



Unit 17 Denmore Industrial Estate, Denmore Road, Bridge of Don, Aberdeen AB23 8JW

**User Manual
Grayloc Riser**

This Manual Covers the Following Part Numbers:

115-3068-HV0



User Manual Grayloc Riser

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User Manual Grayloc Riser

Revision History

Issue, Release Date	Description
Rev A, 29 Oct 10	Initial Issue
Rev B, 10 Jan 11	Seal Ring was BX 156 (Sect 7)
Rev C, 11 Jan 11	Supporting Equipt Update

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.

Seals in high-pressure vessels are also susceptible to explosive decompression; the O-rings or rubber gaskets used to seal pressurised pipelines tend to become saturated with high-pressure gases. If the pressure inside the vessel is suddenly released, then the gases within the rubber gasket may expand violently, causing blistering or explosion of the material.

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, competent and utilising the appropriate PPE.

Safe Lok devices, where used, should be checked for positional security to avoid unnecessary movement of the collar

Ensure the identification band/plate is fitted and is displaying the correct information as per the Tag Sheet/Index

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

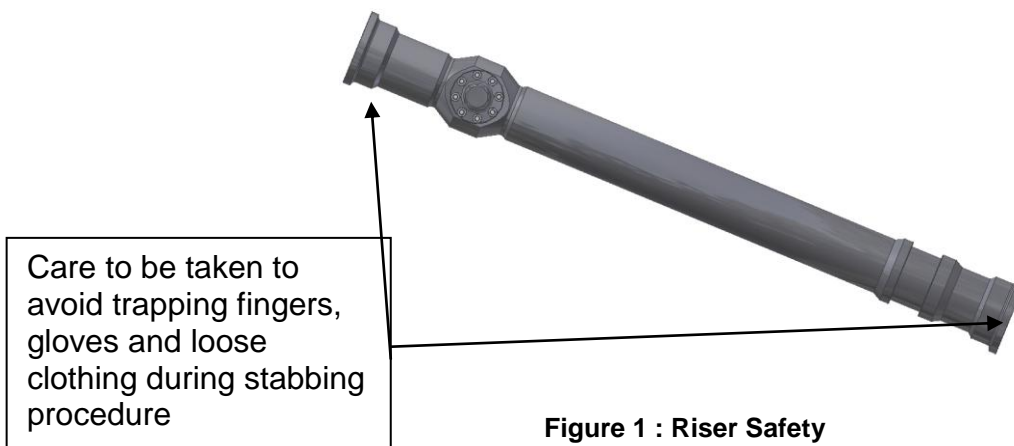


Figure 1 : Riser Safety



1 Introduction

1.1 General

The Phuel Grayloc Riser (or Lubricator) is a pressure containing cylinder used when performing wireline operations. Its purpose is to allow the wireline tool string to be raised above the wellhead valve allowing entry and exit from the well bore.

The Riser body is constructed in one piece with a metal-to-metal Grayloc sealing end connections.

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 stainless steel band secures the nameplate tag that is stamped with the information shown. This tag should be located in the first instance to ensure that this manual refers to the correct equipment. A customer identification number is also included to allow the customer to track the asset in their system

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

2 Technical Specification

Part Number	114-3064
I/D	6.375"
Length (A)	147.21" / 3.74 m
Weight	3912 lbs / 1774 kg
Maximum Working Pressure	15,000 Psi
Maximum Test Pressure	22,500 Psi
End Connection	Grayloc M12/72
Side Connection	3.06 BX Side Outlet

Table 1 : Technical Data

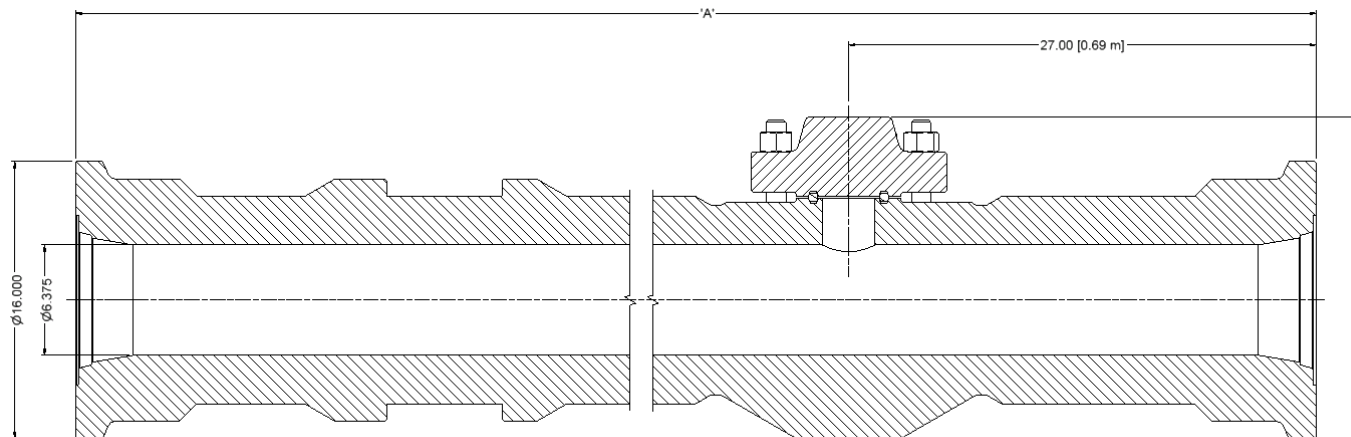


Figure 2 : Riser

3 Technical Description

3.1 Metal Seal Ring

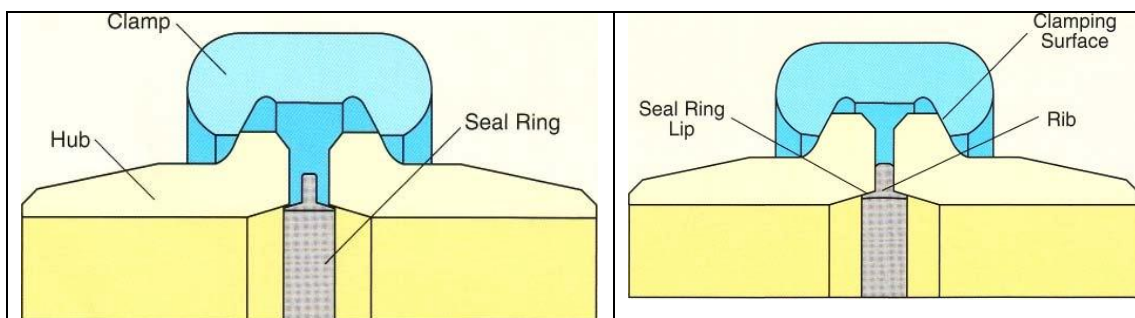
The seal ring resembles a "T" cross section. The leg of the "T" forms a rib that is held by the hub faces as the connection is made-up. The two arms form lip seals that create an area of sealing surface with the inner surface of the hub. Internal pressure works to reinforce this seal.

3.2 Two Hubs

The clamp fits over the two hubs and forces them against the seal ring rib. As the hubs are drawn together by the clamp assembly, the seal ring lips deflect against the inner sealing surfaces of the hubs. This deflection elastically loads the lips of the seal ring against the inner sealing surface of the hub, forming a self-energized seal.

3.3 Clamp Assembly

Designed to provide nearly 360° clamping contact with the hubs. A relief notch in the centre of the clamp segments allow even distribution of makeup forces. No specific orientation is required when installed.



The rib of the seal ring is clamped between hub faces. The lips of The seal ring engage the inner hub surface with an interference fit which deflects the lips to achieve a seal.

4 Operation

All operations to be carried out by suitably qualified and competent personnel

4.1 Lifting

End protectors should always be fitted when lifting or moving the riser.

4.1.1 Vertical

The Riser should be lifted with a suitable lifting clamp or cap that is rated for the total lifting load, following the instructions for the clamp or cap being used.

If practical leave the thread protectors fitted until ready to make up the connections.

4.1.2 Horizontal

Suitable slings can be wrapped around either end of the riser to allow horizontal lifting for means of transportation or fitting. Always pay attention to the centre of gravity and do not continue to lift if the lubricator is not sitting horizontal as it might slip through the slings.

4.2 Before Assembly

- The Grayloc seal ring does not seat until the connection is fully tightened; therefore, a small clearance, or standoff, between the ring rib and hub face should be observed when the ring is placed into a mating hub. If no standoff is present, use a new seal ring.
- Clean all lubricants and foreign matter from the hub seating surfaces before installation. Use a non-abrasive material to clean the seal rings of all foreign matter. Normally, all seal rings have a coating or plating (cadmium, PTFE, MoS₂) which acts as a lubricant during make-up. In some applications where uncoated/ unplated seal rings are used, a light film of clean lubricant is recommended.
- When applying lubricant, take special care to ensure that no solid or foreign particles are present in the lubricant. Also, take care to prevent mechanical damage to the seal ring and the hub sealing surfaces.
- Before assembly, the hubs must be aligned to allow engagement of the seal ring lips to the hub sealing surfaces. This will ensure proper engagement of the hub and clamp segments.

4.3 Assembly

- Align the hubs so that the seal ring can be installed between the hubs.
- Install the seal ring in the sealing surface of the hubs. The seal ring should rock slightly; i.e., the seal ring rib should not be able to firmly contact the hub face. If it does not rock, use a new seal ring.
- Install the clamps around the hubs. Apply lubrication to the hub-clamp contact area to reduce friction; this will aid assembly.
- Insert the stud bolts into the bolt holes of the clamp ears. Install the nuts, ensuring that the spherical surfaces of the nuts and the clamp are in proper position for mating.
- Lubrication of the bolting and the spherical faces of the nuts and the clamp is recommended.
- Tighten the bolting in a criss-cross pattern (i.e., bolt #1, #3, #2, #4) to keep the spacing between the clamp halves approximately equal.
- To properly preload the Grayloc connector against gasket loads, fluid pressure loading, thermal shock loading, and normal pipe reaction loads, the torque values of 870 lbft (1180 Nm) is recommended. Note that torque wrenches are not required, but are recommended to ensure that the minimum preload values are met.
- Assembly should include jarring the clamps during the bolting procedures, i.e., a sound blow to the back of the clamp with a soft hammer (torque, jar, torque, jar, etc.) until bolt torque does not change after jarring.
- At full make-up, the hub faces will shoulder flush against the seal ring rib. The seal ring rib will prevent over torquing from causing seal damage, but to prevent permanent damage from distortion of the other components of the connection, the maximum torque applied to the connection should not be more than twice the values shown in the table. For extreme misalignment and/or extreme piping loads, torque values 1'h to 2 times the table values are recommended. Lubricated bolting should be used to assemble the Grayloc connector..

4.4 Disassembly

Before disassembling the Grayloc connector, bleed all pressure from the line. When removing the clamp, first loosen the bolting and the clamp set from the hubs to allow the safe release of any trapped pressure. Then, remove the bolting completely.

4.5 Pre Job

- Ensure end 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
- Inspect for signs of damage
- Pressure test to at least 1.2x the maximum well pressure
- Ensure all connections are tight

4.6 During Job

- Avoid excessive movement

4.7 Post Job

- Inspect for signs of damage
- Ensure protectors are fitted

5 Maintenance

All maintenance to be carried out by suitably qualified and competent personnel

5.1 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.

Special maintenance is not required for a Grayloc connector that has been properly assembled. However, when disassembling a connector, check the seal ring for standoff prior to reassembly and visually inspect the hub seats for uniformity and freedom from burrs and deep scratches. These irregularities on ring seal surfaces could cause leakage.

Remove scale, rust, burrs, or deep scratches from a ring seat by lightly polishing with a fine steel wool or crocus cloth around the seat circumference to ensure uniform blending-in of the reworked area. Never lap the hub seat with the seal ring; this practice will damage both the ring and the seat and prevent an effective seal.

The connector should not be tightened while under pressure loading or severe mechanical loads. Do not weld on Grayloc clamps, bolting or seal rings without consulting Grayloc Products.

All components of the Grayloc assembly should be obtained only from Grayloc Products or one of its authorized licensees. Do not substitute non-Grayloc brand parts in Grayloc connectors.

5.2 Schedule

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

5.2.1 Pre & Post Job

Refer to Section 4.5 and Section 4.7 for details

5.2.2 Yearly

- Disassemble riser clean and degrease all components
- Inspect the condition of all sealing surfaces and surface coatings

-
- Re-coat sealing surfaces if necessary. If in doubt contact Phuel Oil Tools Ltd
 - Regrease components
 - Re-assemble – torque side outlet bolts to 706Nm (523 ft-lb)
 - Pressure test to maximum working pressure in accordance to testing procedure (see 6)
 - Inspect paint work and repair as necessary

5.2.3 Five Yearly

- Yearly Maintenance (plus the following)
- Carry out surface NDE on all component threads and damaged surfaces
- Pressure test to test pressure (witnessed by certifying authority where applicable)
- Repaint

5.3 Safety

- Many of the components are heavy and should not be lifted without lifting aids.
- Ensure all pressure testing is carried out in the appropriate testing area by suitably qualified personnel.
- 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.
- Clear up any fluid spills immediately to avoid slips.

6 Testing

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

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

- On completion of reassembly fit the appropriate test caps to either end of the riser
- 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 Maximum Working Pressure, allow to stabilise and maintain this pressure for a minimum of 15 Minutes ensuring there are no apparent leaks. .
- Bleed off pressure, drain test fluid and dry
- Remove test caps and plug
- Apply coating of de-watering solution to protect the bore
- Fit protectors

On completion of all maintenance ensure the maintenance record sheet (Para 5.4) is completed

7 Parts List and Drawings

Item Number	Part Number	Quantity	Description
1	115-3120-480	1	15K RISER 3.74M (GRAYLOC M12/72 W/ 3.06 BX)
2	128-2216-A2H	8	HEAVY DUTY NUT 1.125-8 UN
3	900-3253-STL	1	SEAL RING BX 154 (Soft Iron)
4	125-3357-AB7	8	STUDS - 1.125-8 UN X 6 LONG
5	950-3366-475	1	3-1/16in BLANK FLANGE (15K)

Table 3: Parts List 115-3068

Note: The nuts (2) are to be torqued to 523 ft-lbs (706 Nm)

8 Spares

Use only spares supplied or approved by Phuel Oil Tools Ltd.

It is recommended that sufficient quantities of the following spares be maintained to ensure that the equipment is always available when required.

8.1.1 Individual Items

Individual items may be ordered as required using the part number specified

8.1.2 Supporting Equipment

The following are available for order directly from Phuel Oil Tools Ltd or can be procured directly from your local Grayloc distributor if marked thus *.

Part No.	Item Description	Comments
*A90501-9	Grayloc Clamp 12M	AISI 4140 NACE (ASTM A 193 B7M)
*H90136-17	Studs & Nuts for Clamp 12M	ASTM A193 B7/A194 Gr2H, Zinc Plated
*66814	Seal Ring Size 72	AISI 4140 NACE PTFE Coated
*A91072-4	Blind Test Hub	Size 12M 72 with 9/16 Autoclave
950-3825-STL	Lubricator Lift Clamp	25 Ton SWL with 2m of chains

Table 4 : Supporting Equipment

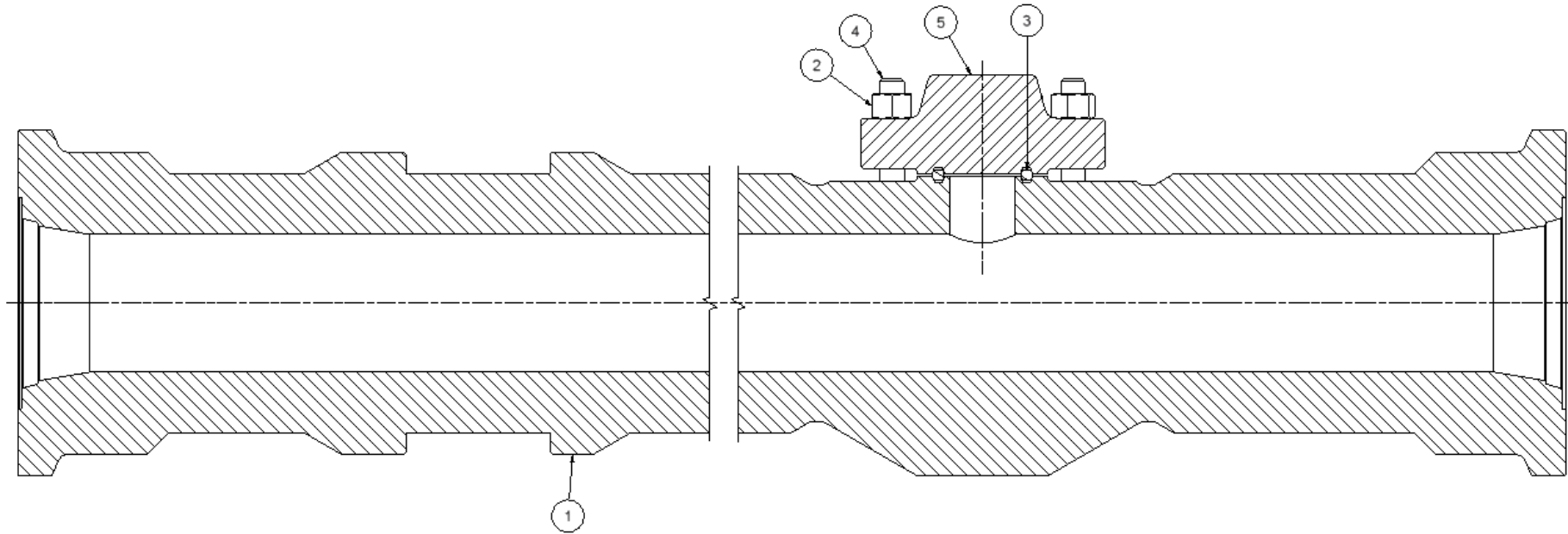


Figure 3: Grayloc Riser