



HYDRAULIC LEVELING
4 POINT / 4 VALVE SPRINTER
OEM INSTALLATION MANUAL

TABLE OF CONTENTS

System Information	3
Component Description	3
Safety	3
Resources Required	4
Preparation	4
Installation	6
Prior to Installation	6
Jack Specifications	6
Jack Fitting Installation	6
Hydraulic Power Unit Installation	7
Hydraulic Hoses	8
Rear Jack Bracket and Jack Installation	8
Front Jack Bracket Installation	10
Installing the Cross Tie Assembly	11
Controller and Touchpad Installation	12
Controller Installation	12
Touchpad Installation	13
System Wiring Requirements	14
Prior to Operation	14
Touchpad Operation	15
Automatic Leveling Procedure	16
Manual Leveling Procedures	16
Jack Retract Procedures	17
Troubleshooting	17
Automatic Safety Shutoff	17
Drive Away Protection System	18
Error Mode	18
Level Zero Point Calibration	18
Manual Override - Jacks	19
Manual Override - Power System	19
"Jacks Down" Alarm	20
User Alarm Mode	20
Low Voltage Signal	20
Preventative Maintenance Procedures	21
Fluid Recommendation	21
Latched Out Warning	21
Troubleshooting Chart	22
Hydraulic Plumbing Diagram	23
Wiring Diagram	24
Notes	25

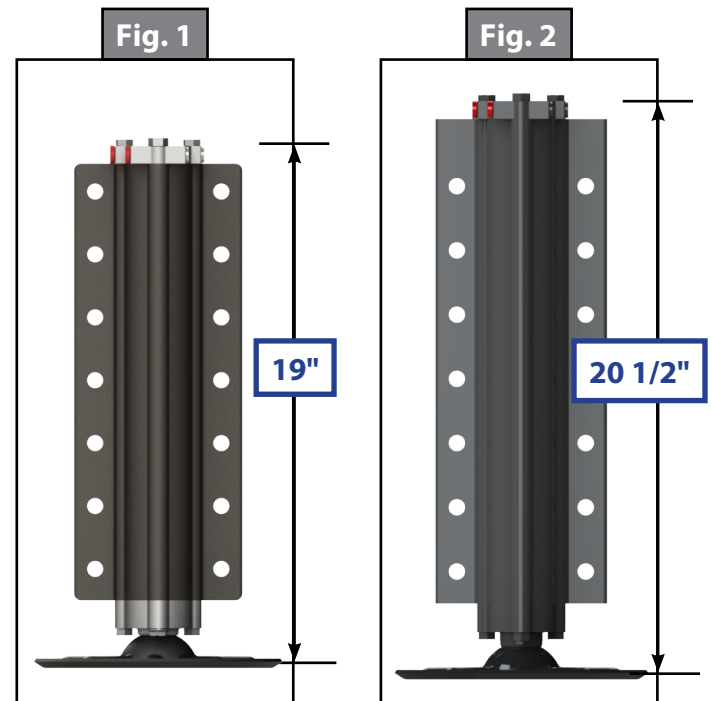
System Information

This hydraulic leveling system was designed for use only on a Sprinter chassis. The four-point, four-valve hydraulic leveling system is a hydraulic system which includes four points of contact utilizing jacks and a four-valve 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 hydraulic leveling system are replaceable. Contact Lippert to obtain replacement parts.

The hydraulic leveling system is primed and tested at the factory. However, the system is shipped dry to avoid hazardous material restrictions.

Component Description

1. Jacks
 - A. 8K Aluminum Jacks:
 - I. (2) 12.5" stroke front jacks (Fig. 1)
 - II. (2) 15" stroke rear jacks (Fig. 2)
 - B. Rated at a lifting capacity for the coach.
 - C. Standard 9-inch diameter (63.5 square inch) footpad on a ball swivel for maximum surface contact on all surfaces.
 - D. Operational 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 valve
3. System Controls
 - A. Controlled electronically from the touchpad.
 - B. Touchpad can be operated in manual mode or fully automatic mode.
4. Fittings and Hoses
 - A. Fittings - High pressure O-Ring Face or J.I.C. - Size 4
 - B. Hose - 1/4" I.D., 3000 psi - W.P. Rated



Safety

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

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



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.



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

During servicing make sure that the coach is supported according to the manufacturer's recommendation. 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 or personal injury or product or property damage. Use proper personal protective equipment damage.

CAUTION

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

CAUTION

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

CAUTION

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

Resources Required

- Electric or cordless drill
- Assorted deep well sockets
- Ratchet wrench
- Torque wrench
- Open end wrenches
- Pliers
- Permanent marker or grease pencil
- Tape measure
- Assorted screwdrivers
- (4) #8 x 1" fasteners
- (4) #6 x 1" Wood Screws

Preparation

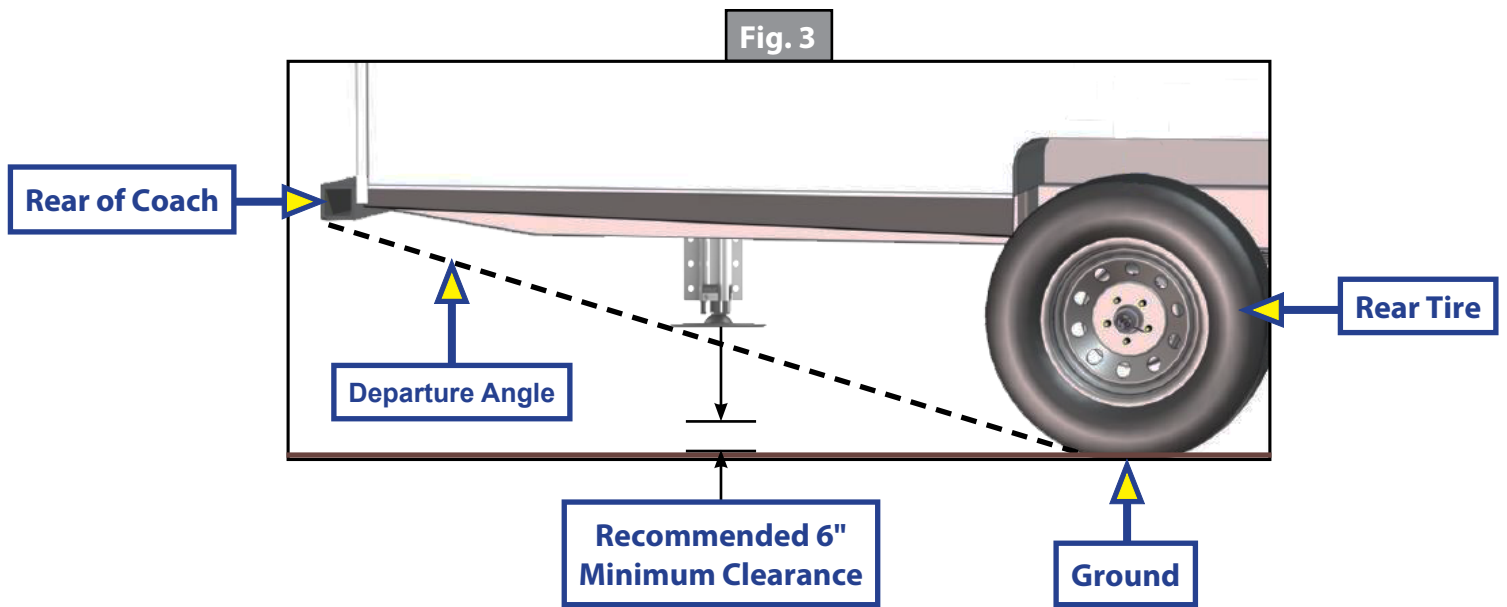
1. Make sure to park the coach on solid and level ground.
2. Clear all jack landing locations of debris and obstructions.
3. Keep hands and other body parts clear of fluid leaks. Hydraulic system leaks in the hydraulic leveling system may be under high pressure and can cause serious skin penetrating injuries.

WARNING

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. Do not lift the coach by the axles. The axles were not designed as a viable lift point.

4. Using the properly-rated floor jack, support framework and lift the coach according to the manufacturer's recommendations.

NOTE: When fully retracted, the rear jacks must be mounted to achieve a minimum ground clearance equal to the departure angle in order to enable maximum leveling correction. Any additional ground clearance added to the jack location will decrease the amount of leveling correction available to the system. A recommended minimum ground clearance between the bottom of the jack footpad and the ground is 6" (Fig. 3).



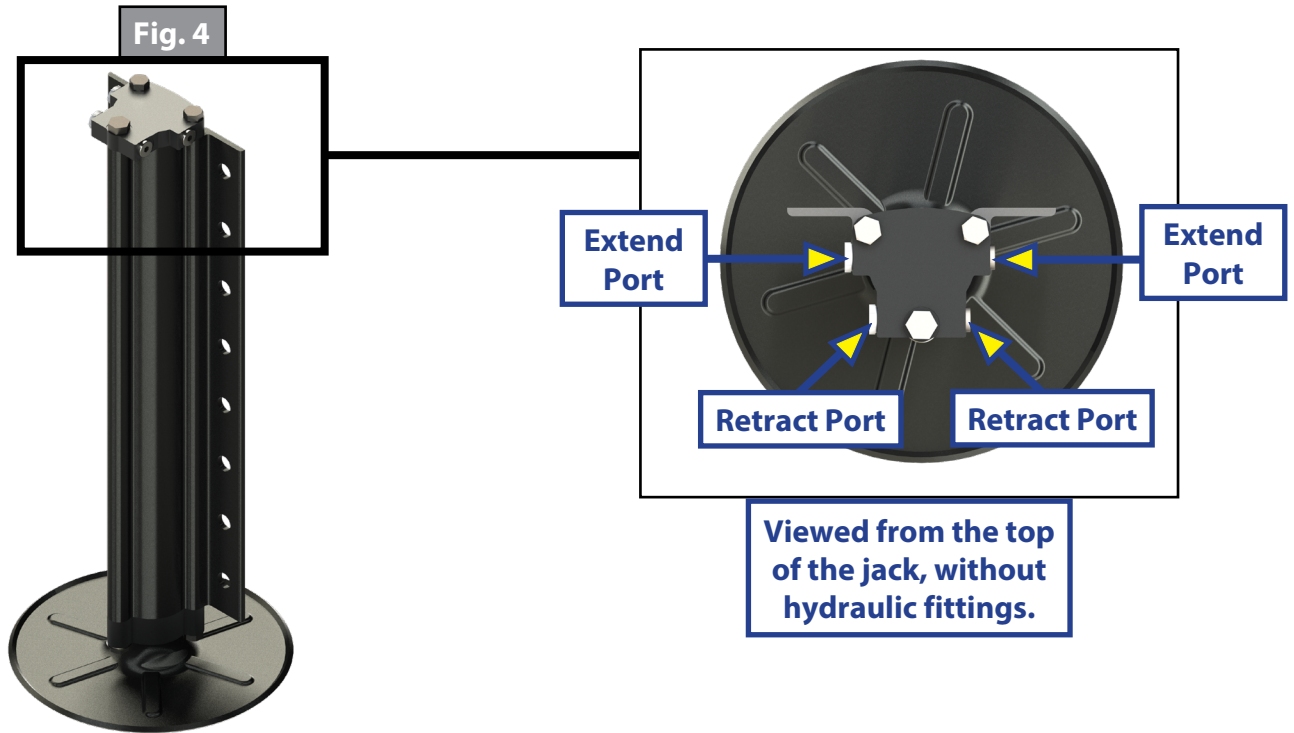
5. Determine how and where the jack brackets will be bolted to the frame of the coach by dry fitting brackets. Mark location with a permanent marker or grease pencil.
 - A. The rear jacks should be mounted so that there is a minimum of 2" clearance between the jack and the rear tires, suspension and exhaust components, and aligned with each other.
 - B. The front jacks should be mounted approximately 12" behind the front axle.
 - C. Determine the location where the new power unit will need to be mounted near center of chassis, roadside frame rail.
6. Check for any obstructions, such as slide-out cross shafts, outriggers or manual override connections for slide-outs that will require modification of the brackets prior to bolting on.
7. Locate and move any wires, hoses, etc. that could be damaged while bolting on the jack brackets to the frame. Check both the inside and outside of the frame.

Installation

Prior to Installation

Refer to the Hydraulic Plumbing Diagram (Fig. 32) for the following steps:

1. Identify where the extend and retract ports are on the jack (Fig. 4).
2. Verify that the ports are clear of any residual machining metal debris.
3. Label each jack Left Front (LF), Right Front (RF), Right Rear (RR) or Left Rear (LR).



Jack Specifications

CAPACITY - 8,000 lbs. max.
CAPACITY - 8,000 lbs. max.

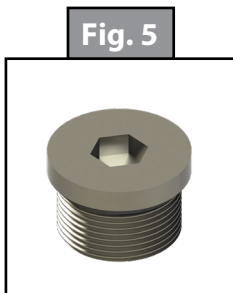
FRONT STROKE - 12 1/2"
REAR STROKE - 15"

FOOTPAD 9" DIA. STANDARD
FOOTPAD 9" DIA. STANDARD

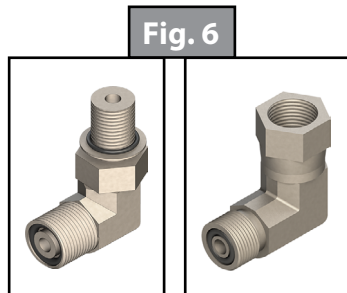
Because of various possible configurations, this manual will provide instructions with the power unit mounted near the center of the coach frame, roadside frame rail. Fittings and hose configurations may be OEM specific. Under normal installation procedures, the jacks closest to the power unit get plumbed first. See the Hydraulic Plumbing Diagram (Fig. 30) for the power unit located on the left side of the coach.

Jack Fitting Installation

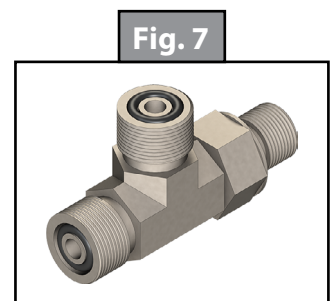
1. The Left Front (LF) jack requires two tees, two 90° elbows and two port plugs.
2. The Right Front (RF) jack requires two 90° elbows and two 7/16" port plugs.
3. The Left Rear (LR) jack requires one tee, two 90° elbows and two 7/16" port plugs.
4. The Right Rear (RR) jack requires two 90 degree elbows and two 7/16" port plugs.
5. The hydraulic fittings and 7/16" port plugs (Figs. 5 - 7) can be installed into the jacks (Fig. 2) per the Hydraulic Plumbing Diagram (Fig. 32).



7/16" Port Plug



90° Fittings



Tee Fitting

Hydraulic Power Unit Installation

1. Identify the hydraulic power unit mounting location. This will determine the orientation of the hydraulic fittings (Fig. 8). For this manual, the power unit is mounted near the center of the coach frame, roadside frame rail.

NOTE: The location where the power unit will be installed should be as near center on the coach as possible. Install the power unit in accordance with RVIA Gas Codes, since the power unit connections are not spark proof.

2. Attach hydraulic power unit bracket assembly (Fig. 9A) to the coach frame.
3. Bolt the hydraulic power unit to the bracket assembly.

Fig. 8

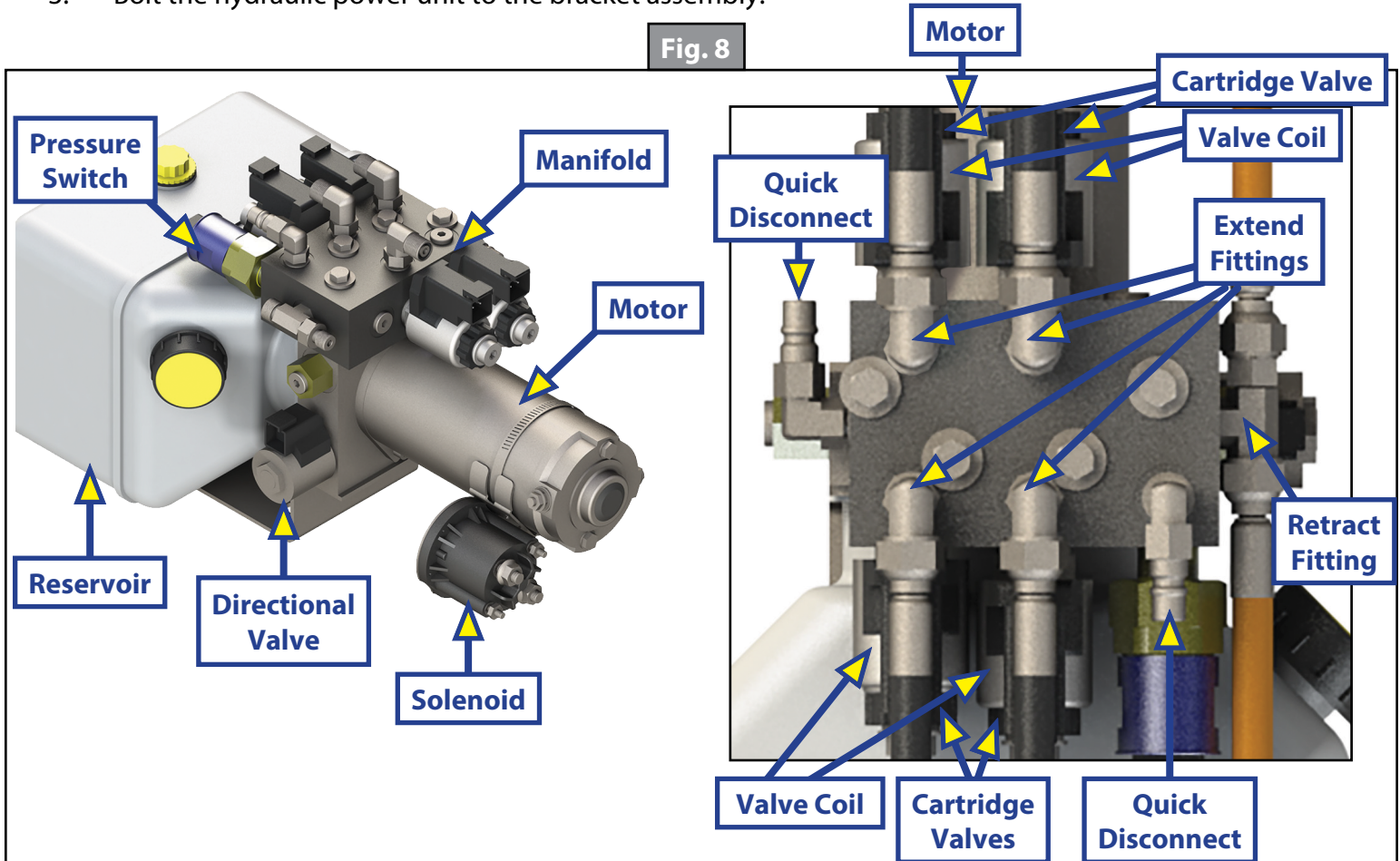
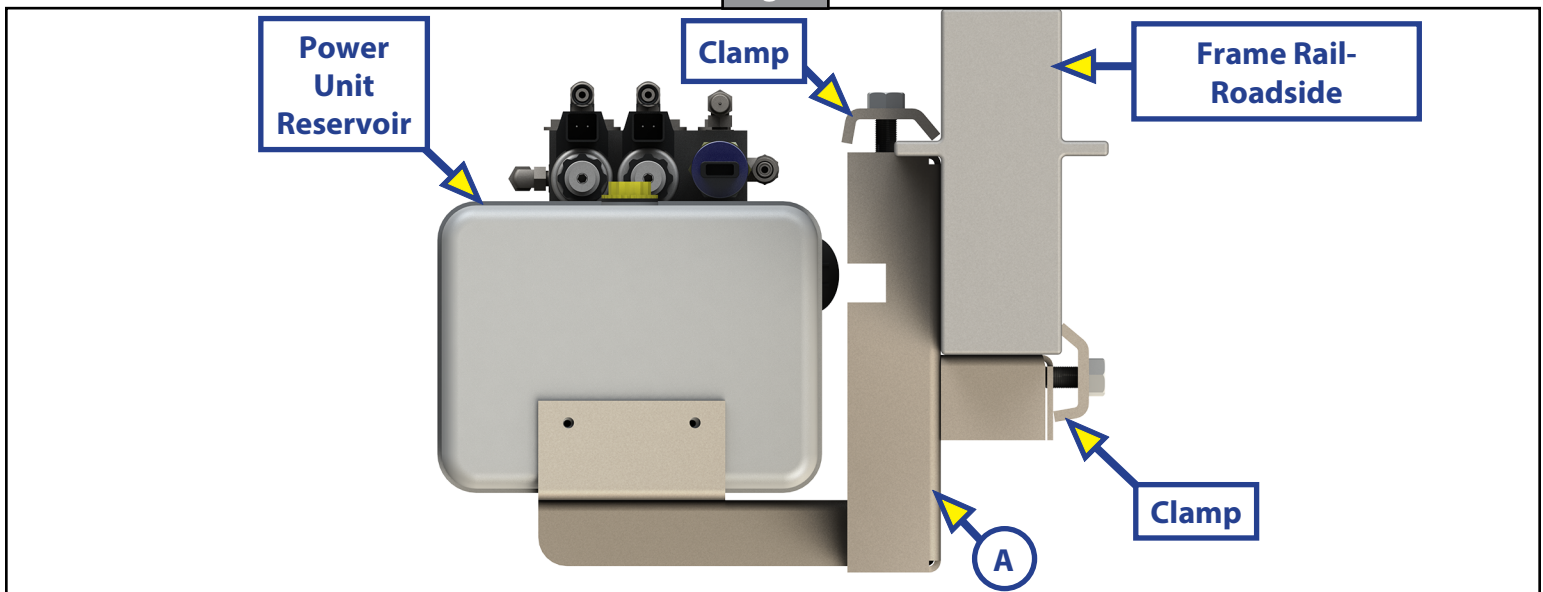


Fig. 9





When installing hydraulic hoses, avoid areas of high heat, e.g. exhaust outlets. Do not use sharp or abrasive materials on or near hydraulic hoses.

NOTE: Verify that the hydraulic fittings were installed on the four jacks and power unit correctly. A 7/16" port plug will be used to seal any ports not used within the system.

NOTE: Refer to the Hydraulic Plumbing Diagram (Fig. 32) for fitting placements and for steps 1 - 8.

Labels on hoses:

- Front extend
- Front cross
- Rear driver
- Rear pass
- Front return
- Rear return
- Rear cross

1. Measure the distance between the RF jack and the power unit; this is an extend hose (Fig. 32A).
2. Measure the distance between the LF jack and the power unit; this is an extend hose (Fig. 32B).
3. Measure from the RL jack and the power unit; this is an extend hose (Fig. 32C).
4. Measure from the RR jack and the power unit; this is an extend hose (Fig. 32D).
5. Measure from the power unit to the RF jack; this is a retract hose (Fig. 32E).
6. Measure from the RF jack to the LF jack; this is a retract hose (Fig. 32F).
7. Measure from the power unit to the RR jack; this is a retract hose (Fig. 32G).
8. Measure from the RR jack to the LR jack; this is a retract hose (Fig. 32H).

NOTE: Make sure hydraulic hose line fittings are compatible with the power unit fittings and the jack fittings. Make sure hose fittings are securely crimped onto the hose lines.

9. When running the hydraulic hoses from the power unit to the jacks, bundle the hoses together. Secure any loose hoses with zip ties as needed.
10. Install all hoses onto the corresponding jacks and power unit fittings.

NOTE: Hose loops should be secured in the horizontal position to prevent trapped air pockets.

NOTE: Before operating the Lippert hydraulic leveling system, make sure the system has been properly purged of air that was introduced into the hydraulic lines during the installation.

NOTE: If necessary, refer to [TI-118](#) for Hydraulic Operation Fluid Recommendation.

Rear Jack Bracket and Jack Installation

To ease system installation, LCI recommends beginning with the rear brackets and leveling jacks.

NOTE: Thick white lines with black borders indicate where marking on the frame rail with a permanent or non-permanent marking method is required to assist in assembly.

The rear jacks should be mounted so that there is a minimum of 2" clearance between the jack and the rear tires, suspension and exhaust components.

1. The rear jacks must be mounted within the rear departure angle (Fig. 3).
2. Rear jacks must be aligned left-to-right of each other.
3. Recommended minimum ground clearance between the bottom of the jack footpad and the ground is 6".

4. Mark the location on both the inside and outside frame rails that satisfies the minimum clearance requirements.
5. Position the bracket on the outside of the frame rail within the previously marked location (Fig. 10).
6. Position the angle weldment (Fig. 11) on the inside of the frame rail, within the previously marked location.
7. Working from the outside of the frame rail, first install the 3/8"-16 X 5 1/4" hex bolts through the top of the brackets, the angle weldments (Fig. 12) and into the attached nuts. Torque the bolt to 30 ft-lbs.
8. Working from the outside of the frame rail, next install the 3/8"-16 X 2 1/2" hex bolts through the bottom of the brackets, the angle weldments (Fig. 12) and into the attached nuts. Torque the bolt to 30 ft-lbs.
9. Dry fit the jack on the jack bracket installed on the chassis frame.
10. Determine the mounting holes for the jack on the jack bracket.
11. Secure the jack onto the mounting bolts with the 1/2" nuts (Fig. 13).
12. Torque the nuts to 90 ft-lbs.
13. Repeat steps 1-8 for the remaining rear jack brackets.

Fig. 10

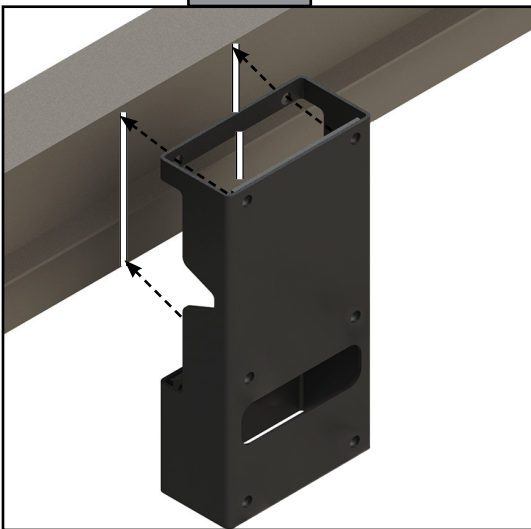


Fig. 11

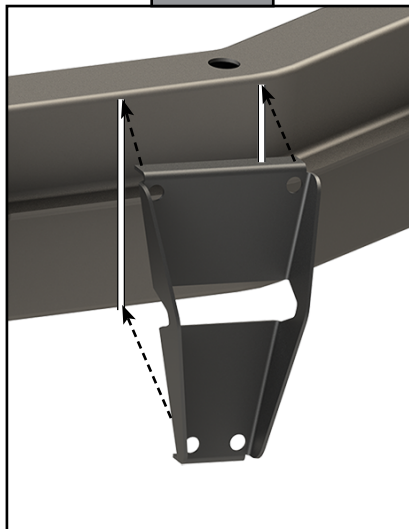


Fig. 12

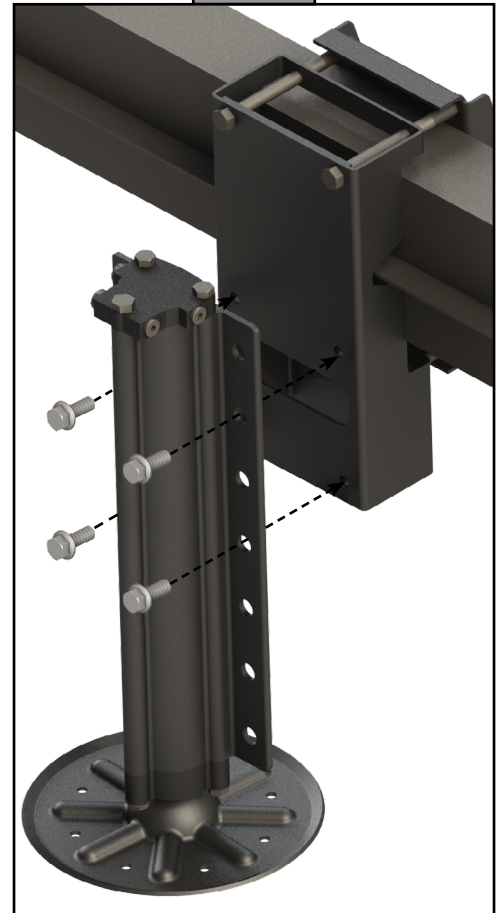
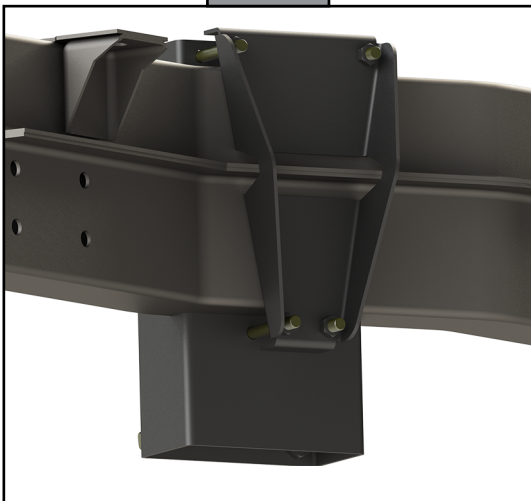


Fig. 13



Front Jack Bracket Installation

NOTE: The front driver's side jack bracket is curved so that it does not interfere with any wire harnesses encountered while installing the bracket assembly.

NOTE: A recommended minimum ground clearance between the bottom of the jack footpad and the ground, is 6" when the coach is at its maximum rated weight. When installing the jacks on a bare chassis, keep in mind that some ground clearance will be lost as the coach is built, and to adjust the installation height accordingly.

NOTE: Make sure that the approach and departure angles are maintained after the jack is mounted to the jack bracket.

1. Assemble the jack (Fig. 14D) onto the bracket (Fig. 14B) using four ½" - 13 X 1 ¼" bolts (Fig. 14A) and four ½" - 13 lock nuts (Fig. 14C). Torque to 90 ft/lbs.
2. Attach the fittings and the extend (Fig. 15A) and retract hoses (Fig. 15C) to the jack (Fig. 15B).
3. Position the jack, bracket and hose assembly onto the frame rail (Fig. 16A).
4. Attach the jack bracket assembly to the frame using one blind bolt (Fig. 16B).
5. Repeat for the other side.

Fig. 14

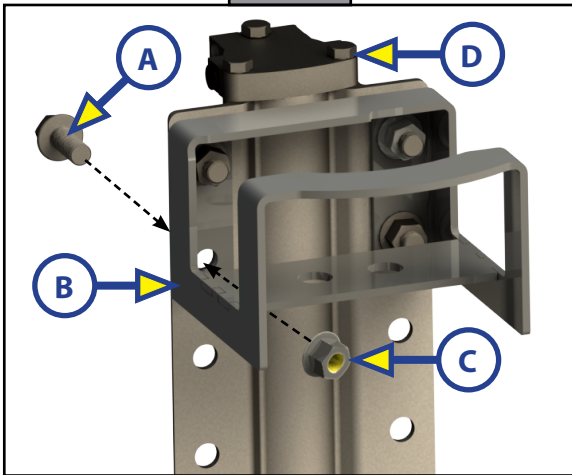


Fig. 15

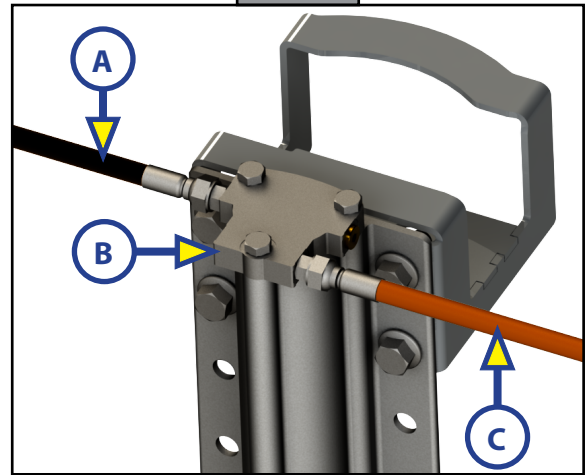
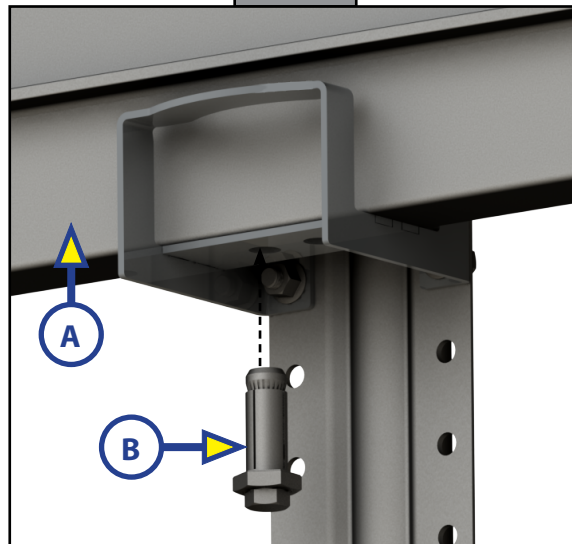


Fig. 16



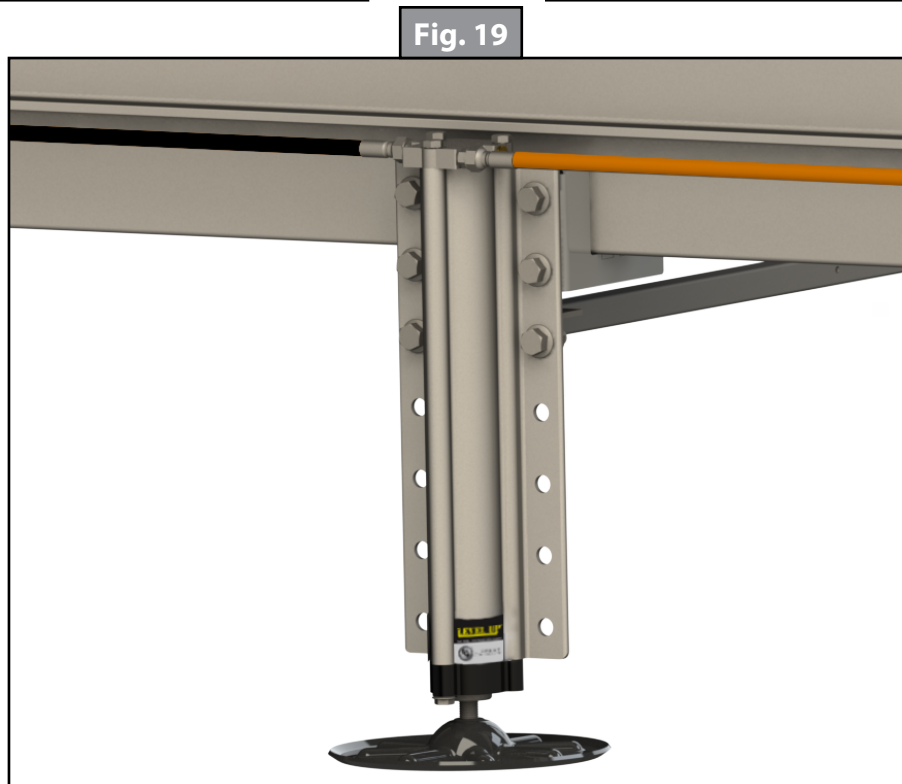
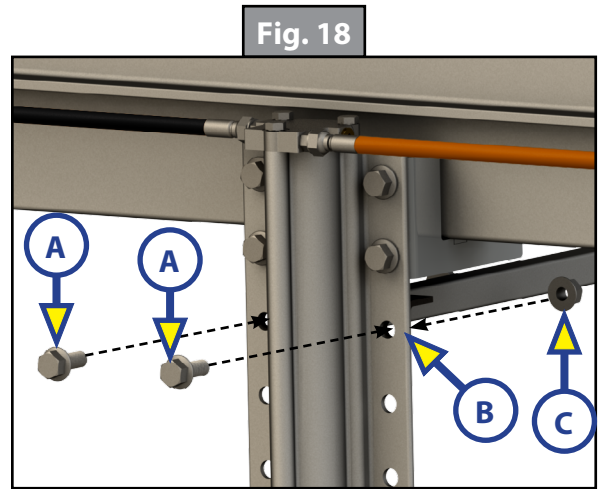
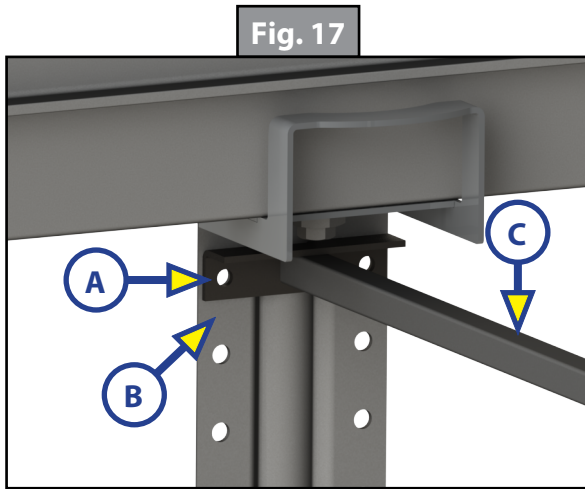
Installing the Cross Tie Assembly

NOTE: It is important to orient the cross tie ends properly for the left- and right-hand threads on the rod and angle weldments.

1. Starting with the front passenger side, attach one rod (Fig. 17C) and angle weldment (Fig. 17A) to the jack mounting bracket (Fig. 17B).
2. Insert two $\frac{7}{16}$ " x $1 \frac{3}{4}$ " bolts (Fig. 18A) through the jack bracket and angle weldment (Fig. 18B). Attach two $\frac{7}{16}$ " serrated flange nuts (Fig. 18C) to the bolts.
3. Attach the other rod and angle weldment to the mounting bracket. Insert $\frac{7}{16}$ " x $1 \frac{3}{4}$ " bolts through the bracket and attach $\frac{7}{16}$ " serrated flange nuts to bolts.

NOTE: It may be necessary to turn the assembly rod clockwise or counter clockwise in order to properly secure the brackets.

4. After both ends have been attached, spread the brackets on the cross tie assembly so that and the mating surfaces all come together, then tighten the locking nuts and bolts on the rod and angle weldments.
5. Make sure that the edge of the stabilizer bar (Fig. 17) is positioned below the welded lip, on the inside of the bracket. The edge of the stabilizer bar will be rest on top of the right front rod and angle weldment.
6. Figure 19 shows the completed front driver's side.



Controller and Touchpad Installation

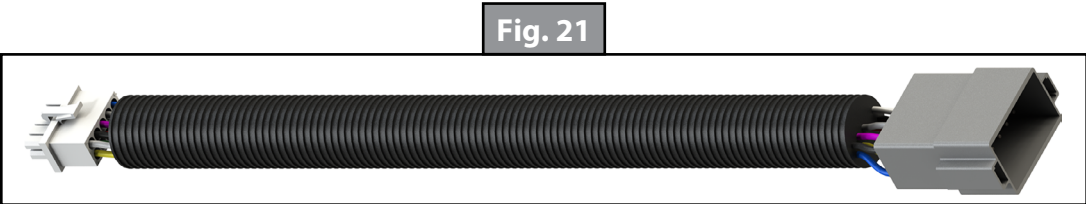
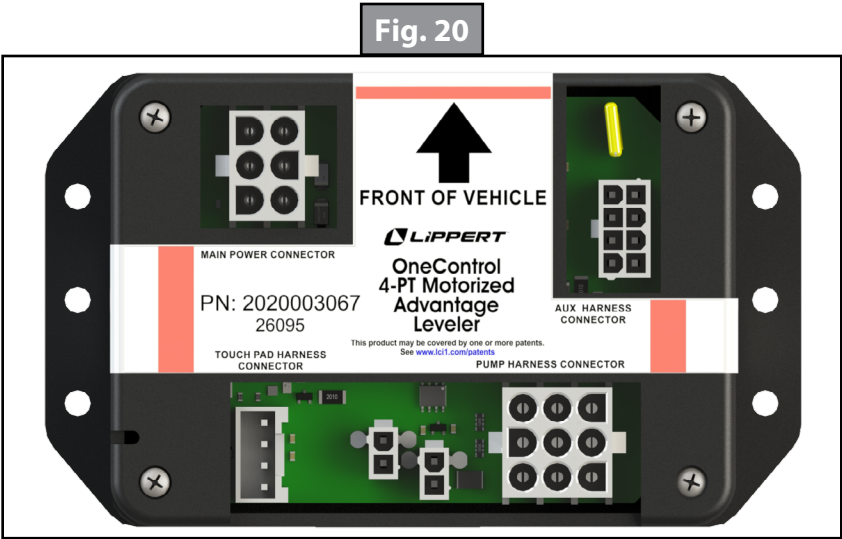
The Lippert Components, Inc. hydraulic leveling system wiring is a "plug and play" leveling system. The leveling kit includes a total of four wiring harnesses for the entire system. If it does not, contact Lippert Components so that the proper wiring harness can be shipped. Three harnesses are shipped loose, and the fourth wiring harness is pre-installed onto the power unit.

NOTE: Refer to the Wiring Diagram (Fig. 33) throughout this section.

Controller Installation

- 1. Install the controller (Fig. 20) in a location close to the center of the coach. It must be centered side-to-side and oriented according to the arrows on the controller's label.
- 2. Connect the multi-colored, nine-wire harness, onto the matching port of the controller. The harness contains a 10-pin end and a 12-pin end (Fig. 21).

NOTE: Each connector on the controller is a different shape and has a different number of pins. Each harness (Fig. 21) has only one way of connecting to the controller. They are not interchangeable. This prevents the installation of the wrong harness onto the wrong connector.



Row 1: 16 AWG RED, 16 AWG BLU, 16 AWG GRY
Row 2: 16 AWG BK/WT, 16 AWG YEL, 16 AWG PUR
Row 3: 14 AWG WT, 16 AWG GN, 16 AWG BLK

Main Harness	
Wire Color	Connection
White (WHT)	Controller Power
Black/White (BLK/WHT)	Start Relay
Red (RD)	Right Rear Jack Valve
Green (GN)	Front Jacks Valve
Yellow (YEL)	Pressure Switch
Blue (BLU)	Left Rear Jack Valve
Black (BLK)	Controller Ground
Purple (PUR)	Not Used
Gray (GRY)	Directional Valve

Row 1: 16 AWG BLK, 16 AWG PUR, 16 AWG GRY
Row 2: 16 AWG BLU, 16 AWG YEL, 16 AWG GN, 16 AWG RED, 16 AWG BK/WT, 14 AWG WT

Touchpad Installation

1. In the designated mounting location, cut a hole (Fig. 22), 4 1/2" x 3" for the touchpad.
2. Feed the touchpad four-wire harness (Fig. 23A) through the pre-cut hole (Fig. 23B), running the opposite end of the wire harness into the compartment where the controller is to be mounted.
3. Plug the harness into the appropriate connector on the controller. See the Wiring Diagram section (Fig. 33).
4. Plug the touchpad harness (Fig. 23A) into the back of the touchpad (Fig. 23C).
5. Insert the touchpad (Fig. 24A) into the cutout hole, and attach it to the mounting surface with four #6 x 1" wood screws (Fig. 24B). Verify that the screws are of sufficient length to thread into the mounting surface.

Fig. 22

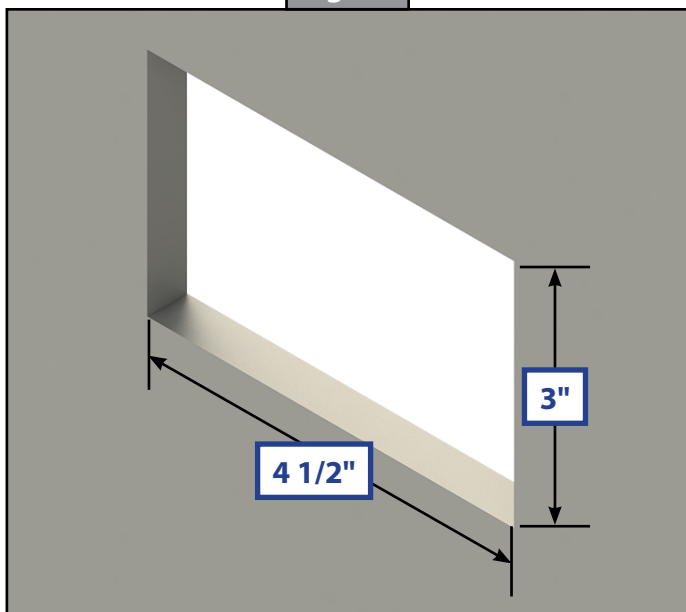


Fig. 23

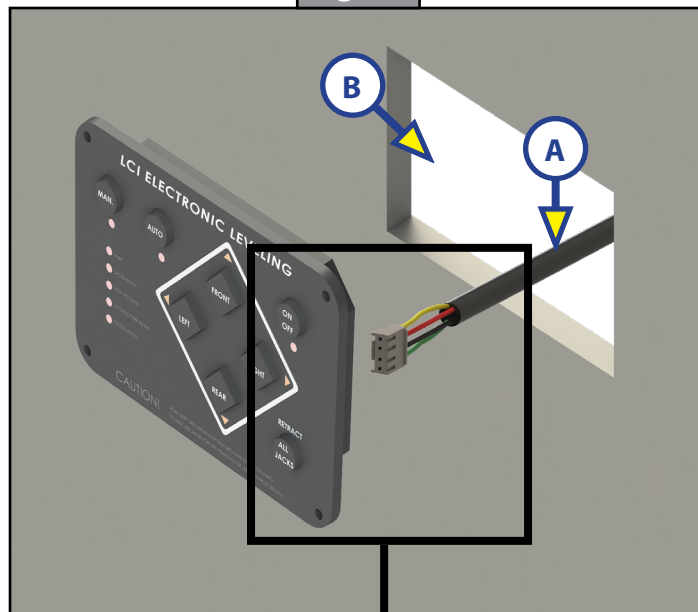
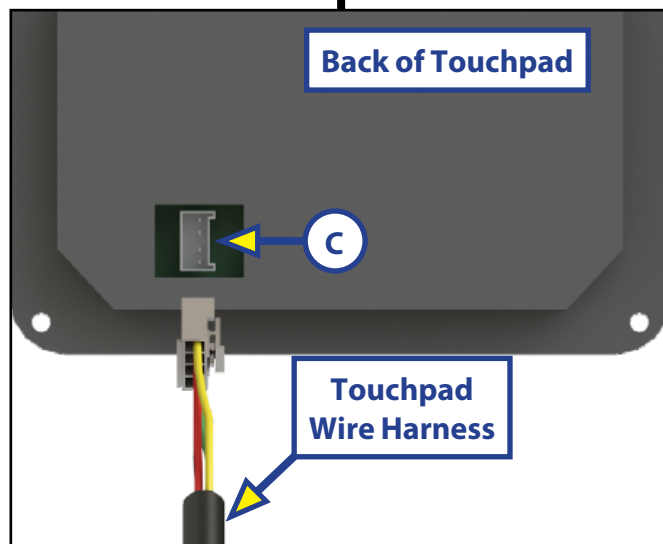
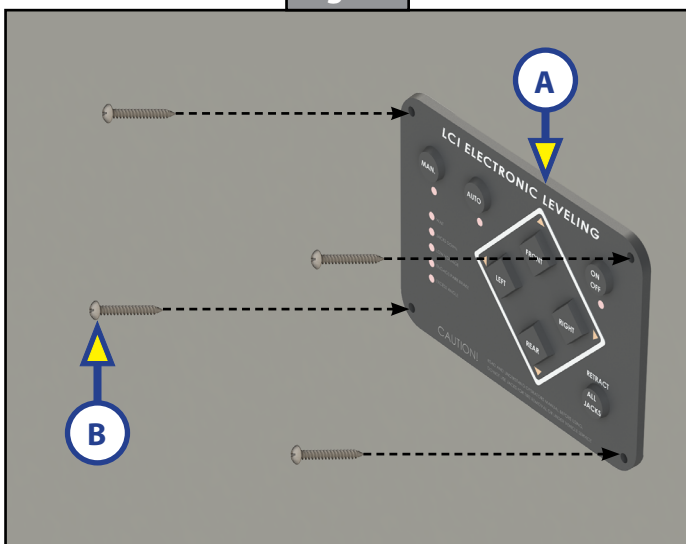


Fig. 24



System Wiring Requirements

NOTE: This document identifies the features on the hydraulic power units (HPU) used in installation of the system. An OEM-supplied circuit protection of at least 50 amps to 100 amps is to be used for supplying voltage to the power unit. The OEM can determine the capacity within this range, as the capacity need will vary by application. All wiring is to conform to RVIA standards.

NOTE: Ground wires are OEM supplied.

1. Battery power cable with an OEM-supplied breaker (RVIA standard).
2. Battery ground cable (RVIA standard) connecting the 12V DC battery, to the ground post on the power unit motor.

NOTE: Lippert recommends connecting the ground cable directly to the battery, rather than a chassis ground point.

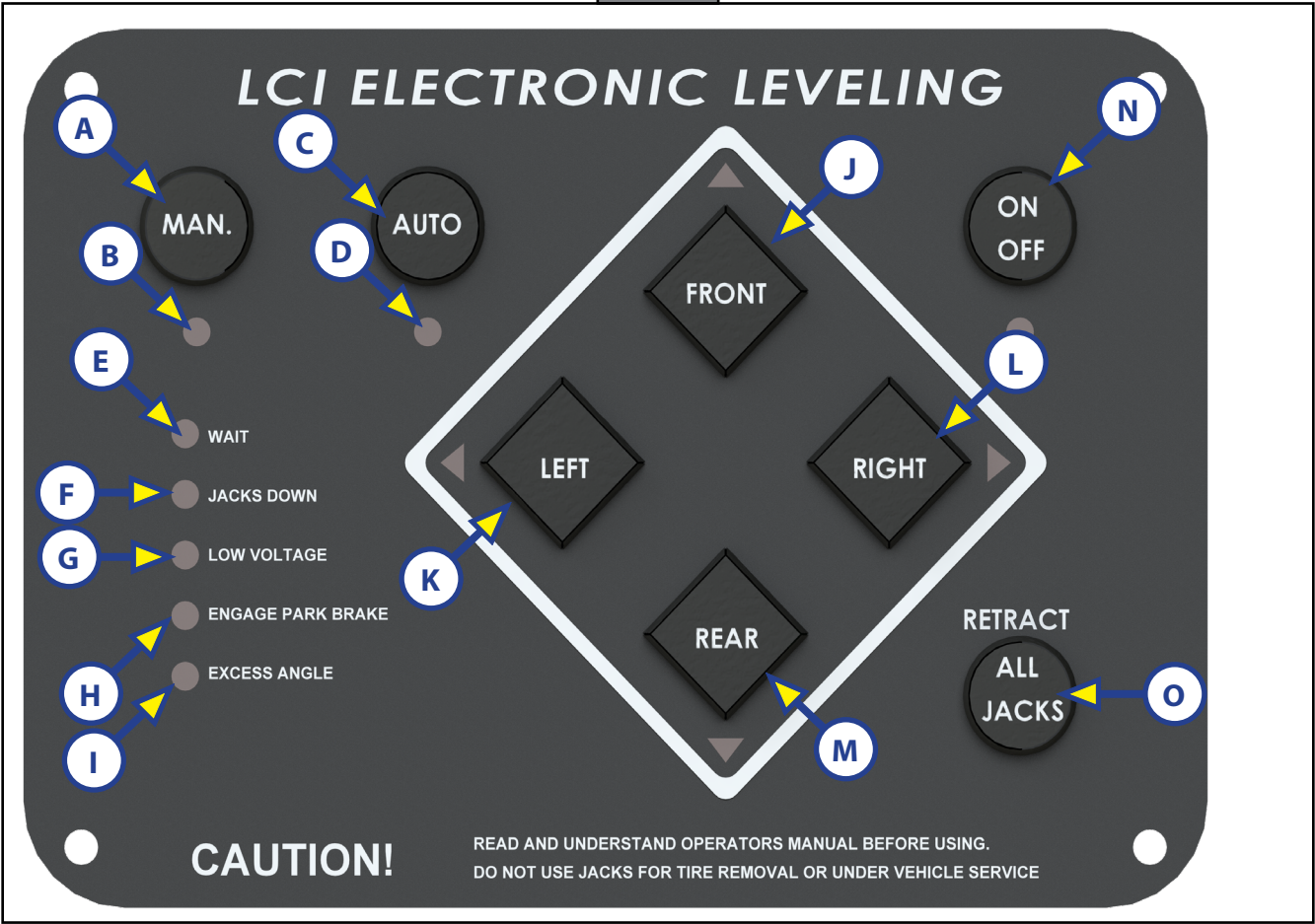
3. Logic power (ignition switch controlled).
4. Parking brake signal (open = park brake disengaged, GND = park brake engaged).
5. A four wire harness connecting the controller to the touchpad.
6. Leveling jack status input - pressure switch.
 - A. Jacks not all up – switch closed to ground .
 - B. Jacks all up – switch open.
7. Connect a ground wire.
8. Connect the four-pin chassis harness to the "Ignition On" wire and the parking brake signal wire.
 - A. White - Parking Brake
 - B. Red - Ignition

Prior to Operation

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

1. The coach is parked on a reasonably level surface, engine running.
2. The coach "parking brake" is engaged.
3. The coach transmission should be in the park position.
4. 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.
5. 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.

Fig. 25



Callout	Description
A	Manual Operation - Places touchpad in manual operation mode.
B	Manual Operation LED - Indicates touchpad in manual operation mode.
C	Automatic Operation - Places touchpad in automatic operation mode.
D	Automatic Operation LED - Indicates touchpad in automatic operation mode.
E	Wait LED - Indicates to the operator to pause operation until the LED turns off.
F	Jacks Down LED - Indicates jacks are not fully retracted.
G	Low Voltage LED - Indicates voltage has dropped below safe operable level. Solid LED indicates voltage is too low to operate system.
H	Engage Park LED - Flashes when park brake is disengaged; off when park brake has been engaged.
I	Excess Angle LED - Coach may not be able to level in current location and must be moved to a more level location.
J	Front Button - Controls operation of both front jacks.
K	Left Button - Controls operation of both left jacks.
L	Right Button - Controls operation of both right jacks.
M	Rear Button - Controls operation of both rear jacks.
N	Power Button - Turns system on and off.
O	Retract All Jacks - Retracts all jacks automatically.

Automatic Leveling Procedure

Refer to (Fig. 25) for questions regarding location and functions of the Lippert Electronic Leveling System. Coach must be running and parking brake must be engaged for Lippert Electronic Leveling System to operate.

1. Push ON/OFF (Fig. 25N) button on touchpad. The system is now operational and the electronic level lights will become active.
2. Check to see that the touchpad ENGAGE PARK BRAKE (Fig. 25H) light is not flashing.
3. Push the AUTO (Fig. 25C) button to begin the automatic leveling cycle.

NOTE: After starting the automatic leveling cycle it is very important that you do not move around in the coach until the coach is level. This could have an affect on the performance of the leveling system.

4. If further adjustments are necessary, refer to the Manual Leveling Procedures section.
5. Push power button to turn off the system.
6. Visually inspect all jacks to ensure all shoes are touching ground. Should one of the rear jack shoes not be touching the ground. Push the corresponding LEFT (Fig. 25K) or RIGHT (Fig. 25L) buttons to lower the corresponding jack to the ground.

Manual Leveling Procedures

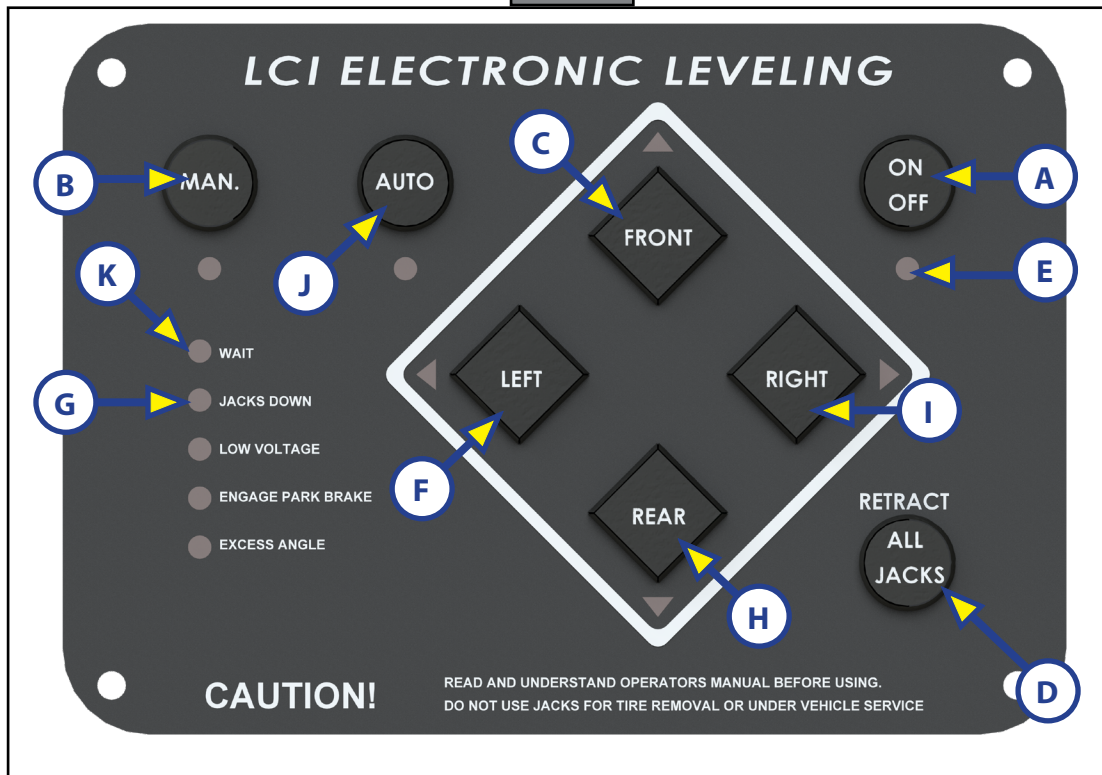
When leveling your coach, the coach should be leveled from front to rear first. When the coach is level from front to rear, then level the coach from left to right. Coach must be running for LCI Electronic Leveling System to operate.

1. Push ON/OFF (Fig. 25N) button on touchpad. The system is now operational, ON/OFF light will be lit.
2. Push and hold MAN. (Fig. 25A) button for 5 seconds.
3. Push FRONT (Fig. 25J) button until jacks contact the ground and lift the front of the coach 1-2 inches.
4. Push REAR (Fig. 25M) button until jacks contact the ground and lift rear of coach.
5. Press FRONT (Fig. 23J) or REAR (Fig. 25M) button; if light is on at the FRONT button press the FRONT (Fig. 25J) button; if the light is on at REAR button press the REAR (Fig. 25M) button. Continue to hold until the light goes out.
6. Push LEFT (Fig. 25K) or RIGHT (Fig. 25L) button: If light is on at RIGHT button, push RIGHT button; if the light is on at LEFT button push LEFT button. Continue to hold until the light goes out.
7. The right and left jacks are used to level the coach side to side. Pushing the LEFT button on the touchpad will extend both left jacks. Pushing the RIGHT button on the touchpad will extend both right jacks. Jacks always work in pairs, both front jacks; both right side jacks, etc.
8. Repeat steps 2 through 6 if needed.
9. Turn power off to leveling system by pushing ON/OFF (Fig. 25N) button.
10. Visually inspect all jacks to ensure all shoes are touching ground. Should one of the rear jack shoes not be touching the ground, press the corresponding LEFT (Fig. 25K) or RIGHT (Fig. 25L) rear jack buttons to lower the corresponding jack to the ground.

⚠ WARNING

Lifting all wheels off the ground may result in serious personal injury or death.

Fig. 26



Jack Retract Procedures

1. Turn the system on by pushing the ON/OFF (Fig. 26A) button on touchpad. The ON/OFF light (Fig. 26E) will be lit.
2. Push the RETRACT ALL JACKS (Fig. 26D) button. All the jacks will start to retract and return to the full retract position. When jacks return to full retract position the JACKS DOWN (Fig. 26G) light will go out. To stop the jacks from retracting, turn the system off and back on again by pushing the ON/OFF button twice. You can then re-level the coach by following steps 1-6 again.
3. When the JACKS DOWN (Fig. 26G) light goes out, push the ON/OFF (Fig. 26A) button on the touchpad 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.

When in the MANUAL mode, if the RETRACT button is pushed the jacks will only retract as long as the RETRACT button is depressed. In AUTOMATIC mode, the RETRACT button need only be pressed once and released for the jacks to fully retract.

Troubleshooting

Automatic Safety Shutoff

If the touchpad is left on and inactive for four 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 must again be pushed.

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. The power unit will also operate to keep the jacks retracted in the event the leveling system loses pressure as the coach is being driven.

Error Mode

If any problem is detected with the jacks, the system will enter Error Mode. Error mode may be recognized by the blinking of Left, Center LCI and Right LEDs. The following errors are detected by this system:

- Jack over current/short circuit.
- Jack under current/ open circuit.
- Jack extending too long (ground not detected after 2 minutes).
- Jack retracting too long (fully retracted not detected after 2 minutes).
- Out of stroke detection during auto cycle (if enabled).

The user must respond by pressing On/Off switch, which resets operation. All normal features are disabled in Error Mode. If panel loses communication with the controller for more than 5 seconds, the panel will blink the Jacks Down, Park Brake and ON/OFF (if included) LEDs.

Level Zero Point Calibration

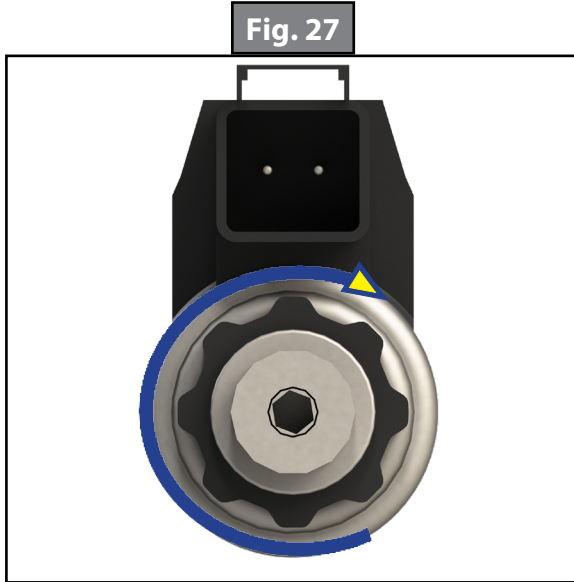
The Zero Point is the programmed point that the coach will return to each time the Auto Level feature is used. The Zero Point must be programmed prior to using the Auto Level feature to ensure the proper operation of the system. To set the zero point, the control module must be fully secured in the production intent location. Activate the Level Zero point configuration mode by following the steps below:

1. Turn system on by pressing the "ON/OFF" (Fig. 26A). The "ON/OFF" indicator light (Fig. 26E) will illuminate.
2. Press the "MAN" (Fig. 26B) and hold for 2-3 seconds. The indicator light below the "MAN" button will then illuminate. This will put the system into "MANUAL" mode.
3. Level the coach in "MANUAL" mode by using a carpenter's level on the floor. Level front to rear and then left to right.
 - A. Push the "FRONT" (Fig. 26C) button until both front jacks contact the ground and lift the front of the coach 1-2 inches.
 - B. Push "REAR" (Fig. 26H) button until both rear jacks contact the ground and lift rear of coach. Keep button depressed until the carpenter's level bubble is centered.
 - C. Push "LEFT" (Fig. 26F) and "RIGHT" (Fig. 26I) buttons as needed to raise the left and right sides of the coach respectively until level bubble is centered.
4. Turn Touch Pad "OFF" (Fig. 26A) to exit "MANUAL" mode; then turn it on again.
5. Now that the coach is leveled, press "FRONT" (Fig. 26C) 5 times.
6. Press "REAR" (Fig. 26H) 5 times. At this time all lights on the touch pad will flash with the exception of the ON/OFF indicator (Fig. 26E), it will remain solidly lit.
7. The touch pad is now in zero mode.
8. With the coach in level condition, simultaneously press the "RETRACT ALL JACKS" (Fig. 26D) button and the "AUTO" (Fig. 26J) button to store this as the Zero Level Point reference.
9. The "WAIT" light (Fig. 26K) will flash for approximately 5 seconds. After this, the control will emit an audible beep and revert back to normal operation mode. Zero Point calibration is now complete.

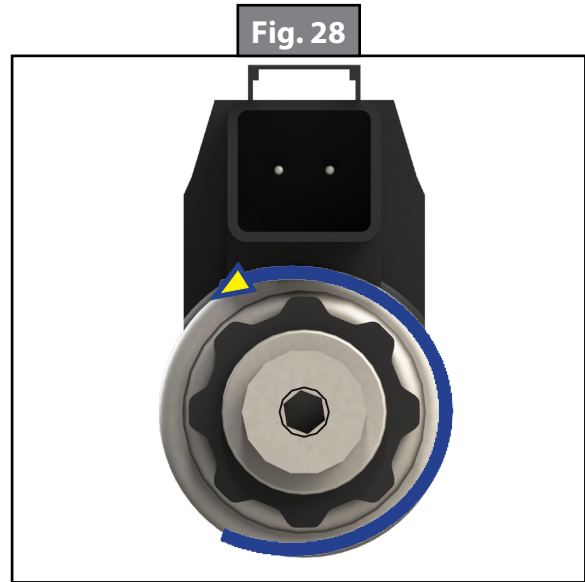
NOTE: You may also enter zero mode per above at anytime the system is in IDLE mode. The user then has control to extend any pair of jacks while in zero mode in order to position the vehicle properly prior to setting the zero point.

Manual Override - Jacks

In the event that the jacks will not extend or retract, the valves can be manually overridden by using a $\frac{5}{32}$ " or $\frac{5}{64}$ " hex wrench to turn the manual override clockwise on the valve. (Fig. 27). The leveling jacks can then be extended or retracted. Remember to turn the manual override completely counterclockwise (Fig. 28) until it will no longer turn, to close the valve after the jacks have been completely extended or retracted.



Clockwise for manual override

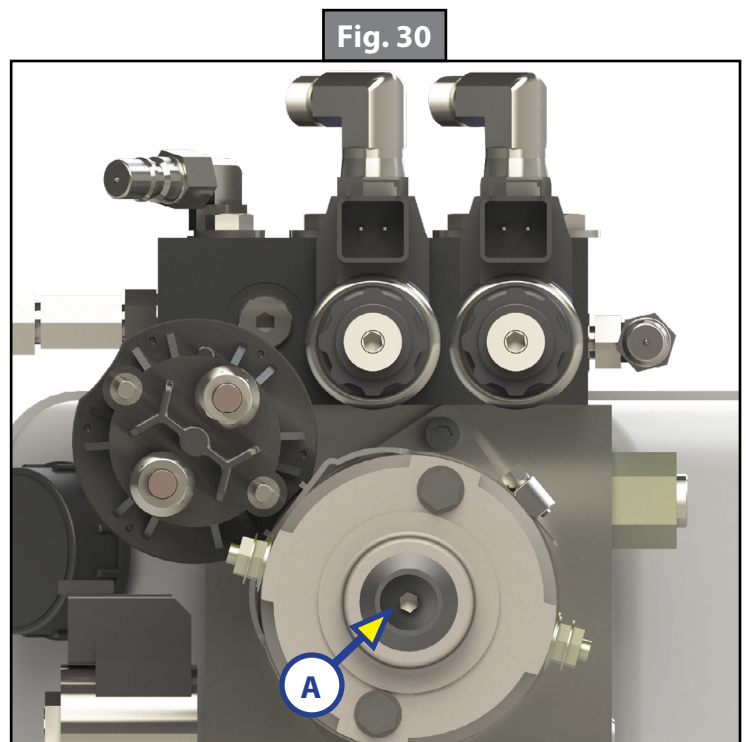
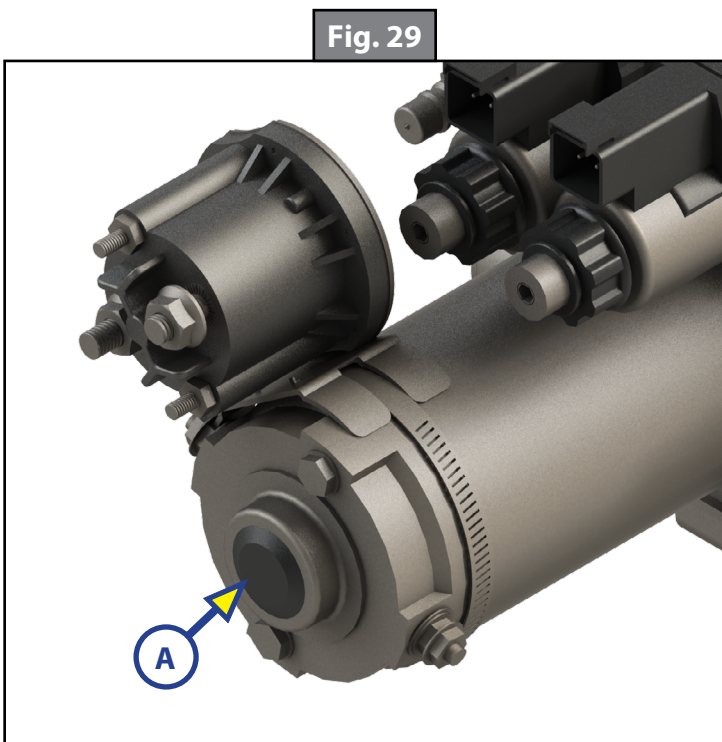


Counter-clockwise for normal operation

Manual Override - Power System

The Lippert Electronic Leveling System can be run with auxiliary power devices like electric drills, ratchet wrenches 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 handheld drill is all that is required.

1. Remove plastic cap (Fig. 29A).
2. Disconnect power cables on the motor.
3. Using a $\frac{1}{2}$ " socket, insert into auxiliary drive device, i.e. cordless or power drill. Insert socket onto coupler found under plastic cap (Fig. 30A).
4. Run drill in reverse or counterclockwise to retract jacks.



"Jacks Down" Alarm

The Lippert Electronic Leveling System is designed to sound an alarm and illuminate the control panel in the event of two (2) possible scenarios:

- A.** A "RETRACT" hose leaks.
- B.** The pressure holding the jacks in the retracted position falls to approximately 1500 psi to sound the alarm.

If the alarm sounds and the touchpad illuminates and flash while driving the vehicle:

- 1.** Immediately find an area to safely pull the vehicle off of the roadway.
- 2.** Set the PARKING BRAKE.
- 3.** Inspect all jacks hoses and check valve for leaks.

If no leaks are observed;

- 1.** Turn touchpad "ON."
- 2.** Push "RETRACT ALL JACKS" button.
- 3.** Wait until "JACKS DOWN" light and alarm are off.
- 4.** Inspect jacks. If jacks are retracted and no leaks are observed, vehicle can be driven.

If system is leaking or alarm does not subside after applying the above procedure, disconnect wires from pressure switch and proceed immediately to a service center. For prolonged travel to the service center, be sure to stop and check the disposition of the leveling jacks periodically to make sure they are not extending.

User Alarm Mode

If the alarm system detects that the park 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 panel will signal this error to the user. When in alarm mode, all LEDs will flash and the buzzer will beep. The status LEDs will show the system status. The system performs an automatic retract. No other features are available in this mode.

Low Voltage Signal

If LOW VOLTAGE light is on solid, it is an indication of a charging system problem. Turn ignition OFF and then back ON to reset system. If LOW VOLTAGE light persists, test battery under load at battery and at the motor solenoid on the pump unit. Check all power and ground connections at the battery, alternator and chassis.

Preventative Maintenance Procedures

1. Change fluid in reservoir ONLY when contaminated.
 - 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 $\frac{1}{4}$ " of fill spout lip.
2. Check the fluid level every month.
3. Inspect and clean all Pump Unit electrical connections every 12 months. If corrosion is evident, spray unit with WD-40 or equivalent.
4. Remove dirt and road debris from jacks as needed.
5. 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 your coach is located in a salty environment, it is recommended to spray the rods every 4 to 6 weeks.

Fluid Recommendation

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.

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](#).

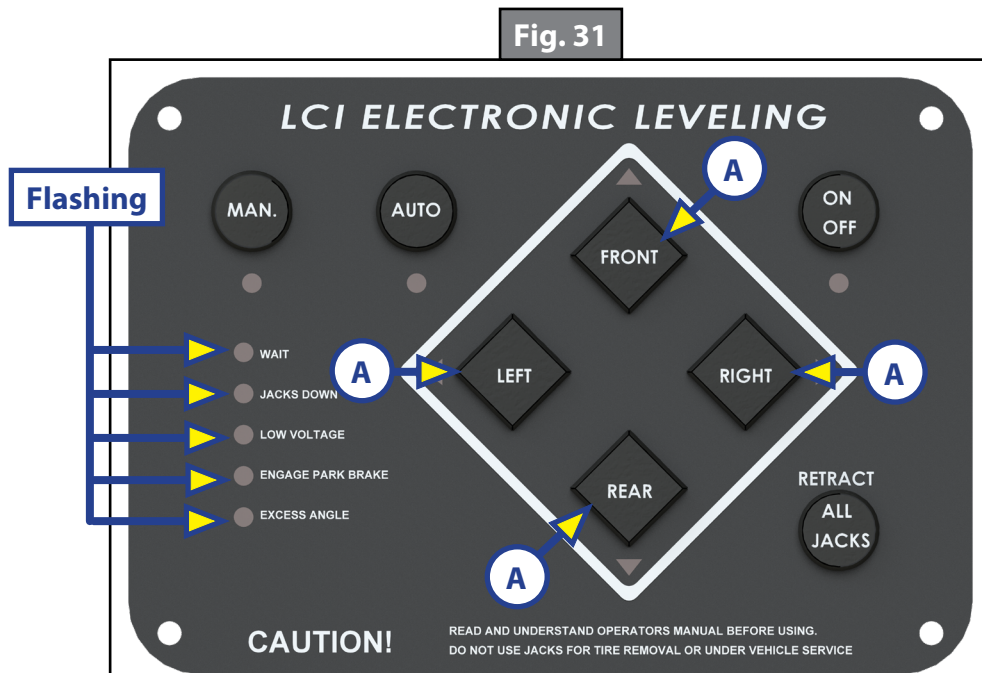
Latched Out Warning

⚠ WARNING

Your coach should be supported at both front and rear axles with jack stands before working underneath. Failure to do so may result in personal injury or death.

LATCHED ERROR mode is "Wait", "Jacks Down", "Park Brake", "Excess Slope" and "Low Voltage" lights flashing.

1. Battery voltage below 10.0V DC.
2. Retract time over 67 seconds in auto retract.
3. This is the only LATCHED ERROR mode.
4. To RESET, push all 4 diamond-shaped jack buttons at the same time (Fig. 31A).

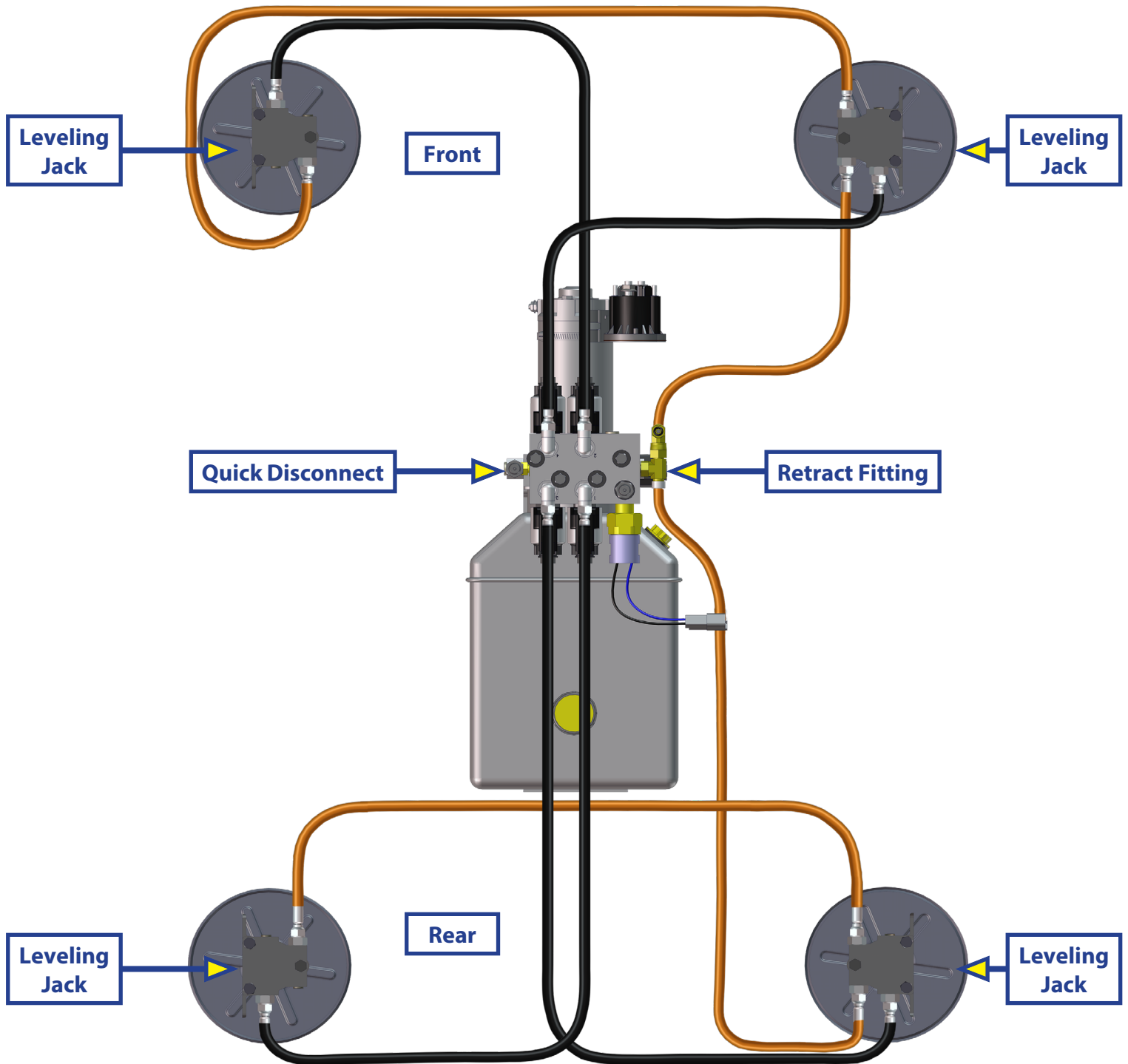


Troubleshooting Chart

What Is Happening?	Why?	What Should Be Done?
System will not turn on and ON/OFF indicator light does not illuminate.	Coach ignition not in RUN position.	Turn ignition to RUN position.
	Parking brake not set.	Set parking brake.
	Controls have been on for more than four minutes and have timed out.	Turn ignition off and then back on.
Touchpad turns on, but turns off when jack button is pushed.	Low voltage on battery.	Start coach to charge battery.
Touchpad turns on, coach will not auto level, JACKS DOWN light is on, jacks are retracted.	Faulty pressure switch or low pressure in system.	Press RETRACT ALL JACKS button on touchpad. If JACKS DOWN light remains on, contact Lippert Customer Care.
Jacks will not extend to ground, pump is running.	Little or no fluid in reservoir.	Fill reservoir with recommended ATF.
	Jack valve is inoperative.	Clean, repair or replace.
	Electronic signal is lost between controller and jack valves.	Trace wires for voltage drop or loss of signal. Repair or replace necessary wires or replace controller.
Any one or two jacks will not retract.	Hose damaged or disconnected.	Replace with new hose or reconnect hose.
	Return valve inoperative.	Replace inoperative return valve.
	Electronic signal is lost between controller and solenoid.	Test for voltage drop between controller and jack valve. Repair bad wiring or replace defective controller or valve.
JACKS DOWN light does not go out when all jacks are retracted.	Insufficient pressure in system.	Contact Lippert Customer Care.
	Retract pressure switch inoperable.	Check connection or replace.
Alarm sounds and JACKS DOWN light starts flashing while traveling; jacks are fully retracted.	Loss of pressure in leveling system.	Contact Lippert Customer Care.
	Retract pressure switch inoperable.	Check connection or replace.
Jack bleeds down after being extended.	Valve Manual Override open.	Close override.
Touchpad powers up; LOW VOLTAGE light flashes.	Engine not running.	Start coach engine.
Low voltage light on solid.	Charging system faulty.	Turn key OFF, then back ON again to reset. Check power and ground connections on battery, alternator and chassis.
No power to touchpad.	Tripped circuit breaker.	Reset breaker.
	Ignition not on.	Turn on.

Hydraulic Plumbing Diagram

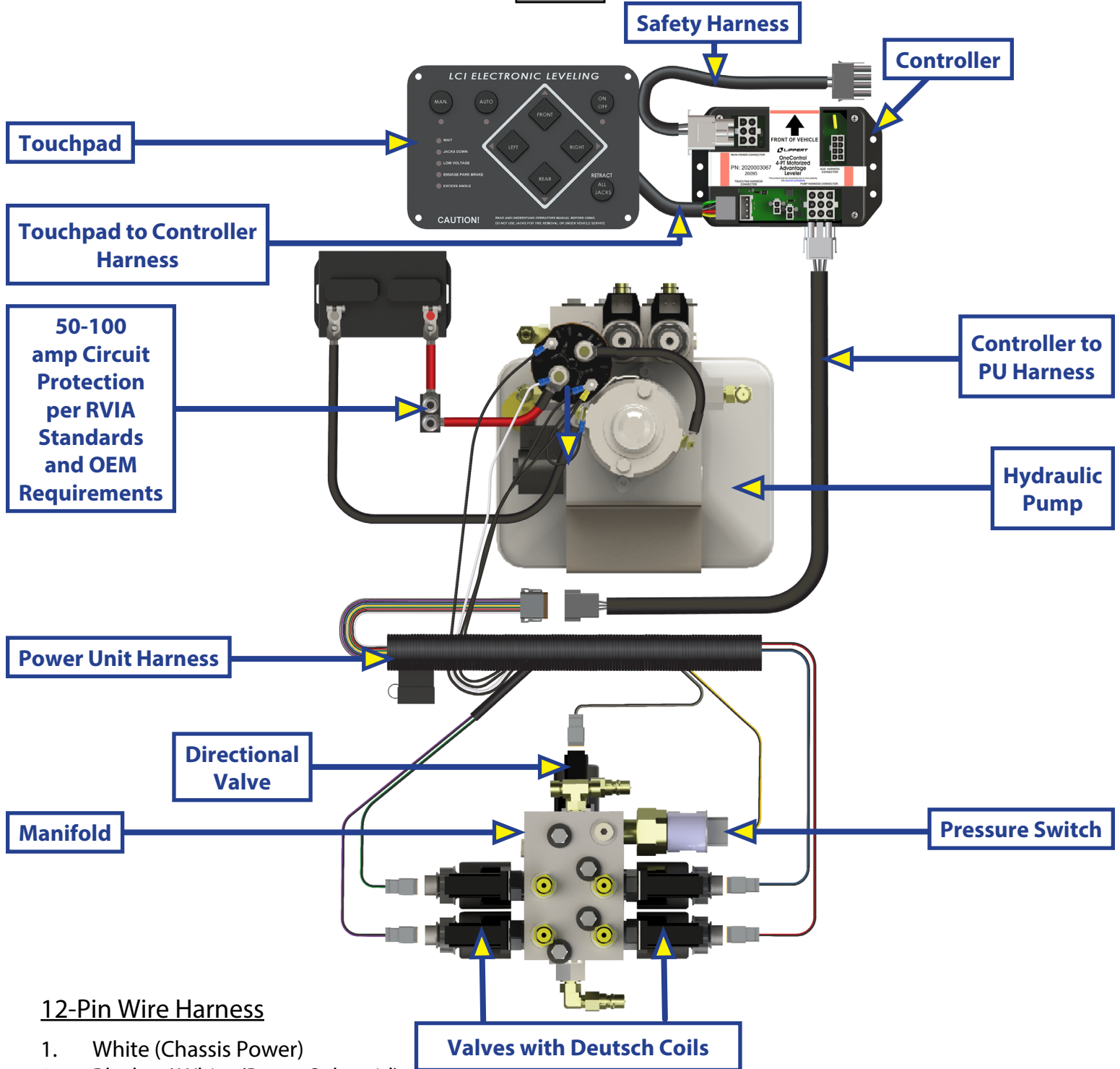
Fig. 32



- Hoses will vary in length by coach model.
- Measure hose and consult LCI Service. Hose Specs. 3000 p.s.i.; ½" in. I.D.
- Curbside Front - Black Hose - PURPLE Label & Wire
- Roadside Front - Black Hose - GREEN Label & Wire
- Curbside Rear - Black Hose - RED Label & Wire
- Roadside Rear - Black Hose - BLUE Label & Wire
- Return - Orange Hose
- PSI Switch - Yellow Wire into Blue PSI Wire

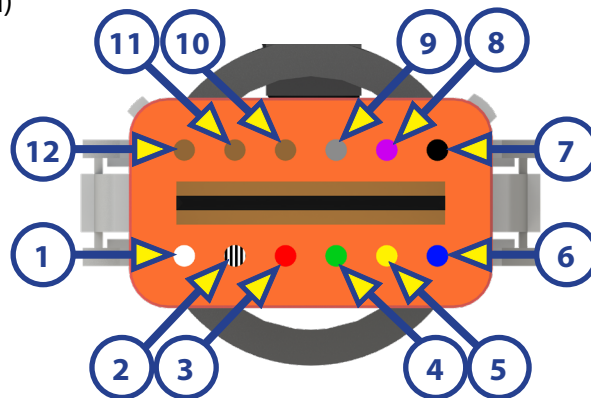
Wiring Diagram

Fig. 33



12-Pin Wire Harness

1. White (Chassis Power)
2. Black w/ White (Pump Solenoid)
3. Red (Curbside Rear Valve)
4. Green (Roadside Front Valve)
5. Yellow (PSI Switch)
6. Blue (Roadside Rear Valve)
7. Black (Ground)
8. Purple (Curbside Front Valve)
9. Gray (Pump Solenoid)
10. Aux
11. Aux
12. Aux



Notes

This image shows a full page of blank, lined paper. It features approximately 28 horizontal black lines spaced evenly across the page, typical of standard notebook paper. The lines are thin and extend from the left edge to the right edge. There are no margins, text, or other markings on the page.



The contents of this manual are proprietary and copyright protected by Lippert. Lippert prohibits the copying or dissemination of portions of this manual unless prior written consent from an authorized Lippert representative has been provided. Any unauthorized use shall void any applicable warranty. The information contained in this manual is subject to change without notice and at the sole discretion of Lippert. Revised editions are available for free download from lippert.com.

Please recycle all obsolete materials.

For all concerns or questions, please contact Lippert
Ph: 432-LIPPERT (432-547-7378) | Web: lippert.com | Email: customerservice@lci1.com



This manual is provided courtesy of **RV Tech Cheat Sheet**



Professional resources for the whole RV industry — free.

We put manuals, wiring diagrams and hard-won tech knowledge in every technician's hands, so repairs get done right the first time, techs work faster, and RV owners everywhere get better service.



rvtechcheatsheet.com/manuals

Find thousands more RV manuals, wiring diagrams and parts lists

RV techs: share fixes, ask questions and learn from each other.

Join our free Facebook group →



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