

# INDEX

<b>1.</b>	<b>SAFETY PROCEDURES</b>	
	<b>1.1 Safe Handling.....</b>	<b>3</b>
	<b>1.2 Air Motor Operation.....</b>	<b>3</b>
<b>2.</b>	<b>Lubemaster Overview.....</b>	<b>5</b>
<b>3.</b>	<b>Key Operating Check Points.....</b>	<b>9</b>
<b>4.</b>	<b>Full Operating Instructions.....</b>	<b>11</b>
	4.1. Connecting Power & Hoses	11
	4.2. Setting Suction and Return	13
	4.3. Starting Machine	14
	4.4. Post Start, Checks & Settings	15
	4.5. Cleaning Centrifuge Rotor	19
	4.6. Cleaning Machine to Change Oil Type	25
	4.7. Servicing Suction Strainer	26
	4.8. Setting pump pressure	26
<b>5.</b>	<b>Parts List.....</b>	<b>27</b>



## LUBEMASTER OS200A

## 1.1 SAFE MOVING PROCEDURE

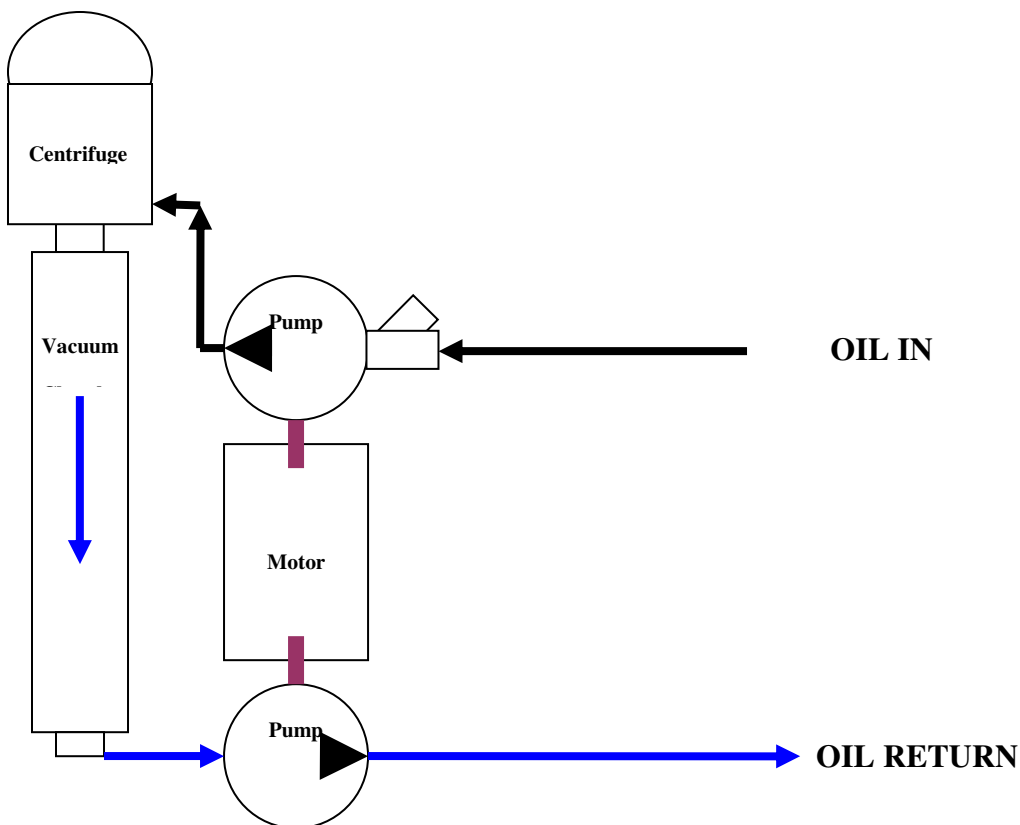
**BE SURE HOSES ARE DISCONNECTED AND ROLLED UP BEFORE MOVING THE MACHINE**

**TAKE CARE WHEN HANDLING THE ROTOR AS ANY DAMAGE CAN CAUSE AN IMBALANCE - IT IS A HIGHLY BALANCED APPARATUS.**

**YOUR LUBEMASTER MACHINE IS DESIGNED ONLY TO BE MOVED ON SMOOTH SURFACES.**

**DO NOT ATTEMPT TO WHEEL THE MACHINE OVER ROUGH GROUND AS IT COULD TIP OVER CAUSING STRUCTURAL DAMAGE.**

**OIL FLOW DIAGRAM -**



## **1.2 MOTOR OPERATION**

Check oil level daily on the auto lubricator on the back of the machine and refill if necessary.

Check that oil is feeding to the air supply via the drip indicator/adjustment on the top of the reservoir.

Lubricator should be set to drip at approximately but not more than 1 drop per minute.

If low, fill with clean 10w grade oil. Take care as any contamination entering will block the drip supply preventing oil from entering the air supply and lubricating the motor.

Check air supply filter for cleanliness and drain trapped water from the bowl.

Feel the motor daily and become familiar with the operating temperature and check that it is not rising abnormally.



**Oil Fill Port**

**Lubricator, check oil level daily  
& top up when needed with 10w  
grade oil**

## **2 LUBEMASTER OVERVIEW**

Thank you for choosing the Lubemaster centrifuge/vacuum dehydration oil cleaning system. Your system is designed to give simple trouble-free operation over long periods with very low maintenance requirements and minimal operating costs.

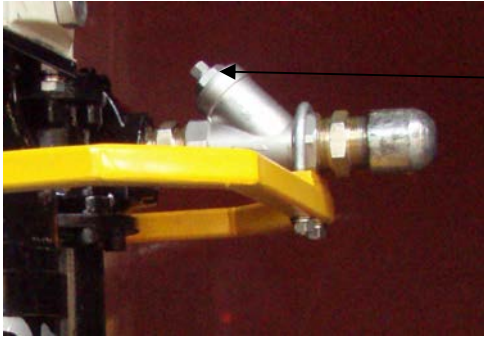
Lubemaster has been designed to eliminate the need for oil changing and disposal, and by preventing the build up of water and particles, pristine oil condition can be maintained at all times. If water levels are kept low, acid build up is prevented and oil additive degradation will be kept to a minimum, providing the correct oil is being used in the correct application.

Your oil and machine life can be substantially extended by maintaining the condition of the oil inside the machinery with the Lubemaster oil cleaning system. Lubemaster will easily clean all oils throughout the common viscosity ranges and will maintain particles to sub-micron levels and water levels to below 50ppm, whilst in most cases, particularly fixed plant, your machinery continues operating.

There are no elements to exchange with your Lubemaster system, simply remove the centrifuge rotor, clean and wash, reassemble and put the machine back to work.

There is a stainless suction strainer in the suction circuit which will need washing periodically, the frequency depending on the condition of the oil being cleaned. This strainer is designed solely to protect the pump from large particles and is not part of the cleaning process.





**Remove the strainer by removing the top cap**

Your Lubemaster centrifuge rotor is a delicate precision instrument which will spin at speeds of up to 5,500 rpm under normal operation. Consequently, the rotor is very highly balanced and must be handled with extreme care when dismantling and cleaning so as not to upset the balance of the rotor which can cause excessive vibration and premature wear.

The spinning rotor is also a very effective energy store which is potentially very dangerous should the rotor cover be removed whilst the rotor is still spinning. Take care and allow at least 3 minutes for the rotor to spin down before dismantling for cleaning and never remove the rotor cover until the rotor has completely stopped.

Cleaning the rotor is the only regular ongoing service required during normal operation of the machine, if not changing oil grades. It is recommended that runs of equipment which use the same oil be planned so as to minimise the need for total cleaning and flushing of the entire machine. If machinery which uses different oil grades is being cleaned, eg from gear oil to hydraulic oil, the entire machine will need to be cleaned, drained and flushed to prevent cross contamination of the oil being cleaned.

Care needs to be exercised when changing oil grades as the Lubemaster holds approximately 10 litres of oil in its circuit which is enough oil to have a considerable effect if mixed with a different grade of oil, say moving from hydraulic to gear oil.

We do not recommend using your Lubemaster centrifugal cleaner on oils containing Molybdenum Disulphide as the Molybdenum is a metal which is denser than normal oil and hence will be removed from the oil by the centrifugal action. As a general rule, anything that settles if the oil is left standing will be removed by the centrifuge as it is denser, or has a higher specific gravity.

We recommend that the residue from the rotor be examined after cleaning each machine as the residue is a very helpful tool to use as a condition monitoring method to inspect contaminant type and check for abnormal wear particles which can tell us a lot about the operation within the machine.

By careful identification of the residue removed from a system, the operator has an opportunity to take corrective action to prevent or reduce the amount of contamination which may be entering the system thus presenting the opportunity of improving the machines operating hygiene.

Your Lubemaster system offers a new concept in the way we think of our lubrication and contamination control, and the most effective operation requires a considerable change of thinking in the way we historically practice lubricant quality management.

Our staff at Clean Oil Services are dedicated in assisting you in ways to better manage your lubricants and virtually eliminate the need for oil disposal in all but engine situations. For assistance on your needs and potential use options, please

contact our service department who are experienced in assisting you achieve the maximum benefit from your Lubemaster product and explore other options to maximise your lubricant management.



### 3. KEY OPERATING CHECK POINTS

#### SHORT OPERATING INSTRUCTIONS -

**ALWAYS CHECK THE OIL LEVEL IN YOUR EQUIPMENT PRIOR TO CONNECTING YOUR LUBEMASTER AND AGAIN SHORTLY AFTER START.**

**TAKE CARE THAT THE LUBEMASTER CANNOT PUMP OIL DRY FROM OPERATING MACHINERY – CHECK THAT OIL IS RETURNING.**

#### Starting your Lubemaster

- Connect hoses and air supply – consider safety with hoses.
- Check that pressure rises immediately on start to approximately 100 psi.
- Check all hose connections for leaks.
- Feel for rotor vibration in centrifuge and that speed is building.
- Turn on vacuum and adjust to desired setting (-5 to -7.5kpa)
- Check rotor vibration again for intense vibration.
- Watch for signs of oil or mist emissions from the vacuum generator.
- Check oil level in equipment and top up if necessary.
- Check that the pressure has stabilised; if pump is noisy and hammering and the pressure gauge is fluctuating, your Lubemaster is starving for oil. Either check the oil flow for restrictions or the suction strainer could be blocked. If required, service strainer as in section 4.7.

## **SHUTTING DOWN YOUR LUBEMASTER.**

### **For servicing centrifuge –**

Simply turn off air supply and isolate at the main supply prior to commencing service.

**ALLOW TIME FOR THE ROTOR TO STOP SPINNING PRIOR TO COMMENCING ANY WORK ON YOUR LUBEMASTER**

Clean the centrifuge in accordance with the instructions in section 4.5

### **FOR SHUTTING DOWN PRIOR TO RELOCATING –**

#### **Whilst the Lubemaster remains running;**

- Turn off vacuum cock.
- Turn off suction valve at equipment oil supply whilst Lubemaster remains running.
- With the Lubemaster running, disconnect suction hose from plant end and elevate the hose to drain oil into the Lubemaster. Allow to suck disconnected for about 1 to 2 minutes.
- Turn off pump at the air supply and disconnect the air supply
- Fully service and drain machine components if moving to a different oil grade or type
- Run the pumps for 30 seconds after drain time to empty drained oil from the vacuum chamber.
- Isolate and disconnect the oil return hose.
- Hang hoses to drain and service machine according to requirements for next use.

## 4. FULL OPERATING INSTRUCTIONS



**IT IS GOOD PRACTICE TO TAKE FIVE AND FAMILIARISE YOURSELF WITH THE LUBEMASTER MACHINE, CONTROLS AND THE SYSTEM YOU ARE ABOUT TO ATTACH TO, PRIOR TO COMMENCING CONNECTION.**

**“MENTALLY - HOW ARE YOU GOING TO EXECUTE THIS TASK AND WHAT ARE THE POSSIBLE HAZARDS”**

### 4.1 CONNECTING POWER AND HOSES

- Position the Lubemaster machine on level flat surface, take precaution against rolling
- Fix the larger suction hose to the drain of the equipment to be filtered taking care that plumbing is adequate and will not reduce the flow below the supplied hose size and restrict flow – check that hose and fitting are tight and sealed on both ends and that all hoses are placed in a safe manner and not detrimental to the safety of other workers in the area or a trip hazard.



**It is advisable to suck the oil from the lowest point in the system being cleaned as the water will usually collect at the bottom of the system.**

- Fix the return hose to the return on the equipment at a point as far from the suction as possible to create as much flow through the oil sump as possible – check that hose and fitting are tight and sealed on both ends.



It is good practice to try and connect hoses as far as possible away from each other (suction one end, return the other) to create wherever possible, a flow through situation within the reservoir. This will have the effect of ‘washing’ the contamination oil toward the suction.

- Connect air hose to air supply and plug into Lubemaster air jack and position hose in a secure safe position. Normal workshop air supply is adequate with approximately 60 cfm required at around 100 psi.
- Check the oil level in the machine prior to starting the Lubemaster – Top up may be required. TOP UP WITH 10W OIL



Lubemaster OS200 holds approximately 8 litres of oil to fill the circuit; this amount will vary depending on the hose length and size – **BE SURE TO CHECK OIL LEVELS AFTER PRIMING THE SYSTEM** – Loss of oil level could result in equipment failure.



Some systems can have free water and sludge lying in the bottom of their reservoir. If you suck off the bottom of the reservoir and suck a volume of free water and sludge, you may be returning that sludge into circulation in the oil reservoir as the centrifuge is not working when pumping commences – This can have a detrimental effect on the oil quality in an operating system –

If this is a concern, drain the first few litres of oil into a waste container until contaminated oil is moved.

**CAUTION** is advised when employing this practice as oil is removed from the system and it could easily pump a small system below operating level and cause oil starvation.

## **4.2 SETTING THE SUCTION AND RETURN.**

- Double check all fittings for tightness on both hose ends
- Open the suction and return valves on the equipment to allow oil supply to the Lubemaster and check for leaks.

### 4.3 STARTING THE MACHINE

- After checking all connections and that both suction and return valves are set to their desired position, start the pumps by activating the air supply. Pump will immediately start.

Immediately after start, check that the pressure gauge is showing a positive pressure reading indicating that the pump is generating positive flow. Pressure deflection may only be slightly positive at the commencement of operation until pump primes. Priming should occur within ½ a minute of starting the pumps – **AVOID RUNNING THE PUMPS DRY FOR ANY MORE THAN 60 SECONDS** – Pump damage could result



Set vacuum by adjusting flow valve – Clockwise = more vacuum, anti-clockwise = less  
Do not close completely

Check that pressure is positive immediately after start and rises quickly to operating pressure not to be greater than 6.3 bar or 100 psi

- Check that pressure has built to about 100 psi operating pressure. Pressure could build to over 100 psi momentarily after start up but should not exceed 130 psi and should show a steady reduction as the system settles down and warms up.

- Slightly higher than normal set pressures may be experienced with cold gear oils and these pressures will drop as the oil warms up and becomes less viscous.
- System should settle down to a steady operating pressure at around 90 - 100 psi and pressure should not be seen to be fluctuating. If pressure is not stable, cavitation or pump starvation could be occurring.
- Heavy oils (gear oils and above) can cause the pump relief valve to hammer, resulting in a louder than normal pump noise. This noise will reduce as the oil heats and becomes more pumpable.

#### 4.4 POST START CHECKS AND SETTINGS

- **NEVER START THE MACHINE AND WALK AWAY WITHOUT THOROUGHLY CHECKING THAT ALL SYSTEMS ARE FUNCTIONING CORRECTLY.**
- After start, double check that the correct oil flow path is occurring, particularly when filtering as a dialysis whilst machinery is on line.
- Check all hoses and fittings for signs of leaking.
- Remember that the Lubemaster holds approximately 8 litres within its circuit, oil which may have an effect on the oil level of the equipment, particularly in smaller systems. – If possible, check that the equipment oil level is adequate and top up if necessary. –



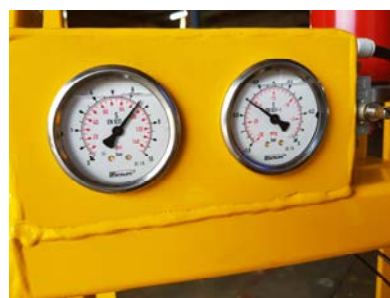
**REMEMBER MACHINERY OPERATING WITHOUT OIL IS DESTINED FOR SERIOUS FAILURE.**

- The rotor rotation should be noticeable by feeling the rotor cover; vibration should be detected due to the rotor action which will increase in intensity as the rotor picks up speed. The lighter the oil's



viscosity, the quicker the rotor will reach high operating speed and the higher the speed and intensity of vibration the higher the speed. A good intense high speed vibration should be evident as operating conditions are reached, if the rotor is not spinning at high speed, the rotor may not be working, hence the machine is not functioning correctly.

- Once a good intense rotor speed is observed, consistent with the rotor spinning above 3,000 rpm, turn on the Vacuum valve which will activate the air supply to the vacuum generator and will immediately commence generating vacuum indicated by an anti-clockwise movement of the vacuum gauge.
- Turn the vacuum control valve either in or out depending on the required vacuum level. Turning the needle valve in (clock-wise) will reduce the volume of air flowing through the chamber, thus achieving higher vacuum, whilst turning the needle out (anti-clockwise) will allow more air entry, hence reducing the vacuum levels. At no time should the vacuum be operated with the needle valve fully closed as this completely prevents the flow of air which will render the vacuum system inoperative.



**Vacuum control adjustment**  
**Must allow air to pass**  
**through chamber for**  
**dehydration to work, never**  
**close off completely**

- For normal use, set the needle valve so that a vacuum of -0.5 to -7.5 Kpa is maintained which will effectively remove water from the oil
- After changing the needle valve setting, allow time for the vacuum to settle as any adjustment will take time a few minutes to stabilise.

- Check again for oil leaks and that all functions are operating as expected
- On switching on the vacuum switch, water could be noted to run from the bottom of the air filter chamber near the solenoid. This is normal and is nothing to do with the vacuum dehydrator and is in fact, condensation being collected from the air supply and automatically drained.



Supply Air filter  
& water trap

- Air will also be heard to escape from the grey vacuum generator; this is normal and is the air being expelled from the vacuum system



**AT NO TIME SHOULD EMISSIONS BE OBSERVED FROM THE VACUUM GENERATOR, IF VAPOURS OR OIL ARE OBSERVED, REDUCE THE VACUUM LEVELS AND/OR THE CENTRIFUGE OPERATING PRESSURE UNTIL THERE ARE NO SIGNS OF EMISSIONS. Continued operation whilst vapours are being emitted will lead to oil spill or loss from the system.**



**Vacuum generator  
should not emit vapour**

- After initial start-up it is recommended to stay with the operating machine for at least 15 minutes to give the system time to settle. Monitor performance closely. Do not leave the machine unattended until all functions have been observed to be operating at a stable, satisfactory level.
- Double check for leaks and that the correct flow functions are observed.
- Check oil level in the machine if running and top up to compensate for any oil loss.

## 4.5 CLEANING THE CENTRIFUGE ROTOR

The centrifuge rotor will require periodic cleaning, the frequency of which will depend on the contamination levels in the oil being cleaned. Some highly contaminated systems will need daily cleaning; others will not need cleaning more than monthly. The dirt holding capacity of the rotor is designated by the rotor size; eg the OS200 rotor holds 2 kg of dirt. Operators will quickly learn the optimum frequency of service as they become familiar with the Lubemaster operation in their applications.

It is not recommended to allow the rotor to completely fill with dirt. Whilst this will not harm the machine, the oil will simply pass through a full rotor which will not function to clean the oil. The fuller the rotor, the less effective it becomes, eventually filling until there is no space left for the dirt to collect.

- Stop the machine by turning off the air supply.
- **ISOLATE THE MACHINE BY EITHER LOCKING OUT THE MAIN VALVE OR UNPLUGGING THE AIR SUPPLY SO THAT IT CANNOT BE ACCIDENTALLY STARTED.**
- Turn off the oil supply suction at the plant outlet.



**If the suction selector is left set to the external source over a long period of time and the oil supply is above the level of the Lubemaster, oil can leak through the system and drain out through the breather and vacuum generator which will spill overnight**

**ALWAYS TURN OFF THE AIR AND OIL SUPPLY AT THE MAIN SUPPLY WHEN LEAVING THE MACHINE STANDING FOR LONG PERIODS**

- Place rag around the base of the centrifuge to collect the small quantity of oil which may drip from inside the cover when removed.

- **DO NOT REMOVE THE CLAMP OR THE ROTOR COVER UNTIL THE ROTOR HAS COMPLETELY STOPPED SPINNING** - allow about 5 minutes standing time for the oil to drain from the rotor.
- Remove the clamp from the rotor cover and remove cover by unscrewing the top nut – all threads are right hand.
- Place a bucket handy to the rotor and lift the rotor off the spindle immediately into a bucket or container.
- Remember that the centrifuge base will now become a receptacle for airborne dust and must be kept covered whilst the rotor is removed otherwise dust will enter the circuit.
- Move the rotor to the cleaning station and unscrew the top nut of the rotor and remove the rotor shell taking care to support the rotor carefully and not to cut the “O” ring.
- Complete dismantling the rotor until all 4 components are separated



- Clean the sludge from all surfaces inside the rotor, remembering to examine the sludge for abnormal particles.

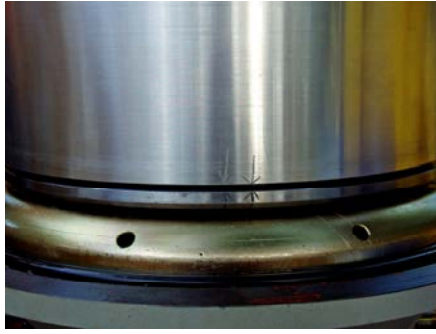


- After cleaning all components, lightly oil the base and sit it upright in a clean area ready for assembly.
- Next clean the “O” ring and separator plate, inspect for damage and lightly oil.
- Place the “O” ring on the base perimeter



- Place the separator plate on the base and be sure that it sits neat and free. Never force to align the separator
- Lightly oil the rotor sleeve and place it on the base, checking the 2 balance arrows align and that the “O” ring is not damaged as the sleeve fits into place. Do not force the assembly.





- Lightly oil the rotor cover, place it in place and carefully screw down the nut taking care that the “O” ring fits into position without getting damaged and that the whole assembly is fitting into place squarely and freely.
- Using the spanner provided, firm the nut without over tightening - the nut need only be screwed firmly into position, hand-tight with the spanner provided, to firm but not overtight.



- Wipe the large cover base “O” ring and surrounding area free of contamination and lubricate the top and bottom rotor bearing surfaces.
- Place the rotor over the spindle, taking care not to trap the fingers as the rotor settles. Do not drop the rotor onto the bearings as bearing



damage can result.



- Check that the rotor is correctly in place and will spin freely.
- Replace the rotor cover and screw the nut down hand tight only.



- Replace the clamp and hand tighten only.
- DO NOT FURTHER TIGHTEN THE COVER NUT OR THE CLAMP AFTER THE INITIAL TIGHTEN AS THEY DO BECOME LOOSE TO FEEL WHEN RUNNING – This looseness is normal and the slack should not be taken up as distortion can occur when machine is stopped which can overload components and

cause damage.

- Wipe all contamination from around the centrifuge and check that it rotates freely.
- Your Lubemaster should now be ready for restart

## **4.6 CLEANING MACHINE TO CHANGE OIL TYPE**

When changing your Lubemaster to clean oil of a different grade than the previous oil cleaned, it is necessary to completely drain and clean all the components which may retain the previous oil.

- Clean the machine externally.
- Whilst the machine remains running, turn off the suction at the plant and remove the suction hose, elevating the hose to allow remaining oil to be sucked out as much as possible.
- Turn off the machine and isolate by disconnecting the air supply.
- Remove the suction and delivery hoses and hang them up to drain taking care that they cannot collect dust.
- Remove the suction strainer by undoing the nut holding the strainer and clean the strainer
- Clean the rotor as in section 4.5 and reassemble.
- Drain the vacuum chamber at the ball cock on the water drain under the chamber. This chamber could contain up to 10 litres of oil.
- A small amount of oil can remain in the system fittings etc. It is recommended to flush the system at start up to remove this oil and prevent contamination.

#### **4.7 SERVICING THE SUCTION STRAINER**

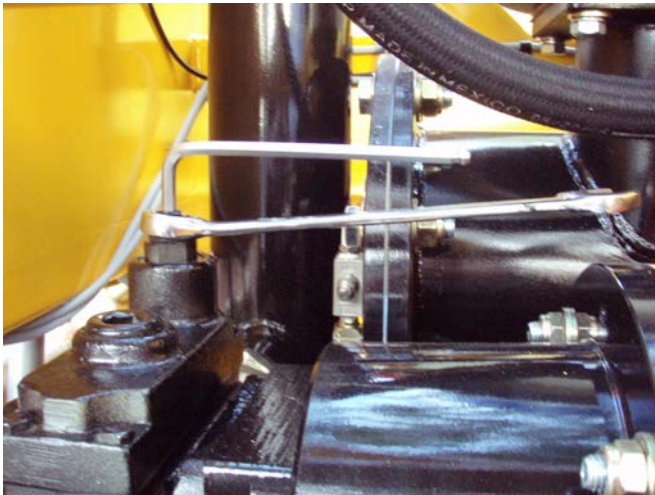
Simply remove the suction element, wash and reassemble.

#### **4.8 SETTING THE PUMP PRESSURE**

Normally, it will not be necessary to alter the pumps pressure once they have been set although occasionally adjustment may be necessary.

Never exceed 100 psi operating pressure as excessive pressure can cause the rotor to expand and distort and consequently will become inoperative.

The pressure is adjusted by firstly loosening the lock nut on the relief valve with a ¾” AF ring spanner and whilst holding the nut, screw in or out the adjusting screw with an Allen key until the desired pressure has been reached.



The bottom return pump pressure should not need adjustment as the return is normally open ended requiring minimal pressure settings; however adjustment is the same as that for the supply pump.

Care should be exercised so as not to pressurise the equipment.

# PARTS LIST

## LUBEMASTER 200U (AIR MOTOR)

Component	Stk Item	Qty	Stk Code	
<b>CENTRIFUGE</b>	OS200	1	OS200	
	1"JIC HOSE END	2	SFJ-2116	
	1" FERRULE	2	FNP16	
<b>WHEELS</b>	FOAM FILLED WHEELS	2	PF1273	
	16mm NYLOC NUTS	2	02093808	
<b>MOTOR</b>	GAST AIR MOTOR	1	LPAU8AM-ARV-70	
	GAST DRIVE END PLATE AK421	1	LPUAK421	
	END PLATE GASKET	1	LPAUAC888B	
	END PLATE BEARING BEARING	1	5205-RS	
	OIL SEAL	1	W09616225	
	N100 NANFLEX HUB 28MM BORE, 6mm KEY	2	N100-28HUB	
	N100 NANFLEX HUB 7/8" BORE 1/4 " KEY	2	N100-0.87HUB	
	N100 NANFLEX RUBBER SPIDER	2	N100SPI-RUB	
<b>PUMPS</b>	HAIGHT PUMP 30U - Top	1	FH30UR	
	HAIGHT PUMP 40U - Bottom	1	FH40UR	
	EXHAUST CLEANER	1	AMC510-6	
	FILTER REGULATOR & AUTO DRAIN	1	AC40A-06D-B	
	LUBRICATOR MODILAR RC1	1	AL60-10	
	I/FACET CONNECTOR FRL50/60 SERIES	1	Y600T	
	SPEED CONTROLLER	1	AS600-10	
	VAC EJECTOR 2X TRIPLE STAGE GAUGE	1	ZL212-G	
	SPEED CONTROLLER	1	AS2000-02	
	MODULAR AIRFILTER RC1½PT AUTO DRAIN	1	AF40-04D-A	
	BRACKET FOR AF40	1	AF40P-050AS	
	SS IN-LINE STRAINER 32mm	1	416S/032	

	SOLENOID VALVE	1	VT307-BDZ1-02	
	BREATHER 5UM	1	VS5	
	BREATHER BASE ASSY	1	VS055	
	WATER MATE	1	AMG250C-03	
	FLOW CONTROL INLINE 3/4"	1	AS500-06	
	CABLE STOCKING NYLON SIZE 3 TYPE R	1	CSNR3	
<b>VACUUM CHAMBER</b>	ISO MOUNT; MACKAY	4	M200065	
	1 1/4" BSP X 45deg HOSE TAIL	2		
<b>HOSES</b>	HOSE ASSY 5MT – return 1" G1	1	R1T16G1	
	HOSE TAIL	2	SFB-1616	
	FERRULE	2	FPN-16	
	HOSE ASSY 5MT – suction 1/1/4" G1	1	R1T20G1	
	HOSE TAIL	2	SFP2020	
	25MM EAGLE 600 YELLOW AIR HOSE	30	RAD5025/20	
	TOTALOCK A-LUG 25MM HOSE TAIL	2	FLAH100	
	2 BOLT CLAW CLAMPADBC25	2	CCDB100	
	TOTAL SAFETY PIN	2	FLSP001	
	AIRHOSE ASSY	1	FITCLAMP-025	
<b>GENERAL</b>	BREATHER BASE ASSEMBLY	1	B1BA	
	SPIN-ON BREATHER 3UM	4	B103	
	HOSE CLAMPS	2	514203127	
	GAUGE 0-1000KPA	1	G36-K10-01-X7	
	PRESSURE GAUGE 0-10 Bar (145psi)	1	SPG63-10-1- RBU	
	GAUGE VACUUM -1/0 Bar COMPOUND	1	SPG63 (-1/+1)1- RBU	
	PUSH ON HIGH TEMP HOSE 3/4"	1	LPHT-12	
	3/4" BSPP F STR P 3/4" HOSE END	2	BF1-1212P	
	BSPP F 90 COMPACT 3/4" HOSE END	2	BFC9-1212P	