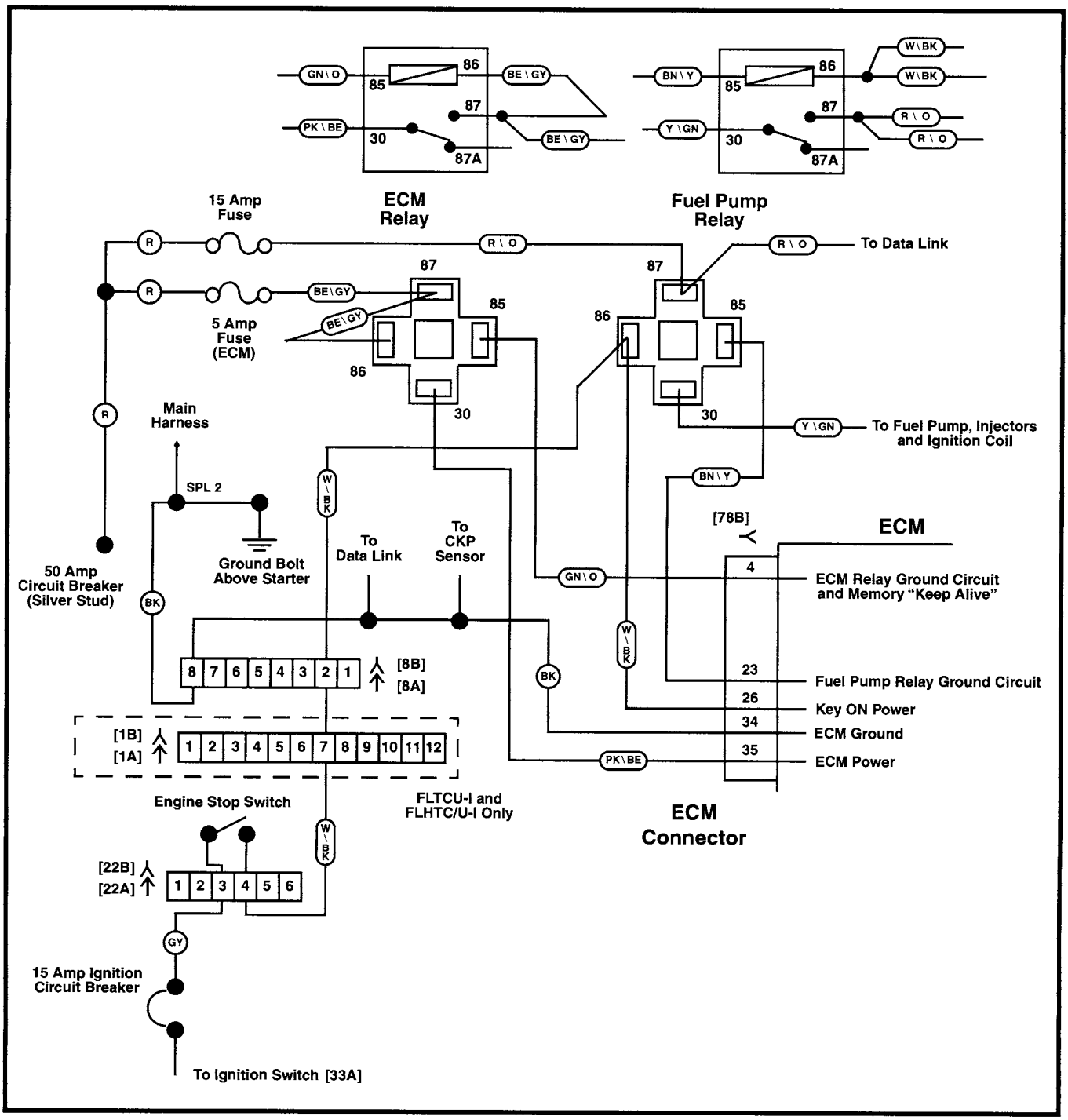
The ECM relay is turned on by grounding terminal 4 inside the ECM. This is done when the ECM sees power at terminal 26. When the Ignition Switch is turned OFF, the ECM keeps the relay latched on for approximately 10 seconds so that the ECM can reset the ISC actuator for the next start sequence. Also, to provide power for ECM RAM, the ECM relay continuously provides a small amount of current to the ECM whenever the Ignition Switch is turned OFF.

DIAGNOSTIC NOTES

The reference numbers which follow correlate with those on the diagnostic flow chart.

① See Fuses, Removal/Installation, page 9-80 of the 1996 FLT Service Manual.

② Connect Breakout Box (HD-41198) between rear EFI wire harness and ECM. See Breakout Box Installation, page 132.

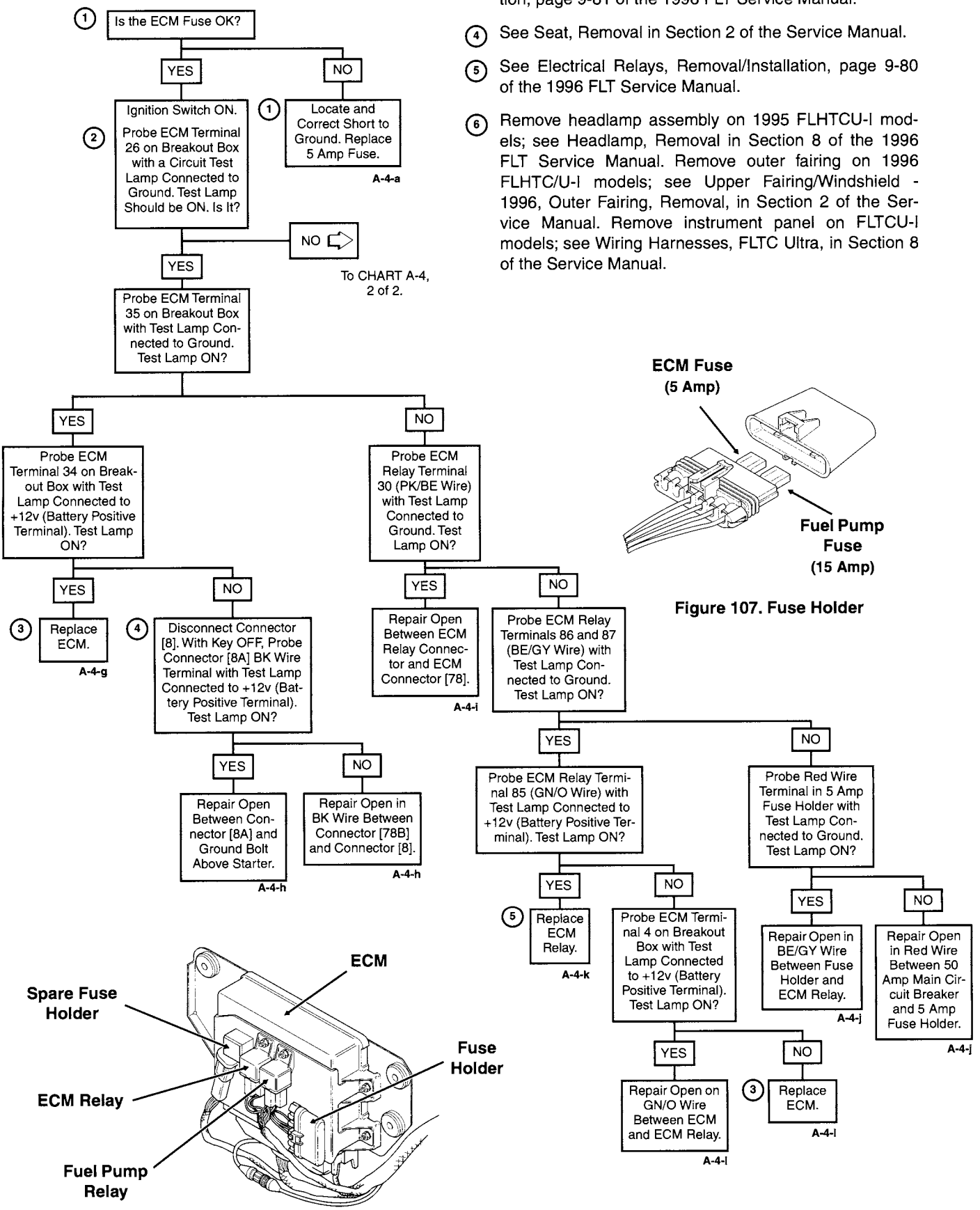


No ECM Power Circuit Diagram

Chart A-4, No ECM Power (1 of 2)

NOTE

With one exception (noted in flow chart), always turn Key ON prior to probing terminals with test lamp.



③ See Electronic Control Module (ECM), Removal/Installation, page 9-81 of the 1996 FLT Service Manual.

④ See Seat, Removal in Section 2 of the Service Manual.

⑤ See Electrical Relays, Removal/Installation, page 9-80 of the 1996 FLT Service Manual.

⑥ Remove headlamp assembly on 1995 FLHTCU-I models; see Headlamp, Removal in Section 8 of the 1996 FLT Service Manual. Remove outer fairing on 1996 FLHTC/U-I models; see Upper Fairing/Windshield - 1996, Outer Fairing, Removal, in Section 2 of the Service Manual. Remove instrument panel on FLTCU-I models; see Wiring Harnesses, FLTC Ultra, in Section 8 of the Service Manual.

Figure 107. Fuse Holder

Figure 108. Electrical Bracket Assembly

Chart A-4, No ECM Power (2 of 2)

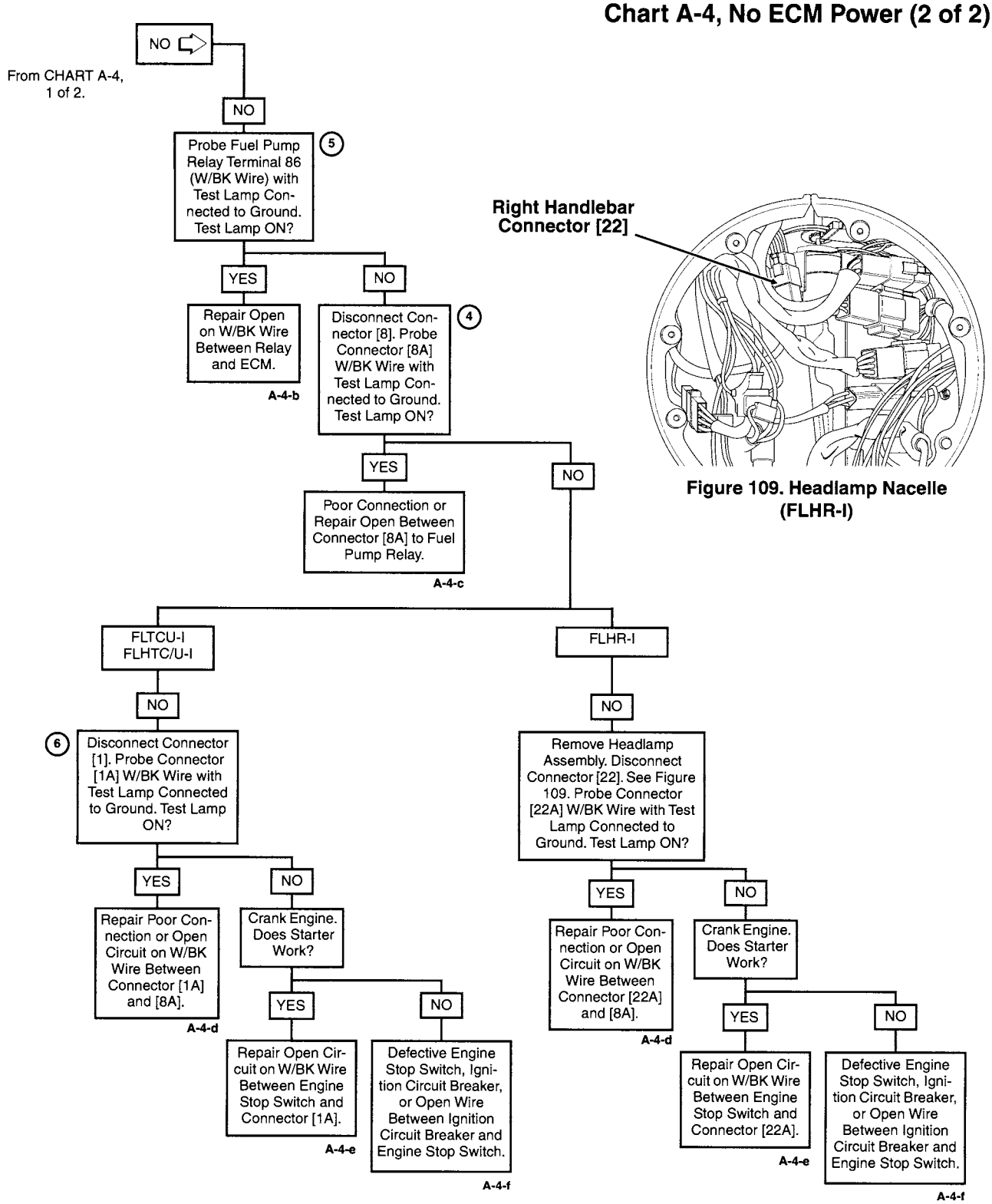


Figure 109. Headlamp Nacelle (FLHR-I)

Wire Harness Connectors

No.	Description	Models	Type	Location
[1]	Main Harness to Interconnect	95 FLHTCU-I	12 - Place Deutsch	Fairing Crossbrace
		96 FLHTC/U-I	12 - Place Deutsch	Inner Fairing - Front of Right Fairing Bracket
		FLTCU-I	12 - Place Deutsch	Instrument Panel Support
[8]	Main Harness to ECM Harness	All	8 - Place Deutsch (Gray)	Upper Frame Cross Member (Under Seat)
[22]	Interconnect to Right Handlebar	FLHR-I	6 - Place Deutsch	Behind Headlamp Assembly
[78]	ECM	All	35 - Place Amp	Under Right Side Cover

CHART B-1, FUEL SYSTEM ELECTRICAL TEST

With the Ignition Switch ON (and the Engine Stop Switch at RUN), the ECM will energize the fuel pump relay to complete the circuit to the in-tank fuel pump. It will remain on as long as the engine is cranking or running, and the ECM is receiving ignition reference pulses. If there are no reference pulses, the ECM will de-energize the fuel pump relay within 2 seconds after ignition is on, or immediately after the engine is stopped.

The fuel pump delivers fuel to the induction module and injectors and then to the pressure regulator, where the system pressure is controlled. Excess fuel flow is bypassed back to the fuel tank. When the engine is stopped, the pump can be turned on by applying battery voltage to the fuel pump connector [86A] or by using the Scanalyzer (see Scanalyzer Notes). The fuel pump connector is located under the seat at the rear of the fuel tank. See Figure 110. Improper fuel system pressure may contribute to one or all of the following symptoms.

- Engine cranks, but won't run.
- Engine cuts out (may feel like ignition problems).
- Hesitation, loss of power and poor fuel economy.

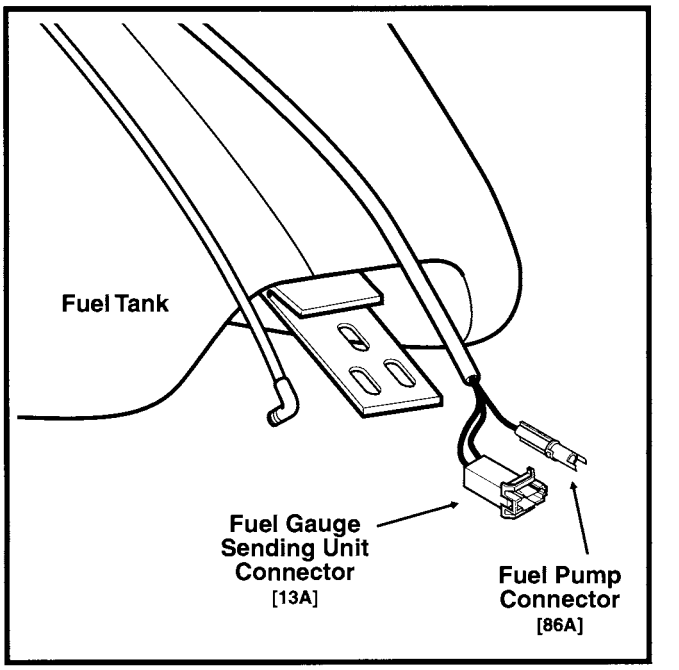


Figure 110. Fuel Pump Connector (FLTCU-I, FLHTC/U-I)

DIAGNOSTIC NOTES

The reference numbers below correlate with those on the diagnostic flow chart.

① See Fuses, Removal, page 9-80 of the 1996 FLT Service Manual. If a fuse is blown, a short to ground is present between the fuse and fuel pump relay, between the fuel pump relay and fuel pump, coil or injectors, or the fuel pump itself may be the cause.

② Locate fuel pump connector and separate pin and socket halves. See Figure 110. Perform test to determine if the fuel pump circuit is being controlled by the ECM. ECM should energize fuel pump relay. Since engine is not cranking or running, ECM should de-energize relay within 2 seconds after ignition is turned on.

③ Turns on fuel pump if wiring is OK. If pump runs, problem is in basic fuel delivery.

④ See Fuel Pump, Removal/Installation, page 9-103 of the 1996 FLT Service Manual.

⑤ This test will determine if short to ground on fuel pump relay circuit caused the fuse to blow. To prevent misdiagnosis, ensure that fuel pump is disconnected before proceeding with test.

⑥ See Electrical Relays, Removal, page 9-80 of the 1996 FLT Service Manual. This test checks for a short to ground in the fuel pump relay harness circuit.

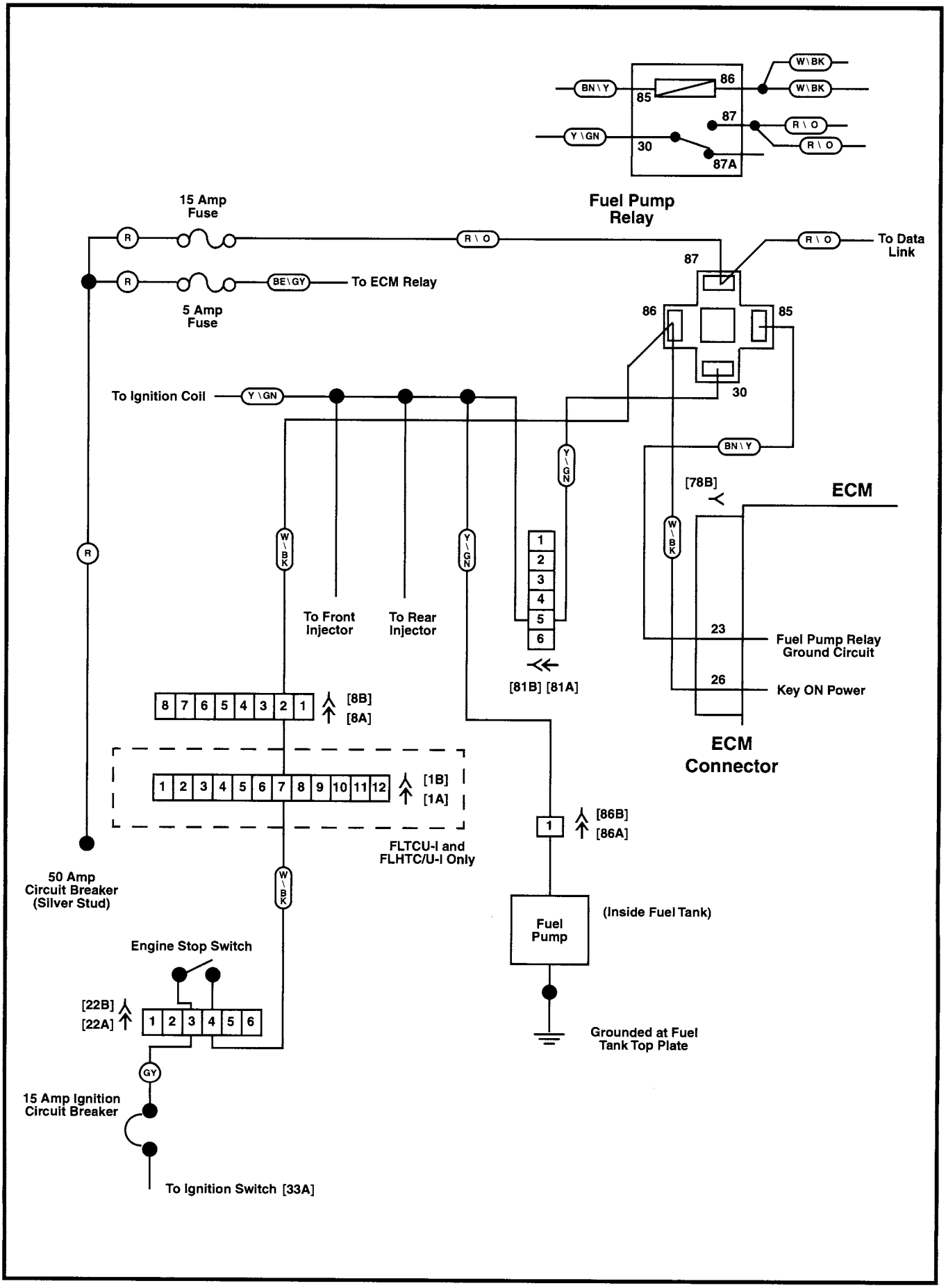
⑦ See Fuel Injectors, Removal/Installation, page 9-117 or Ignition Coil, Removal/Installation, page 9-125 of the 1996 FLT Service Manual.

⑧ See Console Pod/Canopy, Removal, page 9-100 of the 1996 FLT Service Manual, steps 5-9.

SCANALYZER NOTES

*The **Scanalyzer icon** appears at those points in the flow chart where the Scanalyzer may be used. If a number is printed next to the icon, then refer to the **Scanalyzer Notes** which follow.*

1 With the engine off, Scanalyzer (Active Diagnostic Test Mode) can be used to turn fuel pump on for periods up to 30 seconds.



Fuel Pump Circuit Diagram

From CHART A-3 Page 1 of 3, No Pump.

Wire Harness Connectors

No.	Description	Type	Location
[13]	Fuel Gauge Sending Unit	2 - Place Amp	Under Seat
[86]	Fuel Pump	1 - Place Amp	Under Seat

① Inspect Fuel Pump Fuse. See Figure 111. Is Fuse OK?

YES

② Check for 12v at Fuel Pump Connector [86B] During First 2-3 Seconds After Key ON. Is 12v Present?

NO → Go to CHART B-1, 3 of 3.

YES

③
- Apply Battery Voltage to Pump Connector [86A]. See Figure 110.
- Listen at Fuel Tank for Pump Running.
- Is Pump Running?

YES

Check for Corroded Connections or Loose Connectors Between Fuel Pump and Pump Connector [86A].

YES → ④ If All Check Out OK, Replace In-Tank Fuel Pump. B-1-a

NO

With Key OFF, Check for Open Pump Circuit. Connect Ohmmeter Between [86A] (Y/GN Wire) and [13A] (BK Wire). Meter Should Read Continuity. Does It?

NO

④ Remove Fuel Pump. Check for Continuity Across Fuel Pump Terminals. Meter Should Read Continuity. Does It?

YES

Check for Opens in Wiring. B-1-b

NO

④ Replace Fuel Pump. B-1-c

NO

⑤
- Disconnect Fuel Pump Connector [86]. See Figure 110.
- Measure Resistance Between Connector [86A] and Ground. Resistance Should be Greater than 0.8 Ohms. Is It?

YES

⑥ Probe Fuel Pump Relay Connector Terminal 30 with Test Light to 12 Volts. Is Test Light ON?

YES

Disconnect Injectors and Coil. Probe Fuel Pump Relay Terminal 30 With Test Light to 12 Volts. Is Test Light ON?

YES

Y/GN Wire Short to Ground. B-1-e

NO

⑦ Reconnect Connectors One at a Time and Repeat Test With Test Light to Identify Defective Coil or Injector. B-1-f

NO

Probe Fuel Pump Relay Connector Terminal 87 With Test Light to 12 Volts. Is Test Light ON?

YES

R/O Wire Shorted to Ground. B-1-g

NO

Reconnect Fuel Pump Connector [86] and Install New Fuel. Turn Ignition ON, then Recheck Fuse. Is Fuse OK?

YES

⑧ Install Fuel Pressure Gauge. See CHART B-2, Fuel Pressure Test. With Fuel System Intact and Battery Fully Charged, Disconnect Y/GN Wire from Canopy. Connect DVOM from Battery Positive to Pump Spade on Canopy. With the Pump Running, Check Current and Proper System Pressure. Is Current Draw Between 2.5-6.0 Amps? Is System Pressure Between (40-47 PSI).

Current Too High. → Go to CHART B-1, 2 of 3.

Current Too Low. → Check for Supply Line Leak (at Hoses and Filter Connections in Tank) or Poor Electrical Connection (Ground). B-1-h

Incorrect Pressure, Current Draw in Range. → See CHART B-2. B-1-i

NO → Go to CHART B-1, 2 of 3.

NO

④ Pump in Tank or Wiring in Tank is Shorted to Ground. B-1-d

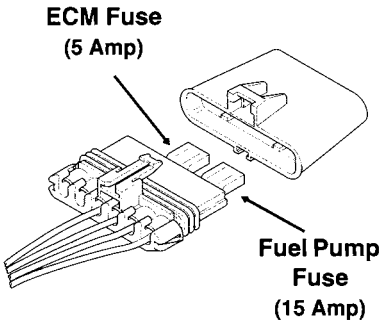


Figure 111. Fuse Holder

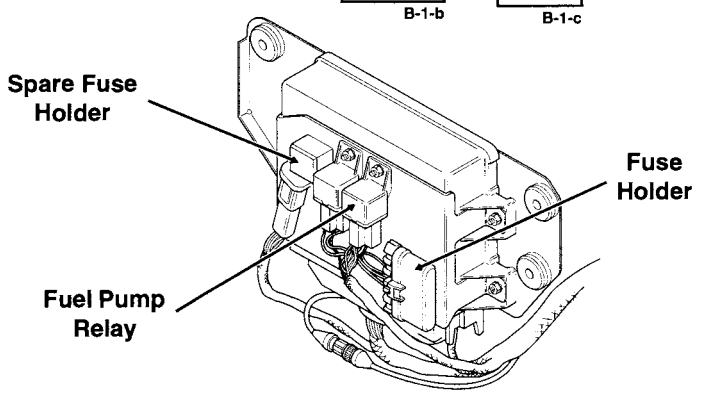


Figure 112. Electrical Bracket Assembly

Chart B-1, Fuel System Electrical Test (2 of 3)

DIAGNOSTIC NOTES (CONT.'D)

The reference numbers below correlate with those on the diagnostic flow chart.

(9) See Fuel Supply/Return Check Valves, Removal/Installation, page 9-105 of the 1996 FLT Service Manual.

(10) See Fuel Supply/Return Lines, Removal/Installation, page 9-115 of the 1996 FLT Service Manual.

(11) See Induction Module, Removal/Installation, page 9-113 of the 1996 FLT Service Manual.

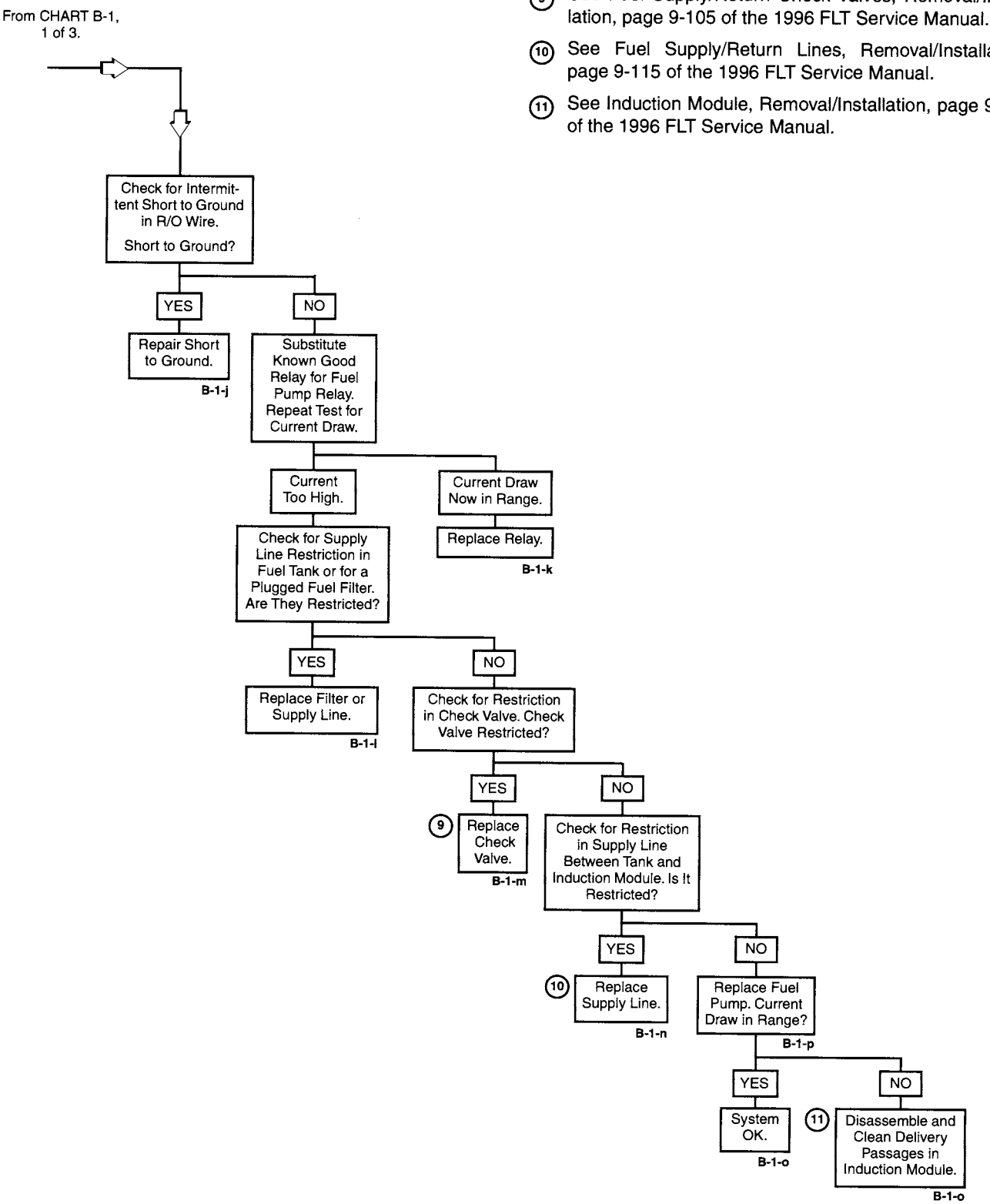


Chart B-1, Fuel System Electrical Test (3 of 3)

When the Ignition Switch is turned ON, the ECM will energize the fuel pump relay, which completes the circuit to the in-tank fuel pump. It will remain on as long as the engine is cranking or running, and the ECM is receiving crank position sensor and cam position sensor inputs. If there are no input signals, the ECM will de-energize the fuel pump relay within 2 seconds after ignition is on, or the engine is stopped.

⚠WARNING

To reduce the risk of vehicle fire and/or personal injury, always relieve fuel system pressure before servicing any fuel system components.

DIAGNOSTIC NOTES (CONT'D)

The reference numbers below correlate with those on the diagnostic flow chart.

⑫ Shake or wiggle harness between fuel pump relay and fuel pump connector [86B] while measuring resistance to detect intermittents.

⑬ Connect Breakout Box (HD-41198) between rear EFI wire harness and ECM. See Breakout Box Installation, page 132.

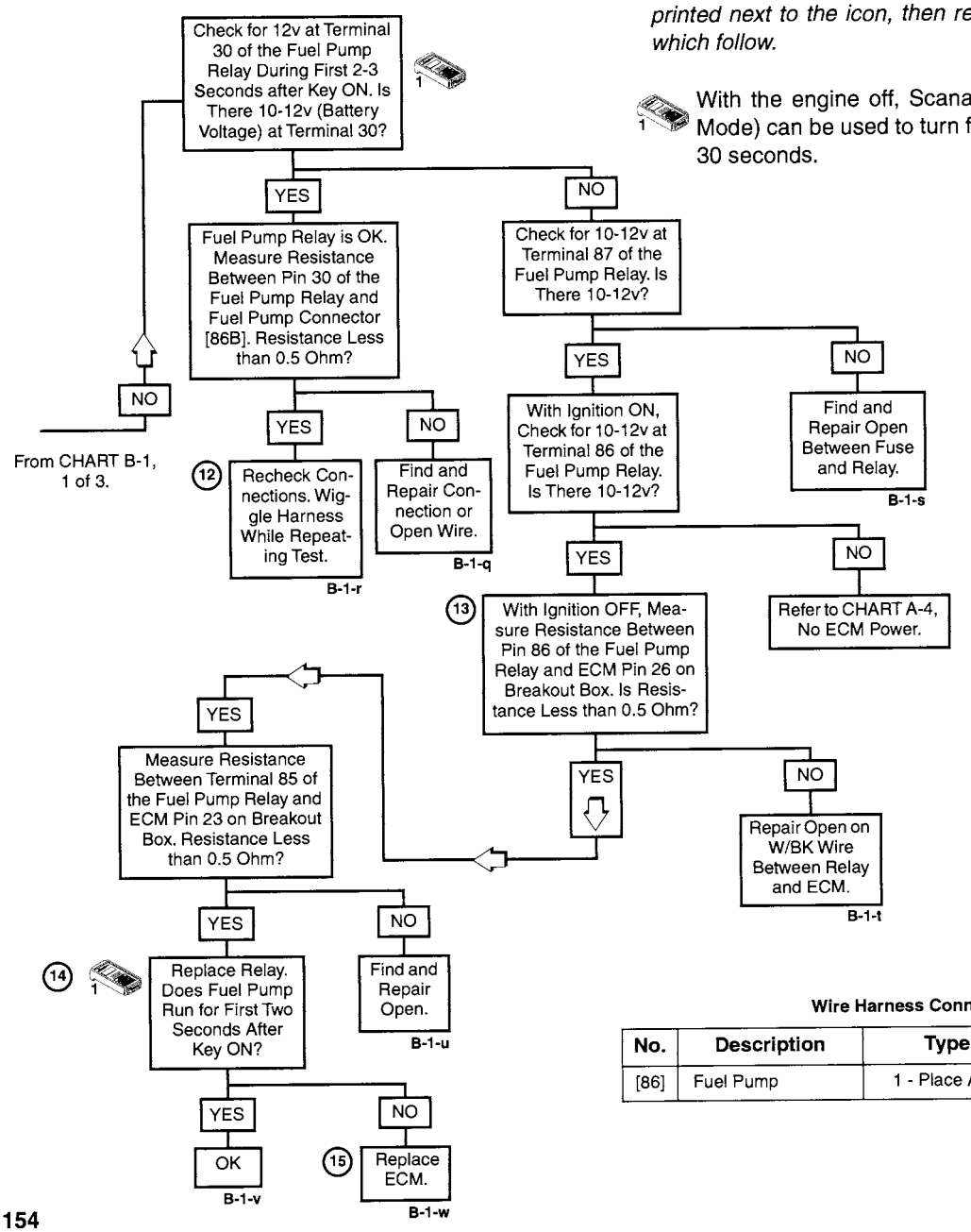
⑭ See Electrical Relays, Removal/Installation, page 9-80 of the 1996 FLT Service Manual.

⑮ See Electronic Control Module (ECM), Removal/Installation, page 9-81 of the 1996 FLT Service Manual.

SCANALYZER NOTES

*The **Scanalyzer icon** appears at those points in the flow chart where the Scanalyzer may be used. If a number is printed next to the icon, then refer to the **Scanalyzer Notes** which follow.*

1 With the engine off, Scanalyzer (Active Diagnostic Test Mode) can be used to turn fuel pump on for periods up to 30 seconds.



Wire Harness Connectors

No.	Description	Type	Location
[86]	Fuel Pump	1 - Place Amp	Under Seat

CHART B-2, FUEL PRESSURE TEST

GENERAL

The fuel pump delivers fuel to the fuel line, to a cavity in the induction module that supplies the fuel injectors and to the pressure regulator, where the system pressure is controlled. Excess fuel pressure is bypassed back to the fuel tank through the return line. The fuel pump wire harness connector [86] is located under the seat behind the fuel tank. See Figure 113. The fuel pump can be turned on with the Scanalyzer or by applying battery voltage to the connector [86].

Improper fuel system pressure may contribute to one of the following conditions:

- Cranks, but won't run.
- Cuts out (may feel like ignition problem).
- Hesitation, loss of power or poor fuel economy.

Fuel Pressure Test

The fuel pressure gauge (0-100 PSI) allows for fuel injector and fuel system pressure diagnosis. A special adapter allows the gauge to be attached to the external fuel supply line. Check the fuel system pressure as follows:

1. Remove the seat. See SEAT, REMOVAL in Section 2 of the Service Manual.

⚠WARNING

The gasoline in the fuel supply line downstream of the fuel pump is under high pressure (43.5 psi). To avoid an uncontrolled discharge or spray of gasoline, always purge the system of high pressure gas before removing the plug in the supply line fitting. Inadequate safety precautions may result in personal injury and/or property damage.

2. Purge the fuel supply line of high pressure gas as follows:

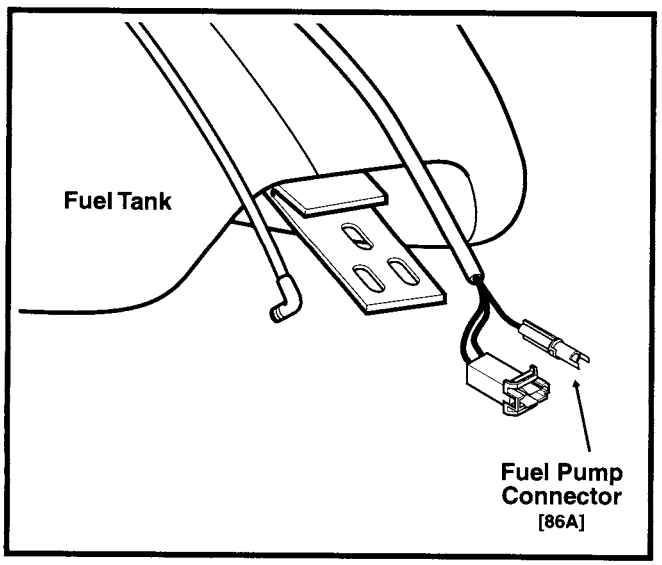


Figure 113. Fuel Pump Connector

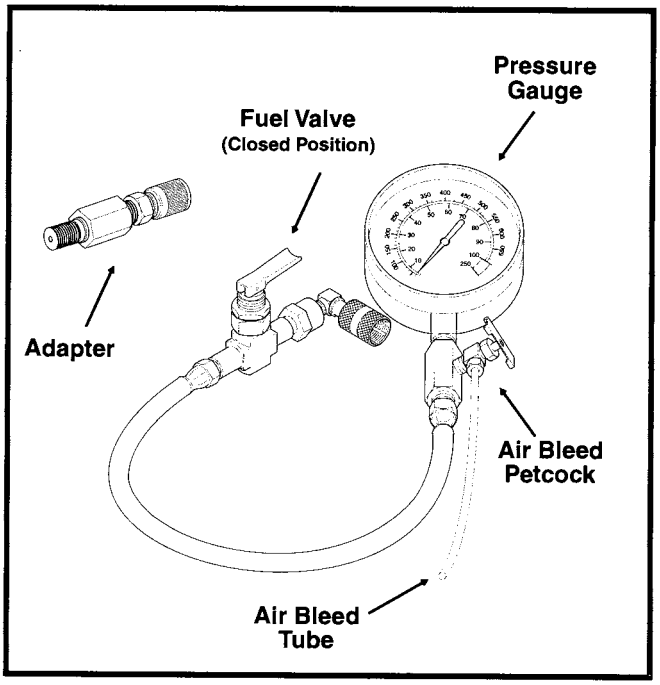


Figure 114. Fuel Pressure Gauge (HD-41182) with Adapter (HD-41182-1)

a. Disconnect the fuel pump connector [86] from the main wiring harness. Locate the black one-place electrical connector in front of the battery. Pull both external latches outward to separate pin and socket halves. See Figure 113.

b. Start the engine and allow the vehicle to run.

c. When the engine stalls, operate the starter for 3 seconds to remove any remaining fuel from the fuel lines.

3. Wrap a shop towel around the fuel supply line fitting (left side of vehicle).

⚠WARNING

A small amount of gasoline will drain from the fitting when the plug is removed. Thoroughly wipe up any spilt fuel immediately. Dispose of rags in a suitable manner. Gasoline is extremely flammable and highly explosive. Inadequate safety precautions may result in personal injury and/or property damage.

4. Position a beaker below the fitting. Holding the hex on the fitting with an open end wrench, use a 5/32 inch allen wrench to remove the plug.

5. Thread the Fuel Pressure Gauge Adapter (HD-41182-1) into the fitting. See Figure 114. Hold the hex on the fuel tank fitting while tightening the adapter.

6. Verify that the fuel valve and air bleed petcock on the Fuel Pressure Gauge (HD-41182) are closed.

⚠WARNING

A small amount of gasoline will drain from the adapter when the gauge is installed. Thoroughly wipe up any spilt fuel immediately. Dispose of rags in a suitable manner. Inadequate safety precautions may result in personal injury and/or property damage.

7. Remove the protective cap from the free end of the adapter. Thread the Fuel Pressure Gauge (HD-41182) onto the adapter.
8. Locate the one-place electrical connector [86] in front of the battery. Press the pin and socket halves together to connect the fuel pump to the main wiring harness.
9. Start and idle engine to pressurize the fuel system. Open the fuel valve to allow the flow of fuel down the hose of the pressure gauge. See Figure 114.
10. Position the clear tube in the beaker and open and close the air bleed petcock to purge the gauge and hose of air. Repeat this step several times until only solid fuel (without bubbles) flows from the air bleed tube. Close the petcock.
11. Open throttle and rev engine. Note the reading of the pressure gauge. Fuel pressure should remain steady at 40-47 psi (280-325 kPa).
12. Turn the engine off. Open the air bleed petcock to relieve the fuel system pressure and purge the pressure gauge of gasoline.
13. Remove the pressure gauge from the adapter.

⚠WARNING

A small amount of gasoline will drain from the fitting when the adapter is removed. Thoroughly wipe up any spilt fuel immediately. Dispose of rags in a suitable manner. Inadequate safety precautions may result in personal injury and/or property damage.

14. Holding the hex on the fuel tank fitting with an open end wrench, remove the adapter.
15. Apply a small amount of Hylomar or Liquid Teflon Pipe Sealant on the threads of the allen plug and install.
16. Install the seat. See SEAT, INSTALLATION in Section 2 of the Service Manual.

DIAGNOSTIC NOTES

The reference numbers below correlate with those on the diagnostic flow chart.

① See Fuel Pressure Test on page 155.

② The application of 12-14 inches Hg vacuum to the pressure regulator should result in reduced fuel pressure. To facilitate installation of the Vacuum Pump (HD-23738A), first install a 6 inch length of thin-wall vacuum line onto the atmospheric pressure port. See Figure 115.

③ If regulator is faulty, see Fuel Pressure Regulator, Removal/Installation, page 9-117 of the 1996 FLT Service Manual.

④ If fuel system has pressure, but it is less than specification, condition may be caused by one of the following.

- The amount of fuel to the injectors is OK, but pressure is too low. Also, hard starting cold and overall poor performance condition may exist.
- Restricted fuel flow causing pressure drop. Normally, a vehicle with fuel pressure of less than 24 psi (170 kPa) at idle will not be driveable. However, if pressure drop occurs only while driving, engine may surge and lose power as pressure begins to drop rapidly.

⑤ See Fuel Filter Canister, Removal/Installation, page 9-104 of the 1996 FLT Service Manual.

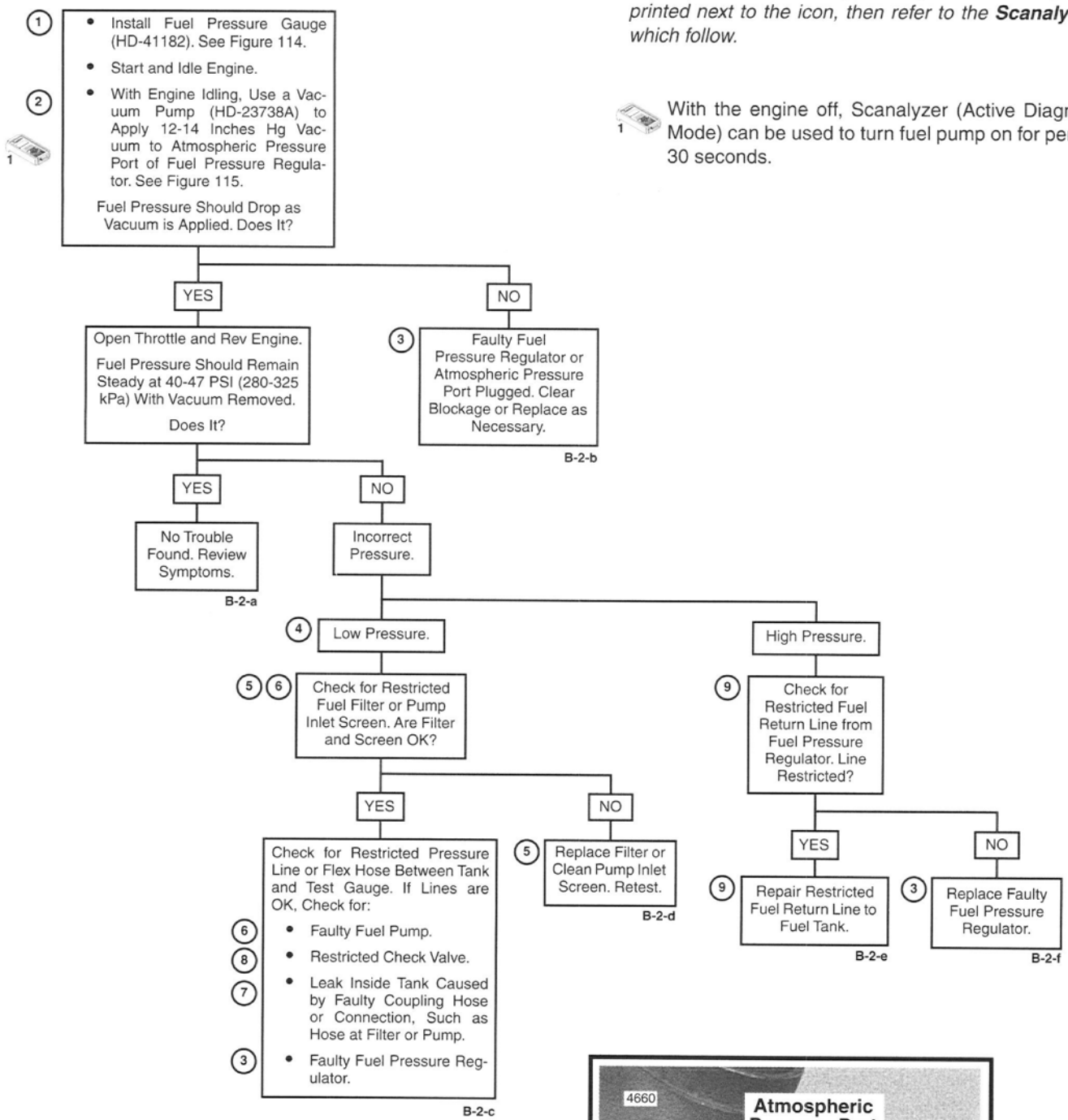
⑥ See Fuel Pump, Removal/Installation, page 9-103 of the 1996 FLT Service Manual.

⑦ This condition may be identified when the fuel level is low and the fuel pump is turned on for the first two seconds after Key On. A metallic ringing sound can be heard as the high pressure fuel is sprayed against the inside wall of the fuel tank.

⑧ See Fuel Supply/Return Check Valves, Removal/Installation, page 9-105 of the 1996 FLT Service Manual.

⑨ See Fuel Supply/Return Lines, Removal/Installation, page 9-115 of the 1996 FLT Service Manual.

Chart B-2, Fuel Pressure Test



SCANALYZER NOTES

*The **Scanalyzer icon** appears at those points in the flow chart where the Scanalyzer may be used. If a number is printed next to the icon, then refer to the **Scanalyzer Notes** which follow.*

1 With the engine off, Scanalyzer (Active Diagnostic Test Mode) can be used to turn fuel pump on for periods up to 30 seconds.

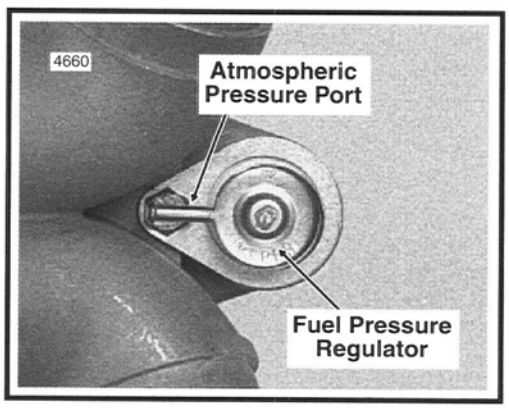


Figure 115. Induction Module (Bottom View)

CHART C-1, IDLE SPEED CONTROL

NOTE

Warm idle speed is controlled by a set screw. See Warm-Slow Idle Speed Adjustment procedure under Section 9C-4, Air Cleaner Assembly.

The ECM will control cold engine idle speed by moving the idle speed control lever to open or close the throttle plate. It does this by sending voltage pulses to the proper motor winding of the ISC actuator. This will cause the actuator shaft to move in or out of the actuator a given distance for each pulse received. The ISC position is measured in counts. This can be monitored on the Data Monitor Display of the Scanalyzer. A high number of counts is a fully extended pintel (high air flow), zero counts is a fully retracted pintel (minimal airflow). To increase idle speed, the ECM will send a signal to extend the throttle lever and allow more air to flow through the manifold. This will increase the ISC counts. To decrease idle speed the ECM will send a signal to retract the throttle lever to reduce airflow through the manifold. This will reduce the ISC counts to zero once the vehicle warms up.

Each time the ignition is turned on and then the ignition is turned off, the ECM will reset the ISC actuator. This is done by sending enough pulses to retract the throttle lever to the warm-idle position (zero counts). The fully retracted value is the ECM reference zero. A given number of counts are then calculated by the ECM. This is how the ECM knows what the actuator position is for a given temperature to obtain a proper idle speed.

DIAGNOSTIC NOTES

The reference numbers below correlate with those on the diagnostic chart.

① See Air Cleaner, Removal, page 9-109 of the 1996 FLT Service Manual.

② When the engine is stopped, the ISC actuator retracts and then extends to a fixed "Park" position for increased airflow and idle speed during the next engine start sequence. This Key OFF reset procedure takes 8-10 seconds to perform.

③ See Warm-Slow Idle Speed Adjustment, page 9-110 of the 1996 FLT Service Manual.

④ At Key On, test lights will alternately flash and then remain steady on to confirm ECM signals. At Key Off, lights alternately flash and go out.

⑤ Connect Breakout Box (HD-41198) to rear EFI wire harness **only** (leave ECM disconnected). See Breakout Box Installation, page 132.

⑥ Use Harness Connector Test Kit (HD-41404), gray pin probe and patch cord.

⑦ Turn the Ignition ON and then OFF while placing a finger on the relay. An audible click will be heard or a sensation felt when the relay shuts off.

⑧ Repair faulty ECM connection or replace ECM. If ECM requires replacement, see Electronic Control Module (ECM), Removal/Installation, page 9-81 of the 1996 FLT Service Manual.

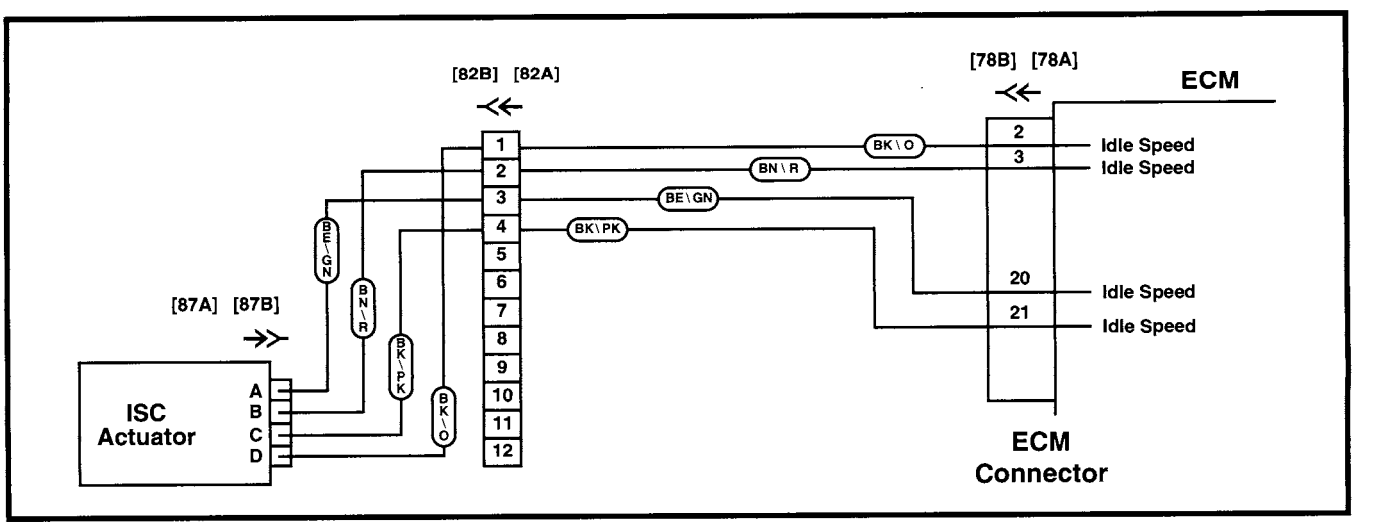
⑨ There is a remote possibility that one of the circuits is shorted to voltage which would have been indicated by a steady light. Disconnect ECM and turn the ignition on. Probe terminals to check for this condition.

⑩ Repair faulty connection or replace ISC actuator. If actuator requires replacement, see Idle Speed Control Actuator, Removal/Installation, page 9-118 of the 1996 FLT Service Manual.

DIAGNOSTIC TIPS

Engine idle speed can be adversely affected by the following:

- Leaking injectors will cause fuel imbalance and poor idle quality due to different air/fuel ratios in each cylinder. (To check for leaky injectors, first remove the air cleaner. See Air Cleaner, Removal, page 9-109 of the 1996 FLT Service Manual. Then, with the throttle wide open, turn Key ON for 2 seconds and then OFF for 2 seconds five consecutive times. Replace the fuel injector if there is any evidence of raw fuel in the bores. See Fuel Injectors, Removal/Installation, page 9-117 of the 1996 FLT Service Manual.)
- Vacuum leaks can affect idle. (To check for vacuum leaks, spray water around the Induction Module seals while idling the engine. If RPM changes, replace seals.)
- Contaminated fuel can adversely affect idle.



Circuit Diagram

Chart C-1, Idle Speed Control

1. • Remove Air Cleaner and Backplate Assembly.
   • Engine Idling at Normal Operating Temperature.
   • Monitor ISC Actuator and Throttle Lever for 10 Seconds After You Turn Ignition OFF.
2. Does Actuator Retract and then Extend During 8-10 Second Key OFF Reset Procedure?

YES

3. Inspect Mechanical Linkage and Refer to Idle Adjustment Procedure.

C-1-a

NO

4. • Disconnect ISC Actuator and Connect Test Lamp (HD-41199-3) to ISC Connector [87B]. See Figure 117.
   • Turn Ignition Switch ON for 2 Seconds, then Turn Ignition Switch OFF.

One Or More Lights Out.

Remove Test Lamp (HD-41199-3).

5. Connect Breakout Box (HD-41198) to Connector [78B] Leaving ECM Disconnected.
6. Using DVOM, Measure Resistance Between Connector [87B] and Breakout Box:

ISC Connector	Wire Color	ECM Terminal
A	(BE/GN)	to 20
B	(BN/R)	to 3
C	(BK/PK)	to 21
D	(BK/O)	to 2

Each Wire Should be Less than 0.5 Ohms. Is It?

YES

6. Turn Ignition ON. With ECM Still Disconnected, Check for Voltage on All Terminals at Connector [87B]. Is Voltage Present?

YES

Repair Short to Voltage.

C-1-d

NO

6. Turn Ignition OFF. Measure Resistance Between each Terminal on Connector [87B] and Ground. Resistance Should be Greater than 1 Megohm. Is it?

YES

7. Remove Breakout Box and Connect ECM to Rear EFI Harness. Check ECM Relay. Should be ON for 10 Seconds after Key OFF. Is it?

YES

8. Faulty ECM Connector or ECM.

C-1-f

NO

Refer to CHART A-4, ECM Relay.

C-1-f

NO

Repair Short to Ground.

C-1-e

NO

Repair Poor Connection at Connectors [87B], [82] or [78B], or Open Wire in Harness.

C-1-c

9. Lights Alternately Flash then Remain Steady after Key ON or Go Out During 8-10 Second Key OFF Reset Procedure (Normal).

NOTE
Color of lights is not important.

10. Faulty ISC Connection or ISC Actuator.

C-1-b

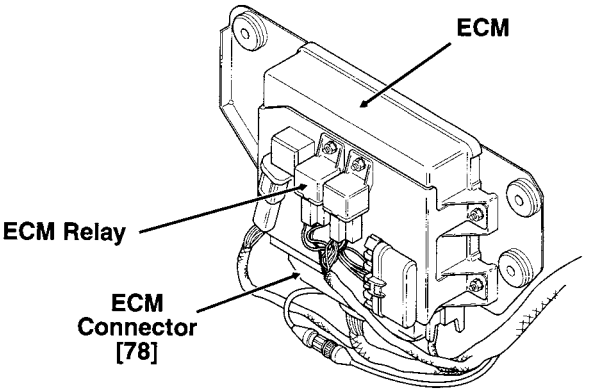


Figure 116. Electrical Bracket Assembly

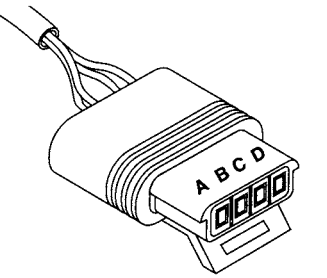


Figure 118. ISC Actuator Connector [87B]

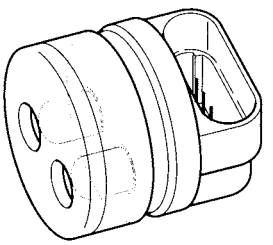


Figure 117. ISC Actuator Test Lamp (HD-41199-3)

Wire Harness Connectors

No.	Description	Type	Location
[78]	ECM	35 - Place Amp	Under Right Side Cover
[82]	ECM Harness to Sensor Harness	12 - Place Deutsch	Upper Frame Cross Member (Under Seat)
[87]	ISC Actuator	4 - Place Packard	Below Fuel Tank

CHART C-2, MISFIRE AT IDLE OR UNDER LOAD

GENERAL

Battery condition and connections may also cause misfires. See Battery in Section 8 of the Service Manual for more information.

DIAGNOSTIC NOTES

The reference numbers below correlate with those on the diagnostic flow chart.

⚠WARNING

Any open spark around gasoline or other combustibles may result in fire or explosion causing personal injury and/or property damage. Thoroughly wipe up any spilt fuel and dispose of rags in a suitable manner.

① A Spark Tester (HD-26792) must be used to verify adequate available secondary voltage at the spark plug (25,000 volts). Remove spark plug cable from spark plug. Visually check condition of plug. Attach cable to Spark Tester (HD-26792). Clip tester to cylinder head bolt. While cranking engine, look for spark. Repeat procedure on other spark plug cable.

② **SPARK PLUG CABLE RESISTANCE TEST:** Remove spark plug cable from spark plug and ignition coil. Using an ohmmeter, touch probes to terminals on each end of plug wire. Resistance must be 1625-3790 ohms for 6.5 inch (165 mm) cable and 4750-11083 ohms for 19 inch (483 mm) cable. Reinstall and repeat on other cable. For best results, use a needle nose pliers for removal and installation on coil. Gently grasp cable as close to terminals as possible.

③ If carbon tracking is evident, replace the ignition coil and be sure spark plug wire to that coil is clean and tight. Excessive wire resistance or faulty connections can cause coil damage. See Ignition Coil, Removal/Installation, page 9-125 of the 1996 FLT Service Manual.

④ If the misfire condition follows the suspected coil, then the coil is faulty. See Ignition Coil, Removal/Installation, page 9-125 of the 1996 FLT Service Manual. This test can also be performed by substituting a known good coil for the one causing the no spark condition. The coil does not require full installation to be functional. Verify faulty coil by performing resistance test (see Troubleshooting, page 177).

⑤ Use Harness Connector Test Kit (HD-41404), red pin probe and patch cord to relay and a purple pin probe and patch cord to the coil connector [83B].

NOTE

Fuel system problems may also cause misfires. Refer to CHART B-2. If fuel pressure is within range, see SYMPTOMS chart on page 137.

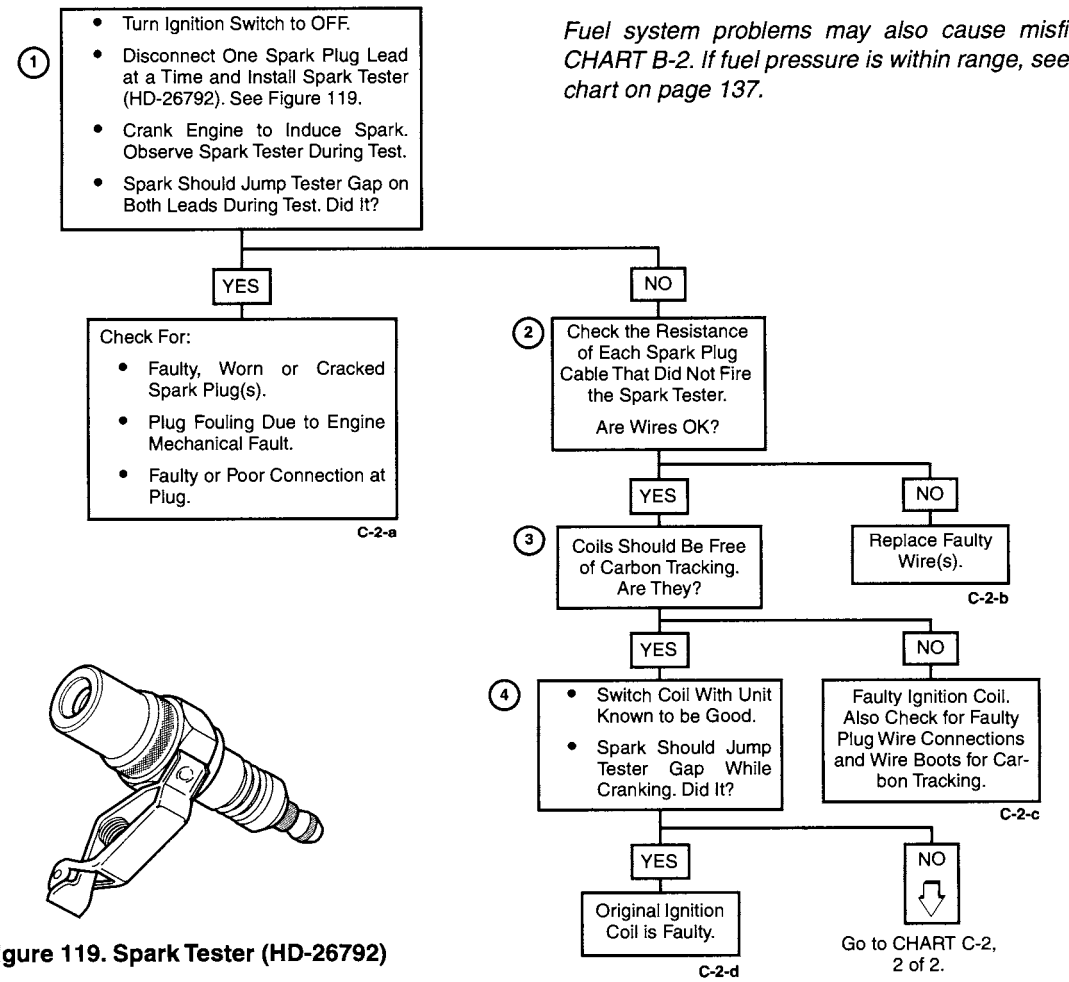


Figure 119. Spark Tester (HD-26792)

From CHART C-2, 1 of 2.

Chart C-2, Misfire At Idle Or Under Load (2 of 2)

Wire Harness Connectors

No.	Description	Type	Location
[83]	Ignition Coil	3 - Place Amp	Below Fuel Tank

NO

(5) Measure Resistance Between Relay Terminal 30 and Coil Connector [83B] Terminal 3 (Y/GN Wire). Wiggle Harness. Resistance Should Be Less Than 0.5 Ohms Continuously. Is It?

YES → Reassemble Coil and Fuel Tank. Measure Voltage Drop Between Battery (Positive Lead) and Terminal 30 (Negative Lead) on Fuel Pump Relay With Engine Running. Voltage Drop Should Be Less Than 1 Volt. Is It?

YES → Problem Fuel Related. Refer to Diagnostic Symptoms on page 137. C-2-f

NO → ⇩

NO → Find Source of Intermittent and Repair. C-2-e

NO → Repeat Voltage Drop Test After Moving Negative Lead to Terminal 87. With Engine Running, Voltage Drop Should Be Less Than 1 Volt. Is It?

YES → Replace Fuel Pump Relay. C-2-g

NO → Repeat Voltage Drop Test After Moving Negative Lead to 15 Amp Fuse (R/O Wire). With Engine Running, Voltage Drop Should Be Less Than 1 Volt. Is It?

YES → Repair R/O Wire. C-2-g

NO → Repeat Voltage Drop Test After Moving Negative Lead to 15 Amp Fuse (Red Wire). With Engine Running, Voltage Drop Should Be Less Than 1 Volt. Is It?

YES → Replace 15 Amp Fuse. C-2-g

NO → ⇩

NO → Repeat Voltage Drop Test After Moving Negative Lead to 50 Amp Circuit Breaker (Silver Post). With Engine Running, Voltage Drop Should Be Less Than 1 Volt. Is It?

YES → Check Terminal or Repair Wire. C-2-g

NO → Repeat Voltage Drop Test After Moving Negative Lead to 50 Amp Circuit Breaker (Copper Post). With Engine Running, Voltage Drop Should Be Less Than 1 Volt. Is It?

YES → Check Terminal or Replace Circuit Breaker. C-2-g

NO → Repeat Voltage Drop Test After Moving Negative Lead to Wire Between Main Circuit Breaker and Starter Motor. With Engine Running, Voltage Drop Should Be Less Than 1 Volt. Is It?

YES → Repair Wire Between Main Circuit Breaker and Starter Motor. C-2-g

NO → Repair or Replace Battery Cable. C-2-g

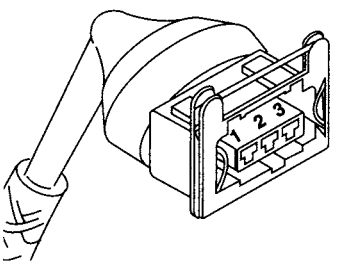


Figure 120. Ignition Coil Connector [83B]

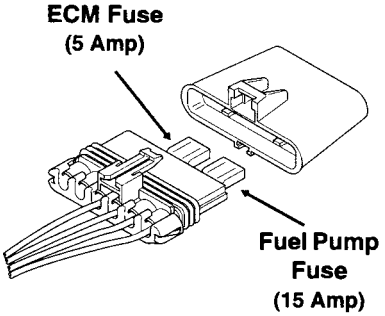


Figure 121. Fuse Holder

TROUBLE CODE 11, THROTTLE POSITION SENSOR

GENERAL

The Throttle Position Sensor (TP Sensor) is supplied 5 volts from the ECM (5v REF) and sends a signal back to the ECM (TP Sensor Signal) which varies according to throttle position. The output signal from the TP Sensor varies from 0.2-0.4 volts at idle (closed throttle) to 4.6-4.9 volts at wide open throttle. A Code 11 will set if the TP Sensor signal voltage does not fall within the acceptable range.

DIAGNOSTIC TIPS

The Scanalyzer or DVOM reads throttle position in volts (the Scanalyzer can also read throttle position as a percentage of throttle opening). Voltage should increase at a steady rate as throttle is moved from idle to wide open throttle. An open or short to ground in R/W or GY/V wires will also result in a Code 11. A short to ground on R/W wire (5v REF) will set multiple codes.

Check for the following conditions:

- Poor Connection - Inspect ECM harness connectors [78B] and [82] for backed out terminals, improper mating, broken locks, improperly formed or damaged terminals, poor terminal-to-wire connection and damaged harness.
- Perform Wiggle Test to Locate Intermittents - If connections and harness check out OK, monitor TP Sensor voltage using a Scanalyzer or DVOM while moving related connectors and wiring harness. If the failure is induced, the TP Sensor display will change.
- TP Sensor Scaling - Observe the TP Sensor voltage display while opening the throttle with engine stopped and Ignition Switch ON. Display should vary from closed throttle TP Sensor voltage (when throttle is closed) to greater than 4.5 volts (when throttle is held wide open). As the throttle is slowly moved, the voltage should change gradually without spikes or low voltages being observed.

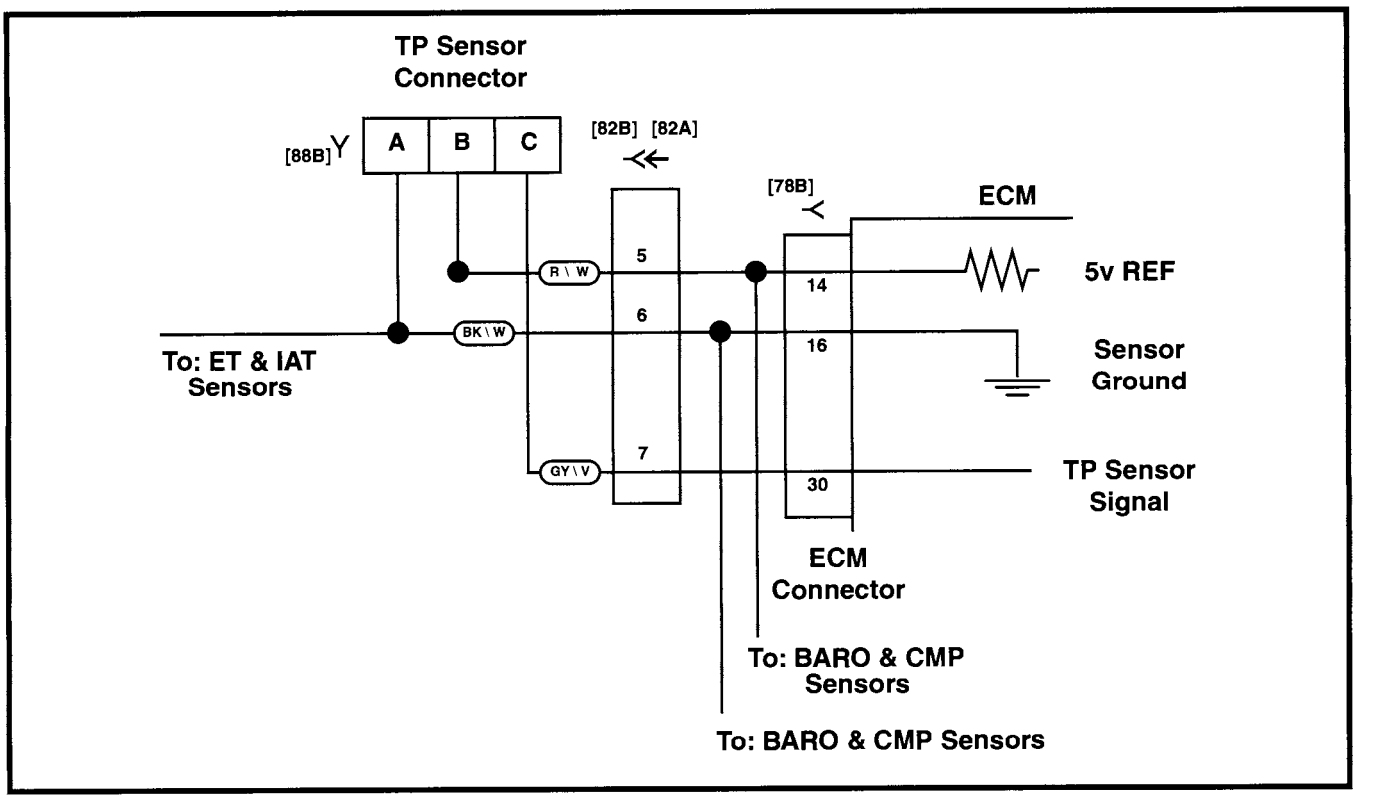
DIAGNOSTIC NOTES

The reference numbers below correlate with those on the diagnostic flow chart.

(1) Connect Breakout Box (HD-41198) between rear EFI wire harness and ECM. See Breakout Box Installation, page 132.

(2) See Electronic Control Module (ECM), Removal/Installation, page 9-81 of the 1996 FLT Service Manual.

(3) Shake or wiggle harness with DVOM or Scanalyzer connected. Radical voltage changes on the DVOM will indicate the presence of intermittents, while the Scanalyzer (in Wiggle Test Mode) will beep, light the four corner LEDs and display a minus sign when a current trouble code is detected. (If a current trouble code is present when the wiggle test is entered, the Scanalyzer will respond as described immediately upon entering the wiggle test mode. With Key On and engine off, clear trouble codes and then perform wiggle test with vehicle running.)



Throttle Position Sensor Circuit Diagram

NOTE

*The **Scanalyzer icon** appears at those points in the flow chart where the Scanalyzer may be used.*

(1) With Ignition Switch ON, Gradually Open Throttle While Observing Voltage (Using DVOM) Across Pin 30 (+) and Pin 16 (-) on Breakout Box or Observe Scanalyzer Voltage Values (Data Monitor Mode).

Does Voltage Steadily Increase with No Spikes or Low Voltages Observed, from 0.2-0.4 Volts at Idle (Closed Throttle) to 4.6-4.95 Volts at Wide Open Throttle?

- YES → Check Engine Lamp ON Continuously and CODE 11 Only One Set?
  - YES → (2) Replace ECM. 11-a
  - NO → With DVOM or Scanalyzer (Wiggle Test Mode) Still Connected, Check for Intermittents by Performing "Wiggle" Test. Radical Voltage Changes or Trouble Code Set While Wiggling Harness Will Indicate the Presence of Intermittents. Intermittent Present?
    - YES → To Identify the Source of Intermittents, Start at Box Marked by Bold Asterisk on Right Side of Flow Chart and Wiggle Harness While Monitoring DVOM. 11-b
    - NO → (4) Replace TP Sensor (Induction Module). Clear Codes if Scanalyzer is Available and Road Test. Did Check Engine Lamp Come On and Set CODE 11?
      - YES → (4) (2) Install Original TP Sensor (Induction Module), Replace ECM and Road Test Again to Verify. 11-c
      - NO → System Now OK. 11-d
- NO * → Voltage Greater Than 4.95 Volts?
  - YES → With Ignition Switch OFF, Disconnect ECM Connector [78B]. Turn Ignition Switch to ON. Is Voltage Greater Than 0 Volts Across Pin 30 and Pin 16 on Breakout Box?
    - YES → Repair Short Between GY/V Signal Wire and 12 Volts. 11-e
    - NO → (5) Measure Resistance Between ECM Pin 30 on Breakout Box and TP Sensor Connector [88B] Terminal C. Is Resistance Less Than 0.5 Ohm?
      - YES → (5) Measure Resistance from TP Sensor Connector [88B] Terminal C to Terminal B. Is Resistance Less Than 1 Megohm?
        - YES → Repair Short Between R/W and GY/V Signal Wire. 11-g
        - NO → (4) Replace TP Sensor (Induction Module). 11-h
      - NO → Repair Open GY/V Signal Wire. 11-f
  - NO → (5) Voltage Low or Spikes Observed... Unplug TP Sensor Connector [88B], Measure Voltage Between Terminal B (+) and A (-) with Ignition ON. Is Voltage 4.8 to 5.0?
    - YES → Check Resistance Between ECM Pin 30 on Breakout Box to Chassis Ground. Is Resistance Greater Than 1 Megohm?
      - YES → (4) Replace TP Sensor (Induction Module). 11-i
      - NO → Find Short to Ground on GY/V Signal Wire. 11-j
    - NO ⇩ → NO ⇧ → Measure Resistance from TP Sensor Connector [88B] Terminal B to ECM Pin 14 on Breakout Box. Is Resistance Less Than 1 Ohm?
      - YES → Repair Open in BK/W Wire. 11-k
      - NO → Repair Open in R/W Wire. 11-l

(4) See Induction Module, Removal/Installation, page 9-113 or Throttle Position Sensor, Removal/Installation, page 9-119 of the 1996 FLT Service Manual.

(5) Use Harness Connector Test Kit (HD-41404), gray pin probes and patch cords.

Wire Harness Connectors

No.	Description	Type	Location
[78]	ECM	35 - Place Amp	Under Right Side Cover
[88]	TP Sensor	3 - Place Packard	Below Fuel Tank

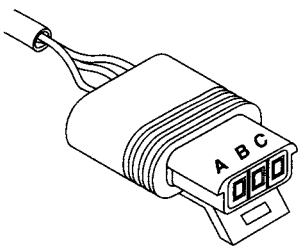


Figure 122. TP Sensor Connector [88B]

Clear Codes and Confirm Proper Operation with No Check Engine Lamp.

TROUBLE CODE 12, BAROMETRIC PRESSURE SENSOR

The Barometric Pressure Sensor (BARO Sensor) is supplied 5 volts from the ECM and sends a signal back to the ECM which varies in accordance with atmospheric barometric pressure. Changes in barometric pressure are influenced by weather and altitude. For example, the output signal from the BARO Sensor will vary from about 3 volts at an altitude of 13,000 ft. (low pressure) to about 4-4.8 volts at sea level (high pressure).

DIAGNOSTIC TIPS

- Code 12 will set if the BARO Sensor signal is out of range.
- With the BARO Sensor disconnected, the ECM and Scanalyzer should recognize a low voltage. If low voltage is observed , the ECM and harness are not at fault.
- Gently place a jumper wire across BARO Sensor connector [80B] terminals 1 and 3 using Harness Connector Test Kit (HD-41404), purple male probes and patch cord. With the BARO Sensor connector jumper in place, the ECM and Scanalyzer should recognize a high voltage. If high voltage is observed and connector terminal 2 has a resistance of less than 1 ohm to ground, the ECM and harness are not at fault.
- BARO Sensor Output Check. Using the vacuum pump (HD-23738A), apply a vacuum to the atmospheric pressure port of the BARO Sensor (see Figure 123). The signal voltage/pressure should lower as the vacuum is applied.

DIAGNOSTIC NOTES

The reference numbers below correlate with those on the diagnostic flow chart.

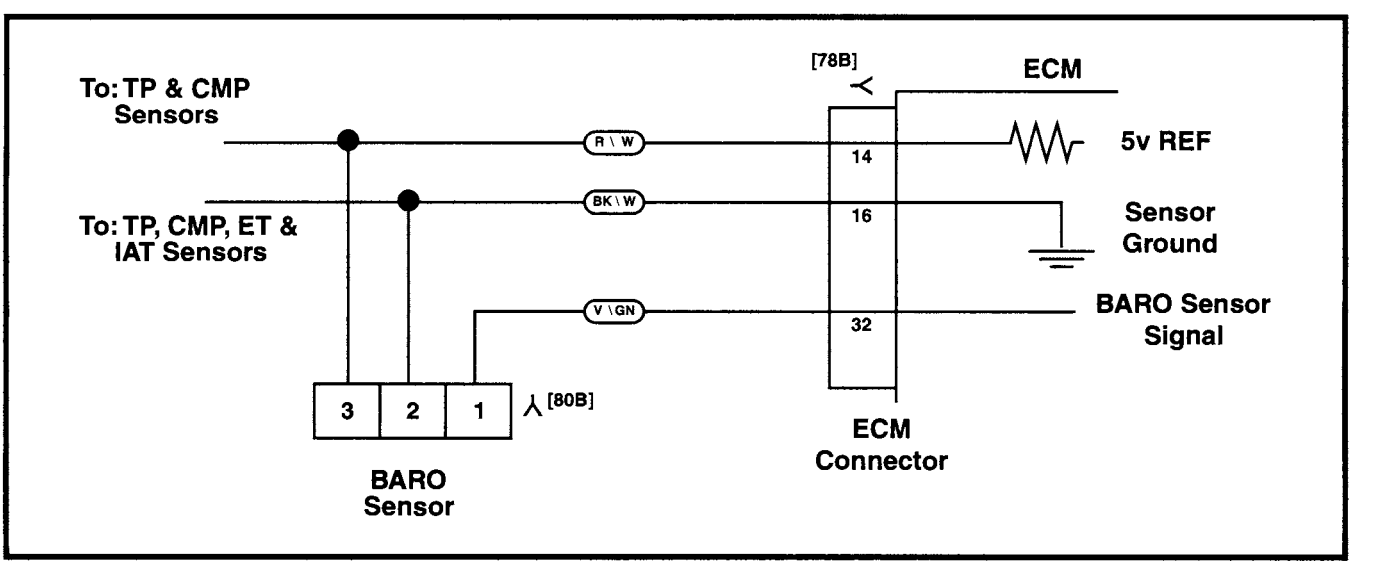
① Connect Breakout Box (HD-41198) between rear EFI wire harness and ECM. See Breakout Box Installation, page 132.

NOTE

All voltage values are approximate and influenced by barometric pressure.

Barometric Pressure Sensor Table		
Altitude (M)	**Altitude (FT)**	**Voltage Out**
Below 305	Below 1000	4.2-4.8
305-610	1000-2000	4.1-4.7
610-914	2000-3000	4.0-4.6
914-1219	3000-4000	3.8-4.4
1219-1524	4000-5000	3.7-4.3
1524-1829	5000-6000	3.6-4.2
1829-2134	6000-7000	3.5-4.1
2134-2438	7000-8000	3.3-3.9
2438-2743	8000-9000	3.2-3.8
2743-3048	9000-10000	3.1-3.7
3048-3353	10000-11000	3.0-3.6
3353-3658	11000-12000	2.8-3.4
3658-3962	12000-13000	2.7-3.3
Low Altitude = High Pressure = High Voltage		

② Shake or wiggle harness with DVOM or Scanalyzer connected. Radical voltage changes on the DVOM will indicate the presence of intermittents, while the Scanalyzer (in Wiggle Test Mode) will beep, light the four corner LEDs and display a minus sign when a current trouble code is detected. (If a current trouble code is present when the wiggle test is entered, the Scanalyzer will respond as described immediately upon entering the wiggle test mode. With Key On and engine off, clear trouble codes and then perform wiggle test with vehicle running.)



Barometric Pressure Sensor Circuit Diagram

NOTE

*The **Scanalyzer icon** appears at those points in the flow chart where the Scanalyzer may be used.*

(3) See Barometric Pressure Sensor, Removal/Installation, page 9-81 of the 1996 FLT Service Manual.

(4) See Electronic Control Module (ECM), Removal/Installation, page 9-81 of the 1996 FLT Service Manual.

(5) Use Harness Connector Test Kit (HD-41404), purple pin probes and patch cords.

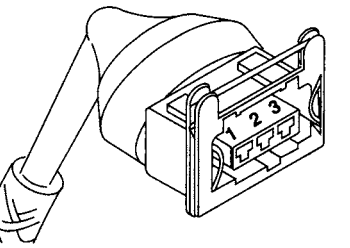


Figure 124. BARO Sensor Connector [80B]

(1) With the Ignition Switch ON (or the Engine Running), Measure the Voltage Between ECM Pin 32 (+) and ECM Pin 16 (-) on Breakout Box or Observe Scanalyzer Voltage Values (Data Monitor Mode).

Is the Voltage Between 2.7 and 4.95 Volts?

YES

(2) With DVOM or Scanalyzer (Wiggle Test Mode) Still Connected, Check for Intermittents by Performing "Wiggle" Test. Radical Voltage Changes or Trouble Code Set While Wiggling Harness Will Indicate the Presence of Intermittents. Intermittent Present?

YES

To Identify the Source of Intermittents, Start at Box Marked by Bold Asterisk on Right Side of Flow Chart and Wiggle Harness While Monitoring DVOM.

12-a

NO

(3) Replace BARO Sensor. Clear Codes if Scanalyzer is Available and Road Test. Did Check Engine Lamp Come On and Set CODE 12?

YES

(3) (4) Install Original BARO Sensor , Replace ECM and Road Test Again to Verify.

12-b

NO

System Now OK.

12-c

NO

* (5) Check the 5v Reference Supply at the BARO Sensor Connector [80B]. Using the DVOM, Measure the Voltage Between Pin 3 (VREF) and Pin 2 (Sensor Ground) with the Ignition ON.

Is the Voltage Approximately 5v?

YES

(5) Check BARO Signal Line for Open or Short. Disconnect ECM from Breakout Box.

OPEN CHECK: Measure Resistance Between BARO Connector [80B] Terminal 3 and ECM Pin 32 on Breakout Box. Is Resistance Less Than 1 Ohm?

YES

(5) SHORT (to Ground) CHECK: Measure Resistance Between BARO Connector Terminal 3 and Chassis Ground. Is Resistance Greater Than 1 Megohm?

YES

(3) Replace Sensor.

12-g

NO

Look for Grounded V/GN Wire.

12-h

NO

Look for Open on V/GN Wire.

12-f

NO Greater Than 5v.

Locate Short to 12 Volts on R/W Wire in Wire Harness. Repair as Necessary.

12-d

NO Less Than 5v.

(5) Check for Opens on VREF Line R/W Wire (BARO Connector [80B] Terminal 1 to ECM Pin 14 on Breakout Box) or Sensor Ground Line BK/W Wire (BARO Connector [80B] Terminal 2 to ECM Pin 16 on Breakout Box). Repair as Necessary.

12-e

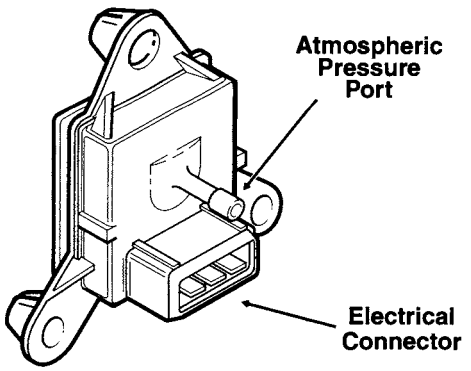


Figure 123. BARO Sensor

Wire Harness Connectors

No.	Description	Type	Location
[80]	BARO Sensor	3 - Place Amp	Under Right Side Cover Behind Electrical Bracket

Clear Codes and Confirm Proper Operation with No Check Engine Lamp.

TROUBLE CODE 14, ENGINE TEMPERATURE SENSOR

The ECM supplies and monitors a 5 volt signal (Pin 13) to one side of the Engine Temperature Sensor (ET Sensor). The other side of the ET Sensor is connected to a common sensor ground, which is also connected to the ECM (Pin 16).

The ET Sensor is a thermistor device, which means that at a specific temperature it will have a specific resistance across its terminals. As this resistance varies, so does the supplied voltage (Pin 13). At high temperatures, the resistance of the sensor is very low, which effectively lowers the signal voltage on Pin 13. Conversely, at low temperatures, the resistance is very high, allowing the voltage to rise close to the supplied voltage of 5 volts.

The ECM monitors this voltage to compensate for various operating conditions. The ECM also uses the sensor input as a reference for determining ISC actuator position.

DIAGNOSTIC TIPS

The Scanalyzer displays engine temperature in degrees. Once the engine is started, the temperature should rise steadily.

An intermittent may be caused by a poor connection, rubbed through wire insulation or a wire broken inside the insulation.

Check the following conditions:

- Poor Connection - Inspect ECM harness connectors [78] and [82] for backed out terminals, improper mating, broken locks, improperly formed or damaged terminals, poor terminal-to-wire connection and damaged harness.
- Shifted Sensor - The Temperature-to-Resistance Values table may be used to test the engine temperature sensor at various temperature levels in order to evaluate the possibility of a shifted (out-of-calibration) sensor which may result in driveability problems.

DIAGNOSTIC NOTES

The reference numbers below correlate with those on the diagnostic flow chart.

(1) Connect Breakout Box (HD-41198) to rear EFI wire harness **only** (leave ECM disconnected). See Breakout Box Installation, page 132.

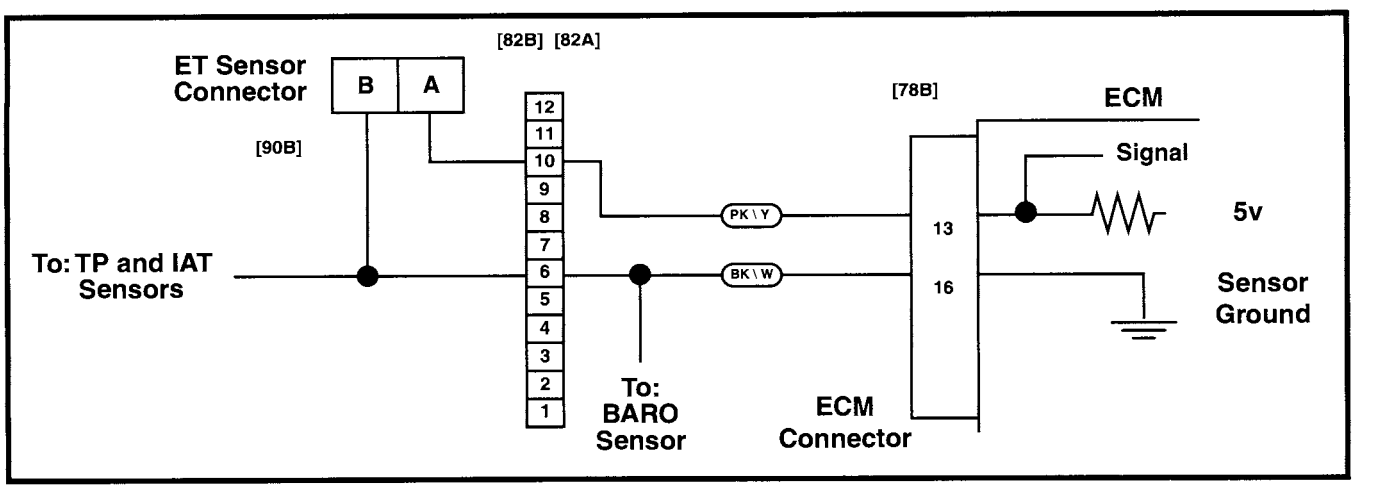
NOTE

All voltage and resistance values are approximate (+/- 20%).

Engine Temperature Sensor Table			
Temp. ° C.	**Resistance**	**Voltage**	**Temp. ° F.**
-10	16599	4.5	14
0	9750	4.1	32
10	5970	3.8	50
20	3747	3.3	68
25	3000	3.0	77
30	2417	2.7	86
40	1598	2.2	104
50	1080	1.8	122
60	746	1.4	140
70	526	1.0	158
80	377	0.8	176
90	275	0.6	194
100	204	0.5	212
110	153	0.4	230
Engine Temperature Sensor is Measured Between Terminal 13 and System Ground (Terminal 16)			

(2) Shake or wiggle harness with DVOM or Scanalyzer connected. Radical voltage changes on the DVOM will indicate the presence of intermittents, while the Scanalyzer (in Wiggle Test Mode) will beep, light the four corner LEDs and display a minus sign when a current trouble code is detected. (If a current trouble code is present when the wiggle test is entered, the Scanalyzer will respond as described immediately upon entering the wiggle test mode. With Key On and engine off, clear trouble codes and then perform wiggle test with vehicle running.)

(3) See Engine Temperature Sensor, Removal/Installation, page 9-90 of the 1996 FLT Service Manual.



Engine Temperature Sensor Circuit Diagram

NOTE

*The **Scanalyzer icon** appears at those points in the flow chart where the Scanalyzer may be used.*

(1) Connect Breakout Box (HD-41198) to Connector [78B] Leaving ECM Disconnected. With Engine at Room Temperature (60°- 90° F.), Use a DVOM to Measure the Resistance Across Pins 13 and 16 on Breakout Box. Is the Resistance Between 1.4k Ohms and 6.9k Ohms?

NOTE

If Engine has Not Been Operated for a Minimum of 4 Hours, the Measured Resistance Should be Very Close to the Measured Resistance Across the IAT Sensor, which is Pins 31 and 16 on Breakout Box. Scanalyzer Values (Data Monitor Mode) Will be Approximately the Same if Code is Historic. Current Code Will Read Default Value.

(4) See Electronic Control Module (ECM), Removal/Installation, page 9-81 of the 1996 FLT Service Manual.

(5) Use Harness Connector Test Kit (HD-41404), gray pin probes and patch cord.

(6) Use Harness Connector Test Kit (HD-41404), gray socket probes and patch cord.

YES

(2) Connect ECM to Breakout Box. With DVOM or Scanalyzer (Wiggle Test Mode) Still Connected, Check for Intermittents by Performing "Wiggle" Test. Radical Voltage Changes or Trouble Code Set While Wiggling Harness Indicate the Presence of Intermittents. Intermittent Present?

YES

While Wiggling Harness to Locate Source of Intermittents, Perform Steps on Right Side of Flow Chart Marked by Bold Asterisks. Repair as Necessary.

14-a

NO

Disconnect ET Sensor Connector [90]. Turn Ignition Switch ON. Using a DVOM, Measure the Voltage Between ECM Pins 13 (Positive) and 16 (Negative) on Breakout Box. Is the Voltage Approximately 5 Volts?

YES

Replace ET Sensor, Clear Codes if Scanalyzer is Available and Road Test. Did Check Engine Lamp Come On and Set Only CODE 14?

(3)

YES

(3) (4) Install Original ET Sensor, Replace ECM and Road Test.

14-b

NO

System OK.

14-c

NO Less Than 4.7 Volts.

With ET Sensor Disconnected. Disconnect ECM Connector [78B]. Measure Resistance Between ECM Pins 13 and 34 on Breakout Box. Is Resistance Less Than 1 Megohm?

YES

Repair Short to Ground on PK/Y Wire.

14-d

NO

Replace ECM.

(4) 14-e

NO Greater Than 5.3 Volts.

Unplug ECM Leaving Breakout Box Connected at Vehicle Harness. Measure Voltage Between ECM Pins 13 and 34 on Breakout Box. Is the Voltage 0 Volts?

YES

Replace ECM.

(4) 14-f

NO

Examine ET Signal Wire (PK/Y) for Short to Voltage and Repair.

14-g

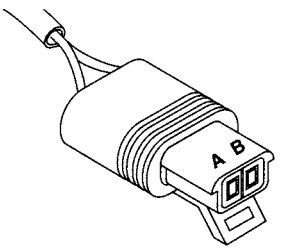


Figure 125. ET Sensor Connector [90B]

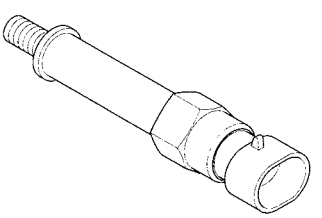


Figure 126. ET Sensor

NO

Disconnect ET Sensor Connector [90B] and Examine for Damage. Connector OK?

YES

* (5) Using a DVOM, Measure the Resistance Between ET Sensor Connector [90B] Terminal A and ECM Pin 13 on Breakout Box. Is it Less Than 1.0 Ohm?

YES

* (5) Using a DVOM, Measure the Resistance Between ET Sensor Connector [90B] Terminal B and ECM Pin 16 on Breakout Box. Is it Less Than 1.0 Ohm?

YES

* Using a DVOM, Measure the Resistance Between ECM Pins 13 and 16 on Breakout Box. Is it Greater Than 1.0 Megohm?

YES

* Using a DVOM, Measure the Resistance Between ECM Pin 13 on Breakout Box and Ground. Is it Greater Than 1.0 Megohm?

YES

(3) (6) Remove ET Sensor and Measure the Resistance Across the Terminals of the ET Sensor Directly. Again, with the Sensor at Room Temperature (60°- 90° F.), the Resistance Should be Between 1.4k Ohms and 6.9k Ohms. Is It?

YES

(2) To Locate Source of Intermittents, Wiggle Harness While Performing Steps Marked by Asterisk (*) Above. Repair as Necessary.

14-i

NO

(3) Replace Sensor.

14-j

NO

Repair Connector.

14-h

NO

Examine PK/Y Wire in Harness for Open Circuit and Repair.

14-h

NO

Examine BK/W Wire in Harness for Open Circuit and Repair.

14-h

NO

Examine PK/Y Wire and BK/W Wire in Harness for Short Between These Two Circuits and Repair.

14-h

NO

Examine Harness for Short to Ground and Repair.

14-h

NO

Replace Sensor.

14-j

Clear Codes and Confirm Proper Operation with No Check Engine Lamp.

TROUBLE CODE 15, INTAKE AIR TEMPERATURE SENSOR

The ECM supplies and monitors a 5 volt signal (Pin 31) to one side of the Intake Air Temperature Sensor (IAT Sensor). The other side of the IAT Sensor is connected to a common sensor ground, which is also connected to the ECM (Pin 16).

The IAT Sensor is a thermistor device, meaning that at a specific temperature, it will have a specific resistance across its terminals. As this resistance varies, so does the supplied voltage (Pin 31). At high temperatures, the resistance of the sensor is very low, which effectively lowers the signal voltage on Pin 31. Conversely, at low temperatures, the resistance is very high, allowing the voltage to rise close to the supplied voltage of 5 volts.

The ECM monitors this voltage to compensate for various operating conditions.

DIAGNOSTIC TIPS

The Scanalyzer displays intake air temperature in degrees.

An intermittent may be caused by a poor connection, rubbed through wire insulation or a wire broken inside the insulation.

Check the following conditions:

- Poor Connection - Inspect ECM harness connectors [78] and [82] for backed out terminals, improper mating, broken locks, improperly formed or damaged terminals, poor terminal-to-wire connection and damaged harness.
- Perform Wiggle Test to Locate Intermittents - If connections and harness check out OK, use the Scanalyzer to check the intake air temperature reading while moving related connectors and wiring harness. If the failure is induced, the intake air temperature display will change.
- Shifted Sensor - The Temperature-to-Resistance Values table may be used to test the intake air temperature sensor at various temperature levels in order to evaluate the possibility of a shifted (out-of-calibration) sensor which may result in driveability problems.

DIAGNOSTIC NOTES

The reference numbers below correlate with those on the diagnostic flow chart.

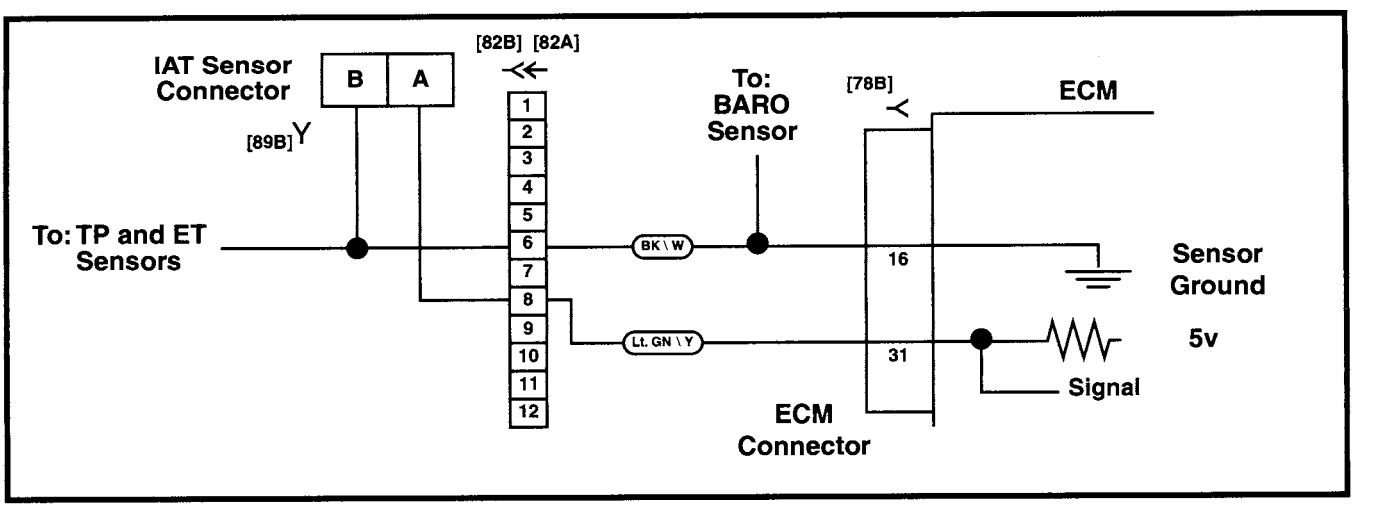
NOTE

All voltage and resistance values are approximate (+/- 20%).

Intake Air Temperature Sensor Table			
Temp. ° C.	**Resistance**	**Voltage**	**Temp. ° F.**
-40	100950	4.9	-40
-30	53100	4.8	-22
-20	29121	4.7	-4
-10	16599	4.5	14
0	9750	4.2	32
10	5970	3.8	50
20	3747	3.3	68
25	3000	3.0	77
30	2417	2.7	86
40	1598	2.2	104
50	1080	1.8	122
60	746	1.4	140
70	526	1.0	158
Intake Air Temperature Sensor is Measured Between Terminal 31 and System Ground (Terminal 16)			

① Connect Breakout Box (HD-41198) to rear EFI wire harness **only** (leave ECM disconnected). See Breakout Box Installation, page 132.

② Shake or wiggle harness with DVOM or Scanalyzer connected. Radical voltage changes on the DVOM will indicate the presence of intermittents, while the Scanalyzer (in Wiggle Test Mode) will beep, light the four corner LEDs and display a minus sign when a current trouble code is detected. (If a current trouble code is present when the wiggle test is entered, the Scanalyzer will respond as described immediately upon entering the wiggle test mode. With Key On and engine off, clear



Intake Air Temperature Sensor Circuit Diagram

NOTE

*The **Scanalyzer icon** appears at those points in the flow chart where the Scanalyzer may be used.*

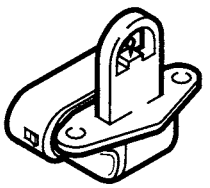


Figure 127. IAT Sensor

trouble codes and then perform wiggle test with vehicle running.)

(3) See Air Cleaner, Removal/Installation, page 9-109 of the 1996 FLT Service Manual.

(4) See Electronic Control Module (ECM), Removal/Installation, page 9-81 of the 1996 FLT Service Manual.

(5) Use Harness Connector Test Kit (HD-41404), gray pin probes and patch cord.

(6) Use Harness Connector Test Kit (HD-41404), gray socket probes and patch cord.

(1) Connect Breakout Box (HD-41198) to Connector [78B] Leaving ECM Disconnected. With Engine at Room Temperature (60°- 90° F.), Use a DVOM to Measure the Resistance Across Pins 31 and 16 on Breakout Box. Is the Resistance Between 1.4k Ohms and 6.9k Ohms?

NOTE

If Engine has Not Been Operated for a Minimum of 4 Hours, the Measured Resistance Should be Very Close to the Measured Resistance Across the ET Sensor, which is Pins 13 and 16 on Breakout Box. Scanalyzer Values (Data Monitor Mode) Will be Approximately the Same if Code is Historic. Current Code Will Read Default Value.

YES

(2) Connect ECM to Breakout Box. With DVOM or Scanalyzer (Wiggle Test Mode) Still Connected, Check for Intermittents by Performing "Wiggle" Test. Radical Voltage Changes or Trouble Code Set While Wiggling Harness Indicate the Presence of Intermittents. Intermittent Present?

YES

While Wiggling Harness to Locate Source of Intermittents, Perform Steps on Right Side of Flow Chart Marked by Bold Asterisks. Repair as Necessary.

15-a

NO

Disconnect IAT Sensor Connector [89]. Turn Ignition Switch ON. Using a DVOM, Measure the Voltage Between ECM Pins 31 (Positive) and 16 (Negative) on Breakout Box. Is the Voltage Approximately 5 Volts?

YES

Replace IAT Sensor, Clear Codes if Scanalyzer is Available and Road Test. Did Check Engine Lamp Come On and Set Only CODE 15?

(3)

YES

(3) (4) Install Original IAT Sensor, Replace ECM and Road Test.

15-b

NO

System OK.

15-c

NO Less Than 4.7 Volts.

With IAT Sensor Disconnected, Disconnect ECM Connector [78B]. Measure Resistance Between ECM Pins 31 and 34 on Breakout Box. Is Resistance Less Than 1 Megohm?

YES

Repair Short to Ground on Lt. GN/Y Wire.

15-d

NO

Replace ECM.

(4) 15-e

NO Greater Than 5.3 Volts.

Unplug ECM Leaving Breakout Box Connected at Vehicle Harness. Measure Voltage Between ECM Pins 31 and 34 on Breakout Box. Is the Voltage 0 Volts?

YES

Replace ECM.

(4) 15-f

NO

Examine IAT Signal Wire (Lt. GN/Y) for Short to Voltage and Repair.

15-g

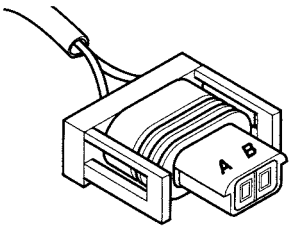


Figure 128. IAT Sensor Connector [89B]

NO

Disconnect IAT Sensor Connector [89B] and Examine for Damage. Connector OK?

YES

* (5) Using a DVOM, Measure the Resistance Between IAT Sensor Connector [89B] Terminal A and ECM Pin 31 on Breakout Box. Is it Less Than 1.0 Ohm?

YES

* (5) Using a DVOM, Measure the Resistance Between IAT Sensor Connector [89B] Terminal B and ECM Pin 16 on Breakout Box. Is it Less Than 1.0 Ohm?

YES

* Using a DVOM, Measure the Resistance Between ECM Pins 31 and 16 on Breakout Box. Is it Greater Than 1.0 Megohm?

YES

* Using a DVOM, Measure the Resistance Between ECM Pin 31 on Breakout Box and Ground. Is it Greater Than 1.0 Megohm?

YES

(3) (6) Remove IAT Sensor and Measure the Resistance Across the Terminals of the IAT Sensor Directly. Again, with the Sensor at Room Temperature (60°- 90° F.), the Resistance Should be Between 1.4k Ohms and 6.9k Ohms. Is It?

YES

(2) To Locate Source of Intermittents, Wiggle Harness While Performing Steps Marked by Asterisk (*) Above. Repair as Necessary.

15-i

NO

(3) Replace Sensor.

15-j

NO

Repair Connector.

15-h

NO

Examine Lt. GN/Y Wire in Harness for Open Circuit and Repair.

15-h

NO

Examine BK/W Wire in Harness for Open Circuit and Repair.

15-h

NO

Examine Lt. GN/Y Wire and BK/W Wire in Harness for Short Between These Two Circuits and Repair.

15-h

NO

Examine Harness for Short to Ground and Repair.

15-h

Wire Harness Connectors

No.	Description	Type	Location
[78]	ECM	35 - Place Amp	Under Right Side Cover
[82]	ECM Harness to Sensor Harness	12 - Place Deutsch	Upper Frame Cross Member (Under Seat)
[89]	IAT Sensor	2 - Place Packard	Below Fuel Tank

Clear Codes and Confirm Proper Operation with No Check Engine Lamp.

TROUBLE CODE 16, BATTERY VOLTAGE

A Code 16 is set if the ECM sees battery positive voltage less than 6.2 or greater than 15.5 volts. A low voltage condition typically occurs during activation of the starter or generally indicates loose wire connections. A high voltage condition is usually caused by a faulty voltage regulator.

DIAGNOSTIC NOTES

The reference numbers below correlate with those on the diagnostic flow chart.

① See Charging System Troubleshooting chart on page 184.

② Connect Breakout Box (HD-41198) between rear EFI wire harness and ECM. See Breakout Box Installation, page 132.

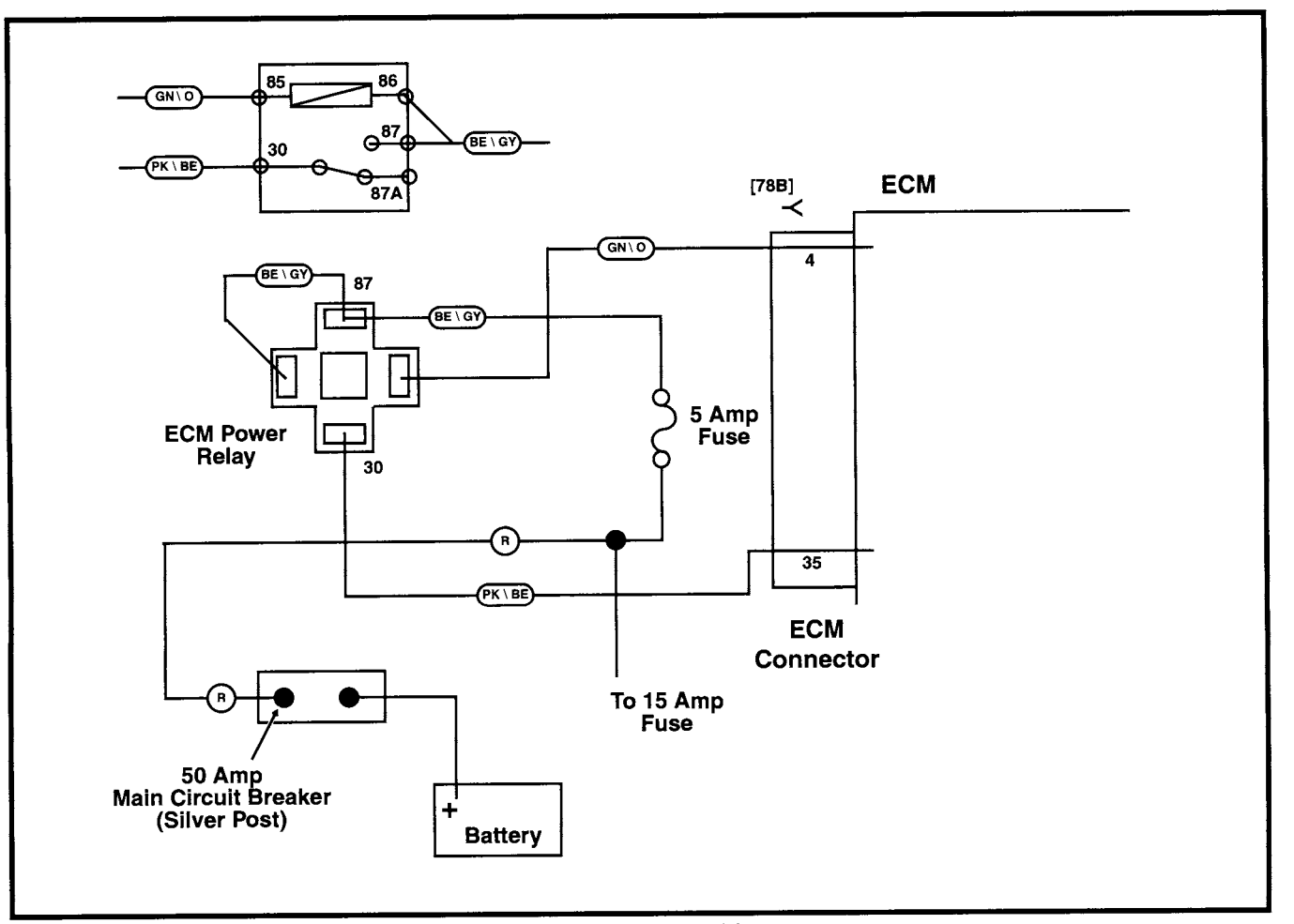
③ The ECM is monitoring voltage at ECM connector terminal 35.

④ This checks for voltage drops in the ECM power circuit. If a significant voltage drop is not present, condition may be caused by excessive starter current draw.

⑤ See Starter Current Draw Test in Section 5 of the Service Manual, Electric Starter.

⑥ See Electrical Relays, Removal/Installation, page 9-80 of the 1996 FLT Service Manual.

⑦ See Fuses, Removal/Installation, page 9-80 of the 1996 FLT Service Manual.



Battery Voltage Circuit Diagram

Code 16, Battery Voltage Test

NOTE

*The **Scanalyzer icon** appears at those points in the flow chart where the Scanalyzer may be used.*

① Perform Charging System Tests. Charging System OK?

- NO → Repair Charging System. (16-a)
- YES → ②③ Remove Spark Plug Cables From Spark Plugs. Measure Voltage at ECM Pin 35 (Positive) and Pin 34 (Negative) on Breakout Box While Cranking Engine. Disregard Reading During First 2 Seconds of Cranking. Is Voltage Above 6.2 Volts?
  - YES → System OK. (16-b)
  - NO → ④ Measure Voltage Drop Between Battery Positive Terminal and ECM Pin 35 on Breakout Box With Key ON. Is Voltage Drop Greater than 0.5 Volt?
    - NO → ⑤ Check for Excessive Starter Current Draw. (16-c)
    - YES → Measure Voltage Drop Between Battery Positive Terminal (+) and Terminal 30 (-) on ECM Power Relay With Key ON. Is Voltage Drop Greater than 0.5 Volt?
      - YES → Replace PK/BE Wire or Terminals. (16-d)
      - NO → Measure Voltage Drop Between Battery Positive Terminal (+) and Terminal 87 (-) on ECM Power Relay With Key ON. Is Voltage Drop Greater than 0.5 Volt?
        - YES → ⑥ Replace ECM Relay. (16-d)
        - NO → Measure Voltage Drop Between Battery Positive Terminal (+) and BE/GY Terminal (-) on 5 Amp ECM Fuse With Key ON. Is Voltage Drop Greater than 0.5 Volt?
          - YES → Replace BE/GY Wire or Terminals. (16-d)
          - NO → Measure Voltage Drop Between Battery Positive Terminal (+) and Red Terminal on 5 Amp ECM Fuse (-) With Key ON. Is Voltage Drop Greater than 0.5 Volt?
            - NO → Measure Voltage Drop Between Battery Positive Terminal (+) and Silver Post on Main Circuit Breaker (-) With Key ON. Is Voltage Drop Greater than 0.5 Volt?
              - YES → Replace Red Wire or Terminals. (16-d)
              - NO → Measure Voltage Drop Between Battery Positive Terminal (+) and Copper Post on Main Circuit Breaker (-) With Key ON. Is Voltage Drop Greater than 0.5 Volt?
                - YES → Replace Circuit Breaker. (16-d)
                - NO → High Resistance Between 50 Amp Circuit Breaker and Battery. Replace Wire or Terminals. (16-d)
            - YES → ⑦ Replace Fuse or Fuse Terminals. (16-d)

Clear Codes and Confirm Proper Operation with No Check Engine Lamp.

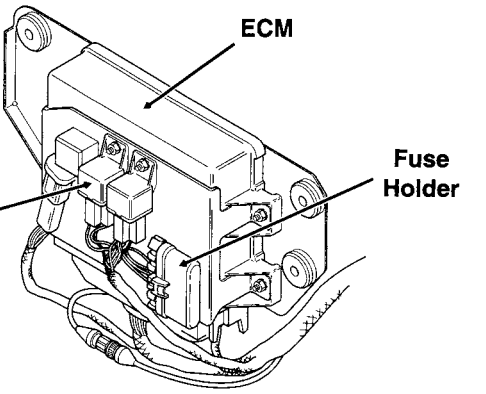


Figure 129. Electrical Bracket Assembly

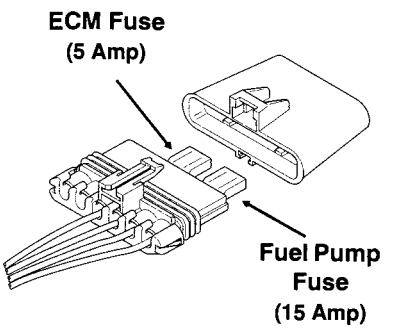


Figure 130. Fuse Holder

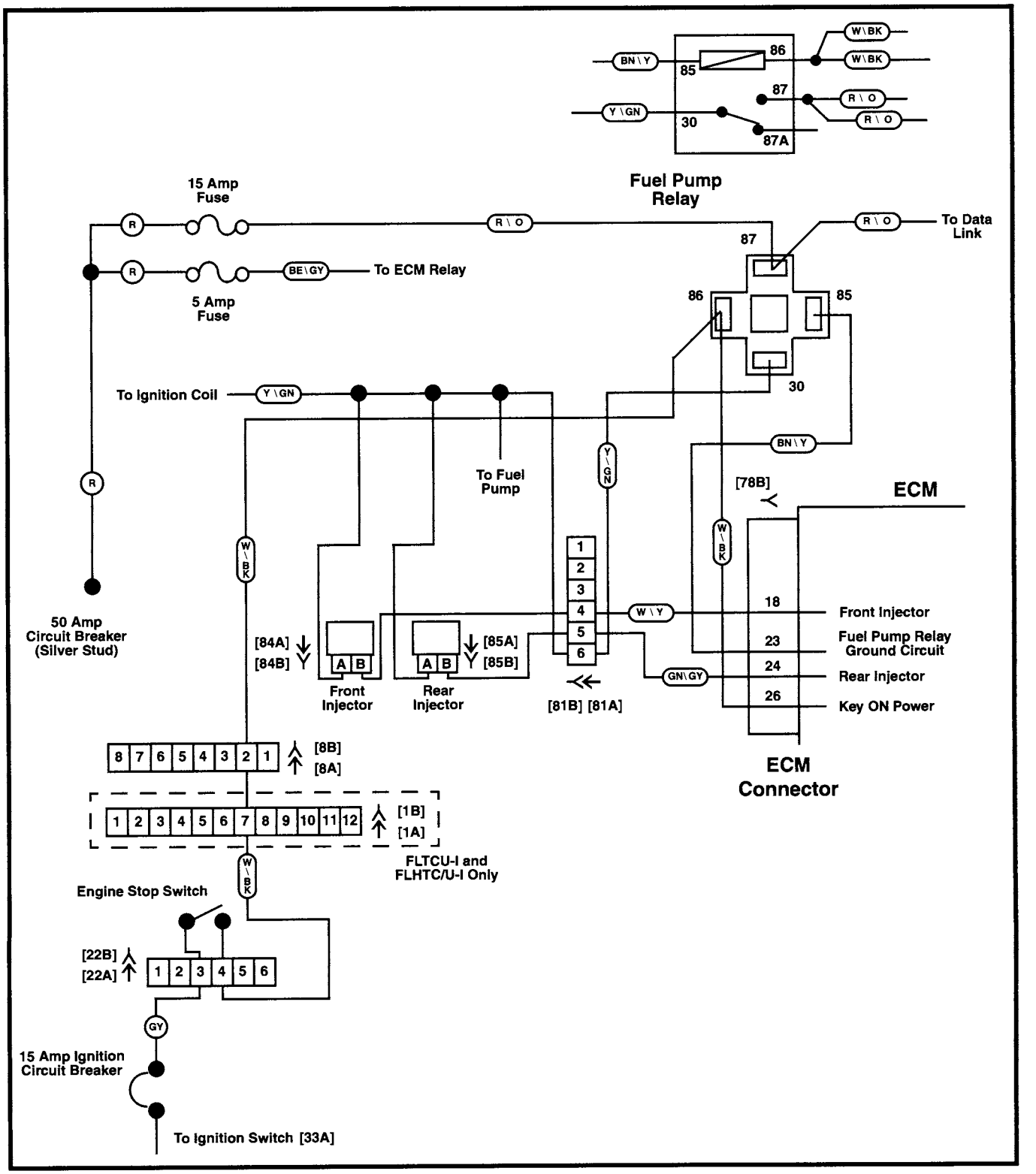
TROUBLE CODES 23 AND 32, FUEL INJECTOR

Code 23 = Front Injector **Code 32 = Rear Injector**

The fuel injectors are solenoids that allow pressurized fuel into the intake tract. The injectors are timed to the engine cycle and are triggered sequentially. The power for the injectors comes from the fuel pump relay. The fuel pump relay also provides power for the fuel pump and the ignition coil. The ECM provides the path to ground to trigger the injectors.

NOTE

System fuse and system relay failures or wiring harness problems will cause 12 volt power to be lost to both injectors, ignition coils and fuel pump.



Fuel Injector Circuit Diagram

Codes 23 and 32, Fuel Injector (1 of 2)

DIAGNOSTIC NOTES

The reference numbers below correlate with those on the diagnostic flow chart.

① To access fuel injector connectors, remove two bolts on back tab of fuel tank, loosen fuel tank front mounting bolt, cut cable straps and elevate tank slightly with wooden blocks.

② See Fuel Injectors, Removal/Installation, page 9-117 of the 1996 FLT Service Manual.

③ Use Harness Connector Test Kit (HD-41404), purple pin probe and patch cord.

④ Connect Breakout Box (HD-41198) between rear EFI wire harness and ECM. See Breakout Box Installation, page 132.

⑤ Use Harness Connector Test Kit (HD-41404), purple pin probes and patch cord to Breakout Box and gray socket probes and patch cord to Fuel Injector Test Lamp (HD-34730-2C).

⑥ Shake or wiggle harness with DVOM or Scanalyzer connected. Radical voltage changes on the DVOM will indicate the presence of intermittents, while the Scanalyzer (in Wiggle Test Mode) will beep, light the four corner LEDs and display a minus sign when a current

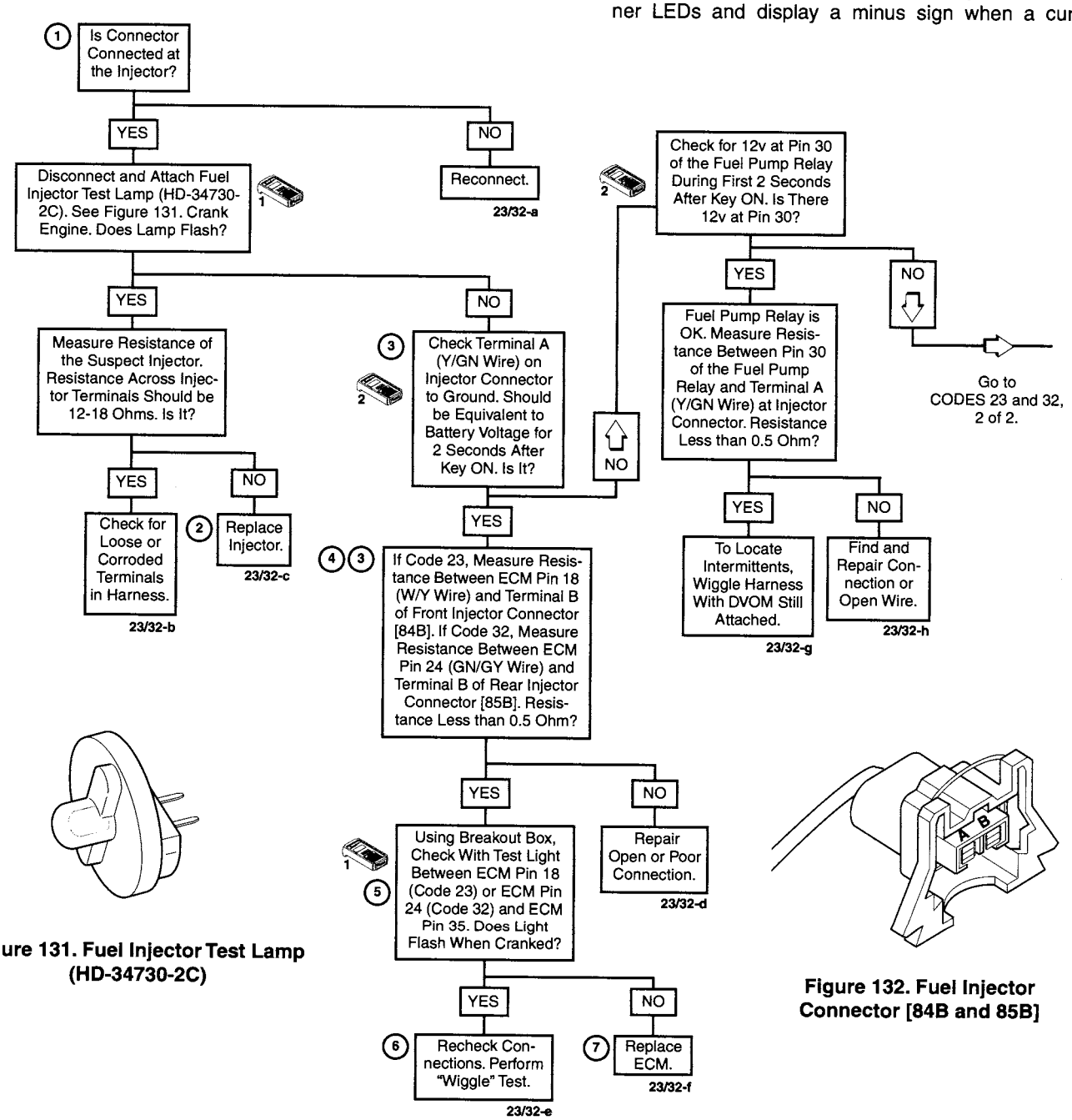


Figure 131. Fuel Injector Test Lamp (HD-34730-2C)

Figure 132. Fuel Injector Connector [84B and 85B]

Clear Codes and Confirm Proper Operation with No Check Engine Lamp.

trouble code is detected. (If a current trouble code is already present when the wiggle test is entered, the Scanalyzer will respond as described immediately upon entering the wiggle test mode. With Key On and engine off, clear trouble codes and then perform wiggle test with vehicle running.)

⑦ See Electronic Control Module (ECM), Removal/Installation, page 9-81 of the 1996 FLT Service Manual.

⑧ See Electrical Relays, Removal/Installation, page 9-80 of the 1996 FLT Service Manual.

Codes 23 and 32, Fuel Injector (2 of 2)

SCANALYZER NOTES

*The **Scanalyzer icon** appears at those points in the flow chart where the Scanalyzer may be used. If a number is printed next to the icon, then refer to the **Scanalyzer Notes** which follow.*

1 With the engine off, Scanalyzer (Active Diagnostic Test Mode) can be used to energize either the front or rear injector once each second for a total of 5 seconds.

2 With the engine off, Scanalyzer (Active Diagnostic Test Mode) can be used to turn fuel pump on for periods up to 30 seconds. Power to the pump also includes power to the fuel injectors and ignition coil.

Wire Harness Connectors

No.	Description	Type	Location
[84]	Front Injector	2 - Place Packard	Below Fuel Tank
[85]	Rear Injector	2 - Place Packard	Below Fuel Tank

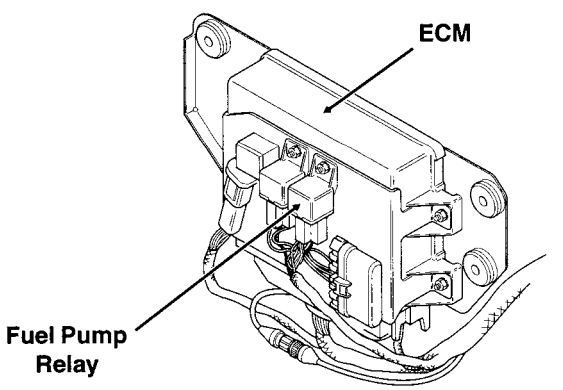
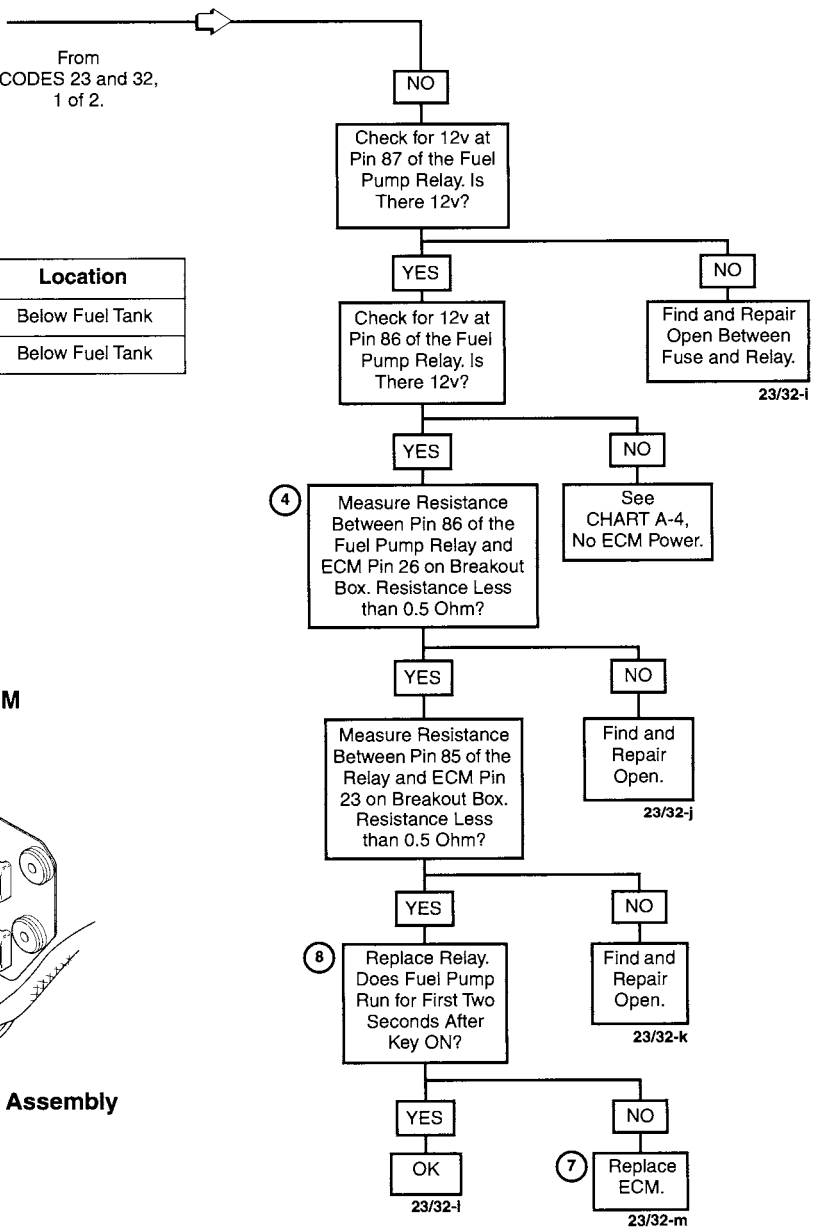


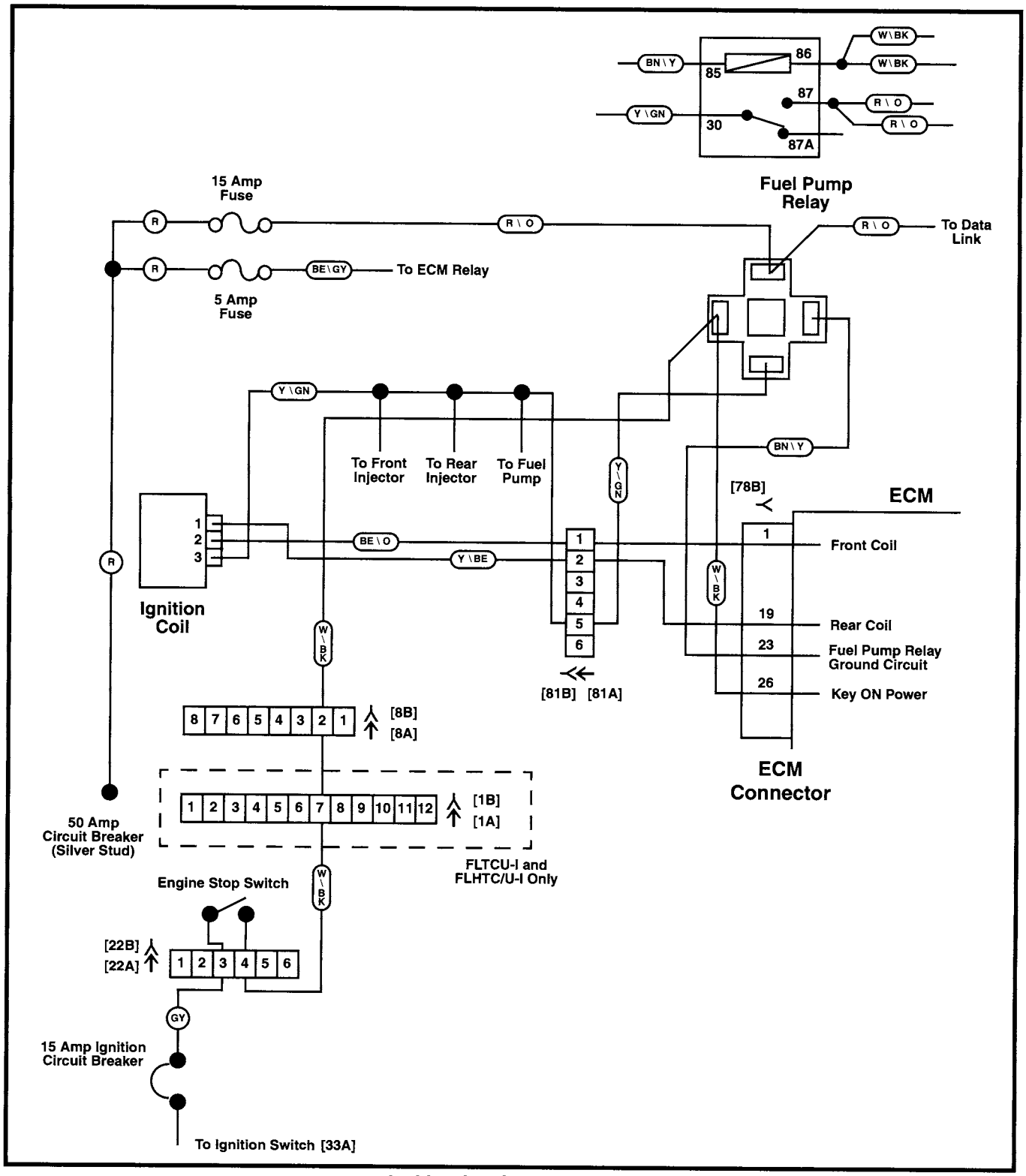
Figure 133. Electrical Bracket Assembly



TROUBLE CODES 24 AND 25, IGNITION COIL

Code 24 = Front Coil **Code 25 = Rear Coil**

A Code 24 or 25 will set if the ignition coil rise time is out of range. This could occur if there is an open coil or loss of power to the coil. The coil receives power from the fuel pump relay at the same time that the fuel pump and injectors are activated. The fuel pump relay is active for the first two seconds after the Ignition Switch is turned to ON, and then shuts off until RPM is detected from the crank and cam position sensors, at which time it is reactivated. The ECM is responsible for turning the fuel pump relay on by providing the ground to activate the relay, which in turn powers the coils. If both codes are set, it is likely a coil power failure or a coil failure.



Ignition Coil Circuit Diagram

Codes 24 and 25, Ignition Coil Test

DIAGNOSTIC NOTES

The reference numbers below correlate with those on the diagnostic flow chart.

① See Ignition Coil, Removal/Installation, page 9-125 of the 1996 FLT Service Manual.

② Use Harness Connector Test Kit (HD-41404), purple pin probe and patch cord.

③ Connect Breakout Box (HD-41198) between rear EFI wire harness and ECM. See Breakout Box Installation, page 132.

④ Shake or wiggle harness with DVOM or Scanalyzer connected. Radical voltage changes on the DVOM will indicate the presence of intermittents, while the Scanalyzer (in Wiggle Test Mode) will beep, light the four corner LEDs and display a minus sign when a current trouble code is detected. (If a current trouble code is present when the wiggle test is entered, the Scanalyzer will respond as described immediately upon entering the wiggle test mode. With Key On and engine off, clear trouble codes and then perform wiggle test with vehicle running.)

⑤ See Electronic Control Module (ECM), Removal/Installation, page 9-81 of the 1996 FLT Service Manual.

SCANALYZER NOTES

*The **Scanalyzer icon** appears at those points in the flow chart where the Scanalyzer may be used. If a number is printed next to the icon, then refer to the **Scanalyzer Notes** which follow.*

1 With the engine off, Scanalyzer (Active Diagnostic Test Mode) can be used to energize either the front or rear coil once each second for a total of 5 seconds.

2 With the engine off, Scanalyzer (Active Diagnostic Test Mode) can be used to turn fuel pump on for periods up to 30 seconds. Power to the pump also includes power to the fuel injectors and ignition coil.

Wire Harness Connectors

No.	Description	Type	Location
[81]	ECM Harness to Sensor Harness	6 - Place Deutsch	Upper Frame Cross Member (Under Seat)
[83]	Ignition Coil	3 - Place Amp	Below Fuel Tank

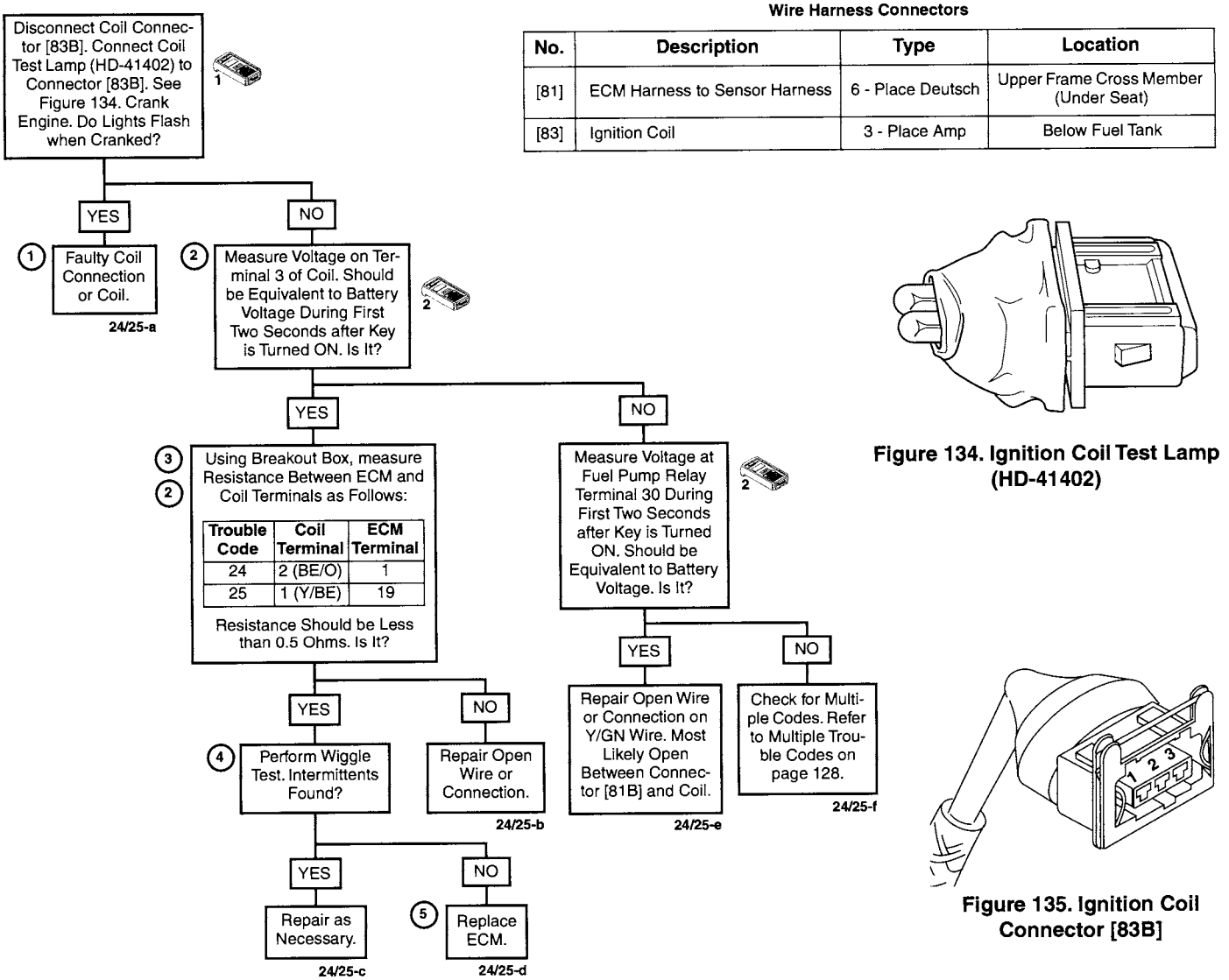


Figure 134. Ignition Coil Test Lamp (HD-41402)

Figure 135. Ignition Coil Connector [83B]

Clear Codes and Confirm Proper Operation with No Check Engine Lamp.

GENERAL

The ignition coil is a pulse type transformer that transforms or steps up low battery voltage to the high voltage necessary to jump the electrode at the spark plug in the cylinder head. Internally the coil consists of primary and secondary windings with a laminated iron core and sealed in waterproof insulating compound. The ignition coil cannot be taken apart or repaired. If the ignition coil is faulty it must be replaced.

Troubleshooting

When the engine will not start or when hard starting or missing indicates a faulty ignition system, see CHART C-2 in this section or follow the procedure listed under TROUBLESHOOTING in Section 5 of the Service Manual. If the condition persists, check primary and secondary resistance of ignition coil with an ohmmeter. See Wiring Diagram in Figure 136.

Resistances should be within the following limits: primary resistance 0.4-0.6 ohms, secondary resistance 5,000-6,000 ohms. Check ignition coil with a coil tester.

If a coil tester is not available, temporarily substitute a new ignition coil by attaching it at any convenient point near the old coil (coil will function without being secured). Transfer terminal wires to new coil. See Wiring Diagram in Figure 136.

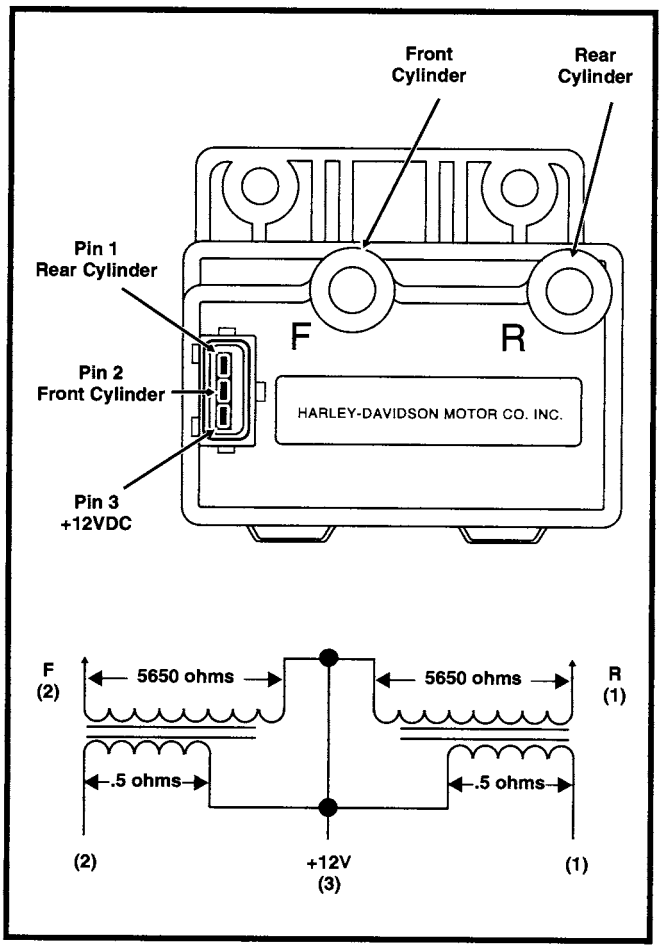


Figure 136. Ignition Coil Wiring Diagram

Attach new spark plug cables to coil and plugs. If ignition trouble is eliminated by the temporary installation of new coil, carefully inspect old coil for damaged cables and insulation. The insulation on cables may be cracked or otherwise damaged allowing high tension current to short to metal parts. This is most noticeable in wet weather or after motorcycle has been washed.

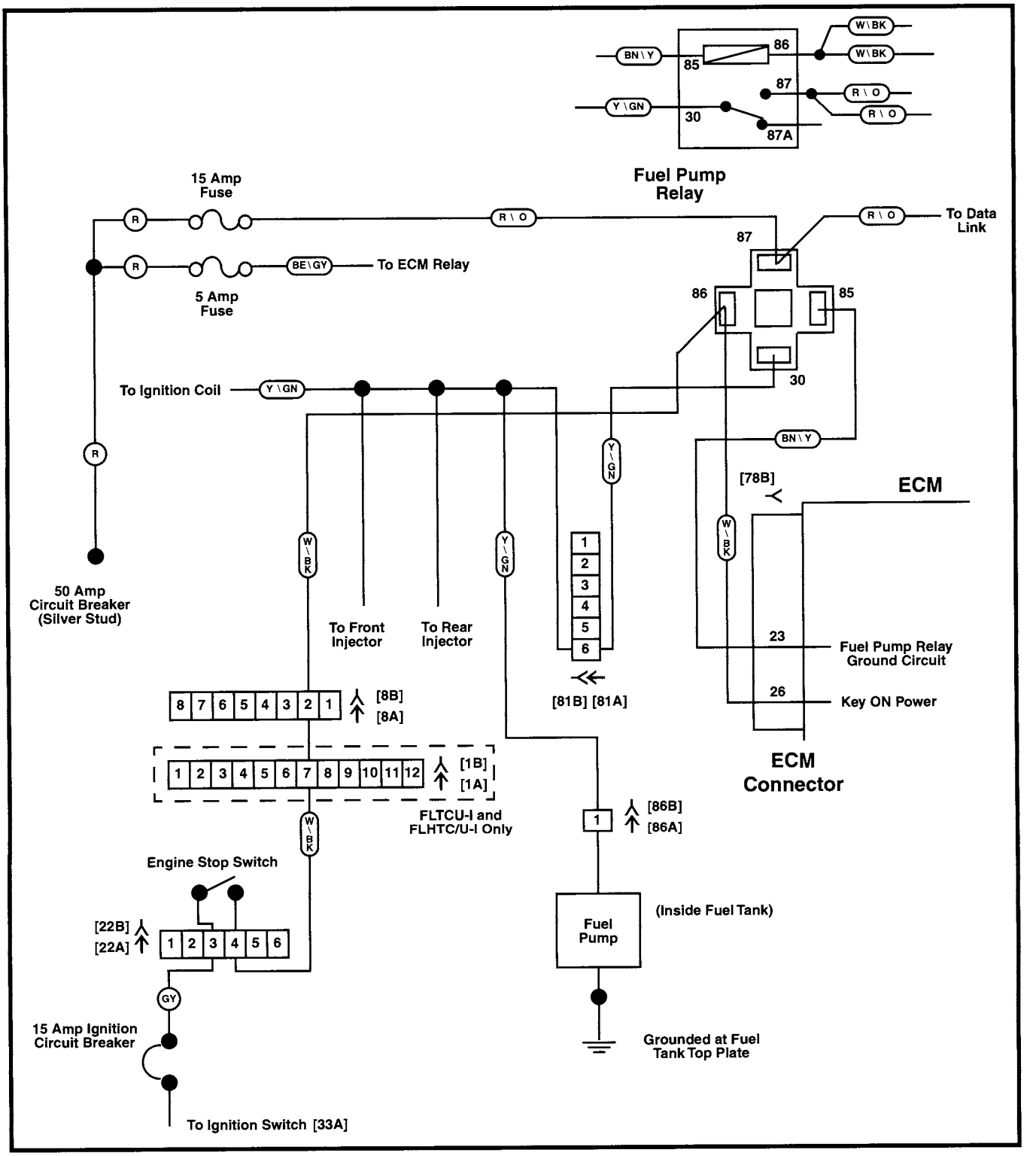
TROUBLE CODE 33, FUEL PUMP RELAY

ECM Pin 23 provides the ground to the fuel pump relay. Code 33 will set if the BN/Y wire is shorted to 12 volts.

DIAGNOSTIC NOTES

The reference numbers which follow correlate with those on the diagnostic flow chart.

① Shake or wiggle harness with DVOM or Scanalyzer connected. Radical voltage changes on the DVOM will indicate the presence of intermittents, while the Scanalyzer (in Wiggle Test Mode) will beep, light the four corner LEDs and display a minus sign when a current trouble code is detected. (If a current trouble code is present when the wiggle test is entered, the Scanalyzer will



Fuel Pump Circuit Diagram

respond as described immediately upon entering the wiggle test mode. With Key On and engine off, clear trouble codes and then perform wiggle test with vehicle running.)

(2) See Electrical Relays, Removal/Installation, page 9-80 of the 1996 FLT Service Manual.

(3) See Electronic Control Module (ECM), Removal/Installation, page 9-81 of the 1996 FLT Service Manual.

(4) Use Harness Connector Test Kit (HD-41404), red pin probe and patch cord.

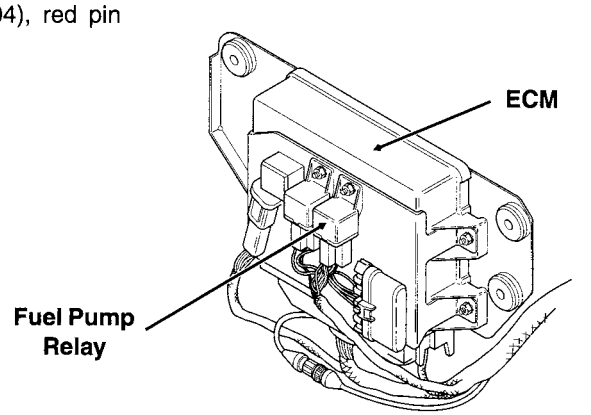
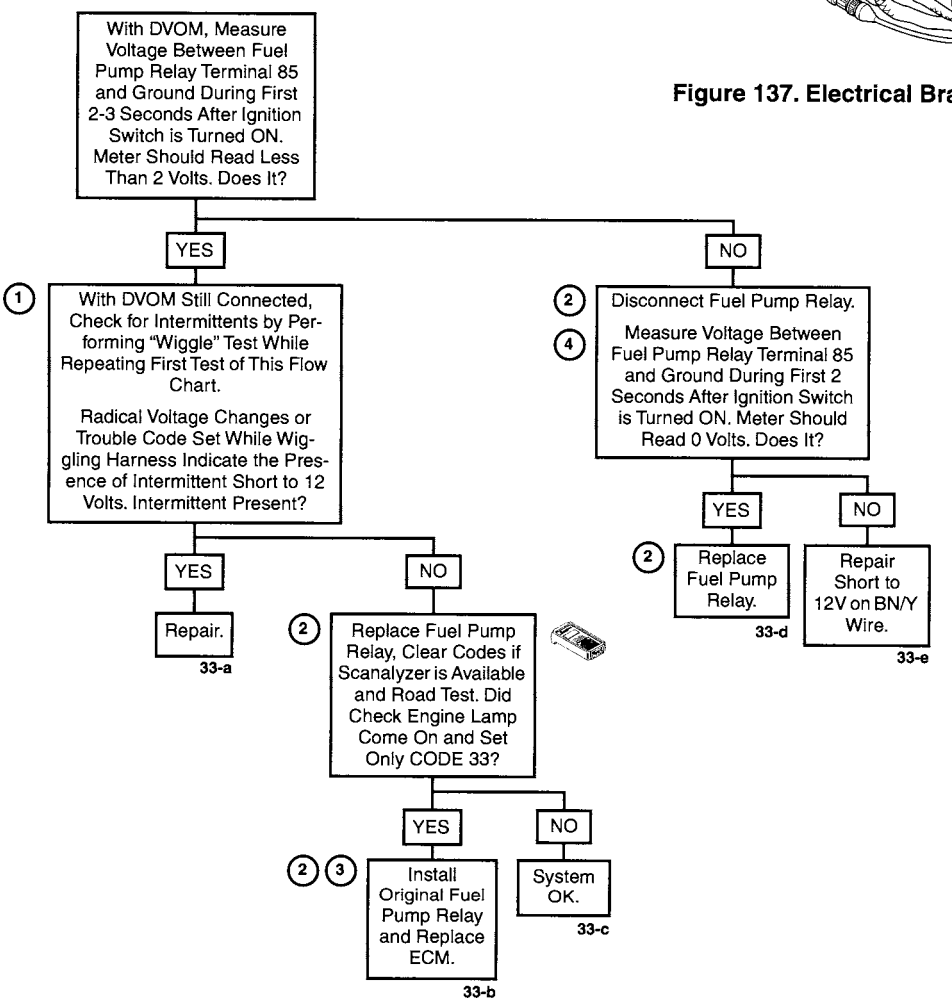


Figure 137. Electrical Bracket Assembly

NOTE

*The **Scanalyzer icon** appears at those points in the flow chart where the Scanalyzer may be used.*



Clear Codes and Confirm Proper Operation with No Check Engine Lamp.

TROUBLE CODES 52, 53, 54 AND 55, ECM FAILURE

GENERAL

All of the following codes indicate a failure which requires replacement of the ECM.

- Code 52 - RAM Failure
- Code 53 - ROM Failure
- Code 54 - EE PROM Failure
- Code 55 - Microprocessor Failure

See Electronic Control Module (ECM), Removal/Installation, page 9-81 of the 1996 FLT Service Manual.

TROUBLE CODE 56, CRANK POSITION SENSOR AND CAM POSITION SENSOR TIMING

A Code 56 will set if the Crankshaft Position Sensor (CKP Sensor) and Camshaft Position Sensor (CMP Sensor) are not timed properly or if the CKP Sensor signal is weak or absent.

DIAGNOSTIC NOTES

The reference numbers below correlate with those on the diagnostic flow chart.

① Connect Breakout Box (HD-41198) to rear EFI wire harness **only** (leave ECM disconnected). See Breakout Box Installation, page 132.

② Use Harness Connector Test Kit (HD-41404), brown pin probes and patch cords.

③ See Electrical Relays, Removal/Installation, page 9-80 of the 1996 FLT Service Manual.

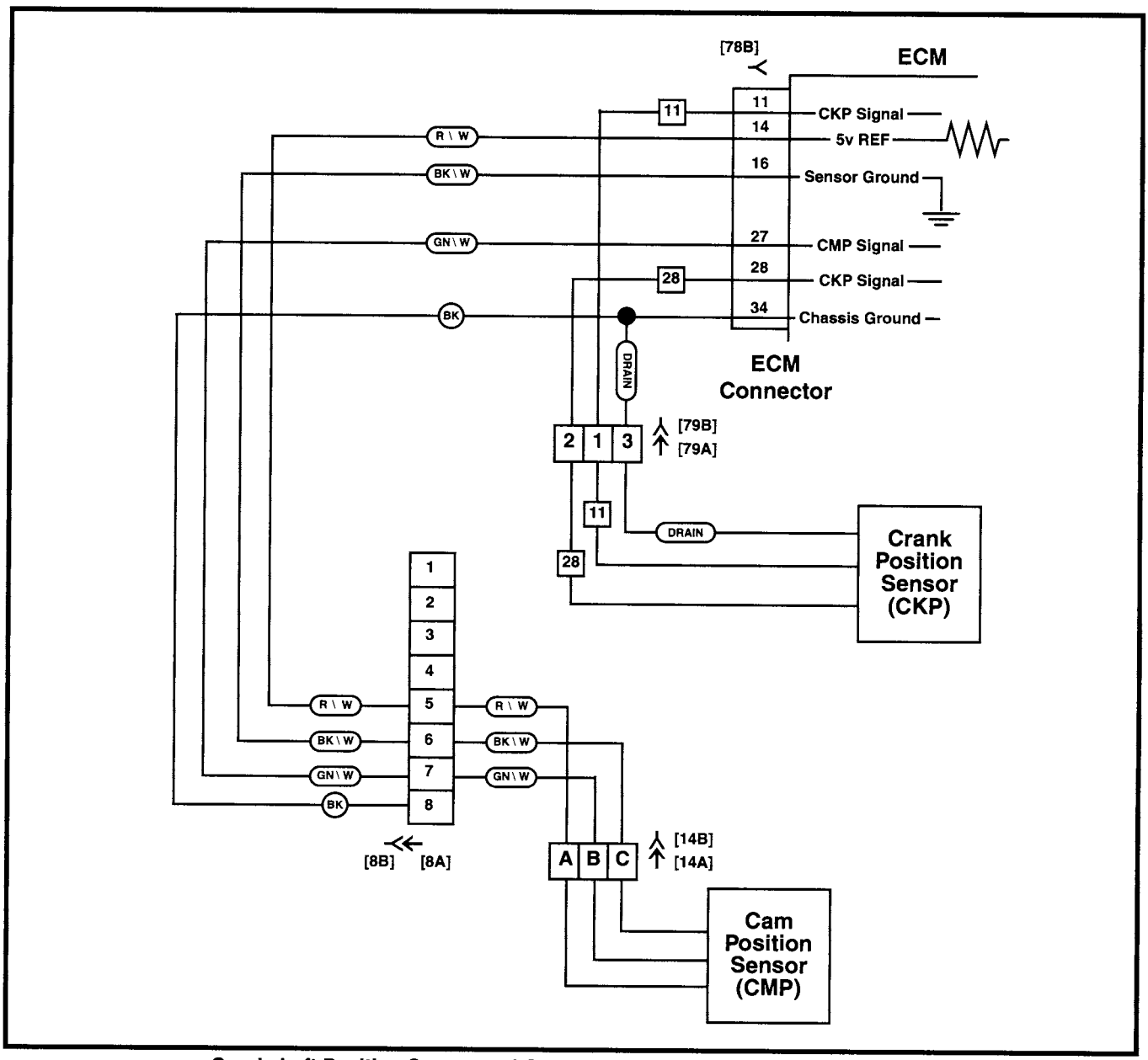
④ Use Harness Connector Test Kit (HD-41404), black pin probes and patch cords.

⑤ See Camshaft Position Sensor, Removal/Installation, page 9-84 of the 1996 FLT Service Manual.

⑥ See Crankshaft Position Sensor Harness Connector, Replacement, page 9-89 of the 1996 FLT Service Manual.

⑦ See Crankshaft Position Sensor, Removal/Installation, page 9-88 of the 1996 FLT Service Manual.

⑧ Use Harness Connector Test Kit (HD-41404), brown socket probes and patch cords.



Crankshaft Position Sensor and Camshaft Position Sensor Circuit Diagram

Code 56, Crank Position Sensor and Cam Position Sensor Timing

Wire Harness Connectors

No.	Description	Type	Location
[14]	CMP Sensor	3 - Place Deutsch	Bottom Frame Cross Member (Right Side)
[78]	ECM	35 - Place Amp	Under Right Side Cover
[79]	CKP Sensor	3 - Place Conxall	Under Right Side Cover Below Electrical Bracket

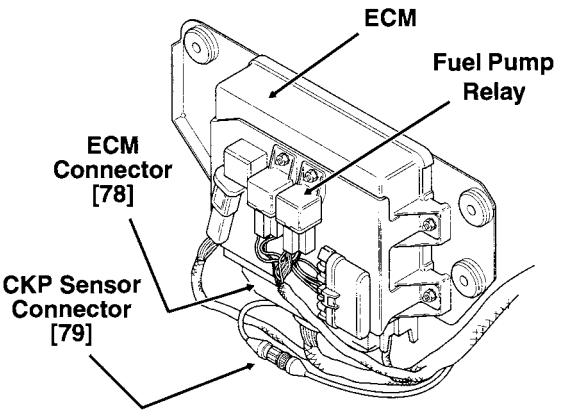


Figure 138. Electrical Bracket Assembly

(1) (2) Connect Breakout Box (HD-41198) to Connector [78B] Leaving ECM Disconnected. Measure Resistance Between Pins 11 and 34 and Between Pins 28 and 34 on Breakout Box. Resistance Should Be Greater Than 1 Megohm. Is It?

- YES → Are Crank Position Sensor Fasteners Tight in Crankcase?
  - YES → (3) Connect ECM to Breakout Box. Disconnect Fuel Pump Relay. Connect DVOM to Terminals 11 and 28 on Breakout Box and Set it to AC Volts. Crank Engine. Meter Should Read 1 VAC Minimum While Cranking. Does It?
    - YES → (4) Disconnect CMP Sensor Connector [14] and Check Voltage on Connector [14B] Terminal A (Pos.), Terminal C (Neg.). Does 5v Exist?
      - YES → Reconnect CMP Sensor Connector [14]. Measure Voltage Between Pin 27 (+) and Pin 16 (-) on Breakout Box. Crank Engine for Short Intervals. Voltage Should Fluctuate Between 0 and 5 Volts. Does It?
        - YES → Crankshaft and Camshaft are Out of Phase. Check for Improper Cam Timing, Pinion Gear Key Failure, Loose Rotor Cup or Other Mechanical Failure. **56-f**
        - NO → Disconnect ECM Connector [78B]. Measure Resistance Between ECM Pins 27 (CMP Signal) and 34 (Ground) on Breakout Box. Resistance Should be Greater than 1 Megohm. Is it?
          - YES → Wiggle Harness with DVOM Still Connected. Is It Intermittently Grounded?
            - YES → Repair. **56-i**
            - NO → (5) Replace Cam Position Sensor. **56-j**
          - NO → Disconnect CMP Sensor. Repeat Test. Resistance Greater than 1 Megohm?
            - YES → (5) Replace Cam Position Sensor. **56-k**
            - NO → Repair Short to Ground on GN/W Wire in Main Wiring Harness. **56-l**
      - NO → (4) Using a DVOM, Measure the Resistance Between Connector [14B] Terminal A and ECM Connector Terminal 14, and Also Between Connector [14B] Terminal C and ECM Connector Terminal 16. Is Resistance Greater than 1 Ohm?
        - YES → Repair Open. **56-g**
        - NO → Repeat Test and Wiggle Harness with DVOM Still Connected to Identify Intermittent Opens. **56-h**
    - NO → Tighten. **56-a**
  - NO → Disconnect Connector [79A]. Still Have Continuity to Ground (Resistance Less than 1 Megohm)?
    - YES → (6) Replace Crank Position Sensor Harness Connector (Service Part). **56-b**
    - NO → (7) Replace Crank Position Sensor. **56-c**
- NO → (8) Repeat Test at Connector [79A] Terminals 1 and 2. Meter Should Read 1 VAC Minimum While Cranking. Does It?
  - YES → (6) Replace Crank Position Sensor Harness Connector (Service Part). **56-d**
  - NO → (7) Replace Crank Position Sensor. **56-e**

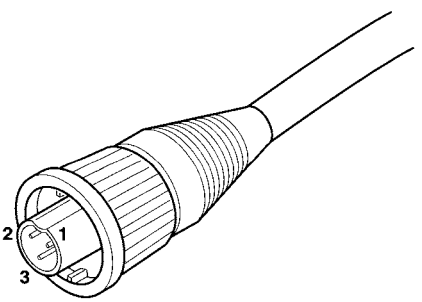


Figure 139. CKP Sensor Connector [79A]

Clear Codes and Confirm Proper Operation with No Check Engine Lamp.

B-5 EFI CHARGING SYSTEM TESTS

ALTERNATOR

The alternator consists of two main components: the rotor which is mounted on the engine sprocket shaft, and the stator, which is bolted to the engine crankcase.

TROUBLESHOOTING

Special Tools	Torque Values
Ammeter Load tester Ohmmeter AC voltmeter	None

PRELIMINARY CHECKS

When the charging system fails or does not charge at a satisfactory rate, it is recommended that the following checks be made:

BATTERY

Check for a weak or dead battery. See the BATTERY section in the Service Manual. The battery must be fully charged before any electrical tests are performed. The regulator will not function with a low battery.

WIRING

Check for corroded or loose connections in the charging circuit. See the wiring diagrams at the back of this book.

VOLTAGE REGULATOR SELF-DIAGNOSTIC CHART (See Charging System Troubleshooting Chart on page 184.)	
LED Indication	**Condition**
Extinguished	Weak or Defective Battery. Open or Grounded Stator. Open or Poor Connection on Regulator Harness to Battery. Regulator Inoperative.
Continuous Green	Normal Full Charge Mode.
Continuous Amber to Red	Thermal Taper Charge Mode.
Red - One Flash	Grounded AC Input (Stator or Regulator).
Red - Two Flashes	Continuous Low Battery Voltage.
Red - Three Flashes	Continuous High Battery Voltage.

VOLTAGE REGULATOR

The voltage regulator is a series regulator with microprocessor control. The circuit combines the functions of rectifying and regulating. With the vehicle running, a three color LED located under the base of the regulator flashes out trouble codes, a self-diagnostic feature that can assist the technician in troubleshooting. See the self-diagnostic chart at the bottom of this page. The regulator is a non-repairable item and must be replaced if it fails.

REGULATOR DC CONNECTOR INSPECTION

The regulator DC connector must have a clean, tight connection for proper operation. Disconnect battery. Check by using an ohmmeter with one lead on a known good ground, such as the battery ground cable, and the other on the regulator DC connector. Repeat check on positive lead.

NOTE

Ground connection at frame and at starter must also be clean and tight.

MILLIAMP DRAW TEST

NOTE

Be sure accessories are not wired so they stay on at all times. Check for this by connecting ammeter between negative battery terminal and battery.

See Figure 140. Connect ammeter between negative battery terminal and battery. With this arrangement, any regulator drain will be picked up.

The limits for these drains are listed in the table which follows on page 185.

Any accessories must be considered and checked for excessive drain.

This condition could drain the battery completely if the vehicle is parked for a long time.

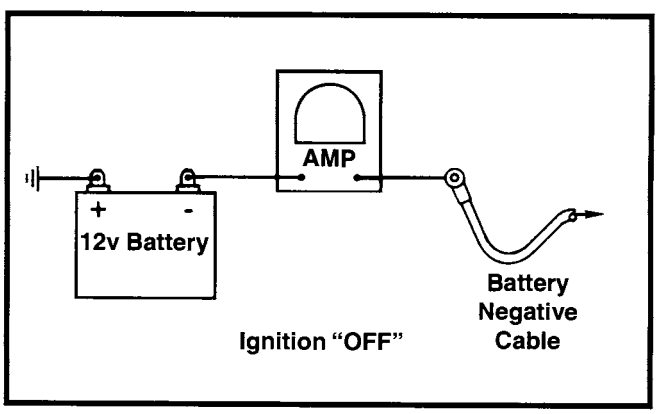


Figure 140. Milliamp Draw Test

NOTE

When a charging system component fails a test, replace the component and then re-test the system to verify that the problem has been corrected.

SYMPTOM: BATTERY BECOMES DISCHARGED

Test Battery. Perform Hydrometer and Load Tests. See Battery in Section 8 of the Service Manual, if Necessary.

- Pass
  - Start Vehicle and Inspect Regulator LED for Self-Diagnostic Output.
    - Red - Three Flashes. → Skip to Box 4
    - Red - Two Flashes. → Skip to Box 3
    - Red - One Flash. → Skip to Box 2
    - Continuous Amber to Red. → Skip to Box 5
    - Continuous Green.
      - Perform MILLIAMP DRAW TEST (If Applicable).
        - Pass
          - 1 Perform TOTAL CURRENT DRAW TEST. Record Measurement.
            - Pass
              - 3 Perform CURRENT OUTPUT TEST. Record Measurement and Compare with TOTAL CURRENT DRAW TEST Before Proceeding.
                - Pass
                  - 4 Perform VOLTAGE OUTPUT TEST.
                    - Pass
                      - 5 System tests good up to this point. Accessories on for long periods when vehicle is parked and not running. Accessories on when vehicle is ridden very slowly for long periods. Battery self-discharge and/or accessory draw because vehicle was not operated for a long period. Allow Vehicle to Cool (High Load, High RPM, Low Vehicle Speed, Insufficient Air Flow Causing Regulator to Overheat). Increase Vehicle Speeds to Increase Air Flow.
                    - Fail
                      - Perform STATOR CHECK.
                        - Pass
                          - Replace Voltage Regulator.
                        - Fail
                          - Replace Stator.
                - Fail
                  - Excessive Current Draw- Reduce Draw, Disconnect Accessories, Reduce Load, Increase Vehicle Speeds or Isolate Damaged Wiring.
            - Fail
              - Isolate Damaged Component or Wiring.
        - Fail
          - 2 Perform STATOR CHECK.
            - Pass
              - Perform AC OUTPUT TEST.
                - Pass
                  - Replace Voltage Regulator.
                  - Perform CURRENT OUTPUT TEST.
                    - Fail
                      - Damaged or Slipping Rotor.
                - Fail
                  - Replace Stator.
            - Fail
              - Inspect Rotor.
                - Pass
                  - Replace Stator.
                - Fail
                  - Replace Rotor.
    - Extinguished.
      - No Diagnostic Output. Inspect DC Regulator Harness for Opens.
        - Pass
          - Perform Stator Check.
            - Pass
              - Replace Voltage Regulator.
            - Fail
              - Replace Stator.
        - Fail
          - Repair Opens.
- Fail
  - Charge or Replace Battery.

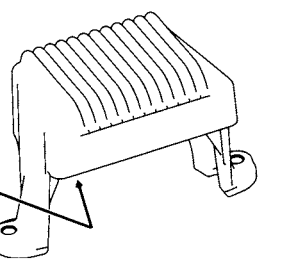


Figure 141. Voltage Regulator

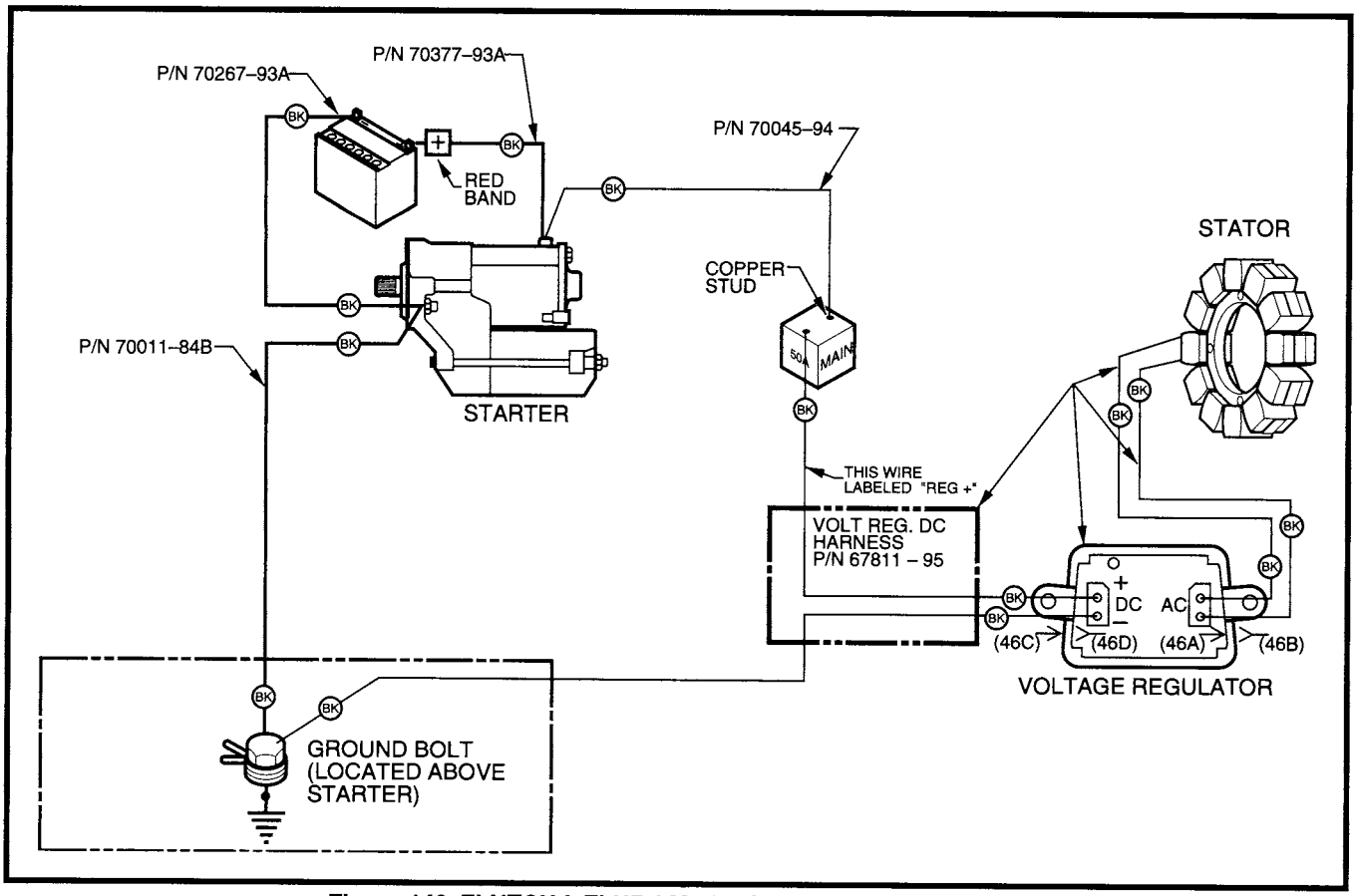


Figure 142. FLHTCU-I, FLHR-I Model Charging System Circuit

NOTE

A battery with a surface discharge condition or over full could cause a static drain. Correct by lowering levels in cells and cleaning battery case.

COMPONENTS	MAXIMUM METER READING (Milliamperes)
ECM	1
Regulator	2
Radio	5
CB	5
Total Maximum Draw	13

NOTE

Any reading that exceeds the above "Maximum Meter Reading" values indicates excessive current draw. Check for bad radio, CB, regulator or a short in the interconnecting wiring. Isolate problem by disconnecting suspected components and observe change in meter reading.

TOTAL CURRENT DRAW TEST

See Figure 143. If the battery runs down during use, the current draw of the motorcycle components and accessories may exceed the output of the charging system. To check for this condition, place load tester induction pickup or current probe pickup over battery negative cable as shown.

Disconnect regulator DC connector. Start vehicle and run engine at 2500 RPM. With the ignition and all continuously running lights and accessories turned on (headlamp on high beam), read the total current draw. Compare this reading to the reading obtained in CURRENT OUTPUT TEST. The current output should exceed current draw by 3.5 amps minimum. If not, there may be too many accessories for the charging system to handle.

NOTE

Rider's habits may require output test at lower RPM.

CURRENT AND VOLTAGE OUTPUT TEST

1. Connect load tester negative and positive leads to battery terminals and place load tester induction pickup over positive regulator cable as shown in Figure 143.

2. Run the engine at 3000 RPM and increase the load as required to obtain a constant 13.0 volts.

   The current output should be 34-40 amperes. Make note of the measurement.

VOLTAGE OUTPUT TEST

After removing the load, read the load tester voltage meter. Voltage to the battery must not be more than 15 volts. If voltage is higher, regulator is not functioning properly, the stator is grounded or connections are loose or dirty.

⚠CAUTION

Do not leave any load switch turned on for more than 20 seconds or overheating and tester damage are possible.

STATOR CHECK

1. To check for a grounded stator, turn off ignition and disconnect the regulator from the stator at the regulator connector.

2. Connect an ohmmeter on the RX1 scale between crankcase and either stator socket. There should be no continuity (∞ ohms) across either test point. Any other reading indicates a grounded stator which must be replaced.

3. Check the resistance of the stator using an ohmmeter set on the RX1 scale. Resistance should be 0.1 ohms or less across the stator sockets. If the resistance is higher, the stator is damaged and must be replaced.

NOTE

Meter accuracy may not be optimal if meter will not zero because of poor connections or weak battery.

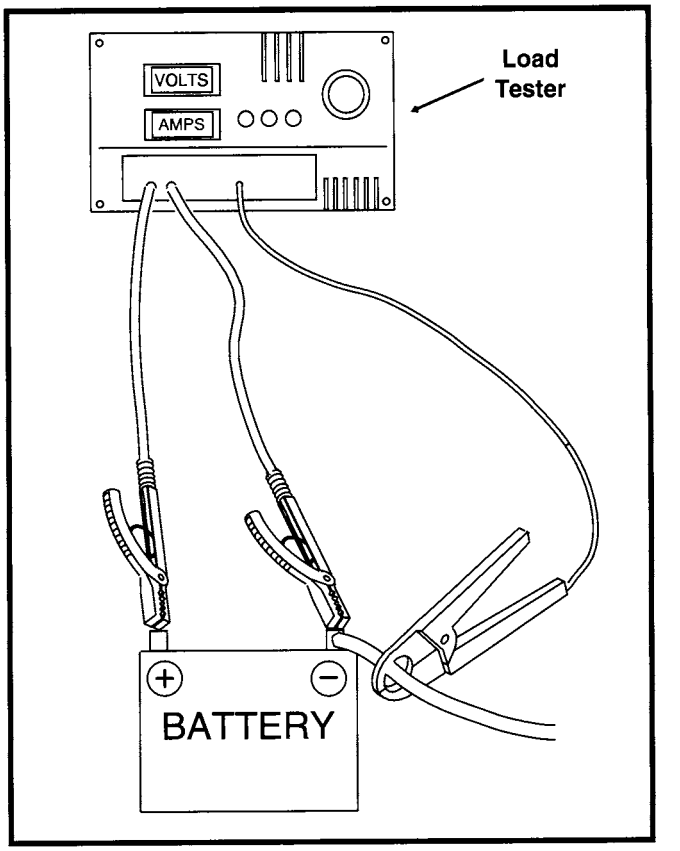


Figure 143. Check Current Draw (Ignition Switch On)

AC OUTPUT CHECK

1. To test AC output, disconnect the regulator and connect an AC voltmeter across both stator sockets. Run the engine at 2000 RPM. The AC output should be between 32-40 AC volts (16-20 per 1000 RPM).

2. If the output is below specifications, charging problem could be a faulty rotor or stator. Replace the rotor or stator as described in the 1996 FLT Service Manual, Section 9C-6, Charging System.

3. Check the output again as described under VOLTAGE OUTPUT TEST above.

C. ELECTRICAL CONNECTOR SERVICE AND REPAIR

DEUTSCH ELECTRICAL CONNECTORS

All FLT models utilize Deutsch DT Series Electrical Connectors. The Deutsch Connector features a superior seal to protect electrical contacts from dirt and moisture in harsh environments. The connector also provides better pin retention than previous connectors.

A 12-place connector is illustrated in Figure 146 to show the various parts of the Deutsch connector. The following instructions may be followed for all 2-place through 12-place Deutsch connectors.

Socket housing: alignment tabs and/or external latch, secondary locking wedge, internal seal, wire seal, seal pin.

NOTE

Seal pins or plugs are installed in the wire seals of unused pin and socket locations. If removed, seal pins must be replaced to maintain the integrity of the environmental seal.

Pin housing: alignment grooves and/or external latch cover, attachment clip, secondary locking wedge, wire seal, seal pin.

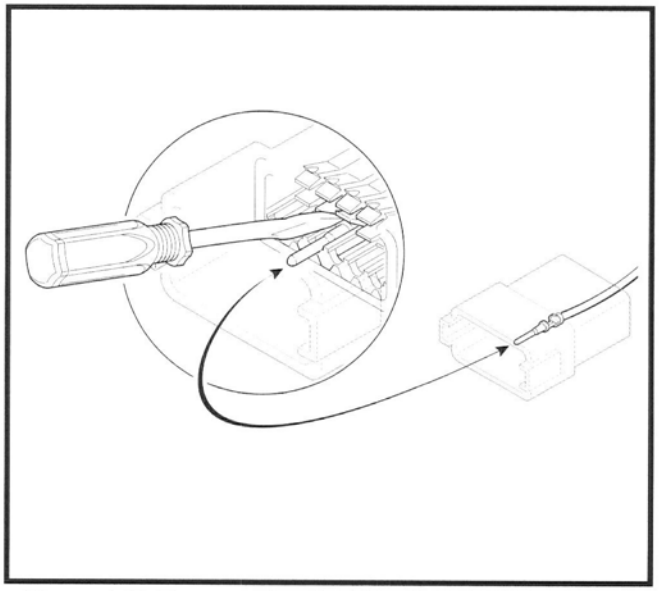


Figure 145. Depress Terminal Latches/Back Out Pins

REMOVING/DISASSEMBLING

Attachment clips are attached to the pin housings of most connectors. The clips are then attached to T-studs on the motorcycle frame. T-studs give positive location to electrical connectors and wire harness. Consistent location reduces electrical problems and improves serviceability.

1. Push the connector to disengage small end of slot on attachment clip fromT-stud. Lift connector off T-stud.
2. Depress the external latch(es) on the socket housing side and use a rocking motion to separate the pin and socket halves. Two-, three-, four- and six-place Deutsch connectors have one external latch, while eight- and twelve-place connectors have two, both of which must be pressed simultaneously to separate the connector halves.

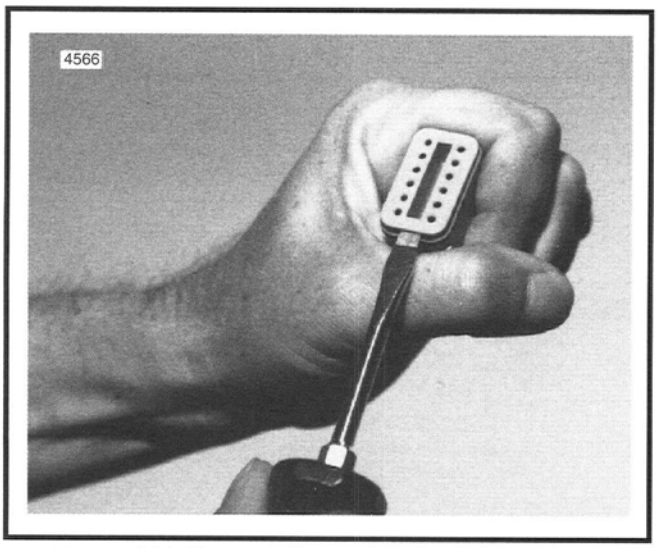


Figure 144. Remove Secondary Locking Wedge

NOTE

With few exceptions, the socket housing can always be found on the accessory side, while the pin side of the connector is plumbed to the wiring harness.

REMOVING/INSTALLING SOCKETS

1. See Figure 144. Remove the secondary locking wedge. Insert the blade of a small screwdriver between the socket housing and locking wedge inline with the groove (inline with the pin holes if the groove is absent). Turn the screwdriver 90 degrees to pop the wedge up.
2. Gently depress terminal latches inside socket housing and back out sockets through holes in rear wire seal. See Figure 145.

NOTE

An Electrical Terminal Crimp Tool (Part No. HD-39965) is used to install Deutsch pin and socket terminals on wires. If new terminals must be installed, follow the instructions included with the crimping tool or see Crimping Instructions in this section.

3. Fit rear wire seal into back of socket housing, if removed. Grasp socket approximately 1 inch (25.4 mm) behind the contact barrel. Gently push sockets through holes in wire seal into their respective chambers. Feed socket into

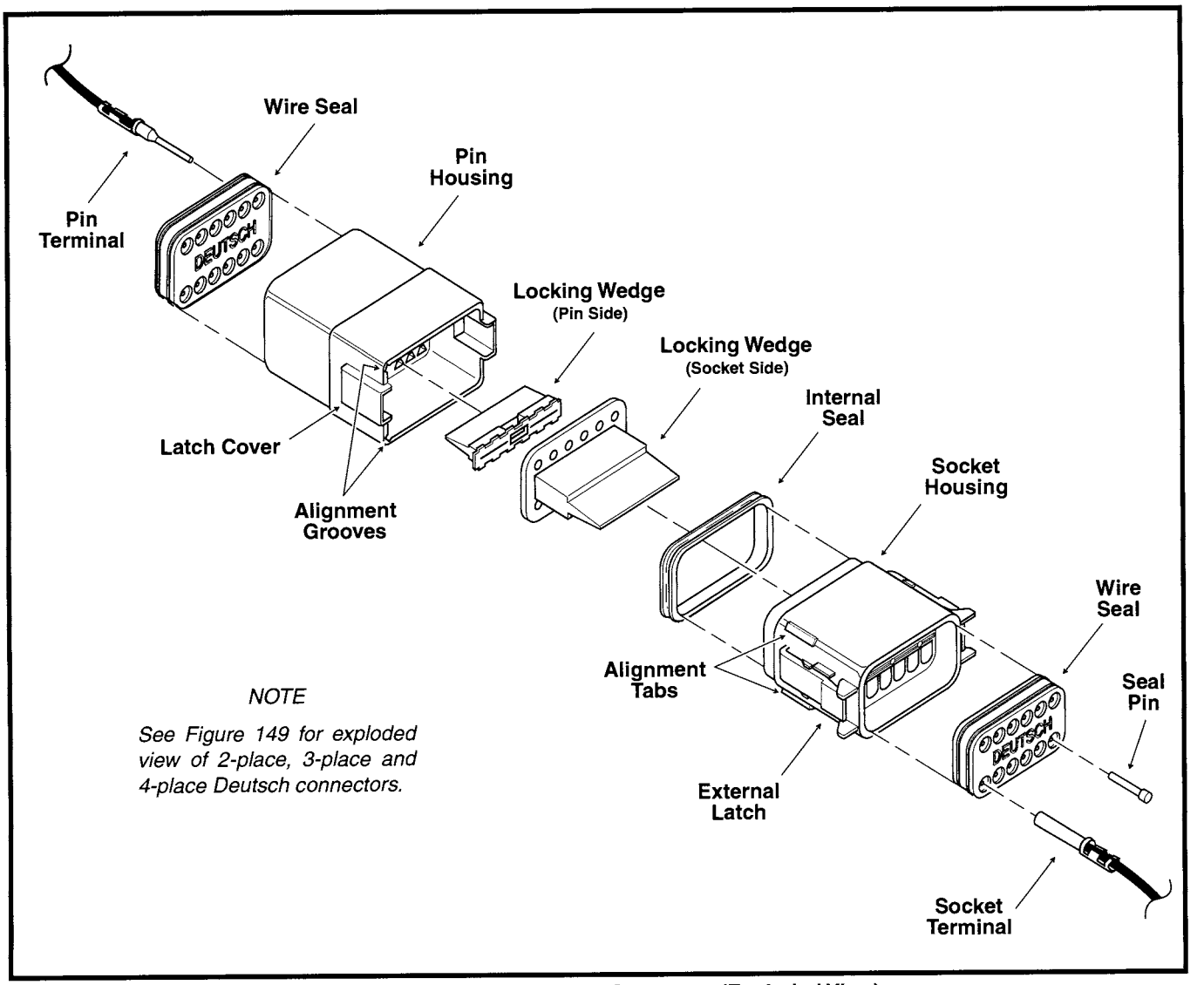


Figure 146. 12-Place Deutsch Connector (Exploded View)

chamber until it "clicks" in place. Verify that socket will not back out of chamber; a slight tug on the wire will confirm that it is properly locked in place.

4. Install internal seal on lip of socket housing, if removed. Insert tapered end of secondary locking wedge into socket housing and press down until it snaps in place. The wedge fits into the center groove within the socket housing and holds the terminal latches tightly closed.

NOTE

While rectangular wedges do not require a special orientation, the conical secondary locking wedge of the 3-place connector must be installed with the arrow pointing toward the external latch. See Figure 147.

NOTE

If the secondary locking wedge does not slide into the installed position easily, verify that all terminals are fully installed in the socket housing. The lock indicates when terminals are not properly installed by not entering its fully installed position.

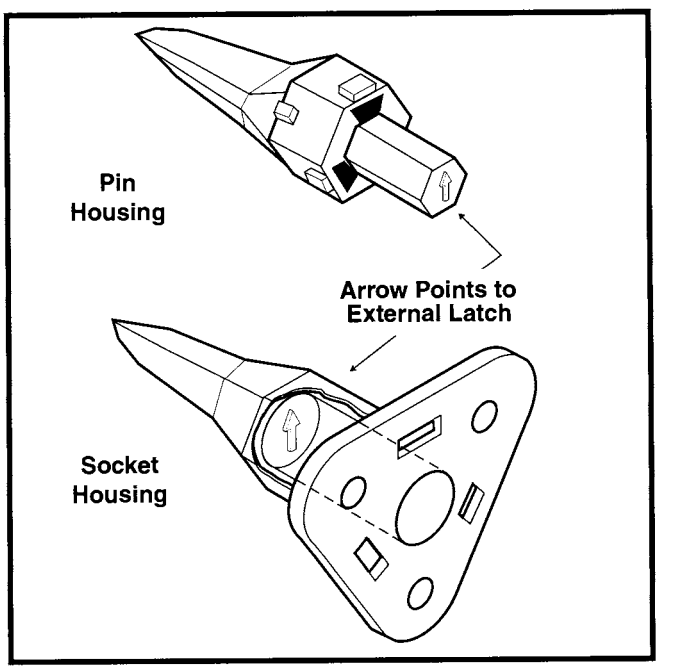


Figure 147. 3-Place Locking Wedge Orientation

REMOVING/INSTALLING PINS

1. Remove the secondary locking wedge. Use the hooked end of a stiff piece of mechanics wire or a needle nose pliers, whichever is most suitable.
2. Gently depress terminal latches inside pin housing and back out pins through holes in wire seal.

NOTE

An Electrical Terminal Crimp Tool (Part No. HD-39965) is used to install Deutsch pin and socket terminals on wires. If new terminals must be installed, see Crimping Instructions in this section.

3. Fit wire seal into back of pin housing. Grasp crimped pin approximately 1 inch (25.4 mm) behind the contact barrel. Gently push pins through holes in wire seal into their respective numbered locations. Feed pin into chamber until it "clicks" in place. Verify that pin will not back out of chamber; a slight tug on the wire will confirm that it is properly locked in place.
4. Insert tapered end of secondary locking wedge into pin housing and press down until it snaps in place. The wedge fits in the center groove within the pin housing and holds the terminal latches tightly closed.

NOTE

While rectangular wedges do not require a special orientation, the conical secondary locking wedge of the 3-place connector must be installed with the arrow pointing toward the external latch. See Figure 147.

NOTE

If the secondary locking wedge does not slide into the installed position easily, verify that all terminals are fully installed in the pin housing. The lock indicates when terminals are not properly installed by not entering its fully installed position.

ASSEMBLING/INSTALLING

1. Insert socket housing into pin housing until it snaps in place. Two-, three-, four- and six-place Deutsch connectors have one external latch on the socket half of the connector. To fit the halves of the connector together, the latch on the socket side must be aligned with the latch cover on the pin side.

   For those connectors with two external latches (8-place and 12-place), a different system is used to prevent improper assembly. Align the tabs on the socket housing with the grooves on the pin housing. Push the connector halves together until the latches "click." If latches do not click (latch), press on one side of the connector until that latch engages, then press on the opposite side to engage the other latch.

NOTE

*Deutsch connectors are colored coded for location purposes. Those connectors associated with **left** side accessories, such as the front and rear **left** turn signals, are **gray**. All other connectors, including those associated with right side accessories, are black.*

If it should become necessary to replace a plug or receptacle, please note that the 8-place and 12-place gray and black connectors are not interchangeable. Since location of the alignment tabs differ between the black and gray connectors, plugs or receptacles must be replaced by those of the same color. If replacing both the socket and pin halves, then the black may be substituted for the gray, and vice versa. The socket and pin halves of all other connectors are interchangeable, that is, the black may be mated with the gray, since the alignment tabs are absent and the orientation of the external latch is the same.

2. Fit the attachment clip to the pin housing, if removed. Place large end of slot on attachment clip over T-stud on frame; push assembly forward to engage small end of slot.

CRIMPING INSTRUCTIONS (Figure 148)

1. Squeeze the handles to cycle the crimp tool to the fully open position.
2. Raise the locking bar by pushing up on bottom flange. With the crimp tails facing upward, insert contact (socket/pin) through hole of locking bar, so that the rounded side of the contact barrel rests on the nest (concave split level area) of the crimp tool. Use the middle hole in the locking bar for 16-18 gauge wire, the front hole for 20 gauge wire.
3. Release locking bar to lock position of contact. If the crimp tails are slightly out of vertical alignment, the crimp tool automatically rotates the contact so that the tails face straight upward. When correctly positioned, the locking bar fits snugly in the space between the contact band and the core crimp tails.

4. Strip lead removing 5/32 inch (3.96 mm) of insulation. Insert wires between crimp tails until ends make contact with locking bar. Verify that wire is positioned so that short pair of crimp tails squeeze bare wire strands, while long pair folds over insulation material.

5. Squeeze handle of crimp tool until tightly closed. Tool automatically opens when the crimping sequence is complete. Raise up locking bar and remove contact.

6. Inspect the quality of the core and insulation crimps. Distortion should be minimal.

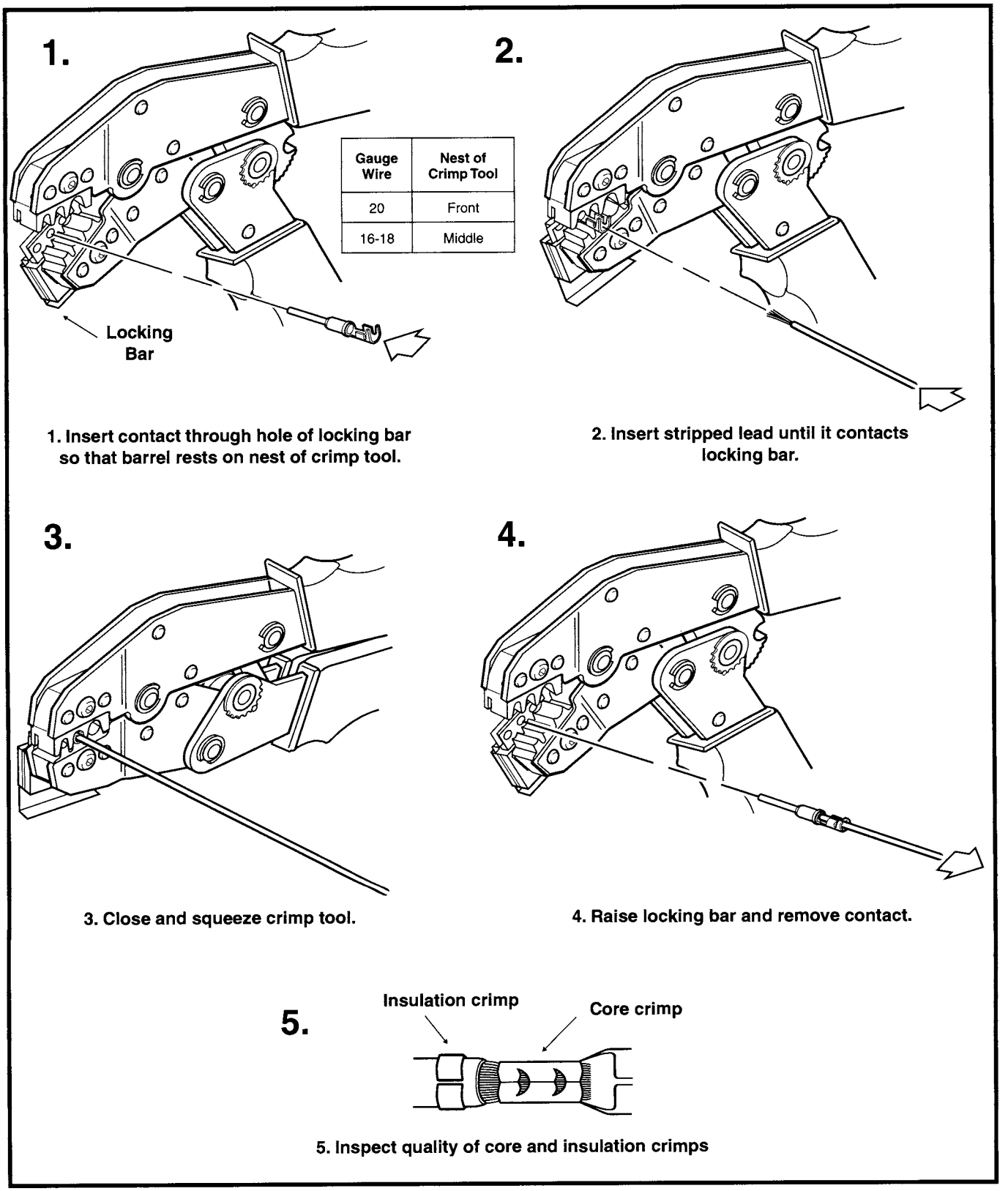


Figure 148. Deutsch Crimping Procedure

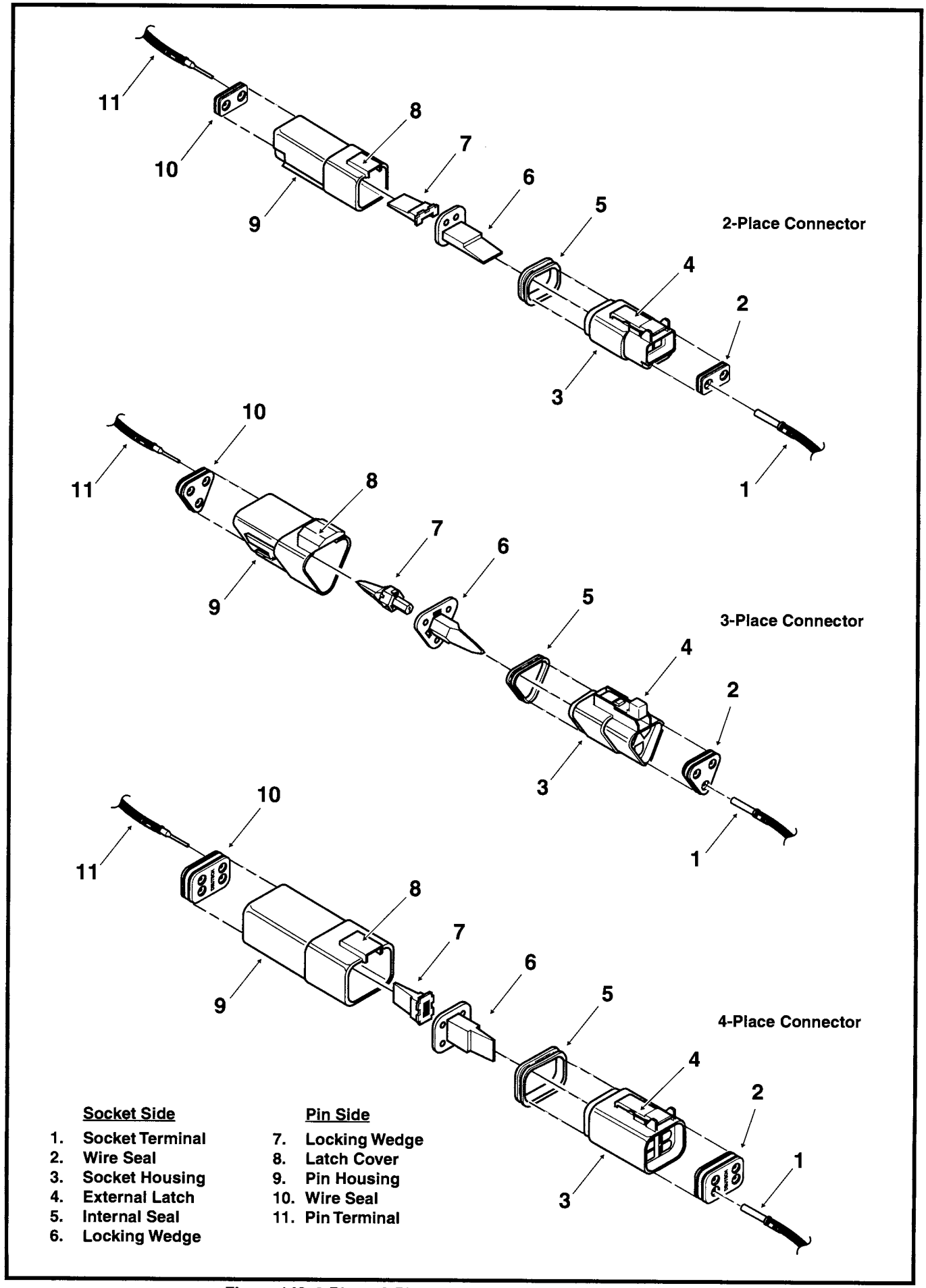


Figure 149. 2-Place, 3-Place and 4-Place Deutsch Connectors

AMP MULTILOCK ELECTRICAL CONNECTORS

REMOVING SOCKET/PIN TERMINALS

1. Remove connector from the retaining device, either attachment or rosebud clip.

2. Depress the button on the socket terminal side of the connector (plug) and pull apart the pin and socket halves. See Figure 150.

3. Bend back the latch slightly and free one side of secondary lock, then repeat the step to release the other side. Rotate the secondary lock outward on hinge to access terminals in chambers of connector housing.

4. Looking in the terminal side of the connector (opposite the secondary lock), take note of the cavity next to each terminal.

5. See Figure 151. With the flat side against the terminal, insert the pick (Snap-On TT600-3) into the cavity until it stops. Pivot the end of the pick away from the terminal and gently tug on wire to pull terminal from chamber. Do not tug on the wire until the tang is released or the terminal will be difficult to remove. A "click" is heard if the tang is engaged but then inadvertently released. Repeat the step without releasing the tang.

NOTE

An Electrical Terminal Crimp Tool (Part No. HD-41609) is used to install Amp Multilock pin and socket terminals on wires. If new terminals must be installed, see Crimping Instructions on the next page.

INSTALLING SOCKET/PIN TERMINALS

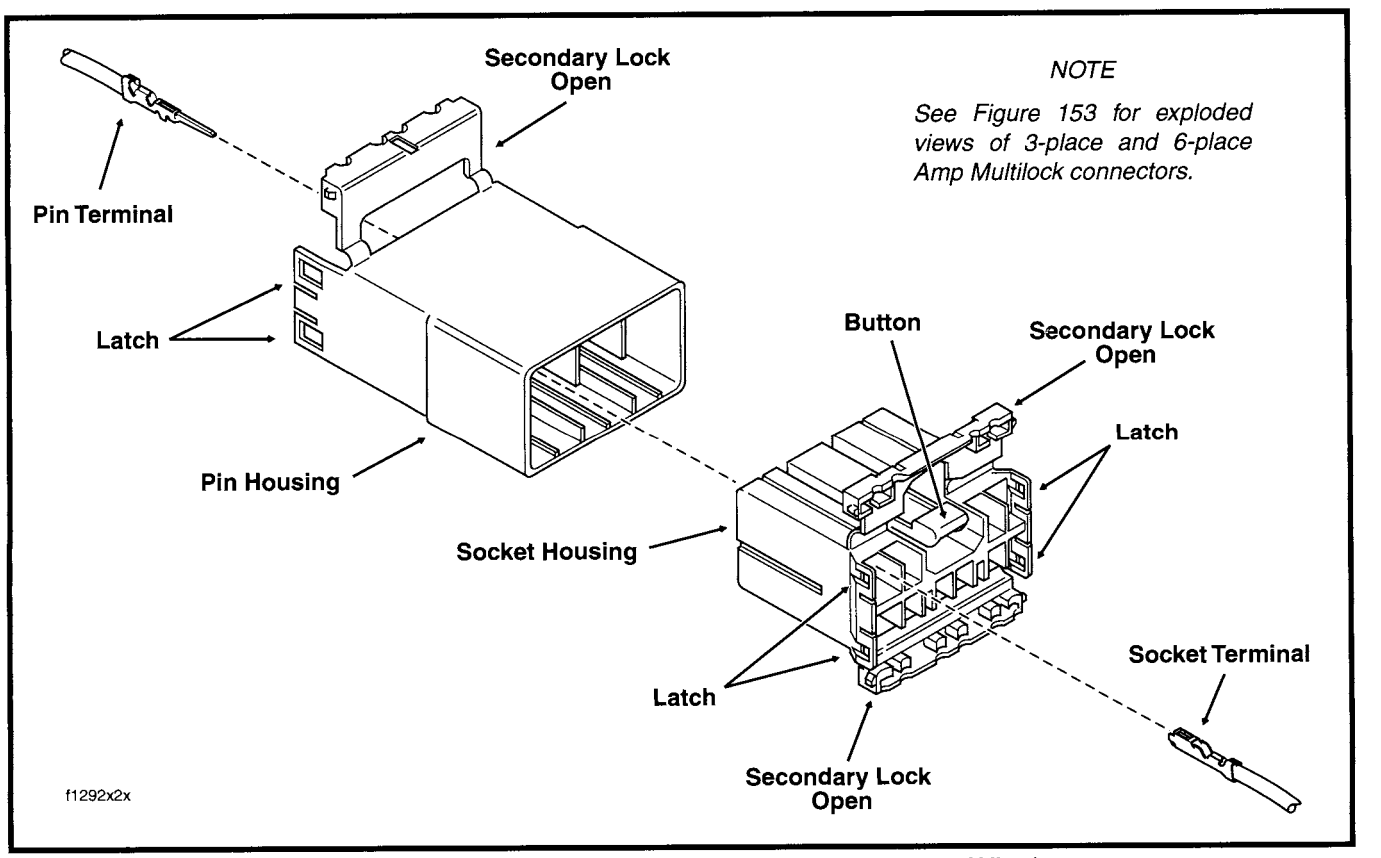
NOTE

For wire location purposes, numbers are stamped into the secondary locks of both the socket and pin housings. See Figure 152.

1. From the secondary lock side of the connector, insert the terminal into its respective numbered chamber until it snaps in place. For proper fit, the slot in the terminal must face the tang in the chamber.

NOTE

The tang in the chamber engages the slot to lock the terminal in position. On the pin side of the connector, tangs are positioned at the bottom of each chamber, so the slot in the pin terminal (on the side opposite the crimp tails) must face downward. On the socket side, tangs are at the top of each chamber, so the socket terminal slot (on the same side as the crimp tails) must face upward. Up and down can be



NOTE

See Figure 153 for exploded views of 3-place and 6-place Amp Multilock connectors.

Figure 150. 10-Place Amp Multilock Connector (Exploded View)

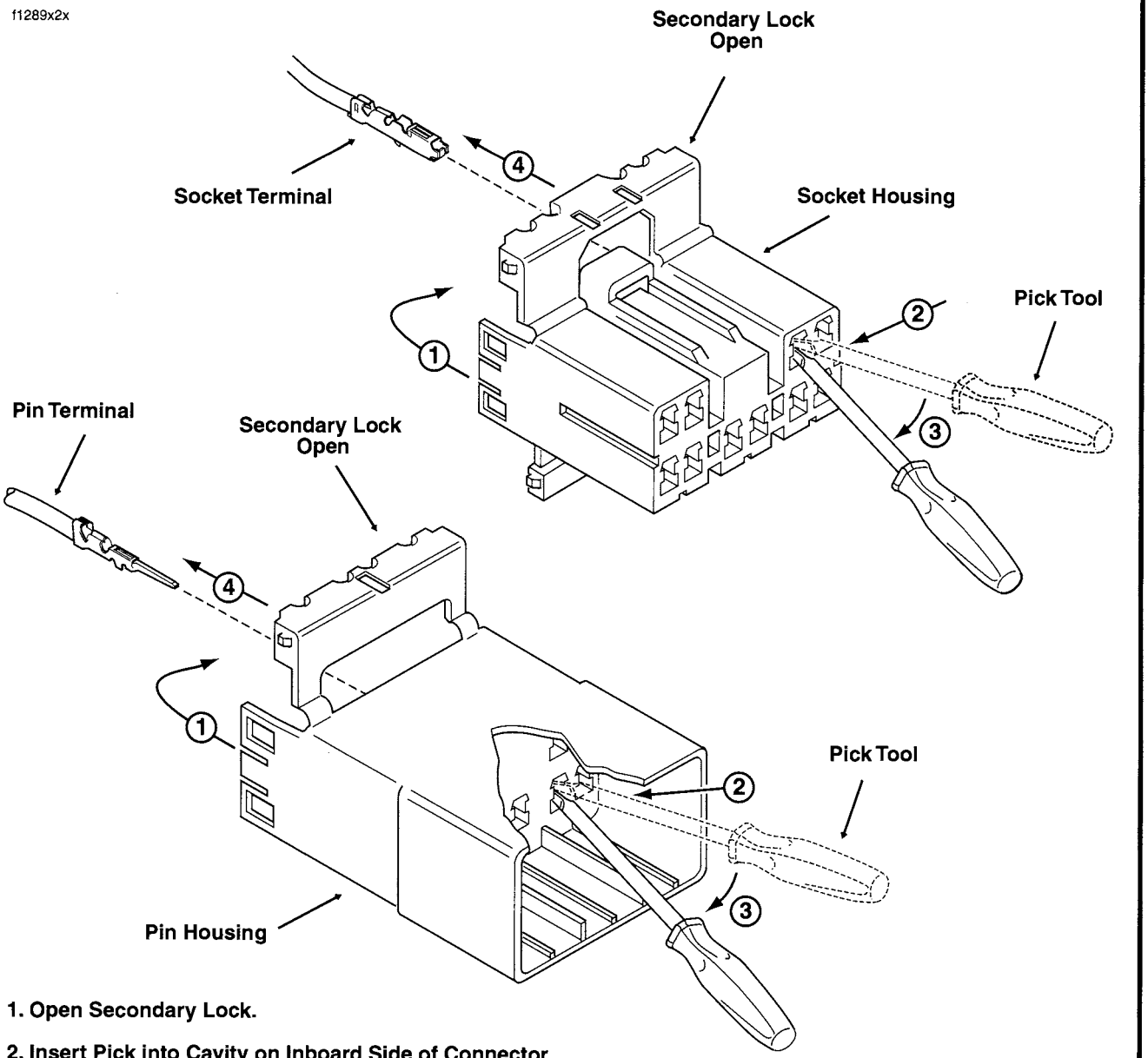


Figure 151. Release Tang and Back Out Terminals

determined by the position of the release button (used to separate the pin and socket halves), the button always being the top of the connector.

2. Gently tug on wire end to verify that the terminal is locked in place and will not back out of chamber.
3. Rotate the hinged secondary lock inward until tabs fully engage latches on both sides of connector.
4. Insert the socket housing (plug) into the pin housing (receptacle) until it snaps in place.
5. Install connector on retaining device, either attachment or rosebud clip.

CRIMPING INSTRUCTIONS

1. Squeeze the handles to cycle the crimp tool (Part No. HD-41609) to the fully open position.
2. Raise locking bar by pushing up on bottom flange. With the crimp tails facing upward, insert contact (socket/pin) through locking bar, so that the closed side of the contact rests on the nest (concave split level area) of the crimp tool). Use the front nest for 20 gauge wire, the middle for 16 gauge and the rear for 18 gauge. See Figure 154.

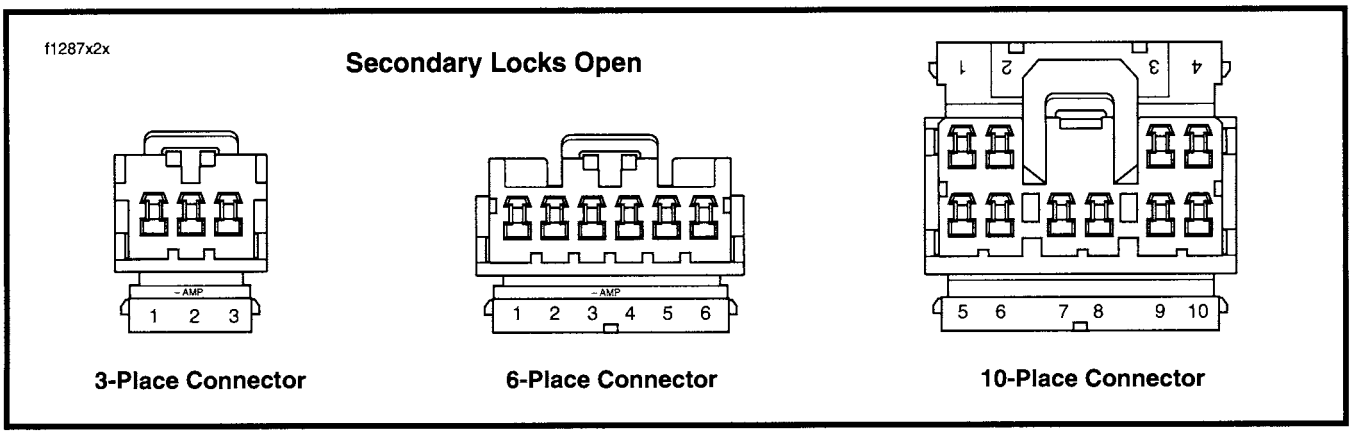


Figure 152. Numbers Stamped on Secondary Locks for Wire Color Locations (Socket Housings Shown)

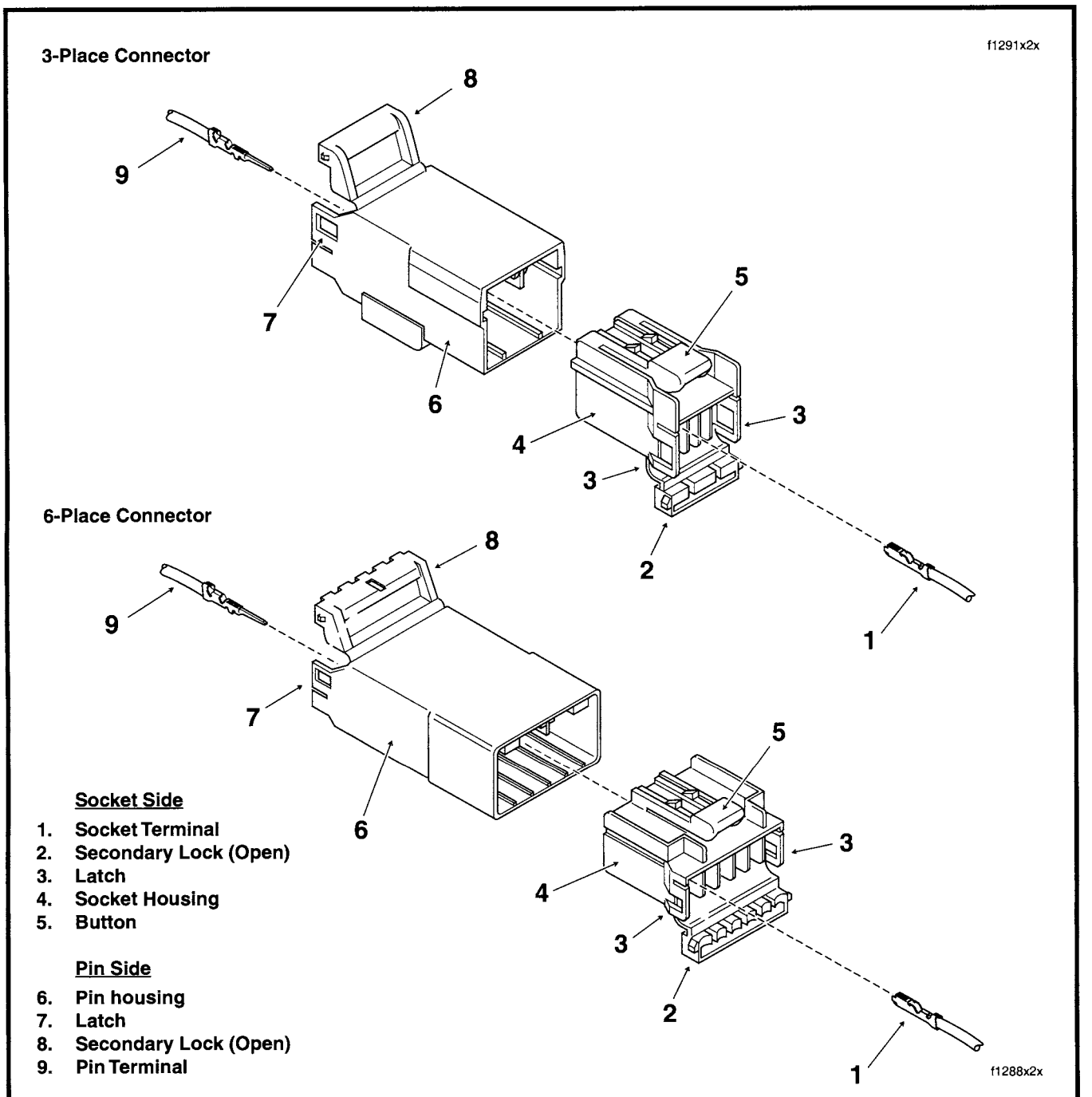


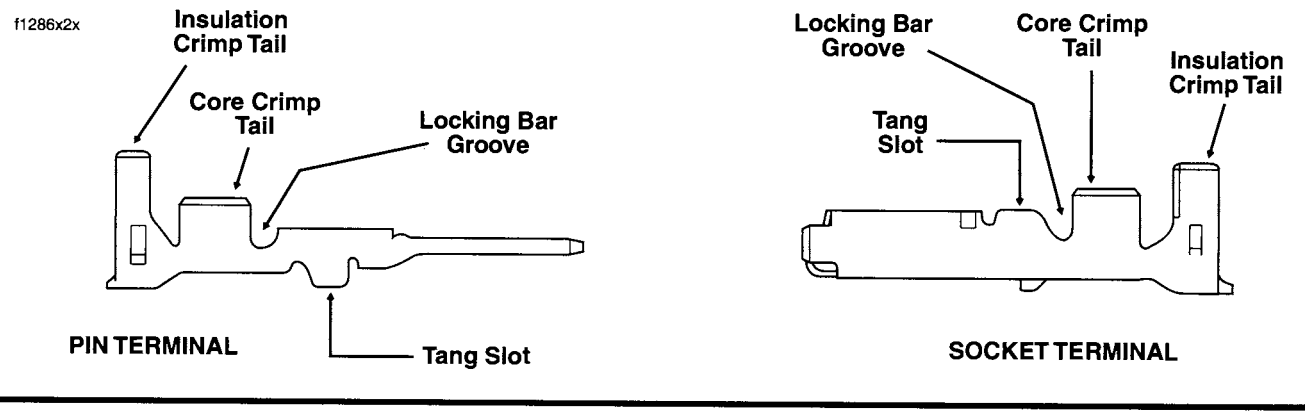
Figure 153. 3-Place and 6-Place Amp Multilock Connectors

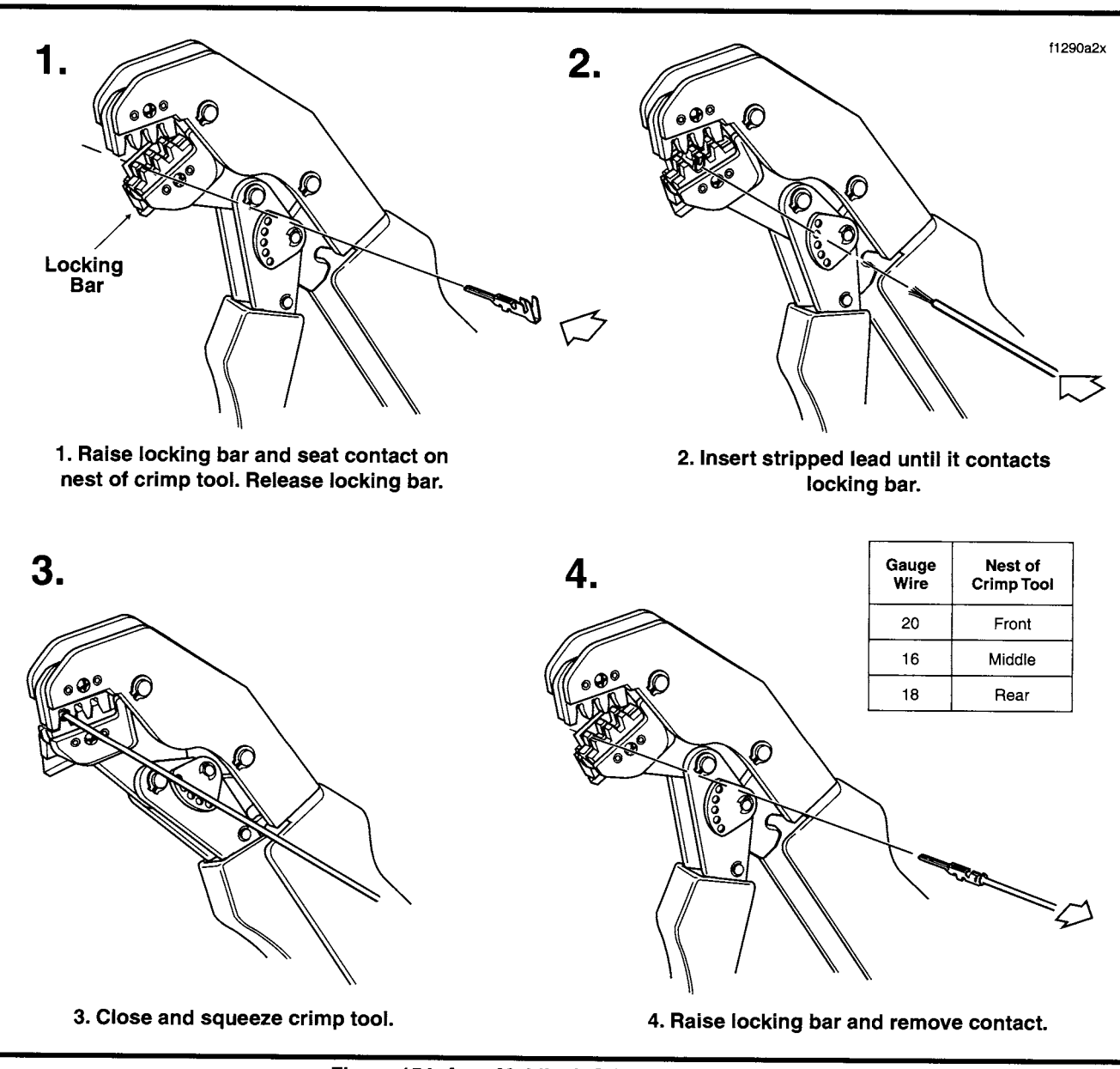
3. Release locking bar to lock position of contact. When correctly positioned, the locking bar fits snugly in the space at the front of the core crimp tails.

4. Strip lead removing 5/32 inch (4 mm) of insulation. Insert wires between crimp tails until ends make contact with locking bar. Verify that wire is positioned so that short pair of crimp tails squeeze bare wire strands, while long pair folds over insulation material.

5. Squeeze handle of crimp tool until tightly closed. Tool automatically opens when the crimping sequence is complete. Raise up locking bar and remove contact.

6. Inspect the quality of the core and insulation crimps. Distortion should be minimal.





Gauge Wire	Nest of Crimp Tool
20	Front
16	Middle
18	Rear

Figure 154. Amp Multilock Crimping Procedure

PACKARD ELECTRICAL CONNECTORS

GENERAL

From a servicing standpoint, there are two basic types of Packard electrical connectors, those with pull-to-seat terminals and those with push-to-seat terminals.

Look into the mating end of the connector. If it appears that the terminal can be extracted from this side, then it is probably the pull-to-seat type.

At least one Packard pull-to-seat terminal can be easily recognized by the presence of a locking ear. The ear engages a slot in the connector housing and prevents the terminal from being removed from the wire end side of the connector. The ear also acts as a strain relief in the event that the wires are pulled and further inhibits movement of the terminal inside the chamber. For an example of this type of connector, note the IAT Sensor connector [89B].

PULL-TO-SEAT TERMINALS

Unlike most connectors, where the terminals are pulled out the wire end of the connector, to remove the terminals from the pull-to-seat connectors, the terminal is pushed out the mating end of the connector. Once a new terminal is crimped onto the end of the wire, the wire is pulled to draw the terminal back inside the chamber of the connector housing.

The Packard pull-to-seat terminal connectors found on FL model vehicles are listed below.

- IAT Sensor [89B]
- ET Sensor [90B]
- TP Sensor [88B]
- ISC Actuator [87B]
- Fuel Injector [84B and 85B]

Two types of Packard pull-to-seat electrical connectors are used. One type has an external latch to lock the pin and socket halves together, while the other makes use of a wireform. See Figure 155. The manner in which the terminals are picked differs between these two types of connectors, as further described below.

Removing Pull-to-seat Terminals

External Latch Type

To remove a pull-to-seat terminal from connectors with external latches, proceed as follows:

1. Remove the connector from the retaining device, if present.
2. Bend back the external latch(es) slightly and separate the pin and socket halves of the connector.
3. To free a pull-to-seat terminal from the connector housing, first look into the mating end of the connector to find the locking tang. See A in Figure 156. The tangs are always positioned in the middle of the chamber and are on the same side as the external latch. On those connectors with locking ears, the tang is on the side opposite the ear.

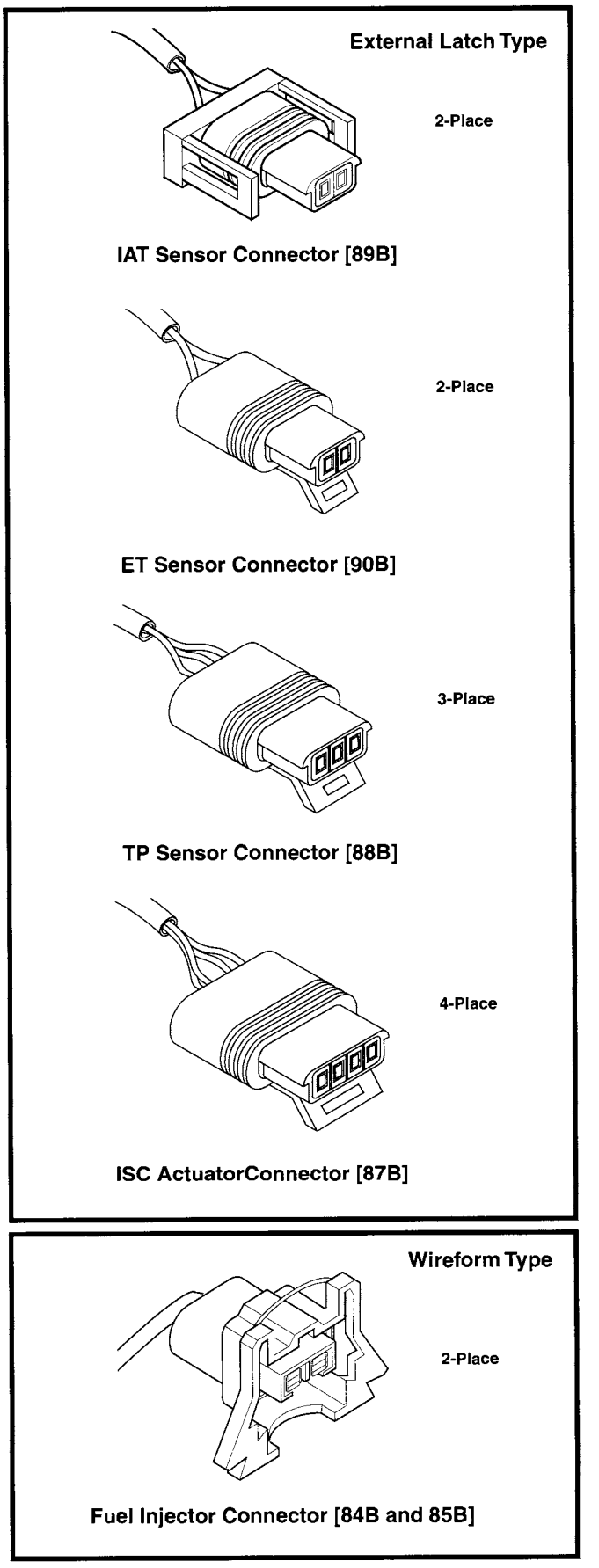


Figure 155. Packard Pull-to-Seat Terminal Connectors (Socket Sides)

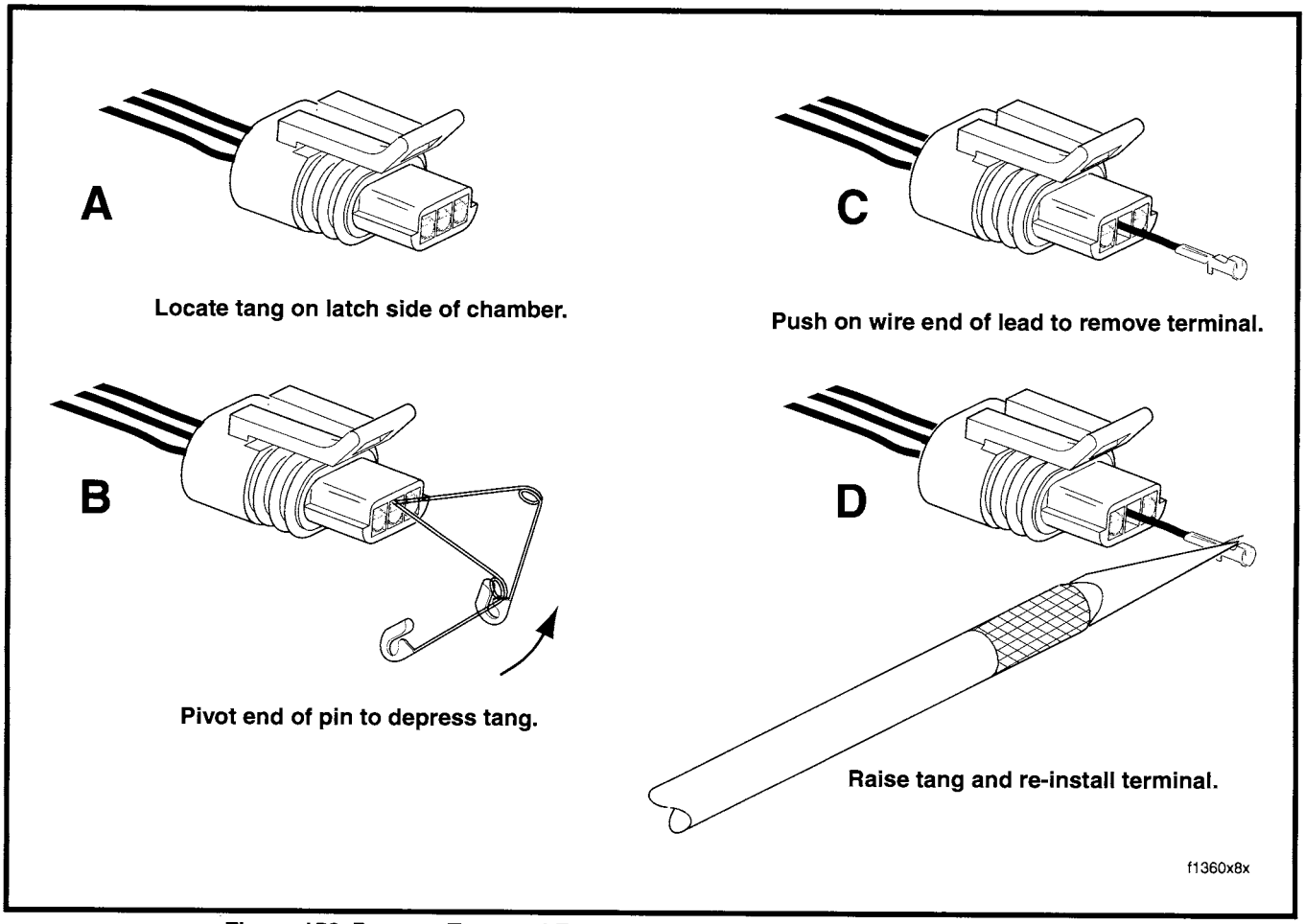


Figure 156. Depress Tang and Extract Terminal From Mating End of Connector

4. At a slight angle, gently insert the point of a one inch safety pin down the middle of the chamber (about 1/8 inch) and pivot the end of the pin toward the terminal body. When a click is heard, remove the pin and repeat the procedure. See B in Figure 156. The click is the sound of the tang returning to the locked position as it slips from the point of the pin. Pick at the tang in this manner until the clicking stops and the pin seems to slide in at a slightly greater depth than it had previously. This is an indication that the tang has been depressed.

NOTE

On those terminals that have been extracted on a previous occasion, no clicking sound may be heard when the pin is pivoted to depress the tang, but proceed as if the clicking is audible and then push on the wire end of the lead to check if the terminal is free.

NOTE

When picking multiple terminals, the end of the pin may become malleable. For best results, continue the procedure with a new safety pin.

5. Remove the pin and push on the wire end of the lead to extract the terminal from the mating end of the connector. See C in Figure 156. If necessary, pull back the conduit and remove the wire seal at the back of the connector to introduce some slack in the wires.

NOTE

A series of Packard Electrical Terminal Crimp Tools are available to install Packard pin and socket terminals on wires. If new terminals must be installed, see Crimping Instructions on page 201.

Installing Pull-to-seat Terminals External Latch Type

NOTE

For wire location purposes, alpha characters are stamped into the socket housings.

1. To install a terminal back into the chamber of the connector housing, use a thin flat blade, like that on an X-Acto knife, and carefully bend the tang outward away from the terminal body. See D in Figure 156.
2. Gently pull on the lead at the wire end of the connector to draw the terminal back into the chamber. A click is heard when the terminal is properly seated.
3. Push on the lead to verify that the terminal is locked in place.
4. Push the pin and socket halves of the connector together until the latches "click."

Removing Pull-to-seat Terminals Wireform Type

To remove a pull-to-seat terminal from a wireform type connector, proceed as follows:

1. Depress the wire form and use a rocking motion to detach the electrical connector.
2. Hold the connector so that the wire form is facing down.
3. Looking at the center of the connector, note the plastic rib that separates the wire terminals. On each side of the rib, you can glimpse the edge of the terminal body at the front, while the edge of the tang can be seen at the rear. See A in Figure 157.
4. Using the tip of an X-Acto knife, depress the tang. Even if the tang is difficult to see, simply tilt the blade at an angle and place the tip at the inboard edge of the terminal body. Push down lightly and you will feel the spring tension of the tang. A click will also be heard if the tang is depressed and released. Repeat the procedure. When the clicking stops and no spring tension is felt, it is an indication that the tang is depressed.

NOTE

As with the other pull-to-seat terminals, if the terminal has been extracted on a previous occasion, there may be little or no indication that the tang is depressed, but proceed as if the clicking is audible and then push on the wire end of the lead to check if the terminal is free.

5. Push on the wire end of the lead to extract the terminal from the mating end of the connector. See B in Figure 157.

Installing Pull-to-seat Terminals Wireform Type

NOTE

For wire location purposes, alpha characters are stamped into the socket housings.

1. To install a terminal back into the chamber of the connector housing, use a thin flat blade, like that on an X-Acto knife, and carefully bend the tang outward away from the terminal body. See C in Figure 157.
2. Gently pull on the lead at the wire end of the connector to draw the terminal back into the chamber. A click is heard when the terminal is properly seated.
3. Push on the lead to verify that the terminal is locked in place.
4. Push the pin and socket halves of the connector together until the latches "click." The grooves in the female spade connector (harness) must be aligned with the tabs on the male spade side.

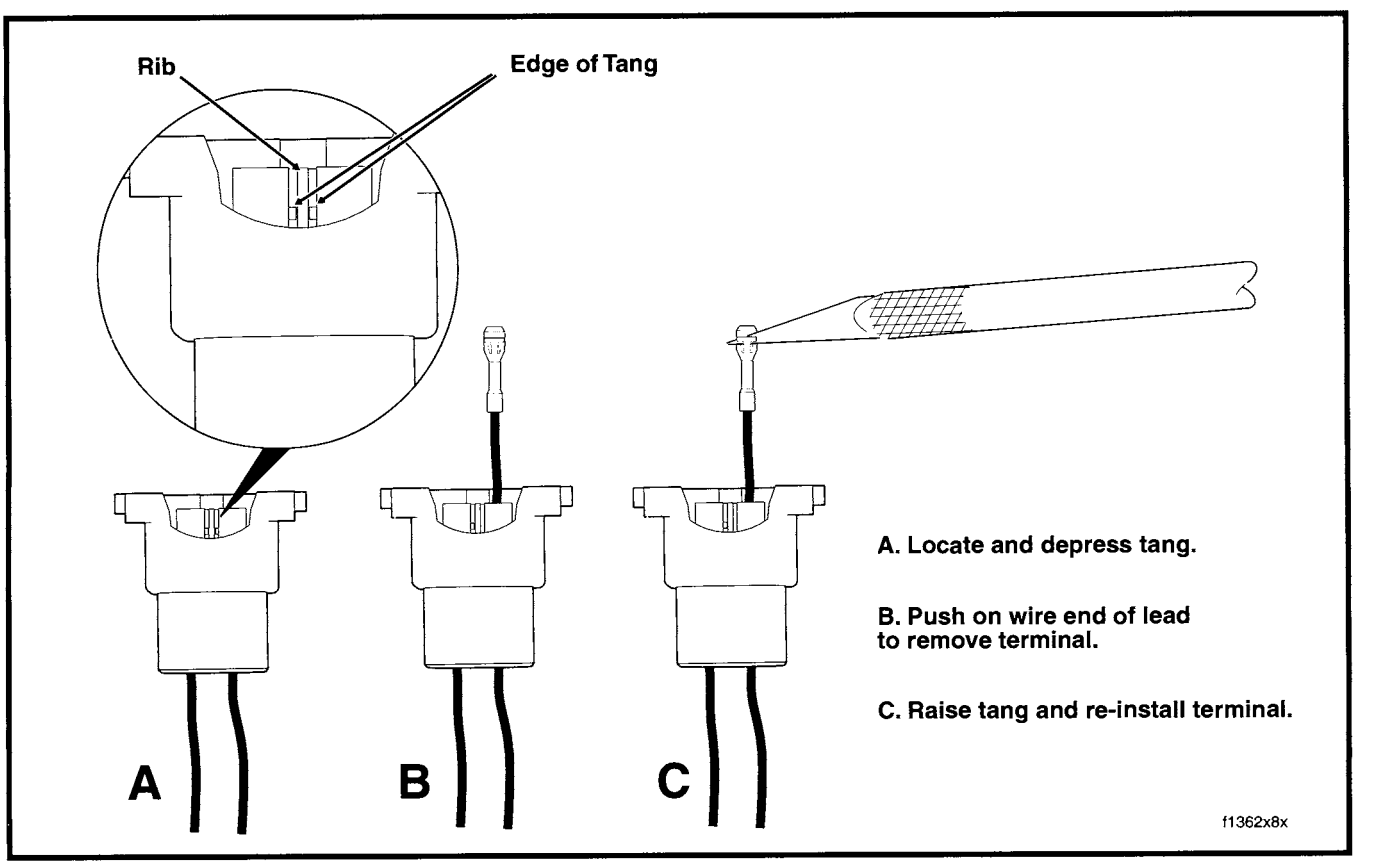


Figure 157. Depress Tang and Extract Terminal From Mating End of Connector

PUSH-TO-SEAT TERMINALS

The Packard push-to-seat terminal connectors found on FL model vehicles are listed below.

- Ignition Light/Key Switch [33]
- Main Power [3]

Removing Push-to-seat Terminals

Like most connectors, Packard push-to-seat terminals are pulled out the wire end of the connector. To remove a push-to-seat terminal, proceed as follows:

1. Remove the connector from the retaining device, if present.
2. Bend back the external latch(es) slightly and separate the pin and socket halves of the connector.

NOTE

Both the Ignition Light/Key Switch and the Main Power connectors are provided with secondary locks. The secondary lock, which may be molded onto the connector or exist as a separate piece, aids in terminal retention. Secondary locks must be opened (or removed) before the terminals can be extracted from the connector housing.

3. Open or remove the secondary lock. Proceed as follows:

   Ignition Light/Key Switch: Bend back the latch slightly and free one side of the secondary lock, then repeat the step to release the other side. Rotate the secondary lock outward on hinge to access the terminals in the chambers of the connector housing.

   Main Power Connector: Depress the ribs on each side of the housing to remove the secondary lock on the wire end of the connector. Exercise caution to avoid breaking barbs off the rib ends.
4. Looking in the mating end or terminal side of the connector (opposite the secondary lock), take note of the larger cavity next to each terminal.
5. Insert the pick (Snap-On TT600-3) into the cavity until it stops. Pivot the end of the pick toward the terminal to depress the locking tang. Remove the pick and gently tug on the wire to pull the terminal from the wire end of the connector. Repeat the step if the terminal is still locked in place.

NOTE

A series of Packard Electrical Terminal Crimp Tools are available to install Packard pin and socket terminals on wires. If new terminals must be installed, see Crimping Instructions on this page.

Installing Push-to-seat Terminals

NOTE

For wire location purposes, alpha characters are stamped onto the secondary locks or onto the wire end of the connector housing.

1. To install a terminal back into the chamber of the connector housing, use a thin flat blade, like that on an X-Acto knife, and carefully bend the tang outward away from the terminal body.
2. Push the lead into the chamber at the wire end of the connector. A click is heard when the terminal is properly seated.
3. Gently tug on the wire end to verify that the terminal is locked in place and will not back out of the chamber.
4. Close or install the secondary lock. Proceed as follows:

   Ignition Light/Key Switch: Rotate the hinged secondary lock inward until tabs fully engage latches on both sides of connector.

   Main Power Connector: Install secondary lock on wire end of connector so that slots fully engage barbs on rib ends.
5. Push the pin and socket halves of the connector together until the latches "click."
6. Install connector on retaining device, if present.

CRIMPING INSTRUCTIONS

1. Strip wire lead removing 5/32 inch (4 mm) of insulation.
2. Compress handles until ratchet automatically opens.

NOTE

Always perform core crimp before insulation/seal crimp.

3. See Figure 158. Determine the correct dye or nest for the core crimp based on the information presented in the Crimp Tables beginning on page 206.

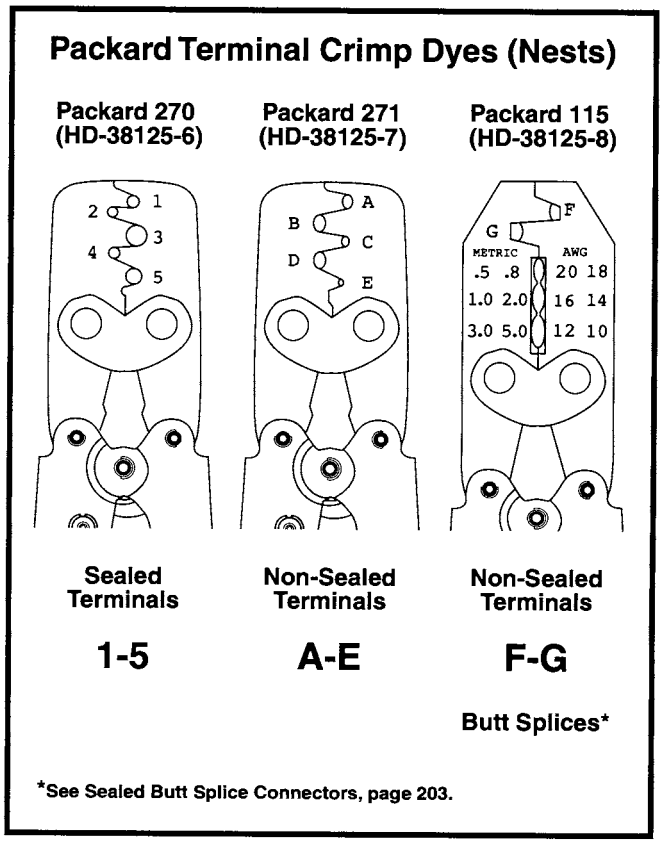


Figure 158. Packard Terminal Crimp Tools

NOTE

When the word "TIP" appears in the Crimp Table, use the tip of the tool specified to perform the core crimp procedure. See Figure 159.

4. Lay the back of the core crimp tails on the appropriate nest. Be sure the core crimp tails are pointing towards the forming jaws.

5. Gently apply pressure to handles of tool until crimpers slightly secure the core crimp tails.

6. Insert stripped wire between crimp tails. Verify that wire is positioned so that short pair of crimp tails squeeze bare wire strands, while long pair folds over insulation or seal material.

7. Squeeze handle of crimp tool until tightly closed. Tool automatically opens when the crimping sequence is complete.

8. See Figure 158. Determine the correct dye or nest for the insulation/seal crimp based on the information presented in the Crimp Tables beginning on page 206.

9. Lay the back of the insulation/seal crimp tails on the appropriate nest. Be sure the insulation/seal crimp tails are pointing towards the forming jaws.

10. Squeeze handle of crimp tool until tightly closed. Tool automatically opens when the crimping sequence is complete.

11. Inspect the quality of the core and insulation/seal crimps. Distortion should be minimal. See Figure 160.

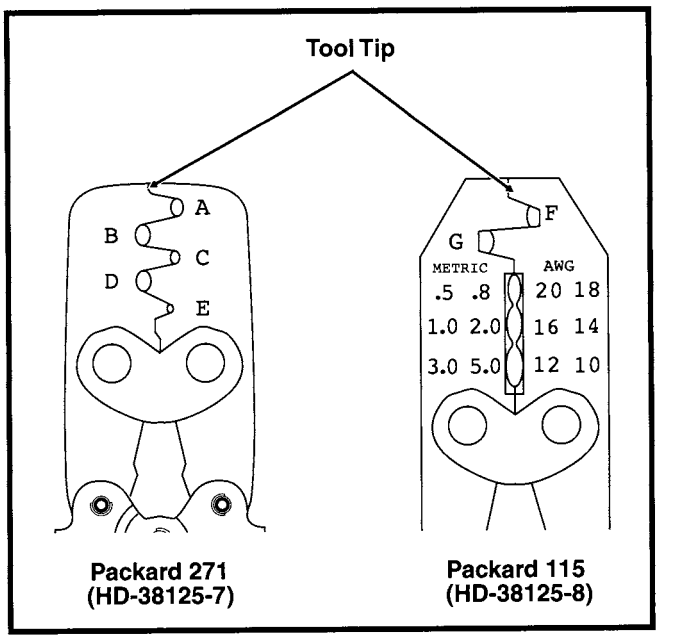


Figure 159. Tool Tips Used on Selected Core Crimps

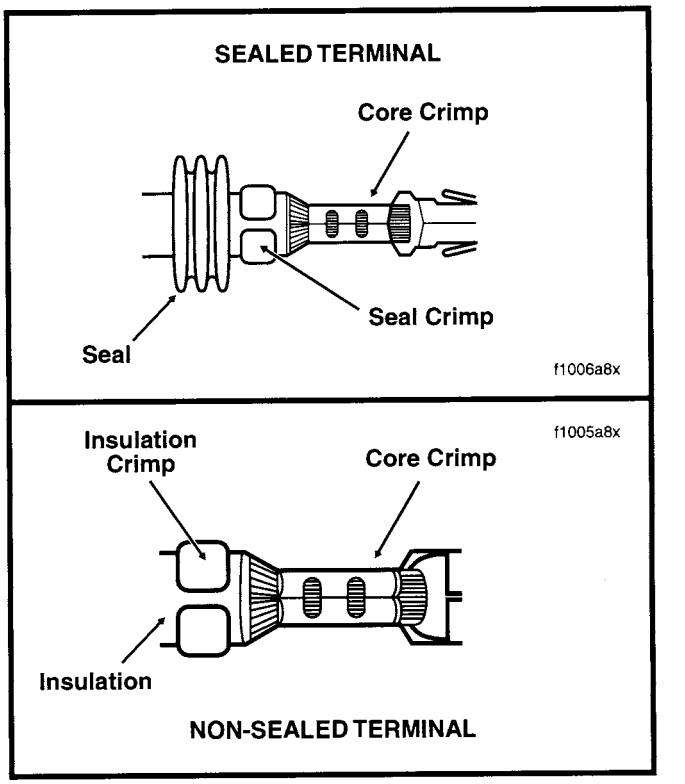


Figure 160. Inspect Core and Insulation/Seal Crimps

SEALED BUTT SPLICE CONNECTORS

INSTALLING SEALED BUTT CONNECTORS

Butt splicing may be a necessary procedure for the replacement of some components.

Proceed as follows:

1. Strip 3/8 inch of insulation off the ends of the wires.
2. Insert wires into opposite ends of the butt splice connector. See Figure 161. Feed the wires into the connector until the stripped ends are housed within the metal insert. Since the size of the connectors vary with the gauge of the wire, reference the following table to ensure properly sealed splices.

Gauge Wire	Connector Color	Part Number
18-20	Red	P/N 70585-93
14-16	Blue	P/N 70586-93
10-12	Yellow	P/N 70587-93

3. Crimp the wires within the connector using the Packard Crimp Tool (HD-38125-8). Be sure to match the color or gauge wire marked on the butt splice connector with the corresponding crimp cavity on the crimp tool. See Figure 162.

NOTE

If adjacent wires are being spliced, stagger the splices so that the butt splice connectors are spaced at different positions along the length of the wires.

4. Using the UltraTorch UT-100 (HD-39969), Robinair Heat Gun (HD-25070) with heatshrink attachment (HD-41183) or other suitable radiant heating device, heat the crimped splice to encapsulate the butt splice connection. Apply heat from the center of the crimp out to each end until the meltable sealant exudes out both ends of the connector. See Figure 161.

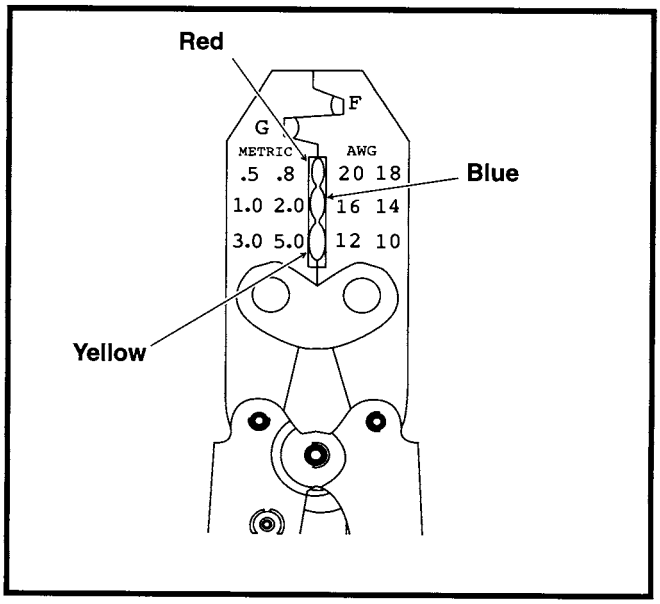


Figure 162. Packard Crimp Tool (HD-38125-8)

⚠WARNING

Use extreme caution when operating the UltraTorch UT-100 or any other radiant heating device. Read the manufacturers instructions carefully before use. Improper handling can result in personal injury and/or vehicle damage. Always keep hands aways from tool tip area and heat shrink attachment. Avoid directing the heat toward any fuel system component. Extreme heat can cause fuel ignition/explosion. Avoid directing heat toward any electrical system component other than the connectors on which heat shrink work is being performed. Be sure to turn the "ON/OFF" switch to the "OFF" position after use.

NOTE

It is acceptable for the splice to rest against the heat shrink tool attachment.

5. Heat the center of the splice until the crimp indentations disappear and the tubing assumes a smooth cylindrical appearance.

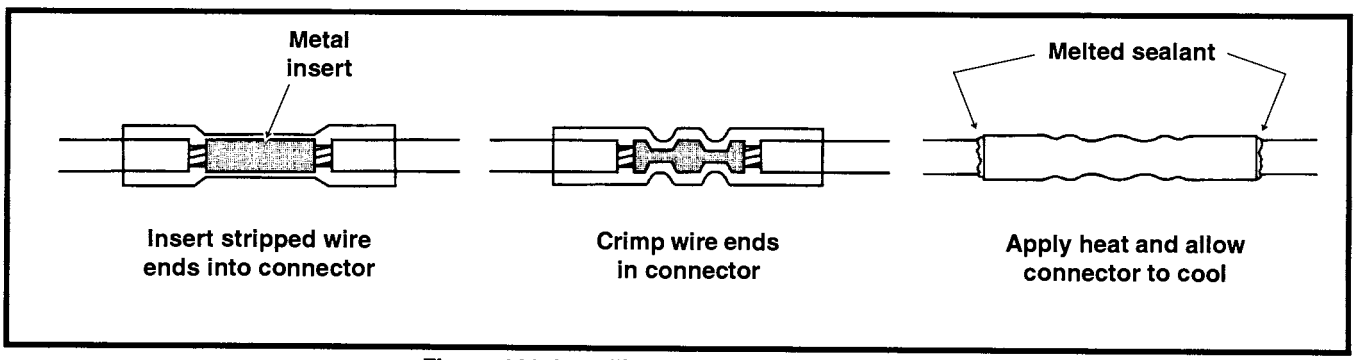


Figure 161. Installing Sealed Butt Connectors

AMP ELECTRICAL CONNECTORS

Wireform Type Connector

See Figure 163. The Amp wireform connectors found on FL model vehicles are listed below.

- BARO Sensor [80B]
- Ignition Coil [83B]

SOCKET TERMINAL REMOVAL

1. Depress the wire form and use a rocking motion to detach the electrical connector.
2. Push back the rubber boot at the back of the connector to expose the wire leads.
3. Grasp the wire and push the terminal forward toward the mating end of the connector until it stops.
4. Holding the terminal in the forward position, insert the pick (Snap-On TT600-2) into the channel on the mating end of the connector until it bottoms in the chamber. See Figure 164.

NOTE

A click should be heard when the pick bottoms in the chamber. If no click is heard, then the wire terminal was not pushed forward far enough before insertion of the pick. If the wire terminal is not first moved forward its full length of travel, the pick will not release the terminal from the connector housing.

5. Holding the pick in position, pull the terminal out the wire end of the connector.

SOCKET TERMINAL INSTALLATION

NOTE

For wire location purposes, numbers are stamped onto the lip at the back of the socket housing (under boot).

1. Push the lead into the chamber at the wire end of the connector. A click is heard when the terminal is properly seated.

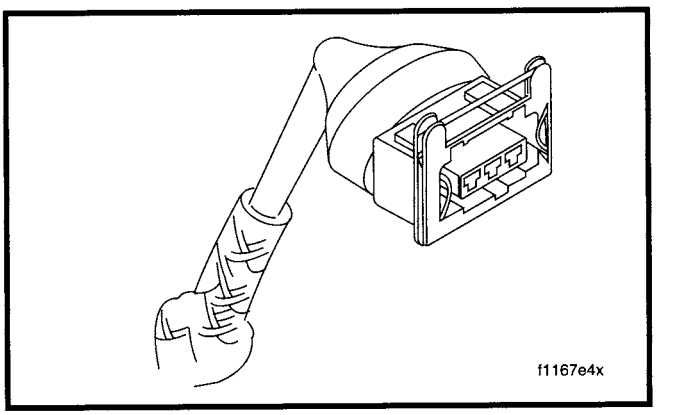


Figure 163. Amp Wireform Electrical Connector (Socket Side)

2. Gently tug on the lead to verify that the terminal is locked in place.
3. Install the rubber boot onto the lip at the back of the connector.
4. Install the electrical connector. The grooves in the female spade connector (harness) must be aligned with the tabs on the male spade side. Push the connector halves together until the latches "click."

1-Place Connector

The Amp 1-place connectors found on FL model vehicles are listed below.

- Fuel Pump [86]
- Passing Lamp Switch [109]

SOCKET TERMINAL

Removal

1. Bend back the ears on the pin housing slightly and separate the pin and socket halves of the connector.

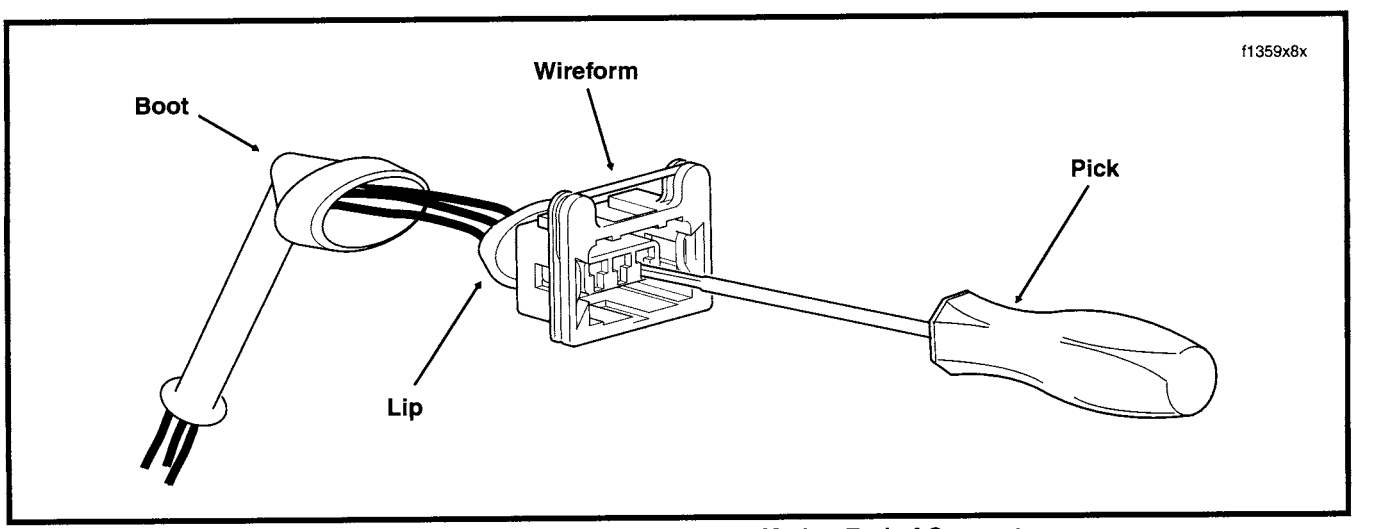


Figure 164. Insert Pick Into Channel on Mating End of Connector

2. Grasp the lead on the wire end of the socket housing and push the terminal forward toward the mating end of the connector until it stops.
3. Looking into the mating end of the connector, note the split or seam in the socket terminal. The locking tang is positioned directly opposite this seam.
4. Fit the barrel of the Amp Socket Terminal Remover (HD-39621-27) over the socket until it bottoms in the housing. See Figure 165.
5. Holding the socket housing, tilt the tool toward the tang and depress the plunger while pushing down. The terminal pops out the wire end of the connector.

NOTE

If the terminal is not released from the socket housing, then the terminal was not pushed forward far enough before placement of the tool or the tool was not bottomed in the connector housing.

Installation

1. Note the lip at the middle of the socket housing. One side of the lip is flat while the other side is tapered. Insert the wire terminal into the socket housing on the flat lip side.
2. Push the lead into the socket housing until it stops. A click is heard when the terminal is properly seated.
3. Gently tug on the lead to verify that the terminal is locked in place.
4. Push the pin and socket halves of the connector together until the latches "click."

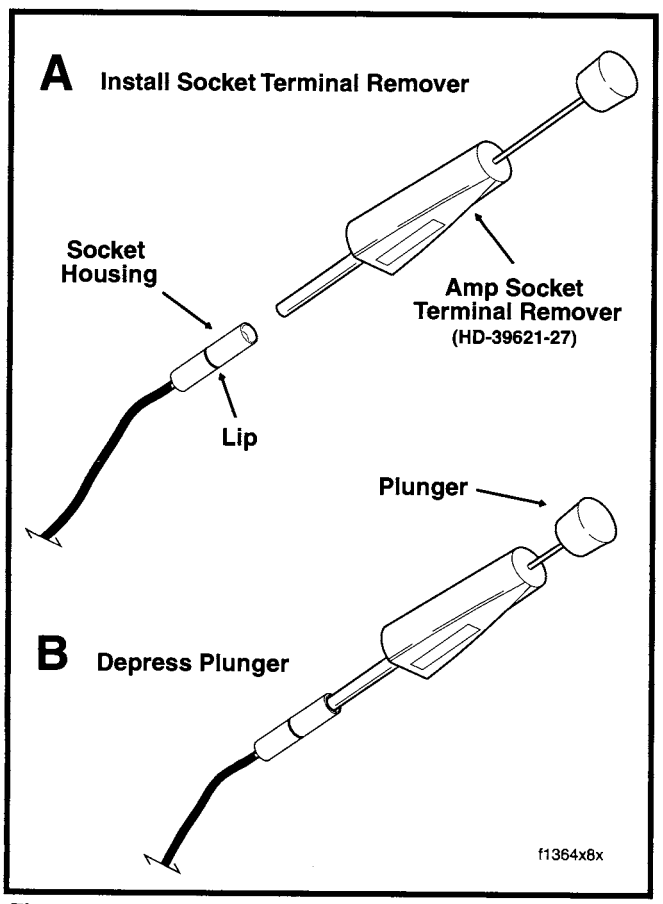


Figure 165. Remove Terminal from Amp Socket Housing

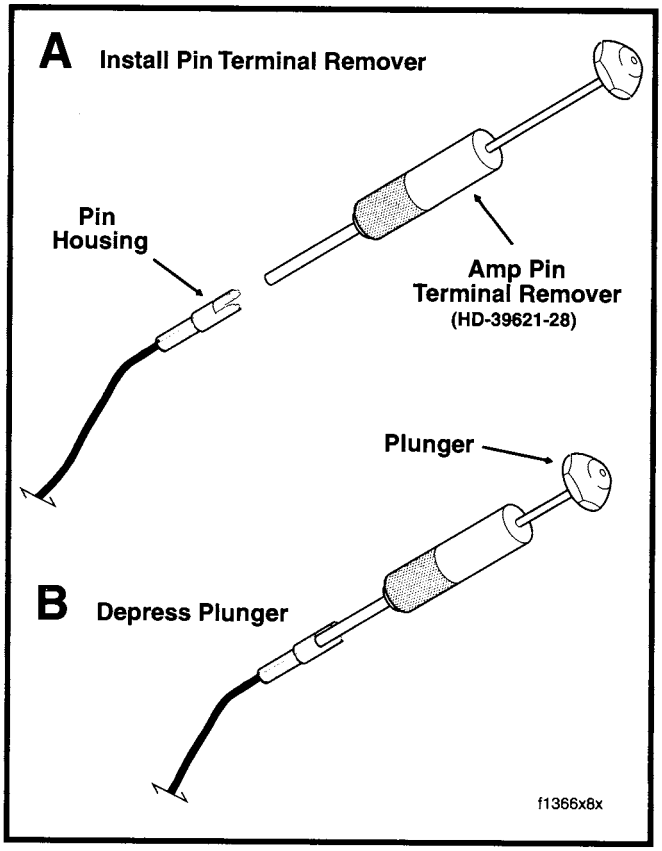


Figure 166. Remove Terminal from Amp Pin Housing

PIN TERMINAL

Removal

1. Bend back the ears on the pin housing slightly and separate the pin and socket halves of the connector.
2. Grasp the lead on the wire end of the pin housing and push the terminal forward toward the mating end of the connector until it stops.
3. Fit the barrel of the Amp Pin Terminal Remover (HD-39621-28) over the pin until it bottoms in the housing. See Figure 166.
4. Holding the pin housing, depress the plunger while pushing down. The terminal pops out the wire end of the connector.

NOTE

If the terminal is not released from the pin housing, then the terminal was not pushed forward far enough before placement of the tool or the tool was not bottomed in the connector housing.

Installation

1. Push the lead into the pin housing until it stops. A click is heard when the terminal is properly seated.
2. Gently tug on the lead to verify that the terminal is locked in place.
3. Push the pin and socket halves of the connector together until the latches "click."

CRIMP TABLES

GENERAL

Crimp tables are provided to assist the user in the repair and replacement of wire terminals. The tables are presented in the following order:

29 Regulator Harness, Part No. 67811-95
30 Steering Ground Wire, Part No. 70101-94
31 ECM Harness, Part No. 70233-95
32 Sensor Harness, Part No. 70238-95
33 1995 FLHTP Fairing Interconnect Harness, Part No. 69552-94
34 1995 FLHTP Windshield Interconnect Harness, Part No. 70308-94
35 1996 FLHTP Fairing Interconnect Harness, Part No. 69552-96
36 1996 FLHP Main Harness, Part No. 70260-96
37 1996 FLHP Components
38 Siren Harness, Part No. 70177-94A

Each crimp table contains the following information:

A. The connector number as identified in the wiring diagrams, such as [14A]. The letter "A" denotes the pin side of the connector, "B" denotes the socket side.

B. The terminal Part Number.

C. Crimping tool identification. Both tool manufacturer and Kent Moore numbers are listed.
DTT-16-00 = HD-399965
PACKARD 270 = HD-38125-6
PACKARD 271 = HD-38125-7
PACKARD115 = HD-38125-8
AMP MULTILOCK = HD-41609

D. Wire gauge.

E. Crimp type and crimper die position.

F. There may be instances where two different crimping tools fit the same terminal. The listing will be repeated immediately for the other tool.

NOTE

Part numbers are given in the Crimp Tables for reference purposes only. Always refer to the applicable Parts Catalog when ordering parts.

G. Footnotes are used in the Crimp Tables to indicate that additional information is offered. Footnotes can be identified by a lower case alpha character in parentheses, such as that seen in the following example:

9930 (a)

When a footnote is encountered, just match the alpha character with those that follow below.

(a) This terminal requires soldering after crimping.

(b) These 9937 and 9866 terminals require the use of a 72249-94 heat shrink tube.

(c) These 72190-94 and 72191-94 terminals require soldering after crimping.

(d) These 9937 terminals require the use of 72249-94 heat shrink tube.

(e) These 9930 terminals require the use of a 71774-77 housing.

(f) The 72223-94 terminal uses a 72227-94 cable seal.

(g) The 72224-94 terminal uses a 72283-94 cable seal.

(h) Double lug crimp.

(i) The 72242-94 and 72255-94 terminals also require the use of a 72249-94 heat shrink tube.

(j) Heat sealed butt splice connector.

(k) The 72225-94 terminal uses a 72227-94 cable seal.

(l) The 72226-94 terminal uses a 72283-94 cable seal.

(m) The 72235-94 terminal uses a 72284-94 cable seal.

(n) The 72236-94 terminal uses a 72284-94 cable seal.

(o) Uses a unique 3-pin Deutsch connector housing (72163-94BK).

(p) Uses a unique 3-socket Deutsch connector housing (72113-94BK).

(q) Requires the use of a 72249-94 heat shrink tube.

Fuse Block Cavity Numbers

See Figure 167 for the cavity numbers or positions in the single and double fuse blocks. These numbers are used to identify fuse block locations in the crimp tables which follow.

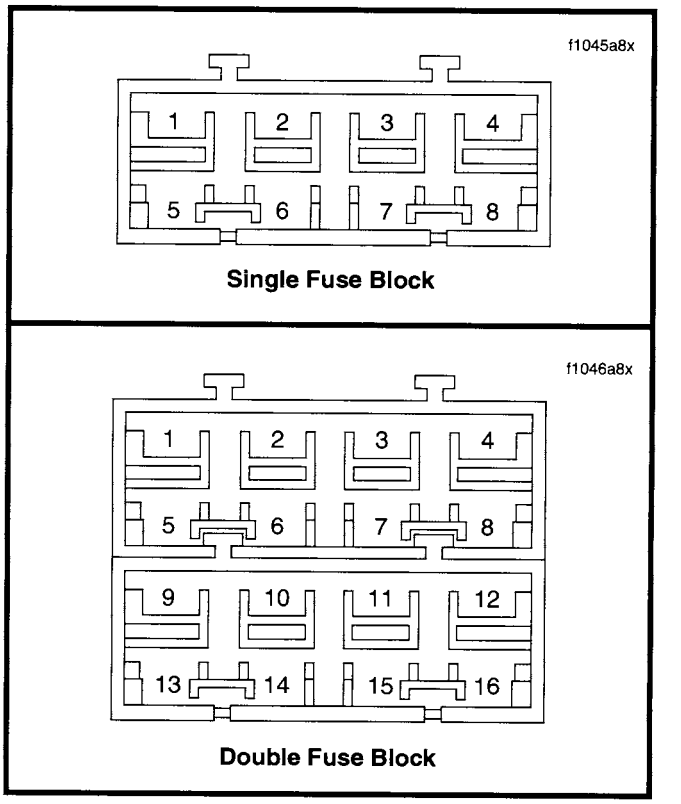


Figure 167 . Fuse Blocks (As Viewed From Wire Side)

Table 1. 1996 XLC Components

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
CAM POSITION SENSOR [14A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TRAP DOOR SOLENOID [15A]	ALL	72039-71A	PACKARD 270	20	2	4
REAR LIGHTING [7B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
REAR DIRECTIONALS [18B, 19B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
V.O.E.S. [11B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
IGNITION MODULE [10B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
FRONT DIRECTIONALS [31B]	ALL	73191-96	HD-41609	18	REAR	REAR
HEADLAMP [38B]	ALL	73191-96	HD-41609	16	MIDDLE	MIDDLE
INSTRUMENT CLUSTER [20B]	ALL	73191-96	HD-41609	18	REAR	REAR
LEFT HANDLEBAR CONTROL [24B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
RIGHT HANDLEBAR CONTROL [22B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
SPEED SENSOR [65A]	ALL	72190-94	DTT-16-00	20 (a)	CENTER POSITION	CENTER POSITION
SPEED SENSOR [65B]	ALL	72191-94	DTT-16-00	20 (a)	CENTER POSITION	CENTER POSITION
SPEEDOMETER TERMINALS		72241-94 (q)	PACKARD 271	18	C	A
POSITION LAMP		9898	PACKARD 271		TIP	
POSITION LAMP		9898	PACKARD 115		TIP	

Table 2. 1996 XL Main Wiring Harness, Part No. 70153-96

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
STARTER TERMINAL		9842	PACKARD 270,271	12	B	3
CIRCUIT BREAKER TERMINAL (BK)		9843	PACKARD 270,271	12	B	3
CIRCUIT BREAKER TERMINAL (2-R)		9843 (h)	PACKARD 115	12,14	16-14 GA.	16-14 GA. (h)
STARTER RELAY (BK,BK/R)	85,86	9937	PACKARD 271	18	C	D
STARTER RELAY (R/BK)	30	9937	PACKARD 271	14	C	A
STARTER RELAY (2-GN)	87	9937 (h)	PACKARD 271	14,16	C (h)	A (h)
FUSE BLOCK (GY)	1	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (2-O)	2	72219-94 (h)	PACKARD 271	18	C (h)	B (h)
FUSE BLOCK (2-BE)	3	72219-94 (h)	PACKARD 271	18	C (h)	B (h)
FUSE BLOCK (2-O/W)	4	72219-94 (h)	PACKARD 271	18	C (h)	B (h)
FUSE BLOCK (2-R/BK)	5	72220-94 (h)	PACKARD 271,115	14	A (h)	G (h)
FUSE BLOCK (2-R/BK)	6	72220-94 (h)	PACKARD 271,115	14	A (h)	G (h)
FUSE BLOCK (R/BK)	7	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/GY)	8	72218-94	PACKARD 271	14	C	A
OIL PRESSURE SENDING UNIT		72241-94 (q)	PACKARD 271	18	C	A
REAR STOP LIGHT SWITCH		9937 (b)	PACKARD 271	18	C	D
REAR STOP LIGHT SWITCH (2-R/Y)		9937 (b)	PACKARD 271	18	C (h)	D (h)
MAIN GROUND-CHASSIS		9860	PACKARD 115	16	20-18 GA.	20-18 GA.
MAIN GROUND-CHASSIS (2-BK)		9869	PACKARD 115	14,18(h)	12-10 GA.	12-10 GA.
SOLENOID		72291-94	PACKARD 271,115	14	A	G
HORN		9898	PACKARD 271	18	TIP	X
HORN		9898	PACKARD 115	18	TIP	X
HDI POSITION LAMP (BK)		9898	PACKARD 271	18	TIP	X
HDI POSITION LAMP (BK)		9898	PACKARD 115	18	TIP	X
NEUTRAL SWITCH		9905	PACKARD 115	18	20-18 GA.	20-18 GA.
COIL		72241-94 (q)	PACKARD 271	18	C (q)	A
COIL (2-PK)		72240-94 (h)				
TAIL LIGHT [7A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
EVAP. SOLENOID (CAL.) [9A]	B,C	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
EVAP. SOLENOID (CAL.) [9A]	A	72190-94	DTT-16-00	16	X	X
IGNITION MODULE [10A]	EXCEPT 7	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
IGNITION MODULE [10A]	7	72190-94	DTT-16-00	16	CENTER POSITION	CENTER POSITION
TO V.O.E.S. [11A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO CAM POSITION SENSOR [14B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO REAR DIRECTIONALS [18A,19A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
INSTRUMENT CLUSTER [20A]	ALL	73190-96	HD-41609	18	REAR	REAR
TO RIGHT HAND CONTROLS [22A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO LEFT HAND CONTROLS [24A]	1,3,4,5,6	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO LEFT HAND CONTROLS [24A]	2	72190-94	DTT-16-00	16	CENTER POSITION	CENTER POSITION
TO TURN SIGNAL MODULE [30A]	EXCEPT 2	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO TURN SIGNAL MODULE [30A]	2	72190-94	DTT-16-00	16	CENTER POSITION	CENTER POSITION
HEADLAMP [38A]	1,4	73190-96	HD-41609	18	REAR	REAR
HEADLAMP [38A]	2,3	73190-96	HD-41609	16	MIDDLE	MIDDLE
FRONT TURN SIGNALS [31A]	ALL	73190-96	HD-41609	18	REAR	REAR
HEADLAMP 68705-93A	ALL	70586-93 (j)	PACKARD 115	16	14-16 GA.	(q)
IGNITION SWITCH KIT 71441-94	ALL	70586-93 (j)	PACKARD 115	14	14-16 GA.	(q)

Table 3. 1996 XL Components

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
IGNITION SENSOR [14B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TRAP DOOR SOLENOID [15A]	ALL	72039-71A	PACKARD 270	20	2	4
TAIL LIGHT [7B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
V.O.E.S. [11B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
IGNITION MODULE [10B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TURN SIGNAL MODULE [30B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
DIRECTIONALS[18B,19B,22B,24B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
INSTRUMENT CLUSTER [20B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
SPEEDOMETER [65A]	ALL	72190-94	DTT-16-00	20 (a)	CENTER POSITION	CENTER POSITION
SPEEDOMETER [65B]	ALL	72191-94	DTT-16-00	20 (a)	CENTER POSITION	CENTER POSITION
LEFT HANDLEBAR CONTROL [24B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
RIGHT HANDLEBAR CONTROL [22B]	EXCEPT 4,5,6	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
RIGHT HANDLEBAR CONTROL [22B]	4,5,6	72191-94	DTT-16-00	16	CENTER POSITION	CENTER POSITION

Table 4. 1996 XL Main Wiring Harness, Part No. 70135-95

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
STARTER TERMINAL		9842	PACKARD 270,271	12	B	3
CIRCUIT BREAKER TERMINAL (BK)		9843	PACKARD 270,271	12	B	3
CIRCUIT BREAKER TERMINAL (2-R)		9862	PACKARD 115	12,14	16-14 GA.	16-14 GA. (h)
STARTER RELAY (BK,BK/R)	85,86	9937	PACKARD 271	18	C	D
STARTER RELAY (R/BK)	30	9937	PACKARD 271	14	C	A
STARTER RELAY (2-GN)	87	9937	PACKARD 271	14,16	C (h)	A (h)
FUSE BLOCK (2-R/BK)	1	72220-94	PACKARD 271,115	14	A (h)	G (h)
FUSE BLOCK (2-R/BK)	2	72220-94	PACKARD 271,115	14	A (h)	G (h)
FUSE BLOCK (R/BK)	3	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/GY)	4	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (GY)	5	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (2-O)	6	72219-94	PACKARD 271	18	C (h)	B (h)
FUSE BLOCK (2-BE)	7	72219-94	PACKARD 271	18	C (h)	B (h)
FUSE BLOCK (2-O/W)	8	72219-94	PACKARD 271	18	C (h)	B (h)
OIL PRESSURE SENDING UNIT		9857	PACKARD 115	18	20-18 GA.	20-18 GA.
REAR STOP LIGHT SWITCH		9937 (d)	PACKARD 271	18	C	D
REAR STOP LIGHT SWITCH		9937 (d)	PACKARD 271	18	C (h)	D (h)
MAIN GROUND-CHASSIS (BK)		3/8" 12 GA	PACKARD 115,270	16	G (h)	3 (h)
MAIN GROUND-CHASSIS (2-BK)		72242-94	PACKARD 115,270	14,18	G (h)	3 (h)
SOLENOID		72291-94	PACKARD 271,115	14	A	G
HORN		9898	PACKARD 271	18	TIP	X
HORN		9898	PACKARD 115	18	TIP	X
HDI POSITION LAMP (BK)		9898	PACKARD 271	18	TIP	X
HDI POSITION LAMP (BK)		9898	PACKARD 115	18	TIP	X
NEUTRAL SWITCH		9905	PACKARD 115	18	20-18 GA.	20-18 GA.
COIL		72241-94 (q)	PACKARD 271	18	C	A
COIL		72240-94 (q)	PACKARD 271	18	C	A
TO TAIL LIGHT [7A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO EVAP. SOLENOID (CAL.) [9A]	A	72190-94	DTT-16-00	16	CENTER POSITION	CENTER POSITION
TO EVAP. SOLENOID (CAL.) [9A]	B,C	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO IGNITION MODULE [10A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO V.O.E.S. [11A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO IGNITION SENSOR [14B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO REAR TURN SIGNALS [18A,19A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
INSTRUMENT CLUSTER [20A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO RIGHT HAND CONTROLS [22A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO LEFT HAND CONTROLS [24A]	EXCEPT 4	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO LEFT HAND CONTROLS [24A]	4	72190-94	DTT-16-00	16	CENTER POSITION	CENTER POSITION
TO TURN SIGNAL MODULE [30A]	ALL	72190-94	DTT-16-00	16	CENTER POSITION	CENTER POSITION
HEADLAMP CONN. KIT 68705-93	BE, W	70583-93 (j)	PACKARD 115	18	20-18 GA.	(j)
HEADLAMP CONN. KIT 68705-93	Y	70583-93 (j)	PACKARD 115	16	14-16 GA.	(j)
IGNITION SWITCH KIT 71441-94	ALL	70586-93 (j)	PACKARD 115	14	14-16 GA.	(j)

Table 5. 1996 XL Main Wiring Harness, Part No. 70135-95A

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
STARTER TERMINAL		9842	PACKARD 270,271	12	B	3
CIRCUIT BREAKER TERMINAL (BK)		9843	PACKARD 270,271	12	B	3
CIRCUIT BREAKER TERMINAL (2-R)		9862	PACKARD 115	12,14	16-14 GA.	16-14 GA. (h)
STARTER RELAY (BK,BK/R)	85,86	9937	PACKARD 271	18	C	D
STARTER RELAY (R/BK)	30	9937	PACKARD 271	14	C	A
STARTER RELAY (2-GN)	87	9937	PACKARD 271	14,16	C (h)	A (h)
FUSE BLOCK (GY)	1	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (2-O)	2	72219-94	PACKARD 271	18	C (h)	B (h)
FUSE BLOCK (2-BE)	3	72219-94	PACKARD 271	18	C (h)	B (h)
FUSE BLOCK (2-O/W)	4	72219-94	PACKARD 271	18	C (h)	B (h)
FUSE BLOCK (2-R/BK)	5	72220-94	PACKARD 271,115	14	A (h)	G (h)
FUSE BLOCK (2-R/BK)	6	72220-94	PACKARD 271,115	14	A (h)	G (h)
FUSE BLOCK (R/BK)	7	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/GY)	8	72218-94	PACKARD 271	14	C	A
OIL PRESSURE SENDING UNIT		9857	PACKARD 115	18	20-18 GA.	20-18 GA.
REAR STOP LIGHT SWITCH		9937 (d)	PACKARD 271	18	C	D
REAR STOP LIGHT SWITCH		9937 (d)	PACKARD 271	18	C (h)	D (h)
MAIN GROUND-CHASSIS (BK)		3/8" 12 GA	PACKARD 115,270	16	G (h)	3 (h)
MAIN GROUND-CHASSIS (2-BK)		72242-94	PACKARD 115,270	14,18	G (h)	3 (h)
SOLENOID		72291-94	PACKARD 271,115	14	A	G
HORN		9898	PACKARD 271	18	TIP	X
HORN		9898	PACKARD 115	18	TIP	X
HDI POSITION LAMP (BK)		9898	PACKARD 271	18	TIP	X
HDI POSITION LAMP (BK)		9898	PACKARD 115	18	TIP	X
NEUTRAL SWITCH		9905	PACKARD 115	18	20-18 GA.	20-18 GA.
COIL		72241-94 (q)	PACKARD 271	18	C	A
COIL		72240-94 (q)	PACKARD 271	18	C	A
TO TAIL LIGHT [7A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO EVAP. SOLENOID (CAL.) [9A]	A	72190-94	DTT-16-00	16	CENTER POSITION	CENTER POSITION
TO EVAP. SOLENOID (CAL.) [9A]	B,C	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO IGNITION MODULE [10A]	EXCEPT 7	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO IGNITION MODULE [10A]	7	72190-94	DTT-16-00	16	CENTER POSITION	CENTER POSITION
TO V.O.E.S. [11A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO IGNITION SENSOR [14B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO REAR TURN SIGNALS [18A,19A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
INSTRUMENT CLUSTER [20A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO RIGHT HAND CONTROLS [22A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO LEFT HAND CONTROLS [24A]	EXCEPT 4	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO LEFT HAND CONTROLS [24A]	4	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO TURN SIGNAL MODULE [30A]	EXCEPT 2	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO TURN SIGNAL MODULE [30A]	2	72190-94	DTT-16-00	16	CENTER POSITION	CENTER POSITION
HEADLAMP CONN. KIT 68705-93A	BE, W	70586-93 (j)	PACKARD 115	18	20-18 GA.	(j)
HEADLAMP CONN. KIT 68705-93A	Y	70586-93 (j)	PACKARD 115	16	14-16 GA.	(j)
IGNITION SWITCH KIT 71441-94	ALL	70586-93 (j)	PACKARD 115	14	14-16 GA.	(j)

Table 1. 1995 Components

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
CAM POSITION SENSOR [14B]	1	74536-77A	PACKARD 271	18	E	A
CAM POSITION SENSOR [14B]	2,3	74539-77A	PACKARD 271	18	E	A
TO TRAP DOOR SOLENOID [15B]	ALL	72038-71A	PACKARD 271	18	E	A
TRAP DOOR SOLENOID [15A]	ALL	72039-71A	PACKARD 270	20	E	A
TAIL LIGHT [7A]	ALL	72039-71A	PACKARD 270	18	E	A
TAIL LIGHT/DIR. GROUND [7C]	ALL	72039-71A	PACKARD 270	18	E	A
TAIL LIGHT/DIR. GROUND [7D]	ALL	72038-71A	PACKARD 271	18	E	A
V.O.E.S.	GROUND	9898	PACKARD 115	18	TIP	
V.O.E.S. [11A]	TO MODULE	9897	PACKARD 115	18	TIP	
IGNITION MODULE [10B]	ALL	74539-77A	PACKARD 271	18	E	A
TO DIRECTIONALS [18B,19B]	ALL	72038-71A	PACKARD 271	18	E	A
FROM DIRECTIONALS [18A,19A]	ALL	72039-71A	PACKARD 270	18	E	A
LEFT HANDLEBAR CONTROL [24B]	ALL	72038-71A	PACKARD 271	18	E	A
RIGHT HANDLEBAR CONTROL [22B]	ALL	72038-71A	PACKARD 271	18	E	A
FENDER TIP LAMPS [32A,32C,45A]		72039-71A	PACKARD 270	18	E	A
FENDER TIP LAMPS [32B,32B,45B]		72038-71A	PACKARD 271	18	E	A
TO PASSING LAMP SWITCH		9937 (d)	PACKARD 271	18	C	D
FROM PASSING LAMP SWITCH [31B]		72038-71A	PACKARD 271	18	E	A
TO PASSING LAMPS [31A]		72039-71A	PACKARD 270	18	E	A
HEADLAMP CONN. KIT 68705-93	ALL	70583-93 (j)	PACKARD 115	18	20-18 GA.	(j)
HDI POSITION LAMP		9898	PACKARD 115	18	TIP	

Table 2. 1995 Instrument Panel Assembly

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
IGNITION CIRCUIT BREAKER, SILVER STUD (GY)		9857	PACKARD 115	18	20-18 GA.	20-18 GA.
LIGHTS CIRCUIT BREAKER, SILVER STUD (BE)		9857	PACKARD 115	18	20-18 GA.	20-18 GA.
LIGHTS CIRCUIT BREAKER, SILVER STUD (2-BE)		9862 (h)	PACKARD 115	18	20-18 GA.	20-18 GA.
ACCESSORY CIRCUIT BREAKER, SILVER STUD (O/W)		9857	PACKARD 115	18	20-18 GA.	20-18 GA.
ACCESSORY CIRCUIT BREAKER, SILVER STUD (2-O)		9862 (h)	PACKARD 115	18	20-18 GA.	20-18 GA.
IGNITION CIRCUIT BREAKER, COPPER STUD (R/BK)		9862	PACKARD 115	14	16-14 GA.	16-14 GA.
LIGHTS CIRCUIT BREAKER, COPPER STUD (R/GY)		9862	PACKARD 115	14	16-14 GA.	16-14 GA.
ACCESSORY CIRCUIT BREAKER, COPPER STUD (R/GY)		9862	PACKARD 115	14	16-14 GA.	16-14 GA.
IGNITION SWITCH TERMINALS	ALL	9871	PACKARD 115	14	16-14 GA.	16-14 GA.
TO ELECTRICAL PANEL GROUND STUD		9858	PACKARD 115	18	20-18 GA.	20-18 GA.
STARTER RELAY 30,87 TERMINALS (R/BK,GN)		9937	PACKARD 271	14	C	A
STARTER RELAY 85,86 TERMINALS (BK,BK/R)		9937	PACKARD 271	18	C	D
LIGHTS CIRCUIT BREAKER, COPPER STUD (R/BK)		9862	PACKARD 115	14	16-14 GA.	16-14 GA.
TO MAIN WIRING HARNESS [20B]	2,3,5	72038-71A	PACKARD 271	18	E	A
TO MAIN WIRING HARNESS [20B]	1,7,8,9,10,11,12	72038-71A	PACKARD 271	14	C	A

Table 3. 1995 Main Harness, Part No. 70216-93B

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
OIL PRESSURE SENDING UNIT		9857	PACKARD 115	18	20-18 GA.	20-18 GA.
REAR BRAKE LIGHT SWITCH		9898	PACKARD 271		TIP	
REAR BRAKE LIGHT SWITCH		9898	PACKARD 115		TIP	
HORN		9898	PACKARD 271		TIP	
HORN		9898	PACKARD 115		TIP	
STARTER RELAY 30,87 TERMINALS (R/BK,GN)		9937	PACKARD 271	14	C	A
STARTER RELAY 85,86 TERMINALS (BK,BK/R)		9937	PACKARD 271	18	C	D
MAIN CIRCUIT BREAKER		9862	PACKARD 115	14	16-14 GA.	16-14 GA.
SOLENOID		72291-94	PACKARD 271,115	14	A	G
STARTER GROUND		9866	PACKARD 115	12	12-10 GA.	12-10 GA.
STARTER GROUND		9868	PACKARD 115	12	12-10 GA.	12-10 GA.
NEUTRAL SWITCH		9905	PACKARD 115	18	20-18 GA.	20-18 GA.
TO TAIL LIGHT & REAR TURN SIGNALS [7B]	1 (h)	72038-71A	PACKARD 271	18	C	D
TO TAIL LIGHT & REAR TURN SIGNALS [7B]	2,3,4,5,6	72038-71A	PACKARD 271	18	E	A
TO LEFT HAND CONTROLS [24A]	3,5,10 (h)	72039-71A	PACKARD 271	18	C	D
TO LEFT HAND CONTROLS [24A]	11 (NO WIRE)	72039-71A	PACKARD 271	18	E	A
TO LEFT HAND CONTROLS [24A]	1,2,4,6,7,8,9	72039-71A	PACKARD 271	18	E	A
TO RIGHT HAND CONTROLS [22A]	3,8,10 (h)	72039-71A	PACKARD 271	18	C	D
TO RIGHT HAND CONTROLS [22A]	11 (NO WIRE)	72039-71A	PACKARD 271		E	A
TO RIGHT HAND CONTROLS [22A]	2,4,5,6,7,9,12	72039-71A	PACKARD 271	18	E	A
CONSOLE [20A]	2,3,11,12 (h)	72039-71A	PACKARD 271	18	C	D
CONSOLE [20A]	1,10	72039-71A	PACKARD 271	14	C	A
CONSOLE [20A]	5,6,7,8,9	72039-71A	PACKARD 271	18	E	A
TO TURN SIGNAL MODULE [30B]	ALL	72038-71A	PACKARD 271	18	E	A
TO COIL		9857	PACKARD 115	18	20-18 GA.	20-18 GA.
TO GROUND		9858	PACKARD 115	18	20-18 GA.	20-18 GA.
TO V.O.E.S. [11A]		9907	PACKARD 115	18	20-18 GA.	20-18 GA.
TO IGNITION MODULE [10A]		74536-77A	PACKARD 271	18	E	A
TO CAM POSITION SENSOR [14A] (BK/W,GN/W)	2,3	74536-77A	PACKARD 271	18	E	A
TO CAM POSITION SENSOR [14A] (R/W)	1	74539-77A	PACKARD 271	18	E	A
TO CALIFORNIA TRAP DOOR [9B]	1	72038-71A	PACKARD 271	18	E	A

Table 4. 1996 Components

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
CAM POSITION SENSOR [14A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TRAP DOOR SOLENOID [15B]	ALL	73191-96	HD-41609	20	FRONT	FRONT
REAR LIGHTING [7B]	ALL	73191-96	HD-41609	18	REAR	REAR
V.O.E.S. [11B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
IGNITION MODULE [10B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
FRONT DIRECTIONALS [31B]	ALL	73191-96	HD-41609	18	REAR	REAR
REAR DIRECTIONALS[18B,19B]	ALL	73191-96	HD-41609	18	REAR	REAR
HEADLAMP [38B]	ALL	73191-96	HD-41609	16	MIDDLE	MIDDLE
INSTRUMENT CLUSTER [20B]	ALL	73191-96	HD-41609	18	REAR	REAR
LEFT HANDLEBAR CONTROL [24B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
RIGHT HANDLEBAR CONTROL [22B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
SPEED SENSOR [65A]	ALL	72190-94 (a)	DTT-16-00	20	FRONT POSITION	FRONT POSITION
SPEED SENSOR [65B]	ALL	72191-94 (a)	DTT-16-00	20	FRONT POSITION	FRONT POSITION
SPEEDOMETER TERMINALS		72241-94 (q)	PACKARD 271	18	C	A
PASSING LAMPS [67B]	ALL	73191-96	HD-41609	18	REAR	REAR
PASSING LAMPS [67A]	ALL	73190-96	HD-41609	18	REAR	REAR
PASSING LAMP SWITCH		9937 (d)	PACKARD 271	16	C	D
FRONT FENDERTIP [32B]	ALL	73191-96	HD-41609	18	REAR	REAR
FRONT FENDERTIP [32A]	ALL	73190-96	HD-41609	18	REAR	REAR
HEADLAMP CONN. KIT 68705-93A	ALL	70586-93 (j)	PACKARD 115	16	14-16 GA.	(q)
POSITION LAMP		9898	PACKARD 271		TIP	
POSITION LAMP		9898	PACKARD 115		TIP	

Table 5. 1996 Main Harness, Part No. 70216-96

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
OIL PRESSURE SENDING UNIT		72241-94 (q)	PACKARD 271	18	C	A
REAR BRAKE LIGHT SWITCH		9898	PACKARD 271	18	TIP	
REAR BRAKE LIGHT SWITCH		9898	PACKARD 115	18	TIP	
HORN		9898	PACKARD 271	18	TIP	
HORN		9898	PACKARD 115	18	TIP	
STARTER RELAY 30,87 TERMINALS (R/BK,GN)		9937	PACKARD 271	14	C	A
STARTER RELAY 85,86 TERMINALS (BK,BK/R)		9937	PACKARD 271	18	C	D
FUSEBLOCK (GY,O,BE,O/W)	1,2,3,4	72217-94	PACKARD 271	18	E	A
FUSEBLOCK (R/BK,R/BK,R/BK,R/GY)	5,6,7,8	72218-94	PACKARD 271	14	C	A
MAIN CIRCUIT BREAKER		9866	PACKARD 115	12	12-10 GA.	12-10 GA.
SOLENOID		72291-94	PACKARD 271,115	14	A	G
HARNESS GROUNDS (4) UNDER SEAT		72255-94	PACKARD 270	16	4 (a)	3,5,1
NEUTRAL SWITCH		9905	PACKARD 115	18	20-18 GA.	20-18 GA.
COIL		72241-94	PACKARD 271	18	C (q)	A
TAIL LIGHT & REAR TURN SIGNALS [7B]	ALL	73190-96	HD-41609	18	REAR	REAR
IGNITION MODULE [10A]	EXCEPT 7	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
IGNITION MODULE [10A]	7	72190-94	DTT-16-00	16	CENTER POSITION	CENTER POSITION
CALIFORNIA TRAP DOOR [9B] (GN)	1	73190-96	HD-41609	16	MIDDLE	MIDDLE
CALIFORNIA TRAP DOOR [9B]	2,3	73190-96	HD-41609	18	REAR	REAR
V.O.E.S. [11A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
CAM POSITION SENSOR [14A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
CONSOLE [20A]	ALL	73190-96	HD-41609	18	REAR	REAR
RIGHT HAND CONTROLS [22A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
LEFT HAND CONTROLS [24A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TURN SIGNAL MODULE [30B]	EXCEPT 2	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TURN SIGNAL MODULE [30B] (O/W)	2	72191-94	DTT-16-00	16	CENTER POSITION	CENTER POSITION
FRONT TURN SIGNALS [31A]	ALL	73190-96	HD-41609	18	REAR	REAR
HEADLAMP [38A]	ALL	73190-96	HD-41609	18	REAR	REAR
KEYSWITCH [33B] (R/BK, R/GY)	1,3	72291-94	PACKARD 271,115	14	A	G
TO IGNITION SWITCH [33A]	ALL	72292-94	PACKARD 115	12	F (a)	G

Table 6. 1996 Starter to 30 A Circuit Breaker, Part No. 70044-96

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
STARTER TERMINAL		9842	PACKARD 270,271	10	B	3
CIRCUIT BREAKER TERMINAL		9843	PACKARD 270,271	10	B	3

Table 7. 1996 Passing Lamp Harness, Part No. 67615-96

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
TO PASSING LAMP SWITCH		9937 (d)	PACKARD 271	18	C	D
PASSING LAMPS [67A]	ALL	73190-96	HD-41609	18	REAR	REAR

Table 8. 1996 Rear Lighting Harness, Part No.'s 68653-96 and 68655-96

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
REAR LIGHTING [7B]	ALL	73191-96	AMP	18	X	X
REAR DIRECTIONALS[18A,19A]	ALL	73190-96	AMP	18	X	X
FENDERTIP LAMP [45A] (DOM)	ALL	73190-96	AMP	18	X	X

Table 1. 1995 Components (Except FXDWG)

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
CAM POSITION SENSOR [14B]	1	74536-77A	PACKARD 271	18	E	A
CAM POSITION SENSOR [14B]	2,3	74539-77A	PACKARD 271	18	E	A
TO TRAP DOOR SOLENOID [15B]	ALL	72038-71A	PACKARD 271	18	E	A
TRAP DOOR SOLENOID [15A]	ALL	72039-71A	PACKARD 271	20	E	A
TO TRAP DOOR SOLENOID [9A]	1,2	72039-71A	PACKARD 271	18	E	A
TO TRAP DOOR SOLENOID [9A]	3 (h)	72039-71A	PACKARD 271	18	C	D
TO FUEL GAUGE(BK)		72038-71A	PACKARD 271	18	E	A
TO FUEL GAUGE (O/W)		72039-71A	PACKARD 271	18	E	A
FUEL GAUGE TERMINALS		9857	PACKARD 115	18	20-18 GA.	20-18 GA.
FUEL GAUGE SENDER TERMINALS		9857	PACKARD 115	18	20-18 GA.	20-18 GA.
TAIL LIGHT [7A]	ALL	72039-71A	PACKARD 271	18	E	A
TAIL LIGHT/DIR. GROUND [7C]	ALL	72039-71A	PACKARD 271	18	E	A
TAIL LIGHT/DIR. GROUND [7D]	ALL	72038-71A	PACKARD 271	18	E	A
V.O.E.S. [11D]	GROUND	9898	PACKARD 115	18	TIP	
V.O.E.S. [11A]	TO MODULE	9897	PACKARD 115	18	TIP	
IGNITION MODULE [10B]	ALL	74539-77A	PACKARD 271	18	E	A
TO DIRECTIONALS[18B,19B]	ALL	72038-71A	PACKARD 271	18	E	A
FROM DIRECTIONALS[18A,19A]	ALL	72039-71A	PACKARD 271	18	E	A
LEFT HANDLEBAR CONTROL [24B]	ALL	72038-71A	PACKARD 271	18	E	A
RIGHT HANDLEBAR CONTROL [22B]	ALL	72038-71A	PACKARD 271	18	E	A
TO HEADLAMP AND GAUGES [21B]	1,3,6,7,8	72038-71A	PACKARD 271	18	E	A
TO HEADLAMP AND GAUGES [21B]	2,5 (h)	72038-71A	PACKARD 271	18	C	D
TO HEADLAMP AND GAUGES [21C]	ALL	72039-71A	PACKARD 271	18	E	A
TO HEADLAMP AND GAUGES [21D]	ALL	72038-71A	PACKARD 271	18	E	A
HEADLAMP CONN. KIT 68705-93	ALL	70583-93 (j)	PACKARD 115	18	20-18 GA.	(j)
TO INDICATOR LIGHTS [20A]	ALL	72038-71A	PACKARD 271	18	E	A
SPEEDOMETER SENSOR [65A]	ALL	72190-94 (o) (a)	DTT-16-00	20	FRONT POSITION	FRONT POSITION
TO SPEEDOMETER SENSOR [65B]	ALL	72191-94 (p) (a)	DTT-16-00	20	FRONT POSITION	FRONT POSITION
SPEEDOMETER TERMINALS		72241-94	PACKARD 271	18	C	A
TACHOMETER TERMINALS		9857	PACKARD 115	18	20-18 GA.	20-18 GA.
HDI POSITION LAMP		9898	PACKARD 115	18	TIP	X
IGNITION SWITCH [33B]	ALL	72207-94	PACKARD 271	14	C	B

Table 2. 1995 FXDWG Components

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
CAM POSITION SENSOR [14B]	1	74536-77A	PACKARD 271	18	E	A
CAM POSITION SENSOR [14B]	2,3	74539-77A	PACKARD 271	18	E	A
TO TRAP DOOR SOLENOID [15B]	ALL	72038-71A	PACKARD 271	18	E	A
TRAP DOOR SOLENOID [15A]	ALL	72039-71A	PACKARD 271	20	E	A
TO TRAP DOOR SOLENOID [9A]	1,2	72039-71A	PACKARD 271	18	E	A
TO TRAP DOOR SOLENOID [9A]	3 (h)	72039-71A	PACKARD 271	18	C	D
TO FUEL GAUGE(BK)		72038-71A	PACKARD 271	18	E	A
TO FUEL GAUGE (O/W)		72039-71A	PACKARD 271	18	E	A
FUEL GAUGE TERMINALS		9857	PACKARD 115	18	20-18 GA.	20-18 GA.
FUEL GAUGE SENDER TERMINALS		9857	PACKARD 115	18	20-18 GA.	20-18 GA.
TAIL LIGHT [7A]	ALL	72039-71A	PACKARD 271	18	2	4
TAIL LIGHT/DIR. GROUND [7C]	ALL	72039-71A	PACKARD 271	18	2	4
TAIL LIGHT/DIR. GROUND [7D]	ALL	72038-71A	PACKARD 271	18	C	A
V.O.E.S. [11D]	GROUND	9898	PACKARD 115	18	TIP	
V.O.E.S. [11A]	TO MODULE	9897	PACKARD 115	18	TIP	
IGNITION MODULE [10B]	ALL	74539-77A	PACKARD 271	18	E	A
TO DIRECTIONALS[18B,19B]	ALL	72038-71A	PACKARD 271	18	E	A
FROM DIRECTIONALS[18A,19A]	ALL	72039-71A	PACKARD 271	18	E	A
LEFT HANDLEBAR CONTROL [24B]	ALL	72038-71A	PACKARD 271	18	E	A
RIGHT HANDLEBAR CONTROL [22B]	ALL	72038-71A	PACKARD 271	18	E	A
TO HEADLAMP (W,Y,O-ON HDI ONLY)	ALL	72038-71A	PACKARD 271	18	E	A
HEADLAMP CONN. KIT 68705-93	ALL	70583-93 (j)	PACKARD 115	18	20-18 GA.	(j)
TO SPEEDOMETER [20A]	ALL	72038-71A	PACKARD 271	18	E	A
SPEEDOMETER SENSOR [65A]	ALL	72190-94 (o) (a)	DTT-16-00	20	FRONT POSITION	FRONT POSITION
TO SPEEDOMETER SENSOR [65B]	ALL	72191-94 (p) (a)	DTT-16-00	20	FRONT POSITION	FRONT POSITION
SPEEDOMETER TERMINALS		72241-94	PACKARD 271	18	C	A
HDI POSITION LAMP		9898	PACKARD 115	18	TIP	X

Table 3. 1995 Switch Harness at Switch, Part No. 70250-95

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
SWITCH TERMINALS RED (B)		9898	14	PACKARD 115	TIP	
SWITCH TERMINALS R/GY (A), R/BK (I)		9907	14	PACKARD 115	16-14	
TO MAIN HARNESS [33B]	A,B,C	72207-94	14	PACKARD 271	C	B

Table 4. 1995 Panel Harness, Part No. 70032-95

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
IGNITION CIRCUIT BREAKER, SILVER STUD (GY)		9857	PACKARD 115	18	20-18 GA.	20-18 GA.
LIGHTS CIRCUIT BREAKER, SILVER STUD (BE)		9857	PACKARD 115	18	20-18 GA.	20-18 GA.
ACCESSORY CIRCUIT BREAKER, SILVER STUD (O/W)		9857	PACKARD 115	18	20-18 GA.	20-18 GA.
TO ELECTRICAL PANEL GROUND STUD						
STARTER RELAY 30,87 TERMINALS (R/BK,GN)		9858	PACKARD 115	18	20-18 GA.	20-18 GA.
STARTER RELAY 85,86 TERMINALS (BK,BK/R)		9937	PACKARD 271	14	C	A
LIGHTS CIRCUIT BREAKER, COPPER STUD (R/BK)		9937	PACKARD 271	18	C	D
TO MAIN WIRING HARNESS [1A]		9862	PACKARD 115	14	16-14 GA.	16-14 GA.
TO MAIN WIRING HARNESS [1A] (GN)	ALL EXCEPT 7	72039-71A	PACKARD 271	18	E	A
	7	72039-71A	PACKARD 271	14	C	A

Table 5. 1995 Ignition Harness, Part No. 70339-91B

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
TO COIL		9857	PACKARD 115	18	20-18 GA.	20-18 GA.
TO ELECTRICAL PANEL GROUND STUD		9858	PACKARD 115	18	20-18 GA.	20-18 GA.
TO V.O.E.S. [11B]		72290-94	PACKARD 271	18	C	D
TO V.O.E.S. [11C]		9897	PACKARD 115	18	TIP	
TO IGNITION MODULE [10A]		74536-77A	PACKARD 271	18	E	A
TO CAM POSITION SENSOR [14A] (BK/W,GN/W)	2,3	74536-77A	PACKARD 271	18	E	A
TO CAM POSITION SENSOR [14A] (R/W)	1	74539-77A	PACKARD 271	18	E	A
TO MAIN WIRING HARNESS [1A]	11,12	72039-71A	PACKARD 271	18	E	A
TO CALIFORNIA TRAP DOOR [9B]	1	72038-71A	PACKARD 271	18	E	A

Table 6. 1995 Switch Harness at Panel, Part No. 70091-95

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
IGNITION CIRCUIT BREAKER, COPPER STUD (R/BK)		9862	PACKARD 115	14	16-14 GA.	16-14 GA.
ACCESSORY CIRCUIT BREAKER, COPPER STUD (R/GY)		9862	PACKARD 115	14	16-14 GA.	16-14 GA.
MAIN CIRCUIT BREAKER, SILVER STUD (R)		9862	PACKARD 115	14	16-14 GA.	16-14 GA.
TO IGNITION SWITCH [33A]	ALL	72208-94	PACKARD 271	14	A	D

Table 7. 1995 FXDL Front Harness, Part No. 70344-95

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
GAUGES [21B]	1,3	72038-71A	PACKARD 271	18	E	A
GAUGES [21B]	2,5 (h)	72038-71A	PACKARD 271	18	C	D
GAUGES [21C]	ALL	72039-71A	PACKARD 271	18	E	A
FUEL LEVEL SENDING UNIT (BK)	SINGLE PIN	72039-71A	PACKARD 271	18	E	A
FUEL LEVEL SENDING UNIT (O/W)	SINGLE SOCKET	72038-71A	PACKARD 271	18	E	A

Table 8. 1995 Main Harness (Except FXDWG), Part No. 69588-95

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
OIL PRESSURE SENDING UNIT		9857	PACKARD 115	18	20-18 GA.	20-18 GA.
REAR STOP LIGHT SWITCH		9937 (d)	PACKARD 271	18	C	D
REAR STOP LIGHT SWITCH		9937 (d)	PACKARD 271	18	C (h)	D (h)
MAIN GROUND-CHASSIS (2-BK)		9864	PACKARD 115	18	20-18 GA. (h)	20-18 GA. (h)
SOLENOID		72291-94	PACKARD 271,115	14	A	G
HORN		9937 (d)	PACKARD 271	18	C	D
MAIN CIRCUIT BREAKER		9866 (b)	PACKARD 115	12	12-10 GA.	12-10 GA.
NEUTRAL SWITCH		9905	PACKARD 115	18	20-18 GA.	20-18 GA.
TO TAIL LIGHT & REAR TURN SIGNALS [7B]	1,4 (h)	72038-71A	PACKARD 271	18	C	D
TO TAIL LIGHT & REAR TURN SIGNALS [7B]	2,6,7,8	72038-71A	PACKARD 271	18	E	A
TO ELECTRICAL PANEL [1B]	1 (h)	72038-71A	PACKARD 271	18	C	D
TO ELECTRICAL PANEL [1B]	2,3,4,5,6,10,11	72038-71A	PACKARD 271	18	E	A
TO ELECTRICAL PANEL [1B] (GN)	7	72038-71A	PACKARD 271	14	E	A
TO LEFT HAND CONTROLS [24A]	1,3,5,6,7	72039-71A	PACKARD 271	18	E	A
TO RIGHT HAND CONTROLS [22A]	1,2,8 (h)	72039-71A	PACKARD 271	18	C	D
TO RIGHT HAND CONTROLS [22A]	3,4,5,6,7	72039-71A	PACKARD 271	18	E	A
INDICATOR LAMPS [20A] (2-BK)	8 (h)	72039-71A	PACKARD 271	18	C	D
INDICATOR LAMPS [20A]	ALL EXCEPT 8	72039-71A	PACKARD 271	18	E	A
TO TURN SIGNAL MODULE [30B]	1,4,6 (h)	72038-71A	PACKARD 271	18	C	D
TO TURN SIGNAL MODULE [30B]	2,3,8,10	72038-71A	PACKARD 271	18	E	A
HEADLAMP CONNECTORS (Y,W)	SINGLE PIN	72039-71A	PACKARD 271	18	E	A
HEADLAMP AND GAUGES [21A]	ALL	72039-71A	PACKARD 271	18	E	A
FUEL LEVEL SENDING UNIT (BK)	SINGLE PIN	72039-71A	PACKARD 271	18	E	A
FUEL LEVEL SENDING UNIT (O/W)	SINGLE SOCKET	72038-71A	PACKARD 271	18	E	A

Table 9. 1995 FXDWG Main Harness, Part No. 69631-95

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
OIL PRESSURE SENDING UNIT		9857	PACKARD 115	18	20-18 GA.	20-18 GA.
REAR STOP LIGHT SWITCH		9937 (d)	PACKARD 271	18	C	D
REAR STOP LIGHT SWITCH		9937 (d)	PACKARD 271	18	C (h)	D (h)
MAIN GROUND-CHASSIS (2-BK)		9864	PACKARD 115	18	20-18 GA. (h)	20-18 GA. (h)
SOLENOID		72291-94	PACKARD 271,115	14	A	G
HORN		9937 (d)	PACKARD 271	18	C	D
MAIN CIRCUIT BREAKER		9866	PACKARD 115	12	12-10 GA.	12-10 GA.
NEUTRAL SWITCH		9905	PACKARD 115	18	20-18 GA.	20-18 GA.
TO TAIL LIGHT & REAR TURN SIGNALS [7B]	1,4 (h)	72038-71A	PACKARD 271	18	C	D
TO TAIL LIGHT & REAR TURN SIGNALS [7B]	2,6,7,8	72038-71A	PACKARD 271	18	E	A
TO ELECTRICAL PANEL [1B]	1 (h)	72038-71A	PACKARD 271	18	C	D
TO ELECTRICAL PANEL [1B]	2,3,4,5,6,10,11	72038-71A	PACKARD 271	18	E	A
TO ELECTRICAL PANEL [1B] (GN)	7	72038-71A	PACKARD 271	14	C	A
TO LEFT HAND CONTROLS [24A]	1,3,5,6,7	72039-71A	PACKARD 271	18	E	A
TO RIGHT HAND CONTROLS [22A]	1,2,8 (h)	72039-71A	PACKARD 271	18	C	D
TO RIGHT HAND CONTROLS [22A]	3,4,5,6,7	72039-71A	PACKARD 271	18	E	A
INSTRUMENT CLUSTER [20A]	5 (h)	72039-71A	PACKARD 271	18	C	D
INSTRUMENT CLUSTER [20A]	ALL EXCEPT 5	72039-71A	PACKARD 271	18	E	A
TO TURN SIGNAL MODULE [30B]	1,4,6 (h)	72038-71A	PACKARD 271	18	C	D
TO TURN SIGNAL MODULE [30B]	2,3,8,10	72038-71A	PACKARD 271	18	E	A
HEADLAMP CONNECTORS (Y,W)	SINGLE PIN	72039-71A	PACKARD 271	18	E	A
HEADLAMP CONNECTORS (2-O/W)	SINGLE PIN (h)	72039-71A	PACKARD 271	18	C	D
FUEL LEVEL SENDING UNIT (BK)	SINGLE PIN	72039-71A	PACKARD 271	18	E	A
FUEL LEVEL SENDING UNIT (O/W)	SINGLE SOCKET	72038-71A	PACKARD 271	18	E	A

Table 10. 1996 Components

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
CAM POSITION SENSOR [14A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TRAP DOOR SOLENOID [9B]	ALL	73191-96	HD-41609	20	FRONT	FRONT
REAR LIGHTING [7B]	ALL	73191-96	HD-41609	18	REAR	REAR
V.O.E.S. [11B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
IGNITION MODULE [10B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
FUEL GAUGE [13B]	ALL	73191-96	HD-41609	18	REAR	REAR
FUEL GAUGE TO [13B] TERMINALS		9856	PACKARD 115	18	20-18 GA.	20-18 GA.
FUEL GAUGE TO SENDER TERMINALS		9857	PACKARD 115	18	20-18 GA.	20-18 GA.
FUEL GAUGE SENDER TERMINALS		9857	PACKARD 115	18	20-18 GA.	20-18 GA.
FRONT DIRECTIONALS [31B]	ALL	73191-96	HD-41609	18	REAR	REAR
HEADLAMP [38B]	ALL	73191-96	HD-41609	16	MIDDLE	MIDDLE
INSTRUMENT CLUSTER [20B]	ALL	73191-96	HD-41609	18	REAR	REAR
LEFT HANDLEBAR CONTROL [24B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
RIGHT HANDLEBAR CONTROL [22B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
INDICATOR LAMPS [21A]	ALL	73190-96	HD-41609	18	REAR	REAR
INDICATOR LAMPS [21B]	ALL	73191-96	HD-41609	18	REAR	REAR
SPEED SENSOR [65A]	ALL	72190-94 (a) (o)	DTT-16-00	20	FRONT POSITION	FRONT POSITION
SPEED SENSOR [65B]	ALL	72191-94 (a) (p)	DTT-16-00	20	FRONT POSITION	FRONT POSITION
SPEEDOMETER TERMINALS		72241-94 (q)	PACKARD 271	18	C	A
TACHOMETER TERMINALS		72241-94 (q)	PACKARD 271	18	C	A
HEADLAMP CONN. KIT 68705-93A	ALL	70586-93 (j)	PACKARD 115	16	14-16 GA.	(q)
POSITION LAMP		9898	PACKARD 271		TIP	
POSITION LAMP		9898	PACKARD 115		TIP	

Table 11. 1996 Switch Harness, Part No. 70250-95A

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
SWITCH TERMINALS RED (B)		9907	PACKARD 115	14	16-14	
SWITCH TERMINALS R/GY (A), R/BK (I)		9898	PACKARD 115	14	TIP	
TO MAIN HARNESS [33B]	A,B,C	72207-94	PACKARD 271	14	C	B

Table 12. 1996 Main Harness, Part. No. 69558-96

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
OIL PRESSURE SENDING UNIT		72241-94 (q)	PACKARD 271	18	C	A
REAR BRAKE LIGHT SWITCH		9937 (d)	PACKARD 271	18	C	D
HORN		9898	PACKARD 271	18	TIP	
HORN		9898	PACKARD 115	18	TIP	
STARTER RELAY 30,87 TERMINALS (R/BK,GN)		9937	PACKARD 271	14	C	A
STARTER RELAY 85,86 TERMINALS (BK,BK/R)		9937	PACKARD 271	18	C	D
STARTER TERMINAL		9842	PACKARD 270,271	10	B	3
MAIN CIRCUIT BREAKER (COPPER POST)		9843	PACKARD 270,271	10	B	3
MAIN CIRCUIT BREAKER (SILVER POST)		9866	PACKARD 115	12	12-10 GA.	12-10 GA.
FUSEBLOCK	1,2,3,4	72218-94	PACKARD 271	14	C	A
FUSEBLOCK	5,6,7,8	72217-94	PACKARD 271	18	E	A
SOLENOID		72291-94	PACKARD 271,115	14	A	G
HARNESS GROUNDS (2) UNDER SEAT	DYNA	72365-96	PACKARD 115	16	F (a)	G
NEUTRAL SWITCH		9905	PACKARD 115	18	20-18 GA.	20-18 GA.
COIL		72241-94 (q)	PACKARD 271	18	C (q)	A
TAIL LIGHT & REAR TURN SIGNALS [7A]	ALL	73190-96	HD-41609	18	REAR	REAR
CALIFORNIA TRAP DOOR [9A] (GN)	1	73190-96	HD-41609	16	MIDDLE	MIDDLE
CALIFORNIA TRAP DOOR [9A]	2,3	73190-96	HD-41609	18	REAR	REAR
IGNITION MODULE [10A]	EXCEPT 7	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
IGNITION MODULE [10A]	7	72190-94	DTT-16-00	16	CENTER POSITION	CENTER POSITION
V.O.E.S. [11A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
FUEL GAUGE [13A]	ALL	73190-96	HD-41609	18	REAR	REAR
CAM POSITION SENSOR [14B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
CONSOLE [20A]	ALL	73190-96	HD-41609	18	REAR	REAR
RIGHT HAND CONTROLS [22A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
LEFT HAND CONTROLS [24A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TURN SIGNAL MODULE [30B]	EXCEPT 2	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TURN SIGNAL MODULE [30B] (O/W)	2	72191-94	DTT-16-00	16	CENTER POSITION	CENTER POSITION
FRONT TURN SIGNALS [31B]	ALL	73190-96	HD-41609	18	REAR	REAR
IGNITION SWITCH (R/BK, R/GY) [33A]	B,C	72210-94	PACKARD 271	14	C	A
IGNITION SWITCH (R) [33A]	A	72208-94	PACKARD 271	12	A	D
HEADLAMP [38B]	ALL	73190-96	HD-41609	18	REAR	REAR

Table 1. 1995 FLHR Components

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
IGNITION SENSOR [14A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TRAP DOOR SOLENOID [15A]	ALL	72039-71A	PACKARD 271	18	E	A
V.O.E.S. [11B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
IGNITION MODULE [10B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TURN SIGNAL MODULE [30B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
REAR SIGNAL LAMPS [18B,19B]	ALL	72038-71A	PACKARD 271	18	E	A
REAR FENDER TIP LAMP [45B]		72038-71A	PACKARD 271	18	E	A
INSTRUMENT CLUSTER [20B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
INSTRUMENT CLUSTER [65B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
LEFT HANDLEBAR CONTROL [24B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
RIGHT HANDLEBAR CONTROL [22B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
FRONT LIGHT BAR [31B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
FRONT FENDER TIP LAMP [32B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
SPEED SENSOR [65A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
PASS/PARK LAMP SWITCH [66B]	ALL	72038-71A	PACKARD 271	18	E	A
ACCESSORY SWITCH [67B]	ALL	72038-71A	PACKARD 271	18	E	A

Table 2. 1996 FLHR Components

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
IGNITION SENSOR [14A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TRAP DOOR SOLENOID [15A]	ALL	72039-71A	PACKARD 271	18	E	A
V.O.E.S. [11B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
IGNITION MODULE [10B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TURN SIGNAL MODULE [30B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
INSTRUMENT CLUSTER [20B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
LEFT HANDLEBAR CONTROL [24B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
RIGHT HANDLEBAR CONTROL [22B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
FRONT LIGHT BAR [31B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
FRONT FENDER TIP LAMP [32B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
SPEED SENSOR [65A]	ALL	72190-94	DTT-16-00	20 (a)	CENTER POSITION	CENTER POSITION
SPEED SENSOR [65B]	ALL	72191-94	DTT-16-00	20 (a)	CENTER POSITION	CENTER POSITION
PASS/PARK LAMP SWITCH [66B]	ALL	72038-71A	PACKARD 271	18	E	A
ACCESSORY SWITCH [67B]	ALL	72038-71A	PACKARD 271	18	E	A

Table 3. 1995 FLHR Main Harness, Part No. 70245-94

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
BRAKE LIGHT RELAY	ALL	9937	PACKARD 271	18	C	D
STARTER RELAY (BK,BK/R)	85,86	9937	PACKARD 271	18	C	D
STARTER RELAY (GN,R/GY)	30,87	9937	PACKARD 271	14	C	A
OIL PRESSURE SENDING UNIT		9857	PACKARD 115	18	20-18 GA.	20-18 GA.
REAR STOP LIGHT SWITCH		9937 (b)	PACKARD 271	18	C	D
MAIN GROUND-CHASSIS (2-BK)		72242-94 (a)	PACKARD 115,270	12,16	G (h)	3 (h)
SOLENOID		72291-94	PACKARD 271,115	14	A	G
HORN		9937 (b)	PACKARD 271	18	C	D
MAIN CIRCUIT BREAKER		9866 (b)	PACKARD 115	12	12-10 GA.	12-10 GA.
NEUTRAL SWITCH		9905	PACKARD 115	18	20-18 GA.	20-18 GA.
FUSE BLOCK (2-O/W)	1	72219-94	PACKARD 271	18	C (h)	B (h)
FUSE BLOCK (BE)	2	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (2-O)	3	72219-94	PACKARD 271	18	C (h)	B (h)
FUSE BLOCK (2-GY)	4	72219-94	PACKARD 271	18	C (h)	B (h)
FUSE BLOCK (R/GY)	5	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/BK)	6	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/BK)	7	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/BK)	8	72218-94	PACKARD 271	14	C	A
P&A ACCESSORY [4A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO REAR LIGHTING HARNESS [7A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO IGNITION HARNESS [8A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO EVAP. SOLENOID (CAL.) [9A] GN	A	72190-94	DTT-16-00	16	CENTER POSITION	CENTER POSITION
TO EVAP. SOLENOID (CAL.) [9A]	B,C	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
FUEL GAUGE SENDER [13B]		72038-71A	PACKARD 271	18	E	A
FUEL GAUGE SENDER [13C]		72039-71A	PACKARD 271	18	E	A
TO IGNITION SENSOR [14B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
INSTRUMENT CLUSTER [20A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO RIGHT HAND CONTROLS [22A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO LEFT HAND CONTROLS [24A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO TURN SIGNAL MODULE [30A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO FRONT LIGHT BAR [31A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO FRONT FENDER TIP LAMP [32A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO IGNITION SWITCH [33A]	ALL	72292-94 (a)	PACKARD 115	12	F	G
HEADLAMP CONN. KIT 68705-93A	ALL	70586-93 (j)	PACKARD 115	18	20-18 GA.	(j)
HDI POSITION LAMP (BK,O/W)		9898	PACKARD 271	18	TIP	X
HDI POSITION LAMP (BK,O/W)		9898	PACKARD 115	18	TIP	X
TO PASS/PARK SWITCH [66A]	ALL	72039-71A	PACKARD 271	18	E	A
TO ACCESSORY SWITCH [67A]	ALL	72039-71A	PACKARD 271	18	E	A

Table 4. 1996 FLHR Main Harness, Part No. 70245-94A

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
BRAKE LIGHT RELAY	ALL	9937	PACKARD 271	18	C	D
STARTER RELAY (BK,BK/R)	85,86	9937	PACKARD 271	18	C	D
STARTER RELAY (GN,R/GY)	30,87	9937	PACKARD 271	14	C	A
OIL PRESSURE SENDING UNIT		9857	PACKARD 115	18	20-18 GA.	20-18 GA.
REAR STOP LIGHT SWITCH		9937 (b)	PACKARD 271	18	C	D
MAIN GROUND-CHASSIS (2-BK)		72242-94 (a)	PACKARD 115,270	12,16	G (h)	3 (h)
SOLENOID		72291-94	PACKARD 271,115	14	A	G
HORN		9898	PACKARD 271	18	TIP	
HORN		9898	PACKARD 115	18	TIP	
MAIN CIRCUIT BREAKER		9866 (b)	PACKARD 115	12	12-10 GA.	12-10 GA.
NEUTRAL SWITCH		9905	PACKARD 115	18	20-18 GA.	20-18 GA.
FUSE BLOCK (GY)	1	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (2-O)	2	72219-94	PACKARD 271	18	C (h)	B (h)
FUSE BLOCK (BE)	3	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (2-O/W)	4	72219-94	PACKARD 271	18	C (h)	B (h)
FUSE BLOCK (R/BK)	5	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/BK)	6	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/BK)	7	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/GY)	8	72218-94	PACKARD 271	14	C	A
P&A ACCESSORY [4A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO REAR LIGHTING HARNESS [7A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO IGNITION HARNESS [8A]	ALL BUT 8	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO IGNITION HARNESS [8A]	8	72190-94	DTT-16-00	16	CENTER POSITION	CENTER POSITION
TO EVAP. SOLENOID (CAL.) [9A] GN	A	72190-94	DTT-16-00	16	CENTER POSITION	CENTER POSITION
TO EVAP. SOLENOID (CAL.) [9A]	B,C	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
FUEL GAUGE SENDER [13B]		72038-71A	PACKARD 271	18	E	A
FUEL GAUGE SENDER [13C]		72039-71A	PACKARD 271	18	E	A
TO IGNITION SENSOR [14B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
INSTRUMENT CLUSTER [20A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO RIGHT HAND CONTROLS [22A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO LEFT HAND CONTROLS [24A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO TURN SIGNAL MODULE [30A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO FRONT LIGHT BAR [31A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO FRONT FENDER TIP LAMP [32A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO IGNITION SWITCH [33A]	ALL	72292-94 (a)	PACKARD 115	12	F	G
HEADLAMP CONN. KIT 68705-93	ALL	70583-93 (j)	PACKARD 115	18	20-18 GA.	(j)
HDI POSITION LAMP (BK,O/W)		9898	PACKARD 271	18	TIP	X
HDI POSITION LAMP (BK,O/W)		9898	PACKARD 115	18	TIP	X
TO PASS/PARK SWITCH [66A]	ALL	72039-71A	PACKARD 271	18	E	A
TO ACCESSORY SWITCH [67A]	ALL	72039-71A	PACKARD 271	18	E	A
HDI PASSING LAMP [PLA]	ALL	72039-71A	PACKARD 271	18	E	A
HDI PASSING LAMP [PLB, PLC]		72038-71A	PACKARD 271	18	E	A

Table 5. 1995 FLT Components

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
FUEL GAUGE SENDER [13A]	ALL	72039-71A	PACKARD 271	18	E	A
IGNITION SENSOR [14A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TRAP DOOR SOLENOID [15A]	ALL	72039-71A	PACKARD 271	18	E	A
V.O.E.S. [11B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
IGNITION MODULE [10B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TURN SIGNAL MODULE [30B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
REAR SIGNAL LAMPS [18B,19B]	ALL	72038-71A	PACKARD 271	18	E	A
REAR FENDER TIP LAMP [45B]		72038-71A	PACKARD 271	18	E	A
PTT SWITCH [26A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
SET/RESUME SWITCH [16A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
IGNITION SWITCH [33B]	ALL	72207-94	PACKARD 271	14	C	B
INSTRUMENT CLUSTER [20B,21B]	ALL	72038-71A	PACKARD 271	18	E	A
LEFT HANDLEBAR CONTROL [24B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
RIGHT HANDLEBAR CONTROL [22B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
RIGHT HB RADIO CONTROL [23B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
RADIO [27B,28B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
CONSOLE POD TO OVERLAY [52B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
POD TO RR SPKRS [41B,42B]	ALL	72038-71A	PACKARD 271	18	E	A
POD TO FUSE BOARD [44B]	ALL	72038-71A	PACKARD 271	18	E	A
POD TO TRANSCEIVER [55A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
POD TO TRANSCEIVER [56B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
POD TO MAIN HARNESS(JAPAN)[5A]	ALL	72039-71A	PACKARD 271	18	E	A
FRONT LIGHT BAR [31B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
FRONT FENDER TIP LAMP	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION

Table 6. 1996 FLT Components

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
FUEL GAUGE SENDER [13A]	ALL	72039-71A	PACKARD 271	18	E	A
CAM POSITION SENSOR [14A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TRAP DOOR SOLENOID [15A]	ALL	72039-71A	PACKARD 271	18	E	A
V.O.E.S. [11B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
IGNITION MODULE [10B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TURN SIGNAL MODULE [30B] (FLTCU-I)	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
REAR SIGNAL LAMPS [18B,19B]	ALL	73190-96	HD-41609	18	REAR	REAR
REAR FENDER TIP LAMP [45B]		72038-71A	PACKARD 271	18	E	A
PTT SWITCH [26A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
SET\RESUME SWITCH [16A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
IGNITION SWITCH [33B]	ALL	72207-94	PACKARD 271	14	C	B
SPEEDOMETER [20A]	ALL	73190-96	HD-41609	18	REAR	REAR
TACHOMETER [108A]	ALL	73190-96	HD-41609	18	REAR	REAR
INSTRUMENT CLUSTER [20B,21B] (FLTCU-I)	ALL	72038-71A	PACKARD 271	18	E	A
INDICATOR LAMPS [21B] (EXCEPT FLTCU-I)	ALL	73191-96	HD-41609	18	REAR	REAR
LEFT HANDLEBAR CONTROL [24B]	EXCEPT Y,BE,W	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
LEFT HANDLEBAR CONTROL [24B]	Y,BE,W	72191-94	DTT-16-00	16	CENTER POSITION	CENTER POSITION
RIGHT HANDLEBAR CONTROL [22B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
RIGHT HB RADIO CONTROL [23B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
RADIO [27B,28B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
CONSOLE POD TO OVERLAY [52B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
POD TO RR SPKRS [41B,42B]	ALL	72038-71A	PACKARD 271	18	E	A
TRANSCEIVER TO FUSE BOARD [43B]	ALL	72038-71A	PACKARD 271	18	E	A
POD TO FUSE BOARD [44B]	ALL	72038-71A	PACKARD 271	18	E	A
POD TO TRANSCEIVER [55A]	ALL	72190-94 (c)	DTT-16-00	20	CENTER POSITION	CENTER POSITION
POD TO TRANSCEIVER [56B]	ALL	72191-94 (c)	DTT-16-00	20	CENTER POSITION	CENTER POSITION
POD TO MAIN HARNESS(JAPAN)[5A]	ALL	72039-71A	PACKARD 270	18	E	A
FRONT LIGHT BAR [31B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
FRONT FENDER TIP LAMP	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
FAIRING SWITCHES [105B](EXCEPT FLTCU-I)	ALL	73191-96	HD-41609	18	REAR	REAR

Table 7. Cruise Harness, Part. No.'s 70141-94 and 70141-95

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
TO CRUISE SWITCH		9937 (d)	PACKARD 271	18	C	D
TO SET\RESUME SWITCH [16B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO MAIN HARNESS [6B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO THROTTLE ROLL-OFF SWITCH		9930 (e)	PACKARD 271	18	C	A

Table 8. 1995 FLT Main Harness, Part. No. 70985-94

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
OIL PRESSURE SENDING UNIT		9857	PACKARD 115	18	20-18 GA.	20-18 GA.
REAR STOP LIGHT SWITCH		9937 (b)	PACKARD 271	18	C	D
MAIN GROUND-CHASSIS (2-BK)		72242-94 (a)	PACKARD 115,270	12,16	G (h)	3 (h)
MAIN GROUND-AUDIO (2-BK\GN)		72255-94	PACKARD 271,270	18	4 (h)	D (h)
SOLENOID		9937 (b)	PACKARD 271	14	C	A
HORN		9937 (b)	PACKARD 271	18	C	D
MAIN CIRCUIT BREAKER		9866 (b)	PACKARD 115	12	12-10 GA.	12-10 GA.
NEUTRAL SWITCH		9905	PACKARD 115	18	20-18 GA.	20-18 GA.
TO INTERCONNECT HARNESS [1B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO INTERCONNECT HARNESS [2B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO INTERCONNECT HARNESS [3B]	A,C	72223-94 (f)	PACKARD 270	12	4	3
TO INTERCONNECT HARNESS [3B]	B	72224-94 (g)	PACKARD 271,270	14	C	3
P&A ACCESSORY [4A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
FUSE/FILTER BOARD [5B]	ALL	72038-71A	PACKARD 271	18	E	A
TO CRUISE HARNESS [6A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO REAR LIGHTING HARNESS [7A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO IGNITION HARNESS [8A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO EVAP. SOLENOID (CAL.) [9A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO TOUR-PAK [12A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
FUEL GAUGE SENDER [13B]	ALL	72038-71A	PACKARD 271	18	E	A
CAM POSITION SENSOR [14B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION

Table 9. 1996 FLT Main Harness, Part. No. 70985-96

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
OIL PRESSURE SENDING UNIT		9857	PACKARD 115	18	20-18 GA.	20-18 GA.
REAR STOP LIGHT SWITCH		9937 (d)	PACKARD 271	18	C	D
MAIN GROUND-CHASSIS (2-BK)***		72242-94 (a) (i)	PACKARD 115,270	12,16	G (h)	3 (h)
MAIN GROUND-AUDIO (2-BK\GN)		72255-94 (a) (i)	PACKARD 271,270	18	4 (h)	D (h)
SOLENOID		72291-94	PACKARD 271,115	14	A	G
HORN		9898	PACKARD 271	18	TIP	
HORN		9898	PACKARD 115	18	TIP	
MAIN CIRCUIT BREAKER		9866	PACKARD 115	12	12-10 GA.	12-10 GA.
NEUTRAL SWITCH		9905	PACKARD 115	18	20-18 GA.	20-18 GA.
TO INTERCONNECT HARNESS [1B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO INTERCONNECT HARNESS [2B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO INTERCONNECT HARNESS [3B]	A,C	72223-94 (f)	PACKARD 270	12	4	3
TO INTERCONNECT HARNESS [3B]	B	72224-94 (g)	PACKARD 271,270	14	C	3
P&A ACCESSORY [4A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
FUSE/FILTER BOARD [5B]	ALL	72038-71A	PACKARD 271	18	E	A
TO CRUISE HARNESS [6A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO REAR LIGHTING HARNESS [7A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO IGNITION HARNESS [8A]	EXCEPT 4	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO IGNITION HARNESS [8A]	4	72190-94	DTT-16-00	16	CENTER POSITION	CENTER POSITION
TO EVAP. SOLENOID (CAL.) [9A]	EXCEPT 1	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO EVAP. SOLENOID (CAL.) [9A](GN)	1	72190-94	DTT-16-00	16	CENTER POSITION	CENTER POSITION
TO TOUR-PAK [12A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
FUEL GAUGE SENDER [13B]	ALL	72038-71A	PACKARD 271	18	E	A
TO CAM POSITION SENSOR [14B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION

Table 10. 1995 FLHTC/U Interconnect, Part. No. 70232-94

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
BRAKE LIGHT RELAY	ALL	9937	PACKARD 271	18	C	D
STARTER RELAY (BK,BK/R)	85,86	9937	PACKARD 271	18	C	D
STARTER RELAY (GN,R/GY)	30,87	9937	PACKARD 271	14	C	A
FUSE BLOCK (O/R)	1	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (BE)	2	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (2-GY)	3	72219-94	PACKARD 271	18	C (h)	B (h)
FUSE BLOCK (2-R/O)	4	72219-94	PACKARD 271	18	C (h)	B (h)
FUSE BLOCK (R/BK)	5	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/BK)	6	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/BK)	7	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R)	8	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (O/Y)	9	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (O/GN)	10	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/GY)	11	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/GY)	12	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (BE/R)	13	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (2-O/BE)	14	72219-94	PACKARD 271	18	C (h)	B (h)
FUSE BLOCK (O/V)	15	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (2-O/W) 14 &18 GA.	16	72220-94	PACKARD 271	18,14	A (h)	B (h)
VOLTMETER (2-BK,2-O/W)		9937	PACKARD 271	18	C (h)	D (h)
VOLTMETER (BK,O/W)		9937	PACKARD 271	18	C	D
OIL PSI GAUGE (2-BK,2-O/W)		9937	PACKARD 271	18	C (h)	D (h)
OIL PSI GAUGE (BK,O/W,BN/GN)		9937	PACKARD 271	18	C	D
SPEAKER TERMINALS	ALL	9937	PACKARD 271	18	C	D
CIGAR LIGHTER	ALL	9937 (d)	PACKARD 271	14	C	A
SPEAKER SWITCH	ALL	9937 (d)	PACKARD 271	18	C	D
P&A ACCESSORY SWITCH	ALL	9937 (d)	PACKARD 271	18	C	D
CRUISE SWITCH	ALL	9937 (d)	PACKARD 271	18	C	D
SPOTLAMP SWITCH	ALL	9937 (d)	PACKARD 271	18	C	D
FROM MAIN HARNESS [3A]	A,C	72225-94 (k)	PACKARD 270	12	4	3
FROM MAIN HARNESS [3A]	B	72226-94 (l)	PACKARD 271,270	14	C	3
TO IGNITION SWITCH [33A]	A,B,C	72208-94	PACKARD 271	12	A	D
TO IGNITION SWITCH [33A]	D	72209-94	PACKARD 271	18	C	A
HEADLAMP CONN. KIT 68705-93	ALL	70583-93 (j)	PACKARD 115	18	20-18 GA.	(j)
INSTRUMENT CLUSTER [20A,21A]	ALL	72039-71A	PACKARD 271	18	E	A
TO MAIN HARNESS [1A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO MAIN HARNESS [2A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO RIGHT HAND CONTROLS [22A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO LEFT HAND CONTROLS [24A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO RIGHT RADIO CONTROLS [25A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO RADIO [27A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO RADIO [28A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO ANTI-DIVE [29B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO TURN SIGNAL MODULE [30A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO FRONT LIGHT BAR [31A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO FRONT FENDER TIP LAMP [32A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
HDI POSITION LAMP (BK)		9898	PACKARD 271	18	TIP	X
HDI POSITION LAMP (BK)		9898	PACKARD 115	18	TIP	X
HDI POSITION LAMP (O/W)		9937 (d)	PACKARD 271	18	C	D

Table 11. 1996 FLHTC/U Interconnect, Part. No. 70232-96

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
BRAKE LIGHT RELAY	ALL	9937	PACKARD 271	18	C	D
STARTER RELAY (BK,BK/R)	85,86	9937	PACKARD 271	18	C	D
STARTER RELAY (GN,R/GY,O/GN)	30,87,87A	9937	PACKARD 271	14	C	A
FUSE BLOCK (O/R)	1	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (O/V)	2	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (O/BE)	3	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (2-R/O)	4	72219-94	PACKARD 271	18	C (h)	B (h)
FUSE BLOCK (R/GY)	5	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/GY)	6	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (O/GN)	7	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R)	8	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (GY)	9	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (O)	10	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (2-BE)	11	72219-94	PACKARD 271	18	C (h)	B (h)
FUSE BLOCK (O/W)	12	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/BK)	13	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/BK)	14	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/BK)	15	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/GY)	16	72218-94	PACKARD 271	14	C	A
SPEAKER TERMINALS	ALL	9937	PACKARD 271	18	C	D
CIGAR LIGHTER	ALL	9937 (d)	PACKARD 271	18	C	D
FROM MAIN HARNESS [3A]	A,C	72225-94 (k)	PACKARD 270	12	4	3
FROM MAIN HARNESS [3A]	B	72226-94 (l)	PACKARD 271,270	14	C	3
HEADLAMP CONN. KIT 68705-93A	ALL	70586-93 (j)	PACKARD 115	18	20-18 GA.	(j)
SPEEDOMETER [20B]	ALL	73191-96	HD-41609	18	REAR	REAR
INDICATOR LAMPS [21A]	ALL	73190-96	HD-41609	18	REAR	REAR
IGNITION SWITCH [33A]	A,B,C	72208-94	PACKARD 271	12	A	D
IGNITION SWITCH [33A]	D	OPEN				
TO MAIN HARNESS [1A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO MAIN HARNESS [2A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO RIGHT HAND CONTROLS [22A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO LEFT HAND CONTROLS [24A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO RIGHT RADIO CONTROLS [25A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO RADIO [27A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO RADIO [28A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO ANTI-DIVE [29B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO TURN SIGNAL MODULE [30B]	EXCEPT 2	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO TURN SIGNAL MODULE [30B]	2	72191-94	DTT-16-00	16	CENTER POSITION	CENTER POSITION
TO FRONT LIGHT BAR [31A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO FRONT FENDER TIP LAMP [32A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
FAIRING SWITCHES [105A]	ALL	73190-96	HD-41609	18	REAR	REAR
LOW FUEL MODULE [106B]	ALL	73191-96	HD-41609	18	REAR	REAR
AIR TEMP SENSOR [107B]	ALL	73191-96	HD-41609	18	REAR	REAR
TACHOMETER [108B]	ALL	73191-96	HD-41609	18	REAR	REAR
AUSTRALIAN SPOTLAMP [109A]	ALL	72039-71A	PACKARD 271	18	E	A
AUSTRALIAN SPOTLAMP [109B,109C]	ALL	72038-71A	PACKARD 271	18	E	A
VOLTMETER [110B,111B]	ALL	72202-94	PACKARD 271	18	C	D
OIL PRESSURE GAUGE [112B,113B]	ALL	72202-94	PACKARD 271	18	C	D
AIR TEMP GAUGE [114B,115B]	ALL	72202-94	PACKARD 271	18	C	D
FUEL GAUGE [116B,117B]	ALL	72202-94	PACKARD 271	18	C	D
HDI POSITION LAMP (BK)		9898	PACKARD 271	18	TIP	X
HDI POSITION LAMP (BK)		9898	PACKARD 115	18	TIP	X
HDI POSITION LAMP (O/W)		9937 (d)	PACKARD 271	18	C	D

Table 12. FLTCU Fairing Harness, Part. No. 70172-94

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
VOLTMETER (BK,O/W)		72202-94	PACKARD 271	18	C	D
VOLTMETER (2-BK,2-O/W)		72202-94	PACKARD 271	18	C (h)	D (h)
OIL PSI GAUGE (BK,O/W,BN/GN)		72202-94	PACKARD 271	18	C	D
OIL PSI GAUGE (2-BK,2-O/W)		72202-94	PACKARD 271	18	C (h)	D (h)
CIGAR LIGHTER	ALL	9937 (d)	PACKARD 271	14	C	A
SPEAKER SWITCH	ALL	9937 (d)	PACKARD 271	18	C	D
TO RADIO OVERLAY HARNESS (2)		72253-94	PACKARD 271	18	C	A
TO RADIO [27A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO RADIO [28A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO INTERCONNECT HARNESS [34B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO INTERCONNECT HARNESS [35B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO INTERCONNECT HARNESS [36A]	ALL	72235-94 (m)	PACKARD 271,270	14	C	3
TO DIRECTIONAL LAMPS [37A,39A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO HEADLAMPS [38A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO SPEAKER HARNESS [47A]	ALL	72039-71A	PACKARD 271	18	E	A

Table 13. FLTCU Front Speaker Harness, Part. No. 77030-94

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
SPEAKER TERMINALS		9937	PACKARD 271	18	C	D
TO INTERCONNECT [47B]		72038-71A	PACKARD 271	18	E	A

Table 14. FLTCU Interconnect Harness, Part. No. 70282-94

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
BRAKE LIGHT RELAY	ALL	9937	PACKARD 271	18	C	D
STARTER RELAY(BK,BK/R)	85,86	9937	PACKARD 271	18	C	D
STARTER RELAY (GN,R/GY,O/GN)	30,87	9937	PACKARD 271	14	C	A
FUSE BLOCK (O/R)	1	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (2-BE)	2	72219-94	PACKARD 271	18	C (h)	B (h)
FUSE BLOCK (GY) 1996 MODELS	3	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (2-GY) 1995 MODELS	3	72219-94	PACKARD 271	18	C (h)	B (h)
FUSE BLOCK (2-R/O)	4	72219-94	PACKARD 271	18	C (h)	B (h)
FUSE BLOCK (R/BK)	5	72219-94	PACKARD 271	14	C	A
FUSE BLOCK (R/BK)	6	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/BK)	7	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R)	8	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (OPEN)	9	72218-94		18		
FUSE BLOCK (O/GN)	10	OPEN	PACKARD 271	14	C	A
FUSE BLOCK (R/GY)	11	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/GY)	12	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (OPEN)	13	72218-94		18		
FUSE BLOCK (2-O/BE)	14	OPEN	PACKARD 271	18	C (h)	B (h)
FUSE BLOCK (O/V)	15	72219-94	PACKARD 271	18	E	A
FUSE BLOCK (O/W)	16	72217-94	PACKARD 271	14	C	A
P&A ACCESSORY SWITCH	ALL	72218-94	PACKARD 271	18	TIP	X
P&A ACCESSORY SWITCH	ALL	9898	PACKARD 115	18	TIP	X
FROM MAIN HARNESS [3A]	A,C	9898	PACKARD 270	12	4	3
FROM MAIN HARNESS [3A]	B	72225-94 (k)	PACKARD 271,270	14	C	3
TO IGNITION SWITCH [33A]	A,B,C	72226-94 (l)	PACKARD 271	12	A	D
TO IGNITION SWITCH [33A]	D	72208-94		18		
INSTRUMENT CLUSTER [20A,21A]	ALL	OPEN	PACKARD 271	18	E	A
TO MAIN HARNESS [1A]	ALL	72039-71A	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO MAIN HARNESS [2A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO RIGHT HAND CONTROLS [22A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO LEFT HAND CONTROLS [24A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO RIGHT RADIO CONTROLS [25A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO ANTI-DIVE [29B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO TURN SIGNAL MODULE [30A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO FRONT FENDER TIP LAMP [32A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO FAIRING HARNESS [34A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO FAIRING HARNESS [35A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO FAIRING HARNESS [36B]	ALL	72236-94 (n)	PACKARD 271,270	14	C	3

Table 15. Fuel Gauge Harness, Part. No. 75047-88

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
FUEL GAUGE SENDING UNIT		9856	PACKARD 115	18	20-18 GA.	20-18 GA.
TO MAIN HARNESS [13A]	ALL	72039-71A	PACKARD 271	18	E	A
TO MAIN HARNESS [13D]	ALL	72038-71A	PACKARD 271	18	E	A

Table 16. Ignition Harness, Part. No. 32435-94

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
TO MAIN HARNESS [8B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO IGNITION MODULE [10A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO V.O.E.S. [11A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO COIL		9857	PACKARD 115	18	20-18 GA.	20-18 GA.

Table 17. Radio Overlay Harness, Part. No. 70160-94

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
SPEAKER SWITCH	ALL	9937 (d)	PACKARD 271	18	C	D
TO RIGHT HB CONTROLS [23A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO INTERCONNECT HARNESS [25B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO PTT [26B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO POD [52A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION

Table 18. 1995 Rear Lighting Harness

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
TO MAIN HARNESS [7B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO REAR DIRECTIONALS [18A,19A]	ALL	72039-71A	PACKARD 271	18	E	A
TO REAR FENDER TIP LAMP [45A]		72039-71A	PACKARD 271	18	E	A

Table 19. 1996 Rear Lighting Harness, Part No. 68680-96

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
REAR LIGHTING [7B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
REAR DIRECTIONALS[18A,19A]	ALL	73190-96	HD-41609	18	REAR	REAR
FENDERTIP LAMP [45A]	ALL	72038-71A	PACKARD 271	18	E	A

Table 20. Rear Speaker Harness, Part No.'s 70647-94 and 70649-94

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
SPEAKER TERMINALS	ALL	9937	PACKARD 271	18	C	D
TO POD		72038-71A	PACKARD 271	18	E	A

Table 21. Starter to 50 A Circuit Breaker Harness, Part No. 70045-94

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
STARTER TERMINAL		9842	PACKARD 270,271	10	B	3
CIRCUIT BREAKER TERMINAL		9843	PACKARD 270,271	10	B	3

Table 22. Tour Pak Harness, Part No.'s 70646-94 and 70648-94

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
TO SIDE LIGHTS		9856	PACKARD 115	18	20-18 GA.	20-18 GA.
TO SIDE LIGHTS		9871 (h)	PACKARD 115	18	20-18 GA.	20-18 GA.
TO MAIN HARNESS [12B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION

Table 23. CA EVAP Trap Door Harness, Part No.'s 32440-94 and 32441-94

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
MAIN HARNESS [9B]	EXCEPT A	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
MAIN HARNESS [9B]	A	72191-94	DTT-16-00	16	CENTER POSITION	CENTER POSITION
TO TRAP DOOR SOLENOID	EXCEPT 2	72038-71A	PACKARD 271	18	E	A
TO TRAP DOOR SOLENOID	2	72038-71A	PACKARD 271	16	E	A

Table 24. EFI Fuel Tank Harness, Part No. 70369-96

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
FUEL PUMP (Y/GN)	ALL	72290-94		18		
FUEL GAUGE (Y/W)	ALL	72290-94		18		
FUEL GAUGE (BK)	ALL	72294-94		18		
MAIN HARNESS [13A]	ALL	72039-71A	PACKARD 271	18	E	A
EFI SENSOR HARNESS [86A]	ALL	72039-71A	PACKARD 271	18	E	A

Table 25. FLT Ground Wire, Part No. 70415-94

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
TO RADIO GROUND		9859	PACKARD 115	18	20-18 GA.	20-18 GA.
TO SPEAKER SWITCH		9937 (d)	PACKARD 271	18	C	D

Table 26. Radio Ground Wire, Part No. 70168-89

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
TO RADIO		9863	PACKARD 115	14	16-14 GA.	16-14 GA.
TO FAIRING BRACKET		9864	PACKARD 115	14	16-14 GA.	16-14 GA.

Table 27. Radio Ground Wire, Part No. 70341-94

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
TO RADIO		9868	PACKARD 115	12	12-10 GA.	12-10 GA.
TO UPPER FORK BRACKET		9866	PACKARD 115	12	12-10 GA.	12-10 GA.

Table 28. Regulator Ground Wire, Part No. 70041-95

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
MAIN GROUND-CHASSIS		72242-94 (a) (i)	PACKARD 115,270	10	B	3
MAIN GROUND-REGULATOR		9843	PACKARD 270,271	10	B	3

Table 29. Regulator Harness, Part No. 67811-95

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
MAIN GROUND-CHASSIS		72242-94 (a) (i)	PACKARD 115,270	10	B	3
CIRCUIT BREAKER TERMINAL		9843	PACKARD 270,271	10	B	3

Table 30. Steering Ground Wire, Part No. 70101-94

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
TO STEERING HEAD & FRAME GROUND		9866	PACKARD 115	12	12-10 GA.	12-10 GA.

Table 31. ECM Harness, Part No. 70233-95

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
FUSE TERMINAL (BE/GY,R/O)	C,E	72296-95	PACKARD 271	18	C	D
FUSE TERMINAL (R)	D,F	72296-95	PACKARD 271	18	C	D
ECM TERMINAL [78B]	ALL	72326-95	PACKARD 271	18	C	D
CKP SENSOR CABLE ASSEMBLY [79B]		72351-95	N/A			
BARO TERMINAL [80B]	ALL	72288-95	PACKARD 271	18	C	D
ECM RELAY (PK/BE,GN/O,BE/GY)	30,85,86	9937	PACKARD 271	18	C	D
ECM RELAY (2-BE/GY)	87	9937	PACKARD 271	18	C (h)	D (h)
FUEL PUMP RELAY (BN/Y)	85	9937	PACKARD 271	18	C	D
FUEL PUMP RELAY (2-W/BK)	86	9937	PACKARD 271	18	C (h)	D (h)
FUEL PUMP RELAY (Y/GN)	30	9937	PACKARD 271	16	C	D
FUEL PUMP RELAY (2-R/O)	87	9937	PACKARD 271	18	C (h)	D (h)
MAIN CIRCUIT BREAKER		9866	PACKARD 115	12	12-10 GA.	X
DATA LINK CONNECTOR [91A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO SENSOR HARNESS [81A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO SENSOR HARNESS [82A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO MAIN WIRING HARNESS [8B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION

Table 32. Sensor Harness, Part No. 70238-95

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
INJECTOR TERMINAL [84B][85B]	ALL	72245-95	PACKARD 271	18	C	D
AIR TEMP SENSOR TERMINAL [89B]	ALL	72251-95	PACKARD 271	18	C	D
TP SENSOR TERMINAL [88B]	ALL	72260-95	PACKARD 271	18	C	D
ISC ACTUATOR TERMINAL [87B]	ALL	72260-95	PACKARD 271	18	C	D
ET SENSOR TERMINAL[90B]	ALL	72260-95	PACKARD 271	18	C	D
COIL TERMINAL [83B]	ALL	72288-95	PACKARD 271	18	C	D
TO SENSOR HARNESS [81B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO SENSOR HARNESS [82B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
FUEL PUMP (Y/GN)[86B]	ALL	72038-71A	PACKARD 271	18	E	A

Table 33. 1995 FLHTP Fairing Interconnect Harness, Part. No. 69552-94

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
TO PURSUIT FLASHER	ALL	9937 (d)	PACKARD 271	18	C	D
BRAKE LIGHT RELAY	ALL	9937	PACKARD 271	18	C	D
STARTER RELAY (BK,BK/R)	85,86	9937	PACKARD 271	18	C	D
STARTER RELAY	30,87	9937	PACKARD 271	14	C	A
FUSE BLOCK (R/BK)	1	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/BK)	2	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/GY)	3	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/GY)	4	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (GY)	5	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (2-BE) 18 AND 16 GA.	6	72220-94	PACKARD 271	18,16	A (h)	B (h)
FUSE BLOCK (2-O/W)	7	72220-94	PACKARD 271	14	A (h)	G (h)
FUSE BLOCK (2-O/V)	8	72219-94	PACKARD 271	18	C (h)	B (h)
CIGAR LIGHTER (OPTIONAL)	ALL	9937 (d)	PACKARD 271	14	C	A
FROM MAIN HARNESS [3A]	A,C	72225-94 (k)	PACKARD 270	12	4	3
FROM MAIN HARNESS [3A]	B	72226-94 (l)	PACKARD 271,270	14	C	3
TO IGNITION SWITCH [33A]	A,B,C	72208-94	PACKARD 271	12	A	D
TO IGNITION SWITCH [33A]	D	OPEN				
HEADLAMP CONN. KIT 68705-93	ALL	70583-93 (j)	PACKARD 115	18	20-18 GA.	(j)
INSTRUMENT CLUSTER [20A,21A]	ALL	72039-71	SUPERCHAMP FT	18	RED DOT	INSUL
INSTRUMENT CLUSTER [20A,21A]	ALL	72039-71	PACKARD 270	18	2	4
TO MAIN HARNESS [1A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO MAIN HARNESS [2A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO RIGHT HAND CONTROLS [22A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO LEFT HAND CONTROLS [24A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO ANTI-DIVE [29B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO TURN SIGNAL MODULE [30A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO FRONT LIGHT BAR [31A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO FRONT FENDER TIP LAMP [32A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION

Table 34. 1995 FLHTP Windshield Interconnect Harness, Part. No. 70308-94

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
TO PURSUIT FLASHER	ALL	9937 (d)	PACKARD 271	18	C	D
BRAKE LIGHT RELAY (BK,R/BE)	85,86	9937	PACKARD 271	18	C	D
BRAKE LIGHT RELAY (BE,R/Y)	30,87	9937	PACKARD 271	18	C	D
STARTER RELAY (BK,BK/R)	85,86	9937	PACKARD 271	18	C	D
STARTER RELAY (GN)	87	9937	PACKARD 271	14	C	A
STARTER RELAY (R/GY)	30	9937	PACKARD 271	12	C	A
FUSE BLOCK (R/BK)	1	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/BK)	2	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/GY)	3	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/GY)	4	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (GY)	5	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (2-BE)	6	72219-94	PACKARD 271	18	C (h)	B (h)
FUSE BLOCK (2-O/W)	7	72219-94	PACKARD 271	18	C (h)	B (h)
FUSE BLOCK (2-O/V)	8	72219-94	PACKARD 271	18	C (h)	B (h)
FROM MAIN HARNESS [3A]	A,C	72225-94 (k)	PACKARD 270	12	4	3
FROM MAIN HARNESS [3A]	B	72226-94 (l)	PACKARD 271,270	14	C	3
TO IGNITION SWITCH [33A]	A,C	72208-94	PACKARD 271	12	A	D
TO IGNITION SWITCH [33A]	B	72208-94	PACKARD 271	14	A	D
TO IGNITION SWITCH [33A]	D	OPEN				
HEADLAMP CONN. KIT 68705-93	ALL	70583-93 (j)	PACKARD 115	18	20-18 GA.	(j)
INSTRUMENT CLUSTER [20A,21A]	ALL	72039-71	SUPERCHAMP FT	18	RED DOT	INSUL
INSTRUMENT CLUSTER [20A,21A]	ALL	72039-71	PACKARD 270	18	2	4
TO MAIN HARNESS [1A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO MAIN HARNESS [2A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO RIGHT HAND CONTROLS [22A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO LEFT HAND CONTROLS [24A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO ANTI-DIVE [29B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO TURN SIGNAL MODULE [30A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO FRONT LIGHT BAR [31A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO FRONT FENDER TIP LAMP [32A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION

Table 35. 1996 FLHTP Fairing Interconnect Harness, Part. No. 69552-96

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
TO PURSUIT FLASHER	ALL	9937	PACKARD 271	18	C	D
BRAKE LIGHT RELAY	ALL	9937	PACKARD 271	18	C	D
STARTER RELAY (BK,BK/R)	85,86	9937	PACKARD 271	18	C	D
STARTER RELAY	30,87	9937	PACKARD 271	14	C	A
HEADLAMP CONN. KIT 68705-93A	ALL	70586-93 (j)	PACKARD 115	18	20-18 GA.	(j)
FUSE BLOCK (O)	1	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (O/V)	2	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (O/PK)	3	72217-94	PACKARD 271	18	E	A
EMPTY	4					
FUSE BLOCK (R/BK)	5	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/GY)	6	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/GY)	7	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/GY)	8	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (GY)	9	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (O)	10	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (2-BE)	11	72219-94	PACKARD 271	18	C (h)	B (h)
FUSE BLOCK (O/W)	12	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/BK)	13	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/BK)	14	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/BK)	15	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/GY)	16	72218-94	PACKARD 271	14	C	A
CIGAR LIGHTER	ALL	9937 (d)	PACKARD 271	14	C	A
TO MAIN HARNESS [1A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO MAIN HARNESS [2A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
MAIN HARNESS [3A]	A,C	72225-94 (k)	PACKARD 270	12	4	3
MAIN HARNESS [3A]	B	72226-94 (l)	PACKARD 271,270	14	C	3
SPEEDOMETER [20B]	ALL	73191-96	HD-41609	18	REAR	REAR
INDICATOR LAMPS [21A]	ALL	73190-96	HD-41609	18	REAR	REAR
IGNITION SWITCH [33A]	A,B,C	72208-94	PACKARD 271	12	A	D
IGNITION SWITCH [33A]	D	OPEN				
TO RIGHT HAND CONTROLS [22A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO LEFT HAND CONTROLS [24A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO ANTI-DIVE [29B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO TURN SIGNAL MODULE [30B]	EXCEPT 2	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO TURN SIGNAL MODULE [30B]	2	72191-94	DTT-16-00	16	CENTER POSITION	CENTER POSITION
TO FRONT LIGHT BAR [31A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO FRONT FENDER TIP LAMP [32A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TACHOMETER [108B]	ALL	73191-96	HD-41609	18	REAR	REAR
VOLTMETER [110B,111B]	ALL	72202-94	PACKARD 271	18	C	D
FUEL GAUGE [116B,117B]	ALL	72202-94	PACKARD 271	18	C	D

Table 36. 1996 FLHP Main Harness, Part No. 70260-96

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
BRAKE LIGHT RELAY	ALL	9937	PACKARD 271	18	C	D
STARTER RELAY (BK,BK/R)	85,86	9937	PACKARD 271	18	C	D
STARTER RELAY (GN,R/GY)	30,87	9937	PACKARD 271	14	C	A
OIL PRESSURE SENDING UNIT		9857	PACKARD 115	18	20-18 GA.	20-18 GA.
REAR STOP LIGHT SWITCH		9937 (b)	PACKARD 271	18	C	D
MAIN GROUND-CHASSIS (2-BK)		72242-94 (a)	PACKARD 115,270	14,16	G (h)	3 (h)
MAIN GROUND-CHASSIS (2-BK)		72242-94 (a)	PACKARD 115,270	12,14	B (h)	3 (h)
MAIN GROUND-CHASSIS		72255-94	PACKARD 115,270	14	4	3,5,1
SOLENOID		72291-94	PACKARD 271,115	14	A	G
HORN		9898	PACKARD 271	18	TIP	
HORN		9898	PACKARD 115	18	TIP	
MAIN CIRCUIT BREAKER		9866 (b)	PACKARD 115	12	12-10 GA.	12-10 GA.
NEUTRAL SWITCH		9905	PACKARD 115	18	20-18 GA.	20-18 GA.
FUSE BLOCK (GY)	1	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (2-O)	2	72219-94	PACKARD 271	18	C (h)	B (h)
FUSE BLOCK (BE)	3	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (O/W)	4	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (R/BK)	5	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/BK)	6	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/BK)	7	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/GY)	8	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (BE)	9	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (O/V)	10	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (O/PK)	11	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (O/R)	12	72217-94	PACKARD 271	18	E	A
FUSE BLOCK (R/BK)	13	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/GY)	14	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/GY)	15	72218-94	PACKARD 271	14	C	A
FUSE BLOCK (R/GY)	16	72218-94	PACKARD 271	14	C	A
P&A ACCESSORY [4A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO REAR LIGHTING HARNESS [7A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO IGNITION HARNESS [8A]	ALL BUT 8	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO IGNITION HARNESS [8A]	8	72190-94	DTT-16-00	16	CENTER POSITION	CENTER POSITION
FUEL GAUGE SENDER [13B]		72038-71A	PACKARD 271	18	E	A
FUEL GAUGE SENDER [13C]		72039-71A	PACKARD 271	18	E	A
TO IGNITION SENSOR [14B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
INSTRUMENT CLUSTER [20A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO RIGHT HAND CONTROLS [22A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO LEFT HAND CONTROLS [24A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO TURN SIGNAL MODULE [30A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO FRONT LIGHT BAR [31A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO FRONT FENDER TIP LAMP [32A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO IGNITION SWITCH [33A]	ALL	72292-94	PACKARD 115	12	F	G
HEADLAMP CONN. KIT 68705-93A	ALL	70586-93 (j)	PACKARD 115	18	20-18 GA.	(j)
SIREN SPEAKER [57B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
SIREN AMPLIFIER [58A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
REAR POLE LAMP [59B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TO PASS/PARK SWITCH [66A]	ALL	72039-71A	PACKARD 271	18	E	A
TO ACCESSORY SWITCH [67A]	ALL	72039-71A	PACKARD 271	18	E	A
TACHOMETER [102A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION

Table 37. 1996 FLHP Components

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
IGNITION SENSOR [14A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
V.O.E.S. [11B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
IGNITION MODULE [10B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
TURN SIGNAL MODULE [30B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
REAR SIGNAL LAMPS [18B,19B]	ALL	72038-71A	PACKARD 271	18	E	A
REAR FENDER TIP LAMP [45B]		72038-71A	PACKARD 271	18	E	A
INSTRUMENT CLUSTER [20B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
INSTRUMENT CLUSTER [65B]	ALL	72191-94	DTT-16-00	20 (a)	CENTER POSITION	CENTER POSITION
LEFT HANDLEBAR CONTROL [24B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
RIGHT HANDLEBAR CONTROL [22B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
FRONT LIGHT BAR [31B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
FRONT FENDER TIP LAMP [32B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
SIREN/PA SPEAKER [57A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
POLE LAMP [59A]	ALL	72190-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
SPEED SENSOR [65A]	ALL	72190-94	DTT-16-00	20 (a)	CENTER POSITION	CENTER POSITION
ACCESSORY SWITCH [67B]	ALL	72038-71A	PACKARD 271	18	E	A
TACHOMETER [102B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION

Table 38. Siren Harness, Part No. 70177-94A

CONNECTOR	POSITION	TERMINAL PART NUMBER	CRIMPER	WIRE GAUGE	CORE CRIMP	INSULATION CRIMP
MAIN HARNESS [6B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
FUSEBOARD [60B,61B,62B]	ALL	72038-71A	PACKARD 271	18	E	A
SPEAKER [57B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION
AMPLIFIER	ALL	72033-93	PACKARD 271	18	E	C
POLE LAMP [59B]	ALL	72191-94	DTT-16-00	18	CENTER POSITION	CENTER POSITION

ELECTRICAL CONNECTOR LOCATIONS

1996 XLH WIRE HARNESS CONNECTORS

No.	Description	Type	Location
[2]	Harness Grounds	Ring Terminals	Rear Engine Mount
[7]	Tail Light	4 - Place Deutsch	Under Seat at Right Frame Rail
[9]	California Trap Door	3 - Place Deutsch; 4 - Place Amp at Air Cleaner	Under Frame Backbone and Behind Air Cleaner
[10]	Ignition Module	8 - Place Deutsch	Under Left Side Cover
[11]	VOES	2 - Place Deutsch	Right Side of Top Motor Mount
[14]	Camshaft Position Sensor	3 - Place Deutsch	Below Transmission at Left Frame Rail
[18]	Right Rear Turn Signal	2 - Place Deutsch	Under Seat, Right Frame Rail
[19]	Left Rear Turn Signal	2 - Place Deutsch	Under Seat, Left Frame Rail
[20]	Gauges/Indicator Lamps	12 - Place Deutsch; 12 - Place Multilock on XL1200C	Under Headlight Bracket (Inside Riser Cover on XL1200C)
[22]	Right Handlebar Controls	12 - Place Deutsch	Headlight Housing (Inside Riser Cover on XL1200C)
[24]	Left Handlebar Controls	12 - Place Deutsch	Headlight Housing (Inside Riser Cover on XL1200C)
[30]	Turn Signal Module	8 - Place Deutsch	Electrical Bracket Under Seat
[31]	Front Turn Signals (Xlc Only)	6 - Place Multilock	Under Fuel Tank
[38]	Headlamp (Xlc Only)	4 - Place Multilock	Under Fuel Tank
[46]	Voltage Regulator to Stator	Special	Near Right Bottom Motor Mount
[65]	Speedometer Sensor	3 - Place Deutsch	Under Seat at Left Frame Rail
[77]	Regulator to Main Circuit Breaker	1 - Place Deutsch	Near Right Bottom Motor Mount
-	Ignition Coil	Ring Terminals	At Ignition Coil
-	Oil Pressure Sending Unit	Ring Terminals	Front of Engine Crankcase
-	Rear Stoplight Switch	Spade Terminals	Below Battery
-	Horn	Spade Terminals	Between Cylinders (1200cc); Between Front Downtubes (883cc)
-	Starter Relay	Spade Terminals	Electrical Bracket Under Seat
-	Fuse Block	Spade Terminals	Electrical Bracket Under Seat
-	Main Circuit Breaker	Ring Terminals	Electrical Bracket Under Seat
-	Starter Solenoid	Spade Terminals	Bottom of Starter
-	Neutral Switch	Post Terminal	Under Front Sprocket Cover

1996 FX WIRE HARNESS CONNECTORS

No.	Description	Type	Location
[7]	Rear Fender Lights	8-place Multilock	Under Seat on Right Side of Ignition Module
[9]	California Trap Door	3 - Place Multilock	Behind Air Cleaner (California Models)
[10]	Ignition Module	8 - Place Deutsch	Under Seat on Left Side of Ignition Module
[11]	VOES	2 - Place Deutsch	Electrical Bracket Between Fuel Tanks (Right Side)
[14]	Camshaft Position Sensor	3 - Place Deutsch	Below Transmission on Right Side Support Bracket
[18] [19]	Rear Turn Signals (FLSTC, FLSTN)	2 - Place Multilock	Inside Turn Signal Support Bracket
[20]	Console	12-place Multilock	Electrical Bracket Between Fuel Tanks
[22]	Right Handlebar Controls	6-place Deutsch	Electrical Bracket Between Fuel Tanks (Right Side)
[24]	Left Handlebar Controls	6-place Deutsch	Electrical Bracket Between Fuel Tanks (Left Side)
[30]	Turn Signal Module	8 - Place Deutsch	Electrical Bracket Between Fuel Tanks (Front)
[31]	Front Turn Signals	6 - Place Multilock	Electrical Bracket Between Fuel Tanks (Left Side)
[32]	Front Fender Tip Lamp (FLSTC, FLSTN)	2 - Place Multilock	Behind Left Fuel Tank
[33]	Ignition/Light Key Switch	Spade Terminals	Under Console

Continued on the Next Page ...

1996 FX WIRE HARNESS CONNECTORS (Continued)

No.	Description	Type	Location
[38]	Headlamp	4 - Place Multilock	Electrical Bracket Between Fuel Tanks (Left Side)
[45]	Rear Fender Tip Lamp (FLSTC, FLSTN)	2 - Place Multilock	Under Fendertip
[46]	Voltage Regulator to Stator	Special	Front of Engine Crankcase
[65]	Speedometer Sensor	3 - Place Deutsch	Electrical Bracket Between Fuel Tanks (Right Side)
[67]	Passing Lamps	2 - Place Multilock	Behind Left Fork Panel
-	Ignition Coil	Ring Terminals	At Ignition Coil
-	Oil Pressure Sending Unit	Ring Terminals	Engine Crankcase
-	Rear Stoplight Switch	Spade Terminals	Behind Transmission
-	Horn	Spade Terminals	Between Cylinders
-	Starter Relay	Spade Terminals	Electrical Box Under Seat
-	Fuse Block	Spade Terminals	Electrical Box Under Seat
-	Main Circuit Breaker	Ring Terminals	On rear Fender Debris Deflector
-	Starter Solenoid	Spade Terminals	Top of Starter
-	Neutral Switch	Post Terminal	Top of Transmission
-	Harness Grounds (2)	Ring Terminals	Under Seat
-	Passing Lamps Switch	Spade Terminals	Behind Left Fork Panel

1996 FXD WIRE HARNESS CONNECTORS

No.	Description	Type	Location
[7]	Rear Fender Lights	8-place Multilock	Under Seat
[9]	California Trap Door	3 - Place Multilock	Behind Air Cleaner (California Models)
[10]	Ignition Module	8-place Deutsch	Under Seat, Back of Electrical Box
[11]	VOES	2 - Place Deutsch	Top of Motor Mount
[13]	Fuel Gauge	2 - Place Multilock	Left Front Side of Fuel Tank
[14]	Camshaft Position Sensor	3 - Place Deutsch	Above Transmission, Back of Electrical Box
[20]	Console Gauges	12-place Multilock	FXD, FXDS-CONV: Under Headlight Bracket FXDL, FXDWG: Under Console
[21]	Console Gauges	10-place Multilock	FXDL: Under Console
[22]	Right Handlebar Controls	6-place Deutsch	Frame Backbone
[24]	Left Handlebar Controls	6-place Deutsch	Frame Backbone
[30]	Turn Signal Module	8-place Deutsch	Electrical Box
[31]	Front Turn Signals	6-place Multilock	Frame Backbone
[33]	Ignition/Light Key Switch	Spade Terminals	FXDWG: Under Console; All Others: Under Seat
[38]	Headlamp	4 - Place Multilock	Frame Backbone
[46]	Voltage Regulator to Stator	Special	Front of Engine Crankcase
[65]	Speedometer Sensor	3 - Place Deutsch	Under Seat
-	Ignition Coil	Ring Terminals	At Ignition Coil
-	Oil Pressure Sending Unit	Ring Terminals	Engine Crankcase
-	Rear Stoplight Switch	Spade Terminals	Behind Rear Master Cylinder
-	Horn	Spade Terminals	Between Cylinders
-	Starter Relay	Spade Terminals	Electrical Box
-	Fuse Block	Spade Terminals	Electrical Box
-	Main Circuit Breaker	Ring Terminals	Electrical Box
-	Starter Solenoid	Spade Terminals	Top of Starter
-	Neutral Switch	Post Terminal	Top of Transmission
-	Harness Grounds (2)	Ring Terminals	Under Seat

1996 FLHT/C/U WIRE HARNESS CONNECTORS

No.	Description	Type	Location	Fig.
[1]	Main Harness to Interconnect	12 - Place Deutsch (Black)	Inner Fairing - Right Fairing Bracket	168
[2]	Main Harness to Interconnect	12 - Place Deutsch (Gray)	Inner Fairing - Right Radio Support Bracket	168
[3]	Main Power	3 - Place Packard	Inner Fairing - Front of Radio Carrier Bracket (Front of Top Fork Bracket on FLHT)	173
[4]	P&A Accessory	4 - Place Deutsch	In Front of Upper Frame Cross Member (Under Seat)	169
[5]	Main/CB Power	3 - Place Amp	Under Left Side Cover	172
[6]	Cruise Harness **	6 - Place Deutsch	Under Left Side Cover	171
[7]	Rear Fender	8 - Place Deutsch	Under Left Side Cover	171
[8]	Ignition Harness (EFI: Main Harness to ECM Harness)	8 - Place Deutsch (Gray)	Upper Frame Cross Member (Under Seat)	169
[9]	California Trap Door (Carbureted)	3 - Place Deutsch	Below Fuel Tank (Right Side)	-
[10]	Ignition Module (Carbureted)	8 - Place Deutsch	Under Right Side Cover	-
[11]	VOES (Carbureted)	2 - Place Deutsch	Below Fuel Tank (Right Side)	-
[12]	Tour-Pak	3 - Place Deutsch	Below Tour-Pak (Left Side)	-
[13]	Fuel Gauge Sending Unit	2 - Place Amp	Behind Fuel Tank (Under Seat)	-
[14]	Camshaft Position Sensor (CMP Sensor)	3 - Place Deutsch	Bottom Frame Cross Member (Right Side)	-
[15]	California Trap Door (Carbureted)	4 - Place Amp	Behind Air Cleaner	-
[16]	Cruise Set/Resume Switch **	3 - Place Deutsch	Inner Fairing - Right Fairing Bracket	168
[17]	Cruise Module	10 - Place Packard	Under Left Side Cover	171
[18] [19]	Rear Directionals	2 - Place Multilock	Behind Directional Support Bracket	-
[20]	Speedometer	3 - Place Multilock	Inner Fairing - Between Tachometer and Speedometer Gauges	168
[21]	Indicator Lamps	10 - Place Multilock	Inner Fairing - Between Tachometer and Speedometer Gauges	168
[22]	Interconnect to Right Handlebar Controls	6 - Place Deutsch (Gray)	Inner Fairing - Right Fairing Support Brace	168
[23]	Interconnect to Radio Overlay **	6 - Place Deutsch (Black)	Inner Fairing - Right Fairing Support Brace	168
[24]	Interconnect to Left Handlebar Controls	12 - Place Deutsch	Inner Fairing - Left Fairing Support Brace	168
[25]	Interconnect to Radio Overlay **	6 - Place Deutsch (Black)	Inner Fairing - Right Fairing Support Brace	168
[26]	PTT Switch **	2 - Place Deutsch	Inner Fairing - Left Fairing Support Brace	168
[27]	Radio *	12 - Place Deutsch	Inner Fairing - Circuit Breaker/Fuse Block Bracket (Left Side)	168
[28]	Radio *	8 - Place Deutsch	Inner Fairing - Circuit Breaker/Fuse Block Bracket (Right Side)	168
[29]	Anti-Dive Solenoid	2 - Place Deutsch	Inner Fairing - Left Fairing Bracket	168
[30]	Turn Signal Module	8 - Place Deutsch	Inner Fairing - Below Radio	168
[31]	Passing Lamps	8 - Place Deutsch	Inner Fairing - Circuit Breaker/Fuse Block Bracket (Left Side)	168
[32]	Front Fender Tip Lamp (DOM)	3 - Place Deutsch	Inner Fairing - Left Fairing Bracket	168
[33]	Ignition/Light Key Switch	4 - Place Packard	Inner Fairing - Right Fairing Bracket	168
[38]	Headlamp	Headlamp Connector	Inner Fairing	-
[41]	Right Rear Speaker	2 - Place Amp	Behind Seat (Right Side)	-
[42]	Left Rear Speaker	2 - Place Amp	Behind Seat (Left Side)	-
[43]	Fuseboard to CB Connector	3 - Place Amp	Under Left Side Cover	172
[44]	Fuseboard to Pod Connector	2 - Place Amp	Under Left Side Cover	172
[45]	Rear Fender Tip Lamp (DOM)	2 - Place Multilock	Under Rear Fender Tip	-
[46]	Voltage Regulator to Stator (Carbureted)	2 - Place Special	Front of Engine Crankcase	-
	Voltage Regulator (Fuel Injected) ***	2 - Place Special	Bottom of Voltage Regulator	
[48]	DIN Cable **	7 - Place DIN	Inner Fairing - Under Radio	168
[49]	DIN Cable **	7 - Place DIN	Under Seat	169
[51]	Antennae Cable *	1 - Place	Inner Fairing - Under Radio	168
[52]	Radio to Pod **	8 - Place Deutsch	Upper Frame Cross Member (Under Seat)	169
[53]	Passenger Tuning Control	8 - Place Deutsch	Right Rear Speaker Box	-
[55]	Transceiver	8 - Place Deutsch	Under Luggage Rack	-
[56]	Transceiver	8 - Place Deutsch	Under Luggage Rack	-
[78]	Electronic Control Module (ECM) ***	35 - Place Amp	Under Right Side Cover	170
[79]	Crankshaft Position Sensor (CKP Sensor) ***	3 - Place Conxall	Under Right Side Cover Below Electrical Bracket	170

Continued ...

* Classic and Ultra ** Ultra Only *** Fuel Injected Models

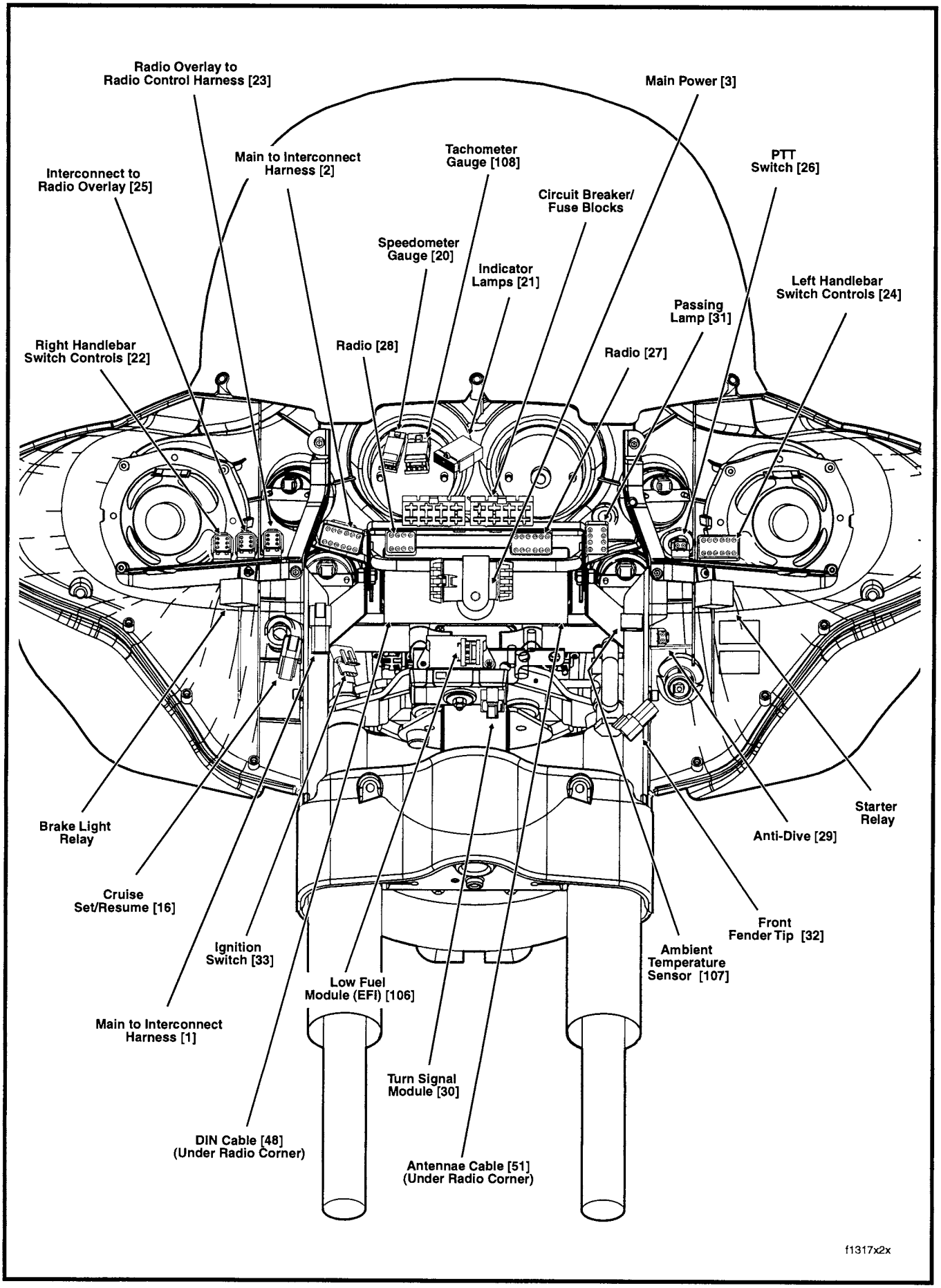


Figure 168. 1996 Inner Fairing Connectors (FLHTC/U)

1996 FLHT/C/U WIRE HARNESS CONNECTORS (Continued)

No.	Description	Type	Location	Fig.
[80]	Barometric Pressure Sensor (BARO Sensor) ***	3 - Place Amp	Under Right Side Cover Behind Electrical Bracket	170
[81]	ECM Harness to Sensor Harness ***	6 - Place Deutsch	Upper Frame Cross Member (Under Seat)	169
[82]	ECM Harness to Sensor Harness ***	12 - Place Deutsch	Upper Frame Cross Member (Under Seat)	169
[83]	Ignition Coil ***	3 - Place Amp	Below Fuel Tank	-
[84]	Front Injector ***	2 - Place Packard	Below Fuel Tank	-
[85]	Rear Injector ***	2 - Place Packard	Below Fuel Tank	-
[86]	Fuel Pump ***	1 - Place Amp	Under Seat (at Rear of Fuel Tank)	-
[87]	Idle Speed Control Actuator (ISC Actuator) ***	4 - Place Packard	Below Fuel Tank	-
[88]	Throttle Position Sensor (TP Sensor) ***	3 - Place Packard	Below Fuel Tank	-
[89]	Intake Air Temperature Sensor (IAT Sensor) ***	2 - Place Packard	Below Fuel Tank	-
[90]	Engine Temperature Sensor (ET Sensor) ***	2 - Place Packard	Below Fuel Tank (Front Cylinder Head Rocker Box Opening)	-
[91]	Data Link ***	4 - Place Deutsch	Under Right Side Cover	170
[105]	Fairing Switches	12 - Place Multilock	Fairing Cap	-
[106]	Low Fuel Module ***	6 - Place Multilock	Inner Fairing - Below Radio	168
[107]	Ambient Air Temperature Sensor *	3 - Place Multilock	Inner Fairing - Left Fairing Bracket	168
[108]	Tachometer	6 - Place Multilock	Inner Fairing - Between Tachometer and Speedometer Gauges	168
[109]	Passing Lamp Switch	1 - Place Amp	Inner Fairing	-
[110]	Voltmeter Lamp	Spade Connector	Inner Fairing	-
[111]	Voltmeter	Spade Connector	Inner Fairing	-
[112]	Oil Pressure Gauge Lamp	Spade Connector	Inner Fairing	-
[113]	Oil Pressure Gauge	Spade Connector	Inner Fairing	-
[114]	Air Temperature Gauge Lamp	Spade Connector	Inner Fairing	-
[115]	Air Temperature Gauge	Spade Connector	Inner Fairing	-
[116]	Fuel Gauge Lamp	Spade Connector	Inner Fairing	-
[117]	Fuel Gauge	Spade Connector	Inner Fairing	-
-	ECM and Fuel Pump Electrical Relays ***	Relay Connector	Under Right Side Cover	170
-	EFI Fuses ***	Fuse Terminals	Under Right Side Cover	170
-	Oil Pressure Sending Unit	Ring Terminals	Engine Crankcase	-
-	Rear Brake Light Switch	Spade Terminals	Beneath Transmission	-
-	Horn	Spade Terminals	Between Cylinders (Left Side)	-
-	Starter Relay	Relay Connector	Inner Fairing - Left Fairing Support Brace	168
-	Brake Light Relay	Relay Connector	Inner Fairing - Right Fairing Support Brace	168
-	Fuse Blocks	Fuse Terminals	Inner Fairing - Circuit Breaker/Fuse Block Bracket	168
-	Front Speakers *	Spade Terminals	Inner Fairing	-
-	Main Circuit Breaker	Ring Terminals	Upper Frame Cross Member (Under Seat)	169
-	Starter Solenoid	Spade Terminals	Top of Starter	-
-	Harness Grounds	Ring Terminals	Frame Cross Member (Above Transmission)	-
-	Ignition Coil	Ring Terminals	At Coil	-
-	Neutral Switch	Post Terminal	Top of Transmission	-
-	Cigarette Lighter *	Spade Terminals	Inner Fairing	-

* Classic and Ultra ** Ultra Only *** Fuel Injected Models

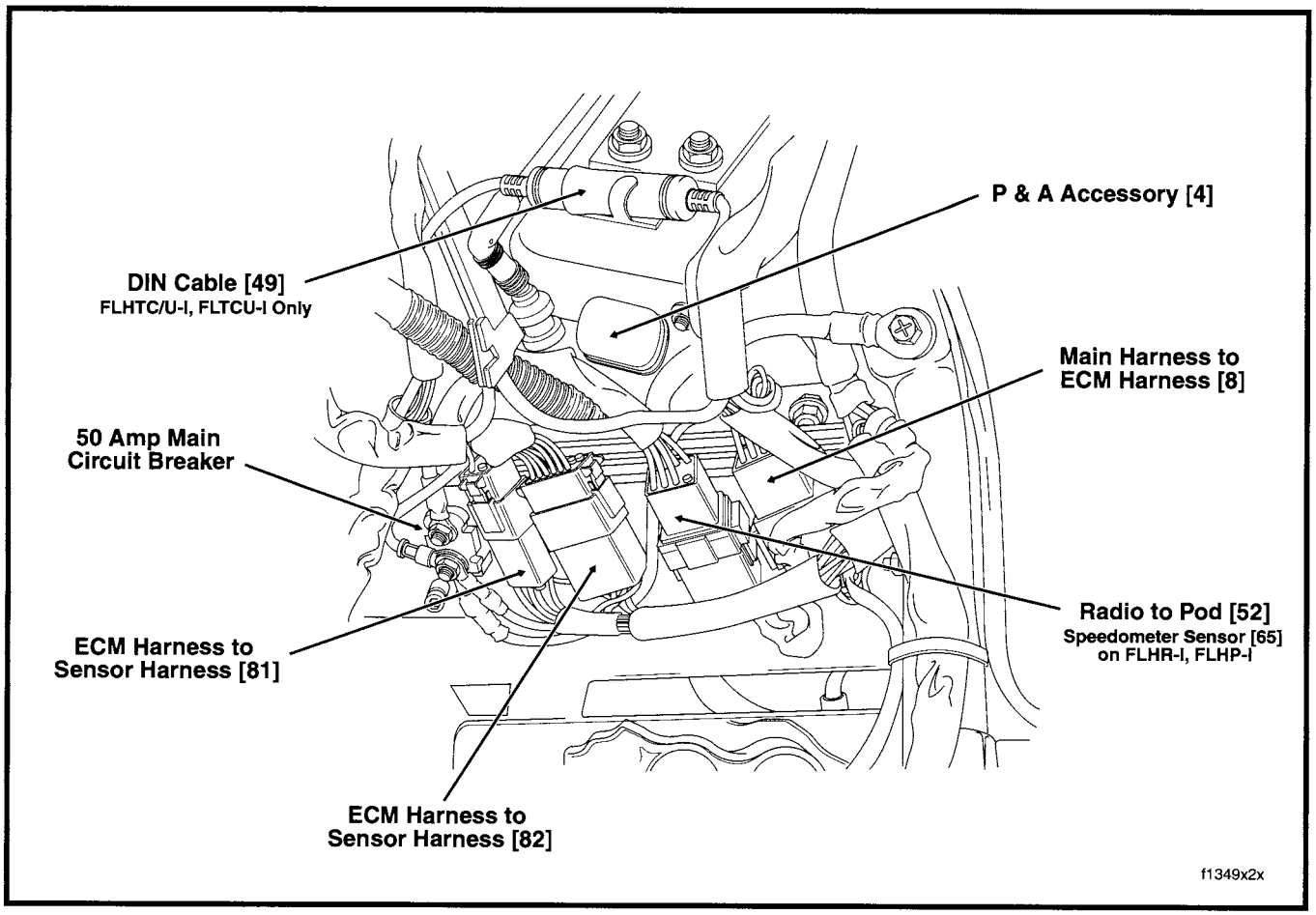


Figure 169. Under Seat Connectors (FLHTC/U-I, FLTCU-I, FLHR-I)

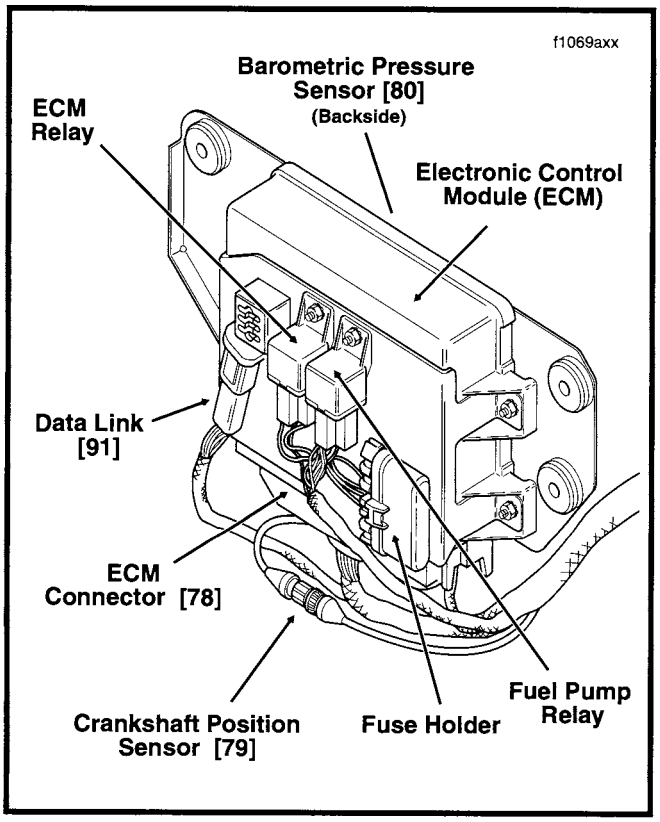


Figure 170. Electrical Bracket Connectors - Under Right Side Cover (FLHTC/U-I, FLTCU-I, FLHR-I, FLHP-I)

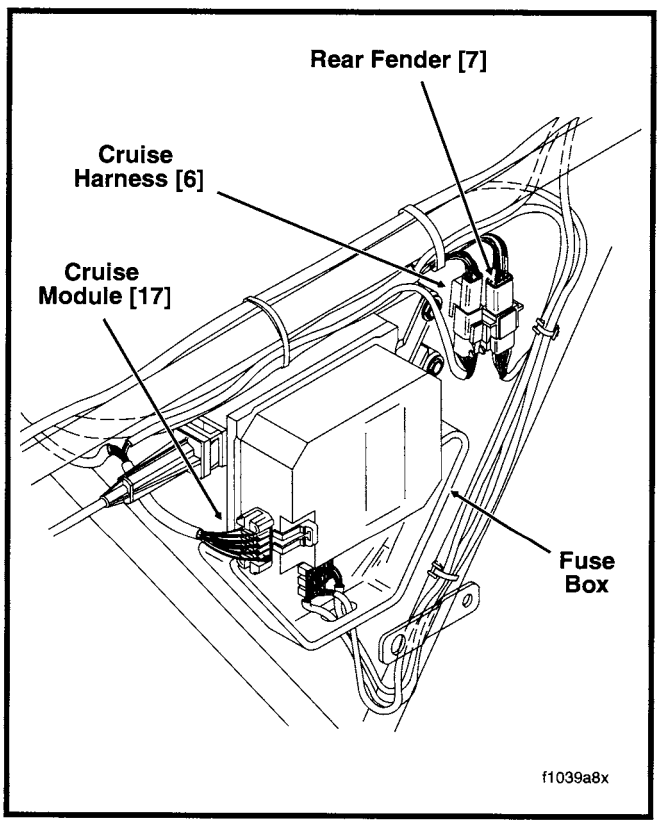


Figure 171. Electrical Connectors - Under Left Side Cover (FLHTCU, FLHTCU-I, FLTCU-I)

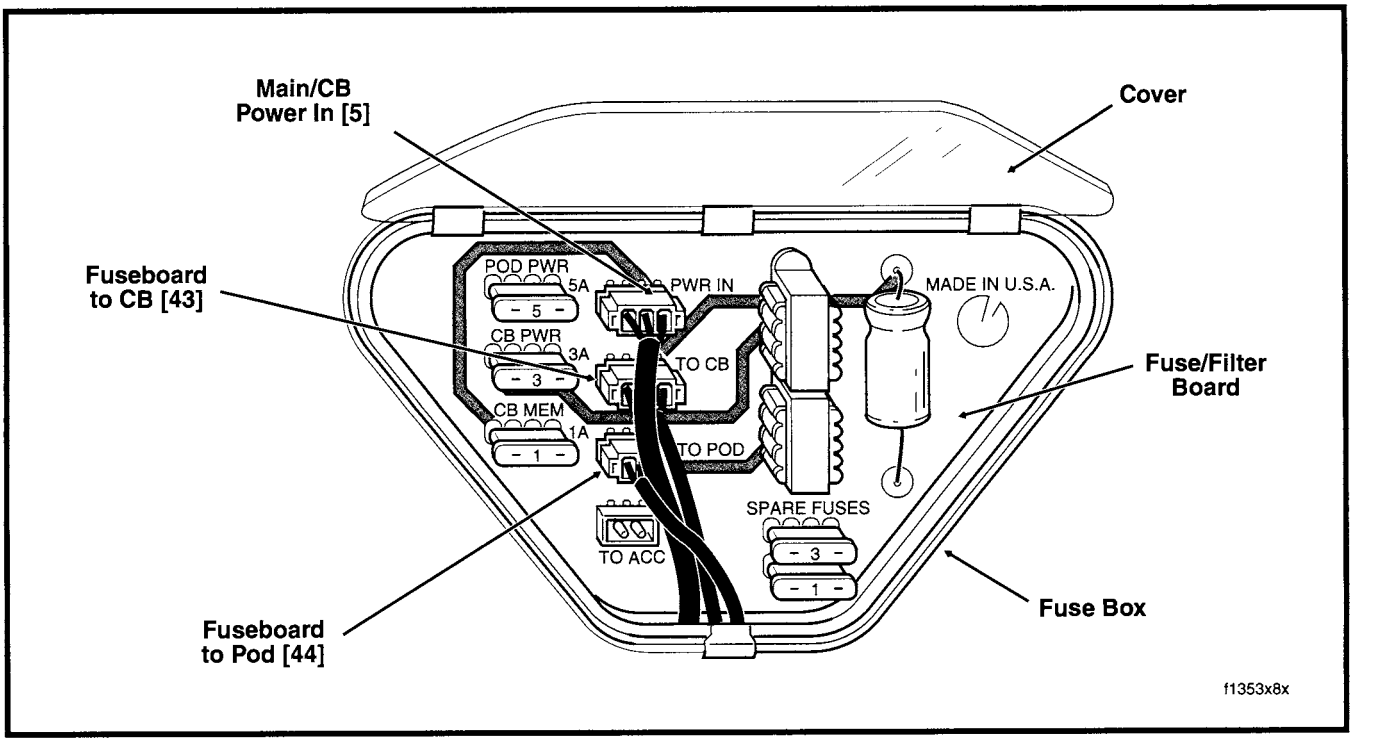


Figure 172. Fuse Box - Under Left Side Cover

1996 FLTCU-I WIRE HARNESS CONNECTORS

No.	Description	Type	Location	Fig.
[1]	Main Harness to Interconnect	12 - Place Deutsch (Black)	Instrument Panel Support	174
[2]	Main Harness to Interconnect	12 - Place Deutsch (Gray)	Instrument Panel Support	174
[3]	Main Power	3 - Place Packard	Instrument Panel Support	174
[4]	P&A Accessory	4 - Place Deutsch	In Front of Upper Frame Cross Member (Under Seat)	169
[5]	Main/CB Power	3 - Place Amp	Under Left Side Cover	172
[6]	Cruise Harness	6 - Place Deutsch	Under Left Side Cover	171
[7]	Rear Fender	8 - Place Deutsch	Under Left Side Cover	171
[8]	Main Harness to ECM Harness	8 - Place Deutsch (Gray)	Upper Frame Cross Member (Under Seat)	169
[12]	Tour-Pak	3 - Place Deutsch	Below Tour-Pak (Left Side)	-
[13]	Fuel Gauge Sending Unit	2 - Place Amp	Behind Fuel Tank	-
[14]	Camshaft Position Sensor (CMP Sensor)	3 - Place Deutsch	Bottom Frame Cross Member (Right Side)	-
[16]	Cruise Set/Resume Switch	3 - Place Deutsch	Instrument Panel Support	174
[17]	Cruise Module	10 - Place Packard	Under Left Side Cover	171
[18] [19]	Rear Directionals	2 - Place Multilock	Behind Directional Support Bracket	-
[20]	Instruments	8 - Place Amp	Instrument Panel Support	174
[21]	Instruments	6 - Place Amp	Instrument Panel Support	174
[22]	Interconnect to Right Handlebar Controls	6 - Place Deutsch (Gray)	Instrument Panel Support	174
[23]	Interconnect to Radio Overlay	6 - Place Deutsch (Black)	Instrument Panel Support	174
[24]	Interconnect to Left Handlebar Controls	12 - Place Deutsch	Instrument Panel Support	174
[25]	Interconnect to Radio Overlay	6 - Place Deutsch (Black)	Instrument Panel Support	174
[26]	PTT	2 - Place Deutsch	Instrument Panel Support	174
[27]	Radio	12 - Place Deutsch	Fairing	173
[28]	Radio	8 - Place Deutsch	Fairing	173
[29]	Anti-Dive Solenoid	2 - Place Deutsch	Instrument Panel Support	174
[30]	Turn Signal Module	8 - Place Deutsch	Instrument Panel Support	174
[32]	Front Fender Tip Lamp	3 - Place Deutsch	Instrument Panel Support	174

Continued ...

1996 FLTCU-I WIRE HARNESS CONNECTORS (Continued)

No.	Description	Type	Location	Fig.
[33]	Ignition/Light Key Switch	4 - Place Packard	Instrument Panel Support	174
[34]	Fairing Harness	8 - Place Deutsch	Fairing	173
[35]	Radio to Interconnect	12 - Place Deutsch	Behind Headlights	173
[36]	Fairing Harness	2 - Place Packard	Fairing	173
[37]	Right Front Directional	3 - Place Deutsch	Fairing	173
[38]	Headlamp	Headlamp Connector	Fairing	173
[39]	Left Front Directional	3 - Place Deutsch	Fairing	173
[41]	Right Rear Speaker	2 - Place Amp	Behind Seat (Right Side)	-
[42]	Left Rear Speaker	2 - Place Amp	Behind Seat (Left Side)	-
[43]	Fuseboard to CB Connector	3 - Place Amp	Under Left Side Cover	172
[44]	Fuseboard to Pod Connector	2 - Place Amp	Under Left Side Cover	172
[45]	Rear Fender Tip Lamp	1 - Place Amp	Under Rear Fender Tip	-
[46]	Voltage Regulator to Stator (Carbureted)	2 - Place Special	Front of Engine Crankcase	-
	Voltage Regulator (Fuel Injected)	2 - Place Special	Bottom of Voltage Regulator	
[47]	Speaker	4 - Place Amp	Behind Headlights	173
[48]	DIN Cable	7 - Place DIN	Fairing	173
[49]	DIN Cable	7 - Place DIN	Under Seat	169
[51]	Antennae Cable	1 - Place	Fairing	173
[52]	Radio to Pod	8 - Place Deutsch	Upper Frame Cross Member (Under Seat)	169

Continued on the Next Page ...

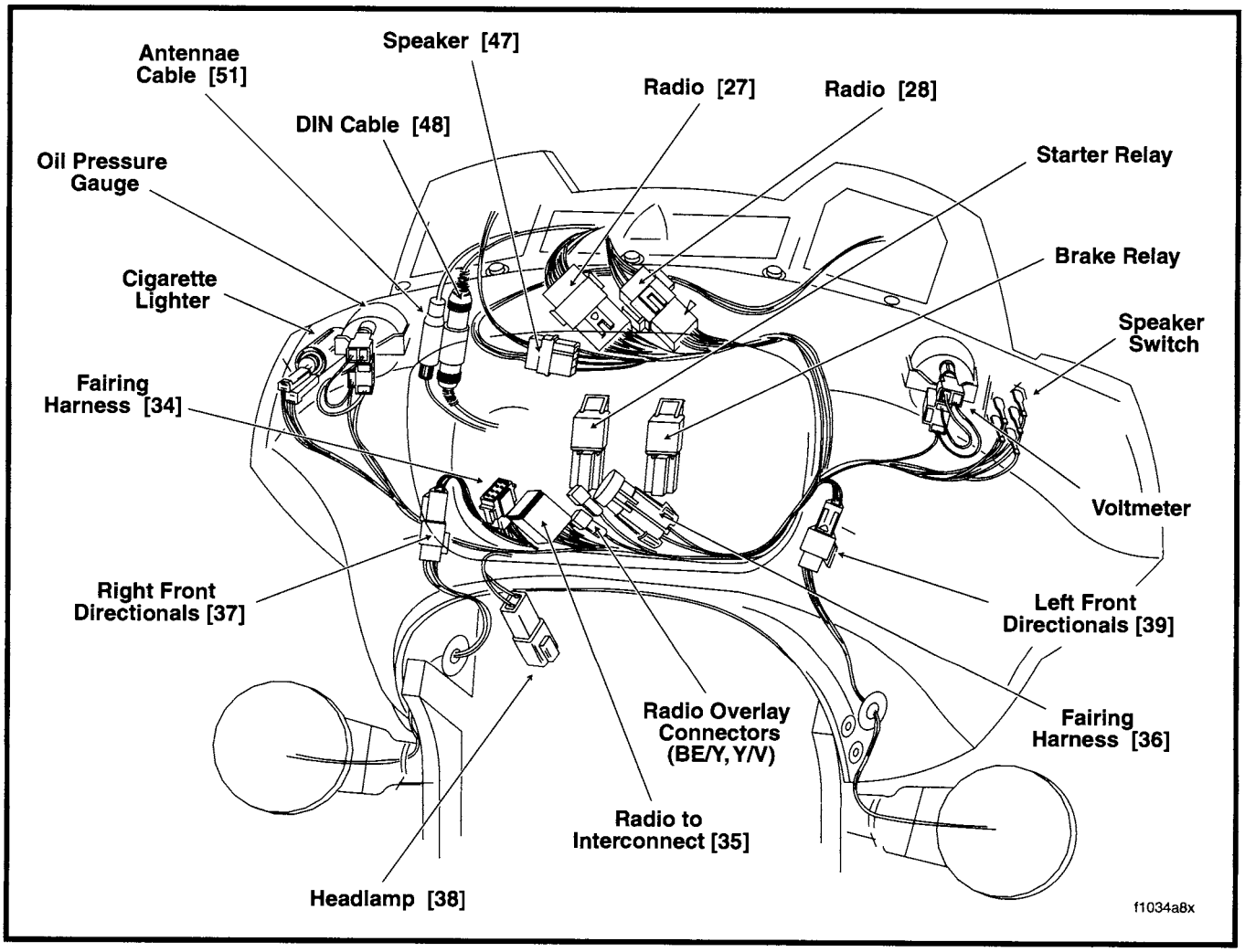


Figure 173. FLTCU-I Fairing

1996 FLTCU-I WIRE HARNESS CONNECTORS (Continued)

No.	Description	Type	Location	Fig.
[53]	Passenger Tuning Control	8 - Place Deutsch	Right Rear Speaker Box	-
[55]	Transceiver	8 - Place Deutsch	Under Luggage Rack	-
[56]	Transceiver	8 - Place Deutsch	Under Luggage Rack	-
[78]	Electronic Control Module (ECM)	35 - Place Amp	Under Right Side Cover	170
[79]	Crankshaft Position Sensor (CKP Sensor)	3 - Place Conxall	Under Right Side Cover Below Electrical Bracket	170
[80]	Barometric Pressure Sensor (BARO Sensor)	3 - Place Amp	Under Right Side Cover Behind Electrical Bracket	170
[81]	ECM Harness to Sensor Harness	6 - Place Deutsch	Upper Frame Cross Member (Under Seat)	169
[82]	ECM Harness to Sensor Harness	12 - Place Deutsch	Upper Frame Cross Member (Under Seat)	169
[83]	Ignition Coil	3 - Place Amp	Below Fuel Tank	-
[84]	Front Injector	2 - Place Packard	Below Fuel Tank	-
[85]	Rear Injector	2 - Place Packard	Below Fuel Tank	-
[86]	Fuel Pump	1 - Place Amp	Under Seat (at Rear of Fuel Tank)	-
[87]	Idle Speed Control Actuator (ISC Actuator)	4 - Place Packard	Below Fuel Tank	-
[88]	Throttle Position Sensor (TP Sensor)	3 - Place Packard	Below Fuel Tank	-

Continued on the Next Page ...

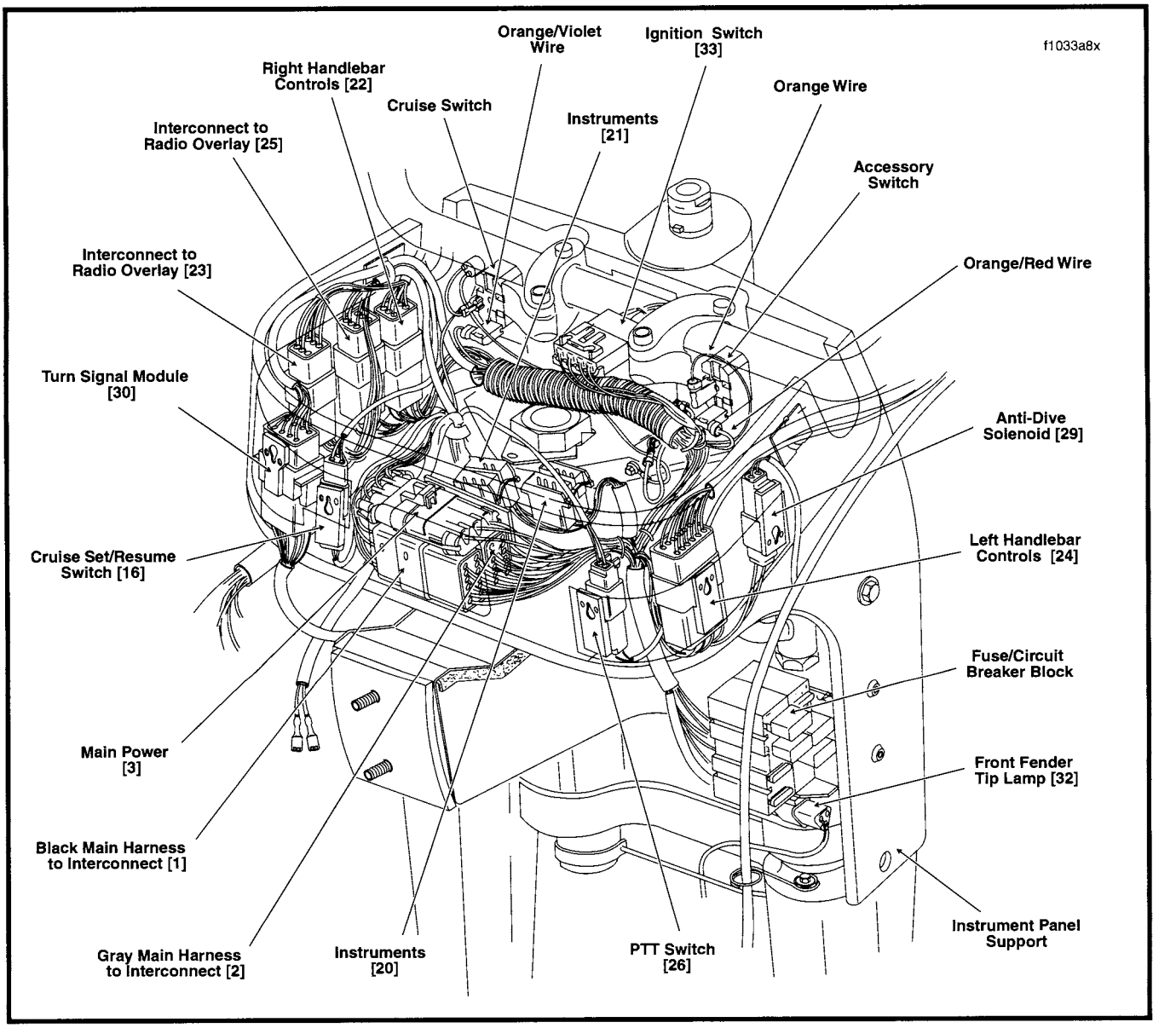


Figure 174. FLTCU-I with Instruments Removed

1996 FLTCU-I WIRE HARNESS CONNECTORS (Continued)

No.	Description	Type	Location	Fig.
[89]	Intake Air Temperature Sensor (IAT Sensor)	2 - Place Packard	Below Fuel Tank	-
[90]	Engine Temperature Sensor (ET Sensor)	2 - Place Packard	Below Fuel Tank (Front Cylinder Head Rocker Box Opening)	-
[91]	Data Link	4 - Place Deutsch	Under Right Side Cover	170
-	ECM and Fuel Pump Electrical Relays	Spade Terminals	Under Right Side Cover	170
-	EFI Fuses	Spade Terminals	Under Right Side Cover	170
-	Oil Pressure Sending Unit	Ring Terminals	Engine Crankcase	-
-	Rear Brake Light Switch	Spade Terminals	Beneath Transmission	-
-	Horn	Spade Terminals	Between Cylinders (Left Side)	-
-	Starter Relay	Relay Connector	Fairing	173
-	Brake Light Relay	Relay Connector	Fairing	173
-	Fuse Blocks	Spade Terminals	Instrument Panel Support	174
-	Radio Overlay (BE/Y,Y/V)	Spade Terminals	Fairing	173
-	Speaker Switch	Spade Terminals	Fairing	173
-	Voltmeter	Spade Terminals	Fairing	173
-	Oil Pressure Gauge	Spade Terminals	Fairing	173
-	Front Speakers	Spade Terminals	Fairing	-
-	Cruise Switch	Spade Terminals	Instrument Panel Support	174
-	Accessory Switch	Spade Terminals	Instrument Panel Support	174
-	Main Circuit Breaker	Ring Terminals	Upper Frame Cross Member (Under Seat)	169
-	Starter Solenoid	Spade Terminals	Top of Starter	-
-	Harness Grounds	Ring Terminals	Frame Cross Member (Above Transmission)	-
-	Ignition Coil	Ring Terminals	At Coil	-
-	Neutral Switch	Post Terminal	Top of Transmission	-
-	Cigarette Lighter	Spade Terminals	Fairing	173

1996 FLHR, FLHR-I WIRE HARNESS CONNECTORS

No.	Description	Type	Location	Fig.
[4]	P&A Accessory	4 - Place Deutsch	In Front of Upper Frame Cross Member (Under Seat)	169
[7]	Rear Fender	8 - Place Deutsch	Under Left Side Cover	176
[8]	Ignition Harness (EFI: Main Harness to ECM Harness)	8 - Place Deutsch (Gray)	Upper Frame Cross Member (Under Seat)	169
[9]	California Trap Door	3 - Place Deutsch	Below Fuel Tank (Right Side)	-
[10]	Ignition Module (Carbureted)	8 - Place Deutsch	Under Right Side Cover	-
[11]	VOES (Carbureted)	2 - Place Deutsch	Below Fuel Tank (Right Side)	-
[13]	Fuel Gauge Sending Unit	2 - Place Amp	Below Fuel Tank (Left Side)	-
[14]	Camshaft Position Sensor (CMP Sensor)	3 - Place Deutsch	Bottom Frame Cross Member (Right Side)	-
[15]	California Trap Door	4 - Place Amp	Behind Air Cleaner	-
[18] [19]	Rear Directionals	2 - Place Multilock	Behind Directional Support Bracket	-
[20]	Instruments	10 - Place Multilock	Under Left Side Cover	176
[22]	Interconnect to Right Handlebar Controls	6 - Place Deutsch	Inside Headlamp Nacelle	175
[24]	Interconnect to Left Handlebar Controls	6 - Place Deutsch	Inside Headlamp Nacelle	175
[30]	Turn Signal Module	8 - Place Deutsch	Inside Headlamp Nacelle	175
[31]	Passing Lamps	8 - Place Deutsch	Inside Headlamp Nacelle	175
[32]	Front Fender Tip Lamp (DOM)	3 - Place Deutsch	Inside Headlamp Nacelle	175
[33]	Ignition/Light Key Switch	3 - Place Packard	Under Left Side Cover	176
[45]	Rear Fender Tip Lamp (DOM)	1 - Place Amp	Under Rear Fender Tip	-
[46]	Voltage Regulator to Stator (Carbureted)	2 - Place Special	Front of Engine Crankcase	-
	Voltage Regulator (Fuel Injected) ***	2 - Place Special	Bottom of Voltage Regulator	
[65]	Speedometer Sensor	3 - Place Deutsch	Upper Frame Cross Member (Under Seat)	169
[66]	Passing Lamp Switch	4 - Place Amp	Inside Headlamp Nacelle	175

Continued on the Next Page ...

*** Fuel Injected Models

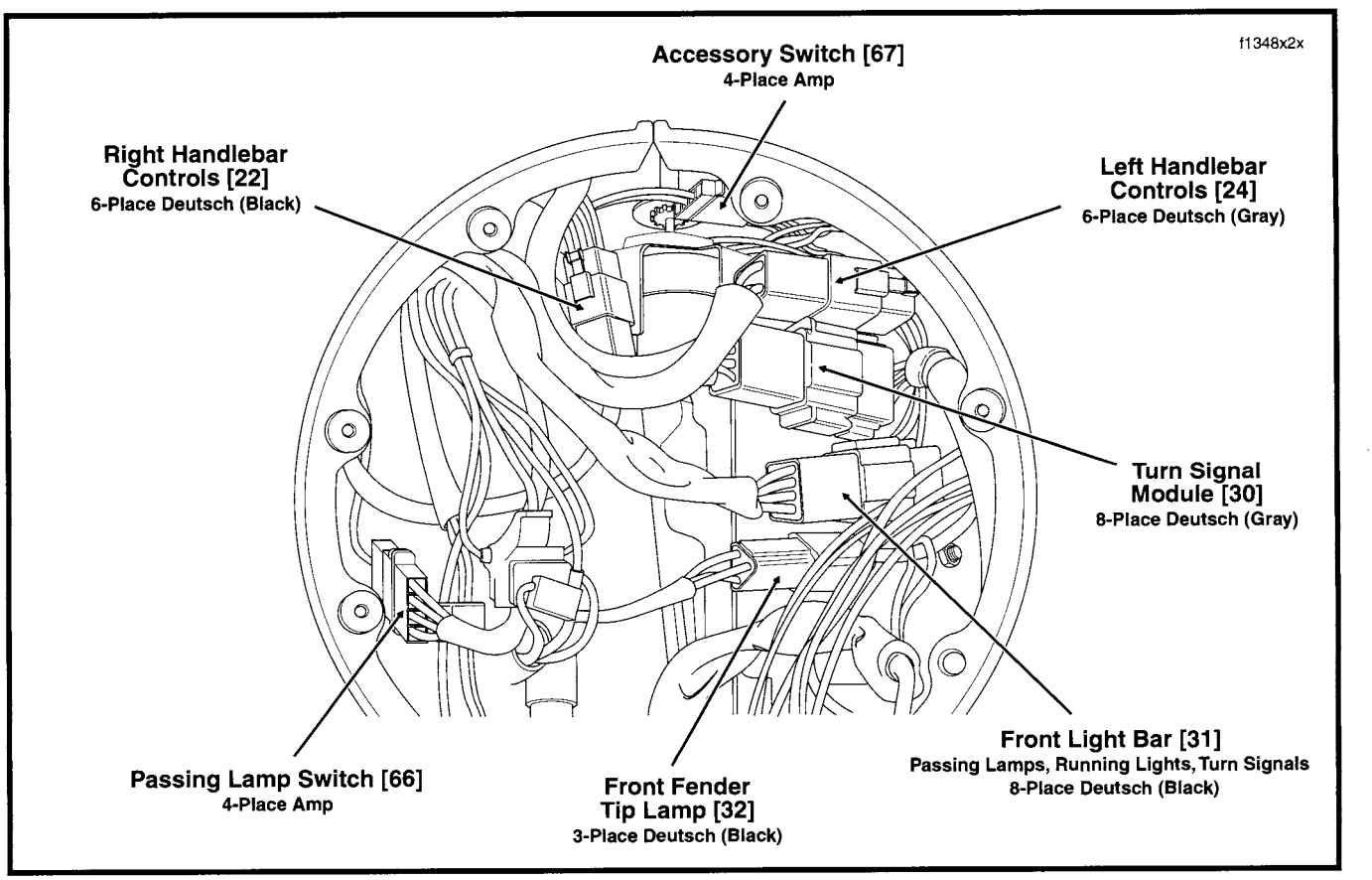


Figure 175. Headlamp Nacelle Connectors (FLHR, FLHR-I)

1996 FLHR, FLHR-I WIRE HARNESS CONNECTORS (Continued)

No.	Description	Type	Location	Fig.
[67]	Accessory Switch	4 - Place Amp	Inside Headlamp Nacelle	175
[78]	Electronic Control Module (ECM) ***	35 - Place Amp	Under Right Side Cover	170
[79]	Crankshaft Position Sensor (CKP Sensor) ***	3 - Place Conxall	Under Right Side Cover Below Electrical Bracket	170
[80]	Barometric Pressure Sensor (BARO Sensor) ***	3 - Place Amp	Under Right Side Cover Behind Electrical Bracket	170
[81]	ECM Harness to Sensor Harness ***	6 - Place Deutsch	Upper Frame Cross Member (Under Seat)	169
[82]	ECM Harness to Sensor Harness ***	12 - Place Deutsch	Upper Frame Cross Member (Under Seat)	169
[83]	Ignition Coil ***	3 - Place Amp	Below Fuel Tank	-
[84]	Front Injector ***	2 - Place Packard	Below Fuel Tank	-
[85]	Rear Injector ***	2 - Place Packard	Below Fuel Tank	-
[86]	Fuel Pump ***	1 - Place Amp	Under Seat (at Rear of Fuel Tank)	-
[87]	Idle Speed Control Actuator (ISC Actuator) ***	4 - Place Packard	Below Fuel Tank	-
[88]	Throttle Position Sensor (TP Sensor) ***	3 - Place Packard	Below Fuel Tank	-
[89]	Intake Air Temperature Sensor (IAT Sensor) ***	2 - Place Packard	Below Fuel Tank	-
[90]	Engine Temperature Sensor (ET Sensor) ***	2 - Place Packard	Below Fuel Tank (Front Cylinder Head Rocker Box Opening)	-
[91]	Data Link ***	4 - Place Deutsch	Under Right Side Cover	170
-	ECM and Fuel Pump Electrical Relays ***	Spade Terminals	Under Right Side Cover	170
-	EFI Fuses ***	Spade Terminals	Under Right Side Cover	170
-	Oil Pressure Sending Unit	Ring Terminals	Engine Crankcase	-
-	Rear Brake Light Switch	Spade Terminals	Beneath Transmission	-
-	Horn	Spade Terminals	Between Cylinders (Left Side)	-
-	Starter Relay	Spade Terminals	Under Left Side Cover	176
-	Brake Light Relay	Spade Terminals	Under Left Side Cover	176
-	Fuse Block	Spade Terminals	Under Left Side Cover	176
-	Fuel Gauge	Ring Terminals	Fuel Tank	-
-	Fuel Level Sender	Ring Terminals	Fuel Tank	-
-	Main Circuit Breaker	Ring Terminals	Upper Frame Cross Member (Under Seat)	169
-	Starter Solenoid	Spade Terminals	Top of Starter	-
-	Harness Grounds	Ring Terminals	Frame Cross Member (Above Transmission)	-
-	Ignition Coil	Ring Terminals	At Coil	-
-	Neutral Switch	Post Terminal	Top of Transmission	-
-	Headlamp	Headlamp Connector	Headlight Nacelle	-
-	Position Lamp (HDI)	Spade Terminals	Headlight Nacelle	-
-	Fuel Pump ***	Spade Terminals	Inside Fuel Tank	-

*** Fuel Injected Models

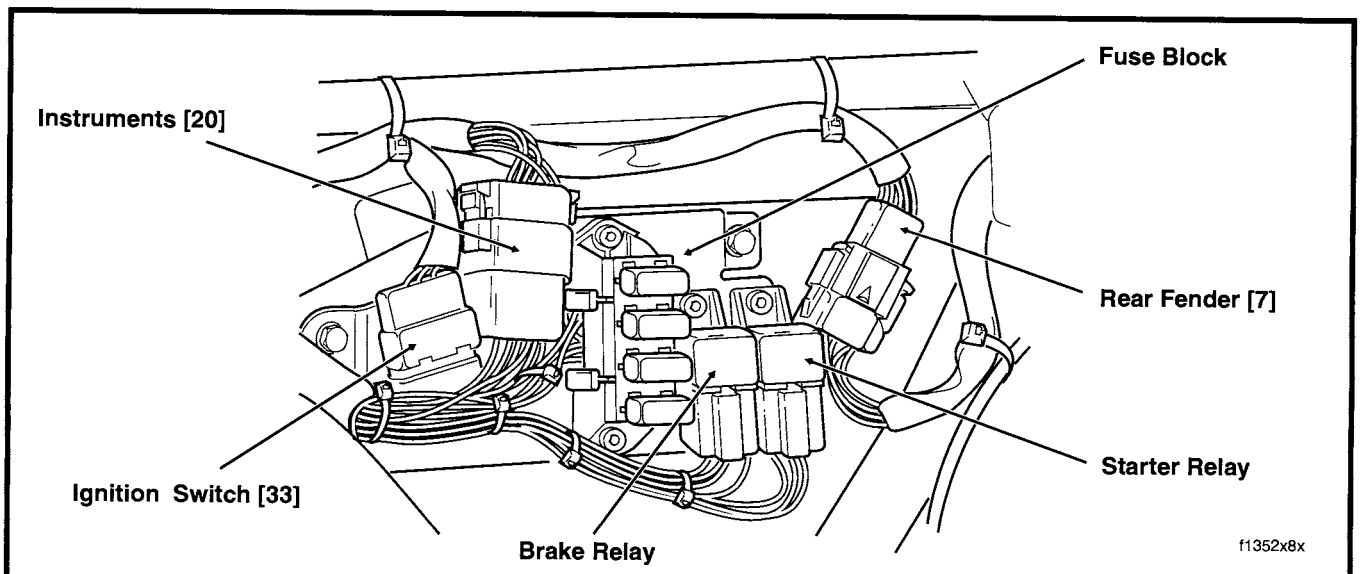


Figure 176. Electrical Bracket Connectors - Under Left Side Cover (FLHR, FLHR-I)

1996 FLHP, FLHP-I WIRE HARNESS CONNECTORS

No.	Description	Type	Location	Fig.
[4]	P&A Accessory	4 - Place Deutsch	In Front of Upper Frame Cross Member (Under Seat)	169
[7]	Rear Fender	8 - Place Deutsch	Under Left Side Cover	176
[8]	Ignition Harness (EFI: Main Harness to ECM Harness)	8 - Place Deutsch (Gray)	Upper Frame Cross Member (Under Seat)	169
[10]	Ignition Module (Carbureted)	8 - Place Deutsch	Under Right Side Cover	-
[11]	VOES (Carbureted)	2 - Place Deutsch	Below Fuel Tank (Right Side)	-
[13]	Fuel Gauge Sending Unit	1 - Place Amp	Below Fuel Tank (Left Side)	-
[14]	Camshaft Position Sensor (CMP Sensor)	3 - Place Deutsch	Bottom Frame Cross Member (Right Side)	-
[18] [19]	Rear Directionals	2 - Place Multilock	Behind Directional Support Bracket	-
[20]	Instruments	12 - Place Deutsch	Under Left Side Cover	176
[22]	Interconnect to Right Handlebar Controls	12 - Place Deutsch	Inside Headlamp Nacelle	175
[24]	Interconnect to Left Handlebar Controls	12 - Place Deutsch	Inside Headlamp Nacelle	175
[30]	Turn Signal Module	8 - Place Deutsch	Inside Headlamp Nacelle	175
[31]	Pursuit Lamps	8 - Place Deutsch	Inside Headlamp Nacelle	175
[32]	Front Fender Tip Lamp (DOM)	3 - Place Deutsch	Inside Headlamp Nacelle	175
[33]	Ignition/Light Key Switch	4 - Place Packard	Under Left Side Cover	176
[45]	Rear Fender Tip Lamp (DOM)	1 - Place Amp	Under Rear Fender Tip	-
[46]	Voltage Regulator to Stator (Carbureted)	2 - Place Special	Front of Engine Crankcase	-
	Voltage Regulator (Fuel Injected) ***	2 - Place Special	Bottom of Voltage Regulator	
[57]	Siren Speaker	2 - Place Deutsch	Front of Fuel Tank (Right Side)	-
[58]	Siren Amplifier	18 - Place Packard	Under Left Side Cover or Left Rear Engine Guard	-
[59]	Rear Pole Lamp	2 - Place Deutsch	Under Radio Carrier (Left Side)	-
[65]	Speedometer Sensor	3 - Place Deutsch	Upper Frame Cross Member (Under Seat)	169
[67]	Accessory Switch	4 - Place Amp	Inside Headlamp Nacelle	175
[78]	Electronic Control Module (ECM) ***	35 - Place Amp	Under Right Side Cover	170
[79]	Crankshaft Position Sensor (CKP Sensor) ***	3 - Place Conxall	Under Right Side Cover Below Electrical Bracket	170
[80]	Barometric Pressure Sensor (BARO Sensor) ***	3 - Place Amp	Under Right Side Cover Behind Electrical Bracket	170
[81]	ECM Harness to Sensor Harness ***	6 - Place Deutsch	Upper Frame Cross Member (Under Seat)	169
[82]	ECM Harness to Sensor Harness ***	12 - Place Deutsch	Upper Frame Cross Member (Under Seat)	169
[83]	Ignition Coil ***	3 - Place Amp	Below Fuel Tank	-
[84]	Front Injector ***	2 - Place Packard	Below Fuel Tank	-
[85]	Rear Injector ***	2 - Place Packard	Below Fuel Tank	-
[86]	Fuel Pump ***	1 - Place Amp	Under Seat (at Rear of Fuel Tank)	-
[87]	Idle Speed Control Actuator (ISC Actuator) ***	4 - Place Packard	Below Fuel Tank	-
[88]	Throttle Position Sensor (TP Sensor) ***	3 - Place Packard	Below Fuel Tank	-
[89]	Intake Air Temperature Sensor (IAT Sensor) ***	2 - Place Packard	Below Fuel Tank	-
[90]	Engine Temperature Sensor (ET Sensor) ***	2 - Place Packard	Below Fuel Tank (Front Cylinder Head Rocker Box Opening)	-
[91]	Data Link ***	4 - Place Deutsch	Under Right Side Cover	170
[102]	Tachometer	3 - Place Deutsch	Inside Headlamp Nacelle	-
-	ECM and Fuel Pump Electrical Relays ***	Spade Terminals	Under Right Side Cover	170
-	EFI Fuses ***	Spade Terminals	Under Right Side Cover	170
-	Oil Pressure Sending Unit	Ring Terminals	Engine Crankcase	-
-	Rear Brake Light Switch	Spade Terminals	Beneath Transmission	-
-	Horn	Spade Terminals	Between Cylinders (Left Side)	-
-	Pursuit Flasher	Relay Connector	Under Left Side Cover	-
-	Starter Relay	Relay Connector	Under Left Side Cover	176
-	Brake Light Relay	Relay Connector	Under Left Side Cover	176
-	Fuse Block	Spade Terminals	Under Left Side Cover	176
-	Fuel Gauge	Ring Terminals	Fuel Tank	-
-	Fuel Level Sender	Ring Terminals	Fuel Tank	-

Continued on the Next Page ...

*** Fuel Injected Models

1996 FLHP, FLHP-I WIRE HARNESS CONNECTORS (Continued)

No.	Description	Type	Location	Fig.
-	Main Circuit Breaker	Ring Terminals	Upper Frame Cross Member (Under Seat)	169
-	Starter Solenoid	Spade Terminals	Top of Starter	-
-	Harness Grounds	Ring Terminals	Frame Cross Member (Above Transmission)	-
-	Ignition Coil	Ring Terminals	At Coil	-
-	Neutral Switch	Post Terminal	Top of Transmission	-
-	Headlamp	Headlamp Connector	Inside Headlamp Nacelle	-
-	Fuel Pump ***	Spade Terminals	Inside Fuel Tank	-

*** Fuel Injected Models

1996 FLHTP WIRE HARNESS CONNECTORS

No.	Description	Type	Location	Fig.
[1]	Main Harness to Interconnect	12 - Place Deutsch (Black)	Inner Fairing - Right Fairing Bracket	177
[2]	Main Harness to Interconnect	12 - Place Deutsch (Gray)	Inner Fairing - Right Storage Box Bracket	177
[3]	Main Power	3 - Place Packard	Inner Fairing - Front of Storage Box Bracket	177
[4]	P&A Accessory	4 - Place Deutsch	In Front of Upper Frame Cross Member (Under Seat)	-
[5]	Main Fuse Board (Siren)	3 - Place Amp	Under Left Side Cover	-
[7]	Rear Fender	8 - Place Deutsch	Under Left Side Cover	-
[8]	Ignition Harness	8 - Place Deutsch (Gray)	Upper Frame Cross Member (Under Seat)	-
[10]	Ignition Module	8 - Place Deutsch	Under Right Side Cover	-
[11]	VOES	2 - Place Deutsch	Below Fuel Tank (Right Side)	-
[13]	Fuel Gauge Sending Unit	2 - Place Amp	Behind Fuel Tank (Under Seat)	-
[14]	Camshaft Position Sensor (CMP Sensor)	3 - Place Deutsch	Bottom Frame Cross Member (Right Side)	-
[18] [19]	Rear Directionals	2 - Place Multilock	Behind Directional Support Bracket	-
[20]	Speedometer	3 - Place Multilock	Inner Fairing - Between Tachometer and Speedometer Gauges	177
[21]	Indicator Lamps	10 - Place Multilock	Inner Fairing - Between Tachometer and Speedometer Gauges	177
[22]	Interconnect to Right Handlebar Controls	12 - Place Deutsch	Inner Fairing - Right Fairing Support Brace	177
[24]	Interconnect to Left Handlebar Controls	12 - Place Deutsch	Inner Fairing - Left Fairing Support Brace	177
[29]	Anti-Dive Solenoid	2 - Place Deutsch	Inner Fairing - Left Fairing Bracket	177
[30]	Turn Signal Module	8 - Place Deutsch	Inner Fairing - Below Storage Box	177
[31]	Pursuit Lamps	8 - Place Deutsch	Inner Fairing - Circuit Breaker/Fuse Block Bracket (Left Side)	177
[32]	Front Fender Tip Lamp (DOM)	3 - Place Deutsch	Inner Fairing - Left Fairing Bracket	177
[33]	Ignition/Light Key Switch	4 - Place Packard	Inner Fairing - Right Fairing Bracket	177
[38]	Headlamp	Headlamp Connector	Inner Fairing	-
[45]	Rear Fender Tip Lamp (DOM)	1 - Place Amp	Under Rear Fender Tip	-
[46]	Voltage Regulator to Stator	2 - Place Special	Front of Engine Crankcase	-
[57]	Siren Speaker	2 - Place Deutsch	Front of Fuel Tank (Right Side)	-
[58]	Siren Amplifier	18 - Place Packard	Under Left Side Cover or Left Rear Engine Guard	-
[59]	Rear Pole Lamp	2 - Place Deutsch	Under Radio Carrier (Left Side)	-
[108]	Tachometer	6 - Place Multilock	Inner Fairing - Between Tachometer and Speedometer Gauges	177
[110]	Voltmeter Lamp	Spade Connector	Inner Fairing	-
[111]	Voltmeter	Spade Connector	Inner Fairing	177
[116]	Fuel Gauge Lamp	Spade Connector	Inner Fairing	-
[117]	Fuel Gauge	Spade Connector	Inner Fairing	177
[118]	Pursuit Indicator Lamp	2 - Place Deutsch	Inner Fairing - Below Left Storage Box Bracket	177
-	Oil Pressure Sending Unit	Ring Terminals	Engine Crankcase	-
-	Rear Brake Light Switch	Spade Terminals	Beneath Transmission	-
-	Horn	Spade Terminals	Between Cylinders (Left Side)	-
-	Starter Relay	Spade Terminals	Inner Fairing - Left Fairing Support Brace	177
-	Brake Light Relay	Spade Terminals	Inner Fairing - Right Fairing Support Brace	177

Continued on the Next Page ...

1996 FLHTP WIRE HARNESS CONNECTORS (Continued)				
No.	Description	Type	Location	Fig.
-	Fuse Blocks	Spade Terminals	Inner Fairing - Circuit Breaker/Fuse Block Bracket	177
-	Main Circuit Breaker	Ring Terminals	Upper Frame Cross Member (Under Seat)	-
-	Starter Solenoid	Spade Terminals	Top of Starter	-
-	Harness Grounds	Ring Terminals	Frame Cross Member (Above Transmission)	-
-	Ignition Coil	Ring Terminals	At Coil	-
-	Neutral Switch	Post Terminal	Top of Transmission	-
-	Cigarette Lighter	Spade Terminals	Inner Fairing	-

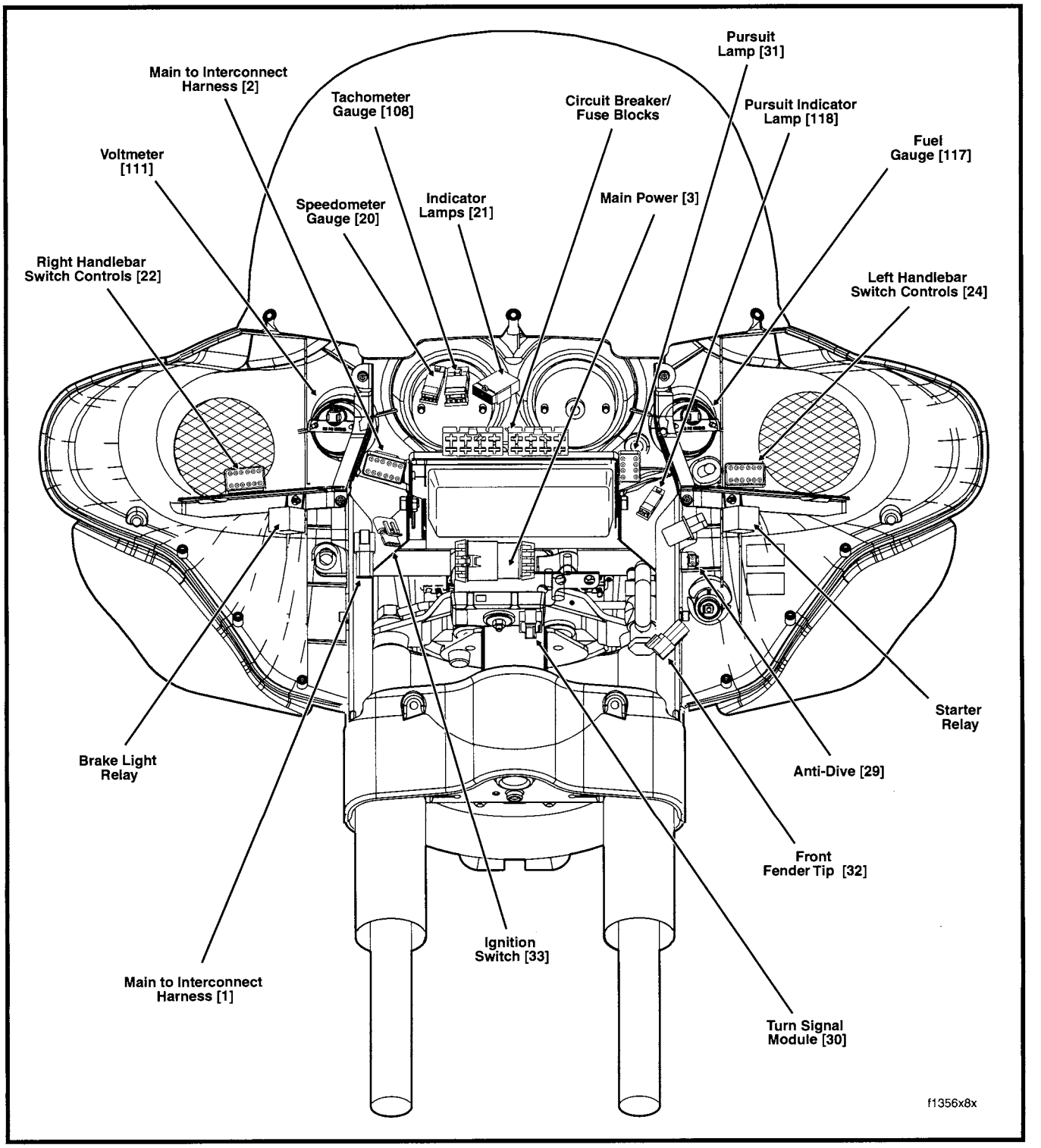


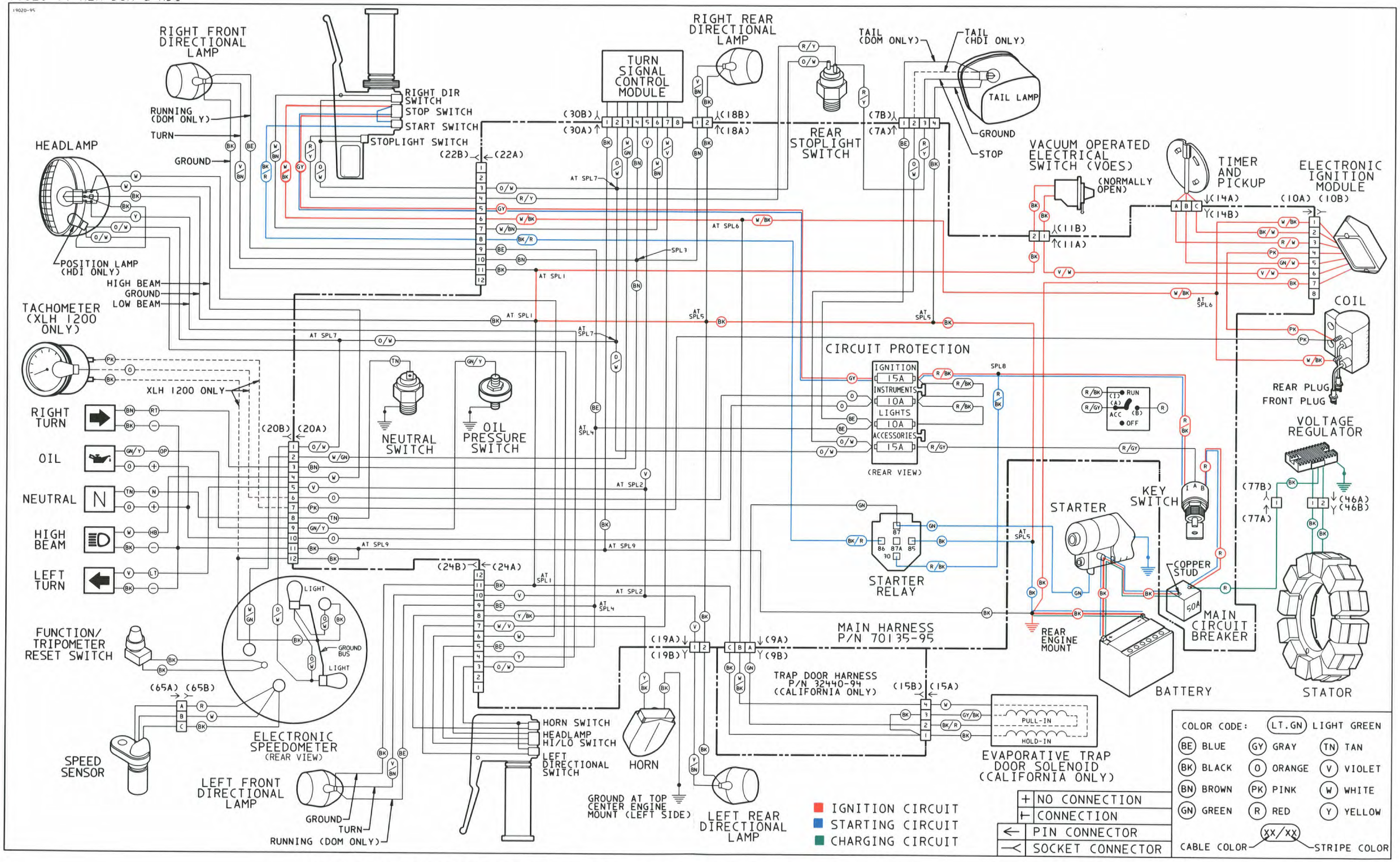
Figure 177. 1996 Inner Fairing Connectors (FLHTP)

1995 WIRING DIAGRAMS - TABLE OF CONTENTS

NOTE

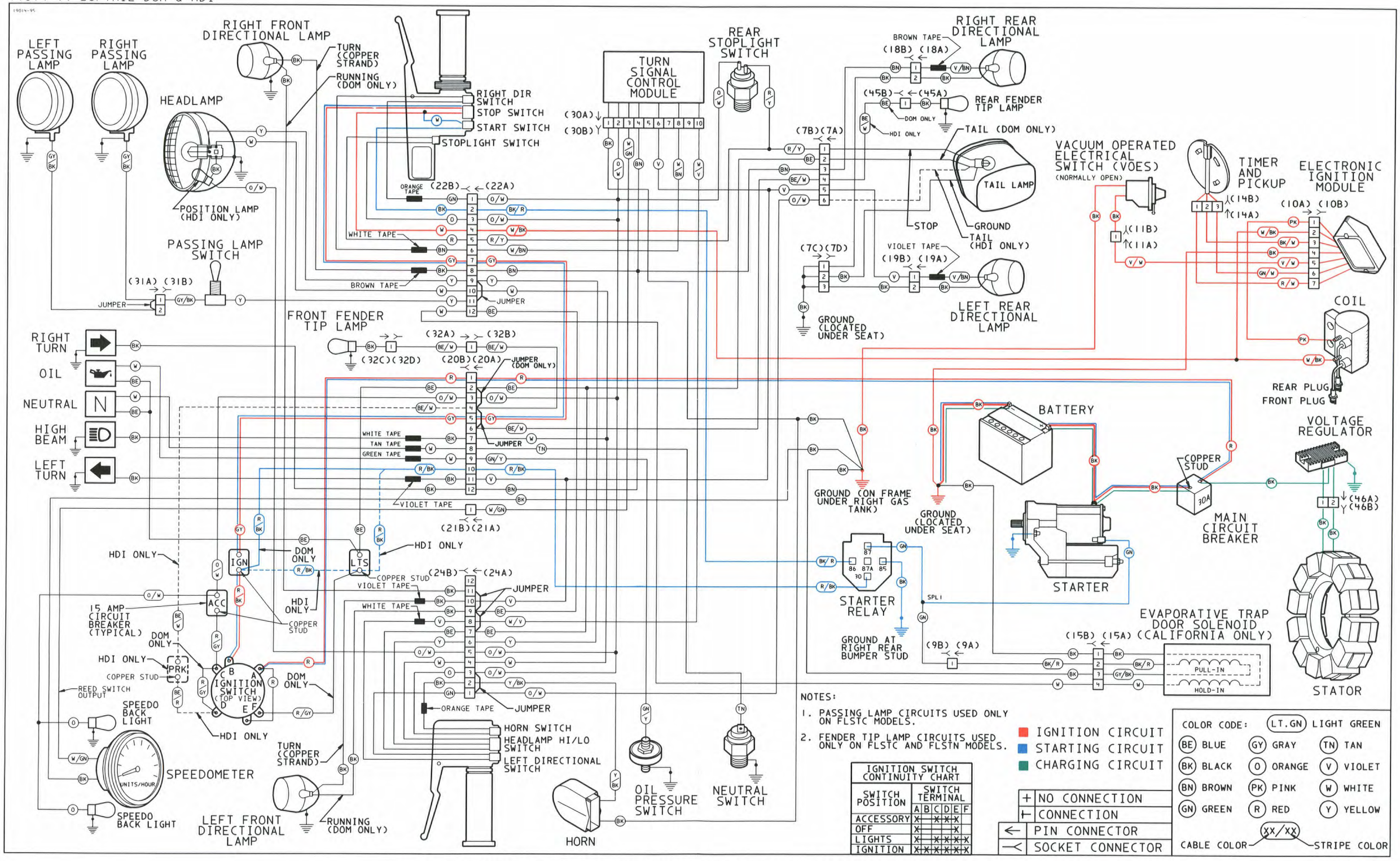
Harness Part No.'s may be included on some wiring diagrams. Use these numbers for reference only. ALWAYS REFER TO THE PARTS CATALOG WHEN ORDERING WIRING HARNESSES.

1996 WIRING DIAGRAMS - TABLE OF CONTENTS



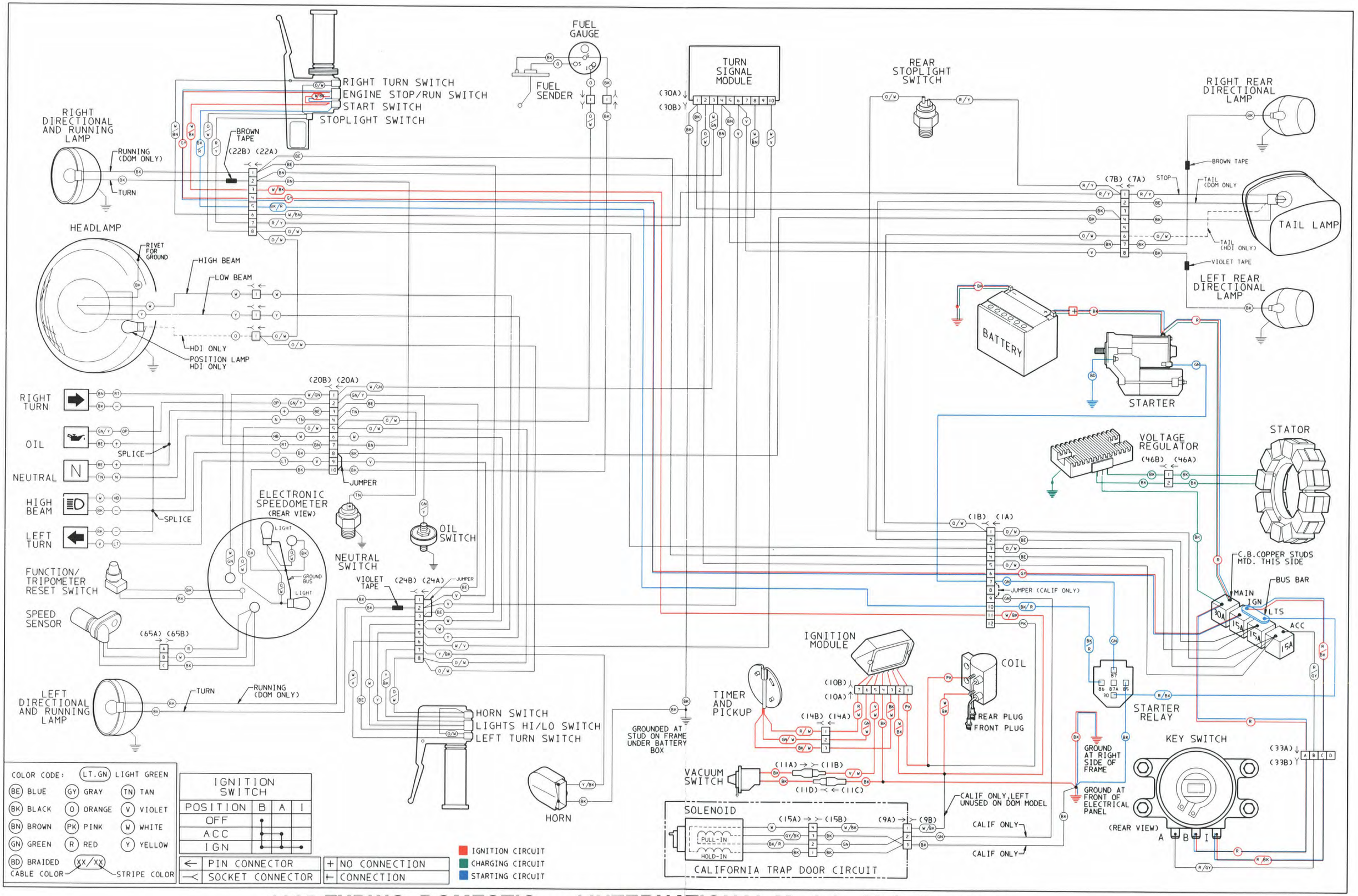
1995 XLH, DOMESTIC and INTERNATIONAL Models, Main Harness

1995 XLH,
DOMESTIC and INTERNATIONAL Models,
Main Harness



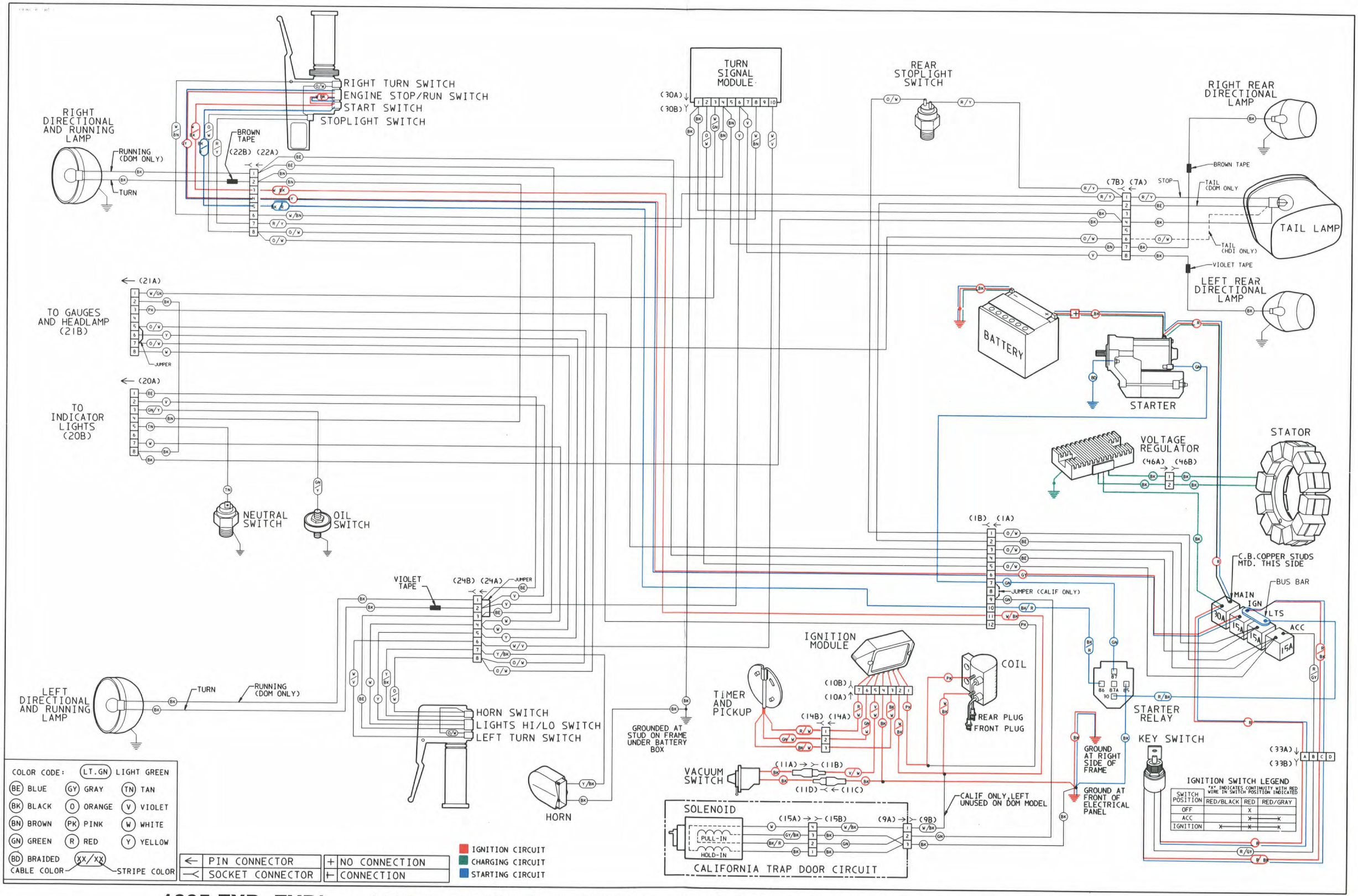
1995 FLSTN, FLSTC, FXSTC, FXSTS, FLSTF and FXSTSB, DOMESTIC and INTERNATIONAL Models, Main Harness

1995 FLSTN, FLSTC, FXSTC, FXSTS, FLSTF and FXSTSB, DOMESTIC and INTERNATIONAL Models, Main Harness



1995 FXDWG, DOMESTIC and INTERNATIONAL Models, Main Harness

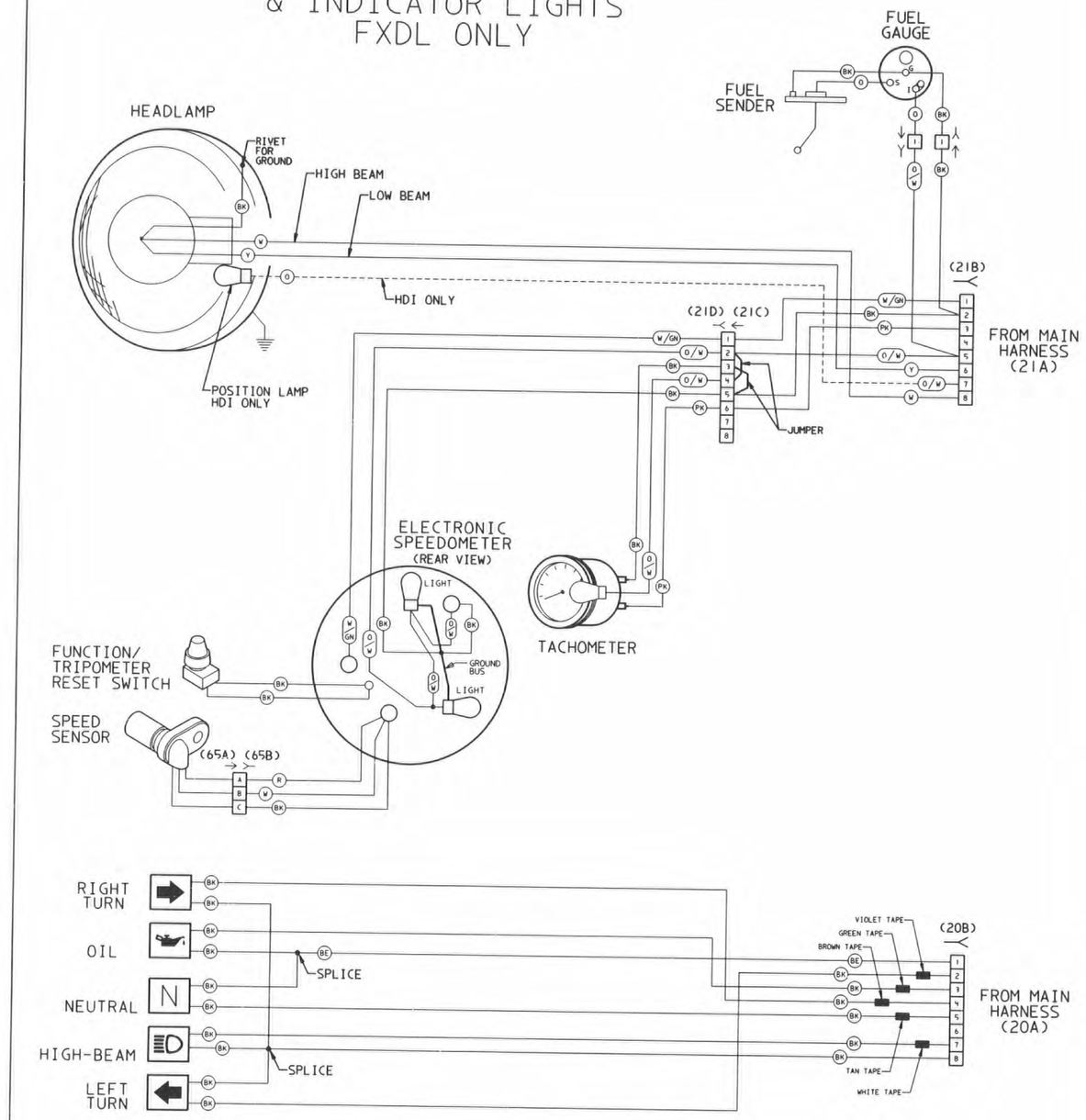
1995 FXDWG,
DOMESTIC and INTERNATIONAL Models,
Main Harness



1995 FXD, FXDL and FXDS-CONV, DOMESTIC and INTERNATIONAL Models, Main Harness

1995 FXD, FXDL and FXDS-CONV, DOMESTIC and INTERNATIONAL Models, Main Harness

GAUGES, HEADLAMP, & INDICATOR LIGHTS FXDL ONLY



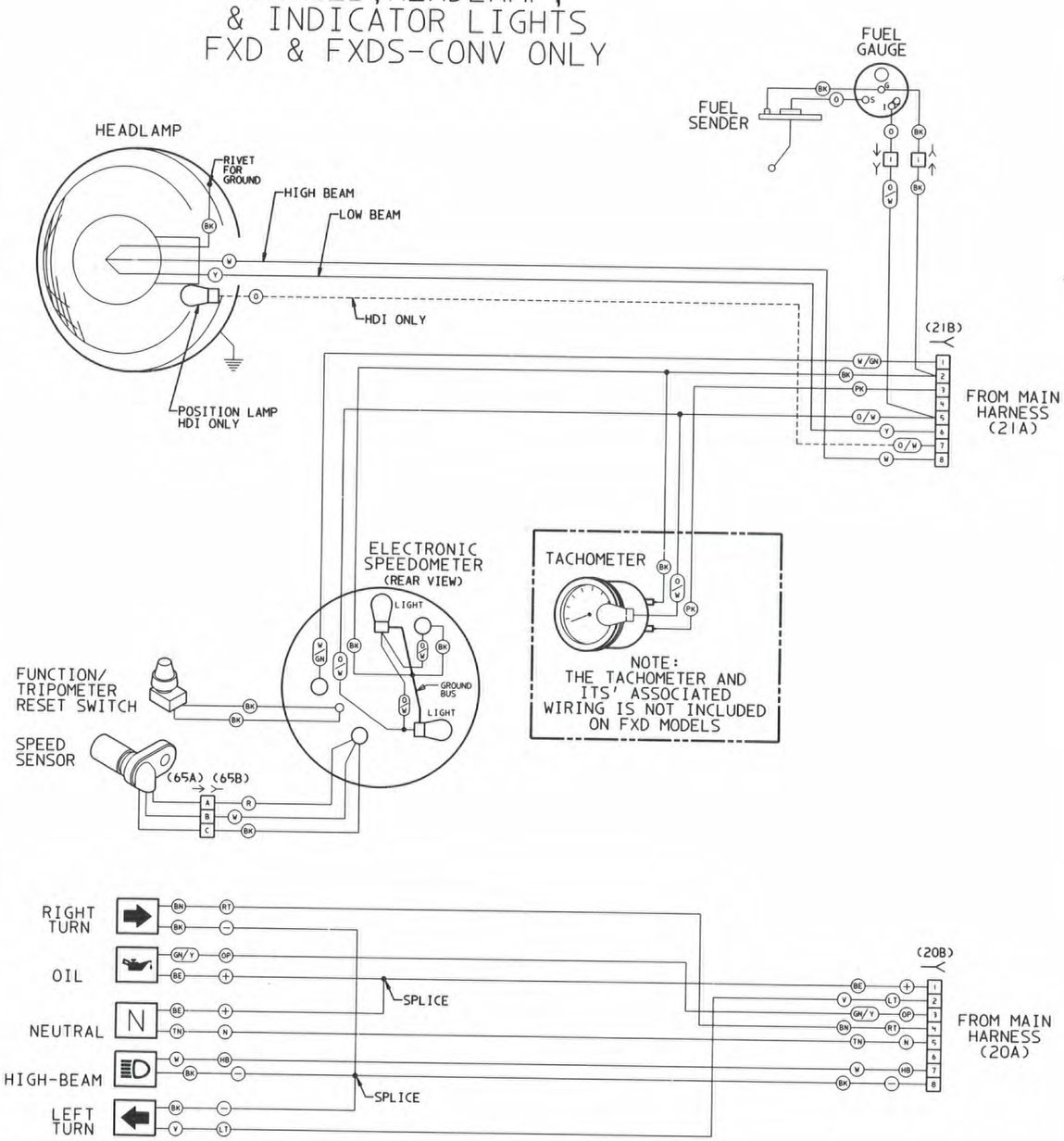
COLOR CODE:

(LT.GN) LIGHT GREEN		
(BE) BLUE	(GY) GRAY	(TN) TAN
(BK) BLACK	(O) ORANGE	(V) VIOLET
(BN) BROWN	(PK) PINK	(W) WHITE
(GN) GREEN	(R) RED	(Y) YELLOW

(BD) BRAIDED (XX/XX) CABLE COLOR — STRIPE COLOR

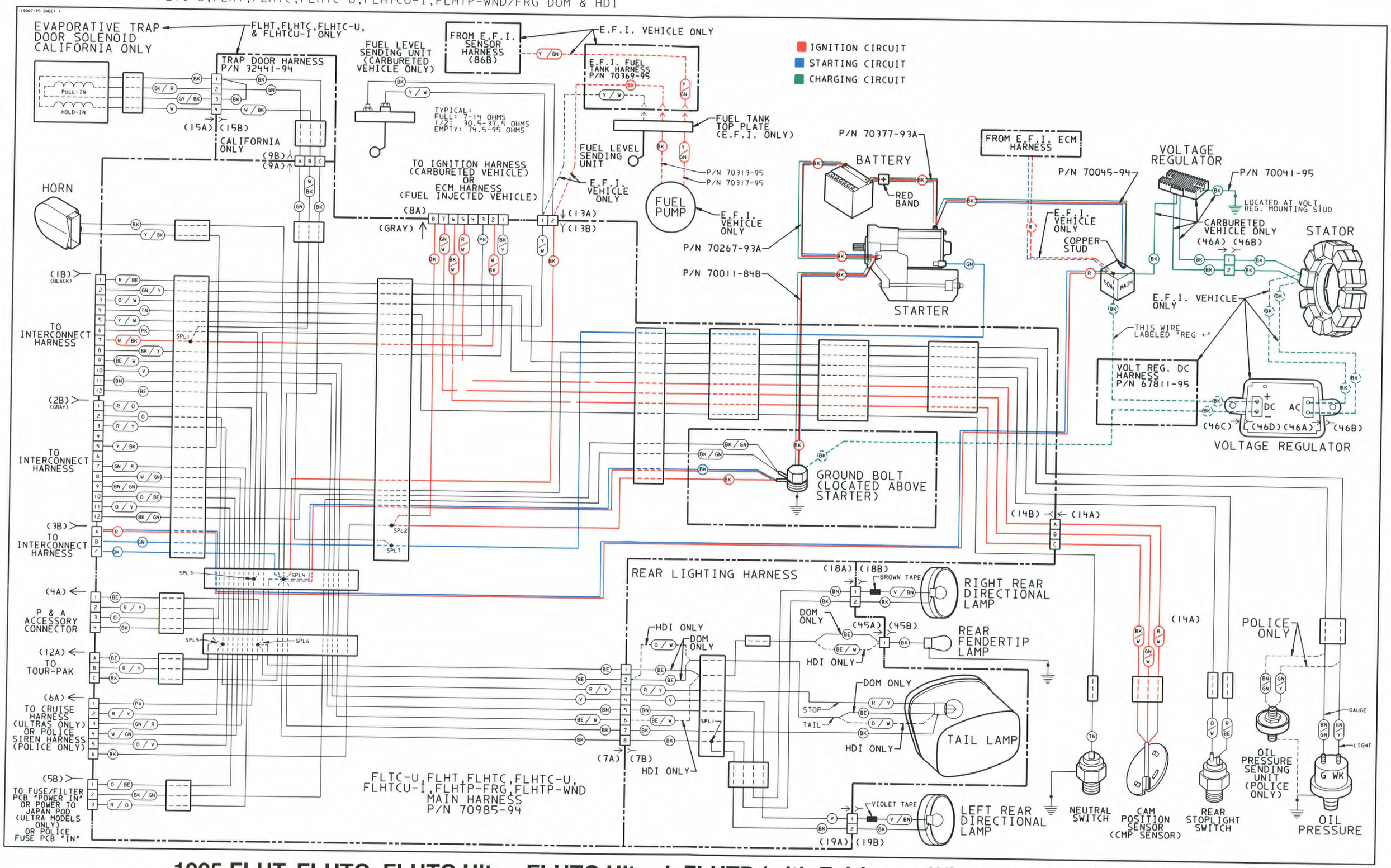
+	NO CONNECTION
⊢	CONNECTION
←	PIN CONNECTOR
⊣	SOCKET CONNECTOR

GAUGES, HEADLAMP, & INDICATOR LIGHTS FXD & FXDS-CONV ONLY



1995 FXD, FXDL and FXDS-CONV, DOMESTIC and INTERNATIONAL Models, Headlamp, Instruments and Indicator Lights

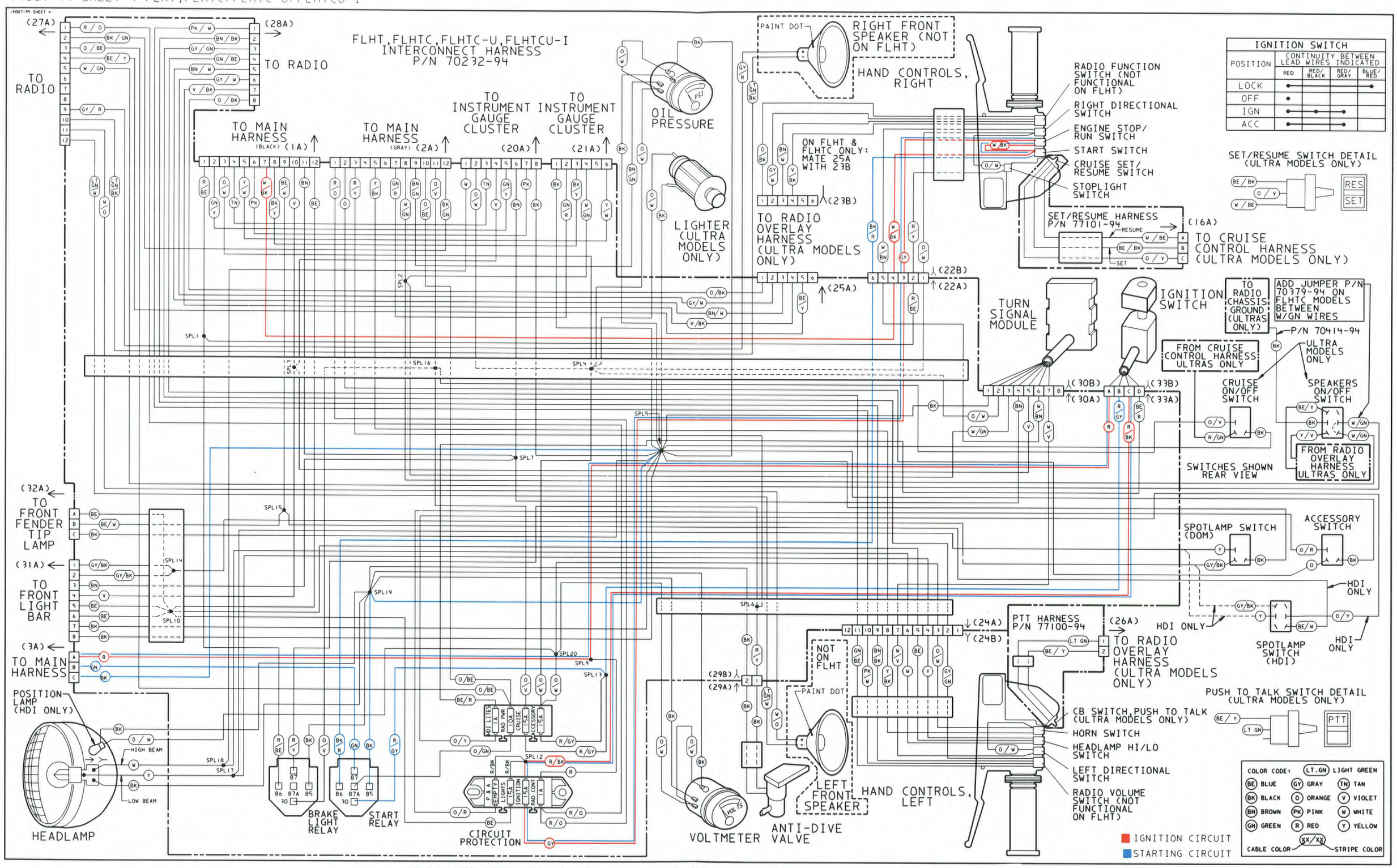
1995 FXD, FXDL and FXDS-CONV, DOMESTIC and INTERNATIONAL Models, Headlamp, Instruments and Indicator Lights



1995 FLHT, FLHTC, FLHTC Ultra, FLHTC Ultra-I, FLHTP (with Fairing or Windshield) and FLTC Ultra, DOMESTIC and INTERNATIONAL Models, Main Harness

WD-6

1995 FLHT, FLHTC, FLHTC Ultra, FLHTC Ultra-I, FLHTP (with Fairing or Windshield) and FLTC Ultra, DOMESTIC and INTERNATIONAL Models, Main Harness



1995 FLHT, FLHTC, FLHTC Ultra and FLHTC Ultra-I, DOMESTIC and INTERNATIONAL Models, Interconnect Harness

WD-7

1995 FLHT, FLHTC, FLHTC Ultra and FLHTC Ultra-I, DOMESTIC and INTERNATIONAL Models, Interconnect Harness

19007-95 SHEET 7

CHASSIS GROUNDS: FLTC-U,FLHT,FLHTC, FLHTC-U,FLHTCU-I,FLHTP-FRG/-WND

HANDLEBAR GROUND — (BK) P/N 70142-93 — TRIPLE CLAMP GROUND

STEERING HEAD GROUND — (BK) P/N 70101-94 — FRAME GROUND

TO INTERCONNECT HARNESS

(31B) 1 2 3 4 5 6 7 8 — (32B) A B C

GY/BK, V/BN, GY/BK, V/BN, BE, BK, BK, BK, BK

DOM ONLY

HDI ONLY

BROWN TAPE

VIOLET TAPE

RIGHT PASSING/PURSUIT LAMP

CLEAR (PASSING)
BLUE (POLICE PURSUIT ONLY)

GY/BK

RIGHT DIRECTIONAL /RUNNING LAMP

TURN — V/BN, BE, BK

DOM ONLY (RUNNING)

FRONT FENDERTIP LAMP

AMBER (DOM)
WHITE (HDI)

BK, BK

LEFT DIRECTIONAL /RUNNING LAMP

TURN — V/BN, BE, BK

DOM ONLY (RUNNING)

GY/BK

LEFT PASSING/PURSUIT LAMP

CLEAR (PASSING)
RED (POLICE PURSUIT ONLY)

FRONT FENDERTIP LAMP USED ON FLTC-U,FLHT,FLHTC, FLHTC-U,FLHTCU-I FLHTP-FRG,FLHTP-WND

FRONT LIGHT BAR ASSEMBLY USED ON FLHT,FLHTC, FLHTC-U,FLHTCU-I, FLHTP-FGR,FLHTP-WND

TO INTERCONNECT HARNESS (27B) 1 2 3 4 5 6 7 8 9 10 11 12

R/O, BK, O/BE, BE/Y, W/GN, GY/R, GN/BK, W/O, GN/W

TO INTERCONNECT HARNESS (28B) 1 2 3 4 5 6 7 8

PK/W, GY/GN, BN/BK, GN/BE, BN/W, GY/W, V/BK, O/BK

TO POD VIA 7 PIN DIN EXTENSION CABLE (USED ON ULTRA MODELS ONLY) (48B)

AM/FM RADIO ANTENNA (LOCATED ON LEFT SIDE OF TOURPAK)

ANTENNA CONNECTOR

(51A)(51B)

ANTENNA WIRE IS INCLUDED ON FLHT

AM/FM STEREO RADIO AND CASSETTE PLAYER

RADIO NOT INCLUDED ON FLHT,FLHTP-FRG,& FLHTP-WND

DOM P/N 76164-94A
HDI P/N 76178-94A
JAP P/N 76194-94A

RADIO GROUND WIRE-

FLHTC,FLHTC-U: GROUNDED AT TRIPLE CLAMP P/N 70341-94

FLTC-U: GROUNDED AT FAIRING BRACKET P/N 70168-89

FROM FLHTC-U SPEAKERS ON-OFF SWITCH

FROM FLTC-U SPEAKERS ON-OFF SWITCH

TO MAIN HARNESS (12B) C B A

BK, BE, R/Y

P/N 70643-94
P/N 70644-94

STOP

TAIL

TOURPAK RIGHT SIDE MARKER LIGHTS

NOTE: FLHTC DOES NOT INCLUDE REAR MARKER/STOP LIGHTS AND ASSOCIATED WIRING

ULTRA TOURPAK REAR MARKER/ STOP LIGHTS

P/N 70644-94
P/N 70643-94

TOURPAK HARNESS
FLHTC P/N 70646-94
FLTC-U,FLHTC-U P/N 70648-94

TOURPAK LEFT SIDE MARKER LIGHTS

TOURPAK NOT INCLUDED ON FLHT,FLHTP-FRG/-WND

(20B) 1 2 3 4 5 6 7 8

W, O/W, GY, V, GN/Y, BN, PK, BK

TO INTERCONNECT HARNESS

BE/BK, BK/R, GN/R, BK/Y, W/GN, Y/W

POLICE ONLY

TO INTERCONNECT HARNESS

(21B)

E.F.I. ONLY

NOTE:
THE "FUEL" LIGHT,"ENGINE" LIGHT, DIODE,LOW FUEL L.E.D.CONTROL P.C.B., AND ALL ASSOCIATED WIRES ARE INCLUDED ONLY ON ELECTRONIC FUEL INJECTED (E.F.I.) MODELS.

INSTRUMENT GAUGE CLUSTER

LEFT TURN INDICATOR — W/GN, BK/R, V, BK

RIGHT TURN INDICATOR — BN, BK, PK, BK/Y

O/W OIL GN/Y
O/W NEUTRAL GY
O/W HI BEAM W

REED SWITCH

SPEEDO

TACH

E F

CARBURETED ONLY

E.F.I. ONLY

GN/R, BE/BK — CRUISE — O/W — BK

ENGINE

FUEL

LOW FUEL L.E.D. CONTROL P.C.B.

DIODE

POLICE ONLY

"PURSUIT" IF POLICE VEHICLE

COLOR CODE:

LT.GN	LIGHT GREEN				
BE	BLUE	GY	GRAY	TN	TAN
BK	BLACK	O	ORANGE	V	VIOLET
BN	BROWN	PK	PINK	W	WHITE
GN	GREEN	R	RED	Y	YELLOW

CABLE COLOR — XX/XX — STRIPE COLOR

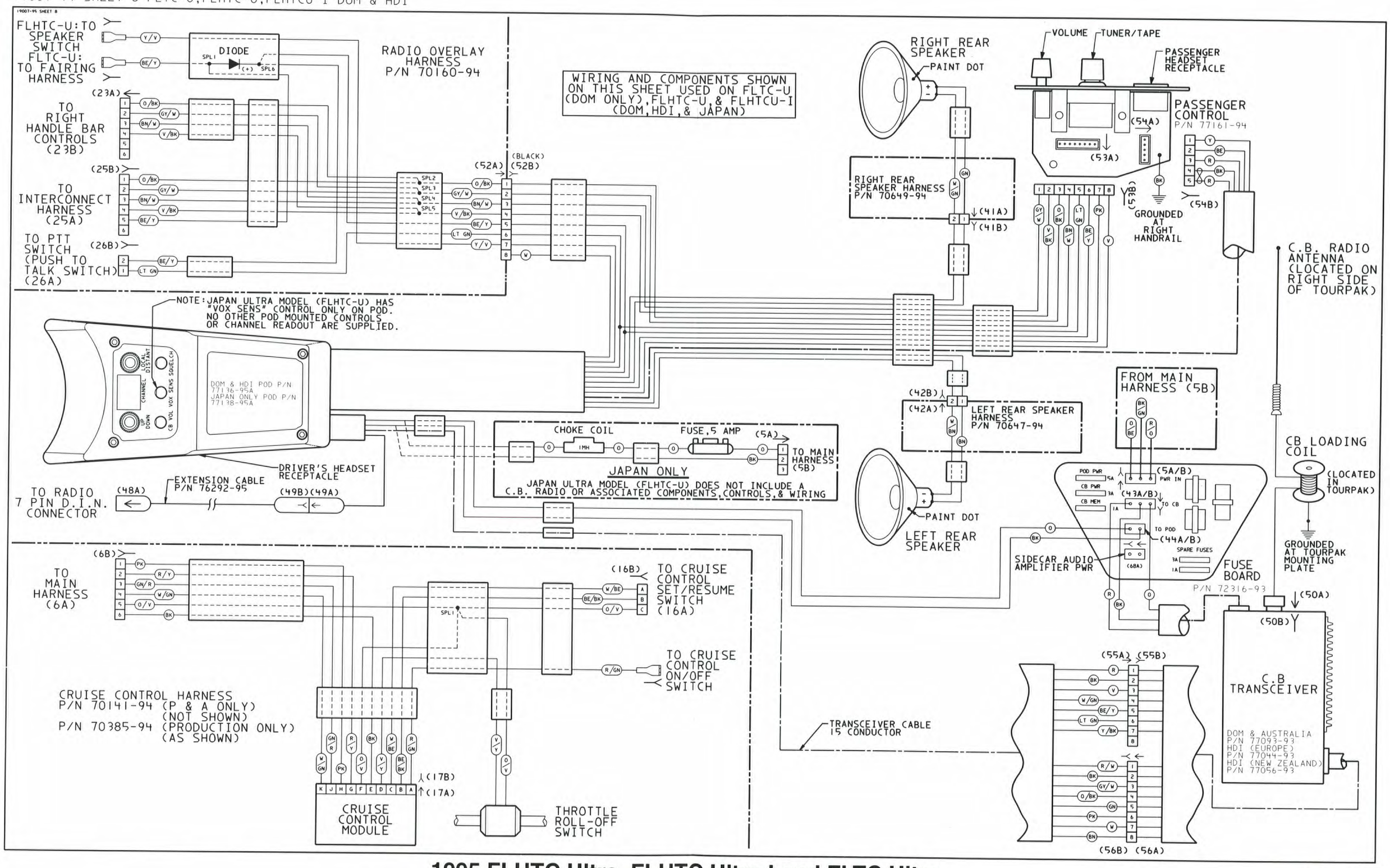
WINDOW:MVFF

1995 FLHT, FLHTC, FLHTC Ultra, FLHTC Ultra-I, FLHTP (with Fairing or Windshield) and FLTC Ultra, DOMESTIC and INTERNATIONAL Models, Radio, Front Lights, Instruments and Tour Pak

1995 FLHT, FLHTC, FLHTC Ultra, FLHTC Ultra-I, FLHTP (with Fairing or Windshield) and FLTC Ultra, DOMESTIC and INTERNATIONAL Models, Radio, Front Lights, Instruments and Tour Pak

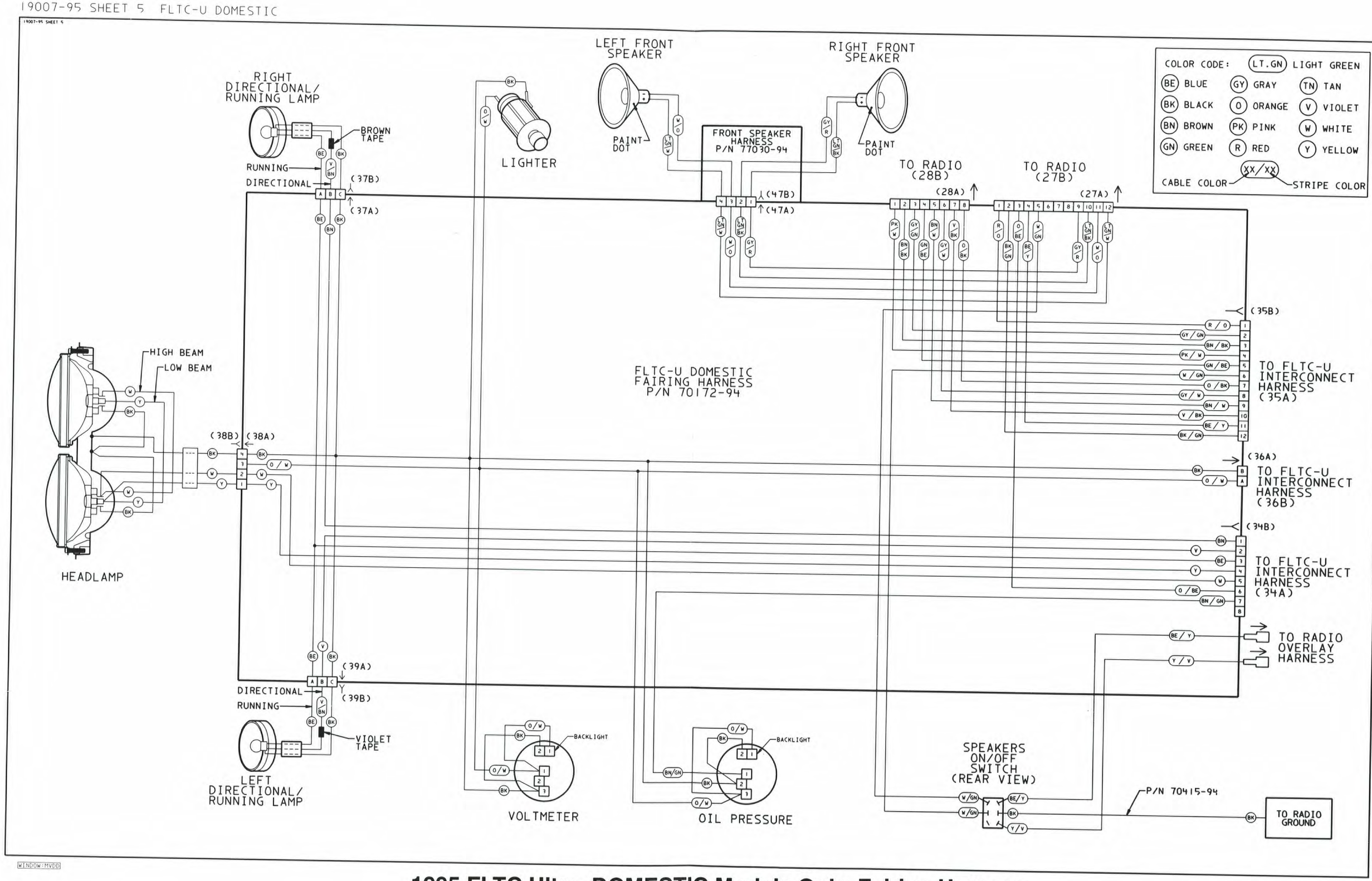
1995 FLHT, FLHTC, FLHTC Ultra, FLHTC Ultra-I, FLHTP (with Fairing or Windshield) and FLTC Ultra, DOMESTIC and INTERNATIONAL Models, Ignition Harness and Engine Management Circuitry

1995 FLHT, FLHTC, FLHTC Ultra, FLHTC Ultra-I, FLHTP (with Fairing or Windshield) and FLTC Ultra, DOMESTIC and INTERNATIONAL Models, Ignition Harness and Engine Management Circuitry



1995 FLHTC Ultra, FLHTC Ultra-I and FLTC Ultra, DOMESTIC and INTERNATIONAL Models, CB/Intercom, Cruise

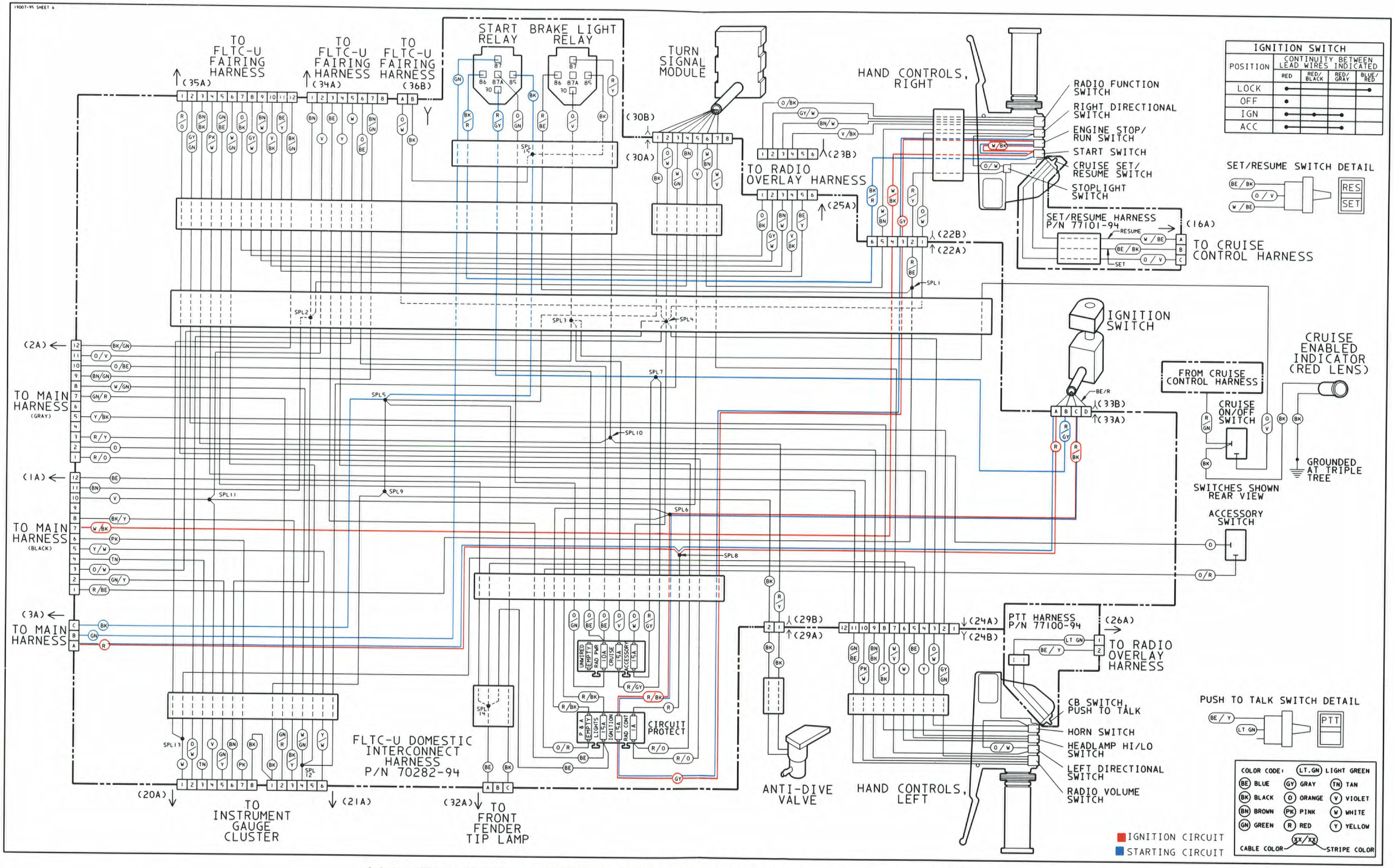
1995 FLHTC Ultra, FLHTC Ultra-I and FLTC Ultra, DOMESTIC and INTERNATIONAL Models, CB/Intercom, Cruise



WINDOW=MVDD

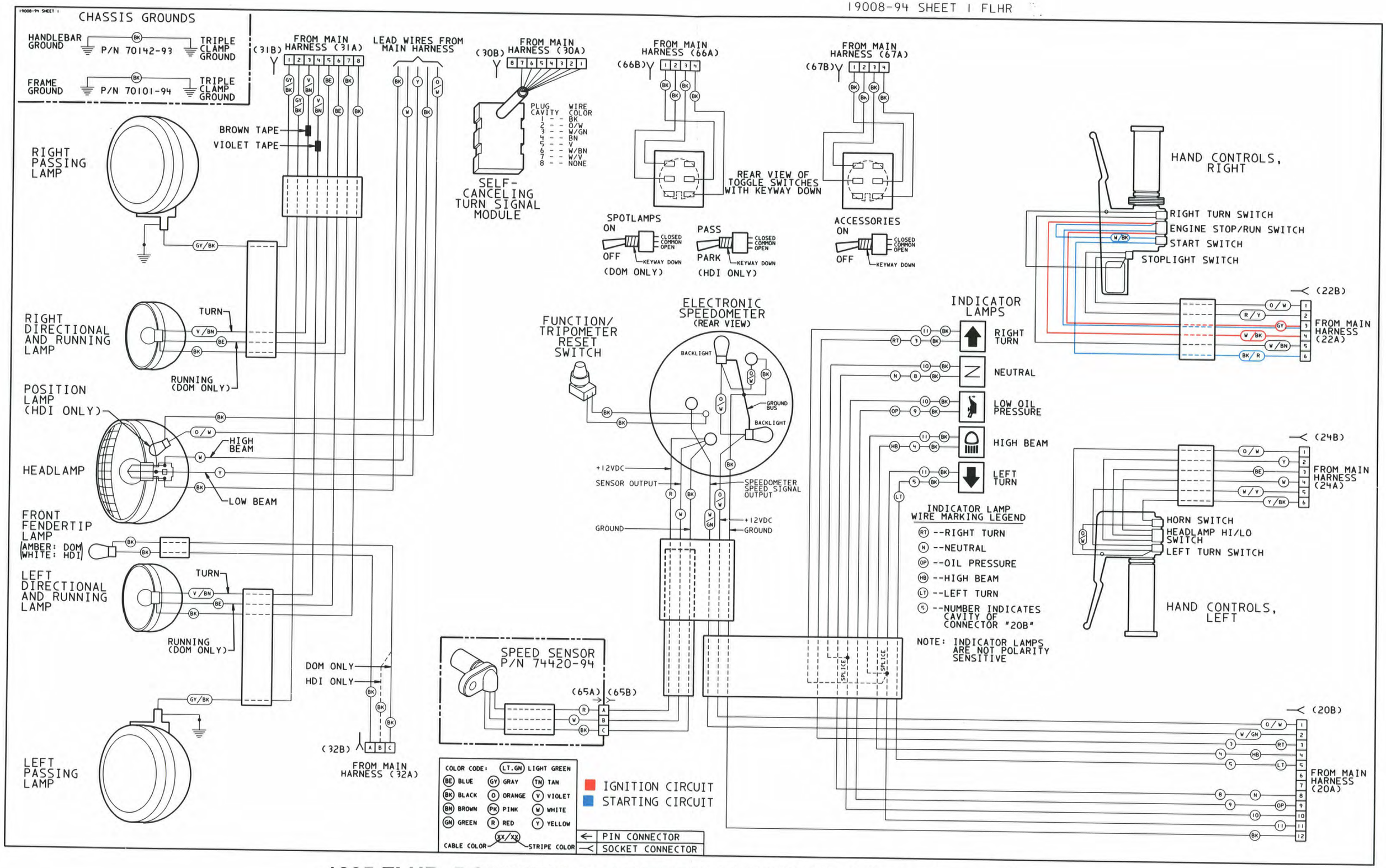
1995 FLTC Ultra, DOMESTIC Models Only, Fairing Harness

1995 FLTC Ultra, DOMESTIC Models Only, Fairing Harness

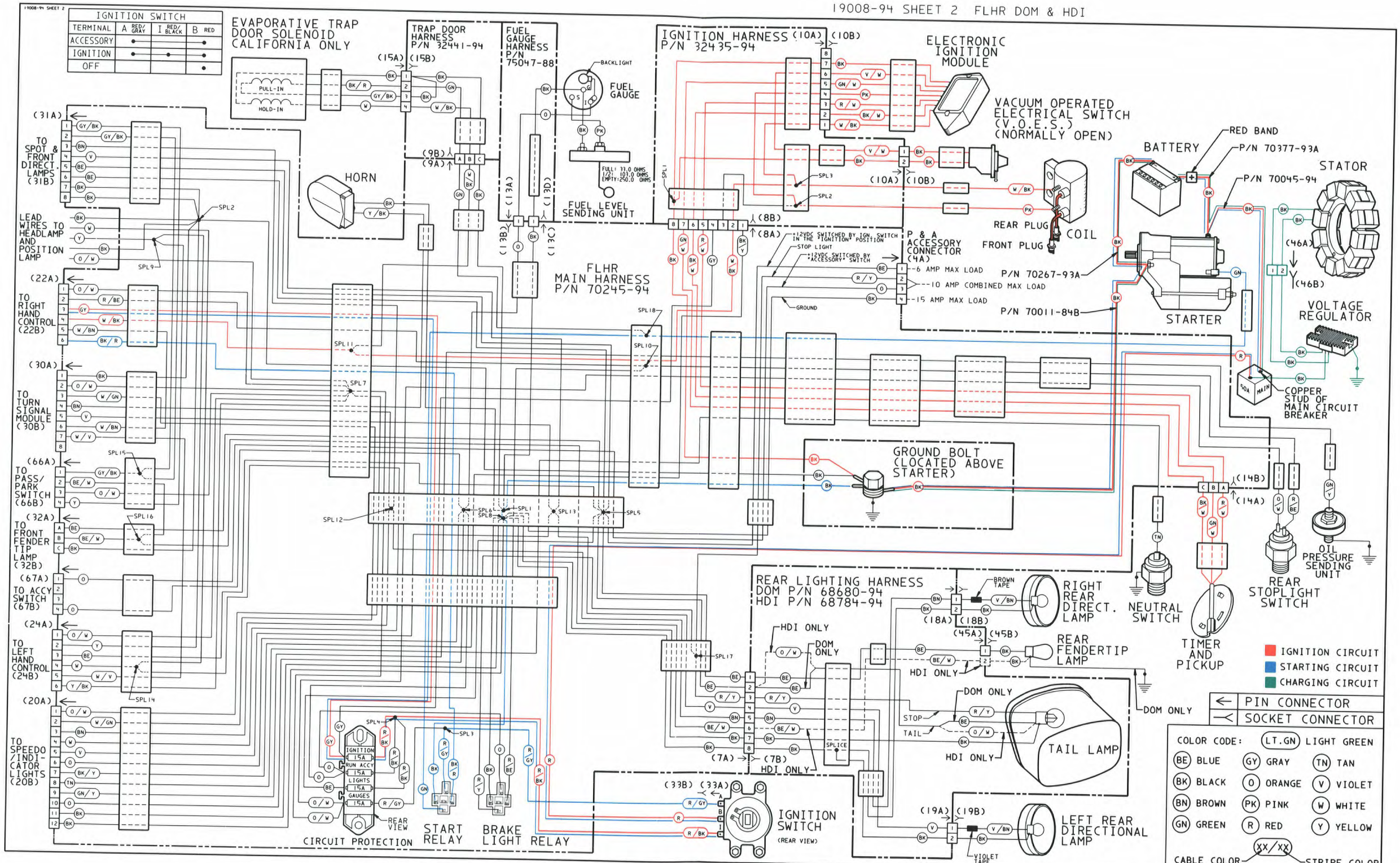


1995 FLTC Ultra, DOMESTIC Models Only, Interconnect Harness

1995 FLTC Ultra, DOMESTIC Models Only, Interconnect Harness


19008-94 SHEET 1
CHASSIS GROUNDS
HANDLEBAR GROUND
P/N 70142-93
TRIPLE CLAMP GROUND
FRAME GROUND
P/N 70101-94
TRIPLE CLAMP GROUND
FROM MAIN HARNESS (31A)
(31B)
LEAD WIRES FROM MAIN HARNESS
FROM MAIN HARNESS (30A)
(30B)
PLUG CAVITY WIRE COLOR
1 -- BK
2 -- O/W
3 -- W/GN
4 -- BN
5 -- V
6 -- W/BN
7 -- W/V
8 -- NONE
SELF-CANCELING TURN SIGNAL MODULE
FROM MAIN HARNESS (66A)
(66B)
FROM MAIN HARNESS (67A)
(67B)
REAR VIEW OF TOGGLE SWITCHES WITH KEYWAY DOWN
SPOTLAMPS
ON
OFF
(DOM ONLY)
PASS
PARK
(HDI ONLY)
ACCESSORIES
ON
OFF
CLOSED
COMMON
OPEN
KEYWAY DOWN
HAND CONTROLS, RIGHT
RIGHT TURN SWITCH
ENGINE STOP/RUN SWITCH
START SWITCH
STOPLIGHT SWITCH
(22B)
FROM MAIN HARNESS (22A)
RIGHT PASSING LAMP
BROWN TAPE
VIOLET TAPE
GY/BK
RIGHT DIRECTIONAL AND RUNNING LAMP
TURN
RUNNING (DOM ONLY)
POSITION LAMP (HDI ONLY)
HEADLAMP
HIGH BEAM
LOW BEAM
FRONT FENDERTIP LAMP
AMBER: DOM
WHITE: HDI
LEFT DIRECTIONAL AND RUNNING LAMP
DOM ONLY
HDI ONLY
(32B)
FROM MAIN HARNESS (32A)
LEFT PASSING LAMP
FUNCTION/ TRIPOMETER RESET SWITCH
ELECTRONIC SPEEDOMETER
(REAR VIEW)
BACKLIGHT
GROUND BUS
+12VDC
SENSOR OUTPUT
SPEEDOMETER SPEED SIGNAL OUTPUT
GROUND
SPEED SENSOR P/N 74420-94
(65A)
(65B)
INDICATOR LAMPS
RIGHT TURN
NEUTRAL
LOW OIL PRESSURE
HIGH BEAM
LEFT TURN
INDICATOR LAMP WIRE MARKING LEGEND
RT --RIGHT TURN
N --NEUTRAL
OP --OIL PRESSURE
HB --HIGH BEAM
LT --LEFT TURN
5 --NUMBER INDICATES CAVITY OF CONNECTOR "20B"
NOTE: INDICATOR LAMPS ARE NOT POLARITY SENSITIVE
SPLICE
(24B)
FROM MAIN HARNESS (24A)
HORN SWITCH
HEADLAMP HI/LO SWITCH
LEFT TURN SWITCH
HAND CONTROLS, LEFT
(20B)
FROM MAIN HARNESS (20A)
COLOR CODE:
LT.GN LIGHT GREEN
BE BLUE
GY GRAY
TN TAN
BK BLACK
O ORANGE
V VIOLET
BN BROWN
PK PINK
W WHITE
GN GREEN
R RED
Y YELLOW
XX/XX
CABLE COLOR
STRIPE COLOR
IGNITION CIRCUIT
STARTING CIRCUIT
PIN CONNECTOR
SOCKET CONNECTOR

1995 FLHR,
DOMESTIC and INTERNATIONAL Models,
Instruments



1995 FLHR, DOMESTIC and INTERNATIONAL Models, Main Harness

1995 FLHR,
DOMESTIC and INTERNATIONAL Models,
Main Harness

19007-95 SHEET 2

COLOR CODE:

BE BLUE	GY GRAY	TN TAN	
BK BLACK	O ORANGE	V VIOLET	
BN BROWN	PK PINK	W WHITE	
GN GREEN	R RED	Y YELLOW	
LT.GN LIGHT GREEN			

CABLE COLOR (XX/XX) STRIPE COLOR

IGNITION CIRCUIT
STARTING CIRCUIT

IGNITION SWITCH				
POSITION	CONTINUITY BETWEEN LEAD WIRES INDICATED			
	RED	RED/BLACK	RED/GRAY	BLUE/RED
LOCK	•			•
OFF	•			
IGN	•	•	•	
ACC	•		•	

TO FRONT FENDER TIP LAMP
TO FRONT LIGHT BAR
IGNITION SWITCH
SELF-CANCELING TURN SIGNAL MODULE
HAND CONTROLS, RIGHT
AUX PURSUIT LAMP SWITCH
RIGHT DIRECTIONAL SWITCH
ENGINE STOP/RUN SWITCH
START SWITCH
STOPLIGHT SWITCH
TO MAIN HARNESS (1A) (BLACK)
TO MAIN HARNESS (2A) (GRAY)
FLHTP-FRG INTERCONNECT HARNESS P/N 69552-94
(32A) (31A) (33B) (33A) (30B) (30A) (22B) (22A)
SPL1 SPL2 SPL3 SPL4 SPL5 SPL7 SPL8 SPL9 SPL10 SPL11 SPL12 SPL13 SPL14
HEADLAMP
HIGH BEAM
LOW BEAM
MOVE Y/BK WIRE TO CAVITY 8 (AS SHOWN) IF USING WHELEN SIREN AMPLIFIER AND "AIR HORN" FUNCTION IS DESIRED.
(20A) TO INSTRUMENT GAUGE CLUSTER
(21A) TO INSTRUMENT GAUGE CLUSTER
CIRCUIT PROTECTION
POLICE 15A ACCESSORY 15A LIGHTS 15A IGNITION 15A
START RELAY
BRAKE LIGHT RELAY
ANTI-DIVE VALVE
(29B) (29A) (24A) (24B)
CLUTCH LOCKOUT SWITCH
SIREN ON/OFF SWITCH
HEADLAMP HI/LO SWITCH
LEFT DIRECTIONAL SWITCH
HORN/SIREN SWITCH
HAND CONTROLS, LEFT
PURSUIT FLASHER
TO OPTIONAL LIGHTER
(3A) TO MAIN HARNESS

1995 FLHTP (with Fairing), DOMESTIC Models, Interconnect Harness

1995 FLHTP (with Fairing), DOMESTIC Models, Interconnect Harness

19007-95 SHEET 3

COLOR CODE: (LT.GN) LIGHT GREEN
(BE) BLUE (GY) GRAY (TN) TAN
(BK) BLACK (O) ORANGE (V) VIOLET
(BN) BROWN (PK) PINK (W) WHITE
(GN) GREEN (R) RED (Y) YELLOW
CABLE COLOR (XX/XX) STRIPE COLOR

IGNITION CIRCUIT
STARTING CIRCUIT

IGNITION SWITCH				
POSITION	CONTINUITY BETWEEN LEAD WIRES INDICATED			
	RED	RED/BLACK	RED/GRAY	BLUE/RED
LOCK	•			•
OFF	•			
IGN	•	•	•	
ACC	•		•	

TO FRONT FENDER TIP LAMP
(32A) C B A
BK BE

CIRCUIT PROTECTION
POLICE 15A
ACCESSORY 15A
LIGHTS 15A
IGNITION 15A

IGNITION SWITCH
BE/R
(33B) A B C D
(33A)

HAND CONTROLS, RIGHT
AUX PURSUIT LAMP SWITCH
RIGHT DIRECTIONAL SWITCH
ENGINE STOP/RUN SWITCH
START SWITCH
STOPLIGHT SWITCH

SELF-CANCELING TURN SIGNAL MODULE
(30B) 1 2 3 4 5 6 7 8
(30A)

PURSUIT FLASHER
P L X

(22B) 12 11 10 9 8 7 6 5 4 3 2 1
(22A)

(31A)
1 GY/BN
2 GY/V
3 BN
4 V
5 BE
6 BE
7 BK
8 BK

TO FRONT LIGHT BAR

SPL1 SPL2 SPL3 SPL4 SPL5 SPL6 SPL7 SPL8 SPL9 SPL10

FLHTP-WND INTERCONNECT HARNESS P/N 70308-94

HEADLAMP
HIGH BEAM W SPL12
Y SPL11
LOW BEAM BK SPL13

(1A) (BLACK)
1 R/BE
2 GN/Y
3 O/W
4 TN
5 Y/W
6 PK
7 W/BK
8 BK/Y
9
10 V
11 BN
12 BE

TO MAIN HARNESS

(2A) (GRAY)
1 PK/BK
2
3 R/Y
4
5 Y/BK
6
7 GN/R
8 Y/BK
9
10 TN/BK
11 O/V
12

TO MAIN HARNESS

(3A)
A R
B GN
C BK

TO MAIN HARNESS

MOVE Y/BK WIRE TO CAVITY 8 (AS SHOWN) IF USING WHELEN SIREN AMPLIFIER AND "AIR HORN" FUNCTION IS DESIRED

(20A) 1 2 3 4 5 6 7 8
W O/W TN V GN/Y BN PK BK

TO INSTRUMENT GAUGE CLUSTER

(21A) 1 2 3 4 5 6
BK GN/R BK/Y W/GN W/V Y/W

TO INSTRUMENT GAUGE CLUSTER

(29B) 2 1
(29A)
BK
BK

ANTI-DIVE VALVE

(24A) 12 11 10 9 8 7 6 5 4 3 2 1
(24B)
BK/R PK/BK W/V BE O/W
BK/R TN/BK Y/BK W Y

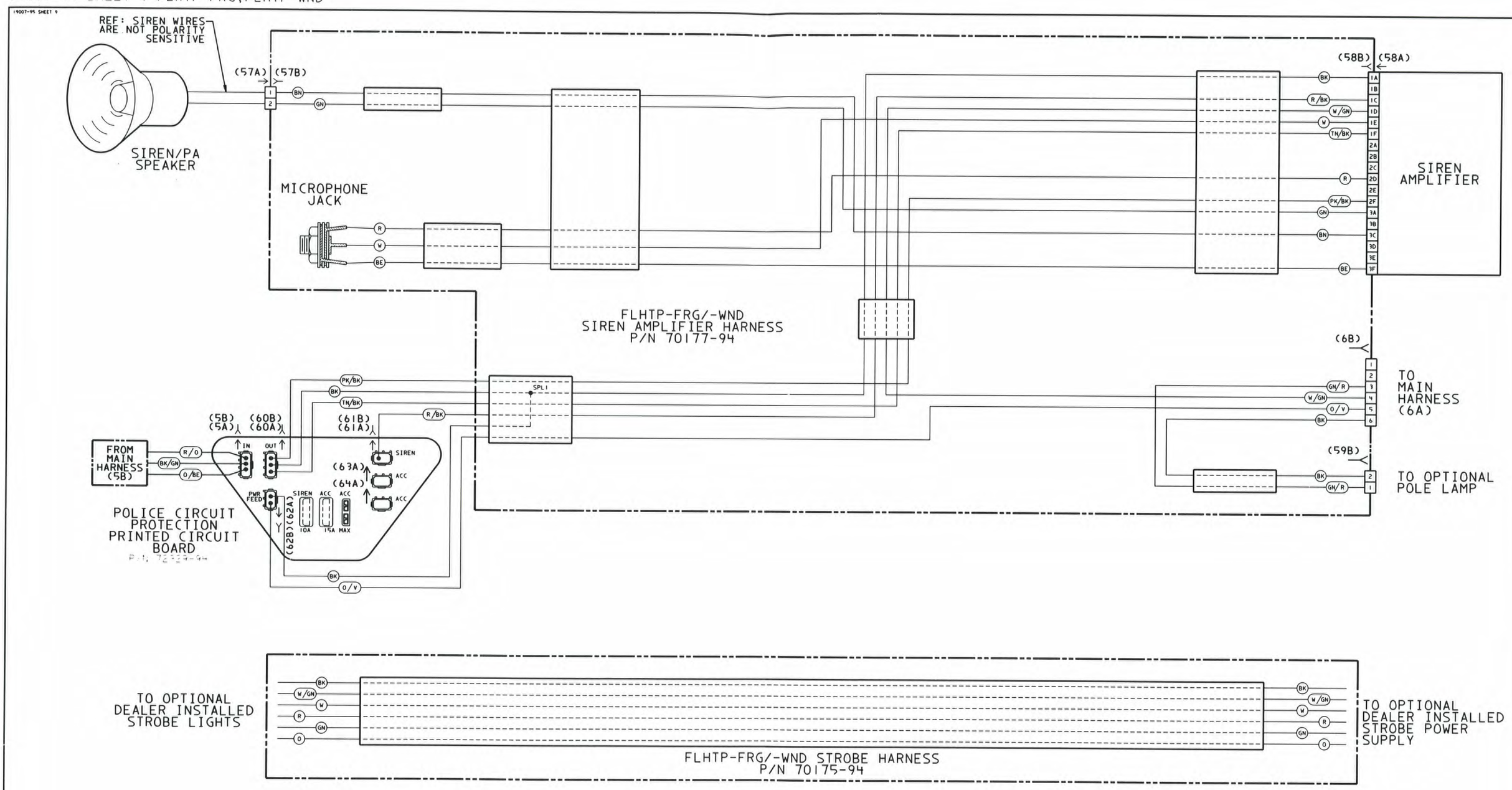
HAND CONTROLS, LEFT
CLUTCH LOCKOUT SWITCH
SIREN ON/OFF SWITCH
HEADLAMP HI/LO SWITCH
LEFT DIRECTIONAL SWITCH
HORN/SIREN SWITCH

START RELAY
BK/R GN R/GY BK
87 86 87A 85 30

BRAKE LIGHT RELAY
R/BE R/Y BE BK
87 86 87A 85 30

1995 FLHTP (with Windshield), DOMESTIC Models, Interconnect Harness

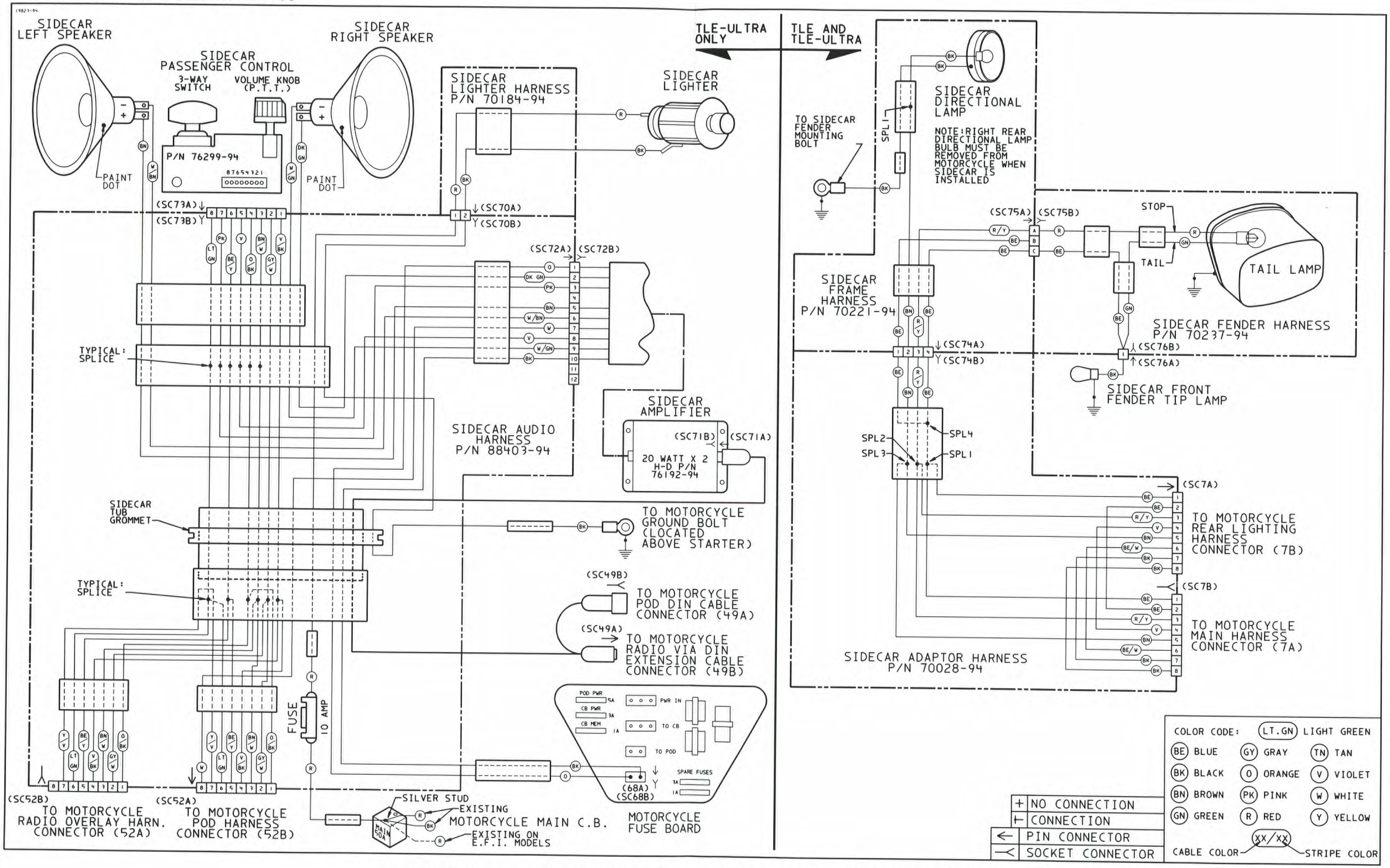
1995 FLHTP (with Windshield), DOMESTIC Models, Interconnect Harness



WINDOW:MVHH

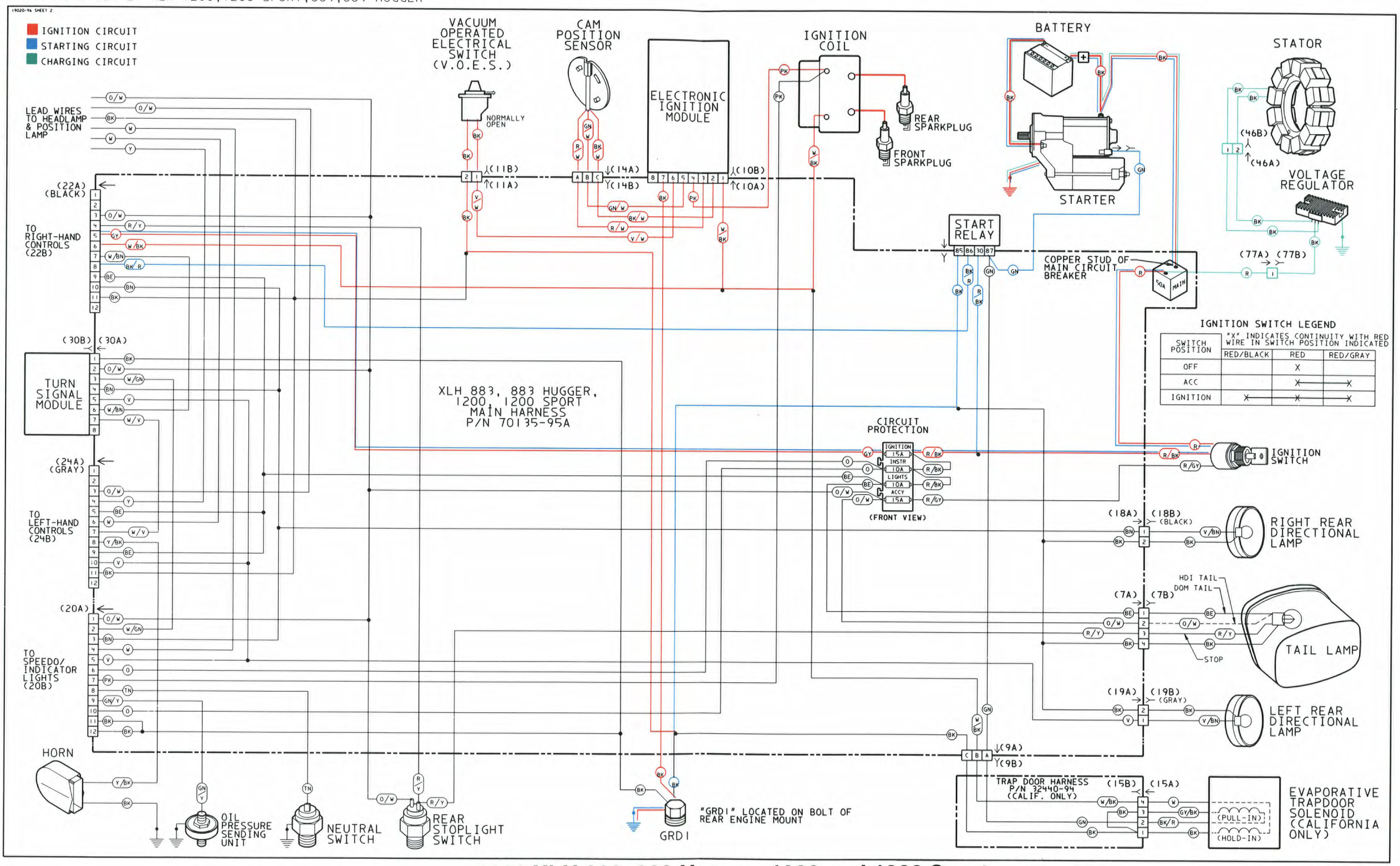
1995 FLHTP (with Fairing or Windshield), DOMESTIC Models, Siren and Strobe Harness

1995 FLHTP (with Fairing or Windshield), DOMESTIC Models, Siren and Strobe Harness



TLE Sidecar, Chassis, and TLE Ultra Sidecar, Audio Harness

TLE Sidecar, Chassis, and TLE Ultra Sidecar, Audio Harness



1996 XLH 883, 883 Hugger, 1200 and 1200 Sport, DOMESTIC and INTERNATIONAL Models, Main Harness

1996 XLH 883, 883 Hugger, 1200 and 1200 Sport, DOMESTIC and INTERNATIONAL Models, Main Harness

19020-96 SHEET 1

LEAD WIRES FROM MAIN HARNESS

HEADLAMP

HIGH BEAM

LOW BEAM

POSITION LAMP (HDI MODELS ONLY)

COLOR CODE: LT.GN LIGHT GREEN
BE BLUE GY GRAY TN TAN
BK BLACK O ORANGE V VIOLET
BN BROWN PK PINK W WHITE
GN GREEN R RED Y YELLOW
CABLE COLOR XX/XX STRIPE COLOR

IGNITION CIRCUIT
STARTING CIRCUIT

← PIN CONNECTOR
SOCKET CONNECTOR

HAND CONTROLS, RIGHT

RIGHT DIR SWITCH
ENGINE OFF/RUN SWITCH
START SWITCH
STOPLAMP SWITCH

RIGHT DIRECTIONAL AND DOM RUNNING LAMP

RUNNING (DOM ONLY)
TURN

(22B) (BLACK)

FROM MAIN HARNESS (22A)

FUNCTION/ TRIPOMETER RESET SWITCH

ELECTRONIC SPEEDOMETER (REAR VIEW)

BACKLIGHT
GROUND BUS

SPEED SENSOR

+12VDC
SENSOR OUTPUT
GROUND

(65A) (65B)

SPEED SIGNAL OUTPUT
+12VDC
GROUND

INDICATOR LAMPS

RIGHT TURN
LOW OIL PRESSURE
NEUTRAL
HIGH BEAM
LEFT TURN

INDICATOR LAMP WIRE MARKING LEGEND

RT --RIGHT TURN
N --NEUTRAL
OP --OIL PRESSURE
HB --HIGH BEAM
LT --LEFT TURN
⊕ --POSITIVE VOLTAGE
⊖ --NEGATIVE VOLTAGE

ALL INDICATOR LAMPS HAVE BLACK WIRES WITH IMPRINTED FUNCTION/WIRE COLOR

LEFT DIRECTIONAL AND DOM RUNNING LAMP

RUNNING (DOM ONLY)
TURN

(24B) (GRAY)

FROM MAIN HARNESS (24A)

HORN SWITCH
LIGHTS HI/LOW SWITCH
LEFT DIR. SWITCH

HAND CONTROLS, LEFT

TACHOMETER (XLH 1200 & 1200 SPORT ONLY)
(REAR VIEW)

BACKLIGHT
BUSBAR
STUD

+12VDC
TACH SIGNAL INPUT
GROUND

XLH 1200 AND 1200 SPORT ONLY

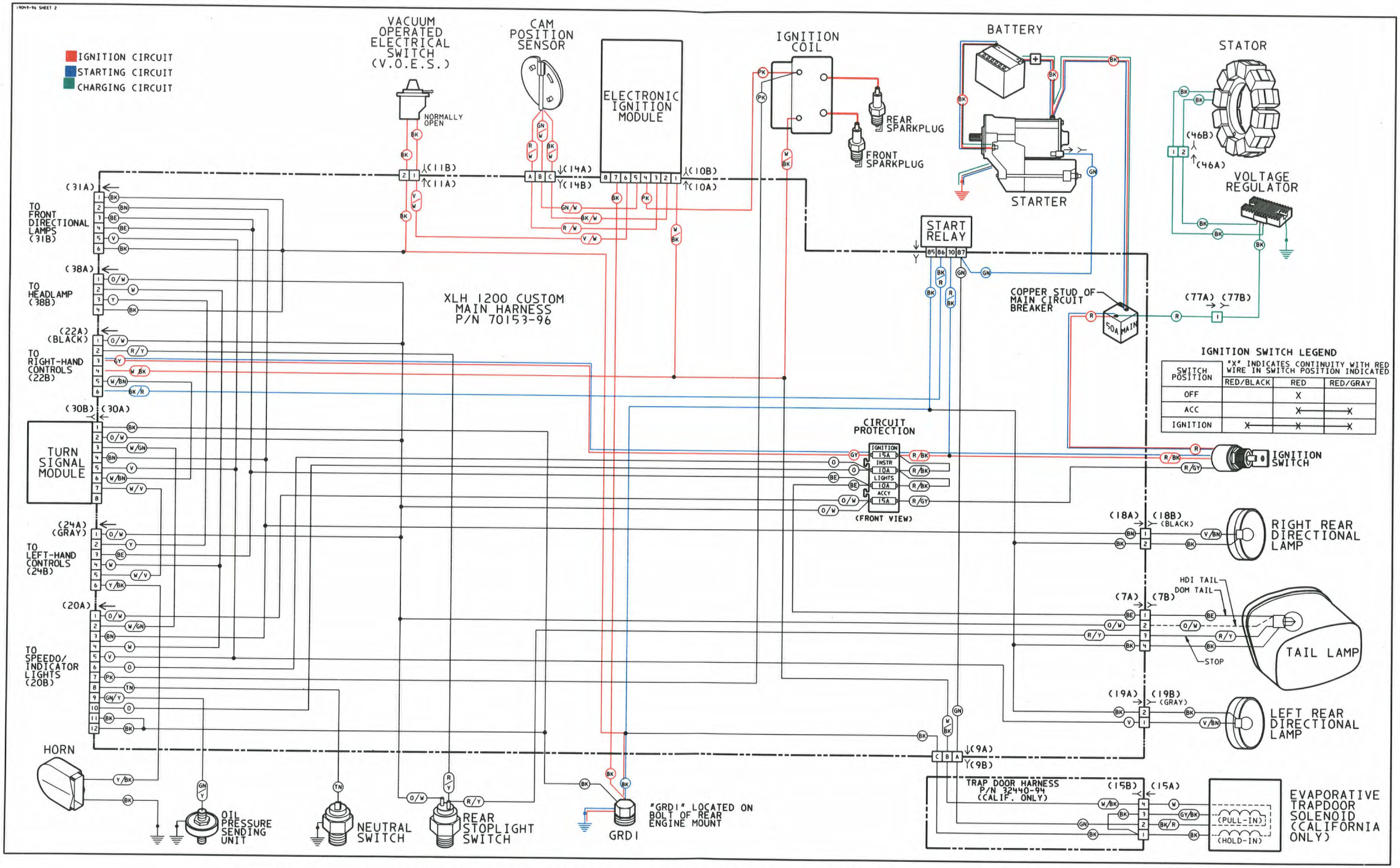
(20B)

FROM MAIN HARNESS (20A)

1996 XLH 883, 883 Hugger, 1200 and 1200 Sport, DOMESTIC and INTERNATIONAL Models, Lighting, Handlebar Controls and Instruments

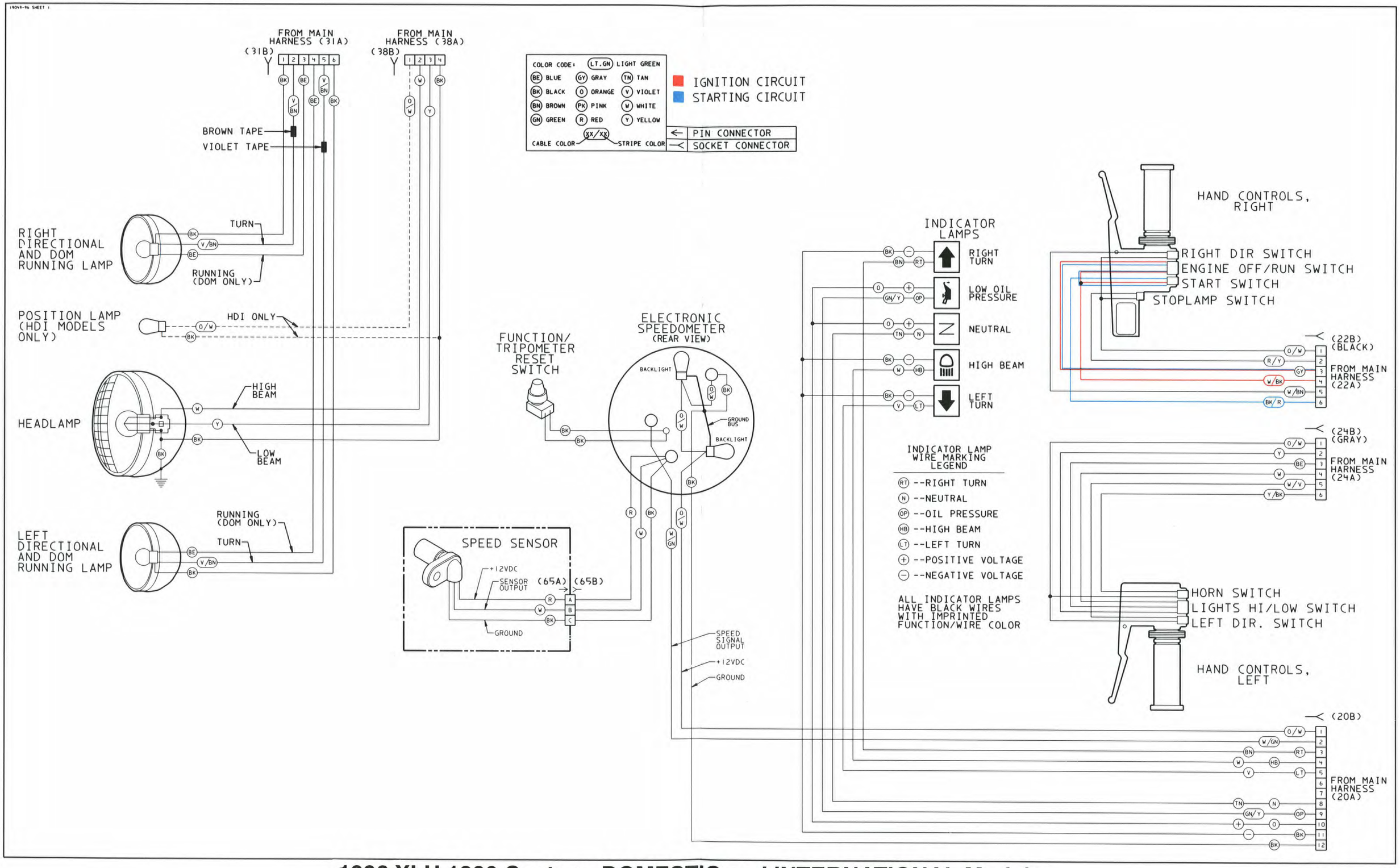
WD-20

1996 XLH 883, 883 Hugger, 1200 and 1200 Sport, DOMESTIC and INTERNATIONAL Models, Lighting, Handlebar Controls and Instruments



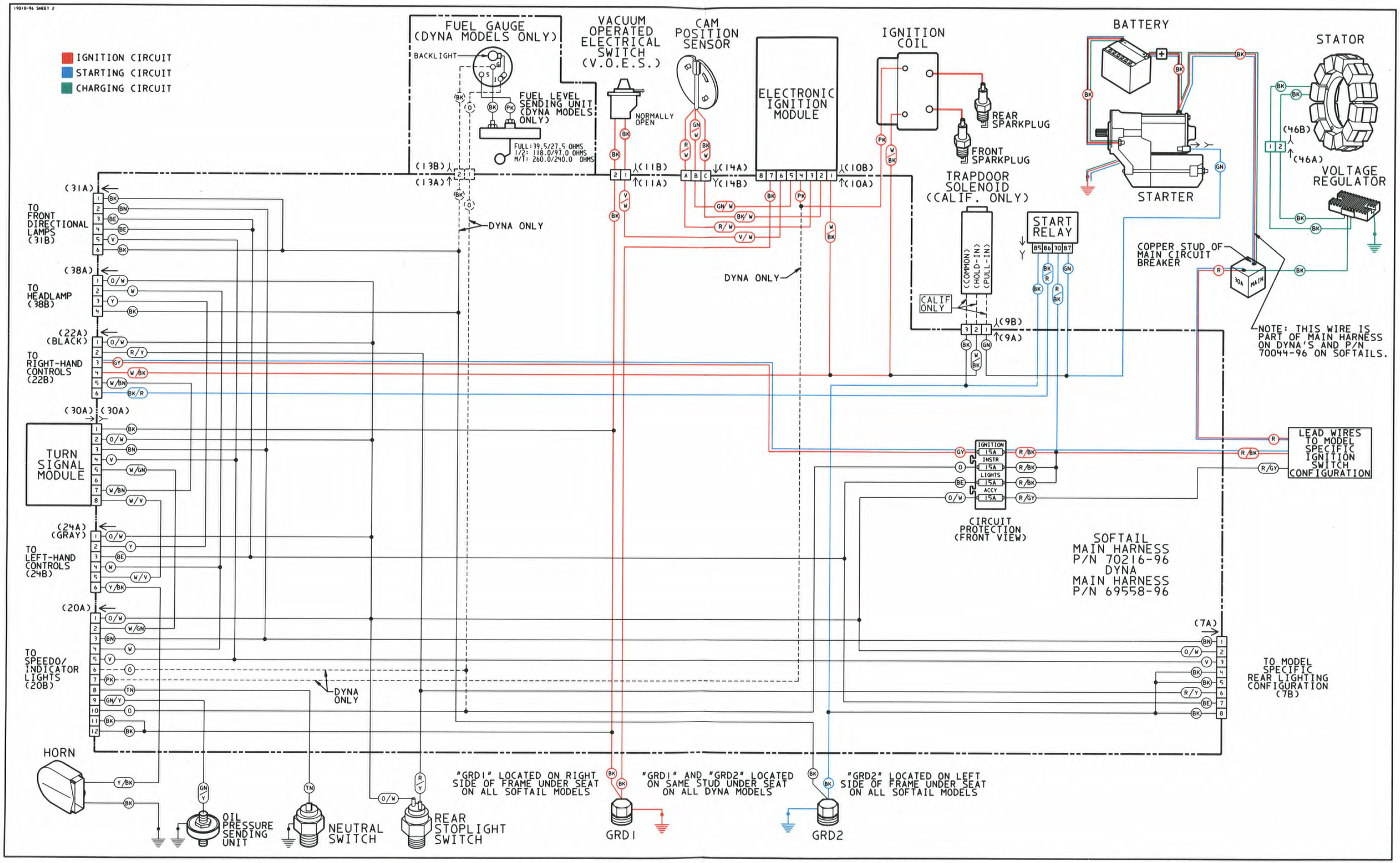
1996 XLH 1200 Custom, DOMESTIC and INTERNATIONAL Models, Main Harness

1996 XLH 1200 Custom, DOMESTIC and INTERNATIONAL Models, Main Harness



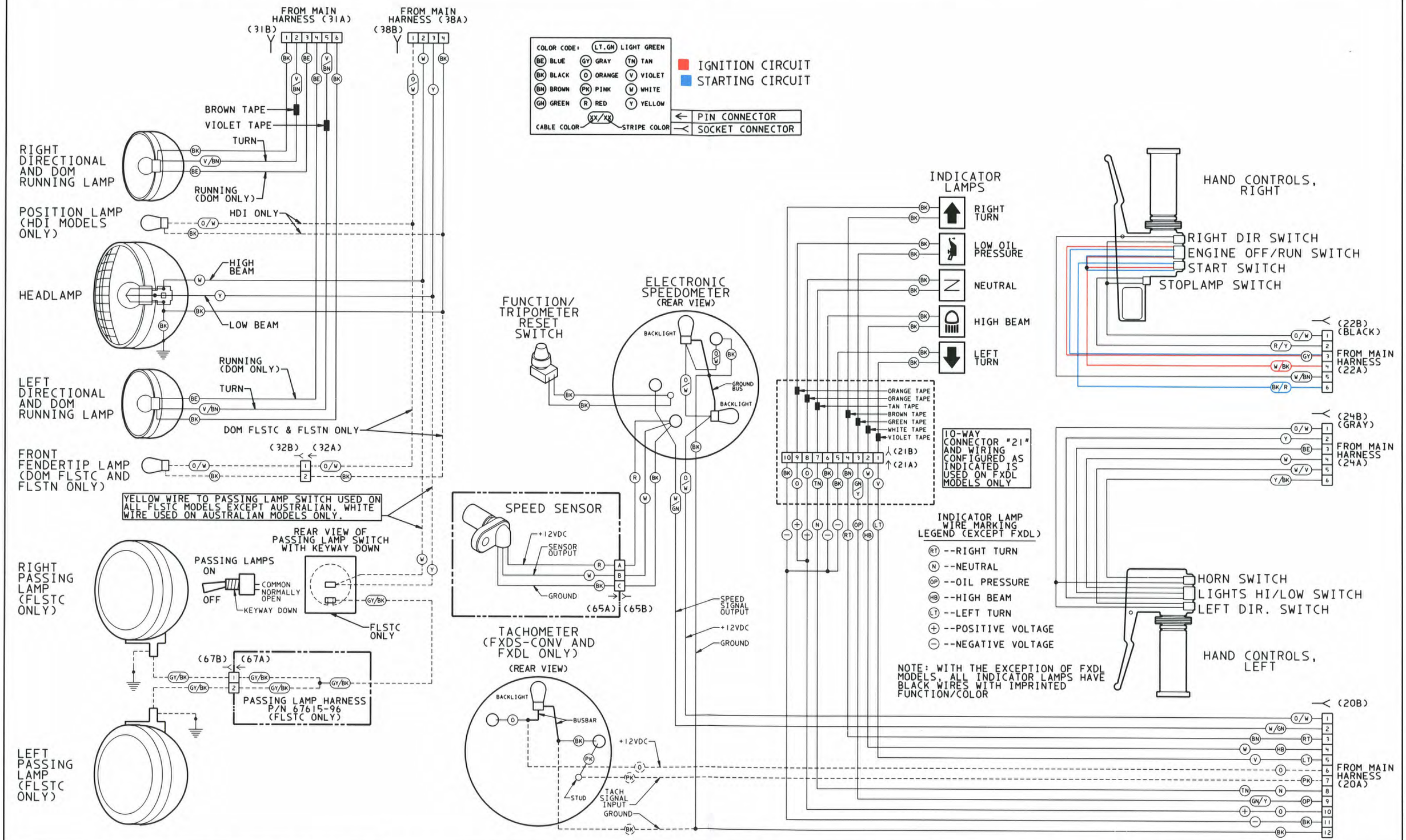
1996 XLH 1200 Custom, DOMESTIC and INTERNATIONAL Models,
Lighting, Handlebar Controls and Instruments

1996 XLH 1200 Custom, DOMESTIC and INTERNATIONAL Models, Lighting, Handlebar Controls and Instruments



1996 FLSTN, FLSTC, FXSTC, FXSTS, FLSTF, FXSTSB, FXDWG, FXD, FXDL and FXDS-CONV, DOMESTIC and INTERNATIONAL Models, Main Harness

1996 FLSTN, FLSTC, FXSTC, FXSTS, FLSTF, FXSTSB, FXDWG, FXD, FXDL and FXDS-CONV, DOMESTIC and INTERNATIONAL Models, Main Harness



1996 FLSTN, FLSTC, FXSTC, FXSTS, FLSTF, FXSTSB, FXDWG, FXD, FXDL and FXDS-CONV, DOMESTIC and INTERNATIONAL Models, Front Lighting, Handlebar Controls and Instruments

WD-24

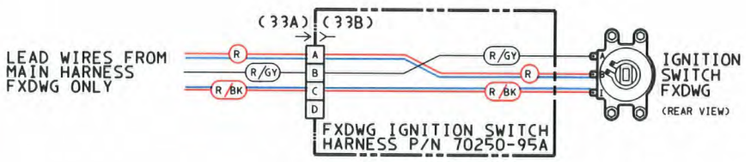
1996 FLSTN, FLSTC, FXSTC, FXSTS, FLSTF, FXSTSB, FXDWG, FXD, FXDL and FXDS-CONV, DOMESTIC and INTERNATIONAL Models, Front Lighting, Handlebar Controls and Instruments

19010-96 SHEET 3

IGNITION SWITCH CONFIGURATIONS

ALL SOFTAILS

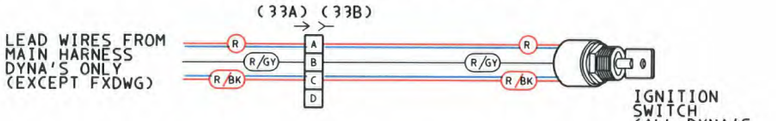
FXDWG



IGNITION SWITCH LEGEND
ALL SOFTAILS AND FXDWG

SWITCH POSITION	*X* INDICATES CONTINUITY WITH RED WIRE IN SWITCH POSITION INDICATED		
	RED/BLACK	RED	RED/GRAY
IGNITION	X	X	X
LOCK		X	
ACCESSORIES		X	X

ALL DYNA'S EXCEPT FXDWG



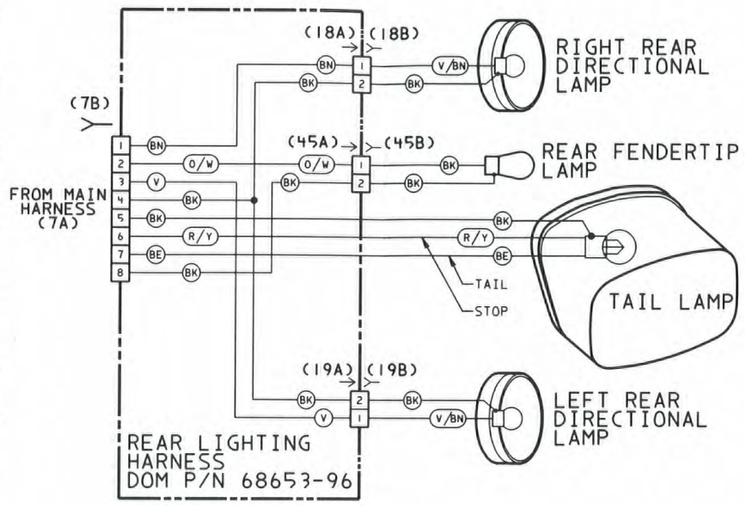
IGNITION SWITCH LEGEND
ALL DYNA'S EXCEPT FXDWG

SWITCH POSITION	*X* INDICATES CONTINUITY WITH RED WIRE IN SWITCH POSITION INDICATED		
	RED/BLACK	RED	RED/GRAY
OFF		X	
ACC		X	X
IGNITION	X	X	X

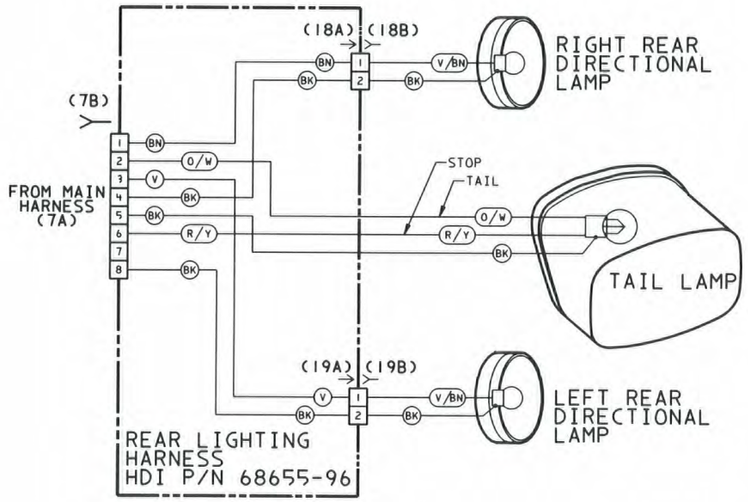
IGNITION CIRCUIT
STARTING CIRCUIT

REAR LIGHTING CONFIGURATIONS

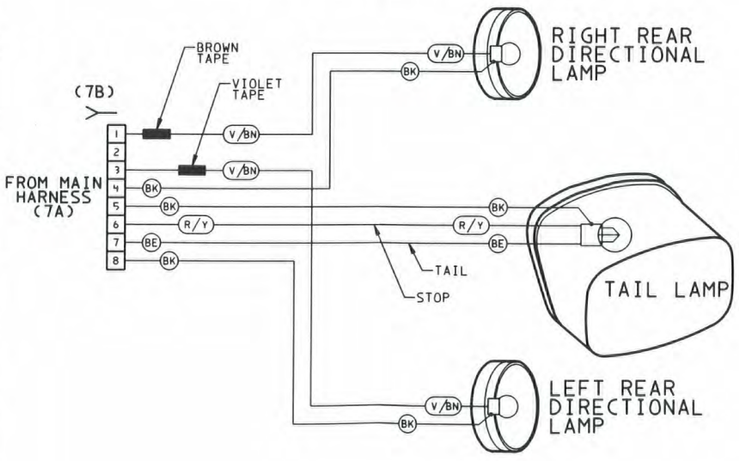
REAR LIGHTING, DOM FLSTC & FLSTN



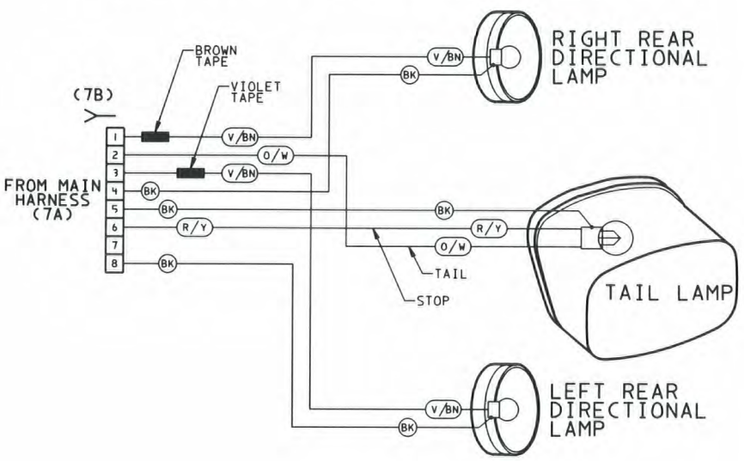
REAR LIGHTING, HDI FLSTC & FLSTN



REAR LIGHTING, ALL DOM DYNA'S AND SOFTAIL'S EXCEPT FLSTC & FLSTN

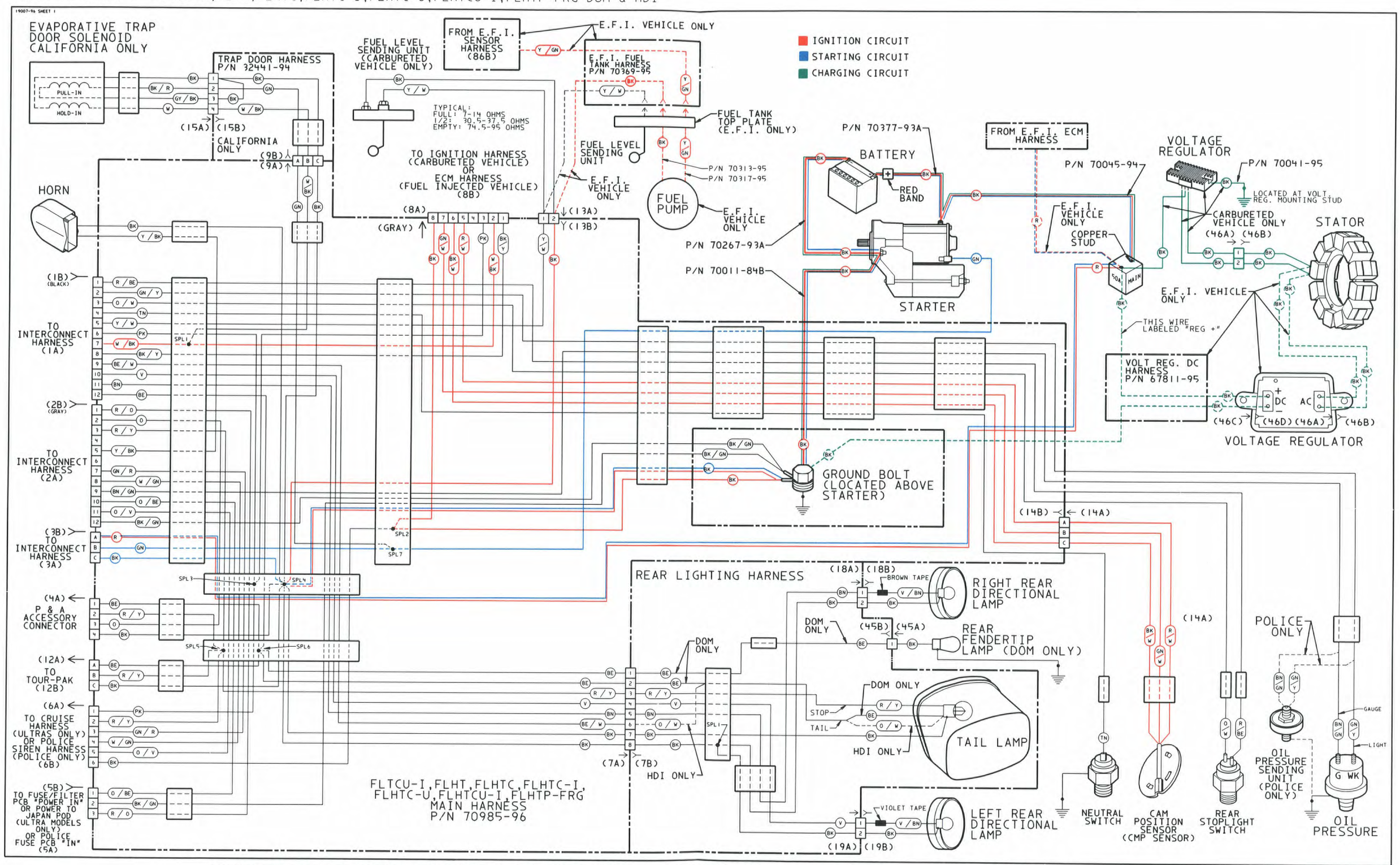


REAR LIGHTING, ALL HDI DYNA'S AND SOFTAIL'S EXCEPT FLSTC & FLSTN



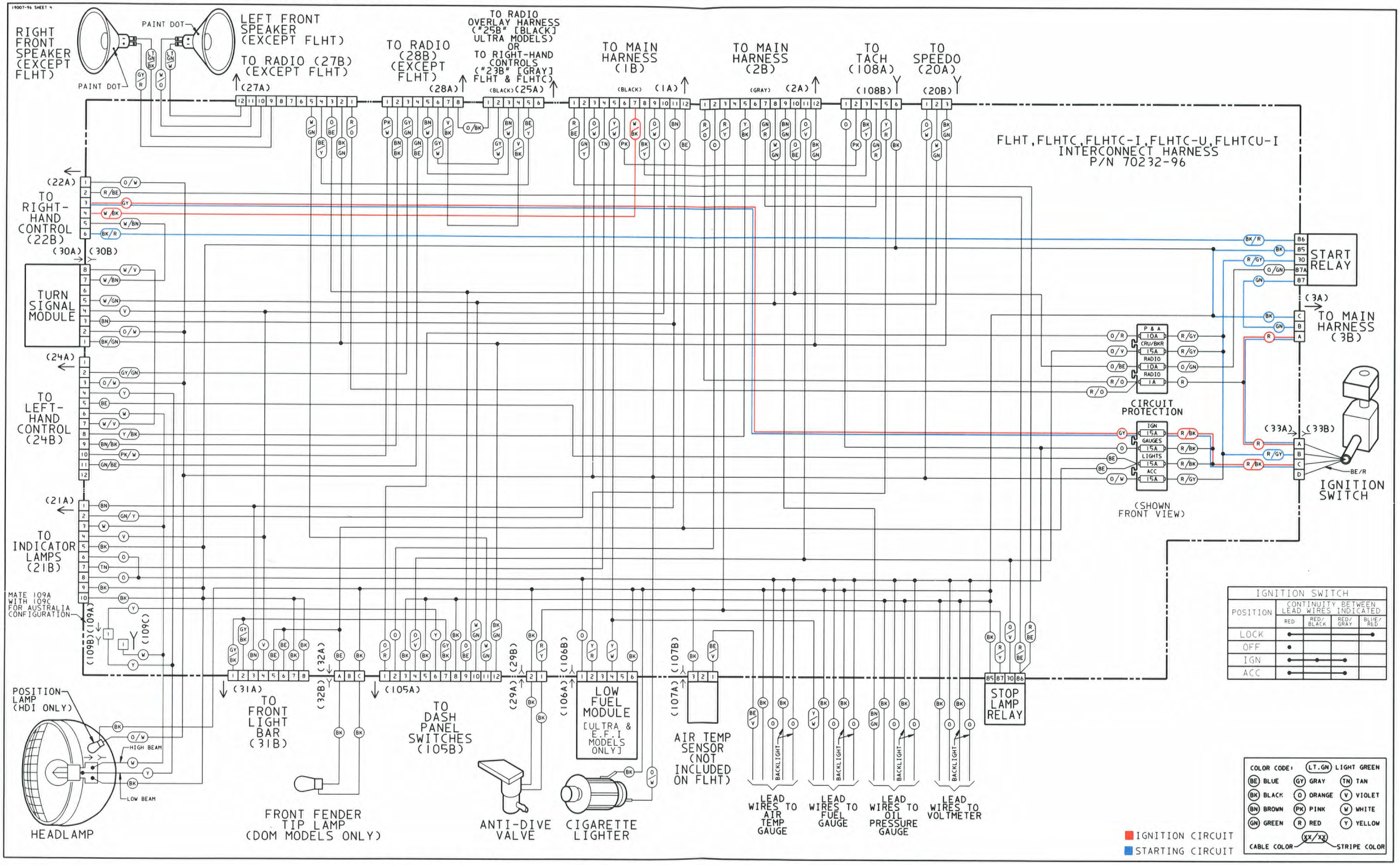
1996 FLSTN, FLSTC, FXSTC, FXSTS, FLSTF, FXSTSB, FXDWG, FXD, FXDL and FXDS-CONV, DOMESTIC and INTERNATIONAL Models, Rear Lighting and Ignition Switch Configurations

1996 FLSTN, FLSTC, FXSTC, FXSTS, FLSTF, FXSTSB, FXDWG, FXD, FXDL and FXDS-CONV, DOMESTIC and INTERNATIONAL Models, Rear Lighting and Ignition Switch Configurations



1996 FLHT, FLHTC, FLHTC-I, FLHTC Ultra, FLHTC Ultra-I, FLHTP and FLTC Ultra-I, DOMESTIC and INTERNATIONAL Models, Main Harness

1996 FLHT, FLHTC, FLHTC-I, FLHTC Ultra, FLHTC Ultra-I, FLHTP and FLTC Ultra-I, DOMESTIC and INTERNATIONAL Models, Main Harness



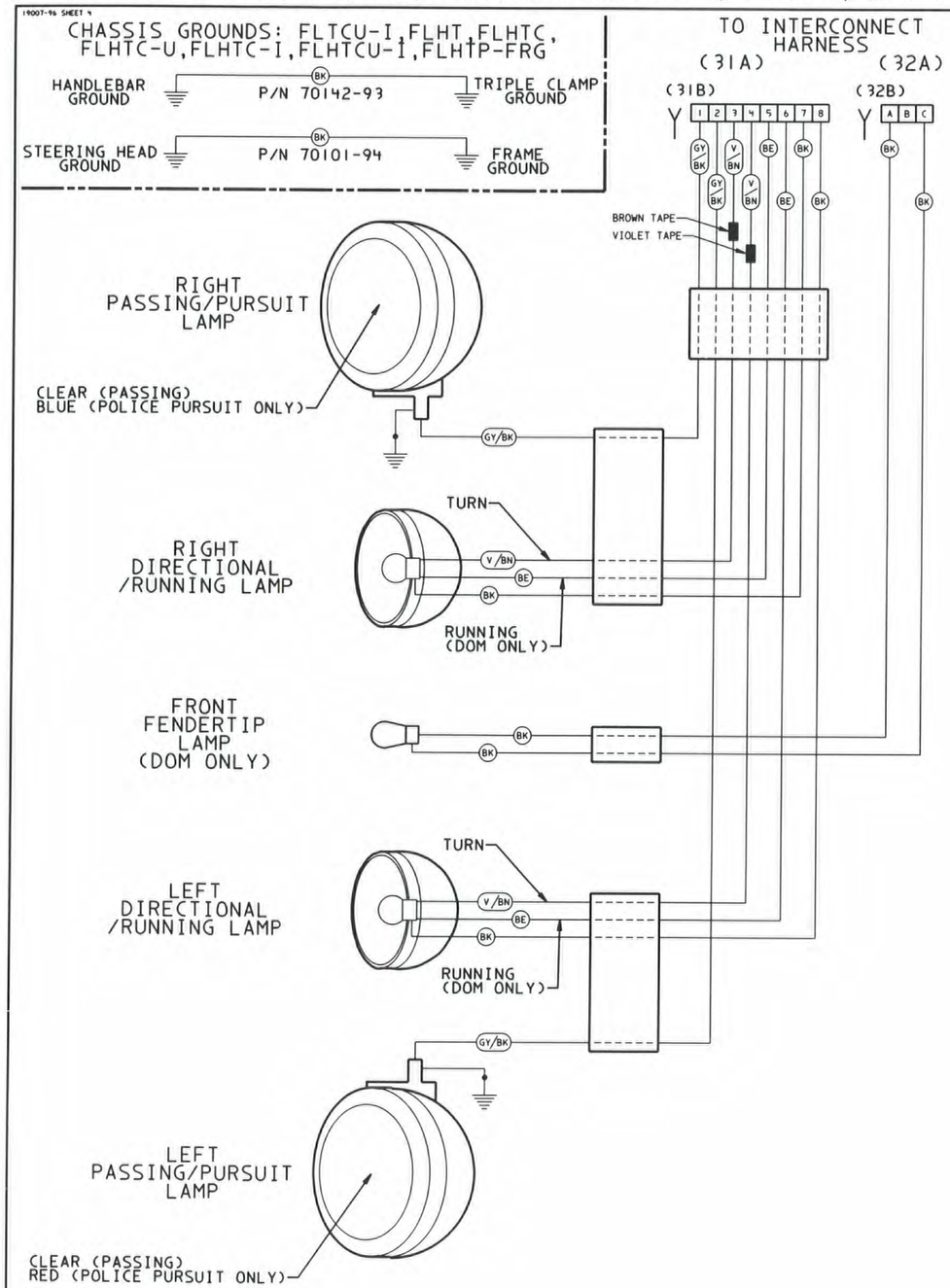
1996 FLHT, FLHTC, FLHTC-I, FLHTC Ultra and FLHTC Ultra-I, DOMESTIC and INTERNATIONAL Models, Interconnect Harness

WD-27

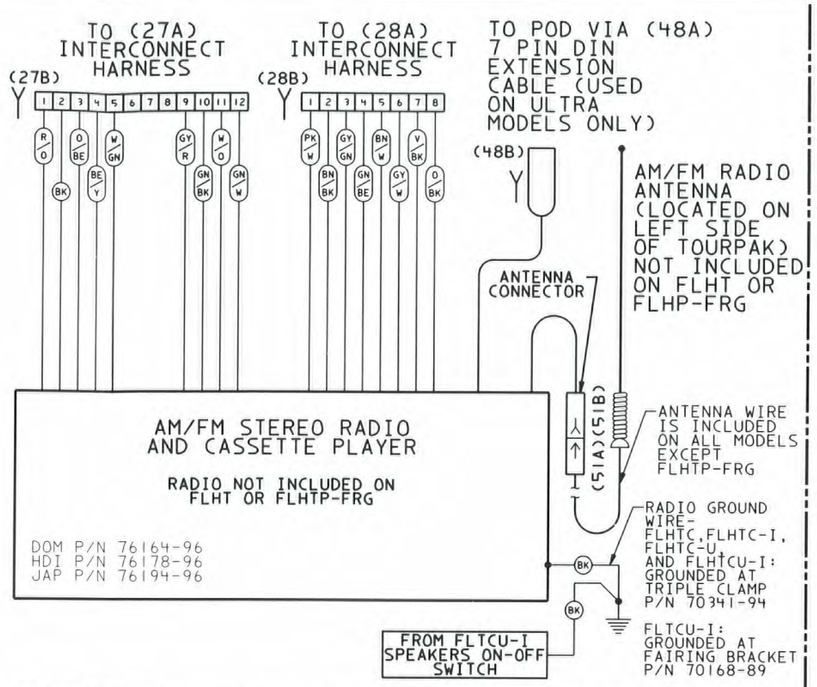
1996 FLHT, FLHTC, FLHTC-I, FLHTC Ultra and FLHTC Ultra-I, DOMESTIC and INTERNATIONAL Models, Interconnect Harness

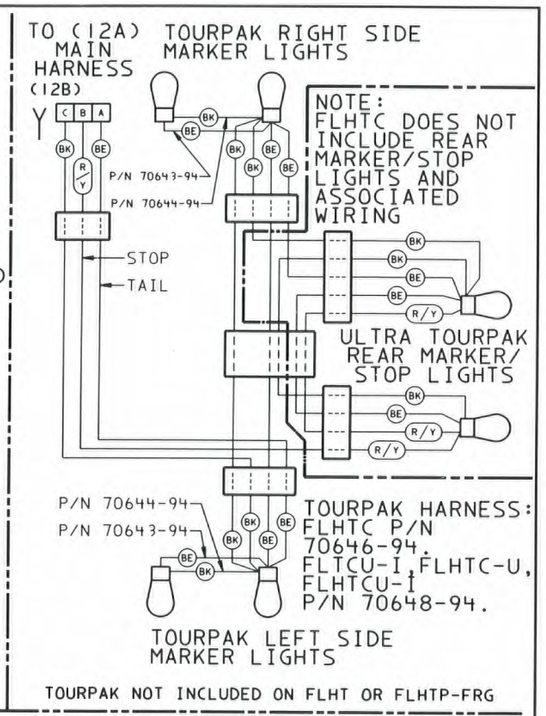
19007-96 SHEET 4

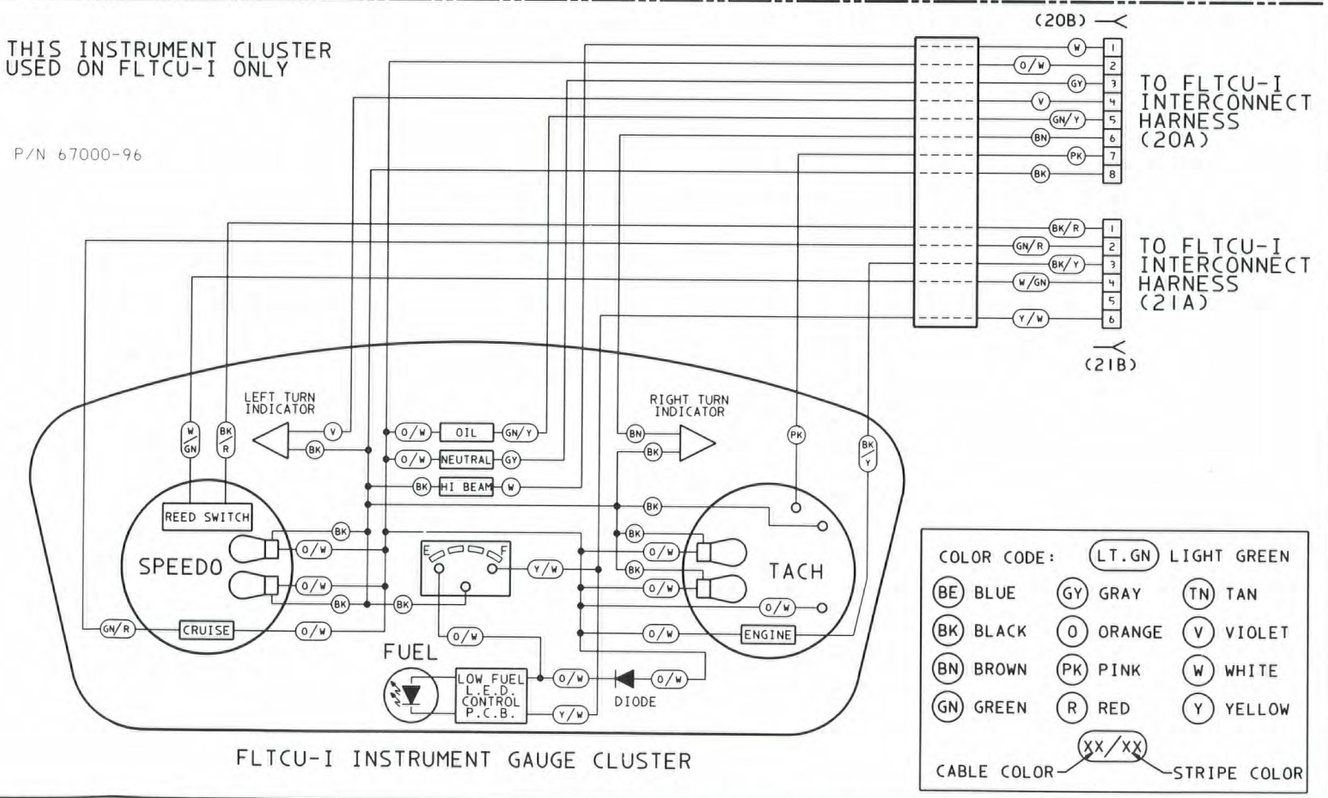
CHASSIS GROUNDS: FLTCU-I,FLHT,FLHTC, FLHTC-U,FLHTC-I,FLHTCU-I,FLHTP-FRG



THIS FRONT LIGHTING CONFIGURATION USED ON FLHT,FLHTC,FLHTC-U,FLHTC-I,FLHTCU-I, AND FLHTP-FRG





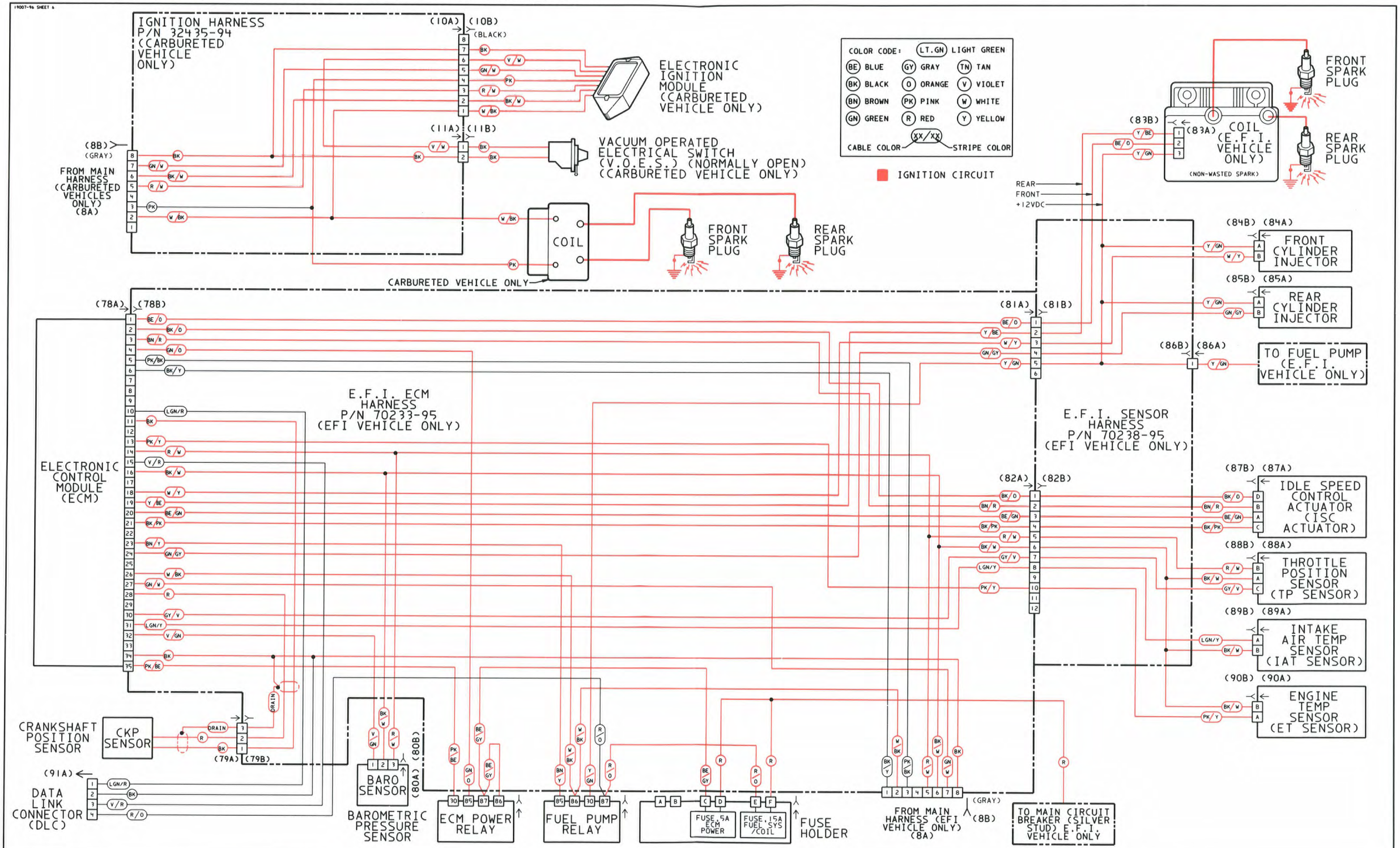


FLTCU-I INSTRUMENT GAUGE CLUSTER

1996 FLHT, FLHTC, FLHTC-I, FLHTC Ultra, FLHTC Ultra-I, FLHTP and FLTC Ultra-I, DOMESTIC and INTERNATIONAL Models, Radio, Front Lights, Instruments and Tour Pak

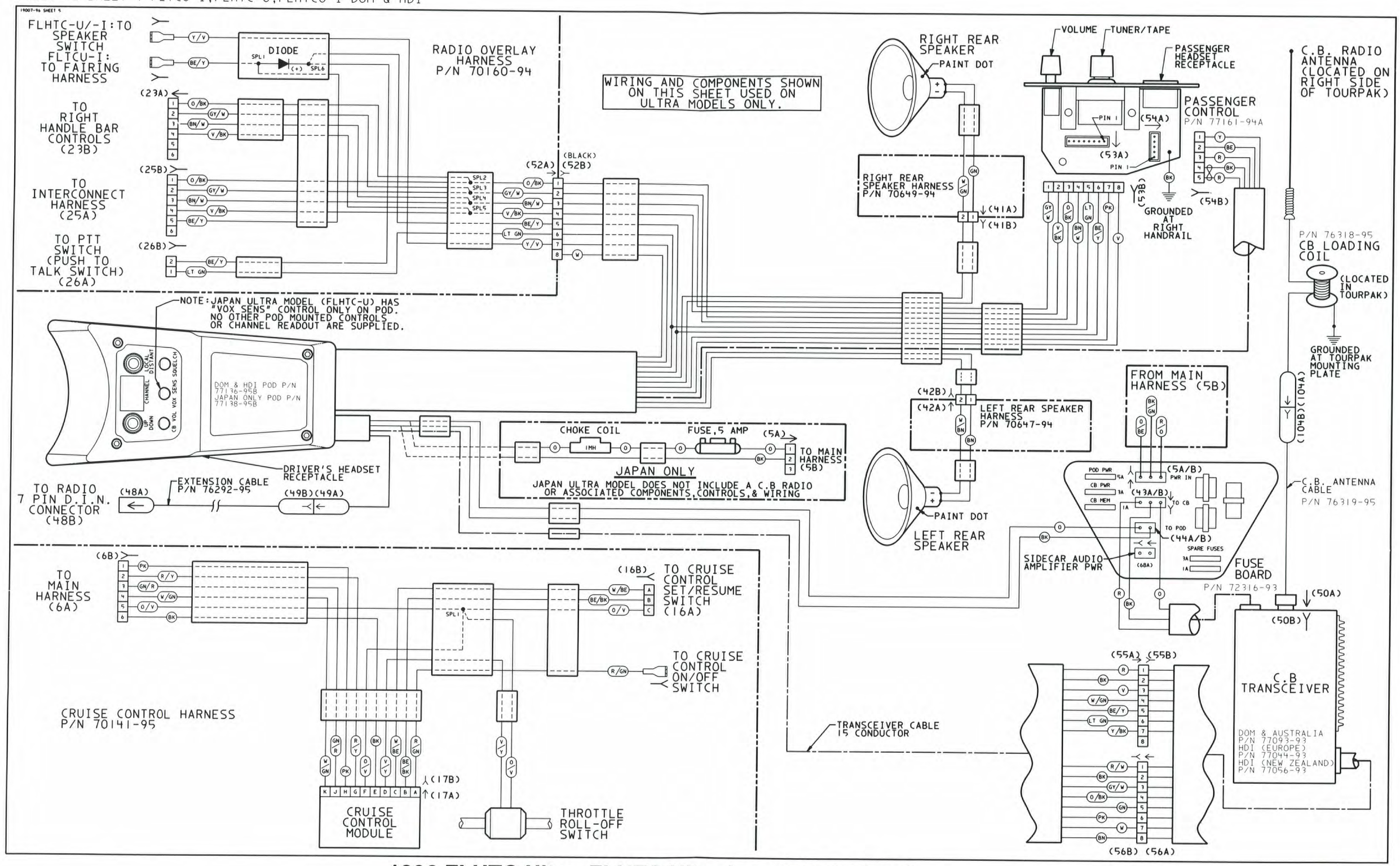
WD-28

1996 FLHT, FLHTC, FLHTC-I, FLHTC Ultra, FLHTC Ultra-I, FLHTP and FLTC Ultra-I, DOMESTIC and INTERNATIONAL Models, Radio, Front Lights, Instruments and Tour Pak



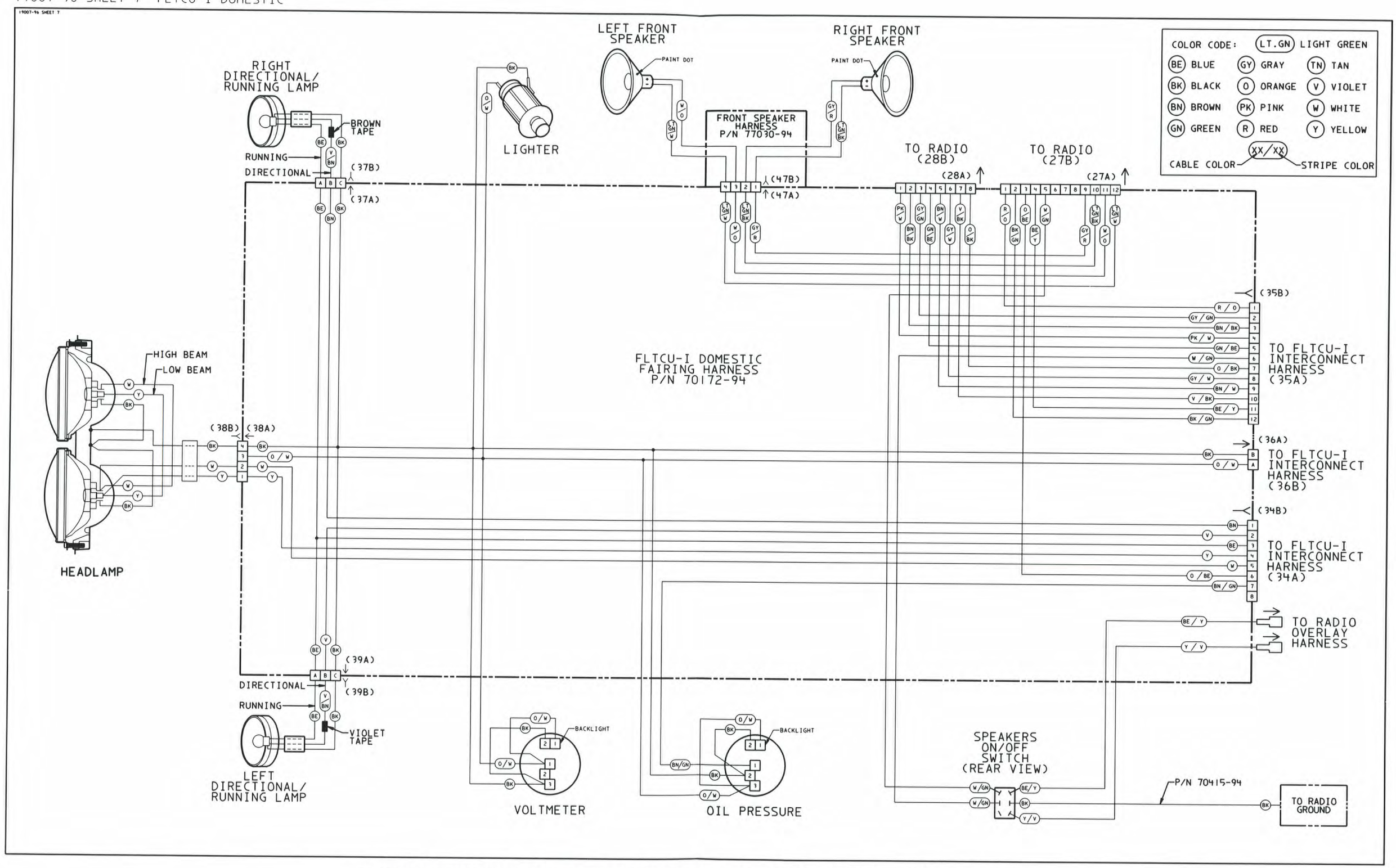
1996 FLHT, FLHTC, FLHTC-I, FLHTC Ultra, FLHTC Ultra-I, FLHTP and FLTC Ultra-I, DOMESTIC and INTERNATIONAL Models, Ignition Harness and Engine Management Circuitry

1996 FLHT, FLHTC, FLHTC-I, FLHTC Ultra, FLHTC Ultra-I, FLHTP and FLTC Ultra-I, DOMESTIC and INTERNATIONAL Models, Ignition Harness and Engine Management Circuitry

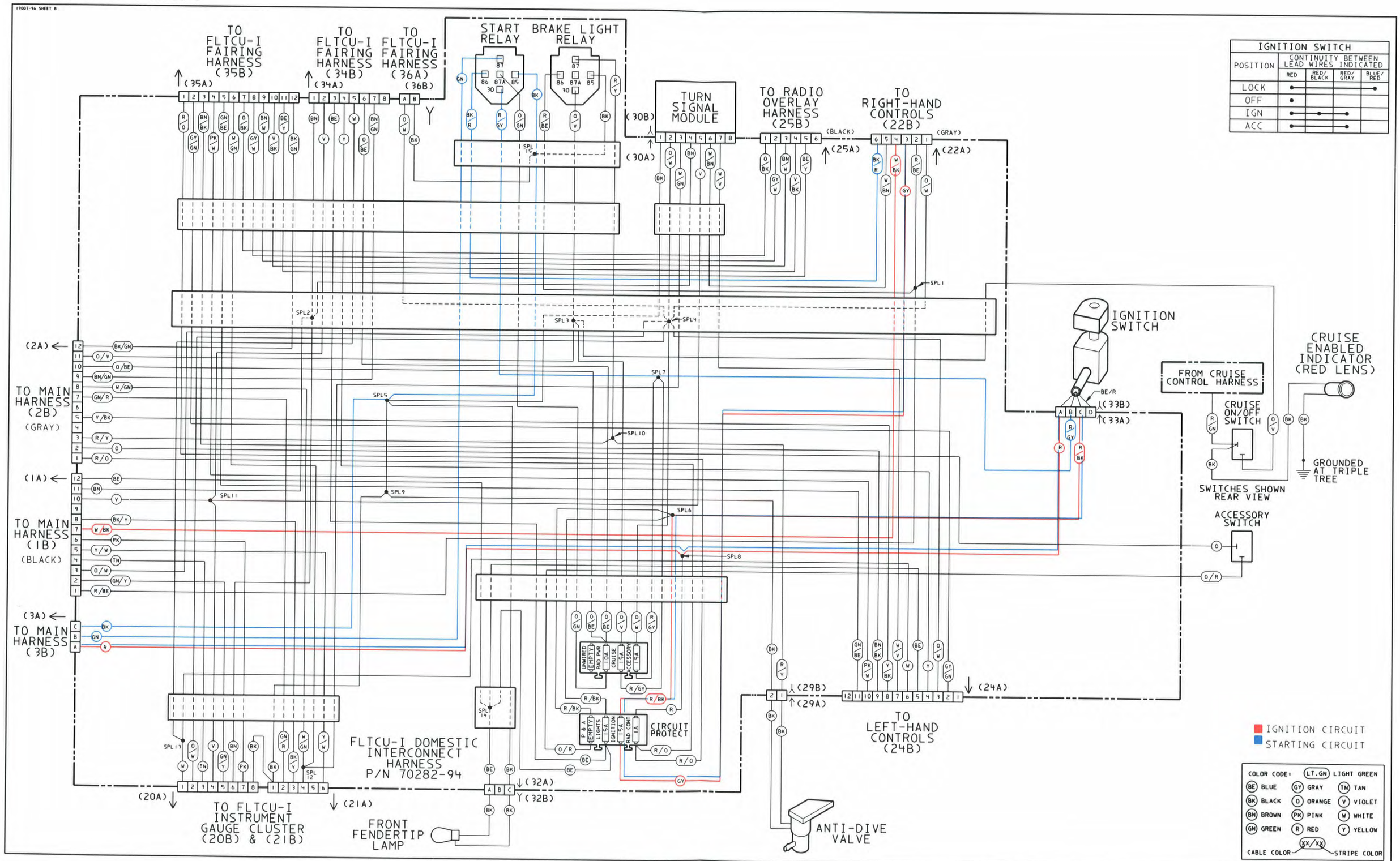


1996 FLHTC Ultra, FLHTC Ultra-I and FLTC Ultra-I, DOMESTIC and INTERNATIONAL Models, CB/Intercom, Cruise

1996 FLHTC Ultra, FLHTC Ultra-I and FLTC Ultra-I, DOMESTIC and INTERNATIONAL Models, CB/Intercom, Cruise

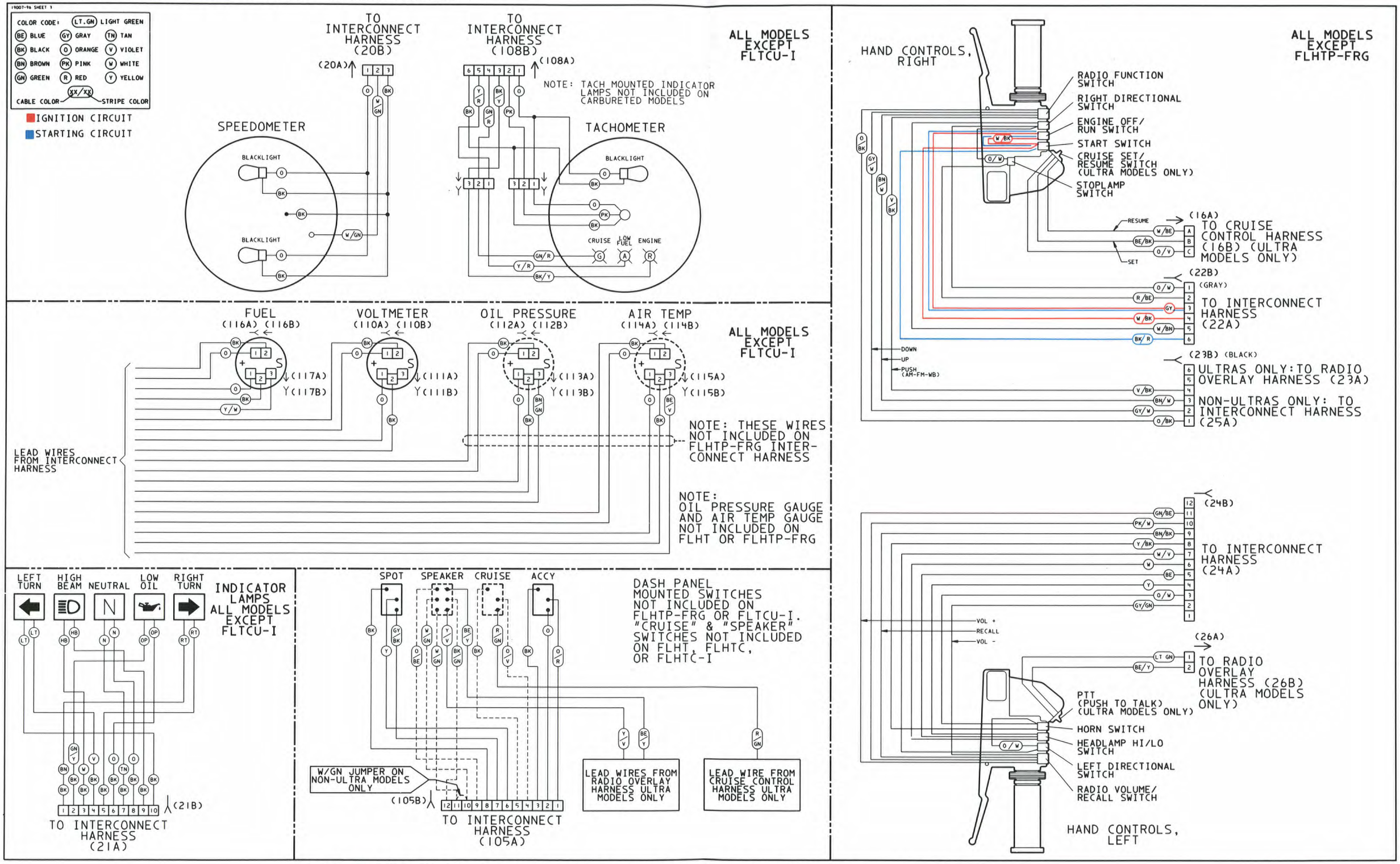

19007-96 SHEET 7
COLOR CODE:
LT.GN LIGHT GREEN
BE BLUE
GY GRAY
TN TAN
BK BLACK
O ORANGE
V VIOLET
BN BROWN
PK PINK
W WHITE
GN GREEN
R RED
Y YELLOW
XX/XX
CABLE COLOR
STRIPE COLOR
RIGHT DIRECTIONAL/ RUNNING LAMP
BROWN TAPE
RUNNING
DIRECTIONAL
(37B)
(37A)
LIGHTER
LEFT FRONT SPEAKER
PAINT DOT
RIGHT FRONT SPEAKER
FRONT SPEAKER HARNESS P/N 77030-94
(47B)
(47A)
TO RADIO (28B)
(28A)
TO RADIO (27B)
(27A)
FLTCU-I DOMESTIC FAIRING HARNESS P/N 70172-94
(35B)
TO FLTCU-I INTERCONNECT HARNESS (35A)
(36A)
TO FLTCU-I INTERCONNECT HARNESS (36B)
(34B)
TO FLTCU-I INTERCONNECT HARNESS (34A)
TO RADIO OVERLAY HARNESS
HIGH BEAM
LOW BEAM
(38B)
(38A)
HEADLAMP
(39A)
(39B)
DIRECTIONAL
RUNNING
VIOLET TAPE
LEFT DIRECTIONAL/ RUNNING LAMP
BACKLIGHT
VOLTMETER
OIL PRESSURE
SPEAKERS ON/OFF SWITCH (REAR VIEW)
P/N 70415-94
TO RADIO GROUND

1996 FLTC Ultra-I, DOMESTIC Models Only, Fairing Harness



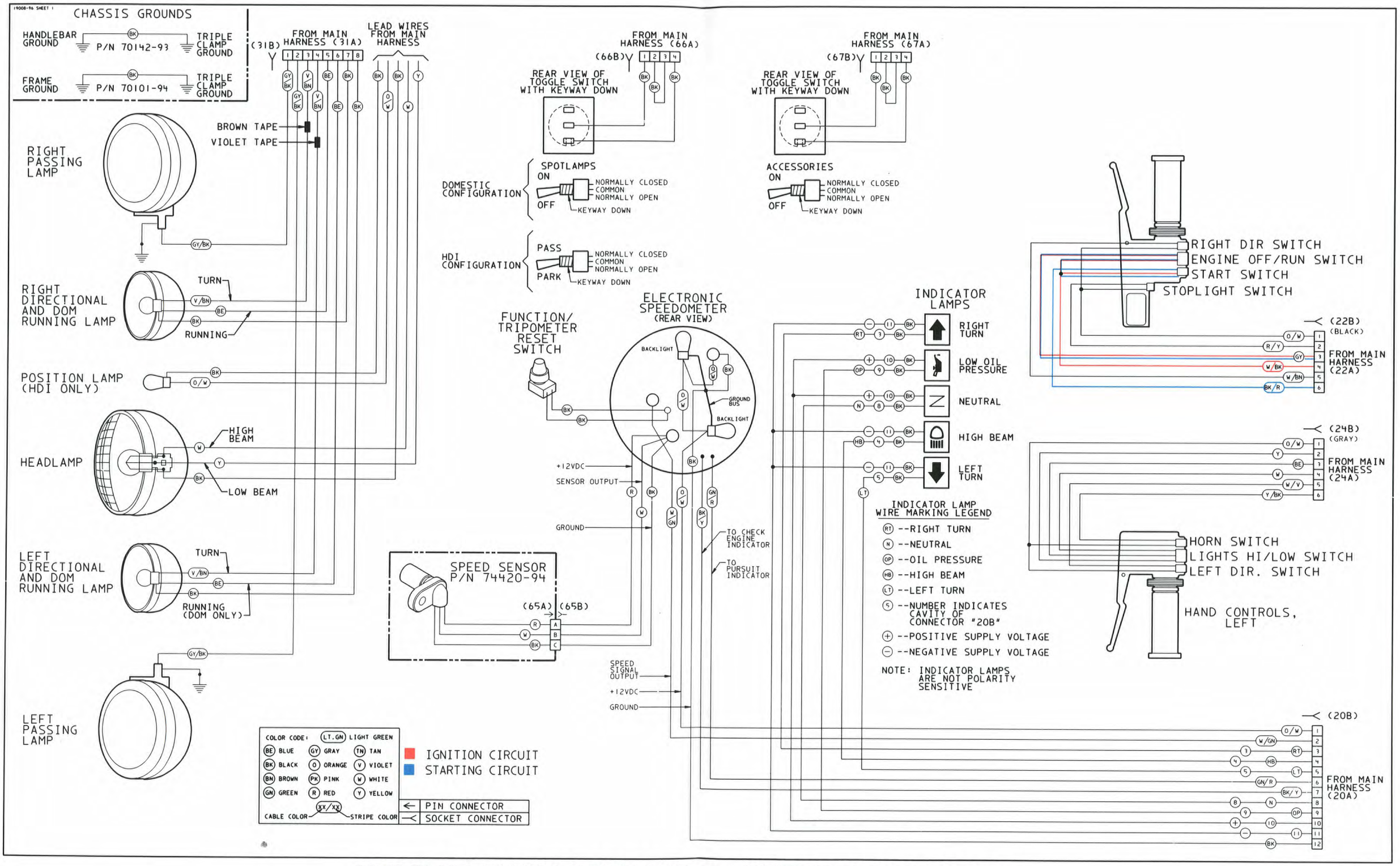
1996 FLTC Ultra-I, DOMESTIC Models Only, Interconnect Harness

1996 FLTC Ultra-I, DOMESTIC Models Only, Interconnect Harness



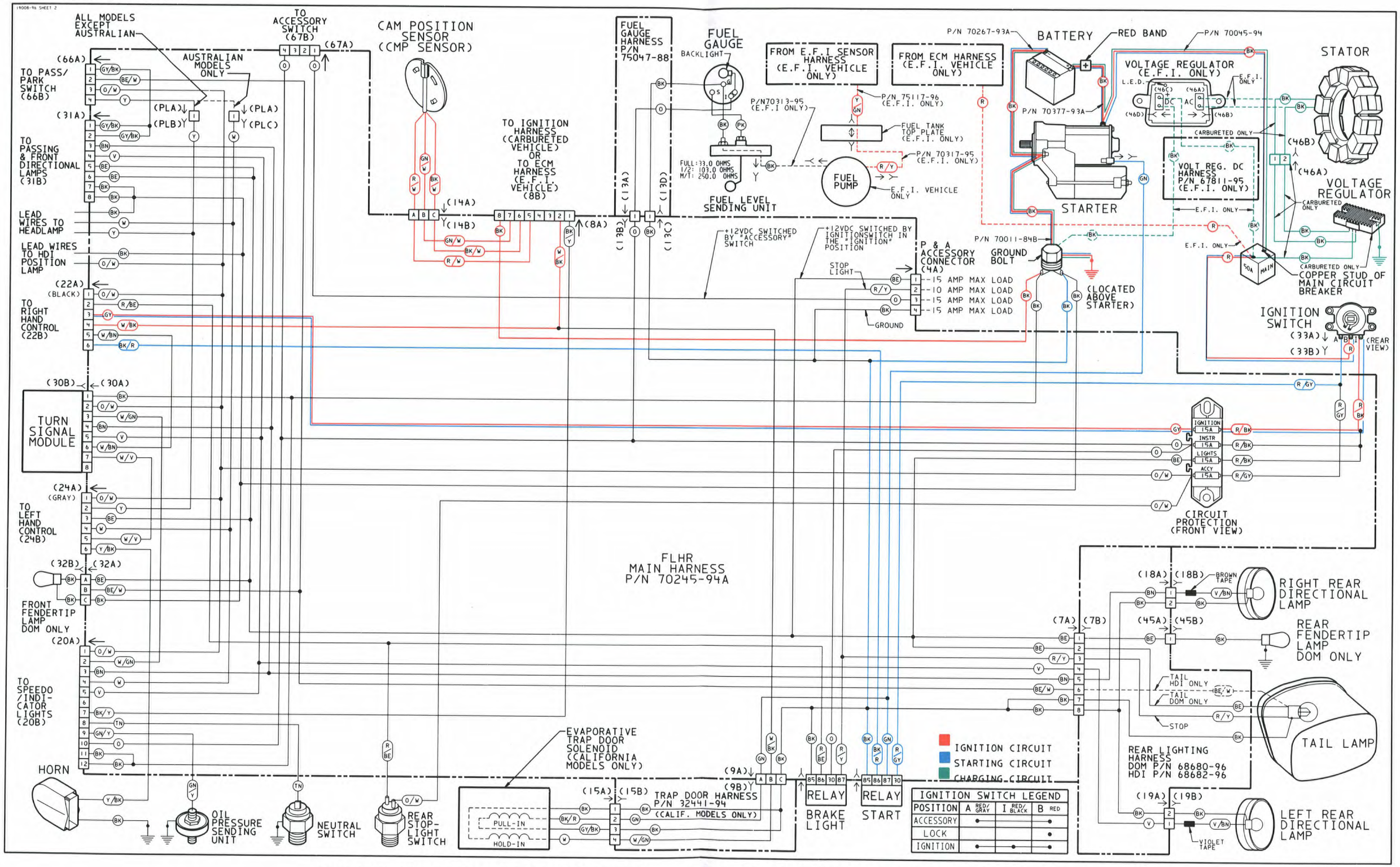
1996 FLHT, FLHTC, FLHTC-I, FLHTC Ultra, FLHTC Ultra-I and FLHTP, DOMESTIC and INTERNATIONAL Models, Instruments

1996 FLHT, FLHTC, FLHTC-I, FLHTC Ultra, FLHTC Ultra-I and FLHTP, DOMESTIC and INTERNATIONAL Models, Instruments



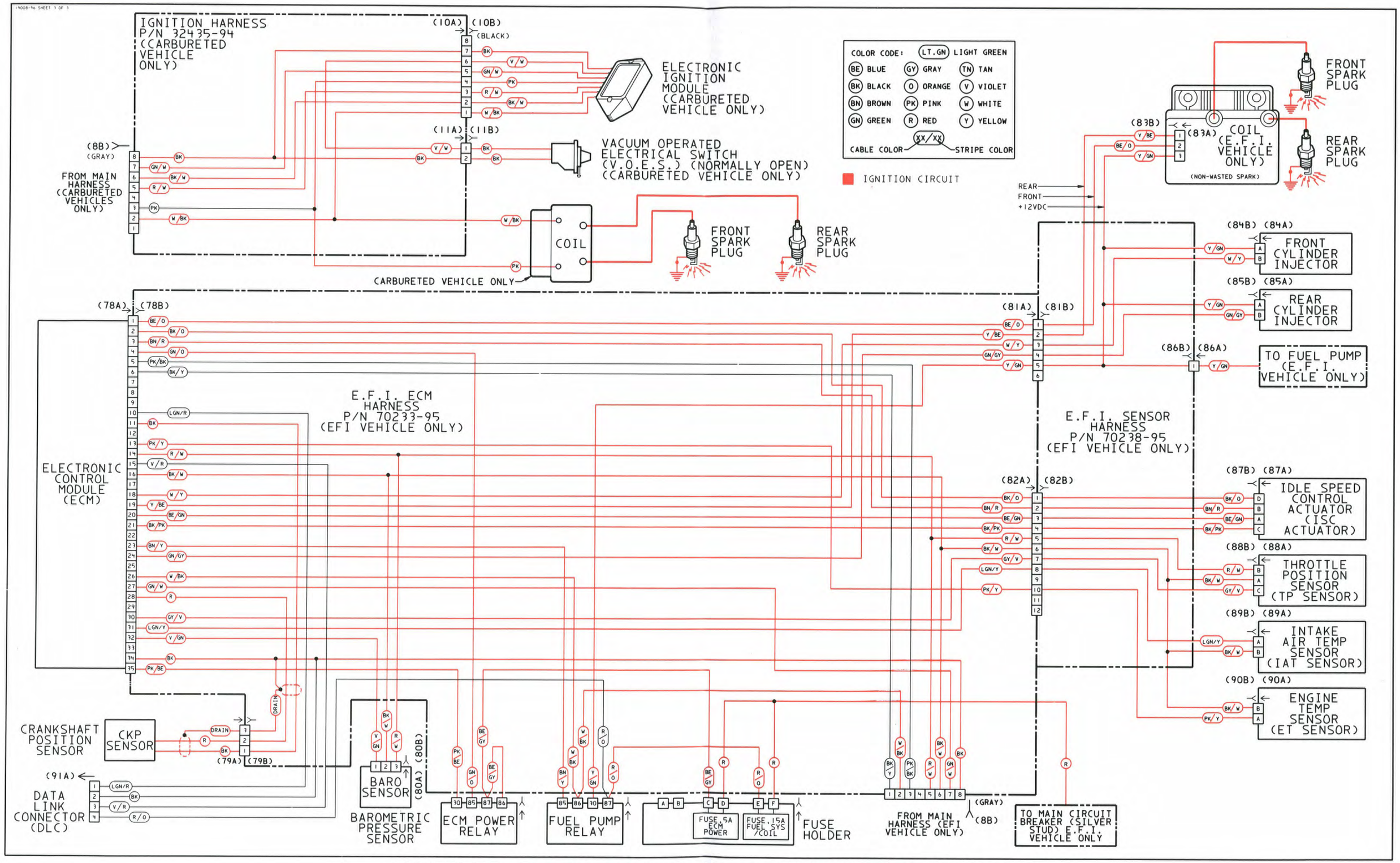
1996 FLHR, FLHR-I, DOMESTIC and INTERNATIONAL Models, Front Lights and Instruments

1996 FLHR, FLHR-I, DOMESTIC and INTERNATIONAL Models, Front Lights and Instruments



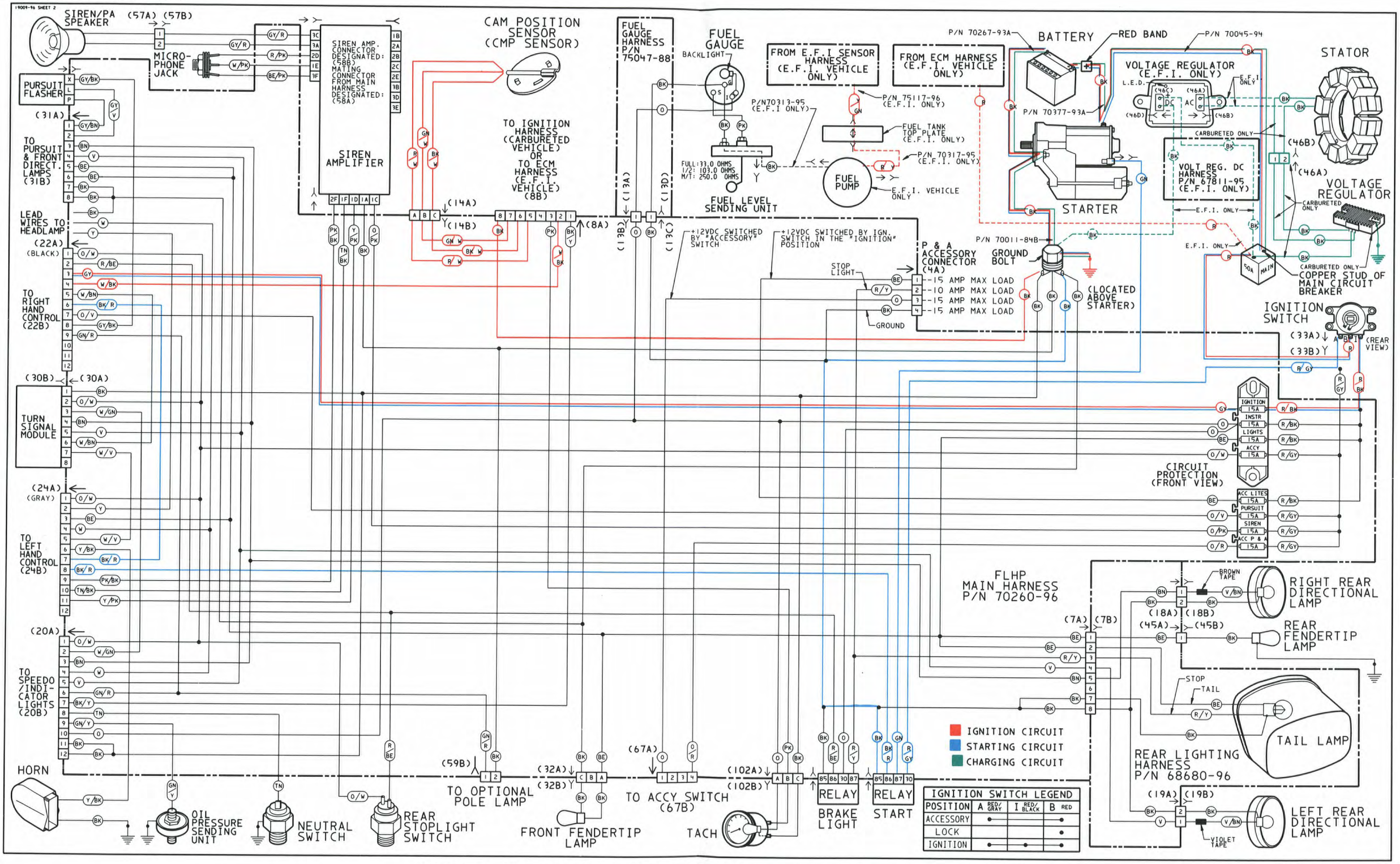
1996 FLHR, FLHR-I, DOMESTIC and INTERNATIONAL Models, Main Harness

1996 FLHR, FLHR-I, DOMESTIC and INTERNATIONAL Models, Main Harness



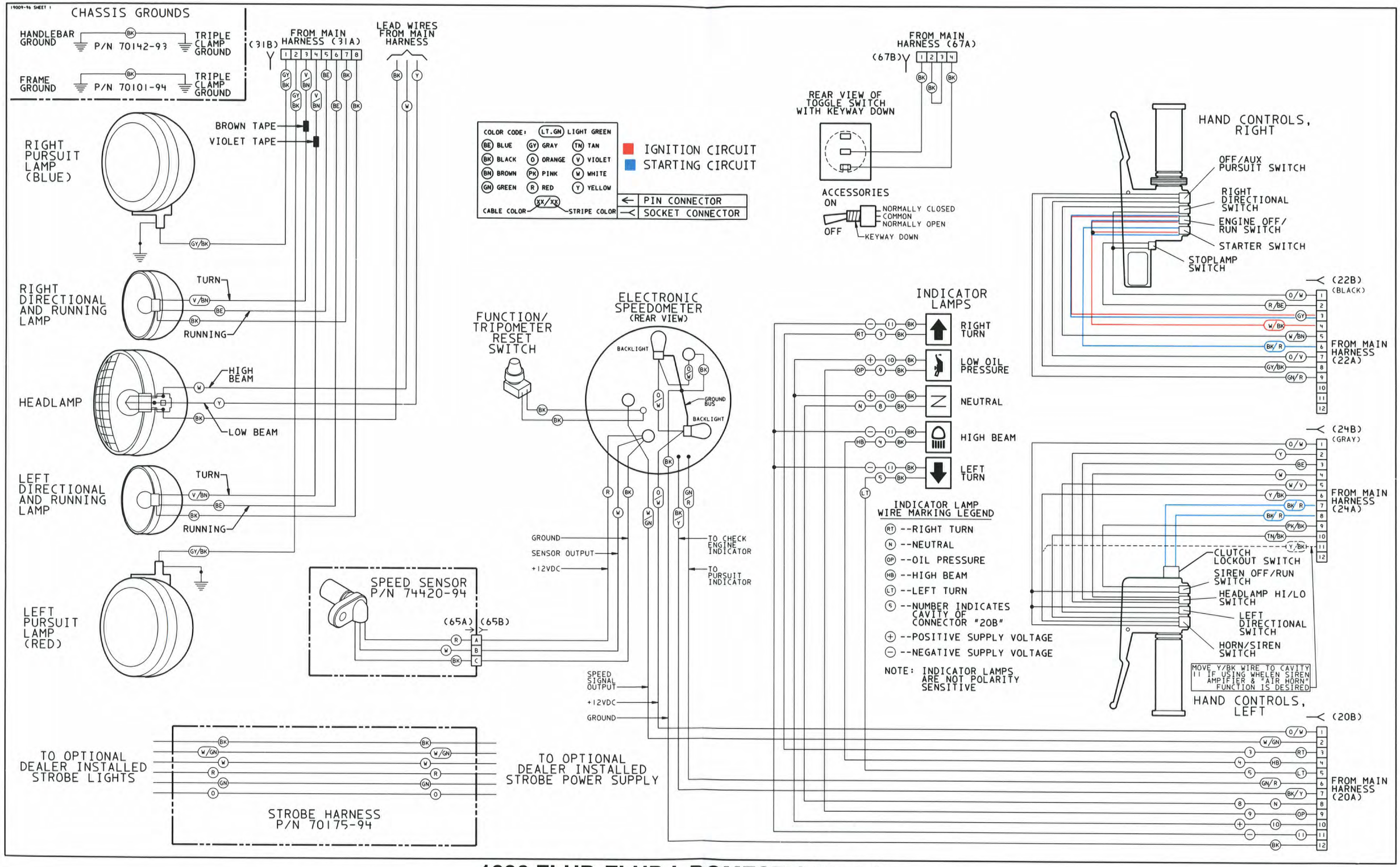
1996 FLHR, FLHR-I, DOMESTIC and INTERNATIONAL Models,
Ignition Harness and Engine Management Circuitry

1996 FLHR, FLHR-I,
DOMESTIC and INTERNATIONAL Models,
Ignition Harness and Engine Management Circuitry



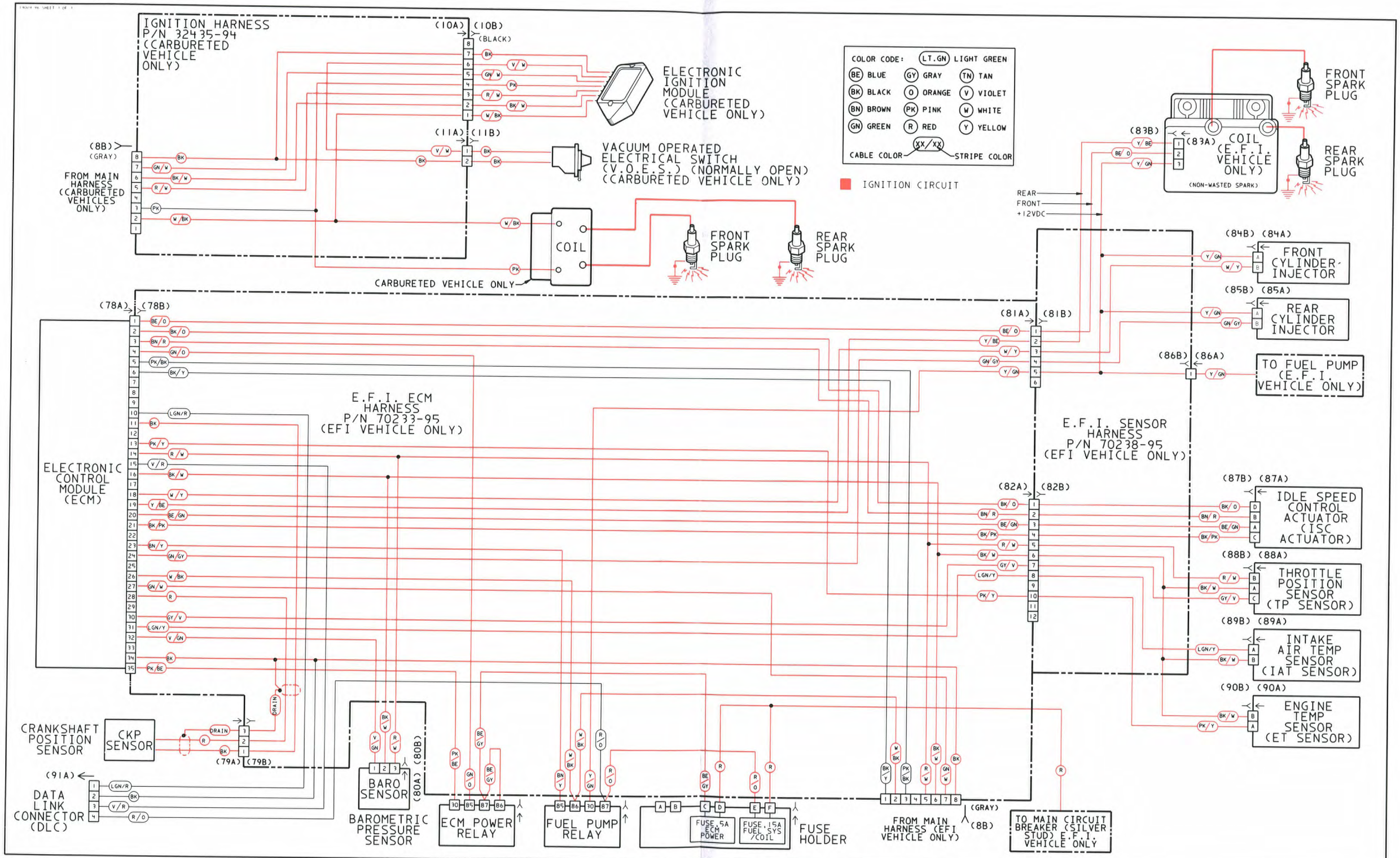
1996 FLHP, FLHP-I, DOMESTIC Models, Main Harness

1996 FLHP, FLHP-I, DOMESTIC Models, Main Harness



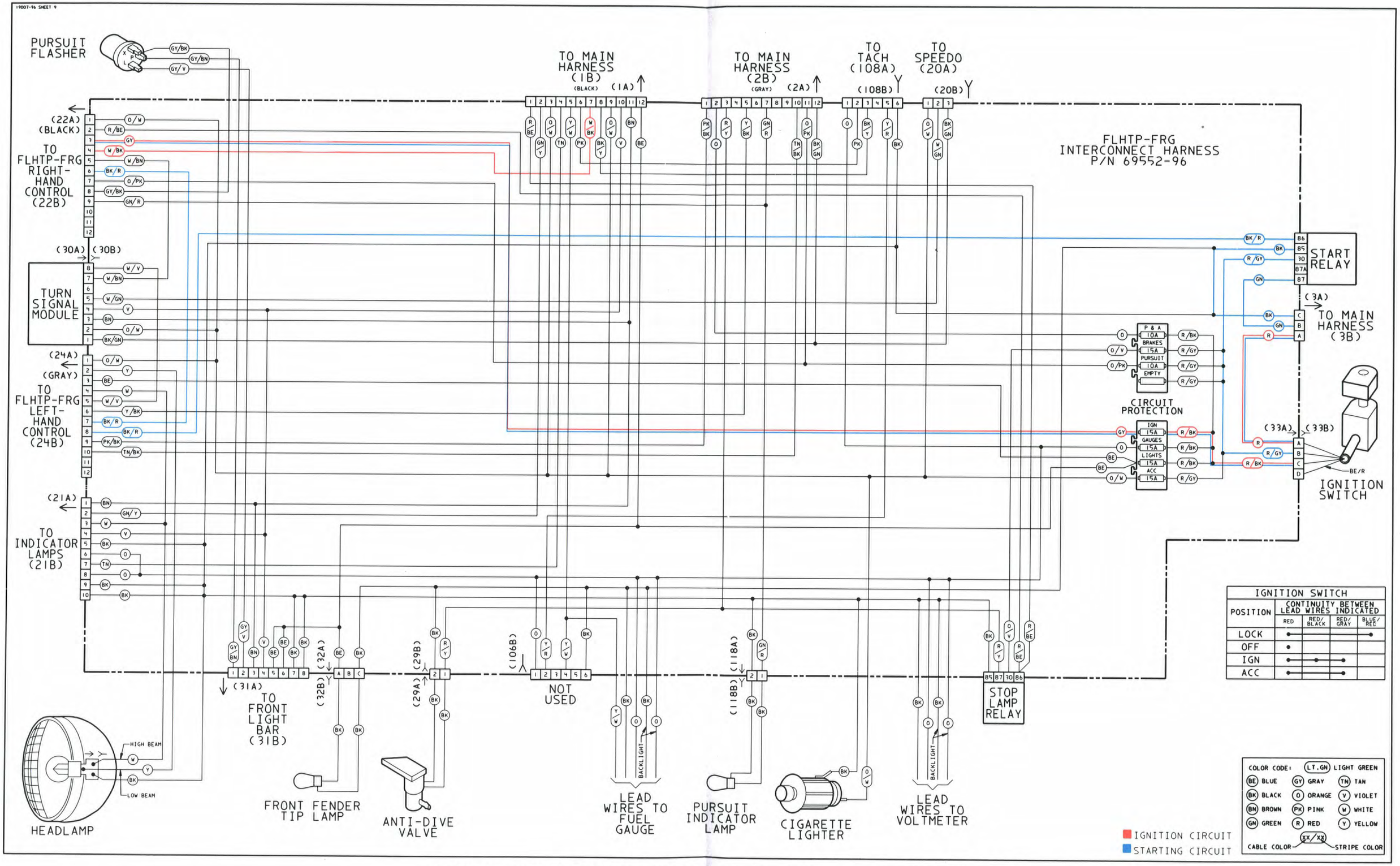
1996 FLHP, FLHP-I, DOMESTIC Models,
Front Lighting, Handlebar Controls and Instruments

1996 FLHP, FLHP-I, DOMESTIC Models, Front Lighting, Handlebar Controls and Instruments



1996 FLHP, FLHP-I, DOMESTIC Models,
Ignition Harness and Engine Management Circuitry

1996 FLHP, FLHP-I, DOMESTIC Models, Ignition Harness and Engine Management Circuitry



1996 FLHTP, DOMESTIC Models, Interconnect Harness

WD-40

1996 FLHTP, DOMESTIC Models, Interconnect Harness

Harley-Davidson Motor Company
Technical Communications, Standards and Graphics
Milwaukee, WI 53201

99948-96