



Hydraulic Tubing Anchor Assembly

MAN-TTT-925 (R01)

Thru-Tubing Technology

A Division of Owen Oil Tools LP

402 Machine Loop

Scott, Louisiana, 70583, USA

Phone: +1 (337) 984-1181

Fax: +1 (337) 984-3044

www.corelab.com/owen

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Hydraulic Tubing Anchor Assembly



Description

The Hydraulic Tubing Anchor Assembly is used to anchor a bottom-hole assembly inside the tubing. The tool uses a cone and anchor collet type grapple to locate and hold the tool in place in the tubing. The anchor collet grapple is attached to a piston so that hydraulic pressure can be used to activate the tool. Mechanical downward force holds the anchor in position while other operations are performed.

Operation

The tool was designed so that the Top Sub and Bottom Sub can be reversed. This allows the tool to be reversed and run upside down, allowing the use of upward tension force to hold the anchor collet grapple, located in the tubing. An internal coil spring forces the piston back down against the Piston Stop Ring, when the tool is released by reducing pressure and slacking off pick-up weight.



Note: Unless otherwise indicated, all the strength figures given in this manual, are the result of calculations based on the yield strength of the material used in the manufacture of this product. These strength calculations are considered accurate within plus or minus 20% and are to be used only as a guide. They do not constitute a guarantee, actual or implied. In use, appropriate allowance should be made as a safety factor.

Flow Rates To Set Anchor vs Orifice Size

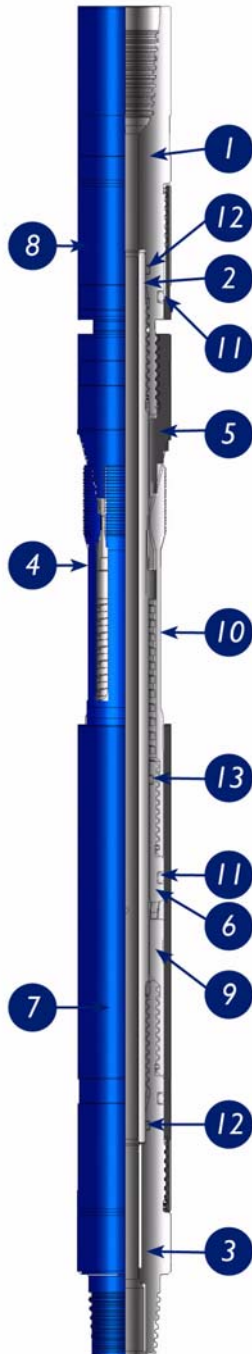
Tool Size	Orifice Diameter					
	0.130"	0.188"	0.250"	0.313"	0.375"	0.500"
1.69"	5	11	25	38	57	79

All flow rates are in gallons per minute (1 barrel per minute = 44 gallons per minute)

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TT0925-169A BOM, Schematic and Specs



ITEM	QTY	TOOL PARTS DESCRIPTION	PART NUMBER
1	1	TOP SUB	TT0925-169A-001
2	1	MANDREL	TT0925-169A-002
3	1	BOTTOM SUB	TT0925-169A-003
4	1	COLLET ANCHOR	TT0925-169A-004
5	1	SUPPORT CONE	TT0925-169A-005
6	1	PISTON	TT0925-169A-006
7	1	PISTON HOUSING	TT0925-169A-007
8	1	OUTER HOUSING	TT0925-169A-008
9	1	PISTON STOP RING	TT0925-169A-009
10	1	RETURN SPRING	TT0925-169A-010
11	3	O-RING 2-217, 80 DUROMETER HSN	PUR-TORV000-217
12	2	O-RING 2-116, 80 DUROMETER HSN	PUR-TORV000-116
13	1	O-RING 2-118, 80 DUROMETER HSN	PUR-TORV000-118

Tool Name: 1.688 OD Hydraulic Tubing Anchor

Product Code: TT0925-169A **Tool OD:** 1.688 in. **Tool ID:** 0.468 in.

Material: AISI 4140 HT 285-341 BHN **Tool Length:** 23.29 in. w/ 1-1/2 in. AMMT Box x Pin

Minimum Yield: 105,000 psi

Strength Properties of Tool:

Minimum Yield Point and Load to Yield: The Thread Relief of the Top Sub, 21,800 lbs.

Burst Point and Burst Pressure: Just below the O-ring groove at top of the Mandrel, 21,570 psi.

Torsional Weak Point and Ft-Lbs to Yield: 333 ft-lbs as a function of torsional yield of either of the Thread Relief of the Mandrel; 222 ft-lbs is the allowable operating torque through the tool.

Recommended Make Up Torque:

1st Connection: Make up all Stub Acme connections - 800 ft-lbs torque

2nd Connection: N/A

3rd Connection: N/A

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1.0 Pre-Assembly



Warning: *Make sure all tool parts and components have been thoroughly cleaned or serious damage and/or injury could occur!*



Note: *Verify that the correct O-ring redress kit and quantities are used as specified on the Bill Of Materials (for example, 5 each etc....). Lay out all redress kit components on a clean surface.*



Note: *Make sure to lubricate all O-rings and threaded surfaces.*



Note: *Visually inspect all parts for damage or wear. Thread parts together without the O-rings to check fit. Repair or replace damaged parts.*



Caution: *Always file wrench marks or burrs and clean off debris!*



Caution: *This tool should always be disassembled, cleaned thoroughly, inspected and reassembled after each job!*

2.0 Assembly

Refer to Drawing No. TT0925-169A.

Use the assembly drawing and parts list for reference as to item numbers used in the following assembly instructions. Prior to assembly, install all O-rings (item #11-13) into their respective parts, and coat all seals, IDs, seal surfaces and threads with a light coat of grease. Makeup all threads with no larger than a 24 inch pipe wrench to prevent component damage due to excessive makeup torque.

2.1 Place the Top Sub (item #1) in a vise.

2.2 Makeup the Outer Housing (item #8) onto the Top Sub (item #1).

2.3 Loosely makeup the Support Cone (item #5) onto the Top Sub.

- 2.4** Makeup the Mandrel (item #2) into the Top Sub.
- 2.5** Tighten the Support Cone (item #5) onto the Top Sub.
- 2.6** Place the Return Spring (item #10) onto the Mandrel and slide the Collet Anchor (item #4) onto the Mandrel.
- 2.7** Slide Piston (item #6) onto Mandrel and makeup the Piston to the Collet Anchor (item #4).
- 2.8** Slide the Piston Housing (item #7) onto the Piston and move it up until it touches the Collet Anchor.
- 2.9** Loosely makeup the Piston Stop Ring (item #9) onto the Bottom Sub (item #3).
- 2.10** Makeup the Bottom Sub onto the Mandrel (item #2).
- 2.11** Makeup the Piston Stop Ring (item #9) onto the Bottom Sub.
- 2.12** Makeup the Piston Housing (item #7) to the Bottom Sub.
- 2.13** The assembly is now complete and ready for pressure testing.

3.0 Disassembly

- 3.1** Remove the Piston Housing (item #7) from the Bottom Sub (item #3), and slide it up until it touches the Collet Anchor (item #4).
- 3.2** Remove the Bottom Sub from the Mandrel (item #2).
- 3.3** Remove the Piston Stop Ring (item #9) from the Bottom Sub.
- 3.4** Remove the Piston Housing (item #7) from the Piston (item #6).
- 3.5** Remove the Piston and Return Spring (item #10) from the Mandrel (item #2).

- 3.6 Remove the Collet Anchor (item #4) from the Mandrel.
- 3.7 Loosen the Support Cone (item #5) from the Top Sub (item #1).
- 3.8 Remove the Mandrel from the Top Sub.
- 3.9 Remove the Support Cone from the Top Sub.
- 3.10 Remove the Outer Housing (item #8) from the Top Sub.
- 3.11 Disassembly is complete.



Note: Remove and discard all O-rings. Replace O-rings after each use. Thoroughly clean tool parts in a cleaner approved by state and/or local laws.



Note: Visually inspect tool for swelling after each use. Damaged or swelled components must be replaced.



Note: It is recommended that a Magnetic Particle Inspection (MPI) be completed on all components after each job.

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