

Description

The Underbalance Sub may be run in a TCP string to achieve a differential pressure between the formation and tubing string to establish an underbalance condition for perforating. This tool uses a thick glass disk sealed inside the housing as a pressure barrier.

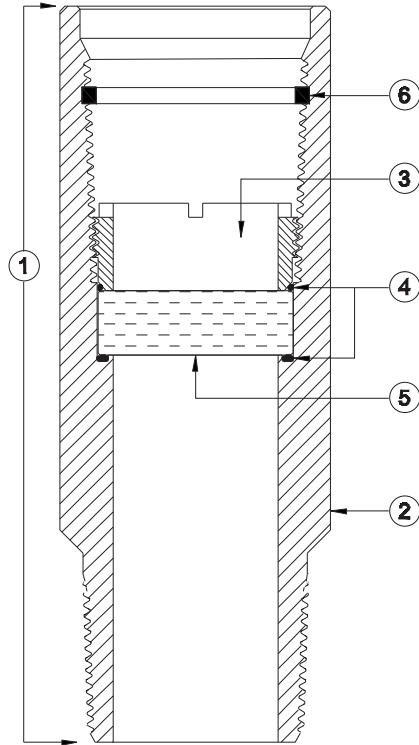
Once a Drop Bar has been released from surface to strike a Mechanical (Percussion) Firing Head, it also impacts the Surge Tool, breaking the glass disk, this impact causes the glass disk to shatter, thereby destroying the pressure barrier and allowing fluids to rush into the tubing from the formation after detonation of the guns. Since the reservoir is under pressure and the tubing is essentially dry, this underbalanced condition removes debris that has settled in the perforation tunnels.

Features and Benefits

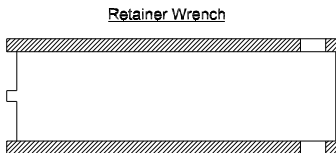
- Inexpensive way of achieving underbalance
- Two pressure ratings available
- Simple hookup for both permanent and shoot and pull applications
- Can be run above or below the packer depending on underbalance desired

Specifications

Thread Connection	2-3/8 in EUE		2-7/8 in EUE	
O.D.	3.13 in	79 mm	3.68 in	93 mm
I.D.	1.90 in	48 mm	2.35 in	60 mm
Make-up Length	6.63 in	168 mm	7.25 in	184 mm
1/2" Glass	TC-090-2375-000		TC-090-2875-000	
Max. Differential	3,500 psi	24 MPa	2,500 psi	17.2 MPa
3/4" Glass	TC-090-2375-200		TC-090-2875-200	
Max. Differential	7,000 psi	48 MPa	4,000 psi	27.6 MPa



Underbalance w/ 3/4" glass

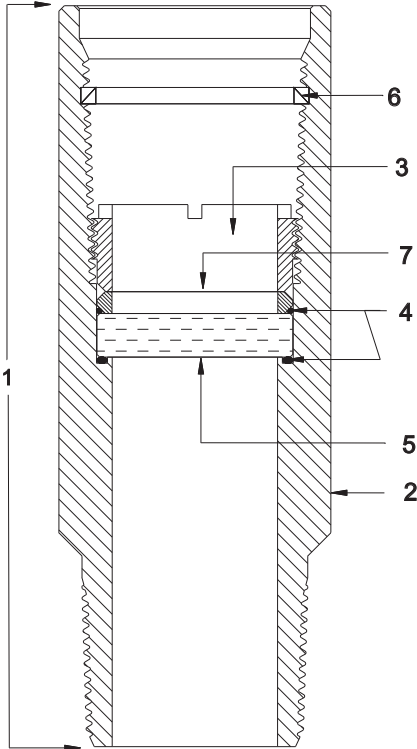


Item	Part Number	Description	Part Number
1	TC-090-2375-200	2-3/8 Underbalance Assy. with 3/4" Glass	TCP-0101-001
	TC-090-2875-200	2-7/8 Underbalance Assy. with 3/4" Glass	TCP-0101-002
2	TC-090-0000-000	2-3/8 Body	TCP-0101-005
	TC-090-0003-000	2-7/8 Body	TCP-0101-010
3	TC-090-0001-000	2-3/8 Glass Retainer	TCP-0101-006
	TC-090-0004-000	2-7/8 Glass Retainer	TCP-0101-011
4	OOO-N569-137	O-Ring, N-90 (Qty. 2), 2-3/8 Assembly	--
	OOO-N569-145	O-Ring, N-90 (Qty. 2), 2-7/8 Assembly	--
5	MI-200-2250-075	2-3/8 Glass Disc, 2-1/4 Dia. x 3/4	TCP-0101-007
	MI-200-2750-075	2-7/8 Glass Disc, 2-3/4 Dia. x 3/4	TCP-0101-012
6	MI-305-2375-000	2-3/8 API Seal	TCP-0100-160
	MI-305-2875-000	2-7/8 API Seal	TCP-0100-161
--	TC-090-0006-000	2-3/8 Retainer Wrench (sold separately)	TCP-0101-008
--	TC-090-0007-000	2-7/8 Retainer Wrench (sold separately)	TCP-0101-013
--	TC-090-2375-299	Redress Kit 2-3/8 w/3/4" Glass	TCP-0101-031
--	TC-090-2875-299	Redress Kit 2-7/8 w/3/4" Glass	TCP-0101-032
--	MAN-TC-090	Operating Manual, Assemblies	MAN-UNDB-GEN

Item	Part Number	Description	Part Number
--	TC-090-2375-299	Redress Kit 2-3/8 w/3/4" Glass	TCP-0101-031
4	OOO-N569-137	O-Ring, N-90 (Qty. 2), 2-3/8 Assembly	--
5	MI-200-2250-075	2-3/8 Glass Disc, 2-1/4 Dia. x 3/4	TCP-0101-007
6	MI-305-2375-000	2-3/8 API Seal	TCP-0100-160

Item	Part Number	Description	Part Number
--	TC-090-2875-299	Redress Kit 2-7/8 w/3/4" Glass	TCP-0101-032
4	OOO-N569-145	O-Ring, N-90 (Qty. 2), 2-7/8 Assembly	--
5	MI-200-2750-075	2-7/8 Glass Disc, 2-3/4 Dia. x 3/4	TCP-0101-012
6	MI-305-2875-000	2-7/8 API Seal	TCP-0100-161

	Assembly	Redress Kit	Old Redress Kit No.	Old Assembly No.
--	TC-090-2375-200	TC-090-2375-299	TCP-0101-031	TCP-0101-001
--	TC-090-2875-200	TC-090-2875-299	TCP-0101-032	TCP-0101-002



Item	Part Number	Description	Part Number
	TC-090-2375-000	2-3/8 Underbalance Assy. with 1/2" Glass	TCP-0101-003
	TC-090-2875-000	2-7/8 Underbalance Assy. with 1/2" Glass	TCP-0101-004
2	TC-090-0000-000	2-3/8 Body	TCP-0101-005
	TC-090-0003-000	2-7/8 Body	TCP-0101-010
3	TC-090-0001-000	2-3/8 Glass Retainer	TCP-0101-006
	TC-090-0004-000	2-7/8 Glass Retainer	TCP-0101-011
4	OOO-N569-137	O-Ring, N-90 (Qty. 2), 2-3/8 Assembly	--
	OOO-N569-145	O-Ring, N-90 (Qty. 2), 2-7/8 Assembly	--
5	MI-200-2250-050*	2-3/8 Glass Disc, 2-1/4 Dia. x 1/2	TCP-0101-015
	MI-200-2750-050*	2-7/8 Glass Disc, 2-3/4 Dia. x 1/2	TCP-0101-016
6	MI-305-2375-000	2-3/8 API Seal	TCP-0100-160
	MI-305-2875-000	2-7/8 API Seal	TCP-0100-161
7	TC-090-0002-000	2-3/8 Spacer Ring for 1/2 Glass	TCP-0101-017
	TC-090-0005-000	2-7/8 Spacer Ring for 1/2 Glass	TCP-0101-018
--	TC-090-0006-000	2-3/8 Retainer Wrench (sold separately)	TCP-0101-008
	TC-090-0007-000	2-7/8 Retainer Wrench (sold separately)	TCP-0101-013
	TC-090-2375-099	Redress Kit 2-3/8 w/1/2" Glass	TCP-0101-033
	TC-090-2875-099	Redress Kit 2-7/8 w/1/2" Glass	TCP-0101-034
--	MAN-TC-090	Operating Manual, Assemblies	MAN-UNDB-GEN

Item	Part Number	Description	Part Number
	TC-090-2375-099	Redress Kit 2-3/8 w/1/2" Glass	TCP-0101-033
4	OOO-N569-137	O-Ring, N-90 (Qty. 2), 2-3/8 Assembly	--
5	MI-200-2250-050*	2-3/8 Glass Disc, 2-1/4 Dia. x 1/2	TCP-0101-015
6	MI-305-2375-000	2-3/8 API Seal	TCP-0100-160

Item	Part Number	Description	Part Number
	TC-090-2875-099	Redress Kit 2-7/8 w/1/2" Glass	TCP-0101-034
4	OOO-N569-145	O-Ring, N-90 (Qty. 2), 2-7/8 Assembly	--
5	MI-200-2750-050*	2-7/8 Glass Disc, 2-3/4 Dia. x 1/2	TCP-0101-016
6	MI-305-2875-000	2-7/8 API Seal	TCP-0100-161

Retainer Wrench



	Assembly	Redress Kit	Old Redress Kit No.	Old Assembly No.
--	TC-090-2375-000	TC-090-2375-099	TCP-0101-033	TCP-0101-003
--	TC-090-2875-000	TC-090-2875-099	TCP-0101-034	TCP-0101-004