



# Dual Flapper Valve

MAN-TTT-750 (R01)

## Thru-Tubing Technology

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# Dual Flapper Valve

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## Description

The Dual Flapper Valve is run in the tubing string as a safety mechanism to prevent fluid flow back up the tubing. This is especially important when running coiled tubing in live wells or where a hole in the tubing at surface would allow the well to flow uncontrolled.

The Dual Flapper Valve is a flapper type back pressure valve that allows flow down the tubing, but stops flow coming back up the tubing. The Dual Flapper Back Pressure Valve has two flappers and flapper seals. The second flapper is redundant to the first and is run where redundant seals are required. The flappers are designed so that a ball can be pumped through them at minimum fluid flow rate.

## Operation

The Dual Flapper Valve is normally run directly below the CT Connector in CT operations and at the top of the bottom hole assembly (BHA) in snubbing operations. No tubing manipulation or pressurization sequence is required to operate the tool. The presence of the Dual Flapper Valve must be taken into consideration during some downhole operations because the flapper will not allow pressure in the coiled tubing below the back pressure valve to be bled off at surface.

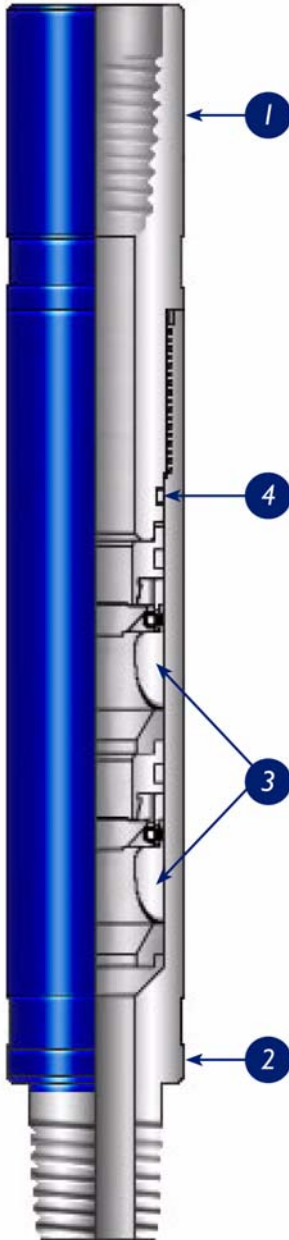


*Note: Unless otherwise indicated, all the strength figures given in this manual, are the result of calculations based on the yield strength of the material used in the manufacture of this product. These strength calculations are considered accurate within plus or minus 20% and are to be used only as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

# Dual Flapper Valve

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## TTT0750-125A BOM, Schematics and Specs



ITEM	QTY	TOOL PARTS DESCRIPTION	PART NUMBER
1	1	TOP SUB	TT0750-125A-001
2	1	BOTTOM SUB	TT0750-125A-002
3	1	0.510" ID Check Valve Cartridge (2 Per Assembly)	TT0750-125AC
4	2	O-RING 2-115 80 DURO HSN	PUR-TORV000-115

**Tool Name:** 1.250 in. OD Dual Flapper Valve

**Product Code:** TT0750-125A    **Tool OD:** 1.250 in.    **Tool ID:** 0.510 in.

**Material:** AISI 4140 HT 30-360 Rock 'C'    **Tool Length:** 9.12 in.

**Minimum Yield:** 105,000 psi

**Strength Properties of Tool:**

**Minimum Yield Point and Load to Yield:** The thread recess of the Stub Acme box connection of the Bottom Sub, 29,650 lbs. Tensile Load to yield the AMMT Pin Thread Connection: 31,920 lbs. Tensile Load to yield the AMMT Box Thread Connection: 36,520 lbs.

**Burst Point and Burst Pressure:** The O-ring bore of the Bottom Sub, 25,550 psi. Collapse pressure on Bottom Sub, 20,500 psi

**Torsional Weak Point and Ft-Lbs to Yield:** 400 ft-lbs as a function of torsional yield of the Stub Acme box connection of the Bottom Sub.

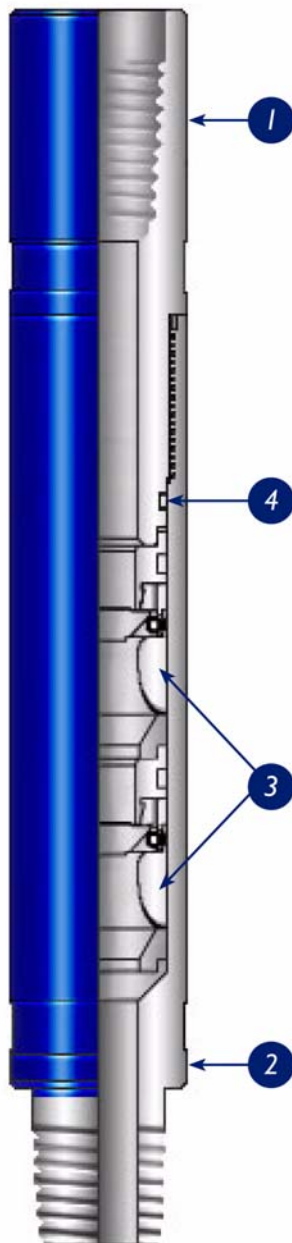
**Recommended Make Up Torque:**

**1st Connection:** The Top Sub - Bottom Sub Stub Acme connection – 110 ft-lbs.

**0.750 in. MT Connection:** Min. Torque – 229 ft-lbs Nom. Torque – 252 ft-lbs Max Torque – 367 ft-lbs

# Dual Flapper Valve

## TTT0750-150A BOM, Schematics and Specs



ITEM	QTY	TOOL PARTS DESCRIPTION	PART NUMBER
1	1	TOP SUB	TT0750-150A-001
2	1	BOTTOM SUB	TT0750-150A-002
3	1	0.510" ID Check Valve Cartridge (2 Per Assembly)	TT0750-125AC
4	2	O-RING 2-115 80 DURO HSN	PUR-TORV000-115

**Tool Name:** 1-1/2 in. OD Dual Flapper Valve w/1.25 in. DFV INTERNALS

**Product Code:** TT0750-150A **Tool OD:** 1.50 in. **Min. Tool ID:** 0.510 in.

**Material:** AISI 4140 HT 30-36 Rock 'C' **Tool Length:** 9.12 in. (w/o 0.750 in. AMMT PIN)

**Minimum Yield:** 105,000 psi

**Strength Properties of Tool:**

**Minimum Yield Point and Load to Yield:** The thread recess of the Stub Acme box connection of the Bottom Sub, 86,300 lbs. Tensile Load to yield the AMMT Pin Thread Connection: 31,920 lbs. Tensile Load to yield the AMMT Box Thread Connection: 36,520 lbs.

**Burst Point and Burst Pressure:** The O-ring bore of the Bottom Sub, 32,100 psi. Collapse pressure on Bottom Sub, 30,300 psi

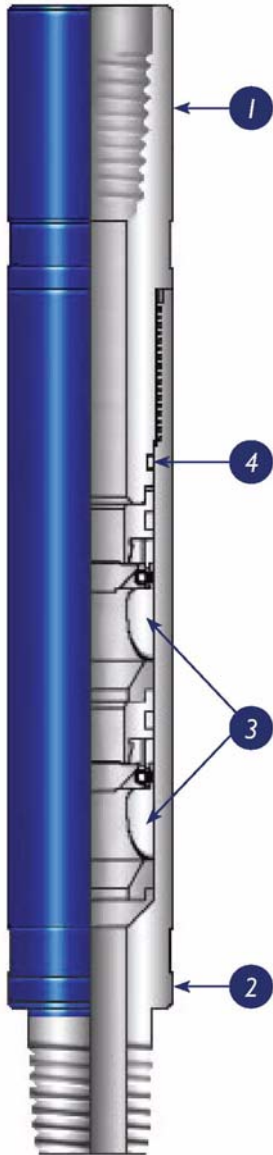
**Torsional Weak Point and Ft-Lbs to Yield:** 600 ft-lbs as a function of torsional yield of the Stub Acme box connection of the Bottom Sub.

**Recommended Make Up Torque:**

**1st Connection:** The Top Sub - Bottom Sub Stub Acme connection – 390 ft-lbs.

**0.750 in. MT Connection:** Min. Torque – 344 ft-lbs Nom. Torque – 378 ft-lbs  
Max. Torque – 458 ft-lbs

## TTT0750-169A BOM, Schematics and Specs



ITEM	QTY	TOOL PARTS DESCRIPTION	PART NUMBER
1	1	Top Sub	TT0750-169A-001
2	1	Bottom Sub	TT0750-169A-002
3	1	11/16" I.D. Check Valve Cartridge (2 Per Assembly)	TT0750-169AC
4	1	2-122 O-Ring 1 1/8" x 1 5/16" x 3/32"	PUR-TORV000-122
5	2	8-122 Back-Up Ring 1 1/8" x 1 5/16" x 3/32"	PUR-TOBU000-122

**Tool Name:** 1.688 in. OD Dual Flapper Valve

**Product Code:** TT0750-169A    **Tool OD:** 1.688 in.    **Tool ID:** 0.688 in.

**Material:** AISI 4140 HT

**Tool Length:** 12.5 in.

**Minimum Yield:** 100,000 psi

**Strength Properties of Tool:**

**Minimum Yield Point and Load to Yield:** The thread recess of the Stub Acme box connection of the Bottom Sub, 29,200 lbs.

**Burst Point and Burst Pressure:** The o-ring bore of the Bottom Sub, 24,100 psi.

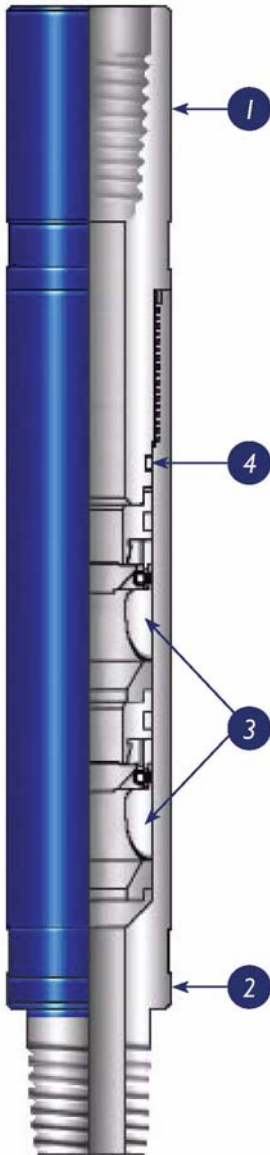
**Torsional Weak Point and Ft-Lbs to Yield:** 610 ft-lbs as a function of torsional yield of the Stub Acme box connection of the Bottom Sub.

**Recommended Make Up Torque:**

**1st Connection:** The Top Sub - Bottom Sub Stub Acme connection - 150 ft-lbs.

# Dual Flapper Valve

## TTT0750-175A BOM, Schematics and Specs



ITEM	QTY	TOOL PARTS DESCRIPTION	PART NUMBER
1	1	Top Sub	TT0750-175A-001
2	1	Bottom Sub	TT0750-175A-002
3	1	11/16" ID Check Valve Cartridge (2 Per Assembly)	TT0750-169AC
4	1	O-Rings 1 1/8" x 1 5/16" x 3/32" 2-122	PUR-TORV000-122
5	2	Back-Up Rings 1 1/8" x 1 5/16" x 3/32" 8-122	PUR-TOBU000-122

**Tool Name:** 1.750 in. OD Dual Flapper Valve

**Product Code:** TT0750-175A    **Tool OD:** 1.750 in.    **Tool ID:** 0.688 in.

**Material:** AISI 4140 HT    **Tool Length:** 12.5 in.

**Minimum Yield:** 100,000 psi

**Strength Properties of Tool:**

**Minimum Yield Point and Load to Yield:** The thread recess of the Stub Acme box connection of the Bottom Sub, 37,900 lbs.

**Burst Point and Burst Pressure:** The O-ring bore of the Bottom Sub, 27,500 psi.

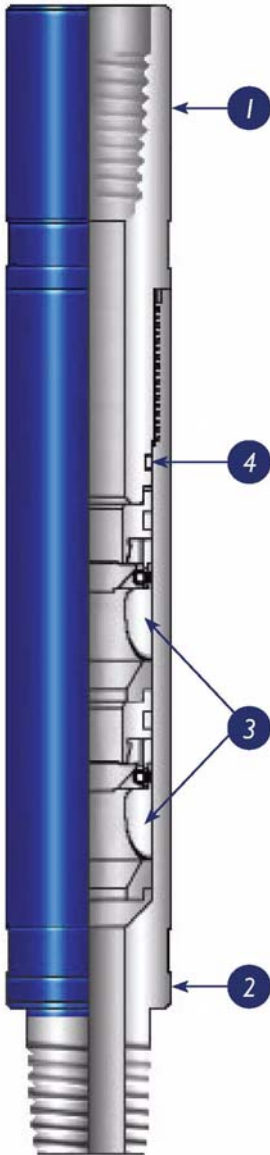
**Torsional Weak Point and Ft-Lbs to Yield:** 800 ft-lbs as a function of torsional yield of the Stub Acme box connection of the Bottom Sub.

**Recommended Make Up Torque:**

**1st Connection:** The Top Sub - Bottom Sub Stub Acme connection - 200 ft-lbs.



## TTT0750-181A BOM, Schematics and Specs



ITEM	QTY	TOOL PARTS DESCRIPTION	PART NUMBER
1	1	Top Sub	TT0750-181A-001
2	1	Bottom Sub	TT0750-181A-002
3	1	11/16" ID Check Valve Cartridge (2 Per Assembly)	TT0750-169AC
4	1	O-Rings 1 1/8" x 1 5/16" x 3/32" 2-122	PUR-TORV000-122
5	2	Back-Up Rings 1 1/8" x 1 5/16" x 3/32" 8-122	PUR-TOBU000-122

**Tool Name:** 1.813 in. OD Dual Flapper Valve

**Product Code:** TT0750-181A    **Tool OD:** 1.813 in.    **Tool ID:** 0.688 in.

**Material:** AISI 4140 HT    **Tool Length:** 12.5 in.

**Minimum Yield:** 100,000 psi

**Strength Properties of Tool:**

**Minimum Yield Point and Load to Yield:** The thread recess of the Stub Acme box connection of the Bottom Sub, 47,200 lbs.

**Burst Point and Burst Pressure:** The O-ring bore of the Bottom Sub, 30,800 psi.

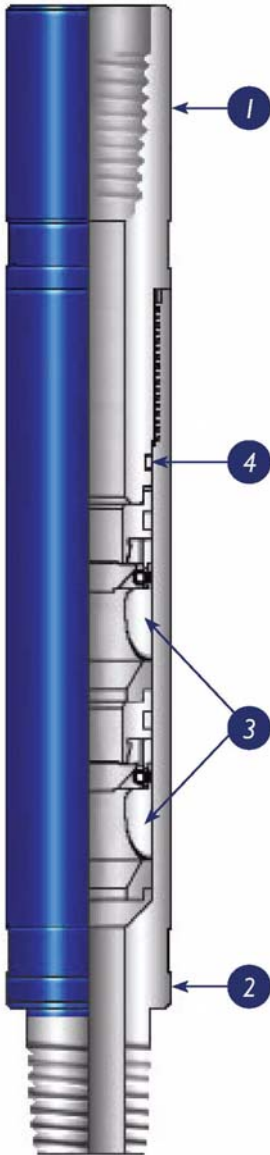
**Torsional Weak Point and Ft-Lbs to Yield:** 1,010 ft-lbs as a function of torsional yield of the Stub Acme box connection of the Bottom Sub.

**Recommended Make Up Torque:**

**1st Connection:** The Top Sub - Bottom Sub Stub Acme connection - 250 ft-lbs.

# Dual Flapper Valve

## TTT0750-213A BOM, Schematics and Specs



ITEM	QTY	TOOL PARTS DESCRIPTION	PART NUMBER
1	1	Top Sub	TT0750-213A-001
2	1	Bottom Sub	TT0750-213A-002
3	1	3/4" I.D. Check Valve Cartridge (2 Per Assembly)	TT0750-169AC
4	1	O-Ring 1 3/8" x 1 5/8" x 1/8" 2-219	PUR-TORV000-219
5	2	Back-Up Rings 1 3/8" x 1 5/8" x 1/8" 8-219	PUR-TOBU000-219

**Tool Name:** 2.125 in. OD Dual Flapper Valve

**Product Code:** TT0750-213A    **Tool OD:** 2.125 in.    **Tool ID:** 0.688 in.

**Material:** AISI 4140 HT    **Tool Length:** 14.0 in.

**Minimum Yield:** 100,000 psi

**Strength Properties of Tool:**

**Minimum Yield Point and Load to Yield:** The thread recess of the Stub Acme box connection of the Bottom Sub, 57,800 lbs.

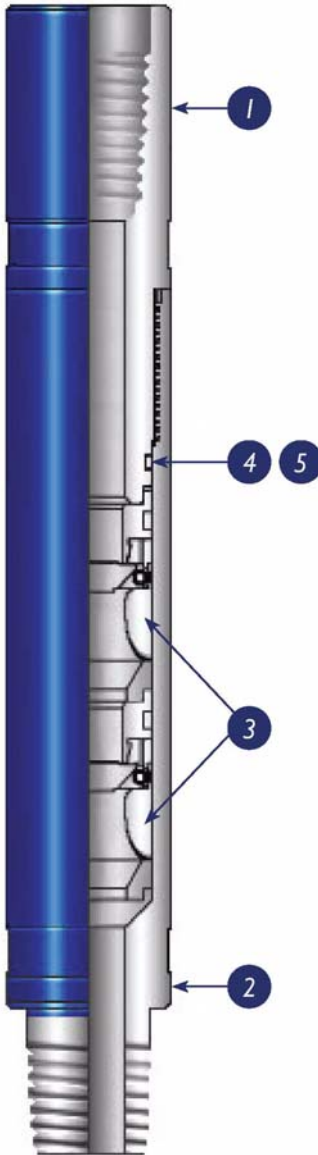
**Burst Point and Burst Pressure:** The O-ring bore of the Bottom Sub, 25,800 psi.

**Torsional Weak Point and Ft-Lbs to Yield:** 1,490 ft-lbs as a function of torsional yield of the Stub Acme box connection of the Bottom Sub.

**Recommended Make Up Torque:**

**1st Connection:** The Top Sub - Bottom Sub Stub Acme connection - 370 ft-lbs.

## TTT0750-225A BOM, Schematics and Specs



ITEM	QTY	TOOL PARTS DESCRIPTION	PART NUMBER
1	1	Top Sub	TT0750-225A-001
2	1	Bottom Sub	TT0750-225A-002
3	1	3/4" I.D. Check Valve Cartridge (2 Per Assembly)	TT0750-169AC
4	1	O-Ring 1 3/8" x 1 5/8" x 1/8" 2-219	PUR-TORV000-219
5	2	Back-Up Rings 1 3/8" x 1 5/8" x 1/8" 8-219	PUR-TOBU000-219

**Tool Name:** 2.250 in. OD Dual Flapper Valve

**Product Code:** TT0750-225A    **Tool OD:** 2.250 in.    **Tool ID:** 0.688 in.

**Material:** AISI 4140 HT    **Tool Length:** 14.0 in.

**Minimum Yield:** 100,000 psi

**Strength Properties of Tool:**

**Minimum Yield Point and Load to Yield:** The fillet on the Top Sub before the Stub Acme pin connection, 77,400 lbs.

**Burst Point and Burst Pressure:** The O-ring bore of the Bottom Sub, 31,100 psi.

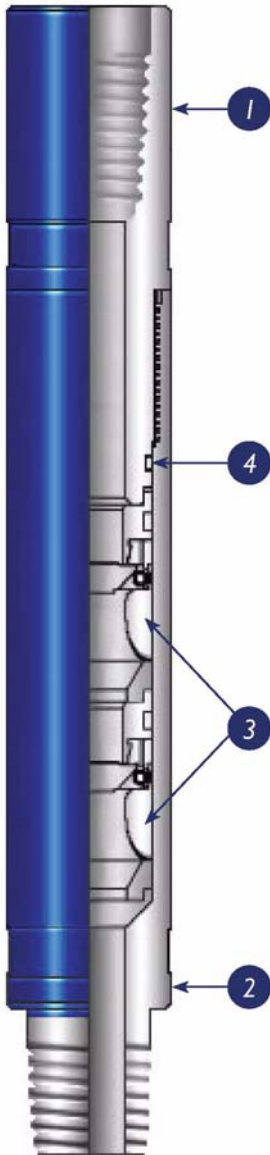
**Torsional Weak Point and Ft-Lbs to Yield:** 2,110 ft-lbs as a function of torsional yield of the Stub Acme box connection of the Bottom Sub.

**Recommended Make Up Torque:**

**1st Connection:** The Top Sub - Bottom Sub Stub Acme connection - 520 ft-lbs.

# Dual Flapper Valve

## TTT0750-288A BOM, Schematics and Specs



ITEM	QTY	TOOL PARTS DESCRIPTION	PART NUMBER
1	1	Top Sub	TT0750-288A-001
2	1	Bottom Sub	TT0750-288A-002
3	1	1" ID Check Valve Cartridge (2 Per Assembly)	TT0750-288AC
4	1	O-Ring 1 3/4" x 2" x 1/8" 2-224	PUR-TORV000-224
5	2	Back-Up Rings 1 3/4" x 2" x 1/8" 8-224	PUR-TOBU000-224

**Tool Name:** 2.875 in. OD Dual Flapper Valve

**Product Code:** TT0750-288A    **Tool OD:** 2.875 in.    **Tool ID:** 1.00 in.

**Material:** AISI 4140 HT    **Tool Length:** 16.9 in.

**Minimum Yield:** 100,000 psi

**Strength Properties of Tool:**

**Minimum Yield Point and Load to Yield:** The fillet on the Top Sub before the Stub Acme pin connection, 104,000 lbs.

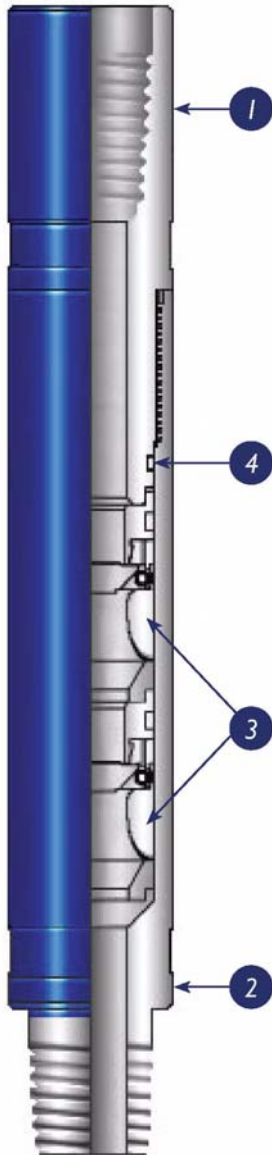
**Burst Point and Burst Pressure:** The o-ring bore of the Bottom Sub, 31,800 psi.

**Torsional Weak Point and Ft-Lbs to Yield:** 4,110 ft-lbs as a function of torsional yield of the Stub Acme box connection of the Bottom Sub.

**Recommended Make Up Torque:**

**1st Connection:** The Top Sub - Bottom Sub Stub Acme connection - 1,020 ft-lbs.

## TTT0750-313A BOM, Schematics and Specs



ITEM	QTY	TOOL PARTS DESCRIPTION	PART NUMBER
1	1	Top Sub	TT0750-313A-001
2	1	Bottom Sub	TT0750-313A-002
3	1	1" ID Check Valve Cartridge (2 Per Assembly)	TT0750-288AC
4	1	O-Ring 1 3/4" x 2" x 1/8" 2-224	PUR-TORV000-224
5	2	Back-Up Rings 1 3/4" x 2" x 1/8" 8-224	PUR-TOBU000-224

**Tool Name:** 3.125 in. OD Dual Flapper Valve

**Product Code:** TT0750-313A    **Tool OD:** 3.125 in.    **Tool ID:** 1.00 in.

**Material:** AISI 4140 HT    **Tool Length:** 17.5 in.

**Minimum Yield:** 100,000 psi

**Strength Properties of Tool:**

**Minimum Yield Point and Load to Yield:** The fillet on the Top Sub before the Stub Acme pin connection, 116,000 lbs.

**Burst Point and Burst Pressure:** The O-ring bore of the Bottom Sub, 39,100 psi.

**Torsional Weak Point and Ft-Lbs to Yield:** 5,670 ft-lbs as a function of torsional yield of the Stub Acme box connection of the Bottom Sub.

**Recommended Make Up Torque:**

**1st Connection:** The Top Sub - Bottom Sub Stub Acme connection - 1,410 ft-lbs.

# Dual Flapper Valve

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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:** *Always visually inspect the Flapper Cartridges after each job! Check the functioning of the flapper hinge to make sure that it opens freely and totally! Make sure that the spring applies sufficient closing force to the flapper hinge and that the flapper hinge seats sufficiently against the Flapper Cartridge Seat! Also make sure that the Flapper Cartridge's pins and springs are correctly installed! Incorrectly installed, these could cause damage to the bore of the Bottom Sub!*

## 2.0 Assembly

**2.1** Place a Viton seat (included in item #3) onto one of the metal Seats (included in item #3), then in the Seat groove, position the O-ring (included in item #3) on the side nearest the Viton seat. Now put the Back up (included in item #3) next to the O-ring.



**Note:** *The Backup O-ring is not required for TT0750-125A or TT0750-150A.*

**2.2** Repeat step 1 for the other metal Seat.

## Dual Flapper Valve

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**2.3** Grease the entire ID of the Bottom Sub (item #2), then take the Bottom Sub and stand it on it's pin end.

**2.4** Grease the Seats and Flapper Cartridges. Insert one of the Seats, Viton Seal end first, into the flapper end of a Flapper Cartridge, then insert into Bottom Sub with the Seat facing up. Tap in with a brass rod that is the same OD as the Seat OD. Repeat for the second Flapper Cartridge/Seat.



*Note: It is recommended to insert the flappers with the side holes of each Flapper Cartridge facing opposite directions.*

**2.5** Vise the assembly on the middle of the Bottom Sub.

**2.6** Grease the entire ID of the Top Sub (item #1), then thread onto the Bottom Sub. Make wrench tight.

**2.7** A pressure test should be performed to test the integrity of the tool before being ran in the well bore.

## 3.0 Disassembly

**3.1** Vice the tool in the middle of the Bottom Sub (item #2), then remove the Top Sub (item #1).

**3.2** Take the assembly from the vise and drop it, large ID end first, onto a wood block, to remove the cartridges and Seats.



*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.*