EQ SYSTEMS®

LEVEL-LITE INSTALLATION AND OPERATION GUIDE

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(800) 846-9659
EQSystems.us

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Contents

Required Tools & Parts Page 3

Jacks Page 4

Pump/Fittings/Hoses Page 5

Control Module/Keypad/Harness Routing & Connection Page 6 & 7

Uni-Directional Pump #1151 & 3218 Page 8

Bi-Rotational Pumps #2532, 2542, 3195 Page 9 & 10

Operation Page 10

Override - Uni-Directional Pump #1151 & 3218 Page 11

Manual Override - Bi-Rotational Pumps #2532, 2542, 3195 Page 12

Diagrams Pages 13 - 20

This manual is intended to be used by technicians installing EQ Systems Level-Lite systems. It is assumed that the reader is familiar with hydraulic, mechanical, and electrical systems; in addition to workplace safety.

REQUIRED TOOLS AND PARTS

Tools Required for Installation

- Ratchet, sockets and wrench set
- Wire cutters / crimpers
- Electric drill and bits
- Screw gun bits
- Welding equipment (if welding leg or bracket in place

Additional Items Required for Installation

**The following cables, connectors and breakers can be purchased from EQ Systems

- #4 AWG power wire (to connect battery + 12V positive to the pump)*
- #4 AWG power wire (to connect battery - 12V positive to the pump)*
- #4 AWG ring terminals
- Loom clips (to secure harnesses and hydraulic hoses to the coach)
- Self-tapping screws or pop rivits
- Wire ties
- 10 – 16 quarts Dexron Automatic Transmission Fluid

***Note:** These items must be #2 AWG or larger if cable run is greater than 12 ft

Note: Modification of any factory supplied item may result in the denial of all warranty claims. Call EQSystems Technical Support prior to any modifications

With any hydraulic application, holding position on a cylinder must be done with safety in mind. Failure in the system may cause the jacks to retract or extend suddenly. When working under or near the coach, always use jack stands of appropriate rating to support the weight of the coach.

JACKS

Secure the jack brackets in place according to the bracket mounting drawings. Bolt the jack to the bracket using the supplied nuts and washers. The jacks must be installed with a minimum of 6 inches of ground clearance. See Installation chart below. In any case, the bottom of the footpad should be no lower than any other item mounted on the coach. Pay particular attention to the angle of departure for the chassis when mounting the rear jacks – and the angle of approach when mounting the front jacks.

The foot/pad must be mounted with-in the range suggested (see chart below) for proper operation of the system. Retract the jack fully (jack up). Ground clearance is determined by measuring from the bottom of the jack foot to the ground (jack retracted fully). When in doubt call EQ Systems 800-846-9659 ext. 339

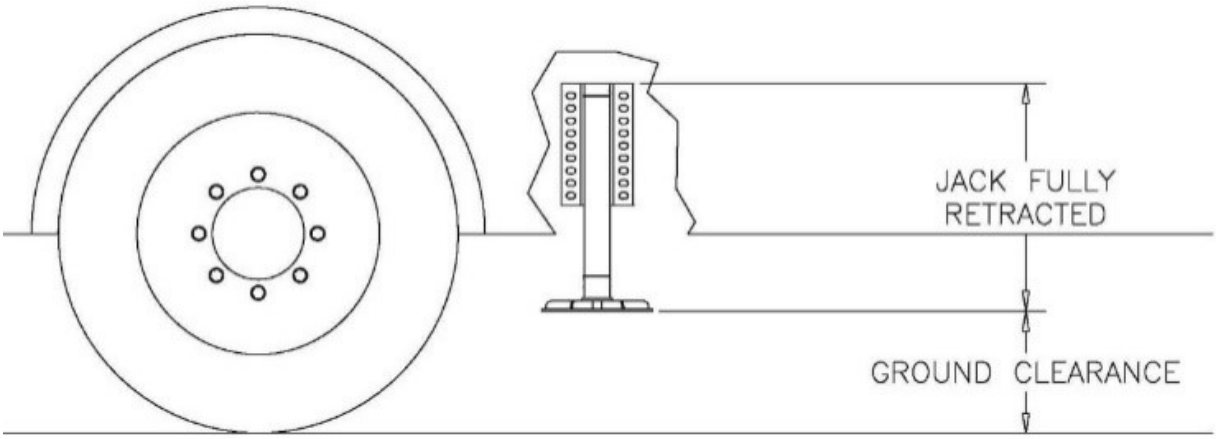
Reference Chart for Installing Jacks

Straight Leg Jacks (SL):

11 & 13:	6 – 8 inches of ground clearance
15 & 16:	8 – 10 inches of ground clearance
18:	10 – 12 inches of ground clearance

Tube in Tube Jacks (AJ, AM, CT, SM – 16, 20, 24, 30, 36)

16:	8 – 10 inches of ground clearance
20:	12 – 14 inches of ground clearance
24:	14 – 16 inches of ground clearance
30:	16 – 18 inches of ground clearance
36:	18 – 20 inches of ground clearance



If there are any questions, please call EQ Systems (800) 846-9659.

PUMP

Install the pump kit on the coach. The pump must be mounted in a location that is reasonable to route all of the hydraulic hoses to the manifold. It must be accessible for filling the reservoir and monitoring the fill level. Take note if the unit is equipped with the manual override option. The pump handle, cartridge valves and directional valves must be accessible to manually override the system. If the pump is equipped with the manual override screw on the end of the motor, than be sure to allow access to that side of the pump. In most applications, a side storage compartment will provide the ideal location. An additional mounting box or tray may be used on other style coaches.

FITTINGS

Install the hydraulic adaptor fittings in the top and bottom of each jack and install the fittings into the manifold. The straight thread O-ring side always goes to the cylinder or manifold. The tapered side will get the hose attached to it. When installing straight fittings into the leg or manifold, tighten to 15 lbs.-ft. When using 90-degree fittings, turn until finger tight, position correctly, then tighten the jam nut to 15 lbs.-ft.

HOSE

Install the hydraulic hoses according to the chart.

- Route the hoses clear of all hot exhaust components and pinch points in the suspension/chassis system. (moving objects, sharp edges and high heat sources)
- Attach the hoses to the manifold and jack fittings.
- Tighten to 15 lbs-ft. Secure the hydraulic hoses with wire ties or loom clamps to the chassis.
- Care should be taken to not kink or twist hoses.
- The min. bend radius is 6 inches.

Installation of Hoses to the Manifold

Jack Leg	Manifold Connection
Left Front - Top	Brown Solid (T-1)
Left Front - Bottom	Brown Stripe (B-1)
Right Front - Top	White Solid (T-2)
Right Front - Bottom	White Stripe (B-2)
Left Rear - Top	Orange Solid (T-3)
Left Rear - Bottom	Orange Stripe (B-3)
Right Rear - Top	Yellow Solid (T-4)
Right Rear - Bottom	Yellow Stripe (B-4)

CONTROL MODULE (CONTROLLER)

Mount the control module (controller part #3288) in a location where it is protected from the elements. It may appear to be sealed however, it is not considered weatherproof. The controller is mounted using 4 screws (one in each corner). It should be mounted in a location so the wire harness may be routed to it. There is a harness that will run from the controller to the keypad and a harness that runs from the controller to the pump assembly.

KEYPAD (PANEL)

Mount the keypad (panel part # 3289) in an interior area of the coach where it is protected from the elements and will allow the user/vehicle driver to easily observe and operate the leveling system. The panel consists of switches to operate the jacks and a jack(s) down warning light and buzzer. The light will be on if the jacks are not fully stowed and the power switch is turned on. The light will come on when extending the jacks. The light and buzzer will sound if the jacks are not fully stowed and the ignition disable (key on) is present. This serves 2 purposes, first it is a warning not to drive off with the jacks down and second, it can serve as a warning during travel that one or more of the jacks may not be fully stowed. For these reasons the panel should be mounted in an area where the driver would be able to hear the warning buzzer. The mounting area should be where the harness can be routed to it. Mounting is performed using a screw in each of the 4 corners. The harness is attached to the panel with a 12 pin connector.

HARNESS ROUTING AND CONNECTION

Controller to panel:

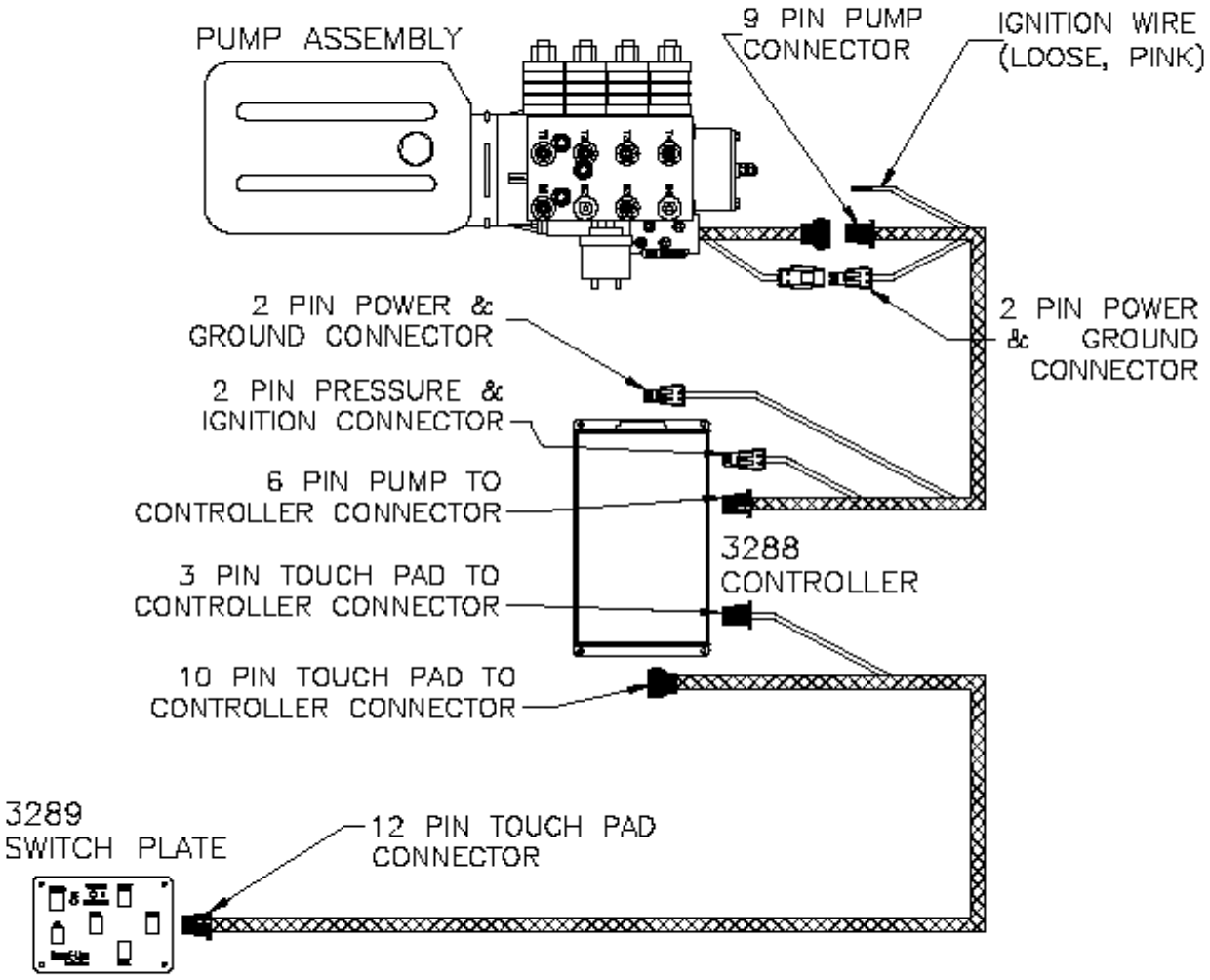
This harness has 1 connector (12 pin) at the panel and 2 connectors (a 10 pin and a 3 pin) at the controller. The harness should be routed and secured in a manner that protects it from heat and chaffing. Plastic wire ties and or loom clamps may be used to secure in place. Care should be taken to not stress the harness or the connectors.

Controller to pump assembly:

This harness has 3 connectors at the controller (one 6 pin and two 2 pin) and 2 connectors at the pump assembly (9 pin and 2 pin).

CAUTION

At the controller, watch the two 2 pin connectors as it is possible to connect them to the wrong connector. The 2 pin with the red and black are the power and ground, it goes to the connector marked +12V and GND (this is the connector below the fuse). If they are connected wrong the system will not operate.



CAUTION

Applicable to motorized vehicles only - The loose pink wire (shown in the drawing above) must be connected to an ignition hot (12 VDC key on source). This is the ignition on disable/jacks down warning light/buzzer. Failure to connect this wire could create an unsafe situation and will void the warranty.

UNI-DIRECTIONAL PUMP #1151 & 3218

Power Connections

Attach a #4 gauge wire (#2 gauge if the run is over 12 ft.) between the **positive** +12V terminal on the battery and the battery post at the motor solenoid on the pump. This solenoid post will generally have a yellow fused wire attached to it that supplies power to the controller.

- This battery connection may be fused at the source with a 150-amp circuit breaker.
- This +12V supply must be a dedicated and isolated circuit (not shared with other devise), and must be constant, non-switched +12V

Attach a #4 gauge wire (#2 gauge if the run is over 12 ft.) between the **negative** -12Vterminal on the battery and the ground stud on the pump. This ground stud is located on the port plate.

- This is the preferred method of grounding. If grounding the pump to the chassis, the connection must be sound, free of paint and not susceptible to corrosion.
- The battery connection to the frame must also be of #4 gauge or larger cable. It is not acceptable to allow the pump mounting bolts to be the sole grounding connection.

PURGING BI-ROTATIONAL PUMP #S 3195KS AND 2542KS

You must follow this procedure strictly. Any deviation from the process will cause the purging process to become difficult and time consuming.

1. Fill pump reservoir to full approx. 1 to 1 ½ inch from top with automatic transmission fluid, the multipurpose or any of the Dexron/Mercon fluids will work.
2. Using the manual switch for the front jacks extend the front jacks until they make ground contact. Do not lift the vehicle. If the vehicle is on a lift the jacks may be fully extended. Note: extend is the arrow pointing down.
3. Press all retract switch. After the front jacks have fully retracted and the pump shuts off check the reservoir fluid. Refill to full approx. 1 to 1 ½ inch from top.
4. If the fluid in the reservoir is aerated or foamed up, allow time for foam/air to dissipate before continuing. Allow 10 minutes for foam and air to dissipate.
5. Using the manual switch for the rear jacks extend the rear jacks until they make ground contact. Do not lift the vehicle. If the vehicle is on a lift the jacks may be fully extended.
6. Press all retract switch. After the rear jacks have fully retracted and the pump shuts off check the reservoir fluid. Refill to full approx. 1 to 1 ½ inch from top.
7. If the fluid in the reservoir is aerated or foamed up, allow time for foam/air to dissipate before continuing. Allow 10 minutes for foam and air to dissipate.
8. Using manual switches extend to full extension of front and rear jacks. At this point jacks may be allowed to lift the vehicle. Allow 10 minutes for foam and air to dissipate.
9. Press all retract switch. After the jacks have fully retracted and the pump shuts off check the reservoir fluid. Refill to full approx. 1 to 1 ½ inch from top. Allow 10 minutes for foam and air to dissipate
10. Check fluid level. Fill to full 1 to 1 ½ inch from top.
11. Repeat steps 7 through 10.

The above purging process is for dealers and retail installation. High volume OEM installers may have special procedures utilizing special equipment. Call EQ Systems for assistance.

BI-ROTATIONAL PUMPS #2532, 2542, 3195

Power Connections

Pump #s 2532, 2542 (on the pump data label)
Attach a #4 gauge wire (#2 gauge if the run is over 12 ft.) between the **positive** +12V terminal on the battery and the battery post at the common posts on the motor solenoid.

- This battery connection may be fused at the source with a 120-amp circuit breaker.
- This +12V supply must be a dedicated and isolated circuit (not shared with other devise), and must be constant, nonswitched +12V.

Attach a #4 gauge wire (#2 gauge if the run is over 12 ft.) between the **negative** -12V terminal on the battery and the ground stud on the pump. This is the preferred method of grounding. If grounding the pump to the chassis, the connection must be sound, free of paint and not susceptible to corrosion.

- The battery connection to the frame must also be of #4 gauge or larger cable.
- It is not acceptable to allow the pump mounting bolts to be the sole grounding connection.

Pump #3195
Attach a #4 gauge wire from the **positive** +12V terminal on the battery to the + terminal on the motor contactor (solenoid).

- This terminal has a + beside it on the contactor, also there will be a yellow fused wire on this terminal.
- The ground (negative) connection is the 5/15 stud in the port plate. (Do not ground to the contactor or the motor)bolts to be the sole grounding connection.

PURGING BI-ROTATIONAL PUMP #S 3195KS AND 2542KS

You must follow this procedure strictly. Any deviation from the process will cause the purging process to become difficult and time consuming.

1. Fill pump reservoir to full approx. 1 to 1 ½ inch from top with automatic transmission fluid, the multipurpose or any of the Dexron/Mercon fluids will work.
2. Using the manual switch for the front jacks extend the front jacks until they make ground contact. Do not lift the vehicle. If the vehicle is on a lift the jacks may be fully extended. Note: extend is the arrow pointing down.
3. Press all retract switch. After the front jacks have fully retracted and the pump shuts off check the reservoir fluid. Refill to full approx. 1 to 1 ½ inch from top.
4. If the fluid in the reservoir is aerated or foamed up, allow time for foam/air to dissipate before continuing. Allow 10 minutes for foam and air to dissipate.
5. Using the manual switch for the rear jacks extend the rear jacks until they make ground contact. Do

not lift the vehicle. If the vehicle is on a lift the jacks may be fully extended.

6. Press all retract switch. After the rear jacks have fully retracted and the pump shuts off check the reservoir fluid. Refill to full approx. 1 to 1 ½ inch from top.
7. If the fluid in the reservoir is aerated or foamed up, allow time for foam/air to dissipate before continuing. Allow 10 minutes for foam and air to dissipate.
8. Using manual switches extend to full extension of front and rear jacks. At this point jacks may be allowed to lift the vehicle. Allow 10 minutes for foam and air to dissipate.
9. Press all retract switch. After the jacks have fully retracted and the pump shuts off check the reservoir fluid. Refill to full approx. 1 to 1 ½ inch from top. Allow 10 minutes for foam and air to dissipate
10. Check fluid level. Fill to full 1 to 1 ½ inch from top.
11. Repeat steps 7 through 10.

The above purging process is for dealers and retail installation. High volume OEM installers may have special procedures utilizing special equipment. Call EQ Systems for assistance.

OPERATION

To operate the Level-Lite system, press the power switch so that the power light comes on and then press and hold the appropriate switches to extend or retract the jacks in pairs until your coach is level. The rocker switches are pressed in the direction of the jack's movement i.e. pressing the rocker switches down will extend the jacks, pressing the switch up will retract the jacks. The jacks may be extended or retracted in pairs for leveling using one of the 4 switches arranged in the diamond pattern. Also, the ALL switch may be used to extend all 4 of the jacks by pressing the ALL switch down. When the ALL switch is pressed to retract (up) it sets an automatic retract process that will stop when the jacks are fully retracted. The jacks downlight will come on as soon as an extend command occurs and should stay on any time that the jacks are not in the fully retracted position. The jacks down light will go out after the all retract process is complete.

Leveling Suggestions

- Press the power switch so that the power light comes on
- Using the ALL rocker switch, push down and hold. The pump should come on and the
- jacks should extend to the ground, you should be able to feel the coach lift.
- Use the rocker switches for the front or the rear to level front to rear.
- After the unit is level front to rear, use the left or right switch to level side to side.

Retraction

Use the ALL switch to retract the jacks prior to travel. The jacks down light will only go out after the ALL switch is pressed (not the independent rocker switches) and the jacks are fully retracted. Check visually to verify that the jacks are fully retracted prior to travel.

OVERRIDE - UNI-DIRECTIONAL PUMP #1151 & 3218

The individual cartridge valves are clustered together on the side of the pump manifold. They are labeled 1 thru 4 (there is one for each jack). Locate the screws recessed in the end of the stem on the appropriate cartridge valve(s). Using a 1/8" allen wrench, turn the screw(s) clockwise until seated in.

Locate valve DV2. This will have an allen screw recessed in the end of the stem. This valve will be on the opposite side of the manifold from the cluster of cartridge valves. Turn the allen screw in until seated in.

To retract: Locate valve DV1. This valve will be on the adjacent side of the manifold to the cluster of cartridge valves. (On pump #3218 it will be in the pump port plate.) Pull the red knob out and turn ¼ turn clockwise. The knob will remain in the 'out' position. This valve is the directional control, the normal 'in' position is for extension of the jacks and the shifted 'out' position is for retraction of the jack(s).

If equipped with override hex on motor: Pump # 3218
Remove the black plastic cap from the end of the motor (can use a small flat head screw driver). Place the drill with the 7/16 inch socket on the manual override shaft located at the end of the motor. Run drill clockwise direction at 2000 r.p.m. (minimum). The jack(s) will retract.

If equipped with hand pump: Pump #s 1551 & 3218 may have a hand pump located in the manifold. (The hand pump is an option, not all units have the hand pump.) Insert the handle into hand pump and operate back and forth until jacks are fully retracted. This will take multiple operations to fully retract the jacks. It may take 50 strokes prior to getting the jacks to move.

To extend: Follow all of the above steps except do not manually shift directional valve DV1 to the 'out' position.

CAUTION

Following manual override operation, failure to return all valves to normal position may result in one or more jacks drifting down from their retracted (stowed) position. For cartridge valves, rotate the center screw fully counter-clockwise. For directional valves, rotate the red knob until it 'snaps' back into the normal 'in' position or return the allen screw to the original 'out' counter-clockwise position.

MANUAL OVERRIDE - BI-ROTATIONAL PUMPS #2532, 2542, 3195

The individual cartridge valves are clustered together on the side of the pump manifold. They are labeled 1 thru 4 (there is one for each jack). Locate the screws recessed in the end of the stem on the appropriate cartridge valve(s). Using a 1/8” allen wrench, turn the screw(s) clockwise until seated in.

The pump may or may not have a DV2 valve on the opposite side of the manifold. Using a 1/8 inch allen wrench, turn the allen screw clockwise until seated in.

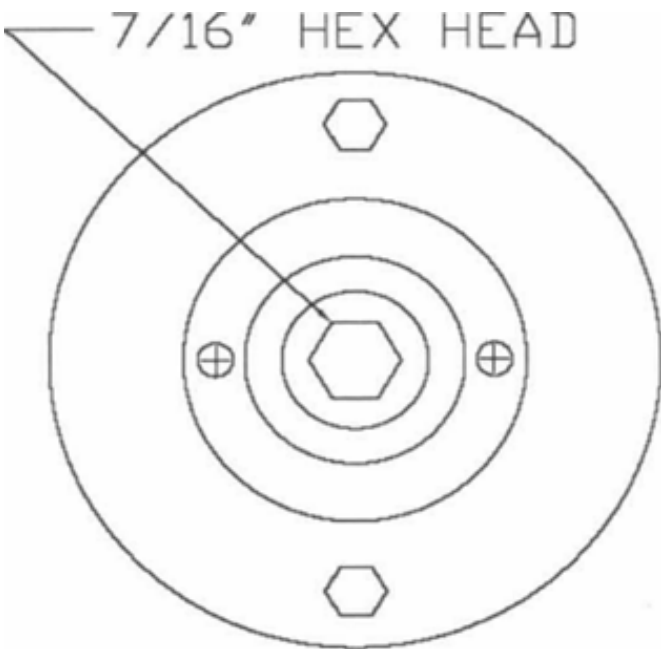
Remove the black plastic cap from the end of the motor (can use a small flat head screw driver). Place the drill with the 7/16 inch socket or 1/4 inch allen on the manual override shaft located at the end of the motor.

To retract: Run the drill in the counter-clockwise direction at 2000 r.p.m. (minimum).

To extend: Run the drill in the clockwise direction at 2000 r.p.m. (minimum).

CAUTION

Following manual override operation, failure to return all valves to normal position may result in one or more jacks drifting down from their retracted (stowed) position. For cartridge valves, rotate the center screw fully counter-clockwise.



End view of motor

HOSE IDENTIFICATION
(BI–ROTATIONAL)

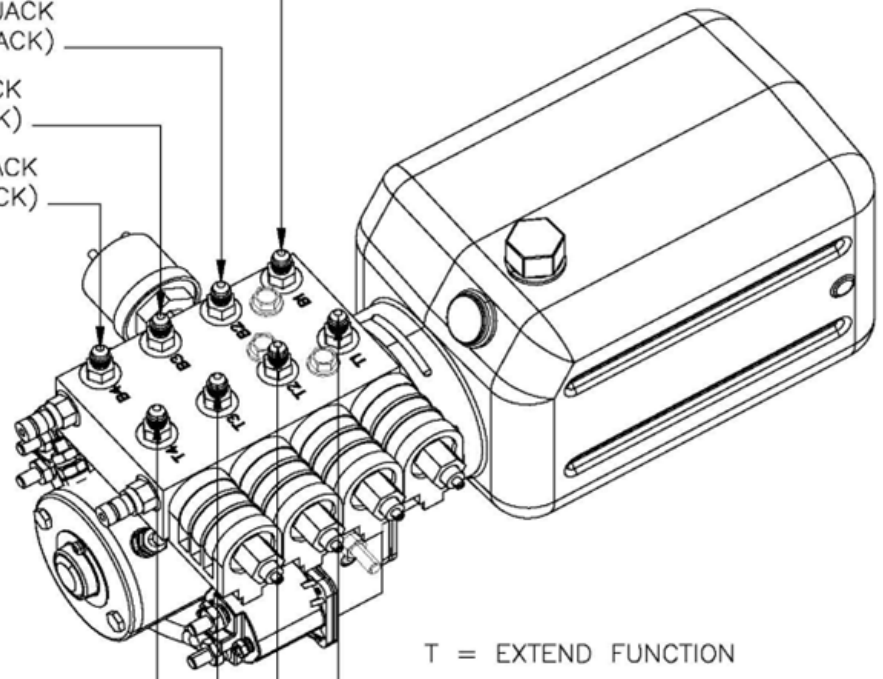
B = RETRACT FUNCTION

B1 = LEFT FRONT JACK (BROWN/BLACK)

B2 = RIGHT FRONT JACK (WHITE/BLACK)

B3 = LEFT REAR JACK (ORANGE/BLACK)

B4 = RIGHT REAR JACK (YELLOW/BLACK)



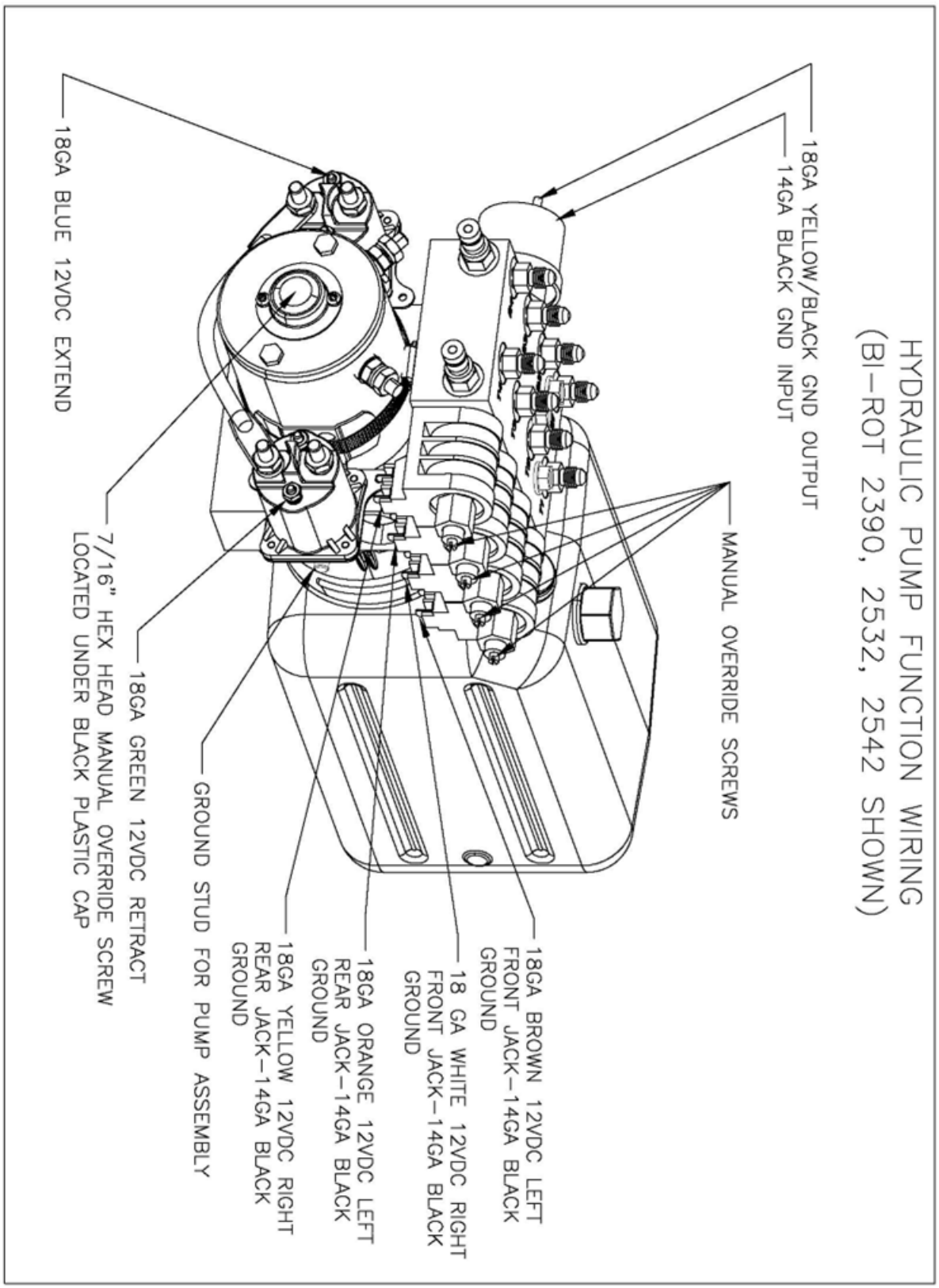
T = EXTEND FUNCTION

T1 = LEFT FRONT JACK (BROWN)

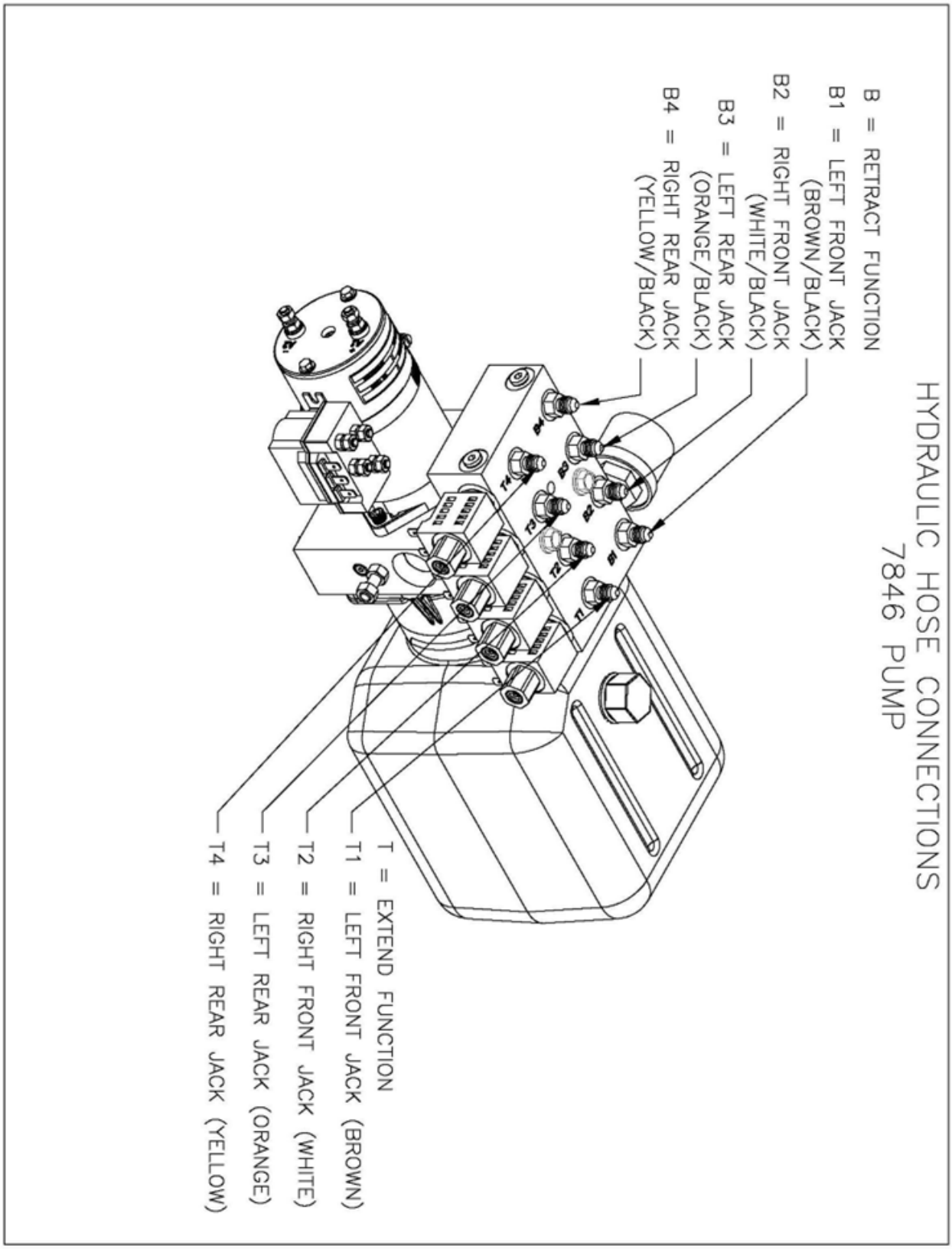
T2 = RIGHT FRONT JACK (WHITE)

T3 = LEFT REAR JACK (ORANGE)

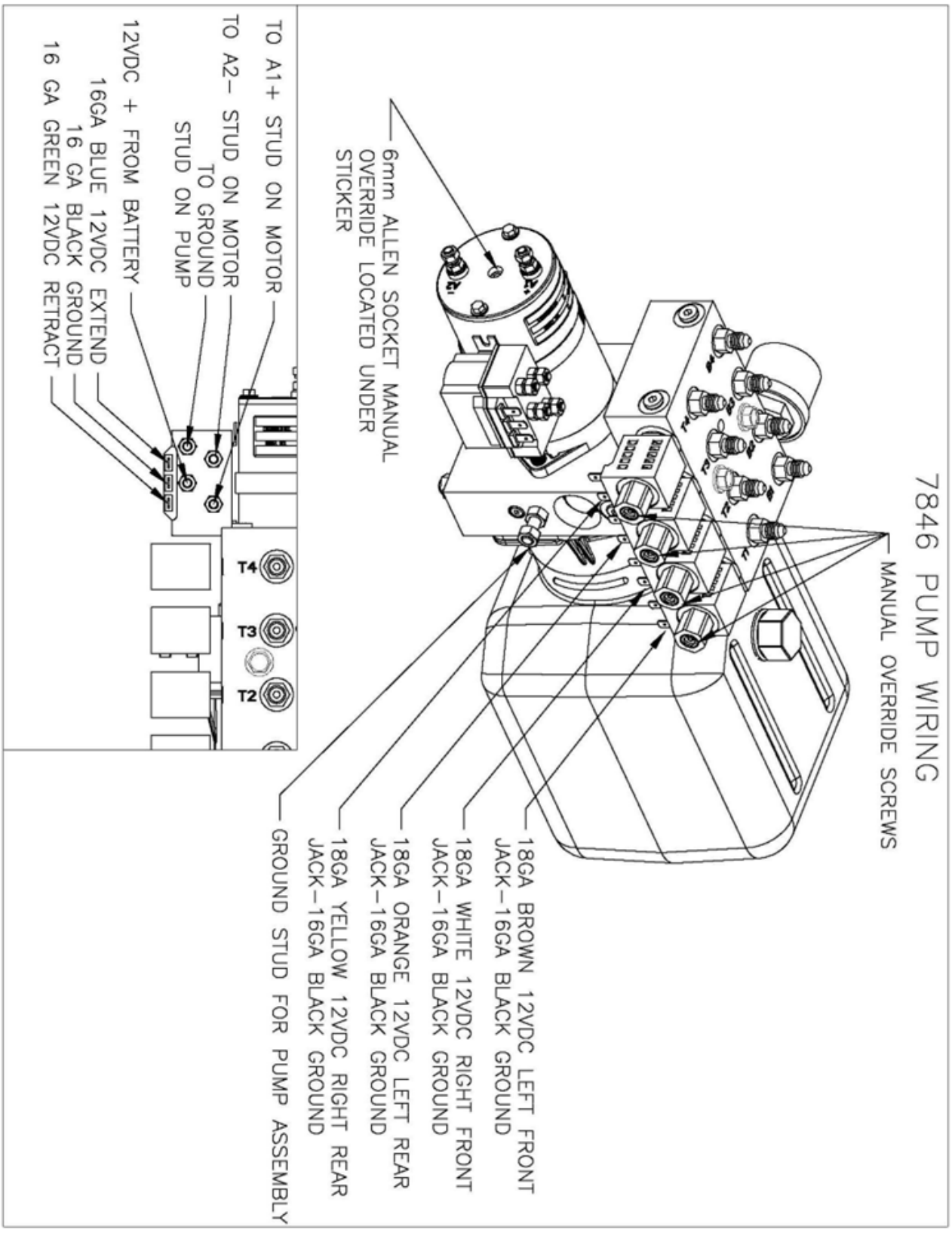
T4 = RIGHT REAR JACK (YELLOW)



Bi directional Pump # 2390, 2532, 2542

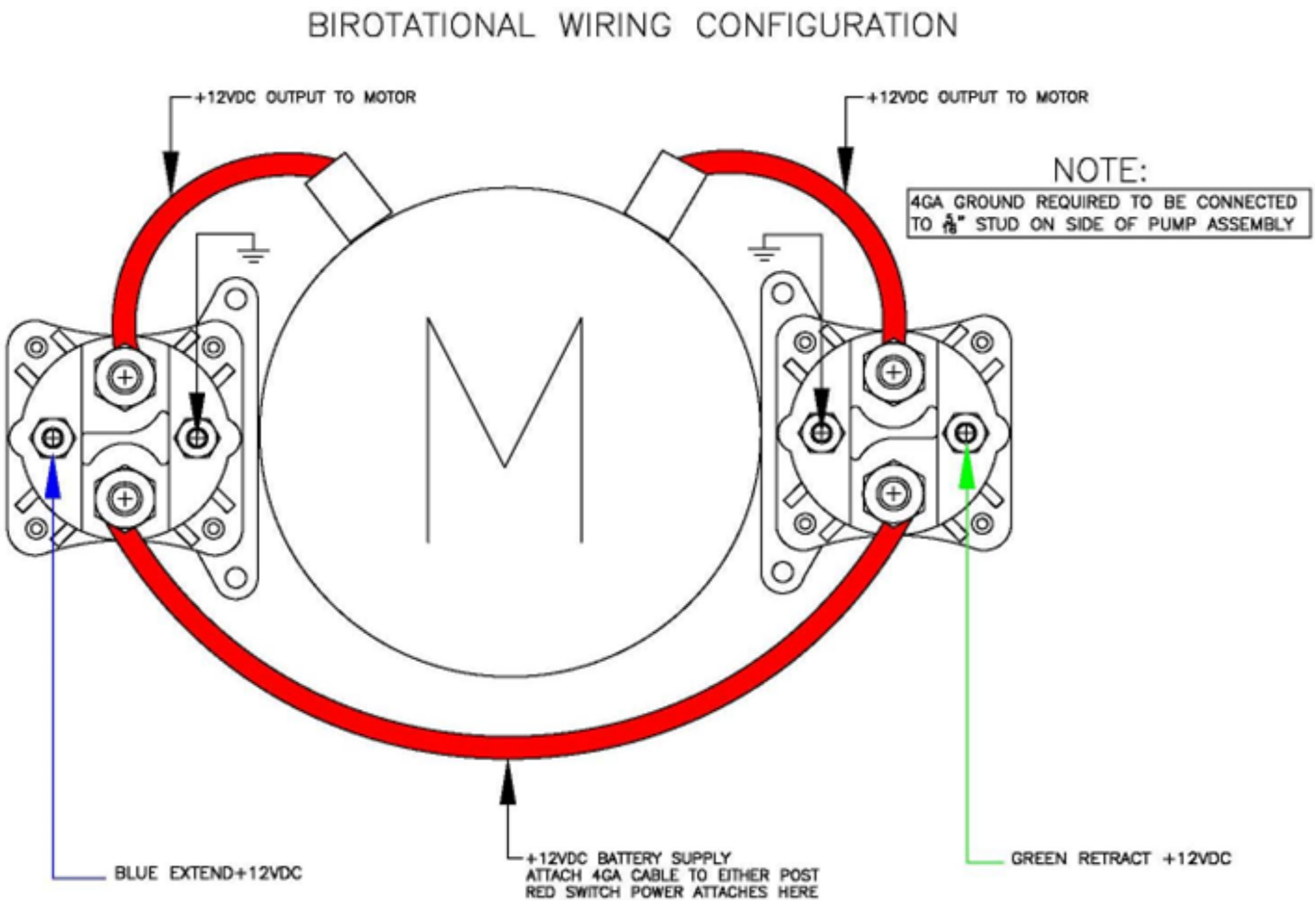


Bi directional Pump # 3195 & 3195KS

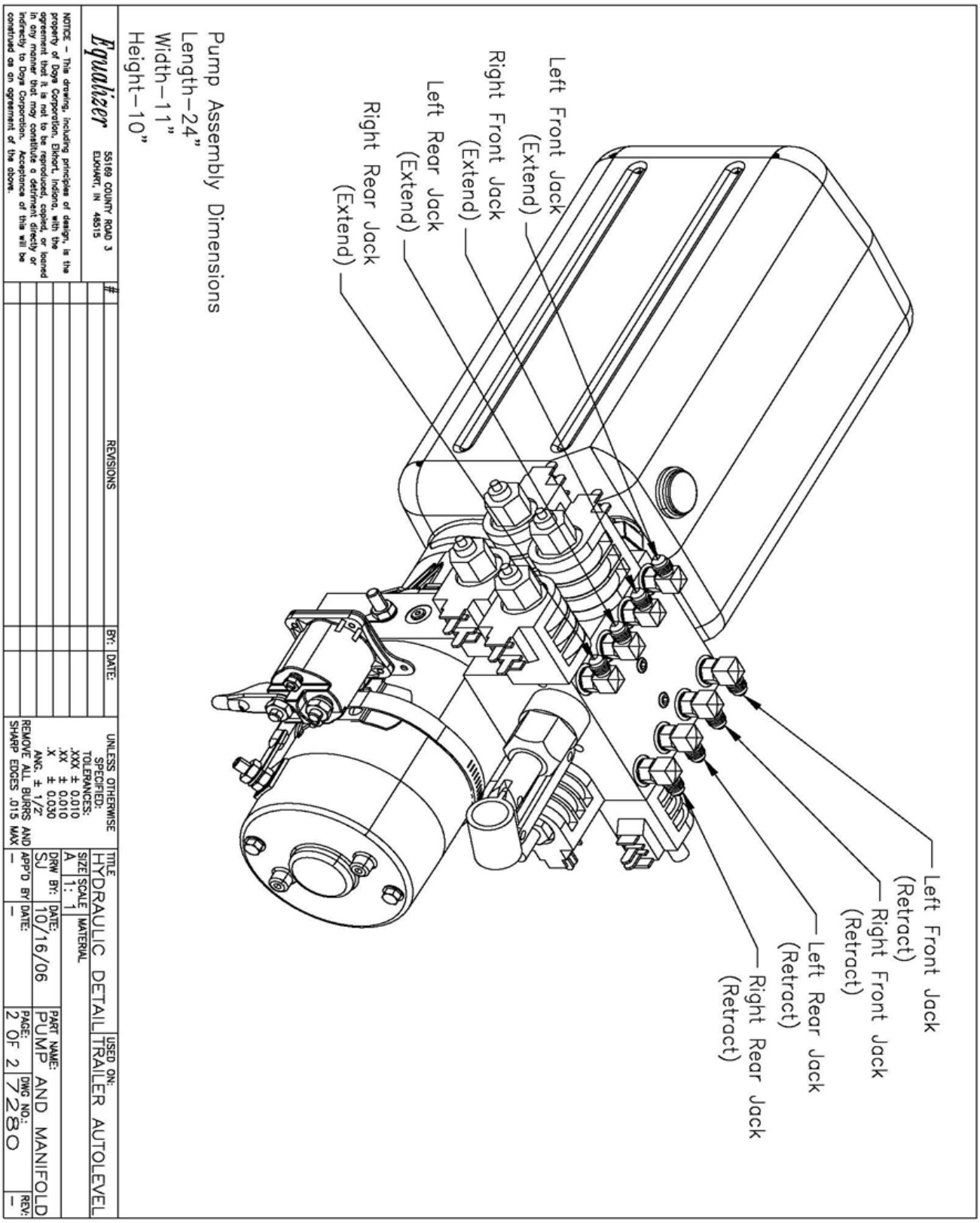


Bi directional Pump # 3195 & 3195KS

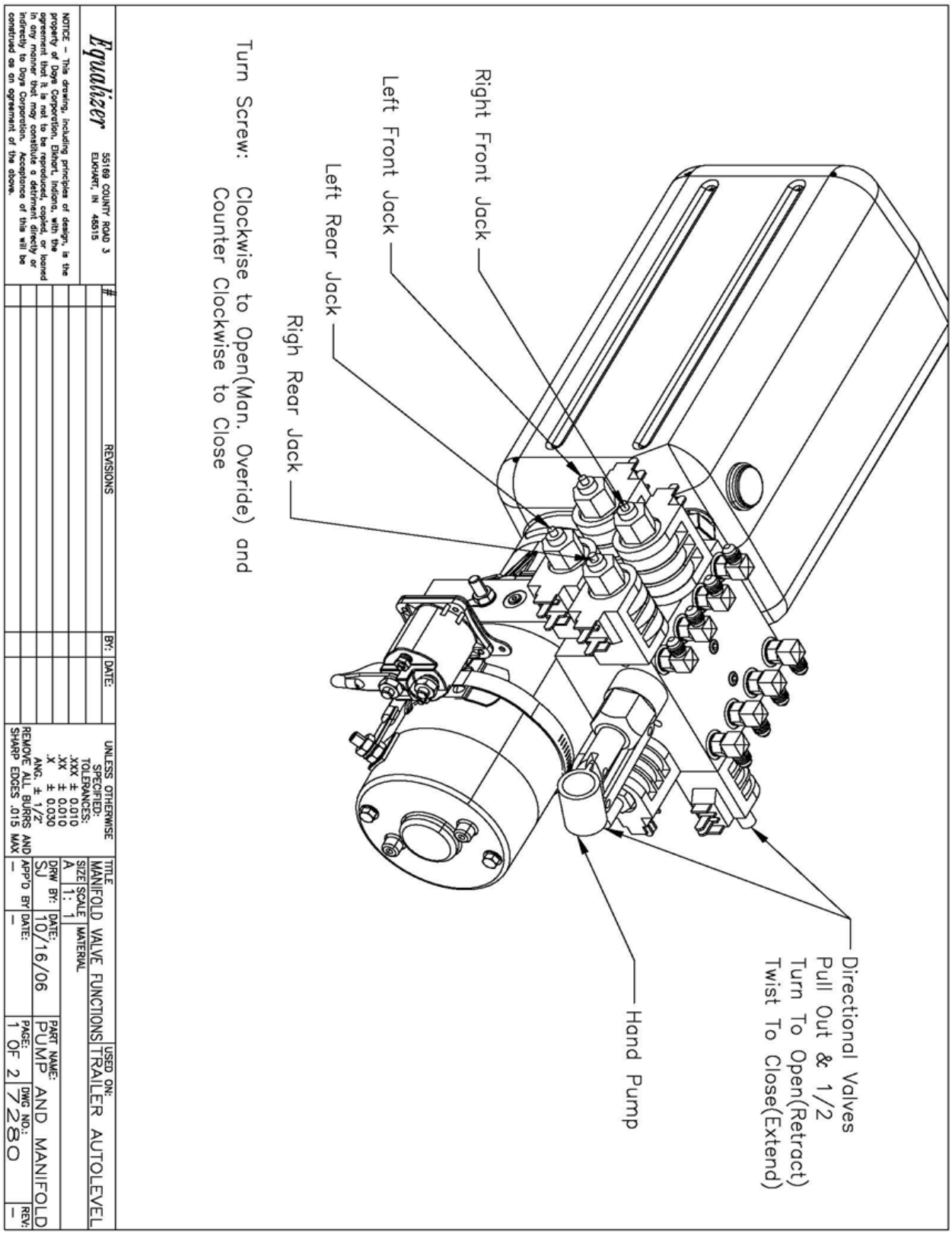
Bi directional Pump # 3195 & 3195KS



Bi directional Pump # 2390, 2532, & 2542



Uni directional Pump # 1551 S103T*4979



Uni directional Pump # 1551 S103T*4979