IN-WALL® SLIDE-OUT

SERVICE MANUAL

LIPPERT COMPONENTS®

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Introduction

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 personal injury, severe product or property damage.

For information on the assembly or individual components of this product, please visit: https://support.lci1.com/in-wall-slide-out

Safety Information

⚠WARNING

Failure to act in accordance with the following may result in death, serious personal injury, severe product or property damage.

⚠WARNING

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.

⚠WARNING

The In-Wall® Slide-out System is intended for the sole purpose of extending and retracting the slide out room. It should not be used for any purpose 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 trailer.

⚠CAUTION

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

Resources Required

- Drill or cordless screw gun
- Fast-bonding adhesive
- Electric drill or cordless screw gun
- Rubber mallet
- 2"x 4" (length=gap between T-molding and side of unit-¼")
- Utility knife
- Floor jack
- Voltmeter
- Flat head screwdriver

Preparation

Prior to actuating the system:

1. Parking locations should be clear of obstructions that may cause damage to the unit when the slide-out room is actuated.
2. Make sure all persons are clear of the unit 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 unit on solid and level ground.

Operation

Prior to Operation

1. Unit should be parked on the most level surface available.
2. Leveling or stabilizing system should be actuated to make sure unit 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. Make 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.

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 in the OUT (Fig. 1B) 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

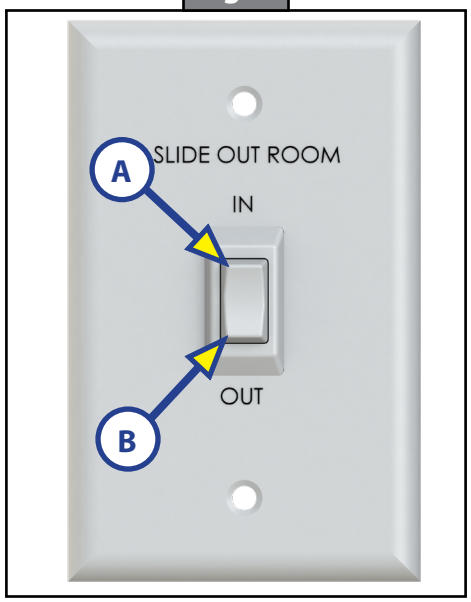
NOTE: In the case of a motorized unit, ignition must be off to operate the slide-out.

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

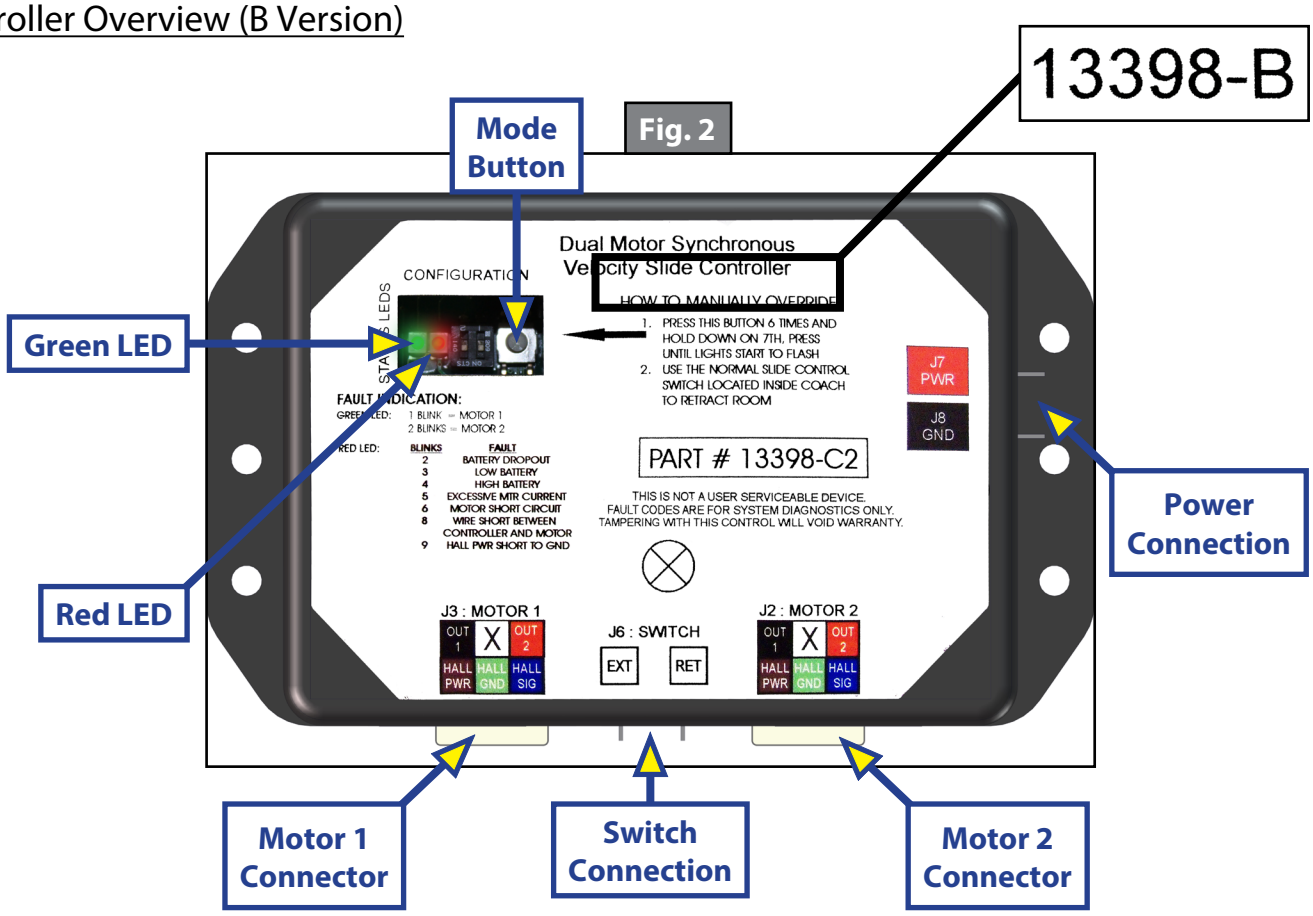
NOTE: It is important to continue to press the slide-out switch for a few seconds after the room is fully retracted until the motor shuts off. The control will sense that the room has stopped and will shut off the motor after a few seconds.

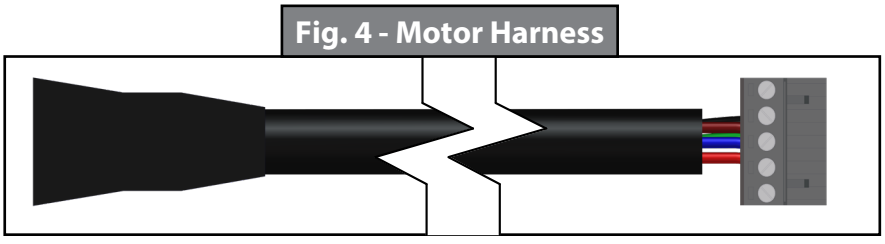
2. Release the switch, which will lock the room into position.
3. Install the transit bars (if so equipped).

Fig. 1



Controller Overview (B Version)





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 installed motor is designated as 1 or 2.

Controller Overview (C2 Version)

Fig. 5

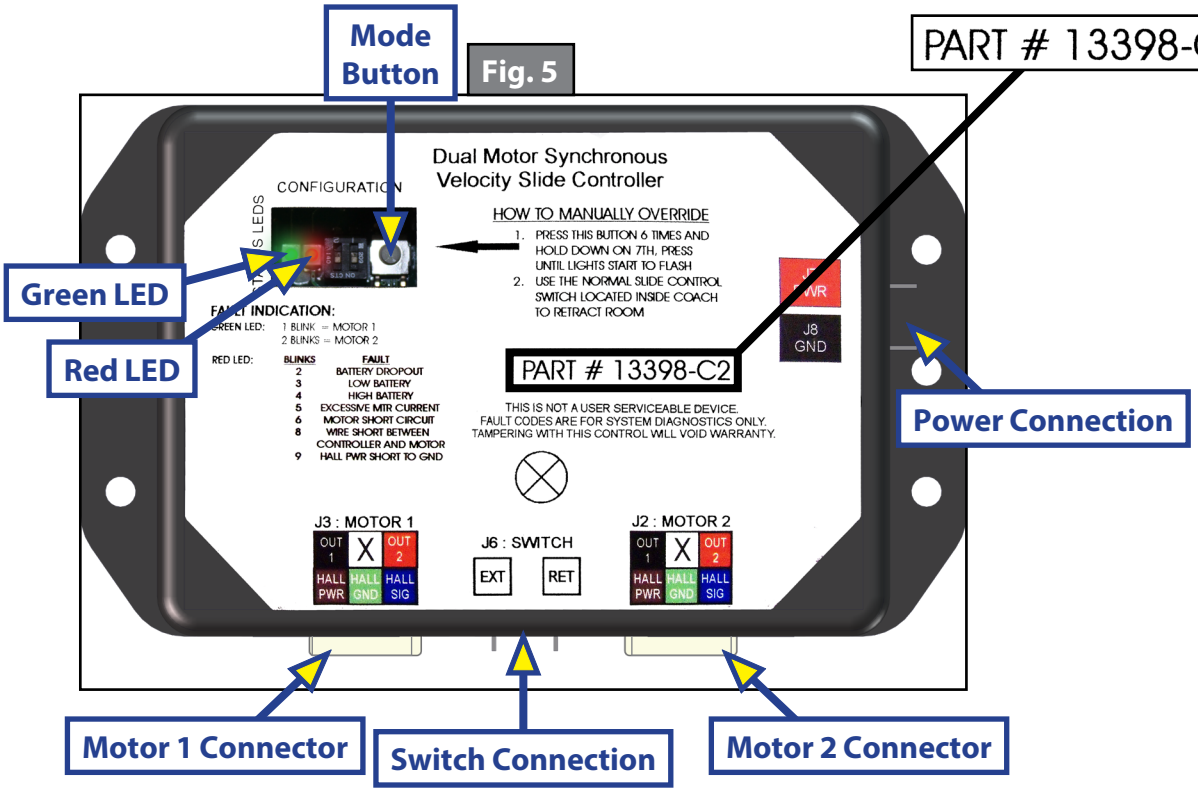


Fig. 6 - Controller Connections

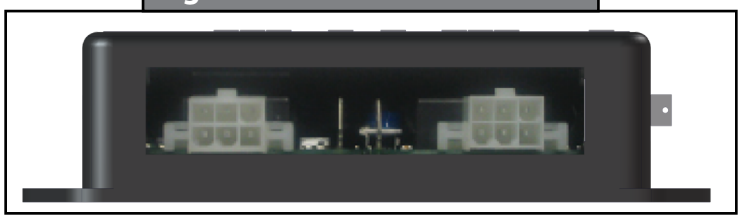
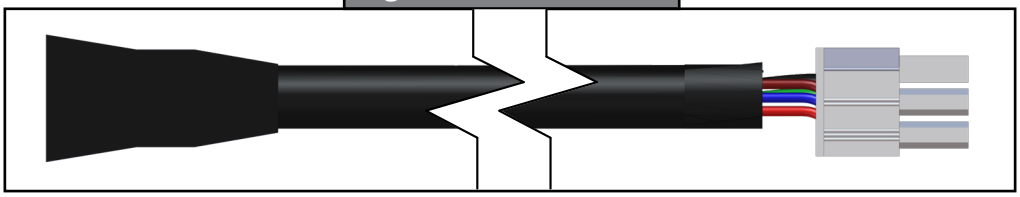


Fig. 7 - Motor Harness



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 installed motor is designated as 1 or 2.

Motor and Controller Compatibility

Part #	Controller Version	Controller Replacement	Motor(s) Used
239657	A (Daisy Chain) (Fig. 8)	A Only	Round-Square (Fig. 14), Round-Round (Fig. 15A)
211852	B (Fig. 9)	B/C2* Only	Round Square (Fig. 14)
	C (Fig. 10)	C/C2* Only	Round-Round (Fig. 15A, 15B), Round-Square Plate (Fig. 16)
	C1 (Fig.11)	C1/C2* Only	
	C2 (Fig. 12)	C2	
326876	8 Amp (Fig. 13)	8 Amp Only	Round-Round (Fig. 15B)
NOTE: Always replace the motor in the system with the same motor except the Round-Square Plate (Fig. 16), which is obsolete. That motor will be replaced with the Round-Round (Fig. 15A, 15B).			
*Two new motor harnesses must be ordered and re-wiring instructions must be used. See Rewiring Instructions section.			

Fig. 8

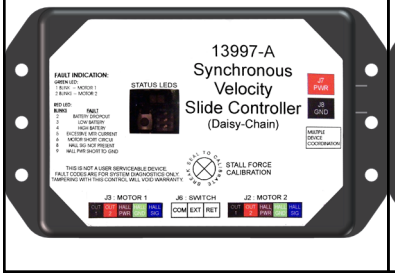


Fig. 9

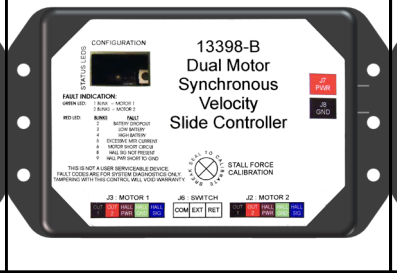


Fig. 10

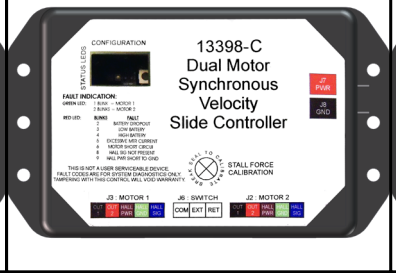


Fig. 11

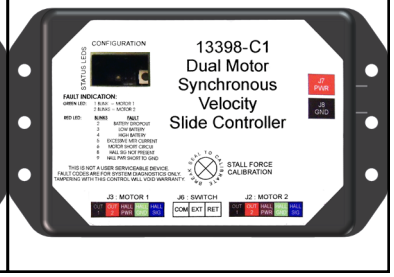


Fig. 12

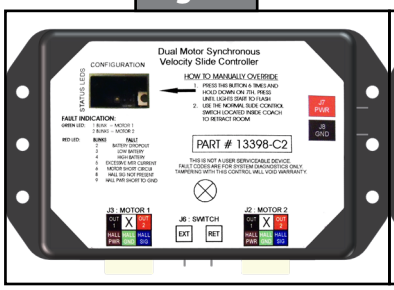


Fig. 13

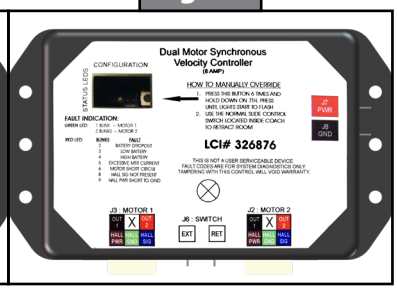


Fig. 14 - 229466

NOTE: Make sure that a 300:1 motor is replaced with a 300:1 motor (Fig. 15A), and that a 500:1 motor is replaced with a 500:1 motor (Fig. 15B).

Fig. 15A - 236575, 300:1

Fig. 15B - 287298, 500:1

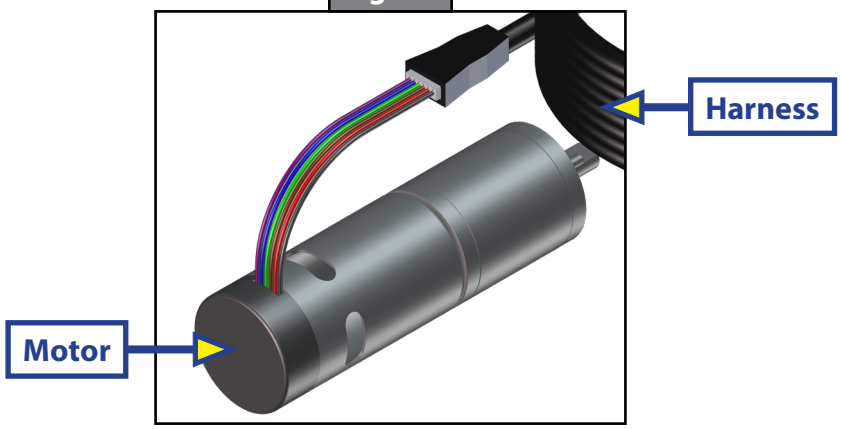
Fig. 16 - Obsolete

Motors and Harnesses

1. Check for proper connections between the motors and harnesses (Fig. 17).
2. Visually inspect the exposed harnesses to make sure 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.).

Fig. 17



Synchronizing 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 synchronize 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 Connection

1. Rev. A - Rev. C1 Controllers: Common connection on controller goes to common connection on extend and retract switch.
2. 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 connections 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 AWG wire is the minimum size recommended. A 30 amp, OEM-supplied resetting or blade fuse is required.

Visual Inspections

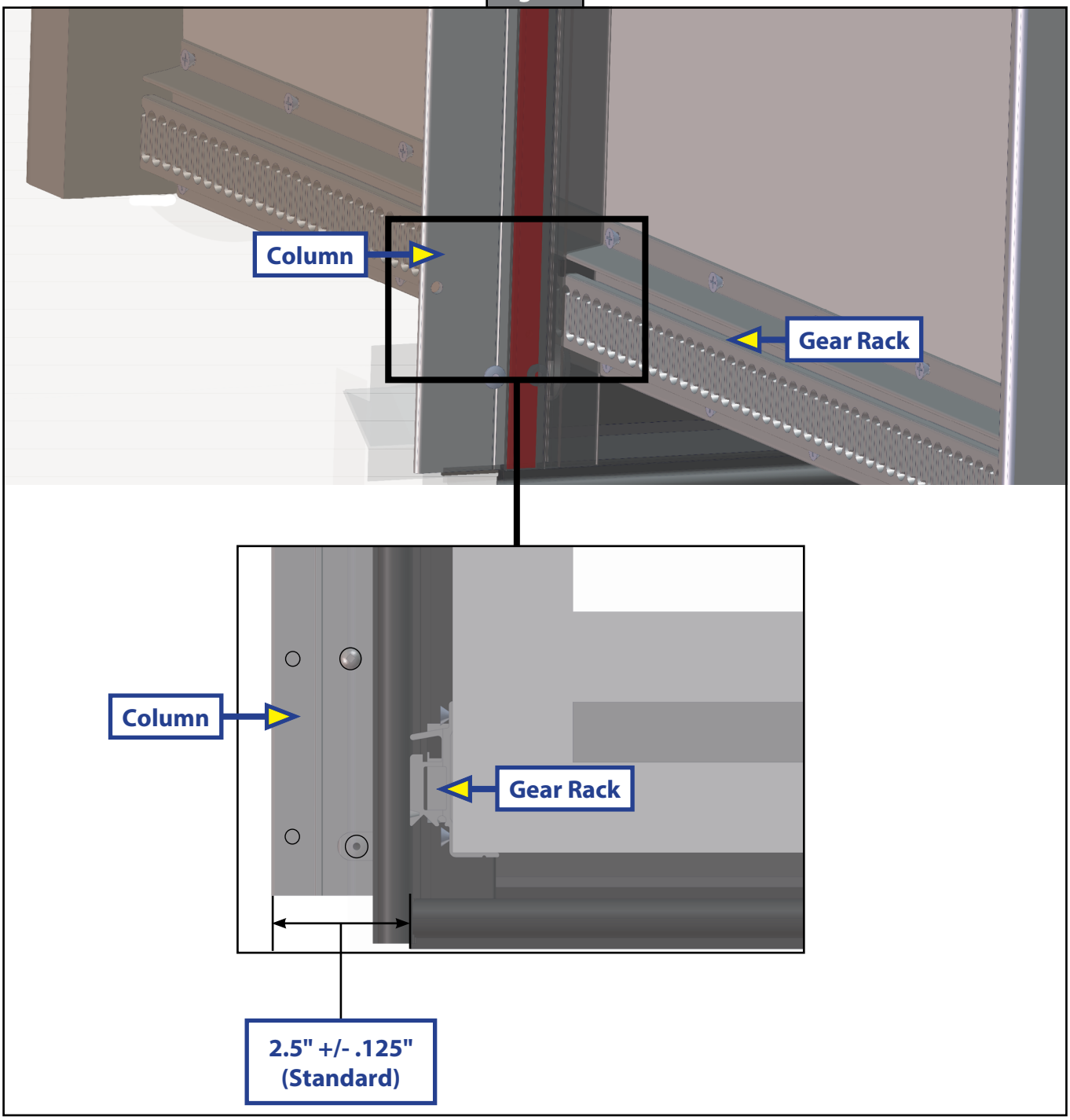
Measurements

1. Measure from the outside edge of the column to the face of the gear rack (Fig. 18). The standard measurement should be 2 1/2" plus or minus 1/8". Take this measurement when the room is fully extended and again when the room is 3" from fully retracted.

NOTE: For units with non-standard installations, contact the OEM for their specific measurements.

2. Measure the gear racks for parallelism. There should be less than 1/8" difference between the parallel measurements.
3. Check for proper seal engagement (no binding, 1/4" nominal overlap).

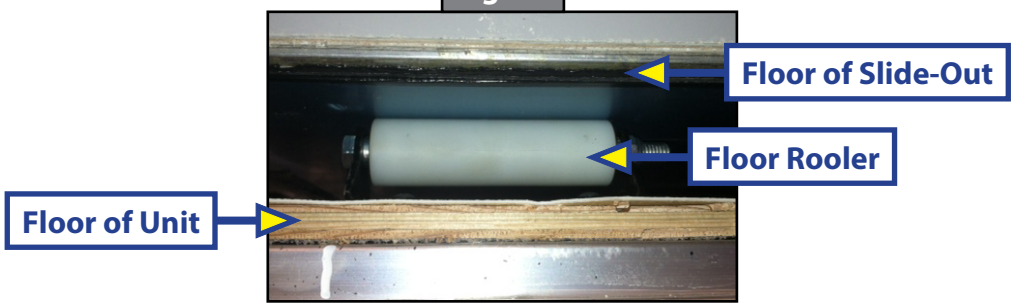
Fig. 18



Floor Rollers

1. Check that the seals are not getting caught in the rollers, which could cause binding of the slide-out.
2. Check for proper roller engagement (Fig. 19).
   - **A.** Rollers should not be digging into the floor of the slide-out.
   - **B.** Rollers should not spin freely beneath slide-out.

Fig. 19



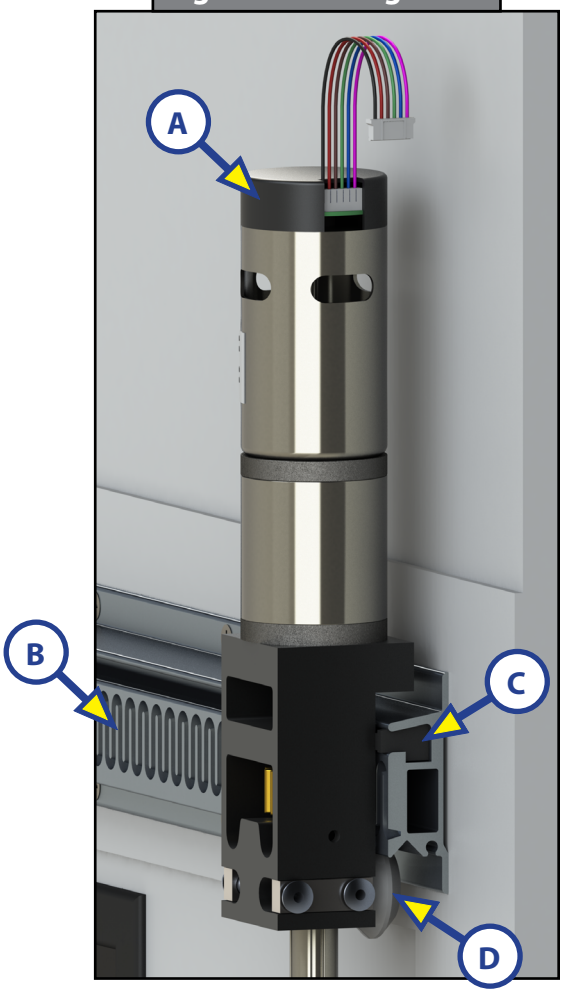
Gear Racks

1. Check to make sure the screws in the gear rack (Fig. 20B) are secured flush and not getting caught in the seals.
2. Gear Racks must be parallel.

V-Rollers

1. Visually inspect V-roller (Fig. 20D) for obstructions or damage.

Fig. 20 - Bearing Block



Callout	Description
A	Motor
B	Gear Rack
C	Shoe
D	V-Roller

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 unit for possible obstructions: tree, post, car, etc. Check inside the unit 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.

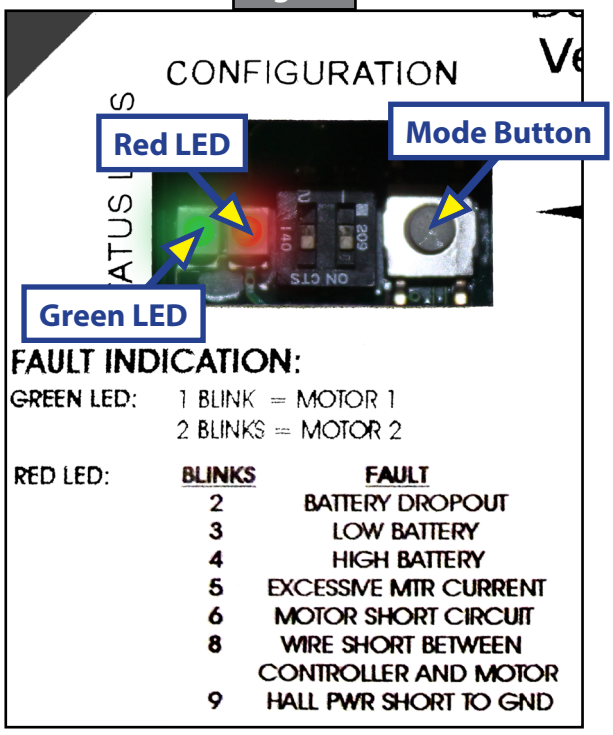
Debris In the Rack

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 controller will use the LEDs (Fig. 21) to indicate where the problem exists. For motor-specific faults, the green LED will blink one time for motor 1, and two times for motor 2. The red LED will blink from 2-9 times depending on the error code. When an error code is present, the controller needs to be reset. To reset the controller, press IN on the slide-out switch (Fig. 1A), then release. Press IN on the slide-out switch again for normal operation.

Fig. 21



Error Code	Name	Description
2	Battery Drop Out	Battery capacity low enough to drop below 6V DC while running or short in switch wiring.
3	Low Battery	Voltage below 8V DC at start of cycle.
4	High Battery	Voltage greater than 18 volts.
5	Excessive Motor Current	High amperage, also indicated by one 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 and C-2 Only)

1. Press the mode button (Fig. 22) on the controller six times and hold on the seventh for five seconds to enter electronic manual override mode.
2. Use the slide-out switch (Fig. 1) to move both motors in or out.

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

3. To exit the electronic manual override mode, press and hold the mode button until the LEDs begin to blink simultaneously. Exiting the override mode resets the motor positions. Motors will have to be resynchronized.

NOTE: During the manual 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 follow the Motor Disengagement Procedure.

Motor Disengagement Procedure

1. Remove motor retention screws located near the top of each vertical column on the outside of the unit. If slide-out is equipped with bulb seal on column, look under bulb seal.
2. Locate motor.
   - **A.** On units built prior to 2011: Bend back wipe seal from outside of unit.
   - **B.** On units from 2011 to current: See slot in H-column on the inside of the unit.
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

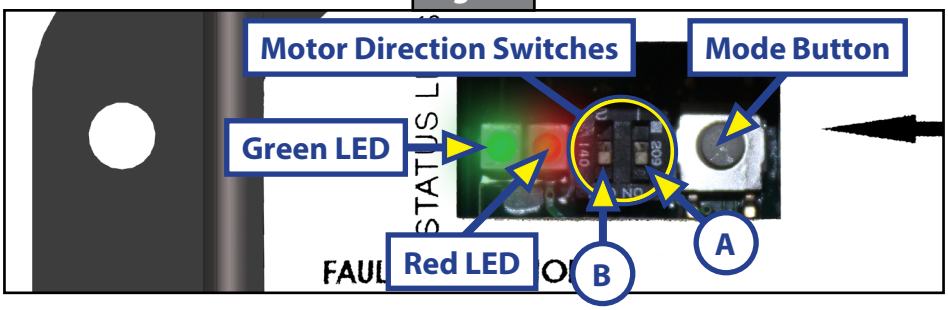
The Lippert In-Wall® Slide-out Controller is capable of operating the room with as little as 8V DC. But at these lower voltages the amperage requirement is greater. Check voltage at the controller (Figs. 2 and 5) for the location of power connections. If the battery is low, it needs to be charged or the unit should be plugged into shore power or the generator can be run, if equipped. It may be possible to "jump" the unit's battery temporarily to extend or retract the room. Consult the unit manufacturer's owner's 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. When extending or retracting the room, if 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 (Fig. 22B) and the right switch controls motor 1 (Fig. 22A). 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 slide-out switch. If the room extends when the slide-out switch is moved to the retract (IN) 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 slide-out switch.

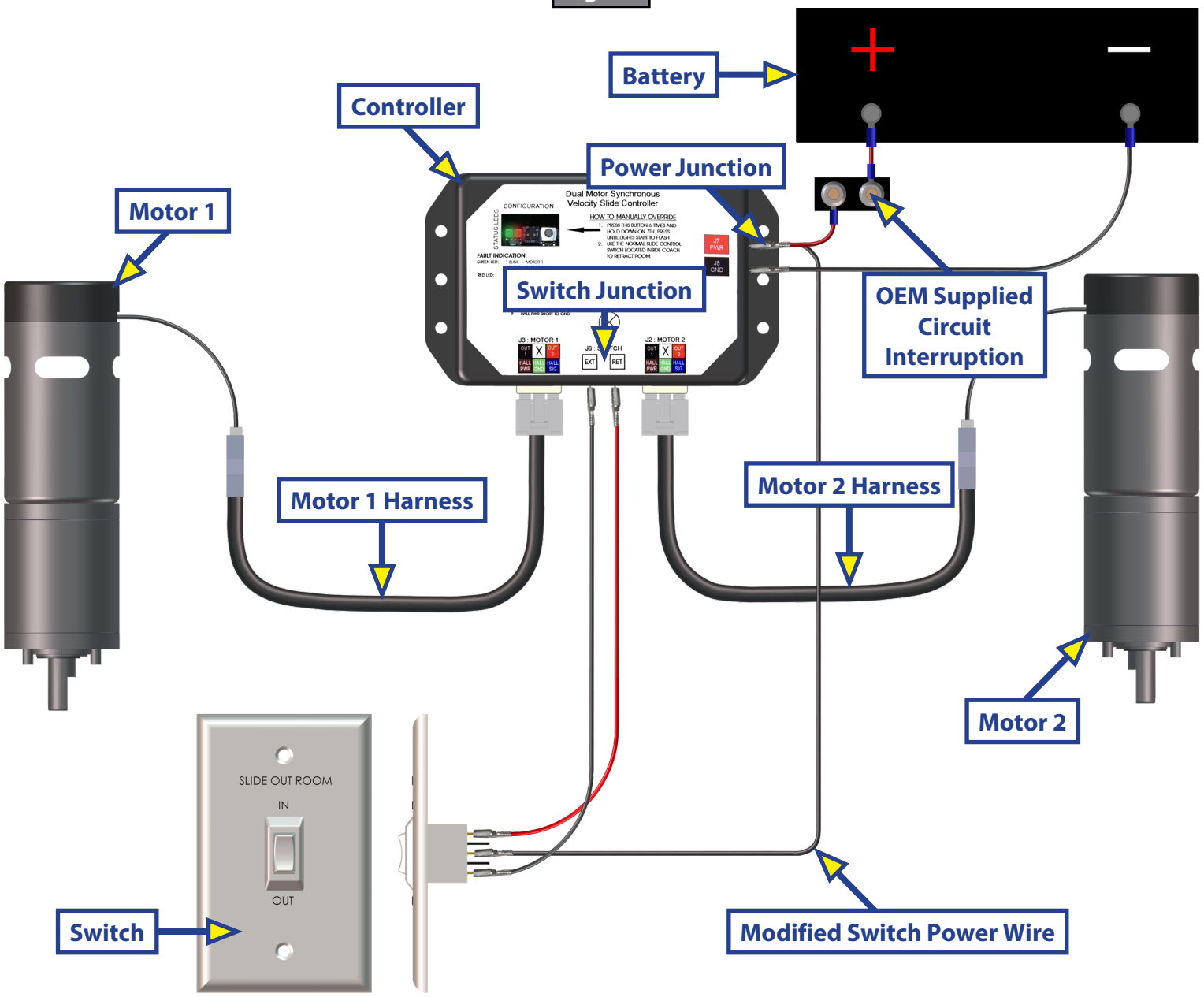
Fig. 22

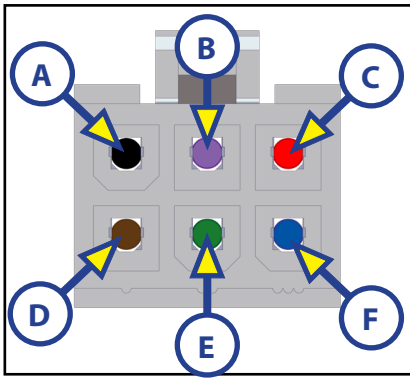


Rewiring Instructions

If it is necessary to replace a malfunctioning Rev. B, C or C1 controller, it is recommended to do so with a new Rev. C2 controller. In order to properly rewire a Rev. B, C, or C1 controller to a new Rev. C2 controller, the customer will need two new motor harnesses (one for each motor) will be required. Additionally, it will be necessary to modify the power wire from the controller to the slide-out 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. 23).

Fig. 23





Wiring Color Code Information

- **A.** Black - Power/Ground
- **B.** Purple - Not Used
- **C.** Red - Power/Ground
- **D.** Brown - Hall Effect Power
- **E.** Green - Hall Effect Ground
- **F.** Blue - Hall Effect Communications

Motor Replacement

H-Column with Motor Notch (Current Style)

NOTE: There must be access to both the interior and exterior of the unit to perform this procedure.

1. Extend the slide-out halfway out of the unit.
2. On the exterior, slide the bulb seal down to access the motor retention screw (Fig. 24).
3. Remove the motor retention screw (Fig. 24).
4. Inside the unit, remove the bulb seal from the wipe seal (Fig. 25).
5. Peel back the wipe seal (Fig. 25) and disconnect the wiring harness from the motor.

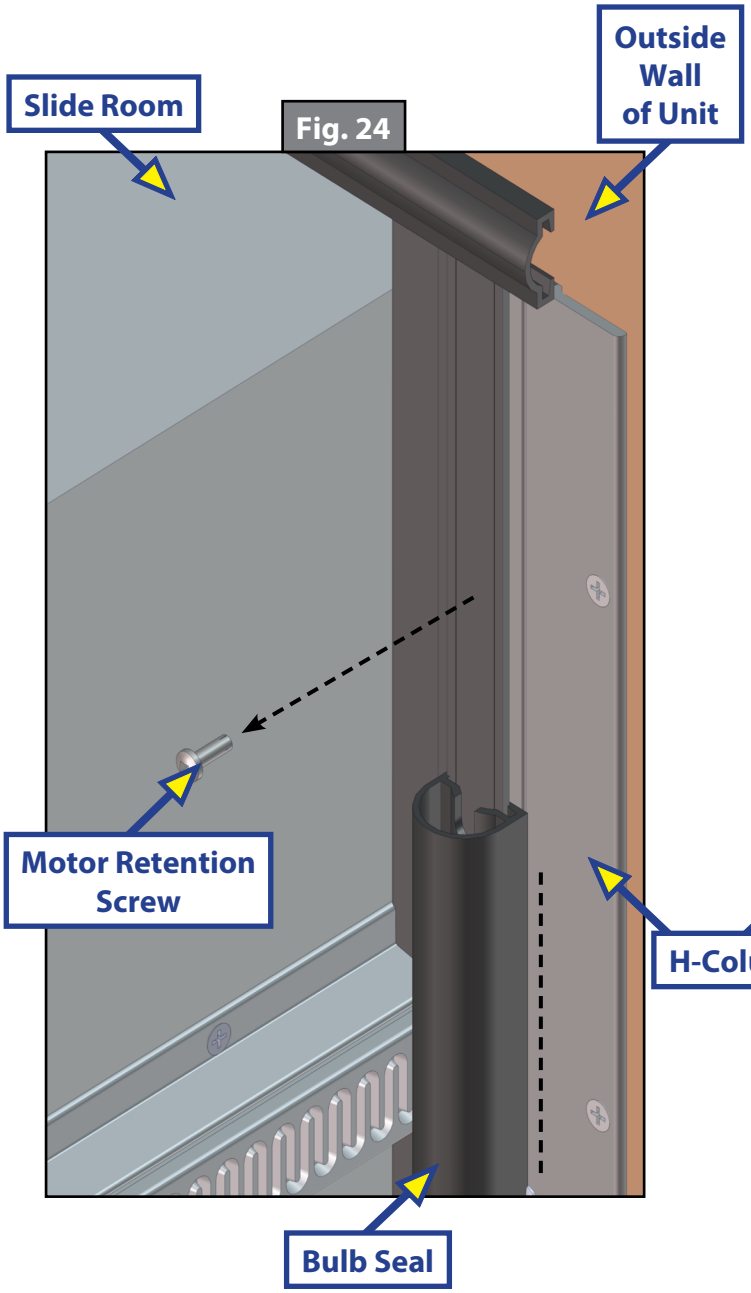


Fig. 24

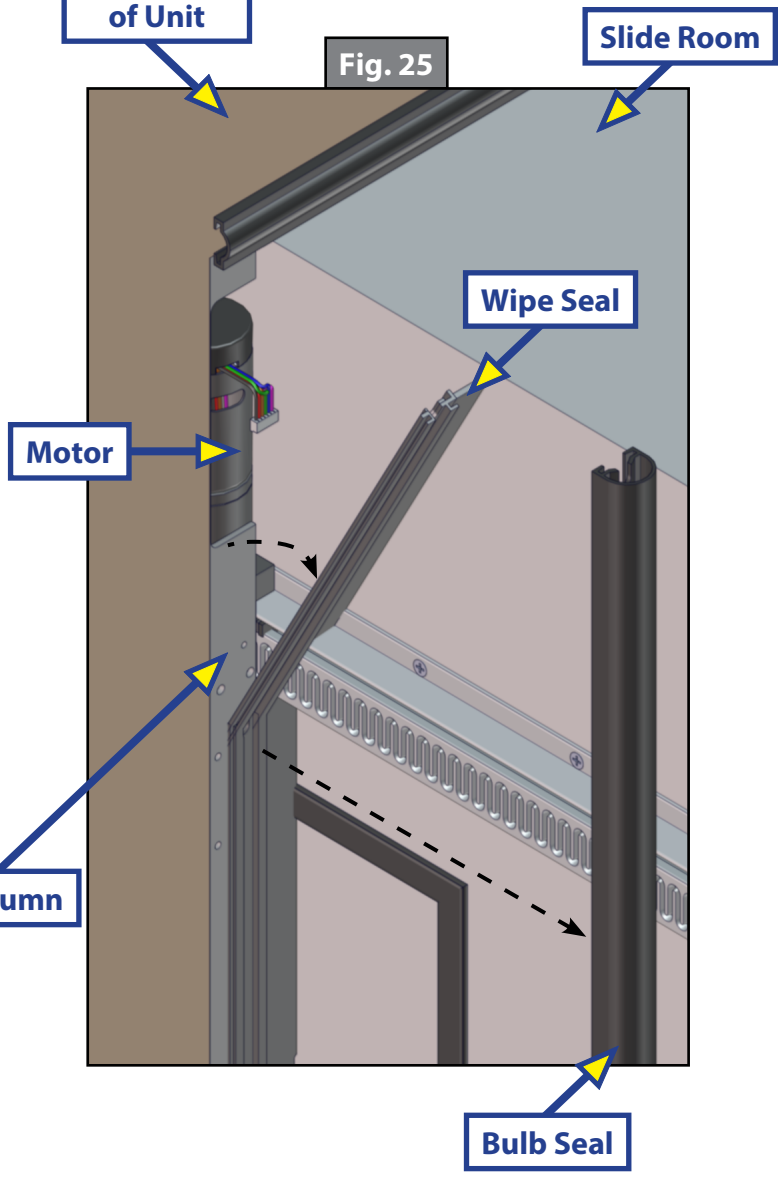


Fig. 25

6. Pull motor up and tip the bottom of the motor out of the notch to remove it (Fig. 26).
7. Place new motor into the H-column, making sure that the wiring is facing the back of the H-column.

NOTE: Look into the column and note the orientation of the coupler and set screw holes in the bearing block. Rotate the drive shaft on the motor to approximately align with the coupler before sliding the new motor into the column.

8. While applying pressure to the top of the motor, push on the room, which will slowly rotate the torque shaft so the coupler and torque shaft can line up with the motor shaft. When the shafts are aligned, the motor will drop into place (Fig. 27).
9. Reattach the wiring harness.
10. Push the wipe seal back into position (Fig. 28).
11. Fasten the wipe seal to the H-column with fast-bonding adhesive.
12. Replace the bulb seal (Fig. 28).
13. Replace the motor retention screw on the outside of the H-column (Fig. 24).

Fig. 26

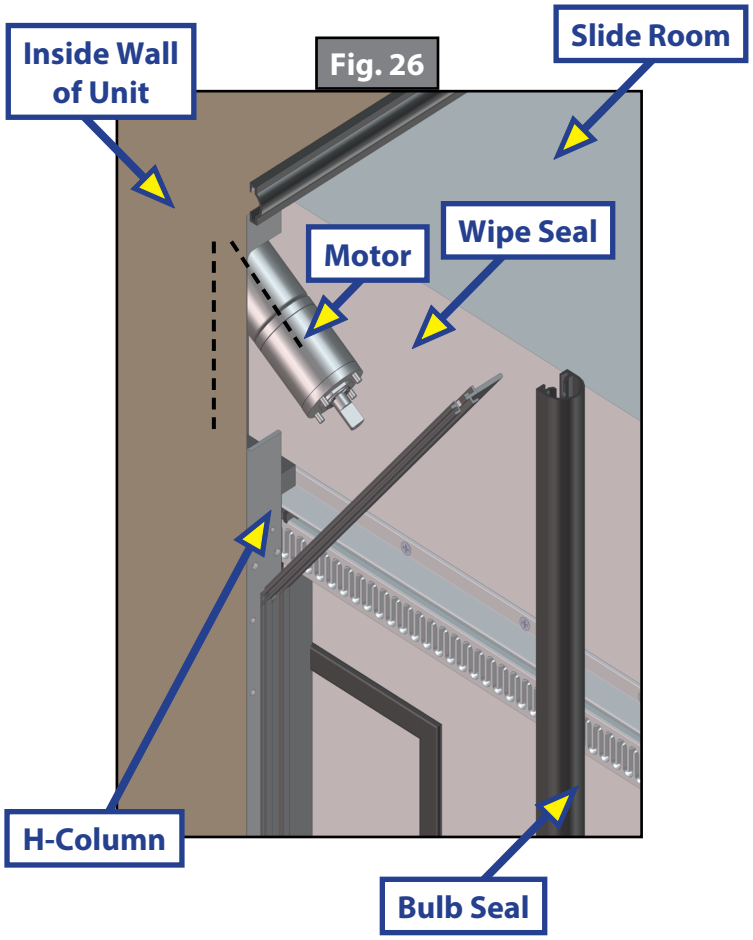


Fig. 27

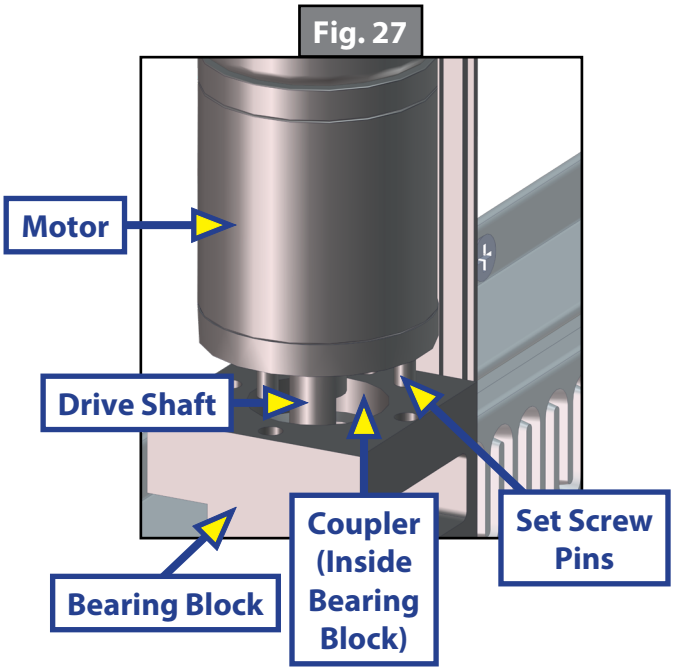
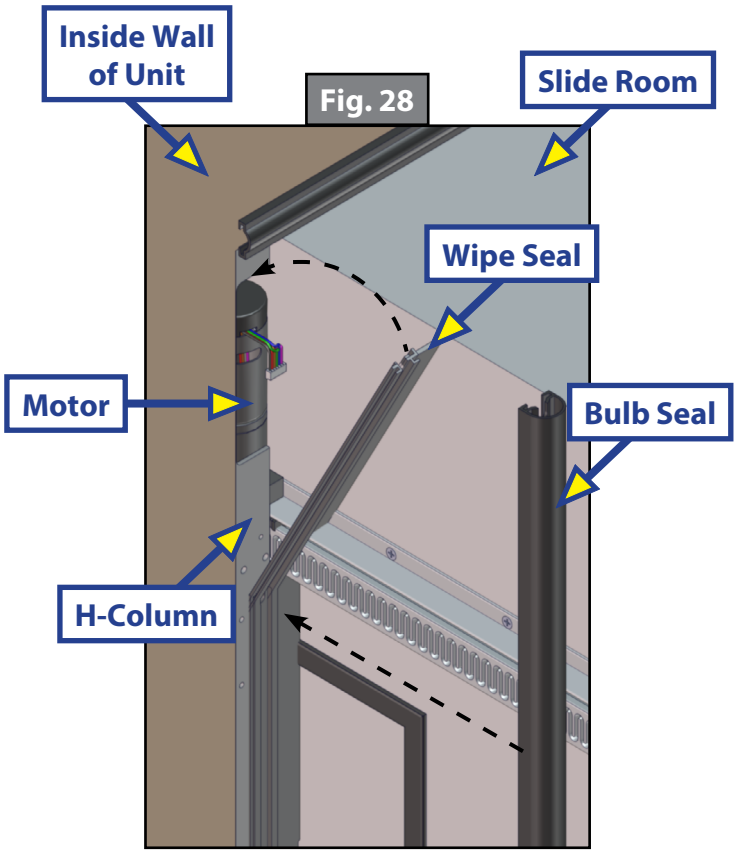


Fig. 28



H-Column Without Motor Notch (Old Style)

NOTE: There must be access to both the interior and exterior of the unit to perform this procedure.

1. Extend the slide-out halfway out of the unit.
2. Adequately support the slide room, but do not lift it.
3. From the exterior, slide the bulb seal down to access the motor retention screw (Fig. 30).
4. Remove the motor retention screw (Fig. 29).
5. Remove screws from H-column, top to bottom (Fig. 30).
6. Unplug the wiring harness from the motor.

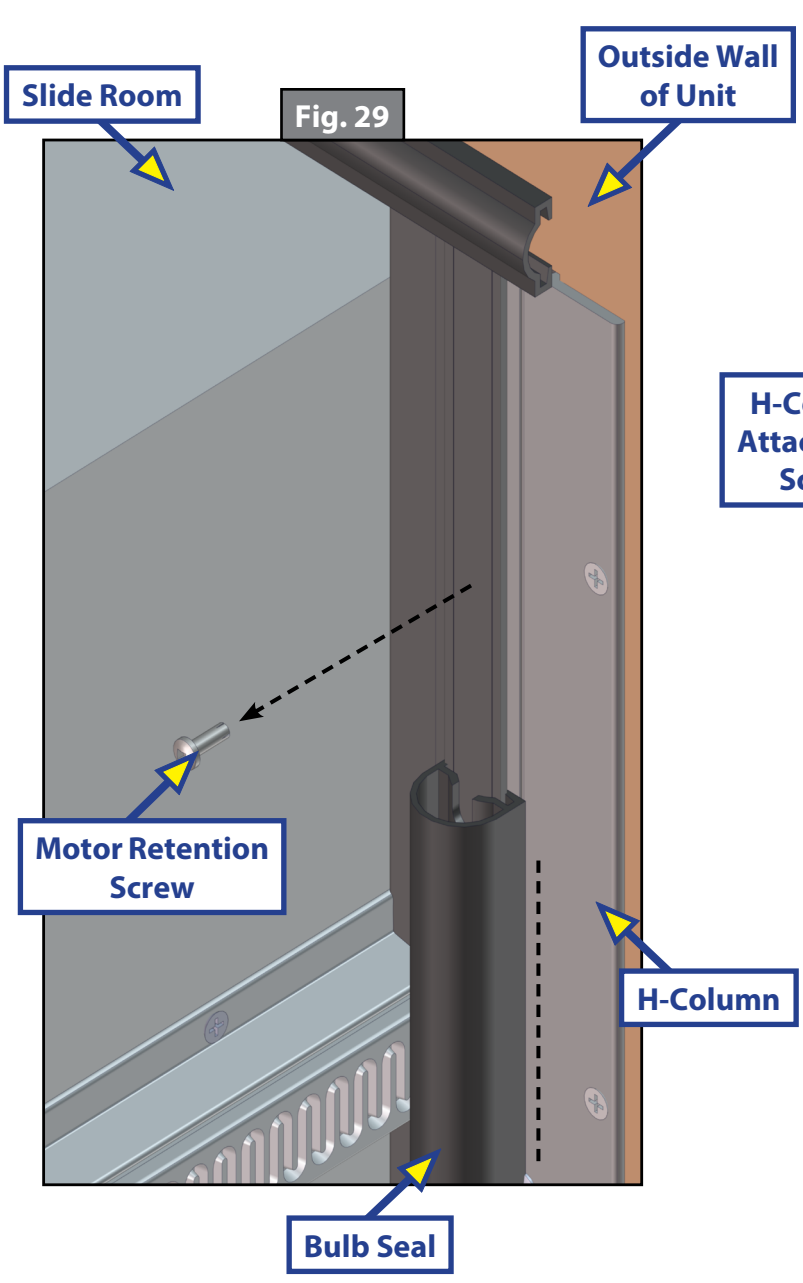


Fig. 29

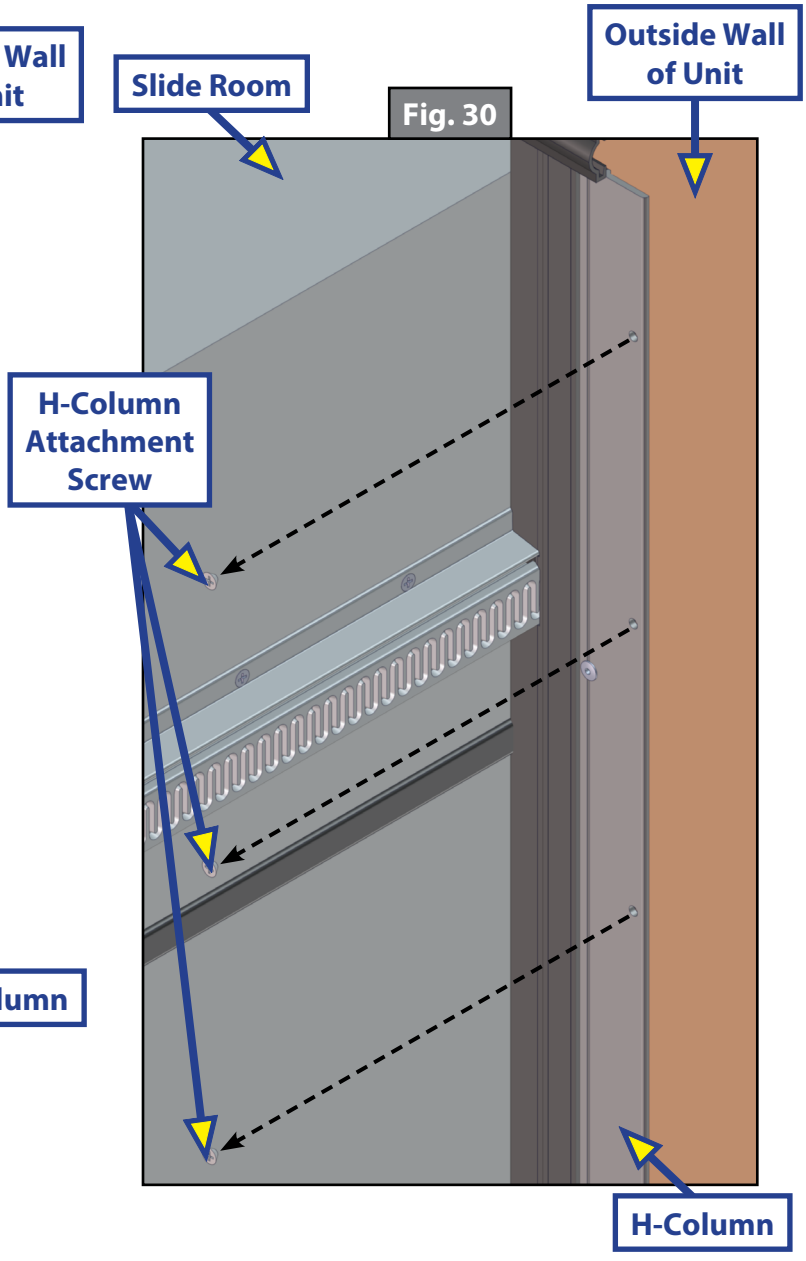


Fig. 30

7. From the inside of the unit, push the slide-out out until the top of the H-column is accessible (Fig. 31).
8. Pull the motor up and out of the H-column (Fig. 32).
9. Place new motor into the H-column, making sure that the wiring is facing the back of the H-Column.

NOTE: Look into the column and note the orientation of the coupler and set screw holes in the bearing block. Rotate the drive shaft on the motor to approximately align with the coupler before sliding the new motor into the column.

10. While applying pressure to the top of the motor, push on the column, which will slowly rotate the torque shaft so the coupler and torque shaft can line up with the motor shaft. Once they are lined up, the motor will drop into place (Fig. 33).
11. Reattach the wiring harness to the motor.
12. Push the slide-out back into place.
13. Replace all screws into the H-column to reattach the slide-out to the unit (Fig. 34).
14. Replace the motor retention screw (Fig. 34).
15. Slide the bulb seal back up into position (Fig. 34).
16. Reseal H-column according to RV manufacturer recommendations.
17. Fasten the wipe seal to the H-column with fast-bonding adhesive.

Fig. 31

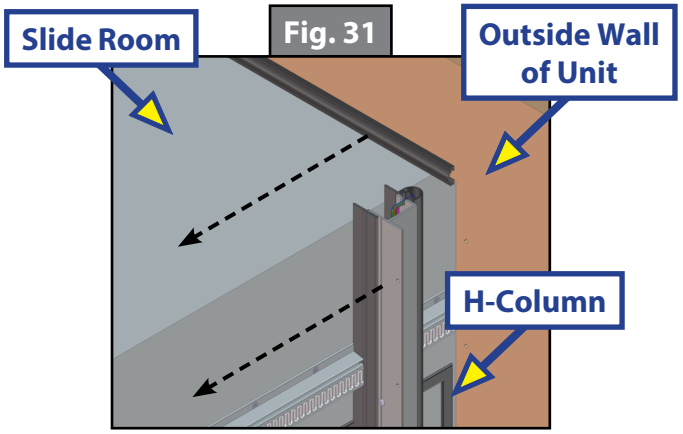


Fig. 32

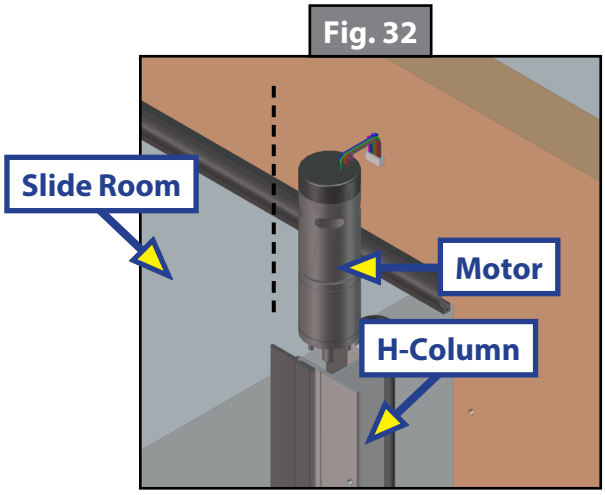


Fig. 33

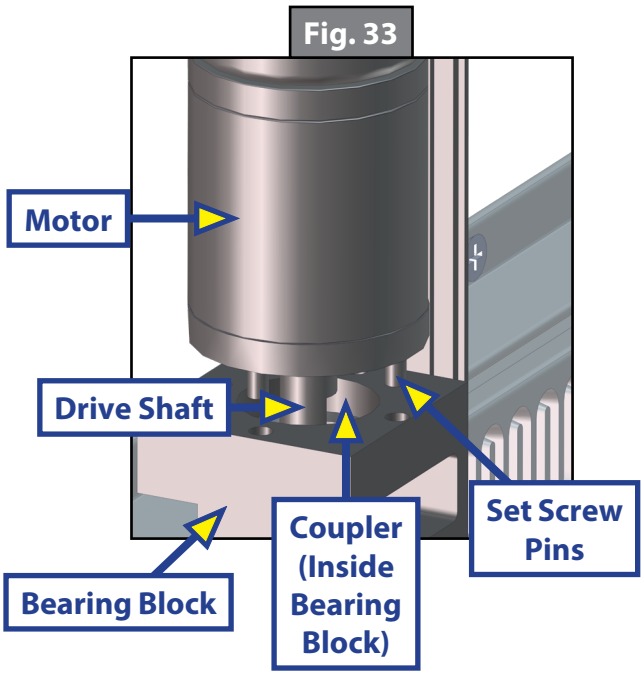
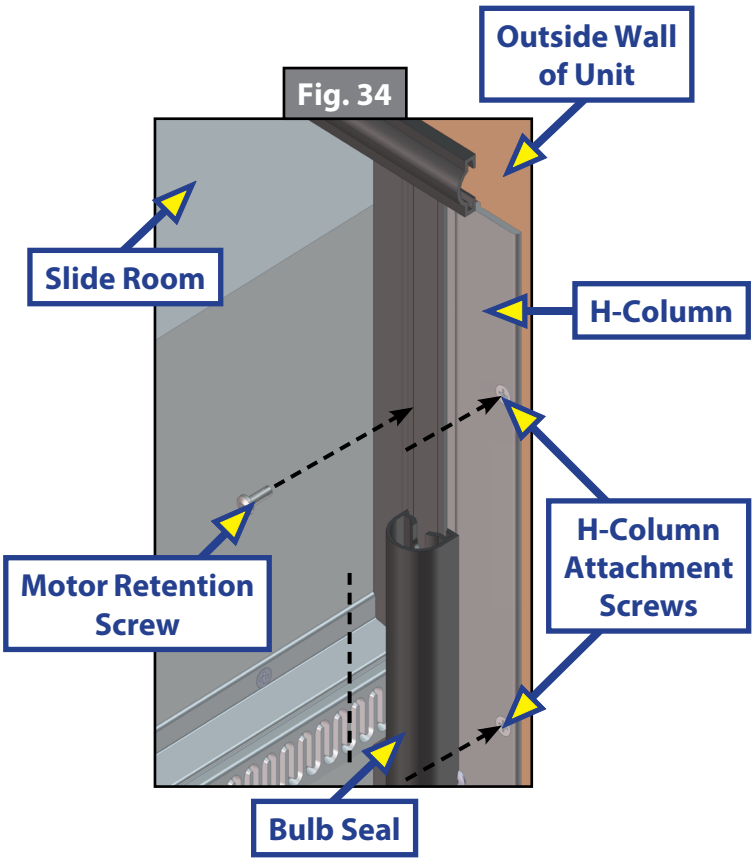


Fig. 34



Assembly Removal

Procedure

NOTE: If the slide-out will not move by use of the slide-out switch it may be necessary to use one of the three following methods:

- **A.** Use electronic override mode on the In-Wall® controller.
  - **I.** Press the “mode button” six times quickly, press a 7th time and hold for approximately five seconds (Fig. 35A).
  - **II.** The red and green LED lights will begin to flash indicating system is in override mode (Fig. 35B).
  - **III.** Using the slide-wall switch, press and hold the IN button until the unit completely retracts.
- **B.** Disconnect the motor harnesses from the In-Wall® controller (Fig. 36A) to allow the slide room to be manually pushed into position.
- **C.** Disengage the motor (Fig. 36B) to allow the slide room to be manually pushed into position.

1. Remove first three sets of screws in each rack on the interior side of slide room.
2. Extend the slide room until about 8" of the room is left inside the unit.
3. Support the slide room with a floor jack or other adequate support before continuing.
4. Place the 2"x 4" block on top of the slide room (standing on its edge between the T-molding and side of the unit).
5. Reach inside the top of the slide column to disconnect the wiring harness from the motor.
6. Using a utility knife, carefully cut the caulk bead along the edge of the slide column.
7. Remove the screws from the slide column attaching it to the side wall of the unit.
8. Using an extra motor wiring harness with the motor wire connector intact, cut harness to 3'. Strip the ends of the red (power) and black (ground) wires (Fig. 37).
9. Plug the jumper harness motor wire connector (Fig. 37) into the motor's wire connector.
10. Holding the black and red wires of the jumper harness against the terminals of your cordless screw gun's battery, determine which polarity actuates the motor in the retract direction. The slide column should slide away from the side of the unit.

Fig. 35

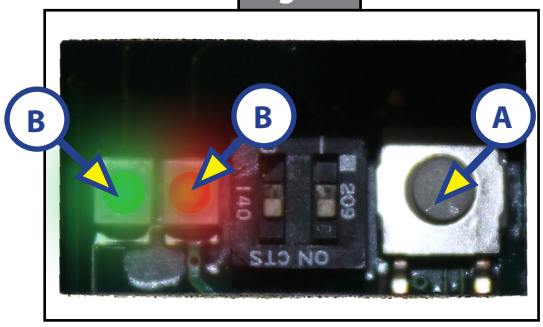


Fig. 36

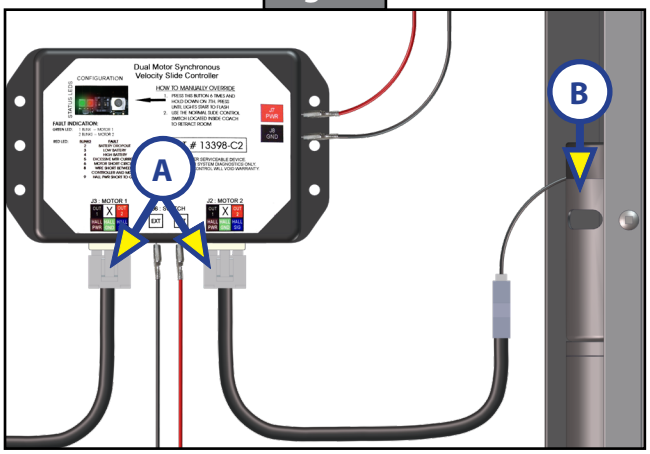
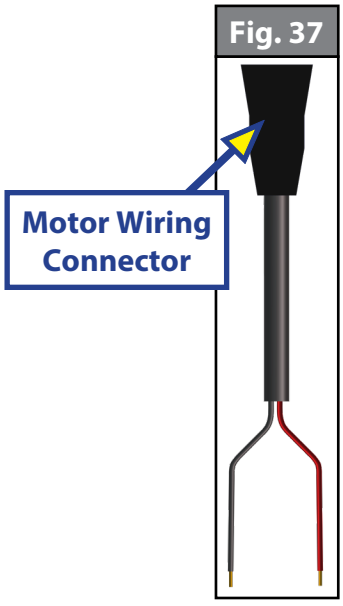


Fig. 37



11. Remove all screws from the gear racks (Fig. 38).

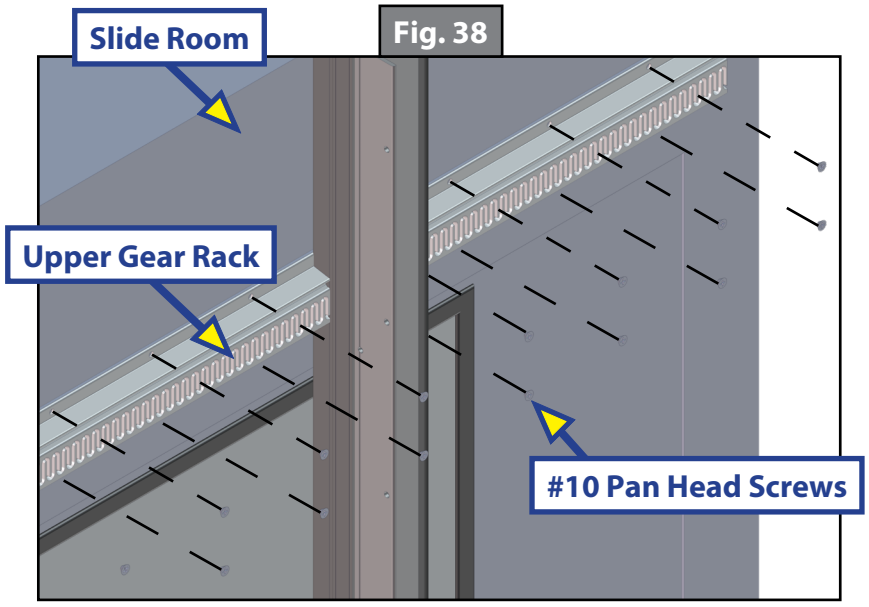


Fig. 38

12. You may need to pry the gear racks away from the sides of the slide room with a flathead screwdriver or putty knife. Do this carefully to prevent damage to the finish on the side of the slide room.
13. Carefully slide the ends of the gear racks past the bulb seal on the T-molding.
14. Pull the full system out and set aside.

NOTE: LCI recommends that inspection and repair of the assembly be done on a clean workbench to prevent further damage to the slide-out system.

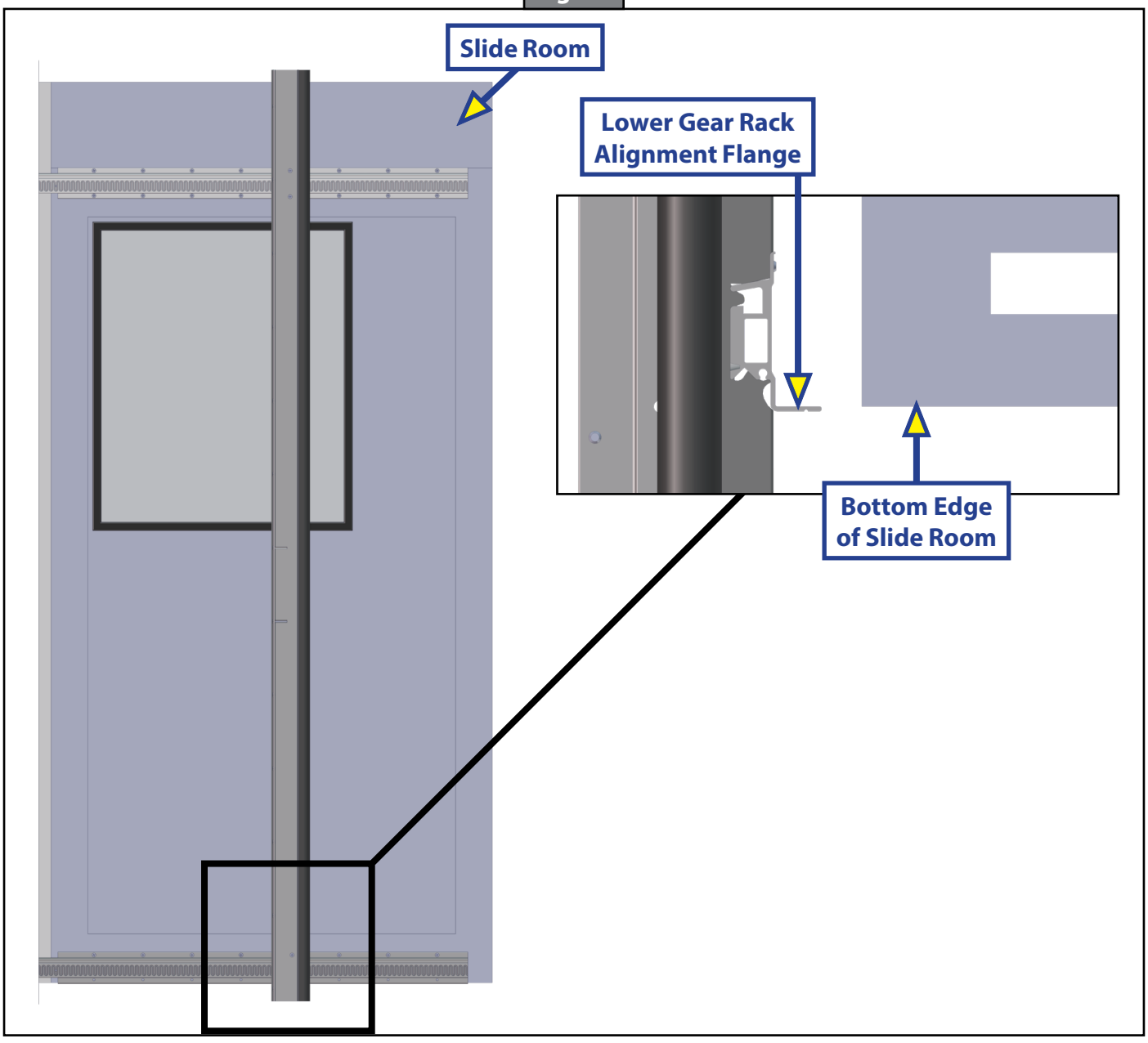
Assembly Installation Procedure

1. Prepare the slide room and side of the unit for the new install by cleaning the surfaces of any adhesive residue using a putty knife and a solvent, being careful not to damage the finishes on the unit.
2. Prepare the new system for installation: measure the distance (center to center) from one gear rack to the next gear rack along the slide column. Write these measurements down.
3. Apply OEM-recommended sealant to the entire length of the H-column along the inside edge where it will contact the side face of the unit.

NOTE: If installing a new assembly, remove the shipping angles before continuing this procedure.

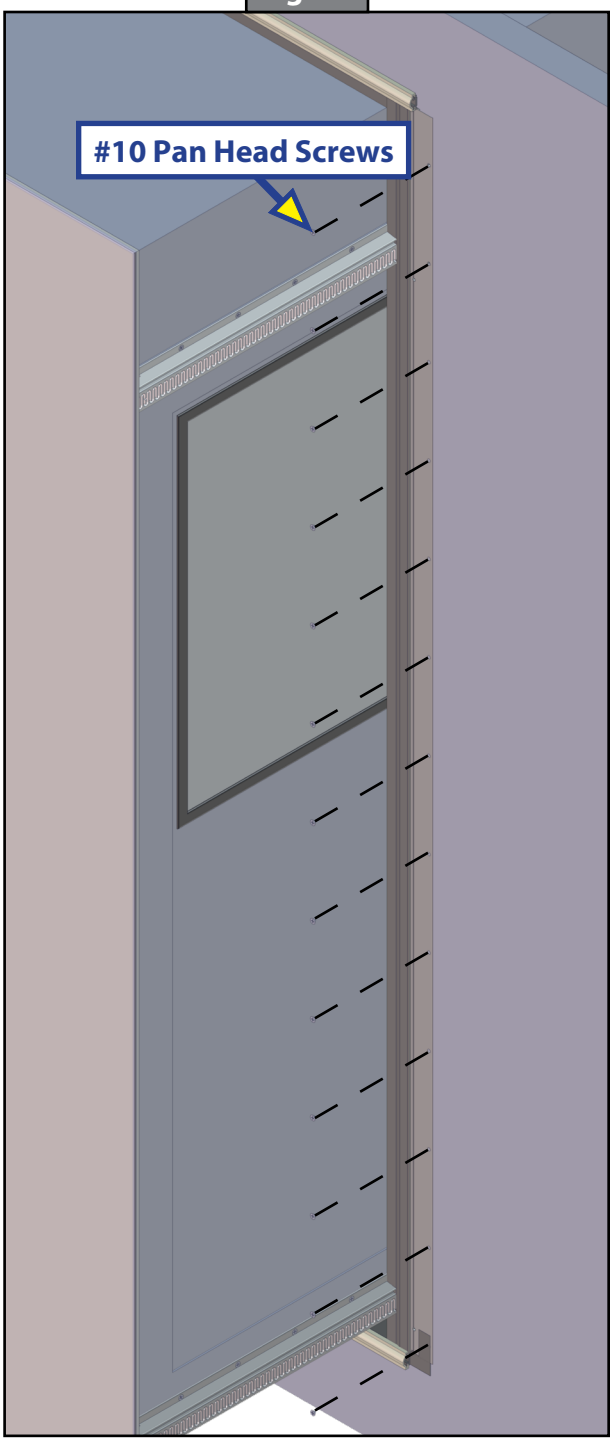
4. Gently slip the system through the opening between the slide room and the side wall opening. Tuck the gear racks inside the bulb seal attached to the T-molding.
5. Align the bottom lip (alignment flange) of the lower gear rack with the bottom edge of the slide room (Fig. 39).
6. Push the bottom gear rack tight against the bottom of the slide room and put a screw into each end of the gear rack.

Fig. 39



7. Measure from the bottom gear rack (center-to-center) to the next gear rack and align that rack so that it matches the measurement taken during step 2. This will make sure that the racks are installed parallel and square. Put a screw in each end of the gear rack to hold it in place until all gear racks are aligned.
8. After gear racks are aligned and secured, install all previously removed screws into the gear racks.
9. Attach the jumper wires to the motor in top of the slide column and then to the cordless screw gun battery. Actuate the motor to move the slide column in towards the unit. Stop the column when it is still a few inches away from the unit. Remove the jumper cable.
10. Make sure the motor cable is tucked into the top of the slide column.
11. Remove the 2" x 4" block.
12. Push the slide room in by hand until the slide column is flush with the side wall of the unit.
13. Screw the slide column into the side wall by placing a screw in the column by each rack and in the middle of the column to ensure the rack is straight, then fill in remaining screws (Fig. 40). Remove the floor jack.
14. From the inside of the unit, connect the wiring harness to the motor cable.
15. Repeat this process for the other side of the slide room (if required).
16. Once you have completed both sides of the slide room, synchronize the slide system motors. See Synchronizing The Slide-Out Motors section.

Fig. 40



Synchronizing The Slide-Out Motors

1. Fully extend the slide room using the slide-out 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, only two or three repetitions are necessary to synchronize the system.
4. Fully extend and retract the room. Always let the motors shut down on their own before releasing the switch.

LIPPERT COMPONENTS®

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