Safe-T-L-Stopper

Mazco Products and PLCS, LLC. Gas-Free Service Renewal or Abandonment 3/4" to 1 1/4" Elbow Swing Joints

Operating Manual





Updated: 11/28/2018

Table of Contents

Introduction	Page 3
Work Area Preparation	Pages 4-5
Operation 1: Fasten Drill Assembly and Drill Through the Elbow	Pages 5-9
Operation 2: Insert Expansion Stopper	Pages 10-13
Operation 3: Remove M X F Street Elbows on a Coupling	Pages 14-18
Parts List.	Pages 18-23

Introduction

This work procedure has been developed to provide information on the correct use of the Safe-T-L-Stopper Tool on ³/₄" to 1 1/4" Elbow Swing Joints . This technology enables gas free renewal or abandonment procedures on live gas services. You are expected to have this procedure with you at all times when carrying out work using this equipment.

Limitations:

There are many different styles and variations of tees that have been installed in the ground over the years. The Safe-T-L-Stopper contains assemblies and adapters that are capable of handling elbow swing joint type service tees and configurations. Additionally, when tees are uncovered their structural integrity varies. It is the operator's responsibility to use the proper adapters and judge the condition of the tee before attempting the operation. Using the tool outside its capabilities or on a corroded tee is not recommended and may result in serious injury.

Safety Statements:

READ THE OPERATING INSTRUCTION: Reading the setup and operating instructions prior to beginning the procedure will save valuable time and help prevent injury to operators or damage to equipment.

INSPECT TOOL & ACCESSORIES: Prior to setup, physically inspect the tool and its accessories. Look for worn parts, loose bolts or nuts, damaged o-rings, etc. A properly maintained tool will greatly decrease the chance of injury.

SECURE LOOSE CLOTHING, LONG HAIR & JEWELRY: These items could get caught in the rotating parts. Removing or securing them will reduce the chance for injury.

KEEP WORK AREA CLEAR: Be sure to keep the work area free of clutter and nonessential materials. Only those personnel directly associated with the work being performed should have access to the area.

ALWAYS WEAR PROTECTIVE EQUIPMENT: Impact resistant eye protection and any and all company approved personal protective equipment must be worn while operating or working near this tool.

ALWAYS FOLLOW YOUR COMPANY PROCEDURES: Gas company procedures override anything presented in this document.

OPERATING PROCEDURE

Work Area Preparation

- 1. Clean all components of the Safe-T-L-Stopper equipment prior to use. Pay particular attention to any o-rings, grooves and matching surfaces. Any dirt in these areas should be wiped off.
- 2. Make sure you have all the parts needed for the operation. See pages 18-22 for parts list and toolbox illustration.
- 3. Identify which of the three elbow swing joint configurations (Photo 1-3).
 - I. **Female x Male (F X M)** street elbow threaded onto a toe nipple welded directly to the main. The tool will drill through the elbow and insert a rubber expansion stopper into the nipple to stop the flow of gas to the branch (Photo 1, use operation #1 and 2, pages 5-13).
 - II. **Female x Female (F X F)** standard elbow threaded onto a toe nipple welded directly to the main. The tool will drill through the elbow and insert the rubber expansion stopper into the nipple to stop the flow of gas to the branch (Photo 2, use operation #1 and 2, pages 5-13).
 - III. Male x Female (M X F) street elbow threaded into a coupling that is welded onto the main. <u>*Requires operation 1, 2 and 3*</u> (Photo 3).
 - a) Use operation #1 and #2 pages 5-13: The tool will drill through the elbow and insert the rubber Expansion stopper into the <u>throat of the elbow</u> to stop the flow of gas to the branch. Then the service connections are removed.
 - b) Use operation #3, page 14-18: The drill assembly removed then equipment is reassembled to seal around coupling on the main. The street elbow is removed and replaced with a plug or other company approved method.



- 4. Clean the work area of the elbow swing tee down to bare metal where the Elbow Housing, Elbow Seals and Chains (MXF operation) will be positioned. Remove all corrosion, raised castings and scale so that the Rubber Elbow Seals will seal properly. It is vitally important to make sure all the scale is completely removed and the integrity of the surface is intact (Photo 4-5). Failure to carry out this step may allow the tool assembly to move and gas to escape. If the elbow tee is severely corroded and surface is uneven, do not attempt the Safe-T-Stopper operation.
- 5. Spray all connection fittings that will be removed with penetrating oil. This will make removing or loosening connection easier.



Operation 1: Fasten Drill Assembly and Drill Through Elbow

 Choose the correct Elbow Seal according to the configuration. Seals are marked on the underside with the letters M or F. The male side has a thicker rubber edge than the female side.

³⁄₄" Elbow Seal Male x Female 54-MF 750
³⁄₄" Elbow Seal Female x Male 54-FM 750
³⁄₄" Elbow Seal Female x Female 54-FF 750
1" Elbow Seal Male x Female 54-MF 1000
1" Elbow Seal Female x Male 54-FM 1000
1" Elbow Seal Female x Female 54-FF 1000
1 1/4" Elbow Seal Male x Female 54-FF 1250
1 1/4" Elbow Seal Female x Male 54-FM 1250
1 1/4" Elbow Seal Female x Female 54-FF 1250



7. Lightly lubricate the underside of the Elbow Seal with silicone gel.



(Photo 7)

8. Place the correct Elbow Seal onto the elbow to ensure proper fit (Photo 8). Check to make sure surface has been completely filed smooth. Then, place the seal inside the Elbow Housing and fit onto the elbow (Photo 9). Make sure the housing position is straight and the recessed area inside the housing match the raised areas of the elbow (Photo 10-11).



9. Secure the Elbow Housing by fully tightening the Elbow Housing nuts equally and alternately using the 9/16" socket (Photo 13) until noticeable resistance is felt. Do not completely tighten one nut before tightening the other. The rear adjustment screw can be tighten or loosened to adjust the housing's vertical position (Photo 14). However, most of the time, screw adjustment is not necessary.



- 10. Fit Ball Valve on top of Elbow Housing and tighten by hand until moderate resistance is felt and the o-ring located on the housing compresses (Photo 15). Do not over-tighten. Exercise the Ball Valve to ensure proper operation.
- 11. Tighten the Drill Shaft Extension onto the Ball Valve (Photo 16)
- 12. Lubricate the inside of Drill Shaft Housing and push the 16" long Drill Shaft through the bore of the housing hex end first. Be sure not to damage the internal o-rings (Photo 17).
- 13. Attached the correct size Elbow Drill Bit and tighten the cap screw with the 3/16" T-Handle Hex Wrench (Photo 18). Liberally apply cutting paste to annular cutter bit (Photo 19)
- 14. Fully retract the Drill Shaft and tighten onto the Drill Shaft Extension (Photo 20-21).
- 15. Push to attach the Quick Connect Pressure Test Assembly onto the Bleeder Valve (Photo 21).
- 16. Fully retract Drill Shaft and hold into place to prevent it from pushing upwards. Pressurize the assembly by introducing air or nitrogen through the Schrader valve and test to mains operating pressure. *Make sure the small valve is fully closed*.
- 17. Perform a leak test on the assembly. If necessary further tighten seals.
- 18. When leak test is complete, open small valve to release pressure.

Push shaft through housing.

(Photo 15)



(Photo 16)



(Photo 17)



(Photo 19)

(Photo 21)

- 19. Using your hands, gently push down and turn the Drill Shaft slightly until it has traveled through the Elbow Housing Bearing and felt touching the top of the elbow (Photo 22).
- 20. Place the Nylon C Collar onto the shaft so it touches the top of the Drill Shaft Housing. Place the Shaft Collar on top. Tighten the Shaft Collar into place using the 3/16th T-Handle Hex Wrench. Remove the Nylon C Collar. The collar prevents accidentally drilling too deep. If the Nylon C Collar is missing measure and secure the Shaft Collar 2" away from the top of the Drill Shaft Housing (Photo 23)
- 21. Tighten the Air Drill directly onto the Drill Shaft hex using the Air Drill Chuck. Make sure the Air Drill is in the forward position (Photo 24).
- 22. Lift up slightly on the Drill Shaft and depress the trigger (Photo 25).
- 23. Gently lower the Drill Shaft so it comes in contact with the top of the elbow (Photo 25).
- 24. Do not push down on the shaft. The weight of the shaft is enough to drill through the elbow. Note: Keep in mind you are drilling on a curved surface, where only half of the bit is drilling into the elbow when starting. When starting to drill the cutter may jam. This is normal. Pull up slightly, take your time and let the cutter do the work.



(Photo 24)

(Photo 25)

Safety Tip: Hold the Air Drill with one hand so that it will be pulling away from you under load. If the cutter jams the Air Drill will be pulled from your grasp and will stop automatically as your fingers are released from the trigger. If operated towards you it may swing around and hit you before you can release the trigger.

- 25. A sudden increase in speed, reduction of load and a higher pitch note of the air motor indicates that the Elbow Drill Bit is through the pipe. At times when the Elbow Drill Bit is almost through the cutter may jam. At this point stop and remove the Air Drill. Continue the cut by hand using the 7/16th socket and ratchet until complete.
- 26. When drilling is complete, fully retract the drill shaft to above the Ball Valve. Close the Ball Valve. Open the bleeder valve and vent off the excess gas. Remove the Drill Shaft Housing and Extension.

<u>Maintenance Tip</u>: Always clean and remove all shavings from the cutter after each use and prior to storage. A pick tool is supplied with the kit and used to remove shavings from the inside of the cutter. Never drill with a dirty cutter.

27. Attach Viewport and check to see there are no obstructions and the hole was completely drilled.



- (Photo 26)
- 28. Attach the Magnet onto the Expansion Plug Tool. Push and turn the magnet attachment onto the bottom of the shaft. Make sure the pin is resting in one of the slots (Photo 26-27).





(Photo 27)

(Photo 28)

- 29. Fully retract the Magnet into the housing and attached the assembly onto the Ball Valve (Photo 28).
- 30. Open the Ball Valve and slowly push the shaft down near the edge of the knurled section (Photo 29). Do not touch the small T-Handle when pushing down.
- 31. Then slowly retract the Magnet into the housing, close the Ball Valve, bleed off the excess gas and remove the assembly.
- 32. Attached the Viewport to ensure there are not any obstructions.



Operation 2: Insert Expansion Stopper

33. Choose the correct size Expander Plug (Photo 31) and fasten to the bayonet mount Expansion Plug Insertion/Removal Assembly (Photo 32).

Please note the rubber Expander Plugs are modified to fit through the hole drilled using Safe T L Stopper. Standard plugs are too small or too large.

IMPORTANT: Before starting the operation, thoroughly clean the Expansion Plug Insertion/Removal Assembly shaft and apply the recommended lubricant to the entire shaft. Move the housing up and down the shaft multiple times until little friction is felt. Wipe off any excess lubricant. Also, clean and re-lubricate the shaft prior to returning the part to the toolbox.



32. To attach the Expansion Plug onto the shaft to <u>EXPAND</u> the plug below the branch of the tee, hold the Expansion Plug with one hand and with the other hand hold the end of the shaft. Push the stem end of the Expansion Plug into the hole inside the shaft (Photo 33) and turn the shaft counter-clockwise (Photo 34), so the Expansion Plug pin engages the off-set slot (Photo 35).



33. Gently turn the Small T-Handle clockwise until you hear it click (Photo 36). This indicates that the small pin inside the shaft fully engages the dimple on the Expansion Plug and will <u>EXPAND</u> the plug when turning the Small T-Handle clockwise.



(Photo 36)

- 34. Measure the travel needed to expand the Expansion Plug into the <u>street elbow on a</u> <u>coupling (MXF operation)</u> or the <u>nipple (FXM and FXF operation)</u>
- 35. Place the Expansion Plug Tool next to the ball valve and line up the lip edge of the Housing with the lip edge of the Ball Valve (Photo 37-38).
 - a. MXF Operation: To set the Expansion Plug into street elbow that is threaded into a coupling, push to extend the shaft so the plug <u>bottom washer</u> is even with bottom edge of the Elbow Housing. Make sure to keep shaft straight Tighten the Collar on the shaft to reference the necessary travel (Photo 37)
 - b. FXM and FXF Operation: To set the Expansion Plug directly into the toe nipple, push to extend the shaft so the plug <u>top washer</u> is even with bottom edge of the Elbow Housing. Make sure to keep shaft straight Tighten the Collar on the shaft to reference the necessary travel (Photo 38)



36. Fully retract the shaft and fasten the Assembly onto the Ball Valve. Make sure the Bleeder Valve is in the closed position. Hold the shaft in the fully retracted position with one hand and slowly open the Ball Valve taking care to prevent the shaft from moving upwards unexpectedly (Photo 39). Push the shaft down to the Collar (Photo 40). Simultaneously hold the shaft into position and turn the Small T-Handle clockwise with two fingers to expand the plug. Tighten until noticeable resistance is felt. Do not over-tighten (Photo 41).

Hold shaft in the fully retracted position and open ball valve.



<u>NOTE</u>: In the unlikely event that the Expansion Plug falls in the tee. Use the Magnet Attachment to remove the plug. Fit the Magnet (Photo 42) onto Expansion Plug Insertion/Removal Tool (Photo 43) and fasten to Ball Valve. Open Ball Valve and push down shaft until it captures the plug. Retract shaft, close Ball Valve and bleed off excess gas.



- 37. Open the Bleeder Valve. If necessary, continue turning clockwise to expand the Expansion Plug until gas has stopped. Once the sound of blowing gas stops, the service has been successfully stopped.
- 38. Detach the Expansion Plug from the shaft by following these steps:
 - a) Loosen Shaft Reference Collar with Hex Wrench.
 - b) Simultaneously push down slightly on the shaft, pull up on Small T-Handle and turn shaft clockwise until plug disengages. (If unable to push down, check to make sure Collar has been loosened.)
 - c) Retract shaft above Ball Valve, close Ball Valve and bleed off excess gas.

39. Remove Expansion Plug Insertion/Removal Tool and close the Ball Valve. Fit Viewport and open Ball Valve. Check to make sure the Expansion Plug has been properly inserted into the elbow or nipple (Photo 44).



(Photo 44)

<u>NOTE</u>: If Expansion Plug needs to be removed after it has been expanded while it is in the throat of the tee follow these steps:

- 1. Fasten the Plug Removal/Insertion Tool Assembly onto the Ball Valve
- 2. Gently push down on until the shaft is felt over the threaded stem of the Expansion Plug.
- 3. Simultaneously push down on the shaft and turn the shaft <u>clockwise</u> so the side pin on the Expansion Plug is captured within the shaft's off-set keyway. Gently pull up on shaft to verify pin is engaged.
- 4. Hold shaft position and turn small T-Handle counter-clockwise until a click is felt. **Do not turn small T-Handle until Expansion Plug pin is fully engaged within the off-set slot.**
- 5. Continue to turn small T-Handle counter-clockwise while gently pulling up on the shaft until plug releases from the throat of the tee.
- 6. Retract shaft to above the Ball Valve, close Ball Valve and bleed off excess gas.
- 7. If plug needs to be reinserted, use a new Expansion Plug and follow steps 32-39.
- The FXM and FXF operation is complete. The Safe T L Stopper assembly can be removed and abandonment operations can be carried out according to company procedures. For MXF operation, leave Safe T L Stopper in place and continue to step 41.



(Photo 45) Rubber Expansion Stopper shown in nipple



(Photo 46) Example of Elbow Removed

Operation 3: Remove M X F Street Elbows on a Coupling

- 41. Close the Ball Valve and remove the Viewport.
- 42. Attach the ³/₄" Plug Removal Adapter onto the T Handle Assembly in order to insert the Street Elbow Removal Tool (Photo 47).

IMPORTANT: Before starting the operation, thoroughly clean the T-Handle shaft and lubricant to the entire shaft. Move the housing up and down the shaft multiple times until little friction is felt. Wipe off any excess lubricant. Also, clean and re-lubricate the shaft prior to returning the part to toolbox storage.



43. Fit the Plug Removal Adapter onto the T-Handle Assembly shaft by lining up the shaft dimple with the grub screw (Photo 48). Tighten with the Hex Wrench. Do not over-tighten (Photo 49).







41. Remove the small 1/2" cap screw from the correct size Street Elbow removal adapter (Photo 50).



- 42. Fit the Street Elbow Removal Adapter onto the Plug Removal Adapter (Photo 51).
- 43. Fit the Drill Shaft Extension, fully retract the T-Handle assembly within the housing and tighten assembly onto the Ball Valve (Photo 52).
- 44. Open the Ball Valve and push down on the T-handle until the Street Tee Removal Adapter is felt touching the top of the rubber Expansion Plug (Photo 53).





(Photo 51)

(Photo 52)

(Photo 53)

45. Tighten Shaft Friction Brake to lock the shaft into place (Photo 54).



- 41. Remove branch fittings (Photo 55)
- 42. Tighten small cap screw into one of the holes located on Street Elbow Removal Adapter. Rotate shaft slightly if necessary. The cap screw stops against the interior wall of the elbow as the shaft turns counterclockwise during the elbow removal process (Photo 56-57).
- 43. Once the cap screw secured, remove the Safe T L Stopper assembly (Photo 58-59).
- 44. Cut the female branch end of the elbow using a hacksaw. <u>Take care not to cut into the cap screw.</u> The elbow must fit through the 2 ½" bore of the Ball Valve. For 1 ¼" elbows, it may be necessary trim off the sides (Photo 60).



(Photo 55)



(Photo 56)



(Photo 57)



(Photo 58)



(Photo 59)



(Photo 60)

- 45. Fit the correct size Coupling Seal (Photo 61).
- 46. Fit the correct size Half Collars. Tighten with the 5/16 Hex Wrench. Take care not to pinch the rubber (Photo 62).
- 47. Loosen the elbow with a pipe wrench to break the initial seal (Photo 63).
- 48. Fit and centralize the Cap Housing over the elbow. Secure using the four Turnbuckles and two chains. For 1 ¼, 2" and 3" fit Poly Spacer under the main and fit each chain in the slot. Tighten each turnbuckle evenly until moderate resistance is felt. Do not over-tighten (Photo 64).
- 49. Fit the 3" x 2 ¹/₂" Adapter. Use the Bar Wrench to tighten (Photo 65). Then fit the Ball Valve and Drill Shaft Extension. Attached the T-Handle assembly fitted with the ³/₄" Plug Removal Tool. It will capture the square on the Street Elbow Removal Tool to remove the elbow (Photo 66).









(Photo 63)

(Photo 66)

(Photo 61)



1 ¼", 2" & 3" Main: Fit Poly Spacer under main, then fit each chain.

(Photo 64)

(Photo 65)

- 50. Tighten the T-Handle assembly onto the Ball Valve. Push down and turn the shaft until you feel it engage the square on the Street Elbow Removal Tool. Turn counterclockwise until the elbow is removed from the coupling. Retract the shaft with the captured elbow to above the Ball Valve. Close the Ball Valve, bleed off the excess gas and remove the T-Handle Assembly and Drill Shaft Extension (Photo 67).
- 51. Fit the correct size Plug Remove Tool and square plug with applied thread sealant onto the T-Handle Assembly (Photo 68).
- 52. Tighten the assembly onto the Ball Valve. Push down until you feel the plug touch the coupling. Turn counterclockwise until you feel the plug skip, then clockwise to tighten the plug. Tighten until you feel noticeable resistance. Open the bleeder valve until you no longer hear the sound of the blowing gas (Photo 68-69).
- 53. Close the Ball Valve and attach the Viewport to verify the plug has been installed properly.
- 54. Remove the Safe T L Stopper (Photo 69-70).
- 55. Further tighten the plug with a pipe wrench.
- 56. The operation is complete.



(Photo 67)



(Photo 68)



(Photo 69)



(Photo 70)

Parts List <u>³/₄</u>" – 1 ¹/₄" Safe T L Stopper

2 1⁄2"" Ball Valve 54-MSTS 1005
1/8" Bleeder Valve with ¼" x 1/8" NPT Quick-Connect Fitting 54-PTSSQ
Safe-T-Stopper Pressure Test Assembly 54-PTSS
Expandable Plug Setting Tool with Threaded Housing: 54-MSTS1010-1007 O-Ring: 54-MSTS1024
3/4" Safe-T-L-Stopper Expansion Plug: 54-100179MOD 1" Safe-T-L-Stopper Expansion Plug: 54-100180MOD 1-1/4" Safe-T-L Stopper Expansion Plug: 54-100181MOD
T-Handle Assembly with T-Handle and Threaded Housing <i>(included in base tool</i>): 54-MSTS1008-1007 (2500BV)
3/4" Elbow drill bit /adapter 54-MSLS 5090 1" Elbow drill bit /adapter 54-MSLS 5100 1 1/4" Elbow drill bit /adapter 54-MSLS 5110
3/4" Elbow Seal Male x Female 54-MF 750 3/4" Elbow Seal Female x Female 54-FF 750 3/4" Elbow Seal Female x Male 54-FM 750 1" Elbow Seal Male x Female 54-MF 1000 1" Elbow Seal Female x Male 54-FF 1000 1 1/4" Elbow Seal Female x Male 54-FM 1000 1 1/4" Elbow Seal Male x Female 54-MF 1250 1 1/4" Elbow Seal Female x Female 54-FF 1250 1 1/4" Elbow Seal Female x Male 54-FM 1250

And and a second se	3/4" Street Elbow Removal Adapter 54-FF750EA 1" Street Elbow Removal Adapter 54-FF1000EA 1 1/4" Street Elbow Removal Adapter 54-FF1250EA
	3/4" Standard Thickness Elbow Housing 54-MSLS 750 1" Standard Thickness Elbow Housing 54-MSLS 1000 1 1/4" Standard Thickness Elbow Housing 54-MSLS 1250
	Bar Wrench 54-MSTS 1004W
	3000 female to 2500 male reducer 54-TR3FX25F
	Drill Shaft Housing Part#: 54-MSLS 5130
	Drill Bit Shaft (16" Long) 54-MSLS 5120
	Drill Shaft Extension 54-MSLS 5140
	Cutting Paste Part# 46-A5314
	Air Drill 49-A3025

	9/16" Deep Socket 7/16" Standard Socket
	Viewport: Part # 54-MSTS 1060
	Lock-Out Plug: Part # 54-MSTS 1014
	Swarf Magnet 54-MSTS 1015C
)0	9/16" Wrench 54-916
	1/8" Hex Wrench 54-MSTS1221 3/16" Hex Wrench 46-A0017
	Mini Flashlight 54-MFL
	Cantilever Tool Box (3000BV tool kit): Part # 54-770298
	Safe-T-Stopper Tool Box (3000BV): Part# CPBOX1 Tool Box 54-CPBOX <u>Note</u> : Includes Tool Box and Cantilever
	¾" Plug Removal Adapter 54-MSTS 1027 1" Plug Removal Adapter 54-MSTS 1027A 1 1/4" Plug Removal Adapter 54-MSTS 1027B
-	Street Tee and Saddle Clamp Housing (Base Housing) 54-MSTS 1050 Housing Turnbuckle Hook (single hook) 54-MSTS 1035C Housing Turnbuckle Hook (double hook) 54-MSTS 1035CD

	Extension Housing: Part# 54-MSTS 1032
	1" Roller Chain for 4" – 8" Main (36" Long) 54-MSTS A2040 For larger main sizes, call PLCS for longer chain.
	Chain retainer Turnbuckle with "J" Style Hooks 54-MSTS 1035B
11t O CPG	Full Coupling Seal ³ / ₄ " (rubber gasket) 54-FCS750 Full Coupling Seal 1" (rubber gasket) 54-FCS1000 Half Coupling Seal 1" (rubber gasket) 54-HCS1000 Full Coupling Seal 1 1/4" (rubber gasket) 54-FCS1250 ³ / ₄ " and 1 ¹ / ₄ " Half Coupling Seals are available. Please call PLCS.
	Coupling Half Collar ¾" 54-CHC 750 Coupling Half Collar1" 54-CHC 1000 Coupling Half Collar 1 1/4"54-CHC 1250
- A	Poly Spacer 5 ½: x 1 ¼" Pipe 54-PS1250 Poly Spacer 5 ½: x 2" Pipe 54-PS2000 Poly Spacer 5 ½: x 3" Pipe 54-PS3000
)	9/16" Wrench 54-916
	5/16" Allen Key 45-4973A19
	Air Chuck 54-ACK

Toolbox



