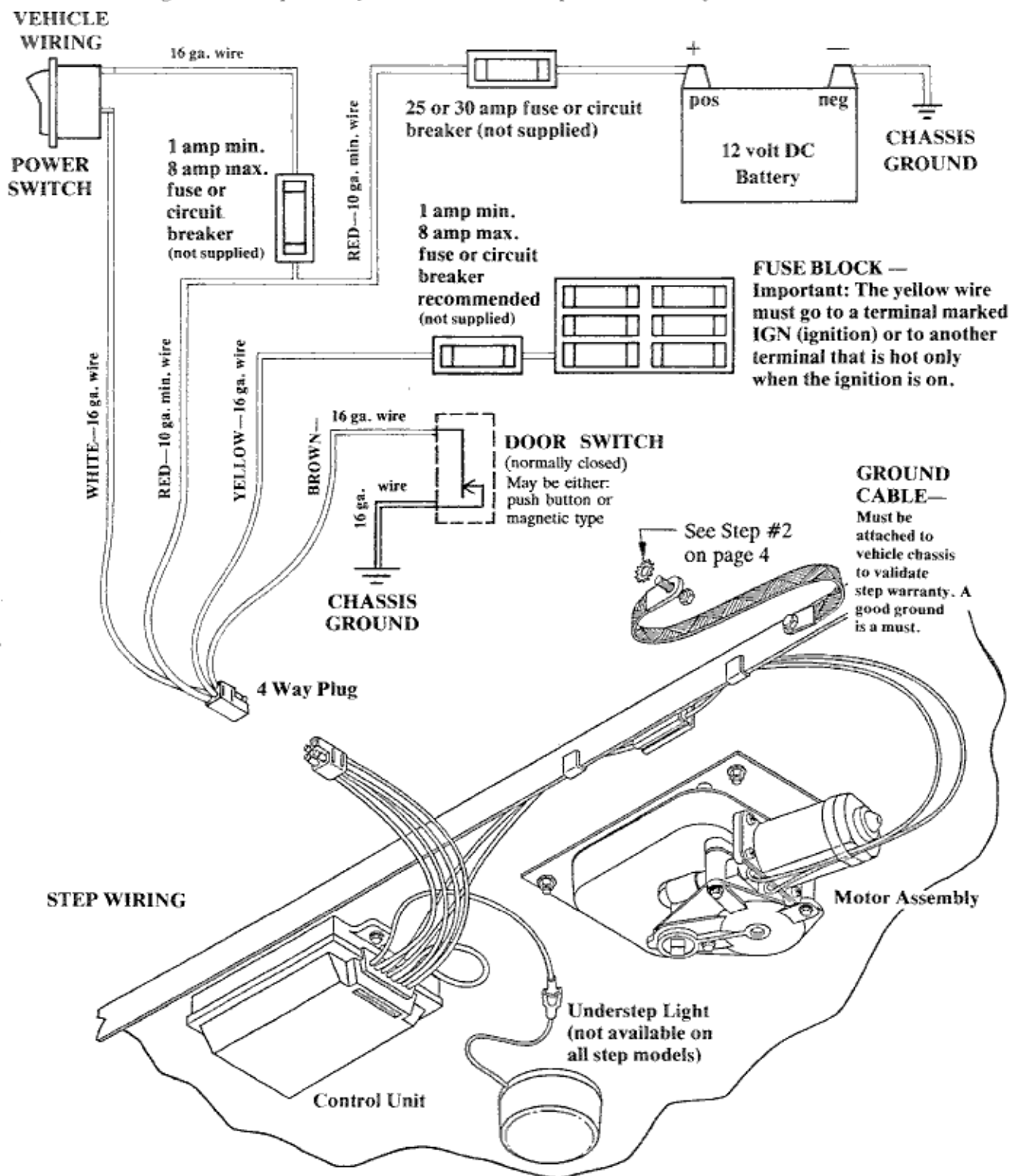


Figure 1

WIRING DIAGRAM — for steps operated by a door switch and power switch

WARNING—The power lead (red wire) must go directly to the battery through a 25 or 30 amp fuse or circuit breaker designated for step use only. **DO NOT** attach the power lead to any other 12 volt lines.



IMPORTANT:

Read this page before beginning any hookup, wiring, operating, or test procedure contained within this manual.

This manual is for installing, operating, and troubleshooting any Kwikkee electric step with an orange control unit box with both power and door switch operation.

Do not use this manual to install, operate, or troubleshoot a Kwikkee electric step with any other electrical package or control unit other than those described in this manual.

Do not install, operate, or troubleshoot a Kwikkee electric step with any old style control unit, such as the black plastic control unit box with the metal base, any plastic boxes other than the color orange, the all metal control unit box, or the all metal control unit box that is mounted inside the vehicle.

Follow all instructions in this manual very carefully. Failure to do so may result in damage to the step control, motor, or vehicle wiring. **WARNING:** No other devices (heaters, fans, burglar alarms, lights, etc.) can be incorporated in the same circuit as the control unit or step. This may cause the step or control unit to malfunction and may void the warranty. There may be specific instructions for your particular step model, based on the control unit part number. The part number is molded on the top of the orange control unit box. Be sure to follow these instructions carefully.

NOTE: When mounting an electric step on a van using the mounting bracket and/or wiring kit supplied by Kwikkee Products Company, Inc. follow all step mounting and wiring instructions included with the kit. These contain specific instructions for a particular van model.

BASIC SUMMARY OF OPERATION:

There are three different methods of operating a Kwikkee electric step. They are as follows:

1. The first method utilizes a self centering rocker switch that allows the step to be extended or retracted by pushing the appropriate side of the rocker switch. There is no control unit on steps using this method of operation. Manual #859 covers the installation, operation, and troubleshooting of these steps.
2. Van steps are the only steps that use a door switch only operation. When the door is opened the step extends and it retracts when the door is closed. Instruction manuals available for individual vans by make and model only. Contact Kwikkee Products Company, Inc. for your particular application.
3. The most popular operating method utilizes a door switch and a power switch. This method is covered in this manual. The step will operate from the door switch, which will extend the step when the door is opened and retract the step when the door is closed. The power switch allows the step to be locked in either the extended or retracted position. It will stay in this position regardless of whether the door is opened or closed. It will remain locked until the power switch is turned on or the vehicle ignition is turned on. When the step is locked in the extended position, the door closed, and the ignition is turned on, the ignition safety system will go into effect and the step will automatically retract. This is a safety feature designed so that the vehicle won't be driven with the step in the extended position. On steps equipped with orange control unit #9513 there is a "last out feature". This is a safety feature designed so when the door is opened the first time after the vehicle ignition is turned off, the step will extend, even if the power switch is turned off. On steps equipped with these control units, when the ignition is on, the step will always extend when the door is opened and retract when the door is closed.

Power is supplied to the system by the red wire. The white wire turns the control on and off through the power switch. When the ignition is turned on, 12 volts DC power is supplied to the yellow wire. This engages a relay that passes power into the system, bypassing the "off" power switch, and retracts the step automatically when the door is closed.

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.

WARNING: If the control unit shuts off power to the motor with the step in the partially extended position, do not step on the partially extended tread or damage to the step frame and/or motor assembly may result.

HOOKUP PROCEDURE:

Read all instructions before beginning any installation procedure.

Due to the many different varieties of vehicle models available, Kwikkee Products Company, Inc. cannot recommend a particular method of mounting the step to the vehicle. This is left to the discretion of the installer. There are a minimum of four (4) holes pierced in the step top for mounting the step to the vehicle. Use at least 5/16-18 (minimum) bolts with lock washers and nuts when mounting.

NOTE- Welding the step directly to the vehicle or any form of mounting bracket may void warranty. Welding may cause distortion to the step frame or severe damage to the electronics of the control unit.

Step Mounting Procedure:

For ease of mounting, the step should be in its extended position. To extend the step, place the step upside down on its top or mounting surface. Connect the four way plug with the four wire leads (enclosed with the step) to the control unit plug. Ground the negative (-) post of a well charged 12 volt DC battery to the braided ground cable attached to the rear or side of the step frame. Use 10 gauge (minimum) wire for jumpers. Connect the red and white wires leading from the four way plug attached to the step control unit to the positive (+) post of the battery. **CAUTION:** Keep hands clear of the step mechanism. Touch the brown wire leading from the four way control unit plug to the braided ground cable attached to the step frame. The step should extend. After the step has stopped its travel, disconnect the red and white wires from the battery. This will hold the step in the extended position. **NOTE-** Releasing the brown wire from the ground cable before removing the red and white wires from the battery will cause the step to retract rapidly.

1. Mount the step to the vehicle.
2. Connect the braided ground cable to the vehicle chassis. The braided ground cable is bolted to the rear or side of the step frame. Place the external tooth lock washer supplied with the ground cable between the cable end and the vehicle chassis. Scrape any paint or undercoating clear at the mounting point to insure a good ground connection. A good ground connection is a must to insure proper step operation. **NOTE-** The ground cable must be attached to the vehicle chassis to validate the step warranty.
3. **PLUNGER DOOR SWITCH INSTALLATION** - Locate and cut a 3/4" diameter hole to mount the door switch in the door frame. 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. The terminals at the rear of the door switch must not touch any metal surface when the wires are connected. This will cause the switch to short and malfunction. It is recommended that the 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. Use additional spacers if needed to attain two thirds travel of the door switch. Spacers are available from Kwikkee Products Company, Inc. if needed. See step #4 before determining if the additional spacer is needed. **NOTE-** Do not install the switch until all wiring to the switch is in place.

NOTE- Optional magnetic door switch, in both round inset and rectangular surface mount (if space permits) are available along with mounting instructions from Kwikkee Products Company, Inc.

4. **PLUNGER DOOR SWITCH ONLY** - Attach the plastic door switch striker plate to the door opposite the door switch. Use either the thick or thin striker plate, whichever fits the particular application. Use only if desired and when room permits.
5. **POWER SWITCH INSTALLATION** - Locate and cut a hole to mount the power switch. If the rocker power switch is supplied by Kwikkee Products Company, Inc. the power switch may be mounted "as is" by cutting a 9/16" x 1-1/8" hole for the switch to snap into. **NOTE - The hole must be very accurate.** The switch may also be mounted using the trim plate. Cut a 5/8" x 1-1/2" hole to mount the switch using the trim plate. **CAUTION:** 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 may be used if desired. **NOTE-** Do not install the switch until all wiring to the switch is in place.

Refer to Figure 1 for the remaining steps

6. Disconnect the vehicle battery before connecting any wiring.
7. Connect the **BROWN** wire lead from the four way plug attached to the control unit to the door switch. Use 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 were tight it would be extremely difficult to replace).
8. Connect a 16 gauge wire from the other terminal of the door switch (wire lead on round magnetic door switches) to the chassis ground. A good ground connection is a must to insure proper step operation. It is suggested that a machine screw, external tooth lock washer, and nut be used instead of a coarse thread sheet metal screw. Place the external tooth lock washer between the cable end and the vehicle chassis. Scrape the paint clear at this point to insure a good ground connection.
9. Mount the door switch in the door jamb.
10. Connect the **WHITE** wire lead from the four way plug to one of the terminals on the power switch. Use 16 gauge wire.
11. 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 1 amp minimum/8 amp maximum fuse or circuit breaker is recommended in the yellow wire. Use 16 gauge wire. Kwikkee Products Company, Inc. recommends that the ignition safety system (yellow wire) be connected on all installations. This insures that the step will be retracted before traveling. On some travel trailer and fifth wheel applications it may not be feasible to connect the yellow wire. Tie off the yellow wire leading from the four way plug (do not connect the yellow wire) and wrap it to protect it from the weather.
12. Connect the **RED** power lead from the four way plug to a 12 volt DC battery through a 25 or 30 amp fuse or circuit breaker designated for step use only. Use 10 gauge wire minimum. **NOTE-** Do not connect the power lead to the battery until completing Step #13.
13. Connect a 16 gauge wire from the other power switch terminal to the red 10 gauge power lead. A 1 amp minimum/8 amp maximum fuse or circuit breaker is required in this line. This wire may be connected to the red power lead anywhere between the four way plug and the 25 or 30 amp fuse or circuit breaker.
14. Wrap any exposed connections to protect them from the weather.
15. Mount the power switch.
16. Reconnect the battery and connect the red power lead to the battery through the 25 or 30 amp fuse or circuit breaker as described in Step #12.

OPERATING INSTRUCTIONS:

For control unit #9513

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. This procedure can also hold the step in the retracted position.
5. With the power switch off, the step extended, and the entrance door closed, turn on the vehicle ignition. The ignition safety system will go into effect and the step will automatically retract. **NOTE-** *If the yellow wire was not connected in Step #11 of the HOOKUP PROCEDURE the ignition safety system is inoperative and the step will remain in the extended position. 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. The power 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 out 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 out 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.*
The last out feature is operative only the first time the door is opened after the vehicle ignition is turned off. **NOTE-** *If the yellow wire was not connected in Step #11 of the HOOKUP PROCEDURE the last out feature will not operate.*
7. When the vehicle ignition is on, the step will always activate with the door movement, regardless of the power switch position. **NOTE-** *This is not valid if the yellow wire was not connected in Step #11 of the HOOKUP PROCEDURE.*

OPERATING INSTRUCTIONS:

For control unit #9514

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. This procedure can also hold the step in the retracted position.
5. With the power switch off, the step extended, and the entrance door closed, turn on the vehicle ignition. The ignition safety system will go into effect and the step will automatically retract. **NOTE-** *If the yellow wire was not connected in Step #11 of the HOOKUP PROCEDURE the ignition safety system is inoperative and the step will remain in the extended position. 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. The power switch must be turned on for the step to retract.*

WARNING: *When the ignition safety system goes into effect and the step automatically retracts, DO NOT OPEN THE DOOR until the step completely retracts. If the door is opened before the step completely retracts and locks in the up position, the step will stop moving. The step may only be partially extended. Stepping on a partially extended step may cause damage to the step frame and/or motor assembly. When the door is closed the step will finish retracting.*

WARNING: *If the entrance door is opened before the vehicle ignition is turned off, the step will extend as soon as the ignition is turned off, even if the power switch is off. If the step is not allowed to extend fully and lock out before the door is closed, the step will stop moving. The step may only be partially extended. Stepping on a partially extended step may cause damage to the step frame and/or motor assembly. If the door remains closed, the step will retract if either the ignition or power switch are turned on. If the door is reopened the power switch must be turned on for the step to finish extending.*

WARNING: *If your step does not have the "last out" feature, it will not extend once the ignition has been turned off and the door is opened. The power switch must be turned on in order to operate the step. To determine if your unit has the "last out" feature follow these procedures: With the ignition switch on, the door closed, the power switch off, and the step retracted, turn off the ignition. Open the door. If the step extends, your unit is equipped with the "last out" feature.*

Be Safe - Look Before You Leap!

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, causing 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 motor.

To further determine that the control is not shutting off, remove the two (2) screws from the connector on the motor leads between the motor and control unit. Remove the seal assembly. (See Figure 2) Place a voltmeter between the red and yellow motor leads then reconnect the four way plug. Turn the power switch on. If any voltage is read, the control 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 shows. If any voltage shows, disconnect the four way plug to keep the motor from overheating. If zero voltage is present, the control 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 battery. The voltage across the battery terminals should be at least 12.7 volts DC to insure a well charged battery. A battery that reads below 12.7 volts DC may drop as low as 8 volts DC when a load is drawn, such as the engaging of the step motor. The control unit will shut off if the loaded voltage falls below 9 volts DC. The control unit will remember which function it was performing. It will wait between two and five seconds (time depends upon temperature) and will try again to complete the original function. If the supply voltage is still below 9 volts, the control will go into another delay state. If the supply voltage remains above 9 volts DC, the original function will be completed. Should the supply voltage again fall below 9 volts, the system will go into another delay state. It may take a couple of minutes to complete the original function. Low supply voltage may cause erratic operation of the step. Intermittent ground 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 ground to the control unit is lost, either between the control unit and the step frame (green wire from the control unit), the step frame and the vehicle chassis (the braided ground cable), or between the vehicle battery and 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 diagram.

WARNING: IMPORTANT: No other devices (heaters, fans, burglar alarms, lights, etc.) can be incorporated in the same circuit as the control unit or step. This may cause the step or control unit to malfunction and may void the warranty.

Check the step for physical damage. If the step has been struck by some kind of road hazard, the step mechanism may be bent, causing the step to bind. Check the tread, sliding rails, and extending arms for physical damage. Also check the pivot points for rusting. (See the LUBRICATION AND MAINTENANCE SCHEDULE)

If the power switch is on and the step will not extend when the door is opened and/or retract when the door is closed, but there is a clicking noise coming from the control unit (the engaging and disengaging of the relays in the control unit) the first item that should be checked is the motor. See the MOTOR TEST PROCEDURE. The relays will engage and disengage (the clicking noise) when the door switch is cycled if the motor is malfunctioning.

These general service notes and the following test procedures cover the most common problems associated with Kwikkee 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.

TEST PROCEDURE - VEHICLE WIRING:

Read the General Service Notes before starting any test procedure.

1. Unplug the four way plug between the control unit and the vehicle wiring. (See Figure 2)
2. **TO CHECK THE MAIN POWER SOURCE:** Connect a voltmeter between the RED wire from the vehicle half of the four way plug and the ground cable attached to the step frame (See Figure 3). The reading should be about 12 volts DC. If the voltage is low there may be a loose or corroded connection, or low battery charge. If the voltage reading is zero, check the 25 or 30 amp fuse/circuit breaker and all connections. Be sure there is a good ground connection between the step frame and the vehicle chassis. See Step #2 of the HOOKUP PROCEDURE. A good ground connection is a must. If the reading is approximately 12 volts DC proceed with the next test.
3. **TO CHECK THE POWER SWITCH:** Connect the voltmeter between the WHITE wire from the vehicle half of the four way plug and the ground cable (See Figure 4). The reading should be about 12 volts DC with the power switch on and zero when the switch is off. If the voltmeter reads zero with the power switch on, the first item to check is the inline fuse or circuit breaker in the wire between the power switch and the power lead (red wire). If the fuse/circuit breaker is all right, connect the voltmeter between the terminal on the power switch with the wire leading to the power wire (red wire) and ground (See Figure 5). If the reading is still zero check the wire leading to the power lead for a loose connection or cut wire. If the reading is about 12 volts DC, turn on the power switch and check the other power switch terminal in the same manner, by connecting the voltmeter between the terminal and ground. If the reading is zero, replace the power switch. If the reading was about 12 volts DC, there may be a loose connection or cut wire between the power switch and the vehicle half of the four way plug.
4. **TO CHECK THE DOOR SWITCH:** Connect the voltmeter between the RED wire from the vehicle half of the four way plug and the BROWN wire in the same plug (See Figure 6). The reading should be about 12 volts DC when the door is open and zero when the door is closed. If the reading is zero with the door open, check the ground connection from the door switch. This connection should be clean and tight. See Step #8 of the HOOKUP PROCEDURE. An improper ground can cause intermittent or erratic operation of the step. If the step will not retract after being extended or extends with the door closed, the BROWN wire to the door switch may be touching a grounded surface inside the wall behind the door jamb, or the door switch terminals may be touching a grounded surface or each other. If the step extends and retracts by itself while traveling, check the conditions previously described. With plunger door switches, be sure that the door switch plunger is depressed at least two thirds of its travel when the door is closed. If the switch is not depressed at least two thirds of its travel, it is possible for the switch to make intermittent contact as the vehicle frame shifts slightly while traveling along the roadway. With magnetic door switches, be sure the magnet is in place and proper clearance is maintained between the switch and magnet. If all the previous conditions check okay, the door switch may be faulty.
5. **TO CHECK THE IGNITION SAFETY SYSTEM:** Connect the voltmeter between the YELLOW wire from the vehicle half of the four way plug and the ground cable (See Figure 7). The reading should be about 12 volts DC when the ignition is on and zero when the ignition is off. If the reading is zero when the ignition is on, check the connection of the yellow wire at the vehicle's fuse panel. If connected at a fuse, check for a blown fuse. **NOTE-** On some installations there may be an inline fuse or circuit breaker in the YELLOW wire that should be checked. Kwikie Products Company, Inc. recommends that this fuse/circuit breaker be installed at this time if the YELLOW wire is not already fused. If the reading was about 12 volts DC when the ignition was off, the YELLOW wire is connected to a constant live source. On control unit #9513, if the YELLOW wire is connected to a constant live source, the step will always activate with the door movement, even if the power switch and ignition are off. **NOTE-** On some travel trailer and fifth wheel applications, the ignition safety system may not be connected and the voltmeter reading will be zero between the YELLOW wire and the ground cable.

Figure 2

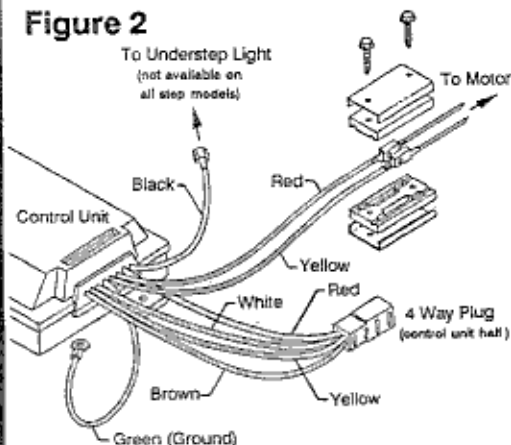


Figure 3

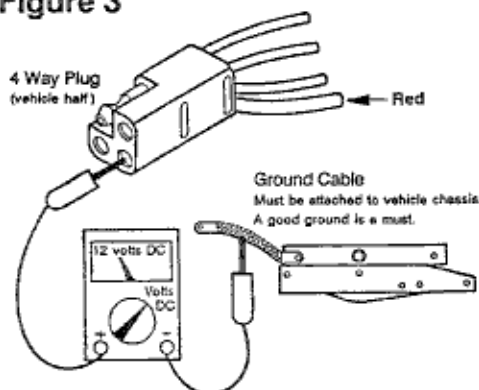


Figure 4

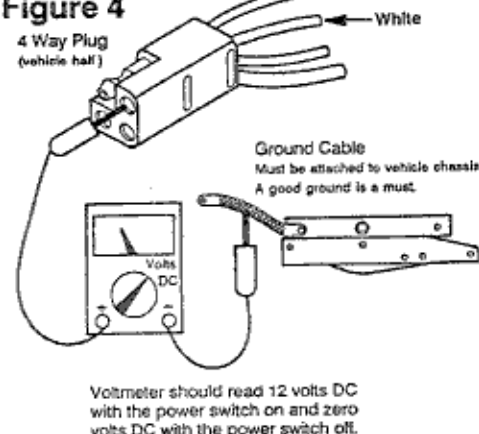


Figure 5

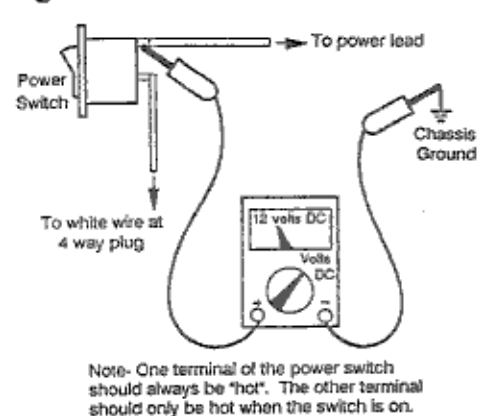
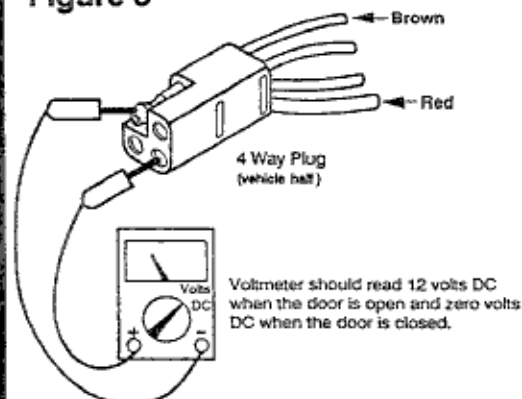
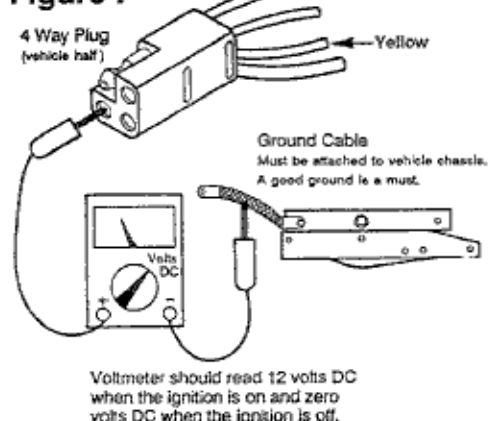
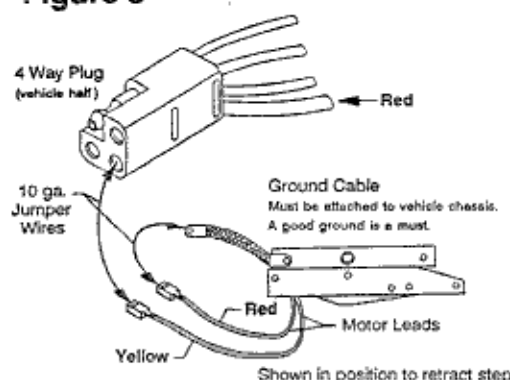


Figure 6**Figure 7****Figure 8****TEST PROCEDURE - MOTOR TEST:**

6. When checking the motor, remove the two (2) screws from the connector on the motor leads between the motor and control unit. Remove the seal assembly exposing the connectors on the red and yellow motor wires. **CAUTION:** Make note of how the wires and connectors are assembled for reassembly later. The wire connectors may be assembled wrong even though the colors match. Disconnect the motor leads. Connect a 10 gauge jumper wire to the RED wire in the vehicle half of the four way plug. This wire must have power. See Step #2 of the VEHICLE WIRING TEST PROCEDURE: Connect another 10 gauge wire to the ground cable (See Figure 8).

TO RETRACT STEP: Connect the ground jumper wire (jumper from the ground cable) to the RED motor lead. Touch the power jumper wire (jumper from four way plug) to the YELLOW motor lead.

TO EXTEND STEP: Connect the ground jumper wire (jumper from the ground cable) to the YELLOW motor lead. Touch the power jumper wire (jumper from four way plug) to the RED motor lead.

CAUTION: Do not leave the jumper wire connected to the motor terminal for more time than it takes to extend or retract the step or damage to the motor may result.

If the motor fails to move, the motor may be defective. If the step has been struck by some kind of road hazard, the step mechanism may be bent and causing the step to bind. The control unit would then shut off power to the step as described in the BASIC SUMMARY OF OPERATION. Check for physical damage to the tread, sliding rails, extending arms, etc. Also check all pivot points for rusting. (See the LUBRICATION AND MAINTENANCE SCHEDULE)

If the step doesn't move when power is applied to the motor terminals, but a dim spark is noticeable, there may be damage to the windings inside the motor, requiring replacement of the motor. A dim spark may also indicate a shorted or burned out motor requiring replacement.

If the motor is defective, refer to page #10 and #11 for instructions for removing the motor from the motor assembly.

TEST PROCEDURE - CONTROL UNIT TEST:

7. The motor must be operational to test the control unit using this procedure. See MOTOR TEST PROCEDURE.

- a. Ground the negative (-) post of a well charged 12 volt DC battery to the ground cable attached to the step frame.

NOTE: A well charged battery will read at least 12.7 volts DC when a voltmeter is connected between the battery posts.

- b. The motor leads must be connected to the control unit.
c. The four way plug between the control unit and the vehicle should be disconnected. Install pigtail (four way plug - vehicle half - Part #9336 - same plug as supplied with the step for connection to the vehicle) into the control unit half of the four way plug.
d. Touch the RED and WHITE wires to the positive (+) post of the battery. At the same time, touching the BROWN wire to the ground cable will cause the step to extend.

CAUTION: Keep hands clear of the step mechanism.

- e. When the BROWN wire is removed from the ground cable the step should retract.
f. Extend the step again by applying power to the RED and WHITE wires and grounding the BROWN wire to the ground cable. Remove the RED and WHITE wires from the battery before removing the BROWN wire from ground. This will cause the step to remain in the extended position.
g. To test the ignition safety system circuit, apply power to the RED and YELLOW wires at the same time and the step should retract.
h. On control unit #9513: To test the "last out feature", remove the YELLOW wire from the battery without removing the RED wire. Ground the BROWN wire to the ground cable and the step should extend. If the RED wire is removed from the battery before grounding the BROWN wire, Step #7f and #7g must be repeated before testing the last out feature. This test will only work if performed immediately after the ignition safety system test.
i. If the control unit tests okay, then recheck all wire and ground connections. If the source of the trouble cannot be found, feel free to contact the customer service department for further information or assistance.
j. If the above tests do not check out, the control unit may be defective and should be returned to the factory for evaluation.

In most cases the control unit does not fail and problems can be traced to vehicle wiring or voltage problems.

Instructions for removing the motor assembly (part #9501, #9502, or #9504) from the step frame and disassembly:

Read all instructions before starting any procedure.

Refer to the motor assembly exploded view drawing on the opposite page for the item numbers referred to in these instructions.

1. Unplug the control unit from the vehicle (four way plug). Do not cut any wiring.
2. Remove the two (2) screws (Item #12) from the connector (Item #18 and #19) on the motor leads between the motor and the control unit. Remove the seal assembly (Item #20). **CAUTION:** Make note of how the wires and connectors are assembled for reassembly later. The wire connectors may be assembled wrong even though the colors match. (See Figure 2)
3. It is easiest to remove the motor assembly from the step frame if the step tread(s) are in a partially extended position. Try to extend the step by following the procedure outlined in Step #6 under the TEST PROCEDURE - MOTOR TEST. If the step is locked in the up position and will not move, read Steps #4 and #5 below before proceeding.
4. Remove the hair pin (Item #6) from the clevis pin (Item #7).
5. Remove the clevis pin (Item #7) from the cast block in the end of the linkage assembly (Item #8, #9 or #10). Note which direction the clevis pin goes into the cast block. If the step is in its locked position, the clevis pin may have to be pried or driven out of the block. If the step is in the locked position, loosening the motor assembly mounting bolts may allow the clevis pin to be removed easier. The step tread(s) should swing freely when the clevis pin is removed. If the tread does not move freely, check for a bent step frame and for rusting at the pivot points.
6. **MOTOR REMOVAL:** The motor (Item #5) may be removed without removing the gear box or linkage assembly simply by removing the three (3) screws (Item #4) along with the bearing bracket (Item #2).
7. **GEAR BOX REMOVAL:** Unbolt the gear box mounting plate (Item #16) from the step frame.
8. Remove the bearing (Item #3) and the linkage assembly (Item #8, #9, or #10) from the gear case (Item #11) along with the adapter gear (Item #1) and shaft (Item #17).
9. Turn the gear box assembly over and remove the four (4) 1-1/4" long #10 self tapping screws (Item #13) from the gear case. Lift off the mounting plate (Item #16).
10. Remove the bearing (Item #3). Lift off the gear case cover (Item #15) and lift out the gear (Item #14). Note which side of the gear goes up.

Reassembly and installation of the motor assembly (part #9501, #9502, and #9504) on the step frame:

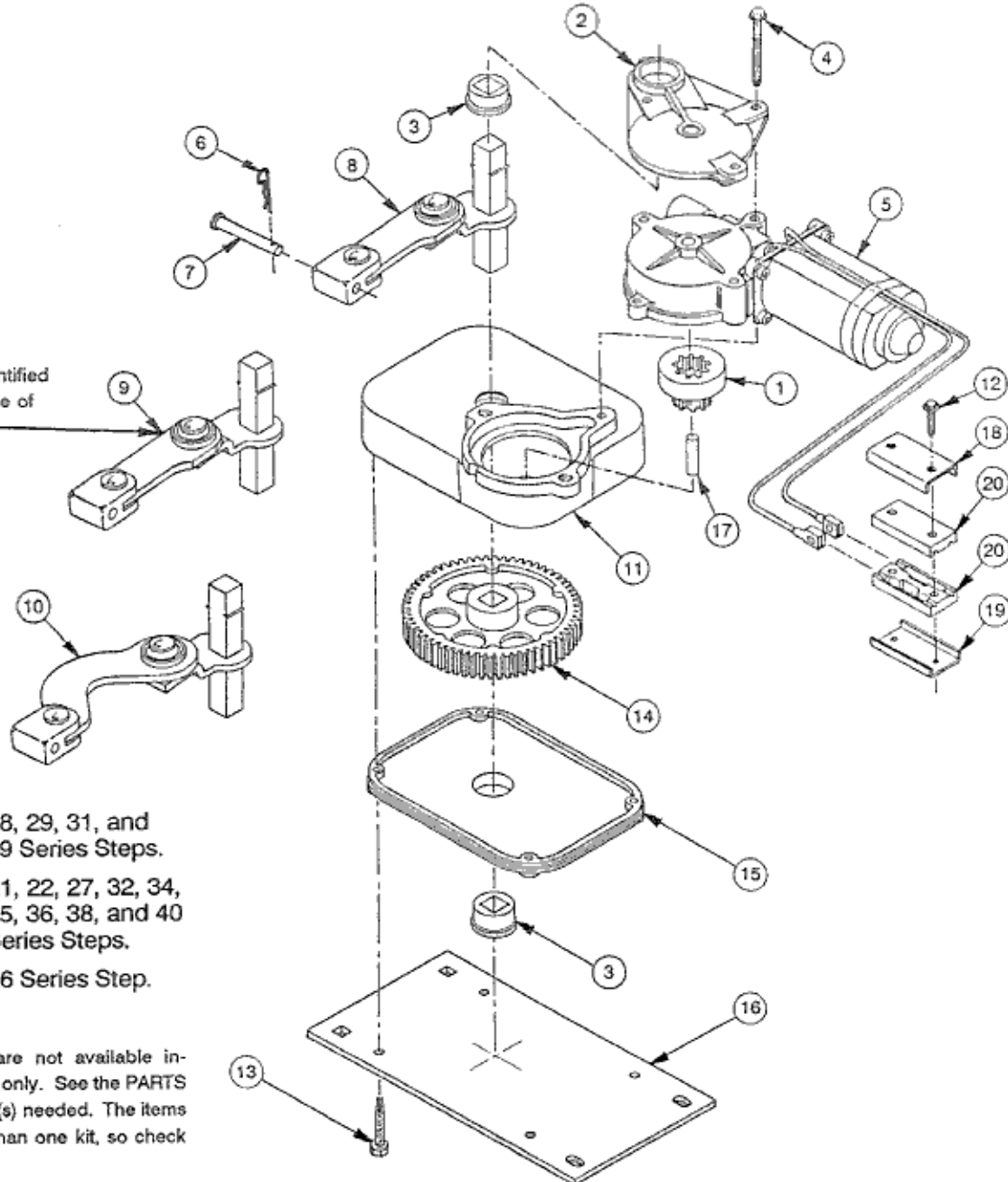
Read all instructions before starting any procedure.

Refer to the motor assembly exploded view drawing on the opposite page from the item numbers referred to in these instructions.

1. **NOTE-** In the following assembly be sure all bearing pockets and surfaces, gear teeth and the gear hub socket that is in the gear case are well lubricated with a good grade of lithium based grease.
2. Install the gear (Item #14) in the gear case (Item #11). Be sure the gear is reinstalled the same way it was removed (With the penny sized depressions down).
3. Place the gear case cover (Item #15) on the gear case. Set the bearing (Item #3) in the center hole of the gear case cover (the flange of the bearing should be up) and align the square hole in the bearing with the square hole of the gear.
4. Place the mounting plate (Item #16) on the gear case cover (the square holes in the mounting plate should be away from the motor) and install and tighten the four (4) 1-1/4" long #10 self tapping screws (Item #13).
5. Turn the motor assembly over and set it on the flat mounting plate. Install the linkage assembly (Item #8, #9, or #10) into the gear case. Be sure the linkage assembly seats all the way into the gear and bearing or the bearing bracket (Item #2) will not set properly. The swivel ball and cast block should face the front of the motor assembly.
6. Place the bearing (Item #3) on the linkage assembly shaft. Place the flange of the bearing down.
7. Lubricate and set the adapter gear (Item #1) and adapter gear shaft (Item #17) in place and mesh with the main gear (Item #14).
8. Replace the motor (Item #5) by carefully aligning the motor and adapter gear (Item #1) so they slide together. Align the screw holes and push the motor into the screw hole alignment pockets in the gear case.
9. Place the bearing bracket (Item #2) on the motor assembly and install and tighten the motor screws (Item #4). These screws must be very secure.
10. Reinstall the motor assembly on the step frame and tighten all mounting bolts. **NOTE-** Be sure the motor assembly is positioned the same way the old one was prior to removal.
11. Install the clevis pin (Item #7) through the drive arms attached to the step frame and the cast block in the linkage assembly (Item #8, #9, or #10). Be sure to reinstall the clevis pin in the same direction it was removed. Install the hair pin (Item #6) in the clevis pin.
12. Reassemble the motor to control unit leads. See Step #2 in column 1 under disassembly on this page.
13. Connect the control unit to the vehicle (four way square plug).
14. Test step functions.

Motor Assembly

NOTE- Item #9 (part #9565) - identified by a 7/32" dia. hole under the edge of the straight ball drive link.



Motor Assembly #9501 - 28, 29, 31, and 39 Series Steps.

Motor Assembly #9502 - 21, 22, 27, 32, 34, 35, 36, 38, and 40 Series Steps.

Motor Assembly #9504 - 26 Series Step.

NOTE- The items listed below are not available individually. They are sold in kit form only. See the PARTS LIST for which kit contains the item(s) needed. The items below may be available in more than one kit, so check the listings carefully.

ITEM NUMBER	PART NUMBER	DESCRIPTION	Qty. Per Motor Assembly		
			9501	9502	9504
1	9556	Adapter Gear	1	1	1
2	9552	Motor Bearing Bracket	1	1	1
3	9045	Bearing	2	2	2
4	9560	#10 Self Tapping Hex Washer Head Screw - Type 23 - 1-3/4" Long	3	3	3
5	9550	Motor	1	1	1
6	9018	Hair Pin	1	1	1
7	9017	Clevis Pin	1	1	1
8	9553	Linkage Assembly for Motor Assembly #9501	1	-	-
9	9565	Linkage Assembly for Motor Assembly #9504	-	-	1
10	9554	Linkage Assembly for Motor Assembly #9502	-	1	-
11	9555	Gear Case	1	1	1
12	9561	#6 Self Tapping Hex Washer Head Screw - Type 23 - 3/4" Long	2	2	2
13	9298	#10 Self Tapping Hex Washer Head Screw - Type 23 - 1-1/4" Long	4	4	4
14	9038	Gear	1	1	1
15	9037	Gear Case Cover	1	1	1
16	7039	Motor Mounting Plate	1	1	1
17	9557	Adapter Gear Shaft	1	1	1
18	9559	Clamp Plate - Upper	1	1	1
19	9562	Clamp Plate - Lower	1	1	1
20	9558	Wire Connector Seal	2	2	2

PARTS LIST

Part Number Description

Frame Assemblies

(Frame Only) - available in black only.

8001	29 series step frame
8205	22 series step frame
8208	27 series step frame
8262	28 series step frame
8284	26 series step frame
8285	32 series step frame
8286	34 series step frame
8303	31 series step frame
8306	21 series step frame
8307	35 series step frame
8322	36 series step frame
8366	39 series step frame
8369	40 series step frame
8374	38 series step frame

Mounting Brackets available in pairs only

7088	adjustable mounting bracket - 26 series step - includes mounting hardware
7270	2" drop - 21, 22, 32, 34, 35, 36, and 38 series steps - includes mounting hardware
7271	4" drop - 21, 22, 32, 34, 35, 36, and 38 series steps - includes mounting hardware

Control Units

9513	control unit - orange box - includes (1) #9336 four way plug (with "last out feature")
9514	control unit - orange box - includes (1) #9336 four way plug (without "last out feature")

Control Unit Mounting Hardware (for mounting the control unit to the step frame)

All Step Series

- four (4) - #8-32 x 3/8" long self tapping screws - type 23
- one (1) - #8 external tooth lock washer - for grounding the green wire exiting the control unit

NOTE - The above control unit mounting hardware should be readily available through your local RV parts supplier or your local hardware store.

Part Number Description

Motor Assembly Kits

5205	clevis and hair pin kit - includes (1) #9017 clevis pin and (1) #9018 hair pin
9501	motor assembly - 28, 29, 31, and 39 series steps
9502	motor assembly - 21, 22, 27, 32, 34, 35, 36, 38, and 40 series steps
9504	motor assembly - 26 series step
9520	motor kit - includes (1) #9550 motor, (1) #9530 parts kit,
9522	linkage assembly kit for motor assembly #9501 - 28, 29, 31, and 39 series steps - includes (1) #9553 linkage assembly, (1) #9017 clevis pin, (1) #9018 hair pin, and (1) #9045 bearing
9523	linkage assembly kit for motor assembly #9502 - 21, 22, 27, 32, 34, 35, 36, 38, and 40 series steps - includes (1) #9554 linkage assembly, (1) #9017 clevis pin, (1) #9018 hair pin, and (1) #9045 bearing
9524	gear box assembly - includes (1) #9555 gear case, (1) #9037 gear case cover, (1) #9038 gear, and (1) #9530 parts kit
9525	gear kit - includes (1) #9038 gear and (1) #9530 parts kit
9526	gear case kit - includes (1) #9555 gear case and (1) #9530 parts kit
9527	gear case cover kit - includes (1) #9037 cover and (1) #9530 parts kit
9530	parts kit - includes (1) #9017 clevis pin, (1) #9018 hair pin, (2) #9045 bearings, and all the screws needed to assemble the motor assembly
9531	linkage assembly kit for motor assembly #9504 - 26 series step - includes (1) #9565 linkage assembly, (1) #9017 clevis pin, (1) #9018 hair pin, and (1) #9045 bearing
9535	motor mounting plate kit - includes (1) #7039 motor mounting plate and (1) #9530 parts kit
9536	motor bearing bracket kit - includes (1) #9552 motor bearing bracket and (1) #9530 parts kit

Motor Assembly Mounting Hardware (for mounting the motor assembly to the step frame)

26, 28, 29, 31, and 39 Step Series

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

NOTE - Some installations may only use three mounting bolts.

32, 34, 35, 36, and 38 Step Series

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

21, 22, 27, and 40 Step Series

- four (4) - 1/4-20 x 3/4" long hex head bolts
- four (4) - 1/4" split lock washers

NOTE - The above motor assembly mounting hardware should be readily available through your local RV parts supplier or your local hardware store.

Electrical

5302	plunger door switch pack - includes (1) #9316 plunger door switch (black plastic), (1) #8321 1/8" thick striker plate, (1) #8349 1/16" thick striker plate, (1) #8331 door switch spacer, and (2) #9317 3/16" blue female push on terminals
5305	power switch kit - includes (1) #9016 power switch and (1) #8329 trim plate
5306	door switch, rectangular magnetic - surface mount
5307	door switch, 3/8" dia. round magnetic
5313	chrome plunger door switch pack
5314	door switch, 3/4" dia. round magnetic
8321	striker plate, plunger door switch - 1/8" thick
8329	trim plate, power switch
8331	spacer, plunger door switch
8349	striker plate, plunger door switch - 1/16" thick
8361	mounting/spacer plate, 3/8" dia. round magnetic door switch 1/16" thick
8364	mounting/spacer plate, 3/8" dia. round magnetic door switch 1/8" thick
9016	power switch
9317	terminals - plunger door switch (black plastic only) - 3/16" blue female push on terminals
9325	ground cable - 24" long
9326	ground cable - 36" long
9336	four way plug - vehicle half - 4 wire leads (16 ga. white wire) for use with control units #9513 and #9514 WARNING: Do not use this plug with the all metal control unit box or the black plastic box with the metal base or damage to the control or vehicle wiring may result.

Miscellaneous Step Parts

8157	stop kit - 26, 27, 32, 34, 35, 36, 38, and 40 series steps - includes (4) #9134 adjustable stops and mounting hardware
9332	nonskid tread - 6" x 18" - 31 series step
9333	nonskid tread - 6" x 22" - 21, 22, 26, 27, 28, 29, 32, 35, 38, 39, and 40 series steps
9334	nonskid tread - 8" x 25" - 34 and 36 series steps

Special Order Item

9004	understep light
------	-----------------

Other Products by Kwikkee Products Company, Inc.

5055	Kwik Flap - Mud Flap Kit - for all Kwikkee electric steps except 26 series steps
5070-14	Kwik Lube - Spray Grease - 14 oz. aerosol can

Kwikkee Products Company, Inc. strongly recommends that you check with your local RV parts supplier for replacement parts. If your dealer does not have them in stock, they can be ordered through a regional warehouse distributor or directly from Kwikkee Products Company, Inc.

LUBRICATION AND MAINTENANCE SCHEDULE

Clean all mud, salt, and road grime from 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 Kwik-ee electric steps and is recommended for lubricating all moving parts. See the Parts List for Kwik-Lube ordering information.

Refer to figures below for lubrication locations:

