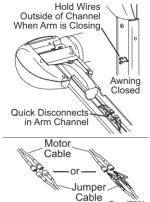
SECTION 4: VEHICLE OPERATION

Locate and separate the quick disconnects located in the motor arm channel. Position the wires from the motor on the outside of the channel.

- Attach jumper wires to the motor wires. Connect the other ends of the jumper leads to the 10VDC– 14VDC source. If the awning moves in the wrong direction, reverse the leads.
- 2. Maintain contact throughout the retraction process.
- 3. Hold the wires from the motor on the outside of the channel while closing the awning. This provides access for opening the awning.
- 4. When power is restored, use the jumper wires and extend the awning to access the cable disconnects. Reattach the disconnects and secure in the arm channel.



Additional Awning Operation Information

- When rolled out, the fabric may "bounce" creating a wave like motion in the canopy fabric. This can creates the appearance of moving jerkily.
- □ Vinyl may have a tendency to "cling" to the when not used for an extended period of time. Open and close the awning in short bursts 2 or 3 times, the awning will then open normally.

If the awning does not operate, contact the Carefree Service Center. See www.carefreeof-colorado.com for a listing of service centers.

ELECTRIC SLIDE ROOM(S) (IF SO EQUIPPED)

The mechanical components of the slide out are gear driven. Electric powered slideout room systems have a manual override to allow you to extend or retract the slideout room(s) in case of a power loss.

Make sure you have sufficient power available before operating your slideout system.

Level the RV prior to extending the slideout.

Slideout switches are typically located inside the RV, either in the command center or on the wall.

A WARNING

- ☐ Make sure the interior slideout room path and the slideout room itself is clear of people and objects before operating.
- Keep away from the slide rails and gear assembly when the room is in motion. They may pinch or catch on loose clothing causing personal injury.

Failure to follow these instructions could result in serious injury or death

A CAUTION

These guidelines should be followed when using your slideout room:

- ☐ Make sure the slideout is in the closed position prior to hooking the unit to the tow vehicle.
- ☐ The recreation vehicle **must be level** before operating the slideout room. Water leaks and other problems could result if the slideout is operated without leveling the RV.
- Do not place excessive weight in the slideout room. It can cause the slideout room to malfunction and cause damage to the slideout.
- Do not over extend/retract the slide out room. Release the switch immediately once the room has been fully extended/retracted. Over extending/retracting the slide out room may result in damage to the stop rod and bracket.
- Additional support jacks are not needed under the slideout. Damage can occur to your slideout room from improper use of aftermarket support jacks.

If your RV is equipped with a touch screen control system, your slide room controls will be built into the touch screen system.

General Slideout Operation

- The auxiliary battery (customer supplied) must be fully charged and connected. If possible, the RV should be hooked up to 120-volt AC power so the converter operates.
- The RV must be level and the **stabilizer jacks in the extended position**.
- Slideout switches are typically located inside the RV, either in the command center or on the wall.
- To extend the slideout, locate the slideout control switch and press the OUT section of the switch; hold until the slideout room stops (travel time is approx. 25 seconds).

SECTION 5: SLIDEOUT SYSTEMS

To retract the slideout, press the in section of the slideout control switch and hold it until the slideout is fully retracted.

Operating the switch after the room is fully extended or retracted may damage the switch and motor.

After the slideout is extended, visually inspect the slideout and the surrounding area to make sure the slideout has extended properly and has adequate clearance from any outside obstructions.

If the slideout is equipped with rubber seals, verify that the corners of the black rubber seal are set up correctly. The seal corners are cut at a 45° angle. The top of the outside seal must overlap the side of the seal to avoid the possibility of water penetration. On the inside seal, the side seal should overlap the top.



Slideout Overlap-Outside



NOTE: For long-term storage it is recommend the room be closed (retracted).

General Slideout Troubleshooting Checklist



 $\underline{\mathbf{NOTE:}}$ For additional troubleshooting information, refer to the specific slideout system detail.

If the slideout does not move when the slideout switch is depressed, follow these steps:

- Check the auxiliary battery (customer supplied) for a full charge and good wire connections.
- Check the 12-volt fuse or circuit breaker.
- ☐ Check for loose connections at the slideout motor.

If the slideout still will not operate, follow these steps:

- If the slideout is extended, refer to the section on operating the specific slideout system installed on your RV.
- If the slideout is retracted, leave it in that position.

If the slideout extends crooked or only one side moves:

- Follow steps on overriding the specific slideout system installed on your RV.
- \(\subseteq\) You may need to push the side that is not sliding to get it to retract all the way.

Contact your dealer or customer service for repair assistance.

Slideout Systems

Your RV may be equipped with one or more of the following slideout systems.

Flush Floor Slideout

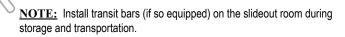
For optimum performance, the slideout system requires full battery current and voltage. Although the system is almost maintenance free, actuate the room once or twice a month to keep the seals and internal moving parts lubricated.



Trouble shooting the flush floor slideout

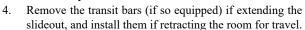
Refer to the general troubleshooting check list before proceeding.

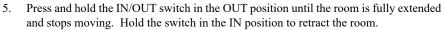
Electric Operation



Extending/retracting the room

- 1. Level the unit.
- 2. Main Power switch at stepwell (locations may vary) must be ON.
- Verify the battery is fully charged and hooked up to the electrical system.





6. Release the switch, which will lock the room into position. If the slideout switch is held after the room is fully extended or retracted, the control will sense that the room has stopped and will shut the motor off after a few seconds.

Manual Operation for the flush floor slideout

Locate the crank extension under the inside of the frame (Fig. 1 and 2). Attach a standard fifth wheel landing gear crank handle, a ³/₄" socket and ratchet, or drill and nut driver.

Rotate the extension clockwise to retract the slideout and counterclockwise to extend it.

DO NOT attempt to disengage the motor as the actuator is "manual ready".

A CAUTION

- Always disconnect battery from system prior to manually operating system. Failure to disconnect battery can cause electricity to back feed through the motor and cause serious damage to the system as well as void the warranty
- Use EXTREME CAUTION when extending/retracting the room using the manual override feature. The gears can be stripped out if the room is manually retracted/extended to its fullest extent and the operator continues to rotate manual override. Damage can also occur to the slide components, slide room structure or trim components. Damages due to misuse of the manual override feature will void any and all claims to the Limited Warranty.



MANUAL OPERATION THROUGH FRAME







Fig. 2-Through Frame Crank Extension w/Pin

MANUAL OPERATION IN FRAME



Fig. 3-Hex Head Crank Extension



Fig. 4-Ratchet

Schwintek In-Wall Slideout System

The in-wall slideout system requires no maintenance or adjustments. This system has two vertical columns with a drive motor located at the top of each column. The right and left motors are synchronized by a circuit board. Schwintek slideouts are typically used on both towables and motorhomes.

NOTE: Do not operate the switch after the room is fully extended or retracted as damage can occur to the motor and/or switch.

To operate the slideout using a wireless remote (if so equipped):

- ☐ Press the on/off button to power on the remote.
- Press the corresponding button of the slideout you want to operate.
- Press and hold the (extend/retract) arrow button to move the room in or out.
 - Press the on/off button once more to power off the remote.

ALWAYS allow the controller to stop both motors before releasing the switch button.

DO NOT try to time the end of the stroke by releasing the button early.

Maintenance

A WARNING

Do not work on your system unless the 12-volt DC (auxiliary battery) and 120-volt AC electrical systems (shore line power cord) have been disconnected.

This slideout system requires very little maintenance. It contains a pre-lubed bearing that is lubricated when the room is moved in and out. Do not spray oil or grease on the rails while the room is extended.

Trouble shooting the in-wall slideout system

Checking Fuses: The in-wall slide requires a minimum 30-amp fuse. Check the load center for blown fuses and replace any if necessary. If the fuse blows immediately upon replacement, there is a problem with the wiring to the in-wall slide control box. A qualified service person should be called to check and repair.

Obstructions: Check both inside and outside for possible obstructions. Also check for smaller objects that may be wedged under the floor or in the sides of the unit. Remove any obstructions before proceeding.

Error Codes: Refer to the error codes section for codes and instructions on how to locate the in-wall slide controller.

Low Voltage: The in-wall slide controller can operate with as little as 8 volts; however, with lower voltages the amperage requirement is greater. Check the voltage at the controller and if it is lower than 11 volts, it is recommended that the battery be placed on a charger until it is fully charged. It may be possible to "jump" the RV battery temporarily to extend or retract the room. Consult Customer Service before attempting to "jump" the auxiliary battery.

Only 1 Side Moving: The slide room has a separate motor to operate each side of the room. If only 1 side is moving, with another person's assistance, press the switch to extend or retract the room while pushing the non-moving side in the appropriate direction. On larger rooms it may be necessary to have 2 or more people pushing the room.

Non-moving side moved manually: Try to push the non-moving side in and out. If a motor shaft has broken it will be possible to move that side of the room several inches by hand. Larger rooms may require several people to push.

Debris in the rack: Check all 4 gear racks on the side of the room for debris.

Status LEDs lights: Locate the slide controller for the slideout in question. Check the status LED lights while pressing the slideout direction switch (in both the extend and retract mode).

Manual override for the in-wall slideout

The slideout system comes with an "electronic" manual override. In event the slide out does not extend or retract follow these steps to override the system which should allow the slideout to be retracted.



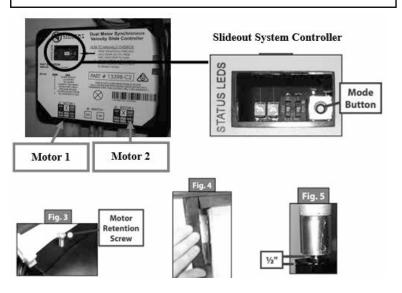
NOTE: Fuses for the slideouts can be found in the load center and may be designated as auxiliary or slideout motor.

- Locate the slideout system controllers. There should be one for each slideout on the recreation vehicle. They are typically located on the forward wall or ceiling of a basement compartment. In some models they may be behind a cargo lined panel.
- 2. The malfunctioning controller should have a flashing red LED indicating a halt signal fault (will flash 8 or 9 times).
- 3. Press the "mode button" six times quickly, then press a seventh time and hold for approximately 5 seconds.
- The red and green LED's will flash indicating you are in override mode. Release the mode button.
- Using either a wall or command center panel switch, press and hold the switch toward
 the word IN or RETRACT until the unit comes in completely. This will allow you to
 get the recreation vehicle to a service center to have the slideout malfunction diagnosed.

A CAUTION

Call your dealer or Customer Service if:

- During the override procedure the motors are not synchronized. Visually watch the room, and if one side is moving significantly slower than the other (or not at all).
- If the system stalls our before reaching end of stroke OR if the room does not close and seal tightly.



Manually pushing in the slideout

- 1. Locate the slideout system controller.
- 2. Unplug motor 1 and motor 2 connectors at the bottom of the slideout controller. This releases the motor brakes for each motor.
- 3. The slideout room can now be manually pushed in. Larger rooms may require several people to push or pull them.
- 4. Keep both sides of the slideout relatively even while pushing/pulling.
- 5. When the room is completely in, *plug both motor connectors back into the control module. This will apply the motor brakes for road travel.*

Disengage motors, manually retract the room and travel lock

- 1. Locate and remove the motor retention screw, which can be found near the top of each vertical column (Fig. 3).
- 2. Bend back the wipe seal and visually locate the motor (Fig. 4).
- 3. Pull the motor up until it disengages (about 1/2 inch).
- 4. Repeat this process for both sides of the slide room.
- 5. Physically push/ pull the room back into the opening; keep both sides relatively even.
- 6. The room must be travel locked to keep the room in place for road travel.

A WARNING

DO NOT MOVE THE RV UNLESS THE MOTORS ARE PLUGGED IN TO THE CONTROLLER AND THERE IS BATTERY POWER TO THE RV. THIS SETS THE BRAKES ON THE SLIDEOUTS TO PREVENT THEM FROM MOVING DURING TRANSIT.

Error Codes

When an error code occurs during operation, the board LEDs lights will indicate where the problem is. For motor specific faults the green LED will blink (1) time for motor #1 and (2) times for motor #2. The red LED will blink 2 to 9 times depending on the error code. Error codes are as follows:

- 2 times **Battery capacity is low** enough to drop below 6 volts while running.
- 3 times **Battery (low) voltage** is below 8 volts at the start of a cycle.
- 4 times **Battery (high) voltage** is greater than 18 volts.
- 5 times **Excessive motor current** (high amperage) also indicated by (1) side of the slide continually stalling.
- 6 times Motor short circuit: motor or wiring to motor has shorted out.
- 8 times Hall signal not present: encoder not providing a signal; usually a wiring problem.
- 9 times **Hall power short to ground:** power to encoder has been shorted to ground; usually a wiring problem.

The board will need to be reset after an error code. Energizing the extend / retract switch will reset the board; energizing it a second time will return it to normal operation.

Refer to the Schwintek Slide Room Operation Guide for additional troubleshooting information, or contact Lippert at (866) 524–7821 or at www.lci1.com.

Norco Slideout System

The Norco slideout system is a cable driven slide out used typically on towable products.

- The cables guide the room in or out, while the Accu-Slide mechanism evenly powers the corners keeping the room square.
 Motors and cables are behind the interior fascia board around the slideout opening.
 Cables may stretch over time. Average stretch will be approximately 1/8" but it will not affect the function and does not require adjustment.
 Slideout runs off the DC power in the RV.
 Rubber wipes prevent debris from entering the unit and actuation guides the bulb seals to close tightly.
 Self-locking motor freezes the room in any position of travel.
- Slideout is supported by rollers or wear bars not the cables. Cables are used to keep the slideout balanced on the rollers.

If the room will not activate, generally there is no 12V power to the drive motor. The motor is equipped with a hex drive override shaft.

This drive can be activated using an electric drill and the flexible shaft provided with each unit (or use a ratchet to actuate the motor) to pull the room in or out. If the motor is functioning, check the room for obstructions.

SECTION 5: SLIDEOUT SYSTEMS

Norco Slideout Manual Operation

- 1. Locate the included flexible shaft in your owner's packet.
- 2. Attach flexible shaft to the 1/4" hex fitting on the end of the motor.



 Attach 1/4" socket & ratchet, or drill to the other end, and turn in the proper direction to move the room.

4.

 If the cables tighten, and the motor is difficult to turn, REVERSE THE DIRECTION. OVER-TORQUEING CAN HAPPEN, RESULTING IN SEVERE DAMAGE.

Power Gear Slideout System

Manual Override - The slideout system is equipped with a manual override that allows you to extend or retract the room in the event of a loss of power.

A CAUTION

- Always disconnect battery from system prior to manually operating system. Failure to disconnect battery can cause electricity to back feed through the motor and cause serious damage to the system as well as void the warranty
- Use EXTREME CAUTION when extending/retracting the room using the manual override feature. The gears can be stripped out if the room is manually retracted/extended to its fullest extent and the operator continues to rotate manual override. Damage can also occur to the slide components, slide room structure or trim components. Damages due to misuse of the manual override feature will void any and all claims to the Limited Warranty.

If the room does not move when the switch is pressed, check the following:

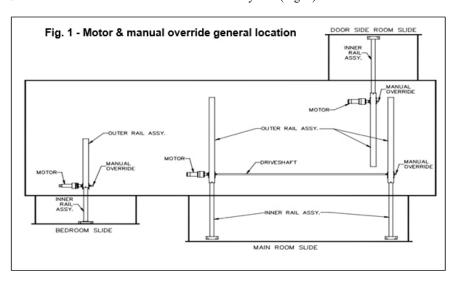
- ☐ Make sure the slideout system is turned on.
- ☐ Battery is fully charged and connected.
- ☐ Transit bars have been removed (if so equipped).

A WARNING

When the motor brake is disengaged the slideout room WILL NOT lock into place and will not be sealed. When the room has been manually retracted, be sure to install transit bars (if so equipped) and return the motor brake lever to its normal engaged position in order to seal and lock the room into position.

If the room still does not move when the switch is pressed, follow the steps below to manually override the slideout room:

- 1. Turn the Main Power OFF. The override will not work if it has power going to it. **Do not work on the system unless the battery is disconnected.**
- 2. Locate the slideout controller. There are two versions of the controller.
- 3. **Version 1**, unplug the 6 pin wiring harness from the controller.
- 4. **Version 2**, remove one of the motor leads, either the motor I or motor II lead from the controller.
- Locate the slideout motor (Fig. 1) mounted to one of the slideout rails. Some models may require removal of the underbelly or cover to access the motor. In a bedroom slideout, it may be located under the bed.
- 6. Rotate the brake lever, on the backside of the motor, counter-clockwise (looking from the rear of the motor) about 1/8 of a turn to the released position (Fig. 2). This will release the brake that holds the room in place.
- 7. Locate the manual override for the slideout system (Fig. 1).



1. The room is now free to move. Using either a 5/8" or 3/4" wrench or socket, crank the room either in or out completely. If the slideout system is supplied with a gearbox override (optional), use the crank handle to move the room.

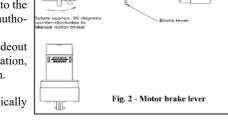
SECTION 5: SLIDEOUT SYSTEMS

a sealed position.

- 2. When the rooms is fully in or out have one person apply pressure to the wrench/ratchet and return the brake lever to its engaged position. This ensures the room is locked into
- Install the transit bars (if so equipped) to the slideout room and take the unit to an authorized dealer for service.
- Refer to the Power Gear® Electric Slideout Operation Manual for detailed operation, safety and troubleshooting information.

Power Gear Slim Rack Slideout System

The Power Gear® Slim Rack slideout is typically used for slideouts 144" long and longer.



- ☐ It is operated by a 12VDC electric motor.
- ☐ The system is equipped with a manual override allowing the room to be extended / retracted in the event of a power loss.
- The system has a controller (Fig 1) with programmable stops that stop the motor when the room is fully extended or retracted.
- ☐ The controller has the ability to detect faults for easier troubleshooting.
- A wall mounted touchpad allows room movement and provides end user feedback.



Fig.1 Slideout Controller

Operating the Slideout

The slideout will not function until the stops are properly set or faults are cleared.

A solid "ON" GREEN LED indicates room movement.

The RED LED indicates a fault or a problem with the system. (Refer to the *Fault Diagnostics / Troubleshooting*).

Prior to moving the slideout room set the parking brake.

To ensure ample voltage is being supplied to the slideout system motor, power should be supplied from one of the following sources:

- Attach the RV to shore power.
- ☐ Have the motorhome engine running.
- Turn on the generator.

Extending/retracting the room:

- Engine or generator must be running, or plugged into shore power.
- 2. Transmission must be in park or neutral (if applicable).
- 3. Set the parking brake and level the unit.
- 4. Remove transit bars (if so equipped) if extending the room; install if retracting.
- 5. Turn **ON** the on/off switch or key.
- 6. Press and hold the OUT button (Fig 4). To retract, press and hold the IN button. There will be a slight delay before the room begins moving.







ROOM SLIDEO

- The GREEN LED should be solid ON when room is in motion.
- 8. Release the OUT button when the room is fully extended or the IN button when fully retracted, and stops moving.
- 9. Turn **OFF** the on/off switch or key.

Fault Diagnostics / Troubleshooting:

The control has the ability to detect and display several faults.

When a fault is detected, room movement stops and two different LEDs will flash in a pattern.

The RED FAULT CODE LED (Fig 4) will flash a number of times corresponding to a specific fault code (refer to the Fault Code Chart).

The GREEN ROOM MOVEMENT LED (Fig 4) will flash GREEN a number of times corresponding to which motor has the associated fault.

Example: (4) RED flashes and (2) GREEN flashes indicate a motor fault on motor 2.

MAJOR and MINOR faults; faults must be cleared for the room to operate normally.

- ☐ MINOR faults can be cleared by pushing and releasing the IN or OUT buttons on the wall touchpad (Fig 4).
- MAJOR faults must be cleared by pushing and releasing the SET STOPS/CLEAR FAULTS button located on the back of the wall touchpad (Fig 2).

NOTE: For MAJOR faults, the control must be overridden by following the EMERGENCY RETRACT MODE in the OVERRIDE MODES section.

Fault	Fault Type	Fault Codes		
Code		Description	Possible Cause	Possible Solution
1	Major	Stops not programmed	-Stops have not been set -Stops were cleared -Stops were improperly set	Steps need to be programmed by an authorized service facility.
2	Minor	System Fault	-Obstruction present -Excessive system drag	Run room in opposite direction. If it continues to move in the opposite direction, remove obstruction, excessive weight in room or repair of damaged component. If room stops moving in opposite direction, observe fault code and refer to this chart

SECTION 5: SLIDEOUT SYSTEMS

4	Major	Excessive Battery Voltage	-Bad or loose connection -Defective harness -Open or shorted motor	-Check all connections at control box and motorCheck the harness for broken wiresPut 12.0 VDC direct to the motor. If it does not run replace the motor.
6	Minor		Supply voltage to control box is 17 0 V DC or greater	Check 2-pin power con- nector at control box. If the voltage is 17. VDC or higher, contact O.E.M for power and ground supplies
Park brake LED flashing		flashing	-Parking brake not set (if applicable) -Ground signal lost at park brake control	-Set parking brake (if applicable) -Check for continuity to ground on wire plugged into park brake connector at control box.
Low voltage LED flashing		D flashing	Incoming violated to control box is below 12.0 VDC	Check 2-pin power connector at control box. If voltage is below 12.0 VDC contact O.E.M for power and ground supplies.

Preventative Maintenance

The Power Gear® slideout system requires very little maintenance. Read and follow these procedures:

- When the room is extended, visually inspect the slide rail assemblies. Check for excess buildup of dirt or foreign material; remove any debris that may be present.
- If the system squeaks or makes any noises, blow out any debris from the gear rack arms and apply a dry lubricant to prevent and/or stop squeaking.

Refer to the Power Gear® website www.powergearus.com for additional information.

Override Modes:

In the event of component failure or loss of system power, your slideout can be manually overridden and retracted for travel.

Emergency Retract Mode



NOTE: During the override procedure, the unit will exit this mode if the room has not been moved for two (2) minutes or if a fault is detected during room movement. The Fault Code (RED) and Room or Lock Movement (GREEN) LEDs will flash rapidly for 10 seconds to indicate the override procedure failed. After 10 seconds of flashing, the control will automatically default to FAULT CODE 1. Programming must be restarted.



NOTE: After overriding the system, the room control will need to be reprogrammed by an OEM authorized dealer.

Use this procedure when there is **NO** loss of power or electrical problem with the system.

- 1. Remove the touchpad (Fig 4) from the wall.
- Prior to clearing the MAJOR fault, record the number of RED & GREEN flashes observed on the touchpad (Fig 6).
 This information will help your dealer/service center in troubleshooting the slideout system.

# of RED	# of GREEN
flashes	flashes
Figu	ure 6

- 3. Press and hold the SET STOPS/CLEAR FAULTS button on the back of the touchpad for five (5) seconds (Fig 2). Both RED & GREEN LEDs will be on solid while pressing this button. After 5 seconds, the GREEN LED will begin flashing and the RED LED will remain solid on.
- 4. The unit is now ready to retract the room. Press and hold the ROOM SLIDEOUT MOTOR buttons 1 and 2 on the back of the touchpad (Fig 3).

A CAUTION

It is very important to note that during this procedure, the slideout control has NO stop locations. Use a second person to assist in determining when the room is retracted. Damage to the room can occur if the room is retracted too far.

Press the IN button on the front of the wall touchpad until the room is fully retracted. If one side of the room needs to retract further in order to get a good seal, press and hold the motor button (Fig 3) corresponding to **ONLY** the motor you want to move. Press the IN button on the front of the touchpad to retract the room the remainder of the way.

- 5. Re-install the wall touchpad.
- 6. Take the unit to an OEM certified dealer for repairs.

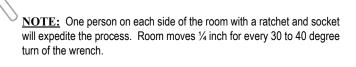
Manually Retract Room with Ratchet and Socket

If the power is lost to the slideout motor(s) or the override mode above will not work, the room may be manually retracted using a ratchet and socket attached to the end of the coupler (Fig 11).

- Gain access to the VERTICAL CHANNEL assembly from inside or outside of the coach (whichever is more convenient). Remove the trim and flange pieces on the slideout room box.
- 2. If applicable, remove the top screw from the bulb seal at the top of the VERTICAL CHANNEL (Fig 8).
- Pull down the bulb seal and remove the motor cover (Fig 9). The motor seal may stick to the bulb seal.
- 4. Using a pick tool, remove the end of the retaining spring from the motor spring clip (Fig 10A). If not equipped with a retaining spring, loosen the motor retaining screw (Fig 10B).
- 5. Unplug the motor from the harness and remove the motor by lifting it up and out.
- 6. Repeat steps 1-4 for the other side.

SECTION 5: SLIDEOUT SYSTEMS

7. Place a socket wrench with a 3-inch extension and a 5/8" deep well socket (Fig 12) through the motor access opening and seat the socket onto the coupler (Fig 13). One person alternating from side to side of the room can retract a 1500 lb. room with or without a ramp.



- 8. Secure the room in place by either:
 - Re-installing the motors (making sure the end of the retaining screw is re-hooked to the motor spring clip (Fig 10A).
 - □ Torque the motor retaining screw to 40 inch/lbs. (Fig 10B) and the motor retainer is fully engaged.
 - Use a travel lock, (a 2x4 cut to size), etc.
 - Refer to Fig 10A and 10B for proper seating of the motor.
- 9. Have the slideout room serviced by an OEM authorized dealer as soon as possible. Do not operate the room until service is complete as damage to the room may result.



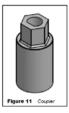






NOTE: Motor shown properly seated. No gap between mounting bracket and block.

Motor Retaining Screw







Power Gear Ram Slideout System

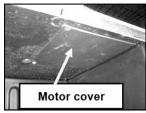
Typically used for Class C motorhomes.

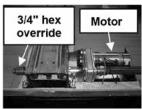
Manual Override Procedure

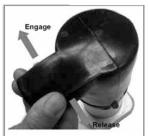
The system has been equipped with 3/4" hex override couplers located on the drive component of the system. Due to the size and weight of some rooms, assistance may be needed to push the room in.

Use the following steps to mechanically operate the room:

- Locate the ABS motor access cover for the slideout.
 This cover will be located inside one of the storage compartments under the slide room up at the top of the compartment.
- 2. Remove 4 screws holding the panel to the top of the compartment. Remove the cover.
- Unplug the motor leads at the connector. Gray connector with red and black wires.
- 4. To release the motor brake you must depress the spring lock lever, which then allows you to pivot the brake lever, which in turn releases the brake. These parts are located inside the rubber boot wire tied over the motor. You must manipulate these parts without removing the rubber boot. As noted on the side-by-side photo, removing this boot will void your motor warranty. These photos will help you figure out how this works. The side-by-side photo (below) shows the spring lock lever and the brake lever.
- The spring lock lever is a thin metal arm with a slight bend at the end, which will hold the brake lever in the released position.
- 6. The brake lever is the heavier thicker metal arm with the hole in the end.
- The normal position for these two levers is to be parallel to each other as shown in the first side-by-side photo. The motor brake is engaged with levers side by side.
- 8. The brake lever is moveable; the spring lock lever is not moveable. To release the brake lever, you must push the bent end of the spring lock lever away from the brake lever; this will allow you to pivot the brake lever so it moves over on top of the spring lock lever. The bent end will hold the brake lever in the released position. (photo shows this "bend").
- Once the brake motor is released, you will need to remove the skirting on the side of the slideout floor where the hex override is located.
- 10. Use a ratchet with a 3/4" socket (or wrench) to turn the hex override and manually move the slideout.
- When the slideout is retracted, check to make sure you have a good seal, and replace the skirting on the slideout.











SECTION 5: SLIDEOUT SYSTEMS

- 12. Return the brake release lever back to the "engaged" position (parallel to the spring lock lever). Pressing the bent end of the spring lock lever will allow the brake lever to be moved.
- 13. Plug the motor connector back in again.
- 14. Replace the plastic motor cover with the 4 screws removed previously.
- 15. Take the unit to an authorized dealer for service.

For further information, refer to the manufacturer's owner's manual.

DO NOT remove boot. Removal of rubber boot will void manufacturer's warranty. Rubber boot removed from end of motor only to show brake lever and spring lock.







Brake lever released

THE ELECTRICAL SYSTEM

The RV electrical system is comprised of two independent electrical systems. One operates off of 12-volt DC power and the other off of 120-volt 60hz AC power. All installations have been made in compliance with industry standards applicable on the date of manufacture. Because the electrical equipment and associated circuitry are engineered into a dedicated system specific to your RV, do not make unauthorized changes or add fixed appliances to it. Changes or additions made after delivery may result in a hazardous condition.

Service and/or modification of the electrical system should only be performed by qualified electrical technicians using approved materials, components, and methods meeting current safety and code requirements. Consult your dealer's service department for assistance.

To read more about the various components incorporated into the RV electrical system, please refer to the information contained in your Warranty Packet.

For motorized vehicles, consult the Chassis Guide for information pertaining to the chassis drivetrain electrical system.

Electrical System Maintenance

Before working on the electrical system:

Make sure the inverter/charger (if so equipped) is turned "off" before disconnect-
ing batteries.Disconnect the shore power cord.

- If equipped with a generator, turn off the generator and disable the automatic generator start functionality.
- Turn off the battery disconnect switch (if so equipped).
- Turn off the 120V main circuit breaker.
- Disconnect the negative 12VDC battery terminal from the battery.

A WARNING

Use caution when using metal tools. If a tool contacts a battery terminal or metal connected to it, a short circuit could occur which could cause personal injury, explosion or fire.

In Case Of An Electrical Fire

A WARNING

Do not attempt to use water to put out an electrical fire. Water can spread some types of fire, and electrocution is possible with an electrical fire.

EVERYONE SHOULD EVACUATE THE RV IMMEDIATELY:

Switch the 120-volt main circuit breaker to the "off" position. It is important that
everyone knows where to find the main circuit breaker and how it operates.
Disconnect the negative battery cable(s) at the battery.
Disconnect the power cord from the share power recentacle

☐ Turn "off" the generator (if so equipped).

Always have faulty or damaged wiring and electrical components repaired immediately.

COMMAND CENTER

The command center is typically located inside the entrance door or in the living area of the RV, and contains switches and controls for various electrical functions. Command center applications, configurations and components will vary by model.

Command Center Panel or Command Center Panel with Switch Modules

Items found on these panels may include:

- ☐ Fuel gauge and hour meter with switches for fuel pump and fuel levels; fuel station (if so equipped) on/off switch
- ☐ Lighted red pump and water heater switches (electric & LP gas)
 - Generator start / stop switch; may include hour meter
 - Tank heater switchesLight switches for porch lights, exterior security lights, interior lights, awning LED lights, front cap LED accent lights, power entry step
 - Cargo bed red lighted control switch
 - Slideout control switches (press and hold to extend / retract)
- Awning control switches (press and hold to extend / retract)
- Systems monitor with LED indicators for tank levels and battery charge status
- ☐ Auto leveling control panel (for leveling the RV)
- ☐ Inverter panel (power switch with display)
- ☐ Power bunk bed lift control switch
- Speaker selector switch

Command Center Modules Mounted to the Wall

Some models may have the modules mounted directly to the interior wall of the vehicle. They are typically located near the entrance door.

Touch Dimmer Switch:

Certain models may include a touch dimmer switch next to the Command Center panel. (There are no interior light switches on the Command Center panel).

- ☐ Turn ON ceiling lights: Tap the LED light on the dimmer
- ☐ Turn OFF ceiling lights: Tap the LED light on the dimmer
- Dimmer: If lights are off, hold finger on the LED light and lights will begin turning on gradually until fully lit. If lights are on, hold finger on the LED light and lights begin to gradually turn off.

The dimmer has a memory so it remembers what the light setting was when the lights were turned OFF. When turned ON again, the lights return to that same setting.



Command Center Panel



Command Center Panel w/Switch Modules



NOTE: If your RV model includes the 5 way/8 way remote control: the LIGHT button on the remote only controls the awning LED lights.

GFCI RECEPTACLE

There is a ground fault current interrupter (GFCI) engineered into the electrical system. It is designed to reduce the possible injury caused by electric shock. The GFCI will not protect against short circuits or circuit overloads.

Test all GFCI receptacles monthly:

- Push in the GFCI "TEST" button. The GFCI "RESET" button should pop out indicating the GFCI receptacle has been "tripped" and interrupted 120-volt power.
 - Push in the GFCI "RESET" button to restore 120-volt power.

Contact your independent dealer for assistance if the GFCI "RESET" button does not restore 120-volt power and pops back out.

A "tripped" GFCI breaker indicates that abnormally high 120-volt current flow (a ground fault) was detected. All ground faults must be repaired before use of the recreation vehicle. If the GFCI "RESET" button does not restore 120-volt power and pops back out. Contact your dealer for assistance.

COMMAND CONTROL SYSTEM (IF SO EQUIPPED)

The Command Control System is a name given to encompass several different types of Bluetooth controlled systems now being used in Jayco and Highland Ridge towable RVs. Examples of Bluetooth controlled systems currently in use are listed below.

The Command Control System is capable of controlling some or all of the following features depending on the Bluetooth system and RV model:

RV Auto Leveling System	Power Jacks and Stabilizers
Interior and Exterior Lighting	RV Slide out rooms
Power awnings	Generator
TV and bed lifts	HVAC thermostat
Gas and Electric water heaters	Water tank levels (Blk, Gry, Fresh)
Battery levels	Back up camera sysems
Water Pump	Kitchen & bath vents and covers
Door locks	TV, radio and DVD systems
Automatic Fireplace control	Automatic ramp door (toyhauler)
Smartsense Propane Sensor	Smarttemp Temperature Sensor

Bluetooth controlled systems:

Current Bluetooth systems in use that fall under the Command Control System would include:

- Jayco JayCommand uses the LCI One Control App (for phone or tablet) (Apple/Android)
- Highland Ridge Ridge Link uses the LCI One Control App (for phone or tablet (Apple/Android)
- Jayco BMPro RVMaster touchscreen system (with its own dedicated App RVGenius for Apple/Android)
- Jayco JayCommand BMPro Mini control system (uses the JayCommand App for Apple/Android)
- Jayco LCI One Control touchscreen system (with a leveling system installed)

SECTION 6: ELECTRICAL SYSTEM

NOTE: Switches that are turned on with the LCI One Control App or the LCI One Control touchscreen, override switches at the command center panel on the wall. If you were to turn on a device with the app or the touchscreen and then the touchscreen or the app were to fail for some reason; you would not be able to turn off that device using the command center panel switches.

To regain command center panel control, battery power would need to be disconnected from the RV to reset the system. This can be done by turning off the Battery Disconnect switch, or removing the power cable from your battery, then re-attach the battery cable or turn the Battery Disconnect switch back on, and the command center panel switches are now active again.

Check the **Table of Contents** in this manual to identify your Bluetooth system and more specific information on system operation.

A digital version of the operator manual may be included with the system. On the HOME screen (upper right corner) press the SETTINGS button (the small Gear icon) then scroll the screen down with your finger until you see USER MANUAL. Tap on it to open the manual. As you scroll through the manual, to return to the beginning, tap the screen and a drop down appears at the top of the screen. Select the back arrow at the top left to return to the menu screen. To get back to the display HOME screen, press the left facing triangle button at the bottom of the screen.

BMPRO MINI SYSTEM (IF SO EQUIPPED)

The Jay Command BMPro Mini is a small control panel used to monitor and control various systems in your RV.

The system has 3 parts: the NODE, the DIS-PLAY and the JayCommand Smartphone App. The mini control panel and the Smartphone App connect to the NODE via Bluetooth. The JayCommand App is available for download for Iphone or Android devices through Google Playstore or the App Store. (Search "JayCommand")



The Jay Command Mini has WiFi capabilities to connect to the internet to download the latest app updates.

The following list describes some of the many features this system may control.

NOTE: Not all the following functions will necessarily be available on your model RV. The following systems shown are a typical representation of what you could see on your smart device or touchscreen. If specific items are not displayed on your device they are not installed and may not be available for your RV.

RV Auto Leveling System	Power Jacks and Stabilizers
Interior and Exterior Lighting	RV Slide out rooms
Power awnings	HVAC thermostat
Gas and Electric water heaters	Water tank levels (Blk, Gry, Fresh)
Water Pump	Generator

Display Control Screen:

The following buttons can be found on the display control unit mounted inside the RV. Refer to the photo above.

Button 1: Page Navigation button

Allows you to move from page to page (e.g. Tanks page to Water page)

Button 2: Menu Navigation button

Allows navigation between items within a page. (e.g. in the Water page move from Pump to Elec Water Heater.

Buttons 3 & 4 Action Buttons

Functions for these buttons change depending on the selected menu item. These functions will be displayed on the screen (e.g. OK, RET, EXT)

Button 5: Redundancy Buttons

These bu	attons across the bottom of the display turn on lights, water pumps, and main A/C.
	First button turns on/off all interior lights (long press sets intensity to 100%)
	Second button turns on/off all exterior lights.
	Third button turns on/off all interior and exterior lights.
	Fourth button turns on/off the water pump.
	Fifth button brings up the A/C control screen on the display.
Pairing	your device:
To opera	te the system with your smartphone, you must download the JayCommand App
and insta	ill it. Next you need to pair the Smartphone with the NODE. The NODE can be

and insta	ll it. Next you need to pair the Smartphone with the NODE. The NODE can be
paired to	a maximum of 4 devices.
	Launch the app on your phone.
	Choose your device on the phone (BMPro Mini)
	Go to the wall display control screen.
	Use the Page Navigation button to go to the Settings page.
	Select Pair Device from the menu.
	Press the OK function button when the Pair Device is highlighted.
	This starts the pairing process.
	When pairing is successful you will be taken to the APP homescreen on your smartphone and the Bluetooth icon will be visible.
П	Your device is now connected.

Display Screens:

There are 6 screens (or pages) that are available on the display screen:

Tanks page which displays levels of fresh, black, and gray tanks. All tanks will appear regardless of whether all are installed.

Water page shows the water pump, Water Heater Elec, and Water Heater Gas.

Motors page shows all of the slideouts and awnings.

HVAC page operates the AC temperature in the RV.

SECTION 6: ELECTRICAL SYSTEM

Energy page shows the generator controls.

Settings page shows pairing, temperature units, software version, forget all (disconnects paired devices).

Tire Pressure Monitor System:

If your RV is equipped with a Tire Pressure Monitoring System (TPMS), please refer to a separate section in the Table of Contents. The TPMS settings can only be displayed and changed via the smartphone app. There is no provision for TPMS on the mini control display mounted inside the RV.

For complete detailed operating instructions for the BMPro Mini System refer to the BMPro owners manual in your warranty packet.

LCI ONE CONTROL® APP(IF SO EQUIPPED)

Certain models of RVs include a Bluetooth control module that works in concert with the LCI One Control App for your smartphone, tablet or other smart device. When connecting to this app, certain systems in your RV can be controlled remotely from your smart device. The free app is available through Google Play Store or the App Store (for IPhone). The One Control Device Selection screen will look similar to (Fig 1).



NOTE: Not all the functions depicted here will necessarily be available on your model RV. The systems shown are only a possible representation of what you could see on your smart device. If specific apps are not displayed on your device they are not installed and may not be available for your RV.

The One Control System will NOT operate the hall light, lights located inside each slide-out, exterior amber/red marker lights, or the LED lights located on the front or rear caps.

Connecting to the Bluetooth Control module:

A Bluetooth control module is mounted in the basement area of the RV. It transmits a Bluetooth signal for the LCI One Control app. A Password and a Device Name are required for this Bluetooth connection. The Password and Device Name can typically be found on a label located inside a cabinet near the entrance door of the RV (Fig 2). The password and device name will also be located on a label on the control module in the basement area although this may not be easily accessible.



The password is 6 numerical digits. Device name will be LCIRemotexxxxxxxx (x's are 9 alpha numeric characters). To connect: enable Bluetooth on your smart device, scan for available Bluetooth connections, and you should see the LCIRemotexxxxxxxx name appear as a connection. Select that, and it should then prompt for the 6 digit password.

Awning Operation: Select the AWNING icon; the screen opens showing the awnings (**Fig** 6). If there are multiple awnings, there will be a selection for each awning at the left of the screen. Select the awning you want to control, then press and hold the **EXTEND** (B) or

RETRACT (C) buttons. Select the back arrow (A) to return to the Device Selection screen

Leveler Operation: Select the LEVELING icon, the screen opens showing the Leveler Control screen (Fig 7). This screen will allow you to extend and retract the jacks and to auto level the RV. Press the AUTO LEVEL button (A) to begin leveling the RV.

Refer to the Lippert User Guide for the One Control system for more detailed information. Select the HOME icon (upper right) to return to the Device Selection screen.

Slide-out Operation: Select the SLIDES icon which will open the Slideout screen (**Fig 8**). The screen can display up to 4 slideouts. Slideouts will be numbered 1-4 on the touchscreen. Press Slide 01, and then press (and hold) the **OUT** (A) button to extend the slide, or the **IN** (B) button to retract it. Repeat this action on the remaining slideouts. Select the back arrow to return to the Device Selection screen.

IMPORTANT SAFETY FEATURE: IF SLIDE 01 IS MISSING FROM THE LIST:

This indicates there is a problem with the bedroom

slide-out. In order for the slideout to function properly, the bedroom door MUST BE OPEN. An electronic door catch has been installed to the wall in the bedroom behind the door (Fig 9). A second piece is mounted to the door (Fig 10). If the door is closed, the Slide 01 notification on the touchscreen display will disappear and the slideout will NOT operate. When the bedroom door is opened and the catch pieces connect, the Slide 01











notification appears on the touchscreen display and the slide-out can then be operated normally.

NOTE: This same safety feature applies to the slide-out switch on the wall or on the Command Center switch panel. The bedroom door must be open and the catch pieces connected for the bedroom slide to work.

DSI FLT - Direct Spark Ignition Fault (if so equipped): This light above the GAS water heater switch on the Command Center panel indicates a problem with the LP portion of the water heater. When the GAS switch is turned on, the light will blink quickly 3 times and the water heater will ignite. The light should then stay OFF. If the light comes on and stays on, it indicates the gas side of the water heater has not fired and there is a problem with the igniter. There is no water heater switch on the app screen.

SECTION 6: ELECTRICAL SYSTEM

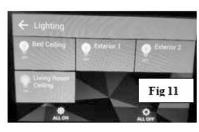
Operating the Lights: Select the **LIGHTING** icon and the Lighting Control screen opens (**Fig** 11) allowing you to control lighting in your RV.

To operate, scroll through the list and find the light you want to control. Individual lighting controls will appear on this screen. If the switch is ON, the light bulb for each item will illuminate.

If the ALL ON switch is selected, all the lights shown on the screen will turn ON. Likewise selecting ALL OFF turns all the lights OFF.

All of the lights will light in steps to prevent a power surge.

Light switches may have to be toggled twice for them to operate as this system is multiplexed with the command center panel and other wireless controllers in the RV.



TESTING THE CAMPSITE POWER CONNECTION

The campsite 120-volt power receptacle(s) should <u>always</u> be tested for proper functionality prior to plugging the recreation vehicle shore power cord into it.

Campsite 120-volt power receptacles can be tested using a digital multimeter or a dedicated circuit analyzer. Dedicated circuit analyzers plug directly into the campsite power receptacle and minimally test for open neutral, open ground, and correct polarity.

Connecting the Power Cord

Always test the external power source (i.e., the campsite power receptacle or electrical box) with a ground monitor before connecting your power cord to it. If the ground monitor indicates 'reverse polarity' or an 'open ground' DO NOT connect the power cord.

To help prevent power surges from damaging the connected loads, please follow these instructions when hooking up to the external power source:

- 1. Turn off the load center main 120-volt circuit breaker.
- 2. Carefully extend the entire length of the power cord (approximately 25'-35') from the electric cable hatch to the external power source.
- 3. Plug the power cord into the receptacle. Be sure all the power cord prongs are properly plugged into the receptacle.
- 4. Return to your RV and turn on the load center main circuit breaker.

The shore power cord should be unplugged when the recreation vehicle is left unattended

When you are ready to leave, reverse the power cord connection process. Use care to prevent damaging the power cord electrical connection pins when connecting or disconnecting the shore power cord. Grasp the plug to remove the power cord from the outlet; do not unplug it by pulling on the cord.

Maintenance

Inspect the power cord for cuts, cracks and worn insulation. Have the power cord replaced immediately if these symptoms are noticed.

A WARNING

Do not hook up the power cord to any receptacle until you have verified proper polarity and grounding. **DO NOT** plug the shore power cord into a campsite receptacle(s): That has reverse polarity With non-functioning ground circuits That shows outward signs of heat damage. Doing so may result in property damage or serious injury. Plugging the shoreline power cord into an incorrectly wired power source could damage the recreation vehicle electrical system and result in severe or fatal injury. Damage or injury resulting from connection to malfunctioning or improperly wired power sources is not covered by your recreation vehicle warranty. DO NOT Do not use any cheater plug, adapter or extension cord to reconfigure incoming AC power or break the continuity of the circuit connected to the grounding pin. Do not connect the power cord into an outlet that is not grounded, or adapt the power cord plug to connect it to a receptacle for which it is not designed. Do not remove the grounding pin to connect to a non-grounded receptacle. Removal of the ground pin disables an important safety feature designed to prevent shock and electrocution hazards. Do not connect the power cord to an extension cord. Use of an improper extension cord will cause overheating of the cord as well as potentially causing premature failure of the AC equipment. The power cord must be fully extended when in use and not left coiled in the electrical compartment or on the ground. If the power cord is left coiled, it may potentially create enough heat to melt its protective casing. It is the responsibility of the owner of the electrical receptacle to ensure that the receptacle is properly wired and grounded. Reverse polarity and/or improper grounding of your RV can cause property damage or serious personal injury.

Power Converter

The power converter converts 120-volt AC power to useable 12-volt DC power when the shore power cord is connected to an external power source.

The converter has a built-in protective thermal breaker that will shut it down should overheating occur. Overheating can be caused by operating the converter above its maximum power output for an extended period of time, or by an obstruction to its ventilation air flow. To reduce converter heat build keep unnecessary 12-volt lights and motors turned "off". Keep the converters cooling fins and fan clear of obstructions.

USE ONLY A DEEP CYCLE BATTERY FOR RV USE. Car batteries (CCA
rating) are not designed for RV applications. If doing a lot of dry camping use a
deep cycle battery rated in amp hours only (NO CCA rating).

☐ If using multiple batteries they must be the same brand and type. Adding more batteries will provide longer use of DC appliances when not on shore power but may reduce charging efficiency.

SECTION 6: ELECTRICAL SYSTEM

The battery works in conjunction with the converter to supply DC power to the RV. A battery is typically only necessary if you do a lot of dry camping or have slideouts and/or a leveling system.
Reverse polarity fuse provides protection for the converter when a battery is used. If the battery is connected backwards to the fuse board this fuse would blow preventing damage to the converter.
If your lights are dimming or flickering that usually indicates an overloaded converter. Remove some of the load by turning off DC lights or appliances.
Fan is controlled by load. It will begin running at 3 to 6 amp DC draw. It increases in speed with a higher load until 14 to 15 amps. Fan is at maximum speed and stays there even with more load. If load drops below 6 amps DC, the fan shuts off.

A CAUTION

It is important that the fluid level of any connected batteries be checked on a regular basis. All batteries will "gas" and lose some fluid when continuously connected to any charging source (does not apply to "gel-cell" batteries).

Before checking for converter output voltage, the battery cables must be disconnected at the battery. Make sure the converter is plugged into an AC source (105-132 AC volts). Check the converter output voltage at the battery with a voltmeter. Place the voltmeter probes on the disconnected battery cables. If the voltage reads 13.6VDC with no load, the converter is functioning properly.

If the converter output voltage at the battery reads in the 0.0VDC range, or the battery is not charging, check for:

An open inline fuse in the battery wire
An open wire between the converter and the RV battery
Loose ground connection
Improper torques

If the converter fuses and AC voltage are good, but the converter output still reads zero volts, the converter is not functioning properly.

Modes of Operation

Absorption (Normal) Mode: 13.6VDC range. Batteries are being charged, just at a slower rate. Converter will not work without AC input.

Float Trickle Mode: To get your converter into this mode reduce the load on the system to almost nothing but the battery. Let the system sit for approximately 44 hours.

Converter voltage will drop to 13.2VDC. If the converter sees any load during this period or after it is in Float Mode it will revert back to Absorption (Normal) Mode. 13.6VDC.

Bulk Mode: Converter will not jump into the "Bulk Mode" unless the battery is below 50% of charge, or approximately below 13.2VDC output voltage. There is no way to force it to go into Bulk Mode.

Red LED indicates blown fuse.

Inspection and maintenance

If the 12-volt power converter is not working (auxiliary battery not being charged) check the reverse polarity fuse(s) located on the end of the converter.

There are no customer serviceable parts inside the converter case and the manufacturer's warranty will be void if the case has been removed. If you have further concerns contact your dealer.

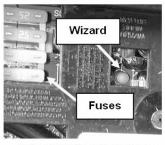
For detailed information on operation and safety, refer to the manufacturer's owner's manual.

Converter With Charge Wizard (if so equipped)

Some converters may be equipped with a charge wizard. There are (3) possible charging modes; NORMAL, BOOST and STORAGE. The charge wizard will automatically select the best mode to charge your battery. A green LED next to the wizard mode button will indicate by flashes, which mode is currently being used.

NORMAL MODE: Green LED flashes once per second; battery is between 50% and 90% charged. Green LED will flash 2-3 times per second; battery is 90% charged. Output voltage is 13.6VDC and the converter is safely completing the charge of the battery.

BOOST MODE: Green LED is on solid. Output voltage is 14.4VDC to rapidly charge the battery up to 90% of full charge.



Wizard Button & Reverse Protection Fuses

STORAGE MODE: Green LED flashes every 6-8 seconds. Output voltage has been reduced to 13.2VDC; the RV battery is fully charged and converter is maintaining the charge.

MANUAL MODE (Not recommended): The wizard mode button is used to override the charge wizard. Refer to the converter owner's manual for additional information.

REVERSE BATTERY PROTECTION: Reverse polarity fuse(s) provide protection for the converter when a battery is used. If the battery is connected backwards to the fuse board a fuse will blow preventing damage to the converter. Four easily accessible fuses are located next to the wizard button. Replace with fuses of the same type and rating.

12-VOLT DC SYSTEM

The majority of your recreation vehicle lighting is powered by 12-volt electricity. The 12-volt DC system is composed of components that will operate when the following conditions are met:

- Power is supplied by the tow vehicle alternator when the engine is running and the 7-way trailer plug is connected. This powers the RV's running lights, brake lights, turn signals and brakes. In addition, the 7-way trailer plug provides a common ground and a 12-volt charge line to charge the auxiliary battery.
- ☐ The converter will supply interior 12-volt DC power when the power cord is plugged into campground power. The converter will also charge the RV battery in most situations (refer to *Battery Disconnect*).
- The auxiliary battery powers many interior 12-volt components including the lighting fixtures, water pump, 12-volt motors, 12-volt appliances, etc. It also powers the breakaway switch.

12-Volt Fuse Panel

A WARNING

Replacement fuses must be of the same voltage, amperage rating and type. **Never use a higher rated replacement fuse;** doing so may cause a fire by overheating the RV wiring.

The 12-volt fuse panel is labeled to indicate fuse sizes, positions and the components powered. Fuses are located in the load center.

SECTION 6: ELECTRICAL SYSTEM

Replacing A Fuse

Before replacing a fuse, always turn off the electrical components protected by it.

- 1. Disconnect the shore power cord.
- 2. Turn "off" the inverter (if so equipped).
- 3. Disconnect the house or auxiliary batteries main negative battery cable.
- 4. Remove the fuse panel cover to check fuses.
- 5. Pull the fuse straight out of the fuse block.
- 6. Insert a new fuse of the same specified voltage, amperage rating and type in the original location.

The fuse panel label should be kept permanently affixed to your recreation vehicle. Fuses will not offer complete protection of the electrical system in the event of a power surge or spike.

12-Volt DC Outlet

There may be one or more 12-volt DC power outlets in your recreation vehicle. When the 12-volt DC outlet is used as a power source for an electric appliance, make sure the appliance operates on 12-volt DC power and that it consumes less than 60 watts (5 amps) of power.

WARNING

Keep the protective dust cap on the 12-volt DC outlet when not in use to prevent ingestion of foreign material and potential short circuit conditions.

AUXILIARY BATTERY (CUSTOMER SUPPLIED)

A WARNING

- □ **Do not store anything inside the battery compartment(s)** or near the batteries that could touch the battery or battery cable terminals. Contact with the battery or battery cable terminals could cause an electrical short circuit, discharge the batteries, or start an electrical fire.
- □ Keep sparks, cigarettes and flames away from the batteries as the hydrogen gas they create may explode. Do not connect a booster battery or other power source that outputs more than 14.2-volts DC to the RV batteries. Use adequate ventilation when charging or using batteries in an enclosed space. Remove metal jewelry and always wear eye protection when working around batteries.
- Do not allow battery electrolyte (acid) to come into contact with skin, eyes, fabric or painted surfaces. Electrolyte is a sulfuric acid solution that could cause serious personal injury or property damage. If your hands, eyes, clothes or the painted surface of your RV are exposed to electrolyte, flush the exposed area thoroughly with water. If electrolyte gets in your eyes, immediately flush them thoroughly with water and get prompt medical attention.

The combined 12-volt DC loads in your recreation vehicle become more than the converter can produce. This demand can be met by using an auxiliary battery for a limited period of time. The 12-volt system is designed for usage with a Group 27, deep cycle battery.

Dry Camping

The auxiliary battery should be fully charged prior to dry camping. If the auxiliary battery is not being recharged and power is being drawn from it, it will eventually discharge. A battery will discharge at a faster rate as its energy level becomes depleted. Plan your electrical usage accordingly. You can test the auxiliary battery voltage using a volt-ohm meter (customer supplied).

A fully charged auxiliary battery will read 12.7 volts DC and 1.265 specific gravity at 80°F (32°C). The auxiliary battery is considered discharged at 11.89 volts, and dead at 11.65 volts. If the voltage drops below those levels, irreversible damage can occur. Typically, a deep cycle battery has an amp-hour rating of 75-100 amps.

If you run the furnace and refrigerator simultaneously, you will be using approximately (12.0 + 3.0) 15.0 amps per hour. This does not include any 12-volt lights, or any other 12-volt component. If the furnace and refrigerator in this example operated constantly, a 75 amp-hour battery would become fully discharged in 5 hours.

The auxiliary battery should be installed in parallel with the battery in your tow vehicle. When the 7-way trailer plug is connected, both batteries power the RV. Do not allow it to discharge your tow vehicle battery below the level required to start the engine. To prevent this from occurring, disconnect the 7-way trailer plug or install a battery isolator. When the tow vehicle engine is operating with the RV connected, the tow vehicle charging system will charge both batteries.

Replacement and Maintenance

Some equipment in your RV will draw small amounts of current even when turned OFF. To prevent the auxiliary battery from being discharged when your RV is not connected to shore line power, disconnect the auxiliary battery negative cable at the battery. During storage, it is important to check the voltage monthly and recharge the auxiliary battery as needed. If you remove the auxiliary battery from your RV, store it in a dry, cool area per the manufacturer's instructions.

When it is time to replace the auxiliary battery, Group 27 or Group 31 true deep cycle batteries are recommended to increase run time of electrical components while dry camping (operating solely on battery power).

Do not reverse the positive and negative battery cables (doing so will blow the reverse polarity fuse(s) that protect the converter).

For more information

Please contact the battery manufacturer for additional information on the auxiliary batteries.

Battery Isolator For Your Tow Vehicle (customer supplied)

You may want to consider the installation of a battery isolator on your tow vehicle as a convenience feature:

- It receives current from the tow vehicle alternator and controls distribution of energy to both the RV auxiliary battery and the tow vehicle battery.
- It serves as a check valve to prevent energy from being drawn from your tow vehicle chassis battery (so you can start your tow vehicle engine).

Your dealer can assist you with the selection, purchase and installation.

Battery Disconnect Switch (if so equipped)

The Battery Disconnect switch is typically located in an enclosed exterior compartment. The style of the disconnect switch may vary per model. This switch does not shut off all power, but only shuts off the 12VDC power to the main 12V fuse panel, and the interior of the vehicle. Batteries can still be trickle charged by the converter, and there will still be power to some devices.

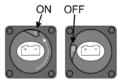
SECTION 6: ELECTRICAL SYSTEM

Rotating Dial Disconnect Switch

When this switch is ON, there will be a green area showing a "1" along the top of the switch. To turn the switch OFF, turn it counter-clockwise until you see the red area along the left side of the switch showing a "0" (zero).

Lever Type Disconnect Switch

To operate this switch, turn the lever counter-clockwise to turn off all 12VDC power to the fuse panel in the RV. The lever can be removed and is equipped with a lanyard to keep the key from getting lost.

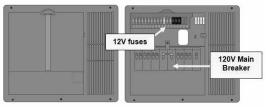




Battery Disconnect Switches (switch appearance may vary by model)

LOAD CENTER

The Load Center contains 12VDC fuses and 120VAC circuit breakers for almost all of the electrical appliances and circuits in the RV. The 120V main breaker may be located in this panel and will turn off all 120-volt power to the RV. Locations will vary by model. Refer to the diagram inside the load center for specific fuse assignments.



Typical Load Center Panel

Load Center Panel w/120 volt Main Breaker

Motorhomes may have separate (appearance and configuration may vary by model) small panels for breakers and fuses.

They are normally located in close proximity to each other typically in the bed platform. The converter is also mounted separately (typically under the bed platform).

120-VOLT CIRCUIT BREAKERS

The 120-volt AC circuit breakers located inside the load center protect all 120-volt wiring and components from circuit overloads and short circuits. Should a circuit overload or short circuit occur the circuit breaker protecting the affected circuit will "trip" preventing the flow of electricity through that circuit.

If a circuit breaker trips, shut off the appliance on that circuit (i.e., power converter, etc.) and allow the circuit breaker to cool down for a brief period of time. After it cools down, reset the circuit breaker by moving its lever "off" and then back to the "on" position. If the circuit breaker re-trips or frequently trips, contact your dealer to have the electrical problem diagnosed and repaired.

A circuit breaker identification label is permanently attached to the inside surface of the 120-volt Load Center.

A CAUTION

Circuit breakers and fuses will not offer complete protection of the electrical system in the event of power surge or voltage spike.

Replacement

Only replace circuit breakers with those of the same specified type, voltage, and current rating. Never replace a circuit breaker with one listed at a higher amperage rating. Please contact your dealer for repair assistance when replacing circuit breakers.

A WARNING

Replacement circuit breakers must be of the same voltage, amperage rating and type. Never use a higher rated replacement circuit breaker; doing so may cause a fire by overheating the RV wiring.

Maintenance

At the beginning of the camping season, inspect the circuit breakers and replace as needed. Test by turning each circuit breaker "off" and back "on". Circuit breakers are wearable parts and must be replaced as needed as part of your RV maintenance. If you have any questions, contact your dealer.

A label is provided to explain the function of every 120-volt circuit breaker. This label is located on or near the appropriate load center or sub-panel and must remain permanently affixed to the recreation vehicle.

APPROXIMATE ELECTRICAL LOAD RATINGS

12 VOLT SYSTEM	
Exterior Entertainment Center	5-7 AMPS
Fan	1.5 AMPS
Furnace	12.0 AMPS
Generator Start	95.0 AMPS*
Illuminated Switch	.125 AMP
Inverter	variable
Leveling System	95.0 AMPS*
LP Detector	.125 AMP
Light; LED	1.7 AMPS
Light; Vanity	4.2 AMPS
Lights; Aisle	1.0 AMP
Lights; Baggage Compartment / Shower	1.4 AMPS
Lights; Decorative Wall / Map / Porch	1.5 AMPS
Lights; Double -12"	2.0 AMPS
Lights; Double -18"	2.5 AMPS
Power Awning	10.0 AMPS*
Power Vent	5.0 AMPS
Refrigerator	3.0 AMPS
Step Cover	10.0 AMPS*
TV Plate/Antenna Booster	1.0 AMP
Water Heater	6.0 AMPS
Water Pump	7.0 AMPS

^{*}Momentary Load

12 Volts: Labeled watts divided by 12 = Power consumed in AMPS