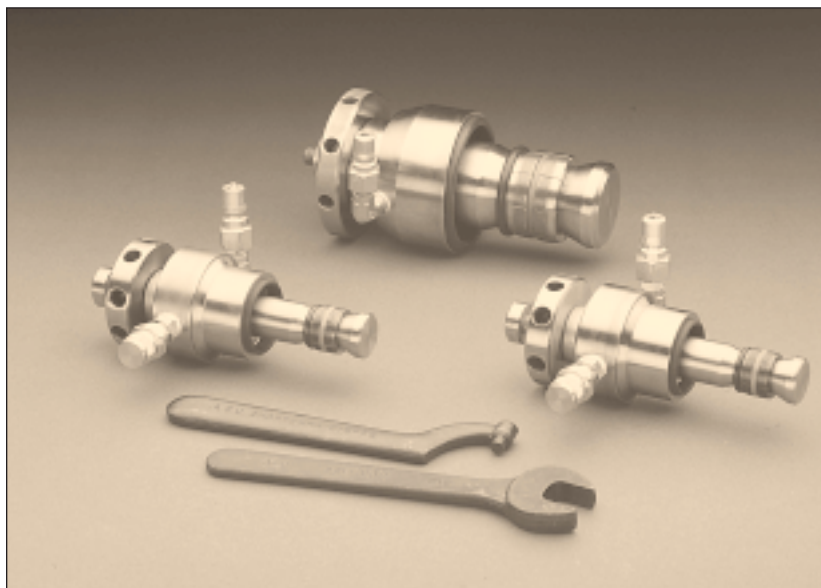


Hydro Joint Tester 2500



Joint Tester

HydroTest Pumps

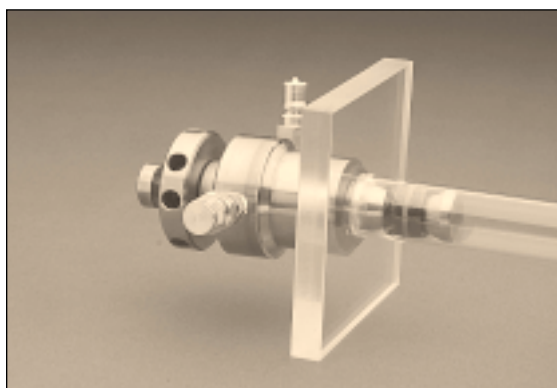
GripTight Test Plugs

Boiler Plugs



At Last...A Fast Way To Pressure Test Tube/Tubesheet and Boiler Tube/Drum Connections

High pressure testing is fast and easy with the HJT 2500, the easy-to-use joint tester for flat tube-to-tubesheet joints and concave boiler tube to drum connections. The HJT 2500 is available for flat tube-tubesheet connections, as well as for concave or convex surfaces. Now you can individually test boiler tubes as they're rolled into the drum. Use the HJT 2500 to test tube sizes from 5/8" to 2-1/2" OD (15.88mm to 63.5mm) at pressures up to 2,500 psi (171.6 Bar). It's easy to use and transport, and can be set up by an operator in less than a minute.



Ideal for . . .

- ***Determining initial expansion procedures by establishing a leak-free first joint.***
- ***Periodically testing expansion quality during fabrication or re-tubing.***
- ***Partial tube replacement: Individually tests prepared tubes, guarantees leak-free joints prior to hydro test.***
- ***Reducing the number of complete hydro tests required on any job.***

Full length tube testing fixtures available.



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Hydro Joint Tester 2500 Sizing Chart

Nom. Tube Size (in)	Wall Thick. (BWG)	Min (in)	Tube ID Range Max (in)	Min (mm)	Max (mm)	Part Number (See Note)
5/8	13-14	0.435	0.500	11.05	12.70	HJT-063-1314-X-XX
	16	0.475	0.540	12.07	13.72	HJT-063-16-X-XX
	18-20	0.520	0.580	13.21	14.73	HJT-063-1820-X-XX
	22-24	0.560	0.630	14.22	16.00	HJT-063-2224-X-XX
3/4	10-11	0.475	0.540	12.07	13.72	HJT-075-1011-X-XX
	12	0.520	0.580	13.21	14.73	HJT-075-12-X-XX
	13-14	0.560	0.630	14.22	16.00	HJT-075-1314-X-XX
	16	0.600	0.680	15.24	17.27	HJT-075-16-X-XX
	18-20	0.640	0.710	16.26	18.03	HJT-075-1820-X-XX
	22-24	0.680	0.750	17.27	19.05	HJT-075-2224-X-XX
1	7	0.600	0.680	15.24	17.27	HJT-100-7-X-XX
	8	0.640	0.710	16.26	18.03	HJT-100-8-X-XX
	9	0.680	0.750	17.27	19.05	HJT-100-9-X-XX
	10-12	0.715	0.815	18.16	20.70	HJT-100-1012-X-XX
	13-14	0.775	0.875	19.69	22.23	HJT-100-1314-X-XX
	16-18	0.830	0.930	21.08	23.62	HJT-100-1618-X-XX
	20-22	0.890	0.990	22.61	25.15	HJT-100-2022-X-XX
	24	0.950	1.050	24.13	26.67	HJT-100-24-X-XX
1-1/4	7-8	0.890	0.990	22.61	25.15	HJT-125-78-X-XX
	9-11	0.950	1.050	24.13	26.67	HJT-125-911-X-XX
	12-13	1.030	1.130	26.16	28.70	HJT-125-1213-X-XX
	14-18	1.070	1.190	27.18	30.23	HJT-125-1418-X-XX
	20-24	1.150	1.270	29.21	32.26	HJT-125-2024-X-XX
1-1/2	6-7	1.070	1.190	27.18	30.23	HJT-150-67-X-XX
	8-10	1.150	1.270	29.21	32.26	HJT-150-810-X-XX
	11-13	1.240	1.360	31.50	34.54	HJT-150-1113-X-XX
	14-18	1.310	1.430	33.27	36.32	HJT-150-1418-X-XX
	20-24	1.390	1.510	35.31	38.35	HJT-150-2024-X-XX
2	5-7	1.545	1.675	39.24	42.55	HJT-200-57-X-XX
	8-10	1.660	1.780	42.16	45.21	HJT-200-810-X-XX
	11-13	1.740	1.875	44.20	47.63	HJT-200-1113-X-XX
	20-24	1.820	1.946	46.23	49.43	HJT-200-2024-X-XX
2-1/4	8-10	1.900	2.025	48.26	51.44	HJT-225-810-X-XX

Note:

Part Number Suffixes are defined as follows:

X = Tube end configuration: 0 = flared; 1 = no flare.

XX = Tubesheet /Drum Curvature, typically the diameter of the surface that the plug will bear against during testing, expressed in inches. Example:

00 = Flat sheet

12 = 12" (304.8 mm) drum ID.

Use the HJT 2500 with these other products from Expansion Seal Technologies:



P Series Test Pump:

A compact, portable, self contained air-driven high pressure hydrostatic test pump.



BMX Hydropumps:

A larger, wheel mounted air-driven high pressure hydrostatic test pump.



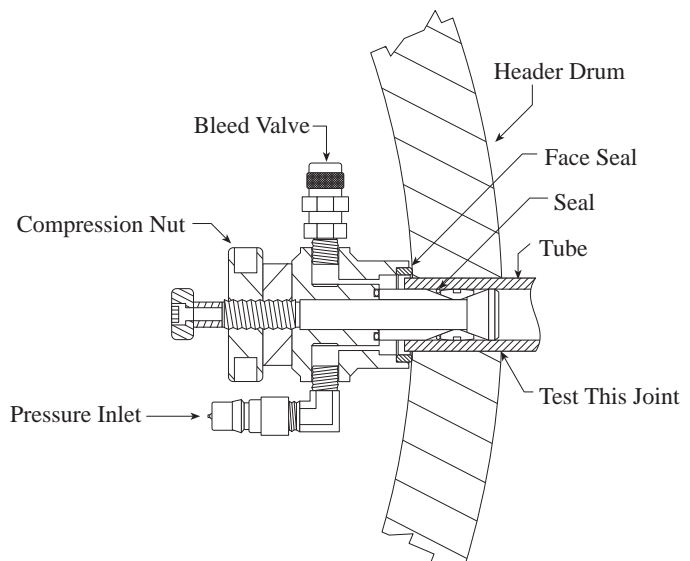
GripTight Test Plugs:

A ported, self gripping high pressure test plug used to test pipe and tube.



Pop-A-Plug® Boiler TubePlugs:

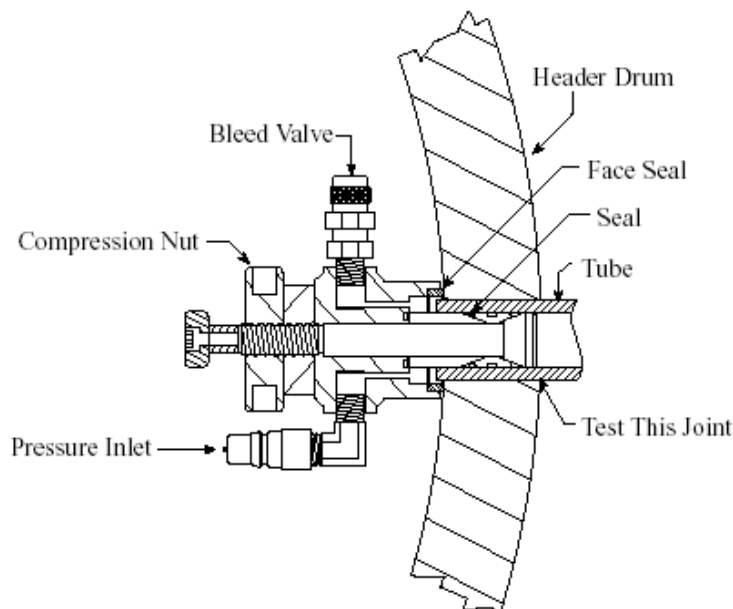
Made for fast, easy installation; provides a leak-proof seal in minutes.



Hydro Joint Tester testing from the concave surface of a boiler drum ID

OPERATING PROCEDURES FOR HYDRO JOINT TESTER 2500

The Hydro Joint Tester 2500 is used to hydro test individual tube-to-tubesheet joints in tubular vessels such as boilers, condensers, air heaters, etc. Using water under pressure, this lightweight, durable tool is used to hydro test at pressures up to 2,500 psi for tube sizes from 5/8" to 2-1/2". The Hydro Joint Tester 2500 can be used on curved drums and headers or flat sheets by changing the collar to allow for the variation in the sheet curvature. Set-up time is less than a minute for a single operation. This tool is suited for determining correct mechanical rolling torque or hydraulic expansion pressure by assuring that a sampling of joints are leak-free, or for checking tube joints prior to a full hydro-test. Periodic use during fabrication and re-tubing operations will help ensure the quality and success of the expansion process.

**WARNINGS!**

- **WEAR PROPER PERSONAL PROTECTIVE EQUIPMENT AS WOULD BE WORN WITH ANY AIR-OPERATED AND/OR HIGH-PRESSURE EQUIPMENT. EYE PROTECTION MUST BE WORN AT ALL TIMES.**
- **DO NOT STAND, WALK, OR ALLOW EXTREMITIES TO BE LOCATED BEHIND TOOL WHILE IN THE PRESSURIZED CONDITION. WHILE A VERY SMALL VOLUME OF WATER IS UNDER PRESSURE, NOT PROPERLY VENTING AIR FROM TUBE JOINT PRIOR TO PRESSURIZING, MAY RESULT IN EXCESSIVELY HIGH INTERNAL FORCES.**
- **DO NOT EXCEED THE 2,500PSI MAXIMUM TEST PRESSURE THE UNIT WAS DESIGNED FOR.**

QUESTIONS? Contact EST 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: info@estgrp.nl

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Hydro Joint Tester 2500 Set-Up

Follow appropriate assembly drawing and photos found in this document for correct assembly of the specific Joint Tester. The numbers in the parentheses below refer to Figures 1 & 2.

1. All Hydro Joint Testers work along the same basic guidelines. A collar (6) and matching face seal (7) fit over the tube joint to be tested forming a watertight seal at sheet or drum face. The seal (4) and segment assembly (2) act at the inside of the tube to form a watertight seal at the tube ID. It is imperative that the seal (4) be installed on the side of segment closest to collar/seal face (6)(4). The inner collar o-ring (8), See Figure 2, forms a seal between the collar (6) and sleeve (5) completing the seal that allows pressurization for a hydro test.
2. Collar Selection (6) – Collar style is dictated by a combination of factors. Tubesheet or drum curvature (if any), tube pitch, and the presence or, lack of a flare at tube end and protrusion all contribute to the collar (6) selection. Selection of the collar (6) with the correct attributes for the specific application is critical to sealing and fit-up. An incorrect curvature combination between sheet/drum face and collar (6) will cause leakage at face seal (7). Collars (6) come in flat, header, and drum configurations. Part numbers are assigned according to the diameter of the vessel being tested. A single face seal (7) fits any of the collar (6) designs within a given tube size and vessel type.

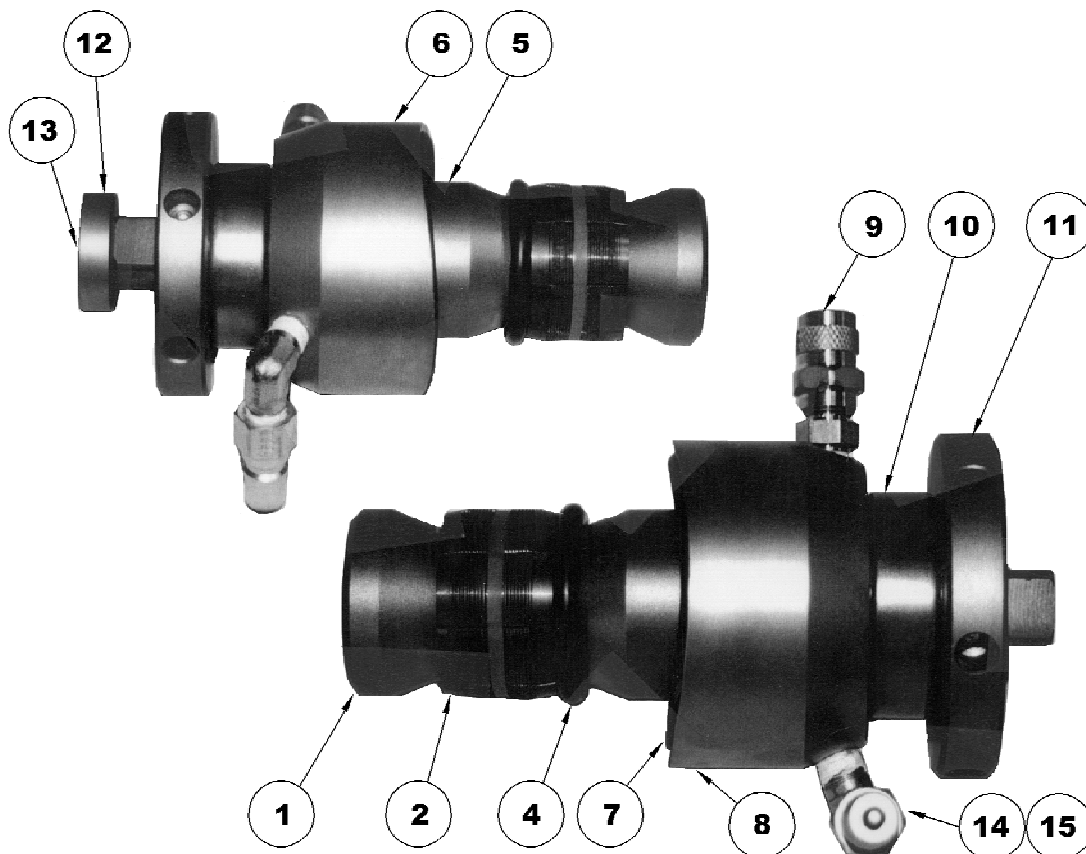


Figure 1. Hydro Joint Tester 2500



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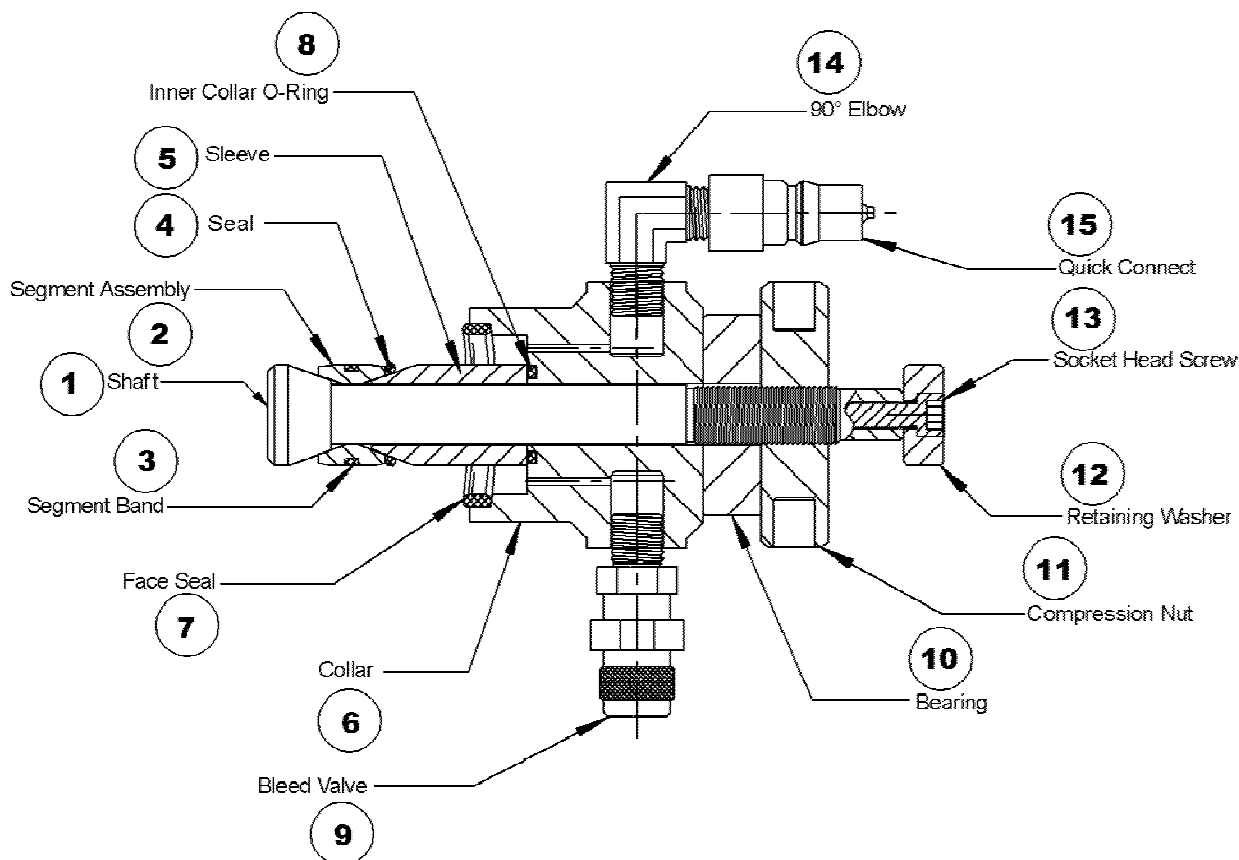


Figure 2. Hydro Joint Tester 2500

Hydro Joint Tester 2500 Installation

1. Once correct assembly is confirmed, the tool may be inserted into tube to be tested and tightened in place. See Figure 4. Seat collar (6) and face seal (7) firmly against sheet/drum face with bleed valve (9) at highest point possible. This will allow proper bleeding (venting) of air from test volume. See Figure 5. Turn compression nut (11) clockwise until firm contact with tube ID is felt. Final tightening may be done with spanner wrench provided until collar (6) pulls face seal (7) tightly against sheet/drum face. See Figure 6. Tightness required will vary with desired test pressure. As test pressure increases, resultant push-out pressure will also increase. This is overcome by tightening the compression nut (11), and increasing the pressure at segment-to-tube ID interface.

Note: Do not remove retaining washer (12) with Hydro Joint Tester 2500 in place! The retaining washer (12) prevents removal of the collar (6) and prevents the possibility of dropping the Hydro Joint Tester 2500 into the tube. In the event maintenance is required remove entire Hydro Joint Tester 2500 and repair outside of vessel where dropping of parts will not result in parts falling down tube(s).

Occasionally, due to an undersized/oversized condition, an appropriately smaller or larger seal (4) may be required for an out-of-tolerance condition. Contact Expansion Seal Technologies for advice on appropriate sizing and part numbers.



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Hydro Joint Tester 2500 Maintenance

1. Routine maintenance is limited to replacement of worn o-rings (4)(8) and segment bands (3), general clean up and lubrication, and greasing of the bearing (10). Segment assemblies (2) are held together by a polyurethane segment band (3), which will wear with extended use and require replacement. To accomplish this task, install the appropriate segment band (3) on small end of band tool and push up ramped surface to large end (this may take some force). Insert individual segment pieces (after removal of old segment band (3)) into large end of band tool and push band over lip of band tool and into segment center groove area.
2. Due to the medium used for hydro testing, the Hydro Joint Tester 2500 will require occasional cleanup and lubrication to ward off corrosion/rust build-up. Water is highly corrosive and even with most components being made of stainless steel, a light coating of machine oil prior to storage for any length of time will allow smooth operation during next use. The bearing (10) should be regularly inspected and lubricated. Check for debris in ball bearing seat areas and clean as required. Pack bearing races with a quality bearing grease, (Lithium base grease is recommended).

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HYDRO JOINT TESTER 2500

Assembled joint tester
ready for insertion

Figure 3

Joint tester being
inserted into tube

Figure 4

Joint tester inserted w/
collar seal flush to
sheet face

Figure 5

Joint tester tightened
into tube and against
sheet face ready for
hydrotest

Figure 6

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