

VAC-U-LIFT[®]

5600 SERIES

operation, maintenance & parts manual

Model No. _____

Owner _____

P. O. Number _____

Shop Order Number _____

Reference Number _____



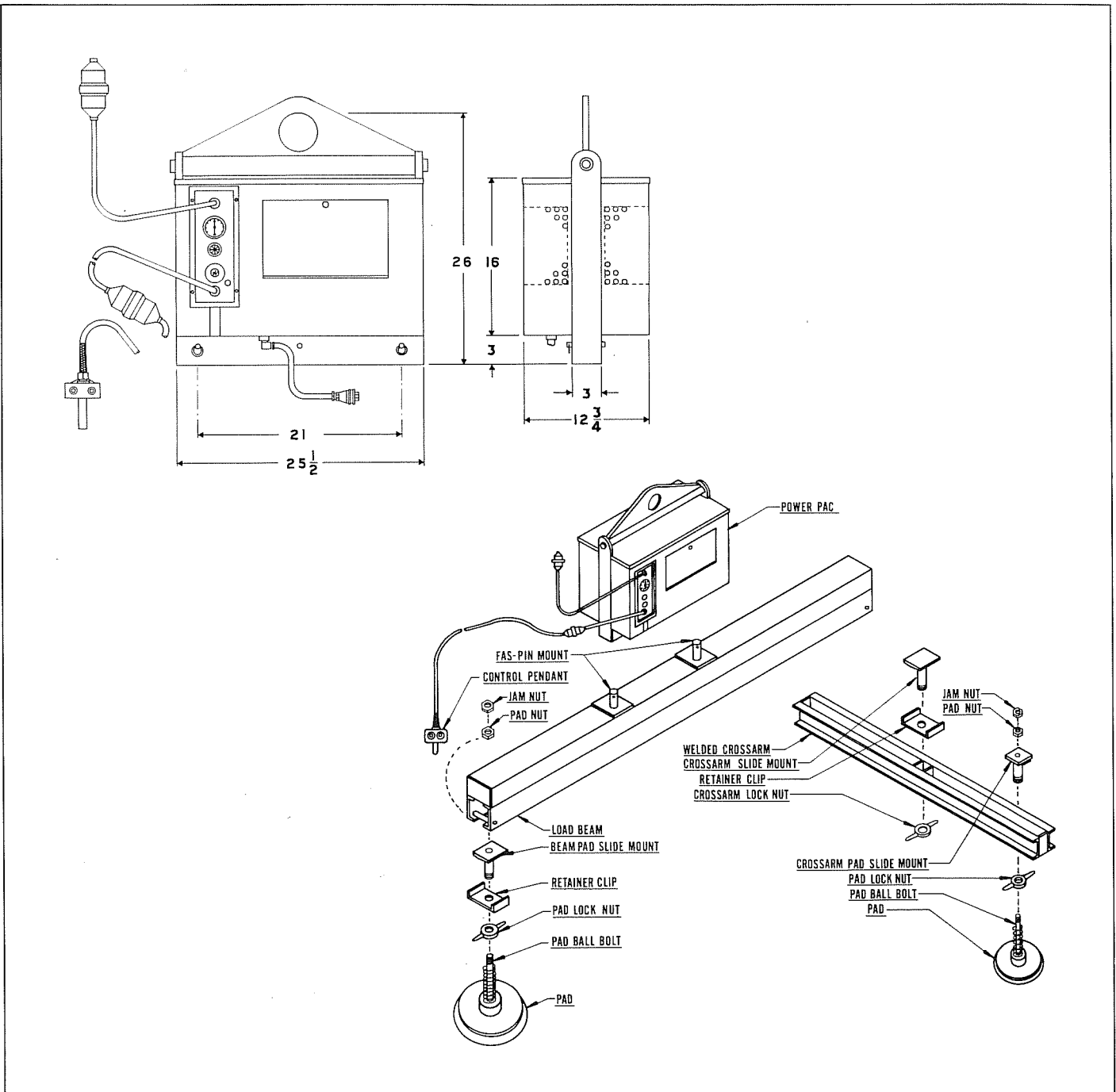
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INTRODUCTION

The Acco 5600 Series Vacuum Lifter has been carefully designed to provide highly-dependable service on a variety of demanding handling applications. The operating instructions included in this manual will help you obtain maximum operating performance and safety from your unit. Reading and following the directions in the maintenance section will ensure that your unit will provide a long and productive service life.



EQUIPMENT DESCRIPTION

5600 Series Lifter

Power Pac

The Power Pac unit supplies and controls the vacuum used to attach the lifting pads to the load material. It houses a vacuum pump vacuum reserve tank, the solenoid-operated main vacuum and vacuum reserve valves and the check valves, as well as the filter, muffler, and the main control panel with its indicators and switches.

The vacuum reserve system is a safety feature which prevents sudden loss of vacuum in the event of a power or equipment failure.

A push-pull, start-stop switch, red and green safety lights, which indicate whether sufficient vacuum has developed for safe lifting, a combination vacuum and pressure gauge to aid in checking performance of equipment and a fuse for the control circuit are mounted on the control panel.

Control Pendant

The control pendant houses a pushbutton, vacuum and vacuum release, to control solenoid-operated main vacuum valve. The vacuum release button is protected by a guard to prevent it from being actuated unintentionally.

Vacuum Lifting Pads

The configuration of the pad (or pads) is specified by the customer at the time of purchase. When more than one pad is used, they are connected in an array by means of a load beam and crossarms.

In multiple-pad configurations, vacuum lines connect all pads to the Power Pac. Hand-operated shut-off valves are included when it is necessary to disconnect certain pads from the vacuum circuit. These valves must be set as described in Step 7 of the Operating Instructions on page 4.

Operating Principles

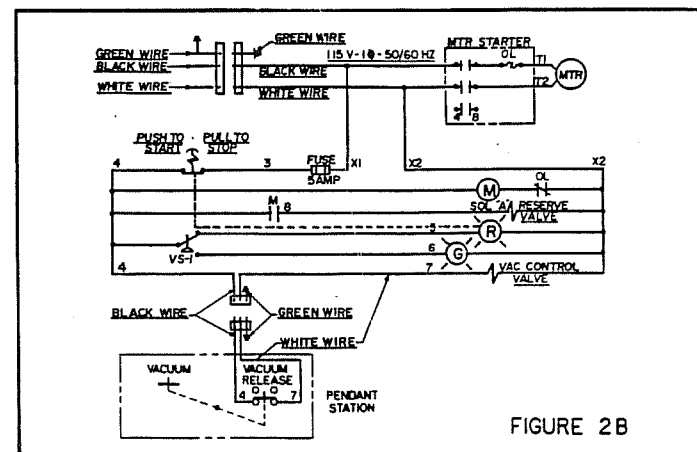
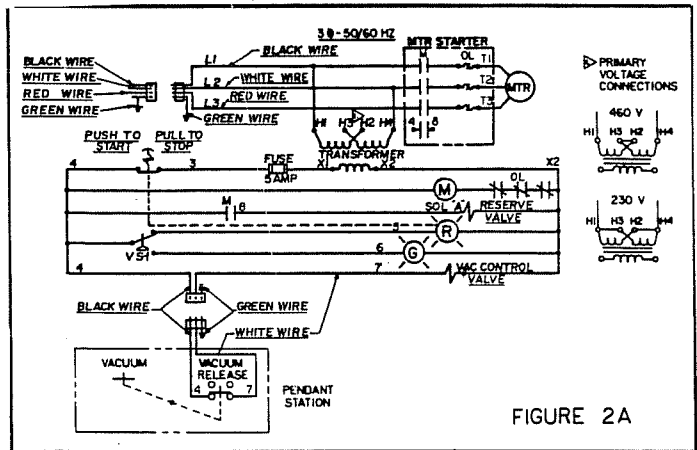
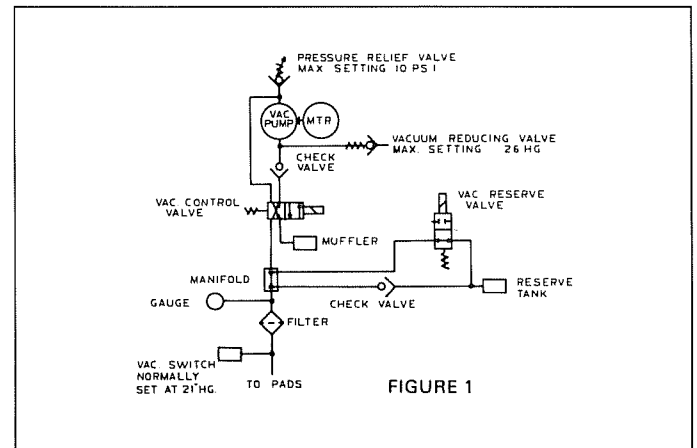
The 5600 Series Lifter is attached to the surface of the load by creating a partial vacuum over the area covered by the pads. Figure 1 depicts the system used to create and control the vacuum. The electrical control system is shown in Figures 2A and 2B.

When the start button on the control panel is in the "on" position and the control pendant is on vacuum, the four-way control solenoid valve is de-energized allowing the vacuum pump to evacuate air from the pads through the filter, the control valve and the check valve. The pump vents the air to the atmosphere through the control valve and the muffler. The check valve prevents air from re-entering the pads should the vacuum pump stop, as in the case of a power failure.

At the same time that air is evacuated from the pads, it is also drawn from the vacuum reserve tank through a second check valve. The vacuum reserve solenoid valve is held in the closed position as long as electrical power is supplied to the unit. If the power is interrupted, however, the solenoid is de-energized, connecting the reserve tank directly to the pad vacuum lines. The vacuum in the pads is thereby maintained for a period of several minutes until power is restored or the load is safely lowered.

To release the vacuum pads from the load once it has been positioned, the pendant control switch is thrown to the VACUUM RELEASE position, energizing the vacuum control solenoid valve. The valve then connects the pad vacuum line to the exhaust side of the vacuum pump and the muffler to the intake (vacuum) side of the pump. This process forces air to the vacuum pads releasing the vacuum and facilitating their removal from the load.

Because the check valve in the reserve tank line prevents air from flowing into the vacuum reserve tank during the release cycle, it is not necessary to re-evacuate the tank each time a load is lifted. The "Attach" time is therefore reduced to a minimum.



Inspection and Testing

Your 5600 Series Lifter should be checked on arrival for shipping damage. Report any such damage to the carrier's agent immediately.

Assembly

Your unit may have been disassembled for shipping. It should be reassembled and checked for loose clamps, vacuum hoses, nuts and bolts.

Testing

Prior to putting the 5600 Series unit in routine operation, read the operating instructions and perform the Proof Load Test described on page 5.

Operating Instructions

- (1.) Connect the power cord to an outlet supplying the proper voltage, phase and cycle; check nameplate on unit for proper voltage, phase and cycle. Any extension power cord used should be of the grounding type to insure operator safety and should be heavy enough to carry the amperes drawn by the Power Pac without excessive voltage drop.
- (2.) If the Power Pac unit is extremely cold, bring it to room temperature before attempting to start it.
- (3.) Open access door on side of Power Pac; locate rotation direction arrow on vacuum pump. Press START/STOP switch on control panel and check rotation of pump. Stop pump and correct if necessary by reversing the wires in the electric outlet receptacle. Check rotation of pump after correction if it was necessary.

CAUTION: If unit is moved to a different location, check pump rotation.

- (4.) Position the pads to support the load evenly, then lower the unit onto the material to be lifted.
- (5.) Turn unit on by pressing START/STOP button on control panel. The red indicator lamp should light.
- (6.) Check the Power Pac for excessive noise or vibration. If the vacuum pump fails to start or if it hums loudly, stop the unit by pulling START/STOP switch on control panel and refer to the troubleshooting section of the manual.
- (7.) If your unit is equipped with hand-operated shut-off valves at each pad, BE CERTAIN to open enough of them to provide sufficient lifting capacity for the intended load. If all of the valves are closed, the red and green indicator lights will give a false indication.
- (8.) Push the START/STOP button on control panel and push the VACUUM button on the control pendant. The vacuum gauge on the control panel will now indicate the system vacuum level in inches of mercury (Hg). The gauge reading will begin to rise. When the vacuum reaches 21" Hg, the green lamp will light. As soon as the green lamp lights, the load may be safely lifted and moved. The gauge reading should continue to increase to 25" Hg or more.

CAUTION: DO NOT attempt to lift the load if the green lamp does not come on even if the vacuum gauge indicates that an adequate vacuum level has been reached. The lights are a more reliable indication of sufficient vacuum than is the gauge.

- (9.) When the load has been lowered into its new position, push the VACUUM RELEASE button on the control pendant. The vacuum will be released and the red lamp will light indicating that the unit is ready to be raised and repositioned on the next load.

Storage

DO NOT store your 5600 Series unit for any appreciable length of time by allowing it to rest on the vacuum pad seals. To do so will shorten the life of the seal rings. The unit must be supported by the load beam or lifting yoke.

Periodic Maintenance

Performing the few simple steps in the following maintenance program will help prolong the life of your 5600 Series Vacuum Lifter and will assure you of the greatest possible operating safety. It is recommended that this schedule be followed as closely as possible.

Daily

Perform Proof Load Test.

Weekly

Clean Vacuum filter and muffler.

Check seal rings, hoses and fittings.

Lubricate load beams and accessories, if required.

Check for loose bolts and nuts as well as structural damage.

Lubricate pad slide valves with one drop of light oil on each side of slide valves and shift valve several times.

Quarterly

Clean vacuum pump chamber by flushing.

The vacuum power unit of your 5600 Series unit requires no lubrication.

**DO NOT ATTEMPT TO LUBRICATE THE MOTOR
OR PUMP ASSEMBLY.**

Performing Proof Load Test

The Proof Load Test should be conducted daily to verify that the vacuum lifter safety features are operating properly. In effect, the test simulates an electrical power failure so that the performance of the vacuum reserve system can be checked:

- (1.) Position the 5600 Series Lifter over a sheet of non-porous material such as steel or aluminum.
- (2.) Adjust the crossarms and the vacuum pads to properly support the load.
- (3.) Lower the unit onto the material so that all pads make contact. If the pads are equipped with shut-off valves, they should all be set to the "vacuum on" position.
- (4.) Start unit by pushing the START-STOP switch on control panel and push the VACUUM pushbutton on the control pendant.
- (5.) Wait until the red lamp goes out and the green lamp lights, indicating that it is safe to lift the load. Note the reading of the vacuum gauge. It should stabilize at 25" Hg or greater.
- (6.) Lift the vacuum unit and the material so that the load is between 1 and 2 inches above its rest position.
- (7.) Simulate a power failure by pulling the START-STOP switch on the control panel. Observe the vacuum gauge. If the reading drops more than 1" Hg in two (2) minutes, there is a leak in the vacuum system. Refer to the troubleshooting section of this manual for guidance in locating leaks.

Flushing Vacuum Pump Chamber

After a period of time, foreign material will collect in the pump chamber. Periodic flushing of the pump will remove most of this trapped material. To flush the pump of dirt, remove the two hoses leading from the vacuum pump to the control valve at the control valve. (Refer to Power Pac parts numbers 72 and 73, page 13.) While pump is running, permit several teaspoonsful of solvent to be drawn into pump at intake. After all the solvent has passed through the pump, replace hoses. Recommended cleaning solvents are: Loctite Safety Solvent, Inhibisol Safety Solvent, Dow Chemical Chlorathane.

Cleaning Filter and Muffler

It is important to keep both the filter and the muffler clean and in good condition to prevent dirt, moisture and oil vapor from entering the pump chamber. The presence of any of these foreign materials can interfere with the action of the pump vanes or even cause them to break. In addition, maximum system performance can be attained only when the filter is kept clean, as a clogged filter will impede the flow of air into the pump.

The filter should be cleaned weekly whether or not it looks dirty. Microscopic particles can completely block the sintered bronze element without leaving any visible evidence. The condition of the filter can be checked by starting the vacuum pump and throwing the vacuum control switches to the VACUUM ON position with no material attached to the pads. The vacuum gauge should read less than 5" Hg. If the reading is higher, the filter element should be cleaned or replaced.

Since the muffler serves as an intake filter when the unit is in the VACUUM OFF condition, it is equally important that it be kept clean and properly attached.

The bronze and felt elements of the filter and muffler may be cleaned by washing them in methanol alcohol and blowing them dry with compressed air. The filter and muffler bowls should be washed in soap and water.

Component Description

The paragraphs which follow provide data on the components and sub-assemblies which make up your 5600 Series unit. Instructions for performing adjustments and repairs are included.

1.0 Main Vacuum System

1.1 Vacuum Pump: The vacuum pump incorporated in your 5600 Series lifter is a rotary-vane, oil-less pump. It is designed for continuous duty under full vacuum. Operating temperatures up to 230° F are normal. NEVER LUBRICATE THE PUMP. The carbon vanes and sealed motor bearings require no oil.

The vacuum pump vanes are made of hard carbon and are precision ground. They should last 5,000 to 10,000 hours, depending upon the vacuum level at which the pump is run. Routine cleaning and checking of the filter and muffler as well as periodic flushing of the pump chamber will help prolong vane life (see the preceding section on periodic maintenance).

The four vanes can readily be replaced by removing the end plate shroud and exchanging new for worn or broken vanes. Use compressed air to clean out the pump chamber prior to inserting new vanes, especially if one of the old vanes has broken.

Sometimes when a vane breaks, a piece will wedge between the top of the rotor and the body, opening the top clearance. The clearance, which should be .004", may be checked with a feeler gauge. The rotor should be turned while the clearance is being checked so that all points of the circumference will clear. To reduce the top clearance to .004", tap VERY LIGHTLY on the top of the body with a miniature hammer.

Never remove the rotor. DO NOT loosen the bolts on either the body or mounting brackets as this will alter the preset clearance between the rotor and these parts.

1.2 Four-way Control Valve: The vacuum to the pads is controlled by a four-way solenoid valve which is connected as follows:

- Port 1 — To pump exhaust
- Port 2 — To pump inlet
- Port A — To pad line
- Port B — To muffler

As a safety feature, the valve is in the VACUUM ON position when the solenoid is de-energized. The valve is energized by the VACUUM RELEASE position on the control pendant. The exhaust air of the vacuum pump is then forced into the line to the pads supplying the air pressure required for a quick release.

1.3 Pressure Relief Valve: This valve is located on the exhaust side of the vacuum pump between the pump and the four-way control valve. Its purpose is to prevent pressure build-up at the pump. This condition can occur during the VACUUM OFF cycle if all of the pad valves are closed or if the filter or vacuum line is clogged. This valve should not be set to release at a pressure greater than 10 psi.

1.4 Check Valve: One of the two check valves used in the 5600 Series is located between the vacuum pump intake port and the four-way valve. It is installed so as to permit air to be pumped from the vacuum line system but to prevent

air from entering the system when the vacuum pump is not running.

1.5 Filter and Muffler: The vacuum filter is located in the vacuum line between the pads and the four-way control valve. It prevents dirt and foreign matter from entering the vacuum pump and valves.

The muffler serves two purposes. During the VACUUM ON cycle, it reduces the noise of the vacuum pump exhaust. In the VACUUM OFF condition, it filters the air entering the pump.

It is very important to keep both the filter and the muffler clean and in good condition to insure maximum system efficiency and long pump life. Instructions for filter and muffler maintenance may be found in the preceding section on periodic maintenance.

1.6 Three-way Hand-operated Shut-off Valves: Hand valves, located on or very near each vacuum pad, are provided when it is necessary to shut off certain pads from the circuit. In most cases, the valve is a three-way type so that the pad can be connected to either the vacuum system or an open port. This feature provides an escape for the slight vacuum formed in the pad when it is lowered onto the material and, thereby, prevents the unused pads from sticking to the load during the release cycle.

1.7 Vacuum Reducing Valve: This valve is located on vacuum side of pump and is set at 26" Hg. Its purpose is to prolong the useful life of the vacuum pump.

2.0 Vacuum Reserve System

2.1 Reserve Tank: The vacuum reserve system is provided to insure a source of vacuum to the pads for a reasonable length of time after a power or pump failure. The reserve tank is evacuated to full vacuum each time a load is lifted.

2.2 Check Valve: The second check valve in the 5600 Series is connected between the vacuum reserve tank and the vacuum line system in such a way that air can be evacuated from the tank during the VACUUM ON cycle, but cannot re-enter the tank when the lines are pressurized during the VACUUM OFF cycle. The reserve tank, therefore, does not have to be completely evacuated each time a load is lifted, cutting down the length of time needed to attach the pad to the load.

2.3 Vacuum Reserve Valve: The check valve is paralleled by a solenoid-actuated two-way valve which is connected as follows:

- Port marked "IN" — To tank
- Port marked "OUT" — To vacuum supply

When energized, the valve is held in the closed position. The solenoid is fed directly from the vacuum pump power line so that in case electrical power to the vacuum pump is lost, the valve will open, connecting the vacuum reserve tank to the pad vacuum circuit.

3.0 Control and Monitoring System

3.1 Switches: A PUSH-PULL, START-STOP switch is mounted on the control panel which starts and stops the unit. A VACUUM ON, VACUUM RELEASE switch is mounted in the control pendant which controls vacuum to the pads.

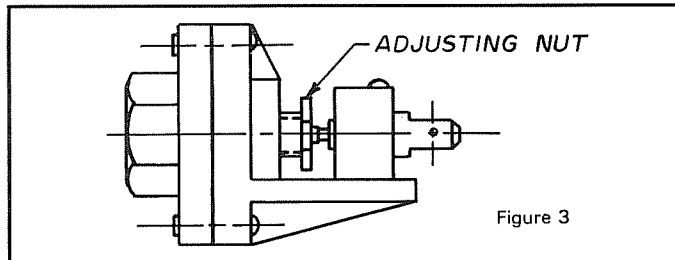
3.2 Fuses: A five (5) ampere fuse is mounted on the control panel. This protects the control circuit. Power for the vacuum reserve valve is fed through this fuse so that if the fuse blows, the reserve valve will open, connecting the vacuum reserve tank to the pad vacuum line.

3.3 Indicator Lights, Vacuum Switch and Vacuum Gauge: Both a vacuum gauge and a pair of indicator lights are provided to indicate the vacuum level. The vacuum gauge serves as a diagnostic instrument during testing and maintenance of the unit and provides a means of checking vacuum level during a power failure.

The red and green indicator lights are actuated by a vacuum switch connected to the pad vacuum line. When the vacuum level reaches 21" Hg, the vacuum switch disconnects the red light from the power line and connects the green light to indicate that sufficient vacuum has developed for lifting.

The vacuum switch, shown in Figure 3, may be adjusted, if necessary, to switch the lights at the correct vacuum level. Adjustment is made by turning the nut which has been indicated with an arrow in the drawing.

Before adjusting the switch, remove the vacuum filter element. A partially plugged filter will cause the gauge to indicate a higher vacuum level than that at the vacuum switch. If adjusted under this condition, the switch will trip at a level which is too low for sufficient capacity to lift the load.



Troubleshooting and Repairs

Troubleshooting is always easier if one has a good understanding of how the equipment is intended to operate. A review of the 5600 Series Lifter operating principles can be found on page 3. Piping and wiring diagrams, which should be useful in servicing this unit, are also shown.

1.0 Testing for Leaks

To insure safety, a Proof Load Test (see page 5) should be performed on your 5600 Series Lifter daily. If it fails, there is a leak somewhere in the vacuum system.

The location of the leak can most readily be determined by a process of elimination. The Power Pac itself is checked first; if it tests good, other sections of the vacuum system are connected one-at-a-time until the leaky section is found.

Disconnect the vacuum hose connecting the Power Pac to the load beam (or the vacuum pad in single pad systems). Insert a plug in the open port leading to the vacuum power unit. Perform the power-off vacuum test in the same manner

as outlined for the Proof Load Test: start the pump, switch the vacuum on and allow the gauge reading to increase to 25" Hg or higher. Then, stop the pump and observe the gauge. If the reading drops more than 1" Hg in two minutes, the leak is located in the Power Pac. If not, the leak is in the piping to the vacuum pads or in the pads themselves.

If the leakage is in the external piping, reconnect the hose to the load beam assembly. Disconnect the hose leading to one end of the assembly and plug the open end. Repeat the power-off vacuum test. If leakage is still indicated, the leak is in the end of the load beam assembly just tested. If not, it is in one of the pads or crossarms of the end which has been disconnected. Continue the process of elimination until the location of the leak is pinpointed.

The following components should be checked as possible sources of vacuum leaks:

- 1.) Seal rings — Check for cracks, cuts or other damage.
- 2.) Vacuum pads — Check for cracks and loose bolts.
- 3.) Vacuum hoses — Check for breaks, cuts or pinch marks.

2.0 Tracing Power Pac Vacuum Leaks

If the tests have shown that leakage is occurring within the Power Pac itself, the same process of elimination may be used to trace the problem to its source. As before, a power-off vacuum test is performed as each portion of the vacuum system is disconnected. Refer to the Power Pac drawings and parts list on page 12.

Disconnect the vacuum hose which connects the aluminum manifold to the vacuum filter by unscrewing the hose stem from the manifold. Plug the open port in the manifold and conduct a power-off vacuum test. If the vacuum reading holds nearly constant, the leak is in the vacuum filter, vacuum switch or interconnecting piping.

2.1 Filter Leak: The filter may sometimes leak because of a damaged or improperly positioned O-ring between the body and the filter bowl. The pet cock should also be checked for tightness.

2.2 Check Valve: The CV3 check valve and the four-way control valve located between the vacuum pump and the filter can be tested by starting the pump and allowing full vacuum to build up. Stop the pump and place a hand over the open part of the muffler. If any vacuum draw can be felt, one of the two valves is defective. In most cases, the check valve will be at fault.

2.3 Threaded Connections: All threaded connections should be drawn up tight using pipe dope. Care should be taken to prevent pipe dope and other foreign materials from entering the vacuum system.

5600 Series Troubleshooting Guide

INTRODUCTION

Successful troubleshooting involves, first, careful observation of the symptoms and then elimination, one by one, of the possible causes of the trouble. The following table provides a logical approach to troubleshooting procedures on your 5600 Series Vacuum Lifter. It is intended as a starting point to help isolate damaged or defective parts or improper operating procedures. The paragraph numbers shown in the right-hand column of the table refer to the paragraphs under "Component Description" on page 6, where you will find detailed information on the component in question.

NOTE: See procedure on testing for leaks described on page 7.

TROUBLE	CAUSE	REMEDY	See Paragraph Number Under Component Description
1. Vacuum pump will not run	1. No power to unit 2. Blown fuse 3. Defective on-off switch 4. Loose or damaged wiring 5. Defective pump 6. Defective motor 7. Unit extremely low temperature	1. Check power source voltage and frequency. 2. Check and replace if needed. 3. Check and replace if needed. 4. Make visual or meter check. 5. Check vacuum pump. 6. Return vacuum pump for repairs. 7. Bring unit to room temperature before starting.	 3.2 3.1 1.1 1.1
2. Vacuum pump runs hot (above 230 degrees)	1. Excessive foreign matter in pump 2. Worn vanes 3. Pump vanes hanging up 4. Low incoming voltage	1. Flush pump assembly. Replace vanes if necessary. 2. Replace vanes. 3. Check vanes and replace if necessary. Flush pump assembly. 4. Check and correct as required.	 1.1 1.1 1.1
3. No or low vacuum reading on vacuum gauge No or low vacuum (cont.)	1. Improper vacuum pad seal 2. Clogged filter or muffler 3. Damaged vacuum pad or seal rings 4. Defective gauge 5. Loose or damaged hoses or fittings 6. Clogged vacuum lines 7. Clogged or damaged gauge line	1. Make visual check. 2. Check, clean or replace as required. 3. Make visual check. 4. Check or replace as required. 5. Make visual check and repair or replace as required. 6. Check and clean as required. 7. Check, clean or replace as required.	 1.5 3.3

**See Paragraph
Number Under
Component
Description**

TROUBLE	CAUSE	REMEDY	See Paragraph Number Under Component Description
	8. Porous material 9. Defective 4-way control valve 10. Pump vanes hanging up 11. Defective pump 12. Loose Vacuum reducing valve	8. Check unit on non-porous material such as steel, aluminum. 9. Check, clean or replace as required. 10. Flush pump assembly. Replace vanes, if necessary. 11. Return pump for repair. 12. Reset to 26" Hg.	1.2 1.1 1.1 1.7
4. Red lamp will not light	1. Burned out bulb 2. Blown fuse 3. Defective vacuum switch 4. Loose or damaged wiring 5. Vacuum switch not properly adjusted	1. Check and replace, if needed. 2. Check and replace, if needed. 3. Check and replace as required. 4. Check and replace as required. 5. Check and adjust, as needed.	3.3 3.2 3.3 3.3 3.3
5. Green lamp will not light	1. Burned out bulb 2. Blown fuse 3. Defective vacuum switch 4. Loose or damaged wiring 5. Vacuum switch not adjusted properly 6. Unit remained on "Vacuum Off" cycle 7. All items listed under: "3. No or low vacuum reading on vacuum gauge" (except items No. 4 and No. 7)	1. Check and replace, if needed. 2. Check and replace, if needed. 3. Check and replace, as required. 4. Check or replace as required. 5. Check and adjust as needed 6. (See Trouble No. 7) Unit remains on "Vacuum Off" cycle.	3.3 3.2 3.3 3.3 3.3
6. Unit remains in "Vacuum On" cycle	1. Blown fuse 2. Loose or damaged wiring 3. Defective 4-way control valve coil 4. 4-way control valve hanging up 5. Defective vacuum on-off pushbuttons	1. Check and replace if needed. 2. Check and replace as required. 3. Check and replace as required. 4. Check, clean or replace as required. 5. Check and replace as required.	3.2 1.2 1.2
7. Unit remains in "Vacuum Off" cycle	1. Vacuum on-off switch left in the "Vacuum Off" position 2. 4-way control valve hanging up 3. Defective vacuum on-off pushbuttons 4. Short in wiring	1. Switch to the vacuum on position. 2. Check, clean or replace as required. 3. Check and replace as required. 4. Check and correct.	1.2

See Paragraph
Number Under
Component
Description

TROUBLE	CAUSE	REMEDY	See Paragraph Number Under Component Description
8. Excessive attach time	<ol style="list-style-type: none"> 1. Clogged filter or muffler 2. Improper vacuum pad seal 3. Damaged vacuum pad or seal rings 4. Clogged, loose or damaged hoses or fittings 5. Loose or damaged wiring on vacuum reserve valve 6. Defective vacuum reserve valve or check valve 7. Defective 4-way control valve 8. Vacuum pump vanes hanging up 9. Worn vacuum pump 10. Porous material 	<ol style="list-style-type: none"> 1. Check, clean or replace as required. 2. Make visual check. 3. Check for cracks, loose or broken bolts, cut or torn seal rings, or excessive seal ring wear. 4. Clean or replace as required. 5. Check or replace as required. 6. Check, clean or replace as needed. 7. Check, clean or replace as required. 8. Check and replace vanes if necessary. Flush pump assembly. 9. Replace vanes or entire pump as needed. 10. Test unit on non-porous material such as steel or aluminum. 	<p>1.5</p> <p>2.3</p> <p>2.3</p> <p>1.2</p> <p>1.1</p> <p>1.1</p>
9. Excessive release time	<ol style="list-style-type: none"> 1. Clogged filter or muffler 2. Clogged, loose or damaged hoses or fittings 3. Loose or damaged wiring on vacuum reserve valve 4. Defective vacuum reserve valve or check valve 5. Defective 4-way control valve 6. Vacuum pump vanes hanging up 7. Worn vacuum pump 8. Loose Pressure Relief 	<ol style="list-style-type: none"> 1. Check, clean or replace as required. 2. Make visual check. 3. Check or replace, as required. 4. Check, clean or replace as required. 5. Check, clean or replace as required. 6. Check vanes and replace if necessary. Flush pump assembly. 7. Check and replace vanes or entire pump as needed. 8. Reset or replace 10 P.S.I. 	<p>1.5</p> <p>2.3</p> <p>2.2 2.3</p> <p>1.2</p> <p>1.1</p> <p>1.1</p>
10. Unit blows fuse	<ol style="list-style-type: none"> 1. Low incoming voltage 2. Short in the electrical circuit 3. Clogged filter or muffler 4. Pressure relief valve set above 10 P.S.I. 5. Vacuum pump freezing up 	<ol style="list-style-type: none"> 1. Check and correct as required. 2. Check and correct as required. 3. Check, clean or replace as required. 4. Check and adjust as required. 5. Check for broken vanes or foreign matter in assembly. 	<p>1.5</p> <p>1.3</p> <p>1.1</p>

TROUBLE	CAUSE	REMEDY	See Paragraph Number Under Component Description
11. Excessive vacuum loss during a Proof Load Test Procedure		1. See Proof Load Test Page 3	
12. Noisy vacuum pump	1. Sticking vane	1. Allow pump to run for a short period. If noise continues, replace vane.	1.1

MAINTENANCE SCHEDULE/REPAIR PARTS ORDERS

Date	Maintenance	By

PARTS ORDER RECORD

Part No.	Description	Quantity	By	Date

Parts List and Ordering Information

INTRODUCTION

Replacement parts for your 5600 Series Vacuum Lifter and further service information may be obtained from:

Parts Manager
Acco Industries Inc.
Industrial Lifters Division
P. O. Box 298
Salem, Illinois 62881
Phone: 618/548-0275

Be sure to include the description of the part and its part number, if any, as well as serial number of your 5600 Series Lifter.

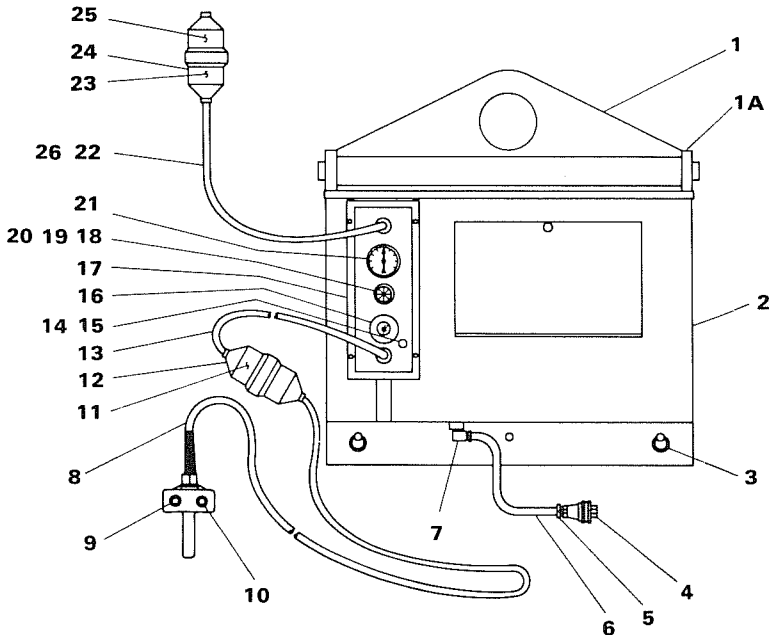
In the parts lists which follow, those parts of an assembly for which no stock number is given cannot be ordered separately from the assembly itself.

Recommended Spare Parts List of Power Pac

REF. NO.	DESCRIPTION	PART NO.	QTY.	REF. NO.	DESCRIPTION	PART NO.	QTY.
1.	(a) Motor and Vacuum Pump 115/230 Volts, Single-phase Only	31121	1	7.	Filter Element Kit	28464	2
	(b) Motor and Vacuum Pump 230/460 Volts, 3-phase	31119	1	8.	Muffler Element — Felt	26168	2
2.	Vanes — Vacuum Pump	26459	4	9.	Check Valve	27554	1
3.	Vacuum Gauge	28609	1	10.	4-Way Control Valve Coil	27079	1
4.	Fuse Mount Assembly	22498	1	11.	4-Way Control Valve Spool Assembly	27284	1
5.	Switch — Start/Stop	22834	1	12.	Vacuum Switch	22883	1
6.	Green Light Assembly	22593	1	13.	Fuse MTH-5	22490	2
				14.	Light Bulb	22192	2
				15.	Reserve Valve Coil	27038	1

Control Pendant and Power Pac External Parts

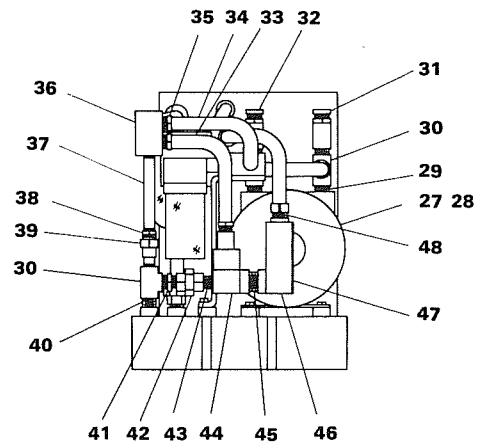
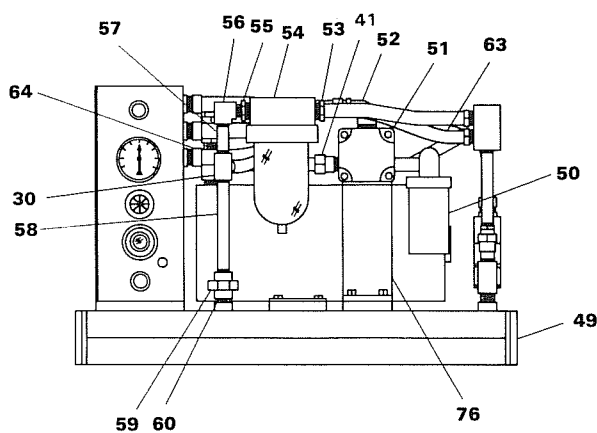
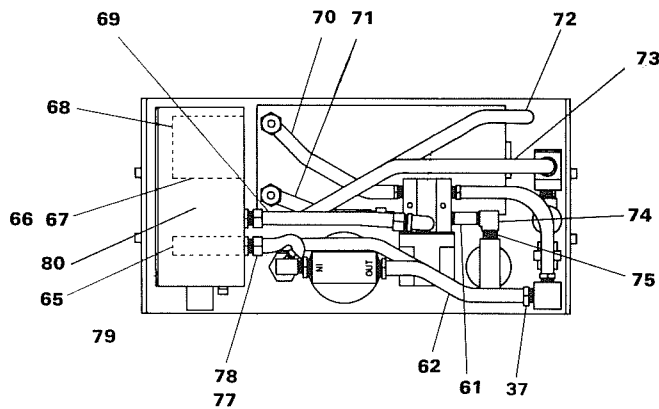
REF. NO.	PART NO.	DESCRIPTION	QTY.
1	29118	Bail	1
1A	29117	Yoke	1
2	28301	Cover	1
3	28484	Faspin	2
4	28393	Quick Disconnect Socket	1
4A	28394	Quick Disconnect Plug	1
5	28920	Hose Stem	2
6	29181	3/8" Vacuum Hose x 36"	1
7	28407	Elbow	1
8	22730	Pendant Complete	1
9	22849	Pushbuttons	1
10	22558	Thumb Guard	1
11	23848	Connector (Pendant)	1
12	23850	Boot	1
13		Cable 16-3 x 3 ft.	1
14	22498	Fuse Mount	1
15	22490	Fuse 5 Amp.	1
16	22834	Pushbutton	1
17	28304	Cover	1
18	22593	Green Light	1
19	22005	Adapter	1
20	22192	Bulb	1
21	28609	Vacuum Gauge	1
22		Cable 16-3 x 3 ft. (115 Volts Only)	1
23	23841	Plug 115 Volt 1 PH. 60HZ.	1
	23843	Plug 240 Volt 3 PH. 60 HZ.	
	23845	Plug 480 Volt 3 PH. 60HZ.	
24	23851	Boot (115 Volt)	2
	23852	Boot (230 and 460 Volt)	2
25	23842	Connector 115 Volt 1 PH. 60HZ.	1
	23844	Connector 240 Volt 3 PH. 60HZ.	1
	23846	Connector 480 Volt 3 PH. 60HZ.	1
26		Cable 14-4 x 3 ft. 230-460V	1



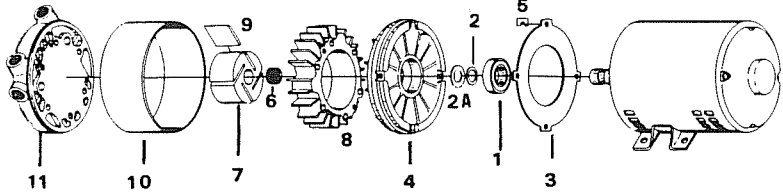
POWER PAC INTERNAL PARTS

REF. NO.	PART NO.	DESCRIPTION	QTY.
27	31121	Vacuum Pump (115/230 Volts, 1-phase)	1
28	31119	Vacuum Pump (230/460 Volts, 3-phase)	1
29	28701	3/8" All Thread	2
30	29013	3/8" Pipe Tee	2
31	26428	Relief Valve (Pressure)	1
32	26431	Relief Valve (Vacuum)	1
33	29181	3/8" Vacuum Hose x 8"	1
34	29181	3/8" Vacuum Hose x 11"	1
35	28916	1/4" Pipe x 3/8" Hose Stem	4
36	28643	Manifold	1
37	28655	1/4" Pipe Nipple x 5-1/2"	1
38	22203	Bushing	1
39	27554	Check Valve	2
40	28701	3/8" All Thread	1
41	21036	3/8-1/4" Reducing Nipple	1
42	29079	Union	1
43	28700	1/4" All Thread	1
44	27863	Valve Reserve	1
45	22708	1/2" NPT Conduit All Thread	1
46	22452	Fitting	1
47	22413	Cover	1
48	22363	Cord Grip	1
49	28989	Reserve Tank	1
50	26266	Muffler	1
51	27639	Control Valve	1
52	22395	Cord Grip	1

REF. NO.	PART NO.	DESCRIPTION	QTY.
53	28922	1/2 Pipe-3/8" Hose Stem	1
54	28518	Filter	1
55	21037	1/2-3/8 Reducer	1
56	21140	Elbow	1
57	28669	3/8" Nipple x 3"	1
58	28671	3/8" Nipple x 5"	1
59	29081	3/8" Union	1
60	28701	3/8" All Thread	1
61	28659	3/8" Nipple x 2"	1
62	29181	3/8" Vacuum Hose x 9"	1
63	29180	1/4" Vacuum Hose x 13"	1
64	22367	Cord Grip	4
65	22883	Vacuum Switch	1
66	22817	Starter (115 230 Volt Single Phase Only)	1
67	22823	Starter	1
68	22944	Transformer (Used on 230/460 Only)	1
69		#14-2 Wire x 24" Long	1
70	29181	3/8" Vacuum Hose x 8" Long	1
71	29181	3/8" Vacuum Hose x 5" Long	1
72		#14-3 Wire x 43" Long	1
73		#14-2 Wire x 33" Long	1
74	21140	3/8" Pipe Elbow	1
75	28701	3/8" Pipe All Thread	1
76	28114	Bracket	1
77	22461	1/4" x 1/4" Bulkhead Fitting	1
78	28908	1/4" N.P.T. x 1/4" Hose Stem	2
79	28700	1/4" Pipe All Thread	1
80	22612-N11	Heater Coil (460V 3PH 60HZ)	3
	22620-N19	Heater Coil (230V 3PH 60HZ)	3
	22627-N26	Heater Coil (230V 1PH 60HZ)	2
	22633-N32	Heater Coil (115V 1PH 60HZ)	2

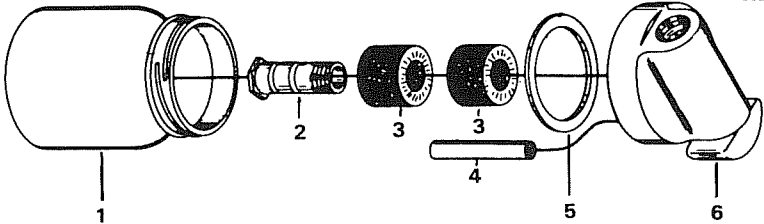


VACUUM PUMP



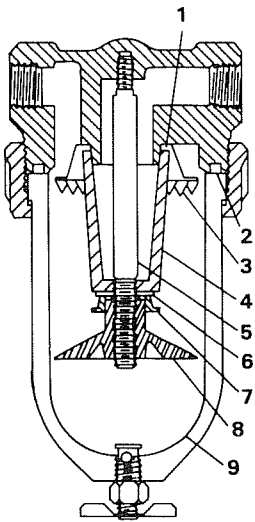
REF. NO.	PART NO.	DESCRIPTION	QTY.
0	31121	Complete Motor and Pump (110/230 Volts, 1-phase Only)	1
0	31119	Complete Motor and Pump (230/460 Volts, 3-phase)	1
1		Bearing	1
2		Spacer	1
2A		Deflector	1
3		Inlet Ring	1
4		Bracket	1
5		Shim	1
6		Tolerance Ring	1
7		Rotor	1
8		Body	1
9	26459	Vane	4
10		Shroud	1
11		End Plate	1

MUFFLER



REF. NO.	PART NO.	DESCRIPTION	QTY.
0	26266	Complete Muffler	1
1	26241	Jar	1
2		Felt Support	1
3	26168	Felt	2
4		Tube	1
5		Gasket	1
6		Body	1

FILTER



REF. NO.	PART NO.	DESCRIPTION	QTY.
0	28518	Complete Filter	1
1		Top Gasket	1
2		Bowl Gasket	1
3		Deflector	1
4		Filter Cone	1
5		Retaining Rod	1
6		Base Gasket	1
7		Secondary Baffle	1
8		Primary Baffle	1
9		Bowl & Drain	1
10	28464	Filter Cone Assy. Ref. #1, 4, 6	1
11	28103	Bowl & Drain Assy. Ref. #2, 9	1

4-WAY VALVE PARTS

REF. NO.	PART NO.	DESCRIPTION	QTY.
0	27639	Complete Valve	1
1	27079	Solenoid Coil	1
2	27237	Solenoid Complete	1
3		Cover Gasket	1
4	27006	Base (Side Ported)	1
5	28558	Gasket (Body to Base)	1
6		Stem Return Spring	1
7	27284	Stem Assembly	1

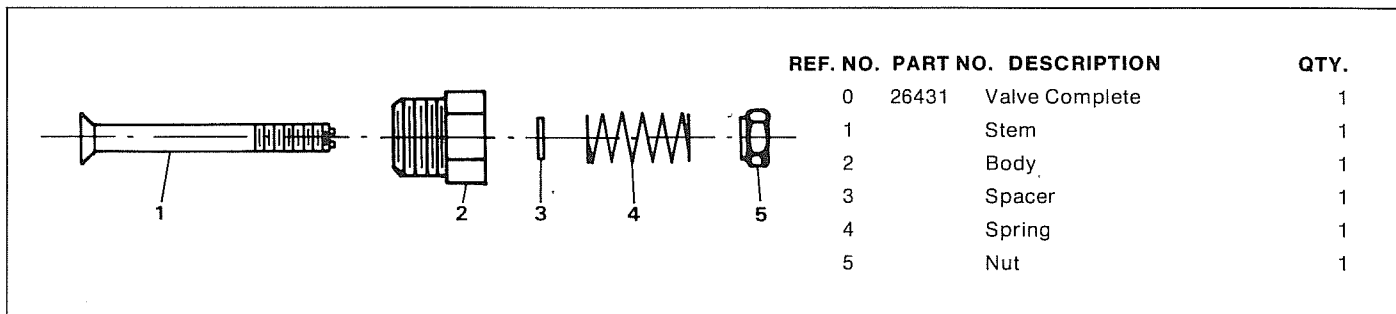
VACUUM RESERVE VALVE

REF. NO.	PART NO.	DESCRIPTION	QTY.
0	27863	Valve Complete	1
1		Adapter	1
2		Sleeve Nut	1
3		Housing Nut	1
4		Nameplate	1
5		Coil Housing	1
6	27038	Coil	1
7		Sleeve Assembly	1
8		Plunger Spring	1
9		Plunger	1
10		Flange Seal	1
11		Body	1

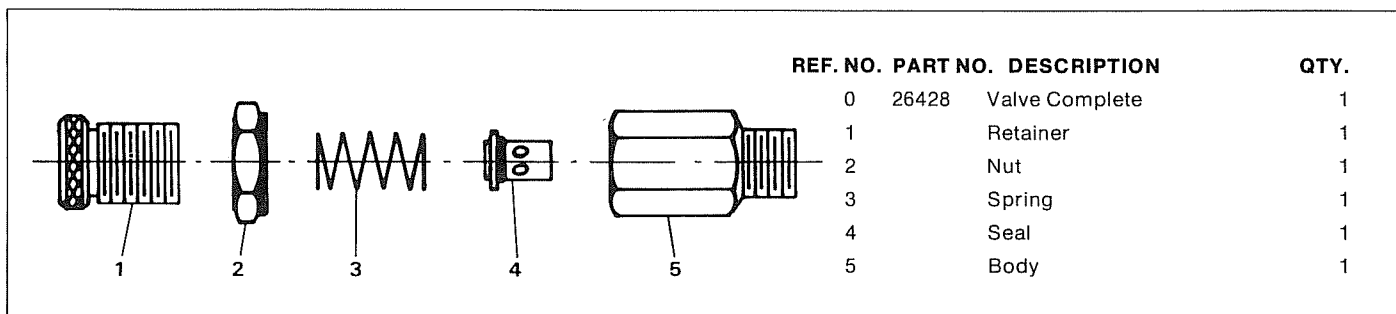
CV-3 CHECK VALVE PARTS

REF. NO.	PART NO.	DESCRIPTION	QTY.
0	27554	Complete Valve	1
1		Body	1
2		Poppet	1
3		Spring	1
4		Retainer	1
5		Snap Ring	1

VACUUM RELIEF VALVE



PRESSURE RELIEF VALVE



Acco Industries Inc.

A Subsidiary of Babcock International Inc.

Industrial Lifters Division

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