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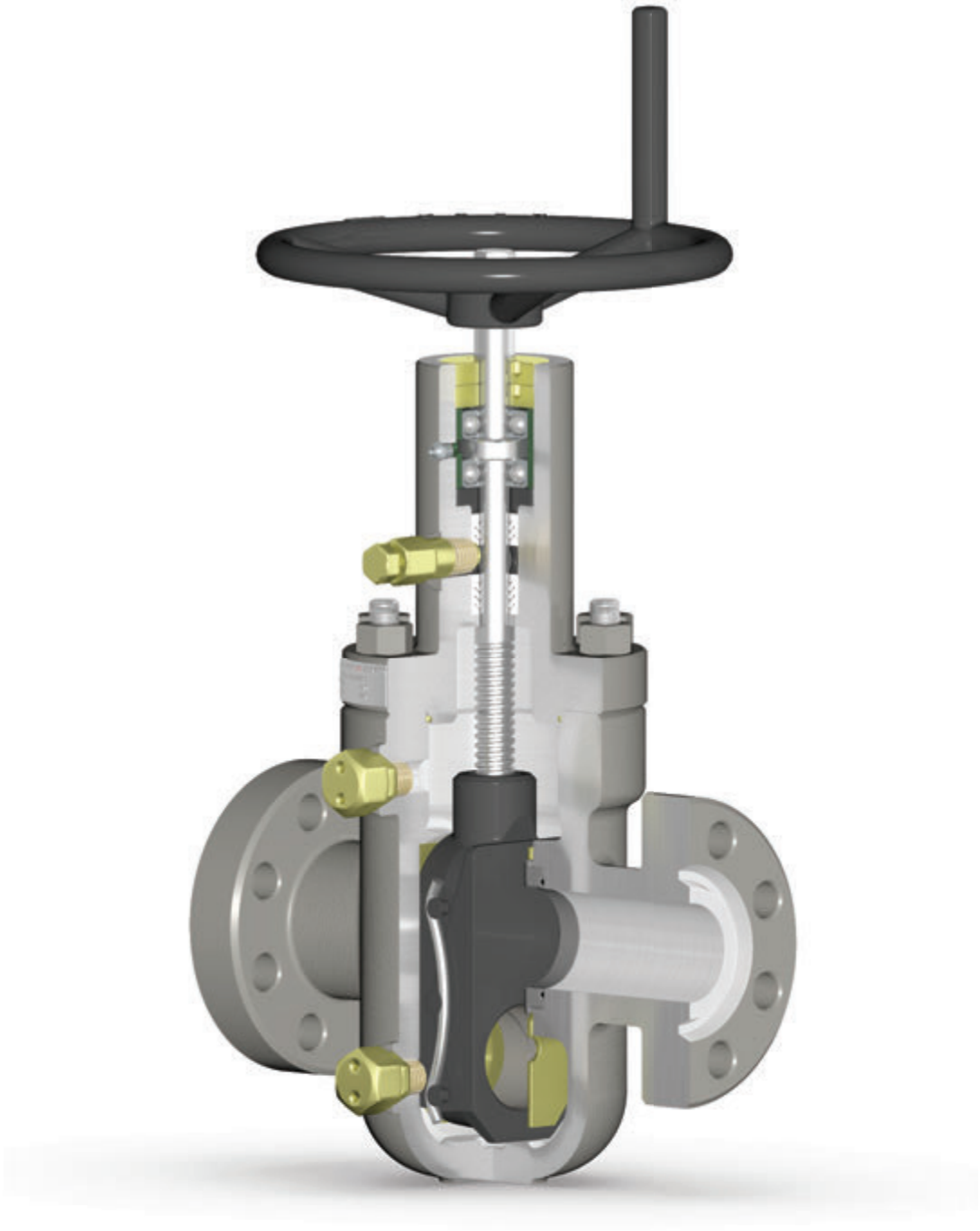

MODEL M AND MSG GATE VALVE
SERVICE AND OPERATION MANUAL

PROPRIETARY BOOKLET OF VALVEWORKS USA. DO NOT REPRODUCE WITHOUT EXPLICIT PERMISSION.

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INTRODUCTION

In appreciation to our customer for purchasing our product, we have prepared this Operation Manual to assist you in the Operation, Maintenance, Assembly and Installation of the Valveworks USA API 6A Model M and MSG Gate Valve. We encourage following the recommendations in this booklet
to attain the best possible service from our product, which is designed and proven to offer the service one can expect of a quality product.
To contact a representative for more specific information pertaining to a special problem:

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BOSSIER CITY, LA USA 71111

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QUALITY

Valveworks USA management and employees are committed to continually improve the effectiveness of our quality management system to produce a quality assured product which meets or exceeds our customer's expectations and requirements.

SAFETY

Caution must be taken as to the surrounding area and its potential dangers of projectiles.

Pressure kills! Even a loose, stand alone valve may contain trapped pressure which will turn any component into a projectile missile when disassembled, causing injury or death. Never stand over a component or in its path of release during assembly. Always operate the valves from the open to close position slowly releasing trapped pressure. Always remove fittings first, taking extreme caution to their potential danger as a projectile. Caution should be taken when handling components during disassembly and assembly, as most components are heavy, greasy, hard to handle and have edges which can cause injury. Always be cautious of how the valve is positioned and standing. Be sure the valve is secured in position so there is no possible chance of tipping over. Never apply test pressure above the manufacturers rated working pressure. The shell test pressure above the working pressure has already been tested by the manufacturer and is not required after the initial assembly test of the valve. The manufacturer has already verified the quality of the valve shell body components and will void the warranty from the manufacturer if the valve is pressure tested above the rated working pressure indicated for the valve. Always wear steel toes shoes, hard hat, eye and ear protection while performing repairs.

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APPLICATIONS

Valveworks USA Model M and MSG gate valves can be applied to the following sizes and working pressures.

APPLICATION	OPTIONS AVAILABLE
GATE VALVE SIZE	2-1/16", 2-9/16",3-1/8", 4-1/16", 5-1/8"
MAXIMUM ALLOWABLE WORKING PRESSURE (MAWP)	2M, 3M, 5M
TEMPERATURE RANGE	-60°C TO 121°C (-75°F TO 250°F)

The Model M and MSG Gate Valves covered in this manual are suitable for performance requirement levels 1 and 2, PR1 and PR2 respectively.

TEMPERATURE RATING

TEMPERATURE CLASSIFICATION	OPERATING RANGE			
	°C		(°F)	
K	-60	82	-75	180
L	-46	82	-50	180
N	-46	60	-50	140
P	-29	82	-20	180
S	-18	60	0	140
T	-18	82	0	180
U	-18	121	0	250
V	2	121	35	250

TRIM CHART

MATERIAL CLASS	MINIMUM MATERIAL REQUIREMENTS	
	BODY, BONNET, END AND OUTLET CONNECTIONS	PRESSURE-CONTROLLING PARTS, STEMS, AND MANDREL HANGERS
AA - General Service	Carbon or low-alloy steel	Carbon or low-alloy steel
BB - General Service	Carbon or low-alloy steel	Stainless steel
CC - General Service	Stainless steel	Stainless steel
DD - Sour Service [a]	Carbon or low-alloy steel [b]	Carbon or low-alloy steel [b]
EE - Sour Service [a]	Carbon or low-alloy steel [b]	Stainless steel [b]
FF - Sour Service [a]	Stainless steel [b]	Stainless steel [b]
HH - Sour Service [a]	CRAs [b]	CRAs [b]

[a] As defined by NACE MR0175.
[b] In compliance with NACE MR0175.

As shown by API-6A. For specific details consult Valveworks USA.

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ORDERING INFORMATION

The following information should be provided with any request for quote or order placement of Valveworks USA Model M and MSG Gate Valves:

- **API 6A Requirements (PR-PSL)**
- **Temperature Rating (API 6A)**
- **Material (API 6A)**
- **Any Special Test Requirements**
- **Any Special Material Requirements**
- **Any Special Coating or Protection Requirements**
- **Other Specifications and/or Certifications**

OPERATION

Valveworks USA Model M and MSG valves are handwheel operated (HWO) valves. The gate of the Model M Valve consists of two pieces (major and minor) acting one against the other by means of a dual wedge expanding when the valve is either fully closed or fully opened. The expansion effect of the wedge against the seats, through the parallel faces of the gate, provides a strong and positive seal against pulsations and vibrations created by flow conditions. The gate of the Model MSG valve is a one piece slab gate that uses two floating seats to generate a highly reliable seal. The slab gate eliminates the chance of trapping pressure within the body cavity which can cause pressure locking.

- **Fully open the valve before installing or shipping. The sealing area of the gates, in the full open position, is protected by the body and is less likely to be damaged.**
- **Do not remove the molybdenum disulfide coating from internal parts. This coating serves as a lubricant and corrosion inhibitor.**
- **To hydrostatically test the valve body after repair at rated working pressure, the valve *must be* in a partially open position. When testing the valve in the closed position (seat test) *do not* exceed the working pressure stamped on the valve identification plate.**
- **During storage always leave the valve in the *fully opened* position. This will tightly wedge the gate against the seats and *prevent* damage to the sealing area of both the gate and seats.**
- **Always remove the valve from service before work is performed on the stem bearings.**
- **When lubricating the body do not exceed the maximum API working pressure stamped on the identification plate.**
- **The valve should be *fully opened* or *fully closed* during lubrication of the body or seats. Do not allow the lubrication pressure to exceed the rated working The expanding gate design of our Model M valves provides a tight mechanical positive seal; however to properly effect this seal, the valve must be wedged fully opened or fully closed in order to wedge the gate segments against the seats. *Do not back off the hand wheel*.**
- **This method of operation will prevent damage to the sealing surfaces of the gate and seats, and will increase the life of the valve.**

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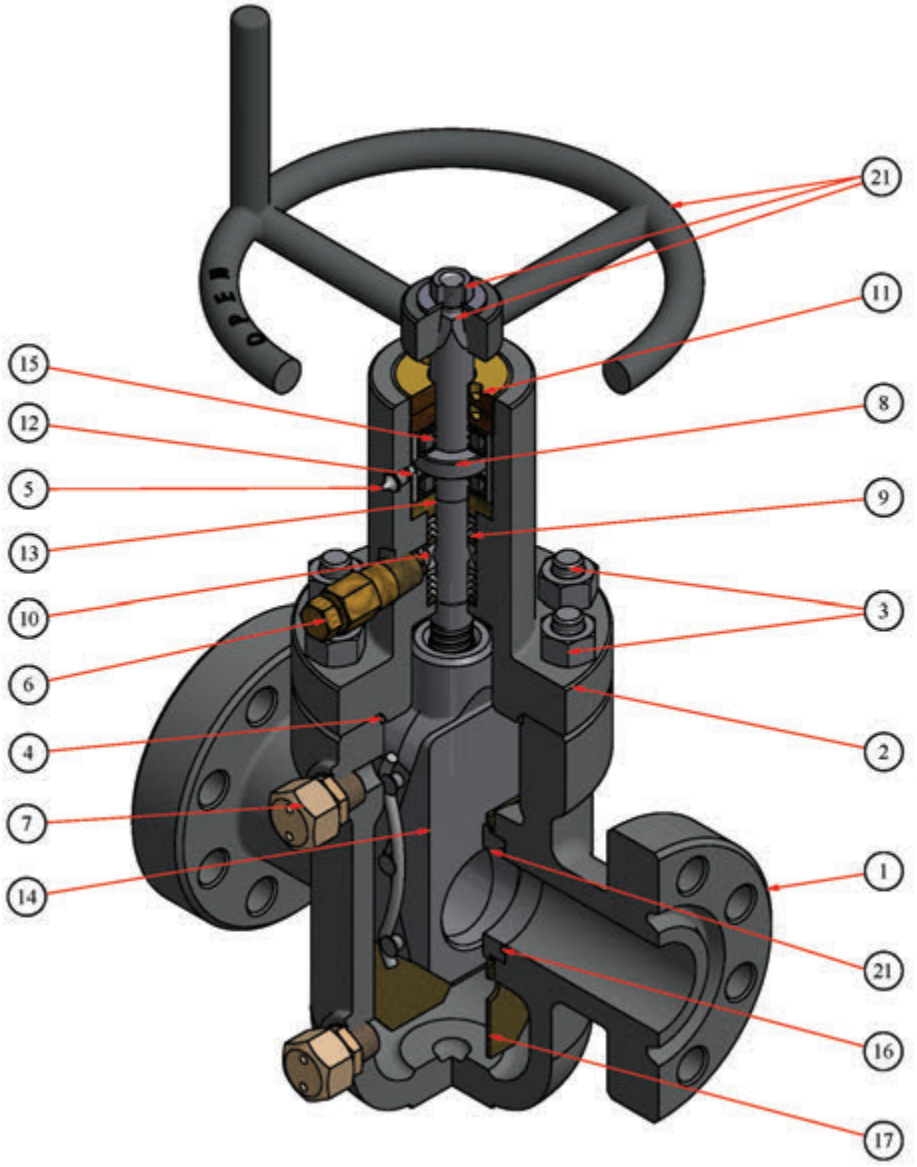

MODEL M - EXPANDING GATE
2-1/16” 5M
(HANDWHEEL OPERATED)

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MODEL M - BILL OF MATERIALS		
ITEM	DESCRIPTION	QTY
1	BODY, FLANGED	1
2	BONNET	1
3	STUD W/ NUT	8
4	BONNET SEAL RING	1
5	GREASE ALEMITE FITTING	1
6	PACKING INJECTION FITTING	1
7	BODY GREASE FITTING	2
8	STEM	1
9	PACKING SET CHEVRON V	1
10	PACKING INJECTION	1
11	BEARING RETAINER NUT/LOCKNUT	2
12	BEARING SPACER SLEEVE	1
13	PACKING RETAINER BUSHING	1
14	GATE & SEGMENT ASSEMBLY	1
15	THRUST BEARING	2
16	O-RING	2
17	GATE GUIDE	2
18	HANDWHEEL W/ NUT & WASHER	1
19	NAME PLATE	1
20	GREASE	FILL
21	SEAT	2

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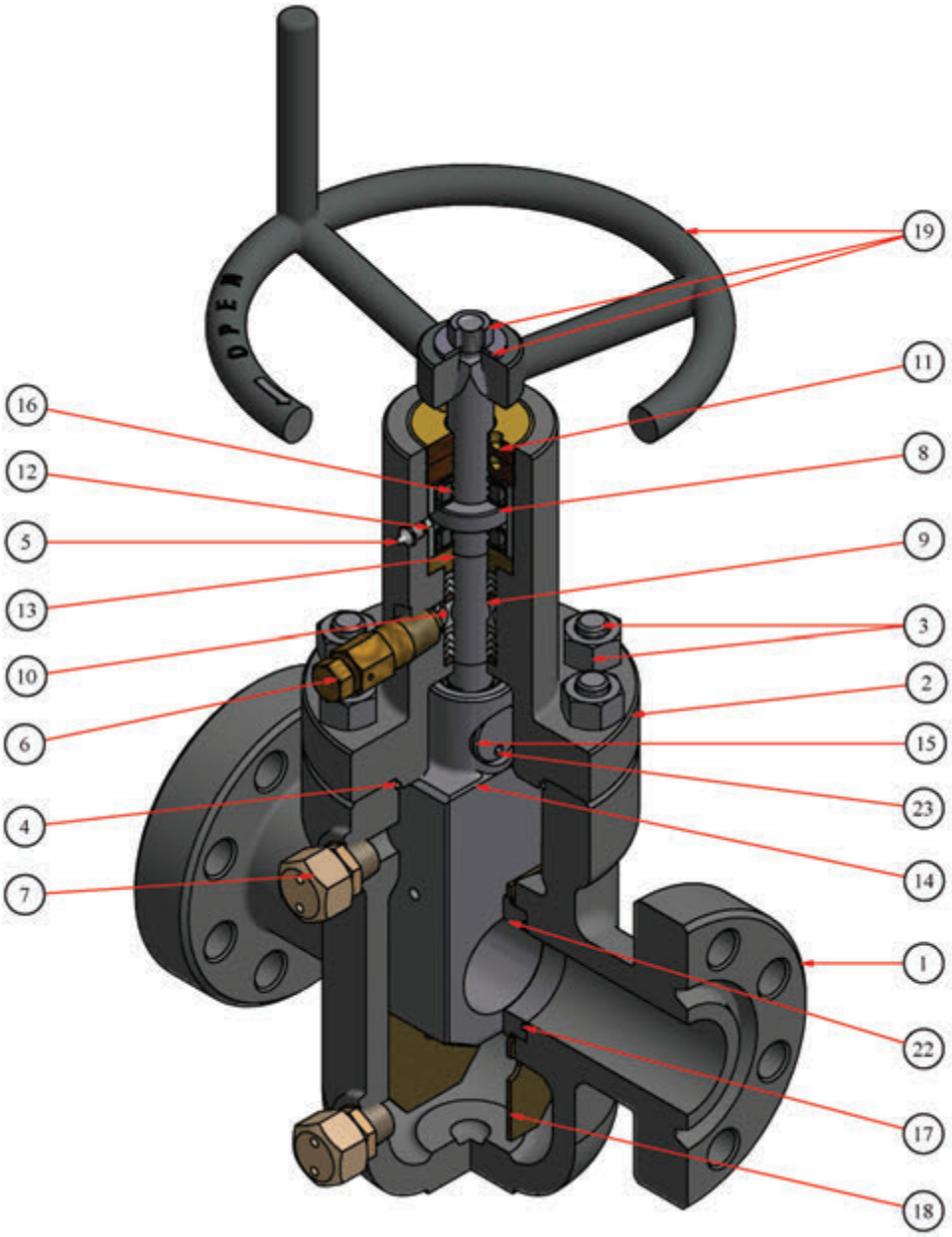

MODEL MSG - SLAB GATE
2-1/16” 5M
(HANDWHEEL OPERATED)

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MODEL MSG - BILL OF MATERIALS		
ITEM	DESCRIPTION	QTY
1	BODY, FLANGED	1
2	BONNET	1
3	STUD W/ NUT	8
4	BONNET SEAL RING	1
5	GREASE ALEMITE FITTING	1
6	PACKING INJECTION FITTING	1
7	BODY GREASE FITTING	2
8	STEM	1
9	PACKING SET CHEVRON V	1
10	PACKING INJECTION	1
11	BEARING RETAINER NUT/LOCKNUT	2
12	BEARING SPACER SLEEVE	1
13	PACKING RETAINER BUSHING	1
14	SLAB GATE D/O	1
15	LIFT NUT	1
16	THRUST BEARING	2
17	O-RING	2
18	GATE GUIDE	2
19	HANDWHEEL W/ NUT & WASHER	1
20	NAME PLATE	1
21	GREASE	FILL
22	SEATS	2
23	ROLL PIN	1

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PART NUMBER BREAKDOWN: 2 A B - 5 C X Y					
"A"	BODY TYPE	"B"	MAWP	"C"	BORE SIZE
3	FLANGED (CAST)	2	2,000 PSI	2	2-1/16"
6	FLANGED (FORGED)	3	3,000 PSI	9	2-9/16"
4	SCREWED, LP (CAST)	5	5,000 PSI	3	3-1/8"
7	SCREWED, LP (FORGED)			4	4-1/16"
5	SCREWED, EU (FORGED)			5	5-1/8"
8	SCREWED, EU (CAST)				

The last two digits in the part numbers vary with "X" Material Type and "Y" Coating. The table below gives the different available material types and coatings. Please refer to the valve tag to know the material type and coating on the valve parts.

"X"	MATERIAL TYPE	"Y"	COATING
1	4130	0	NONE; PHOSPHATE, MOLY, STANDARD PAINT/COATING, POWDER COAT
1A	4140		
1B	1040		
1C	1018		
1D	1020		
1E	SA285-C	1	NITRIDE QPQ-PHOSPHATE; EXCEPTION - FC BODY BUSHING - DO NOT NITRIDE
1F	1026		
2	410SS FORGED		
2A	S42400		
3	174SS		
3A	NITRONIC 50	2	HARDFACE-STELLITE #6 SPRAY & FUSE
4	316SS		
4A	316/304SS		
4B	304SS	3	HARDFACE - TUNGSTEN CARBIDE
5	BRONZE		
6	INCONEL 718		
6A	INCONEL 725	4	HARDFACE - COLMONOY #5
6B	INCONEL X750		
7	MONEL	5	ELECTROLIS NICKEL
8	A487-4D		
8A	A487-4C	6	WELD ON HARDFACE
8B	CA15		
8C	CF8M	7	ZINC PLATE
8D	CF3M	8	XYLAN COATING
8E	CA6NM	9	(4130) INCONEL 625 CLAD
9	STELLITE #6		
9A	PLASTIC	9A	(4130)SS-316-RING GROOVE
9B	STELLITE #3		

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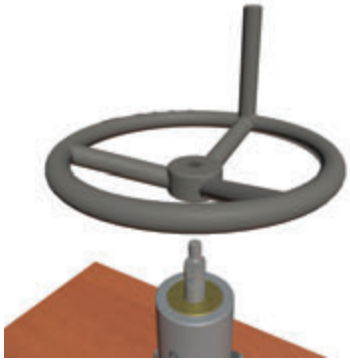
DISASSEMBLING THE BODY



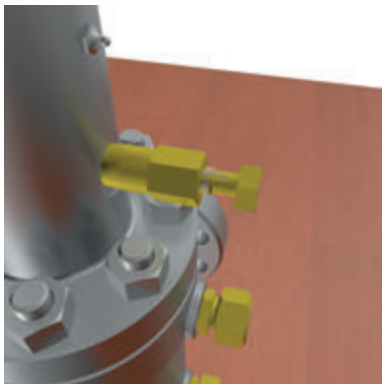
1. (Vertical Orientation) Operate the valve to check for trapped pressure.



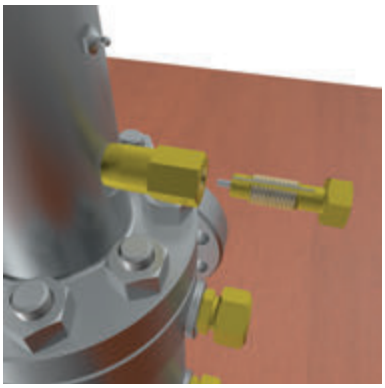
2. Unscrew and remove the Handwheel nut using a crescent wrench.



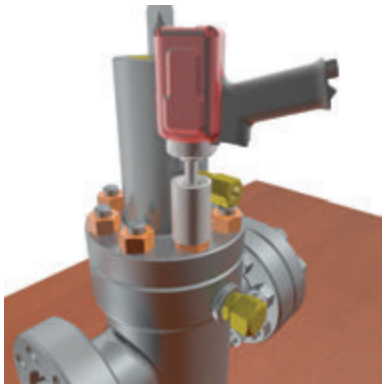
3. Remove the Handwheel.



4. Release the packing pressure from the injection fitting using pressure relief tool PN F2-021-10.



5. Remove the Packing Injection Fitting.



6. Unscrew and remove all Bonnet Bolts using an impact wrench.

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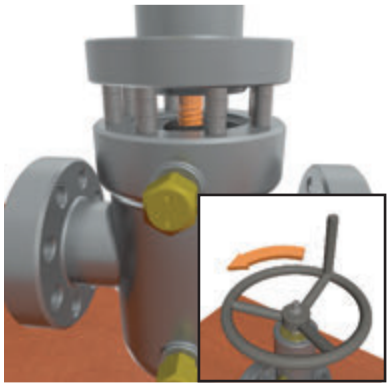
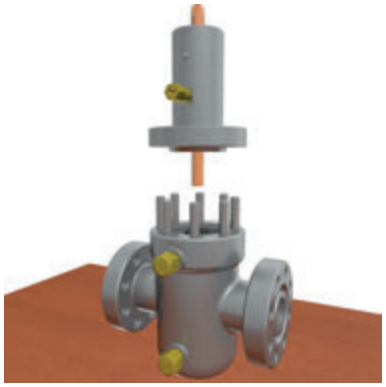
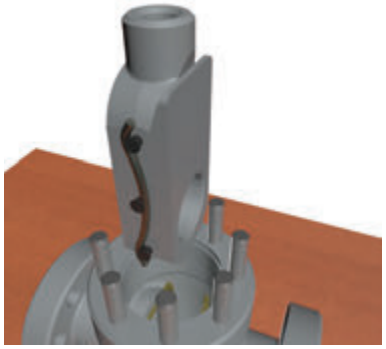


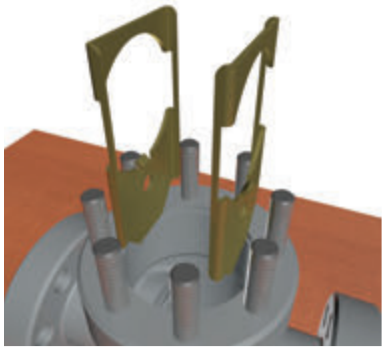
7. Replace the Handwheel and rotate it in the counter-clockwise direction. This will separate the Gate from the Stem.



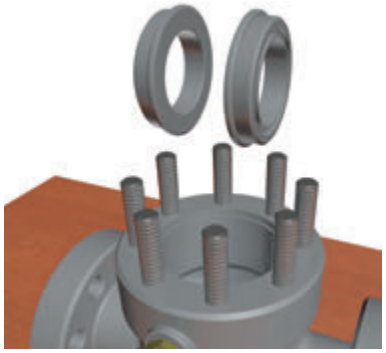
8. Remove the Bonnet Sub-Assembly



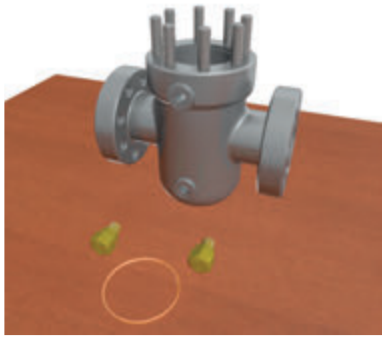
9. Remove the Gate.



10. Remove the Gate Guides.



11. Remove the Seats.



12. Remove the Bonnet Seal Ring and Grease Fittings.

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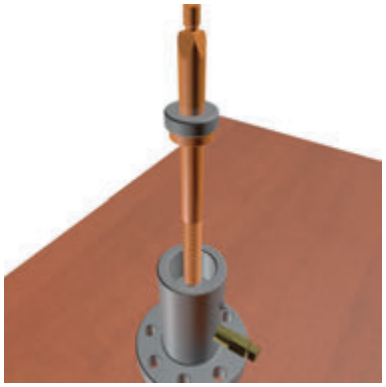
DISASSEMBLING THE BONNET SUB-ASSEMBLY



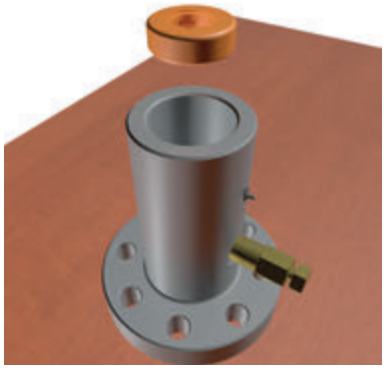
1. Unscrew and remove Bearing Retainer Locknut using an expanding wrench.



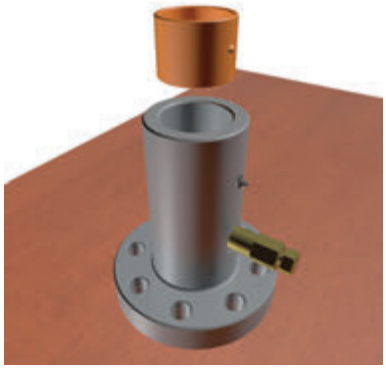
2. Unscrew and remove Bearing Retainer Nut using an expanding wrench.



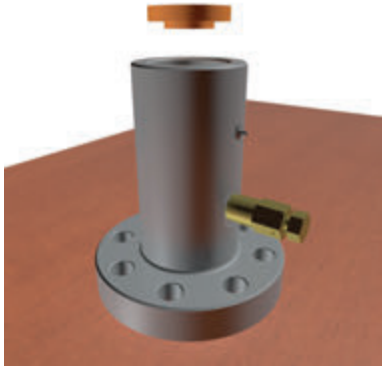
3. Remove the Stem. One of the Thrust Bearings will also be removed.



4. Remove the other Thrust Bearing.



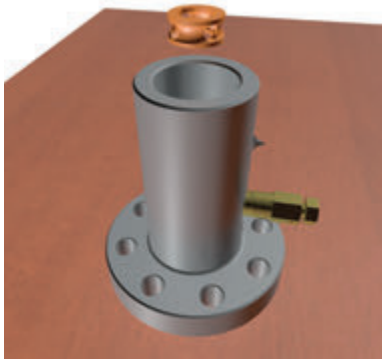
5. Remove the Bearing Spacer Sleeve.



6. Remove the Packing Retainer Busing.



7. Remove the Stem Packing with a bent screw driver. Avoid scratching the internal wall of the bonnet with the screw driver during removal.



8. Remove the Packing Injection Sleeve.



9. Remove the Stem Packing with a pick. Avoid scratching the internal wall of the Bonnet during removal of the packing.

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PERIODIC MAINTENANCE

The Model M & MSG gate valves are non-lubricated sealed valves, in that they do not require the injection of lubricants or sealants to effectively seal. However, to prevent corrosion, excessive wear and ensure continued operation, a routine maintenence program is recommended to extend the life and serviceability of the valve.

MAINTENANCE TOOLS

To perform normal maintenance and lubrication, the following tools are recommended:



Grease pump with adapter and coupling



Safety pressure releasing tool

STEM BEARING LUBRICATION

Valveworks USA API valves are equipped with alemite hydraulic type 1/8" NPT bonnet grease fittings. Stem bearing lubrication is accomplished through this fitting using a standard type grease gun. Any good grade No. 3 grease is recommended for this lubrication. Stem bearings normally do not require great amounts of grease.

CAUTION:

If bearings should need to be changed, the valve must be removed from service.



An example of using a grease gun to grease the stem bearings.
If too much lubrication should occur, excess grease will flow around the stem to the atmosphere.

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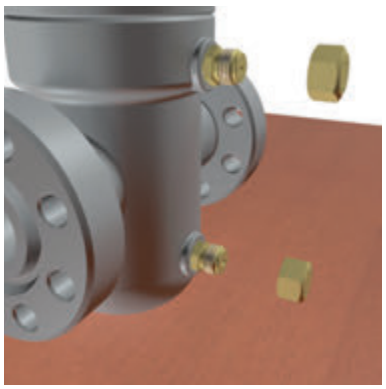
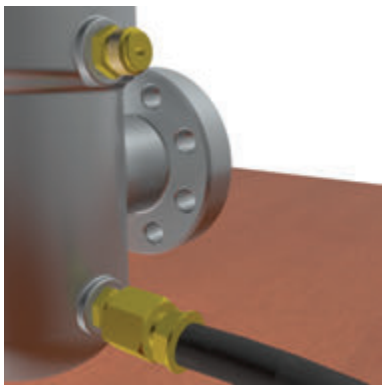
BODY LUBRICATION

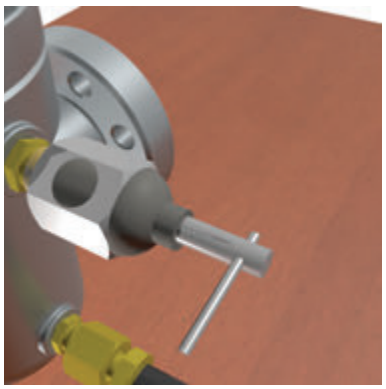
Valves may require body lubrication if they become hard to operate or when they are used in corrosive service conditions. For this purpose, each valve has two safety ball check fittings located at the bottom and top of the body of the valve. Valveworks USA recommends its OEM grease as standard, however; any good grade 3, 4, or 5 grease is recommended for body lubrication. Caution is to be taken so as not to use soluble grease near the product flowing through the valve. Approximately one pound of grease per inch of nominal valve bore size is sufficient to provide adequate lubrication. Place the valve in the fully opened or fully closed position before lubricating the valve.



1. Remove the safety caps from both safety ball check fittings.



2. Install the grease gun fitting (with gauge) on either of the grease fittings.



3. Install the pressure release tool on the other grease fitting.

The pressure release tool must be able to contain pressure by sealing off the grease fitting.

A 1/2” NPT 10,000 psi W.P. needle valve may be attached to the outlet of the pressure release tool as a safety measure, in case the ball check does not hold the pressure. Open 1/2” needle valve, rotate handle of pressure release tool clockwise until main stem makes contact with the ball check.

If the body pressure does not bleed down completely, the volume of the pressure released can be controlled with the pressure release tool. Continue injecting grease into the body through the other grease fitting. After lubrication, reinstall the two safety caps and operate the valve several times and return to desired position.

CAUTION:

During pressurized valve body lubrication, pressure applied to the valve body with the grease gun must not exceed the maximum working pressure of the valve being lubricated.

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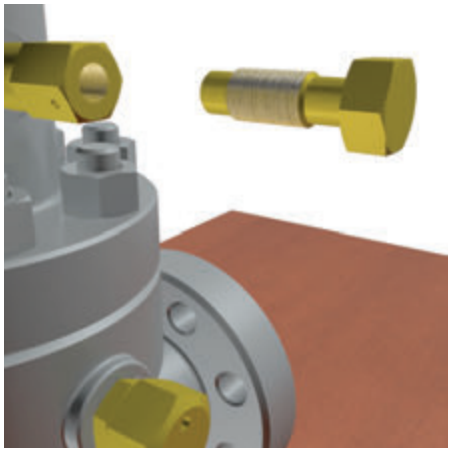
PLASTIC INJECTION PACKING

Plastic packing is added to the stuffing box through the plastic injection fitting on the valve bonnet to further energize the packing around the stem, shutting off package leakage. Injectable packing is an approved method for re-energizing stem packing on an as needed basis per the valve operating procedures. Additional injectable packing can be needed over time as the seals are operated and settling occurs. There are different types of plastic packing depending on service and temperature. Packing is available in 3/8" X 1" (9.5 mm X 25.4 mm) sticks to be injected through the packing fitting on the valve bonnet.

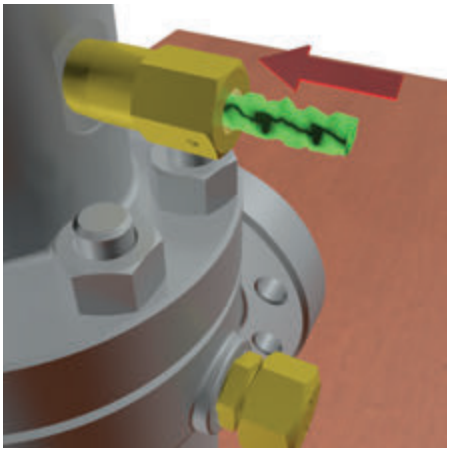
Packing fittings used on Model M & MSG valves are 1/2" (12.7 mm) 14 NPT standard thread connection. This fitting is equipped with a safety ball check which allows the insertion of plastic packing without special adapters or tools. Stick packing can be added through the packing fitting with the valve under pressure. The valve may be installed in any position.

INSTALLING INJECTION PACKING



1. Run the 3/4" hex head screw all the way into the fitting and then back out slowly; observe the bleeder hole in the packing fitting.

Note: If no pressure or plastic packing is observed flowing out through this hole, this would indicate that the ball check has seated.



2. Apply one stick at a time until the leak has stopped.

Note: Apply only as much packing as needed to stop the leak. Excessive packing pressure will cause the stem to bind and will make operation of the valve difficult.

Most products contain a certain amount of water, lime scale, sediment and other foreign matter which tend to accumulate in the valve body. A regular draining program will increase the life of a valve against damage caused by:

1) Water freezing in the body cavity, causing damage to the body.
2) An accumulation of foreign matter in the lower part of the body that could prevent the valve from fully closing; resulting in a throttling action that may cause inefficient sealing.
3) Foreign matter trapped in the body may become lodged between the sealing surfaces of the gate and seats, resulting in scored or damaged sealed.
4) Venting a Model M & MSG valve is a positive method of checking the sealing ability of the gate and seats. If the body vents down to zero pressure with the valve in fully closed position, this is a definite indication that sealing surfaces are in good condition.

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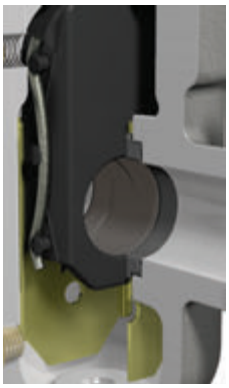
PROCEDURE TO VENT OR DRAIN

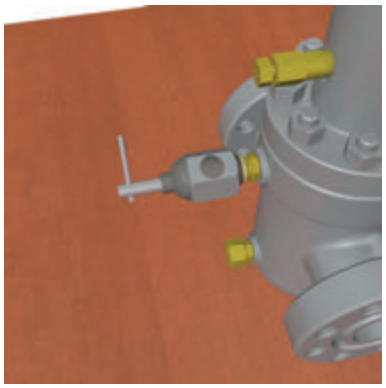




5. The gate must be fully open (left) or fully closed (right).



2. Remove the safety cap from either body grease fitting



3. Attach the pressure release tool.

CAUTION:

Remove the safety cap slowly to allow the ball check to sufficiently seal and avoid uncontrolled venting. Should the ball check fail to seal properly, pressure will continue to blow through the safety cap orifices. You should then retighten the safety cap screw and vent through the other body grease fitting. Once the body pressure is bled to zero you should then attempt to repair the leaking ball check.



4. Screw the stem of the releasing tool into the fitting forcing the ball check off its seat. The valve will vent and drain once the ball check is unseated.

A program of regular draining and body venting is the most positive way to prevent problems caused by foreign matter in the valve. However, if a regular draining program cannot be followed, it is recommended that valves be drained after the following operations:

- **After a well has come in and has been cleaned.**
- **After a mudding operation.**
- **After a cementing operation.**
- **Anytime the valve seems hard to operate by hand and will not fully open or close by the required number of hand wheel turns.**
- **When the valve is hard to operate from the fully open or fully closed position because it is "pressure locked" or "Iced-up".**

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"PRESSURE LOCKED" is a condition that may exist with any dual seat expanding type gate valve when body pressure greatly exceeds line pressure. It occurs in fully closed position or if the valve is not wedged fully open or fully closedand is a positive indication that sealing surfaces are in good condition.

"ICED-UP" is a condition caused by a restriction in the flow or a differential in the pressure of gas flow at high pressure, which produces extremely low temperatures.

This happens by leakage of a closed valve or leakage through the stem packing. Valves in service on gas containing hydrates or in fresh water service, which are exposed to low external temperatures can also get "iced-up". In this case it is advisable to inject alcohol or glycol into the valve body through the grease fitting to combat these conditions.

The same procedures are used for injecting alcohol or glycol as are used for valve body lubrication. Do not operate the valve immediately after injecting as these fluids should be retained in the body to perform the Antifreeze effect.

TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
Leakage when closed	Seats	Disconnect from service and check for the condition of the seats.
Leakage when open through body/bonnet connection	Bonnet Seal Ring	Disconnect from service and replace the bonnet seal ring.
Leakage when partially open thru top of bonnet	Packing	Disconnect from service and replace the packing.
Leakage at flange	Flange Seal Ring	Disconnect from service and replace the flange seal ring.

MAINTENANCE INTERVALS

PROCEDURE	RECOMMENDED INTERVAL
Vent or Drain	See Page 16
Cycle Open to Close	Semi-Annually
Disconnect and Test	Annually

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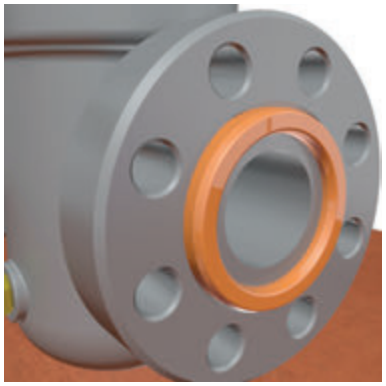
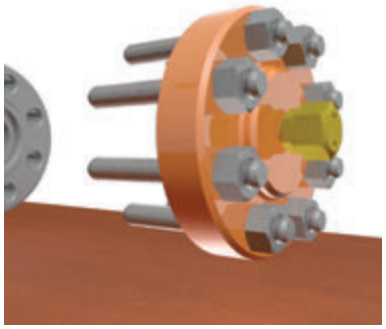
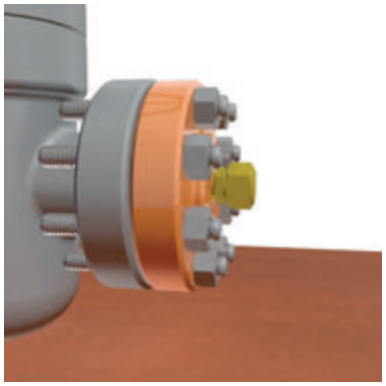
TEST PROCEDURE



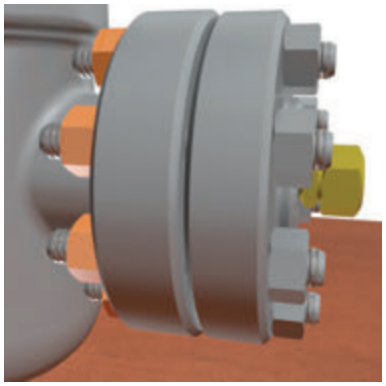
1. Inspect the ring joint for damage before use. Lightly oil the ring groove. Too much grease will cause a false seal.



2. Make sure the test fitting is tight. All studs are the correct size and length for the flange size and pressure being tested. This information can be found on a Valveworks USA API flange slide rule.



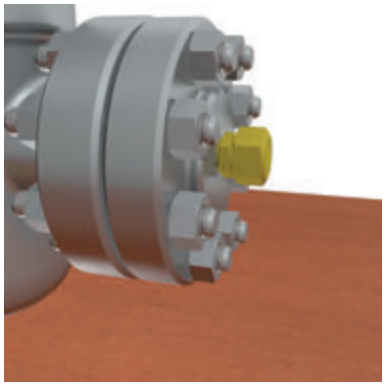
3. Align the test flange studs with the body flange holes. Then, push the test flanges, its studs, and their hex nuts onto the body flange.



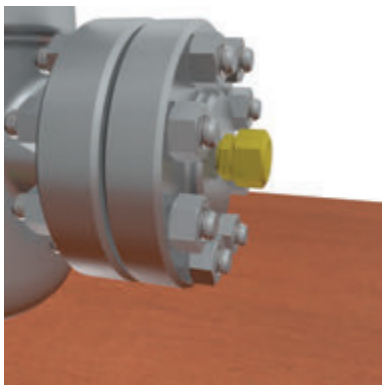
4. Screw a hex nut on the vacant side of each stud until all of the studs have a nut connecting the test flange to the body flange.



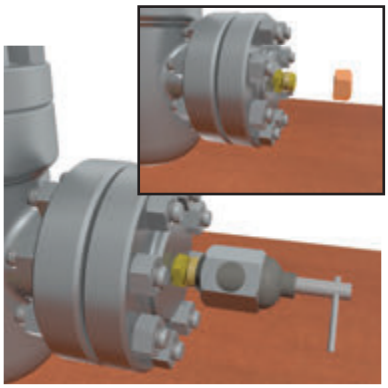
5. Tighten the hex nuts on the test flange side with an impact wrench until they are tight.



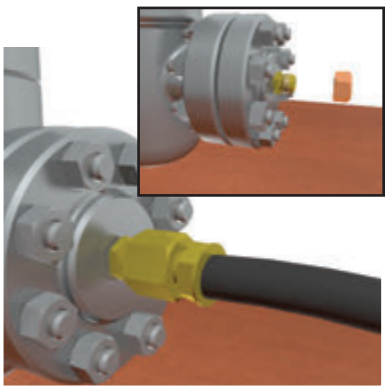
6. Make sure the flange gap is even all the way around



7. Repeat steps 1-5 for the opposite flange.



8. Remove the grease fitting cap from one test flange and attach a pressure release tool.



9. Remove the grease fitting cap from the opposite test flange and attach the flow line.

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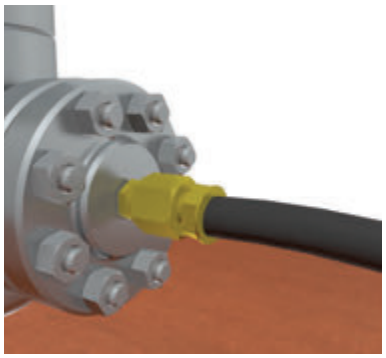
HYDROSTATIC BODY TEST



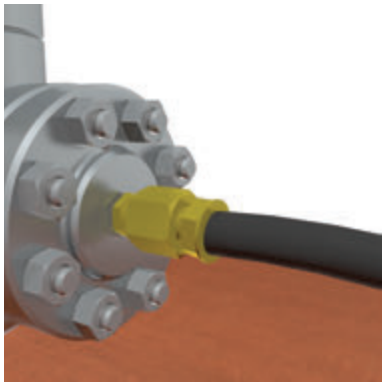
1. With the pressure release tool and flow line connection tight, open the valve partially. Apply the test pressure for at least (3) minutes.



2. Bleed off the pressure until it's reduced to zero, and close the pressure release valve on the test pump.



3. Raise the pressure back up to the test pressure for the secondary pressure-holding period of at least (3) minutes.



4. Bleed off the pressure until it's reduced to zero, and close the pressure release valve on the test pump.

The hydrostatic body test pressure shall be determined by the rated working pressure of the equipment. Hydrostatic test pressures shall be as given as tabulated below.

HYDROSTATIC BODY TEST PRESSURE, PSI (MPa)

WORKING PRESSURE RATING-PSI (MPa)		END AND OUTLET CONNECTIONS-PSI (MPa)		LINE PIPE AND TUBING THREADS-PSI (MPa)	
2,000	(13,8)	4,000	(27,6)	4,000	(27,6)
3,000	(20,7)	6,000	(41,4)	6,000	(41,4)
5,000	(34,5)	7,500	(51,7)	7,500	(51,7)
10,000	(69,0)	15,000	(103,4)	15,000	(103,4)
15,000	(103,4)	22,500	(155,2)	-	-
20,000	(138,0)	30,000`	(207,0)	-	-

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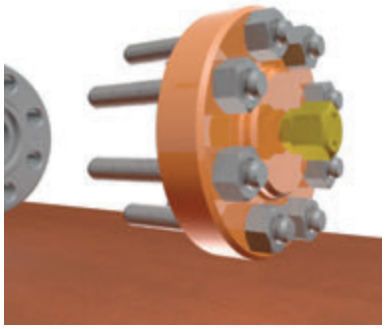
HYDROSTATIC SEAT TEST

- With the valve closed, apply the rated working pressure.
- Hold and monitor at that pressure for at least (3) minutes.
- Open the valve, and bleed off the pressure until it's reduced to zero. Then, close the valve and the pressure release tool.
- Repeat the steps above.
- For bi-directional valves, repeat the above process on the other side.
- For unidirectional valves, move on to the next step.

The valve is acceptable if no leakage is visible during the holding period.



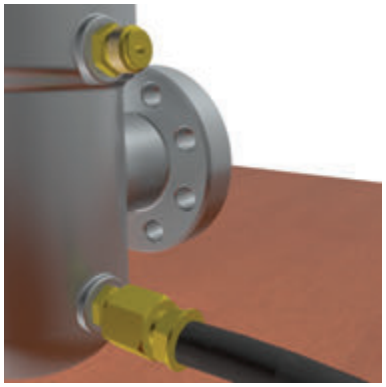
1. While holding the hex nuts on the body flange, loosen each of the test flange hex nuts.



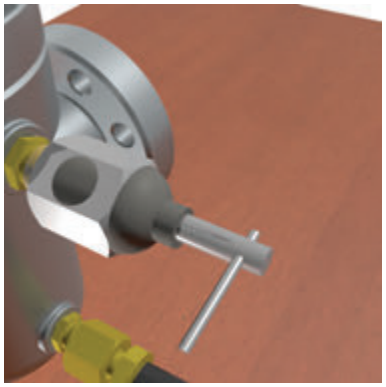
2. After removing the body flange hex nuts, you can remove the test flange, its studs, and their hex nuts.



3. Pass a drift mandrel through the valve bore after the valve has been assembled, operated, and pressure tested.



4. Remove the lower bonnet grease fitting cap, and attach a flow line from the grease pump to the grease fitting as shown above.



5. Remove the upper bonnet grease fitting cap, and attach a pressure release tool as shown above.

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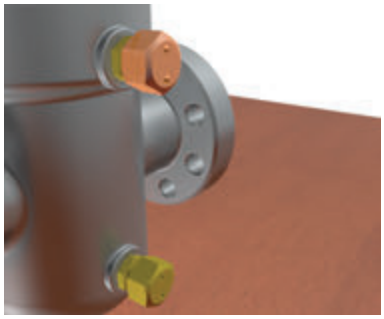
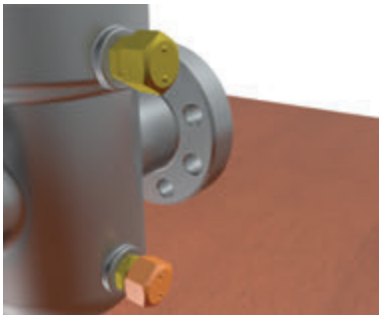
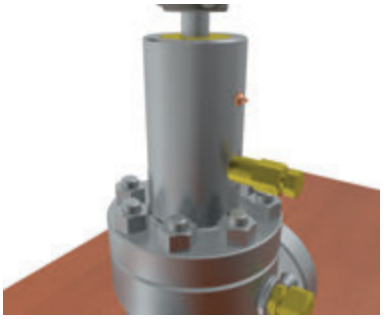
VISUAL INSPECTION



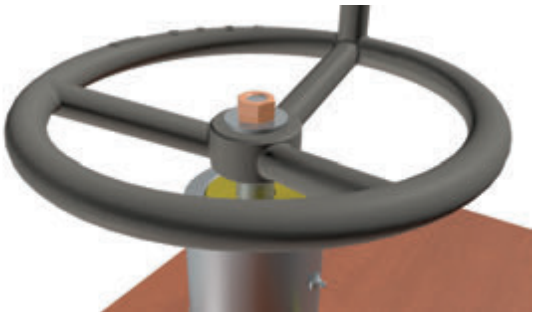
1. Be sure the upper grease fitting cap is on and tight.



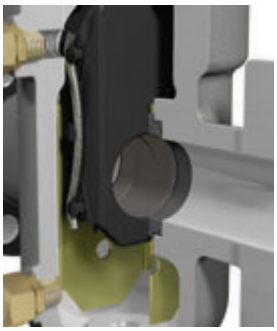
2. Be sure the lower grease fitting cap is on and tight.

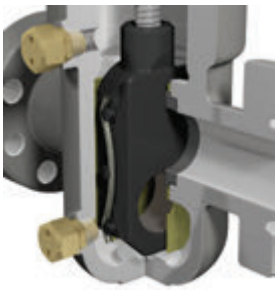


3. Be sure the Alemite fitting is on and tight.



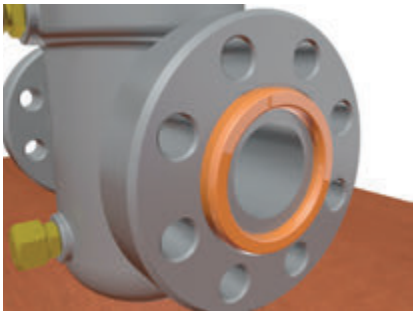
4. Be sure the Handwheel Nut is tight.



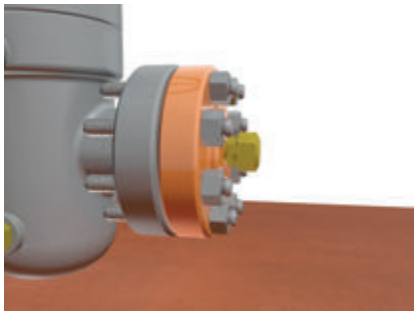


5. The gate must be fully open (left) or fully closed (right).

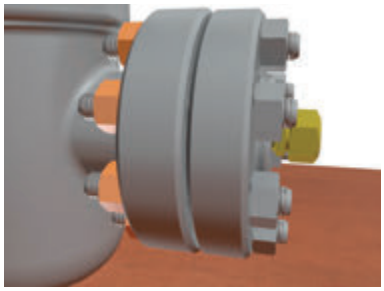
FIELD HOOK-UP INSTRUCTIONS



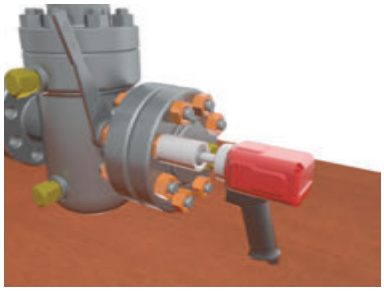
1. Lightly grease ring groove and insert a ring joint.



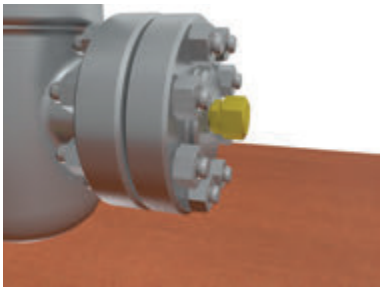
2. Align the service flange holes with the body flange holes. Push a stud thru each aligned hole until there is a stud thru each hole.



3. Screw a hex nut on both sides of each stud by hand.



4. Torque the service flange hex nuts with a certified torque gun until they are tight.



5. A finished flange should appear as shown.

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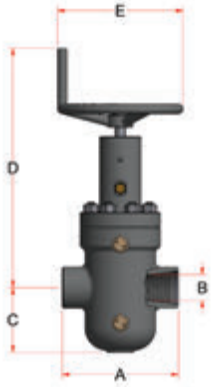
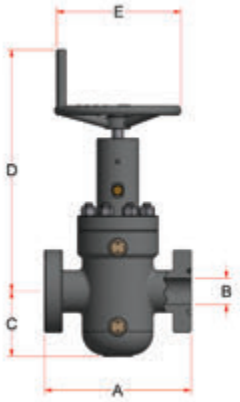
DIMENSION TABLE KEY

A	FLANGE TO FLANGE
B	VALVE BORE SIZE
C	BORE CENTERLINE TO BOTTOM
D	BORE CENTERLINE TO TOP
E	HANDWHEEL DIAMETER
NT	NUMBER OF TURNS
WT	APPROXIMATE WEIGHT



THREADED



FLANGED

THREADED GATE VALVES

SIZE	WP (PSI)	A	B	C	D	E	NT	WT
	2K	9 1/4	2 1/16	5 1/4	19 1/2	10	14	90
2 1/16	3K	9 5/8	2 1/16	5 1/2	19 5/8	13	14	125
	5K	9 5/8	2 1/16	5 1/2	19 5/8	13	14	125
	2K	10 1/4	2 9/16	6 9/16	20 1/2	13	16 1/2	100
2 9/16	3K	10 1/4	2 9/16	6 9/16	20 13/16	16	16 1/2	160
	5K	10 1/4	2 9/16	6 9/16	20 13/16	16	16 1/2	160
	2K	11 7/16	3 1/8	7 5/8	22 7/8	13	20 3/4	190
3 1/8	3K	11 3/8	3 1/8	7 5/8	23	16	20 3/4	230
	5K	11 3/8	3 1/8	7 5/8	23	16	20 3/4	230
	2K	13 3/8	4 1/16	9 5/8	26 1/2	16	24 3/4	315
4 1/16	3K	13	4 1/16	9 5/8	26 5/8	20	24 3/4	420
	5K	13	4 1/16	9 5/8	26 5/8	20	24 3/4	420

FLANGED GATE VALVES

SIZE	WP (PSI)	A	B	C	D	E	NT	WT
	2K	11 5/8	2 1/16	5 1/4	19 1/2	10	14	120
2 1/16	3K	14 5/8	2 1/16	5 1/2	19 5/8	13	14	180
	5K	14 5/8	2 1/16	5 1/2	19 5/8	13	14	180
	2K	13 1/8	2 9/16	6 9/16	20 1/2	13	16 1/2	180
2 9/16	3K	16 11/16	2 9/16	6 9/16	20 13/16	16	16 1/2	220
	5K	16 11/16	2 9/16	6 9/16	20 13/16	16	16 1/2	220
	2K	14 1/8	3 1/8	7 5/8	22 7/8	13	20 3/4	220
3 1/8	3K	17 1/8	3 1/8	7 5/8	23	16	20 3/4	300
	5K	18 5/8	3 1/8	7 5/8	23	16	20 3/4	340
	2K	17 1/8	4 1/16	9 5/8	26 1/2	16	24 3/4	360
4 1/16	3K	20 1/8	4 1/16	9 5/8	26 5/8	20	24 3/4	520
	5K	21 5/8	4 1/16	9 5/8	26 5/8	20	24 3/4	560
	2K	22 1/8	5 1/8	11 3/4	28	20	30 1/4	965
5 1/8	3K	24 1/8	5 1/8	11 3/4	28	24	30 1/4	990
	5K	28 5/8	5 1/8	11 3/4	28	24	30 1/4	1056

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Limited Product Warranty

The following limited warranty ("Limited Warranty") is exclusive and shall supersede all other warranties, whether express, implied or statutory, including, but not by way of limitation, any warranty of merchantability of fitness for any particular purpose. All other warranties or liabilities, expressed or implied, oral or statutory, including any warranty of merchantability or fitness for a particular purpose are hereby terminated and waived upon Purchaser purchasing any Products (as that term is defined herein) manufactured by **VALVEWORKS USA**.

VALVEWORKS USA hereby warrants to each original purchaser ("Purchaser") of material(s) or product(s) (hereinafter collectively referred to as "Products" or "Product(s)") manufactured by **VALVEWORKS USA** that such products are free from material and workmanship defects when operated under Normal Use (as defined herein) and Normal Service (as defined herein) for a period of one (1) year from the date of shipment ("Warranty Period"). This warranty is valid only for the original purchaser of the material(s) or product(s), and is non-transferrable. "Normal Use" shall mean the intended use of the product for which it was designed by **VALVEWORKS USA**. "Normal Service" shall mean the necessary servicing as suggested or required by **VALVEWORKS USA**, industry standards, or applicable laws and regulations.

THIS WARRANTY WILL BE NULL AND VOID FOR THE FOLLOWING PRODUCTS:

- Other than testing during testing processes by **VALVEWORKS USA** in accordance with industry rules and regulations, any Product(s) that has been tested to, or subjected to, any pressure greater than the stated product working pressure* at any time, other than by **VALVEWORKS USA** during testing processes per industry rules and regulations. **PRODUCTS SHOULD NEVER BE TESTED / SUBJECTED TO PRESSURE GREATER THAN THE STATED PRODUCT WORKING PRESSURE*. THIS IMMEDIATELY VOIDS THIS LIMITED WARRANTY, AND IS AN EXTREMELY DANGEROUS SAFETY RISK.**
- Any product repaired, altered, or modified by any contractor, laborer, person or entity that has not been authorized in writing by **VALVEWORKS USA**.
- Any product, in **VALVEWORKS USA's** reasonable judgment, that has been subject to negligence, accident, improper storage, or improper handling by any person(s).
- Any product which has not been operated or maintained in accordance with normal practices and in conformity with the manufacturer's recommendations, industry standards, and operation and maintenance specifications of **VALVEWORKS USA**.

***Stated Product Working Pressure** is defined as "the maximum internal pressure that the equipment is designed to contain and / or control"

Under any circumstances where this Limited Warranty is voided on any Product(s) manufactured and supplied by VALVEWORKS USA, VALVEWORKS USA is immediately excluded from any and all liabilities associated with such Product(s).

For gate valves used in extreme service conditions such as "frac" applications, **VALVEWORKS USA** recommends full lubrication of the gate valve body cavity and bonnet assemblies between each frac stage (or zone). Failure to comply with this recommendation COULD result in warranty claims being denied. Custom orders, or orders where modifications are made to **VALVEWORKS USA** products by **VALVEWORKS USA** per the purchaser's request to the purchaser's design criteria, and do not conform to **VALVEWORKS USA** design criteria, are subject to review at the time of contract review to determine whether warranty coverage applies to that particular order. Unless specified otherwise in writing at the time of order placement, warranty coverage will NOT apply to the aforementioned type(s) of order(s).

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VALVEWORKS USA
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VALVEWORKS USA obligations under this Limited Warranty consist of, and shall be expressly limited to, reasonable efforts to repair, replace or, at **VALVEWORKS USA'S** sole option, refund the purchase price. The cost of labor for installing a Product that has been repaired or replaced shall be borne by Purchaser. Replacement parts provided under the terms of this Limited Warranty are covered by this Limited Warranty for the remainder of the Warranty Period, and no obligations fulfilled under the terms and conditions of this Limited Warranty shall ever extend the Warranty Period. Limited Warranty services provided hereunder shall not give rise to any kind of liability that may be caused by the delays in **VALVEWORKS USA** performing its obligations under this Limited Warranty.

The remedy for claims against **VALVEWORKS USA** for any breach of this Limited Warranty shall be limited to the replacement of any product that was proven defective in material or workmanship. Such remedy shall only be available upon written notice to **VALVEWORKS USA** of such defect within thirty (30) days of delivery of the Product(s), and the return of such Product(s) to **VALVEWORKS USA** at the address provided herein for written notice. Costs of labor, freight, drayage, or other similar charges shall be at the expense of the customer.

Please contact **VALVEWORKS USA** at 1-318-425-0266 prior to returning any Product(s) covered by this Limited Warranty. Upon determination that a Limited Warranty claim is valid, **VALVEWORKS USA** shall issue a return authorization number. **HOWEVER, THE DELIVERY OF AN ALLEGEDLY DEFECTIVE PRODUCT NOT BEARING A VALID RETURN AUTHORIZATION NUMBER WILL BE REFUSED, AND THE SHIPMENT WILL BE RETURNED TO THE SENDER AT THE SENDER'S EXPENSE.** Except as specifically provided herein, any Purchaser hereby waives the right to seek claims, damages or other legal or equitable remedies against or from **VALVEWORKS USA**, its principals, subcontractors, agents, vendors, suppliers and/or design professionals under any and all causes of action whether statutory, at common law or at equity, including but not limited to any claims based on implied warranties of fitness, redhibition, reduction of the purchase price, negligence and/or strict liability. The agreements and remedies contained in this Limited Warranty are the sole remedies available to any Purchaser as to the issues raised herein, shall be enforceable to the fullest extent permissible by applicable state and federal law, and shall apply to any claim thereafter made against VALVEWORKS USA or any other person related to any **VALVEWORKS USA** Products. Purchaser's sole remedy is as prescribed in the terms and conditions of this Limited Warranty document. In no event shall **VALVEWORKS USA**, its agent(s), or employees be liable for any injuries or damages to any person or property whatsoever, or for any special, indirect, secondary, or consequential damage of any nature however arising. By Purchaser purchasing any Products from **VALVEWORKS USA**, Purchaser agrees (without any further action required by **VALVEWORKS USA** or Purchaser) to all remedies, waivers and limitations of warranty set forth herein.

Written Notice: Any written notice shall be sent to 1650 Swan Lake Road, Bossier City, Louisiana 71111.

The obligations of **VALVEWORKS USA** under this Limited Warranty are limited by the terms and conditions provided herein.

This warranty is limited in extent to the warranty, if any, which the user receives from the manufacturer(s) of any component part(s) or buyout items for resell. All other warranties or liabilities, expressed or implied, oral or statutory, including any warranty of merchantability or fitness for a particular purpose are expressly denied. In no event shall VALVEWORKS USA, its agent(s), or employees be liable for injury or damage to any person or property whatsoever or for any special, indirect, secondary, or consequential damage of any nature however arising.

ORDERS POLICY

All orders for Product(s) are subject to acceptance by **VALVEWORKS USA**, and such acceptance shall not be unreasonably withheld. Prices are subject to change without notice and any errors in published or quoted prices are subject to correction. No Product(s) may be returned for credit without written authorization from **VALVEWORKS USA**. Credit will not be issued for Product(s) after the Warranty Period. **VALVEWORKS USA** reserves the right to deduct reconditioning and handling charges when issuing credit for returned material(s) or product(s). Products of special design, not considered "standard" to the **VALVEWORKS USA** product line, will not be permitted to be returned.

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