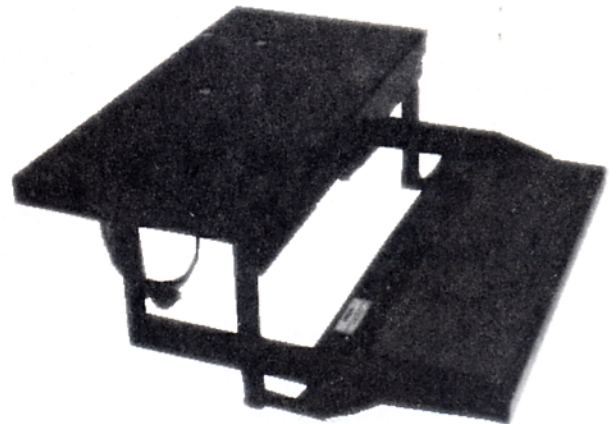
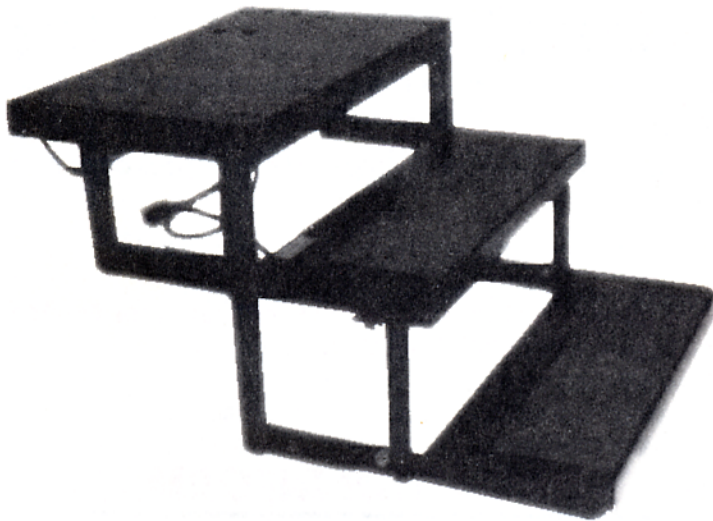


Owner's Manual #874

for

Kwikkee[®] Electric Steps

**using the
Permanent Magnet Motor and Control Unit
with a door and power switch
operating system**



Kwikkee[®]

Kwikkee Products Company

2947 State Highway 38
Drain, Oregon 97435

PH: (503) 836-2126
FAX: (503) 836-2359

KWIKKEE #900874

1. We warrant that the equipment is free from defects in material and workmanship under normal use and service. The provisions of this warranty shall not apply to any equipment that has been subject to misuse, negligence, alteration, accident, improper installation (such as the welding of the step to the vehicle frame or mounting brackets), normal deterioration due to wear, or has been repaired outside our place of business in any way as, in our reasonable judgement, to adversely affect its performance and reliability.
2. Our obligation under this warranty is limited to repairing or replacing, at our option, any product that is returned to our place of business and when in its examination shall disclose to our reasonable satisfaction that it is defective. The repair or replacement of the defective parts under this warranty will be made without charge for parts or labor. Shipping charges for returning parts to Kwikiee Products Company, Inc. ("Kwikiee") shall be the responsibility of the customer. Kwikiee will pay shipping charges when returning warrantable parts to the customer.
3. The warranty is effective as of the date of sale to the original purchaser and extends for one year. Since it is the responsibility of the owner to verify the original purchase date, Kwikiee recommends that a bill of sale or sales receipt be kept for that purpose.
4. The duration of any implied warranty of merchantability or fitness for a particular purpose shall be limited in all respects to the duration of the limited warranty, and the warranty described above shall be in lieu of any other express warranty. Some states do not allow limitations on how long implied warranties last, so the above limitations may not apply to you. We neither assume or authorize any other persons to assume any other liability in connection with our products.
5. The buyer's sole and exclusive remedy against the seller shall be for the repair or replacement of defective merchandise as provided above. No other remedy, including but not limited to, incidental or consequential damages for lost profits, lost sales, injury to property or any other incidental or consequential loss, shall be available to him. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. Before using, user shall determine the suitability of the product for its intended use, and user assumes all risk and liability whatsoever in connection therewith.
6. Kwikiee will not, under any circumstances, reimburse the cost of warranty parts purchased from sources other than Kwikiee Products Company, Inc.
7. This warranty gives you specific legal rights, and you may have other rights which vary from state to state.

For more information on warranty policy and allowances please feel free to contact our Customer Service Department at the telephone number listed on the front cover or at 1 (800) 736-9961.

STEP IDENTIFICATION INFORMATION

In the event that servicing the step becomes necessary, the information that you supply below will help expedite the identification of your step equipment as well as the service response time. Please take a moment now to fill in the information specific to your step application.

Step Serial #: _____

Step Series #: _____

Control Unit #: _____

Year & Manufacturer of the recreation vehicle: _____

Date of Purchase: _____

The Series # and Serial # are on the identification label that is attached to the underside of the step, near the motor. The Control Unit # is molded into the control unit and is visible from below the step. If the information on the label is not available, **the STEP MOTOR PARTS KEY on Page 15** contains information that will help you identify which step you have.

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INTRODUCTION

This manual has been provided to assist the user with the identification, operation, installation, and troubleshooting of any KwikEE electric step equipped with a door switch, a power switch, and a control unit. It does not apply and should not be used as a reference to any other previous versions of a KwikEE 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 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, the door closed, and the ignition is turned on, the ignition safety system will engage and the step will automatically retract.

On steps equipped with the control unit, there is a "Last Out" feature. This is another safety feature designed so that when the door is opened for the first time after the vehicle ignition is turned off, the step will extend, even if the power switch is turned off. When the ignition is switched on, the function of the power switch is disabled and the step will always extend when the door is opened and retract when the door is closed.

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.

KWIKEE PRODUCTS COMPANY HAS INTRODUCED A REDESIGNED CONTROL UNIT BOX FOR THE AUTOMATIC ELECTRIC STEPS. THE NEW DESIGN WAS DEVELOPED TO PROVIDE FOR MORE EFFICIENT ASSEMBLY DURING PRODUCTION, BETTER MOISTURE EXCLUSION WITH A GASKET-SEALED END CAP AND GREATER DURABILITY BY USING A SPECIALLY FORMULATED ABS RESIN. IT WAS PHASED INTO PRODUCTION STARTING IN MAY 1994.

THE NEW DESIGN IS A MOLDED WHITE BOX (HOUSING THE ELECTRONIC CIRCUIT BOARD) AND A BLACK END CAP. THE ACTUAL CIRCUIT BOARD DID NOT CHANGE AND CONTINUES TO FUNCTION IDENTICALLY TO THE PRECEDING ORANGE COLORED CONTROL UNIT.

1. After the installation is complete and with the entrance door open, turn the power switch on.
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 on. **NOTE: THE UNDERSTEP LIGHT IS NOT AVAILABLE ON ALL STEP MODELS.**
4. Turn the power switch off. The step should remain in the extended position with the understep light off when the door is closed. Turning off the power with the step retracted will hold the step in a retracted position as well.
5. With the power switch off, the step extended, and the entrance door closed, turn on the vehicle ignition. The ignition override system will go into effect and the step will automatically retract.

NOTE: IF THE YELLOW WIRE FROM THE FOUR-WAY CONNECTOR WAS NOT CONNECTED TO THE VEHICLE FUSE BLOCK DURING THE INSTALLATION PROCEDURE, THE IGNITION SAFETY SYSTEM WILL BE INOPERATIVE, AND THE STEP WILL REMAIN IN THE EXTENDED POSITION. In this case, the power switch must be turned on for the step to retract.

WARNING! 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.

6. Turn the vehicle ignition off and open the door. The step will extend and lock in the "down" position. This is the "Last Out" feature.

WARNING! IF THE DOOR IS OPENED AND CLOSED WITHOUT ALLOWING THE STEP TO FULLY EXTEND AND LOCK IN THE "DOWN" POSITION, THE STEP WILL RETRACT AND LOCK IN THE "UP" POSITION. WHEN THE DOOR IS REOPENED, THE STEP WILL NOT EXTEND. THE POWER SWITCH MUST BE TURNED ON FOR THE STEP TO EXTEND.

7. The "Last Out" feature is only operative the first time the door is opened after the vehicle ignition is turned off. **NOTE: IF THE YELLOW WIRE FROM THE FOUR-WAY CONNECTOR WAS NOT CONNECTED TO THE VEHICLE FUSE BLOCK DURING INSTALLATION, THE "LAST OUT" FEATURE WILL NOT OPERATE.**

When the vehicle ignition is on, the step will always activate with the door movement, regardless of power switch position. **NOTE: THIS IS NOT VALID IF THE FOREMENTIONED YELLOW WIRE HAS NOT BEEN CONNECTED.**

BE SAFE - LOOK BEFORE YOU LEAP!

1. To provide for easier installation, the step should be in the extended position. To extend the step, place the step upside-down on its mounting surface.

WARNING! MAKING THE WIRE CONNECTIONS DETAILED IN THIS PROCEDURE WILL CAUSE THE STEP TO QUICKLY EXTEND AND RETRACT. KEEP HANDS AND FINGERS CLEAR OF THE STEP EXTENSION MECHANISM.

NOTE: UNDER NO CONDITIONS SHOULD POWER BE APPLIED TO THE MOTOR LEADS WHILE THE MOTOR IS CONNECTED TO THE CONTROL UNIT. TO DO SO WILL CAUSE DAMAGE TO THE CONTROL UNIT AND VOID THE WARRANTY.

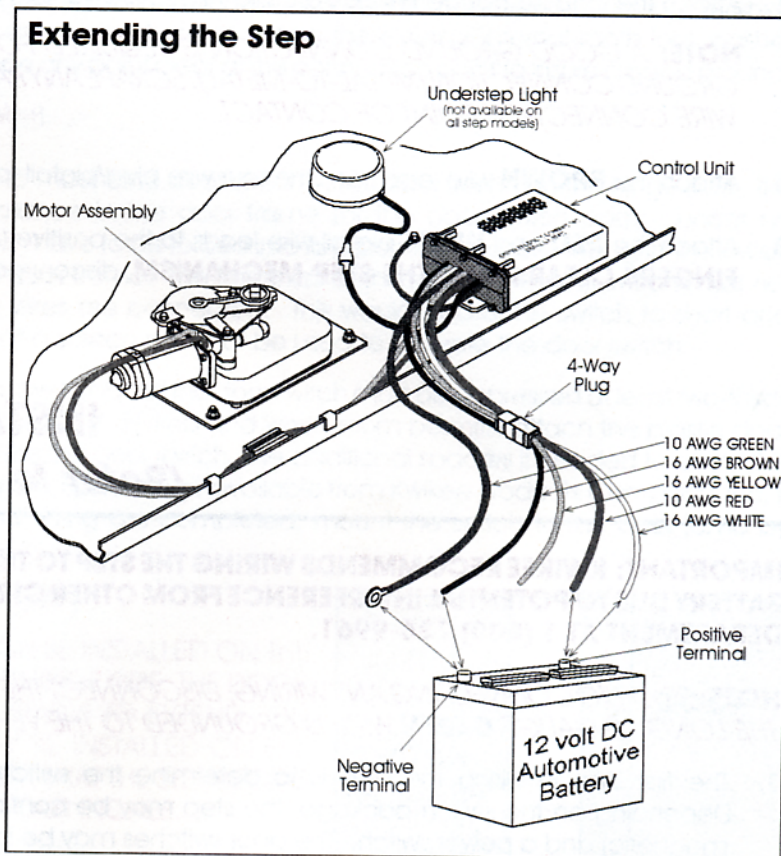
2. Connect the four-wire plug from the control unit with the four wire plug/pigtail that has been included with the step.

3. Ground the control unit by attaching the long 10 gauge **GREEN** wire from the control unit to the negative (-) terminal of a well charged 12 volt DC automotive battery. **THE STEP WILL NOT OPERATE WITHOUT A GOOD GROUND CONNECTION.**

4. **NOTE:** IF IT IS NECESSARY TO USE JUMPERS TO CONNECT THE WIRE LEADS FROM THE PIGTAIL TO THE BATTERY, A MINIMUM OF 10 GAUGE WIRE (8 GAUGE FOR WIRING RUNS OVER 25 FEET) IS RECOMMENDED FOR USE AS JUMPER WIRE.

5. Attach both the **RED** and **WHITE** wires from the pigtail to the positive (+) terminal of the battery. **KEEPING HANDS AND FINGERS CLEAR FROM THE STEP MECHANISM**, ground the **BROWN** wire from the pigtail to the negative terminal to extend the step.

6. After the step has been extended, disconnect the **RED** and **WHITE** pigtail leads from the battery. This will keep the step in the extended position. If the ground connection between the **BROWN** wire and the battery's negative terminal is broken prior to disconnecting the **RED** and **WHITE** wire leads, the step will return to the retracted position and the procedure must be repeated.



After the step has been extended, disconnect the wires from the battery and the four wire plug/pigtail.

INSTALLATION - MOUNTING THE STEP & RETRACTING THE STEP

MOUNTING THE STEP

There are a minimum of 4 holes in the top of the step that should be used when mounting the step. Using $5/16$ -18 (minimum) bolts with lock washers and nuts is recommended for mounting the step.

NOTE: WELDING THE KWIKEE ELECTRIC STEP DIRECTLY TO THE CHASSIS FRAME OR MOUNTING BRACKET CAN RESULT IN DISTORTION TO THE FRAME AS WELL AS SEVERE DAMAGE TO THE ELECTRONIC CIRCUIT BOARD WITHIN THE CONTROL UNIT. THIS DAMAGE WILL NOT BE COVERED UNDER THE WARRANTY.

RETRACTING THE STEP AFTER MOUNTING

1. Attach the long 10 gauge **GREEN** ground wire to the vehicle chassis.

NOTE: A GOOD GROUND CONNECTION IS REQUIRED FOR PROPER STEP OPERATION. TO INSURE A GOOD GROUND CONNECTION (METAL-TO-METAL), SCRAPE ANY PAINT AND/OR UNDERCOATING FROM THE GROUND WIRE CONNECTION POINT OF CONTACT.

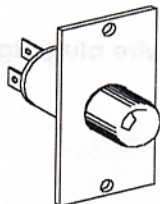
2. Attach the **BROWN** wire lead from the four wire plug/pigtail to the negative (-) terminal of the 12 volt battery.
3. Attach the **RED** and **WHITE** pigtail wire leads to the positive (+) terminal of the battery. **KEEPING HANDS AND FINGERS CLEAR FROM THE STEP MECHANISM**, disconnect the **BROWN** wire lead and the step will retract.

INSTALLATION - WIRING THE STEP (Refer to Page 10 for Wiring Schematic)

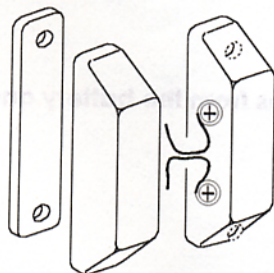
IMPORTANT: KWIKEE RECOMMENDS WIRING THE STEP TO THE VEHICLE BATTERY AS OPPOSED TO THE "HOUSE" BATTERY DUE TO POTENTIAL INTERFERENCE FROM OTHER CIRCUITS. WHEN IN DOUBT CALL KWIKEE'S SERVICE DEPARTMENT AT 1 (800) 736-9961.

NOTE: PRIOR TO CONNECTING ANY WIRING, DISCONNECT THE VEHICLE'S POWER SOURCE AT THE BATTERY. BE SURE THE LONG 10 GAUGE **GREEN** WIRE IS GROUNDED TO THE VEHICLE CHASSIS.

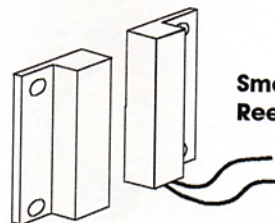
1. The first step in wiring the step is to determine the switch configuration for the step that is being installed. Depending on the switch package, the step may be controlled by any of four door switches (either plunger or magnetic) and a power switch. The door switches may be identified by the following diagrams.



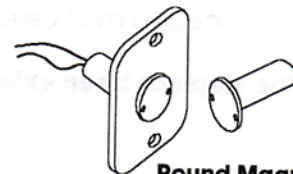
Plunger-Style
Switch



Large Magnetic Reed
Switch



Small Magnetic
Reed Switch



Round Magnetic
Switch

continued next page

INSTALLATION - WIRING THE STEP

(Refer to Page 10 for Wiring Schematic)

- Once preliminary preparations are finished for door switch installation (drilling holes, etc. *See switch installations below*), connect the **BROWN** wire lead from the vehicle-half of the four-way plug to the door switch (to a terminal on the plunger switch or large magnetic reed switch, or to a wire lead on the other two magnetic switches). Use a minimum of 16 gauge wire.

NOTE: DO NOT PULL THIS LEAD TIGHT. LEAVE A LITTLE SLACK, EVEN IF ENCASED IN AN INSULATOR TUBE. REPLACEMENT OF THE DOOR SWITCH MAY SOMEDAY BE NECESSARY. IF THE LEADS TO THE DOOR SWITCH ARE TIGHT, IT WOULD BE EXTREMELY DIFFICULT TO REPLACE.

- Connect a 16 gauge (minimum) wire from the other terminal of the plunger door switch or large magnetic reed switch or the wire leads of the other two magnetic door switches to the chassis ground. A good ground connection is necessary to insure proper step operation. It is suggested that a machine screw, external/internal-tooth lock washer, and a nut be used instead of a coarse thread sheet metal screw. Place the external/internal-tooth lock washer between the cable and the vehicle chassis. Scrape any paint clear at this connection point to insure a good ground.
- Mount the door switch in the door jamb (*see below*).

A. Plunger-Style Switch

- Locate and drill a $\frac{3}{4}$ " diameter hole to mount the door switch in the door frame on the hinge side. It is important that there is ample clearance in the door frame for the door switch body. Under no circumstances, should the door switch have to be forced into its mounting position. Wiring to the switch should come up through the hollow door frame. The terminals at the rear of the door switch must not touch any metal surface when the wires are connected. This would cause the switch to short and malfunction. It is recommended that a screen door not be used to activate the door switch.
- To insure proper operation of the step, the button of the door switch must be depressed at least two-thirds of its travel ability when the door is closed. If desired and when room permits, attach the plastic door switch striker plate to the door, opposite the door switch. Use additional spacers if needed to attain the two-thirds depression for the door switch. Spacers are available from Kwikkee Products Company, Inc. if needed. When all preparations and wiring are completed, mount the switch to the door jamb by screwing down the door switch plate.

B. Round Magnetic Switch (*see diagram right*)

ATTENTION! IT IS RECOMMENDED THAT THE SWITCH BE INSTALLED ON THE LOCK SIDE OF THE DOOR. IF IT IS INSTALLED ON THE HINGE SIDE, THE DOOR MAY HAVE TO OPEN TOO FAR BEFORE THE STEP STARTS TO EXTEND. ON CURVED SIDED VEHICLES ONLY, THE SWITCH MAY BE INSTALLED ON THE HINGE SIDE PROVIDED THAT IT CAN BE DONE IN A WAY THAT THE STEP BEGINS TO EXTEND WHEN THE DOOR IS OPENED ONE TO FOUR INCHES.

- Some experimentation with the switch position may be necessary to achieve proper step operation. The step should begin to extend when the entrance door is opened between one to four inches. Less than one inch may result in the step oscillating (extend and retract) due to road vibration while traveling. The round magnetic switch design is mounted into the door jamb. The magnet is installed in the door, opposite the switch.

Locate and drill a $\frac{3}{8}$ " diameter hole to mount the door switch in the door frame on the lock side. It is important that there is ample clearance in the door frame for the door switch body. Under no circumstances, should the door switch have to be forced into its mounting position. Wiring to the switch should come up through the hollow door frame. After wiring is completed, mount the switch to the door jamb by screwing down the door switch plate.

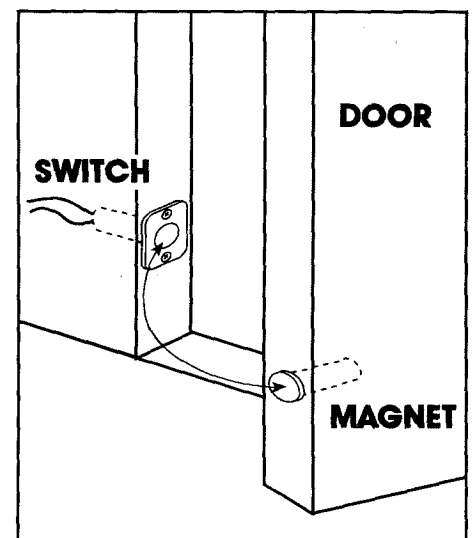


Fig. 1: viewed from outside the vehicle, looking at the lock side of the door

continued next page

INSTALLATION - WIRING THE STEP

(Refer to Page 10 for Wiring Schematic)

Install the magnet in the door, opposite the switch. Precise vertical placement of the magnet is critical to door switch operation. Once placement has been determined, drill a $\frac{3}{8}$ " diameter hole for the magnet. Insert the magnet, and screw it down.

C. Rectangular Magnetic Reed Switch (*see right*)

i. The rectangular magnetic reed switches are a surface-mount design, which are best installed on the lock side of the door. Installation of the door switches on the hinge side of the door is not recommended. The closer the two pieces are, the better. If they are too far apart, the step may oscillate (extend and retract) due to road vibration while traveling. Adjust this spacing accordingly so that the step begins to extend when the door is opened between one to four inches.

ii. Though operation of these two door switches is virtually the same, and the location for installation does not change, the procedure for installation is somewhat different. The **LARGE RECTANGULAR MAGNETIC REED SWITCH** does not have wire leads. Thus in order to wire the step, the housing must be removed from the switch piece, and the wiring is then mounted to the screws located on the switch. Once wiring is completed the switch and magnet are screwed directly to the door frame and door, respectively. The **SMALL RECTANGULAR MAGNETIC REED SWITCH**

does have wire leads. This switch also has an adhesive backing for mounting. Make sure that the door frame and door surfaces have been wiped clean before sticking the switch and magnet to them. Screwing the switch and magnet down as a precautionary measure is also recommended.

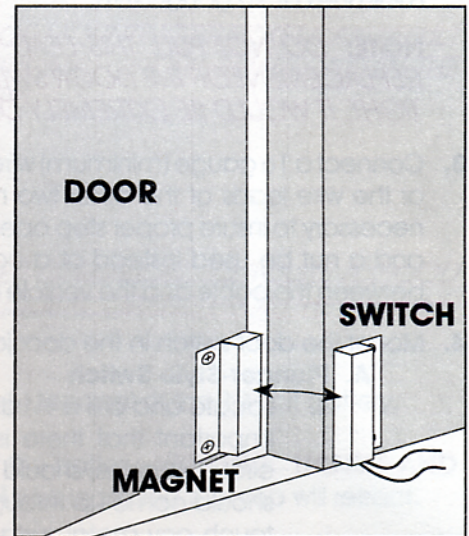


Fig. 2: viewed from inside the vehicle, looking at the lock side of the door

5. Locate and cut a hole to mount the power switch. **NOTE: DO NOT INSTALL THE POWER SWITCH COMPLETELY UNTIL ALL WIRING TO THE SWITCH IS IN PLACE.** If the rocker power switch is supplied by Kwikkee, the power switch may be mounted "as is" by cutting a $\frac{7}{16}$ " x $1\frac{1}{8}$ " hole for the switch to snap into. **NOTE: THIS HOLE MUST BE VERY ACCURATE.** The switch may also be mounted using a trim plate. Cut a $\frac{5}{8}$ " x $1\frac{1}{2}$ " hole to mount the switch using a trim plate. **NOTE: THERE MUST BE ENOUGH ROOM BEHIND THE SWITCH TO CONNECT THE WIRES TO THE SWITCH TERMINALS. DO NOT FORCE THE SWITCH IN PLACE.** A toggle type switch is available and may be used if desired.
6. Connect the **WHITE** wire lead from the four-way plug to one of the terminals on the power switch. Use 16 gauge wire minimum.
7. Connect the **YELLOW** wire lead from the four-way plug to the vehicle fuse block. The **YELLOW** wire must go to a terminal marked **IGN** (ignition) or to another terminal that is hot only when the ignition is turned on. A 5 amp maximum fuse or circuit breaker is recommended in the **YELLOW** wire. Use 16 gauge wire minimum. Kwikkee recommends that the ignition override system (**YELLOW** wire) be connected on all installations. This insures that the step will be retracted before travelling. On some travel trailer and fifth wheel applications, it may not be feasible to connect the **YELLOW** wire. If this applies to this installation, tie off the **YELLOW** wire leading from the four-way plug (do not connect the **YELLOW** wire to anything), and wrap it to protect it from the weather.
8. Connect a 16 gauge minimum wire from the other power switch terminal to the **RED** 10 gauge power lead. A 5 amp maximum fuse or circuit breaker is required in this line. The wire may be connected to the **RED** power lead discussed in the next step anywhere between the four-way plug and the 25 amp fuse or circuit breaker.
9. Connect the **RED** power lead from the four-way plug to the 12 volt DC battery through a 25 amp fuse or circuit breaker designated for step use only.

continued next page

INSTALLATION - WIRING THE STEP

(Refer to Page 10 for Wiring Schematic)

WARNING! DO NOT CONNECT THIS WIRE TO ANY OTHER CIRCUIT THAT EXISTS TO RUN OTHER FUNCTIONS. FURTHERMORE, DO NOT CONNECT ANY OTHER FUNCTIONS TO THIS CIRCUIT. THE CIRCUIT MUST BE DEDICATED TO STEP USE ONLY. FAILURE TO DO SO WILL CAUSE SEVERE DAMAGE TO THE CONTROL UNIT, AND WILL NOT BE COVERED UNDER WARRANTY. Use 10 gauge wire minimum (8 gauge for wiring runs over 25 feet).

10. Wrap any exposed connections to protect them from the weather. Mount the power switch. Reconnect the battery.

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. If battery drain is suspected, observe the understep light (if so equipped) while the step is extending. The power switch must be on for the understep light to operate. When the step locks into the down position, the understep light should become noticeably brighter. If it does not, the control may not be shutting off. Turn the power switch off and unplug the four-way plug between the control unit and the vehicle to prevent overheating the step motor.

To further determine that the control unit is not shutting off, remove the 2 screws from the connector on the step motor leads between the step motor and the control unit. Remove the seal assembly (*see Figure 1 in the Step Test Procedure on Page 12*). Place a voltmeter between the **RED** and **YELLOW** motor leads, then reconnect the four-way plug. Turn the power switch on. If any voltage registers on the meter, 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 leads to be sure no voltage registers. If any voltage does register, disconnect the four-way plug 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, such as extending part way and shutting off, the first item that should be checked is the vehicle's battery. The voltage supplied to the step should be at least 12.7 volts DC for well-charged batteries. A battery that registers below 12.7 volts DC may drop as low as 8 volts DC when a load is drawn, such as engaging the step motor. The control unit will shut off if the loaded voltage falls below 9.5 volts DC. The control unit will remember which function it was performing, it will wait between two and five seconds (time depends on temperature), and will try again to complete the function. If the supply voltage is still below 9.5 volts DC, the control unit will go into another delay state. If the supply voltage remains above 9.5 volts DC, the original function will be completed. Should the supply voltage again fall below 9.5 volts DC, the system would go into another delay state. It could take a couple of minutes to complete the original function. Low supply voltage may cause erratic operation of the step. Poor ground connections may also cause erratic operation of the step.

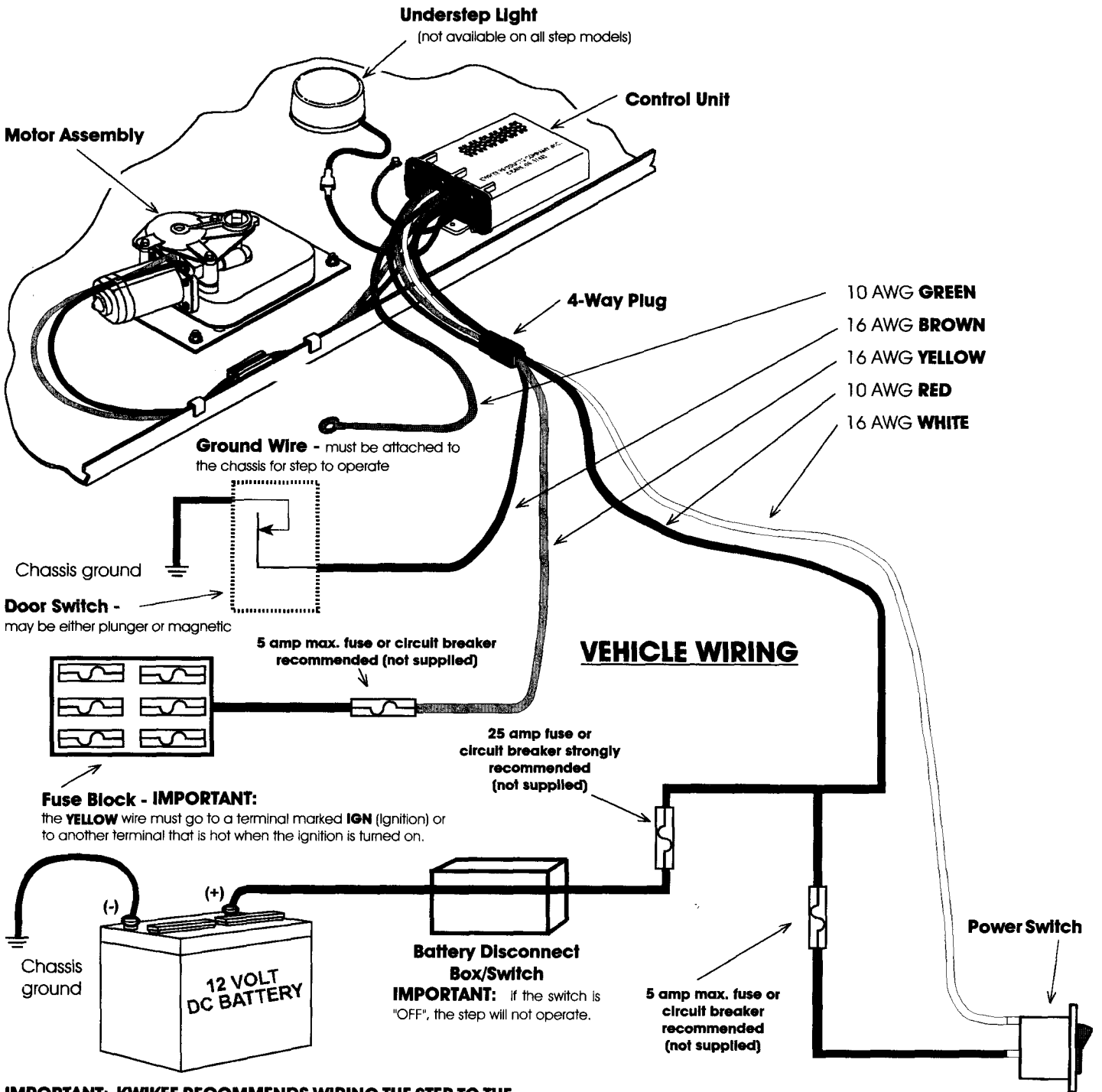
The step may also operate erratically if the step is being operated directly from a converter, and the output from the converter is not adequate or properly filtered for clean DC voltage. The converter must be capable of producing a minimum of 30 amps for proper step operation.

• If the control unit is hooked up electrically backwards, the step will not operate. If the ground to the control unit is lost, either between the step control unit and the vehicle chassis (the long 10 gauge **GREEN** ground wire) or between the vehicle battery and the ground (negative battery cable) the step will not function. Make sure the battery terminals and all wire connections are clean and tight. Be sure all wires are of proper gauges or heavier as specified in the wiring instructions.

• These general service notes and the following **Step Test Procedure** cover the most common problems associated with KwikEE electric steps. Due to the number of variable conditions available, 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.

INSTALLATION - WIRING SCHEMATIC

STEP WIRING



IMPORTANT: KWIKEE RECOMMENDS WIRING THE STEP TO THE VEHICLE BATTERY AS OPPOSED TO THE "HOUSE" BATTERY DUE TO POTENTIAL INTERFERENCE FROM OTHER CIRCUITS. WHEN IN DOUBT CALL KWIKEE'S SERVICE DEPT. AT 1 (800) 736-9961.

This **Step Test Procedure** has been provided as the easiest and quickest way to troubleshoot and test all of the KwikEE automatic electric step functions. It is designed to initially check the step basic functions separately from the RV wiring, thereby determining whether or not the step is malfunctioning. From that initial determination, the procedure goes on to test the various components of the step until the source of the malfunction is located. Using this procedure will shorten and reduce the time spent troubleshooting.

Some portions of this test require additional equipment. This equipment includes: a voltmeter, a well charged 12 volt DC automotive battery, and a 4-way extended-wire pigtail (**Part #909337**, available from KwikEE Products Company).

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.

Reading this entire procedure prior to beginning the tests is recommended. Should you need assistance in the course of performing this test procedure, feel free to contact KwikEE's toll free Service Line at **1 (800) 736-9961**.

TESTING THE STEP

NOTE: *PRIOR TO BEGINNING THE TEST PROCEDURE, CHECK TO BE SURE THAT ALL GROUND CONNECTIONS ARE SECURELY FASTENED WITH GOOD METAL-TO-METAL CONTACT. A GOOD GROUND IS REQUIRED FOR PROPER STEP OPERATION.*

1. Inspect the step for visible damage that might restrict the step's extension.
2. Obtain a 4-way extended-wire pigtail connector (part #909337) from KwikEE.
3. Disconnect the 4-way plug on the underside of the step and connect the step-half of the plug with the extended-wire pigtail connector (*see Page 10 - Wiring Schematic*).
4. Set a fully charged 12 volt DC automotive battery beside the step. Complete a ground for the step tests by connecting a 10 gauge wire from the negative (-) post of the battery to the 10 gauge **GREEN** ground wire from the control unit.
5. For the power supply, attach the **RED** wire from the extended-wire pigtail to the battery's positive (+) post.
6. With the power and ground connections complete, all functions of the control unit can be checked at the leads to the 4-way extended-wire pigtail. The **BROWN** wire is the door switch, the **WHITE** wire is the power switch, and the **YELLOW** wire is the ignition override.

WARNING! KEEP ALL FINGERS, ARMS AND LEGS CLEAR OF THE STEP MECHANISM WHILE PERFORMING THESE TESTS.

7. While holding the **WHITE** wire to the battery's positive (+) post, touch the **BROWN** wire to the battery's negative(-) post. The step should extend. Remove the **BROWN** wire and the step should retract.
8. As in Step 7, extend the step again. With the step extended, disconnect the **WHITE** wire first and Then disconnect the **BROWN** wire. The step should remain extended.
9. With the step still extended, touch the **YELLOW** wire to the battery's positive (+) post. The step should retract.
10. At this point, refer to the control unit. On step models with the number **#909514** all step functions have been tested. Proceed to step 11. On step models with the number **#909513**, test the "Last Out" feature by disconnecting the **YELLOW** wire and then touching the **BROWN** wire to the battery's negative (-) post. The step should extend and remain extended.
11. 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. *continued next page*

If all of the step functions **DO** work, the malfunction is either in the door switch, the power switch or the vehicle wiring. Proceed to **TESTING THE 4-WAY PLUG - VEHICLE HALF** section.

TESTING THE MOTOR

12. Steps equipped with the permanent magnet motor require disconnecting the motor leads from the control unit before applying power to the motor leads (see right, Figure 1). To disconnect the motor leads, disassemble the motor lead wire connector seal (Refer to **Step 3, Instructions for the Step Motor Assembly on Page 17** for further detail).

NOTE: FAILURE TO DISCONNECT THE MOTOR WIRE LEADS FROM THE CONTROL UNIT PRIOR TO APPLYING POWER TO THE MOTOR LEADS WILL DAMAGE THE CONTROL UNIT AND VOID THE WARRANTY.

NOTE: DO NOT CUT ANY MOTOR OR CONTROL UNIT WIRE LEADS. ANY LEADS THAT HAVE BEEN CUT WILL VOID THE WARRANTY.

After the motor leads have been disconnected, connecting the motor's **RED** wire lead to the positive (+) post of the battery and the motor's **YELLOW** wire lead to the negative (-) post of the battery will extend the step. Reversing the lead connections will retract the step. If the step extends and retracts during this test, the condition of the step motor is good.

TESTING THE 4-WAY PLUG - VEHICLE HALF

13. To **CHECK THE MAIN POWER SOURCE**, connect the voltmeter between the **RED** wire from the 4-way plug (vehicle half) and the ground terminal at the end of the control unit's 10 gauge **GREEN** ground wire (see right, Figure 2). 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, or a low level on the battery itself. If the voltage reading is zero (0) volts, check the 25 amp fuse/circuit breaker, all connections, and the condition of the wiring between the battery and the plug.

14. To **CHECK THE POWER SWITCH**, connect the voltmeter between the **WHITE** wire from the 4-way plug (vehicle half) and the terminal at the end of the control unit's 10 gauge **GREEN** ground wire (see right, Figure 3). The reading should be a minimum of 12 volts DC (the same as in Step 13) when the

continued next page

Figure 1

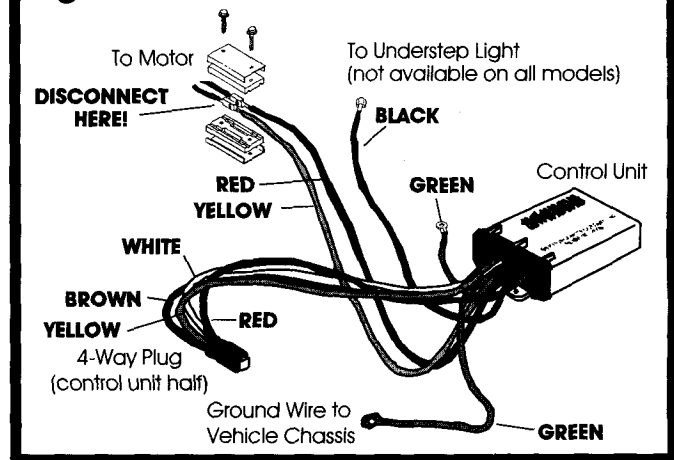


Figure 2

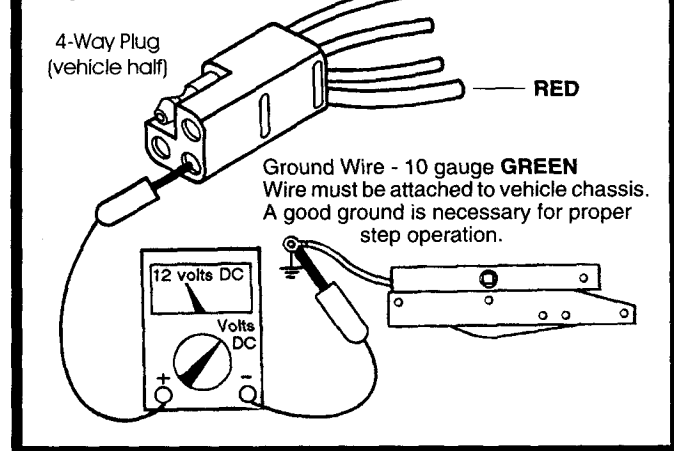
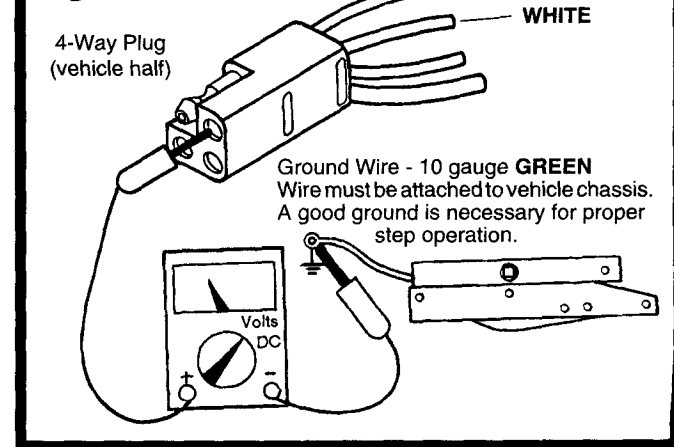


Figure 3



STEP TEST PROCEDURE

switch is **ON**, and zero (0) volts DC when the switch is **OFF**.

If the voltmeter reads zero (0) volts when the power switch is **ON**, there is a problem in the Power Switch circuit.

Check the 5 amp in-line fuse, the Power Switch itself and the condition of the circuit's wiring and terminal connections.

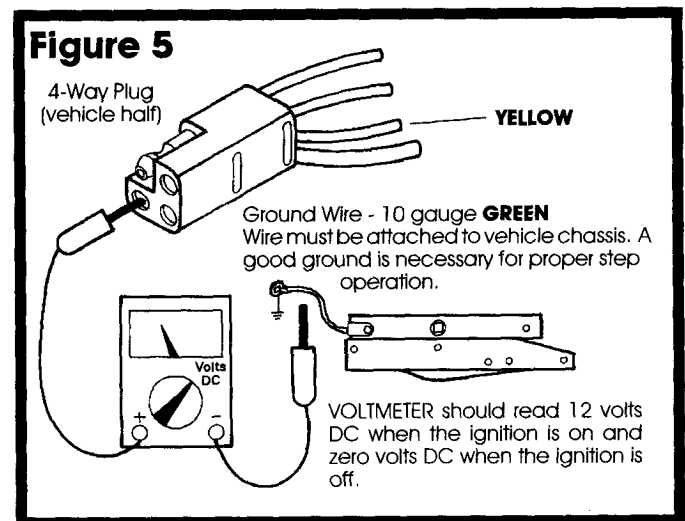
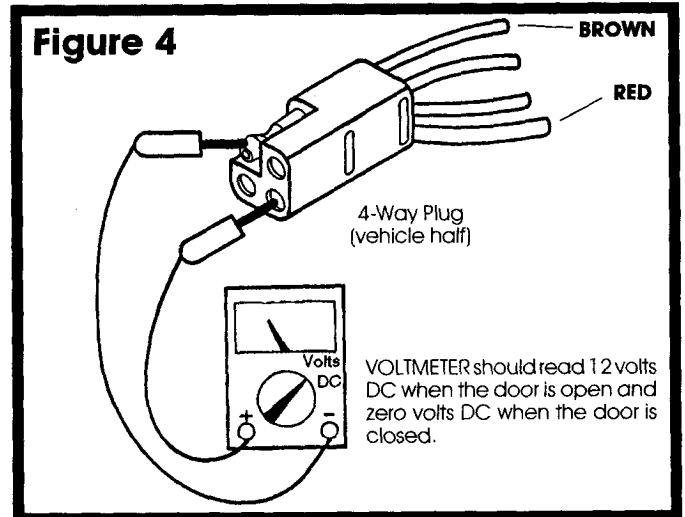
15. To **CHECK THE DOOR SWITCH**, connect the voltmeter between the **RED** wire from the 4-way plug (vehicle half) and the **BROWN** in the same plug (see right, Figure 4). The voltage should be a minimum of 12 volts DC (the same as in step 13) when the door is open and zero (0) volts when the door is closed.

If the readings vary (either zero (0) volts when the door is opened or 12 volts continuously) there is a problem in the door switch. Check the door switch itself and the condition of the circuit's wiring and terminal connections.

16. To **CHECK THE IGNITION OVERRIDE SYSTEM**, connect the voltmeter between the **YELLOW** wire from the 4-way plug (vehicle half) and the ground terminal on the end of the control unit's 10 gauge **GREEN** ground wire (see right, Figure 5). The voltage reading should be approximately 12 volts DC when the ignition is **ON** and zero (0) volts when the ignition is **OFF**.

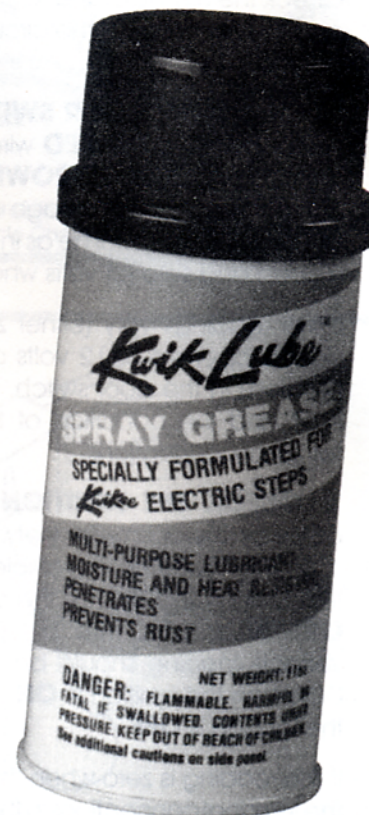
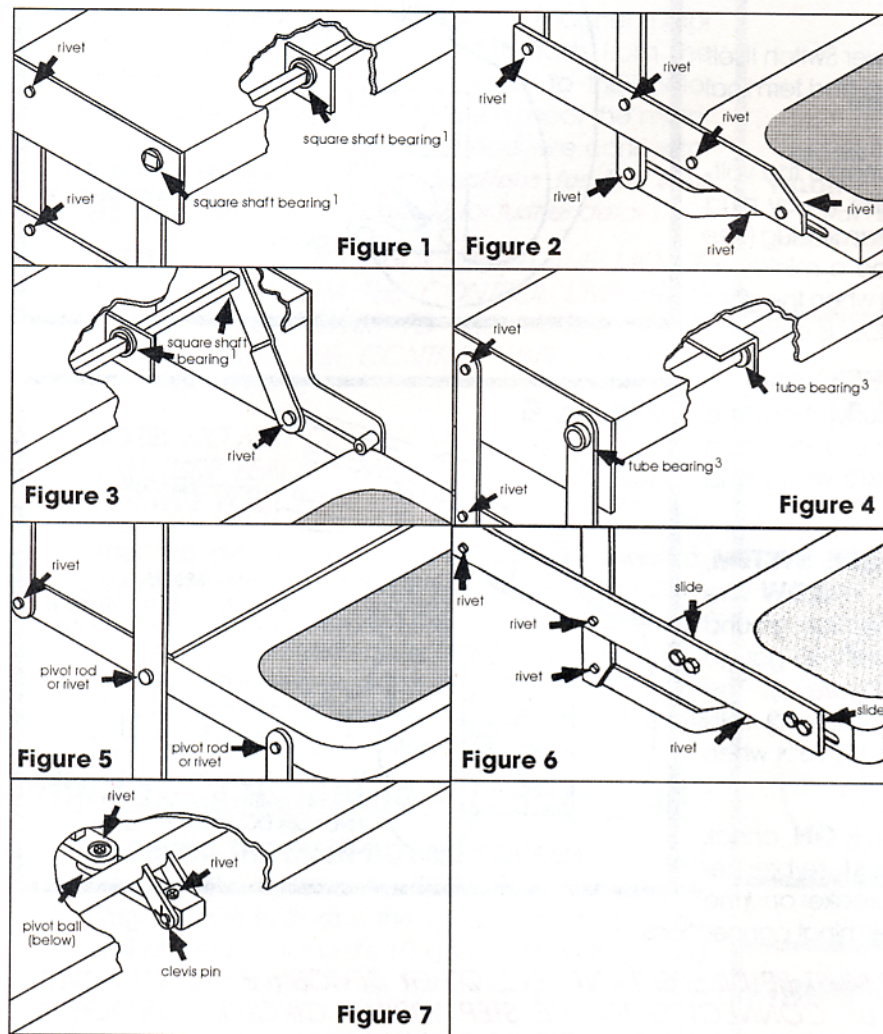
If the reading is zero when the ignition is **ON**, check the terminal connections in the vehicle's fuse/breaker box, the condition of the fuse/circuit breaker and the condition of the circuit's wiring and terminal connections.

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 STEP'S WIRING CAN CAUSE THE STEP TO MALFUNCTION AND WILL VOID THE WARRANTY.



This concludes the **Step Test Procedure**. At this point, the source of a step's malfunction should be known. If you have additional questions or need more assistance, contact Kwikiee's Service Representative at **1 (800) 736-9961**.

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. *Kwik Lube™* Spray Grease is specially formulated to lubricate *Kwikkee* Electric Steps and is recommended for lubricating all moving parts. Refer to the figures below for lubrication locations.



Kwik Lube™ is a unique aerosol grease that has hundreds of automotive, household, and industrial uses in addition to lubricating *Kwikkee* Electric Steps. It sprays on and into hard to reach places. *Kwik Lube™* changes from a penetrating fluid to a tough, protective grease in a matter of minutes! The cured 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.

**Available in 11 oz. aerosol cans
with 6" extension tube
Part #905068**

NOTE: FIGURES ARE TO BE USED AS A GENERAL REFERENCE ONLY. SOME MAY NOT PERTAIN TO YOUR PARTICULAR STEP MODEL. VIEWS ARE TYPICAL TO BOTH ENDS OF THE STEPS.

1. Figures 1 & 3 - square shaft bearing - lubricate around 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 - 1" O.D. tube bearing - lubricate around drive tube and between head of bearing and drive leg.

STEP MOTOR PARTS KEY

Parts shown in the illustration on the following page are only available in kit form and cannot be obtained individually. To select the kit that contains the required part which is numbered in the illustration and in the first column of the lower chart, locate your step by the descriptions below, and cross-reference it to the correct motor assembly kit number.

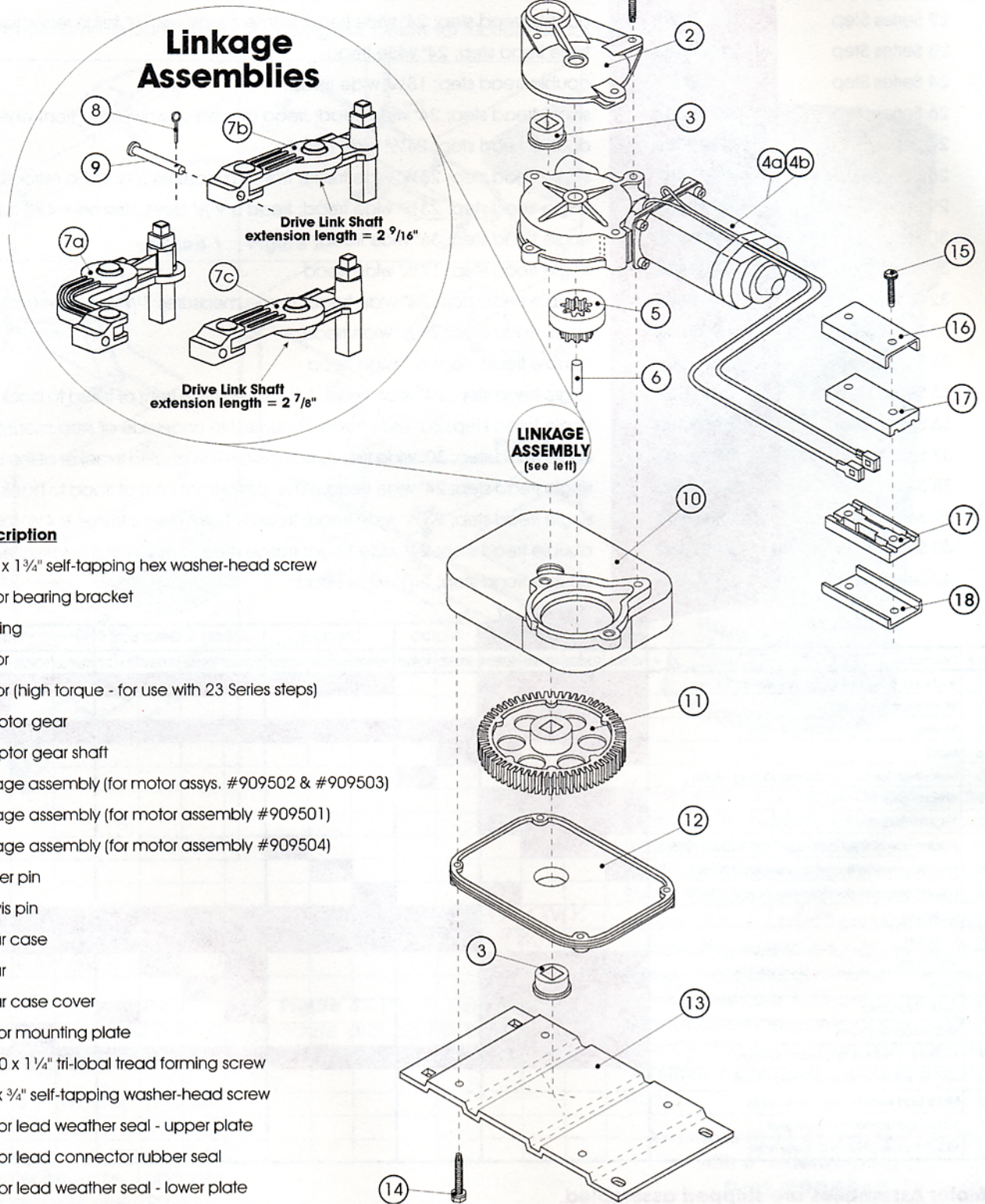
Step Series #	Motor Assembly	Description of Step
22 Series Step	#909502	double tread step; 24" wide tread; frame measures 10" tall in retracted position
23 Series Step	#909503	triple tread step; 24" wide tread
24 Series Step	N/A	double tread step; 18 1/4" wide tread
26 Series Step	#909504	single tread step; 24" wide tread; tread angled downward to front when retracted
27 Series Step	#909502	double tread step; 24 1/2" wide tread
28 Series Step	#909501	single tread step; 23 3/4" wide tread; frame measures 5 7/8" tall in retracted position
29 Series Step	#909501	single tread step; 23 3/4" wide tread; tread is 9 1/8" deep; frame is 4 1/2" tall - retracted
30 Series Step	#909502	single tread step; 36" wide tread
31 Series Step	#909501	single tread step; 17 3/4" wide tread
32 Series Step	#909502	double tread step; 24" wide tread; frame measures 7 1/8" tall in retracted position
33 Series Step	#909502	single tread step; 28 1/8" wide tread
34 Series Step	#909502	double tread step; 30" wide tread
35 Series Step	#909502	single tread step; 24" wide tread; 17 1/2" deep from front of tread to back of ext. arms
36 Series Step	#909502	single tread step; 30" wide tread; mounted to underside of step mounting surface
37 Series Step	#909501	single tread step; 30" wide tread; mounted to an angled bracket at the back of step
38 Series Step	#909502	single tread step; 24" wide tread; 20 1/2" deep from front of tread to back of ext. arms
39 Series Step	#909501	single tread step; 23 3/4" wide tread; tread is 10 3/8" deep; frame is 4 1/2" tall - retracted
40 Series Step	#909502	double tread step; 24" wide tread; frame measures 6 1/2" tall in retracted position
42 Series Step	N/A	double tread step; 24 3/4" wide tread

Part #	Description	Kit #	Motor Assemblies*				Motors		Linkages			Gears & Gear Box				Hardware				
			909501	909502	909503	909504	909520	909521	909532	909533	909534	909524	909525	909526	909527	909530	909535	909536	909537	905205
1	#10 x 1 1/4" self-tapping hex washer-head screw																			
2	Motor bearing bracket																			
3	Bearing																			
4a	Motor																			
4b	Motor (high torque - for use with 23 Series steps)																			
5	Adaptor gear																			
6	Adaptor gear shaft																			
7a	Linkage assembly (for motor assys. #909502 & #909503)																			
7b	Linkage assembly (for motor assembly #909501)																			
7c	Linkage assembly (for motor assembly #909504)																			
8	Cotter pin																			
9	Clevis pin																			
10	Gear case																			
11	Gear																			
12	Gear case cover																			
13	Motor mounting plate																			
14	1/4"-20 x 1 1/4" tri-lobal tread forming screw																			
15	#6 x 3/4" self-tapping washer-head screw																			
16	Motor lead weather seal - upper plate																			
17	Motor lead connector rubber seal																			
18	Motor lead weather seal - lower plate																			

* Motor Assemblies are shipped assembled.

STEP MOTOR ASSEMBLY DIAGRAM

Parts shown in this illustration are only available in kit form and cannot be obtained individually; refer to the illustration below and use the **Step Motor Parts Key** on the preceding page to select the kit that contains the necessary part.



Part # Description

- 1 #10 x 1 3/4" self-tapping hex washer-head screw
- 2 Motor bearing bracket
- 3 Bearing
- 4a Motor
- 4b Motor (high torque - for use with 23 Series steps)
- 5 Adaptor gear
- 6 Adaptor gear shaft
- 7a Linkage assembly (for motor assys. #909502 & #909503)
- 7b Linkage assembly (for motor assembly #909501)
- 7c Linkage assembly (for motor assembly #909504)
- 8 Cotter pin
- 9 Clevis pin
- 10 Gear case
- 11 Gear
- 12 Gear case cover
- 13 Motor mounting plate
- 14 1/4-20 x 1 1/4" tri-lobal tread forming screw
- 15 #6 x 3/4" self-tapping washer-head screw
- 16 Motor lead weather seal - upper plate
- 17 Motor lead connector rubber seal
- 18 Motor lead weather seal - lower plate

FRAME ASSEMBLIES

(frame only - available in black only)

PART#	DESCRIPTION
908022	22 Series step frame
908023	23 Series step frame
908024	24 Series step frame
908026	26 Series step frame
908027	27 Series step frame
908028	28 Series step frame
908029	29 Series step frame
908030	30 Series step frame
908031	31 Series step frame
908032	32 Series step frame
908033	33 Series step frame
908034	34 Series step frame
908035	35 Series step frame
908036	36 Series step frame
908037	37 Series step frame
908038	38 Series step frame
908039	39 Series step frame
908040	40 Series step frame
908042	42 Series step frame

STEP FRAME MOUNTING BRACKETS

(available in pairs only; includes mounting hardware)

PART#	DESCRIPTION
907270	2" drop - 22, 23, 32, 34, 35, 36, and 38 Series steps

CONTROL UNITS

(includes (1) #909336 - four way plug pigtail)

PART#	DESCRIPTION
909513	for use w/ motor #909550 - includes "Last Out" feature
909590	for use w/ motor #909551 (high torque) - includes "Last Out" feature

CONTROL UNIT MOUNTING HARDWARE

(applicable to all step models)

PART#	DESCRIPTION
----	(4) #8-32 x 3/8" type 23 self-tapping screws and (1) #8 external/internal tooth lock washer

MOTOR ASSEMBLY KITS

PART#	DESCRIPTION
905205	clevis and cotter pin kit includes: (1) #909017 clevis pin (1) #909018 cotter pin
909501	motor assembly kit (for 28, 29, 31, 37, and 39 Series steps) includes: (1) #909550 motor (1) #909553 linkage

MOTOR ASSEMBLY KITS *continued*

PART#	DESCRIPTION
909533	linkage assembly kit (for 28, 29, 31, 37, and 39 Series steps) includes: (1) #909553 linkage (1) #909017 clevis pin (1) #909018 cotter pin (1) #909045 bearing
909502	motor assembly kit (for 22, 27, 30, 32, 33, 34, 35, 36, 38, and 40 Series steps) includes: (1) #909550 motor (1) #909554 linkage
909534	linkage assembly kit (for 22, 27, 30, 32, 33, 34, 35, 36, 38, and 40 Series steps) includes: (1) #909554 linkage (1) #909017 clevis pin (1) #909018 cotter pin (1) #909045 bearing
909503	motor assembly kit (for 23 Series step) includes: (1) #909551 motor (high torque) (1) #909554 linkage
909534	linkage assembly kit (for 23 Series step) includes: (1) #909554 linkage (1) #909017 clevis pin (1) #909018 cotter pin (1) #909045 bearing
909521	motor replacement kit (high torque; 23 Series step) includes: (1) #909551 motor (1) #909530 parts kit
909504	motor assembly kit (for 26 Series step) includes: (1) #909550 motor (1) #909565 linkage
909532	linkage assembly kit (for 26 Series step) includes: (1) #909565 linkage (1) #909017 clevis pin (1) #909018 cotter pin (1) #909045 bearing
909520	motor replacement kit (all steps but 23 Series) includes: (1) #909550 motor (1) #909530 parts kit
909524	gear box assembly kit includes: (1) #909555 gear case (1) #909037 gear case cover (1) #909038 gear (1) #909530 parts kit
909525	gear kit includes: (1) #909038 gear (1) #909530 parts kit
909526	gear case kit includes: (1) #909555 gear case (1) #909530 parts kit

MOTOR ASSEMBLY KITS *continued*

<u>PART#</u>	<u>DESCRIPTION</u>
909527	gear case cover kit includes: (1) #909037 gear case cover (1) #909530 parts kit
909530	parts kit includes: (1) #909017 clevis pin (1) #909018 cotter pin (2) #909045 bearings screws needed to mount motor
909535	motor mounting plate kit includes: (1) #907039 motor mounting plate (1) #909530 parts kit
909536	motor bearing bracket kit includes: (1) #909552 motor bearing bracket (1) #909530 parts kit
909537	motor lead connector kit includes: (1) #909559 upper clamp plate (1) #909558 lower clamp plate (2) #909558 connector seals (2) screws

MOTOR ASSEMBLY MOUNTING HARDWARE

(for mounting the motor assembly to the step frame)

NOTE: Most component pieces of the motor assembly mounting hardware should be readily available through your local RV parts supplier or hardware store. Also, some installations may only require three mounting bolts.

DESCRIPTION

for 26, 28 29, 31, and 39 Series steps:

- includes: (4) 1/4-20 x 3/4" long carriage bolts
- (4) 1/4" split lock washers
- (4) 1/4-20 hex nuts

for 32, 34, 35, 36, and 38 Series steps:

- includes: (4) 1/4" split lock washers
- (4) 1/4-20 hex nuts

for 22, 23, 27, and 40 Series steps:

- includes: (4) 1/4-20 x 3/4" long carriage bolts
- (4) 1/4" split lock washers

ELECTRICAL PARTS KITS

<u>PART#</u>	<u>DESCRIPTION</u>
905302	door switch kit (plunger) includes: (1) #909316 plunger door switch (1) #908321 1/8" thick striker plate (1) #908331 door switch spacer (2) #909317 3/16" female spade wire connectors w/ blue insulator

ELECTRICAL PARTS KITS *continued*

<u>PART#</u>	<u>DESCRIPTION</u>
905305	power switch kit includes: (1) #909016 power switch (1) #908329 trim plate
905306	door switch - magnetic rectangular, surface mount
905307	door switch - magnetic 3/8" round, mortise mount
905313	door switch - chrome plunger pack
905314	door switch - magnetic 3/4" round
908329	trim plate for power switch
908361	mounting/spacer plate for 3/8" diameter magnetic door switch, 1/16" thick
909336	four way connector plug (vehicle half) - for use with control units #909513, #909514, #909590 and #909591

WARNING! DO NOT USE PART #909336, THE FOUR WAY CONNECTOR PLUG (VEHICLE-HALF), WITH THE ALL METAL CONTROL UNIT OR THE BLACK PLASTIC BOX WITH METAL BASE CONTROL UNIT. TO DO SO MAY RESULT IN DAMAGE TO THE CONTROL UNIT AND/OR THE VEHICLE WIRING.

MISCELLANEOUS STEP PARTS

<u>PART#</u>	<u>DESCRIPTION</u>
908157	stop kit (for 26, 27, 32, 34, 35, 36, 38, and 40 Series steps) includes: (4) #909134 adjustable stops mounting hardware
909332	non-skid self-adhering tread - 6" x 18" (fits 31 Series step)
909333	non-skid self-adhering tread - 6" x 22" (fits 22, 23, 26, 27, 28, 29, 32, 35, 38, 39 & 40 Series steps)
909334	non-skid self-adhering tread - 8" x 25" (fits 34 & 36 Series steps)
909004	understep light

OTHER KWIKEE PARTS

<u>PART#</u>	<u>DESCRIPTION</u>
905055	"Kwik-Flap™" - mud flap kit applicable to all Kwikkee electric steps (except 26 Series steps)
905068	"KwikLube™" - 11 oz. aerosol can of grease lubricant

Kwikkee recommends that you check with the local RV parts supplier for replacement parts. If your dealer does not have the parts in stock, please contact Kwikkee at 1 (800) 736-9961 for sourcing assistance.