

Operating Procedures for 3/4" and 1" GripTight® Reverse Pressure Test Plugs

WARNING

- ⚠ Pressure testing is inherently dangerous. Strict adherence to these operating instructions and industry safety practices could prevent injury to personnel.
- ⚠ All personnel must be clear of test plug during pressure testing. Never stand in the direct path of a plug during any of the work performed under pressure.
- ⚠ Pressures must never exceed the maximum pressure rating of the weakest component in a system.
- ⚠ An incompressible liquid such as water should be used as the test medium. Residual air or gas must be evacuated from the pipe prior to testing.
- ⚠ Remove metal shipping band or tape securing assembly prior to testing.
- ⚠ Do not use this plug in pipes with internal coatings. Contact EST Group Customer Service before using in any type of coated pipe and/or tube.
- ⚠ Failure to apply specified installation torque (see Table 1) may result in unsafe operation or leakage. Installation equipment and tool must be adequately sized to handle installation torque.
- ⚠ Failure to replace worn or damaged components may affect the ability of the plug to hold pressure and may cause injury or damage to persons or property within the test area.



Figure 1: 3/4" and 1" GripTight Reverse Pressure Test Plug

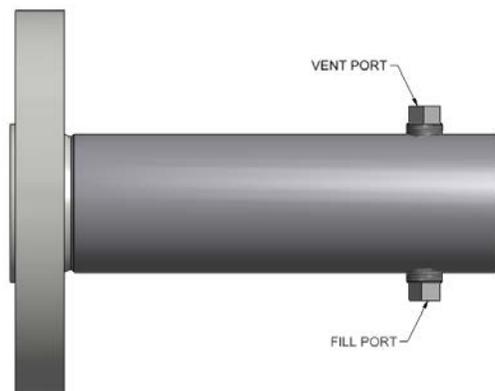


Figure 2: 3/4" and 1" GripTight Reverse Pressure Test Plug Flange Cap Assembly



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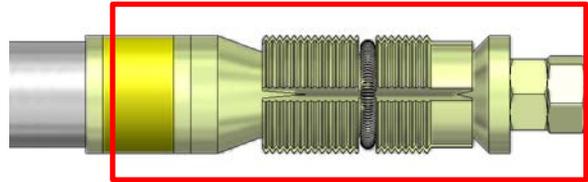
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1. Test Preparation

Perform the steps outlined below prior to performing your pressure test.

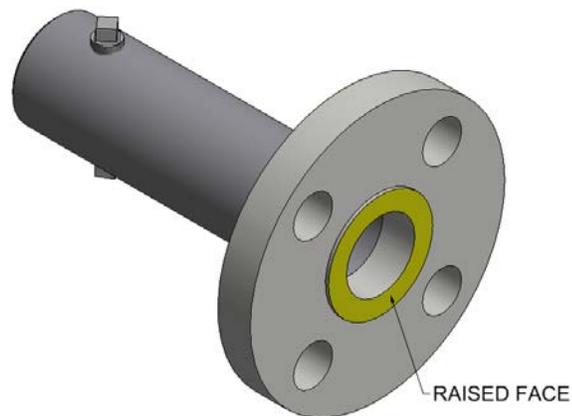
Step/Action	Additional Action/Information/Result
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1. Visually inspect the plug for worn or damaged components. Check the seal for any cuts, scores and deformations. Replace parts as needed.



- The surface between the Cones and Grippers must be free of friction producing dirt or corrosion.

2. Inspect the raised face (gasket surface) of the Flange Cap Assembly and mating flange to be tested. Damage or surface imperfections may result in leakage and should be repaired prior to testing.



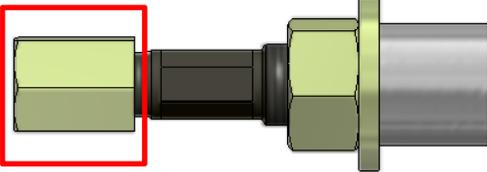
3. Tighten the Compression Nut so the Grippers move freely to the end of the tapered cone surfaces.

<i>If</i>	<i>then</i>
Grippers move freely to end of the tapered cone surfaces,	loosen the Compression Nut back to its original position and go to the next step.
Grippers do not fully retract,	apply a light lubricant such as SAE 10wt motor oil to the tapered surface of the Cones and wipe away any excess. Tighten the Compression Nut so the Grippers move freely to the end of the tapered cone surfaces.
you cannot easily tighten the Compression Nut to allow full Gripper expansion,	do not use this plug for testing. Contact EST Group Customer Service for assistance.

Step/Action	Additional Action/Information/Result
4. Verify that the pipe size and schedule stamped on the plug is equivalent to pipe size you are testing.	<p>NOTE: The stamp 1P80 indicates that the plug is suitable for use in 1" SCH 80 pipe size. See Table 1 for pipe size and schedule of plugs. The Seal OD must agree with the Plug OD listed in Table 1 for the corresponding pipe size.</p>
5. Clean and dry the pipe ID.	<ul style="list-style-type: none"> All moisture, debris and excessive scale must be removed from the pipe ID to ensure proper seal is established during the pressure test. For non-seamless pipes (i.e.: longitudinal or spiral welded), if the weld seam protrudes into the pipe ID, it is to be ground flush with the pipe ID to prevent interference with the Grippers or Seal.
6. Spread antiseize over both sides of the Hardened Washer and threads of the Shaft.	<p>Doing this ensures that all installation torque is transmitted to the Seal.</p> <div style="border: 2px solid red; padding: 10px; text-align: center;"> <p>CAUTION</p> <p>Special caution must be taken when applying lubricant and handling the test plug. The lubricant must not come in contact with the Seal or tube ID. Failure to properly use antiseize on the Shaft threads and Hardened Washer may cause an incomplete torque transmittal resulting in a decrease in pressure rating and unsafe operation.</p> </div>

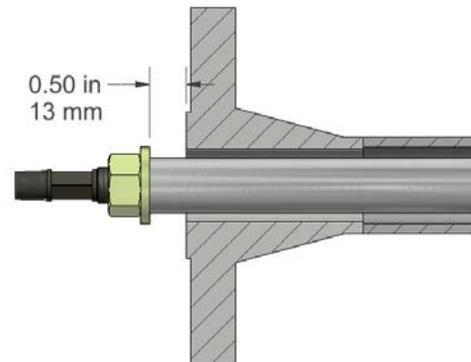
2. Performing the Pressure Test

Perform the steps outlined below when conducting a pressure test.

Step/Action	Additional Action/Information/Result
1. Remove the High Pressure Pipe Cap from the end of the Shaft to ensure that upstream pressure does not accumulate during plug installation. Set it aside for use in a later step.	
2. Position the plug in a clean, lubricant free pipe end.	

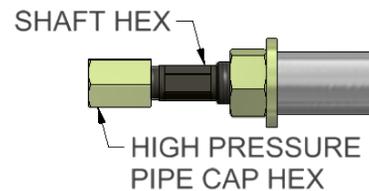
Step/Action**Additional Action/Information/Result**

- Torque the Compression Nut. Keep the plug from rotating during installation by holding the Shaft Hex with a wrench. See Table 1 for installation torque specifications and hex sizes.

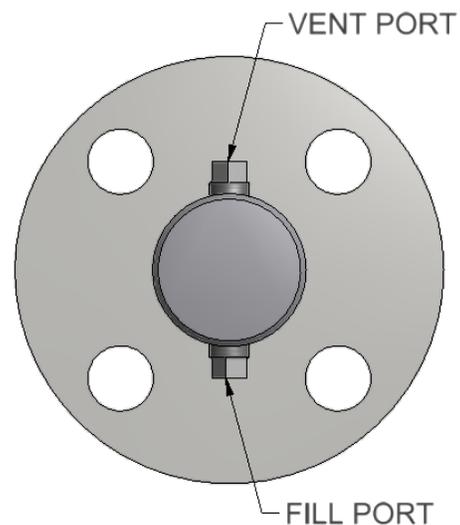


Note: A gap of at least 0.50 in (13 mm) between the Hardened Washer and flange face is necessary for proper plug operation.

- Reinstall the High Pressure Pipe Cap leak tight. Use the Shaft Hex to keep the Shaft from rotating during installation. Refer to Table 1 for Shaft Hex and High Pressure Pipe Cap Hex sizes.

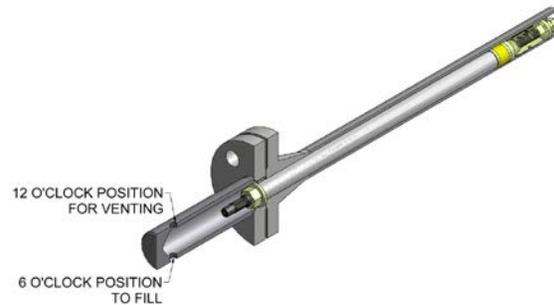


- Remove the Vent and Fill Port plugs from the Flange Assembly. Set the Port plugs aside for use in a later step.



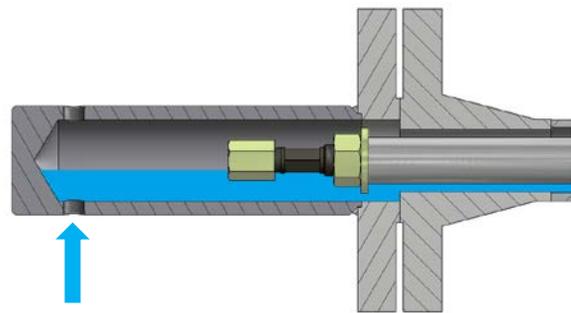
Step/Action**Additional Action/Information/Result**

6. Position the Flange Assembly. One of the NPT ports must be oriented in the 12 o'clock position; the other should be oriented in the 6 o'clock position. Follow industry standards for flange installation.



- Flange Assembly installed.

7. Install the pressure source and/or vent to the Flange Assembly, leak tight. Fill with an incompressible test medium (e.g. water) while evacuating any residual air. After all of the residual air is evacuated from the test area, cap or block off the Vent Port leak tight.



- For horizontal lines, ensure the Vent Port is in the twelve o'clock position while the Fill Port is in the six o'clock position.

Note: Never stand in the possible path of the test plug.

8. Slowly increase the test pressure to the desired test level.
9. If a leak past the plug or pressure drop occurs, stop the test and release all pressure, then remove the Flange Assembly. Before making any adjustments, slowly remove the High Pressure Pipe Cap. If any Upstream Pressure is present, it will leak at this connection. Monitor the High Pressure Pipe Cap carefully during removal to ensure there is no Upstream Pressure present.

- The test pressure must never exceed the pressure listed in Table 1 or the strength of the weakest component within the system being tested.
- Check the gap between the Hardened Washer and the flange face. If it is less than 0.50 in (13 mm), loosen the plug, adjust the gap, then retorque the Compression Nut
- Imperfections within the pipe may cause small plug leaks as the test pressure increases. Should small leaks develop; additional tightening of the plug may be required.

Note: Do not make adjustments with pressure in the system.

- Release pressure, then remove the Flange Assembly. Re-torque the plug. Do not exceed the maximum torque specified in Table 1.
- If leakage continues, the imperfections within the pipe must be removed.

Step/Action	Additional Action/Information/Result
<p>10. At the conclusion of the test, release ALL pressure prior to Flange Assembly removal. Remove the Flange Assembly.</p> <div data-bbox="191 317 748 510" style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Note: Slowly loosen and remove the High Pressure Pipe Cap to vent all upstream pressure. If Upstream Pressure is present, it will leak at this connection.</p> </div> <p>11. Loosen the Compression Nut and remove the GripTight Reverse Pressure Test Plug.</p> <p>12. Remove and inspect the plug. Any plug components which are worn or damaged must be replaced before attempting further testing.</p>	<div data-bbox="781 237 1451 579" style="border: 2px solid red; padding: 10px; margin-bottom: 10px;"> <p style="text-align: center;">Caution</p> <ul style="list-style-type: none"> ⚠ Verify that all upstream pressure has been eliminated prior to removing the plug. ⚠ If noise level at the testing location do not readily allow the above audible detection methods, alternate means of verification such as soapy water or leak detection spray may be used. Follow site specific guidelines with regards to chemical usage. </div> <ul style="list-style-type: none"> • To help the Grippers to release, the plug may need to be pushed slightly forward. • The seal may need time to relax. <div data-bbox="781 741 1385 856" style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Note: Make sure the Compression Nut is loosened sufficiently. Permanent Seal deformation may occur if the Seal is left compressed.</p> </div>

3. Part Replacement – Disassembly

When performing the steps outlined below, be sure to keep track of the assembly order of component parts. Occasionally a flathead screwdriver may be needed to pry Seal away from Washer faces to facilitate removal. If this is the case, be sure not to damage any components while using the flathead screwdriver.

Step/Action	Additional Action/Information/Result
<p>1. Disassemble the plug:</p>	<p>Component parts of the plug must be removed in the following order, reference Figure 1 :</p> <ol style="list-style-type: none"> 1. Jam Nuts 2. Bottom Cone 3. Gripper and Retaining Spring Assembly 4. Front Cone 5. Seal and Seal Washers 6. Compression Tube 7. Hardened Washer 8. Compression Nut <div data-bbox="711 1581 1360 1749" style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p>Note: Some plugs have a 45° tapered Bottom Cone and a 20° tapered Top Cone. Their orientation is critical to proper plug operation. When reassembling the plug, make sure the Cones and Gripper are assembled in the correct orientation. Use Figure 1 as a reference.</p> </div>

Step/Action	Additional Action/Information/Result	
2. Visually inspect component parts for damages.	<i>If</i>	<i>then</i>
	damaged components are identified,	contact EST Group Customer Service for replacement parts.
	no damaged components are identified,	reassemble the plug (see Figure 1) and prep for storage.

4. Storage

Prior to storing, clean and dry the plug. Re-lubricate the Shaft threads and between the Hex Nut and mating surface as previously described. Carefully apply a coat of light oil to the the tapered surfaces of the Bottom and Top cones. Thread the High Pressure Pipe Cap onto the GripTight Reverse Pressure Test Plug Shaft, and thread the Vent Port and Fill Port plugs back into the Flange Assembly. Store the GripTight Reverse Pressure Test Plug in an area out of direct exposure to sun, UV light or temperature extremes. Excessive heat or UV light will damage and prematurely degrade the Seal elements.

Store these instructions with the test plug.

Questions

Contact EST Group Customer Service at any of the following locations with questions.

- In USA and Canada: tel: 800-355-7044, fax: 215-721-1101, e-mail: est-info@curtisswright.com
- In Europe: tel: +31-172-418841, fax: +31-172-418849; e-mail: est-emea@curtisswright.com
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- On the Internet: <http://estgroup.cwfc.com>

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Table 1: GripTight Reverse Pressure 3/4" - 1" Test Plug Installation Torque Specifications

SALES NUMBER	PIPE SIZE	PIPE SCH	OVERALL LENGTH OF GTRP PLUG		PIPE ID - NOMINAL	PLUG OD	CLEARANCE BETWEEN SEAL AND NOMINAL PIPE ID		PIPE CAP HEX SIZE	SHAFT HEX SIZE	COMPRESSION NUT HEX SIZE	NORMAL INSTALLATION TORQUE		MAXIMUM INSTALLATION TORQUE	
			in	mm			in	in				in	mm	in	in
GTRP-075P-80	3/4	80	18 3/4	476	0.74	0.65	0.09	2.3	9/16	3/8	3/4	8	11	12	16
GTRP-075P-40		40	18 3/4	476	0.82	0.72	0.10	2.5	9/16	3/8	3/4	8	11	12	16
GTRP-1P-160	1	160	18 3/4	476	0.82	0.72	0.10	2.5	9/16	3/8	3/4	8	11	12	16
GTRP-1P-80		80	18 3/4	476	0.96	0.84	0.12	3.0	9/16	3/8	3/4	12	16	16	22
GTRP-1P-40		40	18 3/4	476	1.05	0.93	0.12	3.0	9/16	3/8	3/4	12	16	16	22

Table 2: GripTight Reverse Pressure Test Plug and Flange Assembly Specifications

GTRP TEST PLUG			FLANGE ASSEMBLY				
SALES NUMBER	PIPE SIZE	PIPE SCH	SALES NUMBER	FLANGE CLASS	PRESSURE RATING		NPT PORT SIZE (FILL AND VENT)
					PsiG	BarG	
GTRP-075-80	3/4	80	GTRP-075-150	150	450	31	1/8
GTRP-075-40		40	GTRP-075-300	300	1125	78	
			GTRP-075-600	600	2250	155	
GTRP-1P-160	1	160	GTRP-1-150	150	450	31	1/8
GTRP-1P-80		80	GTRP-1-300	300	1125	78	
GTRP-1P-40		40	GTRP-1-600	600	2250	155	

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