OPERATING PROCEDURES FOR AUTO-GRIPTIGHT® HIGH PRESSURE TEST PLUGS

WARNING! FOR PROPER OPERATION, GRIPTIGHT 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. IN NON-VERTICAL APPLICATIONS THE OPTIONAL VENT, SHOWN ABOVE, WILL ALLOW FOR VENTING MOST AIR OR GAS. VENT IS AVAILABLE FOR MOST GRIPTIGHTS.***
- ***GRIPTIGHT TEST PLUGS ARE DESIGNED TO WITHSTAND PRESSURE IN THE DIRECTION SHOWN IN THE BELOW DRAWING. DO NOT USE THESE PLUGS FOR REVERSE PRESSURE APPLICATIONS.***
- ***PLUG SIZES AND OPERATING PRESSURES DO NOT APPLY TO COATED PIPE. CONTACT EST CUSTOMER SERVISE PRIOR TO USE OF GRIP TIGHT PLUG ON ANY TYPE OF COATED PIPE / TUBE.***
- ***THE MAXIMUM TEMPERATURE EXPOSURE FOR URETHANE SEALS IS 180°F (82°C). CONTACT EST CUSTOMER SERVICE IF HIGH TEMPERATURE MATERIAL IS NEEDED.***

ENSURE PARTS ARE ASSEMBLED AS SHOWN

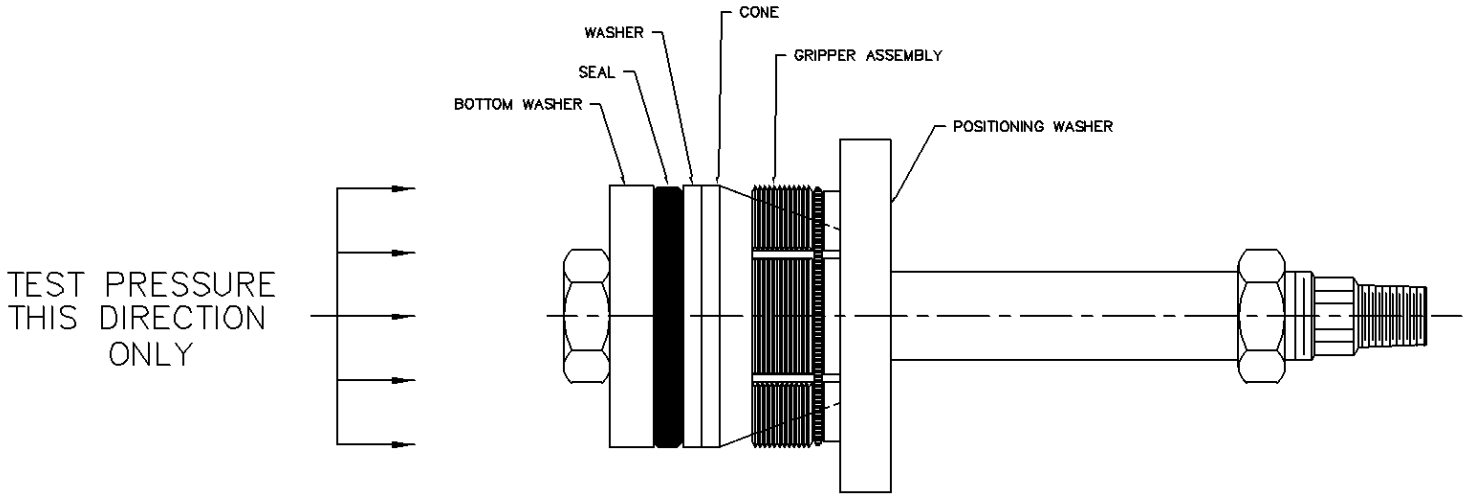

FIGURE 1

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

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PRIOR TO USE

1. PRIOR TO USE, replace damaged or worn grippers and seal. Ensure parts are assembled as shown in figure 1. 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 pushing on positioning washer so that they move freely to the end of the tapered cone surface.

   - If grippers move freely to end of the tapered cone surface, then loosen the jam 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.

CYLINDER/AUTO-GRIPTIGHT ASSEMBLY

1. For sizes that have a 1/2" diameter shaft, the use of the shaft adapter that was supplied with the cylinder assembly is required. Remove jam nut from plug at NPT end and set aside. Replace damaged or worn grippers and seal. Ensure the surface between the cone and grippers must be free of friction production dirt or corrosion. Apply hydraulic thread sealant to the pipe threads on the end of the shaft. Ensure the compression tube around the cylinder piston is in place. the shaft assembly into the front of the Auto-GripTight Cylinder as shown in figure 2 & 4. The shaft assembly will engage the threads in the piston ID. Keep threading until enough of the shaft is extending to allow assembly with the shaft adapter. Tighten down to leak tight. Adjust the shaft adapter to allow proper operation of Auto-GripTight. The grippers should be in the relaxed position, roughly the same diameter as the cones and seals. If excess space exists between parts, the shaft adapter should be turned counter-clockwise to remove the slack. With adjustments complete, hand tighten the jam nut on the shaft adapter against the cylinder piston.

2. For sizes that have a 5/8" diameter shaft, the use of the shaft positioner that was supplied with the cylinder assembly is required. Fully thread the shaft positioner into the cylinder piston. Remove the jam nut from the NPT end of the plug. Holding the wrench flats on the shaft positioner, insert the shaft assembly into the rear of the Auto-GripTight Cylinder as shown in figure 2 & 4. The shaft assembly will engage the threads in shaft positioner ID. Keep threading the plug into the cylinder. To allow proper operation of Auto-GripTight, the grippers should be in the relaxed position, roughly the same diameter as the cones and seals. If excess space exists between parts, the shaft assembly should be threaded into cylinder an additional amount to remove the slack. With adjustments complete, hand-tighten the jam nut on the shaft assembly against the cylinder piston.

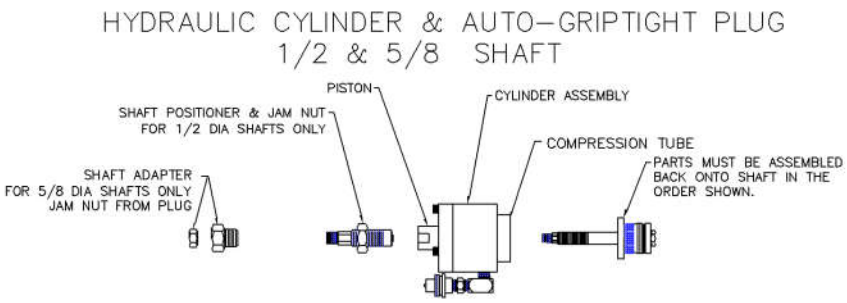

FIGURE 2

3. For sizes that have a 7/8 diameter shaft and larger, remove the jam nut from the NPT end of the plug. Holding the wrench flats on the cylinder, insert the shaft assembly into the rear of the Auto-GripTight Cylinder as shown in figure 3 & 4. The shaft assembly will engage the threads in cylinder ID. Keep threading the plug into the cylinder. To allow proper operation of Auto-GripTight, the grippers should be in the relaxed position, roughly the same diameter as the cones and seals. If excess space exists between parts, the shaft assembly should be threaded into cylinder an additional amount to remove the slack. With adjustments complete, hand-tighten the jam nut on the shaft assembly against the cylinder piston.

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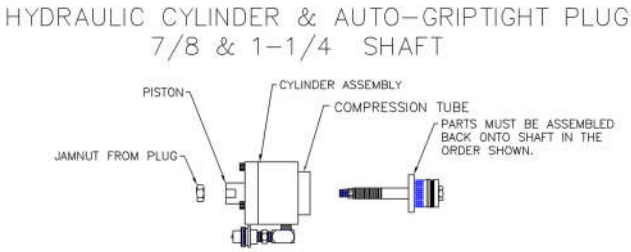

FIGURE 3

HYDRAULIC PUMP ADJUSTMENT

1. Depress the “release” pedal on the hydraulic pump.
2. Connect the clean dry air supply (40-125 PsiG or 3-9 BarG) to the pump.
3. Disconnect any hydraulic hoses that are attached to the pump.
4. Depress the “pump” pedal on the pump and adjust the pressure regulator on the pump to meet the cylinder pressure shown in Table 1.

SYSTEM SET-UP

1. Connect a hydrostatic test supply hose to one Auto-GripTight, leak tight. Connect the bleed valve to the other Auto-GripTight, leak tight.
2. Depress the "release" pedal on the hydraulic pump.
3. Connect hydraulic hose between the pump and each Auto-GripTight cylinder.

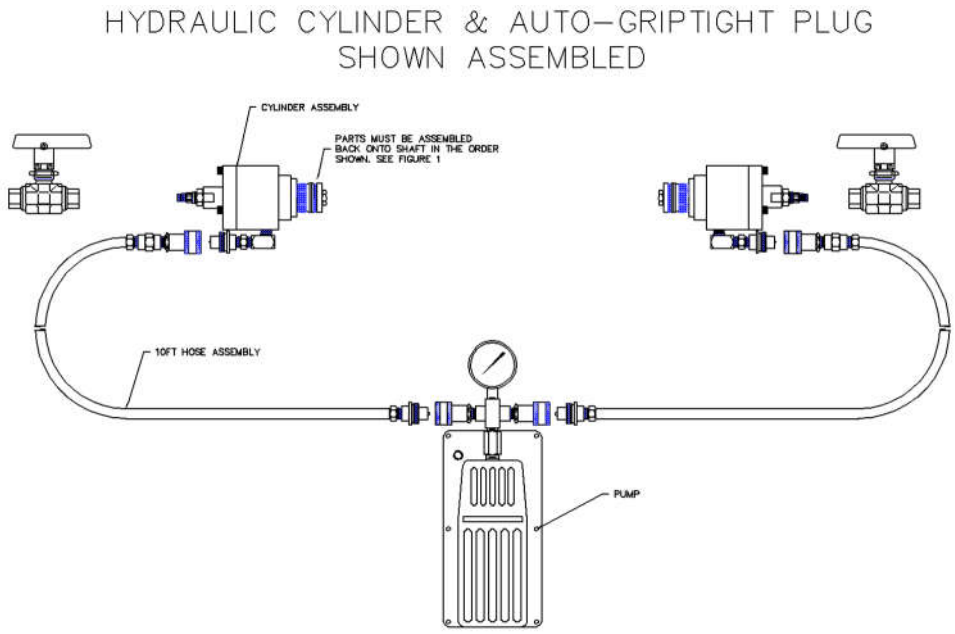

FIGURE 4

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INSTALLATION PROCEDURES

1. The pipe I.D. to be tested must be within the limits specified on the plug. Prepare the pipe end. Auto-GripTight plugs are to be installed in a clean, lubricant free pipe end.

2. Position the Auto-GripTight assemblies in the pipe ends being tested.

3. While holding both cylinder assemblies in place, depress the “pump” pedal until the cylinder pressure listed in Table 1 is achieved.

4. Open the bleed valve on the Auto-GripTight.

5. Fill the pipe with water, while evacuating any residual air or gas. When a constant stream of water flows from the bleed valve, the valve must be closed.

6. Slowly introduce the test pressure. The test pressure must never exceed pressure listed in Table 1.

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 EST Customer Service for technical assistance.

8. Slowly bring the pipe up to the desired test pressure.

9. At the conclusion of the test, release ALL pressure by slowly opening the bleed valve.

10. Depress the ”release” pedal on the pump to release the cylinder pressure. Repeat for all pipes being tested.

11. Withdraw the plug from the pipe and inspect. Any component that is worn or damaged must be replaced before attempting further testing. Contact EST Customer Service for replacement part information. Store these instructions with the plug.

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Table 1. AUTO-GRIPTIGHT CYLINDER PRESSURES & TEST PRESSURES

SALES PART NUMBER	PIPE SIZE (inches)	ID RANGE inches(mm)	CYLINDER PRESSURES PsiG(BarG)	MAXIMUM TEST PRESSURE(1) PsiG(BarG)
GT1P80	1" sch 80	0.93 - 1.00(23.6 - 25.4)	3600 (248)	8600 (590)
GT1P40	1" sch 40	1.01 - 1.09(25.7 - 27.7)	3600 (248)	6200 (430)
GT15PXXS	1-1/2" xxs	1.07 - 1.2(27.2 - 30.5)	3600 (248)	13900 (960)
GT1P10	1" sch 10	1.07 - 1.2(27.2 - 30.5)	3200 (221)	5000 (350)
GT125P160	1-1/4" sch 160	1.13 - 1.24(28.7 - 31.5)	3200 (221)	9600 (660)
GT1P5	1" sch 5	1.13 - 1.24(28.7 - 31.5)	3200 (221)	2900 (200)
GT125P80	1-1/4" sch 80	1.25 - 1.33(31.8 - 33.8)	3200 (221)	7200 (500)
GT125P40	1-1/4" sch 40/std	1.31 - 1.43(33.3 - 36.3)	3200 (221)	5100 (350)
GT15P160	1 1/2" sch 160	1.31 - 1.43(33.3 - 36.3)	3200 (221)	9400 (650)
GT125P10	1 - 1/4" sch 10	1.41 - 1.49(35.8 - 37.8)	3200 (221)	3900 (270)
GT125P5	1-1/4" sch 5	1.47 - 1.61(37.3 - 40.9)	3200 (221)	2300 (160)
GT15P80	1-1/2" sch 80	1.47 - 1.61(37.3 - 40.9)	3200 (221)	6500 (450)
GT2PXXS	2" xxs	1.47 - 1.61(37.3 - 40.9)	3200 (221)	12000 (830)
GT15P40	1-1/2" sch 40/std	1.58 - 1.66(40.1 - 42.2)	3200 (221)	4600 (320)
GT15P10	1-1/2" sch 10	1.66 - 1.77(42.2 - 45.0)	3200 (221)	3400 (240)
GT2P160	2" sch 160	1.66 - 1.77(42.2 - 45.0)	3200 (221)	9200 (640)
GT15P5	1-1/2" sch5	1.74 - 1.91(44.2 - 48.5)	3200 (221)	2000 (140)
GT25PXXS	2-1/2" xxs	1.74 - 1.91(44.2 - 48.5)	3200 (221)	12600 (870)
GT2P80	2" sch 80/xs	1.91 - 1.99(48.5 - 50.5)	3200 (221)	5600 (390)
GT198T		1.98 - 2.06(50.3 - 52.3)	3200 (221)	see note 2
GT2P40	2" sch 40/std	2.04 - 2.12(51.8 - 53.8)	3200 (221)	3900 (270)
GT2P10	2" sch 10	2.10 - 2.22(53.3 - 56.4)	3200 (221)	2700 (190)
GT25P160	2-1/2" sch 160	2.10 - 2.22(53.3 - 56.4)	3200 (221)	8200 (570)
GT2P5	2" sch 5	2.22 - 2.30(56.4 - 58.4)	3200 (221)	1600 (110)
GT25P80	2-1/2" sch 80/xs	2.27 - 2.45(57.7 - 62.2)	3200 (221)	5900 (410)
GT3PXXS	3" xxs	2.27 - 2.45(57.7 - 62.2)	3200 (221)	11100 (770)
GT25P40	2-1/2" sch 40/std	2.44 - 2.54(62.0 - 64.5)	4400 (303)	4200 (290)
GT253T		2.53 - 2.63(64.3 - 66.8)	4400 (303)	see note 2
GT25P10	2-1/2" sch 10	2.60 - 2.74(65.9 - 69.6)	4400 (303)	2400 (170)
GT3P160	3" sch 160	2.60 - 2.74(65.9 - 69.6)	4400 (303)	7800 (540)
GT25P5	2"-1/2" sch 5	2.68 - 2.78(68.1 - 70.6)	4400 (303)	1600 (110)
GT35PXXS	3-1/2" xxs	2.70 - 2.89(68.6 - 73.4)	4400 (303)	10200 (700)
GT3P80	3" sch 80/xs	2.87 - 2.98(72.9 - 75.7)	4400 (303)	5200 (360)
GT296T		2.96 - 3.07(75.2 - 78.0)	4400 (303)	see note 2
GT3P40	3" sch 40/std	3.04 - 3.14(77.2 - 79.8)	4400 (303)	3700 (260)
GT4PXXS	4" xxs	3.12 - 3.32(79.2 - 84.3)	5000 (345)	9500 (660)
GT3P10	3" sch 10	3.23 - 3.34(82.0 - 84.8)	5000 (345)	2000 (140)
GT3P5	3" sch 5	3.30 - 3.41(83.8 - 86.6)	5000 (345)	1400 (100)
GT35P80	3-1/2" sch 80/xs	3.33 - 3.44(84.6 - 87.4)	5000 (345)	4800 (330)
GT4P160	4" sch 160	3.41 - 3.57(86.6 - 90.7)	5000 (345)	7400 (510)
GT35P40	3-1/2" sch 40/std	3.52 - 3.63(89.4 - 92.2)	5000 (345)	3300 (230)
GT4P120	4" sch 120	3.60 - 3.74(91.4 - 95.0)	5000 (345)	6000 (410)
GT35P10	3-1/2" sch 10	3.73 - 3.84(94.7 - 97.5)	5000 (345)	1700 (120)
GT35P5	3-1/2" sch 5	3.80 - 3.91(96.5 - 99.3)	5000 (345)	1200 (80)
GT4P80	4" sch 80/xs	3.80 - 3.91(96.5 - 99.3)	5000 (345)	4500 (310)
GT390T		3.90 - 4.01(99.1 - 101.9)	5000 (345)	see note 2
GT4P40	4" sch 40/std	4.00 - 4.11(101.6 - 104.4)	5000 (345)	3100(210)
GT5PXXS	5" xxs	4.03 - 4.25(102.4 - 108.0)	5000 (345)	8500 (590)
GT4P10	4" sch 10	4.23 - 4.34(107.4 - 110.2)	5000 (345)	1500 (100)

(1) NEVER use a test pressure greater than the weakest component in the system can safely handle. Test pressure specified in Table 1 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 PsiG: Contact EST to determine use.
(2) Sizes which do not have a test pressure listed differ from standard pipe sizes. These plug sizes are normally used to test tubing. For use of these GripTight sizes in tubing with a minimum yield strength of 35ksi (240 MPa), 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 in the system can safely handle.

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