

# Master Owner's Manual

## Slide-outs



LIPPERT  
COMPONENTS®

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# Master Owner's Manual

The Master Owner's Manual is intended to provide information on Lippert Components Inc.'s most widely-used products. Products described in the Master Owner's Manual may not be on every trailer. The trailer may also have products not included in this manual. All manual information is subject to change without notice. Revised editions will be available for free download at [lci1.com/support](http://lci1.com/support). Manual information is considered factual until made obsolete by a revised version. Manual information may be distributed as a complete document only, unless Lippert Components provides explicit consent to distribute individual parts.

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# ABOVE FLOOR SLIDE-OUT (VERTICAL MOTOR)

## SLIDE-OUTS

### Introduction

The LCI Above Floor Slide-out (Vertical Motor) system is a rack and pinion style slide system. Utilizing a bi-directional electric motor to actuate the drive shaft, the slide-out room is extended and retracted from the same source. The actuator has a built-in automatic braking feature.

There are no serviceable parts within the electric motor. If the motor fails, it must be replaced.

Disassembly of the motor voids the warranty.

Mechanical portions of the slide-out system are replaceable. Contact Lippert Components, Inc. to obtain replacement parts.

Additional information about this product can be obtained from [lci1.com/support](http://lci1.com/support) or by downloading the free myLCI app. The app is available on iTunes® for iPhone® and iPad® and also on Google Play™ for Android™ users.

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Google Play™ and Android™ are trademarks of Google Inc.

For information on the assembly or individual components of this product, please visit:

<https://support.lci1.com/slide-outs-support-above-floor-slide-outs>

**NOTE:** Images used in this document are for reference only when assembling, installing and/or operating this product. Actual appearance of provided and/or purchased parts and assemblies may differ.

### Safety

The LCI Above Floor Slide-out (Vertical Motor) system is intended for the sole purpose of extending and retracting the slide-out room. Its function should not be used for any other purpose or reason than to actuate the slide-out room. To use the system for any reason other than what it is designed for may result in damage to the unit and/or cause serious injury or even death.

Read and understand all instructions before installing or operating this product. Adhere to all safety labels.

This manual provides general instructions. Many variables can change the circumstances of the instructions, i.e., the degree of difficulty, operation and ability of the individual performing the instructions. This manual cannot begin to plot out instructions for every possibility, but provides the general instructions, as necessary, for effectively interfacing with the device, product or system. Failure to correctly follow the provided instructions may result in death, serious personal injury, severe product and/or property damage, including voiding of the LCI limited warranty.

**⚠ WARNING**

The "WARNING" symbol above is a sign that a procedure has a safety risk involved and may cause death or serious personal injury if not performed safely and within the parameters set forth in this manual.

**⚠ WARNING**

Failure to follow instructions provided in this manual may result in death, serious personal injury and/or severe product and property damage, including voiding of the component warranty.

**⚠ WARNING**

Unit **MUST** be supported per manufacturer's recommendations before working underneath. Failure to do so may result in death or serious personal injury.

**⚠ CAUTION**

The "CAUTION" symbol above is a sign that a safety risk is involved and may cause personal injury and/or product or property damage if not safely adhered to and within the parameters set forth in this manual.

**⚠ CAUTION**

Always wear eye protection when performing service, maintenance or installation procedures. Other safety equipment to consider would be hearing protection, gloves and possibly a full face shield, depending on the nature of the task.

**⚠ CAUTION**

Moving parts can pinch, crush or cut. Keep clear and use caution.

## Prior to Operation

Before operating the LCI Above Floor Slide-out (Vertical Motor) system, do as follows:

1. Parking location should be clear of obstructions that may cause damage when the slide-out room is actuated.
2. To optimize slide-out actuation, the unit should be parked on the most solid, level surface available.
  - A. Locations should also be free of depressions.
  - B. When parking the unit on extremely soft surfaces, utilize load distribution pads under each jack.
3. For motorized units:
  - A. The battery **MUST** be fully charged.
  - B. The PARKING BRAKE **MUST** be engaged.
  - C. The coach's transmission **MUST** be in PARK.
  - D. The coach's ignition **MUST** be in the OFF position—the engine **NOT** running. (Class A and C only; Gas and Diesel)
4. Make sure all persons, pets and property are clear of the unit prior to slide-out room actuation.
5. Keep hands and other body parts away from slide-out mechanisms during actuation or severe personal injury or death may occur.

## Operation

The family of LCI Above Floor Slide-out systems are controlled by a switch (Fig. 1) mounted on the unit's wall, normally located close to the entry door.

1. Make sure the slide-out path is clear of persons, pets and property before and during operation of the slide-out room.
2. Always keep away from the slide rails when the room is being operated. The gear assembly may pinch or catch on loose clothing causing personal injury.
3. Keep stored items in compartment clear of slide-out motor mechanisms and wiring to prevent interference of slide-out operation.

### Extending Slide-Out

1. Level the unit.
2. Verify the battery is fully charged and hooked up to the electrical system.
3. If equipped, remove transit bars.
4. Press and hold the IN/OUT switch in the OUT position (Fig. 1A) until the slide-out is fully extended and stops moving.
5. Release the switch, which will lock the slide-out into position.

**NOTE:** Only hold the switch's OUT position until the slide-out stops.

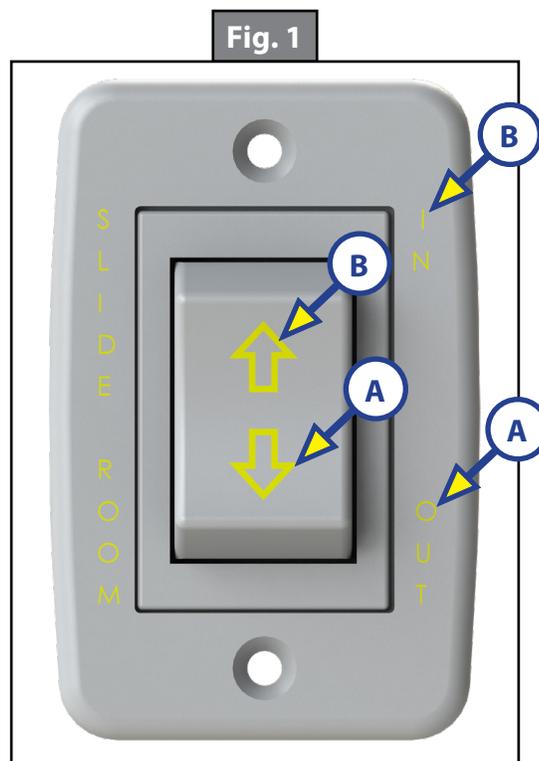
### Retracting Slide-Out

1. Verify the battery is fully charged and hooked up to the electrical system.
2. Press and hold the IN/OUT switch in the IN position (Fig. 1B) until the slide-out is fully retracted and stops moving.
3. Release the switch, which will lock the slide-out into position.

**NOTE:** Only hold the switch's IN position until the slide-out stops.

4. If equipped, install the transit bars.

**NOTE:** Transit bars should only be used during storage and transportation.



## Maintenance

### Preventative

The LCI Above Floor Slide-out (Vertical Motor) system has been designed to require very little maintenance. The system has been static tested to over 2,500 continuous cycles without any noticeable wear to rotating or sliding parts. No grease or lubrication is necessary and, in some situations, may be detrimental to the environment and long term dependability of the system. To ensure the long life of the slide-out system, read and follow these few simple procedures.

### Electric

For optimum performance, the slide-out system requires full battery current and voltage. The battery must be maintained at full capacity. Other than good battery maintenance, check the terminals and other connections at the battery, the control switch, and the electric motor for corrosion and loose or damaged terminals. Check motor leads under the motor-home chassis. Since these connections are subject to damage from road debris, be sure they are in good condition.

**NOTE:** The LCI Above Floor Slide-out (Vertical Motor) system is designed to operate as a negative ground system. A 12V DC system must maintain good wire connections. It is important that the electrical components have good ground connection. Over 90% of unit electrical problems are due to bad ground connections.

### Mechanical Maintenance

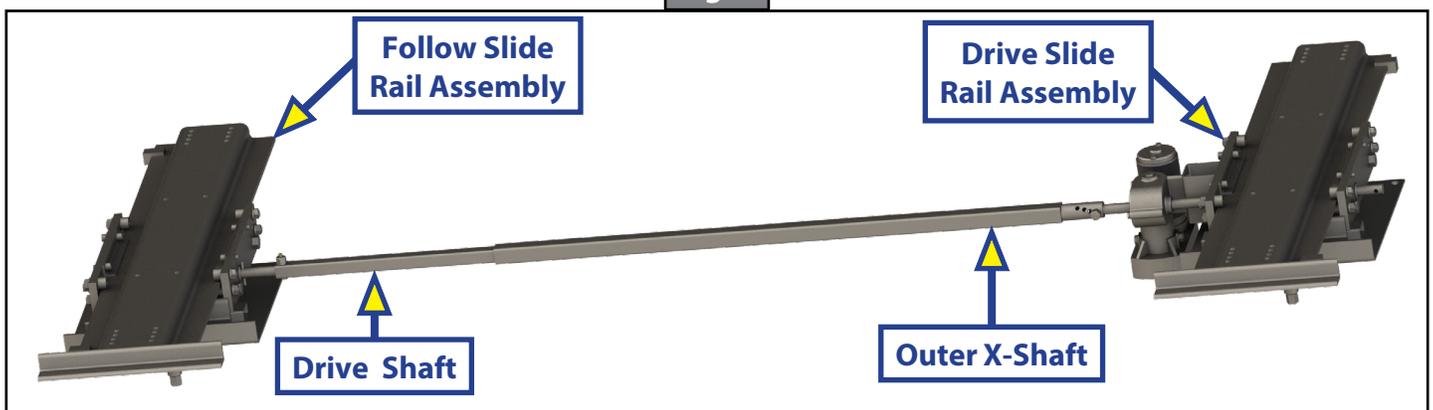
Although the LCI Above Floor Slide-out (Vertical Motor) system is designed to be almost maintenance free, inspect the slide-out for any visible signs of external damage before and after movement of the slide-out. Remember to inspect inside the unit as well as the slide-out outside the unit.

For long-term storage, it is recommended that the slide-out be closed (retracted).

Visually inspect the slide floor and drive box assemblies. Refer to figure 2 for locations of rail assemblies. Check for excess build-up of dirt or other foreign material; remove any debris that may be present.

If the system squeaks or makes any noises it is permissible to apply a coat of lightweight oil to the drive shaft and roller areas, but remove any excess oil so dirt and debris do not build-up. Do **NOT** use grease.

Fig. 2



## Troubleshooting

The LCI Above Floor Slide-out (Vertical Motor) system is only one of four inter-related slide-out system components. These four components are:

- Chassis
- Slide-out room
- Unit
- LCI Above Floor Slide-out (Vertical Motor) system

Each component needs to function correctly with the others or misalignment problems will occur.

Every unit has its own unique build, or "personality," so what may work to fix one unit may not work on another—even if the symptoms appear to be the same.

When something restricts room travel, system performance will be unpredictable. It is very important that slide rails, rack and pinion be free of contamination and allowed to travel freely the full distance or "STROKE." Debris build-up during travel is an example of the type of contamination that may occur.

When beginning to troubleshoot the system, make sure the battery is fully charged, there are no visible signs of external damage to the actuator, motor or rails and that the motor is wired properly and all connections are secure.

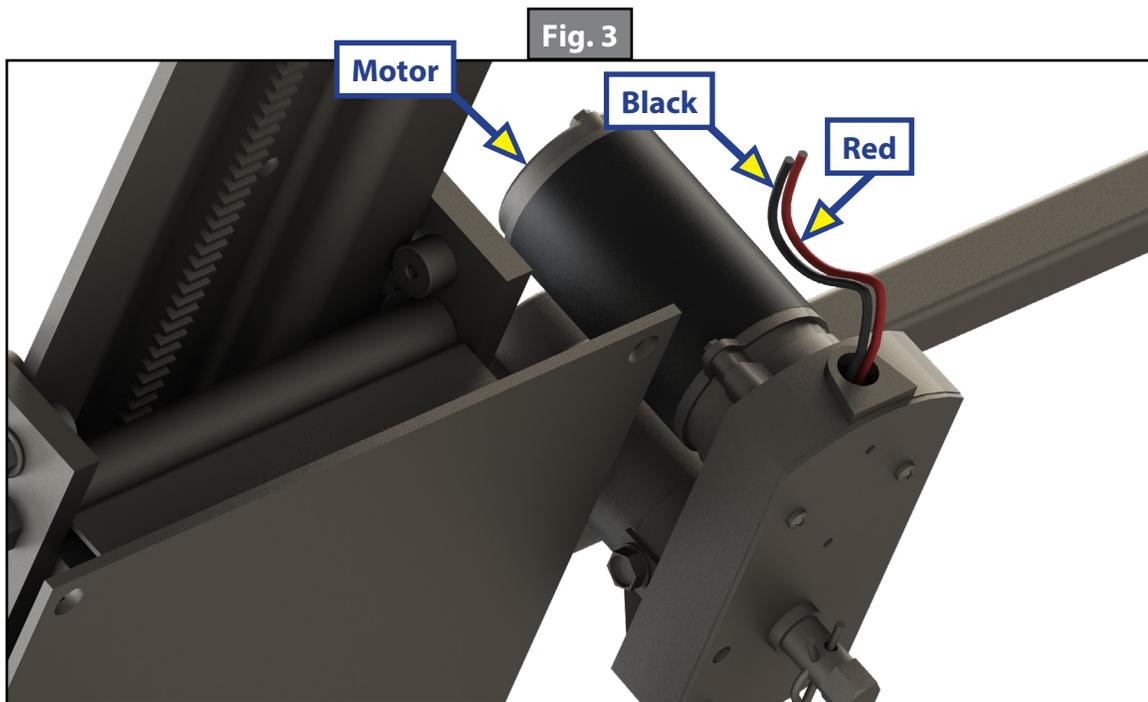
You can adjust slide-out extension by modifying the position of the rack gear on the slide floor rail to the pinion gear on the gear assembly.

During troubleshooting, changing, altering or adjusting one thing may affect something else. Make sure any changes do not create a new problem.

| Troubleshooting Chart                          |   |   |
|--|---|---|
| What is Happening                              | Why?  | What Should Be Done?  |
| Slide-out doesn't move when switch is pressed. | Restriction or obstruction inside or outside of unit. | Check for and clear obstruction.  |
|  | Low battery voltage, blown fuse, defective wiring.    | Check battery voltage and charge if needed. Find and check fuse, replace if blown. Check battery terminals and wiring. Look for loose, disconnected or corroded connectors. |
|  | Excessive slide-out drag.                             | Check that transit bars are removed.  |
| Power unit runs, but slide-out does not move.  | Motor turns, slide-out does not move.                 | Gear key is broken or lost. Replace gear drive assembly.  |
|  | Broken gear on drive shaft.                           | Replace gear drive assembly.  |
|  | Broken gear in gearbox.                               | Replace motor/gearbox assembly.   |
|  | Bad motor or gearbox.                                 | Replace motor/gearbox assembly.   |
| Slide-out starts to move, then stops.          | Low battery voltage, blown fuse, defective wiring.    | Check battery voltage and charge if needed. Find and check fuse, replace if blown. Check battery terminals and wiring. Look for loose, disconnected or corroded connectors. |
|  | Obstruction of slide-out inside or outside.           | Check for and clear obstruction.  |
| Slide-out chatters during operation.           | Teeth on gear drive broken or worn.                   | Replace gear drive assembly.  |
|  | Teeth on inner rail broken and worn.                  | Replace inner rail assembly.  |

## Switch Related Problems

1. If the slide-out moves opposite from what the switch plate indicates, reverse the red and black motor wires at the splice junction (Fig. 3). Wire size must be 10 AWG minimum.
2. If a gear is stripped, the entire gearbox must be replaced.



## Motor Unit

Before attempting to troubleshoot the power unit, make sure an adequate power source is available. The unit's batteries should be fully charged or the unit should be plugged into A/C service with batteries installed. Do **NOT** attempt to troubleshoot the power unit without assuring a full 12V DC charge.

The following tests require only a DC voltmeter, or DC test light, and a jumper lead.

1. Attach voltmeter or test light leads to the negative and positive switch terminals on back of the wall switch. Does the meter indicate 12V DC?
  - A. If yes, go to step 2.
  - B. If no, go to step 3.
2. Check the incoming leads to 12V DC. Does meter indicate 12V DC?

**NOTE:** If necessary, disconnect leads at wire splices.

- A. If yes, the power unit needs to be replaced.

**NOTE:** The motor is not field serviceable. Do **NOT** attempt to repair.

- B. If no, inspect all wires and connections between the wall switch and the motor.
    - I. Repair connections as necessary.
    - II. Re-check voltage per step 1.
3. If meter still does not register 12V DC, then:
    - III. Inspect all connections between battery and switch.
    - IV. Inspect any and all breakers, relays and fuses.
    - V. Re-check voltage per step 1.

## Electrical

Since there are no field-serviceable parts in the motor of the 12V DC motor, electrical troubleshooting and service is limited to replacing only those components as previously outlined.

**NOTE:** Thorough inspection of wiring and connections is the only other electrical service that can be performed.

## Syncing the Slide-Out

When the two opposing sides of the slide-out are misaligned—out-of-sync—an adjustment can be made to realign—sync—the system by performing a manual adjustment of the outer x-shaft.

### ⚠ 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 voiding the warranty.**

Before accessing the power unit, make sure power to the system has been disconnected.

The slide-out adjustment for syncing the LCI Above Floor Slide-out is handled through the drive shaft (Fig. 2).

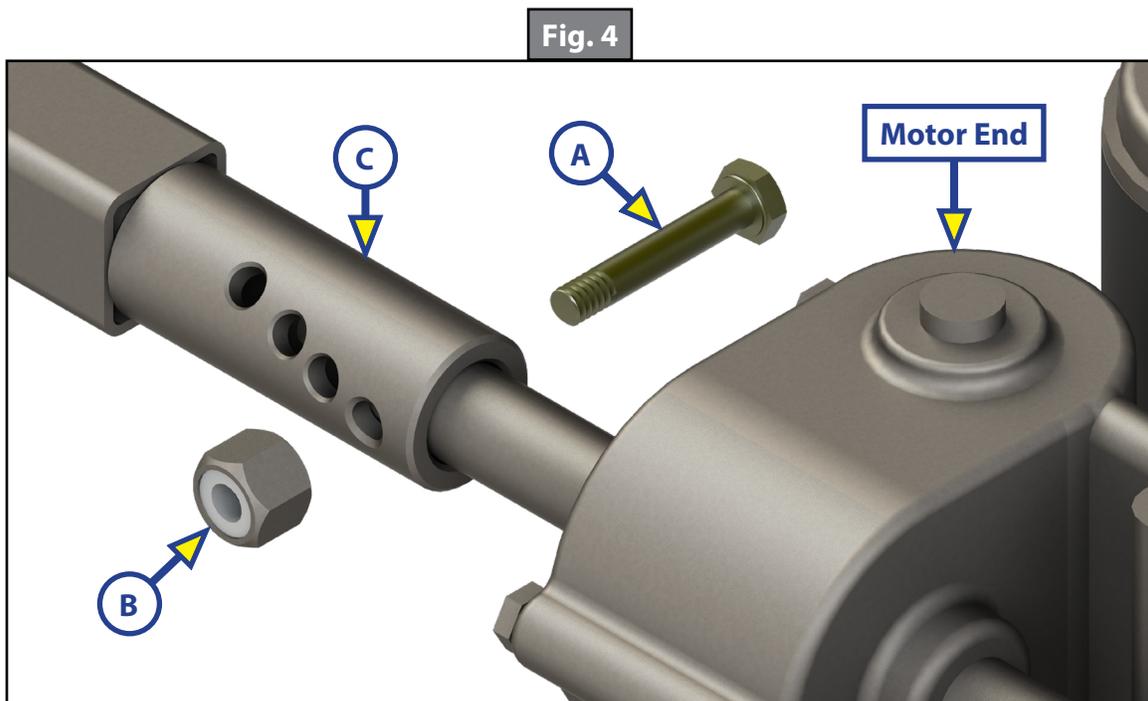
To sync the slide-out system, do as follows:

1. Access the slide-out's drive slide rail assembly (motor end) (Fig. 2).

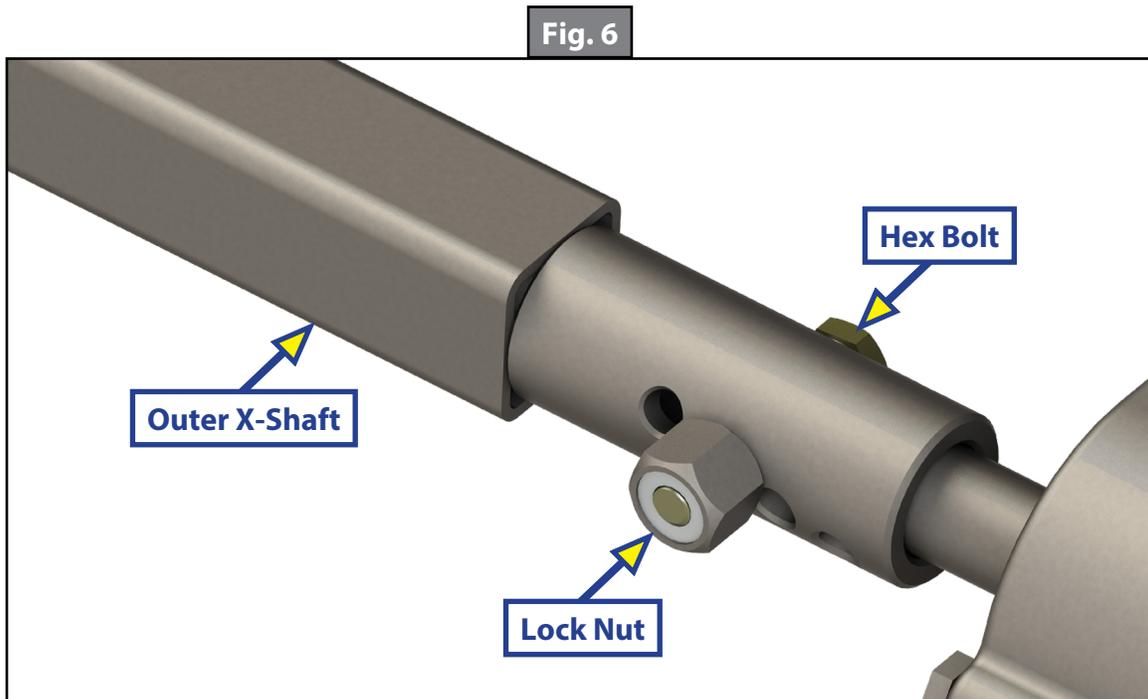
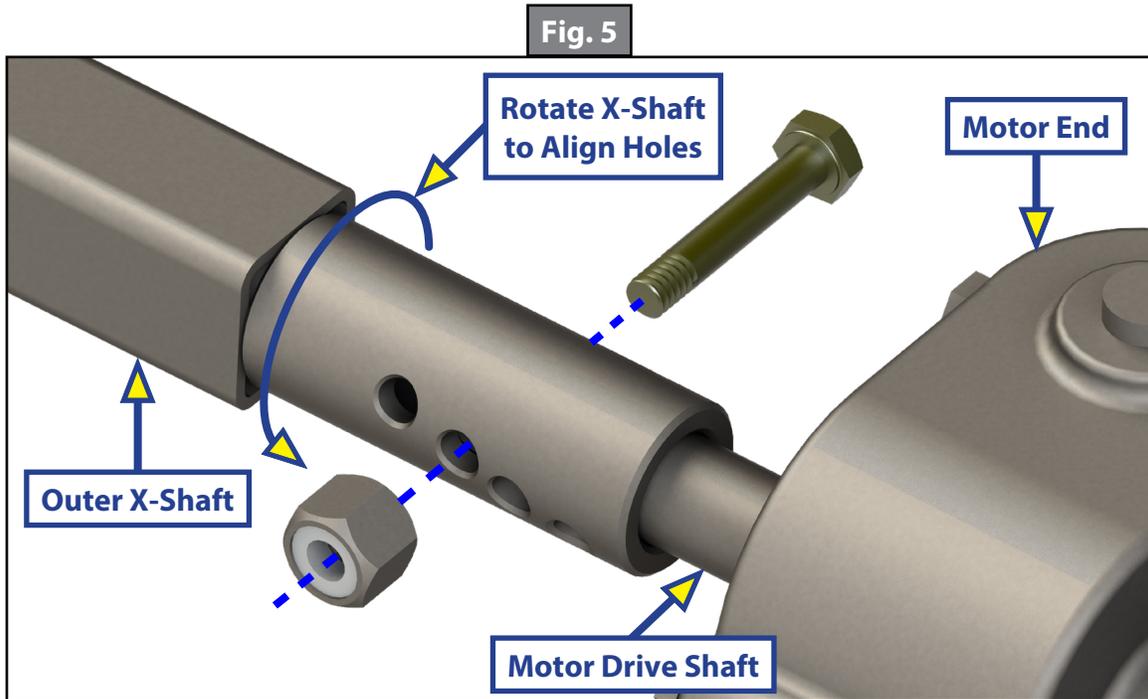
**NOTE:** The slide-out shaft will be accessible from the inside of the unit. The slide-out motor and mechanism are accessible from the outside.

2. At the motor end, remove the 1/4" - 20 bolt (Fig. 4A) and locking nut (Fig. 4B) from the outer x-shaft (Fig. 4C).

**NOTE:** This is the part that allows the follow slide to be adjusted, pulling the room closer to or further away from the wall at the follow end.



3. Turn the outer x-shaft (Fig. 5) to rotate the drive shaft until the follow slide end aligns—syncs—with the drive slide end.
4. Align the closest hole on the outer x-shaft with the through-hole on the drive shaft (Fig. 5), then reinsert the previously removed (step 2) 1/4" - 20 bolt and locking nut (Fig. 6) to secure the synced slides.



5. Reconnect internal and external power to the unit.
6. Using the switch (Fig. 1), operate the slide-out system to make sure the drive and follow slides are properly synced.
7. If slides remain out-of-sync, repeat steps 1-5 until both slides become synced and the room operates normally.

## Manual Override

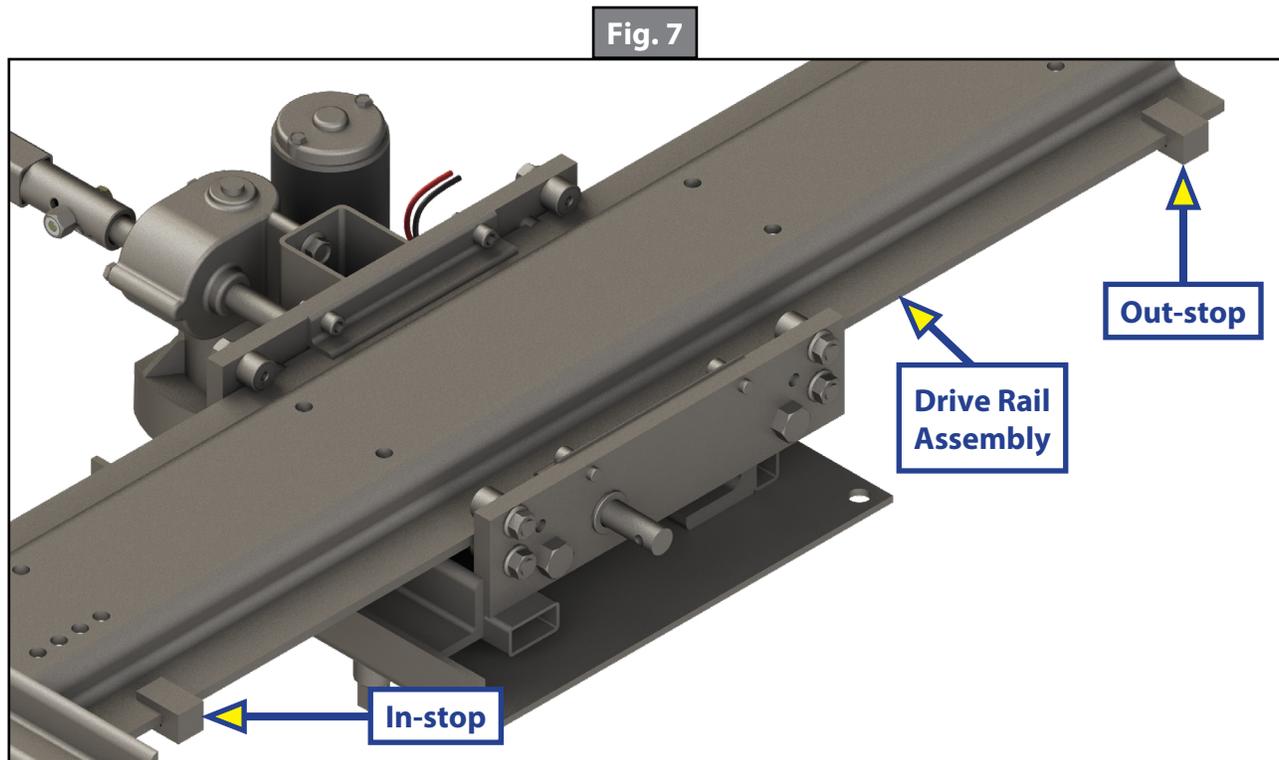
In the event of loss of power, the LCI Above Floor Slide-out (Vertical Motor) system can be manually operated as follows:

### **⚠ 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 voiding the warranty.**

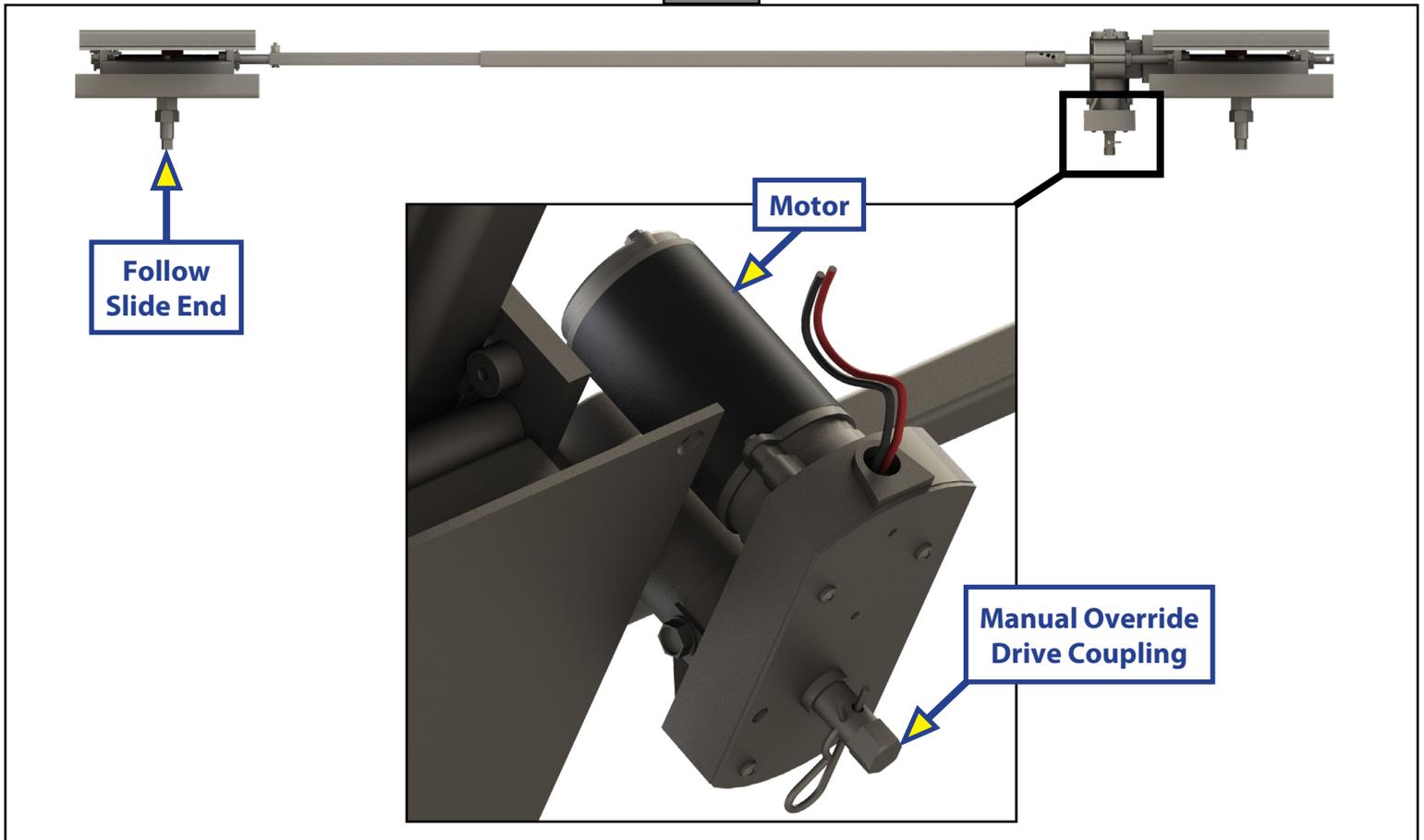
1. Before accessing the power unit, make sure power to the system has been disconnected.
2. Access the out-stop assembly (Fig. 7). Out-stops are located on the outer edge of the drive and follower rails.

**NOTE:** The slide-out out-stop assembly will be accessible from the inside of the unit. The slide-out motor and mechanism are accessible from the outside.



3. Using a 15/16" wrench or socket/ratchet combination, rotate the 5/8" hex head manual override (Fig. 8) to manually extend or retract the slide-out.

Fig. 8



**⚠ CAUTION**

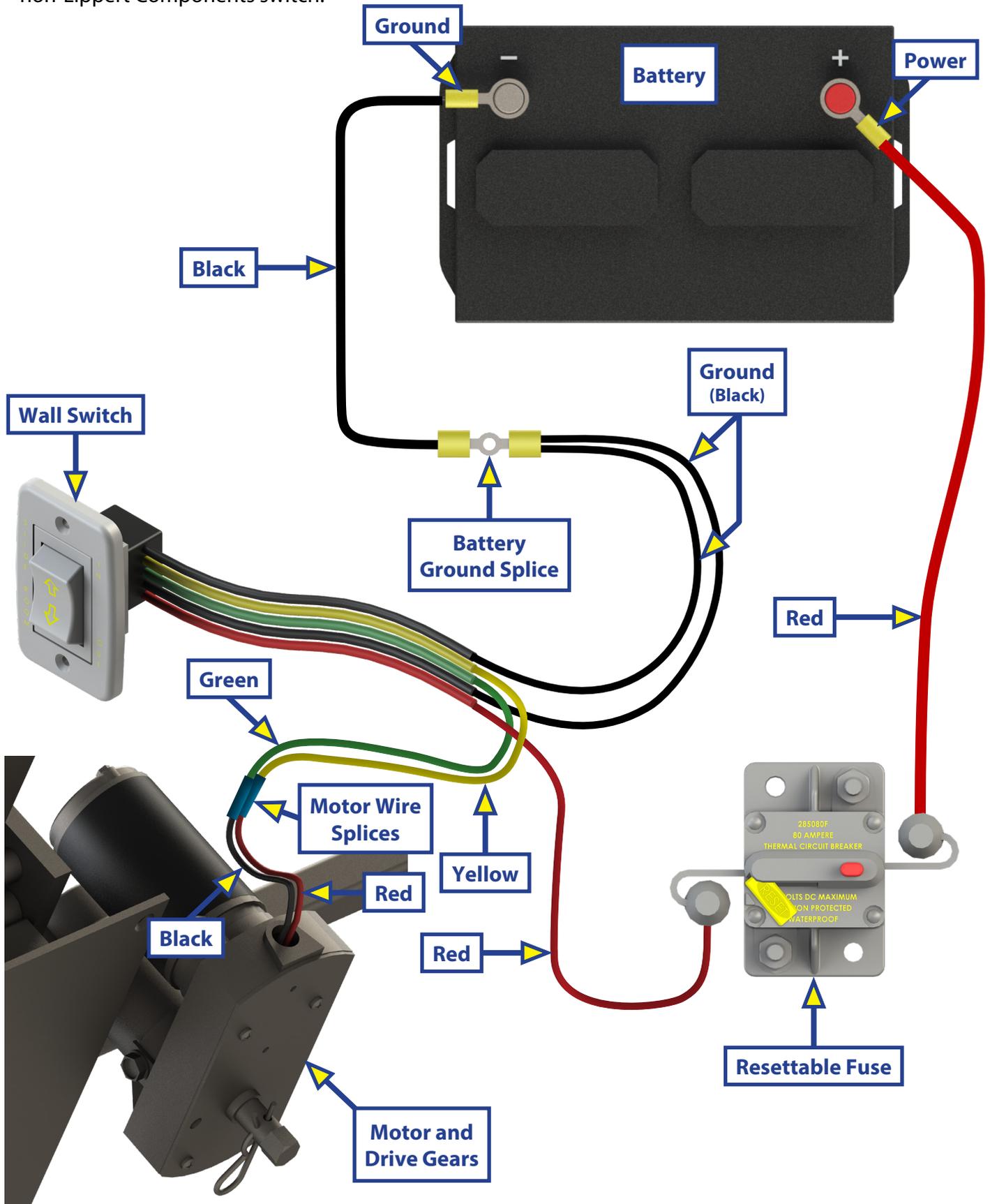
The gears can be stripped out if the slide-out is manually retracted/extended to its fullest extent and the operator continues to rotate manual override. Do NOT over extend or retract the slide-out when manually overriding the system. Damage may occur when over extending or retracting the slide-out, causing the system to fail and void the limited warranty.

4. When the slide-out reaches its stop (Fig. 7), do **NOT** continue to manually extend or retract the slide-out or damage to the system can occur.

**NOTE:** Stops are factory-set to optimize slide-out extension/retraction. No additional adjustment to the stops should be needed. If the retracted slide-out does not fully seal, then an adjustment to the in-stops may be required. Contact the unit's manufacturer for additional adjustment information.

# Wiring Diagram

**NOTE:** Wire colors may differ when using a non-Lippert Components switch.



### Safety Information

#### **WARNING**

**Failure to act in accordance with the following may result in death, serious injury, coach or property damage.**

The In-Wall® Slide-out System is intended for the sole purpose of extending and retracting the slide-out room. Its function should not be used for any purpose or reason other than to actuate the slide-out room. To use the system for any reason other than what it is designed for may result in death, serious injury or damage to the coach.

Before actuating the system, please keep these things in mind:

1. Parking locations should be clear of obstructions that may cause damage when the slide-out room is actuated.
2. Be sure all persons are clear of the coach prior to the slide-out room actuation.
3. Keep hands and other body parts away from slide-out mechanisms during actuation.
4. To optimize slide-out actuation, park coach on solid and level ground.

### Operation

#### Prior to Operation

1. Coach should be parked on the most level surface available.
2. Leveling or stabilizing system should be actuated to ensure coach will not move during operation of slide-out system.

**NOTE:** In the case of a motorized unit, ignition must be off to operate the slide-out.

3. Be sure to keep all persons and pets clear of slide-out system during operation.

**NOTE:** Install transit bars (if so equipped) on the slide-out room during storage and transportation.

#### **CAUTION**

**Always make sure that the slide-out room path is clear of people and objects before and during operation of the slide-out. Always keep away from the gear racks when the room is being operated.**

## Extending Slide-Out Room

1. Level the unit.

**NOTE:** In the case of a motorized unit, ignition must be off to operate the slide-out.

2. Remove the transit bars (if so equipped).
3. Press and hold the IN/OUT switch (Fig. 1B) in the OUT position until the room is fully extended and stops moving.

**NOTE:** It is important to continue to press the slide-out switch for a few seconds after the room is fully extended until the motor shuts off. The control will sense that the room has stopped and will shut off the motor after a few seconds.

4. Release the switch, which will lock the room into position.

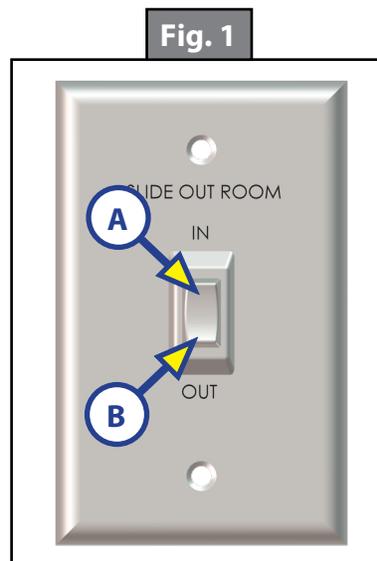
## Retracting Slide-Out Room

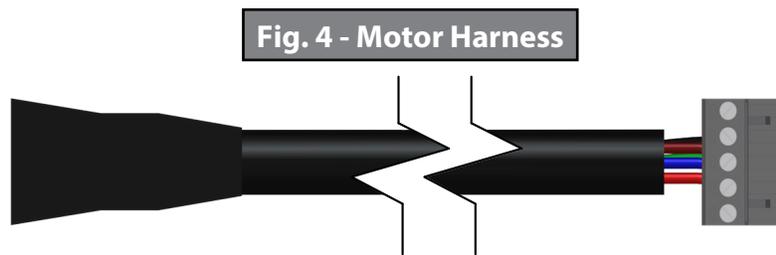
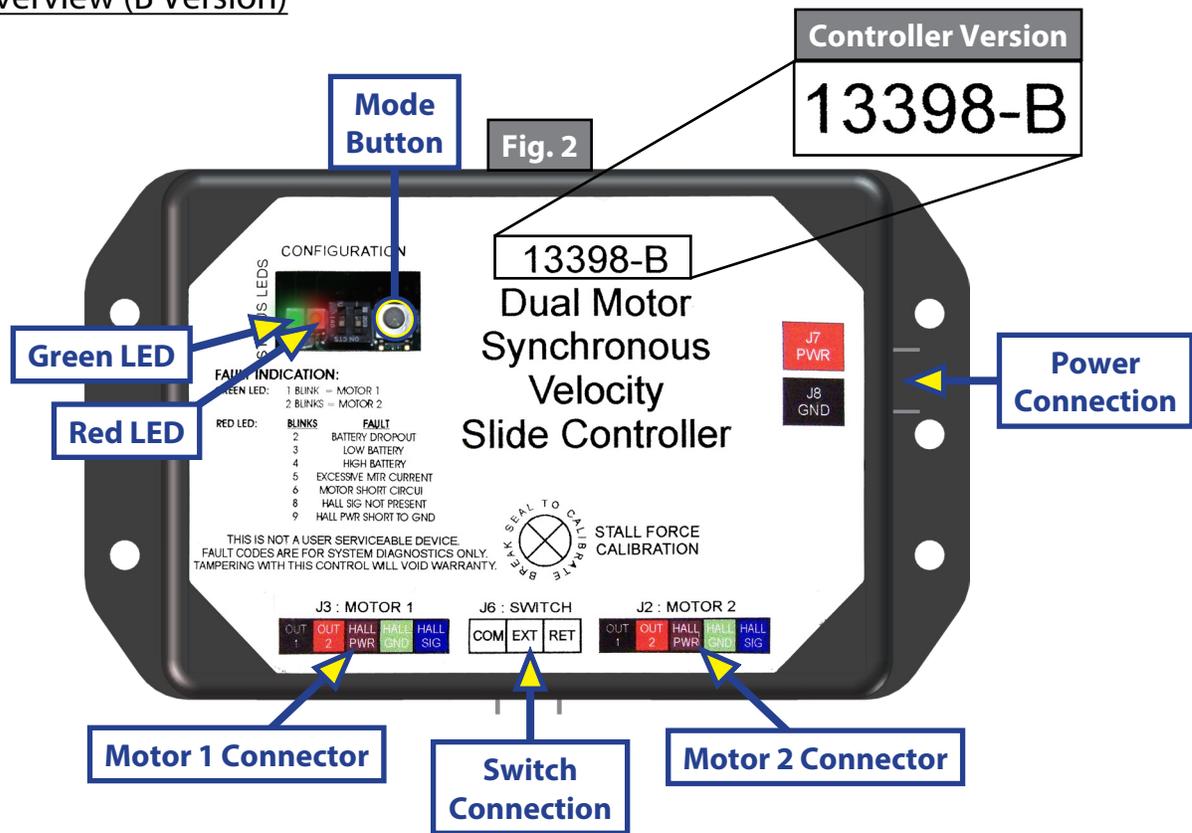
**NOTE:** In the case of a motorized unit, ignition must be off to operate the slide-out.

1. Press and hold the IN/OUT switch (Fig. 1A) in the IN position until the room is fully retracted and stops moving.

**NOTE:** It is important to continue to press the slide-out switch for a few seconds after the room is fully retracted until the motor shuts off. The control will sense that the room has stopped and will shut off the motor after a few seconds.

2. Release the switch, which will lock the room into position.
3. Install the transit bars (if so equipped).





**Status LEDs:** 2 LEDs, 1 green and 1 red, are provided to indicate current controller status and faults.

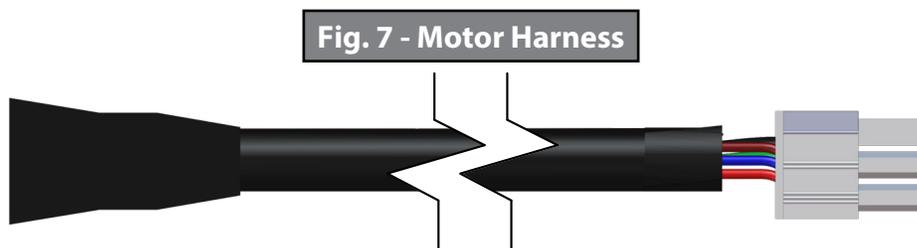
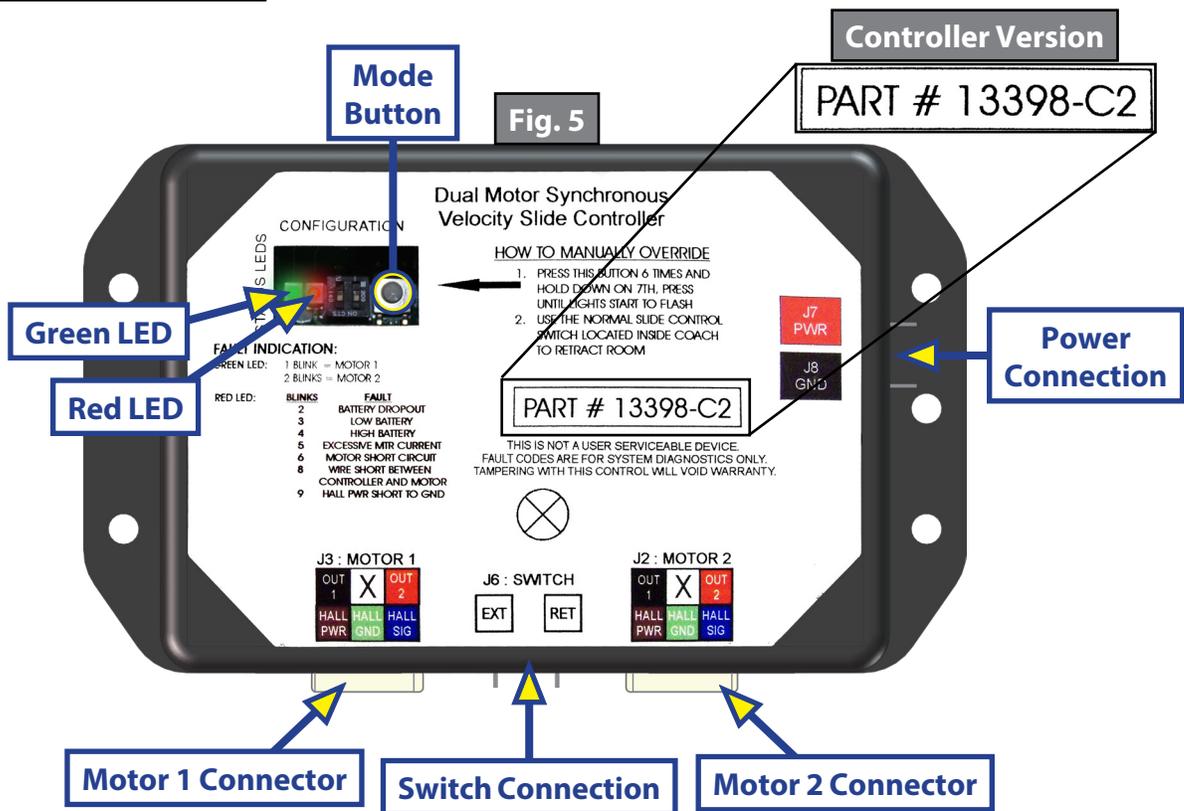
**Power Connection:** 12V DC input. Unit will operate from 8V DC to 18V DC.

**Switch Connection:** Spade connection for the switch wiring.

**Motor 1 Connector:** Power and encoder input for motor 1.

**Motor 2 Connector:** Power and encoder input for motor 2.

**NOTE:** Version B motor harnesses have five wire in-line connectors at the controller and the molded connector at the motor end (Figs. 3 and 4). Wire colors match with color codes on control board. It does not matter which motor is 1 or 2.



**Status LEDs:** 2 LEDs, 1 green and 1 red, are provided to indicate current controller status and faults.

**Mode Button:** Used to engage the electronic manual override.

**Power Connection:** 12V DC input. Unit will operate from 8V DC to 18V DC.

**Switch Connection:** Spade connection for the switch wiring.

**Motor 1 Connector:** Power and encoder input for motor 1.

**Motor 2 Connector:** Power and encoder input for motor 2.

**NOTE:** Motor harnesses have Molex® connectors at the controller and a molded connector at the motor end (Figs. 6 and 7). Wire colors match with color codes on control board. It does not matter which motor is 1 or 2.

# Motor and Controller Compatibility

| Part #   | Controller Version       | Controller Replacement | Motor(s) Used   |
|--|--------------------------|------------------------|---|
| <a href="#">239657</a>   | A (Daisy Chain) (Fig. 8) | A Only                 | Round-Square (Fig. 14), Round-Round (Fig. 15A)                                      |
| <a href="#">211852</a>   | B (Fig. 9)               | B/C2* Only             | Round Square (Fig. 14)<br>Round-Round (Fig. 15A, 15B), Round-Square Plate (Fig. 16) |
|  | C (Fig. 10)              | C/C2* Only             |   |
|  | C1 (Fig.11)              | C1/C2* Only            |   |
|  | C2 (Fig. 12)             | C2                     |   |
| D-0 (Fig. 13)  | B/C1/C2                  |                        |   |
| 326876   | 8 Amp (Fig. 14)          | 8 Amp Only             | Round-Round (Fig.15B)   |
| <p><b>NOTE:</b> Always replace the motor in the system with the same motor except the Round-Square Plate (Fig. 17), which is obsolete. That motor will be replaced with the Round-Round (Fig. 16A, 16B).</p> <p><b>NOTE:</b> (*) Denotes that (2) new motor harnesses must be ordered, and re-wiring instructions must be used. See next page.</p> |                          |                        |   |

Fig. 8



Fig. 8



Fig. 10



Fig. 11



Fig.12

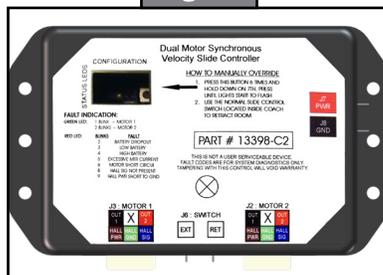


Fig. 13

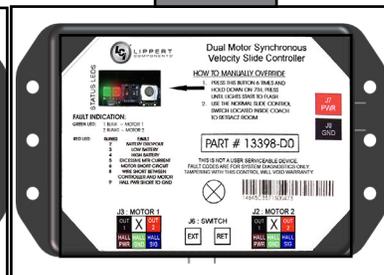


Fig. 14



Fig. 15 - [229466](#)



Fig. 16A - [236575](#), 300:1



Fig. 16B - [287298](#), 500:1



Fig. 17 - Obsolete

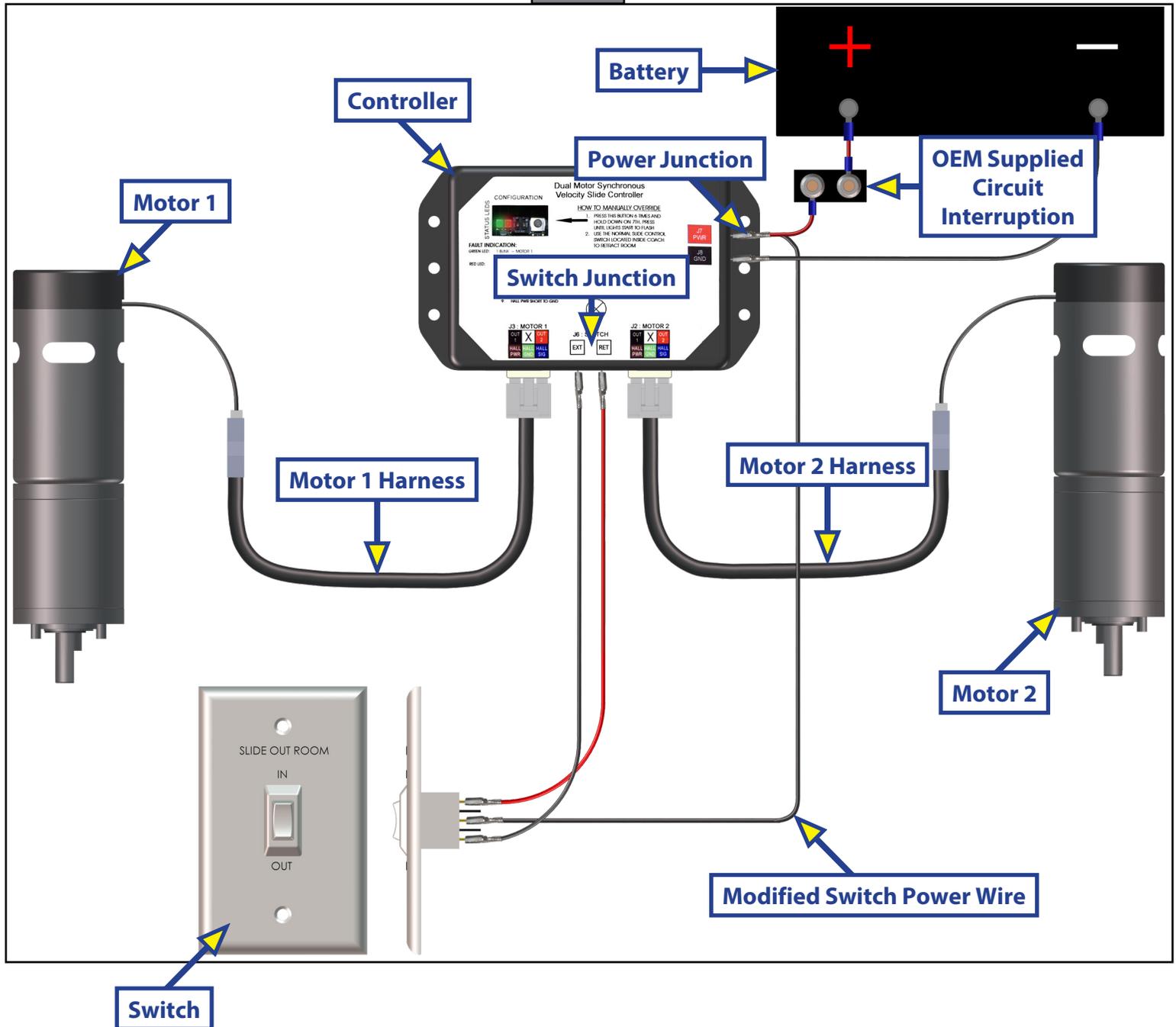


**NOTE:** Ensure that a 300:1 motor is replaced with a 300:1 motor (Fig. 16A), and that a 500:1 motor is replaced with a 500:1 motor (Fig. 16B).

## Rewiring Instructions

If it is necessary to replace a malfunctioning Rev. B, C, or C1 controller, it is recommended that the customer do so with a new Rev. D-0 controller. In order to properly rewire a Rev. B, C, or C1 controller to a new Rev. D-0 controller, the customer will need two new motor harnesses (one for each motor.) Additionally, it will be necessary to modify the power wire from the controller to the extend/retract switch by adapting the wire to piggyback the connection at the power junction. This wire comes from the positive side of the buss bar to the controller (Fig. 18).

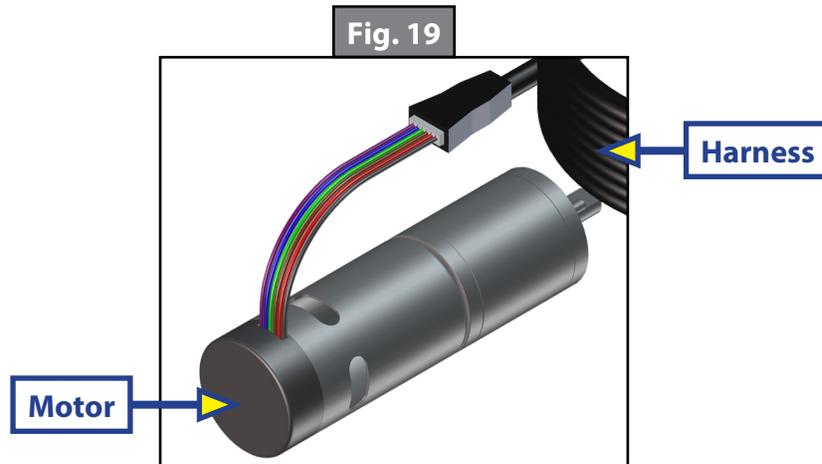
Fig. 18



## Motors and Harnesses

1. Check for proper connections between the motors and harnesses (Fig. 19).
2. Visually inspect the exposed harnesses to ensure they are not pinched or damaged.

**NOTE:** Ribs on motor connector line up with notch inside of female connector on wiring harness. Color codes on wires also match (black to black, red to red, etc.)



## Resynchronizing the Slide-Out Motors

1. Fully extend the slide room using the switch. Keep the switch engaged until the motors shut down on their own.
2. Retract the room 1-2 inches.
3. Repeat steps 1 and 2 until both motors shut down at the same time. In many cases, two or three repetitions are necessary to re-sync the system.
4. Fully extend the slide-out and keep the switch engaged until the motors shut down on their own. Fully retract the slide-out, again keeping the switch engaged until the motors shut down on their own. If both motors shut down at the same time at full extension and full retraction, the room is properly synchronized. If they do not shut down at the same time, repeat the process until they do.

## Extend and Retract Switch Connections

Rev. A - Rev. C1 Controllers: Common connection on controller goes to common connection on extend and retract switch.

Rev. C2 and 8 amp Controllers: Extend and retract connections on the controller go to the extend and retract terminals on the switch. Switch is powered by the OEM supplied 12V DC power source.

## Power and Ground Connections at The Controller

Power and ground are supplied to the controller through the spade terminals located on the right-hand side of the controller (Figs. 2 and 5 - Power Connection). 12V DC is recommended. A 10 GA wire is the minimum size recommended. A 30 amp resetting or blade fuse is required (OEM supplied).

# Troubleshooting

## Checking Circuit Breakers

The IN-WALL® Slide-out requires a minimum of a 30-amp circuit breaker. Check the 12-volt circuit breaker box for blown circuit breakers, and replace any if necessary. Consult the RV manufacturer's documentation for the location of the 12-volt circuit breaker box, and the location of the IN-WALL® Slide-out controller's circuit breaker. If the circuit breaker blows immediately upon replacement, there is a problem with the wiring to the IN-WALL® Slide-out controller. Have qualified service personnel check and repair.

## Obstructions

Check outside the RV for possible obstructions: tree, post, car, etc. Check inside the RV for any obstructions: luggage, furniture, open cabinets, etc. Also, check for smaller objects that may be wedged under the floor or in the sides of unit. Remove obstructions before proceeding.

## Debris In the Rack

Check the sides of the slide room for any dirt or debris. Small dirt clumps or metal shavings can cause the spur gear to bind up and stop the movement of the slide-out. Use compressed air or a dry brush to remove any dirt or debris from the rack before attempting to actuate the system again.

## Error Codes

During operation when an error occurs, the board will use the LEDs to indicate where the problem exists (Fig. 20). 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 from 2 to 9 times depending on the error code (Fig. 21).

When an error code is present, the board needs to be reset. Energizing the extend/retract switch (Fig. 1) resets the board. Energize the extend/retract switch again for normal operation.

Fig. 20

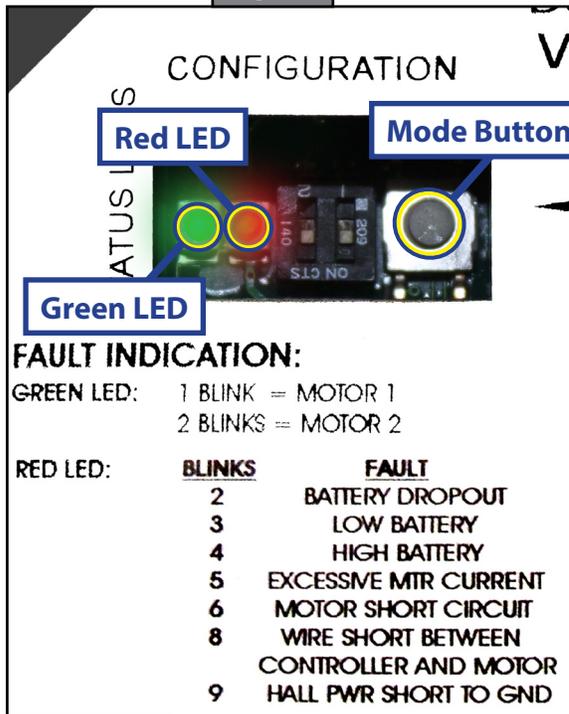


Fig. 21 - Error Code Description

| Error Code | Name                                    | Description  |
|------------|---|--|
| 2          | Battery drop out                        | Battery capacity low enough to drop below 6 volts while running or short in switch wiring. |
| 3          | Low battery                             | Voltage below 8 volts at start of cycle.   |
| 4          | High battery                            | Voltage greater than 18 volts.   |
| 5          | Excessive motor current                 | High amperage, also indicated by 1 side of slide continually stalling.                     |
| 6          | Motor short circuit                     | Motor or wiring to motor has shorted out.  |
| 8          | Wire short between controller and motor | Encoder is not providing a signal. This is usually a wiring problem.                       |
| 9          | Hall power short To ground              | Power to encoder has been shorted to ground. This is usually a wiring problem.             |

## Electronic Manual Override (Controllers C-1, C-2 and D-0 Only)

**NOTE:** See (Fig. 22) for locations of the mode button and LEDs.

1. Press the mode button on the controller six times and hold on the seventh for five seconds to enter electronic manual override mode.
2. Use the extend/retract switch to move both motors in or out.

**NOTE:** Over-current and short circuit detection are still enabled. Electronic manual override provides 12V directly to both motors.

3. To exit the mode, push and hold the mode button until the LEDs begin to blink simultaneously. Exiting the override mode resets the motor positions (you will have to resync motors).

**NOTE:** During this override procedure the motors are not synchronized. Visually watch the room: if one side is moving significantly slower than the other (or not at all) then immediately stop and use the "Motor Disengagement Procedure" below.

## Motor Disengagement Procedure

1. Remove motor retention screws located near the top of each vertical column on the outside of the coach (under bulb seal if equipped with bulb seal on column).
2. Locate motor.
  - A. On units built prior to 2011: Bend back wipe seal from outside of coach.
  - B. On units from 2011 to current: See slot in H-column on the inside of the coach.
3. Pull motor up until disengaged (roughly 1/2"). A flat-head screwdriver can be used to pry the motor up.
4. Reinstall motor retention screw to hold motor in place or remove motor.

## Low Voltage

The Lippert In-Wall Slide-out controller is capable of operating the room with as little as 8 volts. But at these lower voltages the amperage requirement is greater. Check voltage at the controller, see Figs. 2 and 5 for the location of power connections. If the battery is low, it needs to be charged or the unit should be plugged into shore power or the generator can be run, if equipped. It may be possible to "jump" the RV's battery temporarily to extend or retract the room. Consult the RV manufacturer's owners manual.

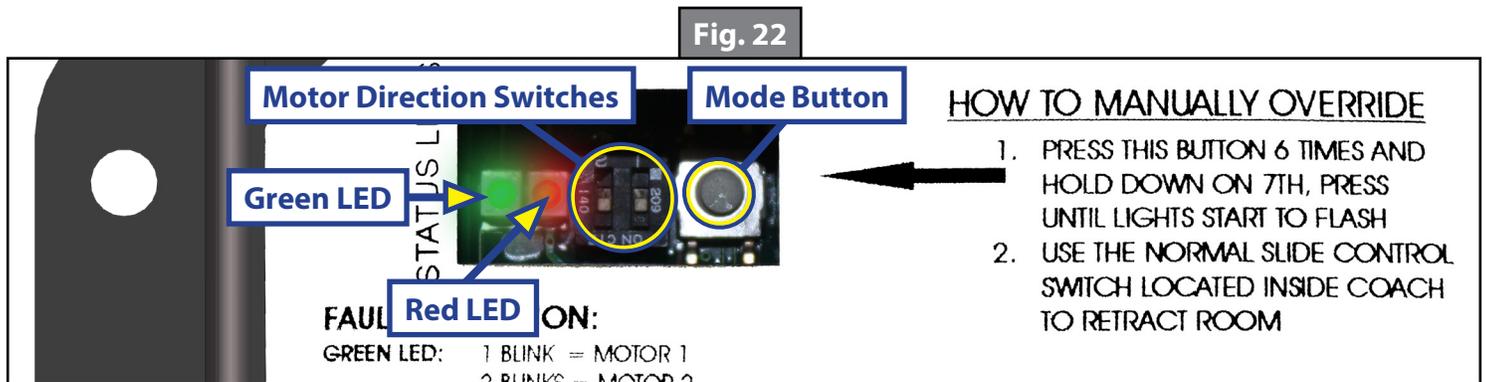
**NOTE:** Always connect directly to the battery and never to the controller power connections.

## Motor Direction Switches

Motor direction switches (Fig. 22) are used to change the direction of individual motors. If when trying to extend or retract the room, one side goes in and the other side goes out, then there is a problem in the wiring.

The motor direction switches can be used to correct this problem. The left switch controls motor 2 and the right switch controls motor 1. If motor 1 is going in the wrong direction, then change switch 1's position. If motor 2 is going in the wrong direction, then change switch 2's position.

The motor direction switches can also be used to change the direction of the extend/retract switch. If the room extends when the extend/retract switch is moved to the retract position, its direction can be reversed by moving both switch 1 and switch 2 to their opposite positions. This feature can be used if it is more convenient to change the motor direction switches than to rewire the extend/retract switch.



## System Maintenance

It is recommended that when operating In-Wall Slide-out system in harsh environments (road salt, ice buildup, etc.) that the gear racks and seals be kept clean and free of debris. They can be washed with mild soap and water.

**NOTE:** No grease or lubrication is necessary, and in some situations may be detrimental to the long-term dependability of the system.

# ABOVE FLOOR SOFA SLIDE-OUT

## SLIDE-OUTS

### **WARNING**

**Failure to act in accordance with the following may result in death, serious injury, coach or property damage.**

The Lippert Above Floor Sofa Slide-out System is intended for the sole purpose of extending and retracting the slide-out room. Its function should not be used for any other purpose or reason than to actuate the slide-out room. To use the system for any reason other than what it is designed for may result in damage to the coach and/or cause serious injury or even death.

Before actuating the system, please keep these things in mind:

1. Parking locations should be clear of obstructions that may cause damage when the slide-out room is actuated.
2. Be sure all persons are clear of the coach prior to the slide-out room actuation.
3. Keep hands and other body parts away from slide-out mechanisms during actuation. Severe injury or death may result.
4. To optimize slide-out actuation, park coach on solid and level ground.

## Product Information

The Lippert Above Floor Sofa Slide-out System is a rack and pinion style slide system. Utilizing a bi-directional electric motor to actuate the drive shaft, the slide-out room is extended and retracted from the same source. The actuator has a built-in automatic braking feature. The Lippert Above Floor Sofa Slide-out is designed as a negative or positive ground system.

There are no serviceable parts within the electric motor. If the motor fails, it must be replaced.

Disassembly of the motor voids the warranty.

Mechanical portions of the slide-out system are replaceable. Contact Lippert Components, Inc. to obtain replacement parts.

## Prior to Operation

Prior to operating the Lippert Above Floor Sofa Slide-out, follow these four (4) guidelines:

1. Coach should be parked on the most level surface available.
2. The PARKING BRAKE must be engaged.
3. The coach's transmission must be in PARK.
4. The coach's ignition must be in the ON or RUN position or the coach's engine must be running. (Class A and C only; Gas and Diesel)

## Operation

### **WARNING**

**Failure to act in accordance with the following may result in death, serious injury, coach or property damage.**

Always make sure that the slide-out room path is clear of people and objects before and during operation of the slide-out room. Always keep away from the slide rails when the room is being operated. The gear assembly may pinch or catch on loose clothing causing personal injury.

Keep stored items in compartment clear of slide-out motor mechanisms and wiring to prevent interference of slide-out operation.

Install transit bars (if so equipped) on the slide-out room during storage and transportation.

The family of Lippert Above Floor Sofa Slide is controlled by a switch mounted on the coach wall, normally located close to the entry door.

### Extending Slide-Out Room

1. Level Unit
2. Verify the battery is fully charged and hooked up to the electrical system.
3. Remove transit bars (if so equipped).
4. Press and hold the IN/OUT switch in the OUT position until room is fully extended and stops moving.
5. Release switch, which will lock the room into position.

**NOTE:** Only hold OUT switch until room stops.

### Retracting Slide-Out Room

1. Verify the battery is fully charged and hooked up to the electrical system.
2. Press and hold the IN/OUT switch in the IN position until the room is fully retracted and stops moving.
3. Release the switch. This will lock the room into position.

**NOTE:** Only hold IN switch until room stops.

4. Install the transit bars (if so equipped).

## **Maintenance**

### Preventative

The Lippert Above Floor Sofa Slide-out has been designed to require very little maintenance and has been static tested to over 2,500 continuous cycles with out any noticeable wear to rotating or sliding parts. No grease or lubrication is necessary and in some situations may be detrimental to the environment and long term dependability of the system. To ensure the long life of your slide-out system, read and follow these few simple procedures.

### Electric

For optimum performance, slide-out system requires full battery current and voltage. The battery must be maintained at full capacity. Other than good battery maintenance, check the terminals and other connections at the battery, the control switch, and the electric motor for corrosion, and loose or damaged terminals. Check motor leads under the motor-home chassis. Since these connections are subject to damage from road debris, be sure they are in good condition.

**NOTE:** The Lippert Above Floor Sofa Slide-out is designed to operate as a negative ground system. A 12VDC system must maintain good wire connections. It is important that the electrical components have good ground connection. Over 90% of unit electrical problems are due to bad ground connections.

## Mechanical Maintenance

Although the system is designed to be almost maintenance free, inspect the slide-out for any visible signs of external damage after and before movement of the room. Remember to inspect inside the coach as well as the slide-out outside the coach.

**NOTE:** For long-term storage: It is recommended that the room be closed (retracted).

**NOTE:** Visually inspect the Slide Floor and Drive Box Assemblies. Refer to Fig. 1 for location of rail assemblies. Check for excess build-up of dirt or other foreign material; remove any debris that may be present.

**NOTE:** If the system squeaks or makes any noises it is permissible to apply a coat of lightweight oil to the drive shaft and roller areas but remove any excess oil so dirt and debris do not build-up. DO NOT use grease.

## **Troubleshooting**

### Troubleshooting Introduction

The Lippert Above Floor Sofa Slide-out System is only one of four inter-related slide-out room system components. These four components are as follows: Chassis, Slide-out room, Coach and Lippert Above Floor Sofa Slide-out System. Each one needs to function correctly with the others or misalignment problems will occur.

Every coach has its own personality and what may work to fix one coach may not work on another, even if the symptoms appear to be the same.

When something restricts room travel, system performances will be unpredictable. It is very important that slide rails, rack and pinion be free of contamination and allowed to travel freely the full distance or "STROKE." Debris build-up during travel is an example of the type of contamination that may occur.

When beginning to troubleshoot the system, make sure the battery is fully charged, there are no visible signs of external damage to the actuator, motor or rails and that the motor is wired properly and all connections are secure.

You can adjust room extension by modifying the position of the rack gear on the slide floor rail to the pinion gear on the gear assembly.

During troubleshooting, remember, by changing, altering or adjusting one thing, it may affect something else. Be sure any changes do not create a new problem.

### Switch Related Problems

- If room moves opposite from what the switch plate indicates, reverse the motor wires on the back of the switch. Wire size must be 10ga. min.
- If a gear is stripped, the entire gearbox must be replaced.

### Motor Unit

Before attempting to troubleshoot the Power Unit, make sure an adequate power source is available. The unit batteries should be fully charged or the unit should be plugged into A/C service with batteries installed. Do not attempt to troubleshoot the Power Unit without assuring a full 12V DC charge.

The following tests require only a DC voltmeter (or DC test light) and a jumper lead.

**Step 1** - Attach voltmeter (or test light) leads to the negative and positive switch terminals on back of wall switch. Does the meter indicate 12VDC?

If **YES**, see **Step 2**; if **NO** see **Step 3**.

**Step 2** - If **YES**, at the motor, check the incoming leads to 12V DC (if necessary, disconnect leads at wire splices). Does meter indicate 12V DC? If **YES**, Power Unit needs to be replaced. The motor is not field serviceable. DO NOT ATTEMPT TO REPAIR. If **NO**, Inspect all wires and connections between the wall switch and the motor. Repair connections as necessary. Recheck as in **Step 1**.

**Step 3** - If **NO**, Inspect all connections between battery and switch. Inspect any and all breakers, relays and fuses. Recheck as above in **Step 1**.

Since there are no field serviceable parts in the motor of the 12V DC motor, electrical troubleshooting and service is limited to replacing only those components as previously outlined.

**NOTE:** Thorough inspection of wiring and connections is the only other electrical service that can be performed.

| Problem                                  | Probable Cause  | Corrective Action   |
|--|---|---|
| Room doesn't move when switch is pressed | Restriction or obstruction inside or outside of unit        | Check for and clear obstruction   |
|  | Low battery voltage, blown fuse, defective wiring           | Check battery voltage and charge if needed. Find and check fuse, replace if blown. Check battery terminals and wiring. Look for loose, disconnected or corroded connectors. |
|  | Excessive room drag   | Check that transit bars are removed   |
| Power unit runs but room does not move   | Motor turns, room does not move                             | Gear key is broken or lost. Replace gear drive assembly   |
|  | Broken gear on drive shaft                                  | Replace gear drive assembly   |
|  | Broken gear in gearbox                                      | Replace motor/gearbox assembly  |
|  | Bad motor or gearbox  | Replace motor/gearbox assembly  |
| Power unit runs but room moves slowly    | Low battery, poor ground, extremely low outdoor temperature | Charge battery and check ground wire  |
|  | Room is in a bind   | Adjust to proper room setting   |
|  | Incorrect height adjustment                                 | Check for proper room height  |
| Room starts to move and stops            | Low battery voltage, blown fuse, defective wiring           | Check battery voltage and charge if needed. Find and check fuse, replace if blown. Check battery terminals and wiring. Look for loose, disconnected or corroded connectors. |
|  | Obstruction of room inside or outside                       | Check for and clear obstruction   |
| Room chatters during operation           | Teeth on gear drive broken or worn                          | Replace gear drive assembly   |
|  | Teeth on inner rail broken and worn                         | Replace inner rail assembly   |

**⚠ 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.**

1. Accessing Out-Stop Assembly (Fig. 1).

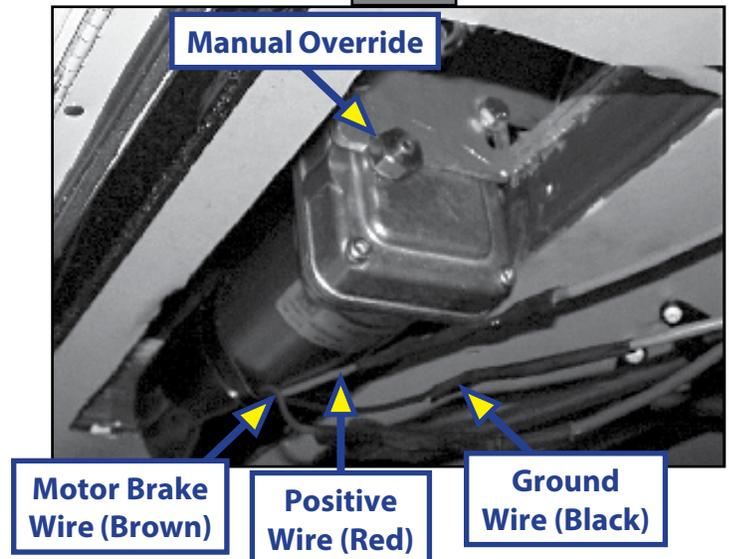
**NOTE:** The slide-out out-stop assembly will be accessible from the inside of the unit. The slide-out motor and mechanism is accessible from the outside.

**NOTE:** 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. Any damage due to misuse of the Manual Override feature will disqualify any and all claims to the limited warranty.

Fig. 1



Fig. 2



2. With a second person assisting, one person must push and hold the manual override switch while the other person, using a 5/8" wrench or socket/ratchet combination, rotates the hex head manual override (Figs. 3 and 4) to manually move the slide-out.

Fig. 3

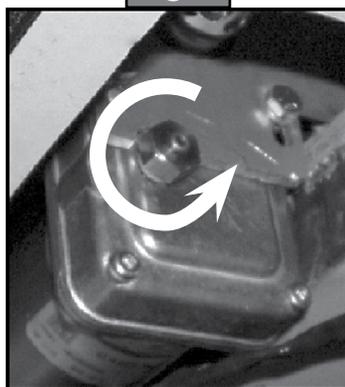
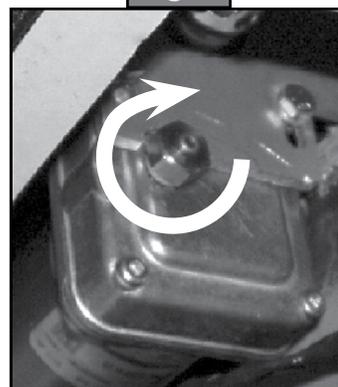
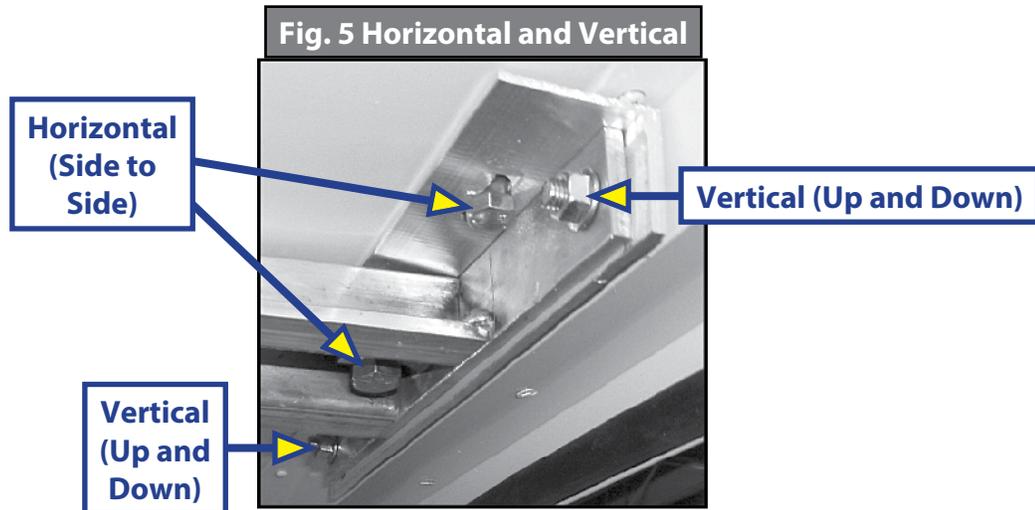


Fig. 4

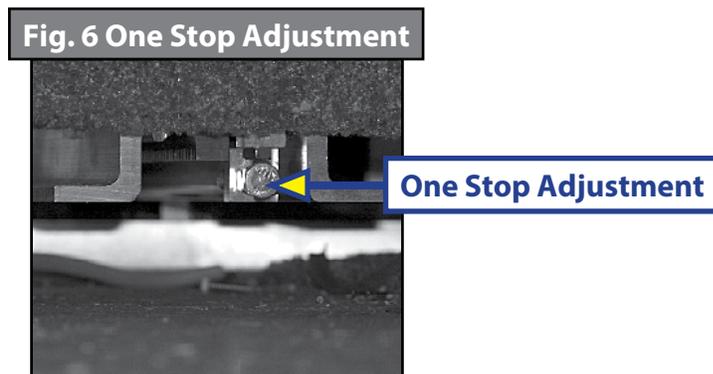


## Room Adjustment

1. For Horizontal Adjustment, back both lag bolts out just enough to release tension. In a Dual System, lag bolts must be loosened on both head stocks to adjust the room horizontally.
2. Adjust room to desired location.
3. Tighten lag bolts before operating room.



1. For One Stop Adjustment, loosen jam nut (shown) on the outside of the Out Stop Bracket.
2. Adjust Stop Bolt to desired location.
3. Tighten jam nut.



# ELECTRIC THROUGH FRAME SLIDE-OUT

## SLIDE-OUTS

### Warning, Safety, and System Requirement Information

#### Description

The Lippert Electric Through Frame Slide-out System is a rack and pinion guide system, utilizing an electric ball screw actuator to move the room assembly. The motor drives the ball screw in a forward and backward motion to move the slide room in and out. The actuator comes equipped with an automatic clutching system. The Lippert Electric Slide-out System is designed to operate as a negative ground system.

#### **⚠ WARNING**

**Failure to act in accordance with the following may result in death or serious personal injury.**

The Lippert Through Frame Slide-out System is intended for the sole purpose of extending and retracting the slide-out room. Its function should not be used for any other purpose or reason than to actuate the slide-out room. To use the system for any reason other than what it is designed for may result in death, serious injury or damage to the coach.

Before actuating the system, please keep these things in mind:

1. Parking locations should be clear of obstructions that may cause damage when the slide-out room is actuated.
2. Be sure all persons are clear of the coach prior to the slide-out room actuation.
3. Keep hands and other body parts away from slide-out mechanisms during actuation. Severe injury or death may result.
4. To optimize slide-out actuation, park coach on solid and level ground.

#### **Prior to Operation**

Prior to operating the Lippert Through Frame Slide-out System, follow these guidelines:

1. Coach should be parked on the most level surface available.
2. Leveling or stabilizing system should be actuated to ensure coach will not move during operation of slide-out system.
3. Be sure battery is fully charged.
4. Be sure to keep all persons and pets clear of slide-out system during operation.

#### **⚠ CAUTION**

**Always make sure that the slide-out room path is clear of people and objects before and during operation of the slide-out room. Always keep away from the slide rails when the room is being operated. The gear assembly may pinch or catch on loose clothing causing personal injury.**

**NOTE:** Install transit bars (if so equipped) on the slide-out room during storage and transportation.

## Operation

### Extending Slide-Out Room

1. Level Unit
2. Verify the battery is fully charged and hooked up to the electrical system.
3. Remove transit bars (if so equipped).
4. Press and hold the IN/OUT switch in the OUT position (Fig. 1B) until room is fully extended and stops moving.
5. Release switch, which will lock the room into position.

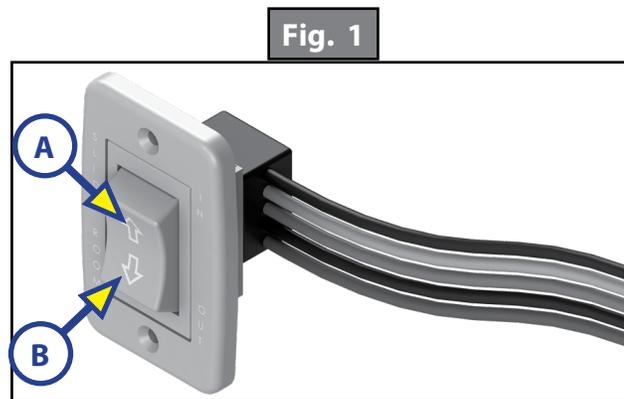
**NOTE:** Only hold OUT switch until room stops.

### Retracting Slide-Out Room

1. Verify the battery is fully charged and hooked up to the electrical system.
2. Press and hold the IN/OUT switch in the IN position (Fig. 1A) until the room is fully retracted and stops moving.
3. Release the switch. This will lock the room into position.

**NOTE:** Only hold IN switch until room stops.

4. Install the transit bars (if so equipped).



# Maintenance

## Inspection

After servicing the slide-out system in any way, be sure to check the following:

1. Slide-out stops are installed and adjusted properly.
2. Head assemblies are installed and adjusted properly.
3. System is mounted properly.
4. Cross shafts are mounted properly and clear all other components.
5. Gear packs function properly.
6. Manual override is accessible.
7. Outside seals compress when slide-out is retracted.
8. Inside seals compress when slide-out is extended.
9. Slide-out extends and retracts smoothly.
10. Both sides of slide-out are synchronized.
11. Any dirt or debris is cleaned from the interior or exterior of the coach.

The Lippert Slide-out System has been static tested to over 4,000 continuous cycles without any noticeable wear to rotating or sliding parts. It is recommended that when operating in harsh environments (road salt, ice build up, etc.) the moving parts be kept clean. They can be washed with mild soap and water. No grease or lubrication is necessary and in some situations may be detrimental to the environment and long term dependability of the system.

## Electrical System Maintenance

For optimum performance, the slide-out system requires full battery current and voltage. The battery must be maintained at full capacity. Other than good battery maintenance, check the terminals and other connections at the battery, the control switch, and the system for corrosion, and loose or damaged terminals. Check motor leads under the trailer chassis. Since these connections are subject to damage from road debris, be sure they are in good condition.

**NOTE:** The Lippert Slide-out System is designed to operate as a negative ground system. A negative ground system utilizes the chassis frame as a ground and an independent ground wire back to battery is necessary. It is important that the electrical components have good wire to chassis contact. To ensure the best possible ground, a star washer should be used. Over 90% of unit electrical problems are due to bad ground connections.

## Mechanical Maintenance

Although the system is designed to be almost maintenance free, actuate the room once or twice a month to keep the seals and internal moving parts lubricated. Check for any visible signs of external damage after and before movement of the travel trailer.

**NOTE:** For long-term storage: It is recommended that the room be closed (retracted).

# Troubleshooting

## Troubleshooting Introduction

This troubleshooting chart outlines some common problems, their causes and possible corrective actions. If any part or serial number information is available, provide it to the service technician when asking for assistance.

The Lippert Slide-out System is only one of four interrelated slide-out room system components. These four components are: chassis, room, coach, and Lippert Slide-out System. Each one needs to function correctly with the others or misalignment problems will occur.

Every travel trailer has its own personality and what may work to fix one trailer may not work on another even if the symptoms appear to be the same.

When something restricts room travel, system performance will be unpredictable. It is very important that slide tubes be free of contamination and allowed to travel full distance (Stroke). Ice or mud buildup during travel is an example of a type of contamination that can occur.

When you begin to troubleshoot the system, make sure the battery is fully charged, there are no visible signs of external damage to the system and that all connections are secure.

During troubleshooting, remember that if you change something, that change may affect something else. Be sure any changes you make will not create a new problem.

You can obtain additional information on the Lippert Slide-out System by visiting [www.lci1.com/customerservice](http://www.lci1.com/customerservice) or by calling 574-537-8900.

| What Is Happening?                          | Why?   | What Should Be Done?  |
|---|--|---|
| Room doesn't move when switch is pressed.   | Restriction or obstruction inside or outside of unit.                | Check for and clear obstruction.  |
|   | Low battery voltage, blown fuse, defective wiring.                   | Check battery voltage and charge if needed. Find and check fuse, replace if blown. Check battery terminals and wiring. Look for loose, disconnected or corroded connectors. |
| Actuator motor runs but room does not move. | Actuator not attached to front mounting drive bracket.               | Check jam nuts/nylock nuts. Be sure that they are properly tightened and adjusted.  |
|   | Bad motor or gear housing.   | Replace motor.  |
| Motor runs but room moves slowly.           | Low battery voltage, poor ground, extremely low outdoor temperature. | Charge battery and check ground wire.   |
|   | Room is in a bind.   | Check to see that room is properly adjusted.  |
| Room stalls in mid-travel.                  | Actuator in a bind.  | Crank manual override and move room short distance then retry electric switch to move room.   |
|   | Bad actuator.  | Replace actuator if above instructions do not work.   |

## Manual Override

**NOTE:** Always disconnect battery from system prior to manually operating system. Failure to disconnect battery can cause electricity to backfeed through the motor and cause serious damage to the system as well as void the warranty.

The Lippert Electric Through Frame Slide-out comes with a Manual Override system. There are two different methods for manually extending and retracting the slide-out room. A crank handle extension can be used outside the chassis main rail at the crank extension with pin (Figs. 2-3). A socket and ratchet can be used inside the main frame on the hex head crank extension (Figs. 4-5).

### Manual Override-Outside Frame

Locate the crank extension with pin outside of the chassis main rail (Fig. 2). This is where the crank handle (standard fifth wheel landing gear crank handle or  $\frac{3}{4}$ " socket and ratchet) fits on (Fig. 3) to allow the manual extension/retraction of the room. Rotate the crank handle clockwise to retract and counterclockwise to extend slide-out. It is important to note that you DO NOT need to attempt to disengage the motor as the actuator is "manual ready." Just hook up and crank.

**NOTE:** Use EXTREME CAUTION when extending and/or retracting room using the manual override feature. It is possible to operate the slide-out beyond the maximum extension and/or retraction and damage the slide components, slide room structure or trim components.

**NOTE:** The gears can be stripped out if the room is manually retracted/extended to its fullest extent and the operator continues to rotate the manual override. Any damage due to misuse of the Manual Override feature will disqualify any and all claims to the Limited Warranty.

Fig. 2

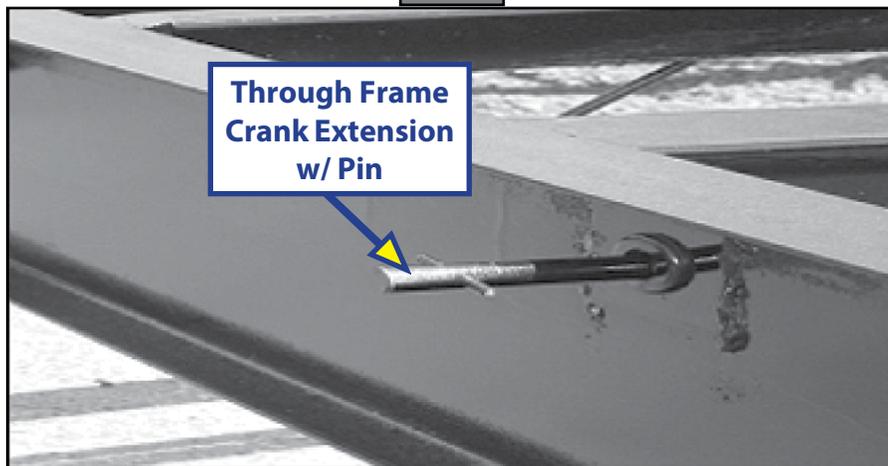


Fig. 3

