

C.C.G.S. LOUIS S. ST. LAURENT

STOTHERT & MITT LTD.

ENGINEERS

BATH, ENGLAND

Telephone BATH 2277 (4 lines) 63041 (8 lines)

Telegrams "STOHERT, BATH TELEX"

Telex No. 44177

E-286-29

*In all future reference to this pump,
please quote the serial number given
on the nameplate fitted to pump body.*

BUNKER "C" FUEL OIL TRANSFER

OPERATION AND
MAINTENANCE OF

SCREW DISPLACEMENT PUMP.

S. & P. Job No. 24/6460.

Client CANADIAN VICKERS LTD.

Their Order No. E286-29 d/a 11.5.65.

Description :

Size 111 x 2 1/2" Pitch x 2 Pitches Vertical Screw Displacement Pump.
Specified output of pump:- 45 Long tons per hour of Bunker 'C' Fuel Oil at speeds
of 1760/880 r.p.m. against a discharge head of 30 ft.

Packing : CRANE S.S. 6.

DESCRIPTION	GENERAL INFORMATION.	NO. 24/6460
		SHEET _____ OF _____

BEARINGS.

- Ball bearing - R&M MJ 1 1/4.
- Ball bearing - R&M Type MJT 1 1/4.

PACKING (PUMP).

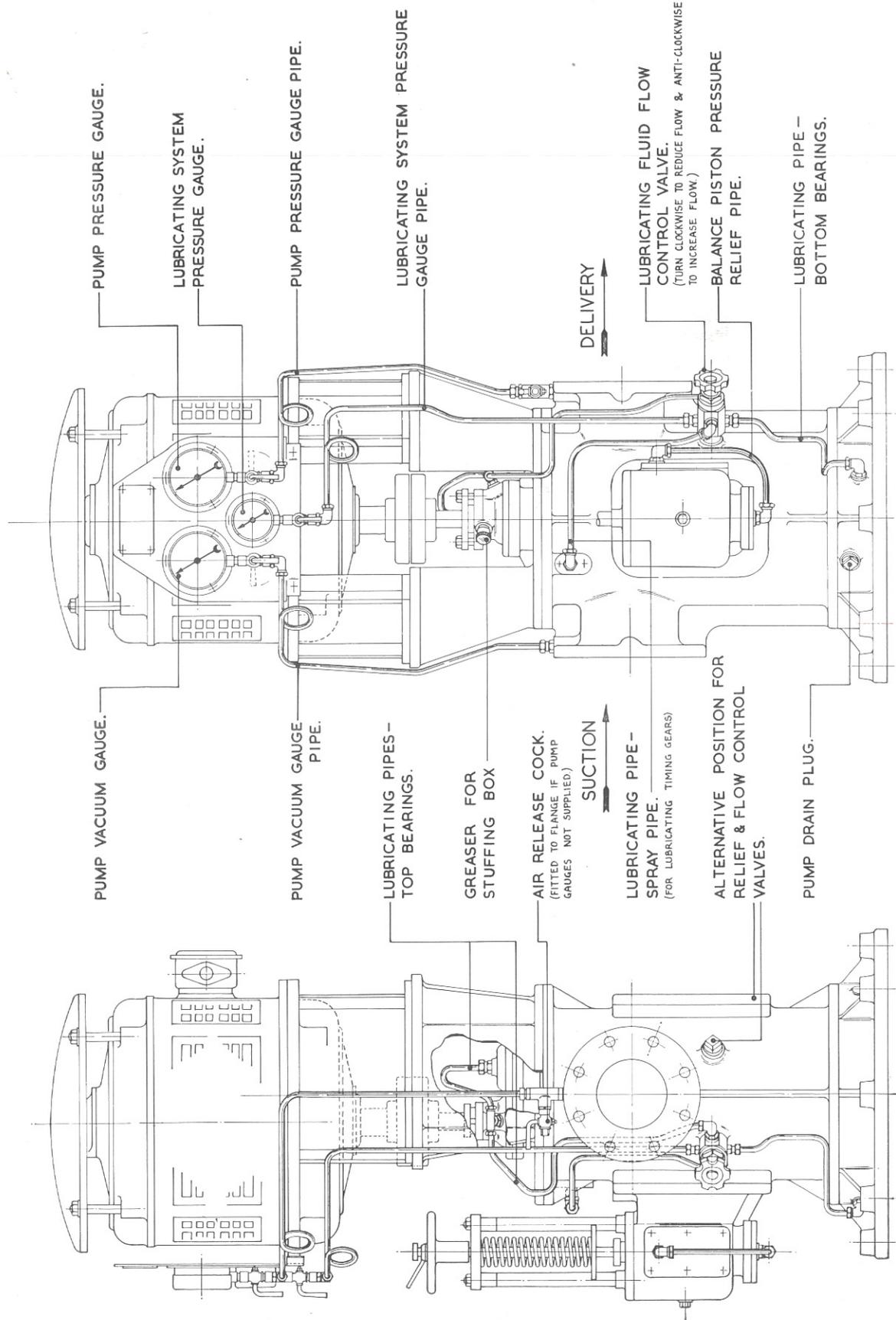
- Crane S.S. 6 - 4 rings 3/8" sq. section.
- Stuffing box size 1 7/8" outside dia. 1 1/8" shaft dia.

RELIEF VALVE.

- Walker "CRESCENT", 3 rings 3/8" sq. section.
- Stuffing box size 1 1/2 " outside dia., 3/4" inside dia.

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Drawing No. 21696. Lubrication System and Piping Arrangement on Vertical Screw Displacement Pumps.

STARTING

VERTICAL PUMP

A section through the pump is shown on Drawing at end of book.

The internal parts of this pump have been oiled to prevent corrosion.

The pump body requires an initial filling of the fluid to be pumped and a filling point is provided at (313). The filling may be effected by flooding from either suction or delivery lines if either is above the pump level.

In the case of the ordinary pumping systems, where there is no pressure when the pump is at rest, the main suction and delivery stop valves will be fully opened before the pump is started.

Where the system is under pressure due to static head or the discharge of another pump the main suction and delivery stop valves will be closed and the volume regulator and relief valve on the pump fully opened before the pump is started.

Upon starting, the fluid is circulated through the volume regulator and relief valve, and when the pump is running at its correct speed the volume regulator is gradually closed and the main suction and delivery valves opened.

The air cock (311) should be opened to release air which may be held in the pump body.

The pump is of the displacement type and dangerous pressure will be generated by a closed valve or other obstruction on the discharge side. Cavitation resulting in hammer, due to restriction of flow, will be set up by a closed valve or restriction in the suction line.

The pump is capable of creating and maintaining a suction lift up to the practical limit, but if restriction to flow rises above a certain point, the pressure of the atmosphere will be insufficient to force the specified quantity of fluid to the pump and completely fill the space displaced by the screws.

Lubrication of the timing gear (139) in this pump is provided for by means of a jet (145) fed from a pipe leading from the discharge side of the pump. This pipe is continued on to the top (14) and bottom bearings (14A). Provision is made for regulation of flow by means of a valve and the pressure may be observed on the gauge. A pressure of 10 lbs. per sq. inch is required.

A lantern ring (142) is fitted in the stuffing box (137) and a grease cup provided to supply grease to it.

DISMANTLING AND RE-ASSEMBLY

VERTICAL PUMP

To dismantle the pump proceed as follows :—

- (1) Remove the bolts from the lower flange of the motor stool (150).
- (2) The motor may now be lifted off without removing the bolts from the coupling, as this is of the pin flexible type.
- (3) The cover (132) with screws (135) and (136) and timing gears (139), may now be lifted out complete with lower bearings (14A).
- (4) To dismantle the screws from the cover first remove the half coupling (45) from the driving shaft, then the stuffing box (137) complete with gland. The top bearing nuts (143) should next be taken off, after which the shafts may be forced through the bearings (14) and cover (132).

The re-assembly should be carried out in the reverse order to that outlined for dismantling, special care being taken to ensure correct assembly of the timing gears and the shafts in their bearings.

Complete re-assembly of the screws is carried out in the cover (132) and there should be equal clearances at both sides of the threads. It is essential that the keys of the timing gears be replaced correctly and not turned end to end.

The screws complete with cover (132) and stuffing box (137) may now be placed in the pump body, after which the driving shaft should be turned by hand to ensure that the parts rotate freely.

All pump joints are made with a jointing composition, "Stag" brand, obtainable from Messrs. Smail, Sons & Co. Ltd., 21/23 India Street, Glasgow, C.2. Should it be found that the composition supplied has thickened, it may be reduced to a plastic form by the addition of methylated spirit.

SPRING LOADED ADJUSTABLE RELIEF VALVE WITH VOLUME REGULATED HANDWHEEL

A section through the relief valve is shown on Drawing No.

DESCRIPTION

This valve operates as a relief valve by automatically fully opening at a particular pressure determined by the setting of the valve spring (384).

Alternatively it can be used as a hand operated regulating valve at any pressure which will regulate the displacement and working pressure of the pump. The hand operation does not affect the setting as a relief valve.

When in operation the valve will rise steadily and pass the whole output of the pump without oscillation or noise.

OPERATION

When the pressure at the discharge side of the pump rises above that at which the spring (384) is set, the piston valve (377) lifts, allowing the fluid from the discharge side to pass back to the suction side.

The external pipe from base of valve to suction chamber is to drain away any fluid that leaks past the piston.

If it is desired to by-pass at any pressure below the setting as a relief valve, the hand regulating valve can be operated by the wheel (386) which lifts the valve off its seat. A locking lever is provided for securing the position of the handwheel.

Gland Packing Fitting Instructions

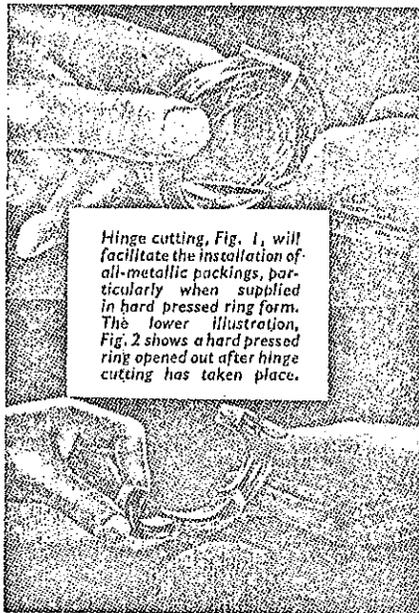
THE SELECTION of materials and the method of construction of a Gland Packing involve a great deal of care and skill so as to ensure that the Packing will give the required performance and the maximum life in service. But if the Packing is not properly fitted, most of the care and skill put into it will be wasted, and its efficiency and length of life are likely to fall far short of the maximum.

To fit a Gland Packing is a very simple operation, and by conforming to the following instructions you will be making the best possible use of the Gland Packing you are using.

1. The ends of the rings of our metallic packings, and of the Superseal group, should be cut at an angle of 45°, making a diagonal joint—no gap is necessary.
2. The ends of channel backed packings should be cut square, and a gap left between the ends. The correct gaps for the various sizes of rings are as follows :

Ring Inside diameter	Gap
1"	$\frac{1}{8}$ "
2 $\frac{1}{2}$ "	$\frac{3}{16}$ "
4"	$\frac{1}{4}$ "
6"	$\frac{5}{16}$ "
10"	$\frac{3}{8}$ "

3. Before attempting to insert the rings of packing into the stuffing box:
 - (a) Completely remove old packing, and clean the stuffing box and the shaft or rod.
 - (b) Examine the shaft or rod and make sure that it is in good condition (badly scored or otherwise damaged shafts will in turn damage the packing and destroy it, or at least reduce its efficiency).
4. When all is ready for the insertion of the packing:
 - (a) Check the packing and see that it is the correct size.
 - (b) Install each ring separately, and caulk home individually, using packing strips which are a good fit; if a well fitting packing strip is not used the rings of packing may buckle as they are inserted.
 - (c) When the correct number of rings have been inserted on a rotary shaft, pull up the gland nut hard, then release and re-set lightly—when the packing has been fitted to a reciprocating rod, pull up the gland nut hard, but do not release.



Hinge cutting, Fig. 1, will facilitate the installation of all-metallic packings, particularly when supplied in hard pressed ring form. The lower illustration, Fig. 2 shows a hard pressed ring opened out after hinge cutting has taken place.

The clearances of neck or lantern rings should be checked to see that they are not excessive. They should not exceed $\frac{1}{16}$ ".



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