



Valve Recognition

Mechanical Department

TTE TRAINING LIMITED

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Types of Valve

- Regulation of flow- Control Valves
- DIAPHRAGM - GLOBE
- Isolation/Stop valve- ON or OFF
- GATE – PLUG - BALL

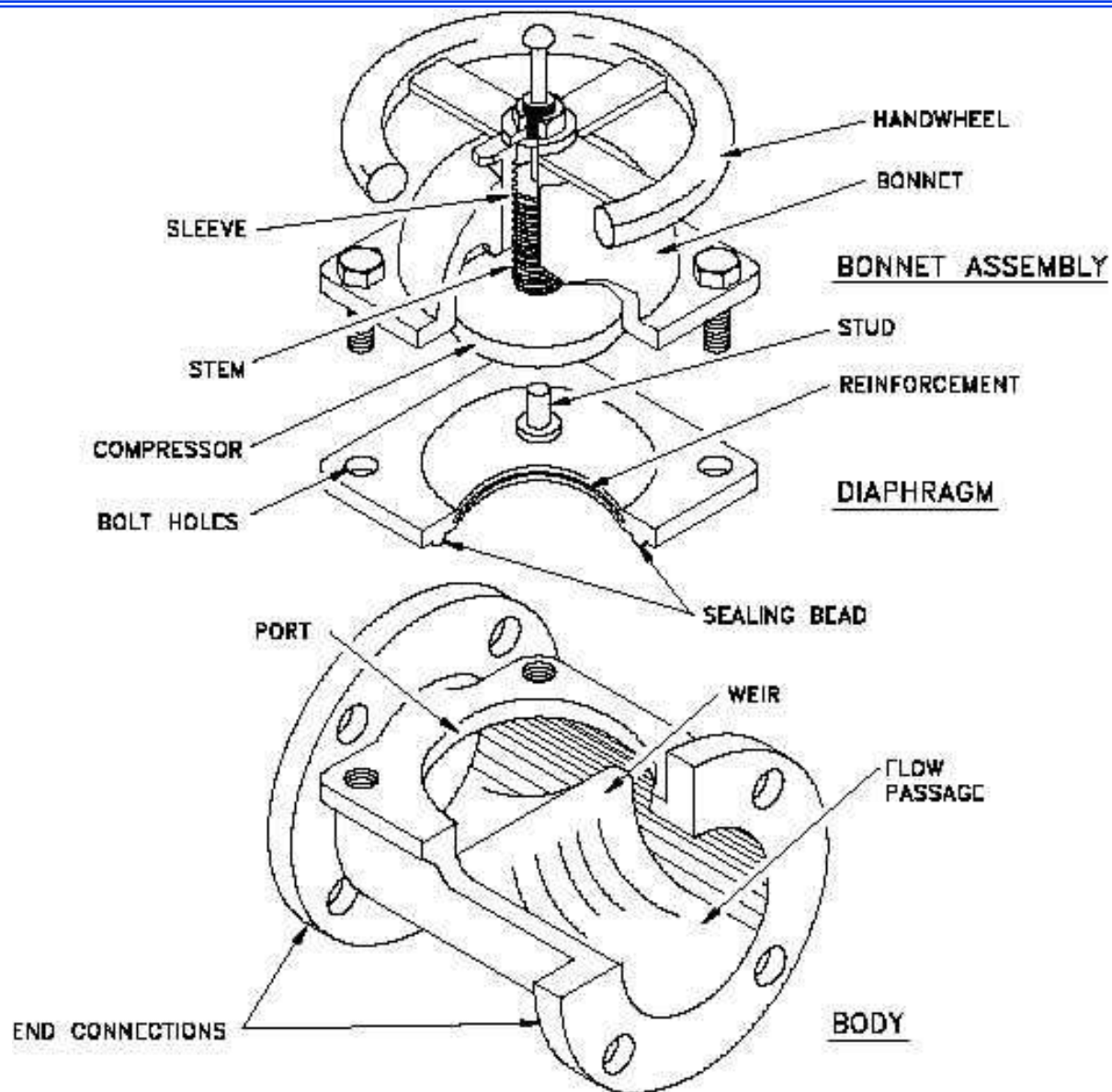


DIAPHRAGM VALVE



- Process only has contact with the diaphragm and the body, therefore no part can become clogged.
- Good for process of a slurry /thick nature, which has deposits.
- Stresses cause short life spans of the diaphragm.
- Can be used as modulators as well as on / off.

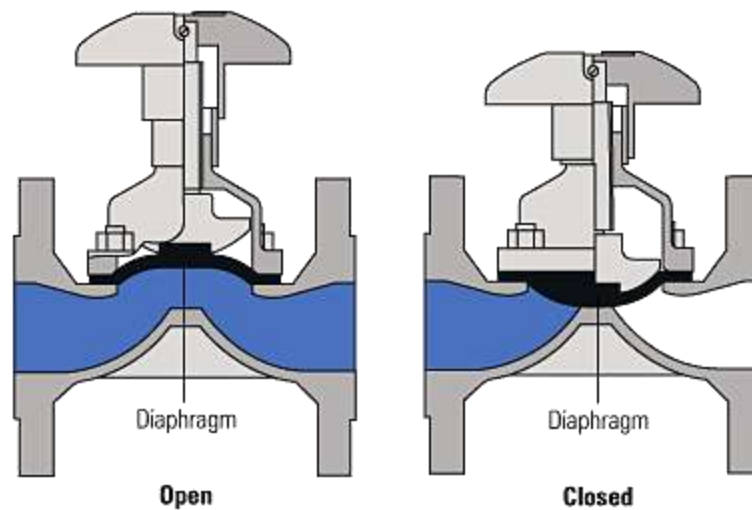
- Widely used in pharmaceutical process production as the purity of the line is guaranteed.
- Short stroke, even shorter on WIER type.
- Medium temperature ranges due to diaphragm materials available.



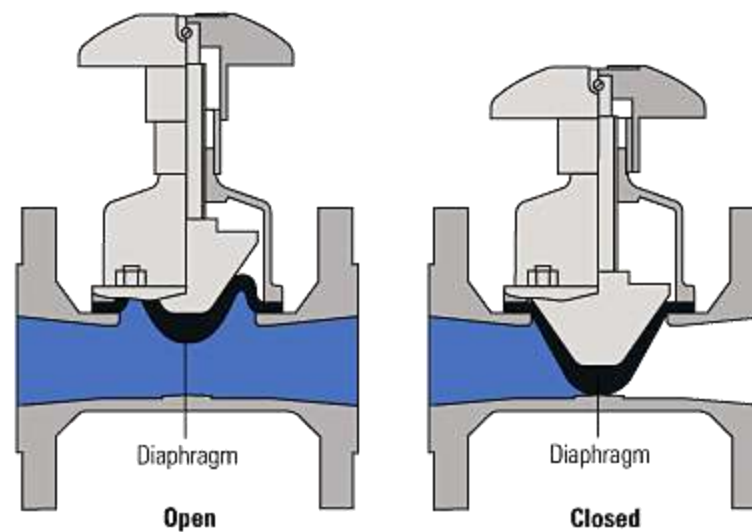
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(a) Weir type

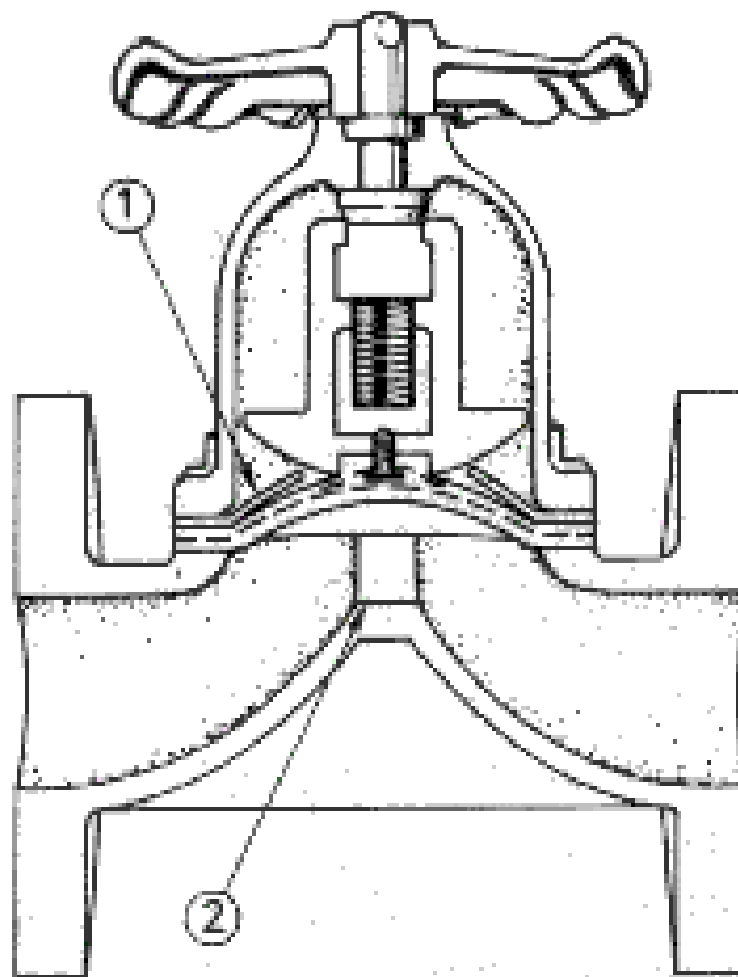


(b) Straight-through type

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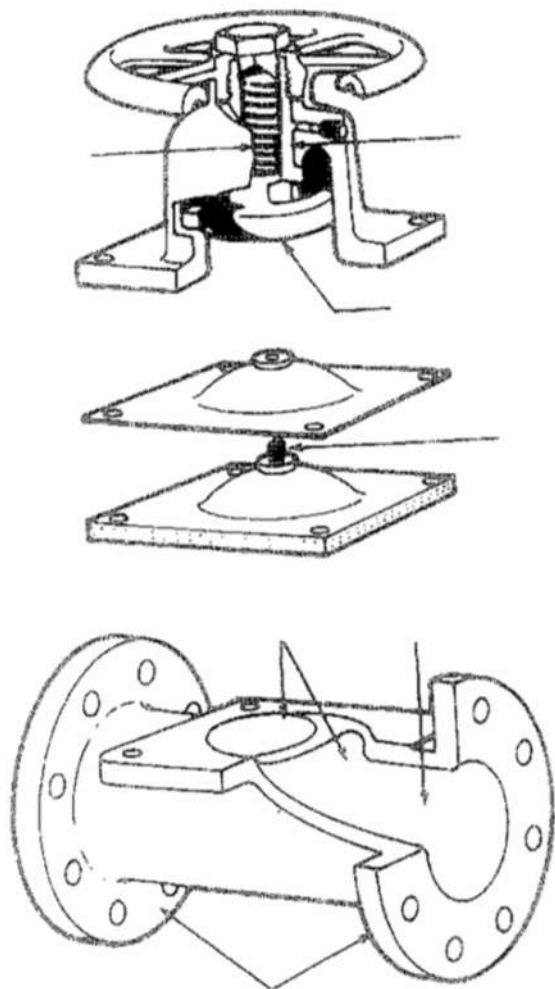
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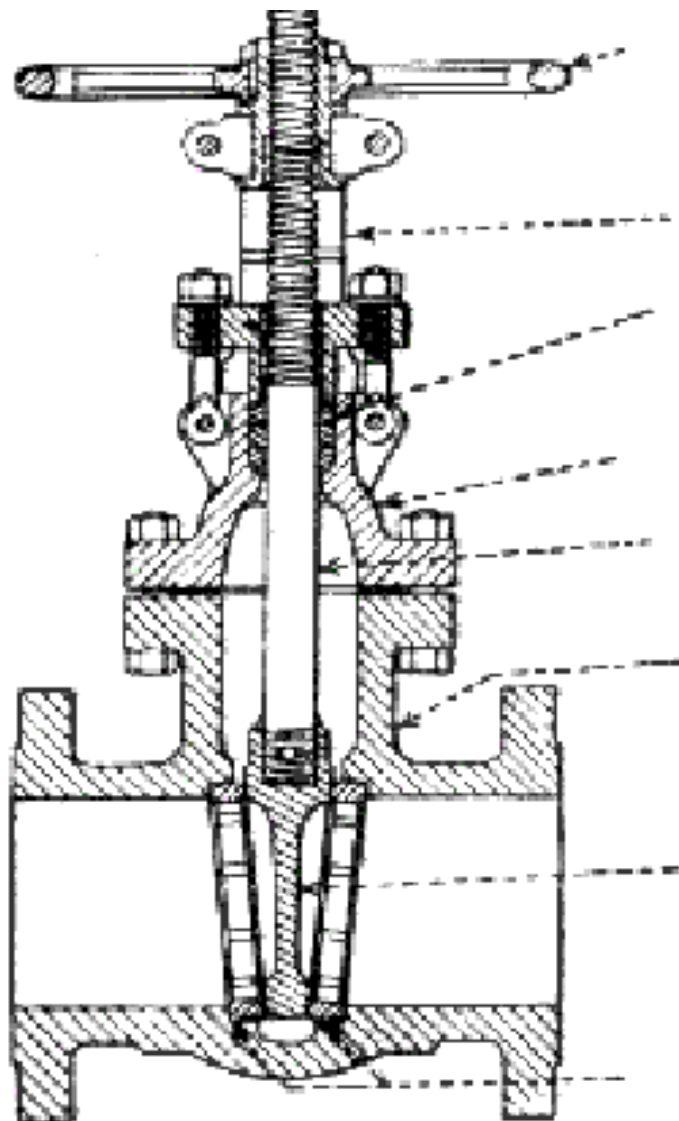




GATE VALVE

- Gate valves are generally used for on-off service.
- They are not suitable for throttling as the gate will suffer from erosion.
- Multi turn thus slowest to open or close, due to the distance the gate must move. – disadvantage
- Common in controlling flow of water or steam.

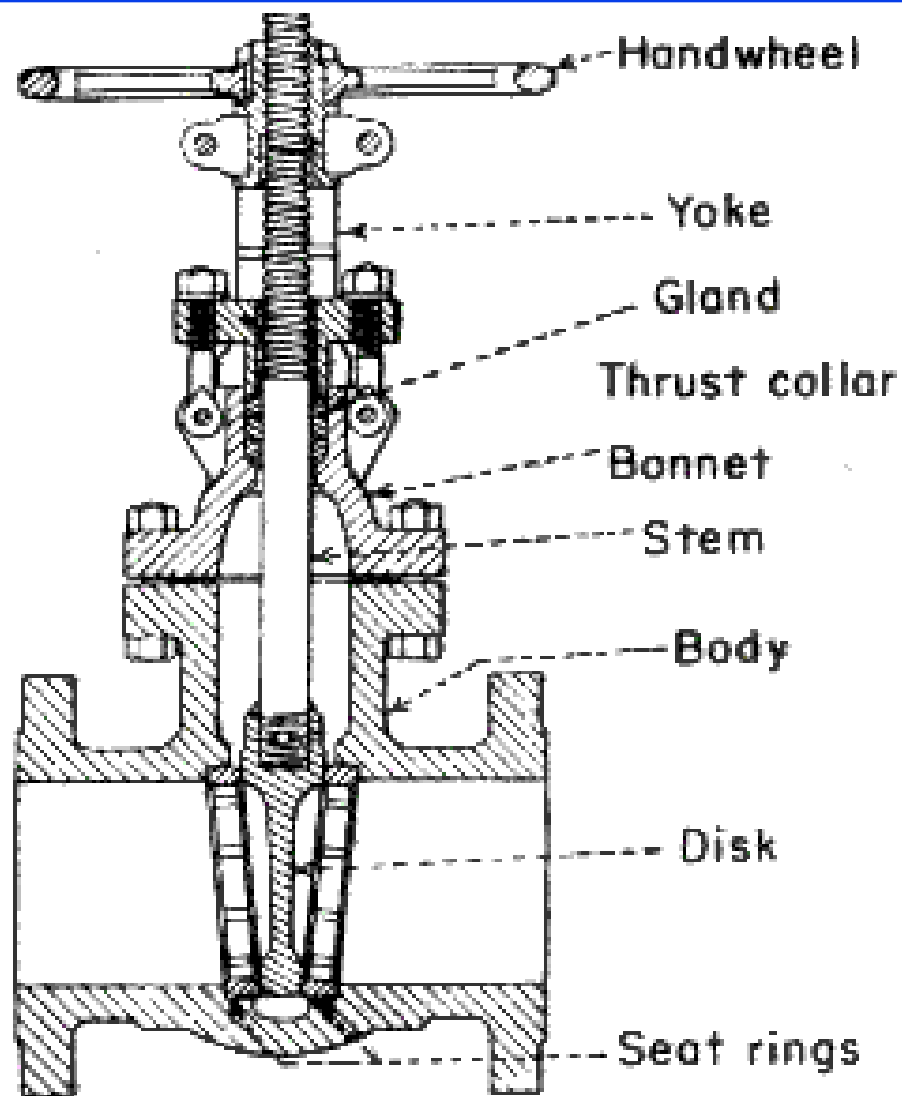
- The valve can be based on a solid wedge, a wedge which can adjust to suit the seal faces, or a parallel faced based on two discs which slide between parallel sealing faces with a mechanism for forcing the discs out on the last part of the spindle travel. The valve can be based on a simple rising spindle design
- Gives straight through flow when open, hence minimal loss of line pressure.



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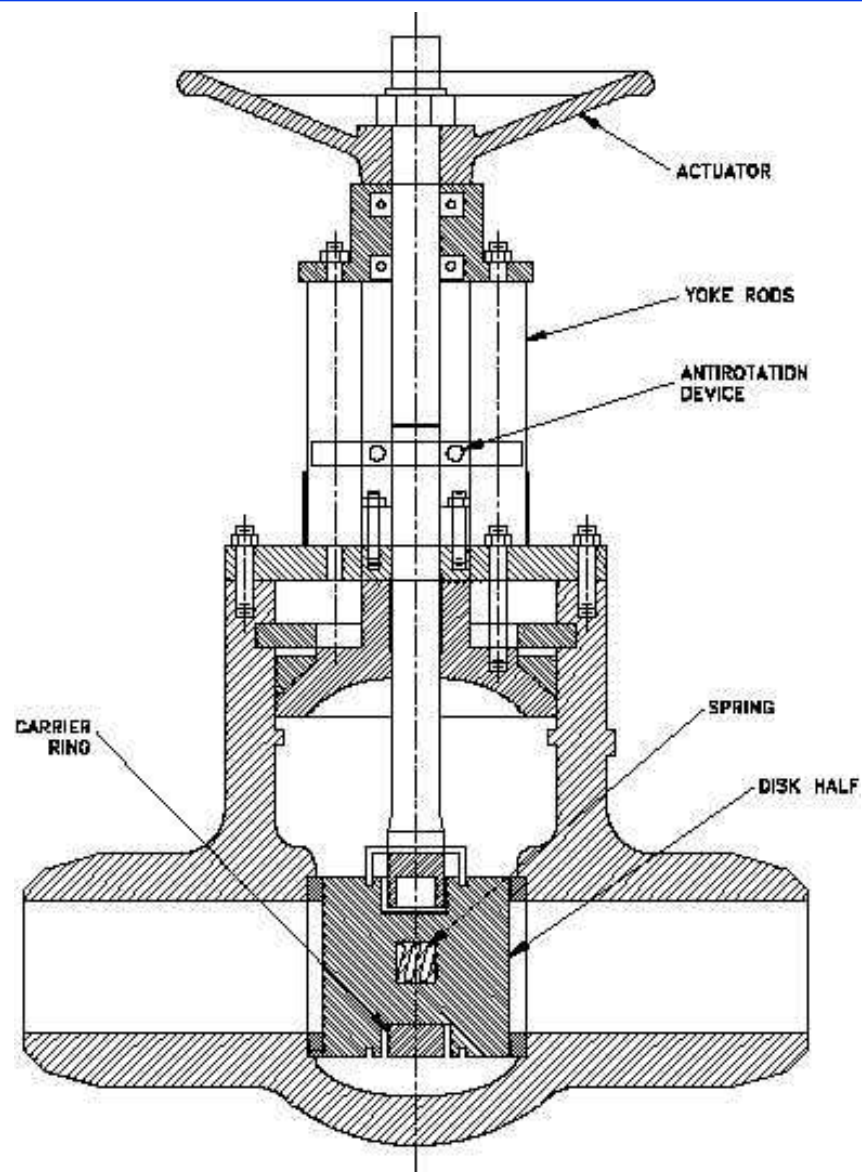
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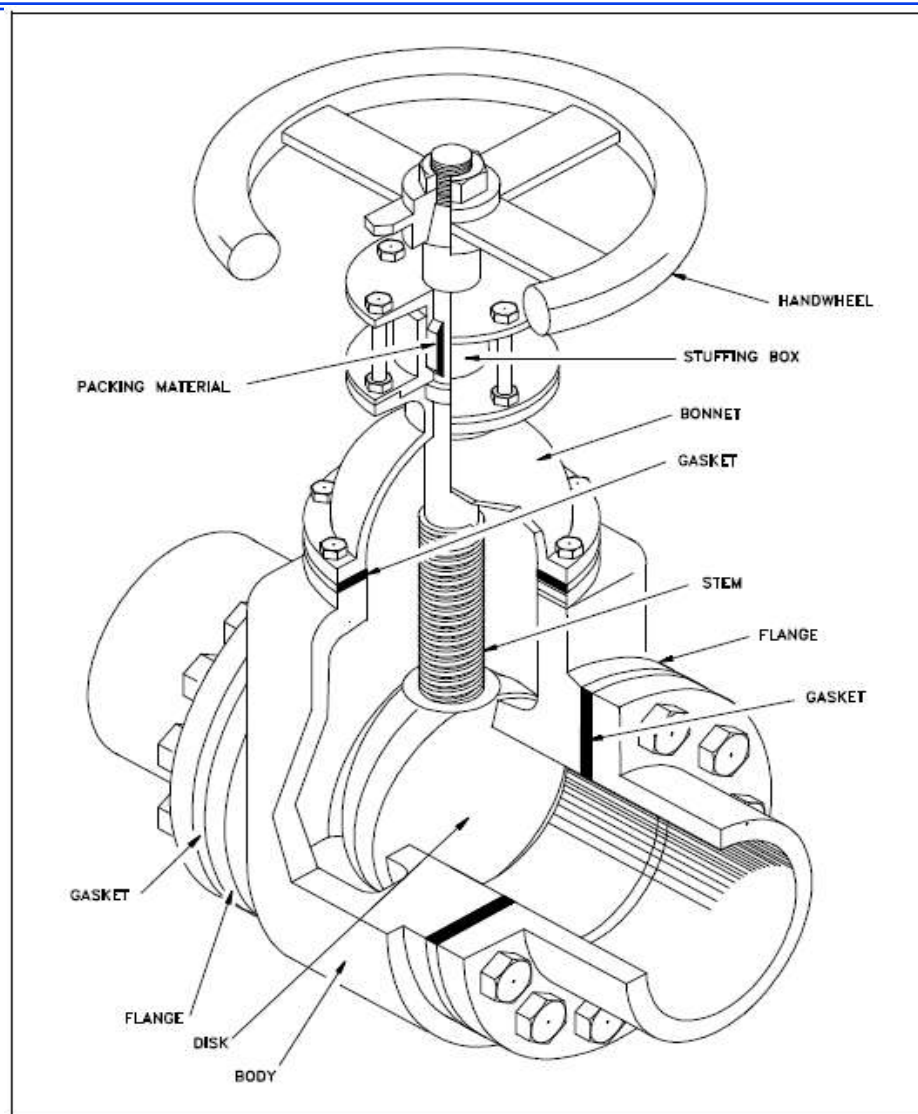


Figure 4 Gate Valve

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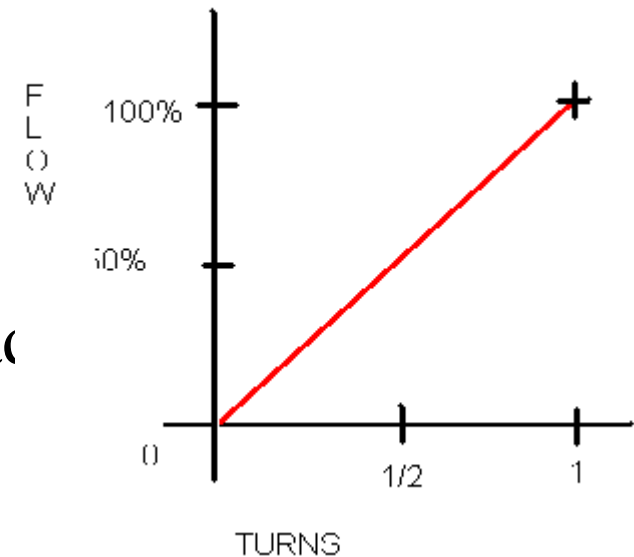
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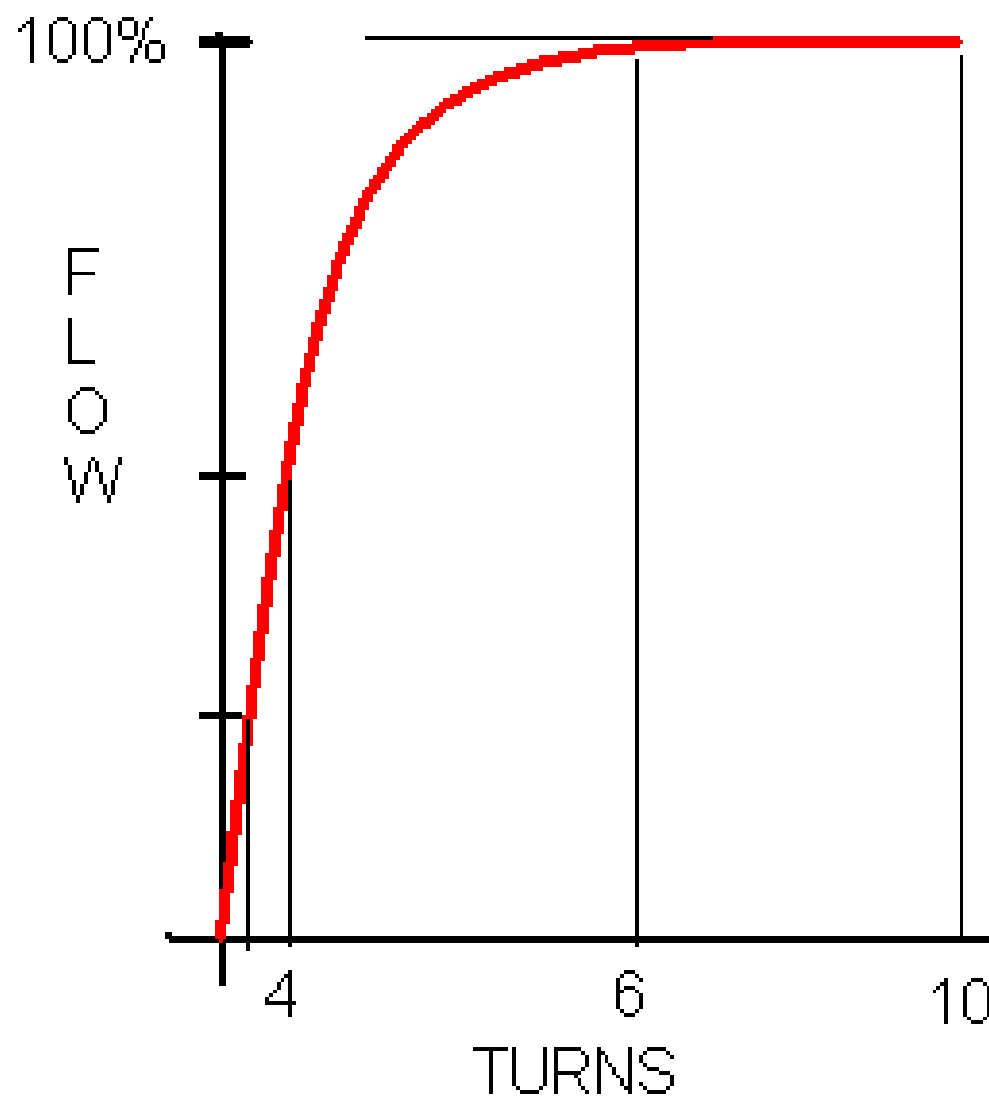
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GLOBE VALVE

- Stem is at right angles to the piping.
- Disk, which is horizontal, operates against a body seat.
- Flow comes from beneath the disk to over the seat.
- Tightest shut off with short movement.
- Resistance to flow greatest due to direction changes.

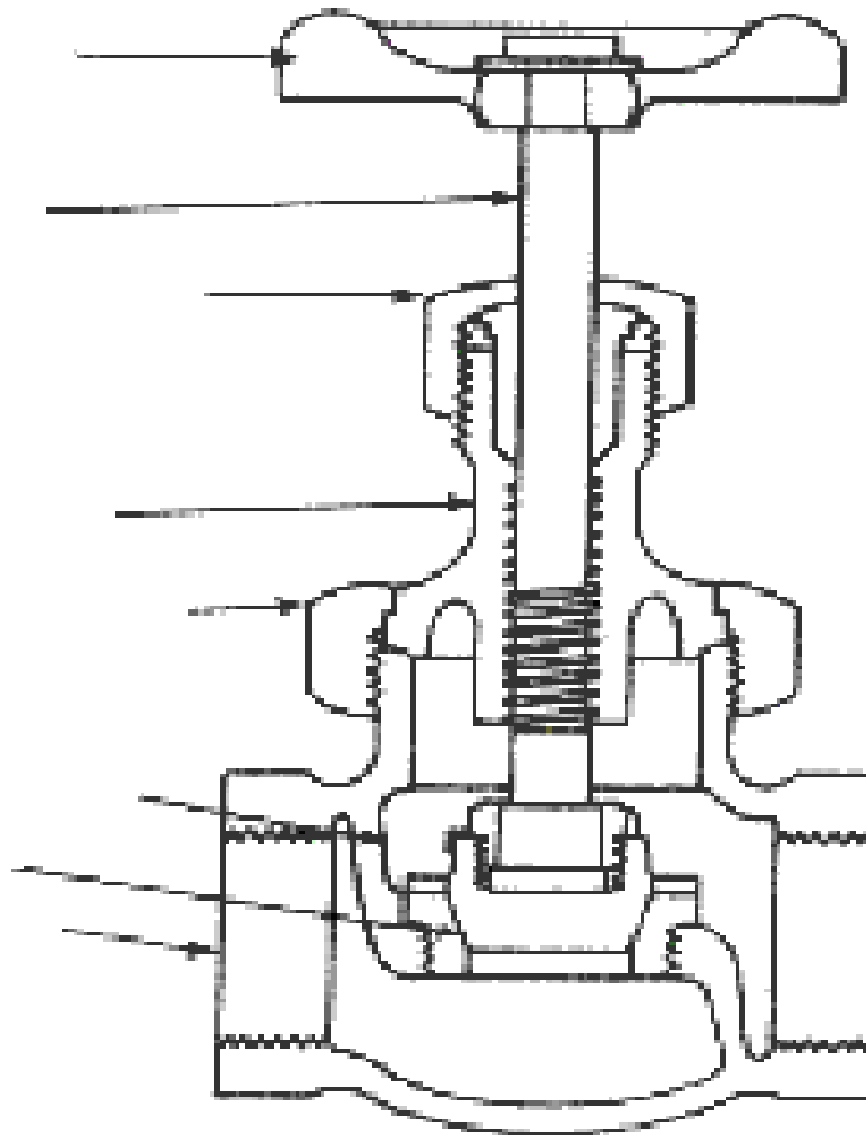
- Expensive to produce
- Linear action, regulates flow.
- Power to drive process increased.
- There is normally a high fluid head valve.



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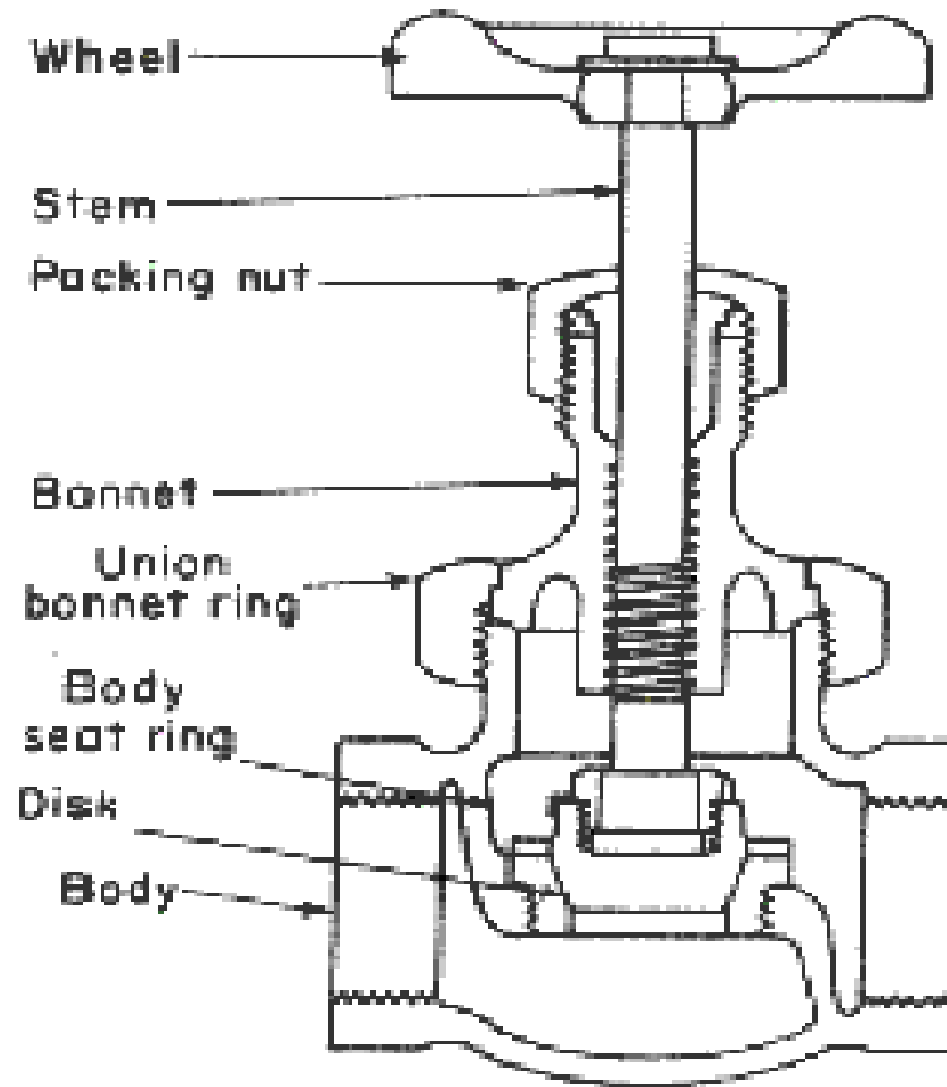
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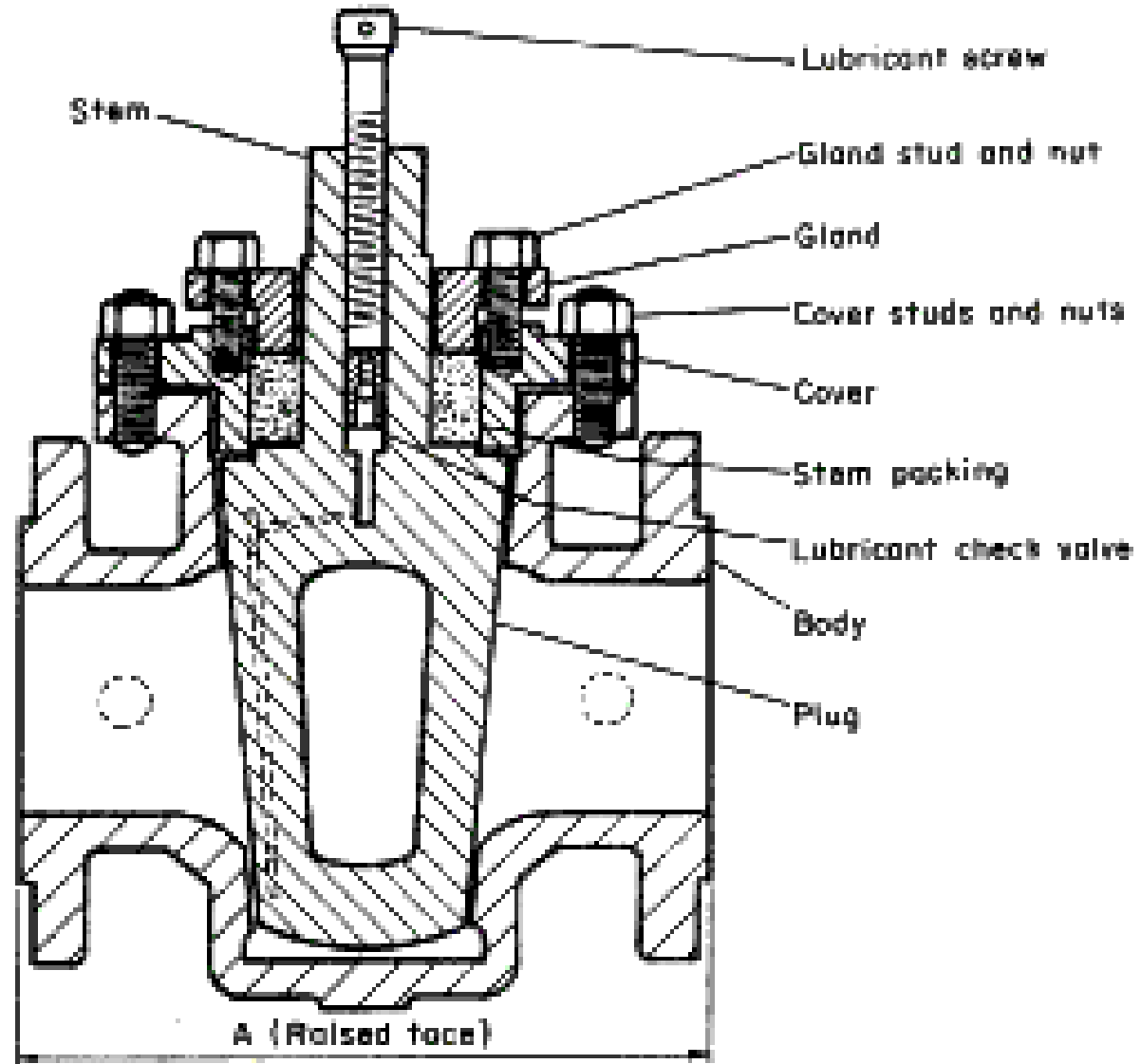
QUARTER TURN VALVES

- PLUG - Tapered or Non Tapered
- BALL

- Faster to operate – only a quarter of a turn.
- Need to consider the position of the lever when fitting
- Plug valve more difficult to operate due to friction, mechanical advantage gained by a larger handle.
- Open or closed only no throttling of process.

PLUG VALVE

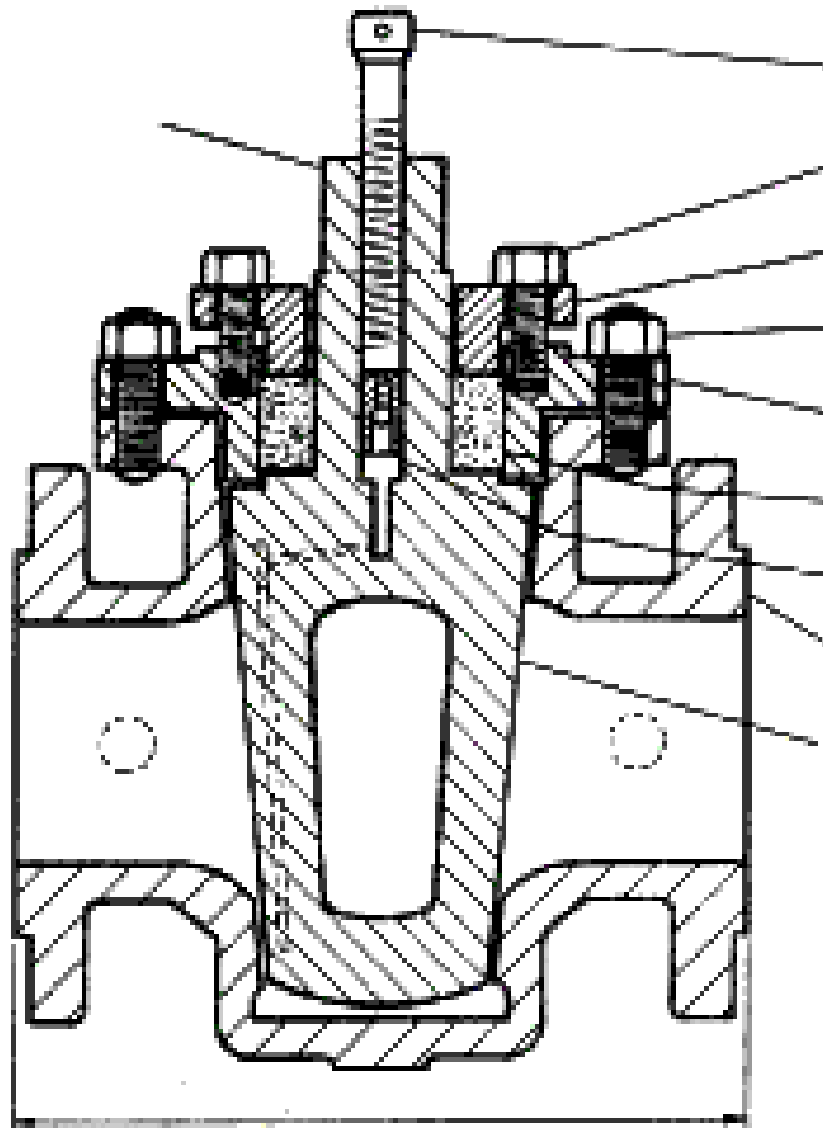
- Requires more torque to operate than other $\frac{1}{4}$ turn valves, due to friction between plug and sleeve.
- Bulkiest of $\frac{1}{4}$ turn valves.
- Versatile with a tight seal and no cavities within body, where process can accumulate.
- Taper gives tighter seal than straight.
- Straight through flow with minimal pressure loss.



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BALL VALVE



- Made in 1,2 or 3 pieces depending upon how robust the construction needs to be.
- Cheaper than plug valves, but similar tight shut off.
- Allows “PIGGING” to be carried out.
- Seating material is normally a fluorocarbon such as PTFE but other materials can be used.

BALL VALVE MATERIALS

- Ball can be made of any number of materials including:-
 - BRASS
 - CAST IRON
 - CARBON STEEL
 - STAINLESS STEEL
 - MONEL
 - TITANIUM
- In order of cost!