



## Owner's Manual #890

© 1/09 Kwikkee #1422282 Rev. OE

# Electric Steps

## Equipped with a Permanent Magnet Motor

(For steps with Control Units 909510000 and steps without Control Units)



Single Steps



Double Steps



Triple Steps



Van Steps

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## Identification Information

To determine replacement parts, refer to the chart for your Series Step.

**CHART 1**

**Replacement Parts Kits for Series Steps 22, 23, 28A\*, 30, 32, 33, 34, 35, 36, 38, and 40**

Parts Key #	Description	Replacement Kit Part #
1	Motor and screws 214	1101428
2	Cotter and Clevis pin	905205000
3	Gear/Linkage 'A' Curved	1101425
	<b>Step Frame only</b>	9080**000
	**insert 2 digit Step Series number	
	<b>Step Light</b>	909004000

**Replacement Parts Kits for Series Steps 28, 31, 37, and 39**

**As shown in CHART 1 except for the following:**

Parts Key #	Description	Replacement Kit Part #
4	Gear/Linkage 'B' Straight	1101426

**Replacement Parts Kits for Series Steps 26**

**As shown in CHART 1 except for the following:**

Parts Key #	Description	Replacement Kit Part #
5	Gear/Linkage 'C' Straight	1101427

**Replacement Parts Kits for Series Steps 24 and 25**

**As shown in CHART 1 except for the following:**

Parts Key #	Description	Replacement Kit Part #
6	Link/Assembly 24/25	3380050
7	Motor Table 24/25	3392152

### Replacement Parts All Step Series

#### DOOR SWITCHES

Description	Replacement Part # (Black, Open)
Magnetic, small rectangular	905323000
3/4" core round	905324000
Magnetic, large rectangular	905326000
Magnetic, 3/8" core round	905327000
Plated plunger switch	905328000

#### CONTROL

Description	Replacement Part #
Control with step lockout	909510000

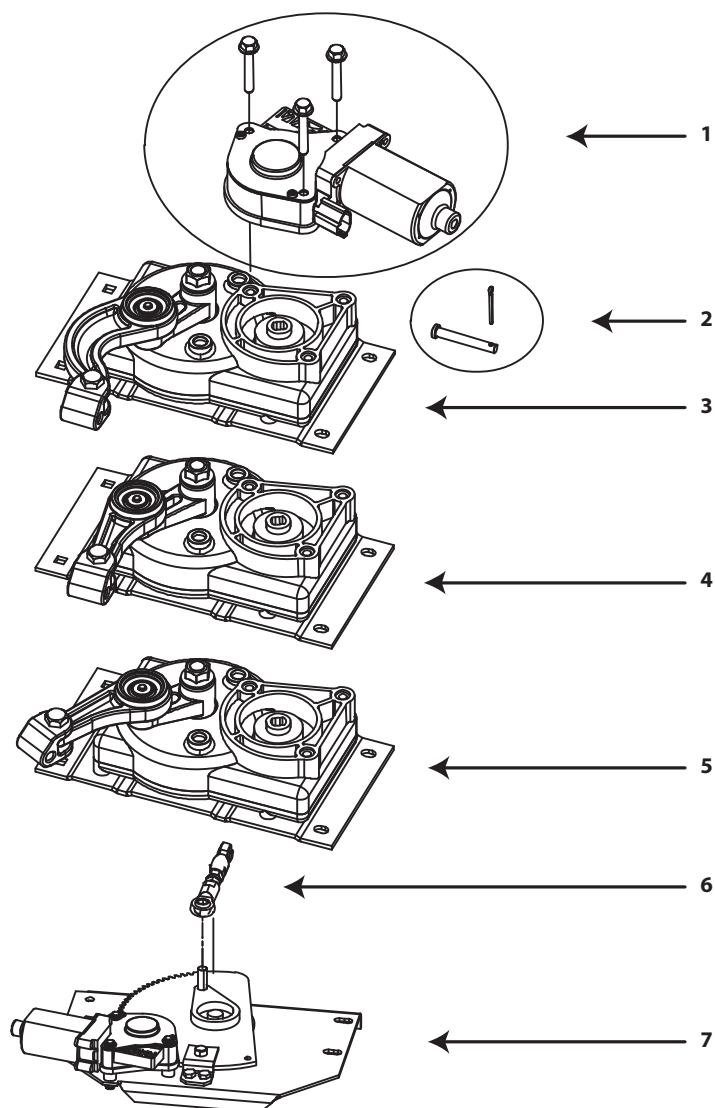
#### ROCKER STYLE POWER SWITCH

Description	Replacement Part #
For all fully automatic steps	905305000

#### SELF-CENTER ROCKER SWITCH

Description	Replacement Part #
Steps NOT equipped with control unit	905316000

**Motor Assembly Drawing and Parts Key Numbers**



Replacement part numbers for steps equipped with **older style motor/gear box** are available online at: [www.kwikkee.com](http://www.kwikkee.com) See 'Downloadable Documents'

## STEP IDENTIFICATION AND REPLACEMENT PARTS INFORMATION

### FILL OUT AND SAVE WITH VEHICLE RECORDS

In the event that servicing the step becomes necessary, the information that you supply below will improve service response time. The Step Series number, Serial number, and Control Unit numbers are on the identification labels attached to the control unit and the underside of the step, near the motor. Please take a moment to record this information:

Step Serial #  Step Series #

Year / Make / Model of RV

Date of Purchase

**CONTROL UNIT** Complete the following only if your step is equipped with Control Unit.

Control Unit Serial #

Control Unit #

**WARNING**

Step control wiring is only to be used for step and step light functions. Do not splice, cut or tap into any of the step wiring. Failure to heed this warning may result in voiding the warranty and/or failure of step control, which may result in loss of step function or fire in the step control. Refer any questions to the step manufacturer.

**CAUTION**

Follow the instructions in this manual carefully. Failure to do so may result in damage to the step control, the motor and/or the vehicle wiring. Such damage may also result in voiding the warranty.

**NOTICE**

- An important change covered in this owner's manual is the "Step Lockout Switch" (previously called the "Power Switch"). The name changed because of a change of functionality from the former "Power Switch".
- The new Control Units are equipped with an ignition override system designed to prevent the vehicle from being driven with the step in the extended position (**STEP LOCKOUT SWITCH IS IN THE 'OFF' POSITION**), the door is closed, and the ignition is turned on, the ignition override system will engage and the step will automatically retract.

## Introduction

### STEPS WITH CONTROL UNIT

This manual has been provided to assist you with the identification, operation, maintenance, and troubleshooting of the Kwikkee electric step equipped for use with a step lockout switch, control unit and permanent magnet motor. This manual does not apply and should not be used as a reference to previous versions of a Kwikkee electric step.

The control unit is essentially a current sensor as well as a switching device. When the motor assembly moves the step tread to its extended position, or stops moving because of an obstruction such as a curb or the binding of a damaged or bent step frame, the motor draws a larger amount of current. The control unit 'senses' the larger current draw and shuts off the power to the motor.

All control units are equipped with an ignition override system. This system is designed so that the vehicle will not be driven with the step in the extended position. When the step is locked in the extended position (step lockout switch is in the 'off' position), the door closed, and the ignition is turned on, the ignition override system will engage and the step will automatically retract.

The 'Auto Extend' feature is another safety feature designed to extend the step when the door is opened for the first time after the vehicle ignition is turned off, even if the step lockout switch is turned off. When the ignition is switched on, the function of the step lockout switch is disabled and the step will always extend when the door is opened and retract when the door is closed.

Some van steps use door-switch-only operation. When the door is opened the step extends and the step retracts when the door is closed.

### STEPS WITHOUT CONTROL UNIT

This manual has been provided to assist you with the identification, operation, maintenance, and troubleshooting of the Kwikkee electric step equipped with a self-centering rocker switch. This manual does not apply and should not be used as a reference to previous versions of a Kwikkee electric step.

**NOTE:** Follow the instructions in this manual carefully. Failure to do so may result in damage to the step control, the motor and/or the vehicle wiring. Such damage may also result in voiding the warranty

## Operation

### STEP WITH CONTROL UNIT

1. After the installation is complete and with the entrance door open, turn the step lockout switch to the 'ON' position  
**NOTE:** Some steps are not equipped with a step lockout switch. They are activated only with a door switch
2. Close the door. The step should retract and lock in the 'up' position
3. Open the door. The step should extend and lock in the 'down' position with the understep light illuminated

**NOTE:** The understep light operation is as follows:

- The light is 'on' when the step is extended
- The light is 'off' when the step is retracted
- If the step lockout switch is 'on' and the step is extended by opening the door and the door is left open, the light will turn 'off' after 5 minutes
- The understep light is not available on all step models
- If the step lockout switch is 'off' and the door is open, the light stays on continuously

4. If your step is equipped with a step lockout switch, turn it to the 'off' position. The step should remain in the extended position with the understep light 'off' when the door is closed
5. With the step lockout switch turned 'off', the step extended, and the entrance door closed, turn the vehicle ignition on. The ignition override system will go into effect and the step will automatically retract  
**NOTE:** If the yellow wire from the four-way connector is not connected to an ignition power source, the ignition safety system will be inoperative and the step will remain in the extended position. In this case, the step lockout switch must be turned on for the step to retract
6. Turn the vehicle ignition off and open the door. The step will extend and lock in the 'down' position. This is the 'Auto Extend' feature. When the vehicle ignition is turned on, the step will always activate with the door movement, regardless of the step lockout switch position

**NOTE:** If the yellow wire from the four-way connector is not connected to an ignition power source, the ignition will not cause the step to retract if the step lockout switch is off, regardless of the door position

### STEPS WITHOUT CONTROL UNIT

1. To extend the step, push and hold the bottom half of the rocker switch. Make sure the step is completely extended and locked in position before releasing the switch
2. Push and hold the top of the rocker switch to retract the step. Be sure the step is completely retracted and locked in position before releasing the switch

**NOTE:** The extend/retract function will be reversed if the red and yellow terminal connections are reversed or the step is equipped with a reverse-driven motor assembly (such as on the 37 and 42 series steps)



### CAUTION

If the vehicle is driven with the step in the extended position, there is the possibility of causing major damage to both the step and the vehicle.



### CAUTION

Stepping on a partially extended step can cause damage to the step frame. Wait until the step is fully extended before stepping on it.



### CAUTION

Do not hold the switch in for longer than it takes to either extend or retract the step or damage to the motor will result.



### CAUTION

Always be sure that the step is fully retracted before traveling. If the step is left extended and strikes an obstruction while the vehicle is moving, major damage to both the step and the vehicle could result.

## Maintenance

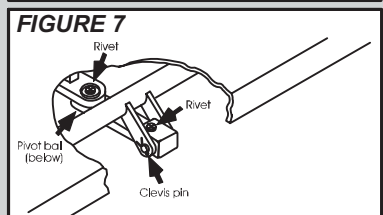
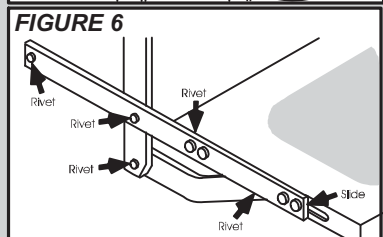
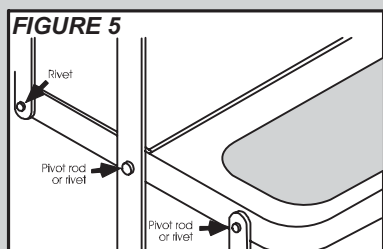
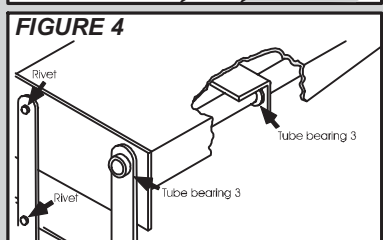
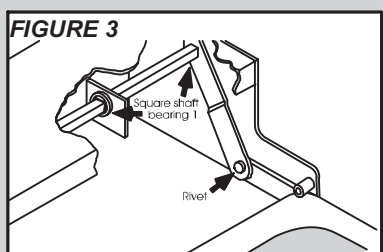
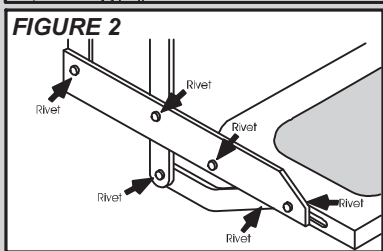
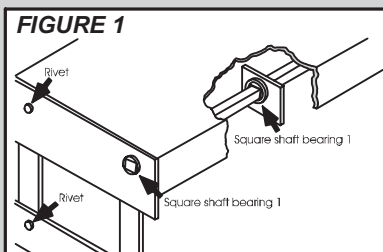
### LUBRICATION

Clean all mud, salt, and road grime from the step before lubricating. Lubricate all moving parts (bearings, pivot points, slides, clevis pin, and drive linkage ball) every 30 days with a good quality moisture and heat resistant penetrating grease. KwikLube™ Spray Grease is specially formulated to lubricate Kwikkee Electric Steps and is recommended for lubricating all moving parts. Refer to the figures on the left for lubrication locations

**NOTE:** Silicone lubricants and WD-40 are not recommended as they have a tendency to evaporate and dry the mating surfaces which leave them vulnerable to the elements

**NOTE:** Figures are to be used for general reference purposes only. Some may not pertain to your particular step model

1. **Figures 1 and 3:** Square shaft bearing - lubricate around the outside and under head of bearing
2. **Figure 4:** On step models equipped with plastic cover, this cover will have to be removed to lubricate center bearings. Lubricate bearings under cover every 90 days
3. **Figure 4:** Lubricate around the bushing-in-bushings
4. Maintain clean, dry electrical connections at the two-way and four-way connectors and any butt connections leading from the four-connector to the vehicle. A small dab of di-electric grease at the connections and replacing corroded butt connections with heat shrink type crimp style automotive connectors will help maintain a good electrical source for the step



**KwikLube™** is a unique aerosol grease that has hundreds of automotive, household, and industrial uses in addition to lubricating Kwikkee Electric Steps.

**KwikLube** sprays on (and into) places that are hard to reach. Then it changes from a penetrating fluid to a **tough, protective grease** in a matter of minutes!

The cured **KwikLube** film is impervious to moisture and can withstand temperatures above 400° F (204° C). This formulation also contains additives to prevent rust and reduce wear.

**Ask your local RV Dealer for KwikLube**



### MAINTENANCE IN SALT ENVIRONMENT

To maintain step finish when step is exposed to a salt environment for extended periods of time, routinely spray with fresh water



## CAUTION

When the cam stops are out of adjustment, the step may feel loose or 'mushy' when stepped on. If the cam stops are not properly adjusted the step may not extend fully to the locked-out position. Using a step with loose or out-of-adjustment cam stops may cause damage to the motor assembly and/or the drive linkage

## CAUTION

When working under the step, be sure that the step cannot be activated and that nothing can get caught in the step mechanism

## WARNING

Keep hands, feet, and clothing away from the step when extending and retracting. Failure to do so may result in personal injury.

## Maintenance -Cont-

### ADJUSTING THE CAM STOPS

24, 25, 27, 28A\*, 32, 34, 35, 36, 38, AND 40 Series Steps

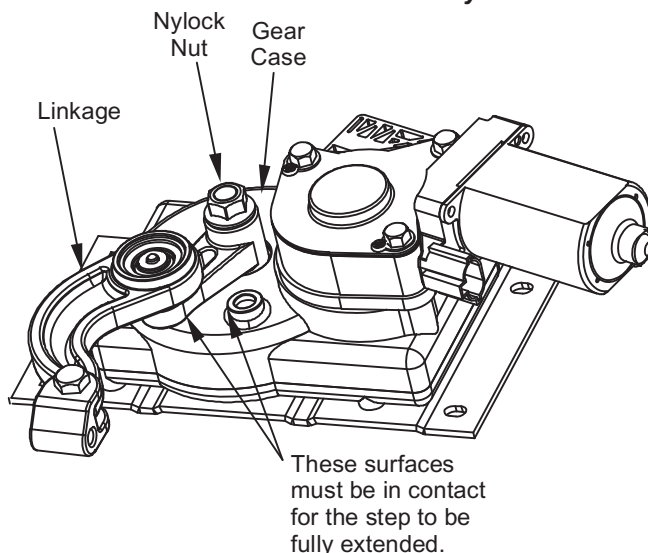
Kwikee steps are fitted with adjustable cam stops on the step frame that help lock the step in the 'out' position, creating a firm stepping platform. The cam is adjusted at the factory but may fall out of adjustment and need to be tightened due to the rigors of shipping, installation, and normal use

The cam stops are located under the step top on the 28A\*, 32, 36, and 38 Series Steps, and on the bottom tread side rail on the 24, 25, 27, and 40 Series Steps. There is one stop on each side of the step

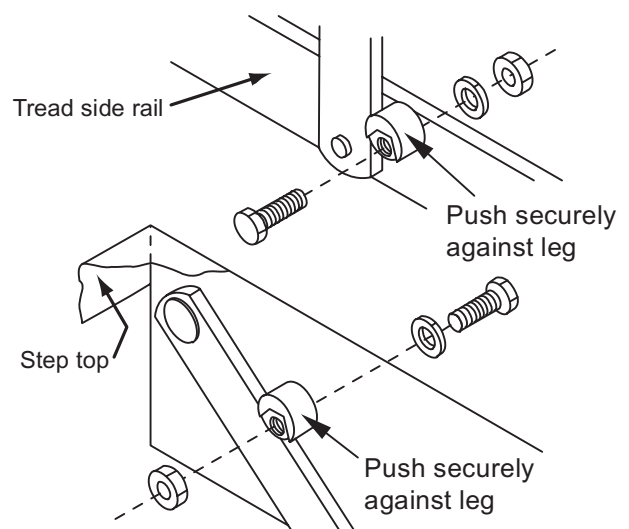
1. Loosen the stops so they move freely and retract the step
2. Extend the step fully to its locked extended position (See **FIG 8**). Be sure that the motor assembly linkage rests against the gear case as illustrated in **FIGURE 8**. Repeat if needed until the motor assembly locks in the extended position
3. Push the stops against the leg and tighten securely (See **FIG 9**). Be sure that both stops are tightened and that they rest securely against the leg
4. Retract and fully extend the step. Check the motor assembly to be sure that it is locked all the way out, and that both stops are secure against the legs. Repeat the above procedures if needed to properly adjust the stops
5. Push on the front edge of the step tread. If the step seems loose, repeat the above procedures. The stops may not be properly adjusted so that they rest tightly against the leg

\*28A is Step Part Number 902829XXX

**FIGURE 8: Gearbox and motor assembly.**



**FIGURE 9: Stop location and assembly**



***These general service notes and the Step Test Procedures address the most common questions about Kwikkee electric steps. Due to the number of variable conditions, you may experience symptoms other than those covered. Please feel free to contact the Customer Service Department at 1-800-736-9961 for further information or assistance.***

## **General Service Notes**

If the power wire to the step is disconnected from its source and reconnected, a spark is common. This is caused by the momentary charging of the control unit and does not necessarily indicate the system is staying on, which would cause a drain on the battery

To determine if a control unit is not shutting off, remove the four-way connector to the chassis and the two-way connector between the step motor and the control unit. Place a voltmeter between the red and yellow motor wires at the two-way connector from the control unit. Reconnect the four-way Connector. Turn the step lockout switch to the 'on' position. If any voltage registers on the meter for more than 5 seconds, the control unit is not shutting off and may be defective. When doing this test, switch the voltmeter leads back and forth between the red and yellow motor wires to be sure no voltage registers

If any voltage registers, disconnect the four-way connector to keep the step motor from overheating. If zero voltage is present, the control unit has shut off and is normal

If the step does not work or operates erratically (for example, extends part way and shuts off) the first item to check is the vehicle battery. Low supply voltage may cause erratic operation of the step. Poor ground connections may also cause erratic operation of the step. Check battery voltage and condition. A battery in good condition and properly charged will have a no load voltage of approx. 12.6 volts. Check the voltage at the battery and at the four-way connector at the control unit. Insure that all battery and step control unit connections are clean and secure. Recharge or replace the battery as necessary and retest the step for proper operation

The step may also operate erratically if it is operating directly from a converter and the converter output is not adequate or properly filtered for clean DC voltage. The converter must be capable of producing a minimum of 30 amps for proper step operation

The step will not function if the ground to the control unit lost between the step control unit and the vehicle chassis (the long green ground wire) or between the vehicle battery and the ground (negative battery cable). Make sure the battery terminals and all wire connections are clean and tight. Verify that all wires meet the minimum requirements specified in **Figures 10, 11, and 12** on page 9

## **Troubleshooting and Testing Procedures**

The step test procedures on page 8 are provided to troubleshoot and test all Kwikkee automatic electric step functions. The procedures are designed to initially check the basic functions of the step separately from the RV wiring to determine whether or not the step is malfunctioning. The procedures test various components of the step until the source of the malfunction is located. Using the procedures will shorten and reduce the time spent troubleshooting

Some portions of the test procedures require additional equipment. This equipment includes:

- voltmeter
- well charged 12V DC automotive battery
- 4-way connector/pigtail (Part #909306000, available from Kwikkee)

**Read the entire procedure prior to testing. If you need assistance contact Kwikkee's Service Line at 1-800-736-9961**



## WARNING

12 volt automotive batteries contain sulfuric acid which can cause severe burns. Avoid contact with the skin, eyes, and clothing. 12 volt automotive batteries produce hydrogen gas which is explosive; keep cigarettes, open flames, and sparks away from the battery at all times



## CAUTION

Do not allow the battery terminals to come in contact with the step.

### IMPORTANT

#### INSTALLER NOTES:

**Be sure that all ground connections are securely fastened with good metal-to-metal contact. A good ground is required for proper step operation**



## WARNING

Keep fingers, arms, and legs clear of step mechanism while performing these test. Failure to do so may result in personal injury

## Troubleshooting and Testing Procedures, Cont

### TESTING THE STEP

1. Inspect the step for visible damage that might restrict step operation
2. Obtain a 4-way pigtail connector (part #909306000) from Kwikkee
3. Disconnect 4-way connector on underside of step and connect the step-half of the connector to the four-way connector pigtail. **See Figures 10, 11, and 12** on Page 9
4. Set a fully charged 12V DC automotive battery beside the step.

**NOTE: Do not allow the battery terminals to come in contact with the step.**

Complete a ground for the step tests by connecting a 10 gauge wire from the negative (-) battery post to the green ground wire of the control unit

5. To supply power, attach the red wire from the pigtail to the battery's positive (+) post. The step will extend
6. With the power and ground connections complete, all functions of the control unit can be checked at the four wires of the pigtail. The brown wire is the door switch, the white wire is the step lockout switch, and the yellow wire is the ignition override
7. To retract the step, touch the brown wire to the negative (-) terminal
8. To extend the step, remove the brown wire from the negative (-) terminal
9. To test the ignition override feature, extend the step as in Step 8. With the step extended, connect the white wire to the positive (+) terminal and attach the brown wire to the negative (-) terminal. Next, touch the yellow wire to the battery's positive (+) terminal. The step should retract. Remove the brown wire and the step should extend
10. If any of the step functions do not work, the source of the malfunction is either in the control unit and/or the motor. Proceed to the "Testing the Motor" section on Page 10.

If all of the step functions do work, the malfunction is either in the door switch, step lockout switch, or the vehicle wiring. Proceed to "Testing the 4-way Connector" section on Page 10.

To test the "Auto Extend" feature, touch the brown wire to the negative (-) terminal to retract the step. While holding the brown wire to the negative (-) terminal, remove the yellow from the positive (+) terminal. Touch the white wire to the positive (+) terminal. The step will stay retracted.

Now, remove the brown wire and the step should extend

Next touch the brown wire to the negative (-) terminal. The step should stay extended.

### VAN STEPS

If the van step is equipped with a splash cover, remove the cover to access motor assembly and control unit. If step is locked in retracted (up) position and the plastic cover can not be removed, disassemble the step tread to access the plastic cover

To disassemble the tread, remove the (8) 1/4-20 x 1" long hex head bolts in tread side rails (connects tread and sliding blocks to side rail). This allows the tread to drop out of the way and the plastic cover to be accessible

Reassemble the tread after removing the cover. Reinstall the cover after testing procedures and any necessary repairs are complete. Fully extend the step to reinstall the cover. Be sure that the four-way connector exits the notch in the plastic cover when reassembling

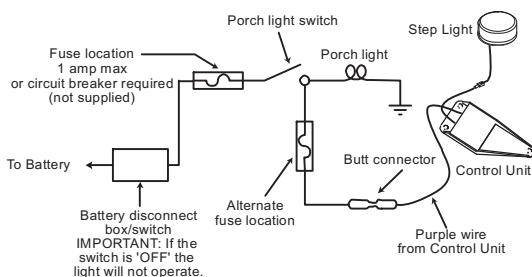




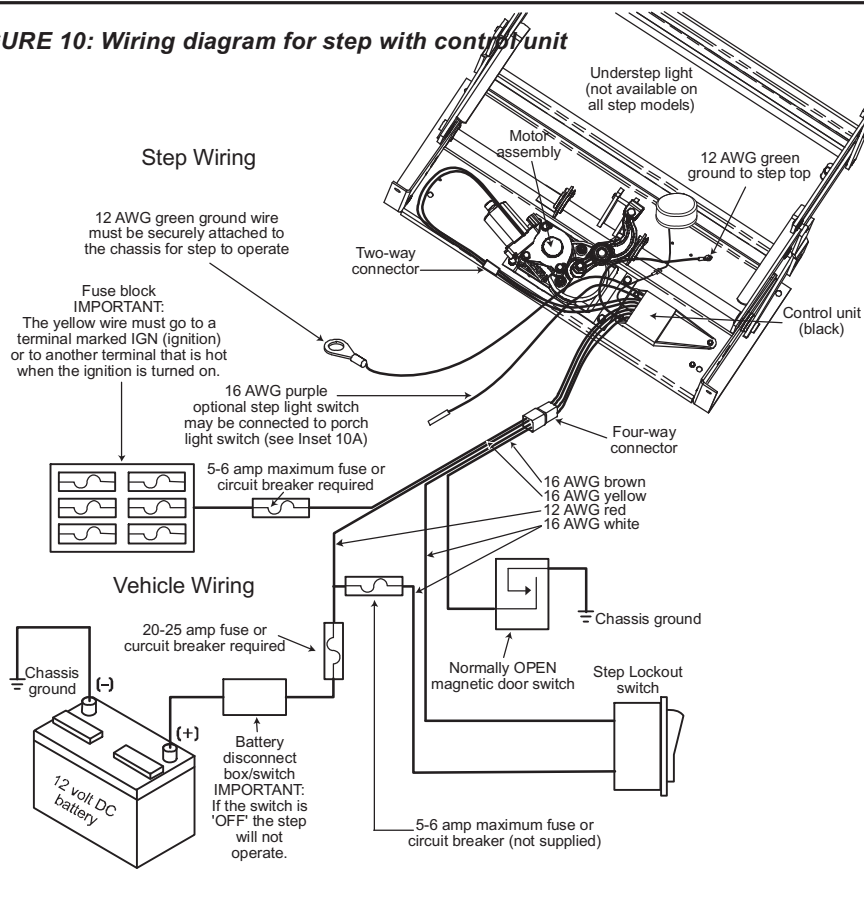
## WARNING

Step control wiring is only to be used for step and step light (provided with the step) functions. Do not splice or tap into any of the step wiring. Failure to heed this warning may result in failure of step control, which may result in loss of step function or fire in the step control. Refer any questions to the step manufacturer

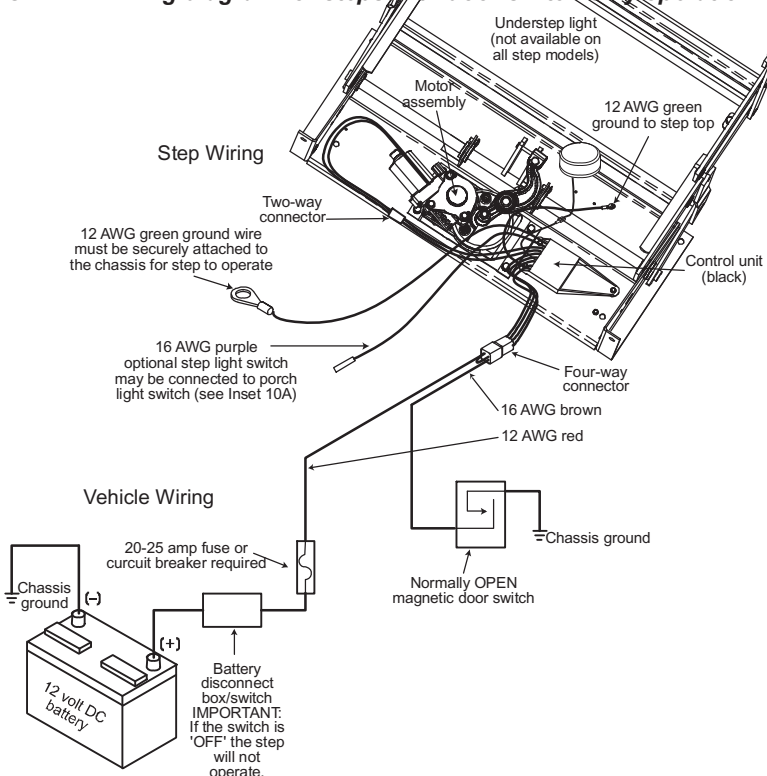
**INSET 10A: Wiring step light to porch light switch:** Understep light can be wired directly to the RV porch light switch. If you choose to do this, a 5 amp maximum fuse or circuit breaker is required and can be installed in either of two locations as shown in the wiring diagram below.



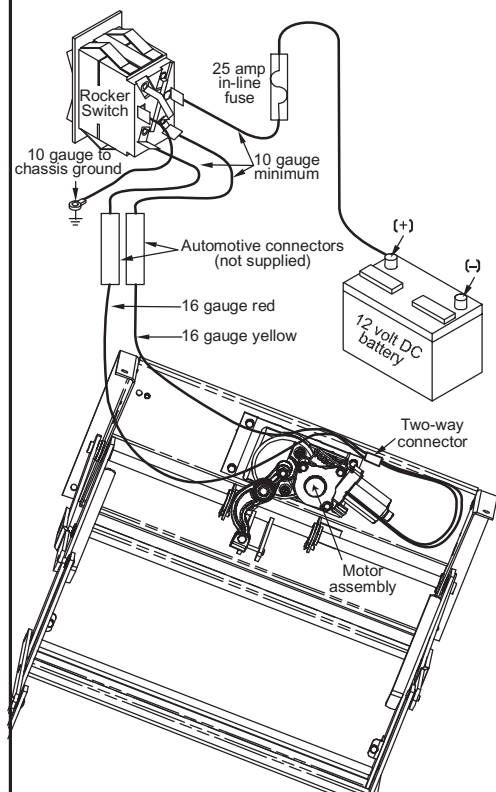
**FIGURE 10: Wiring diagram for step with control unit**



**FIGURE 11: Wiring diagram for steps with door switch only operation**



**FIGURE 12: Wiring diagram for steps without control unit**





**Do not leave the wires connected during this test once the step has cycled either in or out. Failure to remove the wires from the battery will burn out the motor voiding any warranty**

## Troubleshooting and Testing Procedures, Cont

### TESTING THE MOTOR

11. Disconnect the two-way connector between the step motor and the control unit. Connect the motor's red wire to the positive (+) terminal of the battery and touch the motor's yellow wire to the negative (-) terminal of the battery to extend the step. To retract the step, reverse the connections. If the step extends and retracts during this test, the condition of the step motor is good

**NOTE:** On steps with reverse polarity plug (Part #1800711) reverse the red and yellow wire connections to perform the previous test

### TESTING THE 4-WAY CONNECTOR

12. To check the main power source, connect a voltmeter between the red wire from the 4-way connector (vehicle half) and the ground terminal at the end of the control unit's green ground wire (**See Figure 13**). The reading should be a minimum of 12 volts DC

If the voltage reading is low, there may be a loose or corroded connection at the battery, a low charge level on the battery itself, or a poor ground. If the voltage reading is zero (0) volts, check the step fuse/circuit breaker, all connections, and the condition of the wiring between the battery and the plug, including the ground connection at the chassis

13. To check the step lockout switch, connect a voltmeter between the white wire from the 4-way connector (vehicle half) and the terminal at the end of the control unit's green ground wire (**See Figure 14**). The reading should be a minimum of 12 volts DC (the same as in Step 12) when the switch is off, and zero (0) volts DC when the switch is on

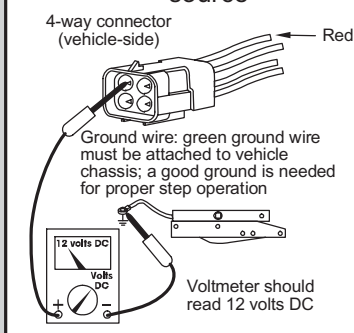
If the voltmeter reads zero (0) volts when the step lockout switch is off, there is a problem in the step lockout switch circuit

Check the 6 amp in-line fuse, the step lockout switch itself and the condition of the circuit's wiring and terminal connections

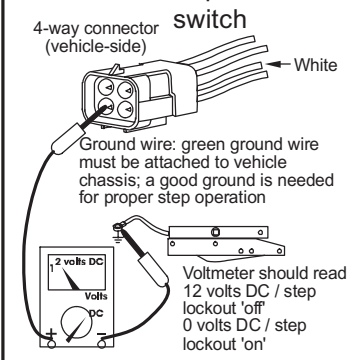
14. To check the door switch, connect a voltmeter between the red wire from the 4-way connector (vehicle half) and the brown in the same connector (**See Figure 15**). The voltage should be a minimum of 12 volts DC (the same as in step 12) when the door is closed and zero (0) volts when the door is open

If the readings are incorrect, there is a problem with the switch. Check the door switch and the condition of the circuit's wiring and terminal connections

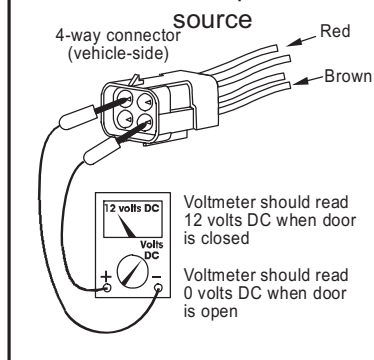
**FIGURE 13: Main power source**



**FIGURE 14: Step lockout switch**



**FIGURE 15: Main power source**



## Troubleshooting and Testing Procedures, Cont

15. To check the ignition override system, connect a voltmeter between the yellow wire from the 4-way connector (vehicle half) and the ground terminal on the end of the control unit's green ground wire (**See Figure 16**). The voltage reading should be approximately 12 volts DC when ignition is on and zero (0) volts when ignition is off

If the reading is zero when the ignition is on, check all terminal connections, wiring, and the vehicle's ignition fuse

**NOTE:** The step wiring circuit must be independent. No other device (i.e. alarm systems, step well lights, etc) can be connected to the step wiring circuit. Any device connected to the steps wiring can cause the step to malfunction and will void the warranty

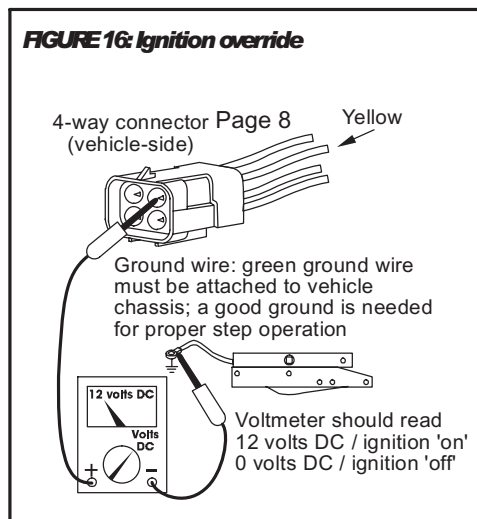
16. For steps equipped with door switch only operation: Connect the white jumper wire from the vehicle half of the four-way connector and the ground terminal at the end of the control unit's green ground wire (**See Figure 17**)

**NOTE:** Be sure to use the terminal with only the white wire

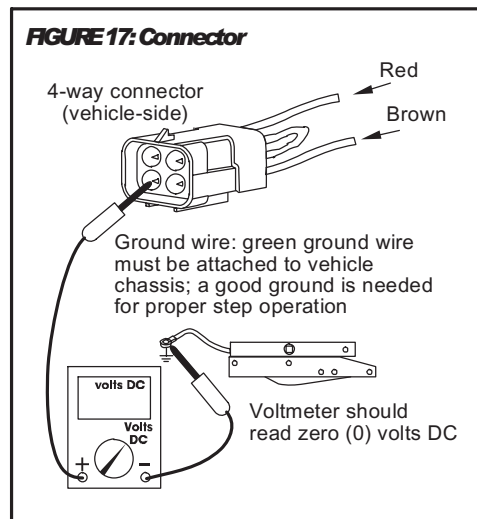
The reading should be zero (0) volts DC. If the voltage reading is more, the white wire is connected to 12 volts and should be cut

**If you have additional questions or need more assistance, contact Kwikie's Service Representative at 1-800-736-9961**

**FIGURE 16: Ignition override**



**FIGURE 17: Connector**



## **Power Gear / Kwikkee Limited Warranty**

Power Gear warrants to the original retail purchaser that the product will be free from defects in material and workmanship for a period of two (2) years. Labor to repair these components will be covered for two (2) years. Power Gear will, at its option, repair or replace any part covered by this limited warranty which, following examination by Power Gear or its authorized distributors or dealers, is found to be defective under normal use and service. No claims under this warranty will be valid unless Power Gear or its authorized distributor or dealer is notified in writing of such claim prior to the expiration of the warranty period. Warranty is transferable pending documentation of original sale date of product.

### **THIS WARRANTY SHALL NOT APPLY TO:**

- Failure due to normal wear and tear, accident, misuse, abuse, or negligence.
- Products which are modified or altered in a manner not authorized by Power Gear in writing.
- Failure due to misapplication of product.
- Telephone or other communication expenses.
- Living or travel expenses.
- Overtime labor.
- Failures created by improper installation of slideout systems to include final adjustments made at the plant; sealing interface between slideout rooms and side walls; synchronization of rails; or improper wiring or ground problems.
- Failures created by improper installation of leveling systems, including final adjustments made at the plant, or low fluid level, wiring or ground problems.
- Replacement of normal maintenance items.

There is no other express warranty other than the foregoing warranty. THERE ARE NO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL POWER GEAR BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state. Some states do not allow the limitations of implied warranties, or the exclusion of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

For service contact your nearest Power Gear authorized warranty service facility or call 1-800-334-4712. Warranty service can be performed only by a Power Gear authorized service facility. This warranty will not apply to service at any other facility. At the time of requesting warranty service, evidence of original purchase date must be presented.



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