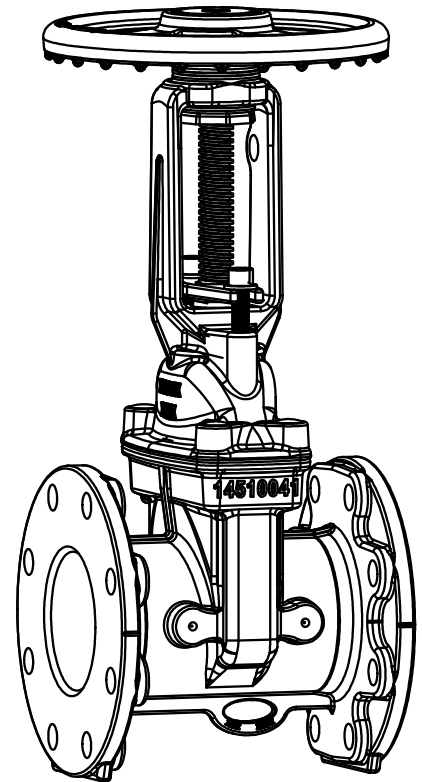
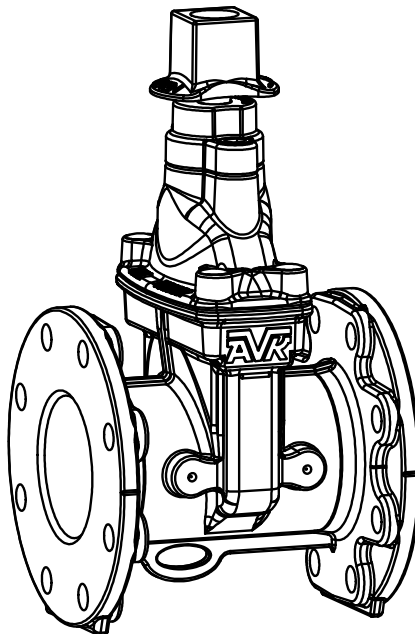


AVK SERIES 145 UL/FM APPROVED RESILIENT SEAT GATE VALVE FIELD MAINTENANCE AND INSTRUCTION MANUAL

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American AVK Series 145 Resilient Seated Gate Valve Exploded Parts Breakdown

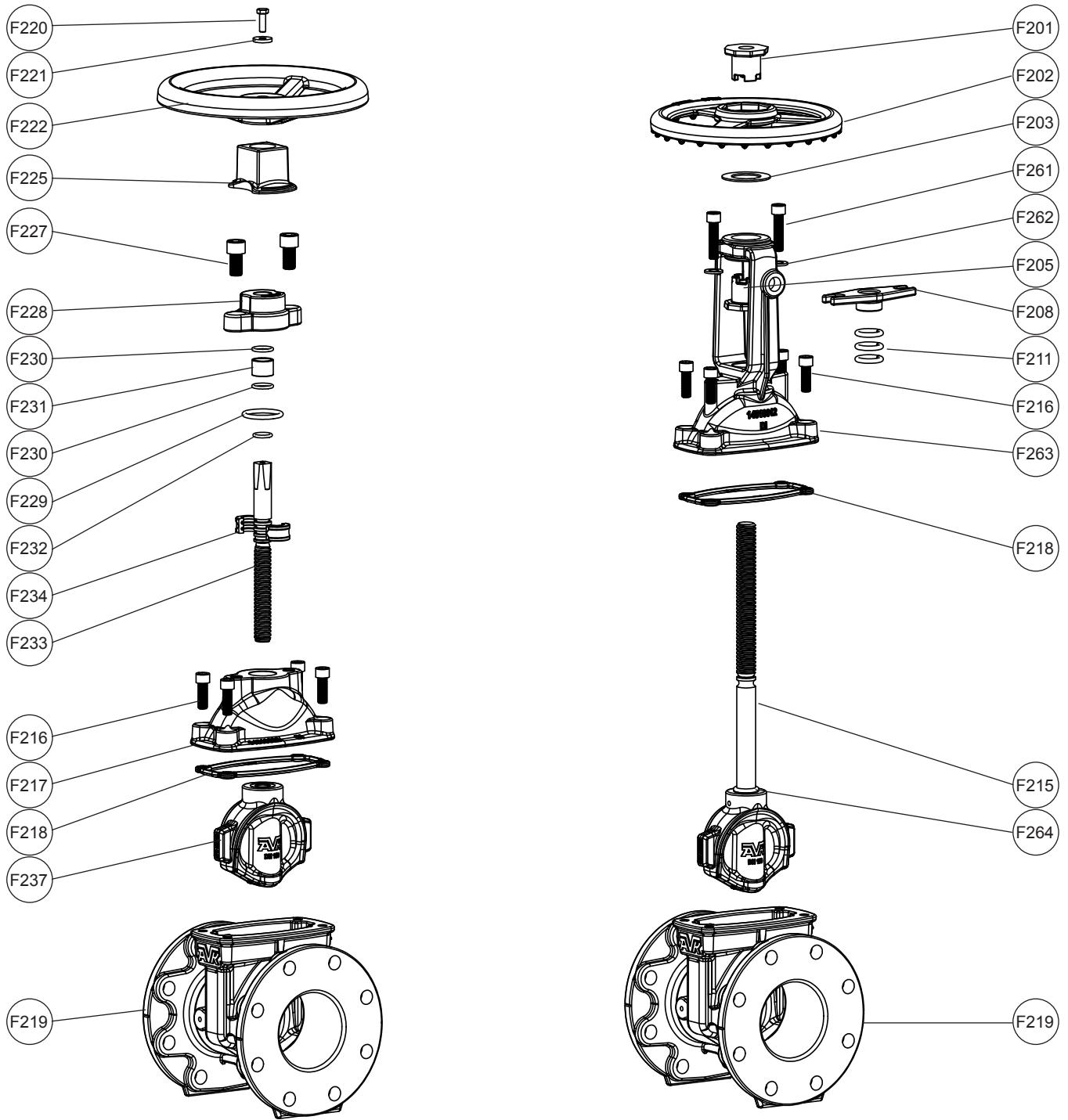


Fig. 1
page 1

Item No.	Description	Material
F201	Upper Stem Nut	Copper Alloy
F202	OS&Y Handwheel	Ductile Iron, ASTM A536
F203	Anti Friction Washer	Copper Alloy
F205	Lower Stem Nut	Copper Alloy
F208	Gland Follower	Ductile Iron, ASTM A536
F211	Stem Seal O-rings	(SBR) Styrene Butadiene Rubber
F215	OS&Y Stem Assembly Stainless Steel Stem Wedge Pin Wedge	304 Stainless Steel 304 Stainless Steel (EPDM) Ethylene-Propylene-Diene Rubber, Encapsulated Ductile Iron core with integral Nylon Wedge Shoes
F216	Bonnet Bolts	Zinc Plated Steel
F217	NRS Bonnet	Ductile Iron, ASTM A536
F218	Bonnet Gasket	(NBR) Acrylonitrile Butadiene Rubber
F219	Body (Ductile Iron)	Ductile Iron, ASTM A536
F220	Wrench Nut/Handwheel Bolt	Zinc Plated Steel
F221	Wrench Nut/Handwheel Washer	Zinc Plated Steel
F222	NRS Handwheel	Grey Iron, ASTM A126, "B"
F225	Wrench Nut	Ductile Iron, ASTM A536
F227	Gland Flange Bolt	Zinc Plated Steel
F228	Gland Flange	Ductile Iron, ASTM A536
F229	Gland O-ring	(NBR) Acrylonitrile Butadiene Rubber
F230	Upper Stem Seal O-rings	(NBR) Acrylonitrile Butadiene Rubber
F231	Stem Seal Bushing	Nylon
F232	Lower Stem Seal O-ring	(NBR) Acrylonitrile Butadiene Rubber
F233	Stainless NRS Stem	304 Stainless steel
F234	Thrust Collar	Copper Alloy
F237	NRS Wedge	(EPDM) Ethylene-Propylene-Diene Rubber, Encapsulated Ductile Iron core with integral Akulon Wedge Shoes
F261	Gland Follower Bolt	Zinc Plated Steel
F262	Gland Follower Washer	Zinc Plated Steel
F263	Bonnet/Yoke	Ductile Iron, ASTM A536
F264	OS&Y Stem Seal O-ring	(NBR) Acrylonitrile Butadiene Rubber

INTRODUCTION:

The American AVK Series 145 Resilient Wedge Gate Valves are UL/FM approved and designed to be trouble/maintenance free, for use in Fire Protection. They have a rated working pressure of 250 PSI and are available in 2½" through 8" sizes. All Series 145 valves are configured for "Open Left" operation and have flanged end connections to ASME B16.42 Class 150. This manual will provide you with the information needed to properly install and maintain the valve and to ensure a long service life.

RECEIVING AND STORAGE

UNLOADING:

All valves should be unloaded carefully. Each valve should be carefully lowered from the truck to the ground; it should not be dropped. Never lift valves by the Wrench Nuts or Handwheels. Failure to carefully follow these recommendations is likely to result in damage to the valve or personal injury.

INSPECTION AFTER UNLOADING:

Resilient-seated gate valves should be inspected at the time of receipt for damage in shipment. The initial inspection should verify compliance with specifications, direction of opening and number of turns to open or close. A visual inspection of the seating surfaces should be performed to detect any damage in shipment or scoring of the seating surfaces. Inspection personnel should look for bent stems, cracked parts, loose bolts, missing parts and accessories, and any other evidence of mishandling during shipment. Each valve should be operated through one complete opening-and-closing cycle in the position in which it is to be installed.

STORAGE:

1. Resilient-seated gate valves should be stored in a manner that protects them from the environment, preferably indoors.
2. The valves should be stored with the wedges in the nearly closed position to prevent unnecessary compression of the rubber compound.
3. The resilient wedges should also be protected from sunlight, ozone and chemical exposure.
4. In colder climates, valves should be drained and left slightly open before storage. Failure to do so may result in cracking the valve castings.
5. Valves stored outside should be stored with the wedges in the vertical position. If the valves are stored in the horizontal or flat position, rainwater may accumulate in the valve cavity, then freeze and crack the castings.

INSTALLATION AND TESTING

INSPECTION PRIOR TO INSTALLATION:

1. Visually inspect each valve for any foreign material in the interior of the valve, and remove it if present.
2. Inspect each valve in a similar manner as described in the "INSPECTION AFTER UNLOADING" section of this manual.

INSTALLATION:

1. All exposed bolts should be checked for proper tightness.
2. Where practical, valves should be located in easily accessible areas.
3. Valves should be supported and aligned to avoid damage to the valves.
4. Valves should not be used to correct the misaligned piping.
5. Tighten the bolts and nuts in the crossover method shown in Fig. 2, to load the pipe and valve evenly and prevent stress on the joints.

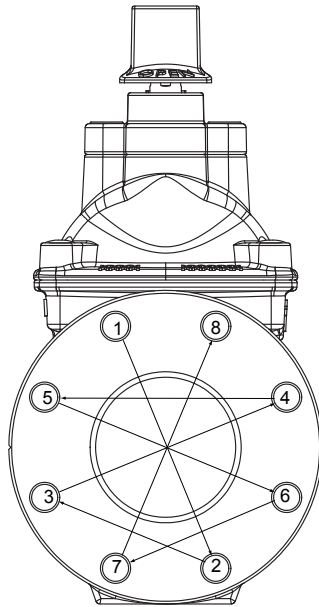


Fig. 2

INSTALLATION AND TESTING

TESTING AFTER INSTALLATION:

WARNING: The line must be isolated, depressurized, and drained before installing/removing the valve to/from the system line. Failure to do so may cause pressure to be released resulting in severe injury or death.

NOTE: Before closing a fire protection system control valve for maintenance or inspection, permission to shut down the affected fire protection systems must be obtained from the proper authorities and all personnel who may be effected by this decision must be notified. Do not exceed 200 pound rim pull torque for handwheels.

It is recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified inspection service.

The owner is responsible for the inspection, maintenance, and testing of their fire protection system and devices in accordance with the applicable standards of the National Fire Protection Association, (NFPA latest) and any other authorities having jurisdiction.

After installation, it is desirable to test newly installed piping sections, including valves, at some pressure above the system designed pressure. The test pressure should not exceed the rated working pressure of the valve. After the test, steps should be taken to relieve any trapped pressure in the body of the valve. The resilient-seated gate valve should not be operated in either the opening or closing direction at differential pressures above the rated working pressure. It should be noted that valves seat better at or near the rated working pressure of the valve. It is also recognized that wear or foreign material may damage valve seating surfaces and may cause leakage.

Upon completion of the installation, valve location, size, make, type, date of installation, number of turns to open, direction of opening, and other information deemed pertinent should be entered on permanent records.

APPLICATION HAZARDS:

1. Resilient-seated gate valves should not be installed in lines where service pressure will exceed the rated working pressure of the valve.
2. Resilient-seated gate valves should not be used for throttling service unless the design is specifically recommended for that purpose or approved in advance by the manufacturer.
3. Resilient-seated gate valves should not be used in applications that are exposed to freezing temperatures.
4. Gate valves should not be installed in a dead end or near a bend in a pipeline without proper and adequate restraint to support the valve and prevent it from blowing off the end of the line.

OPERATION AND MAINTENANCE

TOOLS:

The following tool requirements are listed in both Standard "Inch" sizes as well as "Metric" sizes.

PART	INCH	METRIC
Wrench Nut Retaining Bolts		
2 1/2" - 6" valves	1/2"	13mm (Open end wrench or socket)
8" valves	11/16"	17mm (Open end wrench or socket)
Gland Flange Retaining Bolts		
2 1/2" valves	3/8"	10mm (Allen wrench)
3" - 4" valves	N/A	14mm (Allen wrench)
6" - 8" valves	11/16"	17mm (Allen wrench)
Gland Follower/Yoke Retaining Bolts		
2 1/2" - 4" valves	3/8"	10mm (Allen wrench)
6" - 8" valves	11/16"	17mm (Allen wrench)
2 1/2" Bonnet Bolts	5/16"	8mm (Allen wrench)
3" - 8" Bonnet Bolts	3/8"	10mm (Allen wrench)

OPERATION AND MAINTENANCE

OPERATION:

Each valve should be operated through a full cycle and returned to its normal position on a time schedule designed to prevent a buildup of tuberculation or other deposits that could render the valve inoperable or prevent a tight shutoff. The interval of time between operations of valves in critical locations, or valves subjected to severe operating conditions, should be shorter than that for less important installations, but can be whatever time period is found to be satisfactory based on local experience. The number of turns required to complete the operation cycle should be recorded and compared with permanent installation records to ensure full gate travel.

American AVK Series 145 NRS (Non-Rising Stem) Valves - Turns to Open

Valve Size	Turns to Open
2.5"	19
3"	18
4"	23
6"	27
8"	35

American AVK Series 145 OS&Y (Outside Stem and Yoke) Valves - Turns to Open

Valve Size	Turns to Open
2.5"	20
3"	21
4"	23
6"	31
8"	35

MAINTENANCE PROCEDURES:

INSPECTION:

Each valve should be operated through one complete cycle. If the stem action is tight as a result of "hard water" buildup on the stem threads, the operation should be repeated several times until the opening and closing actions are smooth and free. With the gate in the partially open position, a visual inspection should be performed, where practical, to check for leakage at all joints, connections, and areas of packing or seals. If leakage is observed, all defective O-rings, seals, gaskets, or end-connection sealing members should be replaced. If the leakage cannot be corrected immediately, the nature of the leakage should be reported promptly to those who are responsible for repairs. If the valve is inoperable or irreparable, its location should be clearly established to save time for repair crews. The condition of the valve, and if possible, the gate position, should be reported to personnel responsible for repairs. In addition, fire departments and other municipal departments should be informed that the valve is out of service.

RECORD KEEPING:

In order to carry out a meaningful inspection and maintenance program, it is essential that the location, make, type, size, and date of installation of each valve be recorded. Depending on the type of record system used, other information may be entered in the permanent record. When a resilient-seated gate valve is inspected, an entry should be entered in the permanent record indicating the date of inspection and condition of the valve. If repair work is necessary, it should be indicated. On completion of the work, the nature of the repairs and date completed should be recorded.

REPAIR PROCEDURES

In most instances, in order to keep system down time to a minimum, complete valve assembly replacement is implemented. This also may be preferable due to physical access restrictions in the area of the valve in question. If this is the case, as in all installation/maintenance and inspection procedures, follow all local installation and safety practices as directed by the National Fire Protection Association, (NFPA latest) and any other authorities having jurisdiction.

If system down time is not an issue, the following procedures provide repair instructions for minor issues. Leakage, broken parts, hard operation, and other major defects should be corrected by a repair crew as soon as possible after the defect has been reported. If repairs are to be performed in the field, the repair crews should take a full complement of spare parts to the job site. Provisions should be made to isolate the defective valve from water pressure and relieve internal trapped pressure prior to performing any corrective maintenance. Disassembly of the valve should be accomplished in accordance with the procedure supplied in the following sections. After repairing the valve, the operating mechanism should be cycled through one complete operating cycle. With full line pressure applied to the valve in the open position, an inspection should be made to detect leakage in the areas around the seal plate, bonnet, packing gland, and body-end connections. A record should be made to indicate that the valve has been repaired and is in working condition. Any marking that the valve is inoperable should be removed. In addition, fire department and other appropriate municipal departments should be informed of satisfactory repair of the valve.

NRS VALVE REPAIRS:

WRENCH NUT REPAIR:

WARNING: Although some of the following procedures can be performed under full working line pressure, it is recommended that any partial disassembly or maintenance be performed with the Water Main Supply Line shut off and pressure bled!

1. Remove the Wrench Nut Bolt (F220) and Wrench Nut Washer (F221) using a 1/2", (13mm) wrench, for 2 1/2" to 4" valve sizes, and 11/16", (17mm) wrench for 6" to 8" valve sizes. Remove the Wrench Nut (F225), and replace with a new one. (See Fig.3A)
2. Replace the Wrench Nut Bolt (F220) and Wrench Nut Washer (F221) using a 1/2", (13mm) wrench, for 2 1/2" to 4" valve sizes, and 11/16", (17mm) wrench for 6" to 8" valve sizes.

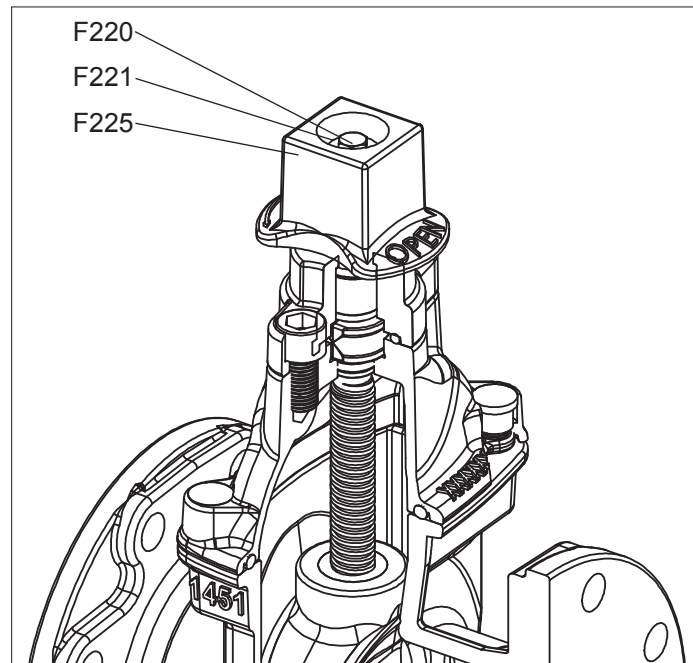


Fig. 3A

NRS (Non-Rising Stem) VALVE REPAIRS:

UPPER STEM SEAL COMPONENT REPAIR:

CAUTION: With the valve in the fully “OPEN” position, the following procedures can be performed under full working pressure, with no need to shut down the system.

1. Remove the Wrench Nut Bolt (F220) and Wrench Nut Washer (F221) using a 1/2", (13mm) wrench, for 2 1/2" to 4" valve sizes, and 11/16", (17mm) wrench for 6" to 8" valve sizes. Remove the Wrench Nut (F225). (See Fig.4A)
2. Remove the two Gland Flange Bolts (F227) using the appropriate sized Allen Wrench. (See page 5)
3. Remove the Gland Flange (F228).
4. When performing step 3, verify the location of the Upper Stem Seal O-rings, quantity 2, (F230) and the Stem Seal Bushing (F231). They may be located on the Stem (F233), (See Fig. 4A), or in the counterbore of the Gland Flange (F228), (See Fig. 4B).
5. There is a groove or recess in the bottom of the Gland Flange (F228), for the Gland O-ring (F229). (See Fig. 4B)
6. Inspect and replace any damaged parts. Use a food grade grease that contains no acetate or silicone, on the o-rings. Re-assemble in reverse order.

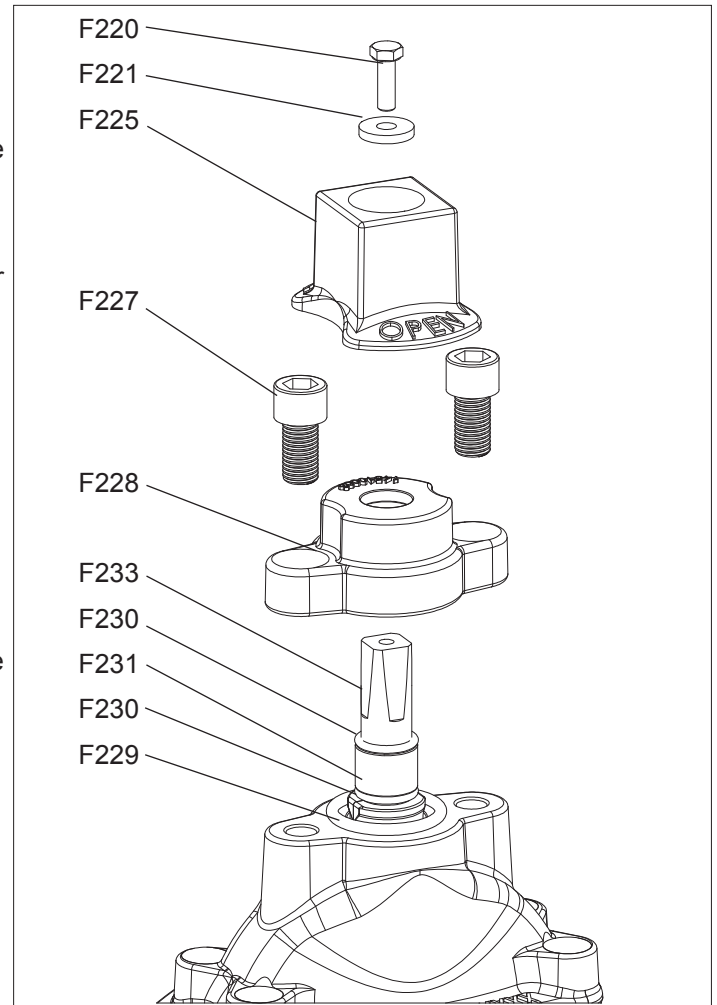


Fig. 4A

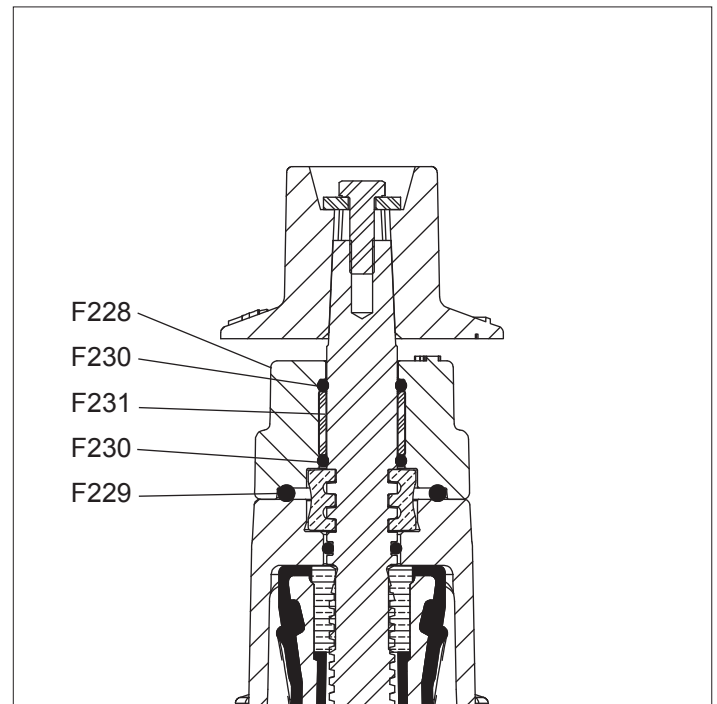


Fig. 4B

NRS (Non-Rising Stem) VALVE REPAIRS:

BONNET GASKET REPLACEMENT

WARNING: To perform the following steps, be sure the Water Main Supply Line has been shut off, and that the pressure has been bled off!

NOTE: Ensure that the valve is in the fully open position to ease head assembly removal.

1. Using a small, flat bladed screwdriver, remove the hot melt glue that covers the Bonnet Bolts (F216).
(See Fig. 5A)
2. Once the hot melt glue has been removed, use 5/16", or 8mm Allen wrench to remove the 2½" valve Bonnet Bolts (F216), and a 3/8", or 10mm Allen wrench for valve sizes 3"- 8".
(See Fig. 5B)
3. Replace the Bonnet Gasket (F218). Place the Bonnet gasket into the relief in the Bonnet (F217), and insert the Bonnet Bolts (F216), into the bolt holes in the Bonnet (F217), and through the Bonnet Gasket (F218).
4. Re-assemble in reverse order, torquing the Bonnet Bolts to 40 ft. lbs., in a diametrically opposed (180 degrees apart) pattern.
5. To replace the protective hot melt glue over the Bonnet Bolts, use any EPA approved caulk, or hot melt glue.

NOTE: The Bonnet Gasket procedures can also be used on OS&Y assemblies.

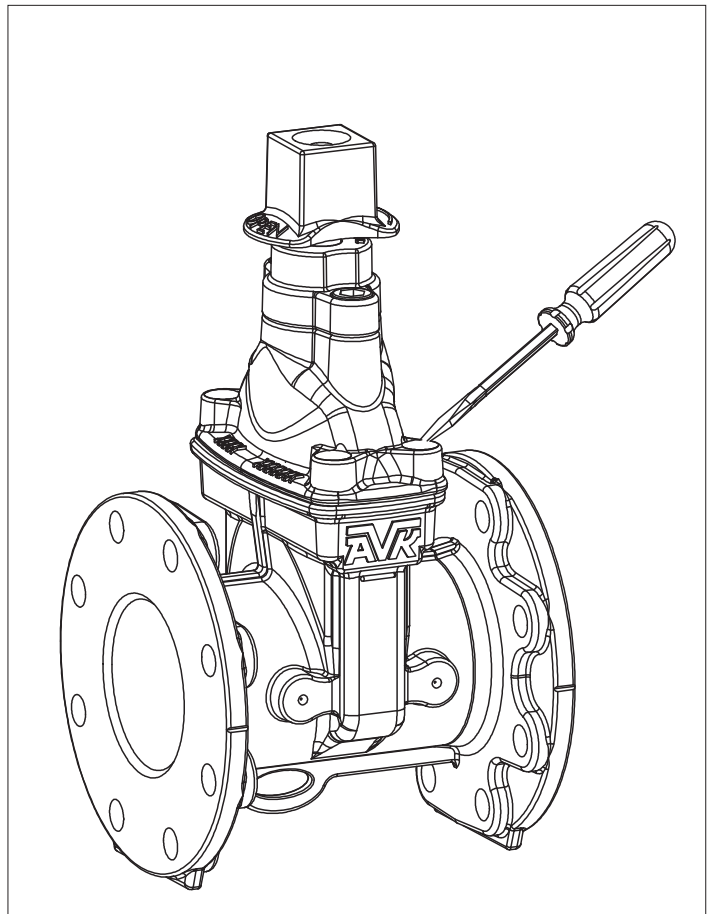


Fig. 5A

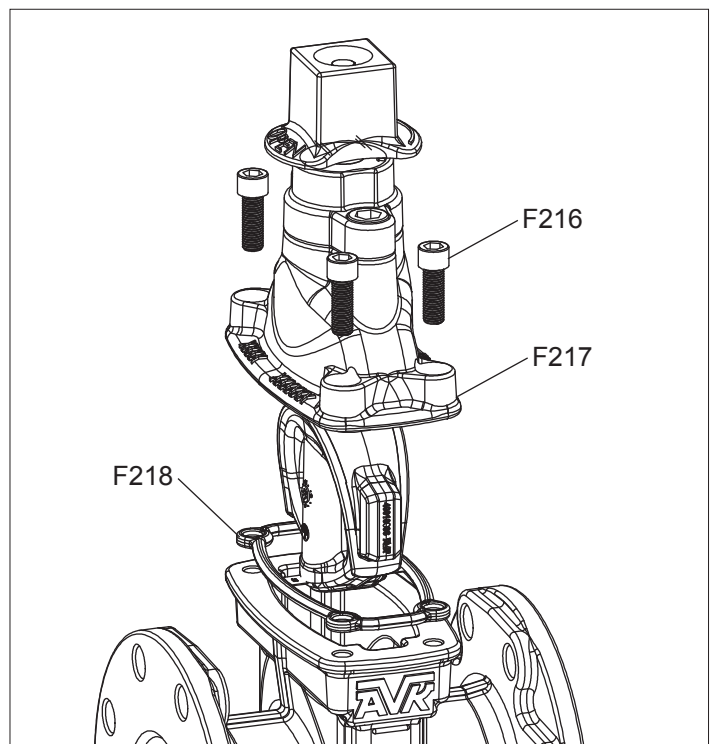


Fig. 5B

OS&Y (Outside Stem & Yoke) VALVE REPAIRS:

HANDWHEEL REPLACEMENT (Figs.6A,6B)

WARNING: To perform the following steps, be sure the Water Main Supply Line has been shut off, and that the pressure has been bled off!

NOTE: As most OS&Y valves are used in fire protection applications, verify that any alarm systems have been disabled prior to performing any maintenance or repairs.

1. Using a small, flat bladed screwdriver, remove the hot melt glue that covers the Bonnet Bolts (F216). (See Fig. 6A)
2. Once the hot melt glue has been removed, use 5/16", or 8mm Allen wrench to remove the 2½" valve Bonnet Bolts (F216), and a 3/8", or 10mm Allen wrench for valve sizes 3"- 8".
3. Turn the remaining part of the Handwheel (F202) in the closing direction. This will lift the Yoke/Bonnet (F263) head assembly, allowing removal of the Upper Stem Nut (F201), from the Stem Assembly (F215).
4. Remove the upper half of the Stem Nut (F201) from the handwheel and place it in the "new Handwheel" (F202).

NOTE: The Stem Nut pair are keyed with different sized lugs. Be sure to align the lugs in the correct location!
(See Fig. 6B)

5. Align the Upper Stem Nut (F201), with the Lower Stem Nut (F205), And insure that there is full engagement of the lugs.
6. Carefully turn the Handwheel (F202) in the opening direction until the Yoke/Bonnet (F263), is fully down and resting on the Body (F219).

CAUTION: When lowering the head assembly back on the body, take care to ensure that the Bonnet Gasket (F218), is not damaged.

7. Install the Bonnet Bolts (F216), taking care to ensure they are inserted through the Bonnet Gasket (F218), and tighten in a diametrically opposed pattern.
8. To replace the protective hot melt glue over the Bonnet Bolts, use any EPA approved caulk, or hot melt glue.
9. Repressurize the system. At this time, if there is a leak around the Stem Seal O-ring area, be sure that the upper Gland Follower Bolts (F261) are screwed down evenly into the Bonnet/Yoke (F263). Tighten the nuts 1/4 turn each until the leak stops.

NOTE: Since UL , ULC and FM Approvals are for the Manufacturer, this procedure will have no effect on listings or approvals.

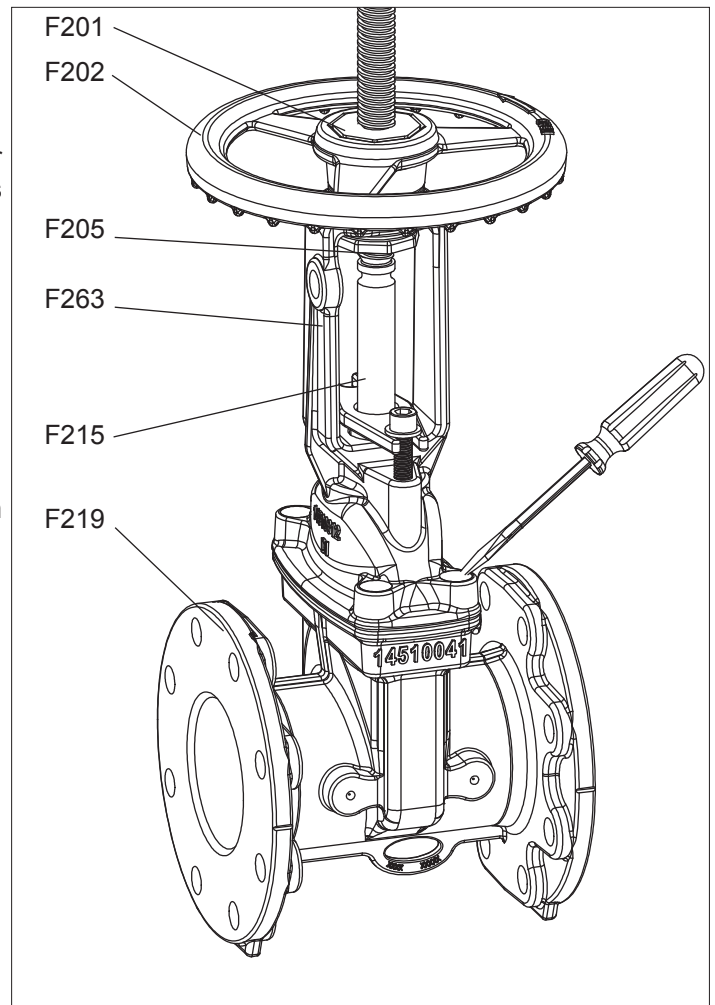


Fig. 6A

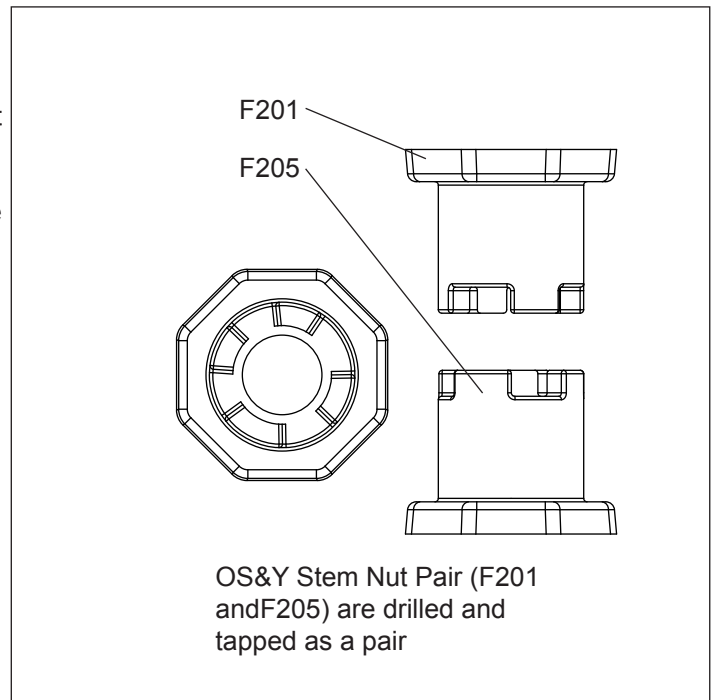


Fig. 6B

OS&Y (Outside Stem & Yoke) VALVE REPAIRS:

STEM SEAL O-RING REPLACEMENT (Figs.7A,7B)

WARNING: To perform the following steps, be sure the Water Main Supply Line has been shut off, and that the pressure has been bled off!

NOTE: Verify that any alarm systems have been disabled prior to performing any maintenance or repairs.

1. Remove the two upper Gland Follower Bolts (F261) and associated Washers (F262). Lift the Gland Follower (F208) up expose the Stem Seal O-rings (F211). (See Fig. 7A)
2. Use a small screwdriver or probe to access the three Stem Seal O-rings (F211).

NOTE: These O-rings are split-type o-rings. When replacing them, insure that the splits DO NOT align. Rotate the splits at approximately 30 degree intervals. Use a light coat of FDA approved, food grade grease for lubrication. (See Fig. 7B)

3. Reverse steps 2 and 3 for re-assembly.

CAUTION: Do not over tighten the upper pair of Gland Follower Bolts (F261). Tighten the bolts evenly so the Gland Follower applies even and level pressure on the O-rings. If the Gland Follower is assembled at an angle, leaks may occur.

4. Repressurize the system. At this time, if there is a leak around the Gland Follower (F208) be sure that Gland Follower Bolts (F261) are screwed down evenly on the Gland Follower (F208). Tighten the bolts 1/4 turn each until the leak stops.

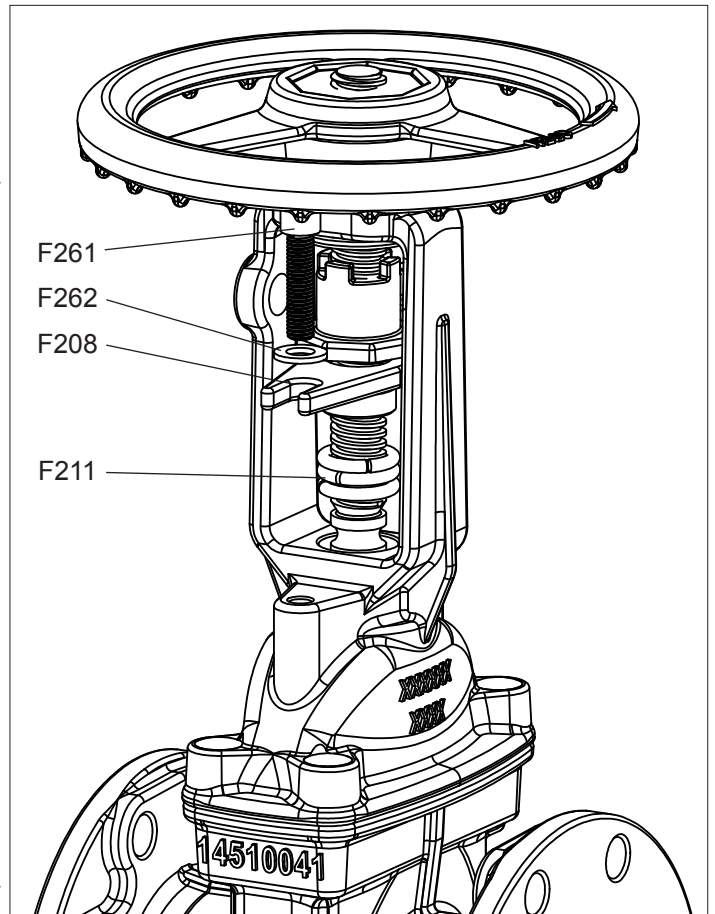


Fig. 7A

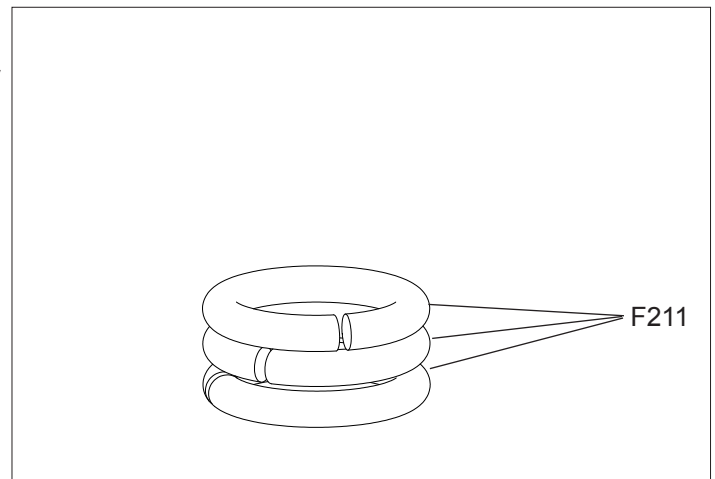


Fig. 7B

OS&Y (Outside Stem & Yoke) VALVE REPAIRS:

SUPERVISORY SWITCH INSTALLATION (Fig.8A)

1. AVK Series 145 OS&Y valves have a pre-tapped, 1/2" NPT threaded hole in the Yoke/Bonnet (F263), for mounting a Supervisory Switch. (See Fig. 8A)
2. With the valve in the fully open position, there is a stem groove that allows the switch to indicate the open position.
3. Refer to the switch manufacturer's instructions for correct switch installation.

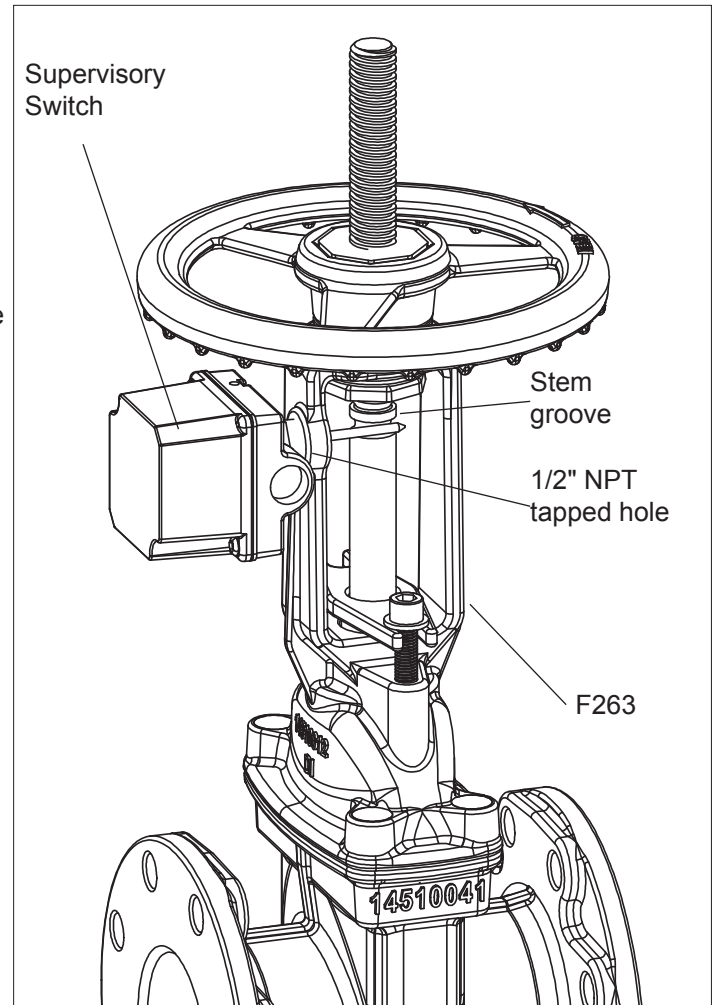


Fig. 8A

TROUBLESHOOTING GUIDE

WARNING: The valve must be isolated before performing any maintenance. Failure to do so may cause pressure to be released resulting in severe injury or death.

Several problems and solutions are presented below to assist you in troubleshooting the valve.

PROBLEM: Valve leaking around stem / gland flange.

Probable Cause: Damaged or worn o-rings.

Corrective action: Refer to the UPPER and LOWER STEM SEAL COMPONENT REPAIR sections of this manual and replace the o-rings.

PROBLEM: Valve leaking around Bonnet and Body.

Probable Cause: Bonnet Bolts loose.

Corrective action: Tighten Bonnet Bolts.

Probable Cause: Damaged Bonnet Gasket.

Corrective action: Replace Bonnet Gasket.

PROBLEM: Valve leaking around pipe connections.

Corrective action: Tighten flange hardware.

Corrective action: Verify gasket is not damaged. Replace if necessary.

PROBLEM: Valve hard to operate.

Probable Cause: Gland Bolts too tight or tightened unevenly.

Corrective action: Loosen then re-tighten Gland Bolts evenly.

Probable Cause: If the valve has not been operated over a prolonged period of time, build-up may occur on the internal parts.

Corrective Action: Open or close the valve one turn at a time until fully opened or closed. Repeat the process a few times then flush the system to remove any debris.

Probable Cause: Pressure build-up in system.

Corrective Action: Relieve pressure and bleed off any air build-up.

PARTS AND SERVICE

For information on parts and service for your area contact American AVK. Make a note of the valve model number and size located on the valve and contact:

American AVK Company

2155 Meridian Blvd.

Minden, NV 89423

PH: 775-552-1400

FAX: 775-783-1031

www.americanavk.com

**AMERICAN AVK COMPANY TWO (2) YEAR WARRANTY
RESILIENT WEDGE GATE VALVES**

American AVK Company warrants its Series 145 Resilient Wedge Gate Valves to be free from defects in workmanship and materials for a period of two (2) years from the date of shipment from American AVK Company. American AVK Company shall have no obligation under this warranty unless it is notified of claims hereunder promptly and in writing upon discovery thereof and within the warranty period, and unless the product is delivered to the American AVK Company facility within thirty (30) days of such notice.

American AVK shall have the right to inspect said product before it is removed from installation. If the product is removed from installation prior to approval from American AVK this warranty shall be void.

As to motors, gearing or accessory equipment purchased by American AVK Company from other manufacturers, and used or incorporated into American AVK Company's products, those manufacturers' warranties shall apply.

American AVK Company will honor all reasonable costs to repair or replace any American AVK Company Resilient Wedge Gate Valve found to be defective.

American AVK Company's sole responsibility shall be, in its sole discretion, to replace the product with the same or a similar product, repair the product, or refund the price paid for the product provided the product has been properly applied and used under normal service and under conditions for which it is designed. American AVK Company shall not be liable for indirect, special, incidental, or consequential damage or penalties and does not assume any liability of purchase to others or to anyone for injury to persons or property.

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