



INSTRUCTIONS

-J00062

REV. 08-29-2002

Kit Numbers 31603-91, 31604-91, 31605-90, and 31608-90

STARTER SOLENOID REBUILD KIT

General

These kits fit Harley-Davidson models as follows:

- 1989 through 1990 Big Twin, use Kit 31608-90.
- 1991 and later Big Twin, use Kit 31604-91.
- 1981 through 1990 XLH, use Kit 31605-90.
- 1991 and later XLH 1200, use Kit 31603-91.
- 1991 through 1994 XLH 883, use Kit 31605-90.
- 1995 and later XLH 883, use Kit 31603-91.

See the Service Parts illustration for kit contents.

WARNING

A Service Manual is necessary for installation of this kit. The rider's safety depends upon the correct installation of this kit. If the procedure is not within your capabilities or you do not have the correct tools, have your Harley-Davidson dealer perform the installation. Improper installation of this kit could result in death or serious injury.

NOTE

A Service Manual for your model motorcycle is available from your Harley-Davidson dealer.

Installation

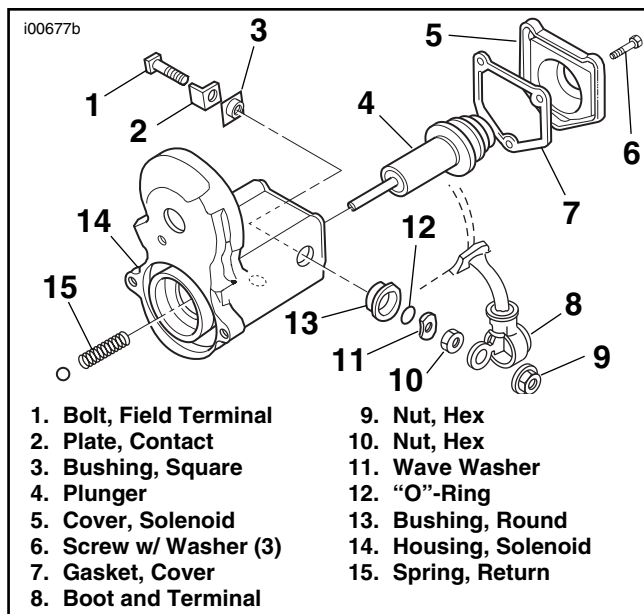
WARNING

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

WARNING

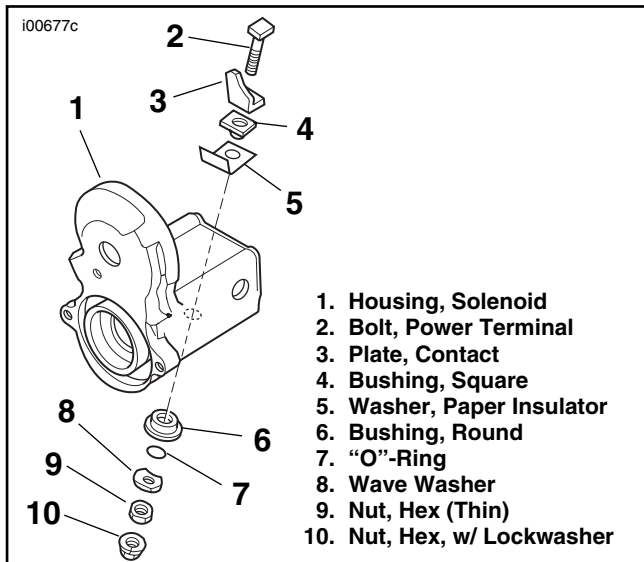
Always disconnect the negative battery cable first. If the positive battery cable should contact ground with the negative cable installed, the resulting sparks may cause a battery explosion which could result in death or serious injury.

1. Refer to the SEAT and BATTERY sections of the Service Manual. Remove the seat and disconnect the battery cables, negative cable first.
2. Remove the existing starter. See the STARTER REMOVAL section of the Service Manual.
3. See Figure 1. Remove the boot (8) from the copper field terminal bolt (1). Remove the hex nut (9) holding the field wire terminal to the bolt.
4. Remove the three solenoid cover screws with washers (6), the cover (5) and gasket (7). Discard the gasket.
5. Remove the plunger (4) and return spring (15) from the housing (14). Remove the spring from the plunger and set aside for later reassembly. Discard the plunger.
6. Remove and discard the field terminal nut (10), wave washer (11), "O"-ring (12) and round bushing (13). Push the copper bolt (1), contact plate (2) and bushing (3) out of the solenoid housing and discard.



- | | |
|-------------------------|-----------------------|
| 1. Bolt, Field Terminal | 9. Nut, Hex |
| 2. Plate, Contact | 10. Nut, Hex |
| 3. Bushing, Square | 11. Wave Washer |
| 4. Plunger | 12. "O"-Ring |
| 5. Cover, Solenoid | 13. Bushing, Round |
| 6. Screw w/ Washer (3) | 14. Housing, Solenoid |
| 7. Gasket, Cover | 15. Spring, Return |
| 8. Boot and Terminal | |

Figure 1. Solenoid Plunger and Field Terminal



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|-----------------------------|
| 1. Housing, Solenoid |
| 2. Bolt, Power Terminal |
| 3. Plate, Contact |
| 4. Bushing, Square |
| 5. Washer, Paper Insulator |
| 6. Bushing, Round |
| 7. "O"-Ring |
| 8. Wave Washer |
| 9. Nut, Hex (Thin) |
| 10. Nut, Hex, w/ Lockwasher |

Figure 2. Power Terminal

7. See the Service Parts Illustration. From the inside of the solenoid housing, insert the center ferrule of a square bushing (3) from the kit through the field terminal hole.

NOTE

Position the contact plate so the leg with the curved edge is next to the plunger opening

8. Position the contact plate (2) from the kit between the bushing and the hold-in winding terminal with the holes aligned. Be sure the leg of the contact plate with the curved edge is next to the plunger opening. Insert the new copper bolt (1), included with the kit, through the hold-in terminal, contact plate and bushing.

9. From the outside of the housing, place the center ferrule of a round bushing (8), an "O"-ring (9) and a wave washer (10) (all from the kit) over the bolt threads. Thread a thin hex nut (11) from the kit onto the bolt. Snug into place, but do not tighten at this time.

10. See Figure 2.

For Kits 31603-91 and 31604-91: Remove the hex nut with lockwasher (10) from the copper power terminal bolt (2).

For All Kits: Remove and discard the power terminal nut (9), wave washer (8), "O"-ring (7) and round bushing (6). Push the copper bolt (2), contact plate (3) and bushing (4) out of the solenoid housing (1) and discard.

For Kits 31603-91 and 31604-91: Remove the paper insulator washer (5) and discard.

NOTE

The knurled shaft of the copper bolt is a slight press fit into the contact plate.

11. See the Service Parts Illustration. Locate the 27 mm long copper bolt (4) and contact plate (5) from the kit. Place the contact plate over the slightly open jaws of a vise with the hole side flat and the leg upward. Insert the bolt threads down through the hole in the contact plate, and tap the bolt into the hole until the bolt head touches the plate.

12. From the inside of the solenoid housing, insert the center ferrule of a square bushing (3) from the kit through the power terminal bolt hole.

NOTE

Position the contact plate so the leg with the curved edge is next to the plunger opening

Insert the threads of the bolt and contact plate assembly through the bushing (and paper insulator, item 13, if applicable), with the contact leg positioned with the curved edge toward the plunger opening. Hold in this position.

13. From the outside of the housing, place the center ferrule of a round bushing (8), an "O"-ring (9) and wave washer (10) (all from the kit) over the bolt threads. Thread a thin hex nut (11) from the kit onto the bolt. Snug into place, but do not tighten at this time.

14. Place the original return spring over the new plunger (6) from the kit. Insert the plunger into the opening in the solenoid housing, spring end first. Be sure the spring is seated all the way into the guide hole.

15. While holding pressure inward on the plunger, tighten the nuts (11) on the terminals to 65-80 **in-lbs**. This will ensure alignment of the contact plates (2 and 5) to the plunger washer.

16. Place the new gasket (7) from the kit in the solenoid cover. Position the cover and gasket against the housing with the holes aligned. Position the clip over the unpainted hole in the cover.

17. Fasten the cover, clip and gasket to the solenoid housing with three screws with washers removed in Step 4. Tighten the screws securely.

18. Place the field wire terminal over the copper bolt (1). Thread on the hex nut removed earlier and tighten to 65-80 **in-lbs**. Place the boot over the terminal.

19. Install the starter on the vehicle. See STARTER INSTALLATION in the Service Manual.

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.

20. Connect the battery cables, positive cable first.

WARNING

After installing seat, pull upward on front of seat to be sure it is locked in position. If seat is loose, it could result in shifting during vehicle operation, loss of control of vehicle, death or serious injury.

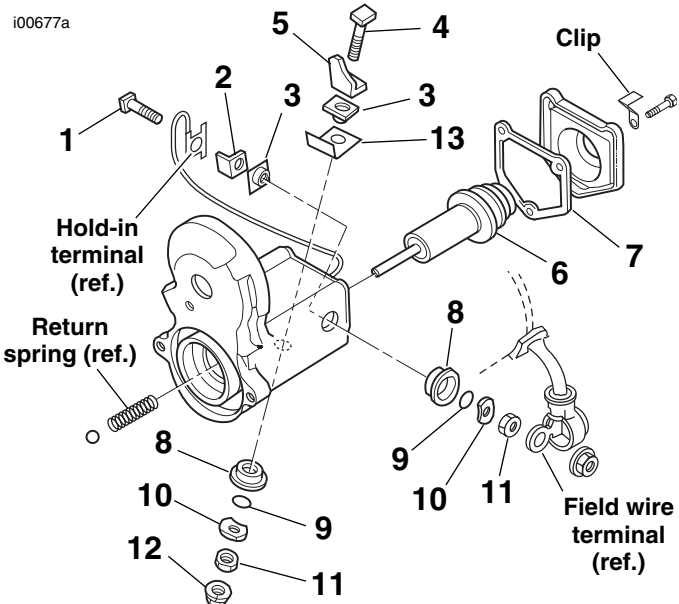
21. Refer to the Service Manual, and follow instructions to install the seat.



Service Parts

Part No. 31603-91 & others | Date 08/02

Starter Solenoid Rebuild Kit



Item	Description	Part No.
1	Bolt, Copper, Field Terminal, with smooth shoulder	Not sold
2	Plate, Contact, Field Terminal	Not sold
3	Bushing, Square (2)	Not sold
4	Bolt, Copper, Power Terminal, 27 mm long, with knurled shoulder	Not sold
5	Plate, Contact, Power Terminal	Not sold
6	Plunger (for Kit 31604-91)	31665-90
	Plunger (for all other Kits)	Not sold
7	Gasket, Cover:	
	For Kits 31603-91 and 31604-91	31687-90
	For Kits 31605-90 and 31608-90	Not sold
8	Bushing, Round (2)	Not sold
9	"O"-Ring (2)	Not sold
10	Washer, Wave (2)	Not sold
11	Nut, Hex (Thin) (2)	Not sold

Additional Items in Kits 31603-91 and 31604-91 only:

12	Nut, Hex, with Lockwasher	Not sold
13	Washer, Paper Insulator	6217