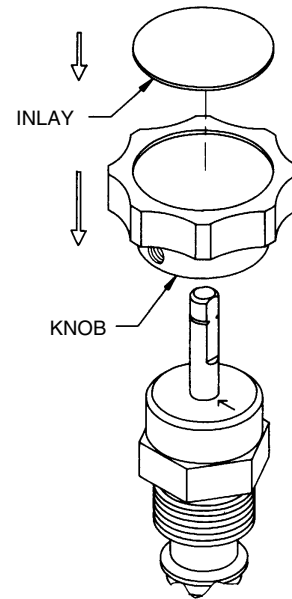
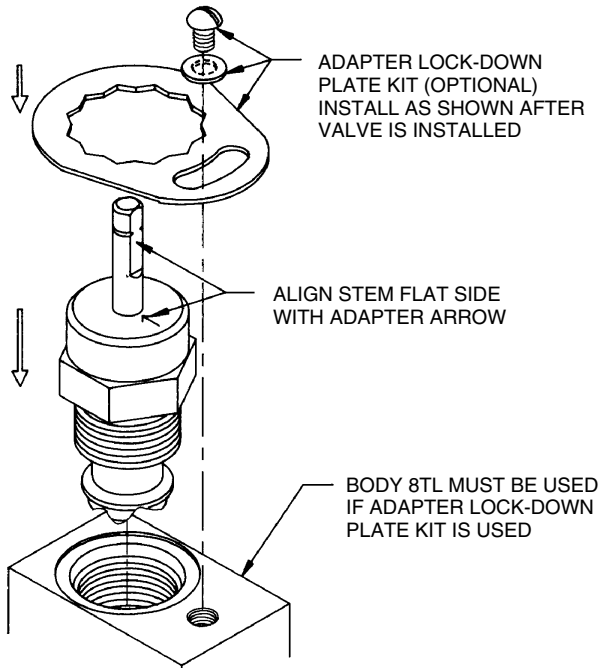


DIRECTIONAL CONTROLS

Plastic Knob Installation Instructions

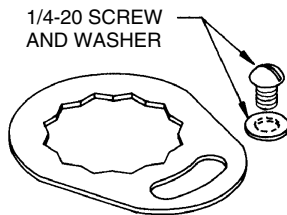
Standard plastic knob kits feature very low effort adjustments and infinite positioning.

- 1 Install the cartridge and optional lock-down plate as indicated. See cartridge torque specifications in the Technical Data section, page 9.020.1.
- 2 Rotate the knob to the Start position by turning the shaft to alignment with the stamped screw.
- 3 Install the knob on the stem and align the Allen head set screw with the flat surface on the stem and tighten the set screw.
- 4 Peel the adhesive from the inlay and install it as desired. (Note that the inlay will be very difficult to re-position, so be careful.)



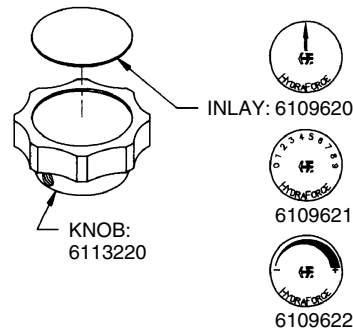
LOCK-DOWN PLATE KIT

Optional, Order Separately: 5399000



KNOB KIT PARTS

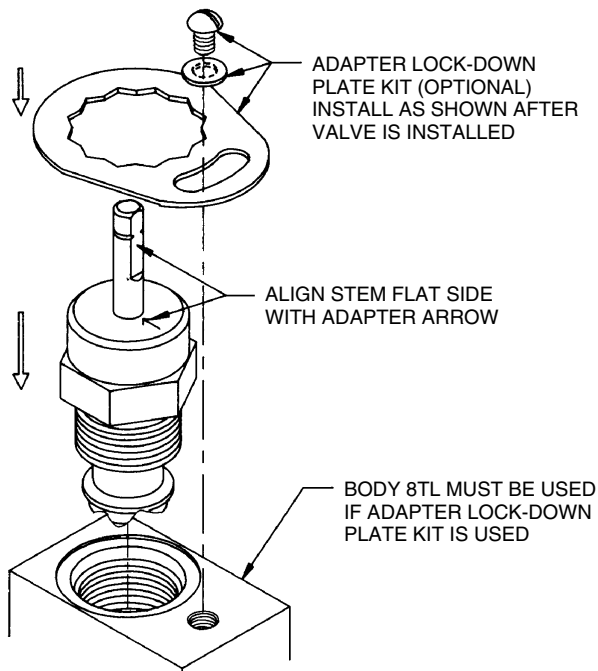
- 5341010 - Includes Knob & Inlay "A"
- 5341020 - Includes Knob & Inlay "B"
- 5341030 - Includes Knob & Inlay "C"



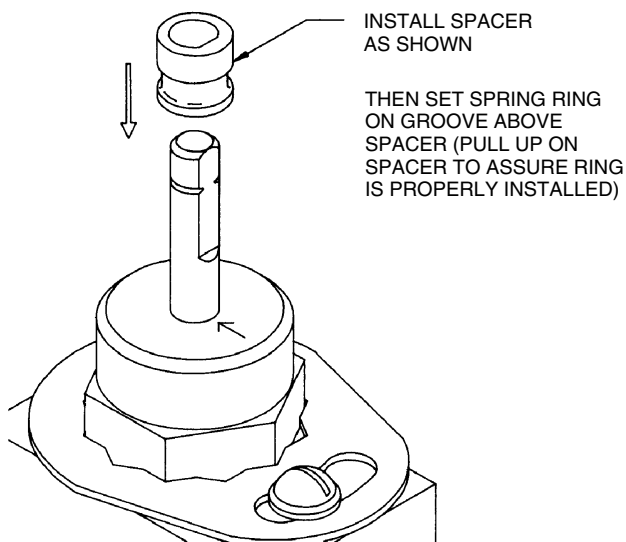
Ball & Lever Handle Installation Instructions

Preliminary Cartridge Installation:

- 1 Install the cartridge and optional lock-down plate as indicated. See cartridge torque specifications in the Technical Data section, page 9.020.1.

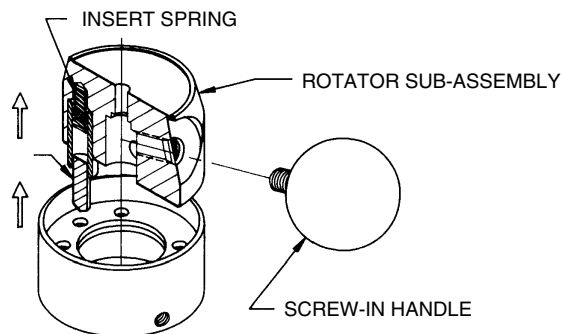


- 2 Install the spacer as shown. Note that an extra spring ring is provided should one get damaged or lost.

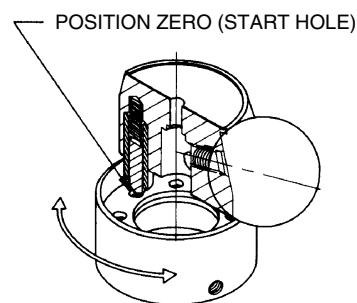


Handle Sub-Assembly:

- 3 Install the ball or lever, the spring, and the position pin into the top rotator. Note that the rotator inlay is fastened, but may be repositioned later.



- 4 Turn the rotator to position the pin in the correct start hole position. Refer to the **Start Hole Position illustrations** on the following page for proper position. HydraForce has pre-assembled the position ring in the adapter plate per the kit ordered. Use the drive stud to find the appropriate start position. Hold this sub-assembly together manually or with tape until ready to proceed.



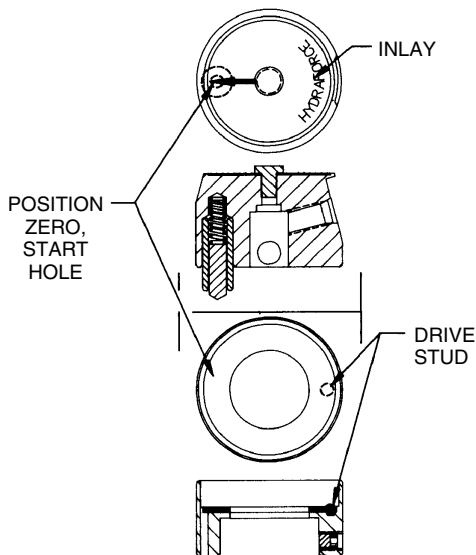
DIRECTIONAL CONTROLS

Ball & Lever Handle Installation Instructions (cont'd)

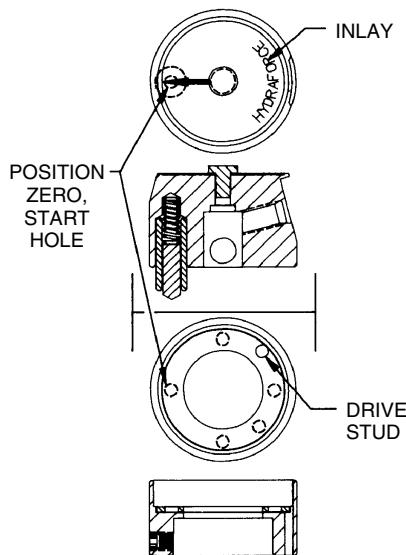
Start Hole Position Illustrations (refer to step 4 on previous page)

- Identify your handle kit part number from these illustrations.
- Align position zero on the inlay and adapter plate subassembly as illustrated.
- All set screws are tightened to 0.03–0.04 Nm (3–4 ft.-lbs.).

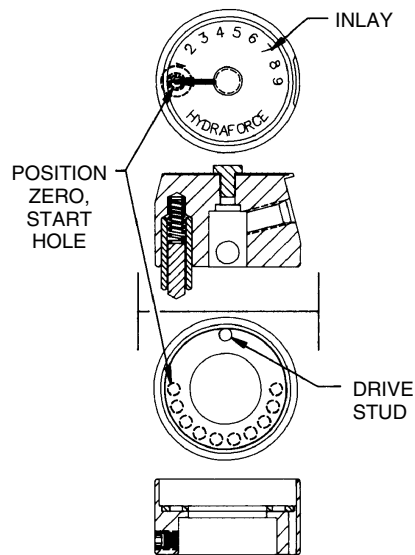
Friction Lock Knob
w/Ball: 5342050 w/Lever: 5342020



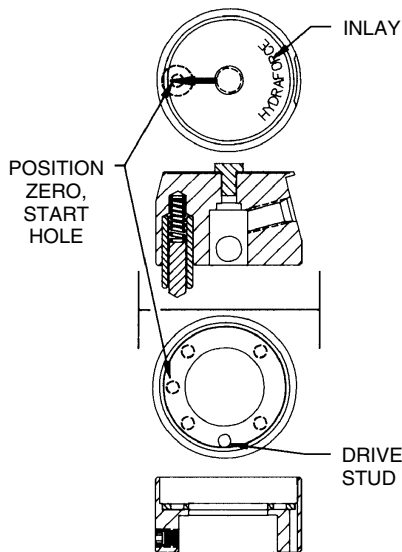
2-Position Knob, 0°–90°
w/Ball: 5342060 w/Lever: 5342030



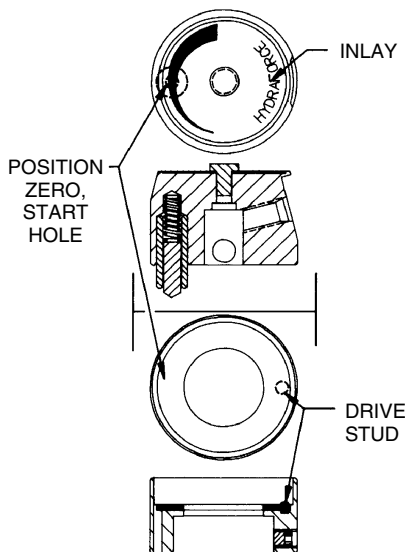
10-Position Knob, 0°–180°
w/Ball: 5341070 w/Lever: 5341050



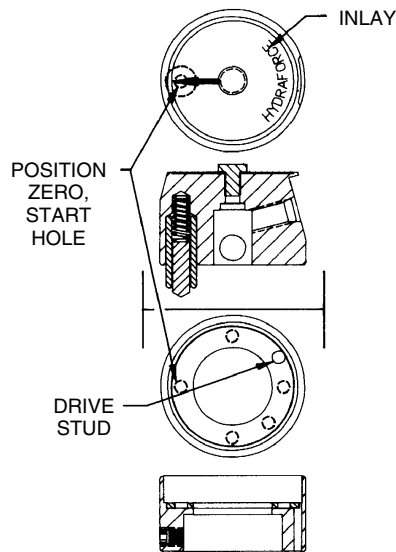
3-Position Knob, 45°–0°–45°
w/Ball: 5343060 w/Lever: 5343030



Friction Lock Knob
w/Ball: 5341060 w/Lever: 5341040



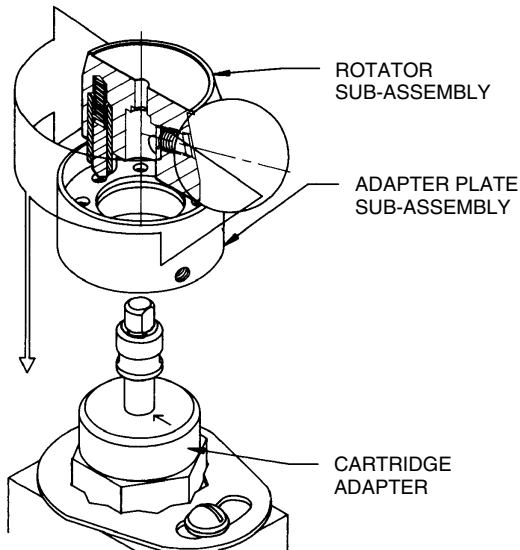
**3-Position Friction Knob
w/Detent in Neutral, 45°–0°–45°**
w/Ball: 5343050 w/Lever: 5343020



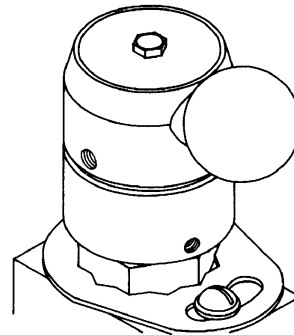
Ball & Lever Handle Installation Instructions (cont'd)

Handle Sub-Assembly to Cartridge Valve:

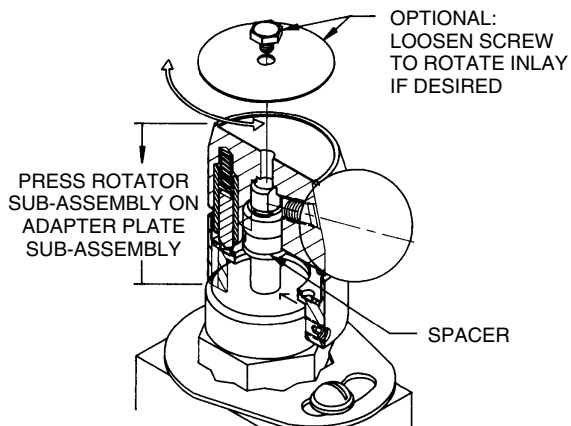
5 Turn handle sub-assembly to the desired position on the cartridge shaft. Push the adapter plate to a flush position with the cartridge adapter and tighten the three set screws to 0.03–0.04 Nm (3–4 ft.-lbs.) in the adapter plate sub-assembly to the cartridge adapter.



7 After all the set screws are tightened, the knob should move slightly upward. This allows the assembly to rotate from one position to the next.



6 Push the rotator subassembly to a flush position with the cartridge shaft spacer. Tighten the two set screws on the rotator into the spacer at 0.03–0.04 Nm (3–4 ft.-lbs.). If necessary, loosen the inlay screw to reposition.



HANDLE KIT PARTS

- SELF-THREADING SCREW: 6111021
- INLAY (ONE INCLUDED): 619610, 6119611, OR 6119612
- ROTATOR SUB-ASSEMBLY: 6503510
- SPRING: 7001570
- DETTENT PIN: 7010246
- SPACER: 7010281
- ADAPTER PLATE SUB-ASSEMBLY (ONLY ONE INCLUDED)
FRICTION LOCK: 6503560
10-POSITION: 6503500
ALL OTHERS: 6503540
- 1/4-20 SCREW AND WASHER

LOCK-DOWN PLATE KIT
Optional, Order Separately:
5399000

KNOB OPTIONS (ONE INCLUDED)
BALL: 6113210
LEVER: 6113200

DIRECTIONAL CONTROLS

Spring Centered Knob Installation

Spring Centered Knob Kit Piece Part List

Description (part no.) qty.

Handle (see Figure 1) qty: 1
Knob Screw (6111021) qty: 1
Inlay (6109610) qty: 1
Knob Subassembly (6503420) qty: 1
Subassembly includes:
Set Screws (6111011) qty: 2
Spacer (7010281) qty: 1
Plunger Subassembly (6503410) qty: 1
Retainer (7011881) qty: 1
Spring (7010416) qty: 1
Spring (7010426) qty: 1
Knob (7011271) qty: 1

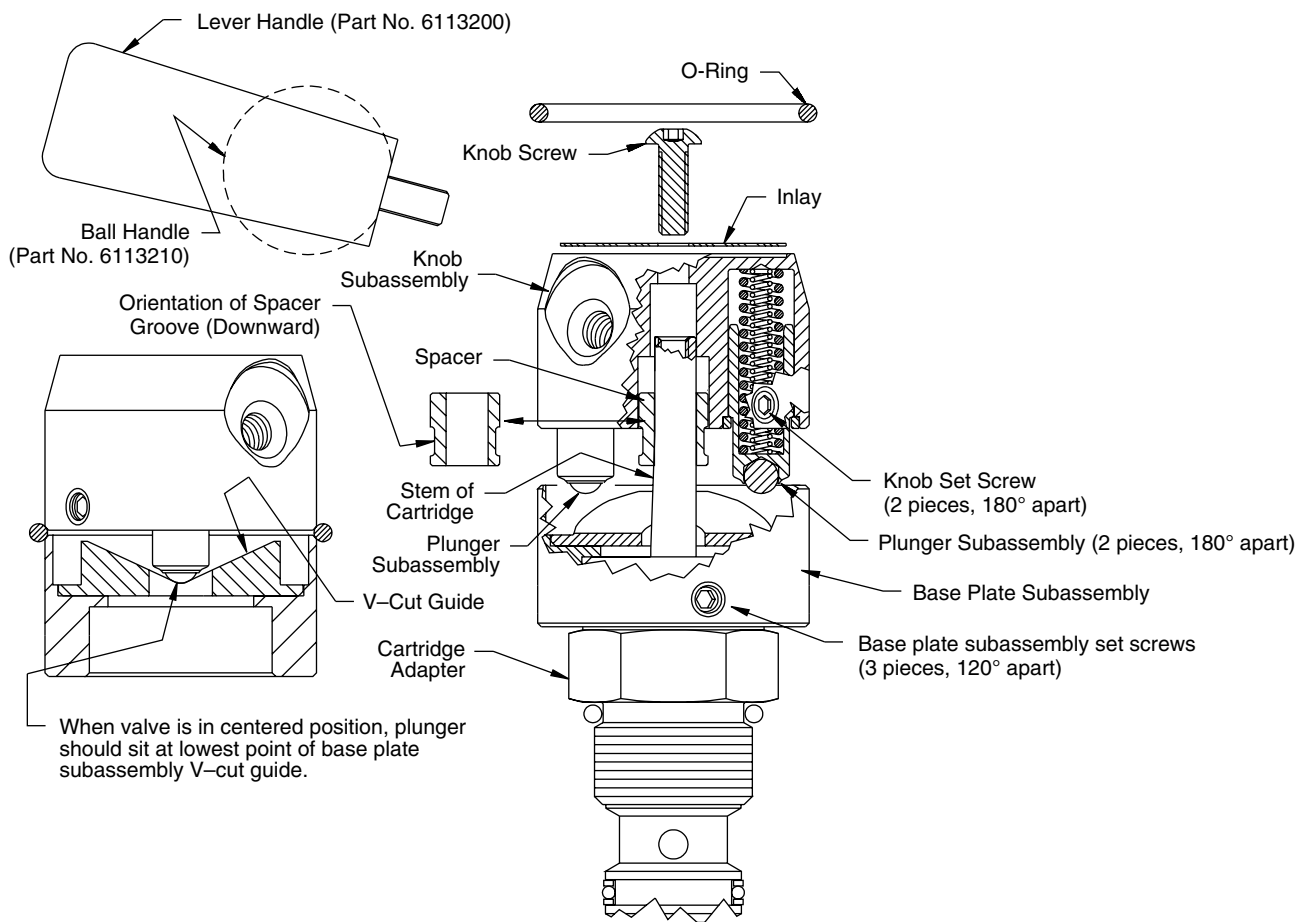
Description (part no.) qty.

Base Plate Subassembly (6503620) qty: 1
Subassembly includes:
Set Screws (6111012) qty: 3
V-Cut Guide (7010376) qty: 1
Stud (6107500) qty: 1
Base Plate (7010271) qty: 1
O-Ring (6023001) qty: 1
3/32 Hex Key Wrench, not shown (6107490) qty: 1

Tools Required

3/32 Hex Key Wrench (included in kit)
1" Hex Torque Wrench
1/4" Flat Head Screwdriver (for adapter lock-down kit only)

Figure 1: Exploded Assembly



Spring Centered Knob Installation (cont'd)

Figure 2: Centering the Valve

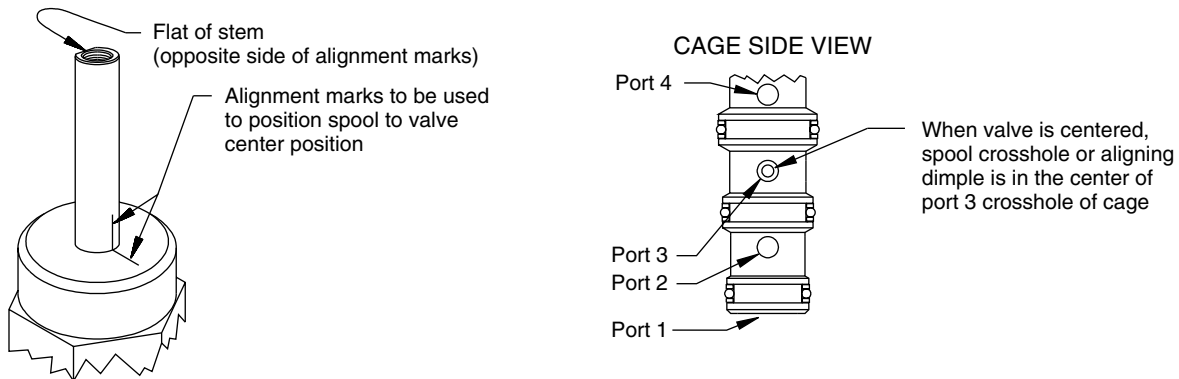
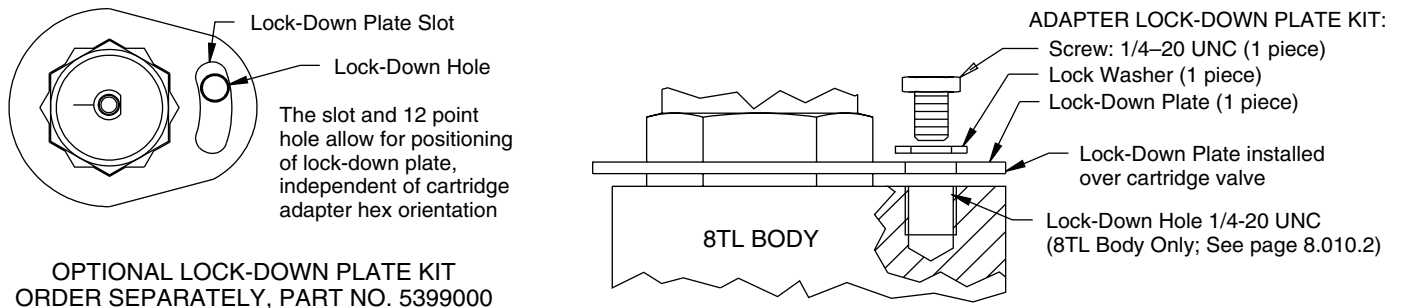


Figure 3: Lock-Down Plate Kit (Optional) for use with 8TL Body Only



Spring Centered Knob Installation Instructions

Please read these instructions and review Figures 1, 2 & 3 before assembling

- 1) With cartridge valve in hand, line up the alignment marks of the stem and adapter as shown in Figure 3. (This will locate valve center position which is critical to valve operation.)
- 2) Install cartridge valve.
- 3) Verify that alignment marks are aligned after installing valve.
- 4) If lock-down plate kit is being used, see Figure 3.
 - A) Body or manifold must have 1/4-20 UNC threaded hole.
 - B) Place lock-down plate over cartridge hex and position slot over body or manifold lock-down hole (1/4-20 UNC threaded hole) Install 1/4-20 UNC screw and washer; tighten to 7-8 ft-lbs.
- 5) Place base plate subassembly (V-cut up) over stem and adapter of cartridge (see Figure 1). Do not tighten base plate subassembly set screws at this time.
- 6) Place spacer onto adjusting stem positioning the outer groove of spacer downward (toward cartridge adapter) as shown in Figure 1.
- 7) If handle is not attached to knob, screw handle into knob.
- 8) Make sure knob subassembly set screws are flush with outside diameter of knob. Carefully place knob subassembly (with plungers facing downward) over stem, aligning plungers with the lowest point of the V-cut in the base plate subassembly, as shown in Figure 1. (Optional: Lightly grease V-cut Guide.)
- 9) Gently rotate knob subassembly and base plate subassembly together, keeping plunger aligned in lowest point of V-cut, and orienting handle to the desired position when valve is centered. It is important that stem does not rotate while rotating knob subassembly and base plate subassembly. If stem does rotate, repeat steps beginning from step 1.
- 10) Once handle is in desired centered position, hold base plate subassembly down on adapter and tighten the three base plate set screws, alternating tightening sequence to center base plate on adapter as best as possible. Tighten to 1-1/2 to 2 ft-lbs.
- 11) After base plate is secure, screw in knob subassembly set screws until they contact the spacer. Then press down firmly on knob and tighten two knob set screws to 1-1/2 to 2 ft-lbs, alternating tightening sequence, as done in step 10. Knob may lift when released.
- 12) Position inlay on top of knob as desired and insert knob screw into top hole of knob. Tighten knob screw, drawing knob toward adjusting stem until knob bottoms out on stem.
- 13) To verify proper assembly, rotate handle both CW and CCW and make sure rotation in both directions is equal (45°).
- 14) Optional: Install O-ring in the gap between the knob subassembly and base plate subassembly, as shown in Figure 1. This step is recommended when operating in an environment where dust and moisture may be present.
- 15) If rotation is unequal in both directions or desired handle position is incorrect, remove knob screw, loosen base plate subassembly set screws, and loosen knob set screws, making sure there is no contact between knob set screws and spacer. Repeat steps 3-12.