



# **Owen Oil Tools**

## Technical Manual

### Mechanical Firing Head Econo Style

TC-011-2375-000

TC-011-2875-000

TC-011-3500-000

MAN-TC-011

**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.**

Mechanical Firing Head

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**Owen Oil Tools**



**Econo Style**

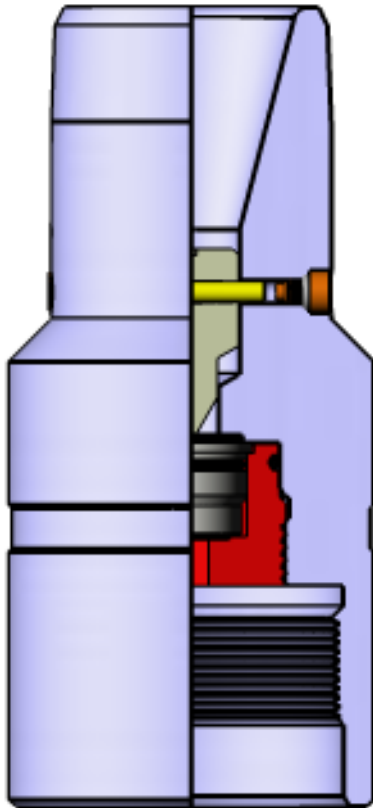
For use with Slim Nose Drop Bars TC-130

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For use with Slim Nose Drop Bars

Description

Econo Style



The Mechanical Firing Head is an economical TCP Firing Head which allows detonation of the gun system by releasing a Slim Nose Drop Bar into the tubing from surface. The Firing Pin is held in the bore of the Firing Head with a Shear Pin which is severed upon impact of the Slim Nose Drop Bar, allowing the Firing Pin to travel downward. The percussion transmitted to the Initiator causes detonation which is transferred to the Gun System.

The Firing Head is designed to use the CP Percussion Initiator. The Initiator is retained in the bottom of the Firing Head with an Initiator Retaining Nut which allows the Firing Head to be transported safely without any explosives installed. The top of the Firing Head features standard 8RD EUE Pin connections to thread into the tubing string as well as an integral No-Go profile which ensures that foreign objects do not accidentally fire the guns.

Features and Benefits

- Connects directly to any gun system top sub with GO 2.750 Acme thread
- CP Percussion Initiator contains no lead azide and maintains differential pressure integrity even after detonation
- Allows easy handling on the rig floor
- Ensures that the Initiator may not be installed incorrectly, reducing the possibility of a misrun
- Integral No-Go feature ensures that foreign objects dropped into the tubing may not detonate the gun. Initiator may be installed at the rig so the Firing Head is not transported with explosives installed
- May be used in snubbing applications
- At least one full tubing joint filled with fluid directly on top of the Firing Head is recommended for optimum drop bar impact

**Note:**  
this Mechanical Firing Head does not comply with API-RP-67, Section 6.4.2. This tool should only be used when no other tool will satisfy job requirements and a procedure has been established to prevent accidental detonation.

Specifications

	2-3/8 in (60.3 mm)		2-7/8 in (73.0 mm)		3-1/2 in (88.9 mm)	
Maximum OD	3.062 in	78.0 mm	3.750 in	95.3 mm	4.500 in	114 mm
Minimum ID	1.875 in	47.6 mm	2.34 in	59.4 mm	2.75 in	69.9 mm
Overall Length	16.0 in	406 mm	17.13 in	435 mm	22.75 in	578 mm
Max Pressure <sup>2</sup>	20,000 psi	137 900 KPa	20,000 psi	137 900 KPa	20,000 psi	137 900 kPa
Tensile	55,200 lb	24 550 daN	79,400 lb	35 300 daN	90,400 lb	40 200 daN
Max Temp <sup>1</sup>	250°F (121°C)					
Connections	2-3/8 in (60.3 mm) EU Pin GO 2.750 Acme Box		2-7/8 in (73.0 mm) EU Pin GO 2.750 Acme Box		3-1/2 in (88.9 mm) EU Pin GO 2.750 Acme Box	
Product Number	TC-011-2375-000		TC-011-2875-000		TC-011-3500-000	
Redress Kit	TC-011-2375-999		TC-011-2875-999		TC-011-3500-999	

<sup>1</sup>The maximum temperature can be increased to 450° (230°C) by substituting the 90 durometer Nitrile o-rings with 90 durometer Viton o-rings. Refer to the Time vs Temperature chart for Explosives to confirm any explosives requirements

<sup>2</sup>The maximum pressure is determined by the maximum allowable pressure differential of Initiator after detonation

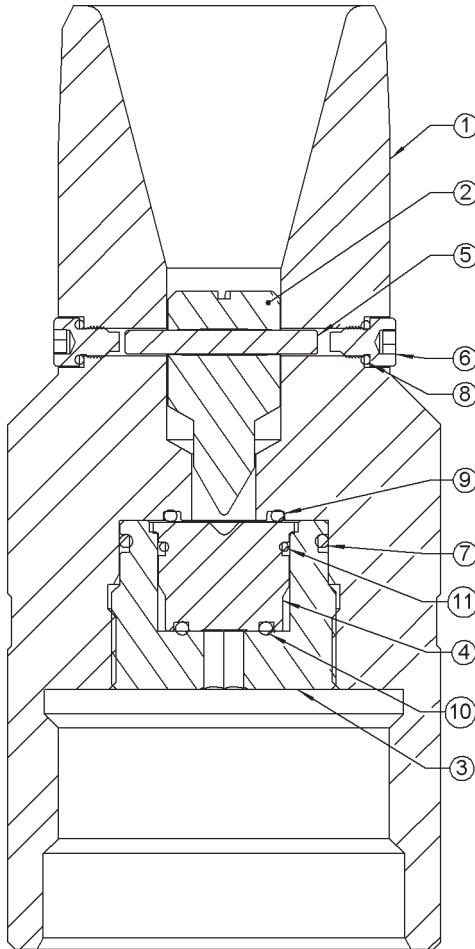
# Mechanical Firing Head

TC-011-2375-000  
 TC-011-2875-000  
 TC-011-3500-000

**Owen Oil Tools**



## Econo Style



Item	Part Number	Qty	Description
--	<b>TC-011-2375-000</b>	--	<b>Mechanical Firing Head 2-3/8" EU</b>
1	TC-011-0000-000	1	Firing Head Body 2-3/8" EU
2	TC-011-0001-000	1	Firing Pin f/Mechanical Firing Head
3	TC-011-0002-000	1	Initiator Retaining Nut
4	Reference	1	Percussion Detonator
5	PF-100-0188-150B	1	Brass Shear Pin (OD 0.188", 1.50 LG)
6	SF-050-025F-050S	2	Shear Screw 1/4" - 28 UNF x 0.5 LG.
7	OOO-N569-127	1	O-Ring 90 Durometer Nitrile
8	OOO-N569-009	2	O-Ring 90 Durometer Nitrile
9	OOO-N569-116	1	O-Ring 90 Durometer Nitrile
10	OOO-N569-113	1	O-Ring 90 Durometer Nitrile
11	OOO-N569-020	1	O-Ring 90 Durometer Nitrile
---	PF-074-0000-000	1	Tube Nut P/N TN-66
---	TC-011-2375-098	1	Redress Kit for Mechanical Firing Head 2-3/8" EU (without Firing Pin)
---	TC-011-2375-099	1	Redress Kit for Mechanical Firing Head 2-3/8" EU
---	MAN-TC-011	1	Assembly Manual

Item	Part Number	Qty	Description
--	<b>TC-011-2875-000</b>	--	<b>Mechanical Firing Head 2-7/8" EU</b>
1	TC-011-0003-000	1	Firing Head Body 2-7/8" EU
2	TC-011-0001-000	1	Firing Pin f/Mechanical Firing Head
3	TC-011-0002-000	1	Initiator Retaining Nut
4	Reference	1	Percussion Detonator
5	PF-100-0188-150B	1	Brass Shear Pin (OD 0.188", 1.50 LG)
6	SF-050-025F-050S	2	Shear Screw 1/4" - 28 UNF x 0.5 LG.
7	OOO-N569-127	1	O-Ring 90 Durometer Nitrile
8	OOO-N569-009	2	O-Ring 90 Durometer Nitrile
9	OOO-N569-116	1	O-Ring 90 Durometer Nitrile
10	OOO-N569-113	1	O-Ring 90 Durometer Nitrile
11	OOO-N569-020	1	O-Ring 90 Durometer Nitrile
---	PF-074-0000-000	1	Tube Nut P/N TN-66
--	MAN-TC-011	1	Assembly Manual
--	TC-011-2375-098	1	Redress Kit, Mechanical Firing Head 2-7/8" EU (without Firing Pin)
--	TC-011-2375-099	1	Redress Kit for Mechanical Firing Head 2-7/8" EU

Item	Part Number	Qty	Description
--	<b>TC-011-3500-000</b>	--	<b>Mechanical Firing Head 3-1/2" EU</b>
1	TC-011-0004-000	1	Firing Head Body 3-1/2" EU
2	TC-011-0001-000	1	Firing Pin f/Mechanical Firing Head
3	TC-011-0002-000	1	Initiator Retaining Nut
4	Reference	1	Percussion Detonator
5	PF-100-0188-150B	1	Brass Shear Pin (OD 0.188", 1.50 LG)
6	SF-050-025F-050S	2	Shear Screw 1/4" - 28 UNF x 0.5 LG.
7	OOO-N569-127	1	O-Ring 90 Durometer Nitrile
8	OOO-N569-009	2	O-Ring 90 Durometer Nitrile
9	OOO-N569-116	1	O-Ring 90 Durometer Nitrile
10	OOO-N569-113	1	O-Ring 90 Durometer Nitrile
11	OOO-N569-020	1	O-Ring 90 Durometer Nitrile
---	PF-074-0000-000	1	Tube Nut P/N TN-66
--	MAN-TC-011	--	Assembly Manual
--	TC-011-2375-098	--	Redress Kit, Mechanical Firing Head 3-1/2" EU (without Firing Pin)
--	TC-011-2375-099	--	Redress Kit for Mechanical Firing Head 3-1/2" EU

Part Number	Qty	Description
TC-011-2375-098	--	<b>Redress Kit for Mechanical Firing Head 2-3/8", 2-7/8", &amp; 3-1/2" EU (without Firing Pin)</b>
OOO-N569-020	1	O-Ring 90 Durometer Nitrile
OOO-N569-113	1	O-Ring 90 Durometer Nitrile
OOO-N569-116	1	O-Ring 90 Durometer Nitrile
OOO-N569-127	1	O-Ring 90 Durometer Nitrile
PF-074-0001-000	1	Tube Nut P/N TN-66
PF-100-0188-150B	1	Brass Shear Pin (OD 0.188", 1.50 LG)
OOO-N569-009	2	O-Ring 90 Durometer Nitrile
SF-050-025F-050S	2	Shear Screw 1/4" - 28 UNF x 0.5 LG.

Part Number	Qty	Description
TC-011-2375-099	--	<b>Redress Kit for Mechanical Firing Head 2-3/8", 2-7/8" &amp; 3-1/2" EU</b>
OOO-N569-020	1	O-Ring 90 Durometer Nitrile
OOO-N569-113	1	O-Ring 90 Durometer Nitrile
OOO-N569-116	1	O-Ring 90 Durometer Nitrile
OOO-N569-127	1	O-Ring 90 Durometer Nitrile
PF-074-0001-000	1	Tube Nut P/N TN-66
PF-100-0188-150B	1	Brass Shear Pin (OD 0.188", 1.50 LG)
TC-011-0001-000	1	Firing Pin f/Mechanical Firing Head
OOO-N569-009	2	O-Ring 90 Durometer Nitrile
SF-050-025F-050S	2	Shear Screw 1/4" - 28 UNF x 0.5 LG.

**Note: Redress Kits, TC-011-2375-098 and TC-011-2375-099 are not included**



**Note:** Before assembling the Mechanical Firing Head, ensure that all components are present (refer to the Exploded View at the end of the manual). Inspect all parts carefully for any signs of wear, thread galling, machining defects or damage. All of the parts should be cleaned thoroughly before attempting any assembly of the Firing Head.

**It is important to check the Firing Pin travel to make sure that the Initiator will not be breached during impact of the Drop Bar. Before installing the Shear Pin, slide the Firing Pin fully into the Body until the Pin hits the internal shoulder. Measure the distance from the tip of the Firing Pin to the face of the Firing Head Body. This distance must be within the range 0.215 - 0.250 inch (5.46 - 6.35 mm). If it is not within this range, the Firing Pin must be replaced.**

In order to ensure the proper operation of the Firing Head, the Firing Pin must be replaced after each detonation. The impact with the Initiator tends to shorten the Firing Pin and make the tapered end blunt.

### Assembly

1. Install the Firing Pin (item 2) by sliding the Firing Pin, point first, into the main body (item 1). Align the hole through the body with the hole in the firing pin. Insert the Brass Shear Pin (Item 5) roughly to the center of the main body. Lightly grease and install O-rings (item 8) on the shear screws (item 6) and screw the shear screws into each side of the body.
2. Lightly grease and install O-ring (item 7) on Initiator Retaining Nut (item 3). The Nut can then be threaded into the Main Body (item 1). At this time, the Initiator (item 4) may be installed or left until the guns are run into the well and landed on the rig floor.
3. **Initiator Installation:** Lightly grease and install O-ring (item 11) on the Initiator (item 4) . To retain the O-rings (item 9 and 10) lightly grease and set them on top and bottom of Initiator as show in the exploded view.  
**Note: it critical that you do not use an excessive amount of grease on the bottom O-ring (item 10) as it may affect the detonation process.**  
Now lightly coat the inside of the Initiator Nut Retainer (item 3) and carefully press the Initiator into the Nut until the top of the Initiator flange is flush with the end of the Nut.

**Caution: Do Not use any pointed device to drive the Initiator into the Initiator Nut, as this may cause detonation resulting in serious injury. Install by hand only with gentle pressure.**

Now install the Nut with the Initiator into the Main Body. Make sure the end of the Retainer Nut is flush with the internal face of the Main Body.

**Notes:** it is good practice to insert the Initiator into the Main Body immediately before running the Firing Head into the well. This may be done easily in field conditions. Ensure that the perforating gun is configured so that the top shot is below the rig floor when installing the Mechanical Firing Head. **Do Not** install the Firing Head until the guns are in the hole and the top shot is located below the rig floor.

The Firing Head is now fully assembled and ready to be installed on the gun Top Sub. Install the appropriate O-rings and thread compound to the Top Sub and tighten the connection. Once tight, lower the tubing string onto the Firing Head Pin thread (EUE). After applying thread compound, make up the tubing connection on the Firing Head and run it into the well.

### Disassembly:

When disassembling the Firing Head, it is important to clean thoroughly all threaded parts and seal surfaces to prevent malfunction. Examine all pieces carefully for signs of wear or deformation as noted earlier in this manual and replace any parts if necessary. Proper care and maintenance is important for the tool to operate as designed.

## Econo Style

### Running Procedures

Once the guns have been properly positioned on depth, drop the bar from surface to detonate the perforating guns. After the appropriate period has elapsed and there has been no indication of gun detonation, a second bar may be released, only after the first bar has been retrieved. However, it is highly recommended that no more than two bars be dropped. At this point, the perforating string may be retrieved.

Important:

In case of a misrun, the Drop Bar must be retrieved prior to removing the guns from the well. **Under no circumstances may the guns be removed from the well with Drop Bar left in place.**

When disassembling a Firing Head that has misfired, **never push on the discharge end of the Initiator with a sharp or pointed object.** A soft rubber piece may be used to remove the Initiator gently.

