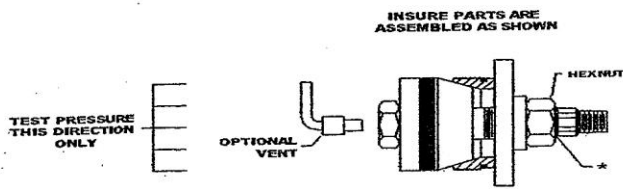
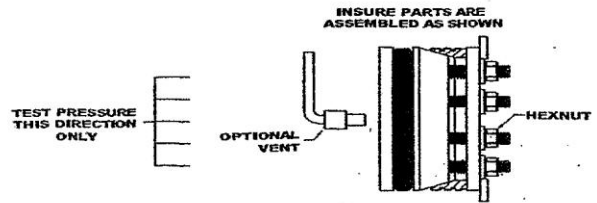


OPERATING INSTRUCTIONS FOR PETERSEN® 147-SERIES HIGH PRESSURE TEST PLUGS 1" to 8"



1" through 6" Test Plugs



8" Test Plugs

NOTE: Threads on shaft have been deformed to prevent plug disassembly and improper re-assembly. Hex nut should never be removed!

WARNING: MAXIMUM HEAD PRESSURES THAT A PIPE PLUG MAY HOLD BACK CAN ONLY BE ESTIMATED. PRESSURES ARE INFLUENCED BY MANY FACTORS INCLUDING FLUID AND DEBRIS IN THE PIPELINE, TYPE AND CONDITION OF PIPE, TIGHTNESS OF PLUG SEAL, AND TEMPERATURE. PLUGS SHOULD ALWAYS BE INSERTED FULLY INTO PIPELINE AND MECHANICALLY BLOCKED WHEN SLIPPAGE MAY CAUSE PROPERTY DAMAGE OR INJURY. NEVER USE A TEST PRESSURE GREATER THAN THE CAPACITY OF THE WEAKEST PIPE OR COMPONENT IN THE SYSTEM. KEEP PERSONNEL OUT OF AREA IN LINE WITH PLUG ENDS DURING USE. THIS IS ANY AREA NEAR A LINE OF SIGHT TO ANY PART OF THE PLUG.

FOR PROPER OPERATION, THESE PLUGS MUST BE ASSEMBLED AND USED ACCORDING TO THESE INSTRUCTIONS.

- **PRESSURE TESTING IS INHERENTLY DANGEROUS.** STRICT ADHERENCE TO THE OPERATION INSTRUCTIONS AND INDUSTRY SAFETY PRACTICES WILL HELP PREVENT INJURY TO PERSONNEL.
 - **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. IN NON-VERTICAL APPLICATIONS THE OPTIONAL VENT, SHOWN ABOVE, WILL ALLOW FOR VENTING MOST AIR OR GAS. VENT IS AVAILABLE FOR MOST PLUGS.
 - **THESE TEST PLUGS ARE DESIGNED TO WITHSTAND PRESSURE IN THE DIRECTION SHOWN IN THE ABOVE DRAWINGS. DO NOT USE THESE PLUGS FOR REVERSE PRESSURE APPLICATIONS.**
 - **PLUG SIZES AND OPERATING PRESSURE DO NOT APPLY TO COATED PIPE.** CONTACT US PRIOR TO USE OF THE PLUG ON ANY TYPE OF COATED PIPE/TUBE.
1. **PRIOR TO USE**, replace damaged or worn grippers and seal. The surface between the cone and grippers must be free of friction producing dirt or corrosion. Verify proper operation of the test plug by hand tightening (plugs with multiple shafts will require use of a wrench) the hex nut(s) so that the grippers move freely to the end of the tapered cone surface. Fully loosen the hex nut(s). Should the grippers not fully retract, apply a light lubricant to the tapered surface of the cone and wipe away any excess. Threads should be kept well lubricated with anti-seize. Inspect threads and apply anti-seize if necessary before testing. If the nut cannot be easily advanced to allow full gripper expansion, **DO NOT USE THIS PLUG FOR TESTING** and contact Customer Service for assistance.
 2. **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 Customer Service for information. Position the test plug in clean, lubricant free pipe end so that all of the gripper is within the pipe.

3. Center the plug within the pipe while hand tightening the hex nut(s). On multi-shaft plugs used horizontally, tightening the bottom hex nuts first will aid in centering the plug. Tighten hex nut(s) until the test plug has gripped the pipe ID. The hex nuts on plugs with multiple shafts must be tightened in star pattern. Slight wiggling of the hand tightened plug may allow further hand tightening of the hex nuts.
4. Tighten the hex nut(s) to the installation torque specified in Table 1 below. Use a calibrated torque wrench.

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

5. 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 or pipe plug that is rated at or above the test plug working pressure. Tighten so that it is leak tight.
6. 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 A1-6 Grade B pipe is shown in Table 1 below.
7. 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 Customer Service for technical assistance.
8. 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(s) further and re-pressurize the system. If leakage continues, the imperfections within the pipe must be removed.

WARNING! KEEP PEOPLE AWAY FROM THE POSSIBLE PATH OF THE TEST PLUG SHOULD IT SLIP.

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

9. At the conclusion of the test, release **ALL** pipeline pressure, loosen the hex nut(s), remove and inspect plug. Worn or damaged plug components must be replaced before attempting further testing. Contact Customer Service for replacement part information.
10. Prior to storing, dry all parts of the plug and lubricate the shaft threads and hardened steel washers with anti-seize.
11. Store these instructions with the plug.

Call Petersen with any questions or suggestions relating to the use of any Petersen product. 800-926-1926

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TABLE 1

INSTALLATION TORQUE SPECIFICATIONS

| PIPE SIZE inches | ID RANGE inches (mm) | NORMAL INSTALLATION TORQUE ft-lbs (kg-m) | MAXIMUM INSTALLATION TORQUE ft-lbs (kg-m) | MAXIMUM TEST PRESSURE psi (bar) |
|---------------------|-------------------------|---|--|---------------------------------------|
| 1" sch 80 | 0.93-1.00 (23.6-25.4) | 50 (7) | 60 (8) | 8600 (590) |
| 1" sch 40 | 1.01-1.09 (25.7-27.7) | 50 (7) | 60 (8) | 6200 (430) |
| 1-1/2" XXS | 1.07-1.2 (27.2-30.5) | 50 (7) | 60 (8) | 13900 (960) |
| 1" sch 10 | 1.07-1.2 (27.2-30.5) | 50 (7) | 60 (8) | 5000 (350) |
| 1-1/4" sch 160 | 1.13-1.24 (28.7-31.5) | 50 (7) | 75 (10) | 9600 (660) |
| 1" sch 5 | 1.13-1.24 (28.7-31.5) | 50 (7) | 75 (10) | 2900 (200) |
| 1-1/4" sch 80 | 1.25-1.33 (31.8-33.8) | 50 (7) | 75 (10) | 7200 (500) |
| 1-1/4" sch 40/std | 1.31-1.43 (33.3-36.3) | 50 (7) | 75 (10) | 5100 (350) |
| 1-1/2" sch 160 | 1.31-1.43 (33.3-36.3) | 50 (7) | 75 (10) | 9400 (650) |
| 1-1/4" sch 10 | 1.41-1.49 (35.8-37.8) | 75 (10) | 150 (21) | 3900 (270) |
| 1-1/4" sch 5 | 1.47-1.61 (37.3-40.9) | 75 (10) | 150 (21) | 2300 (160) |
| 1-1/2" sch 80 | 1.47-1.61 (37.3-40.9) | 75 (10) | 150 (21) | 6500 (450) |
| 2" xxs | 1.47-1.61 (37.3-40.9) | 75 (10) | 150 (21) | 12000 (830) |
| 1-1/2" sch 40/std | 1.58-1.66 (40.1-42.2) | 75 (10) | 150 (21) | 4600 (320) |
| 1-1/2" sch 10 | 1.66-1.77 (42.2-45.0) | 75 (10) | 150 (21) | 3400 (240) |
| 2" sch 160 | 1.66-1.77 (42.2-45.0) | 75 (10) | 150 (21) | 9200 (640) |
| 1-1/2" sch 5 | 1.74-1.91 (44.2-48.5) | 75 (10) | 150 (21) | 2000 (140) |
| 2-1/2" xxs | 1.74-1.91 (44.2-48.5) | 75 (10) | 150 (21) | 12600 (870) |
| 2" sch 80/xs | 1.91-1.99 (48.5-50.5) | 75 (10) | 150 (21) | 5600 (390) |
| | 1.98-2.06 (50.3-52.3) | 75 (10) | 150 (21) | see note 2 |
| 2" sch 40/std | 2.04-2.13 (51.8-53.8) | 75 (10) | 150 (21) | 3900 (270) |
| 2" sch 10 | 2.10-2.22 (53.3-56.4) | 75 (10) | 150 (21) | 2700 (190) |
| 2-1/2" sch 160 | 2.10-2.22 (53.3-56.4) | 75 (10) | 150 (21) | 8200 (570) |
| 2" sch 5 | 2.22-2.30 (56.4-58.4) | 75 (10) | 150 (21) | 1600 (110) |
| 2-1/2" sch 80/xs | 2.27-2.45 (57.7-62.2) | 75 (10) | 150 (21) | 5900 (410) |
| 3" xxs | 2.27-2.45 (57.7-62.2) | 75 (10) | 150 (21) | 11100 (770) |
| 2-1/2" sch 40/std | 2.44-2.54 (62.0-64.5) | 150 (21) | 300 (42) | 4200 (290) |
| | 2.53-2.63 (64.3-66.8) | 150 (21) | 300 (42) | see note 2 |
| 2-1/2" sch 10 | 2.60-2.74 (65.9-69.6) | 150 (21) | 301 (42) | 2400 (170) |
| 3" sch 160 | 2.60-2.74 (65.9-69.6) | 150 (21) | 302 (42) | 7800 (540) |
| 2-1/2" sch 5 | 2.68-2.78 (68.1-70.6) | 150 (21) | 303 (42) | 1600 (110) |
| 3-1/2" xxs | 2.70-2.89 (68.6-73.4) | 150 (21) | 304 (42) | 10200 (700) |
| 3" sch 80/xs | 2.87-2.98 (72.9-75.7) | 150 (21) | 305 (42) | 5200 (360) |
| | 2.96-3.07 (75.2-78.0) | 150 (21) | 306 (42) | see note 2 |
| 3" sch 40/std | 3.04-3.14 (77.2-79.8) | 150 (21) | 307 (42) | 3700 (260) |
| 4" xxs | 3.12-3.32 (79.2-84.3) | 150 (21) | 308 (42) | 9500 (660) |
| 3" sch 10 | 3.23-3.34 (82.0-84.8) | 150 (21) | 309 (42) | 2000 (140) |
| 3" sch 5 | 3.30-3.41 (83.8-86.6) | 150 (21) | 310 (42) | 1400 (100) |
| 3-1/2" sch 80/xs | 3.33-3.44 (84.6-87.4) | 150 (21) | 311 (42) | 4800 (330) |
| 4" sch 160 | 3.41-3.57 (86.6-90.7) | 150 (21) | 312 (42) | 7400 (510) |
| 3-1/2" sch 40/std | 3.52-3.63 (89.4-92.2) | 150 (21) | 313 (42) | 3300 (230) |
| 4" sch 120 | 3.60-3.74 (91.4-95.0) | 150 (21) | 314 (42) | 6000 (410) |
| 3-1/2" sch 10 | 3.73-3.84 (94.7-97.5) | 150 (21) | 315 (42) | 1700 (120) |
| 3-1/2" sch 5 | 3.80-3.91 (96.5-99.3) | 150 (21) | 316 (42) | 1200 (80) |
| 4" sch 80/xs | 3.80-3.91 (96.5-99.3) | 150 (21) | 317 (42) | 4500 (310) |
| | 3.90-4.01 (99.1-101.9) | 150 (21) | 318 (42) | see note 2 |
| 4" sch 40/std | 4.00-4.11 (101.6-104.4) | 150 (21) | 300 (42) | 3100 (210) |
| 5" xxs | 4.03-4.25 (102.4-108.0) | 150 (21) | 300 (42) | 8500 (590) |
| 4" sch 10 | 4.23-4.34 (107.4-110.2) | 150 (21) | 300 (42) | 1500 (100) |
| 4" sch 5 | 4.28-4.47 (108.7-113.5) | 200 (28) | 380 (53) | 1100 (80) |
| 5" sch 160 | 4.28-4.47 (108.7-113.5) | 200 (28) | 380 (53) | 7000 (480) |
| | 4.42-4.58 (112.3-116.3) | 200 (28) | 380 (53) | see note 2 |
| 5" sch 120 | 4.53-4.69 (115.1-119.1) | 200 (28) | 380 (53) | 5500 (380) |
| | 4.66-4.82 (118.4-122.4) | 200 (28) | 380 (53) | see note 2 |
| 5" sch 80/xs | 4.78-4.91 (121.4-124.7) | 200 (28) | 380 (53) | 4000 (280) |
| 6" xxs | 4.87-5.11 (123.7-129.8) | 200 (28) | 380 (53) | 8200 (570) |

TABLE 1 CON'T.

| PIPE SIZE inches | ID RANGE inches (mm) | NORMAL INSTALLATION TORQUE ft-lbs (kg-m) | MAXIMUM INSTALLATION TORQUE ft-lbs (kg-m) | MAXIMUM TEST PRESSURE psi (bar) |
|---------------------|-------------------------|---|--|---------------------------------------|
| 5" sch 40/std | 5.02-5.14 (127.5-130.6) | 200 (28) | 380 (53) | 2700 (190) |
| | 5.14-5.26 (130.6-133.6) | 200 (28) | 380 (53) | see note 2 |
| 6" sch 160 | 5.16-5.37 (131.1-136.4) | 200 (28) | 380 (53) | 6700 (460) |
| 5" sch 10 | 5.27-5.39 (133.9-136.9) | 200 (28) | 380 (53) | 1400 (100) |
| 5" sch 5 | 5.32-5.44 (135.1-138.2) | 200 (28) | 380 (53) | 1100 (80) |
| | 5.34-5.51 (135.6-140.0) | 200 (28) | 380 (53) | see note 2 |
| 6" sch 120 | 5.47-5.64 (138.9-143.3) | 200 (28) | 380 (53) | 5100 (350) |
| | 5.62-5.76 (142.7-146.3) | 200 (28) | 380 (53) | see note 2 |
| 6" sch 80/xs | 5.73-5.87 (145.5-149.1) | 200 (28) | 380 (53) | 3900 (270) |
| | 5.88-6.03 (149.4-153.2) | 200 (28) | 380 (53) | see note 2 |
| 6" sch 40/std | 6.04-6.17 (153.4-156.7) | 200 (28) | 380 (53) | 2500 (170) |
| | 6.18-6.32 (157.0-160.5) | 200 (28) | 380 (53) | see note 2 |
| 6" sch 10 | 6.33-6.47 (160.8-164.3) | 200 (28) | 380 (53) | 1200 (80) |
| 6" sch 5 | 6.38-6.52 (162.1-165.6) | 200 (28) | 380 (53) | 940 (70) |
| | 6.53-6.67 (165.9-169.4) | 200 (28) | 380 (53) | see note 2 |
| | 6.68-6.82 (169.7-173.2) | 200 (28) | 380 (53) | see note 2 |
| 8" sch 160 | 6.78-7.04 (172.2-178.8) | 130 (18) | 175 (24) | 6400 (440) |
| 8" xxs | 6.85-7.09 (174.0-180.1) | 130 (18) | 175 (24) | 6200 (430) |
| 8" sch 140 | 6.97-7.20 (177.0-182.9) | 130 (18) | 175 (24) | 5700 (390) |
| 8" sch 120 | 7.16-7.37 (181.9-187.2) | 130 (18) | 175 (24) | 5100 (350) |
| | 7.30-7.48 (185.4-190.0) | 130 (18) | 175 (24) | see note 2 |
| 8" sch 100 | 7.41-7.59 (188.2-192.8) | 130 (18) | 175 (24) | 4100 (280) |
| 8" sch 80/xs | 7.60-7.75 (193.0-196.9) | 130 (18) | 175 (24) | 3400 (240) |
| | 7.69-7.84 (195.3-199.1) | 130 (18) | 175 (24) | see note 2 |
| 8" sch 60 | 7.78-7.93 (197.6-201.4) | 130 (18) | 175 (24) | 2800 (190) |
| | 7.87-8.02 (199.9-203.7) | 130 (18) | 175 (24) | see note 2 |
| 8" sch 40/std | 7.95-8.10 (201.9-205.7) | 130 (18) | 175 (24) | 2200 (150) |
| 8" sch 30 | 8.04-8.19 (204.2-208.0) | 130 (18) | 175 (24) | 1900 (130) |
| 8" sch 20 | 8.10-8.25 (205.7-209.6) | 130 (18) | 175 (24) | 1700 (120) |
| | 8.20-8.35 (208.3-212.1) | 130 (18) | 175 (24) | see note 2 |
| 8" sch 10 | 8.30-8.45 (210.8-214.6) | 130 (18) | 175 (24) | 980 (70) |
| 8" sch 5 | 8.38-8.53 (212.9-216.7) | 130 (18) | 175 (24) | 720 (50) |

CAUTION: NEVER use a test pressure greater than the weakest component that the system can safely handle. Test pressure specified in the table is equivalent to 80% of pressure that will yield ASTM A106 Grade B pipe. The test pressure for higher and lower strength pipes will differ proportionally. The maximum test pressure for higher strength pipe must never exceed the highest test pressure listed for that pipe OD. **DO NOT** use on coated pipe at any psi.

Sizes which do not have a test pressure listed differ from standard pipe sizes. These sizes are normally used to test tubing. For use of these test plug sizes in tubing with a minimum yield strength of 35ksi (240MPa), the maximum test pressure is estimated by the test pressure listed for the equivalent or next larger pipe OD with the equivalent or next thinner wall thickness. The test pressure for higher and lower strength tubes will differ proportionally. The maximum test pressure for higher strength tubes must never exceed the highest test pressure listed for the equivalent or next larger pipe OD. **NEVER** use a test pressure greater than the weakest component that the system can safely handle.