

Please read this manual carefully before setting-up and using your unit

Tritech

ZipTrench

Operators Manual

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For the latest manual revision always visit "www.tritech.co.uk"

Safety Notice

**This product can cause personal injury if used incorrectly.
It is essential all safety notes in this manual are observed!**

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TECHNICAL SUPPORT

Contact your local agent or

Tritech International Ltd

Telephone : ++ 44 1224 744 111

Fax : ++ 44 1224 741 771

E-mail : support@tritech.co.uk

An out of hours emergency number is available by ringing the above telephone number

If you have cause to use our Technical Support service, please ensure that you have the following details at hand **prior** to calling :

- System Serial Number (if applicable)
- Fault Description
- Any remedial action implemented

Due to the expansion of equipment capabilities and the fact that new sub-modules are continually being introduced, this manual cannot detail every aspect of the operation.

WARRANTY

Tritech International Limited herein after referred to as T.I.

T.I. Warrants that at the time of shipment all products shall be free from defects in material and workmanship and suitable for the purpose specified in the product literature.

1. The system warranty commences at the date of customer acceptance and runs for a period of 180 days.

The Customer Acceptance Test must be performed either at Tritech International or at one of their approved distributors unless otherwise specified in writing. The warranty does not apply unless the recommended maintenance instructions have been followed and does not apply to defects resulting from normal wear and tear, incorrect operation, fire, water or lightning damage or damage caused by variations in a ships voltage, or from any other circumstances which arise after delivery and beyond the control of T.I.

2. Warranty service is performed at the discretion of T.I. either by repair or replacement of the equipment in question.

3. The warranty does not cover personnel transportation and per diem allowances related to repair or replacement.

4. The warranty is subject to the following conditions:-

- a) The system must have been sold by T.I. or one of their authorised representatives.
- b) The system must have been installed and commissioned in accordance with approved technical standards and specifications and for the purpose for which the system was designed.
- c) Any claim must be notified in writing to T.I. without delay upon discovery of a defect.
- d) Defective parts have to be forwarded to T.I. adequately packaged and by suitable means of transport, freight paid and with a report stating the defect. The replacement parts or equipment covered by the warranty will be returned to the customer, carriage paid by T.I.

5. The warranty shall become invalid if the customer repairs or modifies the equipment and components without written authority from T.I.

6. The warranty is not transferable, except as or applies to Purchaser first then to customer.

7. All further claims on any grounds whatsoever, are excluded.

INTRODUCTION

The Tritech ZipTrench has been developed from the highly successful ZipJet and ZipJet Ultra family of products to meet the requirement for cost-effective, simple to use, trenching equipment. The trencher can be mounted on a rigid frame or on a work class ROV manipulator.

The design and location of the water inlet reduces the reaction created by the ZipTrench. Thus less vehicle power is used in compensating for unwanted thrust and more of the power can go towards operating the ZipTrench.

The Inlet is designed to minimise the turbulence produced by turning the water through 180 degrees and therefore maximise the power of the trenching jet.

CE mark & safety note



The installation of the pump is fully the responsibility of the user. It is powered by high pressure hydraulics and contains moving parts. Full consideration has been given to the requirements for CE marking and the relevant safety information is contained within this manual.

This pump shall be operated in accordance with the following instruction manual. Failure to do so invalidates the CE mark of approval and may lead to safety hazards or equipment failure.

OUTLINE SPECIFICATION

Hydraulic input

Pressure	2200-4000 psi	(152-276 Bar)
Flow	10-15gpm	(45-70litres/min)

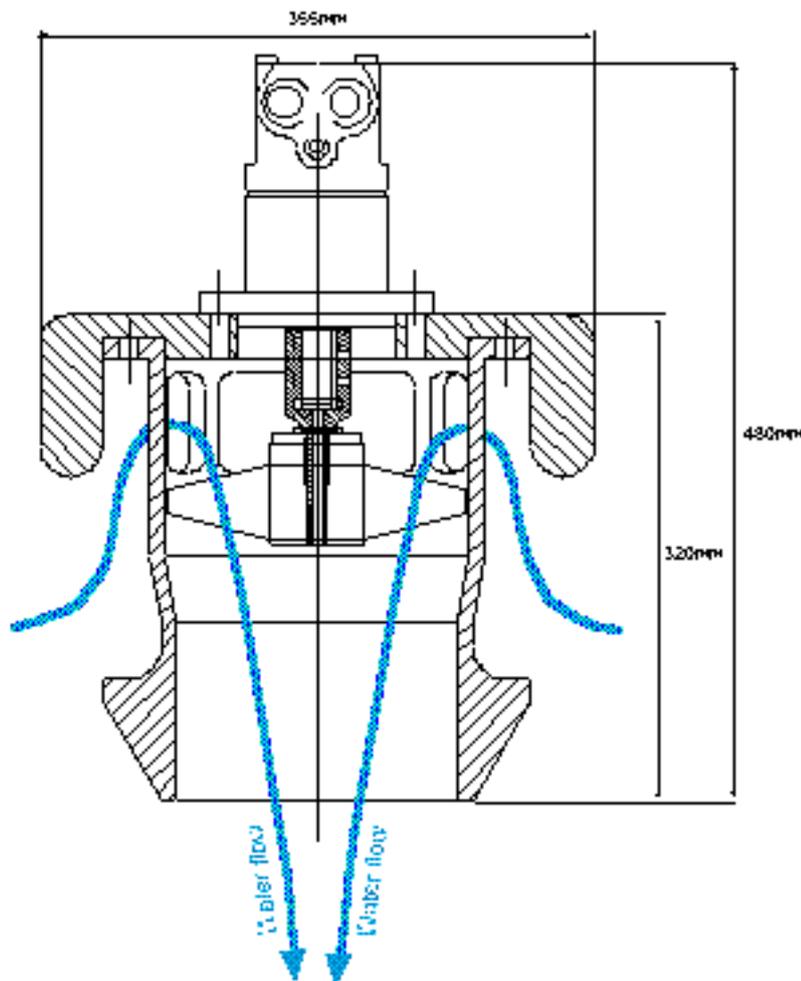
Jetting Performance

Deburial rate	up to 50 cubic metres per hour
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General

Nominal water throughput	1000 cubic metres per hour
Motor Type	Volvo F11-10
Weight in air	21Kg
Weight in water	12.5 Kg
Materials	Oilon-Nylon, Nylatron, Aluminium, Stainless Steel BS970

PRINCIPLES OF OPERATION



The principle of operation is to disperse the sediment with a large mass flow of water. This has benefits over conventional dredging pumps when it is required to cut a trench or debury items without concern about where the dredged material settles.

The ZipTrench is specifically designed for use in unconsolidated sediments. The types of materials in which it is particularly effective are sand, fine gravels, mud and light clay. Where an existing trench has naturally back-filled then these are normally the types of materials encountered.

Safety Note

Do not use the trencher in the vicinity of divers. Large amounts of debris will be displaced from the seabed which could cause serious injury.

INSTALLATION.

Safety Note

Do not power up the ZipTrench until all hoses are properly connected to the motor.

The ZipTrench incorporates a high speed ducted propeller. Therefore there is a risk of serious injury if limbs are inserted in the nozzle or intake during operation.

If the user wishes to power up the ZipTrench when on deck it is his/her responsibility to ensure that suitable guards or other safety measures are in place to prevent injury.

Mechanical Installation

The pump should be mounted in such a way that the direction of the excavation nozzle points vertically downwards to maximise trenching capability. There should be an unobstructed path between the trencher and the seabed. There are two Nylatron brackets to aid mounting of the unit, but any of the eight case bolts may be removed and replaced with longer bolts to provide supplementary mounts.

The pump should not be mounted using the nozzle duct as an attachment point.

Hydraulic Installation.

Hydraulic oil

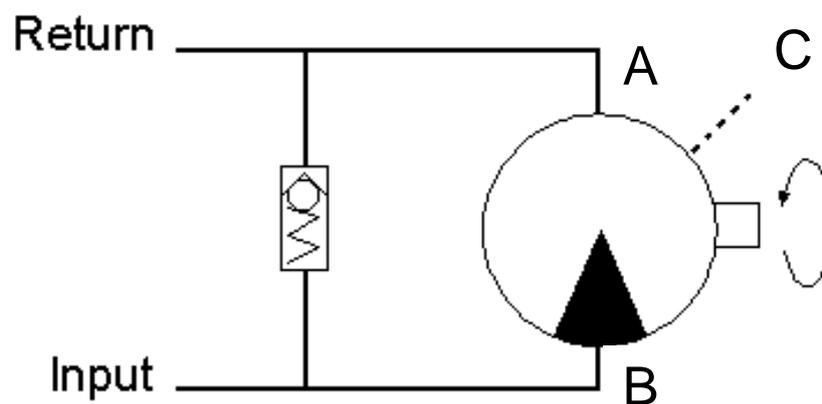
The pump should be operated using a premium grade mineral-based hydraulic oil of ISO VG 22 to 32.

Filtration

The hydraulic system filtration must be to a minimum of 10um absolute standard. A 10um nominal standard is regarded as inadequate.

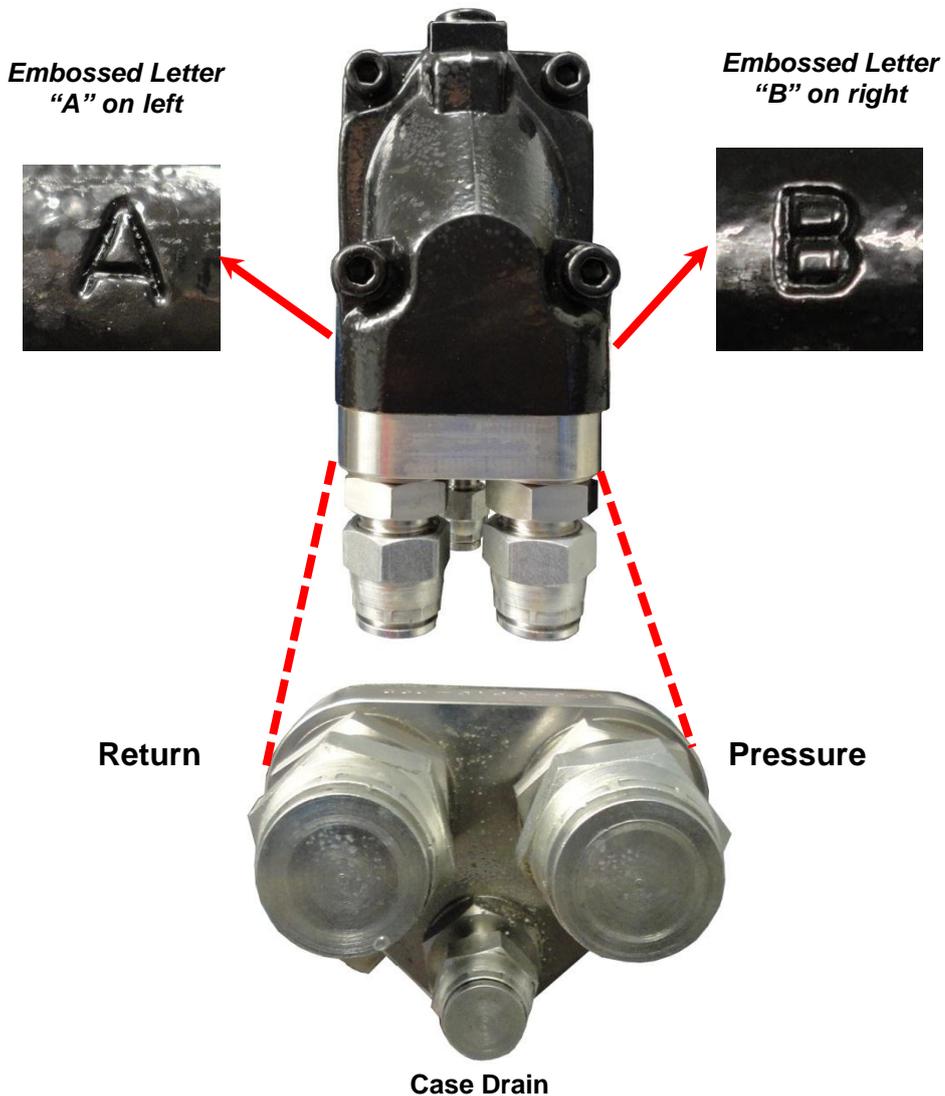
The recommended filtration is UN elements produced by Pall Industrial Hydraulics Ltd. or equivalent products.

Hydraulic Hook-up



The pump is configured for correct rotation when the hydraulic supply is connected to the "B" port of the Volvo motor and the return line to the "A" port. This is inverse from the Trittech standard range of ZIP products

Motor as viewed when fitted to Trittech Pump with the hydraulic fittings downwards



It is mandatory that the drain connection from the motor back to tank is a minimum of 3/8" bore. The drain line should return straight to tank without restriction. It is permissible to connect the drain line back into a larger bore drain manifold which has been correctly sized to accommodate all drains attached to it.

Warnings

It is not permissible to use the return line as the drain line. A separate line must be used.

It is strongly recommended that self sealing quick disconnects are not used on the drain line. Use of such fittings is at the users risk. If such a connection is used then it is mandatory to ensure that it has been fully and correctly fitted prior to starting the motor. Failure to do so may result in pressurisation of the motor casing which could explode under system hydraulic pressure with considerable risk of personal injury.

To avoid shock loading the motor when the supply is stopped it is essential to provide the check valve shown. This will allow the motor to run down steadily rather than coming to an abrupt stop.

Specification for check valve.

1/2" check valve, cracking pressure 0.5 bar.

Recommended valve

Integrated Hydraulics FPR-1/22-0.5

Hydraulic fittings.

The following fittings are supplied as standard:-

Motor A&B ports	No 12 JIC male
Motor case drain	No 6 JIC male

If it is desired to change these for any reason then the motor port threads are

Motor A&B ports	3/4" BSP parallel
Motor case drain	3/8" BSP parallel

Safety Note

Never use the same size fitting for pressure hoses and the case drain. If this is done there is a significant risk of incorrect hook-up causing pressure to be applied to the motor case which could cause the case to explode with high risk of personal injury.

Required hydraulic flow

To power the ZipTrench Volvo F11-10 motor the vehicle hydraulic system should be capable of supplying a minimum 45 litres per minute at 195 bar to the motor ports. A lower flow than this will adversely affect performance.

The maximum permissible flow is 70 litres per minute at 240bar.

Achieving these flows in an unloaded condition is no guarantee that the supply can actually be met in the working condition.

It is recommended that the installation be checked using an hydraulic flowmeter equipped with a loading valve to simulate the motor running under load.

In order to avoid pressure losses it is mandatory that a minimum of 1/2" bore pipework or hoses is used on the flow and return lines to the motor. 3/4" or larger is recommended.

Testing in air

Warning

Under no circumstances must the flow be allowed to exceed 70 litres per minute when testing in air. There is no backpressure on the propeller to control its speed and many vehicle hydraulic systems are capable of higher deliveries when there are no thrusters running. Overspeeding the motor can cause catastrophic failure.

Hydraulic motor shaft seals

Volvo produce two seals:

"N" type coloured blue and

"H" type coloured red.

The "H" type is a high pressure seal and fitted as standard on the Ziptrench.

Replacement of seals with anything other than a genuine Volvo seal (or Trittech supplied seal) will invalidate the warranty.

MAINTENANCE

Safety Note

Do not power up the ZipTrench until all hoses are properly connected to the motor.

The ZipTrench incorporates a high-speed ducted propeller. Therefore there is a risk of serious injury if limbs are inserted in the nozzle or intake during operation.

If the user wishes to power up the ZipTrench when on deck it is his/her responsibility to ensure that suitable guards or other safety measures are in place to prevent injury.

The pump is designed for low maintenance operation. The main materials are stainless steel and wear resistant polymer plastics.

The only moving parts that may need maintenance are

- The propeller

- The hydraulic motor

Basic maintenance procedures

Pre- dive

Visual check for damage

- Check hoses are secure

- Check mountings are secure

Storage

If the trencher is removed from the vehicle, then the hydraulic ports should be blanked off with metal caps and the unit washed out with fresh water.

Visually inspect the leading edges of the propeller for damage.

Basic fault finding

- Check that the hydraulic motor runs freely without excessive noise or vibration.

- Check that the hydraulic flow meets the specification.

Dismantling

Tools required

The following tools are required to work on the trencher.

19mm open ended spanner

19mm socket, short extension bar and ratchet

10mm open ended spanner

10mm Allen key

3mm Allen key

Dead blow hammer

Removal of hydraulic motor and propeller

Disconnect all hydraulic hoses from the motor and fit caps to the ports

Remove the 8 bolts holding the motor mounting plate to the Nozzle Duct.

Remove the mounting plate/motor/propeller assembly

Remove the retaining 10mm bolt from the end of the motor shaft

Remove the 19mm Nyloc Nut from the Stainless steel shaft adapter

The propeller will now slide off the shaft adapter spline

Loosen the two grub screws on the shaft adapter using a 3mm Allen key

Remove the propeller boss from the motor shaft

Reassembly

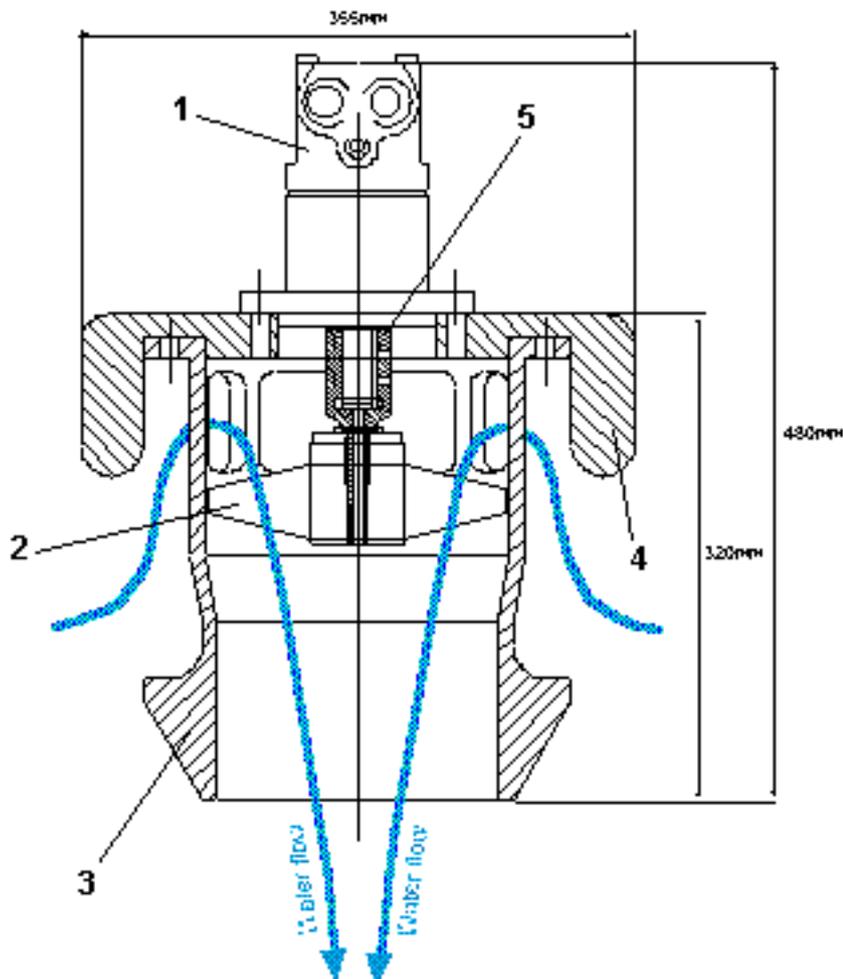
Reassembly is the reverse of the procedures above, with the following actions:

Apply some anti-seize grease to the motor shaft before fitting the shaft adapter.

Press the shaft adapter onto the shaft right up to the shoulder

ZipTrench General Assembly

The ZipTrench General assembly part number is AMI-TRI-ZPT-100.
The serial numbers commence with ZPT-100-01 and follow in sequence.



PARTS LIST

1	AMI-TRI-ZPT-001	Motor (Volvo F11-010-MB-CHK-000)
2	AMI-TRI-ZPT-002	Propeller
3	AMI-TRI-ZPT-003	Nozzle Duct
4	AMI-TRI-ZPT-004	Motor Mount
5	AMI-TRI-ZPT-005	Shaft adapter