



HYDRAPAK PUMP OPERATING INSTRUCTIONS



This equipment is manufactured to the highest standards of workmanship and will give years of satisfactory service with the minimum of attention providing the following points are borne in mind.

The Hydrapak, is a 2-speed light-weight totally enclosed pump in corrosion resistant alloys and suitable for use with oil or water. All pumps are fitted with a standard low pressure plunger which has an output of 51 cc. per stroke and a maximum pressure of 52 bar (750 psi), but there is a choice of six sizes of high pressure plunger covering a pressure range of 110 to 690 bar (1600 to 10,000 psi). The actual high-pressure of which your pump is capable (depending on the size plunger fitted) is indicated on the end cover.

Pressure Plunger Assemblies with the following High-pressure plunger sizes, are available.

High Pressure Plunger diam	1/2"	9/16"	5/8"	3/4"	1"	1 1/4"
Max working bar	690	552	448	310	172	110
Pressure (psi)	10,000	8,000	6,500	4,500	2,500	1,600
Displacement per stroke (c.c)	3.6	4.6	5.7	8.1	14.5	22.6

All valves etc. are readily accessible for cleaning and maintenance and a suction filter is fitted for protection against the ingress of dirt, etc.

In addition to the operating handle, there are two controls; a release valve and push/pull pressure selection button.

The pump is fitted with a rubber faced delivery valve and ball-type suction valves, one for high pressure and one for low pressure. When the pump is operating on low pressure, both high and low pressure pistons are operative. The action of the pressure selection button is to lift the low-pressure suction ball off its seat so that the low- pressure system is rendered inoperative: only the high-pressure piston is operative at this point.

Choice of the Hydraulic Medium

Oil is preferable as a medium because of its lubricating qualities. A good quality hydraulic oil of ISO 32 viscosity should be used.

When water is used it should be clean and soft and be changed if impurities are picked up during operation.

Operating the Pump

First ensure that the release valve is closed by rotating the control knob clockwise as far as it will go. Tighten by hand only. Engage the operating lever in the most convenient position and check that the pressure selection button is pulled out. The pump will now operate on low pressure. When the effort on the lever becomes excessive (pumping against a pressure over 52 bar), the pump should be changed over to high pressure. To do this push the pressure selection button in as far as it will go. Do not apply effort on the operating lever whilst performing this changeover or you will prevent the push button from being pushed fully home. Take care not to operate the pump when oil in the cistern is low, as air may be drawn in and the system will have to be vented.

To release the pressure, rotate the release valve control knob anti-clockwise. If the system is backloaded (as would be the case with a jack or ram and cylinder still under load) the valve should be cracked open very gently in order to prevent rapid return of the ram. The valve is fully opened by approximately three and a half turns.

The Operating Lever

The operating lever socket has a square broached hole, situated off the centre line of the handle axis, so that by turning it over, additional alternative positions are available.

Seven positions of lever engagement are possible, at intervals of 45°, with this arrangement the maximum swing of the lever is 60°.

Charging and Venting the System

After charging the system with fluid, all air should be expelled, via an air vent at the highest point in the system by operating the pump on low pressure. The Hydrapak Pump may be operated in any position except one, i.e. on end with the front delivery connection downwards. When in this position it is not possible to expel all the trapped air and this will cause inefficiency. (See later notes).

Rocker Shaft

Occasionally charge the rocker shaft bearing surfaces with a medium grade grease via the nipple provided.

Suction Strainer

This strainer needs occasional thorough washing out in clean paraffin to remove all the filtered dirt. Remember to close the release valve when the suction strainer is removed otherwise the system will empty itself through the passageway. After cleaning and replacing the strainer the pump should be vented.

Suction Connections

The suction connection in the pump body is a 3/8" B.S.P. threaded hole with a flat-bottomed seat. This provides for a sealing washer either at the bottom of the hole or under a stud coupling on the outside face.

Delivery connections

There are two delivery connections positions, one on the front face and the other on the top _face of the pump. Either one may be used but not both together. A delivery valve stopper is screwed into that connection not in use and as this locates the delivery valve cage in either position, it must always be fitted and on no account must a pressure gauge or any other connector be screwed in direct as an alternative.

The standard fitting for the gauge is direct to the pump, the back of the gauge lying flush with the top of the pump body. A banjo and bolt is supplied when mounting in this manner and must be specially ordered. The delivery connections are tapped 1/2" B.S.P. and are suitable for a stud coupling or hose with an external face joint.

Testing the Pump

When your pump is set up for operation, remove all trapped air and systematically check as follows:

ALWAYS ENSURE:-

1. That a full effective stroke is possible on low pressure when the pump is operated at a reasonable speed and that 52 bar can be developed and held.
 2. That a full effective stroke is possible on high pressure when the pump is operated at a reasonable speed and that the full rated pressure of the pump can be developed and held.
 3. That after several strokes either on high or low pressure no air is picked up to cause a loss of effective stroke*. Check that it is not possible to raise high pressure when on low pressure position.
- *A small amount of free movement of the handle is associated with clearance of the working parts, and should not be confused with loss of effective stroke due to other causes.*
4. That there is no external leakage of fluid from any part of the pump.
 5. That the fluid is returned back to the system in reasonable time when the release valve is opened.
 6. That the 'Push' 'Pull' pressure selection button has a positive location in either position and that it cannot be caused to jump out to the low pressure position when operating the pump rapidly on high pressure.

Trapped Air in the Pump

Air in the pump will cause loss of effective pumping stroke and will also permit high pressure to be raised even when the pressure selection button is in the low-pressure position. It is, therefore, essential to exclude all air to obtain the best performance. If, after having vented the system, the pump continues to collect air, a systematic check should be made on all the seals of the

suction side of the pump to ensure that they are not defective or loose.

Possible sources of air leakage into the pump are as follows:-

1. At the suction connection
2. Release valve cage joint washer.
3. Release valve stem seal.
4. Suction Filter Joint Washer.
5. Pressure Selection Button Seal.

Should there be a positive suction head on the pump and if the above items are defective, they will become sources of external leakage.

Pressure Relief Valve

A pressure relief can be fitted direct into the pump body and can be set to any desired pressure within the rating of the pump. Full details on request.

Other Liquids

Although primarily designed for use with oil or water other liquids can be used in the pump. In certain circumstances they require special seals. Full details on request.

IMPORTANT SAFETY WARNING

Always check operating pressure of equipment when using pump. High pressure pump rating stamped on pump plate.

The connecting hose from pump to equipment should be of adequate pressure rating, be correctly fitted, and in good condition. In circumstances where a hose would be subject to undue flexing, sharp bends, or mechanical damage; we recommend the fitting of steel piping.

We recommend that any servicing of equipment is carried out by Tangye Approved Service Agents. Details of Approved Service Agents on application to Tangye.

FAULT DIAGNOSIS

1. No delivery.
2. Pump handle when operated does not operate plunger.
3. Loss of full delivery.
4. Pump will not change from low to high pressure.

POSSIBLE FAULT

1. Cistern empty.
2. Link plates broken.
3. Air in system.
4. Dirt in system. Remove filter and flush pump.



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