

Operating Procedures for 1 1/2" – 6" (DN40 – DN150) 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.

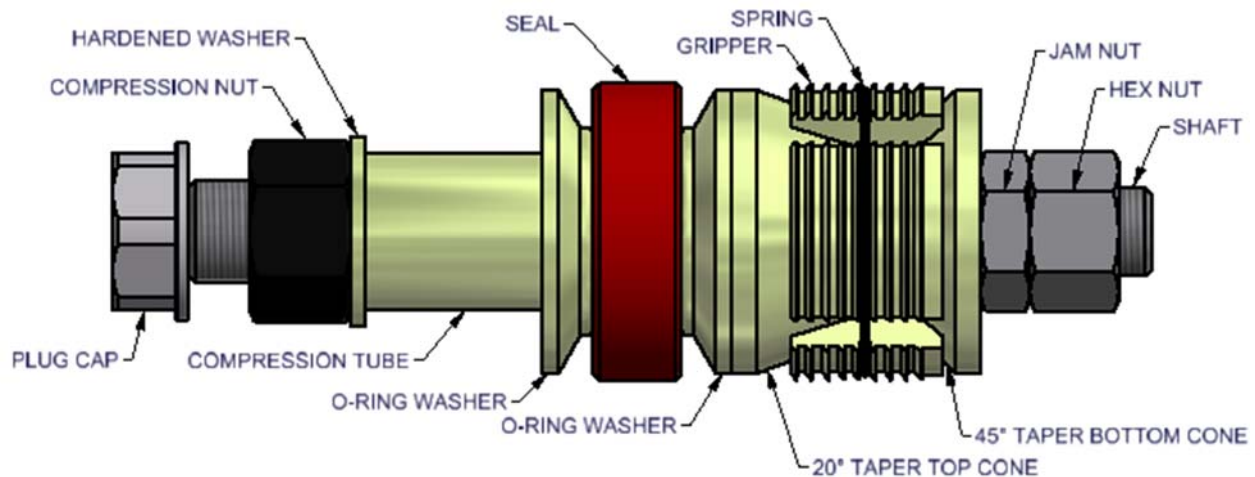


Figure 1: Single Shaft GripTight Reverse Pressure Test Plug

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

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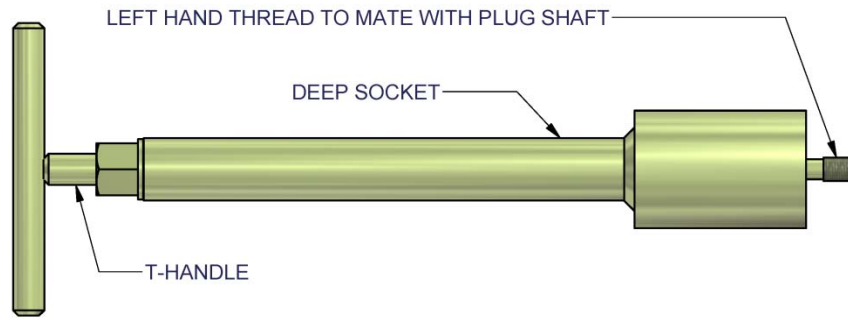


Figure 2: Installation Tool

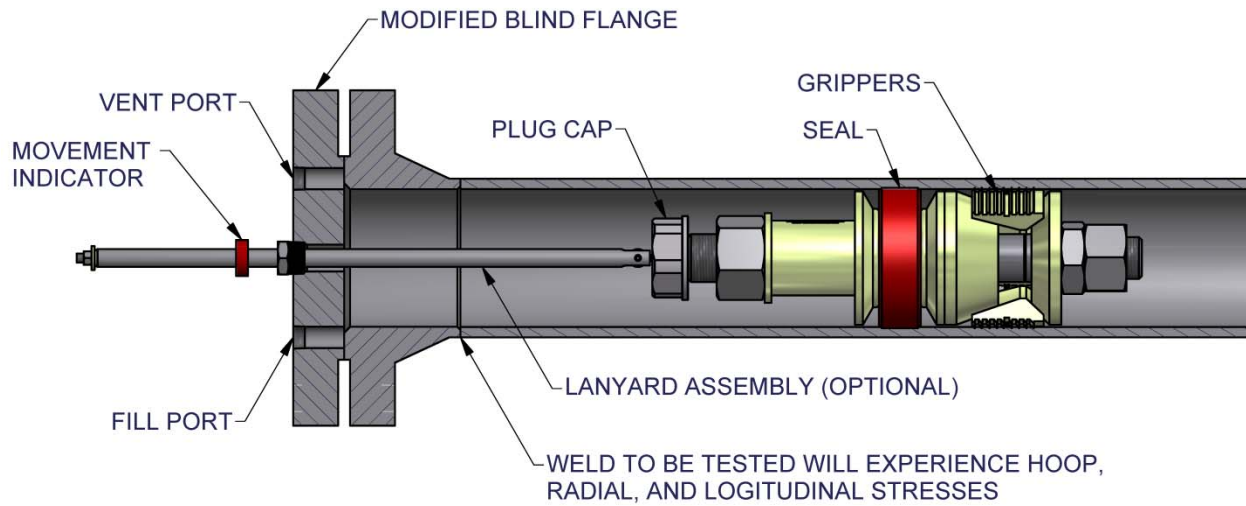


Figure 3: Installed Plug with Lanyard and Flange Assembly

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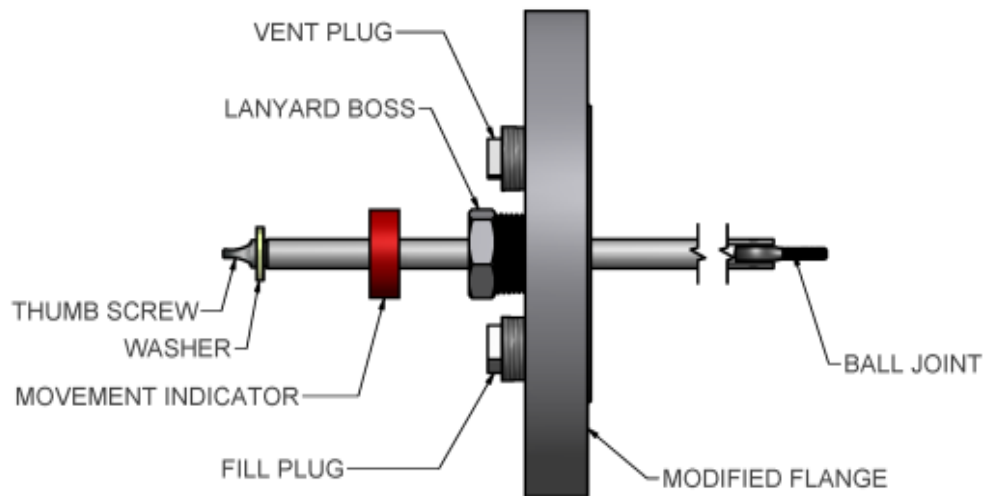
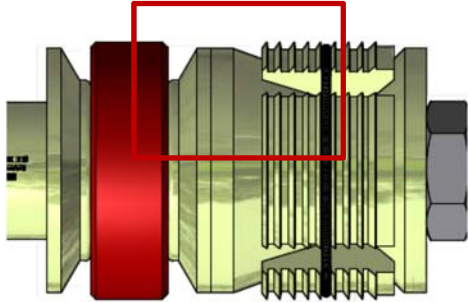


Figure 4: Modified Flange Assembly with Lanyard Assembly

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 including any cuts, scores and deformations. Replace as needed.	
	<ul style="list-style-type: none"> The surface between the Cones and Grippers must be free of friction producing dirt or corrosion.

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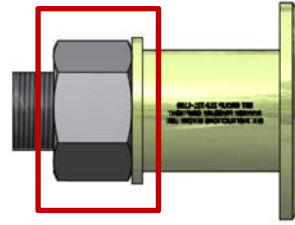
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Step/Action**Additional Action/Information/Result**

2. 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.

3. Verify that the pipe size and schedule stamped on the plug is equivalent to pipe size you are testing.

NOTE:

The stamp **2P80** indicates that the plug is suitable for use in 2" 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.

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 is to be ground flush with the pipe ID to prevent interference with the Grippers or Seal.

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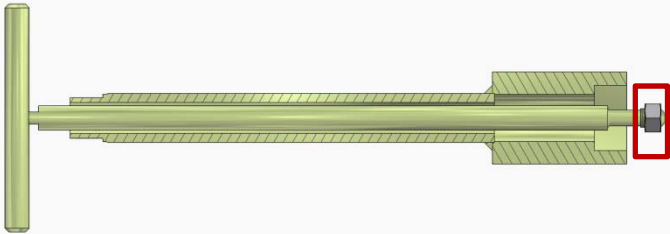
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Step/Action	Additional Action/Information/Result
5. Liberally spread antiseize over both sides of the Hardened Washer and threads of the Shaft.	Doing this ensures that all installation torque is transmitted to the Seal.
<p>CAUTION</p> <p>Special caution 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>	

2. Performing the Pressure Test

Perform the steps outlined below when conducting a pressure test.

Step/Action	Additional Action/Information/Result
1. Remove the shipping/storage nut and/or washer from the Installation Tool.	 <ul style="list-style-type: none"> • Left hand thread of Installation Tool is now able to be connected to plug, reference Table 2.
2. Connect the Installation Tool to the GripTight Reverse Pressure plug.	<ul style="list-style-type: none"> • Remove the Plug Cap (left hand threads) prior to installation of the plug.
<p>Note: Shaft ID, T-Handle, and Plug Cap have left hand threads.</p>	

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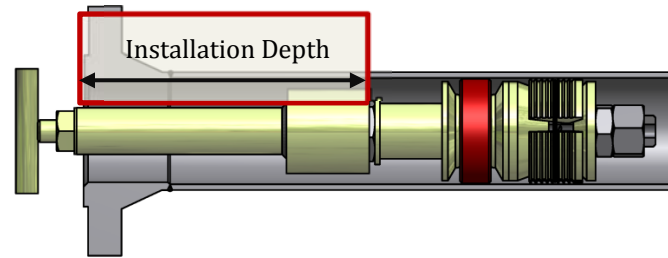
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Step/Action**Additional Action/Information/Result**

3. Position the plug in a clean, lubricant free pipe end at the desired installation depth.



- The installation depth should be kept between 4" and 14" from the flange face to the Deep Socket end.
- For alternate depths, contact EST Group.

For installation torque values, reference Table 1.

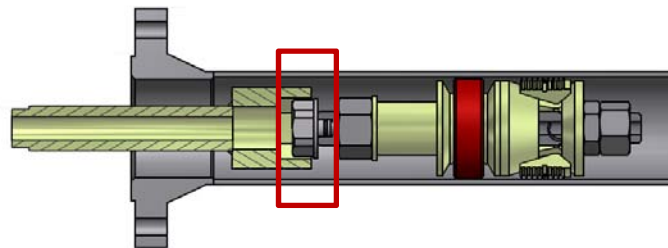
4. Torque the Compression Nut, using the Installation Deep Socket, while holding the T-Handle. Refer to Table 1 for final installation torque.

- Plug is installed in the pipe.

5. Unthread the T-Handle from the plug by rotating clockwise (left hand threads). Remove the T-handle and Deep Socket from the pipe.

6. Install the Plug Cap onto the installed Plug, **Hand Tight 20 in-lbs (2.3 N-m) max**, left hand threads, use Deep Socket if necessary.

Note: Shaft ID, T-Handle, and Plug Cap have left hand threads.



- Plug Cap installed on the plug.

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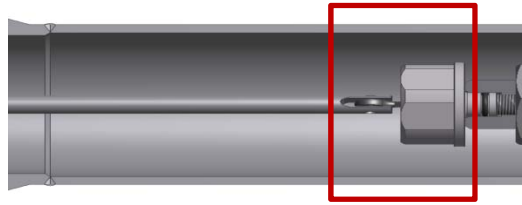
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Step/Action**Additional Action/Information/Result**

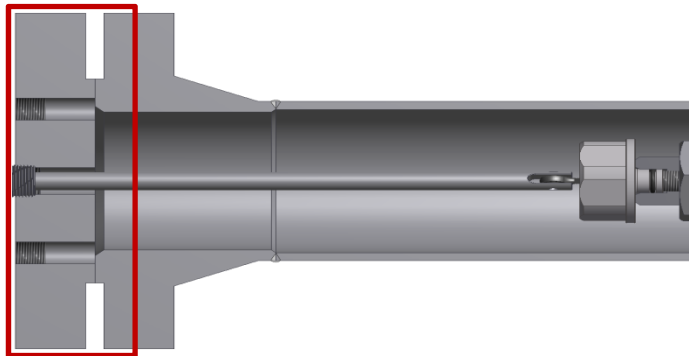
7. Install optional Lanyard Assembly by removing Thumb Screw, Washer, and Movement Indicator, then threading Ball Joint into the Plug Cap, **Hand Tight 10 in-lbs (1.1 N-m)max.**



Note: Lanyard Assembly can be installed onto the Plug Cap prior to installation on the plug.

- Lanyard Assembly installed.

8. Install the Modified Blind Flange, while guiding the Lanyard Assembly through the center hole, onto flange to be tested, leak tight. Reference Table 2 for Modified Blind Flange information. Follow industry standards for flange installation.

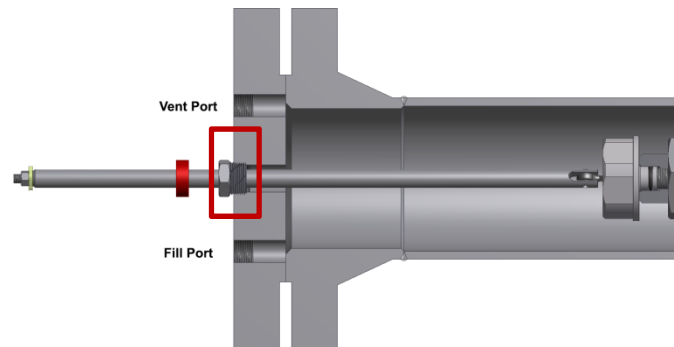


- Modified Blind Flange installed.

9. Install Lanyard Boss over Lanyard Rod and screw into Modified Flange Assembly, leak tight. Slide the Movement Indicator onto the Lanyard Rod, approximately 2" from the flange. Install the Washer and Thumb Screw hand tight onto the Lanyard Rod.

NOTE:

The maximum temperature exposure for urethane seals is 180°F (82°C). It may be necessary to monitor pipe temperatures during hot work to ensure seals are not damaged. Contact EST Group Customer Service if high temperature seal materials are needed.



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

10. Install the pressure source and/or vent to the Modified Blind Flange, leak tight. Fill with an incompressible test medium (e.g. water) while evacuating any residual air.



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

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

11. Slowly increase the test pressure to the desired test level.

- The test pressure must never exceed the pressure listed in Table 1 or the strength of the weakest component within the system being tested.

12. If there is more than 1" (25mm) indication of plug movement, reference Movement Indicator position, stop the testing immediately and remove the pressure. Remove the flange and plug and inspect.

- Imperfections within the 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.

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

- Release pressure, and then remove flange and lanyard, re-torque. Do not exceed maximum torque.
- If leakage continues, the imperfections within the pipe must be removed.

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Step/Action	Additional Action/Information/Result
<p>13. At the conclusion of the test, release ALL pressure prior to Modified Flange removal. Remove the Modified Flange.</p> <div data-bbox="207 296 748 478" style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Note: Plug Cap and Shaft have left hand threads; take precautions when removing to rotate clockwise.</p> </div>	<div data-bbox="781 184 1451 709" style="border: 1px solid red; padding: 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. ⚠ The Plug Cap O-Ring is designed to disengage prior to the threads; if, during removal, there is any sound or hissing, this may be evidence of upstream pressure. Do not fully remove Plug Cap: verify proper safety procedures prior to proceeding. ⚠ 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>
<p>14. Use the Deep Socket to remove the Plug Cap. Lanyard Rod may be left attached to aid in removal. The Plug Cap must be removed slowly, allowing any upstream pressure to escape.</p> <p>15. Use the Installation Tool, Deep Socket and T-Handle, to loosen the Hex Nut and remove the Plug.</p>	<ul style="list-style-type: none"> • To help the Grippers to release, the plug may need to be pushed slightly forward with the T-Handle.
<p>16. Remove and inspect the plug. Any plug components which are worn or damaged must be replaced before attempting further testing.</p>	<ul style="list-style-type: none"> • The seal may need time to relax. <div data-bbox="781 1066 1370 1184" 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.

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

1. To disassemble the plug:

Component parts of the plug must be removed in the following order, reference Figure 1 :

1. Hex Nut
2. Jam Nut
3. 45° Bottom Cone
4. Shaft Clip (not shown)
5. Gripper and Retaining Spring Assembly
6. 20° Front Cone
7. O-Ring Washer
8. Seal
9. O-Ring Washer
10. Compression Tube
11. Hardened Washer
12. Compression Nut

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. Store 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.

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Table 1: GripTight Reverse Pressure (Single Shaft) Installation Torque Specifications

SALES NUMBER	PIPE SIZE	PIPE SCH	OVERALL LENGTH OF GTRP PLUG		PIPE ID NOMINAL	PLUG SEAL OD	CLEARANCE BETWEEN SEAL AND NOMINAL PIPE ID		MAXIMUM TEST PRESSURE		NORMAL INSTALLATION TORQUE		MAXIMUM INSTALLATION TORQUE	
			IN	mm			IN	IN	IN	mm	PSIG	BARG	Ft-lbs	N-m
GTRP-15P160	1 1/2	160	8	203	1.34	1.19	0.15	3.8	2250	155	25	34	40	54
GTRP-15P80		80	8	203	1.5	1.35	0.15	3.8	2250	155	25	34	40	54
GTRP-15P40		40	8	203	1.61	1.46	0.15	3.8	2250	155	25	34	40	54
GTRP-15P10		10	8	203	1.68	1.53	0.15	3.8	2250	155	25	34	40	54
GTRP-15P5		5	8	203	1.77	1.61	0.16	4.1	2250	155	25	34	40	54
GTRP-2PXXS	2	XXS	8	203	1.5	1.35	0.15	3.8	2250	155	25	34	40	54
GTRP-2P160		160	8	203	1.69	1.53	0.16	4.1	2250	155	25	34	40	54
GTRP-2P80		80	9 1/8	232	1.94	1.76	0.18	4.6	2250	155	35	47	50	68
GTRP-2P40		40	9 1/8	232	2.07	1.89	0.18	4.6	2250	155	35	47	50	68
GTRP-2P10		10	9 1/8	232	2.16	1.98	0.18	4.6	2250	155	35	47	50	68
GTRP-2P5		5	9 1/8	232	2.25	2.07	0.18	4.6	2250	155	35	47	50	68
GTRP-25PXXS	2 1/2	XXS	8	203	1.77	1.61	0.16	4.1	2250	155	25	34	40	54
GTRP-25P160		160	9 1/8	232	2.13	1.98	0.15	3.8	2250	155	35	47	50	68
GTRP-25P80		80	9 1/8	232	2.32	2.13	0.19	4.8	2250	155	35	47	50	68
GTRP-25P40		40	9 1/8	232	2.47	2.29	0.18	4.6	2250	155	35	47	50	68
GTRP-25P10		10	9 1/8	232	2.64	2.46	0.18	4.6	2250	155	35	47	50	68
GTRP-25P5		5	9 1/8	232	2.71	2.53	0.18	4.5	2250	155	35	47	50	68

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Table 1: GripTight Reverse Pressure (Single Shaft) Installation Torque Specifications (continued)

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			IN	mm			IN	IN	IN	mm	PSIG	BARG	Ft-lbs	N-m
GTRP-3PXXS	3	XXS	9 1/8	232	2.3	2.13	0.17	4.3	2250	155	35	47	50	68
GTRP-3P160		160	9 1/8	232	2.63	2.46	0.17	4.3	2250	155	35	47	50	68
GTRP-3P80		80	12 1/2	318	2.9	2.69	0.21	5.3	2250	155	200	270	300	400
GTRP-3P40		40	12 1/2	318	3.07	2.86	0.21	5.3	2250	155	200	270	300	400
GTRP-3P10		10	12 1/2	318	3.26	3.04	0.22	5.6	2250	155	200	270	300	400
GTRP-3P5		5	12 1/2	318	3.33	3.11	0.22	5.6	2250	155	200	270	300	400
GTRP-4PXXS	4	XXS	12 1/2	318	3.15	3	0.15	3.8	2250	155	200	270	300	400
GTRP-4P160		160	12 1/2	318	3.44	3.29	0.15	3.8	2250	155	200	270	300	400
GTRP-4P120		120	12 1/2	318	3.63	3.48	0.15	3.8	2250	155	200	270	300	400
GTRP-4P80		80	12 1/2	318	3.83	3.63	0.2	5.1	2250	155	200	270	300	400
GTRP-4P40		40	12 1/2	318	4.03	3.83	0.2	5.1	2250	155	200	270	300	400
GTRP-4P10		10	12 1/2	318	4.26	4.06	0.2	5.1	2250	155	200	270	300	400
GTRP-4P5	5	12 1/2	318	4.33	4.13	0.2	5.1	2250	155	200	270	300	400	
GTRP-6PXXS	6	XXS	19	483	4.9	4.7	0.2	5.1	2250	155	400	540	900	1200
GTRP-6P160		160	19	483	5.19	4.99	0.2	5.1	2250	155	400	540	900	1200
GTRP-6P120		120	19	483	5.5	5.3	0.2	5.1	2250	155	400	540	900	1200
GTRP-6P80		80	19	483	5.76	5.56	0.2	5.1	2250	155	400	540	900	1200
GTRP-6P40		40	19	483	6.07	5.87	0.2	5.1	2250	155	400	540	900	1200
GTRP-6P10		10	19	483	6.36	6.16	0.2	5.1	2250	155	400	540	900	1200
GTRP-6P5	5	19	483	6.41	6.21	0.2	5.1	2250	155	400	540	900	1200	

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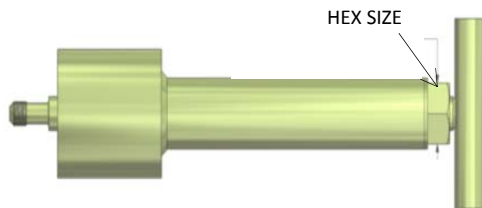
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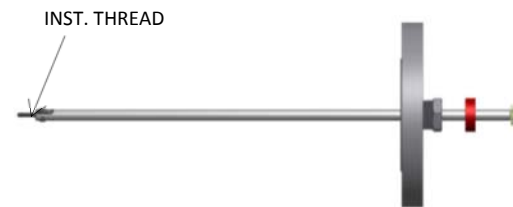
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Table 2: Installation Tool Information

GTRP TEST PLUG			INSTALLATION TOOL				LANYARD / FLANGE ASSEMBLY				
SALES NUMBER	PIPE SIZE	PIPE SCH	SALES NUMBER	OVERALL LENGTH		HEX SIZE	SALES NUMBER	FLANGE CLASS	PRESSURE RATING		INST. THREAD
				in	mm				PsiG	BarG	
GTRP-15P160	1 1/2	160	GTRP-INST-050-13	19.4	494	3/4	GTRP-LA13-15-150 GTRP-LA13-15-300 GTRP-LA13-15-600	150 300 600	450 1125 2250	31 78 155	#10-32
GTRP-15P80		80									
GTRP-15P40		40									
GTRP-15P10		10									
GTRP-15P5		5									
GTRP-2PXXS	2	XXS	GTRP-INST-050-13	19.4	494	3/4	GTRP-LA13-2-150 GTRP-LA13-2-300 GTRP-LA13-2-600	150 300 600	450 1125 2250	31 78 155	
GTRP-2P160		160	GTRP-INST-063-13	19.4	494	15/16					
GTRP-2P80		80									
GTRP-2P40		40									
GTRP-2P10		10									
GTRP-2P5		5									
GTRP-25PXXS	2 1/2	XXS	GTRP-INST-050-13	19.4	494	3/4	GTRP-LA13-25-150 GTRP-LA13-25-300 GTRP-LA13-25-600	150 300 600	450 1125 2250	31 78 155	
GTRP-25P160		160	GTRP-INST-063-13	19.4	494	15/16					
GTRP-25P80		80									
GTRP-25P40		40									
GTRP-25P10		10									
GTRP-25P5		5									



GTRP-INST-YYY-13



GTRP-LA13-YY-ZZZ

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Table 2: Installation Tool Information (continued)

GTRP TEST PLUG			INSTALLATION TOOL				LANYARD / FLANGE ASSEMBLY				
SALES NUMBER	PIPE SIZE	PIPE SCH	SALES NUMBER	OVERALL LENGTH		HEX SIZE	SALES NUMBER	FLANGE CLASS	PRESSURE RATING		INST. THREAD
				in	mm				PsiG	BarG	
GTRP-3PXXS	3	XXS	GTRP-INST-063-13	19.4	494	15/16	CONTACT EST GROUP FOR AVAILABILITY				
GTRP-3P160		160									
GTRP-3P80		80	GTRP-INST-125-13	20.3	514	1 ¼	GTRP-LA13-3-150 GTRP-LA13-3-300 GTRP-LA13-3-600	150 300 600	450 1125 2250	31 78 155	
GTRP-3P40		40									
GTRP-3P10		10									
GTRP-3P5		5									
GTRP-4PXXS		4									XXS
GTRP-4P160	160										
GTRP-4P120	120										
GTRP-4P80	80										
GTRP-4P40	40										
GTRP-4P10	10										
GTRP-4P5	5										
GTRP-6PXXS	6	XXS	GTRP-INST-200-13	20.3	514	2 ¼	GTRP-LA13-6-150 GTRP-LA13-6-300 GTRP-LA13-6-600	150 300 600	450 1125 2250	31 78 155	
GTRP-6P160		160									
GTRP-6P120		120									
GTRP-6P80		80									
GTRP-6P40		40									
GTRP-6P10		10									
GTRP-6P5		5									

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