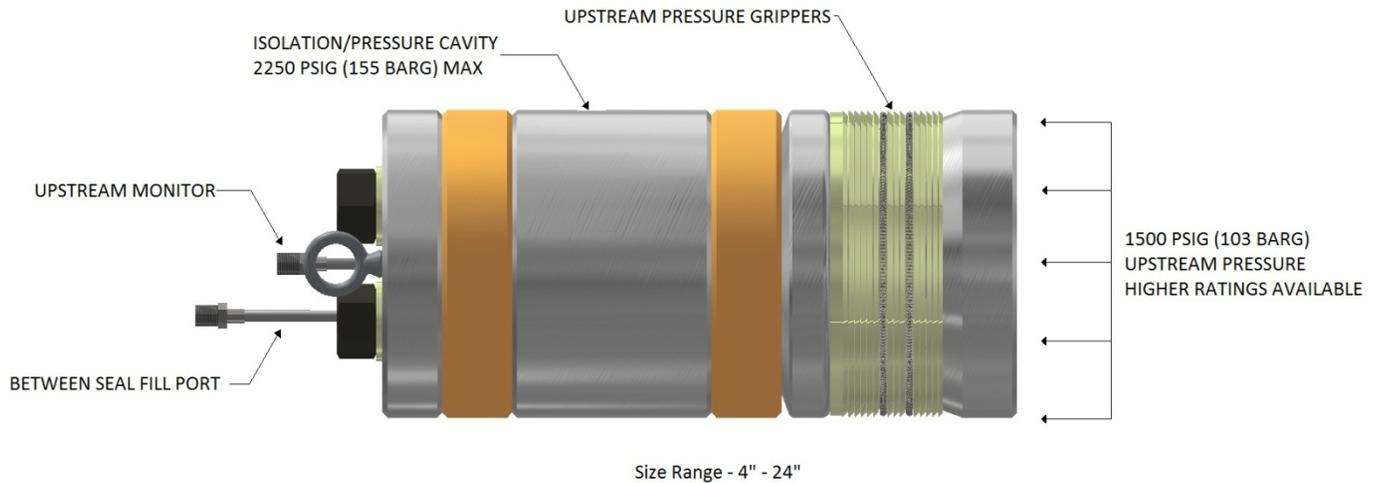


## Operating Procedures for 4" to 24" GripTight® Isolation Plugs

### 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 the test plug when pressure testing.
- ⚠ For safety, 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.
- ⚠ If present, remove the metal shipping band or tape securing the gripper assembly, if present, prior to pressure testing.
- ⚠ Do not use in pipes with ID coatings. Contact EST Group Customer Service prior to use in any type of coated pipe and/or tube.
- ⚠ Failure to use anti-seize may cause an incomplete torque transmittal that may lead to a decrease in the pressure rating of the plug.
- ⚠ Failure to apply the installation torque specified in Table 1 could result in unsafe operation or leakage. Installation equipment and tool must be adequately sized to handle installation torque.
- ⚠ Constantly monitor upstream pressure. Immediately discontinue work if an unplanned or unanticipated increase in upstream pressure occurs.



**MAXIMUM TEST PRESSURE BETWEEN SEALS: 2250 PSIG (155 BARG)**

**MAXIMUM UPSTREAM PRESSURE: 1500 PSIG (103 BARG)**



<http://estgroup.cvfc.com>

#### North America / Central & South America

Corporate Office  
2701 Township Line Rd  
Hatfield, PA 19440-1770 USA  
(P) +1 215.721.1100  
+1 800.355.7044  
(F) +1 215.721.1101  
[est-info@curtisswright.com](mailto:est-info@curtisswright.com)

#### Europe / Middle East / Africa

EST Group B.V.  
Hoom 312a  
2404 HL, Alphen aan den Rijn  
The Netherlands  
(P) +31.172.418841  
(F) +31.172.418849  
[est-emea@curtisswright.com](mailto:est-emea@curtisswright.com)

#### Asia Pacific

EST Group Asia  
35 Tannery Rd, #11-10 Tannery Block  
Ruby Industrial Complex  
Singapore 347740  
(P) +65.6745.8560  
(F) +65.6742.8700  
[est-asia@curtisswright.com](mailto:est-asia@curtisswright.com)

## 1. Test Preparation

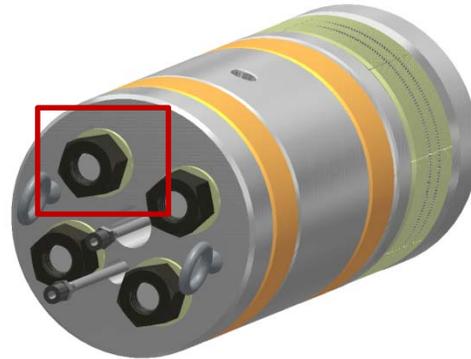
Perform the steps outlined below prior to performing your pressure test.

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.

The surface between the cone and grippers must be free of friction producing dirt, corrosion, or debris.

2. Tighten the hex nuts to verify the grippers move freely on the tapered cone surface.



<i>If</i>	<i>then</i>
grippers move freely on the tapered cone surface,	loosen the hex nuts back to their original position and go to the next step.
grippers do not fully retract,	apply a light lubricant such as 10wt motor oil to the tapered surface of the cones and wipe away any excess. Tighten the hex nuts so the grippers move freely to the end of the tapered cone surface.
you cannot easily tighten the hex 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 **P10P80** indicates that the plug is suitable for use in 10" 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.

Step/Action	Additional Action/Information/Result
5. Liberally spread antiseize over both sides of the hardened washers and threads of the shafts.	Doing this ensures that all installation torque is transmitted to the seal.
	<div style="border: 2px solid red; padding: 10px; text-align: center;"> <p><b>CAUTION</b></p> <p>Special caution must be taken when applying lubricant and handling the test plug. The lubricant must not come in contact with the seals 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.</p> </div>

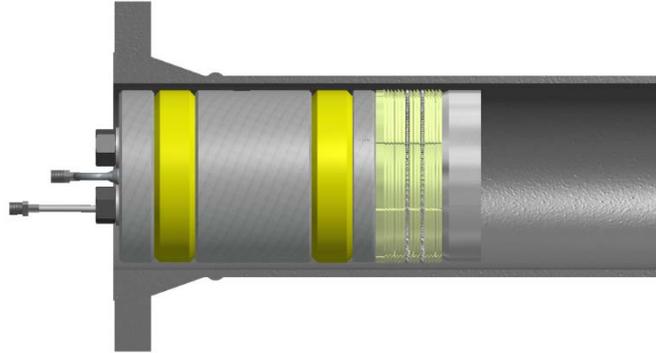
## 2. Performing the Pressure Test

Perform the steps outlined below when conducting a pressure test.

Step/Action	Additional Action/Information/Result						
1. Attach hoses to the pressure and upstream monitor connections plug.	<ul style="list-style-type: none"> <li>Upstream Monitor Connection: Upstream vapors may be vented by attaching approximately 50 ft. of hose to the port and locating the open end of the hose well downwind from the hot work area. If upstream vapors are to be vented, a tee fitting should be used such that the hose and the pressure gauge are both connected to the Upstream Monitor Connection.</li> <li>Pressure Connection: Connect pressure source to pressurize between seals for isolation and/or testing purposes.</li> </ul>						
2. Place plug so both seals are inside the pipe you are testing.	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"><i>If</i></th> <th style="width: 50%;"><i>then</i></th> </tr> </thead> <tbody> <tr> <td>using the plug as an isolation and/or welding plug,</td> <td>position the plug so the seals are an appropriate distance from the weld location.</td> </tr> <tr> <td>using the plug to test a weld,</td> <td>position the plug so that the seals straddle the weld or area you are testing.</td> </tr> </tbody> </table>	<i>If</i>	<i>then</i>	using the plug as an isolation and/or welding plug,	position the plug so the seals are an appropriate distance from the weld location.	using the plug to test a weld,	position the plug so that the seals straddle the weld or area you are testing.
<i>If</i>	<i>then</i>						
using the plug as an isolation and/or welding plug,	position the plug so the seals are an appropriate distance from the weld location.						
using the plug to test a weld,	position the plug so that the seals straddle the weld or area you are testing.						
<div style="border: 1px solid black; padding: 5px;"> <p><b>NOTE:</b> 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.</p> </div>							

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

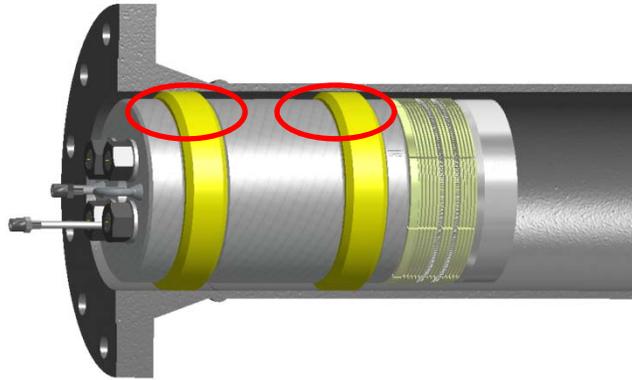
3. Remove residual air between the seals, if necessary.



- Ensure the port between the seals is in the six o'clock position.
  - Tighten the hex nuts on the plug until the seals make light contact with the sides of the pipe.
  - Apply slight pressure of the test medium until a small amount of the medium escapes past the seals. At this point, the majority of residual air is removed between the seals.
- 
4. Tighten the hex nuts to remove any slack from the parts.
- The normal torque values listed in Table 1 should be adequate for most installations, however due to variations within internal pipe finishes, the torque may need to be increased up to the maximum torque values listed in Table 1. If at the maximum torque the plug still leaks, verify the correct seal and washers are being used, correct if necessary, reinstall and torque the plug in increasing increments starting at the normal installation torque.
- 
5. Using a socket wrench capable of produce the required torque, tighten the hex nuts to the normal installation torque (see Table 1).
- Tightening the bottom hex nuts first will aid in centering the plug.
-

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

6. Once the seals have fully contacted the pipe ID, the hex nuts must be tightened in a star pattern.



- Complete installation by using a calibrated torque wrench to ensure that the hex nuts have been tightened to the proper torque.

7. Slowly introduce the test pressure.
8. If performing a pressure drop test, hold the desired pressure with pump for a minimum of 5 minutes to allow parts to settle prior to closing the isolation valve.

**NOTE:**

During pressurization, some settling of the plug may occur. If the plug moves more than a total of 0.125" (3 mm) for 4" and 6" (DN100 and DN150) plug sizes or 0.63" (16 mm) for 8" – 24" (DN200 – DN600) during pressurization or testing, then you must halt and release the pressure immediately. Inspect the test plug and pipe ID for damage and review installation steps taken prior to reinstalling the plug and retesting.

If situation continues, contact EST Group Customer Service for technical assistance.

9. After isolation or testing application is complete, release all pressure from the pipe.
10. Loosen the hex nuts incrementally using the standard bolting pattern until the top of the nuts are at the top of the shaft threads.

**CAUTION**

⚠ Never remove a plug if upstream pressure is present.

- The seal is relaxed. Permanent seal deformation may occur if the seal is left partially compressed.

11. Remove the plug from the tube end.

Step/Action	Additional Action/Information/Result
-------------	--------------------------------------

- |   |  |
|---|--|
| <p>12. Inspect the plug for wear and replace any worn components.</p> | <ol style="list-style-type: none"> <li>a. Visually inspect seals for damage including cuts, scores and deformations.</li> <li>b. Visually inspect O-rings for damage including cuts, scores and deformations if leakage or a pressure drop occurred during the pressure test.</li> <li>c. Verify proper operation of grippers by tightening the hex nuts to expand the gripper assembly. Apply a light lubricant if necessary. Wipe away excess.</li> <li>d. Liberally spread antiseize over both sides of the hardened washer and threads of the shafts. Wipe away any excess.</li> </ol> |
|---|--|

Contact EST Group Customer Service for replacement of worn or damaged parts identified.

### 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 seals away from washer face to facilitate removal. If this is the case, be sure not to damage any components while using the flathead screwdriver.

#### 4" – 6" (DN100 – DN150) Plugs

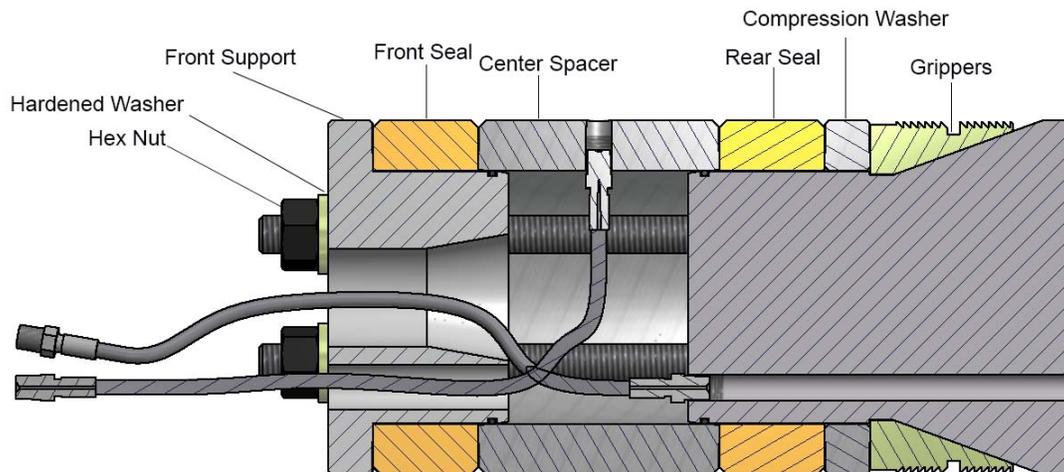


Figure 1: GripTight Isolation Plug 4" - 6" Plug Components

Step/Action	Additional Action/Information/Result
-------------	--------------------------------------

- | <p>1. Visually inspect component parts for damages.</p> | <table border="1"> <thead> <tr> <th style="background-color: #4F81BD; color: white;">If</th> <th style="background-color: #4F81BD; color: white;">then</th> </tr> </thead> <tbody> <tr> <td>damaged components are identified,</td> <td>contact EST Group Customer Service for replacement parts.</td> </tr> <tr> <td>no damaged components are identified,</td> <td>go to the next step.</td> </tr> </tbody> </table> | If | then | damaged components are identified, | contact EST Group Customer Service for replacement parts. | no damaged components are identified, | go to the next step. |
|---|--|----|------|------------------------------------|---|---------------------------------------|----------------------|
| If  | then   |    |      |                                    |   |                                       |                      |
| damaged components are identified,                      | contact EST Group Customer Service for replacement parts.  |    |      |                                    |   |                                       |                      |
| no damaged components are identified,                   | go to the next step.   |    |      |                                    |   |                                       |                      |

Step/Action	Additional Action/Information/Result
-------------	--------------------------------------

2. To disassemble the plug and service the seal, disassemble plug assembly in this order:

Component parts of the plug must be removed in the following order:

- Hex Nut
- Hardened Washer
- Front Support
- Front Seal
- Center Spacer
- Rear Seal

**Note** Occasionally a flathead screwdriver is required to pry seals away from mating face to facilitate removal. If this is the case be sure not to damage any components while using the flathead screwdriver.

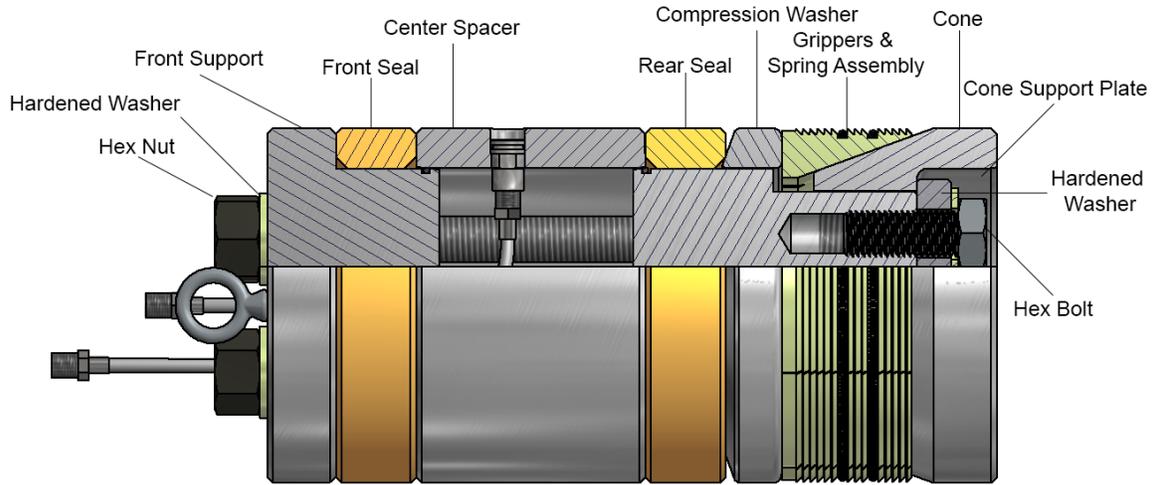
3. Reassemble the Gripper Assembly.

A screwdriver or similar tool may aid in the installation of the grippers and spring.

<i>If</i>	<i>then</i>
Gripper Assembly is not damaged,	ensure that the tapered surface of the Gripper mates with the tapered surface of the cone.
Gripper Assembly is collapsed,	install new spring over the plug so it is positioned around the tapered surface of the cone. Position grippers segments, one at a time on the cone surface and slide the spring into the groove on grippers. Repeat for each gripper segment.

4. install the Gripper Assembly over the shafts and onto the far support. Reassemble plug as in Figure 3.

**8" and Larger Plugs (DN200 and Larger)**



**Figure 2: GripTight Isolation Plug 8" – 24" Plug Components**

Step/Action	Additional Action/Information/Result
-------------	--------------------------------------

1. 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,	go to the next step.

2. To disassemble the plug and service the seal, disassemble plug assembly in this order:

Component parts of the plug must be removed in the following order:

- Hex Nut
- Hardened Washer
- Front Support
- Front Seal
- Center Spacer
- Rear Seal

**Note** Occasionally a flathead screwdriver is required to pry seals away from m face to facilitate removal. If this is the case be sure not to damage any components while using the flathead screwdriver.

3. To disassemble the plug and service the grippers, disassemble plug assembly in this order:

For plugs 8" and larger: component parts of the plug must be removed in the following order:

- Hex Bolt
- Hardened Washer
- Cone Support Plate
- Cone
- Gripper and Spring Assembly

<i>Step/Action</i>	<i>Additional Action/Information/Result</i>	
<p>4. Reassemble the Gripper Assembly.</p> <p>A screwdriver or similar tool may aid in the installation of the grippers and spring.</p>	<p><i>If</i></p>	<p><i>then</i></p>
<p>5. Place the new Gripper Assembly over the Far Support Assembly as shown in Figure 2. Replace the Cone Retaining Plate, Hardened Washers, and Hex Bolts. Tighten Hex Bolts to 20 ft-lb ± 5 ft-lb.</p>	<p>Gripper Assembly is not damaged,</p>	<p>ensure that the tapered surface of the Gripper mates with the tapered surface of the cone.</p>
	<p>Gripper Assembly is collapsed,</p>	<p>install new spring over the plug so it is positioned around the tapered surface of the cone. Position grippers segments, one at a time on the cone surface and slide the spring into the groove on grippers. Repeat for each gripper segment.</p>

Table 1: GripTight Isolation Plug 4" - 24" Installation Torque Specifications

Sales Part Number	Pipe Size	Pipe SCH	Plug OD [in (mm)]	Clearance Between Plug & Pipe [in (mm)]	Length [in (mm)]	Distance Between Seals [in (mm)]	Normal Install. Torque [Ft-Lbs (N-m)]	Maximum Install. Torque [Ft-Lbs (N-m)]	Deep Socket Size [in]
GTDBB-4PXXS	4"	XXS	3.00 (76.2)	0.15 (3.8)	9 (229)	3-1/2 (89)	15 (20)	25 (34)	11/16
GTDBB-4P160	4"	160	3.29 (83.6)	0.15 (3.8)	9 (229)	3-1/2 (89)	15 (20)	25 (34)	11/16
GTDBB-4P120	4"	120	3.48 (88.4)	0.15 (3.8)	9 (229)	3-1/2 (89)	20 (27)	30 (41)	11/16
GTDBB-4P80	4"	80	3.63 (92.2)	0.20 (5.1)	9 (229)	3-1/2 (89)	20 (27)	30 (41)	11/16
GTDBB-4P40	4"	40	3.83 (97.3)	0.20 (5.1)	9 (229)	3-1/2 (89)	20 (27)	30 (41)	11/16
GTDBB-4P10	4"	10	4.06 (103.1)	0.20 (5.1)	9 (229)	3-1/2 (89)	20 (27)	30 (41)	11/16
GTDBB-6P160	6"	XXS	4.70 (119.4)	0.20 (5.1)	12-3/8 (314)	4 (102)	70 (95)	110 (149)	1-1/16
GTDBB-6P160	6"	160	4.99 (126.7)	0.20 (5.1)	12-3/8 (314)	4 (102)	70 (95)	110 (149)	1-1/16
GTDBB-6P120	6"	120	5.30 (134.6)	0.20 (5.1)	12-3/8 (314)	4 (102)	80 (109)	120 (163)	1-1/16
GTDBB-6P80	6"	80	5.56 (141.2)	0.20 (5.1)	12-3/8 (314)	4 (102)	80 (109)	130 (176)	1-1/16
GTDBB-6P40	6"	40	5.87 (149.1)	0.20 (5.1)	12-3/8 (314)	4 (102)	90 (122)	140 (190)	1-1/16
GTDBB-6P10	6"	10	6.16 (156.5)	0.20 (5.1)	12-3/8 (314)	4 (102)	90 (122)	140 (190)	1-1/16
GTDBB-8P160	8"	160	6.56 (167)	0.25 (6.4)	15-3/4 (400)	5 (127)	125 (169)	200 (271)	1-7/16
GTDBB-8PXXS	8"	XXS	6.63 (168)	0.25 (6.4)	15-3/4 (400)	5 (127)	125 (169)	200 (271)	1-7/16
GTDBB-8P140	8"	140	6.75 (171)	0.25 (6.4)	15-3/4 (400)	5 (127)	125 (169)	200 (271)	1-7/16
GTDBB-8P120	8"	120	6.94 (176)	0.25 (6.4)	15-3/4 (400)	5 (127)	125 (169)	200 (271)	1-7/16
GTDBB-8P100	8"	100	7.19 (183)	0.25 (6.4)	15-3/4 (400)	5 (127)	125 (169)	200 (271)	1-7/16
GTDBB-8P80	8"	80	7.38 (187)	0.25 (6.4)	15-3/4 (400)	5 (127)	150 (203)	225 (305)	1-5/8
GTDBB-8P60	8"	60	7.56 (192)	0.25 (6.4)	15-3/4 (400)	5 (127)	175 (237)	250 (339)	1-5/8
GTDBB-8P40	8"	40/STD	7.73 (196)	0.25 (6.4)	15-3/4 (400)	5 (127)	175 (237)	250 (339)	1-5/8
GTDBB-8P20	8"	20	7.88 (200)	0.25 (6.4)	15-3/4 (400)	5 (127)	175 (237)	250 (339)	1-5/8
GTDBB-8P10	8"	10	8.08 (205)	0.25 (6.4)	15-3/4 (400)	5 (127)	175 (237)	250 (339)	1-5/8
GTDBB-10P160	10"	160	8.25 (210)	0.25 (6.4)	16-1/8 (410)	5 (127)	200 (271)	275 (373)	1-5/8
GTDBB-10PXXS	10"	XXS	8.50 (216)	0.25 (6.4)	16-1/8 (410)	5 (127)	200 (271)	275 (373)	1-5/8
GTDBB-10P100	10"	100	9.06 (230)	0.25 (6.4)	16-1/8 (410)	5 (127)	200 (271)	275 (373)	1-5/8
GTDBB-10P80	10"	80	9.31 (236)	0.25 (6.4)	16-1/8 (410)	5 (127)	200 (271)	275 (373)	1-5/8



<http://estgroup.cwfc.com>

North America / Central & South America  
Corporate Office  
2701 Township Line Rd  
Hatfield, PA 19440-1770 USA  
(P) +1 215.721.1100  
+1 800.355.7044  
(F) +1 215.721.1101  
est-info@curtisswright.com

Europe / Middle East / Africa  
EST Group B.V.  
Hoom 312a  
2404 HL, Alphen aan den Rijn  
The Netherlands  
(P) +31.172.418841  
(F) +31.172.418849  
est-emea@curtisswright.com

Asia Pacific  
EST Group Asia  
35 Tannery Rd, #11-10 Tannery Block  
Ruby Industrial Complex  
Singapore 347740  
(P) +65.6745.8560  
(F) +65.6742.8700  
est-asia@curtisswright.com

Sales Part Number	Pipe Size	Pipe SCH	Plug OD [in (mm)]	Clearance Between Plug & Pipe [in (mm)]	Length [in (mm)]	Distance Between Seals [in (mm)]	Normal Install. Torque [Ft-Lbs (N-m)]	Maximum Install. Torque [Ft-Lbs (N-m)]	Deep Socket Size [in]
GTDBB-10PXS	10"	60/XS	9.50 (241)	0.25 (6.4)	16-1/8 (410)	5 (127)	200 (271)	275 (373)	1-5/8
GTDBB-10P40	10"	40/STD	9.77 (248)	0.25 (6.4)	16-1/8 (410)	5 (127)	225 (305)	300 (407)	1-5/8
GTDBB-10P10	10"	10	10.17 (258)	0.25 (6.4)	16-1/8 (410)	5 (127)	225 (305)	300 (407)	1-5/8
GTDBB-12P160	12"	160	9.75 (248)	0.38 (9.7)	17 (432)	5 (127)	200 (271)	250 (339)	1-5/8
GTDBB-12PXXS	12"	XXS	10.37 (264)	0.38 (9.7)	17 (432)	5 (127)	200 (271)	250 (339)	1-5/8
GTDBB-12P80	12"	80	11.00 (279)	0.38 (9.7)	17 (432)	5 (127)	200 (271)	250 (339)	1-5/8
GTDBB-12P40 / 12PSTD	12"	40 STD	11.62 (295)	0.32 (8.1) 0.38 (9.7)	17 (432)	5 (127)	225 (305)	275 (373)	1-5/8
GTDBB-14P80	14"	80	12.12 (308)	0.38 (9.7)	19-1/8 (486)	6-1/2 (165)	225 (305)	275 (373)	1-5/8
GTDBB-14P40	14"	40	12.74 (324)	0.38 (9.7)	19-1/8 (486)	6-1/2 (165)	225 (305)	275 (373)	1-5/8
GTDBB-14PSTD	14"	30/STD	12.87 (327)	0.38 (9.7)	19-1/8 (486)	6-1/2 (165)	225 (305)	275 (373)	1-5/8
GTDBB-16P160	16"	160	12.43 (316)	0.38 (9.7)	19-5/8 (498)	6-1/2 (165)	200 (271)	250 (339)	1-5/8
GTDBB-16P80	16"	80	13.93 (354)	0.38 (9.7)	19-5/8 (498)	6-1/2 (165)	200 (271)	250 (339)	1-5/8
GTDBB-16P40	16"	40/XS	14.62 (371)	0.38 (9.7)	19-5/8 (498)	6-1/2 (165)	225 (305)	275 (373)	1-5/8
GTDBB-16PSTD	16"	30/STD	14.87 (378)	0.38 (9.7)	19-5/8 (498)	6-1/2 (165)	250 (339)	300 (407)	1-5/8
GTDBB-18P80	18"	80	15.74 (400)	0.38 (9.7)	20-1/8 (511)	6-1/2 (165)	250 (339)	300 (407)	1-5/8
GTDBB-18P40	18"	40	16.50 (419)	0.38 (9.7)	20-1/8 (511)	6-1/2 (165)	250 (339)	300 (407)	1-5/8
GTDBB-18PSTD	18"	STD	16.87 (428)	0.38 (9.7)	20-1/8 (511)	6-1/2 (165)	275 (373)	325 (441)	1-5/8
GTDBB-20P80	20"	80	17.56 (446)	0.38 (9.7)	21-3/8 (543)	6-1/2 (165)	225 (305)	275 (373)	1-5/8
GTDBB-20P40	20"	40	18.43 (468)	0.38 (9.7)	21-3/8 (543)	6-1/2 (165)	175 (237)	225 (305)	1-5/8
GTDBB-20PSTD	20"	20/STD	18.87 (479)	0.38 (9.7)	21-3/8 (543)	6-1/2 (165)	225 (305)	275 (373)	1-5/8
GTDBB-24P80	24"	80	21.18 (538)	0.38 (9.7)	22-7/8 (581)	6-1/2 (165)	275 (373)	325 (441)	1-5/8
GTDBB-24P40	24"	40	22.24 (565)	0.38 (9.7)	22-7/8 (581)	6-1/2 (165)	300 (407)	350 (475)	1-5/8
GTDBB-24PSTD	24"	20/STD	22.87 (581)	0.38 (9.7)	22-7/8 (581)	6-1/2 (165)	275 (373)	325 (441)	1-5/8



<http://estgroup.cwfc.com>

**North America / Central & South America**

Corporate Office  
2701 Township Line Rd  
Hatfield, PA 19440-1770 USA  
(P) +1 215.721.1100  
+1 800.355.7044  
(F) +1 215.721.1101  
est-info@curtisswright.com

**Europe / Middle East / Africa**

EST Group B.V.  
Hoom 312a  
2404 HL, Alphen aan den Rijn  
The Netherlands  
(P) +31.172.418841  
(F) +31.172.418849  
est-emea@curtisswright.com

**Asia Pacific**

EST Group Asia  
35 Tannery Rd, #11-10 Tannery Block  
Ruby Industrial Complex  
Singapore 347740  
(P) +65.6745.8560  
(F) +65.6742.8700  
est-asia@curtisswright.com

## 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.

**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](mailto:est-info@curtisswright.com)
- In Europe: tel: +31-172-418841; e-mail: [est-emea@curtisswright.com](mailto:est-emea@curtisswright.com)
- In Asia: tel: +65-6745-8560; e-mail: [est-asia@curtisswright.com](mailto:est-asia@curtisswright.com)
- 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>.

 <p><b>CURTISS WRIGHT</b> Flow Control Company EST Group</p> <p><a href="http://estgroup.cwfc.com">http://estgroup.cwfc.com</a></p>	<p><b>North America / Central &amp; South America</b> Corporate Office 2701 Township Line Rd Hatfield, PA 19440-1770 USA (P) +1 215.721.1100 +1 800.355.7044 (F) +1 215.721.1101 <a href="mailto:est-info@curtisswright.com">est-info@curtisswright.com</a></p>	<p><b>Europe / Middle East / Africa</b> EST Group B.V. Hoom 312a 2404 HL, Alphen aan den Rijn The Netherlands (P) +31.172.418841 (F) +31.172.418849 <a href="mailto:est-emea@curtisswright.com">est-emea@curtisswright.com</a></p>	<p><b>Asia Pacific</b> EST Group Asia 35 Tannery Rd, #11-10 Tannery Block Ruby Industrial Complex Singapore 347740 (P) +65.6745.8560 (F) +65.6742.8700 <a href="mailto:est-asia@curtisswright.com">est-asia@curtisswright.com</a></p>
--	---	--	---