Operating Procedures for 8” – 12” GripTight® Reverse Pressure Test Plugs

WARNING

- ⚠ Pressure testing is inherently dangerous. Strict adherence to these Operating Procedures and industry safe 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 must be used as the test medium. Residual air or gas must be evacuated from the pipe prior to testing.
- ⚠ GripTight Reverse Pressure Test Plugs for 8” to 12” (DN200 to DN300) applications are not designed to withstand upstream pressure. Do not use these plugs for upstream pressure applications.
- ⚠ Verify plug sizing located on test plug prior to use.
- ⚠ Do not exceed the maximum pressure of the flange.
- ⚠ Plug sizes and operating pressures do not apply to coated pipe. Contact EST Group Customer Service prior to using these plugs on any type of coated pipe/tube.
- ⚠ GripTight Reverse Pressure Test Plugs work in conjunction with a modified blind flange equipped with Fill and Vent ports. Contact EST Group customer Service for information.
- ⚠ Use of a Lanyard Assembly a GripTight Reverse Pressure is recommended. Contact EST Group customer service for information.
- ⚠ Always ensure that GripTight Reverse Pressure Test Plugs are assembled as shown in Figure 1.
- ⚠ Accepted industry safety practices must be followed when lifting and moving test plugs and during all steps related to installing and removing the test plug.
- ⚠ Never stand in the possible path of the test plug during pressure testing.
- ⚠ Never exceed the maximum torque specified in Table 1. Excessive torque may damage the plug.
- ⚠ Do not mar or scratch the Tapered Cone or tapered Gripper surface.

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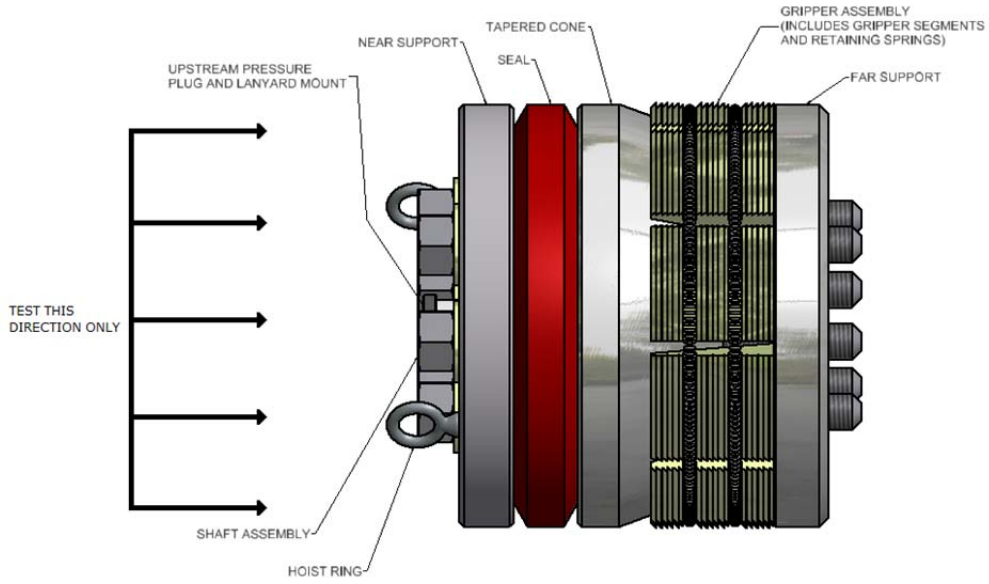


Figure 1: 8" - 12" (DN200 – DN300) GripTight Reverse Pressure Test Plug

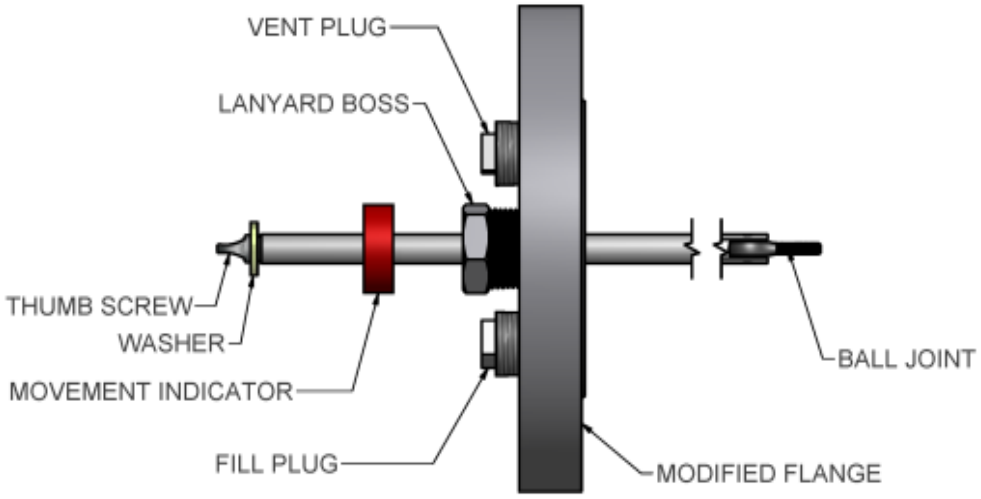
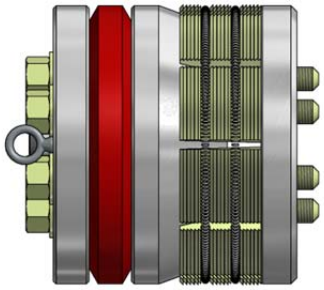


Figure 2: Modified Blind Flange with Optional Lanyard Assembly

1. Test Preparation

Perform the steps outlined below prior to performing your pressure test

Step/Action	*Additional Action/Information/Result*
1. Visually inspect the plug for worn or damaged components. Check the seal and o-rings for any cuts, scores or deformations. Replace as needed.	 • Use a stiff wire brush to remove any debris from the gripper teeth. • The surface between the Cones and Grippers must be free of friction producing dirt or corrosion.
2. Using a wrench, tighten the Shafts so the Grippers move freely to the end of the Tapered Cone surface.	

If	*then*
Grippers move freely to end of the Tapered Cone surface,	loosen the Shafts back to their original positions 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 Cone and wipe away any excess. Tighten the Shafts so the Grippers move freely to the end of the Tapered Cone surface.
you cannot easily tighten the Shafts to allow full Gripper expansion,	do not use this plug for testing. Contact EST Group Customer Service for assistance.

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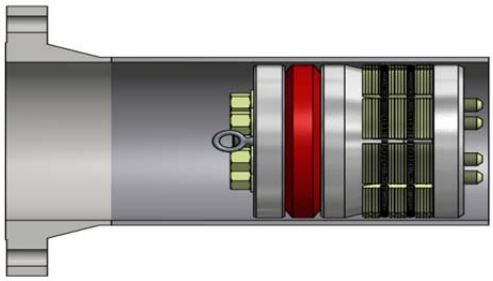
Step/Action	*Additional Action/Information/Result*
3. Verify that the pipe size and schedule stamped on the plug is equivalent to pipe size you are testing.	**NOTE:** The stamp **12P80** indicates that the plug is suitable for use in 12" (DN300) SCH 80 pipe size. See Table 1 for pipe size and schedule of plugs. The Plug OD must agree with the Plug OD listed in Table 1 for the corresponding pipe size.
4. Clean and dry the pipe ID.	• 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 must be ground flush with the pipe ID to prevent interference with the Grippers or Seal.
5. Spread antiseize over both sides of the Hardened Washer and threads of the Shafts.	Doing this ensures that all installation torque is transmitted to the Seal. **CAUTION** 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 leaks, excessive plug movement, and unsafe operation.

2. Performing the Pressure Test

Perform the steps outlined below when conducting a pressure test.

Step/Action	*Additional Action/Information/Result*
1. Position the plug in a clean, lubricant free pipe end. Recommended installation depth is 6" to 14" (152mm to 356mm) from the face of the welded flange.	

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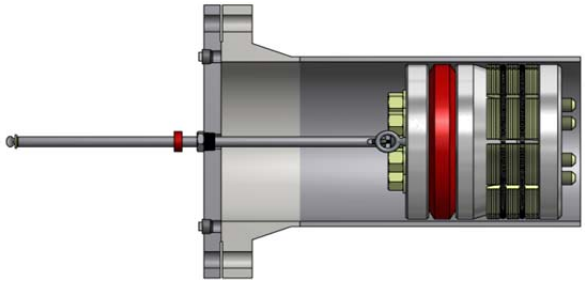
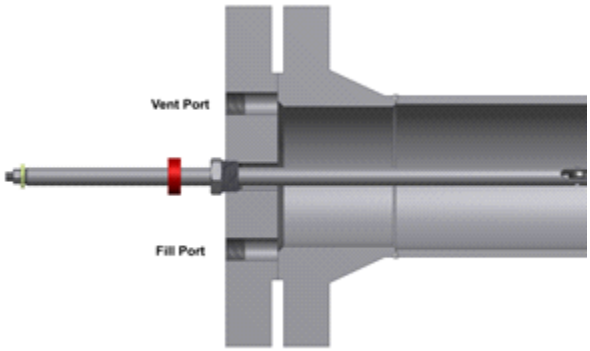
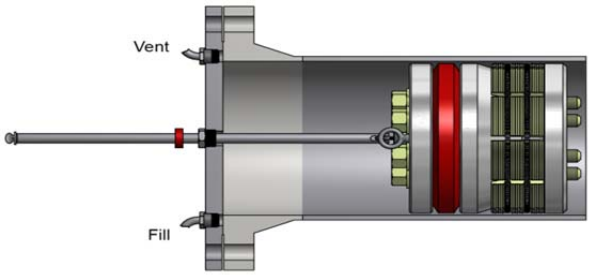
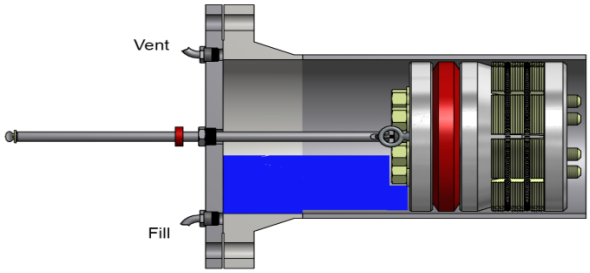
Step/Action	*Additional Action/Information/Result*
2. Using a calibrated torque wrench, tighten the Shafts in standard cross or star pattern to at least the nominal installation torque specified (see Table 1). Approach the desired torque value by increasing the torque incrementally.	• On plugs installed horizontally, tightening the bottom hex nut/shafts first will aid in centering the plug. • Cases may occur (pipe defects, out-of-roundness, pipe seams, etc.) where a higher installation torque is necessary to seal the pipe. If a higher installation torque is necessary, increase the torque incrementally until the plug has sealed. **Note** Do not exceed the maximum installation torque (see Table 1).
3. Remove the Thumb Screw, Washer, Movement Indicator, and Lanyard Boss from the Lanyard Assembly. Thread the Ball Joint into the Upstream Pressure Plug **Hand Tight 10 in-lbs (1.1 N-m)max**.	**Note** If a Lanyard Assembly is not being used, install the Modified Blind Flange onto the flange being tested. The Vent port must be in the twelve o-clock position, and the Fill port must be in the six o'clock position. After correctly installing the Modified Blind Flange leak tight, please skip to step 6. • Ensure the Upstream Pressure Plug has fully engaged the Near Support before continuing. ⚠ The Upstream Pressure Plug is designed to disengage and vent upstream pressure. If the Upstream Pressure Plug disengages at any point in the process, stop the pressure test, locate the source of the pressure and take the steps necessary to remove the upstream pressure.
4. Install the Modified Blind Flange, while guiding the Lanyard Assembly through the center hole, onto flange to be tested, leak tight. Follow industry standards for flange installation.	 • Modified Blind Flange and Lanyard Assembly is installed

Step/Action	*Additional Action/Information/Result*
5. Install Lanyard Boss over Lanyard Rod and screw into Modified Flange Assembly, leak tight. Slide the Movement Indicator onto the Lanyard Rod, approximately 2" (51mm) from the flange. Install the Washer and Thumb Screw hand tight onto the Lanyard Rod.	 • Modified Blind Flange and Lanyard Assembly is installed
6. Install the pressure source to the Fill Port and valve/gauge assembly to the Vent Port, leak tight.	
7. Fill the pipe cavity with test medium while evacuating any residual air or gas from a high-point Vent on the Modified Blind Flange.	

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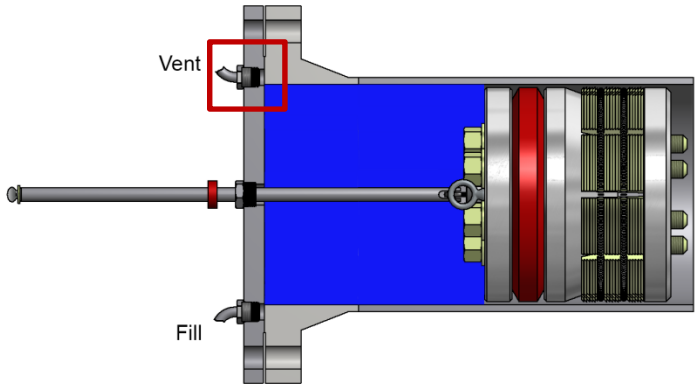
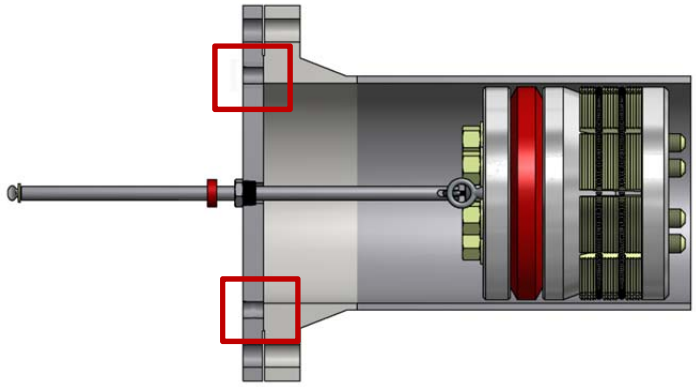
Step/Action	*Additional Action/Information/Result*
8. Close the Vent Port valve and slowly introduce the test pressure. Do not exceed the maximum pressure of the GripTight Reverse Pressure Test Plug or the Modified Blind Flange being used.	 • Imperfections within the test pipe may cause small plug leaks as the test pressure is being increased. Should small leaks develop, additional tightening of the plug may be required. • Release all pressure from the system and remove the Modified Blind Flange. Make any necessary adjustments, then re-torque. Do not exceed the maximum torque specification (see Table 1). • If leakage continues, the imperfections within the pipe must be removed.
9. Perform the pressure test.	**Note** Do not exceed the maximum pressure of the GripTight Reverse Pressure Test Plug or the Modified Blind Flange being used.
10. Monitor the Movement Indicator during testing.	• Plug movement up to 5/8" (16mm) is normal and acceptable. If excessive plug movement occurs, relieve the test pressure, remove the Modified Blind Flange, reposition the plug in the pipe if necessary, and re-torque the plug. Do not exceed the maximum torque specification given (see Table 1).

Step/Action	*Additional Action/Information/Result*
11. At the conclusion of the test, release ALL pressure.	
12. Remove the Modified Flange.	• If a Lanyard Assembly is being used, removal can be performed by reversing the installation process.
13. Remove and inspect the plug. Any plug components which are worn or damaged must be replaced before attempting further testing.	• The seal may need time to relax.

3. Part Replacement – Disassembly

When performing the steps outlined below, be sure to keep track of the assembly order of component parts.

Step/Action	*Additional Action/Information/Result*
1. Disassemble the plug.	Component parts of the plug must be removed in the following order, reference Figure 1 : • Shaft Assemblies and Washers • Near Support with Hoist Rings • Seal • Tapered Cone • Gripper Assembly

Step/Action	*Additional Action/Information/Result*
2. Visually inspect component parts for damages.	

If	*then*
damaged components are identified,	contact EST Group Customer Service for replacement parts.
no damaged components are identified,	• clean and dry the plug • re-lubricate the Shaft Assemblies and washers, • reassemble the plug by reversing the disassembly process.

4. Storage

Store the assembled 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.

NOTE:
The maximum temperature exposure for urethane seals is 180°F (82°C). Do not store the GripTight Reverse Pressure Test Plug in an area where it could experience temperatures in excess of this maximum temperature rating.

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, 215-721-1100; e-mail: est-info@curtisswright.com
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- On the Internet: http://estgroup.cwfc.com

EST Group provides a complete range of repair products, services, and replacement parts covering the life cycle of heat exchangers and condensers; additionally EST Group provides products and services to facilitate pressure testing pipe, piping systems, pressure vessels, and their components. Visit EST Group on the Internet at http://estgroup.cwfc.com.

Table 1: GripTight Reverse Pressure Measurements and Installation Torque

SALES NUMBER	PIPE SIZE	PIPE SCH	OVERALL PLUG LENGTH		PIPE ID - NOMINAL		PLUG OD		CLEARANCE BETWEEN SEAL AND NOMINAL PIPE ID		NORMAL INSTALLATION TORQUE		HEX NUT WRENCH SIZE	MAXIMUM INSTALLATION TORQUE	
			in	mm	in	mm	in	mm	in	mm	Ft-lbs	N-m	in	Ft-lbs	N-m
GTRP - 8P80	8	80	10.45	265	7.63	194	7.38	187	0.25	6.4	85	115	11/16	140	190
GTRP- 8P40		40/STD	10.45	265	7.98	203	7.73	196	0.25	6.4	85	115	11/16	140	190
GTRP- 8P10		10	10.45	265	8.33	212	8.08	205	0.25	6.4	85	115	11/16	140	190
GTRP- 10P80	10	80	11.62	295	9.56	243	9.31	236	0.25	6.4	125	170	1 5/8	225	305
GTRP- 10P40		40/STD	11.62	295	10.02	255	9.77	248	0.25	6.4	125	170	1 5/8	225	305
GTRP- 10P30		30	11.62	295	10.14	258	9.89	251	0.25	6.4	125	170	1 5/8	225	305
GTRP- 12P80	12	80	12.18	309	11.38	289	11.00	279	0.38	9.7	125	170	1 5/8	225	305
GTRP-12P40		40/STD	12.18	309	11.94 / 12.00	303 / 305	11.62	295	0.32 / 0.38	8.1 / 9.7	125	170	1 5/8	225	305
GTRP- 12P20		20	12.18	309	12.25	311	11.87	301	0.38	9.7	125	170	1 5/8	225	305

Table 2: GripTight Reverse Pressure Lanyard Assembly Information

GTRP TEST PLUG			LANYARD/FLANGE ASSEMBLY			
SALES NUMBER	PIPE SIZE	PIPE SCH	SALES NUMBER	FLANGE CLASS	PRESSURE PsiG (BarG)	BALL JOINT THREAD
GTRP - 8P80 GTRP- 8P40 GTRP- 8P10	8	80 40/STD 10	GTRP-LA13-8-150 GTRP-LA13-8-300 GTRP-LA13-8-600	150 300 600	450 (31) 1125 (78) 2250 (155)	¼ - 28
GTRP- 10P80 GTRP- 10P40 GTRP- 10P30	10	80 40/STD 30	GTRP-LA13-10-150 GTRP-LA13-10-300 GTRP-LA13-10-600	150 300 600	450 (31) 1125 (78) 2250 (155)	
GTRP- 12P80 GTRP-12P40 GTRP- 12P20	12	80 40/STD 20	GTRP-LA13-12-150 GTRP-LA13-12-300 GTRP-LA13-12-600	150 300 600	450 (31) 1125 (78) 2250 (155)	

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