



TIFFIN THROUGH FRAME
LOW PROFILE SLIDE-OUT
OEM INSTALLATION MANUAL

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Introduction

The Hydraulic Slide-out System's purpose is to hydraulically actuate slide-out rooms. 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.

Additional information about this product can be obtained from [lci1.com/support](https://support.lci1.com/support) or the LippertNOW app is available for free on Apple App Store® for iPhone® and iPad® and also on Google Play™ for Android™ users. App Store® and iPad® are registered trademarks of Apple Inc. 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/through-frame-selections>

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

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 Lippert 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

During servicing make sure that the coach is supported according to the manufacturer's recommendations. Lift the coach by the frame and never the axle or suspension. Do not go under the coach unless it is properly supported. Unsupported coaches can fall causing death, serious personal injury or severe product and/or property damage.

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

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.

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.

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 operation, park coach on solid and level ground.

Resources Required

- Personal protective equipment (PPE) for welding
- Cordless or electric drill or screw gun
- Oxyacetylene torch
- Welder
- Ratchet and sockets
- Open-end/box-end wrenches
- Jack stands
- Floor jacks
- Tape measure
- Torque wrench
- Fire extinguisher

Slide-outs onto the Chassis

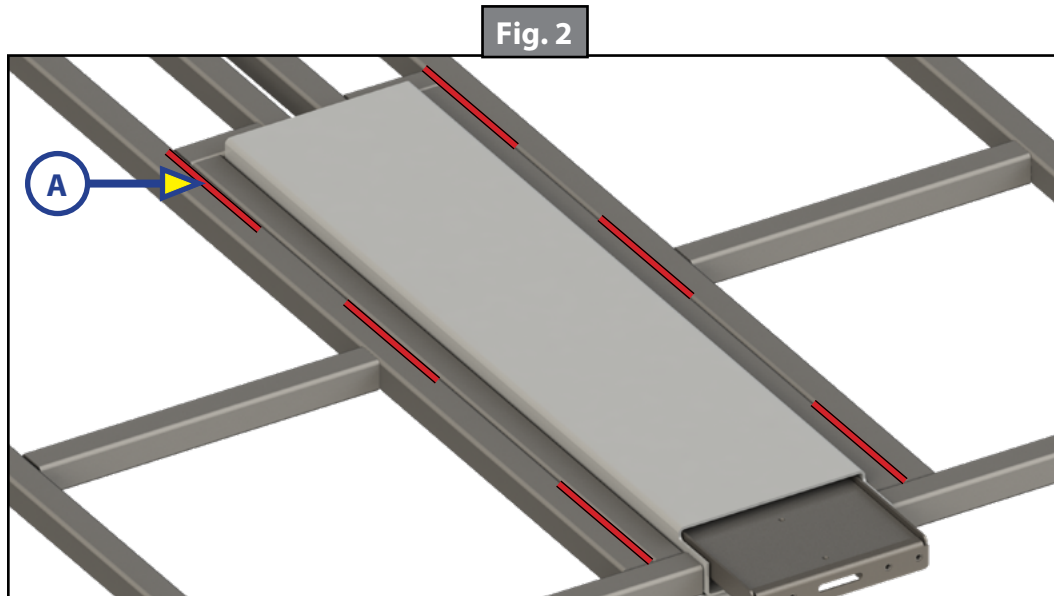
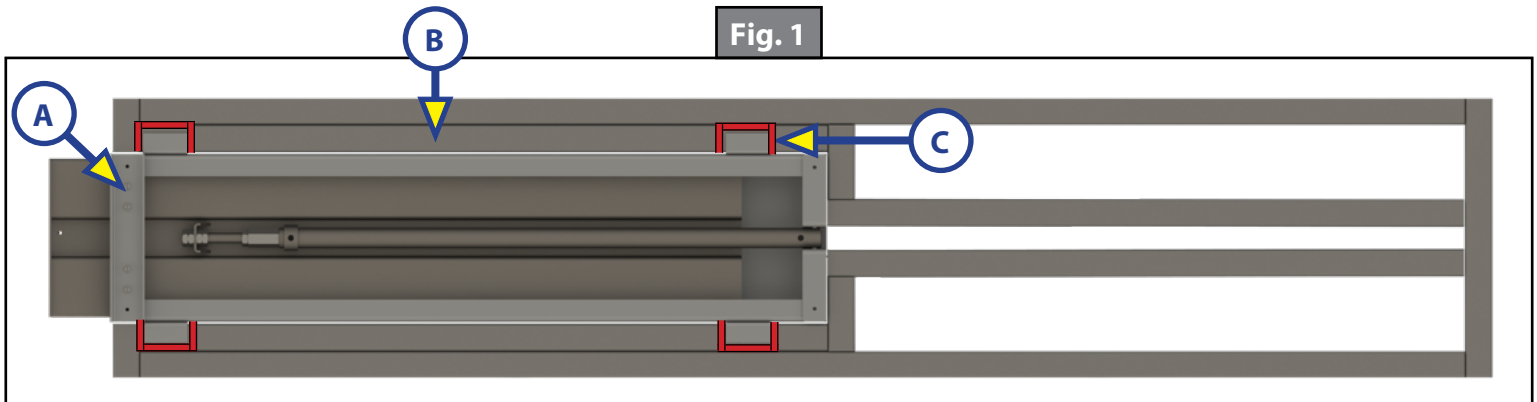
⚠ WARNING

Do not work on the slide-out system unless the battery is disconnected. Failure to act in accordance with the following may result in death or serious personal injury.

⚠ WARNING

Cover the hydraulic cylinder rods during production to avoid contamination on rods and damaging the seals when the slide is extended and retracted. Failure to do so could cause permanent damage to the component.

1. Place the drive-side, slide-out assembly (Fig. 1A), into the fabricated channel (Fig. 1B) with the slide-out assembly upside down in the channel.
2. Stitch weld (Fig. 1C, red lines) the slide-out assembly brackets onto the fabricated channel as per OEM specifications.
3. Flip the welded slide-out channel over and weld into the chassis (Fig. 2), three stitch welds on each side (Fig. 2A, red lines) as per OEM specifications.
4. Repeat steps 1-3 for the idler and other drive slide-out assembly.



Install the Room Mounted Brackets to the Hydraulic Slide-out

1. Align the room mounting bracket (Fig. 3B) four holes with the four holes in the inner arm of the hydraulic slide-out (Fig. 3A).
2. Attach a 5/16" flat washer (Fig. 3D) on a 5/16" -18 x 1" bolt (Fig. 3C) and attach the room mounting bracket to the inner arm of the hydraulic slide-out.
3. Repeat step 2 for the other holes (Fig. 4).

Fig. 3

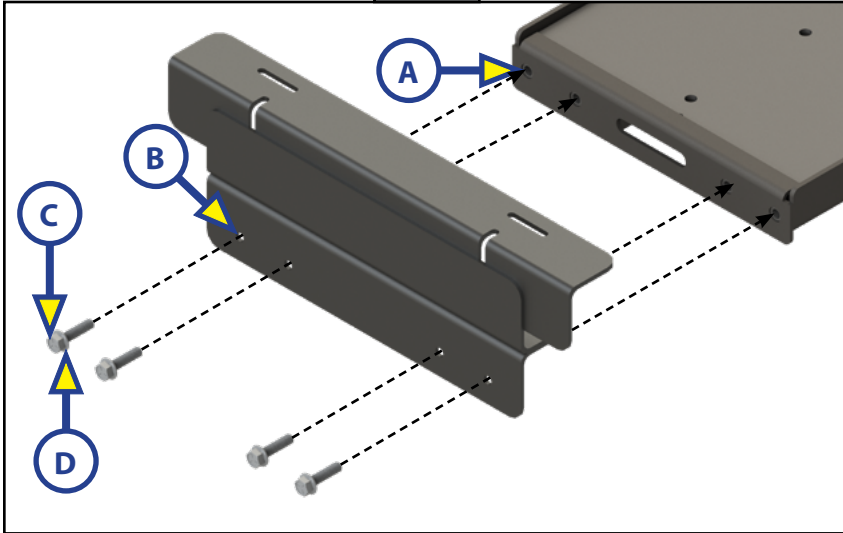
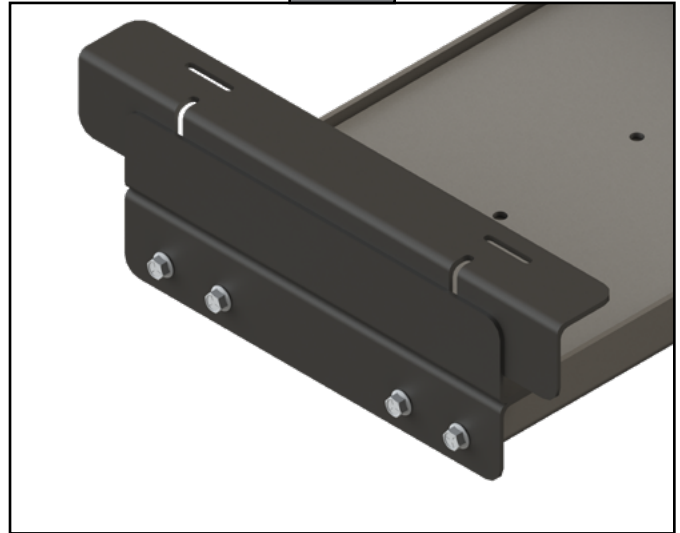


Fig. 4



4. Make sure the two welded bolts (Fig. 5A) for the vertical adjustment on the backside of the room mounting bracket have a 5/16" flat washer (Fig. 5B) and 5/16" nut (Fig. 5C) installed. Later in the installation, the top portion of the bracket can be adjusted vertically for final slide room adjustment.
5. Repeat step 4 for the other room mounting brackets (Fig. 6A).

Fig. 5

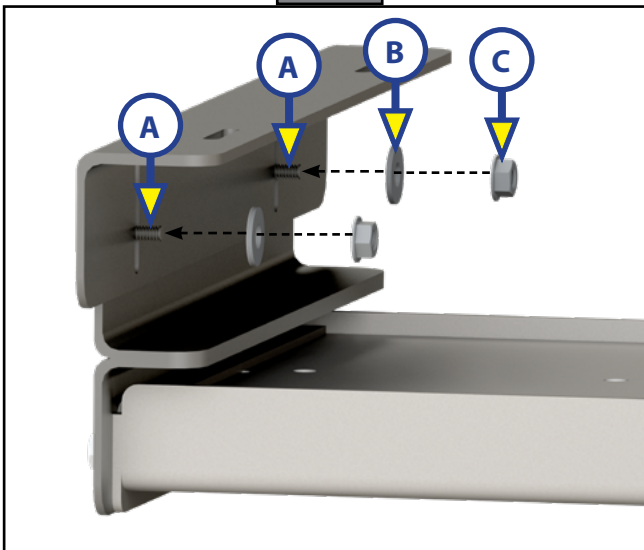
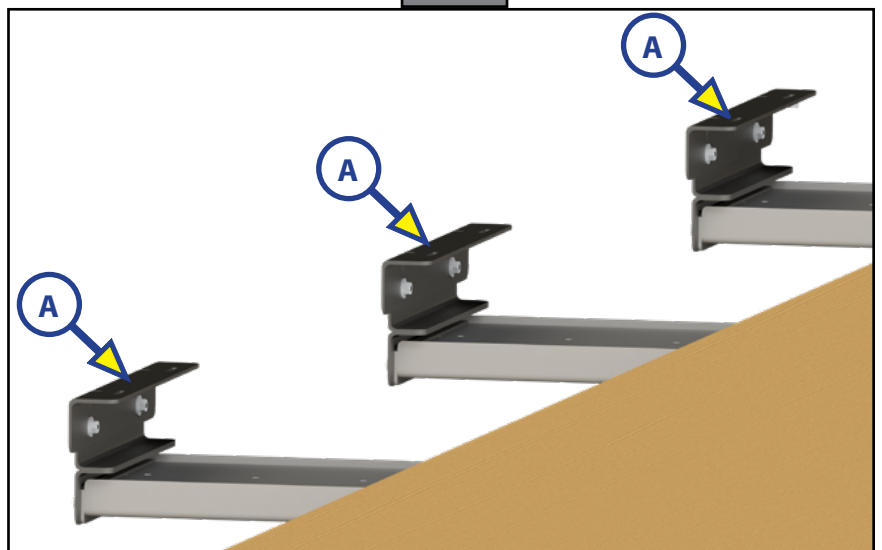


Fig. 6



Slide Room Preparation

1. Make sure coach is parked on solid, level ground.

⚠ WARNING

The coach MUST be supported per manufacturer's recommendations before working underneath. Failure to do so may result in death, serious personal injury and/or severe product or property damage.

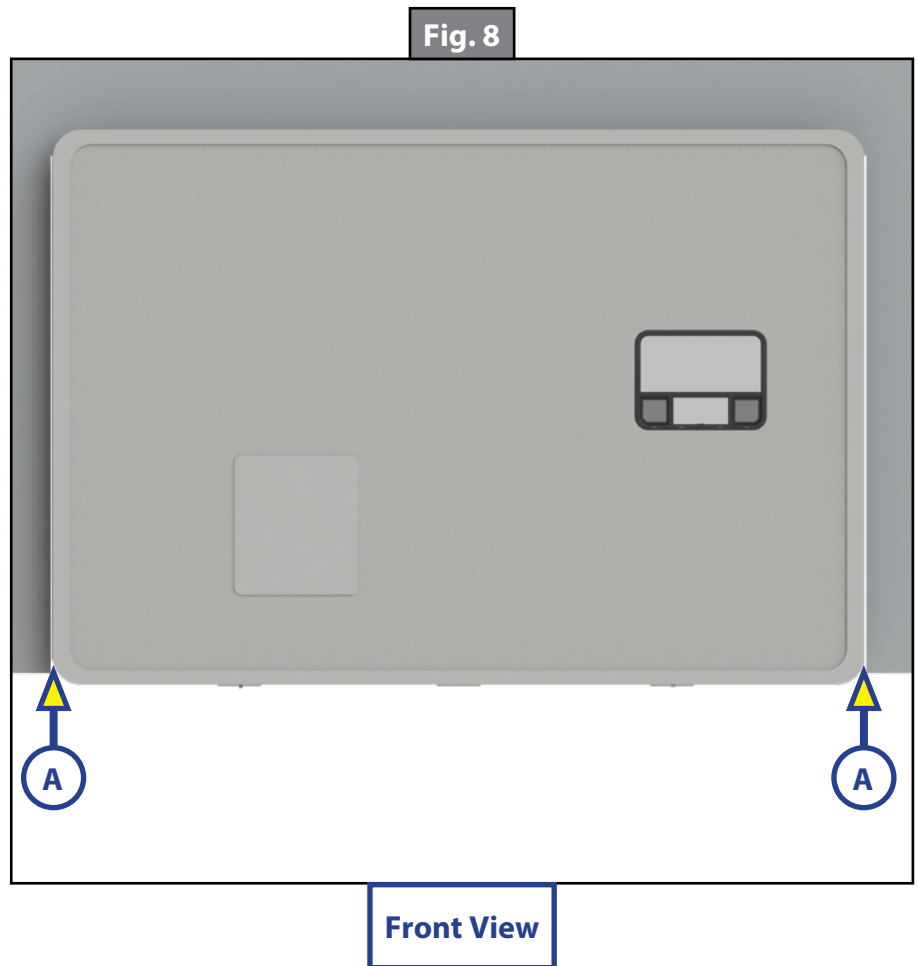
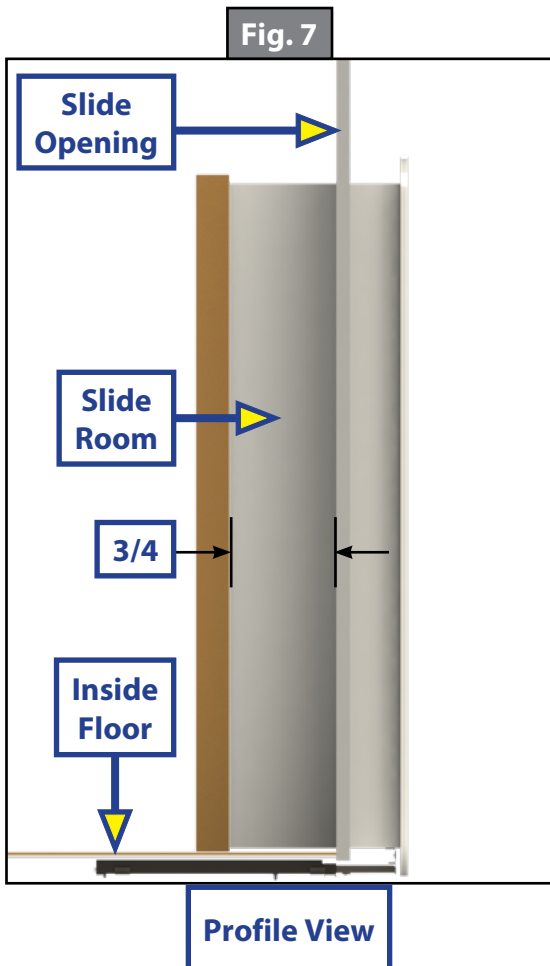
2. Make sure the coach is level and supported in accordance with manufacturer's recommendations.
3. Inspect slide-out mechanism to make sure that all stop blocks are intact and that there are no missing or damaged parts.

Installing the Slide Room

1. Place the slide room 3/4 of the way into the slide opening (Fig. 7).
2. Center the slide room in the slide opening and the head assembly on the slide-out inner arm. Make sure gaps on both sides are even (Fig. 8A). Gaps will vary by coach. A commonly-used wall to sidewall gap is 1½". Specific wipe and seal recommendations can be obtained from a wipe and seal vendor to ensure the gaps are correct.

⚠ CAUTION

If the slide-out room is too tight, it may damage the seals and cause excessive stress to the slide-out system.



Attach Room Mounted Brackets to the Slide Room

1. Once the slide-out room is in place, use the middle of the pre-drilled holes in the room mounting bracket (Fig. 9A) as a guide to drill 11/32" pilot holes up through the floor of the slide room. These pilot holes will be used as the guides to install the bolts down through the floor into the room mounting brackets.
2. At the pilot holes (Fig. 10C), install a 5/16" x 1 1/2" bolt (Fig. 10A) with a 5/16" flat washer (Fig. 10B) down through the slide room floor and into the room mounting bracket.
3. Repeat step 2 for the other four pilot holes in the slide room floor.

Fig. 9

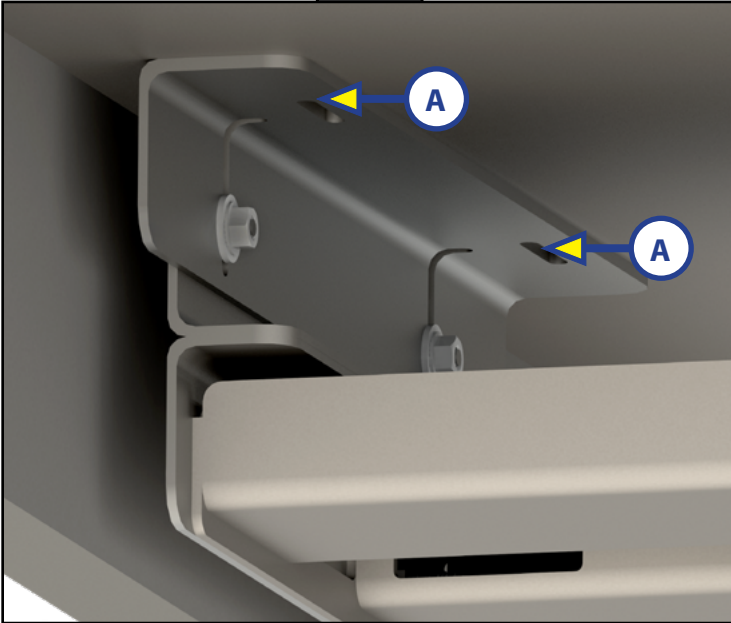
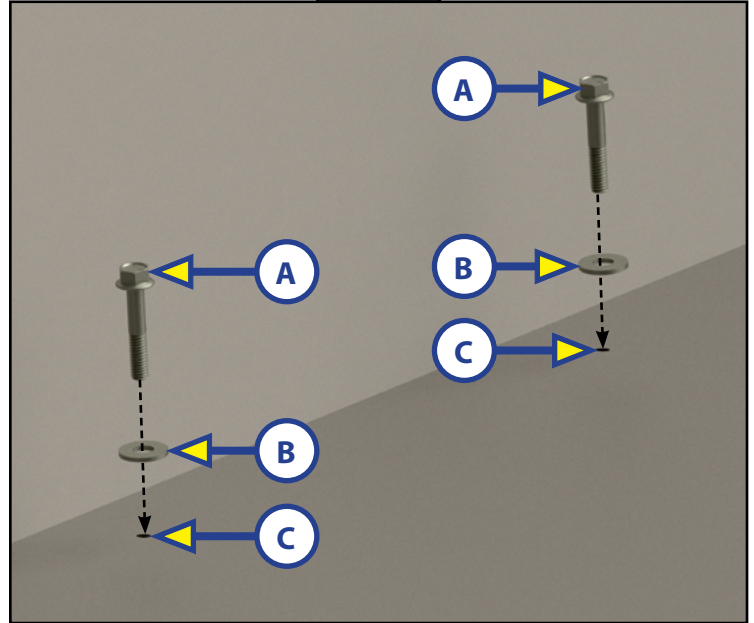


Fig. 10



4. Attach a 5/16" flat washer (Fig. 11B) and 5/16" nut on (Fig. 11C) the backside of the 5/16" bolt (Fig. 11A).
5. Repeat step 4 for the other four bolts on the other room mounting brackets (Fig. 12A).

Fig. 11

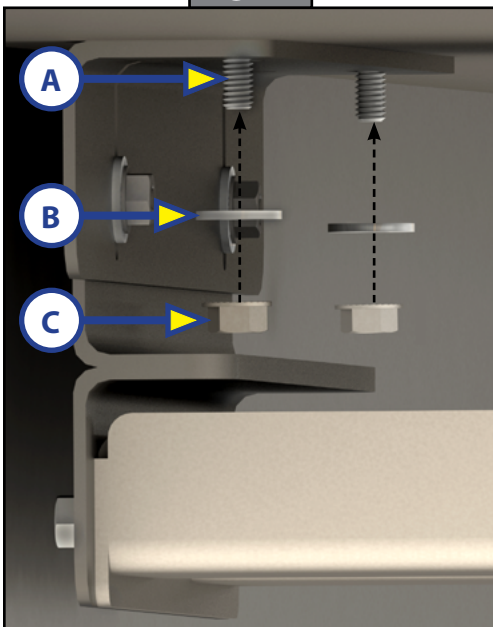
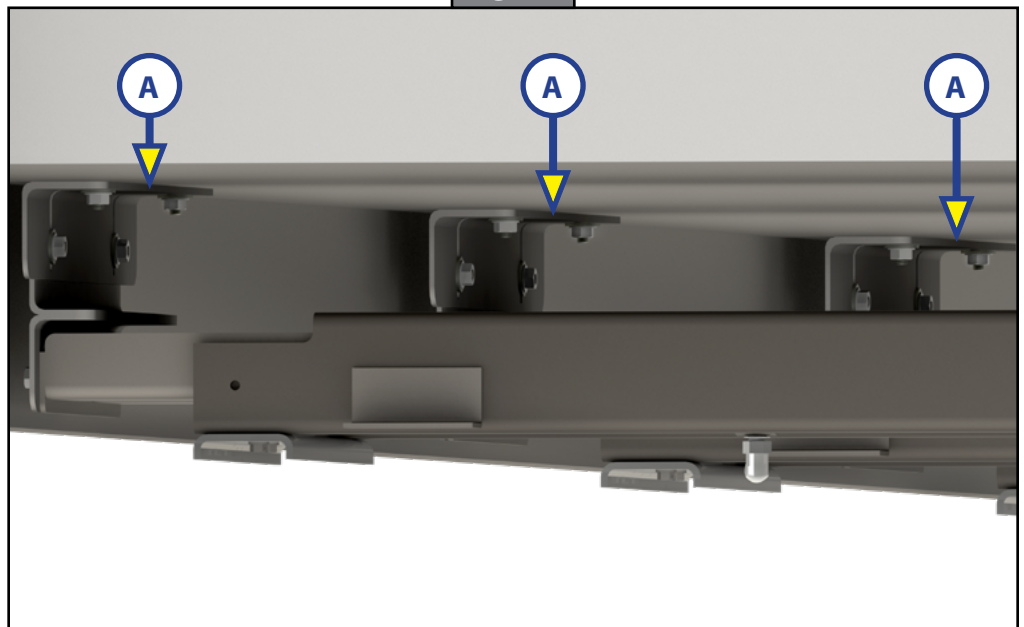


Fig. 12



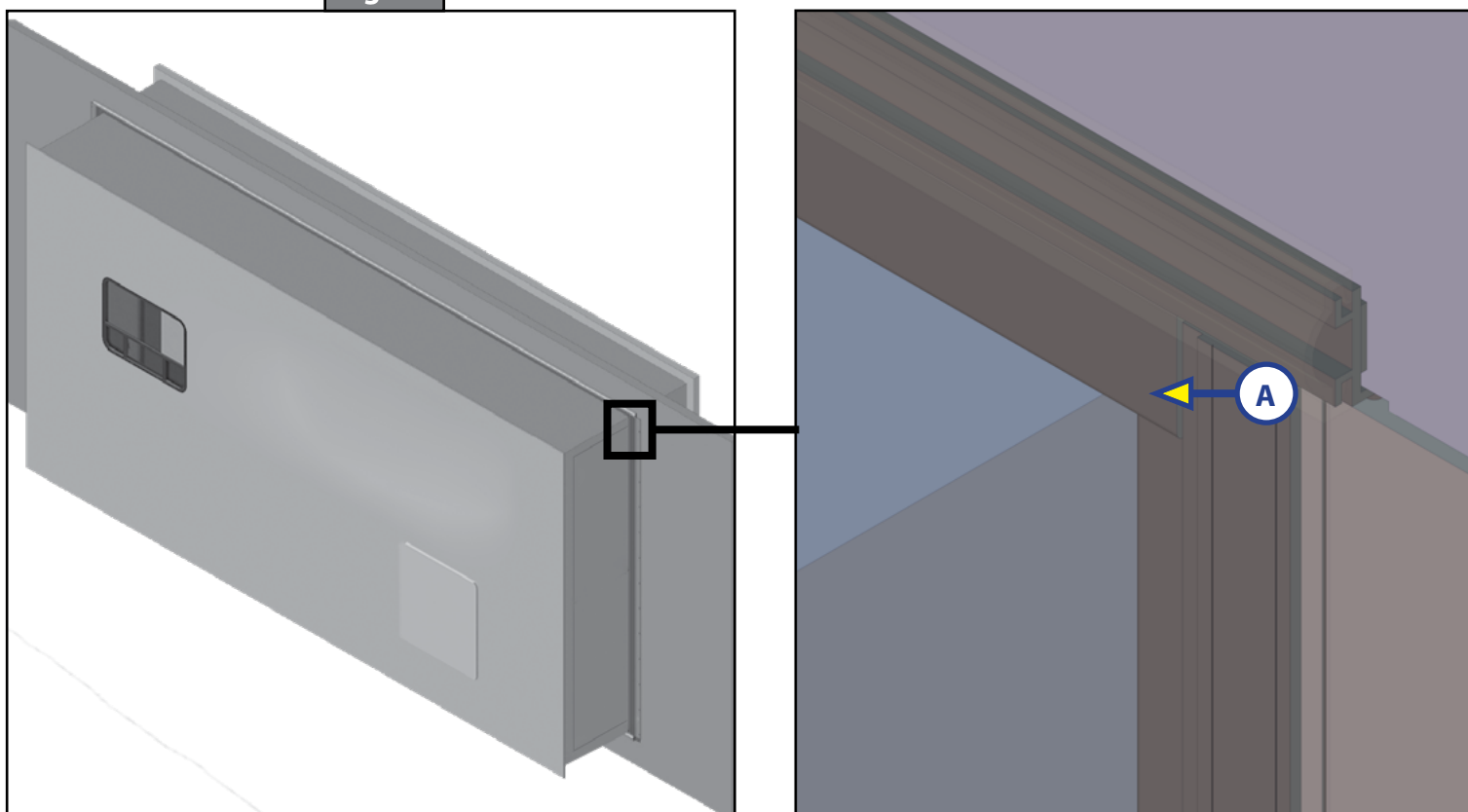
Attach the Slide Room Fascia

⚠ WARNING

Do not attempt to operate the slide room until both the exterior T-molding and the interior fascia are attached to the slide room.

1. Attach the interior slide room fascia.
2. Interior slide room fascia must be attached prior to operating the slide room for safety precautions.
3. Apply Tripolymer sealant to the back of the upper exterior wipe seal and lay it over the top of the vertical wipe seal on the column (Fig. 13A).

Fig. 13



Horizontal Room Adjustment

To move the slide room side to side:

Only perform this procedure if room is not centered in the slide opening. The room should be centered on initial install. Room should be 3/4 of the way into the slide opening.

1. Loosen all the nuts (Fig. 14A) on each room mounting bracket (Fig. 12A), six total nuts.
2. Position room horizontally by pushing on the outside slide box end wall to make sure the box is centered in the slide room opening (Fig. 8A).

NOTE: Gap on each side should be equal.

3. Tighten all the nuts (Fig. 14A) on each room mounting bracket (Fig. 12A), six total nuts.

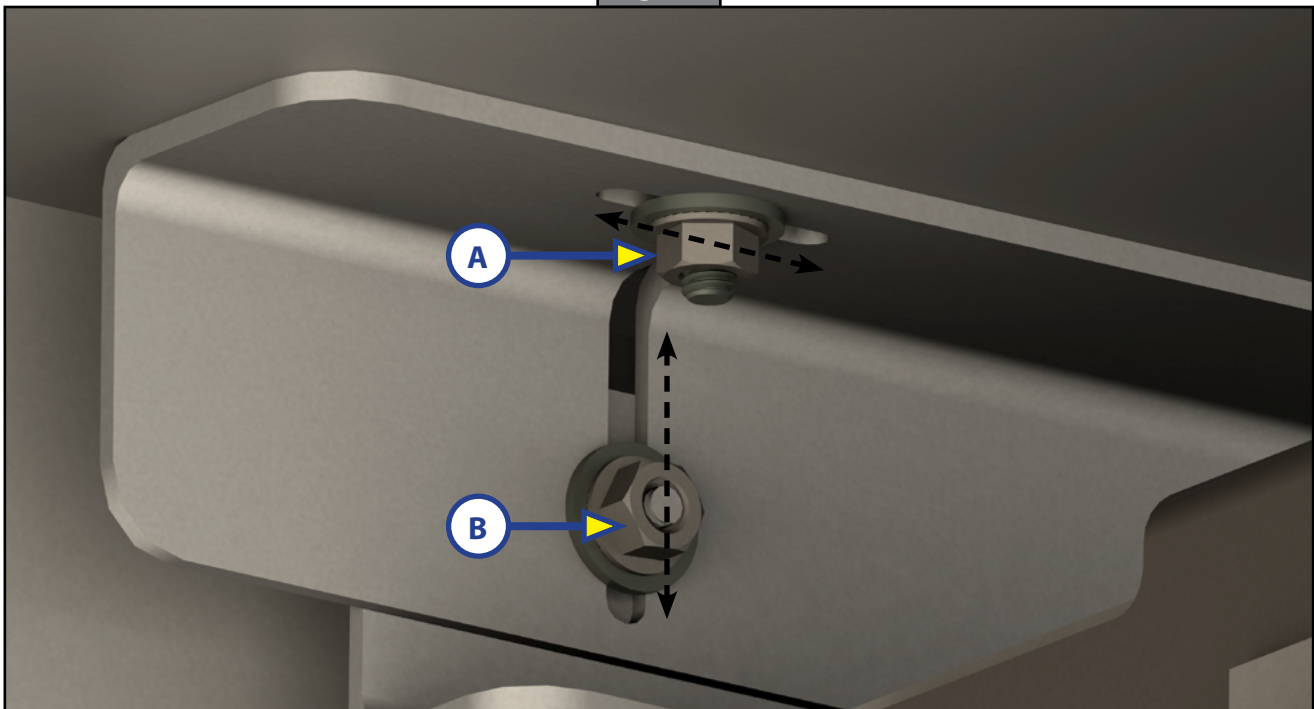
Vertical Room Adjustment

If one side of the room is lower or higher than the other, make adjustments to just the affected side. If the entire room needs to be raised or lowered, all three room mounting bracket vertical adjustment nuts (Fig. 14B) will need to be adjusted to the same level, starting with one side, the middle and then the other side.

To raise or lower the slide room:

1. Loosen the nuts (Fig. 14B) on the room mounting bracket, adjust the room accordingly up or down. Once room height is positioned, tighten the nuts (Fig. 14B).
2. Repeat step 1 for the other room mounting brackets if the entire slide room needs to move up or down, moving next to the middle room mounting bracket and then the opposite side room mounting bracket.

Fig. 14



Slide-out Extend/Retract Adjustments

Adjusting the Slide Room's Retracted Position

If the slide room does not seal:

1. Locate the cylinders (Fig. 15H) underneath the slide out.
2. Run the room partially out.
3. Adjust the specialty stop bell (Fig. 15G) and the jam nut (Fig. 15F) on each cylinder towards the bracket (Fig. 15C) and run the room in until the proper retracted seal is achieved.
4. Turn both specialty stop bells (Fig. 15G) towards the cylinder (Fig. 15H) until they stop. Tighten the jam nut (Fig. 15F) against the specialty stop bell (Fig. 15G) to hold it in place.
5. Tighten the nut (Fig. 15B) against the bracket (Fig. 15C) until it stops. Tighten jam nut (Fig. 15A) against the nut (Fig. 15B) to hold it in place.

NOTE: Make small adjustments, running the room in after each adjustment until proper seal is achieved.

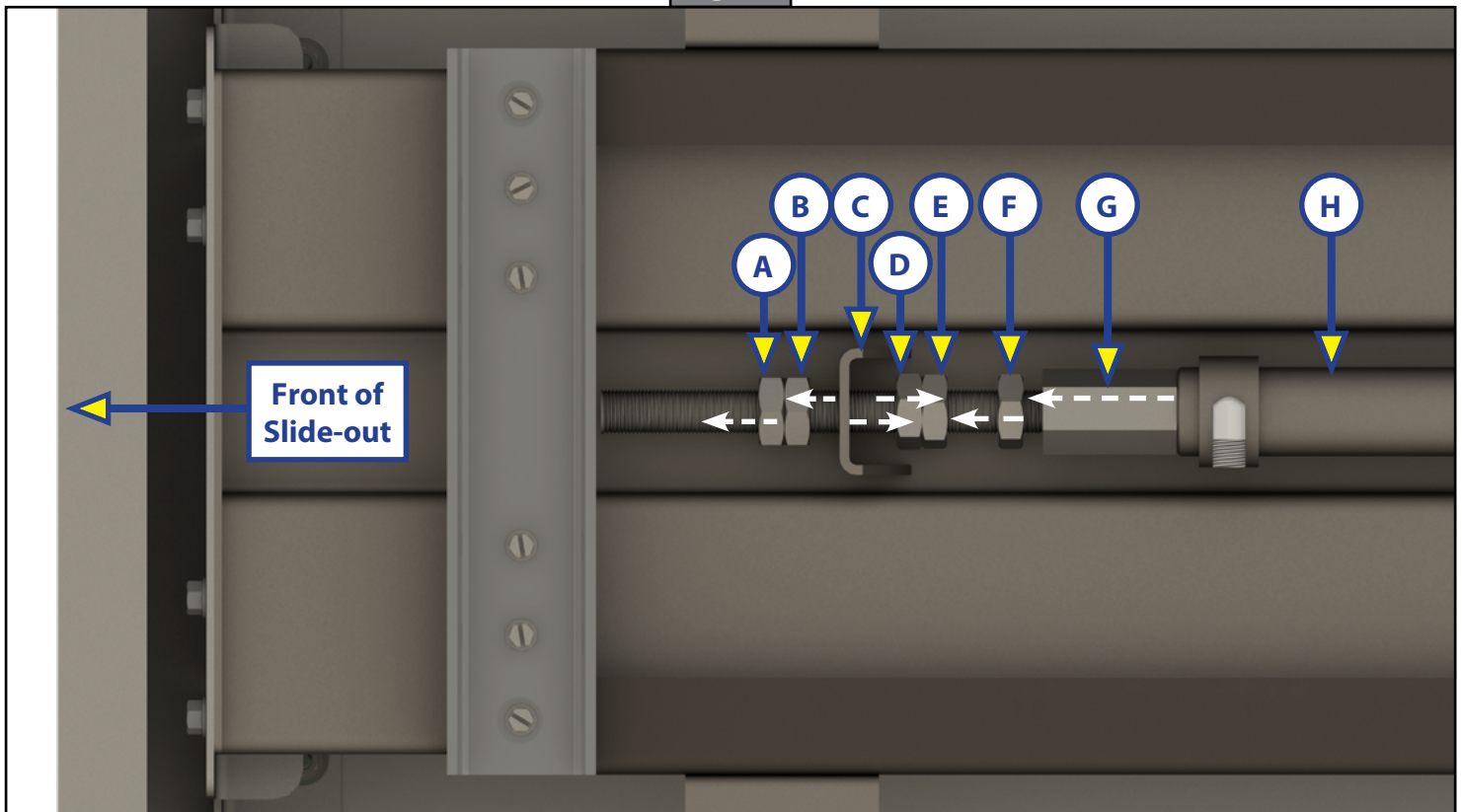
Adjusting the Slide Room's Extended Position

If the slide room does not fully extend:

1. Locate cylinders (Fig. 15H) underneath the hydraulic slide-out.
2. Completely extend the slide out room.
3. Check the inside fascia and seal positioning.
4. Partially retract room.
5. If the extended room seal is inadequate, loosen the jam nuts (Fig. 15E) and turn the nuts (Fig. 15D) towards the bracket (Fig. 15C).
6. Extend the room and verify that proper extended seal has been achieved. Tighten the jam nuts (Fig. 15E) against the nuts (Fig. 15D) to lock them in this position.

NOTE: Make small adjustments, running the room out after each adjustment until proper seal is achieved.

Fig. 15



Hydraulic Power Unit

For this manual the hydraulic power unit is mounted to the front of the driver's side compartment. See figures 16-18 for hydraulic power unit feature identification and the following:

- Fittings - High Pressure O-Ring Face - Size 4
- Hose - 1/4" I.D. 3000PSI - W.P. Rated

NOTE: Install the hydraulic power unit in accordance with RVIA Gas Codes, since the hydraulic power unit connections are not spark-proof.

NOTICE

All electrical wiring harnesses shall be loomed and secured to prevent possible damage and installed in accordance with RVIA electrical standards.

Fig. 16

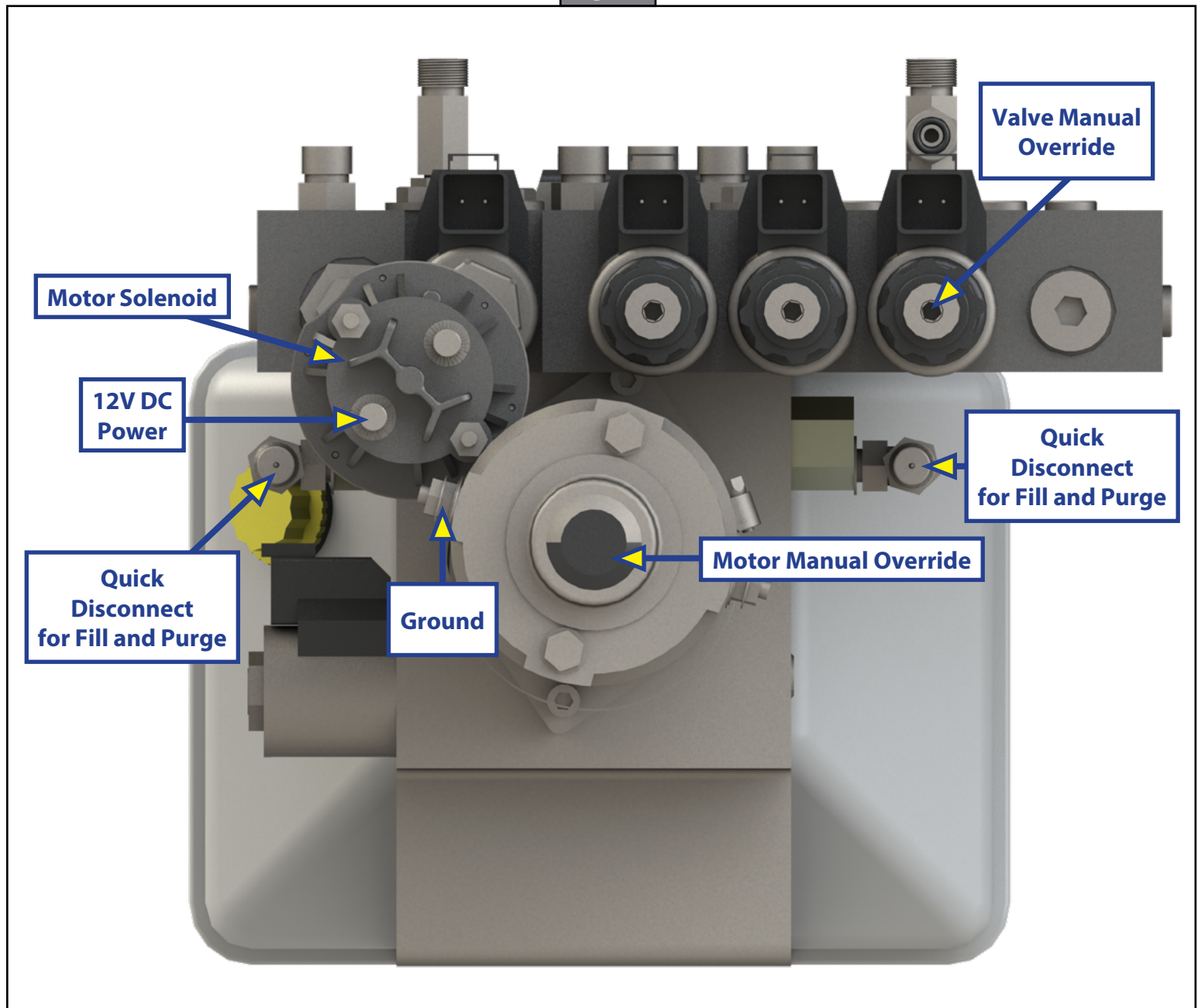


Fig. 17

NOTE: Four valve locations are available for slide-outs, if needed.

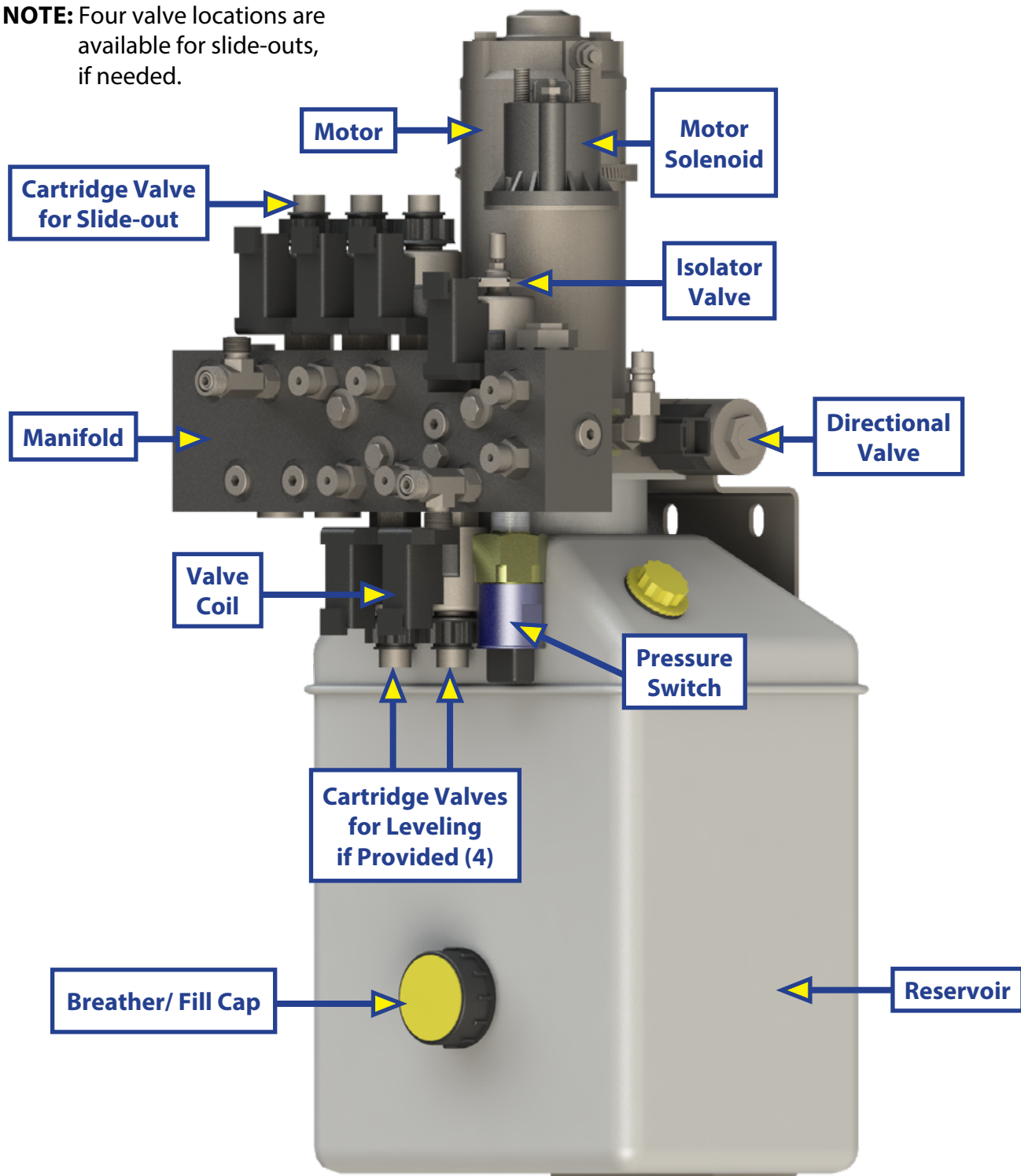
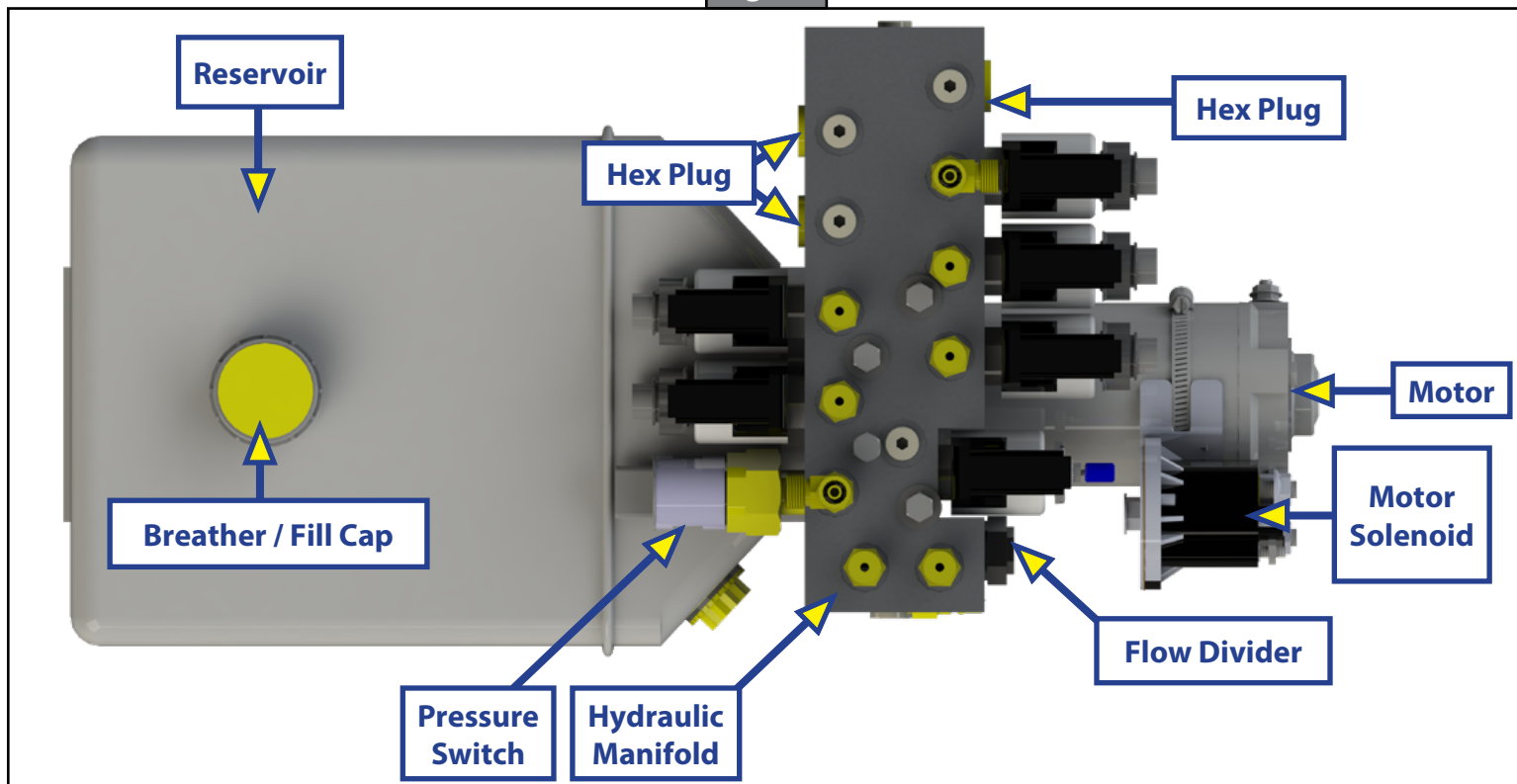


Fig. 18



System Wiring Requirements

OEM-supplied circuit protection to be rated as determined by the OEM. All OEM-supplied wiring is to conform to RVIA Standards.

1. Battery power with OEM-supplied breaker conforming to RVIA Standards.
2. Battery ground as per RVIA Standards.
3. Connect a ground wire from the 12V battery to the ground post on the hydraulic power unit motor.

NOTE: Ground wires are OEM supplied.

Purging the Hydraulic system

NOTE: Before operating the Lippert Components, Inc. hydraulic system, make sure the system has been purged of air introduced into the hydraulic lines during installation.

Fluid Recommendation

Automatic transmission fluid (ATF) with Dexron®III or Mercon®V or a blend of both is recommended by Lippert Components, Inc. For a list of approved fluid specifications, see [TI-188](https://lci-support-doc.s3.amazonaws.com/technical-information-sheets/leveling-and-stabilization/ccd_0002088.pdf) (https://lci-support-doc.s3.amazonaws.com/technical-information-sheets/leveling-and-stabilization/ccd_0002088.pdf).

NOTE: In colder temperatures (less than 10° F) the jacks may extend and retract slowly due to the fluid's molecular nature. For cold weather operation, fluid specially formulated for low temperatures may be desirable.

Purging the System

NOTE: Make sure jacks are fully retracted prior to filling reservoir to prevent over-filling

1. Zip-tie any loose wiring or hydraulic lines.

NOTE: The basic purge procedure to bleed the Lippert Hydraulic Systems can be performed without the use of any tools. The hydraulic system will purge the air from the hydraulic lines and cylinders by simply running the pump.

NOTE: It is recommended to perform a minimum of three complete cycles (steps 2-7) to ensure both proper function and adequate fluid level of the system.

2. Start with all hydraulic components in the fully retracted position, meaning all jacks and slide-outs are brought back inside the coach as if the coach were ready for travel.
3. Find the hydraulic pump location and note the amount of fluid currently in the reservoir. The fluid level should be about 1/4" from the top of the reservoir and no more than 1/2" from the top.

NOTE: When checking the fluid level after ensuring all hydraulic components are retracted, note if there are any bubbles, froth or foam on top of the fluid. This is an indication that air has been pushed back to the reservoir when the hydraulic components were retracted in the last cycle. Wait 15-20 minutes for the foam to dissipate before beginning the purge process.

4. If there is no froth or foam in the reservoir and the fluid is not within 1/2" of the top, fill the reservoir to within the level described in step 3.
5. With the fluid level full and no foam in the reservoir, begin cycling the hydraulic system.
6. Extend jacks fully, taking the coach off the tires. If the coach has hydraulic slide-outs, extend all slide-outs. Once all jacks and slide-outs are extended, immediately retract all slide-outs and then jacks.
7. Check the reservoir for foam. If foam is present, see NOTE following step 3 and then repeat steps 4-6.
8. Repeat these steps until no foam is present in the reservoir. If no foam is present, the system is purged of air.

Slide-out Prior to Operation

Prior to operating the Lippert Hydraulic 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.

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 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.

Operation

Extending Slide-out Room

1. Level the coach.
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 (Fig. 19) in the OUT position (Fig. 19B) 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.

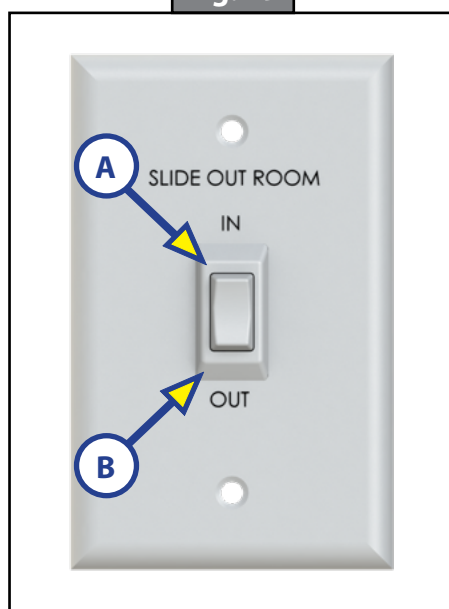
Retracting Slide-out Room

1. Verify the battery is fully charged and hooked up to the electrical system.
2. Press and hold the IN/OUT switch (Fig. 19) in the IN position (Fig. 19A) 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).

Fig. 19



Slide-out Troubleshooting

This troubleshooting chart outlines some common concerns, their causes and possible corrective actions.

Some other troubleshooting tips are;

- If any part or serial number information is available, provide it to the service technician when seeking assistance.
- Every coach has its own personality and what may work to fix one 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).
- 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 concern.

What is Happening	Why?	What Should Be Done?
Room doesn't move when switch is pressed.	Restriction or obstruction inside or outside of coach.	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.
Hydraulic power unit runs but room does not move.	Restrictions both inside and outside of coach.	Check for and clear restriction.
Hydraulic power unit runs, room moves slowly.	Low battery, poor ground, extremely low outdoor temperature.	Charge battery and check ground wire.
Room drifts "in" or "out."	Possible external leak in the hydraulic system.	Tighten fittings. Inspect hoses, fittings and hydraulic power unit for external leaks.
	Air in system.	After checking all connections, perform basic purge procedure, see Basic Purge Procedure for Hydraulic Pump section.
In the closed position, room drifts out.	Leaking cylinder seal.	See Hydraulic Cylinder Test Section.
	Fluid bypassing cylinder piston.	See Hydraulic Cylinder Test section.
	Hose from pump is leaking.	Tighten fitting or replace hose.
	Fluid bypass in cartridge valve.	Replace cartridge valve.
	Loose mounting bolts.	Tighten mounting bolts.

Manual Override

Resources Required

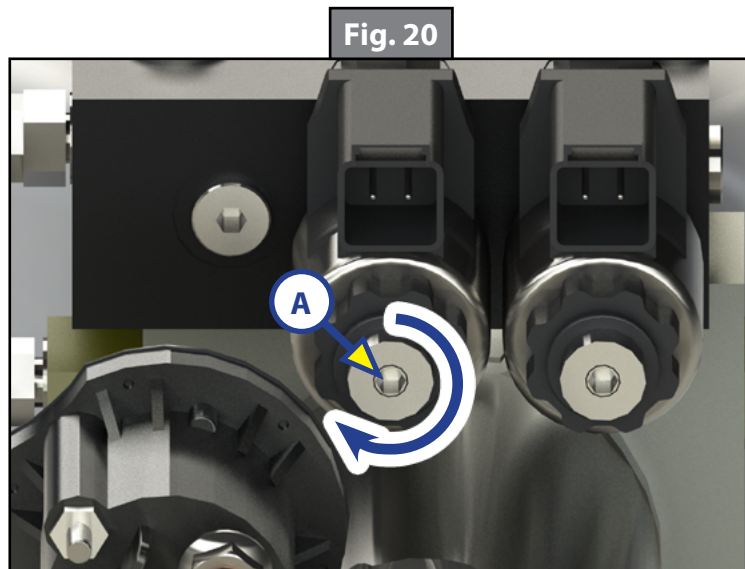
- Cordless or electric drill
- 1/2" socket
- 5/32" or 5/64" hex wrench

The slide-out system can be run with auxiliary power devices like cordless or electric power drills. In the event of electrical or system failure, this manual method of retracting the cylinders can be used. A standard hand-held drill is all that is required. To manually retract the slide out cylinders, do as follows:

1. Insert a 5/32" hex wrench into the adjustment end of the valve (Fig. 20A).

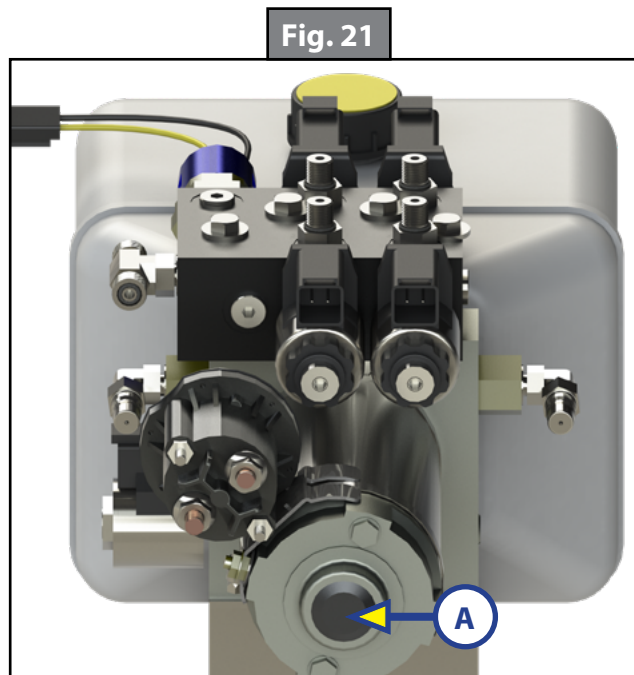
NOTE: If a 5/32" hex wrench will not fit in the end of the valve, use a 5/64" hex wrench.

2. Turn the hex wrench on the valve clockwise (Fig. 20) to allow the cylinders to be retracted.



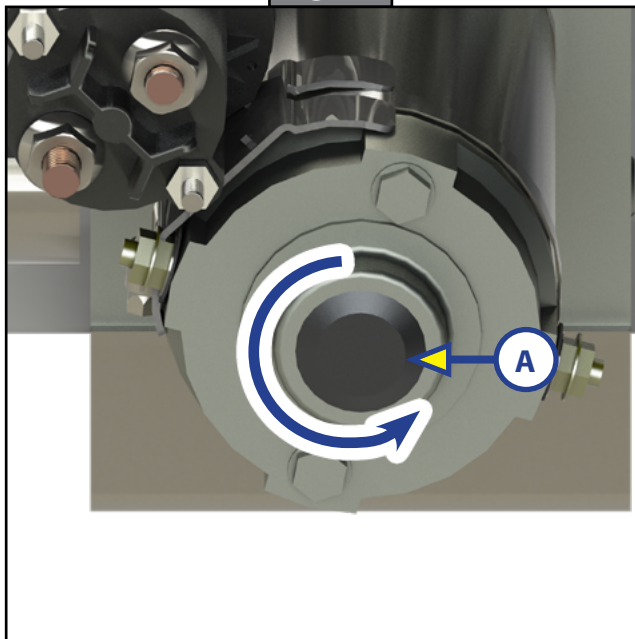
Clockwise for Manual Override

3. Remove the hex wrench from the valve. Remove the plastic cap (Fig. 21A) from the end of the motor.



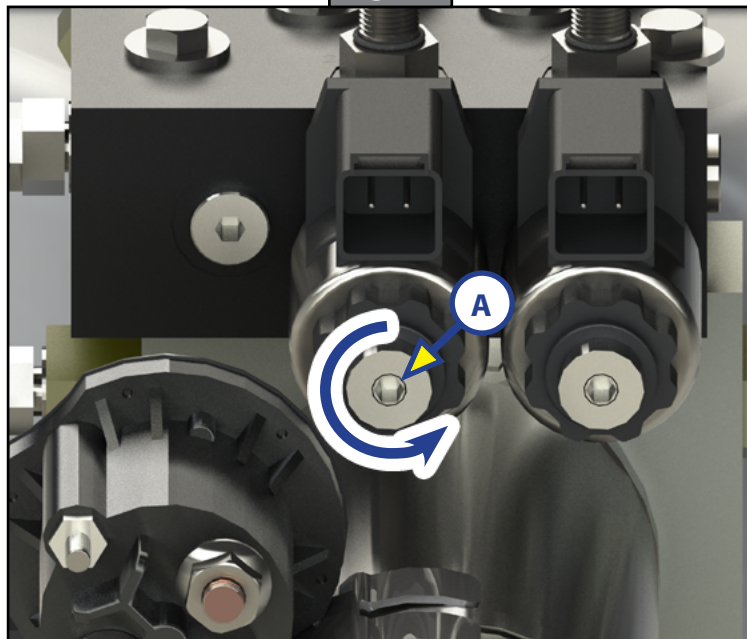
4. Disconnect or shield power cables on the motor.
5. Using a 1/2" socket and auxiliary drive device, e.g., cordless or electric drill, insert 1/2" socket onto the coupler (Fig. 22A).
6. Run drive device in reverse (counterclockwise) to retract cylinders (Fig. 22).
7. After the cylinders have been fully retracted, remove the 1/2" socket and drill from the motor's coupler.
8. Reinsert the 5/32" hex wrench into the valves' manual override adjustment (Fig. 23A).
9. Turn the valve's manual override completely counterclockwise (Fig. 23) until the adjustment no longer turns, thus completely closing the valves.
10. Do not over-tighten override set screws, as this can damage the valves.

Fig. 22



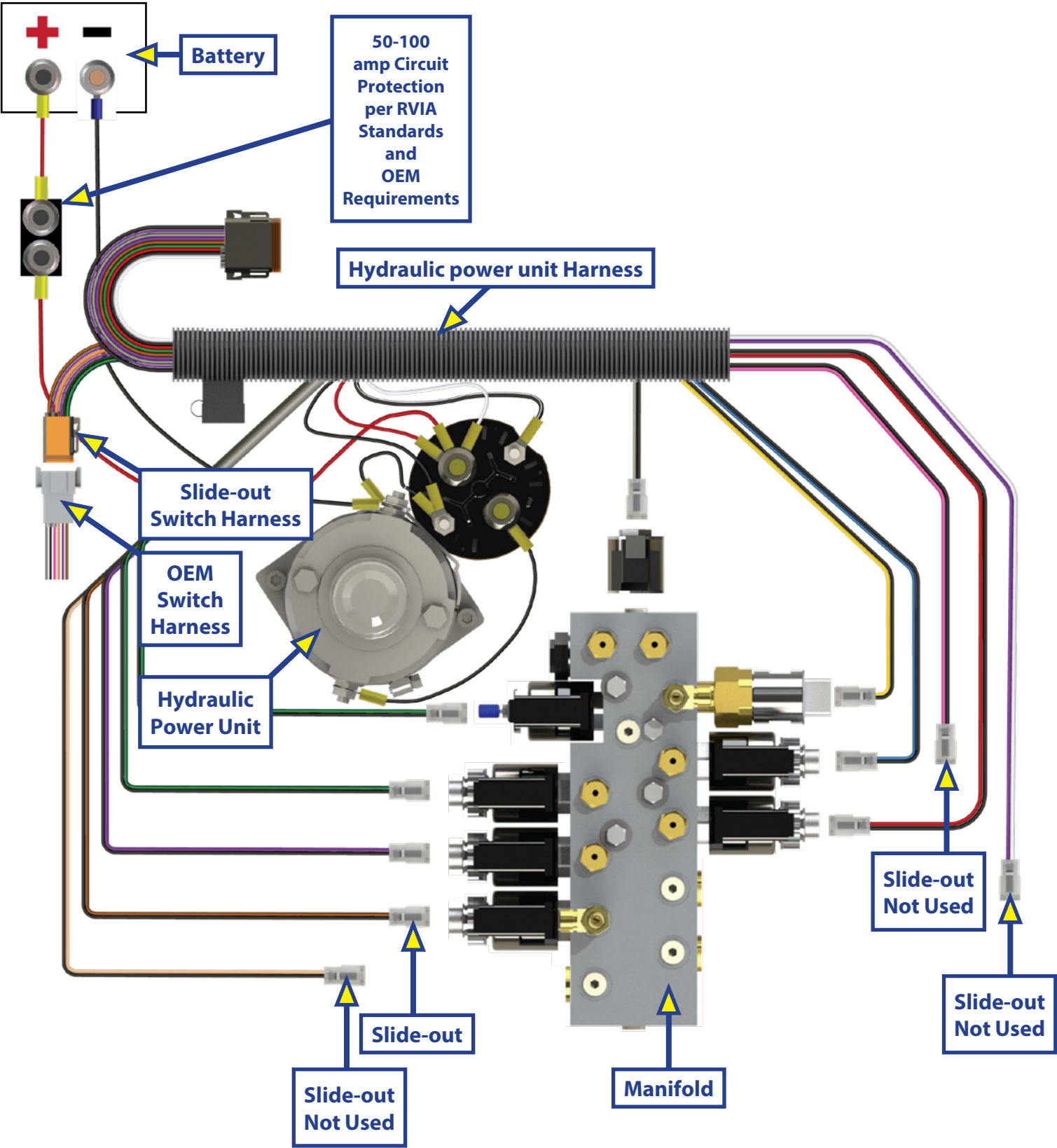
Run Counterclockwise to Manually Retract Cylinders.

Fig. 23



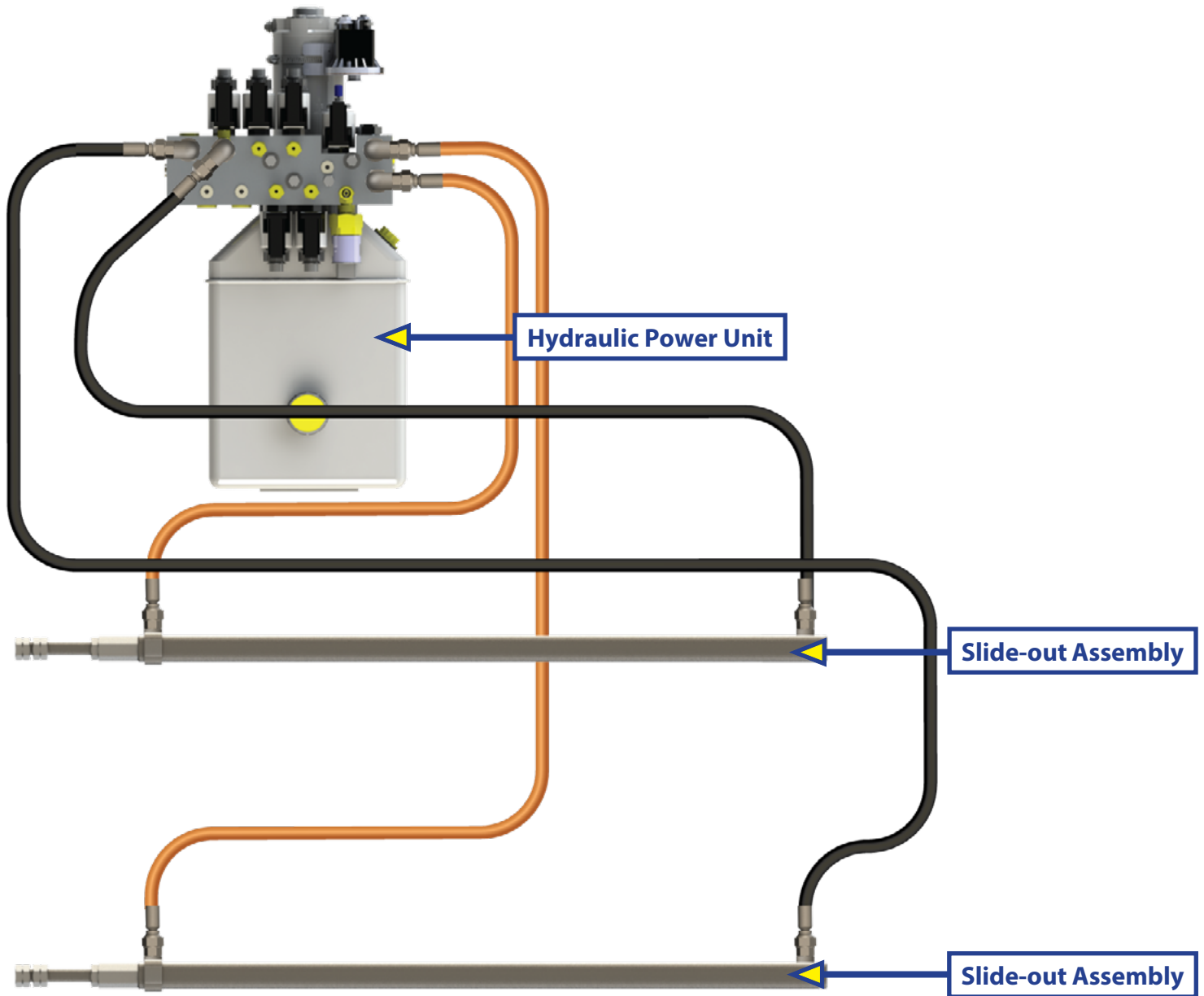
Counterclockwise for normal operation

Slide-out Wiring Diagram



Hydraulic Plumbing Diagram

Orange Hydraulic lines = Retract
Black Hydraulic lines = Extend



Notes

[illegible]



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Follow proper safety practices. If in doubt, consult a professional RV technician.