Kinetics Controls & Innovation Ltd

Case History

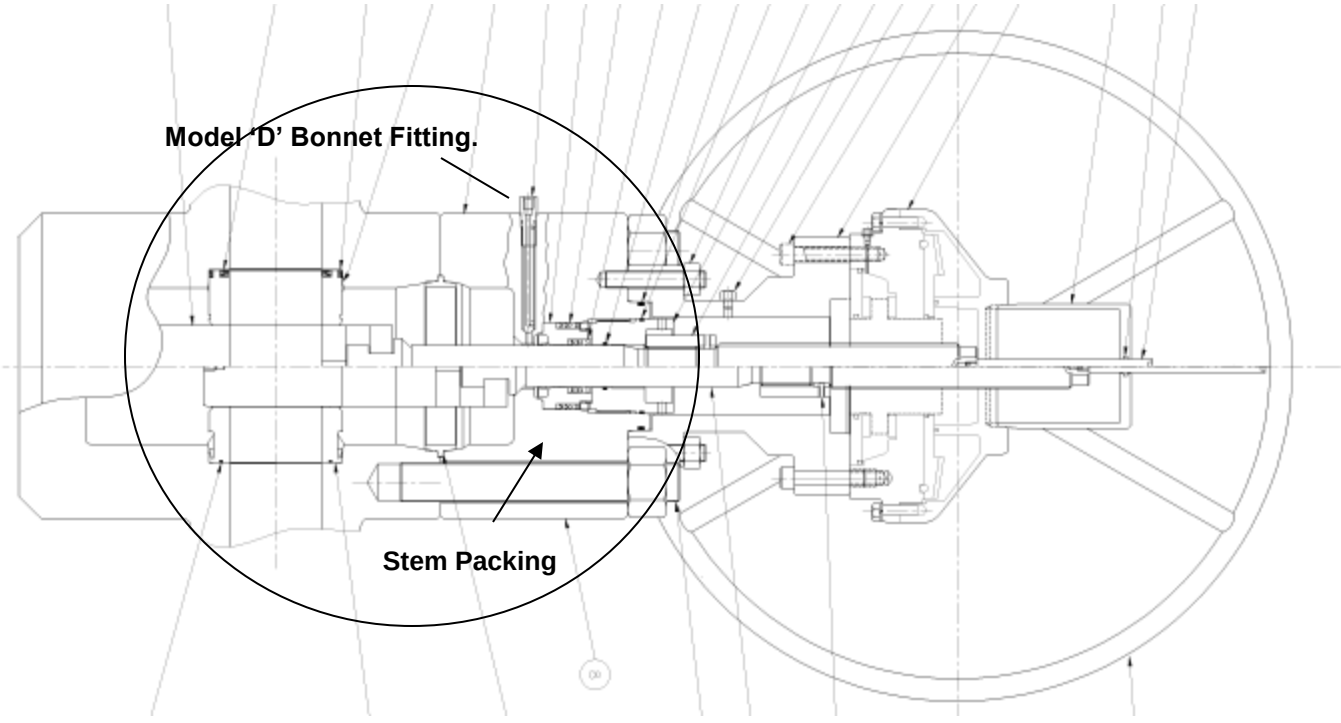
North Sea Platform
Annulus Gate Valve Isolation
Project Overview

Introduction:

KCI has been tasked to provide an isolation on a 2" Annulus gate valve in support of installing a VR Plug on the wellhead. The task will be initially to displace any existing 601 grease and replace this with KCI Mac-Pac through the Model 'D' fitting on the gate valve.

The scope of the operation will be based on the following actions:

1. Displacement of the 601 Grease by injecting sealant through the Model 'D' fitting.
2. Functioning the valve to the open position with the cavity full of Mac-Pac.
3. The displacement of the Mac-Pac when installing the VR Plug.



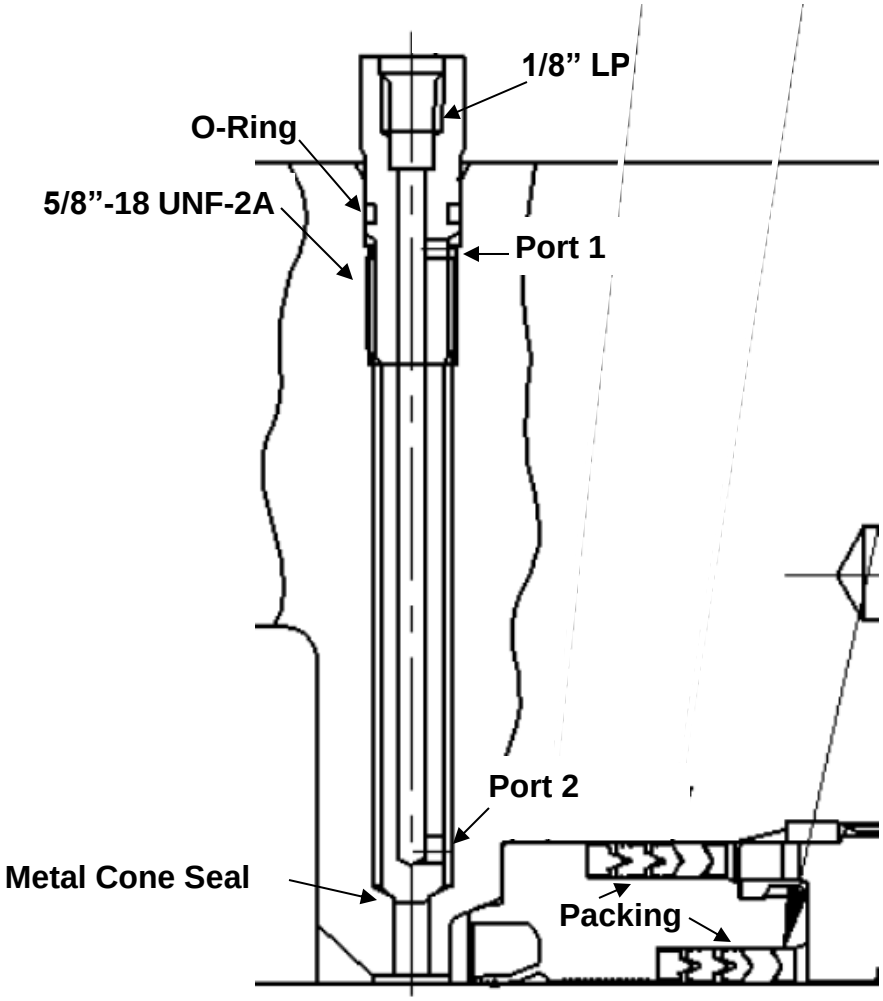
Vetco Valve Example Only Showing the Bonnet Model 'D' Interface Fitting

Model 'D' Fitting:

The model 'D' fitting requires to be screwed back one(1) turn anti-clockwise to gain communication into the cavity between the back seat and stem packing. Test ports, of which there are 2, are positioned below the O-ring and above the cone seal.

This fitting is normally used to inject grease into the valve cavity and lubricate the stem packing.

The O-ring is critical in maintaining the primary barrier when the cone seal is off seat.
A pressure test of the O-ring can be achieved prior to opening the access port i.e. cone seal.



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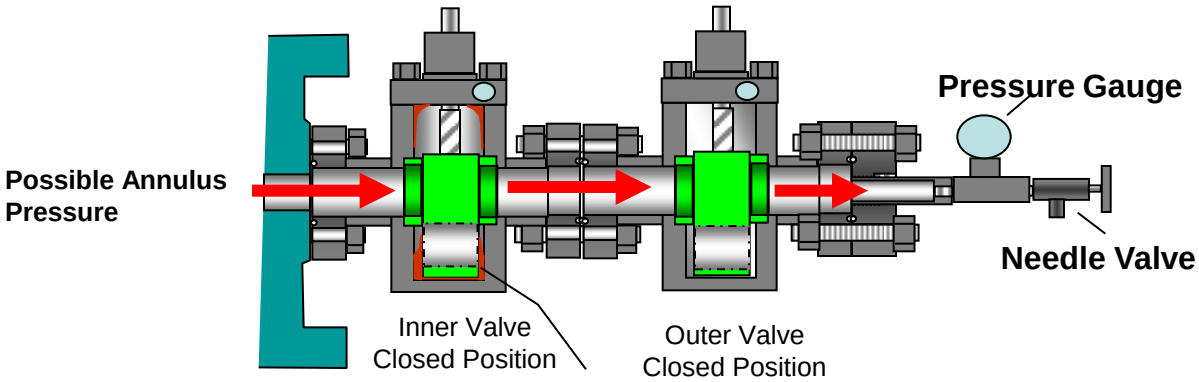
Valve Current Status:

Due to the inner 2” Annulus Gate Valve passing KCI will provide a temporary isolation to obtain safe access for installing and testing of the VR Lubricator tool. The outer valve status is that it cannot be fully closed.



Scope of Mac-Pac Deployment

The Model ‘D’ fitting requires to be screwed back one(1) turn anti-clockwise to gain communication into the cavity between the back seat and stem packing.

The Mac-Pac is designed to displace the 601 Grease which is resident in the valve from maintenance activity.

Mac-Pac Volume to be injected depending on grease content is 1.5 to 2Litres
Valve maintenance suggests valves have previously been injected with 601 Grease filling the valve cavity.
Pressure test against the model D fitting with sealant.
Inject a full 1litre stick of Mac-Pac monitor back pressure and any grease displacement.
Function the valve to the half open position.
Inject a further 500 mils of Mac-Pac.
Function the valve to the three quarters closed position supporting a displacement path.
Inject a further 250 mils of Mac-Pac.
Function the valve to the closed position and inject the remaining 250mls of Mac-Pac.

Note: Monitor back pressure. Do not exceed maximum back pressure 3,000psi (Stand up pressure)

Operate the valve and function it open and closed for up to 1 to 3 times to displace the Mac-Pac at the gate and seat interface.

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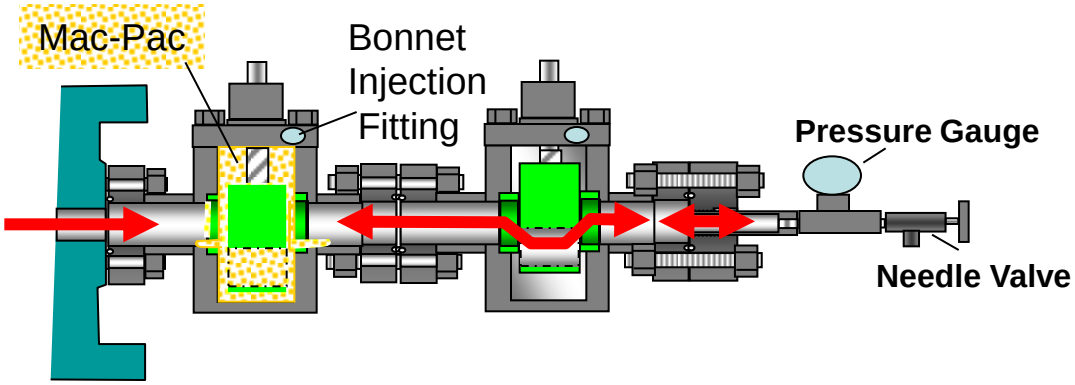
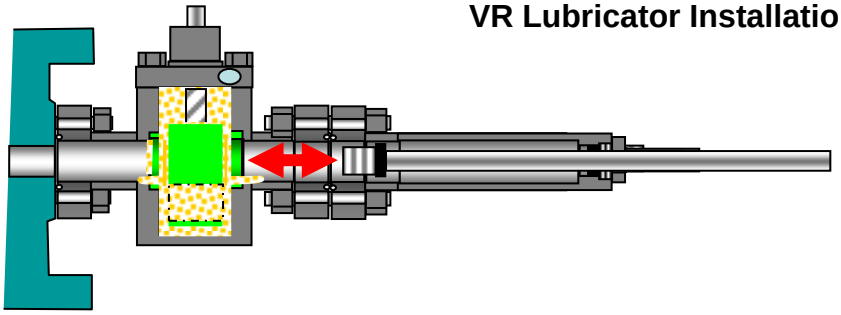
Pressure Test and Removal of the Outer Valve

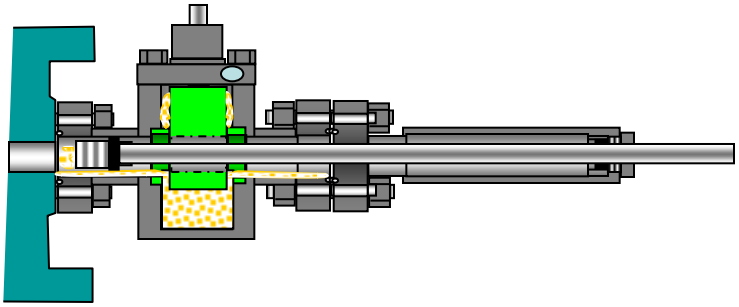


Function the valve to the closed position.
Pressure test against the inner valve and confirm isolation.
Remove the outer valve and install the lubricator tool and pressure test flange interface.

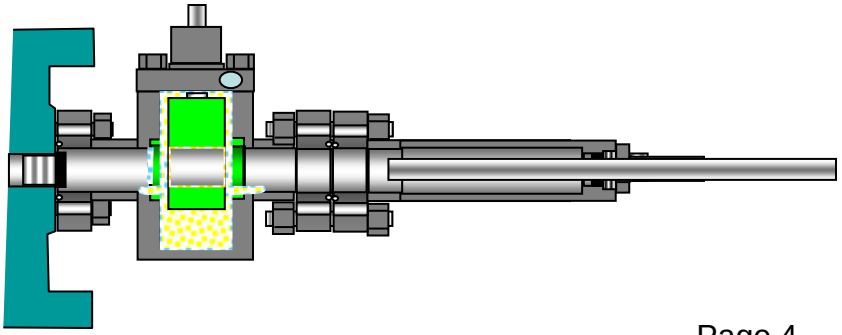
VR Lubricator Installation



With the valve still closed and the Mac-Pac intact the lubricator connection can be tested against the Mac-Pac..



Once tested the valve can be opened shearing the Mac-Pac



With the VR plug safely installed the VR tool can be withdrawn and the valve closed.