



POLYSTOPP® for PE PIPE

Big sizes 315 - 355 mm

Operation and Maintenance Instructions*

**The present transitional version of the manual should be updated, upon the launching of the new design valves.*





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NOTICE

Any operation involving work on pipe containing liquids or gases under pressure is potentially hazardous. It is necessary, therefore, that correct procedures be followed in the use of this equipment to maintain a safe working environment.

No person should use this equipment who is not fully trained in the procedures stated in this manual, and who is not fully aware of the potential hazards connected with work on pipe containing liquids or gases under pressure.

The purchaser of this equipment is responsible for the manner in which this equipment is used and the training and competence of the operators.

Should any difficulty arise at any time in the use of this equipment, please contact TDW immediately.

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Section I: Introduction

1.0 Description

The POLYSTOPP® Tapping and Plugging System is designed for use on 315 and 355 mm polyethylene pipe.

The system is designed for use with TDW Electrofusion Saddle Fittings. The fittings permit access to a line to plug it while line work is being performed.

The entire system includes equipment for tapping into the line, plugging the main, and installing a completion plug in the fitting in order to remove the tapping valve. Some components of the 315-355 mm system are shown in Figure 1.

This manual describes the procedures for using this tapping, plugging and completion system to:

- plug the main line, keeping the line in service.
- to complete the job by setting a completion plug, enabling removal of all tapping/plugging equipment.

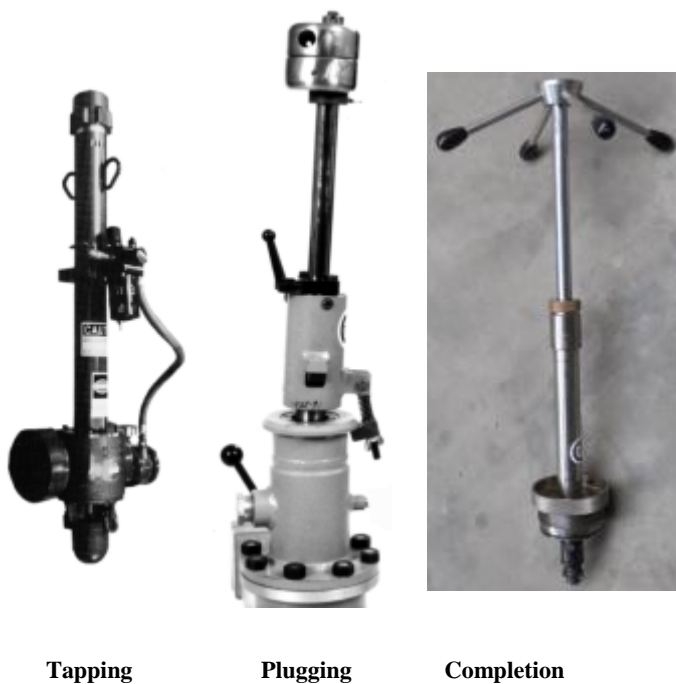


Figure 1. POLYSTOPP® System big sizes
for PE Pipe 315-355 mm



This manual is intended to aid the safe operation and proper maintenance of POLYSTOPP® big sizes 315-355 mm equipment. **Read this manual carefully before attempting to operate the equipment.** If any portion of this manual is not clearly understood, or if any questions arise concerning the equipment's use, contact T.D. Williamson, S.A. or the nearest factory representative.

WARNING: Do not attempt a plugging and completion operation without following the procedures contained in this manual. A departure from prescribed procedures could present a hazardous situation causing injury to personnel and damage to equipment.

Do not alter this equipment or any of its component parts. Use only replacement parts manufactured or recommended by TDW.

Any alteration of this equipment, or use of parts not manufactured or recommended by TDW could cause the machine to malfunction, causing damage to the equipment and/or injury to personnel.

Before taking this equipment to the field for an actual plugging operation, conduct a tapping and plugging exercise on a length of test pipe to become familiar with the operational characteristics of the equipment.

2.0 Scope of Applications

The POLYSTOPP® big sizes equipment can be used on polyethylene pipe, for tapping and plugging SDR 11 and SDR 17.6 pipe in sizes 315 and 355 mm for the following applications:

- To temporarily stop flow in the line (using one plugging machine).
- To isolate a section of the line (using two plugging machines).
- To set a completion plug in the TDW polyethylene electrofusion saddle fitting.

A complete job will consist of the following major steps:

- Installation and testing of the fitting(s).
- Tapping the line through the fitting (s).
- Plugging the main line.
- Setting the completion plug.
- Removing the equipment.

3.0 System Components

3.1 Primary System

- A. The tapping machine used with this system is the TDW T-203 tapping machine for both 315 and 355 mm pipe.
- B. The T-203 tapping machine is an air or hydraulic driven tapping machine used for 315 and 355 mm taps. See figure 2.



Figure 2. T-203 Tapping Machine

- C. The SHORTSTOPP® II 8x12 Folding Head Plugging Machine is used with this system to plug 315- and 355 mm lines. This plugging machine consists of a control bar, housing, a jacking mechanism for lowering and raising the plugging head, and a folding plugging head which opens into the line, stopping flow. An example of a folding head plugging machine is shown in figure 3.



Figure 3. SHORTSTOPP® II Plugging Machine

- D. When tapping and plugging work is done, a completion plug must be inserted into the neck of the fitting using the POLYSTOPP® completion machine. The completion plug is lowered through the valve and threaded into position in the neck of the fitting. An O-ring provides a seal. The completion machine is shown in Figure 4.



Figure 4. POLYSTOPP® Completion Machine

3.2 Accessory Equipment

- A. The POLYSTOPP® 10" Valve is used with the POLYSTOPP Big Sizes Plugging System. See figure 5.



Figure 5. POLYSTOPP® 10" Valve (valve design will be changed after September 2019)

- B. Tapping and plug setting machine adapters are used to connect various equipment components to the POLYSTOPP® 10" valve. They are flanged on the lower end to

match the valve and threaded on the upper end to match related equipment. Two such adapters are shown in Figure 6.



Completion machine Adapter in 2 parts

T-203 Adapter

Figure 6. Machine Adapters

- C. Another adapter is a spool used to adapt the 8" SHORTSTOPP® II plugging machine to the POLYSTOPP® 10" Valve. It is shown in Figure 7.

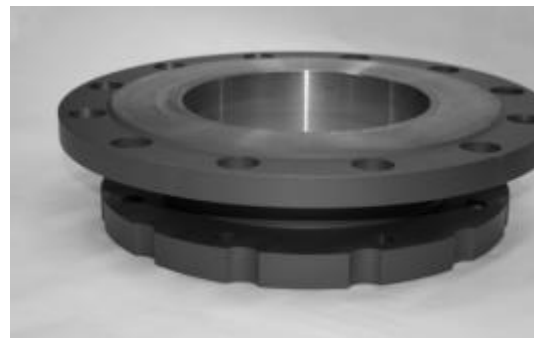


Figure 7. SHORTSTOPP® II plugging machine to POLYSTOPP® 10" Valve adapter

- D. Cutters are designed to cut through the pipe, and retain the coupon and chips, minimizing the amount of chips left in the pipe. Cutter holder, cutter and pilot drill are shown in Figure 8.



Figure 8. Cutter holder, cutter and pilot drill

E. Fittings are designed to plug the main line. The plugging fitting top half is bolted to the lower half and electrofused to the line. The top half of the fittings has a completion plug that is installed into the neck after work is completed and a blind flange is installed. This seals the fitting. Fitting is shown in Figure 9.



Figure 9 : Plugging Fitting

3.3 Related Publications

TDWFrance-22-E-03-09 user manual provides procedures for preparation of the pipe and installation of the fitting by the electrofusion process. Other publications of interest include:

- 00-3795-0115 : T-203b Tapping Machine

4.0 Safety

4.1 Protective Clothing

Protective clothing is recommended whenever working around machinery. Suggestions include use of a hard hat, gloves, safety glasses, safety shoes, garments to cover exposed areas of skin, and breathing apparatus when toxic atmosphere exists.

4.2 WARNINGS and Cautions

The purpose of **WARNINGS** and *Cautions* in this manual is to call the operator's attention to the possible danger of injury to personnel and damage to equipment and deserves careful attention and understanding.

- A. **WARNING:** A Warning indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury and damage to equipment.
- B. **Caution:** A Caution indicates a potentially hazardous situation which, if not avoided,

may result in minor to moderate injury and damage to equipment. It may also be used to alert against unsafe practices.

4.3 Proper Grounding

Polyethylene pipe often has internal and external electrostatic charges that can be hazardous to personnel and equipment. Develop and use procedures that provide a grounding system to eliminate this hazard. The following can be used as a guideline.

- A. Minimize the external charge by wet-wrapping (or equivalent method) the pipe outside before installing the SHORTSTOPP II System.
- B. Ground the equipment as follows:
 1. Before making the tap, attach the TDW provided ground strap assembly from ground to the valve-support.
 2. When using the plugging machine for plugging or completion plug setting, attach the ground strap assembly to the valve-support.

WARNING: Before tapping, plugging or setting a completion plug, properly ground equipment to eliminate any static electricity. Electrostatic charges can be hazardous to personnel and equipment.

4.4 Pipe Support

It is mandatory to provide blocks under the pipe to support the weight of the equipment.

5.0 Equipment Orientation

Use of directional words such as "up," "down," "raise," and "lower" throughout this manual assumes the fitting and valve are mounted on top of the line and the tap is made vertically through the top of the pipe. If the valve is installed and the tap is made in any other orientation, substitution of appropriate directional words will be required.



Section II: Installation and operation of the POLYSTOPP® 10" Valve

1.0 Introduction

The POLYSTOPP® 10" Valve is a full-opening temporary valve used with TDW drilling or tapping machines and SHORTSTOPP® II plugging equipment. It is recoverable after the tap is complete and a completion plug is set in the TDW SHORTSTOPP® or POLYSTOPP® fitting.

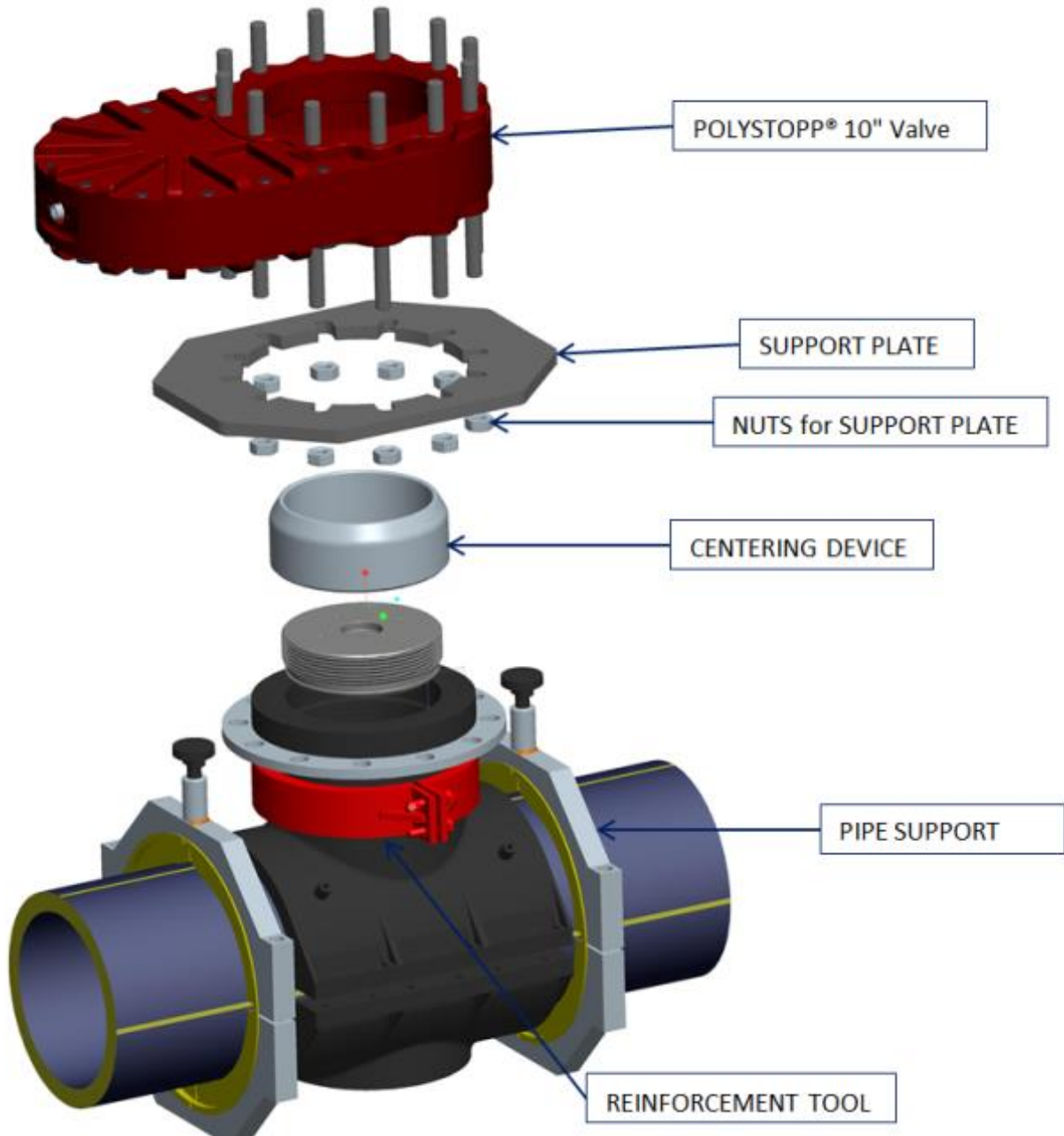
1.1 Site Preparation

The POLYSTOPP® 10" Valve matches ANSI Class 150 bolt patterns.

The compact design of the POLYSTOPP® 10" Valve minimizes drilling machine boring bar length required to complete the tap.

2.0 Operating instructions

2.1 Installation



- A. The POLYSTOPP® 10" Valve (*valve design will be changed after September 2019*) can be installed on a TDW POLYSTOPP® PE or SHORTSTOPP® fitting 315 and 355 mm.
- B. Put the support plate on the lower face of the valve with specific nuts
- C. Put the centering device onto the plug of the fitting.
- D. Put the Plug + centering device onto the fitting.
- E. Put the reinforcement tool around the outlet of the fitting.
- F. Install the valve onto the fitting. The centering device will guide the valve. Squeeze the nuts in cross, respecting the torque in minimum 3 turns The torque applies on the nuts is more and less 47 N.m.
- G. Put the 2 pipe supports on the pipe and screw on hand be in contact with the support plate

- H. Remove the centering device with the completion machine. With the effort to remove the plug is too important, unscrew a little the lower nuts of the valve.
- I. The operating handle is used for both opening and closing the valve seat.

2.2 Operation

- A. When the valve is installed, and before tapping the pipe, open and close the valve disc. The index indicates the operating disk is in position fully open.

CAUTION: do not use force to open or close a POLYSTOPP® 10" Valve. If a valve will not seal with normal force, foreign material may be in the path of the valve disc travel, or an O-ring, damaged by failure to equalize pressure properly, can cause leakage. In these cases, excessive force will not cause a valve to seal and can damage the valve, possibly resulting in personal injury.

Do not use any tool other than the handle provided to operate the valve.

- B. The POLYSTOPP® 10" Valve must not be opened against differential pressure. The pressure must be equalized on both sides of the disc. An internal bypass, shown in Figure 10, is used for pressure equalization as well as purging air from the housing above through a bleeder valve.



Fig 10. Internal bypass on POLYSTOPP® 10" valve (valve design will be changed after September 2019)

- C. When opening the internal bypass, do not force the bypass valve. The internal by-pass valve must remain open so that pressure is equalized on both sides of the valve disc before opening the valve.
- D. Additional information on operating the POLYSTOPP® 10" Valve in tapping or plugging operations can be found in the appropriate tapping or plugging machine manual. Make sure to apply the *CAUTION* remarks provided in paragraph 2.2A above.

Section III: Tapping 315 and 355 mm Lines w/the T-203 Tapping Machine

1.0 Introduction

When tapping a 315 or 355 line, the T-203 Tapping machine is used to make the tap.

It is important that the entire operation be planned carefully in advance to make sure that all equipment and fittings necessary to do the job are readily available.

2.0 General Information

2.1 Procedures

If the line is to be temporarily plugged after tapping, it should be tapped with product flowing so that the tapping chips will disperse. If the chips have been dispersed, a better seal is likely when the line is plugged off.

2.3 Keeping Line in Service

If a section of line is to be isolated and repaired, and it is desired to keep the line in service, as many as six taps of varying sizes could be required.

- A. Two to isolate the section of line.
- B. Two to connect a bypass around the isolated section.
- C. One of two connections for blow-down of the isolated section and equalization of pressure.

- D. After the scope of the work has been defined, the equipment must be selected, assembled, and inspected to ensure proper working order.

3.0 Preparation

3.1 Fitting

Attach fitting to pipeline following fitting installation instructions.

3.2 Valve

- A. For installing the valve, see the paragraph 2.1 above.

3.3 Tapping Machine

- A. Install the tapping machine adapter on tapping machine. Sealing gland on bottom of machine assures proper cutter alignment in the adapter when attached. See Figure 12.



Figure 12. Install Tapping Adapter

- B. Extend boring bar until the end is accessible.
- C. Assemble pilot drill. Insert pilot drill through flange and secure with cap screw. The socket head cap screw goes through the pilot drill shaft.
- D. Install pilot drill and flange assembly through cutter and align four bolt holes.

CAUTION: Cutter teeth are extremely sharp. Wear gloves when handling cutter.

- B. Install cutter holder over pilot drill shaft and align the four bolt holes. Insert bolts into the holes and thread into cutter shell. Use a flat

washer on each bolt. Tighten bolts wrench-tight.



Figure 13. Cutter Holder, Cutter & Pilot drill Assembly

- F. Slide cutter holder/cutter assembly onto tapping machine boring bar, and align bolt hole through boring bar. Be extremely careful of cutter teeth and pilot drill tip.



Figure 14. Cutter holder

- G. Install bolt through cutter holder and boring bar. Install and tighten nut to secure cutter assembly, as shown in Figure 15.



Figure 15. Install bolt and Nut

- H. Retract cutter fully into housing. Zero will show in one of the four tapping machine sight windows. The boring bar may require turning slightly to align zero. See Figure 16.

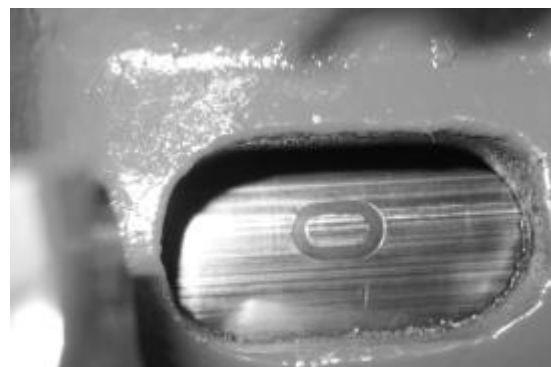


Figure 16. Zero in Window

3.4 Required Measurements

Tapping Measurements. The following measurements must be taken prior to tapping to determine the boring bar travel distance required to complete the tap: Figure 17 shows the measurements necessary to complete the tap.

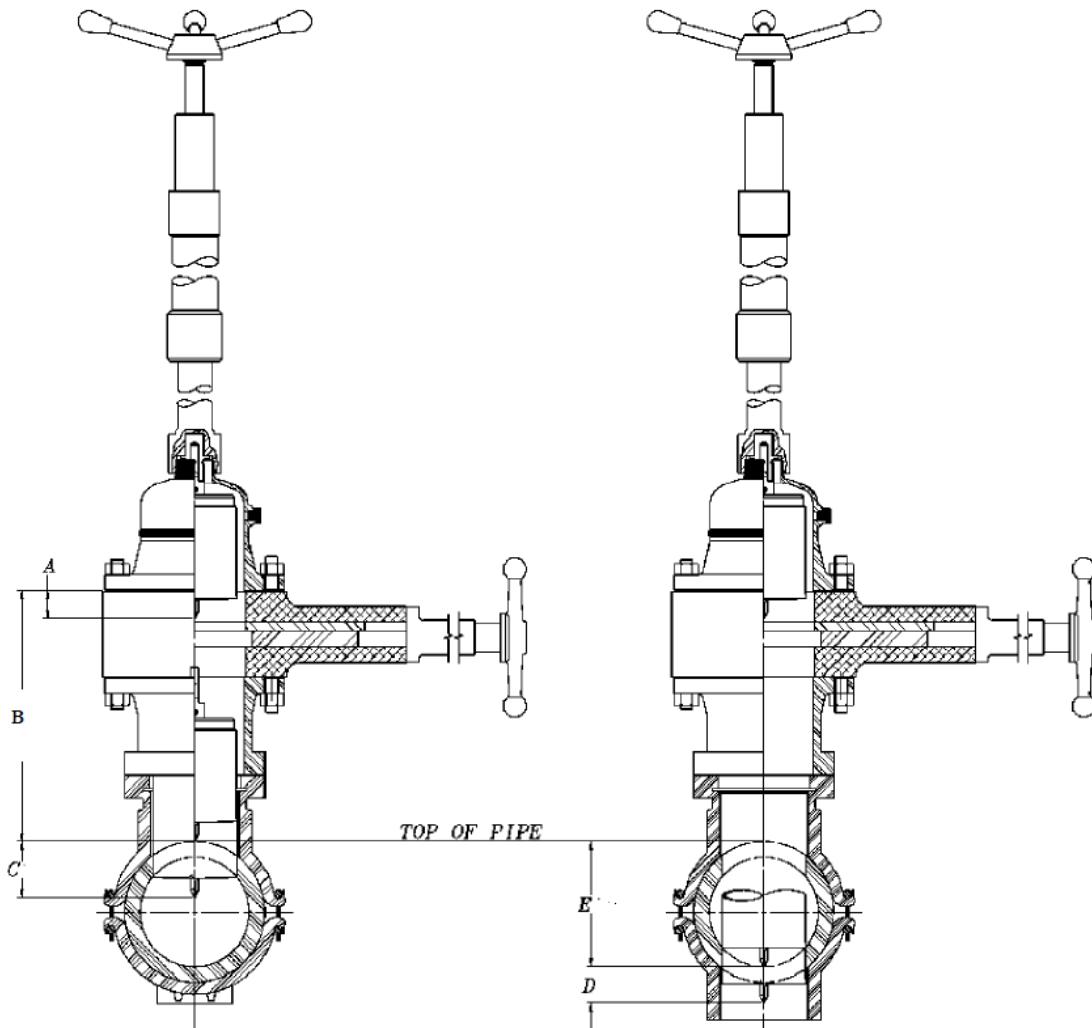


Figure 17. Measurements

- A. Take and record measurement A. This is the distance from the face of the tapping machine adapter flange to the tip of the pilot drill. See Figures 17 and 18.

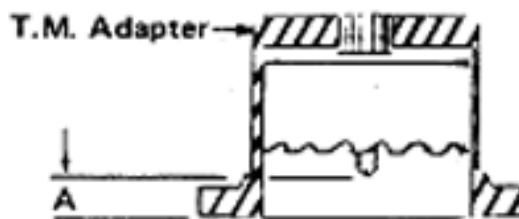


Figure 18. Take and Record Measurement A

- B. Take and record measurement B. This is the distance from the top face of the tapping valve, including gasket, to the top of the pipe to be tapped. See Figures 17 and 19.



Figure 19. Take and record Measurement B

- C. Add Measurement A to Measurement B to determine the lower-in distance.
- D. Measurement C is the distance from the top of the pipe to the point where the coupon is free and the cutter has “cleaned up” the tapped hole. See Figure 20. This distance is dependent on the size of cutter and size of pipe, SDR of the pipe.

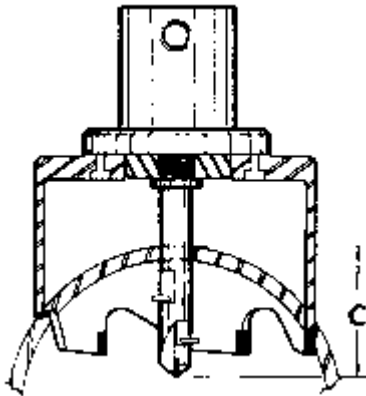


Figure 20. Measurement C

- E. The sum of distance C and the lower-in distance (B+A) is the total boring bar travel required to complete the tap. This number will be visible in the travel indication port when the tap is completed.
- F. If a completion plug is to be set after the tapping operation, take and record measurement H for later use. See Figures 17 and 21. This is the distance from the valve face, including gasket, to the bottom of the groove in the neck of the fitting.

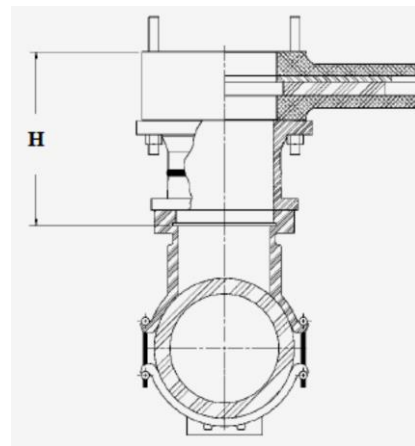


Figure 21. Measurement H

3.5 Install Machine

- A. Open and close tapping valve to make sure that it operates freely. Count and record turns required to open and close the valve. Leave valve closed.
- B. Install T-203 machine on tapping valve and secure. See Figure 22.



Figure 22. Install T-203 Tapping Machine (valve design will be changed after September 2019)

C. Install bleeder valve. See figure 23.

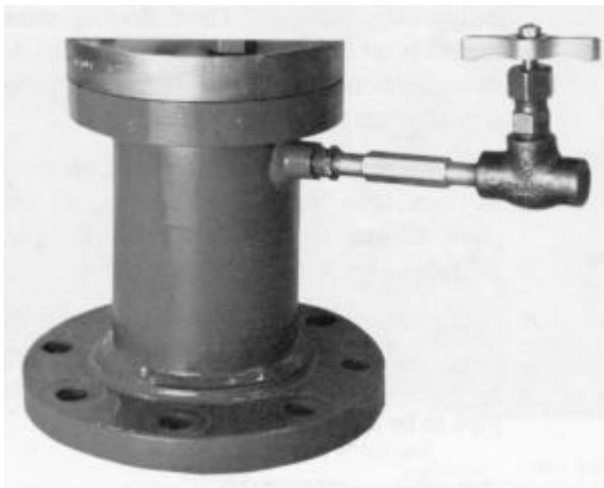


Figure 23. Install Bleeder Valve

3.6 Conduct Pressure Test

A. Using the bleeder valve for access, conduct pressure test on tapping machine/adaptor/valve/fitting installation. Make sure tapping valve is open for test. Test to pipeline pressure.

CAUTION: Do not exceed pipe pressure when conducting pressure test. Exceeding the piping system internal pressure may cause damage to the carrier pipe making it difficult or impossible to complete the tapping and/or line plugging operation.

B. After test is completed, leave tapping valve and bleeder valve open.

3.7 Selecting Power Unit

A. If using air motor drive:

1. Prepare air motor. Minimum air supply must be 105 cfm (2,9736 cubic meter per minute) at 90 psi (6 bar).
2. Be sure air supply hose is blown clear of dirt and moisture. Compressor should have baffled receiver to keep liquid out of supply line.
3. Attach air hose. See Figure 24.

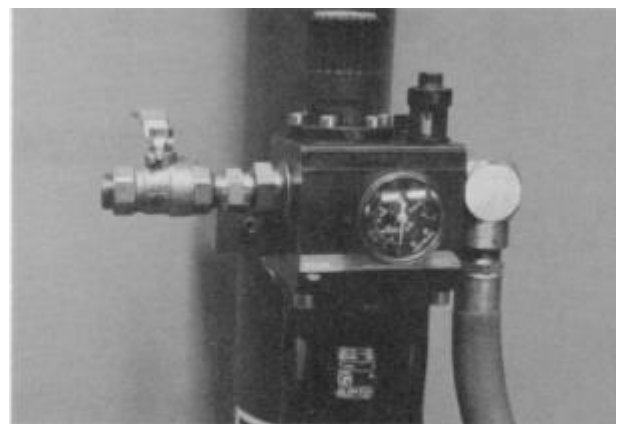


Figure 24. Connect Air Supply

4. Adjust lubricator to supply approximately 10 drops of oil per minute. A good grade of SAE 10W engine oil is recommended.
5. Check operation of motor by opening and closing control valve.

4.0 Tapping the Line

4.1 Making the Tap

- A. Turn feed screw adjusting cap counterclockwise to relieve spring tension. See Figure 25.



Figure 25. Turn Feed Screw Adjusting Cap

- B. Install lower-in crank in top of machine and turn counterclockwise, lowering boring bar until pilot drill touches top of pipe. The computed lower-in distance (measurements A and B) should appear in the travel indicator port. Retract boring bar one revolution and remove hand crank.

Note: One revolution of the hand crank will lower the boring bar 1/8 inch. If, for example, the lower-in distance was 20 inches, it would require 160 revolutions of the hand crank to lower the boring bar to this point.

CAUTION: Do not use the air motor or hydraulic motor to lower the boring bar. Damage to the cutter and pilot may occur.

- C. Open air control valve (Figure 26) to start rotation of boring bar. Adjust filter regulator knob until desired rpm is obtained. The recommended RPM is between 15 & 20 RPM.

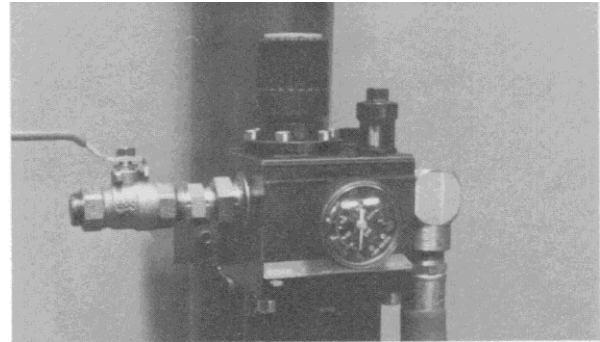


Figure 26. Open Air Control Valve

Note: RPM can be checked easily by observing the numbers as they come around in the travel indication port. Count for 15 seconds and multiply by four to determine rpm.

CAUTION: Speeds higher than 37 rpm may cause damage and premature wear to the air motor.

- E. Turn feed adjusting cap clockwise to feed pilot into pipe. Stop adjustment when air motor begins to load up.
- F. As the pilot drill penetrates the pipe wall, allow line pressure to completely fill valve and fittings. Blow line liquid or gas through bleeder valve a few seconds to purge all air. Close bleeder valve tightly. The machine can continue tapping during the air purging process.

WARNING: Vent pressure bleed valve away from work area and personnel. Stand clear of vent when bleeder valve is opened, otherwise personal injury can result from blowing material.

- G. If the machine stalls, stop and retract cutter a few turns of the hand crank and resume tapping.
- H. When tap is complete, check number on boring bar in travel indication port to make sure computed travel distance has been reached.
- I. Turn off air control valve or close hydraulic valve to stop boring bar rotation.
- J. Turn feed adjusting cap fully counterclockwise to stop feed.
- K. Place hand crank on top of machine and turn clockwise, fully retracting cutter into tapping

machine adapter. Zero should appear in the travel indication port. Remember that it takes eight turns to retract boring bar 1 inch.

- L. Close tapping valve.
- M. Open bleeder valve to bleed off pressure in adapter.

WARNING: Vent pressure bleed valve away from work area and personnel. Stand clear of vent when bleeder valve is opened, otherwise personal injury can result from blowing material.

4.2 Remove Tapping Machine

- A. Remove bleeder valve

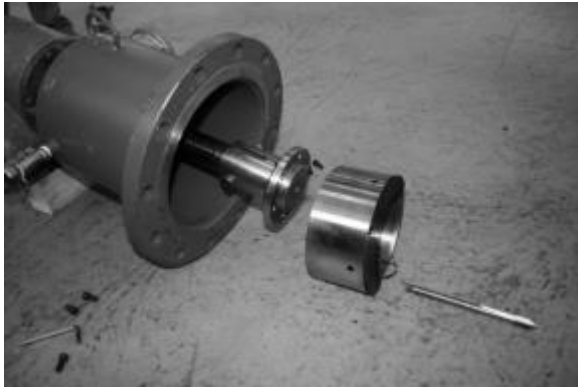


Figure 27. Remove Chips & coupon

CAUTION: Cutter teeth are very sharp. Wear gloves and handle cutter with extreme care when removing chips.

- B. After tapping has been completed, take off the tapping machine.
- C. Extend the boring bar.
- D. Disassemble the pilot drill and the cutter.
- E. Remove the cutter from the cutter holder.
- F. Remove the cutter holder.
- G. Remove the coupon from the cutter and also the chips. PE cutters are designed to capture all but a spoon-full of the chips. In most cases, chip removal is not necessary.
- H. If needed, chips can be removed from the line by using the POLYSTOPP cleaning machine.

Section IV: Plugging the Line

1.0 Introduction

This section provides procedures for temporarily plugging 315-355 mm line while work is being performed. The line may be kept in service during plugging operations by plugging it at two locations to isolate the line section in between and running a bypass around the isolated area.

2.0 Plugging the Main Line

All parts that makeup the plugging head assembly must be clean and in good condition. Remove all dirt and any rust scale from all mating surfaces and bolt holes. All internal threads should be inspected for wear, and a light coating of lubricating oil applied to reduce friction.

If using a plugging machine with a jack, check the drag on the jacking mechanism following the instructions in Section VI, Maintenance. Make sure this test is done without the sealing element attached.

2.1 Install the Plugging Head

- A. Extend the control bar through the plugging head housing and insert the control bar handles in the handle connectors. Twist the upper handle to disengage the locking pin. Turn the control bar handles to align the keyways on the lower end of the external and internal bars, as shown in Figure 28.



Figure 28. Align Control Bar Keyways

- B. Plugging head halves are shown in Figure 29.



Figure 29. Plugging Head Halves

- C. Insert the upper plugging head half, then reposition the control bar handles to the folded position and insert the lower half onto the control bar, as shown in Figure 30.



Figure 30. Install Plugging Head and Secure

- D. Secure with button head screw and the brass washer at the bottom of the bar, as shown in Figure 31.



Figure 31. Secure Plugging Head

- E. Lubricate inside of sealing element halves lightly. Note the curved or notched area on one end, as shown in Figure 32. This goes to the top and curves around the control bar.

WARNING: Do not use a sealing element that is cut or is not pliable. A damaged sealing element can result in excessive gas leaks during plugging operations.



Figure 32. Lubricate Sealing Element



Figure 33. Attach Sealing Elements

F. Attach a 315-355 mm sealing element.

G. Tighten cap screws on each half evenly and firmly as shown in Figure 34. Torque to 55 ft./lbs or 16,76 m/kg Do not over-tighten because excessive deformation of the vertical edge of the sealing elements may occur.



Figure 34. Tighten Bolts Evenly

- E. When both sealing element halves are secure, fully open the folding plugging head until the pin locks into position. Check to make sure the sealing elements meet across the entire mating surfaces, as shown in Figure 35. If they do not meet, tighten or loosen the nosepiece to adjust.

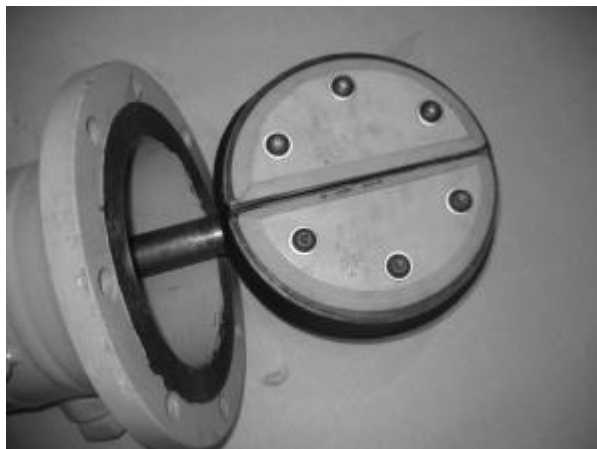


Figure 35. Open Plugging Head

- F. Lubricate the sealing elements around the edges with grease (Figure 36).



Figure 36. Lubricate Sealing Elements

- H. Fold and lock the plugging head in the closed position and remove the handles.
I. Fully retract the plugging head into the plugging head housing. This can be done with the jacking mechanism. Tighten the bar lock clamp to keep the control bar in the retracted position.
J. The plugging head is now ready for use.

2.2 Install the 8" x 10" spool adapter onto the POLYSTOPP® 10" Valve

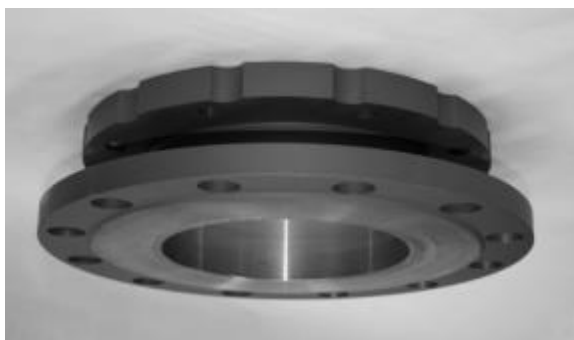


Figure 37.

2.3 Install the Plugging Machine

- A. After the plugging head has been installed, mount the plugging machine on the spool adapter. Make sure the larger outlet on the plugging head housing points toward the area to be isolated, as shown in Figure 38. Tighten nuts evenly.



Figure 38. Install Plugging Machine (*valve design will be changed after September 2019*)

- B. Install a ground strap from ground to the valve-support.
- C. Install the bleeder valve and leave in the open position (Figure 39). Use sealing compound on threaded connections.



Figure 39. Install Bleeder Valve

- D. If this is a double-position application where a bypass will be used, install purge fitting and connect the bypass. Layout is shown in Figure 40.

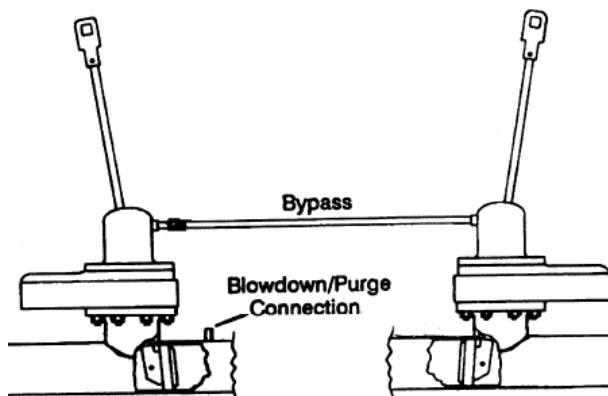


Figure 40. Typical Bypass Layout

2.4 Plugging the Main Line

In a double position operation, the downstream plugging head must be set first. In a 2-way feed line where flow is in both directions, the plugging machine farthest from a regulating station is considered the downstream plugging head. At the start of the operation, valves are opened/closed as follows:

- Upstream bleeder valve is closed
- Downstream bleeder valve is open
- Upstream and downstream tapping valves are closed
- Purge connection valve is closed.

2.5 Lowering the Plugging Head

A. Open upstream tapping valve enough to purge air from both adapter housings and the bypass hose through the downstream bleeder valve.

WARNING: Vent pressure bleed valve away from work area and personnel. Stand clear of vent when bleeder valve is opened. Otherwise, personal injury may result from blowing material.

- B. Close bleeder valve when all air is purged.
- C. Open both tapping valves completely.
- D. Install handles on downstream plugging machine.
- E. Loosen the control bar clamp.
- F. Turn the down-stream control bar handles 45-90 degrees to the run of the pipe and lower into the line. Some back and forth movement of the control bar may be required to get the plugging head through the valve and fitting. Lower by either pushing down or using the jack, as shown in Figure 41, until the plugging head touches the bottom of the pipe.



Figure 41. Lower Plugging Head

WARNING: Do not stand over the control bar while lowering or raising control bar with the jack.

2.6 Setting the Plugging Head

A. If this is a double position job, set the down- stream plugging head first. Twist the top control bar handle clockwise to disengage the locking pin. Open handles until the locking pin snaps back into the locked-open position, as shown in Figure 42. Some "jockeying" of the plugging head, by turning the handles back and forth and even lowering or raising slightly, may be required as it opens.

Note: Handles may rotate several degrees beyond 180 degrees before locking in the open position.



Figure 42. Open Plugging Head

B. When the handles lock in the open position, turn the plugging head until the arrow on the top handle connector points to the isolated section of pipe (handles perpendicular to the pipe) and pull back while slightly turning the handles side to side. This action sets the plugging head in the pipe (Figure 43).



Figure 43. Set the Plugging Head

C. Turn the jack or bar lock mechanism on the control bar to place the control bar latch in the latching position, opposite from the isolated section. This holds the plugging head in the set position. Set and tighten the latch as shown in Figure 44.



Figure 44. Set Control Bar Latch

- D. Tighten the control bar clamp (Figure 45). The plugging head is now in a secure position. Remove the control bar handles.



Figure 45 Tighten Control Bar Clamp

- E. If this is a double-position job, set the upstream plugging head. Repeat steps A through D.
- F. Bleed off pressure and purge the isolated section. Plugging head(s) are set when pressure in the isolated section is zero psi (or zero bar), and handles are properly positioned.
- G. Snug up the control bar latches, if necessary, after purging.
- H. Remove the handles from the plugging machine control bar.
- CAUTION: After the plugging head has been set, remove handles from the control bar. Leaving them in the machine increases the possibility of the plugging head being accidentally dislodged.*
- I. Purge, cut and perform necessary work.

2.7 Removing the Plugging Head

When removing a double system setup, purge and pressure equalize the isolated section, then remove the upstream plugging head-first.

- A. Install the control bar handles in the upstream plugging machine.
- B. Loosen and unlatch the control bar latch.
- C. Slightly loosen the control bar clamp.
- D. Turn the control bar to break the plugging head seal.
- E. Purge the isolated section.
- F. Turn the upper handle to unlock the plugging head, and fold the plugging head by bringing the handles together. At the same time, turn the plugging head 45 degrees to the run of the pipe.
- G. Allow the pin to snap back to lock the folding plugging head in the closed position.

WARNING: Do not stand above plugging machine. Line pressure will tend to force the control bar upward when the seal is broken. This could cause injury.

- H. Retract the plugging head machine fully using the jack. Do not lower the jack handle more than 90 degrees to the control bar, as shown in Figure 46. When fully retracted, tighten the control bar clamp.

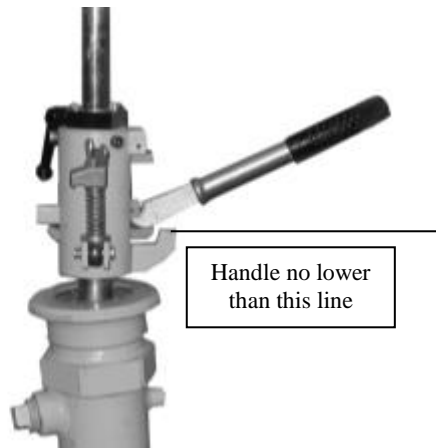


Figure 46. Keep Handle above 90 Degrees

- I. Remove the control bar handles.
 - J. Close the POLYSTOPP® 10" Valve.
 - K. Open the bleeder valve to bleed off trapped pressure. After pressure bleeds off, remove the bleeder valve.
- WARNING: Vent pressure bleed valve away from work area and personnel. Stand clear of vent when bleeder valve is opened. Otherwise, personal injury may result from blowing material.**
- L. Retract the downstream plugging head in a double position setup, following the procedures above. Then bleed off and remove the bypass.
 - M. Remove the plugging machine from the valve.

Section V: Setting the Completion Plug with the POLYSTOPP® completion machine

1.0 Preparing the completion machine

This machine is fitted with a pressure compensating cylinder, which balances out the thrust exerted on the control bar.

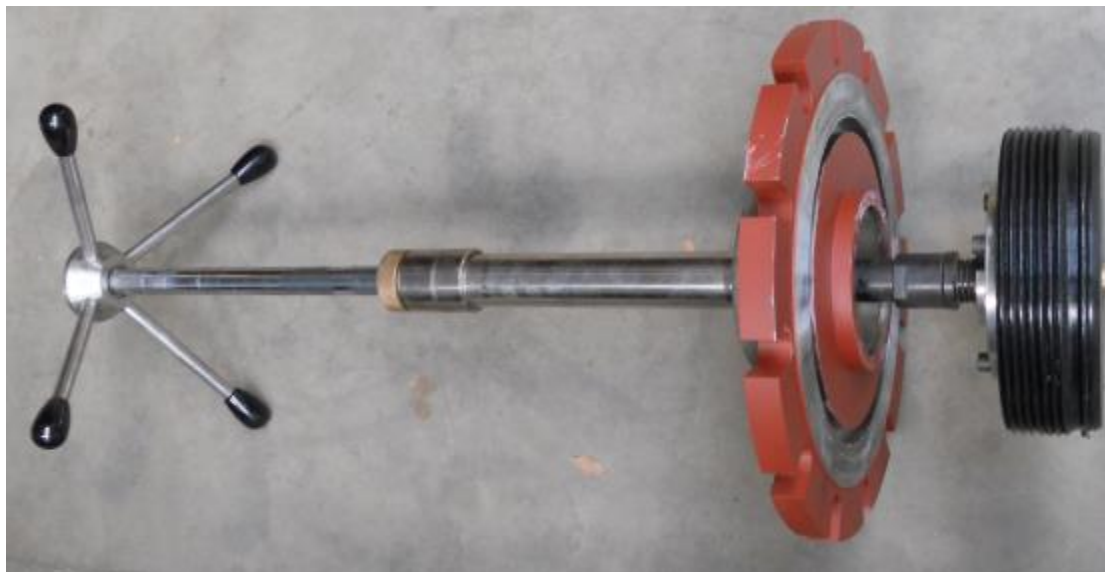


Fig. 47

NOTE : This machine can only be used to fit threaded plugs of POLYSTOPP® Fittings!

- A. Put the completion machine onto the flat adaptor.
- B. Screw the plug holder onto the plug.
- C. Attach the plug to the adapter with lugs by driving it in a clockwise direction
- D. Check by hand for correct operation of the internal bypass of the plug before installing it on the control bar of the machine.



Fig. 49

- E. Fix the Completion machine on the adapter

F. Ensure that the o-ring is in place and that it is lubricated with inert grease.

NOTE : The internal bypass of the plug is now open. (see fig 49)



Fig. 50

G. Lock the control bar in the upper position by tightening the knurled locking nut.

THE COMPLETION MACHINE IS NOW READY FOR USE.

2.0 Installing the plug

2.1 Install the completion machine adapter onto the POLYSTOPP® 10" Valve

2.2 Install the completion machine.

- A. Screw the completion machine onto the adapter by hand until it reaches the stop.
- B. With the bleeder valve open, purge the air in the upper nipple. Close the bleeder valve and equalize the pressures in the POLYSTOPP® 10" Valve.
- C. Open the valve with the operating handle.



Fig 51

- D. Unlock the control bar with the knurled nut.



Fig. 52 (valve design will be changed after September 2019 – Wheel of completion will be updated)

- E. Lower the control bar until it touches the upper saddle.
- F. Screw the plug down with the hand wheel to the stop. Be certain to continue through slight resistance from the O-ring seal. The completion plug is in the correct position when there are 6 mm left between the 160 mark and the threaded knurled nut on the compensation cylinder.
- G. Release the control bar from the plug by pulling and turning the shaft with the hand wheel $\frac{1}{4}$ turn in a counter clockwise direction.
- H. Return the control bar to the upper position and lock.
- I. Open the bleeder valve to purge the valve and adapter, then check the tightness of the plug.
- NOTE : If there is a leak, take back the plug and check the condition of the O-ring. Start again the operation
- J. Half close the disc of the valve and remove the completion machine.
- K. Be sure that the plug is in its right position.

3.0 Removal of the valve

- A. Remove the valve and the adapter.

Design of POLYSTOPP® 10" valve that will become available after September 2019.



Fig. 53 - POLYSTOPP® 10" Valve



Fig. 54 - Removal of POLYSTOPP® 10" Valve, reinforcement collar and valve support

B. Remove the plug holder.



Fig. 55 - Removal of Plug Holder

C. Bolt the blind flange by means of a wrench.

Section VI: Maintenance

1.0 Introduction

Only routine maintenance is required to maintain TDW equipment in good working order. Cleaning and lubricating equipment after each job before returning to storage is most important.

For additional maintenance information, consult the following publications:

T-203 Tapping Machine: TDW Pub. 00-3795-0115.

SHORTSTOPP II Plugging Equipment: TDW Pub. 00-3795-0201.

2.0 SHORTSTOPP® II Plugging Machine

2.1 Control Bar

- A. Remove any scratches or notches on the control bar by using a crocus cloth or a lapping compound.
- B. Keep the control bar coated with a light machine oil when not in use. However, it must be wiped clean before using or the jack may not function properly.
- C. Replace O-Rings. After complete disassembly of the plugging machine, replace the two O-Rings on the inner control bar, near the plugging head. Inspect the O-Ring grooves to make sure they are clean. See Figure 55.

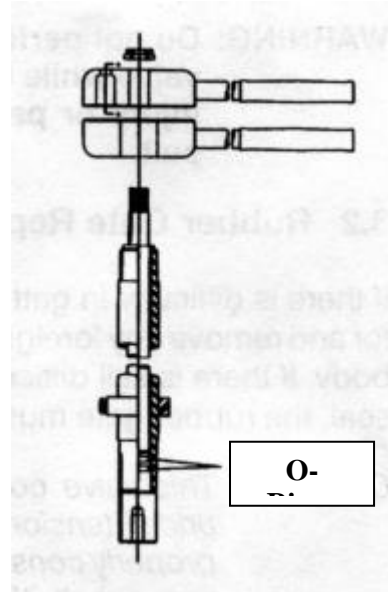


Figure 55. Control Bar O-Rings

2.2 Plugging Head Housing

- A. Do not weld any metal object to the SHORTSTOPP housings. Heat can distort the housing and damage internal seals.
- B. The pivot ball gland must be kept clean. Foreign debris on the surfaces will scratch surfaces and can lead to leaks.

- C. Remove the pivot ball retainer snap ring and nut and clear any debris. Follow the procedure in steps D through K.
- D. Remove the retainer ring from the top of the housing (Figure 56).



Figure 56. Remove Retainer Ring

- E. Remove the compression nut using a spanner wrench. See Figure 57.



Figure 57. Remove Compression Nut

- F. Remove the ball pivot mechanism from the housing (Figure 58).

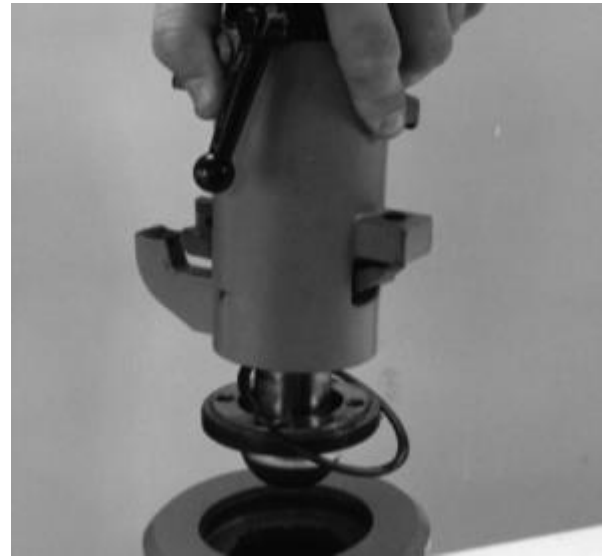


Figure 58. Remove Ball Pivot Mechanism

- G. Clean and remove any debris, and replace O-Rings in the throat of the housing and the internal channel of the pivot ball. Lubricate both with silicone grease.
- H. To remove the pivot ball from the jack housing, remove the snap ring. Note that there are two pair of split bushings: one above the ball pivot and one below it. See Figure 59.



Figure 59. Ball Pivot Components

- I. Inspect the split bushings for wear and replace, if necessary.
- J. Reinstall the ball pivot assembly, remembering the proper position of the split bushing pairs. See Figure 60.



Figure 60. Reinstall Ball Pivot Assembly

- K. When reinstalling the compression nut, snug lightly then install the retainer ring.

2.3 Control Bar Lock/Jack

Occasionally, it is necessary to remove the control bar jack system for lubrication or maintenance, or for use on another housing. Remove as follows:

- A. Remove the plugging head from the control bar, and remove the control bar from the housing.
- B. Disassemble and clean all jack components then reinstall them dry. No lubricant is necessary and may, in fact, attract contaminants.
- C. Remove the ball pivot assembly, following the procedures in paragraph 3.2 above.
- D. The Belleville washers must be stacked in a series, i.e. OD to OD and ID to ID. The lower washer starts with the ID down.
- E. Note size of flat spot wear on upper and lower actuators. These actuators should be replaced when the small flat spots that develop with use exceed .045 inches. See Figure 61.

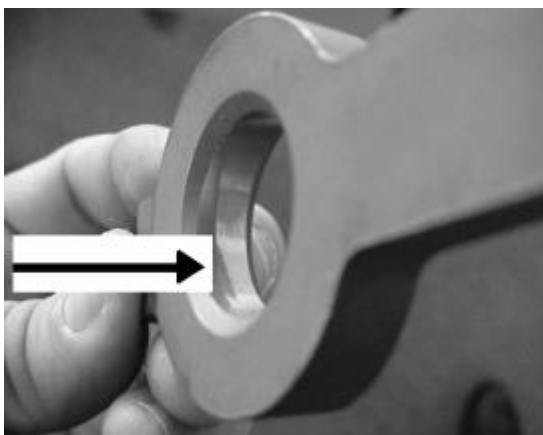


Figure 62. Inspect Actuators for Wear

- F. Reinstall the jack or control bar lock unit on the ball pivot of the plugging housing.

2.4 Adjusting Jack System Drag

- A. The jack system drag needs to be checked prior to each job with the plugging head, without the sealing element, attached. Continual adjustments may be required in the field as components wear or break.
- B. Additional drag can be created by advancing the drag adjust set screw (Figure 62). Turning the adjustment clockwise increases the tension while counterclockwise turning decreases it.



Figure 62. Drag Adjust Set Screw

- C. Do not over-tighten as jacking effort may become difficult. Too little drag may allow the control bar to rise suddenly under higher pressures. Recommended method of adjusting the jack is explained below.
- D. Stand the plugging machine in a vertical position with the plugging head installed, without the sealing element. Do not suspend by the control bar for this purpose.
- E. Adjust the tension to the point that the jack will raise the plugging head and control bar. It should be just enough for the jack to overcome the weight of the control bar and plugging head. When adjusted properly, the control bar will not lower when the jack handle is removed. Too little tension will let the control bar move back down between strokes and can result in slippage under pressure. Too much tension will cause excessive frictional resistance and wear on the actuator components.
- F. Actuator components within the jack housing should be replaced when the small flat spots that develop with use exceed .045 inches. See Figure 61.

3.0 POLYSTOPP® Completion Machine

3.1 Disassembly Procedures

On a clean workbench with easy access, the disassembly and assembly should be carried out in the order given below, using a 6 Ø pin punch and a hammer.

- A. Remove the plug holder from the control bar by removing the flexible pin.
- B. Remove the hand wheel from the control bar using a 24 mm spanner. Then remove the key from the end of the control bar.
- C. Remove the head of the compensating cylinder, the knurled locking nut, the locking ring with the two stops.
- D. Remove the control bar from the pressure compensating cylinder.

3.2 Maintenance of the completion machine

- A. When the completion machine has been completely disassembled, replace all the following O-rings.
- B. Inspect the cover. Carefully clean the cover, the inside, the outer thread and the O-ring grooves.
- C. Protect the surfaces. Use a light oil, compatible with the substance in which the completion machine is to operate.

3.3 Reassembling the completion machine

After dismantling and maintenance, reassemble in the following order.

- A. The control bar : Insert the bar into the compensating cylinder.
- B. When the completion machine has been completely disassembled, replace all the following O-rings.

CAUTION : Take care not to damage the O-ring.

- C. Install the compensating cylinder head with all its components (washer + locking ring).
- D. Install the hand wheel with the key.
- E. Screw the plug holder on the control bar and drive again the flexible pin.

4.0 SHORTCUTT® Valve

The SHORTCUTT® Valve is relatively maintenance-free. Any component can be replaced easily. A parts list and assembly diagram are shown below.

When not in use, the valve should be stored with the disc closed. A light coating of oil should be applied to the disc prior to storing.

5.1 Disassembly and Inspection

The valve should be disassembled and inspected every 30 days during continued use and at least annually when occasionally used.

- A. Inspect and lubricate bearings, the operating stem, and bypass valve stem.
- B. If replacing the thrust collar/bearing (item 24 in Parts List No. 1), delete the item 28 thrust washer and replace with the extra washer furnished with the 00-1014-0007-01 bearing, as shown in Figure 63.

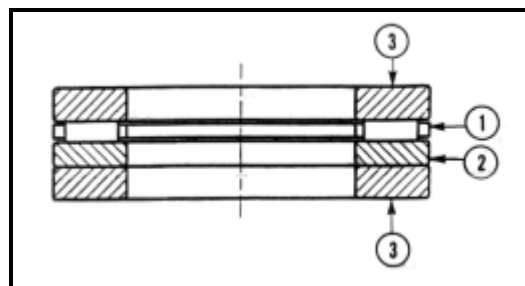


Figure 63. Replacing Thrust Collar/Bearing



Table 1 Thrust Collar/Bearing			
Item	Qty.	Description	Part Number
1	1	Thrust Bearing	00-7447-002
2	1	Thrust Washer	0-6813-0001
3	2	Thrust Washer	00-6813-0002

1. Replacement Bearing 00-1014-0007-01 re-replaces Bearing 00-1014-0007 and Thrust Washer 00-1407-0001.
 2. The 00-1014-0007 thrust bearing used prior to January 1994 has been discontinued by the bearing manufacturer, with no direct replacement available. Because of the size similarity of the new bearing's thrust washers and the old 00-1407-0001 thrust washer, it is necessary to discard the old, softer, thrust washer and use the new, harder, thrust washer to ensure the softer one does not become a bearing race.
- C. Inspect all O-rings and replace if cut, cracked, flattened, or hardened.
- D. A retaining plate, shown in View B of the assembly drawing, prevents the operating stem from backing out of the valve if properly operated. It must be removed to replace the stem O-ring. When reinstalling this plate, torque the two hex-head bolts holding it to the following values:

Table 2 Cap Screw Torque Values	
Size	Torque Range
10"	250-350 in. lbs

- E. Socket stud nuts and hex-head bolts holding the two side plates together should be torqued to the following values:

Table 3 Stud Torque Values		
Size	Minimum	Maximum
10"	170 ft lbs.	222 ft lbs.



Appendix I: Parts Lists

Parts List No. 1		
POLYSTOPP® System for PE Pipes Big Sizes		
315-355 mm		
Description	Part Number	
T-203 Drilling Machine	12303981	
SHORTSTOPP® Plugging Machine 8 x 12	08.3501081.0000.00	
POLYSTOPP® Completion Machine	75.0537.0100.0400.10	
POLYSTOPP® 10" Valve	TBD	

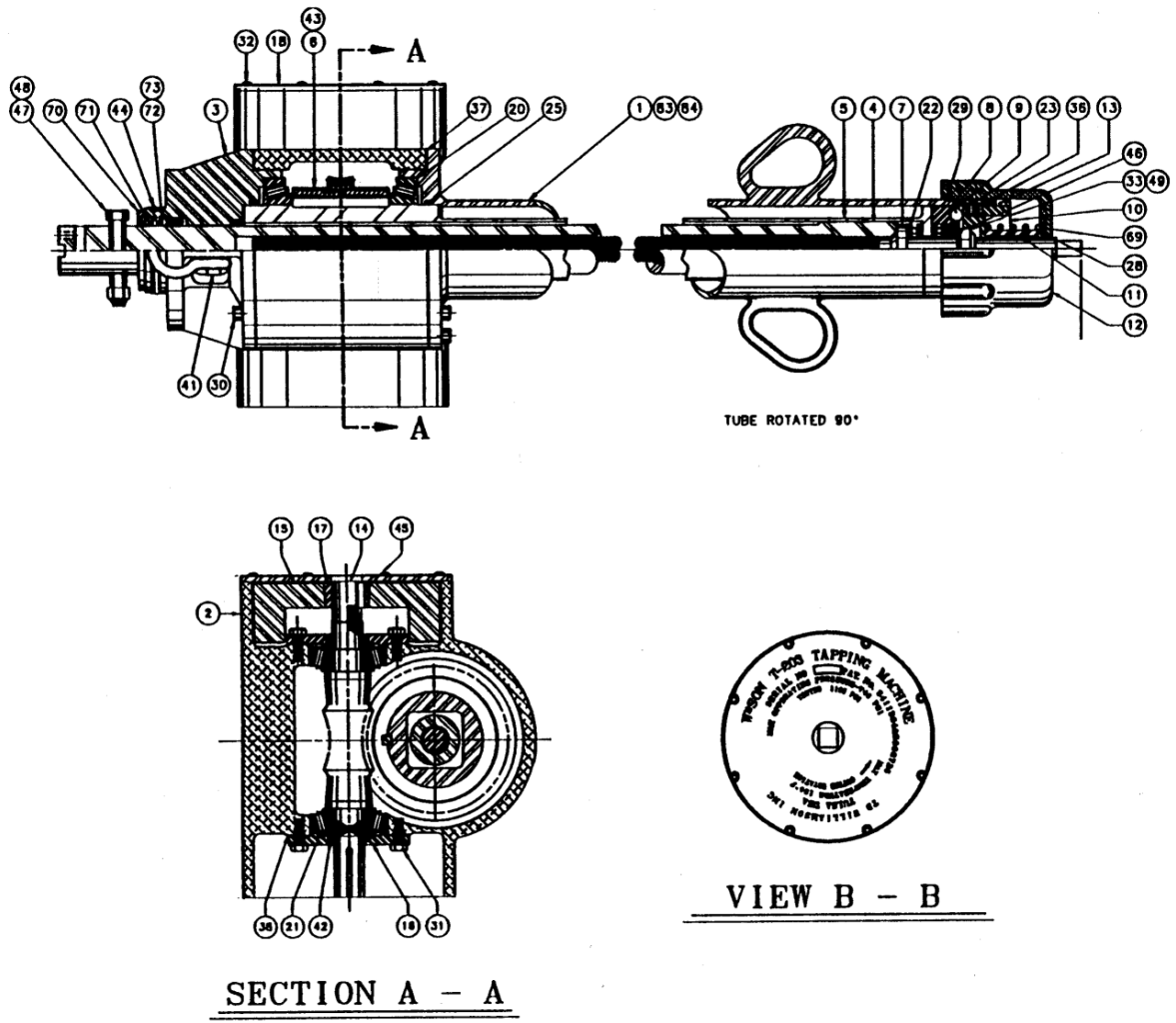


Figure 64. T-203 Tapping Machine (Parts List 1)



Parts List 2
T-203 Tapping Machine

Item	Description	Part Number
		Air Drive
	Tapping Machine	05-2173-0000
1	Body Tube	05-0261-0001
2	Gear Case	05-0222-0002
3	Seal Gland	05-0261-0003
4	Boring Bar	05-0353-0004
5	Drive Tube	06-0261-0005
6	Worm Gear	00-1663-0001
7	Feed Screw	05-0261-0007
8	Feed Ball Race	05-2171-0008
9	Feed Ball Drive Plate	05-2171-0009
10	Cam Feed Plate	05-2171-0010
11	Feed Adjuster	05-2171-0011
12	Feed Adjusting Cap	05-2171-0012
13	Feed Assist Spring	00-0136-0170
14	Worm	05-0261-0014
15	Flywheel	05-0222-0015
16	Worm Bearing Retainer	05-0261-0016
17	Taper-Lock Bushing	00-1641-0003
18	Flywheel Cover	05-0972-0018
19	Lower-in Crank (not shown)	00-0635-0002
20	Worm Gear Bearing	00-0124-0013
21	Worm Shaft Bearing	00-0124-0014
22	Thrust Bearing	00-1014-0014
23	Steel Ball	00-0460-0005
25	O-ring	00-0118-0018
28	Oil Seal	00-2683-0001
29	O-ring	00-0117-0016
30	Socket Head Cap Screw	00-0130-0600-10
31	Bolt	00-0203-0600-08
32	Button Head Screw	00-3336-1000-16
33	Light Thin ESNA Nut	00-0232-0010
36	Dowel Pin	00-0854-0002
37	Gear Case Shim Set	00-0800-0002
38	Worm Shaft Shim Set	00-0798-0002
39	Relief Fitting (not shown)	00-1665-0001



Parts List 3
T-203 Tapping Machine (Continued)

Item	Description	Part Number
		Air Drive
40	Pipe Bushing (not shown)	00-0644-0002
41	Anchor Shackle with Round Pin	00-1666-0001
42	Seal	00-0114-0038
43	Square Key	00-0642-0007
44	O-ring	00-0118-0002
45	Square Key	00-0640-0004
46	Square Key	00-0639-0014
47	Shoulder Screw	00-0204-01000-22
48	ESNA Nut	00-0003-0005
49	Spring Washer	00-5753-0001
50	Bleeder Valve (not shown)	00-0774-0001
51	Nipple (not shown)	00-0220-0001
52	Square Key	00-0640-0002
53	Bolt	00-0203-1000-10
54	Boring Bar Protector (not shown)	05-0222-0054
66	Hex Socket Plug	00-0018-0005
69	Feed Adjusting Spring	00-0136-0169
70	Packing Nut	05-0222-0070
71	Packing spring	00-0136-0033
72	Packing Washer	05-0222-0072
73	Packing	00-1768-0001
74	Packing Nut Wrench (not shown)	00-1767-0001
83	Caution Decal	00-3302-0003
84	Danger Decal	00-3303-0001
85	Instruction Manual	00-3795-0115

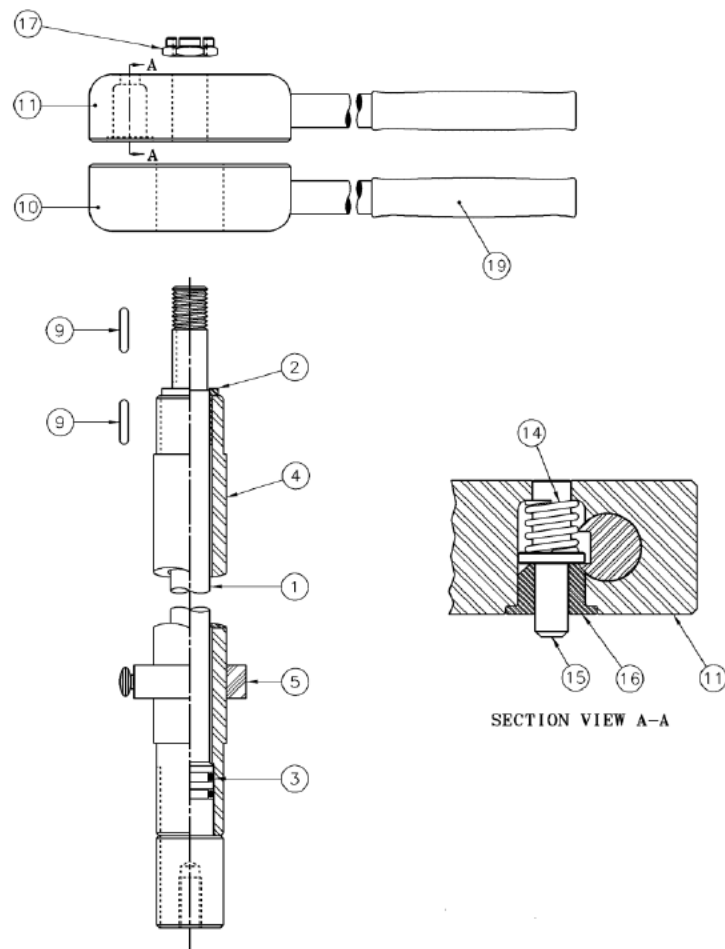


Figure 65. SHORTSTOPP® II Dual Control Bar Assembly



Parts List No. 3 (Figure 65)
SHORTSTOPP® II Dual Control Bar Assembly

Item	Qty	Description
	1	Dual Control Bar Assembly
1	1	Shaft, Inner Control
2	1	Bushing, Bronze
2	1	Bearing
2	2	O-Ring
3	1	O-Ring
4	1	Shaft, Outer Control
5	1	Marker, Control Bar
9	2	Key
10	1	Connector, Lower Handle
11	1	Connector, Upper Handle
14	1	Spring
15	1	Pin, Handle Connector
16	1	Pin, Handle Connector
17	1	Nut
17	1	Shim
18	3	Washer*
19	2	Handle, Control Bar
20	1	Bearing, Flange*
21	2	Plunger*
22	1	Eyebolt*

* Not shown

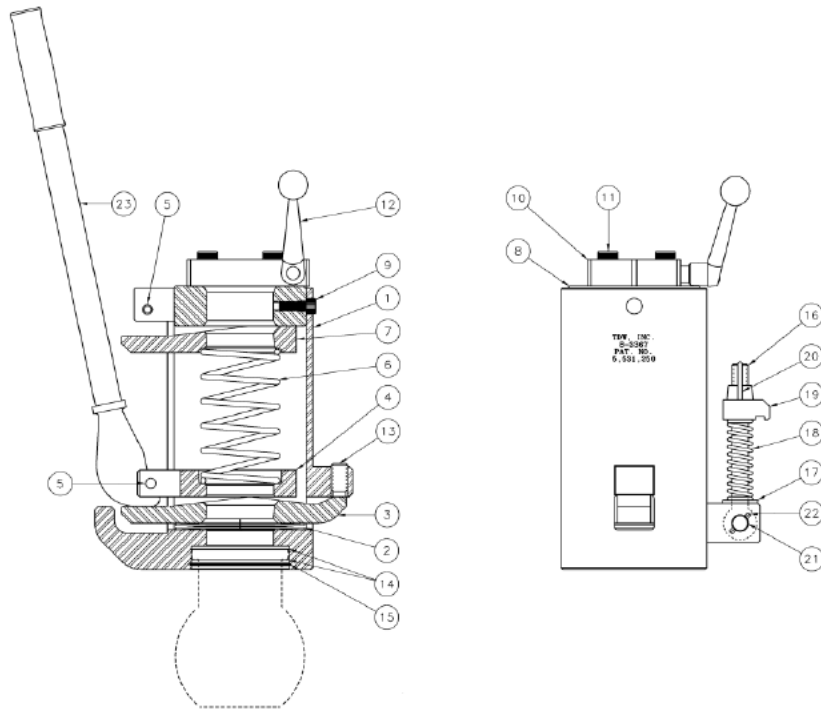


Figure 66. SHORTSTOPP®II Jack Assembly



Parts List No. 4 (Figure 66)
SHORTSTOPP® II Jack Assembly

Item	Qty	Description
		Jack Assembly
1	1	Housing, Jack Control
2	3	Spring, Belleville
3	1	Actuator, Lower Control
4	1	Release, Lower Actuator
5	2	Pin, Sel-Lok
6	1	Spring, Compression
7	1	Actuator, Upper Control
8	1	Cap, Jack Housing
9	3	Capscrew, Skt Hd
10	1	Clamp, Control Bar
11	2	Screw, Shldr
12	1	Handle, Adjustable
13	1	Screw, Half Dog Set
14	2	Bearing, Split Thrust
15	1	Ring, Retainer
16	1	Bolt, Eye
17	1	Washer, Fl Std
18	1	Spring, Compression
19	1	Latch, Hook
20	1	Nut, Wing
21	1	Pin, Clevis
22	1	Pin, Sp Sel-Lok
23	1	Handle, Jack Assy.
25	1	Pin, Sp Sel-Lok

**PARTS LIST No. 5**

COMPLETION MACHINE ASSEMBLY No. 75.0537.0100.0400.10			
ITEM	QTY.	DESCRIPTION	PART No.
1	1	Machine body	07-0703-0001-0000-00
2	1	Compensating cylinder	07-0703-0002-0000-01
3	1	Control bar	07-0703-0003-0000-01
4	1	Piston	07-0703-0004-0000-00
5	1	Cover for compensating cylinder	07-0703-0005-0000-00
6	1	Lock nut for control bar	07-0703-0006-0000-00
7	1	Plugging tool adapter	07-0703-0007-0000-01
8	1	Polyurethane ring	07-0703-0008-0000-00
9	1	Compression stop	07-0703-0009-0000-00
10	1	Parallel key 5 X 5 X 20	00-5147-0505-0200-00
11	1	O-ring 3/16 in nom. OD 4.625 in	00-0118-0101-0000-00
12	3	O-ring 1/8 in nom. OD 1-5/16 in	00-0117-0003-0000-00
13	1	O-ring 1/8 in nom. OD 1.562 in	00-0117-0007-0000-00
14	1	O-ring 1/8 in nom. OD 2 in	00-0117-0010-0000-00
15	2	Round end stop	00-5125-0036-1028-00
16	1	Socket head pressure screw	00-3434-1000-0006-00
17	1	Operating hand wheel	
18	1	Safety nut with nylon ring	00-2327-0016-0000-00
19	1	Plugging tool	75-1060-0206-0040-00

TO BE UPDATED SEPT 2019

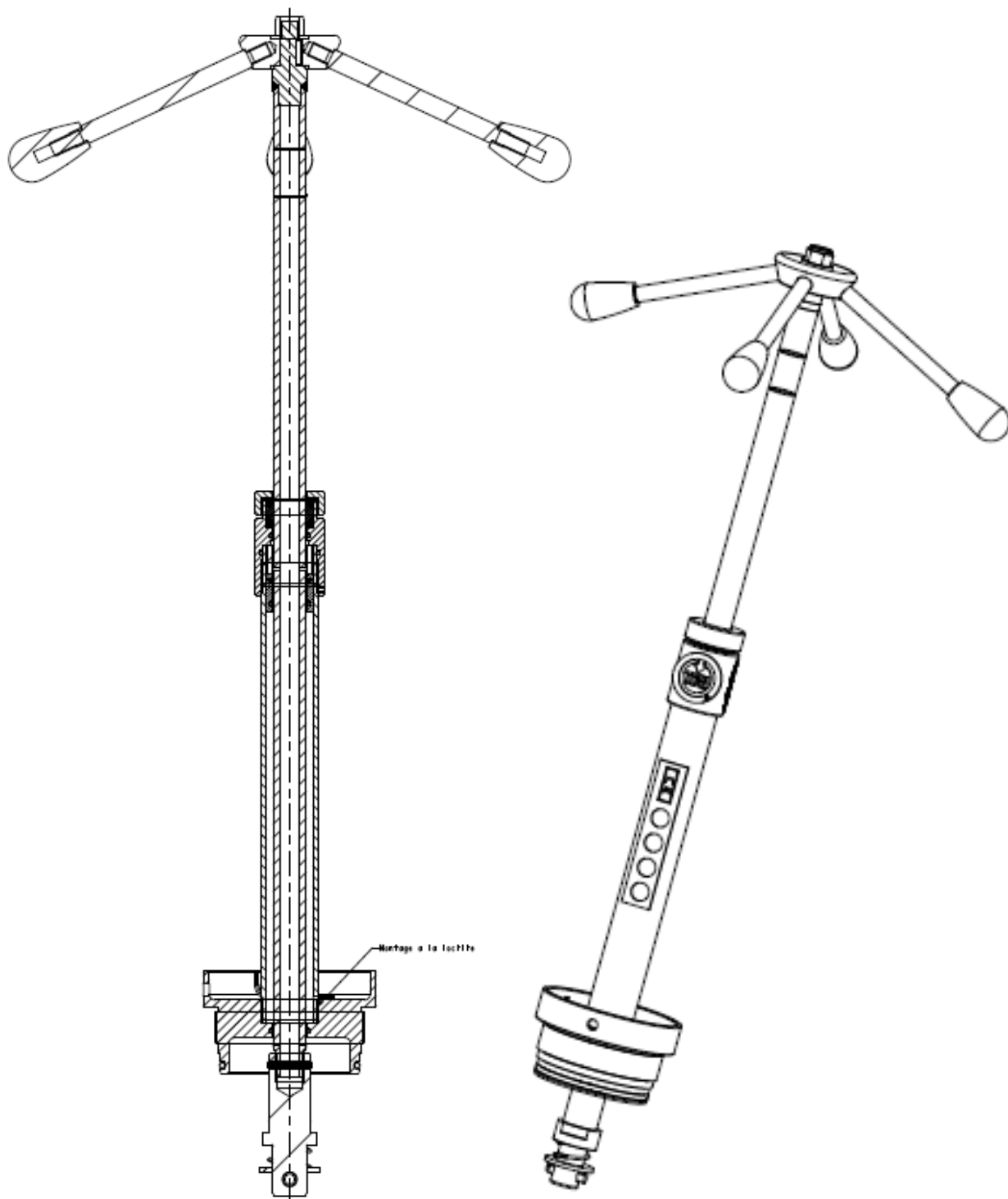


Fig. 67

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**Parts List No. 7
POLYSTOPP® Valve, 10"
(See Figure 68)**

***TO BE ADDED UPON NEW DESIGN VALVE
LAUNCHING***



***TO BE ADDED UPON NEW DESIGN VALVE
LAUNCHING***

Fig. 68



Parts List No. 8
POLYSTOPP® Big Sizes 315-355 PE 100

Description	Part Number	Description	Part number
Installation		Plugging	
POLYSTOPP® Valve 10''	TBD	Plugging machine assembly	75.1046.0100.0300.01
Valve/pipe support 315 - 355	75.1539.0100.0250.20	Std plugging head assembly 8''x12''	08.3331.0000.0000.00
Reinforcement tool for PE fittings	75.1539.0206.0250.10	Flat Adapter PM / valves → 8''ANSI 150X10''ANSI150	75.1539.0206.0810.00
Support plate Assy	75.1539.0206.0315.15	Nose piece 150 Psi MWP 8''x12''- 315 SRD 11	08.3330.1504.0000.00
Calibration Rings Ø315	75.1539.0306.0250.24	Nose piece 150 Psi MWP 8''x12''- 315 SRD 17	75.1539.0306.0315.17
Calibration Rings Ø355	75.1539.0306.0250.23	Nose piece 150 Psi MWP 8''x12'' - 355 SRD 11	75.1539.0306.0355.11
Centering Device	75.1539.0206.0315.00	Nose piece 150 Psi MWP 8''x12'' - 355 SRD 17	08.3331.1504.0000.00
		Sealing Element 150 Psi MWP 8''x12'' - 315 SDR 11	08.2332.0010.0001.00
		Sealing Element 150 Psi MWP 8''x12'' - 315 SDR 17	08.2332.0012.0006.00
		Sealing Element 150 Psi MWP 8''x12'' - 355 SDR 11	08.2332.0012.0008.00
Tapping		Sealing Element 150 Psi MWP 8''x12'' - 355 SDR 17	08.2332.0012.0000.00
Tapping machine T-203 (Air driven)	12303981		
Flanged valve adapter for T-203 Class 150 RF 10°	06.15445.0000.0000.00		
Cutter assembly (composed by)	TBD	Boxes	
PE Cutter Ø194 mm'	05.0780.0194.0001.00	Carrying case for Plugging Machine 8''x12''	08.2565.0005.0000.00
PE Cutter holder for T-203	05.0780.3040.0001.01		
PE Pilot drill for T-203	75.3090.0322.0110.12		
Kit bolt and nuts 3/8''	70.9920.1002.1217.25		
Kit bolt and nuts 1/4	70.9920.1002.0813.50		
Completion			
POLYSTOPP® completion machine Pressure balanced with 4 arms wheel	75.0537.0100.0400.10		
Adapter for Completion machine for POLYSTOPP® valve 10''ANSI150	75.1539.0306.1010.00		
Flat Adapter for Completion machine	75.1539.0206.0010.10		
Completion Plug Adaptor	72.5537.0206.0315.05		



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