American R/D

A Division of McWane, Inc.

In-Plant Valve Products
1800 Greenbrier Road
Anniston, AL 36207
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INSTALLATION, OPERATION & MAINTENANCE MANUAL

AWWA C500 SOLID WEDGE GATE VALVE
2" – 72" NRS and OS&Y – Series 100 and Series 105

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EQUIPMENT LIST

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GENERAL

This manual is issued as a recommendation to the customer concerning the proper use of gate valves. Valves should always be installed and operated by authorized personnel. For additional information on these valves, please reference the AWWA C500 standard.

RECEIPT AND INSPECTION

Valves should be inspected for damage before being removed from the delivery vehicle or signing the delivery receipt

Care should be taken to ensure proper rigging of the valve for lifting and appropriate lifting equipment is being used. Valves should never be lifted by the stem, hand wheel, 2" operating nut, gearing, electric motor operator, and/or bypass valve.

We recommend that you make the following checks before installing this valve:

- Recheck the valve for damage.
- Check all nuts and bolts to make sure they are properly tightened.
- Check direction of opening for compliance with other valves in the system.
- Check to see that the valve end-joints are clean.
- Check inside the valve to remove all contaminants that may affect water system purity, cause the valve to not operate properly or seal tightly.
- Open and close the valve to make sure it works properly.

Keep the valve closed when placing it in the trench. Do not backfill around the valve prior to completion of the hydrostatic system test. Check to see that all valve joints and pressure containing bolting are tight. Leave the valve exposed while the pipeline is being pressurized.

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GATE VALVE RECOMMENDED STORAGE AND HANDLING

Whenever possible, American RD solid wedge gate valves should be stored inside. However, when this is not possible or feasible, some outdoor protection must be provided. The valves must be stored in such a manner to protect them from weather, blowing dirt and debris. A tarp covering will minimize exterior coating damage from these elements and reduce fading or chalking due to exposure to the sun. The valves should also be placed in a location where they will not be damaged by collision from vehicles, lift trucks or falling items. Valves should be stored with the end flanges vertical so that water does not stand on the wedge. If valves are received in crates with the flanges horizontal, they should be placed with the flanges vertical before storage. In cold climates, if water is allowed to freeze in the valve, severe damage to the valve components could result. The valves are shipped in the closed position and should remain in the closed position during long term storage. Any packaging removed for inspection of the valves should be replaced prior to placing the valves into long term storage.

Proper slinging and handling methods should be used when moving valves. The valves should be handled only with apparatus that will safely support the full valve weight. Do not place slings or other devices around operating stem, around the actuator or through the valve port opening.

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INSTALLATION

- Verify correct valve orientation prior to installation. Valves for horizontal installations in horizontal pipelines must be installed with rollers, tracks, and scrapers in the "down" location. Valves for horizontal installations in vertical pipelines must be installed with disc face tracking in the "down" location. Reference approved submittal drawings for verification. Contact American R/D immediately for clarification of proper installation orientation.

- Check all bolts for looseness. If loose, tighten.

- Open the valve and check the seats to make sure they are clean and not damaged. Remove any foreign material inside the valve body. Close the valve before installation.

- Clean all foreign material from the line such as cement, tools, sand, dirt, wire, etc.

- Handle the valve carefully into position.

- Make sure the valve and the line are adequately supported and in line to prevent strain on the valve. Do not use the valve as final joint to correct any error in alignment or spacing of piping.

- With flange end valves, tighten bolts uniformly in stages with a star pattern. Pull up bolts on diametrically opposite sides of the flange until all bolts are uniformly tight and the joint gaskets have sufficient compression to prevent leakage at test pressure.

- On flanged end valves, check and align pipe flanges. Use proper type and size fasteners.

- Use a proper type and size gasket, such as 1/8" thick full face rubber gasket.

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- Do **not** attempt to fit two flanges that are not alike together. Plain face with plain face or raised face with raised face is the proper procedure. Bolting together flanges of two different materials requires special consideration.

- With mechanical joint end valves, tighten the gland uniformly in stages with a star pattern against the rubber gasket.
- If a valve box is used over the valve, make sure the box does not transmit traffic load or other stress to the valve. Also make sure the box is centered over the valve stem and parallel to the valve stem axis.

- Be sure any valve installed at the end of the line or a stub is restrained to prevent blow off.

- Check for proper operating/maintenance clearance around the valve when it is installed.

- On valves with wrench nuts and valve boxes, be sure operating key is kept vertical during operation.

- **Keep the valve closed when placing it in the trench. Do not backfill around the valve prior to completion of the hydrostatic system test.** Leave the valve exposed while the pipeline is being pressurized. Check to see that all valve joints and pressure containing bolting are tight.

- We recommend that protection of some sort be utilized to protect the stem and keep debris from being packed against it on buried valves. Failure to do this may result in problems with operation.

- Refer to AWWA C500 and AWWA M44 for additional installation guidelines and information.

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OPERATION

START-UP AND BREAK-IN PROCEDURES

- Operate the valve from closed to full open and back to the closed position before applying pressure. Check and record number of turns to open.
- The direction to open valve is indicated by an arrow cast on the wrench nut or hand wheel.
- Slowly open and close valves against pressure to avoid damage from surge or water hammer.
- Never force a valve open or closed. If there is difficulty, contact the manufacturer.

SHUTDOWN

- Close the valve in the proper direction based on indication on the wrench nut or the hand wheel.
- Slowly close the valve against pressure to avoid damage from surge or water hammer.
- Verify the valve is completely closed by counting number of turns as recorded during initial start-up.

EMERGENCY OPERATION

Not applicable.

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SEASONAL OPERATION

When valves are exposed to freezing temperatures, do not leave valves closed on water or sewage service. Freezing of line fluid in the valve may cause cracking of the iron. Under such conditions, open the valve slightly to allow a small flow to prevent freezing

CALIBRATION

Not Applicable

TESTING PROCEDURE

- The trench may only be backfilled up to the area between joints, leaving the joints exposed so that leaks can be easily seen. Do this before testing to prevent pipe movement and permit joint inspection during test.
- The system should be stabilized for the test 24 hours prior to testing by filling it with water. The system shall have provisions to vent off all air and for pressurizing to test pressure. This should minimize losses due to entrapped air, changes in water temperature, distension of components under pressure, movement of gaskets, absorption of air by water or water by pipe wall and filling of gate valves.
- After stabilization and at the time of test, raise pressure in 50 PSI increments to the desired test pressure. After each pressure increment, observe stability of the joints looking for gasket extrusion, joint movement, gasket movement and leakage.
- Leakage shall be measured, while maintaining the specified test pressure, by pumping from a calibrated container.
- After the test is complete, hold for one hour and then decrease the pressure to zero PSI.

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SAFETY

- The valve body is a rugged structure but is not intended to be a means of aligning pipe. Care must be taken to ensure that any stresses caused by improper alignment are relieved elsewhere in the piping system. Large valves should be independently supported.

- The following general rules should be followed when installing the valve in the pipeline.

    - Handle valve only with an apparatus that will adequately support it, using a safe and proper technique.

    - Install the valve using good piping practices as governed by the applicable code or specification.

    - The pipeline and valve must be cleaned of all foreign water.

    - Do **not** tighten bolts in sequence. They must be tightened in a crossover, star pattern to load the bolts evenly.

    - Prior to troubleshooting or disassembling, isolate valve and purge pressure. Personnel could be injured if valve is maintenance is performed while the valve is pressurized.

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MAINTENANCE AND INSPECTION

During inspection, the valve should be open and closed on a filled and pressurized pipeline. The valve should function freely with no binding or vibration. Count the number of turns to full closed, this will reveal an obstruction if correct number of turns are not achieved.

Valve Size	Turns to Open
2”	4-3/4
2.5”	5-1/2
3”	10
4”	13
6”	19
8”	25
10”	31
12”	37
14”	107(geared)
16”	147(geared)
18”	165(geared)
20”	183(geared)
24”	292(geared)
30”	365(geared)
36”	546(geared)
42”	510(geared)
48”	776(geared)
54”	Consult Factory
60”	Consult Factory
66”	Consult Factory
72”	Consult Factory

Note: For valves with motors, refer to the actuator data sheet included with wiring diagrams. Attached actuators should be inspected per the manufacturers recommendations provided with those units.

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RECOMMENDED MAINTENANCE AND INSPECTION

- Operate the gate valve from full open to full close at regular intervals. The length of time between operations depends on the service conditions.
- On OS&Y valves, lubricate the valve stem with food grade anti-seize lubricant. Stems should be wiped clean of any debris or particles prior to operation.
- On NRS valves with packing, check regularly for packing leakage and lubricate packing with food grade lubricant. If leakage is detected, tighten packing gland bolts evenly. If this does not stop leakage then replace the valve packing.
- When repacking valve, be sure to use proper packing for the service. To obtain proper packing that will fill the stuffing box, forward the valve identification cast on the side of the valve body, the service and the quantity of valves to be replaced to the factory.
- To repack a valve, either OS&Y or NRS, run the valve to the full open position. Apply excess torque to back seat the upper wedge tightly between the stem and the bonnet. It will then be possible to repack with only slight or no leakage even under pressure.
- If the downstream side of the wedge is damaged and the upstream side is still in good shape, reverse upstream and downstream sides to improve shut off.

Periodic Inspections:

- End Flange Bolts and Bonnet Bolts should be inspected on a quarterly basis.
- For OS&Y valves, stem threads should be inspected for foreign matter, cleaned and then lubricated with food-based grease. Lubrication should be performed as required or per annum as a minimum.
- All valves should be operated on a quarterly basis at a minimum. Record any unusual conditions during cycling and maintain record of operation.
- Inspect packing or o-ring seals if exposed at a quarterly basis.

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Recommended Maintenance Summary Form - A permanent inspection record should be kept for each valve

1. Equipment Item: _____
1a. Model Number: _____
2. Manufacturer: American R/D
2a. Address: 1800 Greenbrier Dear Rd. Anniston, AL 36207 Tel: 256-831-2236
3. Tag Number(s): _____
4. Weight of Individual Components (over 100 lbs): _____
5. Nameplate Date: (hp, voltage, speed, etc):_____
6. Manufacturer's Local Representative: _____

   Name: _____ Tel: _____

   Address: _____
7. Maintenance Requirements:

DISASSMEBLY AND REASSEMBLY INSTRUCTIONS

DISASSEMBLY INSTRUCTIONS FOR AMERICAN R/D OS&Y SOLID WEDGE GATE VALVE (2" – 12")

- Remove retaining nut and washer.
- Remove hand wheel or operating nut.
- Remove packing follower nuts and bolts.
- Remove packing follower.
- Remove bolts & nuts between yoke and bonnet.
- Lift off yoke.
- Remove bonnet flange bolts and nuts.
- Lift off bonnet.
- Grasp stem and lift out wedge.

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DISASSEMBLY INSTRUCTIONS FOR AMERICAN R/D OS&Y SOLID WEDGE GATE VALVE (14" – 72")

- Remove bolts and nuts between gear and top of yoke.
- Unscrew gear by turning and lift off gear assembly. Retain key.
- Remove bolts & nuts between yoke and bonnet.
- Lift off yoke.
- Remove packing follower nuts and bolts.
- Remove packing follower.
- Remove bonnet flange bolts & nuts.
- Lift off bonnet.
- Grasp stem and lift out stem and wedge.

DISASSEMBLY INSTRUCTIONS FOR AMERICAN R/D NRS SOLID WEDGE GATE VALVE (2" – 12")

- Remove retaining nut and washer.
- Remove hand wheel or operating nut.
- Remove packing follower nuts and bolts.
- Remove packing follower.
- Remove stem by turning stem in the opposite direction for valve opening.
- Remove bonnet flange bolts and nuts.
- Lift off bonnet.
- Grasp stem nut and lift out wedge. **Note: Threading stem back into stem nut may make removal of wedge easier.**

DISASSEMBLY INSTRUCTIONS FOR AMERICAN R/D NRS SOLID WEDGE GATE VALVE (14" – 72")

- Remove bolts and nuts between adapter plate and gear.
- Lift off gear assembly. Retain key.
- Remove bolts & nuts between adapter and bonnet.
- Lift off adapter.
- Remove packing follower nuts and bolts.
- Remove packing follower.

- Remove stem by turning the stem in the opposite direction of opening the valve.
- Remove bonnet flange bolts & nuts, and then remove the bonnet.
- Grasp stem nut and lift out wedge. **Note: Threading stem back into stem nut may make removal of wedge easier.**

REASSEMBLY INSTRUCTIONS

Reassemble in reverse order replacing bonnet gasket, stem o-rings or packing, follower plate o-ring and thrust washer if necessary.

TROUBLESHOOTING SOLID WEDGE GATE VALVES

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 disassemble and clean
	Seat damaged	Inspect, repair or replace
Leak Past Stem	Packing Bolts loose	Tighten bolts
	(NRS)O-Rings worn/damaged	Inspect/Replace
	(OS&Y)Packing worn/damaged	Inspect/Replace

For service contact the local manufacturer's rep.

SPARE PARTS

In normal operating conditions, no spare parts are needed on hand.

For parts contact the local manufacturer's rep.