

Valtek Extended Bonnets

GENERAL INFORMATION

The following instructions are designed to assist in installing, disassembling and troubleshooting Valtek® globe valves equipped with extended bonnets. Product users and maintenance personnel should thoroughly review this bulletin in conjunction with Installation, Operation Maintenance Instructions 1 (Mark One and Two Control Valves) before installing, operating or performing any maintenance on the valve.

To avoid possible injury to personnel or damage to valve parts, WARNING and CAUTION notes must be strictly adhered to. Modifying this product, substituting nonfactory parts, or using maintenance procedures other than outlined could drastically affect performance and be hazardous to personnel and equipment, and may void existing warranties.

Five bonnet designs exist: two extended bonnet designs (one-piece bonnets) and three bonnet extension designs in which the extension clamps to a standard bonnet. This bulletin presents instructions and sectioned-view drawings for all five designs.

Installation

Valtek valves equipped with extended bonnets are designed to be installed vertically. This ensures a stagnated, moderate temperature vapor barrier inside the bonnet, protecting the packing from the process.

CAUTION: Do not insulate the extended bonnet or bonnet extension. Although thermal insulation may be installed on the valve body and adjoining piping for extreme temperature service, the extended bonnet operates in hot service by radiating heat to atmosphere, and in cryogenic service by collecting heat from atmosphere. Insulating the bonnet will affect performance and possibly damage the valve.

DISASSEMBLY AND REASSEMBLY

Disassembling One-piece or One-piece Cryogenic Extended Bonnets

To disassemble valves equipped with extended bonnets, refer to Figures 1 and 2 then proceed as follows:

WARNING: Depressurize line to atmospheric pressure, drain all fluids and decontaminate the valve (if caustic or hazardous materials are present). Failure to do so can cause serious injury.

1. Remove bonnet flange bolts or nuts.
2. Remove the entire actuator/bonnet assembly by lifting it straight out of the body.

CAUTION: Heavy assemblies may require a hoist. Attach lifting straps to actuator yoke legs.

3. Loosen the actuator stem clamp.
4. Remove the packing box bolting.

WARNING: Process fluid may be trapped in the extended bonnet; therefore, be extremely cautious when removing the plug from the bonnet. Failure to do so can cause serious injury or damage to equipment.

5. Remove yoke bolting, clamps, and half rings (if present).
6. Remove the actuator by unscrewing the plug and bonnet from the actuator stem. To avoid galling the plug stem, the bonnet must be turned with the plug when unscrewing it from the actuator. This ensures the plug does not turn in relation to the packing box, which may cause plug stem damage.

WARNING: Do not allow the plug or bonnet to fall during removal from the actuator. Serious personal injury or valve damage may result.

7. Remove the bonnet flange from the bonnet.
8. Pull the plug carefully through the packing box.

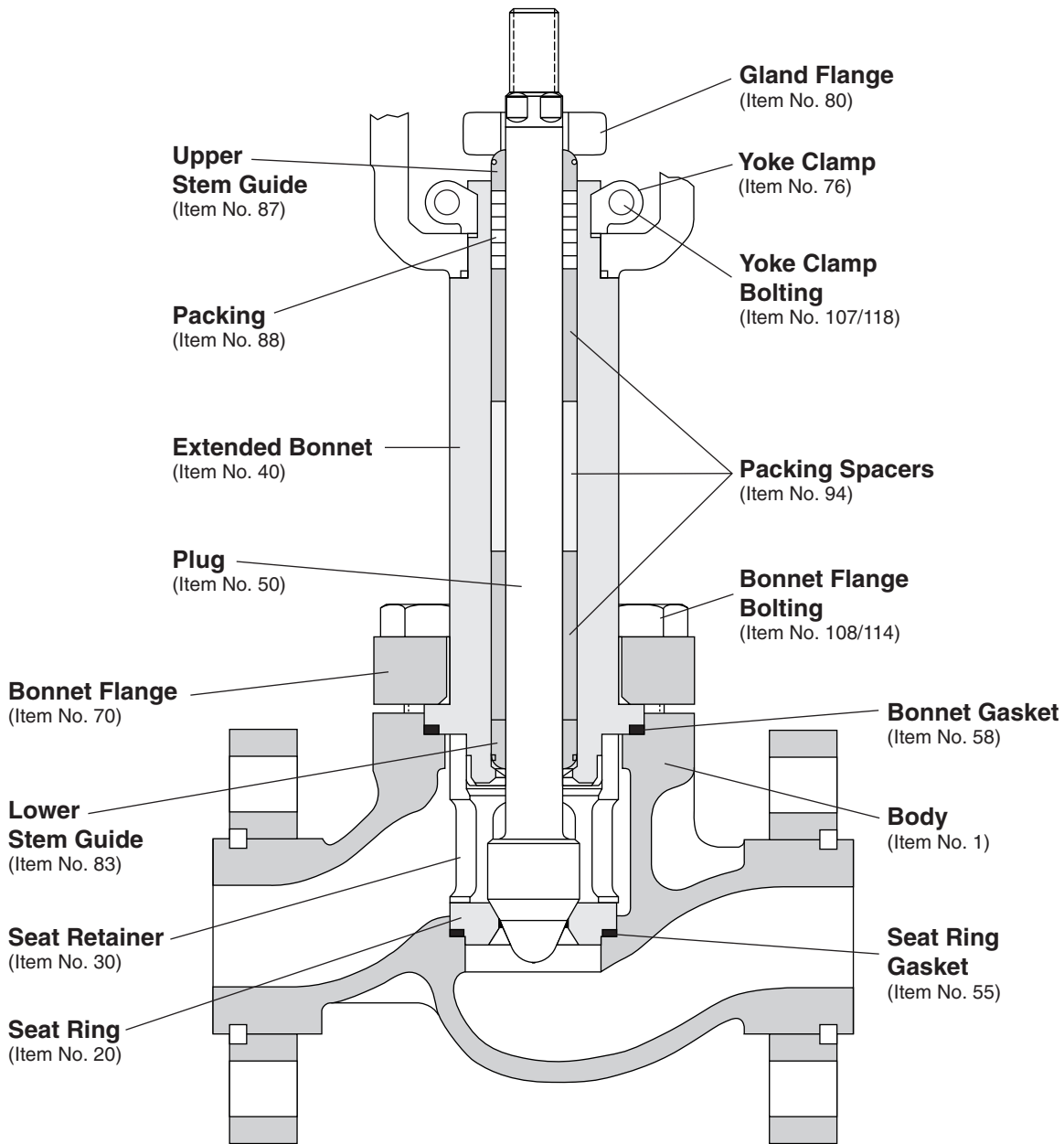


Figure 1: One-piece Extended Bonnet

Note: Item numbers correspond directly to the valve's bill of material. Refer to the bill of material for specific part numbers.

9. If the one-piece, cryogenic bonnet's lower stem guide requires replacement, remove the lower guide by filing or grinding away the six peened-points around the guide. File away only the material necessary to free the guide.

CAUTION: The cryogenic bonnet is designed for the lower guide to be removed a maximum of three times (or 18 peened-points). Unnecessary grinding of material from the bonnet may result in shorter bonnet life.

10. To replace the packing or packing box configuration, push out the upper stem guide, packing, packing spacer and stem follower (and lower stem guide

on non-cryogenic extended bonnets) with a dowel of the same approximate diameter as the plug stem.

Reassembling One-piece or One-piece Cryogenic Extended Bonnets

To reassemble valves equipped with extended bonnets, refer to Figures 1, 2 and 3 then proceed as follows:

1. If a one-piece, cryogenic bonnet's lower stem guide has been removed, push a replacement into the bore and peen six-places in the $\frac{1}{32}$ -inch deep groove around the guide. Peen only enough to hold the guide in place.

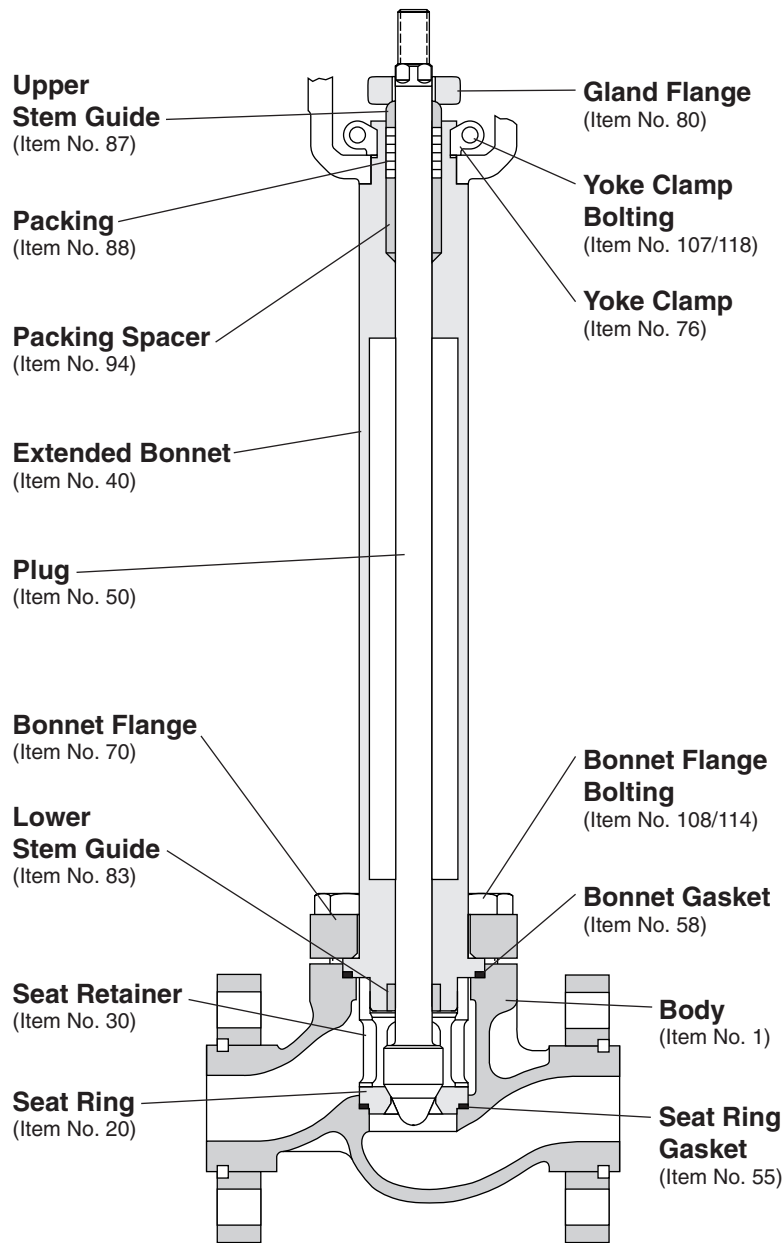


Figure 2: One-piece Cryogenic Bonnet

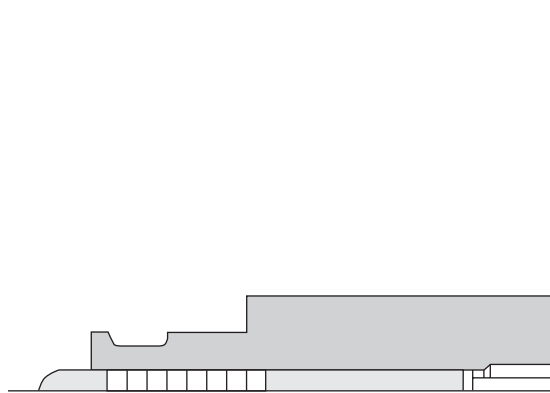
Note: Item numbers correspond directly to the valve's bill of material. Refer to the bill of material for specific part numbers.

CAUTION: Do not distort the guide by using excessive force when peening.

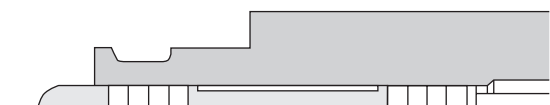
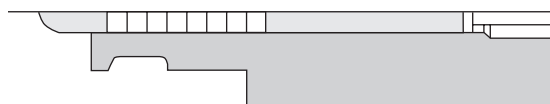
2. If the packing has been removed and will be replaced with packing other than square packing, reinstall the lower guide (in non-cryogenic, extended bonnets only), $\frac{1}{8}$ -inch spacer, tube spacer, additional spacers and lower packing and lube spacer, the upper packing, and upper stem guide. If changing the packing box configuration, refer to Figure 3 for different packing arrangements.
3. Reinsert the plug stem into the packing box, being careful not to score the stem or the guides. If square packing is being installed, slip it over the plug stem

and into the packing box. Tap it in place with a brass tamping bar, being careful not to damage the plug stem or packing box wall.

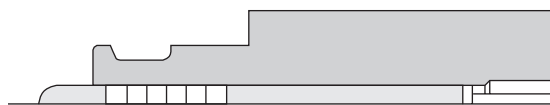
4. Replace the bonnet flange on the bonnet.
5. Turn the actuator back onto the plug, making sure the gland flange is in place before screwing the plug stem into the actuator stem. Be certain to turn the plug and bonnet in unison to avoid galling or scratching. Leave approximately two to three plug stem threads exposed.
6. Attach the yoke clamps and bolting, and the gland flange bolting. Tighten the packing box nuts to slightly more than finger-tight.



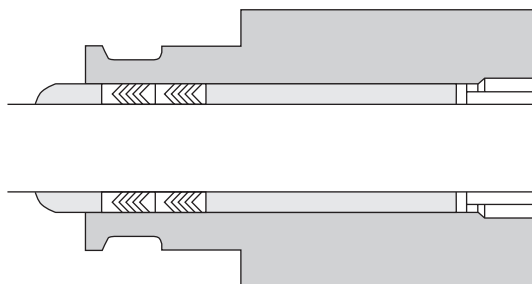
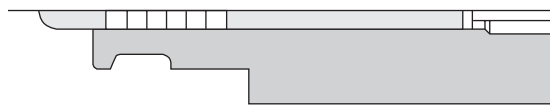
Extended Twin Square



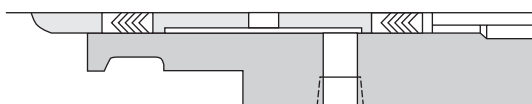
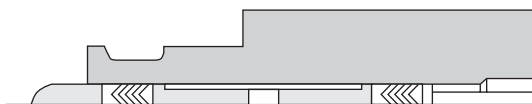
**Extended Twin Square
With Purge**



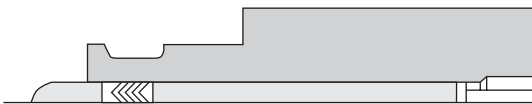
Extended Square



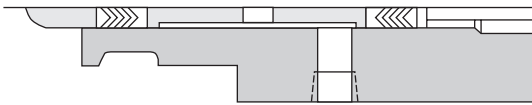
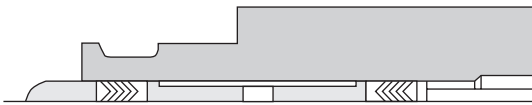
Extended Twin "V"



**Extended Twin "V"
With Purge**

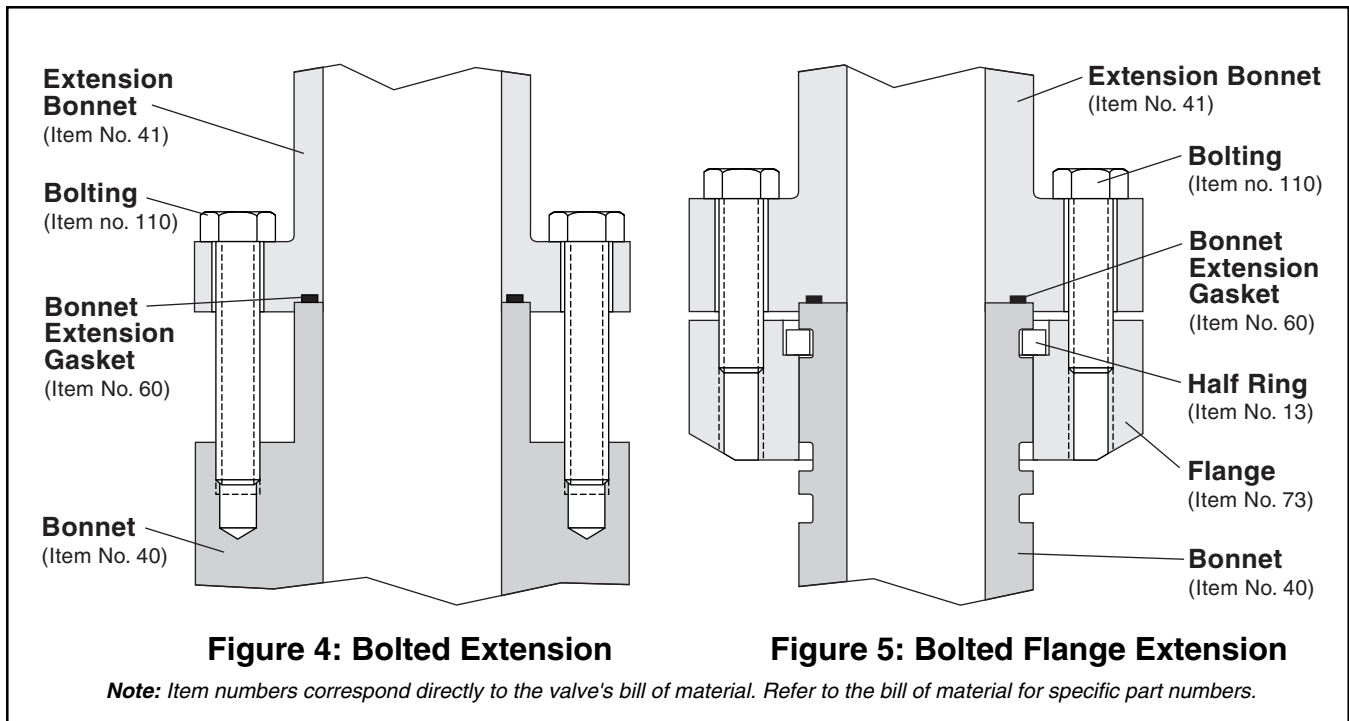


Extended "V"



**Vacuum Seal Twin "V"
With Purge**

Figure 3: Packing Configurations



CAUTION: Do not overtighten packing. This can cause excessive packing wear and stem friction which may impede stem movement.

7. After installing a new seat gasket, the seat ring, seat retainer and a new bonnet gasket, lower the actuator/bonnet assembly squarely into body. Be careful to not scratch or gall plug as it enters the body.

8. Install bonnet flange bolting to finger-tightness. Apply air pressure above the piston to seat the plug in the seat ring. Tighten each bonnet bolt about 1/6 (one flat) of a turn at a time in a clockwise direction around the bonnet flange. Firmly tighten all bolts evenly and completely to compress the bonnet gasket until the bonnet is seated metal-to-metal in the body. Proper tightness is achieved when metal-to-metal resistance can be felt with the wrench.

CAUTION: If the bolting is insufficiently tightened, the seat ring gasket will not have enough compression, resulting in leakage. Overtightening beyond the point of metal-to-metal resistance may damage interior valve parts.

9. The amount the plug stem is screwed into the actuator stem is not particularly important on air-to-close valves as long as the plug fully contacts the seat when the valve is closed. It is necessary only to leave two to three threads exposed. For correct plug engagement on air-to-open valves, screw the plug stem into the actuator stem as far as possible. Apply air pressure above the piston to drive it to the bottom of the actuator cylinder. Back the plug stem out of the actuator stem until the plug just touches the seat ring. Apply air under the piston to lift the plug off the seat and back the plug stem out of the actuator stem exactly one complete turn.

10. Apply air over the piston to seat the plug. With the stem clamp adjusted to the "closed" position of the stroke indicator plate, tighten stem clamp bolting.

Disassembling Bonnet Extensions

To disassemble valves equipped with bonnet extensions, refer to Figures 4, 5, 6 and 7 then proceed as follows:

WARNING: Depressurize line to atmospheric pressure, drain all fluids and decontaminate the valve (if caustic or hazardous materials are present). Failure to do so can cause serious injury.

1. Remove bonnet flange bolts or nuts.
2. Remove the entire actuator/bonnet extension assembly – including the bonnet and plug – by lifting it straight out of the body.

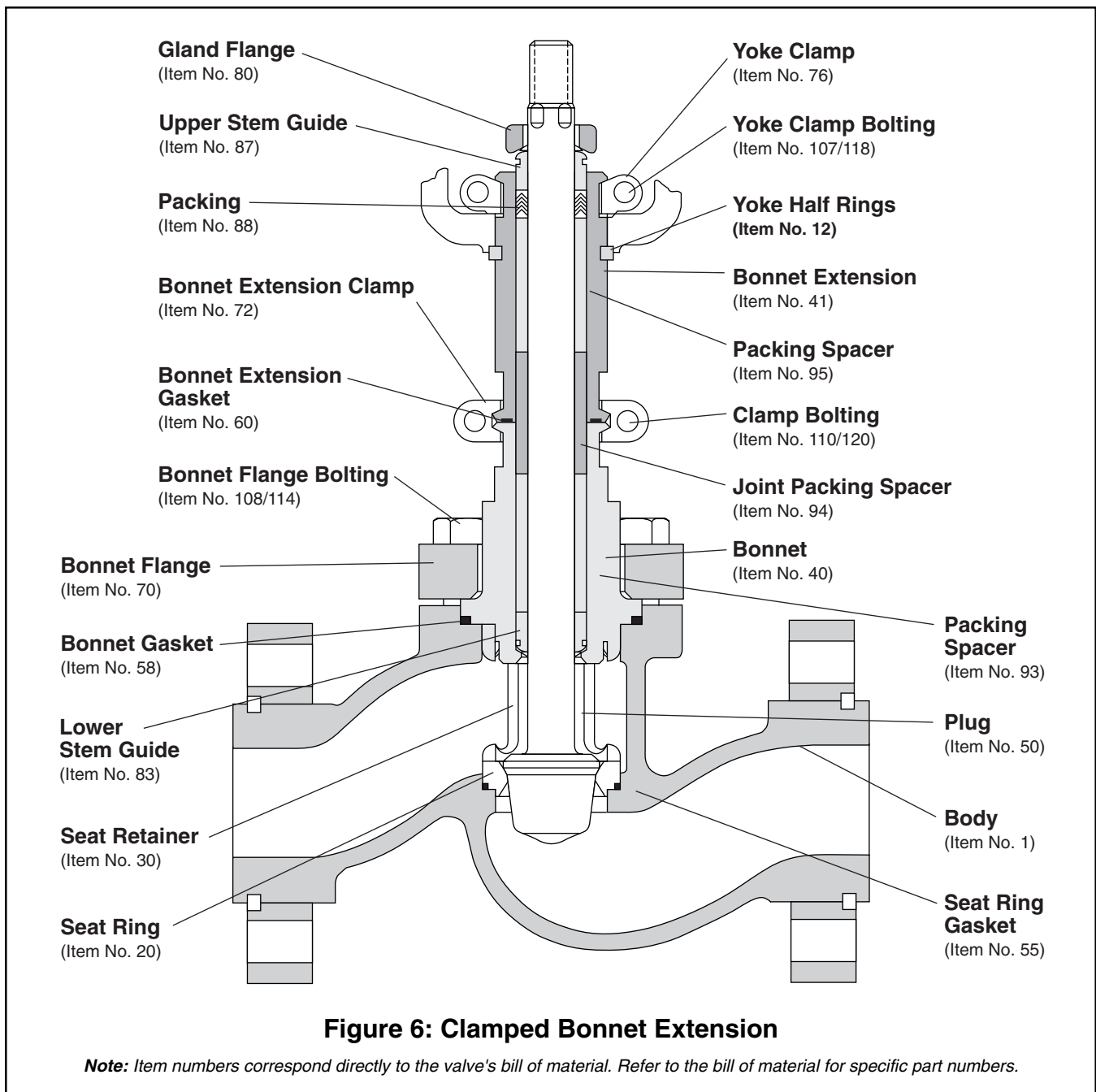
CAUTION: Heavy assemblies may require a hoist. Attach lifting straps to actuator yoke legs.

3. Loosen the actuator stem clamp.
4. Remove packing box bolting.
5. Remove the yoke bolting, clamps and half rings (if present).
6. Remove the actuator by unscrewing the plug and bonnet in unison from the actuator stem. Unscrewing the plug and bonnet together prevents damage to the plug stem and packing box wall.

WARNING: Do not allow the plug or bonnet to fall during removal from the actuator. Serious personal injury or valve damage may result.

7. Pull the plug carefully through the packing box and bonnet.

WARNING: Process fluid may be trapped in the bonnet extension; therefore, be extremely cautious when removing the plug from the bonnet and bonnet extension.



8. Remove the bonnet connecting bolts, extension clamps or flanges and half-rings (see Figures 4, 5, 6 and 7) and associated bolting. The bonnet flange may now be removed, if desired.
9. Pull apart the bonnet and bonnet extension and remove stem guides, packing, and packing spacers from both halves of the packing box.
10. Remove the bonnet extension gasket from gasket groove on the bottom face of the bonnet extension.

Reassembling Bonnet Extensions

To reassemble valves equipped with bonnet extensions, refer to Figures 3, 4, 5, 6 and 7 then proceed as follows:

1. Clean the gasket seating surfaces on the bonnet and bonnet extension.
2. Insert lower stem guide and packing spacer into the bonnet.
3. In clamp-on extensions, place a joint packing spacer in the bonnet. This spacer should be centered at the joint between the bonnet and bonnet extension.

NOTE: Late model extensions do not have joint packing spacers. Packing spacers only need to be installed up to the packing.

4. Making sure the new bonnet extension gasket is properly seated in the gasket groove on the bottom face of the bonnet extension, slip the bonnet exten-

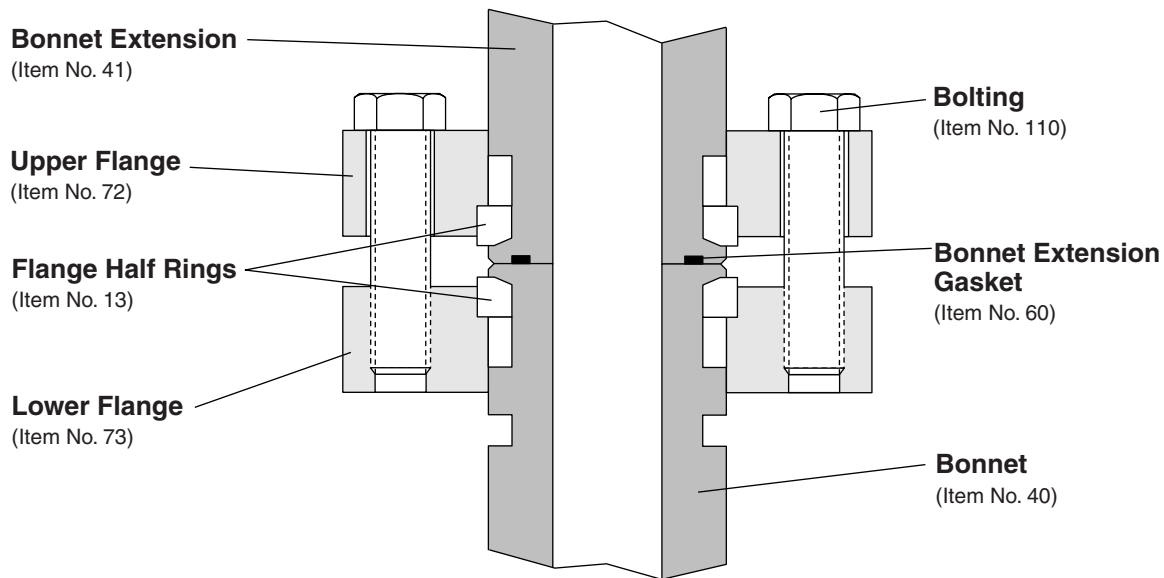


Figure 7: Bolted Double-flange and Clamp Design

Note: Item numbers correspond directly to the valve's bill of material. Refer to the bill of material for specific part numbers.

sion over the joint packing spacer and mate the bottom face of the bonnet extension with the top face of the bonnet.

5. After making sure the bonnet flange is in place, reinstall the connecting bolts, extension clamps or flanges and associated bolting. When using flanges, make sure the flange half-rings are positioned as shown in Figure 5 or 7, depending on the extension configuration. At this point, the bolting should only be just more than finger-tight.
6. Reinstall remaining packing spacer(s), new packing, and upper stem guide. Install lubricator, if required.
7. Insert plug stem through bonnet and bonnet extension, being careful not to score the stem or guides.
8. After reinstalling the two yoke half-rings on the bonnet extension and making sure the gland flange is in place, turn the actuator back onto the plug. Leave approximately two or three plug stem threads exposed.
9. Attach the yoke clamps and gland flange bolting. Tighten packing box nuts to slightly over finger-tight.

CAUTION: Do not over-tighten packing. This can cause excessive packing wear and stem friction which may impede stem movement.
10. After installing new seat and bonnet gaskets, lower the actuator/bonnet assembly squarely into the body. Be careful not to scratch or gall the plug as it enters the body.
11. Install bonnet flange bolting to finger-tightness. Apply air pressure above the piston to seat the plug

in the seat ring. Tighten each bonnet bolt about $\frac{1}{6}$ (one flat) of a turn at a time in a clockwise direction around the bonnet flange. Firmly tighten all bolts evenly and completely. Compress the bonnet gasket until the bonnet is seated metal-to-metal in the body. Proper tightness is achieved when metal-to-metal resistance can be felt with the wrench.

CAUTION: If the bolting is insufficiently tightened, the seat ring gasket will not have enough compression, resulting in leakage. Overtightening beyond the point of metal-to-metal resistance may damage interior valve parts.

12. The amount the plug stem is screwed into the actuator stem is not particularly important on air-to-close valves. It is necessary only to leave two to three threads exposed. For correct plug engagement on air-to-open valves, screw the plug stem into the actuator stem as far as possible. Apply air pressure above the piston to drive it to the bottom of the actuator cylinder. Back the plug stem out of the actuator stem until the plug just touches the seat ring. Apply air under the piston to lift the plug off the seat and back the plug stem out of the actuator stem exactly one complete turn.
13. Apply air over the piston to seat the plug. With the stem clamp adjusted to the "closed" position of the stroke indicator plate, tighten stem clamp bolting.
14. After the bonnet flange bolting has been tightened and the plug adjusted, tighten the extension clamp or flange bolting so that even pressure on the gasket and proper alignment of the bonnet and bonnet extension are maintained.

Troubleshooting Extended Bonnets

Failure	Probable Cause	Corrective Action
Leakage through clamps or flanges	<ol style="list-style-type: none"> 1. Insufficient compression of bonnet extension gasket 2. Worn or damaged bonnet extension gasket 3. Faulty clamp 4. Side loading of the bonnet extension 	<ol style="list-style-type: none"> 1. Tighten flanges or clamps until leakage stops 2. Disassemble and replace gasket 3. Replace with bolted or bolted flange extension or extended bonnet 4. Install valve with extension as vertical as possible
Leakage through packing box	<ol style="list-style-type: none"> 1. Loose packing box bolts 2. Worn or damaged packing 3. Dirty or corroded packing box 	<ol style="list-style-type: none"> 1. Tighten packing box bolts sufficiently to stop leakage 2. Disassemble and replace packing 3. Clean body bore and plug stem, replace packing
Stem motion impeded	<ol style="list-style-type: none"> 1. Overtightened packing 2. Service temperature is beyond operating parameters of trim design 3. Inadequate air supply 4. Malfunctioning positioner 	<ol style="list-style-type: none"> 1. Adjust packing box nuts to slightly more than finger-tight 2. Reconfirm service conditions and contact factory 3. Check for leaks in air supply or instrument signal system; tighten loose connections and replace leaky lines 4. Refer to positioner maintenance instructions
Excessive leakage	<ol style="list-style-type: none"> 1. Improperly tightened bonnet flange bolting 2. Worn or damaged seat ring 3. Worn or damaged seat or bonnet gasket 4. Inadequate actuator thrust 5. Incorrectly adjusted plug 6. Improper flow direction 	<ol style="list-style-type: none"> 1. Refer to Maintenance Instructions 1 for correct tightening procedure 2. Disassemble valve and replace or repair seat ring 3. Disassemble and replace gaskets 4. Check for adequate air supply to actuator; if supply is adequate, reconfirm service conditions, contact factory 5. Refer to appropriate step for plug adjustment contained earlier in this maintenance instructions 6. Make sure flow direction is always over plug; if incorrect, change to flow-over
Inadequate Flow	<ol style="list-style-type: none"> 1. Improper plug adjustment limiting stroke 2. Malfunctioning positioner 3. Service conditions exceeding trim design capacity 	<ol style="list-style-type: none"> 1. Refer to appropriate step for plug adjustment contained earlier in this maintenance instructions 2. Refer to positioner maintenance instructions 3. Verify service conditions and consult factory
Plug slams	<ol style="list-style-type: none"> 1. Incorrect plug adjustment allowing improper cushion of air between actuator piston and yoke 2. Trim sized too large for flow rate 3. Inadequate air supply 	<ol style="list-style-type: none"> 1. Refer to appropriate step for plug adjustment contained earlier in this maintenance bulletin 2. Install reduced trim 3. Check air supply to actuator; repair leaks and remove any restrictions in supply line

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