HYDRAULIC LEVELING WITH LCD TOUCHPAD (4 POINT/3 VALVE MOTORIZED) OEM INSTALLATION MANUAL

TABLE OF CONTENTS

System Information

The four-point three-valve hydraulic leveling system is a hydraulic system which includes four points of contact utilizing jacks and a three-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 Components, Inc. to obtain replacement parts.

NOTE: This manual replaces the following previously released LCI manuals: LCI4A3LCD Hydraulic Leveling OEM Installation Manual (CCD-0001486) dated 12.21.18 and Class C Hydraulic Leveling System OEM Installation Manual (CCD-0001513) dated 06.27.18. These two manuals were consolidated into this manual.

Component Description

1. Jacks
   - **A.** 5K Steel or 8K Aluminum Jacks
   - **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 - ¼" I.D., 3000 psi - W.P. Rated

Safety

Please read and study the operating manual before operating the leveling system.

⚠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 and/or property damage if not performed safely within the parameters set forth in this manual.

⚠CAUTION

The "CAUTION" symbol above is a sign that a procedure has a risk involved that may cause personal injury and/or product damage if not performed safely and within the parameters set forth within this manual.

⚠WARNING

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

⚠CAUTION

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

The use of the Lippert Components, Inc. hydraulic leveling system to support the coach for any reason other than which it is intended is prohibited by the Lippert Limited Warranty. The hydraulic leveling system is designed as a leveling system only and should not be used for any reason to provide service 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 Hydraulic Leveling System could result in damage to the coach and/or cause serious injury or death.

Resources Required

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

Preparation

Jack bracket style, location and fastening method to chassis will be OEM-specific and determined by OEM.

1. Make sure to 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.

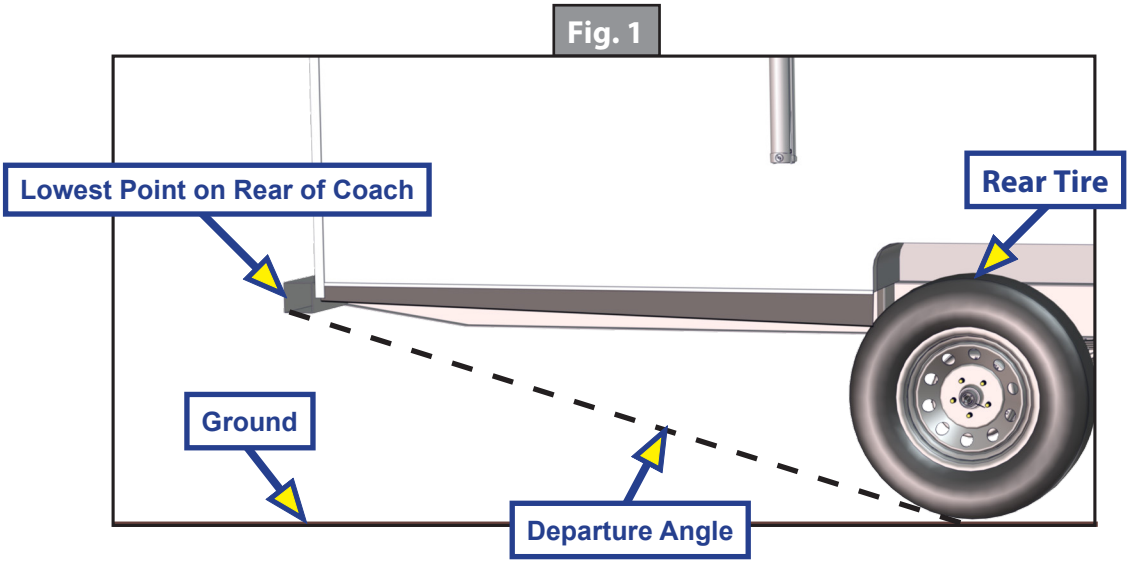
⚠WARNING

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

2. 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.

NOTE: When fully retracted, the rear jacks must be mounted to achieve a minimum ground clearance equal to the departure angle (Fig. 1) 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 minimum of 8" is required for aluminum jacks and 6" for steel jacks.

Fig. 1



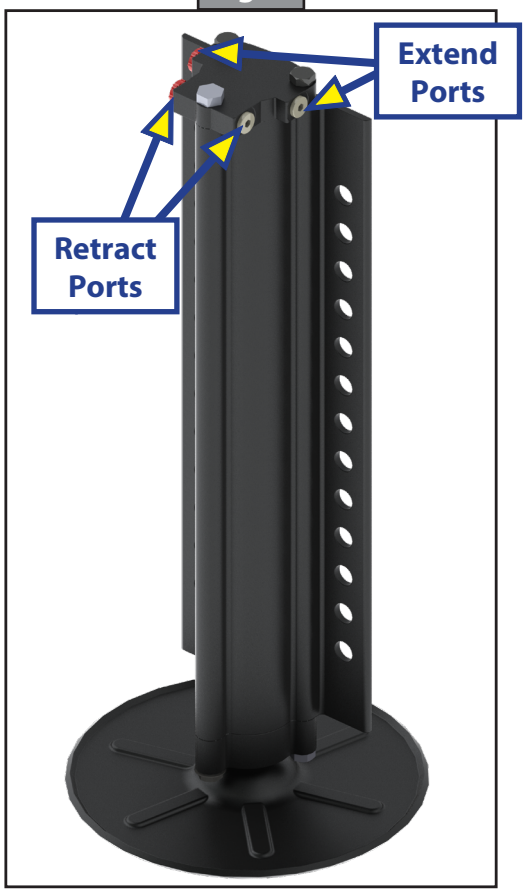
Labeling Jacks

Refer to the Hydraulic Plumbing Diagrams for the following steps:

1. Identify where the extend and retract ports are located on the jack (Figs. 2-5).
2. Verify that the ports (Figs. 3 and 5) 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).

Aluminum Jack

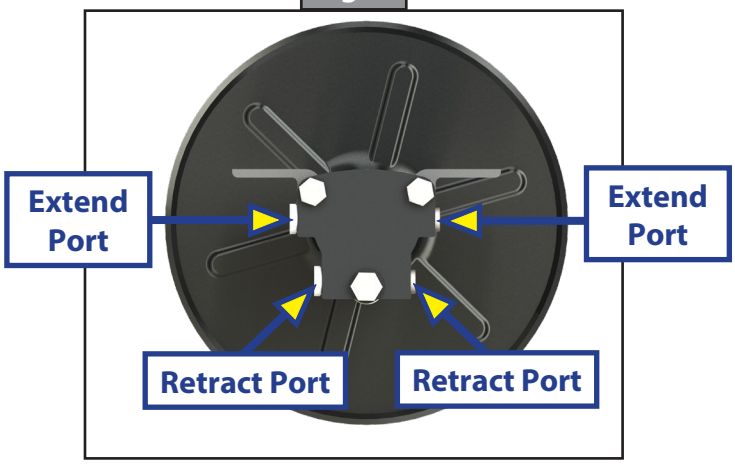
Fig. 2



Steel Jack

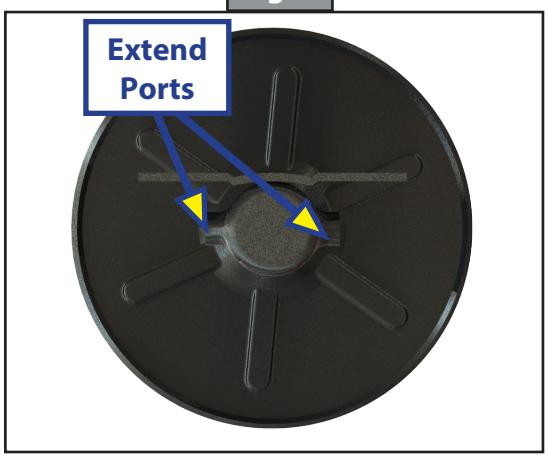
Fig. 4

Fig. 3



Viewed from the top of the jack, without hydraulic fittings.

Fig. 5



Viewed from the top of the jack, without hydraulic fittings.

Installation

Aluminum Jacks Option

1. Align the aluminum jack to the jack bracket mounting holes.
2. Insert four ½" - 20 x 1 ½" Grade 8 flange serrated bolts through the jack and jack mounting bracket (Fig. 6).
3. Install four ½" - 20 Grade 8 flange serrated nuts on the bolts to secure the jack to the jack mounting bracket.
4. Torque nuts to 90 ft-lbs.

NOTE: There should be a recommended minimum of 8" of ground clearance between the bottom of the jack footpad and the ground. Mounting bolts shall be placed apart 6 ¾" minimum to better distribute the weight and pressure of the coach on the jack bracket.

NOTE: Optionally, tack welding the nuts onto the backside of the jack bracket before welding the bracket to the frame simplifies tightening the bolts when mounting the jacks.

5. Make sure that the approach and departure angles (Fig. 1) are maintained after the jack is mounted to the jack bracket.

Fig. 6

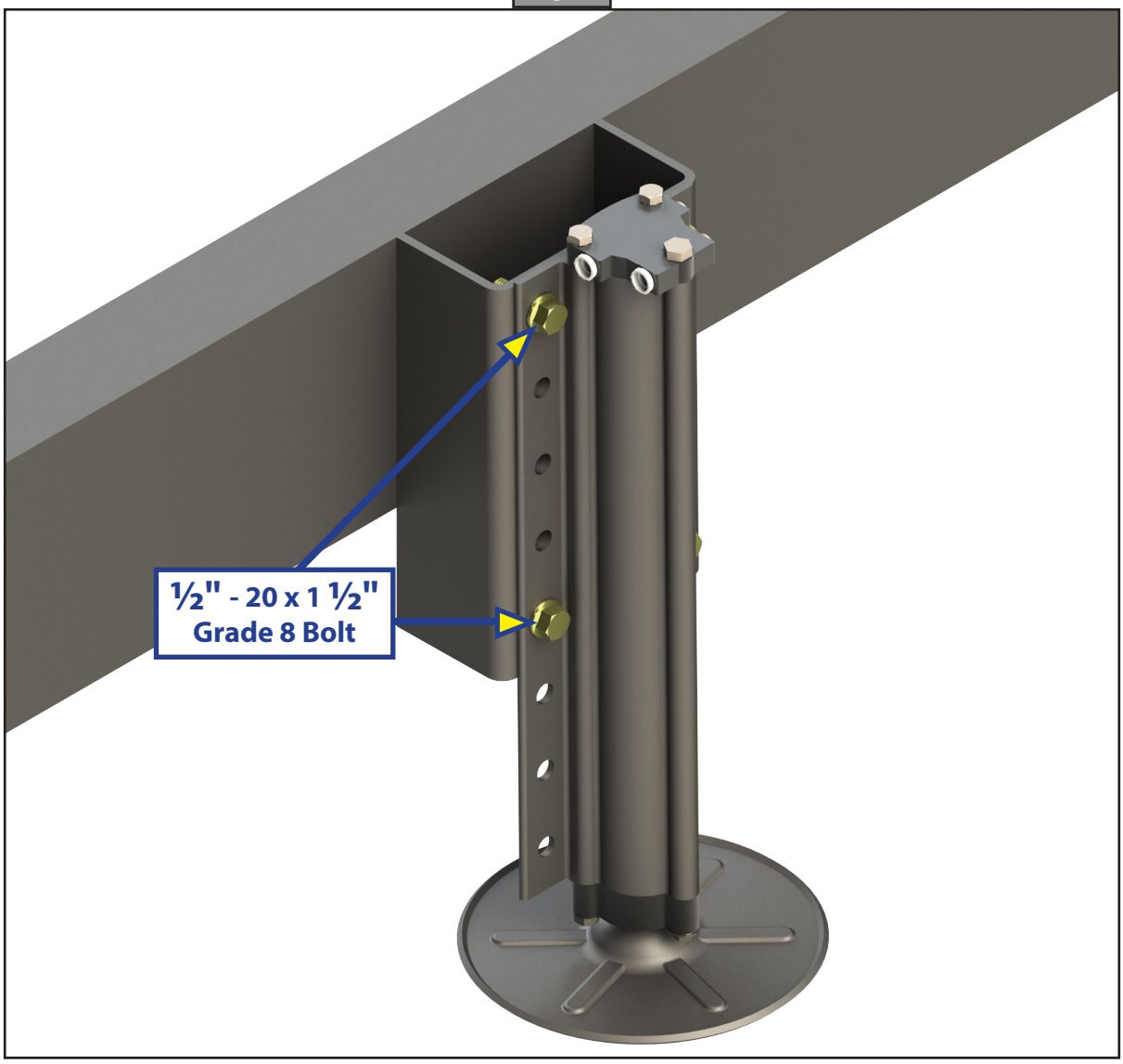
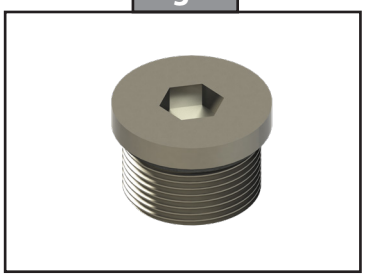
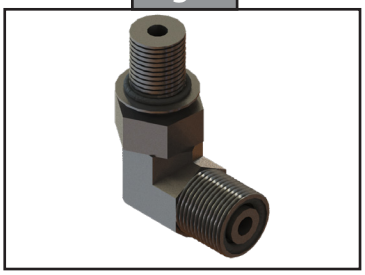


Fig. 7



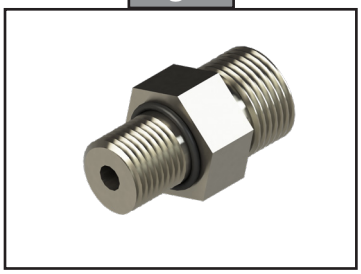
7/16" Port Plug

Fig. 8



90-degree Fitting

Fig. 9

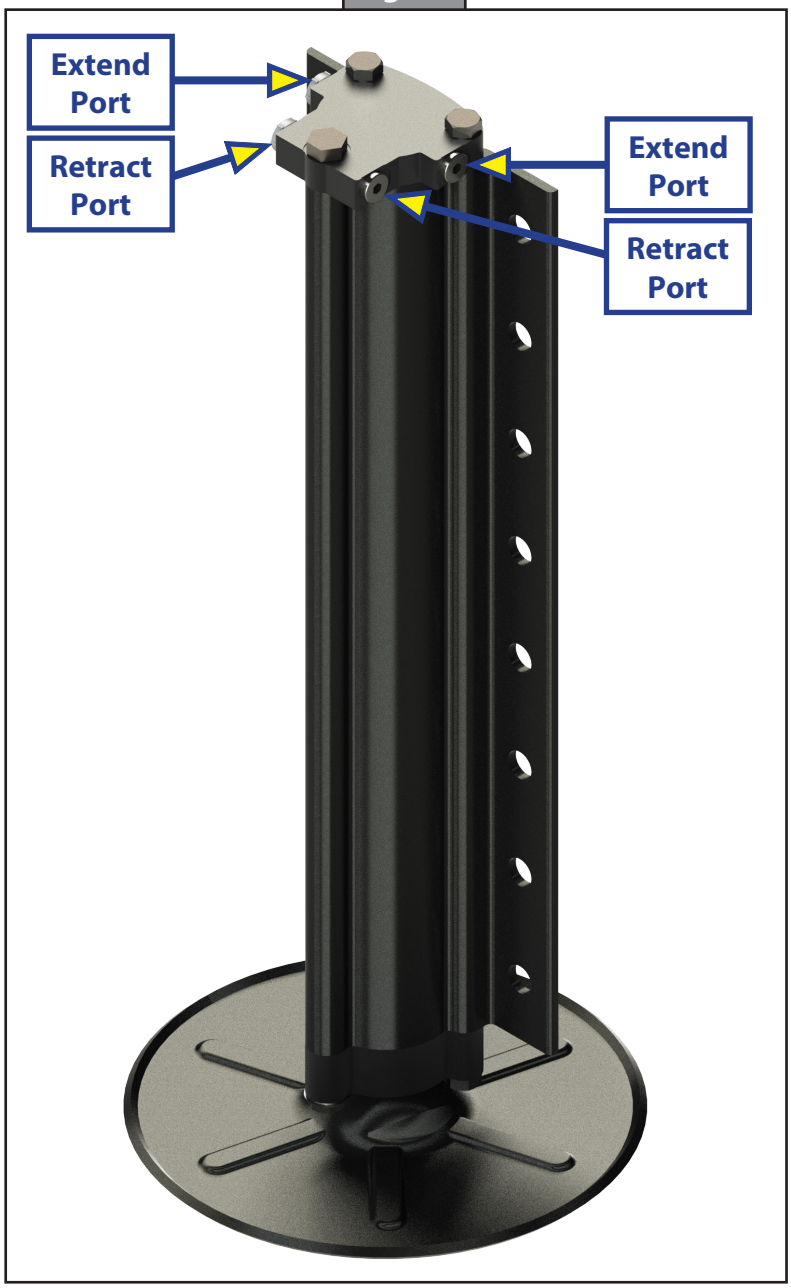


Straight Fitting

Jack Specifications

CAPACITY - 8,000 lbs max
STROKE - 15"
BORE - 2"
HEIGHT - 21.44"
ROD DIA. - 2".
FOOT PAD - 9" standard

Fig. 10



Due to the various installation possibilities, this manual will be detailed as if the power unit is mounted on the left side of the coach. Fittings and hose configuration will be OEM-specific. Under normal installation procedures the jacks closest to the power unit get plumbed first. See the Power Unit Installation section and Fig. 16.

Jack Fittings

NOTE: The hydraulic fittings and 7/16" port plugs (Figs. 7-9) can be installed on the jacks (Fig. 10) as per the Hydraulic Plumbing Diagram (Aluminum Jacks).

1. The Left Front (LF) jack requires four fittings.
2. The Right Front (RF) jack requires two fittings and two 7/16" port plugs.
3. The Left Rear (LR) jack requires three fittings and one 7/16" port plug.
4. The Right Rear (RR) jack requires two fittings and two 7/16" port plugs.

Steel Jacks Option

1. Mount the steel jack to the jack bracket on the coach chassis frame using the provided four ½" – 20 X 1 ½" Grade 8 flange serrated bolts through the jack and jack mounting bracket (Fig. 11).
2. Install four ½" - 20 Grade 8 flange serrated nuts on the bolts to secure the jack to the jack mounting bracket.
3. Torque nuts to 52-64 ft-lbs.

NOTE: A recommended minimum ground clearance between the bottom of the jack footpad and the ground is 6". Place mounting bolts at the furthest available positions around the perimeter of the jack bracket in order to better distribute the weight and pressure of the coach on the jack bracket.

NOTE: Under certain circumstances, tack welding the nuts onto the backside of the jack bracket before welding the bracket to the frame simplifies tightening the bolts when mounting the jacks.

4. Make sure that both the approach and departure angle are maintained once the jack is attached to the jack bracket.
5. Once the jack has been mounted to the welded jack bracket, the ½" port plugs and 90-degree hydraulic fittings (Figs. 12 and 13) can be installed into the jacks.

NOTE: A T-fitting (Fig. 14) may be utilized, if needed, on the front jack extend hose configuration.

Fig. 11

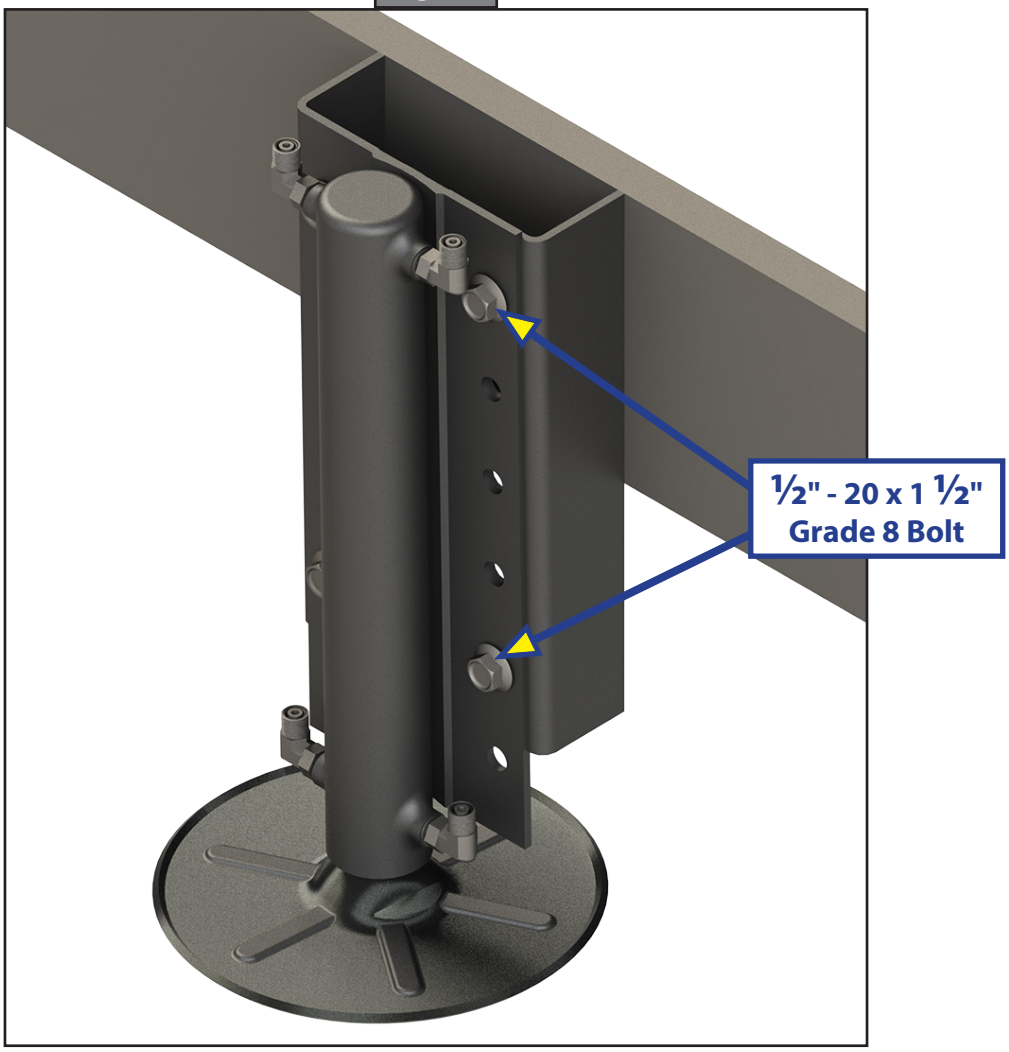
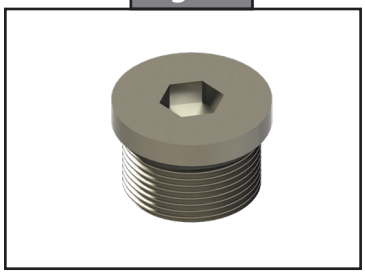
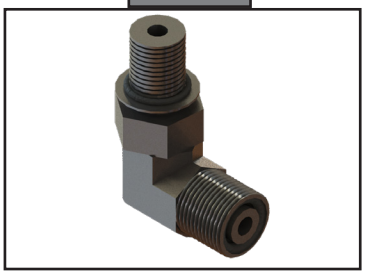


Fig. 12



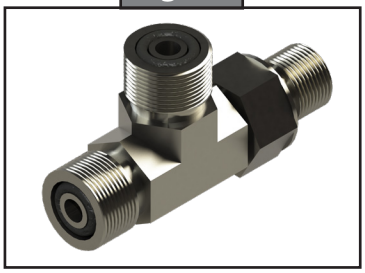
½" Port Plug

Fig. 13



90-degree Fitting

Fig. 14

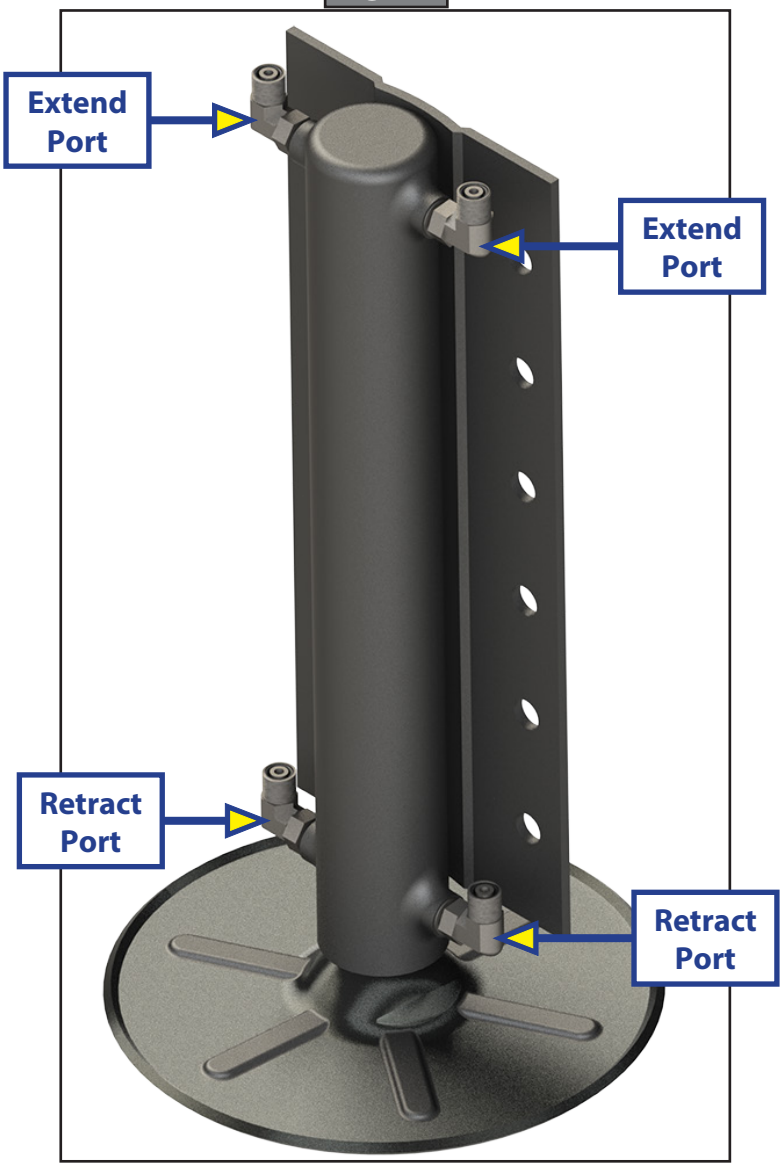


T-Fitting

Jack Specifications

CAPACITY - 6,000 lbs max
STROKE - 12.25"
BORE - 1.75"
HEIGHT - 17.03"
ROD DIA. - 1.25"
FOOT PAD - 9" standard

Fig. 15



Jack Fittings

NOTE: For this document the power unit will be located near the Left Front (LF) jack (Fig. 15). For details on plumbing the system, see the Hydraulic Plumbing Diagram (Steel Jacks).

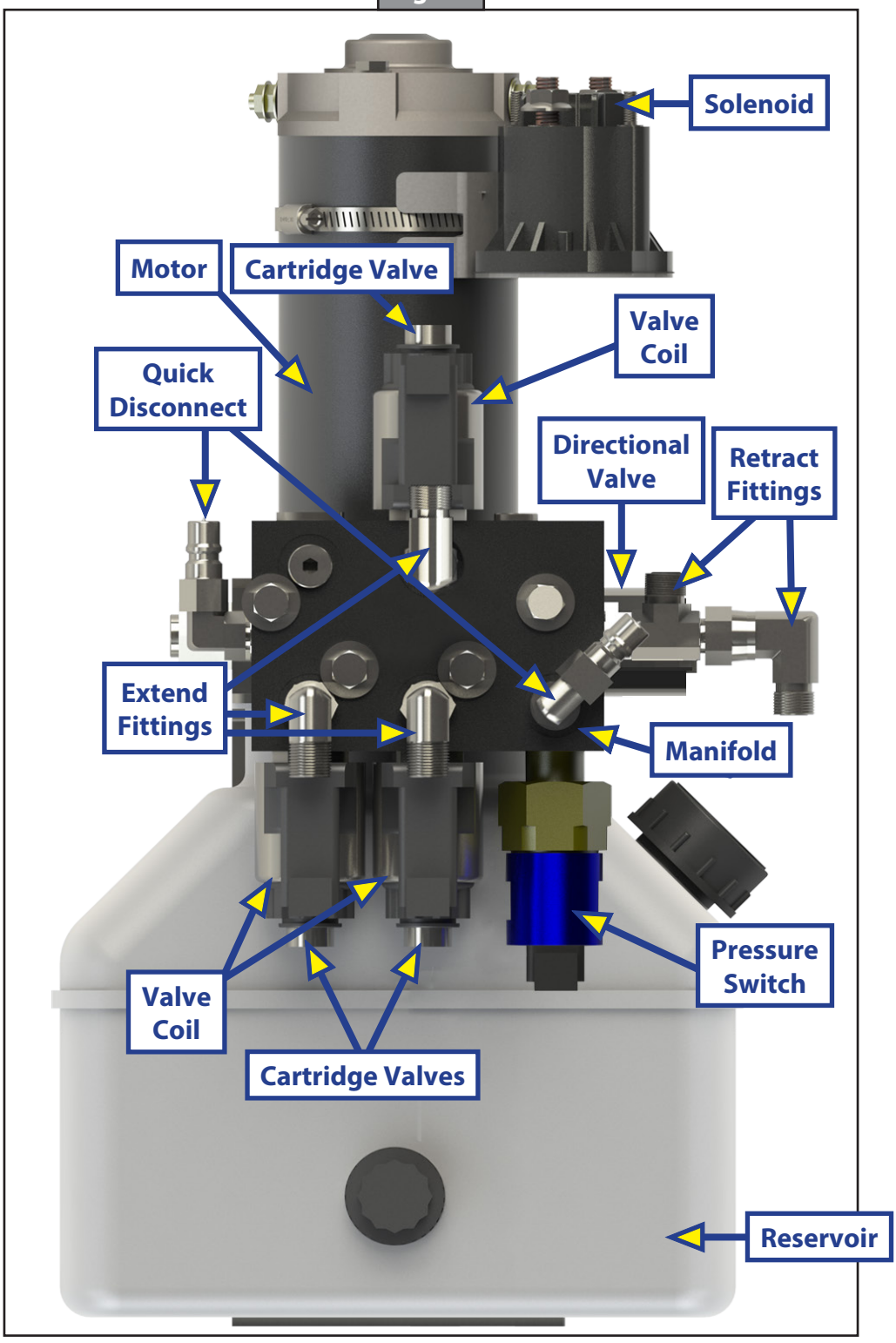
1. The Left Front (LF) jack will need four 90-dgree fittings.
2. The Right Front (RF) jack will need two 90-degree fittings and two ½" port plugs.
3. The Left Rear (LR) jack will need three 90-degree fittings and one ½" port plug.
4. The Right Rear (RR) jack will need two 90-degree fittings and two ½" port plugs.

Power Unit

Identify the power unit mounting location. This will determine the orientation of the hydraulic fittings (Fig. 16). For this manual the power unit is mounted to the front of the driver's side compartment. If the hydraulic power unit is mounted to the front of the driver's side compartment, the driver's side jack (LF jack) will be the first jack in the system.

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

Fig. 16



Hydraulic Hoses

⚠ CAUTION

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.

Verify that the hydraulic fittings were properly installed on the four jacks and power unit. A 7⁄16" port plug will be used to seal any ports not used within the system for the aluminum jacks. A ½" port plug will be used to seal any ports not used within the system for the steel jacks.

NOTE: Refer to the Hydraulic Plumbing Diagrams for fitting placements and for steps 1-8.

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

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 hose lines.

9. When running the hydraulic hoses from the power unit to the rear jacks, bundle the hoses together and run them at once. Secure any loose hoses with zip ties as needed.
10. Install all hoses onto their respective jack 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. Or go to https://www.lci1.com/support-hydraulic-leveling-lcd-br4-point3-valve then select the Technical Information Sheets tab and choose TI - 118: Basic Purge Procedure For Hydraulic Pump Units from the list of documents.

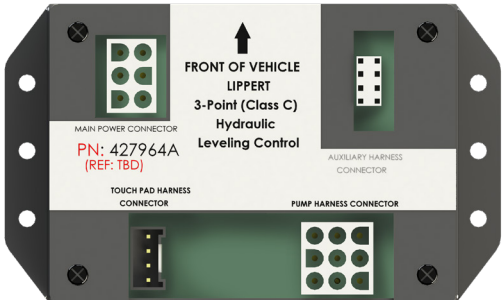
Controller

The Lippert hydraulic leveling system wiring is basically a "plug and play" system. The kit includes wiring harnesses for the entire system. If it does not, contact Lippert Components to have the proper wiring harness shipped.

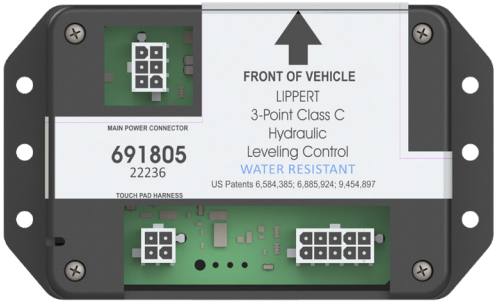
NOTE: Refer to the Wiring Diagrams in this manual throughout this section.

1. Install the controller (Fig. 17) 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.

Fig. 17



Non-Water Resistant Controller



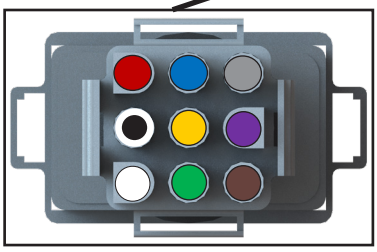
Water-Resistant Controller

2. Connect the harness (Fig. 18) to the matching port on the controller. The harness contains a 9-pin end and a 12-pin end for the regular harness and 10-pin and 12-pin ends for the water-resistant harness.

NOTE: Each connector on the controller is a different shape and has a different number of pins. Each harness (Fig. 18) has only one way of connecting to the controller. The harnesses are not interchangeable. This prevents installation of the wrong harness in the wrong connector.

Fig. 18

Power Unit to Controller Harness (Non-Water Resistant)

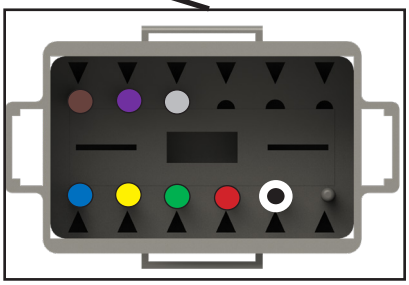


Row 1: 16 GA red, 16 GA blue, 16 GA gray

Row 2: 16 GA black/white, 16 GA yellow, 16 GA purple

Row 3: 14 GA white, 16 GA green, 16 GA brown

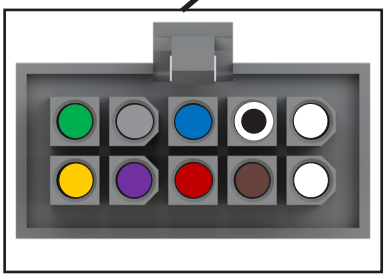
Color	What it Controls
White	Controller power
Black/White	Solenoid extend/retract
Red	Right rear jack valve
Green	Front jacks valve
Yellow	Pressure switch
Blue	Left rear jack valve
Brown	Controller ground
Purple	Not used
Gray	Directional valve
Orange	Dash light warning



Row 1: 16 GA brown, 16 GA purple, 16 GA gray

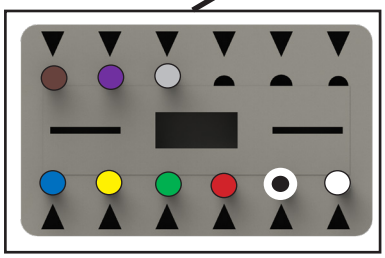
Row 2: 16 GA blue, 16 GA yellow, 16 GA green, 16 GA red, 16 GA black/white, 14 GA white

Power Unit to Controller Harness (Water Resistant)



Row 1: 18 GA green, 18 GA gray, 18 GA blue, 18 GA black/white, 18 GA white

Row 2: 18 GA yellow, 18 GA purple, 18 GA red, 16 GA brown, 18 GA white



Row 1: 18 GA brown, 18 GA purple, 18 GA gray

Row 2: 18 GA blue, 18 GA yellow, 18 GA green, 18 GA red, 18 GA black/white, 14 GA white

Touchpad

1. Remove the faceplate of the touchpad from the mounting bezel (Fig. 19).
2. Cut a hole 3 ⅜" W x 2 ¾" H in the location chosen for installation (Fig. 20).
3. Feed the touchpad harness through the pre-cut hole, and run the wires to the compartment where the controller is mounted. Plug the harness into the appropriate connector on the controller.
4. Insert the touchpad bezel into the cutout hole, and attach it to the mounting surface with four #8 x 1" wood screws. Verify that the screws are sufficient length to thread into the mounting surface (Fig. 21).
5. Plug the touchpad harness into the connector on the back of the touchpad faceplate, and snap the faceplate into the bezel (Fig. 22).

Fig. 19

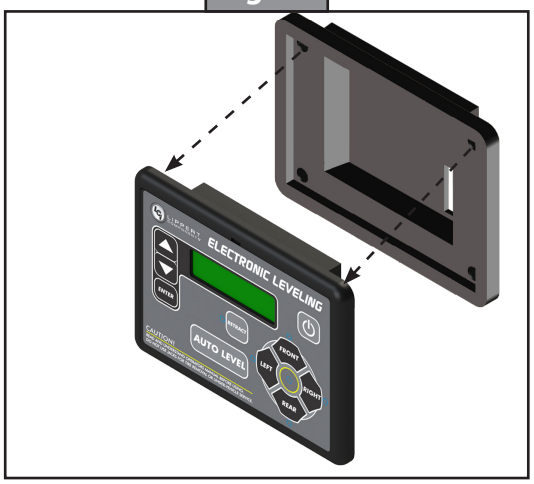


Fig. 20

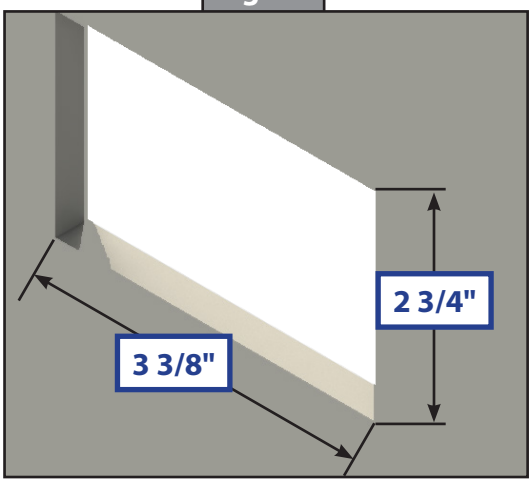


Fig. 21

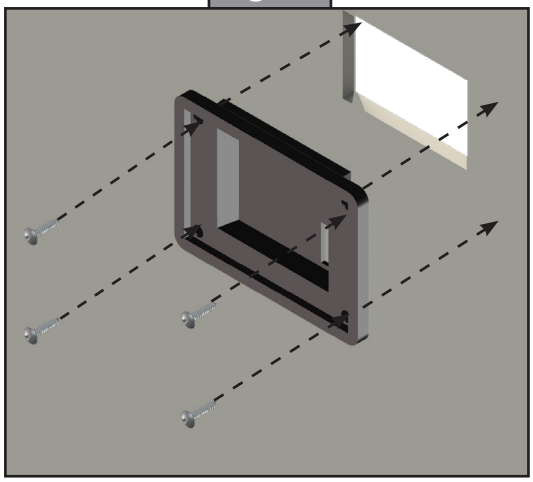
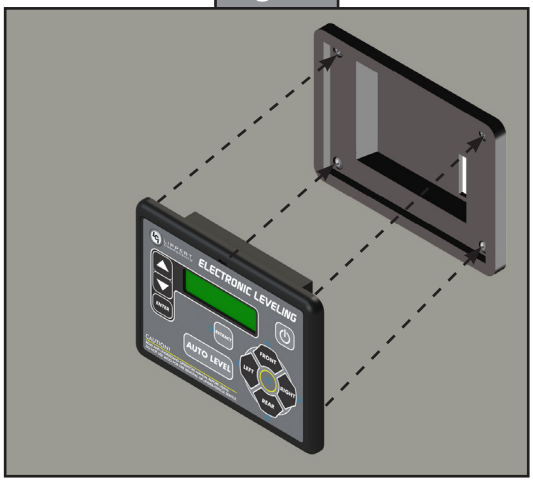


Fig. 22



System Wiring Requirements

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

1. Battery power with OEM-supplied breaker conforming to RVIA Standards.
2. Battery ground as per RVIA Standards.
3. Logic power (switched via ignition).
4. Power brake signal (open=park brake disengaged, GND=park brake engaged).
5. Four-wire harness connecting controller to touchpad.
6. Jacks status input - Switched to GND.
   - **A.** Jacks not all up – switch closed to ground.
   - **B.** Jacks all up – switch open.
7. Connect a ground wire from the 12V battery to the ground post on the power unit motor.

NOTE: Ground wires are OEM supplied.

8. Connect the controller harness power wire to the "Ignition On" wire.
   - **A.** White - Parking Brake
   - **B.** Red - Ignition

Purging the Hydraulic system

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

Fluid Recommendation

Automatic transmission fluid (ATF) with Dexron®III or Mercon®V or a blend of both is recommended by Lippert Components, Inc. For a list of approved fluid specifications, see TI-188. To obtain this Technical Information sheet on-line, go to http://www.lci1.com/support-hydraulic-leveling-lcd-br4-point3-valve. 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.

Purging the System

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

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

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

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

2. Start with all hydraulic components in the fully retracted position, meaning all jacks and slide-outs are brought back inside the coach as if the coach were ready for travel.
3. Find the hydraulic pump location and note the amount of fluid currently in the reservoir. The fluid level should be about ¼" from the top of the reservoir and no more than ½" from the top.

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

4. If there is no froth or foam in the reservoir and the fluid is not within ½" of the top, fill the reservoir to within the level described in step 3.
5. With the fluid level full and no foam in the reservoir, begin cycling the hydraulic system.
6. Extend jacks fully, taking the coach off the tires. If the coach has hydraulic slide-outs, extend all slide-outs. Once all jacks and slide-outs are extended, immediately retract all slide-outs and then jacks.
7. Check the reservoir foam. If foam is present, see NOTE following step 3 and then repeat steps 4-6.
8. Repeat these steps until no foam is present in the reservoir. If no foam is present, the system is purged of air.

Operation

NOTE: It is recommended to have the engine running to maintain minimum required voltage of 12.75V DC.

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.

Make Sure All People and Property Are Clear of Coach While Hydraulic Leveling Is In Operation.

⚠ CAUTION

After starting the automatic leveling cycle it is very important there is no movement inside 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.

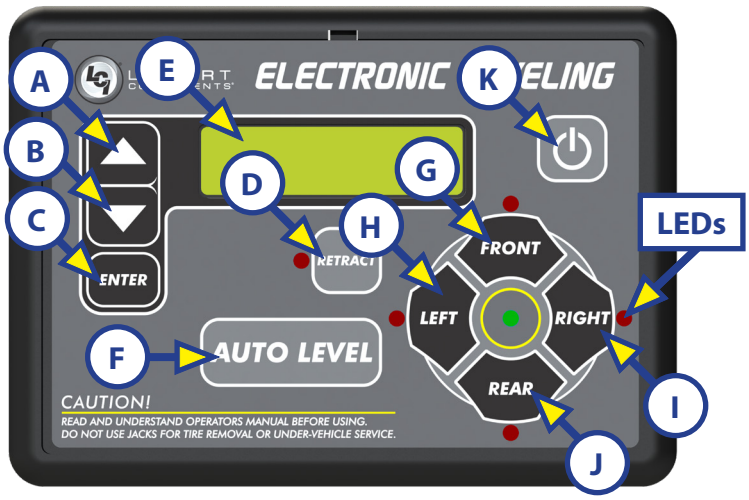
System Features

- Automatic extension of jacks from full retract position (with automatic ground detection).
- Automatic leveling of jacks.
- Manual leveling of jacks.
- Automatic retraction of jacks (with automatic full retract detection).
- Jacks Up verification (jacks not retracted and park brake disengaged).
- Automatic jack error detection and error mode.
- Configurations mode for Zero Point.
- Remote operation.

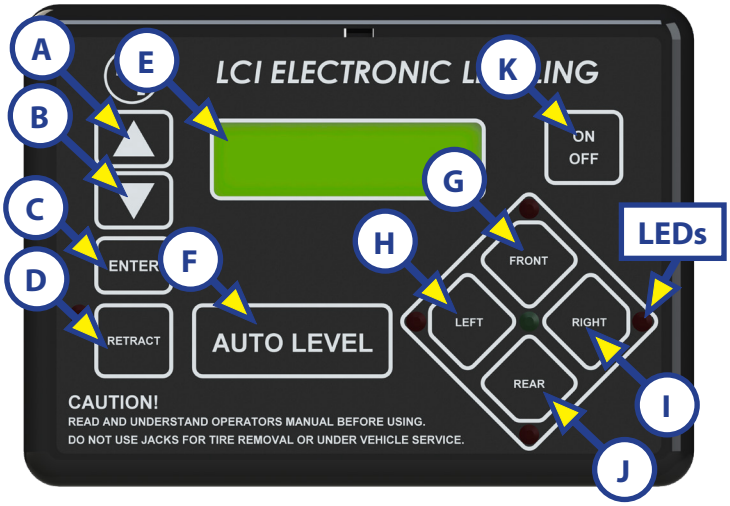
Touchpad Operation

Fig. 23

Gray



Black



Callout	Description
A	Up Arrow (UP) - Scrolls up through the menu on LCD.
B	Down Arrow (DOWN) - 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. 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 Jack Button - Activates both front jacks in manual mode.
H	LEFT Jack Button - Activates left rear jack in manual mode.
I	RIGHT Jack Button - Activates right rear jack in manual mode.
J	REAR Jack Button - Activates both rear jacks in manual mode.
K	Power Button - Turns leveling system on and off.

Zero Point Calibration

Before auto leveling features are available, the Zero Point **MUST** be set. This is the reference point that 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 touchpad off.
2. With touchpad off, perform the following:
   - **A.** Press Front (Fig. 23G) five times.
   - **B.** Press Rear (Fig. 23J) five times.
3. At this point, an alarm will sound and the display will read "**ZERO POINT CALIBRATION** ENTER to Set, POWER to Exit."
4. Press ENTER (Fig. 23C) to set the Zero Point.
5. Screen will then display "PLEASE WAIT."
6. Alarm will sound and the screen will display "ZERO POINT SUCCESSFUL."
7. Control will then turn off.

Automatic Leveling Descriptive Logic

Grounding

The following steps describe the auto-leveling sequence, and extending 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.

Leveling

The following steps describe the process of how the auto-leveling sequence levels the coach once the jacks have been grounded.

NOTE: This process may repeat several times until level.

1. Front-to-rear
2. Side-to-side
3. Individually
4. Minor adjustments to confirm grounding.

Automatic Leveling Procedure

⚠ CAUTION

After starting the automatic leveling cycle it is very important there is no movement inside 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.

NOTE: Coach requires 12.75V DC to commence auto-leveling function.

NOTE: Refer to Component Description listing in the System Information section for questions regarding component locations and functions of the hydraulic leveling system.

NOTE: The engine **MUST** be running and the parking brake **MUST** be engaged for the hydraulic leveling system to operate.

NOTE: Pressing any button during an automatic sequence will stop the sequence and a "Function Aborted" error code will occur. Press ENTER to clear the code and then continue the operation or start a new function.

1. Press Power Button to turn system on (Fig. 23K). The green light will illuminate.
2. Press Auto Level (Fig. 23F). LCD Screen will display "Remain Still."
3. The coach will level automatically and indicate "Auto Level - Success" in the LCD display (Fig. 23E).

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.

4. Visually inspect all jacks to make sure all footpads are touching the ground. If either of the rear jack footpads is not touching the ground, press LEFT (Fig. 23H) or RIGHT (Fig. 23I) to lower the non-compliant jack to the ground.

Manual Leveling Procedure

NOTE: The coach should be leveled from front-to-rear first and then leveled from side-to-side.

NOTE: The engine MUST be running and the parking brake MUST be engaged for the hydraulic leveling system to operate.

NOTE: Performing manual leveling on a coach requires a minimum of 9.5V DC.

1. Press Power Button (Fig. 23K) to turn system on.
2. Press the Up Arrow (Up) (Fig. 23A) or the Down Arrow (Down) (Fig. 23B) to scroll through control features until “Manual Mode” is displayed.
3. Press Enter (Fig. 23C).
4. Press Front (Fig. 23G) to extend front jacks to the ground.
5. Press Rear (Fig. 23J) to extend rear jacks to ground, then level the coach front-to-back.
6. Press appropriate Left (Fig. 23H) or Right (Fig. 23I) to level the coach from side-to-side.

NOTE: 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, i.e., FRONT operates both front jacks.

NOTE: The right and left rear jacks are used to level the coach side-to-side. Pressing LEFT (Fig. 23H) on the control panel will extend the left rear jack. Pressing RIGHT (Fig. 23I) on the control panel will extend the right rear jack.

7. Repeat steps 4-6 as needed.
8. Turn off power to leveling system by pressing the Power Button (Fig. 23K).

⚠WARNING

All coach wheels MUST NOT leave the ground during leveling. Lifting all the wheels off of the ground creates a condition where death, serious personal injury or severe product and/or property damage may occur.

9. Visually inspect all jacks to make sure all footpads are touching the ground. If either of the rear jack footpads is not touching the ground, press LEFT (Fig. 23H) or RIGHT (Fig. 23I) to lower the non-compliant jack to the ground.

Auto Jack Retract Procedures

NOTE: Pressing any button during an automatic sequence will stop the sequence and a "Function Aborted" error code will occur. Press ENTER to clear the code and then continue the operation or start a new function.

1. Pressing the Power Button (Fig. 23K) to turn system on. The LCD screen will display "READY Jacks: Down."
2. Press Up Arrow (UP) (Fig. 23A) or Down Arrow (DOWN) (Fig. 23B) to display "Auto Retract All" on the screen.
3. Press ENTER (Fig. 23C) to begin.

NOTE: “AUTO RETRACT” can also be commenced by pressing and holding RETRACT (Fig. 23D) for one second.

4. The jacks will retract and shut off automatically.
   - **A.** The display will read "READY - Jacks: Up."
   - **B.** Press the Power Button (Fig. 23K) to turn off the leveling system.
   - **C.** Perform a brief visual inspection around the coach to verify the jacks are fully retracted.

Manual Jack Retract Procedures

1. To retract in the MANUAL mode, press RETRACT (Fig. 23D) until the green indicator light comes on.
2. Pressing FRONT (Fig. 23G) or REAR (Fig. 23J) will operate the respective jacks in pairs.
3. Pressing RIGHT (Fig. 23I) will operate the right rear jack.
4. Pressing LEFT (Fig. 23H) will operate the left rear jack.

Troubleshooting

⚠ CAUTION

Make sure all jacks are fully retracted before travel.

Manual Override of Power System and Jacks

In the event that the jacks do not retract, the cartridge valves can be manually overridden.

Resources Required

- Cordless or electric drill
- ½" socket
- 5⁄32" hex wrench

NOTE: Cartridge valves should be opened prior to operating with any auxiliary power device.

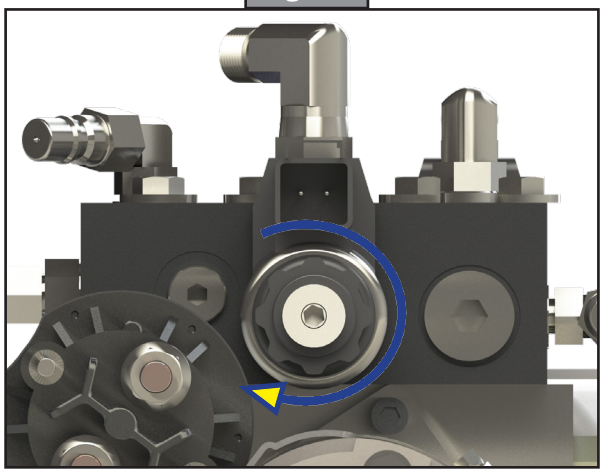
The hydraulic leveling system can be operated in conjunction with auxiliary power devices, like cordless or power drills. In the event of electrical or system failure, the manual method of retracting the jacks can be used. A standard hand-held drill is all that is required.

⚠ CAUTION

Do not over-tighten override set screws as this can damage the valves.

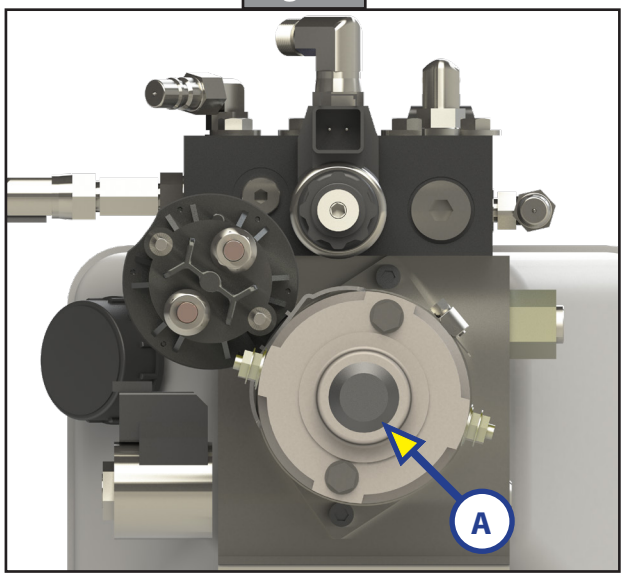
1. Use a 5⁄32" hex key wrench to turn the manual override clockwise (Fig. 24) on each of the three cartridge valves to open the valves.
2. Disconnect or shield power cables on the motor.
3. Remove plastic cap (Fig. 25A) from motor coupler.
4. Unplug the wire harness from the directional valve. See Wiring Diagrams.

Fig. 24



Clockwise for Manual Override

Fig. 25



5. Using a ½" socket and auxiliary drive device, e.g. cordless or power drill, insert ½" socket onto coupler (Fig. 26A).
6. Run drill in reverse, or counterclockwise direction, to simultaneously retract all jacks.
7. After all jacks have been retracted, turn cartridge valve manual overrides, counterclockwise (Fig. 27).
8. Reinsert previously removed protective plastic motor coupler cap.
9. Reattach previously unplugged wire harness to directional valve.

Fig. 26

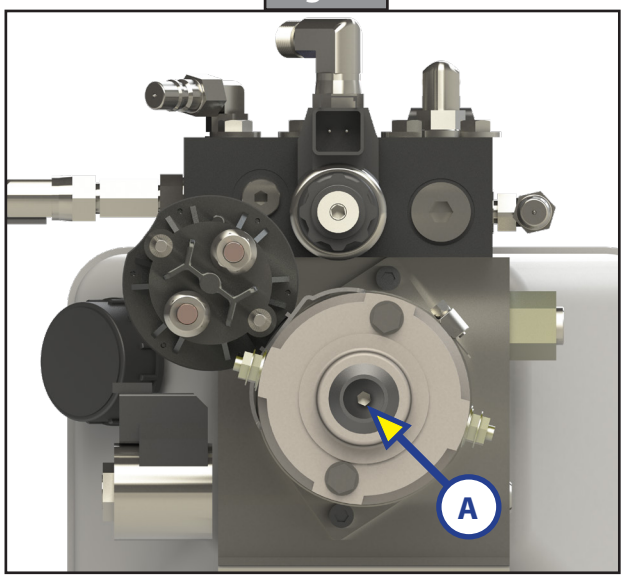
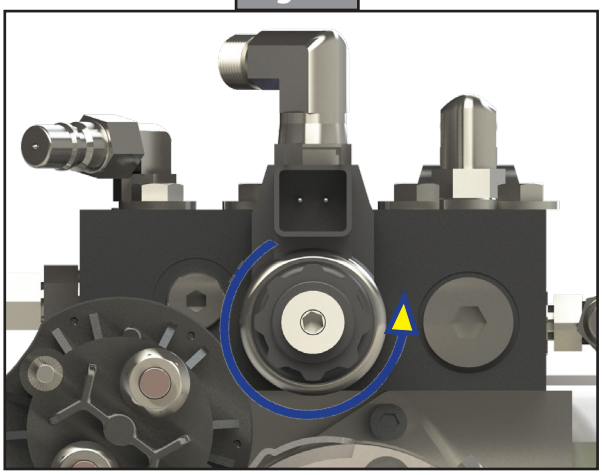


Fig. 27



Counterclockwise for Normal Operation

Automatic Safety Shutoff

The touchpad will automatically shut off after four minutes, if left inactive. To reset the system, turn the coach's ignition off and then back on. Press the touchpad's Power Button (Fig. 23K) again.

Drive-Away Protection System

If the ignition is in the "RUN" position, jacks are extended and the operator releases the parking brake, all indicator lights will flash and the alarm beeper will activate. The leveling system will automatically fully retract the jacks to clear the alarm or, if the operator resets the parking brake, the alarm will shut off.

Jacks Up Verification

If the coach's ignition is in the "RUN" position, the parking brake is released and the vehicle is in motion, the leveling system may activate the power unit to ensure retract pressure is high enough to keep jacks fully retracted. The LCD screen will say "JACKS UP VERIFICATION" until the retract pressure returns to normal level. The touchpad will shut off. No beeping will occur and the "JACKS DOWN" dash light will not illuminate.

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.

Error Mode

1. If an error occurs before or during operation, the error will be displayed in the touchpad's LCD screen (Fig. 23E) and an alarm will sound. To reset common ERROR displays, press ENTER (Fig. 23C).

NOTE: To reset "Return for Service" errors, press ENTER (Fig. 23C) and RETRACT (Fig. 23D) simultaneously.

2. All normal functions will be disabled while the system is in Error Mode.

Error Code Chart		
LCD Display	What is Happening?	What Should Be Done?
Excess Angle	Coach not parked on level ground.	Move coach to level ground prior to starting auto level sequence.
	Zero Point incorrectly calibrated.	Recalibrate Zero Point.
Excessive Angle	Occurs only in manual mode when the angle of the coach is too severe.	Use the manual functions to return coach to a more level condition.
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 touchpad 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 Check Wiring **NOTE**: Screen will not back light.	Wiring connections loose or faulty between touchpad and controller.	Check connections, replace communication harness if necessary.
Retract Timeout Return Levelers for Service	Pressure switch did not sense retract pressure and pump timed out.	Return levelers for service.
	Leaking hose or fitting.	Check for leaks; repair if necessary. Press ENTER and RETRACT to clear error.

Excess Slope

1. The control will not operate at extreme slopes, i.e. 3.5 degrees front and rear and 3.5 degrees side-to-side.
2. If the coach's display indicates “Excess Angle” or “Out of Stroke “ during an auto-level cycle, move the coach to a level spot.

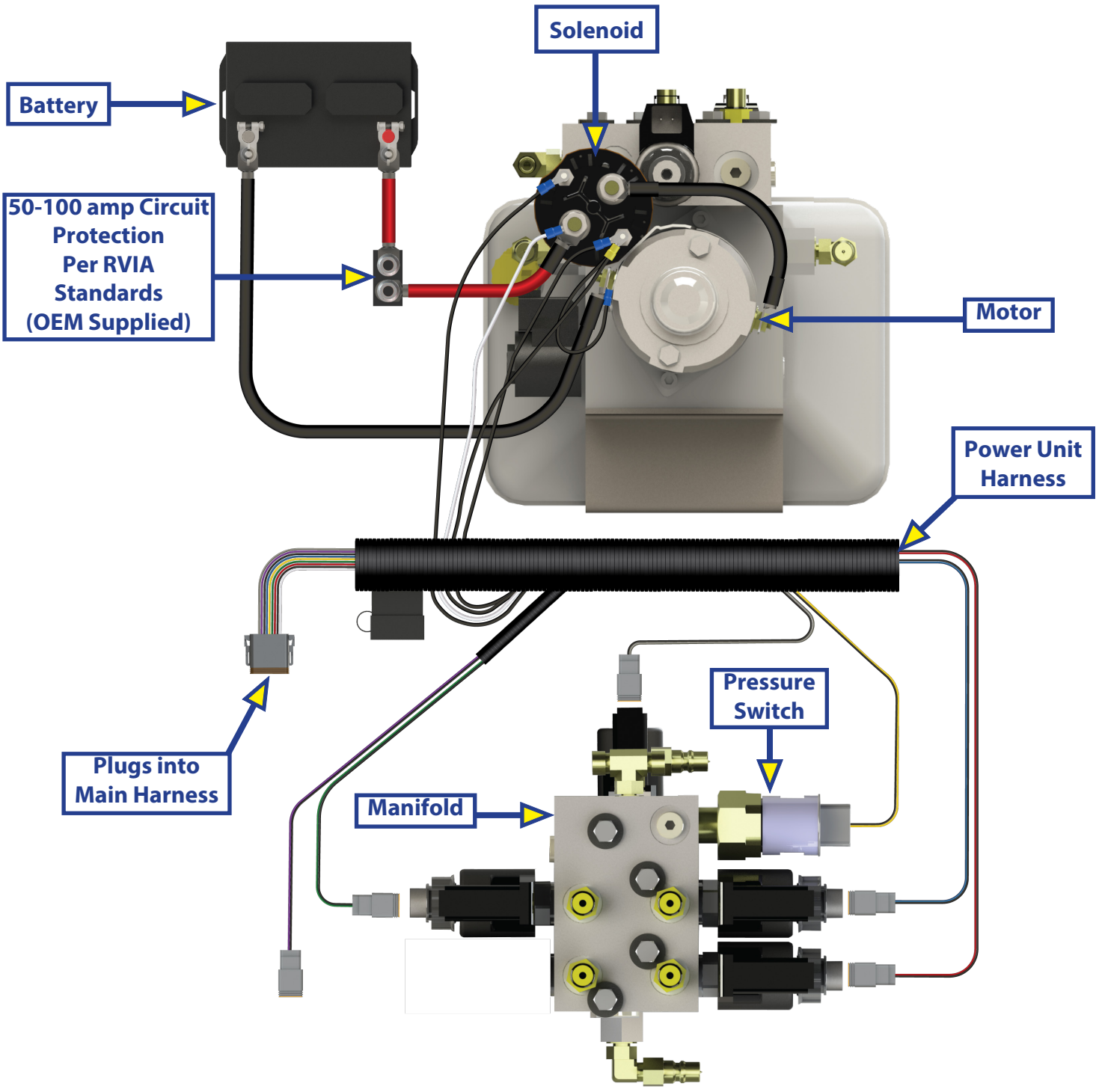
User Alarm Mode

If the alarm system detects that the park brake has been disengaged while at least one jack is not fully retracted, the touchpad will buzz and the LED will signal a park break error to the user. The system will then perform an automatic retract sequence. No other features are available in this mode.

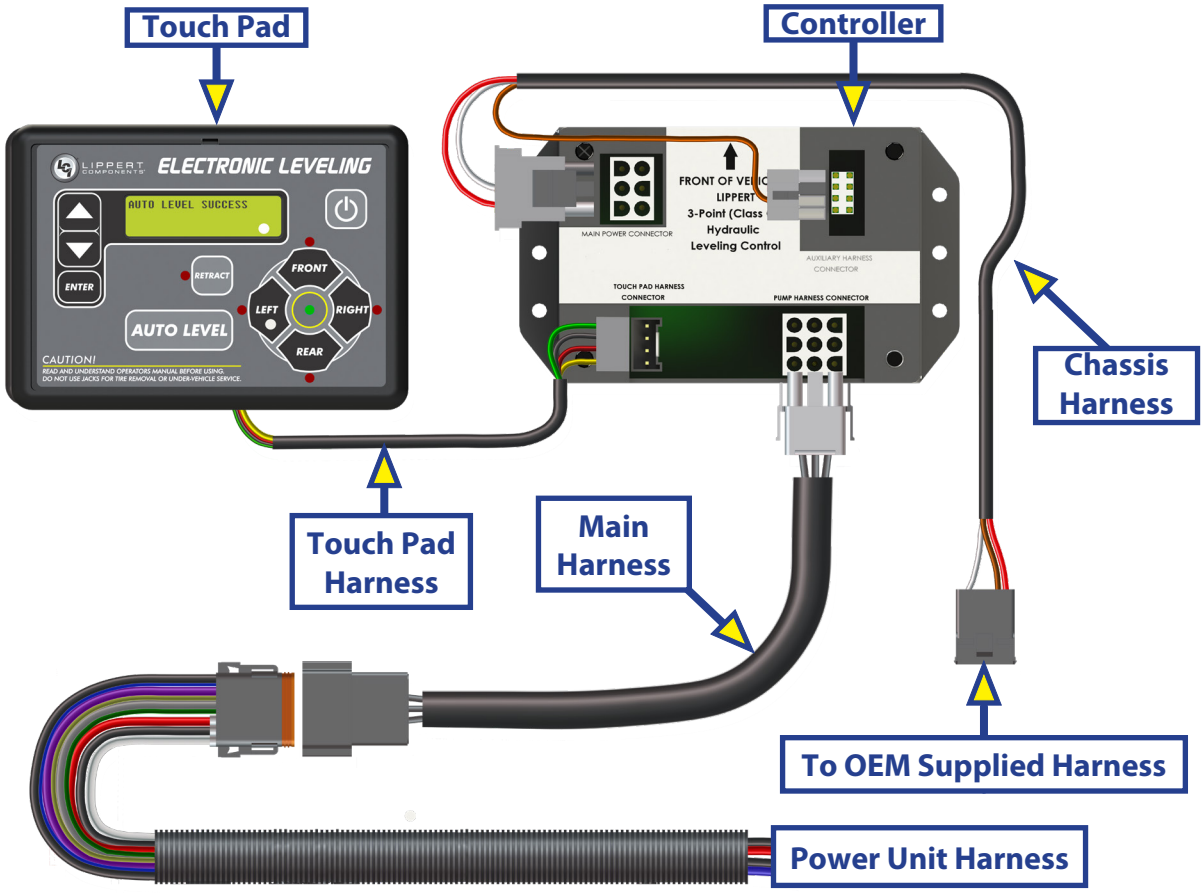
Miscellaneous

1. A "Re-Level" feature is programmed into the controller. If the jacks are extended and the user presses AUTO LEVEL (Fig. 23F), the system will re-level from that point. The system will not retract before performing the re-level.
2. System will refuse any operation when a low voltage condition is present.

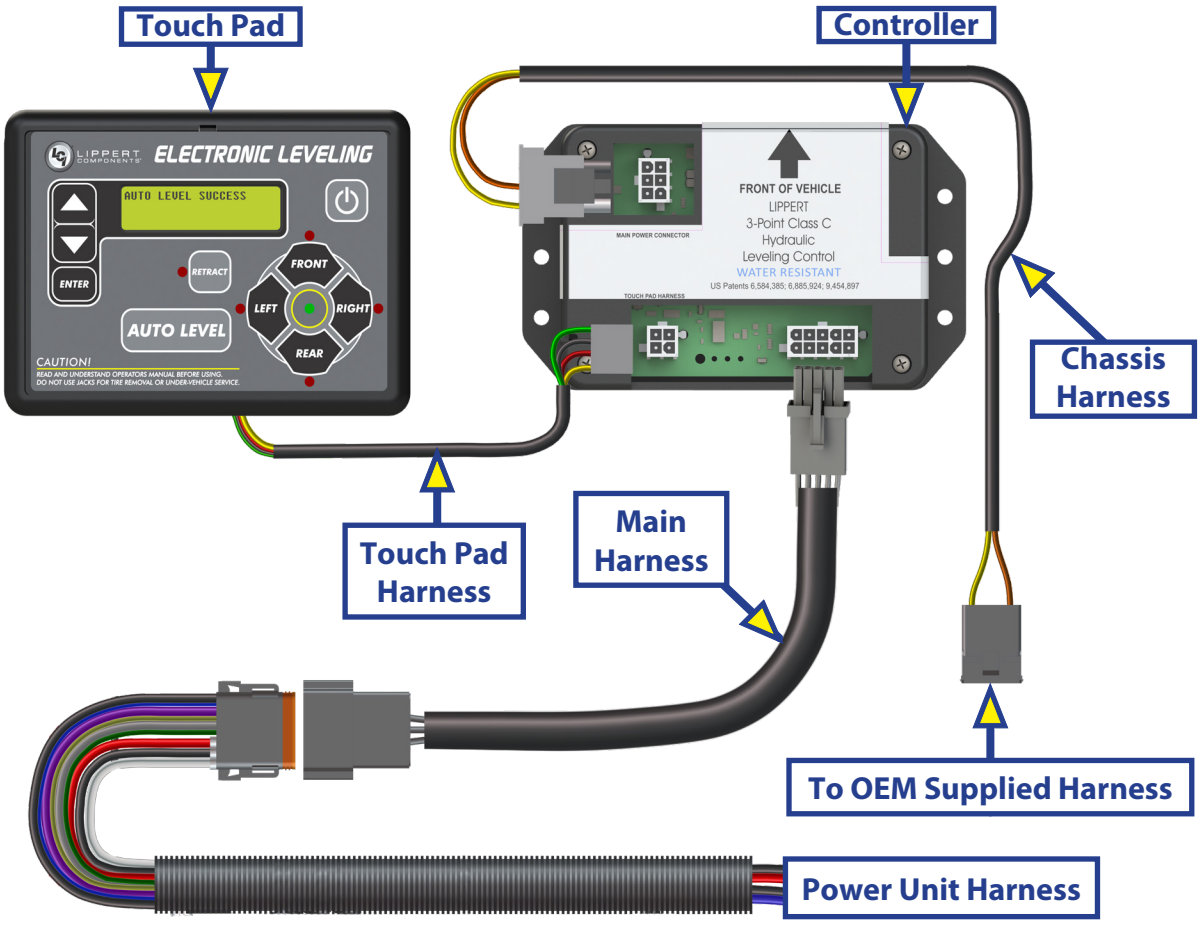
Wiring Diagram - Overall System



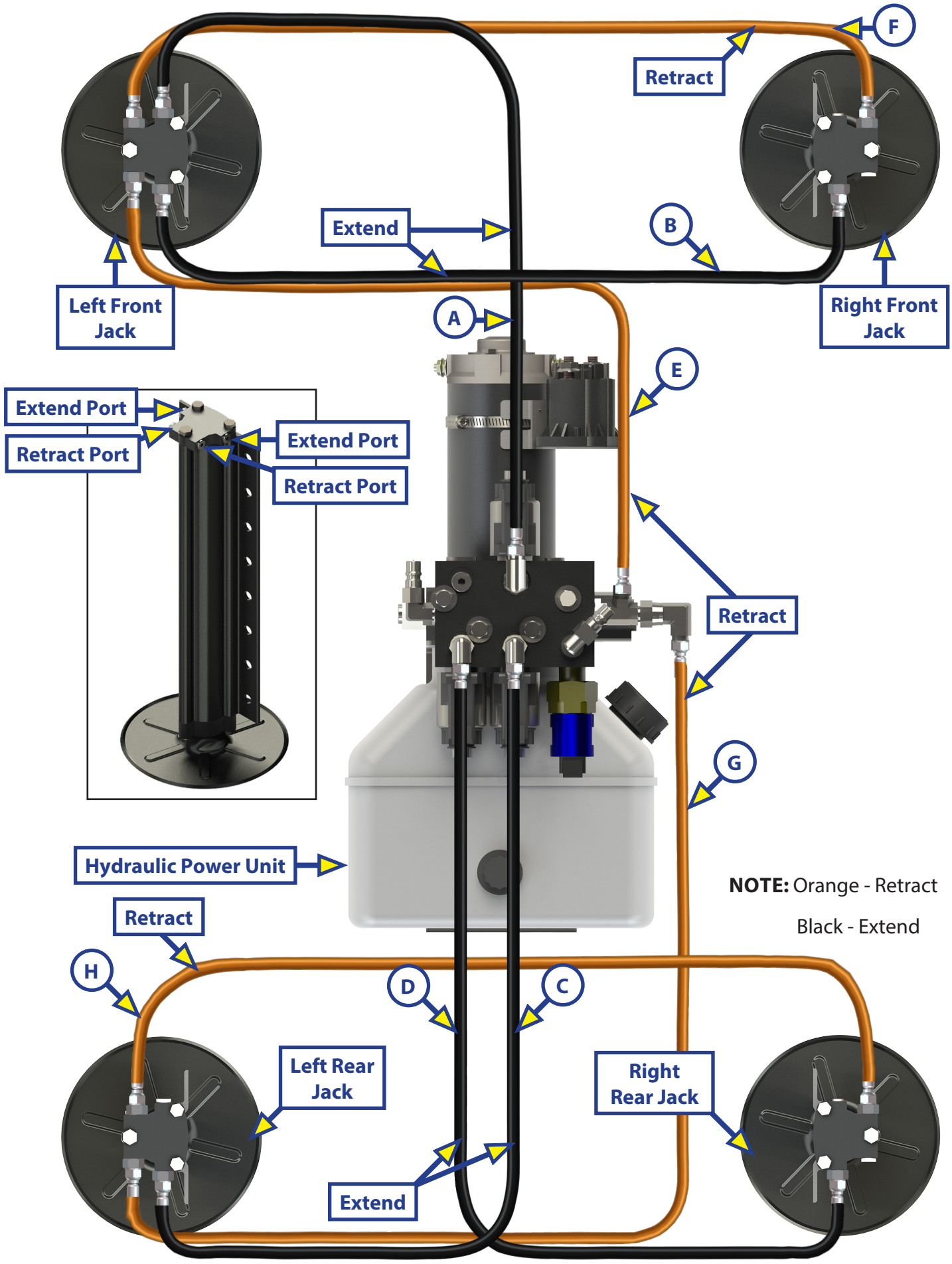
Wiring Diagram - Controller and Touchpad (Non-Water Resistant)



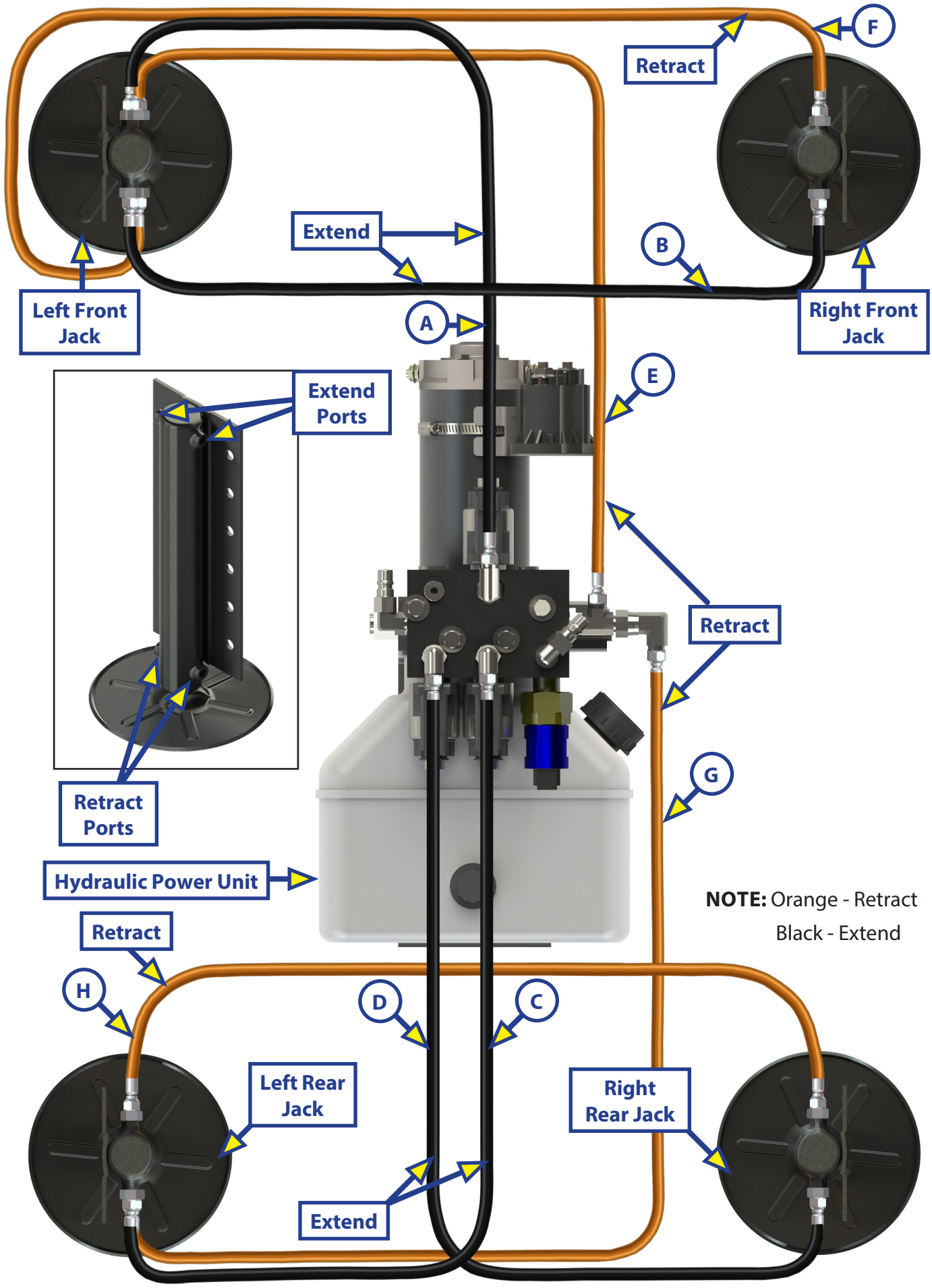
Wiring Diagram - Controller and Touchpad (Water Resistant)



Hydraulic Plumbing Diagram (Aluminum Jacks)



Hydraulic Plumbing Diagram (Steel Jacks)



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Lippert Components, Inc.
Ph: 432-LIPPERT (432-547-7378) | Web: lippert.com | Email: customerservice@lci1.com