

## MAINTENANCE INSTRUCTION MANUAL

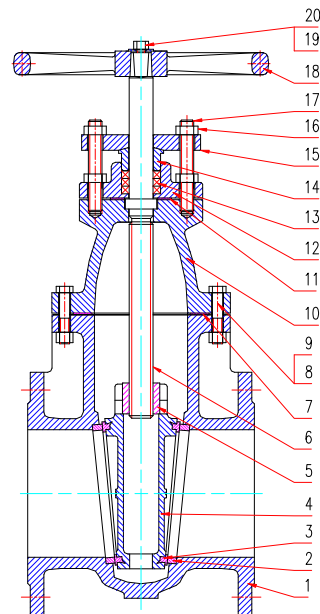
Fig. 3123 / 3124

### NRS Gate Valve Configuration

#### Parts List

Number:	Description:	Material:
1	Body	ASTM A126 Class B
2	Seat	ASTM B62 C83600
3	Wedge Trim	ASTM B62 C83600
4	Wedge	ASTM A126 Class B
5	Stem Nut	ASTM B62 C83600
6	Stem	AISI 420
7	Gasket	Graphite
8	Bonnet Bolts	Carbon Steel, Zinc Plated
9	Bonnet Nuts	Carbon Steel, Zinc Plated
10	Bonnet	ASTM A126 Class B
11	Stuff Box Gasket	Graphite
12	Stuff Box	ASTM A126 Class B
13	Packing	Graphite
14	Packing Bushing	ASTM B16 C36000
15	Gland	ASTM A126 Class B
16	Gland Nuts	Carbon Steel, Zinc Plated
17	Gland Bolts	Carbon Steel, Zinc Plated
18	Handwheel	ASTM A126 Class B
19	Bolt	Carbon Steel, Zinc Plated
20	Washer	Carbon Steel, Zinc Plated

#### Valve Configuration



### LAYOUT AND SITING

It should be considered at the design stage where valves will be located to give access for operation, adjustment, maintenance and repair.

Valves must be provided with adequate support. Adjoining pipework must be supported to avoid the imposition of pipeline strains on the valve body, which would impair its performance.

Heavy valves may need independent support or anchorage.

Gate valves may be installed in:

- Horizontal pipework with stem vertical.
- Vertical pipework with stem horizontal.

The valve should not be installed in horizontal pipework with the stem horizontal because shut off performance may be impaired.

In the interests of safety, valves installed on end-of-line service in the closed position with infrequent opening should be fitted with a locking device on the operating mechanism. Alternatively, it should be fitted with a blanking flange on the downstream flange of the valve.

## **INSTALLATION**

Prior to installation, a check of the identification plate and body marking must be made to ensure that the correct valve is being installed.

Valves are precision manufactured items and as such, should not be subjected to misuse such as careless handling, allowing dirt to enter the valve through the end ports, lack of cleaning both valve and system before operation and excessive force during bolting and handle operation.

All special packaging material must be removed.

Valves must be provided with adequate support. Adjoining pipework must be supported to avoid the imposition of pipeline strains on the valve body, which would impair its performance.

Valves should not be lifted using the stem.

Immediately prior to valve installation, the pipework to which the valve is to be fastened should be checked for cleanliness and freedom from debris.

Valve end protectors should only be permanently removed immediately before installation. The valve interior should be inspected through the end ports to determine whether it is clean and free from foreign matter. The mating flange (both valve and pipework flanges) should be checked for correct gasket contact face, surface finish and condition. If a condition is found which might cause leakage, no attempt to assemble should be made until the condition has been corrected.

The gasket should be suitable for operation conditions or maximum pressure/temperature ratings. The gaskets should be checked to ensure freedom from defects or damage.

Care should be taken to provide correct alignment of the flanges being assembled. Suitable lubricant on bolt threads should be used. In assembly, bolts are tightened sequentially to make the initial contact of flanges and gaskets flat and parallel followed by gradual and uniform tightening in an opposite bolting sequence to avoid bending one flange relative to the other, particularly on flanges with raised faces.

Parallel alignment of flanges is especially important in the case of the assembly of a valve into an existing system.

Flanged joints depend on compressive deformation of the gasket material between the flange surfaces.

The bolting must be checked for correct size, length, material and that all connection flange bolt holes are utilized.

At the conclusion of installation and before operating, all dust deposits shall be removed from the equipment.

## **OPERATING**

The valve is opened by anti-clockwise rotation of the post indicator to a positive stop. Further effort is not necessary. When fully open it is advantageous to rotate the post indicator clockwise 1/2 turn.

To close the valve, the post indicator is rotated clockwise to a positive stop. Wheelkeys or other similar devices should not be used.

Note:

When the valve is closed at extreme high temperature and then cooled, the wedge may become tight in the valve and prove difficult to open.

Conversely, a valve closed at room temperature can be difficult to open if there is an increase in fluid temperature causing a linear expansion of the stem, which tightens the wedge further into the body seats.

The valve should only be used in the open or closed position. Regulating or throttling service should be avoided.

## **MAINTENANCE**

The valve should be at zero pressure and ambient temperature prior to any maintenance.

Maintenance Engineers & Operators are reminded to use correct fitting tools and equipment.

Tools causing showers of sparks are only permissible if:

No hazardous explosive atmosphere is present.

Dust deposits have been removed and no dust cloud is present.

A full risk assessment and methodology statement must be compiled prior to any maintenance. This must include the removal of dust deposits by good housekeeping.

The risk assessment must take into account the possibility of the limits of use being exceeded whereby a potential hazard could result.

A maintenance programme should therefore include checks on the development of unforeseen conditions, which could lead to failure.

In systems where corrosion could be a potential hazard, wall thickness checks on the body and bonnet should be made. This requires either the removal of the valve from the pipeline or removal of the bonnet with the system at zero pressure. If the wall thickness has reduced by 25%, the valve must be replaced.

### **Gland Adjustment**

The gland may need adjustment during installation and then periodically thereafter to maintain a stem gland seal.

The following procedure is recommended:-

Each gland nut should be tightened evenly in a clockwise direction until increased resistance to operate the valve is obtained, or if leakage is present until the leakage stops.

**Note:-** It is recommended that within the 1st year the gland be inspected at 3 monthly intervals to check for gland leakage.

Under normal working conditions gate valves should not need further attention but when required the following procedures are recommended.

### **Fitting Additional Packing Ring or Partially Repacking Valve Stuffing Box**

1. Turn off circulating pumps.
2. Close valve by clockwise rotation of handwheel.
3. Remove handwheel nut and handwheel.
4. Loosen both gland nuts anti-clockwise and remove.
5. Remove the gland.
6. Fit additional packing by means of wrapping packing round stem, cutting to length and pushing packing into stuffing box.
7. If partially repacking valves, remove old packing by means of a thin bladed screw driver or suitable packing removal tool, taking care not to damage the valve stem. Fit new packing rings onto the stem and into the stuffing box.
8. Refit the gland and both nuts.
9. Refit handwheel and handwheel nut.
10. Tighten the gland nuts evenly in a clockwise direction until increased tension to operate the valve is obtained. Repeat the above procedure as required.

### **Replacing Stuffing Box Gasket**

The valve should be isolated from the system and the valve drained before carrying out this operation.

Carry out stages 1, 3, 4 and 5 as for fitting additional packing

1. Operate valve to partially open position. (Handwheel anti-clockwise rotation).
2. Loosen and remove both stuffing box retaining nut situated at the base of gland bolts (anti-clockwise).
3. Refit handwheel and operate valve to closed position. When closed operate the valve a further 1/2 to 1 turn clockwise, this will break the stuffing box seal. (Note: stem damage could occur if the valve operation is continued after the seal is broken).
4. The stuffing box can then be pulled up the stem and removed.
5. After surfaces have been cleaned and the new gasket fitted ensure the stem collar is seated in the bonnet housing before reassembling which is carried out in reverse order to the dismantling procedure.

### **Replacing Bonnet Gasket**

The valve should be isolated from the system and the valve drained before carrying out this operation.

1. Operate valve to mid-position.
2. Loosen and remove series of bonnet/body bolting (anti-clockwise).
3. Operate valve to closed position (clockwise rotation of handwheel). When closed, operate the valve a further 1/2 to 1 turn, which will break the bonnet joint.
4. Open valve to mid position (anti-clockwise rotation of handwheel).
5. The complete bonnet sub-assembly including the valve wedge can then be lifted off the valve body.
6. Upon reassembly, it is important that the guides on the wedge are located in the body guides.
7. Using a new bonnet gasket, refit the bonnet, bolting and tighten diagonally.
8. Note: It is recommended that the bonnet sub-assembly be refitted complete when the valve body is in line.