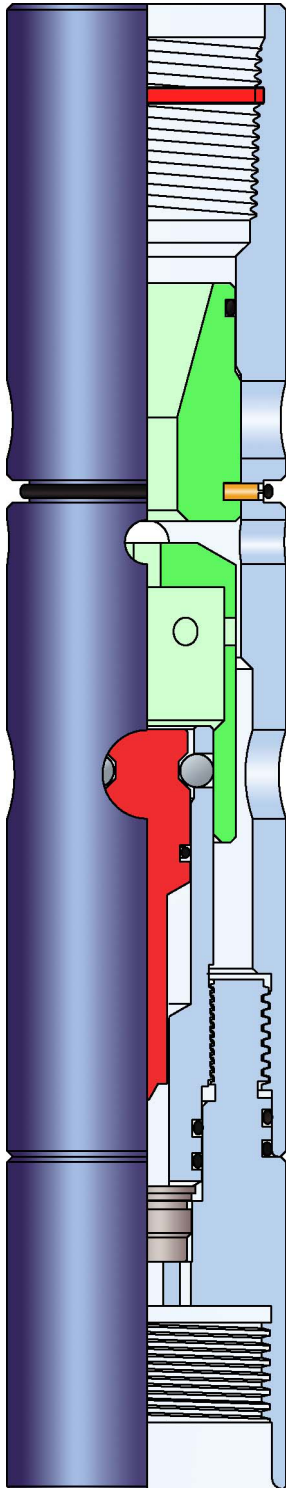


Differential Safety Firing Assembly



DESCRIPTION

This Differential Safety Firing Head was designed to be used in overbalanced tubing conveyed perforating in highly deviated wells, wells with open perforations, when achieving an absolute pressure is not possible, in a situation where it is desirable to allow the tubular to fill itself, or while tripping in the well.

This Firing Head has a set of ports to allow circulation of well fluids prior to activation. A drop ball is introduced into the work string, which conveyed the firing head down hole. The ball can be allowed to free fall or be pumped down to the differential piston. The piston is pinned to a predetermined differential pressure and, once the ball is seated, then pressure is applied against the piston and seated ball. When the piston is sheared free, it will strike the Hydro-Safety Impact assembly releasing the firing pin. This action will allow the well's hydrostatic pressure to drive the released firing pin into the detonator. Once the firing head assembly is activated a set of ports are exposed, allowing circulation of well fluids after detonation.

The standard differential piston uses a 3/4" or a 1" ball. A differential piston to be used with a 5/8" diameter ball is available and is sold separately.

The pressure piston can be differentially pinned up to 6,000 psi @ 72°F.

FEATURES AND BENEFITS

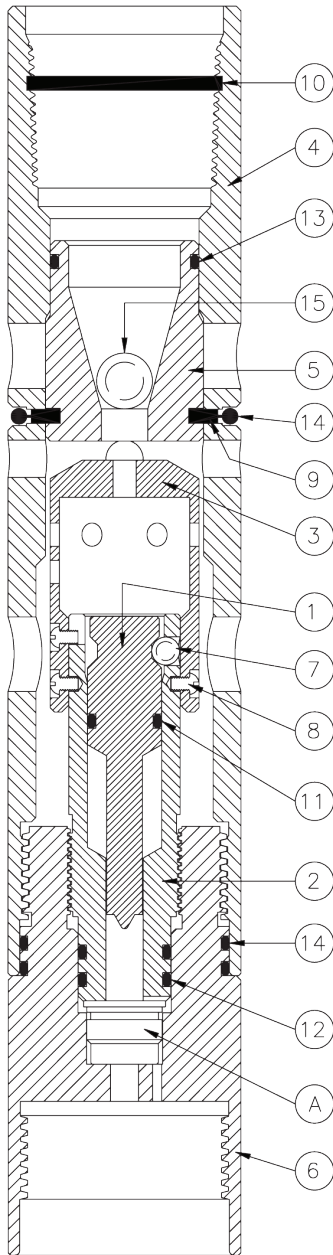
- Overbalanced Tubing Conveyed Perforating in highly deviated wells with open perforations.
- When achieving an absolute pressure is not possible.
- In a situation where it is desirable to allow the tubing to fill itself while tripping in the well.

SPECIFICATIONS

	LOW PRESSURE TC-022-2375-000	HIGH PRESSURE TC-022-2375-200
Top Thread	2-3/8" EUE Box	
O.D.	3-1/8" (79.4 mm)	
Overall Length	16-3/4" (42.55 cm)	
Max. Temperature ¹	250°F (121°C)	
Min. Operating Hydrostatic	300 psi (2.0 MPa)	2,000 psi (13.8 MPa)
Max. Operating Hydrostatic	8,000 psi (55.4 MPa)	20,000 psi (137.9 MPa)
Yield Strength	163,800 lbs.	72,506 daN
Tensile Strength	192,500 lbs.	85,628 daN

¹ 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.

TC-022-2375-000 (LP) BOM and Schematic



ITEM	PART NUMBER	QTY.	DESCRIPTION
-	TC-022-2375-000	-	Differential Safety Firing Head, (LP)
1*	TC-022-0000-000	1	Firing Pin, HSI (Low Pressure)
2	TC-022-0001-000	1	Body, Firing Pin (LP)
3	TC-022-0002-000	1	Retainer Cap HSI
4	TC-022-0003-000	1	Body, BADSFA
5	TC-022-0005-000	1	Piston, for 3/4" or 1" Ball
6	TC-005-0002-000	1	Detonator Body
7*	ST-040-0375-000	3	Retaining Ball
8*	PF-030-019F-025B	3	Shear Screws, Brass
9*	SF-010-0189-045	12	Shear Pins, (Owen)
10*	MI-305-2375-000	1	API Seal Ring
11*	OOO-N569-210	1	O-Ring, N-90 (Low Pressure)
12*	OOO-N569-214	2	O-Ring, N-90
13*	OOO-N569-224	1	O-Ring, N-90
14*	OOO-N569-230	3	O-Ring, N-90
15*	ST-040-0750-000	1	Drop Ball - 3/4" dia.
A	Reference	1	Percussion Detonator (sold separately)
-	TC-022-2375-099P	-	Redress Kit (Low Pressure)
-	TC-022-2375-399P	-	Redress Kit (L P High Temp)

ITEM	PART NUMBER	QTY.	DESCRIPTION
-	TC-022-0008-000	1	Piston Diff. for 5/8" Ball (sold separately)
--	PUR-0514-012	1	Steel Ball 5/8" dia. (sold separately)

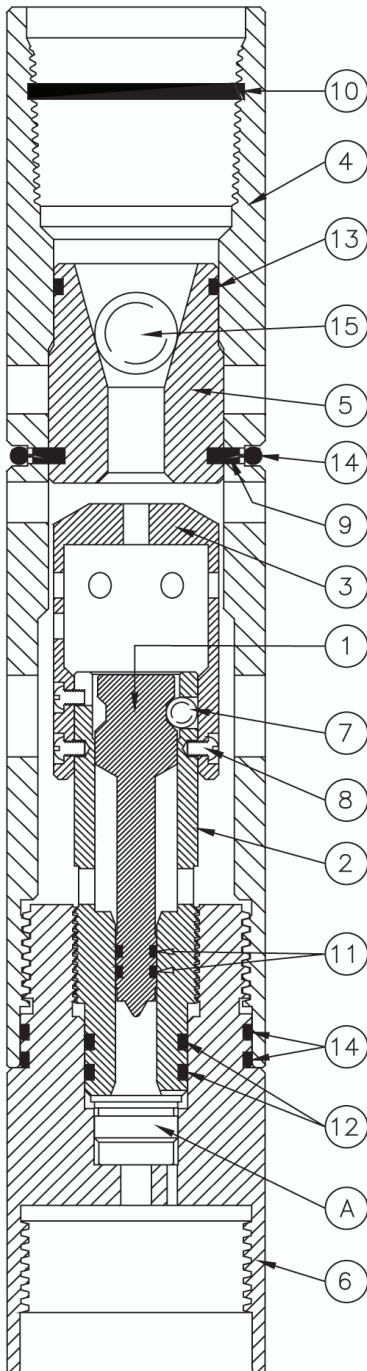
* Denotes parts in Redress Kits

NOTE: Redress kits includes (3) drop balls: 3/4", 5/8" & 1" diameters

High Temperature Kit contains Viton O-Rings.

If the firing head, TC-022-2375-000, is to be used in conjunction with the Owen 6-minute time delay fuse system, TC-043-3125-000, the standard firing pin **must** be changed out to the firing pin TC-022-0010-000 (sold separately).

TC-022-2375-200 (HP) BOM and Schematic



ITEM	PART NUMBER	QTY.	DESCRIPTION
-	TC-022-2375-200	-	Differential Safety Firing Head, (HP)
1*	TC-022-0000-200	1	Firing Pin, HSI (High Pressure)
2	TC-022-0002-200	1	Body, Firing Pin (HP)
3	TC-022-0002-000	1	Retainer Cap HSI
4	TC-022-0003-000	1	Body, BADSFA
5	TC-022-0005-000	1	Piston, for 3/4" or 1" Ball
6	TC-005-0002-000	1	Detonator Body
7*	ST-040-0375-000	3	Retaining Ball
8*	PF-030-019F-025B	3	Shear Screws, Brass
9*	SF-010-0189-045	12	Shear Pins, (Owen)
10*	MI-305-2375-000	1	API Seal Ring
11*	OOO-N569-109	1	O-Ring, N-90 (High Pressure)
12*	OOO-N569-214	2	O-Ring, N-90
13*	OOO-N569-224	1	O-Ring, N-90
14*	OOO-N569-230	3	O-Ring, N-90
15*	ST-040-0750-000	1	Drop Ball - 3/4" dia.
A	Reference	1	Percussion Detonator (sold separately)
--	TC-022-2375-299P	--	Redress Kit (High Pressure)
--	TC-022-2375-699P	--	Redress Kit (H P High Temp)
--	TC-022-0011-000	--	Firing Pin O-Ring installation Tool (sold separately)
	MAN-TC-022		Assembly Manual for Low and High Pressure

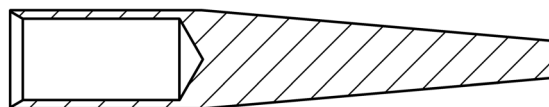
ITEM	PART NUMBER	QTY.	DESCRIPTION
-	TC-022-0008-000	1	Piston diff. for 5/8" Ball (sold separately)
-	PUR-0514-012	1	Steel Ball 5/8" dia. (sold separately)
-	TC-022-0011-000	1	Oring installation Tool (sold separately)

* Denotes parts in Redress Kits

NOTE: Redress kits includes (3) drop balls: 3/4", 5/8" & 1" diameters.

High Temperature Kit contains Viton O-Rings.

If this firing head, TC-022-2375-200, is to be used in conjunction with the Owen 6-minute time delay fuse system, TC-043-3125-000, the standard firing pin **must** be changed out to the firing pin TC-022-0010-200 (sold separately).



TC-022-0011-000