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INSTRUCTION MANUAL FOR VOGT VALVES

Edward Vogt
Valve Company
BTR FLOW CONTROL SYSTEMS

Edward Vogt Valve Company

INSTRUCTION MANUAL

GENERAL: THIS MANUAL IS APPLICABLE TO THE VALVES ILLUSTRATED IN VOGT'S CATALOG VV200. THE COVERAGE IS MORE CONCENTRATED ON OUR COMPACT GATE, GLOBE, CHECK AND ANGLE VALVES. DETAILED INSTRUCTIONS ON VALVES NOT COVERED BY THIS MANUAL MAY BE OBTAINED BY CONTACTING EDWARD VOGT SALES OR ENGINEERING STAFF.

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Recommended Spare Parts for Vogt Valves

A high degree of standardization of Vogt valves permits a small stock of replacement packing and gaskets to service your Vogt valves. The following matrix and part number tables provide the details for the purchasing of replacement gaskets for your Vogt bolted bonnet valves and packing for our popular class 150, 300, 600, 800 and 1500 gate, globe and angle valves.*

PACKING MATRIX

PRESSURE CLASS / **NPS** DN	**1/2** 15	**3/4** 20	**1** 25	**1-1/4** 32	**1-1/2** 40	**2** 50	**2-1/2** 65	**3** 80	**4** 100
150 Conventional Port	B	B	C	D	D	E	F	F	G
300 Conventional Port	B	B	C	D	D	E	F	F	G
600 Conventional Port	B	B	C	D	D	E	F	F	G
800 Conventional Port	B*	B	C	D	D	E	F	F	—
1500 Conventional Port	J	J	D	E	E	F	—	—	—
600 & 800 Full Port	B	C	D	—	E	F	—	—	—
1500 Full Port	B	D	E	E	F	—	—	—	—

*Also 1/4 & 3/8 sizes.

PACKING SET PART NUMBERS

MATRIX	**FLEXIBLE GRAPHITE**				**TEFLON**	
	PACKING SET	**PN****	**PACKING CARTRIDGE**	**PN*****	**PACKING SET**	**PN****
B	36323R	DC00065	36323M5	DC00065	36451T4	DC00065
C	36323R	DU00065	36323M6	DU00065	36451T6	DU00065
D	36323R	EG00065	36323M6	EG00065	36451T6	EG00065
E	36323R	EU00065	363323M6	EU00065	36451T6	EU00065
F	36323R	FI00065	—	—	36451T6	FI00065
G	36323R	FU00065	—	—	36451T5	FU00065
J	36323R	DT00065	36323M9/2	DT00065	36451T9	DT00065

* API 602/ASME B16.34 type valves—see valve description. For other valves consult your Edward Vogt sales or engineering staff.

**Order packing by Packing Set PN, including the suffix. Individual rings of complete set will be supplied.

***1 piece or 2 piece patented Packing Cartridge will be supplied when this PN is used.

Recommended Spare Parts for Vogt Valves

GASKET MATRIX (SPIRAL WOUND TYPE)

PRESSURE CLASS	NPS / DN	1/2 / 15	3/4 / 20	1 / 25	1-1/4 / 32	1-1/2 / 40	2 / 50	2-1/2 / 65	3 / 80	4 / 100
150 Conventional Port		A	A	B	C	C	D	E	E	F
300 Conventional Port		A	A	B	C	C	D	E	E	F
600 Conventional Port		A	A	B	C	C	D	E	E	F
800 Conventional Port		A*	A	B	C	C	D	E	E	—
1500 Conventional Port		A	A	B	C	C	D	—	—	—
600 & 800 Full Port		A	B	G	—	D	E	—	—	—
1500 Full Port		A	B	C	C	D	—	—	—	—

*Also 1/4 & 3/8 sizes.

GASKET PART NUMBERS

GASKET MATRIX	PART NUMBER** (INCLUDING SUFFIX)	SPIRAL WOUND GASKET DESCRIPTION*
A	31102S2 G18029 31102S2 G33029 31102S2 G51029 31102S2 T33029 31102S2 T51029	304/Graphite Filled 316/Graphite Filled Monel/Graphite Filled 316/Teflon Filled Monel/Teflon Filled
B	31103S3 (Same as above)	(Same as above)
C	31107S7 (Same as above)	(Same as above)
D	31105S5 (Same as above)	(Same as above)
E	31114S8 (Same as above)	(Same as above)
F	31119S (Same as above)	(Same as above)
G	31104S4 (Same as above)	(Same as above)

**Order gaskets by PN including the suffix.

*USAGE TABLE	
Gasket	**Where Used**
304/Graphite	A105, A182-F5 F9, F11 Cl.2 F22 Cl.3 Valves
316/Graphite	A182, F316 Valves
Monel/Graphite	MM & HF Acid Trimmed Valves
316/Teflon	"T" Suffix Trimmed Valves
Monel/Teflon	Chlorine Valves

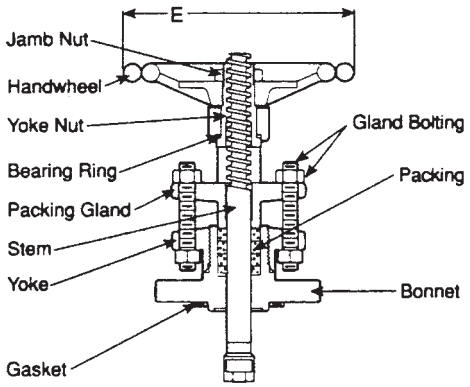
Bonnet Replacement Assemblies

SERIES 21000-VOGT VALVE REPLACEMENT BONNET SUBASSEMBLIES

Some Valve end users find it more expedient to replace the bonnet subassembly, complete with new packing, when repacking small bore valves. To support this maintenance philosophy, Vogt valve users may purchase A105 bonnet subassemblies for replacement on their Vogt Valves by specifying the Series Number noted below. The removed bonnet assemblies, if not damaged and are serviceable, can be repacked in a valve repair shop environment and be used during a later valve repacking cycle.

- Repacking made easy
- Promotes quick change
- Completely packed and ready to install
- Supports valve repacking in valve shop environment
- High degree of standardization permits retrofitting of popular Vogt Class 150, 300, 600, and 800, 13 Cr. trimmed, bolted bonnet valves.

The Replacement Bonnet Assembly Package can be easily installed on most existing in-line Compact Design Gate Valves in Classes 150, 300, 600, and 800, of A105 bolted bonnet design with 13 Cr. trim. Specify the desired replacement Bonnet Assembly Package for the valve size and series you intend to repack by replacing the bonnet subassembly.



Series 21000
A105/13 CR Trim
(Gasket Included)

Order by this number:

Valve Size	For Valve Series No.	Retrofit Bonnet Assembly Package Series No.	E
1/2, 3/4	353, 363, 373,12111, SW12111,12161, SW12161	21000 04	4.00
1	353, 363, 373,12111, SW12111,12161, SW12161	21000 06	4.75
1-1/4, 1-1/2	353, 363, 373,12111, SW12111,12161, SW12161	21000 08	5.75
2	353, 363, 373,12111, SW12111, 12161, SW12161	21000 09	7.00

Write for Vogt's installation procedure covering instructions for proper field replacement of the series 21000 replacement bonnet subassemblies.

Storage

VOGT STORAGE/ SHORT TERM RECOMMENDATION

Following acceptance testing and inspection, Vogt products are moved to storage. During movement to storage, Vogt products are protected from rain and snow. Vogt products are stored in a building that is provided with uniform heating and cooling control. Outdoor storage is not permitted for Vogt products.

Products shall be protected during storage from exposure to outside environment, airborne contaminants, acceleration forces, and physical damage.

Products shall be stored within a fire resistant, weathertight, and well-ventilated building or equivalent enclosure. This area shall be situated and constructed so that it will not be subject to flooding; the floor shall be paved or equal, and well-drained. Items shall be placed on pallets or shoring to permit air circulation. This area shall be provided with uniform heating and temperature control or its equivalent to prevent condensation and corrosion.

Long Term

Keep Vogt products in the as-shipped pallets and/or boxes as long as practical.

Upon receipt, pallet and/or boxes shall be inspected for handling damage and/or exposure to rain and/or ocean spray. Damage shall be reported to the transport agent.

The pallets and/or boxes shall be stored for protection against the weather. Ideally products should be kept indoors with actual storage temperature always higher than the dew point.

The storage area shall be a fire resistant, tear resistant, weather tight, and well ventilated building or equivalent enclosure.

The storage area shall be located and constructed so that it will not be subject to flooding. The floor shall be paved or equal and well drained.

Individual valves or other product separated from its shipment pallet and/or box shall be placed on pallets or shoring to permit air circulation. The valve flow ports shall remain sealed with the Vogt supplied plugs and/or covers.

If outdoor storage is unavoidable, products shall be supported off the ground or pavement and protected by a watertight enclosure.

Weatherproof covering, when used for outdoor storage, shall be a flame resistant type of sheeting or tarpaulins. They shall be placed so as to provide drainage and to ensure air circulation to minimized condensation. They shall be tied down to prevent moisture from entering laps and to protect the covering from wind damage.

Since Vogt valves' packing and gaskets have an indefinite shelf life, valves may be removed from storage and installed without further protection.

This procedure shall be supplemented with valve motor and/or air cylinder manufacturers storage recommendations for Vogt valves modified with motor or air cylinder valve actuators.

Recommendations for Field Welding of Small Carbon Steel Socket Weld Valves

1. Evaluation of Code Requirements

Prior to welding, construction code requirements should be reviewed (ASME Section I, VIII, IX, B31.1, B31.3, etc.). Applicable code requirements may supersede these recommendations. In the absence of specific code requirements, the guidelines of ASME Section IX are recommended for qualification.

2. Selection of Process

Based on the size of the valve and the skill of the welder, either the SMAW (stick) or GTAW (Tig) process is recommended. SMAW is generally preferred, although, GTAW offers more control (at the expense of speed) and may be preferred for 3/4" and smaller valves.

3. Selection of Weld Filler Metal

For SMAW, use 3/32" electrode on the first pass with 1/8" for subsequent passes. 1/8" and 5/32" electrodes may be used effectively on larger valves. E7018 electrodes are recommended, although E6010 may be preferred, particularly on the first pass, if joint cleanliness is less than desirable.

Type ER7OS-2 is preferred for GTAW. ER7OS-3 and ER7OS-6 may also be used. 3/32" size is recommended, although 1/16" and 1/8" may also be used successfully.

4. Selecting the Welder

Most construction codes require a welder to qualify prior to making a production weld. Welder performance qualification provides some assurance that the production weld will be of good quality since the welder has proven, through testing, that he can make a good weld. Care should be taken in comparing the welder's qualification with the code requirements to assure that the welder has qualified with an appropriate test for the intended production weld.

5. Joint Cleanliness

The area in-way-of welding should be cleaned to remove rust, scale, dirt, oil, and protective coatings. This should be done prior to fit-up or residue in the joint overlap will not be removed. Sanding, grinding, or wire brushing is usually adequate. Solvents may be necessary, if oil is to be removed.

6. Fit-up (Socket Weld Valves)

In order to gauge fillet weld size after welding place a circumferential mark 1" from the engaging pipe end prior to welding. Bottom out the pipe engagement into the socket and pull it back approximately 1/16" to allow for weld shrinkage. Note the dimension from the mark to the valve pipe end.

Tack welds should be contoured to allow for easy inclusion into the final weld.

7. Welding Technique

a. Prior to welding, the valve should be lightly closed. Where possible, attach the electrical ground to the adjoining pipe on the same side of the valve as the weld being made. Do not attach the ground to the handwheel or upper structure of the valve or arcing across the valve seating surfaces could occur.

b. Where possible, welding should be done in the flat or horizontal position. Where vertical welding is necessary, progression should be upward (vertical down welding is prone to lack-of-fusion).

c. Welding parameters: The following welding parameters may be used as a guide.

Electrode	Current	Voltage	Shielding Gas
3/32" E6010	55-75A	———	N/A
3/32" E7018	70-90A	*	N/A
1/8"" E7018	90-110 A	*	N/A
3/32" ER7OS-2	75-100A	13-14V	100% Argon at 15-20 CFH

*Use as close and tight an arc as possible.

d. A minimum of two layers should be used for all socket welds. This will decrease the chance of leaking even if one pass contains a weld defect.

Recommendations for Field Welding of Small Alloy Steel Socket Weld Valves

1. Evaluation of Code Requirements

Prior to welding, construction code requirements should be reviewed (ASME Section I, VIII, IX, B31.1, B31.3, etc.). Applicable code requirements may supersede these recommendations. In the absence of specific code requirements, the guidelines of ASME Section IX are recommended for qualification.

2. Selection of Process

Based on the size of the valve and the skill of the welder, either the SMAW (stick) or GTAW (Tig) process is recommended. SMAW is generally preferred, although, GTAW offers more control (at the expense of speed) and may be preferred for 3/4" and smaller valves.

3. Selection of Weld Filler Metal

For SMAW, use 3/32" electrode on the first pass with 1/8" for subsequent passes. 1/8" and 5/32" electrodes may be used effectively on larger valves. 3/32" is recommended for GTAW. 1/16" and 1/8" may also be used successfully. Based on the alloy type, the following filler metals are recommended:

Valve Material	SMAW Filler Material	GTAW Filler Material
A182 F5	E502-15 or 16 electrodes	ER502
A182 F11	E8018-B2	ER80S-B2
A182 F22	E9018-B3	ER9OS-B3

Care should be taken to use only SMAW electrodes that have been kept essentially free of exposure to moisture. Exposure of coated electrodes to moisture can cause high levels of hydrogen in the weld which can result in delayed cracking, especially with hardenable alloys. Electrodes should be kept in heated electrode ovens operating at 250 - 300°F when not being used. Limit atmospheric exposure to 8 hours maximum without reheating. Electrodes may be used immediately following opening of the hermetically sealed containers in which they are normally supplied.

4. Selecting the Welder

Most construction codes require a welder to qualify prior to making a production weld. Welder performance qualification provides some assurance that the production weld will be of good quality since the welder has proven, through testing, that he can make a good weld. Care should be taken in comparing the welder's qualification with the code requirements to assure that the welder has qualified with an appropriate test for the intended production weld.

5. Joint Cleanliness

The area in-way-of welding should be cleaned to remove, dirt, oil, and protective coatings. This should be done prior to fit-up or residue in the joint overlap will not be removed. Sanding, grinding, or wire brushing is usually adequate. Solvents may be necessary, if oil is to be removed.

6. Fit-up (Socket Weld Valves)

In order to gauge fillet weld size after welding, place a circumferential mark 1" from the engaging pipe end prior to welding. Bottom out the pipe engagement into the socket and pull it back approximately 1/16" to allow for weld shrinkage. Note the dimension from the mark to the valve pipe end.

Tack welds should be contoured to allow for easy inclusion into the final weld.

Recommendations for Field Welding of Small Alloy Steel Socket Weld Valves

7. Welding Technique

a. Prior to welding, the valve should be lightly closed. Where possible, attach the electrical ground to the adjoining pipe on the same side of the valve as the weld being made. Do not attach the ground to the handwheel or upper structure of the valve or arcing across the valve seating surfaces could occur.

b. Where possible, welding should be done in the flat or horizontal position. Where vertical welding is necessary, progression should be upward (vertical down welding is prone to lack-of-fusion).

d. Preheat: A minimum preheat of 350°F is recommended for alloy steels.

c. Welding parameters: The following welding parameters may be used as a guide.

Electrode	**Current**	**Voltage**	**Shielding Gas**
SMAW			
3/32″	70-90A	*	N/A
1/8″	90-110 A	*	N/A
GTAW			
3/32″	75-100A	13-14V	100% Argon at 15-20 CFH

*Use as close and tight an arc as possible.

d. A minimum of two layers should be used for all socket welds. This will decrease the chance of leaking even if one pass contains a weld defect.

e. Postweld Heat Treatment: Due to controls on thickness and chemical composition, postweld heat treatment of Vogt F11 and F22 alloy steel valves is not normally required. Postweld heat treatment can reduce weld hardness and weld stresses. However, it is also possible to damage valve components at high temperatures. Refer to applicable governing codes to determine if postweld heat treatment is required. Contact Vogt for further information if postweld heat treatment is required.

Recommendations for Field Welding of Small Stainless Steel Socket Weld Valves

1. Evaluation of Code Requirements

Prior to welding, construction code requirements should be reviewed (ASME Section I, VIII, IX, ANSI B31.1, B31.3, etc.). Applicable code requirements may supersede these recommendations. In the absence of specific code requirements, the guidelines of ASME Section IX are recommended for qualification.

2. Selection of Process

Based on the size of the valve and the skill of the welder, either the SMAW (stick) or GTAW (Tig) process is recommended. SMAW is generally preferred, although, GTAW offers more control (at the expense of speed) and may be preferred for 3/4" and smaller valves.

3. Selection of Weld Filler Metal

For SMAW, use 3/32" electrode on the first pass with 1/8" for subsequent passes. 1/8" and 5/32" electrodes may be used effectively on larger valves. E316L-16 electrodes are recommended.

3/32" type ER316L is recommended for GTAW. 1/16" and 1/8" may also be used successfully.

4. Selecting the Welder

Most construction codes require a welder to qualify prior to making a production weld. Welder performance qualification provides some assurance that the production weld will be of good quality since the welder has proven, through testing, that he can make a good weld. Care should be taken in comparing the welder's qualification with the code requirements to assure that the welder has qualified with an appropriate test for the intended production weld.

5. Joint Cleanliness

The area in-way-of welding should be cleaned to remove, dirt, oil, and protective coatings. This should be done prior to fit-up or residue in the joint overlap will not be removed. Sanding, grinding, or wire brushing is usually adequate. Solvents may be necessary, if oil is to be removed.

6. Fit-up (Socket Weld Valves)

In order to gauge fillet weld size after welding, place a circumferential mark 1" from the engaging pipe end prior to welding. Bottom out the pipe engagement into the socket and pull it back approximately 1/16" to allow for weld shrinkage. Note the dimension from the mark to the valve pipe end.

Tack welds should be contoured to allow for easy inclusion into the final weld.

7. Welding Technique

a. Prior to welding, the valve should be lightly closed. Where possible, attach the electrical ground to the adjoining pipe on the same side of the valve as the weld being made. Do not attach the ground to the handwheel or upper structure of the valve or arcing across the valve seating surfaces could occur.

b. Where possible, welding should be done in the flat or horizontal position. Where vertical welding is necessary, progression should be upward (vertical down welding is prone to lack-of-fusion).

c. Welding parameters: The following welding parameters may be used as a guide.

Electrode	Current	Voltage	Shielding Gas
3/32" E316L-16	70-90A	*	N/A
1/8"" E316L-16	90-110 A	*	N/A
3/32" ER316L	75-100A	13-14V	100% Argon at 15-20 CFH

*Use as close and tight an arc as possible.

d. A minimum of two layers should be used for all socket welds. This will decrease the chance of leaking even if one pass contains a weld defect.

Engineering Information (Operating Instructions)

Check Valve Cracking/Opening Pressures

(701,15701, 573, 583, 593, etc.)

1/2"-.61 psi
3/4"-.61 psi
1"- .52 psi
1 1/4"-.57 psi
1 1/2" - .57 psi
2" - .58 psi

All standard spring loaded Check valves have cracking pressures of 10 -12 psi.

Handwheel Max.Closing Torques (Typical in Ft-lbs)

Class 800 Reduced Port Gate

1/4", 3/8" - 8 ft-lbs
1/2", 3/4" - 15 ft-lbs
1" - 20 ft-lbs
1 1/4", 1 1/2" - 50 ft-lbs
2" - 70 ft-lbs

Class 800 Full Port Gate

1/2" -15 ft-lbs
3/4" - 20 ft-lbs
1" - 40 ft-lbs
1 1/4" - 50 ft-lbs
1 112" - 70 ft-lbs
2" - 100 ft-lbs

Class 800

Reduced Port Globe	Full Port Globe
1/2" - 15 ft-lbs	1/2" - 15 ft-lbs
3/4" - 15 ft-lbs	3/4" - 30 ft-lbs
1"- 30ft-lbs	1"- 40 ft-lbs
1 1/2" - 40 ft-lbs	1 1/2" - 75 ft-lbs
2" - 75 ft-lbs	2" - 125 ft-lbs

MAXIMUM PACKING GLAND BOLTING TORQUE

Size	Class 150, 300, 600 & 800 Conv. Port	Class 600 & 800 Full Port	Class 1500	Class 1500 Full Port
1/2	1.8 ft-lbs	1.8 ft-lbs	4.2 ft-lbs	4.2 ft-lbs
3/4	1.8 ft-lbs	3.7 ft-lbs	4.2 ft-lbs	7.5 ft-lbs
1	3.7 ft-lbs	4.0 ft-lbs	7.5 ft-lbs	13.9 ft-lbs
1 1/4	4.0 ft-lbs		13.9 ft-lbs	13.9 ft-lbs
1 1/2	4.0 ft-lbs	7.5 ft-lbs	13.9 ft-lbs	15.9 ft-lbs
2	7.5 ft-lbs	8.5 ft-lbs	15.9 ft-lbs	
2 1/2	8.5 ft-lbs			
3	8.5 ft-lbs			
4	12.0 ft-lbs			

RECOMMENDED MAXIMUM BONNET BOLT TORQUES (Dry, Unlubricated Values)

Bolt Diameter	Torque (ft-lbs) B7 & B16	B8M
5/16"	25	22
3/8"	40	36
7/16"	50	45
1/2"	85	75
9/16"	144	130
5/8"	125	115
3/4"	175	156
7/8"	530	480
1"	795	710

Note: Reduce above values by 25% to 30% if any type lubrication is used on bolting.

Care and Maintenance of Vogt Forged Steel Valves

VALVE CARE BEFORE INSTALLATION

Vogt valves are carefully made from selected materials to give long, trouble-free service when properly installed in applications for which they were designed. Proper care and maintenance in the field can contribute significantly to maximum performance.

The care the valve receives between the time it is shipped by the manufacturer and installed in the piping system is important. During this period, the valve can be handled many times and can be kept in storage for long periods. Industrial valves are not delicate, but they are mechanical devices which should be treated as such and handled with care.

Vogt always provides valves with appropriate end covers to protect the end connections and to prevent foreign material from entering the valve. In addition, small valves are shipped in sealed cartons while larger valves are usually palletized. If at all practical, keep the valves in the cartons or on the pallets with end covers in place until ready to be installed. Storing the valves off the ground and indoors is always preferable. When stored outside, valves should be off the ground and protected by a weatherproof cover.

Prior to installation, the valves and nameplates should be checked for proper identification to be sure the valve is the proper type and of a suitable pressure class. Actuate the valve to check for possible damage from shipping and handling. Also, it is extremely important to inspect the interior of both the valve and the adjoining pipe for cleanliness. By far the major cause of seat leakage and seat damage is foreign material in the line. Also, inspect end connections to be sure that pipe threads and flange faces are free from scratches, nicks, or dents.

VALVE IDENTIFICATION

All valves have a nameplate attached that include the series number, size, pressure class and material. The valve nameplate needs to be reviewed in conjunction with the installation, maintenance, and spare parts ordering instruction in this manual.

ROUTINE INSPECTION AND MAINTENANCE

Once the right valve is properly installed, field maintenance is of a generally routine nature and can be readily performed by the user. The critical areas of a valve include the stem threads and those locations where leakage will most likely occur—the stem packing, the bonnet joint, the seat and the end connections. It is desirable that a maintenance program be established which will include periodic inspection of the noted critical areas.

The most common location of a noticeable leak is at the stem seal. Leakage at the stem can usually be stopped by adjusting the packing. If leakage cannot be stopped by packing adjustment, repacking is indicated. However, backseating the valve and attempting to repack under pressure is hazardous and is not recommended. Rather than attempting to repack under pressure, it is preferable to use the backseat to control the stem leakage until a shutdown provides safe repacking conditions.

LUBRICATION POINTS

Valves should be lubricated prior to installation and periodically as part of the regular inspection.

Gate valves:
- stem
- yoke nut threads
- bearing ring area

Globe Valves:
- stem
- yoke nut threads
- bearing ring area when applicable

Check Valves:
- none required

RECOMMENDED LUBRICANT

High pressure and temperature lubricant such as Dow Corning Molykote™ G-N Paste or similar.

MAJOR FIELD REPAIR

Maintenance involving rework or replacement of parts is considered major repair. When circumstances dictate field repair of Vogt valves, the following information is offered as an aid. It must be pointed out, however, that Vogt valves repaired in the field are no longer under "Product Warranty," and in no event is Vogt liable for any incidental or consequential damages resulting from any cause whatsoever. There are no warranties of any kind whatsoever, express or implied, other than those stated in Vogt's limited warranty provision.

Care and Maintenance of Vogt Forged Steel Valves

Preliminary Considerations for Valve Repair:

1. Use experienced, trained personnel.
2. Observe all standard safety precautions
3. If possible, remove valve from line so that work can be done in a clean, well lighted area.
4. Use genuine Vogt replacement parts.
5. Use proper tools.
6. Pressure test valve before reinstalling. This is particularly essential on valves intended for critical service.
7. Remember that improper repairs can be hazardous.

REPLACEMENT PARTS… HOW TO ORDER

Genuine replacement parts are available for Vogt current standard valves and can usually be shipped from stock. All parts are made with the same careful inspection and laboratory control given original valves and parts. Orders for replacement parts should clearly identify the items required and should specify the correct name of the part, valve size and series number, drawing and revision number, material, etc. The drawing and revision number which appears on the identification disc attached to the handwheel is of particular value.

In the absence of an identification disc, series numbers may be found on the side of the valve body or drawing numbers may be found on the bonnet flange. The purchase date and/or purchase order number will further identify the parts and materials originally ordered, especially valves with custom designed features.

The embossed number on each handwheel, having a prefix letter "V", is the pattern number of the handwheel and has no relation to the ordering of other valve parts. Prices for valve parts will be furnished on application.

TOOLS FOR INSTALLING REPLACEMENT PARTS

Wrenches are available (price on application) for the removal and replacement of renewable seats for globe, angle, and check valves. The wrenches are machined to an accurate finish to fit the spline broach on the inside diameter of the seat and are properly heat treated for strength and toughness.

DISASSEMBLY

Small valves of the union bonnet type or of the screw bonnet types are readily disassembled by unscrewing the union nut or the bonnet. In bolted bonnet valves, the nut should be removed from the bonnet stud bolts or hexagon head cap screws removed from the body. Tight bolt threads may be loosened by applying penetrating oil to the threads or by selectively heating the bolt at the point of thread engagement. On bonnet joints of the through bolt type, the bolts may be cut between the body and bonnet flanges for removal.

STEMS

Tight stems in valves of the O.S. & Y. type are caused by either dry, worn packing, or non-lubrication of yoke nut threads. Applying a few drops of oil to the stem threads and packing, and opening and closing the valve a few times, may loosen the stem. At the same time, make sure the packing gland bolting is pulled down evenly so the gland will not bind against the stem; however, care should be taken not to overcompress the packing.

A tight stem in an inside screw valve may also result from worn or overcompressed packing, or the stem bonnet threads may "freeze" from excessive service temperatures or from corrosive fluids in the valve. If the stem turns freely after all packing is removed, and if the surface of the stem in contact with the packing is in good condition, new packing is the remedy. If stem is still tight, turn valve to upright position, fill the stuffing box with penetrating oil, and let soak. If stem remains tight, a new bonnet and stem are required, or, if practical, an O.S. & Y. type valve could be substituted.

BONNET JOINTS

On valves of the union bonnet type, repairs can be made without removing the valve from the line provided there is enough wrench room for loosening and tightening the bonnet nut. Before loosening the bonnet nut, be sure valve is relieved of all pressure. A few hammer taps to the side of the bonnet nut or around the body neck of screw bonnet type valves will loosen nut or bonnet. Gasketed joints require smooth, clean surfaces on both the body and the bonnet gasket faces, and a new gasket is recommended for reassembly. On bolted bonnet valves in high temperature service, and particularly where severe thermal cycling is involved, it is recommended that bolt torque be checked periodically. This recommendation applies to gland bolting as well.

Care and Maintenance of Vogt Forged Steel Valves

PACKING - GENERAL

Vogt valves have well proportioned stuffing boxes filled with the best grade of packing available. Before repacking, be sure to have the right grade, type, and size of packing.

Repacking under pressure is hazardous and is not recommended. The backseat should be used as a temporary measure to control the stem leakage until a shutdown provides safe repacking conditions.

Partial disassembly of the valve is required if endless packing rings are to be placed in the valve. Split rings can be added without disassembly but is not the preferred method. Partial disassembly greatly facilitates the removal of old packing and the repacking with new packing.

Vogt makes maximum use of flexible graphite in the packing of its high temperature valves. This packing does not dry out and retains its compressibility. Valves packed with flexible graphite do not require full repacking except for severe blowing leaks, where erosion damage may have occurred to all rings of the flexible graphite packing. In this event all rings of packing shall be replaced. Otherwise, the maintenance of the valve packing can be maintained merely by the addition of one (1) or two (2) rings of flexible graphite without major valve disassembly.

Wipe all parts of the stuffing box, inside and out, before installing new packing. Vogt uses endless* and split ring type packing. If split ring type is used for replacement, take care to stagger the ring slits so that they are not in line. After putting in a few rings, tamp them well into place, using the packing gland as a tamping tool. Then add enough packing to fill the stuffing box. Pressure on the packing is applied by the packing nut or gland flange bolting, depending on valve design, which bears on a gland in the stuffing box. Gland bolting should be tightened evenly to obtain the proper packing compression for leak free service. Upon reassembling the valve, a few turns of the handwheel and a few drops of oil applied on the stem just above the packing will help work in the packing to the stem.

DETAILED PACKING INSTRUCTIONS

O.S. & Y. BOLTED BONNET GATE VALVES (TYPICAL SERIES 12111)

(PARTIAL DISASSEMBLY REQUIRED)

1. Loosen packing gland bolting and free up gland.
2. Remove bonnet bolts and bonnet subassembly. (CAUTION: Mark the gate and note orientation. Same gate and orientation shall be maintained upon replacement.)
3. Spin handwheel until stem is removed from yoke nut thread.
4. Pull stem through packing. Rotating the stem during removal from the packing will aid in this process.
5. Remove packing gland and gland bolting.
6. Remove top ring of packing. This will be a braided graphite packing. Remove additional packing as required.
7. Add new rings of flexible graphite packing and one new top and bottom ring of braided packing as required.
8. Replace packing gland and snug up gland bolting evenly.
9. Insert new bonnet gasket. Insert gate/stem into body.
10. Place yoke bonnet subassembly back on stem and rotate handwheel to seat bonnet.
11. Replace bonnet bolts and torque bonnet bolts until bonnet joint becomes metal-to-metal. A .007" feeler gage may be used to gage joint. A bonnet/body joint that will accept a .007" feeler gage is not properly torqued and is not metal-to-metal. Additional torque should be applied. Caution: During the torquing of the bonnet joint, the valve should be slightly open. This will prevent the bonnet bolt torque from driving the disc or gate into the valve seat and will insure the bonnet joint will go metal-to-metal.
12. Tighten packing gland bolting evenly.
13. Open and close valve to insure free operation.
14. Place valve back in service.

ALTERNATE METHOD

(NO MAJOR DISASSEMBLY REQUIRED)

1. Remove packing gland bolting and free up packing gland.
2. Remove top ring of packing. This will be a braided graphite packing. Prepare

* Note: Vogt has used a patented one piece endless cylinder of packing in its factory made valves for several years, and if this packing is to be replaced it will be necessary to remove the cylinder packing from the valve before repacking. If individual rings have been used, the individual rings can be removed as necessary. If complete valve disassembly is used during packing of a valve, the patented packing cylinder can be used for replacement. See page 2 for Packing Cartridge PN.

chamber to accept new ring or rings of packing.

3. Split a number of packing rings of flexible graphite as required and place individual ring in packing chamber using the gland to ram the packing into the chamber. Stagger packing ring's separations by 90° if more than one ring is required. Replace top ring of braided graphite packing as required. If total replacement of packing is necessary, a bottom ring of braided packing shall be used.
4. Tighten packing gland bolting evenly.
5. Open and close valve to insure free operation.
6. Place valve back in service.

Packing

O.S. & Y. Bolted Bonnet Globe Valve (Typical Series 12141)

(PARTIAL DISASSEMBLY REQUIRED)

1. Loosen packing gland bolting and free up gland.
2. Remove bonnet bolts.
3. Remove handwheel nut and nameplate.
4. Spin handwheel until stem moves through yoke nut loosening and pushing off handwheel.
5. Remove yoke/bonnet subassembly, rotate stem and totally remove stem from yoke thread.
6. Pull stem through packing. Rotating the stem during removal from the packing will aid in this process.
7. Remove packing gland and gland bolting.
8. Remove top ring of packing. This will be a braided graphite packing. Remove additional packing as required.
9. Add new rings of flexible graphite packing and one new top and bottom ring of braided graphite packing as required.
10. Replace packing gland and snug up gland bolting evenly.
11. Place stem back into yoke/bonnet subassembly.
12. Rotate stem to engage yoke nut thread. Stem should be rotated until stem broach is visible and the handwheel can be placed on the stem. Replace nameplate and handwheel nut, tighten nut.
13. Insert new bonnet gasket.
14. Place yoke/bonnet subassembly on valve and replace bonnet bolting.
15. Replace bonnet bolts and torque bonnet bolts until bonnet joint becomes metal-to-metal. A .007" feeler gage may be used to gage joint. A bonnet/body joint that will accept a .007" feeler gage is not properly torqued and is not metal-to-metal. Additional torque should be applied. Caution: During the torquing of the bonnet joint, the valve should be slightly open. This will prevent the bonnet bolt torque from driving the disc into the valve seat and will insure the bonnet join will go metal-to-metal.
16. Tighten packing gland bolting evenly.
17. Open and close valve to insure free operation.
18. Place valve back in service.

Alternate Method

(No Major Disassembly Required)

1. Remove packing gland bolting and free up packing gland.
2. Remove top ring of packing. This will be a braided graphite packing. Prepare chamber to accept new ring or rings of packing.
3. Split a number of packing rings of flexible graphite as required and place individual rings in packing chamber using the gland to ram the packing into the chamber. Stagger packing ring's separations by 90° if more than one ring is required. Replace top ring of braided graphite packing as required. If total replacement of packing is necessary, a bottom ring of braided packing shall be used.
4. Tighten packing gland bolting evenly.
5. Open and close valve to insure free operation.
6. Place valve back in service.

O.S. & Y. Welded Bonnet Gate Valves (Typical Series 2801)

Preferred Method (Requires Disassembly of Yoke/Bonnet Subassembly)

1. Loosen packing gland bolting and free up gland.
2. Remove tack weld(s) at yoke/bonnet interface. A hammer and a sharp chisel should be utilized for this operation.
3. Remove yoke/handwheel assembly from yoke/bonnet subassembly. (CAUTION: The stem should be maintained in a near open position to insure that the yoke/

bonnet thread and the stem thread difference do not create a condition where the stem is locked against the backseat, making removal of the yoke impossible.)

4. Remove top ring of packing. This will be a braided graphite packing. Remove additional packing as required.
5. Add new rings of flexible graphite packing and one new top ring of braided graphite packing as required. If total replacement of packing is necessary, a bottom ring of braided packing shall be used.
6. Replace yoke/handwheel assembly to bonnet subassembly. (CAUTION: When replacing yoke/handwheel assembly, valve stem should be maintained in an open position to insure the yoke thread advance does not drive the gate into the seats potentially making the yoke replacement impossible.)
7. Tighten packing gland bolting evenly.
8. Tack weld yoke/bonnet subassembly at or near same location from which tack weld was removed. Tack weld in accordance with the manufacturer's recommended procedure.
9. Open and close valve to insure free operation.
10. Place valve back in service.

Alternate Method
(No Major Disassembly Required)

1. Remove packing gland bolting and free up packing gland.
2. Remove top ring of packing. This will be a braided graphite packing. Prepare chamber to accept new rings or rings of packing.
3. Split a number of packing rings of flexible graphite as required and place individual rings in packing chamber using the gland to ram the packing into the chamber. Stagger packing ring's separations by 90° if more than one ring is required. Replace top ring of braided graphite ring as required. If total replacement of packing is necessary, a bottom ring of braided packing shall be used.
4. Tighten packing gland bolting evenly.
5. Open and close valve to insure free operation.
6. Place valve back in service.

O.S.& Y. Welded Bonnet Globe Valves (Typical Series 2821)

Preferred Method (Requires Disassembly of Yoke/Bonnet Subassembly)

1. Loosen packing gland bolting and free up gland.
2. Remove handwheel nut, nameplate, and handwheel.
3. Remove tack weld(s) at yoke/bonnet subassembly. Remove yoke. (CAUTION: The stem should be maintained in a near closed position to insure that the yoke/bonnet thread and the stem thread difference do not create a condition where the stem is locked against the backseat, making removal of the yoke impossible.)
4. Remove top ring of packing. This will be a braided graphite packing. Remove additional packing as required.
5. Add new rings of flexible graphite packing and one new top ring of braided graphite packing as required. If total replacement of packing is necessary, a bottom ring of braided packing shall be used.
6. Replace the yoke to the bonnet. (CAUTION: When replacing the yoke the valve stem should be maintained in an open position to insure the yoke thread advance does not drive the disc into the seat, potentially making the yoke replacement near impossible.)
7. Tighten packing gland bolting evenly.
8. Tack weld yoke/bonnet subassembly at or near the same location from which the tack weld was removed. Tack weld in accordance with the manufacturer's recommended practice.
9. Replace handwheel, nameplate, and handwheel nut and tighten nut.
10. Open and close valve to insure free operation.
11. Place valve back in service.

Alternate Method
(No Major Disassembly Required)

1. Remove packing gland bolting and free up packing gland.
2. Remove top ring of packing. This will be a braided graphite packing. Prepare chamber to accept new rings or rings of packing.
3. Split a number of packing rings of flexible graphite as required and place individual rings in packing chamber using the gland to ram the packing into the chamber.

Care and Maintenance of Vogt Forged Steel Valves

Stagger packing ring's separations by 90° if more than one ring is required. Replace top ring of braided graphite packing as required. If total replacement of packing is necessary, a bottom ring of braided packing shall be used.

4. Tighten packing gland bolting evenly.
5. Open and close valve to insure free operation.
6. Place valve back in service.

Inside Screw, Welded or Bolted Bonnet, Gate or Globe Valve (Typical Series 12161 and 12181)

1. Remove handwheel nut, nameplate, and handwheel.
2. Remove packing nut and packing gland.
3. Remove top ring of packing. This will be a braided graphite packing. Remove additional packing as required.
4. Add new rings of flexible graphite packing and one new top ring of braided graphite packing as required. If total replacement of packing is necessary, a bottom ring of braided packing shall be used.
5. Replace packing gland and packing nut.
6. Tighten packing nut.
7. Replace handwheel, nameplate, and handwheel nut and tighten nut.
8. Open and close valve to insure free operation.
9. Place valve back into service.

TEFLON PACKING INSTRUCTIONS

For Vogt standard valves packed with Style C-VH packing, the detailed procedures above may be used as applicable. Teflon packing orientation shall be as outlined below.

VOGT VALVES PACKED WITH TEFLON FOR HIGH PRESSURE APPLICATIONS—STANDARD

See solid assembly arrangement for Vogt method utilizing the C-VH packing rings. All Teflon packing is used even for the bottom ring. This is Vogt standard Teflon packing method and is designed to seal on internal pressure.

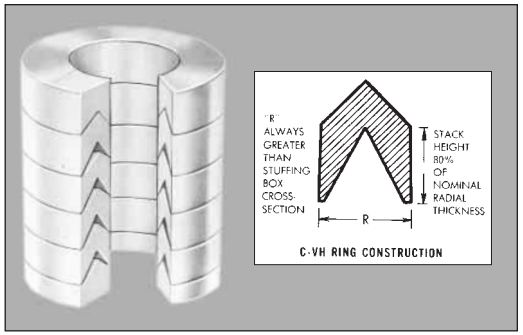
FOR VACUUM APPLICATIONS

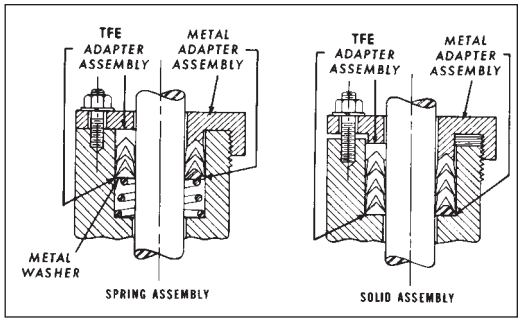
The C-VH rings should be partially inverted for vacuum applications because leakage is from outside environment to inside of valve. Rings should be oriented per Figure A.

FOR COMBINATION PRESSURE/ VACUUM APPLICATIONS

The C-VH rings should be oriented per Figure B.

NOTE:
In the event endless Teflon rings are split, they may be cut at a 45° angle by the use of a razorblade. Install one ring at a time and stagger the splits in succeeding rings by 90°. Endless rings are preferred and this requires valves to be disassembled during repacking.





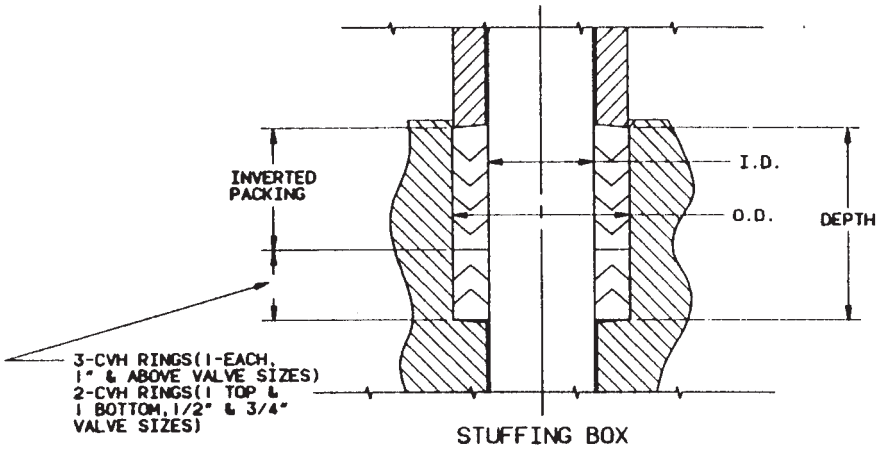
STYLE C-VH RINGS

For High-Pressure Service

This design incorporates a heavy well and heel section necessary to withstand pressures up to 500 PSI and greater.

C-VH Rings are recommended for high pressure applications such as hydraulic cylinders and pumps.

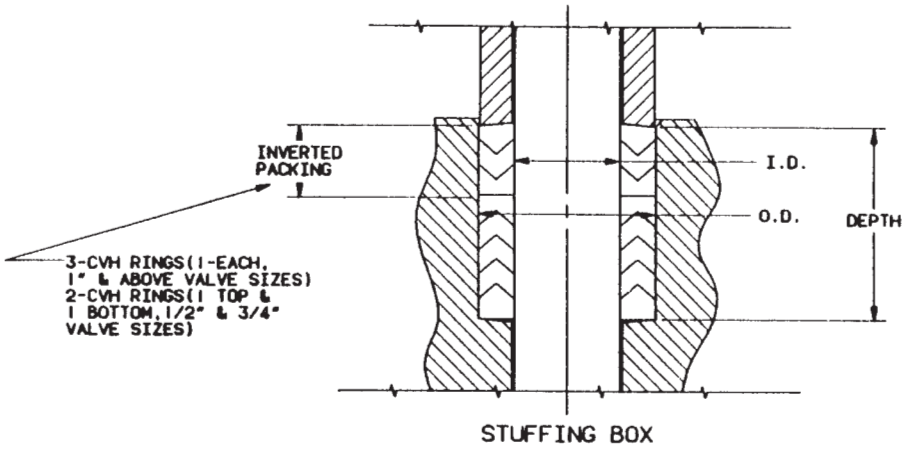
Care and Maintenance of Vogt Forged Steel Valves



STUFFING BOX SPACE					NUMBER OF CVH RINGS		
VALVE SIZE	O.D.	I.D.	DEPTH	CROSS SECTION	TOP RINGS	BOTTOM RINGS	CENTER RINGS
1/2	.62	.38	.62	.125	2	2	2
3/4	.62	.38	.62	.125	2	2	2
1	.88	.50	1.12	.188	2	2	4
1 1/4	.94	.56	1.12	.188	2	2	4
1 1/2	.94	.56	1.12	.188	2	2	4
2	1.12	.62	1.50	.250	2	2	4
3	1.25	.75	1.50	.250	2	2	4
4	1.38	.88	1.75	.250	2	2	5

FIGURE A
(VACUUM APPLICATIONS)

Care and Maintenance of Vogt Forged Steel Valves



STUFFING BOX SPACE					NUMBER OF CVH RINGS		
VALVE SIZE	O.D.	I.D.	DEPTH	CROSS SECTION	TOP RINGS	BOTTOM RINGS	CENTER RINGS
1/2	.62	.38	.62	.125	2	2	2
3/4	.62	.38	.62	.125	2	2	2
1	.88	.50	1.12	.188	2	2	4
1 1/4	.94	.56	1.12	.188	2	2	4
1 1/2	.94	.56	1.12	.188	2	2	4
2	1.12	.62	1.50	.250	2	2	4
3	1.25	.75	1.50	.250	2	2	4
4	1.38	.88	1.75	.250	2	2	5

FIGURE B
(COMBINED PRESSURE/VACUUM APPLICATIONS)

Care and Maintenance of Vogt Forged Steel Valves

DISC AND SEAT

Leakage through the seat and disc is not always easy to detect, but when definitely known to exist, immediate repair is recommended since delay may permanently damage the disc, seat or both.

The internal repair of gate valves 2" and smaller is usually found to be uneconomical. However, if a gate valve is disassembled for inspection or cleaning, care should be taken when removing the wedge to note and mark its orientation with respect to the valve body so that when the wedge is reinserted in the valve, it will have precisely the same relationship to the seats that it had in the original assembly.

The seat threads in angle, globe, and check valve bodies should be carefully inspected to make sure they are in useable condition. When installing new seats by using proper seat tools, the seats should be screwed tightly into the valve body, then unscrewed and examined to make sure they are making continuous contact for tight seal.

If seating surfaces show galling, slight pitting, grooving, or indentations not deeper than 0.010", lapping will usually restore the surfaces sufficiently to permit tight closure. Defects deeper than 0.010" can seldom be corrected by lapping, but seating surfaces can be remachined or new parts installed. For relapping the seat and disc of Vogt globe, angle, or check valves, use a fine and a coarse grade emery base compound such as Clover Compound A and D. Apply a light coat of fine, or A, compound to the seating surface of disc or one-piece stem, insert disc or one-piece stem into seat, and lap using an oscillating motion. Lap a few minutes and then wipe seating surfaces clean. This will clearly show the extent of damage. If severe damage is noted, use the coarse, or D, compound and lap until all defects are removed. Then finish with the fine, or A, compound. It is recommended that the face of the disc be "blued" to check for contact between seating surfaces after final lapping.

Globe and angle valves require a lapping guide fixture to maintain alignment during the lapping operation. A fixture as shown in Figure 1 may be made or, for O.S. & Y. valves, a valve bonnet with yoke nut removed may be used For relapping loose disc globe valves, place a washer between the disc and head of the stem and retighten the disc nut, as shown in Figure 1.

Vogt piston check valves require an adapter to screw or mate into the piston for lapping the piston seating surface to the seat. The bore of the valve body serves as a guide for lapping, see Figure 2. Ball check valves are primarily used for fluids of high viscosity and the rolling action of the ball maintains seating surfaces in good condition until ball size or ball guide is worn and replacement parts are needed.

Figure 1

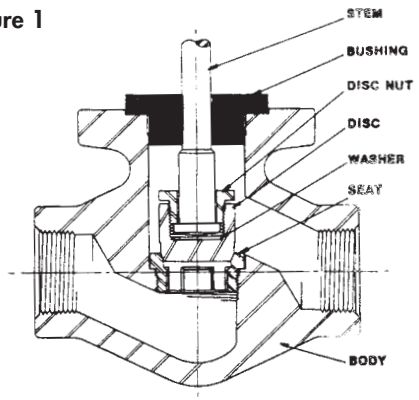
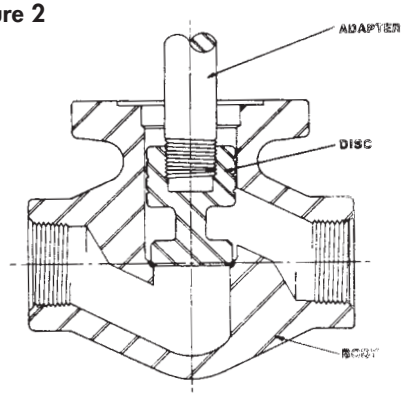


Figure 2



Care and Maintenance of Vogt Forged Steel Valves

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