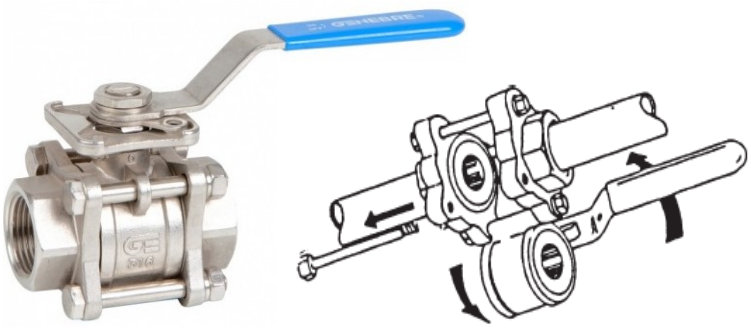
Generic IOMs for 3 piece metal ball valves

The information below is offered as a guide only for typical 3 piece ball valves. They are not specific to any particular valve or manufacturer.



GENERAL DESIGN CONCEPT:

Three piece ball valves allow easy replacement of seats, seals and gaskets as the centre section can be swung out allowing maintenance without disturbing the pipework.

They are of floating ball construction whereby the ball is free to move horizontally inside the body, the movement induced by line pressure acting on the ball. The downstream seat, opposite the pressurised side of a closed valve, carries the load exerted by the line pressure on the ball, whilst the upstream seat is subject to little load or wear. For this reason it is sometimes possible to increase the seat life by swapping these seats around.
The valves are capable of tight shut-off in both flow directions.

USE OF PRODUCT:

Maximum working life of replaceable components and valve parts can be maximised by ensuring that the valve is always operated within the maximum pressure and temperature ranges specified for the particular valve, and that the flowing media is compatible with the wetted parts and/or materials of construction.

AUTOMATED OPERATION:

Ball valves with an integrally cast, or machined ISO:5211 actuator mounting facility ensures stem and actuator drive alignment thus preventing angular or linear misalignment which dramatically reduces stem seal life. A secondary but hugely significant advantage of the ISO:5211 facility is that the actuator to stem alignment is not disturbed when replacing ball seats or body seals, as the actuator swings our with the centre section. Even where the actuator needs to be removed to allow replacement of stem seals, the ISO:5211 facility ensures true realignment of stem and actuator drive on re-assembly.

CLEANING THE VALVE:

Ball valves can trap fluids in the body ball cavity when in the closed position. It is recommended prior to maintenance procedures where the body seals will be broken, to flush the valve through by draining the system, opening the valves to the mid-position, then re-pressurising. This procedure is particularly beneficial is hazardous fluids have been passed through the valve. The system can then be drained again ready for dismantling.

DISMANTLING & REPLACING SOFT BODY SEALS:

De-pressurise, drain and secure the pipeline, ensure that the operating medium to the actuator (air or electric power) is removed from the actuator so that it is not capable of being operated whilst maintenance is being carried out.
Now the body tie bolts can be loosened. Where the body ties bolts are external, leave the one that passes through a loop cast into the body, or where the bolts are encapsulated, leave one (or a pair if they do not pass all the way through) in place, loosened. Leaving this loosened tie bolt in place, remove the opposite tie bolt. This allows the valve body (centre section) to be swung out giving access to, and allowing the soft seats and seals to be replaced with manufacturer's spares. The stem seals can NOT be replaced at this time. To reassemble, simply swing the valve body back in line, replace the tie bolt removed during disassembly, and tighten evenly. Bolts should be tightened by nipping diagonally opposite bolts a little at a time to ensure that the ends are pulled tight and square to the body.

Generic Installation Instructions
3 Piece Ball Valves

DISMANTLING & REPLACING STEM SEALS:

De-pressurise, drain and secure the pipeline. Ensure that the operating medium to the actuator (air or electric power) is removed from the actuator so that it is not capable of being operated whilst maintenance is being carried out.
Remove the actuator from the valve, and if fitted, a drive adapter that connects the valve stem to the actuator output drive.
Carefully remove the body tie bolts and lift the valve body (centre section) out of line.
Move the centre section to the closed position and remove the ball. Inspect for damage/ scoring/ pitting, and if there are signs of damage, replace when re-assembling.
Remove the gland follower/ stem seal compressing nut & belville washers completely.
With a soft head hammer or mallet, gently tap the top of the valve stem towards the centre of the valve body, and as it comes free, remove completely.
Remove the existing thrust washer and stem seals, and replace with new.
Clean the stem hole and thrust washer face inside the valve body using non-abrasive media.
Refit the refurbished valve stem, refit/ replace the belville washers, and replace & tighten the gland follower nut. If there was a tab washer fitted before disassembly, ensure it is replaced as this prevents the gland follower nut slackening during automatic operation.
Before replacing the tab washer, operate the valve using a spanner on the valve stem to ensure that neither the gland follower nut, or the body tie bolts have been over-tightened and are gripping the ball or stem too tightly, which increases the torque required to operate the valve, as the existing actuators may not be able to operate at these higher torque levels. If the operation by hand seems excessively tight, slacken back the gland follower nut 1/4 turn, and the tie bolts 1/4 turn each, until the operation by hand feels firm, but not over-tight.
Ball & body seals can easily be replaced prior to full reassembly if required.
When replacing the actuator, ensure that the valve position matches the actuator position (ie: valve & actuator in the open position) to ensure correct automatic function and function indication on final reassembly.

TYPICAL PARTS LIST AND EXPLODED VIEW:

ITEM	PART NAME	MATERIALS
1	END CAP	CF8M
2	BODY	CF8M
3	BALL	SS 316
4	SEAT	PTFE
5	GASKET	PTFE
6	BOLTS	SS 304
7	THRUST WASHER	RPTFE
8	O-RING	VITON
9	STEM PACKING	PTFE
10	STEM	SS 316
11	GLAND	SS 304
12	DISK WAHSER	SS 301
13	STEM NUT	SS 304
14	NUT STOP	SS 304
15	SPACE WASHER	SS 304
16	PLATER	SS 304
17	STOP PIN	SS 304
18	HANDLE NUT	SS 304
19	HANDLE	SS 304
20	SLEEVE	PLASTIC