ANCORP

High Vacuum Products

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# MAINTENANCE INSTRUCTIONS

## For the B, C, D, E, and F Series High Vacuum Ball Valve


Please follow these instructions carefully. Failure to do so may result in an improper or poorly functioning valve.

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# BEFORE GETTING STARTED

## DETERMINING THE VALVE MODEL

**Legacy design or XL Design:** XL valves will have "XL" engraved on the stem and body (Fig. 1). Legacy valves will not have this engraving.

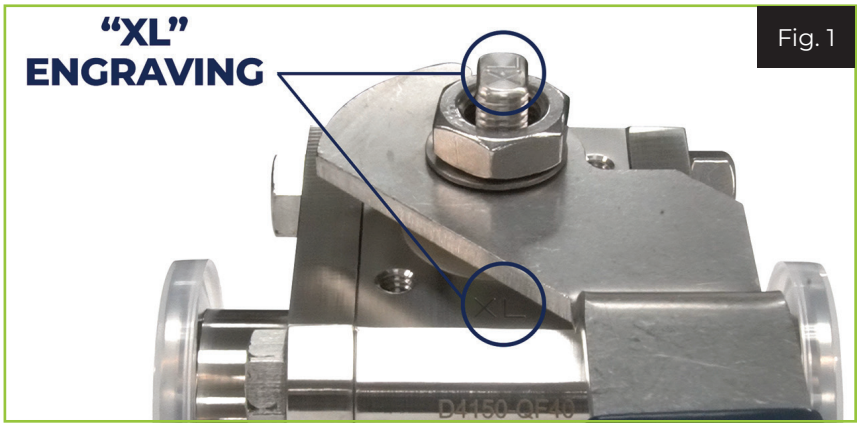


Fig. 1

## IMPORTANT NOTES

Detailed maintenance instructions are provided for manually and pneumatically actuated Legacy and XL model valves using the following kits:

- Universal Maintenance Kit
- Replacement Parts
- Stem Kit

The tools needed for disassembly, cleaning and reassembly are provided before each section. Be sure your maintenance kit is the correct one for your valve size. It is the responsibility of the technician performing valve maintenance to ensure the correct parts are used and that the disassembly, cleaning, and assembly instructions are followed accurately.

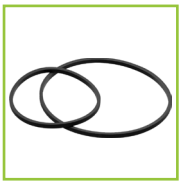
| Valve Size | Ball Port Size | Maintenance Kit | Part # |
|---|---|---|---|
| B Series | 0.56 | B-RK-S | 3010068 |
| C Series | 0.81 | C-RK-S | 3010109 |
| D Series | 1.25 | D-RK-S | 3010141 |
| E Series | 1.50 | E-RK-S | 3010181 |
| F Series | 1.87 | F-RK-S | 3010084 |

# MAINTENANCE KITS

## Universal Maintenance Kit Components

A universal maintenance kit contains parts for both the Legacy and XL valve designs. Be sure the correct parts are used for the maintenance of the valve. The B, C, D, E, and F series maintenance kits contain the following components:

2 Teflon Seats



2 Body O-rings

1 Stem O-ring

Nylon Jam Nut

1 Lower PEEK Bearing (XL Only)

1 Teflon Spacer (Legacy Only)

## Replacement Balls

The universal maintenance kit does not contain a replacement ball, stem, or upper PEEK bearing. Replacement balls can be purchased individually. Contact an ANCORP sales representative to order by calling 1-800-FLANGE1.

| Valve Size | Reference ID | Part # |
|---|---|---|
| B Series | B-SE | 3010068 |
| C Series | C-SE | 3010109 |
| D Series | D-SE | 3010141 |
| E Series | E-SE | 3010181 |
| F Series | F-SE | 3010084 |

## Stem Kit Components

If you require a new stem or upper PEEK bearing, you will need to order a stem kit for the appropriate valve series.

**Legacy Components**

- (1) Legacy design valve stem
- (1) Legacy design upper PEEK Bearing
- (1) Teflon® stem spacer
- (1) Stem o-ring
- (1) Nylon jam nut

**XL Components**

- (1) XL design valve stem
- (1) XL design upper PEEK Bearing
- (1) Lower PEEK bearing
- (1) Stem o-ring
- (1) Nylon jam nut

| Valve | Stem Bearing Kit Ref. ID | Part # |
|---|---|---|
| Legacy C Series | C-SK | 3010428 |
| Legacy D Series | D-SK | 3010430 |
| Legacy F Series | E-SK | 3010430 |
| B Series | B-SBK-S | 3010075 |
| C Series | C-SK-XL | 3010429 |
| D Series | D-SK-XL | 3010432 |
| E Series | E-SK-XL | 3010432 |
| F Series | F-SK-XL | 3010432 |

# LEGACY DESIGN

## MANUAL DISASSEMBLY

Determine if your valve is manual or pneumatic. Manual valves have a handle attached to the valve stem, while pneumatic valves have an actuator positioned on top of the valve.

**Recommendations:** Wear latex or lint free gloves when handling the interior components and surfaces of the ball valve. If you are replacing the ball, replace the Teflon® seats and body seal o-rings at this time as well. If replacing the valve stem, replace the stem seal o-ring. Maintenance kits containing these and other wearable components can be purchased by contacting ANCORP's sales department.

Required tools:

- 9/64" Hex Key
- (2) 1/2" Wrenches
- Vice
- 11/16" Wrench
- 5/8" Wrench
- Adjustable Wrench

1. If your valve is equipped with a locking kit, remove any lock or pin that may be in place (Fig. 2)
2. Next, remove the valve handle by removing the top stem nut with the 11/16" wrench (Fig. 3). Set the nut aside for later use. Tip: With one hand, hold the valve handle firmly and use the wrench with the other hand to loosen the nut.
3. Remove the lock washer and handle by lifting the handle off of the valve stem (Fig. 4). Set these parts aside for later use (Fig. 5). Be careful not to lose the lock washer.

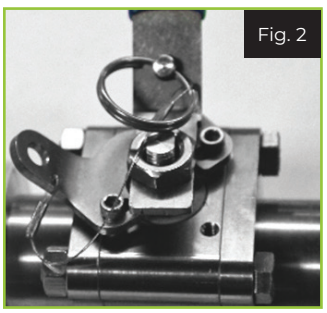


Fig. 2

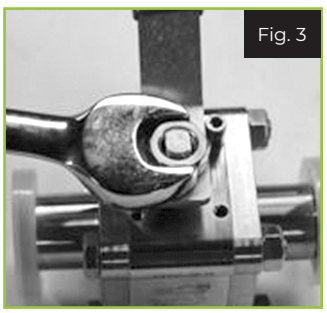


Fig. 3

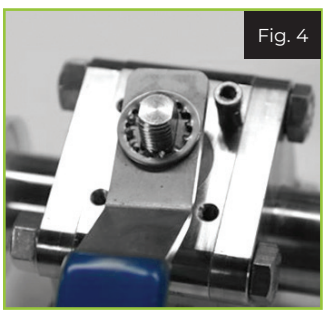


Fig. 4

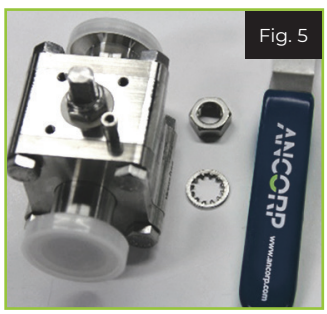


Fig. 5

# MANUAL DISASSEMBLY (CONT.)

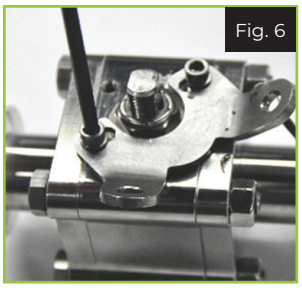


Fig. 6

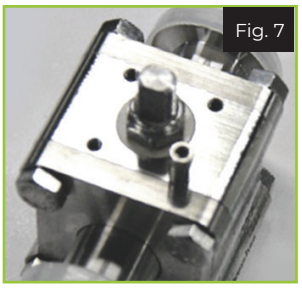


Fig. 7

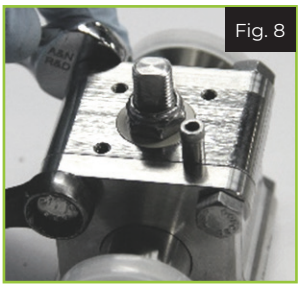


Fig. 8


Fig. 9

4. To finish removing the lock plate, use the 9/64" hex key to remove the two socket head screws securing the lock plate to the valve (Fig. 6).
5. Remove lock plate (Fig. 7)
6. Remove the four body bolts using the two 1/2" wrenches (Fig. 8). Remove the end caps and place them in a safe location (Fig. 9).

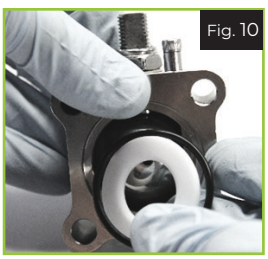


Fig. 10

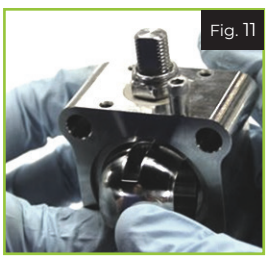


Fig. 11

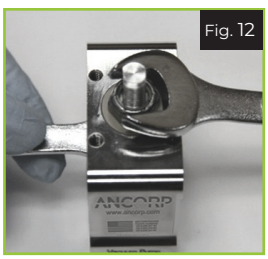


Fig. 12


Fig. 13

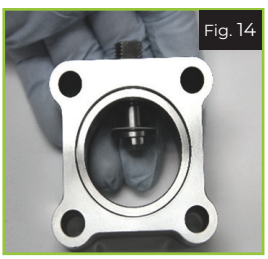


Fig. 14

7. Remove and discard the Teflon® seats and body seal o-rings (Fig. 10).
8. If you have not already done so, rotate the valve stem and ball to the "closed" position to remove the ball. Gently push the ball to remove it from the center section of the valve (Fig. 11). Place the ball in a safe location for reuse, or discard it if it is being replaced. **Note: if the ball is damaged, you can purchase a new one by contacting ANCORP's sales department. (See page 4 for part information)**
9. Remove the stem nut with a 5/8" wrench (some valves may require an 11/16" wrench). Hold the valve stem by grasping the base of the stem on the inside of the valve body with a 7/32" wrench or an adjustable wrench (Fig. 12). **Note: this nut will be replaced with a new nylon jam nut and therefore can be discarded.**
10. Push the valve stem inward and back out. This will expose the PEEK stem bearing and stem seal o-ring (Fig. 13). Place the upper PEEK bearing in a safe location for reuse. If servicing the valve with a stem kit, discard the upper PEEK bearing.
11. Push the valve stem back in to completely remove it from the valve body (Fig. 14). Slide the Teflon® spacer off and discard it. If you are replacing the valve stem, you may now discard it. Note: if the valve stem is damaged, you can purchase a new one by ordering a stem kit **(See page 4 for part information).**

# LEGACY DESIGN

## MANUAL REASSEMBLY

**Recommendations:** Wear latex or lint free gloves when handling the interior components and surfaces of the ball valve. When reusing the ball and/or valve stem, clean all surfaces with isopropyl alcohol and a lint free towel. Remove any debris that may have accumulated on the surfaces. Be sure to distinguish between Legacy and XL components.

**Required tools:**

- 9/64" Hex Key
- Torque Wrench
- 1/2" Socket
- 5/8" Deep-well socket
- (2) 1/2" Wrenches
- 5/8" Wrench
- 11/16" Wrench
- 7/32 Open End/Adjustable Wrench
- Vice

**Optional tools:**

- Dow Corning Vacuum Grease (#0600001)
- Anti-Sieze (#0605208)

1. Place a new Teflon spacer on the valve stem (Fig. 15).
2. Insert the valve stem through the inside of the valve body (Fig. 16).
3. Apply a liberal amount of vacuum grease around the inside of the new stem seal o-ring. Slide the o-ring onto the stem (Fig. 17). **Note: Apply sufficient vacuum grease will reduce stem o-ring wear and extend the life of the stem seal.**
4. Place the upper PEEK stem bearing over the top of the stem. While holding the bottom of the stem, firmly press down on the upper PEEK bearing until it is fully seated (Fig. 18).

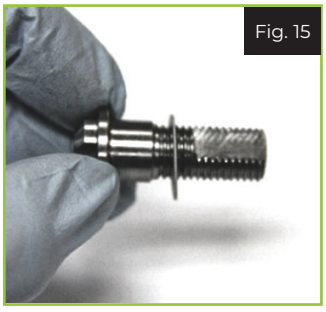


Fig. 15

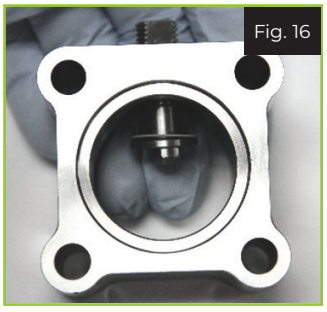


Fig. 16

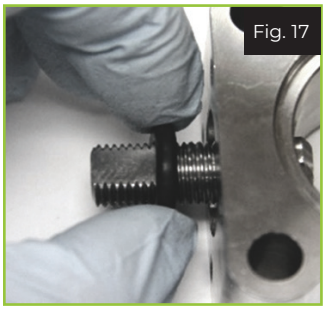


Fig. 17

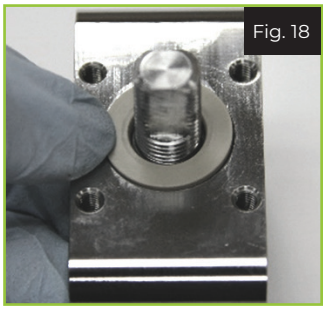


Fig. 18

# MANUAL REASSEMBLY (CONT.)

5. Wipe away excess vacuum grease on the valve stem. Place a new stem lock nut onto the valve stem. Torque the nut to 8 in-lbs with a torque wrench and 5/8" deep-well socket. Hold the valve stem in place by grasping the base of the stem on the inside of the valve body with a 7/32" open-ended or adjustable wrench (Fig. 19). WARNING: Over tightening the stem nut will cause the o-ring to wear prematurely, greatly reduce cycle life, and cause stem leaks.

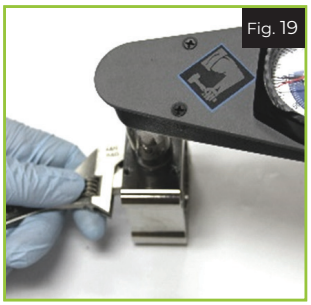


Fig. 19


Fig. 20

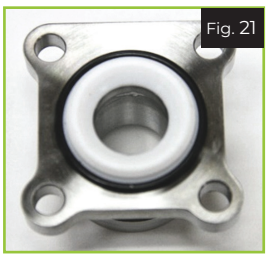


Fig. 21

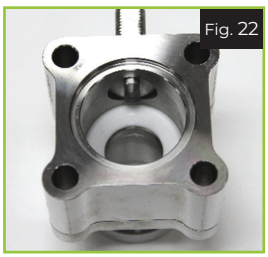


Fig. 22


Fig. 23


Fig. 24

6. Apply a thin coat of vacuum grease around the body seal o-rings and place them on the end caps. Also apply a thin coat to the inner radius of each Teflon® Seat (Fig. 20).

7. Place the Teflon® seat within the o-ring on the end cap as shown. Be sure to place the end cap on a soft surface to avoid damaging the flange (Fig. 21). Note: The new Teflon® seats will be a little thicker than the used ones. This is perfectly normal, as the seats are designed to be compressed when the valve is assembled.

8. With one end cap on a flat surface, place the valve's center section over the end cap. Make sure that the contours of the end cap match the contours of the center section. Orient the center section such that the stop pin, or stop pin hole, is on the left while the valve stem points away from you (Fig. 22).

9. Align the valve stem with the notch in the ball and carefully place the ball into the valve center section, being sure the evac hole is facing up (Fig. 23)

10. Position the second lubricated Teflon® seat and body seal o-ring onto the center section as shown in (Fig. 24).

11. Set the second end cap on top of the center section making sure that the contours match (Fig. 25). Insert the four body bolts into their holes such that the bolt heads and the evac hole of the ball are on the same side of the valve.

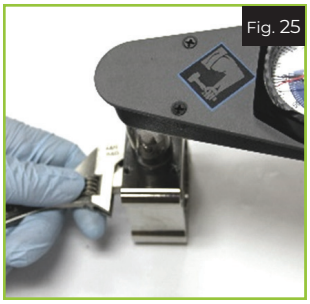


Fig. 25

# MANUAL REASSEMBLY (CONT.)


Fig. 26

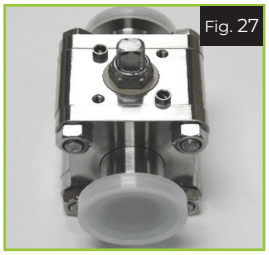


Fig. 27

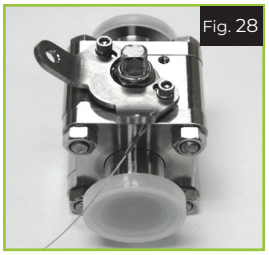


Fig. 28

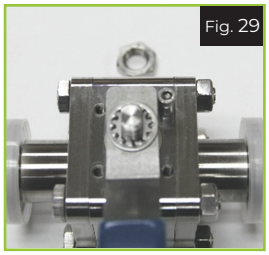


Fig. 29

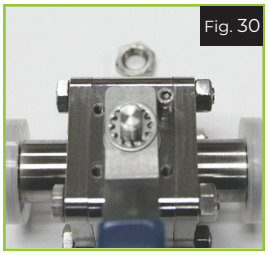


Fig. 30

12. Begin to thread the body bolt nuts onto the body by hand (Fig. 26). Anti-seize lubricant can be applied inside the nut threads to ease insertion and prevent galling. Using two 1/2" wrenches, start with one bolt, tighten so there is only a small compression and move to the next bolt located diagonally from the first. Do the same with the other two bolts. Tighten until there is no gap between the end caps and the valve body approximately 8 in-lbs, using the torque wrench, 1/2" socket and 1/2" wrench. Note: Failure to tighten all bolts evenly can cause the body o-ring to slip out and/or damage the Teflon® seats. Do not tighten one or more bolts with too much force over the others.
13. Let the valve sit 10-15 minutes to allow the Teflon® seats to form to the shape of the ball.
14. Secure the valve in a vice and manually cycle it 4-5 times to check for proper functioning.
15. If your valve is equipped with a lock kit, proceed to step 16, otherwise skip to step 17.
16. If your valve is equipped with a lock kit follow these steps:
    a. With the valves' body bolt nuts facing you (front side), diagonally place the two spacers over the front right and back left threaded holes, on top of the valve (Fig. 27).
    b. Concentrically align the appropriate holes of the lock plate with the spacers. Then, orient the lock plate such that it is to the left of the stem.
    c. Use the 9/64" hex key and the two socket head screws to secure the plate to the valve (Fig. 28).
17. Place the handle on onto the valve stem over the lock nut.
18. Place a lock washer onto the valve stem over the handle (Fig. 29)
19. Thread the nut onto the valve stem and tighten with the 11/16" wrench until the handle is secure (Fig. 30).
20. Insert pin (or a padlock or your choice) through the valve handle and lock plate (Fig. 31).
21. Replacement is complete.

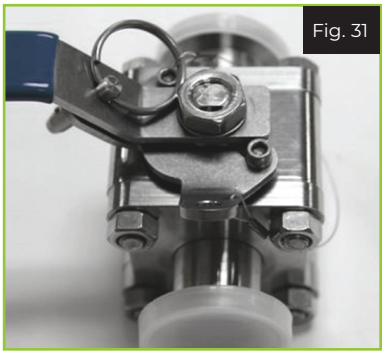


Fig. 31

# LEGACY DESIGN

## PNEUMATIC DISASSEMBLY

**Recommendations:** Wear latex or lint free gloves when handling the interior components and surfaces of the ball valve. If you are replacing the ball, replace the Teflon® seats and body seal o-rings at this time as well. If replacing the valve stem, replace the stem seal o-ring. Maintenance kits containing these and other wearable components can be purchased by contacting ANCORP's sales department.

**Required tools:**

- 9/64" Hex Key
- (2) 1/2" Wrenches
- 11/16" Wrench
- 5/8" Wrench
- 7/32" or Adjustable Wrench
- Vice


Fig. 32


Fig. 33


Fig. 34

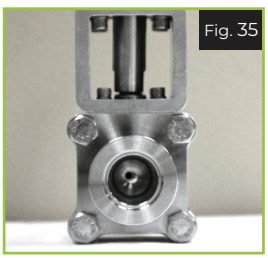


Fig. 35


Fig. 36

1. Determine the type of actuator you have.
    a. For a double-acting actuator (Fig 32), cycle the valve to the closed position and disconnect the air supply from the actuator.
    b. For a fail-safe actuator (Fig 33), disconnect the air supply from the actuator. Make note of whether the valve is in the normally open or normally closed position as shown in (Fig 34 & Fig 35). **Note: This distinction will be very important for the proper reassembly of the valve and the replacement of the actuator assembly.**
    c. Loosen the four bolts connecting the mounting bracket to the valve with the 9/64" wrench (Fig 36). Once the bolts are disengaged from the valve, lift the actuator assembly off of the valve and place it in a safe location. **Tip: It is only necessary to remove the mounting bracket from the valve. Leave the mounting bracket attached to the actuator for convenience.**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# PNEUMATIC DISASSEMBLY (CONT.)

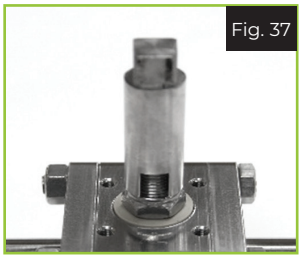
Fig. 37

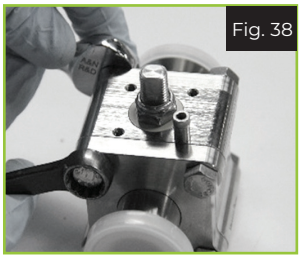
Fig. 38

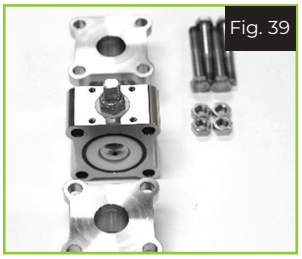
Fig. 39


Fig. 40

2. If the valve has heater jacket standoffs, remove them and place them with the actuator assembly. Remove the actuator adaptor and place it with the actuator assembly (Fig 37).
3. Remove the four body bolts using the two 1/2" wrenches (Fig 38). Remove the end caps and place them in a safe location (Fig 39).
4. Remove and discard the Teflon® seats and body seal o-rings (Fig 40).

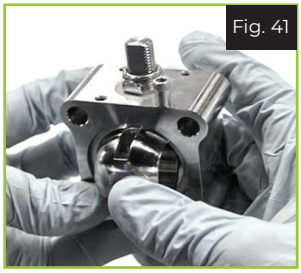
Fig. 41

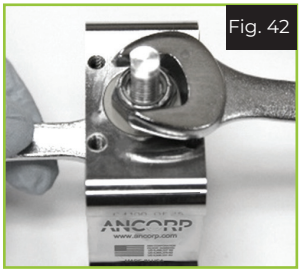

Fig. 42

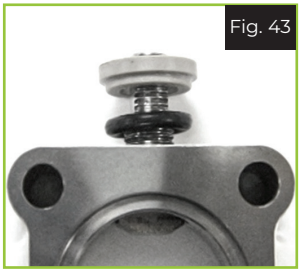
Fig. 43


Fig. 44

5. If you have not already done so, rotate the valve stem and ball to the "closed" position to remove the ball. Gently push the ball to remove it from the center section of the valve (Fig 41). Place the ball in a safe location for reuse or if replacing the ball it can now be discarded. **Note: If the ball is damaged due to corrosion or some other means, you can purchase a new one by contacting ANCORP's sales department.**
6. Remove the stem nut with a 5/8" wrench (some valves may require an 11/16" wrench for stem nut removal). Hold the valve stem in place by grasping the base of the stem on the inside of the valve body with a 7/32"or an adjustable wrench (Fig 42). **Note: A vice with the proper valve insert may be used to keep the stem stationary when removing the stem nut. This nut will be replaced with a new nylon lock nut and can be discarded.**
7. Push the valve stem inward and then back out. This will expose the PEEK stem bearing and the stem seal o-ring (Fig 43). Remove and discard the stem o-ring. Place the upper PEEK bearing in a safe location for reuse. If servicing the valve with a stem kit, discard the upper PEEK bearing.
8. Push the valve stem back in to completely remove it from the valve body. Slide the Teflon® spacer off and discard it (Fig 44).
9. Disassembly is complete.

# LEGACY DESIGN

## PNEUMATIC REASSEMBLY

**Recommendations:** Use latex or lint free gloves when handling the interior components and surfaces of the ball valve. When reusing the ball and/or valve stem, clean all surfaces with isopropyl alcohol and a lint free towel. Remove any debris that may have accumulated on the surfaces. Be sure to distinguish between Legacy and XL instructions.

**Required tools:**

- 9/64" Hex Key
- Torque Wrench
- 1/2" Socket
- 5/8" Deep-Well Socket
- (2) 1/2" Wrenches
- 5/8" Wrench
- 11/16" Wrench
- Adjustable Wrench
- Vice

**Optional:**

- Dow Cornging Vacuum Grease (#0600001)
- Anti-Sieze (#0605208)

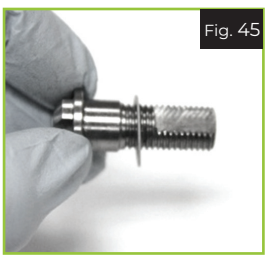
Fig. 45


Fig. 46

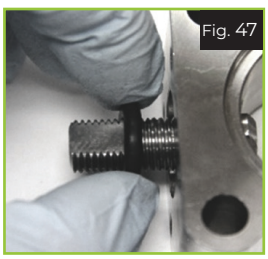
Fig. 47

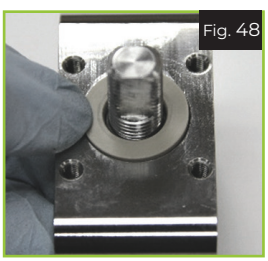
Fig. 48

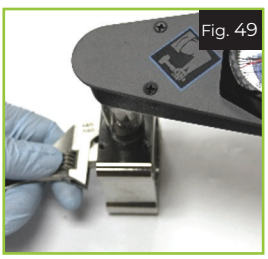
Fig. 49

1. Place a new Teflon® spacer on the valve stem (Fig. 45).
2. Insert the valve stem through the inside of the valve body (Fig. 46).
3. Apply a liberal amount of vacuum grease around the inside and outside of the new stem seal o-ring. Slide the o-ring onto the stem (Fig. 47). **Note: Applying sufficient vacuum grease will reduce stem o-ring wear and extend the life of the stem seal.**
4. Holding the bottom of the stem, place the PEEK stem bearing over the top of the stem. Slide the PEEK stem bearing down until it rests in the groove on top of the body (Fig. 48).
5. Wipe away any excess vacuum grease on the valve stem. Place a new stem lock nut onto the valve stem. Torque nut to 8 in-lbs with a torque wrench and 5/8” deep-well socket. Hold the valve stem in place by grasping the base of the stem on the inside of the valve body with a 7/32” open-ended or adjustable wrench (Fig. 49). **WARNING: Over tightening the stem nut will cause the o-ring to wear prematurely and greatly reduce the cycle life. Stem leaks may result.**

# PNEUMATIC REASSEMBLY (CONT.)


Fig. 50


Fig. 51


Fig. 52


Fig. 53


Fig. 54

6. Apply a thin coat of vacuum grease around the body seal o-rings and place on them on end caps as shown. Apply a thin coat of vacuum grease to the inner radius surface of each Teflon® seat (Fig. 50).

7. Place the Teflon® seat within the o-ring on the end cap as shown. Be sure to place the end cap on a soft surface to avoid damaging the flange (Fig. 51). **Note: The new Teflon® seats will be a little thicker than the used ones. This is perfectly normal as the seats are designed to be compressed when the valve is fully assembled**

8. With one end cap on a flat surface, place the valve's center section over the end cap. Make sure that the contours of the end cap match the contours of the center section. Orient the center section such that the stop pin, or stop pin hole, is on the left while the valve stem points away from you (Fig. 52).

9. Align the valve stem with the notch in the ball and carefully place the ball into the valve center section, being sure the evac hole is facing up (Fig. 53).

10. Position the second lubricated Teflon® seat and body seal o-ring onto the center section as shown in (Fig. 54).

11. Set the second end cap on top of the center section making sure that the contours match (Fig. 55). Insert the four body bolts into their holes such that the bolt heads and the evac hole of the ball are on the same side of the valve.

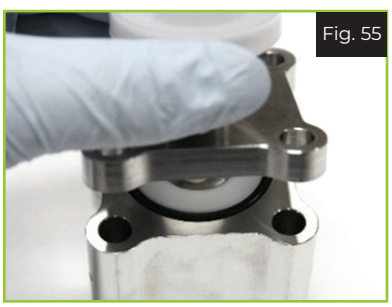
Fig. 55

# PNEUMATIC REASSEMBLY (CONT.)

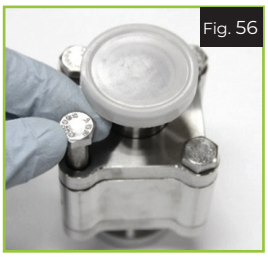
Fig. 56


Fig. 57

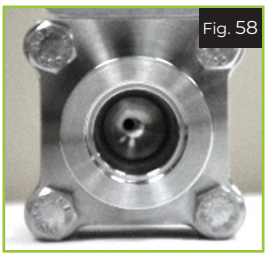
Fig. 58

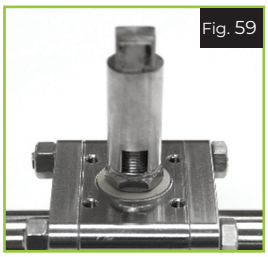
Fig. 59


Fig. 60

12. Begin to thread the body bolt nuts onto the body by hand (Fig. 56). Anti-seize lubricant can be applied inside the nut threads to ease insertion and prevent galling. Using two 1/2" wrenches, start with one bolt, tighten so there is only a small compression and move to the next bolt located diagonally from the first. Do the same with the other two bolts. Tighten until there is no gap between the end caps and the valve body, approximately 8 in-lbs, using the torque wrench, 1/2" socket and 1/2" wrench. **Note: Failure to tighten all bolts evenly can cause the body o-ring to slip out and/or damage the Teflon® seats. Do not tighten one or more bolts with too much force over the others.**

13. Secure the valve in a vice and manually cycle 4-5 times to check for proper functioning. Grasp the valve stem with an adjustable wrench to cycle the valve.

14. If your valve is configured to be normally open, make sure that the valve is in the open position (Fig. 57). If your valve is configured to be normally closed, or if your valve uses a double-acting actuator, position the valve in the closed position (Fig. 58). Failure to do so may result in improper actuation and/or false signals if your valve has position indication.

15. Place the actuator adaptor onto the valve stem (Fig. 59).

16. If your valve has heater jacket stand-offs, position them over the threaded holes on top of the valve.

17. Gently place the actuator assembly onto the valve such that when the valve body bolt heads are facing you, the control ports for the actuator are on the left hand side of the assembly (Fig. 60). Start tightening the four screws by hand. Once you have all four screws started, use the 9/64" hex key to tighten the screws until the actuator assembly is firmly secured to the valve.

18. Check that the valve actuates properly, and in the case of a valve with position indication, check that you have an "open" signal when the valve is open and a "closed" signal when the valve is closed.

19. Replacement is complete.

# XL DESIGN

## MANUAL DISASSEMBLY

Determine if your valve is manual or pneumatic. Manual valves have a handle attached to the valve stem, while pneumatic valves have an actuator positioned on top of the valve.

**Recommendations:** Wear latex or lint free gloves when handling the interior components and surfaces of the ball valve. If you are replacing the ball, replace the Teflon® seats and body seal o-rings at this time as well. If replacing the valve stem, replace the stem seal o-ring. Maintenance kits containing these and other wearable components can be purchased by contacting ANCORP's sales department.

**Required Tools:**

- 9/64" Hex Key
- (2) 1/2" Wrenches
- Vice
- 11/16" Wrench
- 5/8" Wrench
- 7/32" or Adjustable Wrench

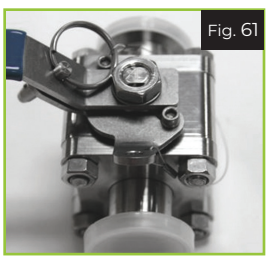
Fig. 61

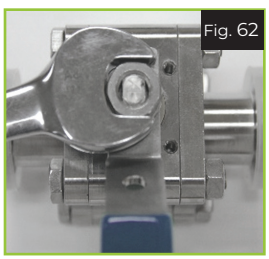
Fig. 62

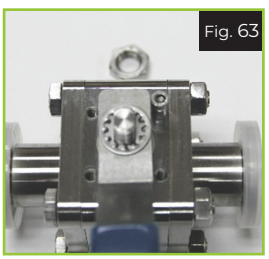
Fig. 63

Fig. 64

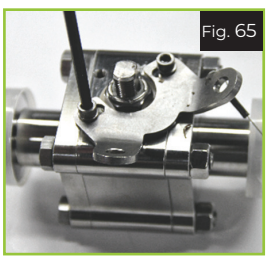
Fig. 65

1. If your valve is equipped with a locking kit, remove any lock or pin that may be in place (Fig 61).
2. Next, remove the valve handle by removing the top stem nut with the 11/16" wrench. Set the nut aside for later use (Fig 62). **Tip: With one hand, hold the valve handle firmly and with the other hand use the wrench to loosen the nut.**
3. Remove the lock washer and handle by lifting the handle off of the valve stem (Fig 63). Set these parts aside for later use (Fig 64). Be careful not to lose the lock washer. **Note: Valves configured with a handle locking kit will have an extra lock washer under the handle. Keep it for later use.**
4. To finish removing the lock plate, use the 9/64" hex key to remove the two socket head screws securing the lock plate to the valve (Fig 65).

# MANUAL DISASSEMBLY (CONT.)

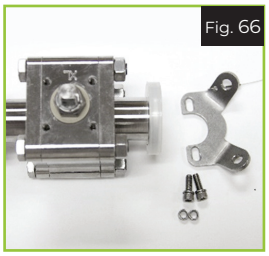
Fig. 66

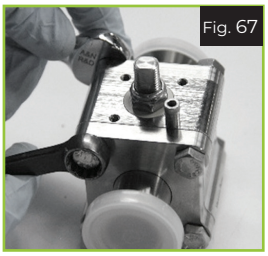
Fig. 67


Fig. 68

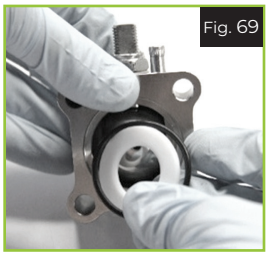
Fig. 69


Fig. 70

5. Remove the lock plate (Fig 66).
6. Remove the four body bolts using the two 1/2" wrenches (Fig. 67). Remove the end caps and place them in a safe location (Fig 68).
7. Remove and discard the Teflon® seats and body seal o-rings (Fig 69).
8. If you have not already done so, rotate the valve stem and ball to the “closed” position to remove the ball. Gently push the ball to remove it from the center section of the valve (Fig 70). Place the ball in a safe location for reuse or if replacing the ball it can now be discarded. **Note: If the ball is damaged due to corrosion or some other means, you can purchase a new one by contacting ANCORP’s sales department.**

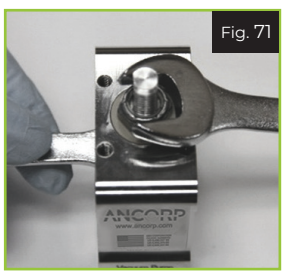
Fig. 71

9. Remove the stem nut with a 5/8” wrench (some valves may require an 11/16” wrench for stem nut removal). Hold the valve stem in place by grasping the base of the stem on the inside of the valve body with a 7/32” wrench or an adjustable wrench (Fig 71). Note: A vice with the proper valve insert may be used to keep the valve stem stationary when removing the stem nut **Note: This nut will be replaced with a new nylon lock nut and therefore can be discarded.**

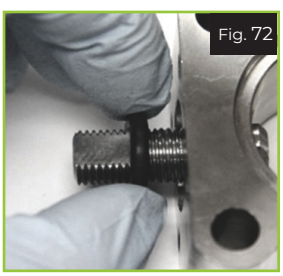
Fig. 72

10. Push the valve stem inward and then back out. This will expose the PEEK stem bearing and the stem seal o-ring (Fig 72). Remove and discard the stem o-ring. Place the upper PEEK bearing in a safe location for reuse. If servicing the valve with a stem kit, discard the upper PEEK bearing.


Fig. 73

11. Push the valve stem back in to completely remove it from the valve body. Slide the lower PEEK bearing off and discard it (Fig 73).
12. Disassembly is complete.

# XL DESIGN

## MANUAL REASSEMBLY

**Recommendations:** Wear latex or lint free gloves when handling the interior components and surfaces of the ball valve. If you are replacing the ball and/or valve stem, clean all surfaces with isopropyl alcohol and a lint free towel. Remove any debris that may have accumulated on the surfaces. Be sure to distinguish between Legacy and XL instructions.

**Required Tools:**

- 9/64” Hex Key
- Torque Wrench
- 1/2" Socket
- 5/8" Deep-well Socket
- (2) 1/2" Wrenches
- 5/8" Wrench
- 11/16" Wrench
- 7/32" Open End or Adjustable Wrench
- Vice

**Optional:**

- Dow Corning Vacuum Grease (#0600001)
- Anti-Sieze (#0605208)


Fig. 74


Fig. 75

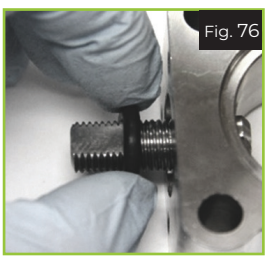
Fig. 76

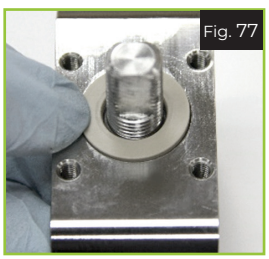
Fig. 77

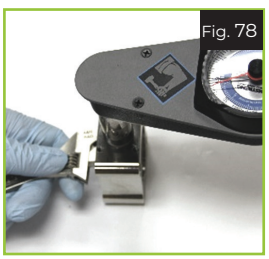
Fig. 78

1. Place a new lower PEEK bearing on the valve stem (Fig. 74)
2. Insert the valve stem through the inside of the valve body (Fig. 75)
3. Apply a liberal amount of vacuum grease around the inside and outside of the new stem seal o-ring. Slide the o-ring onto the stem (Fig. 76). **Note: Applying sufficient vacuum grease will reduce stem o-ring wear and extend the life of the stem seal.**
4. Place the upper PEEK bearing over the top of the stem. While holding the bottom of the stem, firmly press down on the upper PEEK bearing until it is fully seated (Fig. 77).
5. Wipe away any excess vacuum grease on the valve stem. Place a new stem lock nut onto the valve stem. Torque nut to 8 in-lbs with a torque wrench and 5/8” deep-well socket. Hold the valve stem in place by grasping the base of the stem on the inside of the valve body with a 7/32” open-ended or adjustable wrench (Fig. 78).

# MANUAL REASSEMBLY (CONT.)


Fig. 79

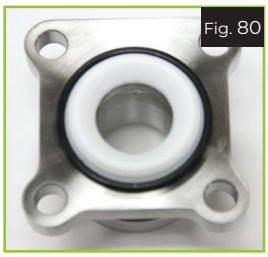
Fig. 80


Fig. 81


Fig. 82


Fig. 83

6. Apply a thin coat of vacuum grease around the body seal o-rings and place on them on end caps as shown. Apply a thin coat of vacuum grease to the inner radius surface of each Teflon® seat (Fig. 79)

7. Place the Teflon® seat within the o-ring on the end cap as shown. Be sure to place the end cap on a soft surface to avoid damaging the flange (Fig. 80). **Note: The new Teflon® seats will be a little thicker than the used ones. This is perfectly normal as the seats are designed to be compressed when the valve is fully assembled.**

8. With one end cap on a flat surface, place the valve's center section over the end cap. Make sure that the contours of the end cap match the contours of the center section. Orient the center section such that the stop pin, or stop pin hole, is on the left while the valve stem points away from you (Fig. 81).

9. Align the valve stem with the notch in the ball and carefully place the ball into the valve center section, being sure the evac hole is facing up (Fig. 82).

10. Position the second lubricated Teflon® seat and body seal o-ring onto the center section as shown in (Fig. 83).

11. Set the second end cap on top of the center section making sure that the contours match (Fig. 84). Insert the four body bolts into their holes such that the bolt heads and the evac hole of the ball are on the same side of the valve.


Fig. 84

# MANUAL REASSEMBLY (CONT.)

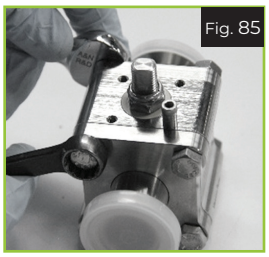
Fig. 85

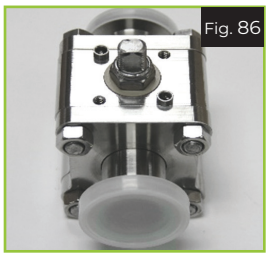
Fig. 86

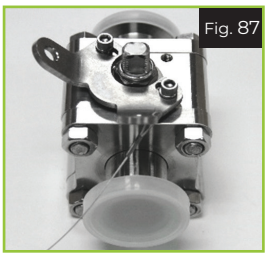
Fig. 87

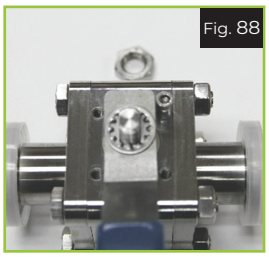
Fig. 88

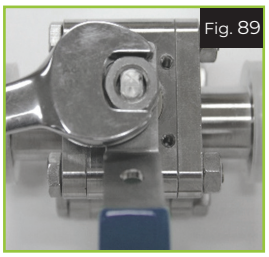
Fig. 89

13. Let the valve sit for 10-15 minutes so the Teflon® seats can form to the shape of the ball.
14. Secure the valve in a vice and manually cycle it 4-5 times to check for proper functioning.
15. If your valve is equipped with a lock kit, proceed to step 16, otherwise skip to step 17.
16. If your valve is equipped with a lock kit follow these steps.
    a. With the valves' body bolt nuts facing you (front side), diagonally place the two spacers over the front right and back left threaded holes, on top of the valve (Fig. 86).
    b. Concentrically align the appropriate holes of the lock plate with the spacers. Then, orient the lock plate such that it is to the left of the stem.
    c. Use the 9/64" hex key and the two socket head screws to secure the plate to the valve (Fig. 87).
17. Place the handle on onto the valve stem over the lock nut. Secure the valve in a vice and manually cycle it 4-5 times to check for proper functioning.
18. Place a lock washer onto the valve stem over the handle (Fig. 88).
19. Thread the nut onto the valve stem and tighten with the 11/16" wrench until the handle is secure (Fig. 89).
20. Insert pin (or a padlock or your choice) through the valve handle and lock plate (Fig. 90).
21. Replacement is complete.

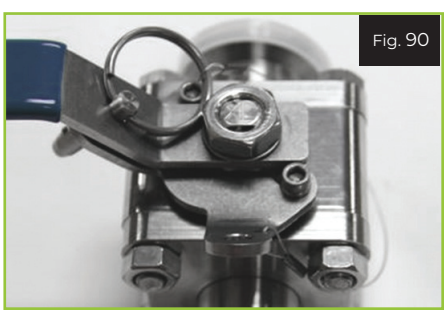
Fig. 90

# XL DESIGN

## PNEUMATIC DISASSEMBLY

**Recommendations:** Wear latex or lint free gloves when handling the interior components and surfaces of the ball valve. If you are replacing the ball, replace the Teflon® body seal o-rings at this time as well. If replacing the valve stem, replace the stem seal o-ring. Maintenance kits containing these and other wearable components can be purchased by contacting ANCORP's sales department.

**Required Tools:**

- 9/64” Hex Key
- (2) 1/2" Wrenches
- 11/16" Wrench
- 5/8" Wrench
- 7/32" or adjustable wrench
- Vice

1. Determine the type of actuator you have.
   a. For a double-acting actuator (Fig. 91), cycle the valve to the closed position and disconnect the air supply from the actuator.
   b. For a fail-safe actuator (Fig. 92), disconnect the air supply from the actuator. Make note of whether the valve is in the normally open or normally closed position as shown in Fig. 93 & Fig. 94 respectively. **Note: This distinction will be very important for the proper reassembly of the valve and the replacement of the actuator assembly.**
   c. Loosen the four screws connecting the mounting bracket to the valve with the 9/64" wrench (Fig. 95). Once the screws are disengaged from the valve, lift the actuator assembly off of the valve and place it in a safe location. **Tip: It is only necessary to remove the mounting bracket from the valve. Leave the mounting bracket attached to the actuator for convenience.**


Fig. 91


Fig. 92


Fig. 93

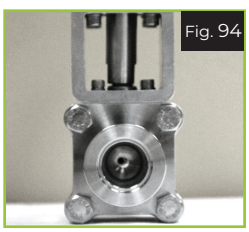
Fig. 94


Fig. 95

# PNEUMATIC DISASSEMBLY (CONT.)

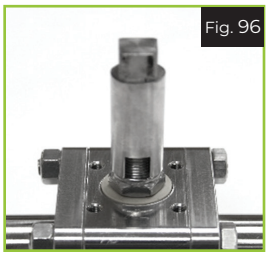
Fig. 96

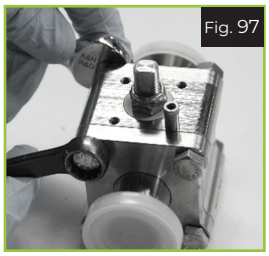
Fig. 97

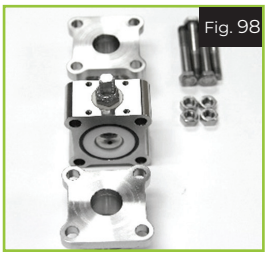
Fig. 98


Fig. 99


Fig. 100

2. If the valve has heater jacket standoffs, remove and place them with the actuator assembly. Remove the actuator adaptor and place it with the actuator assembly (Fig. 96).

3. Remove the four body bolts using the two 1/2" wrenches (Fig. 97). Remove the end caps and place them in a safe location (Fig. 98).

4. Remove and discard the Teflon® seats and body seal o-rings (Fig. 99).

5. If you have not already done so, rotate the valve stem and ball to the "closed" position to remove the ball. Gently push the ball to remove it from the center section of the valve (Fig. 100). Place the ball in a safe location for reuse, or discard it if it is being replaced. **Note: If the ball is damaged, you can purchase a new one by contacting ANCORP's sales department.**

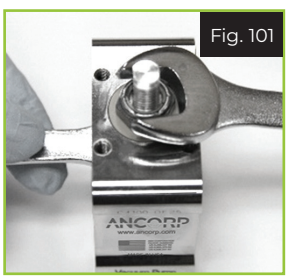
Fig. 101

6. Remove the stem nut with a 5/8" wrench (some valves may require an 11/16" wrench for stem nut removal). Hold the valve stem in place by grasping the base of the stem on the inside of the valve body with a wrench (Fig. 101). **Note: This nut will be replaced with a new nylon lock nut and therefore can be discarded.**


Fig. 102

7. Push the valve stem inward and then back out. This will expose the PEEK stem bearing and then back out. This will expose the PEEK stem bearing and the stem seal o-ring (Fig. 102). Remove and discard the stem o-ring. Place the upper PEEK bearing in a safe location for reuse. If servicing the valve with a stem kit, discard the upper PEEK bearing.


Fig. 103

8. Push the valve stem back in to completely remove it from the valve body (Fig. 103). Slide the lower PEEK bearing off and discard it. If you are replacing the valve stem, you may now discard it. **Note: If the valve stem is damaged, you can purchase a new one by ordering a stem kit.**

9. Disassembly is complete.

# XL DESIGN

## PNEUMATIC REASSEMBLY

**Recommendations:** Wear latex or lint free gloves when handling the interior components and surfaces of the ball valve. When reusing the ball and/or stem, clean all surfaces with iso-propyl alcohol and a lint-free towel. Remove any debris that may have accumulated on the surfaces. Be sure to distinguish between Legacy and XL instructions.

**Required Tools:**

- 9/64” Hex Key
- Torque Wrench
- 1/2" Socket
- 5/8" Deep-well Socket
- (2) 1/2" Wrenches
- 5/8" Wrench
- 11/16" Wrench
- 7/32" Open End or Adjustable Wrench
- Vice

**Optional:**

- Dow Corning Vacuum Grease (#0600001)
- Anti-Sieze (#0605208)


Fig. 104


Fig. 105

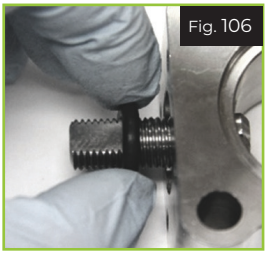
Fig. 106

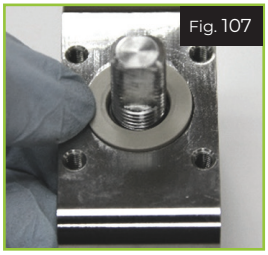
Fig. 107

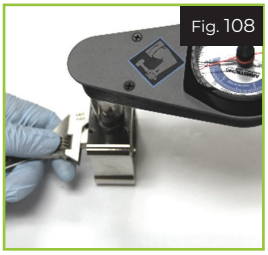
Fig. 108

1. Place a new lower PEEK bearing on the valve stem (Fig. 104).
2. Insert the valve stem through the inside of the valve body (Fig. 106).
3. Apply a liberal amount of vacuum grease around the inside and outside of the new stem seal o-ring. Slide the o-ring onto the stem (Fig. 106). **Note: Applying sufficient vacuum grease will reduce stem o-ring wear and extend the life of the stem seal.**
4. Place the upper PEEK stem bearing over the top of the stem. While holding the bottom of the stem, firmly press down on the upper PEEK bearing until it is fully seated (Fig. 107).
5. Wipe away any excess vacuum grease on the valve stem. Place a new stm lock nut onto the valve stem. Torque the nut to 8 in-lbs with a torque wrench and 5/8" deep-well socket. Hold the valve stem in place by grasping the base of the stem on the inside of the valve body with an adjustable wrench (Fig. 108).

# PNEUMATIC REASSEMBLY (CONT.)


Fig. 109

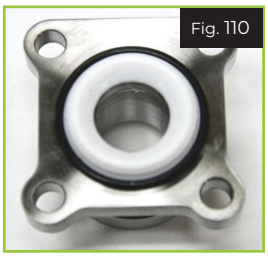
Fig. 110


Fig. 111


Fig. 112


Fig. 113

6. Apply a thin coat of vacuum grease to the inner radius surface of each Teflon® seat (Fig. 109).

7. Next, apply a a thin coat of vacuum grease around the body seal o-rings and place them on the end caps as shown (Fig. 110). Be sure to place the end cap on a soft surface to avoid damaging the flange. **Note: The new Teflon® seats will be a little thicker than the used ones. This is perfectly normal as the seats are designed to be compressed when the valve is fully assembled.**

8. With one end cap on a flat surface, place the valve's center section over the end cap. Make sure that the contours of the end cap match the contours of the center section. Orient the center section such that the vacuum pump arrow is pointing up (Fig. 111).

9. Align the valve stem with the notch in the ball and carefully place the ball into the valve center section, being sure the evac hole is facing up (Fig. 112).

10. Position the second lubricated Teflon® seat and body seal o-ring onto the center section as shown (Fig. 113).

11. Set the second end cap on top of the center section, making sure that the contours match (Fig. 114). Insert the four body bolts into their holes such that the bolt heads and the evac hole of the ball are on the same side of the valve.

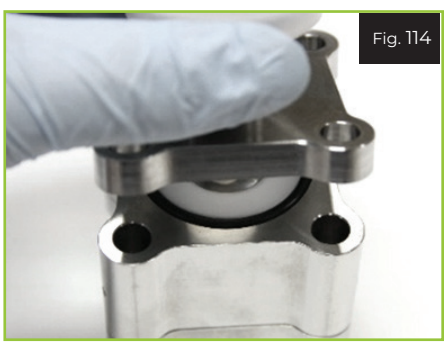
Fig. 114

# PNEUMATIC REASSEMBLY (CONT.)

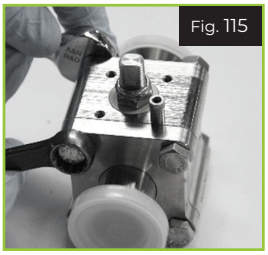
Fig. 115


Fig. 116

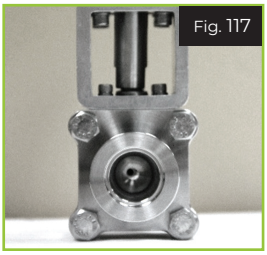
Fig. 117

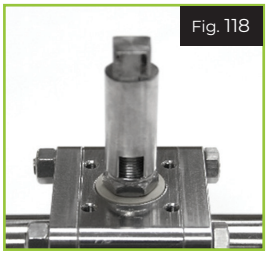
Fig. 118


Fig. 119

10. Begin to thread the body bolt nuts onto the body bolts by hand. Anti-sieze lubricant can be applied inside the nut threads to ease insertion and prevent galling. Using two 1/2" wrenches, tighten bolts so there is only a small compression in a diagonal pattern. (Fig. 115). Tighten until there is no gap between the end caps and valve body, approximately 8 in-lbs. **Note: Failure to tighten all bolts evenly can cause the body o-ring to slip out and/or damage the Teflon® seats.** Let the valve sit for 10-15 minutes to allow the Teflon® seats to form to the shape of the ball.

13. Secure the valve in a vice and manually cycle it 4-5 times to check for proper functioning. Grasp the valve stem with an adjustable wrench to cycle the valve.

14. If your valve is configured to be normally open, make sure that the valve is in the open position (Fig. 116). If your valve is configured to be normally closed, or if your valve uses a double-acting actuator, make sure that the valve is in the closed position (Fig. 117). Failure to do so may result in improper actuation and/or false signals if your valve has postion indication.

15. Place the actuator adaptor onto the valve stem (Fig. 118).

16. If your valve has heater jacket stand-offs, position them over the threaded holes on top of the valve.

17. Gently place the actuator assembly onto the valve such that the control ports for the actuator are on the left hand side of the assembly when the valve body bolts are facing you (Fig. 119).

18. Start tightening the four screws by hand. Once you have all screws started, use the 9/64" hex key to tighten the screws until the actuator assembly is firmly secured to the valve.

19. Check that the valve actuates properly, and in the case of a valve with position indication, check that you have an "open" signal when the valve is open and a "closed" signal when the valve is closed.

20. Replacement is complete.