

**MPI**

**MCWANE**  
PLANT & INDUSTRIAL

**RESILIENT SEATED  
GATE VALVE**  
2"-24" AWWA C509 & C515

# **INSTALLATION & OPERATION MANUAL**

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# INTRODUCTION

Resilient Seated Gate Valves (RSGV) were introduced to the waterworks industry in the 1980's and became a dominant preference for use in distribution systems. This manual will provide you with the information needed to properly install, operate, and maintain the valve and to provide long service life. RSGVs are available as a Full Wall (FW) or Reduced Wall (RW) resilient seated valve and comply with AWWA C509 or C515 standards

The RSGV contains a wedge fully encapsulated with EPDM rubber that is permanently bonded to the wedge and meets ASTM D249. The RSGV body, bonnet, and stuffing plate are coated with fusion bonded epoxy (FBE) and applied in accordance with AWWA C550 and are ANSI / NSF 61/372 certified.

Optional configurations also include a Non-Rising Stem (NRS) or Outside Screw & Yoke (OS&Y). RSGVs also can be ordered with a Spur or Bevel Gear.

# RECEIVING & STORAGE

Inspect valves upon receipt to ensure correct material, quantity, and any optional equipment has been received. Also inspect all received equipment for any damage which may have occurred during shipment. Contact the McWane Plant & Industrial team to report any issues with materials received. RSGV requires no routine maintenance except that the valve must be operated at least once a year to prevent stem binding due to rust and encrustation.

Unload all valves safely to protect both the materials and workers. Do not allow lifting lugs, slings, or chains to encounter the valve wedge seating surface areas. Store valves indoors with the valve in the fully closed position to prevent damage to the seating surface by foreign material. If outdoor storage is required valves need to be protected from weather and foreign materials. In colder climates where freezing may occur, remove any water from the valve interior and close valve before storage to prevent cracking of the valve casting and deterioration of the resilient seated EPDM.

# INSTALLATION

**WARNING:** *Installation of valves should be performed by experienced installers. Valves should never be used as structural supports and movement into place. Valves are heavy and may include accessories or bolt on pieces which should be handled with caution.*

**NOTE:** *BEFORE INSTALLING THE VALVE:*

- 1. Wipe away any dirt and grit from the inside of the valve*
- 2. Flush the line completely.*
- 3. Check the operation of the valve – full open to full closed when installing the valve.*
- 4. Cover the valve with burlap or similar material while backfilling to protect the coating after installing the valve.*
- 5. Open the valve about five turns and allow the flow an opportunity to flush any trash and debris from the line.*

It is recommended that valves be installed into piping system in accordance with AWWA M-11 to prevent any undue piping stress, deflection or bending that may affect the performance of the valve.

- 1.** Prior to installation, check that valve end joints are clean. Check for damage to the valve. Open and close valve to insure proper operation. Close wedge before placing valve in trench or line.
- 2.** Handle valve carefully. Do not drop into position. Do not sling through the port opening.
- 3.** Prepare pipe ends according to manufacturer's instructions. Install valve per proper methods according to end joint type. All piping should be properly supported to avoid line stress on the valve. Do not use the valve as a jack to force a pipeline into position.
- 4.** A valve box or vault should be provided for each valve used in buried service application. These should be installed such that no load is transferred to the valve.
- 5.** Before pressurization of the pipeline and valve, all pressure containing bolting (cover, follower plate, end connection) should be inspected for adequate tightness (usually 90 ft. lbs.). *(CONT'D)*

# MAINTENANCE

The RSGV requires no routine maintenance except that the valve must be operated at least once a year to prevent stem binding due to rust and encrustation.

If the valve has not been abused, the stem seal/packing is the only item that might ever be replaced, and instructions are included below. There have been occasions where a disc has required replacement and instructions are included but this should not be considered normal maintenance.

## STEM SEAL PROCEDURES

### NON-RISING STEM (NRS) VALVES

Before beginning, contact McWane Plant & Industrial or an authorized distributor to obtain:

1. Stem sealing O-rings - (2) req'd
2. One stuffing box gasket / O-ring - (1) req'd

### NRS STEM SEAL REPLACEMENT PROCEDURE

1. Operate the valve to its full position (apply approx. 50 ft-lbs. torque for valves 3" and smaller, 100 ft-lbs. for valves 4" and larger)
2. Remove the nuts retaining the stuffing box
3. Separate the stuffing box and the cover (The seal between the cover and the stuffing box may require the use of a small pry bar or a soft faced hammer).
4. Remove and replace the O-rings. Wipe all grit and dirt from the bore of the stuffing box and stem. Lubricate the bore of the stuffing box, the stem, and the stem seal O-rings before installing the stem seal O-rings. Two O-rings on the shank of the stem and One O-ring/gasket seal on the bottom of the stuffing box. It may be desirable to use a small amount of a cyanoacrylate adhesive to retain the O-ring during reinstallation. (I.e. Permabond 910, Loctite 404, etc.)
5. Replace the stuffing box. Tighten all bolts uniformly and carefully so that the stuffing box is flat and snug against the cover and the gap between the cover and stuffing box does not exceed 0.015" and uniform (normally there should be no gap). Check the stem for binding but operating the valve.

6. Buried valves should be pressurized before backfilling.
7. With valve in open position, the entire system should be thoroughly flushed to clean the system. Debris in the valve could prevent valve from closing or possibly damage the resilient material on the wedge.
8. Upon completion of the installation, gate valve location, size, type, date of installation, number of turns to open, direction of opening, and any other special information should be entered on permanent records.

## OPERATION

The operation of a RSGV is not like that of a double disc gate valve. In normal circumstances less operating torque is required as the resilient wedge valve just closes, or on opening. Valve operators should adhere to the "Turns to Fully Open RSGV" listed in the table below.

Turns to Fully Open RSGV			
Model KS-FW (C509) and KS-RW (C515)			
Size	without Gearing	with Spur Gear	with Bevel Gear
2"	6-1/2	N/A	N/A
2-1/2"	8	N/A	N/A
3"	10	N/A	N/A
4"	13-1/2	N/A	N/A
6"	19-1/2	N/A	N/A
8"	25-1/2	N/A	N/A
10"	31-1/2	N/A	N/A
12"	37-3/4	N/A	N/A
14"	52	104	104
16"	52	104	104
18"	64	192	192
20"	64	192	192
24"	76	228	228
30"	98	588	588
36"	114	684	684
*42"	100	800	800
*48"	100	800	800
*54"	100	800	800

**\*2TPI Stem Threads**

## **OUTSIDE SCREW & YOKE (OS&Y)**

Before attempting to repack the valve, first attempt to stop the leakage by adjusting (tightening) the brass nuts on the packing gland. Tighten both nuts snugly and uniformly to about 60 ft-lb. The switch groove should be above the packing when brass nuts are tightened. Verify that the switch groove on the stem has smooth corners. Sharp corners exist on some older valves. File as necessary. Operate the valve a time or two to determine if the leakage has stopped. Before beginning repacking, contact McWane Plant & Industrial or an authorized distributor to obtain packing (packing supplied by McWane Plant & Industrial may come in one continuous coil or in segments).

### **OS&Y PACKING PROCEDURE**

1. Operate the valve to its fully open position (apply approx. 50 ft-lbs. torque for valves 3" and smaller, 100 ft-lbs. for valves 4" and larger)
2. Verify that the switch groove on the stem has smooth corners. Sharp corners exist on some older valves. File as necessary.
3. Remove the nuts [Item R8] retaining the packing gland.
4. Lift the packing gland. If necessary, lever the packing gland with a crowbar or similar tool.
5. Remove and replace the packing - (if the packing is in multiple or individual rings, be sure to stagger the adjoining ends from one layer to the next). Although not mandatory, it is recommended to use two threaded rods the same diameter as the packing gland bolts and about 6" long to set the packing. Remove the packing gland bolts and replace them with threaded rods through the packing gland and place nuts on the free ends of the threaded rods. Tighten the nuts with a deep well socket until all leakage stops. Exchange the threaded rods for the actual packing gland bolts/nuts (one side and then the other).
6. Reinstall the packing gland bolts and nuts, tightening the nuts uniformly, one side then the other so that the packing gland pulls down evenly. Tighten the nuts until all leakage past the packing stops. Operate the valve through several complete open/close cycles to check for stem binding and to be certain that there is no leakage.

## **OS&Y PACKING GLAND REPLACEMENT PROCEDURE**

1. Remove the packing gland fasteners.
2. Remove the cover fasteners.
3. Rotate the hand wheel in "valve closing direction". This action will allow the entire cover assembly to travel upward until the threads of the yoke nut completely disengage the threads on the stem.
4. Carefully, lift the cover assembly [cover assembly includes Handwheel Hold Down Nut, Handwheel, Upper Thrust Washer (sizes 3" thru 12"), Lower Thrust Washer, Yoke Nut, Packing Bolts & Nuts, Packing Gland, Packing] up and completely off stem [item R14].
5. Remove the old packing and discard the old packing gland.
6. Position the new packing gland into the packing well of the cover. The packing gland is not meant to be secured at this point.
7. Carefully, reposition the cover assembly over the stem until the end of the stem contacts the starting threads of the yoke nut.
8. Rotate the hand wheel in "valve opening direction". This action will allow the entire cover assembly to travel downward until the cover assembly rests on the top of the body flange. --- Make sure that the cover O-ring is not damaged and is in position.
9. Bolt the cover to the body, using an alternating tightening pattern, assuring that the cover is down flush to the body (the maximum gap should not exceed 0.015" and should be uniform (normally there should be no gap). --- see last page for bolt torque recommendations.
10. Refer to the OS&Y Packing Procedure.

## RESILIENT WEDGE REPLACEMENT

1. It is necessary to take the valve fully out of service to replace the wedge, but it is not necessary to remove the valve from the line.
2. It is very unusual to have to replace a wedge. Discs normally can be expected to last for many years and thousands of cycles. Before replacing a wedge, first check to see if the operation personnel are closing the valve tightly. If the valve is closed tightly, open the valve about five turns and attempt to cause the maximum flow through the valve to flush any debris from the seating area. If it is necessary to replace a wedge suspect that there is some systematic problem causing the wedge failure such as stones in the line.
3. Before attempting to replace the disc, contact McWane Plant & Industrial or an authorized distributor to obtain:
  - A. Cover O-Ring
  - B. Wedge

## WEDGE REPLACEMENT PROCEDURE

1. Partially open the valve.
2. Remove the cap (bonnet) bolts and nuts.
3. Lift the cap, stem, stuffing box, disc assembly from the body.
4. Remove and replace the wedge.
5. Replace the cap sealing O-ring (not always necessary) – Retain the O-ring with lubricating grease (Clarion Food Machinery Grease, No. 2). Lubricate stem with same grease.
6. Replace the cap, stem, stuffing box, disc assembly – taking care to start the disc into the guides cast into the body.
7. Place the bolts through the holes in the body and cap – taking care to line the bolt holes up.

8. Snug the cap bolts finger tight and then tighten them. First tighten two bolts diagonally opposite with wrist torque. Then go to another bolt opposite the first two and tighten. Then work around the bolt pattern tightening the bolts.
9. Operate the valve fully open to fully close before backfilling.

## TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
<b>Joint leakage</b>	- Bolt tension relaxing	Tighten bolts
	Foreign material caught in seat	Operate valve to flush out debris
<b>Seat leakage</b>	Seat is dirty / corroded	Flush or disassemble & clean
	Seat is damaged	Inspect- repair or replace.
	Bolts loose	Tighten bolts
<b>Leak Past Stem</b>	O-rings worn / damaged (NRS)	Inspect / Replace
	Packing worn / damaged (OS&Y)	Inspect / Replace

## PARTS & SERVICE

Parts and service are available from your local representative or the factory. For availability and pricing of spare parts please contact the MPI sales team:

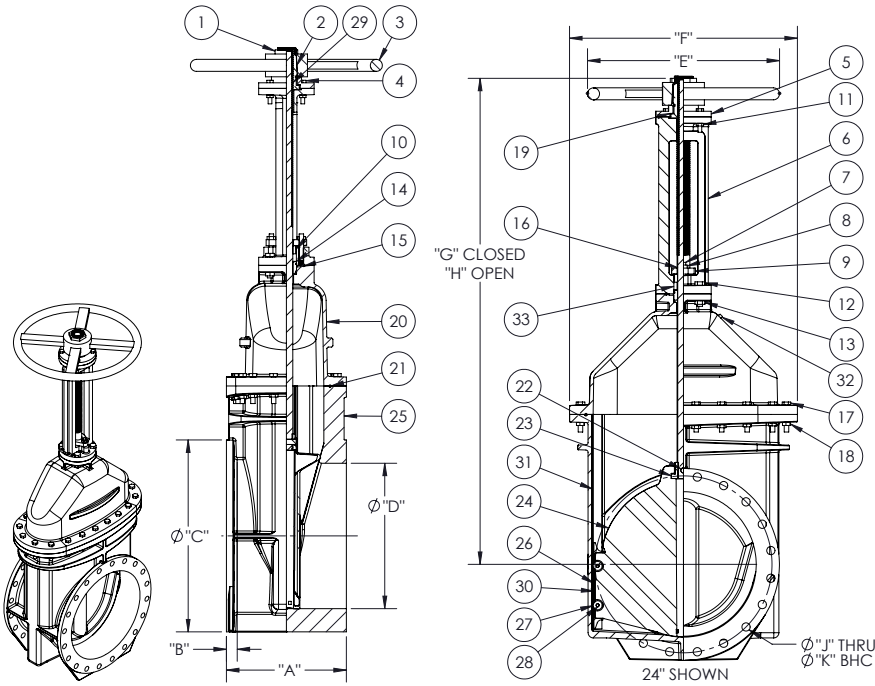
### McWane Plant & Industrial

www.mcwanepi.com

Phone: 866-924-8674

Email: sales@mcwanepi.com

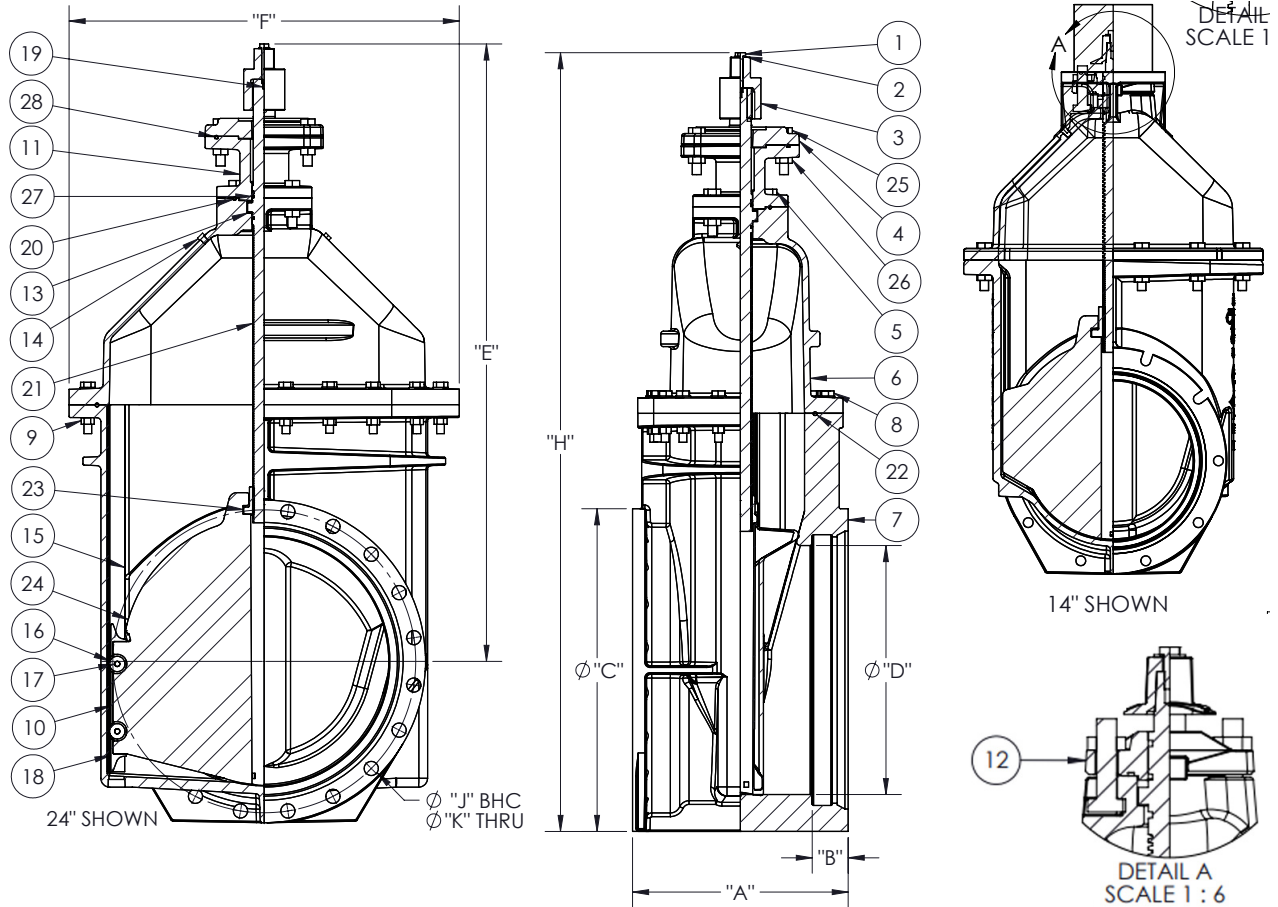
# OS&Y RSGV WITH FLANGED ENDS, SIZE 2" - 24"



DIMENSIONS												
SIZE	A	B	C	D	E	F	G	H	J	K	No. Turns to Open	Weight (lbs.)
2	7"	5/8"	6"	2"	7-1/4"	6"	13-3/32"	15-7/8"	5/8" x 4	4-3/4"	6-1/2	42.10
2-1/2	7-1/2"	11/16"	7"	2-1/2"	7-1/4"	7"	13-7/8"	16-3/8"	5/8" x 4	5-1/2"	8	52.00
3	8"	3/4"	7-1/2"	3"	10"	7-1/2"	15-5/8"	18-7/8"	5/8" x 4	6"	10	67.14
4	9"	15/16"	9"	4-1/4"	10"	9"	18-1/4"	22-3/4"	5/8" x 4	7-1/2"	13-1/2	91.85
6	10-1/2"	1"	11"	6-1/4"	12"	11-3/8"	23-3/4"	30-1/8"	3/4" x 8	9-1/2"	19-1/2	140.67
8	11-1/2"	1-1/8"	13-1/2"	8-1/4"	14"	13-1/2"	29-1/4"	37-3/4"	3/4" x 8	11-3/4"	25-1/2	212.60
10	13"	1-3/16"	16"	10-1/4"	18"	16"	35-3/8"	45-3/4"	7/8" x 12	14-1/4"	31-1/2	368.48
12	14"	1-1/4"	19"	12-1/4"	18"	19"	40-5/8"	53-1/8"	7/8" x 12	17"	37-3/4	479.41
14	15"	1-3/8"	21-1/16"	14-1/4"	22"	26-11/16"	59-3/4"	74-3/4"	1" x 12	18-3/4"	52	670.00
16	16"	1-7/16"	23-1/2"	16-1/4"	22"	26-11/16"	59-3/4"	74-3/4"	1" x 16	21-1/4"	52	735.00
18	17"	1-9/16"	25"	18-1/4"	24"	32-1/4"	71-1/4"	92-9/16"	1-1/4" x 16	22-3/4"	64	1100
20	18"	1-11/16"	27-1/2"	20-1/4"	24"	32-1/4"	67-3/8"	94-3/8"	1-1/4" x 20	25"	64	1325
24	20"	1-7/8"	32"	24-1/4"	32"	38"	81-3/8"	110-5/8"	1-3/8" x 20	29-1/2"	88	1900

PARTS LIST		
SIZE	DESCRIPTION	MATERIAL
1	Hold Down Nut	Bronze ASTM B584 C87850 / C57610 (2"-12")
		Bronze ASTM B584 C83600 (14"-24")
2	Yoke Nut	Bronze ASTM B584 C86700 (2"-12")
		Bronze ASTM B584 C83600 (14"-24")
3	Handwheel	Ductile Iron ASTM A536 70-50-05 (2"-12")
		Gray Iron ASTM A126 Class B (14"-24")
4	Hex Cap Screw	ZN A307 Grade B / ASTM F593 S30400 / S31600
5	Adapter (14"-24")	Gray Iron ASTM A126 Class B
6	Yoke	Ductile Iron ASTM A536 70-50-05 (2"-12")
		Gray Iron ASTM A126 Class B (14"-24")
7	Stud (14"-24")	ASTM F593 S30400 / S31600
8	Hex Nut	ZN A307 Grade B / ASTM F593 S30400 / S31600
9	Follower Plate (14"-16")	Gray Iron ASTM A126 Class B
10	Packing Gland	Ductile Iron ASTM A536 70-50-05 (2"-12")
		Bronze ASTM B584 C83600 (14"-24")
11	Hex Nut	ZN A307 Grade B / ASTM F593 S30400 / S31600
12	Hex Cap Screw	GR 2 ZN SAE J429 / 304SS ASTM 18-8SS
13	Hex Nut	ZN A307 Grade B / ASTM F593 S30400 / S31600
14	Bushing (14"-24")	ZN A307 Grade B / ASTM F593 S30400 / S31600
15	Yoke O-Ring	Buna-N ASTM D2000 (2"-12")
		EPDM (14"-24")
16	Stem	304SS ASTM A276 S30400 / 316SS ASTM A276 S31600 / ECO Brass ASTM B371 C69300 / Silicon Bronze "A" (Everdur) ASTM B98 C65500 (2"-12")
		304SS ASTM A276 S30400 / 316SS ASTM A276 S31600 / Silicon Bronze "A" (Everdur) ASTM B98 C65500 (14"-24")
		304SS ASTM A276 S30400 / 316SS ASTM A276 S31600 / ECO Brass ASTM B371 C69300 / Silicon Bronze "A" (Everdur) ASTM B98 C65500 (2"-12")
		304SS ASTM A276 S30400 / 316SS ASTM A276 S31600 / ECO Brass ASTM B371 C69300 / Silicon Bronze "A" (Everdur) ASTM B98 C65500 (14"-24")
		304SS ASTM A276 S30400 / 316SS ASTM A276 S31600 / Silicon Bronze "A" (Everdur) ASTM B98 C65500 (14"-24")
17	Hex Cap Screw	ZN A307 Grade B / ASTM F593 S30400 / S31600
18	Hex Nut	ZN A307 Grade B / ASTM F593 S30400 / S31600
19	Flat Washer	ZN A307 Grade B / ASTM F593 S30400 / S31600
20	Cover	Ductile Iron ASTM A536 70-50-05 (2"-12")
		Ductile Iron ASTM A536 65-45-12 (14"-24")
21	Cover O-Ring	Buna-N ASTM D2000 (2"-12")
		EPDM (14"-24")
22	Stem O-Ring	Buna-N ASTM D2000 (2"-12")
		EPDM (14"-24")
23	Stem Nut	Bronze ASTM B584 CDA 844 (2"-12")
		Bronze ASTM B584 C87610 / Bronze ASTM B584 C87850 / Bronze ASTM B763 C99500 (NDZ) (14"-20")
		Bronze ASTM B584 C83600 (24")
24	Wedge	Ductile Iron ASTM A584 70-50-05 & EPDM (2"-12")
		Ductile Iron ASTM A536 65-45-12 & EPDM (14"-24")
25	Body-Flanged Type	Ductile Iron ASTM A584 70-50-05 (2"-12")
		Ductile Iron ASTM A536 65-45-12 (14"-24")
26	Scraper (24")	Bronze ASTM B584 C83600
27	Roller (24")	Bronze ASTM B584 C83600
28	Pin (24")	Stainless Steel AISI 303
29	Square Key (18"-24")	GR 2 ZN ZAE J429
30	Wedge Cap (18"-20")	Delrin
31	Track (24")	Stainless Steel AISI 316
32	Pipe Plug (14"-24")	18-8SS
33	Packing	Braided, Lubricated (Non-Asbestos)

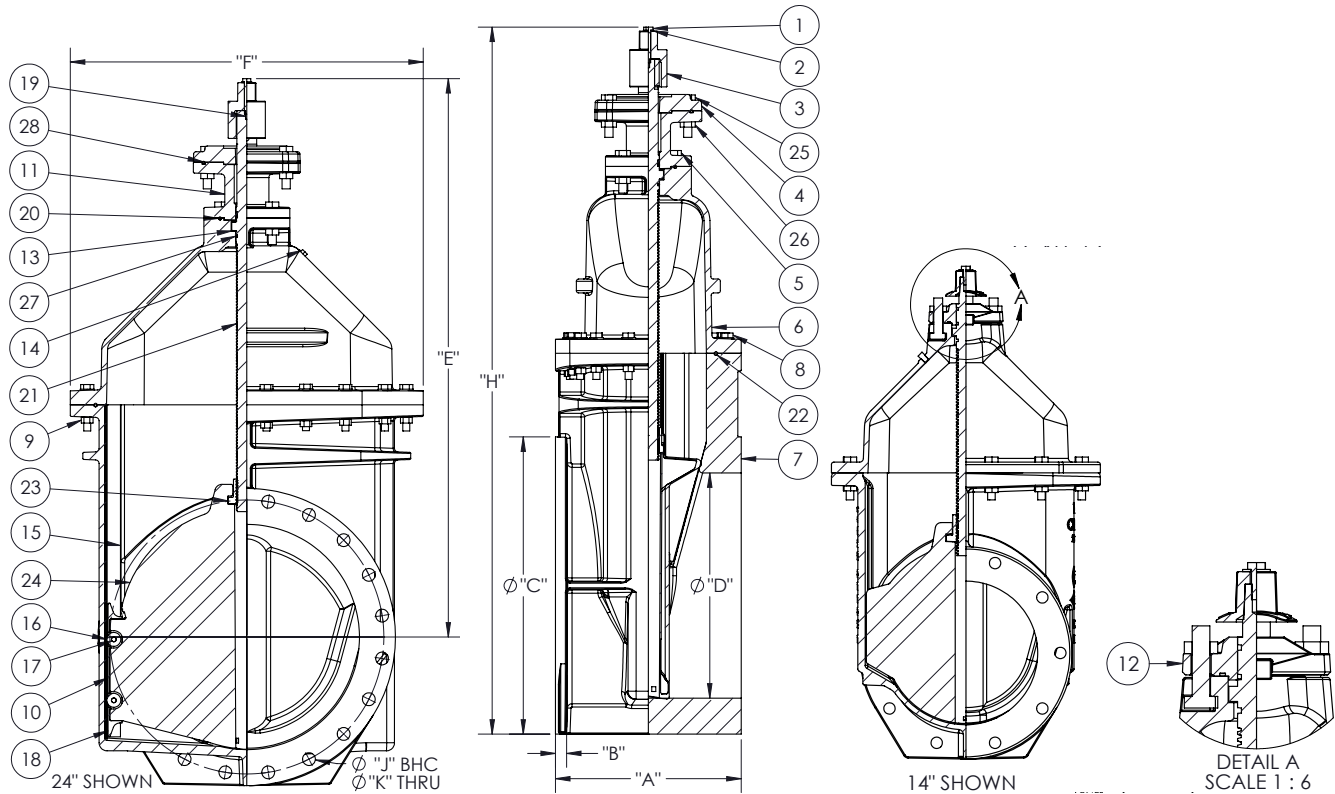
# NRS RSGV WITH MECHANICAL JOINTS, SIZE 2" - 24"



DIMENSIONS												
SIZE	A	B	C	D	E	F	H	J	K	No. Turns to Open	Weight (lbs.)	
2	8-1/4"	2-1/2"	4-1/2"	2"	10-7/8"	6"	14-7/16"	4-3/4"	5/8" x 2	6-1/2	37.14	
3	8-1/2"	2-1/2"	7-3/4"	3"	12-3/8"	7-1/2"	17"	6-1/8"	5/8" x 4	10	58.00	
4	9-1/2"	2-1/2"	9-1/8"	4-1/4"	14-3/4"	9"	19-3/4"	7-1/2"	3/4" x 4	13	69.50	
6	10-1/2"	2-1/2"	11-1/8"	6-1/4"	19"	11-3/8"	24-5/16"	9-5/8"	3/4" x 6	19	110.00	
8	13-1/8"	2-1/2"	13-1/8"	8-1/4"	22-1/2"	13-1/2"	29-11/16"	11-3/4"	3/4" x 6	25	164.00	
10	15-1/2"	2-1/2"	15-1/2"	10-1/4"	26-1/2"	16"	34-1/2"	14"	3/4" x 8	31	287.00	
12	16"	2-5/8"	18"	12-1/4"	30"	19"	39"	16"	3/4" x 8	37	362.00	
14	17"	3-1/2"	20-1/4"	14-1/4"	38-3/4"	26-11/16"	48-1/2"	18-3/4"	3/4" x 10	52	650.00	
16	17"	3-1/2"	22-1/2"	16-1/4"	37-3/4"	26-11/16"	48-5/8"	21"	3/4" x 12	52	720.00	
18	18-3/4"	3-1/2"	24-3/4"	18-1/4"	57-1/16"	32-1/4"	68-13/16"	23-1/4"	7/8" x 12	64	1250.00	
20	18"	3-1/2"	27"	20-1/4"	56-1/4"	32-1/4"	69-3/8"	25"-1/2"	7/8" x 14	64	1325.00	
24	20"	3-1/2"	32"	24-1/4"	60-1/16"	38"	76-1/16"	29-1/2"	3/4" x 16	88	1700.00	

PARTS LIST		
SIZE	A	B
1	Bolt	GR 2 ZN SAE J429
2	Washer	GR 2 ZN SAE J429
3	OP Nut	Grey Iron ASTM A126 Class B
4	Adaptor Plate (18"-24")	Ductile Iron ASTM A536 70-50-05
5	Hex Head Bolt	GR 2 ZN SAE J429 / ASTM F593 S30400/S31600
6	Cover	Ductile Iron ASTM A536 70-50-05
7	Body	Ductile Iron ASTM A536 70-50-05
8	Hex Head Bolt	GR 2 ZN SAE J429 / ASTM F593 S30400/S31600
9	Hex Nut	GR 2 ZN SAE J429 / ASTM F593 S30400/S31600
10	Wedge Cover (18"-20")	Delrin
11	Extension (18"-24")	Ductile Iron ASTM A536 70-50-05
12	Stuffing Box (2"-16")	Ductile Iron ASTM A536 70-50-05
13	Thrust Washer	Delrin
14	Pipe Plug (14"-24")	18-8SS
15	Track (24")	AL Bronze ASTM B148 C95400
16	Roller (24")	Copper Alloy ASTM B584 C95400
17	Pin (24")	316 Stainless Steel
18	Scraper (24")	Copper Alloy ASTM B584 C95400
19	Square Key (18"-24")	GR 2 ZN SAE J429
20	O-Ring	EPDM
21	Stem	Manganese Bronze ASTM B584 C86700 / 304SS ASTM A276 S30400 / 316SS ASTM A276 S31600 / NDZ B763 C99500 (2"-12") Manganese Bronze ASTM B584 C86200 / 304SS ASTM A276 S30400 / 316SS ASTM A276 S31600 / NDZ B763 C99500 (14"-24")
22	O-Ring	EPDM
23	Stem Nut	Manganese Bronze ASTM B584 C86700 (2"-12") Copper Alloy ASTM B584 C87850 (14"-24")
24	Wedge	Ductile Iron ASTM A536 70-50-05 / EPDM Rubber
25	Ind. Post Plate Hex Bolts	ASTM F593 S30400
26	Ind. Post Plate Hex Nuts	ASTM F594 S30400
27	Stem O-Ring	EPDM
28	Ind. Post Plate O-Ring	EPDM

# NRS RSGV WITH FLANGED ENDS, SIZE 2" - 24"



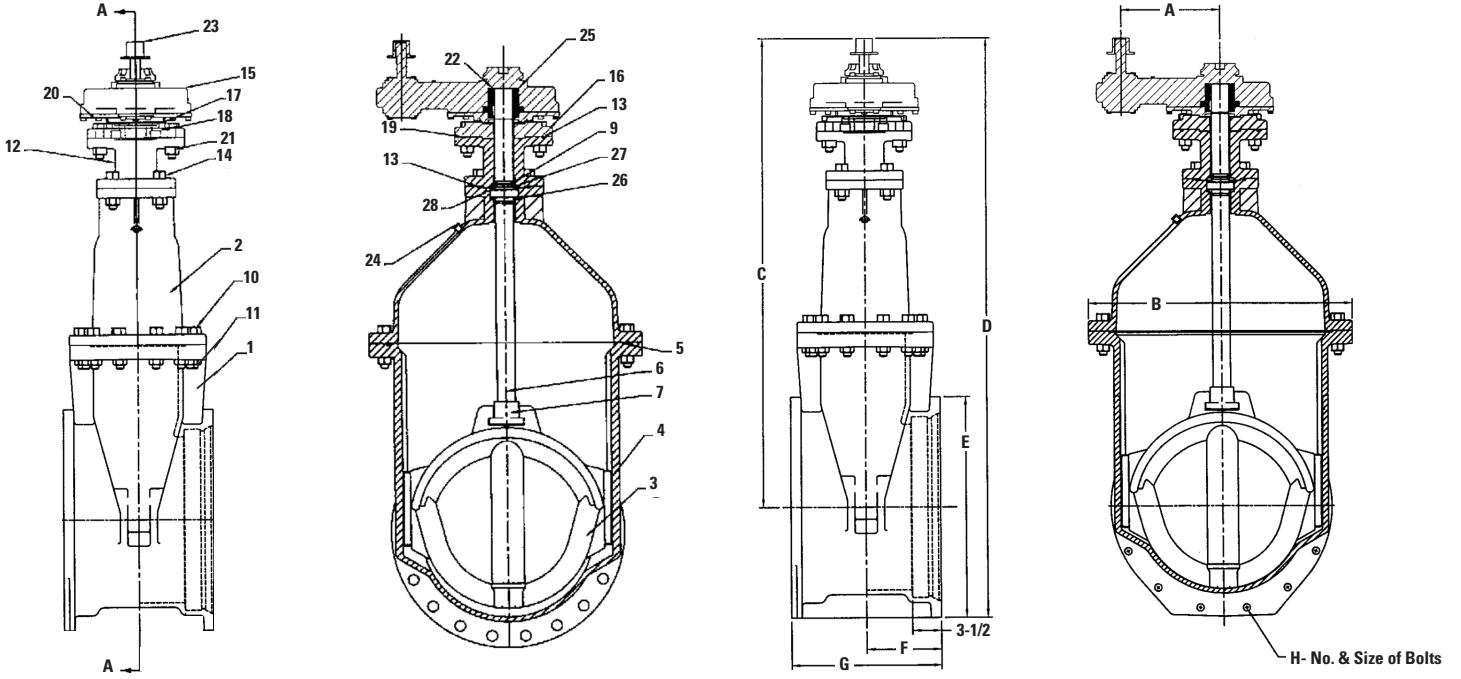
DIMENSIONS											
SIZE	A	B	C	D	E	F	H	J	K	No. Turns to Open	Weight (lbs.)
2	7"	5/8"	6"	2"	11-7/16"	6"	14-7/16"	4-3/4"	5/8" x 4	6-1/2	40.85
2-1/2	7-1/2"	11/16"	7"	2-1/2"	12-1/16"	7"	15-9/16"	5-1/2"	5/8" x 4	8	50.53
3	8"	3/4"	7-1/2"	3"	12-3/8"	7-1/2"	16-15/16"	6"	5/8" x 4	10	79.29
4	9"	15/16"	9"	4-1/4"	14-3/4"	9"	20-1/4"	7-1/2"	5/8" x 4	13	101.75
6	10-1/2"	1"	11"	6-1/4"	19"	11-3/8"	24-1/8"	9-1/2"	3/4" x 8	19	139.04
8	11-1/2"	1-1/8"	13-1/2"	8-1/4"	22-1/2"	13-1/2"	29-1/2"	11-3/4"	3/4" x 8	25	208.05
10	13"	1-3/16"	16"	10-1/4"	26-1/2"	16"	34-1/2"	14-1/4"	7/8" x 12	31	339.52
12	14"	1-1/4"	19"	12-1/4"	30"	19"	39-1/2"	17"	7/8" x 12	37	406.78
14	15"	1-3/8"	21-1/16"	14-1/4"	38-5/16"	26-11/16"	49"	18-3/4"	1" x 12	52	675.00
16	16"	1-7/16"	23-1/2"	16-1/4"	37-5/16"	26-11/16"	49-1/8"	21-1/4"	1" x 16	52	720.00
18	17"	1-9/16"	25"	18-1/4"	56-1/16"	32-1/4"	68-9/16"	22-3/4"	1-1/4" x 16	64	1100.00
20	18"	1-11/16"	27-1/2"	20-1/4"	56-1/4"	32-1/4"	70"	25"	1-1/4" x 20	64	1325.00
24	20"	1-7/8"	32"	24-1/4"	60-1/8"	38"	76-1/8"	29-1/2"	1-3/8" x 20	88	1732.00

PARTS LIST		
SIZE	A	B
1	Bolt	GR 2 ZN SAE J429
2	Washer	GR 2 ZN SAE J429
3	OP Nut	Grey Iron ASTM A126 Class B
4	Adaptor Plate (18"-24")	Ductile Iron ASTM A536 70-50-05
5	Hex Head Bolt	GR 2 ZN SAE J429 / ASTM F593 S30400/S31600
6	Cover	Ductile Iron ASTM A536 70-50-05
7	Body	Ductile Iron ASTM A536 70-50-05
8	Hex Head Bolt	GR 2 ZN SAE J429 / ASTM F593 S30400/S31600
9	Hex Nut	GR 2 ZN SAE J429 / ASTM F593 S30400/S31600
10	Wedge Cover (18"-20")	Delrin
11	Extension (18"-24")	Ductile Iron ASTM A536 70-50-05
12	Stuffing Box (2"-16")	Ductile Iron ASTM A536 70-50-05
13	Thrust Washer	Delrin
14	Pipe Plug (14"-24")	18-8SS
15	Track (24")	AL Bronze ASTM B148 C95400
16	Roller (24")	Copper Alloy ASTM B584 C95400
17	Pin (24")	316 Stainless Steel
18	Scraper (24")	Copper Alloy ASTM B584 C95400
19	Square Key (18"-24")	GR 2 ZN SAE J429
20	O-Ring	EPDM
21	Stem	Manganese Bronze ASTM B584 C86700 / 304SS ASTM A276 S30400 / 316SS ASTM A276 S31600 / NDZ B763 C99500 (2"-12") Manganese Bronze ASTM B584 C86200 / 304SS ASTM A276 S30400 / 316SS ASTM A276 S31600 / NDZ B763 C99500 (14"-24")
22	O-Ring	EPDM
23	Stem Nut	Manganese Bronze ASTM B584 C86700 (2"-12") Copper Alloy ASTM B584 C87850 (14"-24")
24	Wedge	Ductile Iron ASTM A536 70-50-05 / EPDM Rubber
25	Ind. Post Plate Hex Bolts	ASTM F593 S30400
26	Ind. Post Plate Hex Nuts	ASTM F594 S30400
27	Stem O-Ring	EPDM
28	Ind. Post Plate O-Ring	EPDM



# NRS RSGV WITH MECHANICAL JOINTS

## AND SPUR GEARING SIZE 14" - 24"



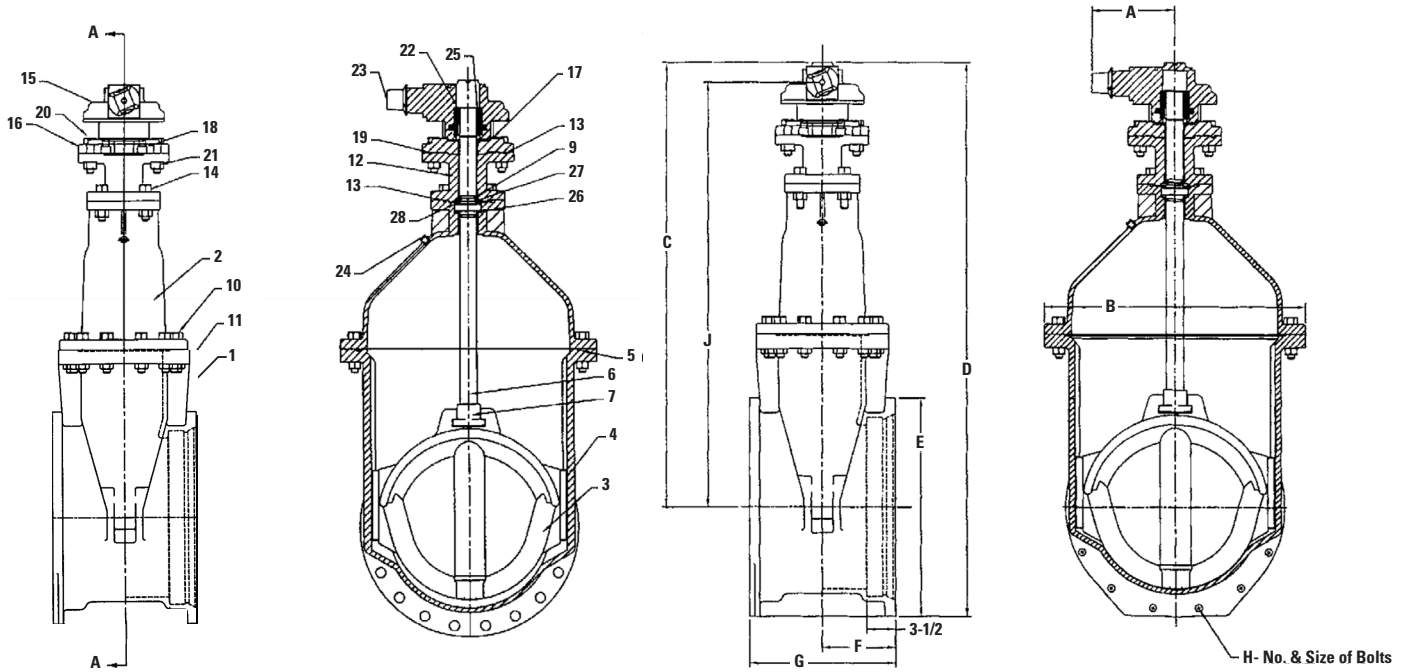
PARTS LIST				PARTS LIST				PARTS LIST			
No.	PART	MATERIAL	ASTM DESIGNATION	No.	PART	MATERIAL	ASTM DESIGNATION	No.	PART	MATERIAL	ASTM DESIGNATION
1	Body	Ductile Iron	ASTM A536 GR 65-45-12	11	Hex Nut	Stainless Steel	ASTM F593-304	20	Hex Bolt	Stainless Steel	ASTM F593-304
2	Cover	Ductile Iron	ASTM A536 GR 65-45-12	12	Extension	Ductile Iron	ASTM A536 65-45-12	21	Hex Nut	Stainless Steel	ASTM F593-304
3	Wedge	Ductile Iron / Rubber EPDM	ASTM A536 GR 65-45-12 / EPDM	13	O-ring	Rubber	NBR	22	Key	Steel	
4	Wedge Cap (18"-24")	Delrin	Delrin	14	Hex Head Bolt	Stainless Steel	ASTM F593-304	23	OP Nut	Ductile Iron	ASTM A536 65-45-12
5	O-ring	Rubber	NBR	15	Actuator - 3:1 (18"-24") 2:1 (14"-16")			24	Pipe Plug	Steel	Steel
6	Stem	Bronze	ASTM B584 C86700	16	Adapter Plate	Ductile Iron	ASTM A536 GR 65-45-12	25	Drive Sleeve	Steel	AISI 1023
7	Stem Nut	Bronze	ASTM B584 C86700	17	Actuator Gasket	Rubber	NBR	26	Cover Bushing	Bronze	ASTM B584 C86700
9	O-ring	Rubber	NBR	18	Socket Head Bolt	Alloy Steel	Alloy Steel	27	Extension Bushing	Bronze	ASTM B584 C86700
10	Hex Head Bolt	Stainless Steel	ASTM F593-304	19	O-ring	Rubber	NBR	28	Thrust Bearing (18"-24")	Delrin	Delrin

DIMENSIONS								
SIZE	A	B	C	D	E	F	G	H
14	8	26-11/16	52-1/8	62-1/2	20-1/4	8-1/2	17	3/4" x 10
16	8	26-11/16	51-1/8	62-1/2	22-1/2	8-1/2	17	3/4" x 12
18	12	32-1/4	58	70-1/2	24-3/4	9	18	7/8" x 12
20	12	32-1/4	57	70-1/2	27	9	18	7/8" x 14
24	12	38	62-5/8	78-1/4	31-1/4	10-1/2	21	3/4" x 16

30" & larger sizes require gearing.  
24" are now furnished with rollers, tracks, and scrapers.

# NRS RSGV WITH MECHANICAL JOINTS

## AND BEVEL GEARING SIZE 14" - 24"



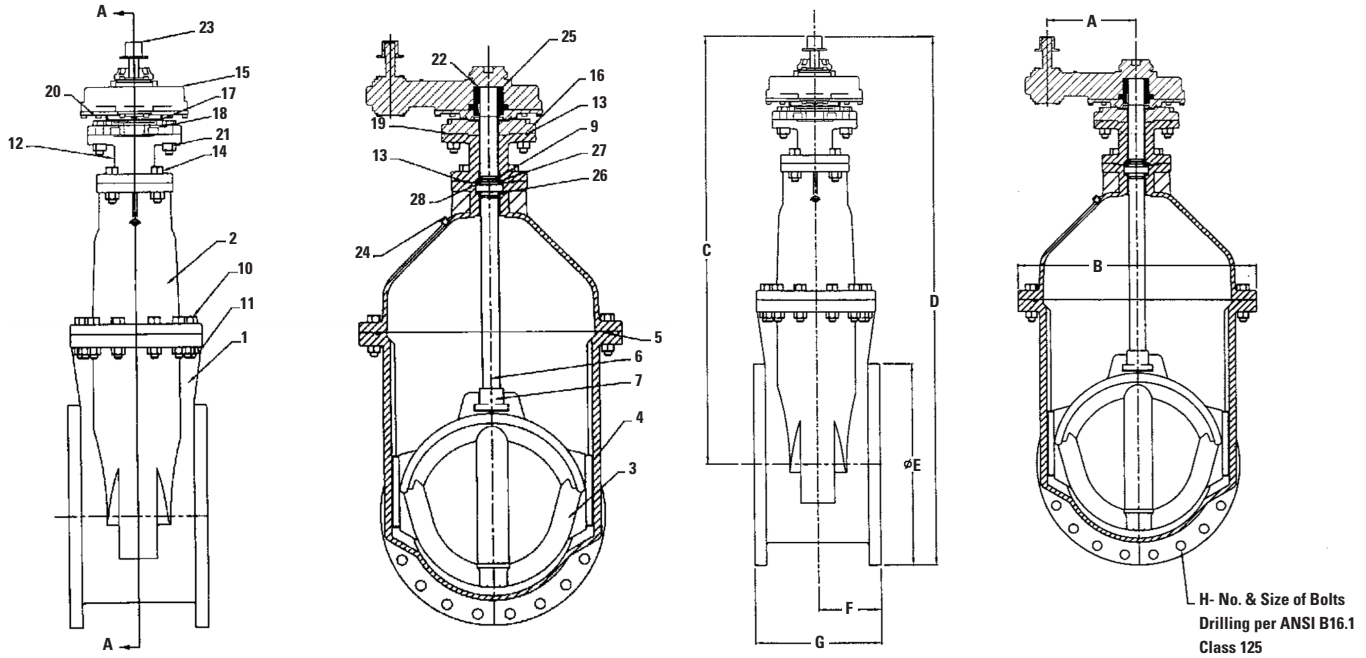
PARTS LIST				PARTS LIST				PARTS LIST			
No.	PART	MATERIAL	ASTM DESIGNATION	No.	PART	MATERIAL	ASTM DESIGNATION	No.	PART	MATERIAL	ASTM DESIGNATION
1	Body	Ductile Iron	ASTM A536 GR 65-45-12	11	Hex Nut	Stainless Steel	ASTM F593-304	20	Hex Bolt	Stainless Steel	ASTM F593-304
2	Cover	Ductile Iron	ASTM A536 GR 65-45-12	12	Extension	Ductile Iron	ASTM A536 GR 65-45-12	21	Hex Nut	Stainless Steel	ASTM F593-304
3	Wedge	Ductile Iron / Rubber EPDM	ASTM A536 GR 65-45-12 / EPDM	13	O-ring	Rubber	NBR	22	Key	Steel	
4	Wedge Cap (18"-24")	Delrin	Delrin	14	Hex Head Bolt	Stainless Steel	ASTM F593-304	23	OP Nut	Ductile Iron	ASTM A536 GR 65-45-12
5	O-ring	Rubber	NBR	15	Actuator - 3:1 (18"-24") 2:1 (14"-16")			24	Pipe Plug	Steel	Steel
6	Stem	Bronze	ASTM B584 C86700	16	Adapter Plate	Ductile Iron	ASTM A536 GR 65-45-12	25	Drive Sleeve	Steel	AISI 1023
7	Stem Nut	Bronze	ASTM B584 C86700	17	Actuator Gasket	Rubber	NBR	26	Cover Bushing	Bronze	ASTM B584 C86700
9	O-ring	Rubber	NBR	18	Socket Head Bolt	Alloy Steel	Alloy Steel	27	Extension Bushing	Bronze	ASTM B584 C86700
10	Hex Head Bolt	Stainless Steel	ASTM F593-304	19	O-ring	Rubber	NBR	28	Thrust Bearing (18"-24")	Delrin	Delrin

DIMENSIONS									
SIZE	A	B	C	D	E	F	G	H	J
14	9-1/8	26-11/16	48-5/8	59	20-1/4	8-1/2	17	3/4" x 10	46-5/8
16	9-1/8	26-11/16	47-5/8	59	22-1/2	8-1/2	17	3/4" x 12	45-5/8
18	10-1/8	32-1/4	55-3/4	68-1/4	24-3/4	9-5/32	18	7/8" x 12	53-3/4
20	10-1/8	32-1/4	54-3/4	68-1/4	27	9-5/32	18	7/8" x 14	52-3/4
24	10-1/8	38	59-7/8	75-1/8	31-1/2	9-1/2	19	3/4" x 16	57-3/8

30" & larger sizes require gearing.  
24" are furnished with rollers, tracks, and scrapers.

# NRS RSGV WITH FLANGED ENDS

## AND SPUR GEARING SIZE 14" - 24"



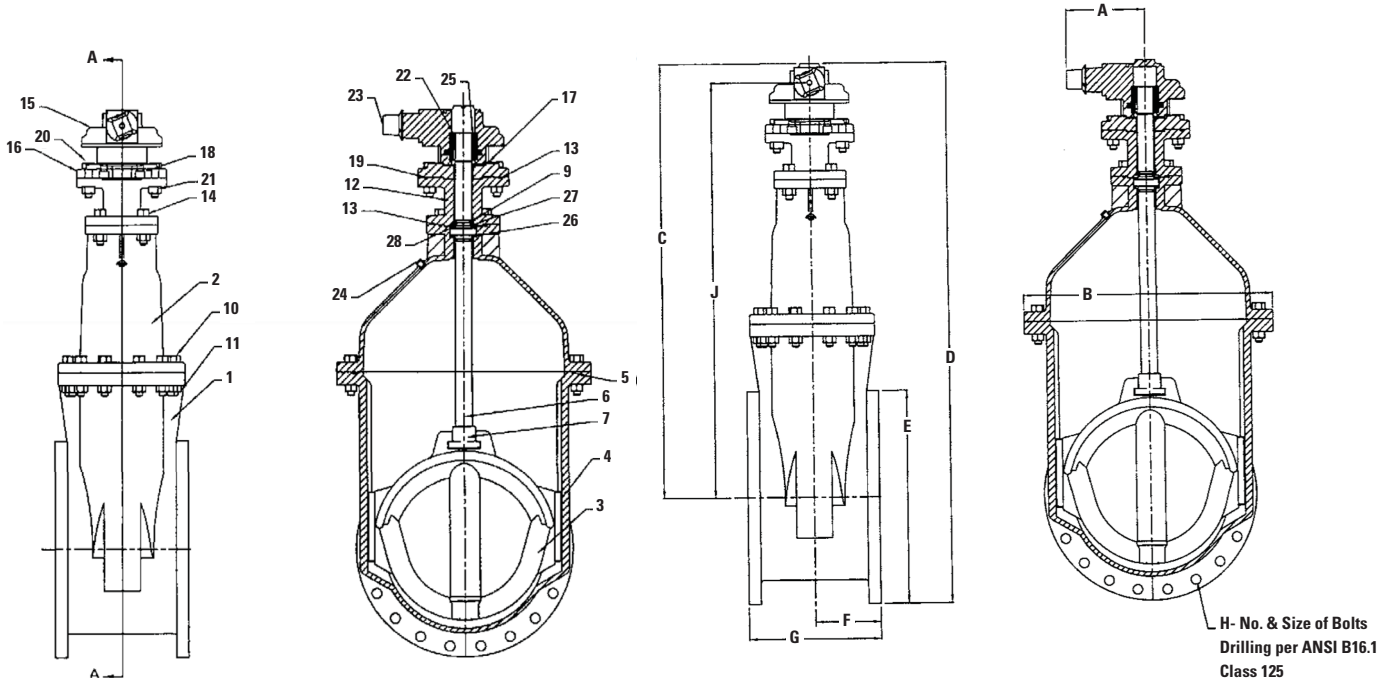
PARTS LIST				PARTS LIST				PARTS LIST			
No.	PART	MATERIAL	ASTM DESIGNATION	No.	PART	MATERIAL	ASTM DESIGNATION	No.	PART	MATERIAL	ASTM DESIGNATION
1	Body	Ductile Iron	ASTM A536 GR 65-45-12	11	Hex Nut	Stainless Steel	ASTM F593-304	20	Hex Bolt	Stainless Steel	ASTM F593-304
2	Cover	Ductile Iron	ASTM A536 GR 65-45-12	12	Extension	Ductile Iron	ASTM A536 65-45-12	21	Hex Nut	Stainless Steel	ASTM F593-304
3	Wedge	Ductile Iron / Rubber EPDM	ASTM A536 GR 65-45-12 / EPDM	13	O-ring	Rubber	NBR	22	Key	Steel	
4	Wedge Cap (18"-24")	Delrin	Delrin	14	Hex Head Bolt	Stainless Steel	ASTM F593-304	23	OP Nut	Ductile Iron	ASTM A536 65-45-12
5	O-ring	Rubber	NBR	15	Actuator - 3:1 (18"-24") 2:1 (14"-16")			24	Pipe Plug	Steel	Steel
6	Stem	Bronze	ASTM B584 C86700	16	Adapter Plate	Ductile Iron	ASTM A536 GR 65-45-12	25	Drive Sleeve	Steel	AISI 1023
7	Stem Nut	Bronze	ASTM B584 C86700	17	Actuator Gasket	Rubber	NBR	26	Cover Bushing	Bronze	ASTM B584 C86700
9	O-ring	Rubber	NBR	18	Socket Head Bolt	Alloy Steel	Alloy Steel	27	Extension Bushing	Bronze	ASTM B584 C86700
10	Hex Head Bolt	Stainless Steel	ASTM F593-304	19	O-ring	Rubber	NBR	28	Thrust Bearing (18"-24")	Delrin	Delrin

DIMENSIONS									
SIZE	A	B	C	D	E	F	G	H	
14	8	26-11/16	52-1/8	63	21	7-1/2	15	1" x 12	
16	8	26-11/16	51-1/8	63	23-1/2	8	16	1" x 16	
18	12	32-1/4	58	70-1/2	25	8-1/2	17	1-1/8" x 16	
20	12	32-1/4	57	70-1/2	27-1/2	9	18	1-1/8" x 20	
24	12	38	62-5/8	78-5/8	32	10	20	1-3/8" x 20	

30" & larger sizes require gearing.  
24" are now furnished with rollers, tracks, and scrapers.

# NRS RSGV WITH FLANGED ENDS

## AND BEVEL GEARING SIZE 14" - 24"



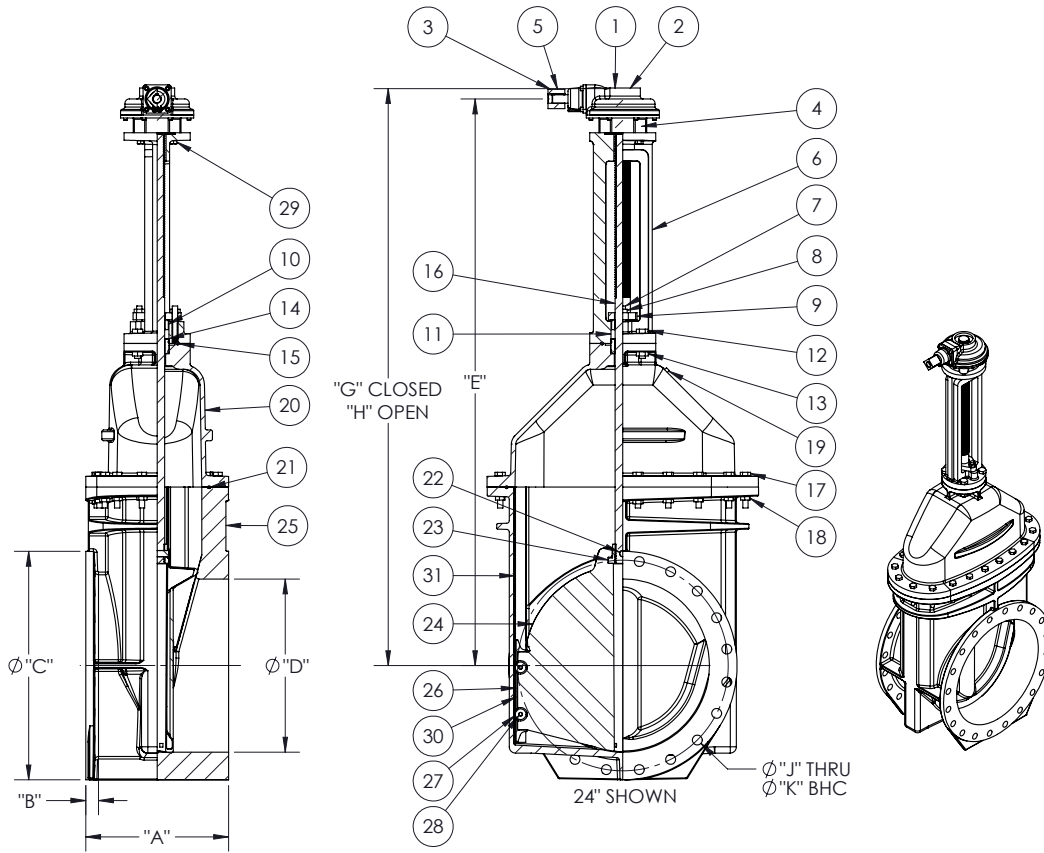
PARTS LIST				PARTS LIST				PARTS LIST			
No.	PART	MATERIAL	ASTM DESIGNATION	No.	PART	MATERIAL	ASTM DESIGNATION	No.	PART	MATERIAL	ASTM DESIGNATION
1	Body	Ductile Iron	ASTM A536 GR 65-45-12	11	Hex Nut	Stainless Steel	ASTM F593-304	20	Hex Bolt	Stainless Steel	ASTM F593-304
2	Cover	Ductile Iron	ASTM A536 GR 65-45-12	12	Extension	Ductile Iron	ASTM A536 GR 65-45-12	21	Hex Nut	Stainless Steel	ASTM F593-304
3	Wedge	Ductile Iron / Rubber EPDM	ASTM A536 GR 65-45-12 / EPDM	13	O-ring	Rubber	NBR	22	Key	Steel	
4	Wedge Cap (18"-24")	Delrin	Delrin	14	Hex Head Bolt	Stainless Steel	ASTM F593-304	23	OP Nut	Ductile Iron	ASTM A536 GR 65-45-12
5	O-ring	Rubber	NBR	15	Actuator - 3:1 (18"-24") 2:1 (14"-16")			24	Pipe Plug	Steel	Steel
6	Stem	Bronze	ASTM B584 C86700	16	Adapter Plate	Ductile Iron	ASTM A536 GR 65-45-12	25	Drive Sleeve	Steel	AISI 1023
7	Stem Nut	Bronze	ASTM B584 C86700	17	Actuator Gasket	Rubber	NBR	26	Cover Bushing	Bronze	ASTM B584 C86700
9	O-ring	Rubber	NBR	18	Socket Head Bolt	Alloy Steel	Alloy Steel	27	Extension Bushing	Bronze	ASTM B584 C86700
10	Hex Head Bolt	Stainless Steel	ASTM F593-304	19	O-ring	Rubber	NBR	28	Thrust Bearing (18"-24")	Delrin	Delrin

DIMENSIONS									
SIZE	A	B	C	D	E	F	G	H	J
14	9-1/8	26-11/16	48-5/8	59-1/2	21	7-1/2	15	1" x 12	46-3/8
16	9-1/8	26-11/16	47-5/8	59-1/2	23-1/2	8	16	1" x 16	45-3/8
18	10-1/8	32-1/4	55-3/4	68-1/4	25	8-1/2	17	1-1/8" x 16	55-3/4
20	10-1/8	32-1/4	54-3/4	68-1/4	27-1/2	9	18	1-1/8" x 20	52-3/4
24	10-1/8	38	60-3/8	76-1/4	32	10	20	1-3/8" x 20	57-7/8

30" & larger sizes require gearing.  
24" are furnished with rollers, tracks, and scrapers.

# OS&Y RSGV WITH FLANGED ENDS

## AND BEVEL GEARING SIZE 14" - 24"

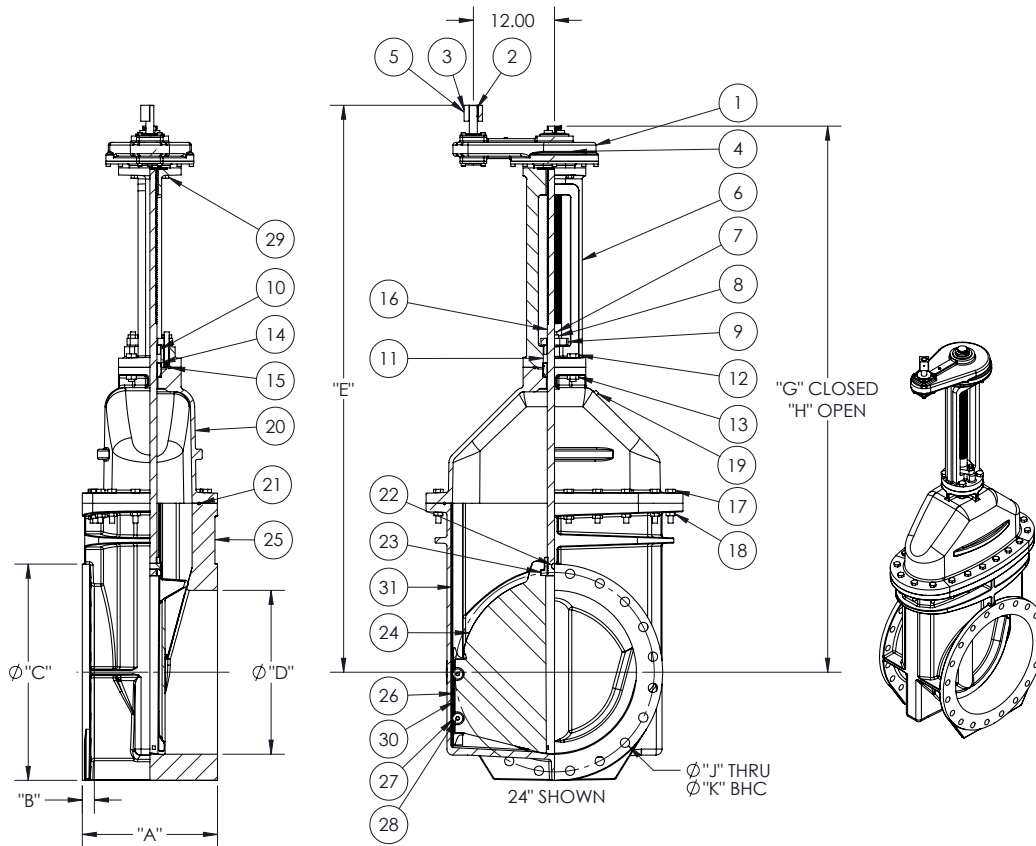


PARTS LIST			PARTS LIST			PARTS LIST		
No.	PART	MATERIAL	No.	PART	MATERIAL	No.	PART	MATERIAL
1	EXEECO IB7	Bronze ASTM B584 C83600	12	Hex Cap Screw	GR 2 ZN SAE J429 / 304SS ASTM 18-8SS	23	Stem Nut	Bronze ASTM B584 C87610 / Bronze ASTM B584 C87850 / Bronze ASTM B763 C99500 (NDZ) (14"-20")
2	Square Key	GR 2 ZN SAE J429	13	Hex Nut	ZN A307 Grade B / ASTM F593 S30400/S31600	24	Wedge	Ductile Iron ASTM A536 Grade 65-45-12
3	OP Nut	Gray Iron ASTM A126 Class B	14	Bushing	ZN A307 Grade B / ASTM F593 S30400/S31600		25	Body-Flanged Type
4	Output Sleeve	Aluminum Bronze ASTM B505 C95800	15	Yoke O-ring	EPDM	26	Scraper (24")	Bronze ASTM B584 C83600 (24")
5	Roll Pin	Stainless Steel	16	Stem	304SS ASTM A276 S30400 / 316SS ASTM A276 S31600 / Silicon Bronze "A" (Everdur) ASTM B98 C65500	27	Roller (24")	Bronze ASTM B584 C83600
6	Yoke	Gray Iron ASTM A126 Class B	17	Hex Cap Screw	ZN A307 Grade B / ASTM F593 S30400/S31600	28	Pin (24")	Stainless Steel AISI 303
7	Stud	ASTM F593 S30400/S31600	18	Hex Nut	ZN A307 Grade B / ASTM F593 S30400/S31600	29	Hex Cap Screw	ZN A307 Grade B / ASTM F593 S30400 / S31600
8	Hex Nut	ZN A307 GRADE B / ASTM F593 S30400/S31600	19	Pipe Plug	18-8SS	30	Wedge Cap (18"-20")	Delrin
9	Follower Plate (14"-16")	Gray Iron ASTM A126 Class B	20	Cover	Ductile Iron ASTM A536 65-45-12 ASTM B16 Alloy 306	31	Track (24")	Stainless Steel AISI 316
10	Packing Gland	Bronze ASTM B584 C83600	21	Cover O-Ring	EPDM			
11	Packing	Braided, Lubricated (Non-Asbestos) Fiber	22	Stem O-Ring	EPDM			

SIZE	DIMENSIONS										No. Turns to Open	Weight (lbs.)
	A	B	C	D	E	G	H	J	K			
14	15"	1-3/8"	21-1/16"	14-1/4"	59-7/8"	59-3/4"	74-3/4"	1" X 12	18-3/4"	52	670.00	
16	16"	1-7/16"	23-1/2"	16-1/4"	59-7/8"	59-3/4"	74-3/4"	1" X 16	21-1/4"	52	735.00	
18	17"	1-9/16"	25"	18-1/4"	70-1/8"	71-1/4"	92-9/16"	1-1/4" X 16	22-3/4"	64	1100	
20	18"	1-11/16"	27-1/2"	20-1/4"	70-1/8"	67-3/8"	94-3/8"	1-1/4" X 20	25"	64	1325	
24	20"	1-7/8"	32"	24-1/4"	78-7/8"	81-3/8"	110-5/8"	1-3/8" X 20	29-1/2"	88	1900	

# OS&Y RSGV WITH FLANGED ENDS

## AND SPUR GEARING SIZE 14" - 24"



PARTS LIST			PARTS LIST			PARTS LIST		
No.	PART	MATERIAL	No.	PART	MATERIAL	No.	PART	MATERIAL
1	EHEECO IS7	Bronze ASTM B584 C83600	12	Hex Cap Screw	GR 2 ZN SAE J429 / 304SS ASTM 18-8SS	23	Stem Nut	Bronze ASTM B584 C87610 / Bronze ASTM B584 C87850 / Bronze ASTM B763 C99500 (NDZ) (14"-20")
2	Square Key	GR 2 ZN SAE J429	13	Hex Nut	ZN A307 Grade B / ASTM F593 S30400/S31600	24	Wedge	Ductile Iron ASTM A536 Grade 65-45-12
3	OP Nut	Gray Iron ASTM A126 Class B	14	Bushing	ZN A307 Grade B / ASTM F593 S30400/S31600		25	Body-Flanged Type
4	Output Sleeve	Aluminum Bronze ASTM B505 C95800	15	Yoke O-ring	EPDM	26	Scraper (24")	Bronze ASTM B584 C83600
5	Roll Pin	Stainless Steel	16	Stem	304SS ASTM A276 S30400 / 316SS ASTM A276 S31600 / Silicon Bronze "A" (Everdur) ASTM B98 C65500	27	Roller (24")	Bronze ASTM B584 C83600
6	Yoke	Gray Iron ASTM A126 Class B	17	Hex Cap Screw	ZN A307 Grade B / ASTM F593 S30400/S31600	28	Pin (24")	Stainless Steel AISI 303
7	Stud	ASTM F593 S30400/S31600	18	Hex Nut	ZN A307 Grade B / ASTM F593 S30400/S31600	29	Hex Cap Screw	ZN A307 Grade B / ASTM F593 S30400 / S31600
8	Hex Nut	ZN A307 GRADE B / ASTM F593 S30400/S31600	19	Pipe Plug	18-8SS	30	Wedge Cap (18"-20")	Delrin
9	Follower Plate (14"-16")	Gray Iron ASTM A126 Class B	20	Cover	Ductile Iron ASTM A536 65-45-12 ASTM B16 Alloy 306	31	Track (24")	Stainless Steel AISI 316
10	Packing Gland	Bronze ASTM B584 C83600	21	Cover O-Ring	EPDM			
11	Packing	Braided, Lubricated (Non-Asbestos) Fiber	22	Stem O-Ring	EPDM			

SIZE	DIMENSIONS									No. Turns to Open	Weight (lbs.)
	A	B	C	D	E	G	H	J	K		
14	15"	1-3/8"	21-1/16"	14-1/4"	64-1/2"	59-3/4"	74-3/4"	1" X 12	18-3/4"	52	670.00
16	16"	1-7/16"	23-1/2"	16-1/4"	64-1/2"	59-3/4"	74-3/4"	1" X 16	21-1/4"	52	735.00
18	17"	1-9/16"	25"	18-1/4"	74-5/8"	71-1/4"	92-9/16"	1-1/4" X 16	22-3/4"	64	1100
20	18"	1-11/16"	27-1/2"	20-1/4"	74-5/8"	67-3/8"	94-3/8"	1-1/4" X 20	25"	64	1325
24	20"	1-7/8"	32"	24-1/4"	83-1/2"	81-3/8"	110-5/8"	1-3/8" X 20	29-1/2"	88	1900