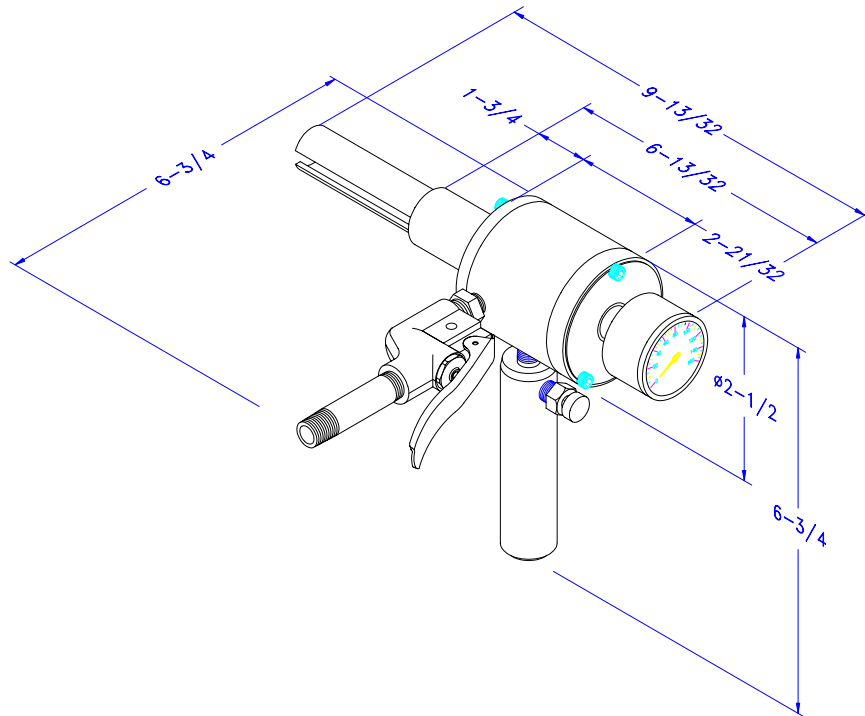


G450 TEST GUN DIMENSIONAL DRAWING



NOTES:

1. STROKE IS 1"

2. DIMENSIONS ARE REFERENCE ONLY

QUESTIONS? Contact EST Customer Service at any of the following locations with questions.In USA and Canada: tel: 800-355-7044, fax: 215-721-1101, e-mail: info@expansionseal.comIn Europe: tel: +31-172-418841, fax: +31-172-418849; e-mail: info@estgrp.nlIn Asia: tel: +65-6745-8560, fax: +65-6742-8700, e-mail: estasia@singnet.com.sgOn the Internet: www.expansionseal.com

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OPERATING PROCEDURES FOR G-450 TUBE TESTING ENDS**PRIOR TO TESTING:**

1. The tubes to be tested should be cleaned and any loose deposits or scale should be removed. If the tubes have not been cleaned any foreign materials present may be ejected during the testing operation and may damage the test guns or injure the operators.

The operators should always wear safety glasses or a face shield when testing with the G-450 or any type of pressure test guns.

2. If the tubes have been chemically cleaned, please check with EST regarding the compatibility of the test gun seals with cleaning agent. Different types of elastomer seals are available as replacements.
3. Make sure the support rod and tube assembly has the correct size Replacement Seal and Washer Set in place for the tubes being tested. See chart below for correct sizing information. The seals and washers are considered to be correctly sized if the OD of the seal is 0.03" to 0.05" (0.7mm to 1.3mm) under the actual tube ID. Using seals that are too small may cause the following: premature seal wear, jamming of the test gun in the tube, or expulsion of the test gun from the tube end. Replacement seals for the G-450 testing guns can be manufactured for any tube ID from 0.50" to 1.23" (12.7mm to 21.2mm). See page 2 for parts list and note for part numbering system on replacement seals sets. (*GSB-XXXX-M)

BWG	5/8	3/4	7/8	1"	1-1/8	1-1/4	1-3/8	1-1/2
8 - 9	-	-	0056	0068	0081	0093	0106	0118
10 - 11	-	-	0062	0072	0087	0097	0112	0122
12 - 13	-	0053	0065	0078	0090	0103	0115	-
14 - 15	-	0056	0072	0083	0097	0110	0122	-
16 - 17	0050	0062	0075	0087	0100	0112	-	-
18 - 19	0053	0065	0078	0090	0103	0115	-	-
20 - 24	0056	0068	0081	0093	0106	0118	-	-

4. Check measurements of total length of tube to be tested and the seal to seal length on the support rod and tube assembly. G-450 will not function properly and may jam in tube, if a seal protrudes partially or completely from tube.

TESTING PROCEDURE:

1. Configuring the Support Rod and Tube Assembly: Place one seal and washer set onto ported pull rod assembly. Firmly thread the remaining support rod extension(s) together with set screws, ending with the end pull rod (with quick connect). Slide ported compression tubes onto rod assembly ending with the non-porting support tube extension. Place seal and washer set onto pull rod and secure with lock nut. Tighten lock nut until all slack in the assembly is taken up.
2. Attach air supply to the air injection gun. The G-450 test guns will be operational on plant air supplies ranging from 40 to 125 psi (3 to 8.6 Bars) at a minimum of 5 cfm (2.4 lps).
3. Insert the support rod and compression tube assembly into the exposed end of the tubesheet. Connect the support rod and tube assembly to the gun via a quick connect on the gun. Turn the slotted end of the gun to meet washer of the tube assembly to remove free play.
4. Begin testing: Squeeze the handle of the air control valve to pressurize tube. Gun operator should observe the pressure gage on the gun. Any tube leaks will be identified by a reduction in pressure on the gage.
5. Press the bleed valve on the injection gun to bleed off the air pressure in the tube, air cylinder and to relax the seals.
6. Disconnect the gun from the support rod and tube assembly. Set the gun aside.
7. Remove the support rod and tube assembly and reinsert it into the next tube to be tested. Mark each leaking tube encountered for repair. The total operation should be completed in 15 to 30 seconds. Your actual testing time will depend on the amount of time you choose to hold the pressure test.
8. Repeat steps 2 through 6 until testing is complete.



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**G450 TEST GUN & AIR ACTIVATED TUBE TESTER
PARTS LIST**

ITEM	QUANTITY	DESCRIPTION	PART NO.
1	1	COMPLETE G450 TEST GUN (INCLUDES ITEMS 13 THRU 19)	GSB-4500
2	1	COMPLETE SUPPORT ROD & TUBE ASSEMBLY (INCLUDES ITEMS 4 THRU 12, 20) 0.50" - 0.86" 0.87" - 1.23"	GSB-4511-LL GSB-4512-LL
3	2	REPLACEMENT SEAL & WASHER SET	*GSB-XXXX-M
4	1	LOCK NUT 0.50" - 0.86" 0.87" - 1.23"	GSA-1533 GSA-1532
5	1	QUICK-CONNECT ASSEMBLY	SEE ITEM 2
6	1	BACK-UP WASHER	SEE ITEM 2
7	1	PORTED PULL ROD ASSEMBLY	SEE ITEM 2
8	1	PORTED COMPRESSION TUBE	SEE ITEM 2
9	1	END PULL ROD	SEE ITEM 2
10	**	SUPPORT ROD EXTENSION	SEE ITEM 2
11	**	SUPPORT TUBE EXTENSION	SEE ITEM 2
12	**	SET SCREW	SEE ITEM 2
13	1	PRESSURE GAGE, 0-160 PSI	GSA-1540
14	1	CYLINDER BODY COMPLETE (INCLUDES NOSE CONE)	GSA-1567
15	1	REDUCING NIPPLE, 1/4 TO 1/8 NPT	GSA-1551
16	1	AIR CONTROL VALVE	GSA-1550
17	1	2-1/2" NIPPLE, 1/4 NPT	GSA-1548
18	1	HANDLE, PORTED W/O BLEED VALVE	GSA-1571
19	1	BLEED VALVE	GSA-1560
20	1	SPACER WASHER	SEE ITEM 2

* GSB-XXXX-M, Seal and Washer Sets must be ordered separately. Replacement Seal and Washer Set part numbers are derived from the actual pipe or tube ID that is to be tested. The part number GSB-XXXX-M is defined as follows:

"XXXX" = tube ID rounded to (2) decimal places XX.XX

"M" = seal material designation

B - buna-n

N - neoprene

S - silicone

V - fluoroelastomer (Viton® or equivalent)

** Quantities vary depending on tube length requirements, pipe, piping systems, pressure vessels and their components. Visit EST Group on the internet at www.estgrp.com.

Viton is a registered trademark of DuPont Dow Elastomers.

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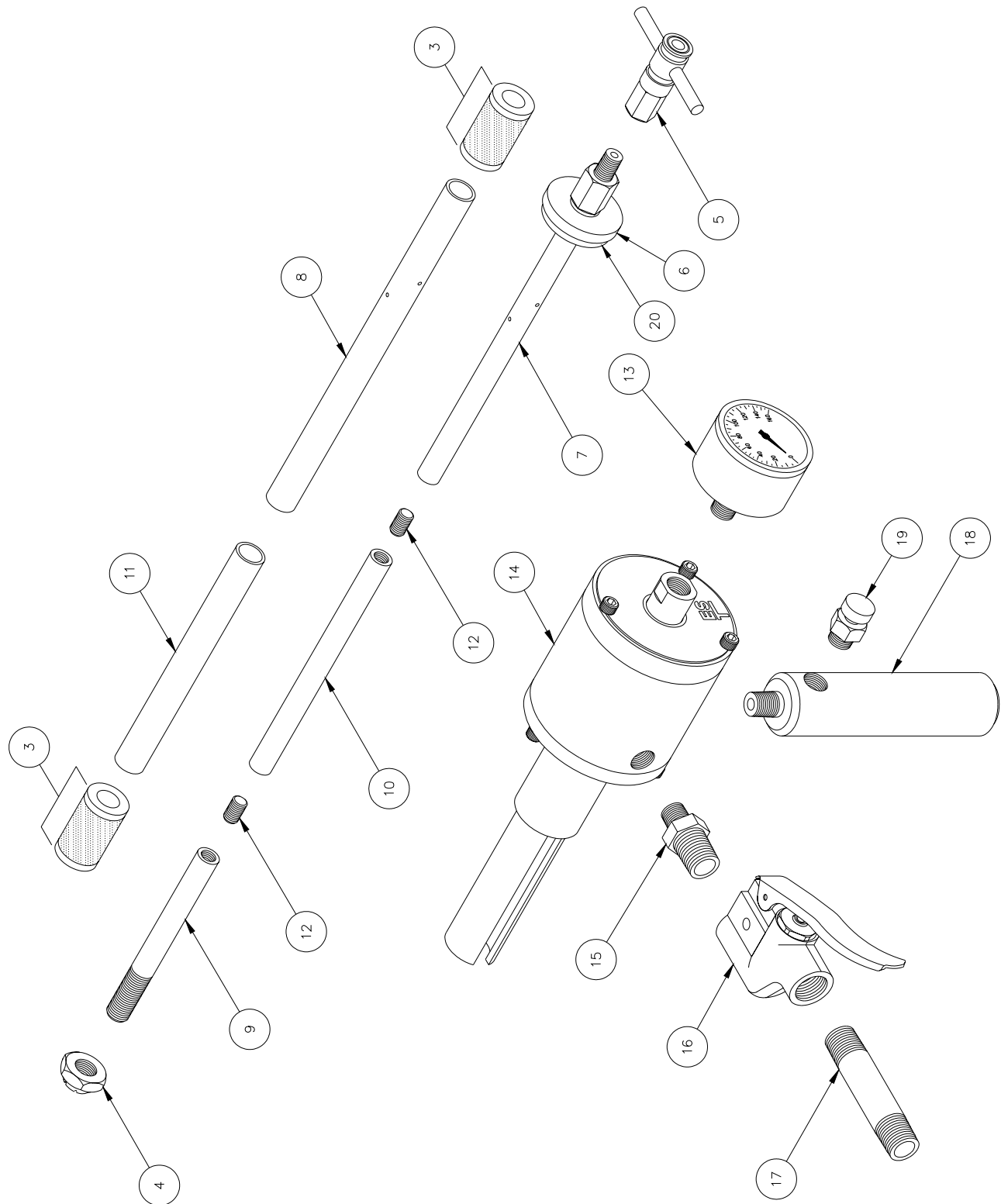
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G-450 Air Activated Tube Tester



G-450 Test Guns

G-150 Test Guns

G-650 Test Guns



Test Straight-Through Exchanger Without Removing Both Heads.

EST's G-450 Air Activated Tube Tester is designed for testing individual straight-through heat exchanger tubes where access is limited to only one tube end. Simply insert the pull rod and compression tube assembly into the tube to be tested, attach the G-450 air control unit via a quick connect coupling, and depress the air control valve to expand the seals and pressurize the tube. Any tube leaks will be identified by any pressure reduction indicated on the integral pressure gauge. When the test is complete, disconnect the air control unit, withdraw the pull rod and compression tube assembly, and move to the next tube.

Here's what the G-450 Air Activated Tube Tester has to offer:

- **Interchangeable Seal and Washer Sets:** Allows testing of tubes from .50" to 1.23" OD (12.7 - 31.3 mm).
- **Light Weight:** Air Control Unit weighs less than 2.5 lbs (1.1 kg).
- **Uses standard plant air supplies from 40 to 125 psi (2.7 to 8.6 bar).**
- **Rod and extension tube assemblies available in 1 to 6 foot lengths (30.5 to 182.9 cm):** Can be assembled to test tubes up to 24 feet long (7.32 m). Shorter rod and tube extensions permit working in close quarters.
- **Complete kit available:** Consists of a G-450 Air Injection Gun and an Extension Tube Assembly with seals set to the distance between the two tube sheets.



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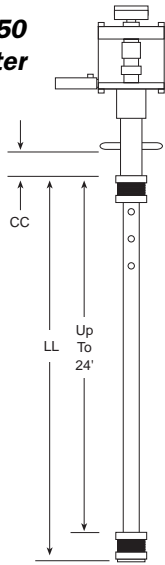
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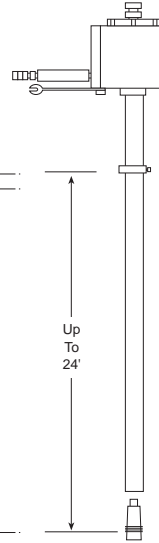
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Test And Seal Leaking Turbine Oil/Hydrogen Coolers, RHR Heaters, Or Any Straight-Tube Heat Exchanger When You Only Have Access To One End.

**G-450
Tube Tester**



**CPI/Perma Plug
Tube Plugging
System**



G-450 Tube Testing Guns are designed to identify leaks in tubes. To plug leaking tubes, use EST's CPI/Perma Plug Tube Plugging System. Consult factory for more information.

**G-450 Air Activated
Tube Tester**

Tube ID Size Range ¹	Part No. ²
.50-1.23 in. (12.7-31.2 mm)	GSB-4500

**Support Rod &
Tube Assembly**

Tube ID Size Range ¹	Part No. ²
.50-.86 in. (12.7-21.8 mm)	GSB-4511-LL
.87-1.23 in. (21.9-31.2 mm)	GSB-4512-LL

**Channel Head Support
Rod & Tube Assembly**

Tube ID Size Range ¹	Part No. ²
.50-.86 in. (12.7-21.8 mm)	GSB-4501-LL-CC
.87-1.23 in. (21.9-31.2 mm)	GSB-4502-LL-CC

G-450 Series Replacement Seal Part Numbers — GSB-XXXX-N

BWG	5/8	3/4	7/8	1	1-1/8	1-1/4	1-3/8	1-1/2
8-9	—	0043	0056	0068	0081	0093	0106	0118
10-11	—	0047	0062	0072	0087	0097	0112	0122
12-13	—	0053	0065	0078	0090	0103	0115	—
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16-17	0050	0062	0075	0087	0100	0112	—	—
18-19	0053	0065	0078	0090	0103	0115	—	—
20-24	0056	0068	0081	0093	0106	0118	—	—

LL designates tube length, CC designates channel head.

Note:

1. Tube ID range is for pricing only. The actual size needed for the XXXX number is listed in the above chart.
2. Support rod and tube extensions, and channel head extension assemblies are available in 1, 2, 3, 4, and 6-ft (30.5, 61.0, 91.4, 121.9 and 182.9 cm) lengths. The suffix LL and CC denote the actual length of the extension in feet. For example, the part number GSB-4511-06 is a 6 ft (182.9 cm) support rod and tube extension assembly

Ordering Information

1. Tube Size: OD & wall thickness or ID
2. Actual length of tube from tubesheet face to tubesheet face
3. Actual channel head length



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