

Air-Actuated Hydraulic Swaging Unit (AHSU)

Setup and Operating Instructions



AHSU with base

READ AND UNDERSTAND THESE INSTRUCTIONS BEFORE USING THE AHSU.

Definitions

Statements and symbols are used in this document to identify safety concerns. Read the definitions below before setting up and operating the AHSU.



WARNING!

Statements that identify conditions or practices that could result in personal injury or loss of life.



CAUTION!

Statements that identify conditions or practices that could result in damage to the equipment or other property.

Safety Precautions



WARNING! **EYE PROTECTION**

Safety glasses must be worn when setting up and operating the AHSU.



CAUTION!

Do not operate AHSU unless all tooling is installed and the tubing, nut and ferrules are properly positioned within tooling.



CAUTION!

Do not tamper with or alter any components of the AHSU.



CAUTION!

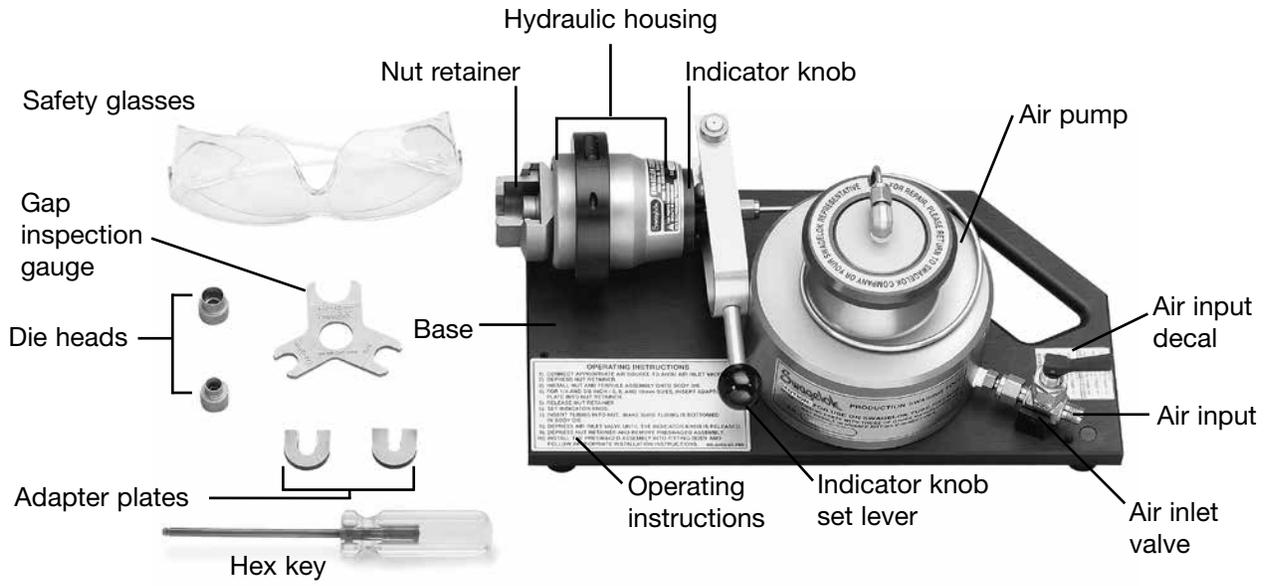
Return the AHSU to your independent Swagelok sales and service representative if any signs of hydraulic fluid leakage or malfunction occur.



CAUTION!

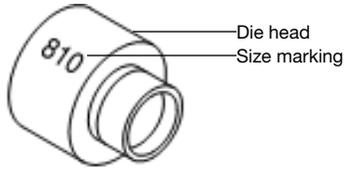
Limit air inlet pressure to less than 90 psig (6.2 bar). If the inlet pressure exceeds 90 psig, a pressure relief valve in the unit will activate

Components (Unit with Die Heads and Base)

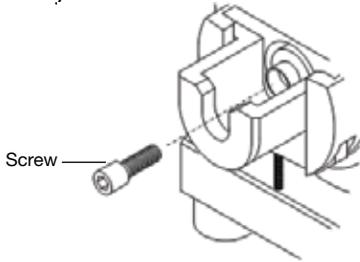


Setup

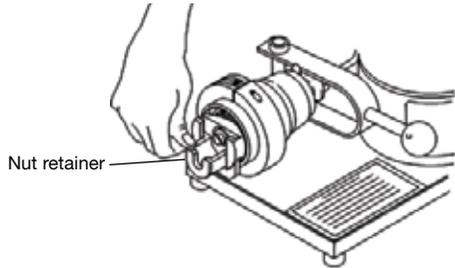
1. Select the proper size **die head** (reference the **size marking** on each die head).



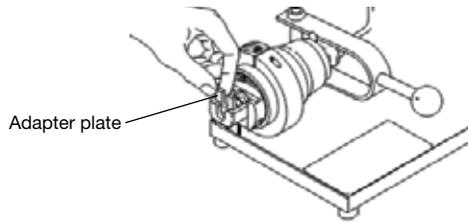
2. Remove the **screw** located in the bore of the die head previously installed in the hydraulic housing by turning counterclockwise with the hex key.



3. Depress the nut retainer to remove the die head.
4. Depress the **nut retainer** and install the selected die head. Tighten the shaft screw sufficiently to keep the die tight, being careful not to break the screw by over-tightening it.



5. For 1/4 and 3/8 in. and 6, 8, and 10 mm sizes, insert the appropriate **adapter plate** into the nut retainer. Refer to the mark on the plate for size information.



6. Connect the appropriate air source to the AHSU air inlet valve.
7. Adjust the source pressure to the value shown in the table or on the air input decal for the tubing material and size.

Required Air Inlet Working Pressure, psig (bar)		
Fitting/Tooling Size	Stainless Steel or Steel Tubing	Soft Copper Tubing
Fractional Series		
400	40 (2.8)	35 (2.4)
600	60 (4.2)	35 (2.4)
810	70 (4.9)	45 (3.1)
Metric Series		
6M0	40 (2.8)	35 (2.4)
8M0	50 (3.5)	35 (2.4)
10M0	60 (4.2)	40 (2.8)
12M0	70 (4.9)	45 (3.1)

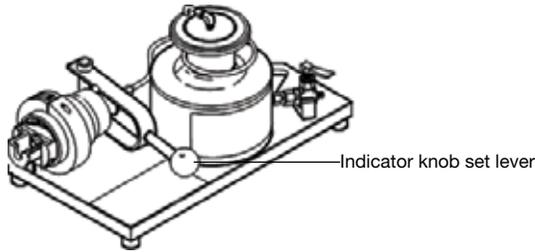


CAUTION!

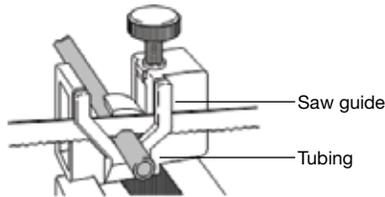
Air inlet pressure should be limited to 90 psig (6.2 bar) or less. If the inlet pressure exceeds 90 psig, there is a pressure relief valve in the unit that will activate.

Operation

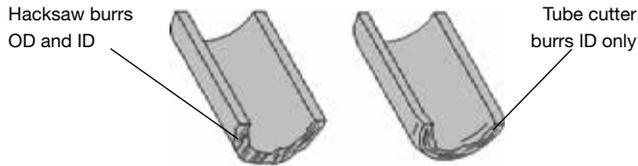
1. Set the **indicator knob** by pivoting the indicator knob set lever until the knob snaps into position and is flush with the hydraulic housing.



2. Prepare tube ends as follows.
 - A. Cut **tubing** squarely. Use of a Swagelok tube **saw guide** is recommended.



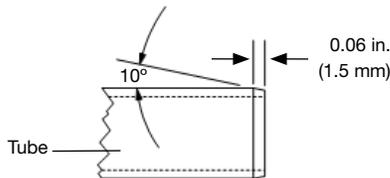
- B. Remove any burrs. Use of Swagelok deburring tools is recommended.



WARNING!

Failure to deburr the OD of the tube could prevent the tube from properly resting against the piston shoulder. ID burrs could break off and cause damage in other components of the system.

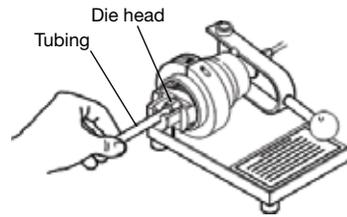
- C. If a file is used on the OD, make a 10° x 0.06 in. (1.5 mm) chamfer.



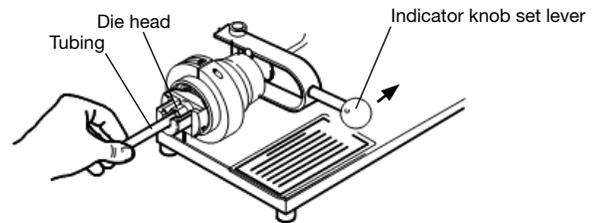
3. Insert tubing into the Swagelok end fitting to be pre-swaged. Disassemble the nut from the end connection, leaving the nut and ferrules on the tubing. The orientation of the nut, rear ferrule, and front ferrule should be as shown.



4. Insert the **tubing** into the **die head**. Make sure that the tubing rests firmly on the shoulder of the die head.



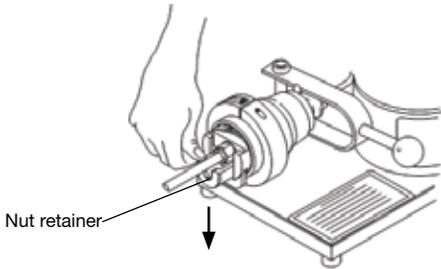
5. Depress the nut retainer and slide the nut over the die head.
6. The front edge of the nut should line up with the groove on the outside of the die head.
7. Allow the nut retainer to return to its starting position.
8. Hold the **tubing** firmly in the **die head** and depress the **air inlet valve handle** for three seconds after the indicator knob is released. The ferrules have now been preswaged onto the tubing.



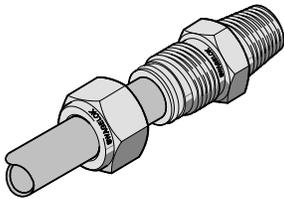
9. Release the air inlet valve handle.

Note: Releasing the air inlet valve handle too soon may result in an insufficiently preswaged assembly.

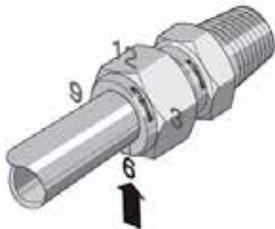
10. Depress the **nut retainer** to remove the preswaged assembly.



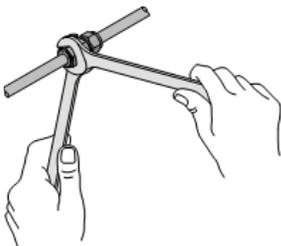
11. Install the preswaged assembly into the fitting body. Turn the nut onto the fitting body until it is finger-tight.



12. Mark the nut at the 6 o'clock position.



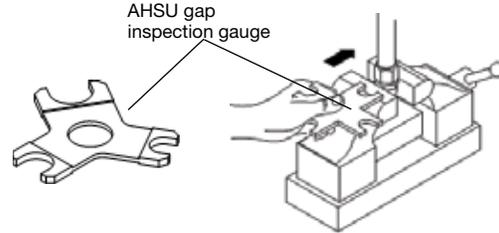
13. While holding the fitting body steady, tighten the nut one-half turn until the mark reaches the 12 o'clock position.



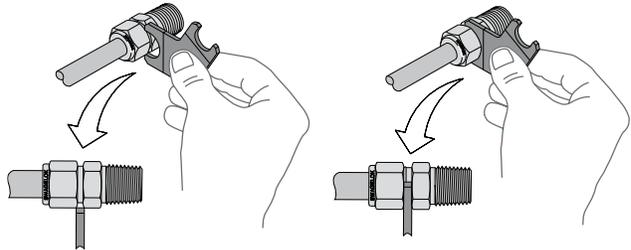
Gauging Instructions

Position the Swagelok AHSU gap **inspection gauge** adjacent to the **gap** between the nut and body hex.

- If the gauge will not enter the gap, the fitting is sufficiently tightened.
- If the gauge will enter the gap, additional tightening is required.



Note: 3-sided AHSU gap gauge is for fractional fittings. 4-sided AHSU gap gauge is for metric fittings.



Sufficiently tightened

Tightening is required

Inspect the fitting with a gap inspection gauge

Troubleshooting

Symptom	Causes	Remedy
Tubing is difficult to remove from the AHSU after preswaging.	Tubing wall may be below recommended minimum wall thickness.	Gently rock the tubing back and forth to remove it. Use tubing that is thicker than the minimum recommended wall thickness. ⚠ CAUTION! Do not rotate the tubing.
The indicator knob does not release.	Improper inlet pressure being used for tubing material and size.	Adjust inlet pressure to the correct value for the tubing size and material.
Oil is leaking from unit.		Return the unit to your independent Swagelok sales and service representative.
The front edge of the Swagelok nut does not line up with the groove on the outside of die head.	Improper die head being used. The ferrules are not oriented properly.	Use the proper die head. Place the ferrules in proper orientation.
The unit fails to swage sufficiently as indicated by the gap inspection gauge after assembly.	The working pressure is too low.	Verify the working air pressure is set to the appropriate pressure recommended on the air input decal. ⚠ CAUTION! Do not swage a tube more than once.

The AHSU cannot be used for alloy 2507 tubing or for medium-pressure tubing.

Refer to Swagelok *Gaugeable Tube Fittings and Adapter Fitting* catalog, [MS-01-140](#), for additional information.

Refer to Swagelok *Tube Fitters* manual, [MS-13-03](#), for additional information.

Refer to Swagelok *Tubing Data* catalog, [MS-01-107](#), for additional information.

Warranty Information

Swagelok products are backed by The Swagelok Limited Lifetime Warranty. For a copy, visit swagelok.com or contact your authorized Swagelok representative.