



**ICE HOUSE
HYDRAULIC LEVELING
OEM INSTALLATION MANUAL**

**L I P P E R T
C O M P O N E N T S®**

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Introduction

This document covers the electrical and hydraulic installation instructions for Ice House equipped with hydraulic jacks and pivot axles.

Images used in this document are for reference only when assembling, installing and/or operating this product. Actual appearance of provided and/or purchased parts and assemblies may differ.

For information on the assembly or individual components of this product, please visit:

<https://support.lci1.com/ice-house-leveling>

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 LCI limited warranty.

WARNING

The "WARNING" symbol above is a sign that an installation procedure has a safety risk involved and may cause death, serious personal injury and/or severe product or property damage 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

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

WARNING

Failure to remove flammable objects or obstructions may result in death, serious injury or property damage.

CAUTION

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

CAUTION

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 applying new grease.

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.

Resources Required

- Floor jack
- Jack stands
- Welder
- Multi-purpose grease
- Ratchet and standard socket set
- Grease gun
- Cordless or electric drill or screw gun
- Appropriate drive bits
- Appropriate drill bits

Installation

Pivot Axles

NOTE: LCI recommends a NLGI #2 grade lithium complex EP grease for all applications contained within this manual. A molybdenum-based grease is preferred.

⚠ WARNING

Incorrect raising or lowering of the trailer could result in death, serious personal injury and/or severe damage to the trailer.

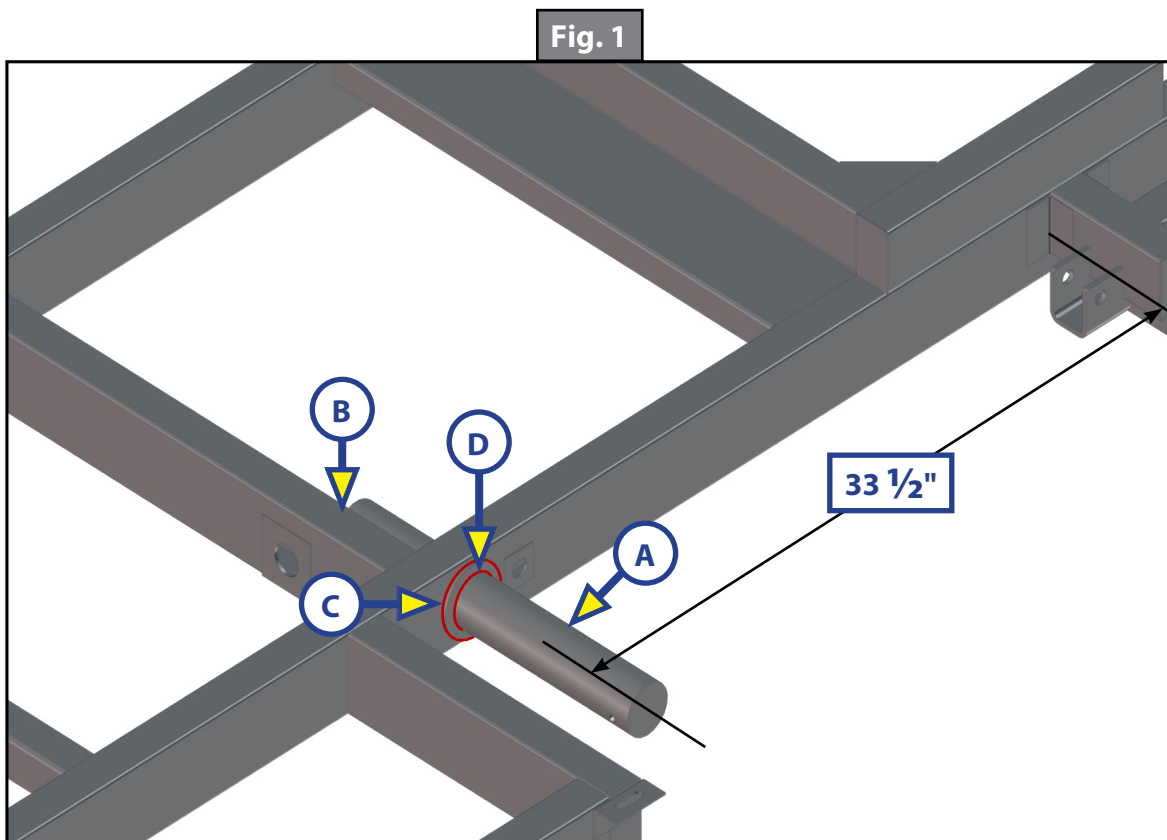
⚠ CAUTION

Make sure the trailer is properly supported before performing any maintenance or repair work. Follow the trailer's manufacturer's recommendations for lifting and supporting the trailer. Use proper personal protective equipment.

NOTE: Do not lift the trailer by the axles. The axles were not designed as a viable lift-point.

1. Using the properly-rated floor jack, lift the trailer according to the manufacturer's recommendations.
2. Support the framework in accordance with the manufacturer's recommendations.
3. Cut a $2 \frac{9}{16}$ " diameter hole into the frame rail, and fit the axle pivot shaft (Fig. 1A) and washer assembly through the hole so it is flush to the frame rail.
3. Place a cross member just ahead of the pivot shaft to weld the rod to (Fig. 1B).

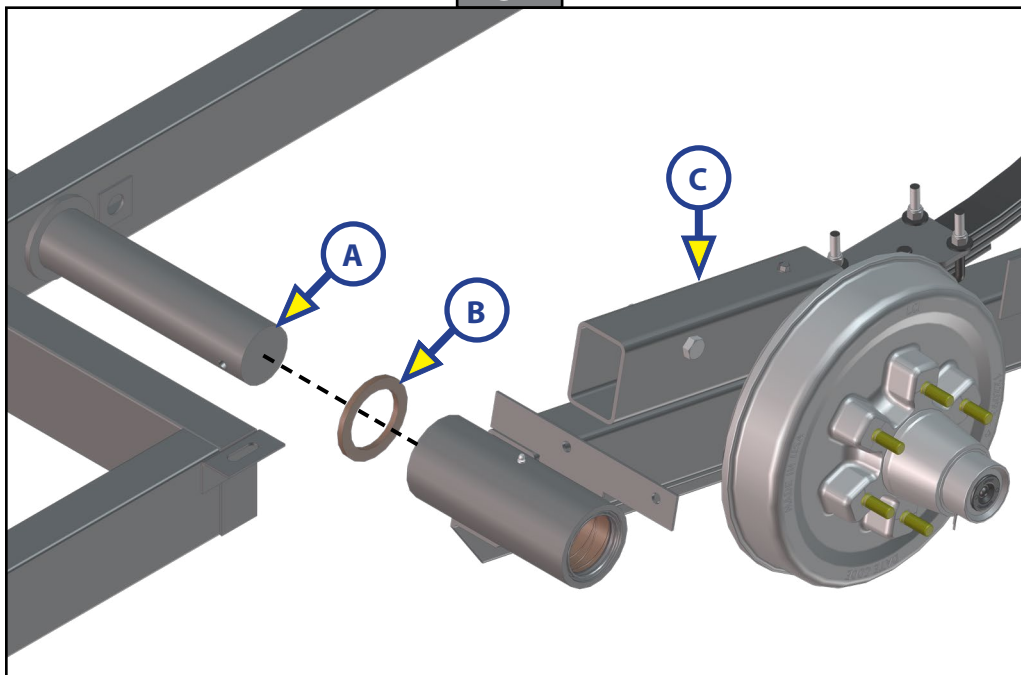
NOTE: Suitable structure to hold the pivot shaft is optional, but suitable structure to support the pivot shaft is required.



4. Make sure that pivot shaft is square to the frame front-to-back or slightly tipped forward up to $\frac{1}{16}$ " (0 - $\frac{1}{4}$ degrees toe-in) for the toe alignment.
5. Make sure that pivot shaft is tipped down to set the axle camber from $\frac{3}{32}$ " to $\frac{3}{16}$ " ($\frac{1}{2}$ - 1 degrees).

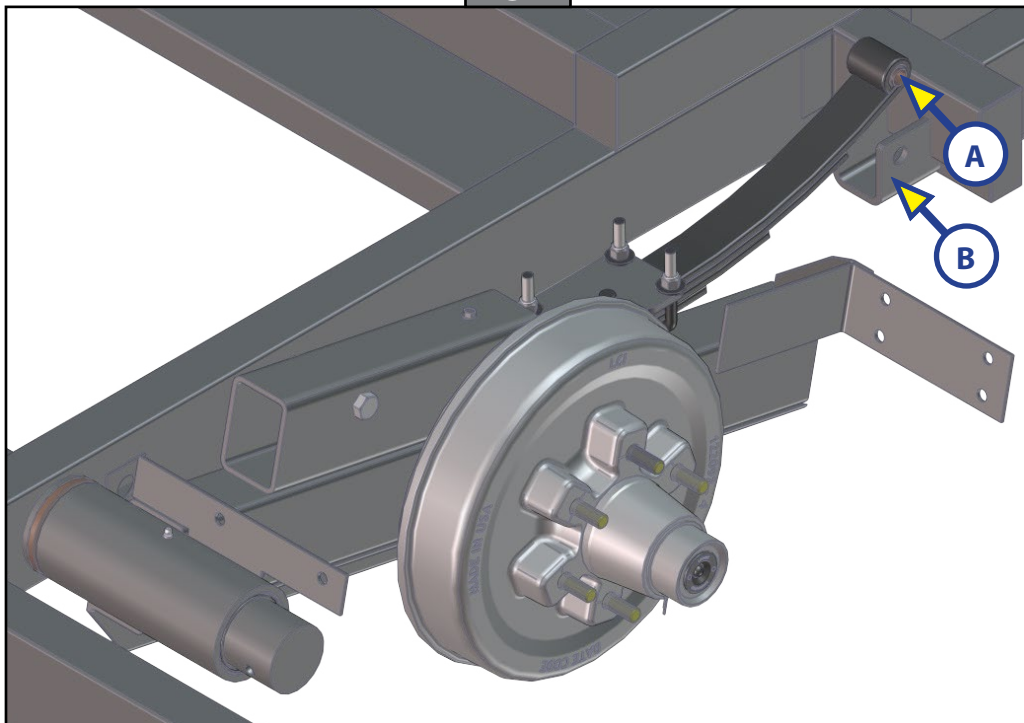
6. Weld around the washer a full 360 degrees to the frame (Fig. 1C).
7. Weld the pivot shaft (Fig. 1D) sticking through the inside of the frame rail all the way around to the cross member.
8. Measure 33 1/2" from the center of the pivot shaft to position the rear hanger weldment (Fig. 1).
9. Before axle install, grease the pivot shaft (Fig. 1A) with lithium-based multipurpose grease. Enough grease should be used to leave a thin film on the pivot shaft.
10. Install a bronze wear washer (Fig. 2B) onto the pivot shaft (Fig. 2A). After installing the bronze wear washer, install the axle assembly (Fig. 2C) onto the pivot shaft (Fig. 2A).

Fig. 2



11. Support the axle assembly with an appropriately weight-rated floor jack. Make sure the rear spring eye (Fig. 3A) is above the hanger (Fig. 3B).

Fig. 3



12. Install the second brass wear washer (Fig. 4B) and collar (Fig. 4C) onto the pivot shaft (Fig. 4A).
13. Install a $\frac{3}{8}$ " - 16 x 3 $\frac{1}{2}$ " bolt (Fig. 5A) and nut (Fig. 5B). The nut should be on the front side away from the tire and the head of the bolt near the tire. Tighten to 25 ft-lbs of torque.

Fig. 4

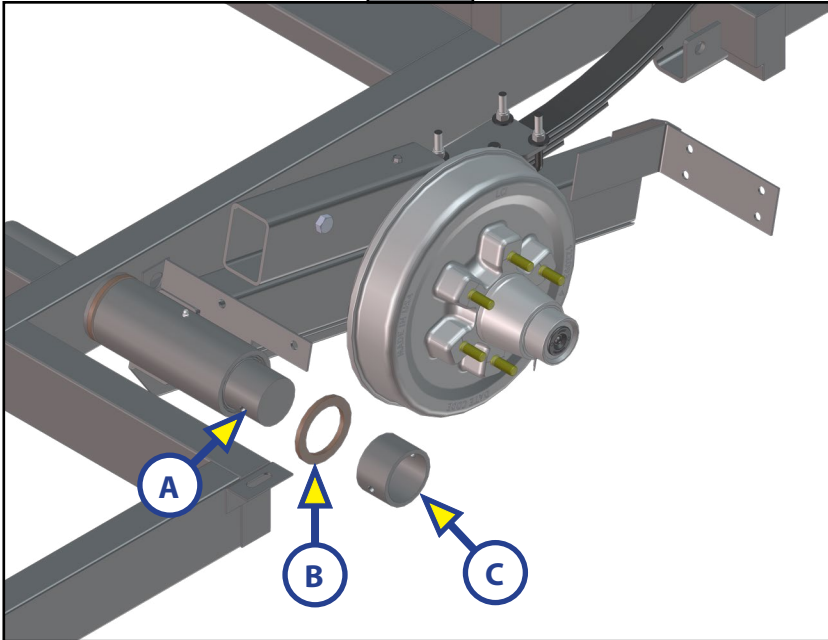
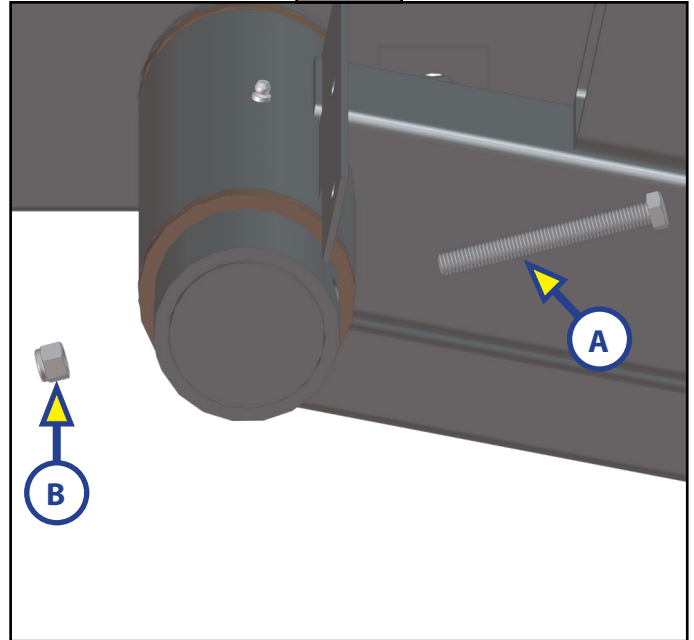
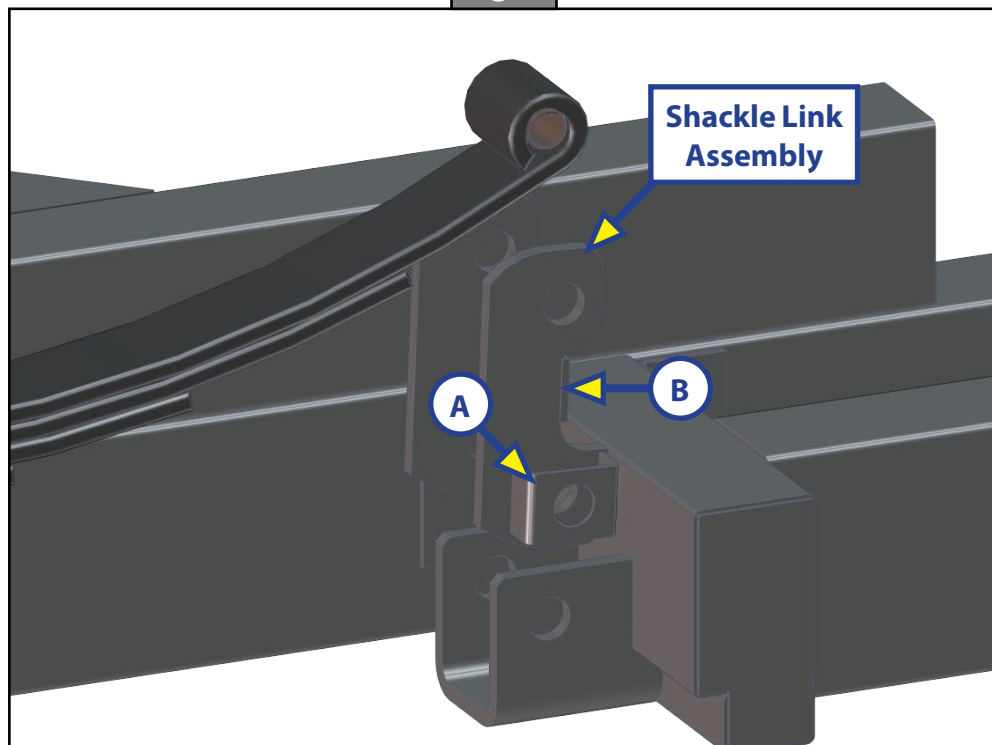


Fig. 5



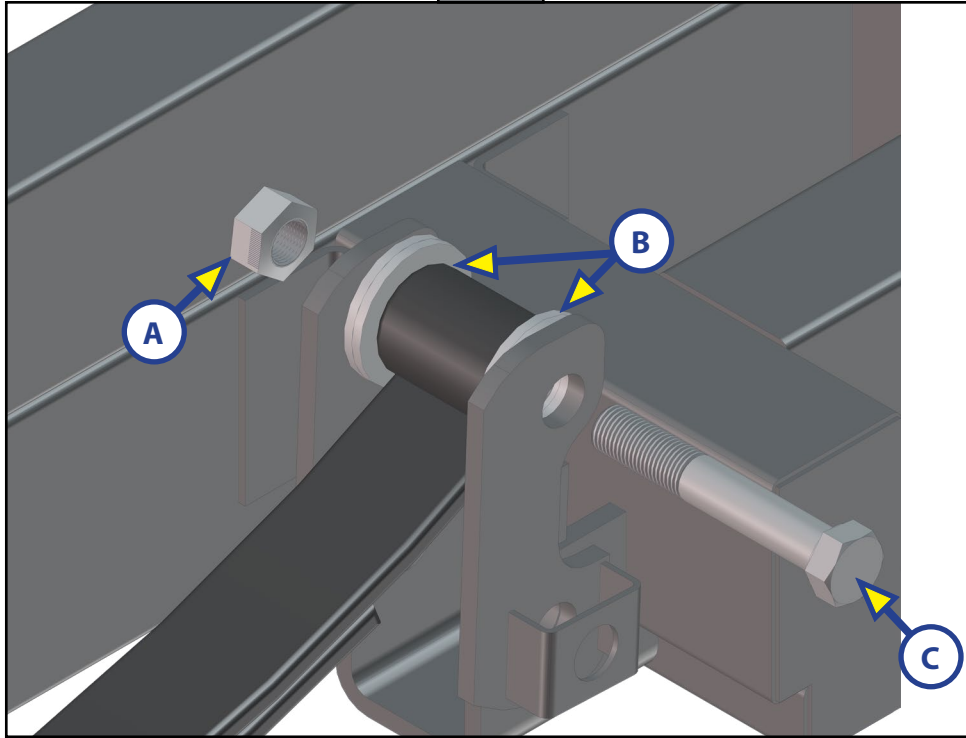
14. Dry fit the shackle link assembly to the frame. The scallop in the shackle assembly (Fig. 6B) should be facing the rear of the trailer and the square bracket (Fig. 6A) facing outward.

Fig. 6



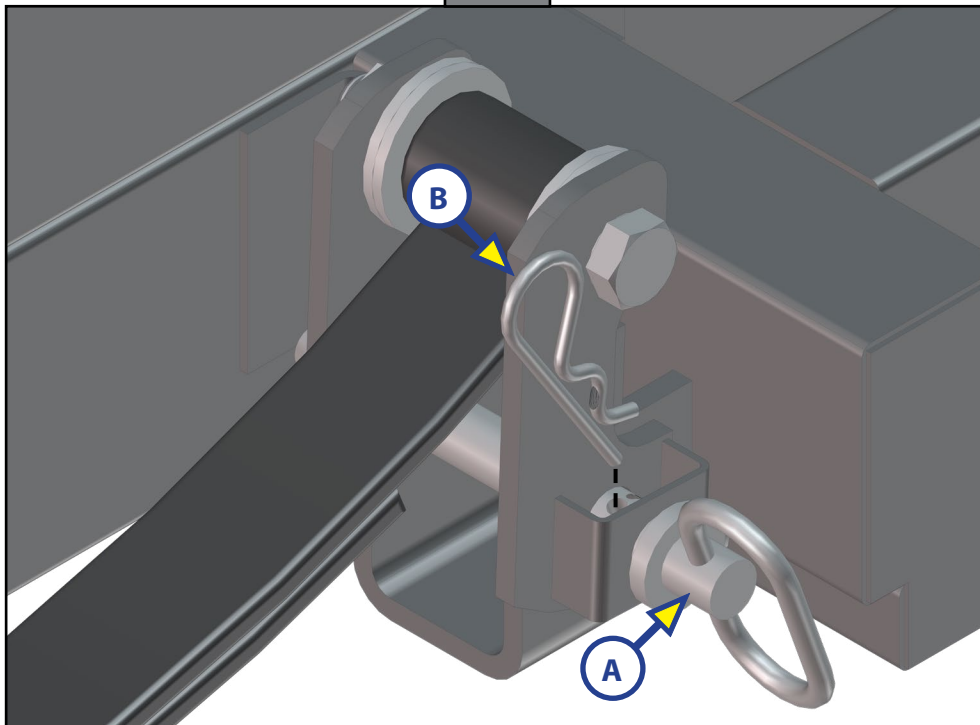
15. Dry fit two washers on the inside of each side of the shackle link (Fig. 7B). Install a $\frac{9}{16}$ " - 18 x 3 $\frac{1}{2}$ " bolt (Fig. 7C) in the top of the top link assembly and the rear spring eye (Fig. 7). Tighten the $\frac{9}{16}$ " nut (Fig. 7A) to 30 ft-lbs of torque.

Fig. 7



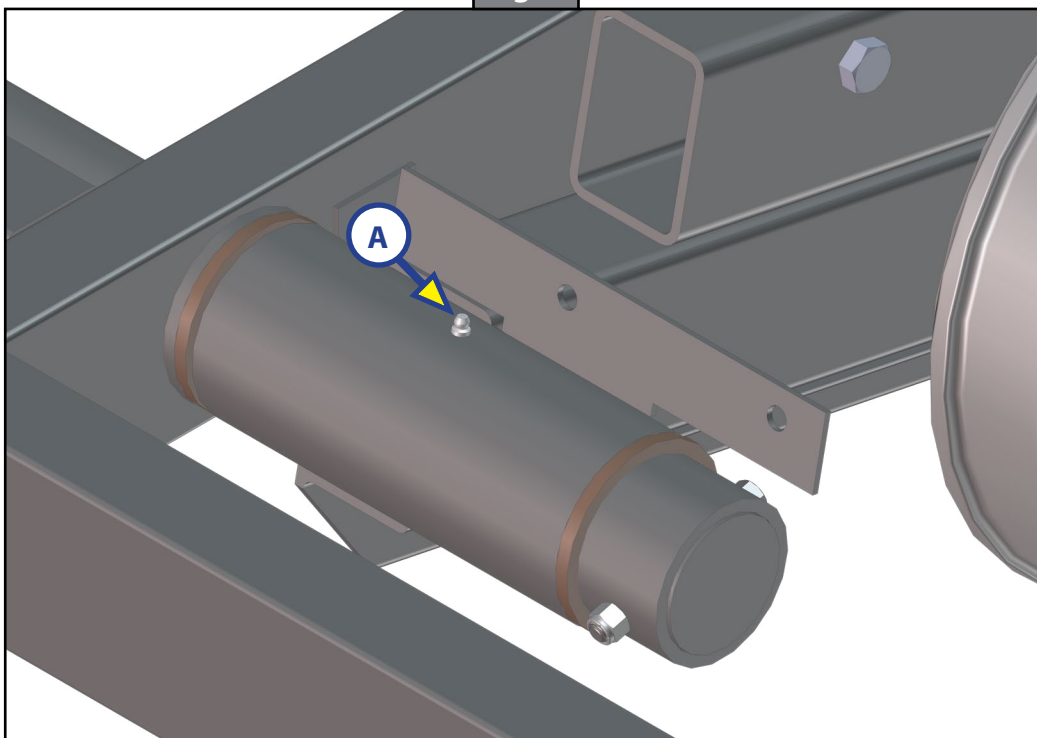
16. Install the hitch pin (Fig. 8A) in the lower hole of shackle link assembly and through the frame hanger. Install the hairpin cotter pin (Fig. 8B) into the hitch pin between the shackle and square bracket (Fig. 8).

Fig. 8



17. Use a grease gun on the grease fitting (Fig. 9A) located on the front pivot tube.

Fig. 9



- NOTE:** Use 80 milliliters or $\frac{3}{8}$ of a cup of lithium-based multipurpose grease on each side of the trailer.
18. Repeat the installation procedure for the opposite side of the trailer.

Jacks

4. Slide the jack mounting bracket (Fig. 10A) into the welded frame bracket (Fig. 10B), making sure to line up the holes in both brackets.
5. Secure the mounting bracket (Fig. 11A) to the frame bracket (Fig. 11B) with two 1/2" - 20 x 4.5" hex bolts (Fig. 11C) and two 1/2" - 20 serrated flange nuts (Fig. 11D).

Fig. 10

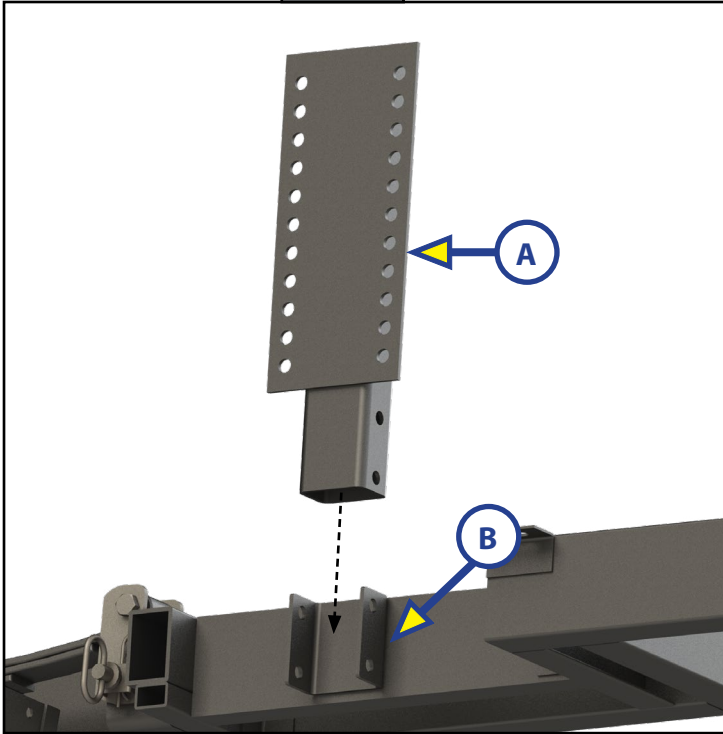
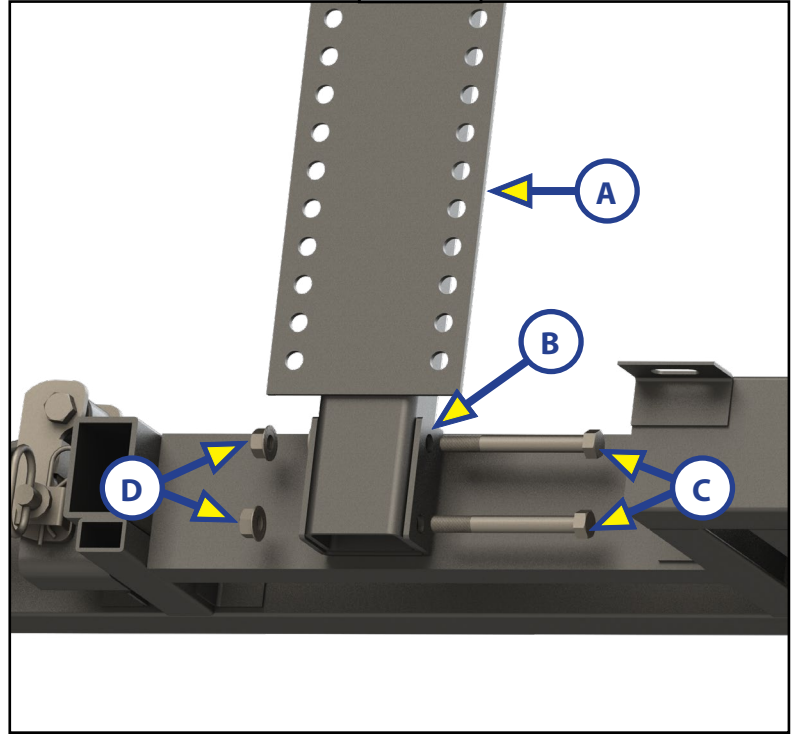
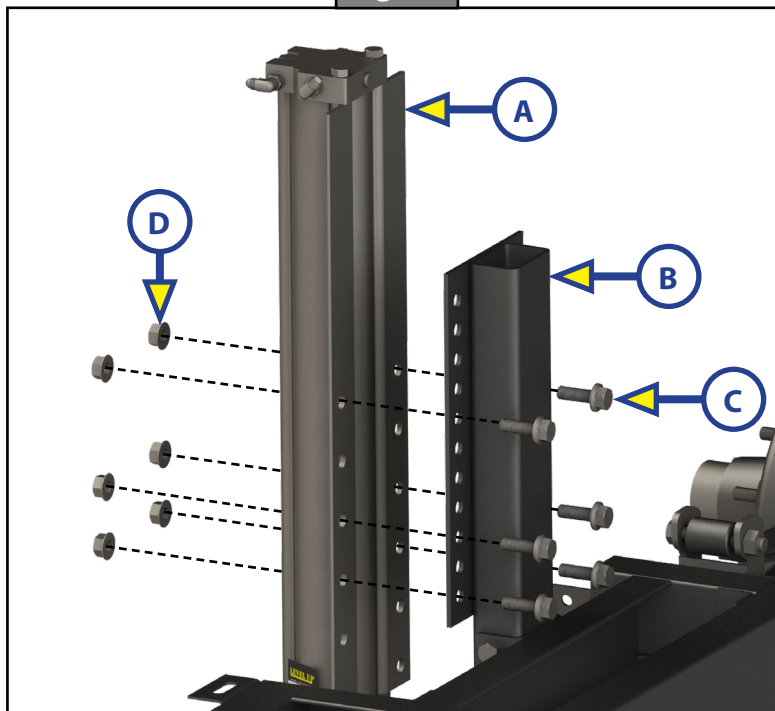


Fig. 11



6. Mount the jack cylinder (Fig. 12A) to the mounting bracket (Fig. 12B) with six 1/2" - 20 x 1 1/2" hex bolts (Fig. 12C) and six 1/2" - 20 serrated flange nuts (Fig. 12D).

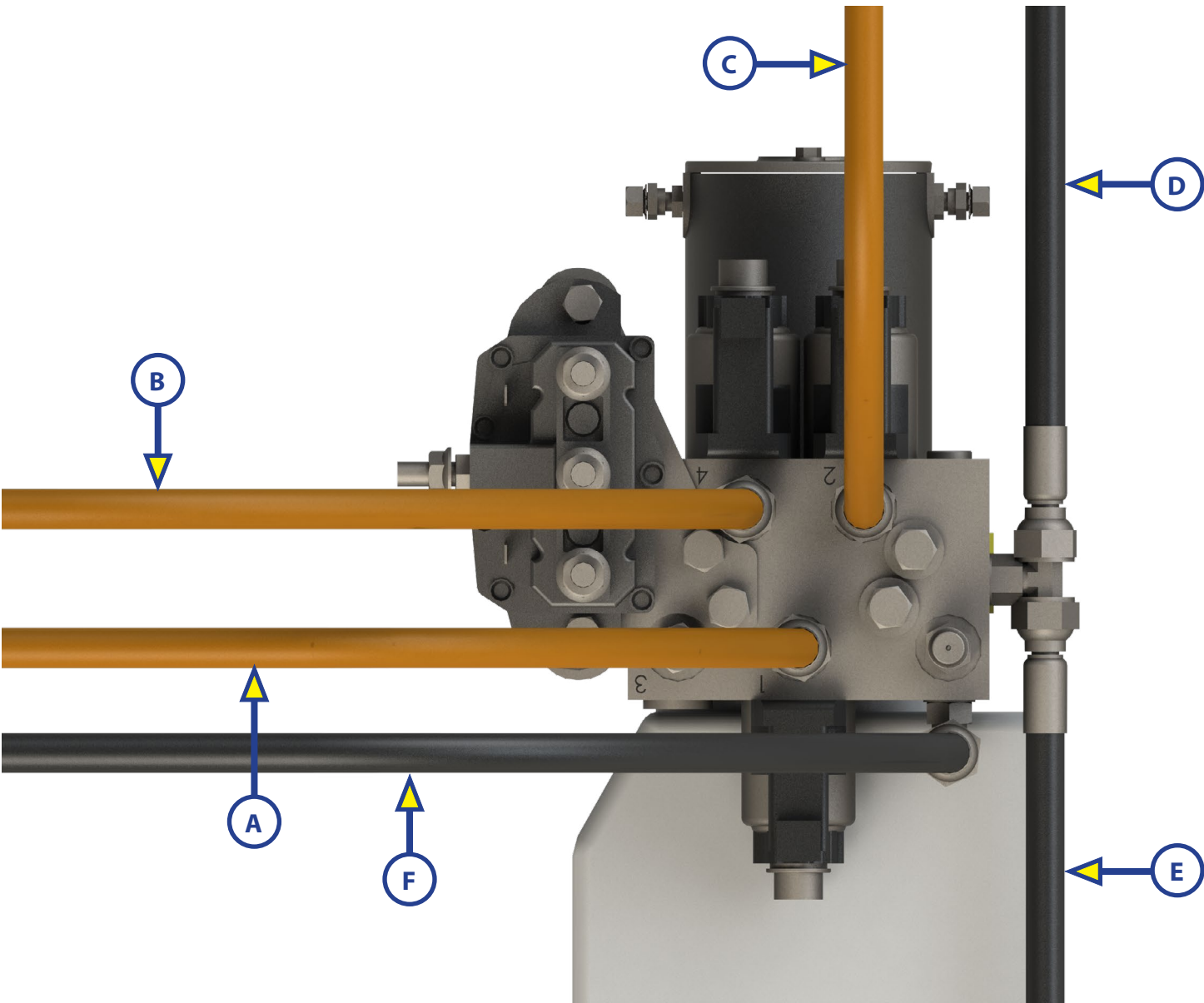
Fig. 12



Hydraulics

Mount the hydraulic power unit with solenoid inside the electrical compartment that is under the bench at the rear of the trailer.

Manifold Connections

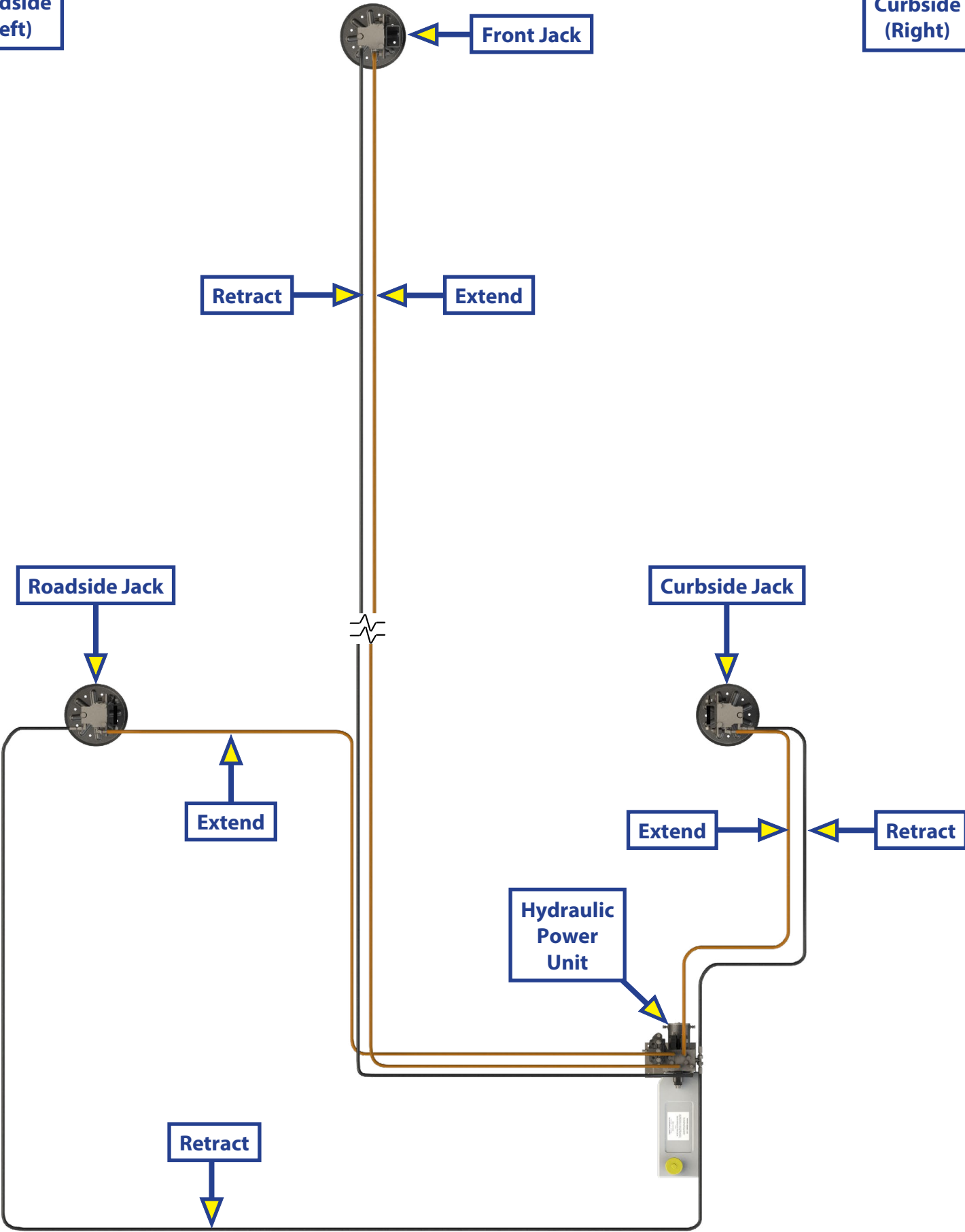


Hydraulic Routing - Manifold		
Callout	Manifold Port	Description
A	1	Extend hose to front jack
B	4	Extend hose to roadside (left) jack
C	2	Extend hose to curbside (right) jack
D	—	Retract hose to curbside (right) jack
E	—	Retract hose to roadside (left) jack
F	—	Retract hose to front jack

Routing

Roadside
(Left)

Curbside
(Right)



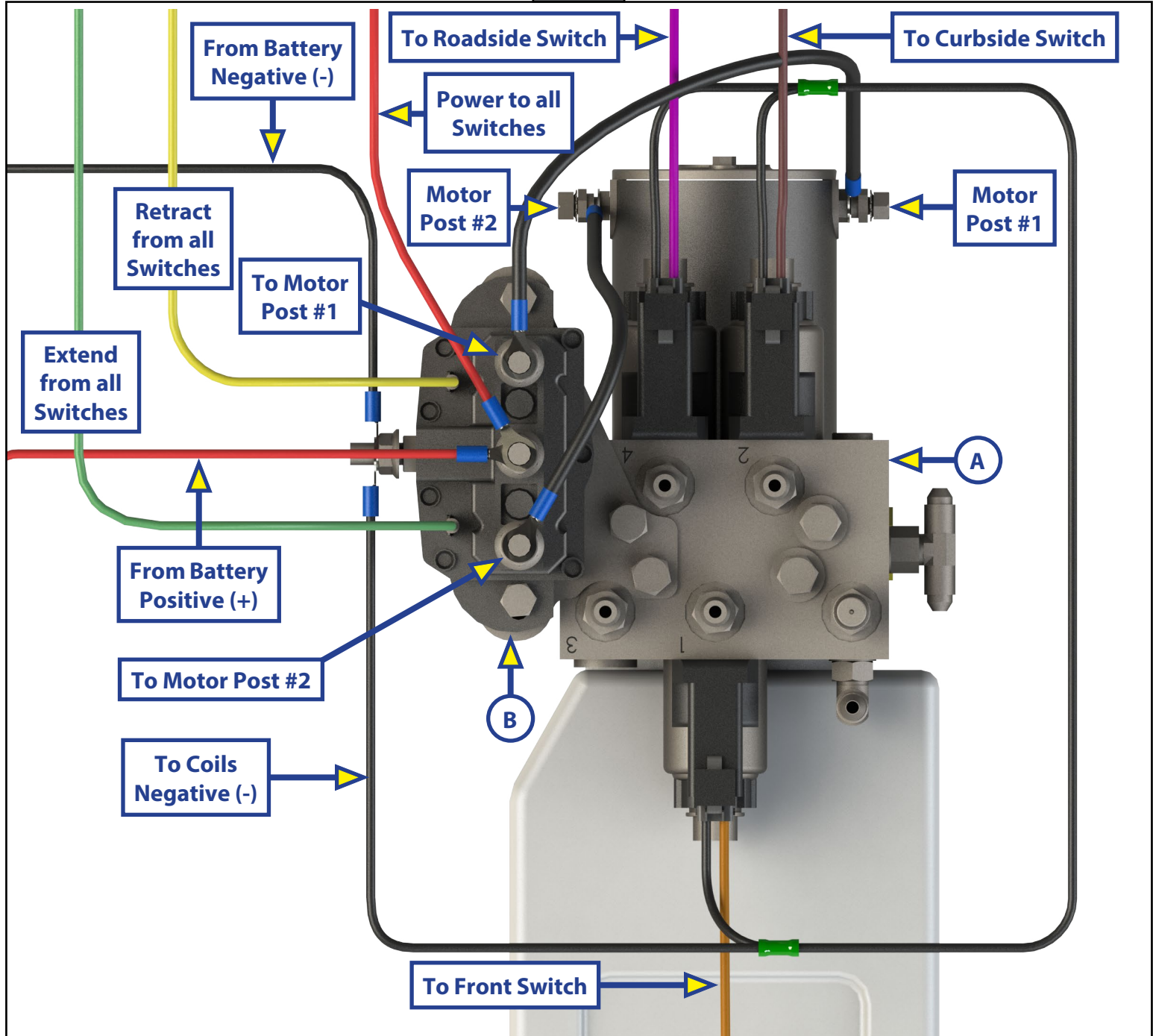
Electrical

Switch and Wiring Installation

1. Install individual jack switches near the jacks on the exterior of the trailer.
2. Connect the wiring harness to the manifold (Fig. 13A) and solenoid (Fig. 13B) as shown.

NOTE: The harness from the solenoid to all the switches requires a 5A blade fuse.

Fig. 13

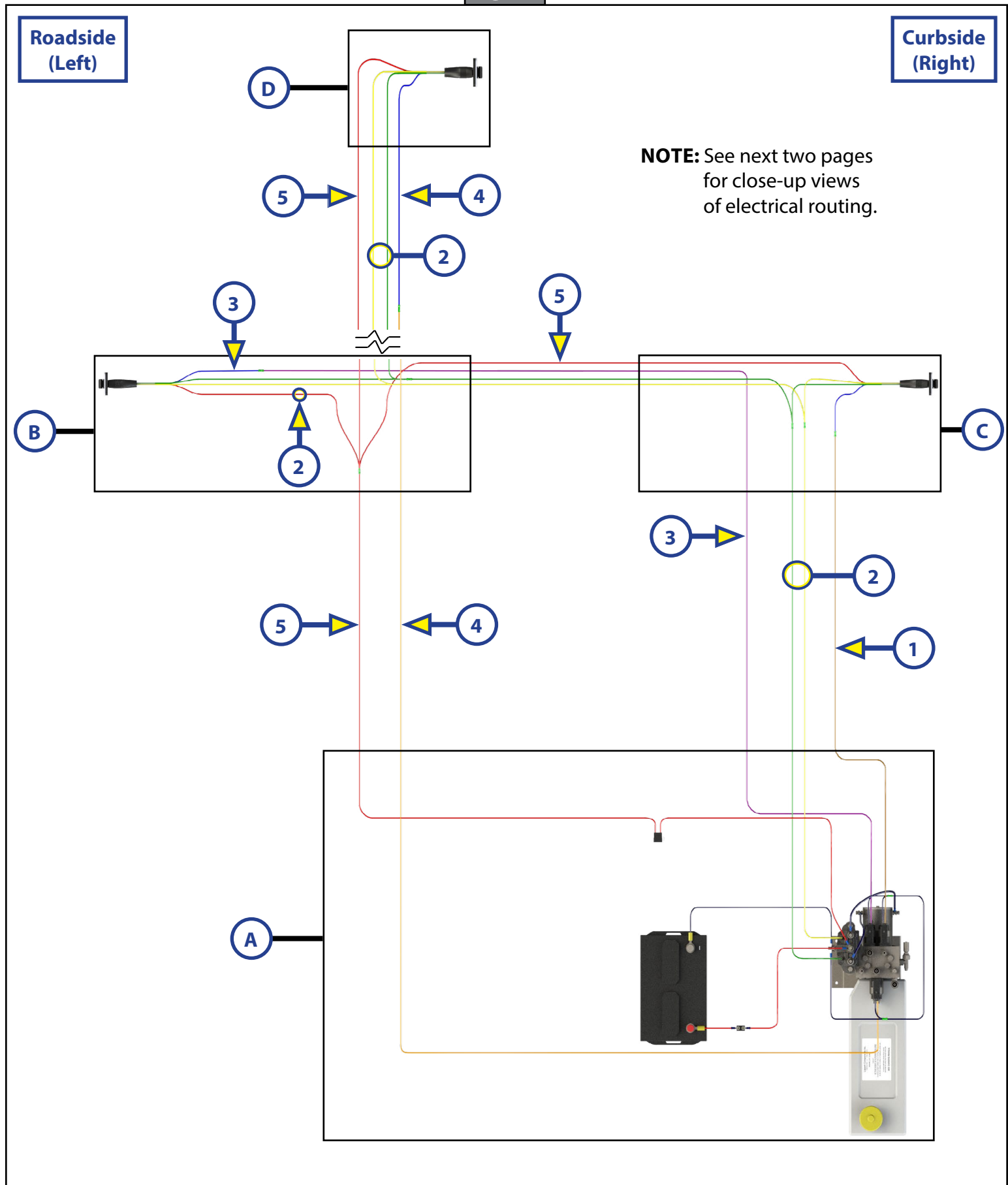


3. Splice in the wiring from the switches into the harness at locations shown in Electrical Routing.
4. Connect wires from solenoid to motor posts 1 and 2 on the HPU.
5. Connect ground wire from solenoid to battery.
6. Connect power wire from solenoid to battery.

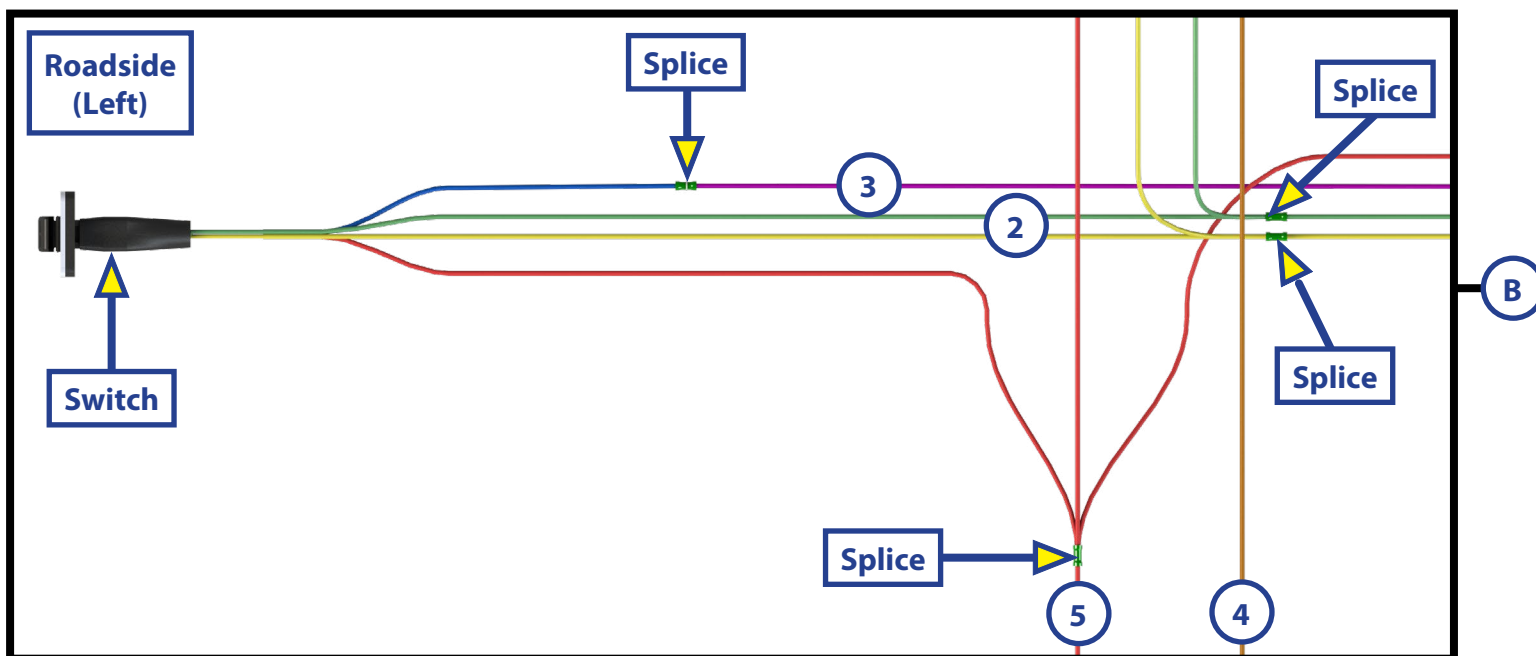
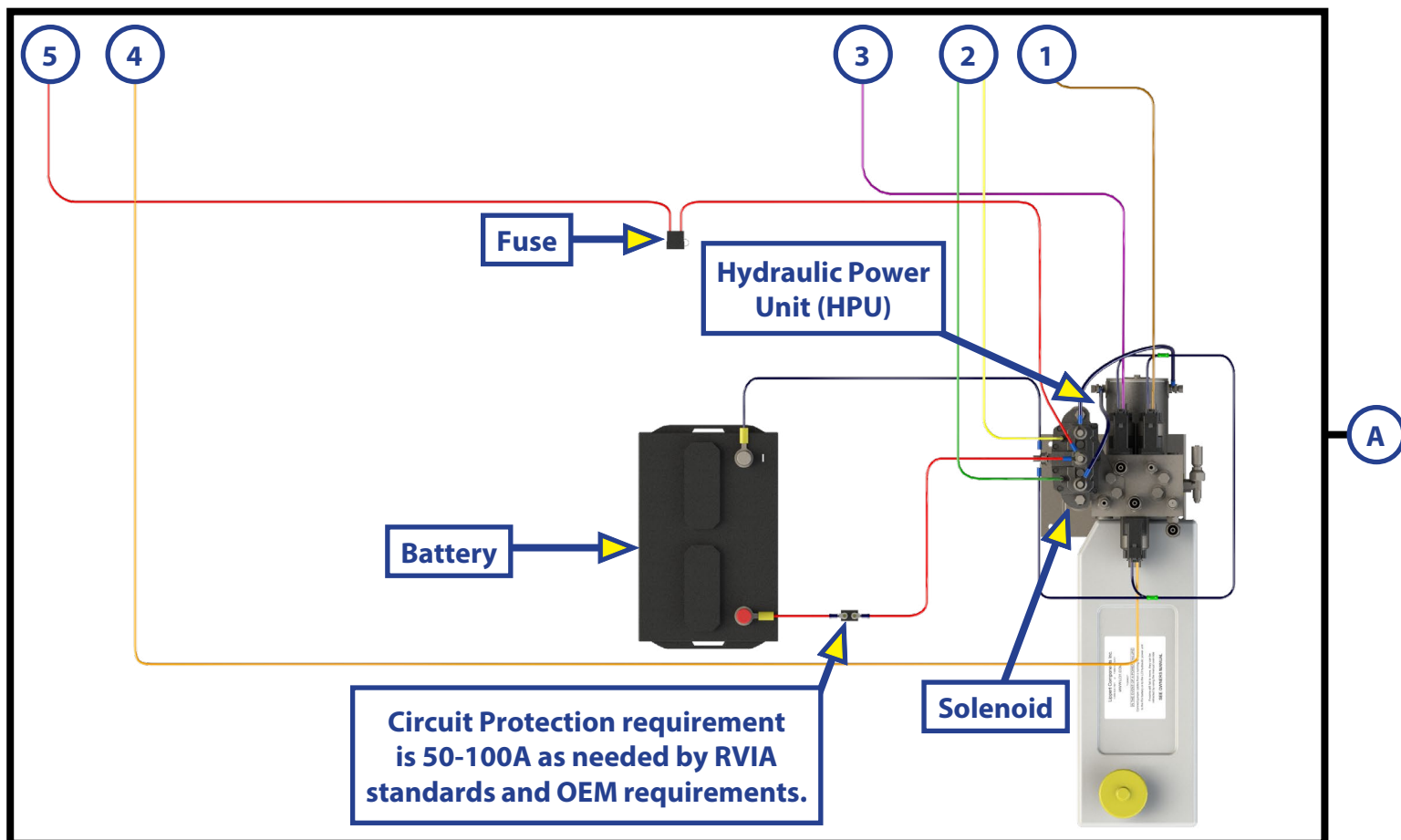
Electrical Routing

NOTE: Electrical routing (Fig. 14) shown is for reference only. OEM wiring colors may vary.

Fig. 14

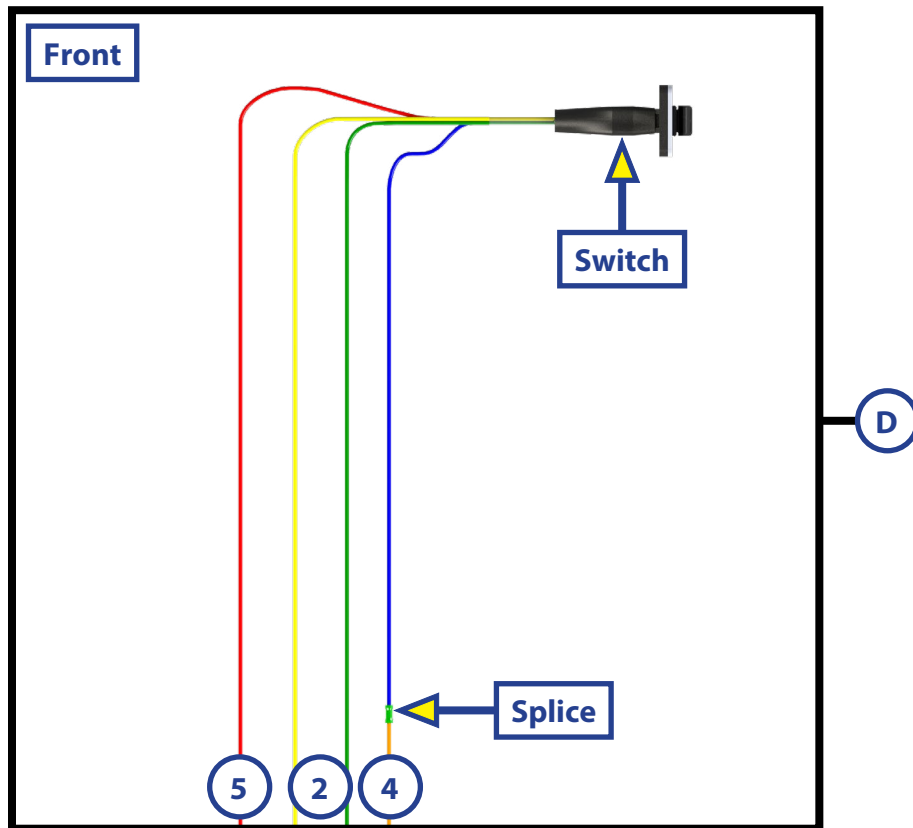
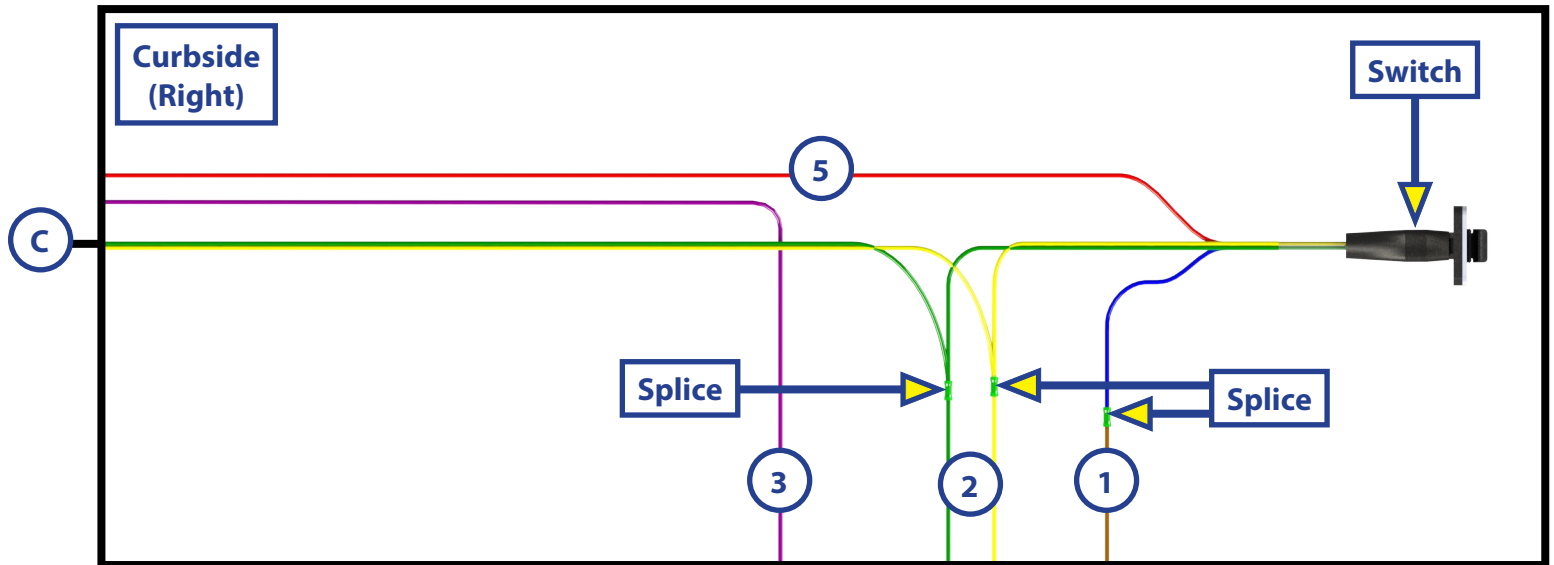


Electrical Routing (Cont'd)



Wiring Diagram Legend		
Callout Number	Routing From	Routing To
A1-C1	HPU	Curbside switch
A2-B2-C2-D2	Solenoid	All switches
A3-B3-C3	HPU	Roadside switch
A4-B4-D4	HPU	Front switch
A5-B5-C5-5D	Solenoid	All Switches

Electrical Routing (Cont'd)



Prior to Operation

1. Make sure all battery(ies) are fully charged and test at 12V DC under load.
2. Park the trailer on level and stable ground/ice.
3. Make sure all persons, pets, and property are clear of the trailer before and during operation.

Operation

NOTE: Each jack has an individual extend/retract rocker switch.

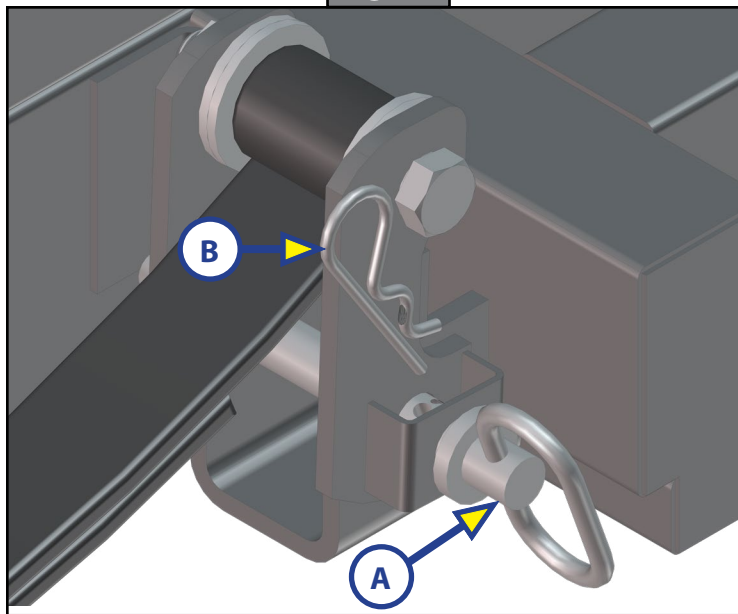
NOTE: Some systems may have an optional all-jack extend/retract rocker switch to be utilized as the owner deems appropriate.

NOTE: The trailer should always be raised or lowered incrementally to avoid placing too much stress on any one jack or the chassis.

Cabin Mode

1. Disconnect the trailer coupler from the tow vehicle hitch.
2. Disconnect any chains or electrical wiring connecting the tow vehicle to the trailer.
3. Extend the front jack by pressing the extend end of the front jack rocker switch, which is mounted near the front jack. Keep extending the jack until the coupler clears the hitch ball.
4. Move the tow vehicle safely away from the trailer.
5. Incrementally extend the rear jacks to make contact with the ice and relieve pressure from the spring hitch pin (Fig. 15A) by pressing the extend end of each individual rear jack rocker switch.
6. Remove the cotter pin (Fig. 15B) from each spring hitch pin (Fig. 15A).

Fig. 15



7. Remove the spring hitch pins (Fig. 15A) from the axle assemblies to free the axles.
8. Retract all jacks incrementally by pressing the retract end of each jack rocker switch until the ice house sets flat to the ground or ice.

Travel Mode

1. Incrementally extend all jacks, keeping the trailer as level as possible to obtain travel mode:
 - A. Extend tongue jack by pressing the extend button on the rocker switch.
 - B. Extend rear jacks by pressing the extend end of each jack rocker switch until the axle assembly is returned to the travel position and the spring hitch pin is in line with the holes.
2. Insert hitch pins (Fig. 15A) into each axle assembly and secure the cotter pins (Fig. 15B).
3. Incrementally retract the rear jacks completely by pressing the retract end of each rear jack rocker switch.
4. Adjust tongue jack as needed to connect the trailer coupler to the tow vehicle hitch.
5. Connect all chains and electrical wires from the tow vehicle to the trailer.
6. Retract the front jack by pressing the retract end of the front jack rocker switch.

Maintenance

⚠ 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, make 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 Specification

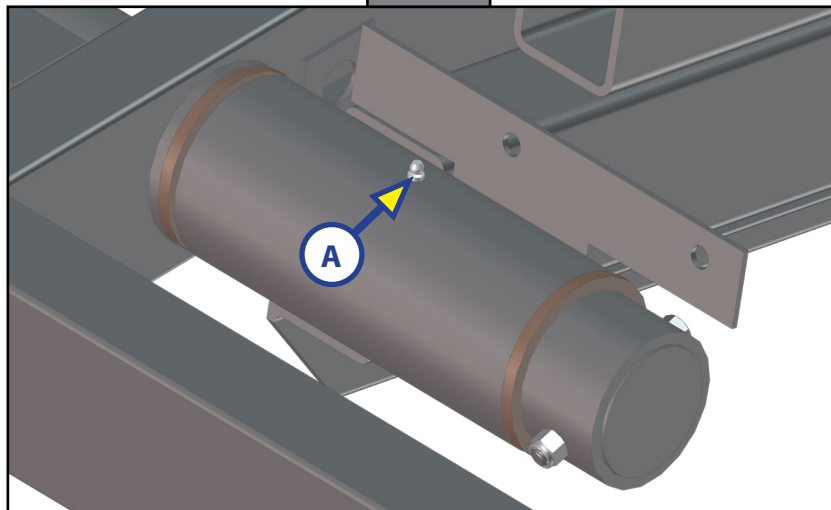
LCI recommends a NLGI Grade 2 lithium EP complex grease for all applications contained within this manual. A molybdenum-based grease is preferred.

Grease Application

This maintenance must be completed every 3,000 miles or 3 months, whichever comes first.

1. Fill the grease gun with a lithium-based multipurpose grease.
2. Use the grease gun to grease the fitting (Fig. 16A) located on the front pivot tube.

Fig. 16



3. Pump grease into the fitting until the grease is overflowing out of the pivot points.
4. Clean off any excess grease with a lint-free shop cloth.
5. Repeat steps 2 through 4 for the other side of the trailer.

Troubleshooting

⚠ CAUTION

Make sure all jacks are fully retracted before travel.

Manual Override

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

NOTE: Cold weather could affect the viscosity of the hydraulic fluid, which may cause the manual override process to take longer than normal.

⚠ CAUTION

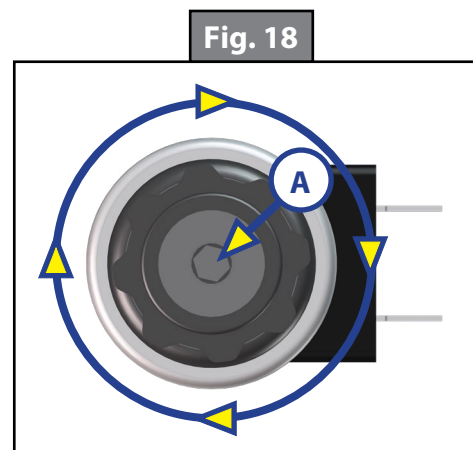
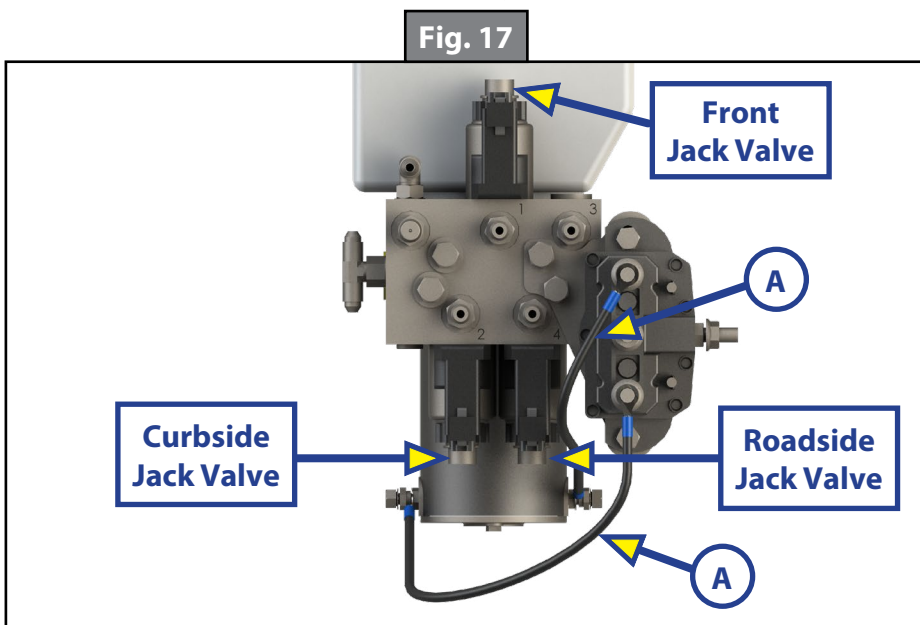
Do not overtighten the override screws in either direction as this can damage the cartridge valves.

⚠ CAUTION

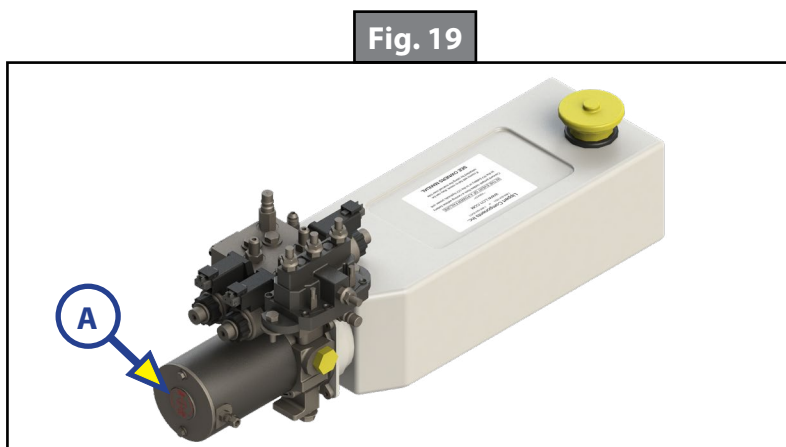
Use of an impact gun to perform an override procedure can damage the motor. Use a hex wrench to perform the override procedure.

1. Using a 5/32" hex wrench, open the desired valve(s) on the manifold (Fig. 17) by turning the manual override screw on the end of the valve clockwise (Fig. 18A).

NOTE: Some cartridge valves may take a 5/64" hex wrench.



2. Disconnect or shield power cables (Fig.17A) on the motor.
3. Remove the protective label (Fig. 19A) located on the front end of the hydraulic power unit to reveal the manual override coupler.



4. Using an electric drill with a 1/4" hex bit, insert the hex bit into the manual override coupler to manually operate the system.
 - A. Run the drill forward (clockwise) (Fig. 20A) to extend/raise the trailer.
 - B. Run the drill in reverse (counterclockwise) (Fig. 20B) to retract/lower the trailer.
5. Make sure to turn the manual override screw on the valve(s) (Fig. 21A) back to the counterclockwise position (Fig. 21) after the manual override procedure is complete.

Fig. 20

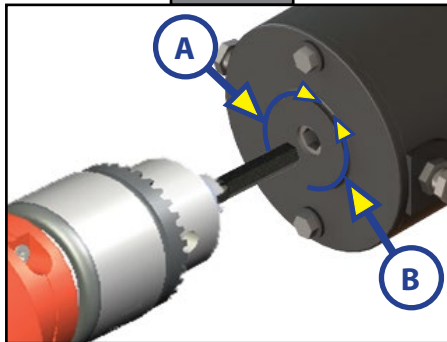
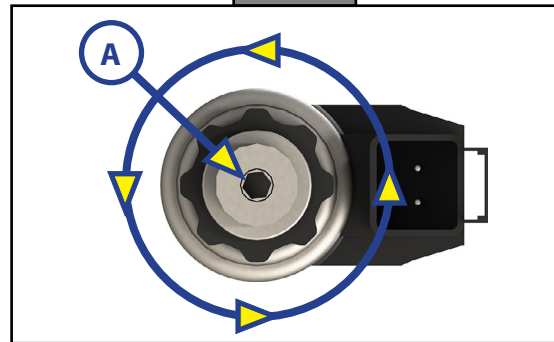


Fig. 21



Pivot Axle and Brake Maintenance Schedule

Item	Function Required	Weekly	3 Months / 3,000 Miles	6 Months / 6,000 Miles	12 Months / 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 manufacturer's specifications.	◆			
Tire Condition	Inspect for cuts, wear, bulging, etc.		◆		
Pivot Shaft	Apply grease through grease fitting (See Grease Specifications Section).		◆		



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