



**User Manual
Pump in Sub VAM HC
165-2222-HS0**



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Revision History

Issue, Date	Remarks
Rev A, 08 May 08	Initial Issue



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Safety

WARNING: Trapped air requires considerable time to compress and when it is compressed is highly dangerous. It has enough stored energy to separate parts with considerable force.

All pressure equipment has a particular pressure rating and care must be taken to ensure that no item is used in a situation that may cause its working pressure to be exceeded.

All personnel involved in pressure testing must be formally trained, and wearing the appropriate PPE.

Ensure the identification band/plate is fitted and is displaying the correct information and that this is the correct manual.

This equipment and the equipment it is attached to is heavy never position yourself below a suspended load

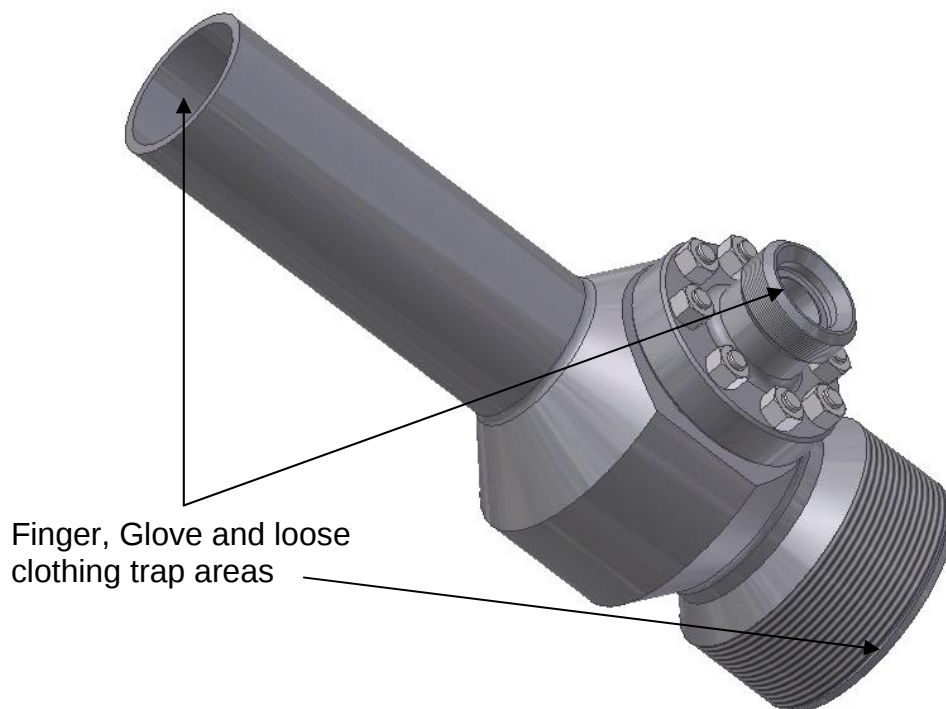


Figure 1: Pump in Sub Safety



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1 Introduction

1.1 General

The pump in sub is normally positioned between the wireline valve and the wellhead. Its main function is to facilitate well control by pumping fluid when the wireline valve is closed.

The Phuel pump in sub body is constructed with a 9-4 connection, a 5.5 VAM HC connection and a side outlet sub which is a standard API BX flange that allows suitable flow connections (2" 1502 weco type in this case) to be attached.

This user manual serves as an introduction to the equipment and contains the relevant specifications, operation, planning and maintenance instructions, parts list and drawings.

1.2 Product Identification

Phuel products are identified by a unique serial number that facilitates full product traceability. Each product is supplied with a documentation pack that contains product certification and material/inspection reports. The serial number is always etched on the surface of the product but can sometimes be difficult to find or read after painting. A customer identification number is also included to allow the customer to track the asset in their system.

A stainless steel band secures the nameplate tag that is stamped with the information shown below. This tag should be located in the first instance to ensure that this manual refers to the correct equipment.

PHUEL OIL TOOLS LTD
DESCRIPTION & SIZE
CUSTOMER ID No
PHUEL ID No 06-XXX-XX
MWP & SERVICE
TEST DATE



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2 Technical Specification

Part No	165-2144-HS0
Connections	9 – 4 Otis Type Connection 5.5 17# VAM HC pin 2" 1502 hammer lug union
Maximum Working Pressure	5000 Psi
Test Pressure	7500 Psi
Service	H2S
Weight	220 lbs/100 Kg
Overall Length	30"/0.762M
Inner Diameter	4.82"/0.122M

Table 1:Technical Data

3 Technical Description

The pump in sub has been specially designed to act as a wellhead adapter crossover from a 9-4 connection to a 5.5 VAM HC pin connection with a WECO 2" 1502 side outlet.

The side outlet sub is a standard API BX flange that allows suitable flow connections (2" 1502 weco type in this case) to be attached



Figure 2:Flange Crossover

4 Operation

Once the relevant valve has been connected to the WECO connection the pump in sub is ready for connection between the wireline valve and the wellhead to allow well control

The pump in sub can also be utilised to allow fluid sampling and/or inhibitor injection.



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5 Job Planning

5.1 Pre Job

- Ensure thread protectors are fitted
- Check maintenance record sheet and ensure the equipment has been maintained by competent personnel
- Check all certification is in date
- Confirm information band is fitted and correct
- Ensure equipment is suitable for the maximum working pressures and services involved
- Ensure 'O' ring is seated correctly and there are no signs of damage
- Ensure threads are clean
- Inspect for signs of damage
- Pressure test to 1.2x the maximum well pressure

5.2 During Job

- Avoid excessive movement

5.3 Post Job

- Inspect for signs of damage
- Ensure threads are clean
- Ensure thread protectors are fitted



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6 Maintenance

6.1 Introduction

Regular maintenance of the equipment using Phuel redress kits or Phuel approved parts is essential to its continued safe operation. Ensure that the pre and post job operating procedures are followed and that maintenance records are kept.

6.2 Schedule

The maintenance schedule may be governed by international or company standards and the following is considered to be the minimum requirements.

6.2.1 Pre & Post Job

Refer to Section 5.1 and Section 5.3 for details

6.2.2 Yearly

- Disassemble Pump in Sub (see below) clean and degrease all components
- Inspect the condition of all sealing surfaces and surface coatings
- Re-coat threads and sealing surfaces if necessary. If in doubt contact Phuel Oil Tools Ltd
- Regrease components
- Re-assemble (see below)
- Pressure test to maximum working pressure
- Inspect paint work and repair as necessary

6.2.3 Five Yearly

- Yearly Maintenance (plus the following)
- Carry out 100% surface NDE on all surfaces
- Pressure test to test pressure witnessed by certifying authority

6.3 Safety

- Many of the components are heavy and should not be lifted without lifting aids
- Wear appropriate personal protective equipment
- Do not over exert yourself while using torque wrenches. Use appropriate mechanical advantages when available.
- Ensure that all tools and equipment are in good condition and are suitable for the intended use.



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6.4 Tools

The following tools are required:

- 50mm Spanner
- Wire Brush
- Torque wrench with 50mm socket (capable of 153lbft/207NM)

6.5 Redress Procedure

6.5.1 Dis-Assembly

- Remove hex nuts
- Remove flange crossover and seals
- Degrease and clean all components
- Inspect threads for damage
- Fit thread protectors

6.5.2 Re-Assembly

- Remove thread protectors
- Inspect all threads for signs of damage and clean with wire brush
- Insert studs into flange sub and tighten
- Ensure top and bottom seal fitted to flange crossover
- Fit flange crossover to flange sub (ensure bottom seal correctly positioned) and tighten down into place with hex nuts to a torque of 153lbft (207NM)

6.5.3 Testing

All testing is to be carried out in the designated test area and by suitably qualified personnel.

- On completion of reassembly fit the appropriate test caps to either end of the pump in sub and to flange crossover
- Fill with test fluid and bleed off any air in the system
- Apply a pressure of 500 psi and ensure pressure holds for a minimum of 10 minutes
- Increase pressure to 5,000 psi (Maximum Working Pressure), allow to stabilise and maintain this pressure until it is evident there are no apparent leaks.
- Bleed off pressure, drain test fluid and dry
- Remove test caps
- Apply coating of de-watering solution to protect the bore and threads
- Fit thread protectors

On completion of all maintenance ensure the maintenance record sheet (Table 2) is completed



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6.6 Maintenance Record Sheet

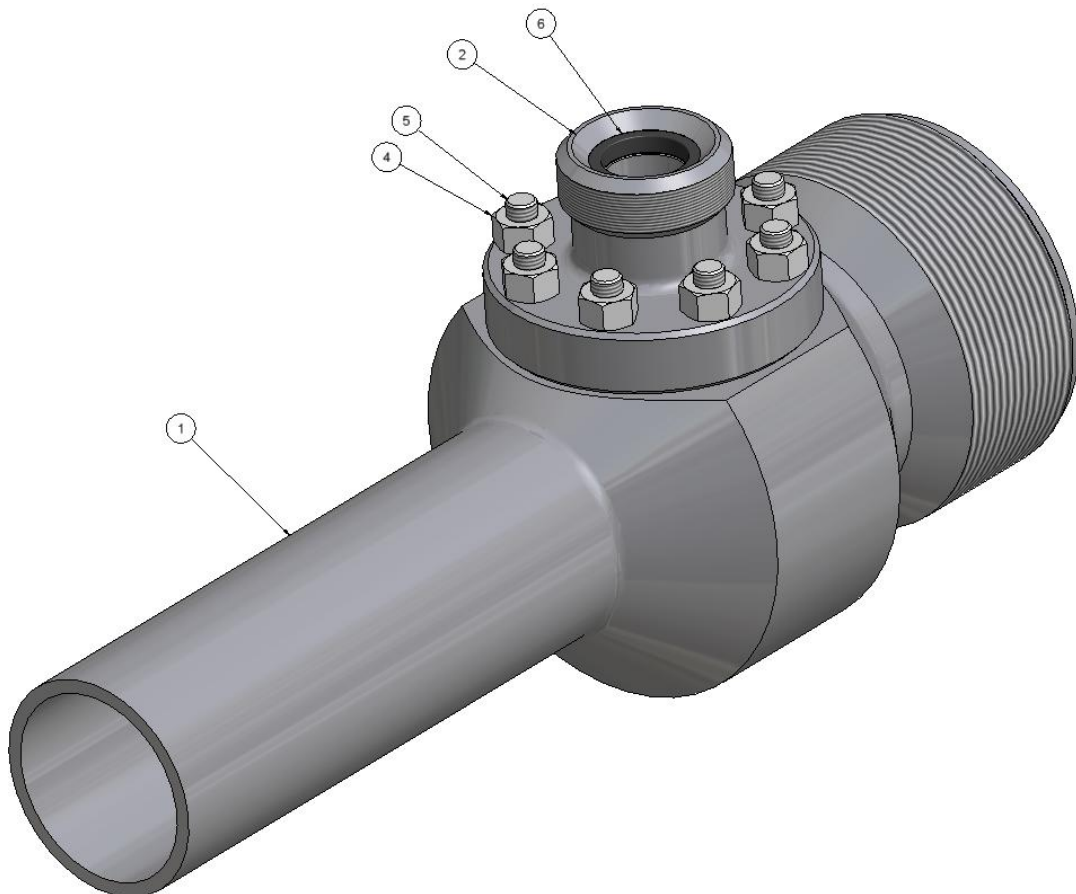
Date Performed	Type of Maintenance	Performed By	Verified By	Comments

Table 2: Maintenance Record

7 Parts List and Drawings

ItemNumber	ItemCommodity	ItemQuantity	TitlePart
1	165-2187-480	1	PUMP IN SUB - BX152
2	950-2160-480	1	FLANGE CROSSOVER
3	950-2164-STL	1	API SEAL BX 152
4	HNC-0670-A2H	8	HEX NUT 3/4 UNC
5	165-2165-AB7	8	STUD 3/4-10 UN X 6" LONG
6	950-2167-N90	1	SEAL FOR FIG 1502 (ANSON)
7	910-2156-N66	1	9-4 ACME FEMALE PROTECTOR

Table 3:Parts List





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8 Troubleshooting

8.1 Leaking BX Seal

Try initially to increase the torque on the bolts but do not exceed 200 ft-lbs

If the leak continues then remove the flange sub and replace the BX seal. Inspect the seal surface (outer angled face only) for any signs of pitting or damage and correct if necessary before re-assembly.

8.2 Leaking 1502 Union

Replace the elastomeric seal. Check that the connection has not been damaged prior to re-assembly.

8.3 Leaking VAM connection

Break out the connection and clean up the threads and inspect the seal surface for any signs of damage. Re-apply thread dope and re-torque paying attention to the torque curve. If the connection still leaks then it may be necessary to cut back the connection. There is sufficient length for one full re-cuts on the pin. Consult an authorised VAM provider if required.