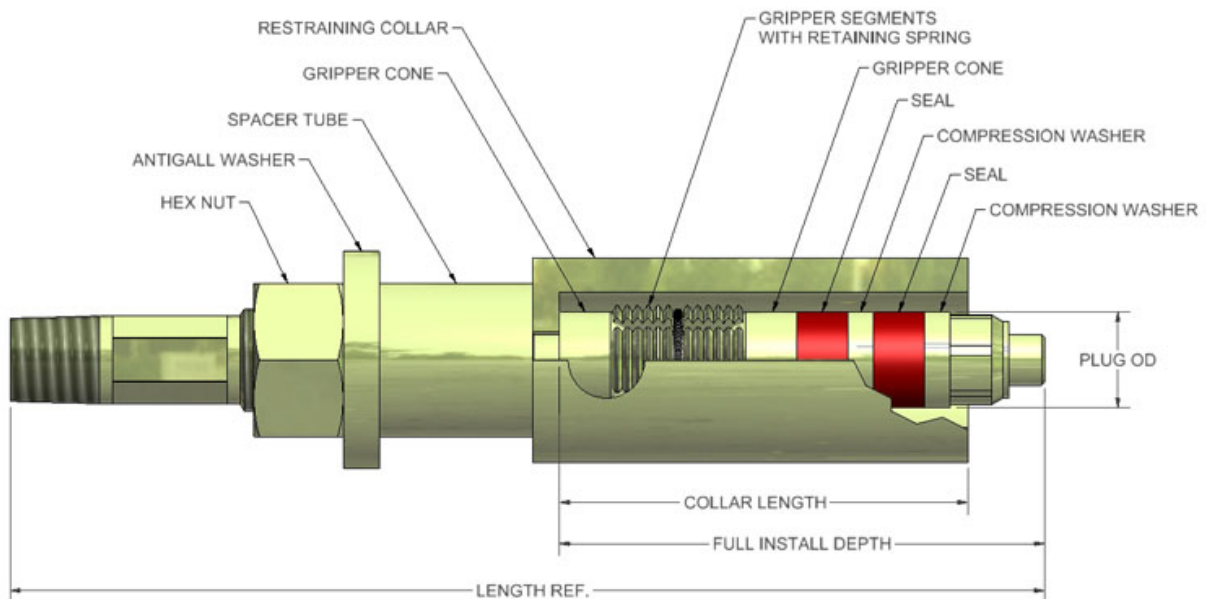


## Operating Procedures for Service Line Test Plugs

### CAUTION

- ⚠ Pressure testing is inherently dangerous. Strict adherence to these operating instructions and industry safety standards could prevent injury.
- ⚠ All personnel must be clear of test plug during pressure testing.
- ⚠ The Plastic Pipe Institute recommends using an incompressible liquid such as water as the test medium. When using alternative test mediums (air, non-combustible gases), additional safety precautions must be taken to protect personnel and equipment from pipe system rupture and/or uncontrolled movement of piping system components.
- ⚠ Pipe system pressure tests identify unacceptable faults in a piping system. Testing may cause such faults to fail by leaking or rupturing. Catastrophic failure may result in sudden, forcible, uncontrolled movement of the system piping, components and/or parts of components.
- ⚠ The pipe system undergoing pressure testing as well as closures in the test section should be restrained against sudden, uncontrolled movement.
- ⚠ Test equipment must be examined prior to performing the pressure test to ensure proper connection to identified pipe.
- ⚠ All low pressure filling lines and other items not subject to pressure testing should be disconnected or isolated.
- ⚠ All personnel must be kept a safe distance away from the section undergoing pressure testing.



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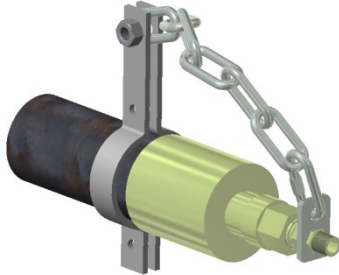
## 1. Test Preparation

Step/Action	Additional Action/Information/Result
1. Replace damaged or worn grippers and seals.	<ul style="list-style-type: none"> <li>The surface between the cone and grippers must be free of friction producing dirt or corrosion. Verify proper operation of the test plug by hand tightening the hex nut so that the grippers move freely to the end of the tapered cone surface. Inspect threads and apply antisieze if necessary before testing. Gripper cones may be lubricated with 20 way oil.</li> <li>If the nut cannot be easily advanced to allow full gripper expansion, <b>DO NOT USE THIS PLUG FOR TESTING</b> and contact EST Group Customer Service.</li> </ul>

## 2. Installing Safety Gag

The use of a gag is mandatory to protect personnel and equipment should something unforeseen occur.

Perform the steps outlined below to properly install and use the Safety Gag prior to pressure testing.

Step/Action	Additional Action/Information/Result
1. Place the test plug into the open end of the pipe being tested.	<ul style="list-style-type: none"> <li>Position the test plug in the pipe end until the collar is fully engaged with the pipe.</li> <li>See <b>Table 2</b> to determine installation depth for your plug.</li> </ul>
2. Place the Safety Gag over the pipe where the gripper assembly is located.	
3. Tighten bolts to secure Safety gag in place.	<ul style="list-style-type: none"> <li>Safety gag is in position.</li> <li>Safety gag is secured in place.</li> </ul>



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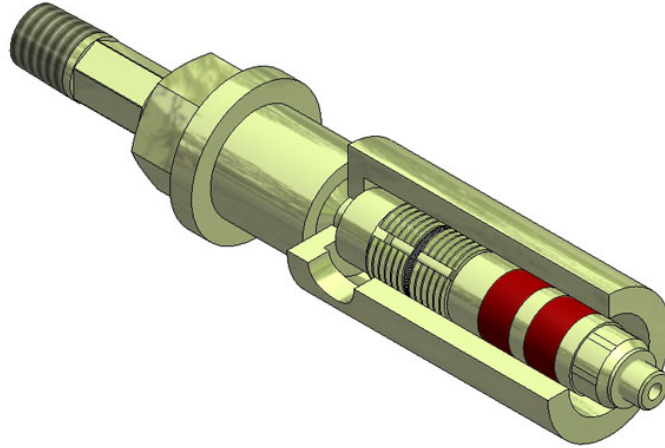
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### 3. Performing the Pressure Test

Consult the tables provided in this document to ensure that you are using the appropriate pressure plug.

Step/Action	Additional Action/Information/Result
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- Center the plug within the pipe while hand tightening the hex nut.

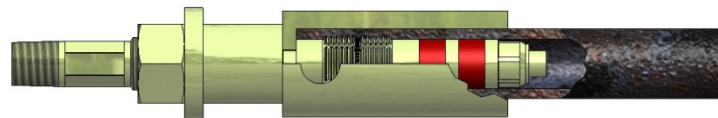


- Tighten hex nut until the test plug has gripped the pipe ID. Slight wiggling of the hand-tightened plug may allow further hand tightening of the hex nuts.
- Tighten to installation torque specified in **Table 1**.

- Connect the pressure source to the plug.

- Pressure source is attached to plug.

- Fill the pipe with test medium. The test pressure must never exceed the maximum pressure listed in the table.



<i>If</i>	<i>then</i>
hydrostatic testing,	all air or gas needs to be vented from the piping system prior to pressurizing.

- Slowly introduce the test pressure.

- Perform the pressure test.

At the conclusion of the test:

- Release and verify ALL pressure BEFORE loosening the hex nut.
- Remove and inspect the plug. Any plug component, which is worn or damaged, must be replaced before attempting further testing. Contact EST Group Customer Service for replacement part information



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### 4. Storage

Prior to storing, dry all parts of the plug and lubricate the cone and shaft threads. Store these instructions with the plug.

### Questions?

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

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- 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>

EST Group is a business unit of Curtiss-Wright Flow Control Company. 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>.

PART NUMBER	APPLICATION	PIPE ID RANGE		PIPE ID RANGE		MAXIMUM PRESSURE WITH RESTRAINING COLLAR		NORMAL INSTALLATION TORQUE		MAXIMUM INSTALLATION TORQUE	
		MIN (in)	MAX (in)	MIN (mm)	MAX (mm)	PSIG	BARG	ft-lbs	kg-m	ft-lbs	kg-m
GT-50CTS-SDR-11	1/2" CTS SDR 11	0.48	0.50	12.2	12.7	225	15.5	6	.83	10	1.38
GT-50IPS-SDR-9	1/2" IPS SDR 9-11	0.60	0.70	15.2	17.8	225	15.5	6	.83	10	1.38
GT-75CTS-SDR-11	3/4" CTS SDR 11	0.67	0.73	17.0	18.5	225	15.5	6	.83	10	1.38
GT-75CTS-077W	3/4" CTS .077-.090 WALL	0.67	0.73	17.0	18.5	225	15.5	6	.83	10	1.38
GT-75IPS-SDR-11	3/4" IPS SDR 11-13.5	0.81	0.91	20.6	23.1	225	15.5	6	.83	10	1.38
GT-1CTS-121W	1" CTS .121-.125 WALL	0.85	0.89	21.6	22.6	225	15.5	6	.83	10	1.38
GT-1CTS-SDR-9	1" CTS SDR 9	0.85	0.89	21.6	22.6	225	15.5	6	.83	10	1.38
GT-1CTS-SDR-11	1" CTS SDR 11	0.89	0.93	22.6	23.6	225	15.5	6	.83	10	1.38
GT-1CTS-099W	1" CTS .099-.101 WALL	0.90	0.93	22.9	23.6	225	15.5	6	.83	10	1.38
GT-1CTS-SDR-114	1" CTS SDR 11.4	0.92	1.01	23.4	25.7	225	15.5	6	.83	10	1.38
GT-1CTS-062W	1" CTS .062-.090 WALL	0.92	1.01	23.4	25.7	225	15.5	15	2.07	25	3.46
GT-1CTS-SDR-125	1" CTS SDR 12.5	0.92	1.01	23.4	25.7	225	15.5	15	2.07	25	3.46
GT-1IPS-SDR-9	1" IPS SDR 9	0.97	1.04	24.6	26.4	225	15.5	15	2.07	25	3.46
GT-1IPS-SDR-11	1" IPS SDR 11-13.5	1.02	1.14	25.9	29.0	225	15.5	15	2.07	25	3.46
GT-125CTS-SDR-11	1-1/4" CTS SDR 11	1.09	1.13	27.7	28.7	225	15.5	15	2.07	25	3.46
GT-125IPS-SDR-7	1-1/4" IPS SDR 7	1.10	1.20	27.9	30.5	225	15.5	15	2.07	25	3.46
GT-125CTS-SDR-062	1-1/4" CTS .062-.121 WALL	1.10	1.26	27.9	32.0	225	15.5	15	2.07	50	6.91
GT-125CTS-SDR-15	1-1/4" CTS SDR 15	1.10	1.26	27.9	32.0	225	15.5	15	2.07	50	6.91
GT-125IPS-SDR-9	1-1/4" IPS SDR 9-10	1.23	1.34	31.2	34.0	225	15.5	15	2.07	50	6.91
GT-15CTS-SDR-11	1-1/2" CTS SDR 11	1.28	1.33	32.5	33.8	225	15.5	15	2.07	50	6.91
GT-125IPS-SDR-11	1-1/4" IPS SDR 11-13	1.30	1.43	33.0	36.3	225	15.5	15	2.07	50	6.91
GT-15IPS-SDR-9	1-1/2" IPS SDR 9-9.33	1.41	1.51	35.8	38.4	225	15.5	15	2.07	50	6.91
GT-15IPS-SDR-11	1-1/2" IPS SDR 11-13.5	1.49	1.64	37.8	41.7	225	15.5	15	2.07	50	6.91

Table 1: Plug OD, Test Pressure and Installation Torque

PART NUMBER	APPLICATION	PLUG OD		LENGTH		COLLAR LENGTH		FULL INSTALLTION DEPTH	
		in	mm	in	mm	in	mm	in	mm
GT-50CTS-SDR-11	1/2" CTS SDR 11	.47	11.9	5 1/16	128.6	2	50.8	2 3/8	60.3
GT-50IPS-SDR-9	1/2" IPS SDR 9-11	.57	14.5	5 1/16	128.6	1 7/8	47.6	2 3/8	60.3
GT-75CTS-SDR-11	3/4" CTS SDR 11	.65	16.5	5 1/16	128.6	1 11/16	42.9	2 3/8	60.3
GT-75CTS-077W	3/4" CTS .077-.090 WALL	.65	16.5	5 1/16	128.6	1 11/16	42.9	2 3/8	60.3
GT-75IPS-SDR-11	3/4" IPS SDR 11-13.5	.78	19.8	5 1/16	128.6	1 13/16	46.0	2 5/16	58.7
GT-1CTS-121W	1" CTS .121-.125 WALL	.80	20.3	5 1/16	128.6	1 13/16	46.0	2 5/16	58.7
GT-1CTS-SDR-9	1" CTS SDR 9	.80	20.3	5 1/16	128.6	1 13/16	46.0	2 5/16	58.7
GT-1CTS-SDR-11	1" CTS SDR 11	.84	21.3	5 1/16	128.6	1 13/16	46.0	2 5/16	58.7
GT-1CTS-099W	1" CTS .099-.101 WALL	.87	22.1	5 1/16	128.6	1 13/16	46.0	2 5/16	58.7
GT-1CTS-SDR-114	1" CTS SDR 11.4	.87	22.1	5 1/16	128.6	1 13/16	46.0	2 5/16	58.7
GT-1CTS-062W	1" CTS .062-.090 WALL	.89	22.6	6	152.4	2 5/16	58.7	3 1/8	79.4
GT-1CTS-SDR-125	1" CTS SDR 12.5	.89	22.6	6	152.4	2 5/16	58.7	3 1/8	79.4
GT-1IPS-SDR-9	1" IPS SDR 9	.89	22.6	6	152.4	2 5/16	58.7	3 1/8	79.4
GT-1IPS-SDR-11	1" IPS SDR 11-13.5	.97	24.6	6	152.4	2 5/16	58.7	3	76.2
GT-125CTS-SDR-11	1-1/4" CTS SDR 11	1.03	26.2	6	152.4	2 3/8	60.3	3 1/8	79.4
GT-125IPS-SDR-7	1-1/4" IPS SDR 7	1.03	26.2	6	152.4	2 3/8	60.3	3 1/8	79.4
GT-125CTS-SDR-062	1-1/4" CTS .062-.121 WALL	1.07	27.2	6 5/8	168.3	2 3/8	60.3	3 1/8	79.4
GT-125CTS-SDR-15	1-1/4" CTS SDR 15	1.07	27.2	6 5/8	168.3	2 3/8	60.3	3 1/8	79.4
GT-125IPS-SDR-9	1-1/4" IPS SDR 9-10	1.19	30.2	6 5/8	168.3	2 1/4	57.2	3 1/8	79.4
GT-15CTS-SDR-11	1-1/2" CTS SDR 11	1.19	30.2	6 5/8	168.3	2 3/8	60.3	3 1/8	79.4
GT-125IPS-SDR-11	1-1/4" IPS SDR 11-13	1.25	31.8	6 5/8	168.3	2 1/4	57.2	3 1/8	79.4
GT-15IPS-SDR-9	1-1/2" IPS SDR 9-9.33	1.35	34.3	7	177.8	2 9/16	65.1	3 9/16	90.5
GT-15IPS-SDR-11	1-1/2" IPS SDR 11-13.5	1.41	35.8	7	177.8	2 9/16	65.1	3 9/16	90.5

Table 2: Plug OD, Length, Collar Length and Installation Depth

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