

# **Kwikkee<sup>®</sup>** **PRODUCTS**

by  Lippert Components<sup>®</sup>

## **ELECTRIC STEP REPLACEMENT KIT #867 INSTALLATION MANUAL**

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## Safety Information

### **WARNING**

The “WARNING” symbol above is a sign that an installation procedure has a safety risk involved and may cause death or serious injury if not performed safely and within the parameters set forth in this manual.

Always wear eye protection when performing this installation procedure. Other safety equipment to consider would be hearing protection, gloves, and possibly a full face shield, depending on the nature of the installation procedure.

### **WARNING**

The coach **MUST** be supported per manufacturer's specifications before working underneath. Failure to do so may result in death or serious injury.

### **CAUTION**

Moving parts can pinch, crush or cut. Keep clear and use caution.

### **WARNING**

There is an electric shock hazard associated with this procedure. Disconnect power before working on this unit. Failure to follow all safety procedures and all procedures in this manual could cause serious injury or death.

### **CAUTION**

Before attempting any electric step assembly repair work, please read all of the following instructions. Disconnect the power at the vehicle battery once the step is extended.

## Product Information

**NOTE:** Part Number 9520 and 9521 refer to the Motor. Part Number 9501, 9502, 9503 and 9504 refer to the Motor Assembly. Part Number 9506, 9507 and 9508 refer to the Control Unit. Part Number 9572, 9574, 9570, 9579 and 9580 refer to the Conversion Kit.

Motor Assemblies contain a motor, linkage, gear, gearbox and hardware. Motors are packaged with spade connectors to be used with steps using a 9513 Control. Conversion Kits contain a Motor Assembly, and Control. Controls are packaged with the appropriate spade connectors to be used with steps fitted with pre-1999 permanent magnet motors using a clamp-style connector.

**NOTE:** Any control unit or motor repair needed on steps using a Delco Field Wound motor (Part Number 8002, 8278, 8279, 8287) requires the IMGL and Control Unit included in the Replacement Kit.

## Motor Assembly Removal and Replacement



**Before attempting any electric step assembly repair work, please read all of the following instructions. Disconnect the power at the vehicle battery once the step is extended.**

1. On Van Steps, remove plastic splash cover if so equipped. If the step is locked in the retracted (up) position where the plastic cover cannot be removed, the step tread will have to be disassembled to access the plastic cover. To disassemble the tread, remove the (8) 1/4"-20 x 1" long hex head bolts in the tread side rails connecting the tread and the sliding blocks to the side rail. This will allow the tread to be dropped out of the way to access the plastic cover. Reassemble the tread after removing the cover.
2. To remove the motor assembly from the step, it is easiest if the step is partially or fully extended. If possible, extend the step with the standard door switch operation. If not, begin by following the "Motor Only" instructions. Removing the motor from the gear case will allow the step to move freely.
3. Control Units:
  - A. **Steps Using a Control Unit:** Unplug the 4-way connector to the control unit (Item 16). Unplug the 2-way connector or disassemble the 2-way clamp style connector, between the motor and the control unit (Item 16).
  - B. **Steps Without a Control Unit:** Cut the wires at the butt connectors approximately 12 " from the motor.
4. Remove the cotter pin (Item 8) from the clevis pin (Item 9) at the linkage assembly.
5. Remove the clevis pin (Item 9) from the cast "U" block in the end of the linkage assembly (Item 7A, 7B, or 7C). Note the direction the clevis pin goes into the cast block. If the step is in its locked position, the pin may have to be pried or driven out of the block. The step tread(s) should now swing freely, if not check for a bent step frame or jammed pivot point(s).
6. Unbolt the motor assembly from the step frame.
7. Install new motor assembly on step frame and tighten all mounting bolts.
8. Install the clevis pin (Item 9) through the drive arms attached to the step frame and the cast block in the linkage assembly (Item 7A, 7B or 7C). Be sure to reinstall the clevis pin in the same direction it was removed. Install the cotter pin (Part 8) into the clevis pin.
9. Reconnect the wiring:
  - A. **Wiring to a 9513, 9516, or 9590 Control Unit** - Cut off the 2-way Packard style connector from the motor/control adapter pigtail (Item 16). Next, attach the two female spade connectors to the red and yellow wires and reassemble the clamp-style connector.
  - B. **Wiring to toggle switch only** - Using the motor/control adapter pigtail connect the mating connector to the connector on the motor and cut off the 2-way Packard style connector from the opposite end of the adapter pigtail. Connect the red and yellow pigtail wires to the vehicle switch wires using heat shrink insulated butt connectors.

# Diagram of Step Motor Assembly

This view of the motor is rotated 180° of actual orientation to the step frame.

Replacement Parts Kits for Series Steps 22, 23, 28A, 30, 32, 33, 34, 35, 36, 38 and 40			
Callout	Description	Kwiikee Part Number	LCI Part Number
1	#10 x 1 3/4" self-tapping hex washer-head screw	909530000	380040
2	Motor bearing bracket (standard - not shown)	909539000	380038
3	Bearing	909530000	379646
4	Motor (pre-IMGL)	909520000	379608
5	Adapter gear (AM-motor-not shown)	909559000	
6	Adapter gear shaft	909530000	379646
7A	Linkage 'A' (pre-IMGL)	909534000	379649
Replacement Parts Kits for Series Steps 28, 31, 33, 37 and 39			
7B	Linkage 'B' (pre-IMGL)	909533000	379648
Replacement Parts Kits for Series Steps 26			
7C	Linkage 'C' (pre-IMGL)	909532000	379647
8	Cotter pin	905205000	379178
9	Clevis pin	905205000	379178
10	Gear case	905260000	
11	Gear	909541000	
12	Gear case cover	909527000	379643
13	Motor mounting plate	909535000	
14	1/4"-20 x 1 1/4" tri-lobal thread forming screw	909530000	
16	Adapter pigtail (standard)	909520000	379164
	Step Frame only	9080**000	
	Step Light	909004000	379414

\*\*Insert the 2 digit Step Series number

Fig. 1

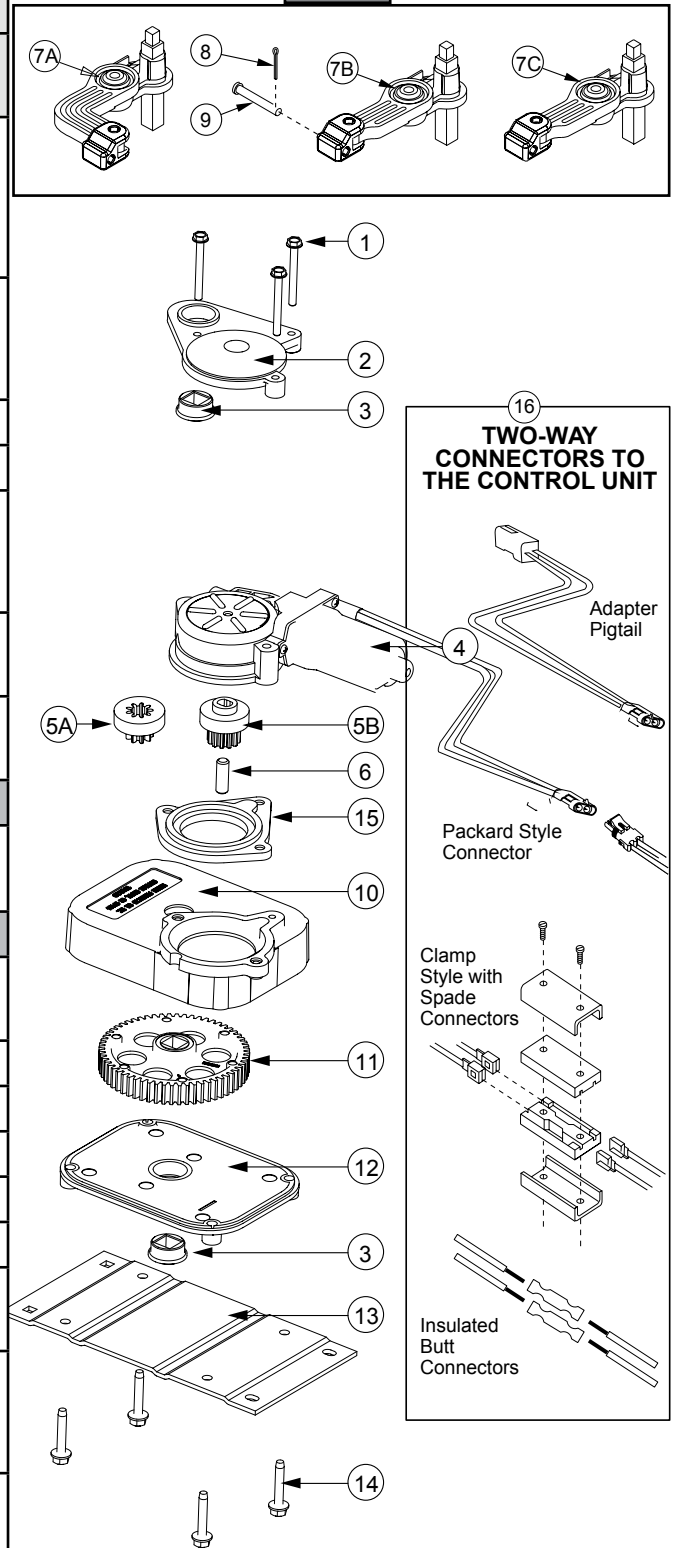
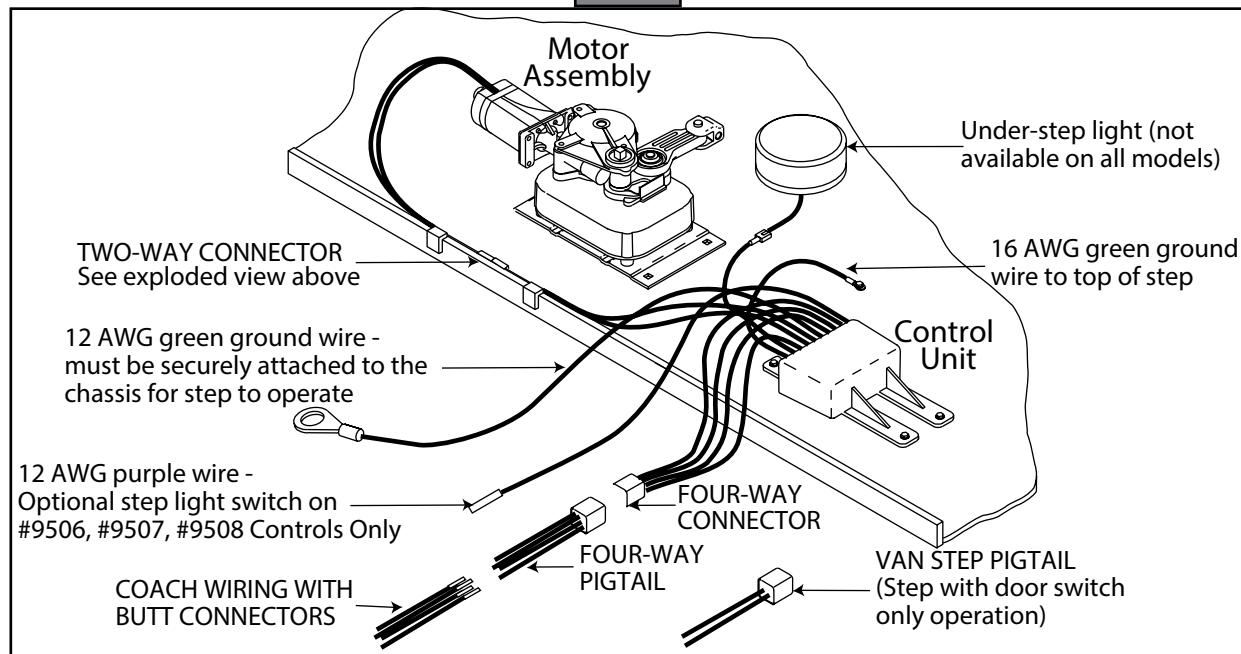


Fig. 2



**C. Wiring to a 9506, 9507, 9508 Control Unit** - Using the motor/control adapter pigtail connect the mating end to the connector on the motor and the opposite end to the 2-way Packard style connector on the step control.

**10.** Plug in the 4-way connector between the control unit and the vehicle.

**NOTE:** On 23 and 34 Series Steps, see the mounting instruction (Fig. 3), when replacing a #8287 double reduction motor with a permanent magnet motor assembly.

## Motor Removal and Replacement

Proceed to the following steps after completing Motor Assembly Removal.

1. The motor may be removed without removing the gearbox (Item 4). On steps using a control unit, disconnect the motor 2-way connector (Item 16). Remove the three screws (Item 1) along with the motor bearing bracket (Item 2). The bearing (Item 3) may come off with the bracket, if not, remove it.
2. Lift the motor (Item 4) from the gear case. The adapter gear (Item 5) and adapter gear shaft (Item 6) may come off with the motor. Note the orientation of the gear and gear shaft.
3. Replace the bearing (Item 3) on the linkage assembly shaft. Place the flange of the bearing facing down.
4. Replace the adapter gear shaft (Item 6) and lubricate.
5. Install new adapter gear, mesh the adapter gear teeth (Item 5) to the gear teeth on the bottom of the new step motor.

**NOTE:** For the Hi-Torque Motor; mesh the existing adapter gear teeth (Item 5) to the gear teeth on the bottom of the new step motor.

6. Replace the motor by aligning the motor and adapter gear (Item 5) so they slide over the adapter gear shaft (Item 6) and align and mesh with the gear (Item 11). Align the screw holes and push the motor into the screw hole alignment pockets in the gear case.

**NOTE:** For the Hi-Torque Motor; install the plastic motor gear case adapter to the underside of the motor. Install the motor and adapter assembly by aligning the motor and adapter gear (Item 5) so they slide over the adapter gear shaft (Item 6) and align and mesh with the gear (Item 11). Align the screw holes and push the motor into the screw hole alignment pockets in the gear case.

7. Place the new bearing bracket (Item 2) on the motor assembly and attach it with the three motor screws (Item 1). These screws must be very secure.

**NOTE:** For the Hi-Torque Motor; place the existing bearing bracket (Item 2) on the motor assembly and attach it with the three motor screws (Item 1). These screws must be secured.

8. Install the clevis pin (Item 9) through the drive arms attached to the step frame and the cast block in the linkage assembly (Items 7A, 7B or 7C). Be sure to reinstall the clevis pin in the same direction it was removed. Install the cotter pin (Item 8) in the clevis pin.
9. Reconnect the wiring by following the directions in Motor Assembly Removal.

## Control Unit Removal and Replacement



**Control Units 9506, 9507, 9508 require a normally open switch. If you are replacing a 9513, 9516, 9590 Control Unit you must also replace the door switch. The new control will not work with older, normally closed switches.**

Proceed to the following steps after completing Motor Assembly Removal.

1. **Controls prior to the 4-way Packard style connector** - Cut the molded rubber 4-way connector pigtail off just above the vehicle half of the butt connectors. Since all manufacturers use different colored wires for vehicle wiring, take a moment to note what color from the vehicle is butt connected to the white, red, brown and yellow wires of the pigtail. Strip the vehicle wires back and connect the new Packard style pigtail connector to the vehicle wiring using heat shrink insulated butt connectors. Make sure that the vehicle wires that were connected to the old pigtail are reattached to the new pigtail in the identical way.
2. Van steps using door switch only operation will have 2 wires coming from the vehicle. Cut the wires just above the connector and butt connect the pigtail wires to the vehicle wiring. Make sure that the vehicle wires that were connected to the old pigtail are connected to the new pigtail in the identical way.
3. Disconnect the black wire leading from the control unit to the under step light at the connector. Do not cut this wire.

**NOTE:** Not all steps are equipped with an under step light.

4. On steps with a blue, red, green, yellow, brown, or orange control unit, remove the screw securing the green wire from the control unit to the step frame. Save the screw for securing the green wire on the new control unit. On orange control units manufactured after 1991 remove the screw securing the 31" long 10 gauge green ground wire from the control unit to the vehicle chassis.
5. Remove the old control unit from the step frame. Save the mounting screws for mounting the new control unit to the step frame. Note the orientation of the control unit on the frame.
6. Using the screws saved from the old control, mount the new control to the step frame in the same orientation as before.
7. Reconnect the following wiring:
  - A. Ground the 16 gauge green wire from the control unit to the step frame. Remove any corrosion at the attachment point. Attach it placing the external tooth lock washer supplied with the new control unit between the ring terminal on the end of the green wire and the step frame.
  - B. Attach the 31" long 12 gauge green wire to the vehicle chassis. Scrape the connection point clear for a good ground connection. On steps with a braided ground cable, the braided cable may be removed.

C. Connect the black wire from the control unit to the under step light. On steps not equipped with an under step light, wrap the black wire to protect it from the weather and secure it to keep it from dangling.

D. Connect the 2-way connector to the step motor.

**NOTE:** If using a Clamp Style Connector, cut off the 2-way Packard Style connector from the control unit. Next attach the two male spade connectors to the red and yellow wires from the control unit. Finally, reassemble the clamp style connector taking care that the orientation of the spade connectors match the pattern in the black plastic seal.

**NOTE: 9508 Control Unit** - Cut off the 2-way Packard style connector from the step control and the motor lead wires. Connect the red and yellow control wires to the red and yellow motor lead wires using heat shrink insulated butt connectors.

E. Attach the 4-way connector to the vehicle wiring using the installed pigtail.

8. Reinstall the splash cover if the step was so equipped.

9. Reconnect the vehicle battery.

10. Test the step functions.

Fig. 3

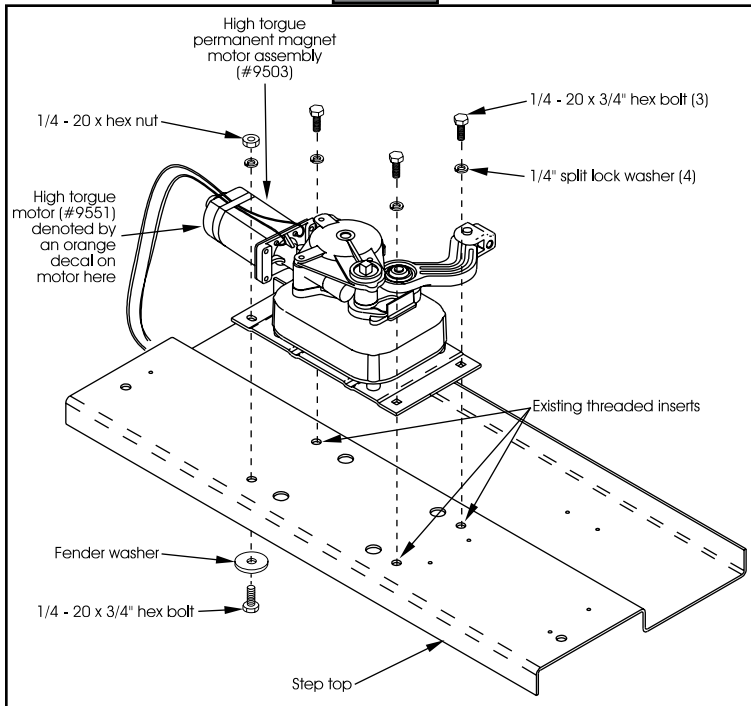
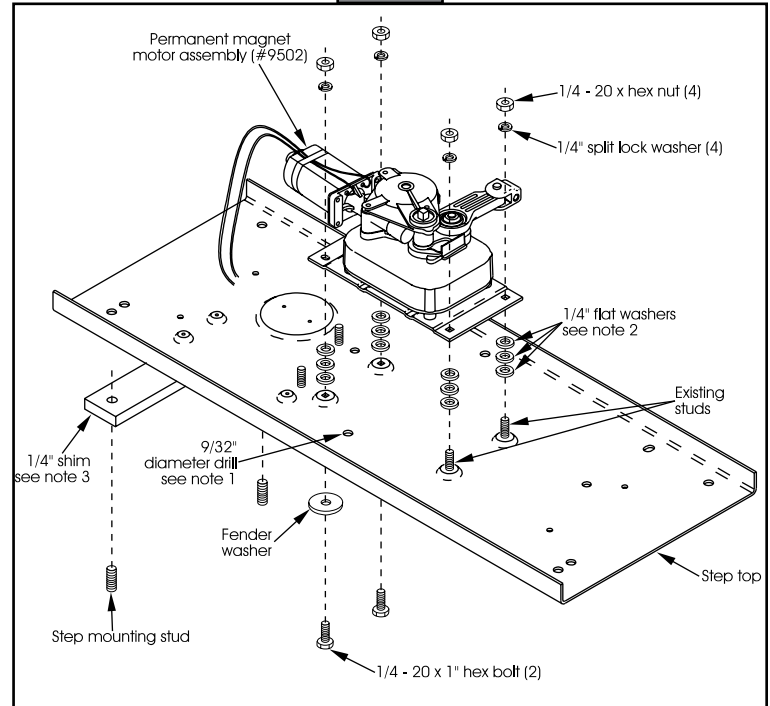


Fig. 4



## Step Replacement

### 23 Series Step

The 4-way connector should be disconnected and the old motor assembly should already be removed from the step top as previously described.

1. If the step frame is mounted flush against the step mounting surface, the step will have to be removed to access the top side of the step frame.
2. The hole pattern for the new motor assembly does not line up properly with the old mounting holes. See the following diagrams for the 23 Series Step (Fig. 3) and the 34 Series Step (Fig. 4).

**NOTE:** All 4 mounting bolts must be used to attach the motor assembly to the step frame, or the step may not operate properly and damage to the step may occur.

3. Bolt down the motor assembly and install the clevis pin and cotter pin as described in Motor Assembly Replacement.
4. Remount the step to the vehicle.

**NOTE:** If you are installing a control unit, it will be easier to do this while the step is removed from the vehicle.

### 34 Series Step

**NOTE:** See (Fig. 4) for important information on remounting 34 Series Steps flush against the step mounting surface.

1. If the step is mounted flush against the mounting surface, the step must be removed from the vehicle before drilling the  $\frac{9}{32}$ " dia. hole for attaching the motor assembly.
2. The  $\frac{1}{4}$ " flat washers are used to shim the permanent magnet motor assembly away from the step top so the motor assembly will sit level. This is important for proper step operation.
3. If the step was originally installed flush against the step well, a  $\frac{1}{4}$ " thick shim may be needed (not provided) so the motor assembly mounting bolt heads will clear the mounting surface.







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