

# Master Owner's Manual

## Towable



LIPPERT  
COMPONENTS®

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# Master Owner's Manual

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# SOLERA® HYBRID AWNING

## AWNINGS

### System Information

The Solera® Hybrid Awning extends and retracts with the easy-to-use hook-and-crank tool. Simply insert the hook into the drive head and turn clockwise to extend the awning and counterclockwise to retract the awning. The Solera® Hybrid Awning features an internal gear box that allows the awning to stop at any point during extension or retraction. Additionally, the pitch arm allows for rain dump and adjustable pitch features, and there is no rafter arm to lock in place. The pitch arm also provides added stability — the arms don't need to be locked in place like manual awnings.

### CAUTION

**This manual provides operational procedures for the Solera Hybrid Awning. Operating the Solera Hybrid Awning in any other manner than described may result in personal injury, damage to the recreational vehicle unit or the awning assembly as well as voiding the Lippert Components Limited Warranty.**

## Operation

**NOTE:** If the unit is equipped with a locking latch, be sure to unlock the latch prior to extending the awning. After retraction and before travel, be sure to lock the support arms back into place.

### Extending the Awning

1. Locate the crank handle for the awning.
2. Insert the hook end of the crank handle into the eye bolt on the drive head (Fig. 1).
3. Turn the crank in a clockwise direction and fully extend the awning (Fig. 2).

**NOTE:** Keeping the handle as parallel to the support arm assembly as possible makes it easier to turn.

**NOTE:** Extension is considered complete when the fabric is completely unrolled, the valance is hanging down from the roll tube and a section of the roll tube is exposed (Fig. 3).

**⚠ CAUTION**

**Tying the roll tube down once the awning is extended will not allow the free floating support arms to work as designed and may cause damage to the awning or unit.**

Fig. 1

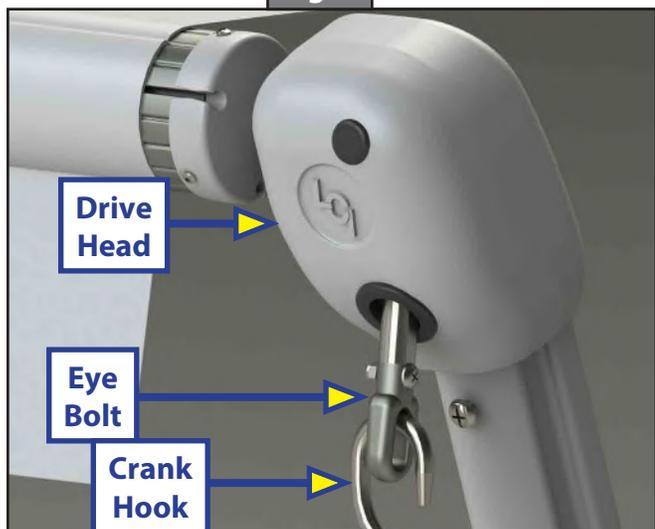


Fig. 2

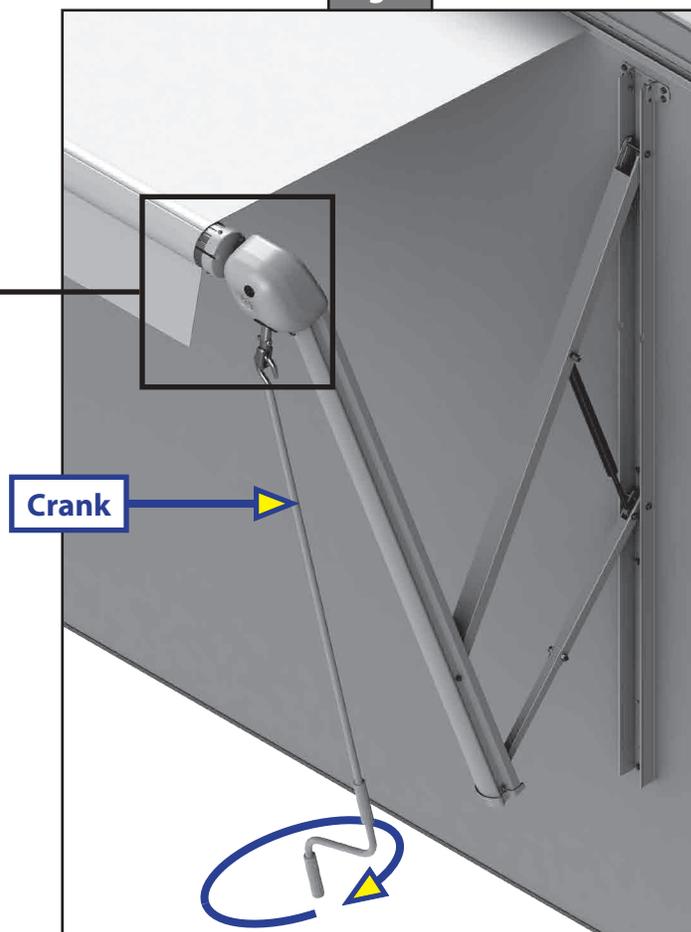
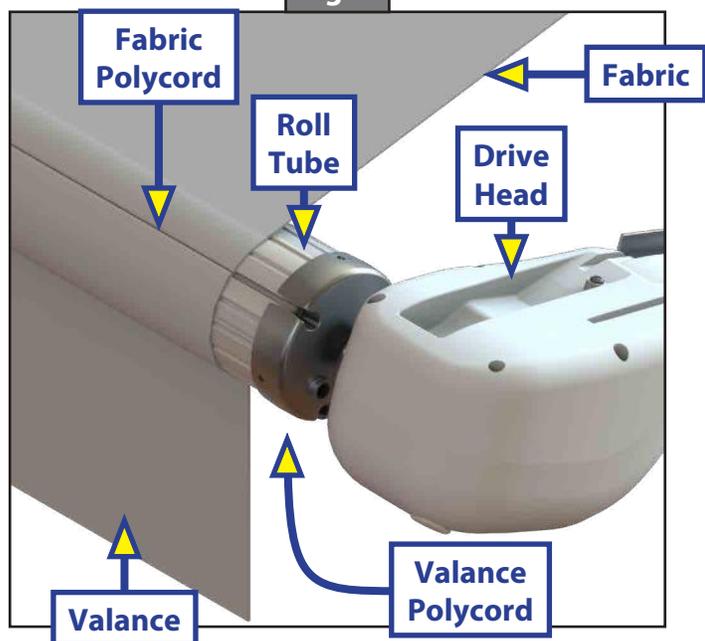


Fig. 3

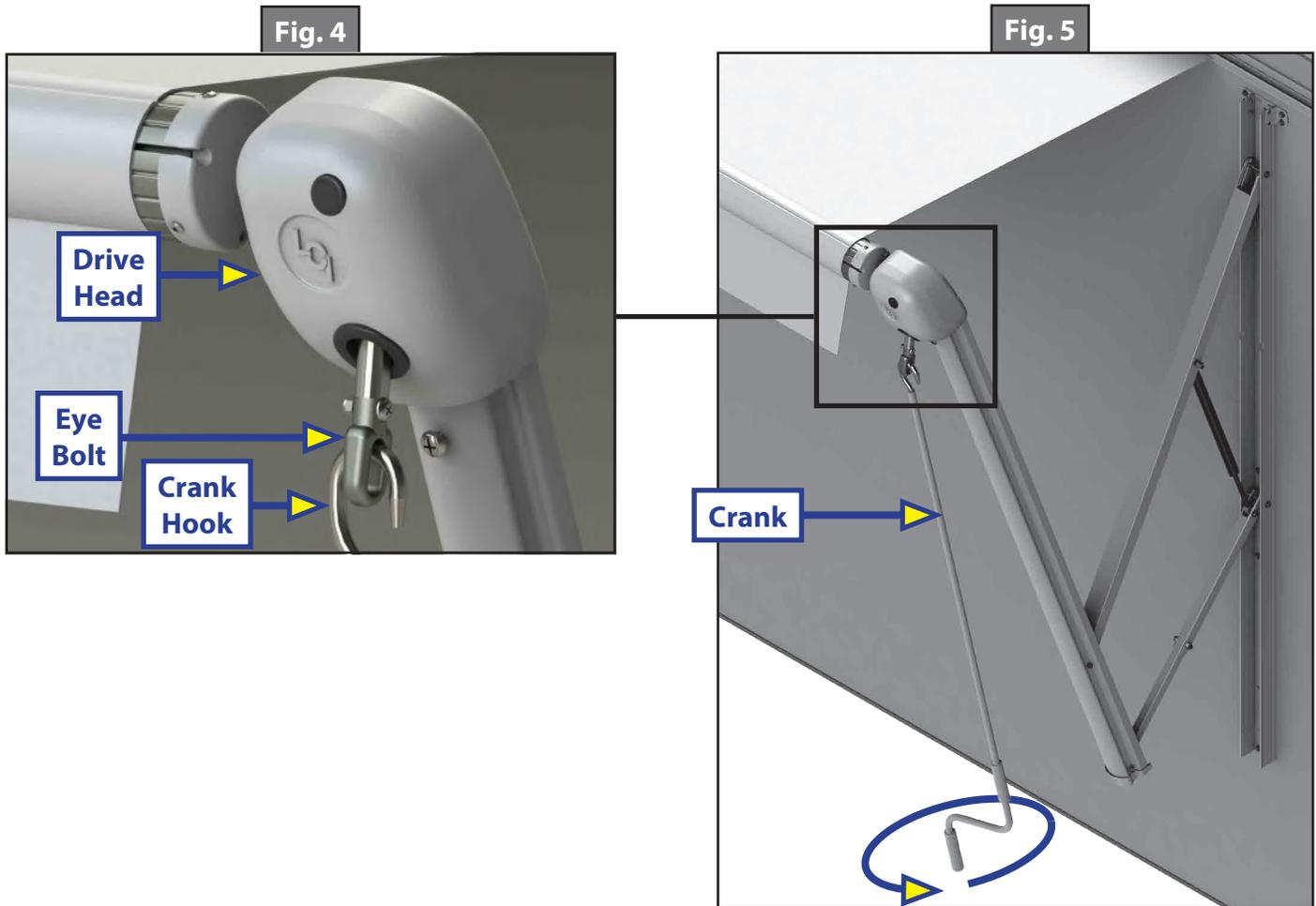


## Retracting the Awning

**NOTE:** The awning can be retracted without resetting the pitch (see Adjusting Pitch).

1. Locate the crank handle for the awning.
2. Insert the hook end of the crank handle into the eye bolt on the drive head (Fig. 4).
3. Turn the crank handle in a counterclockwise direction until the awning is fully retracted (Fig. 5).

**NOTE:** Keeping the handle as parallel to the support arm assembly as possible makes it easier to turn.



## Adjusting Pitch

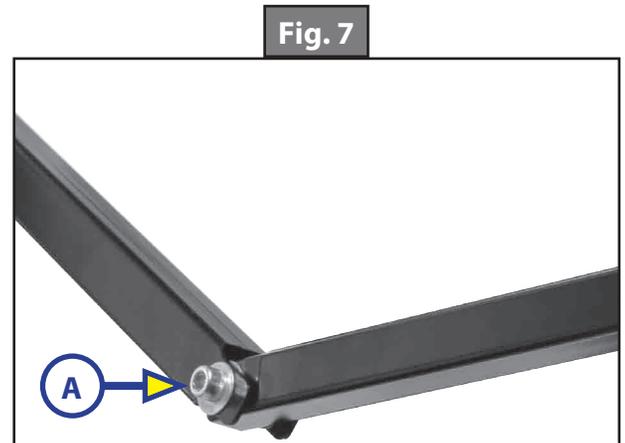
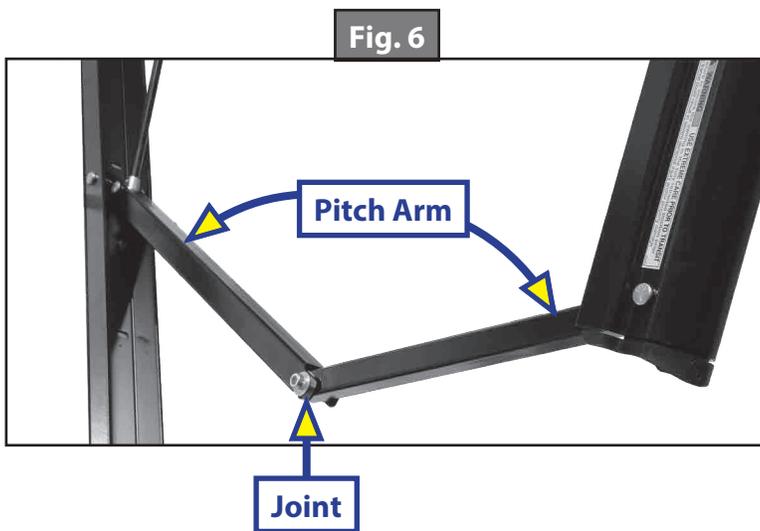
**NOTE:** The awning will pitch itself to purge the pooling of excess water and may dump a significant amount of water without notice.

1. Pitch can be set by adjusting the pitch arm to tip one side of the awning to allow water runoff.
2. Extend the awning to the fully open position.
3. Choose the side of the awning for optimum shade or convenient water runoff. Pull downward on the joint of the pitch arm until desired pitch is set (Fig. 6). Belleville washers and bolt (Fig. 7A) allow for the joint to remain in the position set by the operator.

**NOTE:** Do not push the joint of the pitch arm up past the point where the two sections are in a straight line. This will put tension on the gas strut, which can cause the strut to break.

**NOTE:** The awning can be retracted without resetting the pitch.

**NOTE:** If the pitch arm does not hold position, it can be tightened by adjusting the bolt (Fig. 7A) in the center of the joint.



## Troubleshooting

| Solera Hybrid Awning Basic Troubleshooting Chart     |  |
|--|--|
| What's Happening?                                    | What Should Be Done?   |
| Awning won't open or close                           | If optional travel locks are installed, ensure that they have been unlocked.   |
| Awning pitch won't stay in the flat position.        | Check for bad gas strut  |
|  | Check pitch arm bolt for proper tension. (High winds can cause the pitch arm to deviate from the flat position due to the built-in safety feature of the awning.   |
|  | Make sure all 3 washers are in the proper location of the pitch arm.   |
| Awning doesn't close all the way.                    | The awning is considered completely closed as long as the outer arm is overlapping the mount arm. This overlap can vary.   |
|  | Ensure there are no obstructions in the support arm assemblies preventing the awning from closing.   |
|  | Verify the fabric is square from unit to roll tube and is rolling up straight on the roll tube.  |
| Awning seems to wobble when extending or retracting. | Ensure the bolts that hold the head to the support arm assemblies are tight.   |
|  | Ensure the end caps are seated properly on the roll tube.  |
|  | Ensure the shaft coming out of the head going to the end cap isn't bent.   |
|  | Ensure the mount arms are properly secured to the wall.  |
|  | Ensure no part of the support arm assemblies are bent.   |
|  | Ensure the wear collar spacers are all properly located in the support arm assemblies.   |
| Awning rolls up backwards.                           | The awning fabric should always be above the roll tube. However, if the crank handle is operated past full extension, the awning will roll up backwards. This is not a defect. To correct the fabric orientation, simply operate the crank handle in the retract direction and the awning will then extend to its correct orientation and normal operation can resume. |

## Maintenance

### Fabric Care

If the awning is retracted while wet, extend the awning and let it dry as soon as conditions allow before retracting. This will help prevent the formation of mildew and add greatly to the life of the awning. Mildew does not form on the fabric itself, but on the accumulated dust, dirt and grime.

**NOTE:** Periodically clean vinyl or woven acrylic fabric using a mixture of  $\frac{1}{4}$  cup of dish soap and 5 gallons of warm water. Liberally apply the mixture on the top of the fabric and retract the awning for 5 minutes. This will apply the mixture to the bottom of the fabric as well. Extend the awning and hose off with fresh water. Repeat if necessary. Allow to dry before retracting.

# SOLERA® POWER AWNING

## AWNINGS

### System Information

The Solera® Power Awning features an internal motor to steadily operate the awning. Additionally, the friction joint allows for rain dump and adjustable pitch features, and there is no rafter arm to lock in place. The friction joint also provides added stability.



**This manual provides operational procedures for Solera® Power Awning. Operating the Solera® Power Awning in any other manner than described may result in personal injury, damage to the recreational vehicle or the awning assembly as well as voiding the Lippert Components Limited Warranty.**

## Operation

**NOTE:** Some coaches may not use the LCI switch (Fig. 3).

### Extending the Awning

1. Verify the RV battery is fully charged and connected to the electrical system.
2. Locate the locking latch (Fig. 1), if equipped, and unlock the latch (Fig. 2).

**NOTE:** This latch is optional and may or may not be installed on one or both support arms.

3. Press and hold EXTEND (Fig. 3A) until the awning is extended completely.

**NOTE:** Extension is considered complete when the fabric is completely unrolled, the valance seam is visible and a section of the roll tube is exposed (Fig. 4).

**NOTE:** The awning fabric should always be above the roll tube. However, if the extend switch is engaged too long or extend is hit inadvertently instead of retract, the awning will roll up backward. This is not a defect. To correct the fabric orientation, press the **RETRACT** button. The awning will then extend to its correct orientation and normal operation can resume.

### ⚠ CAUTION

**Tying down the roll tube once the awning is extended will not allow the free-floating support arms to work as designed and may cause damage to the awning or RV.**

### Retracting the Awning

1. Verify the coach battery is fully charged and connected to the electrical system.

**NOTE:** The awning can be retracted without resetting the pitch.

2. Press and hold RETRACT (Fig. 3B) until the awning is retracted completely.
3. Locate the locking latch (Fig. 2), if equipped, and lock the latch (Fig. 1).

**NOTE:** This latch is optional and may or may not be installed on one or both support arms.

Fig. 1

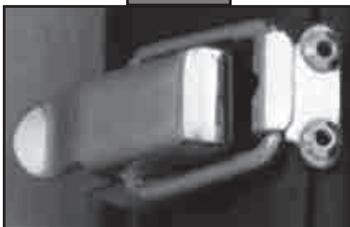


Fig. 2



Fig. 3

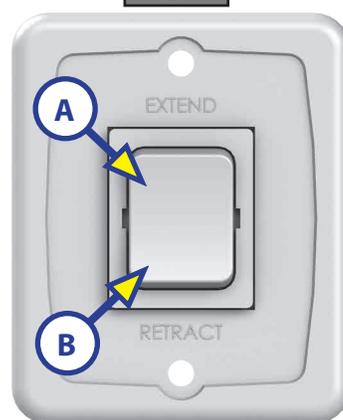
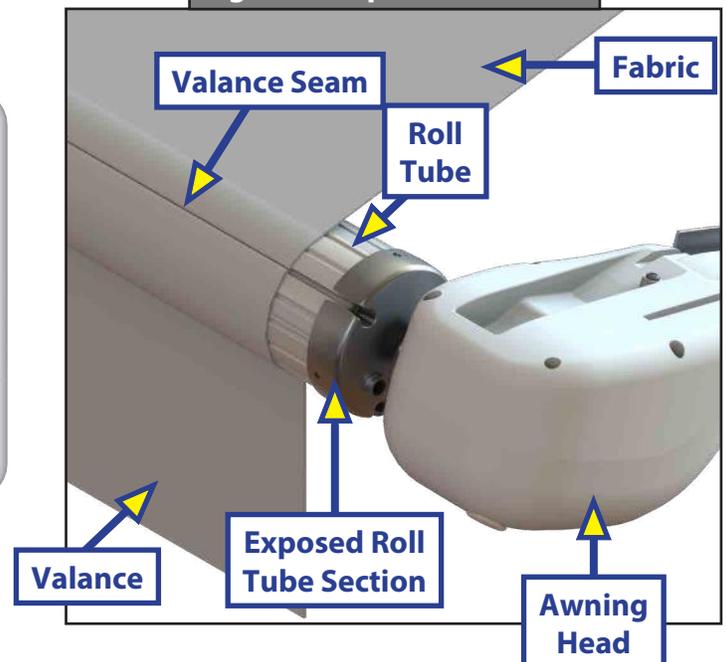


Fig. 4 - Complete Extension



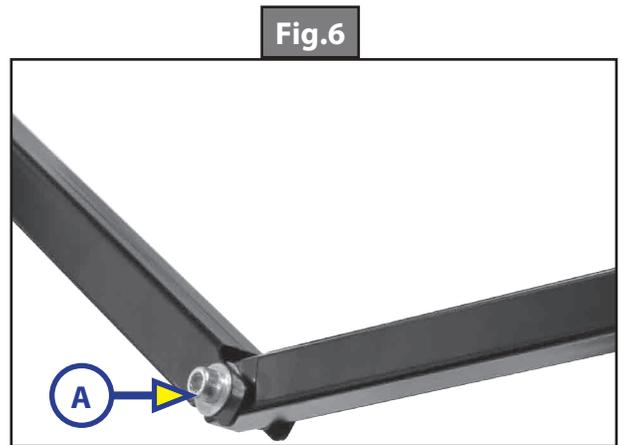
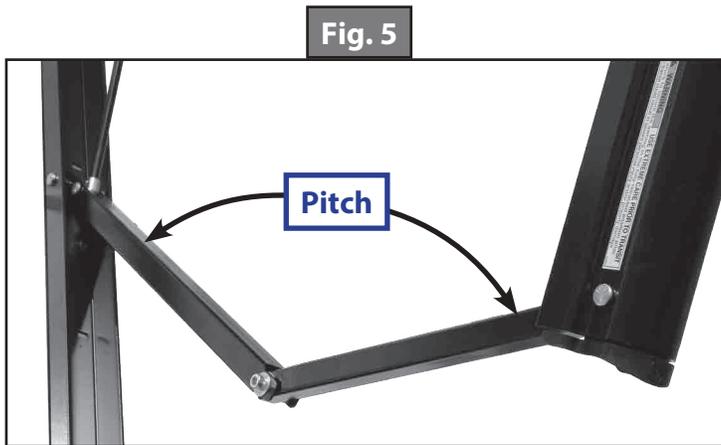
## Adjusting Pitch - All Solera Awnings

**NOTE:** The awning will pitch itself to purge the pooling of excess water and may dump a significant amount of water without notice.

1. Pitch can be set by adjusting the articulating arm to tip one side of the awning to allow water runoff.
2. Extend the awning to desired position.
3. Choose the side of the awning for optimum shade or convenient water runoff. Pull downward on the joint of the articulating arm until desired pitch is set (Fig. 5) to allow for water runoff. Do not push the joints of the articulating arms up. This will put tension on the gas strut, which can cause the strut to break. Belleville washers and bolt (Fig. 6A) allow the joint to remain in the position set by the operator.

**NOTE:** The awning can be retracted without resetting the pitch.

**NOTE:** If the articulating arm does not hold position, it can be tightened by adjusting the bolt (Fig. 6A) in the center of the articulating arm.



## Maintenance - All Solera Awnings

### Fabric Care

If the awning is rolled up while wet, roll it out and let it dry as soon as conditions allow before rolling it up again. This will help prevent the formation of mildew and add greatly to the life of the awning. Mildew does not form on the fabric itself, but on the accumulated dust, dirt and grime.

**NOTE:** Periodically clean vinyl or woven acrylic fabric using a mixture of  $\frac{1}{4}$  cup of dish soap and 5 gallons of warm water. Liberally slish the mixture on the top of the fabric and roll up the awning for 5 minutes. This will apply the mixture to the bottom of the fabric as well. Roll the awning back out and hose off with fresh water. Repeat if necessary. Allow to dry before rolling up.

# Troubleshooting

## Manual Override

In the event of power loss or motor failure, the awning can be extended and retracted manually. Perform the following procedure to manually retract the awning.

**NOTE:** This procedure may also be performed to extend or retract the awning in the event of dry camping or camping without a battery.

1. Remove the rubber grommet (Fig. 7A) from the drive head assembly, exposing the manual override nut on the motor.

**NOTE:** The drive head assembly is always located on the right side of the awning as it is viewed from outside of the coach.

2. Using a 7/16" socket and cordless/power drill, spin the manual override nut counterclockwise to retract the awning (Fig. 8).

**NOTE:** A ratchet may also be used to turn the manual override nut. Using a ratchet will take a significant amount of time and should only be used if no cordless/power drill is available.

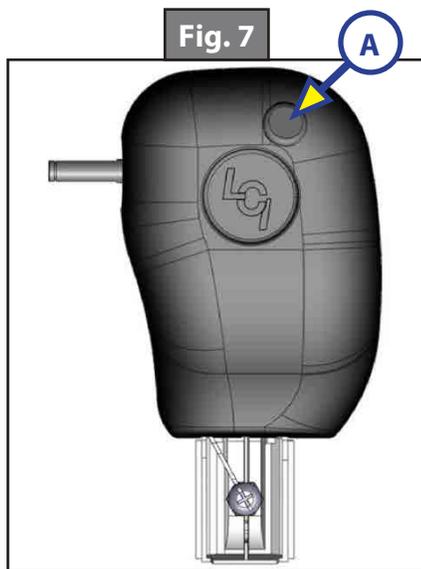
**NOTE:** Use caution when retracting the awning manually. The use of a step stool or ladder may be required to completely retract the awning.

3. When the awning is completely retracted, remove socket or drive device and replace the rubber grommet in the drive head assembly.

**NOTE:** The motor's internal drive system prevents the awning from moving (extend or retract) on its own. If the motor is damaged or disabled, be sure to secure the awning in the retracted position with a strap around both the outer support arm and the mounted support arm before the manual override nut is released.

### **⚠ CAUTION**

**During incidents of high wind, heavy rain or extended time away from the unit, it is advisable to retract the awning completely to prevent damage to the awning and the RV.**



# SOLERA® CLASSIC AWNING

## AWNINGS

### System and Safety Information

The Solera Classic Awning is designed for use on most recreational vehicle units and is available in a variety of sizes to fit even the largest unit. Additional information about this product can be obtained from [www.lci1.com/support](http://www.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.

iTunes, iPhone, and iPad are registered trademarks of Apple Inc. Google Play™ and Android™ are trademarks of Google Inc.

#### **WARNING**

**Failure to follow the instructions provided in this manual may result in death, serious injury, unit damage, or voiding of the component warranty.**

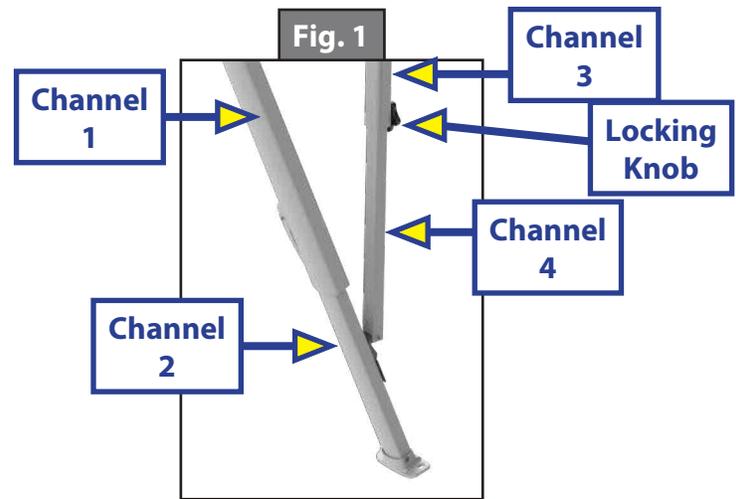
#### **CAUTION**

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

## Operation

### Extending the Awning

1. Make sure the black locking knobs on the mount/rafter arm upper channel (channel #3) (Fig. 1) are loosened and pinch the travel locks together to release the outer arm from the mount/rafter arm.
2. Flip the cam lock down to the roll out position.
3. Using the pull rod, start pulling the awning outward until full extension is complete.
4. Slide the mount/rafter arms all the way to the top of the outer arm and make sure they lock into place.
5. Pull on the mount/rafter arm to ensure the fabric is taut and tighten the black locking knob to lock it into place.
6. Raise the outer arms to the desired height by releasing the support arm assembly handle and allow the outer arm upper channel (channel #1) (Fig. 1) to slide on the outer arm lower channel (channel #2) (Fig. 1). Once to the desired height let go of the support arm assembly handle to lock the arm at this position.
7. Slide the pull strap to one end or the other and wrap it around the arm to get it out of the way.



### Optional Car Port Position

1. Once all the above steps are complete, remove the outer arm from the side of the unit by releasing the lever on the lower mounting bracket.
2. Walk the awning out until the outer arm is straight up and down and let it set on the ground.
3. Make sure to secure the foot of the outer arm to the ground with the provided stakes.

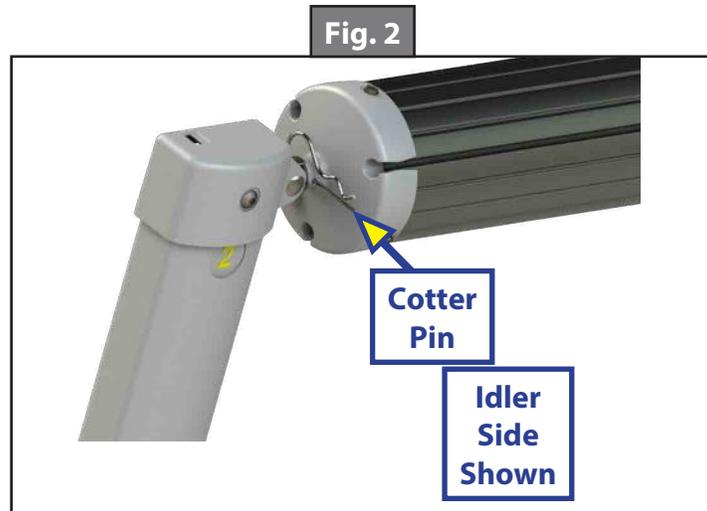
### Retracting the Awning

1. If in car port mode, remove the stakes from the foot of the outer arm. Then walk the outer arm back to the unit and secure it to the lower mounting bracket on the sidewall of the unit. Do this for both ends.
2. Take the awning pull strap and return it to the center of the awning roll tube.
3. Lower the roll tube by holding the outer arm and releasing the support arm assembly handle on the side. Let the outer arm upper channel (channel #1) (Fig. 1) slide down the outer arm lower channel (channel #2) (Fig. 1) until it rests on the acorn nut. Repeat this for the other end.
4. Loosen the black locking knob and unlock the mount/rafter arm by releasing the spring clip from the top of the head assembly. Allow the mount/rafter arm to slide all the way down toward the bottom of the outer arm. Repeat this for both ends.
5. Take a firm hold on the awning strap and release the tension on the springs by flipping the cam lock up to the roll in position.
6. Walk the awning in toward the unit. Hook the pull rod into the pull strap before the strap gets too high. Using the pull rod, walk the awning to the fully-closed position.
7. Lock the arms for travel mode by compressing the outer arm and mount/rafter arm together until the red tab disappears. Then tighten the black locking knob.

# Fabric Replacement

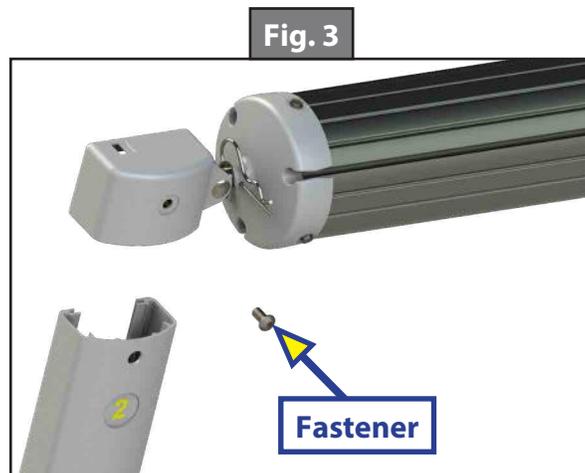
## Fabric Removal

1. Remove the drip cap (if equipped) from the end the fabric will be removed from.
2. Remove the #6 x 1/2" hex head screws located on the awning rail (2 total). Set screws aside.
3. Extend the awning out completely by sliding the mount/rafter arms all the way to the top of the outer arm and make sure they lock into place and insert cotter pins (Fig. 2).



**NOTE:** If the awning is 6' in length it will only need one cotter pin for the drive side end cap.

4. Pull on the mount/rafter arm to ensure the fabric is taut and tighten the black locking knob to lock it into place. As a precaution, tape the cam lock in the roll out position.
5. On the end of the awning rail the fabric will be removed from, remove the upper mounting bracket from the unit wall. Allow the mount/rafter arm to pivot out of the way.
6. Remove the drive head assembly and idler head assembly retaining fasteners from the outer arms to separate the components (Fig. 3).



7. Working together, remove the roll tube assembly (which includes the drive/idler head assemblies) from the awning rail and support arms by sliding the assembly along the awning rail until clear.

### **⚠ WARNING**

**Failure to support the roll tube, fabric and drive/idler head assemblies during removal may result in serious injury or property damage.**

8. Place the removed assembly onto a level area.
9. Have someone securely hold the idler head and roll tube.
10. Hold the drive head assembly securely (there will be tension to be released) and remove the drive head assembly cotter pin.

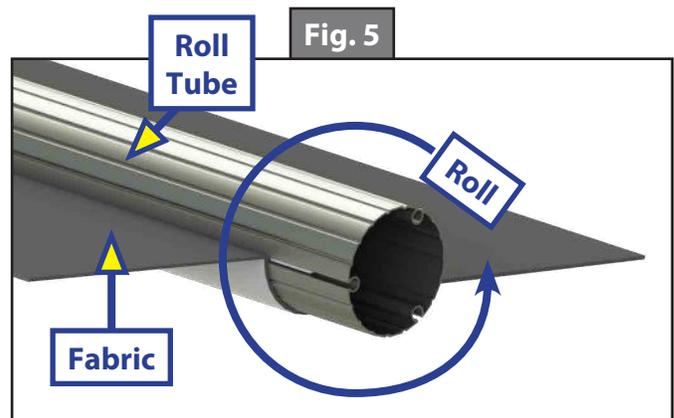
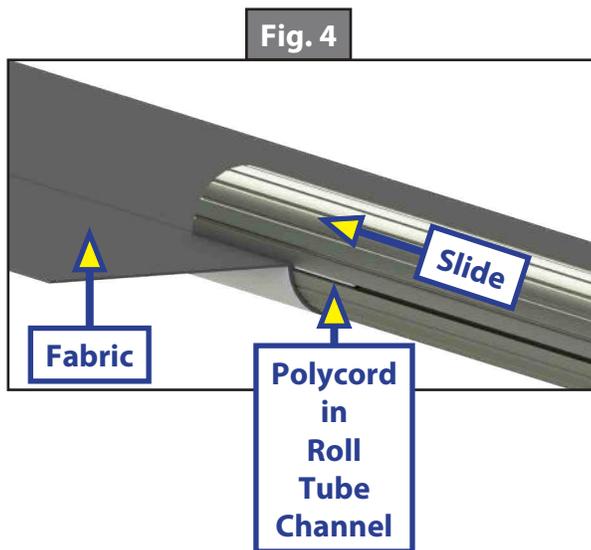
**⚠ WARNING**

**Failure to maintain control of the roll tube, fabric and drive/idler head may result in serious injury or property damage.**

11. Flip the cam lock to the roll in position. Slowly rotate the drive head assembly clockwise to release tension.
12. Mark the cam lock position on the roll tube.
13. Remove the three screws holding the drive head assembly end cap on the roll tube and set the drive head assembly aside.
14. Mark the roll tube grooves containing the polycords prior to removing the fabric from the roll tube.
15. Remove the two screws holding the fabric in place on the roll tube.
16. To remove the fabric, gently pull the roll tube from one end, while another person holds the fabric in place.

### Installing Replacement Fabric

1. Unroll the replacement fabric so that the polycords are parallel with the roll tube.
2. Gently slide the roll tube on to the two polycords of the fabric, making sure that the non-printed side is touching the roll tube (Fig. 4).
3. Center the fabric on the roll tube.
4. Apply the screws that were holding the polycords in place on the roll tube.
5. Roll the fabric onto the roll tube (Fig. 5). Make sure the fabric stays snug and flat to the roll tube with the printed side facing away.



6. Using the three screws previously removed from the end caps, attach the drive head assembly to the roll tube, making sure the orientation is the same.

**NOTE:** Be sure the drive head assembly with the cam lock is on the right-hand side of the awning.

7. Secure the idler head and roll tube.
8. Rotate the drive head assembly counterclockwise the number of turns stated on the turn chart (Fig. 6). Insert a cotter pin into the end cap into the shaft on the drive head assembly.

**Fig. 6**

| Classic Awnings Fabric Replacement Turn Chart |       |
|---|-------|
| Size  | Turns |
| 6 ft to 10 ft                                 | 12    |
| 11 ft to 14 ft                                | 13    |
| 15 ft to 18 ft                                | 14    |
| 19 ft and up                                  | 16    |

**⚠ WARNING**

**Failure to maintain control of the roll tube, fabric and drive/idler heads may result in serious injury or property damage.**

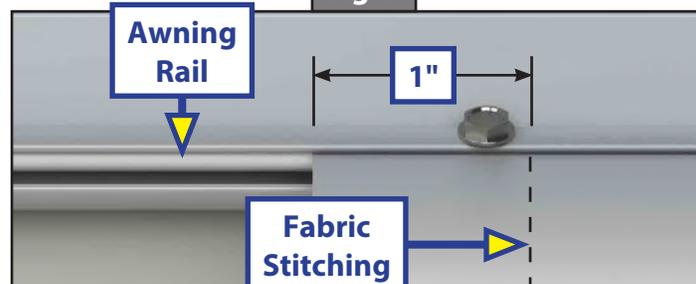
9. Working together, install the roll tube assembly (which includes the drive/idler head assemblies) to the awning rail by sliding the assembly along the awning rail. Make sure the awning will unroll with the printed side of the fabric up.

**⚠ WARNING**

**Failure to support the roll tube, fabric and drive/idler head assemblies during installation may result in serious injury or property damage.**

10. Unroll the fabric from the roll tube to allow the drive/idler head assemblies to be installed into the outer arms.
11. Install the previously-removed drive head assembly and idler head assembly retaining bolts into the outer arms to secure the components.
12. Reinstall the previously-removed support arm upper mounting bracket to the unit wall.
13. Make sure the cam lock is in the roll out position and remove cotter pins from the awning heads.
14. Retract and extend the awning several times (see Operation section of manual) to ensure that the fabric is square on the roll tube.
15. Secure the fabric in the awning rail no more than 1" inside the edge of the fabric on both ends using a #6 x 1/2" hex head screw. Install the screw down through the awning rail into the fabric and the polycord (Fig. 7).
16. Reinstall the drip cap if previously equipped.

**Fig. 7**



## Troubleshooting

| <b>Solera Classic Awning Troubleshooting</b>       |  |
|--|--|
| What's Happening?                                  | What Should Be Done?   |
| Awning will not extend.                            | Check position of the cam lock (roll out).   |
|  | Ensure that the travel locks have been released from the outer arm.  |
|  | Make sure the locking knob for the rafters has been loosened.  |
|  | Check to see if the outer arm is resting on the mount/rafter arm. If so, the outer arm height adjustment is not set properly.  |
| Awning will not retract or only retracts part way. | Make sure the mount/rafter arms have been put in the stored position and the locking knob has not been tightened.  |
|  | Check position of cam lock (roll in).  |
|  | Ensure the outer arms have been placed in the closed/stored position.  |
|  | Ensure the awning has the proper tension on it.  |
| Fabric is loose or sags on the edges and middle.   | Ensure that the mount/rafter arm is not secured to the head of the outer arm.  |
|  | Make sure that the mount/rafter arm has been pulled tight and the locking knob is secured.   |
|  | Check that the fabric is square on the unit and with the roll tube.  |
|  | Make sure the fabric is properly secured to the awning rail on the unit.   |
| Awning will not roll up straight.                  | Make sure roll tube is not bent.   |
|  | The nut for this is a thread part that tightens the arms together. Open the awning and check when turning the knob that the nut is not stripped out. If it is not stripped, it would require replacing both parts.   |
|  | Make sure the locking knob has been loosened.  |
|  | Make sure there is no debris in the track the arm slides in.   |
| Awning will not stay in the rolled out position.   | Make sure arm is not bent.   |
|  | Check to make sure fabric is centered on roll tube and also centered between the arms attached to the unit.  |
|  | If the fabric is not centered, move the screws on both ends of the awning and shift the fabric accordingly.  |
|  | Make sure there are screws at both ends of the fabric securing it to the roll tube and at the awning rail. If there is only one screw at one end and not the other, the awning may not roll up correctly.  |
| Awning will not stay in the rolled out position.   | Make sure the legs are square and straight.  |
|  | Check the cam lock. Signs of a faulty cam lock include:<br><ul style="list-style-type: none"> <li>- The absence of a clicking noise when the awning is rolled out.</li> <li>- The awning rolling back up after it is placed in the stop position.</li> </ul> |

## Maintenance - Solera Awnings

### Fabric Care

**NOTE:** If the awning is retracted while wet, extend the awning and let it dry as soon as conditions allow before retracting. This will help prevent the formation of mildew and add greatly to the life of the awning. Mildew does not form on the fabric itself, but on the accumulated dust, dirt and grime.

**NOTE:** Periodically clean vinyl or woven acrylic fabric using a mixture of  $\frac{1}{4}$  cup of dish soap and 5 gallons of warm water. Liberally apply the mixture on the top of the fabric and retract the awning for 5 minutes. This will apply the mixture to the bottom of the fabric as well. Extend the awning and hose off with fresh water. Repeat if necessary. Allow to dry before retracting.

# SOLERA® PULL STRAP AWNING

## AWNINGS

### System Information

The Solera® Manual Pull Strap Awning extends and retracts with the easy-to-use pull strap. The Solera® Manual Pull Strap Awning features an internal spring system that quickly extends and retracts the awning. Additionally, the friction joint allows for rain dump and adjustable pitch features, and there is no rafter arm to lock in place. The friction joint also provides added stability.

### CAUTION

**This manual provides operational procedures for Solera® Manual Pull Strap Awning. Operating the Solera® Manual Pull Strap Awning in any other manner than described may result in personal injury, damage to the recreational vehicle or the awning assembly as well as voiding the Lippert Components Limited Warranty.**

## Operation

### Extending the Awning

1. Locate the locking latch (Fig. 1), if equipped, and unlock the latch (Fig. 2).

**NOTE:** This latch is optional and may or may not be installed on one or both support arms.

2. Using the pull rod, place the "L" end of the rod on top of the cam lock (Fig. 3A) and pull down on the lock to release it (Fig. 3).

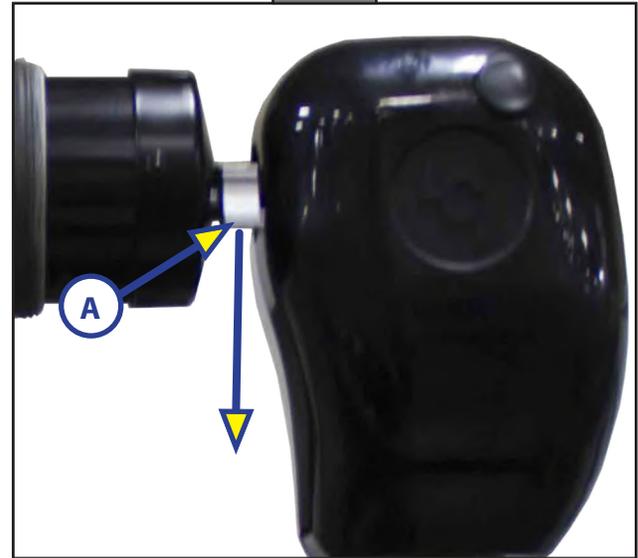
Fig. 1



Fig. 2



Fig. 3



3. Insert the pull rod into the pull strap (Fig. 4).

4. Pull strap to chest height using the pull rod. Using hands to grasp the strap, walk the awning outward, keeping in front of the roll tube at all times (Fig. 5).

**NOTE:** Extension is considered complete when the fabric is completely unrolled, the valance seam is visible and a section of the roll tube is exposed (Fig. 6). The exposed part of the roll tube will be under the awning upon full extension. Also check to make sure the cam lock is on top of the roll tube.

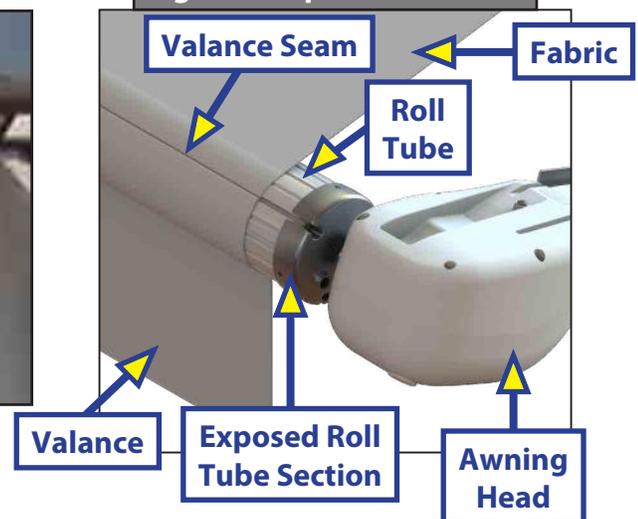
Fig. 4



Fig. 5



Fig. 6 - Complete Extension



### **CAUTION**

**Tying the roll tube down once extended will not allow the free floating support arms to work as designed and may cause damage to the awning or RV.**

## Retracting the Awning

**NOTE:** The awning can be retracted without resetting the pitch (see Page 5).

1. Grasp the strap and pull slightly toward you (Fig. 7) to release pressure on the cam lock (Fig. 7A) and disengage the cam lock.
2. While holding the strap in hand, walk the awning toward the coach until the strap is about chest height (Fig. 8).

Fig. 7

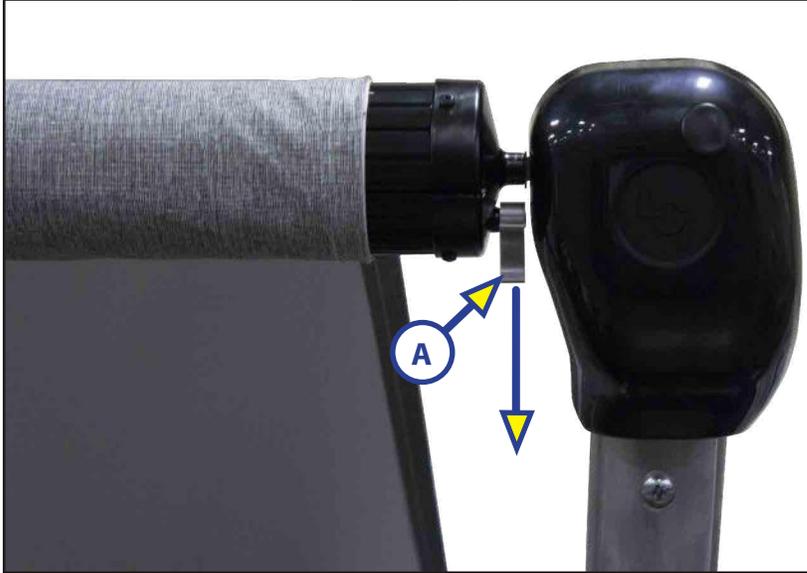


Fig. 8



3. Insert pull rod into the pull strap.
4. Walk awning all the way in until it stops (Figs. 9 and 10). Remove pull rod from strap.
5. Locate the locking latch (Fig. 11), if equipped. Lock the latch to secure the awning in place (Fig. 12).

**NOTE:** This latch is optional and may or may not be installed on one or both support arms. If not installed, awning is secured and ready for transportation.

Fig. 9



Fig. 10



Fig. 11



Fig. 12



## Adjusting Pitch - All Solera Awnings

**NOTE:** The awning will pitch itself to purge the pooling of excess water and may dump a significant amount of water without notice.

1. Pitch can be set manually by adjusting the articulating arm to tip one side of the awning to allow water runoff.
2. Extend the awning to desired position.
3. Choose the side of the awning for optimum shade or convenient water runoff. Pull downward on the joint of the articulating arm until desired pitch is set (Fig. 13) to allow for water runoff. Do not push the articulating arm up past straight. This will put tension on the gas strut, which can cause the strut to break. Belleville washers and bolt (Fig. 14A) allow for the joint to remain in the position set by the operator.

**NOTE:** The awning can be retracted without resetting the pitch.

**NOTE:** If the articulating arm does not hold position, it can be tightened by adjusting the bolt (Fig. 14A) in the center of the articulating arm.

Fig. 13

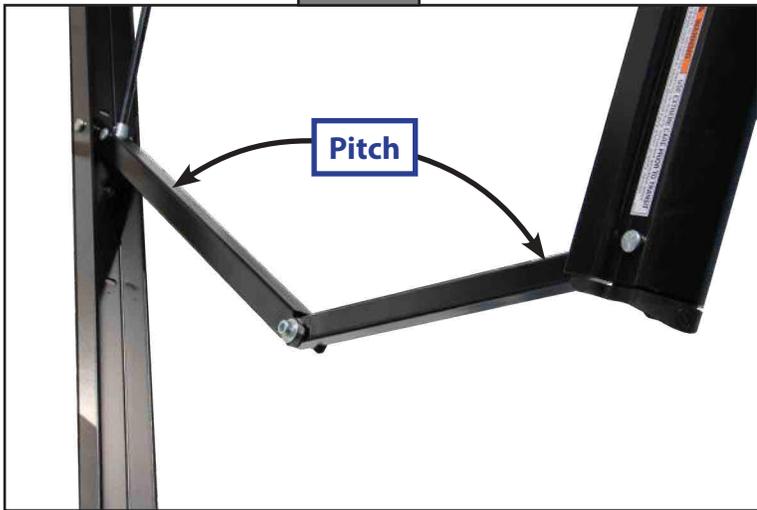
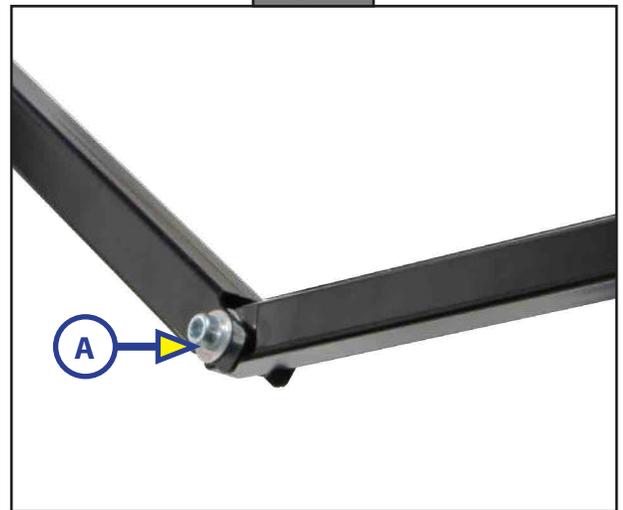


Fig. 14



## **Maintenance - All Solera Awnings**

### Fabric Care

If the awning is rolled up while wet, roll it out and let it dry as soon as conditions allow before rolling it up again. This will help prevent the formation of mildew and add greatly to the life of the awning. Mildew does not form on the fabric itself, but on the accumulated dust, dirt and grime.

**NOTE:** Periodically clean vinyl or woven acrylic fabric using a mixture of  $\frac{1}{4}$  cup of dish soap and 5 gallons of warm water. Liberally slish the mixture on the top of the fabric and roll up the awning for 5 minutes. This will apply the mixture to the bottom of the fabric as well. Roll the awning back out and hose off with fresh water. Repeat if necessary. Allow the fabric to dry before rolling up.

### Introduction

The Solera® Smart Arm™ 12V DC Power Awning features a touch pad that is nested in the awning arm, so the awning can be extended and retracted without going inside the unit. It also features an optional infrared sensor that will activate the awning's security lights if a moving heat source is detected.

It also has an optional wind sensor that will automatically retract the awning in case of severe winds. The awning light has a new low voltage alert system. If the voltage gets below 11V the awning light will automatically start flashing when in use. Also, the awning light has three stages of brightness: low, medium and high.

### WARNING

**This manual provides operational procedures for the Solera Awning Smart Arm. Operating the Solera Awning Smart Arm in any other manner than described may result in personal injury, damage to the recreational vehicle unit or the awning assembly as well as voiding the Lippert Components limited warranty.**

### Operation

### WARNING

**Moving parts can pinch, crush or cut. Holding the touch pad from both sides can cause serious bodily injury if the awning is retracted completely. Press the buttons from the touch pad side only.**

### Extending the Awning

1. Verify the unit's battery is fully charged and connected to the electrical system.
2. To turn the awning controller on, press and hold the lock button (Fig.1A) for three seconds. The green LED will illuminate when the awning is on.
3. Press and hold extend  arrow (Fig.1B) until the awning is extended completely.

**NOTE:** For the auto-extend feature to function, the optional wind sensor must be installed. To use the "One Touch" feature, press the extend  arrow (Fig.1B) twice within two seconds.

**NOTE:** The awning fabric should always be above the roll tube. However, if the extend button is engaged too long or extend is hit inadvertently instead of retract, the awning will roll up backward. This is not a defect. To correct the fabric orientation, press the retract  button (Fig.1C). The awning will then extend to its correct orientation and normal operation can resume.

## ⚠ CAUTION

**Do not tie down the roll tube, screen room or living room after awning has been extended. Tying down the roll tube once the awning is extended will not allow the free-floating support arms to work as designed and may cause damage to the awning or unit.**

### Retracting the Awning

1. Verify the unit's battery is fully charged and connected to the electrical system.
2. To turn the system on, press and hold the LOCK button (Fig.1A) for three seconds. The green LED will illuminate when the system is on.
3. Press and hold the RETRACT ← arrow (Fig.1C) until the awning is fully retracted.

### LED Lights - Optional

The awning can be ordered with or without light kits.

#### **For awnings manufactured prior to 7/26/17.**

1. Press and hold the lock button (Fig. 1A) for three seconds to turn on the awning controller.
2. Then press the light button (Fig.1D) to turn on the LED light strip.
3. The lights will stay on until the light button (Fig. 1D) is pressed again.

#### **For awnings manufactured after 7/26/17.**

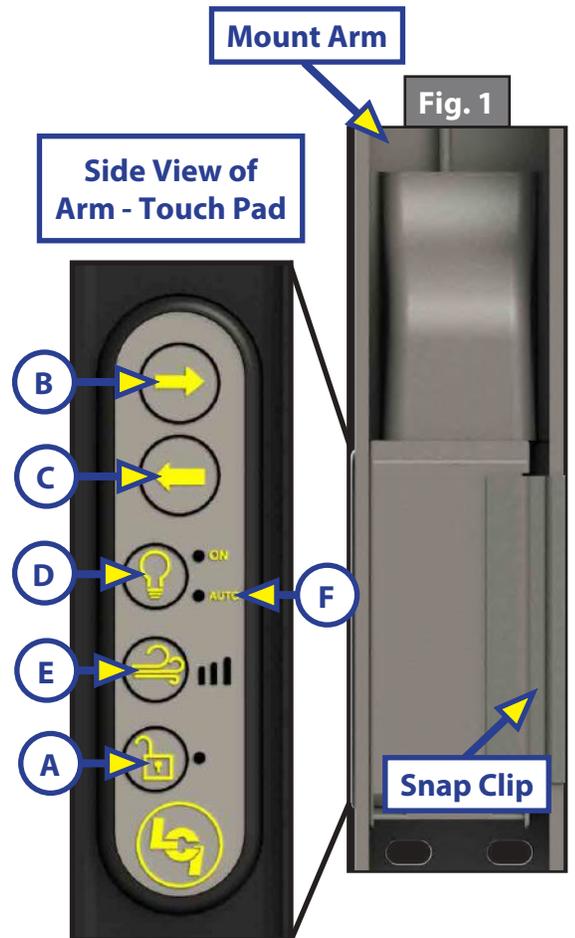
1. Press the light button (Fig.1 D) to turn on the LED light strip.
2. There are three light levels available:
  - A. Press light button (Fig.1 D) once for the low setting or 10% illumination.
  - B. Press light button (Fig.1D) twice for the medium setting or 30% illumination.
  - C. Press the light button (Fig.1D) three times for the high setting or 100% illumination.
  - D. Press the light button (Fig.1D) four times to turn off the LED light strip.

**NOTE:** The light goes to 100% illumination if it is off and then is turned on by an external light input, by CAN bus or if motion is detected by the IR sensor with the AUTO mode on.

### IR Sensor - Optional

For additional safety and security, the optional IR sensor will automatically turn on the LED Lights if a moving heat source is detected during "no-light" conditions. The IR sensor range reaches out approximately 8 feet in a 180-degree radius from where it is mounted on the unit.

1. Press and hold the light button (Fig. 1D) until the red LED AUTO light (Fig.1F) comes on. The IR sensor is now operational.
2. To discontinue IR sensor function, press and hold the light button (Fig.1D) 3-5 seconds, and the red AUTO light will turn off. The IR sensor is no longer operational.



## Wind Sensor - Optional

The optional Wind Sensor will automatically retract the awning if severe wind is detected, based on the wind setting level programmed by the operator.

1. Press and hold the lock button (Fig.1A) for three seconds to unlock the controller. The green LED will illuminate.
2. Press the wind button (Fig.1E) from 1-3 times, depending on the amount of wind sensitivity desired.
3. The amount of wind sensitivity will be displayed via the three LED lights next to the button.

**NOTE:** The levels of wind sensitivity range from 1-3. Level 1 requires more wind (least sensitive) to trigger the feature. Level 3 requires less wind (most sensitive) to trigger the feature.

**NOTE:** When the awning is activated by the Wind Sensor, the awning light will flash as a notification it is preparing to close.

**NOTE:** Any time the awning is retracted for any reason (by the operator or due to strong wind), the desired level of wind sensitivity will need to be set (see Step 2 to set sensitivity). The awning can also be extended without activating the wind sensor.

**NOTE:** Auto extend can be used if the arm has the wind sensor installed. To use the "One Touch" feature, press the extend → arrow (Fig.1B) twice within two seconds.

### **⚠ CAUTION**

**During incidents of high wind, heavy rain or extended time away from the unit, it is advisable to retract the awning completely to prevent damage to the awning and the unit.**

## Adjusting Pitch

**NOTE:** The awning will pitch itself to purge the pooling of excess water and may dump a significant amount of water without notice.

**NOTE:** Pitch can be set by adjusting the pitch arm to tip one side of the awning to allow water runoff.

1. Extend the awning to the fully open position.
2. Choose the side of the awning for optimum shade or convenient water runoff.
3. Pull downward on the joint of the pitch arm until desired pitch is set (Fig. 2A). Belleville washers and bolt (Fig. 2B) allow for the joint to remain in the position set by the operator.

**NOTE:** The awning can be retracted without resetting the pitch.

**NOTE:** If the pitch arm does not hold position, it can be tightened by adjusting the bolt (Fig. 2B) in the center of the joint.

Fig. 1

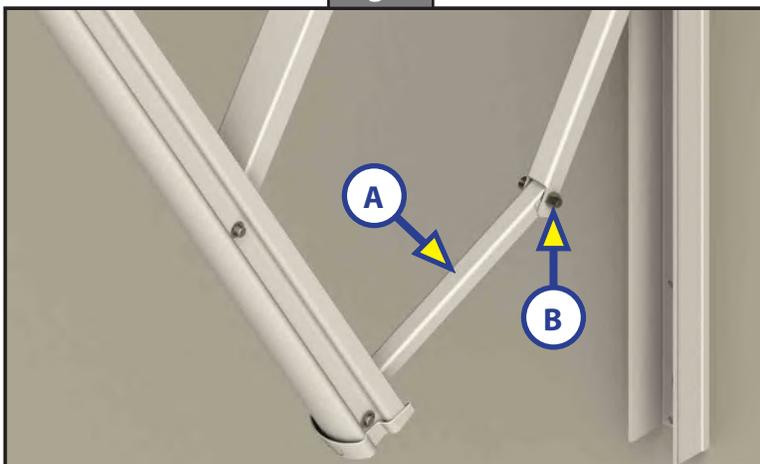
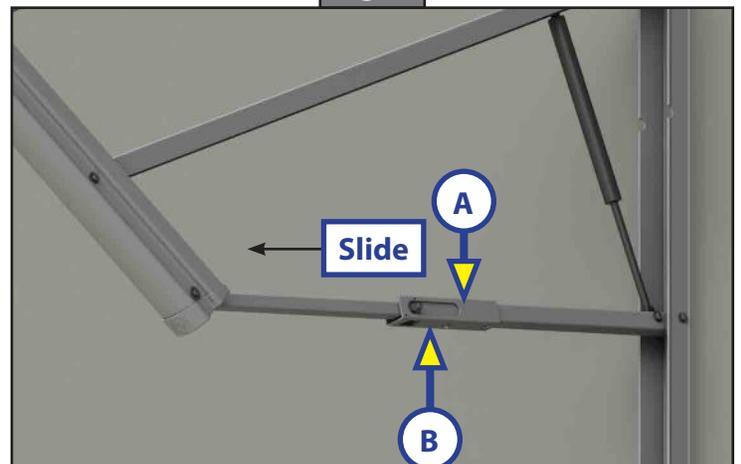


Fig. 1



**NOTE:** Some awnings are equipped with a two-position pitch arm (Fig. 3). The two-position pitch arm can be set in the pitch position or snapped into a straight position by pushing the release button (Fig. 3A) and sliding the sleeve (Fig. 3B).

**NOTE:** Do not push the joint of any pitch arm up past the point where the two sections are in a straight line. This will put tension on the gas strut, which can cause the strut to break.

## Troubleshooting

### Manual Override

In the event of power loss or motor failure, the awning can be extended and retracted manually. Perform the following procedure to manually retract the awning.

1. Remove the rubber grommet (Fig. 4) from the drive head assembly, exposing the manual override nut on the motor.
2. Using a 7/16" socket and a cordless or electric drill or screw gun, spin the manual override nut counterclockwise to retract the awning (Fig. 5).

**NOTE:** Use caution when retracting the awning manually. The use of a step stool or ladder may be required to completely retract the awning.

3. When the awning is completely retracted, replace the rubber grommet in the drive head assembly (Fig. 4).

**NOTE:** The motor's internal drive system prevents the awning from moving (extending or retracting) on its own. If the motor is damaged or disabled, secure the awning in the retracted position with a strap around both the outer arm and the mount arm (Fig. 6) before the manual override nut is released.

Fig. 1

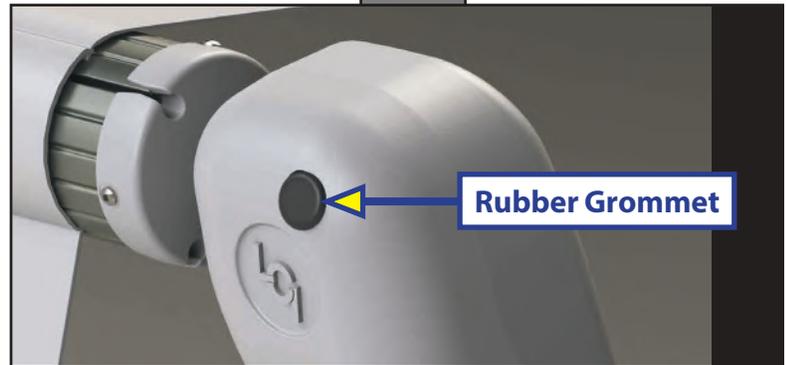


Fig. 1



Fig. 1



## Troubleshooting Chart

| What Is Happening?   | What Should Be Done?  |
|--|---|
| Awning won't open or close.                                  | If optional travel locks are installed, make sure that they have been unlocked.   |
|  | Verify the fuse is good.  |
|  | Motor overheated, thermal breaker has tripped, auto resets once cooled.   |
|  | Check for power at the motor when the switch is in the extended or retracted position.  |
| Awning pitch won't stay in the flat position.                | Check for bad gas strut.  |
|  | Check pitch arm bolt for proper tension. High winds can cause the pitch arm to deviate from the flat position due to the built-in safety feature of the awning.   |
|  | Make sure all three washers are in the proper location of the pitch arm.  |
| Awning doesn't close all the way.                            | The awning is considered completely closed as long as the outer arm is overlapping the mount arm. This overlap can vary.  |
|  | Motor overheated, thermal breaker has tripped, auto resets once cooled.   |
|  | Verify the fabric is square from the unit to roll tube and is rolling up straight on the roll tube.   |
| Lights won't work.   | There is a resettable fuse that can take up to 30 seconds to reset.   |
|  | Make sure to have 12V DC to the red wire on the light.  |
|  | Double check power coming out of the touch pad.   |
| Awning seems to wobble when extending or retracting.         | Make sure the bolts that hold the head to the support arm assemblies are tight.   |
|  | Make sure the end caps are seated properly on the roll tube.  |
|  | Make sure the shaft coming out of the head going to the end cap isn't bent.   |
|  | Make sure the wear collar spacers are all properly located in the support arm assemblies.   |
| Awning works in the opposite direction of what switch shows. | Wires going to awning have been reversed or switched. Reverse the wires.  |
| Awning rolls up backward.                                    | This is not a defect. To correct the fabric orientation, simply operate the awning in the retract direction and the awning will then extend to its correct orientation and normal operation can resume. |

## Maintenance

### Fabric Care

If the awning is retracted while wet, extend the awning and let it dry as soon as conditions allow before retracting. This will help prevent the formation of mildew and add greatly to the life of the awning.

**NOTE:** Mildew does not form on the fabric itself, but on the accumulated dust, dirt and grime.

Periodically clean vinyl or woven acrylic fabric using a mixture of 1/4 cup of dish soap and five gallons of warm water.

1. Liberally apply the mixture on the top of the fabric and retract the awning for five minutes. This will apply the mixture to the bottom of the fabric as well.
2. Extend the awning and hose off with fresh water.
3. Repeat if necessary.
4. Allow to dry before retracting.

### **Additional Information Sources**

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

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# TRAILER AXLES 2K-7K

## AXLES AND SUSPENSION

### Introduction

Combining years of experience in the trailer frame and recreational vehicle industry with the newest and most innovative technology, Lippert Components, Inc. (LCI) introduces the Axle and Running Gear Division.

The following publication is designed to give the customer an easy-to-understand operation and service manual to provide useful and important information. The quality of the Lippert name and the finest materials utilized in the production of the Axles and Running Gear provide you with hubs, brakes, drums and spindles that make trailering and braking the finest in the industry.

Quality comes threefold at LCI:

1. The finest quality materials.
2. The latest technology and design.
3. The quality standards maintained from materials to final assembly.

All three points provide the customer with the best product they can possibly buy and the satisfaction of knowing they can trust the equipment on which they have spent their hard-earned money. LCI thanks you for purchasing our Axles and Running Gear. When you speak of LCI, our quality stands beside you.

### Safety Information

#### **WARNING**

**The “WARNING” symbol is a sign that precedes a service, maintenance or operational procedure containing a possible personal safety risk that could result in serious injury or death if stated safety precautions and procedural steps are not followed as set forth in this manual.**

#### **WARNING**

**Performing service, repair or routine maintenance work can cause personal injury or death. Use personal protective equipment (PPE) whenever performing service work or routine maintenance. Make sure work space is clean and free of slip or trip hazards.**

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

This manual provides general service and maintenance procedures. Many variables can change the circumstances of the service procedure, e.g., the degree of difficulty involved in the service operation and the ability level of the individual performing the operation.

This manual cannot begin to plot out procedures for every possibility, but will provide the general instructions for effectively servicing the vehicle. In the event the skill level required is too high or the procedure too difficult, a certified technician should be consulted before performing the necessary service. Failure to correctly service the vehicle may result in voiding the warranty, inflicting injury or even death. The owner’s manual for your trailer may have more procedures for service and maintenance.

## Break-In Period For Electric Drum Brakes

**NOTE:** Brakes should be manually adjusted after the first 200 miles of operation, then periodically every 3,000 miles.

The break-in period is a typical phenomenon with drum brakes and especially electric drum brakes. Electric drum brakes will require a break-in period to achieve full performance. This break-in period applies for new axles and any time new brake shoes and/or magnets are installed as part of regular maintenance. LCI has found through extensive brake testing that the break-in period for our drum brakes can range from 20 to 50 brake applications.

Brakes can be seated in by applying approximately 8-10 volts to the trailer brakes at an initial speed of 40 mph and allowing the truck/trailer combination to slow down to 20 or 25 mph. For best results do not use truck brakes during this procedure. The trailer brakes will seat in faster by using them to stop both the truck and trailer. The easiest method is to apply the trailer brakes using the manual activation lever located on the in-cab brake controller.

Care **MUST** be taken to not overheat the lining material, therefore brake applications conducted at one mile intervals will suffice. The driver should feel a noticeable difference in the brake performance during this period, sometimes in as few as 10 applications. After 50 applications, the brake lining material will be fully cured from the heat and develop close to 100% contact with the brake drum surface.

This break-in period not only seats the shoe lining material but also seats in the brake electromagnets. During the break-in period, the linings will wear at a faster rate than they do after they are seated in.

## **Trailer Axle Brake Inspections**

In general, based on normal activity, trailer brakes should be checked annually or every 36,000 miles, whichever comes first. If above normal trailer activity is experienced, then more frequent brake component inspections are recommended. In the event the braking system encounters symptoms of improper application or failure, immediate inspection and service **MUST** be performed.

## Recommended Component Inspection Periods

Periodic Bearing Inspection - Should be performed annually or every 36,000 miles, whichever comes first.

Bearing Lubrication Inspection - Should be performed annually unless periodic brake inspections reveal abnormal braking performance.

Brake Cleaning and Inspection - Should be performed annually or every 36,000 miles, whichever comes first.

## **Hubs/Drums/Bearing**

**NOTE:** A small amount of residual grease on the outside of a new brake hub is normal. Simply wipe the residual grease off of the brake hub. However, it is not normal for a hub to continue to weep grease after its initial installation. Excess grease can coat brake pads, magnets and braking surfaces inside of the hub, resulting in diminished braking capability. Have the brakes checked by a qualified service provider.

## Brake Hub Removal

### **⚠️ WARNING**

**Always lift the trailer by its frame and never by its axle or suspension. Axle and suspension components are not designed, or rated, for the dead weight, point-of-contact loads that the trailer's frame is. Do not go under the trailer unless it is supported by appropriately rated jack stands. Improperly supported trailers can collapse, causing possible serious personal injury or death.**

### **⚠️ WARNING**

**Wear appropriate personal protective equipment (PPE) when performing service or maintenance operations. Always wear eye protection when servicing trailer axles, brakes, hubs, springs and wheels. Not using PPE may result in serious personal injury or death.**

Disassemble the brake hub assembly for inspection, maintenance or service as follows:

1. Make sure trailer is on level ground.
2. Chock tires before beginning wheel disassembly.
  - A. Chocked tires will prevent trailer from rolling while brakes are disengaged during disassembly, cleaning, inspection and assembly operations.
3. Loosen wheel lug nuts before raising the trailer to prevent tire from spinning during lug nut removal.
4. After lug nuts have been loosened, raise the trailer until the tire spins freely.
  - A. Continue to lift and support trailer per manufacturer's requirements.
    - I. Use appropriately rated jack stands.
    - II. Place jack stands under the trailer's frame only.
5. Remove all lug nuts from wheel, then remove wheel from brake hub.
  - A. Set wheel and lug nuts aside for later re-assembly.
  - B. Do not lean removed tire against trailer or any jacks. Leaning a heavy tire against a suspended trailer could cause damage to the outside of the trailer or place undue side pressure against a jack, possibly causing the trailer to become unstable.
6. Prior to brake hub disassembly, create a clean area to place removed parts to prevent possible contamination or damage to removed parts.

7. Remove dust cover from hub by prying its edge out of the hub.
  - A. If servicing a brake drum, remove the lubed dust cap with the installed lubed rubber plug.
  - B. If servicing an idler hub, remove the non-lubed dust cap.
  - C. If brake or idler hub assembly is equipped with oil lubrication, place a drip pan underneath the hub.
    - I. Unscrew oil cap using a 2 1/2" socket wrench.
    - II. Let oil drain into drip pan.

8. Pull cotter pin from spindle (castle) nut and discard.
  - A. The cotter pin is a one-time-use item. Do not re-install removed cotter pin.

9. Remove the spindle nut.

**NOTE:** Remaining grease on components can act as a mastic. Inspect removed spindle nut for attached spindle washer.

10. If spindle washer did not come off with the spindle nut, inspect the outer bearing. Grease may have allowed the washer to stick to it.
  - A. Remove spindle washer.
11. Pull brake or idler hub off of spindle as follows:
  - A. Make sure brakes have been disengaged.
  - B. To prevent outer bearing cone falling freely from the assembly, place one hand on the backside outer rim of the hub and the other hand over the outside of the hub bore to cover the bearing cone.
  - C. Slightly turn the hub while pulling to free the hub from the spindle.
    - I. The outer bearing cone will want to drop out of the hub. Secure the bearing and place it in the clean, removed part area.
    - II. The inner bearing cone and cup remains installed within the hub, contained by the grease seal, and will not fall out.
  - D. Remove the grease seal from hub bore as follows:
    - I. Set the brake or idler hub aside on a clean, solid surface with the outer bearing cup side facing down.
    - II. Use a seal puller or equivalent to remove grease seal from hub.
      - a. Do not re-install removed seal.
      - b. Discard removed seal.

## Clean Brake Drum

Older brake linings may contain asbestos dust, which has been linked to serious or fatal illnesses. Certain precautions **MUST** be taken when servicing brakes:



**Potential asbestos dust hazard. Do not use compressed air, a dry brush or dry rag to remove brake dust. Disturbed brake dust can become an airborne irritant that can be inhaled or ingested, causing serious personal illness or death. Wear appropriate personal protective equipment (PPE). Use aerosol brake cleaner to wash brake dust away.**

Prior to brake drum inspection, clean the brake drum to remove any brake dust or lubricant film.

1. Avoid creating or breathing any brake dust.
2. Do not machine, file or grind brake linings.
3. Use an aerosol brake cleaner to wash away brake dust.
4. Place a drip pan underneath the brake drum to catch the brake cleaner for proper disposal.
5. Completely wash the entire brake drum, including the backing plate, magnet arm and brake shoes.
6. Inspect brake drum, braking components and backing plate for any remaining pockets of oil, grease or dust.
7. Repeat brake washing step if necessary.
8. Proceed with brake drum inspection.

## Brake Drum Inspection

The brake shoes contact the drum's inner surface and the brake magnet contacts the armature. These surfaces are subject to wear and should be inspected periodically.



**Resurfacing procedures can produce metal chips and brake dust that can contaminate the wheel bearings and cause component failure. Make sure that the wheel bearing cavities are clean and free of contamination before reinstalling bearings and seals.**

1. The drum's inner surface should be re-machined if wear is more than 0.030" or out of round by more than 0.015".
2. The drum should be replaced if scoring or wear is greater than 0.090".

**NOTE:** If the brake drum must be re-machined, refer to the Brake Drum Specifications chart for the maximum allowable re-bore inner diameter. If the size of the machined bore diameter exceeds the specified dimension, a new brake drum **MUST** be used.

| Brake Drum Specifications |                          |
|---------------------------|--------------------------|
| Drum                      | Maximum Re-bore Diameter |
| 7"                        | 7.09"                    |
| 10"                       | 10.09"                   |
| 12"                       | 12.09"                   |

The inner surface of the brake drum that contacts the brake magnet is the armature surface.

1. If the armature surface is scored or worn unevenly, it should not be machined more than 0.030".
  - A. The magnets should be replaced whenever the armature surface is refaced.
  - B. Similarly, whenever the brake magnet is replaced, the armature surface should be refaced.

## Disc Brake Rotor and Pad Inspection

Disc brake pads are a consumable item. Visually inspect disc brake pads every 36,000 miles or 12 months, whichever comes first. Disc brake rotor and brake pad surfaces should be visually checked at the same time. If there are deep grooves on one or both rotor surfaces this is an indication of caliper piston, slider bolt or residual pressure problems. Disc brake rotors should be turned when disc brake pads are replaced. Disc brake pads are available through auto parts stores.

## Disc Brake Caliper

If the disc brake caliper mounting bolts are removed to service the brake system, do as follows:

1. Lubricate the inside of the rubber slider bolt caliper bushings.
  - A. The rubber bushings are not compatible with petroleum-based grease.
  - B. Use silicone-based grease only.
2. Apply blue thread locking compound to the threaded area of the caliper mounting bolts.
3. Install caliper mounting bolts. Torque caliper mounting bolts to 40-50 ft-lbs.

## Bearing Inspection - Inner and Outer

An inspection of the bearing condition can detect early bearing issues. Upon inspection, bearings should look brand new and can be reassembled and used if in this condition.

**NOTE:** Bearing cones and cups are not interchangeable after installation. Each bearing **MUST** always be matched with its mating cup. Bearing cones and cups are replaced in matching sets of one cone and one cup.

## **⚠ WARNING**

**Wear personal protective equipment (PPE) when using caustic materials. Aerosol, liquid and oil-based paste materials can present splash hazards and skin contact environments that can result in serious adverse eye and skin irritations. Follow all recommended safety precautions when using such materials.**

1. Wash all grease and oil from the bearing cones using a suitable solvent.
2. Dry bearing cones with a clean, lint-free cloth.
3. Inspect bearing cone cages and rollers for any pitting, spalling, corrosion, flat spots, abnormal condition or discoloration.
  - A. If any of these imperfections are present, then the bearing cone and cup (race) **MUST** be replaced at the same time.
  - B. Bearings are available at auto part stores.
    - I. See Components pages for part numbers.
4. To remove a bearing cup (race) for replacement from the brake hub, go to [Bearing Cup Inspection and Removal](#) procedure.

### Bearing Cup Inspection and Removal

## **⚠ WARNING**

**Wear appropriate personal protective equipment (PPE) when performing service or maintenance operations. Always wear eye protection when servicing trailer axles, brakes, hubs, springs and wheels. Not using PPE may result in serious personal injury or death.**

Clean brake or idler hub in accordance with [Clean Brake Drum](#) procedure and as follows:

1. Wipe all grease and oil from the hub, using care not to scratch or otherwise mar the bearing race.
2. Apply brake cleaner to hub.
3. Use lint-free cloths to dry the hub and bearing cups.
4. Inspect bearing cups (raceways) for pitting, spalling, corrosion, flat spots, abnormal condition or discoloration.
  - A. If the bearing cup (race) is in good condition, and its mating bearing cone is in reusable condition, the cup can remain installed in the hub for reuse.
  - B. If the bearing cup (race) is in good condition, but the bearing cone is not, the cup **MUST** be replaced.
  - C. If the bearing cup (race) is damaged, the cup **MUST** be replaced.

Replace damaged bearing cups (race) as follows:

1. For either inner or outer bearing cup, use a brass drift punch and hammer to lightly tap around the cup's exposed bearing race edge to push it out.
  - A. Move the drift punch evenly around the bearing cup edge to make sure the cup is pushed out evenly to prevent binding or damage to the bearing cup or hub bore.
2. Set the removed bearing cup aside and place it with its mating bearing cone.

**NOTE:** Removed bearing cones and cups are not interchangeable.

**NOTE:** Used bearing cone and cup sets must remain matched and re-installed as a matched set until the set is replaced with a new matching set.

3. After removal of the bearing cups from the hub, re-apply brake cleaner to the hub and the hub bearing cup bores to make sure all surfaces are properly prepared for component reassembly.
  - A. Make sure a drip pan is placed underneath the hub to capture and dispose of the cleaner.

## Brake/Idler Hub Installation

Install the brake or idler hub onto the brake drum or spindle as follows:

1. Obtain appropriate hub for installation.
2. Inspect hub for cleanliness.
3. If both bearing cups are installed in the hub bearing bores, go to the Inner Bearing Cone and Grease Seal Installation procedure.
4. If either one of the bearing cups is not installed in the hub, do as follows:
  - A. Place hub on a solid, flat surface with installed bearing cup side of the hub facing down.
  - B. Obtain the appropriate bearing cup for installation. Refer to the Components pages for part numbers.



**Bearing cup replacement is a precise procedure. When installed, the bearing cup MUST be fully seated against the retaining shoulder of the hub. If the cup is not seated correctly, damage to the completed hub assembly may occur, voiding warranty.**

- C. Bearing cup replacement is a precise procedure. Consult LCI prior to replacing a bearing cup. The trailer should be taken to a certified service center for this work to be done.
- D. Gently place new bearing cup into hub bearing bore.
- E. Using a brass drift punch, lightly tap around the outer edge of the cup to drive it into the hub bearing bore.
  - I. Continue tapping the drift punch around the circumference of the cup's edge until the cup is fully seated against the hub's bearing bore retaining shoulder.
- F. Wipe the inside of the bearing cup (race) with a clean, lint-free cloth.
  - I. Inspect the bearing cup race to make sure no damage occurred during installation.
5. If no bearing cups are installed in the hub, do as follows:
  - A. Perform step 4 of this procedure.
  - B. Flip hub, exposing the other, open hub bearing bore.
  - C. Perform step 4 of this procedure.
  - D. Make sure both bearing cup races are clean and ready for bearing cone and grease seal installation.
6. After both bearing cups have been installed in the brake or idler hub, go to Inner Bearing Cone and Grease Seal Installation procedure.

## Inner Bearing Cone and Grease Seal Installation

Bearing grease should be replaced every 36,000 miles or 12 months, whichever comes first.

1. Make sure all old grease has been removed from wheel hub, bearings and axle spindle.
2. Make sure all mating surfaces for new bearing cone and grease seal are clean.
3. Bearings should be packed by machine, if possible, however packing by hand is a viable alternative.

## ⚠ WARNING

**Do not mix lithium, calcium, sodium or barium complex greases. Mixing of these incompatible compounds can create a corrosive and/or toxic chemical with fumes that can result in a serious health risk if exposed to skin or lungs. When converting from one grease to another, make sure all old grease is removed completely prior to applying new grease.**

Hand-pack inner bearing cone as follows:

1. If previously removed inner bearing cone is in reusable condition, place a generous amount of grease into the palm of your hand (Fig. 1).

**NOTE:** Select an appropriate grease that is temperature-rated for the wheel's application. Reference Recommended Wheel Bearing Grease Specifications and Approve Sources - Bearing Grease charts.

**NOTE:**

- A. If previously removed inner bearing cone cannot be reused, obtain a new inner bearing cone. Refer to the Components pages for part numbers.
- B. Place a generous amount of grease into the palm of your hand (Fig. 1).

**Fig. 1**



| Recommended Wheel Bearing Grease Specifications |  |
|---|--|
| Thickener Type                                  | Lithium Complex                        |
| Dropping Point                                  | 230°C (446°F) Minimum                  |
| Consistency                                     | NLGI No. 2                             |
| Additives                                       | EP, Corrosion and Oxidation Inhibitors |
| Base Oil  | Solvent Refined Petroleum Oil          |
| Base Oil Viscosity                              | @40°C (104°F) 150cSt (695 SUS) Minimum |
| Viscosity Index                                 | 80 Minimum                             |
| Pour Point                                      | -10°C (14°F) Minimum                   |

| Approved Sources - Bearing Grease |                                   |
|-----------------------------------|-----------------------------------|
| Mobil Oil                         | Mobilgrease HP                    |
| Exxon/Standard                    | Ronex MP                          |
| Kendall Refining Co.              | Kendall L-427                     |
| Ashland Oil Co.                   | Valvoline Val-plex EP Grease      |
| Pennzoil Prod. Co.                | Premium Wheel Bearing Grease 707L |

**NOTE:** Select appropriate grease that is temperature-rated for the wheel's application.

1. Press widest end of bearing into the outer edge of the grease pile, forcing grease into the inner area of the bearing between two adjacent rollers (Fig. 1).
2. Repeat this process while turning bearing from roller to roller until all rollers are coated.
3. Apply a light coat of grease into the bearing cup surface (race).
4. Install new grease-packed bearing cone into the cup.

LCI recommends replacing the grease seal whenever bearing packing is required. Install a new grease seal into the hub seal bore, to capture the inner bearing cone, as follows:

1. Place the new grease seal into the seal bore.
  - A. Apply a light film of sealant onto the outer rim of the seal.
  - B. Make sure seal is set square to the hub seal bore before pressing the seal all the way in or the seal may become damaged.
2. Use a clean, hardwood block of wood and hammer to drive the seal into the seal bore (Fig. 2).
  - A. Place the wood block evenly across the seal.
  - B. Hold the wood block firmly in place as you begin to tap the seal squarely into the seal bore with the hammer.
  - C. Continue to tap the seal inward until the seal's outer face is flush to the hub's seal bore face.

Fig. 2



## Bearing Lubrication - Oil

### **Recommended Oil Lube for axle bearings:**

Oil designation : SAE 90, SAE 80W-90, SAE 75W-90

| Approved Sources - Bearing Lubrication Oil |                        |
|--|------------------------|
| Union Oil Co.                              | Unocal MP Gear Lube    |
| Exxon Co.                                  | Gear Oil GX 80W-90     |
| Mobil Co.                                  | Mobilube SHC 75W-90    |
| Pennzoil Co.                               | Gear Plus 80W-90 GL-5  |
|  | Gear Plus Super 75W-90 |

The axle bearings are lubricated with a SAE 80-90W hypoid gear oil. Periodically check oil levels as follows:

1. Make sure trailer has been parked for a few minutes to allow oil to cool.
2. Check and refill brake hub oil to the level indicated on the plastic oil cap.
3. To fill brake hub with oil, remove rubber plug or cap plug from the hub's oil cap.
4. Fill oil through the plastic cap until oil level is complete.
5. Insert rubber plug or cap plug into plastic oil cap.

### **⚠ CAUTION**

**Do not over-tighten plastic oil cap. Over-tightening can damage O-ring, resulting in an oil leak.**

**A.** Tighten oil cap to 25 ft-lbs. Do not over-tighten oil cap or an oil leak may occur.

Refer to the Components pages for part numbers. Refer to Approved Sources - Bearing Lubrication Oil chart for recommended axle bearing lubricants.

## Oil Seal

### **⚠ CAUTION**

**Never install a removed oil seal. Installing a removed oil seal may damage the seal, resulting in an oil leak during normal component operation.**

A new two-part oil seal must be installed whenever the brake hub is removed for maintenance. The inside diameter of the two-part seal presses onto the spindle journal, the outside diameter of the seal presses into the brake hub bore.

### **⚠ CAUTION**

**Make sure the oil seal is properly oriented during part installation. Most oil seals have one side marked "AIR SIDE." This side MUST face outwards and not towards the bearing or component failure will occur.**

Make sure when installing a new oil seal the side marked "AIR SIDE" is facing outward, away from the bearing cone.

## Periodic Bearing Inspection

A physical bearing inspection should be conducted every 36,000 miles or 12 months, whichever comes first. An inspection of the bearing condition can detect early bearing issues. Upon inspection, bearings should look brand new and can be reassembled and used if in this condition. If discoloration, pitting, corrosion, flat spots or some abnormal condition is observed, the bearing and race should be replaced at the same time. Bearings are available at auto part stores. See Components pages for part numbers.

## Spindle Nut Adjustment

The proper method to assemble the spindle nut is as follows:

1. After hub installation onto spindle, install outer bearing.
2. Install spindle washer, if equipped, and thread on spindle nut with slots facing outward.
3. Tighten spindle nut with a pair of slip joint pliers to approx 50 ft-lbs.
4. Back off torque usually 1/4 turn so that you can finger tighten the spindle nut.
5. Finger tighten, drop cotter pin through slot and hole in spindle. If slot in nut does not align with either hole in spindle, back nut off until it does. Never tighten past finger tight. Use cotter pin hole that provides the least amount of end play clearance.
6. Bend legs over end of spindle and be sure legs do not interfere with oil cap upon reassembly.

## **Disc Brake Option**

### Disc Brake Pads

Disc brake pads are available through auto part stores. Brake pads are a consumable item so be sure to visually check pads every 36,000 miles or 12 months, whichever comes first. Be sure to also check rotor surfaces visually when you are checking the brake pads. Deep grooves developing on one or both rotor surfaces can indicate a caliper piston, slider bolt or residual pressure problem if this ever occurs. Brake rotors should be turned when disc brake pads are replaced.

### Disc Brake Caliper

The proper mounting torque for the disc brake caliper mounting bolts is 40-50 ft-lbs. If these are removed for servicing the brake system, add blue thread locking compound to the threaded area of the bolt at time of reassembly. Also lubricate the inside of caliper bushings that the slider bolts go through. Be sure to only use silicone based grease. The rubber bushings are not compatible with petroleum-based greases.

## **Electric Brakes**

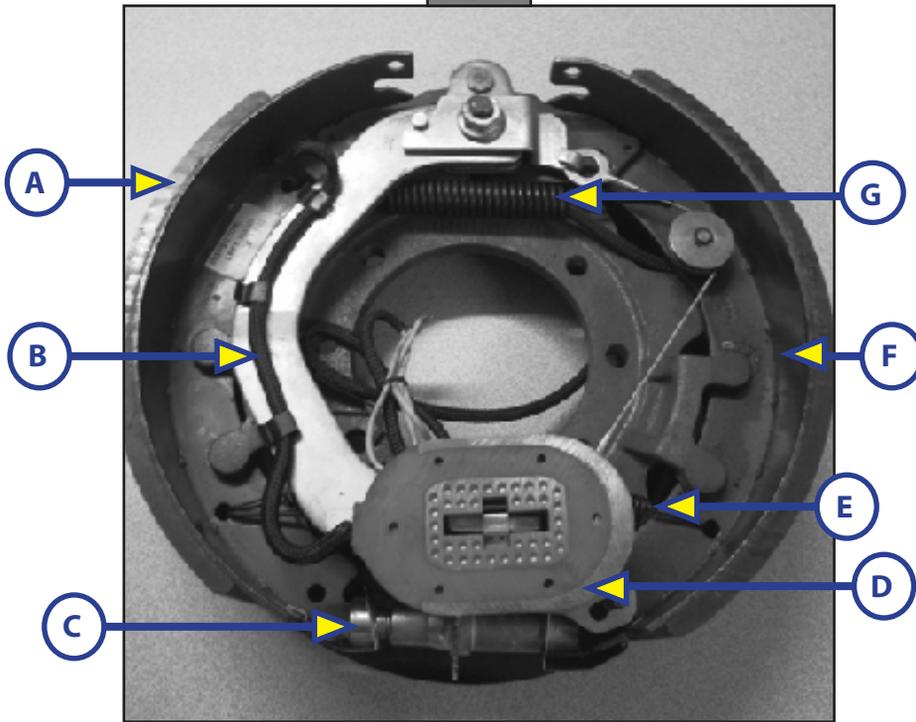
The basic structure of the Electric Brakes on your trailer will resemble the brakes on your car or tow vehicle, with one major difference; your trailer implements an Electric Actuation system and your tow vehicle utilizes a hydraulic system. Refer to the brake components diagram (Fig. 3), the Wiring Diagram (Fig. 13) and Pigtail and Coupler Wiring Color Codes (Fig. 14). The Electric Braking System operates in the following order of steps:

1. Electric current is supplied to the trailer's braking system when the tow vehicle's brakes are applied.
2. From the tow vehicle's battery, the electricity flows to the brake's electromagnet.
3. When energized, the magnets are attracted to the rotating surface of the drums.
4. This moves the actuating levers in the direction the drums are turning.
5. The actuating cam at the end of the shoe forces the primary shoe out to the drum surface.
6. The force of the primary shoe actuates the secondary shoe to contact the drum.
7. The force applied to the brake drum can be increased by elevating the current flow to the magnet.

### How to Use Lippert Electric Brakes Properly

The LCI Electric Braking System is synchronized with the tow vehicle's brakes. Never attempt to stop the combined load of the tow vehicle and the trailer by using either the tow vehicle brakes or the trailer brakes only. They are designed to work together.

Fig. 3



| Brake Components |                   |
|------------------|-------------------|
| Callout          | Description       |
| A                | Primary Shoe      |
| B                | Actuating Lever   |
| C                | Adjuster          |
| D                | Magnet            |
| E                | Adjusting Spring  |
| F                | Secondary Shoe    |
| G                | Retracting Spring |

Small manual adjustments may occasionally be necessary to accommodate changing loads and driving conditions. Synchronization of the tow vehicle-to-trailer braking can only be accomplished by road testing. Locking up, excessive grab, or delayed application is quite often due to the lack of synchronization between the tow vehicle and the trailer being towed. High voltage (2V+), Low voltage (2V-) or improperly adjusted brakes are the most common causes of these problems and can easily be corrected.

Prior to any adjustments, your trailer brakes should be burnished-in by applying the brakes 20-30 times with a 20 m.p.h. decrease in speed, e.g. 40 m.p.h. to 20 m.p.h. Allow ample time for brakes to cool between application. This allows the brake shoes and magnets to begin seating to the brake drum.

## General Maintenance - Electric Brakes

### Brake Adjustment

#### ⚠️ WARNING

**Prior to testing or adjusting brakes, be sure area is clear of any persons and vehicles. Failure to perform test in a clear area may result in serious injury or death.**

#### ⚠️ WARNING

**Lift the trailer by its frame and never the axle or suspension. Do not go under the trailer unless it is properly supported by jack stands. Unsupported trailers can fall causing serious injury or death.**

The LCI Electric Brakes are offered in a manual and automatic adjusting form. If manual brake adjusting is required, do as follows:

1. Jack up trailer and secure on adequate capacity jack stands.
  - A. Follow trailer manufacturer's recommendations for lifting and supporting the trailer.
  - B. Make sure the wheel and drum rotate freely.

1. Remove the adjusting hole cover from the adjusting slot on the bottom of the brake backing plate.
2. With a screwdriver or standard adjusting tool, rotate the starwheel of the adjuster assembly to expand the brake shoes.
  - A. Adjust the brake shoes out until the pressure of the linings against the drum makes the wheel very difficult to turn.
3. Rotate the starwheel in the opposite direction until the wheel turns freely with a slight lining drag, or approximately 10 click adjustments.

**NOTE:** A second screwdriver will be needed to push the auto adjusting lever away from the adjuster starwheel so that the starwheel can be rotated backward in the case of a self-adjusting brake.

4. Replace the adjusting hole cover and lower the wheel to the ground.
5. Repeat the above procedure on all brakes.

**NOTE:** For best results, the brakes should all be set at the same clearance. If the first brake's clearance was adjusted to 10 clicks, then adjust the remaining brake clearances to the same amount.

## Lubricate Brakes

Prior to reassembling the brake drum assembly, do as follows:

1. Apply a light film of white grease or an anti-seize compound to:
  - A. The brake anchor pin,
  - B. The actuating arm bushing and pin,
  - C. The areas of the backing plate that are in contact with the brake shoes and magnet lever arm,
  - D. And on the actuating block mounted to the actuating arm.

## Clean and Inspect Brakes

In the event the braking system encounters symptoms of improper application or failure, immediate inspection and service **MUST** be implemented. During normal use, servicing the braking system once a year is considered normal. Above normal use will require servicing based on a 3,000-6,000 mile increment schedule. Change worn magnets and shoes as needed to maintain maximum braking capability.

When disassembling the brakes for cleaning, make sure to:

1. Clean the backing plate, magnet arm, magnet and shoes.
2. Make sure all parts removed for cleaning are placed back into the same brake drum assembly.
3. Check for parts that have become loose or worn.
  - A. Service or replace loose or worn parts.

## Magnets

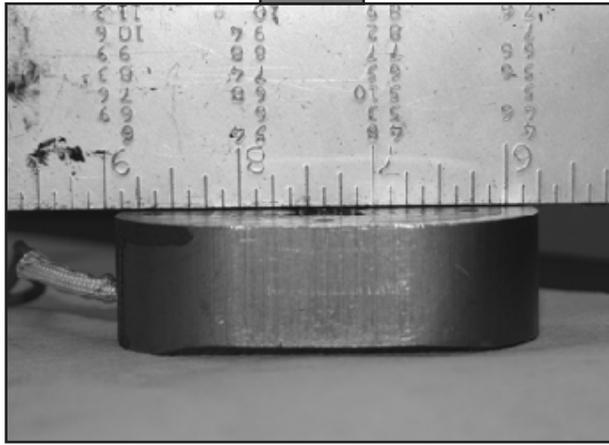
The LCI Electric Braking System uses high-quality electromagnets to actuate the brake shoes. These electromagnets provide superior force and friction to safely, and effectively, stop the trailer. Inspect and service the electromagnets annually if the trailer has seen normal use, more often if the trailer is used extensively. Inspect the electromagnets and do as follows:

1. Use a straight edge to check the electromagnet surface for uneven wear (Fig. 4).

**NOTE:** Figure 4 shows an electromagnet with little or no wear.

- A. Surface of electromagnet should be completely flat.
  - B. If abnormal or uneven wear is indicated by pronounced gaps, replace the electromagnet.
2. If the magnet's coil is exposed in any way, even if normal wear is evident, the magnets should be replaced immediately.
  - A. If the electromagnets are replaced, the drum armature surface should be refaced.
3. If an electromagnet is replaced on one side of an axle, LCI recommends replacing the electromagnet on the opposite brake assembly. This will ensure an even braking capacity.

**Fig. 4**



## Shoes and Linings

Inspect brake shoes and linings for:

1. Grease or oil.
2. Surface scoring, pitting or gouges.
3. Replace both shoes if lubricant contamination or physical damage is present, even if found on only one shoe.
  - A. Replace both shoes (two) on the brake and on both brakes (four) installed on the same axle. Replace brake parts at the same time. This will ensure an even braking capacity.
4. Measure lining thickness.
  - A. Lining thickness shall not be less than 1/16".
    - I. If lining measures less than 1/16", replace the shoe.
    - II. Repeat step 3.A.
5. Heat cracks are normal and rarely require attention.

After replacing the brake shoes and linings, burnish-in trailer brakes as follows:

1. Apply the brakes 20-30 times over a 20 m.p.h. decreasing speed range.
  - A. For example, brake 20-30 times while decreasing in speed from 40 m.p.h. to 20 m.p.h.
  - B. Make sure ample time is allowed for brakes to cool between application.
    - I. The cooling period allows the brake shoes and magnets to begin seating to the brake drum.

## Hub Replacement

To adjust bearings or replace removed hub, follow procedures below:

1. Place hub, bearing, washers and castle nut back on axle spindle in the reverse order from which they were removed. Castle nut should be torqued to 50 ft.-lbs. Hub will rotate during this process.
2. Loosen castle nut to back off the torque.
3. Tighten castle nut finger tight until snug.
4. Insert cotter pin. If cotter pin does not line up with hole, back castle nut up slightly until pin can be inserted (Fig. 5).
5. Bend cotter pin over to lock nut in place. Nut should be free to move with only the cotter pin keeping it in place.

Fig. 5



## Axle and Suspension Installation

### **CAUTION**

**Always wear eye protection when servicing the axle, brakes, hubs, springs and wheels. Failure to wear eye protection may result in serious injury.**

The single most important portion of axle installation is setting the axle(s) square to the center line of the trailer. Axles mounted out of square will cause the trailer to dog track. Dog-tracking is when the axle is not square to the direction of travel. A skewed axle will cause the trailer to swing out to the left or right until the axle becomes square with the direction of travel. When mounting multiple axles to a trailer, take extra care to get the first axle square to the trailer frame. Proper alignment is most readily achieved by measuring from the center of the trailer hitch to the center of each axle spindle. Once the first axle alignment is established, set the remaining axles parallel with the first. Proper installation allows for correct and safe control, prolonged tread life and will all but eliminate dog-tracking.

LCI tubular axles are made of high strength steel to prevent metal fatigue and provide the best possible welding conditions. The round tubular axles allow for even and uniform structure.

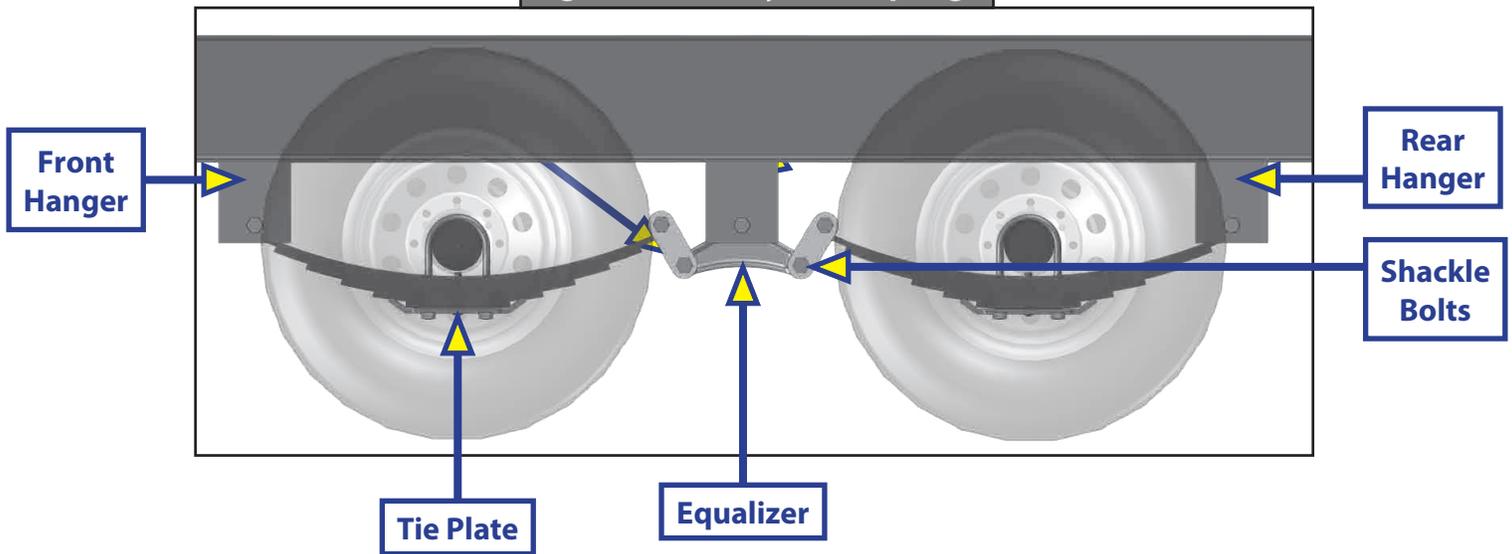
## Suspension Systems

The suspension systems incorporated into LCI axles are designed to provide the following benefits:

- Attach the axle to the trailer.
- Dampen the effects of road shock.
- Provide stability to the trailer.

All LCI suspension systems are available in single, tandem and triple axle configurations. For specific or custom applications, please contact the LCI customer service team.

**Fig. 6 - Double-Eye Leaf Springs**



### Double-Eye Leaf Springs

Double-eye leaf springs have eyes at either end of the spring assembly with nylon bushings to assist in preventing wear. U-bolts hold the springs to the axle with a plate (Fig. 6). Refer to Spring Axle Torque Specifications chart for bolt torque requirements.

| Spring Axle Torque Specifications      |                |               |
|--|----------------|---------------|
| Bolt Type                              | Axle Capacity  | Torque        |
| 3/8" U-Bolt Nuts                       | 2K             | 35 ft-lbs     |
| 1/2" U-Bolt Nuts                       | 3.5K           | 50 ft-lbs     |
| 9/16" U-Bolt Nuts                      | 5.2K           | 65 ft-lbs     |
| 9/16" U-Bolt Nuts                      | 6-8K           | 90 ft-lbs     |
| Spring Eye, Equalizer and Shackle Nuts | All Double Eye | 30-50 ft-lbs  |
| Spring Eye, Equalizer and Shackle Nuts | All Slipper    | Snug nut only |

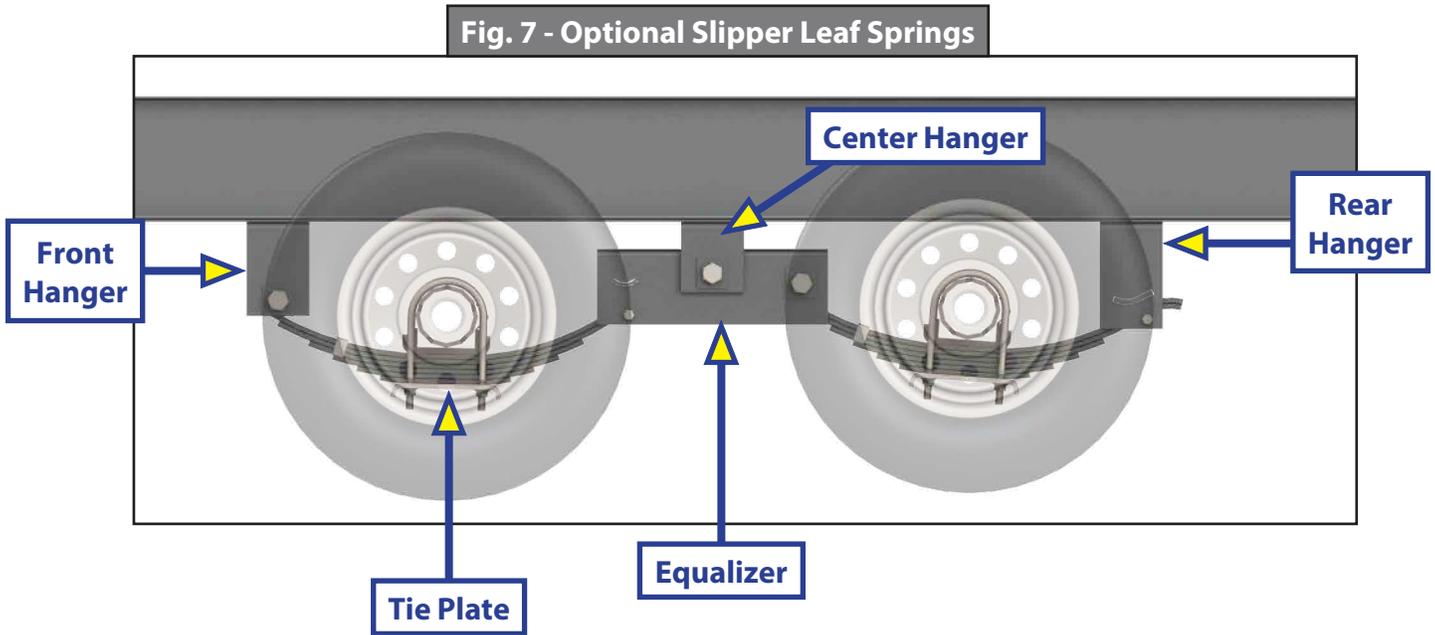
The articulation of this suspension occurs when the eyes rotate on the wear surfaces provided in eyes of the springs and on the equalizers. This suspension is also available in single and multiple axle configurations. In trailers with two or more axles, the additional movement is maintained by an equalizer. This feature allows for even load handling from axle to axle.

Double-eye suspension systems are available only on 8,000 lb. axles. Tandem and triple axle mounting kits are available for both 33" and 35" axle spacing.

## Slipper Leaf Springs—Optional

Slipper springs have a loop eye formed on one end and a reverse radius on the other (Fig. 7). The front eye is secured to either the front hanger or rear of the equalizer with a bolt and nut. The slipper end rides against a wear-block located in either the front of the equalizer or the rear hanger. Refer to Spring Axle Torque Specifications chart for bolt torque requirements.

A keeper bolt or strap is placed under the slipper end to contain the spring when the trailer is lifted off the ground. The 3.5-8K tandem and triple axle attaching kits are available for both 33.5" and 36" axle spacing.



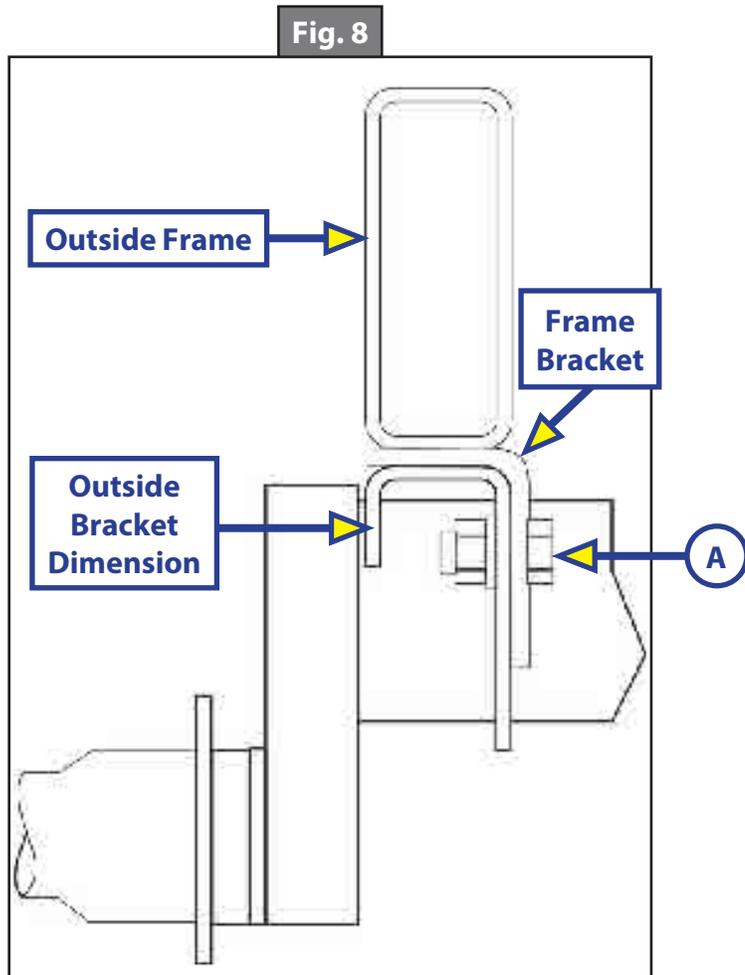
## Torsion Suspension System

The LCI Torsion Suspension system is designed to offer superior qualities over leaf spring technology. Bracketed to the trailer's frame, and housed inside the trailer axle's tube, the spindle is connected to a swing arm, which is connected to a square inner bar surrounded by four rubber cords inside the axle tube. As the swing arm rotates, the rubber absorbs and distributes torque and resistance loads generated by driving conditions. These characteristics provide a measurable benefit over leaf spring suspensions. Torsion axles provide independent wheel end suspension, quieter ride and more vertical wheel travel for a softer ride compared to leaf spring axles.

The LCI Torsion Suspension system requires very little maintenance. Normal inspection of the entire LCI Trailer Axle system can be applied to the Torsion Suspension system. See inspection procedures for system components in this manual.

**NOTE:** For Torsion Suspension System installation, mount axle bracket to frame bracket (Fig. 8) and torque fasteners as specified in the Torsion Axle Torque Specifications chart. Washer(s) **MUST** be placed against the slotted hole in the axle bracket (Fig. 8A). Low profile brackets have plain round holes.

| Torsion Axle Torque Specifications |           |                |
|------------------------------------|-----------|----------------|
| Axle Size                          | Bolt Size | Torque Range   |
| 2K<br>Axle Capacities              | 1/2"      | 70-90 ft-lbs   |
| 3.5K-10K<br>Axle Capacities        | 5/8"      | 120-150 ft-lbs |



## Inspection

Inspect all components of the suspension system annually or every 36,000 miles, whichever comes first. Visually inspect the system for signs of wear, damage or loose fasteners. Replace or tighten loose fasteners, as necessary. Torque fasteners in accordance with specifications in tables Spring Axle Torque Specifications and Torsion Axle Torque Specifications.

### **⚠ WARNING**

**Lift the trailer by its frame and never the axle or suspension. Do not go under the trailer unless it is properly supported by jack stands. Unsupported trailers can fall causing serious personal injury or death.**

### **⚠ WARNING**

**Lift the trailer by its frame and never the axle or suspension. Unsupported trailers can fall causing damage to the frame, axles, suspension system and the trailer. Improper trailer support will void warranty coverage for incurred damages.**

### **⚠ WARNING**

**Wear eye protection when servicing axles, brakes, hubs, springs and wheels. Failure to wear eye protection may result in serious personal injury.**

Refer to the Components pages and the appropriate Service Kit Part # (illustrated parts list) for part descriptions and numbers of replacement components. Replace worn spring eye bushings and sagging or broken springs as follows:

1. Support the trailer with the wheels just off the ground. Follow the trailer manufacturer's recommendations for lifting and supporting the trailer.
2. After the trailer is properly supported, place a suitable block under the axle tube near the area to be repaired.

**NOTE:** The block acts as a support for the weight of the axle only, allowing suspended system components to be serviced or replaced freely. Multiple axle trailers **MUST** have the weight of each axle properly supported before disassembly of any suspension system component.

3. Disassemble the U-bolts, nuts and tie plates.
4. Remove the spring eye bolts and the spring.
5. If the spring eye bushings are to be replaced, press out the old bushing by hand or use a punch to tap it out.
6. Obtain a new free-floating nylon bushing.

**NOTE:** Free-floating nylon bushings do not require lubrication.

7. Press the new bushing into the spring eye by hand or gently tap it into place with a bounce-less rubber or plastic mallet.
8. Install remaining repaired or new suspension system components in reverse order of their original disassembly sequence.

## Equalizer Replacement

Refer to the Components pages and the appropriate Service Kit Part # (illustrated parts list) for part descriptions and numbers of replacement components. Replace equalizer or equalizer bushings as follows:

1. Support the trailer with the wheels just off the ground. Follow the trailer manufacturer's recommendations for lifting and supporting the trailer.
2. After the trailer is properly supported, place a suitable block under both axle tubes.
3. Remove the spring eyebolt, keeper bolt, and equalizer bolt from the equalizer.
4. Press the old nylon bushing out of the equalizer.
5. Install removed equalizer parts in reverse order of their original disassembly sequence.

## Suspension Replacement

Install replacement springs and equalizers as follows:

1. Make sure springs are on straight.
  - A. Align spring eyes to front hanger.
  - B. Insert spring eye bolts and nuts, but do not torque fasteners at this point.
2. Assemble springs to equalizer.
3. Level the equalizer to the frame.
  - A. Torque equalizer nuts and spring eye nuts to 30-50 ft.-lbs.

## **Wheels**

### Wheel Selection



**Air pressure on a weakened or cracked rim can create an unsafe, explosive condition resulting in serious personal injury or death. Do not attempt to modify or repair a wheel. Replace damaged or weakened wheel and rim with new.**



**Use manufacturer's suggested rim contours only. Failure to use recommended rim contours may result in dramatic separation between tire and wheel, resulting in possible serious personal injury or death.**

Trailer wheels, tires and axles **MUST** be properly matched when specifying or replacing trailer wheels. Make sure the following critical wheel replacement characteristics are observed:

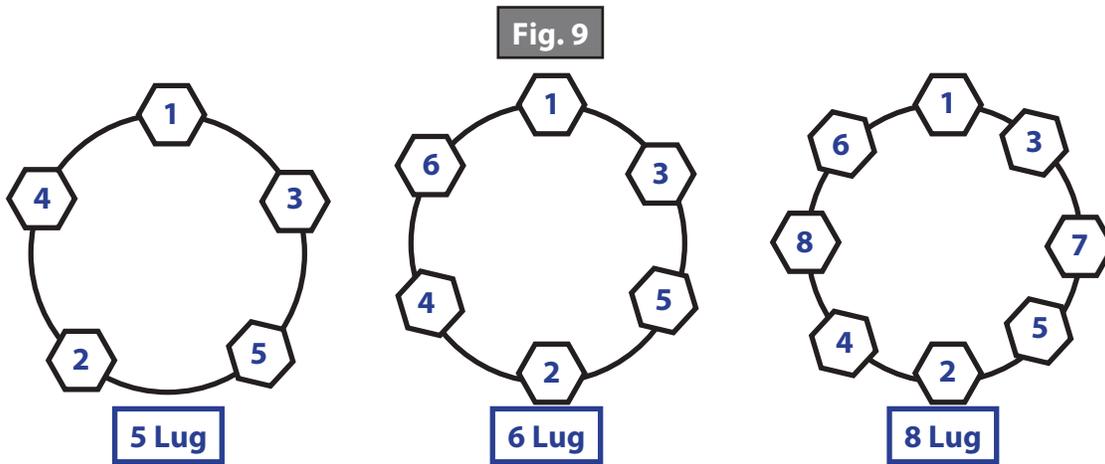
1. Bolt Circle.
  - A. Wheels have varying bolt circle patterns, some close enough to allow installation of mismatched wheel bolt patterns to axle hub bolt patterns.
2. Capacity.
  - A. Wheel load capacity **MUST** match tire and trailer maximum load ratings.
3. Offset.
  - A. The relationship of the tire's centerline to the axle's hub face **MUST** match across replacement parts.
  - B. Failure to match offset reduces axle carrying capacity.
4. Rim Contour.
  - A. Replacement wheels **MUST** directly match the mating rim contour.

### Torque Requirements

It is extremely important to maintain proper wheel mounting torque limits on your trailer axle. Use of torque wrenches will ensure proper torque limits are applied to wheel mounting lug nuts. Use no other method to torque wheel lug nuts.

Make sure wheel fasteners match the cone angle of the wheel (usually 60° or 90°) being serviced. Attach new wheel to the axle hub as follows:

1. Start all bolts or nuts by hand to prevent cross-threading.
2. Continue to hand-tighten wheel lug nuts in the sequential pattern shown in Fig. 9.
3. After wheel lug nuts are fully hand-tightened, torque nuts in stages in the sequential pattern shown in Fig. 9.
  - A. Torque wheel lug nuts to the torque values listed in the Wheel Torque Requirement Chart.



| Wheel Torque Requirement Chart |           |                                      |                |                |
|--------------------------------|-----------|--------------------------------------|----------------|----------------|
| Wheel Size                     | Stud Size | Torque Sequence                      |                |                |
|                                |           | 1st Stage                            | 2nd Stage      | 3rd Stage      |
| 14"                            | 1/2"      | 20-25 ft-lbs                         | 50-60 ft-lbs   | 90-120 ft-lbs  |
| 15"                            | 1/2"      | 20-25 ft-lbs                         | 50-60 ft-lbs   | 90-120 ft-lbs  |
| 16"                            | 1/2"      | 20-25 ft-lbs                         | 50-60 ft-lbs   | 90-120 ft-lbs  |
| 16.5" x 6.75"                  | 1/2"      | 20-25 ft-lbs                         | 50-60 ft-lbs   | 90-120 ft-lbs  |
| 16"                            | 9/16"     | 20-25 ft-lbs                         | 60-70 ft-lbs   | 120-130 ft-lbs |
| 16.5" x 6.75"                  | 9/16"     | 20-25 ft-lbs                         | 60-70 ft-lbs   | 120-130 ft-lbs |
| 16" Dual and 17.5" Cone Nut    | 5/8"      | 50-60 ft-lbs                         | 100-120 ft-lbs | 190-210 ft-lbs |
| 16" Dual and 17.5" Flange Nut  | 5/8"      | 50-60 ft-lbs                         | 150-200 ft-lbs | 275-325 ft-lbs |
| 14.5" Demount                  | 1/2"      | Tighten sequentially to 85-95 ft-lbs |                |                |

**⚠ WARNING**

**Proper and accurate torque MUST be maintained to prevent wheels from loosening, studs from cracking and/or breaking or other possible hazardous breakage resulting in serious injury or death.**

4. Wheel lug nuts should be torqued before first road use and after each wheel removal.
  - B. Check and re-torque wheel lug nuts after 10, 25 and 50 miles. A periodic check during regular service is recommended.

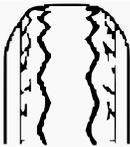
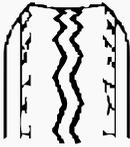
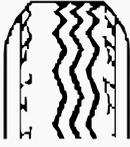
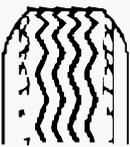
Tires

Prior to mounting tires onto wheels, do as follows:

1. Make sure rim size and contour are approved by the Tire and Rim Association Yearbook or the tire manufacturer's catalog.
2. Verify tire load rating.
  - A. If the load is not evenly distributed across all tires, use the tire rated for the heaviest wheel position.
3. Consult the Rubber Manufacturers Association or the tire manufacturer's guidelines for wheel mounting procedures.

Tire pressure is very important to promoting tire life and performance. Tire pressure should always be in accordance with the manufacturer's recommended pressure rating for any given load. Check tire pressure as follows:

1. Always check tire pressure cold before operation.
2. Do not bleed air from tires when they are hot.

| Tire Tread Wear Pattern Chart  |                                |  |
|--|--------------------------------|--|
| What Is Happening?   | Why?                           | What Should Be Done?   |
| Center Wear<br> | Over-inflation                 | Adjust pressure to particular load per tire catalog.                                   |
| Edge Wear<br>   | Under-inflation                | Adjust pressure to particular load per tire catalog.                                   |
| Side Wear<br>   | Loss of camber or overloading  | Make sure load does not exceed axle rating. Call Lippert Service & Warranty to advise. |
| Toe Wear<br>    | Incorrect Toe-in               | Call Lippert Service & Warranty to advise.   |
| Cupping<br>     | Out-of-balance                 | Check bearing adjustment and balance tires.  |
| Flat Spots<br> | Wheel lockup and tire skidding | Avoid sudden stop if possible and adjust brakes.                                       |

3. Check inflation pressure weekly during use to ensure maximum tire and tread life.
4. Inspect for tire tread wear patterns that may indicate serious wheel alignment or excessive load limit issues. Refer to the Tire Tread Wear Pattern Chart.

**NOTE:** Tire wear should be checked frequently. Once a tire wear pattern is established, stopping becomes difficult, even when the underlying cause is corrected.

## Introduction to Troubleshooting

The following section is a guideline for ensuring operation of your braking system. The safety of you, those traveling with you and those sharing the road is paramount and it starts with the ability to safely stop the tow vehicle and the towed vehicle.

### Troubleshooting

Most brake malfunctions can be corrected by utilizing the Troubleshooting Chart. Mechanical failure is the most common form of malfunction, however, if the brake system fails and it's not mechanical, it is usually electrical. A Voltmeter and Ammeter are essential tools to diagnosing these problems.

Mechanical problems are mostly self-evident; something is bent or broken. Consult the Troubleshooting Chart to determine the probable cause and corrective actions for a variety of issues with the braking system.

Remember to use only LCI replacement parts on these systems. Consult the Limited Warranty or call our Service Department for any other related issues.

## Troubleshooting Chart

**NOTE:** If all trailer lights and brakes do not work, check your wiring plug connection (Wiring Diagram, Fig. 13). Make sure the ball is making solid contact with the coupler (that is how a trailer is grounded). Too much grease or not using dielectric grease on the ball and coupler can cause this to happen.

### Measuring Voltage

The Braking System voltage is measured at the two lead wires of the magnet on any brake. Use the pin probes inserted through the insulation of the lead wires. To ensure that the battery is indicating a full charge, the towing vehicle engine should be running with the trailer coupler connected when checking the voltage.

Voltage in the system should begin at 0 volts and, as the brake pedal of the tow vehicle is applied, voltage will gradually increase to about 12 volts. If the system does not indicate at least 12 volts, problems may occur in the wiring of the system, the battery or alternator of the tow vehicle.

When the brakes are applied, a gradual increase in voltage is preferable to a quick increase to 12 volts. A gradual increase in voltage ensures smooth and firm trailer braking. A quick increase in voltage will cause the braking system to feel like the trailer is grabbing too quickly.

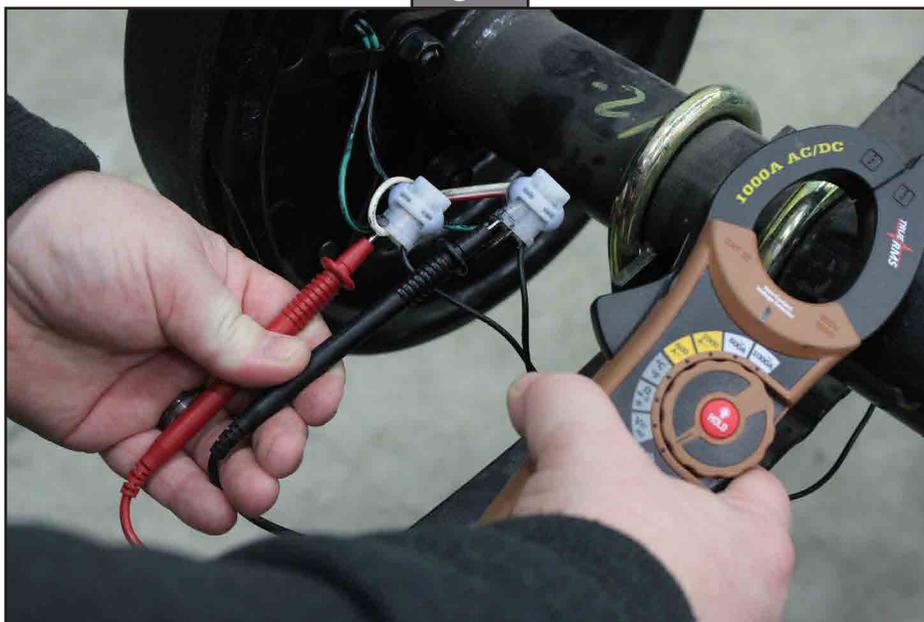
Taking a voltage reading is usually done with probes inserted into the wire connector (Fig. 10).

### Measuring Amperage

Braking System amperage is the amount of current flowing through the system when all magnets have been energized. Amperage will change proportionately with voltage. To ensure the battery is fully charged, the tow vehicle engine should be running with the trailer coupler connected when checking the voltage.

If a resistor is used in the brake system, it **MUST** be set at zero or bypassed completely to obtain the maximum amperage reading. Individual amperage draw can be measured by inserting the ammeter in the line at the magnet you want to check. Disconnect one of the magnet lead wire connectors and attach the ammeter between the two wires. Consult Amperage Chart for normal amp readings.

Fig.10



| Troubleshooting Chart   |  |  |
|-------------------------|--|--|
| What Is Happening?      | Why?                                   | What Should Be Done?                   |
| No brakes               | Open circuits                          | Find and correct                       |
|                         | Short circuits                         | Test and correct                       |
|                         | Severe under-adjustment                | Adjust brakes                          |
| Weak brakes             | Grease or oil on magnets or linings    | Clean or replace                       |
|                         | Corroded connections                   | Clean and correct cause of corrosion   |
|                         | Worn linings or magnets                | Replace                                |
|                         | Scored or grooved brake drums          | Machine or replace                     |
|                         | Improper synchronization               | Correct                                |
|                         | Under-adjustment                       | Adjust brakes                          |
|                         | Glazed Linings                         | Re-burnish or replace                  |
| Locking brakes          | Under-adjustment                       | Adjust                                 |
|                         | Improper synchronization               | Correct                                |
|                         | Loose, bent or broken brake components | Test and correct                       |
|                         | Out-of-round brake drums               | Machine or replace                     |
|                         | Insufficient wheel load                | Adjust system resistor and synchronize |
| Intermittent brakes     | Broken wires                           | Test and correct                       |
|                         | Loose connections                      | Repair or replace                      |
|                         | Faulty ground                          | Find and repair                        |
| Brakes pull to one side | Wrong magnet lead wire color           | Adjust                                 |
|                         | Incorrect adjustment                   | Correct                                |
|                         | Grease or oil on linings or magnets    | Clean or replace                       |
|                         | Broken wires                           | Find and repair                        |
|                         | Bad connections                        | Find and repair                        |
| Harsh brakes            | Under-adjustment                       | Adjust                                 |
|                         | Improper synchronization               | Correct                                |
| Noisy brakes            | Under-adjustment                       | Adjust                                 |
|                         | Lack of lubrication                    | Lubricate                              |
|                         | Broken component                       | Replace component                      |
|                         | Incorrect brake components             | Correct                                |
| Surging brakes          | Grease or oil on linings or magnets    | Clean or replace                       |
|                         | Out-of-round or cracked brake drums    | Machine or replace                     |
| Dragging brakes         | Over-adjustment                        | Readjust                               |
|                         | Out-of-round brake drums               | Machine or replace                     |
|                         | Incorrect brake components             | Replace                                |
|                         | Loose, bent or broken brake components | Replace                                |
|                         | Faulty breakaway switch                | Repair or replace                      |
|                         | Loose wheel bearing adjustment         | Adjust                                 |
|                         | Bent spindle                           | Replace Axle                           |

Fig. 11

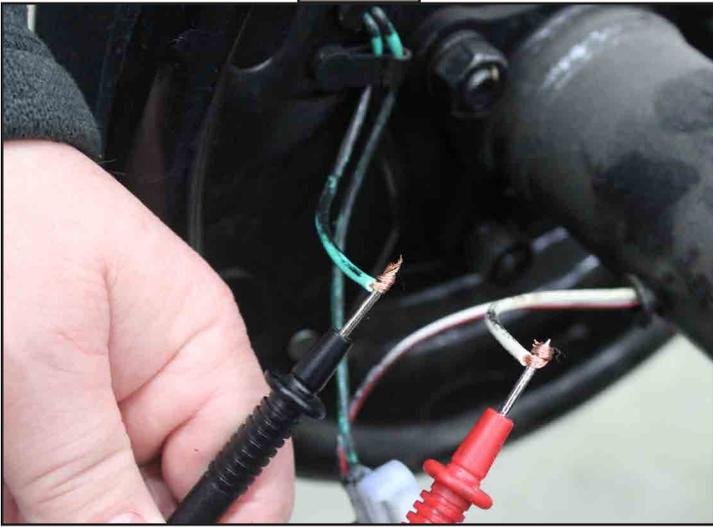


Fig. 12



Make sure that the wires are properly reconnected and sealed after testing is completed.

Testing for amperage can be done with probes (Fig. 11) or alligator clips on the leads or an amp clamp (Fig. 12).

### Amperage Chart

| Amperage Chart |            |             |            |
|----------------|------------|-------------|------------|
| Amps/Magnet    | Two Brakes | Four Brakes | Six Brakes |
| 3.0            | 6.0        | 12.0        | 18.0       |

Low or no voltage are the most common problems with the Braking System. Amperage at the brakes is also a relatively common issue. Common causes of these conditions are:

1. Low quality electrical connections.
2. Open circuits.
3. Insufficient wire gauge. (Reference Trailer Wire Gauge chart.)
4. Broken wires.
5. Blown fuses (fusing of brakes is not recommended).
6. Short circuits (indicated by high amperage).

| Trailer Wire Gauge Chart |                 |  |
|--------------------------|-----------------|--|
| Wire Gauge and Type      | Number of Axles | Length of Run                                    |
| 16 Ga Stranded Copper    | 1               | N/A  |
| 14 Ga Stranded Copper    | 2               | Under 30ft. (9.1m) from hitch to center of axles |
| 12 Ga Stranded Copper    | 2 or 3          | Over 30ft. (9.1m) from hitch to center of axles  |

Possible causes of shorts are:

1. Shorted magnet coils.
2. Bare wires contacting a grounded object.

Finding the cause of a short circuit in the system is done by isolating one section at a time. If the high amperage reading drops to zero by unplugging the trailer, then the short is in the trailer. If the amperage reading remains high with all the brake magnets disconnected, the short is in the trailer wiring.

All electrical troubleshooting procedures should start at the controller. Most complaints regarding brake harshness or malfunction are traceable to improperly adjusted or nonfunctional controllers. See your controller manufacturer's data for proper adjustment and testing procedures. For best results, all the connection points in the brake wiring should be sealed to prevent corrosion. Loose or corroded connectors will cause an increase in resistance which reduces the voltage available for the brake magnets.

## Maintenance Schedule

| Item                   | Function Required   | 3,000 Miles  | 12 Months / 36,000 Miles<br>(Whichever comes first) |
|------------------------|---|--------------|---|
| Brakes                 | Test that they are operational.   | At Every Use |   |
| Oil Level              | Check oil level in hubs, if equipped.   | At Every Use |   |
| Brake Adjustment       | Adjust to proper operating clearance. Not required for self-adjusting brakes. | ◆            |   |
| Brake Magnets          | Inspect for wear and current draw.  |              | ◆   |
| Brake Linings and Pads | Inspect for wear or contamination.  |              | ◆   |
| Hub/Drum and Rotors    | Inspect for abnormal wear or scoring.   |              | ◆   |
| Wheel Bearing          | Inspect for corrosion or wear. Clean and repack.                              |              | ◆   |
| Seals                  | Inspect for leakage. Replace if removed.                                      |              | ◆   |
| Springs                | Inspect for wear, loss of arch.   |              | ◆   |
| Suspension Parts       | Inspect for bending, loose fasteners, wear.                                   |              | ◆   |
| U-bolts                | Tighten to specified torque values  |              | ◆   |

# Wiring Diagram

Fig. 1

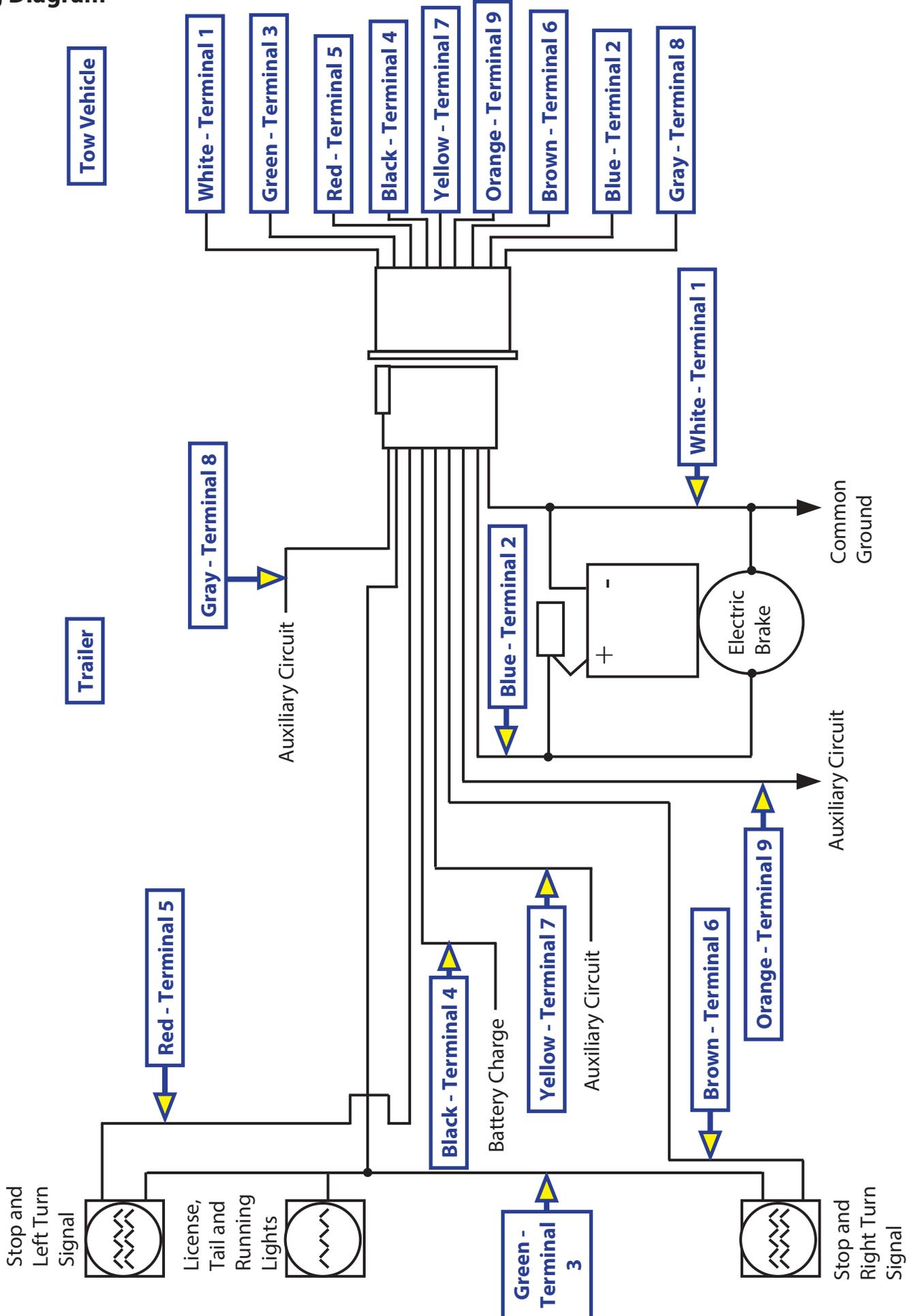
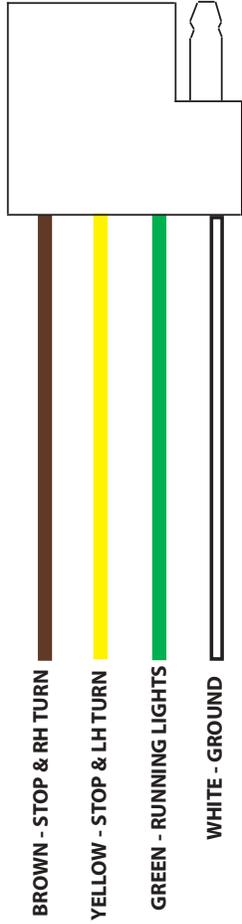
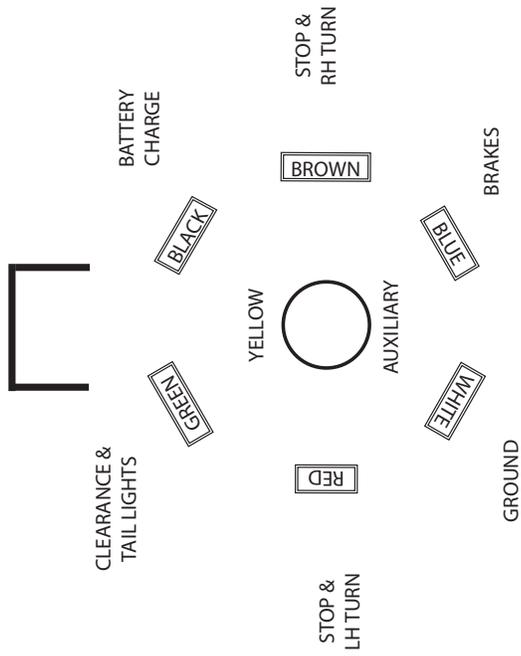


Fig. 1

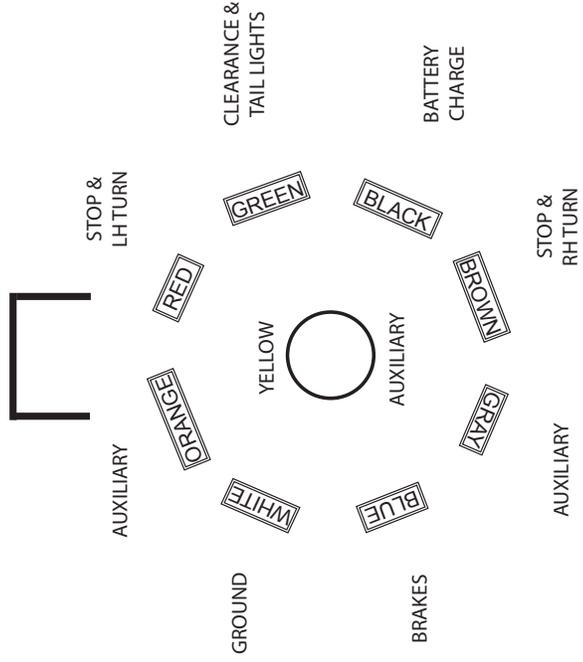


## TRAILER LIGHTS PIGTAIL - DOES NOT OPERATE BRAKES

### 7-PIN COUPLER



### 9-PIN COUPLER



## TRAILER BRAKE AND LIGHT COUPLER - OPERATES BRAKES

## Storage

### Storage Preparation

If your trailer is to be stored for an extended period of time, the trailer will need to be prepared prior to going into storage. Follow these guidelines to set up your trailer for storage:

1. If the trailer has an emergency breakaway battery, remove it and store it inside, out of the weather. Charge the battery at least every 90 days.
2. Jack up the trailer and place jack stands under the trailer frame so that the weight will be off the tires. Follow trailer manufacturer's guidelines to lift and support the trailer.
3. Lubricate mechanical moving parts such as the hitch, and suspension parts, that are exposed to the weather.
4. In the case of boat trailer axles that are subject to repeated immersion, remove brake drums; clean, dry and re-lubricate moving brake components; inspect bearings - clean and re-lubricate.



**Lift the trailer by its frame and never the axle or suspension. Do not go under the trailer unless it is properly supported by jack stands. Unsupported trailers can fall causing death or serious injury.**

### Extended Storage Inspection Procedures

Trailer should remain on jack stands during this procedure:

1. Remove all wheels and hubs or brake drums. Reinstall drum to same spindle and brake from which it was removed.
2. Inspect suspension for wear.
3. Check tightness of hanger bolt, shackle bolt, and U-bolt nuts of the suspension for correct torque.
4. Check brake linings, brake drums and armature faces for excessive wear, scoring, damage or corrosion.
5. Check brake magnets with an ohmmeter. The magnets should check 3.2 ohms. If shorted or worn excessively, they must be replaced.
6. Lubricate all brake moving parts using a high temperature brake lubricant.
7. Remove any rust from braking surface and armature surface of drums with fine emery paper or crocus cloth. Be sure to protect bearings from contaminating dust.
8. Inspect oil or grease seals for wear or nicks. Replace if necessary. Using the [Trip Preparation Checklist](#) before starting a trip with your trailer is highly recommended. Allow plenty of time prior to any trip for any service or repairs that may need to be done before using the trailer.
9. Lubricate hub bearings.
10. Reinstall hubs and adjust bearings.
11. Mount and tighten wheels.

**NOTE:** Avoid getting any grease or oil on brake linings and pads or magnet surfaces.

## Trip Preparation Checklist

The following checklist offers several guidelines to prolonging the quality of your running gear and will provide trustworthy and safe trailering for years to come.

Using the following checklist before starting a trip with your trailer is highly recommended. Allow plenty of time prior to any trip for any service or repairs that may need to be done before using the trailer.

1. Maintenance schedule should be current.
2. Inspect hitch for corrosion, lubrication and wear.
3. Inspect safety chains for rust and wear. Engage chains and breakaway switch actuating chain securely. Breakaway battery should be fully charged.
4. Electronic coupler must be secure. Run check on all lights and brake engagement and synchronization. Refer to Figures 13 and 14.
5. Load trailer with 10% of total weight on the hitch end of trailer. Smaller trailers' front end load should be increased to 15%.
6. Do not overload. Consult your trailers i.d. plate for gross vehicle weight restrictions.
7. Tires should be inflated to manufacturer's specifications. Inspect tires for any damage or wear.
8. Inspect lug nuts/bolts. All should be torqued to specifications. Refer to Wheel Torque Requirement Chart for torque limits.
9. Check torque of hanger bolt, shackle bolt, and U-bolt nuts on suspension.
10. Check that your trailer is towing level. Adjust hitch height if necessary to level trailer.

# TRAILER AXLES 8K-16K

## AXLES AND SUSPENSION

### Introduction

Combining years of experience in the trailer frame and recreational vehicle industry with the newest and most innovative technology, Lippert Components, Inc. (LCI) introduces the Axle and Running Gear Division.

The following publication is designed to give the customer an easy-to-understand operation and service manual to provide useful and important information. The quality of the Lippert name and the finest materials utilized in the production of the Axles and Running Gear provide you with hubs, brakes, drums and spindles that make trailering and braking the finest in the industry.

Quality comes threefold at LCI:

1. The finest quality materials.
2. The latest technology and design.
3. The quality standards maintained from materials to final assembly.

All three points provide the customer with the best product they can possibly buy and the satisfaction of knowing they can trust the equipment on which they have spent their hard-earned money. LCI thanks you for purchasing our Axles and Running Gear. When you speak of LCI, our quality stands beside you.

### Safety Information

#### **WARNING**

**The “WARNING” symbol is a sign that precedes a service, maintenance or operational procedure containing a possible personal safety risk that could result in serious injury or death if stated safety precautions and procedural steps are not followed as set forth in this manual.**

#### **WARNING**

**Performing service, repair or routine maintenance work can cause personal injury or death. Use personal protective equipment (PPE) whenever performing service work or routine maintenance. Make sure work space is clean and free of slip or trip hazards.**

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

This manual provides general service and maintenance procedures. Many variables can change the circumstances of the service procedure, e.g., the degree of difficulty involved in the service operation and the ability level of the individual performing the operation.

This manual cannot begin to plot out procedures for every possibility, but will provide the general instructions for effectively servicing the vehicle. In the event the skill level required is too high or the procedure too difficult, a certified technician should be consulted before performing the necessary service. Failure to correctly service the vehicle may result in voiding the warranty, inflicting injury or even death. The owner's manual for your trailer may have more procedures for service and maintenance.

## Break-In Period For Electric Drum Brakes

**NOTE:** Brakes should be manually adjusted after the first 200 miles of operation, then periodically every 3,000 miles.

The break-in period is a typical phenomenon with drum brakes and especially electric drum brakes. Electric drum brakes will require a break-in period to achieve full performance. This break-in period applies for new axles and any time new brake shoes and/or magnets are installed as part of regular maintenance. LCI has found through extensive brake testing that the break-in period for our drum brakes can range from 20 to 50 brake applications.

Brakes can be seated in by applying approximately 8-10 volts to the trailer brakes at an initial speed of 40 mph and allowing the truck/trailer combination to slow down to 20 or 25 mph. For best results do not use truck brakes during this procedure. The trailer brakes will seat in faster by using them to stop both the truck and trailer. The easiest method is to apply the trailer brakes using the manual activation lever located on the in-cab brake controller.

Care **MUST** be taken to not overheat the lining material, therefore brake applications conducted at one mile intervals will suffice. The driver should feel a noticeable difference in the brake performance during this period, sometimes in as few as 10 applications. After 50 applications, the brake lining material will be fully cured from the heat and develop close to 100% contact with the brake drum surface.

This break-in period not only seats the shoe lining material but also seats in the brake electromagnets. During the break-in period, the linings will wear at a faster rate than they do after they are seated in.

## **Trailer Axle Brake Inspections**

In general, based on normal activity, trailer brakes should be checked annually or every 36,000 miles, whichever comes first. If above normal trailer activity is experienced, then more frequent brake component inspections are recommended. In the event the braking system encounters symptoms of improper application or failure, immediate inspection and service **MUST** be performed.

## Recommended Component Inspection Periods

- Periodic Bearing Inspection - Should be performed annually or every 36,000 miles, whichever comes first.
- Bearing Lubrication Inspection - Should be performed annually unless periodic brake inspections reveal abnormal braking performance.
- Brake Cleaning and Inspection - Should be performed annually or every 36,000 miles, whichever comes first.

## **Hubs/Drums/Bearing**

**NOTE:** A small amount of residual grease on the outside of a new brake hub is normal. Simply wipe the residual grease off of the brake hub. However, it is not normal for a hub to continue to weep grease after its initial installation. Excess grease can coat brake pads, magnets and braking surfaces inside of the hub, resulting in diminished braking capability. Have the brakes checked by a qualified service provider.

## Brake Hub Removal

### **⚠ WARNING**

**Always lift the trailer by its frame and never by its axle or suspension. Axle and suspension components are not designed, or rated, for the dead weight, point-of-contact loads that the trailer's frame is. Do not go under the trailer unless it is supported by appropriately rated jack stands. Improperly supported trailers can collapse, causing possible serious personal injury or death.**

### **⚠ WARNING**

**Wear appropriate personal protective equipment (PPE) when performing service or maintenance operations. Always wear eye protection when servicing trailer axles, brakes, hubs, springs and wheels. Not using PPE may result in serious personal injury or death.**

Disassemble the brake hub assembly for inspection, maintenance or service as follows:

1. Make sure trailer is on level ground.
2. Chock tires before beginning wheel disassembly.
  - A. Chocked tires will prevent trailer from rolling while brakes are disengaged during disassembly, cleaning, inspection and assembly operations.
3. Loosen wheel lug nuts before raising the trailer to prevent tire from spinning during lug nut removal.
4. After lug nuts have been loosened, raise the trailer until the tire spins freely.
  - A. Continue to lift and support trailer per manufacturer's requirements.
    - I. Use appropriately rated jack stands.
    - II. Place jack stands under the trailer's frame only.
5. Remove all lug nuts from wheel, then remove wheel from brake hub.
  - A. Set wheel and lug nuts aside for later re-assembly.
  - B. Do not lean removed tire against trailer or any jacks. Leaning a heavy tire against a suspended trailer could cause damage to the outside of the trailer or place undue side pressure against a jack, possibly causing the trailer to become unstable.
6. Prior to brake hub disassembly, create a clean area to place removed parts to prevent possible contamination or damage to removed parts.

7. Remove dust cover from hub by prying its edge out of the hub.
  - A. If servicing a brake drum, remove the lubed dust cap with the installed lubed rubber plug.
  - B. If servicing an idler hub, remove the non-lubed dust cap.
  - C. If brake or idler hub assembly is equipped with oil lubrication, place a drip pan underneath the hub.
    - I. Unscrew oil cap using a 2 1/2" socket wrench.
    - II. Let oil drain into drip pan.
8. Remove the grease cap by prying the edge out of the hub. If equipped with oil lubrication, unscrew oil cap using a 1 1/2" socket for 8K, 2 1/4" socket for 10K or a 2 5/8" socket for 12K and 16K. Let oil drain into pan.
9. Pull cotter pin from spindle (castle) nut and discard.
  - A. The cotter pin is a one-time-use item. Do not re-install removed cotter pin.
10. Remove the spindle nut.

**NOTE:** Remaining grease on components can act as a mastic. Inspect removed spindle nut for attached spindle washer.
11. If spindle washer did not come off with the spindle nut, inspect the outer bearing. Grease may have allowed the washer to stick to it.
  - A. Remove spindle washer.
12. Pull brake or idler hub off of spindle as follows:
  - A. Make sure brakes have been disengaged.
  - B. To prevent outer bearing cone falling freely from the assembly, place one hand on the backside outer rim of the hub and the other hand over the outside of the hub bore to cover the bearing cone.
  - C. Slightly turn the hub while pulling to free the hub from the spindle.
    - I. The outer bearing cone will want to drop out of the hub. Secure the bearing and place it in the clean, removed part area.
    - II. The inner bearing cone and cup remains installed within the hub, contained by the grease seal, and will not fall out.
  - D. Remove the grease seal from hub bore as follows:
    - I. Set the brake or idler hub aside on a clean, solid surface with the outer bearing cup side facing down.
    - II. Use a seal puller or equivalent to remove grease seal from hub.
      - a. Do not re-install removed seal.
      - b. Discard removed seal.

## Clean Brake Drum

Older brake linings may contain asbestos dust, which has been linked to serious or fatal illnesses. Certain precautions **MUST** be taken when servicing brakes:

### **WARNING**

**Potential asbestos dust hazard. Do not use compressed air, a dry brush or dry rag to remove brake dust. Disturbed brake dust can become an airborne irritant that can be inhaled or ingested, causing serious personal illness or death. Wear appropriate personal protective equipment (PPE). Use aerosol brake cleaner to wash brake dust away.**

Prior to brake drum inspection, clean the brake drum to remove any brake dust or lubricant film.

1. Avoid creating or breathing any brake dust.
2. Do not machine, file or grind brake linings.
3. Use an aerosol brake cleaner to wash away brake dust.
4. Place a drip pan underneath the brake drum to catch the brake cleaner for proper disposal.

5. Completely wash the entire brake drum, including the backing plate, magnet arm and brake shoes.
6. Inspect brake drum, braking components and backing plate for any remaining pockets of oil, grease or dust.
7. Repeat brake washing step if necessary.
8. Proceed with brake drum inspection.

## Brake Drum Inspection

The brake shoes contact the drum's inner surface and the brake magnet contacts the armature. These surfaces are subject to wear and should be inspected periodically.



**Resurfacing procedures can produce metal chips and brake dust that can contaminate the wheel bearings and cause component failure. Make sure that the wheel bearing cavities are clean and free of contamination before reinstalling bearings and seals.**

1. The drum's inner surface should be re-machined if wear is more than 0.030" or out of round by more than 0.015".
2. The drum should be replaced if scoring or wear is greater than 0.090".

**NOTE:** If the brake drum must be re-machined, the maximum allowable re-bore inner diameter for the 12.25" drum is 12.340". If the size of the machined bore diameter exceeds that dimension, a new brake drum **MUST** be used.

The inner surface of the brake drum that contacts the brake magnet is the armature surface.

1. If the armature surface is scored or worn unevenly, it should not be machined more than 0.030".
  - A. The magnets should be replaced whenever the armature surface is refaced.
  - B. Similarly, whenever the brake magnet is replaced, the armature surface should be refaced.

## Disc Brake Rotor and Pad Inspection

Disc brake pads are a consumable item. Visually inspect disc brake pads every 36,000 miles or 12 months, whichever comes first. Disc brake rotor and brake pad surfaces should be visually checked at the same time. If there are deep grooves on one or both rotor surfaces this is an indication of caliper piston, slider bolt or residual pressure problems. Disc brake rotors should be turned when disc brake pads are replaced. Disc brake pads are available through auto parts stores.

## Disc Brake Caliper

If the disc brake caliper mounting bolts are removed to service the brake system, do as follows:

1. Lubricate the inside of the rubber slider bolt caliper bushings.
  - A. The rubber bushings are not compatible with petroleum-based grease.
  - B. Use silicone-based grease only.
2. Apply blue thread locking compound to the threaded area of the caliper mounting bolts.
3. Install caliper mounting bolts. Torque caliper mounting bolts to 40-50 ft-lbs.

## Bearing Inspection - Inner and Outer

An inspection of the bearing condition can detect early bearing issues. Upon inspection, bearings should look brand new and can be reassembled and used if in this condition.

**NOTE:** Bearing cones and cups are not interchangeable after installation. Each bearing **MUST** always be matched with its mating cup. Bearing cones and cups are replaced in matching sets of one cone and one cup.

## **⚠️ WARNING**

**Wear personal protective equipment (PPE) when using caustic materials. Aerosol, liquid and oil-based paste materials can present splash hazards and skin contact environments that can result in serious adverse eye and skin irritations. Follow all recommended safety precautions when using such materials.**

1. Wash all grease and oil from the bearing cones using a suitable solvent.
2. Dry bearing cones with a clean, lint-free cloth.
3. Inspect bearing cone cages and rollers for any pitting, spalling, corrosion, flat spots, abnormal condition or discoloration.
  - A. If any of these imperfections are present, then the bearing cone and cup (race) **MUST** be replaced at the same time.
  - B. Bearings are available at auto part stores.
    - I. See Components pages for part numbers.
4. To remove a bearing cup (race) for replacement from the brake hub, go to [Bearing Cup Inspection and Removal](#) procedure.

### Bearing Cup Inspection and Removal

## **⚠️ WARNING**

**Wear appropriate personal protective equipment (PPE) when performing service or maintenance operations. Always wear eye protection when servicing trailer axles, brakes, hubs, springs and wheels. Not using PPE may result in serious personal injury or death.**

Clean brake or idler hub in accordance with [Clean Brake Drum](#) procedure and as follows:

1. Wipe all grease and oil from the hub, using care not to scratch or otherwise mar the bearing race.
2. Apply brake cleaner to hub.
3. Use lint-free cloths to dry the hub and bearing cups.
4. Inspect bearing cups (raceways) for pitting, spalling, corrosion, flat spots, abnormal condition or discoloration.
  - A. If the bearing cup (race) is in good condition, and its mating bearing cone is in reusable condition, the cup can remain installed in the hub for reuse.
  - B. If the bearing cup (race) is in good condition, but the bearing cone is not, the cup **MUST** be replaced.
  - C. If the bearing cup (race) is damaged, the cup **MUST** be replaced.

Replace damaged bearing cups (race) as follows:

1. For either inner or outer bearing cup, use a brass drift punch and hammer to lightly tap around the cup's exposed bearing race edge to push it out.
  - A. Move the drift punch evenly around the bearing cup edge to make sure the cup is pushed out evenly to prevent binding or damage to the bearing cup or hub bore.
2. Set the removed bearing cup aside and place it with its mating bearing cone.

**NOTE:** Removed bearing cones and cups are not interchangeable.

**NOTE:** Used bearing cone and cup sets must remain matched and re-installed as a matched set until the set is replaced with a new matching set.

3. After removal of the bearing cups from the hub, re-apply brake cleaner to the hub and the hub bearing cup bores to make sure all surfaces are properly prepared for component reassembly.
  - A. Make sure a drip pan is placed underneath the hub to capture and dispose of the cleaner.

## Brake/Idler Hub Installation

Install the brake or idler hub onto the brake drum or spindle as follows:

1. Obtain appropriate hub for installation.
2. Inspect hub for cleanliness.
3. If both bearing cups are installed in the hub bearing bores, go to the Inner Bearing Cone and Grease Seal Installation procedure.
4. If either one of the bearing cups is not installed in the hub, do as follows:
  - A. Place hub on a solid, flat surface with installed bearing cup side of the hub facing down.
  - B. Obtain the appropriate bearing cup for installation. Refer to the Components pages for part numbers.



**Bearing cup replacement is a precise procedure. When installed, the bearing cup MUST be fully seated against the retaining shoulder of the hub. If the cup is not seated correctly, damage to the completed hub assembly may occur, voiding warranty.**

- C. Bearing cup replacement is a precise procedure. Consult LCI prior to replacing a bearing cup. The trailer should be taken to a certified service center for this work to be done.
- D. Gently place new bearing cup into hub bearing bore.
- E. Using a brass drift punch, lightly tap around the outer edge of the cup to drive it into the hub bearing bore.
  - I. Continue tapping the drift punch around the circumference of the cup's edge until the cup is fully seated against the hub's bearing bore retaining shoulder.
- F. Wipe the inside of the bearing cup (race) with a clean, lint-free cloth.
  - I. Inspect the bearing cup race to make sure no damage occurred during installation.
5. If no bearing cups are installed in the hub, do as follows:
  - A. Perform step 4 of this procedure.
  - B. Flip hub, exposing the other, open hub bearing bore.
  - C. Perform step 4 of this procedure.
  - D. Make sure both bearing cup races are clean and ready for bearing cone and grease seal installation.
6. After both bearing cups have been installed in the brake or idler hub, go to Inner Bearing Cone and Grease Seal Installation procedure.

## Inner Bearing Cone and Grease Seal Installation

Bearing grease should be replaced every 36,000 miles or 12 months, whichever comes first.

1. Make sure all old grease has been removed from wheel hub, bearings and axle spindle.
2. Make sure all mating surfaces for new bearing cone and grease seal are clean.
3. Bearings should be packed by machine, if possible, however packing by hand is a viable alternative.

**⚠️ WARNING**

**Do not mix lithium, calcium, sodium or barium complex greases. Mixing of these incompatible compounds can create a corrosive and/or toxic chemical with fumes that can result in a serious health risk if exposed to skin or lungs. When converting from one grease to another, make sure all old grease is removed completely prior to applying new grease.**

Hand-pack inner bearing cone as follows:

1. If previously removed inner bearing cone is in reusable condition, place a generous amount of grease into the palm of your hand (Fig. 1).

**NOTE:** Select an appropriate grease that is temperature-rated for the wheel's application. Reference Recommended Wheel Bearing Grease Specifications and Approve Sources - Bearing Grease charts.

- A. If previously removed inner bearing cone cannot be reused, obtain a new inner bearing cone. Refer to the Components pages for part numbers.
- B. Place a generous amount of grease into the palm of your hand (Fig. 1).

**Fig. 1**



| Recommended Wheel Bearing Grease Specifications |  |
|---|--|
| Thickener Type                                  | Lithium Complex                        |
| Dropping Point                                  | 230°C (446°F) Minimum                  |
| Consistency                                     | NLGI No. 2                             |
| Additives                                       | EP, Corrosion and Oxidation Inhibitors |
| Base Oil  | Solvent Refined Petroleum Oil          |
| Base Oil Viscosity                              | @40°C (104°F) 150cSt (695 SUS) Minimum |
| Viscosity Index                                 | 80 Minimum                             |
| Pour Point                                      | -10°C (14°F) Minimum                   |

| Approved Sources - Bearing Grease |                                   |
|-----------------------------------|-----------------------------------|
| Mobil Oil                         | Mobilgrease HP                    |
| Exxon/Standard                    | Ronex MP                          |
| Kendall Refining Co.              | Kendall L-427                     |
| Ashland Oil Co.                   | Valvoline Val-plex EP Grease      |
| Pennzoil Prod. Co.                | Premium Wheel Bearing Grease 707L |

**NOTE:** Select appropriate grease that is temperature-rated for the wheel's application.

2. Press widest end of bearing into the outer edge of the grease pile, forcing grease into the inner area of the bearing between two adjacent rollers (Fig. 1).
3. Repeat this process while turning bearing from roller to roller until all rollers are coated.
4. Apply a light coat of grease into the bearing cup surface (race).
5. Install new grease-packed bearing cone into the cup.

LCI recommends replacing the grease seal whenever bearing packing is required. Install a new grease seal into the hub seal bore, to capture the inner bearing cone, as follows:

- 1.** Place the new grease seal into the seal bore.
  - A.** Apply a light film of sealant onto the outer rim of the seal.
  - B.** Make sure seal is set square to the hub seal bore before pressing the seal all the way in or the seal may become damaged.
- 2.** Use a clean, hardwood block of wood and hammer to drive the seal into the seal bore (Fig. 2).
  - A.** Place the wood block evenly across the seal.
  - B.** Hold the wood block firmly in place as you begin to tap the seal squarely into the seal bore with the hammer.
  - C.** Continue to tap the seal inward until the seal's outer face is flush to the hub's seal bore face.

**Fig. 2**



## Bearing Lubrication - Oil

### **Recommended Oil Lube for axle bearings:**

Oil designation : SAE 90, SAE 80W-90, SAE 75W-90

| Approved Sources - Bearing Lubrication Oil |                        |
|--|------------------------|
| Union Oil Co.                              | Unocal MP Gear Lube    |
| Exxon Co.                                  | Gear Oil GX 80W-90     |
| Mobil Co.                                  | Mobilube SHC 75W-90    |
| Pennzoil Co.                               | Gear Plus 80W-90 GL-5  |
|  | Gear Plus Super 75W-90 |

The axle bearings are lubricated with a SAE 80-90W hypoid gear oil. Periodically check oil levels as follows:

1. Make sure trailer has been parked for a few minutes to allow oil to cool.
2. Check and refill brake hub oil to the level indicated on the plastic oil cap.
3. To fill brake hub with oil, remove rubber plug or cap plug from the hub's oil cap.
4. Fill oil through the plastic cap until oil level is complete.
5. Insert rubber plug or cap plug into plastic oil cap.

### **⚠ CAUTION**

**Do not overtighten plastic oil cap. Overtightening can damage O-ring, resulting in an oil leak.**

- A. Tighten oil cap to 25 ft-lbs. Do not overtighten oil cap or an oil leak may occur. Refer to the Components pages for part numbers. Refer to Approved Sources - Bearing Lubrication Oil chart for recommended axle bearing lubricants.

## Oil Seal

### **⚠ CAUTION**

**Never install a removed oil seal. Installing a removed oil seal may damage the seal, resulting in an oil leak during normal component operation.**

A new two-part oil seal must be installed whenever the brake hub is removed for maintenance. The inside diameter of the two-part seal presses onto the spindle journal, the outside diameter of the seal presses into the brake hub bore.

### **⚠ CAUTION**

**Make sure the oil seal is properly oriented during part installation. Most oil seals have one side marked "AIR SIDE." This side MUST face outwards and not towards the bearing or component failure will occur.**

Make sure when installing a new oil seal the side marked "AIR SIDE" is facing outward, away from the bearing cone.

## Periodic Bearing Inspection

A physical bearing inspection should be conducted every 36,000 miles or 12 months, whichever comes first. An inspection of the bearing condition can detect early bearing issues. Upon inspection, bearings should look brand new and can be reassembled and used if in this condition. If discoloration, pitting, corrosion, flat spots or some abnormal condition is observed, the bearing and race should be replaced at the same time. Bearings are available at auto part stores. See Components pages for part numbers.

## Spindle Nut Adjustment

The proper method to assemble the spindle nut is as follows:

1. After hub installation onto spindle, install outer bearing.
2. Install spindle washer, if equipped, and thread on spindle nut with slots facing outward.
3. Tighten spindle nut with a pair of slip joint pliers to approx 50 ft-lbs.
4. Back off torque usually 1/4 turn so that you can finger tighten the spindle nut.
5. Finger tighten, drop cotter pin through slot and hole in spindle. If slot in nut does not align with either hole in spindle, back nut off until it does. Never tighten past finger tight. Use cotter pin hole that provides the least amount of end play clearance.
6. Bend legs over end of spindle and be sure legs do not interfere with oil cap upon reassembly.

## **Disc Brake Option**

### Disc Brake Pads

Disc brake pads are available through auto part stores. Brake pads are a consumable item so be sure to visually check pads every 36,000 miles or 12 months, whichever comes first. Be sure to also check rotor surfaces visually when you are checking the brake pads. Deep grooves developing on one or both rotor surfaces can indicate a caliper piston, slider bolt or residual pressure problem if this ever occurs. Brake rotors should be turned when disc brake pads are replaced.

### Disc Brake Caliper

The proper mounting torque for the disc brake caliper mounting bolts is 40-50 ft-lbs. If these are removed for servicing the brake system, add blue thread locking compound to the threaded area of the bolt at time of reassembly. Also lubricate the inside of caliper bushings that the slider bolts go through. Be sure to only use silicone based grease. The rubber bushings are not compatible with petroleum-based greases.

## **Electric Brakes**

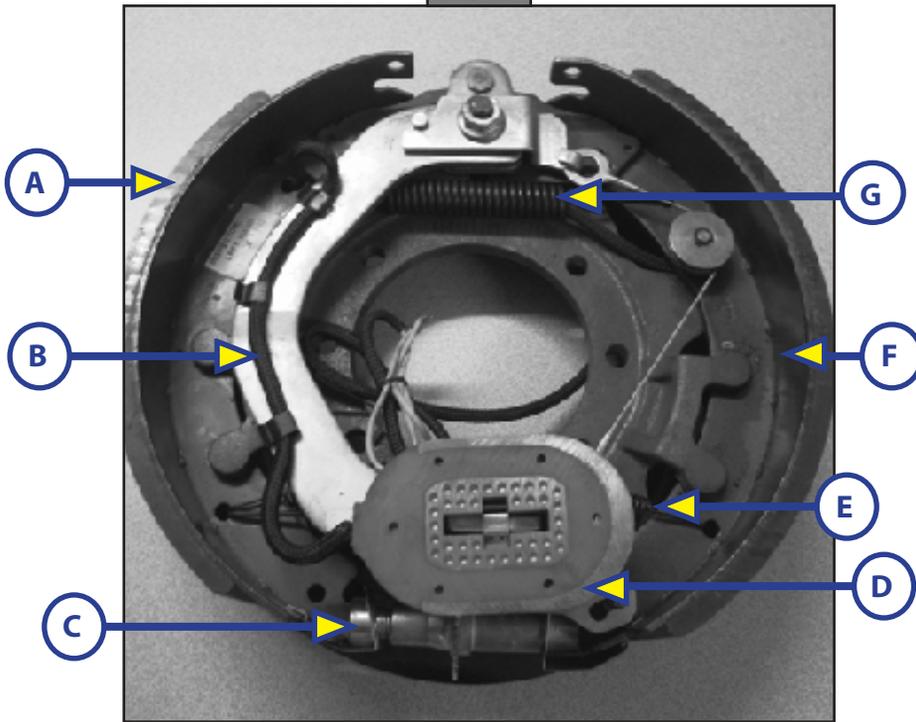
The basic structure of the Electric Brakes on your trailer will resemble the brakes on your car or tow vehicle, with one major difference; your trailer implements an Electric Actuation system and your tow vehicle utilizes a hydraulic system. Refer to the brake components diagram (Fig. 3), the Wiring Diagram (Fig. 13) and Pigtail and Coupler Wiring Color Codes (Fig. 14). The Electric Braking System operates in the following order of steps:

1. Electric current is supplied to the trailer's braking system when the tow vehicle's brakes are applied.
2. From the tow vehicle's battery, the electricity flows to the brake's electromagnet.
3. When energized, the magnets are attracted to the rotating surface of the drums.
4. This moves the actuating levers in the direction the drums are turning.
5. The actuating cam at the end of the shoe forces the primary shoe out to the drum surface.
6. The force of the primary shoe actuates the secondary shoe to contact the drum.
7. The force applied to the brake drum can be increased by elevating the current flow to the magnet.

### How to Use Lippert Electric Brakes Properly

The LCI Electric Braking System is synchronized with the tow vehicle's brakes. Never attempt to stop the combined load of the tow vehicle and the trailer by using either the tow vehicle brakes or the trailer brakes only. They are designed to work together.

Fig. 3



| Brake Components |                   |
|------------------|-------------------|
| Callout          | Description       |
| A                | Primary Shoe      |
| B                | Actuating Lever   |
| C                | Adjuster          |
| D                | Magnet            |
| E                | Adjusting Spring  |
| F                | Secondary Shoe    |
| G                | Retracting Spring |

Small manual adjustments may occasionally be necessary to accommodate changing loads and driving conditions. Synchronization of the tow vehicle-to-trailer braking can only be accomplished by road testing. Locking up, excessive grab, or delayed application is quite often due to the lack of synchronization between the tow vehicle and the trailer being towed. High voltage (2V+), Low voltage (2V-) or improperly adjusted brakes are the most common causes of these problems and can easily be corrected.

Prior to any adjustments, your trailer brakes should be burnished-in by applying the brakes 20-30 times with a 20 m.p.h. decrease in speed, e.g. 40 m.p.h. to 20 m.p.h. Allow ample time for brakes to cool between application. This allows the brake shoes and magnets to begin seating to the brake drum.

## General Maintenance - Electric Brakes

### Brake Adjustment

#### **⚠ WARNING**

**Prior to testing or adjusting brakes, be sure area is clear of any persons and vehicles. Failure to perform test in a clear area may result in serious injury or death.**

#### **⚠ WARNING**

**Lift the trailer by its frame and never the axle or suspension. Do not go under the trailer unless it is properly supported by jack stands. Unsupported trailers can fall causing serious injury or death.**

The LCI Electric Brakes are offered in a manual and automatic adjusting form. If manual brake adjusting is required, do as follows:

1. Jack up trailer and secure on adequate capacity jack stands.
  - A. Follow trailer manufacturer's recommendations for lifting and supporting the trailer.
  - B. Make sure the wheel and drum rotate freely.

2. Remove the adjusting hole cover from the adjusting slot on the bottom of the brake backing plate.
3. With a screwdriver or standard adjusting tool, rotate the starwheel of the adjuster assembly to expand the brake shoes.
  - C. Adjust the brake shoes out until the pressure of the linings against the drum makes the wheel very difficult to turn.
4. Rotate the starwheel in the opposite direction until the wheel turns freely with a slight lining drag, or approximately 10 click adjustments.

**NOTE:** A second screwdriver will be needed to push the auto adjusting lever away from the adjuster starwheel so that the starwheel can be rotated backward in the case of a self-adjusting brake.

5. Replace the adjusting hole cover and lower the wheel to the ground.
6. Repeat the above procedure on all brakes.

**NOTE:** For best results, the brakes should all be set at the same clearance. If the first brake's clearance was adjusted to 10 clicks, then adjust the remaining brake clearances to the same amount.

## Lubricate Brakes

Prior to reassembling the brake drum assembly, do as follows:

1. Apply a light film of white grease or an anti-seize compound to:
  - A. The brake anchor pin,
  - B. The actuating arm bushing and pin,
  - C. The areas of the backing plate that are in contact with the brake shoes and magnet lever arm,
  - D. And on the actuating block mounted to the actuating arm.

## Clean and Inspect Brakes

In the event the braking system encounters symptoms of improper application or failure, immediate inspection and service **MUST** be implemented. During normal use, servicing the braking system once a year is considered normal. Above normal use will require servicing based on a 3,000-6,000 mile increment schedule. Change worn magnets and shoes as needed to maintain maximum braking capability.

When disassembling the brakes for cleaning, make sure to:

1. Clean the backing plate, magnet arm, magnet and shoes.
2. Make sure all parts removed for cleaning are placed back into the same brake drum assembly.
3. Check for parts that have become loose or worn.
  - A. Service or replace loose or worn parts.

## Magnets

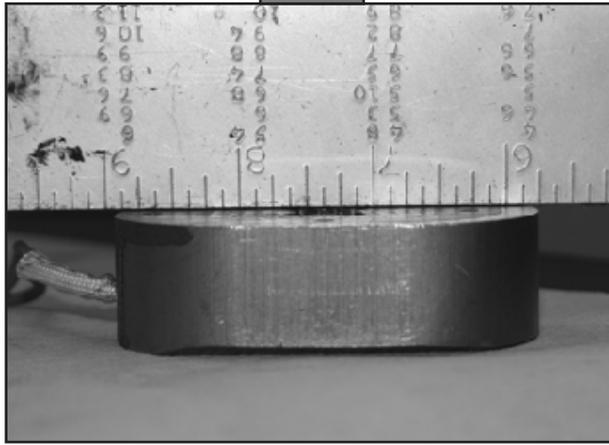
The LCI Electric Braking System uses high-quality electromagnets to actuate the brake shoes. These electromagnets provide superior force and friction to safely, and effectively, stop the trailer. Inspect and service the electromagnets annually if the trailer has seen normal use, more often if the trailer is used extensively. Inspect the electromagnets and do as follows:

1. Use a straight edge to check the electromagnet surface for uneven wear (Fig. 4).

**NOTE:** Figure 4 shows an electromagnet with little or no wear.

- A. Surface of electromagnet should be completely flat.
  - B. If abnormal or uneven wear is indicated by pronounced gaps, replace the electromagnet.
2. If the magnet's coil is exposed in any way, even if normal wear is evident, the magnets should be replaced immediately.
  - A. If the electromagnets are replaced, the drum armature surface should be refaced.
3. If an electromagnet is replaced on one side of an axle, LCI recommends replacing the electromagnet on the opposite brake assembly. This will ensure an even braking capacity.

**Fig. 4**



## Shoes and Linings

Inspect brake shoes and linings for:

1. Grease or oil.
2. Surface scoring, pitting or gouges.
3. Replace both shoes if lubricant contamination or physical damage is present, even if found on only one shoe.
  - A. Replace both shoes (two) on the brake and on both brakes (four) installed on the same axle. Replace brake parts at the same time. This will ensure an even braking capacity.
4. Measure lining thickness.
  - A. Lining thickness shall not be less than 1/16".
    - I. If lining measures less than 1/16", replace the shoe.
    - II. Repeat step 3.A.
5. Heat cracks are normal and rarely require attention.

After replacing the brake shoes and linings, burnish-in trailer brakes as follows:

1. Apply the brakes 20-30 times over a 20 m.p.h. decreasing speed range.
  - A. For example, brake 20-30 times while decreasing in speed from 40 m.p.h. to 20 m.p.h.
  - B. Make sure ample time is allowed for brakes to cool between application.
    - I. The cooling period allows the brake shoes and magnets to begin seating to the brake drum.

## Hub Replacement

To adjust bearings or replace removed hub, follow procedures below:

1. Place hub, bearing, washers and castle nut back on axle spindle in the reverse order from which they were removed. Castle nut should be torqued to 50 ft.-lbs. Hub will rotate during this process.
2. Loosen castle nut to back off the torque.
3. Tighten castle nut finger tight until snug.
4. Insert cotter pin. If cotter pin does not line up with hole, back castle nut up slightly until pin can be inserted (Fig. 5).
5. Bend cotter pin over to lock nut in place. Nut should be free to move with only the cotter pin keeping it in place.

Fig. 5



## Axle and Suspension Installation

### **CAUTION**

**Always wear eye protection when servicing the axle, brakes, hubs, springs and wheels. Failure to wear eye protection may result in serious injury.**

The single most important portion of axle installation is setting the axle(s) square to the center line of the trailer. Axles mounted out of square will cause the trailer to dog track. Dog-tracking is when the axle is not square to the direction of travel. A skewed axle will cause the trailer to swing out to the left or right until the axle becomes square with the direction of travel.

When mounting multiple axles to a trailer, take extra care to get the first axle square to the trailer frame. Proper alignment is most readily achieved by measuring from the center of the trailer hitch to the center of each axle spindle. Once the first axle alignment is established, set the remaining axles parallel with the first. Proper installation allows for correct and safe control, prolonged tread life and will all but eliminate dog-tracking.

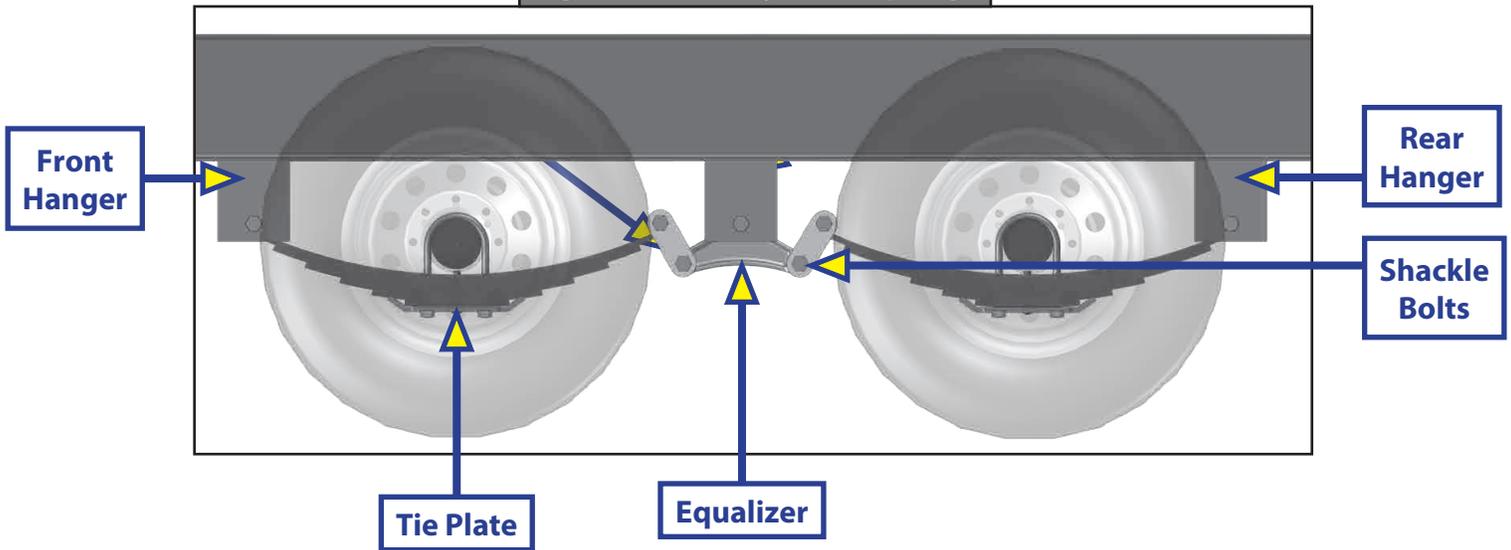
LCI tubular axles are made of high strength steel to prevent metal fatigue and provide the best possible welding conditions. The round tubular axles allow for even and uniform structure.

## Suspension Systems

The suspension systems incorporated into LCI axles are designed to provide the following benefits:

- Attach the axle to the trailer.
- Dampen the effects of road shock.
- Provide stability to the trailer.
- All LCI suspension systems are available in single, tandem and triple axle configurations. For specific or custom applications, please contact the LCI customer service team.

**Fig. 6 - Double-Eye Leaf Springs**



### Double-Eye Leaf Springs

Double-eye leaf springs have eyes at either end of the spring assembly with nylon bushings to assist in preventing wear. U-bolts hold the springs to the axle with a plate (Fig. 6). Refer to Spring Axle Torque Specifications chart for bolt torque requirements.

| Spring Axle Torque Specifications      |                 |               |
|--|-----------------|---------------|
| Bolt Type                              | Axle Capacity   | Torque        |
| 9/16" U-Bolt Nuts                      | 8K              | 90 ft-lbs     |
| 5/8" U-Bolt Nuts                       | 10K             | 95 ft-lbs     |
| 5/8" U-Bolt Nuts                       | 12K-16K         | 115 ft-lbs    |
| Spring Eye, Equalizer and Shackle Nuts | 8K Double Eye   | 30-50 ft-lbs  |
| Spring Eye, Equalizer and Shackle Nuts | 8K Slipper      | Snug nut only |
| Spring Eye Nut                         | 10K-16K Slipper | 200 ft-lbs    |
| Equalizer Nut                          | 10K-16K Slipper | 300 ft-lbs    |
| Keeper Nut                             | 10K-16K Slipper | Snug nut only |

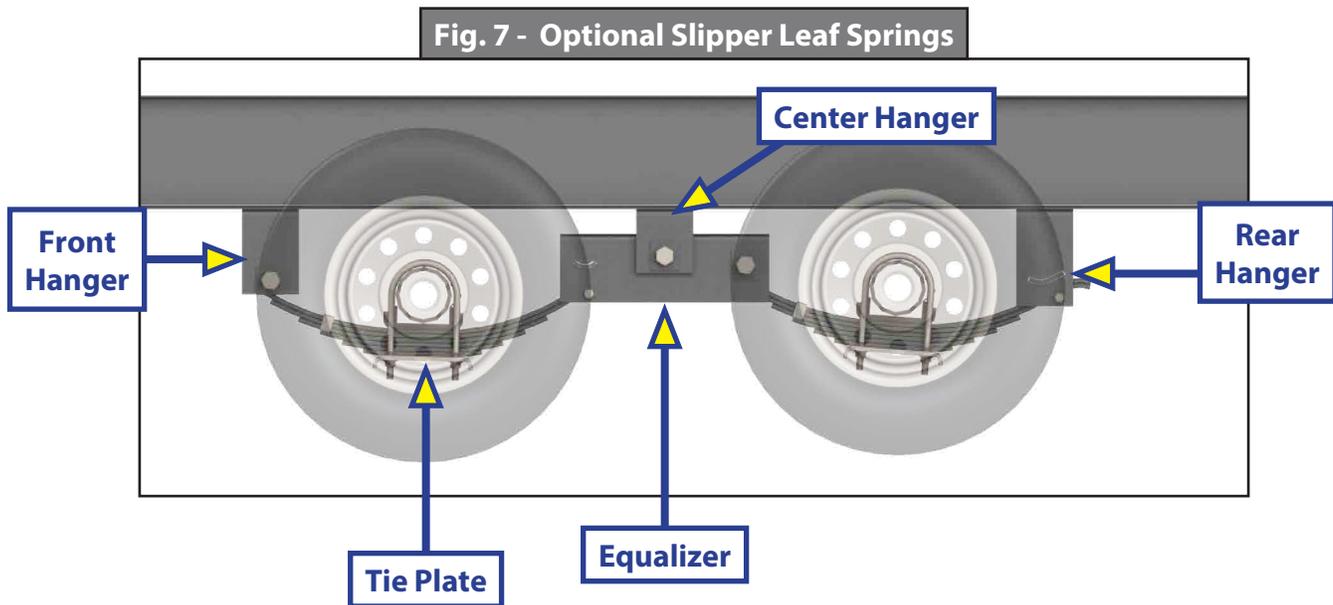
The articulation of this suspension occurs when the eyes rotate on the wear surfaces provided in eyes of the springs and on the equalizers. This suspension is also available in single and multiple axle configurations. In trailers with two or more axles, the additional movement is maintained by an equalizer. This feature allows for even load handling from axle to axle.

Double-eye suspension systems are available only on 8,000 lb. axles. Tandem and triple axle mounting kits are available for both 33" and 35" axle spacing.

## Slipper Leaf Springs—Optional

Slipper springs have a loop eye formed on one end and a reverse radius on the other (Fig. 7). The front eye is secured to either the front hanger or rear of the equalizer with a bolt and nut. The slipper end rides against a wear-block located in either the front of the equalizer or the rear hanger. Refer to Spring Axle Torque Specifications chart for bolt torque requirements.

A keeper bolt or strap is placed under the slipper end to contain the spring when the trailer is lifted off the ground. 8K tandem and triple axle attaching kits are available for both 33.5" and 36" axle spacing. 10K, 12K and 16K tandem and triple axle kits are available for 42.25" or 48.5" axle spacing.



## Torsion Suspension System

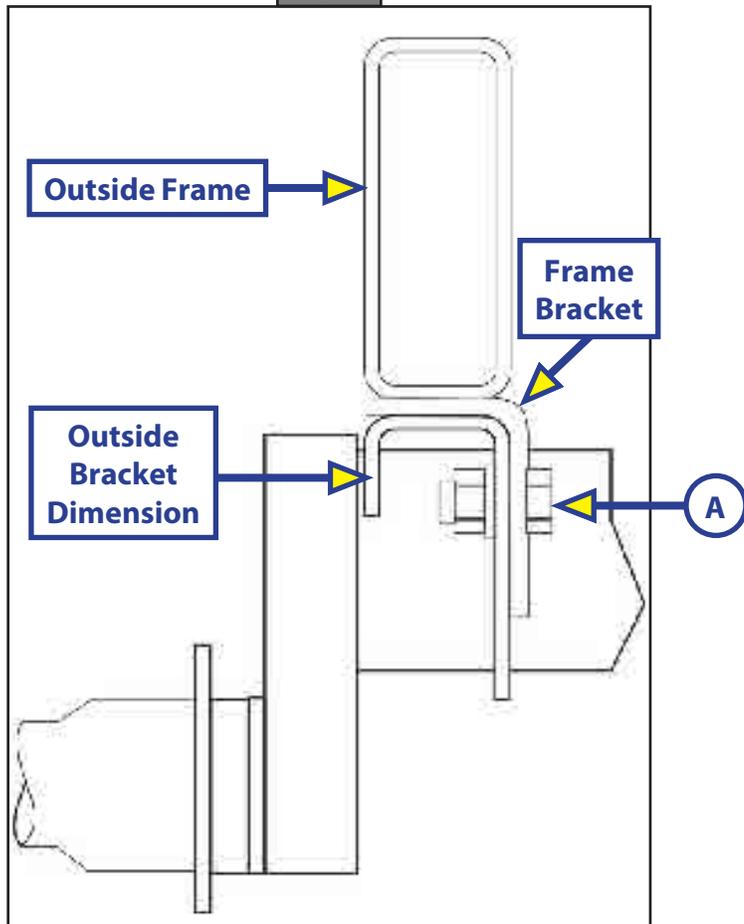
The LCI Torsion Suspension system is designed to offer superior qualities over leaf spring technology. Bracketed to the trailer's frame, and housed inside the trailer axle's tube, the spindle is connected to a swing arm, which is connected to a square inner bar surrounded by four rubber cords inside the axle tube. As the swing arm rotates, the rubber absorbs and distributes torque and resistance loads generated by driving conditions. These characteristics provide a measurable benefit over leaf spring suspensions. Torsion axles provide independent wheel end suspension, quieter ride and more vertical wheel travel for a softer ride compared to leaf spring axles.

The LCI Torsion Suspension system requires very little maintenance. Normal inspection of the entire LCI Trailer Axle system can be applied to the Torsion Suspension system. See inspection procedures for system components in this manual.

**NOTE:** For Torsion Suspension System installation, mount axle bracket to frame bracket (Fig. 8) and torque fasteners as specified in the Torsion Axle Torque Specifications chart. Washer(s) **MUST** be placed against the slotted hole in the axle bracket (Fig. 8A). Low profile brackets have plain round holes.

| Torsion Axle Torque Specifications |           |                |
|------------------------------------|-----------|----------------|
| Axle Size                          | Bolt Size | Torque Range   |
| 8K-10K<br>Axle Capacities          | 5/8"      | 120-150 ft-lbs |

Fig. 8



## Inspection

Inspect all components of the suspension system annually or every 36,000 miles, whichever comes first. Visually inspect the system for signs of wear, damage or loose fasteners. Replace or tighten loose fasteners, as necessary. Torque fasteners in accordance with specifications in tables Spring Axle Torque Specifications and Torsion Axle Torque Specifications.

### **⚠ WARNING**

**Lift the trailer by its frame and never the axle or suspension. Do not go under the trailer unless it is properly supported by jack stands. Unsupported trailers can fall causing serious personal injury or death.**

### **⚠ WARNING**

**Lift the trailer by its frame and never the axle or suspension. Unsupported trailers can fall causing damage to the frame, axles, suspension system and the trailer. Improper trailer support will void warranty coverage for incurred damages.**

### **⚠ WARNING**

**Wear eye protection when servicing axles, brakes, hubs, springs and wheels. Failure to wear eye protection may result in serious personal injury.**

Refer to the Components pages and the appropriate Service Kit Part # (illustrated parts list) for part descriptions and numbers of replacement components. Replace worn spring eye bushings and sagging or broken springs as follows:

1. Support the trailer with the wheels just off the ground. Follow the trailer manufacturer's recommendations for lifting and supporting the trailer.
2. After the trailer is properly supported, place a suitable block under the axle tube near the area to be repaired.

**NOTE:** The block acts as a support for the weight of the axle only, allowing suspended system components to be serviced or replaced freely. Multiple axle trailers **MUST** have the weight of each axle properly supported before disassembly of any suspension system component.

3. Disassemble the U-bolts, nuts and tie plates.
4. Remove the spring eye bolts and the spring.
5. If the spring eye bushings are to be replaced, press out the old bushing by hand or use a punch to tap it out.
6. Obtain a new free-floating nylon bushing.

**NOTE:** Free-floating nylon bushings do not require lubrication.

7. Press the new bushing into the spring eye by hand or gently tap it into place with a bounce-less rubber or plastic mallet.
8. Install remaining repaired or new suspension system components in reverse order of their original disassembly sequence.

## Equalizer Replacement

Refer to the Components pages and the appropriate Service Kit Part # (illustrated parts list) for part descriptions and numbers of replacement components. Replace equalizer or equalizer bushings as follows:

1. Support the trailer with the wheels just off the ground. Follow the trailer manufacturer's recommendations for lifting and supporting the trailer.
2. After the trailer is properly supported, place a suitable block under both axle tubes.
3. Remove the spring eyebolt, keeper bolt, and equalizer bolt from the equalizer.
4. Press the old nylon bushing out of the equalizer.
5. Install removed equalizer parts in reverse order of their original disassembly sequence.

## Suspension Replacement

Install replacement springs and equalizers as follows:

1. Make sure springs are on straight.
  - A. Align spring eyes to front hanger.
  - B. Insert spring eye bolts and nuts, but do not torque fasteners at this point.
2. Assemble springs to equalizer.
3. Level the equalizer to the frame.
  - A. Torque equalizer nuts and spring eye nuts to 30-50 ft.-lbs.

## Adjustable Spring Seats

LCI 10K axles have one adjustable spring seat, the other is fixed. This arrangement allows for squaring the axles to the gooseneck coupler. The procedure for this adjustment is contained in Lippert's Technical Information document [TI-152](#). You may view or download this document at: <http://www.lci1.com/support-spring-axles/>. Once on the site's web page, click on the Technical Information Sheets tab. From the displayed listing, double click on *TI - 152: Adjustable Spring Seat* to open the document.

## **Wheels**

### Wheel Selection

#### **⚠ WARNING**

**Air pressure on a weakened or cracked rim can create an unsafe, explosive condition resulting in serious personal injury or death. Do not attempt to modify or repair a wheel. Replace damaged or weakened wheel and rim with new.**

#### **⚠ WARNING**

**Use manufacturer's suggested rim contours only. Failure to use recommended rim contours may result in dramatic separation between tire and wheel, resulting in possible serious personal injury or death.**

Trailer wheels, tires and axles **MUST** be properly matched when specifying or replacing trailer wheels. Make sure the following critical wheel replacement characteristics are observed:

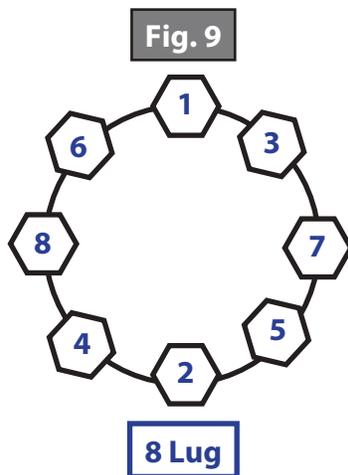
1. Bolt Circle.
  - A. Wheels have varying bolt circle patterns, some close enough to allow installation of mismatched wheel bolt patterns to axle hub bolt patterns.
2. Capacity.
  - A. Wheel load capacity **MUST** match tire and trailer maximum load ratings.
3. Offset.
  - A. The relationship of the tire's centerline to the axle's hub face **MUST** match across replacement parts.
  - B. Failure to match offset reduces axle carrying capacity.
4. Rim Contour.
  - A. Replacement wheels **MUST** directly match the mating rim contour.

### Torque Requirements

It is extremely important to maintain proper wheel mounting torque limits on your trailer axle. Use of torque wrenches will ensure proper torque limits are applied to wheel mounting lug nuts. Use no other method to torque wheel lug nuts.

Make sure wheel fasteners match the cone angle of the wheel (usually 60° or 90°) being serviced. Attach new wheel to the axle hub as follows:

1. Start all bolts or nuts by hand to prevent cross-threading.
2. Continue to hand-tighten wheel lug nuts in the sequential pattern shown in Fig. 9.
3. After wheel lug nuts are fully hand-tightened, torque nuts in stages in the sequential pattern shown in Fig. 9.
  - A. Torque wheel lug nuts to the torque values listed in the Wheel Torque Requirement Chart.



| Wheel Torque Requirement Chart |           |                 |                |                |
|--------------------------------|-----------|-----------------|----------------|----------------|
| Wheel Size                     | Stud Size | Torque Sequence |                |                |
|                                |           | 1st Stage       | 2nd Stage      | 3rd Stage      |
| 16" Dual and 17.5" Cone Nut    | 5/8"      | 50-60 ft-lbs    | 100-120 ft-lbs | 190-210 ft-lbs |
| 16" Dual and 17.5" Flange Nut  | 5/8"      | 50-60 ft-lbs    | 150-200 ft-lbs | 275-325 ft-lbs |
| 17.5" Dual Flange Nut          | M22       | 50-100 ft-lbs   | 250-300 ft-lbs | 450-500 ft-lbs |

**⚠ WARNING**

**Proper and accurate torque MUST be maintained to prevent wheels from loosening, studs from cracking and/or breaking or other possible hazardous breakage resulting in serious injury or death.**

4. Wheel lug nuts should be torqued before first road use and after each wheel removal.
  - A. Check and re-torque wheel lug nuts after 10, 25 and 50 miles. A periodic check during regular service is recommended.

## Tires

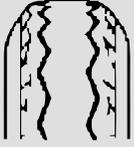
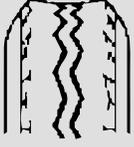
Prior to mounting tires onto wheels, do as follows:

1. Make sure rim size and contour are approved by the Tire and Rim Association Yearbook or the tire manufacturer's catalog.
2. Verify tire load rating.
  - A. If the load is not evenly distributed across all tires, use the tire rated for the heaviest wheel position.
3. Consult the Rubber Manufacturers Association or the tire manufacturer's guidelines for wheel mounting procedures.

Tire pressure is very important to promoting tire life and performance. Tire pressure should always be in accordance with the manufacturer's recommended pressure rating for any given load. Check tire pressure as follows:

1. Always check tire pressure cold before operation.
2. Do not bleed air from tires when they are hot.

## Tire Tread Wear Pattern Chart

| What Is Happening?   | Why?                           | What Should Be Done?   |
|--|--------------------------------|--|
| Center Wear<br> | Over-inflation                 | Adjust pressure to particular load per tire catalog.                               |
| Edge Wear<br>   | Under-inflation                | Adjust pressure to particular load per tire catalog.                               |
| Side Wear<br>   | Loss of camber or overloading  | Make sure load does not exceed axle rating. Call LCI Service & Warranty to advise. |
| Toe Wear<br>    | Incorrect Toe-in               | Call LCI Service & Warranty to advise.   |
| Cupping<br>     | Out-of-balance                 | Check bearing adjustment and balance tires.  |
| Flat Spots<br> | Wheel lockup and tire skidding | Avoid sudden stop if possible and adjust brakes.                                   |

3. Check inflation pressure weekly during use to ensure maximum tire and tread life.
4. Inspect for tire tread wear patterns that may indicate serious wheel alignment or excessive load limit issues. Refer to the Tire Tread Wear Pattern Chart.

**NOTE:** Tire wear should be checked frequently. Once a tire wear pattern is established, stopping becomes difficult, even when the underlying cause is corrected.

## Introduction to Troubleshooting

The following section is a guideline for ensuring operation of your braking system. The safety of you, those traveling with you and those sharing the road is paramount and it starts with the ability to safely stop the tow vehicle and the towed vehicle.

### Troubleshooting

Most brake malfunctions can be corrected by utilizing the Troubleshooting Chart. Mechanical failure is the most common form of malfunction, however, if the brake system fails and it's not mechanical, it is usually electrical. A Voltmeter and Ammeter are essential tools to diagnosing these problems.

Mechanical problems are mostly self-evident; something is bent or broken. Consult the Troubleshooting Chart to determine the probable cause and corrective actions for a variety of issues with the braking system.

Remember to use only LCI replacement parts on these systems. Consult the Limited Warranty or call our Service Department for any other related issues.

## Troubleshooting Chart

**NOTE:** If all trailer lights and brakes do not work, check your wiring plug connection (Wiring Diagram, Fig. 13). Make sure the ball is making solid contact with the coupler (that is how a trailer is grounded). Too much grease or not using dielectric grease on the ball and coupler can cause this to happen.

### Measuring Voltage

The Braking System voltage is measured at the two lead wires of the magnet on any brake. Use the pin probes inserted through the insulation of the lead wires. To ensure that the battery is indicating a full charge, the towing vehicle engine should be running with the trailer coupler connected when checking the voltage.

Voltage in the system should begin at 0 volts and, as the brake pedal of the tow vehicle is applied, voltage will gradually increase to about 12 volts. If the system does not indicate at least 12 volts, problems may occur in the wiring of the system, the battery or alternator of the tow vehicle.

When the brakes are applied, a gradual increase in voltage is preferable to a quick increase to 12 volts. A gradual increase in voltage ensures smooth and firm trailer braking. A quick increase in voltage will cause the braking system to feel like the trailer is grabbing too quickly.

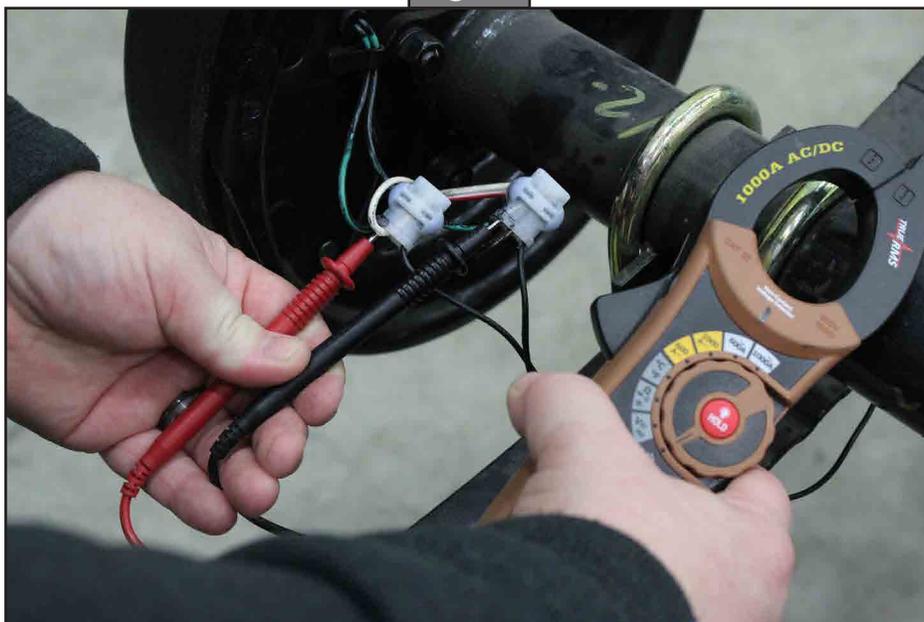
Taking a voltage reading is usually done with probes inserted into the wire connector (Fig. 10).

### Measuring Amperage

Braking System amperage is the amount of current flowing through the system when all magnets have been energized. Amperage will change proportionately with voltage. To ensure the battery is fully charged, the tow vehicle engine should be running with the trailer coupler connected when checking the voltage.

If a resistor is used in the brake system, it **MUST** be set at zero or bypassed completely to obtain the maximum amperage reading. Individual amperage draw can be measured by inserting the ammeter in the line at the magnet you want to check. Disconnect one of the magnet lead wire connectors and attach the ammeter between the two wires. Consult Amperage Chart for normal amp readings.

Fig. 10



| Troubleshooting Chart   |  |  |
|-------------------------|--|--|
| What Is Happening?      | Why?                                   | What Should Be Done?                   |
| No brakes               | Open circuits                          | Find and correct                       |
|                         | Short circuits                         | Test and correct                       |
|                         | Severe under-adjustment                | Adjust brakes                          |
| Weak brakes             | Grease or oil on magnets or linings    | Clean or replace                       |
|                         | Corroded connections                   | Clean and correct cause of corrosion   |
|                         | Worn linings or magnets                | Replace                                |
|                         | Scored or grooved brake drums          | Machine or replace                     |
|                         | Improper synchronization               | Correct                                |
|                         | Under-adjustment                       | Adjust brakes                          |
|                         | Glazed Linings                         | Re-burnish or replace                  |
| Locking brakes          | Under-adjustment                       | Adjust                                 |
|                         | Improper synchronization               | Correct                                |
|                         | Loose, bent or broken brake components | Test and correct                       |
|                         | Out-of-round brake drums               | Machine or replace                     |
|                         | Insufficient wheel load                | Adjust system resistor and synchronize |
| Intermittent brakes     | Broken wires                           | Test and correct                       |
|                         | Loose connections                      | Repair or replace                      |
|                         | Faulty ground                          | Find and repair                        |
| Brakes pull to one side | Wrong magnet lead wire color           | Adjust                                 |
|                         | Incorrect adjustment                   | Correct                                |
|                         | Grease or oil on linings or magnets    | Clean or replace                       |
|                         | Broken wires                           | Find and repair                        |
|                         | Bad connections                        | Find and repair                        |
| Harsh brakes            | Under-adjustment                       | Adjust                                 |
|                         | Improper synchronization               | Correct                                |
| Noisy brakes            | Under-adjustment                       | Adjust                                 |
|                         | Lack of lubrication                    | Lubricate                              |
|                         | Broken component                       | Replace component                      |
|                         | Incorrect brake components             | Correct                                |
| Surging brakes          | Grease or oil on linings or magnets    | Clean or replace                       |
|                         | Out-of-round or cracked brake drums    | Machine or replace                     |
| Dragging brakes         | Over-adjustment                        | Readjust                               |
|                         | Out-of-round brake drums               | Machine or replace                     |
|                         | Incorrect brake components             | Replace                                |
|                         | Loose, bent or broken brake components | Replace                                |
|                         | Faulty breakaway switch                | Repair or replace                      |
|                         | Loose wheel bearing adjustment         | Adjust                                 |
|                         | Bent spindle                           | Replace axle                           |

**Fig. 11****Fig. 12**

Make sure that the wires are properly reconnected and sealed after testing is completed.

Testing for amperage can be done with probes (Fig. 11) or alligator clips on the leads or an amp clamp (Fig. 12).

## Amperage Chart

| Amperage Chart |            |             |            |
|----------------|------------|-------------|------------|
| Amps/Magnet    | Two Brakes | Four Brakes | Six Brakes |
| 3.0            | 6.0        | 12.0        | 18.0       |

Low or no voltage are the most common problems with the Braking System. Amperage at the brakes is also a relatively common issue. Common causes of these conditions are:

1. Low quality electrical connections.
2. Open circuits.
3. Insufficient wire gauge. (Reference Trailer Wire Gauge Chart.)
4. Broken wires.
5. Blown fuses (fusing of brakes is not recommended).
6. Short circuits (indicated by high amperage).

| Trailer Wire Gauge Chart |                 |  |
|--------------------------|-----------------|--|
| Gauge and Type           | Number of Axles | Length of Run                                    |
| 16 Ga Stranded Copper    | 1               | N/A  |
| 14 Ga Stranded Copper    | 2               | Under 30ft. (9.1m) from hitch to center of axles |
| 12 Ga Stranded Copper    | 2 or 3          | Over 30ft. (9.1m) from hitch to center of axles  |

Possible causes of shorts are:

1. Shorted magnet coils.
2. Bare wires contacting a grounded object.

Finding the cause of a short circuit in the system is done by isolating one section at a time. If the high amperage reading drops to zero by unplugging the trailer, then the short is in the trailer. If the amperage reading remains high with all the brake magnets disconnected, the short is in the trailer wiring.

All electrical troubleshooting procedures should start at the controller. Most complaints regarding brake harshness or malfunction are traceable to improperly adjusted or nonfunctional controllers. See your controller manufacturer's data for proper adjustment and testing procedures. For best results, all the connection points in the brake wiring should be sealed to prevent corrosion. Loose or corroded connectors will cause an increase in resistance which reduces the voltage available for the brake magnets.

## Maintenance Schedule

| Item                   | Function Required   | 3,000 Miles  | 12 Months / 36,000 Miles<br>(Whichever comes first) |
|------------------------|---|--------------|---|
| Brakes                 | Test that they are operational.   | At Every Use |   |
| Oil Level              | Check oil level in hubs, if equipped.   | At Every Use |   |
| Brake Adjustment       | Adjust to proper operating clearance. Not required for self-adjusting brakes. | ◆            |   |
| Brake Magnets          | Inspect for wear and current draw.  |              | ◆   |
| Brake Linings and Pads | Inspect for wear or contamination.  |              | ◆   |
| Hub/Drum and Rotors    | Inspect for abnormal wear or scoring.   |              | ◆   |
| Wheel Bearing          | Inspect for corrosion or wear. Clean and repack.                              |              | ◆   |
| Seals                  | Inspect for leakage. Replace if removed.                                      |              | ◆   |
| Springs                | Inspect for wear, loss of arch.   |              | ◆   |
| Suspension Parts       | Inspect for bending, loose fasteners, wear.                                   |              | ◆   |
| U-bolts                | Tighten to specified torque values  |              | ◆   |

# Wiring Diagram

Fig. 1

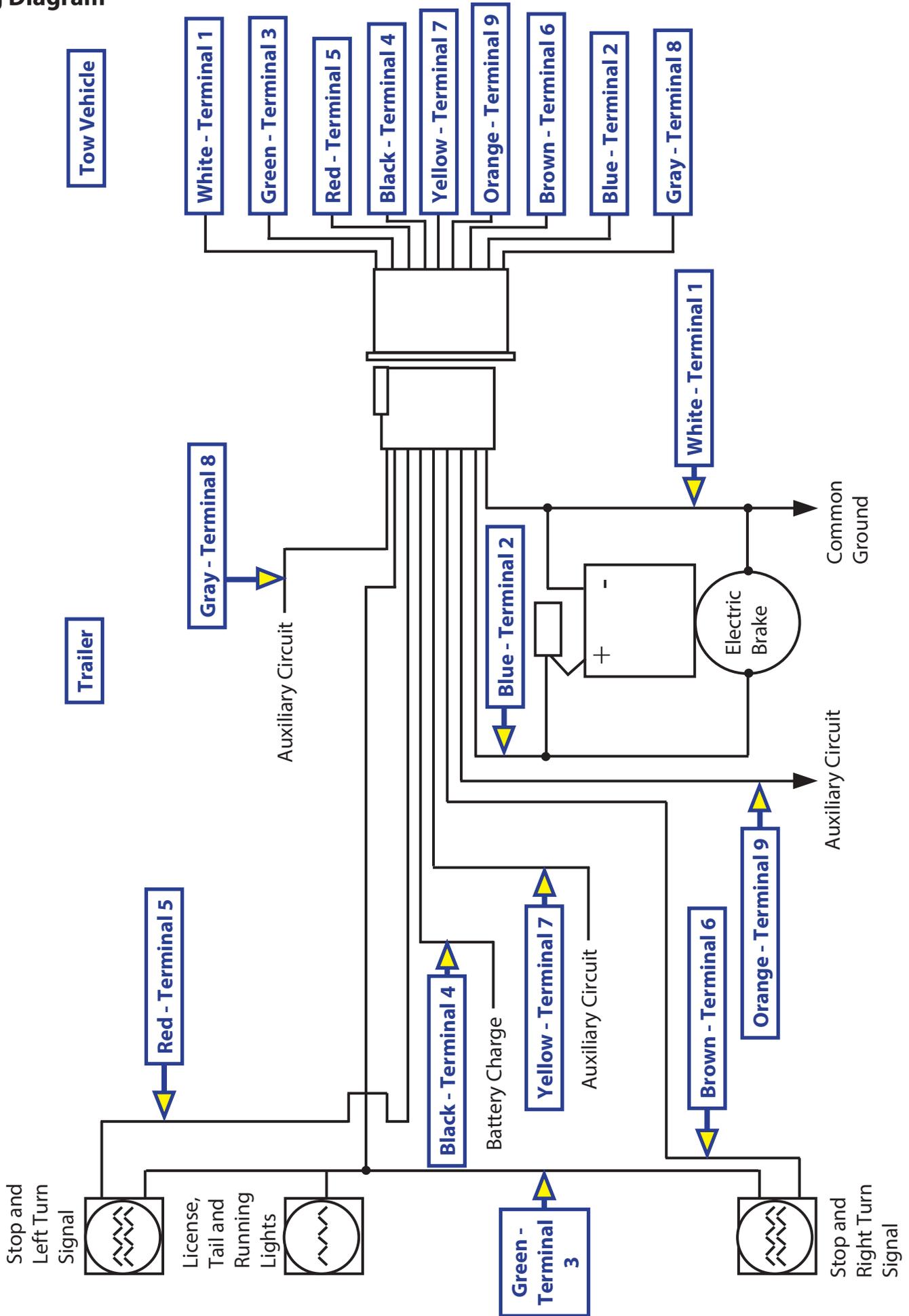
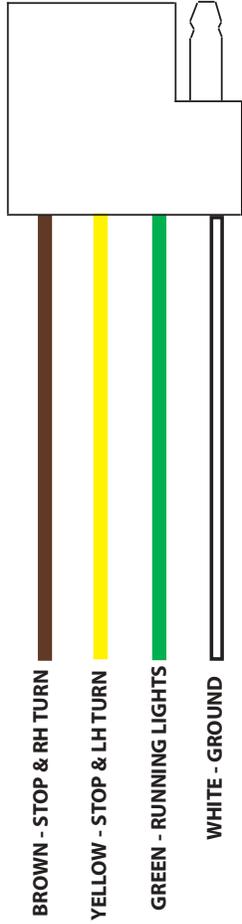
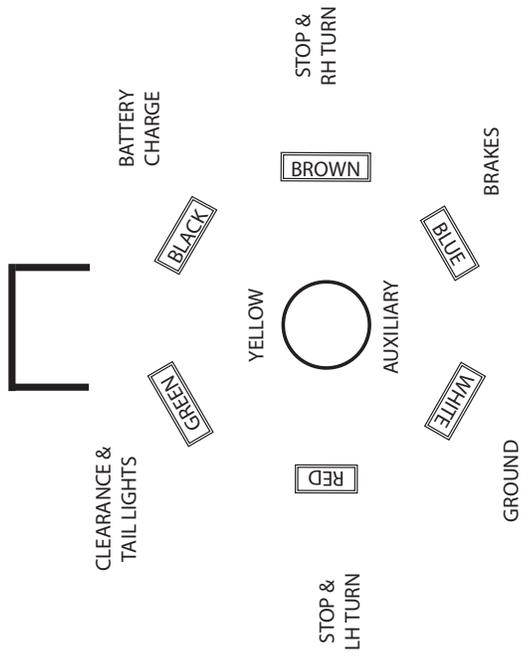


Fig. 1

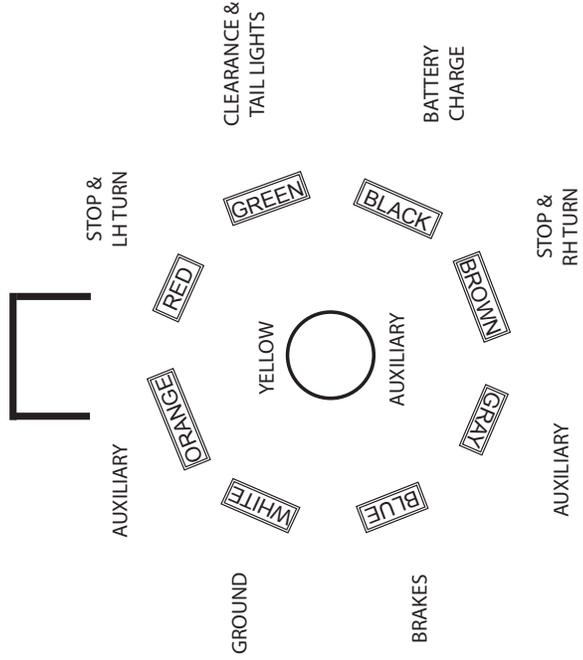


**TRAILER LIGHTS PIGTAIL - DOES NOT OPERATE BRAKES**

**7-PIN COUPLER**



**9-PIN COUPLER**



**TRAILER BRAKE AND LIGHT COUPLER - OPERATES BRAKES**

## Storage

### Storage Preparation

If your trailer is to be stored for an extended period of time, the trailer will need to be prepared prior to going into storage. Follow these guidelines to set up your trailer for storage:

1. If the trailer has an emergency breakaway battery, remove it and store it inside, out of the weather. Charge the battery at least every 90 days.
2. Jack up the trailer and place jack stands under the trailer frame so that the weight will be off the tires. Follow trailer manufacturer's guidelines to lift and support the trailer.
3. Lubricate mechanical moving parts such as the hitch, and suspension parts, that are exposed to the weather.
4. In the case of boat trailer axles that are subject to repeated immersion, remove brake drums; clean, dry and re-lubricate moving brake components; inspect bearings, clean and re-lubricate.

### **WARNING**

**Lift the trailer by its frame and never the axle or suspension. Do not go under the trailer unless it is properly supported by jack stands. Unsupported trailers can fall causing death or serious injury.**

### Extended Storage Inspection Procedures

Trailer should remain on jack stands during this procedure:

1. Remove all wheels and hubs or brake drums. Reinstall drum to same spindle and brake from which it was removed.
2. Inspect suspension for wear.
3. Check tightness of hanger bolt, shackle bolt, and U-bolt nuts of the suspension for correct torque.
4. Check brake linings, brake drums and armature faces for excessive wear, scoring, damage or corrosion.
5. Check brake magnets with an ohmmeter. The magnets should check 3.2 ohms. If shorted or worn excessively, they must be replaced.
6. Lubricate all brake moving parts using a high temperature brake lubricant.
7. Remove any rust from braking surface and armature surface of drums with fine emery paper or crocus cloth. Be sure to protect bearings from contaminating dust.
8. Inspect oil or grease seals for wear or nicks. Replace if necessary. Using the following [Trip Preparation Checklist](#) before starting a trip with your trailer is highly recommended. Allow plenty of time prior to any trip for any service or repairs that may need to be done before using the trailer.
9. Lubricate hub bearings.
10. Reinstall hubs and adjust bearings.
11. Mount and tighten wheels.

**NOTE:** Avoid getting any grease or oil on brake linings and pads or magnet surfaces.

## Trip Preparation Checklist

The following checklist offers several guidelines to prolonging the quality of your running gear and will provide trustworthy and safe trailering for years to come.

Using the following checklist before starting a trip with your trailer is highly recommended. Allow plenty of time prior to any trip for any service or repairs that may need to be done before using the trailer.

1. Maintenance schedule should be current.
2. Inspect hitch for corrosion, lubrication and wear.
3. Inspect safety chains for rust and wear. Engage chains and breakaway switch actuating chain securely. Breakaway battery should be fully charged.
4. Electronic coupler must be secure. Run check on all lights and brake engagement and synchronization. Refer to Figures 13 and 14.
5. Load trailer with 10% of total weight on the hitch end of trailer. Smaller trailers' front end load should be increased to 15%.
6. Do not overload. Consult your trailers ID plate for gross vehicle weight restrictions.
7. Tires should be inflated to manufacturer's specifications. Inspect tires for any damage or wear.
8. Inspect lug nuts/bolts. All should be torqued to specifications. Refer to Spring Axle Torque Specifications Chart and the Wheel Torque Requirement Chart for torque limits.
9. Check torque of all bolts and nuts on suspension.
10. Check that your trailer is towing level. Adjust hitch height if necessary to level trailer.

# EASY APPROACH™ HYDRAULIC LOWERING SYSTEM

## AXLES AND SUSPENSION

### Introduction

The lift and lower operation of the Easy Approach™ Hydraulic Lowering System simplifies the lifting of the trailer's frame and body to an uppermost position, hydraulically locking the linkage into place so the linkage does not move during transport. The system also lowers the trailer's frame and body to the ground at a controlled rate of speed for ease of loading and unloading.

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. iTunes®, iPhone®, and iPad® are registered trademarks of Apple Inc. Google Play™ and Android™ are trademarks of Google Inc.

### Safety Information

#### **WARNING**

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

#### **WARNING**

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

#### **CAUTION**

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

#### **CAUTION**

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

## Resources Required

- 1/4 hex bit
- Spray lubricant
- Spray electrical contact cleaner
- Grease gun
- Torque wrench
- Tire pressure gauge

## Operation

Extending the cylinders will lower the trailer bed for loading and unloading. Retracting the cylinders maximum length will raise the trailer bed ready for travel.

Make sure the trailer is parked on solid, level ground. Clear area under trailer of debris and obstructions. Locations should also be free of depressions. When parking the trailer on extremely soft surfaces, utilize load distribution pads under rear of the trailer.

The trailer should always be hooked to the tow vehicle when loading and unloading.

## Electronic Operation

### ⚠ CAUTION

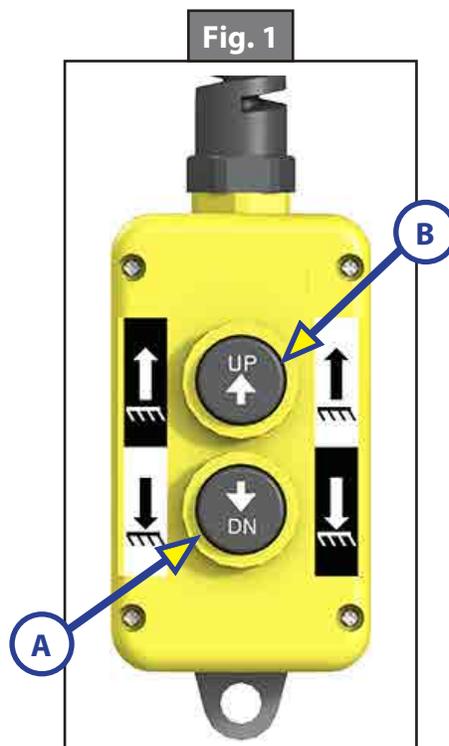
**Never travel with the trailer unless the bed is fully elevated.**

**NOTE:** Always maintain proper battery charge level.

1. Press the down (DN) button (Fig. 1A) on the pendant to raise the axles on the sub-frame, this will lower the trailer for loading and unloading.

**NOTE:** Always lower the trailer until the wheels of the sub-frame are completely off the ground.

2. Press the up (UP) button (Fig. 1B) on the pendant to lower the axles of the sub-frame chassis, which raises the trailer to the maximum height. Continue to hold the button 1-2 seconds after "full up" is achieved. Completing this action for 1-2 seconds after "full up" minimizes any linkage movement during transport and will extend linkage pin and cylinder life.



## Manual Override Procedure - Double Acting Hydraulic Power Unit

It is not recommended to manually extend/raise the trailer while it is loaded.

### Retract

In the event of a dead battery, it is possible to operate the Low Entry Axle system manually.

**NOTE:** Unhook the power unit motor from the power source prior to attempting the manual override procedure.

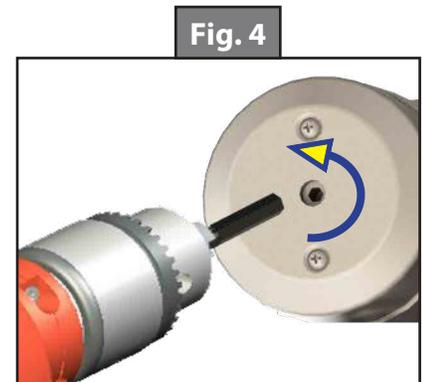
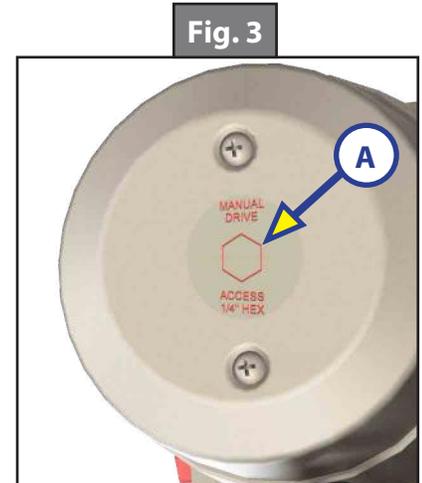
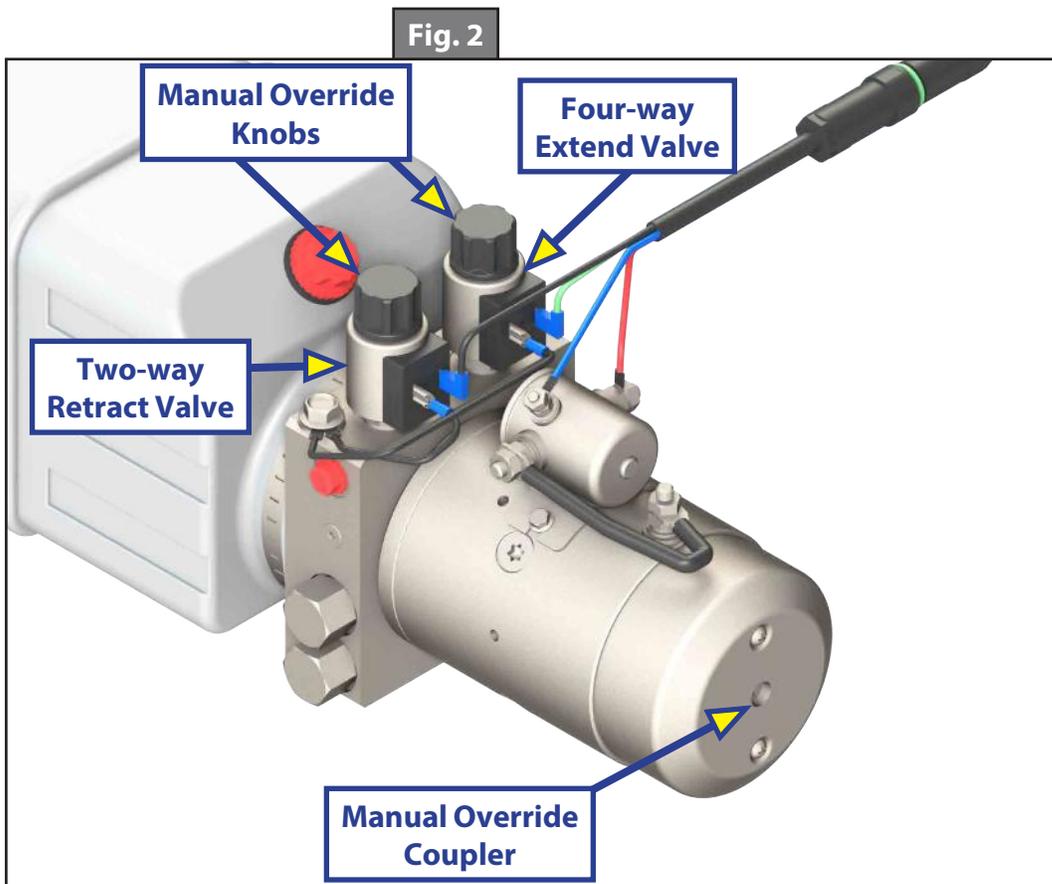
1. Unthread the protective cap on top of the two-way retract cartridge valve, located on the hydraulic power unit (Fig. 2).
2. Turn the override knob counterclockwise until it stops.
3. Locate the manual override coupler on the front end of the power unit (Fig. 2).
4. Remove protective label (Fig. 3A) from the power unit, to reveal the manual override coupler.
5. Using a drill with a 1/4" hex bit, run the drill counterclockwise (Fig. 4) to retract/lower the trailer.

**NOTE:** Do not use an impact gun to perform any of the override procedures as this may damage the motor.

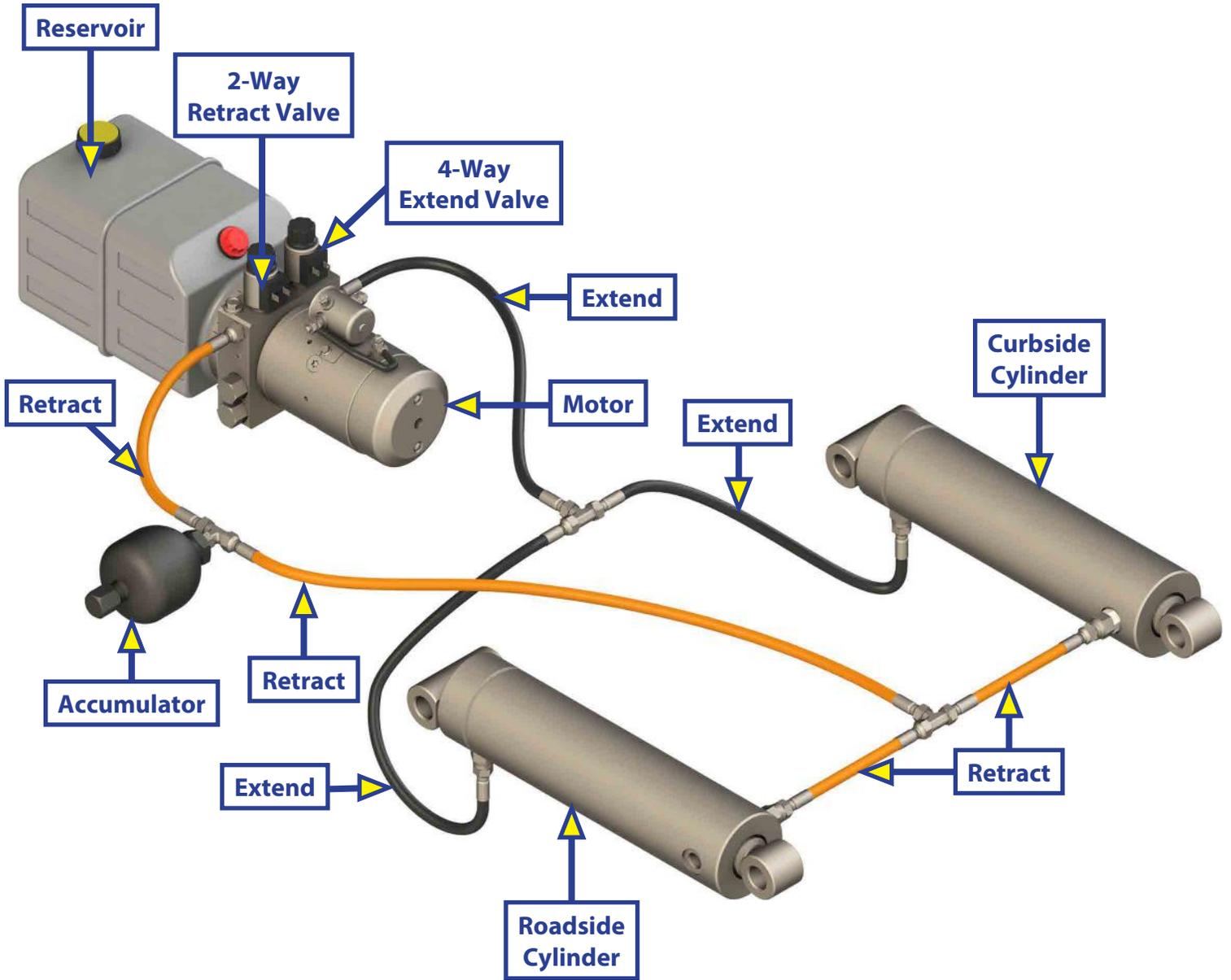
6. After retracting the trailer, make sure to turn the override knob clockwise (Fig. 2) until it stops.
7. Thread on the protective cap until it is finger tight.

### Extend

1. Unthread the protective cap on top of the four-way extend cartridge valve, located on the hydraulic power unit (Fig. 2).
2. Turn the override knob counterclockwise until it stops.
3. Locate the manual override coupler on the front end of the power unit (Fig. 2).
4. Remove protective label (Fig. 3A) from the power unit, to reveal the manual override coupler.
5. Using a drill with a 1/4" hex bit, run the drill counterclockwise (Fig. 4) to extend/raise the trailer.
6. After extending the trailer, make sure to turn the override knob clockwise (Fig. 2) until it stops.
7. Thread on the protective cap until it is finger tight.



# Hydraulic Diagram



# SOUTHCO KEYLESS ENTRY DOOR LATCH

## DOORS

1. Southco® Inc. door latches are used in Lippert's Keyless Entry Door systems.
2. All Southco units are black and the door handle is slightly curved, as opposed to the straight door handle on the Fastec.
3. Keypad (Fig. 1)
4. Keyfob (Fig. 2)
5. The Southco key code is a 3-digit code stamped onto the key (Fig. 3). The key handle has black molded plastic on the key handle and is rounded at the end. The Master Key bears no keycode.
6. If the key or key fob is lost, the keycode can be found on the latch plate (Fig. 4) by removing the 4 screws on the inside latch handle.
7. Southco can be contacted directly for key - 610-459-4000.
8. The receiver is mounted just below the entry door window.
9. The keypad and the keyfob are all matched directly to the receiver. A small black sticker with the Southco Inc. door latches are used in Lippert's Keyless Entry Door systems.
10. All Southco units are black and the door handle is slightly curved, as opposed to the straight door handle on the Fastec.
11. The keypad and the keyfob are all matched directly to the receiver. A small black sticker with the code number is affixed directly to each component. On the keypad, the sticker is located under the 9 - 0 button (Fig. 5). On the keyfob, the sticker is in the middle of the backside of the fob (Fig. 6). The matching code will be located on the receiver next to the antenna (Fig. 7).
12. The default entry code is 1-2-3-4.

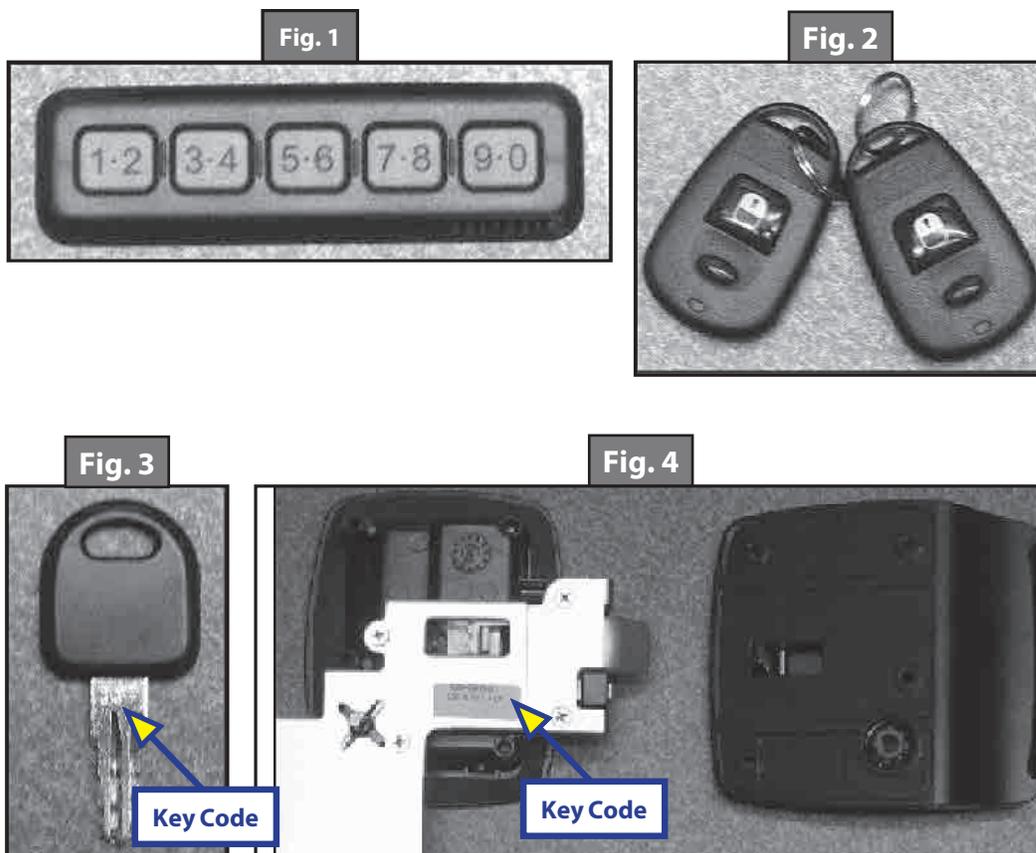


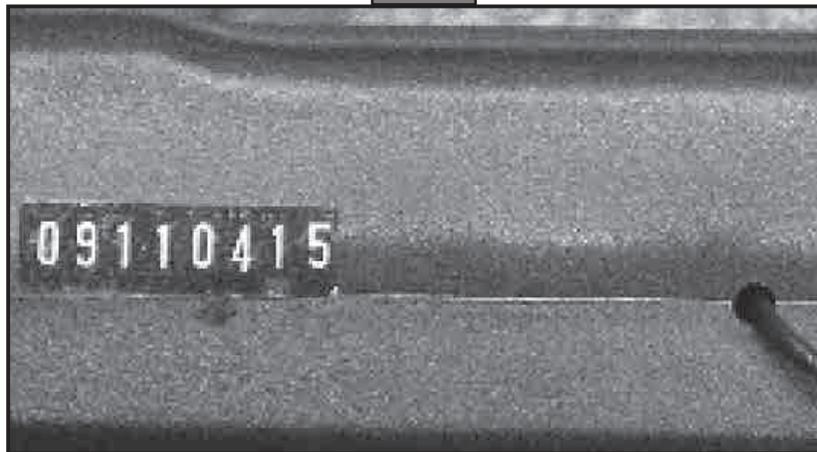
Fig. 5



Fig. 6



Fig. 7



### Product Information

#### Features

Thank-you for purchasing the Bauer NE. We have developed the Bauer NE with the idea to increase your convenience and security. We are a family owned company with over 50 years of service in the locking hardware industry, and we are grateful for the opportunity to serve you. Please review and follow the Installation, Programming and Operating Instructions to ensure proper function.

- The first self-contained electronic RV latch with Capacitive Touch Technology.
- An integral touch pad to the latch which controls the dead bolt.
- Powered by 4 AA batteries.
- Retrofit-able in most RV entry doors and easy to install.
- Programmable with a 4-digit PIN number.
- The large buttons are easy to see and use.
- Proximity sensing, which illuminates the buttons.
- An Intelligent Keyless Entry System, which knows the position of the deadbolt and indicates low battery strength, as well as provides audible feedback to successful locking and unlocking functions.
- The key will always be able to operate the paddle or dead bolt lock in case the user forgets the code or the battery is dead.

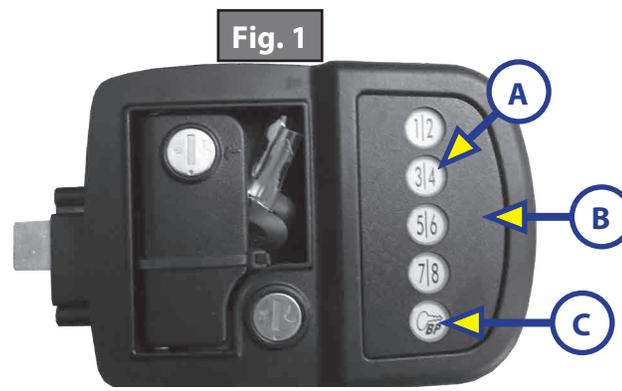
## Operation

The Bauer NE is a 4 touch pad button programmable deadbolt lock (Fig. 1). The 4 buttons are labeled "1|2", "3|4", "5|6", "7|8". The button labeled "1|2" is the same button whether the number 1 or 2 is desired. Please note this handle uses Touch Technology. The buttons are activated by Touch and do not require pressing. Touch the button and lift finger from button for proper code entry. The following steps show how to operate the Bauer Lock:

1. Touch the area next to the buttons to "Wake Up" the lock (Fig. 1B).
2. The buttons will illuminate when the lock is "awake" and will be ready to accept the code.
3. The factory default code is 3, 7, 1, 5 and is followed by the Enter button (Fig. 1C).
4. Touch and hold the 3/4 button (Fig. 1A) and Enter button (Fig. 1C) for 2 seconds. The lock will beep 3 times to accept a new code. Enter a 4-digit code followed by the Enter button (Fig. 1C). The lock will beep 4 times to indicate a new code acceptance. This is now your new code.

**NOTE:** Enter your Personal Code upon installation of lock (Step 4) to prevent inadvertent programming.

**NOTE:** The touch pad only activates the Dead Bolt. The Paddle Lock is Master Keyed for Dealer and Service Center use. The Dead Bolt provides Maximum Security.



## Calibration and Programming

### Preset Factory Code

The Bauer NE has a factory set code of 3,7,1,5 followed by the Enter button. The button with the or the "\*" is the Enter button, and is required to be touched after the code is entered. The factory code resets every time the batteries are removed for at least 10 seconds.

### Programming New Code

To set a new code, touch and hold the "3|4" button and the Enter Buttons for 2 seconds. The Bauer NE will provide three short beeps, indicating it is ready to accept a new code. Enter the new 4 digit code followed by the "\*". The Bauer NE will provide four short beeps to indicate new code acceptance. This new code will now activate the lock.

To reset the code, remove the batteries for at least 10 seconds. Re-install the batteries and follow the steps to Programming New Code.

## Maintenance

- Install fresh batteries as necessary. The Bauer NE is designed to function for months of normal usage with fresh, high quality AA batteries. Battery life is highly dependent upon battery quality, usage, and environment (temperature).
- Make sure there are no obstructions in the door frame to prevent Dead Bolt extension.
- Do not wash with power washer or high pressure cleaner. The Bauer NE is designed to resist water intrusion to protect its electrical components from normal water encounter such as rain.
- The Bauer NE uses Touch Technology. The buttons are activated by touching not pressing.
- Remove batteries when storing or not using this lock for extended periods of time.

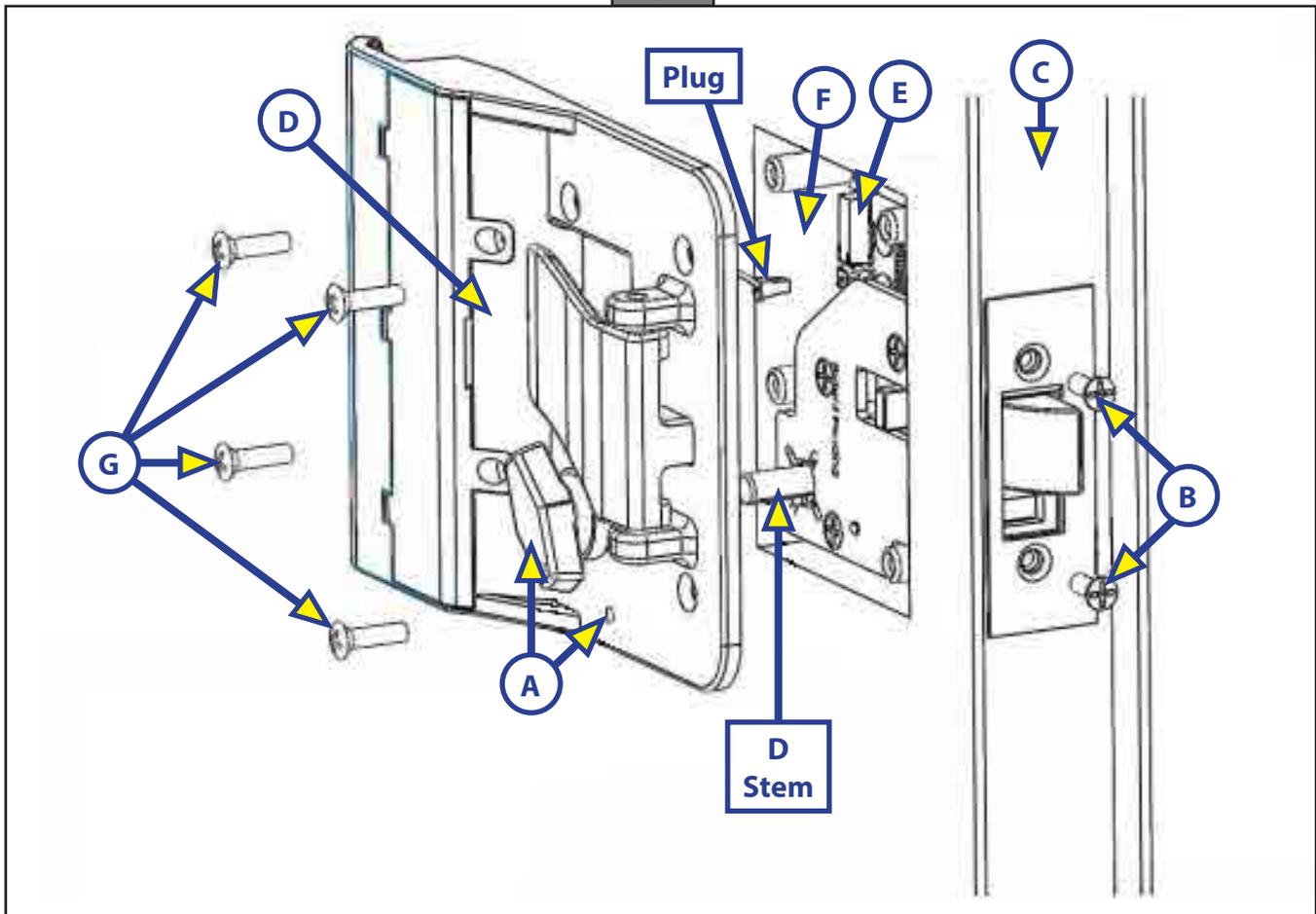
# Installation

## Bauer NE Installation

The following steps are graphically shown on the enclosed Bauer NE Installation schematic.

1. Remove old lock.
2. Clean cut-out. Remove any dirt, loose material, etc.
3. Install outside housing (the portion that includes the Touch Pad) with the dead bolt in the unlocked position (Fig. 2A).
4. Attach the (2) 8x32 screws (Fig. 2B) into the portion of the handle that has the Plunger and Dead Bolt. This is on the edge (Fig. 2C) of the door.
5. Plug wire from Inside Plate Assembly (Fig. 2D) into the receptacle (Fig. 2E) on the housing. Make sure to align the tab on the plug properly with the slot on the receptacle. The plug should make a slight click when properly engaged.
6. Tuck Battery Wires into pocket (Fig. 2F) next to Stamped Steel Plate. Do not allow Battery Wires to get between Inside Plate Assembly and Stamped Steel Plate, as it will cause the motor to bind.
7. Align the Dead Bolt Knob in the unlocked position. The Red Dots on the Dead Bolt Knob and the Inside Plate Assembly should be aligned to indicate the unlocked position of the Dead Bolt. Slide Dead Bolt Knob over D-Stem and align the 4 screw bosses on the housing with the attaching holes on the Inside Plate Assembly. When Inside Plate Assembly is in position with Housing, install the (4) 8x32 Screws. Secure but do not over tighten screws (Fig. 2G).

Fig. 2



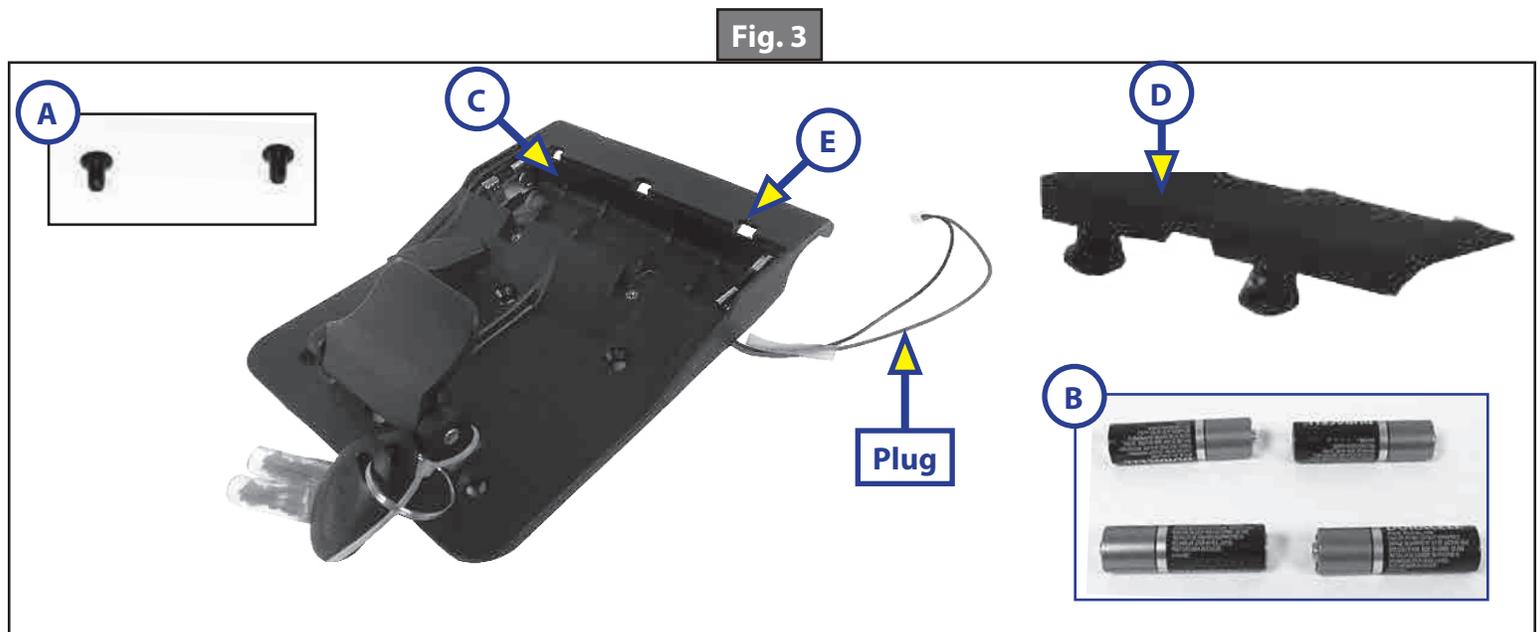
## Battery Installation

The Bauer NE uses 4 AA batteries for operation. We do not recommend zinc carbon batteries for this application. Batteries not included.

**NOTE:** Fresh batteries should be installed as necessary. Battery Life is highly dependent upon battery quality, usage, and environment (temperature). Remove batteries if the lock will not be used for extended periods of time.

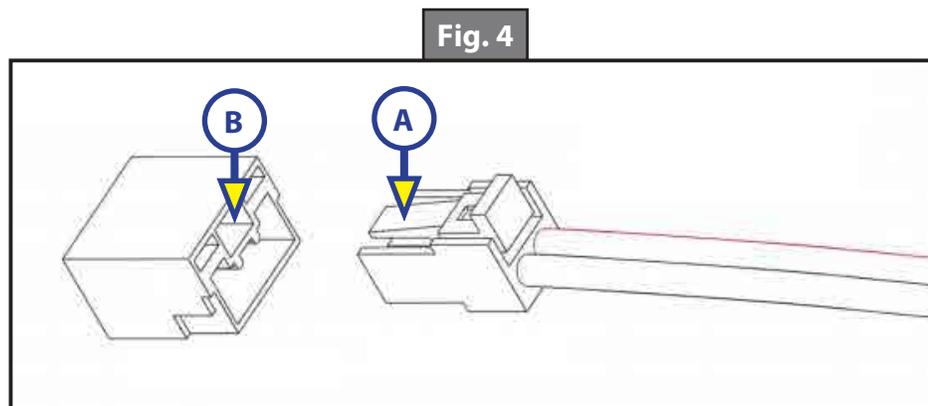
The following steps are shown on the enclosed Battery Installation diagram:

1. Remove (2) 4x40 screws (Fig. 3A) from Battery Compartment Lid. These screws are very small so please take care in removal and installation. A magnetic tip #0 point Phillips Screwdriver is recommended.
2. Install the AA batteries (Fig. 3B) in accordance with the orientation shown in the Battery Compartment (Fig. 3C). The batteries will fit tightly.
3. Install Battery Compartment Lid (Fig. 3D) by aligning the (3) tabs on the lid with the (3) slots (Fig. 3E) on the Inside Plate Assembly. These tabs act as a hinge for closing the Battery Compartment Lid.
4. Install the (2) 4x40 screws (Fig. 3A) back to attach the Battery Compartment Lid to the Inside Plate Assembly.



## Battery Plug Instructions

The following image shows a detailed view of the plug and receptacle for plugging the inside plate assembly into the receptacle on the Bauer housing.



1. Align tab (Fig. 4A) with small, square slot in receptacle (Fig. 4B).
2. With plug aligned, insert into receptacle until a click is heard.

## Troubleshooting

**NOTE:** If the problem is not found on this list please call 1-866-682-2837 for assistance.

| Problem  | Possible Fixes  |
|--|---|
| After installation, the touch pad does not work.   | Batteries are dead or are not installed properly. Plug is not engaged properly. |
| Dead bolt not engaging into door frame.            | Obstructions in the door frame.   |
| Code is not working.                               | Remove batteries for 10 seconds then program a new code.                        |
| Inside paddle is not opening the latch.            | Inside screws are not secured to the housing.                                   |
| Buttons light but the dead bolt does not activate. | Replace the batteries.  |

## Bauer NE Fault Logic

**NOTE:** The lock will cycle up to 10 more times once the low battery indication occurs. After this, the final electric function in a low battery condition will be unlock and not lock until the batteries have been replaced. Please note that if the deadbolt is in the locked position and the batteries die the deadbolt will remain locked. The key will always be able to activate the deadbolt lock.

| Action                    | Bauer NE Response                       |
|---------------------------|---|
| Low Battery               | 1 long beep after the lock/unlock beeps |
| Ready to accept new code  | 3 short beeps                           |
| New code entered          | 4 short beeps                           |
| Wrong code entered        | 1 long beep                             |
| Dead bolt locks           | 2 short beeps                           |
| Dead bolt unlocks         | 2 short beeps                           |
| Dead bolt fails to lock   | 1 long beep                             |
| Dead bolt fails to unlock | 1 long beep                             |

## Limited Warranty

Bauer's warranty is limited. At its sole discretion, Bauer may either replace or repair any defective parts. In no event shall Bauer have any liability to customer for paying incidental, special or consequential damages including (without limitation) damages resulting from personal or bodily injury or death or damages to, or loss of use of, any property. Notwithstanding any provision to the contrary, this limited warranty is made upon the express understanding that shall apply in connection with the sale of the product by Bauer and is in lieu of all other warranties (Express, implied or statutory) including the separate warranties of merchantability and fitness for a particular purpose or use.

# RAMP DOOR PATIO KIT

## DOORS

### Introduction

Lippert Components Patio Railing Kits are designed to help make the ramp door a comfortable, additional living space. The self-storing design stays attached to ramp door at all times and provides additional entertaining space on the toy hauler ramp door. The easy to follow instructions in this manual will describe the process of setting up the Ramp Door Patio Kit.

#### **⚠ WARNING**

**The maximum weight rating for the Ramp Door is 3,000 pounds. The maximum weight rating for the Party Deck is 1,500 pounds. Exceeding the maximum weight ratings can cause death, serious injury or damage to the unit. DO NOT allow the ramp door to fall while lowering into level position, as this could cause injury or damage to the unit or door.**

#### **⚠ CAUTION**

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

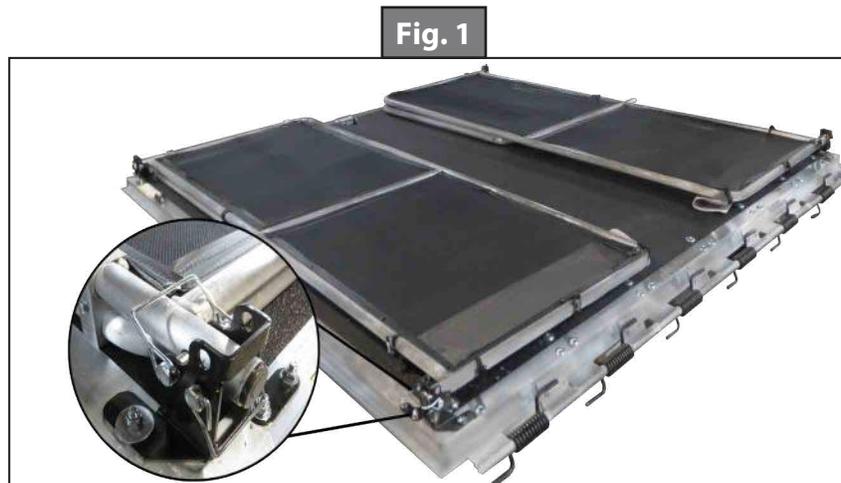
#### **⚠ WARNING**

**Do not remove set screw. Failure to follow this warning may result in death, serious personal injury and/or property damage. See owner's manual for instructions on use of adjustable cable.**

**NOTE:** Cables are not always shown in the images for clarity purposes.

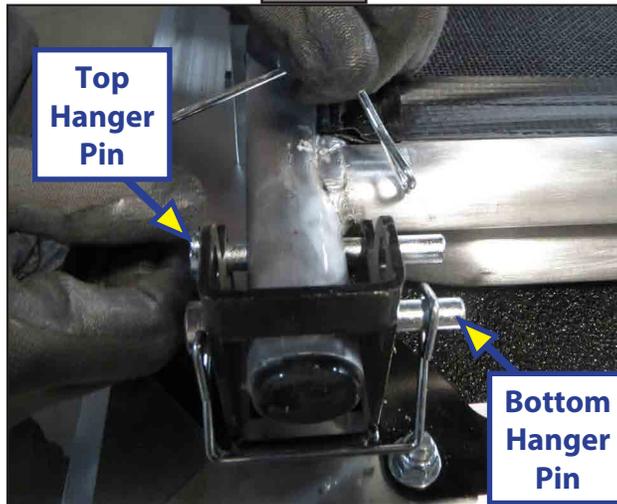
### Operation

1. Lower Ramp Door to level position. Patio Kit should be folded in the storage position (Fig. 1).



2. Starting with the hanger pin closest to the coach, unpin the top (4) hanger pins from foot brackets in corners (Fig. 2).

Fig. 2



3. Firmly grasp both the top and bottom of the patio frames (Fig. 3).

Fig. 3



4. The gate moves vertically. While SUPPORTING frame, pull towards yourself, lifting before it is rotated into either the setup or tear down position (Fig. 4).

**NOTE:** DO NOT scrape the boot and frame leg on the ramp door. Doing so may damage the coating on the floor and the frame.

Fig. 4



5. Replace top hanger pins (4) to secure the railing. Swing the patio kit doors away from the rest of the frame and link together in the middle (Fig. 5).

Fig. 5



6. Be sure to slide legs into guide plate (Fig. 6).
7. Apply thumb screws to secure the gate in a locked position (Fig. 7).

Fig. 6



Fig. 7



Fig. 8

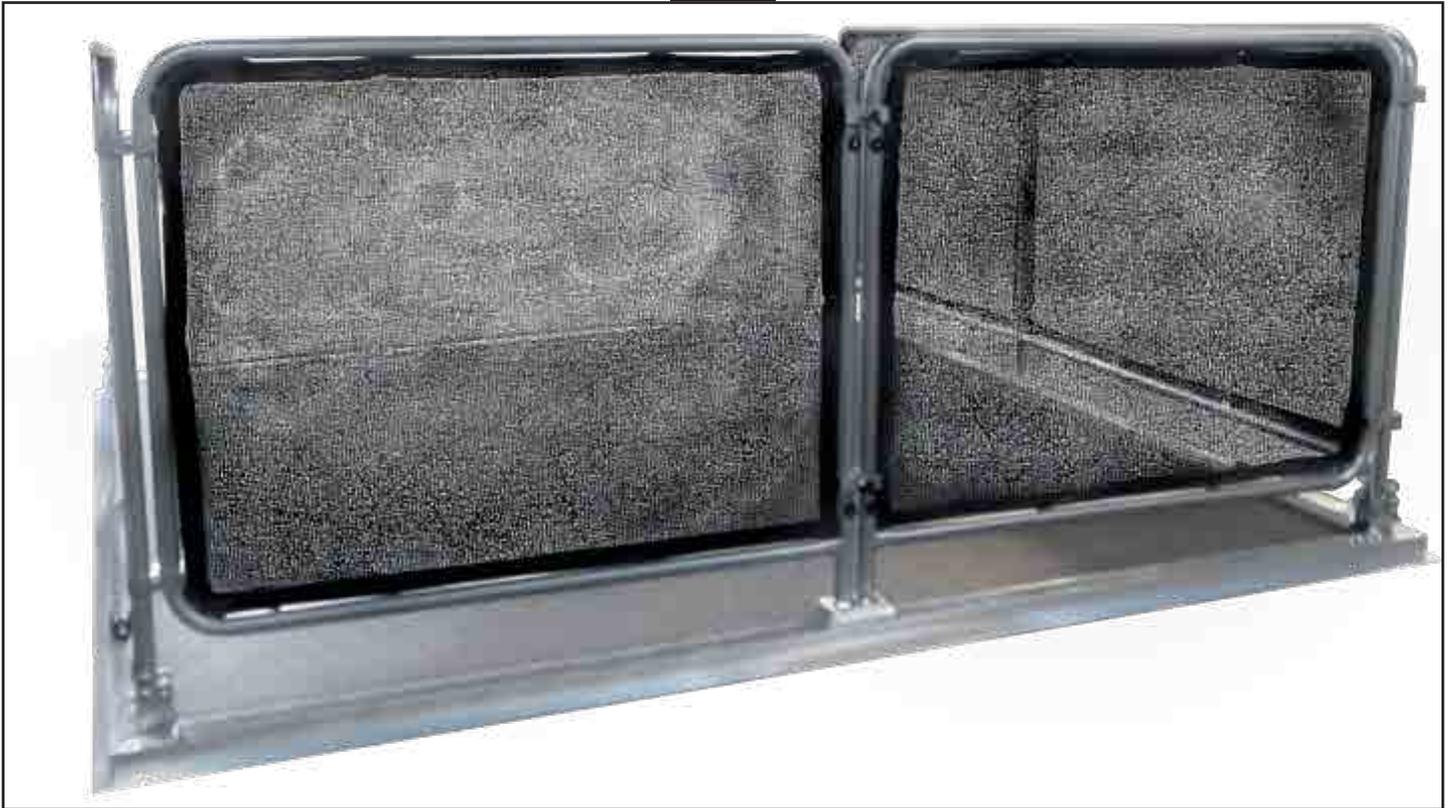


Fig. 9



# LCI PARTY DECK

## DOORS

### Introduction

Lippert Components Party Decks are designed to help transform the ramp door of a coach into a comfortable, additional living space. The LCI Party Deck takes previously unavailable space and maximizes it, converting the ramp door into a fully functional outdoor deck in minutes. The easy-to-follow instructions in this manual will describe the process of setting up the LCI Party Deck.

**NOTE:** While the product is water resistant, it is recommended to store the door in the closed position during periods of rain to reduce the risk of water intrusion, which may result in delamination.

### **⚠ WARNING**

**The maximum weight rating for the Ramp Door is 3,000 pounds. The maximum weight rating for the Party Deck is 1,500 pounds. Exceeding the maximum weight ratings can cause death, serious injury or damage to the unit. DO NOT allow the ramp door to fall while lowering into level position, as this could cause injury or damage to the unit or door.**

### **⚠ CAUTION**

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

### **⚠ WARNING**

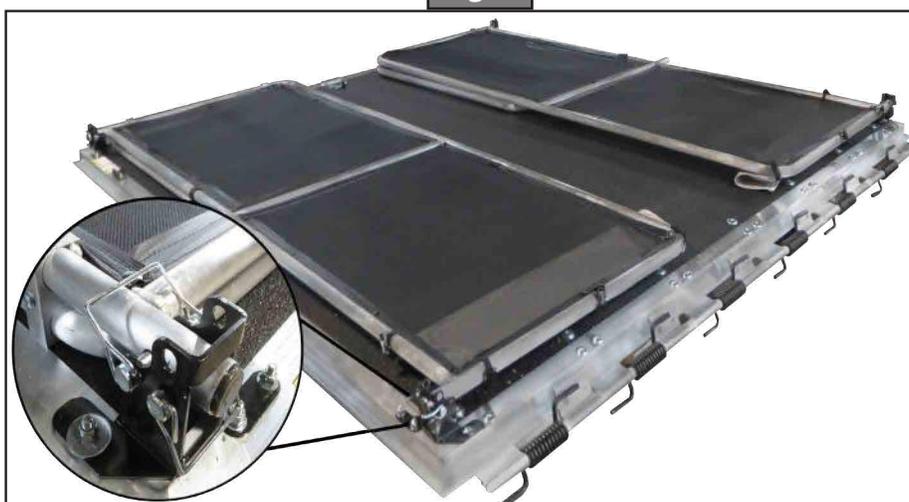
**Do not remove set screw. Failure to follow this warning may result in death, serious personal injury and/or property damage. See owner's manual for instructions on use of adjustable cable.**

**NOTE:** Cables are not always shown in the images for clarity purposes.

**NOTE:** Some trailers are equipped with an optional adjustable cable system for the ramp door. Follow applicable set screw warning for use of the adjustable cable. The adjustable cable system allows for up to +/- 2.5" of adjustment, in order to achieve a 90° angle for the ramp door while in patio mode.

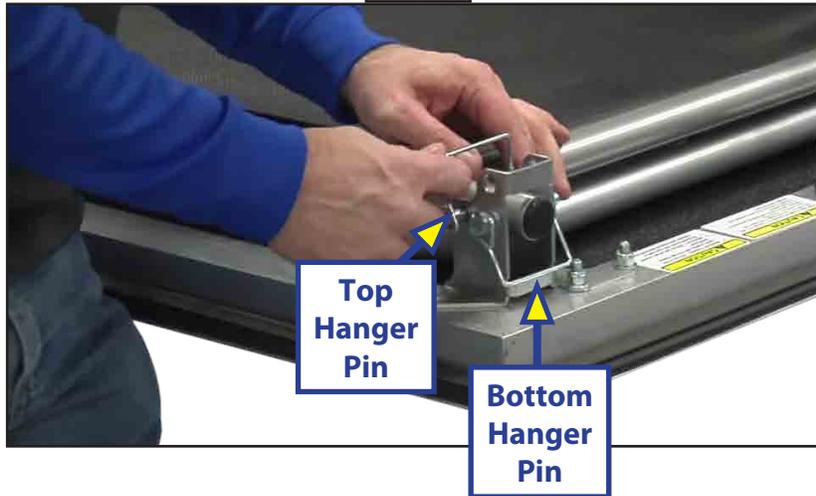
### Operation

Fig. 1



1. Lower Ramp Door to level position. Patio Kit should be folded in the storage position (Fig. 1).
2. Starting with the hanger pin closest to the coach, unpin the top (4) hanger pins from foot brackets in the corners (Fig. 2).

Fig. 2



3. Firmly grasp both the top and bottom of the patio frames (Fig. 3).

Fig. 3



**CAUTION**

**NOTE:** Do not scrape the boot and frame leg on the ramp door. Doing so may damage the coating on the floor and the frame.

4. The gate moves vertically. While SUPPORTING frame, pull towards yourself, lifting before it is rotated into either the setup or tear down position (Fig. 4).

Fig. 4



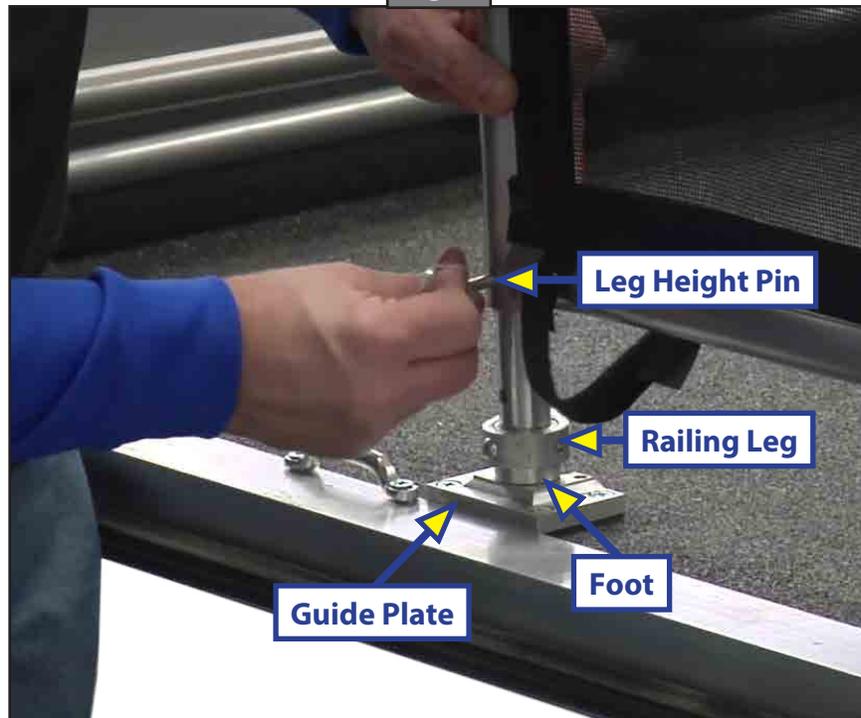
5. Replace top hanger pins (4) to secure the railing. Swing the patio kit doors away from the rest of the frame and link together in the middle (Fig. 5).

Fig. 5

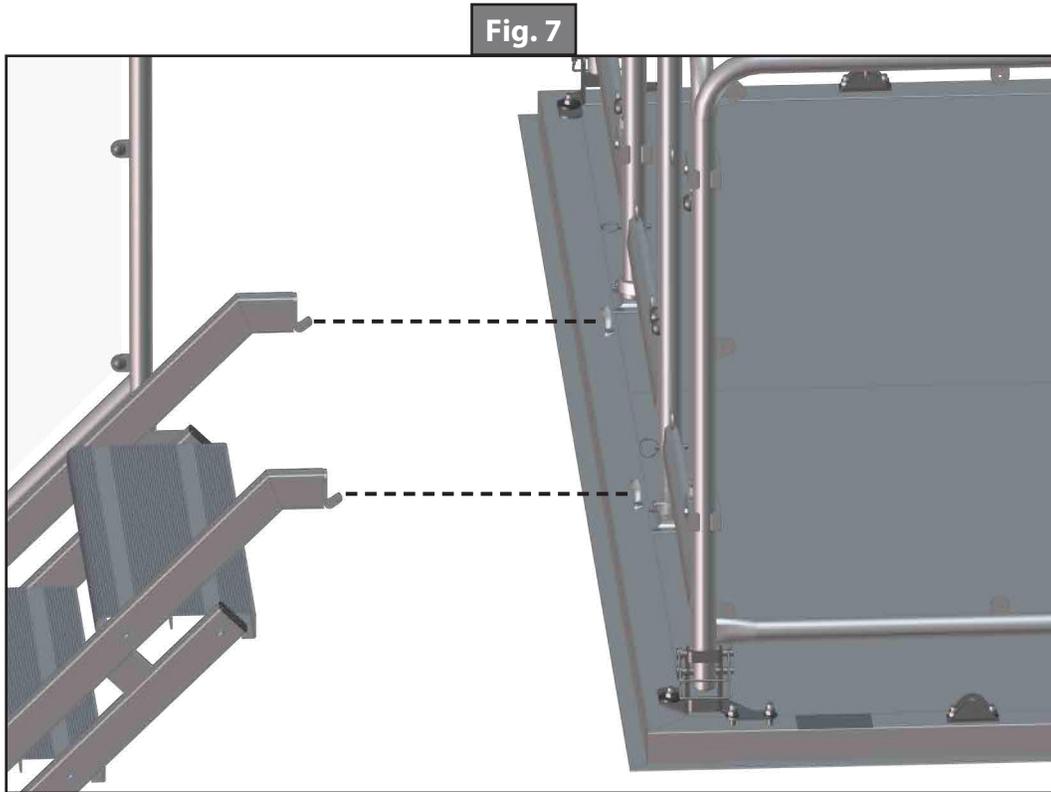


6. Release leg height pin and extend leg until the foot is secured into the guide plate (Fig. 6). Replace leg height pin to secure the leg in the railing.

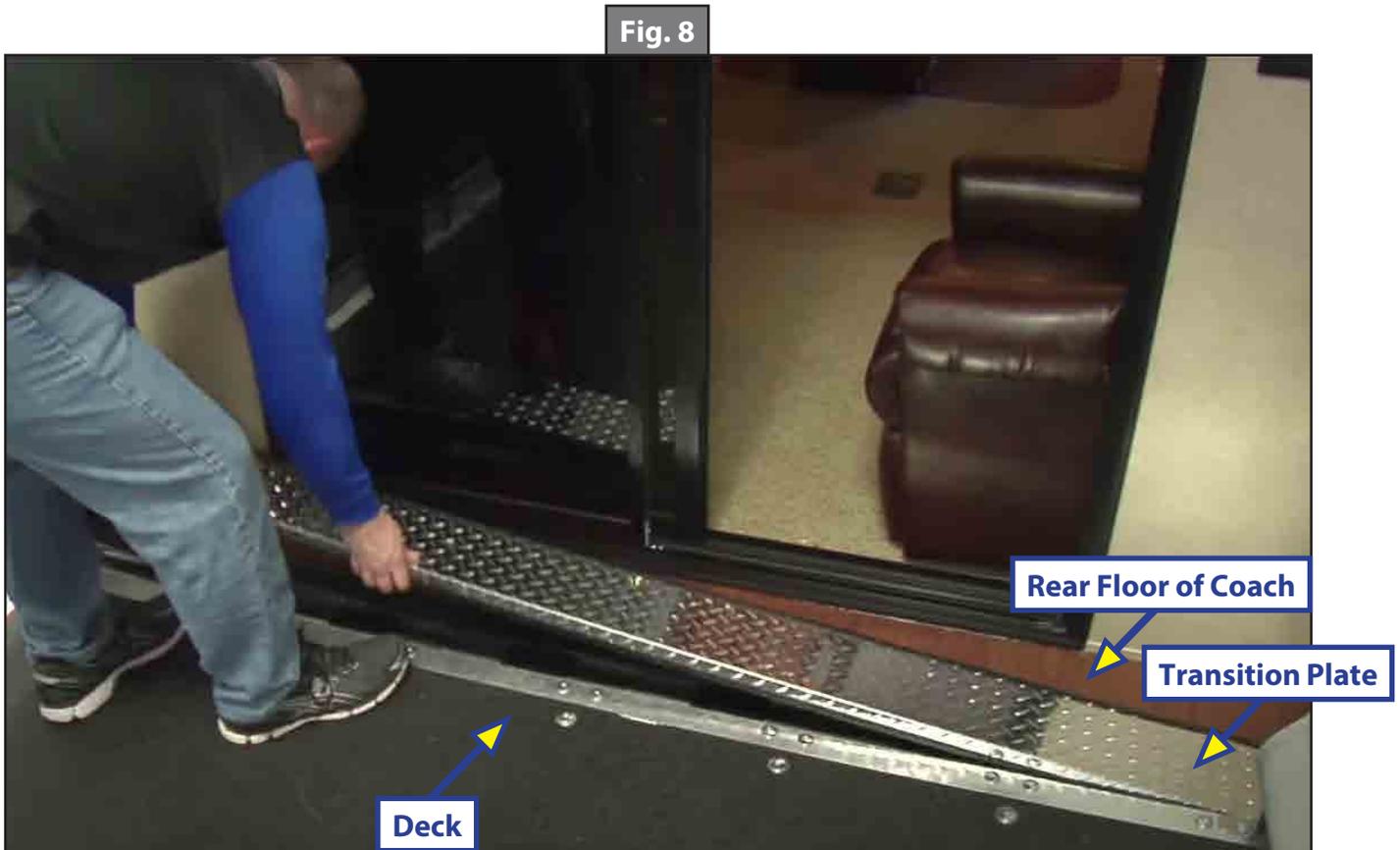
Fig. 6



7. Attach the party deck steps and railing to the end of the deck (Fig. 7).



8. Insert the transition plate between the deck and the rear floor of the coach (Fig. 8).



9. Slide canopy fabric cord into awning cord rail on rear of coach. Roll out the Party Deck canopy (Fig. 9).

Fig. 9



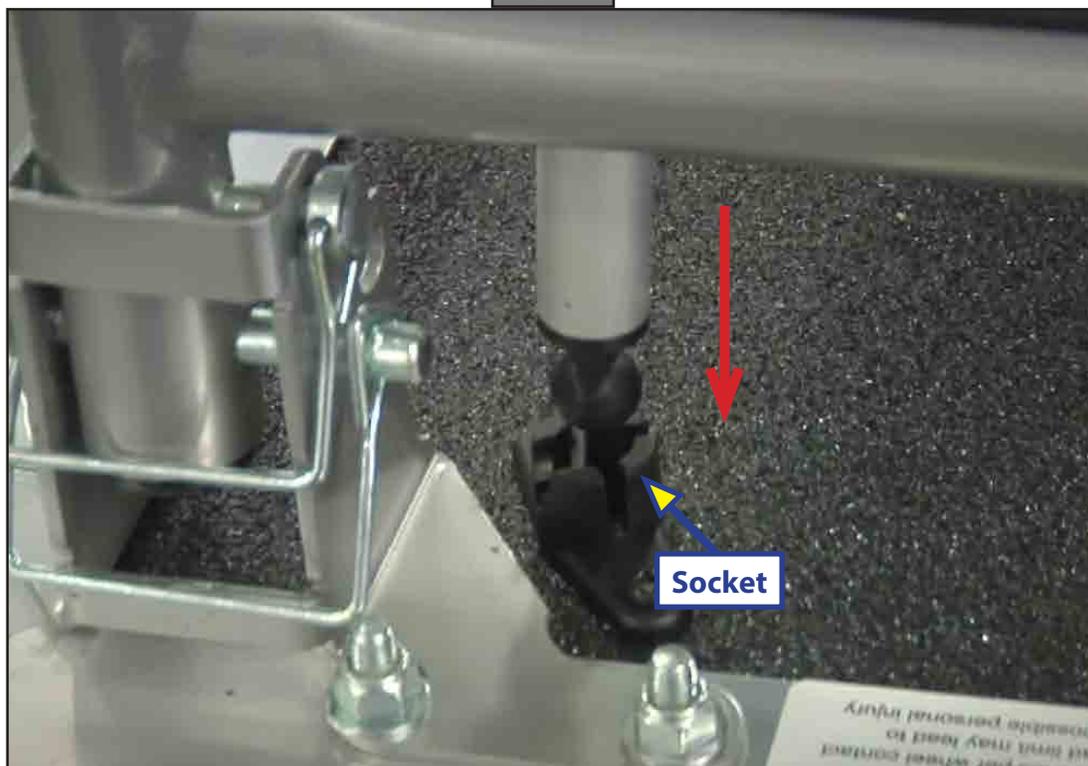
10. Fold the canopy legs (Fig. 10A) out from the canopy and telescope them to the floor (Fig. 10).

Fig. 10



11. Once fully extended, snap the bottom of the legs into the sockets (Fig. 11).

Fig. 11



12. Fold out the side supports (Fig. 12) from the canopy. Unlatch tensioner, telescope out, and insert the hook into the triangular gusset (Fig. 13). This will support the canopy.

Fig. 12

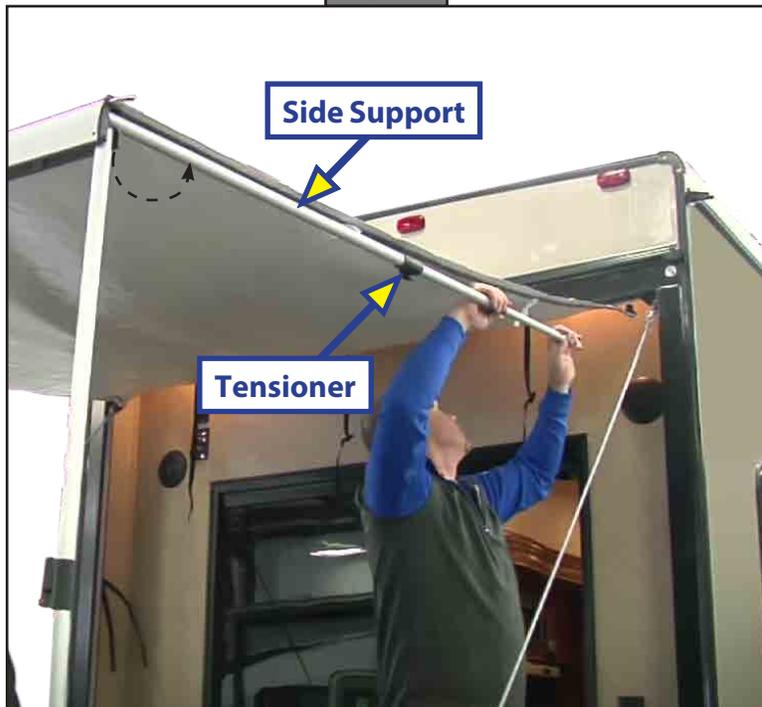
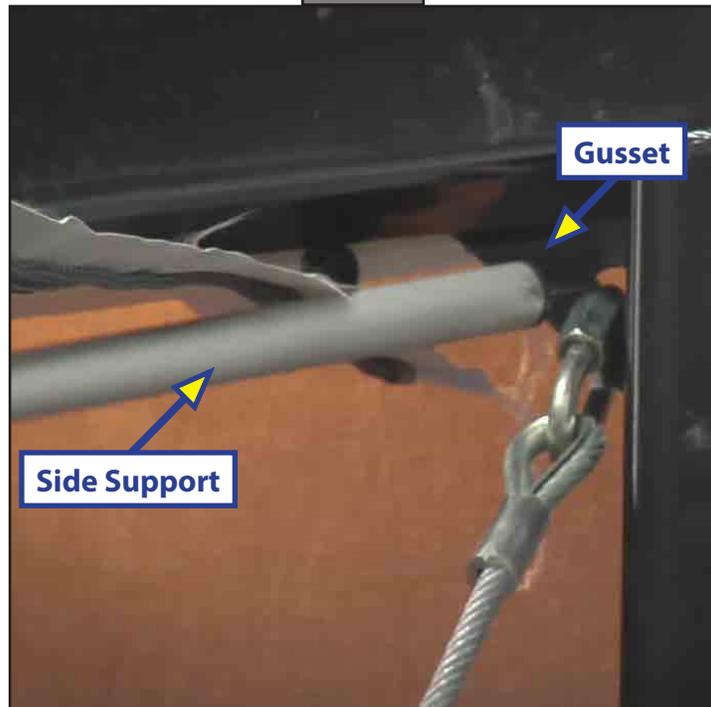


Fig. 13



- 13.** Assemble the roof bow supports by inserting the end sections of the support into the middle section (Fig. 14), and position them evenly under the canopy to ensure proper water runoff. Press the clips into the side supports as shown (Fig. 15).

**Fig. 14**



**Fig. 15**



- 14.** Unfold the side panels, and zip them onto the roof's left and right side (Figs. 16 and 17).

**Fig. 16**

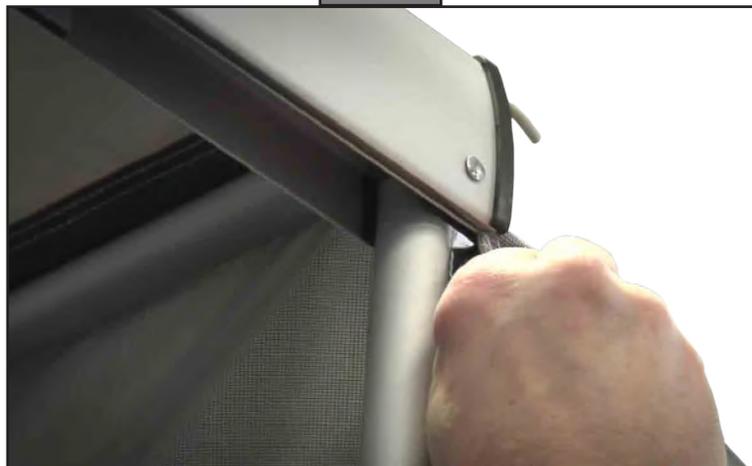


**Fig. 17**



- 15.** Slide the rear canopy cord into the cord rail (Fig. 18).  
**16.** Zip the corners to the left and right side panels (Fig. 19).

**Fig. 18**



**Fig. 19**



17. Secure the bungee cords to the eyelets underneath the deck (Fig. 20).

**⚠ CAUTION**

**Ensure the bungee cords do not snap back, which could cause injury.**

Fig. 20



Fig. 21 - Finished Assembly



## Maintenance

Prior to long periods of storage, it is recommended that the foot brackets and hanger pins of the patio railing assembly be lubricated to prevent rust.

# PATIO RAIL KITS 2.0

## DOORS

### Product Information

The Patio Rail Kits 2.0 are designed for either a rear ramp door or side patio installation allowing for a comfortable and additional living space. The rail kits utilize an existing rear ramp or side patio door. The patio rail kits can be easily extended and then stowed within the door jamb of the door assembly when not in use.

### Adjustable Cable System

**NOTE:** Some trailers are equipped with an optional adjustable cable system for the patio door. Follow applicable set screw warning for use of the adjustable cable.

The optional adjustable cable system assists in maintaining the position of the door at a 90-degree angle from the door jamb. This will allow the rail kit to lock more securely into the keeper bases.

Adjustment of the door is done by lengthening or shortening the adjustable cable. By turning the turnbuckle and holding the other end, the cable can be shortened or lengthened to adjust the angle of the door. When the cable is lengthened, the angle of the door relative to the jamb will increase. When the cable is shortened, the angle of the door relative to the jamb will decrease.

**NOTE:** The adjustable cable system allows for up to +/- 2.5" of adjustment in order to achieve a 90-degree angle for the patio door while in patio mode.

## Safety

### **⚠ WARNING**

The maximum weight rating for the rear door in ramp mode is 3,000 pounds. The maximum weight rating for the side door in patio mode is 1,500 pounds. Exceeding the maximum weight ratings can cause death, serious personal injury, severe product or unit damage. **DO NOT** allow the door to fall while lowering into level position. This could cause serious personal injury, severe product or trailer damage.

### **⚠ CAUTION**

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

## Preparation

Make sure that the door support cables are attached and secure in the patio position prior to operation.

### **⚠ WARNING**

**Do not remove set screw. Failure to follow this warning may result in death, serious personal injury and/or severe property damage.**

#### Product Safety Labels

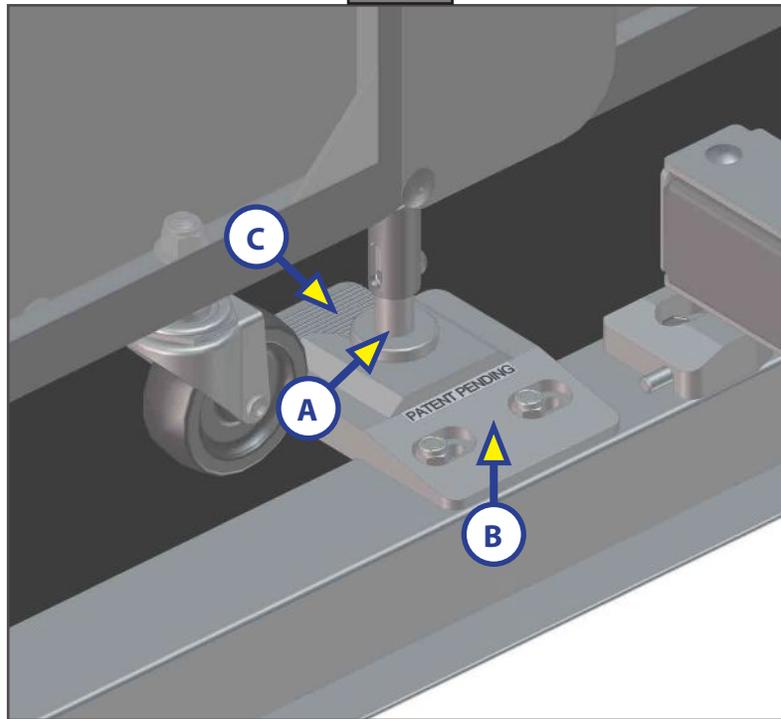
| <b>⚠ WARNING</b>   | <b>⚠ CAUTION</b>   |
|--|--|
| <ul style="list-style-type: none"><li>• Failure to follow these instructions may result in death, serious injury or property damage.</li><li>• Always secure the ramp door in either the closed, ramp or party deck position.</li><li>• Never use the ramp door while anything is obstructing operation.</li><li>• Keep hands away from all openings, rollers and cables when operating the ramp door.</li></ul> | <ul style="list-style-type: none"><li>• Failure to follow these instructions may result in serious injury or property damage.</li><li>• Read the instructions before installation or operation.</li><li>• Never force the ramp door in any direction.</li><li>• Always make sure the cables are pulling out straight, staying in the grooved portion of the rollers and not coming in contact with any obstructions.</li><li>• Do not operate the ramp door if the cable is frayed or damaged.</li></ul> |

## Patio Railing Operation

### Extending Patio Rail

1. Remove the hook and loop fabric strap securing the railing in the closed position.
2. Unfold the railing so that the keeper feet (Fig.1A) slide into the keeper bases (Fig. 1B) and lock in place.
3. Close and secure the gate with the latch.

Fig. 1



### **CAUTION**

**Properly stow rails to make sure that patio door closure does not compromise caster wheels. If patio railing is not properly stowed, caster wheels may get caught and be damaged by the hinge of the patio door when door is closed. Damage to caster wheels due to improper stowage of the patio rail kit is not covered under warranty.**

### **CAUTION**

**To prevent damage to the rails and screen panels, always make sure to properly stow the rails when not in use and prior to travel. Failure to do so may result in personal injury or property damage.**

### Retracting Patio Rail

1. Open the latch on the gate.
2. Depress the foot release (Fig. 1C) on the keeper bases (Fig. 1B).
3. While facing the patio door opening, fold the right railing back onto itself so it rests flush inside the door opening.
4. Make sure no caster wheels are in the hinge space between the patio door and the door jamb.
5. Fold the left railing back onto itself so it rests flush inside the door opening.
6. Make sure no caster wheels are in the hinge space between the patio door and the door jamb.
7. When caster wheels are clear of the hinge area and the railings are folded inside the door opening, secure with attached hook and loop fabric strap to prevent shifting when railing is in the closed position.

## Optional Step Operation

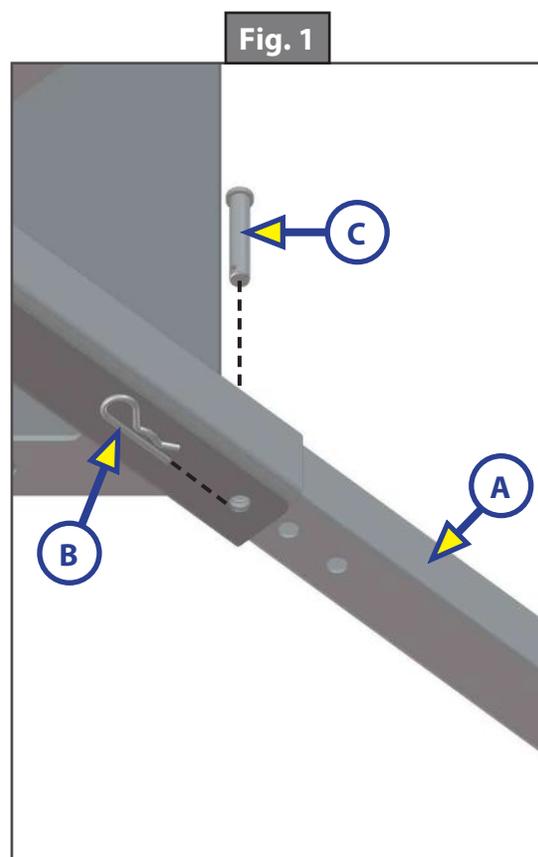
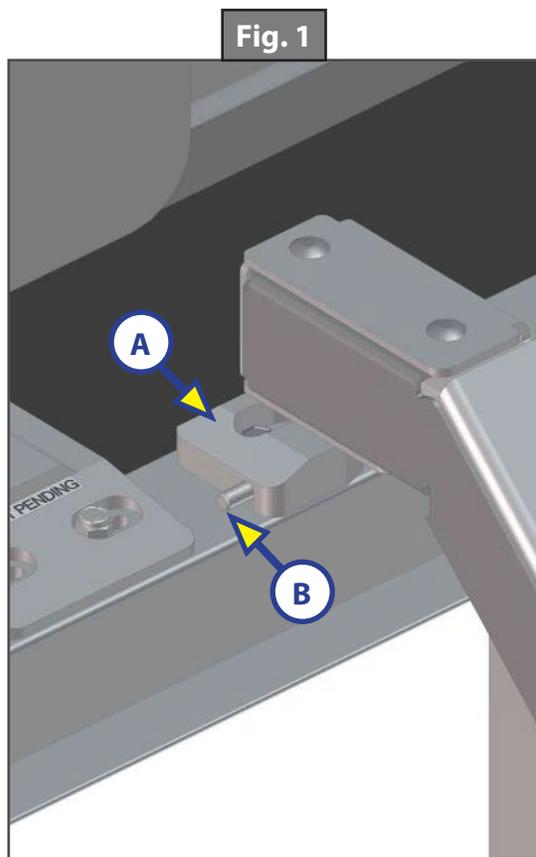
**NOTE:** Steps are an optional component in Patio Railing Kits 2.0.

### Steps Set-Up

1. Attach the steps to the door by locking them into the step keeper bases (Fig. 2A).
2. Extend the feet (Fig. 3A) by removing the cotter pin (Fig. 3B) from the clevis pin (Fig. 3C).
3. Remove clevis pin from the foot rail.
4. Adjust the steps to a level position and secure by inserting the clevis pin into the nearest aligned foot holes, then insert the cotter pin into the clevis pin (Fig. 3).

### Steps Storage

1. Remove the steps from the door by pushing in the pins (Fig. 2B) on the side of the step keeper bases (Fig. 2A).
2. Retract the feet (Fig. 3A) by removing the cotter pin (Fig. 3B) from the clevis pin (Fig. 3C).
3. Remove clevis pin from the foot rail.
4. Adjust the steps to a storage position and secure by inserting the clevis pin into the nearest aligned foot holes, then insert the cotter pin into the clevis pin (Fig. 3).



## Maintenance

To maintain smooth operation of the rail kits,

1. Lubricate all moving parts every 30 days with a good quality moisture and heat resistant penetrating grease.

**NOTE:** Silicone lubricants and WD-40® are not recommended for use. They have a tendency to evaporate and dry the mating surfaces which leave them vulnerable to the elements.

**NOTE:** Prior to long periods of storage, LCI recommends that the keeper bases and keeper feet of the patio railing assembly be lubricated to prevent rust.

2. Check to make sure that the cable is not frayed or damaged. Replace as needed.
3. Check for loose or missing fasteners. Tighten or replace as needed.
4. Check for any visible signs of wear on caster wheels.
5. Inspect hinge points.
6. Check rail screen panels for tears.
7. Clean step assembly before lubricating.

# MYRV® WITH ONECONTROL™ TOUCH PANEL

## ELECTRONICS

### System Information

The OneControl Touch Panel (OCTP) is a MyRV® compatible touchscreen device that provides system controls and monitoring software for the recreational vehicle unit. The systems include slide-outs, leveling systems, awnings, lighting, temperature, water tanks, tire pressure, battery levels and any other compatible systems installed on the unit and programmed into the MyRV® system. Powering up the unit will also power the OneControl Touch Panel and the various controllers throughout the unit.

### Operation

#### Power On/Off

1. The device can be powered on or off using the button on the front of the device.

**NOTE:** It will take a few moments to start up and load the system.

2. To enter or exit sleep mode, press and release the power button.

#### Control Panel

1. Locate "MyRV® Control Panel" (Fig. 1A).
2. Pressing the "MyRV® Control Panel" (Fig. 1A) will open the "MyRV® Control Panel" (Fig. 2).
3. Press the icon of the system you wish to operate.

**NOTE:** The control panel will show icons representing the devices connected to the MyRV® system. Push the system "Home" icon (Fig. 2A) to return to the MyRV® home screen.



## System Operations

**NOTE:** System menus that are grayed out (Fig. 3) are loading and cannot function until loading is complete and the menu options are blue (Fig. 4).

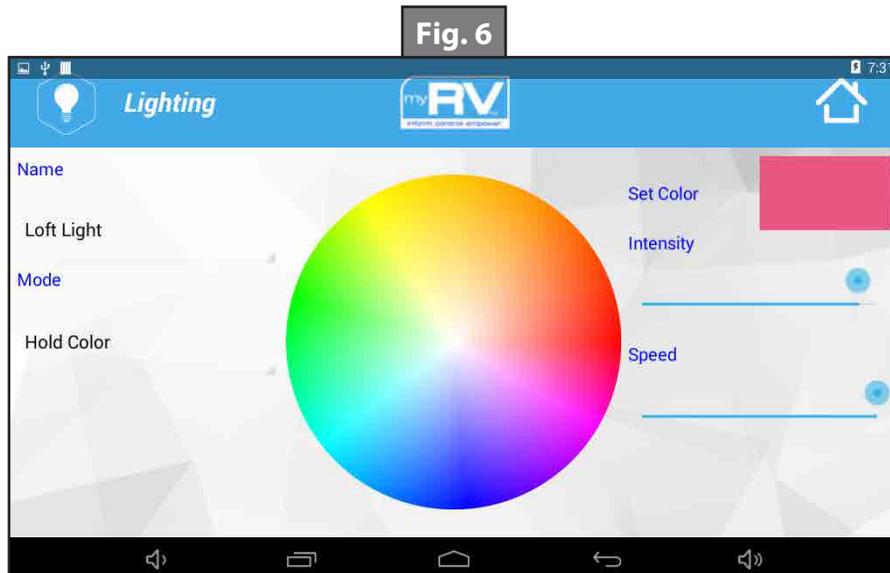
**NOTE:** Push the applications "Home" icon to return to the MyRV® home screen (Fig. 3A).



**A.** Lighting (if equipped Fig. 2):

- I. Pressing the highlighted "On" or "Off" on the "Master Light" will turn all lights on or off (Fig. 5A).
- II. Pressing the highlighted "On" or "Off" will turn individual lights on or off (Fig. 5B).
- III. If the unit is equipped with colored lighting, pressing the settings icon (Fig. 5E) will allow the adjustment of the light name, mode, color, intensity and speed (Fig. 6).

**NOTE:** Status of individual lights is displayed by the light bulb to the left of the light name. The light icon will display a lit bulb (Fig. 5C) if the light is on and a dim bulb (Fig. 5D) if the light is off.



**B. Awning (if equipped Fig. 2):**

- I. Select an awning to operate (Fig. 7A).

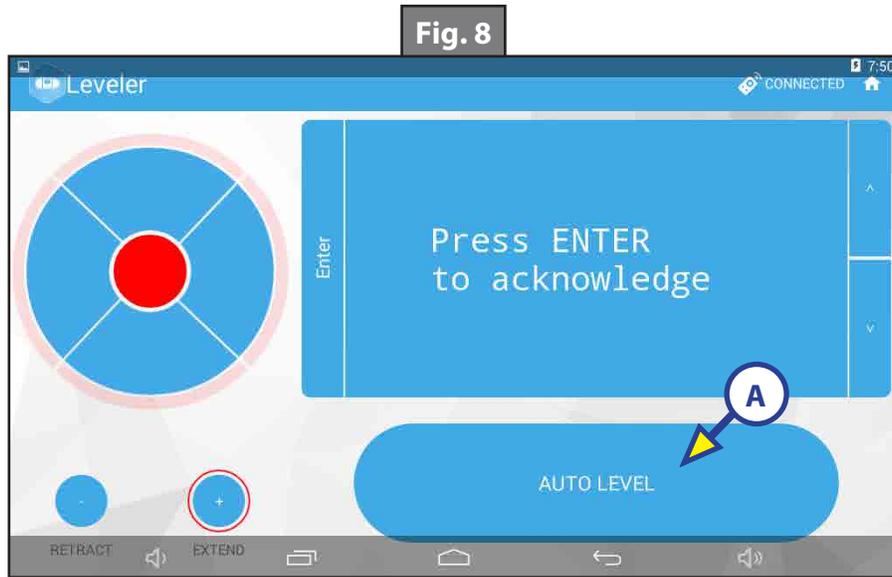
**NOTE:** If there are multiple awnings on the unit, you will be prompted to select which awning to operate.

- II. Pressing "Extend" will extend the awning (Fig. 7B).
- III. Pressing "Retract" will retract the awning (Fig. 7C).



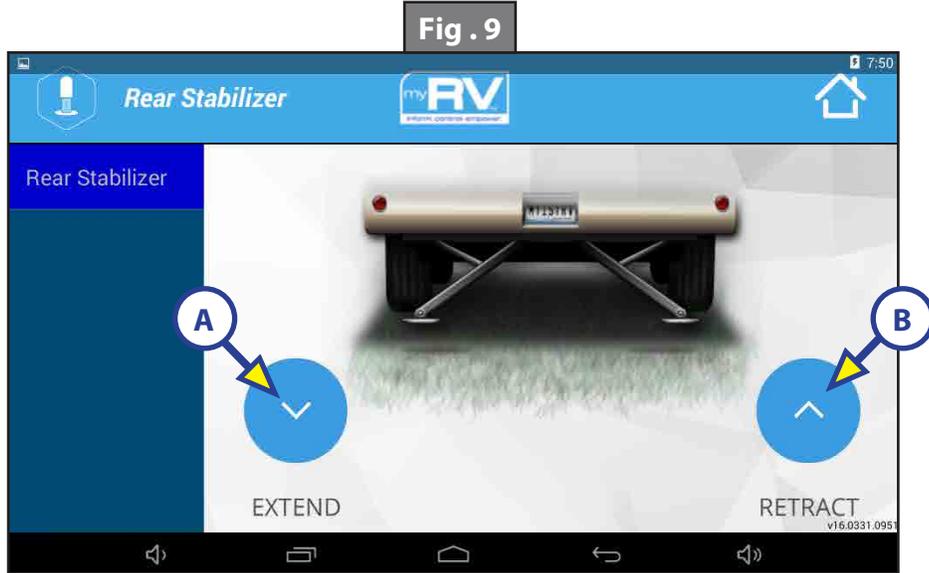
**C. Levelers (if equipped Fig. 2):**

- I. Pressing the "Levelers" icon will allow you to access the leveling user interface.
- II. In order to level the unit, press the "Auto Level" button (Fig. 8A).



**D. Rear Stabilizer (if equipped Fig. 2):**

- I.** Pressing the "Rear Stabilizer" icon will allow you to access the rear stabilizer screen.
- II.** To extend the rear stabilizer, press the "Extend" button (Fig. 9A).
- III.** To retract the rear stabilizer, press the "Retract" button (Fig. 9B).

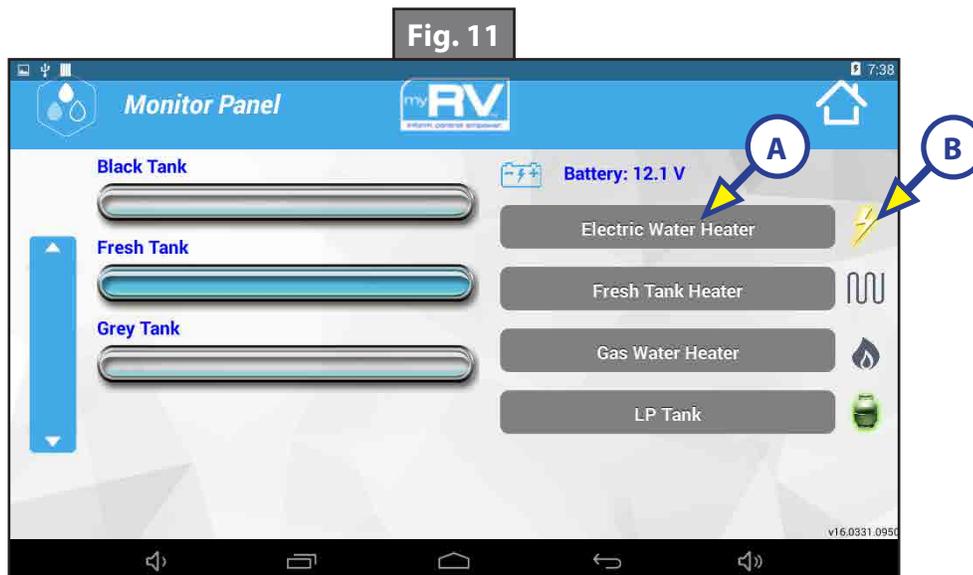


**E. TV Lift (if equipped Fig. 2):**

- I.** Pressing the "TV Lift" icon will allow you to access the TV Lift screen.
- II.** To raise the TV lift, press the "Up" button (Fig. 10A).
- III.** To lower the TV lift, press the "Down" button (Fig. 10B).



- F. Tank Monitor (if equipped Fig. 2):
  - I. Pressing the "Monitor Panel" icon will allow you to access the tank monitor screen (Fig. 11).
  - II. The monitor symbols to the left will allow you to see the status of the various tanks (Fig. 11).
  - III. Pressing the device buttons on the right (Fig. 11A) will activate the component. The icon to the right will light up when the corresponding device is in use (Fig. 11B).



- G. Slides (if equipped Fig. 2):
  - I. Pressing the "Slides" icon will allow you to access the slide-out screen.
  - II. Select a slide-out to operate (Fig. 12A).
  - III. Pressing "Out" will extend the slide-out (Fig. 12B).
  - IV. Pressing "In" will retract the slide-out (Fig. 12C).



**NOTE:** The following documents and resources on the OneControl Touch Panel are pre-loaded on the system at the time of manufacture. To check for the latest revisions, please visit [www.lci1.com](http://www.lci1.com).

There are various types of resources in MyRV® including:

1. How To (Fig. 13A)
  - A. Various operation and informational videos (Fig. 14).
2. Troubleshooting Videos (Fig. 13B)
  - A. Step-by-step troubleshooting and maintenance videos (Fig. 15).

**NOTE:** Troubleshooting videos may not be specific to any unit.

Fig. 13



Fig. 14



3. Owner's Manuals (Fig. 13C)
  - A. Product documentation containing operation and basic troubleshooting (Fig. 16).

**NOTE:** Product documentation may not be specific to any unit.
4. Search Function (Fig. 13D)
  - A. Searches the MyRV® tablet for any files (documentation, videos, images, etc.) containing the search term (Fig. 17).
    - I. Enter search terms into search pop-up and press the search button (Fig. 17A) to view all related files.
5. FAQs (Fig. 13E)

Fig. 15

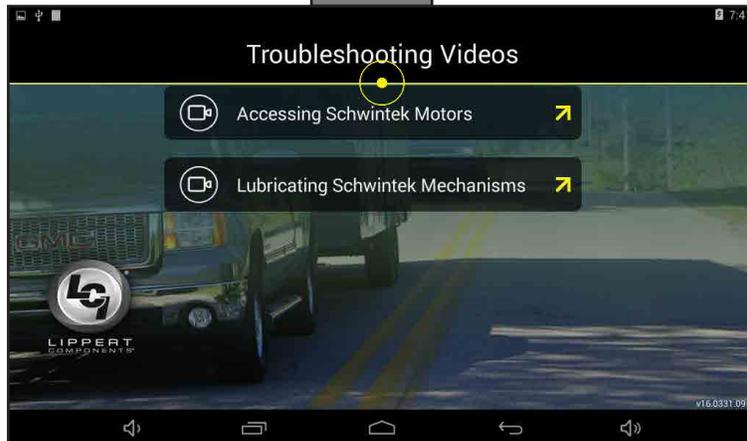
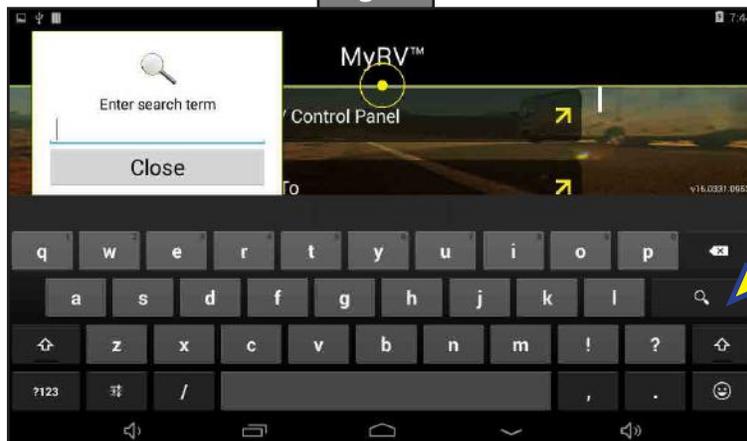


Fig. 16



Fig. 17



- A. Frequently asked questions with drop down answers (Fig. 18).
  - I. Press the question to reveal the answer and a link to more information.
- 6. Apps (Fig. 13F)
  - A. Manage the tablet and information settings (Fig. 19).
    - I. MyRV® Media Sync (Fig. 19A) allows the manufacturer to manage documentation supplied on MyRV® .
    - II. Set Date & Time (Fig. 19B) manages the clock and calendar settings.

Fig. 18

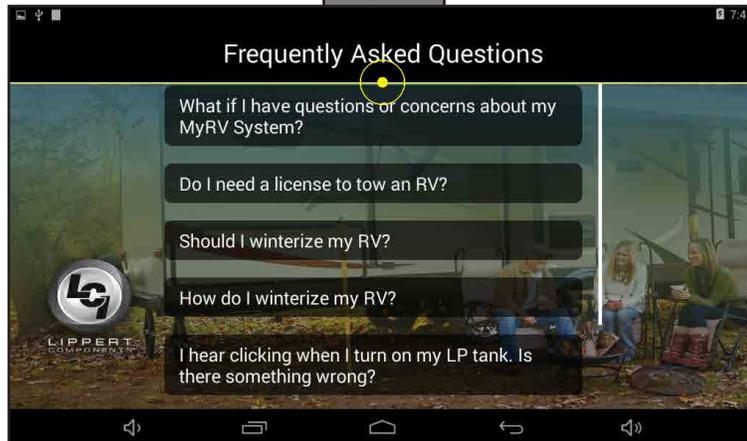


Fig. 19



## Safety and System Information

### System Information

The MyRV® tablet is an Android-based device that uses the MyRV® application to bring system controls and monitoring software to a touchscreen tablet. The MyRV® tablet can access the internet (if available), basic how-to RV videos, product videos, owner's manuals and many more RV owner's resources. The systems controlled and monitored by MyRV® include slide-outs, leveling systems, awnings, lighting, temperature, water tanks, tire pressure, battery levels and many more.

The MyRV® Control Panel is accessed within the MyRV® application on the tablet. When powering on or waking the tablet, the MyRV® application will run automatically as it is pre-configured to do so. In order for the MyRV® application to present the operator with the MyRV® Control Panel, there must be power to the coach. This will power the various MyRV® controllers located throughout the unit. This will also power the wireless hub and enable connectivity with the tablet, ultimately allowing wireless connectivity. Please note that with power to the coach, the tablet should always be able to gain access to the MyRV® Control Panel when placed in the docking station due to it being a wired connection. Use this to assist when diagnosing concerns with the system.

**NOTE:** After powering up the RV, it may take several minutes (2-5) for the MyRV® tablet and MyRV® Hub to fully energize and communicate. Please allow this time for the system to establish communications to ensure swift application operations.

# Operation

## Power On/Off

1. To power ON the MyRV tablet, hold and release the power button for 2-3 seconds (Fig. 1).w

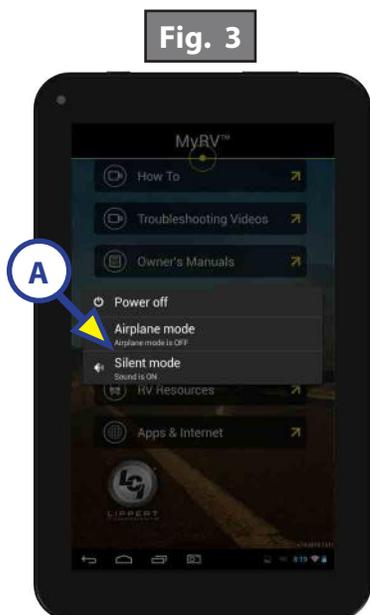
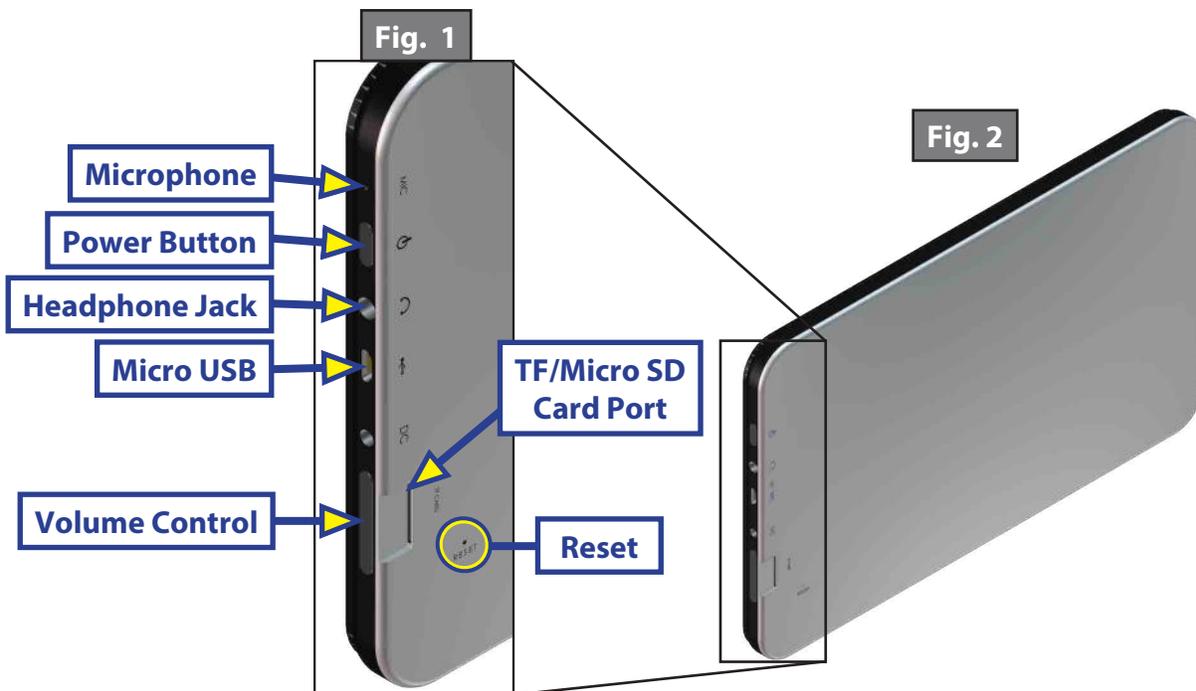
**NOTE:** It will take a few moments to start up and load the system.

2. To enter or exit sleep mode, press and release the power button.

**NOTE:** When in sleep mode, the tablet will continue to draw small amounts of power. If the tablet is going to be unused for an extended period of time, it is recommended that the tablet be powered "off."

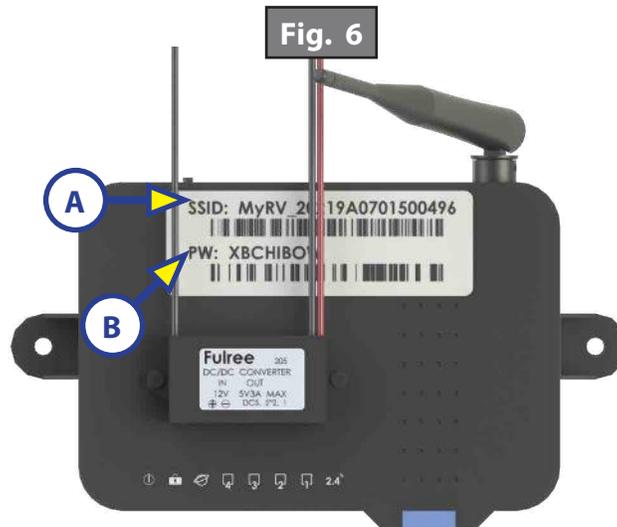
3. To power OFF the MyRV tablet, press and hold the power button until a utility screen appears (Fig. 3).
4. Select "Power off" (Fig. 3A).
5. Press "OK" (Fig. 4A) when confirmation box displays: "Your tablet will shut down."

**NOTE:** Do not complete the steps to "Factory Reset" your tablet in settings. This will erase all data on your tablet and VOID the warranty on the tablet.



## Connecting the MyRV Tablet to The MyRV Wireless Network

1. On the MyRV home page, select "Apps & Internet."
2. On the "Apps and Internet Browser," select the "WiFi Manager."
3. Locate the MyRV Hub (Fig. 5) or Range Extender (Fig. 6) and the label which contains the SSID and password to the MyRV system.
4. Match the SSID on the MyRV Hub (Fig. 5A) or Range Extender (Fig. 6A) to the corresponding SSID in the "Wifi Manager."
5. Select the SSID and enter the password located on the MyRV Hub (Fig. 5B) or Range Extender (Fig. 6B) then press "Connect."



## Wireless Hub and Range Extender

The MyRV system is equipped with a wireless hub and range extender. When powered, the hub and range extender provide the perimeter of the coach with wireless connectivity. This allows the tablet to effectively send commands wirelessly to the MyRV system. The hub and range extender's only purpose is to provide wireless connectivity. The hub and range extender does not keep configuration data, so when troubleshooting wireless connection concerns, ensure the tablet can operate the MyRV Control Panel when housed in the docking station. Again, as long as there is power to the coach, the MyRV system should operate from the dock.

## Docking Station

The MyRV system includes a tablet docking station. This is typically mounted near the center of the coach, and houses the tablet when the wireless operation is unnecessary or during travel. To connect the tablet to the docking station, open the door on the docking station, and slide the tablet into the sleeve on the door about 3/4 of the way in. Then connect the micro USB plug on the docking station into the micro USB port on the tablet. Slide the tablet the rest of the way into the sleeve and then close the door. The docking station is wired to the coach power system, which will charge the tablet during its storage period. The docking station is also wired for communication with the various controllers in the coach. This allows the tablet to function when stored in the dock without being reliant on the wireless hub.

## Applications and Internet

1. Locate "Apps & Internet" by scrolling down to the bottom of the screen (Fig. 7).
2. Pressing the "Apps & Internet" (Fig. 7A) will open the "Apps and Internet Browser" (Fig. 8).

From here the "Apps and Internet Browser" will assist in connecting to Wi-Fi, if available. If Wi-Fi is available, you may proceed in downloading Play Store applications, viewing web pages and email, and setting date/time.

**NOTE:** The wireless hub cannot be used as a Wi-Fi hotspot. The MyRV tablet is Wi-Fi capable and may be used to access the internet, but a usable Wi-Fi connection must be available.



Connectivity can be viewed:

- From the home menu of the MyRV application, click on APPS & INTERNET.
- Click on the WI-FI MANAGER icon and you should see something similar to (Fig. 9).



## MyRV Control Panel

**NOTE:** Password protection will only be on tablets manufactured on or after 7-13-15.

- If the tablet is outside of the dock and connected to the system via WiFi, clicking on “MyRV Control Panel” from the main MyRV screen will show the attached password screen (Fig. 10A). The default PIN is 1234.
- The PIN is not required if the tablet is inside the dock and connected to the USB cable.
- The MyRV Control Panel screen includes a settings button in the upper-right hand corner (Fig. 11A).
- Clicking the settings button will open the attached settings screen, where the PIN can be changed (Fig. 12).

Fig. 10

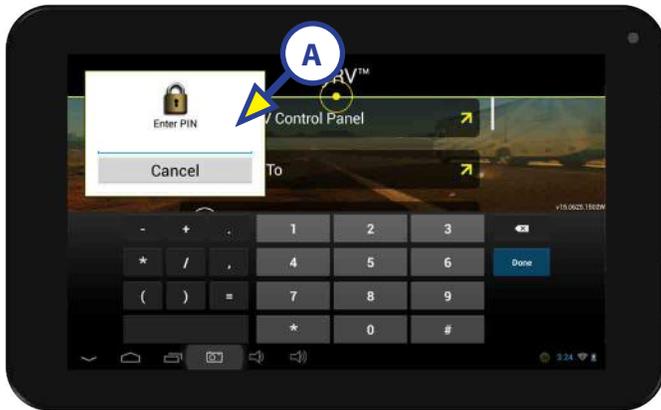


Fig. 11

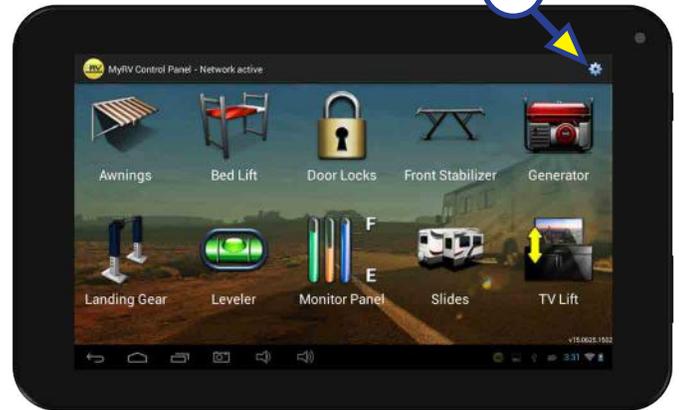
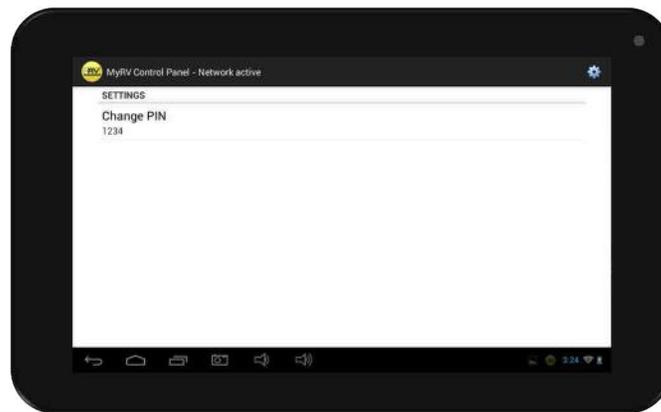


Fig. 12



The control panel will operate various devices connected to the MyRV system.

1. Locate "MyRV Control Panel" (Fig. 13).
2. Pressing the "MyRV Control Panel" (Fig. 13A) will open the "MyRV Applications" (Fig. 14).
3. Press the icon of the device you wish to operate.

**NOTE:** Icons that are grayed out are loading and cannot function until loading is complete. Icons will be full color once loaded.



**A.** Lighting (if equipped) (Fig. 15):

- I. Pressing the highlighted "On" or "Off" on the "Master Light" will turn all lights on or off (Fig. 16A).
- II. Pressing the highlighted "On" or "Off" will turn individual lights on or off (Fig. 16B).

**NOTE:** Status of individual lights is displayed by the light bulb to the left of the light name (Fig. 17A).



**B. Awning (if equipped) (Fig. 18):**

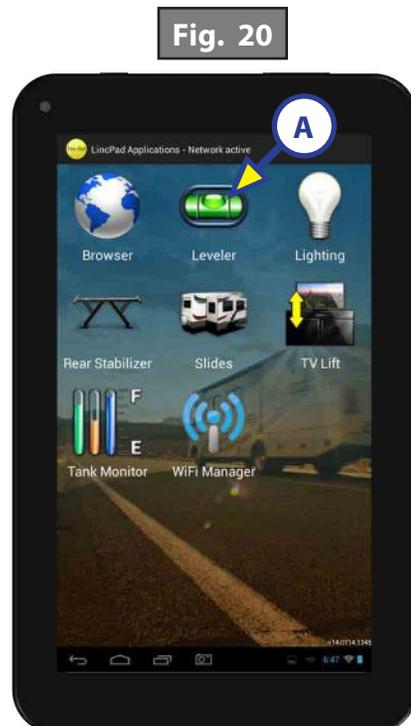
- I.** Pressing "Extend" will extend the awning (Fig. 19A).
- II.** Pressing "Retract" will retract the awning ( Fig. 19B).

**NOTE:** If there are multiple awnings on the unit, you will be prompted to select which awning to extend or retract.



**C. Leveling (if equipped):**

- I.** Pressing the "Leveling" icon (Fig. 20A) will allow you to access the leveling controller.
- II.** In order to level the coach, press the "Auto Level" button (Fig. 21A).



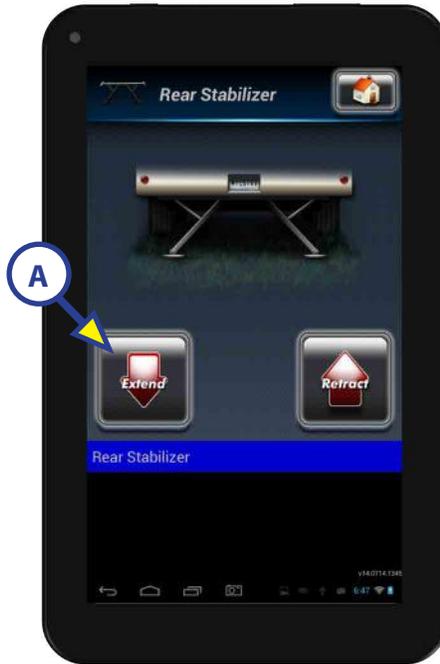
**D. Rear Stabilizer (if equipped):**

- I. Pressing the "Rear Stabilizer" icon (Fig. 22A) will allow you to access the rear stabilizer screen.
- II. To extend the rear stabilizer, press the "Extend" button (Fig. 23A).
- III. To retract the rear stabilizer, press the "Retract" button (Fig. 24A).

**Fig. 22**



**Fig. 23**



**Fig. 24**



**E. TV Lift (if equipped):**

- I. Pressing the "TV Lift" icon (Fig. 25A) will allow you to access the TV Lift screen.
- II. To raise the TV lift, press the "Up" button (Fig. 26A).
- III. To lower the TV lift, press the "Down" button (Fig. 27A).

**Fig. 25**



**Fig. 26**



**Fig. 27**



**F. Tank Monitor (if equipped):**

- I.** Pressing the "Tank Monitor" icon (Fig. 28A) will allow you to access the tank monitor screen (Fig. 29).

**Fig. 28**



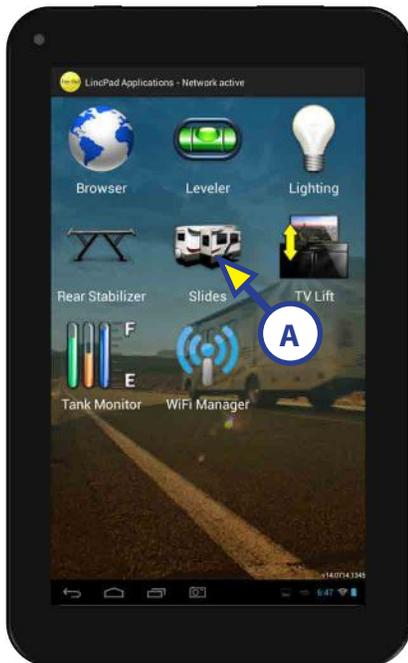
**Fig. 29**



**G. Slide-out (if equipped):**

- I.** Pressing the "Slides" icon (Fig. 30A) will allow you to access the slide-out screen.
- II.** Select the slide-out you would like to operate (Fig. 31).

**Fig. 30**



**Fig. 31**



- I. Pressing "Out" will extend the slide-out (Fig. 32A).
- II. Pressing "In" will retract the slide-out (Fig. 32B).

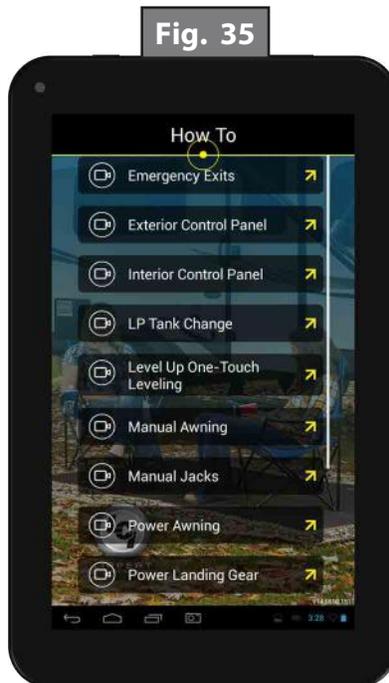
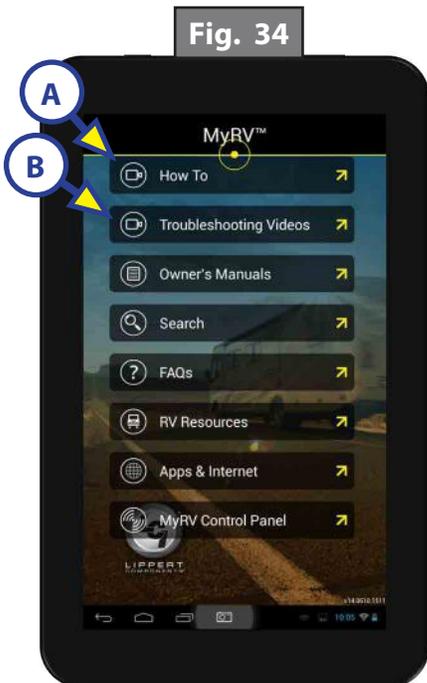
**NOTE:** Push the application "Home" icon (Fig. 33A) to return to MyRV applications (Fig. 13). Push (Fig. 33B) to go back to the MyRV Control Panel (Fig. 14).



## MyRV Resources

There are various types of resources in MyRV including:

1. How To (Fig. 34A)
  - A. Various operation and informational videos (Fig. 35).
2. Troubleshooting Videos (Fig. 34B)
  - A. Step by step troubleshooting and maintenance videos (Fig. 36).



**NOTE:** Troubleshooting videos may not be specific to any coach.

3. Owner's Manuals (Fig. 37A)

A. Product documentation containing operation and basic troubleshooting (Figs. 38 and 39).

**NOTE:** Product documentation may not be specific to any coach.

4. Search Function (Fig. 40B)

A. Searches the MyRV tablet for any files (documentation, videos, images, etc.) containing the search term (Fig. 41).

Fig. 37

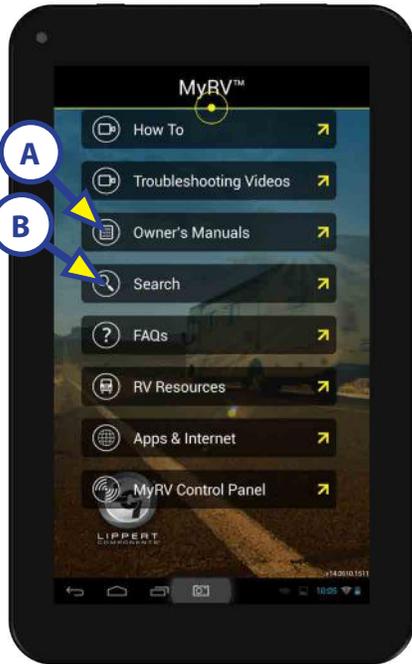


Fig. 38

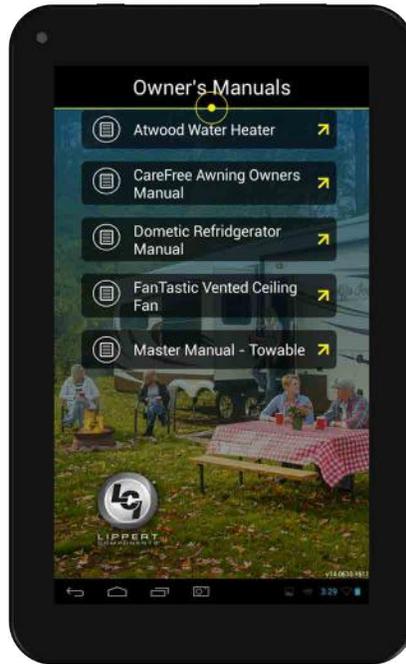


Fig. 39

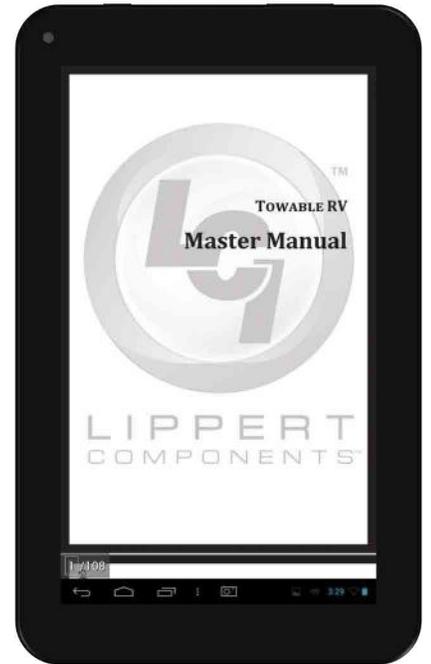


Fig. 40

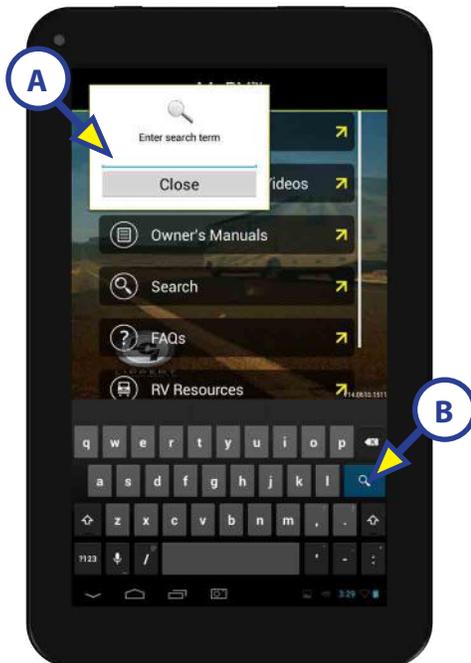
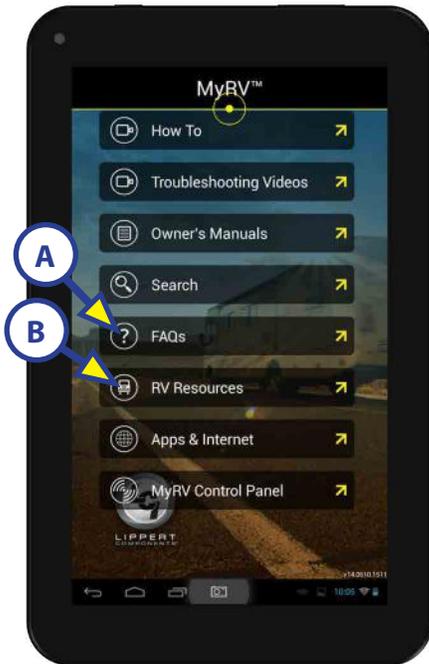


Fig. 41

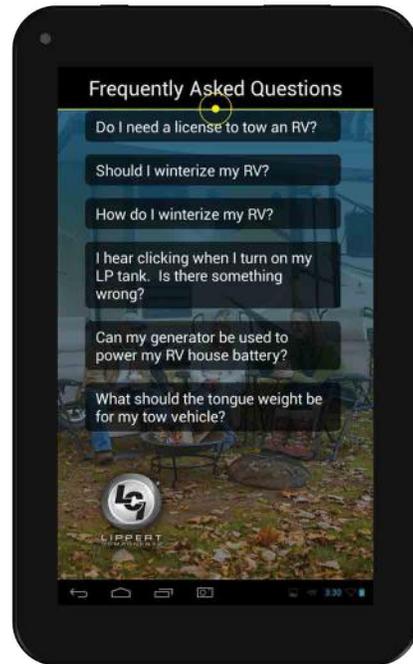


- I. Enter search terms into search pop-up (Fig. 40A) and press the search button (Fig. 40B) to view all files related (Fig. 41).
- 5. FAQs (Fig. 42A)
  - A. Frequently asked questions with drop down answers (Fig. 43).
    - I. Press the question to reveal the answer and a link to more information (Fig. 44A).
- 6. RV Resources (Fig. 42B)
  - A. List of RV resources which link to websites that help with finding campgrounds, ordering parts or being a member of a group (Fig. 45).

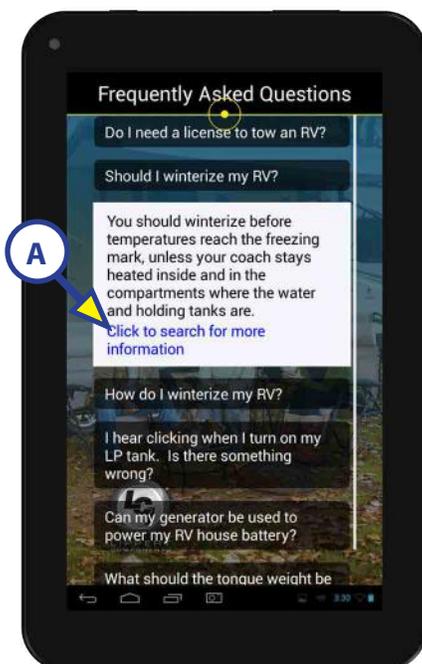
**Fig. 42**



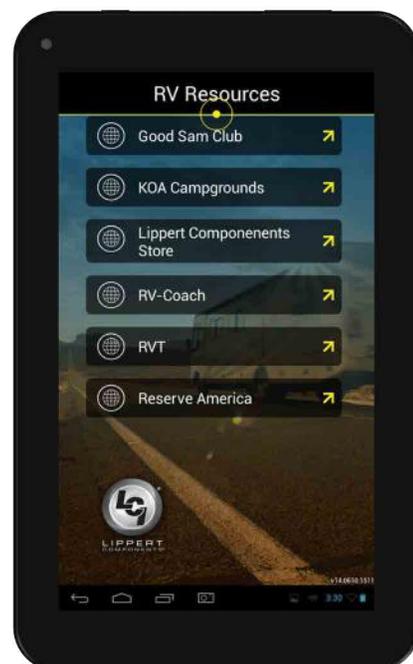
**Fig. 43**



**Fig. 44**



**Fig. 45**



## Troubleshooting

| What Is Happening?                                | Why?   | What Should Be Done?  |
|---|--|---|
| There is no internet access.                      | The MyRV tablet can only connect to a single wifi signal at a time.    | Disconnect from the MyRV Hub wireless signal and reconnect to an external wifi signal.  |
| There is no connection to the MyRV control panel. | There is no connection to the MyRV Hub.                                | Check the connection in the Wifi Manager application. If the connection is weak, move closer to the MyRV hub. If that doesn't remedy the situation, place the tablet into the MyRV docking station. The docking station is wired to the system, and this should connect the tablet to the MyRV Hub. Also, try relocating the MyRV Hub away from appliances such as microwaves or refrigerators. |
|   | There is no power to the MyRV system.                                  | Check power connections to the MyRV hub, multi-function receiver and digital switch. Repair and replace as necessary.   |
|   | Not in range of the MyRV Hub.  | Move closer to the MyRV Hub.  |
| The MyRV tablet will not turn on.                 | The power button was not held down long enough to power on the tablet. | Press and hold the power button for 4-5 seconds.  |
|   | The battery is dead.   | Hook the MyRV tablet into the wall mount docking station to charge the MyRV tablet. If the MyRV tablet will not turn on after being charged on the docking station, it may need to be replaced. Call Lippert Customer Service at (574) 537-8900.  |

**NOTE:** If the MyRV tablet becomes unresponsive, press the reset button on the back of the tablet.

### Connecting the Replacement MyRV Tablet to The MyRV Wireless Network

If replacement of the MyRV tablet is necessary, the new tablet will need to be connected to the MyRV Hub to operate the systems of the coach. See "Connecting the MyRV Tablet to the MyRV Wireless Network" instructions.

**NOTE:** If the MyRV tablet says "authenticating" for more than a few seconds, the password may have been entered incorrectly. Cancel and re-enter the password.

### Safety and System Information

#### System Information

The MyRV tablet is an Android-based device that uses the MyRV application to bring system controls and monitoring software to a touchscreen tablet. The MyRV tablet can access the internet (if available), basic how-to RV videos, product videos, owner's manuals and many more RV owner's resources. The systems controlled and monitored by MyRV include slide-outs, leveling systems, awnings, lighting, temperature, water tanks, tire pressure, battery levels and many more.

The MyRV Control Panel is accessed within the MyRV application on the tablet. When powering on or waking the tablet, the MyRV application will run automatically as it is pre-configured to do so. In order for the MyRV application to present the operator with the MyRV Control Panel, there must be power to the coach. This will power the various MyRV controllers located throughout the unit. This will also power the wireless hub and enable connectivity with the tablet, ultimately allowing wireless connectivity. Please note that with power to the coach, the tablet should always be able to gain access to the MyRV Control Panel when placed in the docking station due to it being a wired connection. Use this to assist when diagnosing concerns with the system.

**NOTE:** After powering up the RV, it may take several minutes (2-5) for the MyRV tablet and MyRV Hub to fully energize and communicate. Please allow this time for the system to establish communications to ensure swift application operations.

## Programming

### Connecting the MyRV Tablet to The MyRV Wireless Network

**NOTE:** Tablet must be connected to MyRV Wifi Hub to complete the programming process. Placing the hub in a high location away from appliances such as microwaves and refrigerators will minimize interference.

1. On the MyRV home page, select "Apps & Internet."
2. On the "Apps and Internet Browser," select the "WiFi Manager."
3. Locate the MyRV Hub (Fig. 1) or Range Extender (Fig. 2) and the label which contains the SSID and password to the MyRV system.
4. Match the SSID on the MyRV Hub or Range Extender (Figs. 1A and 2A) to the corresponding SSID in the "Wifi Manager."
5. Select the SSID and enter the password located on the MyRV Hub or Range Extender (Figs. 1B and 2B) then press "Connect."

**NOTE:** In order to charge the tablet out of the dock, a 5 volt, 1.8 amp micro USB charger or barrel charging connector is needed.

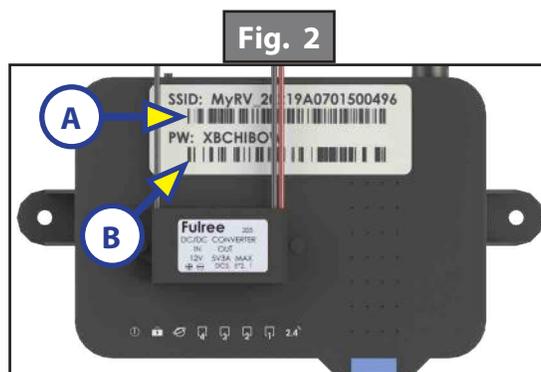


### Docking Station

The MyRV system includes a tablet docking station. This is typically mounted near the center of the coach, and houses the tablet when the wireless operation is unnecessary or during travel. The docking station is wired to the coach power system and will charge the tablet during its storage period. The docking station is also wired for communication with the various controllers in the coach. This allows the tablet to function when stored in the dock and becomes non-reliant on the wireless hub to do so.

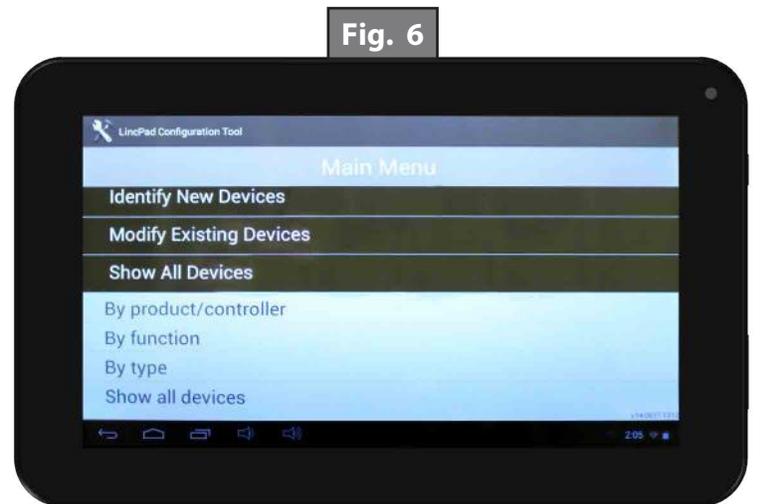
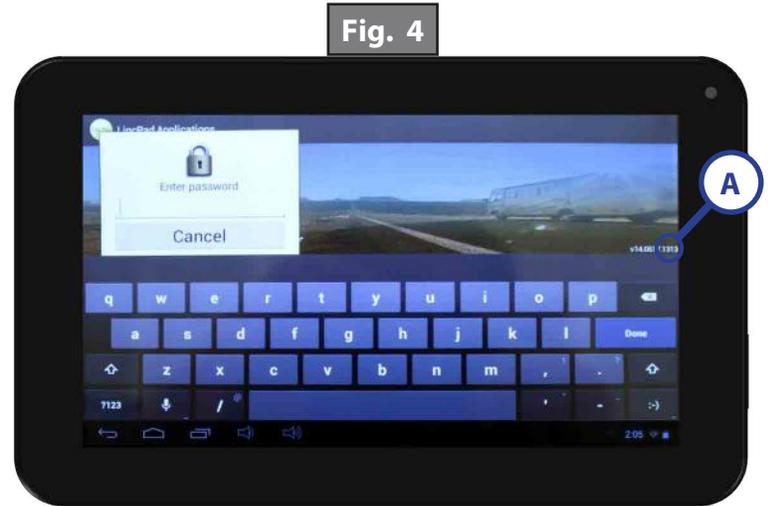
### Wireless Hub and Range Extender

The MyRV system is equipped with a wireless hub and range extender. When powered, the hub and range extender provide the perimeter of the coach with wireless connectivity. This allows the tablet to effectively send commands wirelessly to the MyRV system. The hub's and range extender's only purpose is to provide wireless connectivity. The hub and range extender do not keep configuration data, so when troubleshooting wireless connection concerns, ensure the tablet can operate the MyRV Control Panel when housed in the docking station. Again, as long as there is power to the coach, the MyRV system should operate from the dock.



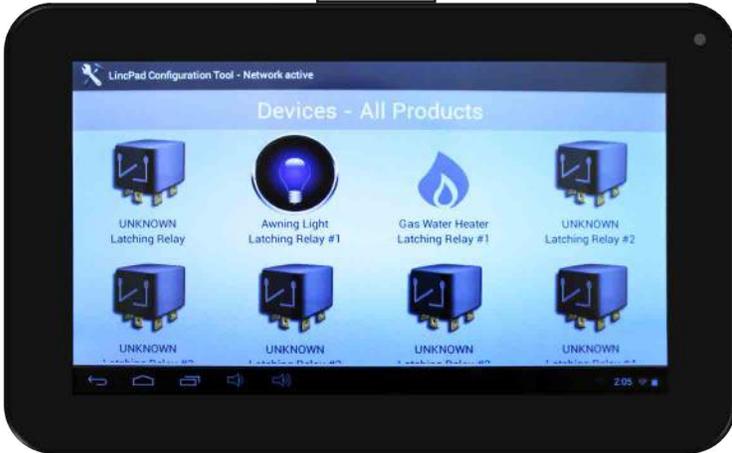
## MyRV Functions

1. Press the yellow LincPad Applications icon 5 times (Fig. 3A).
2. A pop-up window will prompt the user to enter password (Fig. 4). The password is the last 4 digits of the version located in the bottom right hand of the tablet desktop (Fig. 4A).
3. After a password is entered, the Configurator Icon will appear (Fig. 5A). Press the Configurator Icon.
4. To view all components available, press "Show All Devices" (Fig. 6). (A sub list will appear with options: By product/controller, By functions, By type, Show all devices.)



5. Select the relay (latching or reversing polarity) switch or tank sensor to assign a title (Fig. 7).
6. When window pops up select "Rename" (Fig. 8).
7. Select "Group".
8. Select "Name".
9. Press "Send" to set group and name selected (Fig. 9).
10. Repeat process for each function.

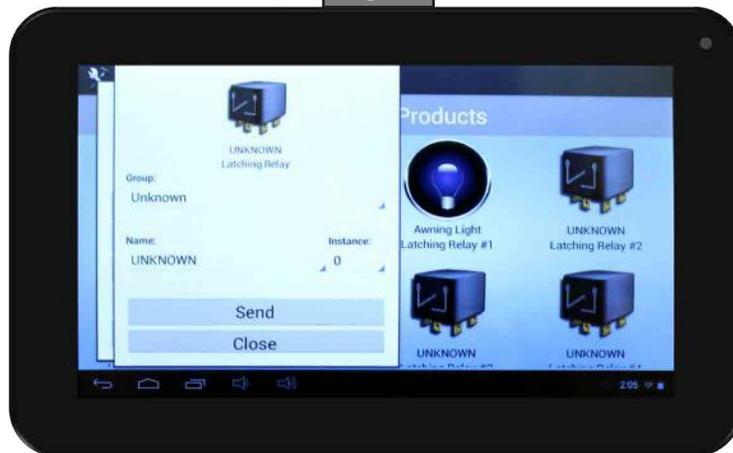
**Fig. 7**



**Fig. 8**



**Fig. 9**



### Circuit Building For MyRV Smart Switch

1. Press "Build Circuit" (Fig. 10).

**Fig. 10**

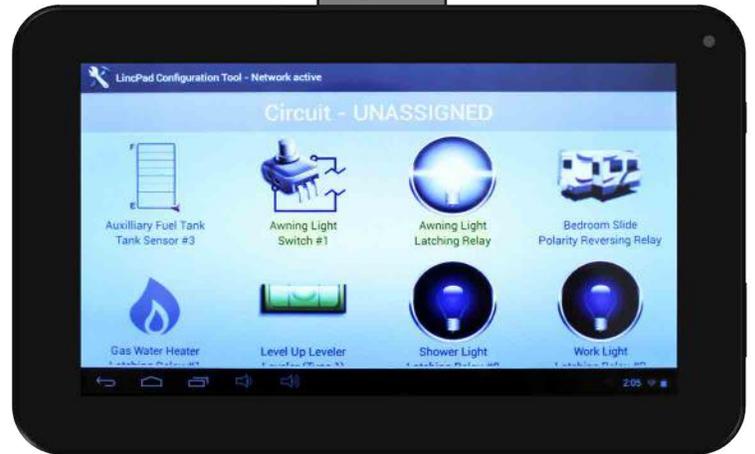


2. Select first device by pressing the preferred icon. Then press Select when the pop-up window shows up on the screen (Fig. 11). Device title will highlight in yellow (Fig. 12).
3. Repeat process for each device included in the circuit.
4. Once you have selected (highlighted) all devices for the circuit, press one of the highlighted device icons. Press "Create Circuit" in pop-up window (Fig. 13). The next screen will show all devices included in the circuit and assign a circuit number (Fig. 14).

**Fig. 11**



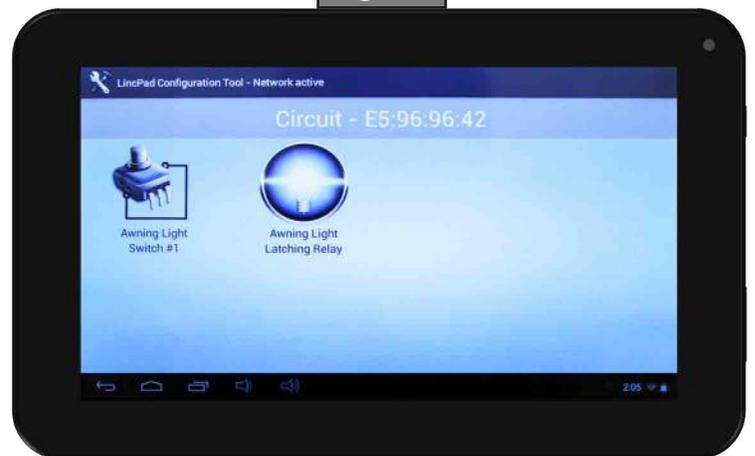
**Fig. 12**



**Fig. 13**

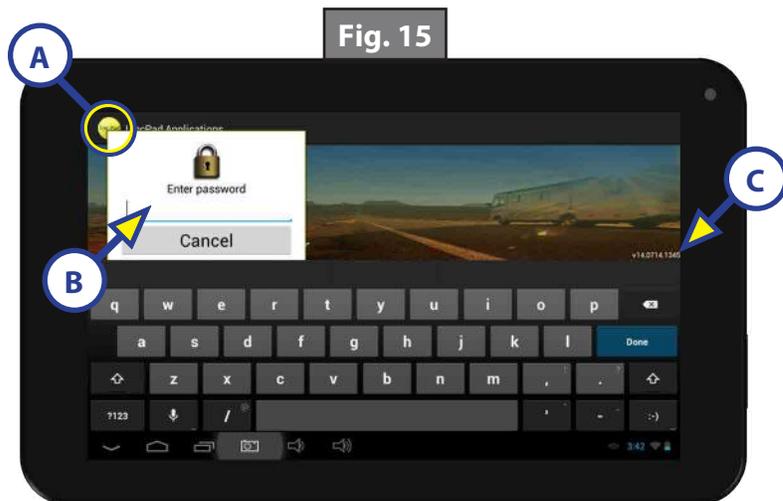


**Fig. 14**

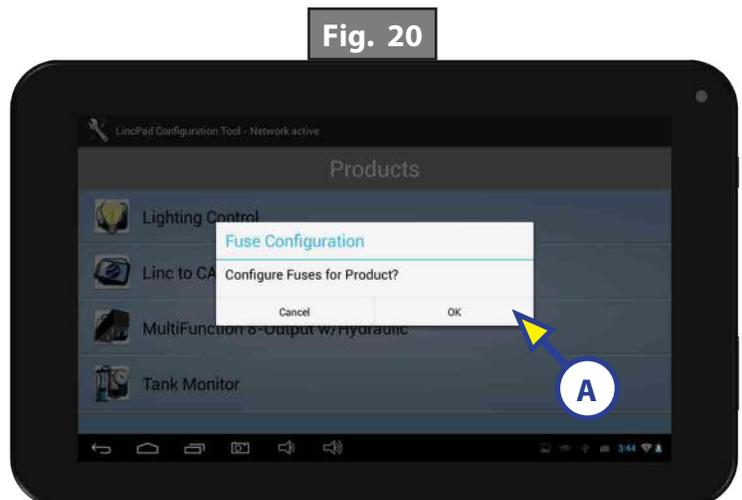
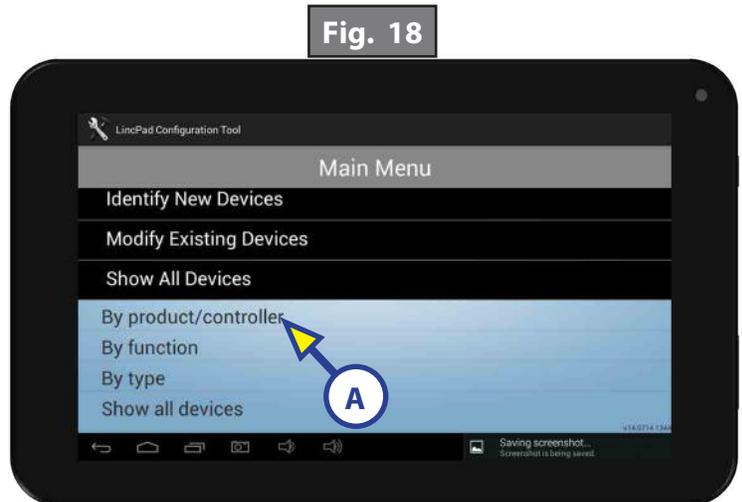


## Multifunction Fuse Programming

1. Enter the MyRV configurator screen by tapping the yellow LincPad Applications icon five (5) times (Fig. 15A). You will then be prompted to enter a four-digit password (Fig. 15B). The password is the last four digits of the version number (Fig. 15C).
2. Choose the "Configurator" option (Fig. 16A).



3. Choose the "Show All Devices" option (Fig. 17A).
4. Choose the "By Product/Controller" option (Fig. 18A). This will display all of the products and controllers connected to the Linc system.
5. Press and HOLD the "Multifunction 8-Output" option (Fig. 19A). You will then be prompted to configure the fuses. Choose "OK" (Fig. 20A) to enter fuse configuration.

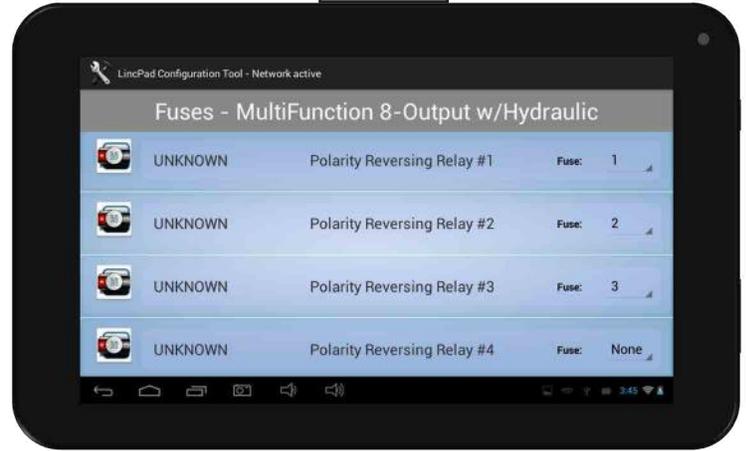


- When in the fuse configuration menu, a list of all labeled and unlabeled relay functions will appear (Fig. 21). Select the fuse location from the drop down menu on the right (Fig. 21A and Fig. 22).

Fig. 21



Fig. 22



- Once all fuse locations are chosen, press and HOLD anywhere on the screen for a pop up menu confirming the fuse locations. Press and hold the sync button on the multifunction receiver (Fig 23A). While holding the sync button, press "OK" on the "Send All" prompt (Fig. 24A). This will program all fuse positions.

Fig. 23

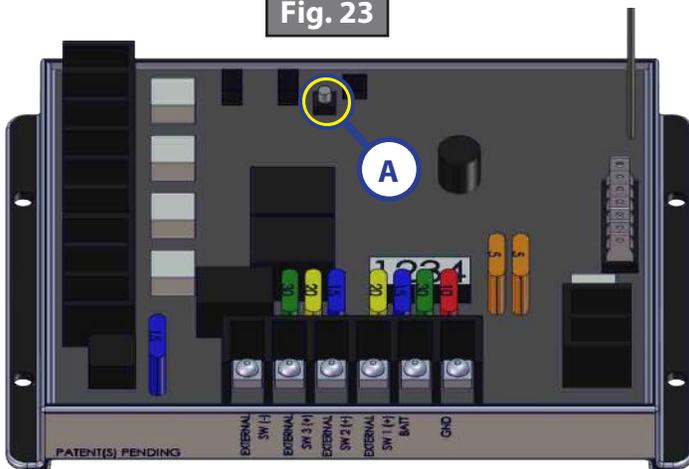
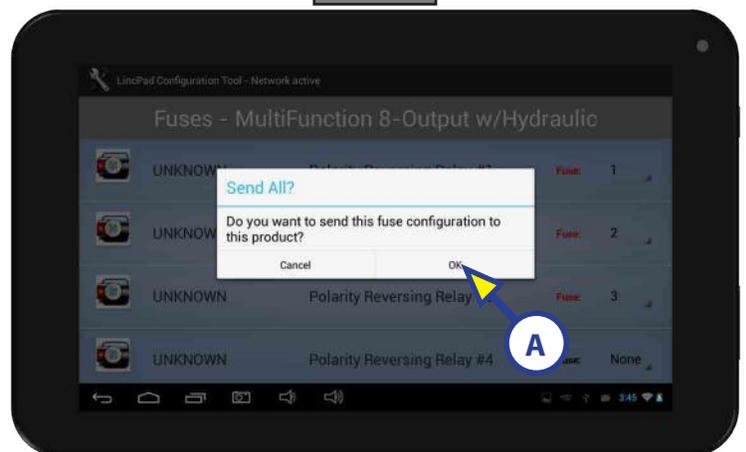


Fig. 24



# Operation

## Power On/Off

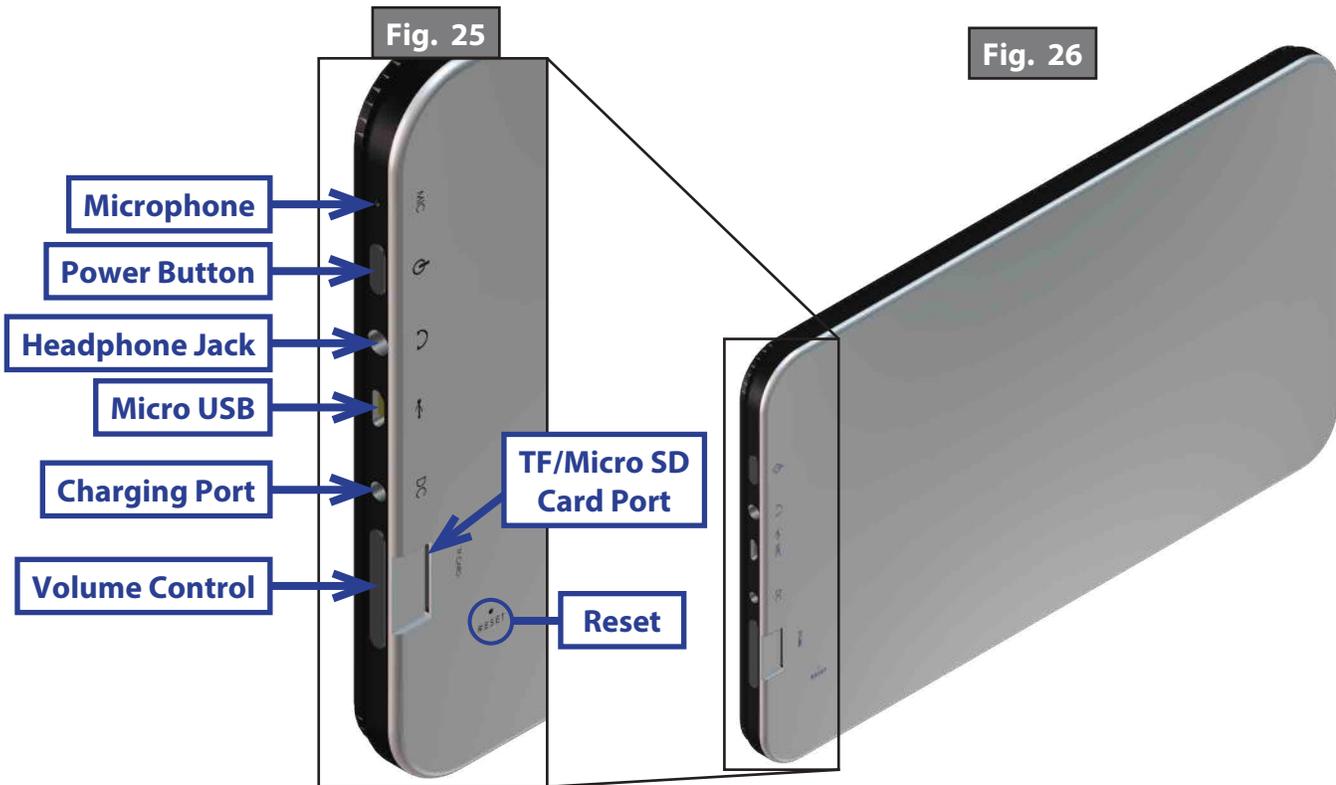
1. To power ON the tablet, hold and release the power button for 2-3 seconds (Fig. 25).

**NOTE:** It will take a few moments to start up and load the system.

2. To enter or exit sleep mode, press and release power button.
3. To power OFF the tablet, press and hold the power button until a utility screen appears.
4. Select "Power off".
5. Press "OK" when confirmation box displays: "Your tablet will shut down." (Fig. 27).

## Volume Button

1. Volume control is located on the side of the tablet (Fig. 25). There is also a volume icon on the menu screen.

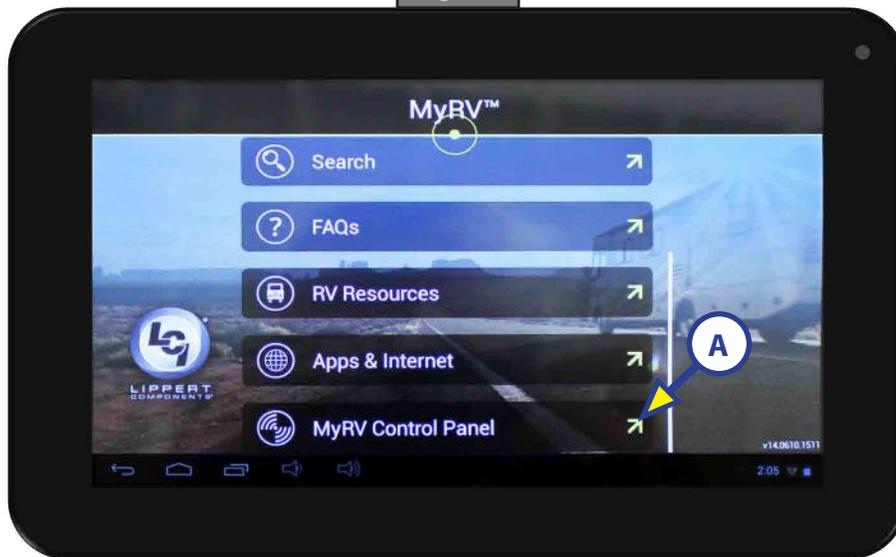


## MyRV

1. Locate the “MyRV Control Panel” on the menu screen (Fig. 28A).
2. Pushing the “MyRV Control Panel” tab will open the “MyRV Applications” screen. This screen will display all the icons of the devices on the RV that can be operated with the MyRV Tablet.
3. Push the icon of the device you wish to operate.
4. Push the “Home” icon button, located in top right of screen, to return to “MyRV application” screen.

**NOTE:** MyRV includes text and video resources, including owner’s manuals and troubleshooting videos.

Fig. 28



# SWAY COMMAND

## ELECTRONICS

### **⚠ WARNING**

The use of LCI's Sway Command® with 2014, 2015 or 2016 GM trucks equipped with an integrated trailer brake control module (ITBCM) could cause reduced braking effectiveness, induce loss of brake control and increase the risk of injury when towing a trailer.

When LCI's Sway Command® is functioning on a trailer, the subject GM truck will display "Service Trailer Brake System" in the vehicle message center, the ITBCM will become disabled and the electric trailer brakes will not function until the ignition has been turned off and back on to clear the code.

Do not use LCI's Sway Command® with 2014, 2015 or 2016 GM trucks equipped with an ITBCM while towing a trailer.

## System Components



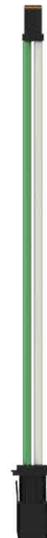
Sway Command™ Controller



Sway Command® Light Pod



Sway Command® Main Harness



Sway Command® Light Pod Harness

## Introduction

The Sway Command® Tow Control system is a self-contained trailer stability control module that detects undesirable trailer movement from external sensors and mitigates it by adaptively applying a variable braking voltage to the left and right trailer electric brakes.

The Sway Command® Tow Control system uses sensors to detect excessive trailer sway. The system activates automatically and applies voltage proportional to the amount of sway detected to the electric trailer brakes. This dampens the sway and slows the trailer down. When excessive sway is detected, the light pod will blink red and the tow vehicle operator may feel the trailer brakes activate until the sway is dampened.

## Causes of Sway

1. When the Tongue weight is less than 10% of the trailer's weight, it has a natural tendency to sway.
2. Improper weight distribution hitch adjustments.
3. Crosswinds.
4. A transfer truck passing from the rear of the trailer.
5. Descending inclines.
6. Towing speeds.
7. Tow vehicle not properly matched for the trailer.
8. Improper loading, overloading and poor weight distribution on the trailer.
9. Incorrect tire inflation.



**Always inflate tires per manufacturer's specifications. In addition to causing sway, improper tire inflation may cause premature tire wear, poor handling, reduced fuel economy, or blowouts. Check tire inflation weekly when the tire is cold before operation.**

## Prior to Operation



**Failure to follow the guidelines below may result in death, serious personal injury, or property damage.**

1. Sway Command® must be installed as detailed in the Sway Command® Installation section. Sway Command® will not operate correctly if improperly installed.
2. Trailer brakes must be adjusted per OEM specifications to ensure proper trailer braking. The tow operator must ensure trailer brakes are properly adjusted. Sway Command® may not operate properly with improperly adjusted brakes. Discuss brake adjustments with the trailer OEM.
3. Trailer brakes must be burnished to ensure proper trailer braking. New electric brakes may contain a coating to prevent rust during shipping. An unburnished brake will reduce trailer braking capacity. The tow vehicle operator must ensure trailer brakes are properly burnished to ensure brakes are effective in slowing the tow vehicle. Sway Command® may not operate properly with improperly burnished brakes. Discuss brake burnishing with the trailer OEM.
4. Improperly adjusted tire pressure can reduce braking effectiveness and can be a source of sway. Tire pressure must be adjusted to OEM recommended pressure.
5. Tires must have useful tread life left to ensure proper braking. Tire tread below useful life could skid during braking. The tow operator must ensure tires have useful tread left.
6. Improperly loaded trailers can be a source of sway. At higher speeds, if the trailer naturally sways, the tongue weight and/or trailer weight distribution must be adjusted. Sway Command® could activate frequently in this situation causing excessive brake wear. Ensure proper hitch tongue weights are observed for the trailer.
7. The tow operator must ensure Sway Command® is operational by observing the Sway Command® Light Pod status. Ensure the light pod is illuminated green. See Sway Command® Status light for status other than green.
8. The operator should operate the tow vehicle safely as driving and weather conditions allow. Sway Command® relies on braking and tire grip to mitigate sway, and overall effectiveness of the system may be reduced or impaired in slippery/icy driving conditions.

## Sway Command Controller Operation

1. When Sway Command® detects excessive sway, the light pod will blink red and the tow operator may feel the trailer brakes activate until the sway is dampened.
2. Sway Command® will wake up if it senses external brake activations. During wake up, Sway Command® performs self-checks and alternately flashes the light pod lights green and red.

**NOTE:** The Sway Command® light pod will be green if no issues are detected. If an issue is detected, the Light Pod will blink green once, followed by a number of red flashes. See troubleshooting for a description of the various blink codes.

3. Sway Command® will enter a low power mode after 10 minutes when it senses no tow vehicle brake activations or movement. The Sway Command® light pod will turn off when it powers down.

## Light Codes and Troubleshooting

| Light Flash  | Why?  | What Should Be Done?   |
|--|---|--|
| Off  | Unit is not powered and not active.                         | Unit is in low power. Activate tow vehicle brake to wake unit.   |
|  |   | Unit is not connected to DC 12V power supply. Verify wiring.   |
| Green, Red, Repeat                                 | Wake up self-checks in progress.                            | After a few seconds, the unit will complete self-checks, and set the lights Green if unit is ready, or a flashing code if an issue is found. |
| Green Solid  | Unit is awake and monitoring for sway.                      | Every 5 seconds, there will be a brief time the Green LED turns off for a fraction of a second. This indicates unit is functional.           |
| Red Blink (1/2 second on, 1/2 second off, repeats) | Sway Command® detected sway event and is activating brakes. | After sway subsides, light will return to green.   |
| Green, 2 Red                                       | A short to 12 volt detected.                                | Verify the break away switch is not activated.   |
|  |   | Verify blue brake wire not shorted to 12 volt.   |
| Green, 3 Red                                       | Not connected to trailer brakes.                            | Verify the blue brake wire is connected to the trailer brakes.   |
| Green, 4 Red                                       | A short to ground detected.                                 | Verify the blue brake wire is not shorted to ground or trailer frame.  |
| Green, 5 Red                                       | Low voltage detected.                                       | Verify tow vehicle and tow battery are at 12 volts.  |
| Red Solid  | Unit is not functional.                                     | Disconnect harness, wait 10 seconds. Connect harness. If light becomes solid red, unplug unit and contact service department.                |
| Red Fast Blink (100ms on, 100ms off, repeats)      |   |  |

**NOTE:** In the event a tow vehicle brake controller detects a fault after **Sway Command®** detects a sway event, manually activate the tow vehicle brake controller a few times to clear the fault.

## Sway Command Compatible Tow Vehicle Brake Control Modules

The tow vehicle brake control module (BCM) applies brakes to the trailer when the tow operator presses on the tow vehicle brake pedal or activates a manual switch on the tow vehicle BCM. A tow vehicle BCM may be OEM factory installed or an aftermarket install.

**NOTE:** LCI attempts to provide compatibility with aftermarket BCMs and integrated trailer brake control modules (ITBCMs) but is unable to anticipate design changes by other manufacturers. LCI is continually testing BCMs and ITBCMs and advises you to visit [www.lci1.com/sway](http://www.lci1.com/sway) for a complete and updated list as the website listing is periodically revised as further testing is completed and approved.

### **WARNING**

**The use of LCI's Sway Command® with 2014, 2015 or 2016 GM trucks equipped with an integrated trailer brake control module (ITBCM) could cause reduced braking effectiveness, induce loss of brake control and increase the risk of injury when towing a trailer.**

When LCI's Sway Command® is functioning on a trailer, the subject GM truck will display "Service Trailer Brake System" in the vehicle message center, the ITBCM will become disabled and the electric trailer brakes will not function until the ignition has been turned off and back on to clear the code.

Do not use LCI's Sway Command® with 2014, 2015 or 2016 GM trucks equipped with an ITBCM while towing a trailer.

# TRI-FOLD SOFA

## FURNITURE

### Introduction

Our one-piece, steel frame Tri-Fold Sofa requires no spare mattress to store. In just four simple steps, it transforms into a comfortable bed. Traditional hide-a-beds have uncomfortable mattresses with support bars that can make sleeping uncomfortable. Air mattress hide-a-beds eliminate the support bar issue, but can be damaged more easily and become unusable. The Tri-Fold Sofa converts from sofa to a very supportive, high-density foam sleep surface in four simple steps. Now campers can actually look forward to sleeping on the couch!

Additional information about this product can be obtained from [www.lci1.com/support](http://www.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.

iTunes®, iPhone®, and iPad® are registered trademarks of Apple Inc. Google Play™ and Android™ are trademarks of Google Inc.

## Safety Information

### ⚠ CAUTION

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

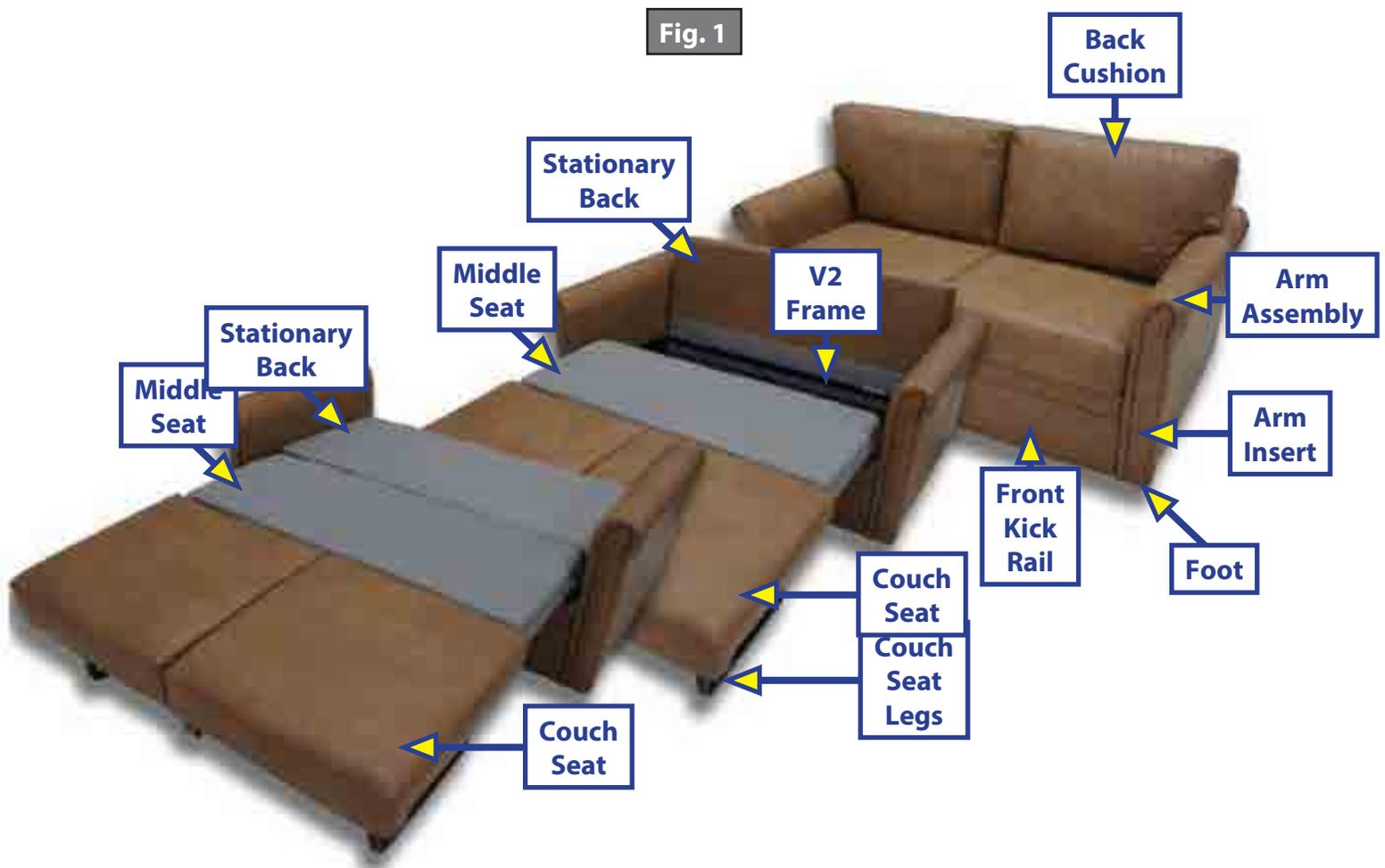
### ⚠ WARNING

Failure to follow the instructions provided in this manual may result in death, serious injury, unit damage, or voiding of the component warranty.

## Operation Instructions

**NOTE:** Refer to (Fig. 1) for steps 1-5.

1. Remove back cushions from the hook and loop fabric strips and set aside.
2. Fold out the couch seat to expose the middle seat.
3. Fold out the couch seat legs and set upright.
4. Fold down the stationary back.
5. Use back cushions as headrest or pillows.



# GROUND CONTROL® 2.0

## LEVELING AND STABILIZATION

### System and Safety Information



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

The use of the Ground Control® 2.0 to support the unit for any reason other than that which it is intended is prohibited by Lippert's limited warranty. The Lippert Ground Control® 2.0 is designed as a "leveling" system only and should not be used to provide service for any reason under the coach such as changing tires or servicing the leveling system.

Lippert Components Inc. recommends that a trained professional be employed to change the tire on the unit. Any attempts to change tires or perform other service while unit is supported by the Ground Control® 2.0 could result in death, serious injury or damage to the 5th Wheel.

#### NOTES:

- A.** Be sure to park the unit on solid, level ground.
- B.** Clear all jack landing locations of debris and obstructions. Locations should also be free of depressions.
- C.** When parking the unit on extremely soft surfaces, utilize load distribution pads under each jack.
- D.** People and pets should be clear of unit while operating leveling system.
- E.** Never lift the unit completely off the ground. Lifting the unit so the wheels are not touching the ground will create an unstable and unsafe condition.

### Prior to Operation

The leveling system shall only be operated under the following conditions:

- 1.** The unit is parked on a reasonably level surface.
- 2.** Be sure all persons, pets and property are clear of the coach while Lippert Ground Control® 2.0 is in operation.
- 3.** Make sure battery(ies) are fully charged and load test at 12+VDC.
- 4.** Drop inner leg of both landing gear jacks to within 4-5 inches of the ground.

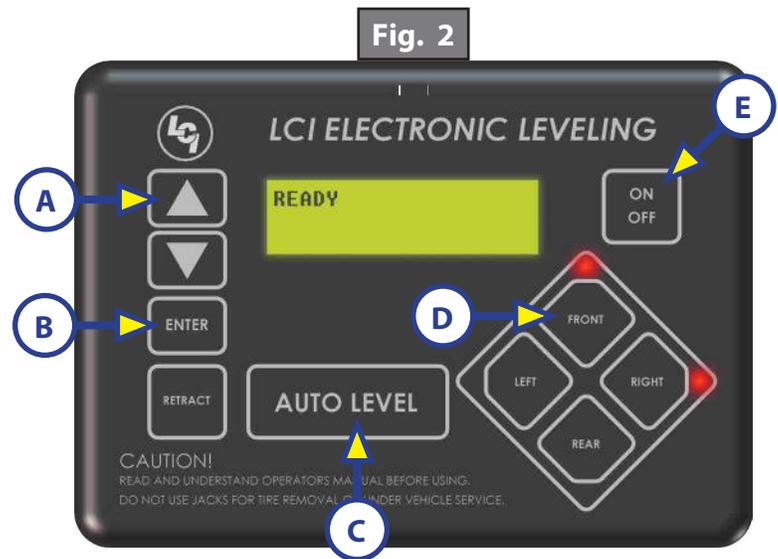
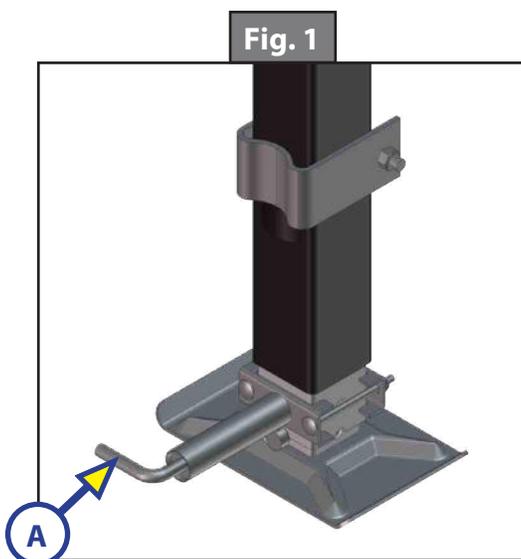
## Basic Jack Operation

1. Front Landing gear jacks.
2. Rear leveling jacks.

Landing Gear jacks can be operated any time the system is "ON" but NOT in the "AUTO MODE." By pushing the "FRONT" button, both front or landing gear jacks can be extended. By pushing either the "LEFT" or "RIGHT" button, the individual front jacks can be extended. If the touch panel is put in the "RETRACT" mode, indicated by the orange illuminated LED next to the "RETRACT" button, the front jacks can be retracted together by pushing the "FRONT" button or individually by pressing either the "LEFT" or "RIGHT" button. The rear jacks can only be operated when the touch panel is in the "MANUAL MODE." Once system is in "MANUAL MODE," pressing the "REAR" button will extend both rear jacks at the same time. To operate individual rear jacks, press the "LEFT" or "RIGHT" button first, depending on what is needed at the time, then press the "REAR" button and hold both at the same time.

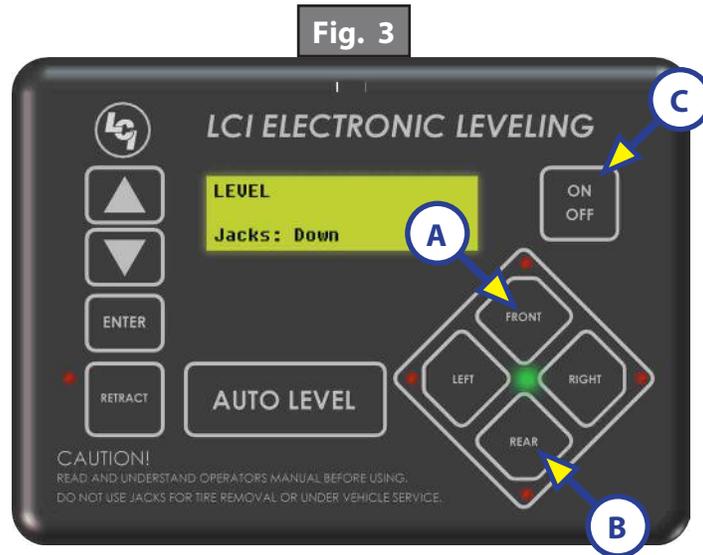
## Dropping Off Unit

1. Park coach on level ground.
2. Chock all tires.
3. Make sure battery power is on.
4. Release front jack legs to within 4-5 inches from the ground by pulling out the quick release pin (Fig. 1A).
5. Release inner legs on rear leveling jacks — 2 (4-point) or 4 (6-point) — by pulling the quick release pins.
6. At this point, you may use automatic controls on your Linc™ remote if supplied. If no Linc remote is supplied, continue to step 7. IMPORTANT: For Linc™ automatic leveling and retraction instructions, refer to your owner's packet.
7. Press "ON/OFF" button to turn panel on (Fig. 2E).
8. Push "UP ARROW" button (Fig. 2A) and scroll to "DROP FRONT JACKS" option on LCD screen.
9. Push "ENTER" button (Fig. 2B). Front legs will lower to ground and stop.
10. Disconnect 5th wheel latch.
11. Push "FRONT" button (Fig. 2D) to extend front landing gear jacks manually and lift front of vehicle to clear 5th wheel plate.
12. Pull tow vehicle away and park at a safe distance.
13. Push "AUTO LEVEL" button (Fig. 2C). The unit will commence auto-level feature by setting front landing gear jacks to level, then dropping rear jacks followed by a leveling sequence check. On the 6 point system, the middle jacks will now lower to the ground to stabilize the unit. When auto-level sequence is complete, LCD screen will indicate, "AUTO LEVEL SUCCESS." "Level Jacks: Down" will then appear, along with a green light in the middle of the jack buttons.
14. Press the "ON/OFF" button (Fig. 2E) to turn system off.



## Taking Up Strut Pin Slop (If JT Strong Arm Stabilizers Are Installed ONLY)

1. Ensure the leveling process has completed. LCD screen should read "Level Jacks: Down" (Fig. 3).
2. Push "FRONT" button (Fig. 3A) momentarily until front stabilizer pins are tight.
3. Enter manual mode, then push "REAR" button (Fig. 3B) momentarily until rear stabilizer pins are tight.
4. Push "ON/OFF" button (Fig. 3C) to turn system off.

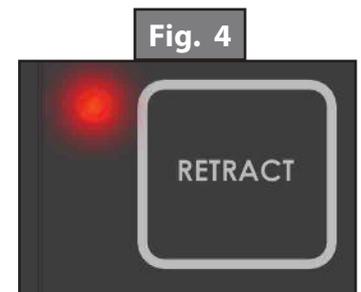


## Reconnecting the Unit to A Tow Vehicle

1. Be sure main power switch is "ON."
2. Loosen J.T. Strong Arm Stabilizer "T" handles (if applicable).
3. Push Touch Pad "ON/OFF" button to turn system on.
4. Push "UP ARROW" to scroll to AUTO RETRACT REAR JACKS and push "ENTER." Rear jacks will fully retract and stop.
5. Push "LEFT" & "RIGHT" button together. Front will raise to previous drop off height. Push "FRONT" button if more height is needed.
6. Back tow vehicle to align 5th wheel hitch.
7. Push the scroll arrow to display "AUTO RETRACT ALL."
8. Push "ENTER." Landing Gear jacks will automatically retract and then stop.
9. Raise inner drop legs on all jacks and secure with quick release pull pin.
10. Turn "ON/OFF" button off.

## Truck Hauler Operation (Manual ONLY)

1. Loosen J.T. Strong Arm Stabilizer "T" handles (if applicable).
2. Turn the Touch Panel "ON." LED lights up green.
3. Push "FRONT" button to extend FRONT jacks to gain height.
4. To retract jacks:
  - A. Push "RETRACT" button; Orange LED lights up (Fig. 4).
  - B. Push the "FRONT" button to retract jacks and hook up vehicle. Once 5th wheel is coupled, push "FRONT" button and hold until jacks are fully retracted.
  - C. Push "ON/OFF" button to turn system off. Green light will go out.
  - D. Double check 5th wheel latch is secure and that all jacks are retracted.
  - E. Ready to tow.



## Zero Point Calibration

The “Zero Point” is the programmed point that the unit will return to each time the Auto Level feature is used. The “Zero Point” must be programmed prior to using the Auto Level feature to ensure the proper operation of the system.

**NOTE:** Prior to starting this procedure, double check all connections on the controller, jacks and touch pad.

1. Manually run the jacks to level the unit. This is best achieved by placing a level in the center of the unit and leveling it both front to back and then side to side. (See “Basic Jack Operation” for instructions on how to manually operate the system).
2. Once the unit is level, turn off the touch pad.
3. With the touch pad off, press and release the “FRONT” button 10 times and then press and release the “REAR” button 10 times.
4. The touch pad will flash and beep and the display will read “ZERO POINT CALIBRATION ENTER to set, Power to Exit” (Fig. 5).
5. To set the current position as the zero point, press the “ENTER” button.
6. LCD display will read “Zero point stability check” (Fig. 6).
7. LCD display will read “Zero point set successfully” once process is complete (Fig. 7).
8. The system will set this point as its level state and the touch pad will turn off.

Fig. 5



Fig. 6

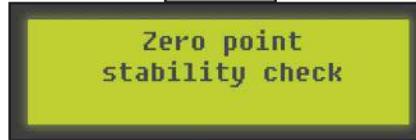


Fig. 7



## Troubleshooting

### Special Jack Error Codes

To clear one of these errors:

1. Correct or otherwise repair the issue (see the table below).
2. Extend all of the jacks at least 6 inches, then press and hold the “RETRACT” button on the touch pad until the jacks begin retracting.
3. All of the jacks will retract fully to clear the error.

**NOTE:** Landing gear will also retract at this time. Ensure the 5th wheel hitch pin is supported by either the tow vehicle or a tripod stand.

| LCD Message  | What's Happening?  | What Should Be Done?  |
|--|--|---|
| ***ERROR***  | Error at a specific jack (left front, right front, left rear, right rear). | Check harness connections at controller and at jack. Check jack for damage. Check harness for damage. Repair or replace as necessary. |
| LF Jack<br>RF Jack<br>LM Jack<br>RM Jack<br>LR Jack<br>RR Jack | Unexpected high amp current stall.   |   |

## Touch Pad Error Codes

**NOTE:** To clear an error from the touch pad, repair or otherwise correct the issue, then press “ENTER.” If the error is still present, the message will be displayed again.

| LCD Message                        | What's Happening?   | What Should Be Done?   |
|------------------------------------|---|--|
| ****ERROR****<br>Excess Angle      | Controller not properly secured.  | Check and secure controller placement.   |
|                                    | Excessive angle reached during auto operation.  | Relocate the coach.  |
| ****ERROR****<br>Bad Calibration   | Sensor calibration values are out of range.   | Reset zero point.  |
| ****ERROR****<br>Feature Disabled  | Front of coach below level when starting Auto Level process (only when trying to initiate Hitch Recognition). | Raise front of coach above level and restart Auto Level process.                         |
|                                    | Touch pad power not cycled between consecutive leveling operations.   | Turn touch pad off and then back on to reset the system.                                 |
|                                    | Zero point not set.   | Set zero point.  |
| ****ERROR****<br>Low Voltage       | Battery voltage dropped below 10.8V.  | Check wiring for loose connection.   |
|                                    |   | Test battery voltage under load - charge or replace.                                     |
| ****ERROR****<br>Out Of Stroke     | Jack has reached maximum stroke length and is unable to lift.   | Check disposition of jacks. Relocate the coach.  |
| ****ERROR****<br>External Sensor   | Bad connection or wiring from the controller to the rear sensor.  | Replace or repair connection to rear remote sensor.                                      |
| ****ERROR****<br>Jack Time Out     | Time limit exceeded for the requested auto operation.   | Check disposition of jacks.  |
| ****ERROR****<br>Auto Level Fail   | Unable to auto level due to uneven ground.  | Check disposition of jacks. Relocate the coach.  |
|                                    | Unable to auto level due to zero point being set incorrectly.   | Reset zero point.  |
| **PANIC STOP**<br>Function Aborted | The user pressed a button on the touch pad during an automatic operation.                                     | Restart automatic operation and then refrain from pressing any buttons on the touch pad. |

## Preventative Maintenance Procedures

1. Remove dirt and road debris from jacks (and stabilizer struts if equipped) as needed.
2. If jacks are down for extended periods, it is recommended to spray exposed leveling jack tubes with a spray lubricant every 3 months for protection. If your coach is located in a salty environment, it is recommended to spray the rods every month.



**Ensure the unit is supported at both the front and rear with jack stands before performing any troubleshooting or service to the unit. Failure to do so may result in death or personal injury.**

# GROUND CONTROL® 3.0 (5TH WHEEL) 4 POINT TO 6 POINT

## LEVELING AND STABILIZATION

### System and Safety Information

#### **WARNING**

Failure to act in accordance with the following may result in death or serious personal injury. The use of the Ground Control® 3.0 leveling system to support the trailer for any reason other than which it is intended is prohibited by Lippert's limited warranty. The Lippert leveling system is designed as a "leveling" system only and should not be used to provide service for any reason under the trailer such as changing tires or servicing the leveling system. Any attempts to change tires or perform other service while trailer is supported by the Ground Control 3.0 leveling system could result in damage to the 5<sup>th</sup> wheel and/or cause death or serious injury.

#### **CAUTION**

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

**NOTE:** The Ground Control 3.0 system is for 5th wheel applications only.

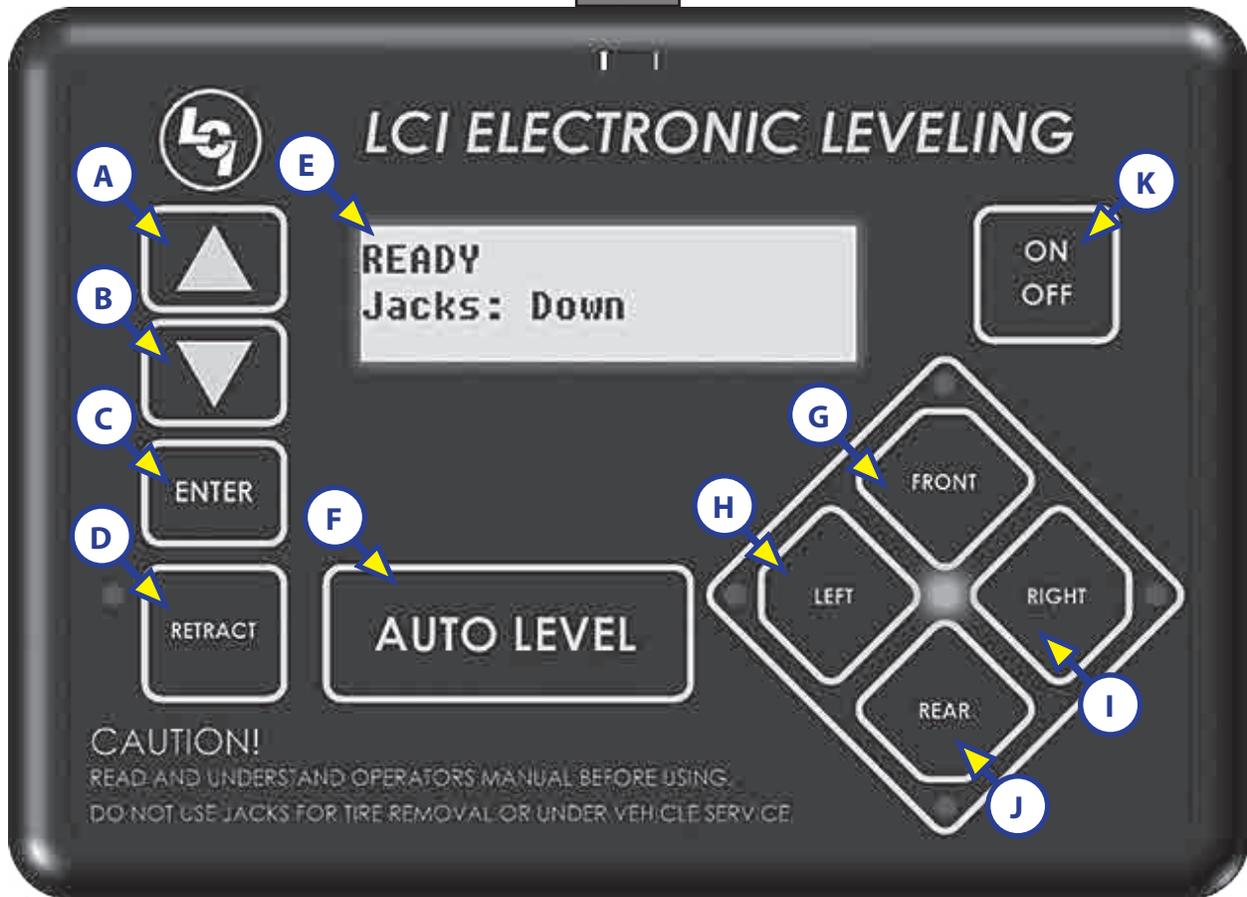
### Prior to Operation

The leveling system should only be operated under the following conditions:

1. The trailer is parked on a reasonably level surface.
2. Be sure all persons, pets, and property are clear of the trailer while the leveling system is in operation.
3. Make sure battery(ies) are fully charged and test at 12+V DC under load.

# Touch Pad Diagram

Fig. 1



| Callout | Description   |
|---------|---|
| A       | Up Arrow - Scrolls up through the menu on LCD.  |
| B       | Down Arrow - Scrolls down through the menu on LCD.  |
| C       | Enter - Activates modes and procedures indicated on LCD.  |
| D       | Retract - Places leveling system into retract mode.<br>- Press and hold down for 1 second to initiate Auto Retract. |
| E       | LCD Display - Displays procedures and results.  |
| F       | Auto Level - Places leveling system into auto level mode.   |
| G       | Front Jack Button - Activates front jacks in manual mode.   |
| H       | Left Jack Button - Activates left jacks in manual mode.   |
| I       | Right Jack Button - Activates right jacks in manual mode.   |
| J       | Rear Jack Button - Activates rear jacks in manual mode.   |
| K       | Power Button - Turns leveling system on and off.  |

## Operation

### **⚠️ WARNING**

Be sure to park the trailer on solid, level ground. Clear all jack landing locations of debris and obstructions. Locations should also be free of depressions. When parking the trailer on extremely soft surfaces, utilize load distribution pads under each jack. People and pets should be clear of trailer while operating leveling system. Never lift the trailer completely off the ground. Lifting the trailer so the wheels are not touching the ground will create an unstable and unsafe condition.

### Basic Jack Operation

Landing gear (front jacks) can be operated any time the system is "ON". By pushing the "FRONT" button (Fig. 1G), both front jacks can be extended. By pushing either the "FRONT" and "LEFT" (Fig. 1H) or "FRONT" and "RIGHT" (Fig. 1I) buttons, the individual front jacks can be extended. If the touch pad is put in the retract mode, indicated by the orange illuminated LED next to the "RETRACT" button (Fig. 1D), the front jacks can be retracted together by pushing the "FRONT" button (Fig. 1G) or individually by pressing "LEFT" (Fig. 1H) or "RIGHT" (Fig. 1I) buttons, while simultaneously pressing the "FRONT" button (Fig. 1G).

Middle jacks, if equipped, can not be extended or retracted in standard mode or manual mode. Middle jacks can only be operated in the special jack code error mode. In order to operate the middle jacks press "LEFT" (Fig. 1H) and "RIGHT" (Fig. 1I) buttons simultaneously.

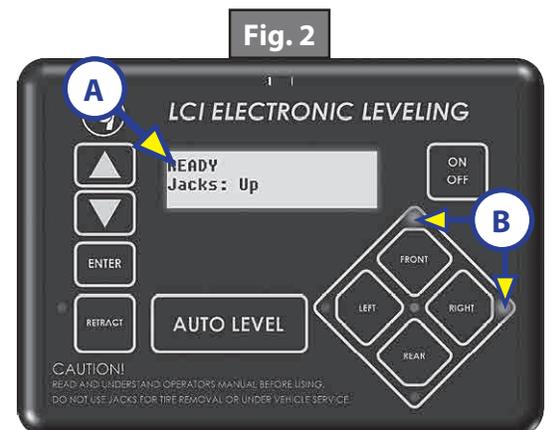
The rear jacks can only be extended when the touch pad is in the manual mode. Once system is in manual mode, pressing the "REAR" button (Fig. 1J) will extend both rear jacks at the same time. To extend individual rear jacks, press the "LEFT" (Fig. 1H) or "RIGHT" (Fig. 1I) buttons while simultaneously pressing the "REAR" button (Fig. 1J), depending on which jack needs to be operated. If the touch pad is put in the retract mode, indicated by the orange illuminated LED next to the "RETRACT" button (Fig. 1D), the rear jacks can be retracted together by pushing the "REAR" button (Fig. 1J) or individually by pressing either the "LEFT" (Fig. 1H) or "RIGHT" (Fig. 1I) buttons, while simultaneously pressing the "REAR" button (Fig. 1J).

**NOTE:** If the rear jacks will not operate individually using the method described above, but they operate properly when Auto Level is performed, the Twist Prevention Protection system has locked out the operation to prevent damage to the frame of the trailer.

### Unhitching From A Tow Vehicle

**NOTE:** Prior to unhitching from the tow vehicle, ensure the trailer is parked on a level surface and be sure to chock the tires of the trailer.

1. Extend the inner legs of both landing gear (front jacks) to within 4-5" of the ground by pulling on the quick-release pins.
2. Push "ON/OFF" (Fig. 1K). LCD Screen will light up and display "READY JACKS: UP" (Fig. 2A).
3. Push the "UP" arrow (Fig. 1A) to scroll to "Drop Front Jacks" option on LCD screen.
4. Red indicator lights (Fig. 2B) may come on, indicating the current disposition of the trailer. In this case, the front and right sides of the trailer are low.
5. Push "ENTER" (Fig. 1C). Both front jacks will go to ground and stop.
6. Push the "FRONT" button (Fig. 1G) extending the front jacks to a sufficient height, which raises the front of the trailer off of the tow vehicle's 5<sup>th</sup> wheel hitch plate.
7. Pull tow vehicle away and park at a safe distance.



## Auto Level

1. After unhitching from tow vehicle and parking the vehicle at a safe distance away from the trailer, press the "ON/OFF" button (Fig. 1K) and then press "AUTO LEVEL" (Fig. 1F).

**NOTE:** Once the automatic leveling cycle has been started, it is important that there is no movement in the trailer until the trailer has completed the leveling process. Failure to remain still during the leveling cycle could have an effect on the performance of the leveling system.

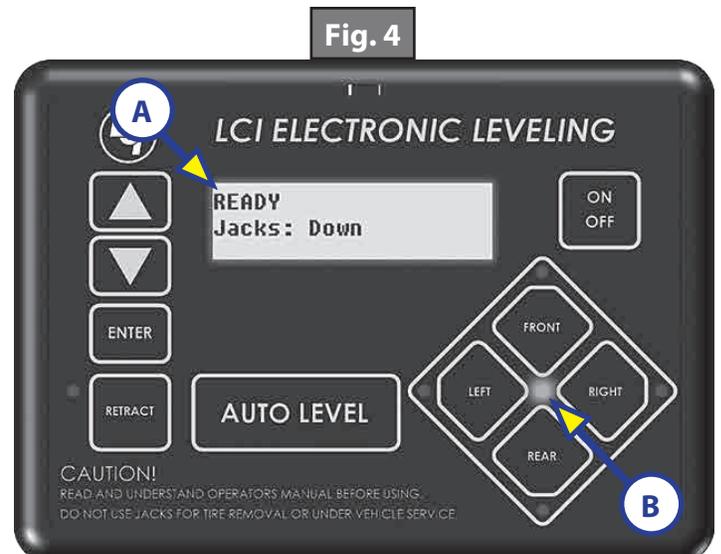
**NOTE:** In order for hitch recognition feature to function, the auto level sequence must be started with the front of the trailer above level.

## Auto Level Sequence

1. When Auto Level Sequence begins, the front of the trailer will lower slightly to a point below level.
2. Rear jacks will be grounded.
3. A side to side leveling sequence occurs.

**NOTE:** At this point on the 6 point system, the 2 middle jacks are grounded to stabilize the trailer. These 2 jacks do not level the trailer.

4. Each jack will perform a final grounding touch.
5. LCD will read "AUTO LEVEL SUCCESS" (Fig. 3).
6. LCD will then read "READY Jacks: Down" (Fig. 4A), and the green LED at the center of the 4 jack buttons will be illuminated (Fig. 4B).

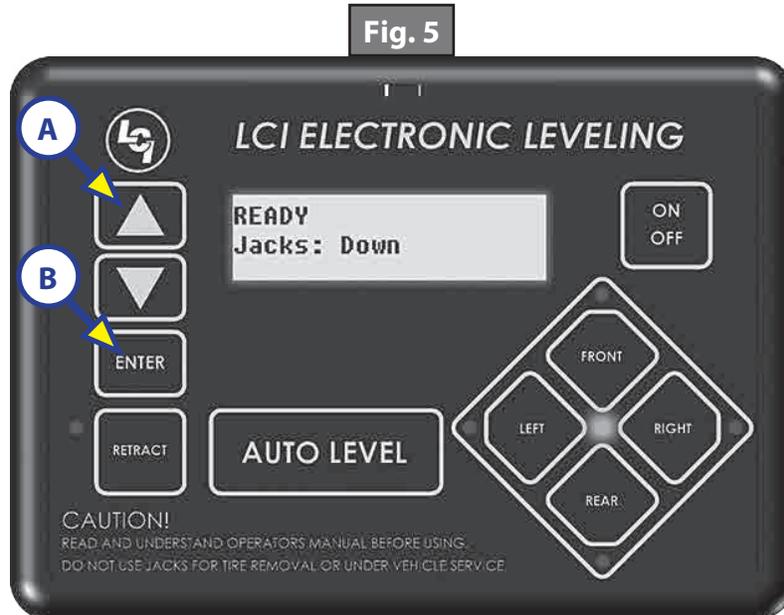


**NOTE:** If the AUTO LEVEL sequence does not perform as described, place the system in manual mode and test that the jacks operate correctly by pushing their coordinating buttons on the touch pad; i.e. "FRONT" button operates only the front jacks, etc.

## Hitch Recognition

1. Turn on the touch pad.
2. Push the "UP" arrow (Fig. 5A) to scroll to "Auto Reconnect" option on LCD screen.
3. Push "ENTER" (Fig. 5B). The rear jacks and middle jacks (if equipped) will retract first, then the front jacks will extend to raise the trailer to the height where the auto level sequence was started.

**NOTE:** If the auto level sequence was started with the front of the trailer in a below-level condition, the Hitch Recognition will not function and the LCD will display "Feature Disabled." In order for the Hitch Recognition feature to function, the auto level sequence **MUST** be started with the front of the trailer above level.



## Troubleshooting

### **⚠ WARNING**

**Ensure the trailer is supported at both the front and rear with jack stands before performing any troubleshooting or service to the trailer. Failure to do so may result in death or personal injury.**

## Manual Override

**NOTE:** For ease of manual override it is recommended to unplug the power harness to the motor prior to performing the manual override procedure.

**NOTE:** Use of a 12-18 volt cordless screw gun or pneumatic screw gun is acceptable to manually override the jacks. Do not use an impact screw gun to perform any of the override procedures, as this may damage the motor. If manual override is necessary there are two options.

### Top of Jack Motor Override:

**Tools needed:**  $\frac{3}{8}$ " drive ratchet and extension (no socket)

1. Find the port on the top of the jack motor (Fig. 6A).
2. Remove the rubber plug (Fig. 7A).
3. Insert the  $\frac{3}{8}$ " drive into the port (Fig. 8).
4. Turn override until the jack extends or retracts to desired position.

Fig. 6

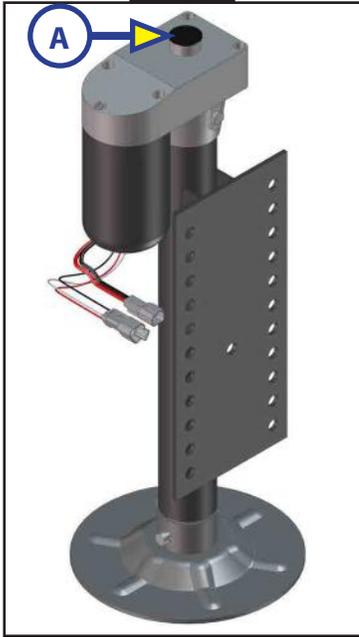


Fig. 7

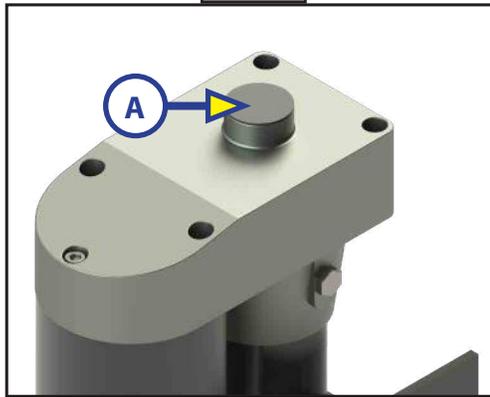
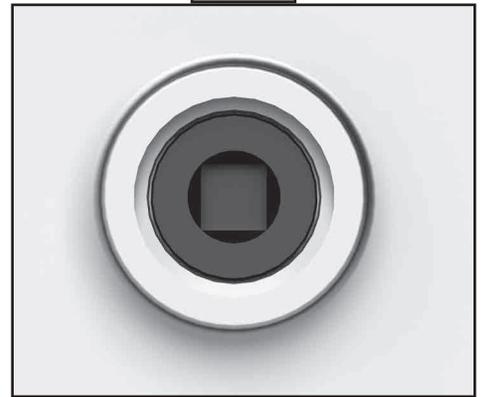


Fig. 8



### Bottom of Jack Motor Override:

**Tools needed:**  $\frac{3}{8}$ " drive ratchet and extension,  $\frac{5}{16}$ " socket

1. Find the port on the bottom of the jack motor (Fig. 9A).
2. Remove the rubber plug (Fig. 10A).
3. Insert the  $\frac{5}{16}$ " socket into the port (Fig. 11).
4. Turn override until the jack extends or retracts to desired position.

Fig. 9

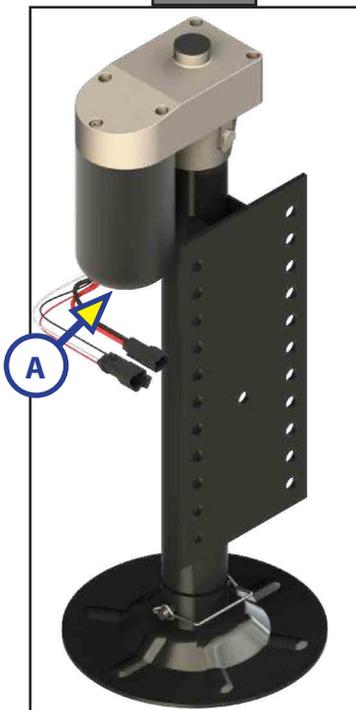


Fig. 10

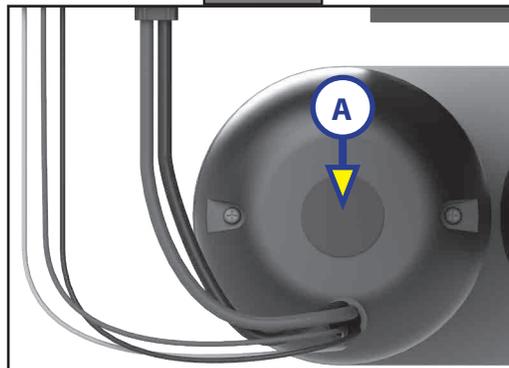
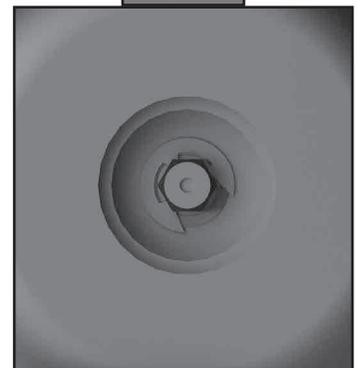


Fig. 11



## Touch Pad Error Codes

**NOTE:** To clear an error code from the touch pad, repair or otherwise correct the issue, then press “ENTER.” If the error is still present, the message will be displayed again.

| LCD Message                        | What's Happening?   | What Should Be Done?  |
|------------------------------------|---|---|
| ****ERROR****<br>Excess Angle      | Controller not properly secured.  | Check and secure controller placement.  |
|                                    | Excessive angle reached during auto operation.  | Relocate the trailer.   |
| ****ERROR****<br>Excessive Angle   | Controller not properly secured.  | Check and secure controller placement.  |
|                                    | Excessive angle reached during auto operation.  | Relocate the trailer.   |
| ****ERROR****<br>Feature Disabled  | Front of trailer below level when starting Auto Level process (only when trying to initiate Hitch Recognition). | Using manual mode on the touch pad, retract rear (which includes the middle, if equipped) jacks and set landing gear (front jacks) to hitch height. |
|                                    | Touch pad power not cycled between consecutive leveling operations.   | Turn touch pad off and then back on to reset the system.  |
|                                    | Zero point not set.   | Set zero point.   |
| ****ERROR****<br>Low Voltage       | Battery voltage dropped below 10.8V.  | Check wiring - repair or replace.   |
|                                    |   | Test battery voltage under load - charge or replace.  |
| ****ERROR****<br>Out Of Stroke     | Jack has reached maximum stroke length and is unable to lift.   | Check disposition of jacks. Relocate the trailer.   |
|                                    | Unexpected high amp current stall.  | Check jacks in manual mode or perform manual override procedure. Repair or replace as needed.   |
|                                    |   | Check for bent or damaged jacks. Repair or replace as needed.   |
| ****ERROR****<br>External Sensor   | Bad connection or wiring from the controller to the rear sensor.  | Replace or repair connection to rear remote sensor.   |
| ****ERROR****<br>Jack Time Out     | Time limit exceeded for the requested auto operation.   | Check disposition of jacks.   |
| ****ERROR****<br>Auto Level Fail   | Unable to auto level due to uneven ground.  | Check disposition of jacks. Relocate the trailer.   |
|                                    | Unable to auto level due to zero point being set incorrectly.   | Reset zero point.   |
| ****ERROR****<br>Comm Error        | Communication between controller and touch pad has been lost.   | Check harness for proper connections or damage. Replace if necessary.   |
| ****ERROR****<br>Bad Calibration   | Sensor calibration values are out of range.   | Replace controller  |
| ****ERROR****<br>Internal Sensor   | Internal sensor problem.  | Replace controller  |
| **PANIC STOP**<br>Function Aborted | The user pressed a button on the touch pad during an automatic operation.                                       | Restart automatic operation and then refrain from pressing any buttons on the touch pad.  |
| ****ERROR****<br>Hall Effect Short | Short circuit detected in one of the hall effect circuits.  | Test for short and repair or replace.   |

## Special Jack Error Codes

To clear 1 of the error codes listed below:

1. Correct or otherwise repair the issue (see the table below).

**NOTE:** In order to clear the special jack error code the jacks need to be "homed." In order to "home" jacks, each jack must be able to retract a minimum of 6".

2. Extend all jacks to reach the 6" of minimum retract needed.
  - A. Press "FRONT" (Fig. 1G) to extend the front jacks (if required).
  - B. Press "REAR" (Fig. 1J) to extend the rear jacks (if required).
  - C. Press "LEFT" and "RIGHT" (Fig. 1H and Fig. 1I) simultaneously to extend the middle jacks (if equipped and required).
3. Press and hold the retract button until all of the jacks begin to retract. The jacks will retract until they reach the hard current limit.
4. The jacks are now "homed" and the special jack error code will be cleared.

**NOTE:** If the jacks do not retract, an error should display on the touch pad screen. This is typically caused by wiring interruption.

| LCD Message   | What's Happening?  | What Should Be Done?   |
|---|--|--|
| ***ERROR***<br>LF Jack<br>RF Jack<br>LM Jack<br>RM Jack<br>LR Jack<br>RR Jack | Error at a specific jack (left front, right front, left middle, right middle, left rear, right rear). Hall signal issue (open, short, malfunction or loss of communication); open or short circuit between controller and motor. | Check harness connections at controller and at jack.<br><br>Check harness for damage.<br><br>Check fuses at controller.<br><br>Repair or replace as necessary. |

## System Settings

### Zero Point Calibration

The "Zero Point" is the programmed point that the trailer will return to each time the Auto Level feature is used.

**NOTE:** Prior to starting this procedure, double check all connections on the controller, jacks, and touch pad.

1. In manual mode, run the jacks to level the trailer. This is best achieved by placing a level in the center of the trailer and leveling it both front to back and then side to side. (See "Basic Jack Operation" for instructions on how to manually operate the system).
2. Once the trailer is level, turn off the touch pad.
3. With the touch pad off, press and release the "FRONT" button (Fig. 1G) 5 times and then press and release the "REAR" button (Fig. 1J) 5 times.
4. The touch pad will flash and beep and the display will read "ZERO POINT CALIBRATION ENTER to set, Power to Exit" (Fig. 12).
5. To set the current position as the zero point, press the "ENTER" button (Fig. 1C).
6. LCD display will read "Zero point stability check" (Fig. 13).
7. LCD display will read "Zero point set successfully" once process is complete (Fig. 14).
8. The system will set this point as its level state and the touch pad will turn off.

Fig. 12



Fig. 13

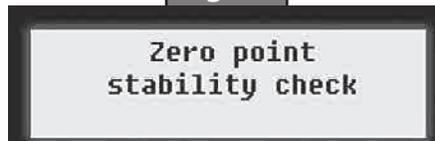
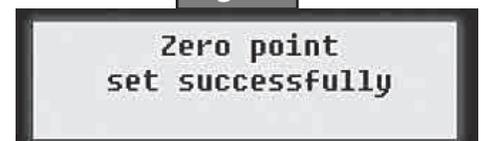


Fig. 14



## **Preventive Maintenance**

- 1.** For optimum performance, the system requires full battery current and voltage. The battery must be maintained at full capacity.
- 2.** Check the terminals and other connections at the battery, the controller, and the jacks for corrosion, and loose or damaged connections.
- 3.** Remove dirt and road debris from jacks as needed.
- 4.** If jacks are down for extended periods, it is recommended to spray exposed leveling jack rods with a silicone lubricant every three months for protection. If the trailer is located in a salty environment, it is recommended to spray the rods every 4-6 weeks.

# GROUND CONTROL® 3.0 ONECONTROL™ TOUCH PANEL

## LEVELING AND STABILIZATION

### System Information

Ground Control 3.0 is an automatic leveling system for 5th wheel applications. The system utilizes one main control board and a separate waterproof remote level sensor to measure and manage level point, and can be operated from several user interface devices, including:

**Auto Leveling Control Touch Pad** - Mounted outside the trailer within view of the hitch.

**MyRV® OneControl™ Touch Panel (OCTP)** - Mounted on a wall inside the living space of the trailer.

**MyRV® OneControl™ Leveling App** - The app is available on iTunes® for iPhone® and iPad® and also on Google Play™ for Android™ users. iTunes®, iPhone® and iPad® are registered trademarks of Apple Inc. Google Play™ and Android™ are trademarks of Google Inc.

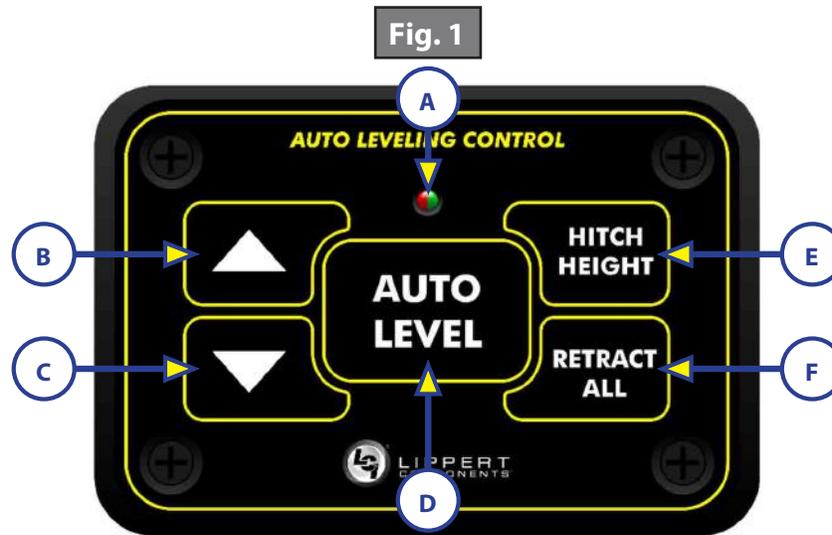
**Linc® Remote Control** - Optional.

**NOTE:** Ground Control 3.0 **IS FOR 5TH WHEEL APPLICATIONS ONLY.**

### ⚠ WARNING

**Lippert Components Inc. recommends that a trained professional be employed to change the tires on the trailer. Ensure that the trailer is properly supported with jack stands or other adequate devices under the frame of the trailer prior to commencing any service or repair procedure. Any attempts to change the tires or perform other service while trailer is supported solely by the Ground Control 3.0 jacks could result in death, serious injury, trailer or property damage.**

### Touch Pad Diagram - Auto Leveling Control Touch Pad



| Callout | Description   |   |
|---------|---|---|
| A       | Red/Green LED - Indicates the status of the system.                 |   |
| B       | Up Arrow - Extends front jacks (landing gear).                      | To turn on the touch pad, press the Up and Down arrow buttons at the same time. |
| C       | Down Arrow - Retracts front jacks (landing gear).                   |   |
| D       | Auto Level Button - Places leveling system into auto level mode.    |   |
| E       | Hitch Height Button - Initiates the Hitch Recognition feature.      |   |
| F       | Retract All Button - Places leveling system into full retract mode. |   |

## Safety Information

Be sure to park the trailer on solid, level ground. Ensure all jack landing locations are cleared of debris and obstructions and also free of depressions. People and pets should be clear of trailer while operating the leveling system. Ensure the battery of the trailer is fully charged or that the trailer is plugged into shore power prior to attempting to operate the system. Ground Control 3.0 requires a minimum of 12.75V DC from the battery for proper operation.

## Operation - Auto Leveling Control Touch Pad

### Unhitching Instructions

**NOTE:** Prior to unhitching from the tow vehicle, ensure the trailer is parked on a level surface and chock the tires of the trailer.

1. Extend the inner legs of both front jacks (landing gear) to within 4-5" of the ground by pulling on the quick-release pins.
2. To turn on the touch pad, press both "UP" and "DOWN" arrows (Fig. 1B and Fig. 1C) at the same time. The green indicator LED (Fig. 1A) will turn on.

**NOTE:** The touch pad will remain on as long as the user is pressing buttons. It will time out after approximately 7 minutes without use.

Press the "UP" arrow (Fig. 1B) to extend the front jacks and lift the front of the trailer to take the weight of the trailer off of the hitch.

Uncouple the trailer connection on the tow vehicle.

Pull the tow vehicle away and park at a safe distance.

### Auto Level

1. After unhitching from the tow vehicle and parking the vehicle at a safe distance away from the trailer. Press both "UP" and "DOWN" arrows (Fig. 1B and Fig. 1C) at the same time if the green indicator LED is not on. Press "AUTO LEVEL" (Fig. 1D).

**NOTE:** Once the automatic leveling cycle has been started, it is important that there is no movement in the trailer until the leveling process is complete. Failure to remain still during the leveling cycle could have an effect on the performance of the leveling system.

### Auto Level Sequence

1. When Auto Level Sequence begins, the front of the trailer will seek a position near a level state.
2. Rear jacks will be grounded.
3. A side-to-side leveling sequence will occur.

**NOTE:** At this point on the 6 point system, the 2 middle jacks will be grounded to stabilize the trailer. These 2 jacks do not level the trailer.

4. Each jack will perform a final grounding touch.

**NOTE:** If the AUTO LEVEL sequence does not perform as described above, locate the OneControl Touch Panel inside the trailer or use the OneControl App to place the system in manual mode. Test that the jacks operate correctly by pushing their corresponding buttons on the OneControl Touch Panel or app; e.g., "FRONT" button operates only the front jacks, etc. (See "Operation - OneControl Touch Panel" or "Operation - OneControl App" in this manual).

### Hitch Recognition

1. To turn on the touch pad, press both "UP" and "DOWN" arrows (Fig. 1B and Fig. 1C) at the same time. The green indicator LED (Fig. 1A) will turn on.
2. Press "HITCH HEIGHT" (Fig. 1E). The rear jacks will retract.
3. The front of the trailer will raise to the height where the auto level sequence was started.

**NOTE:** If the front of the trailer was below level when the Auto Level process was initiated, the hitch recognition feature will retract the rear jacks but will not retract the front jacks to lower the trailer to the initial hitch height. This feature helps prevent injury and/or damage to anything underneath the trailer.

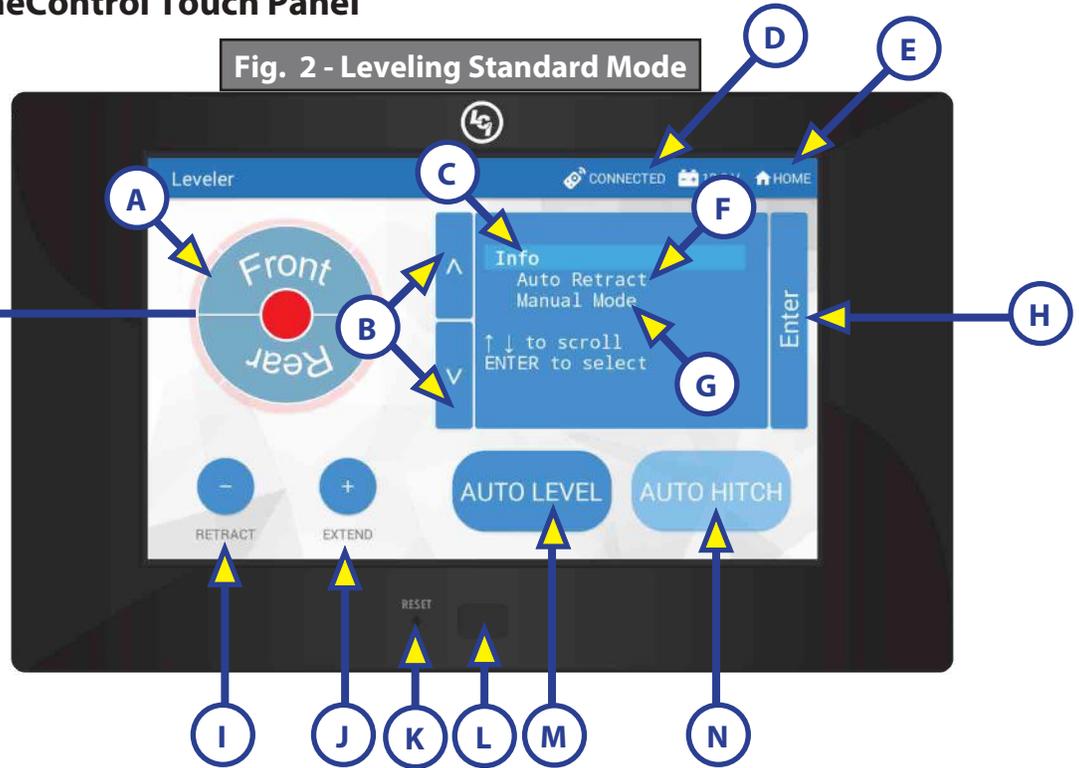
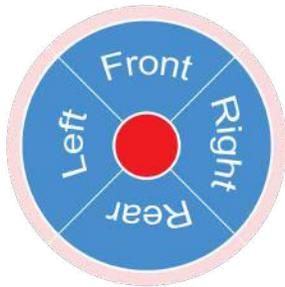
Connect tow vehicle and make sure trailer and hitch are connected and locked.

Press "RETRACT ALL." (Fig. 1F). System will immediately retract all jacks.

Use the quick release pins on the landing gear to manually return the inner jack leg to fully retracted position.

## Touch Panel Diagram - OneControl Touch Panel

Jack Buttons  
in Manual Mode  
See Fig. 3



| Callout | Description   |
|---------|---|
| A       | Jack Buttons - Select front, rear, right and left jacks to be operated depending on mode. Jacks available to be operated will be highlighted in blue. The front jacks can be extended/retracted in Standard Mode. Rear jacks can only be retracted from this mode. In Manual Mode (Fig. 3), all jacks are available to be operated. |
| B       | Up and Down Arrows - Scrolls through options on screen.   |
| C       | Info - Displays system information, e.g. angle, jack stroke or software version.  |
| D       | Connected Icon - Press 6 times to program zero point/ wireless configurations.  |
| E       | Home Icon - Returns screen to home page.  |
| F       | Auto Retract - Enters Auto Retract mode. Choose to retract "All Jacks" or "Rear Jacks."   |
| G       | Manual Mode - Enters Manual Mode to manually operate jacks.   |
| H       | Enter - Push to select various modes.   |
| I       | Retract - Retracts jacks in several modes. Jacks available will be highlighted in blue.   |
| J       | Extend - Extends jacks in several modes. Jacks available will be highlighted in blue.   |
| K       | Reset - Resets to factory default.  |
| L       | Power Button - Turns touch panel on and off.  |
| M       | Auto Level - Starts the Auto Level sequence.  |
| N       | Auto Hitch - Returns trailer to previous hitch height for reconnecting to tow vehicle.  |

# Operation - OneControl Touch Panel

## Standard Mode and Menu

To reach Standard Mode (Fig. 2) for leveling:

1. Power on the OneControl Touch Panel (Fig. 2L).
2. Press "MyRV Control Panel" on the main screen.
3. Press the "Leveler" icon.
4. The screen will show the system menu (Fig. 2) for Standard Mode. The front jacks can be extended/retracted in Standard Mode. Rear jacks can only be retracted from this mode.

## Basic Jack Operation

While in Standard Mode:

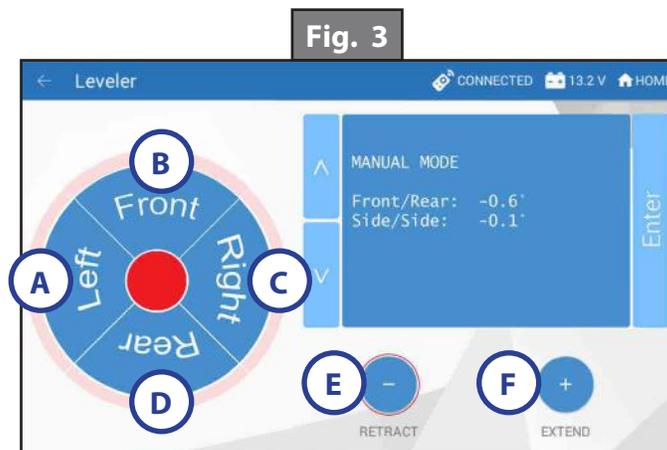
1. Press "RETRACT" (Fig. 2I) or "EXTEND" (Fig. 2J) and "FRONT" (Fig. 2A) to retract or extend front jacks.
2. Press "RETRACT" and "REAR" to retract rear jacks.
3. Press the "AUTO LEVEL" (Fig. 2M) button to start the auto leveling sequence.
4. Press the "AUTO HITCH" (Fig. 2N) button to start the hitch recognition sequence when reconnecting to the tow vehicle.
5. Use the "UP" or "DOWN" arrow (Fig. 2B) buttons to cycle through the menu screen options:
  - A. **Info:** Scroll to "INFO" (Fig. 2C) and press "ENTER" (Fig. 2H) button to display system information, e.g., angle, jack stroke or software version.
  - B. **Auto Retract:** Scroll to "AUTO RETRACT" (Fig. 2F) and press the "ENTER" button. Choose either "ALL JACKS" or "REAR JACKS." Press the "ENTER" button again to start the "Auto Retract" sequence.
  - C. **Manual Mode:** Scroll to "MANUAL MODE" (Fig. 2G) and press "ENTER" button to start Manual Level operation.

**NOTE:** Upon entering Manual Mode, a tutorial on operating the jacks will appear on the screen. Press "OK" to clear the tutorial. To delete the tutorial, click the "Don't show this again" box in the bottom right of the screen.

- I. Press "EXTEND" (Fig. 3F) or "RETRACT" (Fig. 3E) and "FRONT" (Fig. 3B) to operate front jacks.
- II. Press "EXTEND" or "RETRACT" and "REAR" (Fig. 3D) to operate rear jacks.
- III. Press "EXTEND" or "RETRACT" and "RIGHT" (Fig. 3C) to operate right jacks.
- IV. Press "EXTEND" or "RETRACT" and "LEFT" ( Fig. 3A) to operate left jacks.

**NOTE:** To operate jacks individually, press "EXTEND" or "RETRACT" then press the "LEFT" (Fig. 3A) or "RIGHT" (Fig. 3C) button while simultaneously pressing the "FRONT" (Fig. 3B) or "REAR" button (Fig. 3D), depending on which jack needs to be operated.

**NOTE:** If the rear jacks will not operate individually using the method described above, but they operate properly when Auto Level is performed, the Twist Prevention Protection system has locked out the operation to prevent damage to the frame of the trailer.



## Unhitching Instructions

**NOTE:** Prior to unhitching from the tow vehicle, ensure the trailer is parked on a level surface and chock the tires of the trailer.

1. Extend the inner legs of both front jacks (landing gear) to within 4-5" of the ground by pulling on the quick-release pins.
2. Push touch panel "ON/OFF" (Fig. 2L) to turn system on.
3. Press "MyRV Control Panel" on the main screen.
4. Press the "Leveler" icon.
5. The screen will show the system menu (Fig. 2) for Standard Mode. Push "EXTEND" (Fig. 2J) and "FRONT" button (Fig. 2A) to extend front jacks and lift front of the trailer to take the weight of the trailer off of the hitch.
6. Uncouple the trailer connection on the tow vehicle.
7. Pull the tow vehicle away and park at a safe distance.

## Auto Level

1. After unhitching from the tow vehicle and parking the vehicle a safe distance away from the trailer, press the "ON/OFF" button (Fig. 2L) if the OneControl Touch Panel is not on and then press "AUTO LEVEL" (Fig. 2M).

**NOTE:** Once the automatic leveling cycle has been started, it is important that there is no movement in the trailer until the leveling process is complete. Failure to remain still during the leveling cycle could have an effect on the performance of the leveling system.

## Auto Level Sequence

1. When Auto Level Sequence begins, the front of the trailer will seek a position near a level state.
2. Rear jacks will be grounded.
3. A side-to-side leveling sequence will occur.

**NOTE:** At this point on the 6 point system, the 2 middle jacks will be grounded to stabilize the trailer. These 2 jacks do not level the trailer.

4. Each jack will perform a final grounding touch.

**NOTE:** If the AUTO LEVEL sequence does not perform as described above, locate the OneControl Touch Panel inside the trailer or use the OneControl App to place the system in manual mode. Test that the jacks operate correctly by pushing their corresponding buttons on the OneControl Touch Panel or App; e.g., "FRONT" button operates only the front jacks, etc. (See "Operation - OneControl Touch Panel" or "Operation - OneControl App" in this manual).

## Hitch Recognition

1. Push touch panel "ON/OFF" (Fig. 2L) to turn system on.
2. Press "MyRV Control Panel" on the main screen.
3. Press the "Leveler" icon.
4. The screen will show the system menu (Fig. 2) for Standard Mode.
5. Press "AUTO HITCH" (Fig. 2N). Rear jacks will retract.
6. The front of the trailer will raise to the height where the auto level sequence was started.

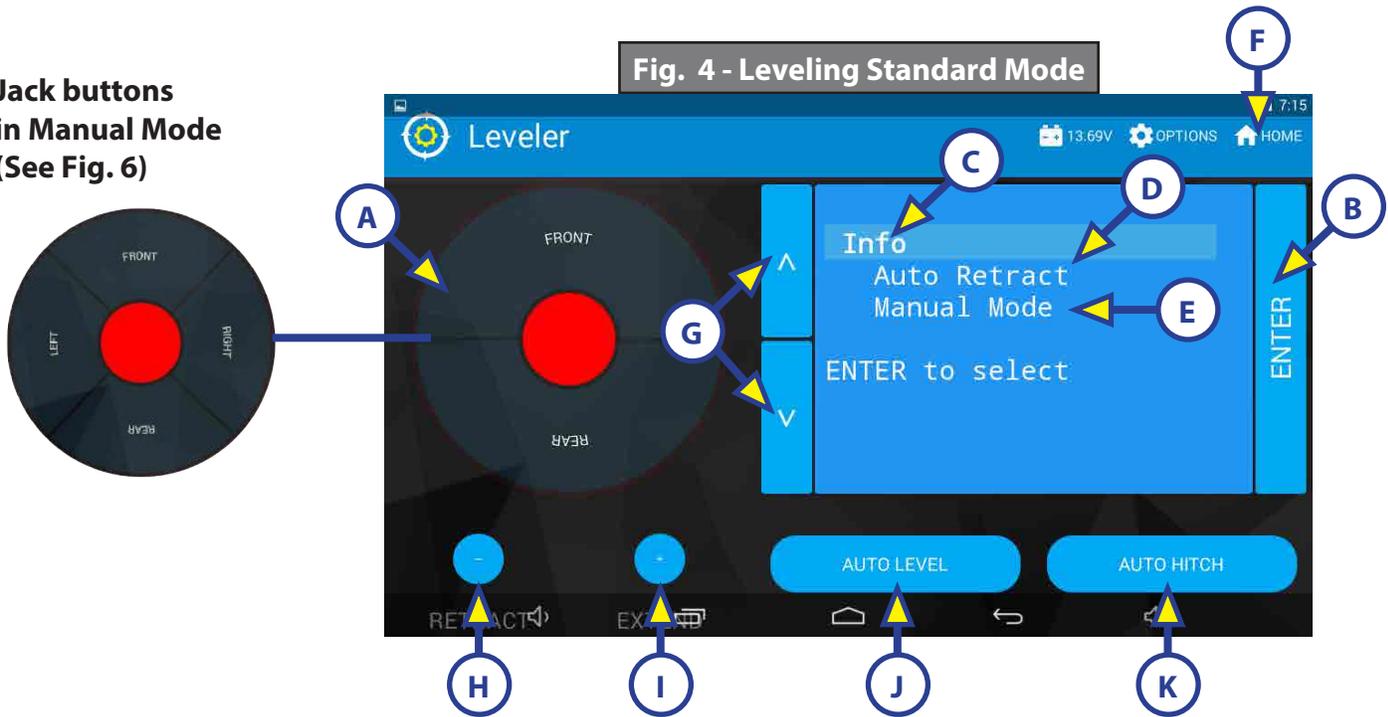
**NOTE:** If the front of the trailer was below level when the Auto Level process was initiated, the hitch recognition feature will retract the rear jacks but will not retract the front jacks to lower the trailer to the initial hitch height. This feature helps prevent injury and/or damage to anything underneath the trailer.

7. Connect tow vehicle and make sure trailer and hitch are connected and locked.
8. On the Standard Mode screen (Fig. 2) use the "UP" and "DOWN" arrows (Fig. 2B) to scroll to "AUTO RETRACT" (Fig. 2F). Press "ENTER."
9. Choose "ALL JACKS." Press "ENTER." System will immediately retract all jacks.  
Use the quick release pins on the landing gear to manually return the inner jack leg to the fully retracted position.

## Touch Panel Diagram - OneControl App from MyRV

**NOTE:** The OneControl Leveling App is available on iTunes® for iPhone® and iPad® and also on Google Play™ for Android™ users.

**Jack buttons  
in Manual Mode  
(See Fig. 6)**



| Callout | Description   |
|---------|---|
| A       | Jack Buttons - Select front, rear, right and left jacks to be operated depending on mode. Jacks available to be operated will be highlighted in blue. The front jacks can be extended/retracted in Standard Mode. Rear jacks can only be retracted from this mode. In Manual Mode (Fig. 6), all jacks are available to be operated. |
| B       | Enter - Push to activate various modes.   |
| C       | Info - Displays system information, e.g., angle, jack stroke, software version.   |
| D       | Auto Retract - Enters Auto Retract mode. Choose to retract "All Jacks" or "Rear Jacks."   |
| E       | Manual Mode - Enters Manual Mode to manually operate jacks.   |
| F       | Home Icon - Returns screen to home page.  |
| G       | Up and Down Arrows - Scroll through options on screen.  |
| H       | Retract - Retracts jacks in several modes. Jacks available will be highlighted in blue.   |
| I       | Extend - Extends jacks in several modes. Jacks available will be highlighted in blue.   |
| J       | Auto Level - Starts the Auto Level sequence.  |
| K       | Auto Hitch - Returns trailer to previous hitch height for reconnecting to tow vehicle.  |

## Operation - OneControl App

### Accessing the OneControl App

1. Ensure there is power to the trailer's wireless network.
2. Navigate to the device's (smart phone, tablet, etc.) wifi settings. Turn wireless feature on and connect to the myRV wireless network.

**NOTE:** If this is the first time connecting to the myRV wireless network, a password will be required. The password is located on the trailer's wifi hub (Fig. 5).

3. Open the OneControl application on the compatible device.

**NOTE:** If the device states "Unresolved Network Connection," retry connecting to the myRV wireless network and/or wait for the connection to resolve and display "Connected" under the myRV wireless connection.

4. The application will request the user "Agree" to an end user license agreement, create a PIN and "Re-enter PIN to confirm."
5. The OneControl app will now display all functions. Choose "Leveler."



### Standard Mode and Menu

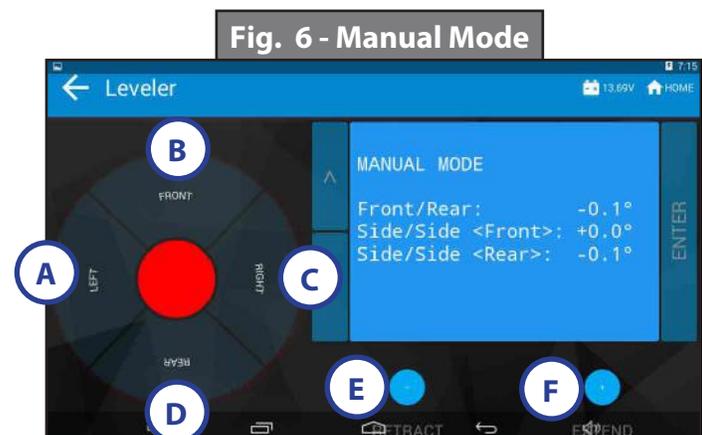
Standard Mode is the mode launched when the OneControl app "Leveler" function is powered up. The screen will show the system menu (Fig. 4). The front jacks can be extended/retracted in Standard Mode. Rear jacks can only be retracted from this mode.

### Basic Jack Operation

While in Standard Mode:

1. Press "RETRACT" (Fig. 4H) or "EXTEND" (Fig. 4I) and "FRONT" (Fig. 4A) to extend or retract front jacks.
2. Press "RETRACT" and "REAR" (Fig. 4) to retract rear jacks.
3. Press the "AUTO LEVEL" (Fig. 4J) button to start the leveling sequence.
4. Press the "AUTO HITCH" (Fig. 4K) button to start the hitch recognition sequence when reconnecting to the tow vehicle.
5. Use the "UP" or "DOWN" arrow buttons (Fig. 4G) to cycle through the menu options:
  - A. **Info:** Scroll to "INFO" (Fig. 4C) and press "ENTER" button to display system information, e.g., angle, jack stroke or software version.
  - B. **Auto Retract:** Scroll to "AUTO RETRACT" (Fig. 4D) and press the "ENTER" button. Choose either "ALL JACKS" or "REAR JACKS." Press the "ENTER" button again to start the "Auto Retract" sequence.
  - C. **Manual Mode:** Scroll to "MANUAL MODE" (Fig. 4E) and press "ENTER" button to start Manual Level operation.
    - I. Press "EXTEND" (Fig. 6F) or "RETRACT" (Fig. 6E) and "FRONT" (Fig. 6B) to operate front jacks.
    - II. Press "EXTEND" or "RETRACT" and "REAR" to operate rear jacks.
    - III. Press "EXTEND" or "RETRACT" and "RIGHT" to operate right jacks.
    - IV. Press "EXTEND" or "RETRACT" and "LEFT" to operate left jacks.

**NOTE:** To operate jacks individually, press "EXTEND" or "RETRACT" then press the "LEFT" (Fig. 6A) or "RIGHT" (Fig. 6C) button while simultaneously pressing the "FRONT" or "REAR" button (Fig. 6B and 6D), depending on which jack needs to be operated.



**NOTE:** If the rear jacks will not operate individually using the method described above, but they operate properly when Auto Level is performed, the Twist Prevention Protection system has locked out the operation to prevent damage to the frame of the trailer.

## Unhitching Instructions

**NOTE:** Prior to unhitching from the tow vehicle, ensure trailer is parked on a level surface and chock the tires of the trailer.

1. Extend the inner legs of both front jacks (landing gear) to within 4-5" of the ground by pulling on the quick-release pins.
2. Open the OneControl App.
3. Press the "Leveler" icon.
4. The screen will show the system menu (Fig. 4) for Standard Mode.
5. Push "Extend" (Fig. 4I) and "FRONT" buttons (Fig. 4) to extend front jacks and lift front of trailer to take the weight of the trailer off of the hitch.
6. Uncouple the trailer connection on the tow vehicle.
7. Pull tow vehicle away and park at a safe distance.

## Auto Level

1. After unhitching from the tow vehicle and parking the vehicle at a safe distance away from the trailer, open the OneControl App and then press "AUTO LEVEL" (Fig. 4J).

**NOTE:** Once the automatic leveling cycle has been started, it is important that there is no movement in the trailer until the trailer has completed the leveling process. Failure to remain still during the leveling cycle could have an effect on the performance of the leveling system.

## Auto Level Sequence

1. When Auto Level Sequence begins, the front of the trailer will seek a position near a level state.
2. Rear jacks will be grounded.
3. A side-to-side leveling sequence will occur.

**NOTE:** At this point on the 6 point system, the 2 middle jacks will be grounded to stabilize the trailer. These 2 jacks do not level the trailer.

4. Each jack will perform a final grounding touch.

**NOTE:** If the AUTO LEVEL sequence does not perform as described above, locate the OneControl Touch Panel inside the trailer or use the OneControl App to place the system in manual mode. Test that the jacks operate correctly by pushing their corresponding buttons on the OneControl Touch Panel or App; e.g., "FRONT" button operates only the front jacks, etc. (See "Operation - OneControl Touch Panel" or "Operation - OneControl App" in this manual).

## Hitch Recognition

1. Open the OneControl App.
2. Press the "Leveler" icon.
3. The screen will show the system menu (Fig. 4) for Standard Mode.
4. Press "AUTO HITCH" (Fig. 4K). Rear jacks will retract.
5. The front of the trailer will raise to the height where the auto level sequence was started.

**NOTE:** If the front of the trailer was below level when the Auto Level process was initiated, the hitch recognition feature will retract the rear jacks but will not retract the front jacks to lower the trailer to the initial hitch height. This feature helps prevent injury and/or damage to anything underneath the trailer.

6. Connect tow vehicle and make sure trailer and hitch are connected and locked.
7. On the Standard Mode screen (Fig. 4) use the "UP" and "DOWN" arrows (Fig. 4G) to scroll to "AUTO RETRACT" (Fig. 4D). Press "ENTER."
8. Choose "ALL JACKS." Press "ENTER." System will immediately retract all jacks. Use the quick release pins on the landing gear to manually return the inner jack leg to the fully retracted position.

## Touch Panel Diagram - Linc Remote Control - Optional

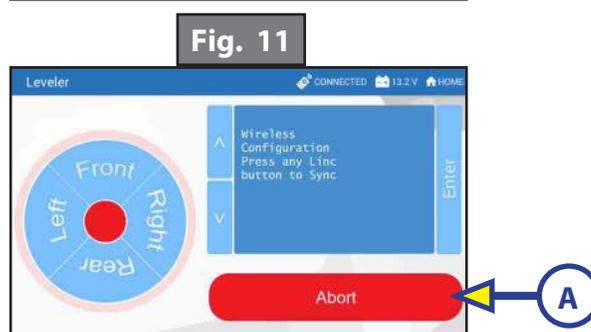
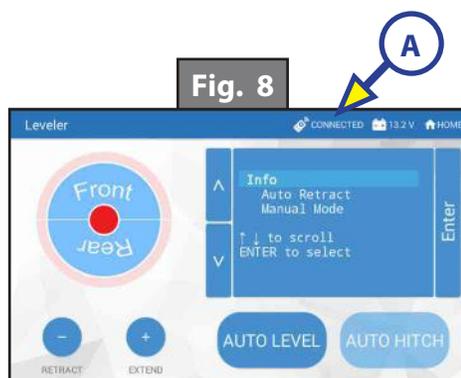
| Callout | Description  |
|---------|--|
| A       | Retract - Retracts front jacks and rear jacks.     |
| B       | Front Arrow - Operates front jacks.                |
| C       | Left Arrow - (See Note below)                      |
| D       | Help - Provides contact information for LCI.       |
| E       | Extend - Extends front jacks. (See Note below)     |
| F       | Right Arrow - (See Note below)                     |
| G       | Rear Arrow - Retracts rear jacks. (See Note below) |
| H       | Auto Level- Initiates Auto Level sequence.         |
| I       | Power Button - Turns remote control on and off.    |

**NOTE:** When the OneControl Touch Panel inside the trailer is placed in Manual Mode, the Linc remote will operate the jacks in a similar fashion as the OneControl, with the exception of operating individual jacks. (See "Operation - OneControl Touch Panel.")



### Configuring Linc Remote to Sync to The One Control Touch Panel

1. Turn on the Linc™ remote control (Fig. 7I) and enter a PIN.
2. Choose "Leveler" from the menu screen.
3. Turn on the OneControl Touch Panel (Fig. 2L).
4. On the OneControl Touch Panel, press the "CONNECTED" icon at the top of the screen (Fig. 8A) quickly 6 times. Wait a few seconds until the gear icon with "OPTIONS" appears (Fig. 9A).
5. Press the gear icon with "OPTIONS" (Fig. 9A).
6. Use the "UP" and "DOWN" arrows (Fig. 9B) to scroll to "WIRELESS CONFIG" (Fig. 10).
7. Press "ENTER" (Fig. 10A). The screen will display "Wireless Configuration Press any Linc button to Sync" (Fig. 11).
8. Press any button in "Leveler" mode on the Linc Remote Control (Fig 7).
9. Pressing "ABORT" on the OneControl Touch Panel (Fig. 11A) will cancel configuration sequence.



## Basic Jack Operation

Press "EXTEND" ( Fig. 7E) or "RETRACT" (Fig. 7A). Press "Front" arrow (Fig. 7B) to operate front jacks.

Press "RETRACT". Press "Rear" arrow (Fig. 7G) to operate rear jacks.

Press "AUTO LEVEL" (Fig. 7H) to start auto level sequence.

If the OneControl Touch Panel is in manual mode press, "EXTEND" (Fig. 7E) or "RETRACT"(Fig. 7A). Press "LEFT" (Fig. 7C), "RIGHT" (Fig. 7F) or "REAR" (Fig. 7G) arrow to operate left, right or rear jacks.

## Unhitching Instructions

**NOTE:** Prior to unhitching from the tow vehicle, ensure the trailer is parked on a level surface and chock the tires of the trailer.

1. Extend the inner legs of both front jacks (landing gear) to within 4-5" of the ground by pulling on the quick-release pins.
2. Turn the Linc remote on (Fig. 7I) and enter a PIN code to turn system on.
3. Press the "LEVELER" button.
4. Press "EXTEND" (Fig. 7E) and "FRONT" arrow (Fig. 7B) to extend front jacks and lift the front of trailer to take the weight of the trailer off of the hitch.
5. Uncouple the trailer connection on the tow vehicle.
6. Pull tow vehicle away and park at a safe distance.

## Auto Level

1. After unhitching from the tow vehicle and parking the vehicle a safe distance away from the trailer, press the "ON/OFF" button (Fig. 7I) on the Linc remote if the Linc is not on.
2. Enter a PIN.
3. Choose the "LEVELER" option.
4. Press "AUTO LEVEL" (Fig. 7H).

**NOTE:** Once the automatic leveling cycle has been started, it is important that there is no movement in the trailer until the trailer has completed the leveling process. Failure to remain still during the leveling cycle could have an effect on the performance of the leveling system.

## Auto Level Sequence

1. When Auto Level Sequence begins, the front of the trailer will seek a position near a level state.
2. Rear jacks will be grounded.
3. A side-to-side leveling sequence will occur.

**NOTE:** At this point on the 6 point system, the 2 middle jacks will be grounded to stabilize the trailer. These 2 jacks do not level the trailer.

4. Each jack will perform a final grounding touch.

**NOTE:** If the AUTO LEVEL sequence does not perform as described above, locate the OneControl Touch Panel inside the trailer or use the OneControl App to place the system in manual mode. Test that the jacks operate correctly by pushing their corresponding buttons on the OneControl Touch Panel or App; e.g., "FRONT" button operates only the front jacks, etc. (See "Operation - OneControl Touch Panel" or "Operation - OneControl App" in this manual).

**NOTE:** There is no Hitch Recognition sequence programmed for the Linc remote.

## Troubleshooting

### Red/Green LED Indicator on Auto Leveling Control Touch Pad **(Rev. A)**

| What Is Happening? | Why?  |
|--------------------|---|
| Off                | Touch pad is locked.  |
| Solid Green        | Touch pad is active.  |
| Blinking Green     | Jacks are moving.   |
| Solid Red          | Low battery.  |
| Blinking Red       | Error - Refer to OneControl Touch Panel or the OneControl App for the specific error, then consult the Troubleshooting section of this manual to clear the error. |

### Red/Green LED Indicator on Auto Leveling Control Touch Pad **(Rev. B)**

| What Is Happening?  | Why?  |
|---|---|
| Off   | Touch pad is locked.  |
| Solid Green   | Touch pad is active.  |
| Blinking Green  | Jacks are moving.   |
| Solid Red   | Low battery.  |
| Blinking Red  | Error - Refer to OneControl Touch Panel or the OneControl App for the specific error, then consult the Troubleshooting section of this manual to clear the error.                   |
| Slowly Blinking Faded Red (Red and Green Blinking Simultaneously) | Error - Refer to OneControl Touch Panel or the OneControl App for the specific jack error code, then consult the Special Jack Error Code section of this manual to clear the error. |

## OneControl Touch Panel or OneControl App Error Codes (Rev. A)

**NOTE:** Faults can only be cleared via the OneControl Touch Panel or OneControl App. The only exception is when the Auto Leveling Control Touch Pad (Fig. 1) was used to abort an auto-sequence. In this case the fault can be cleared by pressing any Auto Leveling Control Touch Pad button.

## OneControl Touch Panel or OneControl App Error Codes (Rev. B)

**NOTE:** Faults can be cleared via the OneControl Touch Panel, OneControl App or Auto Leveling Control Touch Pad. Most standard faults can be cleared from the Auto Leveling Control Touch Pad by pressing "Retract All."

| OneControl Touch Panel or OneControl App Error Codes |  |  |
|--|--|--|
| Touch Panel Message                                  | What's Happening?  | What Should I Do?  |
| "EXCESS ANGLE"                                       | Unsecured controller.<br>Uneven or sloped site.                            | Check and secure controller placement.<br>Relocate the trailer.  |
| "EXCESSIVE ANGLE"                                    | Excessive angle reached during manual operation.                           | Stop manual operation and reset jacks to a more level state. The code will self clear. There is no need to hit "OK." |
| "BAD CALIBRATION"                                    | Trailer zero point was not set correctly.                                  | Reset zero point.  |
| "FEATURE DISABLED"                                   | Hitch recognition requested but no hitch height set.                       | Perform "AUTO LEVEL" sequence to establish hitch height.   |
|  | Zero point not set.  | Set zero point.  |
| "LOW VOLTAGE"  | Bad connection or wiring.<br>Discharged or bad battery.                    | Check wiring - repair or replace.<br>Test battery voltage under load - charge or replace.                            |
| "OUT OF STROKE"                                      | Unsecured controller.<br>Uneven or sloped site.                            | Check and secure controller placement.<br>Relocate the trailer.  |
| "EXTERNAL SENSOR"                                    | Bad connection or wiring.  | Replace or repair connection to rear remote sensor.  |
| "JACK TIME OUT"                                      | System could not level in expected time.                                   | Check disposition of jacks.  |
| "AUTO LEVEL FAIL"                                    | Unsecured controller.<br>Voltage drop.                                     | Check and secure controller placement.<br>Test battery voltage under load - charge or replace.                       |
| "FUNCTION ABORTED"                                   | User has aborted an automatic leveling sequence.                           | Hit OK. Restart the sequence.  |
| "HALL POWER SHORT"                                   | Short circuit detected on one or more of the jack hall effect power lines. | Check harness and replace or repair.   |

| Special Jack Error Codes  |   |   |
|---|---|---|
| Touch Panel Message   | What's Happening?   | What Should I Do?   |
| <p>***ERROR***</p> <p>Left-Front Jack Fault</p> <p>Right-Front Jack Fault</p> <p>Left-Mid Jack Fault</p> <p>Right-Mid Jack Fault</p> <p>Left-Rear Jack Fault</p> <p>Right-Rear Jack Fault</p> | <p>Error at a specific jack (left front, right front, left middle, right middle, left rear, right rear). Hall signal issue (open, short, malfunction or loss of communication); open or short circuit between controller and motor.</p> | <p>Check harness connections at controller and at jack.</p> <p>Check harness for damage.</p> <p>Check fuses at controller.</p> <p>Repair or replace as necessary.</p> |

### Special Jack Error Codes on OneControl Touch Panel or OneControl App (Rev. A)

To clear the error code:

1. Correct or otherwise repair the issue (see Special Jack Error Codes chart).
 

**NOTE:** In order to clear the special jack error code the jacks need to be "homed." In order to "home" jacks, each jack must be able to retract a minimum of 6".
2. Extend all jacks to reach the 6" of minimum retract needed.
  - A. Press "FRONT" (Fig. 3B or Fig. 6B) to extend the front jacks (if required).
  - B. Press "REAR" (Fig. 3D or Fig. 6D) to extend the rear jacks (if required).
  - C. Press "LEFT" and "RIGHT" (Fig. 3A and Fig. 3C or Fig. 6A and Fig. 6C ) simultaneously to extend the middle jacks (if equipped and required).
3. Press "ENTER" to AUTO RETRACT. The jacks will retract until they reach the hard current limit.
4. The jacks are now "homed" and the special jack error code will be cleared.

**NOTE:** If the jacks do not retract, an error should display on the touch panel screen. This is typically caused by wiring interruption.

### Special Jack Error Codes on OneControl Touch Panel or OneControl App (Rev. B)

To clear the error codes:

1. Correct or otherwise repair the issue (see the Special Jack Error Codes chart).
 

**NOTE:** In order to clear the special jack error code the jacks need to perform a successful "Auto Retract."
2. Press "ENTER" to AUTO RETRACT. The jacks will retract until they reach the hard current limit.
3. The jacks are now "homed" and the special jack error code will be cleared.

**NOTE:** If the jacks do not retract, an error should display on the touch panel screen. This is typically caused by wiring interruption.

### Clearing Faults From Auto Leveling Control Touch Pad (Rev. B)

**NOTE:** Landing gear can still be extended/retracted in the "Special Jack Error Code" mode.

1. To clear most standard faults, press "Retract All."
2. To clear jack faults, press and hold "Retract All" until the jacks begin to retract.

**NOTE:** Three faults cannot be cleared from the Auto Leveling Control Touch Pad and must be addressed from the OneControl Touch Panel or OneControl App: HALL POWER SHORT, BAD CALIBRATION and EXTERNAL SENSOR.

## Manual Override

### Top of Jack Motor Override:

**Tools needed:** 3/8" drive ratchet and extension (no socket)

1. Find the port on the top of the jack motor (Fig. 12A).
2. Remove the rubber plug (Fig. 13A).
3. Insert the 3/8" drive ratchet into the port (Fig. 14).
4. Turn the override until the jack extends or retracts to desired position.

### Bottom of Jack Motor Override:

**Tools needed:** 3/8" drive ratchet and extension, 5/16" socket

1. Find the port on the bottom of the jack motor (Fig. 12B).
2. Remove the rubber plug (Fig. 15A).
3. Insert the 5/16" socket into the port (Fig. 16).
4. Turn the override until the jack extends or retracts to desired position.

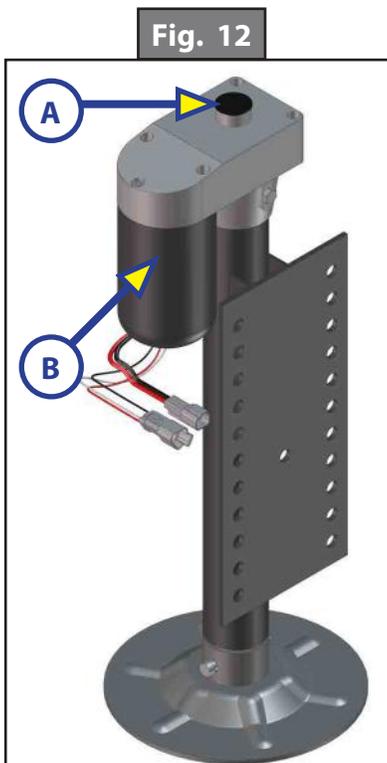


Fig. 12

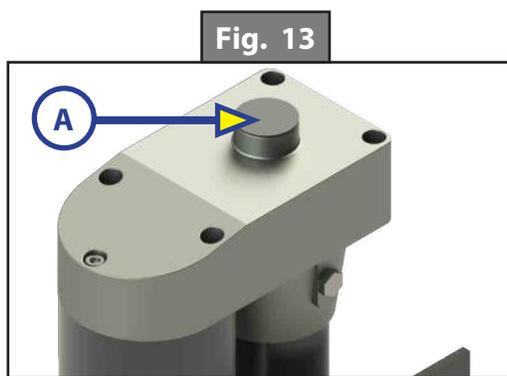


Fig. 13

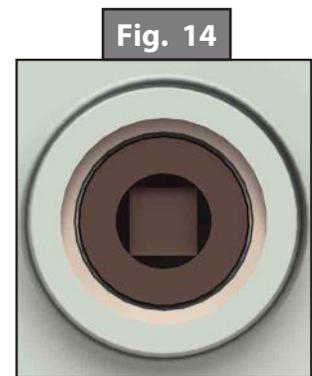


Fig. 14

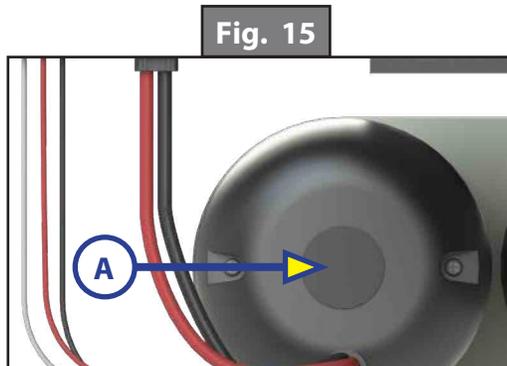


Fig. 15

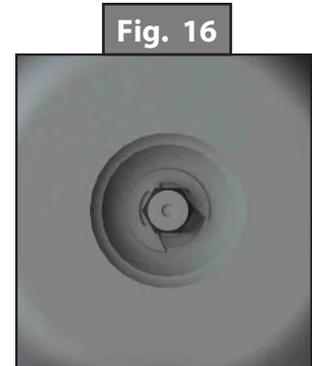


Fig. 16

## Zero Point Calibration

The "Zero Point" is the programmed point that the trailer will return to each time the Auto Level feature is used. The "Zero Point" must be programmed prior to using the Auto Level feature to ensure the proper operation of the system. The "Zero Point" feature is only available on the OneControl Touch Panel and OneControl App with this system. (Figs. 17-22 depict OneControl Touch Panel.)

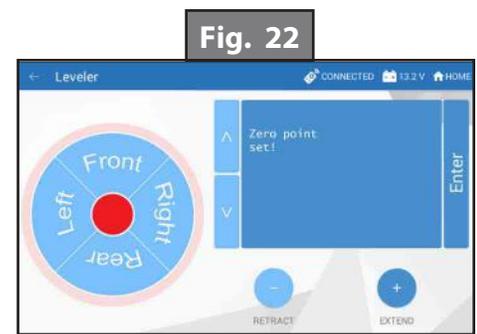
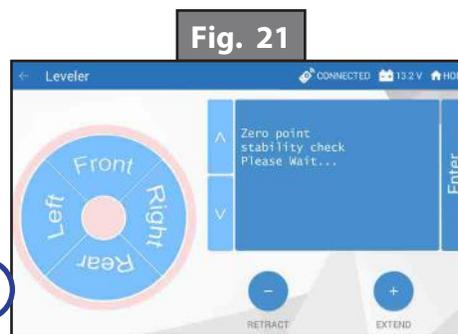
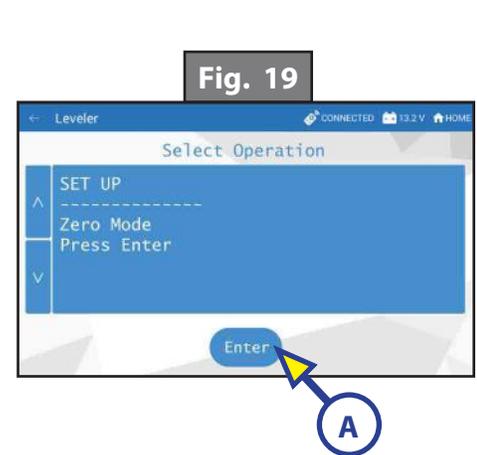
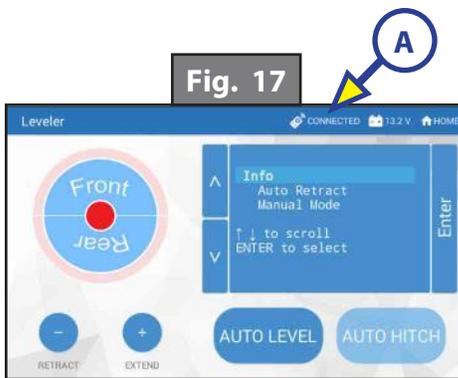
**NOTE:** Prior to starting this procedure, double check all connections on the controller, jacks, and touch panel.

**NOTE:** When calibrating Zero Point, the user has full manual control over the jacks. See "Basic Jack Operation - Manual Mode" to adjust to the desired level position. Press the enter button to set.

### To Set the Zero Point

**NOTE:** The following procedure works from Standard Mode only. (See "Standard Mode and Menu" to reach standard mode.)

1. Press the "CONNECTED" icon (Fig. 17A) at the top of the leveling screen quickly 6 times. Wait a few seconds until the gear icon with "OPTIONS" appears (Fig.18A).
2. Press the gear icon with "OPTIONS" (Fig. 18A).
3. The screen will show "SET UP: Zero Mode Press Enter" (Fig. 19).
4. Press the "Enter button" (Fig. 19A).
5. The touch panel will present options for further leveling of the trailer if needed. The screen will also state "ZERO POINT CALIBRATION - Press Enter to Set" (Fig. 20).
6. Press "ENTER" (FIG. 20A).
7. Screen will show "Zero Point Stability Check ... Please Wait" (Fig. 21), followed by "Zero Point Set" (Fig. 22).



## Preventive Maintenance

1. For optimum performance, the system requires full battery current and voltage. The battery must be maintained at full capacity.
2. Check the terminals and other connections at the battery, the controller, and the jacks for corrosion, and loose or damaged connections.
3. Remove dirt and road debris from jacks as needed.
4. If jacks are down for extended periods, it is recommended to spray exposed leveling jack rods with a silicone lubricant every three months for protection. If the trailer is located in a salty environment, it is recommended to spray the rods every four to six weeks.

# ICE HOUSE

## AXLES AND SUSPENSION

### System and Safety Information

The Ice House is equipped with Ground Control™ 3.0 and pivot axles. LCI has taken its Ground Control Automatic Electric Leveling System to the next level. Its new leveling jacks are driven by Hall Effect Technology, which measures the jack leg motor revolutions instead of amps, ensuring more accurate leveling. The pivot axles offer a smooth operation to lower the ice house without disturbing the ice. We are continually offering better options for a better camping experience. Additional information about this product can be obtained from [www.lci1.com/support](http://www.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.

#### **WARNING**

**Any attempt to perform service while the unit is supported by the Ground Control 3.0 leveling system could result in death, serious injury or damage to the ice house.**

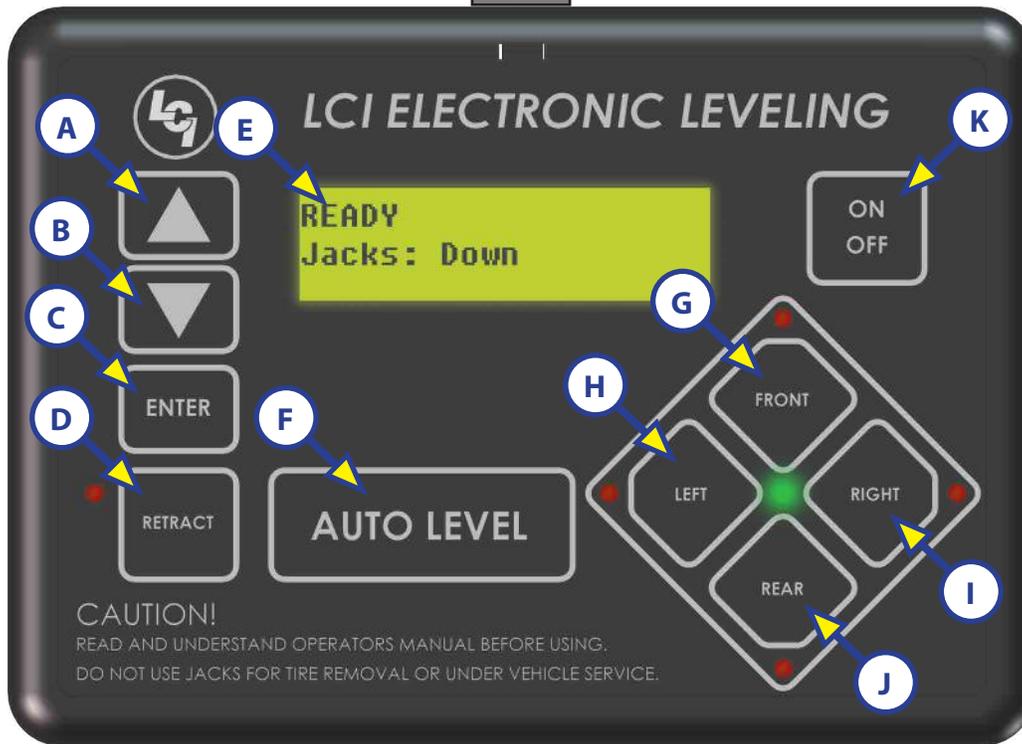
#### **CAUTION**

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

**NOTE:** Lippert Components, Inc. recommends that inspections, troubleshooting, component replacement, and verifications be completed only by certified RV technicians.

## Touch Pad Diagram

Fig.1



| Callout | Description   |
|---------|---|
| A       | Up Arrow - Scrolls up through the menu on LCD.  |
| B       | Down Arrow - Scrolls down through the menu on LCD.  |
| C       | Enter - Activates modes and procedures indicated on LCD.  |
| D       | Retract - Places leveling system into retract mode.<br>- Press and hold down for 1 second to initiate Auto Retract.   |
| E       | LCD Display - Displays procedures and results.  |
| F       | Auto Level - Extends all jacks simultaneously when pressed and held.<br><b>NOTE:</b> If retract button is pressed first, all jacks will retract simultaneously when pressed and held. |
| G       | Front Jack Button - Activates front landing gear.   |
| H       | Left Jack Button - Activates left jack.   |
| I       | Right Jack Button - Activates right jack.   |
| J       | Rear Jack Button - Activates both rear jacks.   |
| K       | Power Button - Turns leveling system on and off.  |

## Menus

**Jack State** – Displays the current state for the jack system (if at least one jack is not fully retracted, displays “Jacks: Down”, otherwise displays “Jacks: Up”).

**Auto Retract All** – Press Enter to automatically retract all of the jacks.

**Auto Retract Rear** – Press Enter to automatically retract the left rear and right rear jacks.

**Front Stroke** – Displays the stroke (inches of extension) of the front landing gear.

**Rear Stroke** – Displays the stroke (inches of extension) of the rear jacks.

**Battery** – Displays the current battery voltage.

**Error** - Displays an error. To clear the error, auto retract all jacks by pressing and holding retract (Fig. 1D).

**NOTE:** If any of the jacks are already retracted, extend them 6 inches and then retract all.

## Prior to Operation

1. Park the trailer on level and stable ground/ice.
2. Be sure all persons, pets, and property are clear of the coach before and during operation.
3. Make sure battery(ies) are fully charged and test at 12+VDC under load.



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

## Operation

### Cabin Mode

1. Extend the front jack.

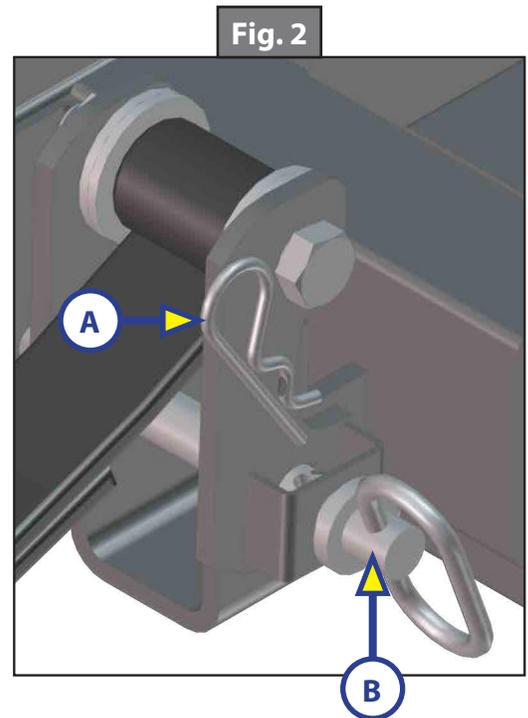
**NOTE:** This can also be done with the switch on the front jack.

2. Disconnect the trailer coupler from the tow vehicle hitch.
3. Extend the rear jacks to make contact with the ground or ice.
4. Remove the cotter pin (Fig. 2A) from each hitch pin (Fig. 2B).
5. Remove the hitch pins (Fig. 2B) from the axle assemblies to free the axles.
6. Retract all jacks until the unit sets flat to the ground or ice.

### Travel Mode

1. Extend all jacks until axle assembly is returned to travel position.
2. Insert hitch pins (Fig. 2B) into each axle assembly and secure the cotter pins (Fig. 2A).
3. Retract rear jacks completely.
4. Connect the trailer coupler to the tow vehicle hitch.
5. Retract the front jack.

**NOTE:** This can also be done with the switch near the front jack.



## Programming

**NOTE:** Begin with the touch pad off.

1. Press the "LEFT" button (Fig. 1H) on the touch pad 10 times.
2. Press the "RIGHT" button (Fig. 1I) on the touch pad 10 times.
3. The touch pad will read "Wireless Configuration" (Fig. 3).

**NOTE:** If the touch pad does not read "Wireless Configuration", repeat steps 1 and 2.

4. Press any button on the remote (Fig. 4) to sync the system.



## Maintenance

### Grease Specifications

LCI recommends a NLGI # 2 grade lithium complex EP grease for all applications contained within this manual. A molybdenum-based grease is preferred.

### CAUTION

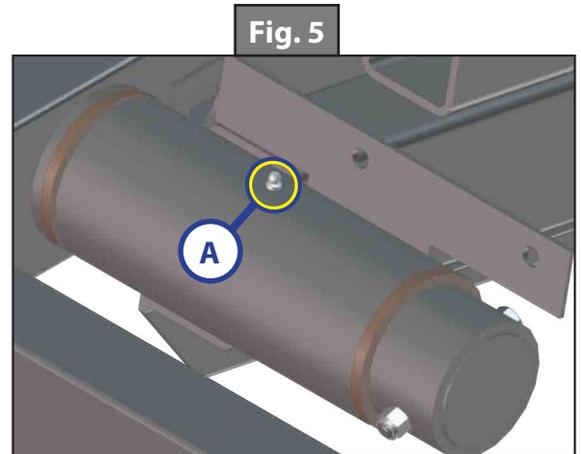
**Do not mix lithium, calcium, sodium or barium complex greases. Chemical compatibility problems may occur. If you are changing from one chemical grease to another, be sure all old grease is removed prior to applying new grease. If the old grease is not removed completely, chemical compatibility problems may result in component failure or damage.**

### Grease Application

This maintenance must be completed every 3,000 miles or 3 months, whichever comes first.

1. Use a grease gun to grease the zerk (Fig. 5A) located on the front pivot tube.

**NOTE:** 80 milliliters or  $\frac{3}{8}$  of a cup of lithium-based multipurpose grease should be used on each side of the coach.



### Electric Leveling Maintenance Schedule

| Item  | Function Required   | Monthly<br>(or as needed) | 3 Months | <sup>1</sup> 6 Months |
|---|---|---------------------------|----------|-----------------------|
| Jacks   | Remove dirt and road debris.  | ◆                         |          |                       |
|   | <sup>2</sup> Lubricate inner jack legs.   |                           | ◆        |                       |
|   | Jack mounting bolt torque (90 ft-lb).   |                           |          | ◆                     |
| Wiring/Electrical   | Inspect wiring for bare spots, fray, etc.   |                           |          | ◆                     |
|   | Inspect and ensure that all wiring harness connections are tight and free of corrosion. |                           |          | ◆                     |
|   | Battery voltage (should be 12.75V DC)   | At each use               |          |                       |
| <sup>1</sup> 6-month interval could also be the beginning and end of the travel season if not a full-time traveler.   |   |                           |          |                       |
| <sup>2</sup> Lubricate inner jacks legs: A 3-month interval is for normal environments. A 4 to 6-week interval would be appropriate for coaches located in a salty environment. |   |                           |          |                       |

Pivot Axle and Brake Maintenance Schedule

| Item                    | Function Required   | Weekly       | 3 Months /<br>3,000 Miles | 6 Months /<br>6,000 Miles | 12 Months /<br>12,000 Miles |
|-------------------------|---|--------------|---------------------------|---------------------------|-----------------------------|
| Brakes                  | Test that they are operational.   | At Every Use |                           |                           |                             |
| Breakaway System        | Check battery charge and switch operation.                              | At Every Use |                           |                           |                             |
| Brake Adjustment        | Adjust to proper operating clearance.                                   |              | ◆                         |                           |                             |
| Brake Magnets           | Inspect for wear and current draw.                                      |              |                           | ◆                         |                             |
| Brake Linings           | Inspect for wear or contamination.                                      |              |                           |                           | ◆                           |
| Brake Controller        | Check for correct amperage and modulation.                              |              |                           | ◆                         |                             |
| Trailer Brake Wiring    | Inspect wiring for bare spots, fray, etc.                               |              |                           |                           | ◆                           |
| Hub/Drum                | Inspect for abnormal wear or scoring.                                   |              |                           |                           | ◆                           |
| Wheel Bearing           | Inspect for corrosion or wear. Clean and repack.                        |              |                           |                           | ◆                           |
| Seals                   | Inspect for leakage. Replace if removed.                                |              |                           |                           | ◆                           |
| Springs                 | Inspect for wear, loss of arch.   |              |                           |                           | ◆                           |
| Suspension Parts        | Inspect for bending, loose fasteners, wear.                             |              |                           | ◆                         |                             |
| Hangers                 | Inspect welds.  |              |                           |                           | ◆                           |
| Wheel Nuts and Bolts    | Tighten to specified torque values.                                     |              | ◆                         |                           |                             |
| Wheels                  | Inspect for cracks, dents, or distortion.                               |              |                           | ◆                         |                             |
| Tire Inflation Pressure | Inflate tires to mfg's specifications.                                  | ◆            |                           |                           |                             |
| Tire Condition          | Inspect for cuts, wear, bulging, etc.                                   |              | ◆                         |                           |                             |
| Pivot Shaft             | Apply grease through grease zerk (see grease specifications on page 5). |              | ◆                         |                           |                             |

# Troubleshooting

## Error Codes

To clear one of these errors:

1. Correct or otherwise repair the issue (see the table below).
2. Extend all of the jacks at least six (6) inches, then press and hold the "RETRACT" button on the touch pad until the jacks begin retracting.
3. All of the jacks will retract fully to clear the error.

| LCD Message   | What Is Happening?  | What Should Be Done?  |
|---|---|---|
| <p>***ERROR***</p> <p>Left Jack</p> <p>Right Jack</p> | <p>Error at a specific jack (left front, right front, left rear, right rear). Hall signal issue (open, short, malfunction).</p> <p>Unexpected high amp current stall.</p> | <p>Check harness connections at controller and at jack.</p> <p>Check that harness connections are in the proper location on the controller by verifying the labels on the harness and controller.</p> <p>Check harness for damage.</p> <p>Repair or replace as necessary.</p> |
| <p>****ERROR****</p> <p>Low Voltage</p>               | <p>Battery voltage dropped below 10.8V.</p>   | <p>Check wiring for loose connection.</p> <p>Test battery voltage under load - charge or replace.</p>   |
| <p>****ERROR****</p> <p>Comm Error</p>                | <p>Communication between controller and touch pad has been lost.</p>  | <p>Check harness for proper connections or damage.</p> <p>Replace if necessary.</p>   |
| <p>****ERROR****</p> <p>Internal Sensor</p>           | <p>Internal sensor problem.</p>   | <p>Replace controller.</p>  |
| <p>**PANIC STOP**</p> <p>Function Aborted</p>         | <p>The user pressed a button on the touch pad during an automatic operation.</p>  | <p>Restart automatic operation and then refrain from pressing any buttons on the touch pad.</p>   |

## Manual Override - Top of Jack Motor

**NOTE:** Use of a 12V-18V cordless screw gun or pneumatic screw gun is acceptable to manually override the jacks. Do not use an impact screw gun to perform the override procedure, as this may damage the motor.

If manual override is necessary on any jack in the system, there are two options. The following process will describe how to use the top override. See next page for the bottom override.

**Tools needed:** 3/8" drive ratchet and extension (no socket).

1. Find the port on the top of the jack motor (Fig. 6A).
2. Remove the rubber plug (Fig. 7).
3. Insert the 3/8" drive into the port (Fig. 8).
4. Turn override until the jack extends or retracts to desired position (Fig. 9).

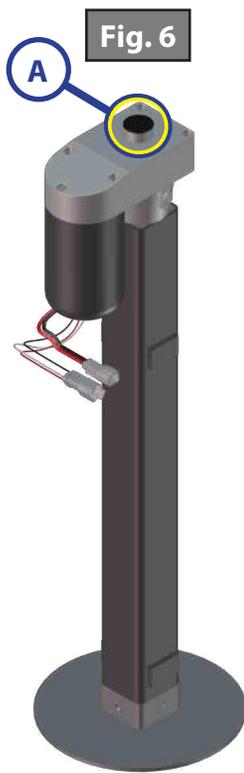


Fig. 6

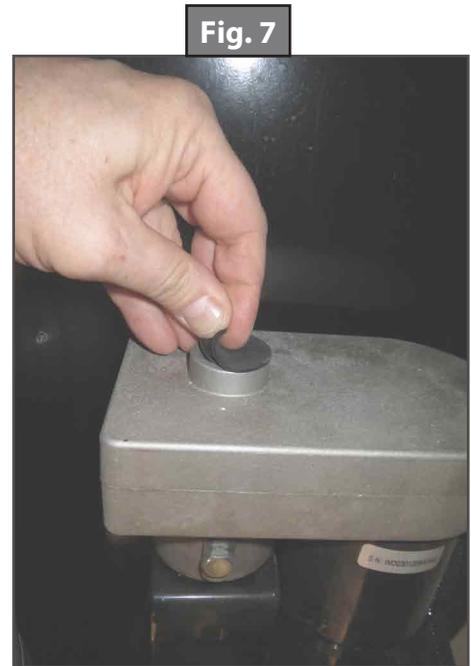


Fig. 7

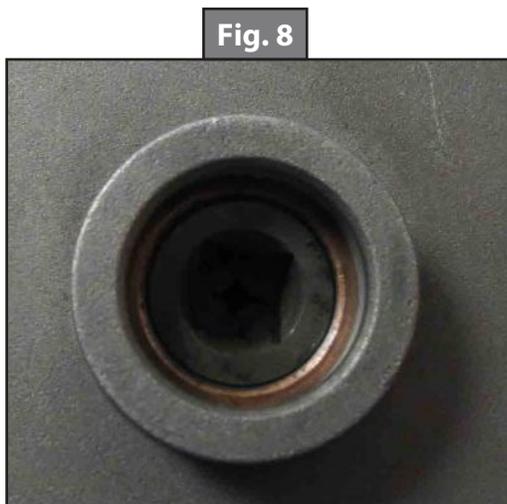


Fig. 8



Fig. 9

## Manual Override - Bottom of Jack Motor

**NOTE:** Use of a 12V-18V cordless screw gun or pneumatic screw gun is acceptable to manually override the jacks. Do not use an impact screw gun to perform the override procedure, as this may damage the motor.

If manual override is necessary on any jack in the system, there are two options. The following process will describe how to use the bottom override. See the previous page for the top override.

**Tools needed:** 3/8" drive ratchet and extension, 5/16" socket.

1. Find the port on the bottom of the jack motor (Fig. 10A).
2. Remove the rubber plug (Fig. 11).
3. Insert the 5/16" socket into the port (Fig. 12).
4. Turn override until the jack extends or retracts to desired position (Fig. 13).

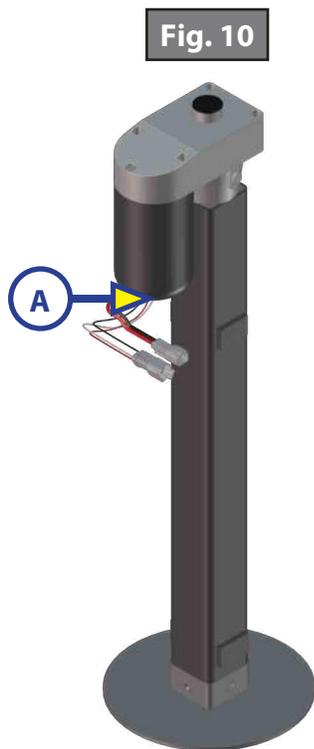


Fig. 10

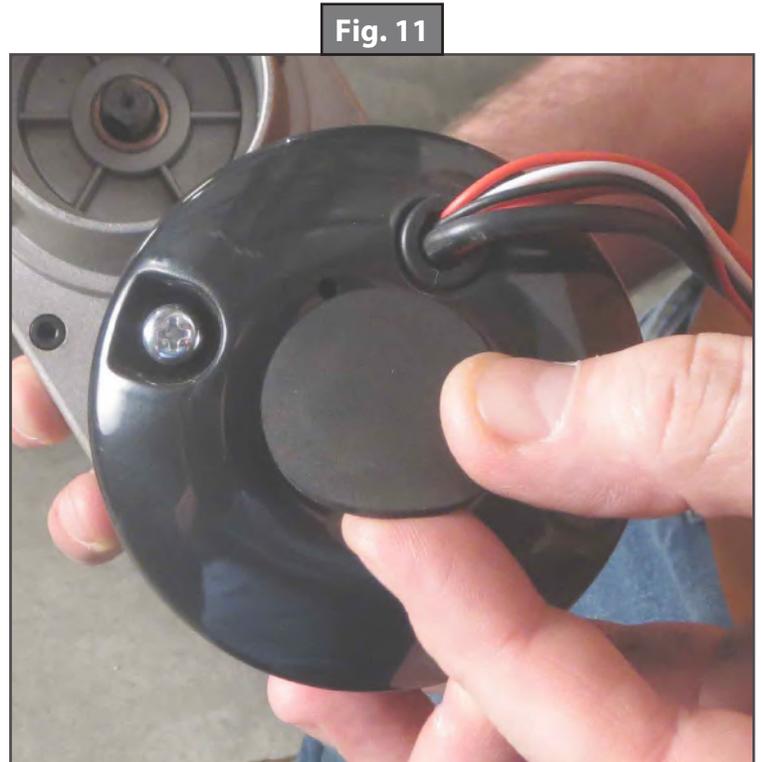


Fig. 11



Fig. 12

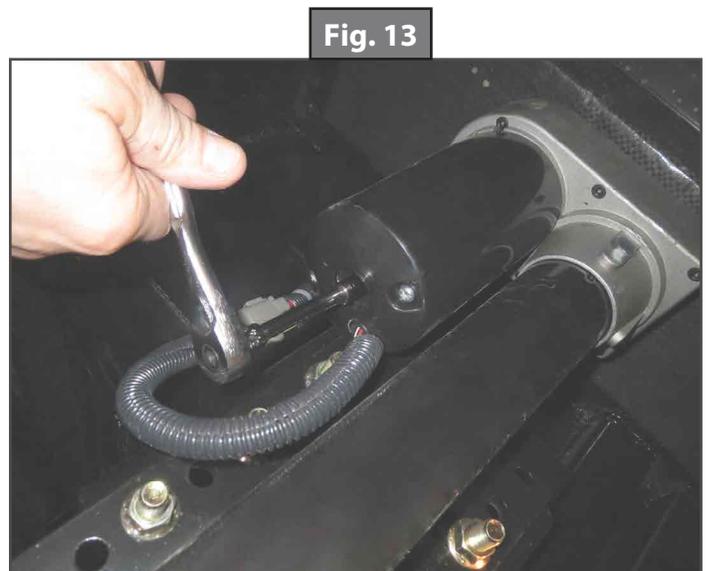


Fig. 13

# GROUND CONTROL® TT LEVELING SYSTEM

## LEVELING AND STABILIZATION

### System Information

With the push of a button, the Ground Control® TT Leveling System levels and stabilizes your travel trailer quickly and accurately, enhancing your overall camping experience. It can take up to an hour to get a travel trailer level with manual jacks, chocks and wedges. The Ground Control TT Leveling System saves you time by leveling and stabilizing the travel trailer in a matter of minutes, and prevents annoying rocking and swaying at the campsite.

Features:

1. Saves time setting up camp
2. Fast, accurate automatic electric leveling
3. Auto re-hitch memory function
4. Level travel trailers function more efficiently than non-level ones

### Safety Information

#### **WARNING**

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

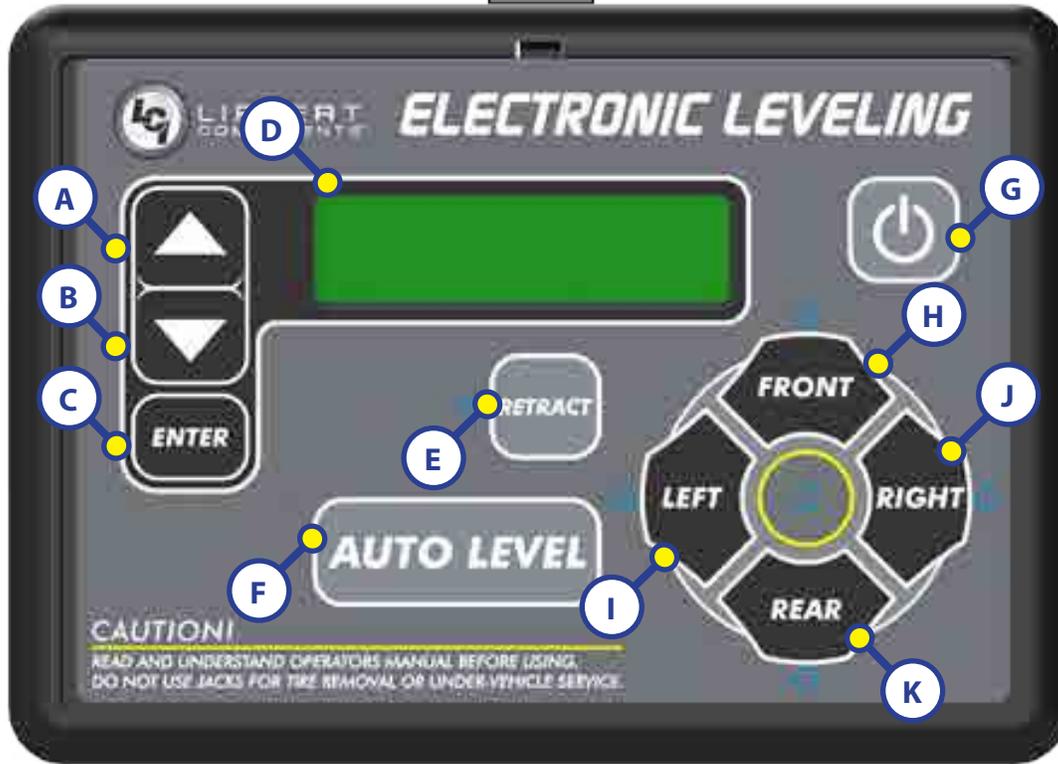
1. The use of the Ground Control TT Leveling System to support the travel trailer for any reason other than which it is intended is prohibited by Lippert's limited warranty.
2. The Ground Control TT Leveling System is designed as a "leveling" system only and should not be used to provide service for any reason under the travel trailer, such as changing tires or servicing the leveling system.
3. Any attempts to change tires or perform other service while travel trailer is supported by the Ground Control TT Leveling System could result in damage to the travel trailer and/or cause death or serious injury.

#### **CAUTION**

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

# Touch Pad Diagram

Fig. 1



| Callout | Description   |
|---------|---|
| A       | Up Arrow - Scrolls up through the menu on LCD.  |
| B       | Down Arrow - Scrolls down through the menu on LCD.  |
| C       | Enter - Activates modes and procedures indicated on LCD.  |
| D       | LCD Display - Displays procedures and results.  |
| E       | Retract - Places leveling system into retract mode.   |
| F       | Auto Level - Places leveling system into auto level mode.   |
| G       | Power Button - Turns leveling system on and off.  |
| H       | Front Jack Button - Activates tongue jack in standard mode<br>- Activates front jacks in manual mode. |
| I       | Left Jack Button - Activates left jacks in manual mode.   |
| J       | Right Jack Button - Activates right jacks in manual mode.   |
| K       | Rear Jack Button - Activates rear jacks in manual mode.   |

## Operation

### **⚠️ WARNING**

Be sure to park the travel trailer on solid and level ground. Prior to operation, clear all jack landing locations of debris and obstructions. The locations should also be free of surface depressions and moisture. When parking the travel trailer on extremely soft surfaces, utilize load distribution pads under each jack.

### **⚠️ CAUTION**

People and pets should be clear of travel trailer while operating leveling system. Never lift the travel trailer completely off the ground. Lifting the travel trailer so the wheels are not touching the ground will create an unstable and unsafe condition.

## Basic Jack Operation

The power tongue jack can be operated at any time using the buttons on the front of the tongue jack motor enclosure or by pressing the "FRONT" button (Fig. 1H) of the touch pad in standard mode.

The leveling jacks can only be extended when the touch pad is in manual mode. Once in manual mode, pressing the "FRONT" button (Fig. 1H) will extend both front jacks at the same time. By pushing the button combination of "FRONT" and "LEFT" (Fig. 1I), or "FRONT" and "RIGHT" (Fig. 1J) buttons, the individual front jacks can be extended. Pressing the "REAR" button (Fig. 1K) will extend both rear jacks at the same time. To extend individual rear jacks, press the button combination of "REAR" and "LEFT" (Fig. 1I), or "REAR" and "RIGHT" (Fig. 1J) buttons, depending on which jack needs to be operated. Pressing the "LEFT" button (Fig. 1I) will extend both the left front jack and the left rear jack. Pressing the "RIGHT" button (Fig. 1J) will extend both the right front jack and the right rear jack.

If the touch pad is put in the retract mode, which is indicated by the orange illuminated LED next to the "RETRACT" button (Fig. 1E), the front jacks can be retracted together by pushing the "FRONT" button (Fig. 1H). Individual front jacks can be retracted by pushing the combination of the "FRONT" and "LEFT" (Fig. 1I), or "FRONT" and "RIGHT" (Fig. 1J) buttons. Similarly, the rear jacks can be retracted together by pushing the "REAR" button (Fig. 1K), or individually by pushing the combination of the "REAR" and "LEFT" (Fig. 1I) or "REAR" and "RIGHT" (Fig. 1J) buttons. Pressing the "LEFT" button (Fig. 1I) will retract both the left front jack and the left rear jack. Pressing the "RIGHT" button (Fig. 1J) will retract both the right front jack and the right rear jack.

**NOTE:** If the leveling jacks will not operate individually using the method described above, but they operate properly when Auto Level is performed, the Twist Prevention Protection system has locked out the operation to prevent damage to the frame of the travel trailer.

## Dropping Off Travel Trailer

1. Park travel trailer on level ground.
2. Chock all tires.
3. Make sure battery power is on.
4. Disconnect any wires, chains, or sway control that may be equipped between the tow vehicle and travel trailer. Unlatch the travel trailer coupler.
5. Press and hold the "EXT" button on the tongue jack or press the "FRONT" button (Fig 1H) on the touch pad in standard mode to extend the tongue jack to the ground (Fig. 2A). Continue extending until the travel trailer coupler releases from the tow vehicle hitch.
6. Once the coupler is clear of the hitch, pull the tow vehicle away and park at a safe distance.

Fig. 2



## Auto Leveling

**NOTE:** Once the automatic leveling cycle has been started, it is important that there is no movement in the travel trailer until the travel trailer has completed the leveling process. Failure to remain still during the leveling cycle could have an effect on the performance of the leveling system.

1. After unhitching from the tow vehicle and parking the vehicle at a safe distance away from the travel trailer, locate the leveling touch pad on the unit (Fig. 3). It will usually be in a side compartment near the front of the travel trailer.
2. Press the "ON/OFF" button (Fig. 3A) and then press "AUTO LEVEL" (Fig. 3B).



## Auto Level Sequence

**NOTE:** Sequence may vary slightly based on the height of the travel trailer coupler prior to leveling.

1. When the Auto Level Sequence begins, the front of the travel trailer will seek a position near a level state using a combination of the tongue jack and front jacks. During this sequence the tongue jack will partially retract.
2. The rear jacks will then extend and complete a rear leveling sequence.
3. When the rear leveling sequence has been completed, the travel trailer will adjust front to back and side-to-side.
4. Each jack will perform a final grounding touch.
5. Once this has been completed the LCD screen will read "AUTO LEVEL SUCCESS."
6. The LED screen will then read "READY" followed by the current battery voltage. The green LED in the center of the four leveling jack buttons will be illuminated (Fig. 4A).



**NOTE:** If the AUTO LEVEL sequence does not perform as described above, place the system in manual mode and test that the jacks operate correctly by pushing their coordinating buttons on the touch pad; i.e. "FRONT" button operates only the front jacks, etc. If the jack functions are incorrect, check that the correct jack wiring harnesses are plugged into the correct ports on the controller.

## Reconnecting To Tow Vehicle

1. Press the "ON/OFF" button to turn panel on (Fig. 5B).
2. Press the "UP ARROW" (Fig. 5A) button on the touch pad until "AUTO HITCH HGT, ENTER TO BEGIN" is displayed on the LCD. Press the "ENTER" button (Fig. 5C).
3. The rear leveling jacks will retract, followed by the tongue jack extending to the ground, then followed by the front leveling jacks retracting. The tongue jack will then adjust the height of the front of the travel trailer coupler to the point at which the "AUTO LEVEL" button was most recently pressed.
4. Press the "ON/OFF" button to turn system off (Fig. 5B).
5. Back the tow vehicle into position to align the tow vehicle hitch and travel trailer coupler with each other.
6. Press and hold "RET" on the tongue jack to retract the tongue jack (Fig. 6A) until the coupler sets into position on top of the tow vehicle hitch.
7. Latch the tow vehicle hitch and connect any wires, chains, or sway control that may be equipped between the tow vehicle and travel trailer.
8. Press the "RET" button (Fig. 6A) twice and then press and hold the "RET" button for 3-5 seconds to engage the tongue jack's auto retract feature.

**NOTE:** The "RET" button (Fig. 6A) can also be pressed and held until the jack is fully retracted.



# Troubleshooting

## Manual Override



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

**NOTE:** For ease of manual override it is recommended to unplug the power harness to the motor prior to performing the manual override procedure.

**NOTE:** Use of a 12-18 volt cordless screw gun or pneumatic screw gun is acceptable to manually override the jacks. Do not use an impact screw gun to perform any of the override procedures, as this may damage the motor. If manual override is necessary there are two options for each style of jack.

### Front Jack-Jack Motor Override:

**Tools needed:** 3/8" drive ratchet and extension (no socket)

1. Find the port on the top of the jack motor (Fig. 7A).
2. Remove the rubber plug (Fig. 8A).
3. Insert the 3/8" drive into the port.
4. Turn the override until the jack extends or retracts to desired position.

### Front Jack-Jack Manual Override Nut:

**Tools needed:** 3/4" socket wrench

1. Locate the manual override nut (Fig 7B).
2. Place 3/4" socket wrench over the manual override nut (Fig. 9A) and turn the override nut until the jack extends or retracts to desired position.

Fig. 7



Fig. 8

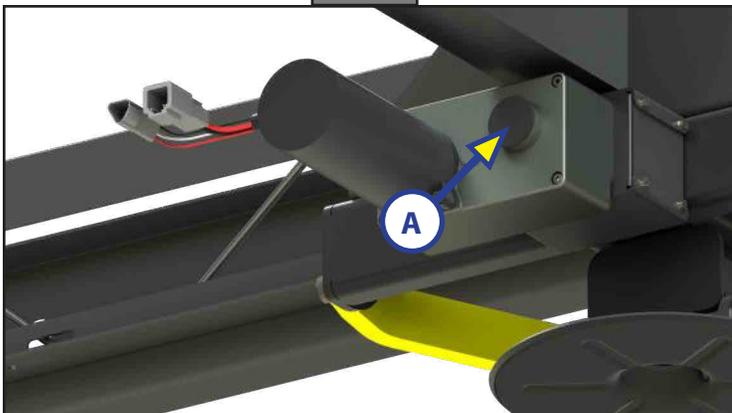
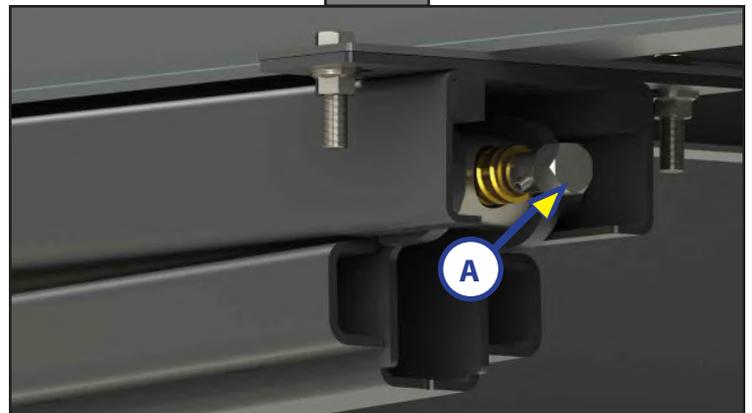


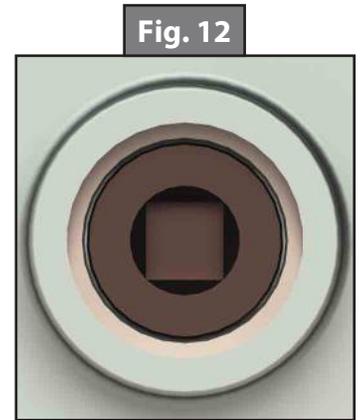
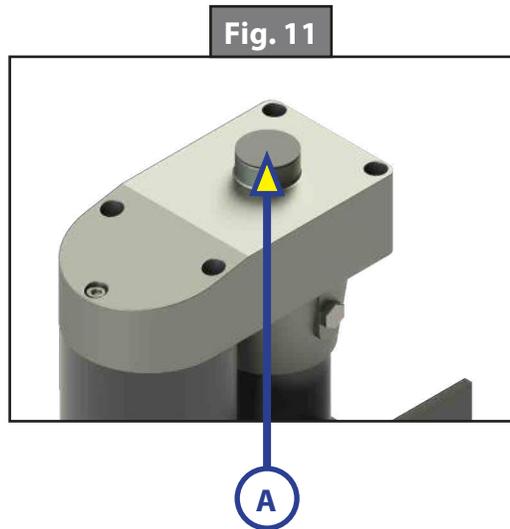
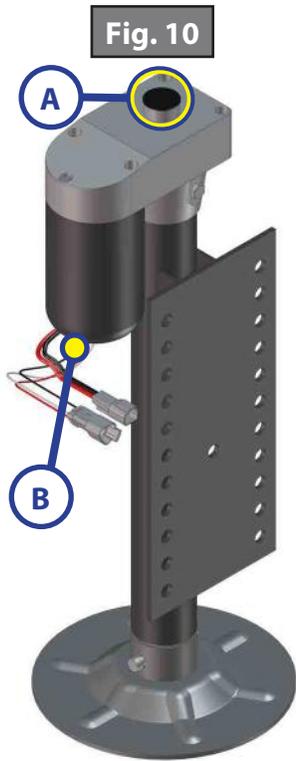
Fig. 9



## Rear Jack - Top of Jack Motor Override:

**Tools needed:** 3/8" drive ratchet and extension (no socket)

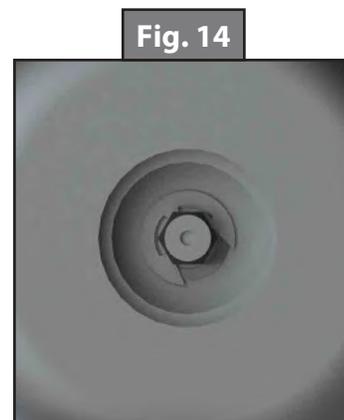
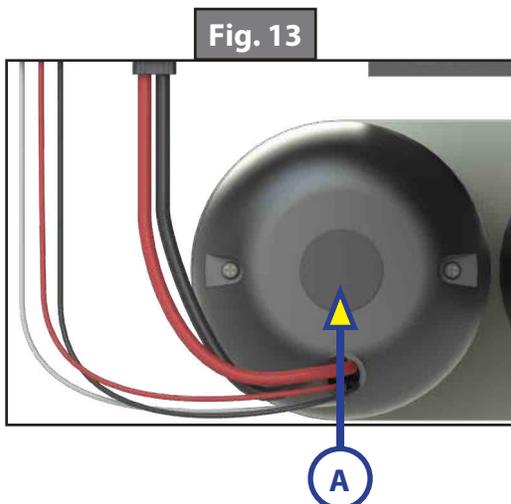
1. Find the port on the top of the jack motor (Fig. 10A).
2. Remove the rubber plug (Fig.11).
3. Insert the 3/8" drive ratchet into the port (Fig. 12).
4. Turn the override until the jack extends or retracts to desired position.



## Rear Jack - Bottom of Jack Motor Override:

**Tools needed:** 3/8" drive ratchet and extension, 5/16" socket

1. Find the port on the bottom of the jack motor (Fig. 10B).
2. Remove the rubber plug (Fig. 13).
3. Insert the 5/16" socket into the port (Fig. 14).
4. Turn the override until the jack extends or retracts to desired position.



## Touch Pad Error Codes

**NOTE:** To clear an error from the touch pad, repair or otherwise correct the issue, then press "ENTER." If the error is still present, the message will be displayed again.

| Touch Pad Error Codes             |   |   |
|-----------------------------------|---|---|
| LCD Message                       | What's Happening?   | What Should Be Done?  |
| ****ERROR****<br>Excess Angle     | Excessive angle reached during auto operation.                            | Relocate the travel trailer.  |
| ****ERROR****<br>Excessive Angle  | Excessive angle reached during manual operation.                          | Stop manual operation and reset jacks to a more level state. The code will self clear, there is no need to hit "ENTER." |
| ****ERROR****<br>Feature Disabled | Hitch recognition requested but no hitch height set.                      | Perform "AUTO LEVEL" sequence to establish hitch height.  |
|                                   | Zero point not set.   | Set zero point.   |
| ****ERROR****<br>Low Voltage      | Battery voltage dropped below 9.5V.                                       | Check wiring - repair or replace.   |
|                                   |   | Test battery voltage under load - charge or replace.  |
| ****ERROR****<br>Out Of Stroke    | Jack has reached maximum stroke length and is unable to lift.             | Check disposition of jacks. Relocate the travel trailer.  |
|                                   | Unexpected high amp current stall.  | Check jacks in manual mode or perform manual override procedure. Repair or replace as needed.                           |
|                                   |   | Check for bent or damaged jacks. Repair or replace as needed.   |
| ****ERROR****<br>External Sensor  | Bad connection or wiring from the controller to the leveling sensor.      | Replace or repair connection to leveling sensor.  |
| ****ERROR****<br>Jack Timeout     | Time limit exceeded for the requested auto operation.                     | Check disposition of jacks.   |
| ****ERROR****<br>Auto Level Fail  | Unable to auto level due to uneven ground.                                | Check disposition of jacks. Relocate the travel trailer.  |
|                                   | Unable to auto level due to zero point being set incorrectly.             | Reset zero point.   |
| ****ERROR****<br>Comm Error       | Communication between controller and touch pad has been lost.             | Check harness for proper connections or damage. Replace if necessary.   |
| ****ERROR****<br>Bad Calibration  | Sensor calibration values are out of range.                               | Replace controller.   |
| **ABORT**<br>Function Aborted     | The user pressed a button on the touch pad during an automatic operation. | Restart automatic operation and then refrain from pressing any buttons on the touch pad.                                |
| ****ERROR****<br>Hall Power Short | Short circuit detected in one of the hall effect power wires.             | Test for short and repair or replace.   |

## Special Jack Error Codes

To clear one of the error codes listed below:

1. Correct or otherwise repair the issue (see the table below).

**NOTE:** In order to clear the special jack error code the jacks need to be "homed." In order to "home" jacks, each jack **MUST** be able to retract a minimum of 6 inches.

2. Extend all jacks to reach the 6 inches of minimum retract needed.
  - A. Press "FRONT" (Fig. 1G) to extend the front jacks (if required).
  - B. Press "REAR" (Fig. 1J) to extend the rear jacks (if required).
3. Press and hold the retract button until all of the jacks begin to retract. The jacks will retract until they reach the hard current limit.
4. The jacks are now "homed" and the special jack error code will be cleared.

**NOTE:** If the jacks do not retract, an error should display on the touch pad screen. This is typically caused by wiring interruption.

| Special Leveling Jack Error Codes |   |  |
|-----------------------------------|---|--|
| LCD Message                       | What's Happening?   | What Should Be Done?                                 |
| ***ERROR***                       | Error at a specific jack (left front, right front, left rear, right rear, tongue jack).   | Check harness connections at controller and at jack. |
| LF Jack                           | <ul style="list-style-type: none"><li>• Hall signal issue (open, short, malfunction or loss of communication)</li><li>• Open or short circuit between controller and motor.</li></ul> | Check harness for damage.                            |
| RF Jack                           |   | Check fuses at controller.                           |
| LR Jack                           |   | Repair or replace as necessary.                      |
| RR Jack                           |   |  |
| Tongue Jack                       |   |  |

## System Settings

### Zero Point Calibration

The “Zero Point” is the programmed point that the travel trailer will return to each time the Auto Level feature is used. The “Zero Point” must be programmed prior to using the Auto Level feature to ensure the proper operation of the system.

**NOTE:** Prior to starting this procedure, double check all connections on the controller, jacks, and touch pad.

1. In manual mode run the jacks to level the travel trailer. This is best achieved by placing a level in the center of the travel trailer and leveling it both front to back and then side to side. (See “Basic Jack Operation” for instructions on how to manually operate the system).
2. Once the travel trailer is level, turn off the touch pad.
3. With the touch pad off, press and release the “FRONT” button (Fig. 1H) five (5) times and then press and release the “REAR” button (Fig. 1K) five (5) times.
4. The touch pad will flash and beep and the display will read “ZERO POINT CALIBRATION ENTER to set, Power to Exit” (Fig. 15).
5. To set the current position as the zero point, press the “ENTER” button (Fig. 1C).
6. LCD display will read “Zero point stability check” (Fig. 16).
7. LCD display will read “Zero point set successfully” once process is complete (Fig. 17).
8. The system will set this point as its level state and the touch pad will turn off.

Fig. 15



Fig. 16

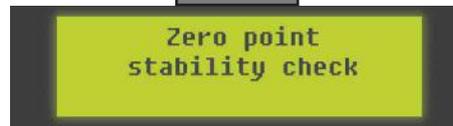
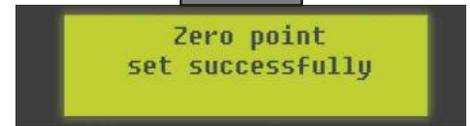


Fig. 17



### Preventive Maintenance

1. For optimum performance, the system requires full battery current and voltage. The battery must be maintained at full capacity.
2. Check the terminals and other connections at the battery, the controller, and the jacks for corrosion, and loose or damaged connections.
3. Remove dirt and road debris from jacks as needed.
4. If jacks are down for extended periods, it is recommended to spray exposed leveling jack rods with a silicone lubricant every three months for protection. If the coach is located in a salty environment, it is recommended to spray the rods every four to six weeks.

# GROUND CONTROL® TT LEVELING ONECONTROL™ TOUCH PANEL

## LEVELING AND STABILIZATION

### System Information

With the push of a button, the Ground Control® TT Leveling System levels and stabilizes your travel trailer quickly and accurately, enhancing your overall camping experience. It can take up to an hour to get a travel trailer level with manual jacks, chocks and wedges. The Ground Control® TT Leveling System saves you time by leveling and stabilizing the travel trailer in a matter of minutes, and prevents annoying rocking and swaying at the campsite.

Features:

1. Saves time setting up camp
2. Fast, accurate automatic electric leveling
3. Auto re-hitch memory function
4. Level travel trailers function more efficiently than non-level ones

The controllers for this system are automatic leveling controls and interface to the Ground Control TT Leveling system to level the trailer. The system utilizes one main control board and a separate waterproof remote level sensor to measure and manage level point, and can be operated from several user interface devices, including:

- Auto Leveling Control Touch Panel - Mounted outside the trailer within view of the hitch.
- MyRV® OneControl™ Touch Panel (OCTP) - Mounted on a wall inside the living space of the trailer or in a trailer compartment.
- MyRV® OneControl™ Leveling App - The app is available on iTunes® for iPhone® and iPad® and also on Google Play™ for Android™ users. iTunes®, iPhone® and iPad® are registered trademarks of Apple Inc. Google Play™ and Android™ are trademarks of Google Inc.
- Linc® Remote Control - Optional.

**NOTE:** The Ground Control® TT Leveling is specific to travel trailer applications only.

There are 2 different options for the controller depending on which jacks are installed:

- A. HD Blue Controller - Part #433632. Installed 2 C-jacks, 2 Hall Effect 5K jacks, uses Auto Leveling Control Touch Panel and OneControl Touch Panel.
- B. SE Green Controller - Part #433633. Installed 4 C-jacks, uses Auto Leveling Control Touch Panel and OneControl Touch Panel.

### Safety Information

#### WARNING

**Failure to act in accordance with the following may result in death or serious personal injury. The use of the Ground Control® TT Leveling system to support the trailer for any reason other than which it is intended is prohibited by Lippert's limited warranty. The Lippert leveling system is designed as a "leveling" system only and should not be used to provide service for any reason under the trailer such as changing tires or servicing the leveling system. Any attempts to change tires or perform other service while trailer is supported by the Ground Control TT Leveling system could result in damage to the trailer and/or cause death or serious injury.**

#### CAUTION

**People and pets should be clear of the trailer while the leveling system is operated. Never lift the trailer completely off the ground. Lifting the trailer so the wheels are not touching the ground will create an unstable and unsafe condition.**

### Prior to Operation

The leveling system should only be operated under the following conditions:

1. The trailer is parked on a reasonably level surface.
2. Be sure all persons, pets, and property are clear of the trailer while the leveling system is in operation.
3. Make sure battery(ies) are fully charged and test at 12+V DC under load.

## Operation - Power Tongue Jack

### **⚠ WARNING**

Be sure to park the trailer on solid and level ground. Prior to operation, clear all jack landing locations of debris and obstructions. The locations should also be free of surface depressions and moisture. When parking the trailer on extremely soft surfaces, utilize load distribution pads under each jack.

**NOTE:** The "On" and "Off" switch (Fig. 2A) controls the Power Tongue Jack's light only. If left on for an extended period of time, the light will drain the trailer's battery.

**NOTE:** The Power Tongue Jack is designed for vertical movement of the trailer only.

### Unhitching From A Tow Vehicle

**NOTE:** Prior to unhitching from the tow vehicle, ensure trailer is parked on a level surface and chock the tires of the trailer.

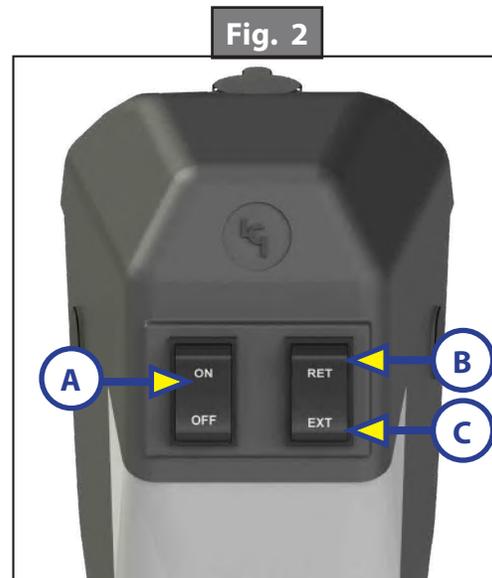
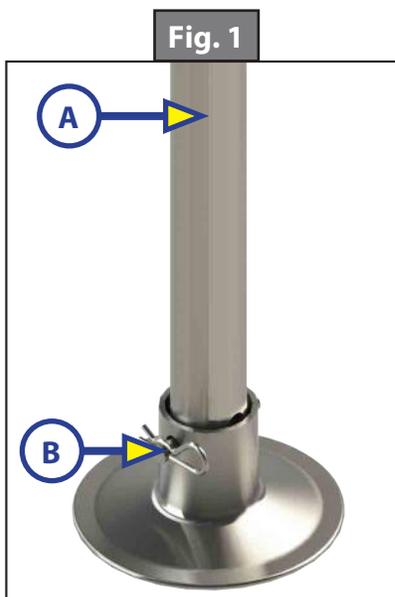
**NOTE:** Ensure the foot pad of the Power Tongue Jack is pinned securely in place with the clevis pin and hairpin cotter pin (Fig. 1B).

1. Disconnect any wires, chains, or sway control that may be equipped between the tow vehicle and the trailer. Unlatch the trailer coupler.
2. Push "EXT" (Fig. 2C) two times holding on the third time approximately 5 seconds, then release the switch and the Power Tongue Jack will automatically extend to the ground.
3. Push "EXT" until the coupler clears the hitch ball.
4. Disconnect the trailer wire connection at the tow vehicle, if not previously completed.
5. Move the tow vehicle away from the trailer.
6. Push "RET" (Fig. 2B) as needed to return the front of the trailer to level or use the Auto Level function to level the trailer per the instructions in this manual.

### Reconnecting to Tow Vehicle

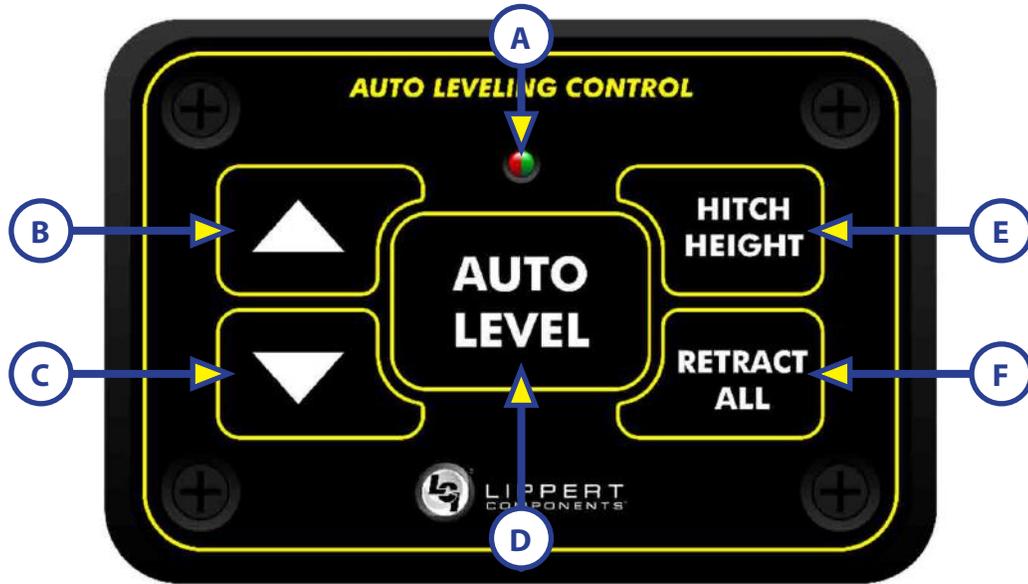
1. Chock the tires of the trailer.
2. Press "EXT" (Fig. 2C) if needed to allow the coupler to clear the hitch ball.
3. Push "RET" (Fig. 2B) to retract the Power Tongue Jack until the coupler properly mounts the hitch ball and the leg.
4. Latch the tow vehicle hitch and connect any wires, chains or sway control that may be equipped between the tow vehicle and trailer.
5. Press "RET" two times and hold on the third time approximately 5 seconds until the Power Tongue Jack pauses. Let go of the switch and the Power Tongue Jack will automatically retract.

**NOTE:** Be sure the leg of the Power Tongue Jack (Fig. 1A) is fully retracted prior to moving the tow vehicle.



## Touch Panel Diagram - Auto Leveling Control Touch Panel

Fig. 3



| Callout | Description   |   |
|---------|---|---|
| A       | Red/Green LED - Indicates the status of the system.   |   |
| B       | Up Arrow - Extends Power Tongue Jack .  | To turn on the touch panel, press the Up and Down arrow buttons at the same time. |
| C       | Down Arrow - Retracts Power Tongue Jack.  |   |
| D       | Auto Level Button - Places leveling system into auto level mode.  |   |
| E       | Hitch Height Button - Initiates the Hitch Recognition feature.  |   |
| F       | Retract All Button - Places leveling system into full retract mode. Power Tongue Jack does not retract. |   |

### Operation - Auto Leveling Control Touch Panel

#### **⚠ WARNING**

**Be sure to park the trailer on solid and level ground. Prior to operation, clear all jack landing locations of debris and obstructions. The locations should also be free of surface depressions and moisture. When parking the trailer on extremely soft surfaces, utilize load distribution pads under each jack.**

#### Basic Power Tongue Jack Operation

- To turn on the touch panel, press both "UP" and "DOWN" arrows (Fig. 3B and Fig. 3C) at the same time. The green indicator LED (Fig. 3A) will turn on.
- Press the "UP" arrow (Fig. 3B) to extend the Power Tongue Jack.
- Press the "DOWN" arrow (Fig. 3C) to retract the Power Tongue Jack.

#### Unhitching From A Tow Vehicle

**NOTE:** Prior to unhitching from the tow vehicle, ensure trailer is parked on a level surface and chock the tires of the trailer.

**NOTE:** Ensure the foot pad of the Power Tongue Jack is pinned securely in place with the clevis pin and hairpin cotter pin.

1. Disconnect any wires, chains, or sway control that may be equipped between the tow vehicle and the trailer. Unlatch the trailer coupler.

2. To turn on the Auto Leveling Control Touch Panel, press both "UP" and "DOWN" arrows (Fig. 3B and Fig. 3C) at the same time. The green indicator LED (Fig. 3A) will turn on.

**NOTE:** The touch panel will remain on as long as the user is pressing buttons. It will time out after approximately 5 minutes without use.

3. Press the "UP" arrow (Fig. 3B) on the Auto Leveling Control Panel to extend the Power Tongue Jack and lift the front of trailer to take the weight of the trailer off of the hitch.
4. Disconnect the trailer wire connection at the tow vehicle, if not previously completed.
5. Pull tow vehicle away and park at a safe distance.

**NOTE:** To utilize the Power Tongue Jack for the unhitching process see "Operation - Power Tongue Jack."

## Auto Level

1. Prior to auto leveling, ensure the trailer is unhitched from the tow vehicle and the tow vehicle is parked a safe distance away from the trailer.
2. Press both "UP" and "DOWN" arrows (Fig. 3B and Fig. 3C) at the same time if the green indicator LED is not on.
3. Press "AUTO LEVEL" (Fig. 3D).

**NOTE:** Once the automatic leveling cycle has been started, it is important that there is no movement in the trailer until the trailer has completed the leveling process. Failure to remain still during the leveling cycle could have an effect on the performance of the leveling system.

**NOTE:** Pressing any button during an Auto Level sequence will abort the auto leveling cycle.

**NOTE:** Sequence may vary slightly based on the height of the trailer coupler prior to leveling.

4. When the Auto Level Sequence begins:
  - A. The system checks that the rear jacks are retracted.
  - B. The Power Tongue Jack may adjust depending on the orientation of the trailer.
  - C. Front jacks will extend until movement of the trailer is sensed.
  - D. The Power Tongue Jack will then retract.
  - E. The front jacks will extend/retract near level.
  - F. Rear jacks will extend and ground.
  - G. Trailer will level front-to-back and then side-to-side.
  - H. The Auto level Sequence will ground all jacks to ensure all foot pads are on the ground.
  - I. The Auto Leveling sequence is complete when the indicator light turns solid green.

**NOTE:** If the AUTO LEVEL sequence does not perform as described above, locate the OneControl Touch Panel or use the OneControl App to place the system in Manual Mode. Test that the jacks operate correctly by pushing their corresponding buttons on the OneControl Touch Panel or App; e.g., "FRONT" button operates only the front jacks, etc. (See "Operation - OneControl Touch Panel" or "Operation - OneControl App" in this manual).

## Hitch Recognition

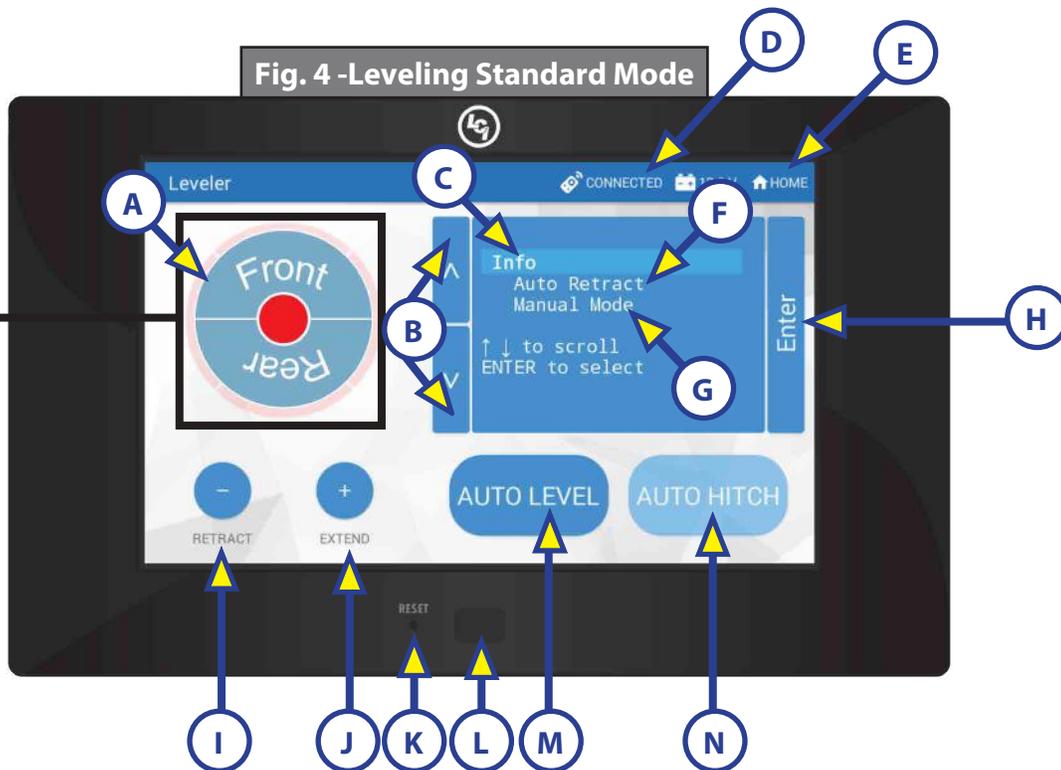
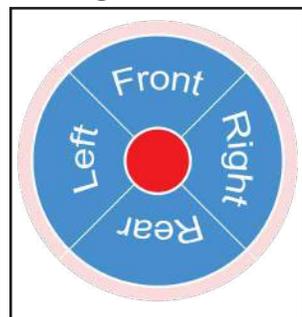
1. To turn on the Auto Leveling Control Touch Panel, press both "UP" and "DOWN" arrows (Fig. 3B and Fig. 3C) at the same time. The green indicator LED (Fig. 3A) will turn on.
2. Press "HITCH HEIGHT" (Fig. 3E).
  - A. Rear jacks will retract.
  - B. The Power Tongue Jack will extend to the ground.
  - C. The front leveling jacks will retract.
  - D. The tongue jack will then adjust the height of the front of the trailer coupler to the point at which the "AUTO LEVEL" button was most recently pressed.
3. Back the tow vehicle into position to align the tow vehicle hitch and trailer coupler with each other.
4. Press and hold the "DOWN" arrow to retract the tongue jack until the coupler sets into position on top of the tow vehicle hitch.

5. Latch the tow vehicle hitch and connect any wires, chains or sway control that may be equipped between the tow vehicle and trailer.
6. Press and hold the "DOWN" arrow until the Power Tongue Jack is fully retracted.

**NOTE:** To utilize the Power Tongue Jack for the hitching process see "Operation - Power Tongue Jack."

## Touch Panel Diagram - OneControl Touch Panel

**Jack Buttons  
in Manual Mode  
See Fig. 7**



| Callout | Description  |
|---------|--|
| A       | Jack Buttons - Select Front, Rear, Right and Left jacks to be operated depending on mode. Jacks available to be operated will be highlighted in blue. Only the Power Tongue Jack can be operated in Standard Mode. In Manual Mode (Fig. 7), all jacks are available to be operated (No Power Tongue Jack operation available). |
| B       | Up and Down Arrows - Scrolls through options on screen.  |
| C       | Info - Displays system information, e.g. angle, jack stroke or software version.   |
| D       | Connected Icon - Press 6 times to program zero point/ wireless configurations.   |
| E       | Home Icon - Returns screen to home page.   |
| F       | Auto Retract - Enters Auto Retract mode to retract all jacks. Power Tongue Jack does not retract.  |
| G       | Manual Mode - Enters Manual Mode to manually operate jacks.  |
| H       | Enter - Push to select various modes.  |
| I       | Retract - Retracts jacks in several modes. Jacks available will be highlighted in blue.  |
| J       | Extend - Extends jacks in several modes. Jacks available will be highlighted in blue.  |
| K       | Reset - Resets to factory default.   |
| L       | Power Button - Turns touch panel on and off.   |
| M       | Auto Level - Starts the Auto Level sequence.   |
| N       | Auto Hitch - Returns trailer to previous hitch height for reconnecting to tow vehicle.   |

## Operation - OneControl Touch Panel



**WARNING**

Be sure to park the trailer on solid and level ground. Prior to operation, clear all jack landing locations of debris and obstructions. The locations should also be free of surface depressions and moisture. When parking the trailer on extremely soft surfaces, utilize load distribution pads under each jack.

### Basic Jack Operation In Standard Mode

To reach Standard Mode (Fig. 4) for leveling:

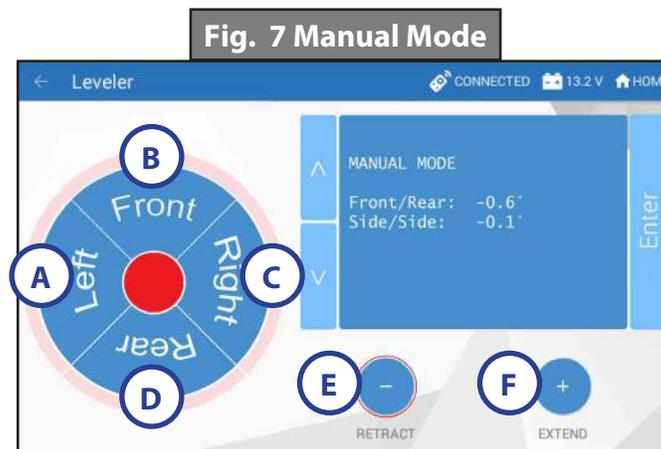
1. Power on the OneControl Touch Panel (Fig. 4L).
2. Press "MyRV Control Panel" on the main screen (Fig. 5A).
3. Press the "Leveler" icon (Fig. 6A).
4. The screen will show the system menu (Fig. 4) for Standard Mode. The Power Tongue Jack can be extended/retracted in Standard Mode. Front and rear jacks cannot be operated in standard mode.



### Basic Jack Operation In Manual Mode

To reach Manual Mode (Fig. 7) for leveling:

1. While in Standard Mode (Fig. 4), use the arrows (Fig. 4B) to scroll to Manual Mode (Fig. 4G). Hit "ENTER" (Fig. 4H).
2. Front and rear jacks can be operated in Manual Mode. The Power Tongue Jack cannot be operated in Manual Mode.



## OneControl Touch Panel In Standard and Manual Modes

### **Standard Mode Features**

- Press "EXTEND" (Fig. 4J) or "RETRACT" (Fig. 4I) and "FRONT" (Fig. 4A) to extend or retract the Power Tongue Jack.
- Press the "AUTO LEVEL" (Fig. 4M) button to start the auto leveling sequence.
- Press the "AUTO HITCH" (Fig. 4N) button to start the hitch recognition sequence when reconnecting to the tow vehicle.
- Use the "UP" or "DOWN" arrow (Fig. 4B) buttons to cycle through the menu screen options:
  - A. Info:** Scroll to "INFO" (Fig. 4C) and press "ENTER" (Fig. 4H) button to display system information, e.g., angle, jack stroke or software version.
  - B. Auto Retract:** Scroll to "AUTO RETRACT" (Fig. 4F) and press "ENTER" button to start the "Auto Retract" sequence, which will retract all jacks. The Power Tongue jack does not retract.
  - C. Manual Mode:** Scroll to "Manual Mode" (Fig. 4G) and press "ENTER" button to start Manual Level operation.

### **Manual Mode Features**

**NOTE:** Upon entering Manual Mode, a tutorial on operating the jacks will appear on the screen. Press "OK" to clear the tutorial. To delete the tutorial, click the "Don't show this again" box in the bottom right of the screen.

- Press "EXTEND" (Fig. 7F) or "RETRACT" (Fig. 7E) and "FRONT" (Fig. 7B) to operate front jacks.
- Press "EXTEND" or "RETRACT" and "REAR" (Fig. 7D) to operate rear jacks.
- Press "EXTEND" or "RETRACT" and "RIGHT" (Fig. 7C) to operate right jacks.
- Press "EXTEND" or "RETRACT" and "LEFT" (Fig. 7A) to operate left jacks.

**NOTE:** To operate jacks individually, press "EXTEND" or "RETRACT" then press the "LEFT" (Fig. 7A) or "RIGHT" (Fig. 7C) button while simultaneously pressing the "FRONT" (Fig. 7B) or "REAR" button (Fig. 7D), depending on which jack needs to be operated.

**NOTE:** If the jacks will not operate individually using the method described above, but they operate properly when Auto Level is performed, the Twist Prevention Protection system has locked out the operation to prevent damage to the frame of the trailer.

## Unhitching From A Tow Vehicle

**NOTE:** Prior to unhitching from the tow vehicle, ensure trailer is parked on a level surface and chock the tires of the trailer.

**NOTE:** Ensure the foot pad of the Power Tongue Jack is pinned securely in place with the clevis pin and hairpin cotter pin.

1. Disconnect any wires, chains, or sway control that may be equipped between the tow vehicle and the trailer. Unlatch the trailer coupler.
2. Press "EXTEND" and "FRONT" button (Fig 4A) on the OneControl Touch Panel in Standard Mode to extend the Power Tongue Jack until the foot touches the ground and the coupler clears the hitch ball.

**NOTE:** If using the OneControl Touch Panel and the hitch is not visible a second person will be needed to monitor the operation of the unhitching process.

3. Disconnect the trailer wire connection at the tow vehicle, if not previously completed.
4. Pull tow vehicle away and park at a safe distance.

**NOTE:** To utilize the Power Tongue Jack for the unhitching process see "Operation - Power Tongue Jack."

## Auto Leveling

1. Prior to auto leveling, ensure the trailer is unhitched from the tow vehicle and the tow vehicle is parked a safe distance away from the trailer.
2. Press the "ON/OFF" button (Fig. 4L) if the OneControl Touch Panel is not on.
3. Press "MyRV Control Panel" on the main screen (Fig. 5A).
4. Press the "Leveler" icon (Fig. 6A).
5. Press "AUTO LEVEL" (Fig. 4M).

**NOTE:** Once the automatic leveling cycle has been started, it is important that there is no movement in the trailer until the leveling process is complete. Failure to remain still during the leveling cycle could have an effect on the performance of the leveling system.

**NOTE:** Sequence may vary slightly based on the height of the trailer coupler prior to leveling.

6. When the Auto Level Sequence begins:
  - A. The system checks that the rear jacks are retracted.
  - B. The Power Tongue Jack may adjust depending on the orientation of the trailer.
  - C. Front jacks will extend until movement of the trailer is sensed.
  - D. The Power Tongue Jack will then retract.
  - E. The front jacks will extend/retract near level.
  - F. Rear jacks will extend and ground.
  - G. Trailer will level front-to-back and then side-to-side.
  - H. The Auto level Sequence will ground all jacks to ensure all foot pads are on the ground.
  - I. The Auto Leveling sequence is complete when the OneControl Touch Panel indicates, "Auto Level Success."

**NOTE:** If the AUTO LEVEL sequence does not perform as described above, locate the OneControl Touch Panel or use the OneControl App to place the system in Manual Mode. Test that the jacks operate correctly by pushing their corresponding buttons on the OneControl Touch Panel or App; e.g., "FRONT" button operates only the front jacks, etc. (See "Operation - OneControl Touch Panel" or "Operation - OneControl App" in this manual).

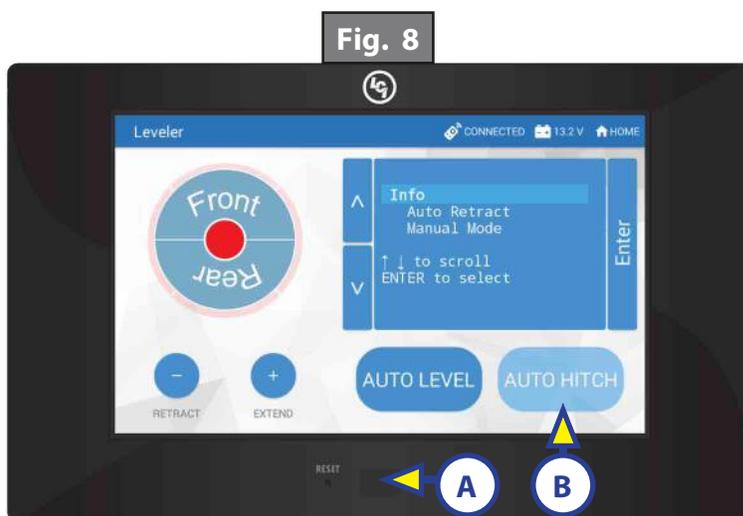
## Hitch Recognition

1. Press the "ON/OFF" button to turn the OneControl Touch Panel on (Fig. 8A).
2. Press "MyRV Control Panel" on the main screen (Fig. 5A).
3. Press the "Leveler" icon (Fig. 6A).
4. Press "AUTO HITCH" (Fig. 8B).
  - A. Rear jacks will retract.
  - B. The Power Tongue Jack will extend to the ground.
  - C. Front leveling jacks will retract.
  - D. The tongue jack will then adjust the height of the front of the trailer coupler to the point at which the "AUTO LEVEL" button was most recently pressed.
5. Back the tow vehicle into position to align the tow vehicle hitch and trailer coupler with each other.

**NOTE:** If using the OneControl Touch Panel and the hitch is not visible a second person will be needed to monitor the operation of the hitching process.
6. Press "RETRACT" button, then press the "FRONT" button to retract the tongue jack until the coupler sets into position on top of the tow vehicle hitch.
7. Latch the tow vehicle hitch and connect any wires, chains or sway control that may be equipped between the tow vehicle and trailer.

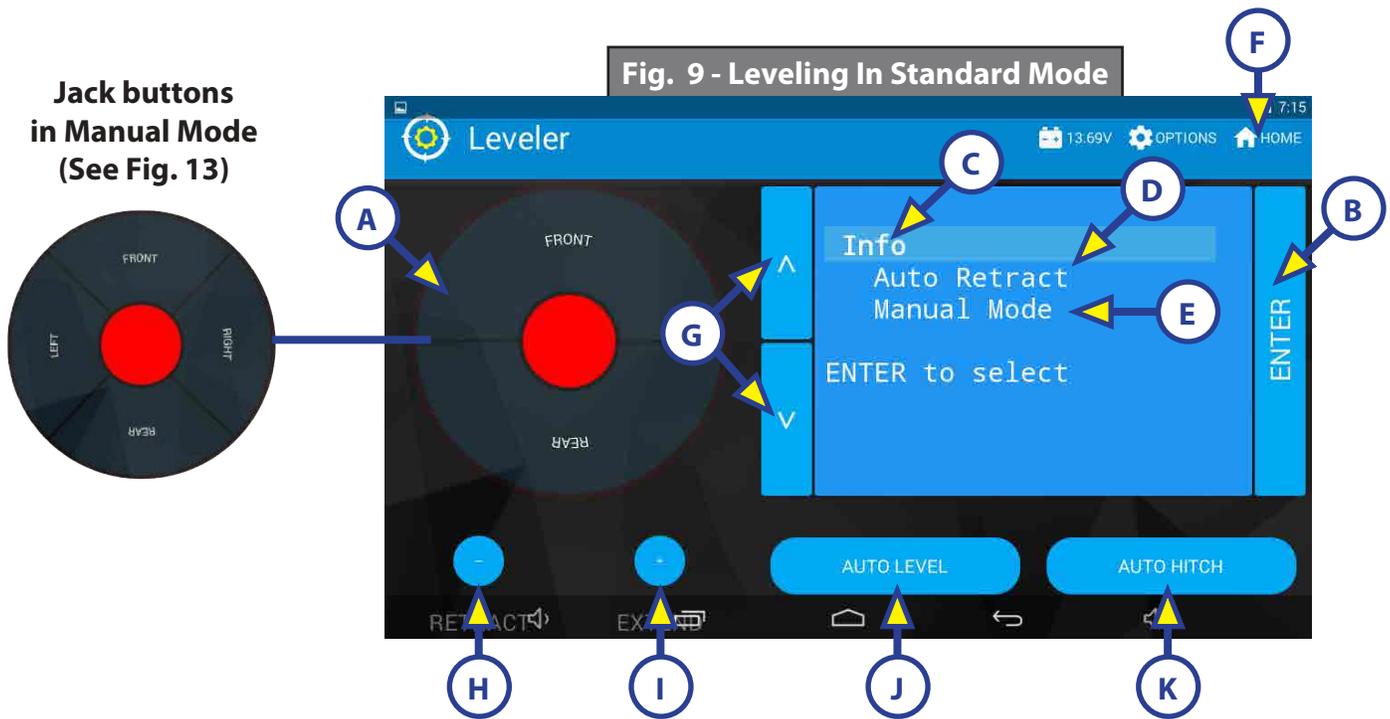
**NOTE:** Press the "RETRACT" button and then press and hold the "FRONT" button until the Power Tongue Jack fully retracts.

**NOTE:** To utilize the Power Tongue Jack for the hitching process see "Operation - Power Tongue Jack."



## Touch Panel Diagram - OneControl App from MyRV

**NOTE:** The OneControl Leveling App is available on iTunes® for iPhone® and iPad® and also on Google Play™ for Android™ users.



| Callout | Description  |
|---------|--|
| A       | Jack Buttons - Select Front, Rear, Right and Left jacks to be operated depending on mode. Jacks available to be operated will be highlighted in blue. Only the Power Tongue Jack can be operated in Standard Mode (Fig. 9). In Manual Mode (Fig. 13), all jacks are available to be operated (no Power Tongue Jack operation available.) |
| B       | Enter - Push to activate various modes.  |
| C       | Info - Displays system information, e.g., angle, jack stroke, software version.  |
| D       | Auto Retract - Enters Auto Retract mode to retract all jacks. Power Tongue Jack does not retract.  |
| E       | Manual Mode - Enters Manual Mode to manually operate jacks.  |
| F       | Home Icon - Returns screen to home page.   |
| G       | Up and Down Arrows - Scroll through options on screen.   |
| H       | Retract - Retracts jacks in several modes. Jacks available will be highlighted in blue.  |
| I       | Extend - Extends jacks in several modes. Jacks available will be highlighted in blue.  |
| J       | Auto Level - Starts the Auto Level sequence.   |
| K       | Auto Hitch - Returns trailer to previous hitch height for reconnecting to tow vehicle.   |

## Operation - OneControl App From myRV

### **⚠ WARNING**

Be sure to park the trailer on solid and level ground. Prior to operation, clear all jack landing locations of debris and obstructions. The locations should also be free of surface depressions and moisture. When parking the trailer on extremely soft surfaces, utilize load distribution pads under each jack.

### Accessing the OneControl App

1. Ensure there is power to the trailer's wireless network.
2. Navigate to the device's (smart phone, tablet, etc.) wifi settings. Turn wireless feature on and connect to the myRV wireless network.

**NOTE:** If this is the first time connecting to the myRV wireless network, a password will be required. The password is located on the trailer's wifi hub (Fig. 10).

3. Open the OneControl application on the compatible device.

**NOTE:** If the device states "Unresolved Network Connection," retry connecting to the myRV wireless network and/or wait for the connection to resolve and display "Connected" under the myRV wireless connection.

4. The application will request the user "Agree" to an end user license agreement, create a PIN and "Re-enter PIN to confirm."
5. On "Initial Setup" choose "myRV" (Fig.11A).
6. The OneControl app will now display all functions.

Fig. 10



### Basic Jack Operation In Standard Mode

To reach Standard Mode (Fig. 9) for leveling:

1. Power on the OneControl Touch Panel App.
2. Press the "Leveler" icon (Fig. 12A).
3. The screen will show the system menu (Fig. 9) for Standard Mode. The Power Tongue Jack can be extended/retracted in Standard Mode. Front and rear jacks cannot be operated in Standard Mode.

Fig. 11

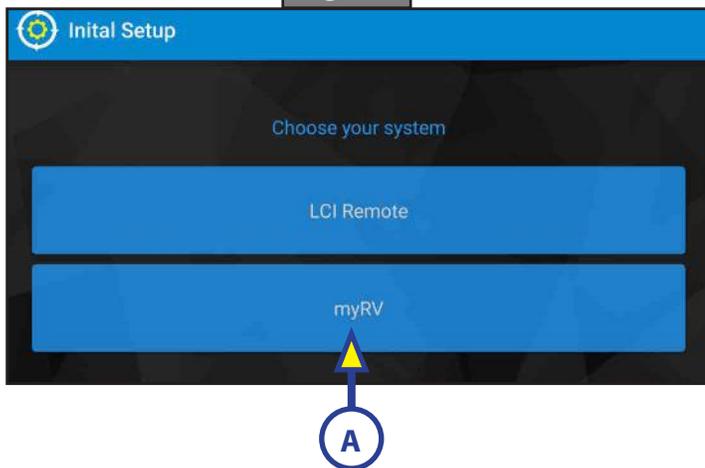
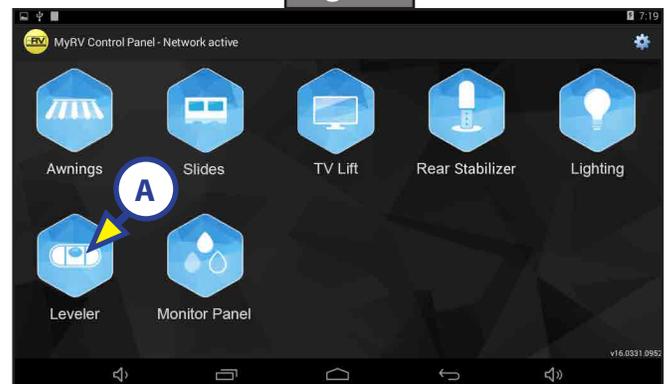


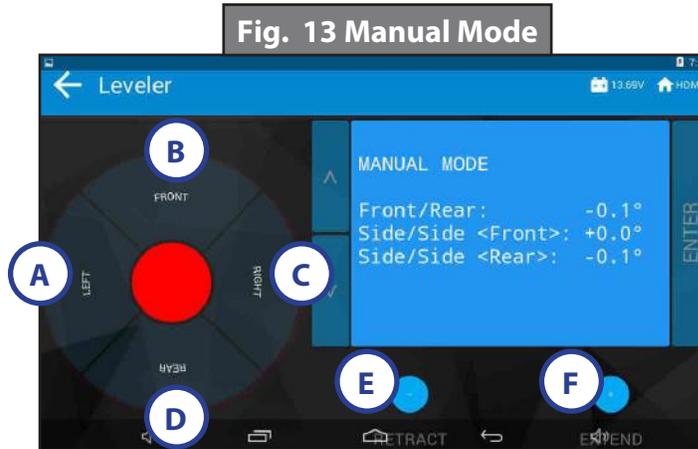
Fig. 12



## Basic Jack Operation In Manual Mode

To reach Manual Mode (Fig. 13) for leveling:

1. While in Standard Mode (Fig. 9), use the arrows (Fig. 9G) to scroll to Manual Mode (Fig. 9E). Hit "ENTER" (Fig. 9B).
2. Front and rear jacks can be operated in Manual Mode. The Power Tongue Jack cannot be operated in Manual Mode.



## OneControl Touch Panel App In Standard and Manual Modes

### Standard Mode Features

- Press "EXTEND" (Fig. 9I) or "RETRACT" (Fig. 9H) and "FRONT" (Fig. 9A) to extend or retract the Power Tongue Jack.
- Press the "AUTO LEVEL" (Fig. 9J) button to start the auto leveling sequence.
- Press the "AUTO HITCH" (Fig. 9K) button to start the hitch recognition sequence when reconnecting to the tow vehicle.
- Use the "UP" or "DOWN" arrow (Fig. 9G) buttons to cycle through the menu screen options:
  - A. Info:** Scroll to "INFO" (Fig. 9C) and press "ENTER" (Fig. 9B) button to display system information, e.g., angle, jack stroke or software version.
  - B. Auto Retract:** Scroll to "AUTO RETRACT" (Fig. 9D) and press "ENTER" button to start the "Auto Retract" sequence, which will retract all jacks. The Power Tongue jack does not retract.
  - C. Manual Mode:** Scroll to "Manual Mode" (Fig. 9E) and press "ENTER" button to start Manual Level operation.

### Manual Mode Features

**NOTE:** Upon entering Manual Mode, a tutorial on operating the jacks will appear on the screen. Press "OK" to clear the tutorial. To delete the tutorial, click the "Don't show this again" box in the bottom right of the screen.

- Press "EXTEND" (Fig. 13F) or "RETRACT" (Fig. 13E) and "FRONT" (Fig. 13B) to operate front jacks.
- Press "EXTEND" or "RETRACT" and "REAR" (Fig. 13D) to operate rear jacks.
- Press "EXTEND" or "RETRACT" and "RIGHT" (Fig. 13C) to operate right jacks.
- Press "EXTEND" or "RETRACT" and "LEFT" (Fig. 13A) to operate left jacks.

**NOTE:** To operate jacks individually, press "EXTEND" or "RETRACT" then press the "LEFT" (Fig. 13A) or "RIGHT" (Fig. 13C) button while simultaneously pressing the "FRONT" (Fig. 13B) or "REAR" button (Fig. 13D), depending on which jack needs to be operated.

**NOTE:** If the jacks will not operate individually using the method described above, but they operate properly when Auto Level is performed, the Twist Prevention Protection system has locked out the operation to prevent damage to the frame of the trailer.

## Unhitching From A Tow Vehicle

**NOTE:** Prior to unhitching from the tow vehicle, ensure trailer is parked on a level surface and chock the tires of the trailer.

**NOTE:** Ensure the foot pad of the Power Tongue Jack is pinned securely in place with the clevis pin and hairpin cotter pin.

1. Disconnect any wires, chains, or sway control that may be equipped between the tow vehicle and the trailer. Unlatch the trailer coupler.
2. Press the "FRONT" button (Fig 9A) on the OneControl Touch Panel App in Standard Mode to extend the Power Tongue Jack until the foot touches the ground and the coupler clears the hitch ball.
3. Disconnect the trailer wire connection at the tow vehicle, if not previously completed.
4. Pull tow vehicle away and park at a safe distance.

**NOTE:** To utilize the Power Tongue Jack for the unhitching process see "Operation - Power Tongue Jack."

## Auto Leveling

1. Prior to auto leveling, ensure the trailer is unhitched from the tow vehicle and the tow vehicle is parked a safe distance away from the trailer.
2. Power on the OneControl Touch Panel App.
3. Press the "Leveler" icon (Fig. 12A).
4. Press "AUTO LEVEL" (Fig. 9J).

**NOTE:** Once the automatic leveling cycle has been started, it is important that there is no movement in the trailer until the leveling process is complete. Failure to remain still during the leveling cycle could have an effect on the performance of the leveling system.

**NOTE:** Sequence may vary slightly based on the height of the trailer coupler prior to leveling.

5. When the Auto Level Sequence begins:
  - A. The system checks that the rear jacks are retracted.
  - B. The Power Tongue Jack may adjust depending on the orientation of the trailer.
  - C. Front jacks will extend until movement of the trailer is sensed.
  - D. The Power Tongue Jack will then retract.
  - E. The front jacks will extend/retract near level.
  - F. Rear jacks will extend and ground.
  - G. Trailer will level front-to-back and then side-to-side.
  - H. The Auto level Sequence will ground all jacks to ensure all foot pads are on the ground.
  - I. The Auto Leveling sequence is complete when the OneControl Touch Panel indicates, "Auto Level Success".

**NOTE:** If the AUTO LEVEL sequence does not perform as described above, locate the OneControl Touch Panel or use the OneControl App to place the system in Manual Mode. Test that the jacks operate correctly by pushing their corresponding buttons on the OneControl Touch Panel or App; e.g., "FRONT" button operates only the front jacks, etc. (See "Operation - OneControl Touch Panel" or "Operation - OneControl App" in this manual).

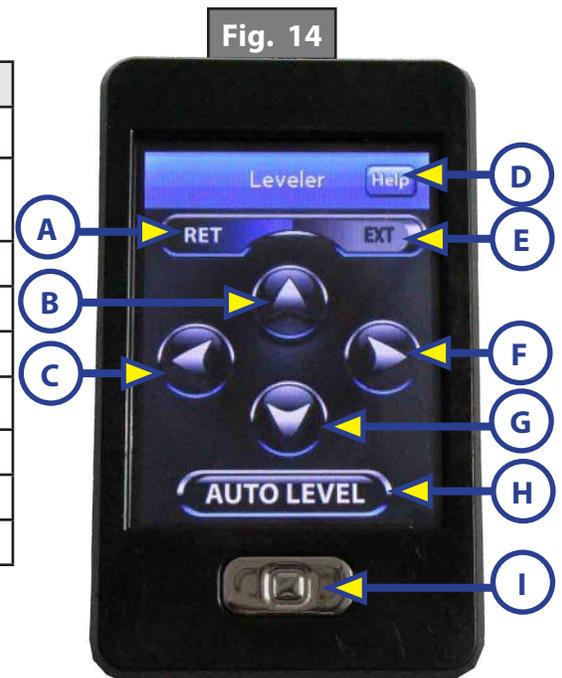
## Hitch Recognition

1. Power on the OneControl Touch Panel App.
2. Press the "Leveler" icon (Fig. 12A).
3. Press "AUTO HITCH" (Fig. 9K).
  - A. Rear jacks will retract.
  - B. The Power Tongue Jack will extend to the ground.
  - C. Front leveling jacks will retract.
  - D. The tongue jack will then adjust the height of the front of the trailer coupler to the point at which the "AUTO LEVEL" button was most recently pressed.
4. Back the tow vehicle into position to align the tow vehicle hitch and trailer coupler with each other.
5. Press "RETRACT" button, then press the "FRONT" button to retract the tongue jack until the coupler sets into position on top of the tow vehicle hitch.
6. Latch the tow vehicle hitch and connect any wires, chains or sway control that may be equipped between the tow vehicle and trailer.
7. Press the "RETRACT" button and then press and hold the "FRONT" button until the Power Tongue Jack fully retracts.

**NOTE:** To utilize the Power Tongue Jack for the hitching process see "Operation - Power Tongue Jack."

## Touch Panel Diagram - Linc Remote Control - Optional

| Callout | Description  |
|---------|--|
| A       | Retract - Retracts Power Tongue Jack.                      |
| B       | Front Arrow - Operates Power Tongue Jack. (See Note below) |
| C       | Left Arrow - (See Note below)                              |
| D       | Help - Provides contact information for LCI.               |
| E       | Extend - Extends Power Tongue Jack. (See Note below)       |
| F       | Right Arrow - (See Note below)                             |
| G       | Rear Arrow - (See Note below)                              |
| H       | Auto Level- Initiates Auto Level sequence.                 |
| I       | Power Button - Turns remote control on and off.            |



**NOTE:** When the OneControl Touch Panel is placed in Manual Mode, the Linc remote will operate the jacks in a similar fashion as the OneControl, with the exception of operating individual jacks. Jacks will operate in pairs. (See "Operation - OneControl Touch Panel").

## Operation - Linc Remote



### WARNING

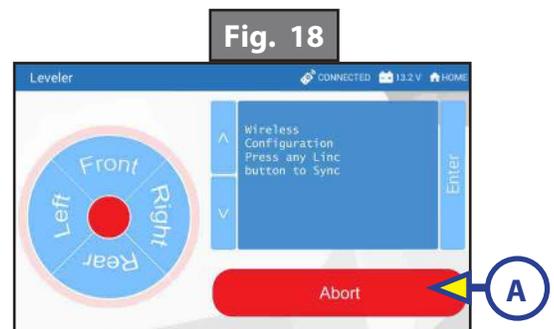
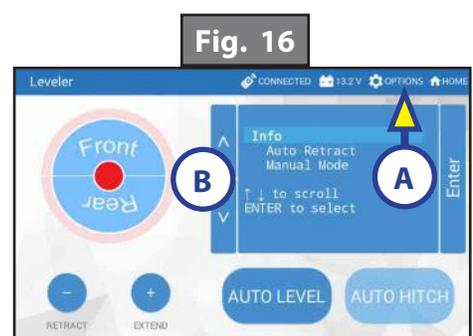
Be sure to park the trailer on solid and level ground. Prior to operation, clear all jack landing locations of debris and obstructions. The locations should also be free of surface depressions and moisture. When parking the trailer on extremely soft surfaces, utilize load distribution pads under each jack.

### Configuring Linc Remote to Sync to The One Control Touch Panel

1. Turn on the Linc™ remote control (Fig. 14I) and enter a PIN.
2. Choose "Leveler" from the menu screen.
3. Turn on the OneControl Touch Panel (Fig. 4L).
4. On the OneControl Touch Panel, press the "CONNECTED" icon at the top of the screen (Fig. 15A) quickly 6 times. Wait a few seconds until the gear icon with "OPTIONS" appears (Fig. 16A).

**NOTE:** If configuring to the OneControl App, press the "OPTIONS" button.

5. Press the gear icon with "OPTIONS" (Fig. 16A).
6. Use the "UP" and "DOWN" arrows (Fig. 16B) to scroll to "WIRELESS CONFIG" (Fig. 17).
7. Press "ENTER" (Fig. 17A). The screen will display "Wireless Configuration Press any Linc button to Sync" (Fig. 18).
8. Press any button in "Leveler" mode on the Linc Remote Control (Fig 14).
9. Pressing "ABORT" on the OneControl Touch Panel (Fig. 18A) will cancel configuration sequence.



### Basic Jack Operation

- Press "EXTEND" ( Fig. 14E) or "RETRACT" (Fig. 14A). Press "FRONT" arrow (Fig. 14B) to operate Power Tongue Jack.
- Press "AUTO LEVEL" (Fig. 14H) to start auto level sequence.
- If the OneControl Touch Panel is in Manual Mode, to operate jacks, press "EXTEND" (Fig. 14E) or "RETRACT" (Fig. 14A) button, then press the "LEFT" (Fig. 14C), "RIGHT" (Fig. 14F), "FRONT" (Fig. 14B) or "REAR" (Fig. 14G) button depending on which pair of jacks need to be operated.

### Unhitching From A Tow Vehicle

**NOTE:** Prior to unhitching from the tow vehicle, ensure trailer is parked on a level surface and chock the tires of the trailer.

**NOTE:** Ensure the foot pad of the Power Tongue Jack is pinned securely in place with the clevis pin and hairpin cotter pin.

1. Disconnect any wires, chains, or sway control that may be equipped between the tow vehicle and the trailer. Unlatch the trailer coupler.
2. Turn the Linc remote on (Fig. 14I) and enter a PIN code to turn system on.
3. Press the "LEVELER" button.
4. Press "EXTEND" (Fig. 14E) and "FRONT" arrow (Fig. 14B) to extend the Power Tongue Jack and lift the front of trailer to take the weight of the trailer off of the hitch.
5. Disconnect the trailer wire connection at the tow vehicle, if not previously completed.
6. Pull tow vehicle away and park at a safe distance.

**NOTE:** To utilize the Power Tongue Jack for the unhitching process see "Operation - Power Tongue Jack."

### Auto Level

1. Prior to auto leveling, ensure the trailer is unhitched from the tow vehicle and the tow vehicle is parked a safe distance away from the trailer.
2. Press the "ON/OFF" button (Fig. 14I) on the Linc remote if the Linc is not on.
3. Enter a PIN.
4. Choose the "LEVELER" option.
5. Press "AUTO LEVEL" (Fig. 14H).

**NOTE:** Once the automatic leveling cycle has been started, it is important that there is no movement in the trailer until the trailer has completed the leveling process. Failure to remain still during the leveling cycle could have an effect on the performance of the leveling system.

6. When the Auto Level Sequence begins:
  - A. The system checks that the rear jacks are retracted.
  - B. The Power Tongue Jack may adjust depending on the orientation of the trailer.
  - C. Front jacks will extend until movement of the trailer is sensed.
  - D. The Power Tongue Jack will then retract.
  - E. The front jacks will extend/retract near level.
  - F. Rear jacks will extend and ground.
  - G. Trailer will level front-to-back and then side-to-side.
  - H. The Auto level Sequence will ground all jacks to ensure all foot pads are on the ground and the Auto Leveling sequence is complete.

**NOTE:** If the AUTO LEVEL sequence does not perform as described above, locate the OneControl Touch Panel or use the OneControl App to place the system in Manual Mode. Test that the jacks operate correctly by pushing their corresponding buttons on the OneControl Touch Panel or App; e.g., "FRONT" button operates only the front jacks, etc. (See "Operation - OneControl Touch Panel" or "Operation - OneControl App" in this manual).

**NOTE:** There is no Hitch Recognition sequence programmed for the Linc remote.

## Troubleshooting

### Red/Green LED Indicator on Auto Leveling Control Touch Panel

| What Is Happening? | Why?   |
|--------------------|--|
| Off                | Touch panel is locked.   |
| Solid Green        | Touch panel is active.   |
| Blinking Green     | Jacks are moving.  |
| Solid Red          | Low battery.   |
| Blinking Red       | Error - Refer to OneControl Touch Panel screen or the Leveling App for the specific error, then consult the Troubleshooting section of this manual to clear the error. |

## Error Display In OneControl Touch Panel or One Control App

**NOTE:** Errors can only be cleared via the OneControl Touch Panel or OneControl Leveling App through MyRV®. The only exception is when the Auto Leveling Control Touch Panel (Fig. 3) was used to abort an auto-sequence. In this case the error can be cleared by pressing any Auto Leveling Control button.

**NOTE:** To clear an error from the OneControl Touch Panel or the OneControl App, correct the issue, then press "OK." If the error is still present, the message will be displayed again.

| Touch Panel Message  | What's Happening?  | What Should I Do?  |
|--|--|--|
| "EXCESS ANGLE"   | Unsecured controller.<br>Uneven or sloped site.  | Check and secure controller placement.<br>Relocate the trailer.  |
| "EXCESSIVE ANGLE"  | Excessive angle reached during manual operation.   | Stop manual operation and reset jacks to a more level state. The code will self clear, there is no need to hit "OK." |
| "BAD CALIBRATION"  | Trailer zero point was not set correctly.  | Reset zero point.  |
| "FEATURE DISABLED"   | Hitch recognition requested but no hitch height set.   | Perform "AUTO LEVEL" sequence to establish hitch height.   |
|  | Zero point not set.  | Set zero point.  |
| "LOW VOLTAGE"  | Bad connection or wiring.<br>Discharged or bad battery.  | Check wiring - repair or replace.<br>Test battery voltage under load - charge or replace.                            |
| "OUT OF STROKE"  | Unsecured controller.<br>Uneven or sloped site.  | Check and secure controller placement.<br>Relocate the trailer.  |
| "EXTERNAL SENSOR"  | Bad connection or wiring.  | Replace or repair connection to rear remote sensor.  |
| "JACK TIME OUT"  | System could not level in expected time.   | Check disposition of jacks.  |
| "AUTO LEVEL FAIL"  | Unsecured controller.<br>Voltage drop.   | Check and secure controller placement.<br>Test battery voltage under load - charge or replace.                       |
| "FUNCTION ABORTED"   | User has aborted an automatic leveling sequence.   | Restart the sequence.  |
| "HALL POWER SHORT"   | Short circuit detected on one or more of the jack hall effect power lines.   | Check harness and replace or repair.   |
| "CAN'T COMPLETE LEVEL IN THIS LOCATION. PLEASE RELOCATE RV TO FLATTER TERRAIN" | The trailer is parked on a steep incline during auto level. The front cannot be leveled and the front jacks are already fully retracted. | Relocate the trailer.  |

## Special Jack Error Codes on OneControl Touch Panel or OneControl App

To clear the error codes listed below:

1. Correct or otherwise repair the issue (see the table below).

**NOTE:** In order to clear the special jack error code the jacks need to be “homed.” In order to “home” jacks, each jack must be able to retract a minimum of 6”.

**NOTE:** The Power Tongue Jack does not need to be “homed.” The Power Tongue Jack cannot be operated from the OneControl Touch Panel or OneControl App while clearing the special jack error codes. The Power Tongue Jack can be operated using the “RET/EXT” switch on the tongue jack during this procedure.

2. Extend all jacks to reach the 6” of minimum retract needed.
  - A. Press “EXTEND” and “FRONT” to extend the front jacks (if required). Refer to “Operation - OneControl Touch Panel” and “Operation - OneControl App.”
  - B. Press “EXTEND” and “REAR” to extend the rear jacks (if required). Refer to “Operation - OneControl Touch Panel” and “Operation - OneControl App.”
3. Press “ENTER” to AUTO RETRACT. The jacks will retract until they reach the hard current limit. The Power Tongue Jack will perform an automatic grounding during the AUTO RETRACT sequence.
4. The jacks are now “homed” and the special jack error code will be cleared.

| Touch Panel Message  | What's Happening?  | What Should I Do?  |
|--|--|--|
| ***ERROR***<br>Left-Front Jack Fault<br>Right-Front Jack Fault<br>Left-Rear Jack Fault<br>Right-Rear Jack Fault<br>Tongue Jack Fault | Error at a specific jack (left front, right front, left middle, right middle, left rear, right rear, tongue). Hall signal issue (open, short, malfunction or loss of communication); open or short circuit between controller and motor. | Check voltage at the battery under load.<br>Check harness connections at controller and at jack.<br>Check harness for damage.<br>Check fuses at controller.<br>Repair or replace as necessary. |

**⚠ CAUTION**

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

Manual Override

**NOTE:** For ease of manual override it is recommended to unplug the power harness to the motor prior to performing the manual override procedure.

**NOTE:** Use of a 12-18 volt cordless screw gun or pneumatic screw gun is acceptable to manually override the jacks. Do not use an impact screw gun to perform any of the override procedures, as this may damage the motor. If manual override is necessary there are two options for each style of jack.

**NOTE:** If the travel trailer is equipped with 4 C-Jacks the override procedure is the same for the front and rear.

**C-Jack Motor Override:**

**Tools needed:** 3/8" drive ratchet and extension (no socket)

1. Find the port on the jack gearbox (Fig. 19A).
2. Remove the rubber plug (Fig. 20A).
3. Insert the 3/8" drive into the port.
4. Turn the override until the jack extends or retracts to desired position.

**C- Jack Manual Override Nut:**

**Tools needed:** 3/4" socket wrench

1. Locate the manual override nut (Fig. 19B).
2. Place 3/4" socket wrench over the manual override nut (Fig. 21A) and turn the override nut until the jack extends or retracts to desired position.

Fig. 19



Fig. 20

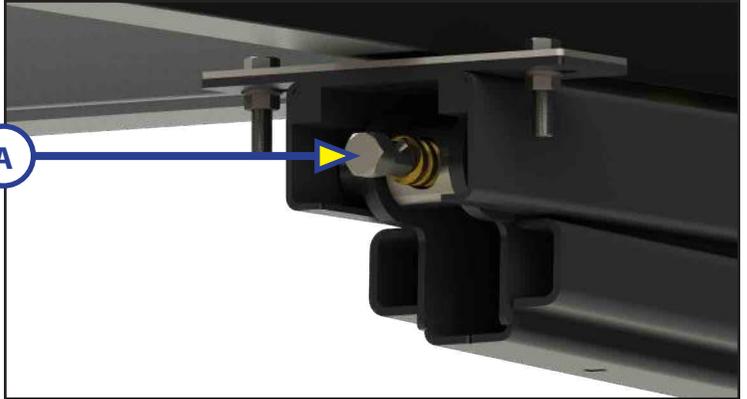
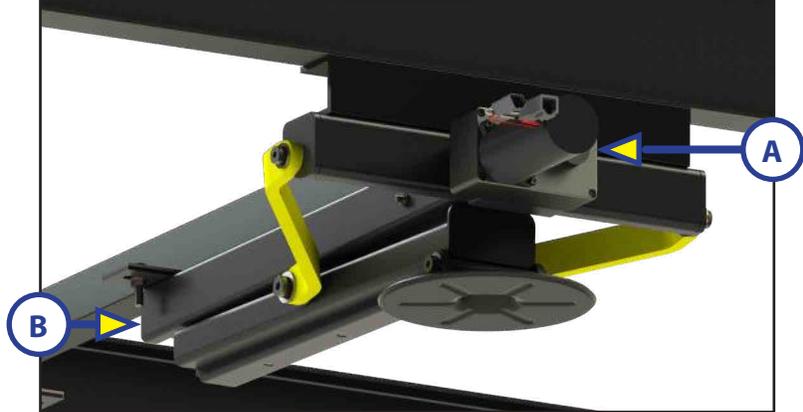


Fig. 21



### Hall Effect Jack - Top of Jack Motor Override:

**Tools needed:** 3/8" drive ratchet and extension (no socket)

1. Find the port on the top of the jack motor (Fig. 22A).
2. Remove the rubber plug (Fig. 23A).
3. Insert the 3/8" drive ratchet into the port (Fig. 24).
4. Turn the override until the jack extends or retracts to desired position.

### Hall Effect Jack - Bottom of Jack Motor Override:

**Tools needed:** 3/8" drive ratchet and extension, 5/16" socket

1. Find the port on the bottom of the jack motor (Fig. 22B).
2. Remove the rubber plug (Fig. 25A).
3. Insert the 5/16" socket into the port (Fig. 26).
4. Turn the override until the jack extends or retracts to desired position.

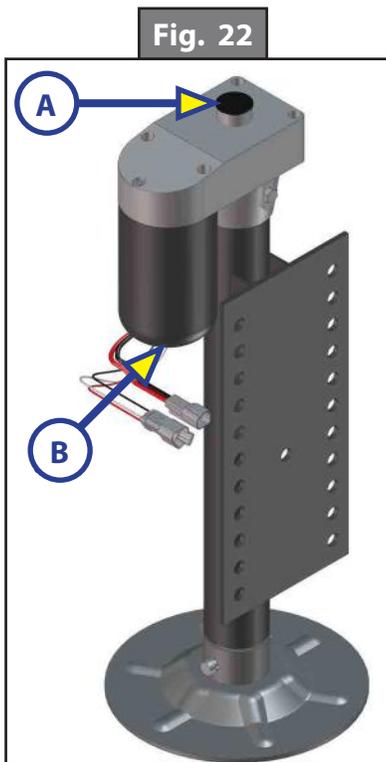


Fig. 22

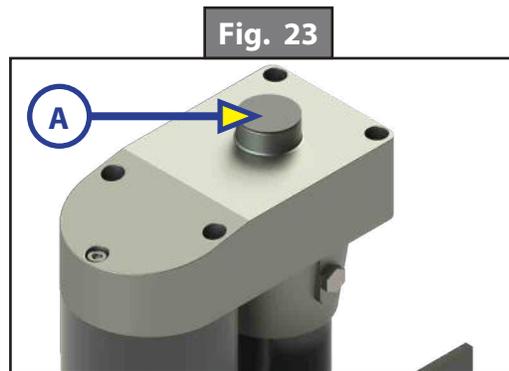


Fig. 23

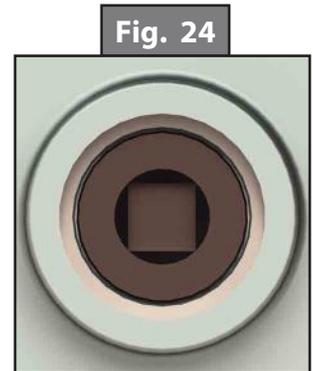


Fig. 24

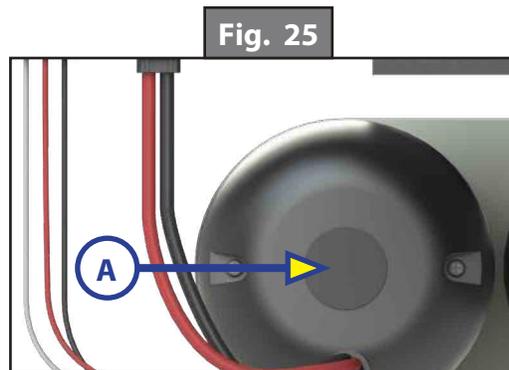


Fig. 25

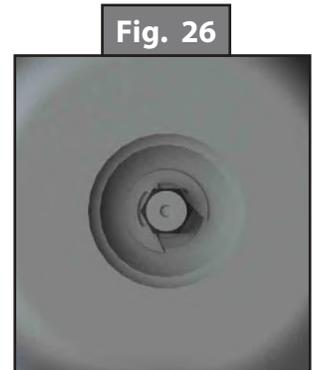


Fig. 26

### Power Tongue Jack Manual Override

1. Chock the tires of the trailer.
2. Be sure the footpad of the Power Tongue Jack is pinned securely in place with the clevis pin and hairpin cotter pin (Fig. 27A).
3. Open the rubber plug (Fig. 28A) on top of the Power Tongue Jack's gearbox to expose the manual drive shaft.
4. Insert the manual crank handle (Fig. 29).
5. Turn the crank handle counterclockwise to retract the tongue jack or clockwise to extend the tongue jack.
6. Remove the crank handle (Fig. 29).
7. Replace the rubber plug (Fig. 28A).

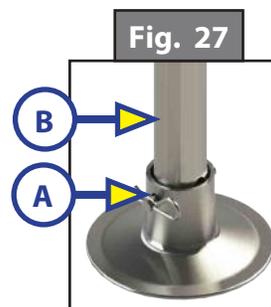


Fig. 27



Fig. 28

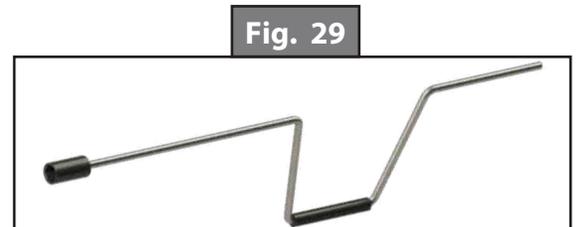


Fig. 29

**NOTE:** Be sure the leg (Fig. 27B) of the Power Tongue Jack is fully retracted prior to moving the tow vehicle.

## Zero Point Calibration

The "Zero Point" is the programmed point that the trailer will return to each time the Auto Level feature is used. The "Zero Point" must be programmed prior to using the Auto Level feature to ensure the proper operation of the system. The "Zero Point" feature is available on the OneControl Touch Panel or the OneControl App with this system.

**NOTE:** Images depicted below are from the OneControl Touch Panel.

**NOTE:** Prior to starting this procedure, double check all connections on the controller, jacks, and touch panel.

**NOTE:** When calibrating Zero Point, the user has full manual control over the jacks. See "Basic Jack Operation - Manual Mode" to adjust to the desired level position. Press the enter button to set.

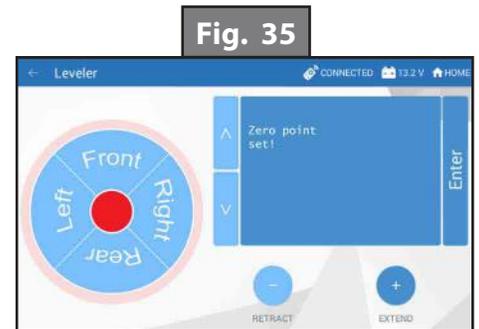
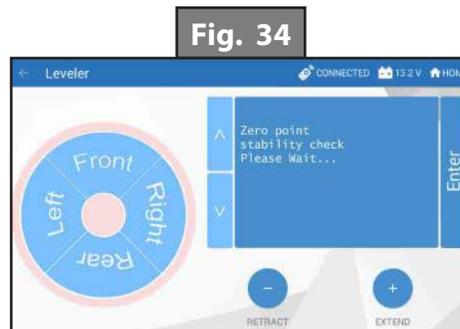
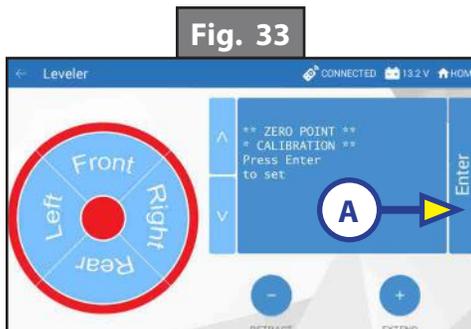
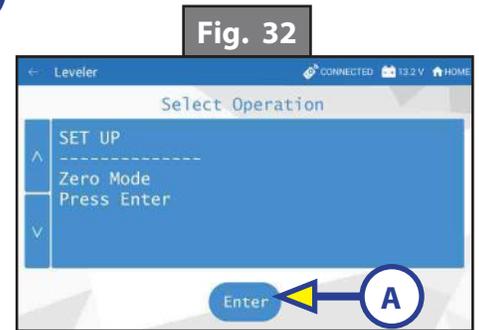
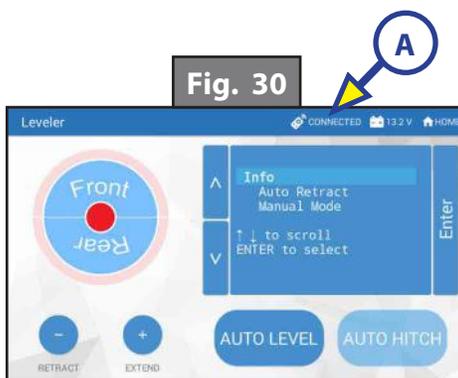
### To Set the Zero Point

The following procedure works from Standard Mode only. (See "Operation - OneControl Touch Panel").

1. Press the "CONNECTED" icon (Fig. 30A) at the top of the leveling screen quickly 6 times. Wait a few seconds until the gear icon with "OPTIONS" appears (Fig. 31A).

**NOTE:** With the OneControl App press the "OPTIONS" button.

2. Press the gear icon with "OPTIONS" (Fig. 31A).
3. The screen will show "SET UP: Zero Mode Press Enter" (Fig. 32).
4. Press the "Enter button" (Fig. 32A).
5. The touch panel will present options for further leveling of the trailer if needed. The screen will also state "ZERO POINT CALIBRATION - Press Enter to Set" (Fig. 33).
6. Press "ENTER" (Fig. 33A).
7. Screen will show "Zero Point Stability Check ... Please Wait" (Fig. 34), followed by "Zero Point Set" (Fig. 35).



## Preventive Maintenance

1. For optimum performance, the system requires full battery current and voltage. The battery must be maintained at full capacity.
2. Check the terminals and other connections at the battery, the controller, and the jacks for corrosion, and loose or damaged connections.
3. Remove dirt, road debris and grease from jacks as needed. Then lightly lubricate the jack screw and wipe off any excess lubrication, leaving only a thin coating.

### System and Safety Information

- Be sure to park the unit on solid, level ground.
- Ensure all jack landing locations are cleared of debris and obstructions and also free of depressions.
- When parking the unit on extremely soft surfaces, utilize load distribution pads under each jack.
- People and pets should be clear of unit while operating leveling system.
- Be sure to keep hands and other body parts clear of fluid leaks. Oil leaks in the Lippert Leveling System may be under high pressure and can cause serious skin-penetrating injuries.

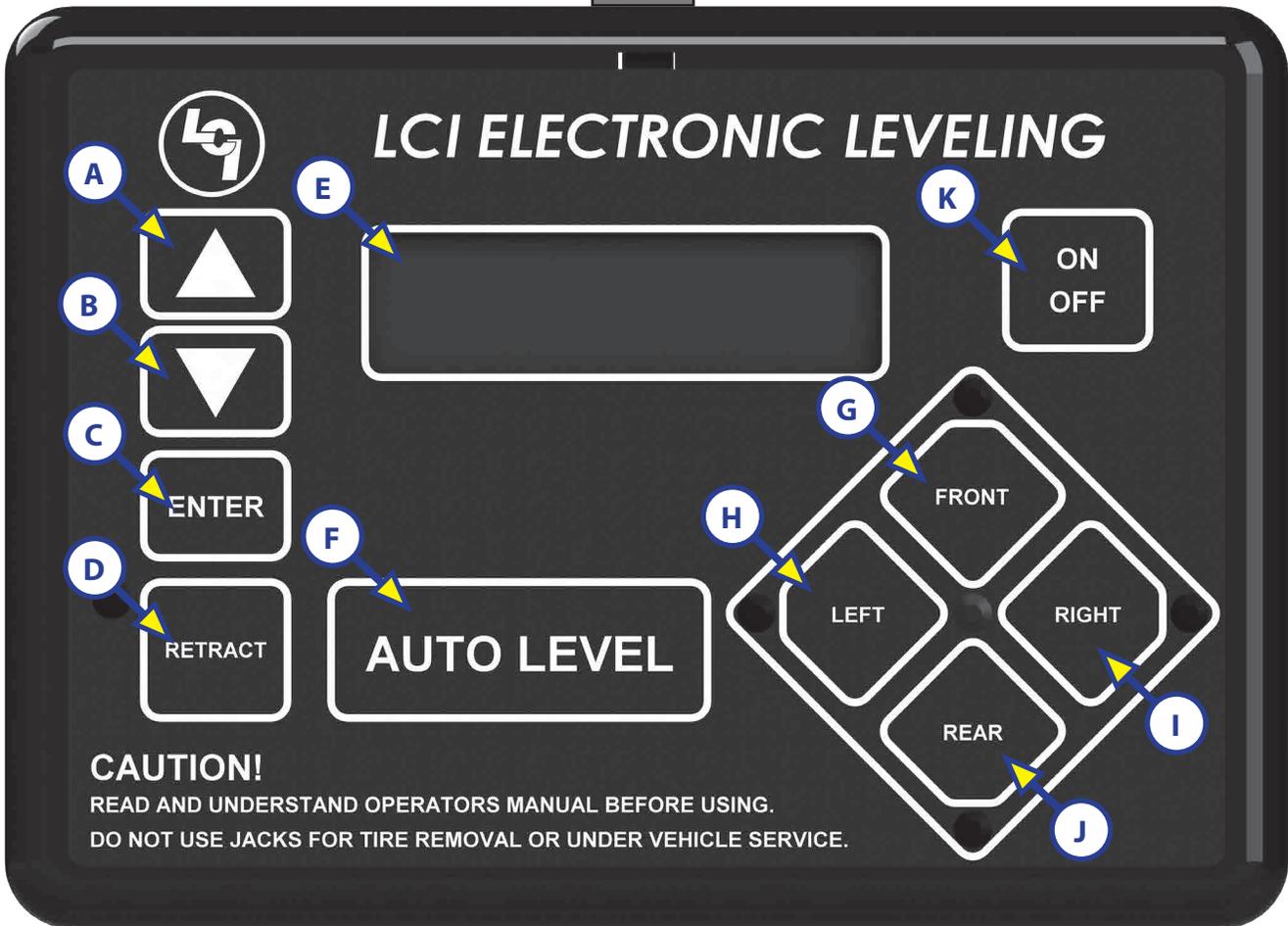
### **WARNING**

**Lippert Components Inc. recommends that a trained professional be employed to change the tires on the unit. Ensure that the unit is properly supported with jack stands, or other adequate devices, under the frame of the unit prior to commencing any service or repair procedure. Any attempts to change the tires or perform other service while unit is supported solely by the LCI Level-Up® with Automatic Leveling System could result in death, serious injury, unit or property damage.**

### Introduction

Level Up® is an Automatic Leveling system. This system is equipped with 14K aluminum landing gear and 8K aluminum leveling jacks. The jacks in the Level Up® system work in pairs.

Fig. 1



| Callout | Description  |
|---------|--|
| A       | Up Arrow - Scrolls up through the menu on LCD.                         |
| B       | Down Arrow - Scrolls down through the menu on LCD.                     |
| C       | Enter - Activates modes and procedures indicated on LCD.               |
| D       | Retract - Places leveling system into retract mode - Manual mode ONLY. |
| E       | LCD Display - Displays procedures and results.                         |
| F       | Auto Level - Places leveling system into auto level mode.              |
| G       | Front Button - Activates both front jacks.                             |
| H       | Left Button - Activates left leveling jack(s) in manual mode.          |
| I       | Right Button - Activates right leveling jack(s) in manual mode.        |
| J       | Rear Button - Activates leveling jacks in manual mode.                 |
| K       | Power Button - Turns leveling system on and off.                       |

## Prior to Operation

The leveling system shall only be operated under the following conditions:

1. The unit is parked on a reasonably level surface.
2. Be sure all persons, pets and property are clear of the unit while LCI Level-Up Automatic System is in operation.
3. Ensure the battery of the unit is fully charged or that the unit is plugged into shore power prior to attempting to operate the system. Level-Up requires a minimum of 12 VDC from the battery for proper operation.

## Operation

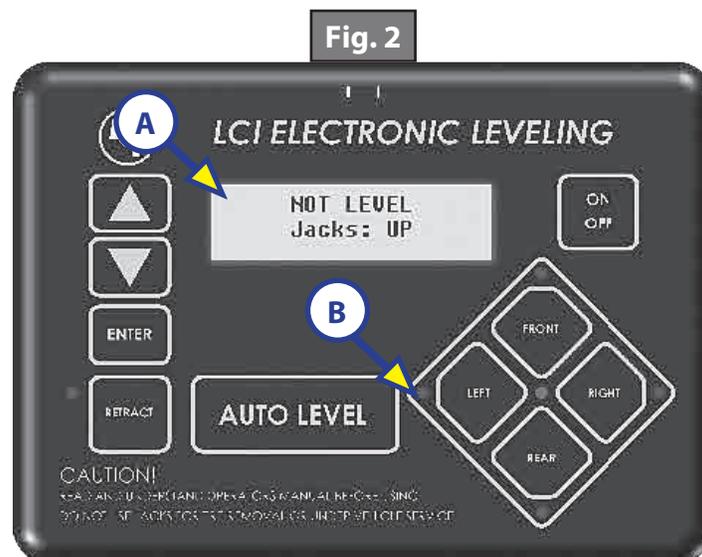
### Basic Jack Operation

1. Landing gear Jacks
  - A. Landing gear jacks can be operated any time the system is "ON" but NOT in the "AUTO MODE." By pushing the "FRONT" button (Fig. 1G), both front or landing gear jacks can be extended. If the touch pad is put in the "RETRACT" mode, indicated by the orange illuminated LED next to the "RETRACT" button (Fig. 1D), the front jacks can be retracted together by pushing the "FRONT" button.
2. Level-Up jacks
  - A. The Level-Up jacks operate when the "AUTO MODE" is activated or the touch pad is in the "MANUAL MODE." Once system is in "MANUAL MODE," pressing the "REAR" button (Fig. 1J) will extend all Level-Up jacks at the same time. Press the "LEFT" or "RIGHT" buttons (Fig. 1H and 1I) to operate Level-Up jacks on the left or right side of the unit, respectively.

## 5th Wheel Operation

### Unhitching Instructions

1. Push touch panel "ON/OFF," (Fig. 1K) to turn system on. LCD Screen (Fig. 1E) lights up.
  2. LCD will display status ... "NOT LEVEL JACKS: UP" (Fig. 2A).
- NOTE:** Orange arrow lights (Fig. 2B) may come on, indicating the current disposition of the unit.
3. Push "FRONT" button (Fig. 1G) to extend landing gear jacks and lift front of unit to take the weight of the 5th wheel off of the hitch.
  4. Uncouple the 5th wheel connection on the tow vehicle.
  5. Pull tow vehicle away and park at a safe distance.



## Auto Level

**NOTE:** Prior to unhitching from the tow vehicle, ensure unit is parked on a level surface and chock the tires of the unit.

1. After unhitching from tow vehicle press "AUTO LEVEL" (Fig. 1F).

**NOTE:** Pressing any button during an Auto Level sequence will abort the auto leveling cycle.

**NOTE:** In order for hitch recognition feature to function, the auto level sequence **MUST** be started with the front of the unit above level.

## Auto Level Sequence

1. Front landing gear retract, lowering the front of the unit below level, stopping, then lifting the front end to level the unit front to back.
2. The left side leveling jack(s) extend and raise the roadside of the unit.
3. The right side leveling jack(s) extend and raise the curbside of the unit, beginning side to side leveling.
4. The front landing gear extend to complete the leveling cycle.

**NOTE:** Additional left to right or front to back leveling may occur if the controller deems necessary.

**NOTE:** If the auto level sequence does not happen as stated above, check to ensure proper manual function in all zones.

## Hitch Recognition

1. Turn on touch pad.
2. Press the "LEFT" and "RIGHT" buttons simultaneously (Fig. 1H and 1I).
3. The front of the unit will raise to the height where the auto level sequence was started.

**NOTE:** If the auto level sequence was started with the front of the unit in a below level condition, the Hitch Recognition will not function and the LCD will display "Feature Disabled." In order for the hitch recognition feature to function, the auto level sequence **MUST** be started with the front of the unit above level.

4. Connect tow vehicle and make sure 5th wheel and hitch are connected and locked.
5. Push "UP" arrow (Fig. 1A) until "AUTO RETRACT" appears in LCD screen.
6. Push "ENTER" (Fig. 1C). System will immediately retract all jacks.

# Travel Trailer Operation

## Unhitching Instructions

**NOTE:** Prior to unhitching from the tow vehicle, ensure unit is parked on a level surface and chock the tires of the unit.

1. Push "ON/OFF" button (Fig. 1K) to turn system "ON" (green light).
2. Push "UP" (Fig. 1A) or "DOWN" arrow (Fig. 1B) to scroll through features to "MANUAL MODE" in display.
3. Push "ENTER" (Fig. 1C).
4. Push "FRONT" button (Fig. 1G) to extend front jacks to the ground until the trailer is unhitched from the tow vehicle.

**NOTE:** The Power Tongue Jack should **ONLY** be used when storing the trailer.

## Auto Level

**NOTE:** The Power Tongue Jack **MUST** be retracted prior to starting auto level sequence (Fig. 3 shows the LCD alert).

1. After unhitching from tow vehicle press "AUTO LEVEL" (Fig. 1F).



**NOTE:** Pressing any button during an Auto Level sequence will abort the auto leveling cycle.

**NOTE:** In order for hitch recognition feature to function, the auto level sequence **MUST** be started with the front of the unit above level.

## Auto Level Sequence

1. Front jacks retract, lowering the front of the unit below level, stopping, then lifting the front end to level the unit front to back.
2. The rear left side leveling jack extends and raises the roadside of the unit.
3. The rear right side leveling jack extends and raises the curbside of the unit, beginning side to side leveling.
4. The front jacks extend to complete the leveling cycle.

**NOTE:** Additional left to right or front to back leveling may occur if the controller deems necessary.

**NOTE:** If the auto level sequence does not happen as stated above, check to ensure proper manual function in all zones.

## Hitch Recognition

1. Turn on touch pad.
2. Press the left and right buttons simultaneously (Fig. 1H and 1I).
3. The front of the unit will raise to the height where the auto level sequence was started.

**NOTE:** If the auto level sequence was started with the front of the unit in a below level condition, the Hitch Recognition will not function and the LCD will display "Feature Disabled." In order for hitch

recognition feature to function, the auto level sequence **MUST** be started with the front of the unit above level.

4. Connect tow vehicle and make sure travel trailer and hitch are connected and locked.
5. Push "UP" arrow until "AUTO RETRACT" appears in LCD screen.
6. Push "ENTER." System will immediately retract all jacks.

## Manual Operation

1. Front landing gear (5th Wheels) or Front jacks (Travel Trailers)

**NOTE:** The landing gear or front jacks will operate manually any time system is "ON" except in "AUTO MODE."

- A. Push "ON/OFF" (Fig. 1K) to turn system on.
- B. Push "UP" arrow (Fig. 1A) once or until screen reads "MANUAL MODE" (Fig. 4).
- C. Push "ENTER" (Fig. 1C) once while screen reads "MANUAL MODE" (Fig. 4).
- D. Push "FRONT" (Fig. 1G) to extend front landing gear or front jacks.
- E. Push "RETRACT" (Fig. 1D) and orange LED (Fig. 5) comes on.
- F. Push "FRONT" (Fig. 1G) to retract front landing gear or front jacks.

**NOTE:** If orange LED (Fig. 5) is on, landing gear or jacks will retract. If orange LED (Fig. 5) is off, landing gear or jacks will extend.

- G. Push "ON/OFF" to turn system off.
- H. After 3 minutes the system will turn off by itself.

Fig. 4

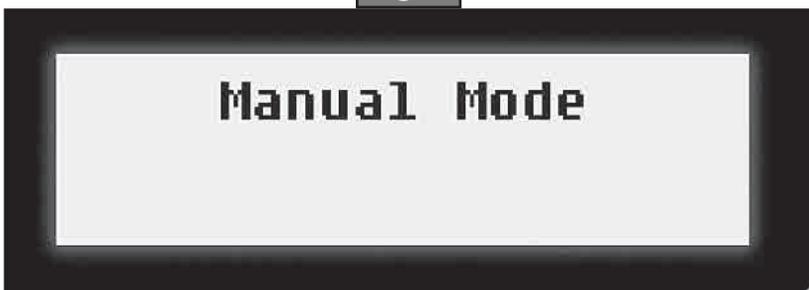


Fig. 5



2. Level-Up jacks - EXTEND

- A. Turn "ON/OFF" button "ON."
- B. Push scroll arrow to display "MANUAL MODE" (Fig. 4).
- C. Push "ENTER" button, "MANUAL MODE" displayed (Fig. 4).

**NOTE:** By pushing "RIGHT," passenger side Level-Up jacks operate. By pushing "LEFT," driver side Level-Up jacks operate, and so on.

3. Level-Up jacks - RETRACT

- A. Push "RETRACT" and orange LED (Fig. 5) will come on.
- B. Push "REAR" to retract all Level-Up jacks.
- C. To extend, the "RETRACT" light (Fig. 5) should be off.

**NOTE:** The side-to-side movement in manual mode is limited to 5° of tilt.

## Zero Point Calibration

The “Zero Point” is the programmed point that the unit will return to each time the Auto Level feature is used. The “Zero Point” must be programmed prior to using the Auto Level feature to ensure the proper operation of the system.

**NOTE:** Prior to starting this procedure, double check all connections on the controller, jacks, and touch pad.

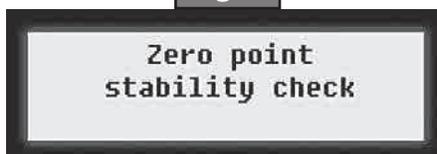
1. Manually run the jacks to level the unit. This is best achieved by placing a level in the center of the unit and leveling it both front to back and then side to side. (See “Basic Jack Operation” for instructions on how to manually operate the system).
2. Once the unit is level, turn off the touch pad.
3. With the touch pad off, press and release the “FRONT” button (Fig. 1G) ten (10) times and then press and release the “REAR” button (Fig. 1J) ten (10) times.
4. The touch pad will flash and beep and the display will read “ZERO POINT CALIBRATION ENTER to set, Power to Exit” (Fig. 5).
5. To set the current position as the zero point, press the “ENTER” button (Fig. 1C).

Fig. 5



6. LCD display will read “Zero Point stability check” (Fig. 6).

Fig. 6



7. LCD display will read “Zero point set successfully” once process is complete (Fig. 7).

Fig. 7



8. The system will set this point as its level state and the touch pad will turn off.

## Maintenance

1. Each month, check that the fluid level is within 1/4" of the fill spout lip while jacks and slide-outs are fully retracted.  
**NOTE:** Always fill the reservoir with the jacks and slide-outs in the fully retracted position. Filling reservoir when jacks and slide-outs are extended will cause reservoir to overflow into its compartment when jacks and slide-outs are retracted.
2. Inspect and clean all power unit electrical connections prior to the first use of the unit of the season and prior to storing the unit. If corrosion is evident, clean all corrosion with a wire brush and apply dielectric grease to the connections.
3. Remove dirt and road debris from jacks as needed.
4. If jacks are down for extended periods, it is recommended to spray exposed leveling jack rods with a silicone lubricant every three months for protection. If the unit is located in a salty air environment, it is recommended to spray the rods every 4 to 6 weeks.

## Fluid Recommendation

The Lippert Electronic Leveling System is pre-filled, primed and ready to operate direct from the manufacturer. Type "A" Automatic Transmission Fluid (ATF) is utilized and will work. ATF with Dexron III® or Mercon 5® or a blend of both is recommended by Lippert Components, Inc.

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. For a list of approved fluid specifications, see TI-188.

## Troubleshooting

### Error Display In LCD Screen

**NOTE:** To clear Error Code, push "ENTER" - If error remains, the code will appear again.

| LCD Message          | What's Happening?   | What Should I Do?  |
|----------------------|---|--|
| "EXCESS ANGLE"       | Unsecured controller.<br>Uneven or sloped site.             | Check and secure controller placement.<br>Relocate the unit.                                   |
| "BAD CALIBRATION"    | Unit zero point was not set correctly.                      | Reset zero point. See "Calibration."   |
| "FEATURE DISABLED"   | Front of unit below level when starting Auto Level process. | Raise front of unit above level and restart Auto Level process.                                |
| "LOW VOLTAGE"        | Bad connection or wiring.<br>Discharged or bad battery.     | Check wiring - repair or replace.<br>Test battery voltage under load - charge or replace.      |
| "OUT OF STROKE"      | Unsecured controller.<br>Uneven or sloped site.             | Check and secure controller placement.<br>Relocate the unit.                                   |
| "EXTERNAL SENSOR"    | Bad connection or wiring.                                   | Replace or repair connection to rear remote sensor.  |
| "JACK TIME OUT"      | System could not level in expected time.                    | Check for obstructions, leaks, fluid level and voltage to power unit motor under load.         |
| "AUTO LEVEL FAILURE" | Unsecured controller.<br>Voltage drop.                      | Check and secure controller placement.<br>Test battery voltage under load - charge or replace. |

## Manual Override

The LCI Level-Up Automatic Leveling System can be manually operated with an electric drill. In the event of electrical or system failure, this manual method of extending and retracting the jacks can be used. See the instructions below.

**NOTE:** Unhook the power unit motor from the power source prior to attempting the manual override procedure.

1. Locate the valves that are paired with the landing gear or leveling jack to be manually overridden.
  - A. Landing Gear - Valve located on the landing gear (Fig. 8).
  - B. Leveling Jacks - Valve located on manifold (Fig. 9).
2. Using a  $\frac{5}{32}$ " hex wrench, open the valve by turning the manual override set screw clockwise (Fig. 10A).
3. Remove protective label (Fig. 11A) from power unit to reveal the manual override coupler.
4. Using an electric drill with a  $\frac{1}{4}$ " hex bit, insert the hex bit into the manual override coupler to manually operate the Level-Up system (Fig. 12).
  - A. Run the drill forward (clockwise) to retract the landing gear or leveling jack (Fig. 12A).
  - B. Run the drill in reverse (counterclockwise) to extend the landing gear or leveling jack (Fig. 12B).
5. Be sure to turn the manual override set screw on the valve (Fig. 13A) back to the counterclockwise position after extending or retracting the landing gear or leveling jack.

Fig. 8

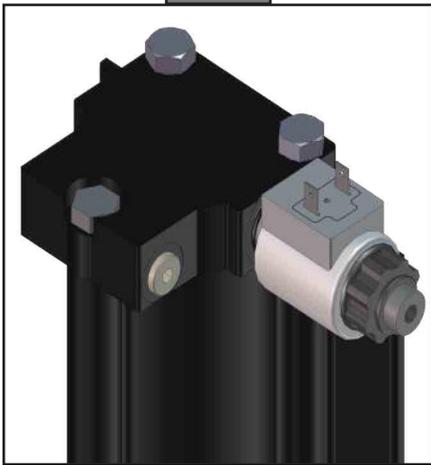


Fig. 9

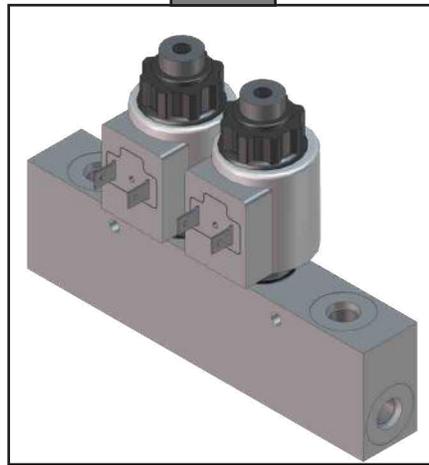


Fig. 10

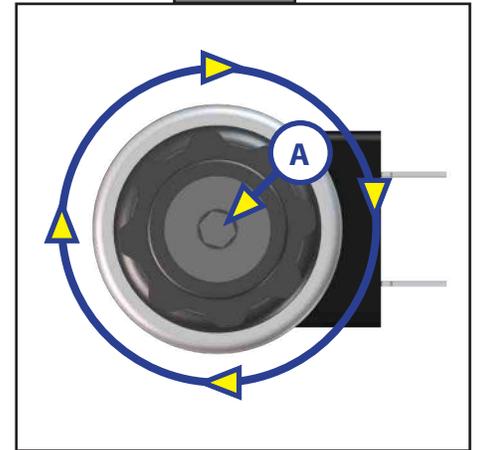


Fig. 11

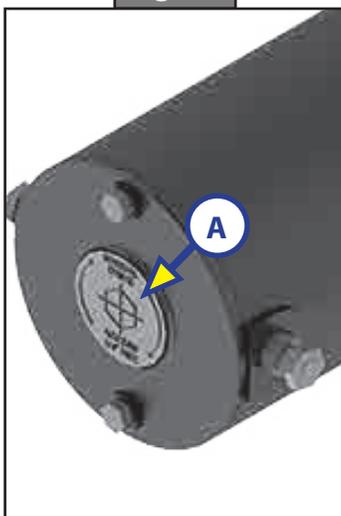


Fig. 12

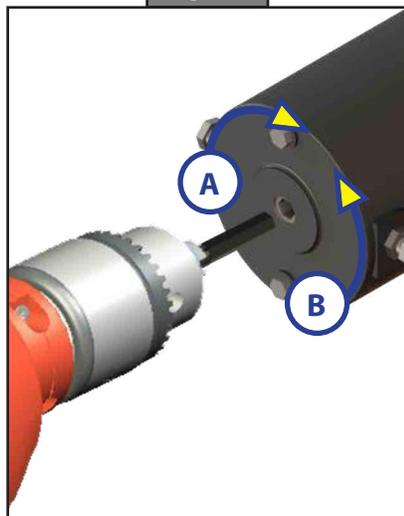
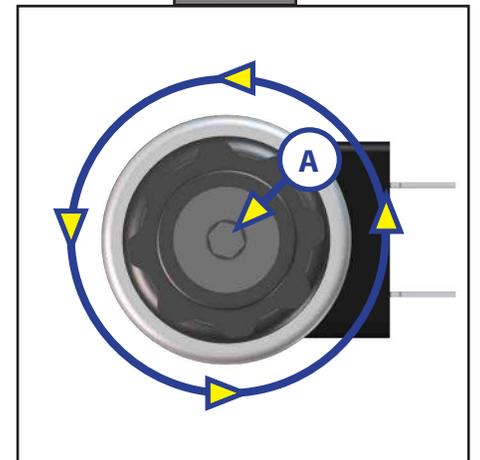


Fig. 13



# LEVEL UP® WITH ONECONTROL™ TOUCH PANEL

## LEVELING AND STABILIZATION

### System Information

The LCI Level Up® OneControl Touch Panel is an automatic leveling system control for fifth wheel applications. It interfaces to the LCI Level Up® pump/jack system to level the trailer. The system utilizes one main control board and a separate waterproof remote level sensor to measure and manage level point, and can be operated from several user interface devices, including:

**Auto Leveling Control Touch Pad** - Mounted outside the trailer within view of the hitch.

**MyRV® OneControl™ Touch Panel (OCTP)** - Mounted on a wall inside the living space of the trailer.

**MyRV® OneControl™ Leveling App** - The app is available on iTunes® for iPhone® and iPad® and also on Google Play™ for Android™ users. iTunes®, iPhone® and iPad® are registered trademarks of Apple Inc. Google Play™ and Android™ are trademarks of Google Inc.

**Linc® Remote Control** - Optional.

The LCI Level-Up® OneControl Touch Panel is for fifth wheel applications only.

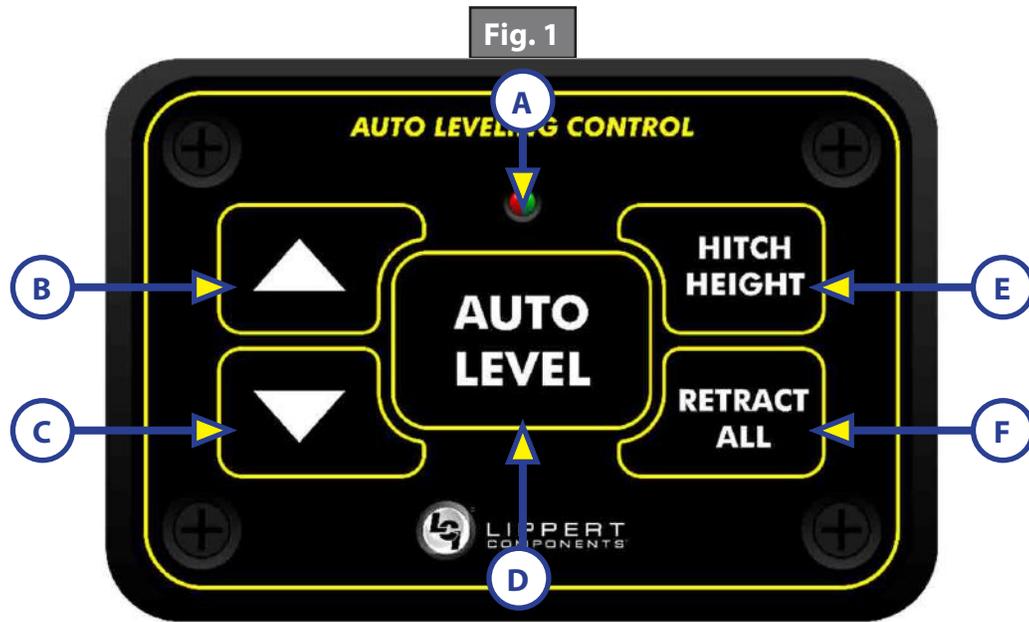
### Safety Information

Be sure to park the trailer on solid, level ground. Ensure all jack landing locations are cleared of debris and obstructions and also free of depressions. People and pets should be clear of trailer while operating the leveling system. Ensure the battery of the trailer is fully charged or that the trailer is plugged into shore power prior to attempting to operate the system. Level-Up requires a minimum of 12.75 VDC from the battery for proper operation. Be sure to keep hands and other body parts clear of fluid leaks. Hydraulic fluid leaks in the Lippert Leveling System may be under high pressure and can cause serious skin-penetrating injuries.

#### **WARNING**

**Lippert Components Inc. recommends that a trained professional be employed to change the tires on the trailer. Ensure that the trailer is properly supported with jack stands, or other adequate devices, under the frame of the trailer prior to commencing any service or repair procedure. Any attempts to change the tires or perform other service while trailer is supported solely by the LCI Level-Up could result in death, serious injury, trailer or property damage.**

## Touch Pad Diagram - Auto Leveling Control



| Callout | Description   |   |
|---------|---|---|
| A       | Red/Green LED - Indicates the status of the system.                 |   |
| B       | Up Arrow - Extends front jacks (landing gear).                      | To turn on the touch pad, press the Up and Down arrow buttons at the same time. |
| C       | Down Arrow - Retracts front jacks (landing gear).                   |   |
| D       | Auto Level Button - Places leveling system into auto level mode.    |   |
| E       | Hitch Height Button - Initiates the Hitch Recognition feature.      |   |
| F       | Retract All Button - Places leveling system into full retract mode. |   |

### Red/Green LED Indicator

| What Is Happening | Why?  |
|-------------------|---|
| Off               | Touch pad is locked.  |
| Solid Green       | Touch pad is active.  |
| Blinking Green    | Jacks are moving.   |
| Solid Red         | Low battery.  |
| Blinking Red      | Error - Refer to OneControl™ Touch Panel screen or the Leveling App for the specific error, then consult the Troubleshooting section of this manual to clear the error. |

## Operation - Auto Leveling Control Touch Pad

### Unhitching Instructions

**NOTE:** Prior to unhitching from the tow vehicle, ensure trailer is parked on a level surface and chock the tires of the trailer.

1. To turn on the touch pad, press both "UP" and "DOWN" arrows (Fig. 1B and Fig. 1C) at the same time. The green indicator LED (Fig. 1A) will turn on.

**NOTE:** The touch pad will remain on as long as the user is pressing buttons. It will time out after approximately 7 minutes without use.

2. Press the "UP" arrow (Fig. 1B) to extend the front jacks and lift the front of trailer to take the weight of the trailer off of the hitch.
3. Uncouple the trailer connection on the tow vehicle.
4. Pull tow vehicle away and park at a safe distance.

### Auto Level

**NOTE:** Once the automatic leveling cycle has been started, it is important that there is no movement in the trailer until the trailer has completed the leveling process. Failure to remain still during the leveling cycle could have an effect on the performance of the leveling system.

1. After unhitching from tow vehicle press "AUTO LEVEL" (Fig. 1D).

**NOTE:** Pressing any button during an Auto Level sequence will abort the auto leveling cycle.

### Auto Level Sequence

**NOTE:** Sequence may vary slightly based on the height of the trailer king pin prior to leveling.

1. When the Auto Level sequence begins, the front of the trailer will seek a position near a level state, then the trailer will level from front to back.
2. The left side jack(s) extend to ground (left mid and left rear).
3. The right side jack(s) extend to ground (right mid and right rear).
4. Jack pairs will extend as needed in order to level the trailer.

**NOTE:** Step 4 may repeat several times if the controller deems necessary.

**NOTE:** If the AUTO LEVEL sequence does not perform as described above, place the system in manual mode and test that the jacks operate correctly by pushing their coordinating buttons on the OneControl™ Touch Panel inside the trailer; e.g., "FRONT" button operates only the front jacks, etc. See Operation - myRV® OneControl™ Touch Panel in this manual.

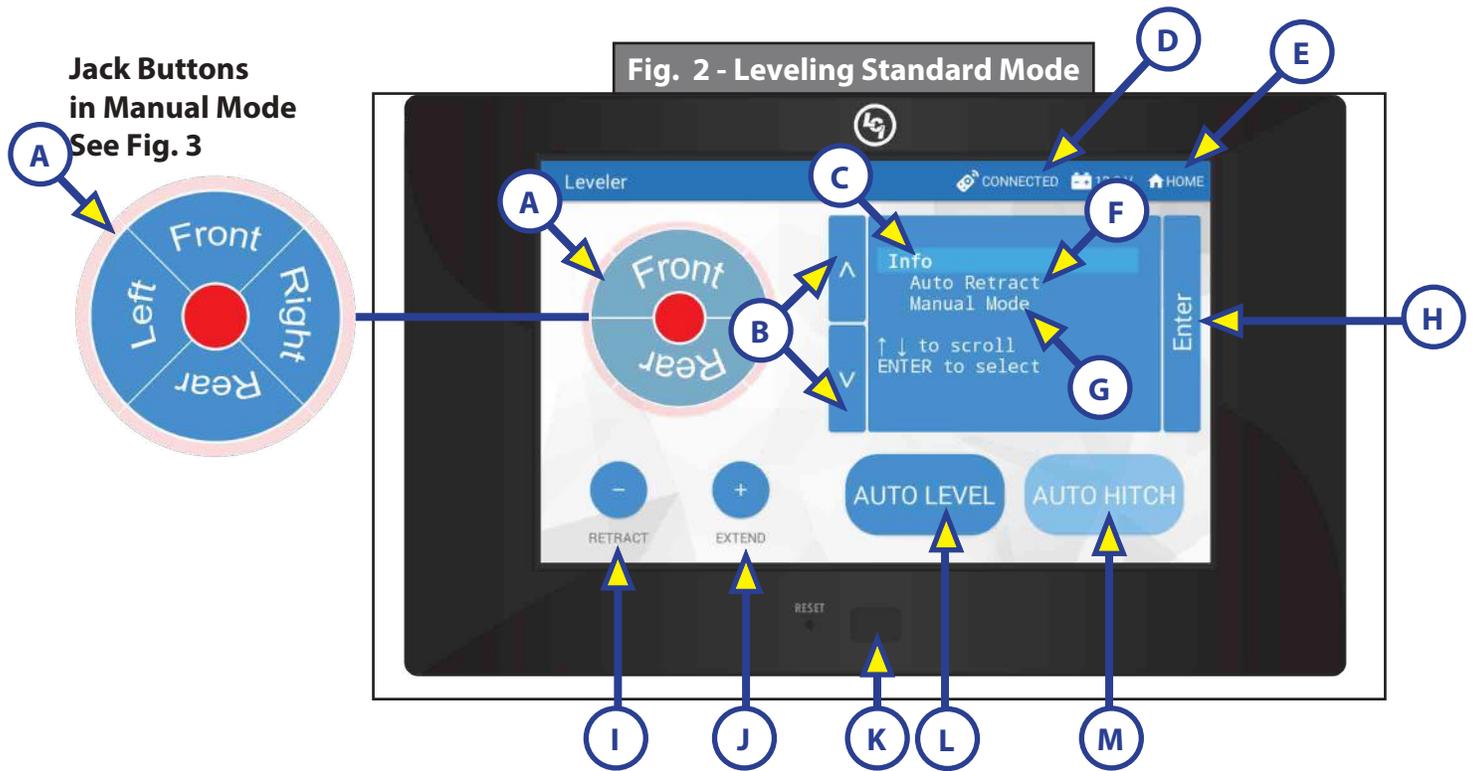
### Hitch Recognition - Reconnecting to Tow Vehicle

1. To turn on the touch pad, press both "UP" and "DOWN" arrows (Fig. 1B and Fig. 1C) at the same time. The green indicator LED (Fig. 1A) will turn on.
2. Press "HITCH HEIGHT" (Fig. 1E). The rear jacks will retract.
3. The front of the trailer will raise to the height where the auto level sequence was started.

**NOTE:** If the front of the trailer was below level when the Auto Level process was initiated, the hitch recognition feature will retract the rear jacks but will not retract the front jacks to lower the trailer to the initial hitch height. This feature helps prevent injury and/or damage to anything underneath the trailer.

4. Connect tow vehicle and make sure trailer and hitch are connected and locked.
5. Press "RETRACT ALL." System will immediately retract all jacks.

# Touch Panel Diagram - myRV OneControl Touch Panel



| Callout | Description   |
|---------|---|
| A       | Jack Buttons - Select front, rear, right and left jacks to be operated depending on mode. Jacks available to be operated will be highlighted in blue. In Standard Mode (Fig. 2), only front and rear jacks are available to be operated. In Manual Mode (Fig. 3), all jacks are available to be operated. |
| B       | Up and Down Arrows - Scrolls through options on screen.   |
| C       | Info - Displays system information, e.g. angle, jack stroke or software version.  |
| D       | Connected Icon - Press 6 times to program zero point/ wireless configurations.  |
| E       | Home Icon - Returns screen to home page.  |
| F       | Auto Retract - Enters Auto Retract mode to retract all jacks.   |
| G       | Manual Mode - Enters Manual Mode to manually operate jacks.   |
| H       | Enter - Push to select various modes.   |
| I       | Retract - Retracts jacks in several modes. Jacks available will be highlighted in blue.   |
| J       | Extend - Extends jacks in several modes. Jacks available will be highlighted in blue.   |
| K       | Power Button - Turns touch panel on and off.  |
| L       | Auto Level - Starts the Auto Level sequence.  |
| M       | Auto Hitch - Returns trailer to previous hitch height for reconnecting to tow vehicle.  |

# Operation - MyRV OneControl Touch Panel

## Standard Mode and Menu

To reach Standard Mode (Fig. 2) for leveling:

1. Power on the OneControl Touch Panel (Fig. 2K).
2. Press "MyRV Control Panel" on the main screen.
3. Press the "Leveler" icon.
4. The screen will show the system menu (Fig. 2) for Standard Mode. The front jacks can be extended/retracted in Standard Mode. Rear jacks can be retracted from this mode.

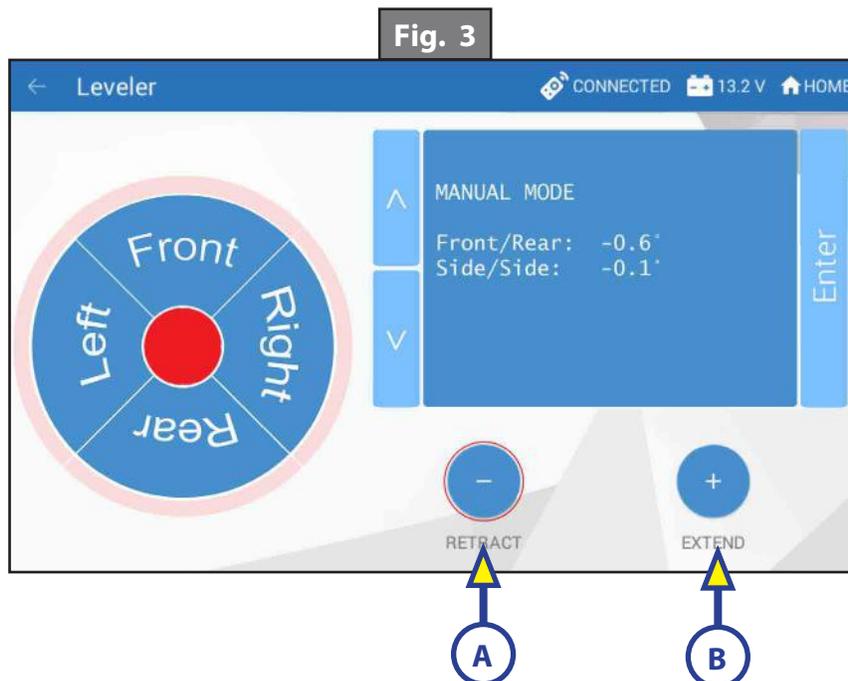
## Basic Jack Operation

While in Standard Mode:

1. Press "RETRACT" (Fig. 2I) or "EXTEND" (Fig. 2J) and "FRONT" to retract or extend front jacks.
2. Press "RETRACT" and "REAR" to retract rear jacks.
3. Press the "AUTO LEVEL" (Fig. 2L) button to start the auto leveling sequence.
4. Press the "AUTO HITCH" (Fig. 2M) button to start the hitch recognition sequence when reconnecting to the tow vehicle.
5. Use the "UP" or "DOWN" arrow (Fig. 2B) buttons to cycle through the menu screen options:
  - A. Info:** Scroll to "INFO" (Fig. 2C) and press "ENTER" (Fig. 2H) button to display system information, e.g., angle, jack stroke or software version.
  - B. Auto Retract:** Scroll to "AUTO RETRACT" (Fig. 2F) and press "ENTER" button to start the "Auto Retract" sequence, which will retract all jacks.
  - C. Manual Mode:** Scroll to "MANUAL MODE" (Fig. 2G) and press "ENTER" button to start Manual Level operation. Jacks operate in pairs. Use "RETRACT" or "EXTEND" to operate front jacks, right rear and left rear jacks.

**NOTE:** Upon entering Manual Mode, a tutorial on operating the jacks will appear on the screen. Press "OK" to clear the tutorial. To delete the tutorial, click the "Don't show this again" box in the bottom right of the screen.

- I. Press "RETRACT" (Fig. 3A) or "EXTEND" (Fig. 3B) and "FRONT" (Fig. 3) to operate front jacks.
- II. Press "EXTEND" or "RETRACT" and "REAR" to operate rear jacks (right rear, right mid, left rear and left mid).
- III. Press "EXTEND" or "RETRACT" and "RIGHT" to operate right jacks (right mid and right rear).
- IV. Press "EXTEND" or "RETRACT" and "LEFT" to operate left jacks (left mid and left rear).



## Unhitching Instructions

**NOTE:** Prior to unhitching from the tow vehicle, ensure trailer is parked on a level surface and chock the tires of the trailer.

1. Push touch panel "ON/OFF" (Fig. 2K) to turn system on (See "Standard Mode and Menu" to reach standard mode.)
2. Push "EXTEND" (FIG. 2J) AND "FRONT" button (Fig. 2) to extend front jacks and lift front of the trailer to take the weight of the trailer off of the hitch.
3. Uncouple the trailer connection on the tow vehicle.
4. Pull tow vehicle away and park at a safe distance.

## Auto Level

**NOTE:** Once the automatic leveling cycle has been started, it is important that there is no movement in the trailer until the trailer has completed the leveling process. Failure to remain still during the leveling cycle could have an effect on the performance of the leveling system.

1. After unhitching from tow vehicle press "AUTO LEVEL" (Fig. 2L).

**NOTE:** Pressing "ABORT" during an Auto Level sequence will abort the auto leveling cycle.

## Auto Level Sequence

**NOTE:** Sequence may vary slightly based on the height of the trailer king pin prior to leveling.

1. When the Auto Level sequence begins, the front of the trailer will seek a position near a level state, then the trailer will level from front to back.
2. The left side jack(s) extend to ground (left mid and left rear).
3. The right side jack(s) extend to ground (right mid and right rear).
4. Jack pairs will extend as needed in order to level the trailer.

**NOTE:** Step 4 may repeat several times if the controller deems necessary.

**NOTE:** If the "AUTO LEVEL" sequence does not perform as described above, place the system in manual mode and test that the jacks operate correctly by pushing their coordinating buttons on the touch panel; e.g., "FRONT" button operates only the front jacks, etc.

## Hitch Recognition - Reconnecting to Tow Vehicle

1. Push touch panel "ON/OFF" (Fig. 2K) to turn system on (See "Standard Mode and Menu" to reach standard mode.)
2. Press "AUTO HITCH" (Fig. 2M). Rear jacks will retract.
3. The front of the trailer will raise to the height where the auto level sequence was started.

**NOTE:** If the front of the trailer was below level when the Auto Level process was initiated, the hitch recognition feature will retract the rear jacks but will not retract the front jacks to lower the trailer to the initial hitch height. This feature helps prevent injury and/or damage to anything underneath the trailer.

4. Connect tow vehicle and make sure trailer and hitch are connected and locked.
5. On the Standard Mode screen (Fig. 2) use the "UP" and "DOWN" arrows (Fig. 2B) to scroll to "AUTO RETRACT" (Fig. 2F).
6. Push "ENTER" (Fig. 2H). System will immediately retract all jacks.

## Zero Point Calibration

The "Zero Point" is the programmed point that the trailer will return to each time the Auto Level feature is used. The "Zero Point" must be programmed prior to using the Auto Level feature to ensure the proper operation of the system. The "Zero Point" feature is only available on the OneControl™ Touch Panel with this system.

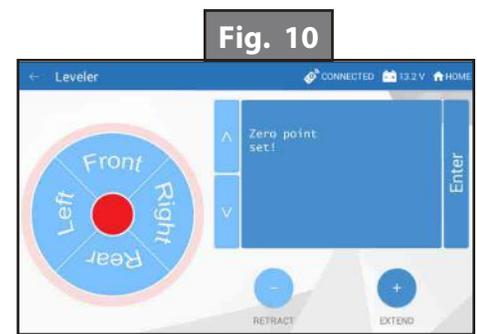
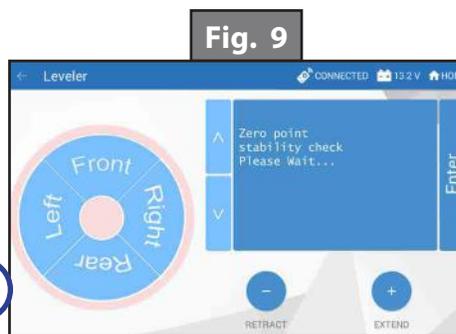
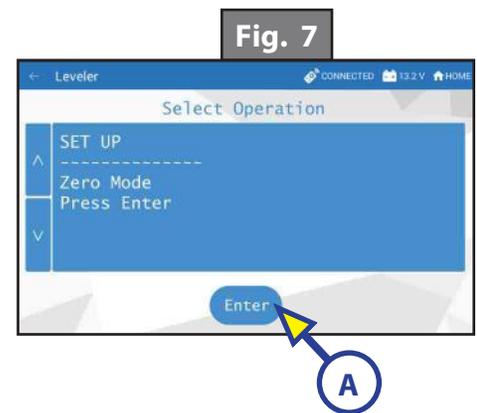
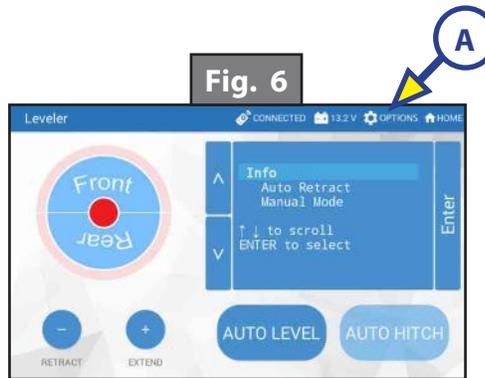
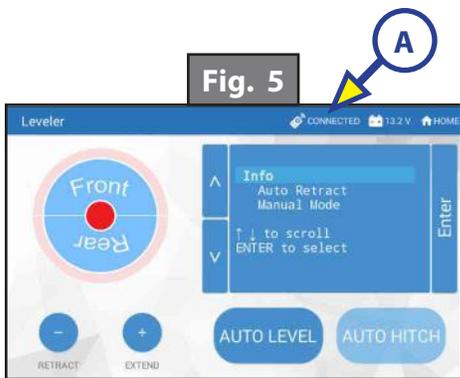
**NOTE:** Prior to starting this procedure, double check all connections on the controller, jacks, and touch panel.

**NOTE:** When calibrating Zero Point, the user has full manual control over the jacks. See "Basic Jack Operation - Manual Mode" to adjust to the desired level position. Press the enter button to set.

### To Set the Zero Point

**NOTE:** The following procedure works from Standard Mode only. (See "Standard Mode and Menu" to reach standard mode.)

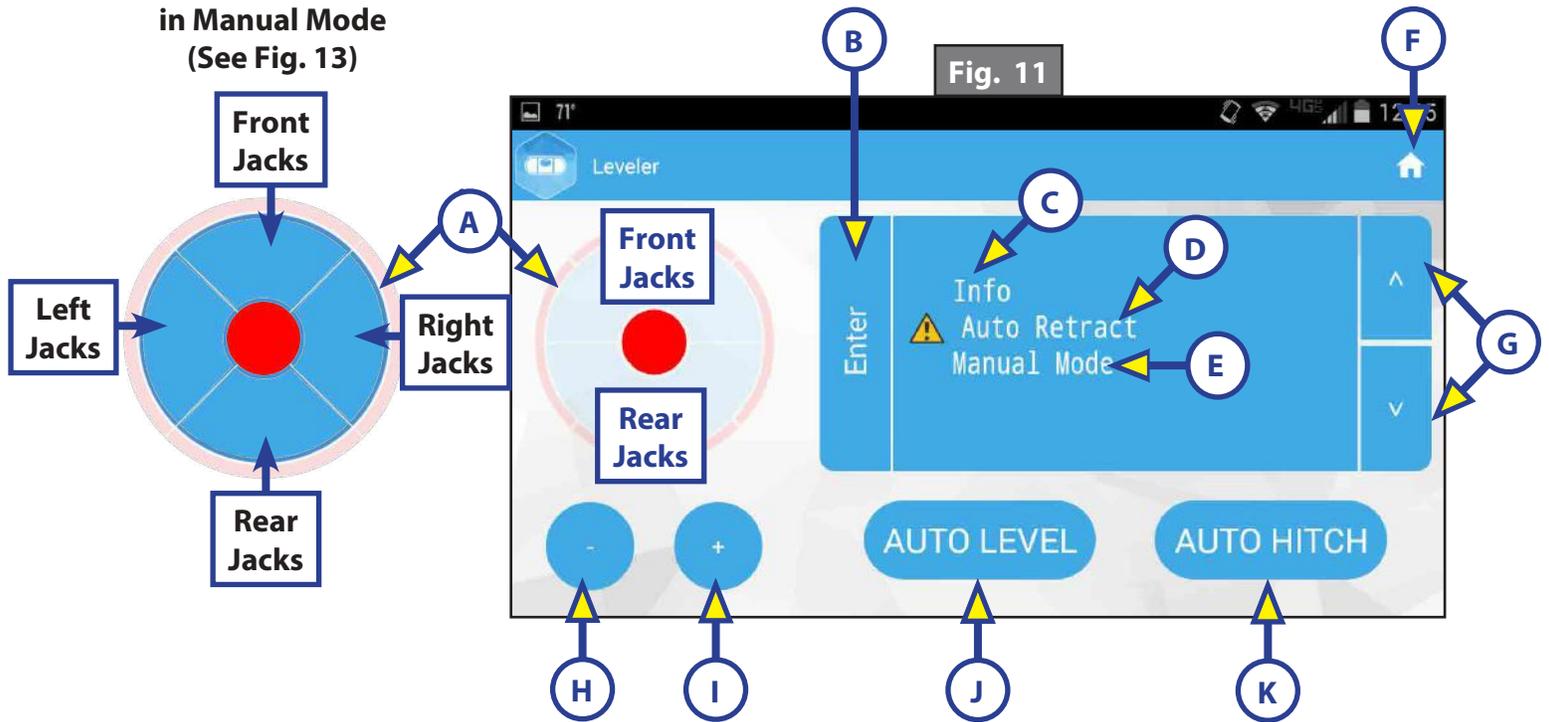
1. Press the "CONNECTED" icon (Fig. 5A) at the top of the leveling screen quickly 6 times. Wait a few seconds until the gear icon with "OPTIONS" appears (Fig. 6A).
2. Press the gear icon with "OPTIONS" (Fig. 6A).
3. The screen will show "SET UP: Zero Mode Press Enter" (Fig.7).
4. Press the "Enter button" (Fig. 7A).
5. The touch pad will present options for further leveling of the trailer if needed. The screen will also state "ZERO POINT CALIBRATION - Press Enter to Set" (Fig. 8).
6. Press "ENTER" (FIG. 8A).
7. Screen will show "Zero Point Stability Check ... Please Wait" (Fig. 9), followed by "Zero Point Set" (Fig. 10).



## Touch Pad Diagram - OneControl App from MyRV

**NOTE:** The One Control™ Leveling App is available on iTunes® for iPhone® and iPad® and also on Google Play™ for Android™ users.

### Jack buttons in Manual Mode (See Fig. 13)



| Callout | Description   |
|---------|---|
| A       | Jack Buttons - Select front, rear, right and left jacks to be operated depending on mode. Jacks available to be operated will be highlighted in blue. In Standard Mode (Fig. 11), only front and rear jacks are available to be operated. In Manual Mode (Fig. 13), all jacks are available to be operated. |
| B       | Enter - Push to activate various modes.   |
| C       | Info - Displays system information, e.g., angle, jack stroke, software version.   |
| D       | Auto Retract - Enters Auto Retract mode to retract all jacks.   |
| E       | Manual Mode - Enters Manual Mode to manually operate jacks.   |
| F       | Home Icon - Returns screen to home page.  |
| G       | Up and Down Arrows - Scroll through options on screen.  |
| H       | Retract - Retracts jacks in several modes. Jacks available will be highlighted in blue.   |
| I       | Extend - Extends jacks in several modes. Jacks available will be highlighted in blue.   |
| J       | Auto Level - Starts the Auto Level sequence.  |
| K       | Auto Hitch - Returns trailer to previous hitch height for reconnecting to tow vehicle.  |

## Operation - OneControl App

### Accessing the OneControl App

1. Turn on the trailer to provide power to the trailer's wireless network.
2. Navigate to the device's (smart phone, tablet, etc.) wifi settings. Turn wireless feature on and connect to the myRV® wireless network.

**NOTE:** If this is the first time connecting to the myRV® wireless network, a password will be required. The password is located on the trailer's wifi hub (Fig. 12).

3. Open the OneControl™ application on the compatible device.

**NOTE:** If the device states "Unresolved Network Connection," retry connecting to the myRV® wireless network and/or wait for the connection to resolve and display "Connected" under the myRV® wireless connection.

4. The application will request the user "Agree" to an end user license agreement, create a PIN and "Re-enter PIN to confirm."
5. The OneControl™ app will now display all functions. Choose "Leveler."



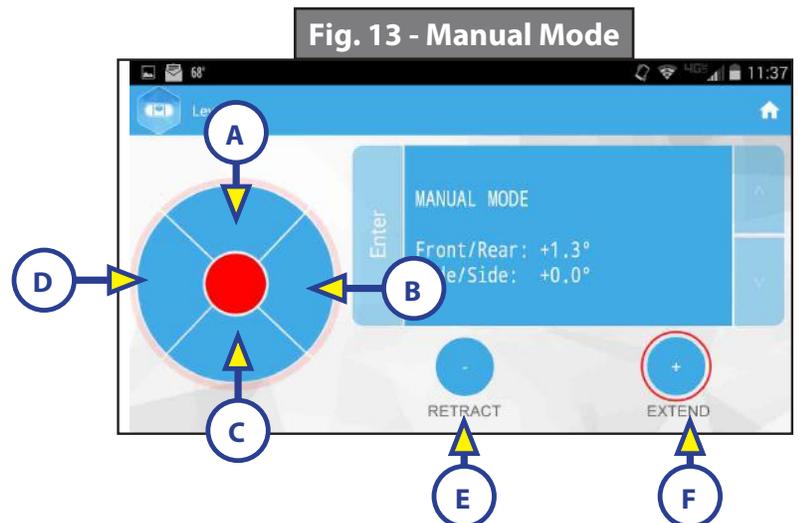
### Standard Mode and Menu

Standard Mode is the mode launched when the OneControl™ app "Leveler" function is powered up. The screen will show the system menu (Fig. 11). The front jacks can be extended/retracted in Standard Mode. Rear jacks can be retracted from this mode.

### Basic Jack Operation

While in Standard Mode:

1. Press "RETRACT" (Fig. 11H) or "EXTEND" (Fig. 11I) and "FRONT" (Fig. 11) to extend or retract front jacks.
2. Press "RETRACT" and "REAR" (Fig. 11) to retract rear jacks.
3. Press the "AUTO LEVEL" (Fig. 11J) button to start the leveling sequence.
4. Press the "AUTO HITCH" (Fig. 11K) button to start the hitch recognition sequence when reconnecting to tow vehicle.
5. Use the "UP" or "DOWN" arrow buttons (Fig. 11G) to cycle through the menu options:
  - A. **Info:** Scroll to "INFO" (Fig. 11C) and press "ENTER" button to display system information, e.g., angle, jack stroke or software version.
  - B. **Auto Retract:** Scroll to "AUTO RETRACT" (Fig. 11D) and press "ENTER" button to start the Auto Retract sequence.
  - C. **Manual Mode:** Scroll to "MANUAL MODE" (Fig. 11E) and press "ENTER" button to start Manual Level operation. Jacks operate in pairs. Use "RETRACT" or "EXTEND" to operate front jacks and rear jacks.
    - I. Press "RETRACT" (Fig. 13E) or "EXTEND" (Fig. 13F) and FRONT (Fig. 13A) to operate front jacks.
    - II. Press "RETRACT or "EXTEND" and "REAR" (Fig. 13C) to operate rear jacks (right rear, right mid, left rear and left mid).
    - III. Press "RETRACT" or "EXTEND" and "RIGHT" (Fig. 13B) to operate right jacks (right mid and right rear).
    - IV. Press "RETRACT" or "EXTEND" and "LEFT" (FIG. 13D) to operate left jacks (left mid and left rear).



## Unhitching Instructions

**NOTE:** Prior to unhitching from the tow vehicle, ensure trailer is parked on a level surface and chock the tires of the trailer.

1. Push "Extend" (Fig. 11I) and "FRONT" buttons (Fig. 11) to extend front jacks and lift front of trailer to take the weight of the trailer off of the hitch.
2. Uncouple the trailer connection on the tow vehicle.
3. Pull tow vehicle away and park at a safe distance.

## Auto Level

**NOTE:** Once the automatic leveling cycle has been started, it is important that there is no movement in the trailer until the trailer has completed the leveling process. Failure to remain still during the leveling cycle could have an effect on the performance of the leveling system.

1. After unhitching from tow vehicle press "AUTO LEVEL" (Fig. 11J).

**NOTE:** Pressing "ABORT" during an Auto Level sequence will abort the auto leveling cycle.

## Auto Level Sequence

1. Sequence may vary slightly based on the height of the trailer king pin prior to leveling.
2. When the Auto Level sequence begins, the front of the trailer will seek a position near a level state, then the trailer will level from front to back.
3. The left side jack(s) extend to ground (left mid and left rear).
4. The right side jack(s) extend to ground (right mid and right rear).
5. Jack pairs will extend as needed in order to level the trailer.

**NOTE:** Step 4 may repeat several times if the controller deems necessary.

**NOTE:** If the AUTO LEVEL sequence does not perform as described above, place the system in manual mode and test that the jacks operate correctly by pushing their coordinating buttons on the touch panel in manual mode, e.g., "FRONT" button operates only the front jacks, etc.

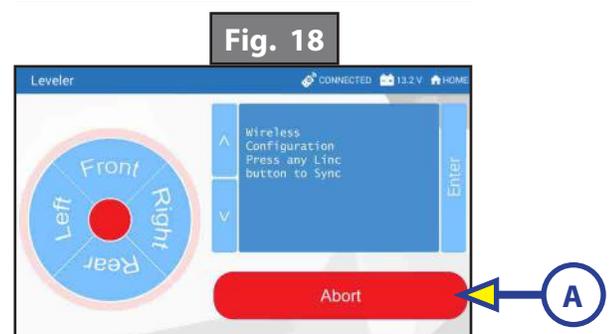
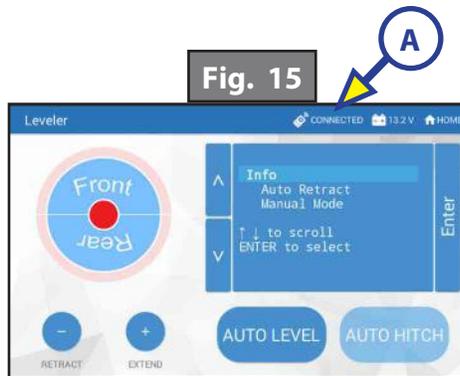
## Touch Pad Diagram - Linc Remote Control - Optional

| Callout | Description                                     |
|---------|---|
| A       | Retract - Retracts front jacks and rear jacks.  |
| B       | Extend - Extends front jacks and rear jacks.    |
| C       | Help - Provides contact information for LCI.    |
| D       | Front Arrow - Operates front jacks.             |
| E       | Left Arrow - Operates left rear jacks.          |
| F       | Right Arrow - Operates right rear jacks.        |
| G       | Rear Arrow - Operates rear jacks.               |
| H       | Auto Level- Initiates Auto Level sequence.      |
| I       | Power Button - Turns remote control on and off. |



## Configuring Linc Remote to Sync to MyRV One Control Touch Panel

1. Turn on the Linc™ remote control (Fig. 14I) and enter a PIN.
2. Choose "Leveler" from the menu screen.
3. Turn on the myRV® OneControl™ Touch Panel (Fig. 2K).
4. On the myRV® OneControl™ Touch Panel, press the "CONNECTED" icon at the top of the screen (Fig. 15A) quickly 6 times. Wait a few seconds until the gear icon with "OPTIONS" appears (Fig. 16A).
5. Press the gear icon with "OPTIONS" (Fig. 16A).
6. Use the "UP" and "DOWN" arrows (Fig. 16B) to scroll to "WIRELESS CONFIG" (Fig. 17).
7. Press "ENTER" (Fig. 17A). The screen will display "Wireless Configuration Press any Linc button to Sync" (Fig. 18).
8. Press any button in "Leveler" mode (Fig. 14) on the Linc remote control (Fig 14).
9. Pressing "ABORT" on the myRV® OneControl™ Touch Panel (Fig. 18A) will cancel configuration sequence.



## Basic Jack Operation

- Press "RETRACT" ( Fig. 14A) or "EXTEND" (Fig. 14B) and "Front" arrow (Fig. 14D) to operate front jacks.
- Press "RETRACT" or "EXTEND" and "Rear" arrow (Fig. 14G) to operate rear jacks (right rear, right mid, left rear and left mid).
- Press "RETRACT" or "EXTEND" and "Right" arrow (Fig. 14F) to operate right jacks (right mid and right rear).
- Press "RETRACT" or "EXTEND" and "LEFT" arrow (Fig. 14E) to operate left jacks (left mid and left rear).
- Press "AUTO LEVEL" (Fig. 14H) to start auto level sequence.

## Unhitching Instructions

**NOTE:** Prior to unhitching from the tow vehicle, ensure trailer is parked on a level surface and chock the tires of the trailer.

1. Turn the Linc™ remote on (Fig. 14I) and enter a PIN code to turn system on.
2. Press the "LEVELER" button.
3. Press "EXTEND" (Fig. 14B) and "FRONT" arrow (Fig. 14D) to extend front jacks and lift front of trailer to take the weight of the trailer off of the hitch.
4. Uncouple the trailer connection on the tow vehicle.
5. Pull tow vehicle away and park at a safe distance.

## Auto Level

**NOTE:** Once the automatic leveling cycle has been started, it is important that there is no movement in the trailer until the trailer has completed the leveling process. Failure to remain still during the leveling cycle could have an effect on the performance of the leveling system.

1. After unhitching from the tow vehicle press "AUTO LEVEL" (Fig. 14H).

**NOTE:** Pressing any button on the Linc™ remote during an Auto Level sequence will abort the auto leveling cycle. To restart the Auto Level process, refer to the OneControl™ Touch Panel (Fig. 2).

## Auto Level Sequence

**NOTE:** Sequence may vary slightly based on the height of the trailer king pin prior to leveling.

1. When the Auto Level sequence begins, the front of the trailer will seek a position near a level state, then the trailer will level from front to back.
2. The left side jack(s) extend to ground (left mid and left rear).
3. The right side jack(s) extend to ground (right mid and right rear).
4. Jack pairs will extend as needed in order to level the trailer.

**NOTE:** Step 4 may repeat several times if the controller deems necessary.

**NOTE:** If the AUTO LEVEL sequence does not perform as described above, test that the jacks operate correctly by pushing their coordinating buttons on the Linc™ remote; e.g., "FRONT" button operates only the front jacks, etc. The jacks can also be tested in manual mode on the OneControl™ Touch Panel (Fig. 2). See Operation - myRV® OneControl Touch Panel.

## **Maintenance Level Up OneControl**

1. Each month, check that the fluid level is within 1/4" of the fill spout lip while jacks and slide-outs are fully retracted.

**NOTE:** Always fill the reservoir with the jacks and slide-outs in the fully retracted position. Filling reservoir when jacks and slide-outs are extended will cause reservoir to overflow into its compartment when jacks and slide-outs are retracted.

2. Inspect and clean all power unit electrical connections prior to the first use of the trailer of the season and prior to storing the trailer. If corrosion is evident, clean all corrosion with a wire brush and apply dielectric grease to the connections.
3. Remove dirt and road debris from jacks as needed.
4. If jacks are down for extended periods, it is recommended to spray exposed jack rods with a silicone lubricant every 3 months for protection. If the trailer is located in a salty air environment, it is recommended to spray the rods every 4 to 6 weeks.

## Fluid Recommendation

The Lippert Electronic Leveling System is pre-filled, primed and ready to operate direct from the manufacturer. Type "A" Automatic Transmission Fluid (ATF) is utilized and will work. ATF with Dexron III® or Mercon 5® or a blend of both is recommended by Lippert Components, Inc. 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. For a list of approved fluid specifications, see TI-188.

## Manual Override

The LCI Level Up Automatic Leveling System can be manually operated with an electric drill. In the event of electrical or system failure, this manual method of extending and retracting the jacks can be used. See the instructions below.

**NOTE:** Unhook the power unit motor from the power source prior to attempting the manual override procedure.

1. Locate the valves that are paired with the front jacks or rear jacks to be manually overridden.
  - A. Front jacks - Valve located on the front jacks (Fig. 19).
  - B. Rear Jacks - Valve located on manifold (Fig. 20).
2. Using a  $\frac{5}{32}$ " hex wrench, open the valve by turning the manual override set screw clockwise (Fig. 21A).
3. Remove protective label (Fig. 22A) from power unit to reveal the manual override coupler.
4. Using an electric drill with a  $\frac{1}{4}$ " hex bit, insert the hex bit into the manual override coupler to manually operate the Level-Up system (Fig. 23).
  - A. Run the drill forward (clockwise) to retract the front jacks or rear jacks (Fig. 23A).
  - B. Run the drill in reverse (counterclockwise) to extend the front jacks or rear jacks (Fig. 23B).
5. Be sure to turn the manual override set screw on the valve (Fig. 24A) back to the counterclockwise position after extending or retracting the front jacks or rear jacks.

Fig. 19

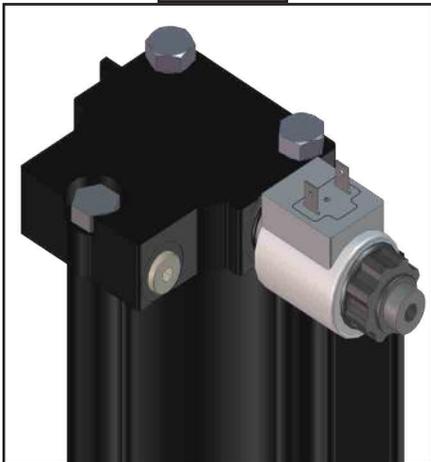


Fig. 20

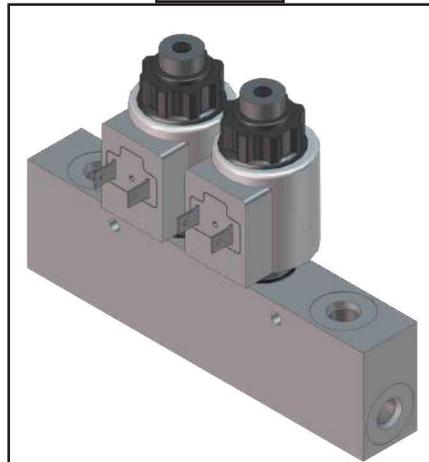


Fig. 21

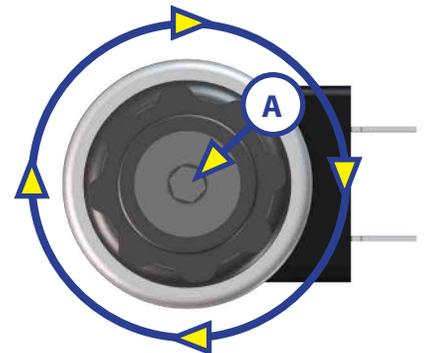


Fig. 22

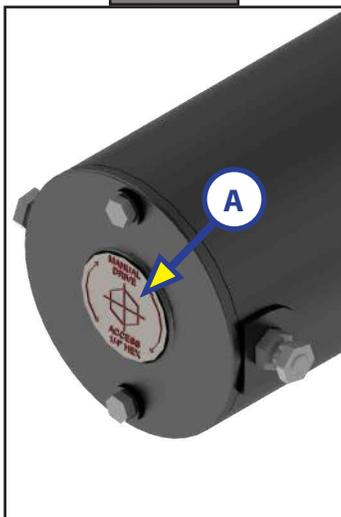


Fig. 23

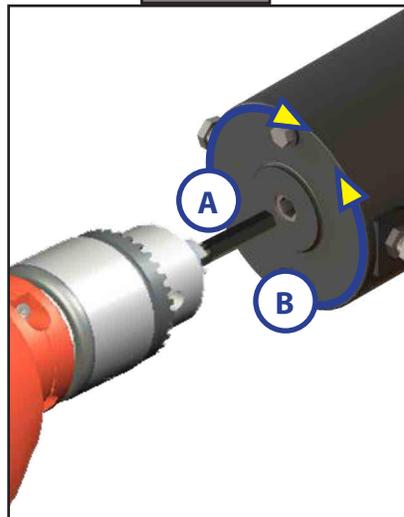
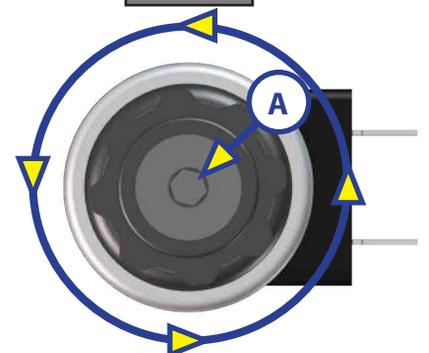


Fig. 24



## Troubleshooting

### Error Display In LCD Screen

Faults can only be cleared via the OneControl™ Touch Panel or OneControl™ Leveling App through myRV®. The only exception is when the Auto Leveling Control mini-touch pad (Fig. 1) was used to abort an auto-sequence. In this case the fault can be cleared by pressing any Auto Leveling Control button.

| LCD Message          | What's Happening?                                       | What Should I Do?  |
|----------------------|---|--|
| "EXCESS ANGLE"       | Unsecured controller.<br>Uneven or sloped site.         | Check and secure controller placement.<br>Relocate the trailer.                                |
| "EXCESSIVE ANGLE"    | Controller not properly secured.                        | Check and secure controller placement.   |
|                      | Excessive angle reached during manual operation.        | Relocate the coach.  |
| "BAD CALIBRATION"    | Trailer zero point was not set correctly.               | Reset zero point.  |
| "FEATURE DISABLED"   | Hitch recognition requested but no hitch height set.    | Perform "AUTO LEVEL" sequence to establish hitch height.                                       |
|                      | Zero point not set.                                     | Set zero point.  |
| "LOW VOLTAGE"        | Bad connection or wiring.<br>Discharged or bad battery. | Check wiring - repair or replace.<br>Test battery voltage under load - charge or replace.      |
| "OUT OF STROKE"      | Unsecured controller.<br>Uneven or sloped site.         | Check and secure controller placement.<br>Relocate the trailer.                                |
| "EXTERNAL SENSOR"    | Bad connection or wiring.                               | Replace or repair connection to rear remote sensor.  |
| "JACK TIME OUT"      | System could not level in expected time.                | Check for obstructions, leaks, fluid level and voltage to power unit motor under load.         |
| "AUTO LEVEL FAILURE" | Unsecured controller.<br>Voltage drop.                  | Check and secure controller placement.<br>Test battery voltage under load - charge or replace. |
| "FUNCTION ABORTED"   | User has aborted an automatic leveling sequence.        | Restart the sequence.  |

# HYDRAULIC LANDING GEAR

## LEVELING AND STABILIZATION

### System



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

The use of the Lippert Hydraulic Landing Gear to support the coach for any reason other than which it is intended is prohibited by Lippert's limited warranty. The Lippert Hydraulic Landing Gear system is designed as a system to drop the unit off of a truck, level the unit from front to back and stabilize the front of the unit only and should not be used to provide service for any reason under the coach such as changing tires or servicing the landing gear.

Lippert Components, Inc. recommends that a trained professional be employed to change the tire of the coach. Any attempts to change tires or perform other service while coach is supported by the hydraulic landing gear could result in death, serious personal injury and/or damage to the coach.

- Be sure to park the coach on solid, level ground.
- Clear all jack landing locations of debris and obstructions. Location should also be free of depressions.
- When parking the coach on extremely soft surfaces, utilize load distribution pads under each jack.
- People and pets should be clear of coach while operating Lippert hydraulic landing gear system.
- Be sure to keep hands and other body parts clear of fluid leaks. Oil leaks in the Lippert hydraulic landing gear may be under high pressure and can cause serious skin penetrating issues.
- Never lift the coach completely off the ground. Lifting the coach so the wheels are not touching ground will create an unstable and unsafe condition.

### Prior to Operation

The Lippert Hydraulic Landing Gear shall only be operated under the following conditions:

1. The unit is parked on a reasonably level surface.
2. The towing vehicle is disengaged from the unit.
3. Be sure all persons, pets and property are clear of the coach while Lippert Hydraulic Landing Gear is in operation.

### System Description

Please read and study the operating manual before you operate the Lippert Hydraulic Landing Gear.

- The Lippert Hydraulic Landing Gear is an electric/hydraulic system. A 12V DC electric motor drives a hydraulic pump that moves fluid through a system of hoses, fittings and jacks to level and stabilize the coach.
- 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 Lippert Hydraulic Landing Gear are replaceable. Contact Lippert Components, Inc. to obtain replacement parts.

### Component Description

The Lippert Hydraulic Landing Gear consists of the following major components:

- Lippert Hydraulic Landing Gear are rated at a lifting capacity appropriate for your coach.
- Lippert Hydraulic Landing Gear is powered from a central 12VDC motor/pump assembly, which also includes the hydraulic oil reservoir tank, control valve manifold, and solenoid valves.
- The Lippert Hydraulic Landing Gear is controlled electronically from the switch near the pump.

## Preventative Maintenance Procedures

The Lippert Hydraulic Landing Gear has been designed to require very little maintenance. To ensure the long life of your slide-out system, read and follow these few simple procedures.

1. Check the fluid level every month.
  - A. Check fluid only when jacks are fully retracted.
  - B. Always fill the reservoir with the jacks in the fully retracted position. Filling reservoir when jacks are extended will cause reservoir to overflow into its compartment when jacks are retracted.
  - C. When checking fluid level, fluid should be within ¼" of fill spout lip.
2. Inspect and clean all Pump Unit electrical connections every 12 months.
3. Remove dirt and road debris from Landing Gear as needed.

### **WARNING**

**The coach should be supported at both front and rear axles with jack stands before working underneath. Failure to do so may result in death or serious injury.**

The Lippert Hydraulic Landing Gear has been static tested to over 6,000 continuous cycles without any noticeable wear to rotating or sliding parts. It is recommended that when operating in harsh environments and conditions (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.

### Mechanical Components

Although the system is designed to be almost maintenance-free, actuate the landing gear once or twice a week to keep the seals and internal moving parts lubricated.

Check for any visible signs of "leaking" before and after movement of the system and the coach.

When the landing gear is down, visually inspect the inner and outer assemblies. Refer to components list for location of inner 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 or silicone lubricant spray to the hydraulic rod but remove any excess oil so dirt and debris do not build-up. DO NOT use grease.

### Electrical Components

For optimum performance, the landing gear 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 pump motor for corrosion and loose or damaged terminals. Check motor leads under the coach chassis. Since these connections may be subject to damage from road debris, be sure they are in good condition.

**NOTE:** The Lippert Hydraulic Landing Gear is designed to operate as a negative ground system. A negative ground system utilizes the chassis frame as the ground source. An independent ground wire back to the battery is not needed. It is important the electrical components have good wire to chassis contact. Over 90% of unit electrical problems can be attributed to bad ground connections.

**NOTE:** For long-term storage: It is recommended that the room be closed (retracted) and if your unit is equipped with the IRC room control, it is recommended all of the control knobs be kept in the closed position.

## Auxiliary Operation

The Lippert Hydraulic Landing Gear can be run with power devices like electric drills or cordless screwdrivers. In the event of electrical or system failure, this manual method of extending and retracting the jacks can be used. A standard hand-held cordless or power drill is all that is required.

1. Locate the blocking valve (Fig. 1) on the top cap of either of the landing gear jacks.
2. Using a  $\frac{5}{32}$ " Allen wrench, manually open the valve by turning the manual override set screw in the end of the valve clockwise (Fig. 1).
3. Remove protective label from the motor (Fig. 2).
4. Using a standard  $\frac{1}{4}$ " hex bit, insert into auxiliary drive device, i.e. cordless drill or power drill. Insert hex bit into coupler found under protective label (Fig. 2).
5. Run drill forward or clockwise to retract jacks and in reverse or counterclockwise to extend jacks.
6. Be sure to turn manual override set screw back to the counterclockwise position after extending or retracting landing gear (Fig. 3).

Fig. 1

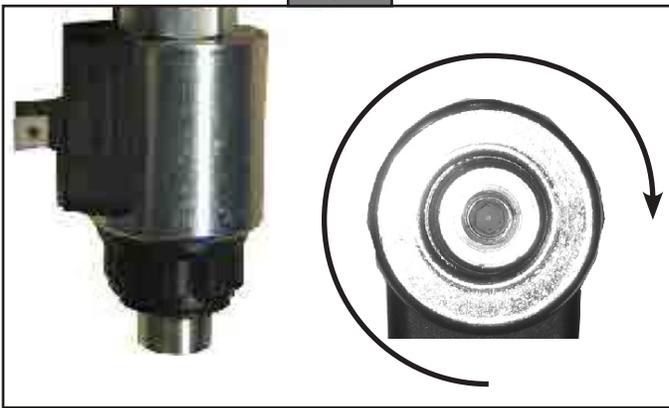


Fig. 2

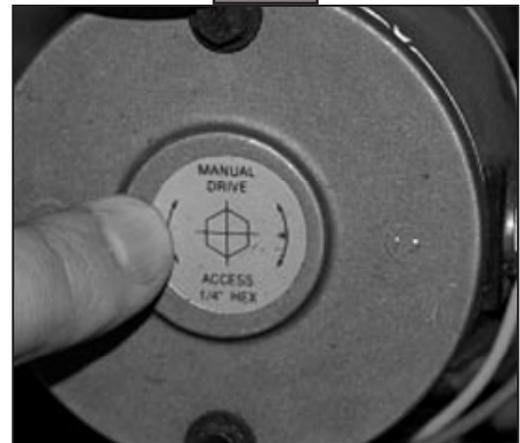
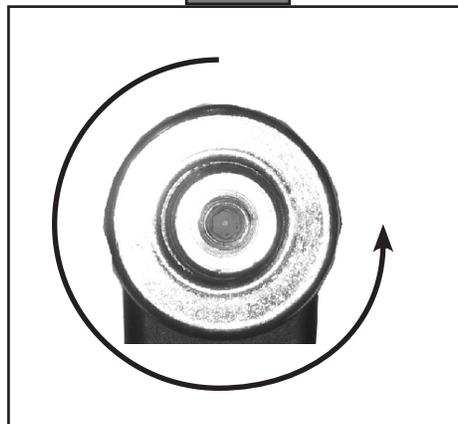


Fig. 3



## Fluid Recommendation

The Lippert Electronic Leveling System is pre-filled, primed and ready to operate direct from the manufacturer. Type "A" Automatic Transmission Fluid (ATF) is utilized and will work. ATF with Dexron III® or Mercon 5® or a blend of both is recommended by Lippert Components, Inc.

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. For a list of approved fluid specifications, see [TI-188](#).

## Filling Directions

**NOTE:** Be sure landing gear are fully retracted prior to filling reservoir to prevent over-filling.

1. Remove Breather/Fill Cap
2. Pour ATF into Breather/Fill opening.

**NOTE:** Do not allow any contamination into reservoir during fill process.

**NOTE:** Standard reservoir holds approximately 2 quarts (1.89 liters) of ATF.

3. Fill to within ½" of top.
4. Replace Breather/Fill cap when finished.

System is self-purging. By simply cycling the system 2-3 times, any air in the system will be forced back to the reservoir and out of the Breather/Fill cap.

## **Troubleshooting**

### Power 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 to 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 terminals on motor solenoid. Does the meter indicate 12V DC? If YES, see Step 2; if NO see Step 3.
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.
3. If NO, Inspect all connections between battery and solenoid. Inspect 30A Auto-reset Circuit Breaker. Recheck as above in Step 1.

**NOTE:** Since there are no field serviceable parts in the motor of the Power Unit, 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  |
|---|--|--|
| Jacks will not extend to ground, pump is running. | Little or no fluid in reservoir.                         | Fill reservoir with Dexron III ATF.  |
|   | Leg valve is inoperative.                                | Clean, repair or replace.  |
|   | Electronic signal is lost between switch and leg valves. | Trace wires for voltage drop or loss of signal. Repair or replace necessary wires or replace switch.   |
| Any one or two jacks will not retract.            | Hose damaged or not connected.                           | Replace with new hose or reconnect.  |
|   | Return valve is inoperative.                             | Replace inoperative return valve.  |
|   | Electronic signal is lost between switch and solenoid.   | Attempt to retract jacks in manual mode, if successful replace control pad; if not, test voltage drop. |
|   | Electronic signal is lost between switch and leg valve.  | Repair bad wiring or replace defective board or valve.   |

# PSX1™ (POWER STABILIZING SYSTEM)

## LEVELING AND STABILIZATION

### System Description

The PSX1™ is a 12V DC electric motor-driven system. The electric motor drives Acme-threaded screws to extend and retract the stabilizer legs to stabilize the trailer.

The stabilizing system can be installed on travel trailers and 5th Wheels. Travel trailer options include both front and rear stabilizers or a rear stabilizer only, while 5th Wheels typically utilize only a rear stabilizer. The standard duty stabilizer is suitable for all trailers.

There are no serviceable parts within the electric motor. If a motor fails, it must be replaced. Disassembly of the motor voids the warranty. Mechanical portions of the PSX1 are replaceable. Contact Lippert Components, Inc. to obtain replacement parts.

### Safety Information

The PSX1 is intended for the purpose of stabilizing the trailer after the trailer has been leveled. The use of this system for any reason other than which it is intended is prohibited by Lippert's Limited Warranty and may result in serious personal injury or death. The PSX1 is designed as a stabilizing component system and should not be used to provide service under the trailer for any reason such as changing tires or repairing or replacing any components beneath the trailer.

#### **WARNING**

**The “WARNING” symbol above is a sign that an installation procedure has a safety risk involved and may cause death, serious personal injury or severe product or property damage if not performed safely and within the parameters set forth in this manual. Always wear eye protection when performing this installation procedure. Other safety equipment to consider would be hearing protection, gloves, and possibly a full face shield, depending on the nature of the installation procedure.**

#### **WARNING**

**Lippert Components Inc. recommends that a trained professional be employed to change the tires on the trailer. Any attempts to change tires or perform other service while trailer is supported by the PSX1 could result in death, serious personal injury or severe product or property damage.**

## Operation

### **⚠ WARNING**

Failure to act in accordance with the following may result in death, serious personal injury or severe product or property damage. Always make sure the stabilizer area is clear of pets, people and objects before and during operation of the system. Always keep away from the stabilizer legs when in operation.

### **⚠ CAUTION**

The PSX1 is to be used for stabilizing the trailer, not leveling the trailer. The stabilizer legs should never be extended longer than two seconds beyond initial contact with the ground.

### **⚠ CAUTION**

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

### **⚠ CAUTION**

Never lift the trailer completely off the ground. Lifting the trailer completely off the ground creates an unstable condition that could result in property damage and personal injury.

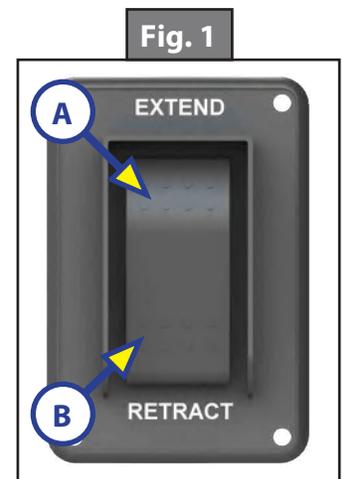
## Preparation

The PSX1 is intended for the purpose of stabilizing the trailer after the trailer has been leveled.

1. Make sure the trailer is on solid, level ground.
2. Clear all stabilizer leg landing locations of debris and obstructions. Locations should also be free of depressions.
3. When parking the trailer on extremely soft surfaces, utilize load distribution pads under each stabilizer leg.
4. People and pets should be clear of trailer while operating the stabilizers.

## Extending Stabilizers

1. Make sure the trailer is level.
2. Verify the battery is fully charged and hooked up to the electrical system.
3. Press and hold "EXTEND" on the switch (Fig. 1A) for the rear stabilizer until the footpads of the stabilizer legs contact the ground and the rear of the trailer is stabilized. Then release the switch.
4. If a front stabilizer is installed, press and hold "EXTEND" on the switch (Fig. 1A) for the front stabilizer until the footpads of the stabilizer legs contact the ground and the front of the trailer is stabilized. Then release the switch.



### **⚠ CAUTION**

Once the stabilizer legs have been extended, do not use the tongue jack on a travel trailer or the landing gear on a 5th Wheel. Damage to the stabilizer legs can occur when lifting or leveling the trailer after the stabilizer legs have been extended. Doing so will void the warranty of the stabilizers.

## Retracting Stabilizers

1. Verify the battery is fully charged and hooked up to the electrical system.
2. If a front stabilizer is installed, press and hold "RETRACT" on the switch (Fig. 1B) for the front stabilizer until the stabilizer legs are fully retracted. Then release the switch.
3. Press and hold "RETRACT" on the switch (Fig. 1B) for the rear stabilizer until the stabilizer legs are fully retracted. Then release the switch.

## Stabilizing System

By keeping the "EXTEND" switch (Fig. 1A) engaged for one to two seconds after the legs' footpads make contact with the ground, the trailer will be stabilized and ready for use.

In the event the system shuts off while trying to stabilize the trailer, an in-line auto-reset circuit protection has tripped and will reset within 10 seconds. This is an indication the PSX1 is not being used as intended and is trying to lift too much weight.

**NOTE:** Make sure the stabilizer legs are fully retracted before moving the trailer.

## Manual Override

The PSX 1 comes with a manual override system located on the stabilizer end opposite the electric motor (Fig. 2A).

To manually operate the stabilizer:

1. Disconnect one of the wire leads from the motor to prevent backfeeding the motor.
2. Next, insert the 1/2" diameter manual crank handle (PN #119226) (Fig. 3) over the coupler and pin at the end of the stabilizer (Fig. 2A). The slot in the end of the crank handle (Fig. 3) accommodates the pin on the coupler (Fig. 2A) to allow the manual extension/retraction of the stabilizer legs.

### **CAUTION**

**The gears can be stripped if the stabilizer legs are retracted/extended to the fullest extent and the operator continues to rotate the manual override. Do NOT use a power tool to extend or retract stabilizers.**

3. Rotate the crank handle clockwise to extend or counterclockwise to retract the stabilizer legs.

Fig. 2

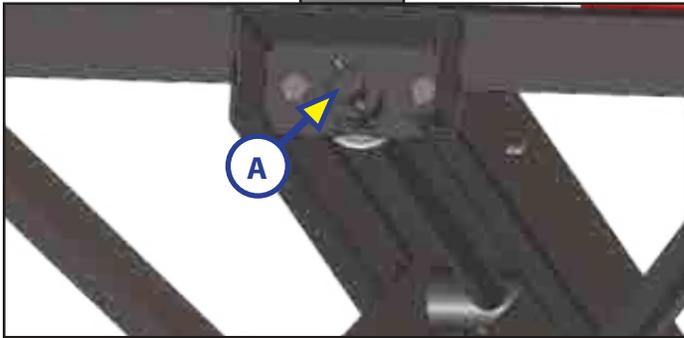
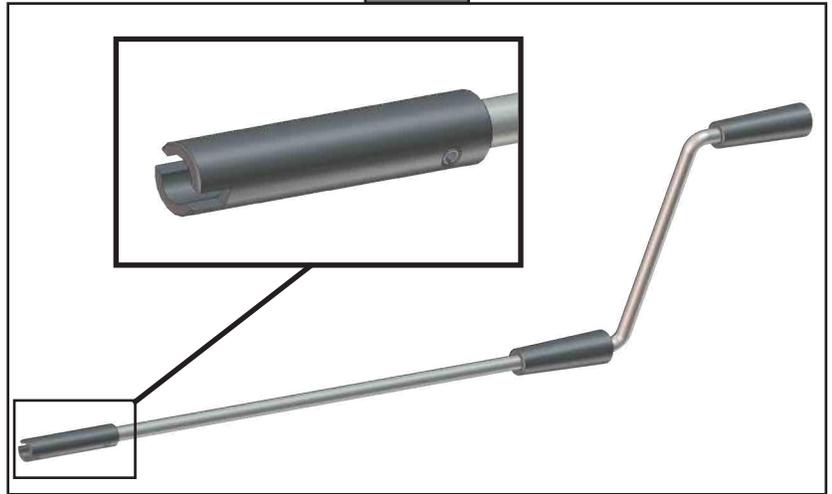


Fig. 3



## System Maintenance



**Do not work on the stabilizer unless the battery is disconnected. Failure to act in accordance with the following may result in death, serious personal injury or severe product or property damage.**

### Mechanical Maintenance

It is recommended that when operating in harsh environments, e.g. road salt or ice buildup, the moving parts be kept clean. They can be washed with mild soap and water. The ACME screw is precoated with grease. If the screw is cleaned, it may be necessary to add grease to the screw to ensure smooth stabilizer operation.



**Operating the stabilizer without grease on the screw could lead to product failure.**

### Electrical Maintenance

For optimum performance, the 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 motors for corrosion and loose or damaged terminals. Check motor leads under the trailer chassis. Since these connections are subject to damage from road debris, make sure they are in good condition.

## Troubleshooting

| What Is Happening?              | Why?                            | What Should Be Done?                                |
|---------------------------------|---------------------------------|---|
| System shuts off                | Too much weight.                | Circuit protection will reset in 10 seconds.        |
| Switch does not activate system | Low voltage.                    | Test battery voltage under load. Charge or replace. |
|                                 |                                 | Use Manual Override.                                |
|                                 | Damaged or disconnected wiring. | Check wiring. Repair or replace.                    |
|                                 |                                 | Use Manual Override.                                |

# PSX2™ (POWER STABILIZING SYSTEM)

## LEVELING AND STABILIZATION

### Safety Information

The PSX2™ (Power Stabilizing System) is intended for the purpose of stabilizing the trailer. The use of this system for any reason other than which it is intended is prohibited by Lippert's Limited Warranty and may result in serious personal injury or death. The PSX2™ is designed as a stabilizing component system and should not be used to provide service under the trailer for any reason, including changing tires or repairing or replacing any components beneath the trailer.

#### **WARNING**

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

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

#### **WARNING**

The PSX2™ is designed as a stabilizing component system. Do NOT use this stabilizing system to attempt to level the trailer. Failure to follow instructions in this manual could result in death, serious personal injury or severe product or property damage.

#### **WARNING**

Lippert Components Inc. recommends that a trained professional be employed to change the tires on the trailer. Any attempts to change tires or perform other service while trailer is supported by the PSX2™ could result in death, serious injury and/or damage to the trailer.

#### **CAUTION**

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

## System Description

Please read and study the Operation section of the manual before operating the PSX2™. The PSX2™ is a 12V DC electric motor-driven system. The electric motors drive Acme-threaded screws to extend and retract the stabilizer legs to stabilize the trailer.

The stabilizing system can be installed on travel trailers and 5th Wheels. Travel trailer options include both front and rear stabilizers or a rear stabilizer only, while 5th Wheels typically utilize only a rear stabilizer. The PSX2™ has two motors per stabilizer.

There are no serviceable parts within the electric motors. If either motor fails, it must be replaced. Disassembly of the motor voids the warranty. Mechanical portions of the PSX2™ are replaceable. Contact Lippert Components, Inc. to obtain replacement parts.

## Operation

### **WARNING**

**Failure to act in accordance with the following may result in death or serious injury. Always make sure that the stabilizer area is clear of people, pets and objects before and during operation of the system. Always keep away from the stabilizer legs when operated.**

### **CAUTION**

**The PSX2™ is to be used for stabilizing the trailer, not leveling the trailer. The stabilizer legs should never be extended longer than two seconds beyond initial contact with the ground.**

### **CAUTION**

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

## Preparation

The PSX2™ is intended for the purpose of stabilizing the trailer after the trailer has been leveled.

### **WARNING**

**Never lift the trailer completely off the ground. Lifting the trailer completely off the ground creates an unstable condition that could result in death, serious personal injury or severe product or property damage.**

1. Make sure the trailer is parked on solid, level ground.
2. Clear all stabilizer leg landing locations of debris and obstructions. Locations should be free of depressions.
3. When parking the trailer on extremely soft surfaces, utilize load distribution pads under each stabilizer leg.
4. Make sure people and pets are clear of the trailer while operating the stabilizers.

## Extending Stabilizers

1. Make sure the trailer is level.
2. Verify the battery is fully charged and hooked up to the electrical system.
3. Press and hold "EXTEND" on the switch (Fig. 1A) for the rear stabilizer until the footpads of the stabilizer legs contact the ground and the rear of the trailer is stabilized. Then release the switch.
4. If a front stabilizer is installed, press and hold "EXTEND" on the switch (Fig. 1A) for the front stabilizer until the footpads of the stabilizer legs contact the ground and the front of the trailer is stabilized. Then release the switch.

### ⚠ CAUTION

**Once the stabilizer legs have been extended, do not use the tongue jack on a travel trailer or the landing gear on a 5th Wheel. Damage to the stabilizer legs can occur when lifting or leveling the trailer after the stabilizer legs have been extended. Doing so will void the warranty of the stabilizers.**

## Retracting Stabilizers

1. Verify the battery is fully charged and hooked up to the electrical system.
2. If a front stabilizer is installed, press and hold "RETRACT" on the switch (Fig. 1B) for the front stabilizer until the stabilizer legs are fully retracted. Then release the switch.
3. Press and hold "RETRACT" on the switch (Fig. 1B) for the rear stabilizer until the stabilizer legs are fully retracted. Then release the switch.

## Stabilizing System

By pressing and holding the "EXTEND" switch (Fig. 1A) for one to two seconds after the stabilizer legs' footpads make contact with the ground, the trailer will be stabilized and ready for use.

In the event the system shuts off while trying to stabilize the trailer, the auto-reset circuit protection contained within the motors has tripped and will reset within 10 seconds. The internal circuit protection is included to prevent the stabilizer from lifting. If the circuit protection trips, then the stabilizer legs should not be extended farther.

If the stabilizer legs are not synchronized and are extending unevenly, press and hold "RETRACT" (Fig. 4B) on the switch until both legs are fully retracted. The circuit protection will trip. After the circuit protection resets, the stabilization sequence can be restarted.

**NOTE:** Make sure the stabilizer legs are fully retracted before moving the trailer.

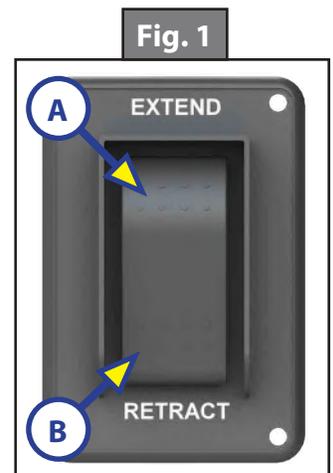
## Manual Override

The PSX2™ comes with a manual override system located on the side of each motor.

**NOTE:** Use of a ratchet with a  $\frac{5}{16}$ " socket or a  $\frac{5}{16}$ " manual override tool (optional tool sold separately) is recommended to manually override the system. Do not use a power tool to perform any of the override procedures since this may damage the motor.

### ⚠ CAUTION

**The gears can be stripped if the stabilizer legs are manually retracted/extended to the fullest extent and the operator continues to rotate the manual override. Use of a power tool could cause harm to the user or damage the stabilizer motor.**

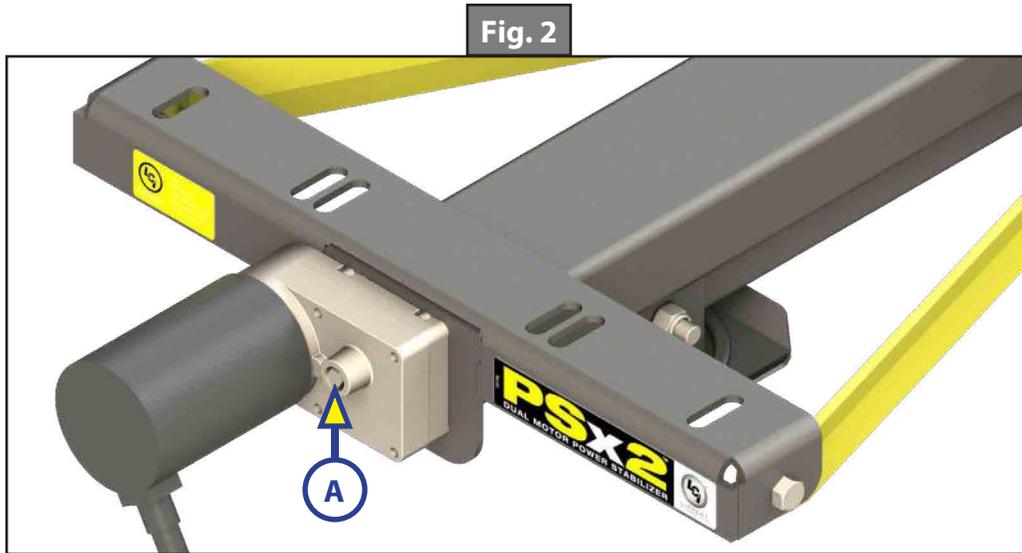


To manually operate the stabilizers:

1. Disconnect one of the wire leads from each motor to prevent backfeeding the motors.

**NOTE:** The manual override procedure must be performed individually on each motor of PSX2 in order to manually extend or retract the legs.

2. Find the access port on the side of the leg motor (Fig. 2A).
3. Remove the rubber plug.
4. Place the 5/16" socket or 5/16" manual override tool (optional) over the manual override nut (Fig. 2A).
5. Turn the override nut until the leg extends or retracts to the desired position. A clockwise rotation will extend the leg and counterclockwise will retract the leg.



## System Maintenance

### **⚠ WARNING**

**Do not work on the stabilizer unless the battery is disconnected. Failure to act in accordance with the following may result in death, serious personal injury or severe product or property damage.**

## Mechanical Maintenance

It is recommended that when operating in harsh environments, e.g. road salt or ice buildup, the moving parts be kept clean. They can be washed with mild soap and water. The ACME screw is pre-coated with grease. If the screw is cleaned, it may be necessary to add grease to the screw to ensure smooth stabilizer operation.

## Electrical Maintenance

For optimum performance, the system requires full battery current and voltage. Maintain battery at full capacity. Also, check the terminals and other connections at the battery, the control switch and the electric motors for corrosion and loose or damaged terminals. Check motor leads under the trailer chassis. Since these connections are subject to damage from road debris, make sure they are in good condition.

## Troubleshooting

| What Is Happening?              | Why?                               | What Should Be Done?                                  |
|---------------------------------|------------------------------------|---|
| Legs out of sync                | Uneven ground.                     | Fully retract both stabilizer legs to synchronize.    |
|                                 | Stabilizer legs extended unevenly. |   |
| System shuts off                | Too much weight.                   | Internal circuit protection will reset in 10 seconds. |
| Switch does not activate system | Low voltage.                       | Test battery voltage under load. Charge or replace.   |
|                                 | Damaged or disconnected wiring.    | Check wiring. Repair or replace.                      |

# MANUAL OVERRIDE WRENCH

## LEVELING AND STABILIZATION

### Introduction

This product is a 3 in 1 manual override handle for your tongue jack or stabilizer system. The three options are  $\frac{3}{4}$ " hex override,  $\frac{5}{16}$ " hex override, and pin override (as seen on the PSX1). The  $\frac{3}{4}$ " socket can be used on tongue jacks and scissor jacks. The  $\frac{5}{16}$ " socket is intended for PSX2, and the pin override is intended for PSX1.

### Safety

Read and understand all instructions before starting any procedures stated in this manual. Adhere to all safety labels to prevent personal injury and/or product damage. Failure to follow instructions and safety labels may void product 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**

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

#### **CAUTION**

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

### Preparation

1. Applicable tongue jack or stabilizer owner's manual with operation, override and troubleshooting instructions.
2. Frame supports as per manufacturers recommendations.

### Manual Override

Most stabilizers and tongue jacks come equipped with a manual override system.

**NOTE:** The manual override procedure must be performed individually on each motor of PSX2 in order to manually extend or retract the stabilizer legs.

## Manual Operation For Stabilizers

### ⚠ CAUTION

The gears can be stripped if the stabilizer legs are retracted/extended to the fullest extent and the operator continues to rotate the manual override. Do NOT use a power tool to extend or retract stabilizers.

### ⚠ CAUTION

Operating the stabilizer without grease on the screw could lead to product failure.

1. If equipped, disconnect one of the wire leads from the motor to prevent backfeeding the motor.
2. Insert the ½" pin over the nut or coupler and pin on the end of the stabilizer (Fig. 1A). The slot in the end of the Manual Override Wrench (Fig. 2) accommodates the pin on the coupler (Fig. 1A) to allow the manual extension/retraction of the stabilizer legs. Rotate the Manual Override Wrench clockwise to extend or counterclockwise to retract the stabilizer legs.

**NOTE:** Make sure the stabilizer legs are fully retracted before moving the trailer.

Fig. 1

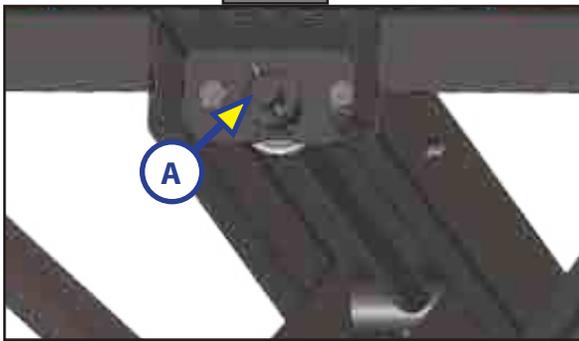
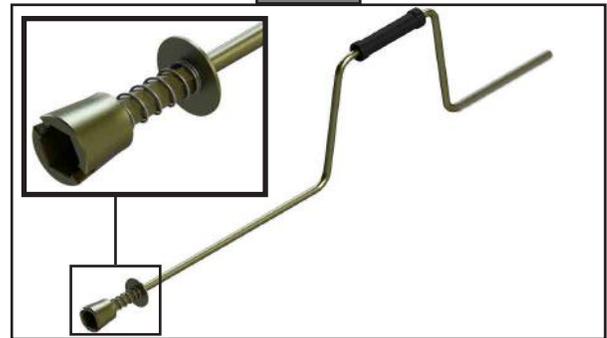


Fig. 2



## Manual Operation For Tongue Jacks

### ⚠ CAUTION

Chock the tires of the trailer. Be sure the footpad of the tongue jack is pinned securely in place with the clevis pin and hairpin cotter pin. Make sure the ground surface under the tongue jack is firm and level.

1. Open the rubber plug on top of the tongue jack's gearbox (Fig. 3A) to expose the manual drive shaft.
2. Insert the Manual Override Wrench (Fig. 4).
3. Turn the crank handle counterclockwise to retract the jack leg or clockwise to extend the jack leg.
4. Remove the crank handle.
5. Replace the rubber plug.

**NOTE:** Be sure the leg of the tongue jack is fully retracted prior to moving the tow vehicle.

Fig. 3



Fig. 4



# CLASS C HYDRAULIC LEVELING

## LEVELING AND STABILIZATION

### System Information

Please read and study the operating manual before operating the leveling system. The Class C Hydraulic Leveling System is an electric/hydraulic system. A 12V DC electric motor drives a hydraulic pump that moves fluid through a system of hoses, fittings and jacks to level and stabilize the coach. Mechanical portions of the Class C Hydraulic Leveling System are replaceable. Contact Lippert Components, Inc. to obtain replacement parts.

### Component Description

1. Jacks
  - A. Steel jack rated at a lifting capacity for the coach.
  - B. 9" diameter (63.5 square inch) footpad on a ball swivel for maximum surface contact on all surfaces.
  - C. 12" diameter - (113 square inch) footpad also available.
  - D. Powered from a 12V DC motor/pump assembly.
2. Motor/Pump Assembly
  - A. 12V DC motor
  - B. Hydraulic fluid reservoir tank
  - C. Control valve manifold
  - D. Solenoid valves
3. System Controls
  - A. Controlled electronically from touchpad.
  - B. Touchpad can be operated in manual mode or fully automatic mode.
4. Fittings and Hoses
  - A. Fittings - High pressure O-Ring Face - Size 4
  - B. Hose - 1/4" I.D., 3000 psi - W.P. Rated

### Safety Information

#### **WARNING**

**Make sure that the coach is supported at all four corners 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, severe product or property damage or voiding of the component warranty.**

#### **WARNING**

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

#### **CAUTION**

**Moving parts can pinch, crush, or cut. Keep clear at all times.**

The use of the Lippert Components, Inc. Class C Hydraulic Leveling System to support the coach for any reason other than which it is intended is prohibited by the Lippert Limited Warranty. The Class C Hydraulic Leveling System is designed as a leveling system only and should not be used to provide service for any reason under the coach, e.g. changing tires or servicing the leveling system.

Lippert Components, Inc. recommends that a trained professional be employed to change the tires on the coach. Any attempts to change tires or perform other service while coach is supported by the Class C Hydraulic Leveling System could result in death, serious personal injury or severe product or property damage or voiding of the component warranty.

## **⚠ WARNING**

Be sure to park the coach on solid, level ground. Clear all jack landing locations of debris and obstructions. Locations should also be free of depressions. When parking the coach on extremely soft surfaces, utilize load distribution pads under each jack. Make sure to keep hands and other body parts clear of fluid leaks. Hydraulic system leaks in the Class C Hydraulic Leveling System may be under high pressure and can cause serious skin penetrating injuries. People and pets should be clear of the coach while operating leveling system. Never lift the coach completely off the ground. Lifting the coach so the wheels are not touching the ground will create an unstable and unsafe condition.

## **Operation**

The leveling system should only be operated under the following conditions:

1. The coach is parked on a reasonably level surface.
2. The coach parking brake is engaged.
3. The coach transmission should be in the park position.
4. Make sure all persons, pets and property are clear of the coach while LCI Class C Hydraulic Leveling System is in operation.

## **⚠ CAUTION**

**After starting the automatic leveling cycle it is very important that you do not move around in the coach until the coach is level and the green LED light illuminates in the center of the touchpad. Failure to remain still during the leveling cycle could have an effect on the performance of the leveling system.**

## Selecting A Site

When the coach is parked on an excessive slope, the leveling requirements may exceed the jack lift stroke capability. For angles greater than 1.0 degree, leveling blocks and jack pads may be required in order to level properly. If the coach is parked on an excessive slope, the coach should be moved to a more level surface before the leveling system is deployed. "EXCESS ANGLE" will appear on the LCD screen if the coach is 3.5 degrees out of level from front-to-rear, or side-to-side.

**NOTE:** Leveling blocks and jack pads may be needed to achieve proper leveling if front to rear angles exceed 1 degree when the 4" maximum extension of the jack may not be enough.

## **⚠ WARNING**

**While utilizing leveling blocks and jack pads, all the wheels MUST NOT leave the ground during the leveling of the coach. Lifting all the wheels off the ground creates an unsafe condition that could result in death, serious personal injury, severe product or property damage or voiding of the component warranty.**

## Zero Point Calibration

**NOTE:** Zero Point Calibration may have been preset by the OEM. Verify if Zero Point has already been set. If not, then recalibration for Zero Point must be performed.

Before auto-leveling features can be made available, the Zero Point **MUST** be set. This is the point to which the system will return to when an auto-leveling cycle is initiated. To set the Zero Point, first run a manual leveling sequence to get the coach to the desired level point. Then activate the Zero Point configuration mode. This mode is enabled by performing the following sequence:

1. Turn panel off.
2. Press the FRONT button (Fig. 1G) five times.
3. Press the REAR button (Fig. 1J) five times.

4. At this point, an alarm will sound and the LCD display will read "\*\*\*ZERO POINT CALIBRATION\*\* ENTER to Set, POWER to Exit."
5. Press ENTER (Fig. 1C) to set the Zero Point.
6. Screen will then display "PLEASE WAIT."
7. Alarm will sound and the screen will display "ZERO POINT SUCCESSFUL."
8. LCD will display "configuring air feature".
9. Control will then turn off.

Fig. 1



**NOTE:** Units manufactured before Jan. 2018 will utilize the black touchpad.

| Callout | Description   |
|---------|---|
| A       | Up Arrow - Scrolls up through the menu on LCD.  |
| B       | Down Arrow - Scrolls down through the menu on LCD.  |
| C       | ENTER - Activates modes and procedures indicated on LCD.  |
| D       | RETRACT - Places leveling system into retract mode. - Manual mode ONLY<br>Press and hold for several seconds to activate Auto Retract Function. |
| E       | LCD Display - Displays procedures and results.  |
| F       | AUTO LEVEL - Places leveling system into auto level mode.   |
| G       | FRONT - Activates both front jacks in manual mode.  |
| H       | LEFT - Activates left rear jack in manual mode.   |
| I       | RIGHT - Activates right rear jack in manual mode.   |
| J       | REAR - Activates both rear jacks in manual mode.  |
| K       | Power Button - Turns leveling system on and off.  |

## Automatic Leveling Procedure

**NOTE:** Coach requires 12.75V DC to commence auto leveling function.

**NOTE:** The coach **MUST** be running and the parking brake **MUST** be engaged for the Class C Hydraulic Leveling System to operate.

**NOTE:** Refer to the Wiring Diagram or Hydraulic Plumbing Diagram in this document for questions regarding location and functions of the Class C Hydraulic Leveling System.

1. Press "On/Off" button to turn system on (Fig. 1K).
2. Press AUTO LEVEL button (Fig. 1F). LCD Screen will display "Remain Still."
3. The coach will level automatically and indicate "Auto Level - Success" in the LCD display (Fig. 1E).

**NOTE:** Display will then read "Level - Jacks: Down." Do not press any buttons until this message appears or a "Function Aborted" error will be displayed.

## Automatic Leveling Descriptive Logic



**After starting the automatic leveling cycle it is very important that you do not move around in the coach until the coach is level and the green LED light illuminates in the center of the touch pad. Failure to remain still during the leveling cycle could have an effect on the performance of the leveling system.**

### **Grounding**

The following steps describe the process of how the auto leveling sequence extends the jacks to the ground:

1. Depending on which end of the coach is lowest to the ground, the level sensor in the controller will activate the jacks—the lowest end first, either front or rear.
  - A. If the rear of the coach is the lowest end, ground the lowest rear jack first.
  - B. If the front end is the lowest end, ground the front jack closest to the power unit.
2. Ground the remaining front or rear lowest end jack.
3. Lift lowest end jacks together until level.
4. The leveling system will then ground remaining end jacks.
  - A. If the rear of the coach is the remaining end, ground lowest jack first.
  - B. If the front of the coach is the remaining end, ground the front jack closest to the power unit.
5. Ground the remaining front or rear remaining end jack
6. Lift remaining end jacks together until level.
7. Visually inspect all jacks to ensure all footpads are touching the ground. If one of the rear jack footpads is not touching the ground, put the system in manual mode. See Manual Leveling Procedure then press the corresponding LEFT or RIGHT arrow buttons to lower the non-compliant jack to the ground.

### **Leveling:**

The following steps describe the process of how the auto leveling sequence levels the coach, once the jacks have been grounded. This process may repeat several times until level.

1. Front-to-Rear
2. Side-to-Side
3. Individually
4. Minor adjustments to confirm grounding.

## **WARNING**

**All the wheels MUST NOT leave the ground during the leveling of the coach. Lifting all the wheels off the ground may result in death or serious personal injury.**

### Manual Leveling Procedure

**NOTE:** When leveling the coach, level from front-to-rear first. When the coach is level from front-to-rear, then level the coach from side-to-side.

**NOTE:** The coach **MUST** be running and the parking brake **MUST** be engaged for the Class C Hydraulic Leveling System to operate.

**NOTE:** Coach requires a minimum of 9.5V DC to perform manual leveling.

1. Press Power Button (Fig. 1K) to turn system on.
2. Press UP or DOWN button (Fig. 1A and 1B) to scroll through features to "MANUAL MODE" in display.
3. Press ENTER (Fig. 1C).
4. Press FRONT button (Fig. 1H) to extend front jacks to the ground; press REAR button (Fig. 1I) to run rear jacks to the ground and level the coach front-to-back.
5. Press appropriate LEFT or RIGHT button to level the coach from side-to-side. Red lights next to the buttons on the touchpad will indicate which side(s) of the coach needs to be raised to achieve level condition.

**NOTE:** The front jacks will work in pairs, e.g., FRONT button operates both front jacks, etc.

**NOTE:** The right and left rear jacks are used to level the coach side-to-side. Pressing the LEFT button (Fig. 1G) on the touchpad will extend left rear jack. Pressing the RIGHT button (Fig. 1J) on the touchpad will extend the right rear jack.

6. Repeat steps 4 and 5 as needed.
7. Turn power off to leveling system by pressing Power Button (Fig. 1K).
8. Visually inspect all jacks to ensure all footpads are touching the ground. If one of the rear jack footpads is not touching the ground, press the corresponding LEFT or RIGHT arrow buttons to lower the non-compliant jack to the ground.

### Jack Retract Procedures

## **CAUTION**

**Check to make sure all jacks are fully retracted before travel.**

1. Energize the system by pressing Power Button (Fig. 1K) on touchpad. The LCD screen will display "READY Jacks: Down."
2. Press UP or DOWN button (Fig. 1A) to display "Auto Retract All" on the screen.
3. Press ENTER (Fig. 1C) to begin.

**NOTE:** Auto retract feature can also be initiated by pressing and holding the RETRACT button (Fig. 1D) for one second.

**NOTE:** To stop the jacks from retracting, turn the system off and back on again by pressing the Power Button (Fig. 1K) twice. The coach can then be manually leveled by following steps 1-9 in the MANUAL LEVELING PROCEDURE section. Press "ENTER" to acknowledge.

4. The jacks will retract and shut off automatically; the display will read "READY - Jacks: Up." Press the "ON/OFF" button (Fig. 1K) on the touch pad to de-energize the system. After a brief visual inspection around the coach to verify the jacks are fully retracted, you may proceed to travel.

5. To retract in the manual mode, press the RETRACT button (Fig. 1D) until it lights. Pressing the FRONT or REAR jack buttons will operate front or rear jacks in pairs. Pressing the RIGHT or LEFT jack buttons will operate the right or left rear jacks individually.

**NOTE:** To enter the manual mode, refer to Manual Leveling Procedure section.

## Manual Override of The Power System and Jacks

In the event that the jacks do not retract, the valves can be manually overridden.

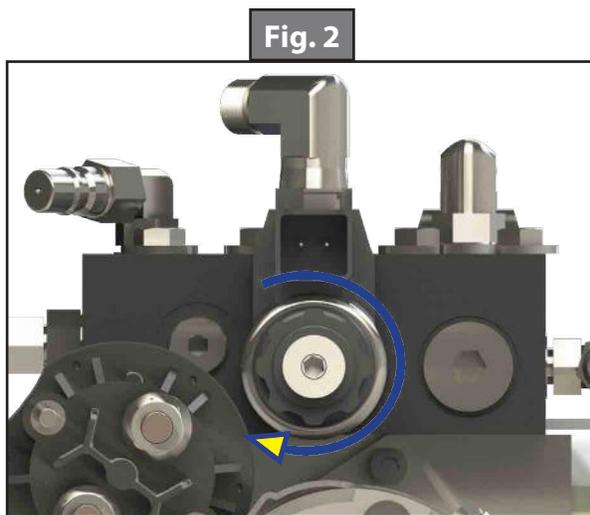
**NOTE:** Valves should be opened prior to operating them with any auxiliary power device.

The Class C Hydraulic Coach Leveling System can be run with auxiliary power devices, like cordless or power drills. In the event of electrical or system failure, this manual method of retracting the jacks can be used. A standard handheld drill is all that is required.

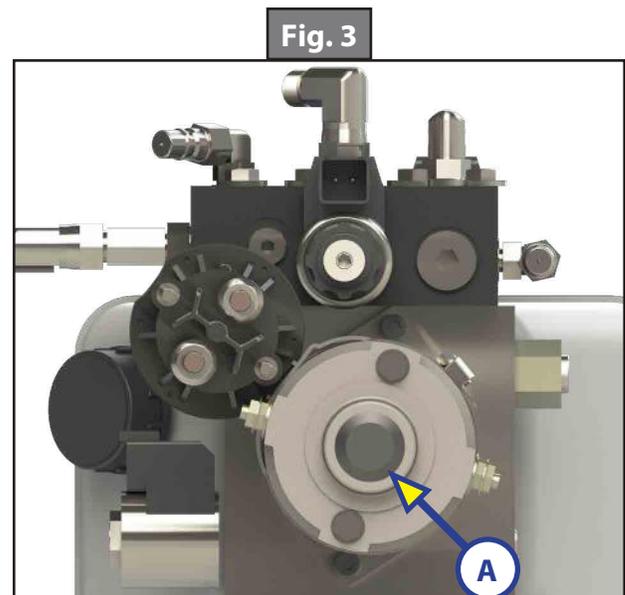
### **⚠ WARNING**

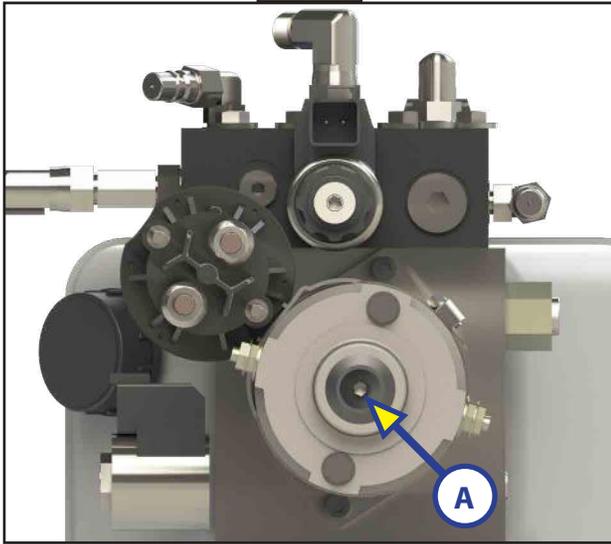
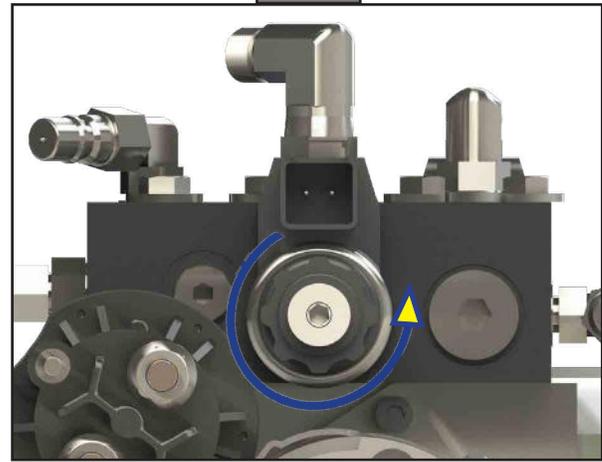
**Do not overtighten override set screws as this can damage the valves.**

1. Use a  $\frac{5}{32}$ " hex wrench to turn the manual override on the valve clockwise (Fig. 2).
2. Remove plastic cap (Fig. 3A).
3. Disconnect or shield power cables on the motor.
4. Unplug the harness wire to the directional valve. See Wiring Diagram.
5. Using a  $\frac{1}{2}$ " socket and auxiliary drive device, e.g. cordless or power drill, insert  $\frac{1}{2}$ " socket onto the coupler (Fig. 4A) found under plastic cap (Fig. 3A).
6. Run drill in reverse or counterclockwise to retract jacks.
7. Turn the manual override on the valves counterclockwise (Fig 5).



**Clockwise for manual override**



**Fig. 4****Fig. 5****Counterclockwise for normal operation**

### Automatic Safety Shutoff

If the touch pad is left on and inactive for 4 minutes it will shut off automatically. To reset the system, the coach ignition must be turned off, then back on, and the ON/OFF button (Fig. 1K) must again be pressed.

### Drive Away Protection System

If the ignition is in the "RUN" position, jacks are down, and the operator releases the parking brake, all indicator lights will flash and the alarm beeper will activate. The system will then automatically retract the jacks until the jacks are fully retracted or the operator resets the parking brake.

### Jacks Up Verification

If the ignition is in the "RUN" position, the parking brake is released, and the vehicle is in motion, the system may activate the power unit to ensure that the retract pressure is high enough to keep the jacks fully retracted. The LCD screen will say "JACKS UP VERIFICATION" until the retract pressure has returned to normal. If the touch pad was previously off, the touch pad will shut off again. No beeping will occur and the "JACKS DOWN" dash light will not illuminate.

# Troubleshooting

## Error Mode

1. If an error occurs before or during operation, the error will be displayed in the LCD screen and an alarm will sound. To reset common ERROR displays, press ENTER (Fig. 1C).

**NOTE:** To reset "Return for Service" errors, press "ENTER" (Fig. 1C) and "RETRACT" (Fig. 1D) simultaneously.

2. All normal functions will be disabled when the system is in error mode.

## Excess Slope

1. The control will not operate at extreme slopes, e.g. 3.5 degrees fore and aft and 3.5 degrees side-to-side.

2. If the coach indicates "EXCESS ANGLE" or "OUT OF STROKE" during an auto level cycle, move the coach to a more level spot.

| Error Codes   |   |  |
|---|---|--|
| LCD Message   | What Is Happening?  | What Should Be Done?   |
| Excess Angle  | Coach not parked on level ground. Zero point incorrectly calibrated.                        | Move coach to level ground prior to starting auto level sequence. Recalibrate Zero Point.                  |
| Out of Stroke   | Jack has insufficient length to complete the leveling procedure.                            | Check the disposition of the jack.   |
| Low Voltage   | Battery voltage dropped below 9.5V DC during operation.                                     | Turn engine on, check battery voltage under load.  |
| Function Aborted  | A button was pressed on touch pad during Auto Level operation.                              | Hit enter to acknowledge. Restart procedure.   |
| Unable to Finish Leveling                                       | Excessive movement inside coach during auto level sequence.                                 | Discontinue movement inside coach during auto level sequence.  |
| Engage Park Brake   | Parking brake not set prior to starting auto level sequence.                                | Set parking brake prior to starting auto level sequence.   |
| Comm Error<br>Check Wiring<br>NOTE: Screen will not back light. | Wiring connections loose or faulty between touch pad and controller.                        | Check connections, replace communication harness if necessary.   |
| Retract Timeout<br>Return Levelers for Service                  | Pressure switch did not sense retract pressure and pump timed out. Leaking hose or fitting. | Return levelers for service. Check for leaks, repair if necessary. Press enter and retract to clear error. |
| Excessive Angle   | Occurs only in manual mode when the angle of the unit is too severe.                        | Use the manual functions to return coach to a more level condition.  |

## User Alarm Mode

If the alarm system detects that the parking brake has been disengaged while at least one jack is not fully retracted and the sensor value changes in any axis more than a predefined amount, the touch pad will buzz and the LED will signal this error to the user. The system will perform an automatic retract. No other features are available in this mode.

## Miscellaneous

1. The leveling system will automatically shut off after being idle for 4 minutes.
2. A "Re-Level" feature is programmed into the controller. If the jacks are extended and the user presses "AUTO LEVEL" again the system will re-level from that point. The system will not retract before performing the re-level.
3. System will refuse any operation when a low voltage condition is present.
4. System will automatically alarm and retract if park brake is disengaged and jacks are not retracted with any change in sensor readings. In alarm mode, the only available feature is to retract all jacks.

## Low Voltage Signal

1. The vehicle requires 12.75V DC to operate in the AUTO mode. If the voltage is too low, the screen will display "LOW VOLTAGE."
2. Minimum Voltage - If voltage drops below 9.5V DC during AUTO or MANUAL operation, "LOW VOLTAGE" will appear in the screen and the system will cease operating.

**NOTE:** Coach will operate in manual mode between 9.5V DC and 12.75V DC.

| Troubleshooting   |  |  |
|---|--|--|
| What Is Happening?  | Why?   | What Should Be Done?   |
| System will not turn on and the on/off indicator light does not illuminate.                                     | Coach ignition is not in RUN position.                           | Turn ignition to RUN position.   |
|   | Touch pad has been on for more than 4 minutes and has timed out. | Turn ignition OFF and then back ON.  |
| Touch pad turns on but turns off when jack directional buttons are pressed or touch pad displays "low voltage." | Blown fuse.  | Check and replace faulty fuse(s).  |
|   | Low voltage on battery.  | Start coach to charge battery.   |
| Touch pad turns on, coach will not auto-level, "Jacks Down" displayed, jacks are retracted.                     | Low fluid level.   | Check fluid level in reservoir, if fluid is low, add fluid to 1/2" from top of reservoir with jacks retracted. If "JACKS DOWN" light remains on, call Customer Service.                              |
| Jacks will not extend to ground, pump is running.   | Little or no fluid in reservoir.                                 | Add fluid as recommended.  |
|   | Cartridge valve is inoperative.                                  | Clean, repair, or replace.   |
|   | Electronic signal is lost between controller and solenoid.       | Trace wires for voltage drop or loss and valves signal. Repair or replace necessary wires or replace control pad.  |
| Any one or two jacks will not retract.  | Hose damaged or unconnected.                                     | Replace with new hose or reconnect hose.   |
|   | Cartridge valve inoperative.                                     | Replace inoperative cartridge valve.   |
|   | Electronic signal is lost between controller and solenoid.       | Attempt to retract jacks in MANUAL mode. If successful, replace touch pad; if not, test for voltage drop between touch pad control and valve, repair bad wiring or replace defective board or valve. |
| "READY - Jacks: Up" does not display when all jacks are retracted.  | Low fluid level.   | Add fluid as recommended.  |
|   | Retract pressure switch inoperable.                              | Check connection or replace pressure switch.   |
| Alarm sounds and "Jacks Down" light starts flashing while traveling; jacks are fully retracted.                 | Low fluid level.   | Add fluid as recommended.  |
|   | Retract pressure switch inoperable.                              | Check connection or replace pressure switch.   |
| Coach drifts down after jacks are extended. Jack bleeds down after being retracted.                             | Possible fluid leak.   | Check for fluid leaks and repair or replace components as necessary.   |
|   | Valve manual override open.                                      | Close override, see Manual Override of The Power System and Jacks.   |
| Touch pad powers up; screen displays "Low Voltage."   | Loose ground wire at power unit.                                 | Check for loose wires.   |
|   | Engine not running.  | Start coach engine.  |
| No power to touch pad.  | Tripped circuit breaker.   | Reset.   |
|   | Circuit protection tripped.                                      | Replace circuit protection.  |
|   | Ignition not "ON".   | Turn ignition "ON".  |
| Auto level function does not finish.  | Error code "Unable to finish leveling."                          | Move coach to a more level site.   |

## Maintenance

### 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](#). To obtain this Technical Information sheet on-line, go to <http://www.lci1.com/support-lci4a3lcd>. Then click on the Technical Information Sheets tab. Look for *TI-188: Hydraulic Operation Fluid Recommendation* within the listing.

**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.

### Preventive Maintenance

1. Check hydraulic fluid in reservoir every 12 months. If fluid is a clear, red color do not change. If fluid is milky, pink and murky and not clear red in color, drain reservoir and add new fluid. Hydraulic fluid in reservoir should be changed a minimum of every five years.

**NOTE:** Check the fluid only when all the jacks are fully retracted.

**NOTE:** When checking the hydraulic fluid level, fill to within ¼" to ½" of fill spout.

2. Inspect and clean all power unit electrical connections every 12 months. If corrosion is evident, use a small amount of lubricant to remove corrosion. Contacts must be cleaned with a non-residue cleaner prior to use. LCI recommends the use of an electrical contact cleaner spray.
3. Remove dirt and road debris from jacks as needed.

### **⚠ WARNING**

**The coach should be supported at both front and rear axles with jack stands before working underneath. Failure to do so may result in death, serious personal injury, severe product or property damage.**

4. If jacks are down for extended periods of time, it is recommended to spray exposed jack rods with a dry silicone lubricant every three months for protection. If the coach is located in a salty environment, it is recommended to spray the rods every 4 - 6 weeks.

# POWER TONGUE JACK

## LEVELING AND STABILIZATION

### Product Information

This manual provides general service and maintenance procedures. Many variables can change the circumstances of the service procedure, ie., the degree of difficulty involved in the service operation and the ability level of the individual performing the operation.

This manual cannot begin to plot out procedures for every possibility, but will provide the general instructions for effectively servicing the vehicle. In the event the skill level required is too high or the procedure too difficult, a certified technician should be consulted before performing the necessary service.

Our 3,500 lbs. capacity Power Tongue Jacks make lifting and lowering a trailer so easy. With just the flip of the switch, the power tongue jack lifts a trailer with ease.

Helical cut gears reduce noise and improve operating efficiencies, and four LED lights makes setting up camp simple, day or night. The owner's manual for the trailer may have more procedures for service and maintenance.

**NOTE:** The Power Tongue Jack is designed for vertical movement of the trailer only.

## Safety

### **WARNING**

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

### **WARNING**

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

### **WARNING**

Failure to correctly service the vehicle may result in death, serious injury or property damage.

### **WARNING**

- Never allow anyone unfamiliar with this product to install, operate or service this product.
- Never lift or level the trailer without a properly installed footpad.
- Never crank the jack or couple the trailer without preventing the trailer from rolling.
- Never exert excessive side forces to the power tongue jack.
- Never allow anyone, including the operator, to put any body parts under the power tongue jack or the supported load during jack operation.
- Never drop the trailer off the hitch ball.
- Never exceed the load capacity.
- Never use the power tongue jack to lift the trailer for service or tire change.
- Never move the trailer before the power tongue jack is fully retracted.
- Never use the power tongue jack unless the footpad clevis pin and hairpin cotter pin are fully inserted through both sides of the jack’s inner tube.

## Operation

**NOTE:** The ON and OFF light switch (Fig. 2) controls the power tongue jack's light only. If left on for an extended period of time, the light will drain the trailer's battery.

**NOTE:** The power tongue jack is designed for vertical movement of the trailer only.

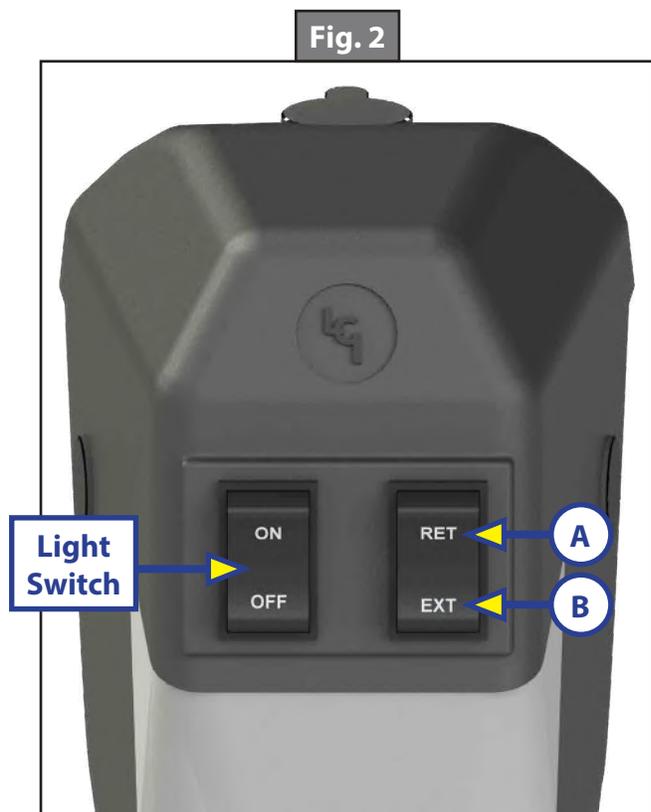
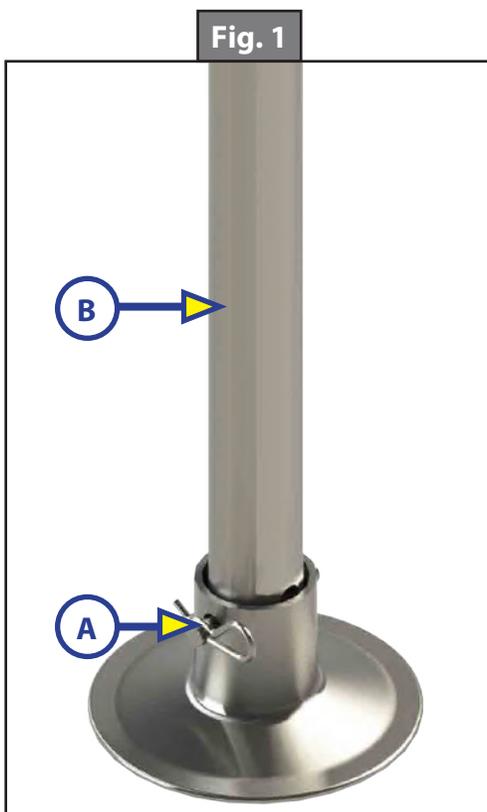
### Unhitching From Tow Vehicle

1. Chock the tires of the trailer.
2. Make sure the footpad of the power tongue jack is pinned securely in place with the clevis pin and hairpin cotter pin (Fig. 1A).
3. Make sure the ground surface under the power tongue jack is firm and level.
4. Push EXT (Fig. 2B) to extend the power tongue jack until the footpad touches the ground and the coupler clears the hitch ball.
5. Disconnect all electrical and mechanical connections between the trailer and tow vehicle.
6. Move the tow vehicle away from the trailer.
7. Push RET (Fig. 2A) as needed to return the front of the trailer to level.

### Hitching to Tow Vehicle

1. Chock the tires of the trailer.
2. Press EXT (Fig. 2B) if needed to allow the coupler to clear the hitch ball.
3. Push RET (Fig. 2C) to retract the power tongue jack until the coupler properly mounts the hitch ball and the leg of the power tongue jack is fully retracted.

**NOTE:** Make sure the leg of the power tongue jack (Fig. 1B) is fully retracted prior to moving the tow vehicle.

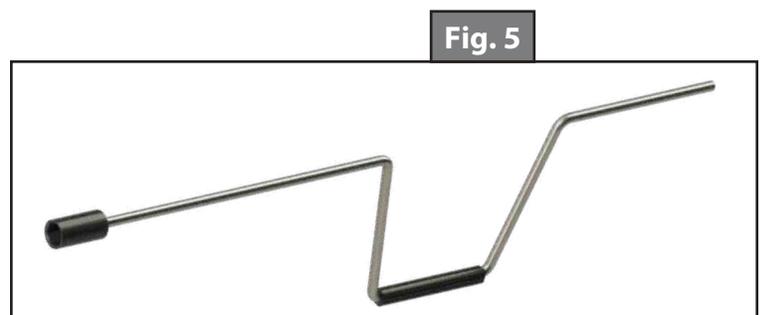
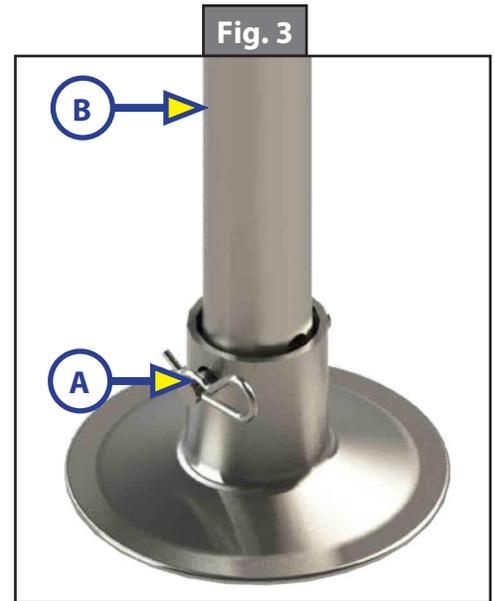


## Manual Operation

**NOTE:** In the event of loss of power, the power tongue jack can be operated manually.

1. Manually Unhitching from Tow Vehicle
  - A. Chock the tires of the trailer.
  - B. Be sure the footpad of the power tongue jack is pinned securely in place with the clevis pin and hairpin cotter pin (Fig. 3A).
  - C. Make sure the ground surface under the power tongue jack is firm and level.
  - D. Open the rubber plug (Fig. 4A) on top of the power tongue jack's gearbox to expose the manual drive shaft.
  - E. Insert the manual crank handle (Fig. 5).
  - F. Turn the handle clockwise until the trailer is supported and the coupler clears the hitch ball.
  - G. Move the tow vehicle away from the trailer.
  - H. Lower the trailer until it is level by turning the crank handle counterclockwise.
  - I. Remove the crank handle (Fig. 5).
  - J. Replace the rubber plug (Fig. 4A).
2. Manually Reconnecting to Tow Vehicle
  - A. Chock the tires of the trailer.
  - B. Be sure the footpad of the power tongue jack is pinned securely in place with the clevis pin and hairpin cotter pin (Fig. 3A).
  - C. Open the rubber plug (Fig. 4A) on top of the power tongue jack's gearbox to expose the manual drive shaft.
  - D. Insert the manual crank handle (Fig. 5).
  - E. Turn the crank handle counterclockwise until the coupler properly mounts the hitch ball and the leg of the power tongue jack is fully retracted.
  - F. Remove the crank handle (Fig. 5).
  - G. Replace the rubber plug (Fig. 4A).

**NOTE:** Be sure the leg (Fig. 3B) of the power tongue jack is fully retracted prior to moving the tow vehicle.



## Troubleshooting

### Fuse

1. The power tongue jack has a motor, clutch and a 30A fuse. The 30 Amp fuse will be located in-line and will need to be replaced with a 30A ATO-type fuse if it blows.
2. The battery must be fully charged prior to operating the power tongue jack. Low voltage from the battery will cause the fuse to blow prematurely.
3. The ON and OFF switch (Fig. 2) controls the power tongue jack's light only. If left on for an extended period of time, the light will drain the trailer's battery.

### Clutch

The clutch will slip under two conditions:

1. The power tongue jack has reached its extend or retract limit.
2. The tongue weight of the trailer has exceeded the capacity limits of the power tongue jack.
  - A. Items stored in the trailer can vastly influence the weight distribution of the power tongue jack. Reorganize stored items if the power tongue jack motor clutch continues to slip.
  - B. Release the switch immediately when the clutch noise occurs. The clutch is the overload protection for the motor. The clutch should not slip during normal operation. This will cause excessive wear on the clutch and the motor.

## Additional Information Sources

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.

iTunes®, iPhone®, and iPad® are registered trademarks of Apple Inc.

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

### Introduction

The Aftermarket Smart Jack features a high-efficiency motor, a new streamlined plastic shroud, and a new user interface. These features, along with the single power lead and the hitch height memory, give the end user a perfect reason to replace the traditional tongue jack with a far superior product.

### Safety Requirements

Warning, Caution and Danger symbols indicate that an installation procedure has a safety risk involved and may cause death, serious injury or property damage if not performed safely and within the parameters set forth in this manual. Always wear eye protection when performing this installation procedure. Other safety equipment to consider would be hearing protection, gloves, and possibly a full face shield, depending on the nature of the installation procedure.



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



**Moving parts can pinch, crush or cut. Keep clear at all times.**



**Lifting the unit off of the ground so that the unit's wheels are not touching the ground will create an unstable and unsafe condition. Severe property damage, serious injury or death could occur. Keep people and pets clear of the unit and work area while operating the leveling system.**

### Preparation

Be sure to park the unit on solid, level ground. Clear all jack landing locations of debris and obstructions. Locations should also be free of depressions. When parking the unit on extremely soft surfaces, utilize load distribution pads under each jack. Make sure tires are chocked.

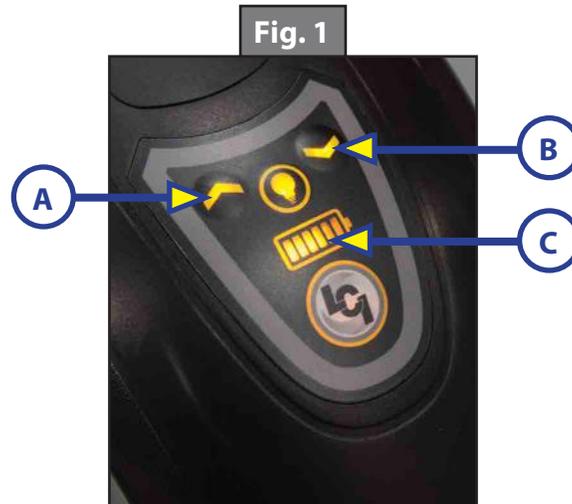
## Powered Operation

The hitch height **MUST** be set in the memory prior to normal operation of the Smart Jack. If the hitch height is not set in the memory, the Smart Jack and trailer will not function as intended.

**NOTE:** The battery indicator light (Fig. 1C) flashes or oscillates to validate certain functions of the Smart Jack. The light also displays the remaining battery charge of the trailer.

### Setting Hitch Height Memory

1. Press and hold the up arrow (Fig. 1A) and down arrow (Fig. 1B) at the same time for a minimum of five seconds to store the vertical position of the Smart Jack.
2. The battery indicator lights (Fig. 1C) will flash five times to show that the new position has been successfully stored in memory.



### Normal Operation

1. Press and hold the up arrow (Fig. 1A) to extend the Smart Jack.
2. Press and hold the down arrow (Fig. 1B) to retract the Smart Jack.

### Return to Hitch Height Operation

1. Press and release the up arrow (Fig. 1A) and the down arrow (Fig. 1B) at the same time 3 times, holding on the 3rd time for several seconds until the jack engages and the indicator light oscillates back and forth.
2. The Smart Jack will automatically extend or retract to the original hitch height position stored in the memory.

**NOTE:** Visual indication that the jack is actuating to the hitch height is seen through the oscillation of the battery indicator lights (Fig. 1C) (e.g., lights will illuminate left to right, and then right to left). Battery indicator light oscillation will continue until the original hitch height is achieved.

3. To cancel an action, press either the up arrow or down arrow. The action in progress will stop.

### Auto Retract Operation

**NOTE:** This function should only be operated once the tow vehicle has been reconnected and secured to the trailer prior to travel.

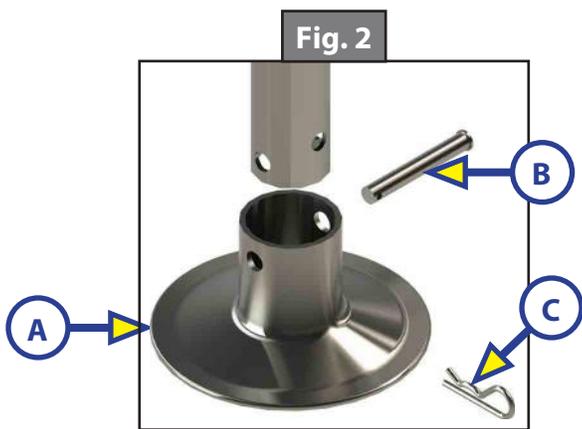
1. Press and release the down arrow three times (Fig. 1B), holding on the 3rd time until the jack engages and the battery indicator light oscillates back and forth.

## Manual Operation

If 12V DC power is unavailable to operate the Smart Jack, use the following directions to manually operate the Smart Jack.

### Unhitching From Tow Vehicle

1. Chock the tires of the trailer.
2. Be sure the footpad (Fig. 2A) of the Smart Jack is pinned securely in place with the Clevis Pin (Fig. 2B) and Hairpin Cotter Pin (Fig. 2C).
3. Make sure the ground surface under the Smart Jack footpad is firm and level.
4. Remove the manual drive shaft plug (Fig. 3A) on top of the Smart Jack's gearbox.
5. Insert the manual crank handle (Fig. 4) onto the manual drive shaft.
6. Turn the crank handle clockwise to extend the jack until the trailer is supported and the coupler clears the tow vehicle's hitch ball.
7. Move the tow vehicle a safe distance away from the trailer.
8. Turn the crank handle either direction as needed until front of the trailer is level.
9. Remove the crank handle (Fig. 4) from the manual drive shaft.
10. Reinsert the manual drive shaft plug (Fig. 3A).



### Hitching to Tow Vehicle

1. Chock the tires of the trailer.
2. Be sure the footpad (Fig. 2A) of the Smart Jack is pinned securely in place with the Clevis Pin (Fig. 2B) and Hairpin Cotter Pin (Fig. 2C).
3. Remove the manual drive shaft plug (Fig. 3A) on top of the Smart Jack's gearbox.
4. Insert the manual crank handle (Fig. 4) onto the manual drive shaft.
5. Turn the crank handle counterclockwise until the coupler properly mounts the hitch ball and the leg of the Smart Jack is fully retracted.

**NOTE:** The crank handle may need to be initially turned clockwise to extend the jack to clear the hitch ball prior to retracting the jack.

6. Remove the crank handle (Fig. 4) from the drive shaft.
7. Reinsert the manual drive shaft plug (Fig. 3A).

**NOTE:** Make sure the leg of the Smart Jack is fully retracted before moving the tow vehicle.

# GROUND CONTROL® 3.0 LANDING GEAR

## LEVELING AND STABILIZATION

### System Information

The Ground Control® 3.0 Landing Gear operate independently on uneven terrain. The landing gear feature minimal wiring and each will have an in-line fused link to allow the landing gear to amp out when coming into contact with the ground. The mini breakers on each landing gear also work as amp limiters. When an out-of-sync landing gear is fully retracted, the breaker will trip and allow the other landing gear to fully retract to again synchronize both landing gear. The landing gear system is for 5th wheel applications only.

### Operation



**Never attempt to operate the system without the footpad properly installed. Electric landing gear is designed for vertical operation. Excessive side loads may cause damage to the landing gear. The bolt-on pull pin MUST be inserted fully through both sides of the tube prior to use. Do not use landing gear to service the trailer or change tires. Retract landing gear completely prior to moving the trailer.**

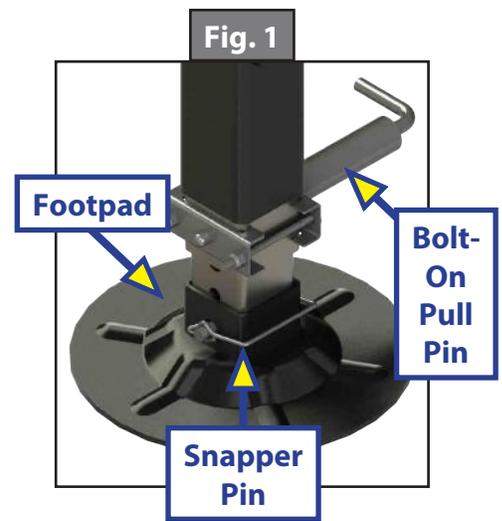
### Prior to Operation

The landing gear system should only be operated under the following conditions:

1. The trailer is parked on a reasonably level surface and the tires are chocked.
2. Be sure all persons, pets and property are clear of the trailer while the landing gear system is in operation.
3. Make sure battery is fully charged.

## Extending Landing Gear

1. Extend both landing gear to the ground by pulling the quick release bolt-on pull pins (Fig. 1).
- NOTE:** If the front of the trailer is above level, do not extend the inner legs to the ground. The trailer cannot be leveled if the front is already above level when released from the tow vehicle.
2. Make sure the bolt-on pull pins are re-engaged with the landing gear leg.
  3. Push EXT (extend) side of the LANDING LEGS CONTROL switch (Fig. 2).
  4. Unhook trailer from tow vehicle.
  5. Push and hold the EXT button to raise the landing gear to desired height.



## Retracting Landing Gear

1. Push RET (retract) side of LANDING LEGS CONTROL switch (Fig. 2).
  2. Lower trailer onto tow vehicle.
  3. Once trailer is secured, make sure the trailer is latched.
  4. Press and hold the RET button to fully retract both landing gear.
- NOTE:** Be sure to hold down the switch until both landing gear are fully retracted before pulling the bolt-on pull pins.
5. Pull the bolt-on pull pins and slide the inner legs into the outer landing gear legs.
  6. Make sure the bolt-on pull pins are re-engaged upon completion.



- NOTE:** In the event the landing gear becomes out of sync, fully retract them to resynchronize the landing gear.

## Troubleshooting

| What Is Happening?                    | What Should Be Done?  |
|---------------------------------------|---|
| Landing gear out of sync              | Fully retract landing gear to synchronize.                                  |
| Difficulty leveling trailer           | If front of trailer is above level, do not extend inner legs to the ground. |
| Switch does not activate landing gear | Test battery voltage under load. Charge or replace.                         |
|                                       | Check wiring. Repair or replace.  |

### Introduction

The Patriot Jack Systems™ are three designs for hydraulic landing gear for gooseneck trailers, including dual jack options with either one valve or two valves and a single jack option. The system features a hydraulic power unit mounted vertically on the roadside jack. Refer to jack rating for system lifting capacity and stroke length.

#### **WARNING**

**The "WARNING" symbol above is a sign that an installation procedure has a safety risk involved and may cause death, serious injury, severe product or property damage if not performed safely and within the parameters set forth in this manual.**

#### **WARNING**

**Make sure the trailer is properly supported before performing any maintenance or repair work. Follow the trailer manufacturer's recommendations for lifting and supporting the trailer. Failure to do so may result in death, serious personal injury or severe product or property damage.**

#### **CAUTION**

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

## Operation

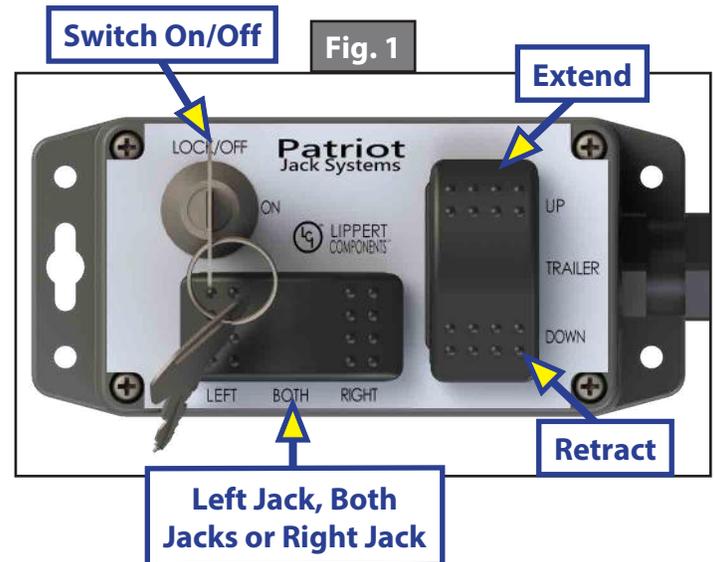
Before operating the jacks, unlock the pendant switch to activate it (Figs. 1 and 2).

**NOTE:** The switch key should always be returned to the LOCK/OFF position after operating the jacks and while towing the trailer.

### Dual Jack Two-Valve System

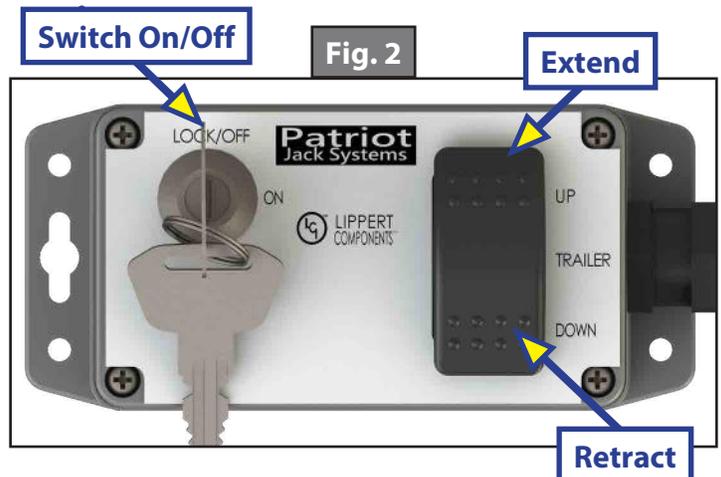
**NOTE:** The jacks can be operated independently or simultaneously.

1. Using the center portion of the switch, select the left jack (roadside) by moving the switch to the left; select both jacks by moving the switch to the center; or select the right jack (curbside) by moving the switch to the right (Fig. 1).
2. Press the rocker switch to extend the jack(s) (TRAILER UP) or retract the jack(s) (TRAILER DOWN) (Fig. 1).
3. Release the switch when either the trailer is level or stabilized or the jacks have been completely retracted.
4. Turn the key to the LOCK/OFF position.



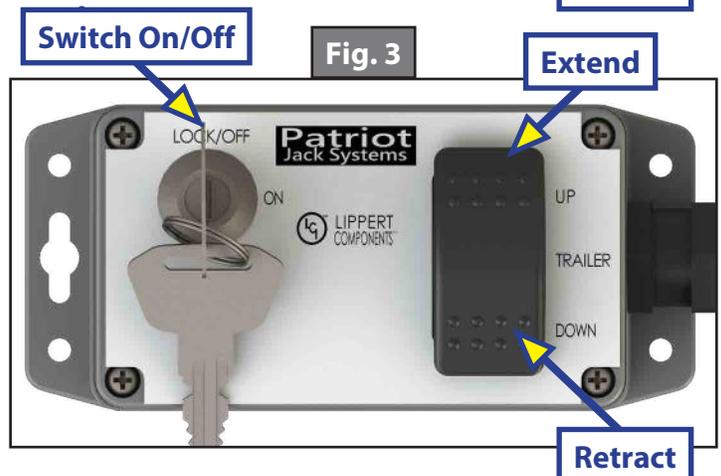
### Dual Jack One-Valve System

1. Press the rocker switch to extend the jack(s) (TRAILER UP) or retract the jack(s) (TRAILER DOWN) (Fig. 2).
2. Release the switch when either the trailer is level or stabilized or the jack(s) has been completely retracted.
3. Turn the key to the LOCK/OFF position.



### Single Jack One-Valve System

1. Press the rocker switch to extend the jack(s) (TRAILER UP) or retract the jack(s) (TRAILER DOWN) (Fig. 3).
2. Release the switch when either the trailer is level or stabilized or the jack(s) has been completely retracted.
3. Turn the key to the LOCK/OFF position.



## Preventive Maintenance

1. Check hydraulic fluid in reservoir every 12 months. If fluid is a clear red color, do not change. If fluid is milky, pink and murky and not clear red in color, drain reservoir and add new fluid. See Adding Fluid, Purging Air From Hydraulic System section.

**NOTE:** Check and fill the hydraulic fluid only when the jacks are fully retracted. Filling the reservoir when jacks are extended will cause the reservoir to overflow when jacks are then retracted.

**NOTE:** When adding hydraulic fluid, fill reservoir to the fill line.

2. Inspect and clean all power unit electrical connections every 12 months. If corrosion is evident, spray power unit electrical connectors with lubricant.
3. Remove dirt and road debris from jacks as needed.
4. If jacks are down for extended periods, it is recommended to spray exposed inner tubes with a silicone lubricant every three months for protection. If the trailer is located in a salty environment, it is recommended to spray the exposed inner tubes every four to six weeks.

## Adding Fluid, Purging Air From Hydraulic System

1. Start with all hydraulic components in the fully retracted position, i.e. the trailer is ready for travel.
2. Remove motor cover to gain access to the hydraulic reservoir. See Manual Override section.
3. Remove fill cap and check fluid level.

**NOTE:** When checking the fluid level after the 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. 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 to the fill line, fill the reservoir to the fill line at the top of the reservoir.
5. With the fluid level full and no foam in the reservoir, begin cycling the hydraulic system. Extend the jacks until the footpads touch the ground, and then immediately fully retract the jacks.
6. Check the reservoir for foam. If foam is present, see **NOTE** after step 3 and repeat steps 4 and 5.
7. Repeat these steps until no foam is present in the reservoir. If no foam is present, the system is purged of air.
8. Replace fill cap and reinstall motor cover.

## Fluid Recommendation

Type "A" automatic transmission Fluid (ATF) is to be utilized. Lippert Components, Inc. recommends ATF with Dexron III® or Mercon V® or a blend of both.

For a list of approved fluid specifications, see [TI-188](#). Or go to <https://www.lci1.com/stabilization/support-patriot-jack-systems>, click on the Technical Information Sheets tab and then select *TI - 188: Hydraulic Operation Fluid Recommendation* from the listed documents.

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

# Troubleshooting

## Troubleshooting Guide

| What Is Happening?                                     | Why?                                  | What Should Be Done?  |
|--|---------------------------------------|---|
| Switch does not activate system.                       | Low voltage.                          | Test battery voltage under load. Charge or replace.<br>Use Manual Override. |
|  | Damaged or disconnected wiring.       | Check wiring. Repair or replace.<br>Use Manual Override.                    |
|  | Tripped or blown circuit protection.  | Reset or replace circuit protection.  |
| Jacks will not extend to ground while pump is running. | Little or no fluid in reservoir.      | Add fluid as recommended.   |
|  | Cartridge valve is inoperative.       | Clean, repair or replace cartridge valve.                                   |
|  | Hose damaged or unconnected.          | Replace with new hose or reconnect hose.                                    |
| Jacks will not retract while pump is running.          | Little or no fluid in reservoir.      | Add fluid as recommended.   |
|  | Cartridge valve is inoperative.       | Replace inoperative cartridge valve.  |
|  | Hose damaged or unconnected.          | Replace with new hose or reconnect hose.                                    |
| Trailer bleeds down after jacks extended.              | Possible fluid leak.                  | Check for fluid leaks and repair or replace components as necessary.        |
|  | Cartridge valve manual override open. | Close override. See Manual Override of the system.                          |
| Jack bleeds down after being retracted.                | Possible fluid leak.                  | Check for fluid leaks and repair or replace components as necessary.        |
|  | Cartridge valve manual override open. | Close override. See Manual Override of the system.                          |

## Manual Override

In the event of electrical or system failure, the jacks can be operated manually. Unhook the hydraulic power unit motor from the power source prior to attempting the manual override procedure.

### Two-Valve System

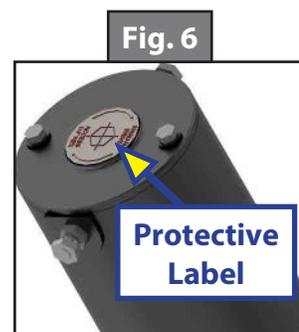
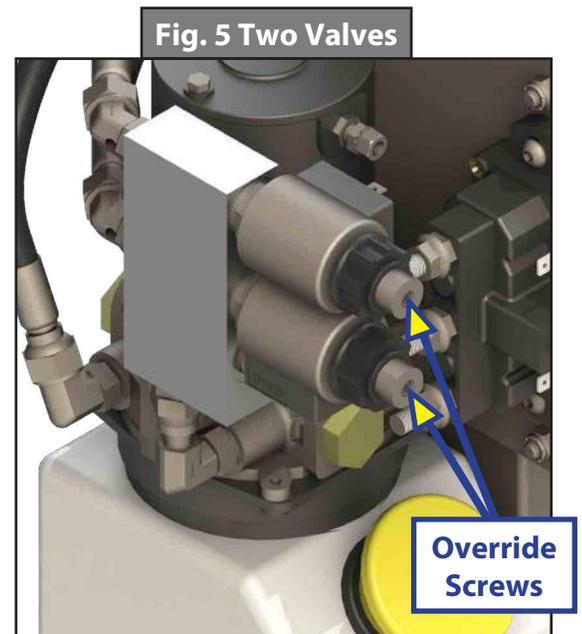
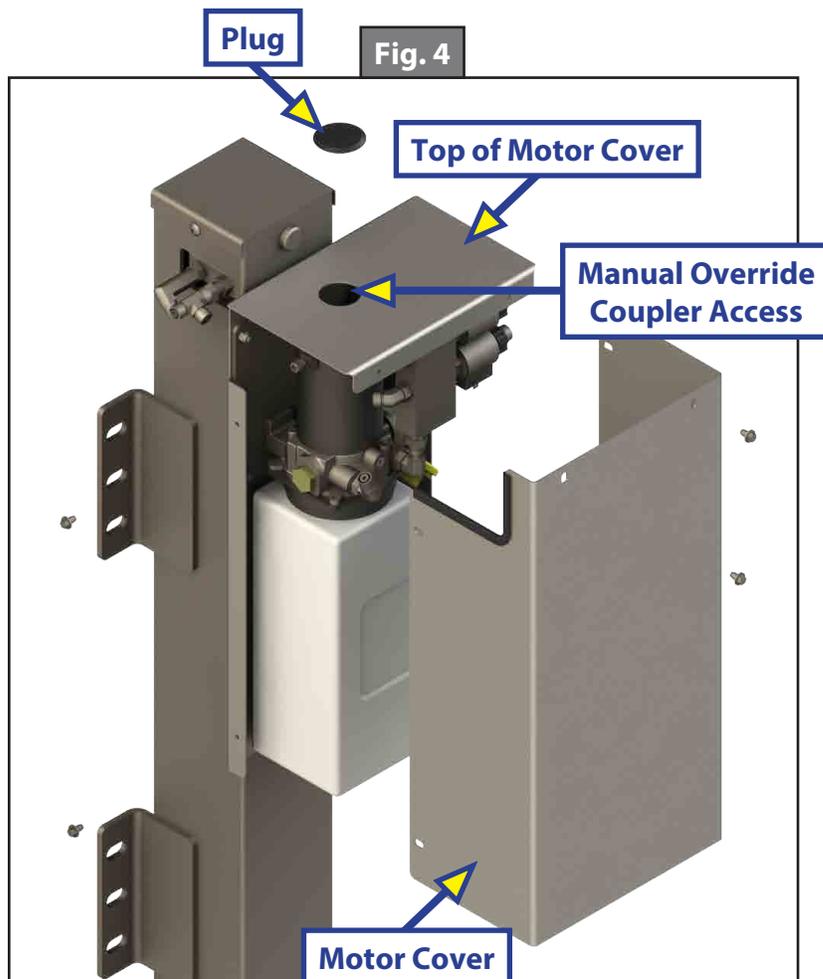
1. Remove six screws around the perimeter of the motor cover and remove cover (Fig. 4).
2. Using a  $\frac{5}{32}$ " hex wrench, open the valve(s) by turning the manual override screw(s) clockwise until it stops (Fig. 5).

**NOTE:** With the two-valve system, the jacks can be independently extended or retracted. To manually extend or retract the curbside (right) jack, open the top valve. To manually extend or retract the roadside (left) jack, open the bottom valve. To manually operate both jacks simultaneously, open both top and bottom valves.

3. Remove plug from top of motor cover (Fig. 4).
4. Remove protective label from power unit to reveal the manual override coupler (Fig. 6).

**NOTE:** Top of motor cover and wiring removed for clarity in Figs. 5, 6 and 7.

5. Using a drill with a  $\frac{1}{4}$ " hex bit, insert the hex bit into the manual override coupler (Fig. 7).
6. Run the drill clockwise to retract the jacks.
7. Run the drill counterclockwise to extend the jacks.
8. After extending or retracting the jacks, make sure to turn the override screw(s) counterclockwise until it stops.
9. Reinstall motor cover and plug.

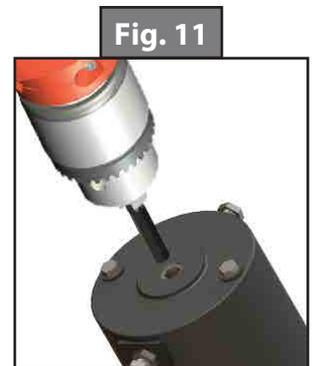
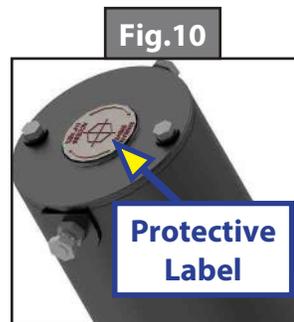
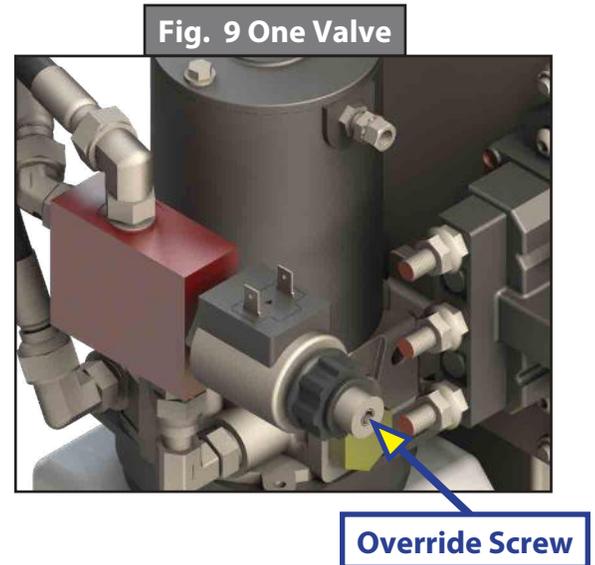
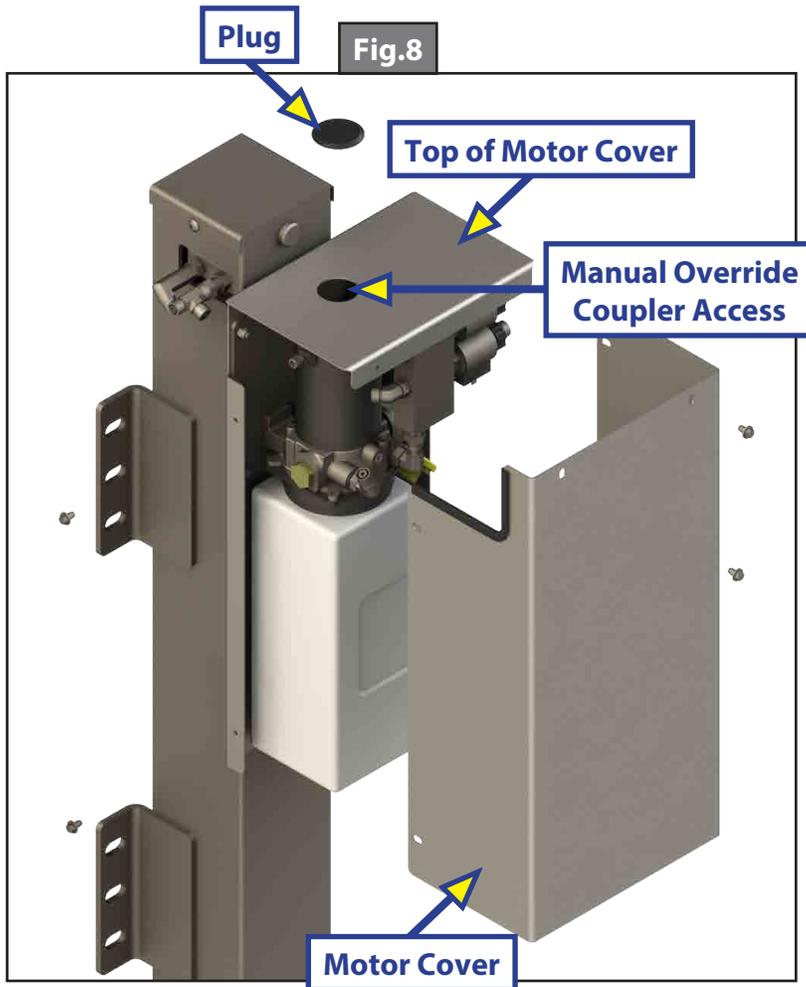


## One-Valve Systems

1. Remove six screws around the perimeter of the motor cover and remove cover (Fig. 8).
2. Using a  $\frac{5}{32}$ " hex wrench, open the valve by turning the manual override screw clockwise until it stops (Fig. 9).
3. Remove plug from top of motor cover (Fig. 8).
4. Remove protective label from power unit to reveal the manual override coupler (Fig. 10).

**NOTE:** Top of motor cover and wiring removed for clarity in Figs. 9, 10 and 11.

5. Using a drill with a  $\frac{1}{4}$ " hex bit, insert the hex bit into the manual override coupler (Fig. 11).
  - A. Run the drill clockwise to retract the jack(s).
  - B. Run the drill counterclockwise to extend the jack(s).
6. After extending or retracting the jack(s), make sure to turn the override screw counterclockwise until it stops.
7. Reinstall motor cover and plug.



# SCHWINTEK BUNK LIFT

## POWER AND MOTION

### System Information

The Schwintek Bunk Lift System is designed to raise and lower an unoccupied and unloaded bunk bed integrated into a dinette/bed setting in a stationary recreational vehicle.

Bed is not to be occupied, loaded or used for cargo storage in any way while being raised or lowered. The dinette/bed setting is not to be occupied during raising or lowering the bunk bed.

Periodic light lubrication (multi-purpose lubricant) of the gear racks may be necessary if gear chatter sounds occur due to normal wear.

## Operation

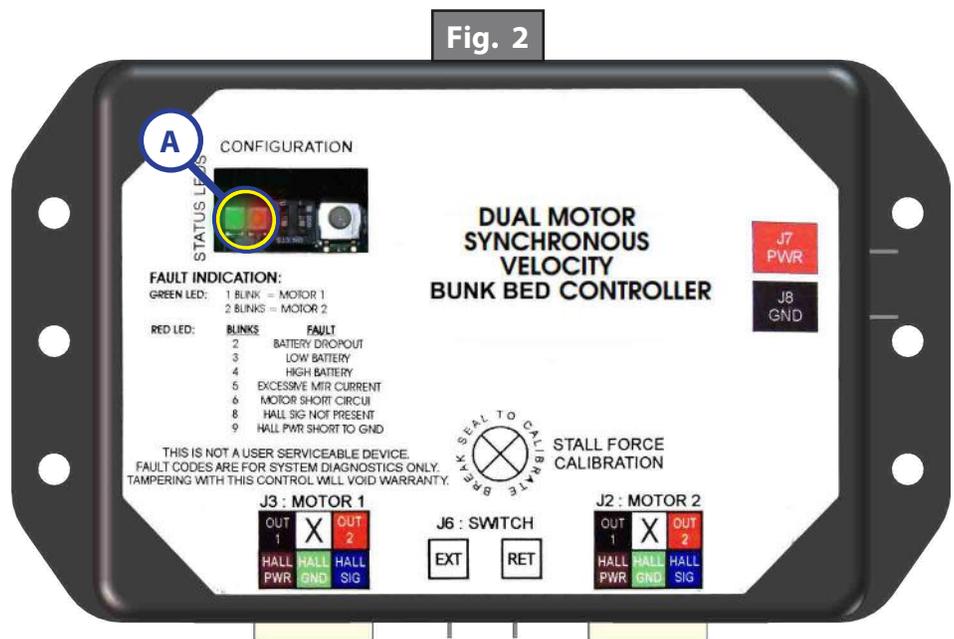
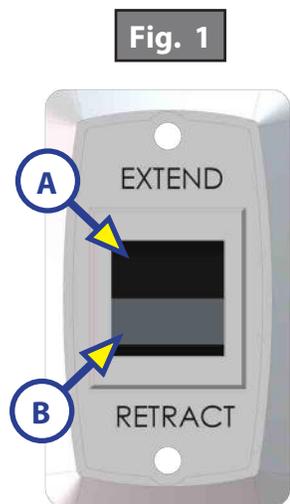
1. Press and hold the "RETRACT" button (Fig. 1B) until the Bunk Lift lowers into the rested position. Continue to press the switch for 2-3 seconds after the Bunk Lift has stopped moving.
2. Press and hold the "EXTEND" button (Fig. 1A) until the Bunk Lift raises up to the ceiling. Continue to press the switch for 2-3 seconds after the Bunk Lift has stopped moving.

**NOTE:** Holding the switch for 2-3 seconds after the mechanism stops maintains motor synchronization.

## Programming

### Homing the Bunk Lift

1. Using the wall switch, press the "EXTEND" button (Fig. 1A).
2. Quickly verify that both motors are moving in the same direction.
3. If not stop and see Troubleshooting on Page 4.
4. Allow the Bunk Lift to power all of the way up and continue pressing the "EXTEND" button (Fig. 1A) until both sides have completely stopped and the motors turn off by themselves.
5. Release the "EXTEND" wall switch and check the red and green LED lights on the controller and confirm that both are on (Fig. 2A). They will both turn off automatically after one minute.
6. If only one of the LEDs is on, go back to the wall switch, press the "RETRACT" button (Fig. 1B) for one second and release and repeat Step 1 until both LEDs are on (Fig. 2A).



# Troubleshooting

## Electronic Manual Override

**NOTE:** See (Fig. 3) 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.

## Extend and Retract Switch Connections

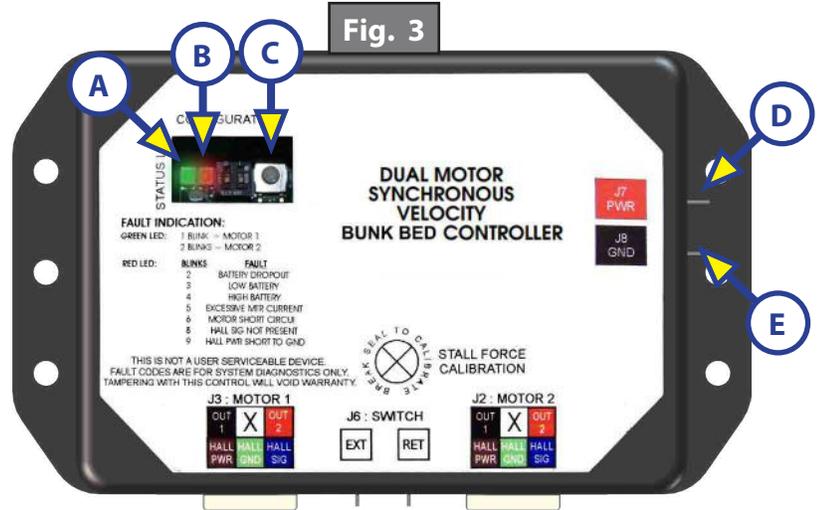
Common connection on controller goes to common connection on extend and retract switch. Extend and retract connections on the controller go to the extend and retract terminals on the switch. Switch is powered by the OEM supplied 12V DC power source.

## Power, Ground Connections at Controller

Power and ground are supplied to the controller through the spade terminals located on the right hand side of the controller (Fig. 3D, 3E). 12V DC is recommended. A 10 ga wire is the minimum size recommended. 30 Amp resettable or blade is required.

## Error Codes

During operation when an error occurs the board will use the LEDs to indicate where the problem exists. For motor-specific faults the green LED (Fig. 3A) will blink 1 time for motor 1, and 2 times for motor 2. The red LED (Fig. 3B) will blink from 2 to 9 times depending on the error code.



| Error Code  | Name                       | Description   |
|---|----------------------------|---|
| 2   | Battery Drop Out           | Battery capacity low enough to drop below 8 volts while running.                |
| 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 bunk continually stalling.           |
| 6   | Motor Short Circuit        | Motor or wiring to motor has shorted out.                                       |
| 8   | Hall Sig Not Present       | Encoder is not providing a signal, which is usually a wiring problem.           |
| 9   | Hall Power Short To Ground | Power to encoder has been shorted to ground, which is usually a wiring problem. |
| When an error code is present, the board needs to be reset. Energizing the extend/retract switch resets the board. Energize the extend/retract switch again for normal operation. |                            |   |

## Low Voltage

The Schwintek Bunk Lift Controller is capable of operating the bunk with as little as 8 volts. But at these lower voltages the amperage requirement is greater. Check voltage at the controller (Fig. 3D and 3E). If voltage is lower than 11 volts, it is recommended that the battery be placed on a charger until it is fully charged. It may be possible to "jump" the RV's battery temporarily to operate the system. Consult the RV manufacturer's owners manual on the procedure for "jumping" or charging the battery.

**NOTE:** Never "jump" or charge the battery from the power connections on the Schwintek Bunk Lift Controller. Always do this at the battery.

## Obstructions

Check inside the RV for any obstructions near the bunk. Also, check for smaller objects that may be wedged in the gear rack or in the bearing block assembly. Remove obstructions before proceeding.

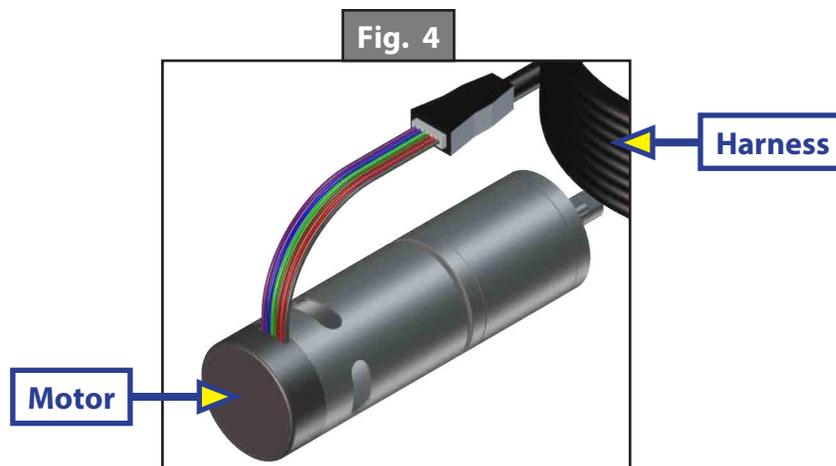
## Checking Fuses

The Schwintek Bunk Lift requires a minimum of a 30-amp fuse. Check the 12-volt fuse box for blown fuses, and replace any if necessary. Consult the RV manufacturer's documentation for the location of the 12-volt fuse box, and the location of the Schwintek Bunk Lift Controller's fuse. If the fuse blows immediately upon replacement, there is a problem with the wiring to the Schwintek Bunk Lift Controller. Have qualified service personnel check and repair.

## Motors and Harnesses

1. Check for proper connections between the motors and harnesses (Fig. 4).
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 male connector on wiring harness. Color codes on wires also match (black to black, red to red, etc.)



## Resynchronizing the Slide-Out Motors

1. Fully raise the bunk lift using the switch. Keep the switch engaged until the motors shut down on their own.
2. Lower the bunk lift 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 raise and then lower the bunk lift. Again, always let the motors shut down on their own before releasing the switch.

# SLIMRACK® BED LIFT

## POWER AND MOTION

### System Information

The SlimRack® Bed Lift Platform is a rack and pinion design operated by a 12V DC gear motor. The Bed Lift Platform was engineered to provide years of trouble-free service. Changes to weight, stroke, rail position, controller, power supply, etc. all have an effect on the performance of the system.

### Features

- Rocker switch that mounts to the wall allows bed movement and provides end user feedback.
- The control box has programmable stops that can detect faults and control the bed lift movement.
- Horizontal channel with 12V DC gear motor and gear rack arms that mounts onto the top and bottom of the bed platform.
- Provided wiring harnesses to connect the touch pad, motors and control box.

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

## Operation



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

### Prior to Operating the SlimRack Bed Lift System

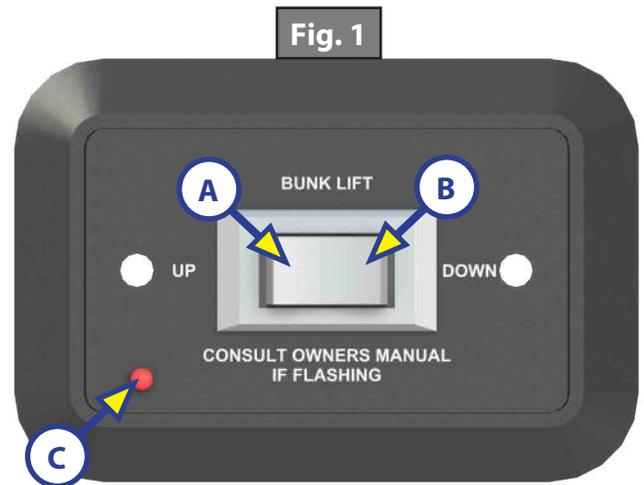
1. The engine or generator must be running or the unit must be plugged into shore power to ensure ample voltage is being supplied to the SlimRack Bed Lift control box. If installed in a non-motorized unit, make sure batteries are charged to 12V or greater.
2. Transmission must be in park or neutral (if applicable).
3. Parking brake must be set (if applicable).
4. Unit must be level.

### Raising the Bed

1. Press and hold the "UP" button on the wall rocker switch (Fig. 1A). There will be a slight delay before the bed will begin to move. This is normal.
2. Release the button when the bed is fully raised (Fig. 2) and stops moving.

### Lowering the Bed

1. Press and hold the "DOWN" button on the wall rocker switch (Fig. 1B). There will be a slight delay before the bed will begin to move, which is normal.
2. Release the button when the bed is fully lowered (Fig. 3) and stops moving.



**NOTE:** When lowering the SlimRack Bed Lift, make sure the garage area is clear of people and objects.

Fig. 2

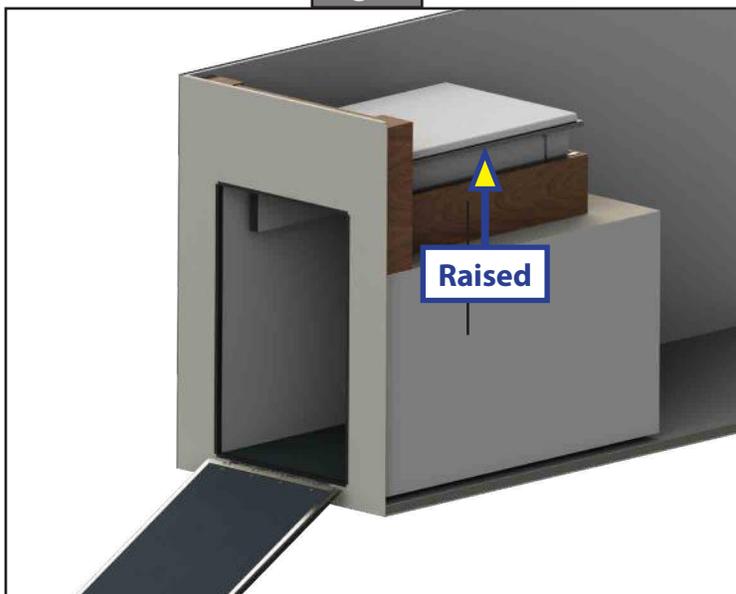
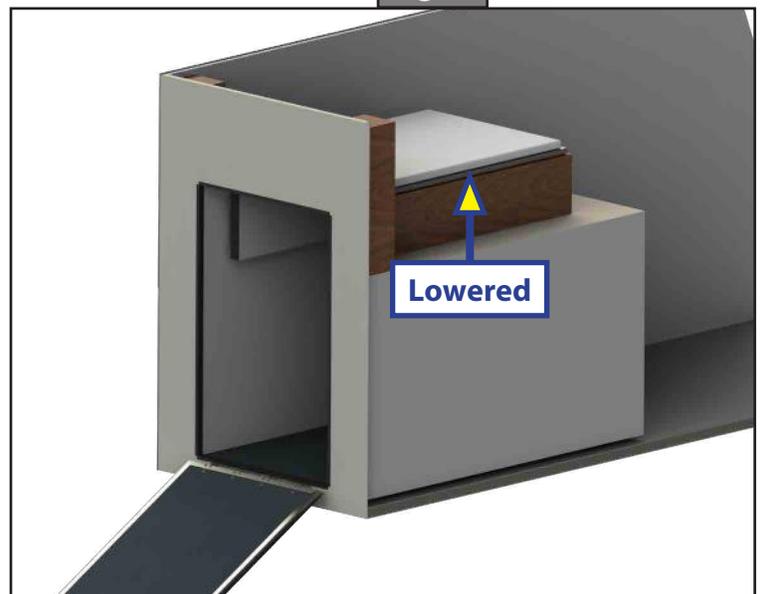


Fig. 3



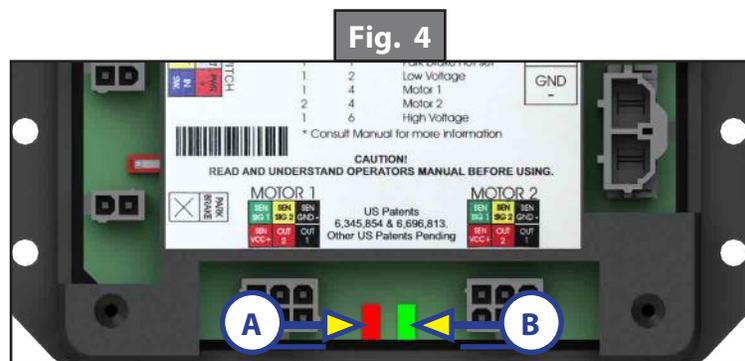
## Troubleshooting

The control box has the ability to detect and display several faults. When a fault is detected, the room movement may stop and two different LEDs on the control box will flash in a pattern.

- The Fault Code LED (Fig. 1C) on the wall rocker switch will flash RED a number of times corresponding to the number of red flashes on the control box (Fig. 4A). Refer to the troubleshooting chart below to best determine what caused the fault.
- The Motor LED (Fig. 4B) on the control box will flash GREEN a number of times corresponding to which motor had the associated fault. For example: Two GREEN flashes and four RED flashes means there is a motor fault on Motor 2.

**NOTE:** For major faults, the control will automatically enter "Emergency Jog" mode when motor movement is not detected by the control box in either direction during bed actuation. When in "Emergency Jog" mode, the control will jog both motors in the direction the rocker switch is pressed ("UP" or "DOWN"). The rocker switch may need to be pressed multiple times to fully raise or lower the bed. Take the unit to an OEM-authorized dealer for service.

**NOTE:** The control box will return to normal operation mode after five minutes of inactivity or by cycling power to the control box.



| Fault Code Flashes |           | Fault Type | Description           | Why?   | What Should Be Done?  |
|--------------------|-----------|------------|-----------------------|--|---|
| Green Flash        | Red Flash |            |                       |  |   |
| 1                  | 1         | Minor      | Parking Brake Not Set | Parking brake not set (if applicable).   | Set parking brake (if applicable).  |
|                    |           |            |                       | Ground signal lost at park brake receptacle at control box.  | Check for continuity to ground on wire plugged into park brake receptacle at control box.   |
| 1                  | 2         | Minor      | Low Voltage           | Incoming voltage to control is below 12V DC. The room will NOT move if the voltage is 10.5V DC or below. | Start vehicle or generator or make sure coach is plugged into shore power. Check 2-pin power connector at control box at BATT + and GND. Consult manufacturer of unit charging system for troubleshooting assistance. |
| 1                  | 4         | Major      | Motor 1 Fault         | Bad wire connection<br>Bad motor   | Take unit to an OEM-authorized dealer for service.  |
| 2                  | 4         | Major      | Motor 2 Fault         | Bad wire connection<br>Bad motor   |   |
| 1                  | 6         | Minor      | High Voltage          | Supply voltage to control box is 17V DC or greater.  | Consult manufacturer of unit charging system for troubleshooting assistance.  |

## Override Mode

In the event of component failure or loss of system power, the SlimRack Bed Lift can be manually overridden and lowered for travel.

**NOTE:** At any time during the override procedure, the unit will exit this mode if the bed has not been moved for five minutes.

**NOTE:** For major faults, the control will automatically enter "Emergency Jog" mode when motor movement is not detected by the control box in either direction during bed actuation. When in "Emergency Jog" mode, the control will jog both motors in the direction the rocker switch is pressed ("UP" or "DOWN"). The rocker switch may need to be pressed multiple times to fully raise or lower the bed. Take the unit to an OEM-authorized dealer for service.

**NOTE:** The control box will return to normal operation mode after five minutes of inactivity or by cycling power to the control box.

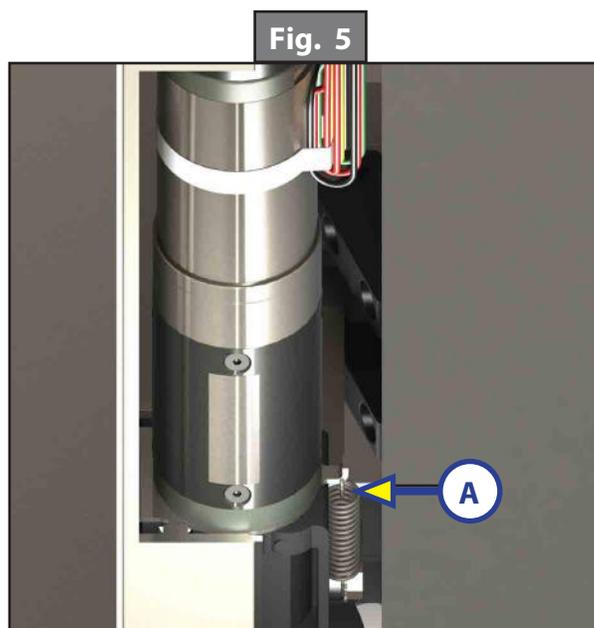
## Manual Emergency Lowering Mode

### **⚠ WARNING**

**Before removing the motors make sure the SlimRack Bed Lift platform is supported with a T-block and a floor jack. Failure to act in accordance with the following may result in death or serious personal injury.**

In the event that power is lost to the SlimRack Bed Lift motors, the bed can be manually lowered by following these steps:

1. Support the bed lift platform with a T-block and a floor jack in the inside middle of the bed platform.
2. Gain access to the motors from the bottom sides of the bed lift platform to the horizontal channel assembly. The motor in the channel is currently located toward the exit end of the trailer.
3. Remove the end of the retaining spring from the motor spring clip (Fig. 5A).
4. Unplug the motor from the harness and remove the motor by lifting it up and out.
5. Repeat steps 1-4 for the opposite side.
6. Carefully lower the bed lift platform with the floor jack and T-block until the bed lift is in the lowered position.



7. Secure the bed in place by re-installing the motors. Make sure the end of the retaining spring is re-hooked to the motor spring clip (Fig. 5A).
8. Have the SlimRack Bed Lift serviced by the OEM-authorized dealer as soon as possible. Do not operate bed until service is complete as damage to the bed may result.

## **Preventative Maintenance**

- The SlimRack Bed Lift system has been designed to require very little maintenance. To ensure the long life of the SlimRack Bed Lift system, read and follow these few simple procedures:
- When the bed is raised, visually inspect the slide rail assemblies. Check for excess buildup of dirt or other foreign material. Remove any debris that may be present.
- If the system squeaks or makes any noises, blow out any debris from the gear rack arms and apply a dry lubricant to prevent and/or stop squeaking.

# EUROLOFT™ BED LIFT

## POWER AND MOTION

### System Information

The EuroLoft™ Bed Lift distributed by Lippert Components, utilizes a unique nylon strap-based system, adaptable to a broad range of RV and heavy truck applications including cabs, living rooms, slide-out rooms and master bedrooms. The straps retract into the bed base, concealing the lifting system in the retracted position, permitting OEMs more floor plan design freedom. The nearly silent EuroLoft system is operated by a single motor that controls four support mounts to raise and lower the bed at 2.3 inches per second. The 800-pound capacity system can be customized in both size and configuration to maximize space in any motorhome, towable RV or truck cab floor plan design. The system can even “bend” to conform to wall curvatures found in some motorhome cabs.

### Safety Information

#### **WARNING**

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

#### **CAUTION**

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

### Important Safety Information

- Safety devices shall not be tampered with for any reason.
- It is strictly forbidden to be on the bed lifting system while it is being operated.
- Do not interfere with the bed lifting system while operated, neither with any objects or with hands.
- Before starting the vehicle engine and driving, always make sure the bed lifting system is in its highest position and the safety belts are fastened (excluding garage bed).
- Do not operate the system improperly (e.g. with people on it).
- The bed lifting system shall only be used by adults and responsible staff.
- It is forbidden to use the bed lifting system while the vehicle is running.
- Do not move the bed lifting system if people or animals or items are around, under or on it.
- The bed lifting system must never be used while the vehicle is running.
- It is forbidden to start the bed lift system manually with disconnected wires from motor unit to control unit.
- Should the mechanism not work, do not use the bed and ask for assistance at the next service center.

**NOTE:** Always install the bed lifting system taking into account the system maximum load. THE BED UNIT, AS A WHOLE-INCLUDING BED LIFTING SYSTEM, MATTRESS, PILLOW, BLANKETS, ETC., MUST NOT WEIGH MORE THAN 132 lbs.

**NOTE:** The bed lifting system can bear a total maximum weight of 800 lbs.

## Operation

### **⚠ WARNING**

**Always make sure that the EuroLoft Bed Lift path is clear of people, pets and objects before and during operation. Always keep away from the slide rails when the bed is being operated.**

### Prior to Operating the EuroLoft Bed Lift System

### **⚠ WARNING**

**The bed lifting system must never be used while the vehicle is in motion.**

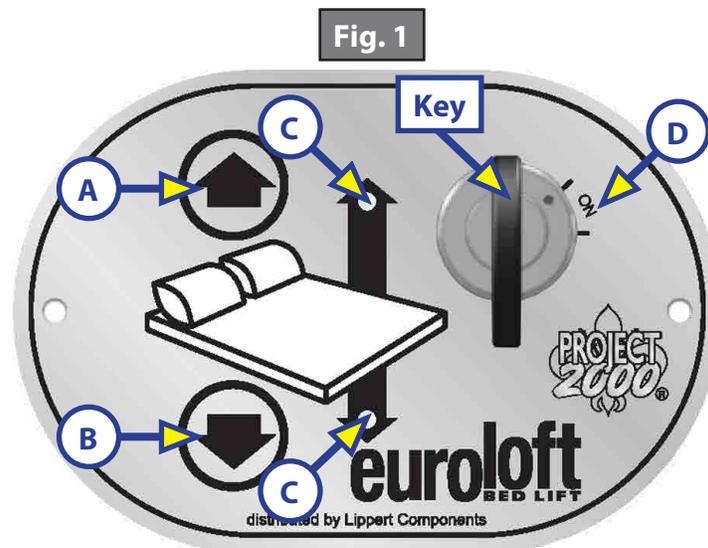
1. Make sure the vehicle is parked, secured and stabilized before starting bed lift operations.
2. Set the parking brake, if applicable.

### Lowering the Bed Lift

1. Make sure the safety belts are unfastened.
2. Turn the key switch to the ON position (Fig. 1D) located on the key pad.
3. Press and hold the DOWN arrow-shaped button (Fig. 1B) on the key pad. A green LED light (Fig. 1C) on the key pad will turn on in the direction the bed is moving. The bed will keep moving until it reaches the pre-set stop position.

**NOTE:** The bed will stop moving when the button is released. Continue to press and hold the button until the stop position has been reached.

4. Release the DOWN arrow-shaped button.
5. Turn the key to the OFF position.



## Raising the Bed Lift

1. Turn the key switch to the ON position (Fig. 1D) located on the key pad.
2. Press and hold the UP arrow-shaped switch (Fig. 1A) on the key pad. A green LED light (Fig. 1C) on the key pad will turn on in the direction the bed is moving. The bed lift will keep moving until it reaches the pre-set stop position.

**NOTE:** The bed will stop moving when the button is released. Continue to press and hold the button until the stop position has been reached.

3. Release the UP arrow-shaped button.
4. Make sure safety belts are fastened.
5. Turn the key to the OFF position.

## Troubleshooting

### **⚠ WARNING**

**Bed lifting systems may cause death, serious injury or property damage if improperly used. When operating the bed lifting system, clear operation area of obstructions. Do not reach into the bed lifting system components while the system is being operated.**

## Advanced Control System (ACS) Stop Setting Procedure

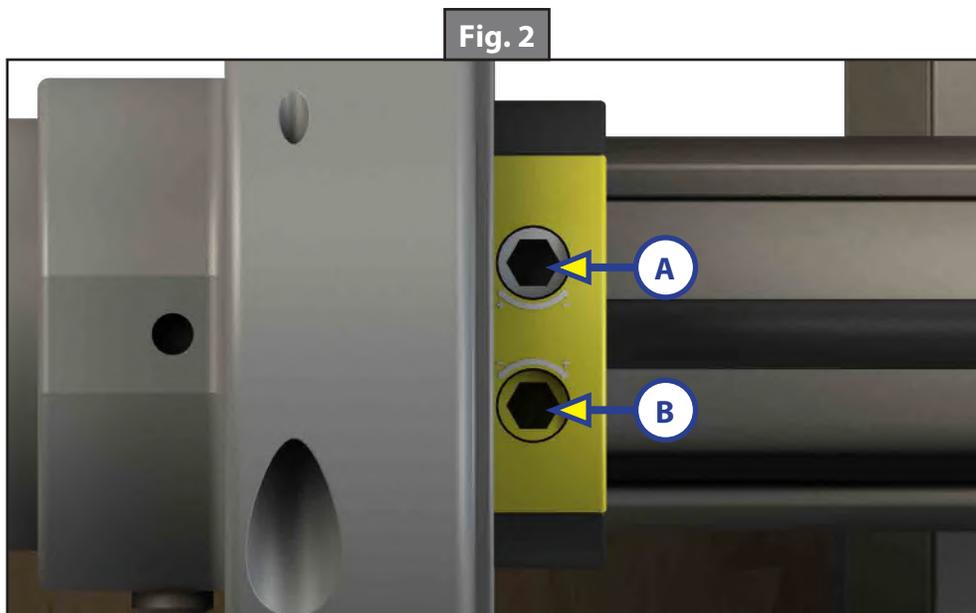
The bed lift pre-set stops for the Up and Down positions are determined at the OEM Installation. If for any reason the bed lift's up or down position needs adjusting, do the following procedures:

### **Setting the UP Position**

1. Make sure the safety belts are unfastened.
2. Turn the key switch to the ON position (Fig. 1D) located on the key pad.
3. Press and hold the UP arrow-shaped switch (Fig. 1A) on the key pad. A green LED light (Fig. 1C) on the key pad will turn on in the direction the bed is moving. The bed will keep moving until you reach the pre-set stop position.
4. If the bed lift stops too low, turn the white screw (Fig. 2A) in the ACS module counterclockwise. This will allow the bed lift to move higher. If the bed lift stops too high, turn the white screw (Fig. 2A) clockwise until the bed lift stops lower.

**NOTE:** One full rotation of the screw is approximately one inch of movement up or down.

5. Press the UP arrow (Fig. 1A) and DOWN arrow (Fig. 1B) to run the bed lift system after each adjustment of the screw. If necessary, repeat this procedure until desired stop location is obtained.



## Setting the DOWN Position

1. Make sure the safety belts are unfastened.
2. Turn the key switch to the ON position (Fig. 1D) located on the key pad.
3. Press and hold the DOWN arrow-shaped switch (Fig. 1B) on the key pad. A green LED light (Fig. 1C) on the key pad will turn on in the direction the bed is moving. The bed will keep moving until you reach the pre-set stop position.
4. If the bed lift stops too high, turn the yellow screw (Fig. 2B) counterclockwise. This will allow the bed lift to move lower. If the bed lift stops too low, turn the yellow screw (Fig. 2B) clockwise until the bed lift stops higher.

**NOTE:** One full rotation of the screw is approximately one inch of movement up or down.

5. Press the UP arrow (Fig. 1A) and DOWN arrow (Fig. 1B) to run the bed lift system after each adjustment of the screw. If necessary, repeat this procedure until desired stop location is obtained.

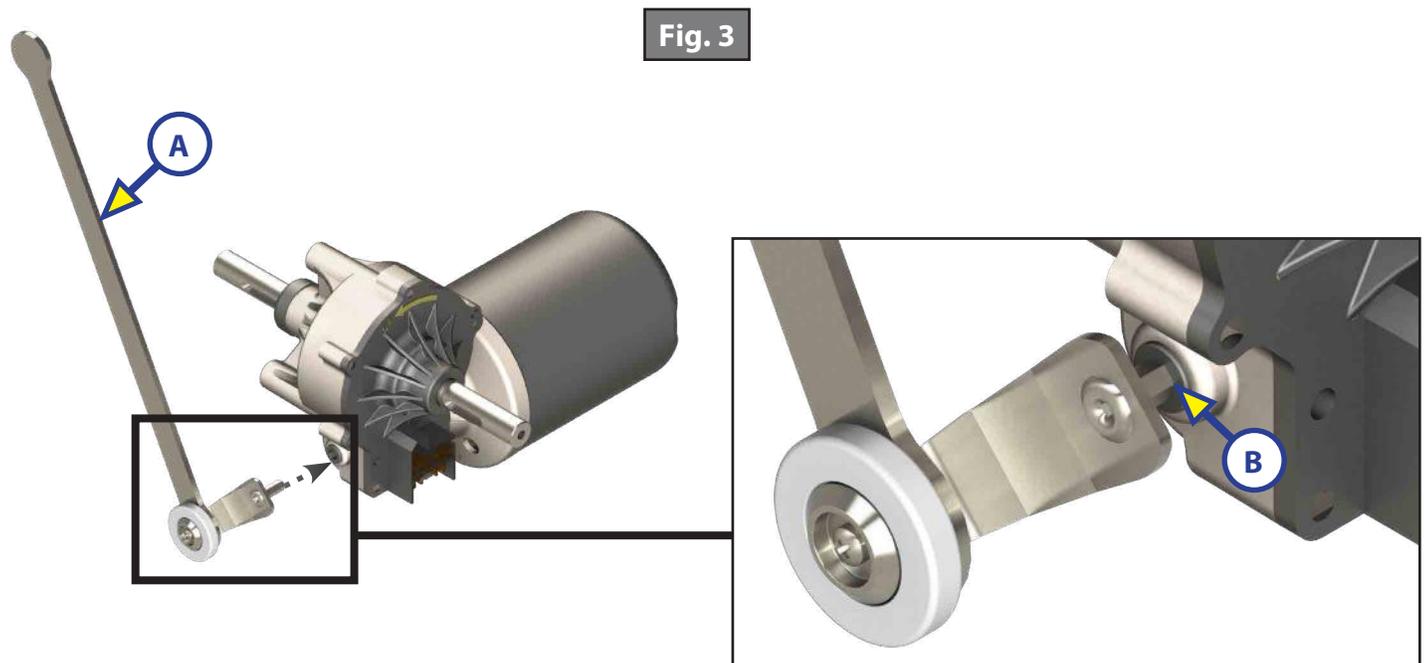
## Manual Override

### **⚠ WARNING**

**Always disconnect from power source before performing any operation on the bed lifting system.**

To raise or lower the bed lift In case of emergency, it is possible to operate the system manually.

1. Insert the provided crank device (Fig. 3A) into the motor (Fig. 3B).
2. Turn clockwise to raise or counterclockwise to lower the bed.
3. Have the bed lift serviced by an OEM-authorized dealer as soon as possible. Do not operate the bed lift until service is complete, as damage to the bed lift system may result.



## Maintenance

The EuroLoft Bed Lift system has been designed to require very little maintenance. To ensure the long life of your EuroLoft Bed Lift system, read and follow these few simple procedures:

- When the bed is raised, visually inspect the slide rail assemblies. Check for excess buildup of dirt or other foreign material. Remove any debris that may be present.
- If the system squeaks or makes any noises, blow out any debris from the drive shaft and apply a dry lubricant to prevent and/or stop squeaking.

### 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

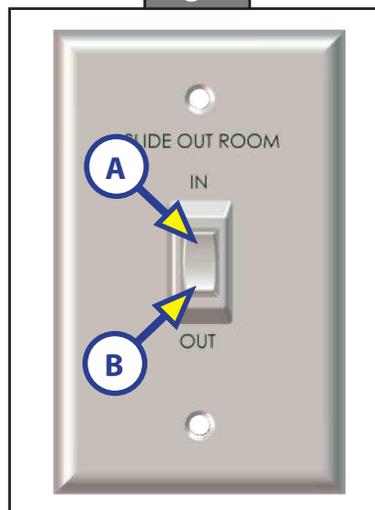
**NOTE:** In the case of a motorized unit, ignition must be off to operate the slide-out.

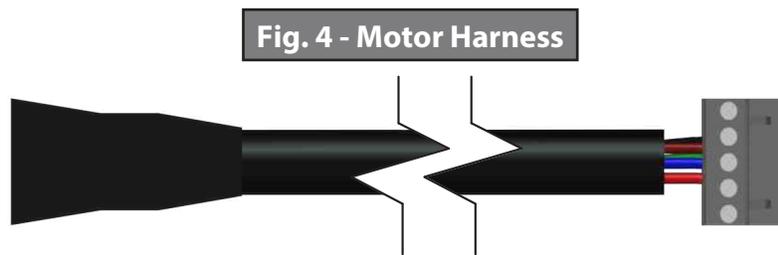
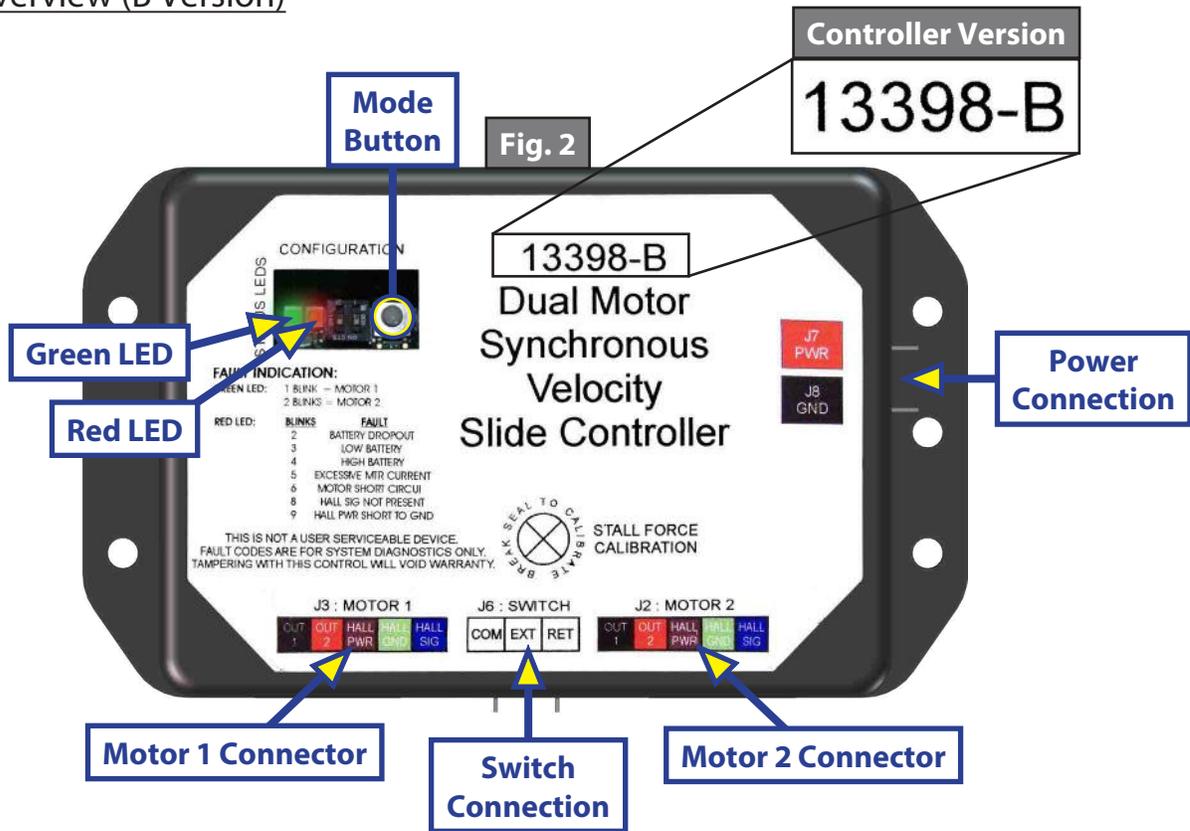
1. Press and hold the IN/OUT switch (Fig. 1A) in the IN position until the room is fully retracted and stops moving.

**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).

Fig. 1





**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.

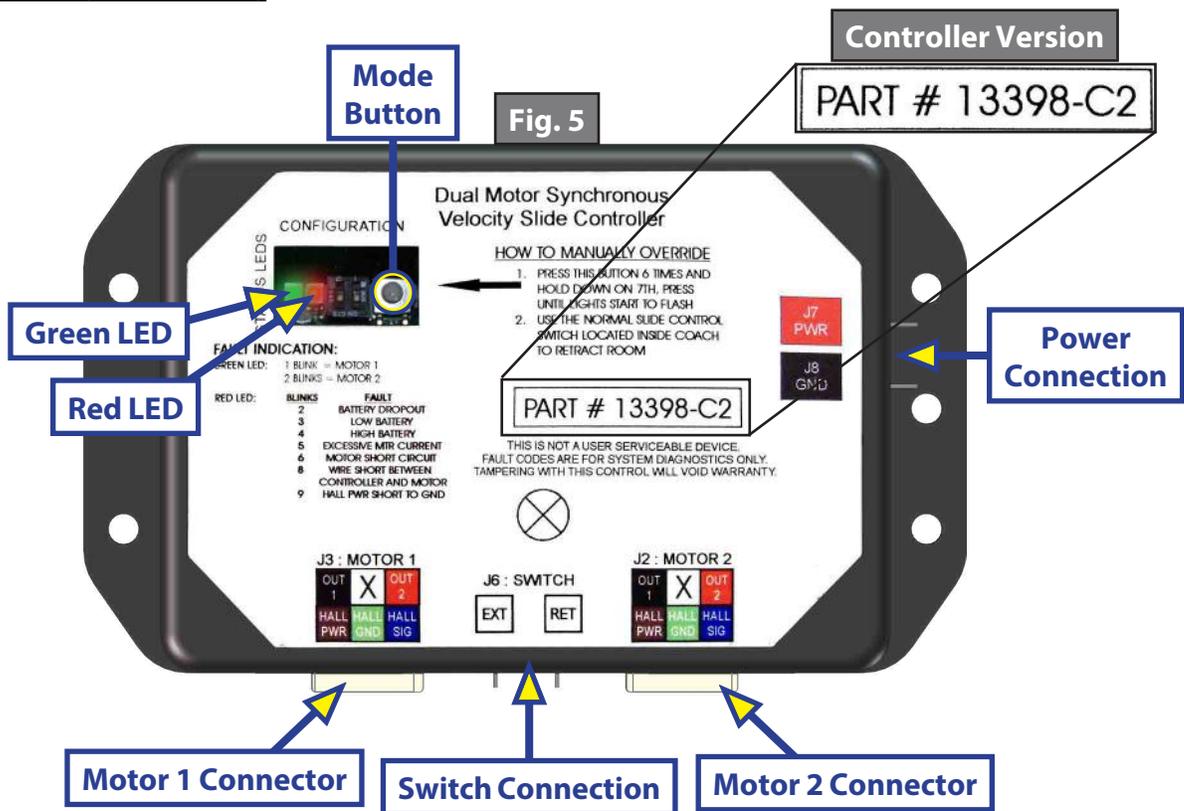
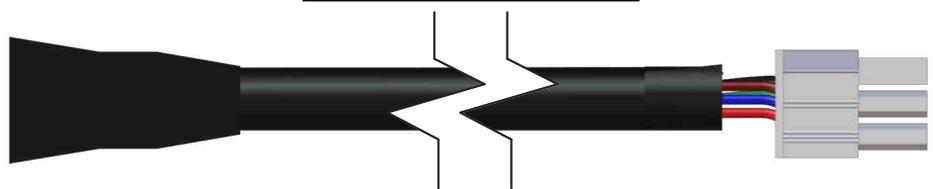


Fig. 6 - Controller Connections



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 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)                                    |
|                        | 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                     |   |
| D-0 (Fig. 13)          | B/C1/C2                  |                        |   |
| 326876                 | 8 Amp (Fig. 14)          | 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. 17), which is obsolete. That motor will be replaced with the Round-Round (Fig. 16A, 16B).

**NOTE:** (\*) Denotes that (2) new motor harnesses must be ordered, and re-wiring instructions must be used. See next page.

Fig. 8



Fig. 8



Fig. 10



Fig. 11



Fig.12

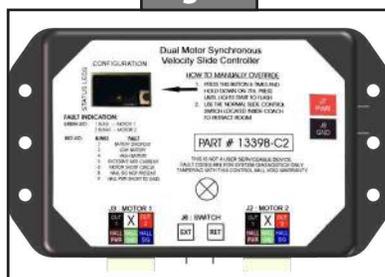


Fig. 13

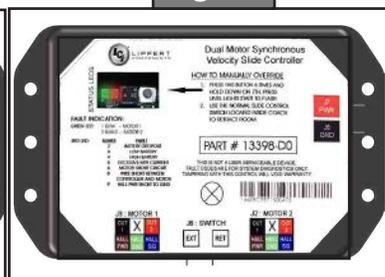


Fig. 14



Fig. 15 - [229466](#)



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



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



Fig. 17 - Obsolete

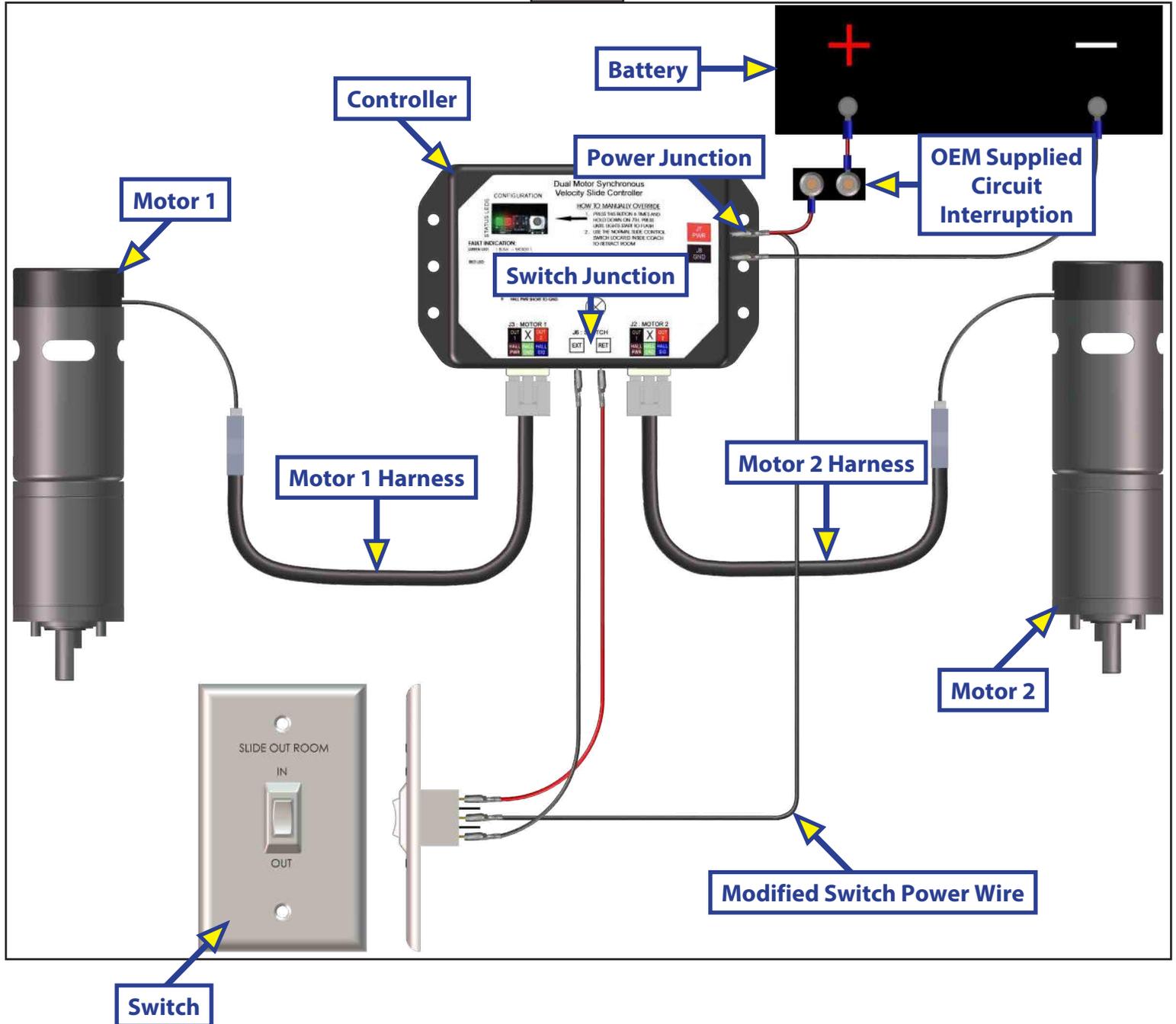


**NOTE:** Ensure that a 300:1 motor is replaced with a 300:1 motor (Fig. 16A), and that a 500:1 motor is replaced with a 500:1 motor (Fig. 16B).

## 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).

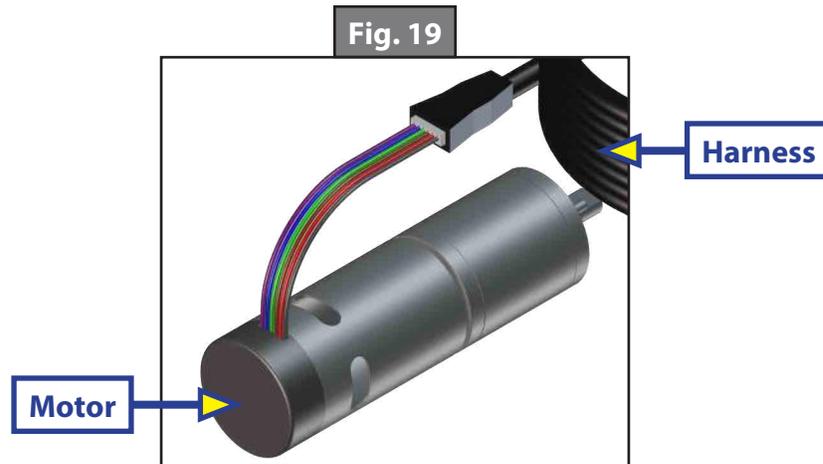
Fig. 18



## 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

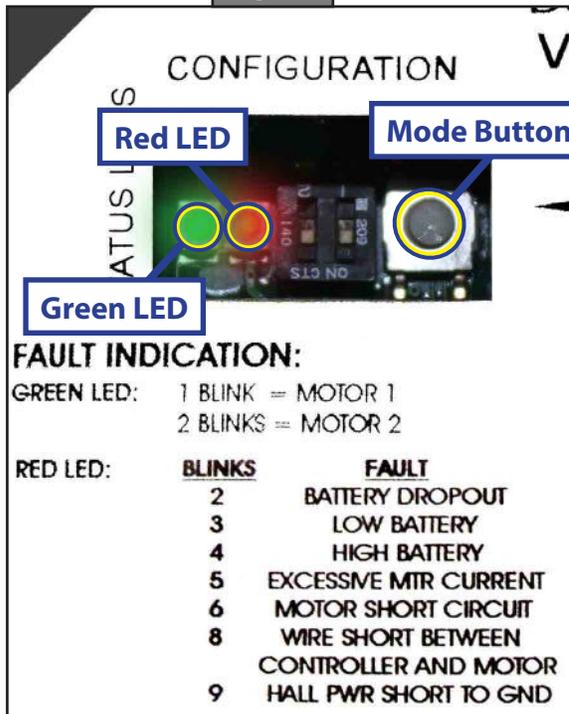


Fig. 21 - Error Code Description

| 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.

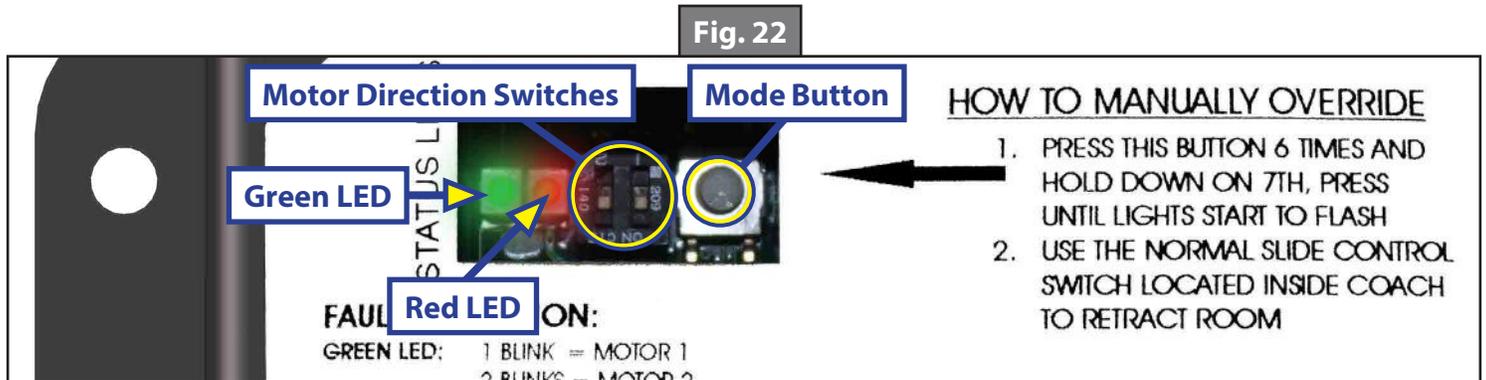
**NOTE:** Always connect directly to the battery and never to the controller power connections.

## 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).

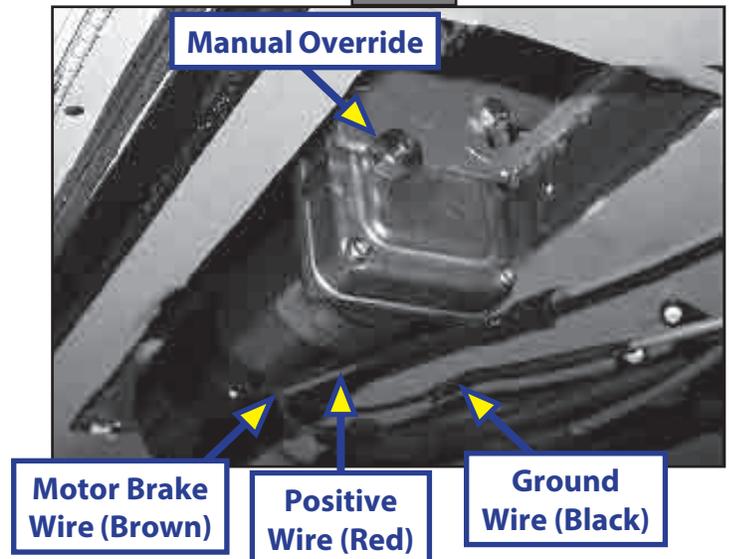
**NOTE:** The slide-out out-stop assembly will be accessible from the inside of the unit. The slide-out motor and mechanism is accessible from the outside.

**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

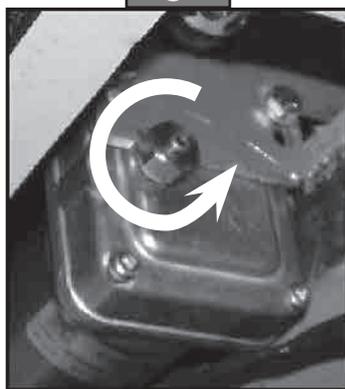
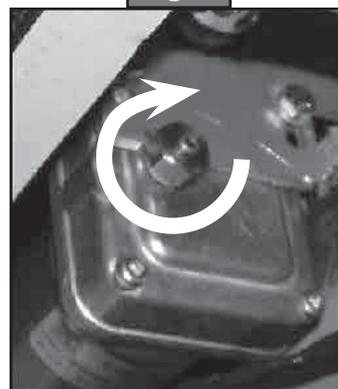
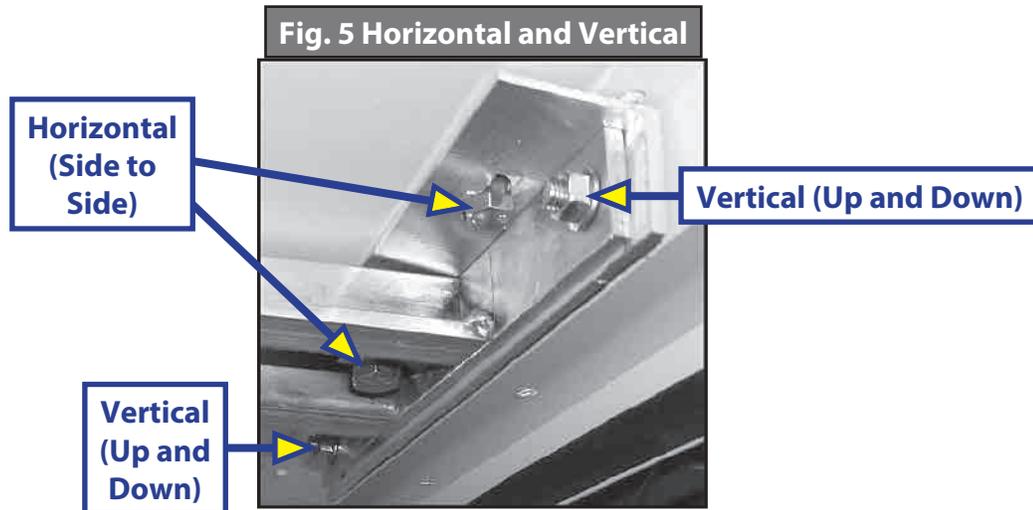


Fig. 4



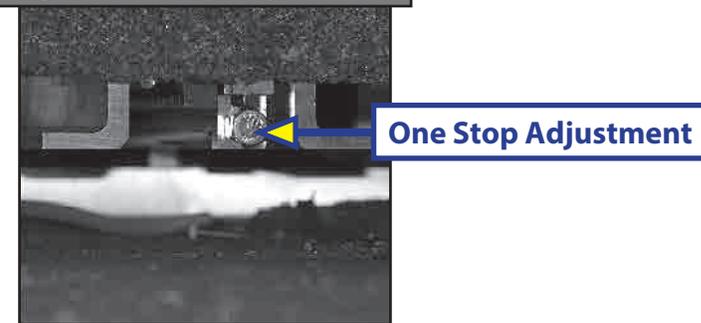
## Room Adjustment

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.

**Fig. 6 One Stop Adjustment**



# 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.

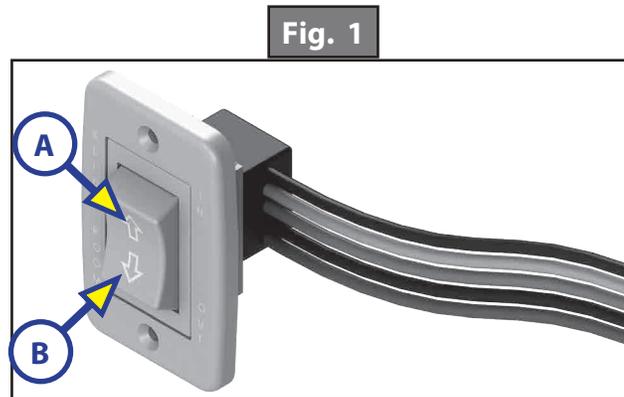
**NOTE:** Only hold OUT switch until room stops.

### 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

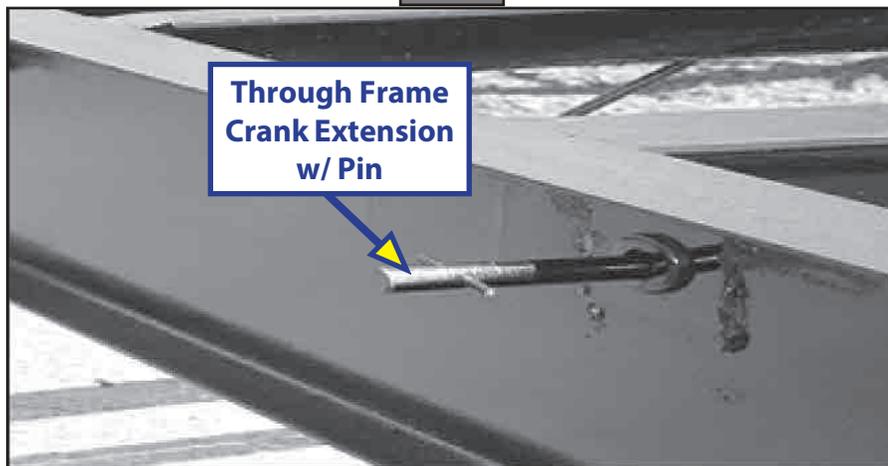
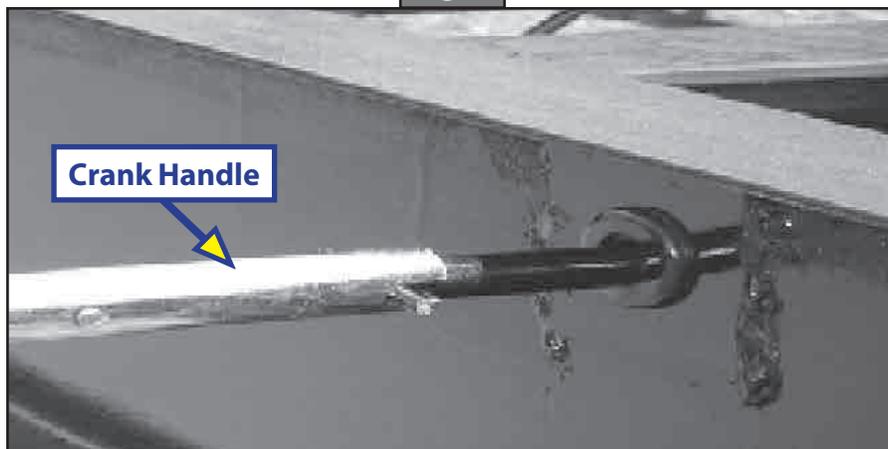


Fig. 3



## Manual Override - Inside Frame

Locate the hex head crank extension at the top of the actuator inside the chassis main frame (Fig. 4). Using a 3/4 socket and ratchet (Fig. 5), rotate the extension clockwise to retract the slide-out and counter clockwise to extend the slide-out. It is important to note that you DO NOT need to attempt to disengage the motor as the actuator is "manual ready."

**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. 4

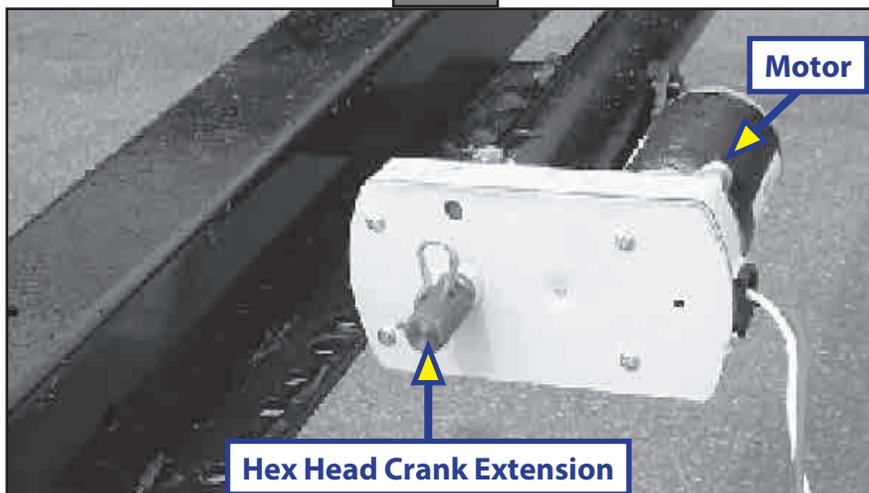
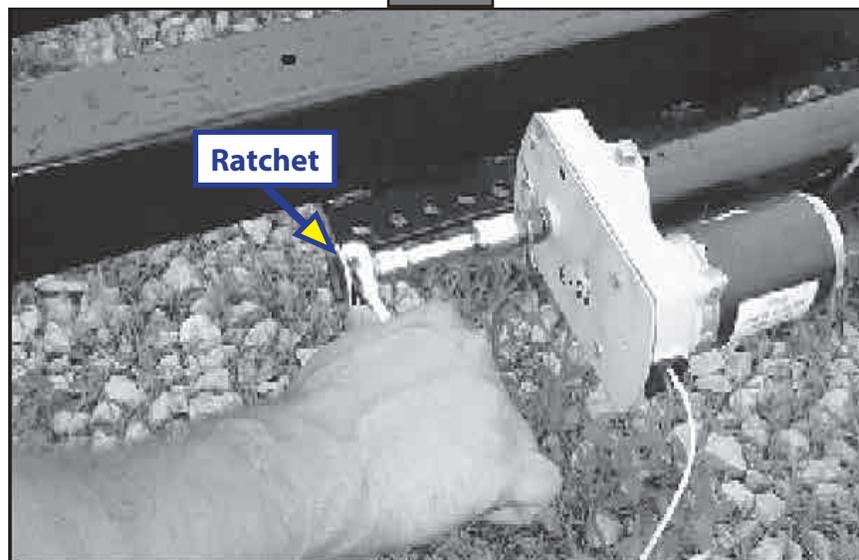


Fig. 5



# HYDRAULIC THROUGH FRAME SLIDE-OUT

## SLIDE-OUTS

### Warning, Safety, and System Requirement Information

#### Description

The Lippert Hydraulic Through Frame Slide-out System is a rack and pinion guide system, utilizing a hydraulic cylinder to move the room assembly. The power unit drives the cylinder rod in a forward and backward motion to move the slide room in and out. The Lippert Hydraulic Slide-out System is designed to operate as a negative ground system.

#### Safety Information

#### **WARNING**

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

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

This manual provides general service and maintenance procedures. Many variables can change the circumstances of the service procedure, i.e., the degree of difficulty involved in the service operation and the ability level of the individual performing the operation. This manual cannot begin to plot out procedures for every possibility, but will provide the general instructions for effectively servicing the vehicle. In the event the skill level required is too high or the procedure is too difficult, a certified technician should be consulted before performing the necessary service. Failure to correctly service the vehicle may result in death, serious injury or voiding the warranty. The owner’s manual for the unit may have more procedures for service and maintenance.

#### **WARNING**

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

The Lippert Hydraulic 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 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.

## 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.



**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 the 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 (Fig.1) in the OUT position (Fig.1B) until room is fully extended and stops moving.
5. Release switch, which will lock the room into position.

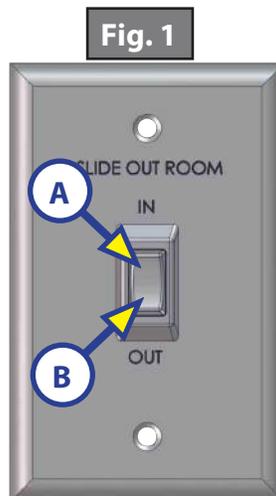
**NOTE:** Only hold OUT switch until room stops.

### 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 (Fig.1) 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.

## **System Maintenance**

The Lippert Through Frame 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 Through Frame 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 the 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).

## Fluid Recommendation

The Lippert Electronic Leveling System is pre-filled, primed and ready to operate direct from the manufacturer. Type "A" Automatic Transmission Fluid (ATF) is utilized and will work. ATF with Dexron III® or Mercon 5® or a blend of both is recommended by Lippert Components, Inc.

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. For a list of approved fluid specifications, see [TI-188](#).

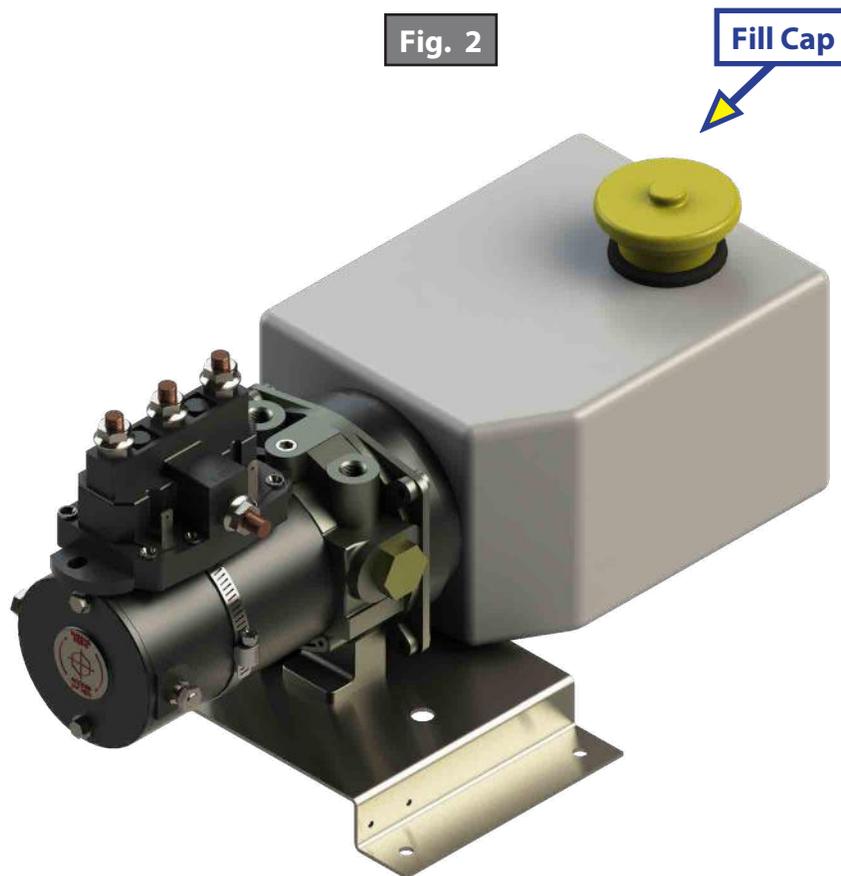
1. Remove Breather/Fill Cap (Fig. 2).
2. Pour ATF into Breather/Fill opening.

**NOTE:** Do not allow any contamination into reservoir during fill process.

**NOTE:** Standard reservoir holds approximately 2 quarts (1.89 liters) of ATF.

3. Fill to within ½" of top.
4. Replace Breather/Fill cap when finished.

**NOTE:** System is self-purging. By simply cycling the system 2-3 times, any air in the system will be forced back to the reservoir and out of the Breather/Fill cap.



## Adjusting room so it seals in the IN position

1. Locate cylinder coming through the frame.
2. Run room partially out.
3. Hold jam nut (Fig. 3A) in place with wrench.
4. Adjust Nylock nut (Fig. 3C) towards the bracket if the room does not seal. Adjust the Nylock nut (Fig. 3C) away from the bracket if the room is too tight and damages the fascia.

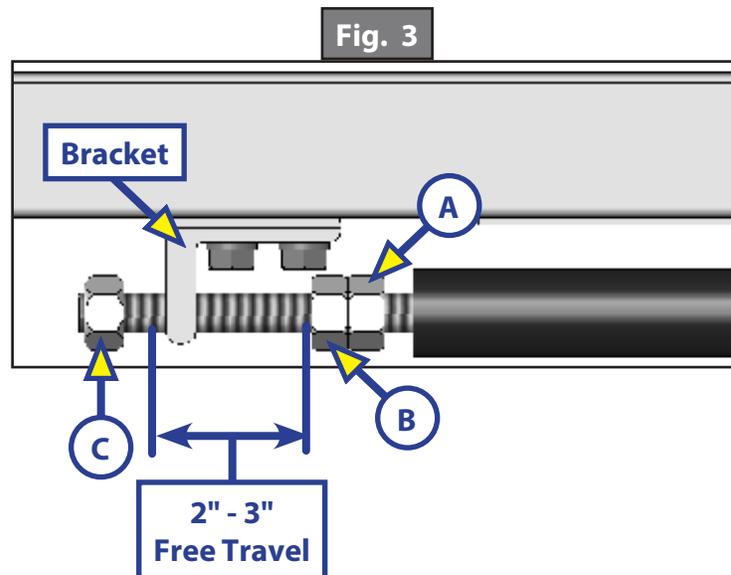
**NOTE:** Make small adjustments, running the room in after each adjustment until proper seal is achieved.

## Adjusting room so it seals in the OUT position

1. Locate cylinder coming through the frame.
2. Extend room completely out.
3. Check the inside fascia and seal positioning.
4. Partially retract room.
5. Loosen and back off jam nut (Fig. 3A) from nut (Fig. 3B) to give nut (Fig. 3B) room for adjustment.
6. Adjust nut (Fig. 3B) away from the bracket if the room extends too far and damages the inside fascia. Adjust nut (Fig. 3B) towards the bracket if the room does not seal.

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

7. Tighten jam nut (Fig. 3A) to nut (Fig. 3B).



2\" to 3\" of free travel is normal.

## Mechanical Room Adjustment

**NOTE:** All slide-out room adjustments must be performed by certified service technicians. Adjustments made by non-certified persons may void any and all warranty claims.

### Horizontal Adjustment

1. Loosen carriage bolts (Fig. 4A) on each bracket located at the end of each guide tube.
2. Room is ready to be positioned horizontally by pushing on the outside, sidewall or by using a prying device inserted into the opening between the room and coach.

**NOTE:** Use caution when using prying device so seals do not become damaged.

### Vertical Adjustment

1. Loosen 2 carriage bolts (Fig. 4A) on each bracket located at the end of each guide tube.
2. Loosen jam nut (Fig. 5A).
3. For vertical adjustment turn vertical adjustment bolt (Fig. 5B) up or down to locate room height.
4. Once room height is located, tighten carriage bolts (Fig. 4A) and jam nut (Fig. 5A).

Fig. 4

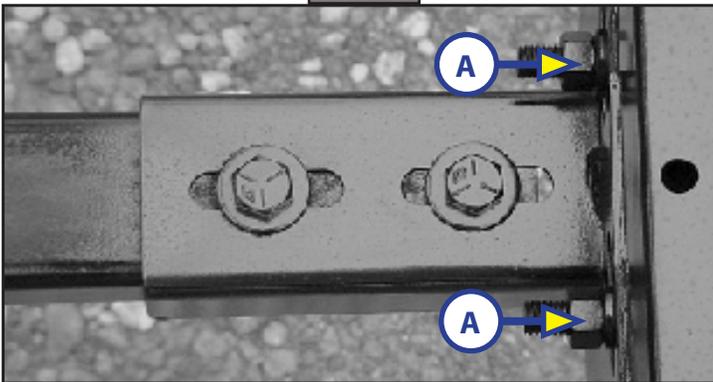
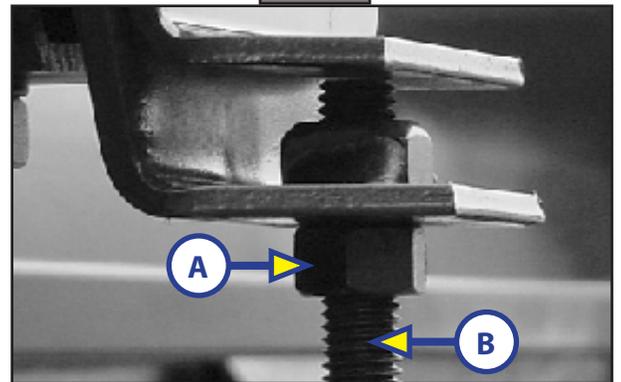


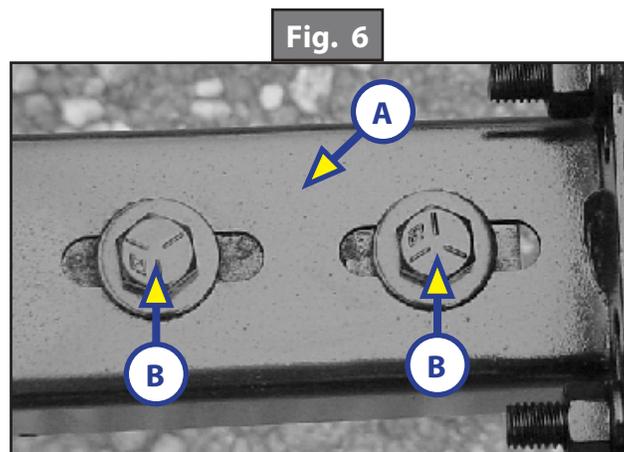
Fig. 5



## Synchronizing Room Travel

The Lippert Hydraulic Slide-out System room travel (both sides of the room traveling the same distance) can be adjusted with specially designed synchronizing bracket mounted on the passive slide tube. The passive slide tube is the one that is not powered. The active slide tube is the one that has the cylinder attached. If one side of the room fails to seal adjust as follows:

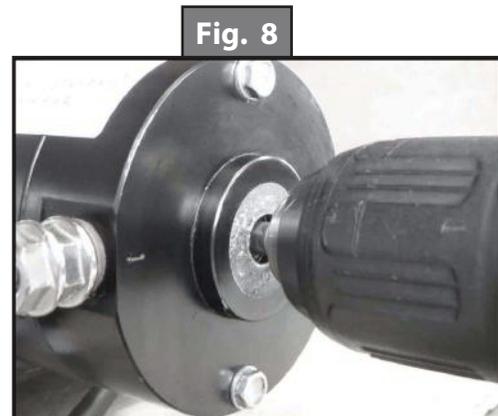
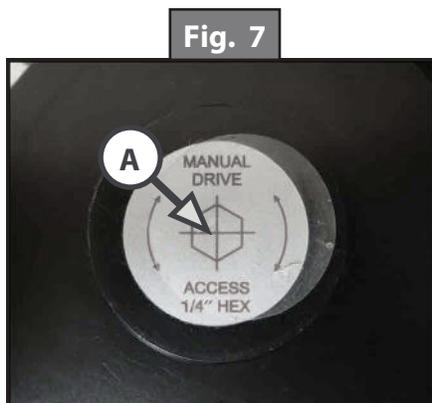
1. Extend the slide-out about halfway out.
2. Measure the active side from the "T"-molding on the slide-out back to the outside wall of the coach.
3. Then, measure the passive side in the same manner.
4. Loosen bolts (Fig. 6B) on top of the passive slide tube (Fig. 6A).
5. Push or pull room (on passive side) to align the passive side with the active side.
6. Tighten bolts (Fig. 6B) to secure the passive side position.
7. Retract room and run as normal.



## Manual Override

The Lippert Hydraulic Slide-out System can be run with an auxiliary power device like an electric or cordless drill. In the event of electrical or system failure, this manual method of extending and retracting the slide-out room can be used. A standard hand-held drill is all that is required. A standard 38" room will take approximately 45 seconds to retract. See the instructions below.

1. Remove protective label (Fig. 7A).
2. Using a standard hex bit and auxiliary drive device (cordless or electric drill), insert hex bit into coupler found under protective label (Fig. 8).
3. Run drill counterclockwise to extend slide-out room and clockwise to retract slide-out room.



# F.A.S.T. TRACK® SLIDE-OUT

## SLIDE-OUTS

### System Information

The F.A.S.T. (Fast Assembly Self Tensioning) Track® Slide-out is a cable-driven system that is operated by a 12V DC electric motor. The system is designed to actuate rooms up to 2,000 pounds and 40" of stroke. Room slide-out systems rated for higher weight or longer strokes can be obtained. Please act LCI for application assistance.

### Major Components

- Vertical column that mounts into the side wall opening
- Horizontal cables that actuate the room
- A 12V DC gear motor that operates the room using power from the battery
- A specially designed control box that gives the user full control of room movement. The control box has programmable stops. When programmed, the stops limit extend and retract and have the ability to detect faults for ease in troubleshooting.
- Harnesses to connect the rocker switch and motors to the control box

### Safety

#### **WARNING**

**The F.A.S.T. Track Slide-out is intended for the sole purpose of extending and retracting a slide-out room. Its function should not be used for any other purpose. To use the system for any purpose other than its original design may result in death, serious personal injury, severe product or unit damage.**

#### **WARNING**

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

## Prior to Operation

1. To optimize slide-out actuation, the unit **MUST** be parked on solid, level ground.
2. Inspect all connections at the controller and verify they are securely attached.
3. Verify there are no obstructions that could hinder normal movement of the slide-out room.
4. Make sure there is ample voltage being supplied to the slide-out controller.
5. Set the parking brake, if applicable.
6. The ignition of the unit **MUST** be turned off in order to operate the slide-out system, if applicable.



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



**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 to avoid possible serious personal injury.**

## Operation

### Extending the Slide-Out Room

1. If equipped, remove the transit bars.
2. If equipped, turn "ON" the on/off switch or key.
3. Press and hold the "OUT" or "EXT" button.

**NOTE:** There will be a slight delay before the slide-out room will begin to move. This is normal.

4. Release the button when the slide-out room is fully extended and stops moving.
5. If equipped, turn "OFF" the on/off switch or key.

### Retracting the Slide-Out Room

1. If equipped, turn "ON" the on/off switch or key.
2. Press and hold the "IN" or "RET" button.

**NOTE:** There will be a slight delay before the slide-out room will begin to move. This is normal.

3. Release the button when the slide-out room is fully retracted and stops moving.
4. If equipped, turn "OFF" the on/off switch or key.
5. If equipped, replace the transit bars.

## Troubleshooting

The Error Code Chart in this section 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.

When something restricts room travel, system performance will be unpredictable. It is very important that the entire slide system be free of contamination and allowed to travel full distance (stroke). Ice or mud build-up during travel is an example of some types 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. Make sure any changes you make will not create a new problem.

## Fault Codes

The controller has the ability to detect and display several faults within the slide-out system. When a fault is detected, the room movement may stop and two different LED lights on the controller will flash in a particular pattern indicating the proper action needed to clear the fault, such as:

1. The Motor LED will flash GREEN 1 or 2 times, indicating which motor is experiencing the associated fault. For example, 1 GREEN flash indicates Motor 1 and 2 GREEN flashes indicates Motor 2.
2. The Fault Code LED will flash RED a number of times, indicating the determined fault. Refer to the troubleshooting chart below to best determine the cause of the fault.

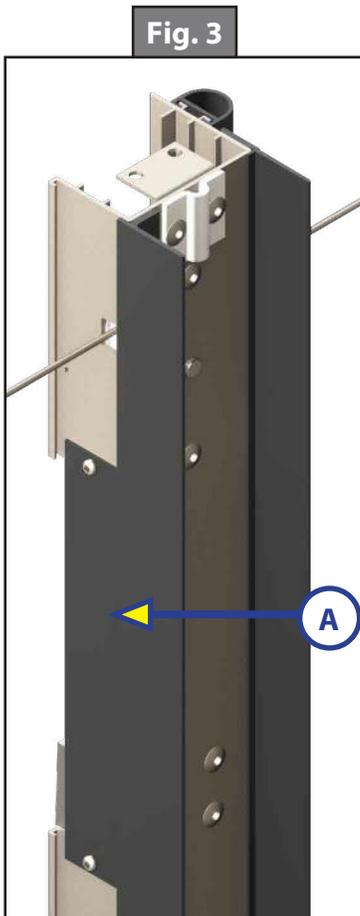
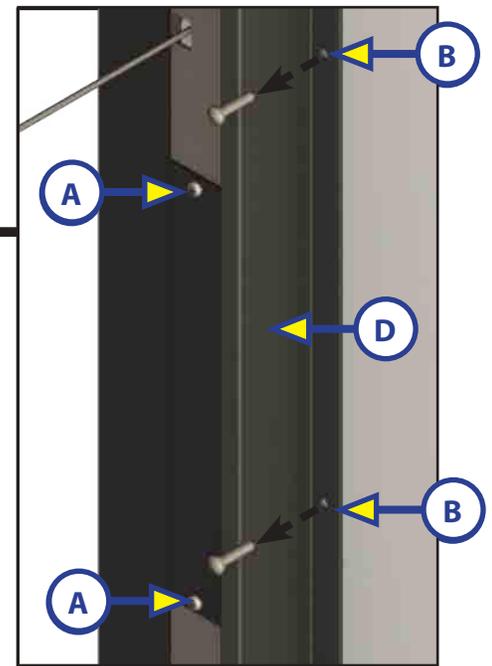
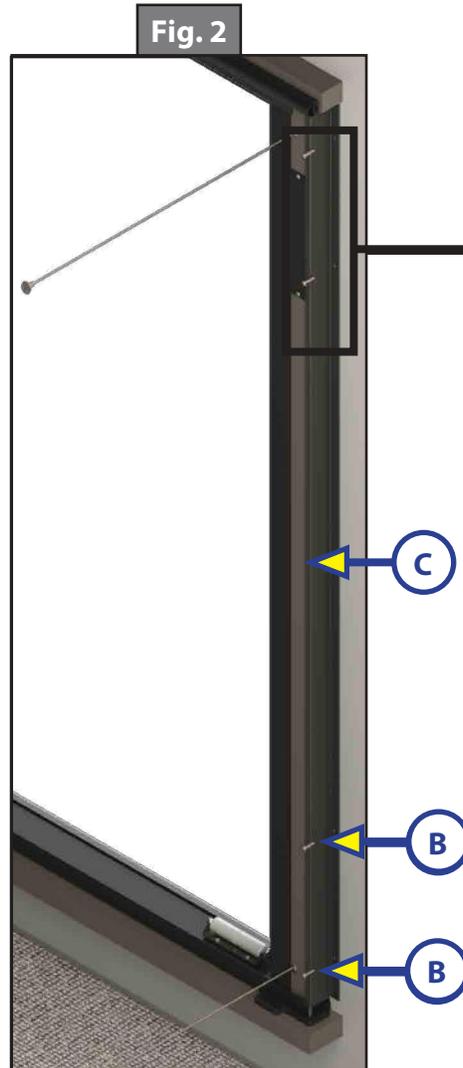
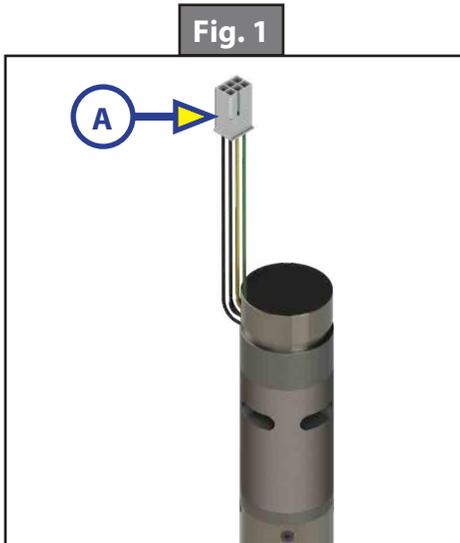
| Error Code Chart   |  |   |
|--------------------|--|---|
| What Is Happening? | Why?   | What Should Be Done?  |
| 1 Red Flash        | Parking brake (if applicable) is not set.  | Set parking brake (if applicable).  |
|                    | Ground signal is lost at parking brake receptacle at control box.  | Check for continuity to ground on wire plugged into parking brake receptacle at control box.  |
| 2 Red Flashes      | Incoming voltage to control is below 12V DC. The room will not move if the voltage is 10.5V DC or below. | Start vehicle, generator, or make sure the unit is plugged into shore power. Check 2-pin power connector at the control box at BATT + and GND. Consult manufacturer of unit charging system for troubleshooting assistance. |
| 4 Red Flashes      | Bad wire connection.   | Refer to TIP Sheet 82-SO533 for troubleshooting.  |
|                    | Bad motor.   |   |
| 6 Red Flashes      | Supply voltage to control box is 17V DC or greater.  | Consult manufacturer of unit charging system for troubleshooting assistance.  |

**NOTE:** When motor movement is not detected by the control box in either direction during room actuation, the controller will automatically enter into "Emergency Jog" mode. When in Emergency Jog mode, the controller will jog both motors in the direction the switch is pressed, i.e. "IN" or "OUT". The switch may need to be pressed multiple times to fully retract or extend the slide-out room. Take the unit to an OEM-authorized dealer for service.

**NOTE:** The control box will return to normal mode after five minutes of inactivity or by cycling power to the control box.

## Manual Override

1. Disconnect the wire harness from the motor lead (Fig. 1A).
2. Remove the screws (Fig. 2B) anchoring the interior column clamp (Fig. 2C) to the wall.
3. Detach the interior column clamp from the column and set aside.
4. Remove the two screws (Fig. 2A) that hold the motor cover (Fig. 3A) to the column (Fig. 2D) and remove the motor cover.
5. Disengage the motor from the drive sprocket assembly (Fig. 4A).
6. Repeat steps 1-5 on the opposite column.
7. The slide-out system should be free to move manually.
8. Once fully, manually retracted, insert the motor into the drive sprocket assembly. This prevents the slide-out from moving freely while the unit is in motion.

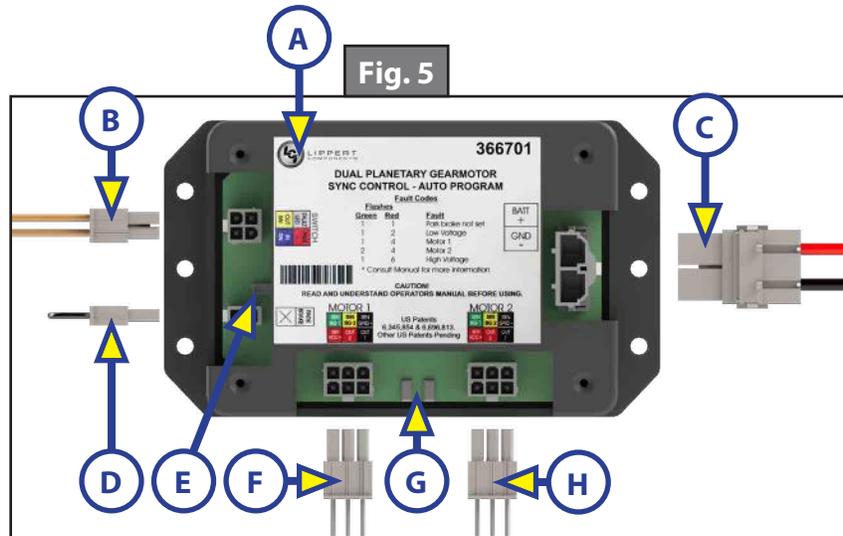


## Wiring

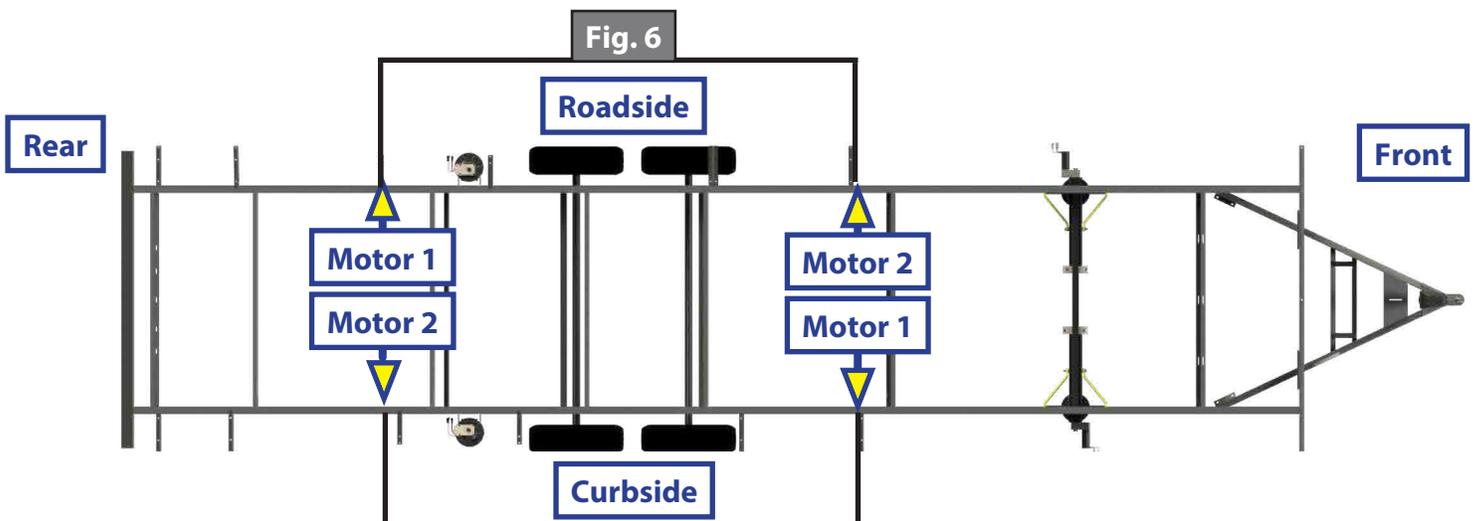
**NOTE:** The controller (Fig. 5A) is **NOT** waterproof.

**NOTE:** When identifying Motor 1 and Motor 2, refer to figure 6.

**NOTE:** With the mode switch (Fig. 5E) in the left position, the controller will not operate the slide-out room unless a park brake signal is found. With the mode switch in the right position, the controller will bypass this safety feature. For all travel trailers, the switch will need to be in the right position.



| Callout | Description                  |
|---------|------------------------------|
| A       | Controller                   |
| B       | SWITCH Harness               |
| C       | Power Harness (BATT+ / GND-) |
| D       | PARK BRAKE Input Harness     |
| E       | Mode Switch                  |
| F       | MOTOR 1 Harness              |
| G       | Indicator Lights             |
| H       | MOTOR 2 Harness              |



## Maintenance

The F.A.S.T. Track® Slide-out has been designed to require very little maintenance. To ensure the long life of your slide-out system, read and follow these few simple procedures:

- When the room is extended, visually inspect the slide system assemblies. Check for excess buildup of dirt or other foreign material. Remove any debris that may be present.
- If the system squeaks or makes any noises, wipe off any debris or dirt from the cables.
- If a slide-out cable is fraying, contact a qualified service center technician.

# SLIMRACK® SLIDE-OUT

## SLIDE-OUTS

### Introduction

The Lippert Components (LCI) SlimRack® Slide-Out system maximizes interior RV space by providing added comfort and offering a practical solution for additional space needs. The LCI SlimRack Slide-Out system combines versatile above-floor placement with attractive, seamless flush-floor style for a sleek, polished, high-end look with no step up.

Additional information about this product can be obtained from [www.lci1.com/support](http://www.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.

iTunes®, iPhone®, and iPad® are registered trademarks of Apple Inc.

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

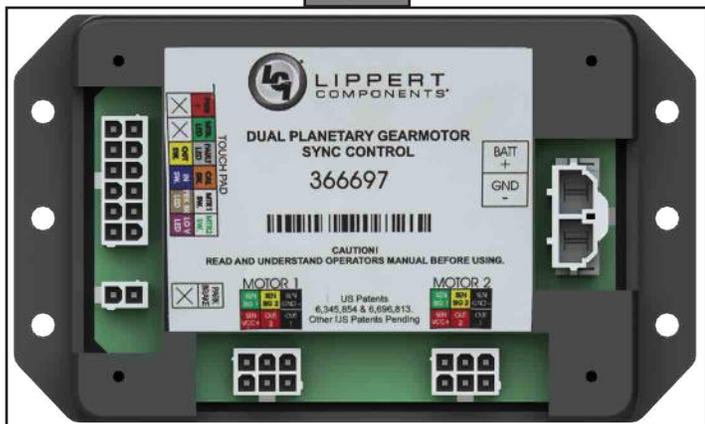
## Product Information

The LCI SlimRack Slide-Out system is a rack-and-pinion design operated by a 12V DC gear motor. Slide-Out systems are engineered to provide years of trouble-free service. Changes to weight, stroke, weight distribution, gear rack position, controller, power supply seals, slide toppers, ramps, rollers, etc., all have an effect on the performance of the system. In order to secure warranty coverage, each new application or changes to existing applications **MUST** be audited and approved by Lippert Components with a signed document. Audits can be arranged by contacting Lippert Components.

This manual provides information for slide-out systems that use one of three different controllers: Power Gear part number 1510000199 / LCI part number [366697](#) (Fig. 1), Power Gear part number 1510000236 / LCI part number [366701](#) (Fig. 2) or Power Gear part number 1510000276 / LCI part number 366703 (Fig. 3). Controller Power Gear part number 1510000199 / LCI part number [366697](#) connects to a touchpad. Controller part numbers (Power Gear / LCI) 1510000236 / [366701](#) and 1510000276 / 366703 connect to a rocker switch.

**NOTE:** Previously, some Winnebago models used controller Power Gear part number 1510000276 / LCI part number 366703 (Fig. 3) which required a wire harness with an 8-pin connector for connecting the controller to Motor 2 (Fig. 3A). For all new units, Power Gear part number 1510000276 / LCI part number 366703 has been replaced by Power Gear part number 1510000236 / LCI part number [366701](#). For servicing older Winnebago units, controller Power Gear part number 1510000276 / LCI part number 366703 has been replaced with controller Power Gear part number 1510000236 / LCI part number [366701](#) with an added adapter wire harness.

Fig. 1



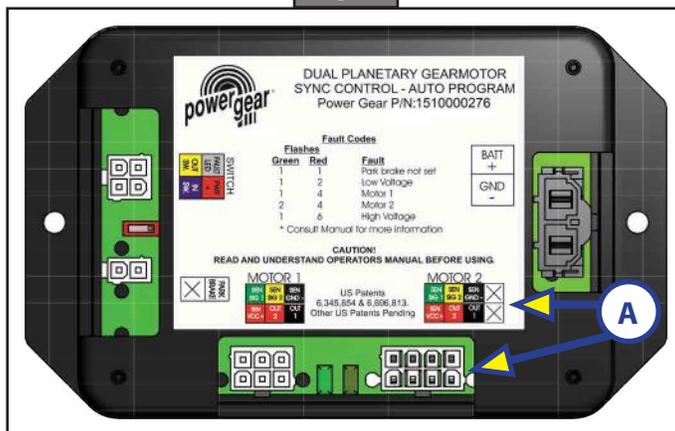
1510000199 / [366697](#)

Fig. 2



1510000236 / [366701](#)

Fig. 3



1510000276 / 366703 (Winnebago)  
Discontinued - replaced by 1510000236 / [366701](#)

There are two types of brackets used for fastening the motor and block assembly. Effective early February, 2018, the bracket used for the spring and hook attachment (Figs. 4 and 5) between the motor and the block was replaced with a new bracket and retention screw (Figs. 6 and 7).

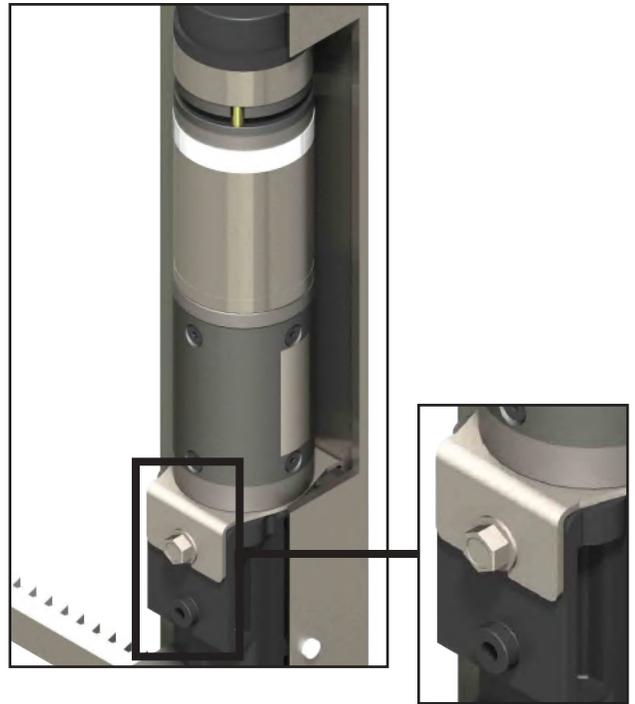
**Fig. 4**

**Motor-Block Assembly  
Production Prior to February 2018**



**Fig. 6**

**Motor-Block Assembly  
Early February 2018 Production**



**Fig. 5**

**Old Bracket 389061**



**Fig. 7**

**New Bracket 422671**

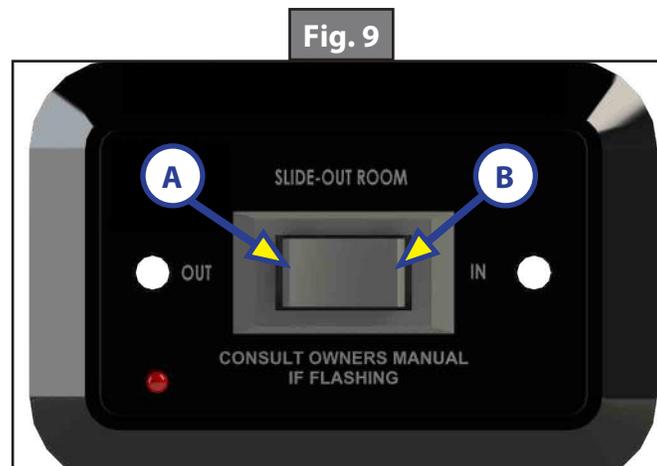
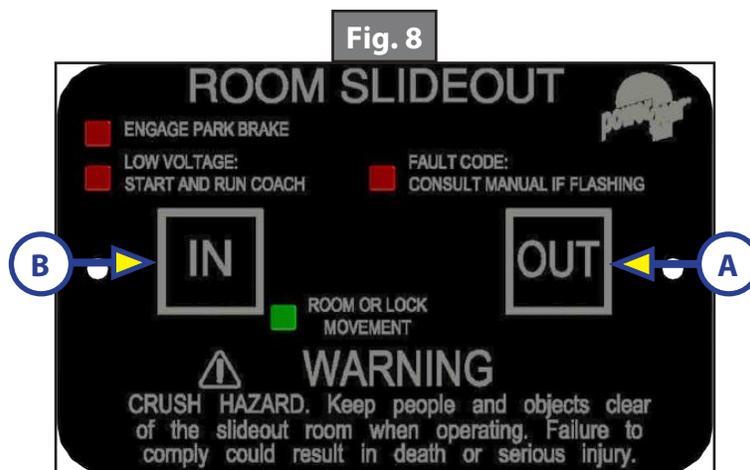


## Component Descriptions

- A touchpad (Fig. 8), used with programmable controller Power Gear part number 1510000199 / LCI part number [366697](#), or a rocker switch (Fig. 9), used with auto-programmable controller part numbers (Power Gear / LCI) 1510000236 / [366701](#) and 1510000276 / 366703 (Winnebago). Both types of devices mount to the wall and allow slide-out room movement as well as provide feedback to the user.
- A specially designed controller that gives the user full control of slide-out room movement, in or out. The controller has programmable stops that stop the motor when the slide-out room is fully extended or retracted and the ability to detect faults for ease in troubleshooting.

**NOTE:** The programmable controller, which incorporates use of a touchpad, is initially programmed once at installation. It is reprogrammed by an OEM-authorized dealer only if stops must be reset due to fault codes or to change the initial settings. With the auto-programmable controllers, those that connect to a rocker switch, the stops are automatically programmed each time the slide-out room is used.

- Vertical channel with 12V DC gear motor and gear rack arms that mount into the side wall opening and slide-out room.
- Harnesses to connect the rocker switch or touchpad and the motors to the controller.
- A manual override that allows extension / retraction of the slide-out room in the event of a loss of power.
- Floor rollers (not supplied by Lippert Components) that support the slide-out room's weight while extending and retracting the slide-out room. Only floor rollers approved by Lippert Components can be used with the system. Contact Lippert Components for recommended rollers.



## Safety

### **WARNING**

The “WARNING” symbol above is a sign that an procedure has a safety risk involved and may cause death or serious injury if not performed safely and within the parameters set forth in this manual. Always wear eye protection when performing this procedure. Other safety equipment to consider would be hearing protection, gloves, and possibly a full face shield, depending on the nature of the procedure.

### **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 slide-out room is being operated. Obstructions in the slide-out room's path can cause serious personal injury, severe product or property damage .

### **CAUTION**

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

### **CAUTION**

When manually retracting the slide-out room, make sure that both sides of the slide-out room move together. Damage to the slide-out room may result if movement is not uniform.

## Preparation

### Resources Required

- 1-2 people, depending on task
- Phillips head screwdriver
- Pick tool
- Ratchet or socket wrench
- 1/2" 8-point star socket or 15 mm 12-point star socket
- Dry lubricant
- 3" extension for sockets
- 5/8" deep well socket
- 12V DC power source
- Multimeter
- 5/16" open-ended wrench or ratcheting box wrench

## Operation

### CAUTION

**Always make sure that the slide-out room path is clear of people, pets and objects before and during operation of the slide-out. Always keep away from the gear racks when the slide-out room is being operated. Obstructions in the slide-out room's path can cause serious personal injury, severe product or property damage .**

### CAUTION

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

#### Prior to Moving the Slide-Out Room

1. Make sure the engine or generator is running to ensure ample voltage is being supplied to the slide-out controller.
2. Set the parking brake if applicable.

#### Extending the Slide-Out Room

1. The engine or generator must be running, or unit must be plugged into shore power.
2. Transmission must be in park or neutral (if applicable).
3. If applicable, set the park brake and level the unit.
4. If equipped, remove the transit bars.
5. If equipped, turn "on" the on/off switch or key.
6. Press and hold the OUT button (Fig. 8A or 9A). There will be a slight delay before the slide-out room will begin to move. This is normal.
7. Release the button when the slide-out room is fully extended and stops moving.
8. If equipped, turn "off" the on/off switch or key.

#### Retracting the Slide-Out Room

1. The engine or generator must be running, or the unit must be plugged into shore power.
2. If applicable, transmission must be in park or neutral.
3. If applicable, set the park brake and level the unit.
4. If equipped, turn "on" the on/off switch or key.
5. Press and hold the IN button (Fig. 8B or 9B). There will be a slight delay before the slide-out room will begin to move. This is normal.
6. Release the button when the slide-out room is fully retracted and stops moving.
7. If equipped, turn "off" the on/off switch or key.
8. If equipped, install the transit bars.

# Troubleshooting

## Controller 1510000199 / 366697

Controller 1510000199 / [366697](#), which connects to a touchpad, has the ability to detect and display several faults. When a fault is detected, the slide-out room movement will stop and two different LEDs on the touchpad will flash in a pattern.

**NOTE:** The slide-out system with controller 1510000199 / [366697](#) will **NOT** function until the stops are properly set or faults are cleared.

1. The FAULT CODE LED (Fig. 10A) on the touchpad will flash red a number of times corresponding to a specific fault code. Refer to Fault Code Table - Controller 1510000199 / [366697](#) to best determine what caused the fault.
2. The ROOM MOVEMENT LED (Fig. 10B) on the touchpad indicates system operation and will flash green a number of times corresponding to which motor had the associated fault.

**NOTE:** For example, four RED flashes (Fault Code) and two GREEN flashes (Motor code) means there is a motor fault on Motor 2.

**NOTE:** A solid GREEN LED indicates normal slide-out room movement.

There are two types of faults, minor and major. Faults **MUST** be cleared in order for the slide-out room to operate.

1. Minor faults can be cleared by pressing and releasing the IN (Fig. 10C) or OUT (Fig. 10D) buttons on the wall touchpad.
2. Major faults **MUST** be cleared by pressing and releasing the SET STOPS/CLEAR FAULTS button located on the back of the touchpad (Fig. 11A).

**NOTE:** For major faults, the controller must be overridden by following the Electrical Override Mode procedure described in the Override Mode section. When the problem is repaired, the controller must then be reprogrammed by an OEM-authorized dealer.

Fig.10

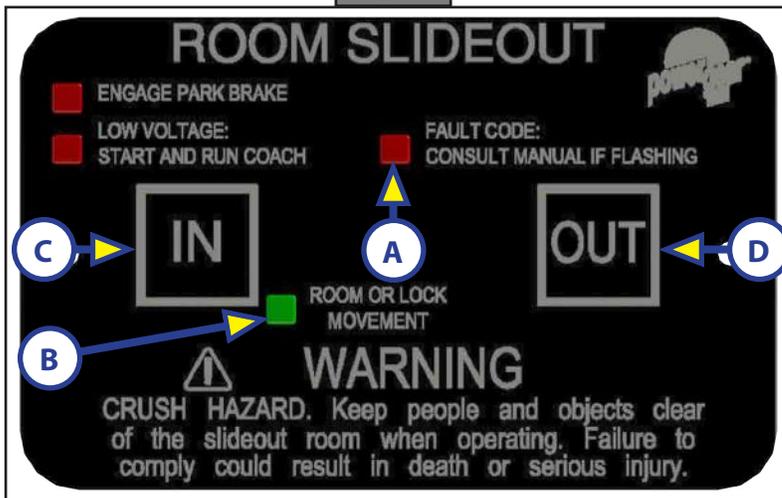
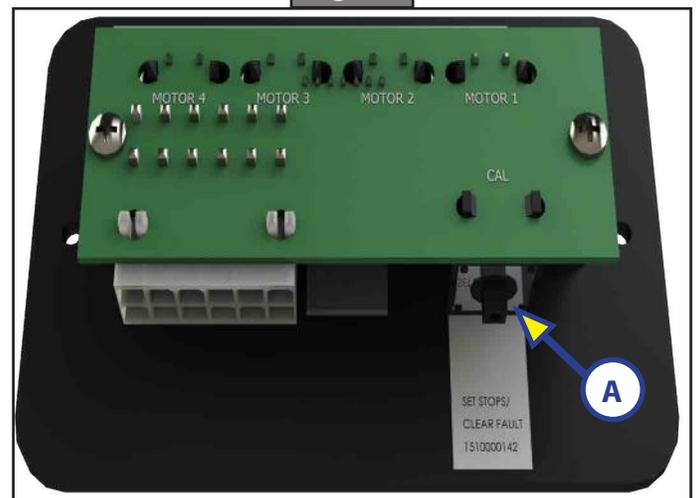


Fig. 11



Fault Code Table - Controller 1510000199 / [366697](#)

| Fault Code (# of RED flashes) | Fault Type | Description               | Why?   | What Should Be Done?  |
|-------------------------------|------------|---------------------------|--|---|
| 1                             | Major      | Stops not programmed      | Stops have not been set                                  | Stops must be programmed by an authorized service facility.   |
|                               |            |                           | Stops were cleared                                       |   |
|                               |            |                           | Stops were improperly set                                |   |
| 2                             | Minor      | System fault              | Obstruction present                                      | Run slide-out room in opposite direction of drag. If slide-out room continues to move in opposite direction, remove obstruction or have damaged component replaced. If slide-out room stops moving in opposite direction, observe fault code and refer to this chart. |
|                               |            |                           | Excessive system drag                                    | Run slide-out room in opposite direction of drag. If slide-out room continues to move in opposite direction, remove obstruction or have damaged component replaced. If slide-out room stops moving in opposite direction, observe fault code and refer to this chart. |
| 4                             | Major      | Motor fault               | Bad or loose connection(s)                               | Check all connections at controller and motor. See Wiring Diagram for Controller 1510000199 / <a href="#">366697</a> .  |
|                               |            |                           | Defective harness  | Check harness for broken wires. Replace as needed.  |
|                               |            |                           | Open or shorted motor                                    | Apply a 12V DC power source to the motor. If motor does not operate, replace the motor.   |
| 6                             | Minor      | Excessive battery voltage | Supply voltage to controller is 17V DC or greater        | Use a multimeter to check 2-pin power connector at controller. See Wiring Diagram for Controller 1510000199 / <a href="#">366697</a> . If the voltage is 17V DC or higher, contact OEM for power and ground supplies.   |
| Park brake LED flashing       |            |                           | Parking brake not set if applicable                      | Set parking brake if applicable   |
|                               |            |                           | Ground signal lost at park brake connector on controller | Check for continuity to ground on wire plugged into park brake connector at controller. See Wiring Diagram for Controller 1510000199 / <a href="#">366697</a> .   |
| Low voltage LED flashing      |            |                           | Incoming voltage to controller is below 12V DC           | Use a multimeter to check 2-pin power connector at controller. See Wiring Diagram for Controller 1510000199 / <a href="#">366697</a> . If the voltage is below 12V DC, contact OEM for recommendation.  |

## Auto-Programmable Controllers

Auto-programmable controllers, 1510000236 / [366701](#) or 1510000276 / 366703 (Winnebago), which connect to a rocker switch, have the ability to detect and display several faults. When a fault is detected, the slide-out room movement may stop and two different LEDs on the controller will flash in a pattern.

**NOTE:** Not all rocker switches contain fault indicator LEDs. For best results when reading fault codes, refer to the controller's Fault Code LED scheme and Auto-Programmable Controllers Fault Codes table.

1. The Fault Code LED on the rocker switch (Fig. 12A) will flash RED a number of times corresponding to the number of red flashes on the controller (Fig. 13A).

**NOTE:** Refer to the Fault Code Table - Auto-Programmable Controllers to best determine what caused the fault.

2. The Motor LED (Fig. 13B) on the controller will flash GREEN a number of times corresponding to which motor had the associated fault. For example, two GREEN flashes and four RED flashes means there is a motor fault on Motor 2.

**NOTE:** For major faults, the controller will automatically enter "Emergency Jog" mode when motor movement is not detected by the controller in either direction during slide-out room activation. When in "Emergency Jog" mode, the controller will jog both motors in the direction the rocker switch is pressed (IN or OUT). The rocker switch may need to be pressed multiple times to fully retract or extend the slide-out room. Take the unit to an OEM-authorized dealer for service.

The controller will return to normal operation mode after five minutes of inactivity or by cycling the power to the controller.

Fig. 12

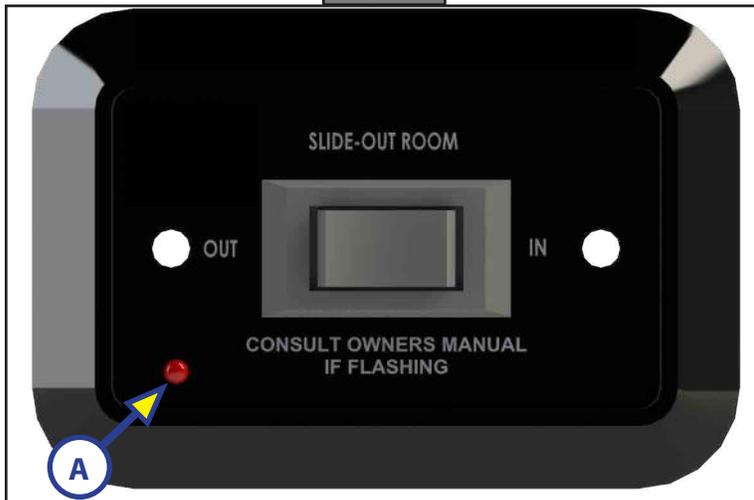
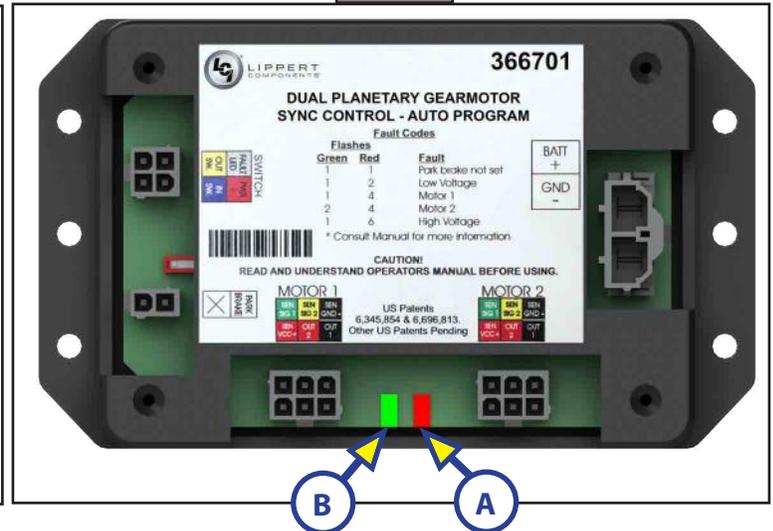


Fig. 13



Fault Code Table - Auto-Programmable Controllers

| Fault Code Flashes |           | Fault Type | Description        | Why?   | What Should Be Done?  |
|--------------------|-----------|------------|--------------------|--|---|
| Green Flash        | Red Flash |            |                    |  |   |
| 1                  | 1         | Minor      | Park brake not set | Park brake not set if applicable   | Set parking brake if applicable.  |
|                    |           |            |                    | Ground signal lost at park brake receptacle at controller  | Check for continuity to ground on wire plugged into park brake receptacle at controller.  |
| 1                  | 2         | Minor      | Low voltage        | Incoming voltage to controller is below 12V DC. The slide-out room will NOT move if voltage is 10.5V DC or below | Start vehicle, generator, or make sure coach is plugged into shore power. Use a multimeter to check 2-pin power connector at controller at BATT+ and GND-. Consult manufacturer of unit's charging system for troubleshooting assistance.   |
| 1                  | 4         | Major      | Motor 1 fault      | Bad wire connection  | Refer to Troubleshooting Control Box for SlimRack Systems (82-S0533). To locate this document online, go to <a href="https://www.lci1.com/slide-outs-/support-slimrack">https://www.lci1.com/slide-outs-/support-slimrack</a> . Go to the Technical Information Sheets tab. Look for: <i>Troubleshooting Control Box for SlimRack Systems (82-S0533)</i> in the document listing. |
|                    |           |            |                    | Bad motor  |   |
| 2                  | 4         | Major      | Motor 2 fault      | Bad wire connection  |   |
|                    |           |            |                    | Bad motor  |   |
| 1                  | 6         | Minor      | High voltage       | Supply voltage to controller is 17V DC or greater  | Consult manufacturer of unit's charging system for troubleshooting assistance.  |

## Electrical Override Modes

### Controller 1510000199 / 366697

In the event of component failure, the slide-out room operation can be overridden and retracted for travel. Use this procedure when there is NO loss of power or electrical problem with the system.

1. Using a Phillips head screwdriver, remove the touchpad from the wall.
2. Prior to clearing the MAJOR fault, write down the number of red and green flashes, indicated by the LEDs on the touchpad, for reference later.

**NOTE:** Once the slide-out room is forced to move, the fault code will be cleared. Writing down the fault code allows monitoring to see if the original code changes to a different code. This information will help the OEM-authorized dealer troubleshoot the slide-out system.

3. Press and hold the SET STOPS / CLEAR FAULTS button (Fig. 14A) on the back of the touchpad for five seconds. Both red and green LEDs will be solidly lit while this button is pressed. After five seconds, the GREEN LED will begin flashing and the RED LED will remain solidly lit.

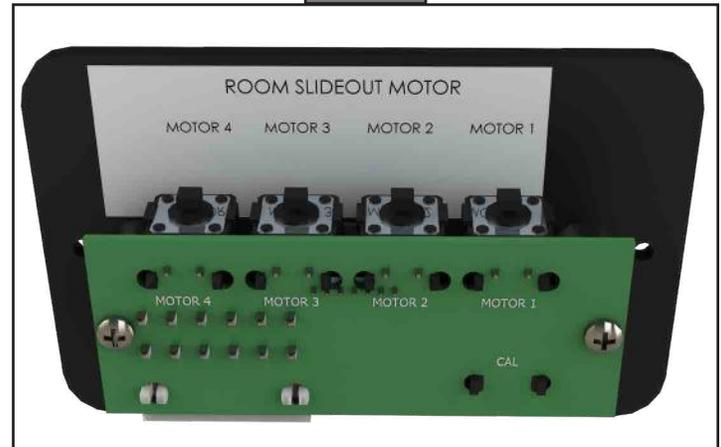
**NOTE:** The unit is now ready to retract the slide-out room.

4. Press and hold the ROOM SLIDEOUT MOTOR buttons 1 and 2 on the back of the touchpad (Fig. 15).

Fig. 14



Fig. 15



### **CAUTION**

**During this procedure, the slide-out room has NO stop locations. Use another person to assist in determining when the slide-out room is retracted. Damage to the slide-out room can occur if the slide-out room is retracted too far.**

### **CAUTION**

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

5. Press the IN button on the front of the wall touchpad until the slide-out room is fully retracted. If one side of the slide-out room needs to retract further in order to get a good seal, press and hold the motor button corresponding only to the motor on the side that needs to move. Press the IN button on the front of the touchpad to retract the slide-out room the remainder of the way.

**NOTE:** At any time during the override procedure, the unit will exit the override mode if the slide-out room has not been moved for two minutes or if a fault is detected during slide-out room movement. The Fault Code and Room or Lock Movement LEDs on the front of the touchpad will flash rapidly for 10 seconds to indicate that the override procedure failed. After 10 seconds of flashing, the controller will automatically default to FAULT CODE 1 and programming must be restarted. Refer to Controller 1510000199 / 366697 Fault Codes chart for additional information.

6. Using a Phillips head screwdriver, reinstall the wall touchpad.
7. Take the unit to an OEM-authorized dealer for repairs.

**NOTE:** After the system has been overridden, the controller must be re-programmed by an OEM-authorized dealer.

### Auto-Programmable Controllers

For major faults, controllers 1510000236 / [366701](#) and 1510000276 / 366703 will automatically enter "Emergency Jog" mode when motor movement is not detected by the controller, in either direction, during slide-out activation. When in Emergency Jog mode, the controller will jog both motors in the direction the switch is pressed (IN or OUT). The switch may need to be pressed multiple times to fully retract or extend the slide-out. Take the unit to an OEM-authorized dealer for service.

**NOTE:** At any time during the override procedure, the unit will exit override mode if the slide-out has not been moved for five minutes. The controller will return to normal operation mode after five minutes of inactivity or by cycling power to the controller.

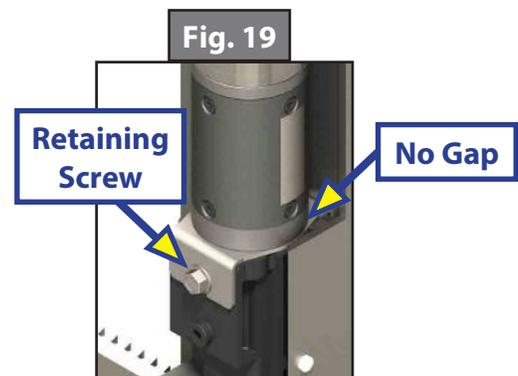
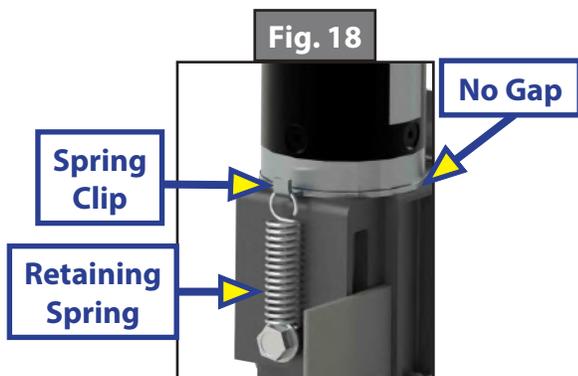
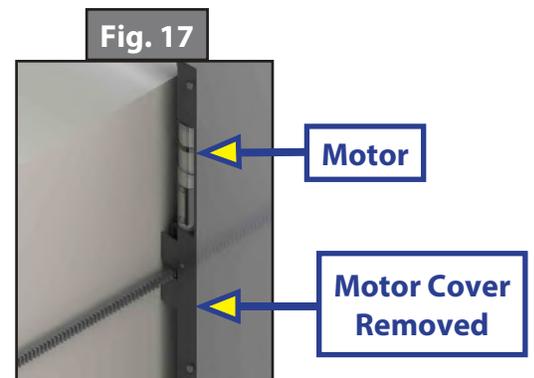
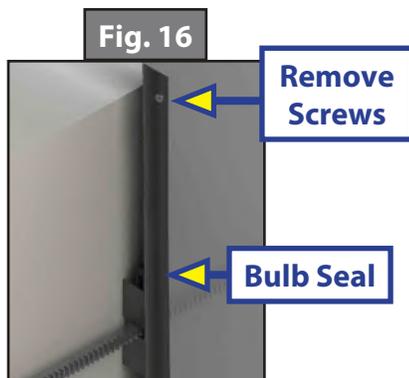
## Manual Override Mode—All Controllers

In the event that power is lost to the slide-out motor(s) or when the Electrical Override Mode does not work, the slide-out room can be manually retracted by following these steps.

### **⚠ CAUTION**

**When manually retracting the slide-out room, make sure that both sides of the slide-out room move together. Damage to the slide-out room may result if movement is not uniform.**

1. Gain access from either the inside or outside of the unit to the vertical channel assembly by removing the OEM trim and flange pieces on the slide-out room box. The motors are currently located at the top of the channel.
2. If applicable, use a Phillips head screwdriver to remove the top screw from the bulb seal at the top of the vertical channel (Fig. 16).
3. Pull down the bulb seal and remove the motor cover (Fig. 17). The motor cover may stick to the bulb seal.
4. If there is a retaining spring (Fig. 18), use a pick tool to remove the end of the retaining spring from the motor spring clip. Do not remove the retaining spring screw.
5. If not equipped with a retaining spring, use a  $\frac{5}{16}$ " open-ended wrench or ratcheting box wrench to loosen the motor retaining screw (Fig. 19) one to two rotations. Do not remove the motor retaining screw.
6. Unplug the motor from the harness and remove the motor by lifting it up and out of the column.
7. Repeat steps 1-6 for the other side.
8. Push the slide-out room uniformly into the retracted position.
9. Once the slide-out room is retracted, secure the slide-out room in-place by:
  - A. Re-installing the motors. If there is a retaining spring, make sure the end of the retaining spring is rehooked to the motor spring clip (Fig. 18).
  - B. Torquing the motor retaining screw to 40 in-lbs (Fig. 19) with the motor retainer fully engaged.
  - C. Using a transit bar (slide-out locking bar). Make sure motor is properly seated with no gap between the mounting bracket and block (Figs. 18 and 19).
10. Have the slide-out room serviced by the OEM-authorized dealer as soon as possible. Do not operate slide-out room until service is complete, as damage to the slide-out room may result.



## Alternate Override Modes—All Controllers

If none of the previous override methods retract the slide-out room, it may be possible to manually retract the slide-out room by one of the following alternate methods. Both of these procedures will only be possible if there is access to the described areas.

1. Manually retract the slide-out room using a ratchet and socket attached to the end of the coupler (Fig. 20) to move the slide-out room.
  - A. Remove the motor. Follow steps 1-6 under the Manual Override Mode section.

### ⚠ CAUTION

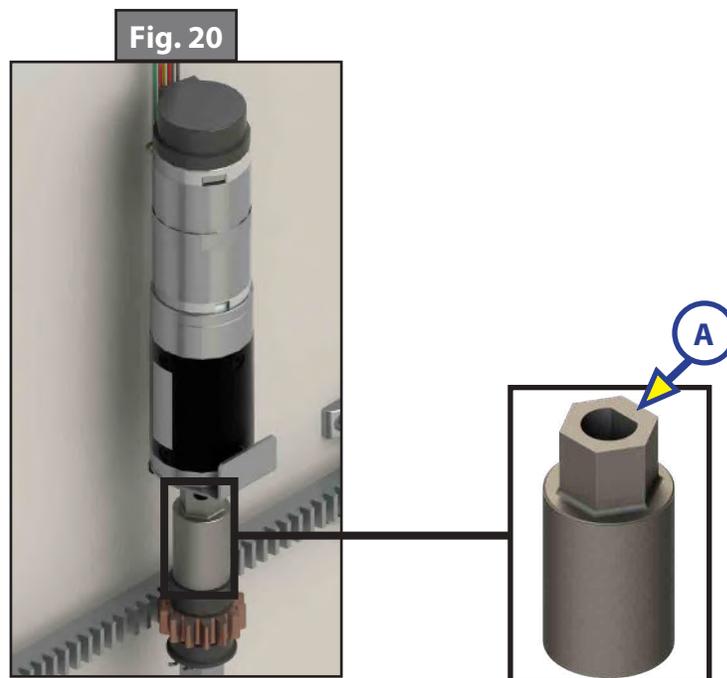
**When manually retracting the slide-out room, make sure that both sides of the slide-out room move together. Damage to the slide-out room may result if movement is not uniform.**

### ⚠ CAUTION

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

- B. Place a ratcheting wrench with a 3" extension and  $\frac{5}{8}$ " deep well socket through the motor access opening and seat the socket onto the coupler (Fig. 20A).
- C. Using the ratcheting wrench with socket, and alternating from one side to the other, turn the wrench to retract the slide-out room.

**NOTE:** One person per side of the slide-out room (two total) with ratcheting wrench and socket will expedite the process. Make sure that both sides of the slide-out room retract together uniformly. The slide-out room moves approximately  $\frac{1}{4}$ " for every 30-40 degree turn of the wrench.

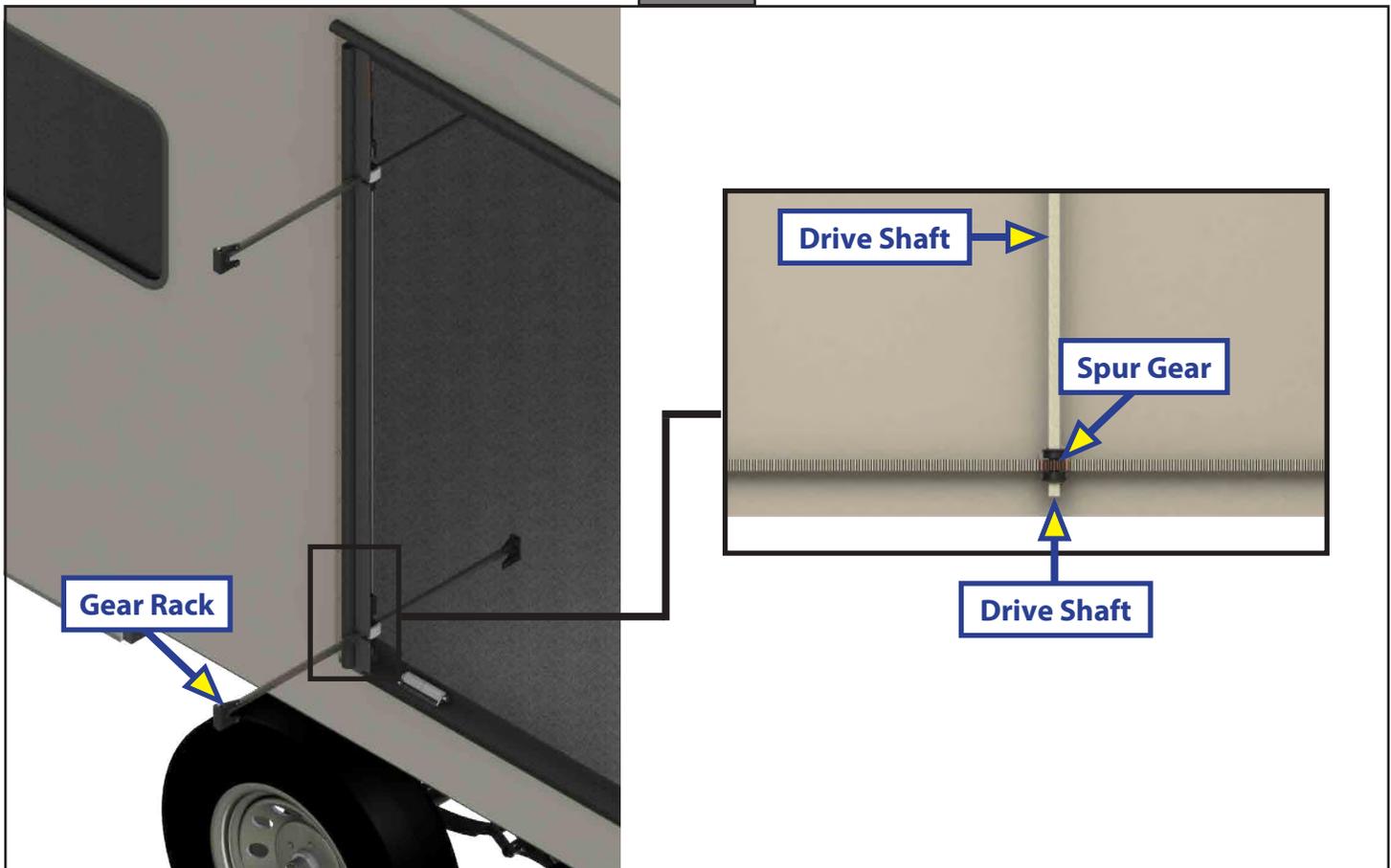


- D. Once the slide-out room is retracted, secure the slide-out room in-place by:
  - I. Re-installing the motors. If there is a retaining spring, make sure the end of the retaining spring is rehooked to the motor spring clip (Fig. 18).
  - II. Torquing the motor retaining screw to 40 in-lbs (Fig. 19) with the motor retainer fully engaged.
  - III. Using a transit bar (slide-out locking bar). Make sure motor is properly seated with no gap between the mounting bracket and block (Figs. 18 and 19).
- E. Have the slide-out room serviced by an OEM-authorized dealer as soon as possible. Do not operate the slide-out room until service is complete as damage to the slide-out room may result.
- 2. Manually retract the slide-out room by turning the 1/2" square drive shaft of each vertical channel assembly.
  - A. Remove the motor. Follow steps 1-6 of the Manual Override Mode.
  - B. Access the 1/2" square drive shaft (Fig. 23) of each vertical channel.
  - C. Using a 1/2" 8-point, star socket and alternating from one side to the other, turn the 1/2" square drive shaft to retract the slide-out room.

**NOTE:** A 15 mm 12-point socket is an option if the 1/2" 8-point star socket is not available. Use caution, as the 15 mm 12-point socket does not fit as snug as the 1/2" 8-point socket.

- D. Once the slide-out room is retracted, secure the slide-out room in-place by:
  - I. Re-installing the motors. If there is a retaining spring, make sure the end of the retaining spring is rehooked to the motor spring clip (Fig. 18).
  - II. Torquing the motor retaining screw to 40 in-lbs (Fig. 19) with the motor retainer fully engaged.
  - III. Using a transit bar (slide-out locking bar). Make sure motor is properly seated with no gap between the mounting bracket and block (Figs. 18 and 19).
- E. Have the slide-out room serviced by an OEM-authorized dealer as soon as possible. Do not operate slide-out room until service is complete as damage to the slide-out room may result.

Fig. 21



## Maintenance

The Lippert Components Slide-Out system has been designed to require very little maintenance. To ensure the long life of the Slide-Out system, read and follow these simple procedures:

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

### Introduction

Unlike traditional hose coils that trap debris, the Waste Master® hose is designed with its helical coil on the outside, while the inside is much smoother, preventing waste from getting trapped inside the hose. The UV-protected hose features "stay put" technology that keeps it extended during use to the exact length required. The Waste Master will feature either a cam lock connection or a bayonet connection from the Waste Master hose to the unit's waste water outlet pipe.

The Waste Master optional storage box may be mounted on the chassis in proximity to the unit's waste water outlet pipe for a permanent cam lock or bayonet connection. The storage box may also be mounted elsewhere on the unit for convenient storage of the Waste Master hose and nozzle assembly.

### CAUTION

**Use proper personal protective equipment when operating the Waste Master system. PPE to consider could include gloves and goggles.**

## Operation

1. Unlock and open the Waste Master storage box door (Fig. 1A).
2. Pull the Waste Master nozzle (Fig. 1B) from the storage box and slightly open the nozzle using the lever (Fig. 2A) to allow air to enter as hose extends. "Open" (Fig. 2B) and "Close" (Fig. 2C) are marked on the nozzle.

**NOTE:** If your system is not permanently connected to the unit's waste water outlet pipe, remove the entire Waste Master hose from the storage box. Connect the hose to the fitting (cam lock or optional bayonet adapter) at the waste water outlet pipe.

- A. If equipped with a cam lock (Fig. 3) open the cam lock arms on the unit's waste water outlet pipe. The arms open away from the unit. Insert end of the Waste Master hose into the cam lock. Close the arms.
  - B. If equipped with bayonet fitting (Fig. 5), place the hose's bayonet fitting on the unit's waste water outlet pipe. Turn the bayonet fitting clockwise to lock into place.
3. Walk to the sewer inlet and insert the tapered end of the nozzle into the sewer inlet. Close the nozzle using the lever.
  4. Walk back to the unit and open the black tank gate valve on the unit.
  5. Open the nozzle by turning the lever. Let the black tank fully drain and then close the nozzle and the black tank gate valve on the unit.

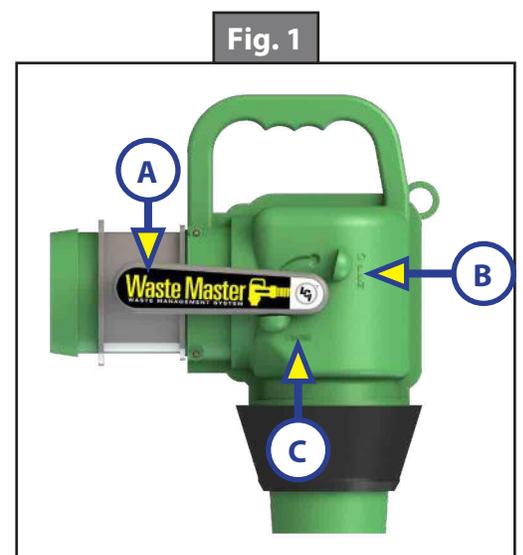
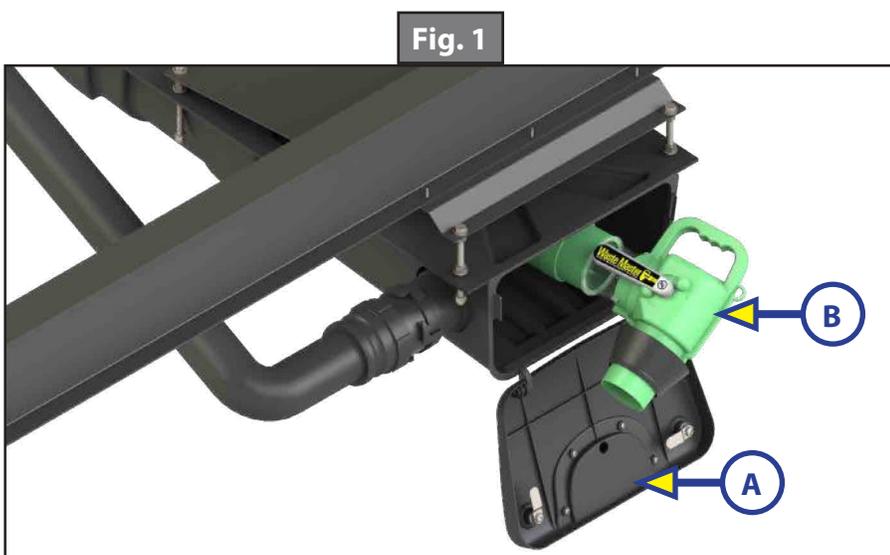
**NOTE:** Common industry practice is to empty the black (waste water) tank first, followed by the gray (sink and shower water) tank(s). This order allows the gray water to flush out the sewer hose and helps prevent sewage from remaining in the hose after emptying the tanks.

6. Open the gray tank gate valve on the unit.
7. Open the nozzle by turning the lever. Let the gray tank fully drain. Close the nozzle, but leave the gray tank gate valve on the unit open to allow air to purge as the hose retracts.
8. Once tanks are empty, hold the nozzle and walk back to the unit. Lay the nozzle on the ground, grasp hose near the storage box and begin to collapse the hose and push it back into the storage box.

**NOTE:** If your system is not permanently connected to the unit's waste water outlet pipe, disconnect the hose from the fitting (cam lock or bayonet) at the waste water outlet pipe:

- C. If equipped with a cam lock fitting, open the cam lock arms and disconnect the hose. The arms open away from the unit.
  - D. If equipped with a bayonet fitting, turn the fitting counterclockwise and disconnect the hose.
  - E. Collapse the hose and insert it into the storage box, if equipped.
9. Close the storage box door and the gray tank gate valve upon completion.

**NOTE:** The lever on the side of the nozzle must be in the closed position during storage and transportation.

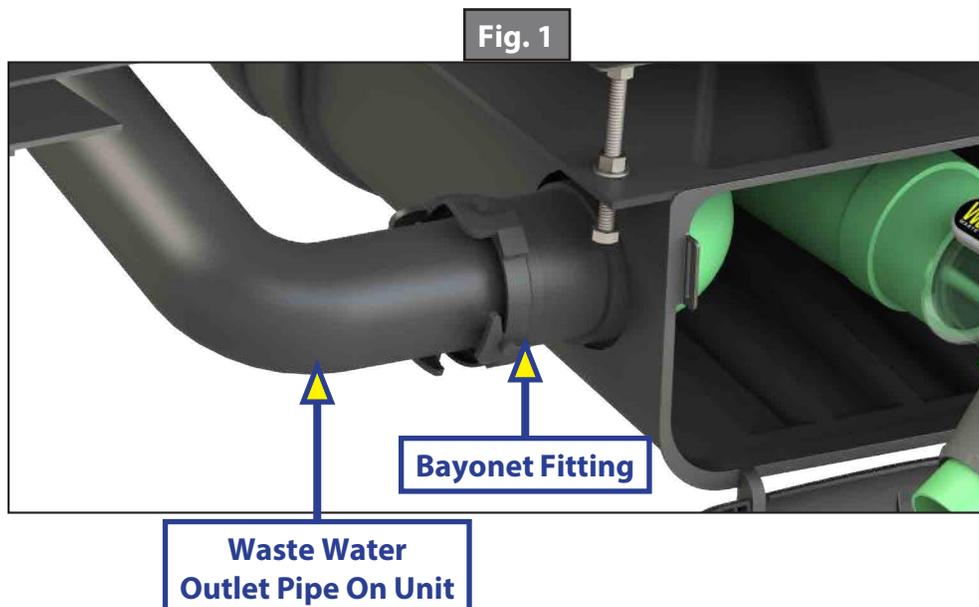
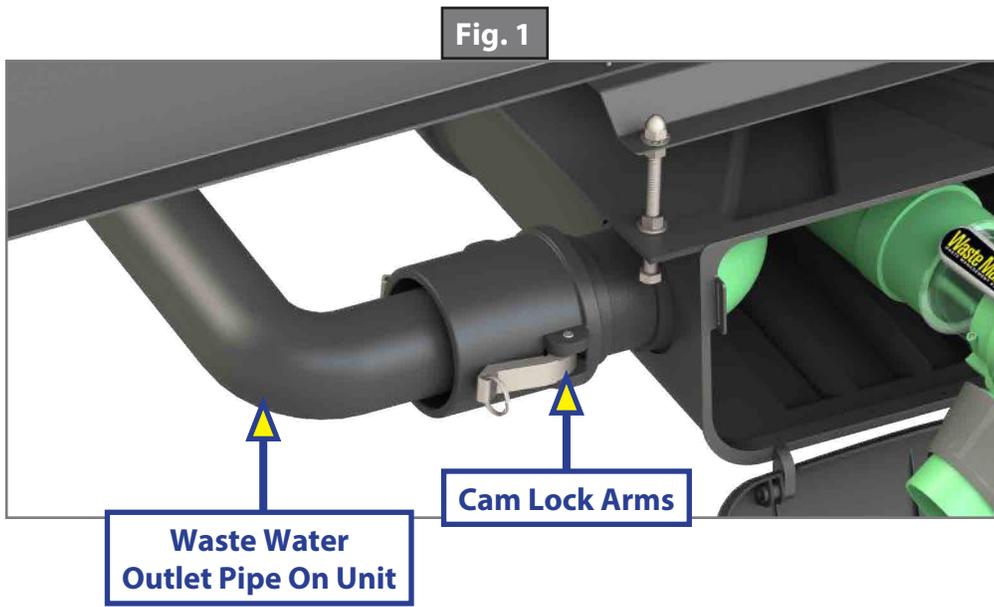


## Troubleshooting

### Hose Removal (If System Has Permanent Connection to Unit)

1. The unit's waste water outlet pipe will be fitted with either a Waste Master cam lock or Waste Master optional bayonet adapter. To remove the hose assembly from the waste water outlet:
  - F. If equipped with cam lock (Fig. 3): Release the two secure cam lock arms from the female section of the Waste Master (arms open toward the Waste Master box). Once both arms are opened, the hose section should separate from the waste water outlet.
  - G. If equipped with the optional bayonet adapter kit (Fig. 5): Turn the bayonet fitting counter-clockwise to separate hose section from the waste water outlet.
2. Remove the entire length of hose from the box.
3. If equipped with cam lock, insert the provided cam lock cap (Fig. 4A) into the cam lock to insure that no waste water drips from the terminal end of the plumbing.

**NOTE:** The cam lock cap is required during storage and transportation of the unit if the male cam lock fitting on the hose is not locked into the female cam lock fitting at the unit.



## Nozzle Replacement

### Resources Required

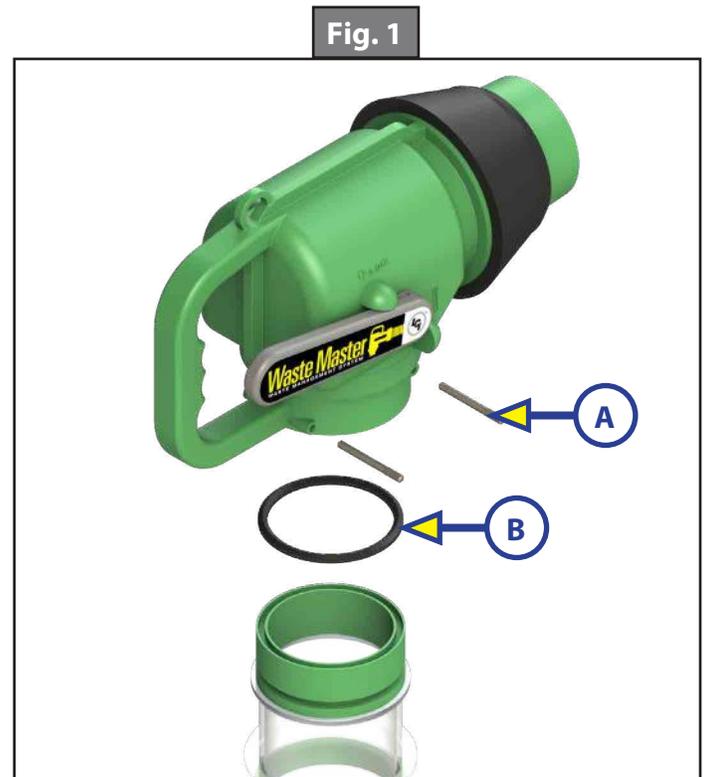
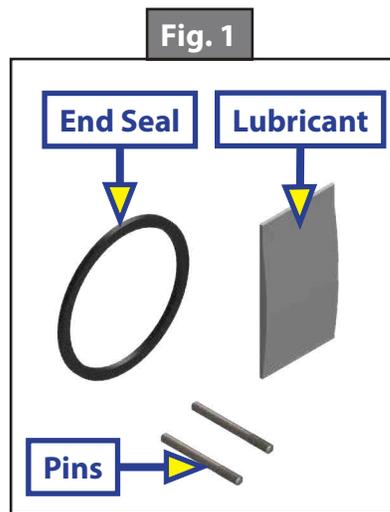
- Waste Master Ball Valve Kit - PN 349521 (Fig. 6)
- Waste Master Seal Replacement Kit - PN 360807 (Fig. 7)
- 1/8" Punch
- Hammer

1. At the nozzle, drive the two pins (Fig. 8A) out with a 1/8" punch and hammer.

**NOTE:** Drive pins out toward operating lever.

2. Remove nozzle from hose.
3. Before installing new nozzle, make sure new end seal (Fig. 8B) is in place in the bottom of the nozzle (flat end of seal in groove in nozzle).
4. Coat the seal with Dow Corning 111 lubricant (included in kit).
5. Install new nozzle on hose.
6. Drive pins back into place.

**NOTE:** Install new pins from operating lever side, smooth end first.



# SUMP PUMP SYSTEM

## SEWER AND FRESH WATER

### System and Safety Information

The Sump Pump System by Duraself (Model Number: DS-600GSP-M) is a 12V DC system designed for 600 GPH flow. The cover snaps on to allow quick installation and also to permit easy filter removal for cleaning. A gasket seals the sump box against overflow, and the sump box has an air vent to prevent air locks. Multiple inlets can be hooked up to more than one drain with different hose size options.

The specifications for the sump pump system include 3.2 feet of wire lead, 2.6 pounds net weight and 3.8 pounds gross weight. Pressure head is 2.5 meters/8 feet/3.5 psi.



**The sump pump system may be used only for water/bilge water and not for any other liquid. The pump should not be run dry.**



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

### Operation

When the drain water rises and reaches the second detector cell at about 1 1/2" to 2" deep, the automatic float switch will start the pump. When the water level has sunk to about an inch and the first detector cell is above the water level, the pump will stop.

The system is constructed with a check valve on the outlet port that will close to prevent the backflow of water into the box.

### Maintenance

It is recommended to periodically clean the plastic mesh screen filter (Fig. 1) for improved performance.

**NOTE:** The motor and float switch assembly (Fig. 1) can be pulled out to aid in removal of hair or debris.

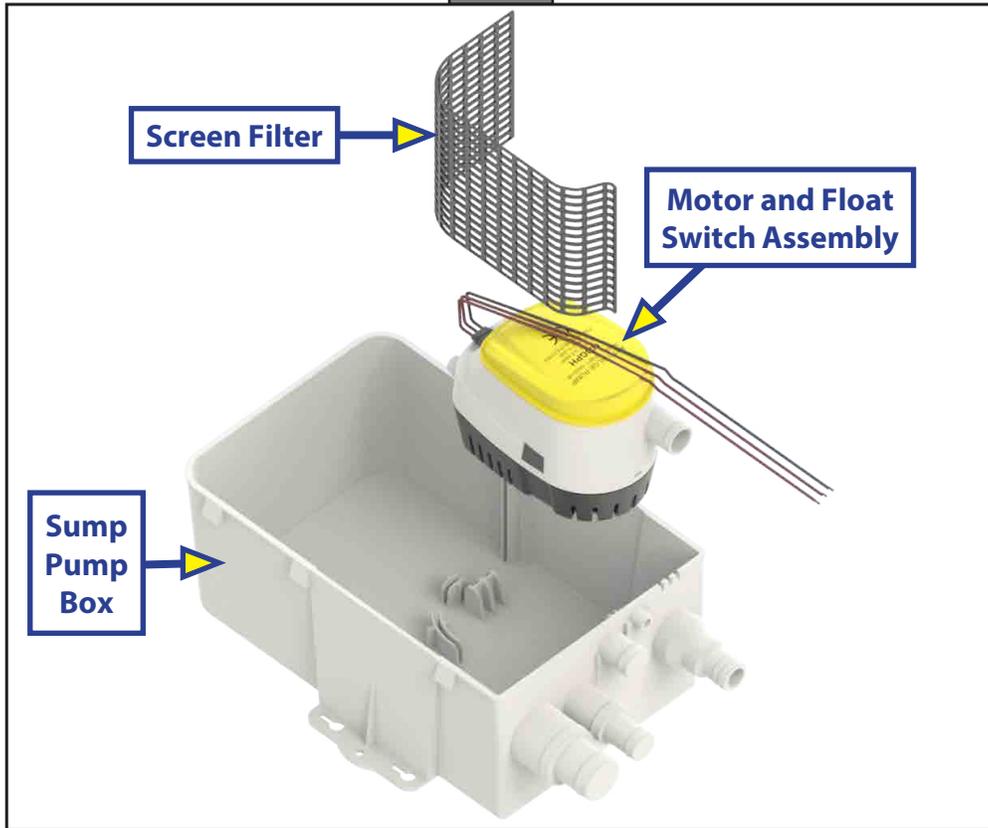
1. Remove the cover and slip out the screen filter (Fig. 1).
2. Use only mild soap and water to clean the screen filter, wipe off the pump and clean out the sump box (Fig.1).
3. When finished cleaning, reinstall pump (if removed) and screen filter and replace cover.

The sump pump box should be drained during the winter months.

1. Disconnect and drain all lines to the box.
2. Remove mounting screws and empty the box.

**NOTE:** If it is impractical to drain the system, a non-toxic RV/marine antifreeze can be added to the drain and circulated through the system.

**Fig. 1**



**Troubleshooting**

| What Is Happening?                           | Why?                | What Should Be Done?                                       |
|--|---------------------|--|
| Pump will not turn on                        | Line clogged        | Check if line is plugged or broken.                        |
|  | No power            | Check if the fuse is blown and manual switch is on.        |
|  | Incomplete circuit  | Check for loose or broken wires.                           |
|  | Float switch off    | Check if the float switch is jammed in the "off" position. |
| Pump will not turn off                       | Incomplete circuit  | Check for loose or broken wires.                           |
|  | Float switch on     | Check if the float switch is jammed in the "on" position.  |
|  | Mounting not level  | Determine if the box is level.                             |
| Pump output is low                           | Wires reversed      | Determine if system's electrical connections are reversed. |
|  | Line clogged        | Check if line is plugged or restricted.                    |
| System is leaking at inlet/outlet connection | Clamp missing       | Check if hose clamp is missing.                            |
|  | Loose hose          | Determine if hose clamp or pipe connection is loose.       |
| Pump turns on but does not pump              | Line clogged        | Check if line is plugged.                                  |
| Water returns to sump from outlet hose       | Check valve problem | Determine if check valve is plugged or damaged.            |

# MANUAL STEPS

## STEPS

### Introduction

This document details the operation and maintenance of manual steps.

### Safety

#### **WARNING**

The “WARNING” symbol above is a sign that an installation procedure has a safety risk involved and may cause death or serious injury if not performed safely and within the parameters set forth in this manual. The trailer **MUST** be supported per manufacturer's recommendations before working underneath. Failure to do so may result in death, serious personal injury or severe product or property damage.

#### **CAUTION**

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

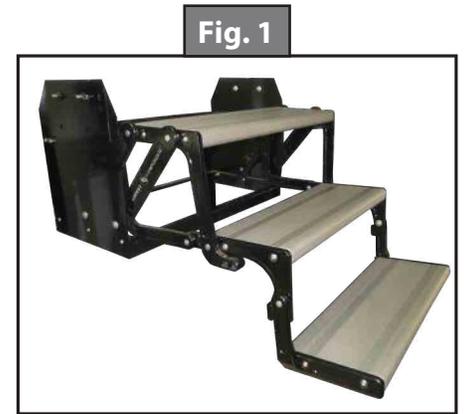
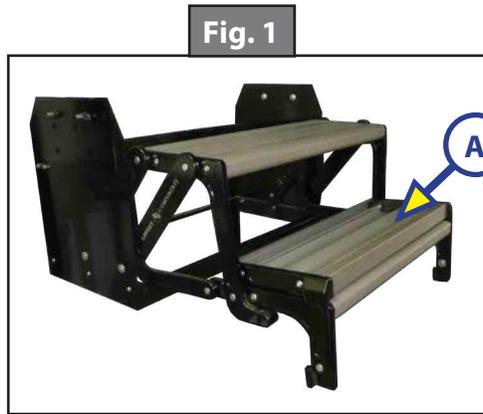
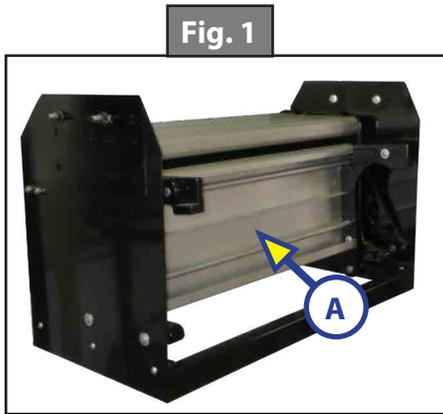
## Step Operation

### Unfolding Steps

1. Pull out on the top lip of the step vertically stored (Fig. 1A).
2. Pull up and out on the back of step resting on the second step (Fig 2A).
3. Unfold bottom step (Fig. 3).

### Folding Steps

1. Pull up on bottom step and fold over the second step (Fig. 2A).
1. Pull up on bottom of steps and fold inward under top step (Fig. 1A).



## Maintenance

### Scratches

1. Clear any chipped paint or material adhering to scratched area.
2. Apply automotive grade primer to scratch.
3. Paint primed area with automotive high gloss paint.

### Lubrication

1. Remove all dirt and foreign matter from hinge areas.
2. Lubricate hinge areas in between the sheet metal portions of the steps.

**NOTE:** Utilize a dry silicone lubricant. Wet lubricants will attract dirt and possibly cause damage to the hinge areas.

### Anti-Skid Tape

1. Inspect steps for loose, missing or damaged anti-skid tape.
2. Replace anti-skid tape as necessary.

### Introduction

The SolidStep® 2.0 is a trailer entry step assembly mounted to the side of any trailer, providing an ease of entry, regardless of level ground.

### Safety Information

#### **WARNING**

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

#### **CAUTION**

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

#### **CAUTION**

**No repairs should be attempted by anyone other than a qualified professional. The deployment and retraction of the Step assembly can cause injury if proper precautions are not taken. The Step assembly was designed for an operational weight rating of 400 lbs.**

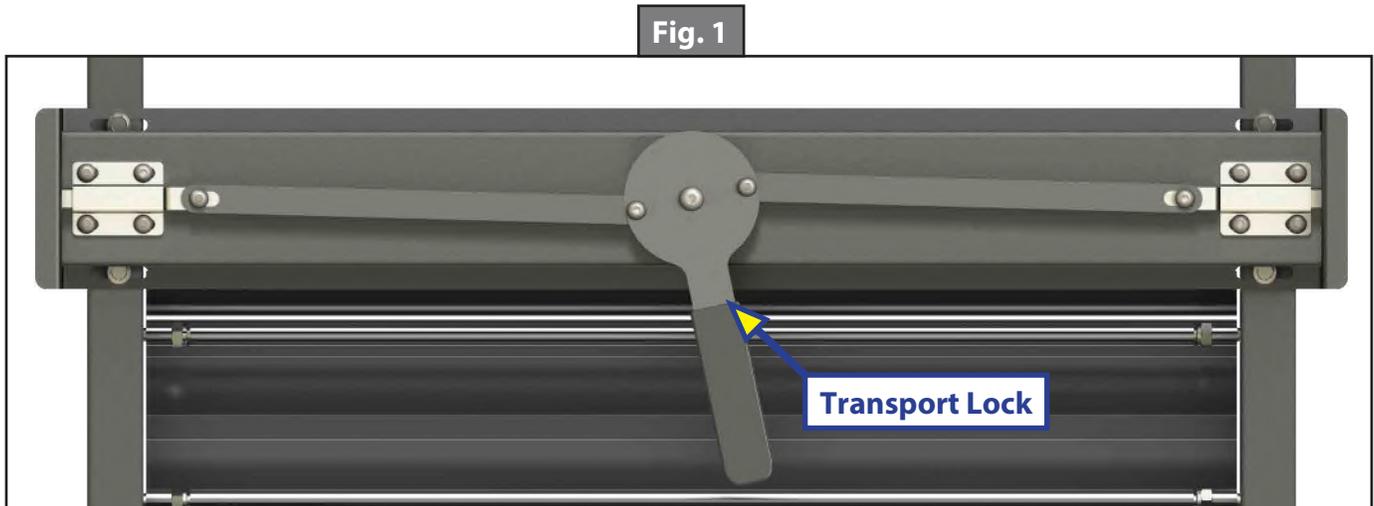
#### **CAUTION**

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

## Operation

### Release Steps

1. Disengage transport lock (Fig. 1).
2. Firmly grasp and pull out the vertically stored SolidStep and firmly rest it on the ground.
3. Adjust leg extensions as needed, see Leg Extension Adjustment section.



### Storage of Steps

1. Retract leg extensions, if desired.
2. Lift up SolidStep to its stored position and make sure the transport lock has been engaged.

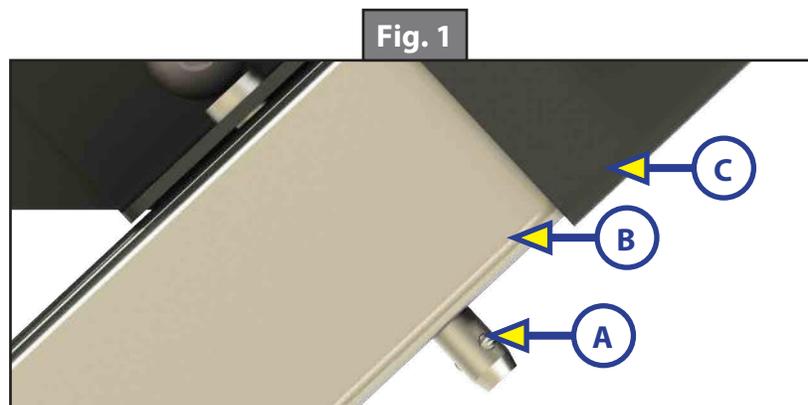
### Adjust Leg Extension

The leg extension is secured with a quick release clevis pin. Adjustments can be made to the leg extensions in 1" increments by moving the inner leg up or down for the optimal angle and to adjust for the ground surface angle.

### ⚠ CAUTION

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

1. To extend the inner leg (Fig. 2B):
  - A. Remove the quick release clevis pin (Fig. 2A) from the tube and the slot in the angle.
  - B. Extend the inner leg to the ground and at an angle so the steps are parallel to the ground and are level.
  - C. Replace the quick release clevis pin in the tube and slot and into the closest inner leg hole that intersects with the outer leg's slot to where the inner leg and the outer leg (Fig. 2C) meet.

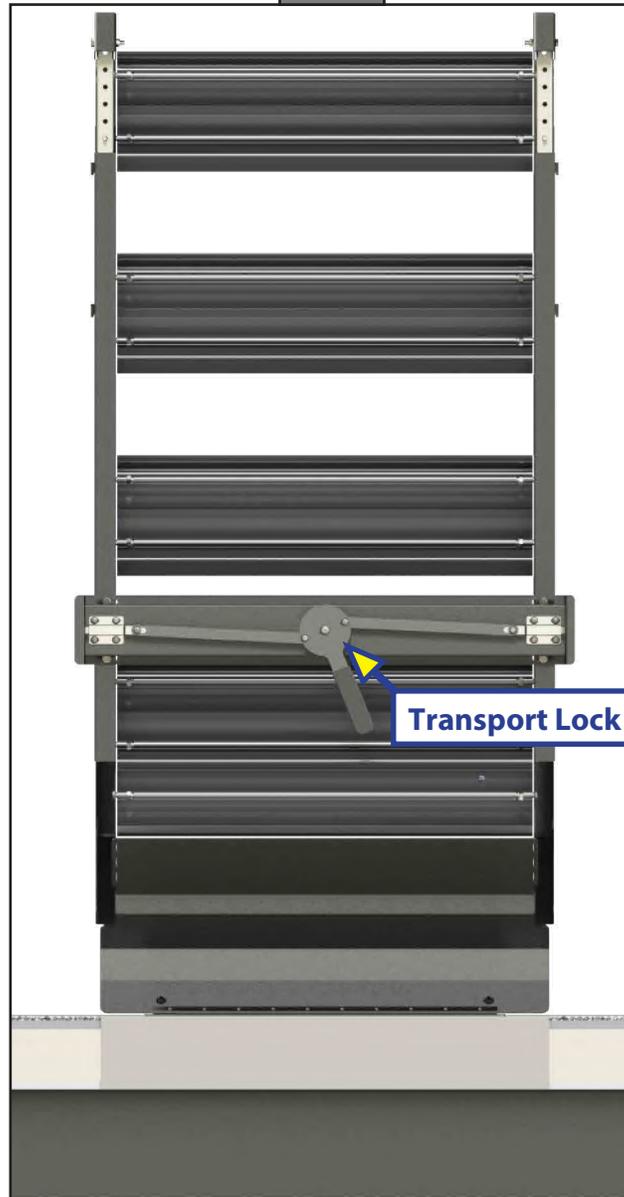


**CAUTION**

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

2. To retract the inner leg:
  - D. Remove the quick release clevis pin from the outer and inner legs.
  - E. Retract the inner leg.
  - F. Reinstall the quick release clevis pin into the outer leg slot and into the closest inner leg hole that intersects with the outer leg's slot.
  - G. The step assembly is shown in the upright stored position, as viewed from underneath the step assembly in figure 3.

Fig. 1



# SOLIDSTEP® 3.0

## STEPS

### System Information

The SolidStep® 3.0 is a trailer entry step assembly mounted to the side of any trailer, providing an ease of entry, regardless of level ground.

**NOTE:** Step identification tags are located under one of the step extrusions, typically the top full step.

### Safety information

#### **WARNING**

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

#### **CAUTION**

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

#### **CAUTION**

**No repairs should be attempted by anyone other than a qualified professional. The deployment and retraction of the step assembly can cause injury if proper precautions are not taken. The step assembly was designed for an operational weight rating of 400 lbs.**

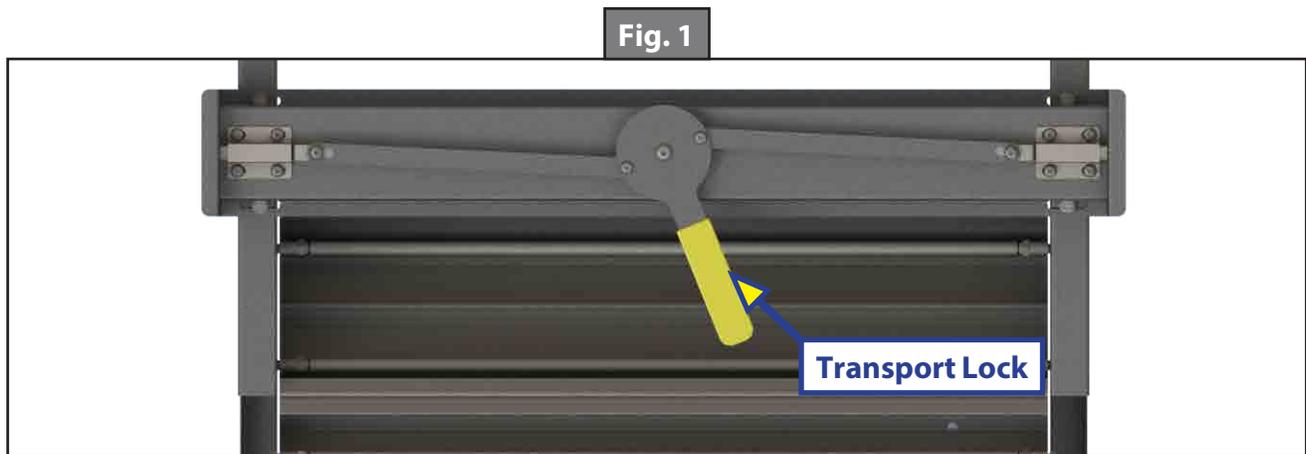
#### **CAUTION**

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

## Operation

### Release Steps

1. Disengage transport lock (Fig. 1).
2. Firmly grasp and pull out the vertically stored SolidStep and firmly rest it on the ground.
3. Adjust leg extensions as needed, see Leg Extension Adjustment section.



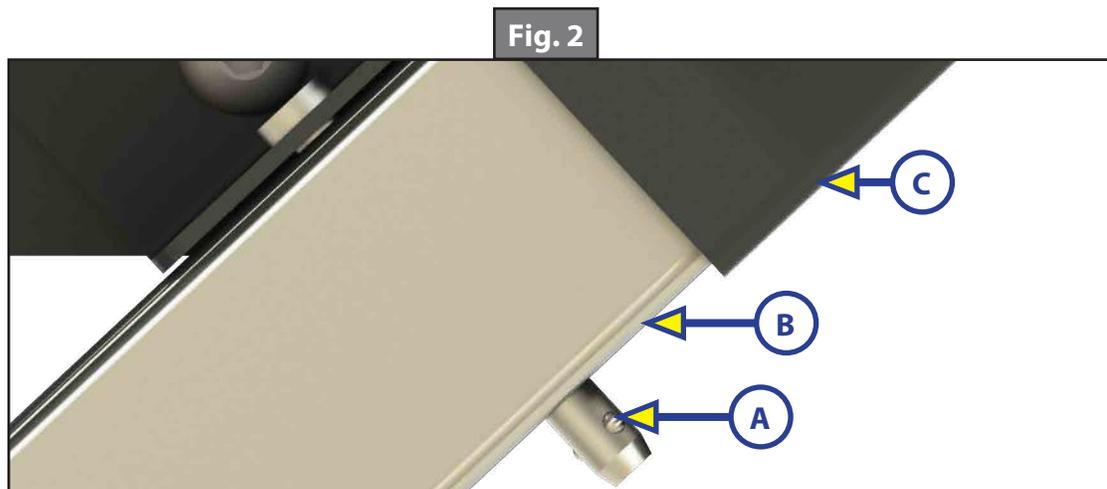
### Storage of Steps

1. Retract leg extensions, if desired.
2. Lift up SolidStep to its stored position and make sure the transport lock has been engaged.

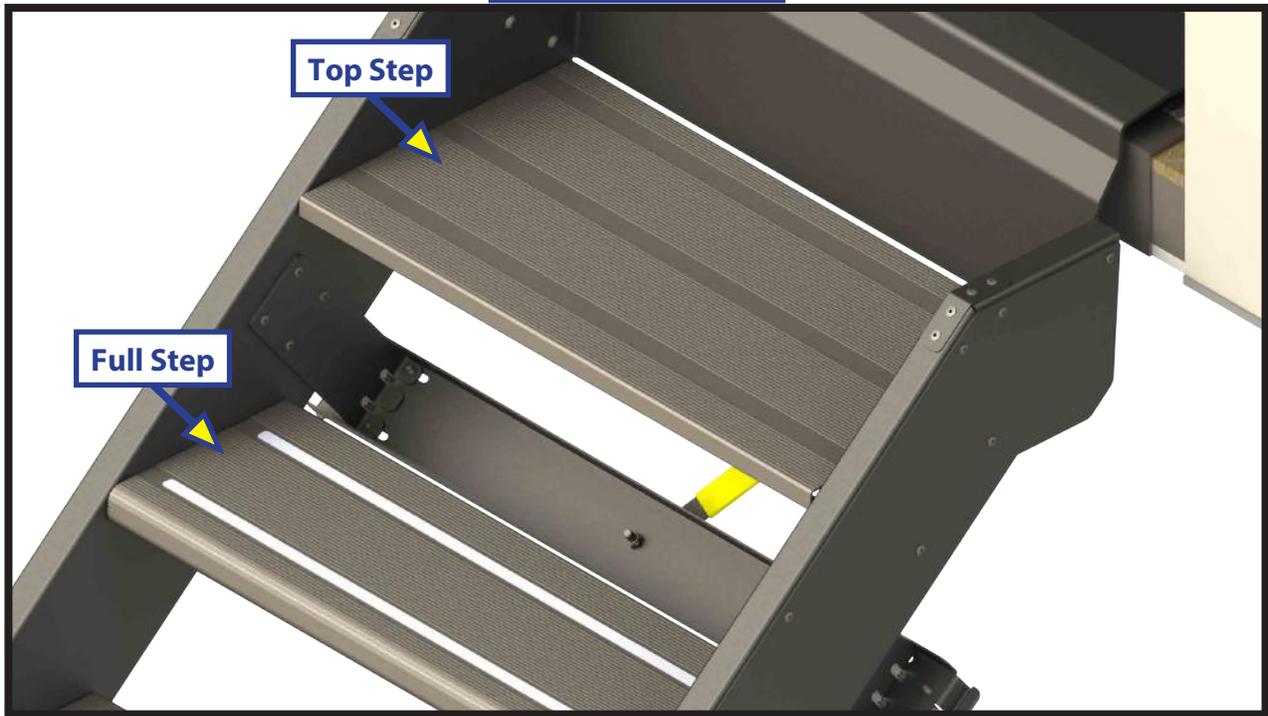
### Adjust Leg Extension

The leg extension is secured with a quick release clevis pin. Adjustments can be made to the leg extensions in 1" increments by extending or retracting the inner leg for the optimal angle and to adjust for the ground surface angle.

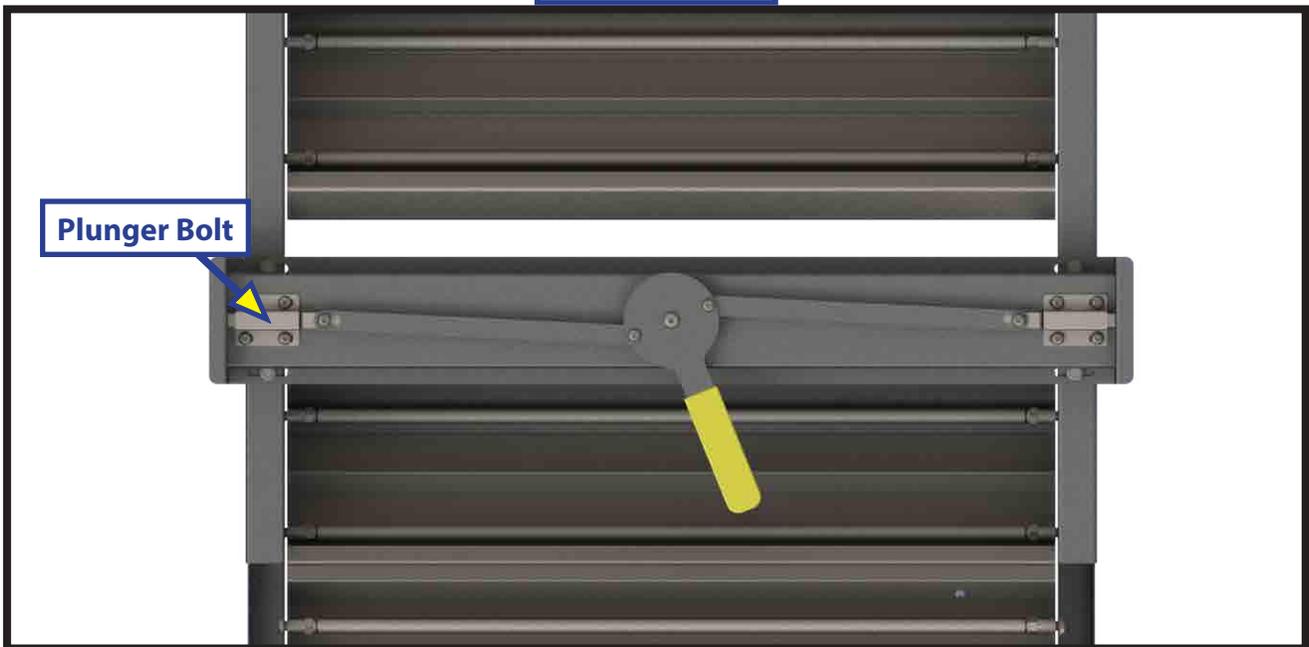
1. To extend the inner leg (Fig. 2B):
  - A. Remove the quick release clevis pin (Fig. 2A) from the tube and the slot in the angle.
  - B. Extend the inner leg to the ground and at an angle so the steps are parallel to the ground and level.
  - C. Reinsert the quick release clevis pin into the tube and slot closest to where the inner leg and tube (Fig. 2C) meet.
2. To retract the inner leg:
  - A. Remove the quick release clevis pin from the tube and slot.
  - B. Retract the inner leg.
  - C. Reinsert the quick release clevis pin into the tube and slot.



### Step Identification



### Lock Assembly



# BIKE RACK AND TIRE CARRIER

## STORAGE AND CONVENIENCE

### System

#### **WARNING**

**Lippert bike rack and tire carriers should not be used for any other purpose or reason than its intended use. To use the feature for any reason other than what it is designed may result in death or serious injury.**

### Description

Before using a Lippert bike rack or tire carrier, please note the following:

Follow all Lippert bike rack and tire carrier operation instructions. Failure to utilize the instructions provided may result in damage to the unit or cause death or serious injury.

The bumper is not intended for mounting of electric or motorized equipment. Any welding modifications to the bumper will void the warranty. Any aftermarket attachments by dealers or consumers to the bumper area will not be covered and will void the warranty of the bumper area.

Please be advised that Lippert frames, bumpers, bike racks, and hitches are warranted for factory installed equipment by the RV Manufacturer only.

## Prior To Operation

1. Remove all loose items from bicycles (pumps, bags, etc.)
2. Check that all quick release hubs are tight.

The max load and rating per the applicable product is referenced on Page 4. The weight limit includes all items secured to the bumper, including mounting devices, attachment hardware, spare tires, bikes and load attaching devices.

## Manual Slide-Out Bike Rack Operation

1. Pull hair pin from cane bolt (Fig. 1).
2. Pull cane bolt from bike rack assembly. Repeat steps 1 and 2 on opposite side of the assembly (Fig. 2).
3. Extend the bike rack by pulling on the bumper to extend (Fig. 3).

Fig. 1



Fig. 2



Fig. 3



**NOTE:** DO NOT attempt to extend the bike rack by pulling on the spare tire rack.

4. After bike rack is extended, replace cane bolt in assembly bracket (Fig. 4).
5. Replace hairpin in cane bolt (Fig. 5).
6. Once the bike rack is extended, it is ready to set up to store the bicycle(s) (Fig. 6).

Fig. 4



Fig. 5



Fig. 6



7. Release the snap pin and pull it from the stored mounting tube (Fig. 7).
8. Rotate the mounting tube vertically and place in the mounting bracket (Fig. 8).
9. Insert the snap pin completely through the mounting bracket and tube holes (Fig. 9).

Fig. 7



Fig. 8



Fig. 9



10. Be sure the snap pin is securely fastened (Fig. 10).
11. Set the first bicycle on the bike rack up against the mounting tube (Fig. 11).
12. Utilizing the mounting holes on the front cross member of the bike rack and the hole and eye-bolt on the mounting tube, secure the bicycle to the bike rack. Possible items to use to secure the bicycle include rope, bungee cords and ratchet-style motorcycle straps, none of which are included with the bike rack assembly (Fig. 12).

Fig. 10



Fig. 11



Fig. 12



## Bike Rack Weight Ratings

Lippert bike racks and tire carriers are weight rated based on the height of the main rail tube. Weight ratings for pull-out and fold-down bike racks are as follows:

- Pull-out bike rack on 4"- 6" main rail tube - 150 lb.
- Pull-out bike rack on 8" I-Beam main rail - 200 lb.
- Fold-down bike rack on 10" main rail tube - 250 lb.



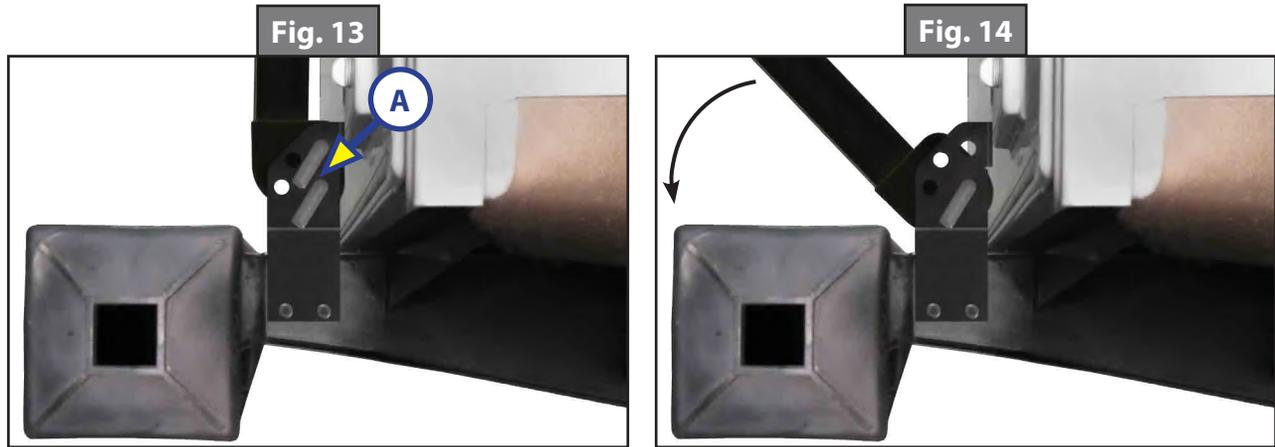
**Failure to acknowledge bike rack weight ratings may result in damage to the coach.**

## Maintenance

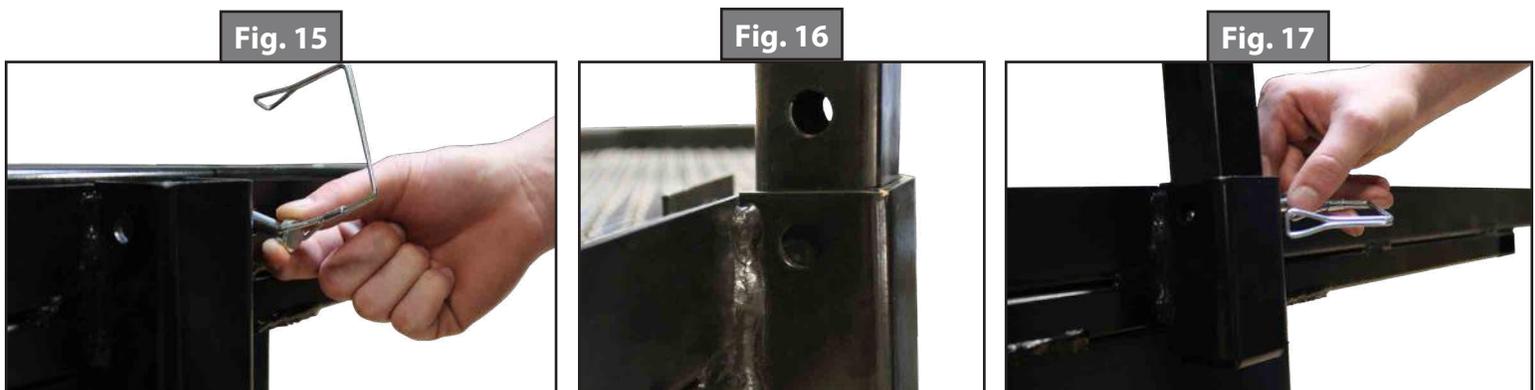
Bike racks and tire carriers may contain movable parts. Clean and/or lubricate periodically.

## Manual Fold-Down Bike Rack Operation

1. Remove hair pin from cane bolt.
2. Remove cane bolt from bike rack bracket (Fig. 13A).
3. Repeat steps 1 and 2 on the opposite side of the assembly.
4. Fold bike rack into the "down" position (Fig. 14).
5. Replace cane bolt and hair pin into bike rack bracket, securing the rack in the "down" position.



6. Remove pin from the mounting tube (Fig. 15).
7. Rotate the mounting tube vertically and place it in the mounting bracket (Fig. 16).
8. Insert the pin completely through the mounting bracket and tube holes (Fig. 17).
9. Make sure the pin is securely fastened and that the bike rack is stable.
10. The bike rack is now extended and ready for operation.
11. Utilizing the mounting holes on the front cross member of the bike rack and the hole and eye-bolt on the mounting tube, secure the bicycle to the bike rack. Possible items to use to secure the bicycle include rope, bungee cords and ratchet-style motorcycle straps, none of which are included with the bike rack assembly.



## Manual Loading of Bike Racks

1. Load first bicycle with its chain and gears facing away from rack. Make sure that bicycles do not come in contact with the coach.
2. Load subsequent bicycles in alternating directions. For best weight distribution, load heaviest bicycles first, with lighter bicycles on the outside. Add padding between bicycle contact points, if necessary.
3. After bicycles are loaded, check that entire rack is secure and that the rack is still firmly in place. Use side mirrors accordingly when backing up.

## Manual Tire Winch Operation

1. Place the tire directly underneath the spare tire bracket.
2. Thread the winch portion of the of the tire bracket assembly through the wheel hub opening (Fig. 18).
3. Adjust the winch until it sits flush with the inside of the tire rim (Fig. 19).

Fig. 18



Fig. 19



4. By using the manual crank (Fig. 20A) or with a hand wrench, lower (counter-clockwise) or raise (clockwise) the tire. While raising the tire, take great care to assure that the winch is still in position.

Fig. 20



**NOTE:** The spare tire must be raised to the stow position by manual hand crank only. The tire should be raised to the point that the tire's sidewall contacts the angle brackets firmly (Fig. 21A).

Fig. 21



**⚠ CAUTION**

**DO NOT over crank the winch or use a power drill or impact wrench to raise the spare tire. It may damage the winch or cable, causing the spare tire to drop from its stowed position and damage the vehicle.**

### Spare Tire Holder Operation

1. Remove mounting nuts.
2. Mount tire to spare tire carrier by threading bolts through the back of the wheel lug holes. Secure using mounting nuts.

### Spare Tire Carrier Weight Ratings

Lippert spare tire carriers are not intended to be used for more than one spare tire. The weight of the spare tire carrier and tire must not exceed 110 lbs combined.

**⚠ CAUTION**

**Failure to acknowledge tire carrier weight ratings may result in damage to the coach.**

# TURNING POINT® PIN BOX

## TOWING

### Product and Safety Information

The Turning Point® Pin Box is designated for 5th wheel application only. The Turning Point Pin Box can be used as a standard pin box for conventional transport or, with the pivot point relocated to the trailer, will provide up to a 90-degree turn and towing capability.

**NOTE:** Please refer to hitch manufacturer's instructions as to the compatibility with the Lippert Turning Point Pin Box. Not all hitches are designed to accept a wedge that relocates the pivot point.

#### **WARNING**

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

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

#### **WARNING**

Failure to follow the instructions provided in this manual may result in death, serious injury, trailer damage or voiding of the component warranty.

#### **WARNING**

The trailer **MUST** be supported per manufacturer's specifications before working underneath. Failure to do so may result in death or serious injury.

#### **CAUTION**

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

## Preparation

### **⚠️ WARNING**

**Failure to check and follow tow ratings could result in tow vehicle damage or truck and trailer separation while towing. Trailer and its contents must not exceed truck, hitch and/or trailer tow ratings.**

#### Tow Rating Weights Check For 10,000 lbs Pin Box (Fig. 1)

1. Do not exceed:
  - A. Vehicle tow rating
  - B. Turning Point Pin Box rating of 10,000 lbs
  - C. Gross trailer weight (trailer + full water tanks + cargo)
  - D. Pin weight of 2,000 lbs (20 percent maximum of step 1.C.)
2. Trailer weight should be lowest of the tow rating weights to ensure safe towing.

**NOTE:** The Turning Point Pin Box's pin weight is designed for a maximum load of 20 percent of the gross trailer weight of 2,000 lbs.

Fig. 1



#### Tow Rating Weights Check For 16,000 lbs Pin Box (Fig. 2)

1. Do not exceed:
  - E. Vehicle tow rating
  - F. Turning Point Pin Box rating of 16,000 lbs
  - G. Gross trailer weight (trailer + full water tanks + cargo)
  - H. Pin weight of 3,200 lbs (20 percent maximum of step 1.C.)
2. Trailer weight should be lowest of the tow rating weights to ensure safe towing.

**NOTE:** The Turning Point Pin Box's pin weight is designed for a maximum load of 20 percent of the gross trailer weight of 3,200 lbs.

Fig. 2



## Cab and Bed Clearance Check

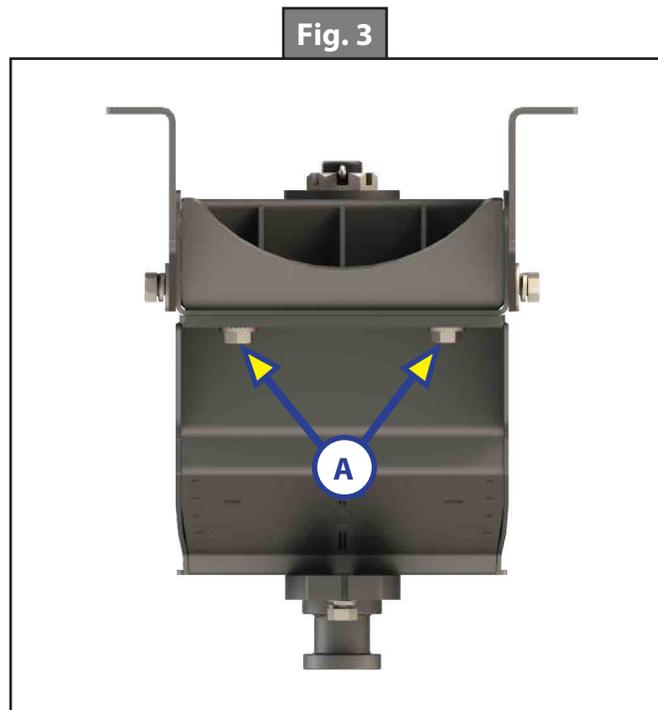
1. Measure the distance from the hitch jaws on the tow vehicle to the cab.
  - I. Record measurement and vehicle make/model here: \_\_\_\_\_
  - J. Add 22" (the length of the Turning Point Pin Box) to recorded measurement in step 1.A.
  - K. Record result here: \_\_\_\_\_
2. Measure the trailer width.
  - L. Record measurement here: \_\_\_\_\_
  - M. Divide measurement in step 2.A. by 2.
  - N. Record result here: \_\_\_\_\_
3. Determine towing configuration.
  - O. If the step 1.C. result is 4" greater than the step 2.C. result, then the Turning Point Pin Box can be used in both configurations.
  - P. If the step 1.C. result is less than 4" greater than the step 2.C. result, then the Turning Point Pin Box can only be used in the standard configuration for conventional towing. The 90-degree turn and tow capability will not be available.

## **Operation**

### Conventional Transport

The Turning Point Pin Box can be used as standard pin box. Two  $\frac{5}{8}$ " - 11 x 2" lockout bolts (Fig. 3A) installed on the back of the unit prevent rotation and permit use of the pin box without the wedge installed.

When using the unit as a standard pin box, the two  $\frac{5}{8}$ " lockout bolts shall be torqued to 200 ft-lbs.



## Moving Pivot Point

To provide towing with up to a 90-degree turn, the pivot point must be moved. Installation of a wedge will lock the pin box at the tow vehicle's hitch and move the pivot point from the vehicle's bed to the nose of the 5th wheel (Fig. 4A).

**NOTE:** Not all tow vehicle and trailer combinations will allow a 90-degree turn.

Fig. 4



**NOTE:** Please refer to hitch manufacturer's instructions as to the compatibility with the Lippert Turning Point Pin Box. Not all hitches are designed to accept a wedge that relocates the pivot point.

### **WARNING**

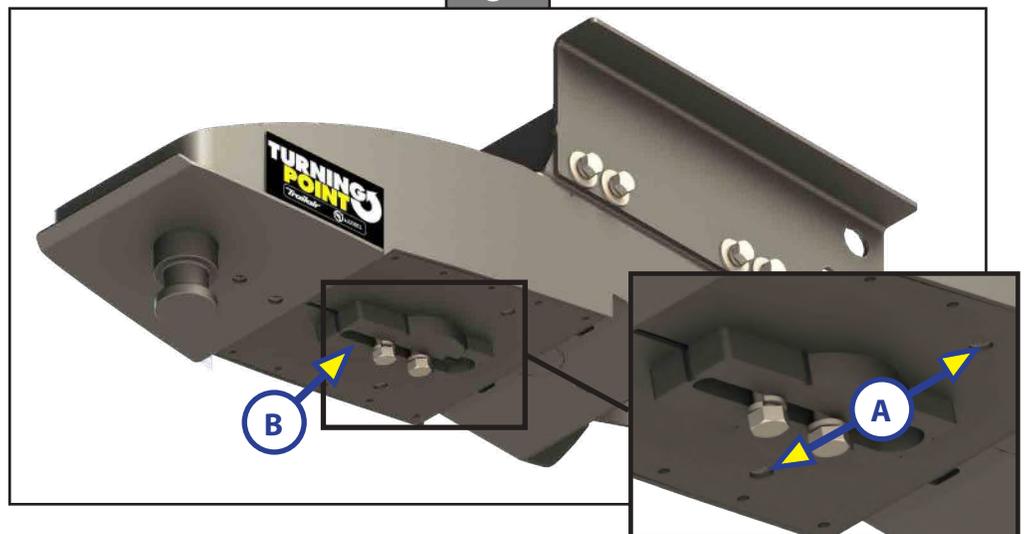
**Remove rear lockout bolts when hitch wedge is to be installed. Use these same bolts to install hitch wedge. When removing hitch wedge, re-install rear lockout bolts to original location. Failure to install bolts correctly according to instructions can result in vehicle instability, vehicle damage, serious injury and death.**

1. Remove the two 5/8" - 11 x 2" lockout bolts and mounting hardware from the rear of the pin box (Fig. 3A) and store in the two bolt holes on the underside of the pin box (Fig. 5A).
2. Remove the universal wedge from its storage location (Fig. 5B) by removing two bolts and lock washers.

**NOTE:** The two bolts holding the wedge in place are identical to the 5/8" - 11 x 2" lockout bolts and can be used interchangeably.

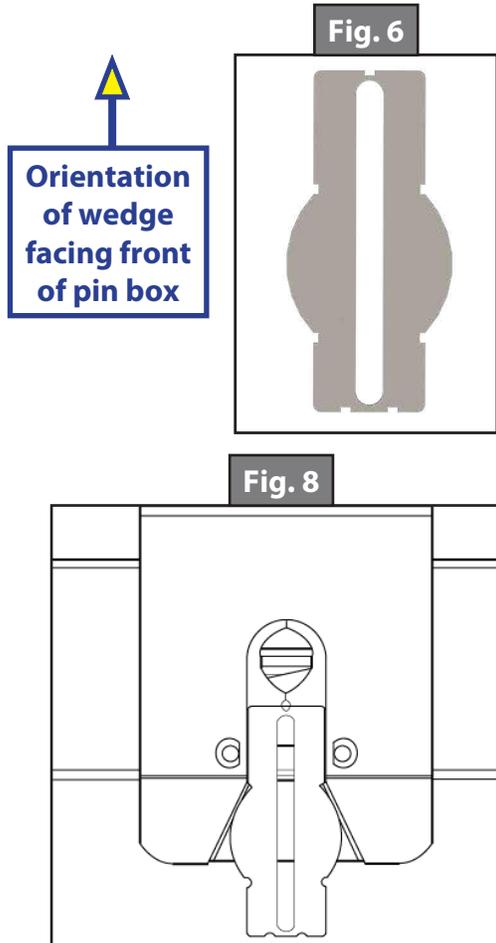
**NOTE:** The universal wedge is supplied with the pin box and is compatible with many different 5th wheel hitches.

Fig. 5

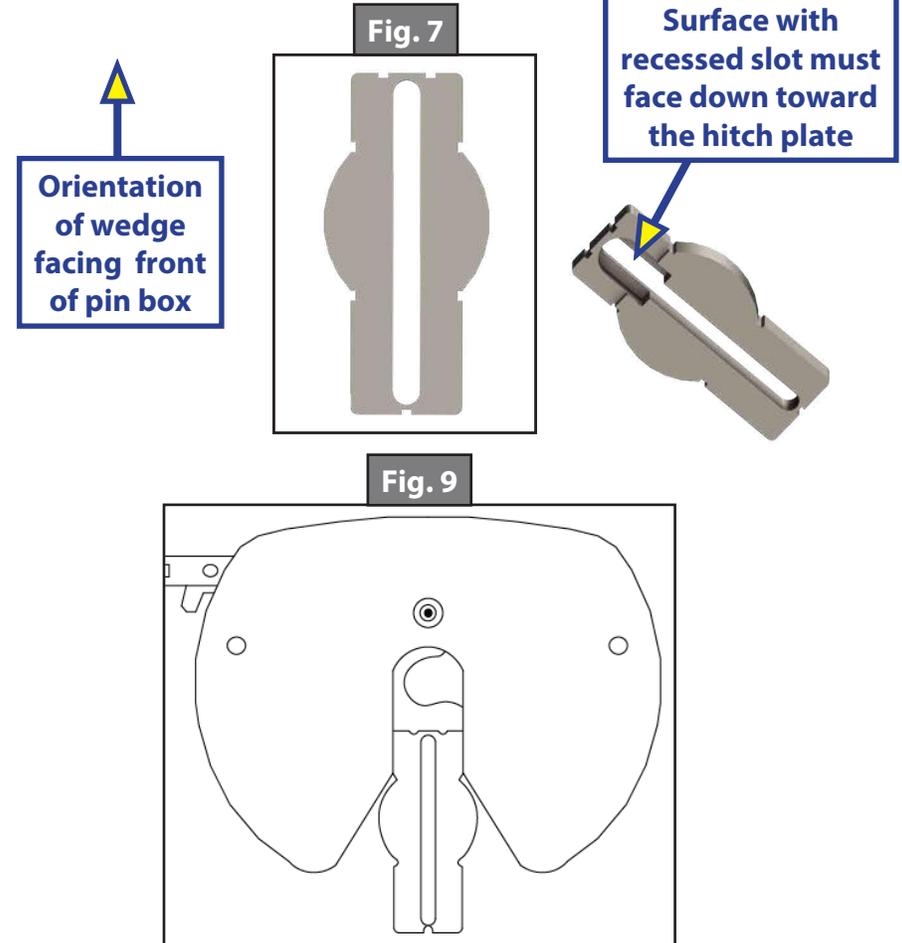


3. Determine the best orientation for installation of the wedge (Fig. 6 and Fig. 7).
  - A. Dry fit the wedge into the hitch funnel (Fig. 8 and Fig. 9) to make sure of the proper orientation.
  - B. The wedge should have contact with all parts of the funnel while providing adequate space for the kingpin receiver.
  - C. Different hitch configurations may require a different orientation for the wedge.

Wedge orientation for Reese/Draw-Tite/Hidden Hitch Select Series, Pro Series, Husky and similar 5th wheel hitch styles.

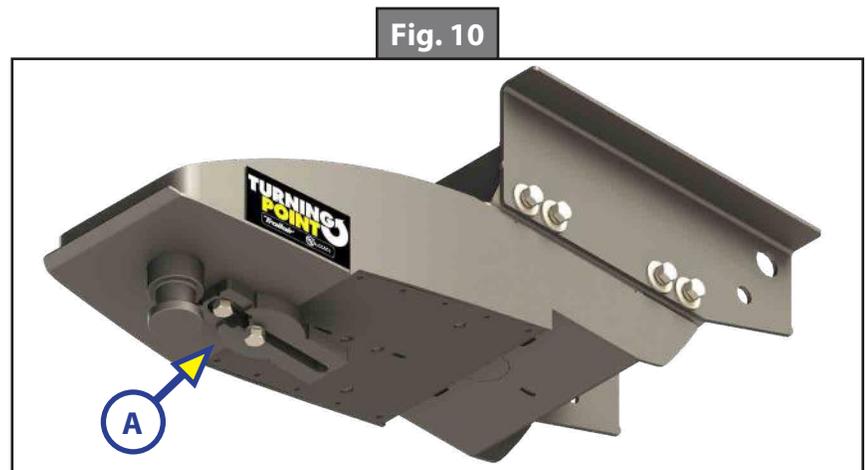


Wedge orientation for Reese/Draw-Tite/Hidden Hitch Signature Series, Elite Series and Select Plus, Reese Titan 16K and 20K, compatible B&W and similar 5th wheel hitch styles.



4. After best wedge orientation has been determined, place the wedge into position on the pin box (Fig. 10A).
  - A. Install previously removed two 5/8" - 11 x 2" bolts and lock washers.
  - B. Tighten the bolts until the lock washers begin to engage.
    - I. Do not fully tighten the bolts.
    - II. The wedge should be allowed to slide by tapping it with a hammer or mallet.
5. Go to the Hitching Procedure section and follow the instructions to connect the trailer's pin box to the tow vehicle's hitch.

**NOTE:** To assist with hitching, grease may be applied to the wedge, around the kingpin and on the skid plate surface.



**NOTE:** For proper latching of the 5th wheel hitch, refer to the hitch owner's manual.

6. Raise the trailer landing gear and drive the truck and trailer forward a few feet so the truck and trailer are in a straight line.
7. Put the vehicle in park and apply the emergency brake.
8. Block the trailer wheels and lower the trailer landing gear so the landing gear is resting firmly on the ground and supporting the trailer's weight.
9. Tap the wedge firmly forward until it will no longer move.
10. Tighten both wedge bolts.

**NOTE:** Both bolts may not be accessible while the unit is hitched. In this case, tighten the most accessible bolt (usually the rear bolt). The bolts will later be tightened to the proper torque value.

11. Unhitch the trailer from the tow vehicle following the manufacturer's instructions.
12. Torque the two 5/8" - 11 x 2" wedge bolts to 200 ft-lbs.

**NOTE:** A thin-walled socket may be necessary to torque the bolts.

The wedge should be adjusted or checked for proper adjustment before each trip. If a different 5th wheel hitch is used after the adjustment, it is necessary to readjust the wedge for the new 5th wheel hitch.

## Hitching Procedure

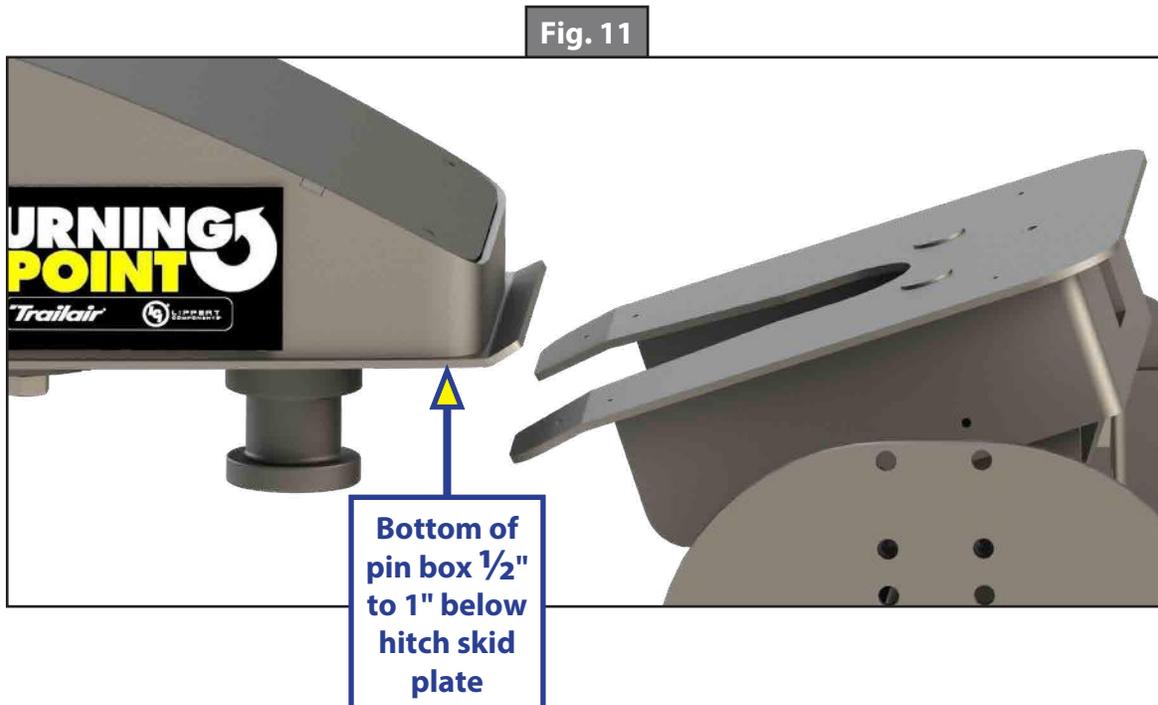
### **⚠ WARNING**

**Failure to follow these instructions may result in death or serious injury.**

1. Place blocks firmly against the front and rear of each trailer wheel to prevent possible movement either forward or backward.
2. If necessary, lower the tow vehicle's tailgate.

**NOTE:** Clearance of the lowered tailgate to the trailer needs to be monitored during hookups, since some combinations of truck and trailer have little or no clearance.

3. Using the trailer landing gear, adjust trailer height per the manufacturer's recommendation so the bottom of the trailer's pin box is 1/2" to 1" below the hitch skid plate (Fig. 11).



**⚠️ WARNING**

**Failure to follow these instructions may result in the kingpin being too high and coming to rest on top of closed jaws or not completely inside the jaw. This could result in the trailer separating from the hitch which may result in death or serious injury.**

**⚠️ WARNING**

**Do not attempt to hitch the trailer by using trailer jacks to lower the trailer and kingpin. This could result in the kingpin coming to rest on top of the skid plate instead of within the hitch opening, which may result in death or serious injury.**

**NOTE:** During the hitching maneuver, the bottom of the trailer's pin box should come into contact with the hitch skid plate ramp.

4. Open the jaw on the 5th wheel head. Refer to the manufacturer's instructions for proper 5th wheel hitch latch operation.
5. Back the truck slowly toward the trailer until the truck's hitch contacts the bottom of the pin box and the kingpin slides into the receiver.

**NOTE:** The truck and trailer must be straight and in line for the wedge to enter into the 5th wheel funnel.

6. Latch 5th wheel hitch in closed position per the instructions of the 5th wheel hitch manufacturer.
7. With the trailer wheels still blocked, make sure:
  - The landing gear is resting on firm, level ground.
  - The landing gear fully supports the trailer's weight.
  - The truck is stationary and in park with the emergency brake on.
  - The bottom of the pin box is resting on top of the hitch.
  - There is no space between the mating surfaces.

**NOTE:** If space exists between the pin box and hitch, the trailer has not been properly hitched. Do not tow the trailer. Instead, repeat the hitching steps 1-7 until the trailer is properly hitched.

**⚠️ WARNING**

**Working between the tow vehicle and trailer can be dangerous. Failure to properly secure the tow vehicle and trailer from movement can result in serious personal injury or death and serious product damage. Make sure tow vehicle and trailer are secured from movement. Make sure all safety precautions are followed to prevent personal injury or product damage.**

1. Connect the electrical cable between the truck and trailer.
2. Connect the breakaway switch cable from the pin box to a permanent part of the truck with slack to allow for rotation of pin box.
3. Raise the tailgate of the truck.
4. Do not tow the trailer until a Pull Test has been conducted.

**⚠ WARNING**

**Failure to perform a pull test may result in severe property damage, serious personal injury or death. Failure to secure tow vehicle and trailer from movement during procedure could result in severe property damage, serious personal injury or death. Make sure tow vehicle and trailer are properly secured against movement during the procedure.**

1. Make sure the trailer wheels are blocked, the trailer landing gear is resting on firm ground to support the trailer and the tow vehicle is in park with the emergency brake engaged.
2. Return to the cab of the tow vehicle, release the emergency brake and then apply the trailer brakes.
3. Slowly pull the trailer forward with the tow vehicle.
  - A. If the tow vehicle is properly hitched, the wheel blocks and trailer brakes should keep the truck from moving forward.
  - B. If the trailer is not properly hitched, the trailer will separate from the hitch and the truck will move forward while leaving the trailer behind. If this happens, repeat the Hitching Procedure.
4. After successfully performing the Pull Test, fully raise the landing gear per manufacturer's recommendations.
5. Check and inspect all electrical circuits for proper operation, including clearance lights, turn signals and stop lights.
6. Remove and store all trailer wheel blocks.

**Maintenance**

1. Check all fasteners every 500 miles to ensure connections have not loosened.
2. Periodically check the torque values of all bolts, including 200 ft-lbs for wedge/pivot lock and 175 ft-lbs for mounting bolts located between the trailer wings and the pin box.
3. Tighten loose fasteners to previously stated torque requirements.
4. Check bearing and grease once per season. If more grease is needed, add it to the bearing assembly. Use any of the recommended brands below.

| Approved Sources - Bearing Grease |                                   |
|-----------------------------------|-----------------------------------|
| Mobile Oil                        | Mobilgrease HP                    |
| Exxon/Standard                    | Ronex MP                          |
| Kendall Refining Co.              | Kendall L-427                     |
| Ashland Oil Co.                   | Valvoline Val-plex EP Grease      |
| Pennzoil Prod. Co.                | Premium Wheel Bearing Grease 707L |

**⚠ WARNING**

**Do not mix lithium, calcium, sodium or barium complex greases. Mixing of these incompatible compounds can create a corrosive and/or toxic chemical with fumes that can result in a serious health risk if exposed to skin or lungs. When converting from one grease to another, make sure all old grease is removed completely prior to applying new grease.**

5. If the nut needs to be removed when checking the bearing, leave in the rear locking bolts to maintain engagement.
6. Re-torque the nut to 50 ft-lbs when replacing the nut and make sure to install a new cotter pin.

# LCI CHASSIS INFORMATION

## CHASSIS

### Lippert chassis maintenance

The Lippert Chassis needs relatively little maintenance. The chassis and its components are powder coated to resist rust and corrosive materials that cause rust.

A few simple guidelines should be kept in mind to maintain the integrity of the chassis structure.

1. Never overload the trailer. The chassis is built to the specifications for GVWR (Gross Vehicle Weight Rating) set forth by the manufacturer of the trailer. Overloading the trailer may cause damage to the structure of the chassis causing residual damage to the trailer.
2. In the event the trailer is pulled through winter conditions where salt on the road can be splashed up and onto the chassis or the trailer is pulled or located near coastal areas of the country, periodically rinsing down the chassis will wash away the corrosive salt and keep the powder coat clean.
3. Pinbox mounting bolts should be torqued 90 - 110 ft. lb. and checked annually.
4. Inspect welds of cross-members, outriggers bumpers and draw bars (A-frame with coupler on the front of a travel trailer).

### Issues Resulting From Improper Maintenance

1. Cracks or "spider-webbing" in the powder coated surfaces.
2. Paint or powder coat flaking in large sheets.
3. Surface rust coming through powder coating.
4. Large areas of bubbling rust.

### Axle Hangers

1. Axle hangers are welded to the underside of the main rails and are brackets used to mount the axle suspension. Axle hangers should be perpendicular to the ground and parallel to the length of the main rails. Bent or damaged hangers may cause tire wear or spring issues.

Lippert Chassis Maintenance and Inspection Schedule

| Area of inspection | Inspection point  | As Needed | Before use if not moved in 6 months | 1 year | Every 1500-2000 miles |
|--------------------|---|-----------|-------------------------------------|--------|-----------------------|
| Couplers           | Latch function  |           | x                                   |        | x                     |
|                    | Hitch Ball peeling or flat spots                              |           | x                                   |        | x                     |
|                    | Ball housing metal shavings or flat spots                     |           | x                                   |        | x                     |
|                    | Lubricate hitch ball Dry lube                                 | x         |                                     |        | x                     |
|                    | Welds not broken for cracked                                  |           |                                     | x      | x                     |
|                    | Dry lubricant for latch                                       | x         |                                     |        | x                     |
| Pin Boxes          | Pin level/latching correctly by hitch manufacture guideline   |           | x                                   |        | x                     |
|                    | Skid plate bent/cracked or damaged                            |           | x                                   |        | x                     |
|                    | Welds not broken or cracked                                   |           |                                     | x      | x                     |
|                    | Hitch rating sticker  |           |                                     | x      |                       |
|                    | Side plate bolts not cracked, bent or damaged                 |           |                                     | x      | x                     |
|                    | Grease contact surface during use (skid plate or hitch plate) | x         |                                     |        | x                     |
|                    | Bolt torque 95-110 ft-lbs                                     |           |                                     | x      | x                     |
|                    | Bolt holes on side plates no cracking or damaged              |           |                                     | x      | x                     |

Lippert Chassis Maintenance and Inspection Schedule

| Area of inspection                     | Inspection point  | As Needed | Before use if not moved in 6 months | 1 year | Every 1500-2000 miles |
|--|---|-----------|-------------------------------------|--------|-----------------------|
| General weld checks(broken or cracked) | A-Frame/Draw bars   |           |                                     | X      | X                     |
|  | Upper Deck Risers   |           |                                     | X      | X                     |
|  | Axle hangers  |           |                                     | X      | X                     |
|  | Outriggers  |           |                                     | X      |                       |
|  | Chain elbow cracking or damage (holds your safety chains on travel trailers)          |           |                                     | X      |                       |
| Powder Coating                         | Clean regularly (dirt and salt can cause rust, bubbling, flaking, and spider-webbing) | X         |                                     |        |                       |
| Accessory Hitches                      | Welds not broken or cracked   |           |                                     | X      | X                     |
|  | Hitch not bent or twisted   |           |                                     | X      |                       |
|  | Hitch rating sticker  |           |                                     | X      |                       |
| Stabilizer Jack Brackets               | Cracked or Damaged  |           | X                                   |        | X                     |
|  | Bolts are not broken or bent (where applicable)                                       |           | X                                   |        | X                     |
| Axle Hangers                           | Welds not broken or cracked   |           |                                     | X      | X                     |
|  | Axle bolt and holes no cracking or damaged  |           | X                                   |        | X                     |
|  | Axle bolts tight 30-50 ft-lbs spring axles. Torsion Axles 120-150 ft-lbs              |           | X                                   |        | X                     |

Lippert Chassis Maintenance and Inspection Schedule

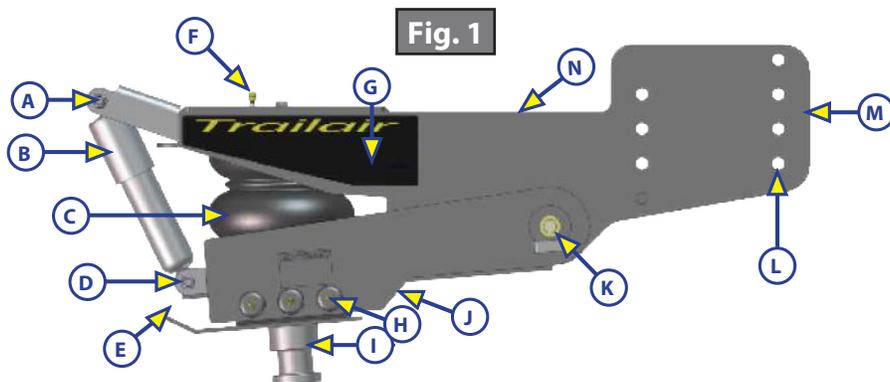
| Area of inspection                     | Inspection point   | As Needed | Before use if not moved in 6 months | 1 year | Every 1500-2000 miles |
|--|--|-----------|-------------------------------------|--------|-----------------------|
| Safety Chains                          | Latch Function   |           | X                                   |        |                       |
|  | Bolts are not cracking or damaged for bolt-on safety chain   |           |                                     | X      | X                     |
|  | Cracking or damaged  |           | X                                   |        | X                     |
| Landing Gear/ Leveling System Brackets | Welds not broken or cracked  |           |                                     | X      |                       |
|  | Bolts are tight 30ft pounds for front electric LG Bracket. 52-64ft pounds for electric/ hyd level up legs to bracket |           | X                                   |        | X                     |
|  | Cracking or damage to brackets and bolts   |           | X                                   |        | X                     |
| Main Rails                             | I beam or tube not cracking or damaged   |           |                                     | X      |                       |
| Detachable A-Frame/ Draw Bars          | Bolts are tight 95-110 ft-lbs  |           | X                                   |        | X                     |
|  | Cracking or bent bolts on detachable plates  |           | X                                   |        | X                     |

**NOTE:** Some of the items above are marked twice, please inspect whichever comes first. If there are any issues with any of these items please see your local RV dealership for repair or further inspection Any fabrication or addition of non-OEM parts will void warranty.

## Lippert Chassis Maintenance and Inspection Schedule

| Area of inspection  | Inspection point   | As Needed | Before use if not moved in 6 months | 1 year | Every 1500-2000 miles |
|---------------------|--|-----------|-------------------------------------|--------|-----------------------|
| Trail Air Pin Boxes | Pin level/latching correctly according to manufacturer's guideline.  |           | x                                   |        | x                     |
|                     | Skid plate (Fig. 1E) for bends, cracks, or other damage  |           | x                                   |        | x                     |
|                     | Hitch Rating Sticker (Fig. 1G)   |           |                                     | x      |                       |
|                     | Welds not broken or cracked  |           |                                     | x      | x                     |
|                     | Side Plate (Fig. 1M) bolts not cracked, bent, or damaged   |           | x                                   |        | x                     |
|                     | Grease contact surface during use (skid plate or hitch plate)  | x         |                                     |        | x                     |
|                     | Bolt torque 95-110 ft-lbs on side plates   |           | x                                   |        | x                     |
|                     | Bolt holes (Fig. 1L) on side plates not cracked or damaged   |           | x                                   |        | x                     |
|                     | Grease zerks greased (9 total) (Fig. 1H and J) Where applicable)   |           |                                     |        | x                     |
|                     | Air bag (Fig.1C) ride height verified on shock. (Fig. 1B)  | x         | x                                   |        |                       |
|                     | Air bag leak check using soapy water (spray entire air bag and look for bubbling while under load).  | x         |                                     |        | x                     |
|                     | Shock and pivot mounting bolts (Fig. 1A, D and K) torqued to 95-110 ft-lbs   |           |                                     | x      | x                     |
|                     | Check for standing water in recessed area on top of pin box (Fig. 1N). Drain water and remove debris as needed. Make sure area is clean and clear of all contaminants. | x         |                                     |        |                       |

**NOTE:** Recommended bag pressure is 100 PSI max. PSI will vary for each unit depending on load.



## **Axles**

### Bearings

Service and repack every 12 months or 36,000 miles. See Lippert Trailer Axle section for procedure and grease specifications. See also Technical Information Sheet TI-081.

### Brakes

For brake inspection and maintenance information, see Technical Information Sheet TI-082. Also, new brake assemblies must go through a break-in period to set initial contact. See Technical Information Sheet TI-086.

### Connecting Components

- Equa-Flex - Grease every 5,000 - 8,000 miles.
- Center Point - Check for proper inflation indicated by arms positioned vertically.
- Wet Bolts - Grease every 5,000 - 8,000 miles.

## **Kinro**

### Windows

Inspect glazing around window to be free of damage, cracks or holes and that glazing goes completely around the window. Replace if damaged.

### Cargo Doors

Inspect seals for damage, cracks or holes. Replace if damaged.

### Ramp Doors

Inspect seals for damage, cracking or holes.

## Recommendations For Jacking the Frame to Change A Tire

1. Carrying a jack rated for the weight of the coach is essential. The jack must be rated between 8 and 12 tons.
2. To prevent damage to the coach, carry wood blocks to place between the jack and the main rail (I-beam or tube) of the coach and to go under the jack.
3. DO NOT jack the coach on the axle tube or black pipe gas lines that can sometimes be mounted to the bottom of the main rail.
4. Chock the wheels, both front and rear, on the opposite side of the coach.
5. If hitched to tow vehicle, stay hitched and set the parking brake.

### **⚠ WARNING**

**DO NOT use the front landing gear, leveling system (if equipped), or rear stabilizer jacks to pick the coach up to change a tire. This is dangerous and may result in death or serious bodily injury.**

## Slide-outs

Inspect for dirt.

- Inner Arms - Extend and wipe down and apply dry lube only.
- Hydraulic Cylinder - Extend and wipe down piston rod and apply dry lube. Inspect hoses and hose fittings at cylinder for leaks.
- Electric Actuator - Extend and wipe down inner actuator and apply dry lube. Do not leave extended for long periods of time.

**NOTE: NOTE:** If unit is near coastal areas or exposed to salt air, maintain above components at least once a month.

## Electric Landing Gear

- Extend jacks and wipe down inner and outer jacks and apply dry lube to inner.
- Inspect bevel gears in top of jack to be free of dirt and contamination.

## Hydraulic Landing Gear - Level-Up Jacks - Rear Hydraulic Stab Jacks

- Wipe down inner and outer. Rinse outer after winter travel or coastal or salt air travel. Extend and apply dry lube to inner and piston rod where applicable.
- Inspect Hoses and hose fittings for leaks.

## Hydraulic Power Units

Inspect for leaks around ports, hoses and fittings. Be sure fluid in reservoir is full to within 1/4" of the top.

## Maintenance Free Systems

- Touch audio
- TV lift
- Wireless remote systems
- Keyless entry
- Door alarm
- Door and slam latches
- Entry doors
- Manual steps
- Coachsteps





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