

# KEYSTONE

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**INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS FOR M63A, M65A & M65AR  
MANIFOLD****1.0 INTRODUCTION**

Anderson, Greenwood & Co., M63A, M65A & M65AR large orifice 5-valve meter manifolds are made for use with field meters or differential pressure transmitters. They feature two mainline block valves along with double block and bleed for the by-pass line. The manifolds are available in soft and hard seat configuration. For maximum pressure/temperature ratings see the applicable valve assembly drawings.

**2.0 INSTALLATION**

2.1 Check manifold nameplate, if so equipped, for schematic of valve arrangement and note which ports are for process connections and instrument connections.

2.2 Immediately prior to valve installation, check the piping to which the valve is to be connected for cleanliness and freedom from foreign materials.

2.3 Threaded pipe joints depend on a good intimate fit between the male and female pipe threads, therefore the use of a thread sealant is recommended and the pipe fitting connections must be made up tight.

**3.0 OPERATION**

Valves which have been reasonably matched to a typical valve service application and properly installed in its piping system can expect to have a long service life with a minimum of attention. However, these valves have moving and wearing parts and depend on long term preservation of highly finished surfaces on these parts for satisfactory valve performance.

3.1 The use of a "cheater" to operate the valve handle is not necessary and not recommended. This practice can cause valve damage.

3.2 All manifolds have rising stems with right hand thread. Rotate the handle counter-clockwise to open and clockwise to close.

3.3 Bonnets with rising stems are provided with a backseat. Backseats in rising stem bonnets should be considered basically as stops to prevent overtravel when opening valves. It is recommended not to leave the upper stem in the backseated position. Note MSS SP-92, "MSS Valve User Guide", paragraph 4.3

### 3.4 Operation of 5-Valve Manifold

The M63A, M65A & M65AR manifolds illustrated in Figure 1 are five valve units designed for use with differential pressure transmitters or other flow metering instruments. Two valves on the sides of the body are block valves for shutting off the high and low side connections to the d/p transmitter when the instrument is to be adjusted or removed from service. The three valves in the center of the body, two equalizing valves and one vent valve, are for equalizing pressure on the two sides of the instrument while readjusting.

- 3.4.1 In normal operation of the system the two block valves along with the vent valve will be open and the two equalizer valves will be closed.
- 3.4.2 To readjust the instrument to zero, close the block valve to the low pressure side (downstream side) of the instrument along with the vent valve. Then open the two equalizer valves to equalize the pressure on both sides of the instrument.
- 3.4.3 To return the instrument to service, close the two equalizer valves and open the block valve to the low pressure side of the instrument along with the vent valve.

## 4.0 MANIFOLD MAINTENANCE

The important performance parameters are pressure boundary integrity, actuating force required and internal leak tightness. Maintenance should logically address the importance of preserving the performance parameters.

Valves which remain in one position for long periods of time may be subject to some degree of operability as a result of loss of effective lubricants in threads, aging of packing surface corrosion of moving parts or accumulation of harmful solids. In some applications it may be desirable to schedule periodic partial or full cycle exercising these valves.

- 4.1 O-ring stem seal leakage usually results from seal wear, and can usually be corrected by replacement of stem seal.

4.2 Teflon stem packings do not often need replacement if leakage occurs. The leak can usually be stopped by tightening the packing nut. Overtightening can cause high stem friction, accelerated wear and shortened stem seal life.

4.3 Bonnet Removal

- a) Remove bonnet lock pin from valve body by using heavy duty pliers or wire cutters.
- b) Unscrew bonnet counter clockwise to remove bonnet assembly from valve body.

4.4 Stem Seal Replacement

If stem seal replacement is needed, safe practice requires depressurizing the valve before removal of the bonnet bushing. Use of backseat to permit repacking under pressure should be considered unsafe.

4.4.1 Block Valve Bonnet (O-ring Stem Packing)

- a) Refer to Figure 2 for part identification.
- b) Remove handle (item 7) by loosening handle bolt.
- c) Remove dust boot (item 6) from the bonnet (item 1).
- d) Remove stem (item 2) from bonnet by screwing it downward.
- e) Remove the two C-washers (item 11) from the stem.
- f) Slide plug (item 9) and thrust washer (item 8) down onto the stem.
- g) Remove retaining ring (item 10) from the end of the stem.
- h) Slide the plug and thrust washer off of the stem.
- i) Remove the retaining ring (item 5), two back-up rings (item 3) and O-ring (item 4) from the stem (these parts will come out of the bonnet with stem removal).

- j) Clean all bonnet assembly parts with Acetone or Alcohol.
- k) Inspect parts for damage, particularly the stem threads and plug. Replace both stem and bonnet if threads do not engage smoothly.
- l) Install one of the back-up rings (item 3), O-ring (item 4), the other back-up ring (item 3) onto the stem (item 2).
- m) Lubricate the stem threads with the appropriate lubricant specified on the assembly drawing and screw it up into the bonnet from the bottom of the bonnet.
- n) Install retaining ring (item 5) into bonnet (item 1) and push it down as far as it will go.
- o) Slide thrust washer (item 8) and plug (item 9) onto stem in that order.
- p) Install retaining ring (item 10) into groove on the end of the stem.
- q) Slide thrust washer (item 8) and plug (item 9) down until the plug contacts the retaining ring just installed.
- r) Install the two C-washers (item 11) onto the stem with the opening on the C-washer going in opposite direction from each other.
- s) Install dust boot (item 6) over stem and down onto the bonnet.
- t) Install handle (item 7) onto the stem and tighten the handle bolt to 12 in lb, torque. Make sure that the handle bolt contacts the stem on the flat area provided for it.

- 4.4.2 Block Valve Bonnet (Teflon Stem Packing)
- a) Refer to Figure 3 for part identification.
  - b) Remove handle (item 11) by loosening handle bolt.
  - c) Remove packing nut (item 10) from the bonnet (item 1).
  - d) Remove follower (item 9) from around stem (item 2).
  - e) Remove stem from bonnet by screwing it downward.
  - f) Remove the two C-washers (item 6) from stem.
  - g) Slide plug (item 3) and thrust washer (item 5) down onto stem.
  - h) Remove retaining ring (item 4) from end of stem.
  - i) Slide plug and thrust washer off of stem.
  - j) Remove stem seal (item 8) and packing washer (item 7) from bonnet.
  - k) Clean all bonnet assembly parts with Acetone or Alcohol.
  - l) Inspect parts for damage, particularly the stem threads and plug. Replace both stem and bonnet if threads do not engage smoothly.
  - m) Slide thrust washer (item 5) and plug (item 3) onto stem.
  - n) Install retaining ring (item 4) into groove on end of stem.
  - o) Slide thrust washer (item 5) and plug (item 3) down as far as they will go.
  - p) Install the two C-washers (item 6) onto stem with the opening on the C-washer going in opposite direction from each other.

- q) Lubricate the stem threads with the appropriate lubricant specified on the assembly drawing.
- r) Install the stem (item 2) into the bonnet.
- s) Install packing washer (item 7) and stem seal (item 8) into bonnet in that order.
- t) Install follower (item 9) over stem and let it rest on stem seal.
- u) Install packing nut (item 10) onto bonnet and hand tighten.
- v) Install handle (item 11) onto stem and tighten handle bolt to 12 in lb, torque. Make sure that handle bolt contacts stem on flat area provided for it.

#### 4.4.3 Equalizer Valve Bonnet

- a) Refer to Figure 4 for part identification.
- b) Remove handle (item 1) by loosening handle bolt.
- c) Remove packing nut (item 2) from bonnet (item 6).
- d) Remove packing (item 3) from bonnet.
- e) Remove packing washer (item 4) from bonnet.
- f) Remove stem (item 5) from bonnet.
- g) Remove secondary seal (item 7) from bonnet.
- h) Clean all bonnet assembly with Acetone or Alcohol.

- i) Inspect parts for damage, particularly the stem and bonnet threads. Replace both stem and bonnet if threads do not engage smoothly.
- j) Lubricate the stem threads with the appropriate specified on the assembly drawing.
- k) Screw stem (item 5) into the bonnet (item 6) from the bottom.
- l) Install packing washer (item 4) into the bonnet.
- m) Install packing (item 3) into the bonnet.
- n) Screw the packing nut (item 2) onto the bonnet and tighten snugly by hand.
- o) Install the handle (item 1) and tighten the handle screw to 25 in lb.
- p) Install secondary seal (item 7) over threaded end of bonnet and into thread relief.

#### 4.5 Seat Replacement (Soft Seat Only)

If seat replacement is needed, safe practice requires depressurizing the valve before removal of the bonnet.

##### 4.5.1 Block Valve

- a) Refer to Section 4.3 for bonnet removal.
- b) Remove seat from seat cavity. The seat may be removed from the seat cavity with any smooth surface bar, used as a pry bar, inserted into one of the orifice holes in the seat.
- c) Clean seat cavity with Acetone or Alcohol.
- d) Inspect seat cavity for damage, such as scratches that go from one hole to the other or heavy corrosion in the area where the seat goes. If seat cavity is damaged the body must be replaced.

- e) Make sure that indexing pin is still securely installed into the hole in the bottom of the seat cavity.
- f) Install new seat making sure that the notch in the side of the seat is centered over the indexing pin.
- g) Install bonnet assembly back into body per Section 4.6.

#### 4.5.2 Equalizer - Vent Valve

- a) Refer to Section 4.3 for bonnet removal.
- b) Refer to Figure 5 for part identification.
- c) Remove wave spring flow washer (item 1) from seat cavity.
- d) Remove washer type seat (item 2) from seat cavity.
- e) Clean seat cavity with Acetone or Alcohol.
- f) Install new seat into seat cavity.
- g) Install wave spring flow washer into seat cavity.
- h) Install bonnet assembly back into body per Section 4.6.

### 4.6 Valve Assembly

#### 4.6.1 Bonnet Installation

- a) Lightly lubricate the bonnet threads with the appropriate lubricant.
- b) Place bonnet assembly into seat cavity and screw the bonnet into the body by hand. Make sure that the stem is fully retracted into the bonnet.

- c) Tighten the bonnet to the proper torque value shown below with a torque wrench.

BLOCK VALVE

O-Ring Stem Packing or  
 Teflon Stem Packing.....50-60 ft lb

EQUALIZER AND VENT VALVE

Carbon Steel.....13-15 ft lb  
 Stainless Steel.....16-18 ft lb

- d) Tap the bonnet lock roll pin into one of the two holes that one of the flats on the bonnet hex best center over.

4.6.2 Block Valve Adjustment/Teflon Packed (Refer to Figure 3)

- a) With bonnet assembly installed back into body tighten the packing nut (item 10) while turning the handle. When a slight resistance in turning is felt stop turning.
- b) When valve is repressurized the packing nut can be further tightened if needed to stop stem leakage. When leakage stops the packing nut should not be tightened further.

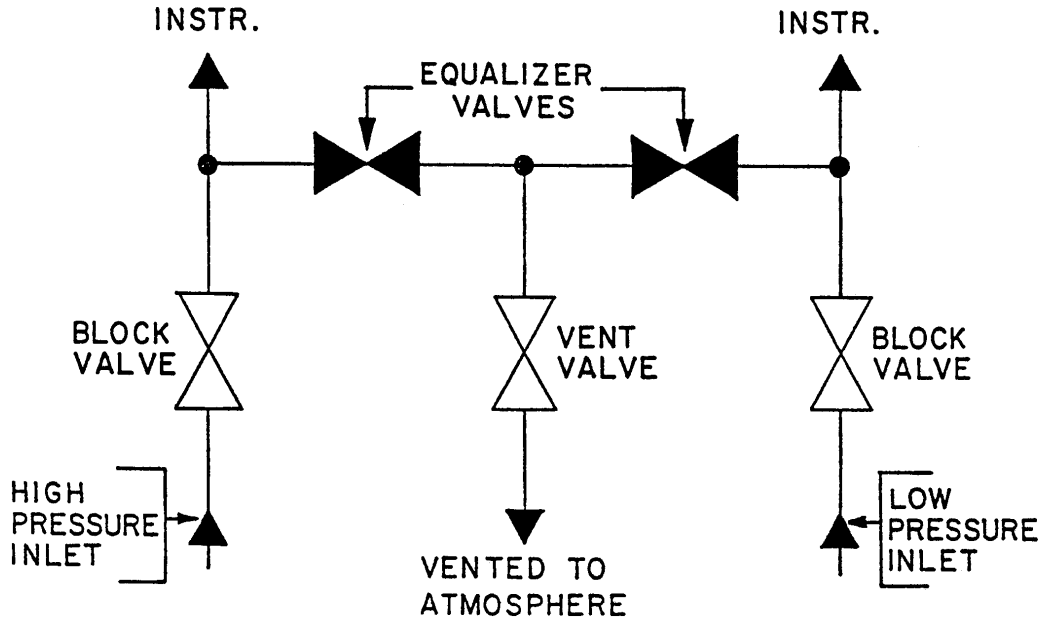
4.6.3 Equalizer and Vent Valve Adjustment (Refer to Figure 4)

- a) Tighten the packing nut (item 2) until a slight resistance to turning the handle is felt.
- b) After valve is repressurized tighten the packing nut more if stem seal is leaking. Once the leak is stopped do not tighten the packing nut any further.

**5.0 POST ASSEMBLY INSPECTION**

Turn the handle to open and close the valve. Check for binding, rubbing, or any resistance to smooth operation.

# NORMAL OPERATION



# CALIBRATION

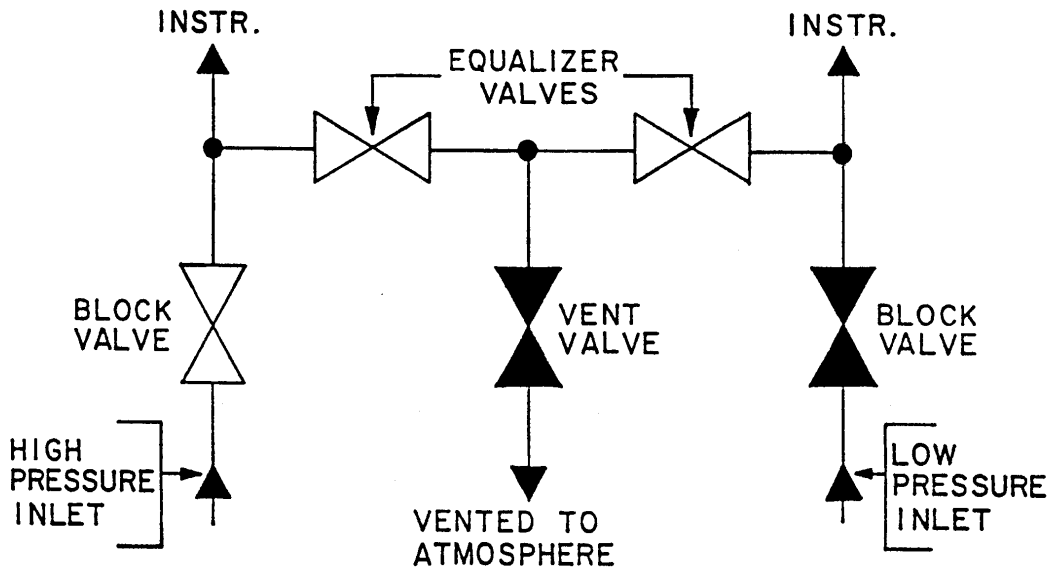
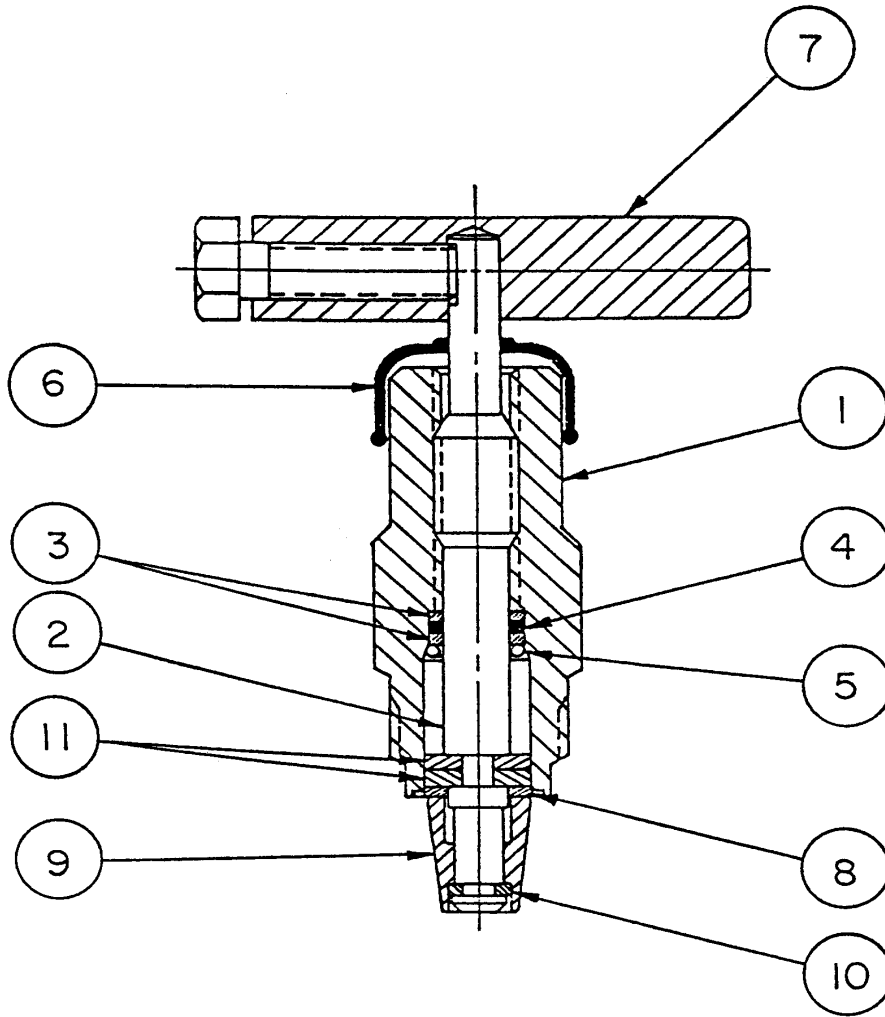
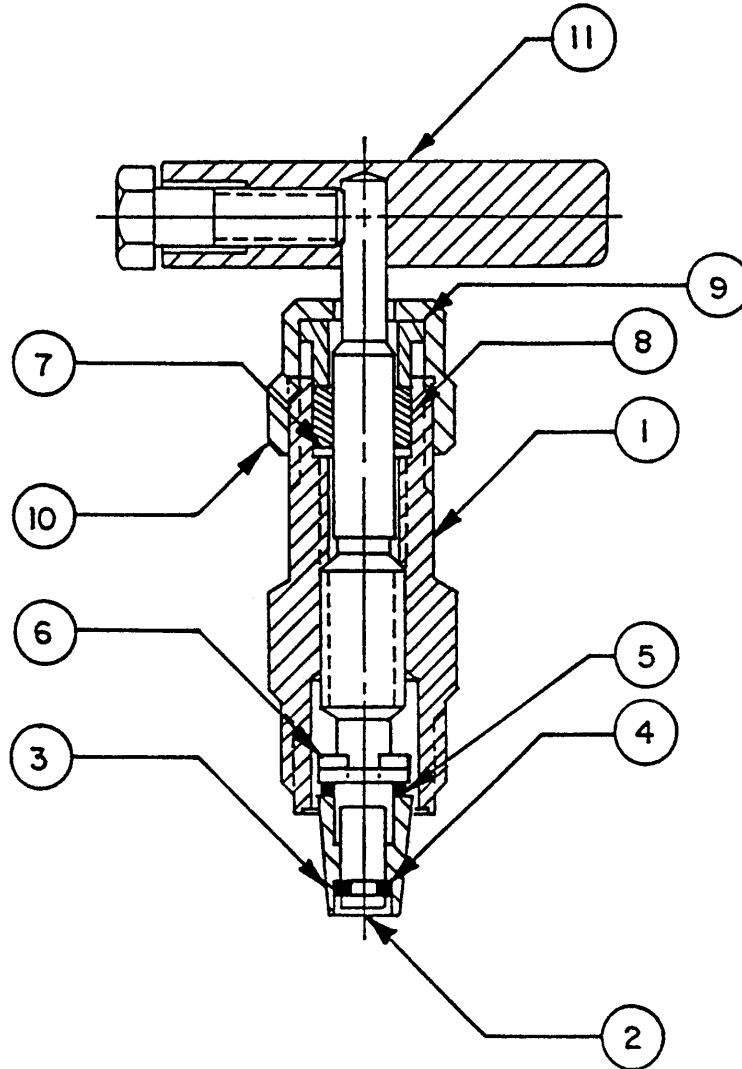


FIGURE 1



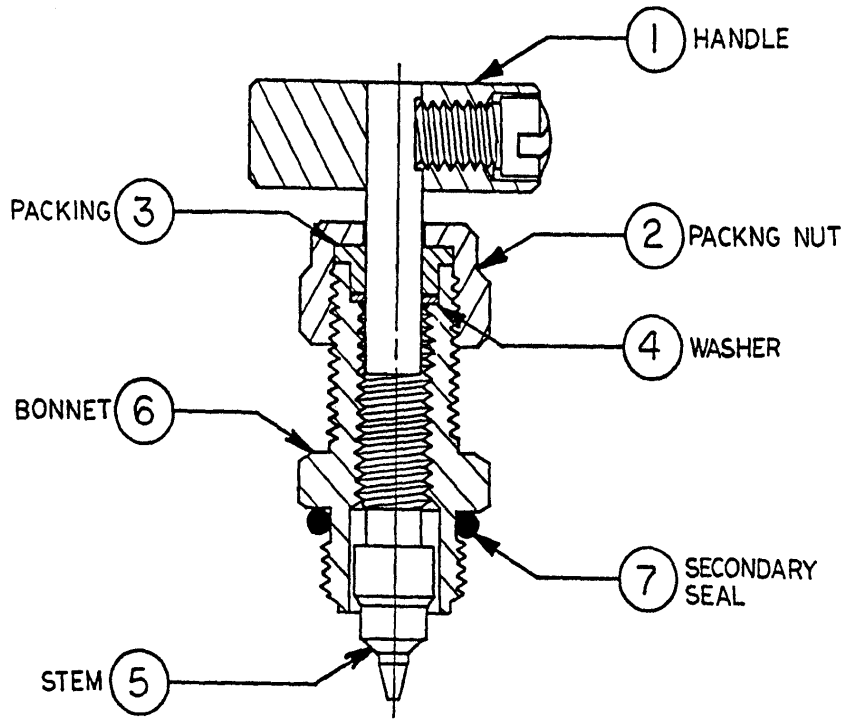
O-RING STEM PACKING  
M63A, M65A, M65AR BLOCK VALVE BONNET ASSEMBLY

FIGURE 2



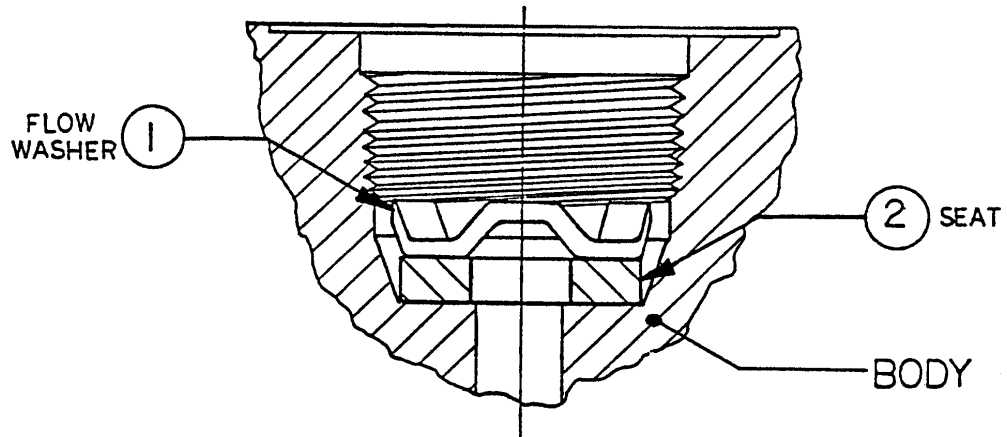
TEFLON STEM PACKING  
M63A, M65A, M65AR BLOCK VALVE BONNET ASSEMBLY

FIGURE 3



EQUALIZER-VENT VALVE  
BONNET

FIGURE 4



EQUALIZER-VENT VALVE  
SEAT CAVITY

FIGURE 5