

## Agenda

- History
- Details of Itag's Sub Sea Valve
- FEA
- Alternative Design
- Actuators
- Actuator Replacement Tool

## History

In 1996 Itag has got the order Statoil of Norway to carry out a study for a sub sea ball valve for their Aasgard field.

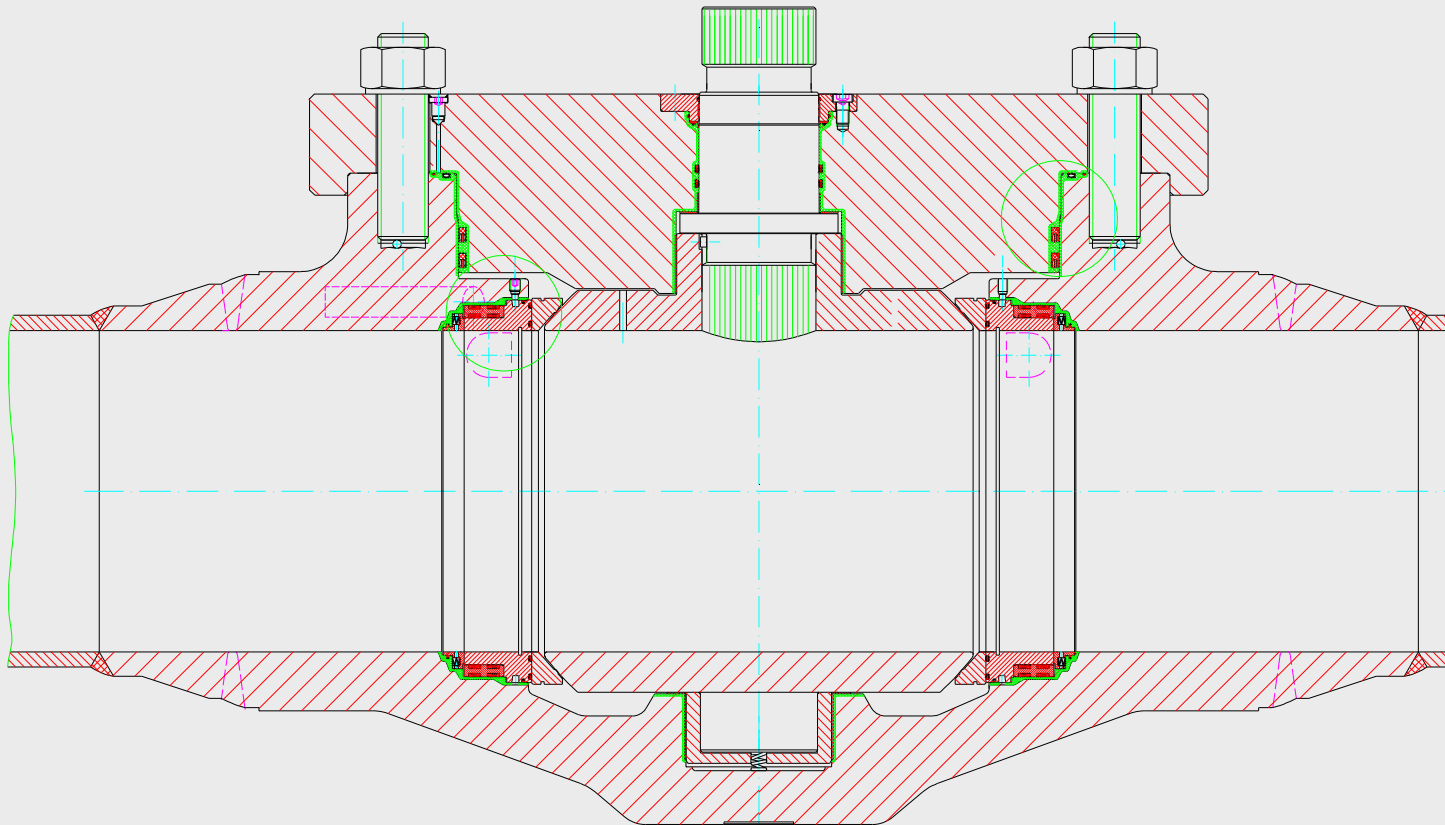
## Requirements

<b>Depth:</b>	<b>approx. 300 m</b>
<b>Size:</b>	<b>42"</b>
<b>Pressure Class:</b>	<b>1500</b>
<b>Body:</b>	<b>LCC with 625 cladd</b>
<b>Trim:</b>	<b>Super Duplex</b>
<b>Seals:</b>	<b>no elastomers</b>
	<b>metal seated</b>
	<b>metal stem seal</b>
	<b>metal bonnet seal</b>

**Unfortunately the 42" Ball Valve hasn't been built so far. But as a result of the study Itag got several orders from Statoil for the supply of Top Entry Sub Sea Ball Valves from 2" to 22" all in class 1500. For these valves the same design features as for the valve of the study has been used.**



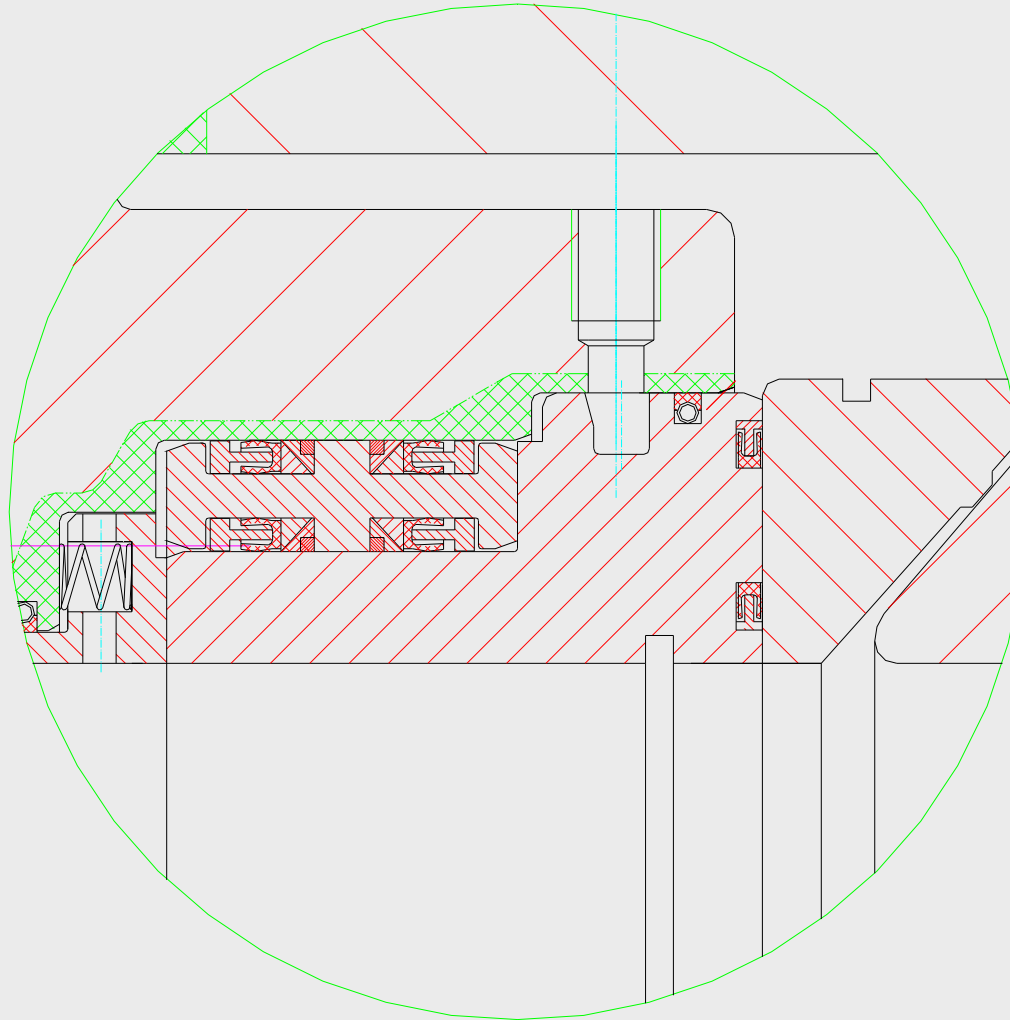
# Top Entry Sub Sea Ball Valve



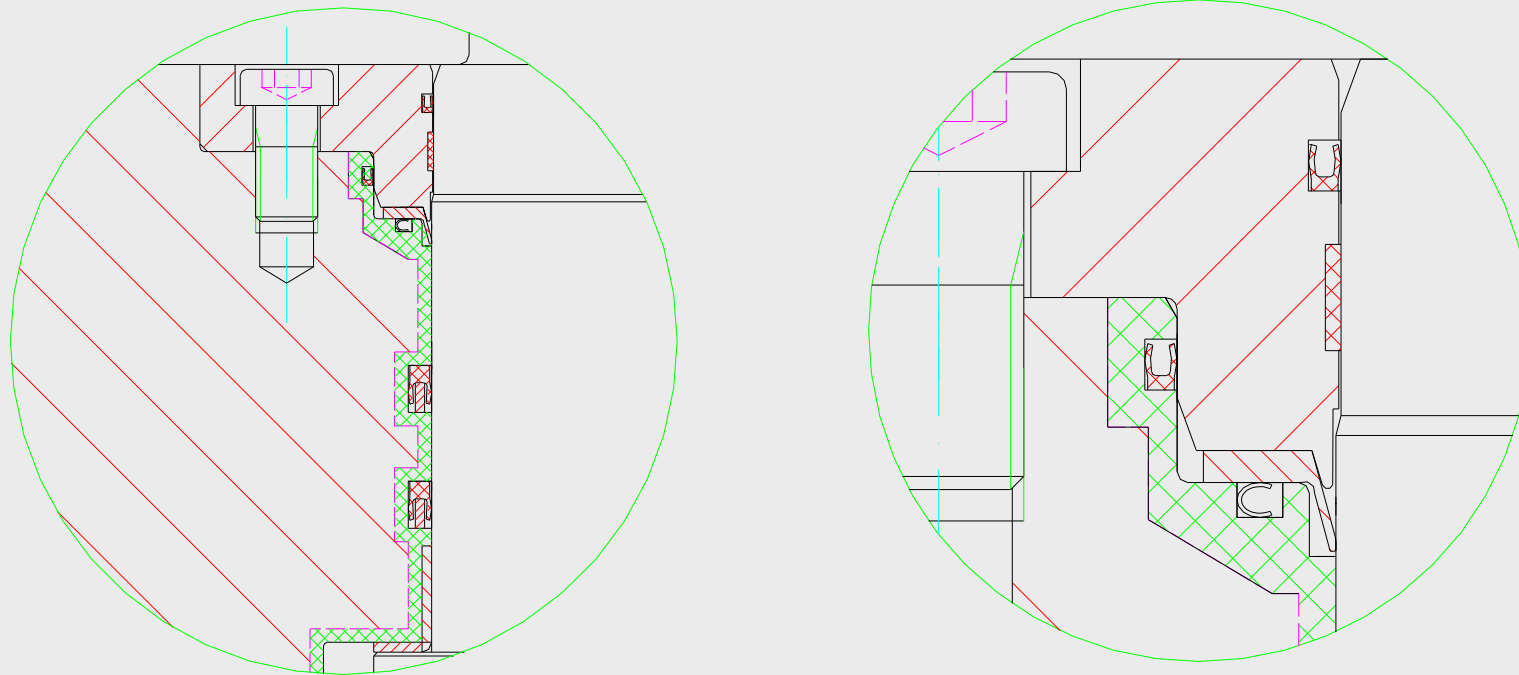
# Detail of Seat Ring



X1:1

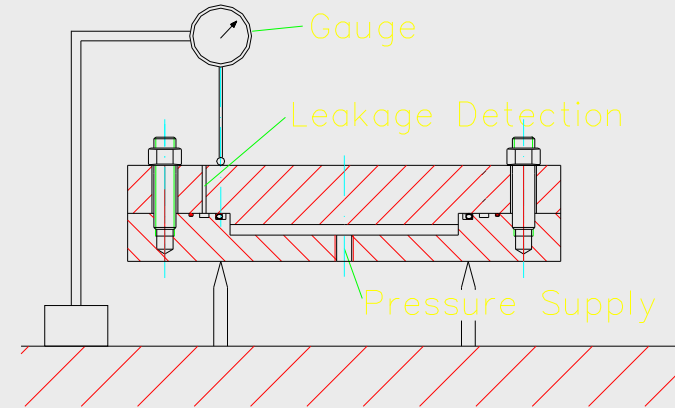
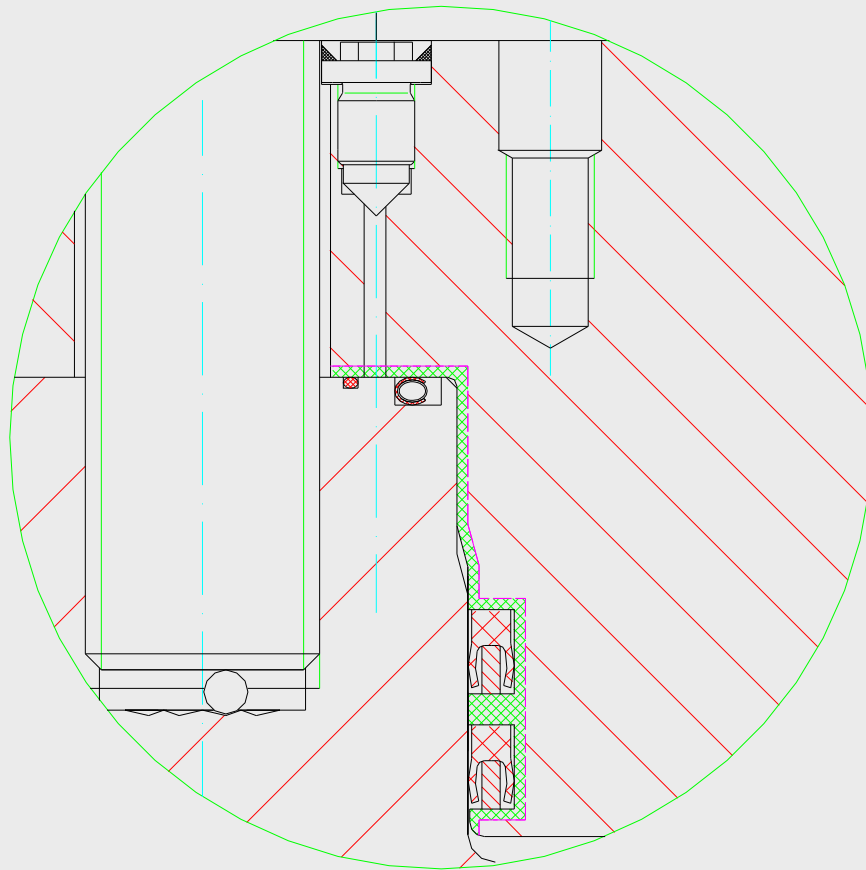


# Stem Seal Detail

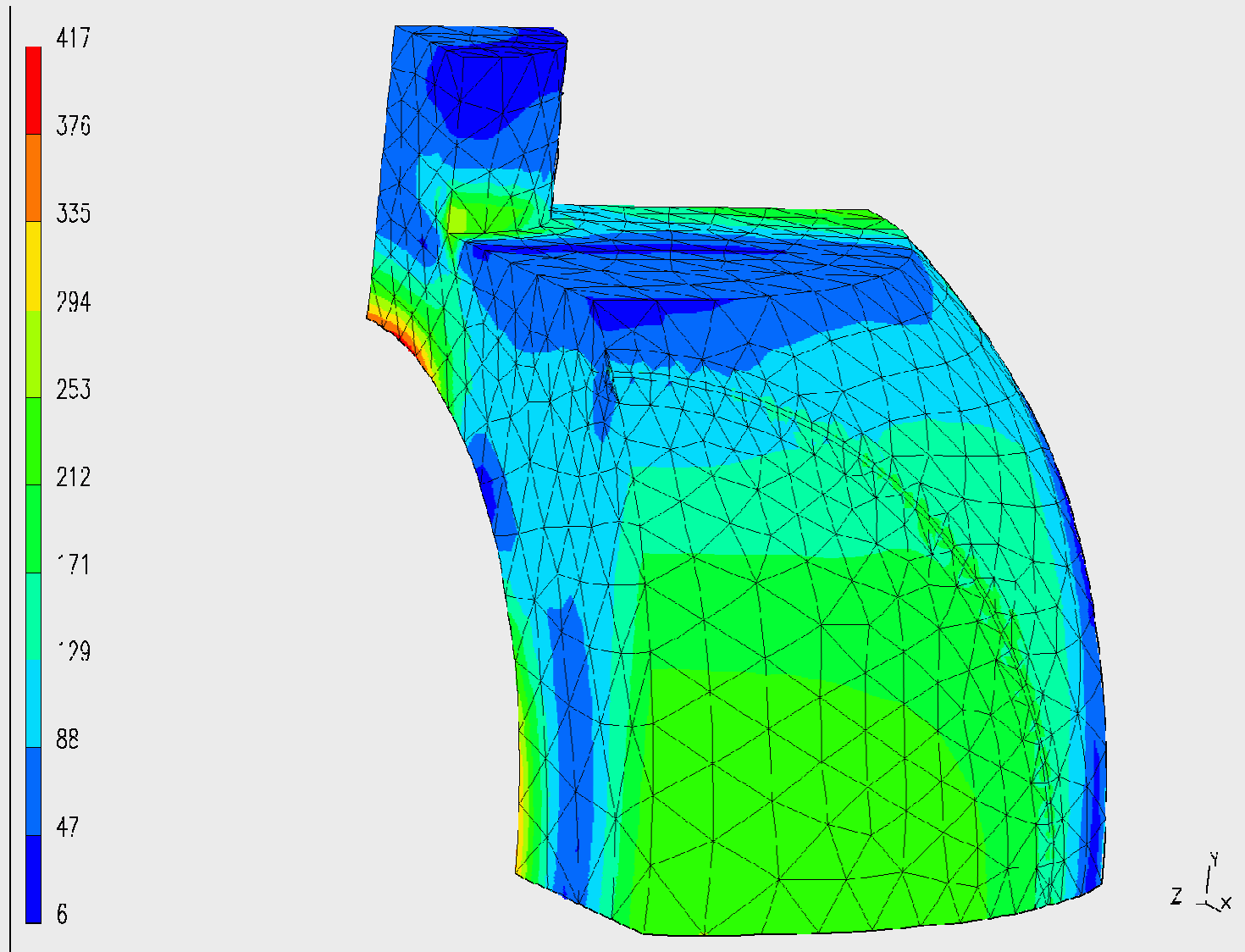


Number of Cycles	50	100	200	300	400	500
Leakage	0	0	0	0	0	0

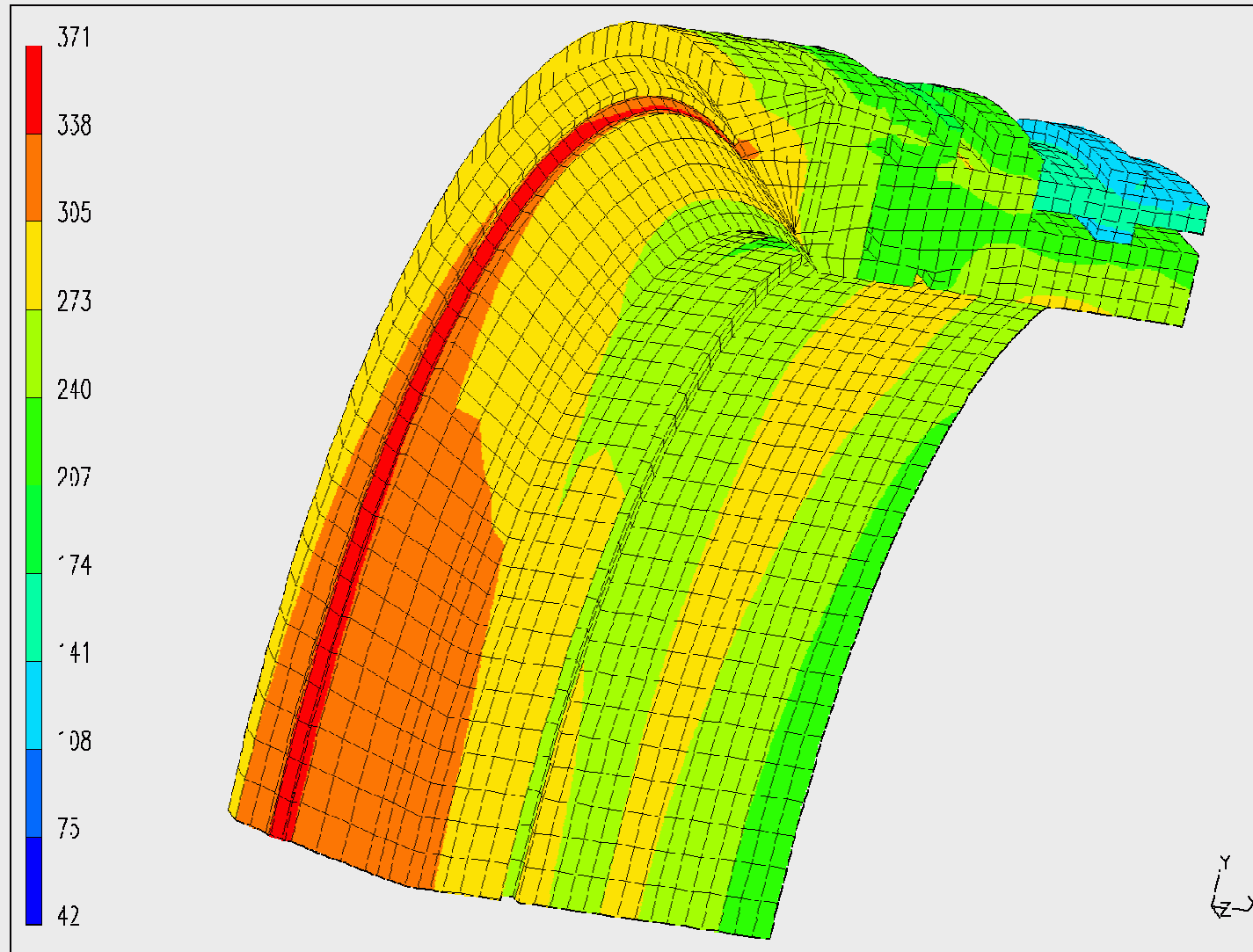
# Bonnet Seal Detail



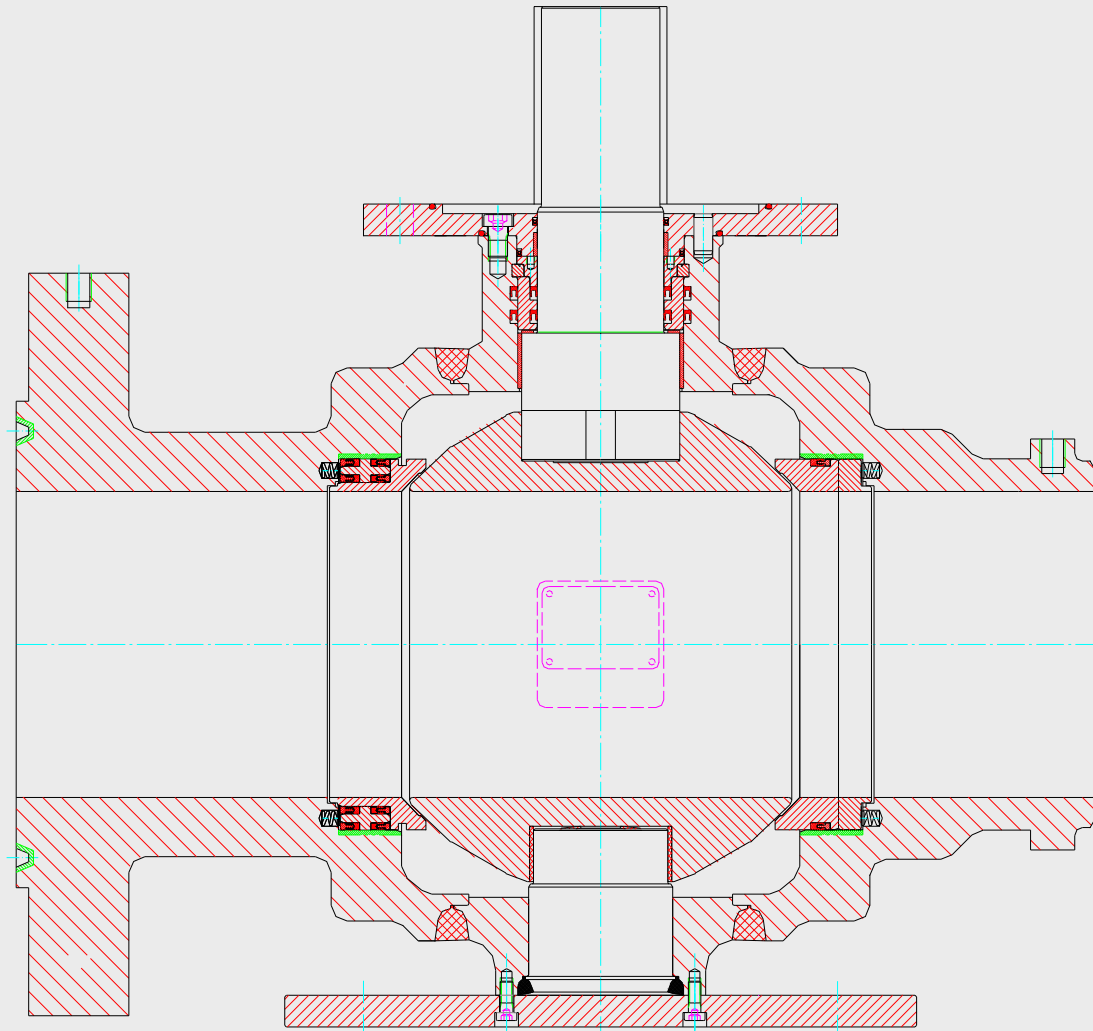
Pressure [ bar ]	Movement [ $\mu\text{m}$ ]	Leakage
1	0	0
5	0	0
50	69	0
100	190	0
150	295	0
200	430	0
250	558	0
300	710	0
350	900	0

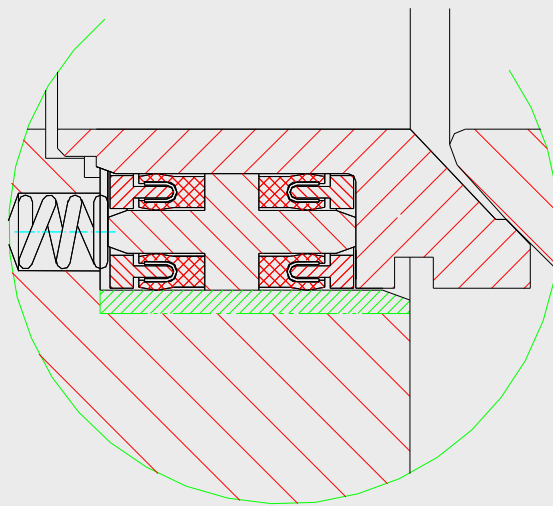




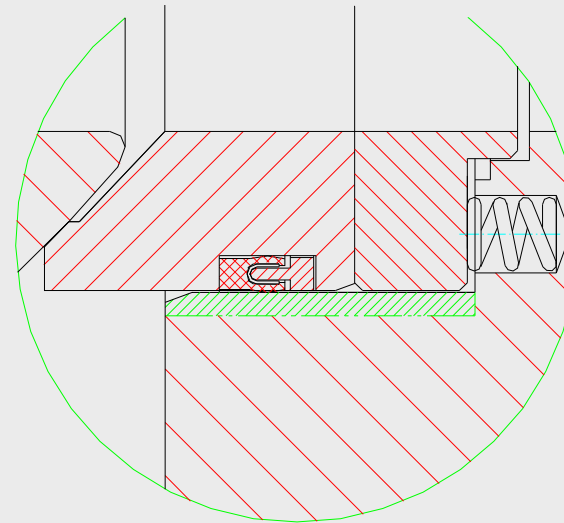


# Fully Welded Sub Sea Ball Valve



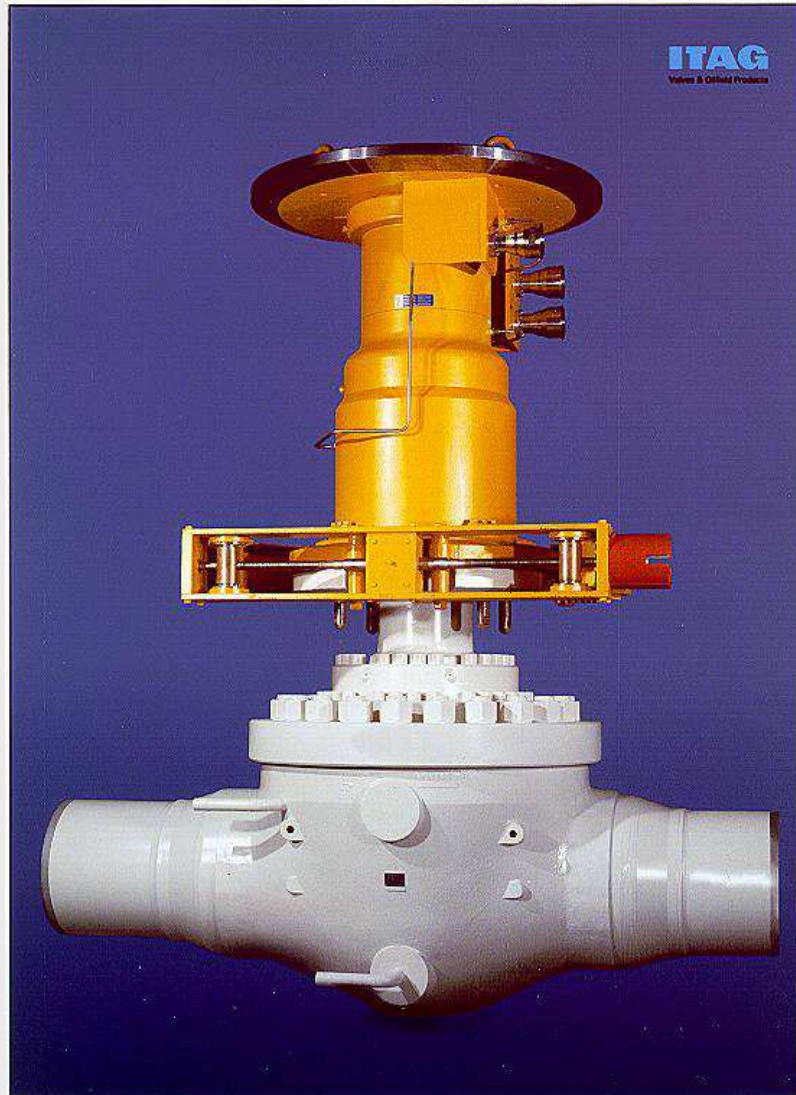


**Double Piston Effekt**

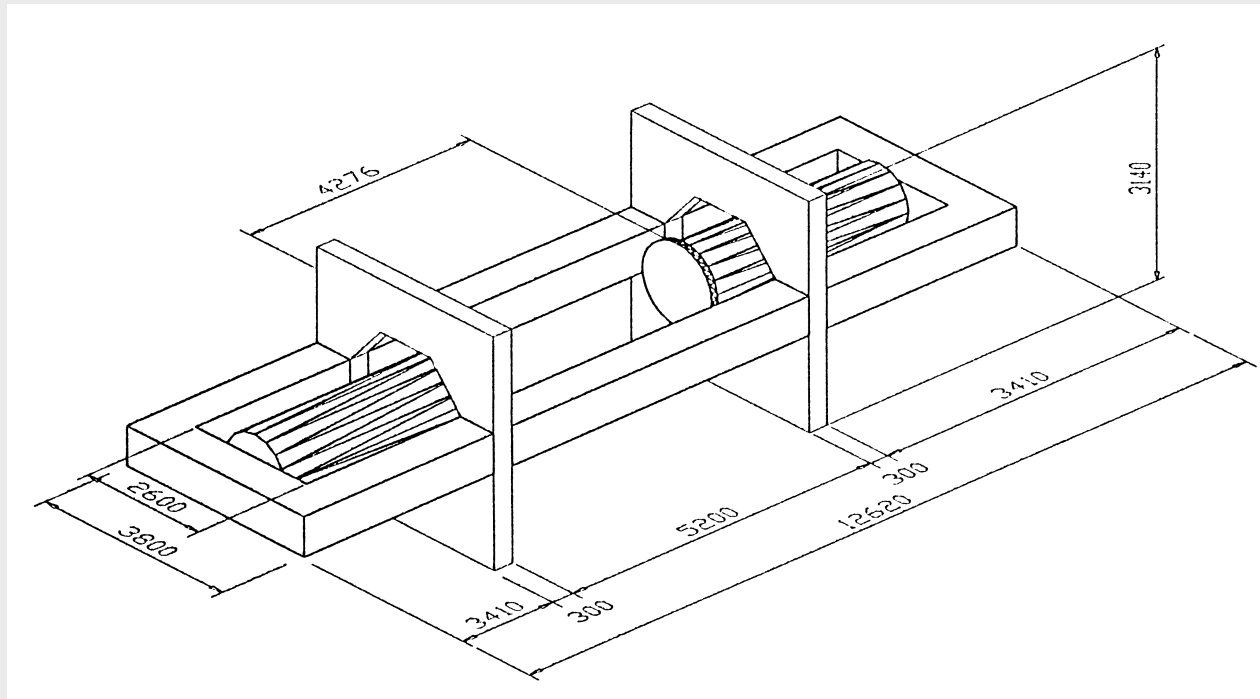


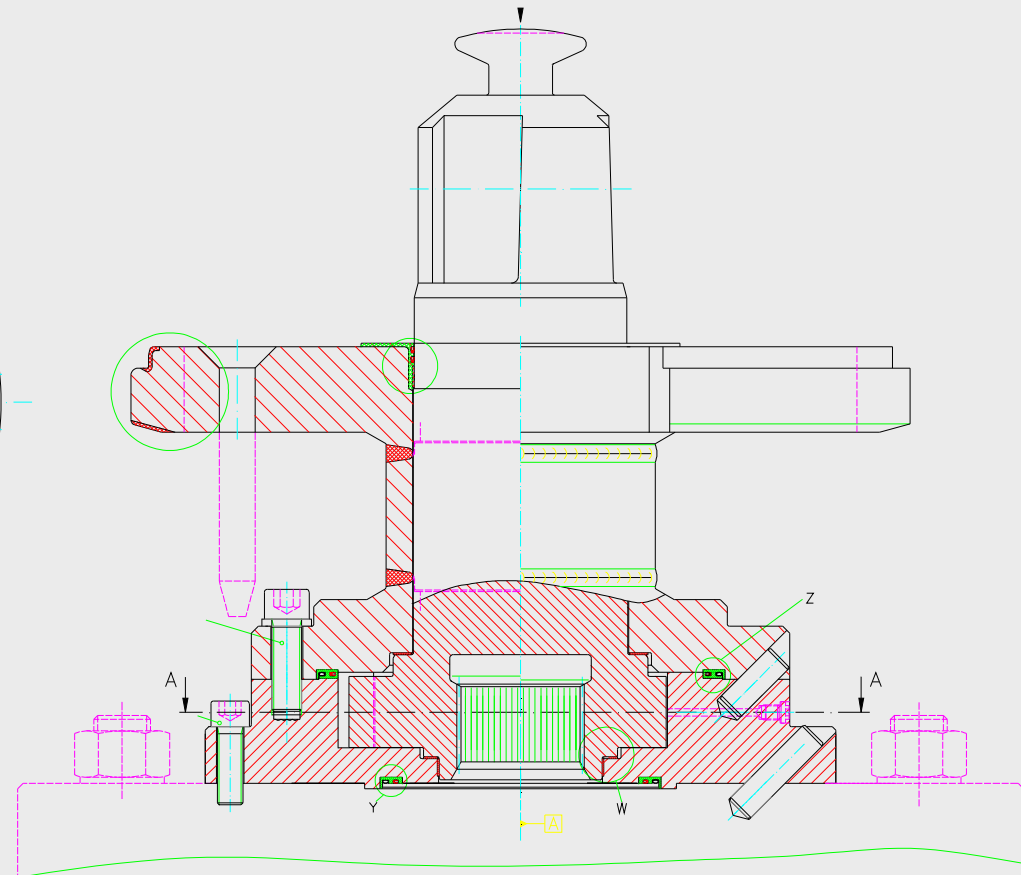
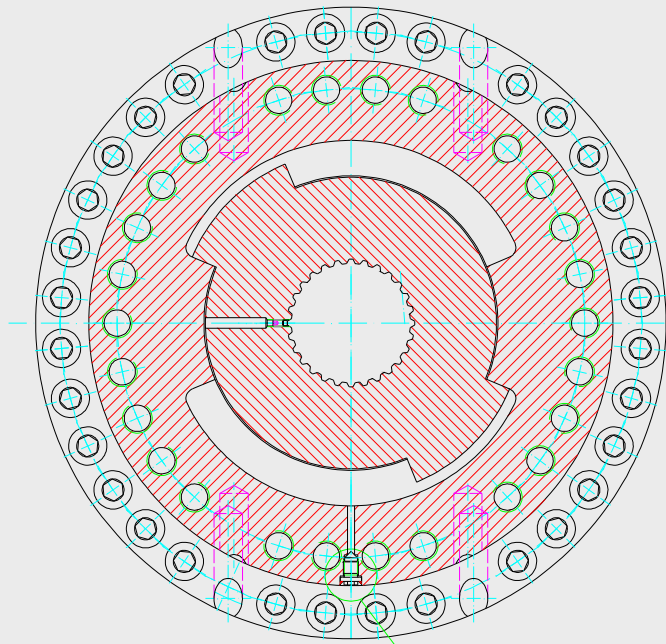
**Single Piston Effekt**



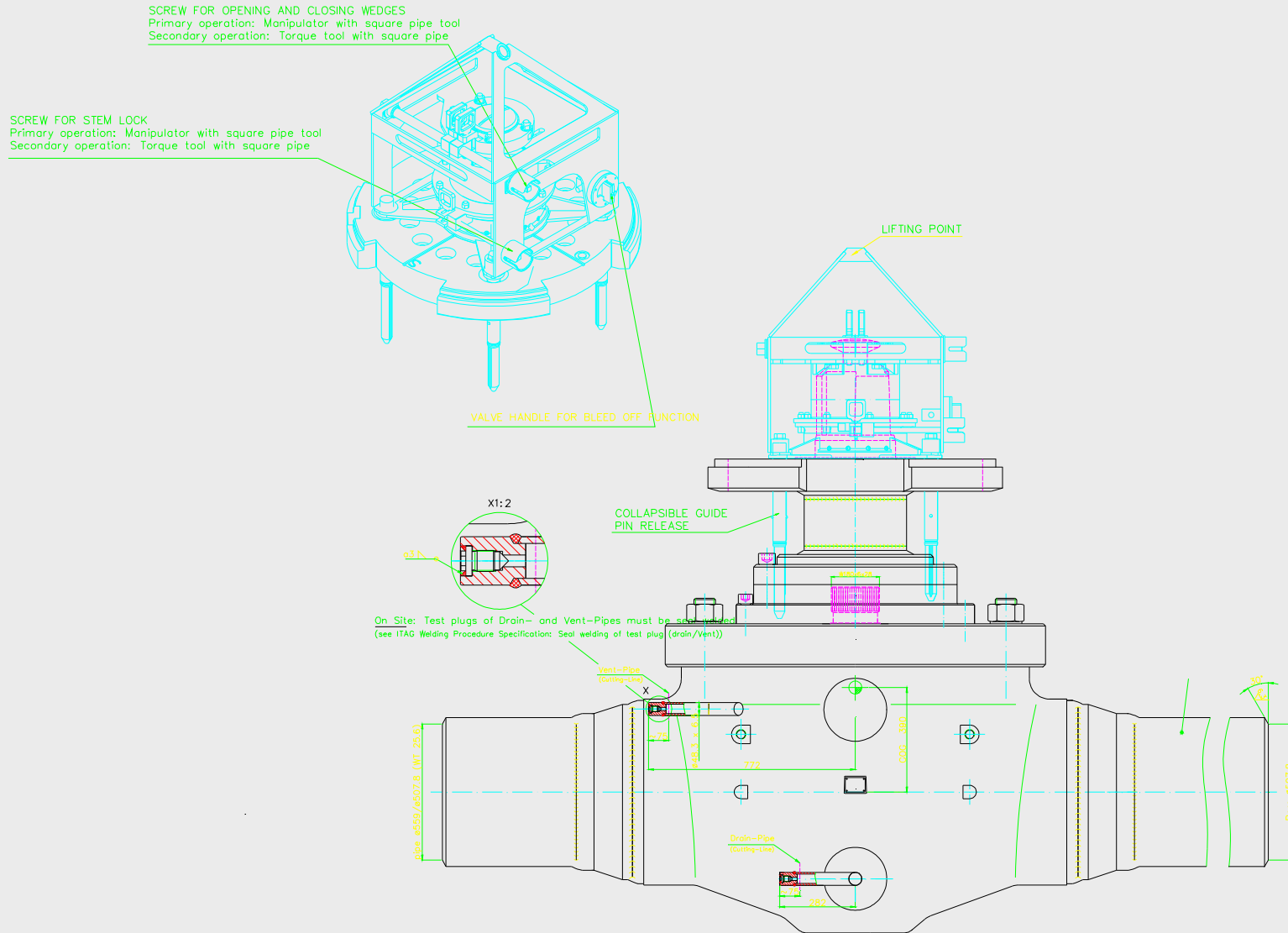


- For water depth up to 2000 m
- Available with Top Entry and Fully Welded body design
- Design life of 50 years
- Pure metal seated
- Single piston and double piston seat ring design available
- Double Block & Bleed
- Metal stem and bonnet seal
- Omission of rubber seals by using spring pre energised PTFE Lip Seals
- High flexibility in material selection (Carbon clad, Duplex Stainless, Super Duplex Stainless, etc)
- Different types of actuators and ROV intervention systems available



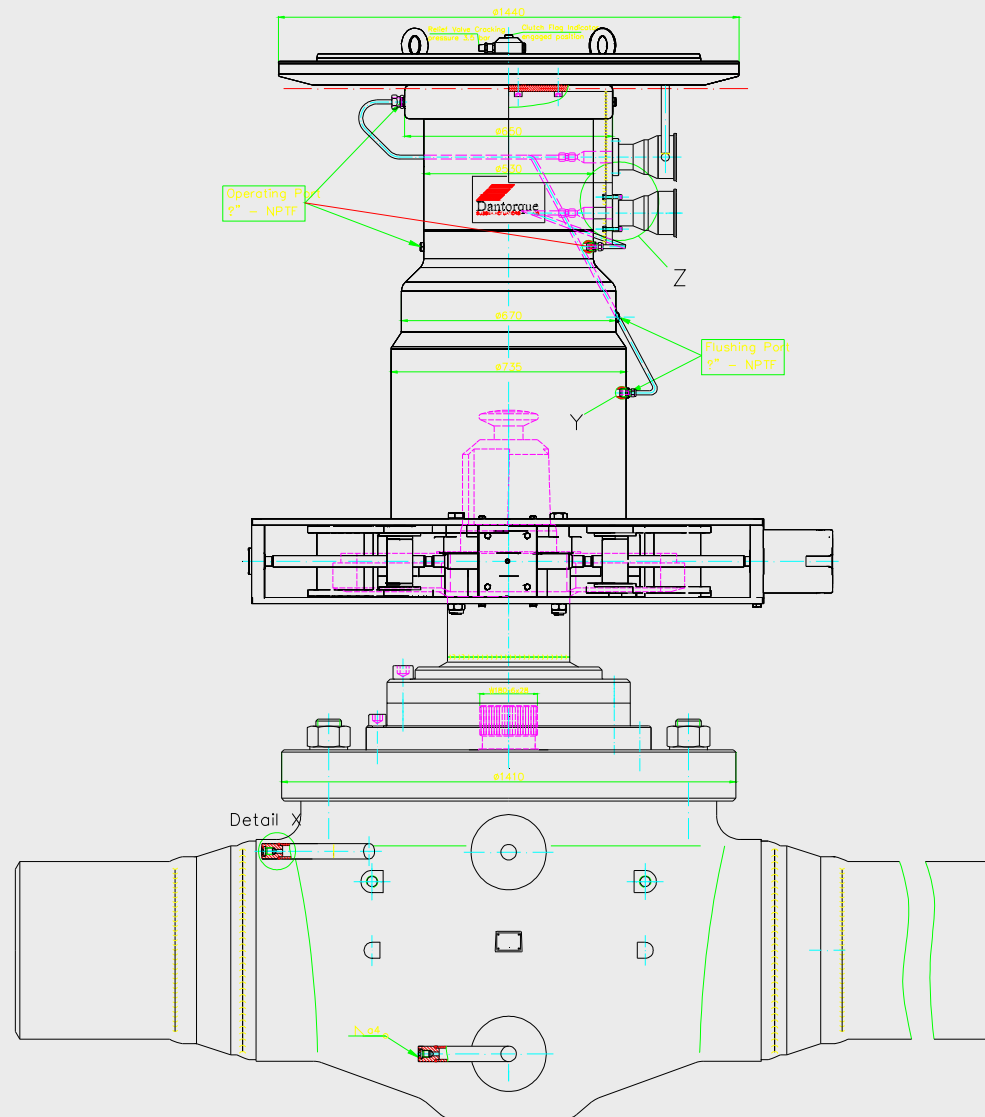


# Locking and Protection Cap

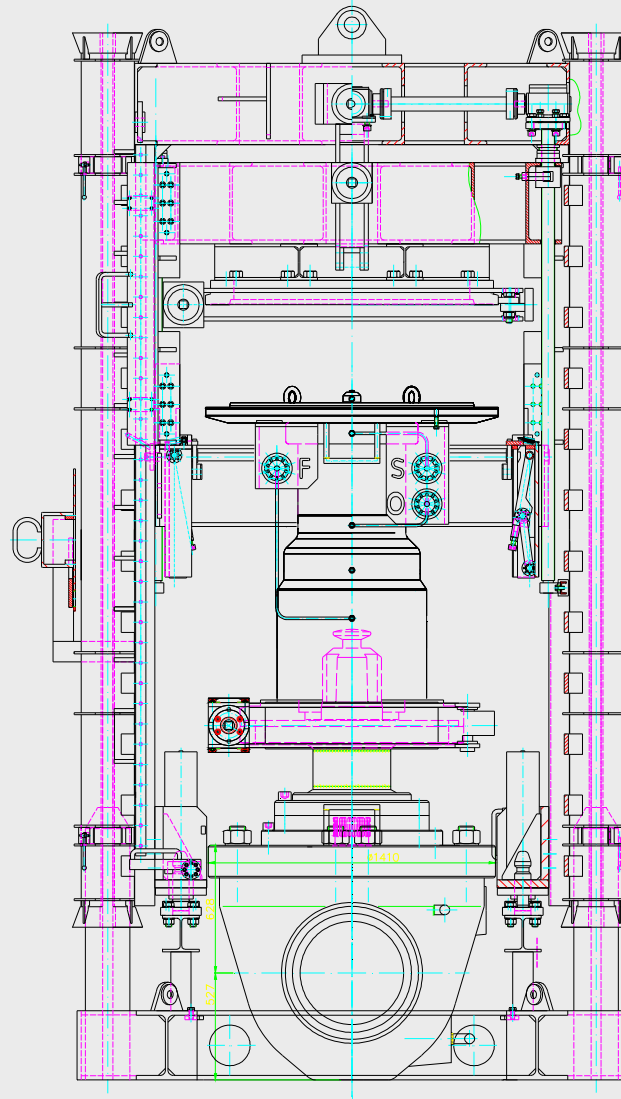




# Valve with Dantorque Actuator



# Actuator Replacement Tool (ART)



# Actuator Replacement Tool (ART)

