

# PRATT®

a **MUELLER** brand

# Pratt Figure 93 Knife Gate Valve

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## **WARNING:**

1. Read and follow instructions carefully. Proper training and periodic review regarding the use of this equipment is essential to prevent possible serious injury and/or property damage. The instructions contained herein were developed for using this equipment on fittings of Mueller manufacturer only, and may not be applicable for any other use.

2. Do not exceed the pressure ratings of any components or equipment. Exceeding the rated pressure may result in serious injury and/or property damage.

3. Safety goggles and other appropriate protective gear should be used. Failure to do so could result in serious injury.

**MUELLER**

# Pratt Figure 93 Knife Gate Valve

## GENERAL INFORMATION / SAFETY MESSAGES

### FUNCTIONAL DESCRIPTION

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The Pratt Fig 93 is a bonnetless knife gate valve. It has either a metal to metal or a metal to o-ring seat. In either case it is a unidirectional valve, meaning that there is a preferred seating direction. 4 rows of packing are used to seal between the gate and the body. The pressure rating of the Fig 93 valve is 150 PSI CWP (Cold working pressure).

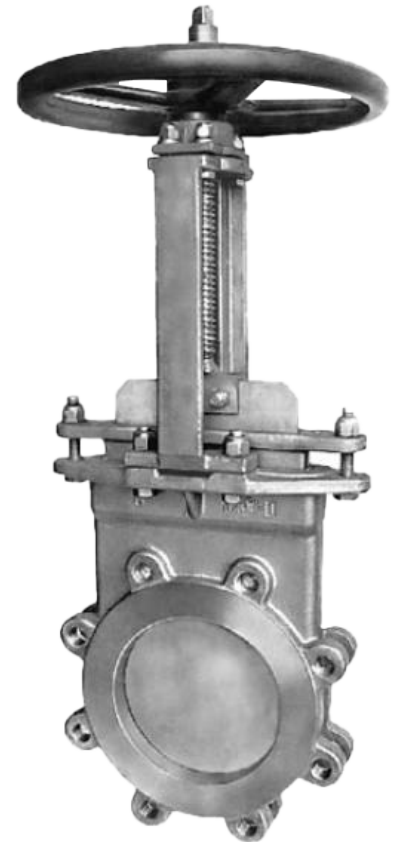
The Pratt Figure 93 is designed, manufactured, and tested per the guidelines identified in MSS-SP-81 and AWWA C520.

Manual operated Pratt Figure 93 valves are handwheel operated for all sizes with optional bevel gear operator, pneumatic cylinder actuator, hydraulic cylinder actuator, and electric actuators available.

### SAFETY MESSAGES

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All safety messages in the instructions are flagged with an exclamation symbol and the word "Warning". These messages indicate procedures that must be followed exactly to avoid equipment damage, physical injury, or death. Safety labels on the product indicate hazards that can cause equipment damage, physical injury, or death.



#### **WARNING:**

Personnel involved in the installation or maintenance of valves should be constantly alert to potential emission of pipeline material and take appropriate safety precautions. Always wear suitable protection when dealing with hazardous pipeline materials.

#### **WARNING:**

Read all applicable directions and instructions prior to any maintenance, troubleshooting or installation.

# Pratt Figure 93 Knife Gate Valve

## **PARTS**

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Pratt products are designed for long life. The stocking of spare parts is not recommended or required for normal operations. If the need for a replacement part develops, it may be ordered from our After Market / Parts Group.

**Please Note:** Published part numbers and price lists are not available.

If a need arises, you can contact your Pratt representative or Pratt's After Market / Parts Group directly:

**E-Mail:** [aftermarket@muellerwp.com](mailto:aftermarket@muellerwp.com)

**Call:** (877) 436-7977

***Please include valve serial number (if applicable) and description of part requested.***

## **SERVICE**

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To obtain further information or secure field service, contact your Pratt representative.

***Please include the following with your inquiry for service:***

- Henry Pratt Order Number
- Henry Pratt Item Number
- Type of Service Requested

# Pratt Figure 93 Knife Gate Valve

## SHIPPING, HANDLING & STORAGE

### SHIPPING

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The valve will be in closed position during shipment. Small valves sizes 2”- 6” may be shipped in individual boxes. Larger valves and large quantities will be shipped on pallets or skids all of which will require a forklift for unloading and moving.

### UNLOADING & HANDLING

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Inspect valves on receipt for damage in shipment and conformance with quantity and description. Carefully unload all valves to the ground without dropping, using a fork truck where applicable. Do not lift valves with slings or chain around operating shaft, actuator, or through port.

***Contact your Pratt representative for valve specific lifting points.***

### STORAGE

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**MANUALLY OPERATED:** Valves should be stored in a clean, dry environment such as a warehouse. If outdoor storage cannot be avoided, cover the valve to protect it from sources of heat or direct sunlight. Provide good ventilation to avoid moisture. Valves can be stored vertically or horizontally with the gate in full-open position. Do not stack valves on top of one another.

**CYLINDER OPERATED:** Valves should be stored in a clean, dry environment such as a warehouse. If outdoor storage cannot be avoided, cover the valve to protect it from sources of heat or direct sunlight. Provide good ventilation to avoid moisture. Do not stack valves on top of one another.

**ELECTRIC MOTOR OPERATED:** Valves should be stored in a clean, dry environment such as a warehouse, free from excessive vibration and rapid temperature changes. The recommended storage position is with the valve stem and motor shaft in the horizontal position and the actuator limit switch compartment cover vertically up. The gate should be in full-open position. Do not stack valves on top of one another.

***Pratt does not recommend long-term outdoor storage.***

# Pratt Figure 93 Knife Gate Valve

## INSTALLATION

### PRE-INSTALLATION INSPECTION

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Prior to installation, inspect the valve body and components for any damage that may have occurred during shipping or storage. Ensure the internal cavities within the valve body are clean. Inspect the pipeline and mating flanges to ensure the pipe is free of foreign material and that the flanges are clean.

### WARNING:

- To avoid personal injury or damage to property from the release of process fluid:
- Those in charge of handling and maintenance of the valve must be qualified and trained in valve operations.
- Use appropriate personal protection equipment (gloves, safety shoes, etc).
- Shut off all operating lines to the valve and place a warning sign.
- Isolate the valve completely from the process.
- Release process pressure.
- Drain the process fluid from the valve.

### INSTALLATION

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Find the marking on the valve body near the top flange that says “SEAT SIDE”. This is the down-stream side of the valve. Be sure to install the valve so that pressure enters the upstream side of the valve and flows out of the downstream side of the valve. Failure to install the valve properly can result in damage to the valve gate. The Pratt Figure 93 might have an O-Ring resilient seat installed and therefore placing in the correct flow orientation is especially important.

The valves can be used at the end of a pipeline without a downstream flange supporting the downstream side of the valve with all the bolts or studs installed. The valves are lugged and available in 2” through 24” sizes.

# Pratt Figure 93 Knife Gate Valve

## INSTALLATION

### INSTALLATION (CONTD)

Install the valve to the mating pipe flange using proper size bolts. See the charts below for bolt size and recommended bolt torques to be used during installation. Bolt length is not included for all since different flanges require different bolt lengths. Contact your Pratt representative for further information.



**It is important to choose the proper length of bolt for the bolt holes in the valve's chest. These holes are bottom drilled and tapped and, in some cases, contain less than a bolt diameter of threads. Be careful not to bottom out bolts in the chest during installation. If necessary, use washers to shorten the penetration of the bolt into the chest holes.**

Use the cross-torque pattern bolts evenly on both sides when installing. Recommended torque values during installation may be higher or lower depending on the type of gaskets being used. Do not tighten the bolts more than necessary to stop any leakage.



**Do not use the valve to pull together or force apart the two mating pipes.**

VALVE SIZE (IN)	BOLT SIZE (IN)	NUMBER OF BOLTS
3"	5/8-11	4
4"	5/8-11	8
6"	3/4-10	8
8"	3/4-10	8
10"	7/8-9	12
12"	7/8-9	12
14"	1-8	12
16"	1-8	16
18"	1-1/8-7	16
20"	1-1/8-7	20
24"	1-1/4-7	20
30"	1-1/4-7	28
36"	1-1/2-6	32
42"	1-1/2-6	36
48"	1-1/2-6	44

VALVE SIZE (IN)	RECOMMENDED TIGHTENING TORQUE (FT-LBS)
2"-3"	55 +/- 5
4"-8"	65 +/- 5
10"-12"	110 +/- 10
14"-16"	135 +/- 10
18"-24"	150 +/- 10
30"	200 +/- 10
36"-48"	250 +/- 10

# Pratt Figure 93 Knife Gate Valve

## START-UP PROCEDURE / MAINTENANCE & TROUBLE SHOOTING

### START-UP

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After installation, open and close the valve at least once to assure smooth operation.

### POST-INSTALLATION ADJUSTMENTS

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The packing gland may require adjustment after installation, especially if the valve has been in storage for a long time. This includes assuring packing gland is properly aligned and tightening the packing gland just enough to stop any leaks that may occur.

### MAINTENANCE

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The only items requiring maintenance on the Fig 93 knife gate valve are the packing and the lubrication of the stem. The packing gland may require adjustment after installation, especially if the valve has been in storage for a long time. All sizes of the Fig 93 valve have four or more packing gland bolts except for 8 " and smaller valves. When adjusting packing on valves with four or more bolts it is best to tighten the bolts on the side opposite the seat side first. Normally just a small amount of tightening per bolt is required. Do not tighten the bolts more than is necessary to stop the leaks. Try to adjust the packing gland down evenly to avoid the possibility of the gland rubbing on the gate as it moves. Generally, the more a valve is operated the more maintenance will be required to keep packing leaks under control.

### LUBRICATION

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***It is recommended to use Mobilgrease GC40 or equal\****

- a. It is recommended to lubricate the stem and stem nut every three (3) months.
- b. It is recommended to lubricate the gear operator once per year.

# Pratt Figure 93 Knife Gate Valve

## PACKING REPLACEMENT

### PACKING REPLACEMENT - DISASSEMBLY

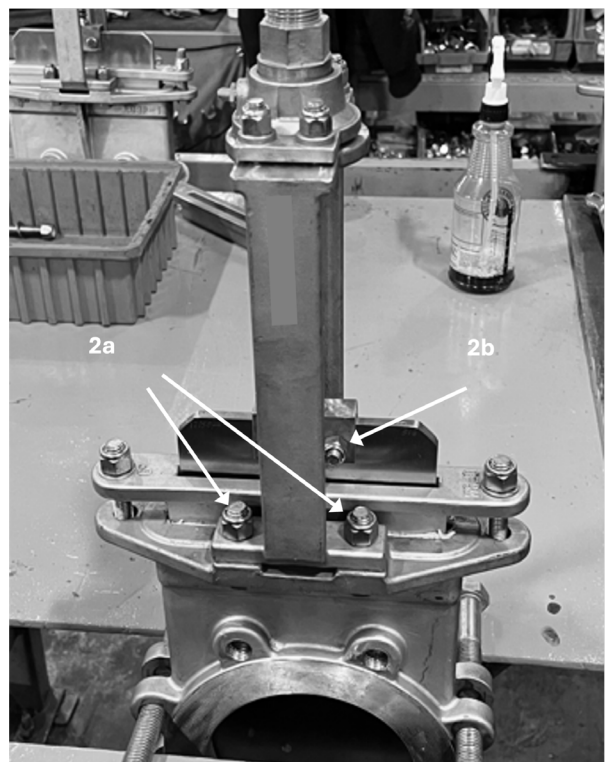
#### Disassembly :

1. Remove valve from installation.
2. Remove operator and the “top works” (operator, yoke and stem assembly) and set aside.

2a. Remove the 4 - yoke to body bolts.



2b. Remove the 2 - gate lifter bolts.



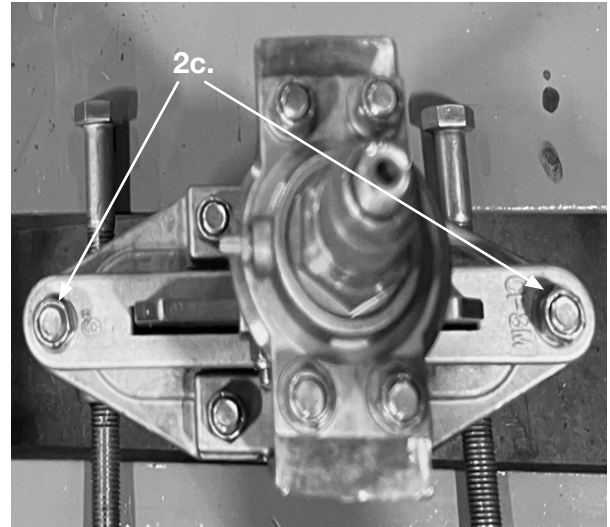


# Pratt Figure 93 Knife Gate Valve

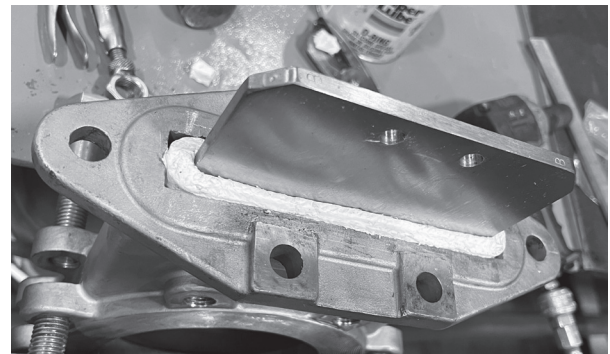
## PACKING REPLACEMENT

### PACKING REPLACEMENT - DISASSEMBLY (CONTD)

**2c.** Remove packing gland bolts:



**2d.** Lift and remove top works from the valve body.



# Pratt Figure 93 Knife Gate Valve

## PACKING REPLACEMENT

### PACKING REPLACEMENT - DISASSEMBLY (CONTD)

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3. Remove and set aside packing gland.



4. Remove the old packing with a packing hook or screwdriver. Clean the packing box thoroughly.

# Pratt Figure 93 Knife Gate Valve

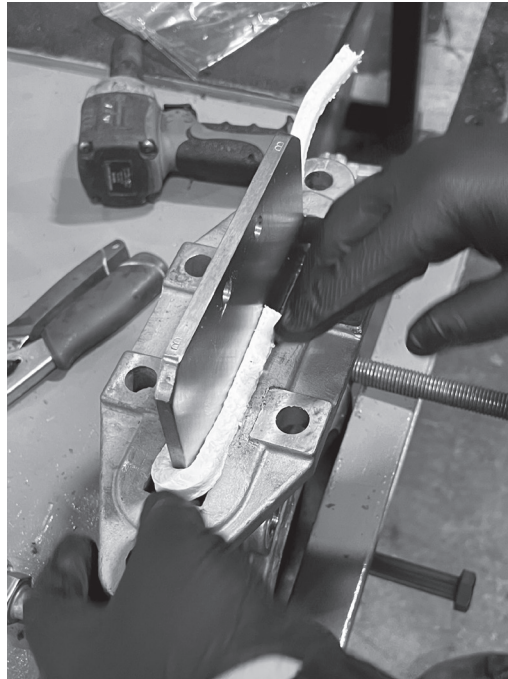
## PACKING REPLACEMENT

### PACKING REPLACEMENT - REASSEMBLY

#### 1. Install 4+ rows of new Packing.

**1a.** Insert new packing using flat bar and hammer

Use precut packing kit supplied by Pratt. The new Packing will wrap completely around the gate. Snip an end if needed for ends to meet, leaving no gap nor overlap. Press or hammer in so that Packing near flush with top of Body top flange.



**1b.** Place packing gland a line holes and tighten packing gland bolts



*It is recommended (but not necessary) to use shims to support and center the gate and anti-seize on bolt threads*



# Pratt Figure 93 Knife Gate Valve

## PACKING REPLACEMENT

### PACKING REPLACEMENT - REASSEMBLY (CONTD)

2. Reinstall the top works (yoke and operator) in the reverse order of disassembly:

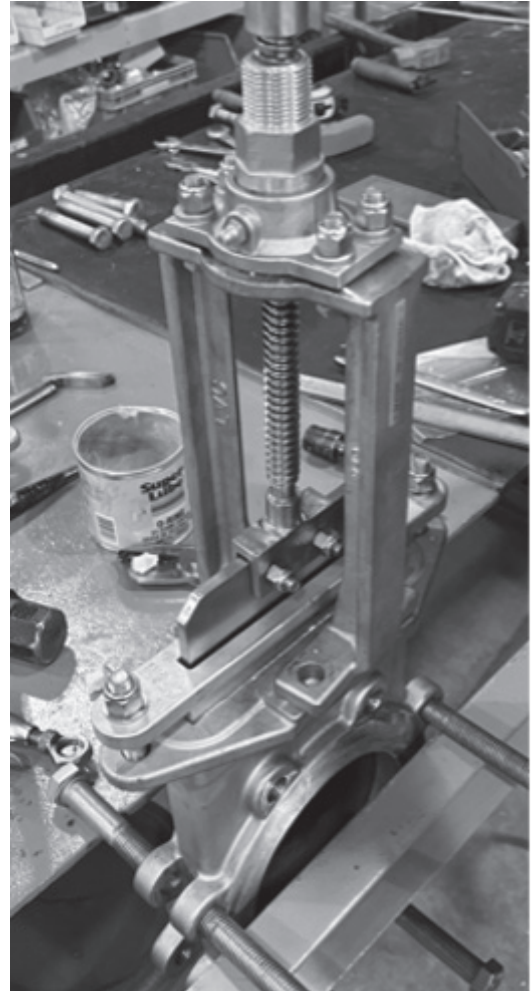
2a. Place yoke onto body

2b. Tighten 4 - yoke to body bolts

3. Reinstall operator and cycle valve.

**!** *Bringing valve up to working pressure and tighten the packing gland just enough to stop any leaks or drips.*

**!** *Over tightening of the gland will result in reduced packing life.*



# Pratt Figure 93 Knife Gate Valve

## TROUBLESHOOTING

### TROUBLE SHOOTING PROCEDURE

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#### 1) LEAKAGE FROM PACKING:

##### SOLUTION:

Tighten the packing gland bolts/nuts evenly and slowly. Usually only 1/8 to 1/4 turn on the bolts/nuts will stop the leakage. Only tighten bolts/nuts enough to stop the leak.

#### 2) SEAT LEAKAGE:

##### SOLUTION:

The gate may not be completely closed due to an obstruction between the gate and the seat. Open the gate to 1/4 open and then close to fully closed position. Check for seat leakage. Note: Metal seated valves will not provide a tight shutoff. Allowable seat leakage when new is 40cc/in/min.

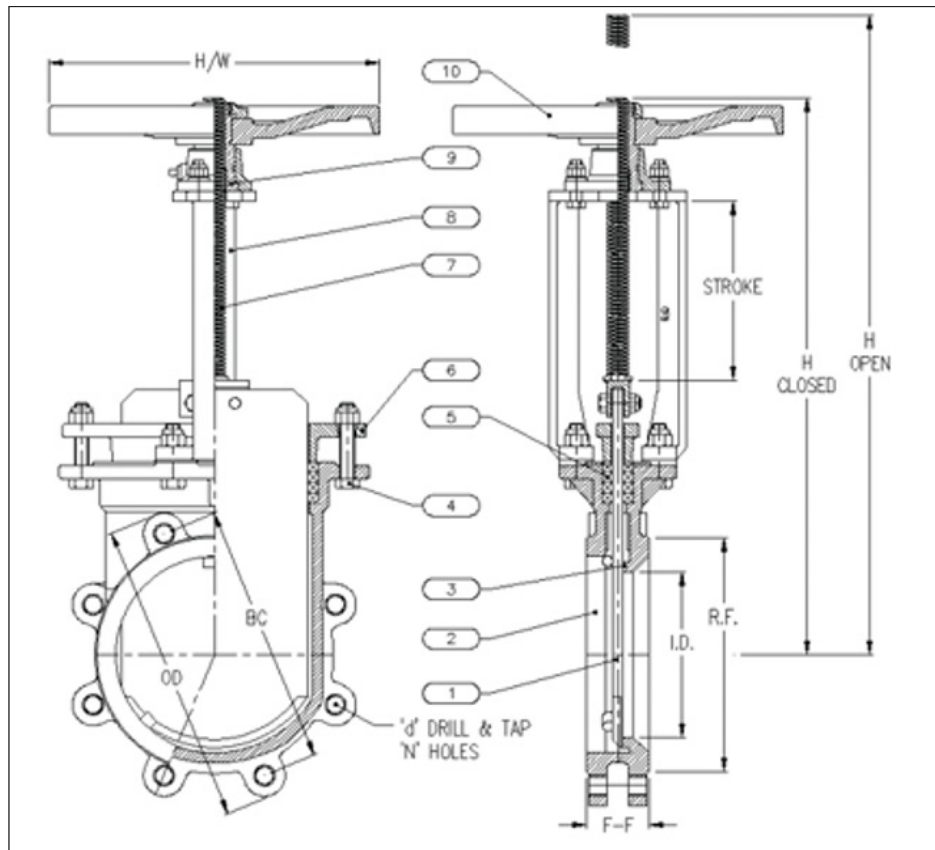
#### 3) VALVE DIFFICULT TO OPERATE

##### SOLUTION:

- a. Lubricate stem and stem nut. Check for improvement.
- b. Loosen packing gland bolts a small amount (not enough to cause a leak around the stem packing). Check for improvement.
- c. If problem persists consult the factory.

# Pratt Figure 93 Knife Gate Valve

## PARTS LIST



PART #	PART	MATERIAL
1	GATE	SS
2	BODY	SS
3	SEAT	SS
4	BOLTS	SS
5	PACKING	TLSP
6	GLAND	SS
7	STEM	SS
8	YOKE	SS
9	STEM NUT	BRONZE
10	HANDWHEEL	DI

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