

### III. S/K-SERIES PUBLIC USE MAINTENANCE AND REPAIR

Regular maintenance of the RICON S-Series and K-Series Public Use wheelchair lift will help optimize its performance and reduce the need for repairs. This chapter contains cleaning and lubrication instructions, maintenance schedule, troubleshooting section, and maintenance diagrams.

<b>⚠ CAUTION</b>
This Ricon product is highly specialized. Maintenance and repairs must be performed by a Ricon dealer or qualified service technician using Ricon replacement parts. Modifying or failing to properly maintain this product will void warranty and may result in unsafe operating conditions.

#### A. LUBRICATION

<b>⚠ CAUTION</b>
Do not lubricate motor or other electrical components. Lubrication of electrical components may create unintentional short circuits.

Lubrication should be performed at least every six months, or sooner depending on usage. Refer to **Figure 3-1** and the following Maintenance Schedule. Lubricate lift at points specified.

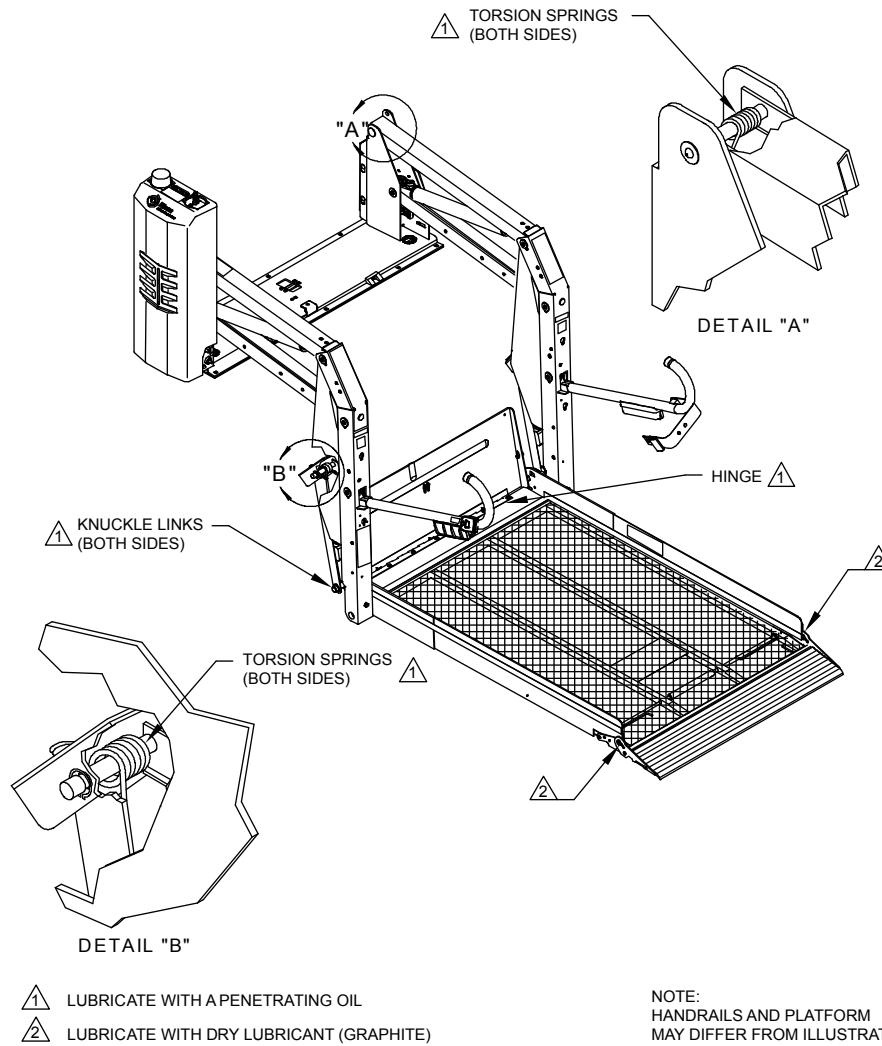



FIGURE 3-1: LIFT LUBRICATION POINTS

#### B. CLEANING

Regular cleaning with mild soap (i.e. dish soap, car wash liquid) and drying thoroughly will protect lift painted surfaces. Cleaning is especially important in areas where roads are salted in winter. Make sure that lift pivot points remain clear and clean prior to lubrication.

**C. MAINTENANCE SCHEDULE**

Under normal operating conditions, maintenance inspections are required at least every six months (1750 cycles) and a thorough inspection should be performed at service intervals referenced in **Table 3-1**. Service should be increased under conditions of heavier use (more than 10 cycles per day).

<b>TABLE 3-1: MAINTENANCE SCHEDULE</b>	
<b>SERVICE POINT</b>	<b>ACTION TO PERFORM</b>
<b>10 CYCLES</b>	
Overall condition	Listen for abnormal noises as lift operates (i.e. grinding or binding noises.)
Control pendant	Verify that control pendant is undamaged and cable connector is tight.
Threshold warning system	Verify that system properly detects objects in threshold area and actuates the audible alarm.
Bridgeplate load sensor	Verify that sensor inhibits downward movement of platform when a weight is present on lowered bridgeplate.
<b>150 CYCLES</b>	
Electrical wiring	Inspect electrical wiring for frayed wires, loose connectors, etc.
Vehicle interlock	Place vehicle in non-interlock mode and verify that lift does not operate.
Decals	Verify that lift decals are properly affixed, clearly visible, and legible. Replace, if necessary.
Armrests	Verify that armrest fasteners are properly tightened.
Lift mounting points	<ul style="list-style-type: none"> <li>▪ Verify that vehicle mounting and support points are undamaged.</li> <li>▪ Verify that mounting bolts are sufficiently tight and free of corrosion.</li> </ul>
Main lifting pivots	Verify that link pins on arms are properly installed, free from damage, and locked in position.
Platform pivot points	Verify that platform moves freely, without binding, and does not wobble.
Bridgeplate	<ul style="list-style-type: none"> <li>▪ Verify that bridgeplate operates without binding during lift functions.</li> <li>▪ Verify that bridgeplate deploys fully when platform stops at floor level.</li> <li>▪ Verify bridgeplate rests flat against baseplate.</li> </ul>
Front rollstop	<ul style="list-style-type: none"> <li>▪ Verify that rollstop is opened completely when platform is at ground level.</li> <li>▪ Verify that rollstop closes and locks when platform leaves ground.</li> </ul>
Hydraulic power unit	 <b>CAUTION</b>
	<p>Check and add fluid when platform is at ground level. Fluid that is added when platform is raised will overflow when platform is lowered.</p> <ul style="list-style-type: none"> <li>▪ Verify that pump hydraulic fluid level is at FULL mark when platform is at ground level. Add Texaco 01554 Aircraft Hydraulic Oil or equivalent U.S. mil spec H5606G fluid.</li> <li>▪ Verify there are no hydraulic fluid leaks.</li> <li>▪ Verify that manual backup pump operates properly.</li> </ul>
<b>1800 CYCLES</b>	
Cleaning and lubrication	<ol style="list-style-type: none"> <li>1. Clean lift with mild soap and water and wipe dry. Prevent rust by coating all surfaces with a light weight oil. Remove excess oil.</li> <li>2. Spray penetrating oil (Curtisol® Red Grease 88167 or WD-40®) where specified following directions on container. Remove excess grease from surrounding areas.</li> </ol>
 <b>CAUTION</b>	
A Ricon dealer or qualified service technician must perform the following safety check.	
<b>3600 CYCLES</b>	
Hydraulic cylinder, hoses and fittings	<ul style="list-style-type: none"> <li>▪ Check hydraulic cylinder for evidence of leaks.</li> <li>▪ Inspect hydraulic hoses for damage.</li> <li>▪ Verify that all fittings are tight.</li> </ul>
<b>END OF TABLE</b>	

**D. TROUBLESHOOTING**

The troubleshooting guides are designed to provide logical starting points to locate general problems that could occur with lift. However, not all possible problems or combinations of problems are listed. For troubleshooting lift, refer to **Tables 3-2**. The guide do not incorporate routine safety precautions or preliminary procedures and assume that vehicle battery is fully charged and battery terminals/connectors are clean and tight.

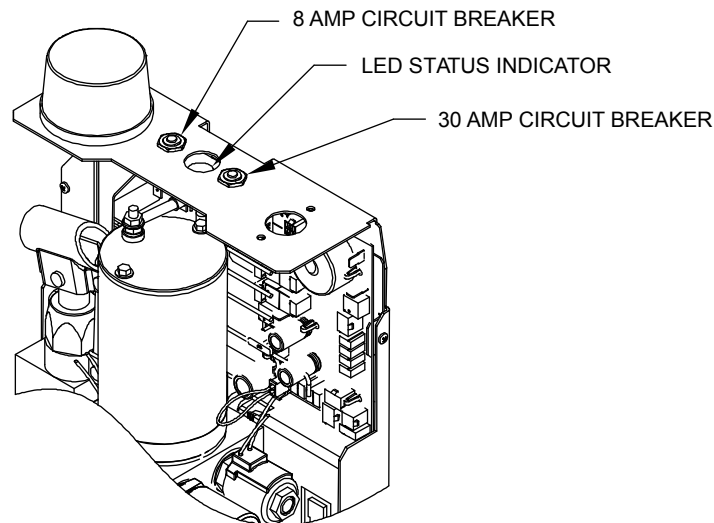
 <b>WARNING</b>
<p>THE TROUBLESHOOTING GUIDES DO NOT INCORPORATE ROUTINE SAFETY PRECAUTIONS OR PRELIMINARY PROCEDURES. DURING THE RICON WARRANTY PERIOD A TRAINED, RICON DEALER OR QUALIFIED SERVICE TECHNICIAN MUST PERFORM TROUBLESHOOTING. AFTER THE WARRANTY PERIOD, IT IS RECOMMENDED THAT TROUBLESHOOTING BE CONTINUED BY A RICON DEALER OR QUALIFIED SERVICE TECHNICIAN.</p>

**1. LIFT TROUBLESHOOTING**

<b>TABLE 3-2: TROUBLESHOOTING LIFT OPERATION</b>			
<b>SYMPTOM</b>	<b>POSSIBLE CAUSE</b>	<b>REMEDY</b>	
Hydraulic fluid leaks	Loose hydraulic fitting.	Make sure fitting is PROPERLY tightened.	
	Hydraulic component defective.	Discontinue use of lift. Have repairs made by a Ricon dealer or qualified service technician.	
Rollstop does not open	Obstruction of rollstop release latch.	Raise lift and remove obstruction.	
Lift functions	Abnormal Operation.	Obstruction in lifting frame.	Remove obstruction and check for any damage
		Backup pump manual release valve OPEN.	Turn manual release valve CLOCKWISE until slightly snug.
		Hydraulic fluid may be low.	While platform is at GROUND LEVEL, be certain that pump hydraulic fluid level is maintained at required FULL level. Add only Texaco 01554 Aircraft Hydraulic Oil or equivalent U.S. mil spec H5606G fluid.
		Air may be trapped in hydraulic system.	Purge hydraulic system by operating lift through its maximum range of travel for at least four complete cycles. (For vehicles that do not use full travel of lift, the maximum range of travel is accomplished by raising vehicle on a service hoist or ramp.)
	No Operation.	Control system circuit breaker tripped.	Reset circuit breaker.
		Backup pump manual release valve OPEN.	Turn manual release valve CLOCKWISE until slightly snug.
		Hydraulic hose or fitting leak.	Contact a Ricon dealer or qualified service technician for repair.
		Hydraulic fluid may be low.	While platform is at GROUND LEVEL, be certain that pump hydraulic fluid level is maintained at required FULL level. Add only Texaco 01554 Aircraft Hydraulic Oil or equivalent U.S. mil spec H5606G fluid.
		Air can be trapped in hydraulic system.	Purge hydraulic system by operating lift through its maximum range of travel for at least four complete cycles. (For vehicles that do not use full travel of lift, the maximum range of travel is accomplished by raising vehicle on a service hoist or ramp.)
<b>END OF TABLE</b>			

## 2. PUMP SOLENOID LED STATUS INDICATOR

Refer to **Figure 3-2**. Two identical solenoids provide a margin of safety in the event that one of the solenoids fails with its contacts closed. A two-color status indicator LED is located between the 8A and 30A circuit breakers to monitor the condition of the two solenoids. The LED is normally off when the pump is not operating and becomes green when the pump operates. When the pump is not operating and the left solenoid has failed the LED will be red. The LED will be green when the right solenoid has failed.



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**FIGURE 3-2: STATUS INDICATORS FOR PUMP SOLENOIDS**

## 3. BRIDGEPLATE CABLE ASSEMBLY REPLACEMENT

The following steps provide instructions for replacing the bridgeplate (also known as inner rollstop or IRS) cable assembly. Refer to **Figure 3-3** on following page. Please follow these instructions carefully. Call Ricon Product Support if you need assistance.

- a. Study the routing of the cable before removing it.
- b. Deploy the lift platform to vehicle floor level. Be certain that bridgeplate is resting against baseplate assembly.
- c. Remove pinch point shields from the left and right vertical arm assemblies.
- d. Assemble and secure one end of an IRS cable to the IRS pulley mount block (#1; located inside the left vertical arm assembly) using a hex screw, bushing, and washer.
- e. Route the cable around the IRS pulley mount block bushing (#2). Verify that cable is routed between the bushing tab and the point where the cable makes contact with the bushing. Install washer and hex nut over bushing and cable assembly.
- f. Continue to route the cable around grooved bearings #3, #4, and #5.
- g. Route the cable down the length of the vertical arm assembly and around grooved bearing #6.
- h. Assemble and secure the end of the IRS cable to the left side of the bridgeplate (#7) using a hex screw, washer, bushing, and he nut. Be sure to install a hex nut on the inside of the inner rollstop.
- i. Repeat for right side.
- j. Reinstall pinch point shields removed in step 2.

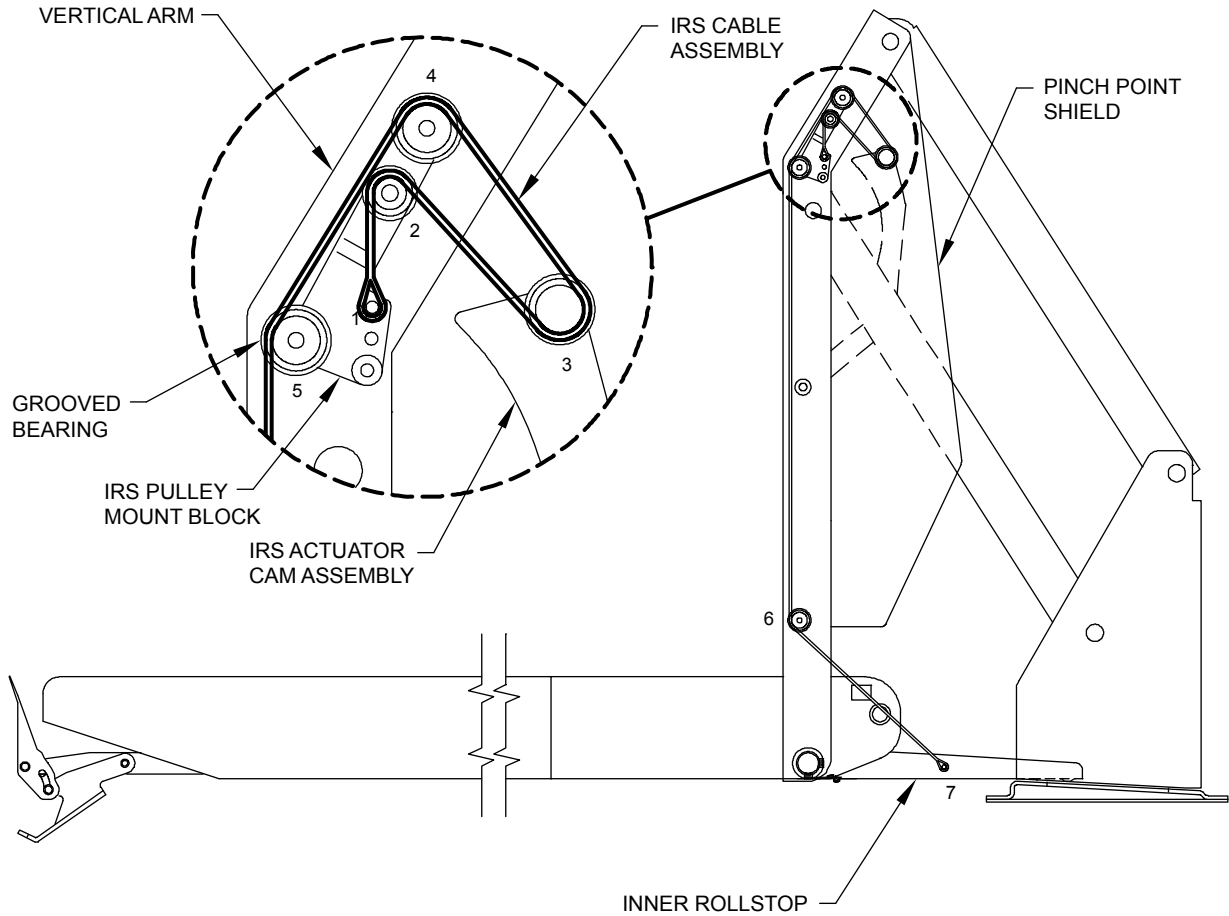
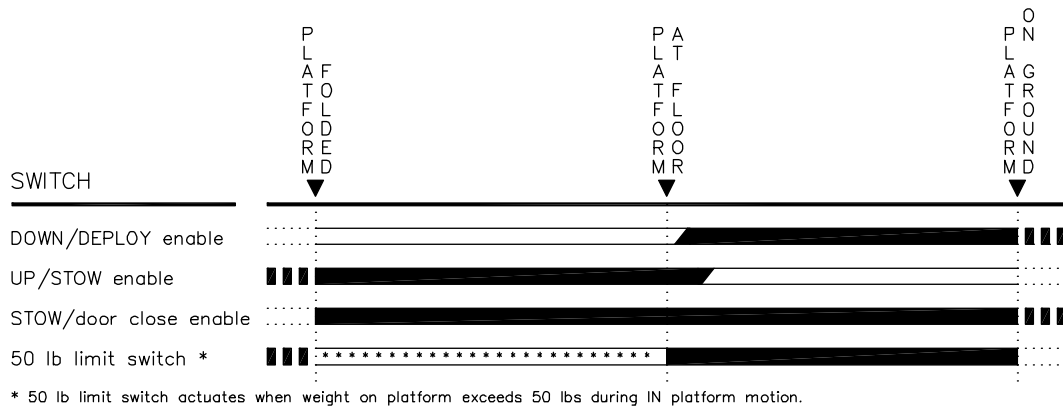


FIGURE 3-3: BRIDGEPLATE CABLE ROUTING

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4. S/K-SERIES LIMIT SWITCH STATES

Refer to **Figure 3-4**. The limit switch actuation diagram shows the state of all limit switches as the platform travels from fully stowed, to vehicle floor level, and to ground level. The solid (—) line indicates the normally CLOSED portion of switch is operational, while the two thin lines (≡) indicate the normally OPEN portion of the switch is operational. The dotted lines (⋯) are used to show switch states beyond normal travel boundaries of the platform. This is useful to show the operation of switches that change state at folded or ground level positions. For proper operation of lift, the switch actuations must overlap as shown.



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FIGURE 3-4: LIMIT SWITCH ACTUATION CHART

## 5. BRIDGEPLATE ADJUSTMENT

**NOTE:** The purpose of the bridgeplate adjustment is to adjust the floor level setting by adjusting the Up Cutoff Adjustment Screw and Deploy Cutoff Adjustment Screw so that the bridgeplate properly sits onto the load sensor.

- a. Fully STOW platform.
- b. Refer to **Figure 3-5 and 3-6**. Insert the screwdriver into the DEPLOY CUTOFF ADJUSTMENT SCREW (bottom adjusting screw) then deploy the platform to floor level. Push and hold control pendant DEPLOY switch.

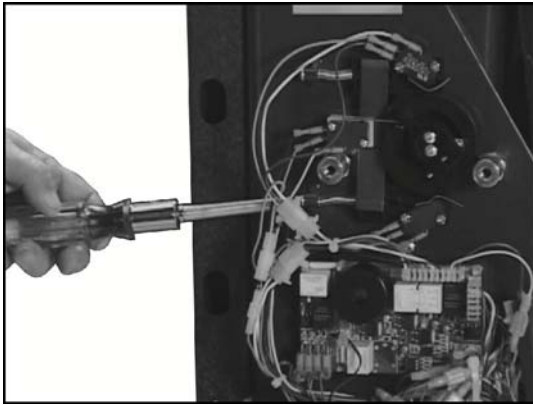


FIGURE 3-5: BOTTOM ADJUSTING SCREW

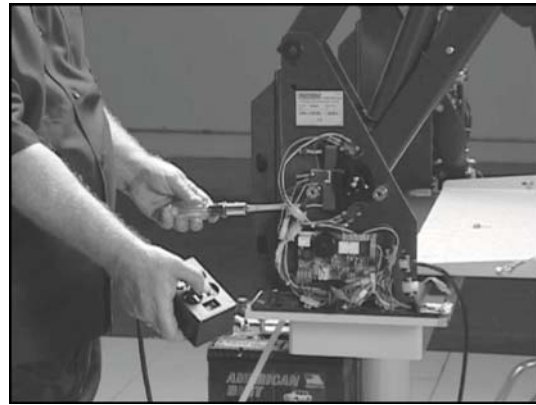


FIGURE 3-6: PUSH AND HOLD DEPLOY

- c. Slowly turn DEPLOY CUTOFF ADJUSTMENT SCREW **clockwise** until the bridgeplate moves onto the load sensor, as shown in **Figure 3-7**.

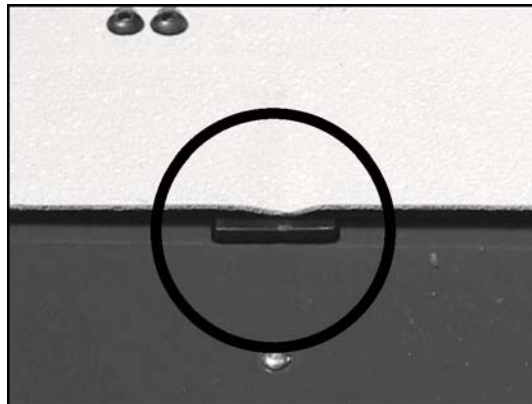


FIGURE 3-7: BRIDGEPLATE ADJUSTED CORRECTLY

- d. DEPLOY platform about 10 inches from ground.
- e. Refer to **Figure 3-8**. Insert the screwdriver into the UP CUTOFF ADJUSTMENT SCREW (top adjusting screw) then push and hold control pendant UP switch to cycle the platform back up to floor level.

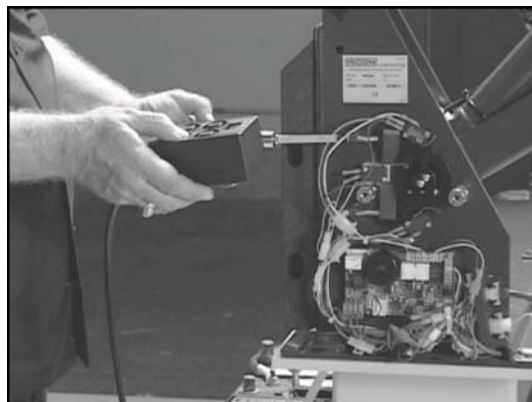
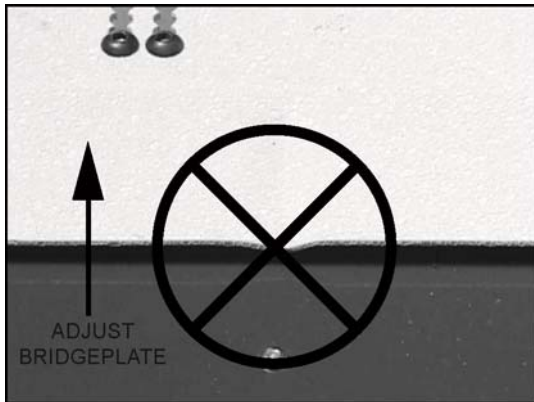


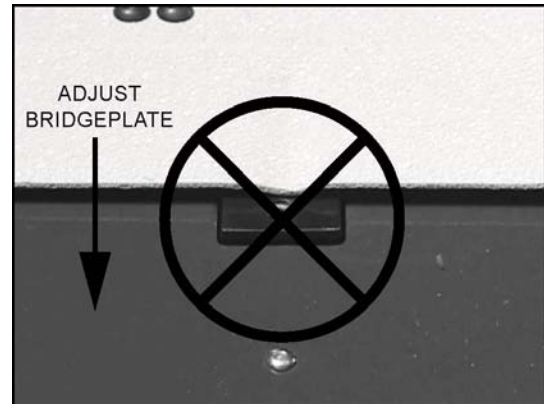
FIGURE 3-8: PUSH AND HOLD UP



- f. Refer to **Figure 3-9 and 3-10**. When the platform is at floor level, observe where the bridgeplate sits on the load sensor.



**FIGURE 3-9: ADJUSTMENT REQUIRED**



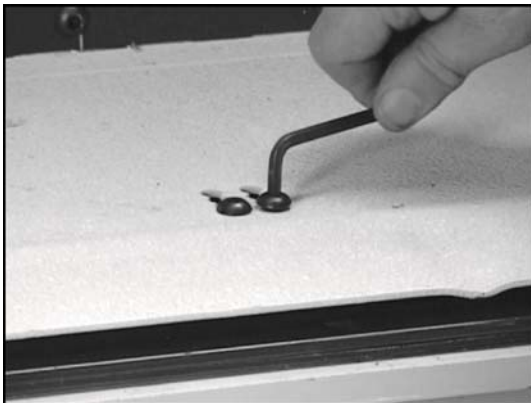
**FIGURE 3-10: ADJUSTMENT REQUIRED**

- g. Refer to **Figure 3-9 and 3-10**. If the bridgeplate sits over the load sensor where it is not visible or if the rivet head is visible, slowly turn the UP CUTOFF ADJUSTMENT SCREW **counterclockwise** to adjust the bridgeplate backward or **clockwise** to adjust the bridgeplate forward.
- h. Cycle platform to DEPLOY then UP to floor level. Observe the position of the bridgeplate to the load sensor and make any necessary adjustments. The bridgeplate should sit on the load sensor, as shown in **Figure 3-7**.

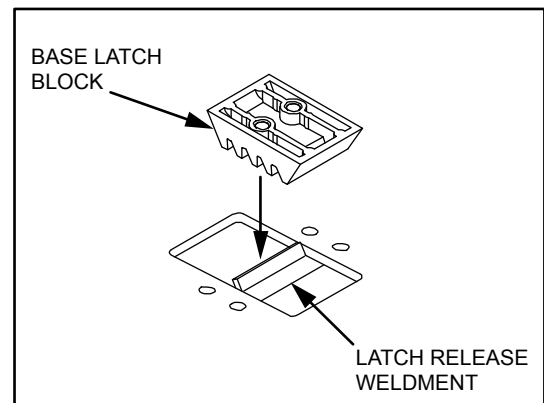
## 6. STOW-LOCK ADJUSTMENT

**NOTE:** The purpose of this procedure is to replace and properly set the stow-lock.

- Fully STOW platform.
- Refer to **Figures 3-11 and 3-12**. Use a 3/16" allen wrench to remove the two screws and washers that attach the base latch block to the bridgeplate. Partially deploy platform then remove base latch block for replacement.



**FIGURE 3-11: PUSH AND HOLD UP**



**FIGURE 3-12: BASE LATCH BLOCK**

- Place sharp edge of the base latch block against the blade of the platform latch release weldment in the baseplate, as shown in **Figure 3-12**.
- Stow the platform.
- Add medium strength thread lock to the screws then install the two screws and washers. Turn the screws out one turn so that the screws are not completely tightened.

**NOTE:** This is done to ensure the sharp edge of the base latch block contacts the blade of the platform latch release weldment in the baseplate before tightening.

- Slowly open the manual release valve to apply load to the lift. The weight of the lift will pull the base latch block flush with the blade of the platform latch release weldment. Tighten the screws until the base latch block is secured in place.
- Close the manual release valve the press the STOW function to remove the load from the lift.
- Partially deploy the lift. Ensure that the platform deploys with no delay. Stow the lift and verify that there is a positive lock when the lift is stowed.

7. REAR SPRING REPLACEMENT

**NOTE:** A well maintained and lubricated parallel arm spring will prolong the life of the spring. In the event that the spring will need to be replaced, proceed with rear spring replacement.

- a. Deploy platform to ground level onto a pallet for support and to maintain the parallel arms at a 90 degree angle perpendicular to the rear of the platform towers. The tine of the spring will load straight up and down when done so.
- b. Use a 3/16" allen wrench to remove screw and lock washer from the pin.
- c. Refer to **Figures 3-13 and 3-14**. Attach pin alignment tool to pin. Replace pin with appropriate tool to hold parallel arm and rear spring in place.



FIGURE 3-13: PIN WITH PIN ALIGNMENT TOOL

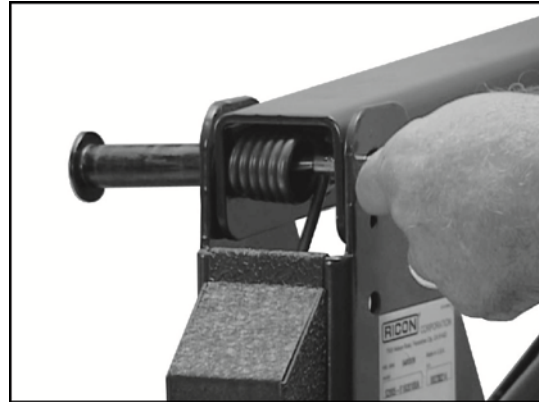


FIGURE 3-14: PIN WITH PIN ALIGNMENT TOOL

- d. Refer to **Figure 3-15**. Carefully remove tool holding parallel arm and rear spring in place. Hold rear spring and parallel arm, then pull parallel arm up and remove rear spring.

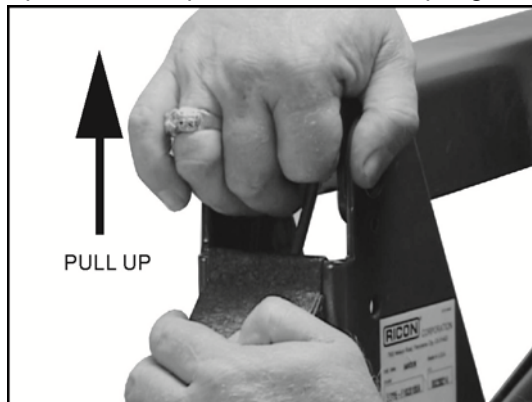


FIGURE 3-15: PIN WITH PIN ALIGNMENT TOOL

- e. Replace and install rear spring.
- f. Refer to **Figures 3-16**. Install a 2" extension pin through parallel arm and rear spring.

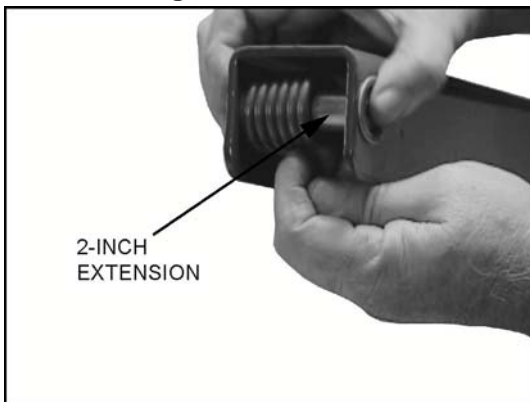


FIGURE 3-16: 2-INCH EXTENSION

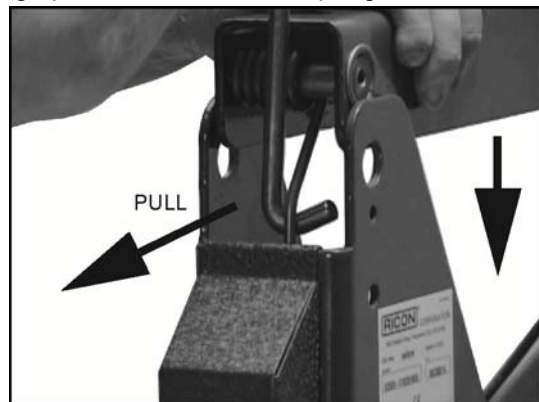


FIGURE 3-17: PLACE REAR SPRING

- g. Refer to **Figure 3-17**. Use appropriate tool to use as leverage to pull back tine of bent rear spring and place into baseplate tower.



- h. Replace 2-Inch extension with existing pin.
- i. Reinstall screw and lock washer.
- j. Repeat removal and installation for opposite parallel arm.

### 8. HYDRAULIC CYLINDER GLAND NUT AND PISTON REPLACEMENT

- a. Lower lift to ground level.

**NOTE:** Lift must be lowered as far as possible to avoid personal injury and oil spillage when hydraulic components are dismantled.

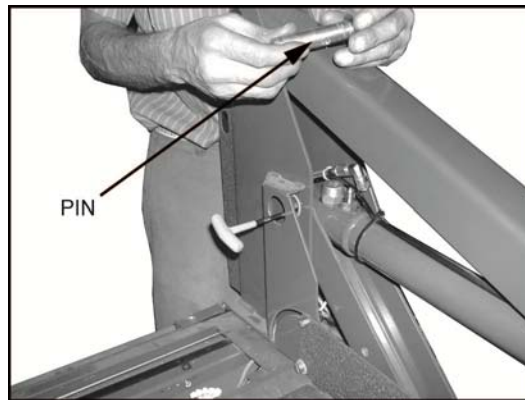
- b. Fully open manual release valve.

**NOTE:** Important for allowing easy removal/insertion of ram into cylinder.

- c. Install hydraulic breather tube if available.

**NOTE:** The hydraulic breather tube may help in avoiding oil overflow from filler neck when reinstalling ram. An assistant may be required to check oil level in filler neck as ram is reinserted, if breather tube is not available.

- d. Loosen both hydraulic button head screws with 3/16" hex wrench to loosen pin.
- e. Remove and retain cap screw with 5/32" hex wrench.
- f. Refer to **Figure 3-18**. Drive rear pin out and retain. Use pin driver, pin is driven towards bushing side.

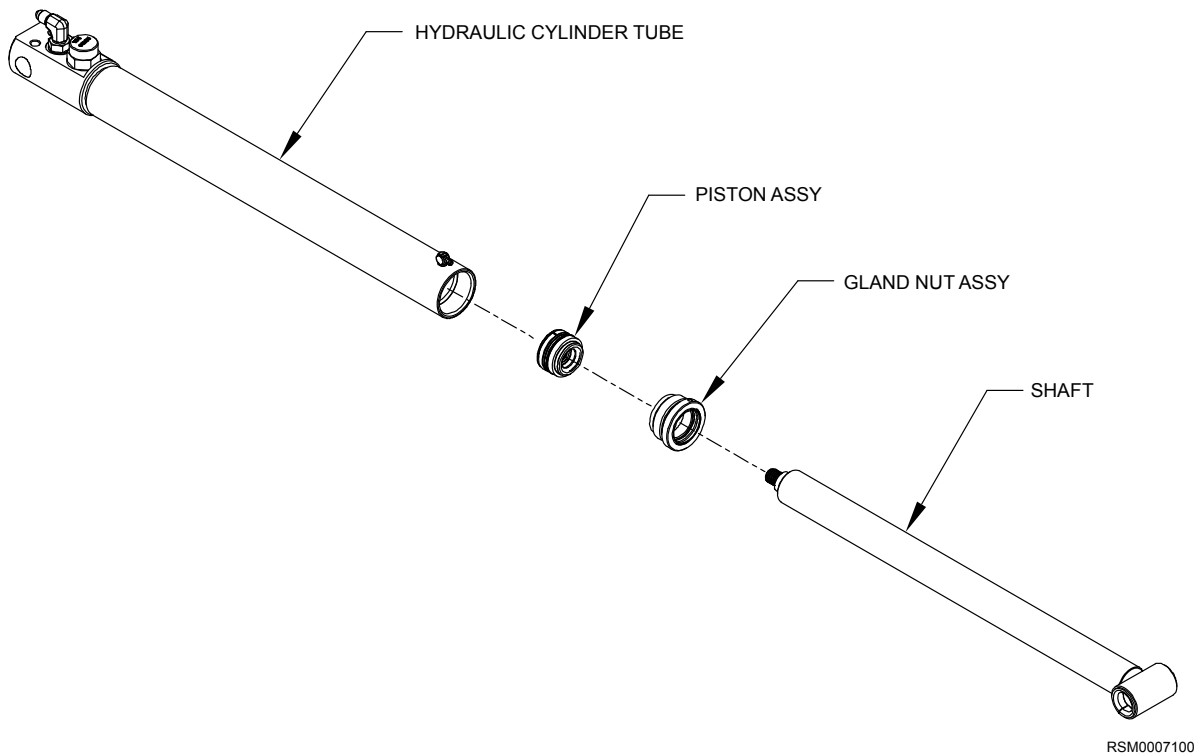


**FIGURE 3-18: PLATFORM FOLDING BRACKET**

- g. Drive front pin out and retain.

**NOTE:** Hydraulic cylinder may be left in baseplate "U" tower for this and proceeding operations.

- i. Refer to **Figure 3-19**. Unscrew gland nut.
- j. Refer to **Figure 3-19**. Pull shaft out.
- k. Refer to **Figure 3-19**. Remove old piston using appropriate tool. Heat piston thread if required to soften the thread lock and remove piston.



**FIGURE 3-19: HYDRAULIC CYLINDER**

- l. Refer to **Figure 3-19**. Replace gland nut with the gland nut supplied in kit. Apply thin film of hydraulic fluid to the seals before installing.
- m. Thoroughly clean shaft and new piston threads.

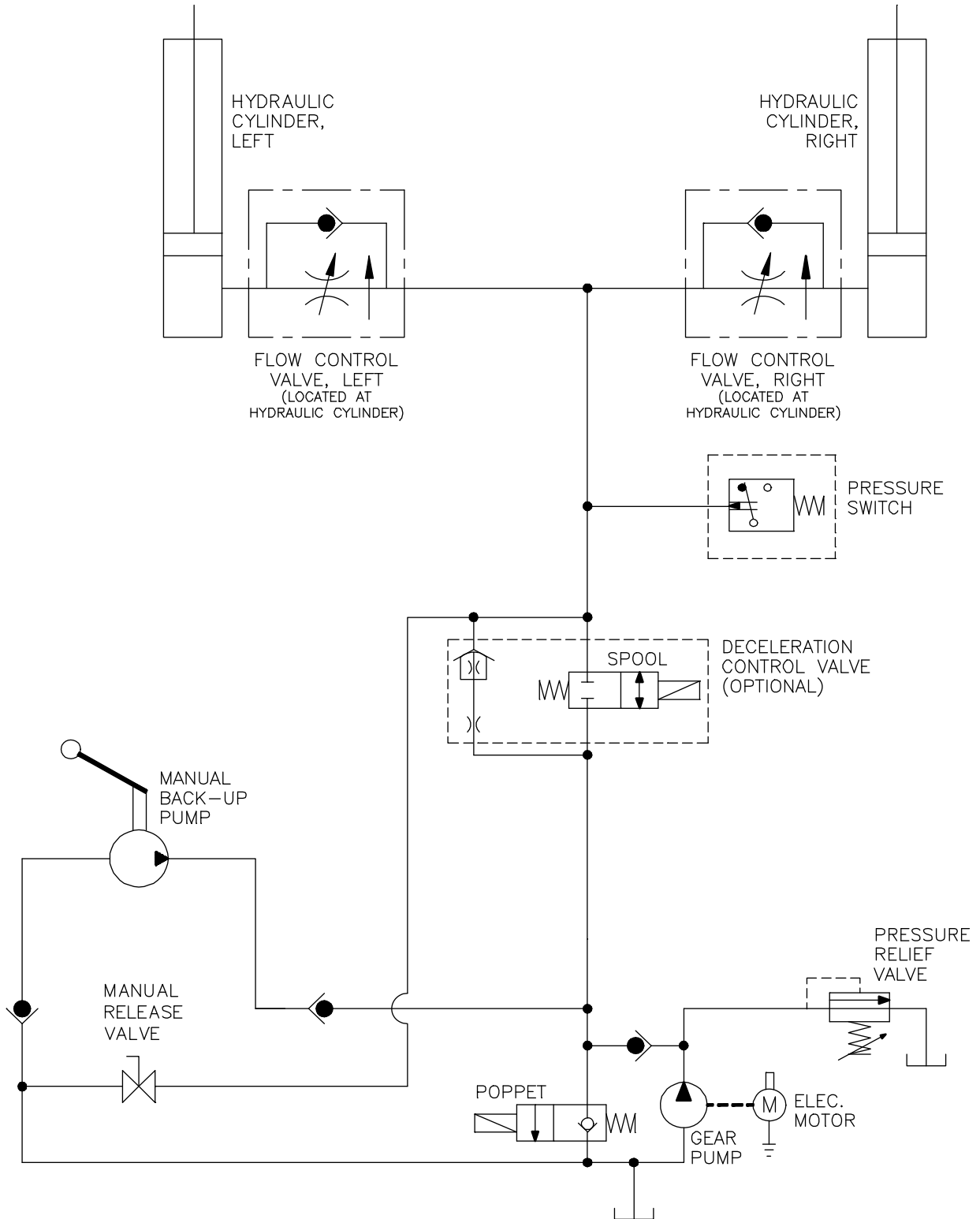
**NOTE:** If shaft threads were damaged by the thread locking punch, rethread with 1/2-20 die. Use a wire brush to remove all thread sealer from shaft threads. Blow clean. Always blow piston threads clean even if no dirt is visible.

- n. Refer to **Figure 3-19**. Install new piston supplied in kit. Apply medium strength thread lock (blue) on shaft threads and tighten securely.
- o. Refer to **Figure 3-19**. Reinsert shaft into cylinder. Apply thin film of hydraulic fluid to seals before installing. Use split cup tool to insert piston.

**NOTE:** Be extra careful not to damage piston seals.

- p. Firmly tighten gland nut. Apply medium strength thread lock (blue) on gland nut threads.
- q. Install front pin. Place set screw face down. Apply medium strength thread lock (blue) on cap screw. Tighten using 5/32" hex wrench.
- r. Install rear spring using spring installation tools.
- s. Install rear pin. Insert pin from bushing side. Apply medium strength thread lock (blue) to button head screw. Tighten using 3/16" hex wrench.

E. HYDRAULIC CIRCUIT DIAGRAM



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FIGURE 3-20: S/K-SERIES HYDRAULIC CIRCUIT

F. ELECTRICAL WIRING DIAGRAM

1. DIAGRAM LEGEND

a. Wire Color Codes

TABLE 3-3: WIRE COLOR CODES			
LETTER	COLOR	LETTER	COLOR
BLK	Black	RED	Red
BLU	Blue	VIO	Violet
BRN	Brown	GRY	Gray
GRN	Green	WHT	White
ORG	Orange	YEL	Yellow
END OF TABLE			

b. Electrical Connector Description

Refer to **Figure 3-6**. The standard electrical connectors used by Ricon are Molex .062" Series. These connectors have terminal numbers molded onto the back. Use these numbers and colors to identify all wires.

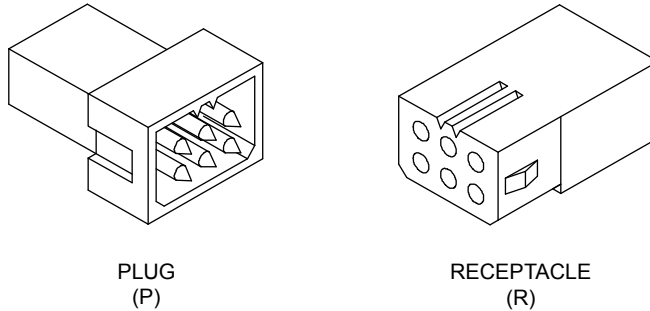


FIGURE 3-21: MOLEX CONNECTORS

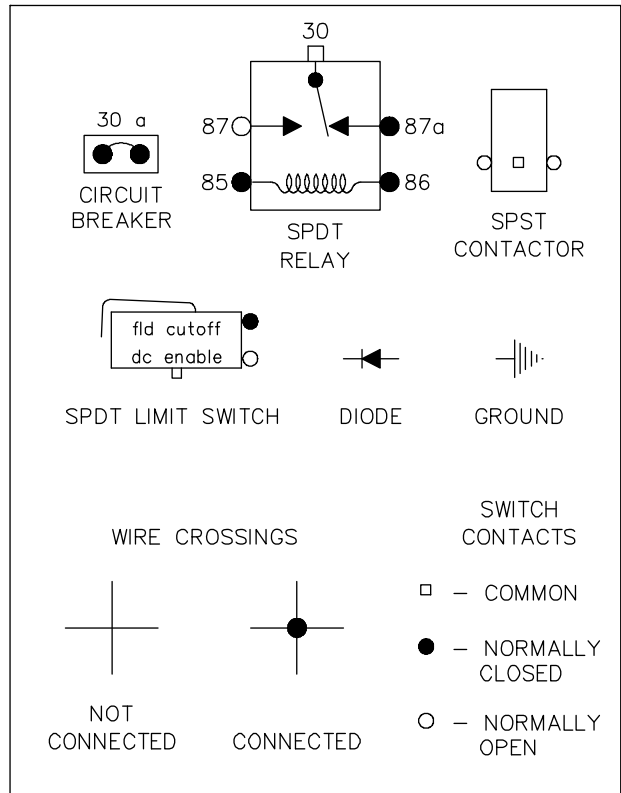
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c. Diagram Labels

TABLE 3-4: DIAGRAM LABELS		
Diagram Label	Definition	Command/Description
12V	12 Volts	Circuit current rating is also given
DC	Door Close	Direct Command
DO	Door Open	Direct Command
DOE	Door Open Enable	From Door Open Cut-off switch.
DWN	Pump Down	Used by OUT and DOWN
DWNA	Down Attempt	Must be enabled
FAST		Signal to speedup valve for UP and DOWN
GND	Ground	
OUTA	Out Attempt	Out must be enabled
SDA	System Deploy Attempt	DO followed by OUT
SSA	System Store Attempt	IN followed by DC
UP	Pump Up	Used by UP and IN
UPA	Up Attempt	Up must be enabled
END OF TABLE		

d. **Electrical Symbols**

**Figure 3-22** shows standard symbols used in the electrical wiring diagram.



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**FIGURE 3-22: DIAGRAM SYMBOLS**

e. **WIRING DIAGRAM**

Refer to **Figures 3-23** on the following page for the S/K-Series Public Use wiring diagram.

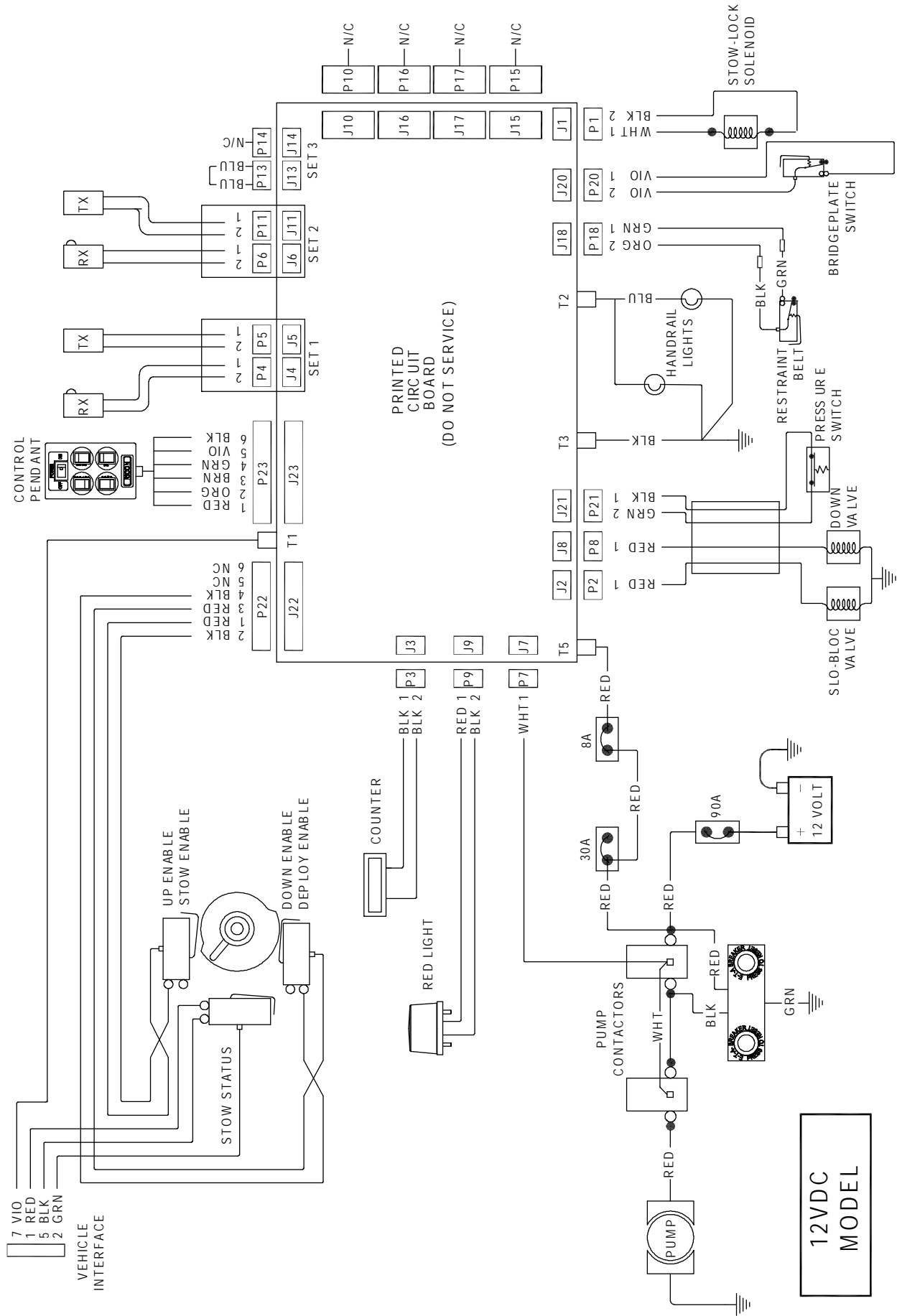


FIGURE 3-23: S/K-SERIES DOT PUBLIC USE WIRING DIAGRAM

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