



Owner's Manual #880

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Kwikkee #1422257

Electric Steps

Equipped with a Permanent Magnet Motor

(For steps with Control Units 909506000, 909507000, or 909508000
and steps without Control Units)



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- 3 Operating the Step
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 - Cam Stop Adjustment
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Single Steps



Double Steps



Triple Steps



Van Steps

PLEASE NOTE:

The 880 Owners Manual shipped with steps prior to October 2004. Repair parts listed on this page are no longer the manufacturer's recommended repair procedure. See new Replacement Kits listed on Page 7 of this training.

FILL OUT AND SAVE WITH VEHICLE RECORDS

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

Step Serial # _____ Step Series # _____
 Year / Make / Model of RV _____
 Date of Purchase _____ Control Unit # _____

CONTROL UNIT Complete the following only if your step is equipped with Control Unit.
 Control Unit Serial # _____

STEP IDENTIFICATION AND REPLACEMENT PARTS INFORMATION

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

CHART 1 Replacement Parts Kits for Series Steps 22, 30, 32, 34, 35, 36, and 38

Parts Key #	Description	Replacement Kit Part #	Parts Key numbers included in Kit
1	#10 x 1 3/4" self-tapping hex washer-head screw	909530000	1, 3, 6, 8, 9, 14
2	Motor bearing bracket	909530000	1, 3, 6, 8, 9, 14
3	Bearing	909520000	1, 2, 4A, 5B, 16A
4A	Motor	909559000	1, 5A, 5B, 6, 8, 9
5	Adaptor gear	909530000	1, 3, 6, 8, 9, 14
6	Adaptor gear shaft	909534000	1, 3, 7A, 8, 9
7A	Linkage assembly A	905205000	8, 9
8	Cotter pin	905205000	8, 9
9	Clevis pin	909526000	1, 3, 8, 9, 10, 14
10	Gear case	909541000	1, 3, 8, 9, 11, 14
11	Main gear	909527000	1, 3, 8, 9, 12, 14
12	Gear case cover	909535000	1, 3, 8, 9, 13, 14
13	Motor mounting plate	909530000	1, 3, 6, 8, 9, 14
14	1/4-20 x 1 1/4" tri-lobal thread forming screw	909520000	1, 2, 4A, 5B, 16A
16A	Adapter pigtail (standard)	9080**000	
		**Insert 2 digit Step Series number	
	Step Frame only	90904000	
	Step Light		

Replacement Parts Kits for Series Steps 28, 31, 33, 37, and 39 As shown in CHART 1 except for the following:

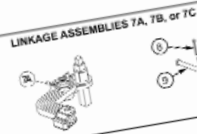
Parts Key #	Description	Replacement Kit Part #	Parts Key numbers included in Kit
7B	Linkage assembly B	909533000	1, 3, 7B, 8, 9

Replacement Parts Kits for Series Steps 26 As shown in CHART 1 except for the following:

Parts Key #	Description	Replacement Kit Part #	Parts Key numbers included in Kit
7C	Linkage assembly C	909532000	1, 3, 7C, 8, 9

For Steps with and without Control Unit

LINKAGE ASSEMBLIES 7A, 7B, or 7C



Replacement Parts All Step Series

Part #	White* (Closed)	Part #	Black** (Open)	Description
905312000	905323000			Magnetic, small rectangular
905314000	905324000			Magnetic, 3/4" core round
905306000	905326000			Magnetic, large rectangular
905307000	905327000			Magnetic, 3/8" core round
905302000	905328000			Plated plunger switch

* Used for all color controls manufactured prior to 2/99. Does NOT include "black" 909506000, 909507000.
 ** Used for "black" controls since 2/99 including 909506000, 909507000, and 909508000.

ROCKER STYLE POWER SWITCH

Part # 905305000 Description For all fully automatic steps.

Part # 905316000 Description SELF-CENTER ROCKER SWITCH For steps NOT equipped with control units.

Replacement Parts Kits for Series Steps 23 and 40 As shown in CHART 1 except for the following:

Parts Key #	Description	Replacement Kit Part #	Parts Key numbers included in Kit
2	Motor bearing bracket	909536000	2
1B	Motor (high-torque, use with 23 & 40 Series steps)	909521000	1, 1B, 15, 16B
15	Motor gear case adapter	909521000	1, 1B, 15, 16B
16B	Adapter pigtail (high torque)	909521000	1, 4B, 15, 16B

Replacement part numbers are also available online at:
www.kwikkee.com
 See 'Downloadable Documents'

INTRODUCTION

STEPS WITH CONTROL UNIT

This manual has been provided to assist you with the identification, operation, maintenance, and troubleshooting of any Kwikkee electric step manufactured after January 2002 that is equipped with a door switch, a power switch, control unit and a permanent magnet motor. It does not apply and should not be used as a reference to any other previous versions of a Kwikkee electric step.

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

The “Last Out” feature is another safety feature designed to extend the step when the door is opened for the first time after the vehicle ignition is turned off, even if the 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.

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

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.

STEPS WITHOUT CONTROL UNIT

This manual has been provided to assist you with the identification, operation, maintenance, and troubleshooting of any Kwikkee electric step equipped with the self-centering rocker switch manufactured after January 2002. It does not apply and should not be used as a reference to any other previous versions of a Kwikkee electric step.

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

STEPS WITH CONTROL UNIT

OPERATION

1. After the installation is complete and with the entrance door open, turn the power switch on.

NOTE: Some steps are not equipped with a power switch. They are activated only with a door switch.

2. Close the door. The step should retract and lock in the "up" position.

3. Open the door. The step should extend and lock in the "down" position with the understep light on.

NOTE: The understep light is not available on all step models.

4. If your step is equipped with a power switch, turn it 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 is not connected to an ignition power source, the ignition safety system will be inoperative and the step will remain in the extended position. In this case, the 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 "down" position. This is the "Last Out" feature.

7. The "Last Out" feature is only operative the first time the door is opened after the vehicle ignition is turned off.

When the vehicle ignition is on, the step will always activate with the door movement, regardless of the power switch position.

NOTE: If the yellow wire from the four-way connector is not connected to an ignition power source, the "Last Out" feature will not operate.



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.

STEPS WITHOUT CONTROL UNIT

1. To extend the step, push and hold the bottom half of the rocker switch. Make sure the step is completely extended and locked in position before releasing the switch.

2. Push and hold the top of the rocker switch to retract the step. Be sure the step is completely retracted and locked in position before releasing the switch.

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

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



WARNING: Stepping on a partially extended step can cause damage to the step frame.



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

MAINTENANCE

FIGURE 1

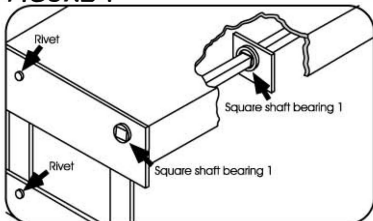


FIGURE 2

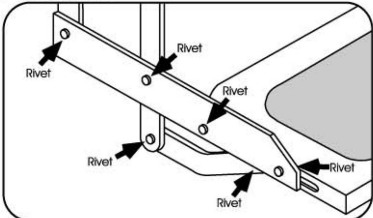


FIGURE 3

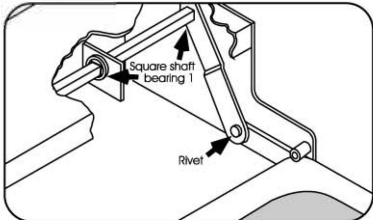


FIGURE 4

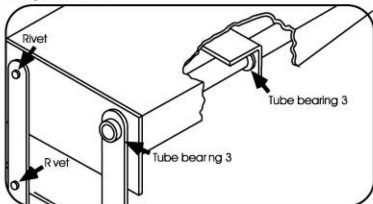


FIGURE 5

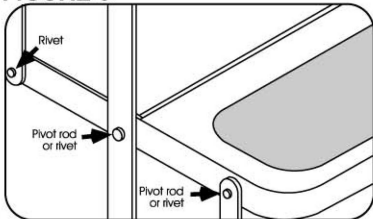


FIGURE 6

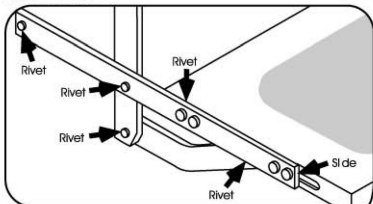
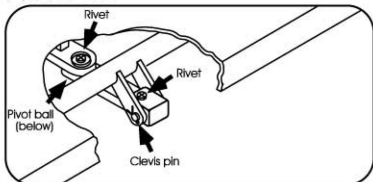


FIGURE 7



LUBRICATION

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

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

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

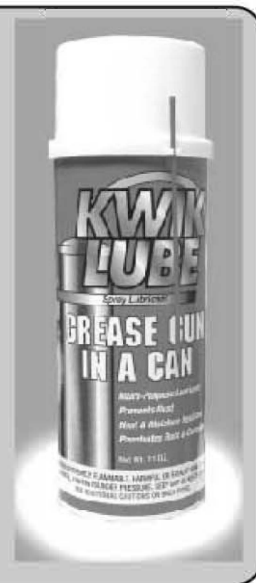
- Figures 1 and 3:** Square shaft bearing - lubricate around outside and under head of bearing.
- Figure 4:** On step models equipped with plastic cover, this cover will have to be removed to lubricate center bearings. Lubricate bearings under cover every 90 days.
- Figure 4:** Lubricate around the bushing-in-bushings.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

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

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

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

Ask your local RV Dealer for KwikLube



MAINTENANCE IN SALT ENVIRONMENT

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

ADJUSTING THE CAM STOPS

24, 25, 27, 32, 34, 35, 36, 38, and 40 Series Steps

Kwikkee steps are fitted with adjustable cam stops on the step frame that help lock the step in the "out" position, creating a firm stepping platform and relieving load-bearing stress on the motor and drive linkage. The cam is adjusted at the factory but due to the rigors of shipping, installation, and normal use the cam may fall out of adjustment and need to be tightened.

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

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

1. Loosen the stops so they move freely and retract the step.

2. Extend the step fully to its locked extended position (see **Figure 8**). Be sure that the motor assembly linkage rests against the gear case as illustrated in **Figure 1**. Repeat if needed until the motor assembly locks in the extended position.

3. Push the stops against the leg and tighten securely (see **Figure 9**). Be sure that both stops are tightened and that they rest securely against the leg.

4. Retract and fully extend the step. Check the motor assembly to be sure that it is locked all the way out, and that both stops are secure against the legs. Repeat the above procedures if needed to properly adjust the stops.

5. Push on the front edge of the step tread. If the step seems loose, repeat the above procedures. The stops may not be properly adjusted so that they rest tightly against the leg.

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

CAUTION: Be sure that nothing can get caught in the step.

FIGURE 8: This view shows motor removed and parts exploded for clarity only. These parts need not be disassembled to adjust cam stops.

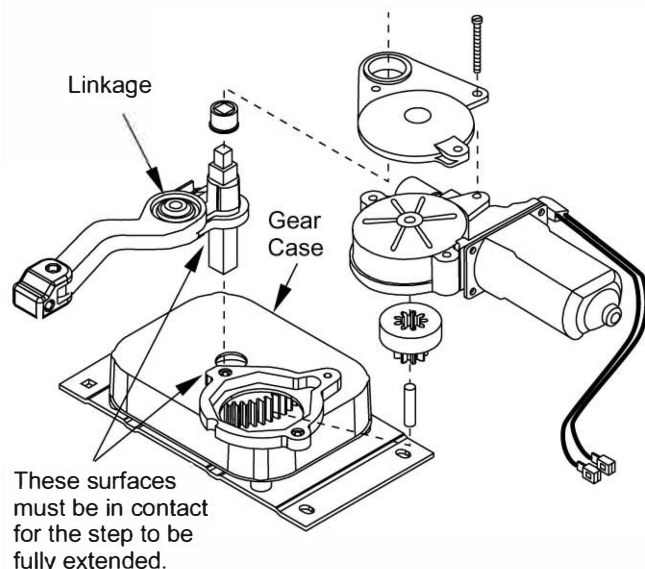
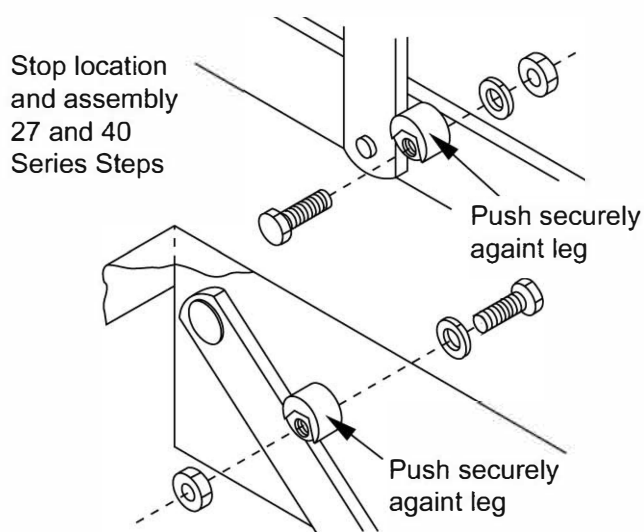


FIGURE 9: Stop location and assembly, 32, 34, 36, and 38 Series Steps



GENERAL SERVICE NOTES

These general service notes and the Step Test Procedures address the most common questions about Kwikkee electric steps. Due to the number of variable conditions, you may experience symptoms other than those covered. Please feel free to contact the Customer Service Department at (574) 537-8900 for further information or assistance.

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.

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

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

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

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

TROUBLE- SHOOTING AND TESTING PROCEDURES

The following Step Test Procedures have been provided to troubleshoot and test all of the Kwikkee automatic electric step functions. They are designed to initially check the step's basic functions separately from the RV wiring to determine whether or not the step is malfunctioning. The following procedures test the various components of the step until the source of the malfunction is located. Using these procedures will shorten and reduce the time spent troubleshooting.

Some portions of the test procedures require additional equipment. This equipment includes: a voltmeter, a well charged 12 volt DC automotive battery, and a 4-way connector/pigtail (Part #909306000, available from Kwikkee Products Company).

Read the entire procedure prior to testing. If you need assistance contact Kwikkee's Service Line at (574) 537-8900.

TESTING THE STEP

1. Inspect the step for visible damage that might restrict the step's operation.
2. Obtain a 4-way pigtail connector (part #909306000) from Kwikkee.
3. Disconnect 4-way connector on underside of step and connect step-half of the connector to the four-way connector pigtail. **See Figures 10, 11, and 12, Page 10-11.**
4. Set a fully charged 12 volt DC automotive battery beside the step.
ATTENTION: Do not allow the battery terminals to come in contact with the step. Complete a ground for the step tests by connecting a 10 gauge wire from the negative (-) battery pos to the green ground wire of the control unit.

VAN STEPS

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

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

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

5. To supply power, attach the red wire from the 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 four wires of the pigtail. The brown wire is the door switch, the white wire is the power switch, and the yellow wire is the ignition override.

7. To extend the step, touch the white wire to the battery's positive (+) post. The step should extend and remain extended.

8. To retract the step, hold the white wire to the battery's positive (+) terminal and touch the brown wire to the negative (-) terminal.

9. To test the Ignition Override feature, extend the step as in Step 7. With the step extended, disconnect the white wire from the battery and attach the brown wire to the battery's negative (-) terminal. Next, touch the yellow wire to the battery's positive (+) terminal. The step should retract. Remove the brown wire and the step should extend.

To test the "Last Out" feature, touch the brown wire to the negative (-) terminal to retract the step. While holding the brown wire to the negative (-) terminal, remove the yellow from the positive (+) terminal. The Step will stay retracted. Now, remove the brown wire. The step should extend.



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.

IMPORTANT

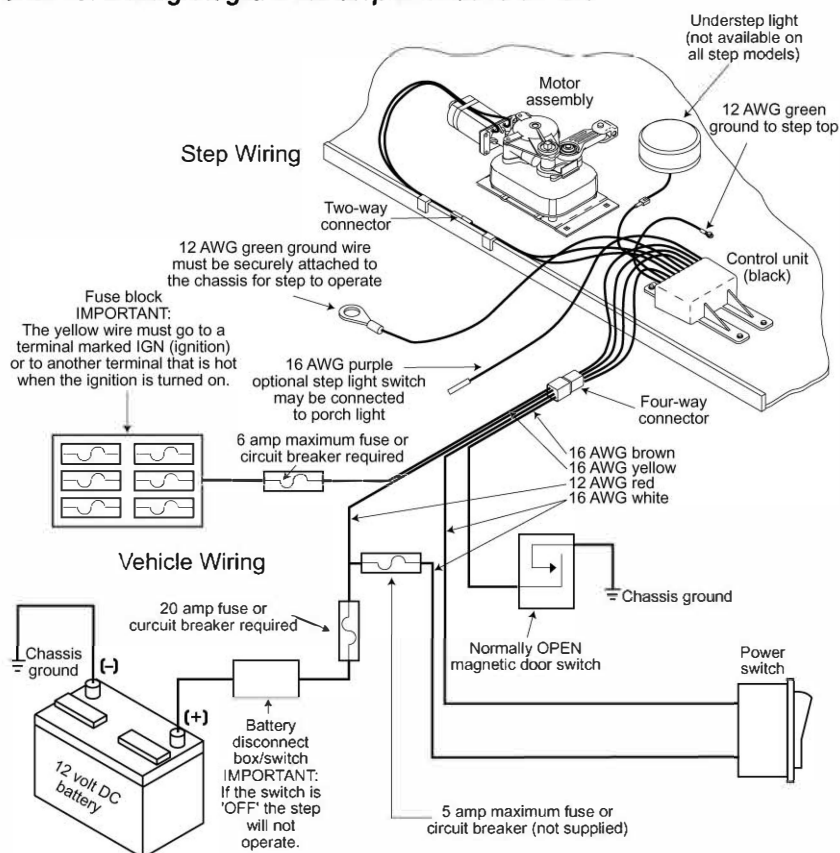
INSTALLER NOTES:

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



WARNING: Keep fingers, arms, and legs clear of step mechanism while performing these tests.

FIGURE 10: Wiring diagram for step with control unit



10. If any of the step functions do not work, the source of the malfunction is either in the control unit and/or the motor. Proceed to the "Testing the Motor" section on Page 11.

If all of the step functions do work, the malfunction is either in the door switch, power switch, or the vehicle wiring. Proceed to "Testing the 4-way Connector" section on Page 11.

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

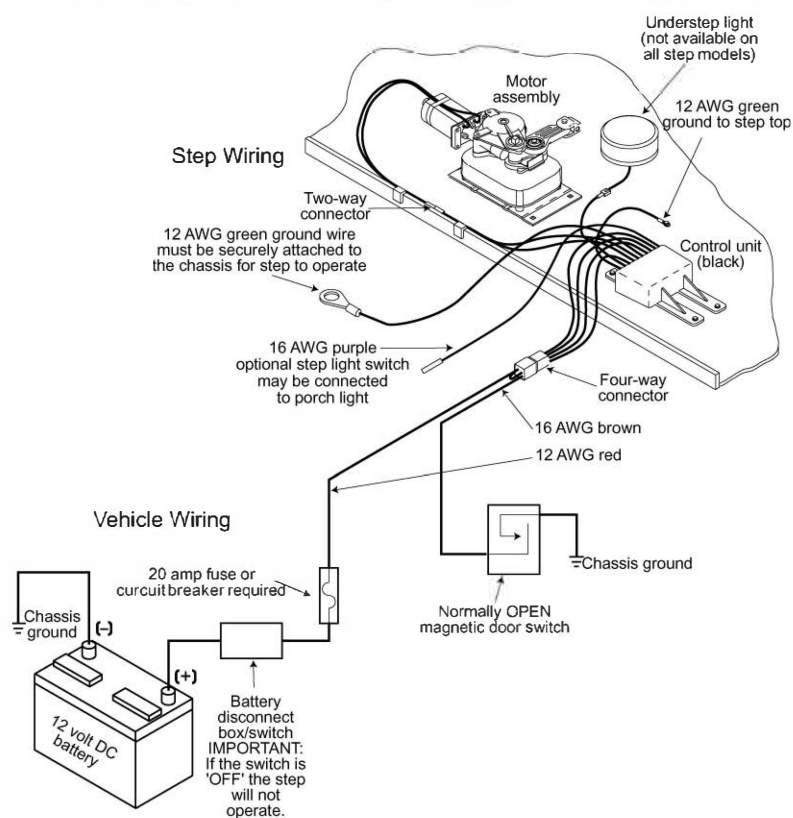
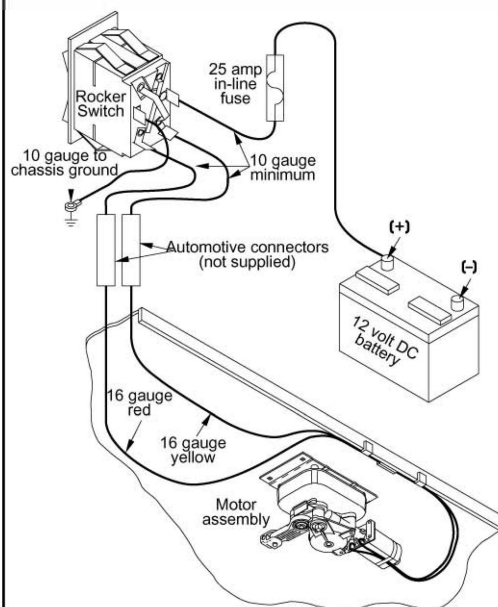


FIGURE 12: Wiring diagram for steps without control unit



TESTING THE MOTOR

- 11.** Disconnect the two-way connector between the step motor and the control unit.

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

NOTE: On steps with control unit #909507000 reverse the red and yellow wire connections to perform the aforementioned test.

TESTING THE 4-WAY CONNECTOR

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

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

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

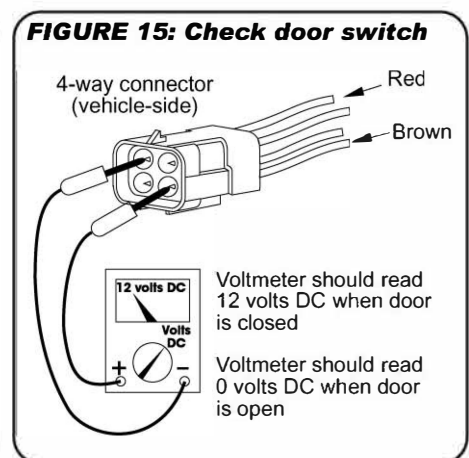
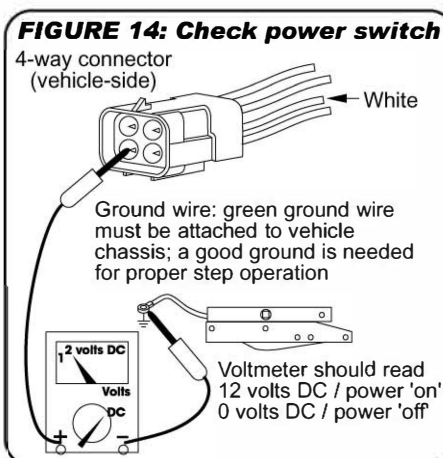
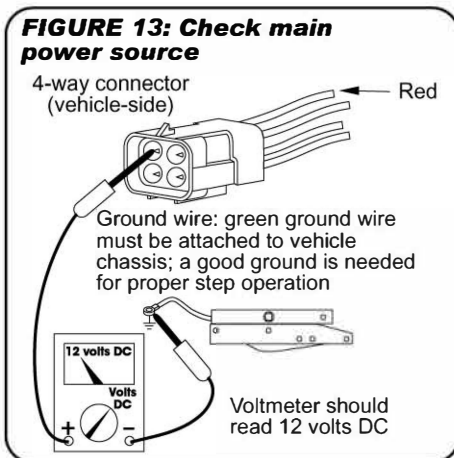
If the voltmeter reads zero (0) volts when the power switch is on, there is a problem in the power switch circuit.

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

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

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

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



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

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

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

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

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

The reading should be a minimum of 12 volts DC. If the voltage reading is low, there may be a loose or corroded connection at the battery, a low charge level on the battery itself, or a poor ground. If the voltage reading is zero (0) volts, check the step fuse/circuit breaker, all connections, and the condition of the wiring between the battery and the plug, including the ground connection at the chassis.

If you have additional questions or need more assistance, contact a Lippert Components Service Representative at 574-537-8900.

FIGURE 16: Check ignition override

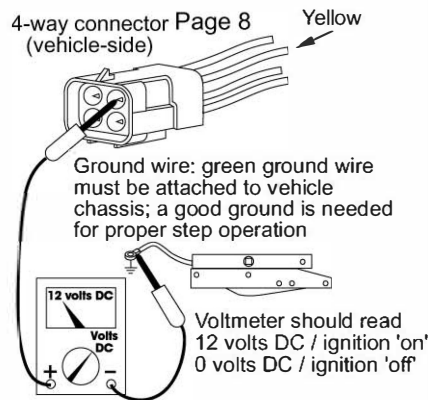
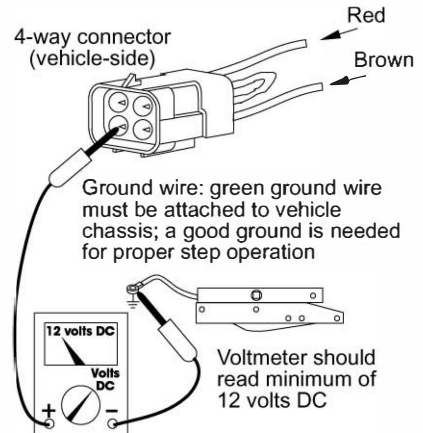


FIGURE 17: Check connector



Kwikkee®

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PLEASE NOTE:

At the time of the printing of this Training, 42 Series Steps have not been changed over to the new IMGL and 909510000 Control Unit.

This change is scheduled to happen mid-year 2005 at which time information relating to the control unit, motor, and gearbox will be updated.

*Check **www.kwikee.com** downloadable documents for updates.*

If you have a service or repair related question, contact the Kwikkee Customer Service Department at 1-800-736-9961.



FILL OUT AND SAVE WITH VEHICLE RECORDS

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

Step Serial #	Step Series #
Year / Make / Model of RV	
Date of Purchase	
CONTROL UNIT Complete the following only if your step is equipped with Control Unit.	
Control Unit Serial #	Control Unit #

STEP IDENTIFICATION AND REPLACEMENT PARTS INFORMATION

This manual has been provided to assist you with the identification, operation, maintenance, and troubleshooting of any Kwikkee electric step manufactured after January 2002 that is equipped with a door switch, a power switch, control unit and a permanent magnet motor. It does not apply and should not be used as a reference to any other previous versions of a Kwikkee electric step.

INTRODUCTION

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 override system will engage and the step will automatically retract.

The "Last Out" feature is another safety feature designed to extend the step when the door is opened for the first time after the vehicle ignition is turned off, even if the 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.

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

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

OPERATION

1. After the installation is complete and with the entrance door open, turn the power switch on.

NOTE: Some steps are not equipped with a power switch. They are activated only with a door switch.

2. Close the door. The step should retract and lock in the "in" position.
3. Open the door. The step should extend and lock in the "out" position.

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.



4. If your step is equipped with a power switch, turn it off. The step should remain in the extended position 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 is not connected to an ignition power source, the ignition safety system will be inoperative and the step will remain in the extended position. In this case, the power switch must be turned on for the step to retract.

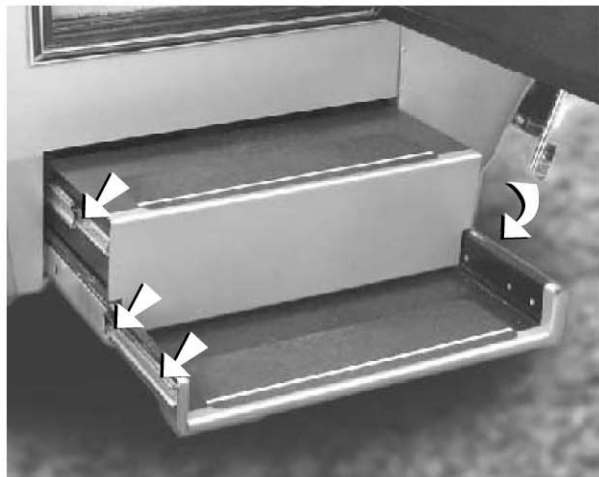
6. Turn the vehicle ignition off and open the door. The step will extend and lock in the "out" position. This is the "Last Out" feature.
7. The "Last Out" feature is only operative the first time the door is opened after the vehicle ignition is turned off.

When the vehicle ignition is on, the step will always activate with the door movement, regardless of the power switch position.

NOTE: If the yellow wire from the four-way connector is not connected to an ignition power source, the "Last Out" feature will not operate.

MAINTENANCE

FIGURE 1 Power wash and spray dry lubricant on bearings on both sides of step.



LUBRICATION

1. Clean all mud, salt, and road grime from the step before lubricating. Power wash and spray dry lubricant on the bearings (see **Figure 1**.)

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

2. Maintain clean, dry electrical connections at the two-way and four-way connectors and any butt connections leading from the four-connector to the vehicle. A small dab of di-electric grease at the connections and replacing corroded butt connections with heat shrink type crimp style automotive connectors will help maintain a good electrical source for the step.

ADJUSTING THE OUT STOPS

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

1. Loosen the stops so they move freely and retract the step.

2. Extend the step fully to its locked extended position. Be sure that the motor assembly linkage rests against the steel plate as illustrated in **Figure 2**. Repeat if needed until the motor assembly locks in the extended position.

3. Push the stops against the lower tread and tighten securely. Be sure that both stops are tightened and that they rest securely against the lower tread.

4. Retract the step. Check to be sure that both stops are secure against the top tread (see **Figure 3**.) Repeat the above procedures if needed to properly adjust the stops.



WARNING: When the stops are out of adjustment, the step may feel loose when stepped on.

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

CAUTION: Be sure that nothing can get caught in the step

FIGURE 2

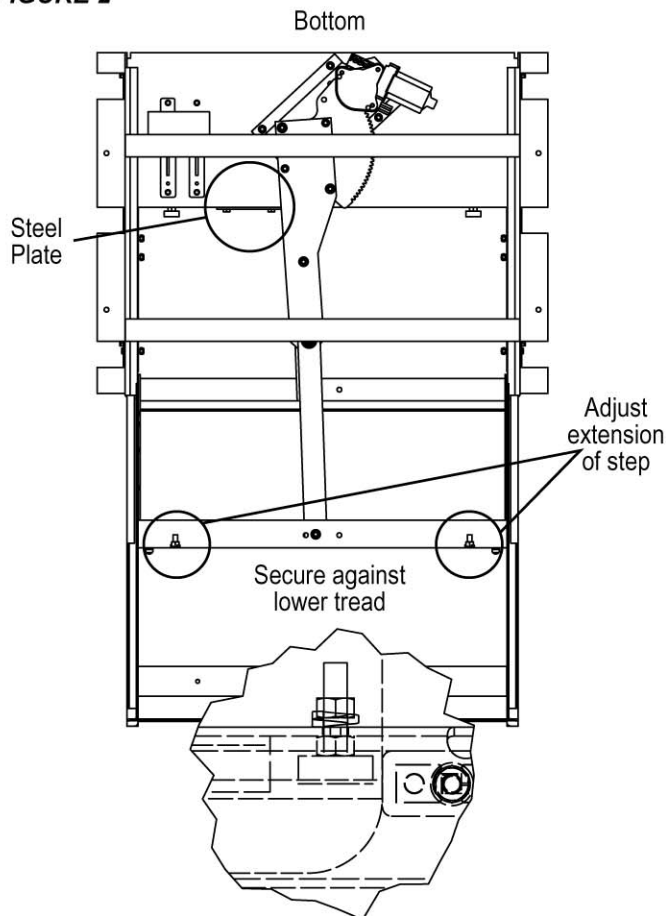
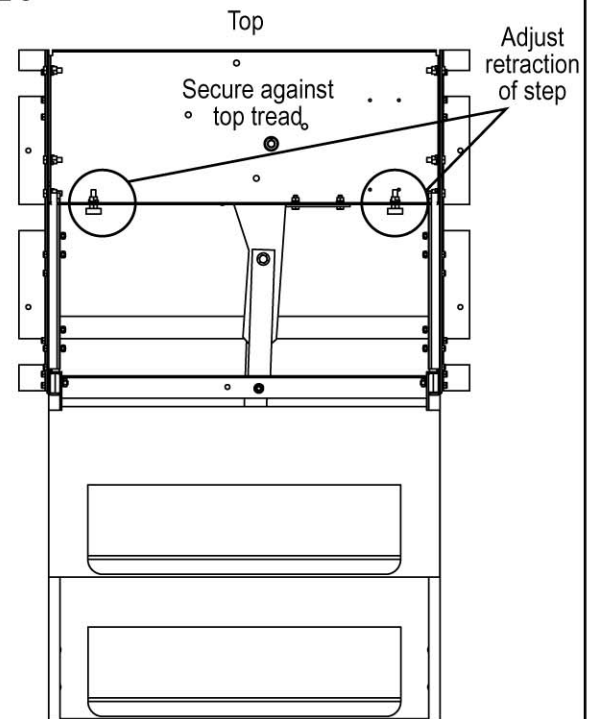


FIGURE 3



GENERAL SERVICE NOTES

These general service notes and the Step Test Procedures address the most common questions about KwikEE electric steps. Due to the number of variable conditions, you may experience symptoms other than those covered. Please feel free to contact the Customer Service Department at (574) 537-8900 for further information or assistance.

TROUBLE SHOOTING AND TESTING PROCEDURES

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.

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

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

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

The step may also operate erratically if 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 ground to the control unit is lost, either between the step control unit and the vehicle chassis (the long green ground wire) or between the vehicle battery and the ground (negative battery cable) the step will not function. Make sure the battery terminals and all wire connections are clean and tight. Verify that all wires meet the minimum requirements specified in **Figures 4 and 5** on Page 8.

The following Step Test Procedures have been provided to troubleshoot and test all of the KwikEE automatic electric step functions. They are designed to initially check the step's basic functions separately from the RV wiring to determine whether or not the step is malfunctioning. The following procedures test the various components of the step until the source of the malfunction is located. Using these procedures will shorten and reduce the time spent troubleshooting.

Some portions of the test procedures require additional equipment. This equipment includes: a voltmeter, a well charged 12 volt DC automotive battery, and a 4-way connector/pigtail (Part #909306000, available from KwikEE Products Company).

Read the entire procedure prior to testing. If you need assistance contact KwikEE's Service Line at (574) 537-8900.

TESTING THE STEP

1. Inspect the step for visible damage that might restrict the step's operation.
2. Obtain a 4-way pigtail connector (part #909306000) from Kwikkee.
3. Disconnect 4-way connector on underside of step and connect step-half of the connector to the four-way connector pigtail. **See Figures 4 and 5** on Pages 8 and 9.

4. Set a fully charged 12 volt DC automotive battery beside the step.

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

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

5. To supply power, attach the red wire from pigtail to positive (+) post.
6. With the power and ground connections complete, all functions of the control unit can be checked at the four wires of the pigtail. The brown wire is the door switch, the white wire is the power switch, and the yellow wire is the ignition override.
7. To extend the step, touch the white wire to the battery's positive (+) post. The step should extend and remain extended.
8. To retract the step, hold the white wire to the battery's positive (+) terminal and touch the brown wire to the negative (–) terminal.



WARNING: Keep fingers, arms, and legs clear of step mechanism while performing these tests.



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.

IMPORTANT INSTALLER NOTES:

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

FIGURE 4: Wiring diagram for step with control unit

The diagram illustrates the electrical connections for a step assembly. It is divided into two main sections: **Vehicle Wiring** and **Step Wiring**.

Vehicle Wiring: A 12 volt DC battery is connected to a 20 amp fuse or circuit breaker. The positive terminal (+) is connected to a battery disconnect box/switch. The negative terminal (-) is connected to the chassis ground. A 5 amp maximum fuse or circuit breaker (not supplied) is also shown.

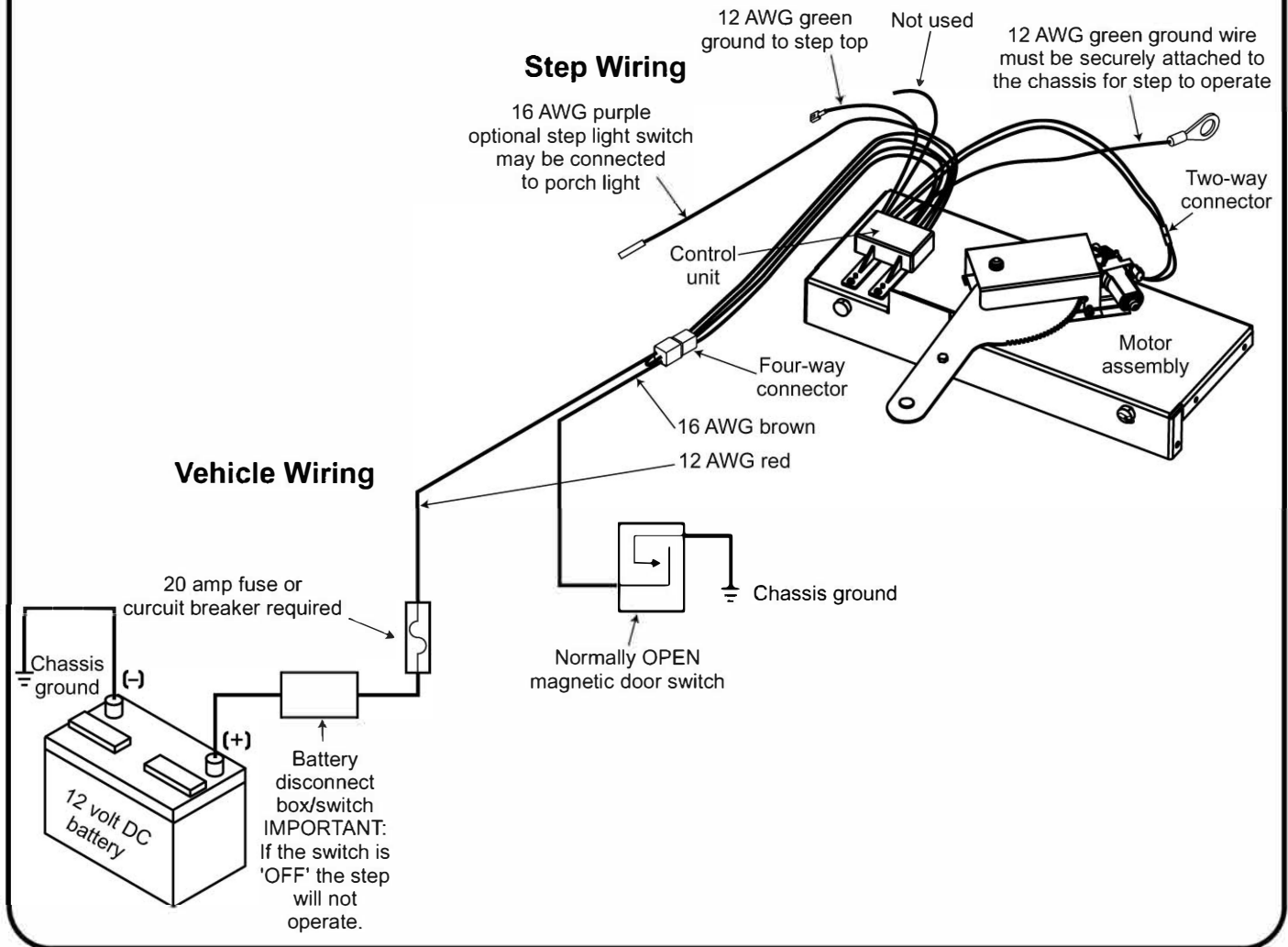
Step Wiring: The control unit is connected to the motor assembly via a four-way connector. The control unit has several wires: 12 AWG green ground to step top, 16 AWG purple optional step light switch (may be connected to porch light), 16 AWG brown, 16 AWG yellow, 12 AWG red, and 16 AWG white. The motor assembly is connected to the chassis ground. A power switch is connected to the 12 AWG red wire and the chassis ground. A 12 AWG green ground wire must be securely attached to the chassis for the step to operate. A two-way connector is also shown.

Important Notes:

- Fuse block IMPORTANT:** The yellow wire must go to a terminal marked IGN (ignition) or to another terminal that is hot when the ignition is turned on.
- IMPORTANT:** If the switch is 'OFF' the step will not operate.
- 12 AWG green ground wire must be securely attached to the chassis for step to operate.**

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

FIGURE 5: Wiring diagram for steps with door switch only operation



TESTING THE MOTOR

1. Disconnect the two-way connector between the step motor and the control unit.

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

TESTING THE 4-WAY CONNECTOR

1. To check the main power source, connect a voltmeter between the red wire from the 4-way connector (vehicle half) and the ground terminal at the end of the control unit's green ground wire (see **Figure 6** on Page 9). The reading should be a minimum of 12 volts DC.

If the voltage reading is low, there may be a loose or corroded connection at the battery, a low charge level on the battery itself, or a poor ground. If the voltage reading is zero (0)

volts, check the step fuse/circuit breaker, all connections, and the condition of the wiring between the battery and the plug, including the ground connection at the chassis.

2. To check the power switch, connect a voltmeter between the white wire from the 4-way connector (vehicle half) and the terminal at the end of the control unit's green ground wire (see **Figure 7**). The reading should be a minimum of 12 volts DC (the same as in Step 1) when the switch is on, and zero (0) volts DC when the switch is off.

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



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

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

3. To check the door switch, connect a voltmeter between the red wire from the 4-way connector (vehicle half) and the brown in the same connector (see **Figure 8**) on Page 11). The voltage should be a minimum of 12 volts DC (the same as in Step 1) when the door is closed and zero (0) volts when the door is open.

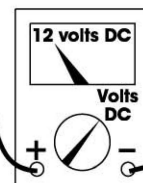
If the readings are incorrect, there is a problem with the switch. Check the door switch and the condition of the circuit's wiring and terminal connections.

FIGURE 6: Check power source

4-way connector
(vehicle-side)

Red

Ground wire: green ground wire must be attached to vehicle chassis; a good ground is needed for proper step operation



Voltmeter should read 12 volts DC

FIGURE 7: Check power switch

4-way connector
(vehicle-side)

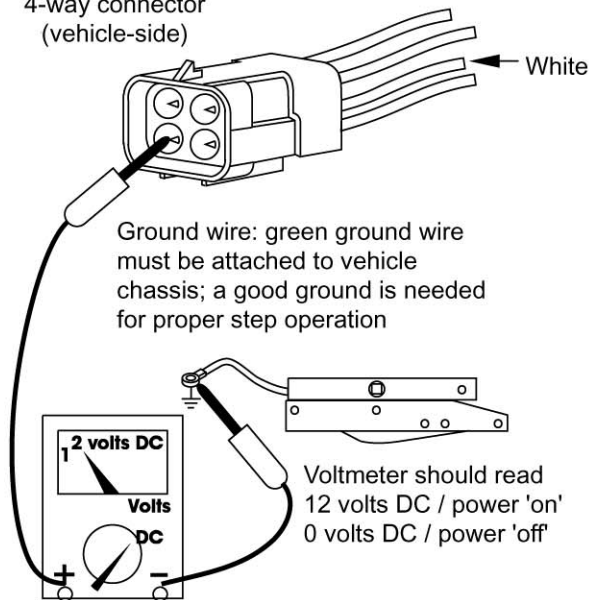


FIGURE 8: Check door switch

4-way connector
(vehicle-side)

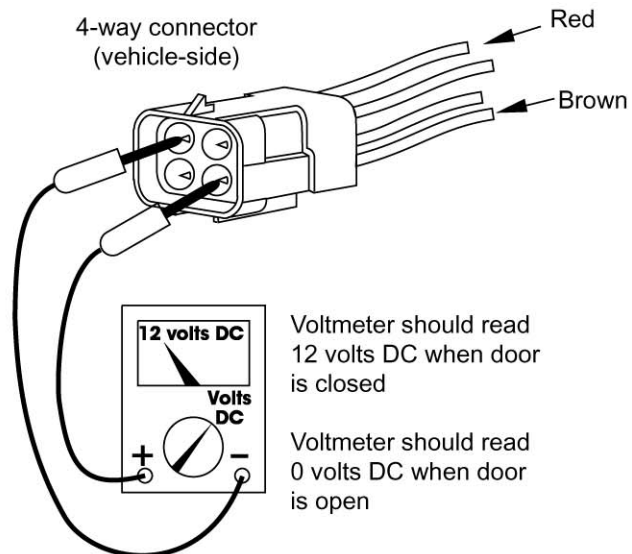


FIGURE 9: Check ignition override

4-way connector
(vehicle-side)

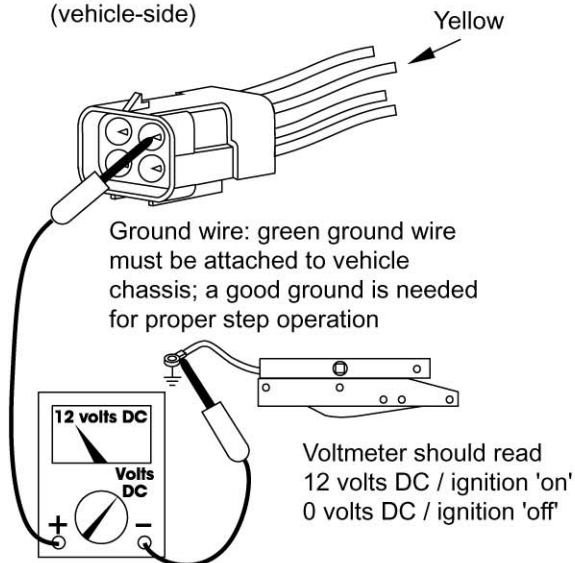
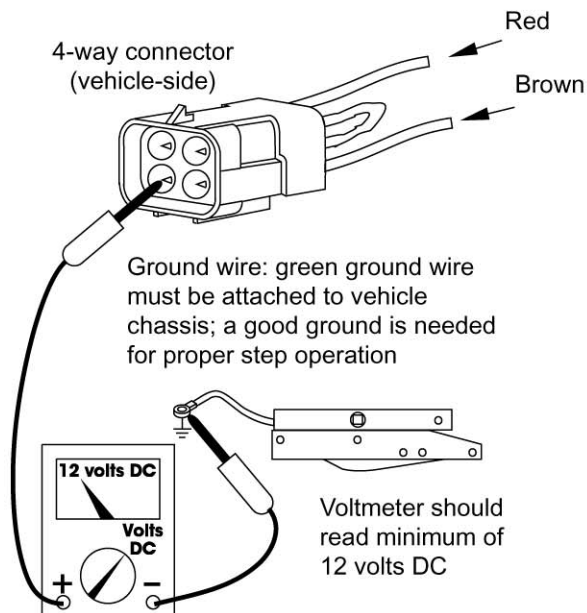


FIGURE 10: Check connector

4-way connector
(vehicle-side)



4. To check the ignition override system, connect a voltmeter between the yellow wire from the 4-way connector (vehicle half) and the ground terminal on the end of the control unit's green ground wire (see **Figure 9**.) The voltage reading should be approximately 12 volts DC when ignition is on and zero (0) volts when ignition is off.

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

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

5. For steps equipped with door switch only operation: Connect the white jumper wire from the vehicle half of the four-way connector and the ground terminal at the end of the control unit's green ground wire (see **Figure 10**).

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

The reading should be a minimum of 12 volts DC. If the voltage reading is low, there may be a loose or corroded connection at the battery, a low charge level on the battery itself, or a poor ground. If the voltage reading is zero (0) volts, check the step fuse/circuit breaker, all connections, and the condition of the wiring between the battery and the plug, including the ground connection at the chassis.

If you have additional questions or need more assistance, contact Kwikkee's Service Representative at (574) 537-8900.



THE INFORMATION CONTAINED HEREIN IS FOR INFORMATION ONLY.
IT IS NOT INTENDED TO BE USED AS A SUBSTITUTE FOR THE
ORIGINAL INSTRUCTIONS.



KwikTest Users Manual #909518000

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Kwikkee #1420994 Rev. 3



KwikTest Part #909518000
(includes 4-way connector)

KwikTest Users Manual Part #909518000

Connecting the KwikTest unit to the Step (See Figure 1, Page 2)

Step 1) Attach the Packard style four-way connector from the KwikTest to the four-way connector on the step control unit.

Step 2) Connect the red wire clip to the positive post on the battery.

Step 3) Attach one of the green wire clips to the negative post of the battery. Attach the other green wire clip to the ring terminal on the end of the 12 gauge green ground wire coming from the step control unit.

KwikTest Set Up: For all steps except those with Control Unit #909510000

Step 4A) Set the Control Switch to "black" or "white" depending on the color of the control unit on the step being tested.

A. Testing Procedures For all steps except those with Control Unit #909510000

Run the following test a minimum of 6 cycles, allowing 3 to 5 seconds between opening and closing the Door Switch to give the control unit internal relays enough time to reset.

NOTE: On steps fitted with the rubber four-way plug, use the four-way plug/pigtail (included with the KwikTest) to make the connection between the step control unit and the tester.

For steps with other than Control 909510000

For all steps except those with 909510000 Control

Perform tests in sequence listed.	Ignition Switch		Power Switch		Door Switch		Step Function				Step Light	
	OFF	ON	OFF	ON	CLOSED	OPEN	GOES IN	STAYS IN	GOES OUT	STAYS OUT	OFF	ON
Test 1 Settings	■			■	■		✓				✓	
Test 2 Settings	■			■		■			✓			✓
Test 3 Settings	■			■	■		✓				✓	
Test 4 Settings	■			■		■			✓			✓
Test 5 Settings	■		■			■				✓	✓	
Test 6 Settings	■		■		■					✓	✓	
Test 7 Settings		■	■		■		✓				✓	
Test 8 Settings		■	■			■			✓		✓	
Test 9 Settings		■	■		■		✓				✓	
Test 10 Settings	■		■		■			✓			✓	
Test 11 Settings	■		■			■			✓		✓	

Check step response

Tests Ignition Override Feature

Tests 'Last Out' Feature

At this point the step should remain extended until one of the following occurs:

- The Door Switch is flipped "close" and the Power Switch is in the "on" position, or
- The Door Switch is flipped "close" and the Ignition Switch is in the "on" position.

NOTES: (1) The ignition override will not work until the door is closed. (2) For steps fitted with a white control unit, the 'last-out' feature will be disabled by turning the power switch on and then off (between steps 16 and 17), or if the power switch is "on" when the ignition is turned "off" and is then turned "off" before the door is opened. These sequences will disable the 'last-out' feature and the step will not extend.

Troubleshooting

If a problem is discovered during the testing procedure, follow the troubleshooting guide below to determine the source of the problem.

Disconnect the motor leads from the control unit. Apply 12 volts to the red wire on the motor only and attach the yellow wire to ground. This will cause the motor to extend the step.

Reverse the polarity to retract the step. Repeat this function 15-20 times. If the step functions properly the motor is fine.

Examine the step frame. Check to see if there is any binding or obstruction impeding the movement of the step.

To thoroughly check the frame you must disconnect the drive linkage from the frame by removing the cotter pin and clevis pin from the end of the linkage. Removing the pins is easier if the step is not fully extended. To stop the step midway out, simply apply enough pressure with your hand to the leading edge of the step to stop its motion. The control will sense the load and stop the step.

Disconnect power to the step either at the battery or by disconnecting the four-way connector between the step control unit and the coach wiring harness. Once the pins have been removed, manually push and pull the step in and out. The frame will need to be free from binding or stiffness in both directions.

If the motor and frame check out, the source of the problem may be in the coach wiring (including the door switch), low voltage, fuses, etc.

If there are any questions, please call **Kwik Customer Service at (574) 537-8900.**

For steps with Control 909510000

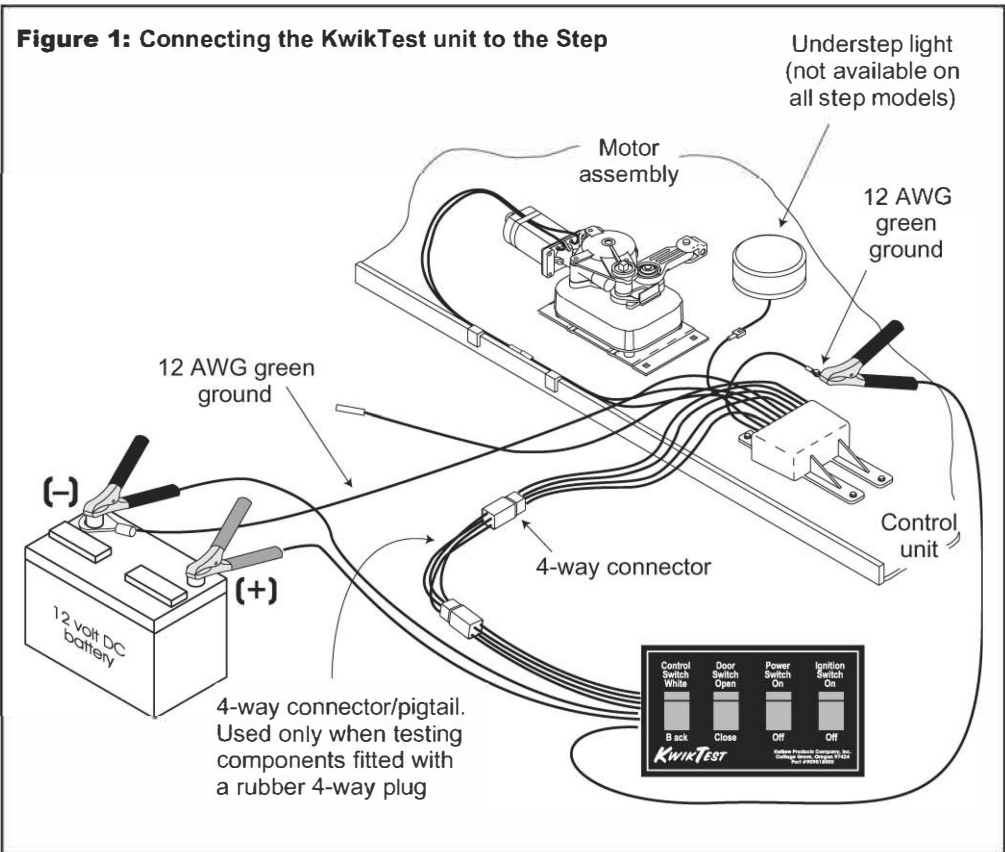
B. KwikTest Set Up: For all steps with Control Unit #909510000

Step 4B) Set the Control Switch to "black."

B. Testing Procedures For all steps with Control Unit #909510000

Run the following test a minimum of 6 cycles, allowing 3 to 5 seconds between opening and closing the Door Switch to give the control unit internal relays enough time to reset.

For steps with 909510000 Control													
Perform tests in sequence listed.	Ignition Switch		Override (Power) Switch		Door Switch		Step Function	Step Light					
	OFF	ON	OFF	ON	CLOSED	OPEN		GOES IN	STAYS IN	GOES OUT	STAYS OUT	OFF	ON
Test 1 Settings	■		■		■		Check step response	☑	☐	☐	☐	☑	☐
Test 2 Settings	■		■			■		☐	☐	☑	☐	☐	☑
Test 3 Settings	■			■		■		☐	☐	☐	☑	☐	☑
Test 4 Settings	■			■	■			☐	☐	☐	☑	☑	☐
Test 5 Settings		■		■	■			☑	☐	☐	☐	☑	☐
Test 6 Settings	■			■	■			☐	☑	☐	☐	☑	☐
Test 7 Settings	■			■		■		☐	☐	☑	☐	☐	☑



MAINTENANCE: LUBRICATE WITH KWIKLUBE

NOTE: Silicone lubricants and WD-40 are not recommended as they tend to evaporate and dry the mating surfaces, leaving them vulnerable to the elements.

Clean all mud, salt, and road grime from the step before lubricating. With a good quality moisture and heat-resistant penetrating grease, lubricate all moving parts including:

- Bearings
- Pivot points
- Slides
- Clevis pin
- Drive linkage ball

Refer to diagrams below for lubrication points. Please note that diagrams are to be used for general reference only. Some may not pertain to your particular step model.

KwikLube™ Spray Grease is specially formulated to lubricate Kwikkee Electric Steps and is recommended for lubricating all moving parts. KwikLube is a unique aerosol grease with hundreds of automotive, household, and industrial uses in addition to lubricating the steps. It sprays on and into hard to reach places, changing from a penetrating fluid to a tough, protective grease in a matter of minutes. The cured film is impervious to moisture and withstands temperatures above 400°F (204°C). The formula also contains additives to prevent rust and reduce wear.



FIGURE 1

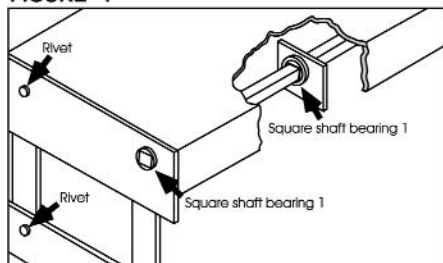


FIGURE 2

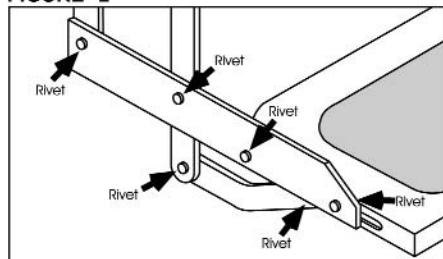


FIGURE 5

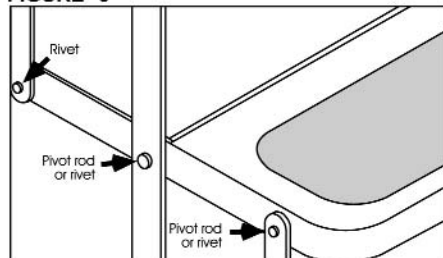


DIAGRAM NOTES:

Fig. 1 & 3: Square shaft bearing: lubricate around outside and under bearing head.
Fig. 4: On step models equipped with plastic cover, this cover will have to be removed to lubricate center bearing. Lubricate bearings under cover every 90 days. Figure 4 also shows bushing-in-bushing lubrication.

Maintain clean, dry electrical connections at the two- and four-way connectors and any butt connectors leading to the vehicle. Apply a small dab of di-electric grease at the connections and replace corroded butt connectors to maintain a good electrical source for the step.

FIGURE 3

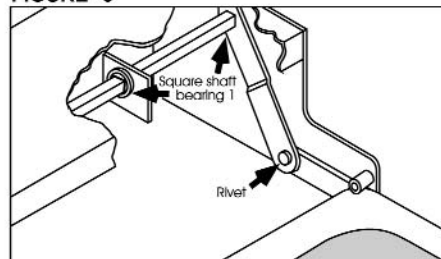


FIGURE 6

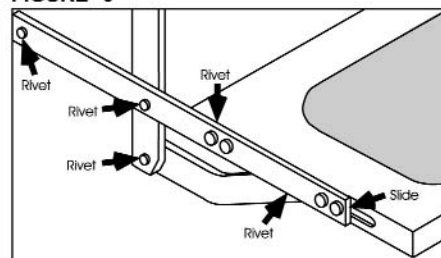


FIGURE 4

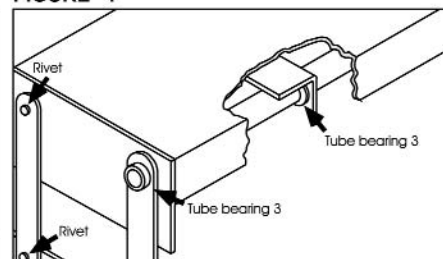
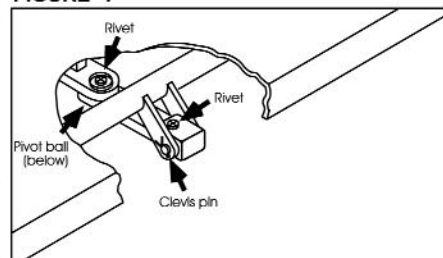


FIGURE 7



MAINTENANCE: ADJUSTING THE CAM STOP

Applies to the 24, 25, 27, 32, 34, 35, 36, 38, and 40 Series Steps

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

Kwikkee steps are fitted with adjustable cam stops on the step frame that help lock the step in the "out" position, creating a firm stepping platform and relieving load-bearing stress on the motor and drive linkage. The cam is adjusted at the factory but due to the rigors of shipping, installation, and normal use the cam may fall out of adjustment and need to be tightened.

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

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

1. Loosen the stops so they move freely and retract the step.

CAUTION: Be sure that nothing can get caught in the step mechanism.

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

FIGURE 1 This view shown with motor removed and parts exploded for clarity only. These parts need not be disassembled to adjust cam stops.

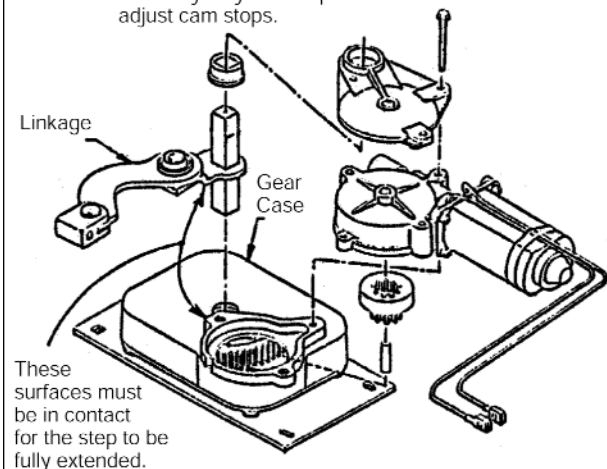
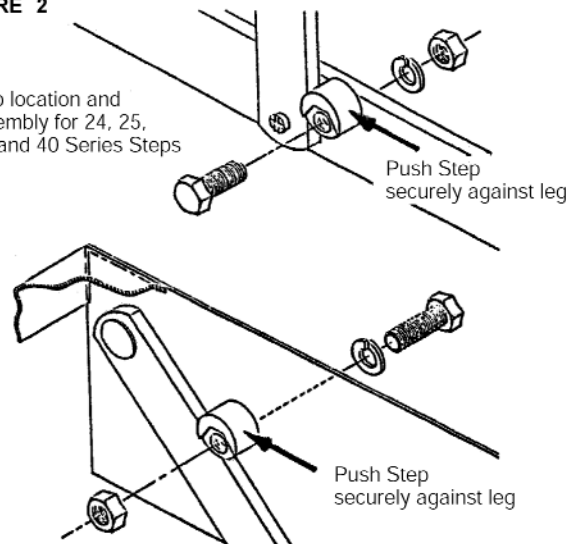


FIGURE 2

Stop location and assembly for 24, 25, 27, and 40 Series Steps

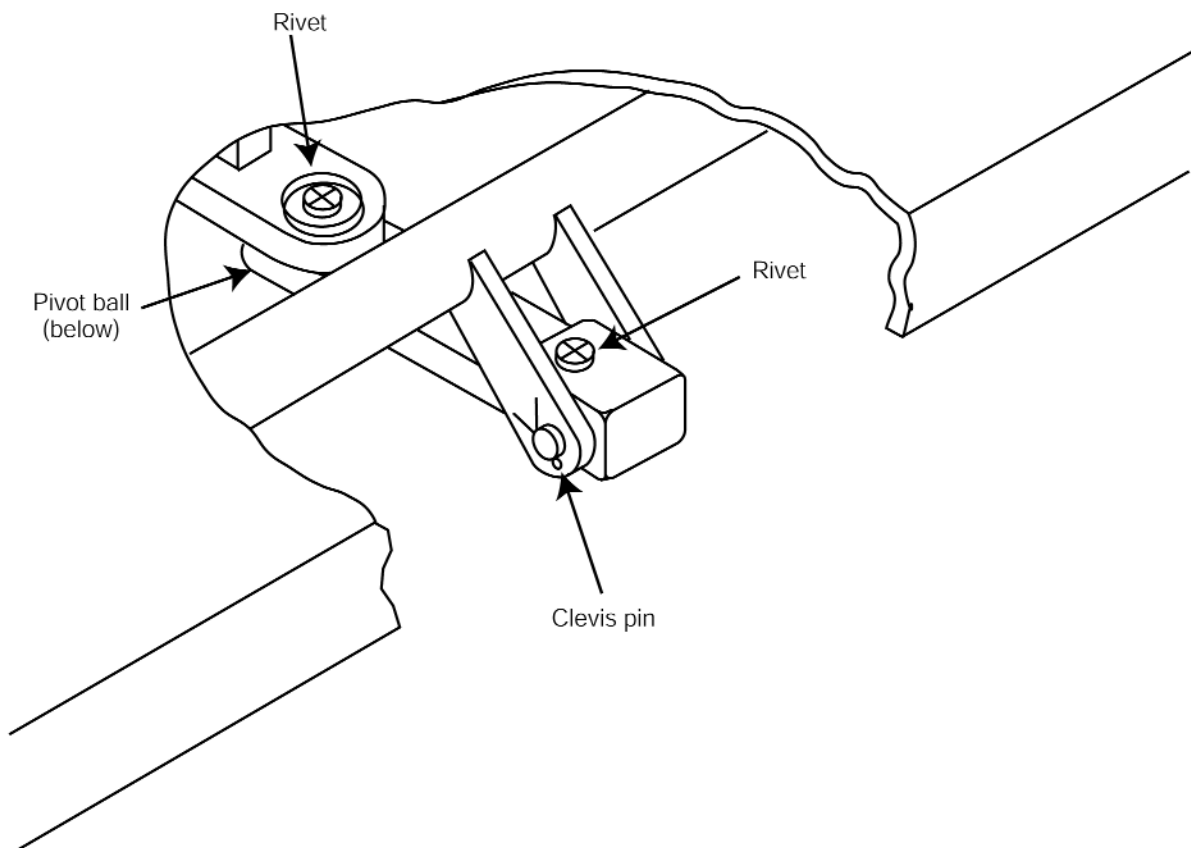


Stop location and assembly for 32, 34, 35, 36, and 38 Series Steps

MAINTENANCE: MANUAL RETRACTION OF THE STEP

NOTICE: Before attempting any motor assembly repair work, please read all of the following instructions.

1. To manually retract the step, the step needs to be partially or fully extended to expose the drive linkage. If possible, extend the step with the standard Door Switch operation. If that is not possible, it is necessary to remove the clevis pin.
 2. Unplug the four-way connector from the Control Unit.
 3. Remove the cotter pin from the clevis pin at the linkage assembly.
 4. Remove the clevis pin from the case "U" block in the end of the linkage assembly. Note the direction the clevis pin goes into the cast block. If the step is in its locked position, the pin may have to be pried or driven out of the block.
- Once the clevis pin is removed, the step tread(s) should now swing freely. If they do not, check for a bent step frame or jammed pivot point(s).



DOOR SWITCHES

When troubleshooting a coach, you may run into any of these door switches. The important thing to determine is whether the switch is “normally open” or “normally closed.” Use the chart below to identify the switch.

The current IMGL (integrated motor/gear box/linkage) and 909510000 Control Unit operates properly with any of the belowed listed “NORMALLY OPEN” switches.

Kwikkee Door Switch Replacement Parts Guide

Magnetic,
small
rectangular

Magnetic,
3/4" core
round

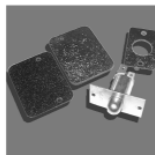
Magnetic,
large
rectangular

Magnetic,
3/8" core
round

Plated
plunger
switch

White (Normally Closed)

Used for all color controls manufactured prior to 2/99. Does NOT include "black" controls #909506000, #909507000



Part # **905312000** **905314000** **905306000** **905307000** **905302000**

Black (Normally Open)

Used for "black" controls since 2/99 including controls #909506000, #909507000, and #909508000.



Part # **905323000** **905324000** **905326000** **905327000** **905328000**