

Swagelok® Tube Fitting Reassembly Instructions for Well Control Equipment Systems



This document was created in response to the International Association of Oil & Gas Producers (IOGP) Report 625, Prevention of Subsea BOP Control Tubing, Hoses, and Fittings Failures, and a collaboration between Swagelok Company and participating companies in the oil and gas industry. Its intent is to provide best practice reassembly instructions for Swagelok® tube fittings used in critical Well Control Equipment systems.

⚠ WARNING

Always depressurize the system before disassembling a Swagelok tube fitting.

1. Mark the tube at the back of the nut; mark a line along the nut and fitting body flats. Use these marks to ensure that you return the nut to the previously pulled-up position. The fitting is ready for disassembly.



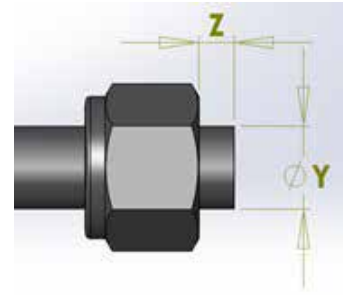
2. Examine the ferrules on the tube for proper orientation. If the ferrules are not oriented properly, the tube should be discarded.



3. Examine the tube protrusion (Z) to verify the tubing was bottomed in the tube fitting body during initial installation. If the tube protrusion does not meet the criteria, the tube should be discarded.

To verify that the tubing was bottomed, pull the nut up against the back ferrule and measure the distance (Z) from the end of the tubing to the front (threaded end) of the nut. The minimum acceptable length is given in the following table.

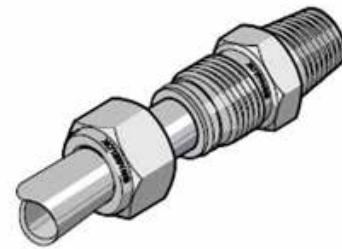
Note: The maximum length is controlled by the body or preswage tool and does not require measurement.



Tube OD, Y	Minimum Length, Z	Tube OD, Y	Minimum Length, Z
inch		mm	
1/4	0.03	6	0.7
5/16	0.03	8	0.7
3/8	0.03	10	0.2
1/2	0.14	12	3.4
5/8	0.20	16	5.0
3/4	0.20	18	5.0
7/8	0.30	20	6.6
1	0.35	22	6.6
1 1/4	0.30	25	8.9
1 1/2	0.40	32	5.8
—	—	38	6.6

4. Upon reassembly, insert the tube with preswaged ferrules into the fitting until the front ferrule seats against the fitting body.

Note: If the components have been cleaned, then reapply a system-compatible hydrocarbon lubricant to the nut and body threads and the ferrules.



5. a. While holding the fitting body steady, rotate the nut with a wrench to the previously pulled-up position, as indicated by the marks on the tube and flats. At this point you will feel a significant increase in resistance. Tighten the nut 1/12 turn (1/2 hex).

Note: This may reduce the number of times the fitting can be reassembled compared to tightening the nut slightly.

- b. If any of the following conditions are met:

- the marks are not visible
- this is the installation reassembly after 1-1/4 turns preswage
- this is the installation reassembly of an existing tubing assembly with nut and ferrules and a new fitting,

then rotate the nut with a wrench until you feel a significant increase in resistance. Tighten the nut 1/12 turn (1/2 hex).

Note: This may reduce the number of times the fitting can be reassembled compared to tightening the nut slightly.



Step 5 ensures sufficient reassembly tightening.

6. Check the gap between the nut and body with the Swagelok Gap Inspection Gauge (GIG). If the Swagelok GIG will enter the gap, then while holding the fitting body steady, rotate the nut with a wrench 1/6 turn.

The Swagelok GIG entering into the gap indicates an undertightened condition.

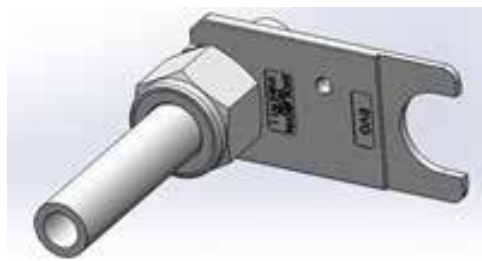
Recheck the gap with the Swagelok GIG. If the Swagelok GIG will enter the gap then rotate the nut with a wrench an additional 1/6 turn. Repeat this additional tightening until the Swagelok GIG will not enter the gap.

The Swagelok GIG is designed for initial assembly. When used for reassembly, the Swagelok GIG does not ensure sufficient reassembly tightening.

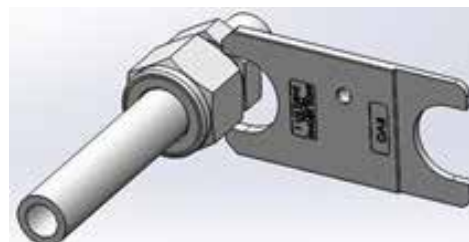


Caution

Do not use the Swagelok GIG as a stop collar during reassembly.



Swagelok GIG enters gap



Swagelok GIG does not enter gap

⚠ WARNING

Do not mix/interchange Swagelok products or components not governed by industrial design standards, including Swagelok tube fitting end connections, with those of other manufacturers.