



Locking Swivel Joint

MAN-TTT-810 (R01)

Thru-Tubing Technology

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Locking Swivel Joint

Description

The Locking Swivel Joint was designed to allow the assembly of long coil tubing strings with minimum lubricator length. Many times it is necessary to have long lengths of lubricator to accommodate the tool string, creating a difficult and dangerous situation. The Locking Swivel Joint allows for sections of the tool string to be made up and lowered into the well bore.

Operation

The string is spaced out and a pup joint is inserted, allowing the pup joint to seal in the rams of the BOP. The Locking Swivel is placed on top of the section of tools and dropped in the lubricator. Pulling the coupling back and tightening the set screws, allows the clutches to disengage and lets the swivel free spin. The other section of tool string can now be assembled. Before lowering the swivel in the hole, loosen the set screws so the coupling can slide back down, engaging the clutches. If rotation is required in the tool string, simply take the brass drive pins out from under the coupling. This will prevent any back torque through the string. If ran below the motor, the clutches must be engaged and the brass drive pins installed.



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.

Locking Swivel Joint

Brass Drive Pin Information

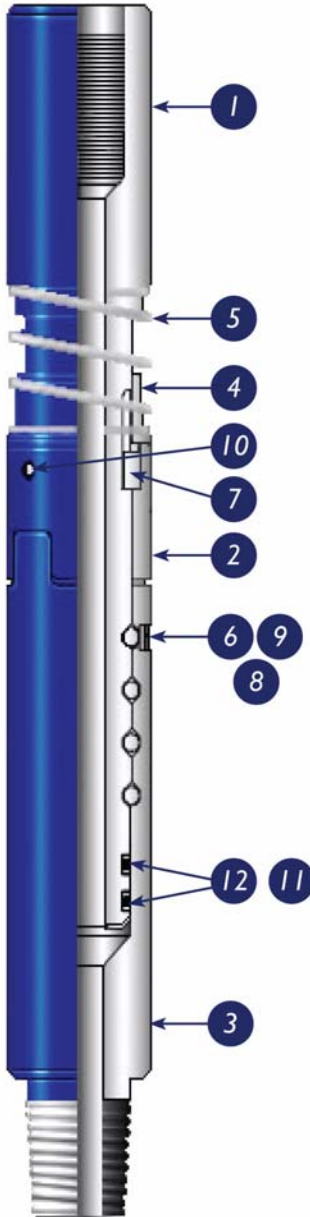
The torque that will shear the Brass Drive Pin, is listed below.

Tool OD	Torque (ft/lbs) Plus or Minus	
	1 Pin	2 Pins
1-11/16 in.	180	720
1-3/4 and 1-13/16 in.	200	800
2-1/8 and 2-1/4 in.	340	1,360
2-7/8 in.	770	6,160
3-1/8 in.	850	6,800

Steel Ball Information

Tool OD	Ball Size	Balls per Hole	Total Balls
1-11/16 in.	3/16 in.	19	76
1-3/4 and 1-13/16 in.	3/16 in.	22	88
2-1/8 and 2-1/4 in.	1/4 in.	21	84
2-7/8 in.	1/4 in.	25	125
3-1/8 in.	1/4 in.	27	135

TT0810-168B BOM, Schematic and Specs



ITEM	QTY	TOOL PARTS DESCRIPTION	PART NUMBER
1	1	Top Sub	TT0810-168B-001
2	1	Torque Coupling	TT0810-168B-002
3	1	Bottom Sub	TT0810-168B-003
4	1	Follower	TT0810-168B-004
5	1	Spring	PUR-TCS0096-224
6	4	Bearing Caps 5/16"	TT0320-206A-010
7	4	Brass Drive Pins 3/16" x 1/2"	PUR-TDWB012-032
8	4	Internal Snap Rings 5/16" Bore	PUR-TSRI020-000
9	76	Steel Ball Bearings 3/16"	PUR-TSBC000-012
10	4	Steel Allen Set Screws 10-32 x 3/16"	PUR-TSAS121-012
11	2	O-Rings 7/8" x 11/8" x 1/8" 2-212	PUR-TORV000-212
12	4	Back-Up Rings 7/8" x 11/8" x 1/8" 8-212	PUR-TOBU000-212

Tool Name: 1.688 in. OD Locking Swivel Joint

Product Code: TT0810-168B **Tool OD:** 1.688 in. **Tool ID:** 0.531 in.

Material: AISI 4140 HT **Tool Length:** 15.6 in. w/1 in. MT

Minimum Yield: 100,000 psi

Strength Properties of Tool:

Minimum Yield Point and Load to Yield: Either of the V-notch grooves of the Top Sub, 21,000 lbs.

Burst Point and Burst Pressure: The O-ring bore of the Bottom Sub, 35,000 psi.

Torsional Weak Point and Ft-Lbs to Yield: 830 ft-lbs as a function of torsional yield of either V-notch groove of the Top Sub, if the Top Sub and Bottom Sub are "frozen"; 910 ft-lbs as a function of torsional yield of the Top Sub at the Drive Pin grooves, if the Top Sub and Bottom Sub are "frozen".

Recommended Make Up Torque:

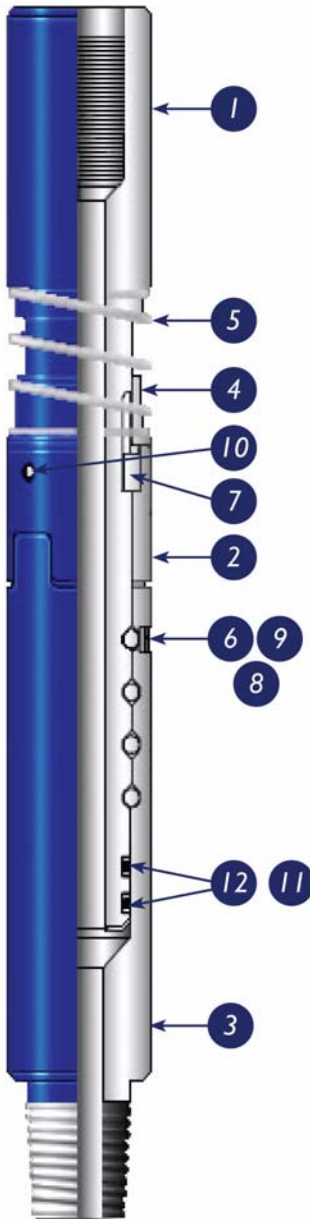
1st Connection: The 10-32 Steel Allen set screw - 33.5 in-lbs.

Miscellaneous Information:

Drive Pin Size and Values: 3/16" X 1/2" Long Brass Drive Pin, 180 ft-lbs (plus or minus 20%) per pin.

Locking Swivel Joint

TT0810-175C BOM, Schematic and Specs



ITEM	QTY	TOOL PARTS DESCRIPTION	PART NUMBER
1	1	Top Sub	TT0810-175B-001
2	1	Torque Coupling	TT0810-175C-002
3	1	Bottom Sub	TT0810-175C-003
4	1	Follower	TT0810-175B-004
5	1	Spring	PUR-TCS0108-231
6	4	Bearing Caps 5/16"	TT0320-206A-010
7	4	Brass Drive Pins 3/16" x 1/2"	PUR-TDWB012-032
8	4	Internal Snap Rings 5/16" Bore	PUR-TSRI020-000
9	88	Steel Ball Bearings 3/16"	PUR-TSBC000-012
10	4	Steel Allen Set Screws 10-32 x 3/16"	PUR-TSAS121-012
11	2	O-Rings 1" x 11/4" x 1/8" 2-214	PUR-TORV000-212
12	4	Back-Up Rings 1" x 1 1/4" x 1/8" 8-214	PUR-TOBU000-212

Tool Name: 1.750 in. OD Locking Swivel Joint

Product Code: TT0810-175C **Tool OD:** 1.750 in. **Tool ID:** 0.56 in.

Material: AISI 4140 HT **Tool Length:** 15.75 in. w/ 1" MT

Minimum Yield: 100,000 psi

Strength Properties of Tool:

Minimum Yield Point and Load to Yield: Either of the V-notch grooves on the Bottom Sub, 20,500 lbs.

Burst Point and Burst Pressure: The O-ring bore on the Bottom Sub, 29,500 psi.

Torsional Weak Point and Ft-Lbs to Yield: 1,220 ft-lbs as a function of torsional yield of either V-notch groove on the Top Sub, if the Top Sub and Bottom Sub are "frozen"; 1,370 ft-lbs as a function of torsional yield of the Top Sub at the Drive Pin grooves, if the Top Sub and Bottom Sub are "frozen".

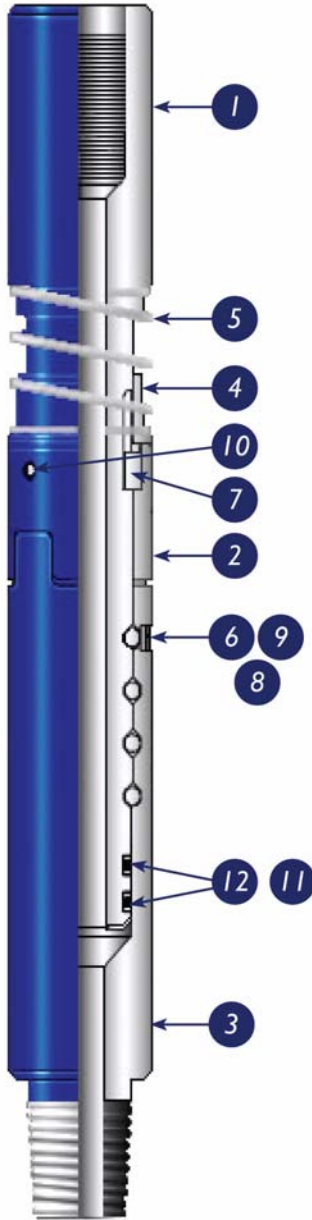
Recommended Make Up Torque:

1st Connection: The 10-32 Steel Allen set screw - 33.5 in-lbs.

Miscellaneous Information:

Drive Pin Size & Values: 3/16 in. X 1/2 in. Long Brass Drive Pin, 200 ft-lbs (plus or minus 20%) per pin.

TT0810-181C BOM, Schematic and Specs



ITEM	QTY	TOOL PARTS DESCRIPTION	PART NUMBER
1	1	Top Sub	TT0810-181B-001
2	1	Torque Coupling	TT0810-181C-002
3	1	Bottom Sub	TT0810-181C-003
4	1	Follower	TT0810-181C-004
5	1	Spring	PUR-TCS0198-231
6	4	Bearing Caps 5/16"	TT0320-206A-010
7	4	Brass Drive Pins 3/16" x 1/2"	PUR-TDWB012-032
8	4	Internal Snap Rings 5/16" Bore	PUR-TSRI020-000
9	88	Steel Ball Bearings 3/16"	PUR-TSBC000-012
10	4	Steel Allen Set Screws 10-32 x 3/16"	PUR-TSAS121-012
11	2	O-Rings 1" x 1 1/4" x 1/8" 2-214	PUR-TORV000-214
12	4	Back-Up Rings 1" x 1 1/4" x 1/8" 8-214	PUR-TOBU000-214

Tool Name: 1.813 in. OD Locking Swivel Joint

Product Code: TT0810-181C **Tool OD:** 1.813 in. **Tool ID:** 0.56 in.

Material: AISI 4140 HT **Tool Length:** 15.7 in. w/1 in. MT

Minimum Yield: 100,000 psi

Strength Properties of Tool:

Minimum Yield Point and Load to Yield: Either of the V-notch grooves on the Bottom Sub, 27,600 lbs.

Burst Point and Burst Pressure: The O-ring bore on the Bottom Sub, 32,700 psi.

Torsional Weak Point and Ft-Lbs to Yield: 1,220 ft-lbs as a function of torsional yield of either V-notch groove on the Top Sub, **if** the Top Sub and Bottom Sub are "frozen"; 1,370 ft-lbs as a function of torsional yield of the Top Sub at the Drive Pin grooves, **if** the Top Sub and Bottom Sub are "frozen".

Recommended Make Up Torque:

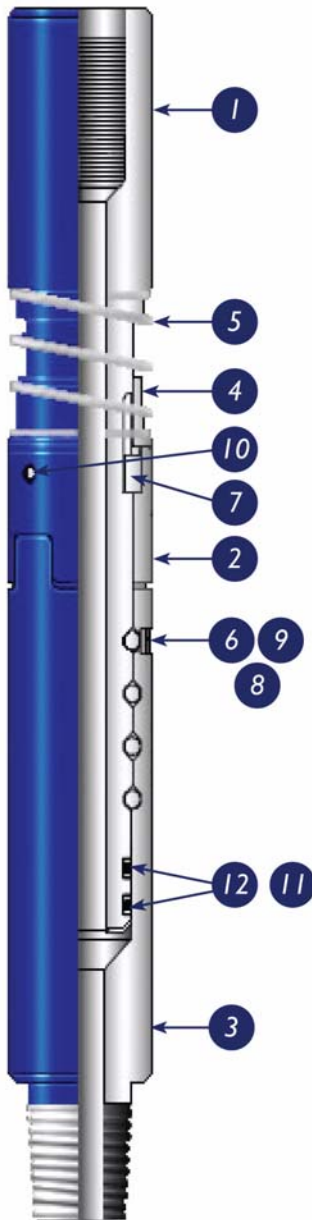
1st Connection: The 10-32 Steel Allen set screw - 33.5 in-lbs.

Miscellaneous Information:

Drive Pin Size and Values: 3/16 in. X 1/2 in. Long Brass Drive Pin, 200 ft-lbs (plus or minus 20%) per pin.

Locking Swivel Joint

TT0810-213C BOM, Schematic and Specs



ITEM	QTY	TOOL PARTS DESCRIPTION	PART NUMBER
1	1	Top Sub	TT0810-225B-001
2	1	Torque Coupling	TT0810-225C-002
3	1	Bottom Sub	TT0810-213C-003
4	1	Follower	TT0810-225B-004
5	1	Spring	PUR-TCS0122-304
6	4	Bearing Caps 3/8"	TT0810-213B-007
7	4	Brass Drive Pins 1/4" x 1/2"	PUR-TDWB016-032
8	4	Internal Snap Rings 3/8" Bore	PUR-TSRI024-000
9	88	Steel Ball Bearings 1/4"	PUR-TSBC000-016
10	4	Steel Allen Set Screws 10-32 x 3/16"	PUR-TSAS121-012
11	2	O-Rings 1 3/8" x 1 5/8" x 1/8" 2-220	PUR-TORV000-220
12	4	Back-Up Rings 1 3/8" x 1 5/8" x 1/8" 8-220	PUR-TOBU000-220

Tool Name: 2.125 in. OD Locking Swivel Joint

Product Code: TT0810-213C **Tool OD:** 2.125 in. **Tool ID:** 0.81 in.

Material: AISI 4140 HT **Tool Length:** 15.3 in. w/1-1/2 in. MT

Minimum Yield: 100,000 psi

Strength Properties of Tool:

Minimum Yield Point and Load to Yield: Either of the V-notch grooves on the Bottom Sub, 22,300 lbs.

Burst Point and Burst Pressure: The O-ring bore on the Bottom Sub, 25,600 psi.

Torsional Weak Point and Ft-Lbs to Yield: 2,280 ft-lbs as a function of torsional yield of either V-notch groove on the Top Sub, **if** the Top Sub and Bottom Sub are "frozen"; 2,590 ft-lbs as a function of torsional yield of the Top Sub at the Drive Pin grooves, **if** the Top Sub and Bottom Sub are "frozen".

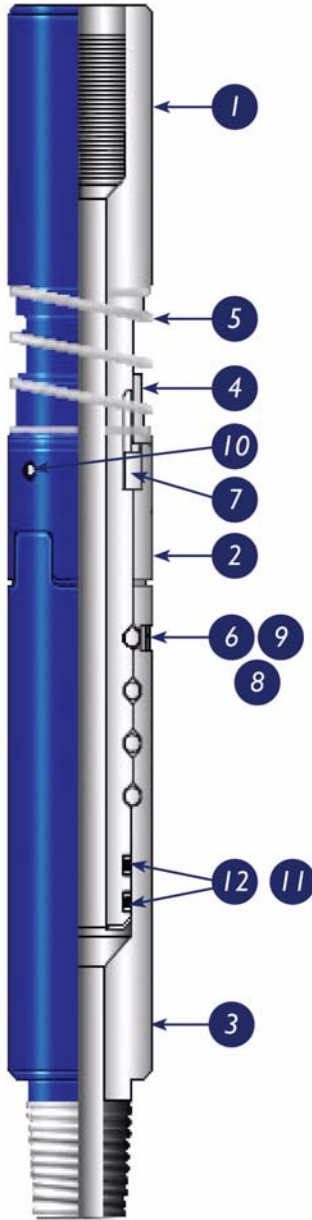
Recommended Make Up Torque:

1st Connection: The 10-32 Steel Allen set screw - 33.5 in-lbs.

Miscellaneous Information:

Drive Pin Size and Values: 1/4 in. X 1/2 in. Long Brass Drive Pin, 340 ft-lbs (plus or minus 20%) per pin.

TT0810-225C BOM, Schematic and Specs



ITEM	QTY	TOOL PARTS DESCRIPTION	PART NUMBER
1	1	Top Sub	TT0810-225B-001
2	1	Torque Coupling	TT0810-225C-002
3	1	Bottom Sub	TT0810-225C-003
4	1	Follower	TT0810-225C-004
5	1	Spring	PUR-TCS0122-304
6	4	Bearing Caps 3/8"	TT0810-225A-003
7	4	Brass Drive Pins 1/4" x 1/2"	PUR-TDWB016-032
8	4	Internal Snap Rings 3/8" Bore	PUR-TSRI024-000
9	88	Steel Ball Bearings 1/4"	PUR-TSBC000-016
10	4	Steel Allen Set Screws 10-32 x 3/16"	PUR-TSAS121-012
11	2	O-Rings 1 3/8" x 1 5/8" x 1/8" 2-220	PUR-TORV000-220
12	4	Back-Up Rings 1 3/8" x 1 5/8" x 1/8" 8-220	PUR-TOBU000-220

Tool Name: 2.250 in. OD Locking Swivel Joint

Product Code: TT0810-225C **Tool OD:** 2.250 in. **Tool ID:** 0.81 in.

Material: AISI 4140 HT **Tool Length:** 15.3 in. w/1-1/2 in. MT

Minimum Yield: 100,000 psi

Strength Properties of Tool:

Minimum Yield Point and Load to Yield: Either of the V-notch grooves on the Bottom Sub, 40,200 lbs.

Burst Point and Burst Pressure: The O-ring bore on the Bottom Sub, 31,000 psi.

Torsional Weak Point and Ft-Lbs to Yield: 2,280 ft-lbs as a function of torsional yield of either V-notch groove on the Top Sub, **if** the Top Sub and Bottom Sub are "frozen"; 2,590 ft-lbs as a function of torsional yield of the Top Sub at the Drive Pin grooves, **if** the Top Sub and Bottom Sub are "frozen".

Recommended Make Up Torque:

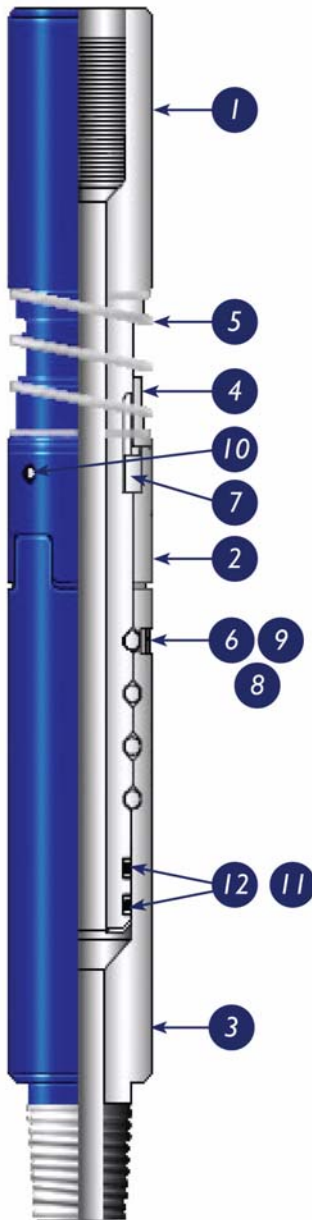
1st Connection: The 10-32 Steel Allen set screw - 33.5 in-lbs.

Miscellaneous Information:

Drive Pin Size and Values: ¼ in. X ½ in. Long Brass Drive Pin, 340 ft-lbs (plus or minus 20%) per pin.

Locking Swivel Joint

TT0810-288B BOM, Schematic and Specs



ITEM	QTY	TOOL PARTS DESCRIPTION	PART NUMBER
1	1	Top Sub	TT0810-288B-001
2	1	Torque Coupling	TT0810-288B-002
3	1	Bottom Sub	TT0810-288B-003
4	1	Follower	TT0810-288B-004
5	1	Spring	PUR-TCS0154-275
6	5	Bearing Caps 3/8"	TT0810-225A-003
7	8	Brass Drive Pins 1/4" x 1/2"	PUR-TDWB016-048
8	5	Internal Snap Rings 3/8" Bore	PUR-TSRI024-000
9	125	Steel Ball Bearings 1/4"	PUR-TSBC000-016
10	4	Steel Allen Set Screws 10-32 x 3/8"	PUR-TSAS121-024
11	2	O-Rings 1 5/8" x 1 7/8" x 1/8" 2-223	PUR-TORV000-223
12	4	Back-Up Rings 1 5/8" x 1 7/8" x 1/8" 8-223	PUR-TOBU000-223

Tool Name: 2.875 in. OD Locking Swivel Joint

Product Code: TT0810-288B **Tool OD:** 2.875 in. **Tool ID:** 1.000 in.

Material: AISI 4140 HT **Tool Length:** 20.0 in. w/2-3/8 in. PAC DSI

Minimum Yield: 100,000 psi

Strength Properties of Tool:

Minimum Yield Point and Load to Yield: Either of the V-notch grooves on the Top Sub, 59,300 lbs.

Burst Point and Burst Pressure: The O-ring bore on the Bottom Sub, 37,100 psi.

Torsional Weak Point and Ft-Lbs to Yield: 4,100 ft-lbs as a function of torsional yield of either V-notch groove on the Top Sub, if the Top Sub and Bottom Sub are "frozen"; 5,000 ft-lbs as a function of torsional yield of the Top Sub at the Drive Pin grooves, if the Top Sub and Bottom Sub are "frozen".

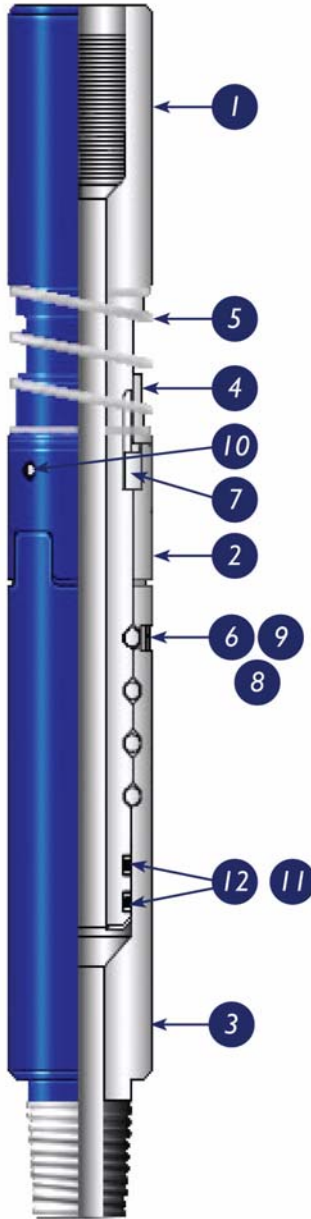
Recommended Make Up Torque:

1st Connection: The 10-32 Steel Allen set screw - 33.5 in-lbs.

Miscellaneous Information:

Drive Pin Size and Values: ¼ in. X ¾ in. Long Brass Drive Pin, 770 ft-lbs (plus or minus 20%) per pin.

TT0810-313B BOM, Schematic and Specs



ITEM	QTY	TOOL PARTS DESCRIPTION	PART NUMBER
1	1	Top Sub	TT0810-313B-001
2	1	Torque Coupling	TT0810-313B-002
3	1	Bottom Sub	TT0810-313B-003
4	1	Follower	TT0810-313B-004
5	1	Spring	PUR-TCS0160-157
6	5	Bearing Caps 3/8"	TT0810-225A-003
7	8	Brass Drive Pins 1/4" x 3/4"	PUR-TDWB016-048
8	5	Internal Snap Rings 3/8" Bore	PUR-TSRI024-000
9	135	Steel Ball Bearings 1/4"	PUR-TSBC000-016
10	4	Steel Allen Set Screws 10-32 x 3/8"	PUR-TSAS121-024
11	2	O-Rings 1 7/8" x 2 1/8" x 1/8" 2-225	PUR-TORV000-225
12	4	Back-Up Rings 1 7/8" x 2 1/8" x 1/8" 8-225	PUR-TOBU000-225

Tool Name: 3.125 in. OD Locking Swivel Joint

Product Code: TT0810-313B **Tool OD:** 3.125 in. **Tool ID:** 1.000 in.

Material: AISI 4140 HT **Tool Length:** 19.9 in. w/2-3/8 in. API Regular

Minimum Yield: 100,000 psi

Strength Properties of Tool:

Minimum Yield Point and Load to Yield: Either of the V-notch grooves on the Top Sub, 82,000 lbs.

Burst Point and Burst Pressure: The O-ring bore on the Bottom Sub, 35,200 psi.

Torsional Weak Point and Ft-Lbs to Yield: 6,100 ft-lbs as a function of torsional yield of either V-notch groove on the Top Sub, **if** the Top Sub and Bottom Sub are "frozen"; 7,400 ft-lbs as a function of torsional yield of the Top Sub at the Drive Pin grooves, **if** the Top Sub and Bottom Sub are "frozen".

Recommended Make Up Torque:

1st Connection: The 10-32 Steel Allen set screw - 33.5 in-lbs.

Miscellaneous Information:

Drive Pin Size and Values: ¼ in. X ½ in. Long Brass Drive Pin, 850 ft-lbs (plus or minus 20%) per pin.

Locking Swivel Joint

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: *This tool should always be disassembled, cleaned thoroughly, inspected and reassembled after job!*

2.0 Assembly

2.1 Grease the entire ID of the Top Sub (item #1) and the slots on the OD. Put the sub in a vise on the larger OD.

2.2 Slide on the Spring (item #5)

2.3 Slide on the Follower (item #4), beveled end first.

2.4 Insert the 4 Set Screws (item #10) into the Coupling (item #2). Screw in, but not fully.

2.5 Push up the Follower into the Spring with one hand and with the other, put the 8 Brass Pins (item # 7) into the slots on the Top Sub.

Locking Swivel Joint



Note: The grease should hold the pins in place.



Note: If you don't want to torque lock swivel, then leave the Brass Pins out of the assembly.

2.6 Now slide the Coupling, teeth end down, onto the Top Sub and align it with the Brass Pins. Push it against the Follower/Spring as far as it will go, then tighten the Set Screws.

2.7 Install the O-rings (item #11) and Backups (item #12) onto the Top Sub in this order; Backup, O-ring, Backup. Grease the O-rings and the grooves above them.

2.8 Slide on the Bottom Sub (item #3), with the 2 holes that are in a row facing up, onto the Top Sub as far as it will go. Then pull it back until the 2 holes line up with the grooves on the Top Sub.



Note: The top hole on the Bottom Sub must align with the top groove on the Top Sub.

2.9 Insert the correct number of Ball Bearings (item #9) into the top hole of the Bottom Sub. Insert a Bearing Cap (item #7), then use a snap ring tool to insert the Snap Ring (item #8).

2.10 Repeat step 2.9 with the other 4 Bottom Sub holes.

2.11 Finally, unscrew the Set Screws on the Coupling so that the Coupling teeth can mesh with those on the Bottom Sub.

3.0 Disassembly

3.1 Put the tool in a vise on the Top Sub (item #1).

3.2 Push up the Coupling (item #2) so that it detaches from the Bottom Sub (item #3) and tighten the Set Screws (item #10).

3.3 Remove and discard the Snap Ring (item #8) from one of the holes on the Bottom Sub. Remove the Bearing Cap (item #6) and set to the side for later cleaning. Now remove the Ball Bearings (item #9).



Note: You may have to use de-greaser and or a magnet to remove all of the ball bearings.

3.4 Repeat step 3.3 for the other 4 Bottom Sub holes.

3.5 Remove the Bottom Sub.

3.6 Unscrew and discard, the 4 Set Screws (item #10) from the Coupling. Remove the Coupling from the Top Sub.

3.7 Remove the 8 Brass Pins (item #7).

3.8 Remove the Follower and Spring (item #4 and #5)

3.9 Finally, remove the Top Sub from the vise.



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.

Locking Swivel Joint
