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INTRODUCTION

Installation of Norris butterfly valves is a simple procedure that requires no special tools. Special care should be taken, however, in unpacking and installing the valve to avoid damage to the sealing surfaces (O-ring flange seals, seat and disc edge or disc O-ring).

Installation Compatibility

Norris wafer span and lug type valves 2- through 36-in. are designed for use with ANSI 150 flanges with an inside diameter equivalent to Schedule 40 pipe ID. Check disc clearance charts on individual Valve Data Sheets to be sure the inside diameter of companion flanges and piping does not interfere with disc movement when the valve is cycled to the open position. Back beveling of heavy wall, plastic or cement pipe may be required for disc clearance.

Weldneck or socket weld flanges are recommended for use with elastomer-lined R-Series valves. Slip on type flanges are not recommended for use with R-Series valves. Slip-on type flanges should only be used with R-Series valves when the flanges have been installed with single beveled, fillet-reinforced weld, per Mil-Std-22A, P43.

Norris automated valves and those with gear operators should be installed between flanges with the operator in place. Lever-operated valves are shipped with the handle removed. Attach handle to operator shaft and check disc to be sure it seats on raised sealing surface before installing between flanges.

CAUTION!

Although life expectancy is difficult to determine, approximately 5 to 10 years of life can be expected in general service with proper maintenance (no warranty is implied by this statement). The user shall determine suitability for corrosive or abrasive applications. The user shall determine suitability of material for application. Valves for hydrogen sulfide and chloride containing applications should be checked by the user for the application of applicable recognized standards. The user is responsible for insulating the valve as necessary to prevent hot/cold surface contact. These valves are not for operation in an external fire environment. The system shall provide protection from exceeding the allowable limits of pressure and temperature.

Required Tools and Materials

The only tool required to install Norris butterfly valves is a wrench suitable for tightening flange bolts and nuts or cap screws. A hoist may be required for 10-in. and larger valves. Smaller sizes can usually be handled by one man. Temporary pipe supports may be used to keep the flange faces parallel and aid in installing the valve.

Flange gaskets are not required since O-ring flange-face seals are a built-in feature of the Norris valve design. Flange bolts and nuts or cap screws are not included with valve shipment unless ordered as a separate item. The individual Valve Data Sheets will indicate the required number and size of bolts or cap screws which are available from most supply stores or distributors.

Preparation of Valve and Flanges

If the valve and flanges are properly prepared for installation, problems can be avoided later. Flange faces



should be free of dirt, grit, dents or surface irregularities which might damage the body O-ring flange seals and cause leakage at the flange. Also inspect the valve and wipe away any grit or dirt which might be around the seat seals or disc. The valve must be in the "closed position" to protect the sealing edge of the disc.

1.0 INSTALLATION

CAUTION!

Flange bolting should not be used to position flanges. Flanges should be in proper installation position prior to torquing bolting to prevent external loads from transferring to the valve. Ensure that piping is properly supported to prevent piping loads from being transferred to the valve.

1.1 INSTALLATION OF ALL 2- TO 12-IN. SPAN-TYPE VALVES

Loosely bolt lower half of flanges together. Make sure the flanges are separated enough to allow the valve to be inserted without damaging flange seals and the face of the elastomer seat.

Insert valve between flange faces with care and lower into bolt cradle. Special care should be taken, especially when raised-face flanges are used, to prevent damage to face of seat and O-ring flange seals during installation.

Loosely install remaining flange bolts and nuts.

Snug all flange bolts. Tighten first one bolt and then the opposite, 180° apart,

keeping flange faces parallel. Make sure there is full metal-to-metal contact between flange and valve face. The O-ring seal makes excessive bolt loading unnecessary.

1.2 INSTALLATION OF 14- TO 36-IN. SEMI-LUG AND 2- TO 36-IN. FULL-LUG VALVES

Attach valve to one flange and then the other using the tapped flange holes. Loosely install all cap screws in tapped holes on one flange. Tighten evenly, working with alternate cap screws 180° apart. Keep flange and valve faces parallel.

Tighten cap screws evenly in the same manner, alternating between screws that are 180° apart. Make sure there is full metal-to-metal contact between flange and valve face. Do not over-tighten cap screws. The O-ring flange seal makes excessive bolt loading unnecessary.

Repeat procedure for second flange.

In the case of semi-lug 14- through 36-in. valves, install remaining bolts after valve is attached to both flanges.

2.0 MAINTENANCE AND REPAIR

Norris butterfly valves are designed and manufactured to exacting standards to help avoid operating problems. However, trouble with valves can occur if they are improperly handled, if they are used beyond the recommended working pressure and flow rates, or if the wetted parts are not compatible with the flow medium.

Operating maintenance and lubrication is not required. Shaft bearing surfaces have been factory lubricated. O-ring seat and shaft seals are permanently locked in lubricant to prevent flow medium from penetrating major bearing surfaces.

Under normal conditions, operating torques will not exceed a comfortable range for manual operation of the valve although valve torques may increase somewhat with age.

Repairs which may be required:

1. O-ring flange seal replacement if a leak develops between flange and valve body. Flange seal can be replaced without disassembling the valve and replacing the seat. See Step 6 of assembly procedure on following pages. Flange face should be inspected for dirt, grit or irregularities which could prevent sealing, or damage replacement seal.
2. Seat, disc or disc O-ring replacement if the valve develops a leak through the valve bore.
3. Replacement of O-ring shaft seals if valve develops a leak at top or bottom shaft or operating torque increases beyond comfortable limits.
4. Shaft replacement if shaft becomes corroded or operating torque increases appreciably.
5. Disc or shaft replacement if drive slot or shaft is damaged by pressure surges or flow velocity exceeding recommended limits.

3.0 DISASSEMBLY/ASSEMBLY OF 2- TO 12-IN. 200 PSI VALVES

(See Figure #1)

WARNING!

It is not safe to make any valve repairs while the valve is under pressure/vacuum. Do not loosen cap screws or attempt to remove topworks, operator or bottom plate until all pressure/vacuum has been eliminated and valve removed from line.

Removal of Valve from Line

Remove all pressure from line. Close valve and remove flange bolts or cap screws. Spread flanges so valve can be removed without damaging face of elastomer seat.

Disassembly of 2- to 12-in. Valves

1. Open disc (#2) enough to clear raised seating surface.
2. Remove topworks, gear operator or other actuator.
3. Remove cap screws (#13) and bottom plate (#12).
4. Remove top and bottom shaft retention screw (#14) and washer (#15).
5. Pull top and bottom shaft (#3 and #4) from body with pliers or vise grips. O-ring shaft seal (#7) and thrust washers (#10 and #11) will come out with top shaft. Bottom O-ring shaft seal (#7) will come out with bottom shaft.

6. Push disc (#2) from seat carefully so as not to damage sealing edge.
7. Tap seat (#5) from body with plastic or rubber mallet. O-ring flange seals (#6) will come free as seat is removed. Seat O-rings (#7) will be in counterbore of seat.

FOR M-SERIES VALVES ONLY:

Inspect disc O-ring for damage or compression set. If replacement is necessary, carefully cut the O-ring (#16) and remove from disc edge groove. Do not pry the O-ring loose with sharp tools which could damage the disc or groove. See special instructions for replacing disc O-ring (page 7).

Assembly of 2- to 12-in. Valves

1. Thoroughly clean all parts, then grease outside diameter and

raised sealing surface of seat, all O-rings, and disc edge with a silicon-based lubricant such as Dow Corning Valve-Seal or Magnalube.

WARNING!

Valve must not be put under pressure/vacuum until topworks, operator and bottom plate have been installed.

CAUTION!

Petroleum-based lubricants can cause damage to some elastomers and should not be used on rubber parts.

2. Place shaft O-rings (#7) in seat counterbores, slip seat (#5) into body (#1), accurately aligning shaft holes in seat with shaft bores in body. A "soft" plastic or rubber mallet may be used to tap seat into place if necessary.

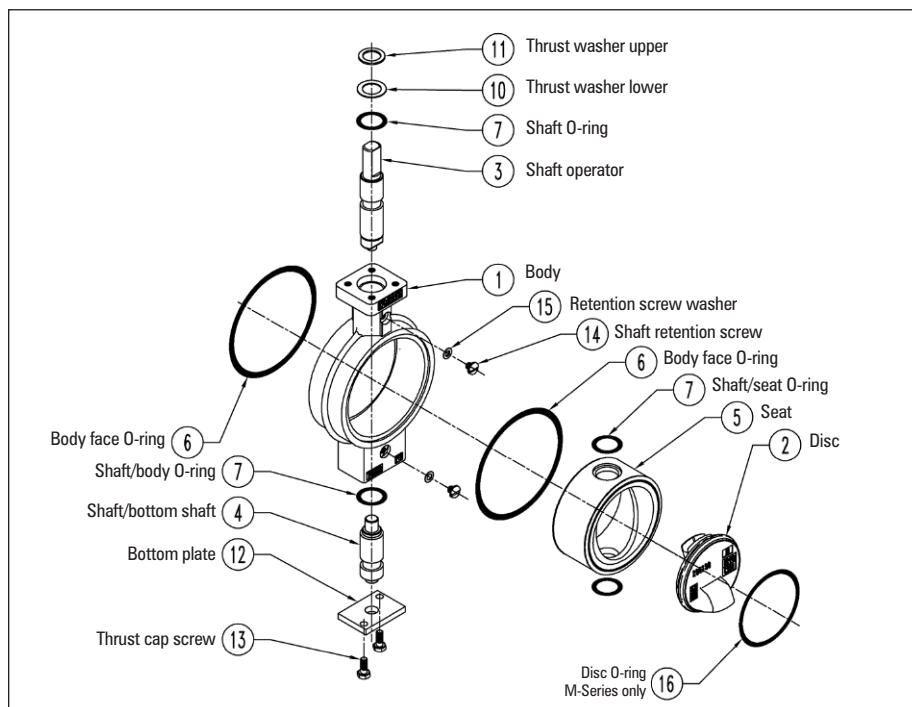


Figure #1

3. Grease bearing surface (nub) of bottom shaft (#4) and full length of operator shaft (#3) with a general-purpose lubricant. Insert operator shaft and bottom shaft to check alignment of shaft bore in seat and body. Carefully rotate and push shaft past the seat and seat O-rings to prevent damage to these sealing surfaces. *Do not force shaft past seat O-ring and seat.* If necessary, realign seat with shaft bores. Withdraw the shafts enough to allow clearance for disc.

4. Insert disc (#2) perpendicular to shaft holes and raised sealing surface, then rotate 90° to align disc bosses with shaft bores. Engage bottom shaft (#4) with bottom disc boss. Insert shaft O-ring (#7) in counterbore of body, attach bottom plate (#12) with two cap screws (#13). Align flats of operator shaft (#3) with milled slot in disc boss and insert as far as it will go. *Do not hammer shaft into place.*

5. Install top and bottom retention washers (#15) and shaft retention screws (#14) in valve. Rotate top shaft (#3) to be sure retention screw (#14) does not interfere with shaft movement. *Check to be sure disc seats on raised seating surface.* If it does not, rotate disc 180°. Disc can be rotated 360° without damaging valve.

6. Insert O-ring flange seal (#6) in groove between body and seat. Avoid stretching O-ring by first pressing it into place at four points — 12, 3, 6 and 9 o'clock — then pressing it into place alternately

at points between until the entire O-ring is smooth and evenly secured.

7. Insert shaft O-ring (#7), stainless steel washer (#10) and Teflon washer (#11) in counterbore of mounting pad. Install topworks or operator. Again, check to be sure disc seats on raised sealing surface.

8. Install valve between flanges.

WARNING!

Valve must not be put under pressure/vacuum until topworks or operator is installed.

4.0 DISASSEMBLY/ASSEMBLY OF 2½- TO 12-IN 285 PSI VALVES

(See Figure #2)

WARNING!

It is not safe to make any valve repairs while the valve is under pressure/vacuum. Do not loosen cap screws or attempt to remove topworks, operator or bottom plate until all pressure/vacuum has been eliminated and valve removed from line.

Removal of Valve from Line

Remove all pressure from line. Close valve and remove flange bolts or cap screws. Spread flanges so valve can be removed without damaging O-ring flange seals or face of elastomer seat.

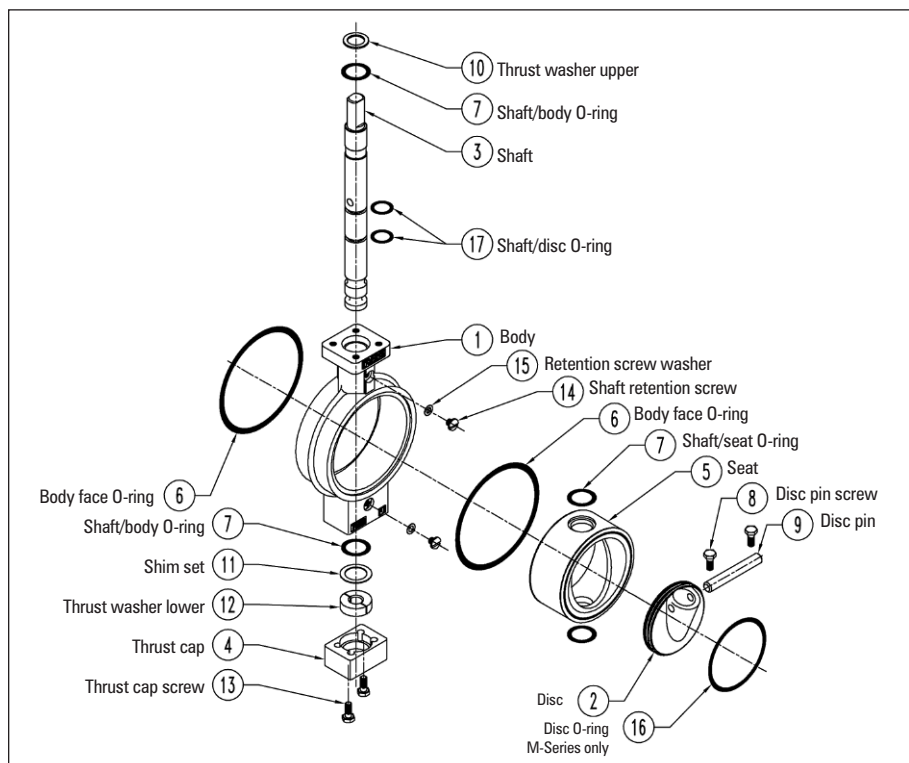


Figure #2

Disassembly of 2½- to 12-in Valves

Lay valve body flat between two blocks or secure rim of body in vise to simplify disassembly and assembly.

1. Open disc, then remove gear operator or other actuator and key.
2. Remove shaft retention screws (#14) and washers (#15).
3. Remove cap screws (#16) and thrust cap (#13). Remove split thrust washer (#12), shim set (#11) and O-ring shaft seal (#7) from shaft bore, taking care not to damage the shaft.
4. Remove cap screws (#13) from disc pin and tap pin (#9) out with a "soft" hammer.
5. Support the disc to prevent damage to the seal edge as the shaft is removed from body.
6. Remove shaft (#3) through bottom bore of body. Tap top of shaft with a soft plastic or rubber hammer to loosen, then pull from the opposite end. Disc (#2) will come free when shaft has been removed.
7. Tap seat (#5) from body with rubber mallet. O-ring flange seals (#6) will come free as seat is removed. Seat O-rings (#7) will be in counterbores of seat.
8. Remove shaft O-rings (#17) from grooves in shaft.
9. Remove O-ring shaft seal (#7) and TFE washer (#10) from top shaft bore.

FOR M-SERIES VALVE ONLY:

Inspect disc O-ring for damage or compression set. If replacement is necessary, carefully cut the O-ring (#19) and remove from disc edge groove. *Do not pry the O-ring loose with sharp tools which could damage the disc or groove.* See special instructions for replacing disc O-ring (page 7).

Assembly of 2½- to 12-in Valves

1. Thoroughly clean all parts, then grease outside diameter and raised sealing surface of seat, all O-rings, and disc edge with a silicon-based lubricant such as Dow Corning Valve-Seal or Magnalube.

WARNING!

Valve must not be put under pressure/vacuum until topworks, operator and bottom plate have been installed.

CAUTION!

Petroleum-based lubricants can cause damage to some elastomers and should not be used on rubber parts.

2. Place O-ring seat seals (#7) in seat counterbores. Slip seat (#5) into body (#1), accurately aligning shaft holes in seat with shaft bores in body. A "soft" plastic or rubber mallet may be used to tap seat into place if necessary.
3. Carefully roll shaft O-rings (#7) into shaft grooves.
4. Carefully lower disc (#2) into seat perpendicular to shaft bores and raised sealing surface. Rotate disc

to align disc bosses with shaft bores.

5. Grease shaft (#3) thoroughly with general-purpose lubricant. Insert shaft, carefully revolving it past O-rings and seat to prevent damage to these sealing surfaces. Do not force shaft past seat O-rings and seat. *Do not hammer into place.*
6. Rotate disc to align disc pin hole with hole in shaft, insert disc pin (#9) and attach cap screws (#8). A soft hammer may be used to tap the disc pin into place. Close the disc.
7. Install shaft retention screws (#14) and washers (#15).
8. Insert bottom shaft O-ring (#7) in counterbore of body. A set of shims (#11) is provided to balance the self-centering disc. A split thrust washer (#12) and thrust cap (#13) hold them in place. The number of shims necessary for each valve may vary because of manufacturing tolerances. Insert the thrust washer (#12), determine the correct number of shims required for a tight fit. Remove shims and thrust washer. Install the required shims, thrust washer and close with thrust cap (#13) and cap screws (#16).
9. Insert O-ring flange seals (#6) in groove between body and seat. Avoid stretching O-ring by first pressing it into place at four points — 12, 3, 6 and 9 o'clock — then pressing it into place alternately at points between until the entire O-ring is smooth and evenly secured.

10. Insert O-ring (#7) and TFE washer (#10) in counterbore of mounting pad.
11. Insert key and install gear operator or other actuator. Close valve to be sure disc seats on raised sealing surface. If it does not, rotate disc 180°. Disc can be rotated a full 360° without damaging valve.
12. Use hoist to install valve between flanges. Temporary pipe supports should be used to keep flanges parallel during installation and prevent damage to disc edge, O-ring flange seals and face of elastomer seat.

5.0 DISASSEMBLY/ASSEMBLY OF 14- TO 36-IN 200 AND 285 PSI VALVES

(See Figure #3)

WARNING!

It is not safe to make any valve repairs while the valve is under pressure/vacuum. Do not loosen cap screws or attempt to remove topworks, operator or bottom plate until all pressure/vacuum has been eliminated and valve removed from line.

Removal of Valve from Line

Remove all pressure from line. Close valve. Attach hoist to support valve and aid in removing valve from line. Use of temporary pipe supports will help prevent damage to the valve.

Remove flange bolts. All cap screws should be removed from one flange and then the other. Spread flanges so valve can be lifted from the line without damaging disc edge, O-ring flange seats or face of elastomer seat.

Disassembly of 14- to 36-in. Valves

Lay valve body flat between two blocks or sawhorses to simplify disassembly and assembly.

1. Open disc, then remove gear operator or other actuator and key (#11).
2. Remove cap screws (#18) and thrust washer (#10), shim set (#8) and O-ring shaft seal (#16) from shaft bore, taking care not to damage the shaft.
3. Remove cap screws (#22) from disc pin and tap pin (#7) out with a "soft" hammer.
4. Attach a sling to support disc and prevent damage to the sealing edge as the shaft is removed from body.

5. Remove shaft (#3) through bottom bore of body. Tap top of shaft with a soft plastic or rubber hammer to loosen, then pull from the opposite end. Disc (#2) will come free when shaft has been removed.
6. Tap seat (#6) from body with plastic or rubber mallet. O-ring flange seals (#15) will come free as seat is removed. Seat O-rings (#16) will be in counterbores of seat.
7. Remove shaft O-rings (#17) from grooves in shaft.
8. Remove O-ring shaft seal (#16) and Teflon washer (#27) from top shaft bore.

FOR M-SERIES VALVE ONLY:

Inspect disc O-ring for damage or compression set. If replacement is

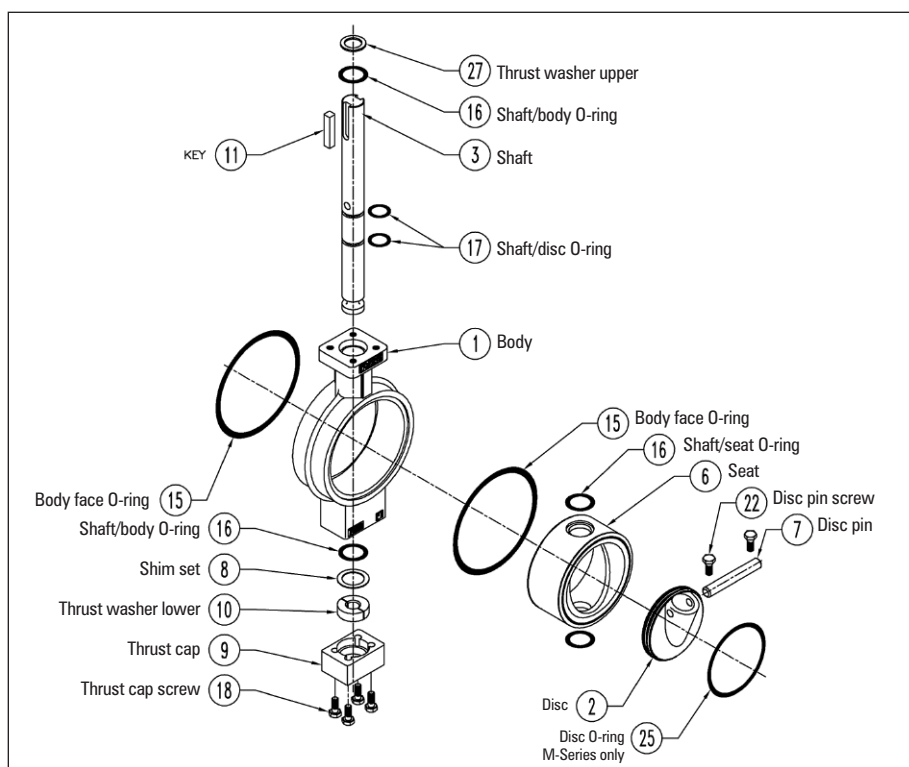


Figure #3

necessary, carefully cut the O-ring (#25) and remove from disc edge groove.

Do not pry the O-ring loose with sharp tools which could damage the disc or groove. See special instruction for replacing disc O-ring (page 7).

Assembly of 14- to 36-in. Valves

1. Thoroughly clean all parts, then grease outside diameter and raised sealing surface of seat, all O-rings and disc edge with a silicon-based lubricant such as Dow Corning Valve-Seal or Magnalube.

WARNING!

Valve must not be put under pressure/vacuum until topworks, operator and bottom plate have been installed.

CAUTION!

Petroleum-based lubricants can cause damage to some elastomers and should not be used on rubber parts.

2. Place shaft O-rings (#16) in seat counterbores, slip seat (#6) into body (#1), accurately aligning shaft holes in seat with shaft bores in body. A "soft" plastic or rubber mallet may be used to tap seat into place if necessary.

3. Carefully roll shaft O-rings (#17) into shaft grooves.

4. Attach a sling to disc (#2). With the hoist, carefully lower disc into seat perpendicular to shaft bores and raised sealing surface. Rotate disc to align bosses with shaft bores.

5. Grease shaft (#3) thoroughly with general-purpose lubricant. Insert

shaft, carefully revolving it past O-rings and seat to prevent damage to these sealing surfaces. *Do not force shaft past seat O-rings and seat. Do not hammer into place.*

6. Rotate disc to align disc pin hole with hole in shaft. Insert disc pin (#7) and attach cap screws (#22). A soft hammer may be used to tap the disc pin into place. Close the disc.

7. Insert bottom shaft O-ring (#16) in counterbore of body. A set of shims (#6) is provided to balance the self-centering disc. A split thrust washer (#10) and thrust cap (#9) hold them in place. The number of shims necessary for each valve may vary because of manufacturing tolerances. Insert the thrust washer (#10), determine the correct number of shims required for a tight fit. Remove shim and thrust washer. Install the required shims, thrust washer and close with thrust cap (#9) and cap screws.

8. Insert O-ring flange seals (#15) in groove between body and seat. Avoid stretching O-ring by first pressing it into place at four points — 12, 3, 6 and 9 o'clock — then pressing it into place alternately at points between until the entire O-ring is smooth and evenly secured.

9. Insert O-ring (#16) and Teflon washer (#27) in counterbore of mounting pad.

10. Insert key (#11) and install gear operator or other actuator. Close valve to be sure disc seats on raised sealing surface. If it does not, rotate disc 180°. Disc can be

rotated full 360° without damaging valve.

11. Use hoist to install valve between flanges. Temporary pipe supports should be used to keep flanges parallel during installation and prevent damage to disc edge, O-ring flange seals and face of elastomer seat.

6.0 INSTALLTION OF DISC O-RING ON 2- TO 36-IN. M-SERIES VALVES (200 AND 285 PSI RATED VSLVES)

Inspect disc edge for damage. Thoroughly clean the groove lips of dirt and grit which might damage O-ring. Use an emery cloth to smooth edges if necessary. Use a generous amount of silicon-based grease such as Dow Corning Valve-Seal or Magnalube on the O-ring. The groove may be lightly greased but excessive amounts of grease in the groove may prevent O-ring from seating properly.

CAUTION!

Petroleum-based lubricants can cause damage to some elastomers and should not be used on rubber parts.

1. Place O-ring about halfway around disc groove. Holding it in place with one hand, pull O-ring to position on edge of disc with index finger of other hand.

2. With finger still under O-ring, rotate disc completely to equalize rubber tension.

3. To ensure equal distribution of the O-ring around the disc, press it into place at four equally spaced points — 12, 3, 6 and 9 o'clock. Six-inch and larger valve discs are more easily handled if placed in

a vise or laid flat on a clean surface. A smooth bar or hammer handle can be used to press the O-ring into place at the four points.

4. Continue pressing the O-ring into place at points between the original four, alternately on one side and then the other until the entire O-ring is smooth and evenly secured. Large discs are easily handled by putting the edge of the disc against the chest and working the opposite side. Hold the bar at a slight angle and roll a small section of the O-ring into place. Rotate the disc 180° to work the opposite area.

Disc O-rings on large valves can be installed most efficiently with specially prepared sheet metal vise-grips. The grips are heated, flattened and finished so the lips are flush and smooth. They are available from Norriseal at a nominal charge (Part #51843A001).

Follow Step #1 and Step #2 above. Then adjust end screw of vise-grip to close flat plates. Open the grips and turn the end screw one half-turn. Taking care not to cut through it, squeeze the O-ring with the grips to flatten. The O-ring should slip into the groove easily. Proceed in the same way at 3, 6 and 9 o'clock, then at points between until the O-ring is smoothly secured in the groove.

NOTE

A little practice will enable you to determine the exact adjustment for installing the O-ring. Adjustments will vary for different sizes of valves.

Do not install O-ring by rolling it up the side of disc into groove. This will cause the O-ring to twist and early failure will result. Do not stretch O-ring so cross section is reduced. This will cause it to become large in diameter and even distribution of the O-ring around the disc edge will be more difficult. Never pound the O-ring into the groove with a hammer! This will result in damage to the groove lips and prevent the valve from closing properly.



7.0 REPAIR KITS FOR R&M SERIES BUTTERFLY VALVES, 200 AND 285 PSI

Kits include installation instructions and all rubber goods, washers, shims and lubrication required to rebuild valves.

TABLE 1 — SEAT/O-RING REPLACEMENT KITS FOR 200 PSI RUBBER SEATED BUTTERFLY VALVES, R-SERIES

Use "54000" as a prefix when ordering replacement kits. Example: Order 54000-A001 for 2-in. Type A Buna N Replacement Kit.

ELASTOMER	2 in.	2.5 in.	3 in.	4 in.	5 in.	6 in.	8 in.	10 in.	12 in.
Type A Buna N	A001	A004	A007	A010	A013	A016	A019	A021	A024
Type B Viton	B001	B004	B007	B010	B013	B016	B019	B021	B024
Type S EPDM	S001	S004	S007	S010	S013	S016	S019	S021	S024

TABLE 2 — O-RING REPLACEMENT KITS FOR 200 PSI METAL-SEATED BUTTERFLY VALVES, M-SERIES

Use "54000" as a prefix when ordering replacement kits. Example: Order 54000-A003 for 2-in. Type A Buna N Replacement Kit.

ELASTOMER	2 in.	2.5 in.	3 in.	4 in.	5 in.	6 in.	8 in.	10 in.	12 in.
Type A Buna N	A003	A005	A008	A011	A014	A017	A027	A022	A025
Type B Viton	B003	B005	B008	B011	B014	B017	B027	B022	B025
Type S EPDM	S003	S005	S008	S011	S014	S017	S027	S022	S025

TABLE 1 — SEAT/O-RING REPLACEMENT KITS FOR RUBBER SEATED 285 PSI BUTTERFLY VALVES, R-SERIES

Use "54000" as a prefix when ordering replacement kits. Example: Order 54000-A127 for 2-in. Type A Buna N Replacement Kit.

ELASTOMER	2 in.	2.5 in.	3 in.	4 in.	5 in.	6 in.	8 in.	10 in.	12 in.
Type A Buna N	NA	A127	A128	A129	A130	A131	A132	A133	A134
Type B Viton	NA	B127	B128	B129	B130	B131	B132	A133	B134
Type S EPDM	NA	S127	S128	S129	S130	S131	S132	A133	S134

Table 4. Replacement Kits

OPERATING AND MAINTENANCE MANUAL

Norris Butterfly Valves

TABLE 4 — O-RING REPLACEMENT KITS FOR METAL-SEATED 285 PSI BUTTERFLY VALVES, M-SERIES

Use "54000" as a prefix when ordering replacement kits. Example: Order 54000-A119 for 2.5-in. Type A Buna N Replacement Kit.

ELASTOMER	2 in.	2.5 in.	3 in.	4 in.	5 in.	6 in.	8 in.	10 in.	12 in.
Type A Buna N	NA	A119	A121	A120	A122	A123	A124	A125	A126
Type B Viton	NA	B119	B121	B120	B122	B123	B124	B125	B126
Type S EPDM	NA	S119	S121	S120	S122	S123	S124	S125	S126

TABLE 5 — SEAT/O-RING REPLACEMENT KITS FOR RUBBER-SEATED 200 & 285 PSI BUTTERFLY VALVES, R-SERIES

Use "54000" as a prefix when ordering replacement kits. Example: Order 54000-A034 for 14-in. Type A Buna N Replacement Kit.

ELASTOMER	14 in.	16 in.	18 in.	20 in.	24 in.	26 in.	28 in.	30 in.	32 in.	36 in.
Type A Buna N	A034	A035	A036	A037	A039	A231	A041	A042	A043	A333
Type B Viton	B034	B035	B036	B037	B039	B040	B041	B042	B043	B333
Type S EPDM	S034	S035	S036	S037	S039	S040	S041	S042	S043	S333

TABLE 6 — O-RING REPLACEMENT KITS FOR METAL-SEATED 200 & 285 PSI BUTTERFLY VALVES, M-SERIES

Use "54000" as a prefix when ordering replacement kits. Example: Order 54000-A045 for 14-in. Type A Buna N Replacement Kit.

ELASTOMER	14 in.	16 in.	18 in.	20 in.	24 in.	26 in.	28 in.	30 in.	32 in.	36 in.
Type A Buna N	A045	A046	A253	A048	A050	NA	A052	A053	A054	C.F.
Type B Viton	B045	B046	B047	B048	B213	NA	B052	B053	B054	C.F.
Type S EPDM	S045	S046	S047	S048	S050	NA	S052	S053	S054	C.F.

TABLE 7 — O-RING REPLACEMENT KITS, NORRIS BBODY STYLE VALVES

Use "54000" as a prefix when ordering replacement kits. Example: Order 54000-A103 for 1.5-in. Type A Buna N Replacement Kit.

ELASTOMER	THREADED END					GROOVED END			
	1.5 in.	2 in.	2.5 in.	3 in.	4 in.	2 in.	2.5 in.	3 in.	4 in.
Type A Buna N	A103	A104	A105	A106	A107	A045	A046	A253	A048
Type B Viton	B103	B104	B105	B106	B107	B045	B046	B047	B048
Type S EPDM	S103	S104	S105	S106	S107	S045	S046	S047	S048

Other Available Elastomers:

Type E	Black Neoprene	Type J	Abrasion-Resistant Buna	Type L	ECO
Type G	White Neoprene	Type K	Hypalon	Type 4	HSN

8.0 VALVE STORAGE PROCEDURES

The proper storage of Norris valves should consist of:

1. A clean, weathertight, well-ventilated, fire-resistant storage area. This storage area must provide protection from the weather, plus flooring that seals against dust and dirt and will not be subject to flooding.
2. Valves should be protected against rodent and insect damage.
3. The valves must be protected from mechanical damage. The proper use of racks, pallets, and handling equipment shall be used. The valves should be arranged so as to prevent damage to the stored valves during handling.
4. The valves should be stored off the floor on suitable skids, pallets or racks. They must be protected from excessive dust and dirt.
5. Valves should not be stored in direct sunlight. They should also be covered with black flame-retardant visqueen or fire-retardant canvas cloth. This is to keep as much light as possible from the valves to protect and

prolong the life of the elastomers. After completion of storage and upon installation of the valves, the following steps and precautions should be taken:

- A. Valves should not be taken out of storage until ready for installation. If valves must be taken to the installation site before piping is ready, the same storage requirements as above should be followed. Care should be taken to protect the valves from dirt, foreign particles and weather.
- B. Care should be taken in unpacking and installing the valve so damage to the sealing surfaces (face of seat, O-ring flange seals, and disc edge) does not occur.
- C. Flange faces should be free from dirt, grit or other irregularities which might damage the flange seals.
- D. Inspect valve and clean off any dirt or grit that might have accumulated around seat, seals or disc.
- E. Install valves per Norriseal's standard installation instructions.

- F. Before operating or cycling the valves, flush pipe thoroughly (with valves open). After flushing pipe, slowly cycle valves from full open to full closed approximately 10 times. Leave in the partially open position until shut-off is required.
- G. If valves have not been cycled for an extended period, cycle them 5 to 10 times before operation start-up.

9.0 OPERATING PROCEDURES

All Norris butterfly valves are assembled clockwise to close per accepted industry standards. To close handle-operated valves, rotate the handle clockwise. To open handle-operated valves, rotate the handle counter-clockwise. For valves with gear operators, rotate the handwheel clockwise to close the valve and counter-clockwise to open the valve. For power-actuated valves, refer to the instructions provided by the actuator manufacturer.

OPERATING AND MAINTENANCE MANUAL

Norris Butterfly Valves

HEADQUARTERS, MANUFACTURING PLANT AND SALES



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