



# Owen Oil Tools

## Technical Manual

### Hydraulic Tubing Drain

TC-145-2375-000

TC-145-2875-000

MAN-TC-145

### Caution

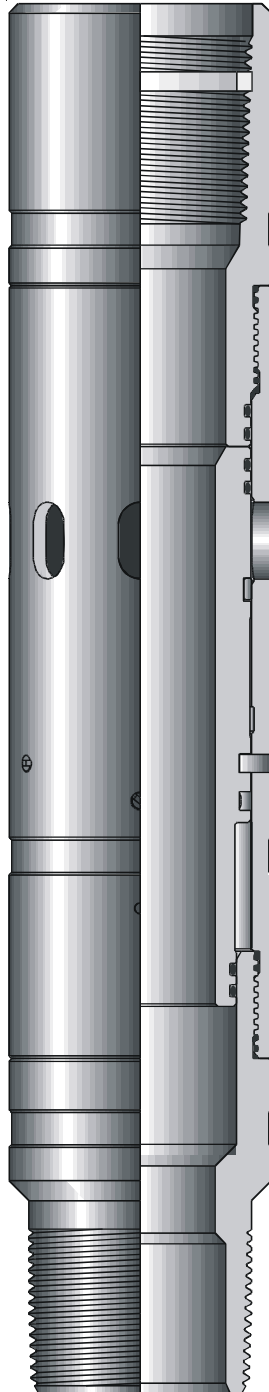
#### Safety Information

**If you are not properly trained in the handling, and use of explosives devices, do not attempt the assembly of any Owen Oil Tools Perforating Systems or Firing Devices.**

#### Technical Assistance

**For technical assistance, please call or contact your local support station.**

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## Description

The Hydraulic Tubing Drain may be used in conjunction with Hydraulic Actuation Equipment and serves as a means of draining tubing fluids to the wellbore after setting tools or firing perforating guns. The Hydraulic Tubing Drain is operated by the differential pressure between the hydrostatic pressure in the annulus, and the combination of hydrostatic and applied pressure in the tubing.

The Hydraulic Tubing Drain features an internal Sliding Sleeve which seals against the drain ports, isolating tubing pressure from the annulus. The sleeve is held in place with Shear Screws. By applying a predetermined pressure to the inside of the tubing, the screws shear and the sleeve shifts. Once shifted, the sleeve permanently opens the ports which provides a flow area equal to that of the tubing ID.

The tubing drain is used with any tubing conveyed application that requires drainage or that is activated by differential pressure, including Hydraulic Firing Heads. Example applications are:

- **Horizontal and Vertical Hydraulic Tool Actuation:** the tubing drain is used here to drain fluid from the tubing after a particular hydraulic tool has been activated
- **Horizontal and Vertical Perforating:** the tubing drain is used to drain fluid from the tubing after the guns have been fired
- **Extreme Overbalanced Perforating:** the tubing drain is designed to open prior to firing the guns so that tubing fluids are forced against the casing under extreme pressure

## Features and Benefits

- Internal sleeve design decreases the risk of premature sleeve shift
- Sliding internal sleeve will shift in any hole deviation
- The sleeve locks in the open position upon shifting to guarantee continuous flow through the tubing drain ports
- Large flow area permits temporary use as a perforated nipple for production

## Specifications

	2-3/8 in (60.3 mm)		2-7/8 in (73.0 mm)	
Maximum OD	3.062 in	77.8 mm	3.668 in	93.2 mm
Minimum ID	1.750 in	44.5 mm	2.250 in	57.2 mm
Flow Area <sup>2</sup>	3.316 in <sup>2</sup>	2140 mm <sup>2</sup>	4.690 in <sup>2</sup>	3026 mm <sup>2</sup>
Maximum Pressure	11,900 psi	82.1MPa	11,100 psi	76.5 MPa
Max Temp <sup>1</sup>	250°F (121°C)			
Connections	2-3/8 in (60.3 mm) EU Box X Pin		2-7/8 in (73.0 mm) EU Box X Pin	
Product Number	TC-145-2375-000		TC-145-2875-000	
Redress Kit	TC-145-2375-099		TC-145-2875-099	

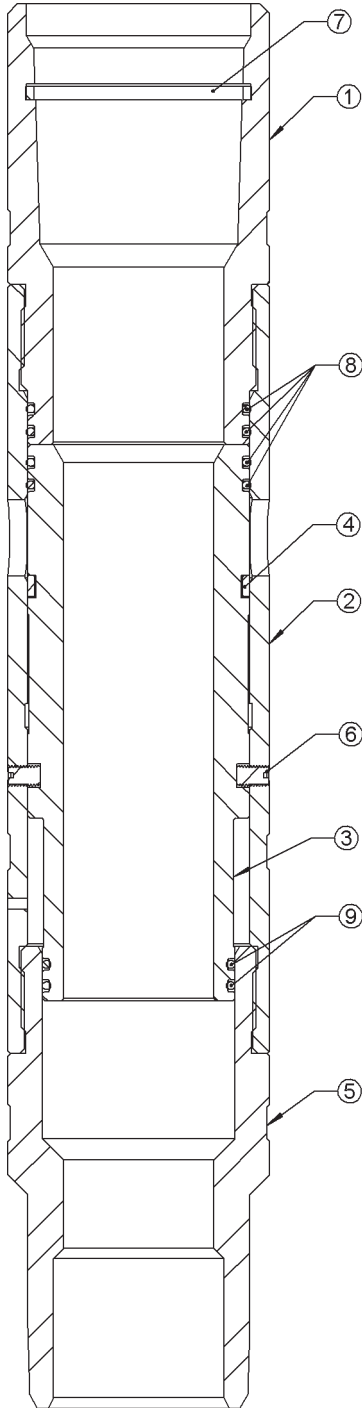
<sup>1</sup>The maximum temperature can be increased to 450°F (230°C) by substituting the 90 durometer Nitrile O-rings with 90 durometer Viton O-rings

<sup>2</sup>Greater flow area than the tubing bore

# Hydraulic Tubing Drain

TC-145-2375-000  
TC-145-2875-000

**Owen Oil Tools**



Item	Part Number	Qty	Description
--	<b>TC-145-2375-000</b>	--	<b>Hydraulic Tubing Drain 2-3/8" EU</b>
1	TC-145-0000-000	1	Top Sub 2-3/8" EU
2	TC-145-0001-000	1	Body
3	TC-145-0002-000	1	Sleeve
4	TC-145-0004-000	1	Snap Ring
5	TC-145-0003-000	1	Bottom Sub 2-3/8" EU
6	SF-050-025C-038B	10	Shear Screw 1/4-20 UNC x 3/8 Brass
7	MI-305-2375-000	1	Seal Ring 2-7/8" EU
8	OOO-N569-143	4	O-Ring 90 Durometer Nitrile
9	OOO-N569-137	2	O-Ring 90 Durometer Nitrile

Item	Part Number	Qty	Description
--	<b>TC-145-2375-099</b>	--	<b>Redress Kit Hydraulic Tubing Drain 2-3/8" EU</b>
6	SF-050-025C-038B	10	Shear Screw 1/4-20 UNC x 3/8 Brass
7	MI-305-2875-000	1	Seal Ring 2-7/8" EU
8	OOO-N569-143	4	O-Ring 90 Durometer Nitrile
9	OOO-N569-137	2	O-Ring 90 Durometer Nitrile

Hydraulic Data 2-3/8	
Piston Area	1.308 sq.in. (843.9 sq.mm)
Shear Screw Strength	1 screw min - 1,415 lb. (629.4 daN) $\pm$ 15%
Opening Pressure	1,082 psi/screw (7460 kPa/screw)
Max Opening Pressure	10,890 psi (75090 kPa) @ 10 screws

Item	Part Number	Qty	Description
--	<b>TC-145-2875-000</b>	--	<b>2-7/8" EU Hydraulic Tubing Drain</b>
1	TC-145-0005-000	1	Top Sub 2-7/8" EU
2	TC-145-0006-000	1	Body
3	TC-145-0007-000	1	Sleeve
4	TC-145-0009-000	1	Snap Ring
5	TC-145-0008-000	1	Bottom Sub 2-7/8" EU
6	SF-050-025C-038B	10	Shear Screw 1/4-20 UNC x 3/8 Brass
7	MI-305-2875-000	1	Seal Ring 2-7/8" EU
8	OOO-N569-150	4	O-Ring 90 Durometer Nitrile
9	OOO-N569-146	2	O-Ring 90 Durometer Nitrile

Item	Part Number	Qty	Description
--	<b>TC-145-2875-099</b>	--	<b>Redress Kit Hydraulic Tubing Drain 2-7/8" EU</b>
0	MI-305-2875-000	1	2-7/8" EU Thread API Seal Ring
6	SF-050-025C-038B	10	Shear Screw 1/4-20 UNC x 3/8 Brass
8	OOO-N569-150	4	O-Ring 90 Durometer Nitrile
9	OOO-N569-146	2	O-Ring 90 Durometer Nitrile

Hydraulic Data 2-7/8	
Piston Area	1.526 sq.in. (985 sq.mm)
Shear Screw Strength	1,415 lb. (629.4 daN) $\pm$ 15%
Opening Pressure	927 psi/screw (6391 kPa/screw)
Max Opening Pressure	9,270 psi (63914 kPa) @ 10 screws

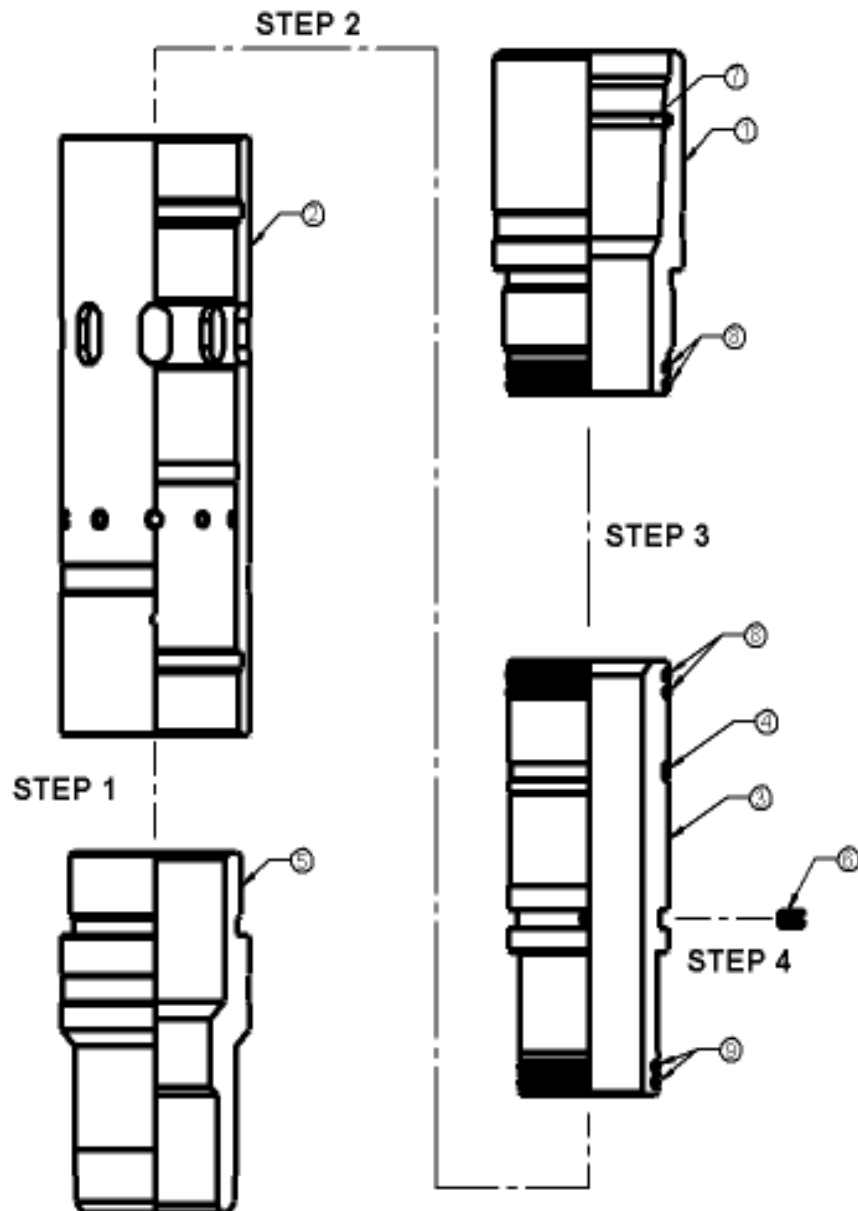


Figure 1

## Assembly and Disassembly Refer to Figure 1 Explosion View

### Step 1

Thread the Bottom Sub (Item 5) into the Body (Item 2) and torque

### Step 2

Slide the Snap Ring (Item 4) over the Sleeve (Item 3) until it snaps into its groove as show in Figure 1. Lightly grease the O-rings (Items 8 and 9) and install them onto the Sleeve (Item 3). Slide the Sleeve (Item 3), small end first, into the Body (Item 2). Slide the Sleeve into the Body far enough to let the thread of the Top Sub (Item 1) engage the Body thread.

### Step 3

Lightly grease O-rings (Item 8) and install onto the Top Sub (Item 1). Install the Seal Ring (Item 7) into the EU thread of the Top Sub. Now thread the Top Sub (Item 1) into the Body (Item 2).

Note: as you shoulder the Top Sub to the Body, the shear holes on the body should be aligned with the groove in the Sleeve (Item 3). Now torque the Top Sub.

### Step 4

Thread the Shear Screws (Item 6) into the shear holes of the Body (Item 2). The number of shear screws will vary with each well condition.