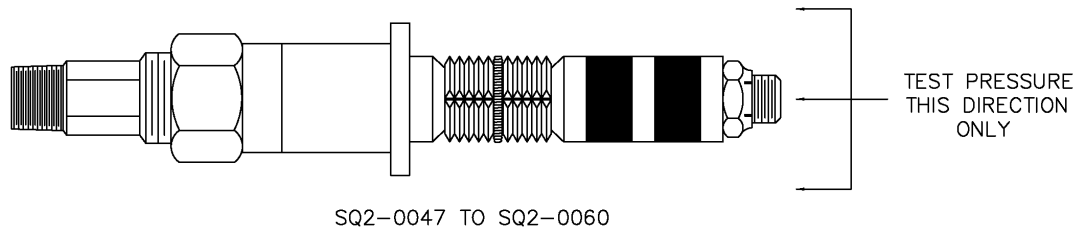
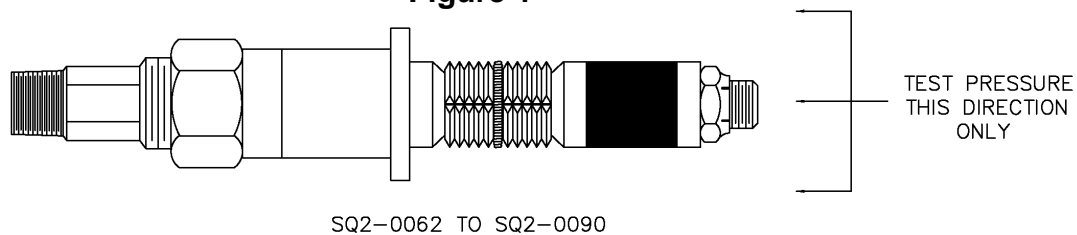


## OPERATING PROCEDURES FOR SQ2 HIGH PRESSURE TEST PLUGS



**Figure 1**



**Figure 2**

**WARNING! FOR PROPER OPERATION, SQ2 PLUGS MUST BE ASSEMBLED AS SHOWN.**

- ♦ **PRESSURE TESTING IS INHERENTLY DANGEROUS. STRICT ADHERENCE TO THESE OPERATION INSTRUCTIONS AND INDUSTRY SAFETY PRACTICES COULD PREVENT INJURY TO PERSONNEL.**
- ♦ **ALL PERSONNEL MUST BE CLEAR OF TEST PLUG WHEN PRESSURE TESTING.**
- ♦ **FOR SAFETY, AN INCOMPRESSIBLE LIQUID SUCH AS WATER SHOULD BE USED AS THE TEST MEDIUM. RESIDUAL AIR OR GAS IS TO BE EVACUATED FROM THE PIPE PRIOR TO TESTING.**
- ♦ **SQUATLINE II PLUGS ARE DESIGNED TO WITHSTAND PRESSURE IN THE DIRECTION SHOWN IN THE ABOVE DRAWINGS. DO NOT USE THESE PLUGS IN REVERSE PRESSURE APPLICATIONS.**
- ♦ **PLUG SIZES AND OPERATING PRESSURES DO NOT APPLY TO COATED PIPE. CONTACT EST CUSTOMER SERVICE PRIOR TO USE OF SQ2 PLUG ON ANY TYPE OF COATED PIPE / TUBE.**

Questions? Contact EST Group Customer Service at any of the following locations.

**CURTISS -  
WRIGHT**

EST Group  
[www.cw-estgroup.com](http://www.cw-estgroup.com)

**North, Central & South America**  
EST Group Corporate Office  
2701 Township Line Road  
Hatfield, PA 19440-1770 USA  
P: +1.215.721.1100  
+1.800.355.7044  
F: +1.215.721.1101  
[est-info@curtisswright.com](mailto:est-info@curtisswright.com)

**Europe / Middle East / Africa**  
EST Group B.V.  
Hoon 312a  
2404 HL Alphen aan den Rijn  
The Netherlands  
P: +31.172.418841  
F: +31.172.418849  
[est-emea@curtisswright.com](mailto:est-emea@curtisswright.com)

**Asia Pacific**  
EST Group Asia  
35 Tannery Road, #11-10 Tannery Block  
Ruby Industrial Complex  
Singapore 347740  
P: +65.6745.8560  
F: +65.6742.8700  
[est-asia@curtisswright.com](mailto:est-asia@curtisswright.com)

**China**  
EST Group China  
Rm 3709, China World Office 1  
No. 1 Jian Guo Men Wai Avenue  
Beijing, 100004  
P: +86.10.65058966  
F: +86.10.65050966  
[est-china@curtisswright.cn](mailto:est-china@curtisswright.cn)

**PRIOR TO USE**

1. PRIOR TO USE, replace damaged or worn grippers and seal. Ensure parts are assembled as shown in figures 1 & 2. The surface between the cone and grippers must be free of friction producing dirt or corrosion. Apply a light lubricant such as SAE 10W motor oil to the tapered surface of the cone. Wipe away any excess lubricant from components making sure to leave an ample amount on tapered cone face and mating surface of the gripper back. Lubricant must not be on seal.
2. Verify proper operation by hand advancing the grippers by hand tightening the hex nut so that the grippers move freely to the end of the tapered cone surface.
  - If grippers move freely to end of the tapered cone surface, then loosen the hex nut back to its original position and go on to next step.
  - Should the grippers not fully retract, if required, remove any light rust, residue or corrosion on the cone face, gripper backs and tops and underside of positioning washer using a Scotch Brite Pad or pad of equivalent quality. Re-lubricate gripper backs, tops and tapered cone surface using a light lubricant such as SAE 10W motor oil. Wipe away any excess lubricant from components making sure to leave an ample amount on tapered cone face and mating surface of gripper back. If grippers still do not fully retract and nut cannot be easily advanced, do not use this plug for testing. Contact EST Group Customer Service for assistance.
3. **The pipe ID to be tested must be within the limits specified on the plug.** Schedule 5 wall thickness pipe, or tubes with a wall thickness thinner than equivalent schedule 10 pipe, must have an OD restraint. Contact EST Customer Service for information. Position the test plug in clean, lubricant free pipe end so that all of the gripper teeth are within the pipe.
4. Center the plug within the pipe while hand tightening the hex nut. Tighten hex nut until the test plug has gripped the pipe ID. Slight wiggling of the hand-tightened plug may allow further hand tightening of the hex nut.
5. Tighten the hex nut to the installation torque specified in Table 1. Use of a calibrated torque wrench is recommended.

***WARNING! FAILURE TO APPLY THE INSTALLATION TORQUE SPECIFIED IN TABLE 1 COULD RESULT IN UNSAFE OPERATION OR LEAKAGE***

6. Install the pressure source or vent to the plug, leak tight. For plugs not being used to pressurize or vent the system install a pipe cap rated to or above plug rating, leak tight.
7. Fill the pipe with test medium while evacuating any residual air or gas. Slowly introduce the test pressure. The test pressure must never exceed the strength of the weakest component within the system being tested. Maximum test pressure based on ASTM A106 Grade B pipe is shown in Table 1.
8. As pressure increases, movement of the shaft as large as 0.10" (2.54mm) may be detected. This movement indicates additional squeeze of the seal and expansion of the grippers and is normal for this plug design. Should movement of the shaft or plug exceed 0.10" (2.54mm), release **ALL** pressure immediately, remove plug, examine, reinstall and begin testing in accordance with this operating procedure. Should movement of the shaft or plug during the test still exceed 0.10" (2.54mm), contact EST Customer Service for technical assistance.
9. Imperfections within the pipe being tested may cause small plug leaks as the test pressure is being increased. Should small leaks develop, additional tightening of the plug may be required. Prior to additional tightening remove pressurization from the system. Tighten the hex nut further and repressurize the system. If leakage continues, the imperfections within the pipe must be removed.

***WARNING! NEVER STAND IN THE POSSIBLE PATH OF THE TEST PLUG.***

***WARNING! NEVER EXCEED THE MAXIMUM TORQUE SPECIFIED IN TABLE 1 AS DAMAGE TO THE PLUG MAY OCCUR.***

10. At the conclusion of the test, release **ALL** pressure, loosen the hex nut, remove and inspect plug. Any plug component which is worn or damaged must be replaced before attempting further testing. Contact EST Customer Service for replacement part information.

**Questions?** Contact EST Group Customer Service at any of the following locations.

**CURTISS -  
WRIGHT**

EST Group  
[www.cw-estgroup.com](http://www.cw-estgroup.com)

**North, Central & South America**  
EST Group Corporate Office  
2701 Township Line Road  
Hatfield, PA 19440-1770 USA  
P: +1.215.721.1100  
+1.800.355.7044  
F: +1.215.721.1101  
[est-info@curtisswright.com](mailto:est-info@curtisswright.com)

**Europe / Middle East / Africa**  
EST Group B.V.  
Hoon 312a  
2404 HL Alphen aan den Rijn  
The Netherlands  
P: +31.172.418841  
F: +31.172.418849  
[est-emea@curtisswright.com](mailto:est-emea@curtisswright.com)

**Asia Pacific**  
EST Group Asia  
35 Tannery Road, #11-10 Tannery Block  
Ruby Industrial Complex  
Singapore 347740  
P: +65.6745.8560  
F: +65.6742.8700  
[est-asia@curtisswright.com](mailto:est-asia@curtisswright.com)

**China**  
EST Group China  
Rm 3709, China World Office 1  
No. 1 Jian Guo Men Wai Avenue  
Beijing, 100004  
P: +86.10.65058966  
F: +86.10.65050966  
[est-china@curtisswright.cn](mailto:est-china@curtisswright.cn)

Prior to storing, dry all parts of the plug and lubricate the shaft threads and hardened steel washer with anti-seize. Store these instructions with the plug.

**Table 1.** SQ2 Test Plug Installation Specifications

Part Number	ID RANGE Inches (mm)	NORMAL INSTALLATION TORQUE Ft-lbs (N-m)	MAXIMUM INSTALLATION TORQUE Ft-lbs (N-m)	MAXIMUM TEST PRESSURE (1) PsiG (BarG)
SQ2-0047	.47 - .50 (11.9 – 12.7)	12 (16.3)	16 (21.7)	6500 (446)
SQ2-0050	.50 - .53 (12.7 – 13.5)	12 (16.3)	16 (21.7)	6500 (446)
SQ2-0053	.53 - .56 (13.5 – 14.2)	12 (16.3)	16 (21.7)	6500 (446)
SQ2-0056	.56 - .60 (14.2 – 15.2)	12 (16.3)	16 (21.7)	6500 (446)
SQ2-0060	.60 - .62 (15.2 – 15.7)	12 (16.3)	16 (21.7)	6500 (446)
SQ2-0062	.62 - .65 (15.7 – 16.5)	16 (21.7)	19 (25.8)	6500 (446)
SQ2-0065	.65 - .68 (16.5 – 17.3)	16 (21.7)	19 (25.8)	6500 (446)
SQ2-0068	.68 - .72 (17.3 – 18.3)	16 (21.7)	19 (25.8)	6500 (446)
SQ2-0072	.72 - .75 (18.3 – 19.1)	30 (40.7)	38 (51.5)	6500 (446)
SQ2-0075	.75 - .78 (19.1 – 19.8)	30 (40.7)	38 (51.5)	6500 (446)
SQ2-0078	.78 - .81 (19.8 – 20.6)	30 (40.7)	38 (51.5)	6500 (446)
SQ2-0081	.81 - .83 (20.6 – 21.1)	30 (40.7)	38 (51.5)	6500 (446)
SQ2-0083	.83 - .87 (21.1 – 22.1)	30 (40.7)	38 (51.5)	6500 (446)
SQ2-0087	.87 - .90 (22.1 – 22.9)	30 (40.7)	38 (51.5)	6500 (446)
SQ2-0090	.90 - .93 (22.9 – 23.6)	30 (40.7)	38 (51.5)	6500 (446)

- (1) MAXIMUM TEST PRESSURES HAVE BEEN DETERMINED FROM TESTS PERFORMED IN CLEAN, DRY ASTM-A-106 GRADE B CARBON STEEL PIPE. MAXIMUM OPERATING PRESSURES CAN VARY FOR DIFFERENT PIPE MATERIALS. PLUG SIZES AND OPERATING PRESSURES DO NOT APPLY TO COATED PIPE. CONTACT EST CUSTOMER SERVICE PRIOR TO USE OF SQ2 PLUG ON ANY TYPE OF COATED PIPE / TUBE.

Questions? Contact EST Group Customer Service at any of the following locations.

**CURTISS -  
WRIGHT**

EST Group  
[www.cw-estgroup.com](http://www.cw-estgroup.com)

**North, Central & South America**  
EST Group Corporate Office  
2701 Township Line Road  
Hatfield, PA 19440-1770 USA  
P: +1.215.721.1100  
+1.800.355.7044  
F: +1.215.721.1101  
[est-info@curtisswright.com](mailto:est-info@curtisswright.com)

**Europe / Middle East / Africa**  
EST Group B.V.  
Hoon 312a  
2404 HL Alphen aan den Rijn  
The Netherlands  
P: +31.172.418841  
F: +31.172.418849  
[est-emea@curtisswright.com](mailto:est-emea@curtisswright.com)

**Asia Pacific**  
EST Group Asia  
35 Tannery Road, #11-10 Tannery Block  
Ruby Industrial Complex  
Singapore 347740  
P: +65.6745.8560  
F: +65.6742.8700  
[est-asia@curtisswright.com](mailto:est-asia@curtisswright.com)

**China**  
EST Group China  
Rm 3709, China World Office 1  
No. 1 Jian Guo Men Wai Avenue  
Beijing, 100004  
P: +86.10.65058966  
F: +86.10.65050966  
[est-china@curtisswright.cn](mailto:est-china@curtisswright.cn)