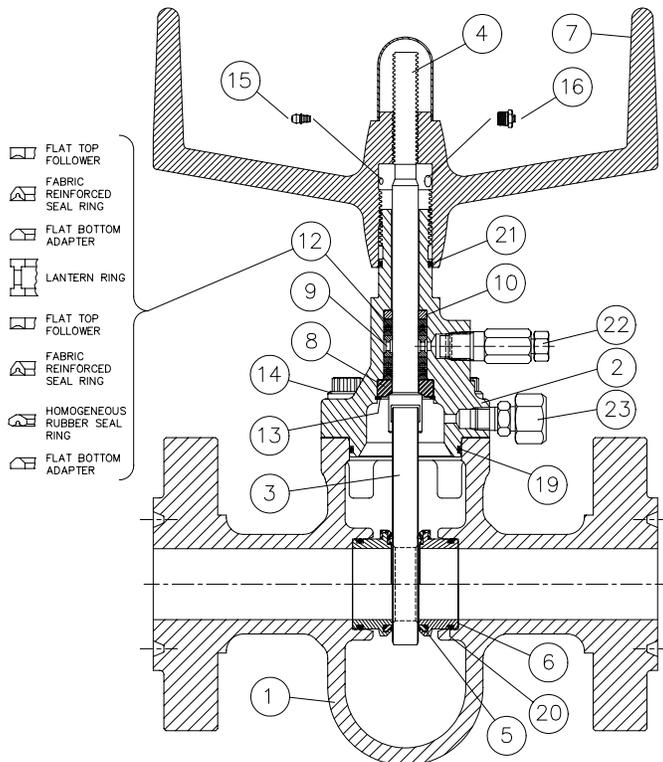


## W-K-M SERIES DT-S GATE VALVE OPERATIONS & MAINTENANCE INSTRUCTIONS API-6A 2000-3000-5000, 2-1/16" & 2-9/16" SIZES



### I. DISASSEMBLY

- A. Release all pressure from the line in which the valve is installed. If the valve is downstream from another closed valve under pressure, that valve should be locked or sealed and tagged to prevent opening while this work is being done.
- B. Open the gate valve approximately half way until all trapped body pressure is vented into the line. Then open fully. Remove screws (14) uniformly and withdraw the bonnet assembly from the body. Be careful not to scratch the sides of the bonnet bore while withdrawing the gate from the body. If the bonnet moves out of the body as the screws are being removed, it may be assumed that there is still pressure in the system. Proceed no further until absolutely sure that all pressure has been removed from the system. Remove seats (5) by use of a large screwdriver or similar tool alternately on each side of the seat between the body wall and seat flange until it is loosened and pried out of the body. When excessive amounts of rust or other deposits are present, penetrating oil or rust solvent should be applied. Inspect seat seals (20). Remove springs (6) from plastic insert seated valves. Lay the bonnet assembly on its side, turn the handle (7) clockwise until the gate (3) is clear of the bonnet. Slide the gate off the T-head of the stem (4).
- C. Remove retainer snap ring (13). Turn stem (4) clockwise until it disengages from the handle. Withdraw stem, packing (upper and lower sets) (12), bushing (10), lantern ring (9), and packing retainer (8) from the bonnet. Remove the handle from the bonnet by rotating it counterclockwise.

### II. MAINTENANCE

- A. Thoroughly clean all parts and inspect them for wear or damage. It is recommended that all o-rings, packing, and the valve seats be replaced if they show wear or damage. All sealing surfaces should be clean and free of dirt, rust, nicks, and scratches. These surfaces include seat cavities in the body, the bonnet sealing surface in the body, the stuffing box in the bonnet, sealing surfaces of the stem, and both faces of the gate. Before reassembly, apply a good grade of general purpose grease to all seals, the valve seats, seat cavities, and sealing surfaces of all parts. Lubricate the stem and handle threads with valve stem thread lubricant, Val-Tex 10-S or equal. Badly worn threaded parts should be replaced.

### III. REASSEMBLY

- A. Install o-ring (21) into its groove in the bonnet (2). Turn the handle (7) onto the bonnet until the bottom of the handle is even with the bottom of the o-ring groove. Install bushing (10) into the bore of the bonnet.
- B. Place the packing retainer (8) on the stem (4), chamfered side towards the stem head. Install the stem seal assembly (12) and lantern ring (9) on the stem as follows: From the bottom, a flat bottomed male adapter ring, a rubber seal ring, a fabric reinforced rubber ring, a flat topped female follower ring, a lantern ring, a flat bottomed male adapter ring, a fabric reinforced rubber seal, and a flat topped follower ring. Lubricate each ring and individually work down over the stem threads with the lips of the rings pointed towards the stem head. Avoid cutting or folding the edges of these lips.
- C. Slide the stem into the bonnet and engage the threads 1-2 turns into the handle. Using a blunt screwdriver or other suitable tool, work each packing ring into the bore of the bonnet being careful not to damage the bore or stem.
- D. Place the retainer snap ring (13) over the stem head. Assemble the gate (3) onto the stem head and rotate the gate counterclockwise until the packing retainer is drawn into its bore in the bonnet, the stem head is firmly seated against the packing retainer, and install the retainer snap ring into its groove. Install o-ring (19) into its groove in the bonnet.
- E. Make sure the seat pockets in the body are free of any obstructions that would prevent the seats from bottoming. Install o-ring (20) on each seat (5). For valves with plastic seats only, install seat spring (6) into each body seat pocket. If the valve was removed from the line, the seats are installed by setting the valve on end, starting the seat into the pocket, holding a piece of pine or other relatively soft material against the seat face and tapping the seat into place with a bar or tool handle through the line bore. If the valve is in the line, work one seat into place with a piece of 1" pine or other relatively soft material. The other seat is worked into place with successively thicker pieces of material from 1/4" to 5/8" thick. On plastic inserted seats, rock the seats back and forth a few times to insure they will spread without cocking when the gate is installed.

- F. Rotate the gate clockwise relative to the bonnet, if necessary, until it straddles the bolt holes. Not more than 1/4 turn is required. Lift the bonnet/gate assembly, maintaining the position of the gate relative to the bonnet, and align the gate with the slot between the seats. Insert the bonnet/gate assembly straight down into the body. Do not allow the gate to drag against the side of the body bore and damage the sealing surface. On plastic seated valves, be especially careful not to rock the gate back and forth as this would damage the plastic faces of the seats. It may be necessary to tap on the stem with a soft hammer to start the gate between the seats to overcome the resistance of the seat springs. Attach the bonnet to the body with cap screws (14).

Valve	Screws	Torque
2 1/16" 2000	5/8"-11	130
2 1/16" 3000/5000	3/4"-10	230
2 9/16" 2000	5/8"-11	130
2 9/16" 3000/5000	7/8"-9	375

- G. Fully close and open the valve to assure it will operate smoothly. If operation is difficult, determine and correct the cause. In the fully closed position, the handle is seated against the shoulder of the bonnet. In the fully open position, the bottom of the stem head is back seated against the packing retainer and the bottom of the handle is even with the bottom of the seal groove in the bonnet within  $.025"$ . If the bottom of the handle does not line up with the bottom of the seal groove in the open position, adjustment may be made by turning the handle clockwise a couple of turns, backing out the cap screws and rotating the bonnet clockwise to raise the handle or counter-clockwise to lower the handle. One quarter turn of the bonnet will effect a change in vertical handle position of  $.021"$ . Tighten the cap screws to the appropriate values (lb-ft) listed in the following table:

## IV. TROUBLE SHOOTING

A. DIFFICULTY OF OPERATION may be due to the following causes:

- 1). The system may be closed and filled with liquid. The valve is of the rising stem type and the stem displaces volume as the valve is being closed. Extremely high pressures may be imposed on the system unless a certain amount of liquid is vented prior to attempting to close the valve.
- 2). Dry, worn or galled stem or handle threads or a bent stem. If lubricating through the fitting (15) does not correct the problem, the handle, bonnet and stem may be inspected by removing the handle as directed in paragraph I.B. Replace defective parts.
- 3). The valve may be packed with ice, sand or other material. Ice may be thawed by warming the valve body to temperatures not exceeding  $200^{\circ}$  F. Remove bonnet to flush out sand or other solids (see Disassembly).

B. LEAKAGE THROUGH THE VALVE may be due to the following:

- 1). Foreign object preventing full closure. Open and close the valve a few times to dislodge the object.
- 2). Valve improperly assembled. Check to be sure the bottom of the handle lines up with the bottom of the o-ring groove within  $.025"$  with the valve fully open. If it does not, follow the procedure in REASSEMBLY, first making sure there is no pressure in the valve - See DISASSEMBLY.

C. STEM LEAKAGE

- 1). May be stopped by the use of the packing fitting. If stick packing is required, back the screw out part way. The screw should feel loose at this point if the ball check in the packing fitting is seated properly. DO NOT stand in front of the screw while removing it from the packing fitting. If so, remove the screw, insert one stick of packing and follow it with the screw. Turn the screw on the fitting clockwise to force the stick packing (Cameron Part No. J005377-001) into the stuffing box. If the leak is not stopped by this means, the valve must be disassembled for inspection and replacement, if necessary, of the stem packing rings or stem. Do not over tighten the screw. Over tightening can cause extreme pressure build-up in the stuffing box. Damage to packing, retainer snap ring, or bonnet could result. Maximum recommended torque is 5 lb-ft @ 0 psi and 8 lb-ft @ 5,000 psi.

D. LEAKAGE BETWEEN BODY AND BONNET

- 1). Leakage may be caused by a damaged bonnet seal or sealing surface in the body. Replace the seal and polish the mating body surface.

## IV. PERIODIC MAINTENANCE

A. Body Cavity Lubrication (Normal Operating Conditions)

- NOTE: Cameron lubricates gate valves on assembly. Lubricate the body cavity after ten operating cycles. One cycle equals opening and closing the valve one time. The service interval can vary according to application, fluids used, and well conditions. If pressure is equalized across the valve before the valve is opened, the service interval can be extended. If the valve is removed from service, lubricate the body cavity before returning it to the line.
- 1). Remove the grease fitting cap located on the side of the bonnet. (23)
  - 2). Thread a Pressure Relief Fitting (K021960) on the grease fitting and vent all pressure from the valve body, or if there is no line pressure put the gate in the partially open position to relieve all body pressure.
  - 3). Using either a bucket-type gun, P/N 19873-03, or a hand-held type, P/N 19873-01, connect the grease gun coupler to the grease fitting.
  - 4). Pump lubricant into the body cavity until it flows into the valve bore. Refer to the chart below.

**B. Body Cavity Lubrication (Unusual Operating Conditions)**

**NOTE:** If it becomes necessary to cement through, acidize through, or subject the valve to any other unusual service, proceed as follows:

- 1). Lubricate the valve body cavity before it is put into service.
- 2). Flush the valve with the appropriate neutralizing fluid in the line.
- 3). Operate the valve with fresh water or appropriate neutralizing fluid in the line.

- 4). Lubricate the valve body cavity.

**C. Handwheel / Stem Thread Lubrication**

**NOTE:** Lubricate the stem threads as often as required to ensure smooth valve operation.

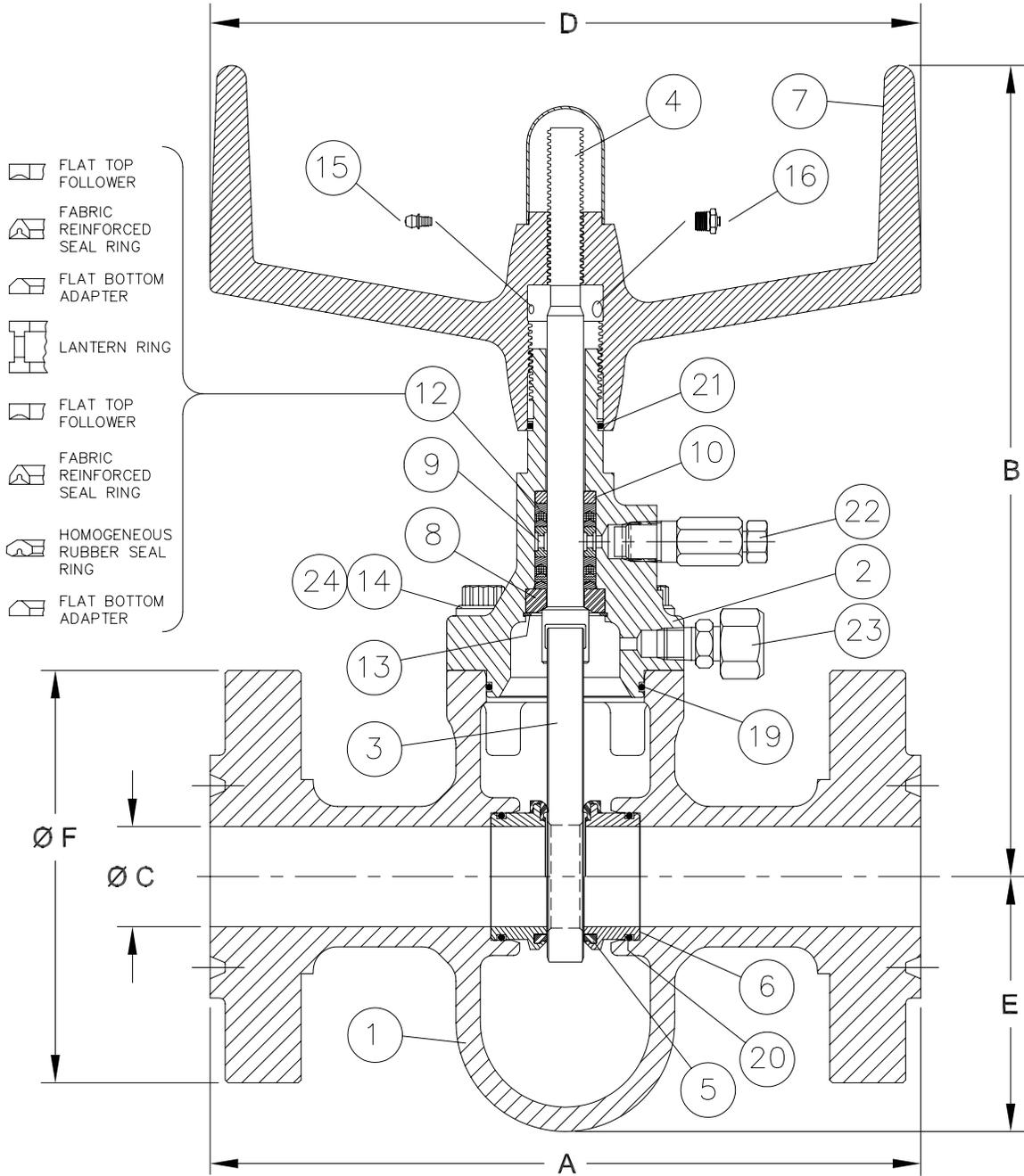
- 1). Using a hand-held grease gun for automotive type grease fittings, connect the grease gun fitting to the hydraulic grease fitting on the handwheel. (15)
- 2). With the valve in the closed position, pump lubricant into the fitting until clean grease flows out the vent fitting (16).

Lubricant Selection

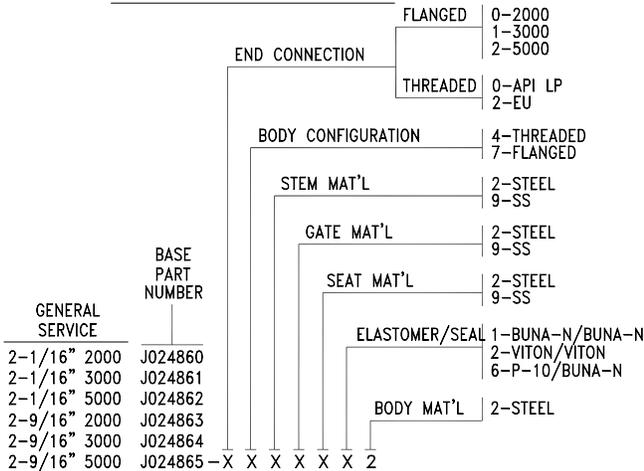
Service	Lubricant Name	Operational Properties							Solvent	Quantities (By Part Number) Available on a Standard Order Basis				
		Std. Crude	Low Temp. to-75°F	Diesel	Hlgh Temp. RT to 650°F	With H <sub>2</sub> S (Sour Crude or Gas)	With Gas Well Condensate	Very High CO <sub>2</sub>		(Per Pound)	5 lb Can	25 lb Pail	120 lb Drum	400 lb Drum
Standard	CI-14 or TF-41	E	P	P	P	F	F	P	Mineral Spirits	700149	700667	700668	700669	700670
Arctic	NS-14	E	E	P	P	F	F	P	Mineral Spirits	700123	700671	700672	700673	700674
Diesel Resistant	SS-14 or TS-41	E	P	E	P	G	G	G	Alcohol	700150	700675	700676	700677	700678
High Temp.	HT-14S	G	F	P	E	F	F	P	Mineral Spirits	700217	700679	700680	700681	700682
High Temp.	Moly 101	G	P	P	E	G	F	P	Mineral Spirits	710194	700679	700680	700681	700682
E -Excellent G -Good		F-Fair P - Poor												
Example for Ordering: Order Part Number 700672 for 25 lb of NS-14														SD-4185



# W-K-M SERIES DT-S API 6A GATE VALVES FOR GENERAL SERVICE



**ASSEMBLY PART NUMBER**



**DIMENSIONS**

VALVE SIZE	2-1/16"		2-9/16"	
	2,000	3,000 5,000	2,000	3,000 5,000
A - THREADED	8.50	8.50	-----	8.75
A - FLANGED	11.62	14.62	13.12	16.63
B	16.71	16.71	-----	17.98
C	2.06	2.06	2.56	2.56
D	14.62	14.62	14.62	14.62
E	5.00	5.25	6.17	6.50
F - FLANGE O.D.	6.50	8.50	7.50	9.63
FLANGE BOLTS	8-5/8"	8-7/8"	8-3/4"	8-1"
RING NO. (RTJ)	R-23	R-24	R-26	R-27

SERIES DT-S GATE VALVES  
PARTS LIST

GENERAL SERVICE

INDEX	REQD	DESCRIPTION	VALVE SIZE		2-1/16"			2-9/16"			MATERIAL
			RATING		2000	3000	5000	2000	3000	5000	
		ASSEMBLY BASE NUMBER			J024860	J024861	J024862	J024863	J024864	J024865	
1	1	BODY - API LP			J024853-002	J024846-002		J024859-002	J024844-002		ASTM A487 GRADE 4 CLASS C
		- EU			J024852-002	J024839-002		J024858-002	J024845-002		
		- RTJ			J024849-002	J024838-002		J024855-002	J024841-002		
2	1	BONNET			J024867-002	2061601-02		J024869-002	2061610-02		ASTM A487 GRADE 4 CLASS C
3	1	GATE - FOR RUBBER SEAT - STEEL				J024558-002			2060265-02		ASTM A487 GR 4 CLASS E MOD., NICKEL PLATED
		- SS				J024558-009			2060265-09		ASTM A487-CA15 (410SS) MOD.
		- FOR PLASTIC SEAT - STEEL				J024559-002			2060266-02		ASTM A487 GR 4 CLASS E MOD., CHROME PLATED
		- SS				J024559-009			2060266-09		ASTM A487-CA-15 (410SS) MOD.
4	1	STEM - STEEL				J024870-002			J024871-002		STEEL 4130-4140 ZINC PLATED
		- SS				J024870-009			J024871-009		410SS
5	2	SEAT - STEEL / BUNA-N				J024564-281			2060244-71		SEAT RING - STEEL; ELAST. - BUNA-N, 90 DURO
		- SS / BUNA-N				J024564-981			2060244-91		SEAT RING - 410SS; ELAST. - BUNA-N, 90 DURO
		- STEEL / VITON				J024564-282			2060244-72		SEAT RING - STEEL; ELAST. - VITON
		- SS / VITON				J024564-982			2060244-92		SEAT RING - 410SS; ELAST. - VITON
		- STEEL / P10				J024563-023			2060246-23		SEAT RING - STEEL; INSERT - PEEK
		- SS / P10				J024563-053			2060246-93		SEAT RING - 410SS; INSERT - PEEK
6	2	SEAT SPRING - FOR P-10 SEAT				2060349-01-01			2060349-02-01		INCONEL X-750
7	1	HANDLE ASSEMBLY				2139043-01			2139044-01		DUCTILE IRON ASTM A536
8	1	STEM PACKING RETAINER				J024324-001			2060259-01		C1213 STEEL ZINC PLATED
9	1	LANTERN RING				J024763-002			J024764-002		AISI 1018 STEEL ZINC PLATED
10	1	STEM BUSHING				J024661-060			J024676-060		ASTM B505 ALLOY 93200 COPPER ALLOY
12	1	STEM SEAL ASSEMBLY - BUNA-N				J024757-11702			J024757-21702		BUNA-N, 90 DURO
		- VITON				J024757-11602			J024757-21602		VITON
13	1	RETAINER SNAP RING				J090066-162			J090066-162		PH 15-7 Mo SS
14	4	CAP SCREWS	J005671-32024			J005671-34032		J005671-32028		J005671-36036	ASTM A193 GRADE B7
15	1	LUBE FITTING				J005194			J005194		STEEL ZINC PLATED
16	1	RELIEF FITTING				J005197			J005197		STEEL ZINC PLATED
19	1	O-RING - BODY SEAL - BUNA-N				J005520-234			J005520-239		BUNA-N, 90 DURO
		- VITON				J005521-234			J005521-239		VITON
20	2	O-RING - SEAT - BUNA-N				J005520-229			J005520-234		BUNA-N, 90 DURO
		- VITON				J005521-229			J005521-234		VITON
21	1	O-RING - HANDLE SEAL				J005526-219			J005526-221		BUNA-N
22	1	SEALANT INJECTOR				K462467			K462467		CARBON STEEL
23	1	GREASE FITTING	- - -			2726046-01		- - -		2726046-01	CARBON STEEL