

April 2009

# Types N301, N310, N350, N401, N410, and N450 Globe and Angle Valves



## GLOBE VALVES



## ANGLE VALVES

Figure 1. N300 and N400 Series Valves



# N300 and N400 Series

## Specifications

SERVICE	INLET AND OUTLET CONNECTIONS	TYPE NUMBER			
		Heavy-Duty Version <sup>(1)</sup>		Economy Version	
		Globe	Angle	Globe	Angle
LP-Gas and NH <sub>3</sub>	1/2 FNPT	N301-04	N401-04	----	----
	3/4 FNPT	N301-06	N401-06		
	1 FNPT	N301-08	N401-08		
	1-1/4 FNPT	N310-10	N410-10		
	1-1/2 FNPT	N310-12	N410-12		
	2 FNPT	N310-16	N410-16		
	3 FNPT	N310-24	N410-24		
	NPS* 3 (DN 80), CL300 RF Flange	N310F-24	N410F-24		
LP-Gas	1/2 FNPT	----	----	N350-04	N450-04
	3/4 FNPT			N350-06	N450-06

\*Nominal pipe size.  
1. For Polytetrafluoroethylene (PTFE) seal disk, add "T" to basic type number, e.g., Type N310T or N410T.

**Maximum Operating Pressure:** 400 psig (27,6 bar)

**Temperature Capabilities:** -20° to 150°F (-29° to 66°C)



### WARNING

Failure to follow these instructions or to properly install and maintain this equipment could result in an explosion and/or fire causing property damage and personal injury or death.

Fisher® equipment must be installed, with federal, state, and local codes and manufacturer's instructions. The installation in most states must also comply with NFPA No. 58 or ANSI K61.1 standards.

Only personnel trained in the proper procedures, codes, standards, and regulations applicable industries should install and service this equipment.

## Introduction

### Scope of the Manual

This instruction manual covers installation and maintenance for Fisher Types N30, N310, N350, N40, N410, and N450 globe and angle valves used on LP-Gas and anhydrous ammonia (NH<sub>3</sub>) service. Polytetrafluoroethylene (PTFE) disks are available. Type numbers may be suffixed for both size and disk material.

## Description



### WARNING

For "Hose End" service, use Fisher N480 Series hose end valves. Excessive cycling of globe and angle valves can cause stem thread failure resulting in uncontrolled gas discharge and personal injury.

Globe and angle valves are used at bulk plants to control gas flow in the piping system, at storage tanks, on trucks, and at pumps or compressors. Their body configuration permits installation in a straight section of pipe (globe body) or where it is desired to make a change in piping direction (angle body).

All valves have a non-restricted, 1/4 FNPT plugged boss in the downstream side of the body. For LP-Gas service, a hydrostatic relief valve (Type H124) or a vent valve can be installed in this outlet.

**Types N301, N310, N401, and N410** – Heavy-duty ductile iron valves for either LP-Gas or NH<sub>3</sub> service. Ranging in size from NPS 1/2 to 3 (DN 15 to 80), each valve has spring-loaded PTFE chevron packing for sealing against leakage.

Ball bearing valve disk construction on NPS 1-1/4 (DN 32) and larger sizes, gives a strong

connection to the stem to protect the disk under back-flow conditions. The ball bearings permit the valve disk to stop rotating as soon as it touches the body seat, minimizing disk wear.

Types N310 and N410 can be supplied with PTFE seat disks instead of synthetic rubber for special service where synthetic rubber is not compatible. When ordering, add "T" to the basic style number such as Type N310T or N410T.



## WARNING

**Types N350 and N450 valves must not be used on anhydrous ammonia service as they contain brass parts.**

**Types N350 and N450** – Economy globe and angle valves for LP-Gas service. With many of the construction features of the Types N310 and N410 valves, these valves can be supplied in NPS 1/2 and 3/4 (DN 15 and 20) sizes. PTFE spring-loaded packing provides an effective seal against leakage within the valve's pressure range.

Valve disk rotation stops as soon as the disk contacts the body seat to help minimize disk wear. Oversize ports in all units give high flow capacity.

## Installation



## CAUTION

**If the valve is to be used in service other than LP-Gas or Anhydrous Ammonia, contact the factory to determine if the valve materials are suitable for the particular service.**

**Flow through the valve must be in the same direction as the flow arrow stamped on the valve.**

Use pipe compound on the male threads of the pipeline. PTFE tape or PTFE pipe dope compound is

recommended for the male threads of the larger valves such as the NPS 2 or 3 (DN 50 or 80) sizes.

Pull the piping into the valve hand tight, and then wrench tighten the piping for approximately two additional turns. Do not install the piping with such extreme torque that the piping can cut threads into the valve. This can cause valve distortion and affect the internal working parts. Larger size valves may require an additional amount of torque to obtain a leak free connection.

After installation, test the inlet and outlet connections and around the stem for leaks using an approved leak detector solution.

## Maintenance

Valves do wear out.

A simple preventative maintenance program for valves will eliminate a lot of potential problems. Fisher recommends these steps be conducted once a month:

1. Regularly inspect the stem and packing for leakage. If leakage occurs replace the packing and check the stem for scratches. Replace the stem if necessary.
2. Regularly inspect the stem and bonnet threads for wear. If the stem has up and down give, when turning or pushing down on the handle, inspect the threads for wear and replace the stem and bonnet as needed. Thread wear will occur on heavily cycled valves.
3. Regularly inspect the seat for tight shutoff. If the valve leaks or requires excessive torque to tighten, replace the disk or disk holder assembly as required.

Only parts manufactured by Fisher should be used in repairing Fisher® Globe and Angle Valves. Refer to Form MCK-1090 Replacement Parts List for available parts and kits.

# N300 and N400 Series

## Parts List

### N300/N400 and N310/N410 Series Globe and Angle Valves

Key	Description	Part Number
	Repair Parts Kit Topwork, Stem, and Packing Assembly - Include keys 2 through 17 completely assembled. Types N300/N400 only	
	NPS 1/2, 3/4, and 1	T12690T0012
	NPS 1-1/4 and 1-1/2	T20838T0012
	NPS 2	T20818T0012
	NPS 3 (DN 80)	T40259T0012
	Stem and Disk Holder Assembly* - Include keys 2 through 7 completely assembled. Type N300/N400 only	
	NPS 1/2, 3/4, and 1	T12592T0012
	NPS 1-1/4 and 1-1/2	T13281T0012
	NPS 2	T13260T0012
	NPS 3 (DN 80)	T20461T0012
1	Body, Ductile iron For N300 Series	
	NPS 1/2	T2039519172
	NPS 3/4	T2032419172
	NPS 1	T1141819172
	For N400 Series	
	NPS 1/2	T2039619172
	NPS 3/4	T2031819172
	NPS 1	T2031919172
	For N310 Series	
	NPS 1-1/4	T4011419172
	NPS 1-1/2	T2034619172
	NPS 2	T2036419172
	NPS 3	T4017119172
	NPS 3 (DN 80)	T8010219172
	For N410 Series	
	NPS 1-1/4	T20647T0012
	NPS 1-1/2	T20628T0012
	NPS 2	T20648T0013
	NPS 3	T4017819172
	NPS 3 (DN 80)	T8010419172
2	Disk Holder, Zinc-plated steel	
	NPS 1/2, 3/4, and 1	T1141324102
	NPS 1-1/4 and 1-1/2	T20823T0012
	NPS 2	T20809T0012
	NPS 3 (DN 80)	T2045824272
3*	Disk, Neoprene (CR)	
	NPS 1/2, 3/4, and 1	T1141403032
	NPS 1-1/4 and 1-1/2	T1144703032
	NPS 2	T1149103032
	NPS 3 (DN 80)	T1195606992
4	Retainer, Zinc-plated steel	
	NPS 1/2, 3/4, and 1	T1141524152
	1 NPS-1/4 and 1-1/2	T1144824102
	NPS 2	T1149024102
5	Nut, Zinc-plated steel	
	NPS 1/2, 3/4, and 1	1L872324122
	NPS 1-1/4 and 1-1/2	T1166328982
	NPS 2	1A353724122
	NPS 3 (DN 80)	T1195524272
6	Stem, 410/416 Stainless steel	
	NPS 1/2, 3/4, and 1	T2039414092
	NPS 1-1/4 and 1-1/2	T20810T0012
	NPS 2	T20810T0012
	NPS 3 (DN 80)	T2045935132

\*Recommended spare parts.

Key	Description	Part Number
7	Ball Bearing, Stainless steel NPS 1/2, 3/4, and 1 NPS 1-1/4, 1-1/2, and 2 (9 required) NPS 3 (DN 80) (18 required)	T1141935022 1B793546202 1B793546202
8	Bonnet, Steel/Ductile iron NPS 1/2, 3/4, and 1 NPS 1-1/4 and 1-1/2 NPS 2 NPS 3 (DN 80)	T1242624102 T2033919172 T2036119172 T2046019172
9	Spring, 302 Stainless steel NPS 1/2, 3/4, and 1 NPS 1-1/4, 1-1/2, and 2 NPS 3 (DN 80)	T1141637022 T1145037022 T1196137022
10*	Male Packing Adaptor, Stainless steel/Aluminum NPS 1/2, 3/4, and 1 NPS 1-1/4, 1-1/2, and 2 NPS 3 (DN 80)	T11421T0012 T11451T0012 T1195809042
11*	Packing Ring, PTFE (2 Required) NPS 1/2, 3/4, and 1 NPS 1-1/4, 1-1/2, and 2 NPS 3 (DN 80)	1C752701012 T1145201012 T1196201012
12*	Female Packing Adaptor, PTFE NPS 1/2, 3/4, and 1 NPS 1-1/4, 1-1/2, and 2	1F124301012 T1145301012
13	Washer, Zinc-plated steel/Carbon steel-plate NPS 1/2, 3/4, and 1 NPS 1-1/4, 1-1/2, and 2	T1142324152 T1145428982
14	Gland, 303/410/416 Stainless steel NPS 1/2, 3/4, and 1 NPS 1-1/4, 1-1/2, and 2 NPS 3 (DN 80)	T1141235132 T1145535132 T2045735132
15*	O-ring, Nitrile (NBR) NPS 1/2, 3/4, and 1 NPS 1-1/4, 1-1/2, and 2 NPS 3 (DN 80)	T12944T0012 T1145606562 T1196306562
16	Slip disk, Carbon steel NPS 1/2, 3/4, and 1 NPS 1-1/4, 1-1/2, and 2 NPS 3 (DN 80)	T1142228992 T1145728992 T1195910062
17*	Body Gasket NPS 1/2, 3/4, and 1 NPS 1-1/4 and 1-1/2 NPS 2 NPS 3 (DN 80)	T1142028992 T1145804022 T1149304022 T1195704022
18	Handwheel, Ductile iron NPS 1/2, 3/4, and 1 NPS 1-1/4, 1-1/2, and 2 NPS 3 (DN 80)	T1145919312 T1145919312 T4017019222
19	Washer, Carbon steel/Zinc-plated steel NPS 1/2, 3/4, and 1 NPS 1-1/4, 1-1/2, and 2 NPS 3 (DN 80)	T1142524152 1C225728982 T1196528982
20	Nut, Carbon steel NPS 1/2 through 2 NPS 3 (DN 80)	T1166328982 1H262224122 T13718T0012
21	Pipe Plug, Carbon steel	
23	Cap Screw (4 Required), Zinc-plated steel NPS 1-1/4, 1-1/2, and 2 (4 required) NPS 3 (DN 80) (4 required)	1H446924052 1N462324052
25	Set Screw, Stainless steel NPS 1-1/4, 1-1/2, and 2 NPS 3 (DN 80)	T13237T0012 T13402T0012
26	Snap Ring, 302 Stainless steel NPS 1-1/4, 1-1/2, and 2	T13259T0012

# N300 and N400 Series

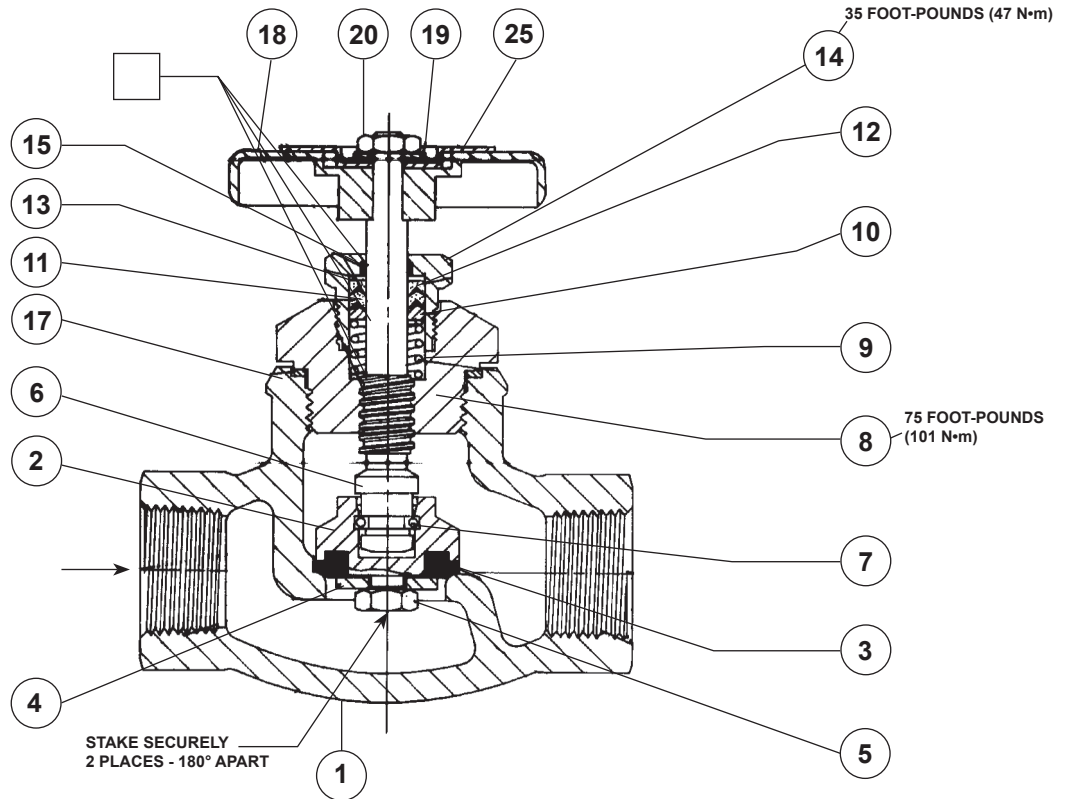


Figure 2. Type N350 Globe Valve Assembly

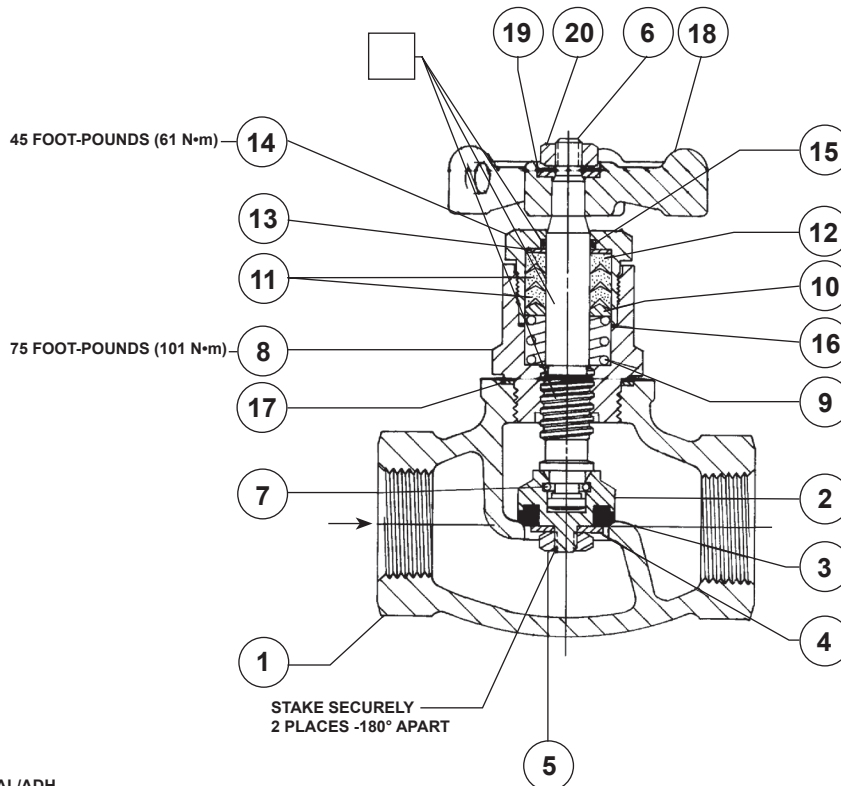
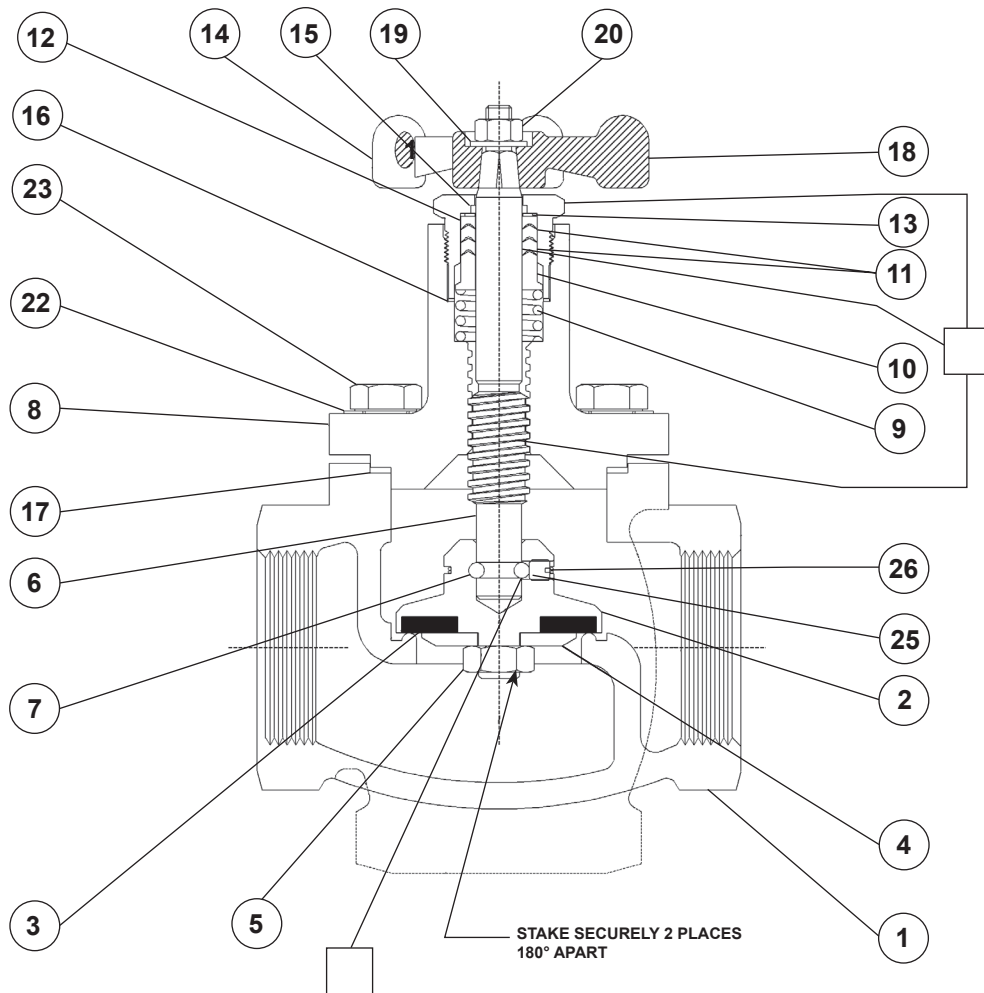


Figure 3. Type N301 Globe Valve Assembly

# N300 and N400 Series



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Figure 4. Types N310/410 Globe Valve Assembly

## Types N350 and N450 Globe and Angle Valves

Key	Description	Part Number	Key	Description	Part Number
	Repair Parts Kit Topwork, Stem, and Packing Assembly - Include keys 2 through 17 completely assembled. NPS 1/2 and 3/4	T12689T0012	3*	Disk, Neoprene (CR)	T1141403032
	Note: Key numbers 2, 6, and 7 are available only as part of the above parts kit.		4	Retainer, Zinc-plated steel	T1141524152
1	Body, Ductile iron For N350 Series NPS 1/2 NPS 3/4 NPS 1	T2039519172 T2032419172 T1141819172	5	Nut, Zinc-plated steel	1L872324122
	For N450 Series NPS 1/2 NPS 3/4 NPS 1	T2039619172 T2031819172 T2031919172	6	Stem, Bronze	T2039414092
2	Disk Holder, Zinc-plated steel	T1141324102	7	Snap Ring, 302 Stainless steel	T1141935022
			8	Bonnet, Brass	T1160314012
			9	Spring, 302 Stainless steel	T1160237022
			10*	Male Packing Adaptor, Aluminum	T1160709012
			11*	Packing Ring, PTFE	T1160601012
			12*	Female Packing Adaptor, PTFE	T1160501012
			13	Washer, Carbon steel-plate	T1160828982
			14	Gland, 416 Stainless steel	T1160435132
			15*	O-ring, Nitrile (NBR)	T12946T0012
			17*	Body Gasket, Aluminum	T1142028992
			18	Handwheel	T1210908012
			19	Washer, Carbon steel-plate	1B416728982
			20	Nut, Carbon steel	T1209728982
			21	Pipe Plug, Carbon steel	T13718T0012

\*Recommended spare parts.

# N300 and N400 Series

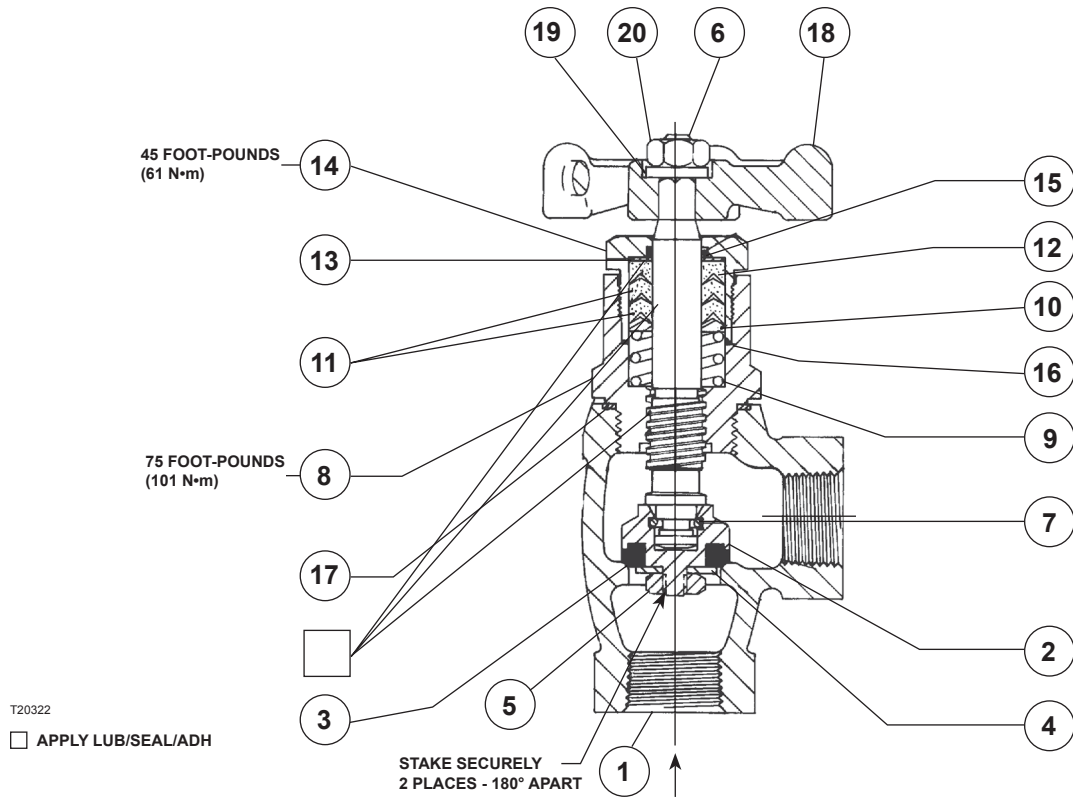


Figure 5. Type N400 Angle Valve Assembly

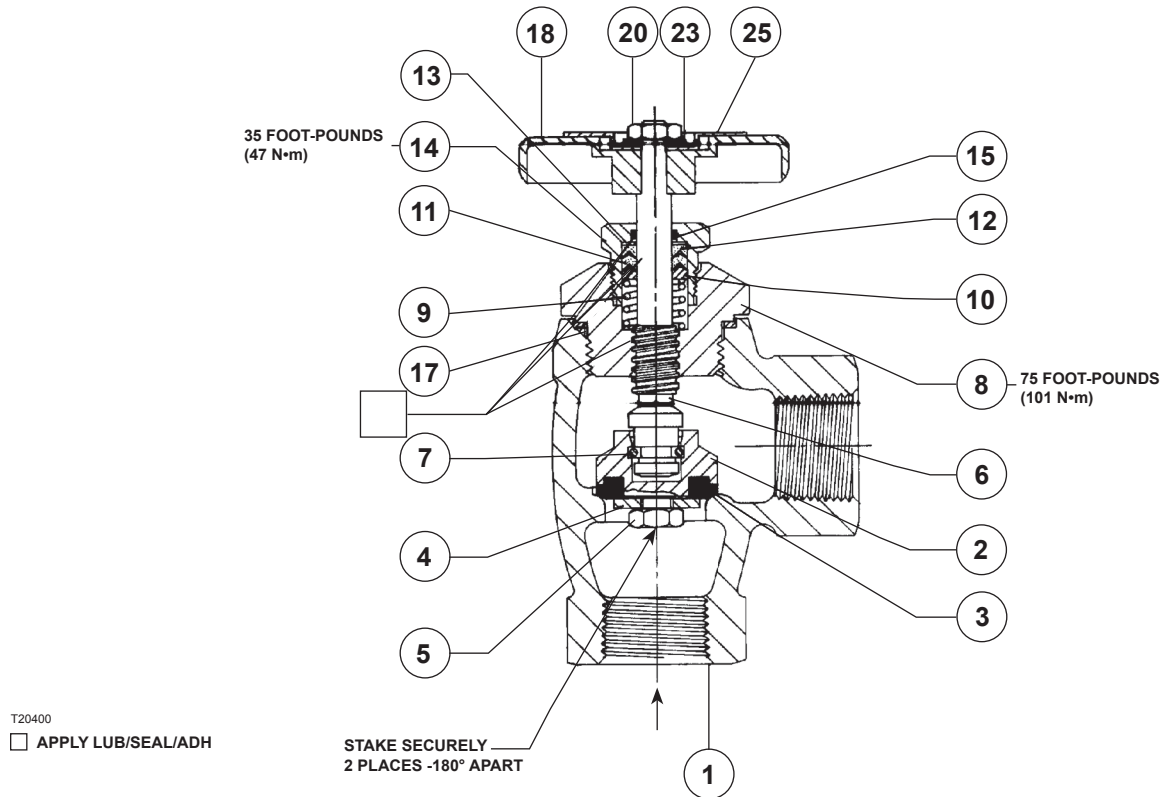


Figure 6. Type N450 Angle Valve Assembly

# N300 and N400 Series

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## LP-Gas Equipment

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For further information visit [www.emersonprocess.com/regulators/lp](http://www.emersonprocess.com/regulators/lp)

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