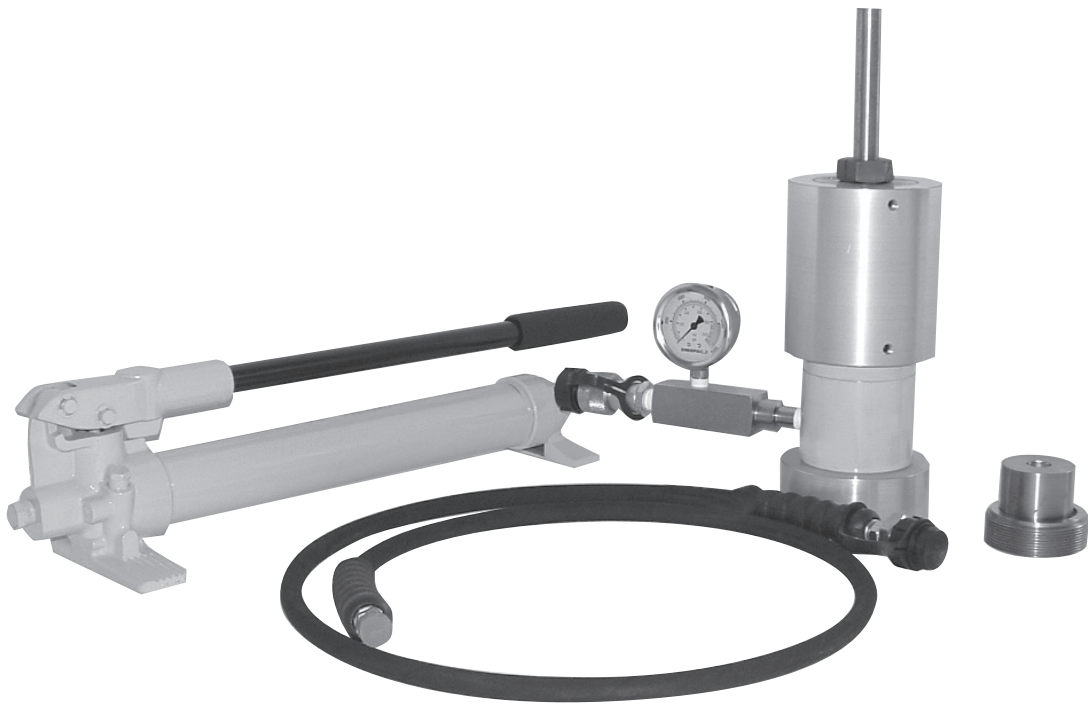




**Autoclave
Engineers** 

HST Hydraulic Set Tool

Assembly and Operating Instructions



***For use with Quick Set
Series (QSS) sleeves
and tubing***

Parker Autoclave Engineers
Instrumentation Products Division
8325 Hessinger Drive
Erie, Pennsylvania 16509-4679 USA
PH: 814-860-5700 FAX: 814-860-5811
www.autoclave.com

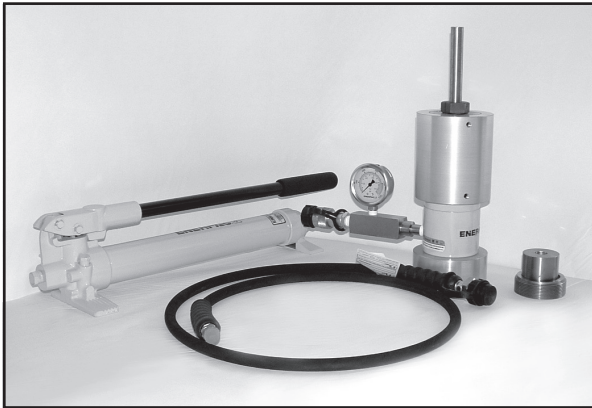
Assembly and Operating Instructions for HST Hydraulic Set Tool

The hydraulic set tool requires minimal assembly and is easy to use. There are three models available; a manual hydraulic pump, an air operated hydraulic pump and a complete stand mounted system with air pumps and tooling for all five connection sizes.

Hydraulic Sleeve Set Tool

The Parker Autoclave hydraulic sleeve set tool is designed for use with the QS Series glands, sleeves and Parker Autoclave tubing. This tool is required to set the sleeve for the 9/16", 3/4" and 1" sizes and suggested for the 1/4" and 3/8" sizes. It not only produces the required bite into the tubing, it is much easier than trying to set the sleeve the conventional method.

The tool comes in a self contained portable, lockable case complete with hand or air pump, cap and dies for all sizes.



Features

Case Dimensions: 28"W x 14.25"H x 13.75"D (711cm x 362cm x 292cm)

Total Weight: 69 lbs. (31 Kg)

Hand Pump: Single stage hydraulic (standard)

Hydraulic Cylinder: 10,000 psi, 2.5" 25 ton

Base & Housing: Aluminum anodized

Die and Cap: Precision hardened steel

Gauge: 15,000 psi (1034 bar)

Air-operated hydraulic pump option can be furnished in place of standard hand pump. (Add "-A" to order number). Operating pressure 0 to 10,000 psi (0 to 690 bar). Required air pressure, 30 psi (2.1 bar) minimum 120 psi (8.3 bar) maximum. Reservoir capacity: 24 cu. in. (393cm³). Air lubricator/air separator is recommended for air operated units.

Tooling Installation and Changing Sizes

To change tooling to another size only requires interchanging 2 parts.

1. Loosen the 5/16" set screw that locks the threaded cap from rotating.
2. Using a 5/32" hex key to rotate and remove the threaded steel cap from the aluminum housing.
3. Turn the tool assembly upside down the remove the die from inside the housing.
4. Install the die of the appropriate connection size you wish to use. The solid side of the die should be facing down towards the hydraulic cylinder.
5. Install the appropriate size cap to match the size of the die. Insert cap with the 5/32" hex up. Rotate with a 5/32" hex key until it bottoms out on the shoulder side of the housing.
6. Thread in the 5/16" set screw until it bottoms out on the cap threads. Tighten set screw to prevent movement during use.

Ordering Information

HST-912: Complete tool kit with hand pump (shown in photo)

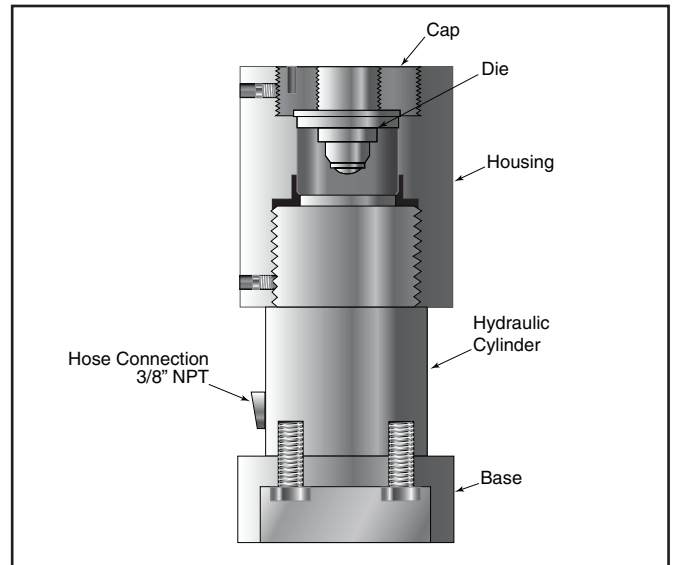
HST-912TW: Complete tool kit with torque wrench and adapters

HST-912A: Complete tool kit with air-operated pump (air operated pump #P-1948)

HST-912ATW: Complete tool kit with torque wrench and adapters

HST-S: Complete stand mounted system that includes everything in the HST-921ATW plus the required tooling for the 1" size connections. Not shown, consult factory for replacement parts. System weight 260 lbs.

Description	Part #
Hydraulic Cylinder	90588
Gauge	90594
Adapter	90593
Base	101F-3407
Housing	101F-3408
Hydraulic Pump	P-1893
Hose	P-1894
3/4" Die	HSTD12
9/16" Die	HSTD9
3/4" Cap	HSTC12
9/16" Cap	HSTC9
Tool Chest	P-10011
Moly Paste	P-9766
1/4" Die	HSTD4
1/4" Cap	HSTC4
3/8" Die	HSTD6
3/8" Cap	HSTC6
(TW) Kits with torque and adapters	
20 to 150 ft-lbs (27-203 Nm) Torque Wrench	P-1680
75 to 250 ft-lbs (102-339 Nm) Torque Wrench	91020
5/8" wrench adapter	P-1683
3/4" wrench adapter	P-9813
1-3/16" wrench adapter	P-1689
1-1/2" wrench adapter	P-6040



QSS Assembly Procedure

Fast, Positive Sealing for Pressures up to 15,000 psi (1034 bar)

Hydraulic Set Tool Assembly

1. Cut tubing to length and deburr. Allow extra length for proper engagement (per table below).

Outside Diameter Tube Size inches (mm)	Extra Allowance for Engagement** inches (mm)
1/4 (6.35)	0.75 (19.05)
3/8 (9.53)	0.81 (20.64)
9/16 (14.27)	1.25 (31.75)
3/4 (19.04)	1.63 (41.28)
1 (25.40)	1.75 (44.45)

2. Slip gland nut and sleeve onto tubing. Lubricate the nose of the compression sleeve or the tapered die surface with a metal to metal lubricant. We recommend Jetlube MP-50. Make sure larger end of sleeve is toward gland nut. Push tubing into hydraulic set tool until it bottoms into the setting die. For the 1" size only, assemble the split nut (2A-1) around the tubing between the sleeve and gland with the larger counter bore towards the gland and thread into the cap. Be sure both the split nut and cap have been tightened down and neither can be moved by hand. The cap should always be flush with the top of the housing (2A-2) while the split nut will not. Skip step 3.

3. Thread gland nut into cap until the hex touches the top surface.

4. Pressurize cylinder up to the set pressure (per table below.)

DO NOT EXCEED THE SET PRESSURE.

AS WITH ALL HIGH PRESSURE EQUIPMENT, USE CAUTION DURING OPERATION. SET TOOL MAWP IS 10,000 PSI (690 BAR)

Outside Diameter Tube Size inches (mm)	Set Pressure for Full Tubing Bite psi (bar)
1/4 (6.35) 3/8 (9.53) 9/16 (14.27)	4500 (310) to 5000 (344)
3/4 (19.04)	8000 (552) to 10000 (690)
1 (25.4)	9000 (620) to 9500 (655)

Vent all pressure from hydraulic cylinder. Remove gland assembly from preset tool and inspect biting end of sleeve. Looking inside the biting end of the sleeve you should see a shoulder pushed up from the tubing material. A properly set sleeve must spin freely to achieve a seal. If the sleeve is seized in place after setting, discard and make another.

Do not set a sleeve more than once.

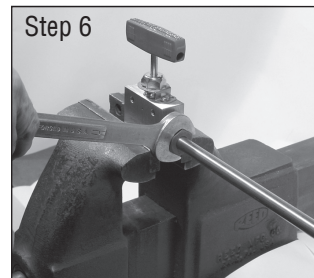
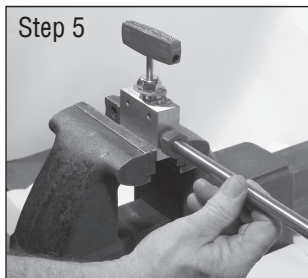
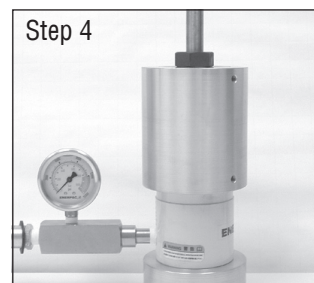
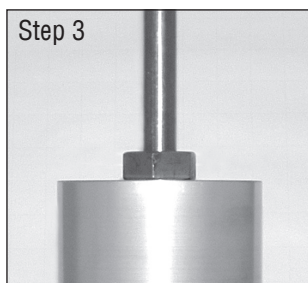
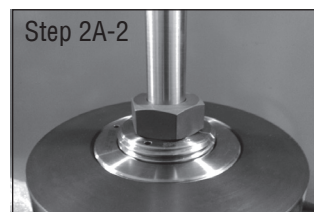
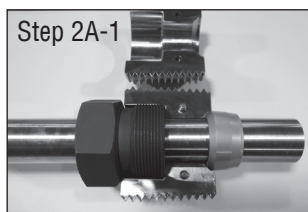
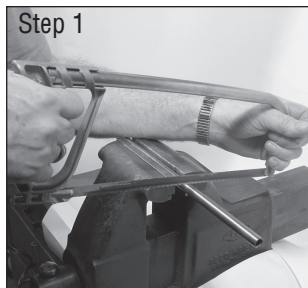
5. Install gland assembly into valve/fitting. If process tolerable, a slight amount of inert grease on the nose of the compression sleeve should be used to aid sealing. Lubrication of gland threads will also aid in assembly.

TIGHTEN GLAND NUT UNTIL SLEEVE BEGINS TO GRIP TUBING.

6. Note starting position of wrench.[†] Tighten gland nut 1/4 turn to complete the QSS connection. Since the mechanical bite has already been completed with the hydraulic set tool, it is permissible to vary the torque to achieve sealing.

If torque values are required, use the following:

Size (in)	Required Torque ft-lbs (Nm)	Max. Torque ft-lbs (Nm)	Torque Wrench Adapter Size	Adapter Part #
1/4	30 (40.7)	50 (67.8)	5/8"	P-1683
3/8	35 (47.5)	80 (108.5)	3/4"	P-9813
9/16	90 (122.0)	135 (183.0)	1-3/16"	P-1689
3/4	175 (237.3)	250 (339.0)	1-1/2"	P-6040
1	375 (508.4)	500 (677.9)	1-3/4"	91269



Completed Connection

The hydraulically set sleeve has cut into the tubing as it moved forward into the tapered seat, upsetting material ahead of it and establishing a shoulder on the tubing to provide positive mechanical support for the tubing end-load. A properly set sleeve cannot be displaced back and forth along the tubing but may be rotated around the tubing.

Reassembly

To reassemble a connection, insert tubing with sleeve and gland nut into valve or fitting.

Install gland into valve/fitting.

TIGHTEN GLAND NUT UNTIL SLEEVE BEGINS TO GRIP TUBING.

Note starting position of wrench.[†] Tighten gland nut 1/4 turn to complete the QSS connection.

** Distance tubing protrudes into connection from face of fitting.

[†] A small blind hole on the face of the gland is provided for a starting position reference.

Parker Autoclave Engineers Medium Pressure tubing is required for these connection components.

When assembling tubing into fittings such as in rack systems, alignment of tubing is critical in connection make up.

Do not force into alignment with connections as bending stress will effect the sealing capability of the connections.

QSS Assembly Procedure

Fast, Positive Sealing for Pressures up to 15,000 psi (1034 bar)

1/4" & 3/8" Tubing Size (Standard setting operation)
See previous page for setting with hydraulic tool.
(Setting with hydraulic tool is recommended but not required).

1. Cut tubing to length and deburr. Allow extra length for proper engagement (per table below).

Outside Diameter Tube Size inches (mm)	Extra Allowance** for Engagement inches (mm)
1/4 (6.35)	0.75 (19.05)
3/8 (9.53)	0.81 (20.64)

2. Slip gland and sleeve onto tubing.

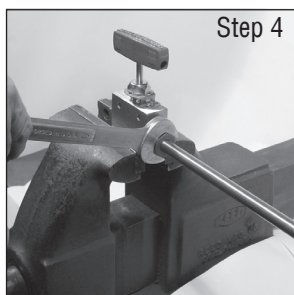
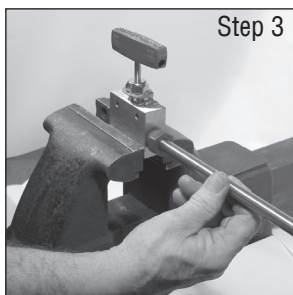
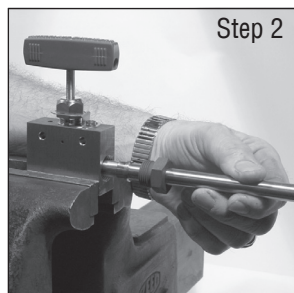
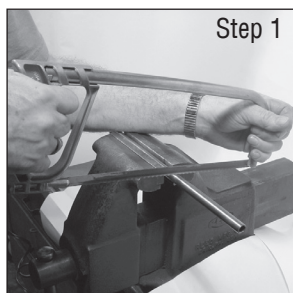
Note: Be sure to remove gland and sleeve from components and slide them onto the tubing before inserting the tubing into the components.

Make sure larger end of sleeve is toward gland.

Push tubing into valve or fitting until it bottoms. If process tolerable, a slight amount of inert grease on the nose of the compression sleeve is recommended to improve sealability. Lubrication of the gland threads will also aid in assembly.

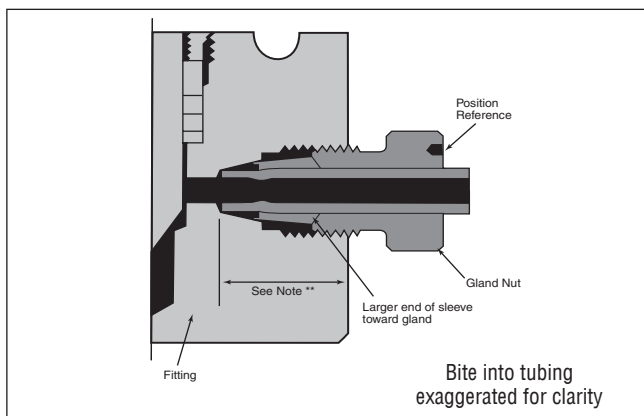
3. TIGHTEN GLAND NUT UNTIL SLEEVE BEGINS TO GRIP TUBING.

4. Note starting position of wrench.† Tighten gland nut 1-1/4 turns to complete the QSS connection.*



Completed Connection

The illustration below shows the condition of sleeve and tubing after completion of "sleeve setting." The sleeve has cut into the tubing as it moved forward into the tapered seat, upsetting material ahead of it and establishing a shoulder on the tubing to provide positive mechanical support for the tubing end-load. A properly set sleeve cannot be displaced back and forth along the tubing but may be rotated around the tubing.



Reassembly

To reassemble a 1/4" or 3/8" connection, insert tubing with sleeve and gland nut into valve or fitting. Tighten gland nut until the sleeve begins to grip tubing. Tighten gland with a wrench 1/4 of a turn for a gas-tight seal. After frequent reassemblies, it may take less than 1/4 turn to affect a gas-tight seal and as little as 1/8 of a turn may be sufficient.

Torque values can be used for both initial setting and reassembly connections. See the previous page for reassembly values and ranges.

Initial setting torque
ft-lbs (NM)

1/4"	40 (54.3)
3/8"	80 (108.5)

* No special torque wrenches or mandrels required.

** Distance tubing protrudes into connection from face of fitting.

† A small blind hole on the face of the gland is provided for a starting position reference.

Parker Autoclave Engineers Medium Pressure tubing is required for these connection components.

When assembling tubing into fittings such as in rack systems, alignment of tubing is critical in connection make up. Do not force tubing into alignment with connections as bending stress will effect the sealing capability of the connections.

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信德迈科技(北京)有限公司 CNMEC Technology

地址：北京市朝阳区望京SOHO-T1-C座2115室

邮编：100102

*Tel: 010-8428 2935 | * Fax: 010-8428 8762

*手机：139 1096 2635

*电子邮件：sales@cnmec.biz

主页：http://www.cnmec.biz

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