

HOKE® 3HPST User Instructions



Continuously Improving
Flow Control

INPEX Operation Instructions

For The Use with GYROLOK® Fittings

Hydraulic Pre-Setting Tool (HPST) Operations Manual For Model Number 3HPST

3HPST pre-setting tool was designed to initially set ferrules onto tubing prior to final make-up. Pre-setting assures correct and consistent make-ups. Final manual make-up torque is reduced approximately by 30% of what would have been required without pre-setting.



ASSEMBLY INSTRUCTIONS

| | 1/16 | 1/8 | 1/4 | 3/8 | 1/2 | 5/8 | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 |
|------------|-----------------------|-------|-------|------------------------|-----|-----------------------|-----|-----|-------|-------|-----|
| SS 316 | Green | Green | Green | Green | Red | Red | Red | Red | Red | Red | Red |
| MONEL® | Green | Green | Green | Green | Red | Red | Red | Red | Red | Red | Red |
| Titanium | Green | Green | Green | Green | Red | Red | Red | Red | Red | Red | Red |
| 6MO | Green | Green | Green | Yellow | Red | Red | Red | Red | Red | Red | Red |
| HASTELLOY® | Green | Green | Green | Yellow | Red | Red | Red | Red | Red | Red | Red |
| Titanium | Green | Green | Green | Yellow | Red | Red | Red | Red | Red | Red | Red |
| | Green Manual Assembly | | | Yellow PST Recommended | | Red HPST Must Be Used | | | | | |

The INPEX project owners have mandated and CIRCOR Instrumentation endorses the requirement that all 1/2" fittings and larger regardless of tube wall thickness or alloy selection shall be made-up using the Hydraulic Pre-Setting Tool (3HPST). All 1/2" fittings and larger are to be pre-set using the 3HPST and with final make-up being accomplished during installation by rotating the nut an additional 1/2 turn using the appropriately sized wrench / spanner.



HPST Setup

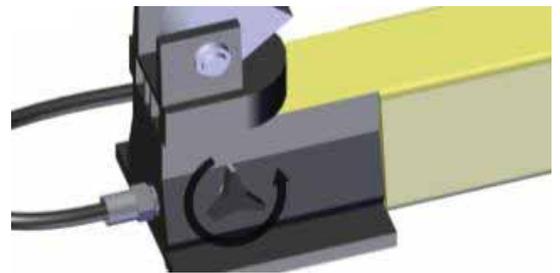
1. Connect hand pump to Pre-Setting head

The hand pump is supplied with a hose connected. Therefore the free end needs to be connected to the Pre-Setting head.

- 1.1 Remove the hand pump and Pre-Setting head from the case and place them in a suitable location.



- 1.2 Open the release valve on hand pump by turning the handle counter-clockwise.



- 1.3 Remove the protective plug from the inlet connector on the Pre-Setting head, turn counter-clockwise. Keep the plug in a safe place, such as in the black case.



- 1.4 Connect the free end of the hand pump hose to the inlet connector on the Pre-Setting head tightening the male and female couplers together.

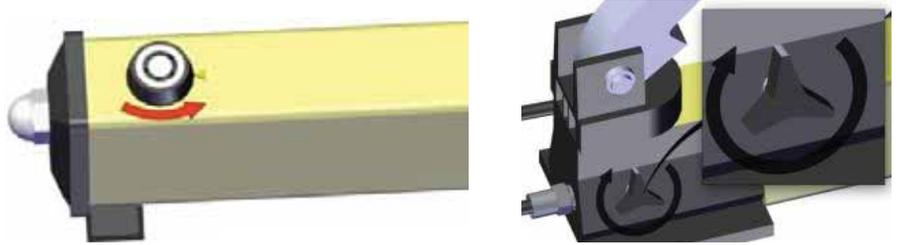


2. System Bleeding (Air Removal)

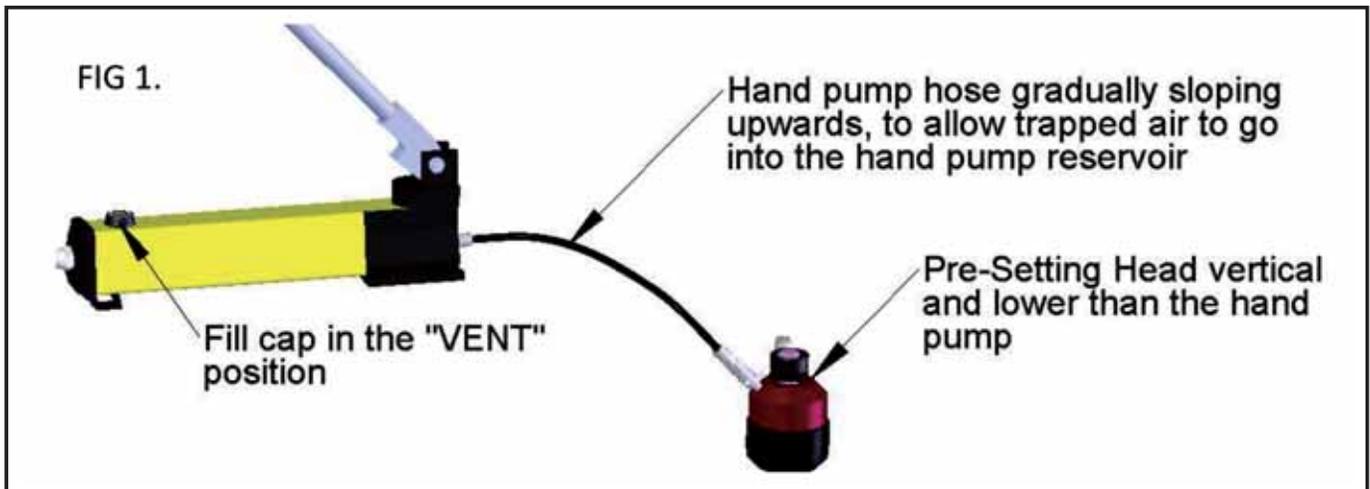
Perform the System Bleeding process prior to using the tool and whenever any part of the hydraulic system has been disconnected.

- 2.1 Position the hand pump at a higher elevation than the Pre-Setting head; this will help in chasing any trapped air out of the hydraulic system. (See FIG 1, below)

- 2.2 Vent hand pump reservoir, by turning the fill cap a 1/4 of a turn to the "VENT" position and ensure the hand pump release valve is closed.



- 2.3 Turn release valve handle clockwise. Ensure the vent end of the Hand Pump reservoir is the highest point in the system.



- 2.4 Operate the hand pump (pump the handle) until the piston in the Pre-Setting head is fully extended. This is achieved when the pump handle is hard to push. Do not try to pump the handle any further. Pre-Setting head, turn counter-clockwise. Keep the plug in a safe place, such as in the black case.



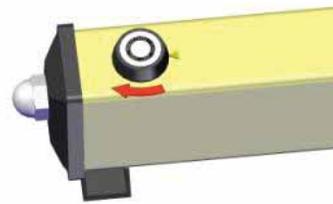
- 2.5 Open the release valve on the hand pump to retract the Pre-Setting head piston. This action will force any trapped air to move up into the hand pump reservoir.



- 2.6 Repeat the above step as necessary.

- 2.7 Add oil to the hand pump reservoir, if necessary. Reference hand pump manufacturer's manual for instructions.

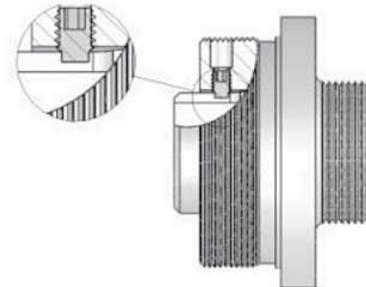
- 2.8 Return fill cap to the operating position ("CLOSE").



3. Die and Jig Installation

Always keep the Die and Jig as a matched pair and stored in the black case when not in use.

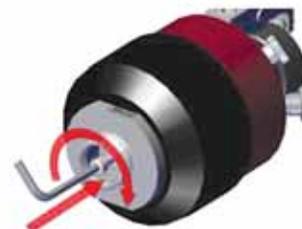
- 3.1 Select the corresponding Die and Jig set to the desired tube size you wish to pre-set. Make sure the Die and Jig is a matched pair. Use a 3/32 Allen Wrench to loosen the set screw located on the large end of the jig (See adjacent figure). This ensures that the Die moves freely prior to installing the Die and Jig assembly into the Pre-Setting head unit.



- 3.2 Maintaining the Jig key in the Die slot, install the Jig and Die by screwing the Jig into the Pre-Setting head and tighten completely, turning clockwise. Do not over-tighten. Use ONLY open-end wrenches provided.



- 3.3 Screw the Die-Fixing bolt to secure the Die onto the Pre-Setting head's piston, use the 5mm hex wrench, provided. Apply a small amount of lube, provided with the fitting, to the Jig threads. Do this on the first and every 5th use of the tool thereafter.



4. Indicator Nut Installation

4.1 Select the corresponding Indicator Nut for the fitting pre-set.

A. **Black** Indicator Nut is used with size 1/2" (12mm) only

B. **Grey** Indicator Nut is used with size 5/8" (14mm) and above fittings

4.2 With the Indicator Arm in the release position, screw the Indicator Nut on to the threaded piston shaft.



5. Tube Preparation

5.1 Ensure the tube outside diameter wall thickness and hardness is within acceptable specifications. Free from scratches, indentations and flat surfaces.

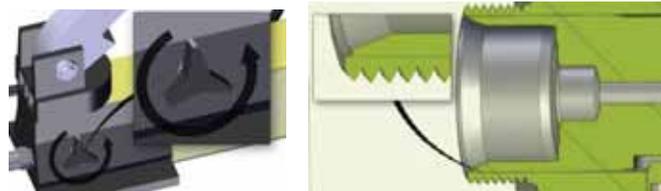
5.2 Make a square cut and remove any burrs from the end of the tubing.

6. Ferrule Pre-Setting Procedure

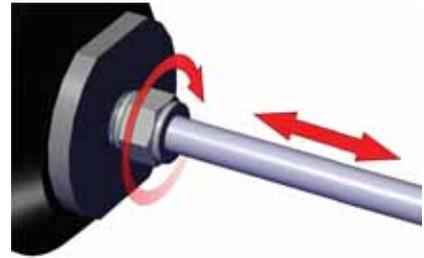
6.1 With the Pre-Setting head in the desired location, ensure the Indicator Arm is in the released position and the required Die and Jig set installed.



6.2 Open the release valve on the hand pump (turn counter-clockwise). Insure the end of the Die is back from the end of the threaded portion of the Jig.



- 6.3 Fully insert a correctly cut, deburred tube into the HPST head. Visually ensure both ferrules are correctly oriented. Thread and rotate the nut until hand-tight.

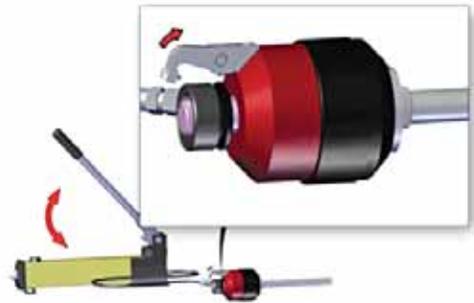


- 6.4 Set the indicator arm in the operating position by rotating the Indicator Nut counter-clockwise until it stops.

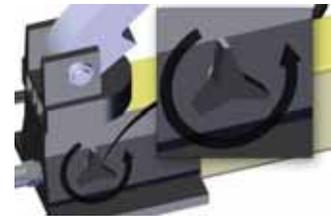


- 6.5 Close the hand pump release valve (turn clockwise).

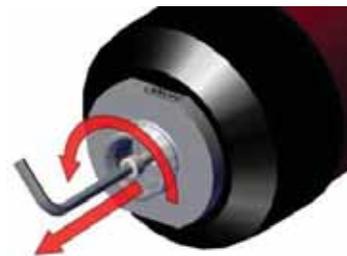
- 6.6 Pump the handle until the indicator arm releases. **CAUTION:** Stop pumping immediately after the arm releases, as over-pumping may cause the tube to swell and stick.



- 6.7 Open the release valve on the hand pump. Unscrew the nut and withdraw the pre-set assembly from the Pre-Setting head.



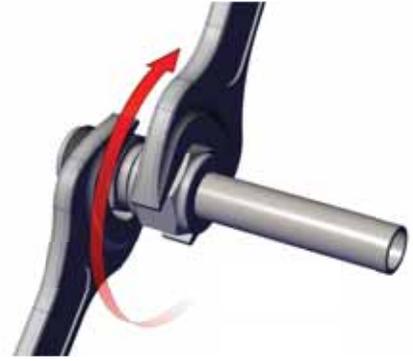
- 6.8 The initial pre-setting is now complete. The completion of the initial fitting make-up can take place in the final location.



Repeat steps 6.3-6.8 for subsequent make-ups.

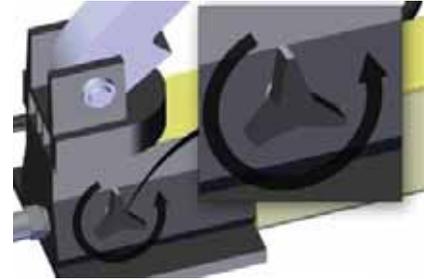
7. Finalizing the Fitting Make-up

- 7.1 Insert the end with pre-set ferrules and nut into the fitting. Thread and rotate the nut until hand-tight. While supporting the fitting body, tighten the nut with a wrench $\frac{1}{2}$ turn for tubing up to 1" (25mm). For tubing greater than 1" (25mm) $\frac{3}{4}$ turn is required. **The initial fitting make-up is now complete.**

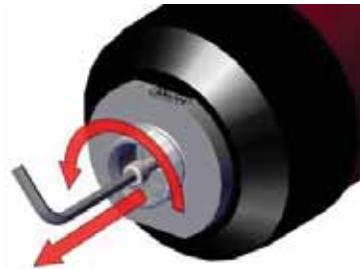


8. Dismantle & Store Unit

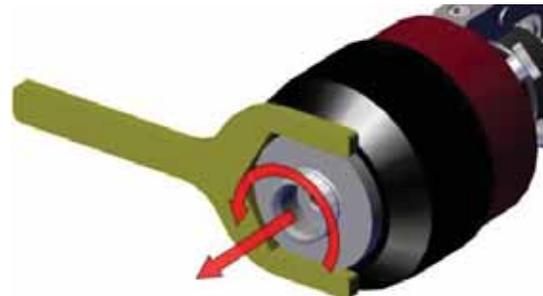
- 8.1 Open the Hand pump release valve.



- 8.2 Remove the Die and Jig from the Pre-Setting head by first unscrewing the Die-Fixing bolt, using the 5mm Hex wrench provided.



- 8.3 Remove the Die-Fixing bolt and store in a safe place. Unscrew the Jig along with the Die, turning it counter-clockwise, using the wrench provided.



- 8.4 Disconnect the hand pump hose from the female coupler on the Pre-Setting head by loosening the coupler collar.



8.5 Plug the uncoupled end of Pre-Setting head with the protective plug removed and stored earlier.



8.6 Store clean components and accessories in the black case.



8.7 Lay the black case down (horizontally), when possible, during storage.

Installation Appendix: Utilization of Used Fittings and Nuts

Fitting Manufacturing Warning

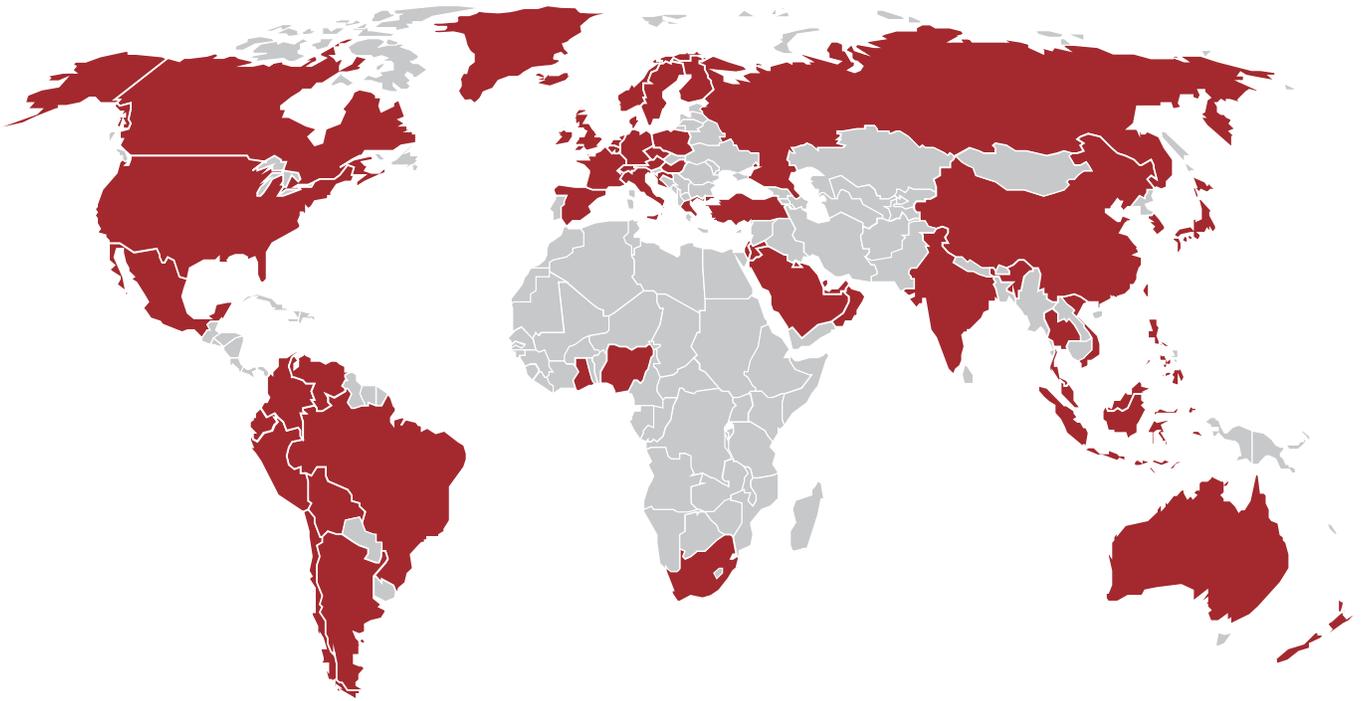
During the first make-up of a fitting the front ferrule is coined or seated with the fitting body. Coining is a cold working process where a moderate amount of force is applied from the front ferrule to the body causing slight plastic deformation which generates the sealing action of the ferrule and the body. During subsequent remakes of the original body and ferrule; the ferrule re-seats and seals the connection to create a leak tight connection. Therefore; if attempting to install a used fitting body with new ferrules it may compromise the leak tight integrity of the fitting since the body was previously coined. Also, the nut and rear ferrule coin with each other to create optimal driving force to seat the ferrules to the tube and create a leak tight connection. The installation of used fittings and bodies may cause unintended leakage due to the installation of used hardware; CIRCOR assumes no responsibility of the installation when used fittings are utilized, all warranties are voided. All responsibility and liability for leakage and product failure remains solely with the installer.

Fittings up to and Including ½”/12mm – All Alloys

When using previously installed nuts and fittings with new ferrule sets (sizes \leq ½” / 12mm) , the ferrules must be set with new tubing using a manual pre-setting tool (PST). Refer to the “Manual Installation” instructions above.

Over ½” / 12mm –All Alloys

When using previously installed nuts and fittings with new ferrule sets / (sizes $>$ than ½” / 12mm), the ferrules must be set with new tubing using the Hydraulic Pre-Setting Tool (HPST). Refer to the “HPST Installation” instructions above.



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PO Box 4866
Spartanburg, SC 29305-4866
Tel +1-864-574-7966
www.hoke.com
sales-hoke@circor.com

Our headquarters and manufacturing facilities are located at:
405 Centura CT
Spartanburg, SC, USA,
29303-6603