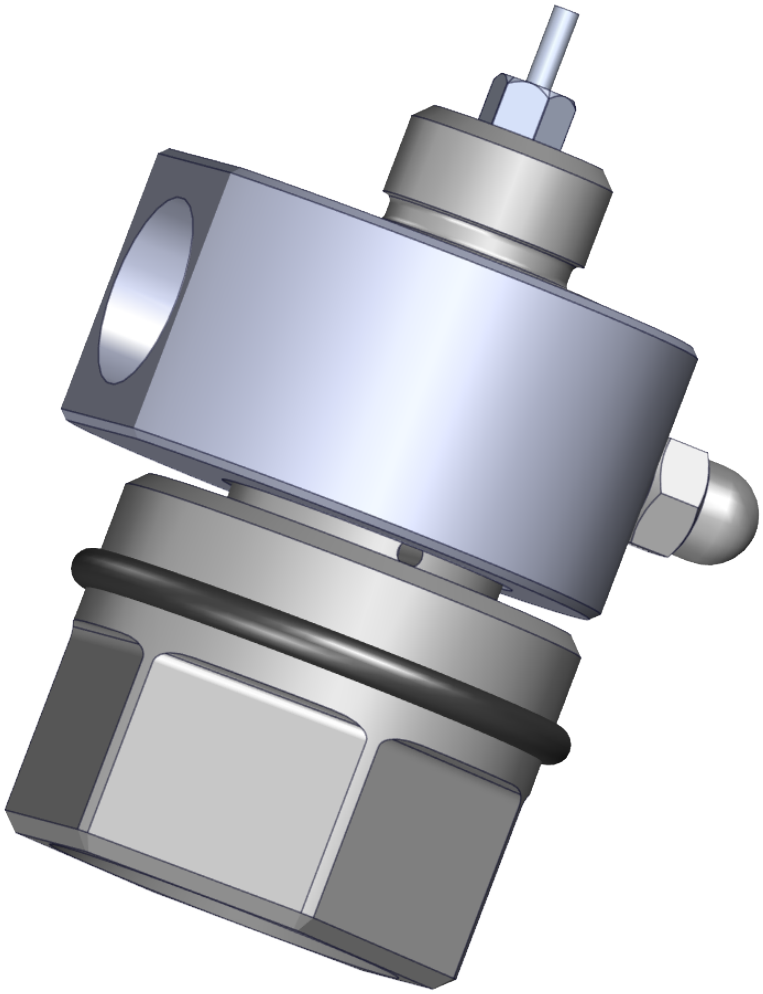
Dual On/off Valve

Rebuild Guide



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400475C-EN

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Original Instructions in English
October 2020

Contents

SAFETY

This section contains important safety information for the equipment. Careful observance of the safety information will help prevent physical injury, damage to the equipment, and extend the equipment life.

Equipment Labels

The following safety labels may appear on the equipment. If ignored, physical injury, death, or equipment damage may occur. Read the safety information in the equipment operation guides before installing, operating, or maintaining the equipment.

WARNING Electrical Shock Hazard

This symbol indicates the presence of life-threatening voltages. Never access areas labeled as such without first taking appropriate safety precautions: locking out power, verifying no voltage is present on circuits prior to maintenance activities, etc.

WARNING Flying Debris/Loud Noise

Eye and ear protection are required during operation. Removing the abrasive feed tube from the nozzle while under pressure will blow abrasive particles into the air, getting into eyes, and could contaminate tools and machines.

No Open Flame

Do not allow smoking near the machine. Do not operate the equipment in an explosive atmosphere. Take care that no ignition source (such as open flame or electrostatic discharge) is nearby the equipment. Do not store flammable materials near the equipment. Do not use equipment in or around flammable gases or liquids. Do not allow explosive or flammable vapors to accumulate in the area of the equipment. Proper ventilation in your work area will assist in dissipating the accumulation of gas, vapor, and fumes. Be especially careful when cutting materials that create sparks, such as titanium—these can ignite gases in the tank.

Lock Out Power

Never do maintenance on the equipment with the main AC disconnect ON, unlocked, or with the pump in operation. Always follow standard lockout/tagout procedures.

Wear Eye Protection

Always wear approved safety glasses whenever cutting. Regular glasses do not provide sufficient eye protection! The garnet abrasive is not a chemical irritant, but if not quickly washed out, it can injure an eye just as any sand would. In addition, tank water could contain particles from the material or chemical irritants. Have an eyewash station located near the work area in the event abrasive spray splashes into your eyes.

Read the product labels and refer to product Safety Data Sheets (SDS) to identify properties and hazards of chemical products and materials referenced in this document. Handle in accordance with good industrial hygiene and safety practice. Use personal protective equipment as specified in the SDS.

Wear Gloves
Bacteria in the tank water can build up. A minor break in the skin can introduce harmful bacteria into a wound. Always wear protective gloves if you have cuts or open wounds on your hands. When setting up material for cutting, wear gloves that provide protection against sharp metal edges.

Read the product labels and refer to product Safety Data Sheets (SDS) to identify properties and hazards of chemical products and materials referenced in this document. Handle in accordance with good industrial hygiene and safety practice. Use personal protective equipment as specified in the SDS.

Read Manual
Read the equipment operator's guide for specific operator instructions and additional safety requirements. Do not attempt to operate this machine until you have read and understand all safety precautions and operating instructions.

Electrostatic Discharge
Attention! Observe precautions for handling electrostatic sensitive devices.

Safety Legend

The following safety signal word panels and paragraph notifications may appear throughout this and other documentation. Each provides safety issue identification and recommended actions to avoid the hazard. Be alert! Follow the recommended safety actions and precautions to prevent injury or damage to the equipment.

⚠WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

Used to address practices not related to physical injury—property damage only.

NOTE

Used to provide supplementary information, emphasize a point or give a tip for easier operation.

REQUIRED TOOLS

These tools are needed to maintain the equipment.

NOTE

Additional tools may be needed to operate or maintain equipment are not addressed in this guide. See the applicable equipment guides.

Customer Tools

These tools are not provided by OMAX or included with the equipment.

Icon	Tool	Size(s)
	Open-end wrench	1/4 in., 13/16 in., 1 in., 1-1/4 in., 1-1/2 in.
	Needle-nose pliers	
	Pick tool (non-metal or softer metal, such as brass, copper, or aluminum)	
	Shop rags	
	Torque wrench	60–65 ft-lbs (81–88 N·m) 25 in-lb (3 N·m)
	Crowfoot	1/4 in., 13/16 in.

OMAX Tools

These tools are provided by OMAX and are included with the equipment.

Icon	Tool	Size(s)
	Lubriplate® P/N 201304	
	Blue Goop® P/N 100271	

REFERENCES

Documents

These documents and diagrams are associated with these instructions and can be found in the Customer Dashboard at https://support.omax.com.

Part Number	Title
400535	ADO Rebuild Kit Instructions
400715	MAXJET 5i Installation and Maintenance
400927	Exploded Pictorial Diagram Integrated On-Off Valve, MAXIEM Gen 2
401044	High Pressure Fittings, .375in Tubing
401060	Installation and Maintenance OMAX Air Actuator
401082	Maintenance, Perform Post-Maintenance Flush
401120	Exploded Pictorial, Integrated On-Off Valve, PTO, Fixed Cutting Head

Videos

Videos associated with these instructions are located at https://elearning.omax.com.

OMAX

- Preparing for Maintenance
- Adjustable Dump Orifice (ADO) and Dump On/off Valve Rebuild
- Air Actuator Installation and Maintenance
- Post Maintenance Flush

MAXIEM

- Preparing for Maintenance
- Adjustable Dump Orifice (ADO) and Dump On/off Valve Rebuild
- Air Actuator Installation and Maintenance
- Post Maintenance Flush

SCOPE

This guide contains the instructions to rebuild the dual on/off valve.

OVERVIEW

The on/off valves, located in the nozzle and in the pump ADO assembly, control water flow through the cutting nozzle and the pump. The on and off cycles wear out the internal components of the on/off valve. Rebuild the on/off valve when it fails to operate properly or when there is evidence of leaks.

When rebuilding the on/off valve, use all items included in the Dual On/Off Valve Repair Kit (P/N 301927), including the seat, seal, and stem assemblies. Do not reuse undamaged components. Using new components extends the operating life of the rebuilt on/off valve.

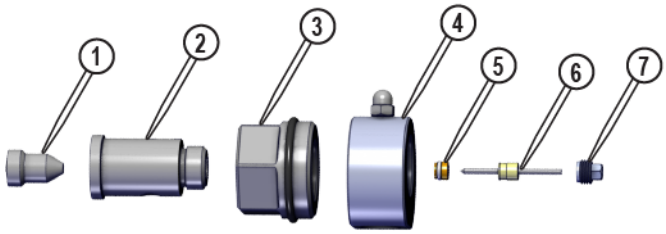


Figure 1

[1] Integrated seat [3] Gland nut [5] Seal assembly [7] Retaining screw
[2] Integrated body [4] Fitting ring [6] Stem assembly

PREPARATION

⚠CAUTION

Before performing service on the equipment, turn OFF the air supply to the system and bleed the entire pneumatic system to make sure it is exhausted of air pressure, including any accessories. Failure to release the pressure may result in injury.

NOTE

A clean work environment is very important. Always work on a clean surface and thoroughly clean parts before assembly or installation. Dust, dirt, abrasive particles, and other contaminants can reduce the performance and operating life of the equipment.

See the OMAX Preparing for Maintenance video or MAXIEM Preparing for Maintenance video, located at https://elearning.omax.com.

1. Thoroughly wipe the area clean to ensure it is free of garnet and other debris.
2. Turn **OFF** the power at the **pump** and **table**.
3. Turn **OFF** the primary power breaker and put a lockout tag on the power breaker to alert others that maintenance is in progress.
4. Close the air and water supply valves.

⚠WARNING

Make sure the pump power if OFF before removing the air line. When the air line controlling the on/off valve is removed, the nozzle becomes active.

5. Remove the **air line** from the top of the **air actuator** and move it out of the way.

NOTICE

To avoid damage to high-pressure components (such as lines, tubing, nipples, gland nuts, safety valves, nozzle, inlet body) use two wrenches to counter the torque when adjusting, attaching, or removing high-pressure components. Binding and twisting of the high-pressure components may cause leaks and water damage.

NOTE

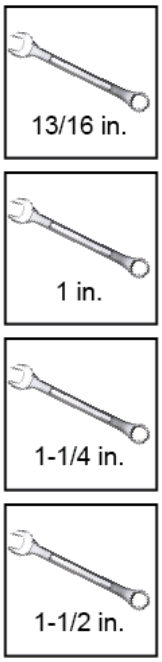
The on/off valve seat is not attached and may fall out of the valve assembly. Make sure that the valve seat remains with the valve body.

6. Remove the **on/off valve assembly**, then move it to a clean work area.

   - At the **nozzle**, remove the **ultra high-pressure (UHP) tube assembly** [1], **air actuator** [2], and **on/off valve assembly** [3] from the **Z-axis**.

NOTE

If the UHP tube assembly cannot be removed from the machine, detach the UHP tube assembly from the valve fitting ring.



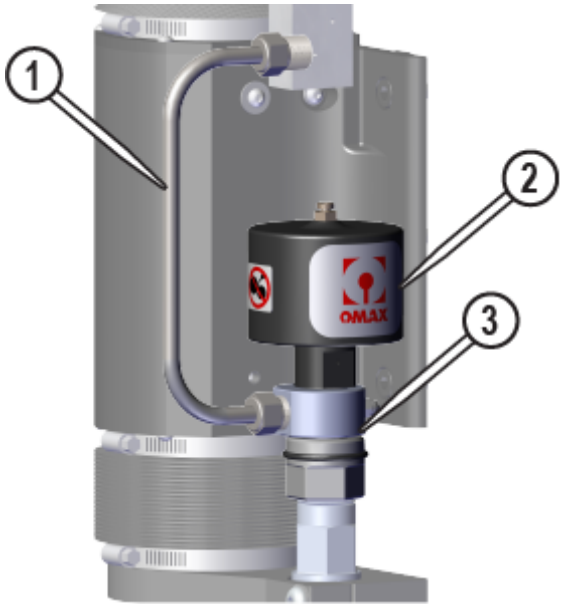


Figure 2

   - At the **pump**, remove the **air actuator** [1], **on/off valve assembly** [2], and **Adjustable Dump Orifice (ADO) assembly** [3]. See *400535 ADO Rebuild Kit Instructions*, and the OMAX Adjustable Dump Orifice (ADO) and Dump On/off Valve Rebuild or MAXIEM Adjustable Dump Orifice (ADO) and Dump On/off Valve Rebuild video, located at https://elearning.omax.com/.

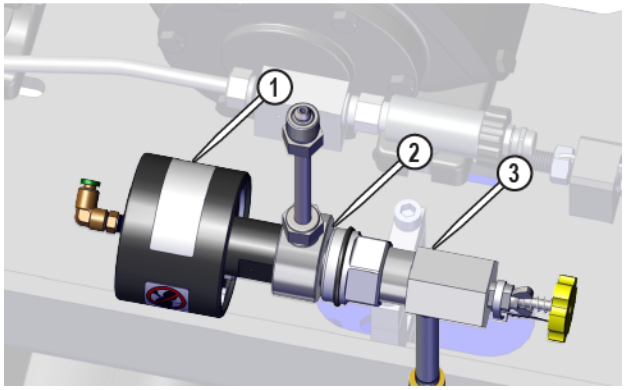


Figure 3

DISASSEMBLE THE DUAL ON/OFF VALVE

NOTE

A clean work environment is very important. Always work on a clean surface and thoroughly clean parts before assembly or installation. Dust, dirt, abrasive particles, and other contaminants can reduce the performance and operating life of the equipment.

1. Remove the **air actuator**.
   See *401060 Installation and Maintenance OMAX Air Actuator*, and the OMAX Air Actuator Installation and Maintenance or MAXIEM Air Actuator Installation and Maintenance video, located at https://elearning.omax.com.

NOTE

The on/off valve seat is not attached and may fall out of the valve assembly.

2. Remove the **on/off valve seat** [1] from the **valve assembly**.

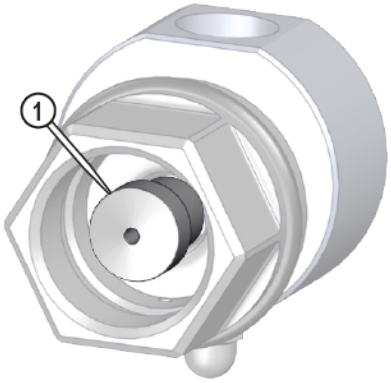


Figure 4

3. Remove the **retaining screw** [1] from the **valve body** [2].

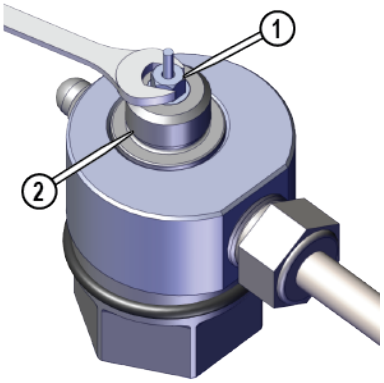


Figure 5

NOTICE

To avoid damage to high-pressure components (such as lines, tubing, nipples, gland nuts, safety valves, nozzle, inlet body) use two wrenches to counter the torque when adjusting, attaching, or removing high-pressure components. Binding and twisting of the high-pressure components may cause leaks and water damage.

4. If needed, remove the **UHP tube** [1] from the **fitting ring**.

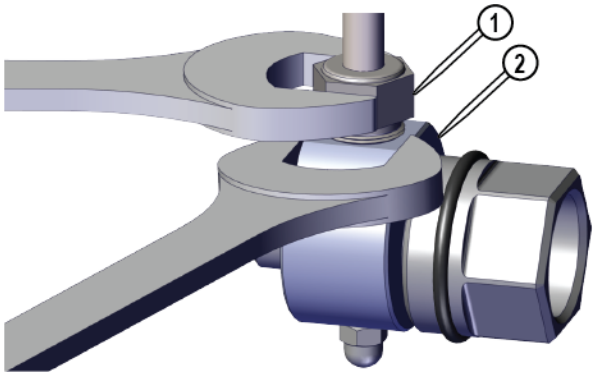


Figure 6

5. Pull the **fitting ring** [1] from the **valve gland nut** [3] and the **valve body** [2].

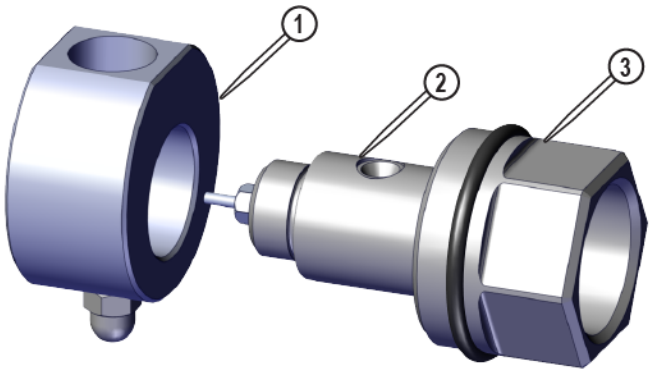


Figure 7

6. Remove the **stem assembly** [1] from the **valve body** [2].

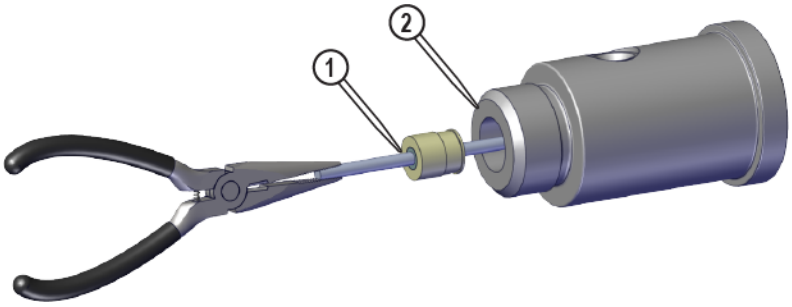


Figure 8

NOTICE

To prevent damage, always use non-metal or softer metal tools (such as brass, copper, or aluminum) to remove washers, O-rings, and seals. Scratches can cause leaks and low pressure in the system. Replace damaged components.

7. Push the **seal assembly** [2] out of the **valve body** [1], if needed.

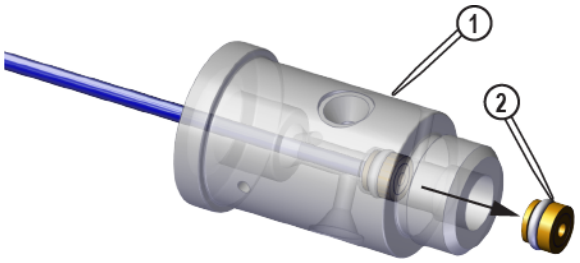


Figure 9

NOTE

Use all items included in the Dual On/off Valve Repair Kit. Do not reuse any parts provided in the repair kit. Reusing these parts will decrease the life of your rebuilt on/off valve assembly.

8. Discard the **seat** [1], **seal assembly** [2] and **stem assembly** [3].

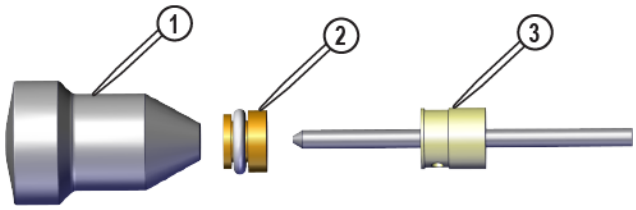


Figure 10

9. Clean and examine the **valve body** [1], **gland nut** [2], **fitting ring** [3], and **retaining screw** [4] for cracks and other defects. Replace damaged parts.

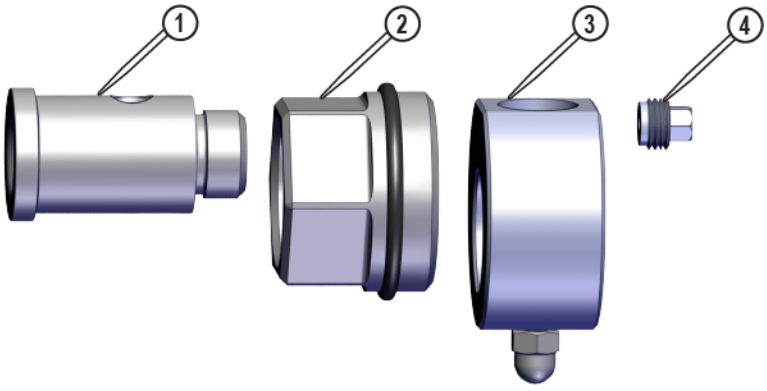


Figure 11

ASSEMBLE THE DUAL ON/OFF VALVE

1. Install the **seal assembly** [1] onto the **stem assembly** [2] with the **O-ring** closest to the pointed end of the **stem assembly**.

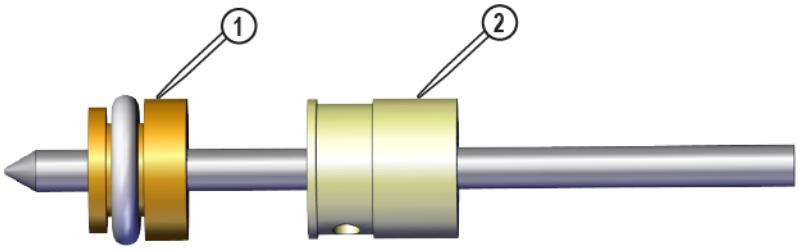


Figure 12

2. Apply a light coat of Lubriplate to the **seal assembly** and **stem assembly**.

3. Apply a light coat of Lubriplate from the opening of the **valve body bore** [1] to the internal lip.

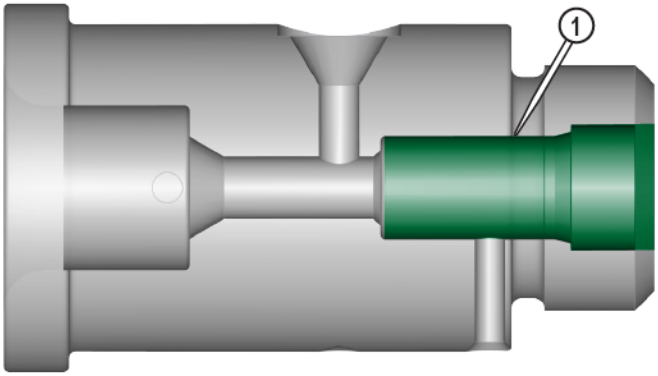


Figure 13

4. Gently push the **stem and seal assemblies** [2] into the **valve body bore** [1]. If needed, use a long tool to gently push the **stem assembly** until it clears all of the **internal threads** [3] of the **valve body**.

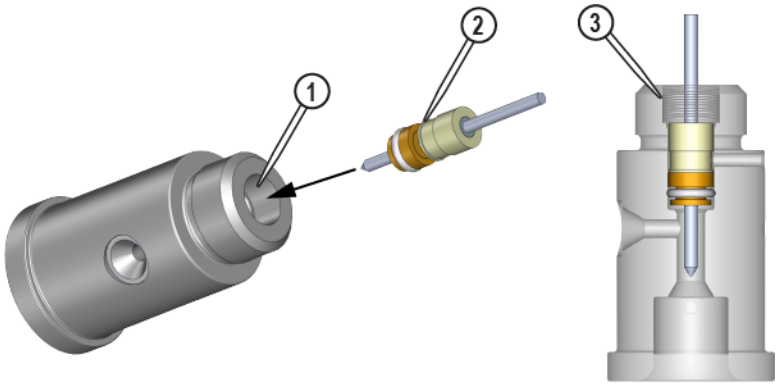


Figure 14

5. Apply a light coat of Blue Goop to the **retaining screw threads** [1], then install it into the **valve body**.

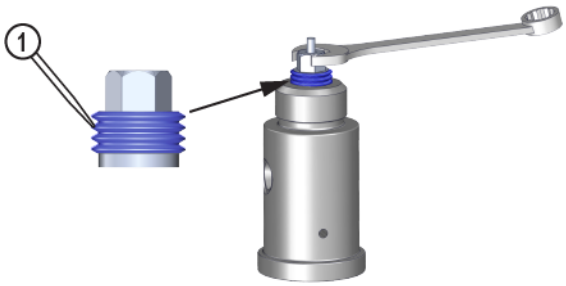


Figure 15

6. Apply a light coat of Blue Goop to each **end** [1] of the **on/off seat**, then insert it into the **valve body**.

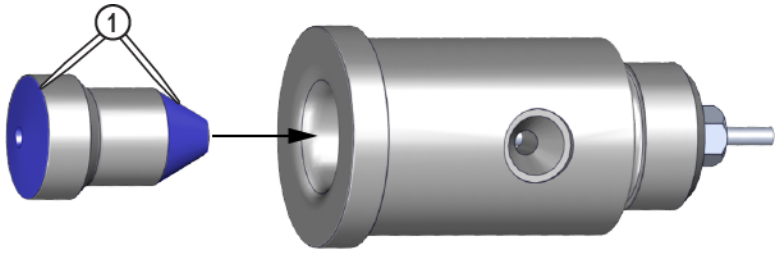


Figure 16

7. Put the **valve gland nut** [1] and the **fitting ring** [2] onto the **valve body**.

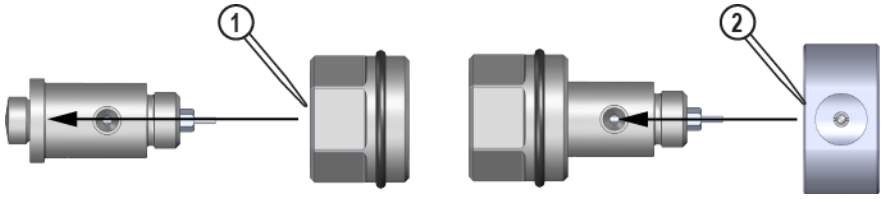


Figure 17

The **on/off valve** rebuild is complete.

INSTALL THE DUAL ON/OFF VALVE

NOTE

The on/off valve seat is not attached and may fall out of the valve assembly. Make sure that the valve seat remains with the valve body.

1. Turn the **valve body** and **fitting ring** so that the **UHP line openings** [1] are aligned.

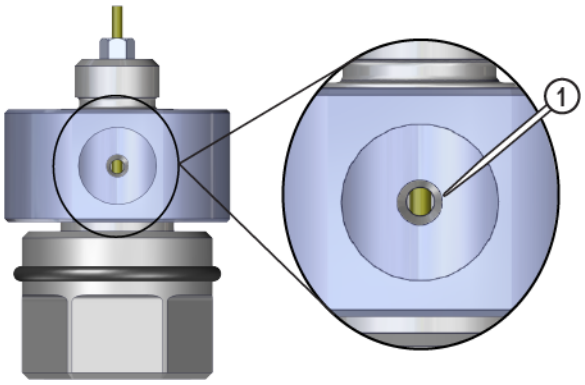


Figure 18

2. Install the **on/off valve**, do one of the following.

   - At the pump:
     see *400535 ADO Rebuild Kit Instructions*, and the OMAX Adjustable Dump Orifice (ADO) and Dump On/off Valve Rebuild or MAXIEM Adjustable Dump Orifice (ADO) and Dump On/off Valve Rebuild video, located at https://elearning.omax.com.
   - At the nozzle, install on the **inlet body** [2], make sure that the **valve body** and **fitting ring openings** [1] are aligned, then tighten by hand.

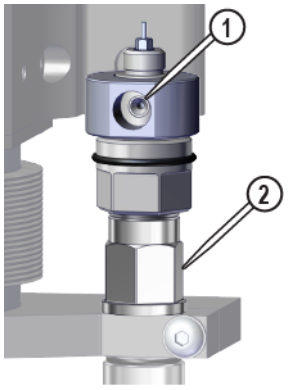


Figure 19

   a. Clean the **UHP tubing**, **gland nuts**, **collars**, and **split collets**, then prepare the assembly for installation. See *401044 High Pressure Fittings, .375in Tubing*.

   b. Install the **UHP tube assembly** into the **fitting ring** [2], then tighten by hand.

NOTICE

Make sure the valve body, fitting ring, and UHP line are aligned to prevent stress and damage on the UHP line and on/off valve.

c. Make sure the **UHP tube** remains square with the **hp fitting** and **fitting ring**, then torque the **fitting ring gland nut**.
See *401044 High Pressure Fittings, .375in Tubing*.

Figure 20

d. Tighten the **on/off valve gland nut**.

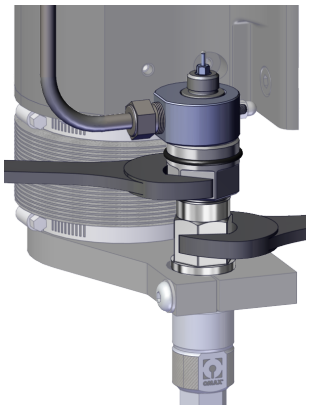


Figure 21

NOTICE

To avoid damage to high-pressure components (such as lines, tubing, nipples, gland nuts, safety valves, nozzle, inlet body) use two wrenches to counter the torque when adjusting, attaching, or removing high-pressure components. Binding and twisting of the high-pressure components may cause leaks and water damage.

e. Torque the **retaining screw** [1].

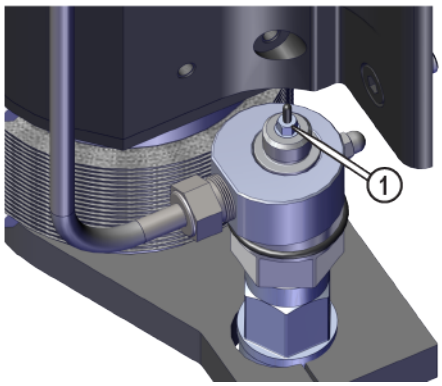


Figure 22

3. Install the **air actuator**.
   See *401060 Installation and Maintenance OMAX Air Actuator*, and the OMAX Air Actuator Installation and Maintenance or MAXIEM Air Actuator Installation and Maintenance video, located at https://elearning.omax.com.

4. Install the air line to the **air actuator air fitting**.

5. Install the **on/off valve assembly**.

   - At the **pump**, install the **Adjustable Dump Orifice (ADO) assembly**.
     See *400535 ADO Rebuild Kit Instructions*, *401044 High Pressure Fittings, .375in Tubing*, and the OMAX Adjustable Dump Orifice (ADO) and Dump On/off Valve Rebuild or MAXIEM Adjustable Dump Orifice (ADO) and Dump On/off Valve Rebuild video, located at https://elearning.omax.com.
   - At the **nozzle**, install the **UHP tube assembly** into the **fitting** [2], make sure the **hp line** is square with the **fitting ring** and **hp fitting** (Figure 20), then tighten **hp fitting gland nut**.
     See *401044 High Pressure Fittings, .375in Tubing*.

Figure 23

6. Do a post-maintenance flush.
   See *401082 Maintenance, Perform Post Maintenance Flush*, and the OMAX Post Maintenance Flush or MAXIEM Post Maintenance Flush video, located at https://elearning.omax.com.

7. Reinstall the nozzle.
   See *400715 MAXJET 5i Installation and Maintenance*, and the OMAX MAXJET 5i Nozzle Maintenance or MAXIEM MAXJET 5i Nozzle Maintenance video, located at https://elearning.omax.com.

CORRECT WATER LEAKS

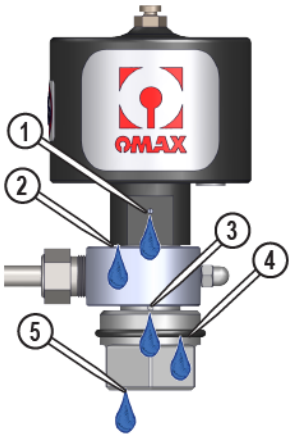


Figure 24

Leak Point	Leak Point Description	Suspected Causes	Recommended Action
1	Air actuator weep hole	Leaky seal; cracked valve body	Replace seal; check valve body for cracks
2	Leak between air actuator and fitting ring	Leaky seal; cracked valve body	Replace seal; check valve body for cracks
3	Valve body weep hole (between collar and nut)	Cracked valve body; loose nut; damaged metal-to-metal seal between valve body and on/off seat	Replace defective component; tighten nut
4	Gland nut weep hole (beneath the O-ring)	Damaged metal-to-metal seal between the ADO and on/off seat	Replace seal, stem assembly, and seat first, if still leaking, repair ADO
5	Leaking between the gland nut and inlet body or ADO body	Normal wear leakage, low pressure leaks	Fix at regular scheduled maintenance

CUSTOMER SUPPORT

For service and support, go to omax.com.