



## ATI SPLIT COUPLING VALVE STEM CONNECTION

### Scope of Supplement

This supplement is intended to assist those who are involved with the installation, operation and maintenance of ATI Linear Actuators with a Split Coupling between the actuator piston rod and the valve stem. This supplement shall be used only in conjunction with a relevant ATI Installation, Operation & Maintenance Manual (IOM) and with any other applicable manuals and supplements that apply to a Product.

### Applicable Product

This manual is intended as a guide for the Split Coupling. Failure to read and comply with installation, operation and maintenance instructions may result in bodily injury or equipment damage and will void the manufacturer's warranty.

### Company Contact

For any questions or clarification, or for details on your nearest ATI Authorized Representative, contact ATI.

Email: [Sales@ATlactuators.com](mailto:Sales@ATlactuators.com)

Web: <http://www.ATlactuators.com/>

### Reference Documents

This IOM Supplement is referenced in the following standard IOM's and may be referenced in additional documents.

- IOM 1001 ATI Pneumatic Spring-Return Extend (SRE) Actuator
- IOM 1002 ATI Pneumatic Spring-Return Retract (SRR) Actuator
- IOM 1003 ATI Pneumatic Double-Acting (DA) Actuator
- IOM 1004 ATI Hydraulic Spring-Return Extend (SRE) Actuator
- IOM 1005 ATI Hydraulic Spring-Return Retract (SRR) Actuator
- IOM 1006 ATI Hydraulic Double-Acting (DA) Actuator
- IOMS 002 JS2 Bi-directional Mechanical Override

### Safety Warnings

**THIS SUPPLEMENT IS NOT A COMPLETE INSTALLATION, OPERATION AND MAINTENANCE MANUAL (IOM). USERS MUST FOLLOW INSTRUCTIONS AND GUIDELINES OF A COMPLETE IOM TO PREVENT PERSONAL INJURY, PROPERTY DAMAGE, AND DAMAGE TO THE PRODUCT.**

**DO NOT INSTALL, OPERATE, OR MAINTAIN AN ATI PRODUCT UNLESS TRAINED AND QUALIFIED IN PRODUCT AND ACCESSORY INSTALLATION, OPERATION AND MAINTENANCE.**

### Revision Record

Rev #	Issue Date	Description	Reviewed By	Approved By
A	7/01/2015	Initial Release based on IOM1003 Rev C.	DGR/DAR	DPL
B	1/20/2017	Add Appendix B	DAR	DPL



## General Description

The Split Coupling is a 2-piece block of bolted construction that connects an actuator piston rod to a valve stem.

## Product Operation

The Split Coupling connects the threaded connection of the valve stem to the actuator piston rod. The Split Coupling is manufactured with a shim between the 2-piece block. Removal of this shim at assembly creates a clamp force on the threads of the actuator piston rod and the threads of the valve stem. This clamp force prevents the coupling from rotating, assuring a stiff and strong connection between the valve and actuator.

An anti-rotation plate is bolted to the split coupling, or the split coupling includes a slot for an anti-rotation guide, to assure that dynamic forces in the valve do not cause rotation of the stem connection. This anti-rotation feature provides additional stiffness to improve position monitoring and control of the assembly.

Split Couplings are available with an option for adjustable, external stops for one or both ends of travel. External stops are typically adjustable approximately +/- 1/2 inch up to 1 inch.

### ***Split Coupling without Stops, Valve Closed***

Refer to drawing "Figure 1, Split Block without stops" in "Appendix A – Split Coupling Installation" for item references that follow.

To connect the actuator to a valve in the closed position (piston rod extended):

1. Position the subject valve to the full close position (tight shut off).
2. Remove the handwheel and handwheel drive assembly (refer to Valve Manufacturer's Assembly/Disassembly Instructions).
3. Position the Actuator in the full close (fully extended) position. If necessary, supply pressure to the close port (upper head).
4. Loosen or remove the Cap Screws that fix the Actuator to the Adaptation Bracket and install two (2) or more 1/4" shims equally spaced between the Actuator Lower Head and the Adaptation Bracket. Tighten the Cap Screws so that actuator is snug against the adaption bracket.
5. Remove the Coupling Block (Item 1) by removing (Item 2) nuts or cap screws.
6. Install the Adaptation Bracket onto the valve. The hardware may vary depending on the application and type of valve being actuated.
7. Install the Coupling Block (Item 1) on to the valve stem and Actuator piston rod (split coupling block) using cap screws (Item 2).
8. Install and tighten the fasteners to the valve body (Items 3 & 4). Fastener types and mounting positions may vary depending on your application.
9. Loosen Cap Screws connecting the Actuator Lower Head and Bracket and remove the shims installed in step 4. Tighten Cap Screws; this will create a ~1/4" gap between actuator piston and its lower head, which will ensure that valve stops on its seat when actuator is fully extended.
10. Cycle Actuator fully open and fully closed. Ensure full stroke and smooth operation.

### ***Split Coupling without Stops, Valve Open***

Refer to drawing "Figure 2, Split Block with Anti-Rotation Plate" in "Appendix A – Split Coupling Installation" for item references that follow.

For many rising-stem valves, for actuator designs without adjustable mechanical stops, the actuator can be installed so that the upper head of the power cylinder acts as an internal stop for the actuator piston, protecting the valve stem from an overload condition with the actuator retracted at maximum supply pressure.



This procedure is useful for most gate and globe valves. The upper head of the actuator acts as an internal up stop for the piston, protecting the valve stem from an overload condition without the need to adjust stops.

To connect the actuator to a valve in the open position (piston rod retracted):

1. Position the subject valve to the full open position (tight shut off).
2. Remove the hand wheel and hand wheel drive assembly (refer to Valve Manufacturer's Assembly/Disassembly Instructions).
3. Position the Actuator in the full open (fully retracted) position. Install a block valve on the open port (lower head), supply pressure then close the block valve to trap air in the cylinder, which will hold the actuator in a full retract position.
4. Remove the coupling block (Item 1) by removing fasteners (Items 2 & 3).
5. Install the actuator onto the valve. The hardware may vary depending on the application and type of valve being actuated.
6. Install the coupling block (Item 1) on to the valve stem and actuator piston rod. Unless otherwise approved by engineering, the coupling block should engage a length of thread that is 1X thread diameter up to 1.5X thread diameter (e.g.  $\text{\O}3/4''$  stem should engage at least  $.75''$  of thread). Install anti-rotation plate (Item 4) thru slot in adaptation bracket and secure it to coupling block (Item 1) using fasteners (Item 2 & 3).
7. Cycle actuator fully opened and fully closed. Check for full stroke and smooth operation.

### ***Coupling with Stops***

Variations of the Split Coupling with External, Adjustable Stops are included in *Figures 3 & 4* of "Appendix A – Split Coupling Installation."

### ***Split Coupling with JS2 mechanical override***

Refer to drawing *Figure 5* in "Appendix A – Split Coupling Installation" for the stem coupling instructions for the optional JS2 mechanical override.

Refer to IOMS002 for additional details on the optional JS2 mechanism.



### APPENDIX A – SPLIT COUPLING INSTALLATION

Figure 1, Split Block without stops (adapted from Drawing 3239)

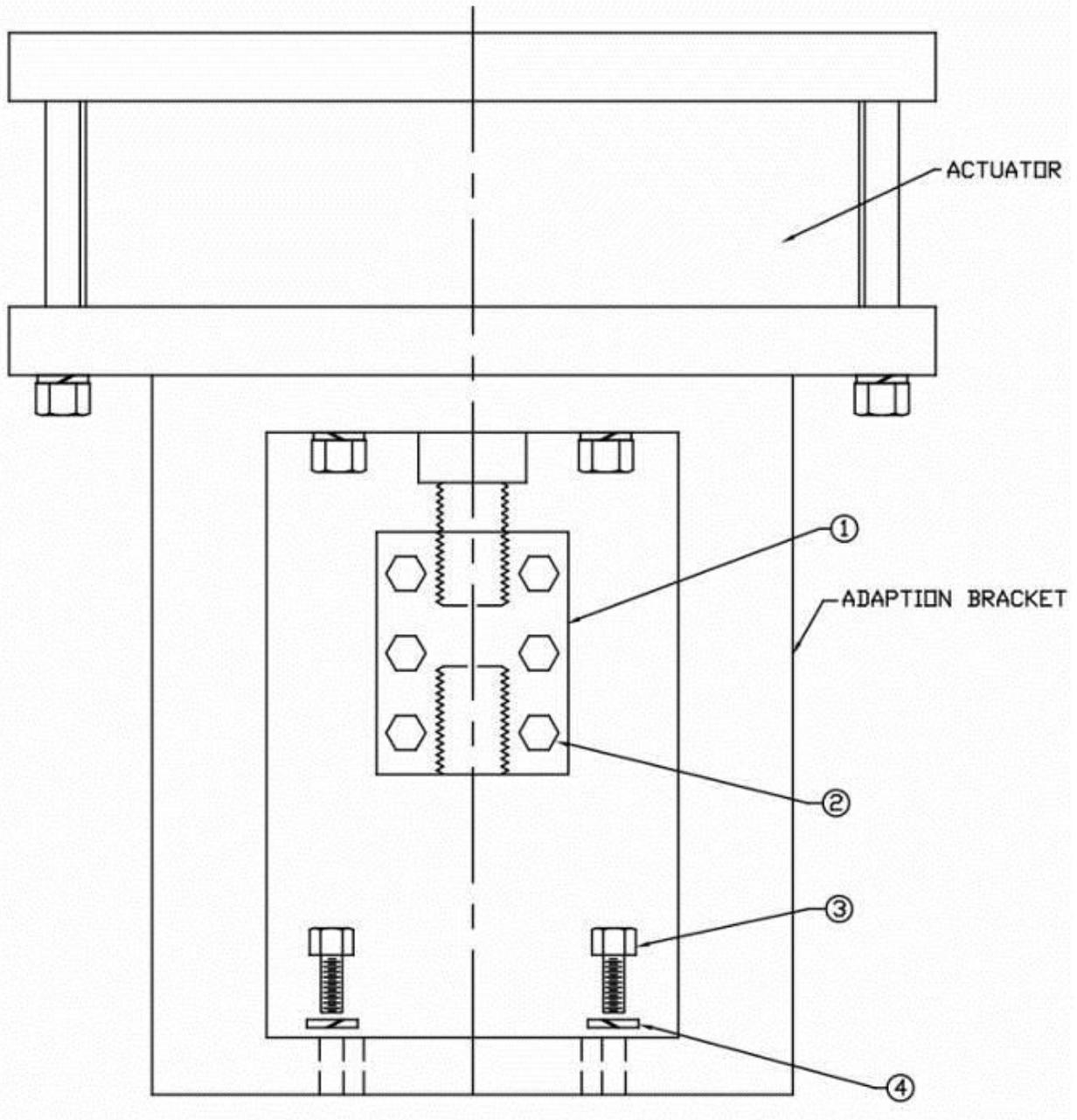


Figure 2, Split Block with Anti-Rotation Plate (adapted from Drawing 16720)

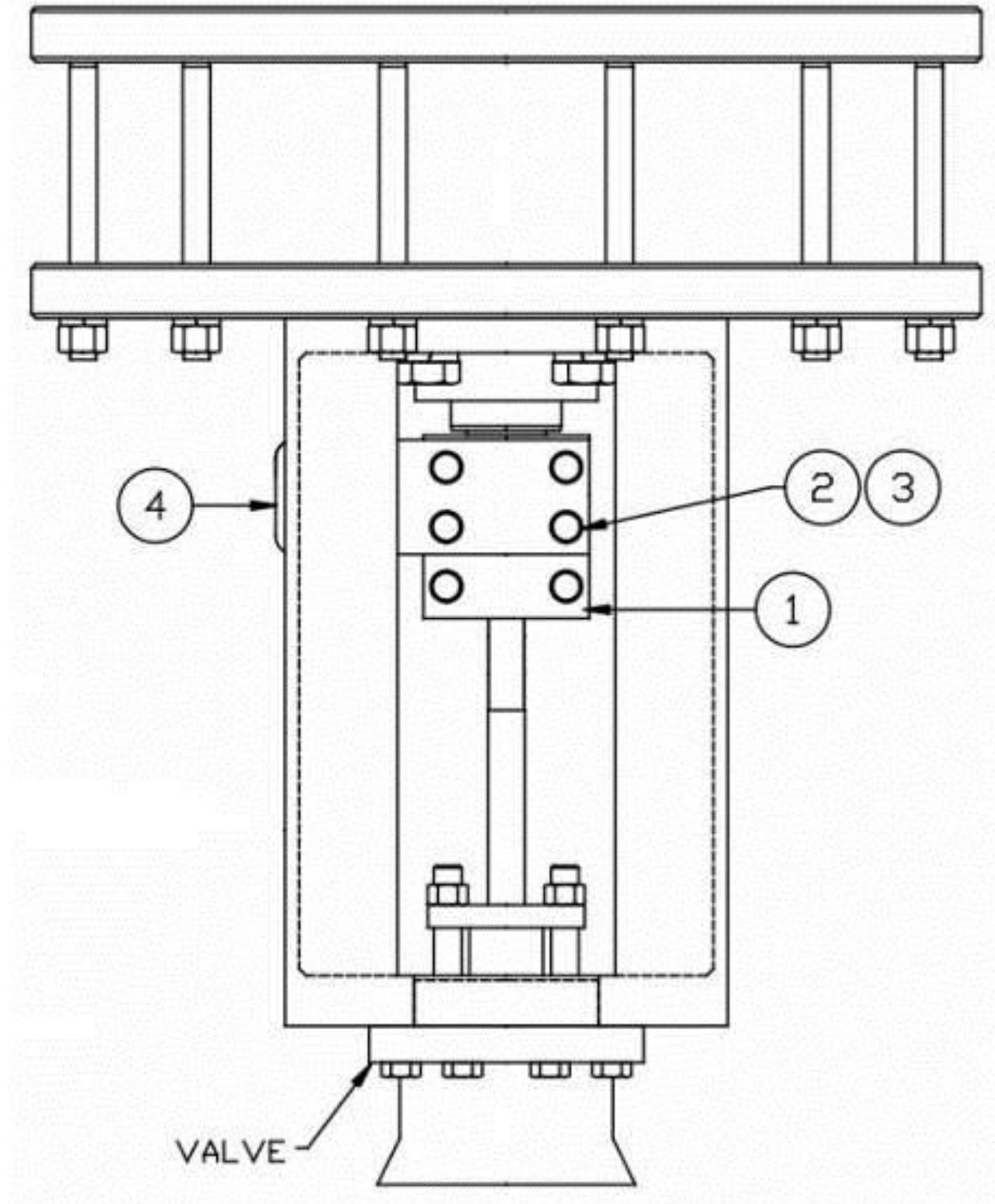
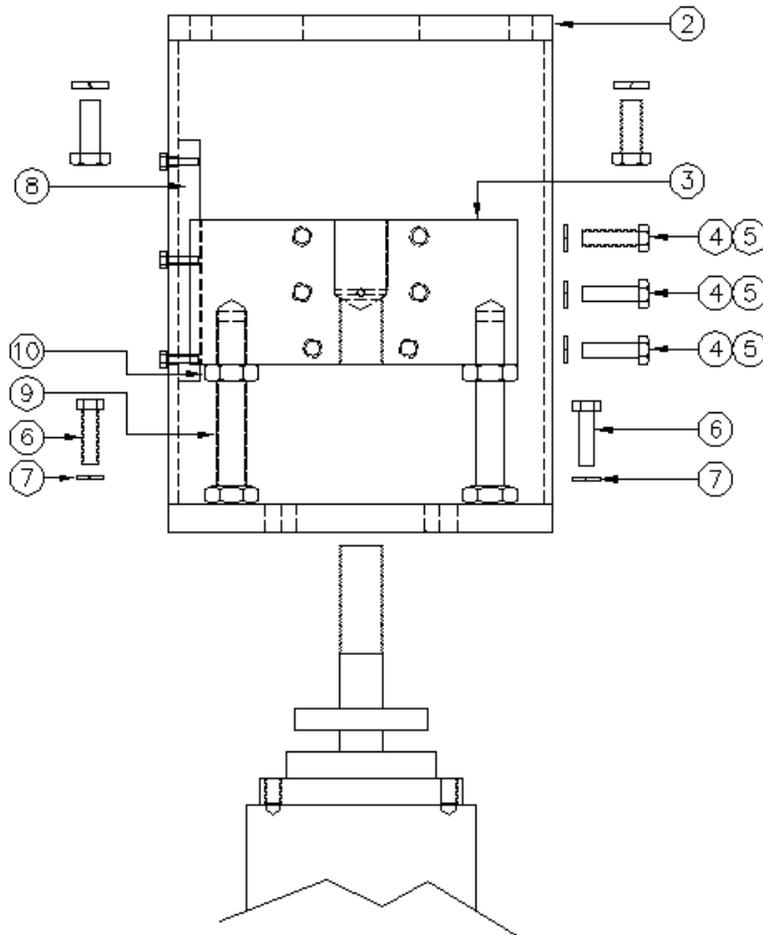


Figure 3, Split Block with down stops (adapted from Drawing 8168)



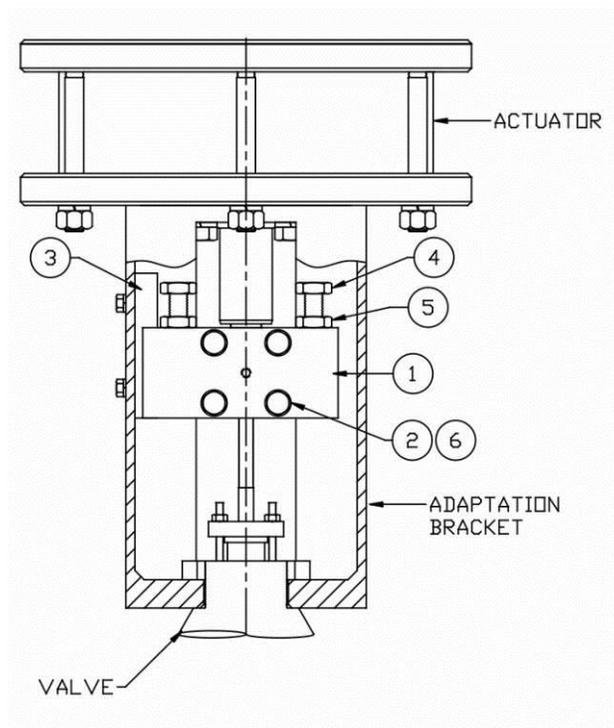
To connect a split coupling with stops to the actuator and to a valve in the closed position (piston rod extended):

1. Position the subject valve to the full closed position (TIGHT SHUT OFF).
2. Remove the valve hand wheel and hand wheel drive assembly (refer to Valve Manufacturer's Assembly/Disassembly Instructions).
3. Position the Actuator in the full close (fully extended) position. If necessary, supply pressure to the close port (upper head).
4. If applicable, remove the position indicator from the split coupling block (item 3) along with the position indicator guide, screws and lock washers from split coupling
5. Remove split coupling block (item 3) by removing fasteners (items 4 & 5).
6. Position the actuator adaptation on the valve as per application. Attach with the appropriate fasteners (items 6 & 7).
7. Install the coupling block (Item 3) on to the valve stem and actuator piston rod. Unless otherwise approved by engineering, the coupling block should engage a length of thread that is at 1X thread diameter up to 1.5X thread diameter (e.g.  $\text{\O}3/4''$  stem should engage at least .75" of thread). If actuator includes split block guide (item 8), then the coupling block groove must be clamped over this guide.
8. Reinstall fasteners on split coupling (items 4 & 5). Tighten to the recommended torque specs.
9. As applicable, reinstall position indicator components removed in step 4.



10. Cycle the actuator to check for full open and full close. Identify if stop adjustments are necessary.
11. Stop adjustments are made by repositioning the stop adjustment bolts (item 9) in split coupling block (item 3). Loosen jam nut (item 10), then reposition the stop adjusting bolts (item 9), then cycle actuator for full open and full close. Retighten jam nut (item 10) to split coupling block (item 3).

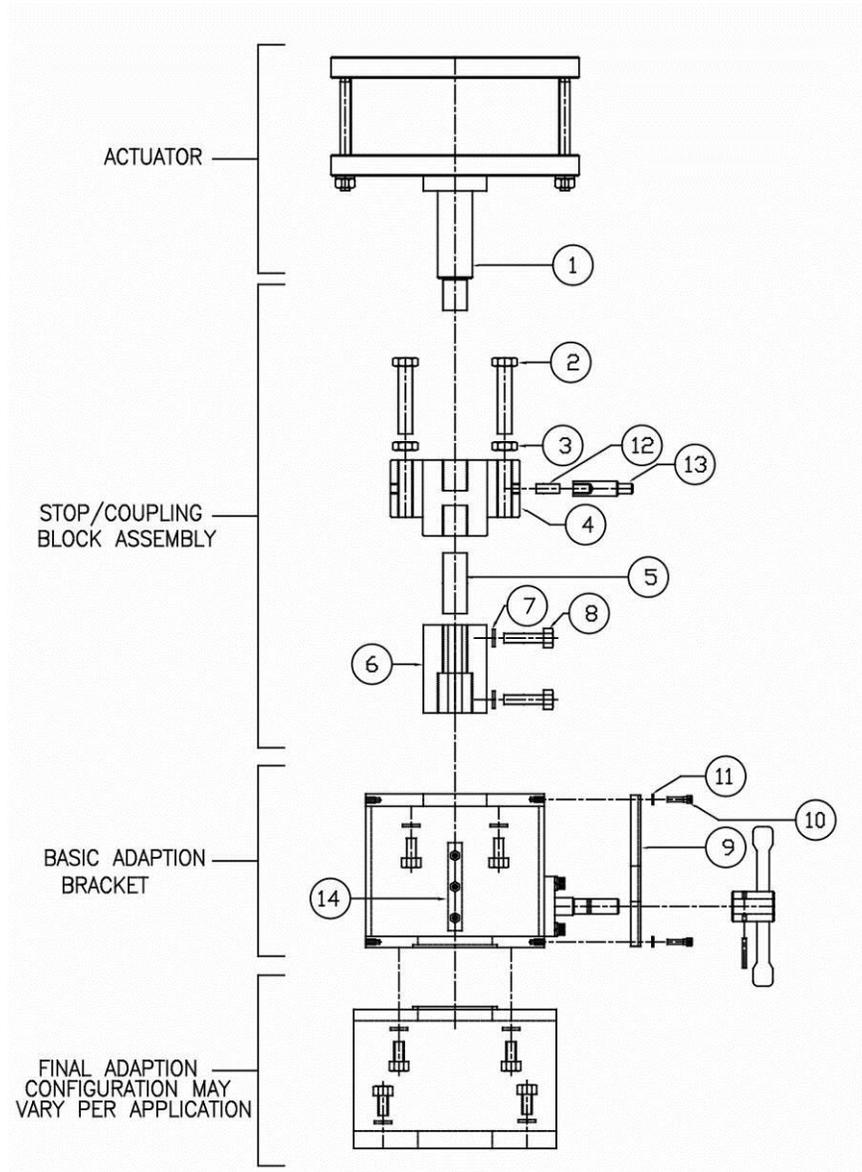
*Figure 4, Split Block with up stops (adapted from Drawing 6828)*



To connect a split coupling with stops to the actuator and to a valve in the closed position (piston rod extended):

1. Position the subject valve to the full close position (tight shut off).
2. Remove the hand wheel and hand wheel drive assembly. (See Valve Assembly/Disassembly Instructions).
3. Position the Actuator in the full close (fully extended) position. If necessary, supply pressure to the close port (upper head).
4. Remove the split coupling block (Item 1) by removing fasteners (Items 2 & 6).
5. Install the actuator onto the valve, leaving a 1/8" gap between the adaptation bracket and valve. The hardware may vary depending on the application and type of valve being actuated.
6. Install the coupling block (Item 1) on to the valve stem and actuator piston rod. Unless otherwise approved by engineering, the coupling block should engage a length of thread that is at 1X thread diameter up to 1.5X thread diameter (e.g.  $\text{Ø}3/4$ " stem should engage at least .75" of thread). If actuator includes split block guide (item 3), then the coupling block groove must be clamped over this guide.
7. Install and tighten the fasteners required for holding the valve to the actuator. Fastener types and mounting positions may vary depending on your application. Tighten fasteners to torque specifications on torque chart provided.
8. Cycle Actuator fully opened and fully closed and check for full stroke and smooth operation.
9. Adjust stop bolts (Item 4) for valve stroke and tighten jam nuts (Item 5) down on coupling block (Item 1) to torque specifications on torque chart.

*Figure 5, Split Block with up stops, JS2 Manual Override (adapted from Drawing 6897)*



To connect a split coupling with stops to the actuator and to a valve in the closed position (piston rod extended):

1. Position the subject valve to the full closed position (tight shut off).
2. Remove the valve hand wheel and hand wheel drive assembly (refer to Valve Manufacturer's Assembly/Disassembly Instructions).
3. Position the Actuator in the full close (fully extended) position. If necessary, supply pressure to the close port (upper head).
4. Remove the final adaptation assembly (This assembly configuration varies per application) from the bottom of the basic adaptation bracket.
5. Install final adaptation on subject valve.
6. If applicable, remove the position indicator from the split coupling block (item 3) along with the position indicator guide, screws and lock washers from split coupling



7. Remove the position indicator guide (Item 9) screws (Item 10) and lock washers (Item 11) if items exist on actuator.
8. Remove the position indicator (Item 12) and stud (item 13).
9. Remove split coupling block (item 6) by taking out bolts (item 8) and lock washers (item 7).
10. Position the actuator and the basic adaptation to the final adaptation or the valve as per application. Set actuator on valve leaving 1/8 to 1/4" gap between the final bracket and the valve. (This is done so that the valve will seat before the piston bottoms out in the actuator. Attach with the appropriate fasteners to the recommended torque specs.
11. Install split coupling block (item 6) clamping on valve stem and all thread stud (item 5). Coupling block must also be clamped on split coupling block guide (item 14).
12. Reinstall the position indicator (Item 12) and stud (Item 13) if they apply in your application.
13. Reinstall the position indicator guide (Item 9) screws (Item 10) and lock washers (Items 11) per application.
14. Attach valve to the actuator with the appropriate fasteners. Tighten fasteners to the recommended torque specs. Cycle the actuator and check for full open and full close. Adjustment may be necessary.
15. Adjustment may be made by repositioning the stop adjustment bolts (Item 2). In engage/disengage block (item 4) tighten jam nuts (item 3) on stop adjusting bolts when you have them set correct per valve stroke.



## APPENDIX B – MOUNTING ACTUATORS TO WEDGE GATE VALVES

These guidelines require that stops be included in the split coupling. Contact ATI for replacement coupling if required.

The guidelines below are to ensure the valve, and not the actuator, is stopping the travel in the closed direction.

### **Double Acting (DA)**

1. Set the regulated pressure to 50% of the customer pressure.
2. Retract close stops until they do not touch.
3. Stroke the valve to the closed position and let the pressure build to the 50% point.
4. Adjust the close stops finger tight against the bracket.
5. Stroke to full open position.
6. Adjust stops finger tight against bracket.
7. Extend actuator and turn open stops out two turns.
8. Adjust pressure regulator to customer pressure and stroke test the actuator.

### **Spring Return Extend (SRE)**

1. Set regulator pressure to customer supply pressure.
2. Retract open stops until they do not touch.
3. Stroke valve open.
4. Adjust open stops finger tight.
5. Retract lower stops until they do not touch.
6. Vent air and allow spring to fully close valve.
7. Turn open stops out two turns.
8. Adjust the close stops finger tight against the bracket.
9. Stroke test the actuator.

### **Spring Return Retract (SRR)**

1. Set regulator pressure to customer supply pressure.
2. Retract close stops until they do not touch.
3. Stroke the actuator to the close position and let pressure build.
4. Adjust close stops finger tight.
5. Retract upper stops until they do not touch.
6. Vent actuator allowing it to stroke full open.
7. Adjust open stops finger tight.
8. Stroke actuator closed and extend the upper stops two turns.
9. Stroke test the actuator.