

# STALKER END SUCTION CENTRIFUGAL PUMPS

## INSTRUCTIONS FOR INSTALLING AND OPERATING

### FORWARD

Information in this instruction manual applies to centrifugal pumps and the instructions given are to assist in the installation and operation of the pumps to obtain the best results.

It is not possible in this manual to cover all situations or special problems that may arise on site or in the field. In such cases it is recommended that the customer consult Stalker Pumps, who would be pleased to give advice should such problems or queries arise. All correspondence concerning a pump should contain the size and type as detailed on the nameplate tag.

### INSTALLATION

Unloading and Storing:

1. Upon receipt of the pump, ensure that it has not been damaged in transit and that no parts are missing.
2. Take care in unloading and handling of equipment to avoid damage.
3. If it is required that the pump be stored for some time prior to installation, the following procedures should be adopted:-
  - a) Store pump in a dry, dirt-free location.
  - b) Do not remove any protective packing until the pump is ready to be connected to piping.
  - c) Back off gland and extract packing (See Maintenance Section).

NOTE: When pump is ready for installation the packings should be hand worked to bring the lubricant to the surface and then reinstalled into the stuffing box.

- d) Apply an oil based lubricant to exposed areas of the pump shaft and wrap in a clean cloth to protect against dirt and grit.

### Location of Pump

Select a site permitting the shortest and most direct suction pipe and the smallest possible suction lift. The maximum

suction lift varies for different pump sizes and this can be obtained from the pump performance curve or if in doubt, consult Stalker Pumps.

### Type of Foundation

The foundation must be of sufficient size and the rigidity so as to prevent movement when the pump unit is anchored down and to absorb vibration when the pump is running. It must also be even to prevent distortion of the base plate when the holding down bolts are tightened. A well laid concrete slab is the most effective way of ensuring a sound foundation.

The coupling face (if direct coupled), suction and discharge flanges of the pump should also be checked for horizontal or vertical position by use of a level. If the pump is to be installed into existing piping, it is recommended to connect the pump to the pipe flanges. This enables the pump unit to be moved slightly to suit the existing pipework. Flange connections and holding down bolts are then lightly tightened.

NOTE: The foundation bolts should preferably be installed in pipe sleeve type holders. When the pump is set up and level, the grout should be thoroughly worked under the baseplate and allowed to set for about 48 hours. Once the grout has set, the holding down bolts should be tightened evenly. The shaft should be turned by hand to ensure it is running freely.

NOTE: DO NOT OVERTIGHTEN HOLDING DOWN BOLTS OR BASEPLATE MAY DISTORT.

### Suction and Delivery Pipework

It is important that the suction and delivery pipes are supported independently of the pump and of equal importance, that they be correctly aligned and matched to the pump connections. Pump and pipe flanges must parallel and mate together without the use of force. This is to ensure that abnormal strains are not transmitted to the pump casing.

DO NOT FORCE ALIGNMENT OF FLANGES OR BOLTHOLES AS THIS COULD DAMAGE THE PUMP AND THROW OUT PUMP/MOTOR ALIGNMENT.

### FOR SUMP PUMPS

After installing pump in pit the column must be filled with basic multigrade engine oil to the level of the top bearing under head plate.

## Suction Piping

A common cause of the unsatisfactory operation of a centrifugal pump is the improper installation of the suction piping.

Particular care should be taken to ensure that:-

1. All joints and pipes are absolutely air tight.
2. Suitable piping is used.
3. The normal size of the suction piping must not be less than the size of the suction opening of the pump.

NOTE: Larger diameter piping can be used to advantage, particularly when a long suction pipe is necessary.

4. Except where the pump is below the level of supply, ensure that:-
  - a) No part of the suction pipe is above the level of the suction opening on the pump.
  - b) A continual fall is maintained between the pump and liquid source to prevent air pockets forming. In order to avoid formation of air pockets an eccentric taper pipe should be used. (This applies when suction piping diameter is greater than pump suction opening).
  - c) Ensure the foot valve fitted has ample liquid openings, at least equal to the suction piping and that it seals properly. This should be arranged in the vertical position with adequate liquid submergence to ensure air is not drawn through the suction piping when the pump is operating. Please consult Stalker Pumps Technical Consultants or distributors if unsure as to the correct submergence depth of your particular pump.

## Delivery Piping

A pipe of suitable size to carry the normal discharge of the pump, without excessive frictional resistance, should be selected. As a general rule, the diameter of the delivery pipe should be at least one size larger than the pump discharge size. This practice helps to minimise hydraulic losses due to pipe friction. In cases where the delivery pipe has high points, air locks are likely to occur. In such cases vent cocks should be fitted to allow the escape of accumulated air which may affect the capacity of the pump.

A gate valve or butterfly valve fitted in the delivery pipe close to the pump will enable the capacity to be controlled and also enable the pump to be isolated for maintenance purposes.

NOTE: ON NO ACCOUNT REGULATE FLOW OF PUMP BY USE OF A SUCTION VALVE. (IF FITTED)

## Alignment

### Motor-Driven Pumps

After the holding down bolts have been tightened and the suction and delivery pipes fitted, the coupling alignment must be carefully checked as indicated in the following:

NOTE: A FLEXIBLE COUPLING WILL PERMIT END MOVEMENT IN THE AXIAL DIRECTION BUT WILL NOT AVOID THE NEED FOR ACCURATE ALIGNMENT BETWEEN PUMP AND MOTOR SHAFTS.

### Procedure

With the coupling bolts removed, angular alignment and parallel alignment may be checked by the use of feeler gauges and a straight edge. For a more accurate check, dial indicators should be used.

NOTE: When a spacer coupling is employed, the driver end of the coupling (fixed end) is secured to the motor coupling.

The alignment procedure as described is performed on the floating end of the coupling i.e. the pump coupling side.

### STARTING AND OPERATING

Prior to starting the special attention should be given to the following points:

1. Check that the direction of motor rotation corresponds to the direction arrow on the pump casing. If rotation of motor is incorrect, consult motor manufacturer's instructions to correct rotation.
2. Adjust gland nuts to finger tightness.
3. Turn pump shaft by hand to ensure it is running freely. If this is not the case the cause of the problem will have to be investigated. It may be necessary to dismantle pump.
4. Prime the pump.

Before the pump is started the casing and suction line must be completely filled with the liquid being pumped. This is essential as some rotating parts require the pumped liquid to act as a lubricant.

**NOTE: ENSURE ALL AIR IS EXPELLED FROM THE SUCTION LINE AND THE PUMP CASING AS THE ROTATING ELEMENT MAY SEIZE IF THE PUMP IS NOT CORRECTLY PRIMED.**

Pumps operating with a suction lift may be primed in a number of ways, the two most common being:

- a) PRIMING WITH A FOOT VALVE: A good sealing foot valve mounted on the suction inlet will retain liquid in the suction line. This enables the pump and suction line to be completely filled with water, from an external source, when the pump is not operating. A plug tapping mounted in the discharge valve, should be installed to allow priming of the unit. The discharge valve should be open to allow air from the suction line and pump casing to escape while the pump is being primed.
  - b) PRIMING WITH A VACUUM PUMP: The pump may be primed by using a vacuum pump to evacuate air and hence draw water up through the suction line and casing. With this method the discharge valve needs to be of the tight shut-off type and should be closed while priming the pump.
5. Close the discharge valve.
  6. Where connections are provided for external seals or cooling that all valves are open.
  7. Ensure suction valve (if fitted) is fully open.
  8. Start the pump and let it come to full speed.
  9. Open the discharge valve slowly to obtain the required flow

**CAUTION: DO NOT RUN THE PUMP DRY OR AGAINST SHUT VALVE FOR A PROLONGED PERIOD.**

The pump must be stopped promptly if no liquid is being pumped. Serious damage may be caused through running the pump dry as this will result in excessive wear to moving parts which depend on liquid for lubrication.

**GLAND**

Standard pumps are fitted with a high quality gland packing. Care must be taken, however, to avoid overheating the gland. On starting up, the gland nuts should be adjusted to finger tightness and after the pump has been in operation for a short while, it will be found necessary to further adjust the gland as the packing beds down. Once again it is emphasized the gland is not to be over-tightened as a too tight gland causes the packing to burn, scores the shaft, thereby absorbing more power in friction. A steady drip from the gland is normal practice and is an indication of correct adjustment. If an external flush is fitted to the pump, it is most important to ensure that an adequate and continuous supply of flushing water is present.

**Mechanical Seals**

Pumps fitted with mechanical seals should not be rotated unnecessarily when dry and great care must be taken not to damage the seal faces by shock or foreign matter. When a mechanical seal fails, it is good practice to replace the entire assembly, as the failure of one element almost always involves the failure of another, even though it may not be obvious when the parts are inspected.

**Maintenance**

Check the following parts for wear or damage and replace if necessary:-

- a) Bearings Ball.

Bearings must be handled carefully to achieve the best results. The essential factors for maximum bearing life are:-

- I. The exclusion of dust, dirt and moisture during assembly and operation.
  - II. The correct methods of fitting bearings are adopted during assembly.
  - III. Adequate lubrication with the correct grade of grease.
  - IV. Accurate pump/motor alignment.
- b) Pump shaft.

Check for scoring and straightness. Shaft straightness can be checked by using a dial indicator on the impeller end of the shaft while the shaft is supported in the bearing housing. The total runout should not exceed 0.05mm.

- c) Gland Packing.

**LUBRICATION**

Most Stalker Pumps are fitted with sealed for life bearings and require no lubrication however, bearings must be lubricated to prevent inter-metallic contact between the rolling elements and to prevent the ingress of moisture and foreign matter into the bearing itself.

Lubricating properties of greases deteriorate with time, become contaminated in service and must therefore be changed from time to time. The lubrication interval is dependent on a number of factors, namely temperature, speed and the presence of foreign matter. It is not possible to give a definite recommendation but the following table will serve as a guide for most applications.

NOTE: If the pump has been idle for an extended period, it's bearings should be re-lubricated before the pump is run. This is a necessary precaution since the grease has a tendency to deteriorate with long standing.

**LUBRICATION INTERVALS:**

Every 2000 hours with approx 8 grams of grease.  
**DO NOT OVERFILL** and check for excess purging.

**(FOR ARDUOUS CONDITIONS USE – CHECK EVERY 168 HOURS)**

**Recommended Grease Types:**

SUPPLIER	DESIGNATION
British Petroleum	BP Energrease LS2
SKF	SKF LGMT 2
ESSO	Beacon 2
MOBIL	Mobilplex 48
SHELL	Alvania RS