KENNEDY VALVE

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KENNEDY VALVE RESILIENT WEDGE GATE VALVE MAINTENANCE MANUAL

This Kennedy Valve general maintenance guide is intended to cover AWWA (C509 & C515), UL (262) and FM (1120/1130) valves.

The Kennedy Valve Resilient Wedge Gate Valve 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.

Kennedy Valve does not recommend stocking any spare parts for the Resilient Wedge Gate Valve.

To obtain correct components it is necessary to furnish the following information to Kennedy Valve or an authorized distributor.

1. Model (Ken-seal II, KS-FW, KS-RW and KS300)
2. Valve Size.
3. Year of manufacture.

INSTALLATION:

Install the resilient wedge gate valve like any other gate valve, following the recommendations of AWWA and NFPA.

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 close 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.

GENERAL OPERATION:

The operation of resilient wedge gate valve is not like that of a double disc gate valve. Resilient wedge gate valves require considerable torque to fully shut off the flow through the valve but are easily opened. Closing torque to close the valve can be expected to be as follows:

2”	20 ft-lb	6”	110 ft-lb
2½”	28 ft-lb	8”	150 ft-lb
3”	52 ft-lb	10”	185 ft-lb
4”	75 ft-lb	12”	225 ft-lb

TOOLS:

All repair of a Kennedy Valve resilient wedge gate valve may be accomplished with only:

1. A ½” drive socket set.
2. A 12” adjustable (“Crescent”) wrench.
3. A small pry bar (a soft faced hammer is occasionally useful).
4. Lubricating grease (Clarion Food Machinery Grease, No.2).

STOCKING SPARE PARTS:

Kennedy Valve does not recommend stocking any repair parts for resilient wedge valves.

COMPONENT REPLACEMENT:

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 been replaced and instructions for disc replacement are included but this should not be considered normal maintenance.

STEM SEAL PROCEDURES:

I. Non-Rising Stem (NRS) Valves:

Before beginning, contact Kennedy Valve or an authorized distributor to obtain:

A. Stem sealing o-rings:- [item R6] - (2) req’d.
B. One stuffing box gasket/o-ring – [item R7] - (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 [item R4] retaining the stuffing box [item R5].

3. Separate the stuffing box [item R5] and the cover [item R11] (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 [item R6] on the shank of the stem and

One o-ring/gasket seal [item R7] 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 [item R5]. Tighten all bolts uniformly and carefully so that the stuffing box is flat and snug against the cover [item R11] 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.

II. <u>Outside Screw & Yoke (OS&Y):</u>

1. Before attempting to repack the valve, first attempt to stop the leakage by adjusting (tightening) the brass nuts [item R4] on the packing gland [item R10]. 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 Kennedy Valve or an authorized distributor to obtain packing (packing supplied by Kennedy Valve may come in one continuous coil or in segments).

--OS&Y Packing Procedure:

2. Operate the valve to its <u>full open position</u> (apply approx. 50 ft-lbs torque for valves 3" and smaller, 100 ft-lbs for valves 4" and larger)

3. Verify that the switch groove on the stem has smooth corners. Sharp corners exist on some older valves. File as necessary.

4. Remove the nuts [item R8] retaining the packing gland [item R10].

5. Lift the packing gland. If necessary, lever the packing gland with a crow bar or similar tool.

6. Remove and replace the packing [item R11] --- (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, engineering prefers 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).

7. 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 <u>Replacement</u> Procedure:

1. Remove the packing gland fasteners [item R8].

2. Remove the cover fasteners [item R6].

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 [item R5] completely disengage the threads on the stem [item 14].

4. Carefully, lift the cover assembly (cover assembly includes items R1, R2, R3, R4, R5, R8, R10, R11) up and completely off stem [item R14].

5. Remove the old packing [item R11] and discard the old packing gland [item R10].

6. Position the new packing gland into the packing well of the cover [item R7]. *** *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 [item R5].

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 [item R16]. --- *Make sure that the cover O-ring [item R12] is not damaged and is in position.*

9. Bolt the cover to the body (items R6), 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 DISC REPLACEMENT:

1. It is necessary to take the valve fully out of service to replace the disc but it is not necessary to remove the valve from the line.

2. It is very unusual to have to replace a disc. Discs normally can be expected to last for many years and thousands of cycles. Before replacing a disc, 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 disc suspect that there is some systematic problem causing the disc failure such as stones in the line.

3. Before attempting to replace the disc, contact Kennedy Valve or an authorized distributor to obtain:

   A. Cover O-ring
   B. Disc

-- Disc 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 disc.

   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.

Suggested Bolt Torks 'KS-RW', 'KS-FW', 'KS-300', KenSeal II (a.k.a. "KS II")

VALVE SIZE	COVER BOLTS			OSY Gland Follower			NRS Follower Plate		
	Nut Size	Wrench Opening	TORQUE	Nut Size	Wrench Opening	TORQUE	Nut Size	Wrench Opening	TORQUE
2 & 2 1/2	1/2	3/4	40 50 ft-lb	1/2 Hvy-Hex	7/8	As Required	1/2	3/4	50 - 60 ft-lb
3	1/2	3/4	40 - 50 ft-lb	1/2 Hvy-Hex	7/8	As Required	5/8	15/16	70 - 80 ft-lb
4	1/2	3/4	50 - 70 ft-lb	1/2 Hvy-Hex	7/8	As Required	5/8	15/16	70 - 80 ft-lb
6	5/8	15/16	80 - 100 ft-lb	1/2 Hvy-Hex	7/8	As Required	5/8	15/16	80 - 100 ft-lb
8	1/2	3/4	50 - 70 ft-lb	1/2 Hvy-Hex	7/8	As Required	5/8	15/16	80 - 100 ft-lb
10 & 12	5/8	15/16	80 - 100 ft-lb	5/8 Hvy-Hex	1 1/16	As Required	7/8	1 5/16	100 - 120 ft-lb

All dimensions U.S. inches – all torks U.S. foot-pounds(force)

TROUBLESHOOTING RESILIENT WEDGE GATE VALVE

POSSIBLE MALFUNCTION	SYMPTOMS - CAUSES	CORRECTIVE ACTION
Joint Leakage	Bolt Tension Relaxing	Tighten Bolts
Seat Leakage	Foreign Material caught in seat	Operate valve to flush out debris
	Seats Dirty/ Corroded	Flush or dis-assemble & clean
	Seats Damaged	Inspect-repair or Replace
Leak Past Stem	Bolts Loose	Tighten Bolts
	O-rings worn/ damaged (NRS)	Inspect/ Replace
	Packing worn/ damaged (OS&Y)	Inspect/ Replace

Inspection for the above should be done semi/ annually at a minimum. Lubrication is only required for exposed OS&Y stems, use a food grade grease similar to Mystic FG2.

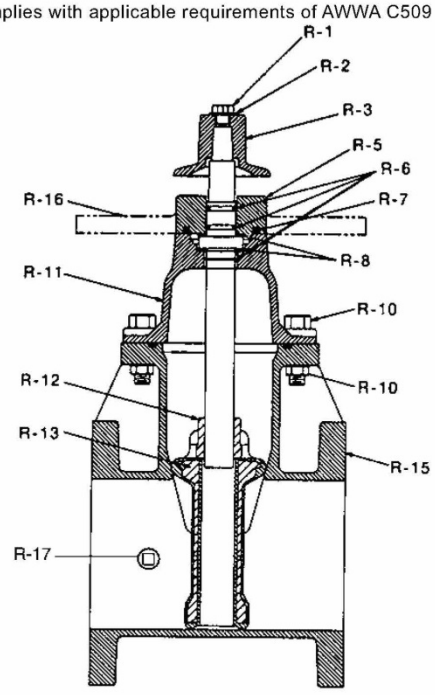
(The following pages from Kennedy Valve catalog)

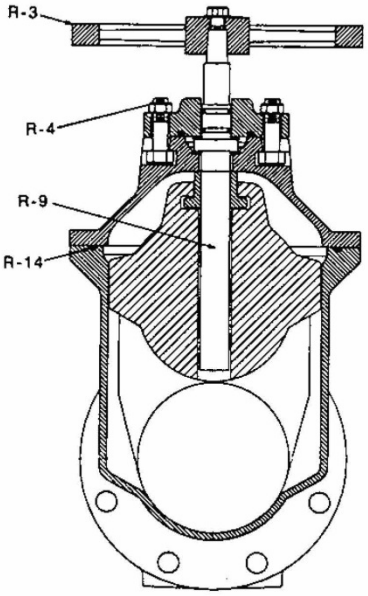
LISTED APPROVED LISTED

Complies with applicable requirements of AWWA C509

RESILIENT SEAT GATE VALVE
N.R.S. ASSEMBLY
KS-FW

KENNEDY VALVE MODEL KS-FW





PIPE PLUG STANDARD ON FLANGE & GROOVE VALVES @ POSITION "A"

DET.	NAME OF PART		MATERIAL	ASTM SPEC.
R-1	Hex Head Bolt		Stainless Steel	ASTM F593C
R-2	Flat Washer		Zinc Plated Steel	ASTM A307
R-3	Operating Nut		Cast Iron	ASTM A126 Class B
	Handwheel		Cast Iron	ASTM A126 Class B
R-4	Hex Bolt & Nut		Stainless Steel	ASTM F593C/F594
R-5	Stuffing Box	2" thru 8"	Cast Iron	ASTM A126 Class B
		10" and 12"	Ductile Iron	ASTM A536 Grade 70-50-5
R-6	O-Ring (Stem)		Buna - N	----------
R-7	O-Ring (Stuffing Box)		Buna - N	----------
R-8	Thrust Washer		Delrin	----------
R-9	Stem		Bronze	ASTM B584 C86700
R-10	Hex Head Cover Bolts & Nuts		Stainless Steel	ASTM F593C/F594
R-11	Cover		Cast Iron	ASTM A126 Class B
R-12	Stem Nut		Bronze (NDZ)	ASTM B763 C99500
R-13	Wedge (EPDM Encapsulated)		Ductile Iron	ASTM A536 Grade 70–50–5
R-14	O-Ring (Cover)		Buna - N	----------
R-15	Body (All Types)		Cast Iron	ASTM A126 Class B
R-16	Plate		Cast Iron	ASTM A126 Class B
R-17	Pipe Plug: 1/2"; 2 1/2"-4"--3/4"; 6'-12"		Galvanized Steel	----------

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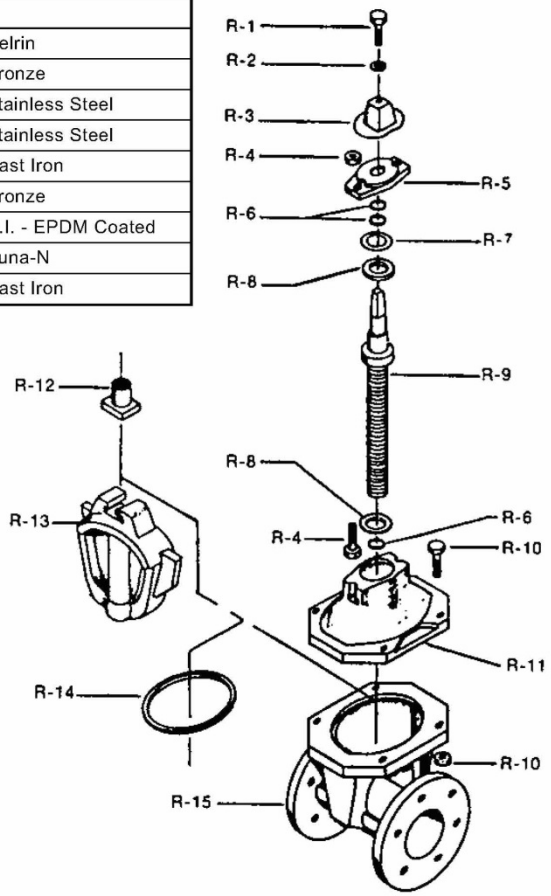
2" - 12" GATE VALVE
NRS ASSEMBLY EXPLOSION

KENNEDY VALVE MODEL KS-FW

DET.	QTY.	DESCRIPTION	MATERIALS
R-1	1	Hold Down Hex Bolt	Stainless Steel
R-2	1	Hold Down Bolt Washer	Zinc Plated Steel
R-3	1	Sq. Operating Nut OR Handwheel (Not Shown)	Cast Iron
R-4	2	Bolt & Nut (Stuffing Box)	Stainless Steel
R-5	1	Stuffing Box (10" & 12" D.I.)	Cast Iron
R-6	3	O-Ring (Stem) 1 Below Collar	Buna-N
R-7	1	O-Ring (Stuffing Box)	Buna-N
R-8	1	Thrust Washer (Sizes 2"-2 1/2")	
	2	Thrust Washer (Sizes 3" thru 12")	Delrin
R-9	1	Stem	Bronze
R-10	4	Cover Bolts & Nuts (Sizes 2" thru 6")	Stainless Steel
	8	Cover Bolts & Nuts (Sizes 8" thru 12")	Stainless Steel
R-11	1	Cover	Cast Iron
R-12	1	Stem Nut	Bronze
R-13	1	Wedge Disc	D.I. - EPDM Coated
R-14	1	O-Ring (Cover)	Buna-N
R-15	1	Body	Cast Iron



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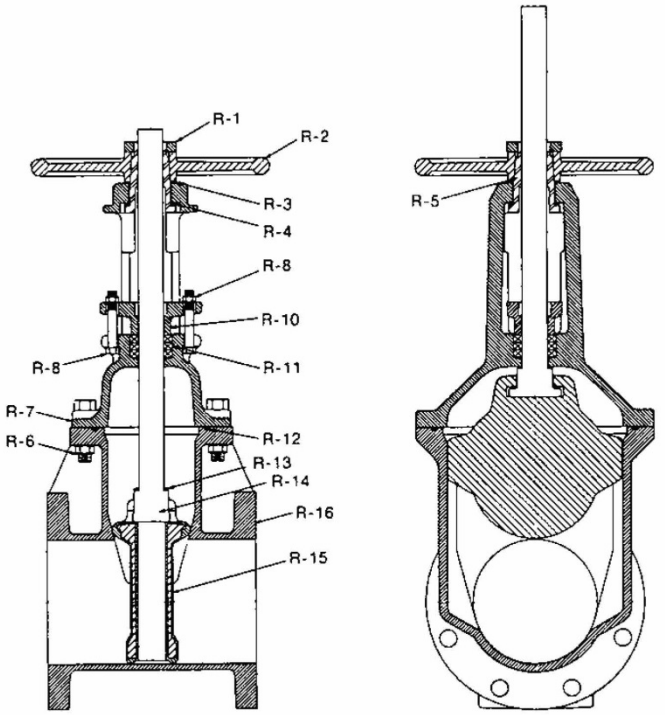
LISTED FM APPROVED c LISTED

Complies with applicable requirements of AWWA C509

2"-12" R/S VALVE OS&Y MATERIAL LIST

KENNEDY VALVE MODEL KS-FW



PIPE PLUG STANDARD ON FLANGE & GROOVE VALVES @ POSITION "A"

DET.	NAME OF PART	MATERIAL	ASTM SPEC.
R-1	Handwheel Nut	Bronze (AWWA Grade A)	ASTM B584 C84400
R-2	Handwheel	Cast Iron	ASTM A126 Class B
R-3	Upper Thrust Washer	Brass	ASTM B36 C26000
R-4	Lower Thrust Wahser	Nylatron	----------
R-5	Yoke Nut	Bronze	ASTM B584 C86700
R-6	Hex. Head Cover Bolts & Nuts	Zinc Plated Steel	ASTM A307/A563
R-7	Cover	Cast Iron	ASTM A126 Class B
R-8	Packing Bolts	Zinc Plated Steel	ASTM A307
R-8	Packing Bolt Nuts	Brass	ASTM F467
R-10	Packing Gland	Ductile Iron	ASTM A536 Grade 70-50-5
R-11	Packing	Sq. Braided Non-Asbestos	----------
R-12	O-Ring (Cover)	Buna - N	----------
R-13	O-Ring (Stem)	Buna - N	----------
R-14	Stem	Stainless Steel	ASTM A276 Type 304
R-15	Wedge (EPDM Encapsulated)	Ductile Iron	ASTM A536 Grade 70–50–5
R-16	Body (All Types)	Cast Iron	ASTM 126 Class B
R-17	Pipe Plug: 1/2"; 2 1/2"-4"--3/4"; 6'-12"	Galvanized Steel	----------

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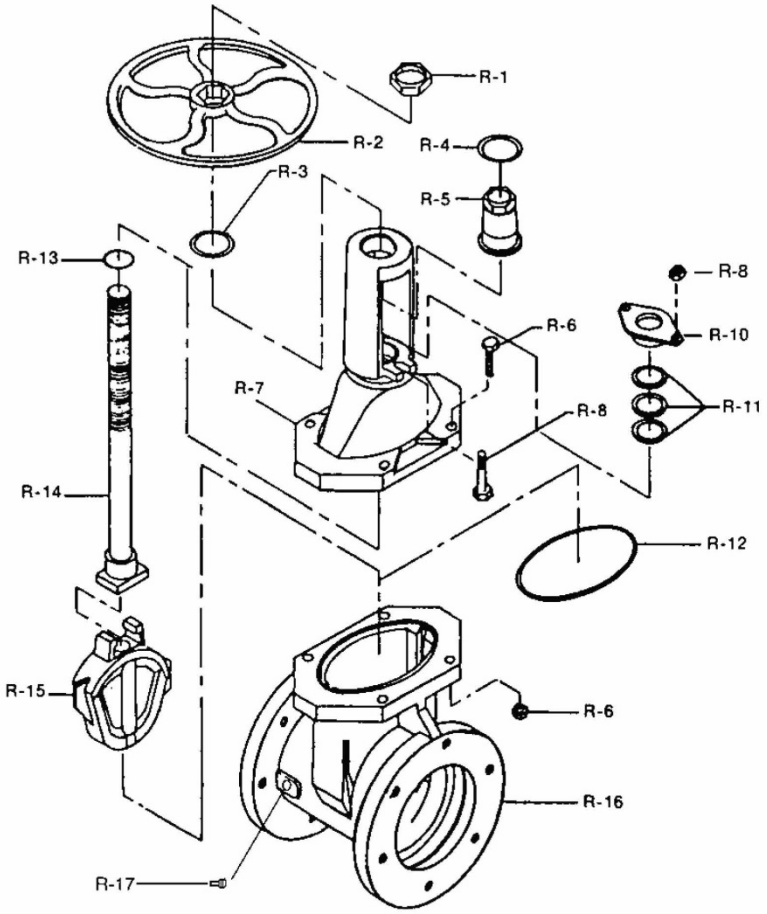
2" - 12" R/S GATE VALVE
OS&Y ASSEMBLY EXPLOSION

KENNEDY VALVE MODEL KS-FW

DET.	QTY.	DESCRIPTION	MATERIALS
R-1	1	Handwheel Hold Down Nut	Bronze
R-2	1	Handwheel	Cast Iron
R-3	1	Upper Thrust Washer (Sizes 3" thru 12")	Bronze
R-4	1	Lower Thrust Washer	Bronze
R-5	1	Yoke Nut	Bronze
R-6	4	Cover Bolts & Nuts (Sizes 2-1/2" thru 6")	Zinc Plated Steel
R-6	8	Cover Bolts & Nuts (Sizes 8" thru 12")	Zinc Plated Steel
R-7	1	Cover	Cast Iron
R-8	2	Packing Bolts	Zinc Plated Steel
R-8	2	Packing Bolt Nuts	Brass
R-10	1	Packing Gland	Ductile Iron
R-11		Packing	Sq. Braided Polymer
R-12	1	O-Ring (Cover)	Buna-N
R-13	1	O-Ring (Stem)	Buna-N
R-14	1	Stem	Stainless
R-15	1	Wedge Disc	D.I. - EPDM Coated
R-16	1	Body	Cast Iron
R-17	1	Pipe Plug	Galvanized Steel



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