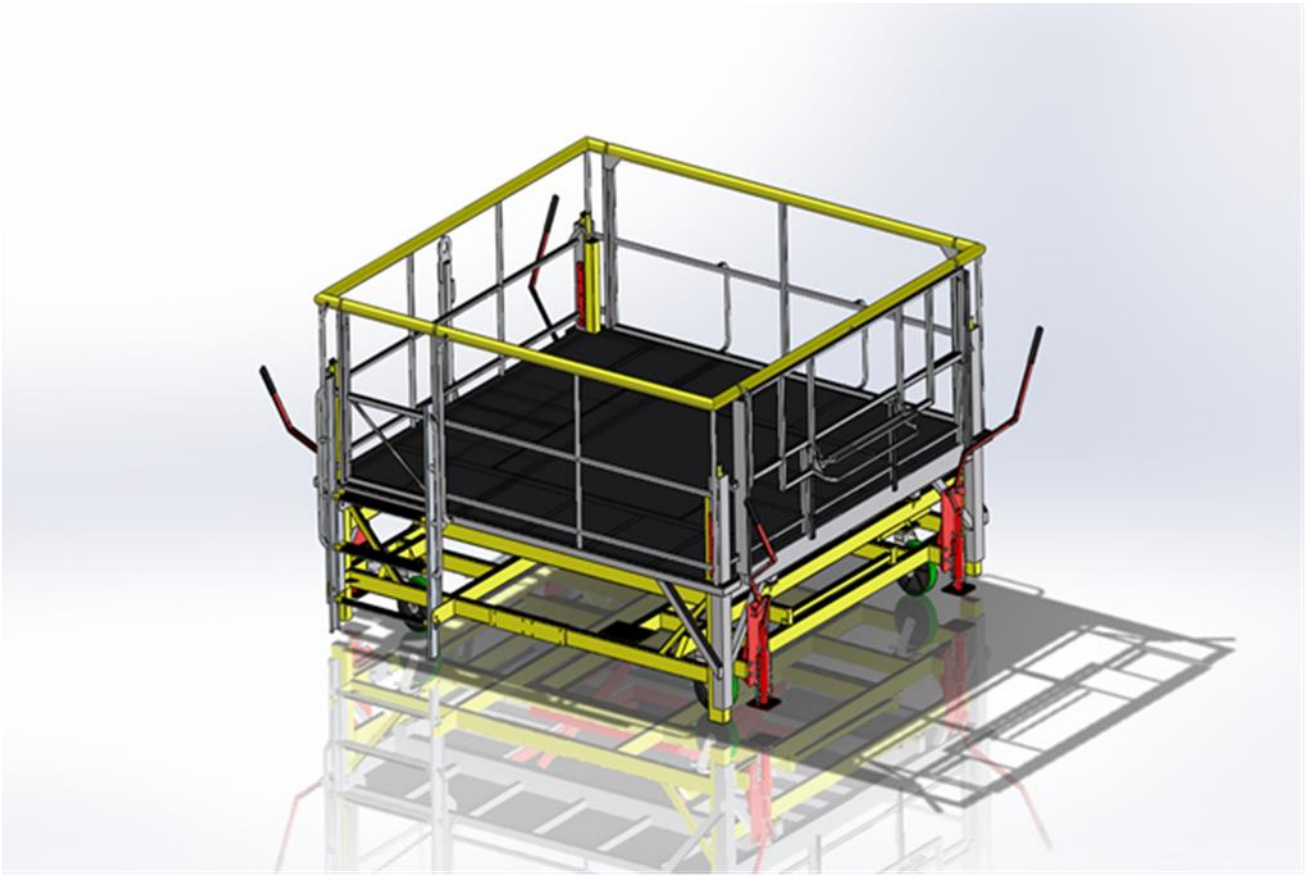
ST-APU Auxiliary Power Unit Stand
Operations & Parts Manual

Maintenance Schedule



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•Table of Contents•

Overview…….. 2
Operations……..3-4
Preventative Maintenance ……5
Safe Servicing of the Lift ……6-11
Troubleshooting……..12-13
How to Order Replacement Parts……14
Parts Breakdown……15-16
Electrical Wiring Diagram……...17
Hydraulic System Diagram……..18
Warranty Information……..19

• Overview •

The KCI APU Stand is a key component used for installation and removal of the aircraft APU. The APU Stand has the ability to be operated by minimal personnel; one man operation for mechanically lifting or lowering the deck height. Its removable gate allows it to be properly fitted under the tail of the aircraft during maintenance. It has a 2000lb weight limit. Polyurethane tread wheels ensure easy maneuvering, but are made to withstand tough terrain if need be.

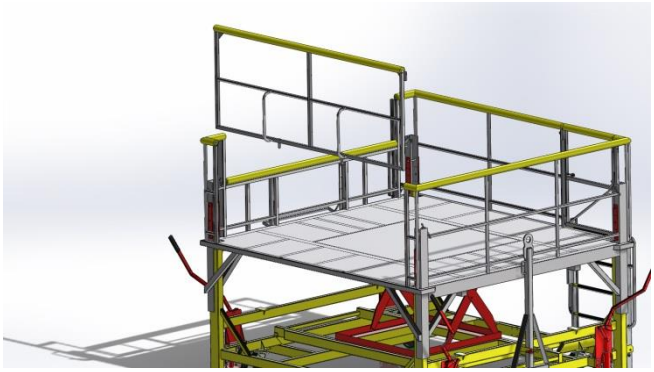
• Operations •

•*Towing*•

The STAPU-10-10 is equipped with a tow bar. Remove the lock pin and lower the tow bar and attach to the towing vehicle. All stabilizer feet should be in the stowed (raised position), towing speed shall not exceed 10 MPH, adequate clearances shall be maintained at all times.

•*Lifting and Lowering*•

The STAPU-10-10 is rated for a 2,000lb load and is equipped with a hydraulic jack for lifting and lowering the platform by one person. The Foot actuated control is located on the side of the platform near the motor; there is also a hand held control accessible from on the platform. Remove the horizontal gate and position the stand appropriately under the tail of the aircraft. Deploy the stabilizer feet and raise the stand to the desired height, maintaining adequate clearances from aircraft fuselage at all times. Install lock pins at all four corners of stand.



Removable gate

Locking pins

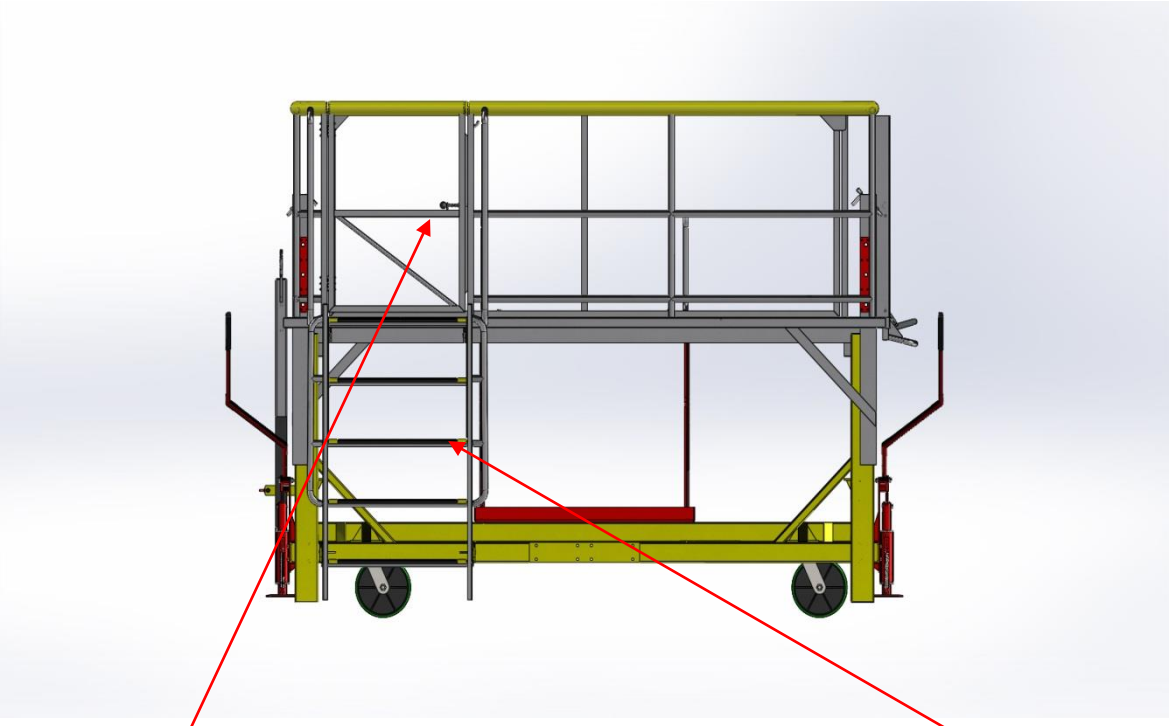
Foot actuated pedal

Hand held control

• Operations •

•*Working from the APU Stand*•

The platform of the stand is accessible from the side using the ladder rungs. Pull the lock pin to release the self-closing gate to gain access to the platform. The platform has 4 location markings for proper placement of the APU removal/installation tool. *NOTE: Never raise or lower the APU stand with personnel on the ladder rungs.*

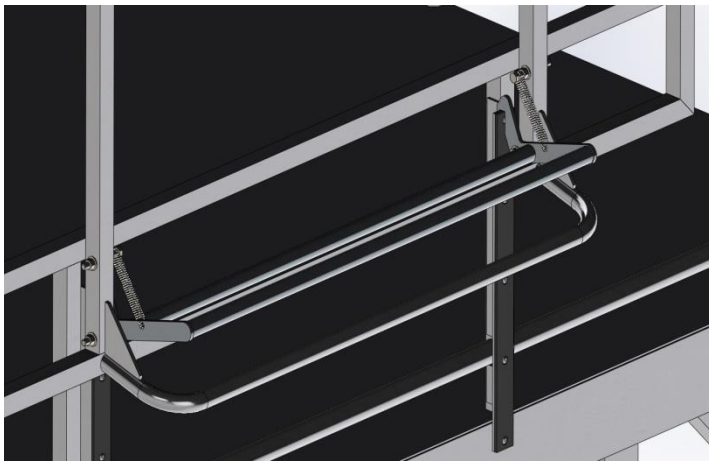


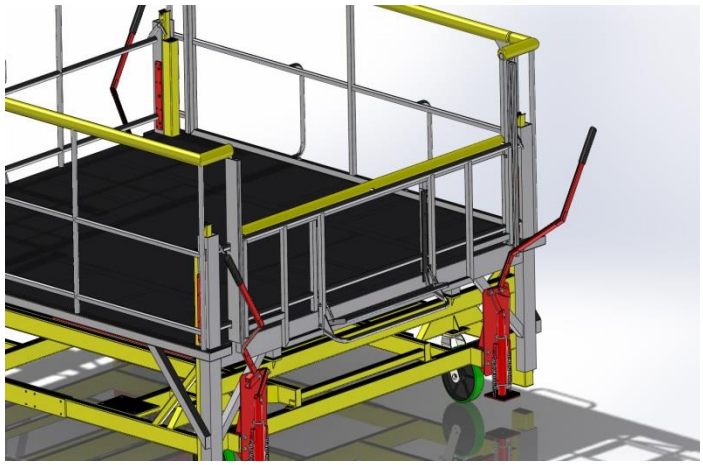
Lock pin for self-closing gate

Platform access ladder

•*Operating the Sliding Gate*•

To lower the sliding gate on the platform, grasp the lock bar mechanism on the gate to release the latch and pull down. To close, simply lift the gate until it latches.





•Preventative Maintenance Checklist •

The following is a general maintenance checklist which covers the major components of your ST-APU Stand. It is recommended that the following be checked regularly as scheduled to ensure proper function, and the longevity, and safety of your ST-APU Stand.

COMPONENT	SUGGESTED ACTION	SCHEDULE		
		Monthly	Quarterly	Bi-Annually
PLATFORM	Check for cracks/breaks/Fatigue			
SCISSOR LIFT	Check for cracks/breaks/fatigue			
	Check Hydraulic Fluid Level (AMOCO AW32 Hydraulic Fluid)			
	Check Hose Fittings			
	Lubrication			
WHEELS	Grease wheels			
STRUCTURAL	General Check: Loose bolts, etc. tightened. Cracks, broken areas.			
	Check all mounting points, steel & aluminum for cracks/breaks			

•Lubrication•

Wheels:

The wheels are lubricated with Lubriplate #1200-2 heavy duty lithium grease before they leave KCI. They should be re-lubed every 6-12 months.

Scissor Lift:

The Scissor Lift uses AMOCO AW32 Hydraulic fluid

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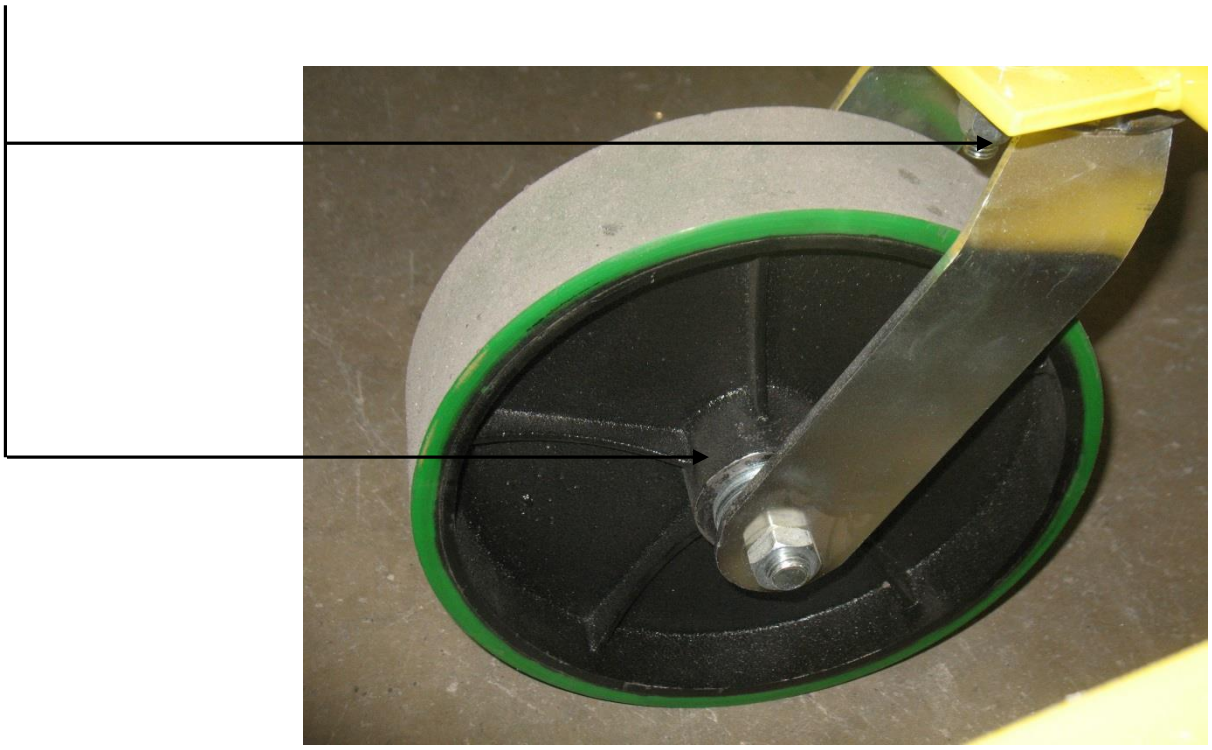


• Safe Servicing of the Lift •

WARNING!

Only authorized personnel should perform inspection or maintenance and service procedures. Unauthorized personnel attempting these procedures do so at the risk of severe injury or death.

WARNING!

Failure to properly adhere to lift blocking procedures is to risk the sudden and uncontrolled descent of the lift during maintenance or inspection. A falling lift can cause severe injury or death.

This procedure describes the only factory approved method of working under a lift. Follow these instructions **EVERY** time you plan to reach or crawl beneath the lift to perform service or maintenance, no matter how momentary that might be.

If the factory provided maintenance device is damaged or missing, stop immediately and consult KCI for assistance. KCI is not liable for the failure to use approved maintenance device(s) and procedures that have been provided.

1. Any load must be removed from the lift prior to engaging the maintenance device(s). These devices are designed to support an unloaded lift only. Failure to remove the load from the lift prior to blocking could cause the failure of the maintenance device(s) and allow the lift to fall unexpectedly. This can result in personal injury or death, or permanent damage to the maintenance device(s) and/or the lift.

2. Raise the lift to its fully raised position. If you do not, the maintenance device(s) may not be able to be placed properly in its/their designed blocking position.

3. Remove the maintenance device(s) from its/their storage location and place it/them into the engaged position as shown in Figure 1.

4. Lower the lift until it makes complete contact with the maintenance device(s). Re-check to ensure that all provided devices are fully and securely engaged. If the device(s) is/are not fully engaged the lift could fall unexpectedly, resulting in permanent damage to the device(s) or the lift.

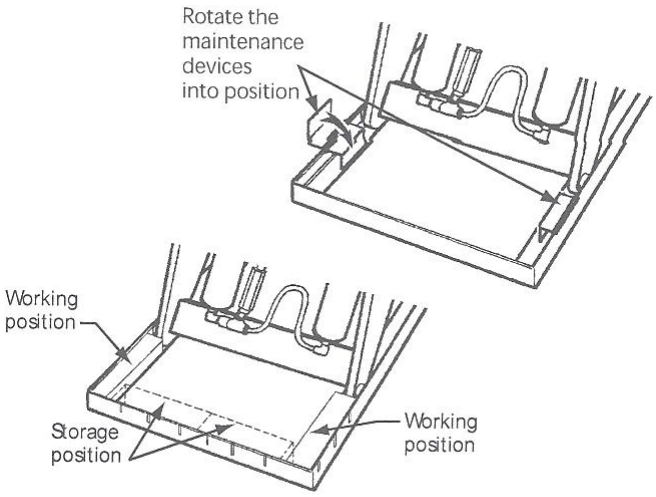


Figure 1 – Safe Servicing of Lift

• Safe Servicing of the Lift •

DANGER!

If for any reason you are unable to lower the lift completely onto the maintenance device(s), stop immediately and consult KCI. Failure to properly use the factory approved maintenance device(s) could result in injury or death.

1. Once the maintenance device(s) is/are properly and securely engaged, continue to press the down button, valve or switch for an additional 5-10 seconds to relieve all the pressure in the operating system.

WARNING!

Failure to relieve the operating system pressure could result in the sudden and unexpected release of high pressure fluids during maintenance and/or repair of the lift and result in injury or death.

2. Follow OSHA electrical lock-out/tag-out procedures. Disconnect and tag all electrical and/or other power sources to prevent an unplanned or unexpected actuation of the lift.

3. Once inspection or work is complete, reverse the performance of the steps above to raise the lift off the maintenance device(s) and place the device(s) back into its/their designated storage positions.

DANGER!

HIGH VOLTAGE! – Disconnect and/or lock out the electrical supply to the power unit prior to any installation or maintenance being performed.

WARNING!

If you are going to repair the center pivot pins and bushings, you must support the lift table in a special way. Each set of leg plates, on both sides of the unit, must be clamped together firmly using large C-clamps. You cannot use the maintenance devices shown in figure 1- with the pivot pins removed, they will not support the lift platform. If you do not support the lift platform correctly, the platform may drop suddenly when you remove the pivot pins.

• Safe Servicing of the Lift •

• *Every Six Months or 500 Hours of Operation* •

Raise the lift and insert the maintenance pins as shown in figure 1.

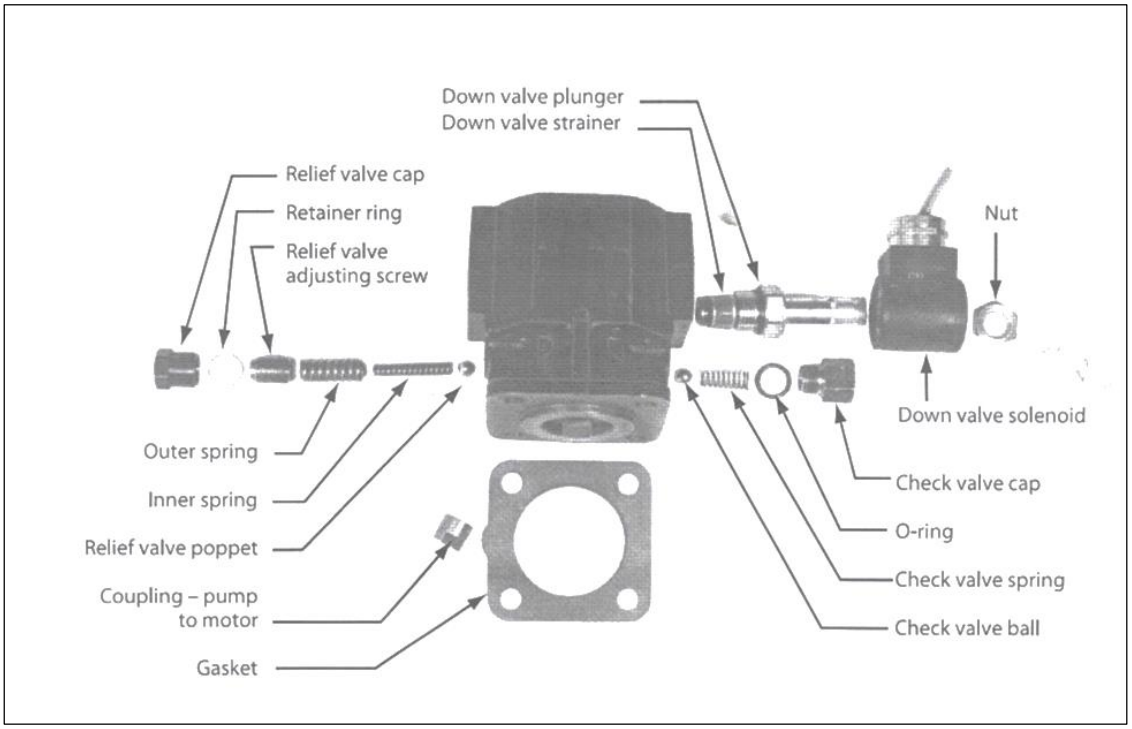
- Check all of the hydraulic fittings and hoses, and repair the connections as necessary. Occasionally the fittings can be worked loose by the vibrations from the power unit.

WARNING!

If a hydraulic fitting becomes loose, or if a hydraulic hose breaks, the hydraulic fluid may escape from the system under pressure. If the lift is raised when this happens, it can drop quickly. Personnel can be injured or the lift may be damaged.

- The clear plastic vent line and the cylinder rods should be free of hydraulic fluid. If much hydraulic fluid is seen in either place, the cylinder seals could be leaking. (It is also possible the tank may be overfilled.) See the section "Repacking the Cylinders" on page 9.
- Disassemble the down valve as shown in the figure below. Blow the valve plunger clean with compressed air. Reassemble and reinstall.
- Drain and discard the hydraulic fluid. The suction filter is in the tank, at the point where the suction line runs out to the pump. Unscrew the hydraulic filter.
- Blow the filter clean. Reinstall the filter in the tank and reassemble the hydraulic line.
- Refill the tank with new hydraulic fluid.

Figure 2



• Safe Servicing of the Lift •

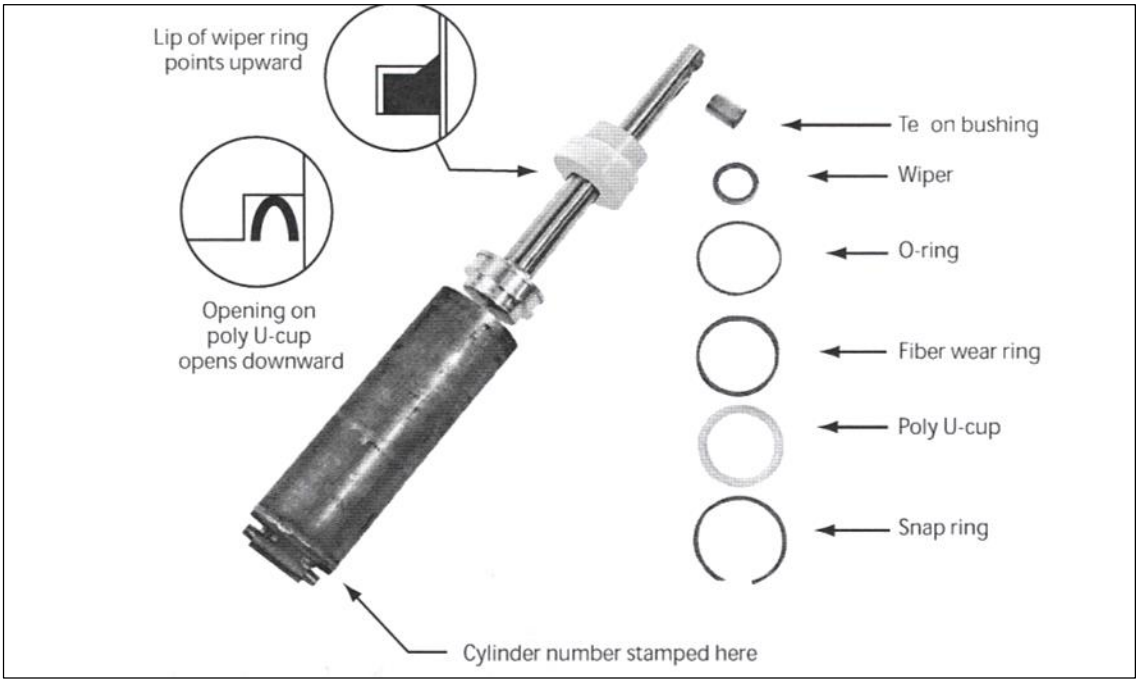
• *Repacking Cylinders* •

WARNING!

Before working underneath the lift, always raise the lift and insert the maintenance device(s), as shown in figure 1. Failure to do so may result in damage to the lift and severe personal injury.

1. Before you disassemble the old cylinder, be sure to have on hand the following.
   - A repacking kit (available from KCI)
   - New hydraulic oil
2. Raise the lift and insert the maintenance device(s).
3. Turn off electrical power at the main disconnect or circuit breaker, or unplug the machine.
4. Disconnect the cylinder supply line at the pump, and place the end into a container to collect the used oil.
5. Disconnect the vent line at the cylinder(s).
6. At the top end of the cylinder rod, remove the "keeper," and drive out the clevis pin. Push the rod back into the cylinder to drive the hydraulic fluid out through the hose into the container. You may use air pressure at the vent hole to do this. Disconnect the hydraulic line(s) from the cylinder(s). Lift the cylinder(s) out of the lift. Be careful, the cylinder is heavy.

Figure 3



• Safe Servicing of the Lift •

7. Figure 3 shows the parts inside a lift cylinder. At the upper end of the cylinder, remove the snap ring. Pull the rod and piston all the way out of the cylinder. This assembly is heavy, be careful not to drop it as it comes free.

8. Remove the press fit bushing from the hole at the upper end of the cylinder rod.

9. Look for deformation around the hole at the clevis end of the cylinder rod. If necessary, clean up the rod diameter with a file to allow the rod bearing to slide off without damage.

10. Remove the plastic rod bearing from the cylinder rod. Observe how the wiper ring sits in the rod bearing. Remove the wiper ring and the O-ring from the rod bearing. Do not try to remove the aluminum piston from the cylinder rod, as this will damage the assembly. Remove the poly U-cup and the fiber wear ring from the piston.

11. Check the vent plug and clean it if it appears dirty.
    - **Caution! While reassembling, it is very important to keep all of the parts free of dirt, dust, metal chips, water and other contamination. Most of the problems with hydraulic systems are caused by contamination in the oil.**

12. Clean the piston surfaces, and install a new fiber wear ring. Install a new poly U-cup seal, with the open part of the seal facing down.

13. Clean all of the surfaces on the rod bearing. Install a new O-ring and wiper. Replace the rod bearing assembly on the rod.
    - **Caution! Be careful not to install the wiper backwards. The lip on the wiper should point upwards, as shown in the detail in figure 3.**

14. Clean the bore of the cylinder tube thoroughly. Inspect the bore of the tube for scratches that run up and down, along the length of the cylinder. If scratches are present, hone the inner surface of the cylinder. Be sure to clean the tube thoroughly after you do this.

15. Lubricate the seal and piston with clean grease or oil. Carefully insert the piston and rod back into the cylinder. Be very careful not to pinch or tear the poly U-cup as the piston passes the shoulder inside the cylinder. It is helpful to tip the rod assembly and twist it as you slide it into the cylinder. Once the piston is inside the cylinder, it should slide easily.

    - **Caution! If the poly U-cup is pinched or torn during reassembly, the piston may not retain pressure as designed.**

16. Slide the rod bearing into the cylinder. Install a new snap ring to hold the rod bearing in place. Replace the bushing or install a new one in the top of the cylinder rod.

17. Install the cylinder in the lift. Replace the clevis pin and “keeper.” Reconnect all of the hydraulic lines and the vent line.

18. At the start of the packing process, the oil in the cylinder(s) was drained into a container. Replace this used oil with an equal amount of fresh oil. Be sure to reinstall the vent plug upon completion of this step.

19. Turn on the electrical power and press the up button. The pump will self-prime. After a few seconds, the cylinder should lift the platform off the blocks. Remove the maintenance device(s) Cycle the lift up and down a few times to remove air pockets. Check for leaks.

20. Raise the lift and check the oil level with a dip stick. The oil should be about ¾ inch above the bottom of the tank.

• Troubleshooting •

PROBLEM	POSSIBLE CAUSE	CHECK THIS
Lift will not raise	Weight of load too heavy	Check the actual weight of the load
	Motor not running	Check the main disconnect switch, fuses, and wiring to the motor. A 20 amp, designated braker must be supplied for 110V
	Hydraulic oil level low	When lift is raised as far as possible, oil level should be 3/4" from bottom of tank. When lift is down, 3/4" from top
	Lift has reached its upper limit	Upper limit switch may need to be adjusted
	Motor may be "single phasing"	If motor hums but does not turn, check motor wiring and line fuses.
	Motor voltage too low	Supply voltage should be +/- 10% of the rating at the motor terminals.
	Tank vent plugged	If supplied, remove solid plug from tank, insert vent plug.
	Suction filter clogged	Clean suction filter as described in periodic maintenance
	Vacuum leak in suction line	Check all fittings in suction line
	Down valve may be energized	Check wiring to down valve, and solenoid in the valve
	Missing coupling	Check to insure the coupling has been installed between the pump and motor
The lift fails to hold	Down valve may be leaking	Remove down valve and inspect for debris which may be preventing it from closing.
	Down valve may be energized	Check the solenoid in the valve with a volt meter.
	Cylinder may be leaking	Check for oil in cylinder in the vent line.
Lift will not lower	Down valve may be de-energized	Check the solenoid in the valve with a volt meter
	Flow control needs adjustment	Adjust flow control as needed
Lift raises too slowly	Voltage may be low	Check voltage at motor to ensure proper voltage is being supplied
	Foreign material clogging suction filter, breather cap or pressure line	Remove necessary components and clean
	Pump may be overheating due to insufficient oil	Check oil level and oil viscosity
Lift lowers too slowly	Down valve may not be fully open or stuck closed	Remove down valve and clean
	Flow control may need adjustment	Adjust flow control as needed

• Troubleshooting •

All servicing should be done by qualified personnel. Qualified personnel should be able to read and understand wiring and hydraulic diagrams.

WARNING!
Before working underneath the lift, always raise the lift and insert the maintenance devices, as shown in figure 1. Failure to do so may result in damage to the lift and severe personal injury.

If The Lift Will Not Raise:

Caution! Do not continue to hold the "up" button for more than 2-3 seconds. Damage to the pump can occur.

Warning! Do not change the relief valve setting. This valve has been included for the protection of workers who install, use, or service the lift.

Warning! Do not disconnect the up limit switch. Instead, loosen the adjusting screw, and change the position of the arm. If the switch is disconnected, when the lift platform moves up, it may not stop at the correct point. If the platform rises above the normal stopping point, the frame of the unit may be damaged, or injury to personnel can occur.

If The Lift Fails To Lower:

Warning! Do not adjust the flow control while pressing the "down" button. If this is attempted, the platform may drop suddenly and without warning, damage to the lift and severe injury or death can occur.

• How to Order Replacement Parts •

Please have model number and serial number available when ordering replacement parts

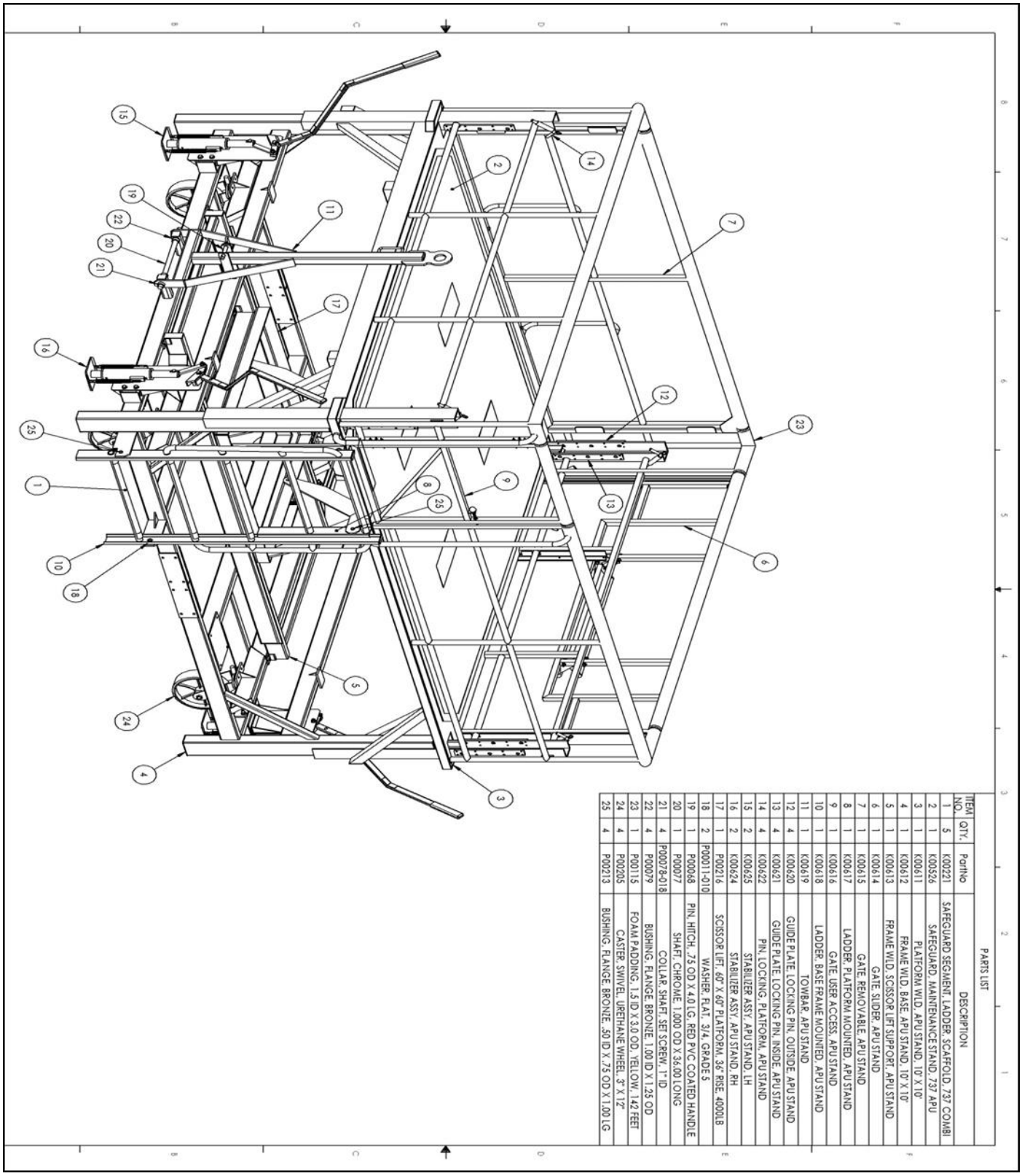
When ordering replacement parts:

a. Contact the KCI parts dept. at (541) 830-4877 or email msankey@kci.nu
b. Give the Model Number, Serial Number, and Mfg. Date) to the parts representative.
c. If possible, give the part number and a description from the parts list. Or describe the needed part(s) to the best of your ability.
d. If you are in a breakdown situation, please tell us, we will try to get your unit operational as soon as possible.

Serial Number
(The ID Plate is located on the frame.)

Mfg. Date
(You may be asked the Mfg. Date of your unit, have it ready if you are asked for it)

• Parts Breakdown •



PARTS LIST

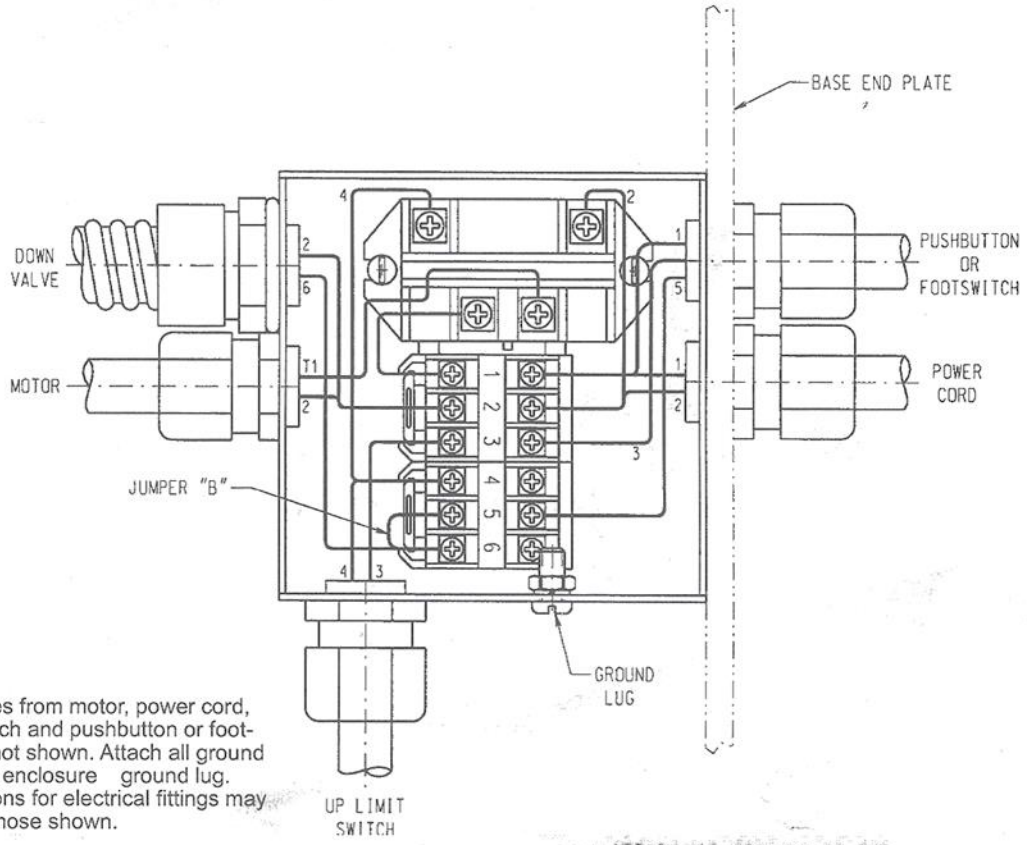
ITEM NO.	QTY.	PartNo	DESCRIPTION
1	5	K00221	SAFEGUARD SEGMENT, LADDER, SCAFFOLD, 737 COMBI
2	1	K00526	SAFEGUARD, MAINTENANCE STAND, 737 APU
3	1	K00611	PLATFORM WLD, APU STAND, 10' X 10'
4	1	K00612	FRAME WLD, BASE, APU STAND, 10' X 10'
5	1	K00613	FRAME WLD, SCISSOR LIFT SUPPORT, APU STAND
6	1	K00614	GATE, SLIDER, APU STAND
7	1	K00615	GATE, REMOVABLE, APU STAND
8	1	K00617	LADDER, PLATFORM MOUNTED, APU STAND
9	1	K00616	GATE, USER ACCESS, APU STAND
10	1	K00618	LADDER, BASE FRAME MOUNTED, APU STAND
11	1	K00619	TOWBAR, APU STAND
12	4	K00620	GUIDE PLATE, LOCKING PIN, OUTSIDE, APU STAND
13	4	K00621	GUIDE PLATE, LOCKING PIN, INSIDE, APU STAND
14	4	K00622	PIN, LOCKING, PLATFORM, APU STAND
15	2	K00625	STABILIZER ASSY, APU STAND, LH
16	2	K00624	STABILIZER ASSY, APU STAND, RH
17	1	P00216	SCISSOR LIFT, 60" X 60" PLATFORM, 36" RISE, 4000LB
18	2	P00011-010	WASHER, FLAT, 3/4, GRADE 5
19	1	P00068	PIN, HITCH, .75 OD X 4.0 LG, RED PVC COATED HANDLE
20	1	P00077	SHAFT, CHROME, 1.000 OD X 36.00 LONG
21	4	P00078-018	COLLAR, SHAFT, SET SCREW, 1" ID
22	4	P00079	BUSHING, FLANGE, BRONZE, 1.00 ID X 1.25 OD
23	1	P00115	FOAM PADDING, 1.5 ID X 3.0 OD, YELLOW, 142 FEET
24	4	P00205	CASTER, SWIVEL, URETHANE WHEEL, 3" X 1/2"
25	4	P00213	BUSHING, FLANGE, BRONZE, .50 ID X .75 OD X 1.00 LG

• Parts Breakdown •

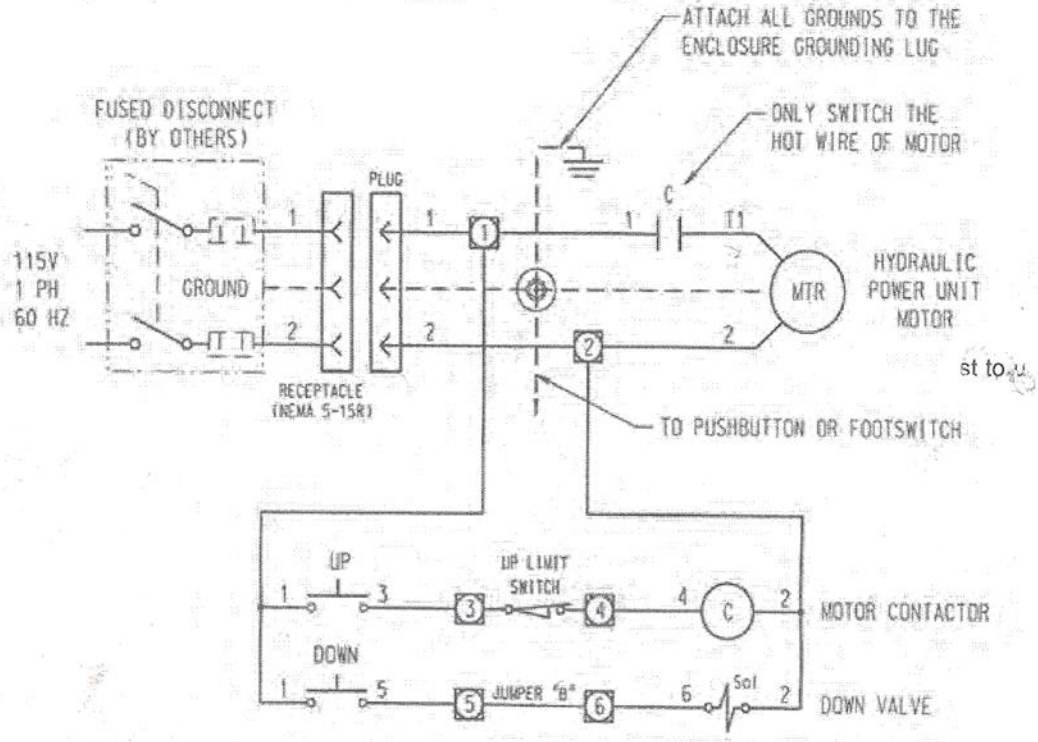
Item	*Qty.*	*Description*	*Part Number*
1	5	Safeguard segment, ladder	K00221
2	1	Safeguard, maintenance stand,737,APU	K00526
3	1	Platform WLD, APU Stand, 10’x 10’	K00611
4	1	Frame WLD, Base, APU Stand, 10’x10’	K00612
5	1	Frame WLD, Scissor Lift Support, APU Stand	K00613
6	1	Gate, Slider, APU Stand	K00614
7	1	Gate Removable, APU Stand	K00615
8	1	Ladder, Platform Mounted, APU Stand	K00617
9	1	Gate, User Access, APU Stand	K00616
10	1	Ladder, Base Frame Mounted, APU Stand	K00618
11	1	Tow Bar, APU Stand	K00619
12	4	Guide Plate, Locking Pin, Outside, APU Stand	K00620
13	4	Guide Plate, Locking Pin, Inside, APU Stand	K00621
14	4	Pin, Locking, Platform, APU Stand	K00622
15	2	Stabilizer Assy, APU Stand, LH	K00625
16	2	Stabilizer Assy, APU Stand, RH	K00624
17	1	Scissor Lift, 60”x60” Platform, 36” Rise, 4000LB	P00216
18	2	Washer, Flat, ¾, Grade 5	P00011-010
19	1	Pin, Hitch, .75OD x 4.0 LG, Red PVC Coated Handle	P00068
20	1	Shaft, Chrome, 1.000 OD x 36.00 Long	P00077
21	4	Collar, Shaft, Set Screw, 1” ID	P00078-018
22	4	Bushing, Flange, Bronze, 1.00 ID x 1.25 OD	P00079
23	1	Foam Padding, 1.5 ID x 3.0 OD, Yellow, 142 FT	P00115
24	4	Castor, Swivel, Urethane Wheel, 3” x 12”	P00205
25	4	Bushing, Flange, Bronze, .50 ID x .75 OD x 1.00 LG	P00213

• Electrical Diagram •

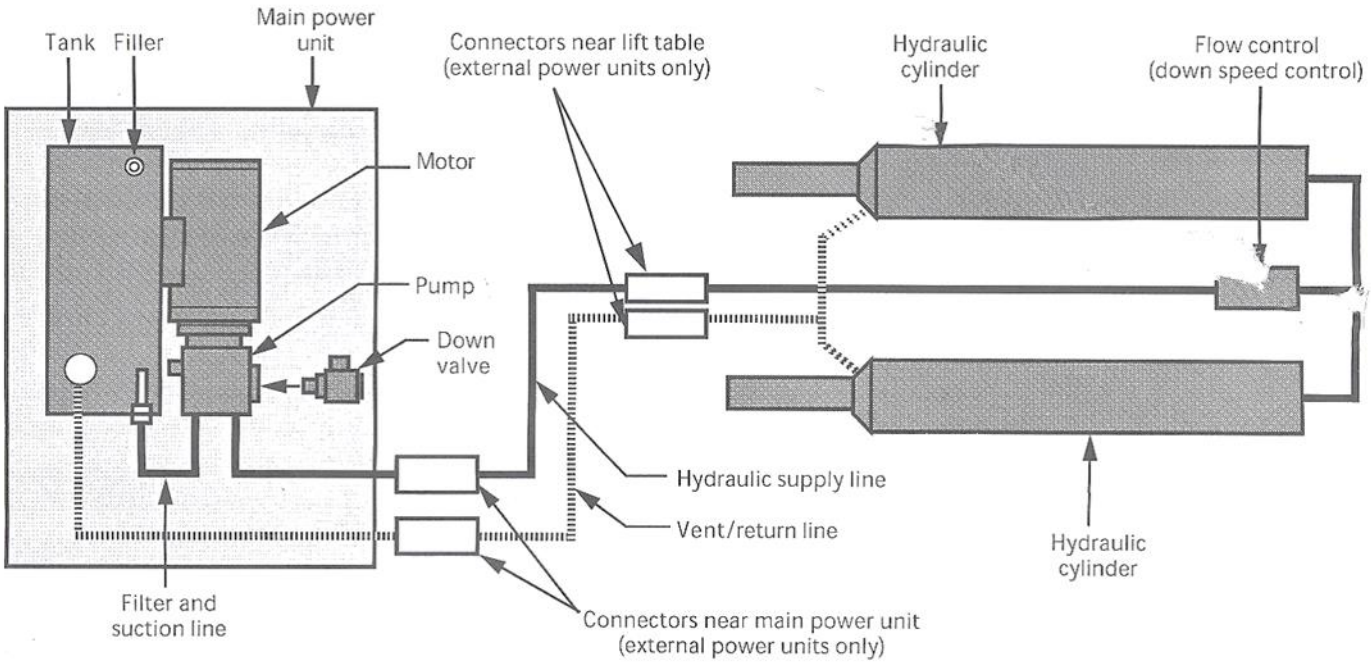
Electrical Connections for Single-Phase AC, continued

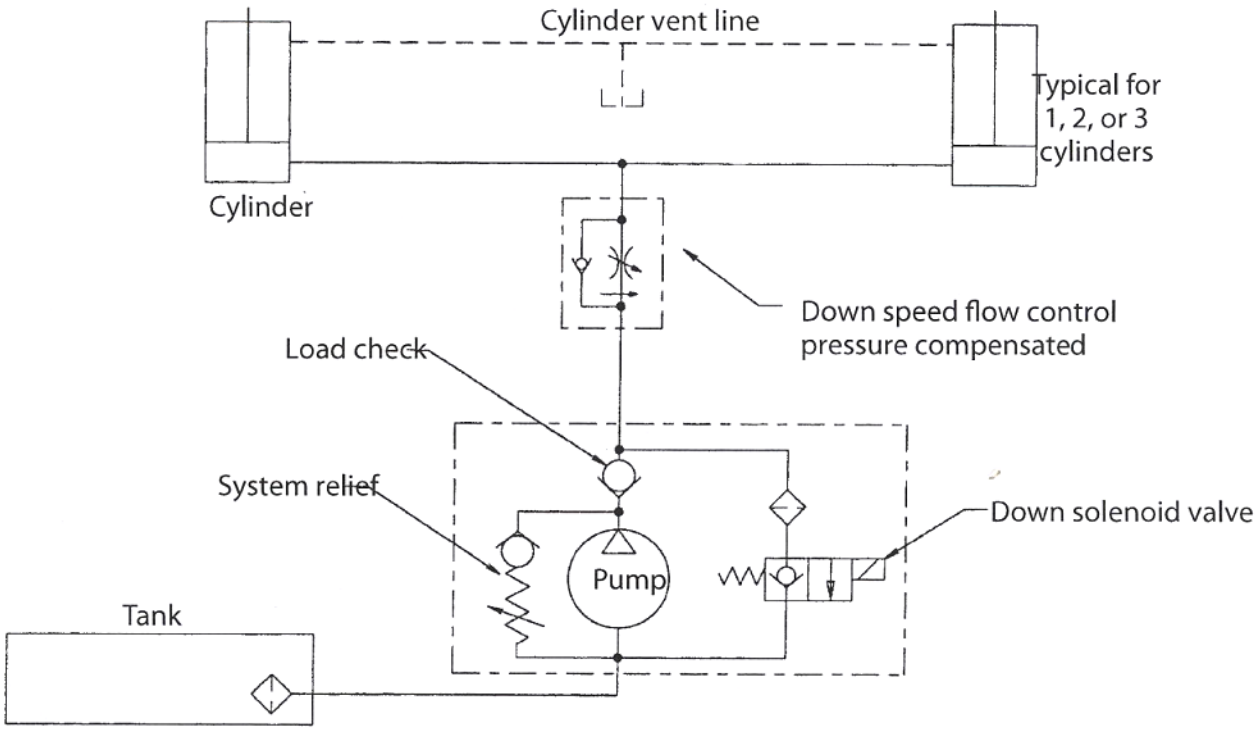


*NOTES:
1. Ground wires from motor, power cord, up limit switch and pushbutton or foot-switch are not shown. Attach all ground wires to the enclosure ground lug.
2. Entry locations for electrical fittings may differ from those shown.



• Hydraulic System Diagram •





• Warranty •

This warranty is in lieu of all other warranties, either expressed or implied.

What is Covered:

This warranty covers equipment manufactured by KCI, Inc. from any defects in materials, workmanship and/or installations performed.

Period of Coverage:

This warranty lasts for a period of two years, electrical component coverage is for one year from the date the product ships, or until the original ownership of the ramp is transferred to another party, whichever comes first. Any repairs or modifications without the express written consent of KCI, Inc. will be grounds to immediately void all or part of this warranty.

What is Not Covered:

This warranty does not cover the following:

1. Accidental damage.
2. Misuse or abuse.
3. Damage caused by adverse weather, disasters, or other forces of nature.
4. Worn out adhesive skid walk.
5. Worn out tires/wheels.
6. Worn out/faded canvas canopies.
7. Any other wear or damage caused by the equipment's general use.
8. Any consequential or incidental damages to include:
    a. Any loss of profit.
    b. Loss by reason of airport or flight line shutdown.
    c. Non-operation or increased expense of operation.
    d. Loss of passengers or business.

What KCI Will Do:

Repair or replace any original part, component or piece of equipment that is found to have defects from time of shipment through the end of the period of coverage.

How to Make a Service Claim:

Provide a claim in writing within the period of coverage to the address listed below or email to msankey@kci.nu. We will then determine if the problem is a defect with the product. Once the nature of the problem is ascertained, we will notify the buyer of our planned resolution. This may include an on-site visit by KCI, Inc. for repairs, or that the buyer ships the defective part or component to us for inspection and replacement at KCI's expense.

KCI GSE Inc.
1718 Antelope Road
White City, Oregon 97503