

Oteco Inc. Houston, Texas

4" 5K DM Gate Valve Maintenance

Issued: BH

Date: 10/06/10

Manual: **OS-154500 Rev.A**

Revision Date: 10/06/10

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**OTECO INC.
MODEL 45
4" 5,000 PSI
4-1/16" PORT
DM GATE VALVE
MAINTENANCE MANUAL**

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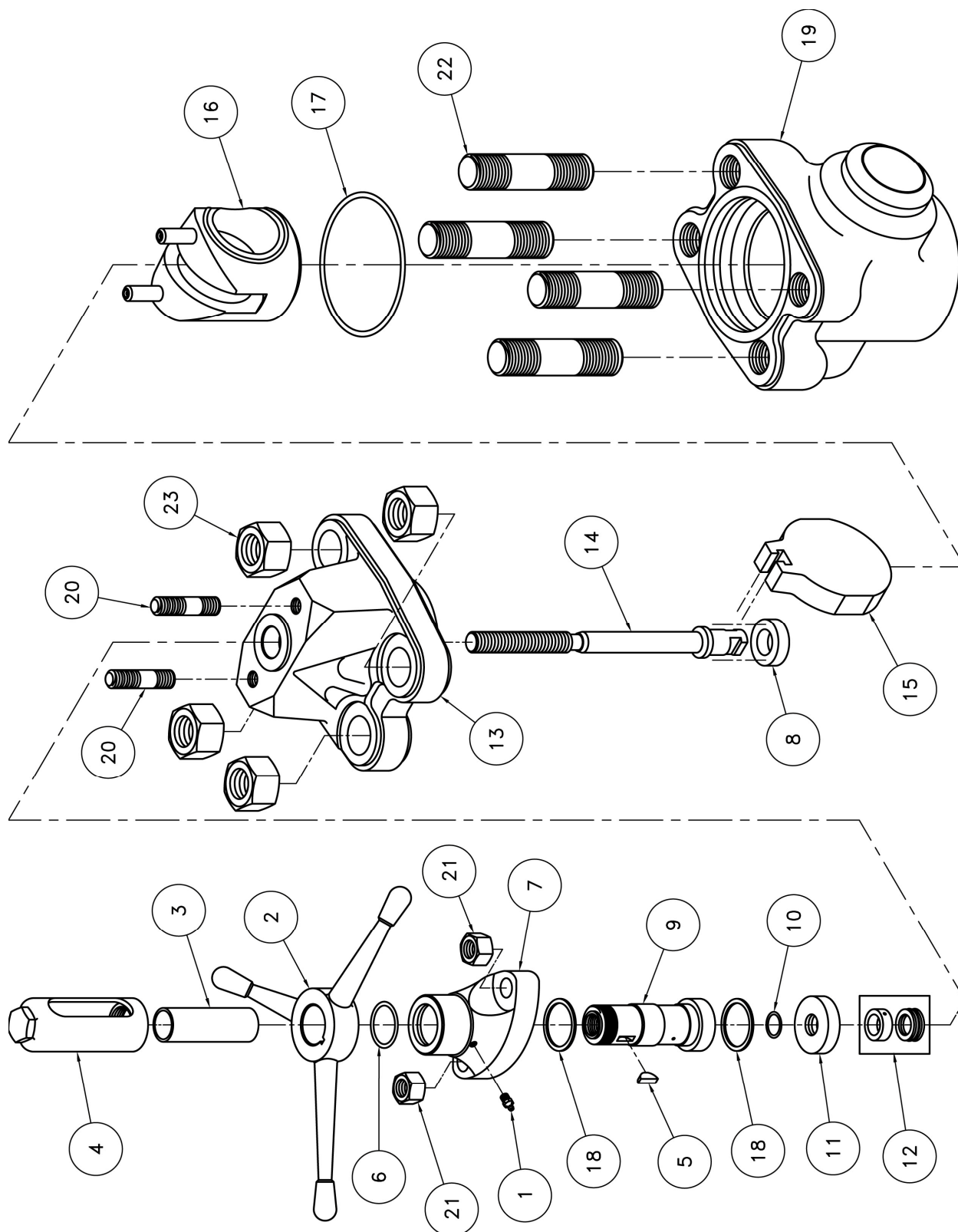
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REPAIR KIT CONTENTS

MINOR REPAIR KIT

1. GATE (15)
2. SEAT (16)
3. BONNET SEAL (17)

MAJOR REPAIR KIT

1. GATE (15)
2. SEAT (16)
3. BONNET SEAL (17)
4. STEM (14)
5. STEM SEAL ASSEMBLY (12)
6. STEM SCREW SEAL (6)
7. RETAINER (11)
8. RETAINER SEAL (10)
9. BEARINGS (18)
10. DOWN STOP RING (8)
11. WOODRUFF KEY (5)

TECHNICAL SPECIFICATIONS

1. Grease – Molybdenum Disulfide base
2. Bonnet Nut (21) torque – 239 ft-lbs
A. 7/8" stud - 1-7/16" socket or wrench
3. Body Nut (23) torque – 2,200 ft-lbs
B. 1-3/4" stud - 2-3/4" torque or impact socket

TOOLS REQUIRED

Rawhide Hammer – Large
1-7/16" socket or wrench
2-3/4" torque or impact socket
Pliers
Grease gun & brush
"O"-Ring pick
Screwdriver – Small

DISASSEMBLY

1. Release line pressure to zero. Turn Handle (2) counterclockwise to fully open the Gate Valve. Remove four right hand Body Nuts (23). Remove Bonnet assembly (items 1-13, 20, 21) from Valve Body (19) taking care not to damage sealing surface on Body Studs (22). Collapse Seat (16) by pressing metal inserts together and remove from Body (19). Remove Bonnet Seal (17) from Body.
2. Turn Handle (2) clockwise until Gate (15) is in the fully closed position. Rotate Gate 90 degrees and slide off Stem (14). Inspect Gate, Stem & Bonnet sealing surface for wear & scratches.
3. Minor repair kit can be installed at this point by skipping to section 4 of the reassembly directions. For Major repair kit rebuild continue with disassembly procedures.
4. Remove Stem Cap (4) by turning counterclockwise. Remove Tube (3). Remove Handle (2) by tapping gently on underside evenly. Remove Woodruff Key (5) with small screwdriver.
5. Remove two right hand Bonnet Nuts (21) and pull off Screw Housing (7). Remove top bearing (18). Unscrew left hand Stem Screw (9) by turning clockwise. Remove bottom Bearing (18) & Retainer (11). Remove Retainer Seal (10) from Retainer. Remove brass ring from Stem Seal Assembly (12). Stem Seals may currently be left in place. From bottom of Bonnet (13) push Stem (14) inward until Down Stop Ring (8) can be removed. Pull Stem out through bottom of Bonnet. Remove Stem Seals (12) from Bonnet. Degrease and check parts for wear or damage.
6. Major repair kit can be installed during reassembly along with any non repair kit parts that necessitate replacement.

REASSEMBLY

1. Slide Stem (14) threaded end first into Bonnet (13) from the underside. Stem should be placed far enough into Bonnet so the Down Stop Ring (8) can be placed over Stem end. Pull Stem with Down Stop Ring downward until Down Stop Ring is resting on internal Bonnet face.
2. Place grease on Stem threads, sealing surface and Bonnet seal bore. Place Stem Seal Assembly (12) over Stem and onto Bonnet top face. Seals may need to be threaded over Stem threads due to tight fit. Slide stem seal brass ring over Stem onto face of Stem Seals. Grease I.D. groove of Retainer (11) and place new Retainer Seal (10) into I.D. of Retainer groove. Slide Retainer with seal over Stem onto brass ring. Press Stem Seal assembly into Bonnet by pressing down on both sides of Retainer. Place one Bearing (18) over Stem onto Retainer face. Partially thread Stem Screw (9) onto Stem by turning counterclockwise until Stem screw rests on face of Retainer. Concentrically place lower Bearing with Stem Screw so Screw Housing (7) does not pinch bearing during later assembly. Place Bearing (18) over Stem Screw. Place grease in I.D. groove of Stem Screw Housing (7). Insert new Stem Screw Seal (6) into Stem Screw Housing. Grease Place Stem Screw Housing over Stem and Bonnet Studs (20). Grease Bonnet Studs and Bonnet Nut (21) faces. Fasten Bonnet Nuts onto Bonnet Studs (20) then torque to 239 ft-lbs.
3. Tap Woodruff Key (5) into keyway of Stem Screw (9). Be careful not to deform Key. Place Handle (2) over Stem Screw, lining up milled slot with key. If fit is too tight Woodruff key may be ground or polished along its side for easier assembly. Place Tube (3) over Stem (14) threads. Place Stem Cap (4) over tube and fasten to Stem Screw by turning clockwise.
4. Rotate Stem (14) on underside of Bonnet (13) until Gate (15) can be slotted onto Stem. The Stem must be fully down against the Down Stop Ring for this procedure. Once slotted rotate Gate 90 degrees. Place Grease on Gate surfaces. Spread new Seat (16) apart using metal inserts and place over Gate. Slide Seat or tap with rawhide hammer until metal inserts bottom out in locator holes. Enough surface friction should exist to keep Seat on Gate for final assembly.

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5. Grease I.D. groove and bore of Body (19). Place new Bonnet Seal (17) into Body I.D. groove. Place grease on Body Studs (22) and Body Nut faces (23). Using lift raise assembled Bonnet and Seat over Body and line up holes of Bonnet (13) with Body Studs (22). Slowly lower assembly into Body then using a rawhide hammer pound Bonnet assembly into Body. Once Seat is in the Body and Body Studs extrude through Bonnet holes fasten Body Nuts (23) onto Body Studs. Evenly compress Bonnet assembly into Body using a cross bolt pattern of tightening nuts until Body face is touching metal to metal with Bonnet. Don not torque Bonnet with Gate in fully closed position. Torque Body Nuts to 2,200 ft-lbs using the cross bolt method.
6. Using grease gun pack Bonnet assembly with grease using Grease Fitting (1) on side of Screw Housing (7).