

IGNITION TIMING

ALL FL Models	
RANGE	TDC - 50° BTDC
START	TDC

ALTERNATOR SYSTEM

Output Voltage @ 3600 rpm 14.3-14.7

50 Amp: All Models

BATTERY

Voltage 12V

Amperes – 28 AH @ 20 Hour Rate

FUSES

Circuit	Rating (Amperes)	Color
System Fuses		
Maxi-Fuse	40	Orange
Headlamp	15	Blue
Ignition	15	Blue
Lighting	15	Blue
Instruments	15	Blue
Brakes/Cruise	15	Blue
Radio Memory	15	Blue
Radio Power	10	Red
Accessory	15	Blue
Battery	15	Blue
P & A	15	Blue
EFI Fuses		
Fuel Pump	15	Blue
ECM Power	15	Blue

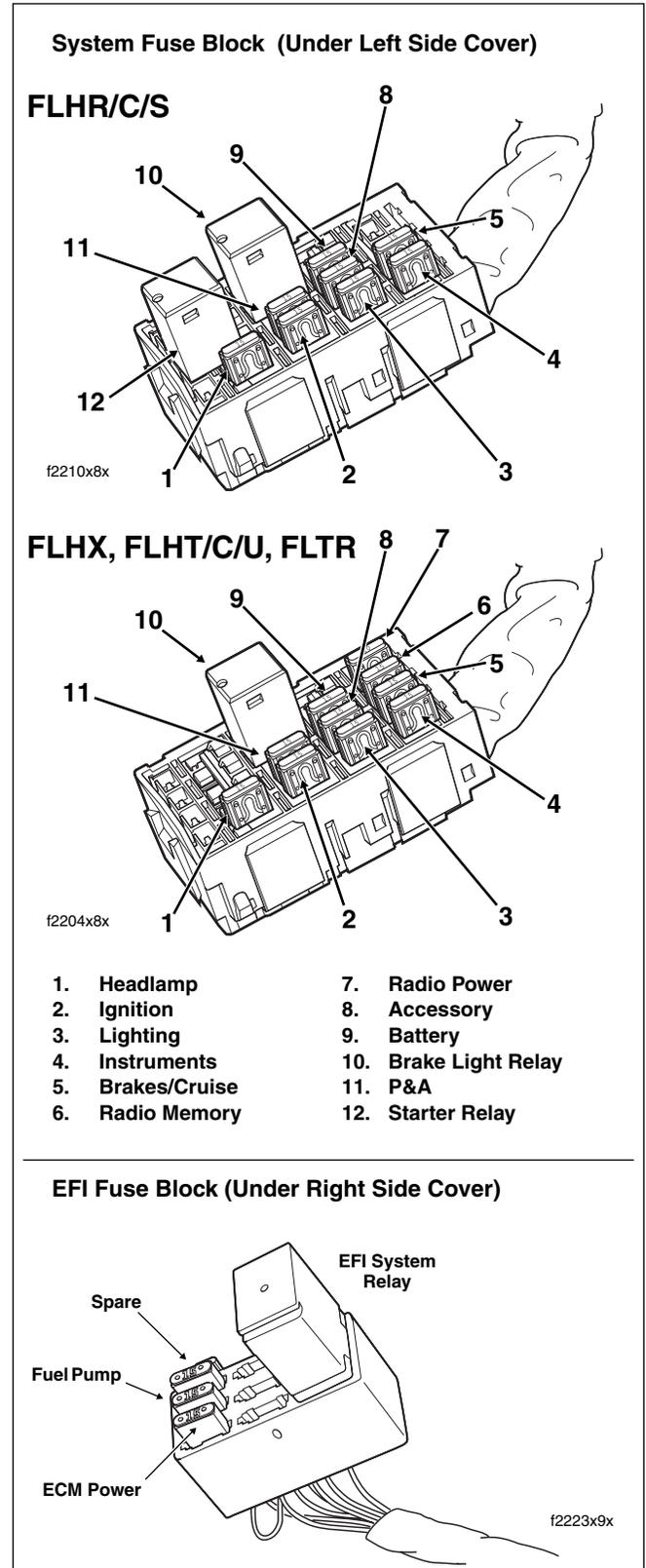


Figure 8-1. Fuse Locations

SPARK PLUG

Part No.	No.	Size	Gap
32317-86A	6R12	12 mm	0.038-0.043 in. 0.97-1.09 mm

NOTE

Be sure spark plugs are gapped to specification before installation.

TORQUE VALUES

Item	ft/in-lbs	Nm
Ignition module socket head screws	50-60 in-lbs	5.7-6.8 Nm
MAP sensor TORX screw	25-35 in-lbs	2.8-4.0 Nm
Ignition coil bracket socket screws	84-144 in-lbs	9.5-16.3 Nm
Spark plug	12-18 ft-lbs	16-24 Nm
Stator to crankcase TORX screws	55-75 in-lbs	6.2-8.5 Nm
Battery cable bolt	60-96 in-lbs	6.8-10.9 Nm
Voltage regulator locknuts	70-100 in-lbs	7.9-11.3 Nm
Battery hold-down clamp TORX screw	15-20 ft-lbs	20-27 Nm
Headlamp door screw	9-18 in-lbs	1.0-2.0 Nm
Auxiliary lamp bracket to fork bracket TORX bolts	15-20 ft-lbs	20-27 Nm
Auxiliary lamp bracket to fork bracket stud acorn nuts	72-108 in-lbs	8.1-12.2 Nm
Tail lamp lense screws	20-24 in-lbs	2.3-2.7 Nm
Tail lamp circuit board/chrome base screw	40-48 in-lbs	4.5-5.4 Nm
Rear fender tip lamp nuts	20-25 in-lbs	2.3-2.8 Nm
Front fender tip lamp nuts	20-25 in-lbs	2.3 - 2.8 Nm
Front fender trim strip tee bolt nuts	10-15 in-lbs	1.1-1.7 Nm
Ignition switch to upper fork bracket	36-60 in-lbs	4.1-6.8 Nm
Fairing cap TORX screws	25-30 in-lbs	2.8-3.4 Nm
Ignition switch nut	125-150 in-lbs	14.1-16.9 Nm
Fork lock to upper fork bracket (FLHR/C/S)	36-60 in-lbs	4.1-6.8 Nm
Ignition switch screws (FLHR/C/S)	20-30 in-lbs	2.3-3.4 Nm
Continued ...		

Item	ft/in-lbs	Nm
Instrument bezel TORX screws	25-35 in-lbs	2.8-4.0 Nm
Handlebar clamp to master cylinder housing screws	60-80 in-lbs	6.8-9.0 Nm
Lower and upper handlebar switch housing TORX screws	35-45 in-lbs	4-5 Nm
Handlebar clamp to clutch lever bracket TORX screws	60-80 in-lbs	6.8-9.0 Nm
Neutral switch	120-180 in-lbs	13.6-20.3 Nm
Horn stud flange nut (10mm)	80-100 in-lbs	9.0-11.3 Nm
Horn bracket acorn nut to rubber mount stud	80-100 in-lbs	9.0-11.3 Nm
2 inch diameter gauge nuts	10-20 in-lbs	1.1-2.3 Nm
Tachometer bracket socket screws	10-20 in-lbs	1.1-2.3 Nm
Speedometer speed sensor screw	84-108 in-lbs	9-12 Nm
Speedometer bracket socket screws	10-20 in-lbs	1.1-2.3 Nm
Console mounting bolt acorn nut (FLHR/C/S)	50-90 in-lbs	5.7-10.2 Nm
Console pod Phillips screws	6-11 in-lbs	0.7-1.2 Nm
Fuel tank canopy TORX screws	18-24 in-lbs	2.0-2.7 Nm
Cruise module locknuts	60-96 in-lbs	6.8-10.9 Nm
Radio to support bracket socket screws	35-45 in-lbs	4.0-5.1 Nm
Upper fairing speaker lower TORX screw	22-28 in-lbs	2.5-3.2 Nm
Upper fairing speaker upper TORX screws	35-50 in-lbs	4.0-5.7 Nm
Throttle cable J-clamp screw to wellnut (FLHR/C/S)	9-18 in-lbs	1.0-2.0 Nm
Ground post flange nuts	50-90 in-lbs	5.7-10.2 Nm
VSS screw	84-132 in-lbs	9.5-14.9 Nm
Rear stoplight switch	12-15 ft-lbs	16.3-20.3 Nm
Rear fender lights harness stud plate flange nut	60-96 in-lbs	6.8-10.9 Nm

BULB CHART

Lamp Description, All Lamps 12V	Number of Bulbs	Current Draw (Amperage)	Wattage	Harley-Davidson Part No.
HEADLAMP FLHR/C/S, FLHX, FLHT/C/U, FLTR	1 2	4.58/5 4.58/5	55/60 55/60	68329-03 68329-03
POSITION LAMP (HDI)	1	0.32	3.9	53438-92
AUXILIARY LAMPS (DOM) (HDI)	2 2	2.10 2.70	26.9 35.0	68453-05 68851-98
TAIL AND STOP LAMP Tail Lamp Stop Lamp Tail Lamp (HDI) Stop Lamp(HDI) License Plate (HDI)	1 1	0.59 2.10 0.59 2.10 0.37	6 24 6 24 5.2	68167-88 68167-88 68167-88 68167-88 53436-97
TURN SIGNAL LAMP Front/Running Front (HDI) Rear Rear (HDI)	2 2 2 2	2.25/.59 1.75 2.25 1.75	27/7 21 27 21	68168-89 68163-84 68572-64B 68163-84
TOUR-PAK Side Marker Lamps ** Tail/Brake Lamps (Ultra)	2	0.59	7	68168-89A
FENDER TIP LAMPS *	2	0.3	3.7	53439-79
LICENSE PLATE LAMPS (FLHX)	2	0.35	-	52441-95
INSTRUMENT PANEL LAMPS FLHX, FLHT/C/U, FLTR High Beam Oil Pressure Neutral Turn Signal	1 1 1 2	0.15 0.15 0.15 0.15	2.1 2.1 2.1 2.1	68024-94 68024-94 68024-94 68024-94
GAUGE LAMPS FLHX, FLHT/C/U, FLTR Speedometer ** Tachometer ** Voltmeter Oil Pressure Gauge Air Temperature Gauge Fuel Gauge Engine **	1 1 1 1	0.24 0.24 0.24 0.24	3.4 3.4 3.4 3.4	67445-00 67445-00 67445-00 67445-00
INSTRUMENT PANEL/ GAUGE LAMPS FLHR/C/S High Beam ** Oil Pressure ** Neutral ** Turn Signal ** Fuel Gauge ** Speedometer ** Odometer ** Engine **				

* Not Applicable to HDI

** LED Illuminated. LEDs are not repairable. Assembly must be replaced if LED fails.

NOTES

MAXI-FUSE

REMOVAL

1. Remove left side saddlebag. See Section 2.26 [SADDLEBAG, REMOVAL](#).
2. Gently pull side cover from frame downtubes (no tools required).
3. Depress latches on maxi-fuse holder and then slide cover rearward to disengage tongue from groove in fuse block cover. See [Figure 8-2](#).
4. Pull maxi-fuse from maxi-fuse holder. See [Figure 8-3](#).

INSTALLATION

1. Insert maxi-fuse into maxi-fuse holder. See [Figure 8-3](#).
2. Slide cover forward to engage tongue in groove of fuse block cover and then insert maxi-fuse holder into cover until latches engage. See [Figure 8-2](#).
3. Align barbed studs in side cover with grommets in frame downtubes and push firmly into place (no tools required).
4. Install left side saddlebag. See Section 2.26 [SADDLEBAG, INSTALLATION](#).

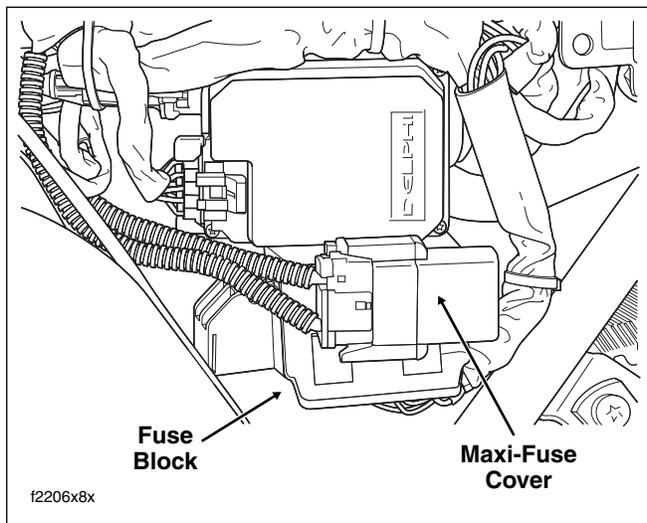


Figure 8-2. Remove Left Side Cover

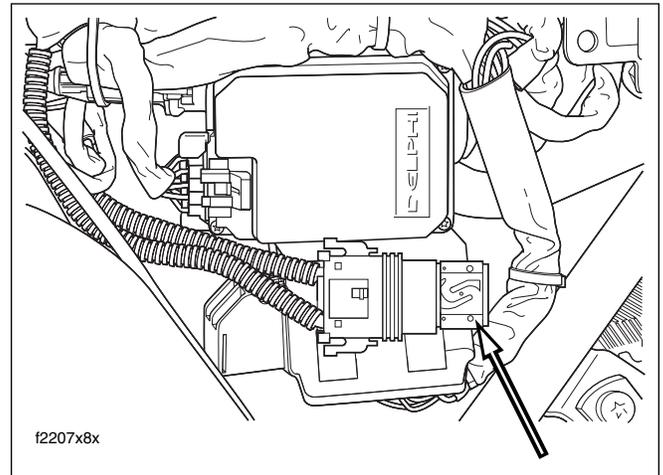


Figure 8-3. Remove Maxi-Fuse

MAXI-FUSE HOLDER

REMOVAL

1. Remove maxi-fuse. See [MAXI-FUSE, REMOVAL](#), in this section.
2. Remove socket terminals from maxi-fuse holder. See Section B.4 [PACKARD ELECTRICAL CONNECTORS, 800 METRI-PACK SERIES](#).

INSTALLATION

3. Install socket terminals into maxi-fuse holder. See Section B.4 [PACKARD ELECTRICAL CONNECTORS, 800 METRI-PACK SERIES](#).
4. Install maxi-fuse. See [MAXI-FUSE, INSTALLATION](#), in this section.

SYSTEM FUSES/RELAYS

REMOVAL

1. Remove maxi-fuse. See [MAXI-FUSE, REMOVAL](#), in this section.
2. Pull fuse block from tabs on mounting bracket. Tabs on bracket fit into slots on each side of fuse block cover.

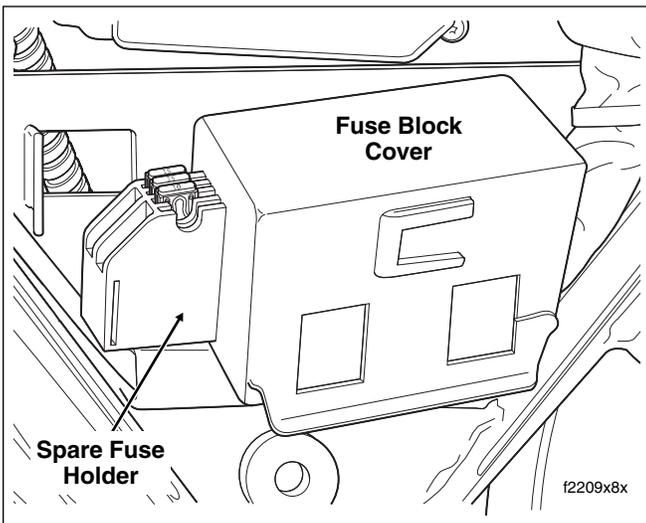


Figure 8-4. Fuse Block Cover

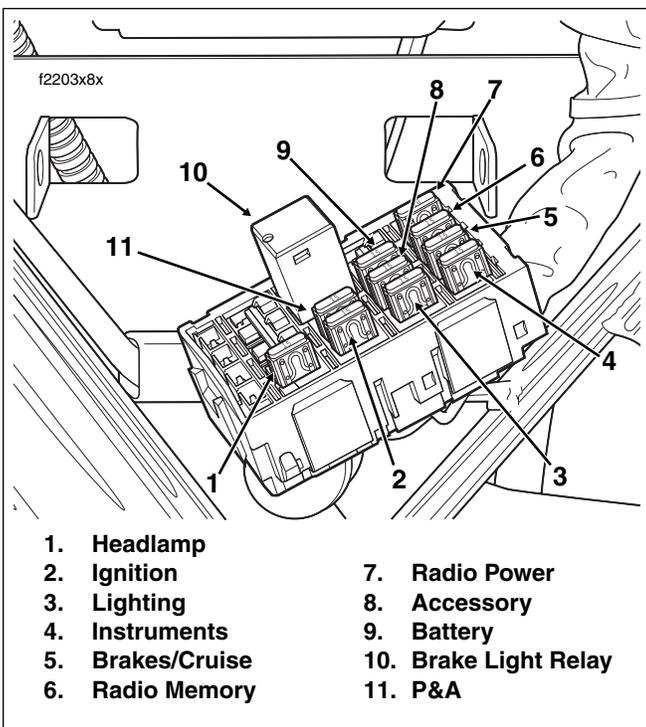


Figure 8-5. Fuse Block (FLHX, FLHTC/U, FLTR)

NOTE

The fuse block cover also serves as the spare fuse holder. One spare 10 amp and 15 amp fuse are provided.

- Remove the fuse block cover. Raise lipped side slightly to disengage slots from tabs on fuse block. See [Figure 8-4](#).
- Remove system fuse/relay from fuse block. Replace fuse if the element is burned or broken. Automotive type ATO fuses are used. See [Figure 8-5](#).

NOTE

For FLHR/C/S configuration, see upper frame of [Figure 8-1](#) in [Section 8.1 SPECIFICATIONS](#).

INSTALLATION

- Install system fuse/relay in fuse block. See [Figure 8-5](#).

NOTE

For FLHR/C/S configuration, see upper frame of [Figure 8-1](#) in [Section 8.1 SPECIFICATIONS](#).

- Slide cover over fuse block until slots fully engage tabs on block. See [Figure 8-4](#).
- Slide fuse block into position on mounting bracket. Tabs on bracket fit into slots on each side of fuse block cover.
- Install maxi-fuse. See [MAXI-FUSE, INSTALLATION](#), in this section.

FUSE BLOCK**REMOVAL**

- Remove system fuses and relay(s). See [SYSTEM FUSES/RELAYS, REMOVAL](#), in this section.
- Remove socket terminals from fuse block. See [Section B.4 PACKARD ELECTRICAL CONNECTORS, 280 METRI-PACK SERIES](#).

INSTALLATION

- Install socket terminals into fuse block. See [Section B.4 PACKARD ELECTRICAL CONNECTORS, 280 METRI-PACK SERIES](#).
- Install system fuses and relay(s). See [SYSTEM FUSES/RELAYS, INSTALLATION](#), in this section.

EFI FUSES

See [Section 9.2 ELECTRICAL BRACKET ASSEMBLY, EFI SYSTEM RELAY/EFI FUSES](#).

REMOVAL

1. Remove right side saddlebag. See Section [2.26 SADDLEBAG, REMOVAL](#).
2. Gently pull side cover from frame downtubes (no tools required).
3. Disconnect ICM connector [10], 12-place Deutsch. See [Figure 8-6](#).
4. Remove two socket screws to detach ICM from electrical bracket.

INSTALLATION

1. Align holes in ICM with those in electrical bracket. Install two socket screws and tighten to 50-60 **in-lbs** (5.7-6.8 Nm).
2. Connect ICM connector [10], 12-place Deutsch. See [Figure 8-6](#).
3. Align barbed studs in side cover with grommets in frame downtubes and push firmly into place (no tools required).

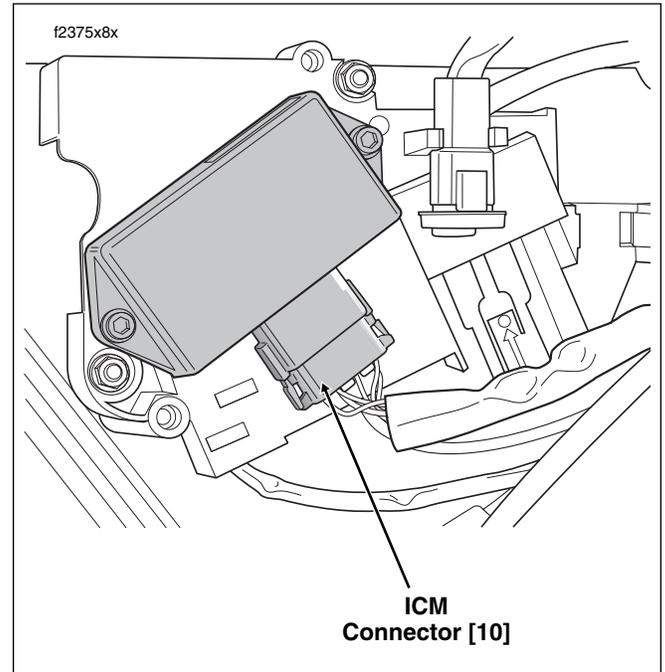


Figure 8-6. Electrical Bracket (Under Right Side Cover)

4. Install right side saddlebag. See Section [2.26 SADDLEBAG, INSTALLATION](#).

MAP SENSOR

Removal

1. Partially remove fuel tank. See Section 4.7 FUEL TANK (CARBURETED), PARTIAL REMOVAL, FLHX, FLHT, or FLHR/S.
2. Disconnect MAP sensor connector [80], 3-place Packard, at top of intake manifold.
3. Remove T20 TORX screw to release retaining clip from intake manifold. See Figure 8-7.
4. Carefully pull pressure port (enveloped in rubber seal) from hole in intake manifold.
5. If reusing sensor, inspect condition of rubber seal. Replace the seal if it is cut, torn or shows signs of deterioration.

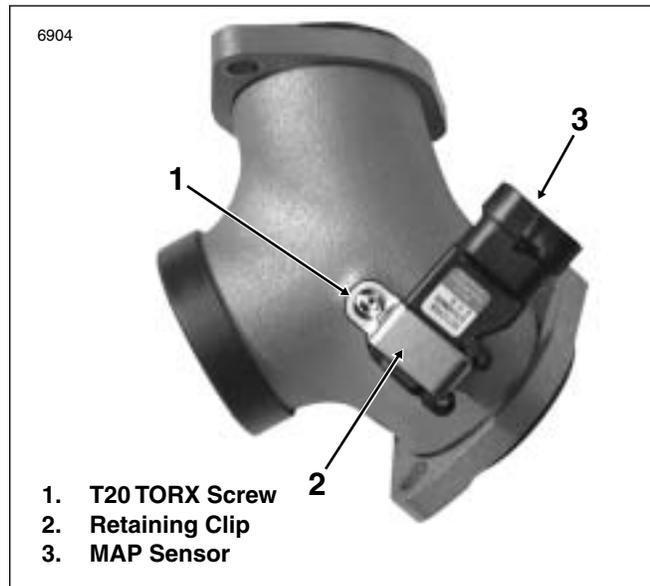


Figure 8-7. Intake Manifold

Installation

1. Install rubber seal on pressure port, if removed.
2. With port side down, slide end of retaining clip in slot at side of sensor. Aligning hole in retaining clip with threaded hole in intake manifold, carefully press pressure port into bore.
3. Install T20 TORX screw and tighten to 25-35 in-lbs (2.8-4.0 Nm). See Figure 8-7.
4. Connect MAP sensor connector [80], 3-place Packard.
5. Install fuel tank. See Section 4.7 FUEL TANK (CARBURETED), INSTALLATION (AFTER PARTIAL REMOVAL), INSTALLATION (AFTER PARTIAL REMOVAL), or FLHR/S.

CKP SENSOR

See Section 9.3 SENSORS, CKP SENSOR.

REMOVAL

1. Partially remove fuel tank. For carbureted models, see Section 4.7 FUEL TANK (CARBURETED), PARTIAL REMOVAL, FLHX, FLHT or FLHR/S. For fuel injected models, see Section 9.4 FUEL TANK (FUEL INJECTED), PARTIAL REMOVAL, FLHXI, FLHT/C/U/I, FLTRI or FLHR/C/S/I.
2. Unplug spark plug cables from ignition coil towers.
3. Remove ignition coil connector [83] from left side of ignition coil. See Figure 8-8.
4. Pull sides of ignition coil bracket outward to remove from bosses of front fuel tank mount.
5. Remove two socket screws to free ignition coil from bracket.

INSTALLATION

1. Align holes in **new** ignition coil with holes in bracket. Properly positioned, connector pin housing should be positioned at cut in bracket. Install two socket screws and tighten to 84-144 **in-lbs** (9.5-16.3 Nm). See Figure 8-9.
2. With the coil towers facing rear of motorcycle, hold ignition coil and bracket at bottom of frame backbone. Pull sides of bracket outward and install on bosses of front fuel tank mount. See Figure 8-8.
3. Install ignition coil connector [83] onto left side of ignition coil.
4. Install spark plug cable to front cylinder onto left side coil tower. Verify that spark plug cable is captured in double-sided cable clip at bottom left side of frame backbone. Install **new** cable clip on T-stud if damaged or missing. See Figure 8-11.
5. Install spark plug cable to rear cylinder onto right side coil tower. Verify that spark plug cable is captured in two single-sided cable clips at bottom left side of frame backbone. Install **new** cable clips on T-studs if damaged or missing. See Figure 8-11.

6. Install fuel tank. For carbureted models, see Section 4.7 FUEL TANK (CARBURETED), INSTALLATION (AFTER PARTIAL REMOVAL), INSTALLATION (AFTER PARTIAL REMOVAL) or FLHR/S. For fuel injected models, see Section 9.4 FUEL TANK (FUEL INJECTED), INSTALLATION (AFTER PARTIAL REMOVAL), FLHXI, FLHT/C/U/I, FLTRI or FLHR/C/S/I.



Figure 8-8. Remove Ignition Coil Bracket From Vehicle

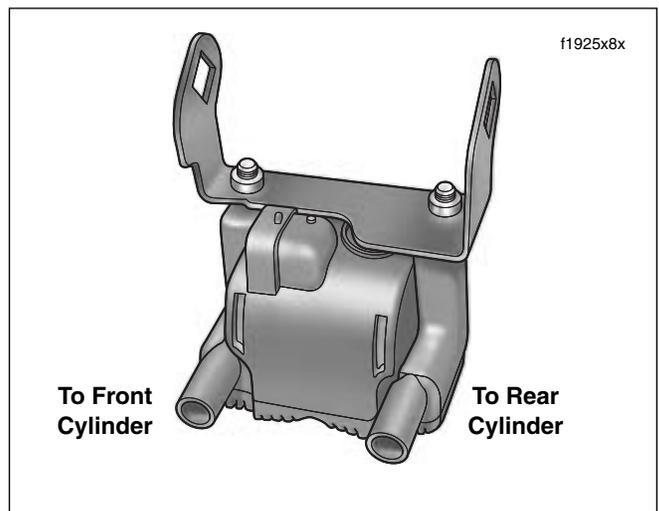


Figure 8-9. Install Bracket to Ignition Coil

SPARK PLUGS

NOTE

The number 6R12 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 adversely affect performance or fuel economy.

REMOVAL

1. Remove spark plug cables. See [SPARK PLUG CABLES](#) on the next page.
2. Remove spark plug using a 5/8 inch spark plug socket.

INSPECTION

See [Figure 8-10](#). 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.

CLEANING

1. Degrease firing end of spark plug using ELECTRICAL CONTACT CLEANER. Dry spark plug with compressed air.
2. Use a thin file to flatten spark plug electrodes. A spark plug with sharp edges on its electrodes requires 25%-40% less firing voltage than one with rounded edges.
3. Adjust spark plug gap. See [ADJUSTMENT](#) on this page.



Figure 8-10. 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 in. (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. Apply a very light coating of ANTISEIZE LUBRICANT to spark plug threads.
3. Install spark plug finger tight and then tighten to 12-18 ft-lbs (16-24 Nm).

NOTE

If a torque wrench is not available, finger tighten spark plug and then using a spark plug wrench, tighten plug an additional 1/4 turn.

4. Connect spark plug cables to spark plug terminals. Make sure boots/caps are secured properly.
5. Check engine idle speed, and adjust if necessary.

SPARK PLUG CABLES

NOTE

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. Doing so will result in an electric shock from the ignition system that could result in death or serious injury.

CAUTION

When disconnecting a spark plug cable from the spark plug terminal, always grasp and pull on the rubber boot at the end of the cable assembly (as close to the spark plug terminal as possible). Pulling on the cable portion will damage the carbon core.

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

INSPECTION

1. Check cables for cracks or loose terminals.

2. Check spark plug cable resistance with an ohmmeter. Resistance must be as follows:

Table 8-1. Spark Plug Cable Resistance

Position	Cable Length	Resistance (Ohms)
Front /Rear	20 Inches (508 mm)	5,000 - 11,666

3. Replace cables that are worn or damaged, or that do not meet resistance specifications.
4. 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

1. Connect spark plug cables to spark plug terminals.
2. Install spark plug cable to front cylinder onto left side coil tower. Verify that spark plug cable is captured in double-sided cable clip at bottom left side of frame backbone. Install **new** cable clip on T-stud if damaged or missing. See [Figure 8-11](#).
3. Install spark plug cable to rear cylinder onto right side coil tower. Verify that spark plug cable is captured in two single-sided cable clips at bottom left side of frame backbone. Install **new** cable clips on T-studs if damaged or missing. See [Figure 8-11](#).

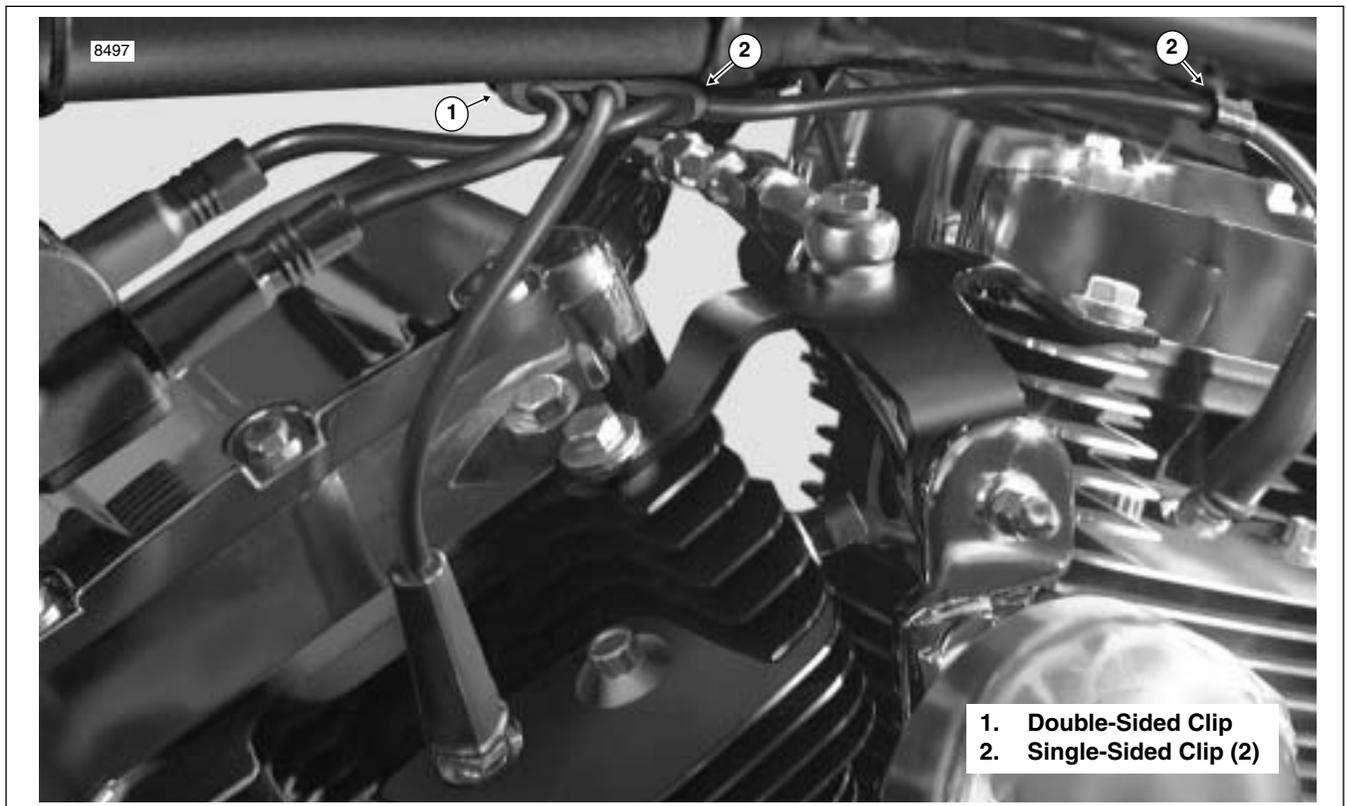


Figure 8-11. Spark Plug Cable Clips (Left Side View)

REMOVAL

1. Remove seat. See Section 2.25 SEAT, REMOVAL.

WARNING

To protect against shock and accidental start-up of vehicle, disconnect the negative battery cable before proceeding. Inadequate safety precautions could result in death or serious injury.

2. Unthread bolt and remove battery negative cable (black) from battery negative (-) terminal.
3. Remove the primary chaincase cover. Remove the clutch, primary chain, compensating sprocket and shaft extension as a single assembly. See Section 6.5 PRIMARY CHAINCASE, REMOVAL, steps 3-15.

CAUTION

The high-output rotor contains powerful magnets. Use the ROTOR REMOVER/INSTALLER and SHAFT PROTECTOR SLEEVE (HD-41771) to prevent parts damage and possible hand injury during removal and installation.

4. Remove the rotor as follows:
 - a. Verify that threads of engine sprocket shaft are clean, especially of old Loctite material. See A of Figure 8-12.
 - b. Thread the Shaft Protector Sleeve onto the shaft. See B of Figure 8-12.
 - c. Turn thumbscrews of Rotor Remover/Installer into threaded holes in rotor face. See C of Figure 8-12.
 - d. Rotate handle of forcing screw in a clockwise direction to remove rotor from shaft.
5. Locate CKP sensor connector [79], 2-place Deutsch, fixed to bracket at bottom of voltage regulator. Push connector toward right side of motorcycle to disengage attachment clip from T-stud on bracket. See Figure 8-15.
6. Loosen locknuts on studs of lower frame crossmember. Lift voltage regulator and release conduit from P-clip under left side leg of voltage regulator.
7. Pull away locking latch and remove socket of stator connector [46], 3-place Lyall, at bottom left side of voltage regulator.

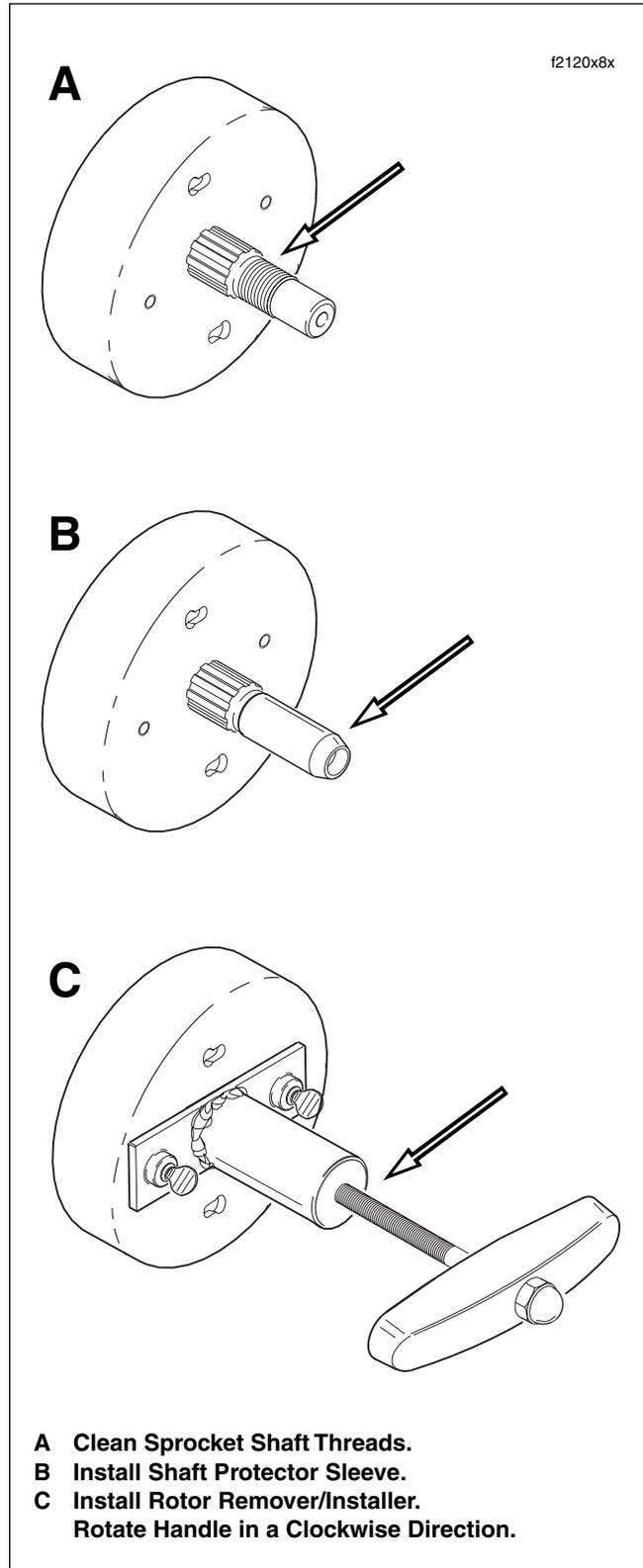


Figure 8-12. Remove Rotor from Engine Sprocket Shaft

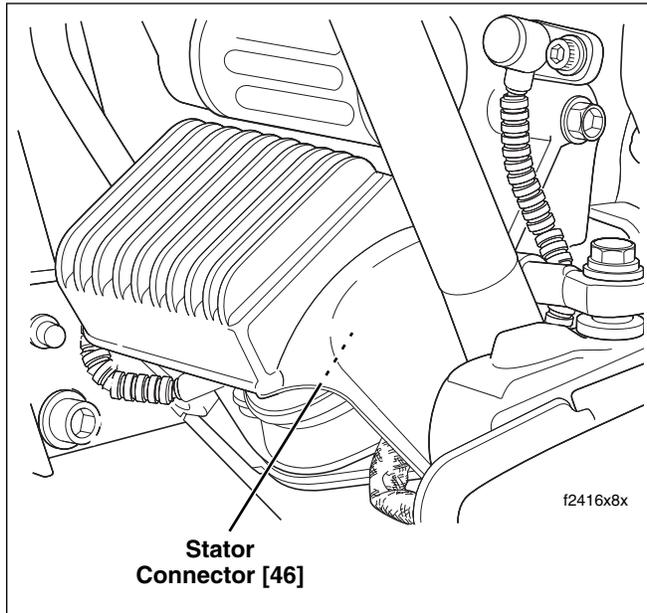


Figure 8-13. Voltage Regulator (Left Side View)

NOTE

The rubber molded stator connector is not serviceable. Damage to terminals or molding requires stator and/or voltage regulator replacement.

8. Draw stator conduit and socket to rear of front engine stabilizer link and then up to area in front of primary chaincase.
9. Remove four T27 TORX screws to free stator from crankcase. Discard screws.
10. Using point of awl, carefully lift capped rib on grommet away from crankcase and then insert into bore between grommet and casting. See Figure 8-14. Tilt awl slightly squirting isopropyl alcohol or glass cleaner into opening. Repeat this step at one or two other locations around grommet.
11. While pushing on capped rib from outside of crankcase, draw grommet through bore by pulling on cable stop with needle nose pliers. Rock grommet back and forth to facilitate removal, if necessary. Exercise caution to avoid damaging ribs on grommet if stator is to be reused.
12. Draw conduit and socket through crankcase bore.

CLEANING AND INSPECTION

1. Check inside of rotor and remove any metal fragments captured by magnets.
2. Clean the rotor using a petroleum solvent. Clean the stator and grommet by wiping it with a clean cloth.

INSTALLATION

1. From inside crankcase, feed socket and conduit through hole in crankcase.
2. Thoroughly lubricate grommet with isopropyl alcohol or glass cleaner. Ribs of grommet must be clean and free of dirt and oily residue.
3. Carefully grasp cable stop behind grommet with a needle nose pliers. Push grommet into crankcase bore while carefully pulling on outside cable. Installation is complete when cable stop contacts casting and capped rib of grommet exits crankcase bore.
4. If necessary, carefully run awl around edge of capped rib so that it rests flat against seating surface on crankcase.

CAUTION

Do not reuse T27 TORX screws. The threads of the screws contain a locking compound in pellet form. When the screw is started, the pellet breaks releasing the compound.

5. Install four **new** T27 TORX screws to fasten stator to crankcase. Alternately tighten screws to 55-75 **in-lbs** (6.2-8.5 Nm).

CAUTION

The high-output rotor contains powerful magnets. Use the ROTOR REMOVER/INSTALLER and SHAFT PROTECTOR SLEEVE (HD-41771) to prevent parts damage and possible hand injury during removal and installation.

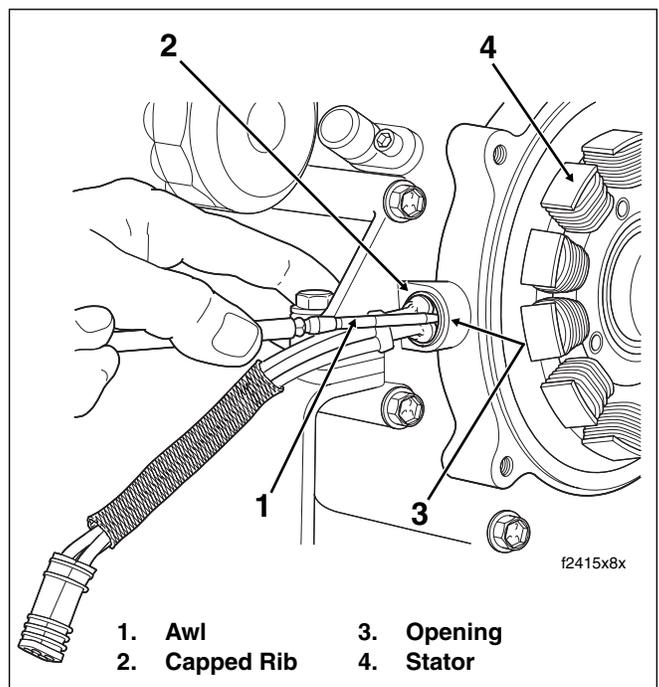


Figure 8-14. Remove Grommet From Crankcase

6. Install the rotor as follows:
 - a. Install the Shaft Protector Sleeve and Rotor Remover/Installer, if removed. See [Figure 8-12](#).

NOTE

The Shaft Protector Sleeve not only protects the threads from the splines of the rotor, but acts as a guide to ensure that the rotor is properly centered.

- b. Center ball on forcing screw in recess at end of engine sprocket shaft. Rotate the handle of the tool in a counterclockwise direction to ease rotor into position over stator.
 - c. Loosen thumbscrews and remove Rotor Remover/Installer. Remove Shaft Protector Sleeve.
 - d. Install the shaft extension on the engine sprocket shaft.
7. Feed socket and conduit under front engine stabilizer link and then forward along outboard side of voltage regulator leg. See [Figure 8-13](#).
8. Capture conduit in P-clip under left side leg of voltage regulator. Remove slack to ensure that conduit does not contact front engine stabilizer link.
9. Install socket of stator connector [46], 3-place Lyall, at bottom left side of voltage regulator. Push against locking latch until socket is fully engaged.
10. Alternately tighten locknuts on studs of lower frame crossmember to 70-100 **in-lbs** (7.9-11.3 Nm).

11. Locate CKP sensor connector [79], 2-place Deutsch. Place large end of slot on attachment clip over T-stud on bracket at bottom of voltage regulator. Push connector toward left side of motorcycle to engage small end of slot.
12. Install the clutch, primary chain, compensating sprocket and shaft extension as a single assembly. Install the primary chaincase cover. See Section [6.5 PRIMARY CHAINCASE, INSTALLATION](#), steps 9-31.
13. Insert bolt through battery negative cable (black) into threaded hole of battery negative (-) terminal. Tighten bolt to 60-96 **in-lbs** (6.8-10.9 Nm).
14. Install seat. See Section [2.25 SEAT, INSTALLATION](#).

REMOVAL

1. Remove maxi-fuse. See Section 8.3 SYSTEM FUSES, MAXI-FUSE, REMOVAL.
2. Locate CKP sensor connector [79], 2-place Deutsch, fixed to bracket at bottom of voltage regulator. Push connector toward right side of motorcycle to disengage attachment clip from T-stud on bracket. See Figure 8-15.
3. Remove locknuts from studs on lower frame crossmember. Lift voltage regulator off studs.
4. Release conduit and convoluted tubing from P-clips under left and right side legs of voltage regulator. Allow voltage regulator to hang upside down at front of lower frame crossmember. See Figure 8-16.
5. Pull away locking latch and remove socket of voltage regulator connector [77], 2-place Lyall, at bottom right side of voltage regulator.
6. Pull away locking latch and remove socket of stator connector [46], 3-place Lyall, at bottom left side of voltage regulator.

NOTE

The rubber molded voltage regulator and stator connectors are not serviceable. Damage to terminals, molding or locking latches requires voltage regulator and/or stator replacement.

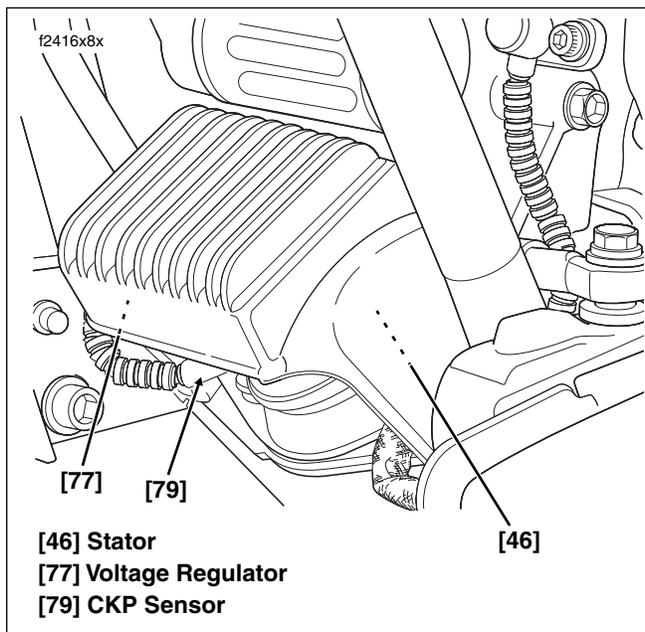


Figure 8-15. Voltage Regulator (Left Side View)

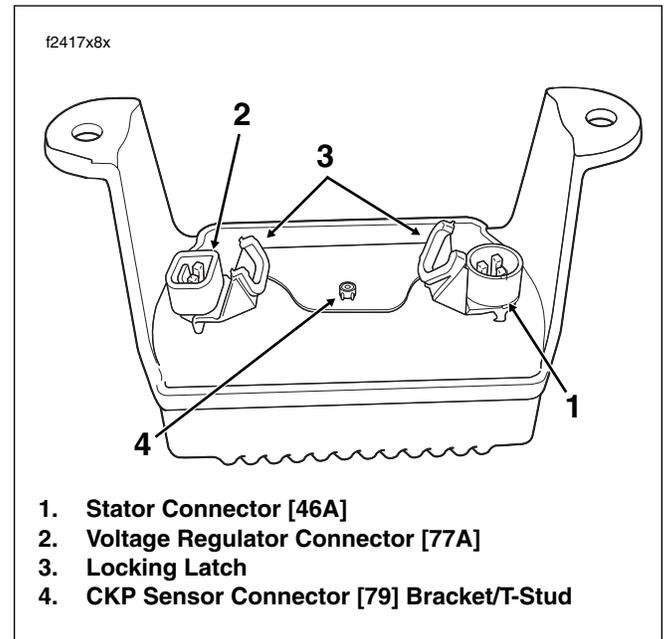


Figure 8-16. Voltage Regulator (Bottom View)

7. Remove voltage regulator from motorcycle.

INSTALLATION

1. Position voltage regulator upside down at front of lower frame crossmember. See Figure 8-16.
2. Install socket of stator connector [46], 3-place Lyall, at bottom left side of voltage regulator. Push against locking latch until socket is fully engaged.
3. Install socket of voltage regulator connector [77], 2-place Lyall, at bottom right side of voltage regulator. Push against locking latch until socket is fully engaged.
4. Turning voltage regulator right side up, start onto studs on lower frame crossmember.
5. Capture stator connector conduit in left side P-clip. Capture voltage regulator connector conduit and CKP sensor connector convoluted tubing in right side P-clip. See Figure 8-15. Remove slack to ensure that stator conduit and CKP sensor tubing does not contact front engine stabilizer link.
6. Install locknuts on studs and alternately tighten to 70-100 in-lbs (7.9-11.3 Nm).

7. Locate CKP sensor connector [79], 2-place Deutsch. Place large end of slot on attachment clip over T-stud on bracket at bottom of voltage regulator. Push connector toward left side of motorcycle to engage small end of slot.
8. Install maxi-fuse. See Section [8.3 SYSTEM FUSES, MAXI-FUSE, INSTALLATION](#).
9. Load test charging system.

GENERAL

All batteries are permanently sealed, maintenance-free, valve-regulated, lead/calcium and sulfuric acid batteries. The batteries are shipped pre-charged and ready to be put into service. Do not attempt to open these batteries for any reason.

⚠ WARNING

All batteries contain electrolyte. Electrolyte is a sulfuric acid solution that is highly corrosive and can cause severe chemical burns. Avoid contact with skin, eyes, and clothing. Avoid spillage. Always wear protective face shield, rubberized gloves and protective clothing when working with batteries. A warning label is attached to the top of the battery. See [Figure 8-17](#). Never remove warning label from battery. Failure to read and understand all precautions contained in warning label before performing any service on batteries could result in death or serious injury. See [Figure 8-18](#).

Table 8-2. 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 with water, get immediate medical attention.

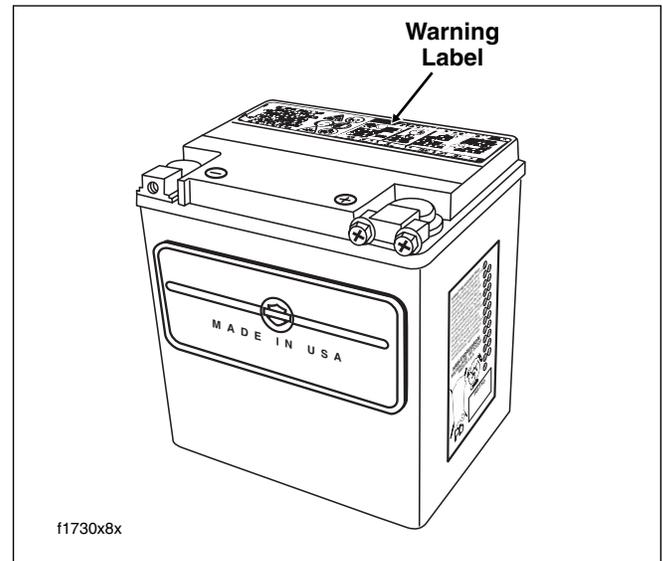


Figure 8-17. Maintenance-Free Battery

BATTERY TESTS

Three different procedures may be performed to provide a good indicator of battery condition: a voltmeter test, a conductance test, or a load test.

A battery may be tested, whether fully charged or not, via the voltmeter or conductance tests. In order to perform a load test, however, the battery must be fully charged.

VOLTMETER TEST

See [Table 8-3](#). Check the voltage of the battery to verify that it is in a 100% fully charged condition. If the open circuit (disconnected) voltage reading is below 12.6V, charge the battery and then recheck the voltage after the battery has set for

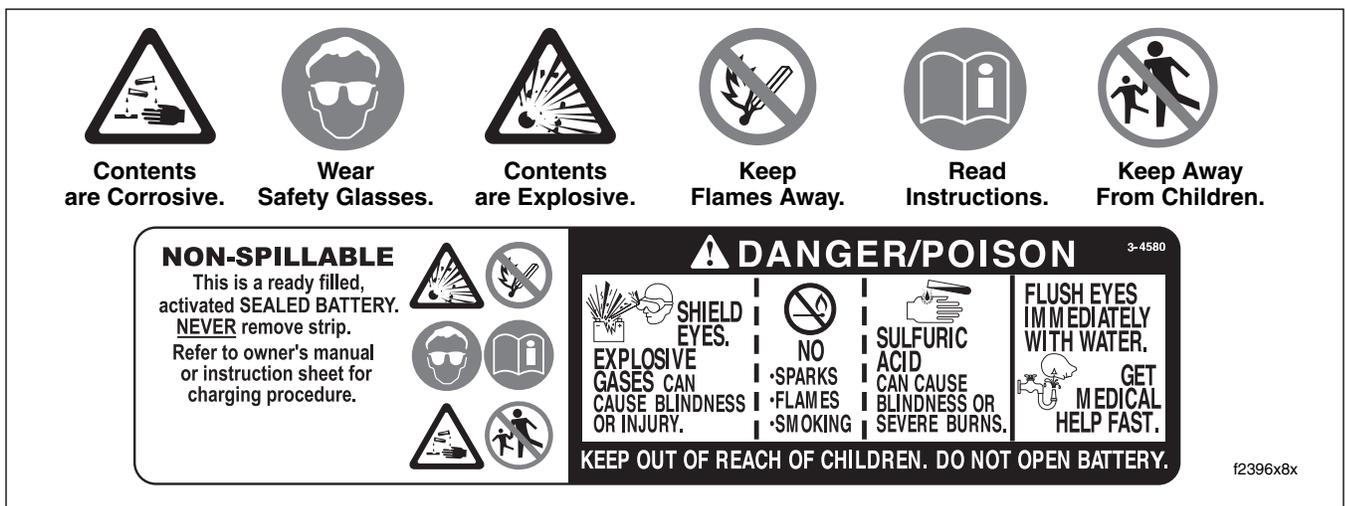


Figure 8-18. Battery Warning Label

one to two hours. If the voltage reading is 12.7V or above, perform the [LOAD TEST](#) described on this page.

Table 8-3. Voltmeter Test

Voltage (OCV)	State of Charge
12.7	100%
12.6	75%
12.3	50%
12.0	25%
11.8	0%

CONDUCTANCE TEST

Test battery using the ADVANCED BATTERY CONDUCTANCE AND ELECTRICAL SYSTEM ANALYZER (HD-48053). See [Figure 8-19](#). Proceed as follows:

1. Connect the analyzer leads to the battery.
2. Follow the instructions in the analyzer instruction manual to perform a battery test.

The test results will include a decision on the battery condition, the measured state of charge and the measured CCA.

See [Figure 8-20](#). The analyzer printer will provide you with a printout including one of five possible test results:

- GOOD BATTERY—return the battery to service.
- GOOD-RECHARGE—fully charge the battery and return to service.
- CHARGE & RETEST—Fully charge the battery and retest.
- REPLACE BATTERY—replace the battery and retest.
- BAD CELL-REPLACE—replace the battery and retest.



Figure 8-19. Advanced Battery Conductance and Electrical System Analyzer (Part No. HD-48053)

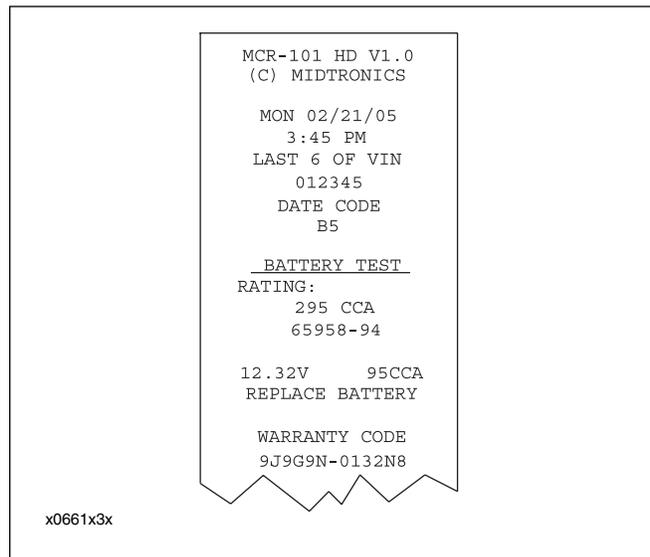


Figure 8-20. Battery Test Results—Printout

NOTE

A **REPLACE BATTERY** test result may also mean a poor connection between the battery cables and the motorcycle. After disconnecting the battery cables from the battery, retest the battery using the out-of-vehicle test before replacing.

LOAD TEST

The load test measures battery performance under full current load. To load test the battery, proceed as follows:

1. Remove the battery from the motorcycle. See [DISCONNECTION AND REMOVAL](#) in this section.

CAUTION

Load testing a discharged battery can result in permanent battery damage.

2. Always fully charge the battery before testing or test readings will be incorrect. See [CHARGING BATTERY](#), in this section. Load testing a discharged battery can also result in permanent battery damage.
3. After charging, allow battery to stand for at least one hour before testing.

WARNING

Always turn the battery load tester OFF before connecting the tester cables to the battery terminals. Connecting tester cables with the load tester ON could cause a spark resulting in a battery explosion. A battery explosion may rupture the battery case causing a discharge or spray of sulfuric acid which could result in death or serious injury.

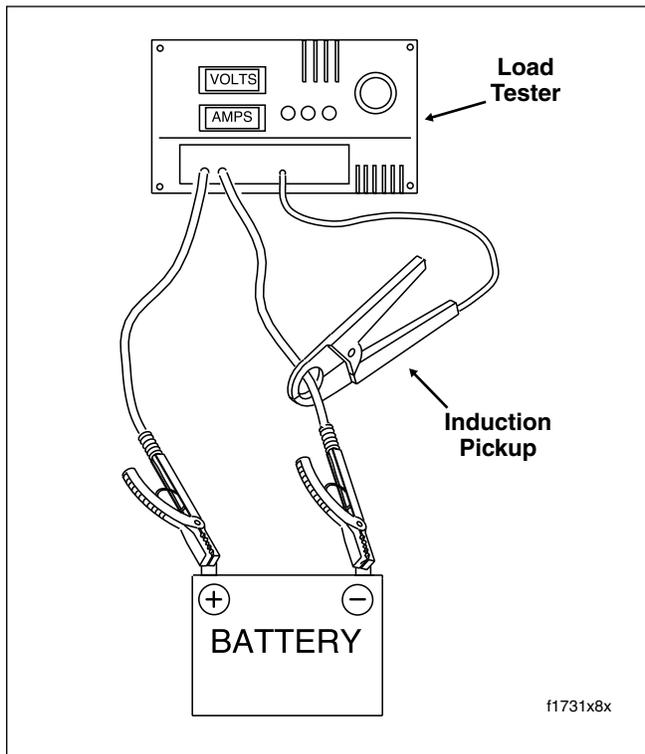


Figure 8-21. Load Test Battery

4. Connect tester leads to battery posts and place induction pickup over negative (black) cable. See [Figure 8-21](#).

CAUTION

To avoid load tester and/or battery damage, do not leave the load tester switch turned ON for more than 20 seconds.

5. Referencing Table 8-4, load battery at 50% of CCA rating using the load tester. Voltage reading after 15 seconds should be 9.6V or more at 70°F. (21°C).

Table 8-4. Battery Load Test

COLD CRANKING AMPERAGE (CCA)	100%	50%
TOURING	300	150

WARNING

Always turn the battery load tester OFF before disconnecting the tester cables from the battery terminals. Disconnecting tester cables with the load tester ON could cause a spark resulting in a battery explosion. A battery explosion may rupture the battery case causing a discharge or spray of sulfuric acid which could result in death or serious injury.

6. Install the battery on the motorcycle. See [INSTALLATION AND CONNECTION](#) in this section.

DISCONNECTION AND REMOVAL

1. Remove seat. See Section [2.25 SEAT, REMOVAL](#).

WARNING

Always disconnect the negative battery cable first. If the positive cable should contact ground with the negative cable installed, the resulting sparks may cause a battery explosion which could result in death or serious injury.

2. Unthread bolt and remove battery negative cable (black) from battery negative (-) terminal.
3. Unthread bolt and remove battery positive cable (red) from battery positive (+) terminal.
4. Loosen T40 TORX screw to move lip of hold-down clamp off edge of battery. Remove battery from battery box.

CLEANING AND INSPECTION

1. Battery top must be clean and dry. Dirt and electrolyte on top of the battery can cause battery to self-discharge. Clean battery top with a solution of baking soda (sodium bicarbonate) and water (5 teaspoons baking soda per quart or liter of water). When the solution stops bubbling, rinse off the battery with clean water.
2. Clean cable connectors and battery terminals using a wire brush or sandpaper. Remove any oxidation.
3. Inspect the battery screws, clamps and cables for breakage, loose connections and corrosion. Clean clamps.
4. Check the battery posts for melting or damage caused by overtightening.
5. Inspect the battery for discoloration, raised top or a warped or distorted case, which might indicate that the battery has been frozen, overheated or overcharged.
6. Inspect the battery case for cracks or leaks.

BATTERY CHARGING

SAFETY PRECAUTIONS

Never charge a battery without first reviewing the instructions for the charger being used. In addition to the manufacturer's instructions, follow these general safety precautions:

- Always wear proper eye, face and hand protection.
- Always charge batteries in a well-ventilated area.
- Turn the charger "OFF" before connecting the leads to the battery to avoid dangerous sparks.

Table 8-5. Battery Charging Rates/Estimated Times

Battery Amp-Hour	State of Charge		3 Amp Charger	6 Amp Charger	10 Amp Charger	20 Amp Charger
	Voltage Reading	% of Charge				
TOURING 28	12.7 V	100%	-	-	-	-
	12.6 V	75%	2.5 hours	1.25 hours	45 minutes	25 minutes
	12.3 V	50%	5 hours	2.5 hours	1.5 hours	50 minutes
	12.0 V	25%	7.5 hours	3.75 hours	2.25 hours	70 minutes
	11.8 V	0%	10 hours	5 hours	3 hours	1.5 hours

The figures listed above assume that the battery is charging at room temperature. If warmer than room temperature, use a slightly shorter charging time. If colder, use a slightly longer charging time.

The use of constant current chargers to charge sealed maintenance-free batteries is not recommended. Any overcharge will cause dry-out and premature battery failure. If a constant current charger is the only type available, do **not** exceed the charge times listed above and do **not** continue charging the battery if it gets hot. When charging, never exceed 15 volts for more than 30 minutes.

- Never try to charge a visibly damaged or frozen battery.
- Connect the charger leads to the battery; red positive (+) lead to the positive (+) terminal and black negative (-) lead to the negative (-) terminal. If the battery is still in the motorcycle, connect the negative lead to the chassis ground. Be sure that the ignition and all electrical accessories are turned off.
- Make sure that the charger leads to the battery are not broken, frayed or loose.
- If the battery becomes hot, or if violent gassing or spewing of electrolyte occurs, reduce the charging rate or turn off the charger temporarily.
- Always turn the charger "OFF" before removing charger leads from the battery to avoid dangerous sparks.

CHARGING BATTERY

Charge the battery if any of the following conditions exist:

- Motorcycle lights appear dim.
- Electric starter sounds weak.
- Battery has not been used for an extended period of time.

WARNING

Always charge the battery in a well ventilated area. Explosive hydrogen gas escapes from the battery during charging. Keep open flames, electrical sparks and smoking materials away from the battery at all times. Failure to do so could result in death or serious injury.

CAUTION

If the battery releases an excessive amount of gas during charging, decrease the charging rate. If the battery gets hotter than 110°F. (43°C) during charging, discontinue charging and allow the battery to cool. Overheating may result in plate distortion, internal shorting, dryout or other damage.

1. Perform a voltmeter test to determine the state of charge. See [VOLTMETER TEST](#) in this section. If battery needs to be charged, proceed to step 2.

CAUTION

Always remove the battery from the motorcycle before charging. Accidental electrolyte leakage will damage motorcycle parts.

2. Remove the battery from the motorcycle. See [DISCONNECTION AND REMOVAL](#) in this section. Place the battery on a level surface.

WARNING

Always unplug or turn OFF the battery charger before connecting the charger clamps to the battery. Connecting clamps with the charger ON could cause a spark resulting in a battery explosion. A battery explosion may rupture the battery case causing a discharge or spray of sulfuric acid which could result in death or serious injury.

CAUTION

Do not reverse the charger connections described in the following steps or the charging system of the motorcycle could be damaged.

3. Connect the red battery charger lead to the positive (+) terminal of the battery.
4. Connect the black battery charger lead to the negative (-) terminal of the battery.

NOTE

If the battery is still in the motorcycle, connect the negative lead to the chassis ground. Be sure that the ignition and all electrical accessories are turned off.

5. Step away from the battery and turn on the charger. See the charging instructions in [Table 8-5](#).

⚠ WARNING

Always unplug or turn OFF the battery charger before disconnecting the charger clamps from the battery. Disconnecting clamps with the charger ON could cause a spark resulting in a battery explosion. A battery explosion may rupture the battery case causing a discharge or spray of sulfuric acid which could result in death or serious injury.

6. After the battery is fully charged, disconnect the black battery charger lead to the negative (-) terminal of the battery.
7. Disconnect the red battery charger lead to the positive (+) terminal of the battery.
8. Mark the charging date on the battery.
9. Perform [CONDUCTANCE TEST](#) or [LOAD TEST](#) to determine the condition of the battery.

NOTE

If charging battery because voltmeter test reading was below 12.6V, recheck the voltage after the battery has set for one to two hours. If the voltage reading is 12.7V or above, perform the [LOAD TEST](#).

BATTERY CABLE ROUTING

⚠ WARNING

Hole on left side of frame crossmember is used for cruise cable routing only. Use of the hole for battery cable routing can result in contact with hot exhaust pipe causing melting or burning of the cable insulation, damage that can lead to driveability problems or fire hazard, conditions which could result in death or serious injury.

Route all battery cables through opening between tray of battery box and bottom of frame cross member. Cables should be positioned as shown in [Figure 8-22](#).

INSTALLATION AND CONNECTION

1. Place the fully charged battery into the battery box, terminal side forward.

CAUTION

Connect the cables to the correct battery terminals or damage to the motorcycle electrical system will occur.

⚠ WARNING

Always connect the positive battery cable first. If the positive cable should contact ground with the negative cable installed, the resulting sparks may cause a battery explosion which could result in death or serious injury.

CAUTION

Overtightening bolts can damage battery terminals.

1. Insert bolt through battery positive cable (red) into threaded hole of battery positive (+) terminal. Tighten bolt to 60-96 in-lbs (6.8-10.9 Nm).

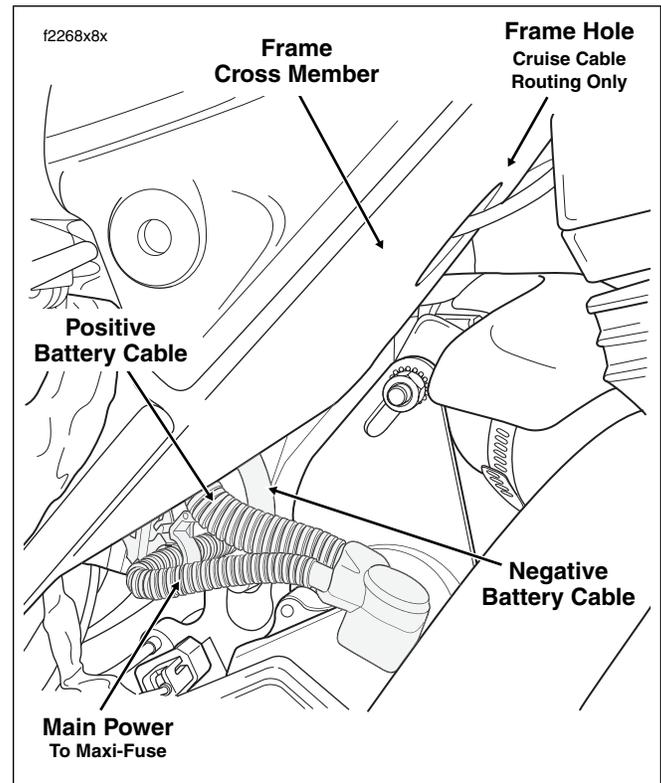


Figure 8-22. Battery Cable Routing (Right Side View)

2. Insert bolt through battery negative cable (black) into threaded hole of battery negative (-) terminal. Tighten bolt to 60-96 **in-lbs** (6.8-10.9 Nm).
3. Apply a light coat of petroleum jelly or ELECTRICAL CONTACT LUBRICANT, Part No. 99861-02 (1 oz tube), to both battery terminals.
4. Rotate the hold-down clamp so that the lip (with rubber pad) rests on the edge of the battery. Tighten T40 TORX screw to 15-20 ft-lbs (20-27 Nm).
5. Install seat. See Section [2.25 SEAT, INSTALLATION](#).

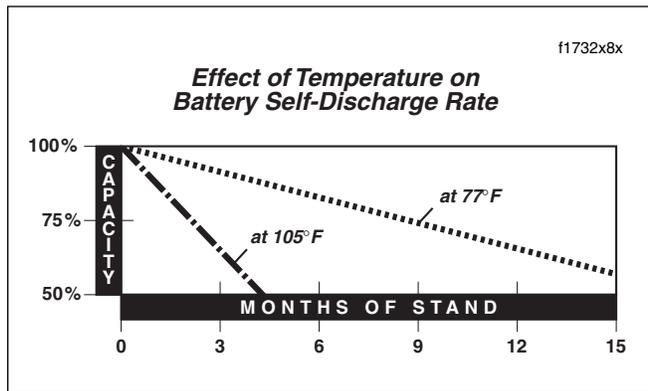


Figure 8-23. Battery Self-Discharge Rate

STORAGE

WARNING

Store the battery out of the reach of children. Inadequate safety precautions could result in death or serious injury.

CAUTION

The electrolyte in a discharged battery will freeze if exposed to freezing temperatures. Freezing may crack the battery case and buckle battery plates.

If the motorcycle will not be operated for several months, such as during the winter season, remove the battery from the motorcycle and fully charge. See [CHARGING BATTERY](#) in this section.

Self-discharge is a normal condition and occurs continuously at a rate that depends on the ambient temperature and the battery's state of charge. Batteries discharge at a faster rate at higher ambient temperatures. To reduce the self-discharge rate, store battery in a cool (not freezing), dry place. See [Figure 8-23](#).

Charge the battery every month if stored at temperatures below 60° F. (16° C). Charge the battery more frequently if stored in a warm area above 60° F. (16° C).

NOTE

The GLOBAL BATTERY CHARGER (Part No. 99863-01) may be used to maintain battery charge for extended periods of time without risk of overcharging or boiling.

When returning a battery to service after storage, refer to the instructions under [CHARGING BATTERY](#) in this section.

HEADLAMP ASSEMBLY

REMOVAL

1. Remove Phillips screw at bottom of headlamp door (chrome ring). Remove headlamp door.
2. Proceed as follows:

FLHX, FLHT/C/U: Remove three Phillips screws from retaining ring and carefully pull headlamp assembly from outer fairing. See [Figure 8-24](#).

FLHR/C/S: Remove seven Phillips screws from headlamp housing and carefully pull headlamp assembly from headlamp nacelle.
3. Remove headlamp connector [38] at back of headlamp bulb. Remove headlamp assembly from motorcycle.

INSTALLATION

1. Install headlamp connector [38] at back of headlamp bulb.
2. Proceed as follows:

FLHX, FLHT/C/U: Align holes in retaining ring of headlamp assembly with those in outer fairing (headlamp door bracket at bottom). Install three Phillips screws and alternately tighten to 23-28 **in-lbs** (2.6-3.2 Nm). See [Figure 8-24](#).

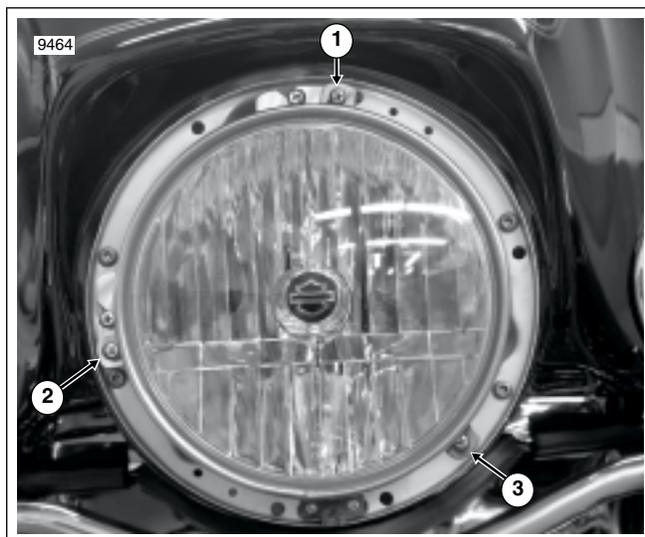


Figure 8-24. Remove Retaining Ring Screws (FLHX, FLHT/C/U Model Shown)

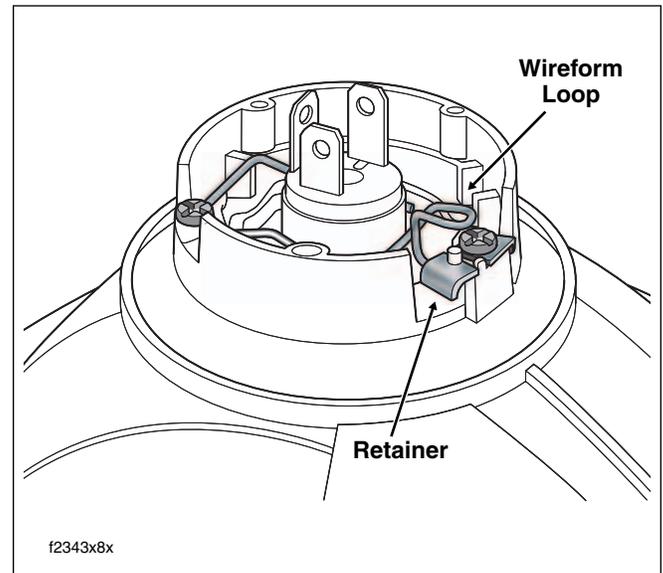


Figure 8-25. Headlamp Bulb Assembly

- FLHR/C/S:** Align holes in headlamp housing with well-nuts in headlamp nacelle (headlamp door bracket at bottom). Install seven Phillips screws and alternately tighten to 9-18 **in-lbs** (1.0-2.0 Nm).
3. Fit the square-shaped portion of the headlamp door spring into slot at top of headlamp housing and then snap the headlamp door (chrome ring) into place. Install Phillips screw at bottom of headlamp door and tighten to 9-18 **in-lbs** (1.0-2.0 Nm).

HEADLAMP BULB REPLACEMENT

The headlamp is a replaceable bulb (and not a sealed beam). Made of quartz glass filled with Halogen gas, the bulb is very delicate and must be handled with care.

NOTE

When replacement is required, use only the specified bulb available from your Harley-Davidson dealer. Improper wattage or bulb may cause charging system problems.

1. Remove headlamp. See [HEADLAMP ASSEMBLY, REMOVAL](#).
2. Remove rubber boot at back of lens.
3. Press down on wireform loop and push pin end out from under lip of retainer to release. See [Figure 8-25](#). Use hinge to swing wireform out of the way.

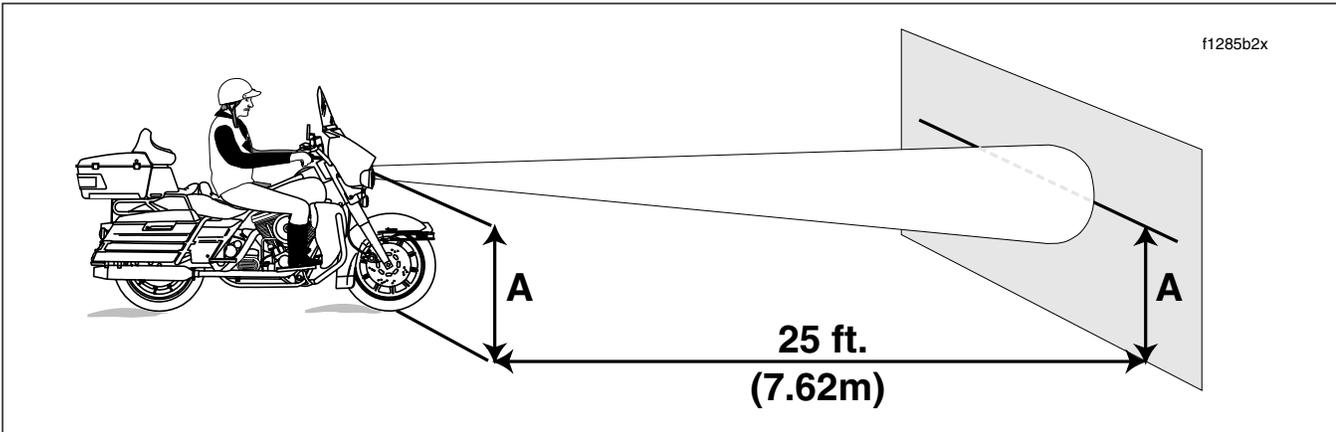


Figure 8-26. Check Headlamp Alignment

NOTE

If it is difficult to free pin end of wireform from under lip of retainer, loosen retainer screw 1/2-1 turn and then repeat step 3.

WARNING

The bulb contains Halogen gas under pressure. Wear adequate eye protection and handle the bulb carefully. Inadequate safety precautions could result in death or serious injury.

4. Remove and discard bulb.

CAUTION

Never touch the quartz bulb with your fingers. Fingerprints will etch the glass and cause premature bulb failure. Always wrap the bulb in paper or a clean dry cloth during handling.

5. Install **new** bulb in lense. Rotate bulb as necessary so that wider ear on backplate points toward the top of the headlamp assembly.

NOTE

The top of the headlamp assembly can be determined by the orientation of the decorative logo on the opposite side, or the location of the headlamp door bracket, which is always at the bottom of the assembly.

6. Use hinge to rotate wireform over socket at back of bulb. Press down on loop and push pin end under lip of retainer to secure. See Figure 8-25.

NOTE

If retainer screw was loosened to release wireform, use finger to hold retainer in place and then slowly tighten screw until snug. Turning headlamp assembly over, verify that reflector cone is still centered under decorative logo. If it is not, loosen retainer screw and repeat step until the proper results are achieved.

7. Install rubber boot at back of lense.
8. Install headlamp. See [HEADLAMP ASSEMBLY, INSTALLATION](#).

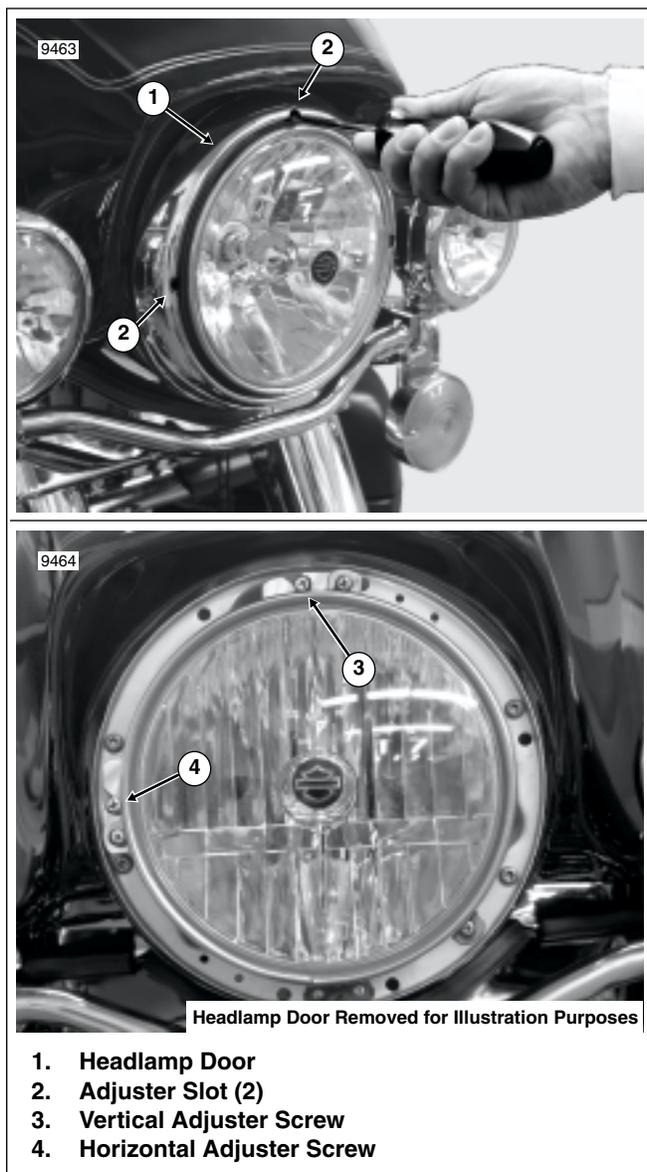
HEADLAMP ADJUSTMENT

Check headlamp beam for proper height and lateral alignment.

WARNING

DO NOT modify the ignition/light key switch wiring to disable the automatic-on headlamp feature. High visibility is an important safety consideration for motorcycle riders. Ensure that the headlamp is on at all times. Failure to do so could result in death or serious injury.

1. Verify correct front and rear tire inflation pressure.
2. Place the motorcycle on a level floor or pavement in an area with minimum light.
3. See Figure 8-26. Point the front of the motorcycle toward a screen or wall which is 25 feet (7.62 m) from where patch of front tire contacts floor (i.e. - directly below front axle).
4. Draw a horizontal line on screen or wall that is exactly the same height above the floor as the headlamp center.
5. Have a person whose weight is roughly the same as that of the principal rider sit on the motorcycle seat. The weight of the rider will compress the vehicle suspension slightly.
6. Stand the motorcycle upright with both tires resting on the floor and with the front wheel held in straight alignment (directly forward).



**Figure 8-27. Adjust Headlamp Alignment
(FLHX, FLHT/C/U Model Shown)**

7. Turn the Ignition/Light Key Switch to IGNITION. Set the Light Switch on the left handlebar to Hi(gh) beam.
8. Check the light beam for proper height alignment. The center of the main beam of light should be even with the horizontal line on the screen or wall.
9. Check the light beam for proper lateral alignment. The main beam of light should be directed straight ahead (i.e., equal area of light to right and left of center).

NOTE

The headlamp adjustment can be performed without removing the headlamp door (chrome ring).

10. If the headlamp alignment requires adjustment, use adjuster slots in headlamp door to insert Phillips screwdriver between headlamp housing and rubber gasket. See upper frame of [Figure 8-27](#).

Turn the vertical adjuster screw as necessary to adjust the headlamp vertically. Turn the horizontal adjuster screw to adjust the headlamp horizontally. See lower frame of [Figure 8-27](#).

HEADLAMP ASSEMBLY

REMOVAL

1. Remove the outer fairing. See Section 2.31 UPPER FAIRING/WINDSHIELD (FLTR), OUTER FAIRING, REMOVAL.
2. Move outer fairing assembly to bench area.
3. Squeeze two external tabs to disconnect headlamp harness connectors from bulb contacts.

CAUTION

Wrap electrical tape around blade of screwdriver to prevent damage to tabs of transparent lense cover.

4. From inboard side of outer fairing, release top of transparent lense cover from slots in fairing by gently depressing two tabs with blade of screwdriver. Depress two bottom tabs and remove lense cover from fairing.

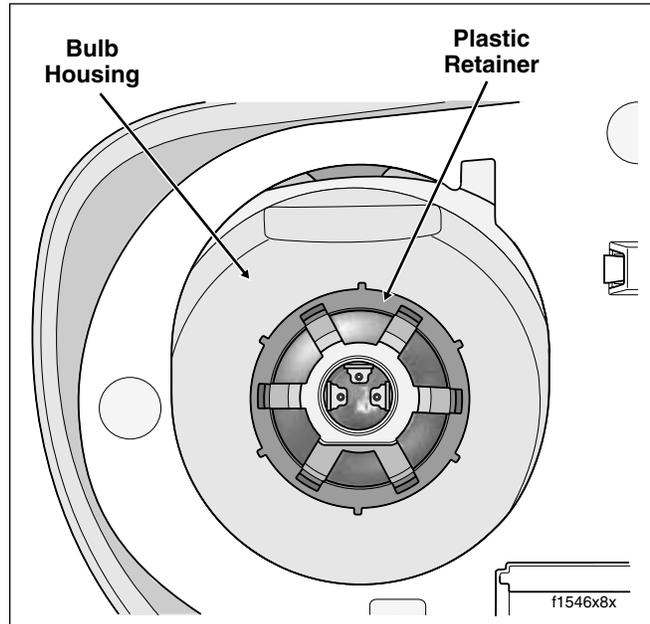


Figure 8-29. Remove Retainer to Release Bulb

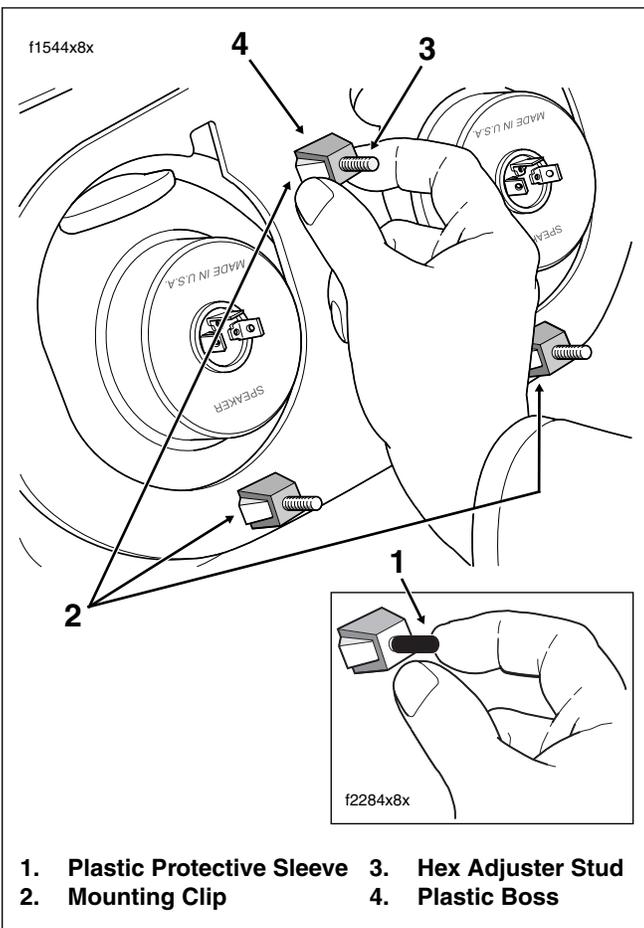


Figure 8-28. Depress Mounting Clips

5. Remove plastic protective sleeve from top center hex adjuster stud. See inset of Figure 8-28.
6. Depress mounting clips on all three hex adjuster studs and pull headlamp assembly out front of outer fairing. See Figure 8-28.

INSTALLATION

1. At front of outer fairing, align ends of hex adjuster studs with holes in plastic bosses. Push headlamp assembly into position until mounting clips engage outer fairing.

CAUTION

To avoid cutting or chafing wires, be sure to install plastic protective sleeve on top center stud of headlamp assembly. See inset of Figure 8-28.

2. Carefully snap bottom tabs of transparent lense cover into bottom slots of outer fairing. Carefully snap upper tabs of lense cover into upper slots of fairing.
3. Install headlamp harness connectors onto bulb contacts.
4. Install the outer fairing. See Section 2.31 UPPER FAIRING/WINDSHIELD (FLTR), OUTER FAIRING, INSTALLATION.

HEADLAMP BULB REPLACEMENT

The headlamp is a replaceable bulb (and not a sealed beam). Made of quartz glass filled with Halogen gas, the bulb is very delicate and must be handled with care.

NOTE

When replacement is required, use only the specified bulb available from your Harley-Davidson dealer. Improper wattage or bulb may cause charging system problems.

REMOVAL

1. Remove the outer fairing. See Section 2.31 UPPER FAIRING/WINDSHIELD (FLTR), OUTER FAIRING, REMOVAL.
2. Move outer fairing assembly to bench area.
3. Squeeze two external tabs to disconnect headlamp harness connector from bulb contacts.
4. Remove rubber boot at back of bulb housing.
5. Rotate plastic retainer in a counter-clockwise direction to remove from bulb housing flange. See Figure 8-29.

WARNING

The bulb contains Halogen gas under pressure. Wear adequate eye protection and handle the bulb carefully. Inadequate safety precautions could result in death or serious injury.

6. Remove and discard bulb.

INSTALLATION

CAUTION

Never touch the quartz bulb with your fingers. Fingerprints will etch the glass and cause premature bulb failure. Always wrap the bulb in paper or a clean dry cloth during handling.

1. Install **new** bulb in bulb housing. Orient bulb so that wider ear on backplate is topside and then push bottom of backplate so that tabs on outboard side fit snugly in slot of bulb housing. See Figure 8-30.
2. Place plastic retainer over bulb housing flange and rotate in a clockwise direction until tight. See Figure 8-29.

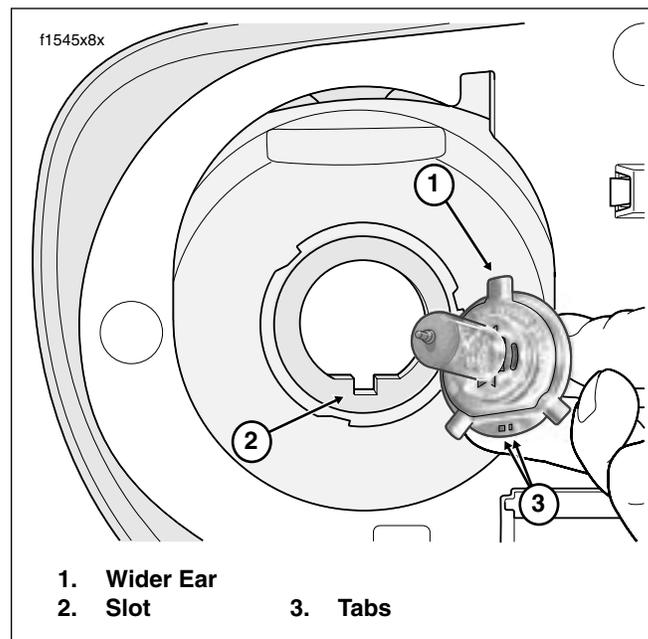


Figure 8-30. Install New Bulb in Bulb Housing

3. Install rubber boot over retainer until flush with base of bulb socket.
4. Connect headlamp harness connector to bulb contacts.
5. Install the outer fairing. See Section 2.31 UPPER FAIRING/WINDSHIELD (FLTR), OUTER FAIRING, INSTALLATION.

HEADLAMP ADJUSTMENT

Check headlamp beam for proper height and lateral alignment. Proceed as follows:

WARNING

DO NOT modify the ignition/light key switch wiring to disable the automatic-on headlamp feature. High visibility is an important safety consideration for motorcycle riders. Ensure that the headlamp is on at all times. Failure to do so could result in death or serious injury.

1. Verify correct front and rear tire inflation pressure.
2. Place the motorcycle on a level floor or pavement in an area with minimum light.
3. See Figure 8-26. Point the front of the motorcycle toward a screen or wall which is 25 feet (7.62 m) from where patch of front tire contacts floor (i.e. - directly below front axle).
4. Draw a horizontal line on screen or wall that is exactly the same height above the floor as the headlamp center.

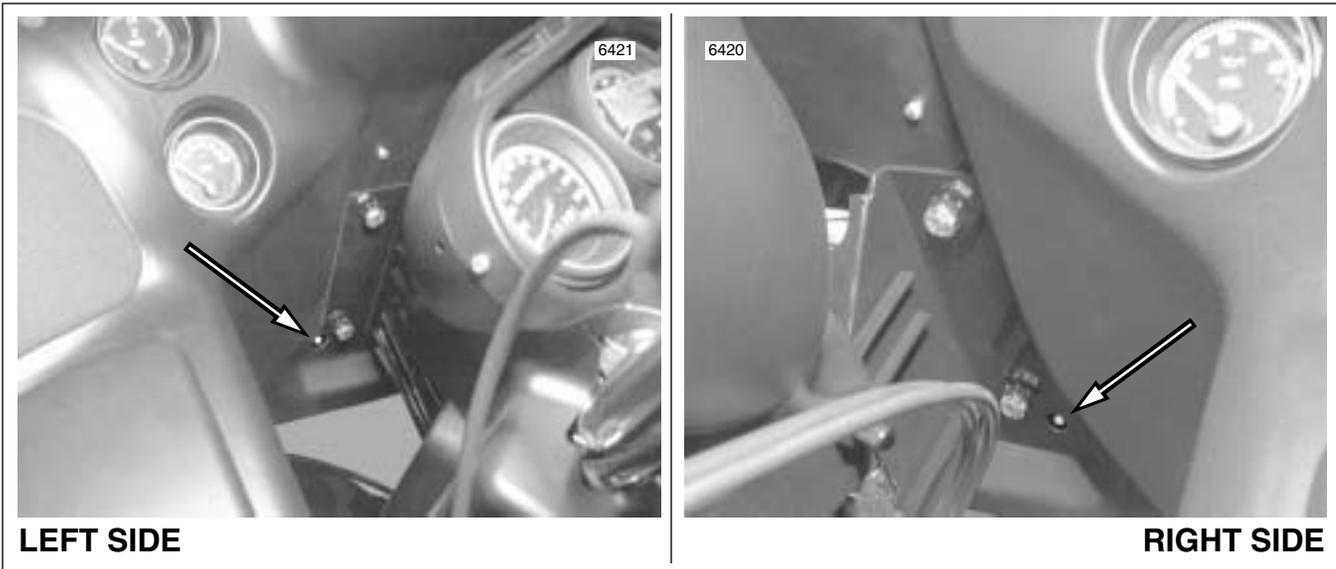


Figure 8-31. Rotate Hex Adjusters to Adjust Headlamp (FLTR)

5. Have a person whose weight is roughly the same as that of the principal rider sit on the motorcycle seat. The weight of the rider will compress the vehicle suspension slightly.
6. Stand the motorcycle upright with both tires resting on the floor and with the front wheel held in straight alignment (directly forward).
7. Turn the Ignition/Light Key Switch to IGNITION. Set the Light Switch on the left handlebar to Hi(gh) beam.
8. Check the light beam for proper height alignment. The center of the main beam of light should be even with the horizontal line on the screen or wall.
9. Check the light beam for proper lateral alignment. The main beam of light should be directed straight ahead (i.e., equal area of light to right and left of center).
10. Locate the hex adjusters near the bottom edge of the inner fairing. See [Figure 8-31](#). Turning the adjusters causes the double headlamp housing to pivot around its upper mount.
11. Using a deepwell 4.5 mm with 1/4 inch drive socket (Snap-On STMM4.5) and flexible driver (Snap-On TM62B), adjust the headlamp horizontally by turning either the left or right side adjuster. Turn both adjusters equally to adjust the headlamp vertically.

NOTE

If the socket does not easily fit the adjuster, see if a deepwell 3/16 inch with 1/4 inch drive socket (Snap-On STM6) produces better results.

Adjuster rotation moves the headlamp beam as follows:

Table 8-6. FLTR Hex Adjuster Rotation

Hex Adjuster	Rotation	Beam Movement
Left Only	CW	To the Right
Right Only	CCW	
Left Only	CCW	To the Left
Right Only	CW	
Left and Right Equally	CW	Upward
Left and Right Equally	CCW	Downward

CW= Clockwise

CCW= Counter-Clockwise

AUXILIARY LAMP BULB

REMOVAL

1. Loosen auxiliary lamp door screw as required to pull lamp door from lip of lamp housing. See [Figure 8-32](#).
2. Disconnect auxiliary lamp connector [199L/R], 2-place Packard. See [Figure 8-33](#).
3. Remove nesting ring at back of lense.

WARNING

The bulb contains Halogen gas under pressure. Wear adequate eye protection and handle the bulb carefully. Inadequate safety precautions could result in death or serious injury.

4. Rotate bulb/pin housing 1/4 turn in a counterclockwise direction and remove from lense. Discard bulb/pin housing. See [Figure 8-34](#).

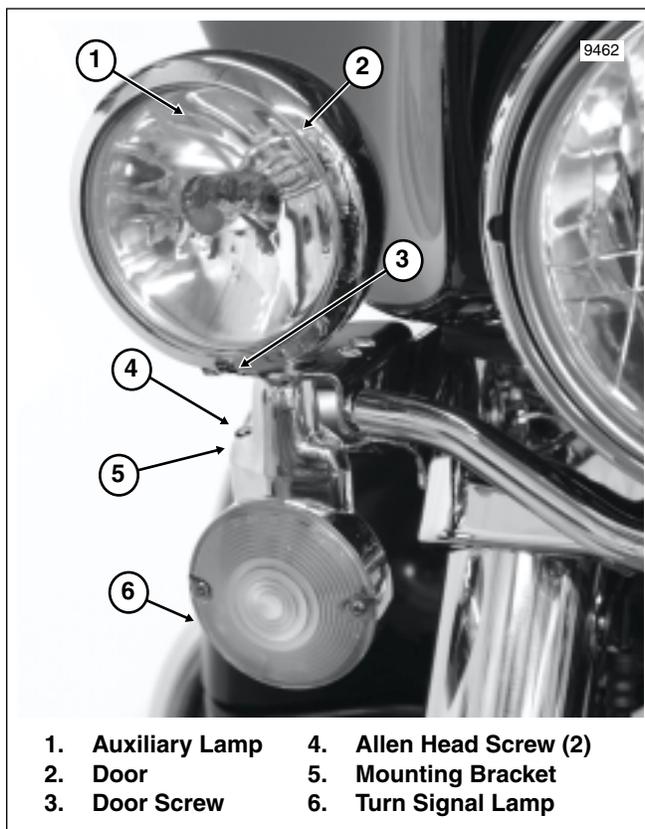


Figure 8-32. Auxiliary and Front Turn Signal Lamp

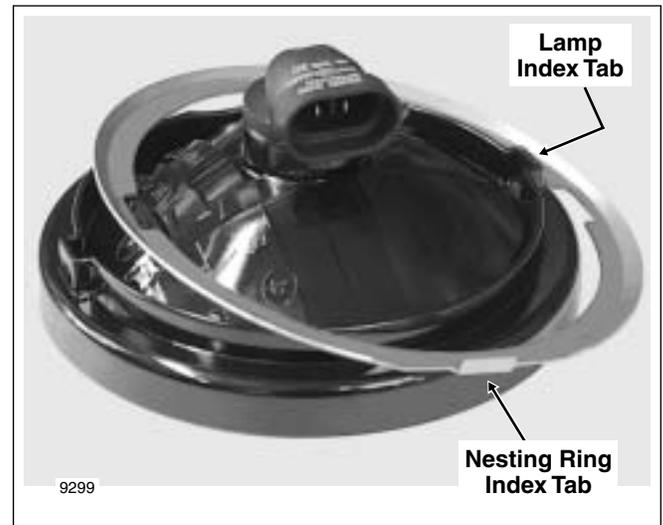


Figure 8-33. Auxiliary Lamp Assembly



Figure 8-34. Auxiliary Lamp Bulb/Pin Housing

CAUTION

Never touch the quartz bulb with your fingers. Fingerprints will etch the glass and cause premature bulb failure. Always wrap the bulb in paper or a clean dry cloth during handling.

5. Install **new** bulb/pin housing in lense and rotate 1/4 turn in a clockwise direction. See [Figure 8-34](#).

INSTALLATION

1. Place nesting ring at back of lense with the concave side up. See [Figure 8-33](#).
2. Connect auxiliary lamp connector [199L/R], 2-place Packard. See [Figure 8-33](#).

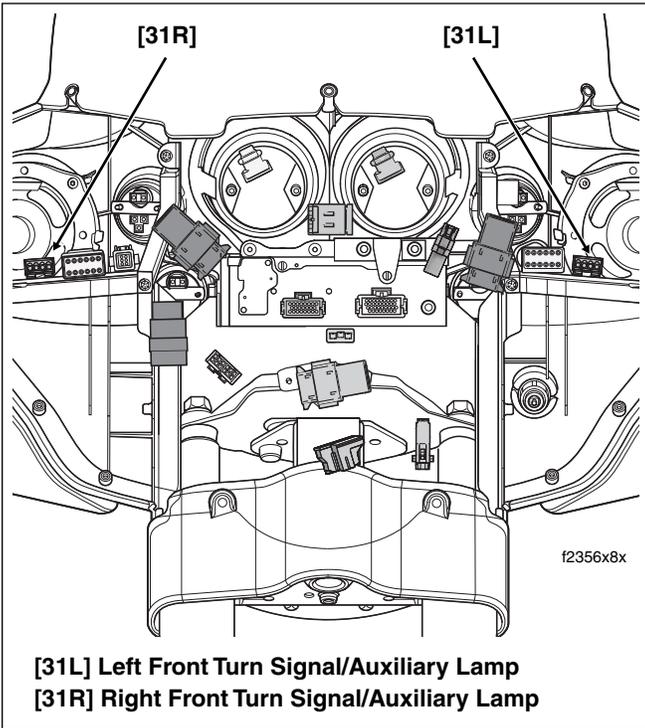


Figure 8-35. Inner Fairing (FLHT/C/U)

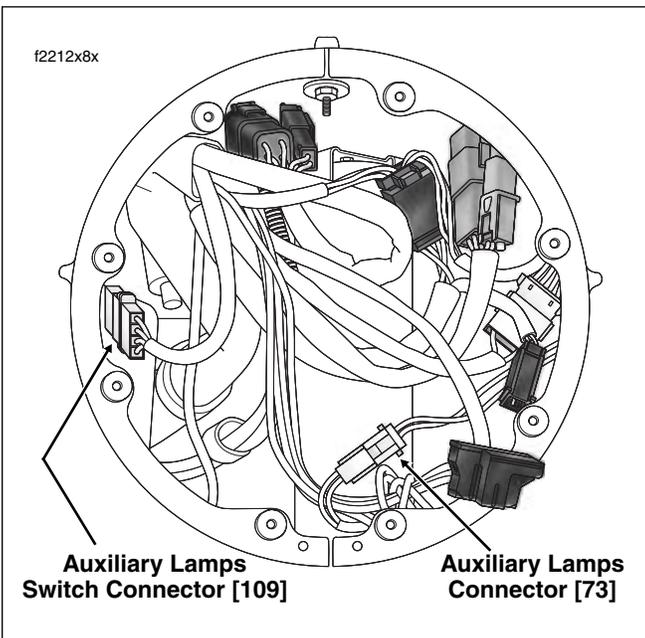


Figure 8-36. Headlamp Nacelle (FLHR/C)

- Place nesting ring over edge of lamp housing. Rotate nesting ring until index tab engages slot at bottom of lamp housing.
- Holding nesting ring in place, rotate lens so that index tabs at back engage slots in nesting ring.

- Install lamp door over lip of lamp housing. Rotate lamp door so that screw is centered at bottom, and then tighten door screw until snug.

AUXILIARY LAMP HOUSING

REMOVAL

NOTE

If replacing only the lamp housing, begin at step 1. Start at step 2 if replacing the entire lamp assembly

- Disassemble auxiliary lamp if not replacing the entire assembly, if necessary. See [AUXILIARY LAMP BULB, REMOVAL](#), in this section, steps 1-3. See [Figure 8-37](#).
- Proceed as follows: **FLHT/C/U**: Remove outer fairing. See Section 2.30 [UPPER FAIRING/WINDSHIELD \(FLHX, FLHT/C/U\), OUTER FAIRING/WINDSHIELD, REMOVAL](#). Locate the left or right front turn signal/auxiliary lamp connector [31L/R], 4-place Multilock, on T-stud at top of left or right fairing support brace (outboard side). See [Figure 8-35](#).
FLHR/C: Remove headlamp assembly. See Section 8.11 [HEADLAMP \(FLHR/C/S, FLHX, FLHT/C/U\), HEADLAMP ASSEMBLY, REMOVAL](#). Locate auxiliary lamps connector [73], white 2-place Multilock. See [Figure 8-36](#).
- Disconnect front turn signal/auxiliary lamp connector.
- Remove appropriate terminal(s) from socket housing.

Table 8-7. Auxiliary Lamps

FLHT/C/U [31L/R], 4-Place			
Left Side [31L]		Right Side [31R]	
Wire Color	Chamber	Wire Color	Chamber
Gray/Black	4	Gray/Black	4
NOTE: Terminals 1, 2 and 3 are reserved for the turn signal lamp.			
FLHR/C [73], 2-Place			
Left Side		Right Side	
Wire Color	Chamber	Wire Color	Chamber
Gray/Black	1	Gray/Black	2

NOTE

For instructions on removing terminals, see [APPENDIX B.2 MULTILOCK ELECTRICAL CONNECTORS, REMOVING SOCKET/PIN TERMINALS](#).

- Remove two allen head screws to release turn signal lamp from mounting bracket. See [Figure 8-32](#).



Figure 8-37. Auxiliary Lamp Housing

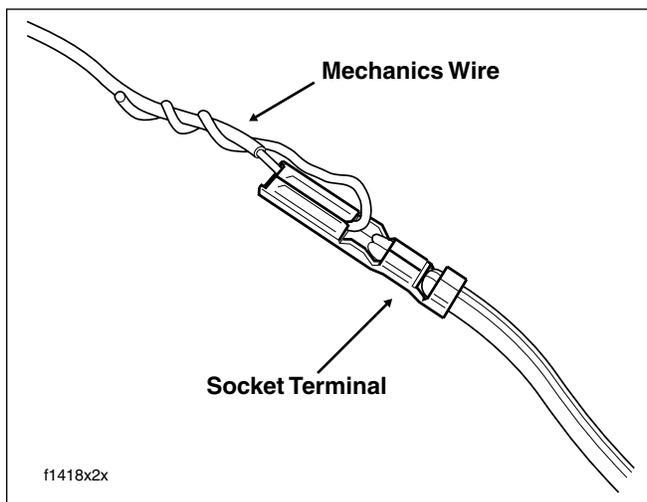


Figure 8-38. Fix Mechanics Wire to Socket Terminals

- Obtain length of strong flexible wire for use as mechanics wire. Feed wire through opening in socket terminal and then loop back twisting end until tightly coiled around longer strand as shown in [Figure 8-38](#).

NOTE

Be sure that mechanics wire is of sufficient strength to pull terminal through conduit without breaking. Wire length must also be long enough so that free end is not lost in conduit when pulled.

- Carefully pull wire to draw socket terminal through conduit.
- Unravel mechanics wire to release socket terminal.
- Insert flare nut socket (Snap-on® FRX181) at bottom of turn signal mounting bracket and remove locknut from stud. Remove the turn signal mounting bracket and clamp block.

- Remove auxiliary lamp (with Belleville washer and swivel block) from the auxiliary lamp bracket.

INSTALLATION

- Lay old auxiliary lamp next to **new** auxiliary lamp and cut wire to length.
- Strip 3/16 inch (4.8 mm) of insulation off wire and crimp on **new** socket terminal.

NOTE

For instructions on crimping terminals, see [APPENDIX B.2 MULTILOCK ELECTRICAL CONNECTORS, CRIMPING INSTRUCTIONS](#).

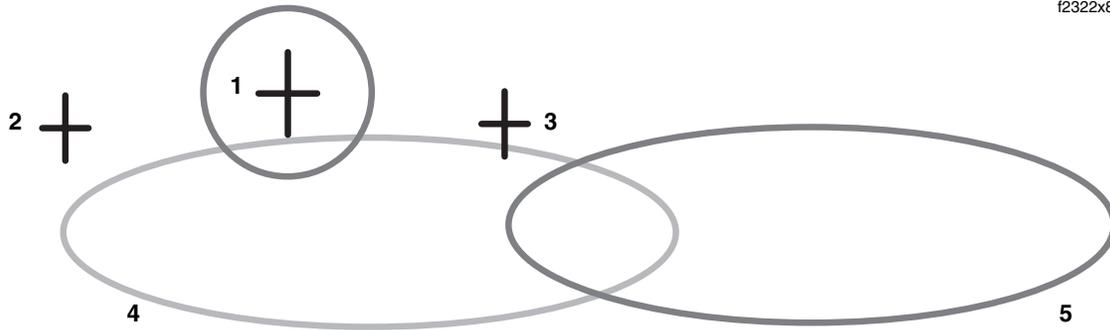
- If removed, slide swivel block and Belleville washer down wire onto auxiliary lamp stud. Be sure that rounded side of swivel block and concave side of Belleville washer face auxiliary lamp.
- Feed wire through slot at top of auxiliary lamp bracket and insert threaded stud into forward slot. Slide clamp block (rounded side up), turn signal mounting bracket and locknut up wire onto auxiliary lamp stud at bottom of bracket.
- Using flare nut socket (Snap-on® FRX181), tighten locknut to 18 ft-lbs (24.4 Nm).
- Reattach mechanics wire to socket terminal and carefully pull end of mechanics wire to draw socket terminal back through conduit.
- Carefully remove mechanics wire to avoid damage to terminal.
- Install terminal into socket housing. Refer to [Table 8-7](#).

NOTE

For instructions on installing terminals, see [APPENDIX B.2 MULTILOCK ELECTRICAL CONNECTORS, INSTALLING SOCKET/PIN TERMINALS](#).

- Connect front turn signal/auxiliary lamp connector.
- Turn Ignition/Light Key Switch to IGNITION and test for proper operation and alignment. Adjust if necessary.
- Start two allen head screws to secure turn signal lamp to mounting bracket. See [Figure 8-32](#). Verify that conduit fits in slot at back of bracket and is not pinched. Alternately tighten screws to 36-60 **in-lbs** (4.1-6.8 Nm).
- Proceed as follows:

FLHT/C/U: Install connector on T-stud at top of left or right fairing support brace (outboard side). Verify that conduit is routed inboard using relief in upper outboard corner of chrome skirt. Install outer fairing. See [Section 2.30 UPPER FAIRING/WINDSHIELD \(FLHX, FLHT/C/U\), OUTER FAIRING/WINDSHIELD, INSTALLATION](#).



1. Adjust headlamp high beam for proper height and lateral alignment.
2. Locate left side auxiliary lamp relative to high beam centerlines.
3. Locate right side auxiliary lamp relative to high beam centerlines.
4. Adjust high intensity beam below and right of left side auxiliary lamp centerlines.
5. Adjust high intensity beam below and right of right side auxiliary lamp centerlines.

Figure 8-39. Properly Aim Auxiliary Lamps

FLHR/C: Install headlamp assembly. See Section 8.11 HEADLAMP (FLHR/C/S, FLHX, FLHT/C/U), HEADLAMP ASSEMBLY, INSTALLATION.

13. Assemble auxiliary lamp, if necessary. See AUXILIARY LAMP BULB, INSTALLATION, in this section.

AUXILIARY LAMP BRACKET

REMOVAL

1. Remove auxiliary lamp bracket from motorcycle. Proceed as follows:
 - FLHR/C:** Remove acorn nuts from fork bracket studs.
 - All Others:** Loosen T40 TORX screws in upper and lower fork brackets.
2. Remove auxiliary lamp bracket from motorcycle.

INSTALLATION

1. Install auxiliary lamp bracket on motorcycle. Proceed as follows:
 - FLHR/C:** Slide slots of auxiliary lamp bracket onto upper and lower fork bracket studs. Install acorn nuts on studs. Alternately tighten acorn nuts to 72-108 in-lbs (8.1-12.2 Nm) using a crosswise pattern.
 - All Others:** Slide slots of auxiliary lamp bracket onto T40 TORX screws in upper and lower fork brackets. Alternately tighten screws to 15-20 ft-lbs (20-27 Nm) using a crosswise pattern.

ADJUSTMENT

Headlamp High Beam

1. Adjust the headlamp high beam for proper height and lateral alignment. See Section 8.11 HEADLAMP (FLHR/C/S, FLHX, FLHT/C/U), HEADLAMP ADJUSTMENT, steps 1-10.
2. With a rider seated on the motorcycle and the front wheel pointed straight ahead, turn on the headlamp high beam.
3. Mark the center of the headlamp high beam by making a vertical line through the horizontal line already drawn on the wall. Properly adjusted, the beam should project an equal area of light to the left and right of the vertical centerline. See item 1 in Figure 8-39.

Auxiliary Lamps

4. Turn the headlamp off and move to the front of the motorcycle.
5. Measure the distance from the headlamp horizontal centerline down to the horizontal centerline of the left side auxiliary lamp. Now measure the distance from the headlamp vertical centerline out to the vertical centerline of the same lamp.
6. Repeat measurements performed in step 5 on right side auxiliary lamp.
7. From the headlamp high beam centerlines, perform the measurements taken in steps 5-6 to locate the left and right side auxiliary lamp centerlines on the wall. See items 2 and 3 in Figure 8-39.

8. Turn on the headlamp high beam again, and with a rider seated on the motorcycle, verify that it is still aligned with the horizontal and vertical centerlines.
9. Turn on the headlamp low beam and then cover both the headlamp and the right side auxiliary lamp. Adjust the left side auxiliary lamp as necessary so that the entire high intensity zone is both below and to the right of the left side auxiliary lamp centerlines. See item 4 in [Figure 8-39](#).
10. Leaving the headlamp covered, remove cover from right side auxiliary lamp and place over left side auxiliary lamp. Adjust the right side auxiliary lamp as necessary so that the entire high intensity zone is both below and to the right of the right side auxiliary lamp centerlines. See item 5 in [Figure 8-39](#).
11. Verify that auxiliary lamps are properly tightened. Proceed as follows:
 - a. Remove two screws to release turn signal lamp from mounting bracket. See [Figure 8-32](#).
 - b. Insert flare nut socket (Snap-on® FRX181) at bottom of turn signal mounting bracket and tighten locknut to 18 ft-lbs (24.4 Nm).
 - c. Start two screws to secure turn signal lamp to mounting bracket. Verify that conduit fits in slot at back of bracket and is not pinched. Alternately tighten screws to 36-60 **in-lbs** (4.1-6.8 Nm).

TAIL LAMP/TAIL LAMP BULB

REMOVAL

1. Remove two Phillips screws from lense to release tail lamp assembly from chrome base. See left side of [Figure 8-40](#).
2. Disconnect tail lamp connector [93], 4-place Multilock. See right side of [Figure 8-40](#).
3. Rotate bulb socket 1/4 turn in a counterclockwise direction and remove from tail lamp assembly. Gently pull bulb from socket.

INSTALLATION

1. Gently push **new** bulb into socket. Insert socket into tail lamp assembly and rotate 1/4 turn in a clockwise direction.
2. Connect tail lamp connector [93], 4-place Multilock. See right side of [Figure 8-40](#).

3. Place tail lamp into position against chrome base.

CAUTION

Over tightening screws can crack the lense or result in scratching of the fender paint.

4. Install two Phillips screws and alternately tighten to 20-24 **in-lbs** (2.3-2.7 Nm).
5. Turn the Ignition/Light Key Switch to IGNITION and test lamp for proper operation.

CIRCUIT BOARD/CHROME BASE

REMOVAL

1. Remove two Phillips screws to release tail lamp assembly from chrome base. See left side of [Figure 8-40](#).
2. Disconnect tail lamp connector [93], 4-place Multilock. See right side of [Figure 8-40](#).

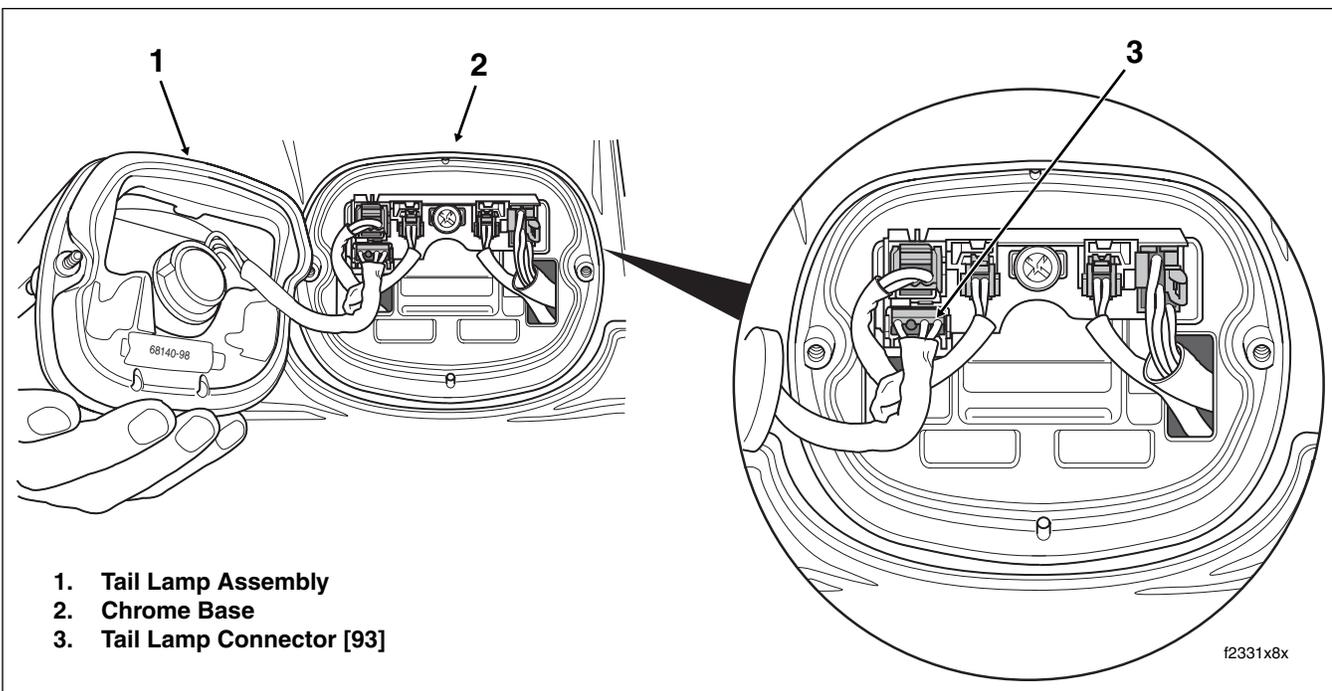


Figure 8-40. Remove Tail Lamp and Depress Button to Release Socket Housing

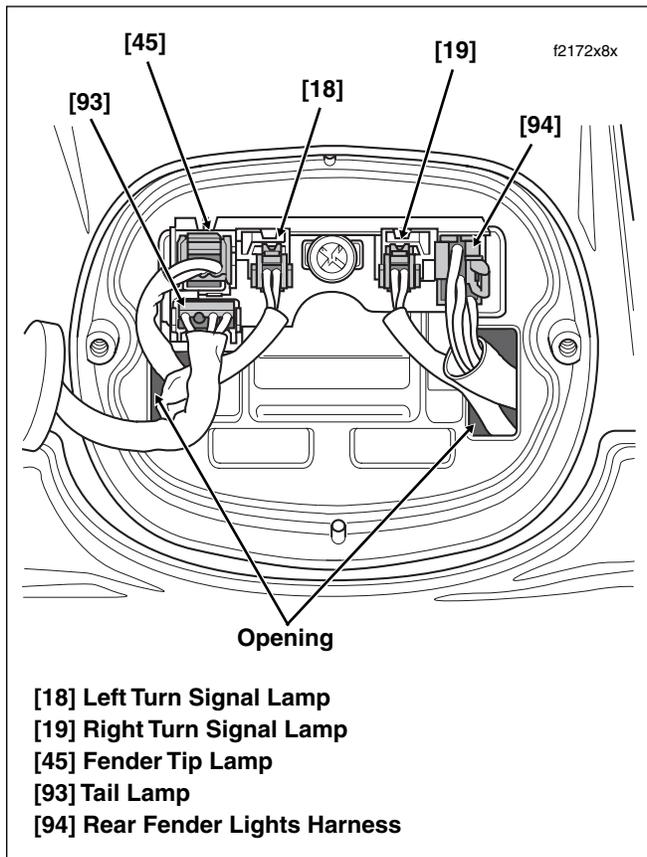


Figure 8-41. Rear Fender Lights Assembly

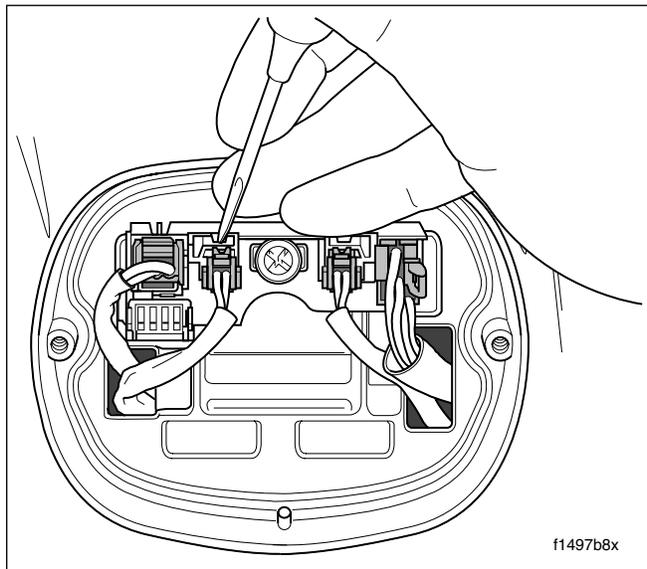


Figure 8-42. Use Pick Tool to Release Left Turn Signal Lamp Socket

3. Disconnect remaining connectors. See [Figure 8-41](#). To release socket housings of left and right turn signal lamps, use a pick or small screwdriver to depress button as shown in [Figure 8-42](#).

NOTE

The rear fender tip lamp is present on FLHR and FLHT/C/U models only. As the lamp is absent on FLHX models, the circuit board location is used for power to the license plate lamps, a feature unique to that model. On FLHRC/S and FLTR models, the location is unused.

4. Remove Phillips screw (with captive washer) at center of chrome base. Use both thumbs to push chrome base upward until it becomes free of fender and then pull out of fender hole.
5. Feed socket housings through openings to inboard side of chrome base. See [Figure 8-41](#). For best results, free the smaller socket housings first.
6. Remove pin housing/circuit board from chrome base. For best results, push index pins on pin housing from holes in chrome base.

INSTALLATION

1. Feed socket housings through openings to outboard side of chrome base. See [Figure 8-41](#). For best results, feed the larger socket housings first.
2. Fit bottom of chrome base into fender hole and then push down to align center hole with clip nut on fender flange.
3. Place pin housing over circuit board, if removed. See [Figure 8-43](#).
4. Insert index pins at back of pin housing into holes in chrome base.

CAUTION

Over tightening screw can crack the chrome base or result in scratching of the fender paint.

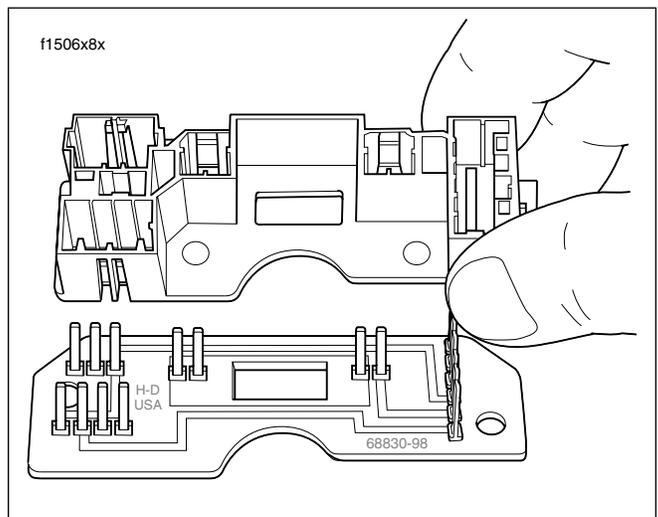


Figure 8-43. Place Pin Housing Over Circuit Board

5. Install Phillips screw (with captive washer) to secure pin housing/circuit board and chrome base to clip nut on fender flange. Tighten screw to 40-48 **in-lbs** (4.5-5.4 Nm).
6. Install socket housings into pin housing/circuit board. Install rear fender tip lamp and both left and right turn signal lamp sockets so that the release buttons are at the top. Install the rear fender lights harness socket with the button on the outboard side and the tail lamp socket with the button at the bottom.
7. To avoid stressing wires, verify that tail lamp conduit is positioned on the outboard side of the rear fender tip lamp and left turn signal lamp conduit as shown in [Figure 8-40](#).
8. Place tail lamp into position against chrome base.

CAUTION

Over tightening screws can crack the lense or result in scratching of the fender paint.

9. Install two Phillips screws and alternately tighten to 20-24 **in-lbs** (2.3-2.7 Nm).
10. Turn the Ignition/Light Key Switch to IGNITION and test lamp for proper operation.

REAR FENDER LIGHTS HARNESS

REMOVAL

1. Remove rear fender. See Section [2.34 REAR FENDER](#).
2. Remove two Phillips screws to release tail lamp assembly from chrome base. See [Figure 8-40](#).
3. Disconnect tail lamp connector [93], 4-place Multilock. Set tail lamp assembly aside.
4. Disconnect rear fender lights connector [94], 6-place Multilock. Feed socket housing through opening to inboard side of fender. See [Figure 8-41](#).
5. Release left and right rear turn signal lamp conduit from respective cable clip anchored on T-stud. On FLHX models, also release license plate lamps conduit from left side cable clip. On FLHR and FLHT/C/U models, release rear fender tip lamp conduit from both left side cable clip and stamped fender clip.
6. Release rear fender lights harness from channel in stud plate. Loosen two flange nuts, if necessary.
7. Draw socket housing of rear fender lights connector [7], 8-place Multilock, through hole to inboard side of fender.
8. Remove wire harness and adhesive conduit from fender well.

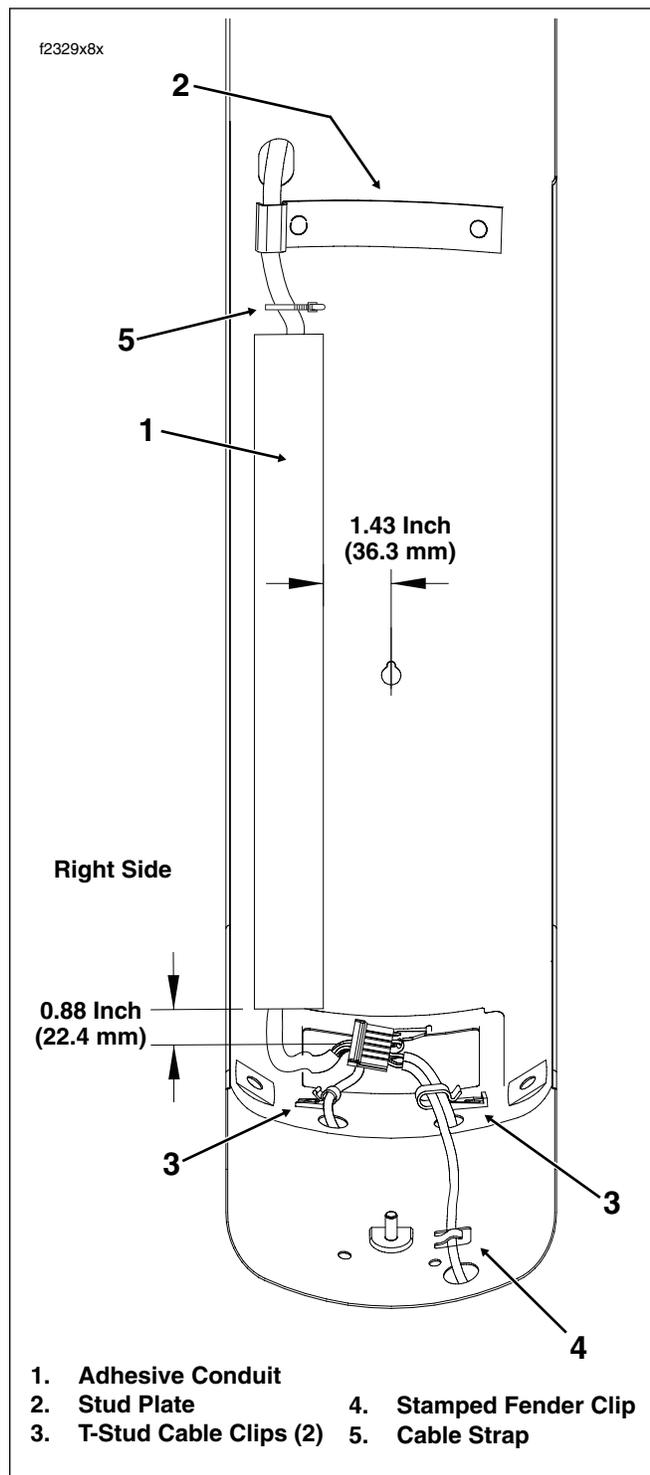


Figure 8-44. Rear Fender Well

INSTALLATION

1. Proceed as follows:
 - a. Thoroughly clean fender well with soap and water. Do not use solvents or harsh chemicals or damage to painted surfaces may occur.

- b. Remove remnants of old conduit, as well as all residual adhesive. For good results, use 3M GENERAL PURPOSE ADHESIVE REMOVER (Part No. 051135).
 - c. Using a soapy Scotch Brite® pad, thoroughly clean fender well in area of adhesive conduit. See [Figure 8-44](#).
 - d. Rinse with clear water and thoroughly dry with a clean white cloth. Repeat step until clean cloth shows no evidence of dirt.
 - e. Swab area with isopropyl alcohol and allow to dry.
 - f. Obtain **new** harness with adhesive conduit. Remove paper backing to expose adhesive and lightly press into place in the right side fender well.
Adhesive conduit should be approximately 0.88 inches (22.4 mm) from the chrome base hole and 1.43 inches (36.3 mm) from the fender seat screw centerline. See [Figure 8-44](#).
 - g. Using a wallpaper seam roller (available at most home improvement stores), work roller over adhesive conduit to purge air from between fender and adhesive. Be aware that most other installation methods will produce unsatisfactory results.
 - h. Allow the adhesive 72 hours to fully cure. Installation of the fender may proceed, but exercise caution to avoid pulling or repositioning adhesive conduit.
2. Feed socket housing of rear fender lights connector [7], 8-place Multilock, through hole to outboard side of fender.
 3. Capture rear fender lights harness in channel of stud plate. If loosened, tighten two flange nuts to 60-96 **in-lbs** (6.8-10.9 Nm).
 4. Feed socket housing of rear fender lights connector [94] through opening to outboard side of fender. Connect socket housing to pin housing/circuit board. See [Figure 8-41](#).
 5. Capture left and right rear turn signal lamp conduit in respective cable clip anchored on T-stud. On FLHX models, also capture license plate lamps conduit in left side cable clip. On FLHR and FLHT/C/U models, capture rear fender tip lamp conduit in both left side cable clip and stamped fender clip.
 6. Connect tail lamp connector [93], 4-place Multilock.
 7. To avoid stressing wires, verify that tail lamp conduit is positioned on the outboard side of the rear fender tip lamp and left turn signal lamp conduit as shown in [Figure 8-40](#). Place tail lamp into position against chrome base.

CAUTION

Over tightening screws can crack the lense or result in scratching of the fender paint.

8. Install two Phillips screws and alternately tighten to 20-24 **in-lbs** (2.3-2.7 Nm).
9. Install rear fender. See Section [2.34 REAR FENDER](#).

FRONT FENDER TIP LAMP

REMOVAL

1. Insert blade of small screwdriver into slot at top of fender tip lamp lens. Rotate end of screwdriver to unsnap lens from lamp bracket.
2. Holding Keps nuts at inboard side of rear fender, remove two Phillips screws to release fender tip lamp bracket.
3. Disconnect front fender tip lamp connector [143], 2-place Multilock. See [Figure 8-47](#).

INSTALLATION

1. Connect front fender tip lamp connector [143], 2-place Multilock. See [Figure 8-47](#).
2. With wires routed along bottom left side, place fender tip lamp bracket into position aligning holes in bracket with those in fender.

CAUTION

Over tightening screws can crack the bracket or result in scratching of the fender paint.

3. Slide Phillips screws through bracket and fender holes and install Keps nuts. Holding nuts at inboard side of fender, tighten screws to 20-24 **in-lbs** (2.3 - 2.7 Nm).
4. Insert tab at bottom of lens into slot of fender tip lamp bracket. Apply thumb pressure at top of lens until it snaps into place.
5. Turn the Ignition/Light Key Switch to IGNITION and test lamp for proper operation.

FRONT FENDER TIP LAMP JUMPER HARNESS

REMOVAL

1. Proceed as follows:

FLHT/C/U: Reaching in below the fairing cap on the left side of the steering head, disconnect the front fender tip lamp jumper harness connector [32], 2-place Multilock. See [Figure 8-45](#). Remove outer fairing only if necessary. See [Section 2.30 UPPER FAIRING/WINDSHIELD \(FLHX, FLHT/C/U\), OUTER FAIRING/WINDSHIELD, REMOVAL](#).

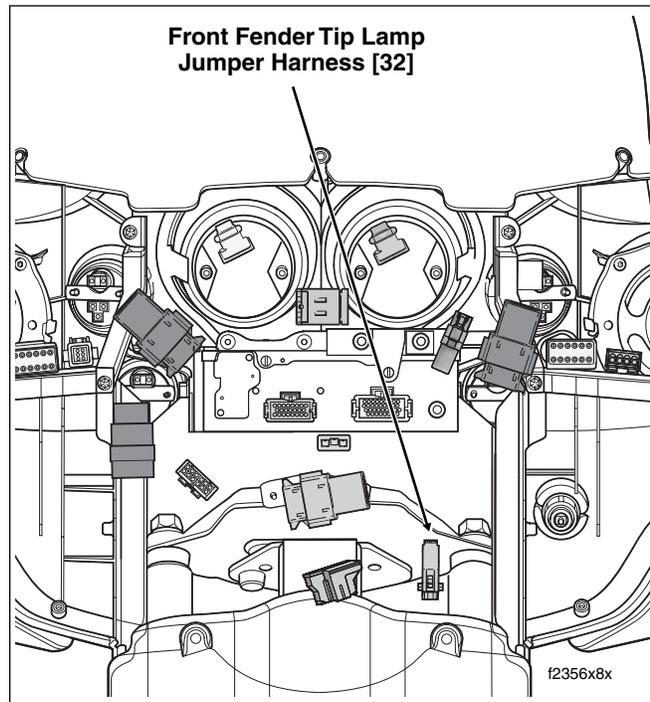


Figure 8-45. Inner Fairing (FLHT/C/U)

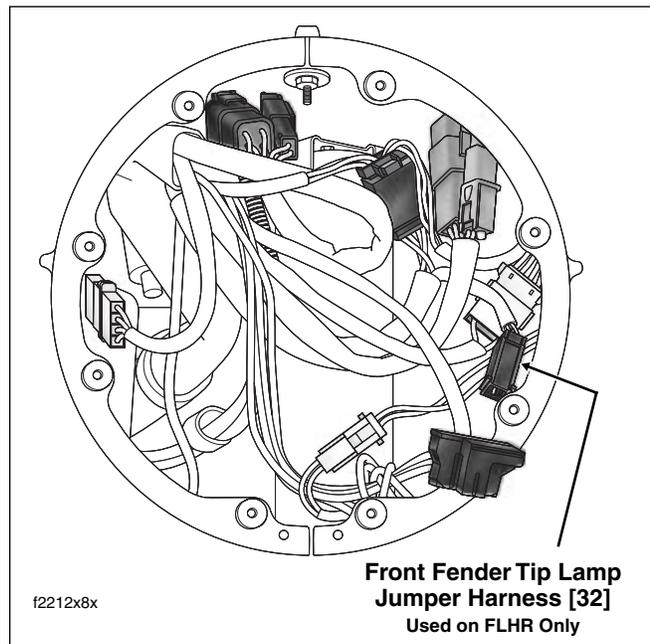


Figure 8-46. Headlamp Nacelle (FLHR)

FLHR: Remove headlamp assembly. See [Section 8.11 HEADLAMP \(FLHR/C/S, FLHX, FLHT/C/U\), HEADLAMP ASSEMBLY, REMOVAL](#). Disconnect the front fender tip lamp jumper harness connector [32], 2-place Multilock. See [Figure 8-46](#).

HOME

2. Draw socket housing down to fender area.
3. Carefully cut cable strap to release front fender tip lamp wires from brake caliper hose.
4. Remove terminals from socket housing.

NOTE

For instructions on removing terminals, see [APPENDIX B.2 MULTILOCK ELECTRICAL CONNECTORS, REMOVING SOCKET/PIN TERMINALS](#).

5. Place the motorcycle on a hydraulic center stand with the front wheel raised off the ground.
6. Remove the front wheel. See Section [2.3 FRONT WHEEL, REMOVAL](#).
7. From inboard side of front fender, remove two nuts to release trim strip from left side of fender. See [Figure 8-48](#).
8. Pull wires and socket terminals through grommet to inboard side of fender. See [Figure 8-49](#). Reaching under left side of fender, draw wires forward out from beneath fender bracket.
9. Feed wires through oblong hole to outboard side of fender.
10. Insert blade of small screwdriver into slot at top of fender tip lamp lens. Rotate end of screwdriver to unsnap lens from lamp bracket.
11. Holding Keps nuts at inboard side of front fender, remove two Phillips screws to release fender tip lamp bracket.

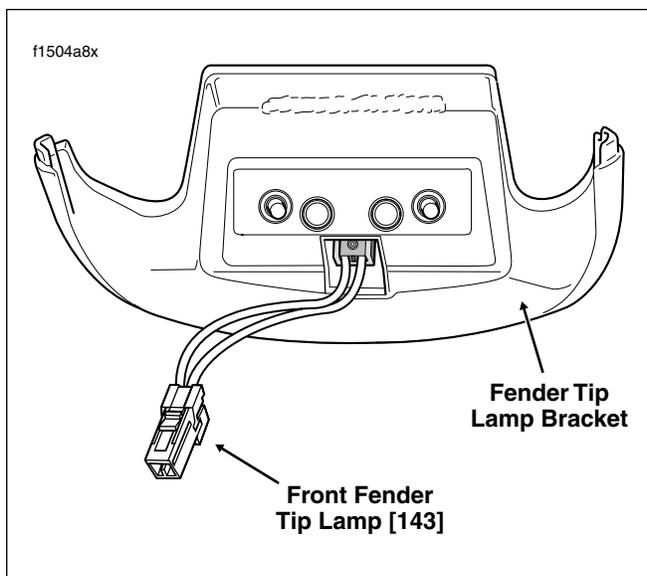


Figure 8-47. Fender Tip Lamp Assembly

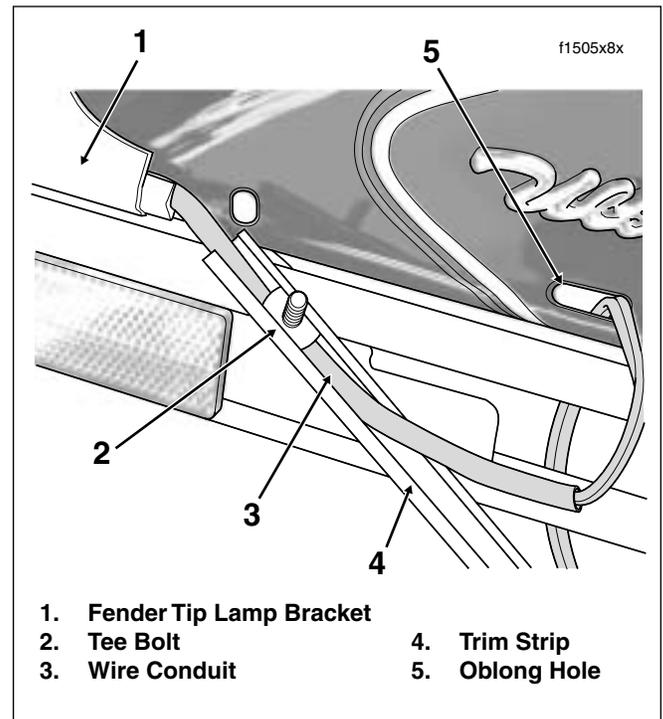


Figure 8-48. Install Conduit in Trim Strip

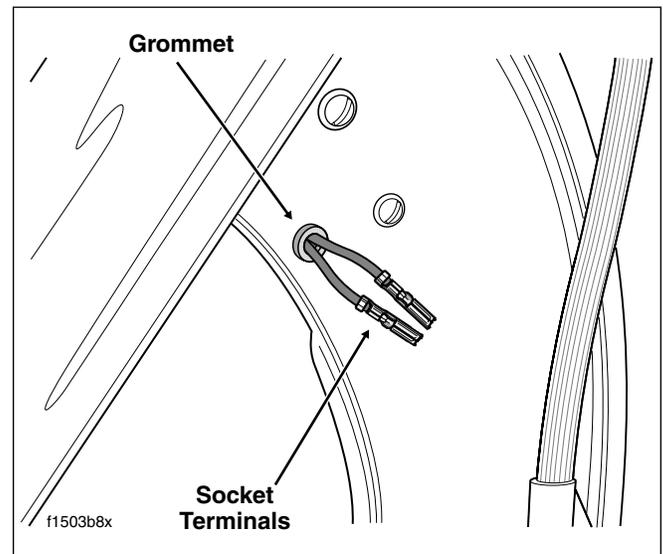


Figure 8-49. Pull Fender Tip Lamp Wires and Terminals Through Fender Grommet

12. Disconnect front fender tip lamp connector [143], 2-place Multilock, to release fender tip lamp assembly from jumper harness. See [Figure 8-47](#).

INSTALLATION

1. Connect front fender tip lamp connector [143], 2-place Multilock, to attach fender tip lamp assembly to jumper harness. See [Figure 8-47](#).

2. Pull jumper harness conduit as close to fender tip lamp connector [143] as possible, for the conduit is not easily routed beneath the fender bracket.
3. With conduit routed along bottom left side, place fender tip lamp bracket into position aligning holes in bracket with those in fender.

CAUTION

Over tightening screws can crack the bracket or result in scratching of the fender paint.

4. Slide Phillips screws through bracket and fender holes and install Keps nuts. Holding nuts at inboard side of fender, tighten screws to 20-25 **in-lbs** (2.3-2.8 Nm).
5. Insert tab at bottom of lense into slot of fender tip lamp bracket. Apply thumb pressure at top of lense until it snaps into place.
6. Route wire conduit inside trim strip and slide front tee bolt over conduit. See [Figure 8-48](#). Verify that second tee bolt is in position at rear of trim strip.
7. Feed socket terminals and wires through oblong hole to inboard side of fender.

NOTE

Use the rearmost oblong hole as the front may be used for installation of certain P&A accessories.

8. While removing slack from wires on outboard side of fender, align tee bolts with fender holes. With trim strip positioned against left side of fender, reach under fender and install nuts on tee bolts. Alternately tighten nuts to 10-15 **in-lbs** (1.1-1.7 Nm).

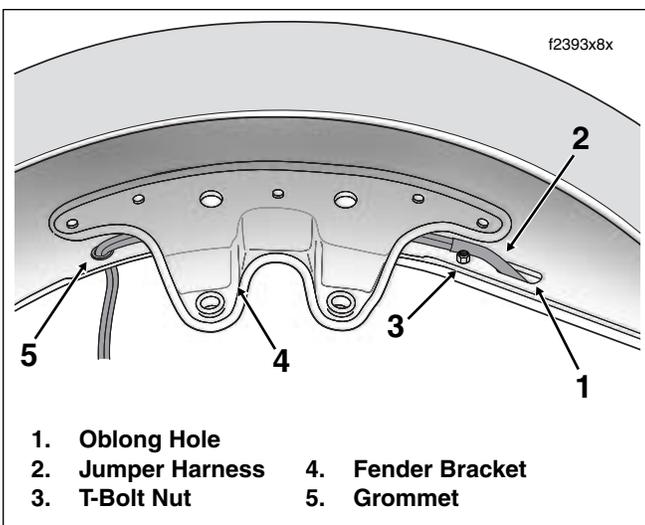


Figure 8-50. Left Side Front Fender Well

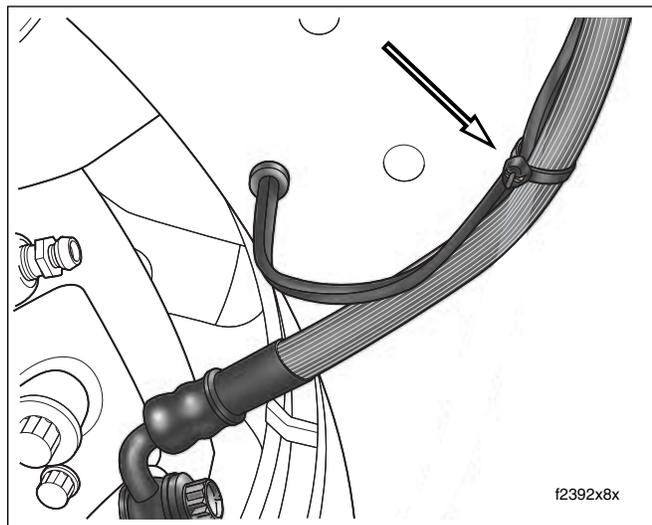


Figure 8-51. Install Cable Strap to Brake Hose

9. Reaching under left side of fender, route wires of the jumper harness rearward between tee bolt nut and fender bracket and then beneath fender bracket to grommet. See [Figure 8-50](#).
10. Feed socket terminals and wires through grommet to outboard side of fender. See [Figure 8-49](#).

WARNING

If any portion of the jumper harness is above the height of the fender bracket, contact with the tire can cause chafing or other damage. Damage to the wiring can lead to loss of lighting while riding, which could result in death or serious injury.

11. Remove slack from wires on inboard side of fender. Verify that no portion of the jumper harness is above the height of the fender bracket.
12. Install terminals into socket housing.

NOTE

For instructions on installing terminals, see [APPENDIX B.2 MULTILOCK ELECTRICAL CONNECTORS, INSTALLING SOCKET/PIN TERMINALS](#).

13. Route socket housing upward behind chrome skirt (FLHT/C/U) or through bottom of headlamp nacelle (FLHR) to area beneath upper fork bracket. Connect front fender tip lamp jumper harness connector [32].

NOTE

To connect jumper harness connector with the outer fairing installed (FLHT/C/U models), reach in below the fairing cap on the left side of the steering head.

14. Install the front wheel. See [Section 2.3 FRONT WHEEL, INSTALLATION](#).

15. Install **new** cable strap to secure front fender tip lamp wires to brake caliper hose. Cut any excess cable strap material. See [Figure 8-51](#).
16. Proceed as follows:
 - FLHT/C/U:** Install outer fairing, if removed. See Section 2.30 UPPER FAIRING/WINDSHIELD (FLHX, FLHT/C/U), OUTER FAIRING/WINDSHIELD, INSTALLATION.
 - FLHR:** Install headlamp assembly. See Section 8.11 HEADLAMP (FLHR/C/S, FLHX, FLHT/C/U), HEADLAMP ASSEMBLY, INSTALLATION.
17. Turn Ignition/Light Key Switch to IGNITION and test lamp for proper operation.

REAR FENDER TIP LAMP

REMOVAL

1. Remove two Phillips screws to release tail lamp assembly from chrome base.
2. Disconnect tail lamp connector [93], 4-place Multilock. Set tail lamp assembly aside. See [Figure 8-52](#).
3. Disconnect rear fender tip lamp connector [45], 3-place Multilock.

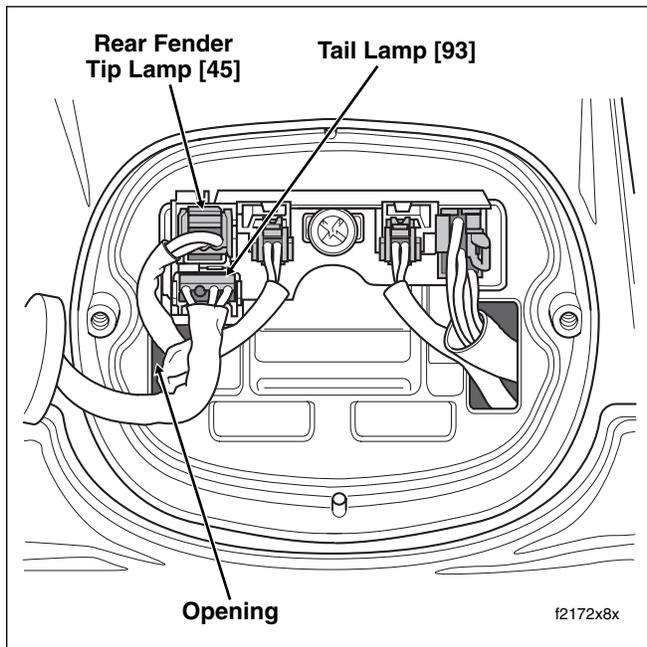
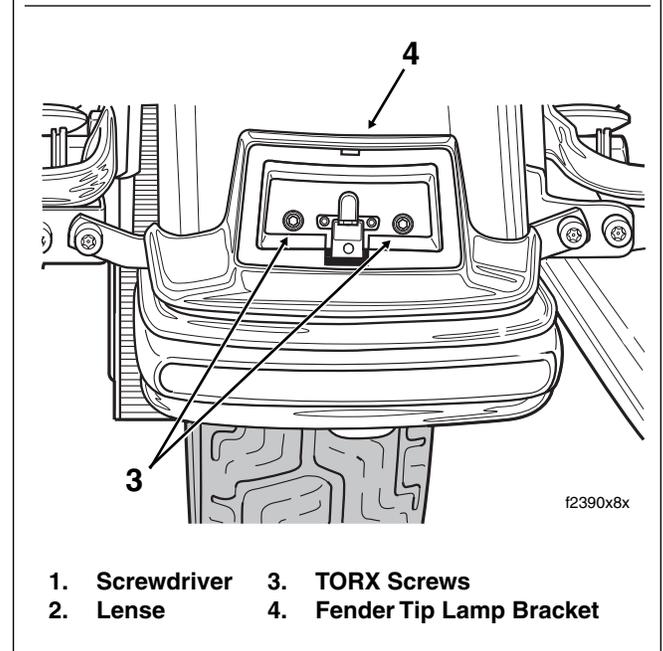
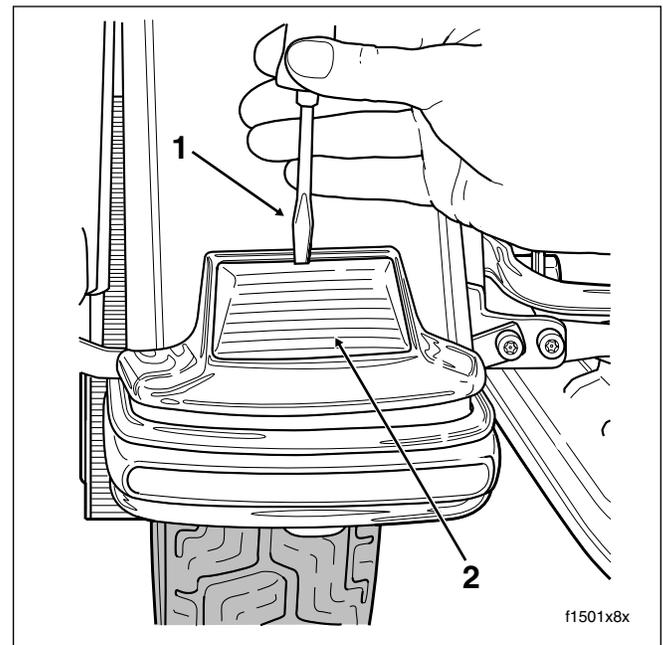


Figure 8-52. Depress Button to Release Socket From Pin Housing



- | | |
|----------------|----------------------------|
| 1. Screwdriver | 3. TORX Screws |
| 2. Lens | 4. Fender Tip Lamp Bracket |

Figure 8-53. Remove Rear Fender Tip Lamp Lens and Bracket

4. Feed socket housing through opening in chrome base to inboard side of rear fender.
5. Reaching under left side of rear fender, release conduit from cable clip anchored on T-stud. Release conduit from stamped fender clip.
6. Insert blade of small screwdriver into slot at top of fender tip lamp lens. Rotate end of screwdriver to unsnap lens from lamp bracket. See upper frame of [Figure 8-53](#).

7. Holding nuts at inboard side of rear fender, remove two TORX screws to release fender tip lamp bracket. See lower frame of [Figure 8-53](#).
8. Draw conduit and socket housing out through bottom fender hole. See [Figure 8-54](#).
9. Remove terminals from socket housing.

NOTE

For instructions on removing terminals, see [APPENDIX B.2 MULTILOCK ELECTRICAL CONNECTORS, REMOVING SOCKET/PIN TERMINALS](#).

INSTALLATION

1. Place **new** fender tip lamp assembly next to discarded unit and cut wires to proper length.
2. Crimp **new** socket terminals onto fender tip lamp wires.

NOTE

For instructions on crimping terminals, see [APPENDIX B.2 MULTILOCK ELECTRICAL CONNECTORS, CRIMPING INSTRUCTIONS](#).

3. Install terminals into socket housing.

Table 8-8. Rear Fender Tip Lamps [45]

Wire Color	Chamber Number
Black	1
Not Used	2
Black	3

NOTE

For instructions on installing terminals, see [APPENDIX B.2 MULTILOCK ELECTRICAL CONNECTORS, INSTALLING SOCKET/PIN TERMINALS](#).

4. Feed socket housing and conduit through bottom fender hole. See [Figure 8-54](#).
5. Place fender tip lamp bracket into position aligning holes in bracket with those in fender. Slide TORX screws through bracket and fender holes and install nuts. See lower frame of [Figure 8-53](#).
6. Insert tab at bottom of lense into slot of fender tip lamp bracket. Apply thumb pressure at top of lense until it snaps into place.
7. Reaching under left side of rear fender, capture conduit in cable clip anchored on T-stud. Capture conduit in stamped fender clip next to fender hole.
8. Feed socket housing through opening on left side of chrome base to outboard side of rear fender. Oriented with the release button at the top, insert socket housing into pin housing/circuit board.

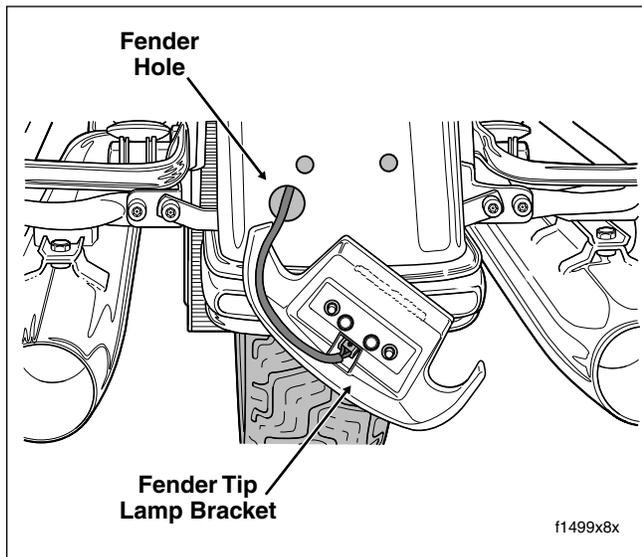


Figure 8-54. Feed Fender Tip Lamp Socket and Conduit Through Fender Hole

9. To install tail lamp assembly, orient 4-place Multilock socket so that the release button is at the bottom and insert into pin housing until it “clicks.” To avoid stressing wires, verify that tail lamp conduit is positioned on the outboard side of the rear fender tip lamp and left turn signal lamp conduit as shown in [Figure 8-52](#).
10. Place tail lamp into position against chrome base.

CAUTION

Over tightening screws can crack the lense or result in scratching of the fender paint.

11. Install two Phillips screws and alternately tighten to 20-24 **in-lbs** (2.3-2.7 Nm).
12. Turn the Ignition/Light Key Switch to IGNITION and test lamp for proper operation.

BULB REPLACEMENT

REMOVAL

1. Proceed as follows:

FLHR/C, FLHT/C/U: Remove two Phillips screws to release lense from lamp. See [Figure 8-55](#).

FLHR, FLHX, FLTR: Insert blade of small screwdriver into slot at bottom of lense. Gently rotate end of screwdriver to unsnap lense from lamp.

2. Push in bulb and rotate in a counterclockwise direction to remove.
3. Inspect condition of electrical contacts in socket. If necessary, clean with a small wire brush and electrical contact cleaner.

INSTALLATION

1. Liberally apply dielectric grease to contacts in socket and at bottom of **new** bulb. For correct bulb type, see [Section 8.2 BULB CHART](#).

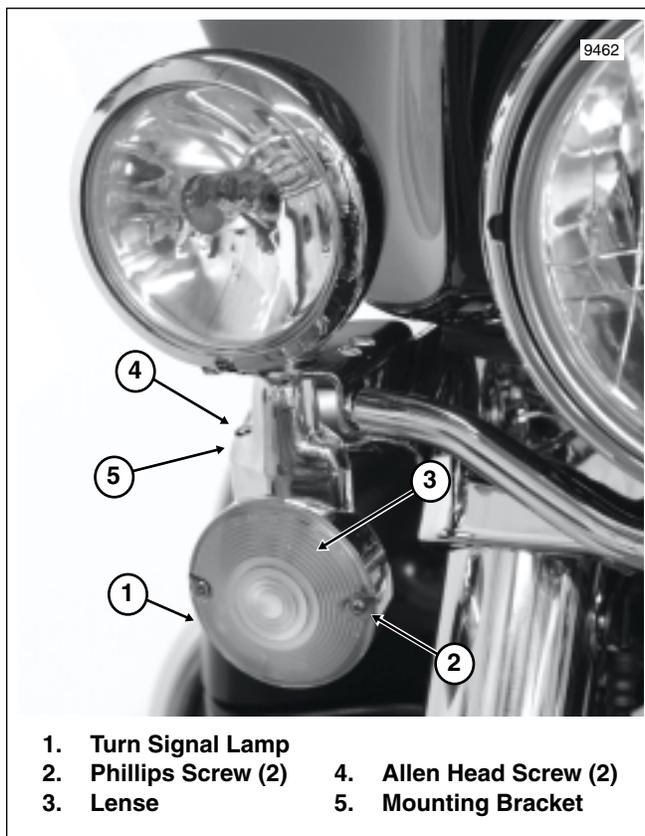
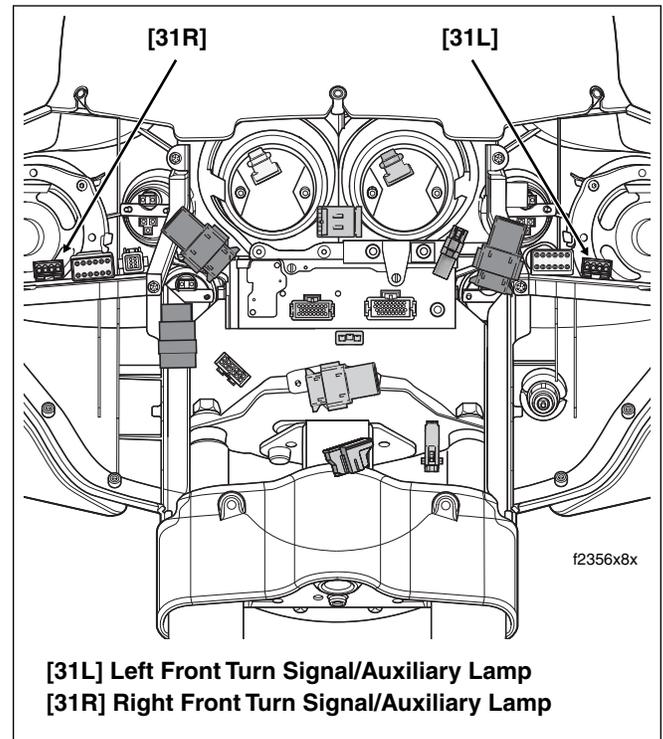


Figure 8-55. Front Turn Signal Lamp (FLHR/C, FLHT/C/U)



[31L] Left Front Turn Signal/Auxiliary Lamp
[31R] Right Front Turn Signal/Auxiliary Lamp

Figure 8-56. Inner Fairing (FLHT/C/U)

2. Push in **new** bulb and rotate in a clockwise direction to install.
3. Proceed as follows:

FLHR/C, FLHT/C/U: Seat lense in lamp and install two Phillips screws.

FLHR, FLHX, FLTR: Seat lense in lamp and gently apply thumb pressure until it snaps into place. Rotate lense to position slot at bottom of lamp.

FRONT TURN SIGNAL LAMP

FLHR/C, FLHT/C/U

REMOVAL

1. Proceed as follows:

FLHT/C/U: Remove outer fairing. See [Section 2.30 UPPER FAIRING/WINDSHIELD \(FLHX, FLHT/C/U\), OUTER FAIRING/WINDSHIELD, REMOVAL](#). Disconnect the left or right front turn signal/auxiliary lamp connector [31L/R], 4-place Multilock, on T-stud at top of left or right fairing support brace (outboard side). See [Figure 8-56](#).

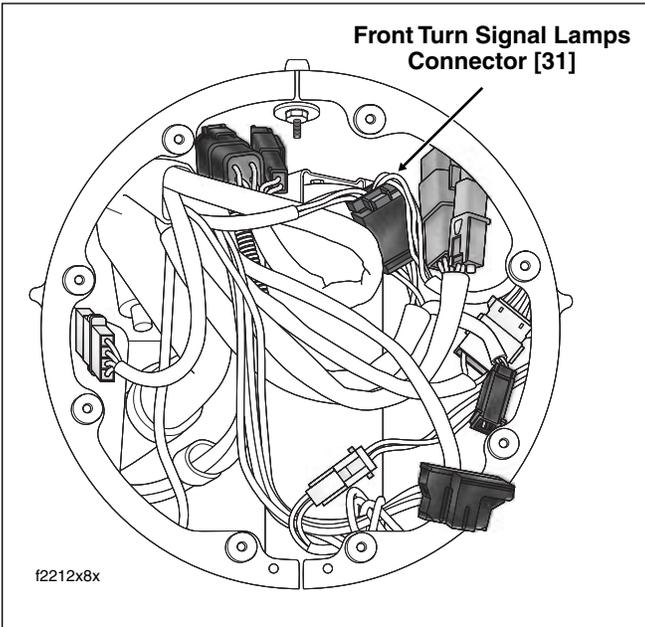


Figure 8-57. Headlamp Nacelle (FLHRC)

FLHR/C: Remove headlamp assembly. See Section 8.11 HEADLAMP (FLHR/C/S, FLHX, FLHT/C/U), HEADLAMP ASSEMBLY, REMOVAL. Disconnect the front turn signal lamps connector [31], 6-place Multilock, anchored in hole of fork stem nut lockplate (left side). See Figure 8-57.

- Remove appropriate terminal(s) from socket housing as follows:

Table 8-9. Front Turn Signal Lamps [31]

FLHT/C/U, 4-Place			
Left Side [31L]		Right Side [31R]	
Wire Color	Chamber	Wire Color	Chamber
Blue	1	Blue	1
Violet	2	Brown	2
Black	3	Black	3
NOTE: Terminal 4 is reserved for the auxiliary lamp.			
FLHR/C/S, 6-Place			
Left Side		Right Side	
Wire Color	Chamber	Wire Color	Chamber
Blue (DOM)	4	Black	1
Violet	5	Brown	2
Black	6	Blue (DOM)	3

NOTE

For instructions on removing terminals, see APPENDIX B.2 MULTILOCK ELECTRICAL CONNECTORS, REMOVING SOCKET/PIN TERMINALS.

- Remove two allen head screws to release turn signal lamp from mounting bracket. See Figure 8-55.
- Obtain three equal lengths of strong flexible wire for use as mechanics wire. Feed wire through opening in socket terminal and then loop back twisting end until tightly coiled around longer strand as shown in Figure 8-58. Repeat step with remaining socket terminals.

NOTE

Be sure that mechanics wire is of sufficient strength to pull terminals through conduit without breaking. Wire lengths must also be long enough so that free ends are not lost in conduit when pulled.

- Carefully pull wires to draw socket terminals through both sections of conduit. For best results, pull one wire at a time.
- Unravel mechanics wire to release socket terminals.

INSTALLATION

- Lay old turn signal lamp next to new turn signal lamp and cut wires to length.
- Strip 3/16 inch (4.8 mm) of insulation off new lamp wires and crimp on new socket terminals.

NOTE

For instructions on crimping terminals, see APPENDIX B.2 MULTILOCK ELECTRICAL CONNECTORS, CRIMPING INSTRUCTIONS.

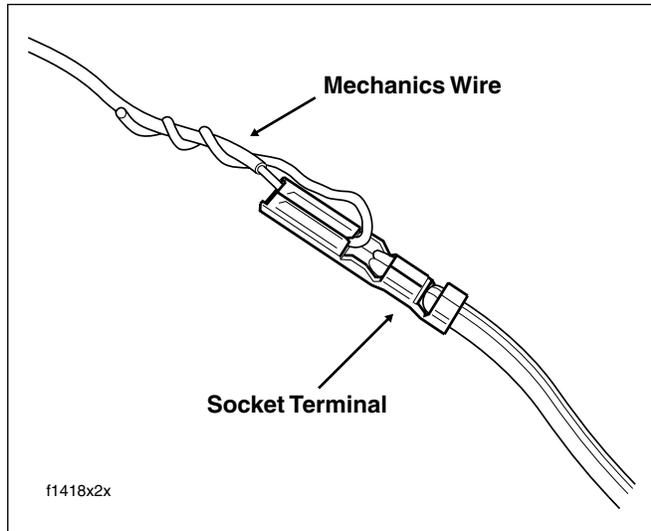


Figure 8-58. Fix Mechanics Wire to Socket Terminals

3. Reattach mechanics wire to socket terminals and carefully pull ends of mechanics wire to draw socket terminals back through conduit.
4. Carefully remove mechanics wire to avoid damage to terminals.
5. Install terminals into socket housing. For correct terminal locations refer to [Table 8-9](#).

NOTE

For instructions on installing terminals, see [APPENDIX B.2 MULTILOCK ELECTRICAL CONNECTORS, INSTALLING SOCKET/PIN TERMINALS](#).

6. Start two allen head screws to secure turn signal lamp to mounting bracket. See [Figure 8-55](#). Verify that conduit fits in slot at back of bracket and is not pinched. Alternately tighten screws to 36-60 **in-lbs** (4.1-6.8 Nm).
7. Connect front turn signal/auxiliary lamp connector.
8. Proceed as follows:

FLHT/C/U: Install connector on T-stud at top of left or right fairing support brace (outboard side). Verify that conduit is routed inboard using relief in upper outboard corner of chrome skirt. See [Figure 8-56](#). Install outer fairing. See [Section 2.30 UPPER FAIRING/WINDSHIELD \(FLHX, FLHT/C/U\), OUTER FAIRING/WINDSHIELD, INSTALLATION](#).

FLHR/C: Install anchor on connector into hole of fork stem nut lockplate (left side). See [Figure 8-57](#). Install headlamp assembly. See [Section 8.11 HEADLAMP \(FLHR/C/S, FLHX, FLHT/C/U\), HEADLAMP ASSEMBLY, INSTALLATION](#).

9. Turn Ignition/Light Key Switch to IGNITION and test for proper operation.

FLHRS

REMOVAL

1. Remove handlebar clamp shroud/wind deflector. See [Section 2.32 WINDSHIELD/HEADLAMP NACELLE \(FLHR/C/S\), NACELLE REMOVAL \(FLHRS\)](#), steps 1-7.
2. Inside headlamp nacelle, locate the front turn signal lamps connector [31], 6-place Multilock, anchored in hole of fork stem nut lockplate (left side). See [Figure 8-57](#).
3. Disconnect front turn signal lamps connector.
4. Remove appropriate terminals from socket housing. Refer to [Table 8-9](#).

NOTE

For instructions on removing terminals, see [APPENDIX B.2 MULTILOCK ELECTRICAL CONNECTORS, REMOVING SOCKET/PIN TERMINALS](#).

5. Carefully cut cable strap to release turn signal lamp conduit from lower handlebar clamp. Draw free end of conduit out of headlamp nacelle.

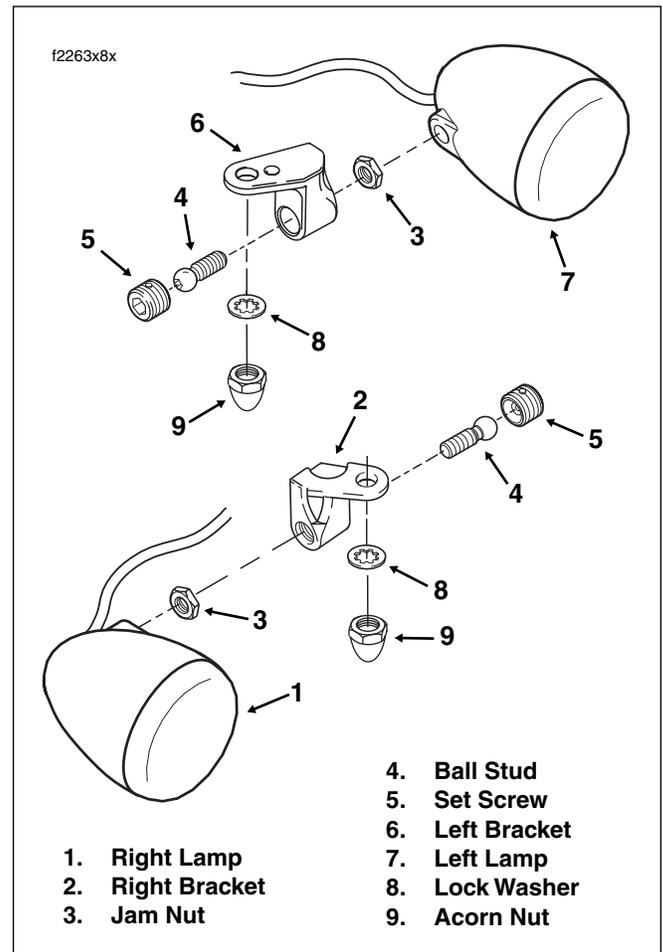


Figure 8-59. Front Turn Signal Lamp Brackets (FLHRS)

6. Remove two cable clips anchored in holes at bottom of handlebar. Free turn signal lamp conduit from cable clips.
7. Remove acorn nut, lock washer and turn signal lamp bracket from stem of mirror. Remove turn signal lamp assembly from motorcycle.
8. If complete disassembly is required, proceed as follows:

Bracket Assembly

- a. Using a 1/4 inch allen head socket, remove set screw from turn signal lamp bracket. See [Figure 8-59](#).
- b. Using a 3/16 inch ball allen, remove ball stud from turn signal lamp housing.
- c. Remove jam nut from ball stud. Remove ball stud from turn signal lamp bracket.

Socket/Isolator Assembly

- d. Push grommet at end of conduit into lamp housing. Lightly lubricate grommet with glass cleaner, if necessary.

- e. Insert blade of small screwdriver into slot at bottom of lense. Gently rotate end of screwdriver to unsnap lense from lamp.
- f. Push in bulb and rotate in a counterclockwise direction to remove.
- g. Inserting blade of small screwdriver between outer edge of rubber isolator and inside of lamp housing, gently pry up socket assembly until free.
- h. Pull socket assembly to draw conduit and terminals into lamp and then out through lense opening.
- i. Remove rubber isolator from lamp if still installed.

INSTALLATION

NOTE

If turn signal lamp is already assembled, begin procedure at step 2.

1. Assemble front turn signal lamp as follows:

Socket/Isolator Assembly

- a. Seat socket assembly in rubber isolator aligning tab on socket with slot in isolator.
- b. Feed terminals and conduit into lamp through lense opening and then out through unthreaded hole.
- c. Exercising caution to avoid pulling on wires, carefully pull grommet out through hole in lamp. For best results, grasp edge of grommet with needle nose pliers. Lightly lubricate grommet with glass cleaner, if necessary.
- d. Install socket assembly aligning tab on socket with slot inside lamp.
- e. Using thumbs of both hands, apply even pressure around outer edge of socket assembly until fully seated.
- f. Liberally apply dielectric grease to contacts in socket and at bottom of bulb. Push in bulb and rotate in a clockwise direction to install.
- g. Install lense in lamp and gently apply thumb pressure until it snaps into place. Rotate lense to position slot at bottom of lamp.

Bracket Assembly

- h. Install ball stud into turn signal lamp bracket with the ball end on the same side as the mirror stem hole.
 - i. Thread jam nut onto ball stud until it contacts shoulder.
 - j. Using a 3/16 inch ball allen, turn ball stud into turn signal lamp housing until contact is made with jam nut.
 - k. Using a 1/4 inch allen head socket, start set screw into turn signal lamp bracket.
2. If removed, install stem of mirror into hole in clutch lever bracket (left side) or master cylinder reservoir bracket (right side).



Figure 8-60. Front Left Turn Signal Lamps (FLHRS)



Figure 8-61. Front Right Turn Signal Lamps (FLHRS)

3. Slide turn signal lamp bracket onto stem of mirror and install lock washer and acorn nut.

NOTE

Index pin at bottom of clutch lever bracket engages blind hole at top of left turn signal lamp bracket to ensure proper orientation. On the right side, location of the front brake lever pivot pin relief prevents improper installation. See Figure 8-60 and Figure 8-61.

4. Following bottom of handlebar, feed free end of turn signal lamp conduit into top of headlamp nacelle staying outboard of lower handlebar clamp.
5. Reaching inside headlamp nacelle, install terminals into socket housing. For correct terminal locations refer to [Table 8-9](#).

NOTE

For instructions on installing terminals, see [APPENDIX B.2 MULTILOCK ELECTRICAL CONNECTORS, INSTALLING SOCKET/PIN TERMINALS](#).

6. Connect front turn signal lamps connector. Install anchor on connector into hole of fork stem nut lockplate (left side).
7. Install two cable clips into holes at bottom of handlebar after capturing handlebar switch and turn signal lamp conduit.
8. Install **new** cable strap to secure handlebar switch and turn signal lamp conduit to lower handlebar clamp. Cut any excess cable strap material.
9. Install handlebar clamp shroud/wind deflector. See Section [2.32 WINDSHIELD/HEADLAMP NACELLE \(FLHR/C/S\), NACELLE INSTALLATION \(FLHRS\)](#), steps 5-13.
10. Adjust mirror as necessary and tighten acorn nut to 60-96 **in-lbs** (6.8-10.8 Nm).
11. Turn Ignition/Light Key Switch to IGNITION and test for proper operation.
12. Adjust front turn signal lamp if necessary. See ADJUSTMENT which follows.

ADJUSTMENT

1. Using a 1/4 inch allen head socket, loosen set screw in turn signal lamp bracket. See [Figure 8-59](#).
2. Point turn signal lamp straight forward and snug set screw.
3. Carefully turn the front forks to the left and right fork stops to verify that the turn signal lamp does not contact fuel tank or any other components. Loosen set screw and readjust lamp as required.
4. Tighten set screw to 50-60 **in-lbs** (5.7-6.8 Nm).

FLHX

REMOVAL

1. Remove outer fairing. See Section [2.30 UPPER FAIRING/WINDSHIELD \(FLHX, FLHT/C/U\), OUTER FAIRING/WINDSHIELD, REMOVAL](#).
2. Disconnect the left or right front turn signal lamp connector [31L/R], 4-place Multilock. Connector is attached to T-stud at top of left or right fairing support brace (outboard side). See [Figure 8-56](#).
3. Remove two T40 TORX screws to release turn signal lamp mounting bracket from upper and lower fork brackets. See [Figure 8-62](#).
4. To remove socket/isolator assembly, proceed as follows:
 - a. Remove terminals from socket housing.

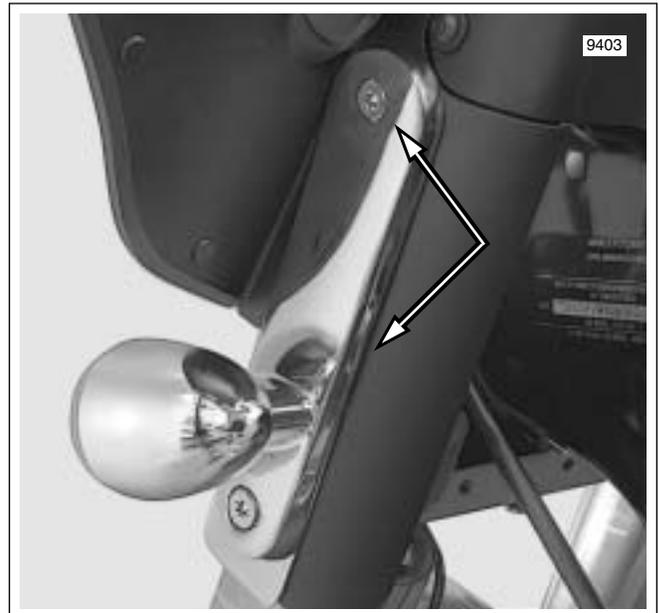


Figure 8-62. Front Turn Signal Lamp (FLHX)



Figure 8-63. Route Conduit Thru Mounting Bracket and Chrome Skirt Reliefs (FLHX)

NOTE

For instructions on removing terminals, see [APPENDIX B.2 MULTILOCK ELECTRICAL CONNECTORS, REMOVING SOCKET/PIN TERMINALS](#).

- b. Pull mounting bracket from conduit.
- c. Remove socket/isolator assembly from lamp. See [FLHRS, REMOVAL](#), in this section, steps 8(e) thru 8(i).

INSTALLATION

NOTE

If turn signal lamp is already assembled, begin procedure at step 2.

1. To install socket/isolator assembly, proceed as follows:
 - a. Seat socket assembly in rubber isolator aligning tab on socket with slot in isolator.
 - b. Feed terminals and conduit into lamp through lense opening and then out through unthreaded hole.
 - c. Complete installation of socket assembly. See [FLHRS, INSTALLATION](#), in this section, steps 1(d) thru 1(g).
 - d. Feed terminals and conduit through triangular shaped hole in mounting bracket.
 - e. Align thru hole in mounting bracket with threaded hole in lamp and start hex screw. Tighten hex screw to 15-20 ft-lbs (20-27 Nm).

NOTE

For instructions on installing terminals, see [APPENDIX B.2 MULTILOCK ELECTRICAL CONNECTORS, INSTALLING SOCKET/PIN TERMINALS](#).

- f. Install terminals into socket housing as follows:

Table 8-10. Front Turn Signal Lamp [31L/R]

FLHX, 4-Place			
Left Side [31L]		Right Side [31R]	
Wire Color	Chamber	Wire Color	Chamber
Blue	1	Blue	1
Violet	2	Brown	2
Black	3	Black	3
Empty	4	Empty	4

2. Start two T40 TORX screws to fasten turn signal lamp mounting bracket to upper and lower fork brackets.
3. To avoid pinching wires, verify that conduit is routed forward through relief at front of mounting bracket, and then inboard using relief in upper outboard corner of chrome skirt. See [Figure 8-63](#).
4. Alternately tighten T40 TORX screws to 15-20 ft-lbs (20-27 Nm).
5. Connect front turn signal lamp connector. Install connector on T-stud at top of left or right fairing support brace (outboard side). See [Figure 8-56](#).
6. Install outer fairing. See Section [2.30 UPPER FAIRING/WINDSHIELD \(FLHX, FLHT/C/U\), OUTER FAIRING/WINDSHIELD, INSTALLATION](#).

FLTR**REMOVAL**

1. Remove outer fairing and front turn signal lamp. See Section [2.31 UPPER FAIRING/WINDSHIELD \(FLTR\), OUTER FAIRING, REMOVAL](#). See [Figure 8-64](#).
2. To remove socket/isolator assembly, proceed as follows:
 - a. Remove terminals from socket housing.

NOTE

For instructions on removing terminals, see [APPENDIX B.2 MULTILOCK ELECTRICAL CONNECTORS, REMOVING SOCKET/PIN TERMINALS](#).

- b. Pull lamp from mounting bracket.
- c. Remove socket/isolator assembly from lamp. See [FLHRS, REMOVAL](#), in this section, steps 8(e) thru 8(i).

INSTALLATION**NOTE**

If turn signal lamp is already assembled, begin procedure at step 2.

1. Assemble front turn signal lamp as follows:
 - a. Seat socket assembly in rubber isolator aligning tab on socket with slot in isolator.
 - b. Feed terminals and conduit into lamp through lense opening and then out through unthreaded hole.
 - c. Complete installation of socket/isolator assembly. See [FLHRS, INSTALLATION](#), in this section, steps 1(d) thru 1(g).
 - d. Install lamp onto mounting bracket. See [Figure 8-64](#).



Figure 8-64. Front Turn Signal Lamp (FLTR)

NOTE

For instructions on installing terminals, see [APPENDIX B.2 MULTILOCK ELECTRICAL CONNECTORS, INSTALLING SOCKET/PIN TERMINALS](#).

- e. Install terminals into socket housing. For correct terminal locations refer to [Table 8-10](#).
2. Install outer fairing and front turn signal lamp. See Section [2.31 UPPER FAIRING/WINDSHIELD \(FLTR\), OUTER FAIRING, INSTALLATION](#).
3. Turn Ignition/Light Key Switch to IGNITION and test for proper operation.

REAR TURN SIGNAL LAMP

FLHR/C, FLHT/C/U

REMOVAL

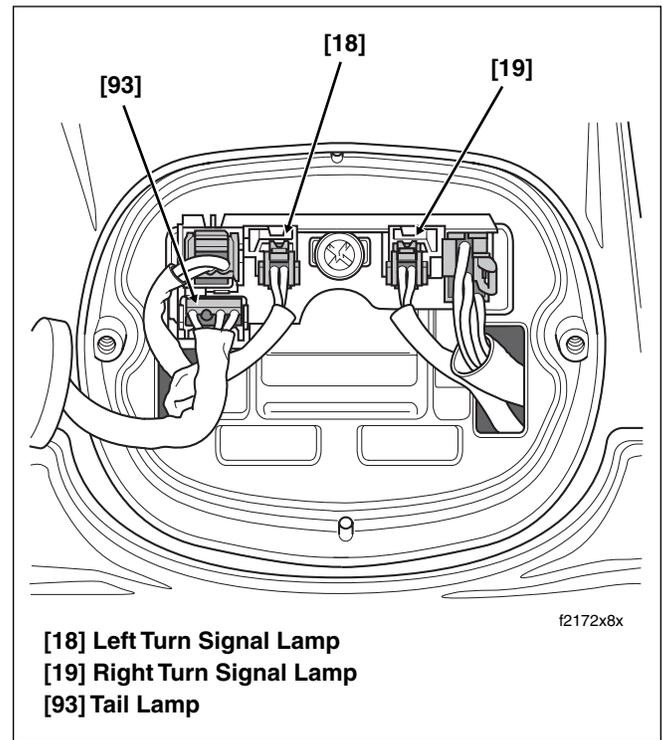
1. Remove saddlebag on same side of motorcycle. See Section [2.26 SADDLEBAG, REMOVAL](#).
2. Remove two Phillips screws to release tail lamp assembly from chrome base.
3. Disconnect tail lamp connector [93], 4-place Multilock. Set tail lamp assembly aside. See [Figure 8-65](#).
4. Disconnect turn signal lamp assembly, 2-place Multilock. For best results, use a pick or small screwdriver to depress release button as shown in [Figure 8-66](#).
5. Feed socket housing through opening in chrome base to inboard side of rear fender.
6. Reaching under rear fender, release conduit from cable clip anchored on T-stud.
7. Draw conduit and socket housing out through fender hole just below chrome base. See [Figure 8-66](#).
8. Draw socket housing through channel on inboard side of rear turn signal lamp bracket, so that length of conduit hangs below turn signal lamp.
9. Inserting a long shank ball end socket (Snap-on® FABL5) through channel in bracket, remove two socket head screws to release turn signal lamp assembly.
10. Remove terminals from socket housing.

NOTE

For instructions on removing terminals, see [APPENDIX B.2 MULTILOCK ELECTRICAL CONNECTORS, REMOVING SOCKET/PIN TERMINALS](#).

INSTALLATION

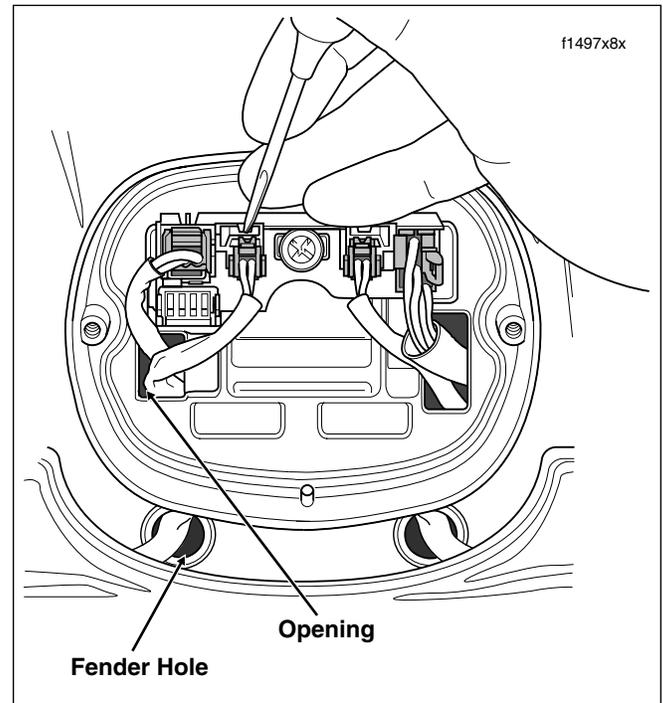
1. Place **new** turn signal lamp assembly next to discarded unit and cut wires to proper length.



[18] Left Turn Signal Lamp
[19] Right Turn Signal Lamp
[93] Tail Lamp

f2172x8x

Figure 8-65. Release Tail Lamp Socket



f1497x8x

Figure 8-66. Use Pick Tool to Release Left Turn Signal Lamp Socket

2. Crimp **new** socket terminals onto turn signal lamp wires.

NOTE

For instructions on crimping terminals, see [APPENDIX B.2 MULTILOCK ELECTRICAL CONNECTORS, CRIMPING INSTRUCTIONS](#).

3. Install terminals into socket housing.

Table 8-11. Rear Turn Signal Lamps [18/19]

Wire Color	Chamber Number
Violet/Brown	1
Black	2

NOTE

For instructions on installing terminals, see [APPENDIX B.2 MULTILOCK ELECTRICAL CONNECTORS, INSTALLING SOCKET/PIN TERMINALS](#).

4. Align holes in turn signal lamp assembly with those in rear turn signal lamp bracket and start two socket head screws. For best results, insert a long shank ball end socket (Snap-on® FABL5) through channel on inboard side of bracket. Alternately tighten screws to 30-50 **in-lbs** (3.4-5.6 Nm).
5. Route socket housing through channel in bracket, and then feed through fender hole just below chrome base. See [Figure 8-66](#).
6. Reaching under rear fender, capture conduit in cable clip anchored on T-stud.
7. Feed socket housing through opening in chrome base to outboard side of rear fender.
8. Orient socket housing so that the release button is at the top and insert into pin housing/circuit board.
9. To install tail lamp assembly, orient 4-place Multilock socket so that the release button is at the bottom and insert into pin housing until it “clicks.” To avoid stressing wires, verify that tail lamp conduit is positioned on the outboard side of the rear fender tip lamp and left turn signal lamp conduit as shown [Figure 8-65](#).
10. Place tail lamp into position against chrome base.

CAUTION

Over tightening screws can crack the lense or result in scratching of the fender paint.

11. Install two Phillips screws and alternately tighten to 20-24 **in-lbs** (2.3-2.7 Nm).
12. Turn the Ignition/Light Key Switch to IGNITION and test lamp for proper operation.
13. Install saddlebag. See [Section 2.26 SADDLEBAG, INSTALLATION](#).

FLHRS, FLHX, FLTR

NOTE

This procedure entails replacement of the rear turn signal lamp socket/isolator assembly. To remove and install the turn signal lamps bracket, see [REAR TURN SIGNAL LAMPS BRACKET](#) in this section.

REMOVAL

1. Remove chrome base and circuit board assembly. See [Section 8.14 TAIL LAMP ASSEMBLY, CIRCUIT BOARD/CHROME BASE, REMOVAL](#).
2. Remove terminals from socket housing of rear turn signal lamp connector.

NOTE

For instructions on removing terminals, see [APPENDIX B.2 MULTILOCK ELECTRICAL CONNECTORS, REMOVING SOCKET/PIN TERMINALS](#).

3. Reaching inside rear fender, release conduit from cable clip anchored on T-stud.
4. Draw conduit and terminals through hole to outboard side of fender.
5. Remove socket/isolator assembly as follows:
 - a. Insert blade of small screwdriver into slot at bottom of lense. Gently rotate end of screwdriver to unsnap lense from lamp.
 - b. Push grommet at end of conduit into lamp housing. Lightly lubricate grommet with glass cleaner, if necessary.
 - c. Push in bulb and rotate in a counterclockwise direction to remove.
 - d. Inserting blade of small screwdriver between outer edge of rubber isolator and inside of lamp housing, gently pry up socket assembly until free.
 - e. Pull socket assembly to draw conduit and terminals into lamp and then out through lense opening.
 - f. Remove rubber isolator from lamp if still installed.

INSTALLATION

1. Place **new** socket/isolator assembly next to discarded unit and cut wires to proper length. Crimp **new** socket terminals onto wires.

NOTE

For instructions on crimping terminals, see [APPENDIX B.2 MULTILOCK ELECTRICAL CONNECTORS, CRIMPING INSTRUCTIONS](#).

2. Install socket/isolator assembly as follows:
 - a. Seat socket assembly in rubber isolator aligning tab on socket with slot in isolator.

- b. Feed terminals and conduit into lamp through lense opening and then out through unthreaded hole.
 - c. Exercising caution to avoid pulling on wires, carefully pull grommet out through hole in lamp. For best results, grasp edge of grommet with needle nose pliers. Lightly lubricate grommet with glass cleaner, if necessary.
 - d. Install socket assembly aligning tab on socket with slot inside lamp.
 - e. Using thumbs of both hands, apply even pressure around outer edge of socket assembly until fully seated.
 - f. Liberally apply dielectric grease to contacts in socket and at bottom of bulb. Push in bulb and rotate in a clockwise direction to install.
 - g. Install lense in lamp and gently apply thumb pressure until it snaps into place. Rotate lense to position slot at bottom of lamp.
3. Feed socket terminals through hole to inboard side of fender.
 4. Install terminals into socket housing. See [Table 8-11](#).

NOTE

For instructions on installing terminals, see [APPENDIX B.2 MULTILOCK ELECTRICAL CONNECTORS, INSTALLING SOCKET/PIN TERMINALS](#).

5. Reaching inside rear fender, capture conduit in cable clip anchored on T-stud.
6. Install chrome base and circuit board assembly. See [Section 8.14 TAIL LAMP ASSEMBLY, CIRCUIT BOARD/ CHROME BASE, INSTALLATION](#).

REAR TURN SIGNAL LAMPS BRACKET

FLHR/C, FLHT/C/U

REMOVAL

1. Remove chrome base and circuit board assembly. See [Section 8.14 TAIL LAMP ASSEMBLY, CIRCUIT BOARD/ CHROME BASE, REMOVAL](#).
2. Remove rear turn signal lamps from bracket. See [REAR TURN SIGNAL LAMP, REMOVAL](#), in this section, steps 6-9.
3. Remove two flange bolts to free rear turn signal lamps bracket from rear fender.

INSTALLATION

1. Apply one drop of LOCTITE THREADLOCKER 271 (Red) to two flange bolts.
2. Install flange bolts to fasten rear turn signal lamps bracket to rear fender. Alternately tighten bolts to 84-144 **in-lbs** (9.5-16.3 Nm).
3. Install rear turn signal lamps to bracket. See [REAR TURN SIGNAL LAMP, INSTALLATION](#), in this section, steps 4-6.
4. Install chrome base and circuit board assembly. See [Section 8.14 TAIL LAMP ASSEMBLY, CIRCUIT BOARD/ CHROME BASE, INSTALLATION](#).

FLHRS, FLHX, FLTR

REMOVAL

NOTE

To remove the rear turn signal lamps bracket on FLHX models, see [Section 8.17 LICENSE PLATE LAMPS/BRACKET \(FLHX\), LICENSE PLATE BRACKET, REMOVAL](#).

1. Remove circuit board and chrome base. See [Section 8.14 TAIL LAMP ASSEMBLY, CIRCUIT BOARD/ CHROME BASE, REMOVAL](#).
2. Reaching inside rear fender, release left and right rear turn signal lamp conduit from respective cable clips anchored on T-studs.
3. Remove two flange bolts to release rear turn signal lamps bracket.
4. Pull rear turn signal lamps bracket away from motorcycle drawing socket housings out through fender holes.

INSTALLATION

NOTE

To install the rear turn signal lamps bracket on FLHX models, see [Section 8.17 LICENSE PLATE LAMPS/BRACKET \(FLHX\), LICENSE PLATE BRACKET, INSTALLATION](#).

1. Feed socket housings of left and right rear turn signal lamps through respective holes to inboard side of fender.
2. Apply one drop of LOCTITE THREADLOCKER 271 (Red) to two flange bolts.
3. Install flange bolts to fasten rear turn signal lamp bracket to fender. Alternately tighten bolts to 84-144 **in-lbs** (9.5-16.3 Nm).
4. Install chrome base and circuit board assembly. See [Section 8.14 TAIL LAMP ASSEMBLY, CIRCUIT BOARD/ CHROME BASE, INSTALLATION](#).

BULB REPLACEMENT

REMOVAL

1. Using a 7/32 inch allen head wrench, remove two screws to release lense of license plate lamp from rear turn signal lamps bracket.
2. See [Figure 8-67](#). Exercising caution to avoid stressing wires, carefully pull down lamp assembly only as far as necessary to access bulbs. Remove bulbs from sockets.

INSTALLATION

1. Liberally apply dielectric grease to contacts in sockets and at bottom of **new** bulbs. Install bulbs in sockets. For correct bulb type, see [Section 8.2 BULB CHART](#).
2. Using a 7/32 inch allen head wrench, install two screws to fasten lense of license plate lamp to rear turn signal lamps bracket.

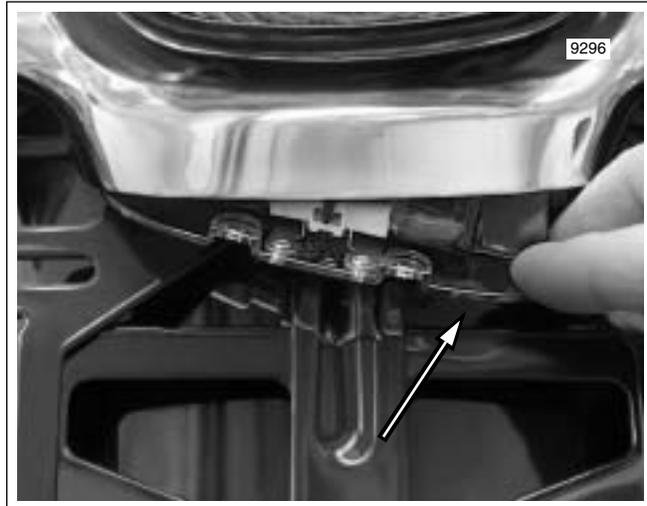


Figure 8-67. Release Lamp Assembly

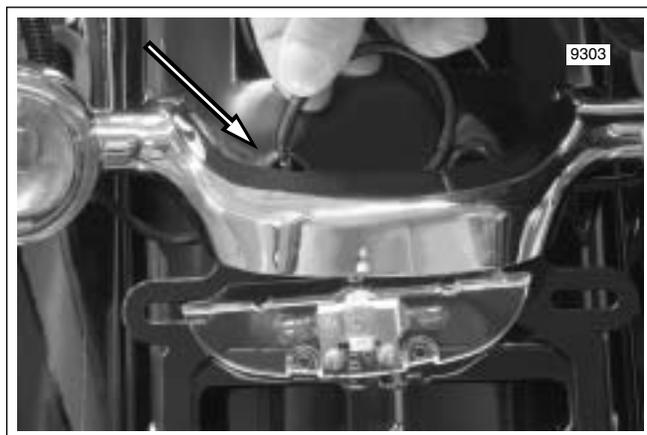


Figure 8-68. Draw Wires Through Fender Hole

LICENSE PLATE LAMPS

REMOVAL

1. Using a 7/32 inch allen head wrench, remove two screws to release lense of license plate lamp from rear turn signal lamps bracket.
2. See [Figure 8-67](#). Exercising caution to avoid stressing wires, carefully pull down lamp assembly only as far as necessary to access bulbs.
3. Remove circuit board and chrome base. See [Section 8.14 TAIL LAMP ASSEMBLY, CIRCUIT BOARD/CHROME BASE, REMOVAL](#).
4. Remove terminals from socket housing of license plate lamps connector [45].

NOTE

For instructions on removing terminals, see [APPENDIX B.2 MULTILOCK ELECTRICAL CONNECTORS, REMOVING SOCKET/PIN TERMINALS](#).

5. Reaching inside rear fender, release conduit from left side cable clip anchored on T-stud.
6. Draw conduit and socket terminals through hole to out-board side of fender, and then down through slot in center of turn signal lamps bracket. See [Figure 8-68](#).

INSTALLATION

1. Place **new** lamp assembly next to discarded unit and cut wires to proper length.
2. Crimp **new** socket terminals onto license plate lamp wires.

NOTE

For instructions on crimping terminals, see [APPENDIX B.2 MULTILOCK ELECTRICAL CONNECTORS, CRIMPING INSTRUCTIONS](#).

3. Feed socket terminals and conduit up through slot in center of turn signal lamps bracket, and then through hole to inboard side of fender. See [Figure 8-68](#).

4. Install terminals into socket housing.

Table 8-12. License Plate Lamps [45]

Wire Color	Chamber Number
Black	1
Not Used	2
Black	3

NOTE

For instructions on installing terminals, see [APPENDIX B.2 MULTILOCK ELECTRICAL CONNECTORS, INSTALLING SOCKET/PIN TERMINALS](#).

5. Using a 7/32 inch allen head wrench, install two screws to fasten lense to rear turn signal lamps bracket.
6. Reaching inside rear fender, capture conduit in cable clip anchored on T-stud.
7. Install chrome base and circuit board assembly. See [Section 8.14 TAIL LAMP ASSEMBLY, CIRCUIT BOARD/CHROME BASE, INSTALLATION](#).

LICENSE PLATE BRACKET**REMOVAL**

1. Remove circuit board and chrome base. See [Section 8.14 TAIL LAMP ASSEMBLY, CIRCUIT BOARD/CHROME BASE, REMOVAL](#).
2. Remove terminals from socket housing of license plate lamps connector [45].

NOTE

For instructions on removing terminals, see [APPENDIX B.2 MULTILOCK ELECTRICAL CONNECTORS, REMOVING SOCKET/PIN TERMINALS](#).

3. Reaching inside rear fender, release license plate lamps conduit from left side cable clip anchored on T-stud.
4. Draw socket terminals through hole to outboard side of fender. See [Figure 8-68](#).
5. Reaching inside rear fender, release left and right rear turn signal lamp conduit from respective cable clips anchored on T-studs.
6. Remove two flange bolts to release rear turn signal lamps bracket.
7. Pull rear turn signal lamps bracket away from motorcycle drawing socket housings out through fender holes.
8. Remove two allen head socket screws to release license plate bracket from rear turn signal lamps bracket. See [Figure 8-69](#).

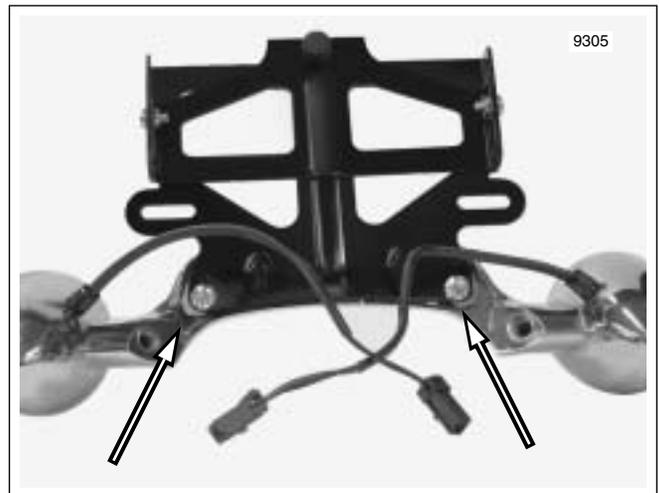
INSTALLATION

1. Install two allen head socket screws to fasten license plate bracket to rear turn signal lamps bracket. See [Figure 8-69](#).
2. Feed socket housings of left and right rear turn signal lamps through respective holes to inboard side of fender.
3. Apply one drop of LOCTITE THREADLOCKER 271 (Red) to two flange bolts.
4. Install flange bolts to fasten rear turn signal lamps bracket to fender. Alternately tighten bolts to 84-144 **in-lbs** (9.5-16.3 Nm).
5. Feed socket terminals of license plate lamp connector [45] through left side hole to inboard side of fender. See [Figure 8-68](#).
6. Install terminals into socket housing. Refer to [Table 8-12](#).

NOTE

For instructions on installing terminals, see [APPENDIX B.2 MULTILOCK ELECTRICAL CONNECTORS, INSTALLING SOCKET/PIN TERMINALS](#).

7. Reaching inside rear fender, capture conduit of rear turn signal lamps connectors in respective cable clips anchored on T-studs. Also capture license plate lamps conduit in left side cable clip.
8. Install chrome base and circuit board assembly. See [Section 8.14 TAIL LAMP ASSEMBLY, CIRCUIT BOARD/CHROME BASE, INSTALLATION](#).

**Figure 8-69. Remove License Plate Bracket**

REMOVAL

NOTE

If equipped with the optional "Harley-Davidson Factory Security System," verify that the security status lamp in speedometer face is not flashing before proceeding (security system disarmed).

1. Remove seat. See Section 2.25 SEAT, REMOVAL.
2. Depress tab at front of spring clip and lift to release legs from holes in frame crossmember at rear of battery box. See Figure 8-70.
3. Remove module from cavity and disconnect TSM/TSSM connector [30], 12-place Deutsch.

INSTALLATION

1. Connect TSM/TSSM connector [30], 12-place Deutsch, to **new** module. Install module in cavity of frame crossmember at rear of battery box.
2. Insert legs of spring clip into holes in frame crossmember and push down until tab at front snaps in place.
3. Install seat. See Section 2.25 SEAT, INSTALLATION.
4. Test all turn signal functions. Test all security system functions, if so equipped.

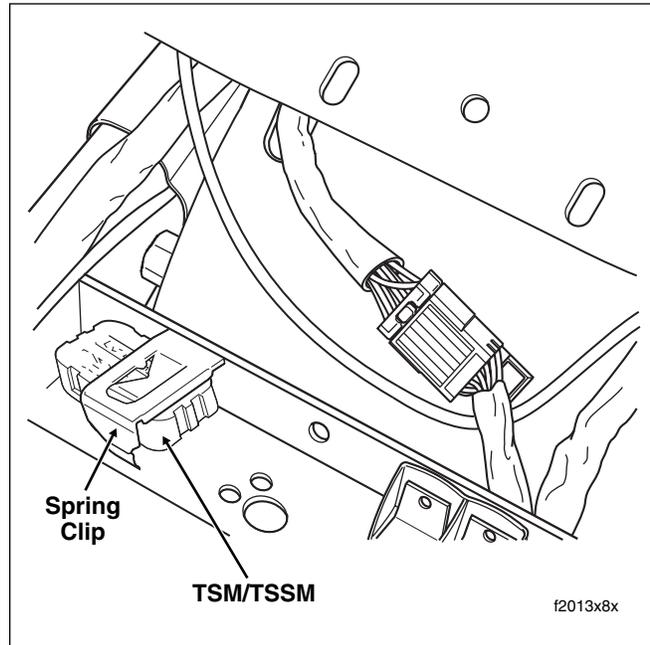


Figure 8-70. TSM/TSSM