

# KHP Series Regulators Maintenance Instructions

Swagelok®

## Kit Contents



Seat retainer



Seat



Poppet



Poppet spring



Poppet damper



Body seal



Piston seal backup ring



Piston seal



Self-vent seat



Self-vent seat retainer



Inlet Filter



Lubricant  
MS-LT-WL8

Note: Kits for regulators with a self-vent contain a self-vent poppet and self-vent poppet spring.



Self-vent poppet



Self-vent poppet spring

## Symbols



Discard



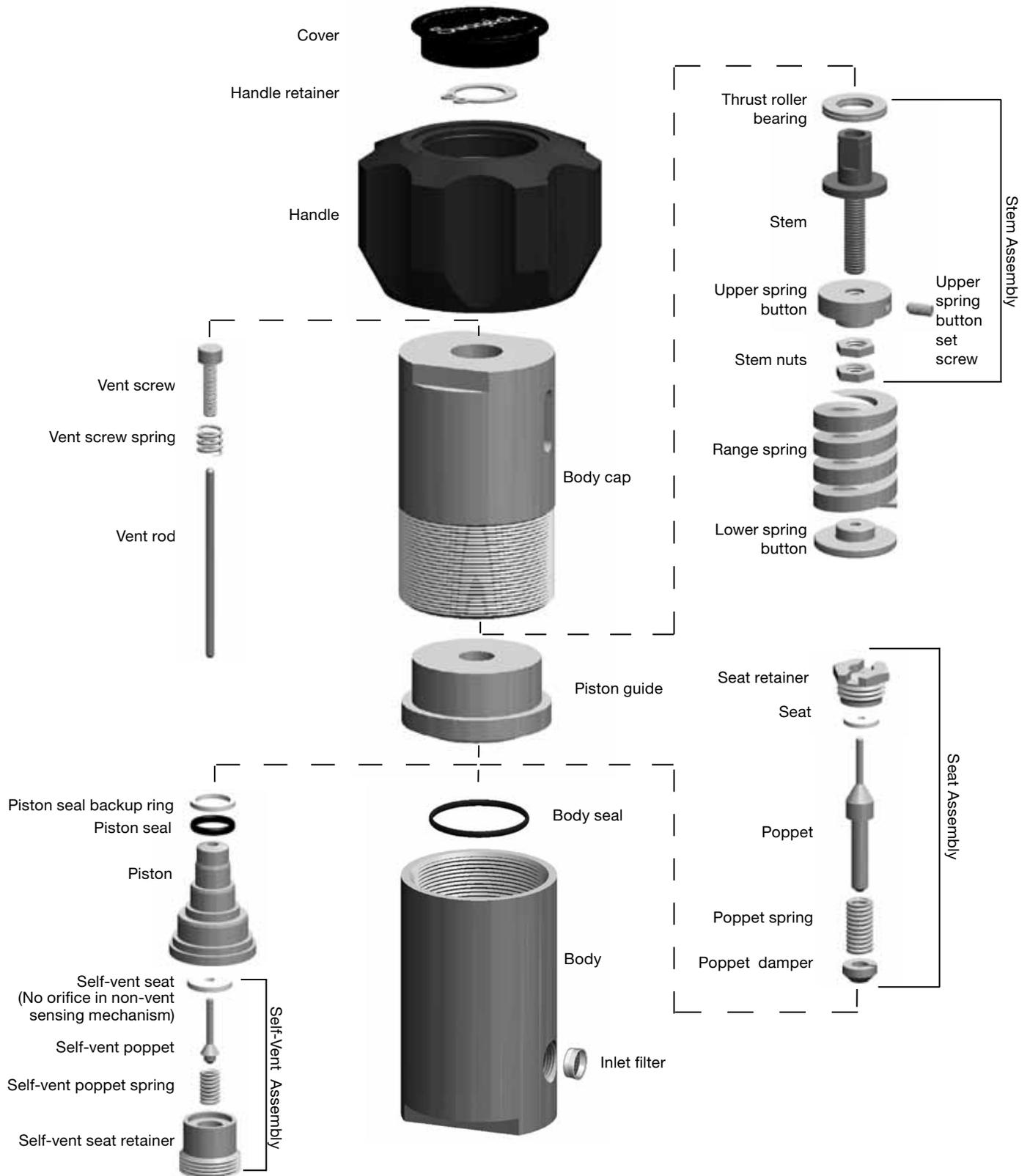
Lightly lubricate

## Tools Required

Tool	Size	Component
Vise 	-	Body
Socket 	5/8 in. or 16 mm	Seat retainer
Crow's foot 	3/4 in. or 19 mm	Vent assembly retainer nut
	1 5/8 in. or 41 mm	Body cap
Open-ended wrench 	3/4 in. or 19 mm	Vent assembly retainer nut
	1 5/8 in. or 41 mm	Body cap
Torque wrench 	Capable of 129 ft·lb (175 N·m, 17.8 m·kg)	Seat retainer, Body cap
Hex key 	1/8 in. or 3 mm	Vent screw
Needle-nose pliers 	-	Knob handle retainer
<b>Swagelok Tools Available</b>		
Vent retainer tool 	-	Poppet retainer
Piston assembly bar 	-	Piston
Filter insertion tool 	-	Inlet filter
Filter pick tool 	-	Inlet filter

NOTE: See *Pressure Regulators*, MS-02-230, for tool ordering information.

# Exploded View



Note: Regulators with no self-vent option do not contain a vent screw, vent screw spring, vent rod, self-vent poppet, and self-vent poppet spring.

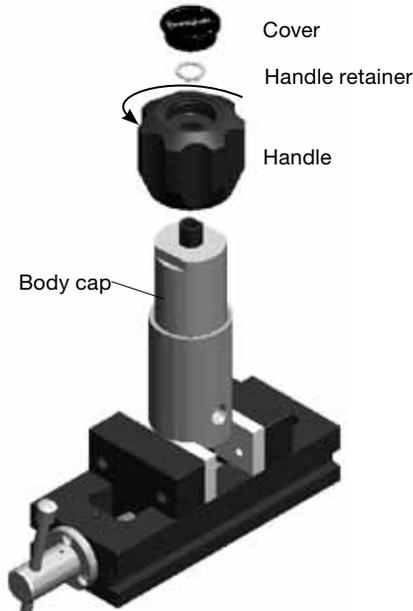
## ⚠ WARNING

Before removing a regulator from the system for service, you must

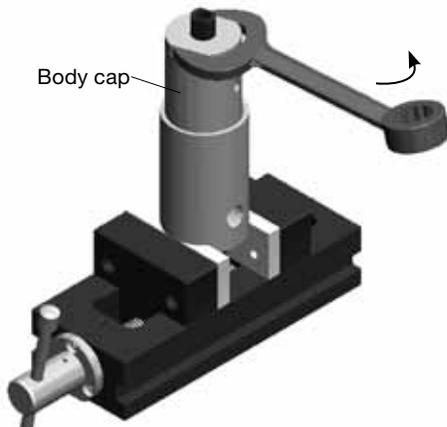
- depressurize system
- purge the system to remove any residual system media left in the regulator.

## Disassembly

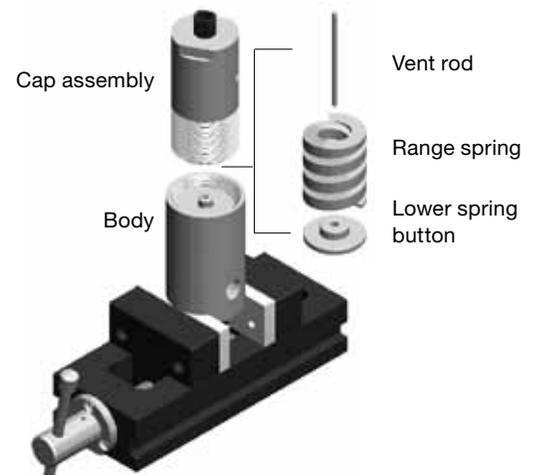
1. Place the regulator in a vise.
2. Turn the **handle** counterclockwise until it stops. Remove the **cover**, **handle retainer** and the **handle** from the **body cap**.  
Note: Use needle-nose pliers to remove the handle retainer.



3. Loosen the **body cap**.



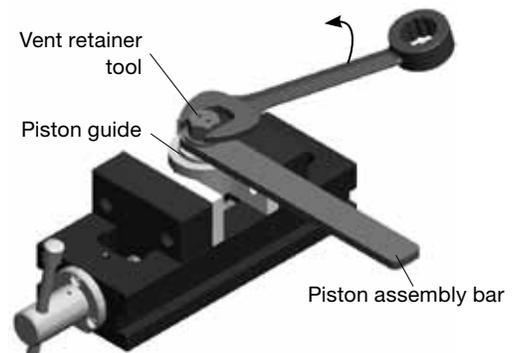
4. Remove the **body cap** from the **body**.  
Note: The **vent rod**, **range spring**, and **lower spring button** (self-vent only) may fall from the body cap. Set aside for later use.



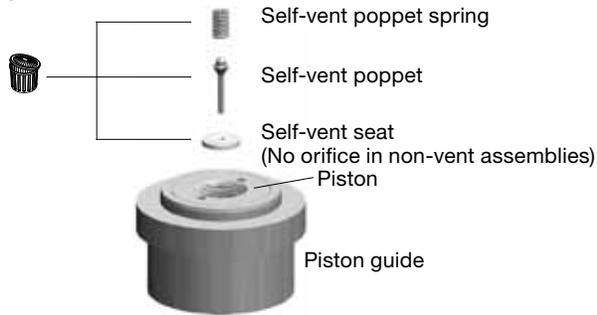
5. Remove the **piston guide** from the **body** by pinching the **piston** top with your fingers and gently rocking it.



6. Lightly grip the **piston guide** in the vise and loosen the self-vent seat retainer from the piston guide using the **piston assembly bar** and **vent retainer tool**. The piston assembly bar must be held still.



7. For regulators with a self vent, remove the **self-vent poppet spring** and the **self-vent poppet**. For all regulators, remove the **self-vent seat** from the **piston guide**.



8. Push the **piston** out of the **piston guide**.



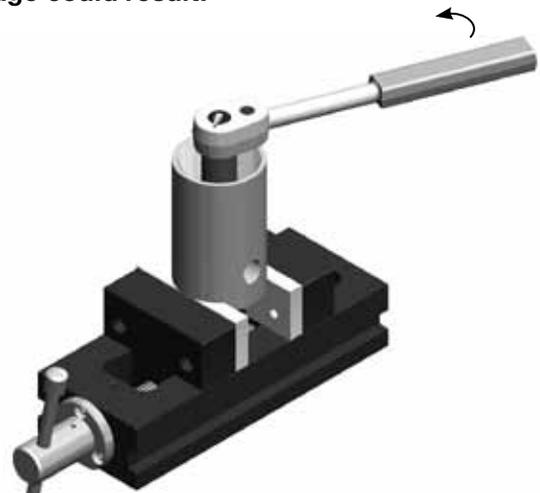
9. Remove the **piston seal** and the **backup ring** from the **piston guide**, and the **body seal** from the **body**.



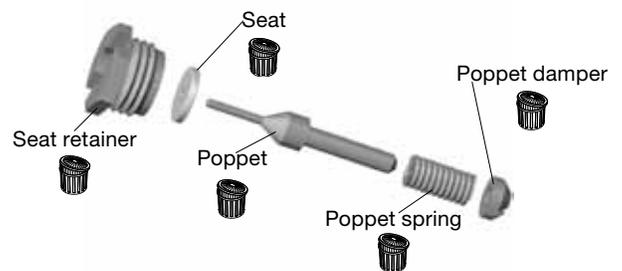
10. Loosen the **seat assembly**.

**NOTICE**

**Be careful not to scratch the inside of the body. Leakage could result.**



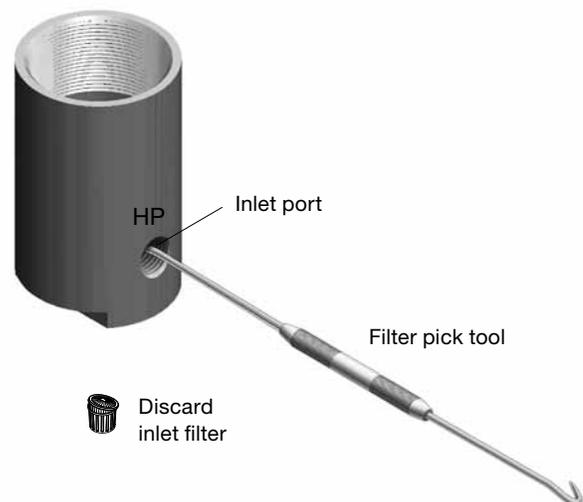
11. Invert the body and remove the **seat retainer**. Then remove the **poppet damper**, the **poppet spring**, **poppet** and the **seat** from the **seat retainer**.



12. Remove the **inlet filter** from the **inlet port (marked 'HP')** using the **filter pick tool**.

**NOTICE**

**Be careful not to scratch the sides of the inlet port. Leakage could result.**

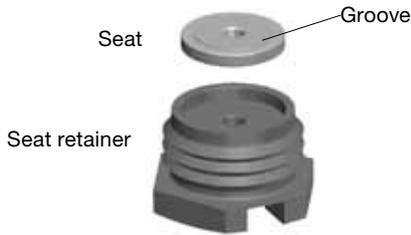


## Reassembly

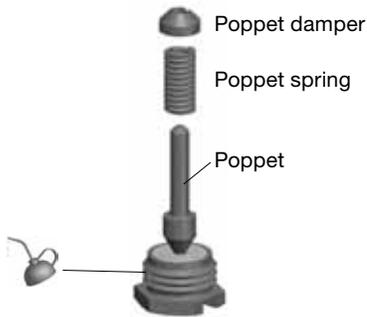
### NOTICE

Ensure all parts and tools are free of debris or damage.

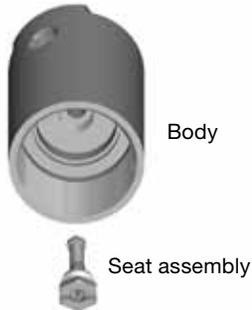
13. Insert the **seat** into the **seat retainer** with the groove away from the seat retainer.



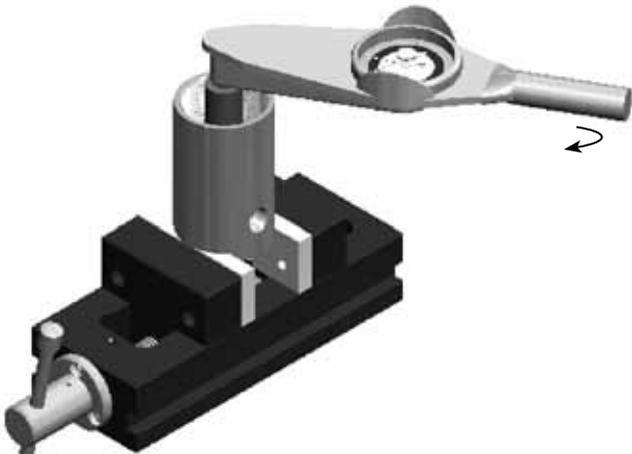
14. Place the **poppet** through the **seat**. Place the **poppet spring** and the **poppet damper** onto the exposed end of the **poppet**.



15. Invert the **body** and **seat assembly** and thread the seat assembly into the body.



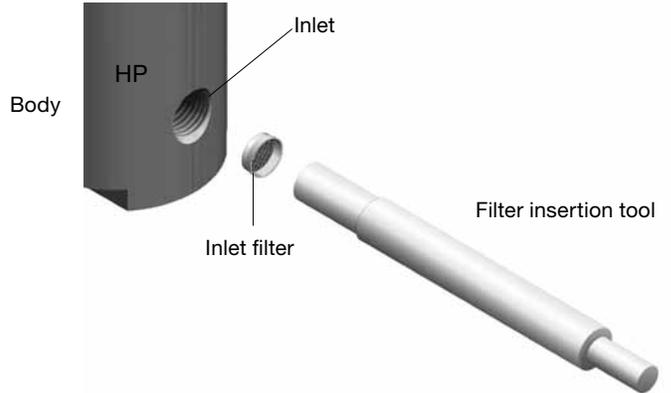
16. Tighten the **seat assembly** to:  
for non-metallic seat: 13 ft·lb (17.5 N·m, 1.8 m·kg)  
for metallic seat: 26 ft·lb (35.0 N·m, 3.7 m·kg)



17. Insert the **inlet filter** into the inlet port (marked 'HP') using the **filter insertion tool**.

### NOTICE

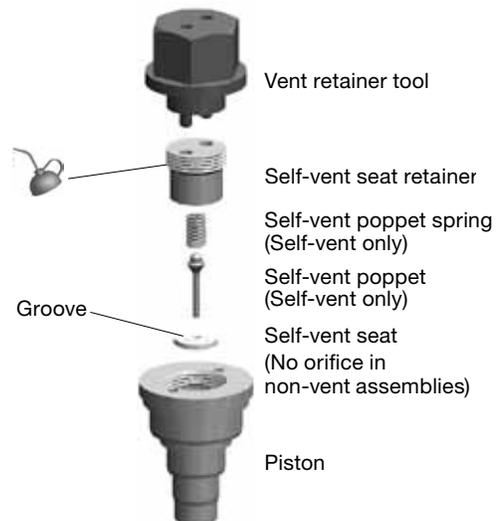
Do not insert the inlet filter with a sharp tool. Damage to the filter could result.



18. Insert **backup ring** followed by the **piston seal** into the **piston guide**. Insert the **body seal** into the **body**.



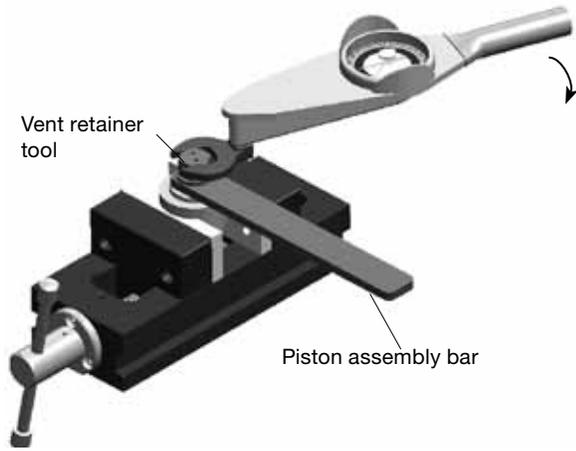
19. Invert the **piston** and insert the **self-vent seat** with groove facing away from the piston. Insert the **self-vent poppet** and the **self-vent poppet spring** into the piston. Finger-tighten the **self-vent seat retainer** into the piston using the **vent retainer tool**.



20. Insert the piston into the piston guide. Lightly grip the piston guide in the vise and tighten the self-vent seat retainer to 7 ft-lb (10 N·m) using the **piston assembly bar** and **vent retainer tool**.

**NOTICE**

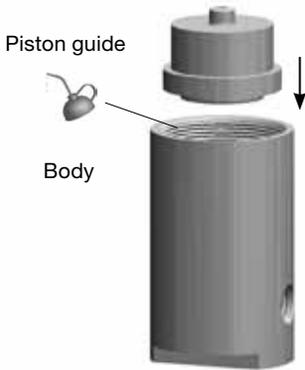
**Do not force the piston into the piston guide. Damage to the seals could result.**



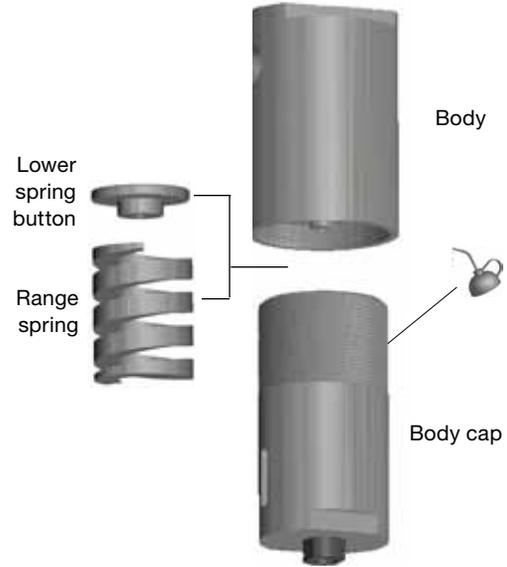
21. Insert the **piston guide** into the **body**. Lightly press down on the piston guide until it is fully seated

**NOTICE**

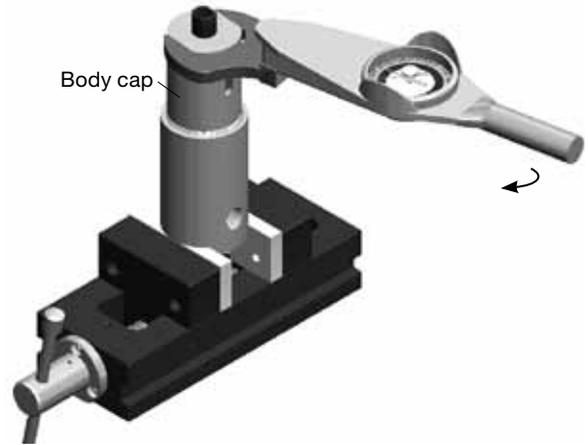
**Ensure the piston seal is lubricated and do not pinch the piston seal when inserting it into the body. Damage could result.**



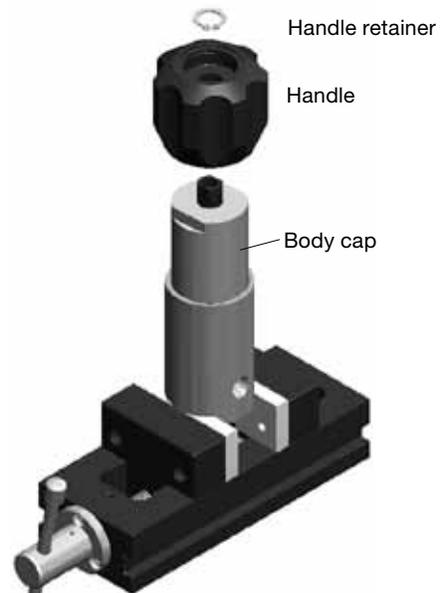
22. Place the **range spring** and the **lower spring button** into the **body cap**. Thread the body cap finger-tight into the **body** in the inverted position.



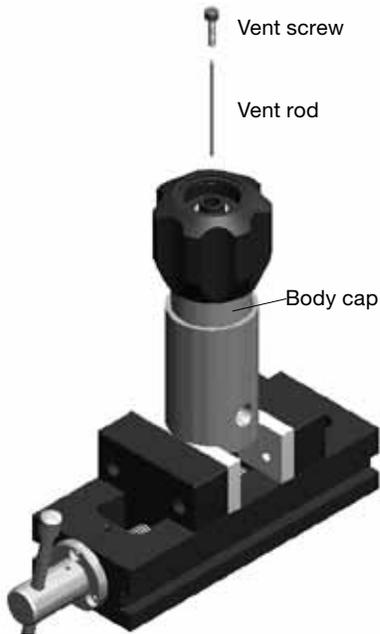
23. Tighten the **body cap** to 129 ft-lb (175 N·m, 17.9 m·kg).



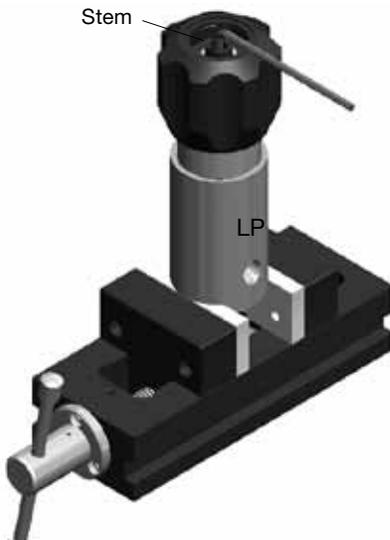
24. Place the **handle** and the **handle retainer** on the **body cap**.



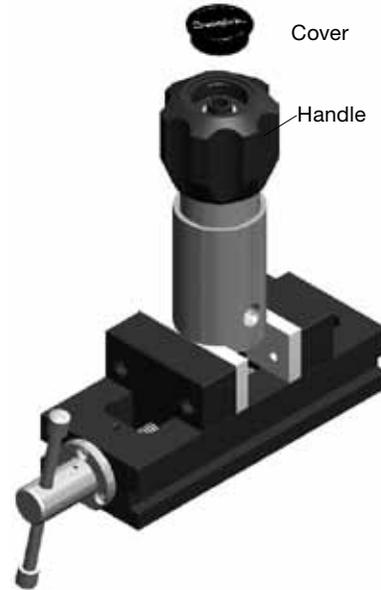
25. For regulators with a self-vent only, loosen the **vent screw** and insert the **vent rod**. Thread the vent screw into the cap assembly.



26. Test the regulator for proper operation.  
Note: For non-vent assemblies replace cover according to Step 28.
27. For regulators with a self-vent only, apply 50 to 100 psig (3.4 to 6.8 bar) to the LP port, tighten the vent screw until leakage is heard, and then loosen by one-half turn.



28. Place the **cover** on the **handle**.



For additional information, see [www.swagelok.com](http://www.swagelok.com).