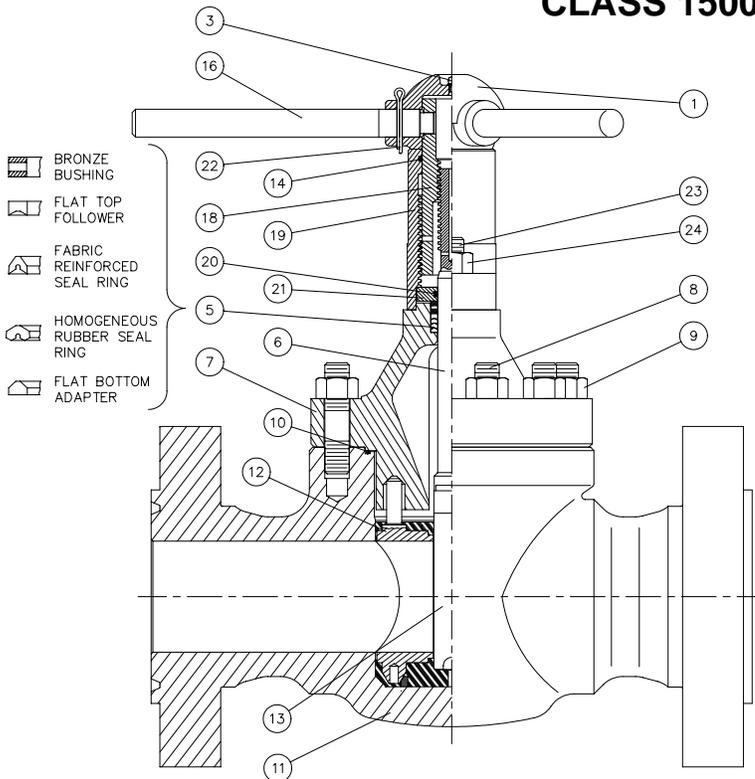


## SERIES DB GATE VALVE MAINTENANCE INSTRUCTIONS CLASS 1500 4" FULL PORT AND 6" REGULAR PORT



### DISASSEMBLY

1. Fully open the gate valve. Remove nuts (9) and withdraw the bonnet assembly from the body. Collapse the seat (12) by compressing the top pins together and remove it from the body.
2. With the bonnet assembly on its side, remove pin (22) and lock handle (16) then lift off hub (1). Turn stem screw (18) clockwise to bottom, then withdraw gate (13) from stem (6) by rotating a quarter turn and sliding it off the tee-head of the stem.
3. Seat or gate replacement may be made at this point. To reassemble the valve, proceed from reassembly instruction 3 after following the applicable maintenance instructions. If it is desired to inspect other parts, the following instructions apply.
4. Turn the stem clockwise until it disengages from stem screw (18) and withdraw it from the underside of the bonnet. Unscrew the two nuts (24) and lift screw housing (19) off the bonnet. Remove retainer (21), o-ring seal (20) and stem seal assembly (5) from the bonnet. Turn stem screw (18) clockwise out of the screw housing. Remove screw seal (14) from the screw housing and bonnet seal (10) from the valve body.

### MAINTENANCE

Thoroughly clean all parts and inspect them for wear or damage. It is recommended that seals (14), (10), (20) and stem seal assembly (5) be replaced if they are worn or cut. All sealing surfaces should be clean and free of dirt, rust, nicks and scratches. These will include the areas inside the body adjacent to the line bore where the seat fits, the area around the lower part of the bonnet that lies against the bonnet o-ring seal, the bonnet stuffing box and the surface of the stem that passes through the packing. Clean these surfaces well and polish with 320 grit emery cloth if necessary, paying particular attention to the valve stem. Before reassembling, apply a good grade of general purpose grease to all threads, seal rings and exterior of the seat and on the surfaces of the bonnet, stem and stem screw which are in contact with seals.

### REASSEMBLY

1. Slide the threaded end of the stem through the bonnet bore from the underside and place the stem seal assembly over the stem. This assembly consists of a flat bottomed adapter ring, homogeneous rubber seal ring, fabric reinforced seal ring, a flat-topped follower ring and a bushing, which are placed over the end of the stem in that order. The lips on "V" rings point towards bottom of bonnet. Slide the retainer (21) with o-ring seal (20) inside over the stem. Seat the stem seal assembly into its counterbore in the bonnet.
2. Engage the stem screw (18) in the screw housing (19) about half its total travel and place the screw housing on the bonnet and stem. Replace nuts (24).
3. Rotate the stem screw clockwise until it bottoms on the retainer, then back it up approximately one-eighth turn. Engage the gate on the tee-head of the stem and turn them together counterclockwise until the gate touches the underside of the bonnet lugs. Align the gate with the opening between the lugs and retract it into the bonnet by turning the stem screw counterclockwise. Place the hub on the stem screw, insert the lock handle and retain it with the cotter pin. Do not spread the pin since it may be removed later while adjusting the gate level.
4. Install the seat on the bonnet and stand the assembly upright resting on the seat. Turn the handle clockwise until the hub is stopped by the top of the screw housing.

Make a pencil mark on one side of the gate even with the bottom of the seat port. Raise the bottom of the gate into the seat bore by rotating the handle and measure the distance from the pencil mark to the bottom of the gate. This distance must be within 7/16" to 9/16".

If the distance is correct, proceed to assembly step 5. If not, remove the seat, lock handle and hub from the assembly. Rotate the stem screw clockwise to bottom then back off one-eighth turn. Turn the gate and stem together while holding the stem screw: counterclockwise to reduce the distance or clockwise to increase the distance as required. One-half turn of the gate and stem changes the distance approximately .100". Repeat step 4 until the closed gate position is correct.

5. Replace bonnet seal (10). Assemble seat and bonnet to the valve body keeping the seat ports aligned with the body line bore, making sure the gate is in the slot in the seat and that the top pins of the seat are in the drilled holes in the bonnet while performing this operation. Replace and tighten nuts (9). Spread the cotter pin (22) in the lock handle and repack the hub with general-purpose grease through fitting (3). This is most effectively done when the valve is closed.

## **TROUBLE SHOOTING**

**DIFFICULTY OF OPERATION** may be due to the following:

- a) Sand or other foreign material packed in the bonnet. Remove bonnet and clean out.
- b) Dry threads. Lubricate through the lube fitting. This is most effectively done when the valve is closed
- c) Stem threads galled. Replace stem and/or stem screw.

**LEAKAGE THROUGH THE VALVE** may be due to the following:

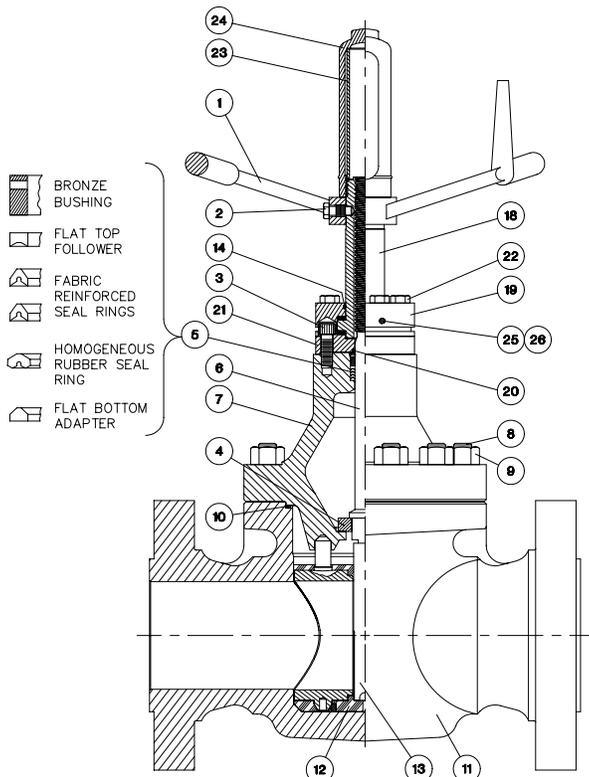
- a) Washed out gate or seat. Replace damaged parts.
- b) Improper closed gate position. Set gate as instructed above in the reassembly instructions.

**LEAKAGE AROUND THE STEM** is caused by a damaged stem seal assembly or stem. Replace stem seal assembly and inspect stem for wear.

**LEAKAGE BETWEEN BODY AND BONNET** is caused by a damaged bonnet seal which must be replaced.

## SERIES DM GATE VALVE MAINTENANCE INSTRUCTIONS

### 6", 8" x 6" CLASS 900 SERIES DB GATE VALVES



#### DISASSEMBLY

1. Fully open the gate valve. Remove nuts (9) and withdraw the bonnet assembly from the body. Collapse the seat (12) by compressing the top pins together and remove it from the body.
2. With the bonnet assembly on its side, turn the handwheel (1) clockwise to move the gate (13) out of the bonnet. Withdraw the gate from the stem (6) by rotating a quarter turn and sliding it off the tee-head of the stem.
3. Seat or gate replacement may be made at this point. To reassemble the valve, proceed from reassembly instruction 4 after following the applicable maintenance instructions. If it is desired to inspect other parts, the following instructions apply.
4. Remove stem cap (24), tube (23), screw (2) and handwheel (1). Remove screws (22) and lift off the housing (19). Rotate the stem screw (18) off the stem (left hand Acme) and remove roller and cage assemblies and thrust washers. Remove screws (3) and lift off the retainer (21). Lift the stem part way so that the down stop ring (4) may be removed, then withdraw the stem from the underside of the bonnet. The stem seal assembly and bushing (5) may now be removed.

#### MAINTENANCE

Thoroughly clean all parts and inspect them for wear or damage. It is recommended that seals (10), (14) (20) and stem seal assembly (5) be replaced if they are worn or cut. All sealing surfaces should be clean and free of dirt, rust, nicks and scratches. These will include the areas inside the body adjacent to the line bore where the seat fits, the area around the lower part of the bonnet that lies against the bonnet o-ring seal, the bonnet stuffing box and the surface of the stem that passes through the packing. Clean these surfaces well and polish with 320 grit emery cloth if necessary, paying particular attention to the valve stem. Also clean and polish the surfaces of the stem screw that run against the bearings. Before reassembling, apply a good grade of general purpose grease to all threads, bearings, seal rings and exterior of the seat and on the surfaces of the bonnet, stem and stem screw which are in contact with seals.

#### REASSEMBLY

1. Slide the threaded end of the stem (6) through the bonnet bore from the underside and draw the stem head part way up into the bonnet. Put the down stop ring (4) on over the bottom of the stem head, lower the stem so that the down stop ring shoulders on the inside of the bonnet.
2. Place the stem seal assembly (5) over the stem. This assembly consists of a flat bottomed adapter ring, homogeneous rubber seal ring, two fabric reinforced seal rings, a flat topped follower ring and a bushing which are placed over the end of the stem in that order. The lips on "V" rings point towards bottom of bonnet. Work the seal and follower rings carefully down over the stem thread, lips first, and into the stuffing box, being careful that the lips of the rings do not get curled back.
3. Put o-ring (20) into its groove in the bottom of retainer (21) and work retainer with o-ring down over the stem. Bolt retainer to the bonnet with four screws (3). Place two thrust washers (16) with a bearing (15) between them on top of the retainer then turn the stem screw (18) counterclockwise on the stem so that it seats against the thrust washer and lifts the stem off the down stop approximately one turn. Place the other two thrust washers with bearing between them over the stem screw. Put o-ring (14) in its groove in housing (19) and bolt housing to bonnet with screws (22). Attach handwheel (1) to stem screw with screw (2) and replace tube (23) and stem cap (24).

4. Slide the gate (13) into the stem, turn it a quarter turn to line it up with the slot in the bonnet and draw it up all the way into the bonnet by turning the hand wheel counterclockwise. Replace bonnet seal (10). Assemble the seat (12) and bonnet to the valve body keeping the seat ports aligned with the body line bore, making sure the gate is in the slot in the seat and that the top pins on the seat are in the drilled holes in the bonnet while performing this operation. Replace and tighten nuts (9). Repack housing (19) with a good grade of general purpose grease through fitting (25).

## **TROUBLE SHOOTING**

DIFFICULTY OF OPERATION may be due to the following:

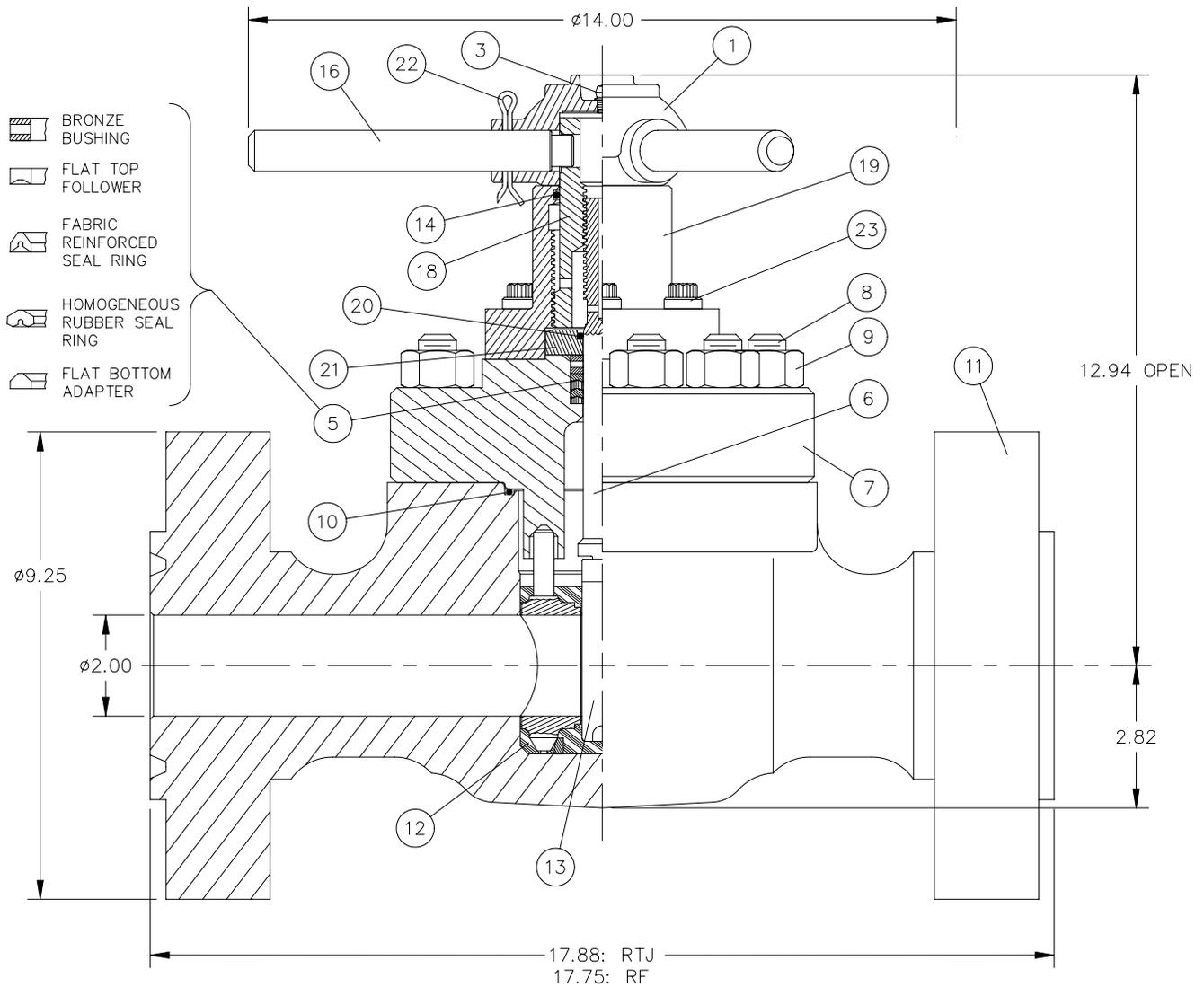
- a) Sand or other foreign material packed in the bonnet. Remove bonnet and clean out.
- b) Dry stem threads or bearings. Lubricate through the lube fitting.
- c) Stem threads galled. Replace stem and/or stem screw.
- d) Bearings worn out. Replace

LEAKAGE THROUGH THE VALVE may be due to a washed out gate or seat. Replace.

LEAKAGE AROUND THE STEM is caused by a damaged stem seal assembly or stem. Replace stem seal assembly and inspect stem for wear.

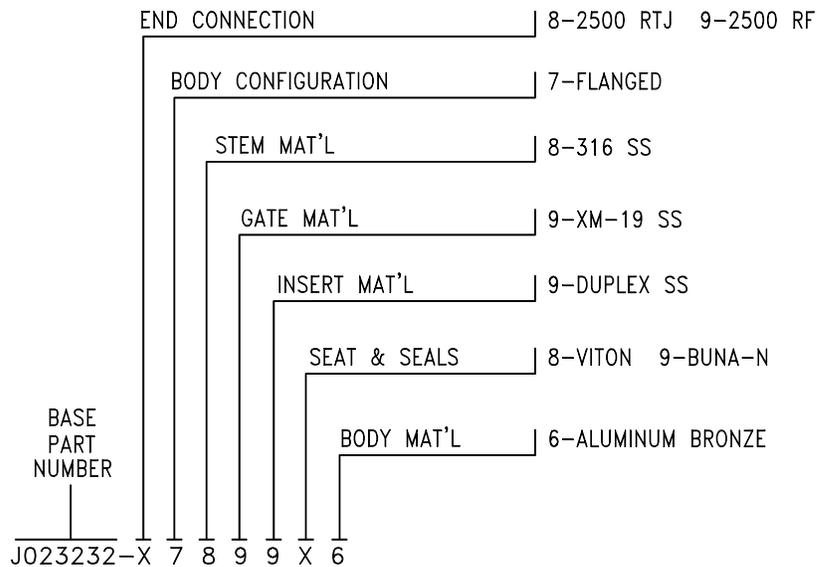
LEAKAGE BETWEEN BODY AND BONNET is caused by a damaged bonnet seal which must be replaced.

**SERIES DB GATE VALVE  
2" CLASS 2500, GENERAL SERVICE**



FLANGE BOLTS 8-1"  
RING NO. (RTJ) R26

**ASSEMBLY PART NUMBER**

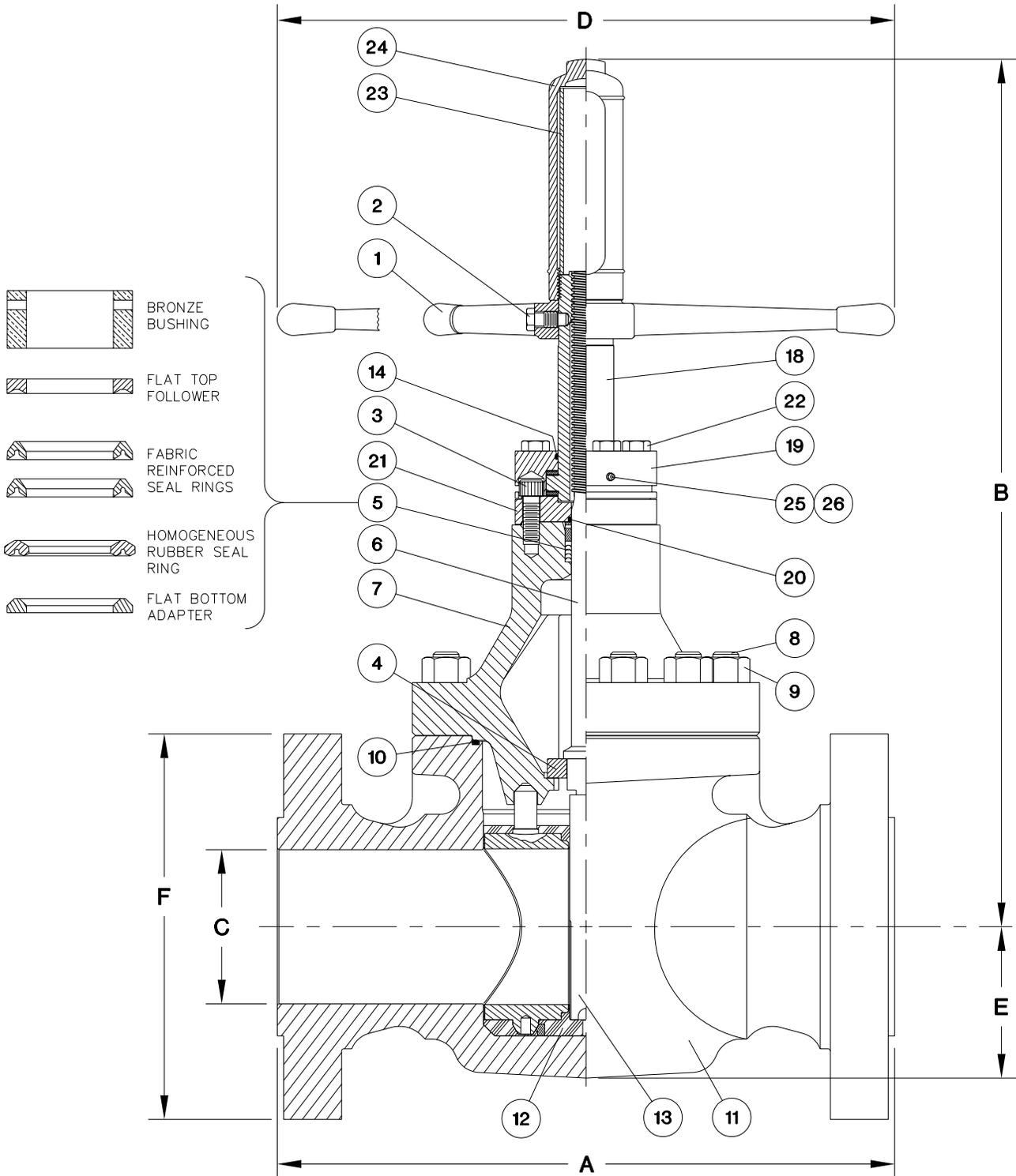


PARTS LIST

INDEX	REQD	DESCRIPTION	SIZE RATING	2" 2500	MATERIAL
		ASSEMBLY – FLANGED		J023232	
1	1	HUB ASSEMBLY		J014687	AISI 1020 STEEL
3	1	LUBE FITTING		005929-05	STEEL
5	1	STEM SEAL ASSEMBLY		J023231-001	BUNA-N/BRONZE BUSHING
				J023231-006	VITON/BRONZE BUSHING
6	1	STEM		J001931-008	316 SS
7	1	BONNET		J023233-060	AL. BRZ. ASTM B148 ALLOY 955
8	12	BODY STUD		J012574	ASTM A193 GRADE B7
9	12	BODY STUD NUT		J053251-034	ASTM B194 GRADE 2H
10	1	BONNET SEAL		J005520-239	BUNA -N
				J005521-239	VITON
11	1	BODY – RF – RTJ		J023234-060	AL. BRZ. ASTM B148 ALLOY 955
				J023235-060	
12	1	SEAT ASSEMBLY		J001876-092	VITON/DUPLEX SS *
				J001876-099	BUNA-N/DUPLEX SS *
13	1	GATE		J023237-009	ASTM A479 XM-19 H.R., 35 HRC MAX.
14	1	SCREW SEAL		J005526-224	BUNA-N
16	1	LOCK HANDLE		J001891	AISI C1213 STEEL
18	1	STEM SCREW		J014655	AISI 4140 STEEL
19	1	SCREW HOUSING		J023236-002	AISI C1018 STEEL
20	1	SECONDARY SEAL		J005526-210	BUNA-N
21	1	RETAINER		J014656	AISI 4140 STEEL
22	1	PIN, LOCK HANDLE		J005420-18728	STEEL
23	6	HOUSING SCREW		J005673-28028	ALLOY STEEL

\* DUPLEX SS  
PER COOPER CAMERON SPEC J022952

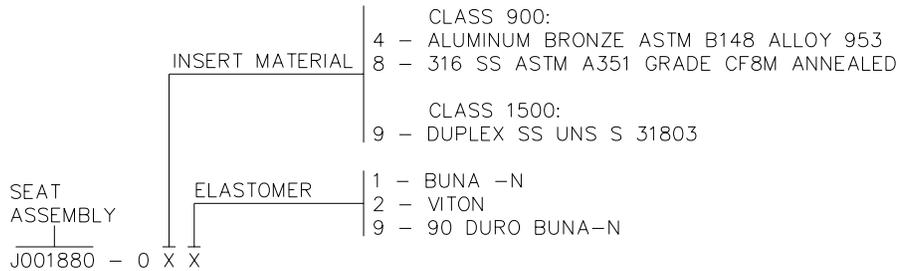
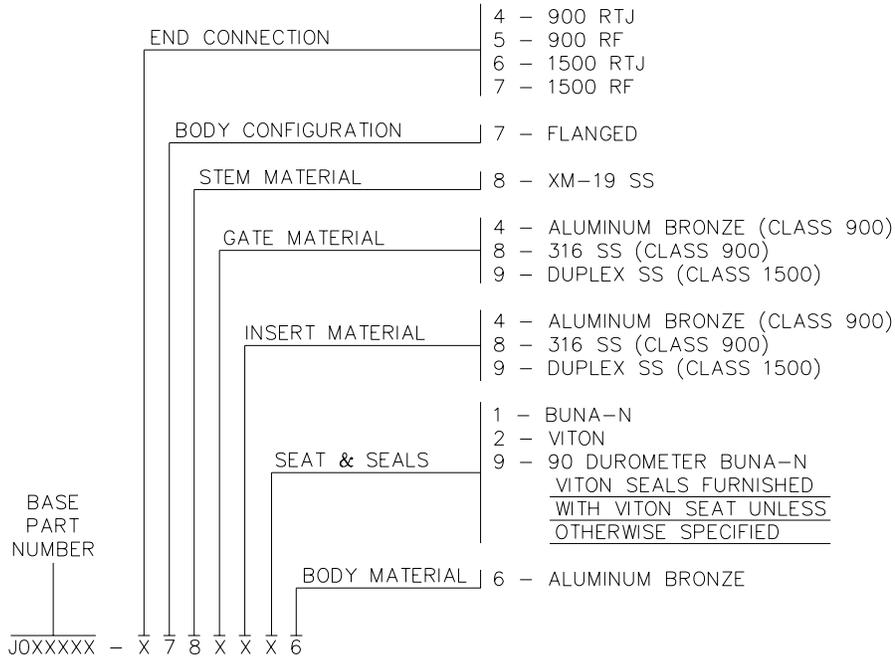
# DEMCO SERIES DB GATE VALVE 6", 8" x 6" CLASS 900 & 6" 1500



**DIMENSIONAL DATA**

DIMENSION	RATING SIZE	CLASS 900			CLASS 1500
		6"	8" X 6"	6"	6"
A - RF		24	29	27.75	
- RTJ		24.12	29.12	28	
B		34	34	34	
C (SEAT BORE)		6	6	6	
D		24	24	24	
E		5.88	5.88	6.12	
F (FLANGE DIAMETER)		15	18.50	15.50	
FLANGE BOLTS (QTY. - SIZE)		12 - 1-1/8	12 - 1-3/8	12 - 1-3/8	
RING NO. (RTJ)		R45	R49	R46	
WEIGHT - POUNDS		540	680		

### ASSEMBLY PART NUMBER



### PARTS LIST

INDEX	REQD.	DESCRIPTION	RATING	CLASS 900		CLASS 1500
				6"	8" X 6"	6"
		ASSEMBLY BASE NUMBER - FLANGED		J019163	J019785	J018418
1	1	HANDWHEEL Ductile Iron ASTM A536 Grade 65-45-12		2227656-01	2227656-01	J016986
2	1	SCREW - HANDWHEEL Steel AISI C1018		J014832	J014832	J016987
3	4	SCREW - RETAINER Alloy Steel		J005665-32028	J005665-32028	J005665-32028
4	1	DOWNSTOP RING 316 ss		J015848	J015848	J015848
5	1	STEM SEAL ASSEMBLY Buna-N		J015853-001	J015853-001	J016995-001
				J015853-006	J015853-006	J016995-006
6	1	STEM XM-19 SS		J019152-008	J019152-008	J018419-008
7	1	BONNET Aluminum Bronze ASTM B148 Alloy 955		J019151-060	J019151-060	J023411-060
8	12	BODY STUD Steel ASTM A193 Grade B7		J015432	J015432	J015329
9	12	BODY STUD NUT Steel ASTM A194 Grade 2H		2709000-10-01	2709000-10-01	2709000-12-01
10	1	BONNET SEAL Buna-N		J005526-371	J005526-371	J005526-371
				J005531-371	J005531-371	J005531-371
11	1	BODY - RF Aluminum Bronze ASTM B148 Alloy 955		J019149-560	J019784-560	J023412-060
		- RTJ		J019149-460	J019784-460	J023413-060
12	1	SEAT ASSEMBLY		J001880-0XX	J001880-0XX	J001880-09X
13	1	GATE Aluminum Bronze ASTM B148 Alloy 955		J019150-004	J019150-004	---
		316 SS ASTM A351 Grade CF8M		J019150-008	J019150-008	---
		Duplex SS UNS S 31803		---	---	J019150-009
14	1	STEM SCREW SEAL Buna-N		J005526-228	J005526-228	2726191-02-95
18	1	STEM SCREW w/BEARINGS Steel AISI C1018		J023888	J023888	J023848
19	1	HOUSING Steel AISI C1018		J015332	J015332	J018190
20	1	SECONDARY SEAL Buna-N		J005526-216	J005516-216	J005526-218
21	1	RETAINER Steel AISI C1018		J015330	J015330	J018191
22	4	SCREW - HOUSING Steel		J005650-32056	J005650-32056	J005650-34064
23	1	TUBE Clear Acrylic		J019160	J019160	J018192
24	1	STEM CAP Ductile Iron ASTM A536 Grade 65-45-12		J019161	J019161	J018193
25	1	LUBE FITTING Steel		005929-05	005929-05	005929-05
26	1	RELIEF FITTING Steel		J051971	J051971	---

## APPLICATION INSTRUCTIONS SERIES DM AND DB GATE VALVES

**CAUTION** – EXPOSURE OF THIS VALVE TO CERTAIN MEDIA OR OPERATING CONDITIONS LISTED BELOW MAY RESULT IN HAZARDOUS CONDITIONS. FAILURE TO FOLLOW THE INSTRUCTIONS HEREIN MAY RESULT IN LEAKAGE OR MALFUNCTION CAUSING PROPERTY DAMAGE AND/OR SERIOUS PERSONAL INJURY OR DEATH.

It is the responsibility of the user to determine the suitability of the valve and trim in his particular application. Regular maintenance schedules should be established, the intervals being determined by the length of satisfactory performance of the valve in the actual service conditions. A functional check is recommended weekly until the required interval is determined, except as stated below.

### HYDROGEN SULFIDE

Hydrogen sulfide, even in small amounts, is extremely toxic and can cause embrittlement of metallic pressure containing parts. Valves to be used for hydrogen sulfide containing fluids must be specifically ordered for this type of service. All parts of such valves are carefully inspected for conformance with NACE MR-01-75 and one end of the valve body is stamped "NACE" for identification.

Elastomeric seat and seals may deteriorate in the presence of hydrogen sulfide. Establish a regular maintenance schedule by inspecting the seat and seals within six months of installation and every three months thereafter for hardening, softening, embrittlement, shrinkage and/or compression set. The durometer hardness of the elastomer should be between 65-90 Shore A (compare with a new o-ring) and the shrinkage or compression set must not be great enough to cause significant loss of compression of the elastomer against the mating metal parts. Replace seat and seals before these conditions occur.

### CARBON DIOXIDE

DEMCO Series DM Gate Valves are giving satisfactory service in applications involving carbon dioxide. However, elastomeric seat and seals tend to absorb this gas and, depending on several factors, may swell to such an extent that the valve becomes difficult or impossible to operate and the seat may leak. Seat damage by sudden swelling may occur upon sudden decompression as when the valve is opened under high differential pressure. Satisfactory performance can be assured only by test under actual operating conditions.

### NATURAL GAS ABOVE 3000 PSI

Standard elastomeric seat and seals absorb natural gas at high pressures and may swell to such an extent that the valve becomes difficult or impossible to operate. Seat damage may occur upon sudden decompression as when the valve is opened under high differential pressure. The valve should be ordered with special 90 durometer Buna-N seats for use in gas or multiphase systems above 3000 psi.

### FORMATION FRACTURING PROPPING AGENTS

Use of a gate valve in formation fracturing service will cause the bonnet cavity to be filled with the propping agent (sand in particular) which may set up over a period of time, rendering the valve inoperable. The valve must be thoroughly flushed out as soon as possible after such use.

### CEMENT

Use of a gate valve in cementing operations will cause the bonnet cavity to become filled with cement, which will set up in a short time, rendering the valve inoperable. The valve must be thoroughly flushed out before the cement sets up

### ACIDIZING FLUIDS

The dilute acids used in acidizing of wells can become trapped in pockets and crevices in the areas of the valve seat and seals. Metallic surfaces in contact with the seals in these areas may corrode, resulting in loss of sealing ability. Thoroughly flush the valve immediately after the acidizing treatment is finished.

### SEVERE PRESSURE PULSATION

If a valve is to be located close to a positive displacement pump, it should be protected by a pulsation damper to reduce exposure to body stud failure and excessive wear of gate and seat. A relief valve should be installed in the system to insure that the working pressure rating of the valve is not exceeded.

### EXTREME VIBRATION

Severe vibration such as may be found close to a pump or other source can cause excessive wear of valve gates, seats and other moving parts resulting in leakage or malfunction. Vibration at the valve must be eliminated or reduced to an acceptable level.

### TEMPERATURE ABOVE 200°F

Temperature above the ratings of the elastomeric seat and seals (200°F for Buna-N, 400°F for Viton) will in a short period of time cause them to soften and take compression set, resulting in loss of sealing ability. Exposure to extremely high temperatures, as might

occur during a fire, can cause disintegration of these parts. Following exposure to high temperature, the seat and seals should be inspected for hardening, embrittlement, shrinkage or compression set. Hardness should not exceed 90 Durometer A for good sealability (compare with a new 90 Durometer o-ring) and the shrinkage or compression set must not be great enough to cause significant loss of compression of the elastomer against the mating metal parts. Replace seat and seals if they have been damaged to this extent.

### **THROTTLING CONDITIONS**

A gate valve should never be left in a throttling condition (partially open) during service. The resulting high velocity line fluids may cause erosion of the gate and seat and result in loss of sealing ability. Throttling conditions also occur momentarily during opening or closing of the valve against high differential pressure/high flow rates. The life of the gate and seat will be substantially increased by avoiding these conditions. We suggest that these parts be inspected for erosion after every 50 operations until a regular maintenance schedule can be established.

### **CLOSING AGAINST HIGH PRESSURE**

In addition to creating throttling conditions (see above paragraph), closing a valve against high pressure requires more effort than closing against low pressure and causes a higher rate of wear on the operating mechanism. It will at times be necessary to close the valve against high pressure and in such instance the operating personnel must have sufficient room and footing to perform this task. The piping system should be designed accordingly. We suggest that the threaded parts be inspected after every 100 operations until a regular maintenance schedule can be established. The parts should be replaced if the threads are worn beyond 80% of their original thickness.

### **REASSEMBLY PROCEDURE**

Following disassembly for repairs, the valve must be reassembled in accordance with the instructions on Data Sheet G-2, G-3, G-5, G-6 or G-7 (copy obtainable from Cooper Cameron Valves, Oklahoma City, Oklahoma 73143) as applicable. Otherwise the valve may not close fully, resulting in erosion to gate and seat, or may close too far resulting in seat damage, or the stem or gate may become disengaged from their mating parts upon closing of the valve.