

The use of the auxiliary valve in ball/gate valves

The how (and why) of maintenance Part 11

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As discussed in previous articles some important equipment is needed in order to be able to perform maintenance on valves. Without the lubrication fittings it is not possible to inject valve cleaner, lubricants or sealing component. When injecting into pressurized valves, a leak lock must be used between the pump connection and the lubrication fitting as a safety device in the case of a leak through the fitting after the injection of cleaner, lubricants or sealing component.

An important part of maintenance is being able to measure and control the leak rate passing the seats into the cavity of the valve. To do so a service valve connected to the cavity of the main valve is needed. In addition to the service valve there is a need for a gauge showing the cavity pressure thus allowing the calculation of the leak rate by reading the increasing pressure in the cavity of the main valve.

In earlier years it was "normal" to connect a 1/2" instrument valve to the cavity, but one must be aware of the fact that any



Figure 59

"any valve connected to the cavity of an API 6D valve should be in accordance with API 6D"

valve connected to the cavity of an API 6D valve should be in accordance with API 6D, which the instrument valves are not, and for that reason should not be used as a cavity auxiliary valve. In recent years it has become more common to use modular valves (so called DB&B valves) as auxiliary valves on the cavity drain/ vent connection. The modular valves consist of one body with two valves and a bleed valve in between and can, of course, be used connected to the cavity. But there are a couple of factors which should be taken into consideration when it comes to modular valves:

1. First of all the modular valves are relatively large and in some cases, heavy valves which may need extra support.
2. If connected with tapered threads they are, because of the length and weight, easily breakable.
3. In many cases it is impossible to install the modular valve on to the drain point due to the lack of space as the modular valve is quite long.
4. When using an auxiliary valve in testing and maintaining a ball valve, the outer valve of the modular valve will be used as a throttle valve when depressurizing the cavity of the main ball valve. When using the last valve on the modular valve as a throttle valve, the seal surface will suffer wear and subsequently the valve will start leaking, and will no longer be reliable when testing the main ball valve.

Together with the Italian machine factory Tèchne a special auxiliary valve has been created, the AXY valve shown in Figure 59. The special features of the AXY valve are that the inlet of the valve can be threaded, raised face or RTJ in any dimension and pressure classes from 1/2" up to 2" but the valve itself will always be a 1/2" floating ball valve with metal to metal seal. This because the drain or bleed hole in the main valve will normally never be larger than the hole in a 1/2" ball valve.

The outlet of the AXY valve will always be 1/2" NPT for connecting the service valve. The reason for this being, a service valve will be installed in the outlet of the AXY valve and used for depressurising the cavity, and when testing the integrity of the main ball valve (see Figure 62).



Figure 60



Figure 61

Between the outlet and the ball on the AXY valve there will be a ¼" test hole for installing a gauge which will be used to determine the leak rate passing the seats and into the cavity of the main valve. The outlet ½" NPT may be at the end of the valve as in Figure 62, or on the side of the valve as in Figure 59, it all depends on the available space. Figure 60 shows an AXY valve installed where there was very limited space for a traditional valve and when it was impossible to connect a hose to the end of the service valve, to vent the gas to a safe place.

The ¼" test hole can be machined after the ball, as explained, or it could be machined between the main valve and the ball of the AXY valve, the gauge would then be permanently installed. In that case the AXY valve will become a tell-tale valve to be used for example on the stem of a major valve. The AXY valve will normally be in the closed position and as long as the stem seal is OK the gauge will indicate 0 pressure. But if a stem leak



Figure 63



Figure 62

should occur the gauge will show this and indicate the increasing pressure between the AXY ball and the main valve; one can connect to the outlet of the AXY valve, open the AXY valve and inject sealing component to seal off the stem leak. The AXY valve may be specially made to fit in where there is normally no space for a valve as illustrated in Figure 61. In that case there was only 132 mm of space between the clamp connector and the body threads (drain connection). Sideways there was no place to rotate a valve when installing into the threads of the drain-point.

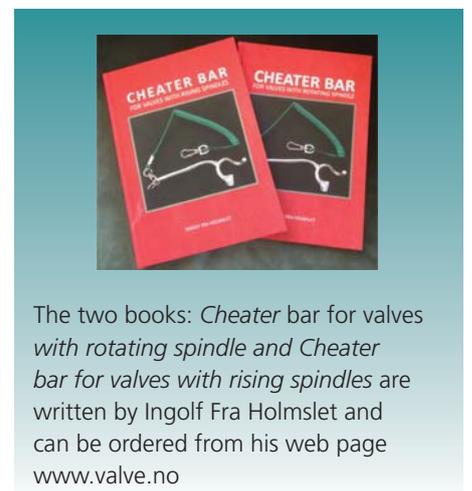
To solve this problem, and at the same time have only one NPT connection, Tèchne constructed a valve in a 90-degree angle as illustrated in Figures 62 and 63. The valves are in two parts. The first part is screwed up into the main valve, then the ball valve part is bolted onto the part installed in the main valve. The AXY valve may have the handle on the side as illustrated in Figure 63 or it may have the handle on the top as illustrated in Figure 62. In Figure 62 the gauge is installed in the ¼" test port and the service valve is installed in the ½" outlet of the AXY valve.

The idea behind the AXY valve

When the AXY valve is installed and not in use the valve will be in the closed position with a ½" NPT bleed plug in the outlet, and a ¼" blind plug in the test port, and the valve will be secure in its closed position. The valve is small and does not

require any support, and when needed for maintenance or for setting a barrier, you install the service valve by opening the ½" bleed plug and testing the integrity of the AXY valve. Then disconnect the blind plug and install the gauge, disconnect the bleed plug and install the service valve and the valve is ready to be used for testing of the main valve. Close off the outer service valve and quickly open the inner AXY valve, which will stay in its open position until the testing or maintenance is completed. It is only the outer service valve which will be used as a throttle valve to reduce the cavity pressure. This service valve will, after the job is done, be disconnected from the AXY valve and the plugs will be reinstalled. The day the service valve starts to leak it will be fixed or replaced.

To be continued...



The two books: *Cheater bar for valves with rotating spindle* and *Cheater bar for valves with rising spindles* are written by Ingolf Fra Holmslet and can be ordered from his web page www.valve.no