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# LEAD SERVICE LINE REPLACEMENT PRODUCTS & PROCEDURES

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04/12/2022

## EQUIPMENT

LEAD KITS 912-7167 (5/8"-1") and 912-7168 (1/2")



DESIGNED FOR CONTRACTORS TO REPLACE LEAD SERVICE LINES.

THE KIT IS COMPRISED OF THE MAJORITY OF THE COMPONENTS NEEDED TO COMPLETE LEAD LATERAL REPLACEMENTS FROM 1/2" TO 1".

OTHER REQUIRED TOOLING TO BE ADRESSED LATER INCLUDES: CABLE, EXPANDER, WIRE ROPE PULLER, RODDER, AND NEW PRODUCT PULLER.

## LEAD KIT COMPONENTS

EXPANDER CONE, LS - 5/8" THRU 1"

912-7112

QUANTITY: 2



EXPANDER CONE, LS - 1/2"

912-7111

QUANTITY: 1



SEPERATION TUBE, LS - 1/2" THRU 1"

912-7110

QUANTITY: 2



JAW ASSEMBLY 3/8" CABLE

912-5552

QUANTITY: 2



JAW ASSEMBLY 1/4" CABLE

912-5512

QUANTITY: 2



LEAD SLITTING BLADES

BLADE, 1/2"-LS – 912-7106

QUANTITY: 1

BLADE, 5/8"-LS – 912-7105

QUANTITY: 2

BLADE, 3/4"-LS – 912-7103

QUANTITY: 2

BLADE, 1"-LS – 912-7104

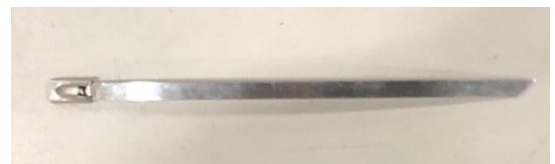
QUANTITY: 1



CABLE TIE, SS 8"

912-7119

QUANTITY: 10



# OTHER REQUIRED COMPONENTS

CABLE ASSEMBLY 1/4" (120') X 3/8" (120')

912-7118



CABLE ASSEMBLY, 1/4" X 120'

912-7115



CABLE PULLER, 1/4"

912-7120



CABLE PULLER, 3/8"

912-7121



OTHER COMPONENTS NOT PICTURED BUT UTILIZED

EXPANDERS (1/2" – 1")

PIPE GRIPS (1/2" – 1")

SEE ATTACHED MATRIX FOR FURTHER DETAIL

RODDER  
912-7123



# LEAD WATER SERVICE REPLACEMENT PROCEDURE

## PREWORK

1. Checking municipality records for prior repairs may assist in locating couplers and fittings.
2. Validate material of the visible portion of the pipe at the meter.

## REPLACEMENT

- 1.) Revalidate material of the visible portion of the pipe at the meter.
- 2.) Locate lead service and optimal pulling path.
  - a. Find where the lead water service enters the residence.
    - i. Basement, crawlspace, etc.
  - b. Choose best pulling location for excavator.
    - i. Curb stop, meter pit, main, etc.
    - ii. This location should be large enough to track back with the excavator.
- 3.) Close the water service valve.
- 4.) Dig curb stop/meter pit.
- 5.) Dig exit pit at chosen location from step 1b, if it is not the curb stop/meter pit.
- 6.) Compare service material at the residence to that at the exit pit.
  - a. If the material is different (e.g., copper) in the residence than it is in the exit pit, this is indicative of a coupler or fitting being present somewhere in the service.
    - i. Excavating and removing any couplers or additional fittings prior to pulling will significantly improve the replacement process.
    - ii. See the troubleshooting section for more details on locating and eliminating these connections.
- 7.) Disconnect the lead service at both pits.
  - a. Cut the lead pipe close to the wall/floor where the service enters the residence, or the foundation wall/floor if outside.
    - i. If the service enters the residence through a wall, the surrounding concrete will need to be removed from around the pipe to provide clearance for the expander to travel.
    - ii. If the service enters the residence through the floor, additional digging is required to get past the foundation. This allows for a straighter pull and provides clearance for the expander.
- 8.) Determine ID of the service & select the appropriately sized cable/tooling.
  - a. Only use 1/4" cable for 1/2" diameter lead.
  - b. Use 1/4" – 3/8" transition cable for 5/8" – 1" lead.
- 9.) Begin feeding the cable through the lead service.

- a. Feed the cable from the entrance pit to the exit pit.
  - i. If using the transition cable, feed the  $\frac{1}{4}$ " diameter end through the existing service first.
  - ii. This cable end is distinguishable by the brazed-on eye.



10.) If feeding the cable through the existing lead service becomes difficult...

- a. Push the rodder through the lead from the exit pit into the entrance pit.
- b. Once the rodder reaches the entrance pit, use the supplied stainless steel zip ties to connect the rodder eye to the cable eye.
  - i. Attach the zip tie.
  - ii. Trim extra length.
  - iii. Use tape to compress and protect the zip tie.



- c. Pull the rodder back, dragging the cable back through the lead service to the exit pit.
  - d. You may also pour lubricants (e.g., dish soap) into the lead pipe to lubricate the pulling path.
- 11.) Pull the remainder of the cable length through the lead pipe until 5' are exposed in the entrance pit.
- 12.) Install tooling onto the cable as shown in your kit.
- a. Slitting blade
    - i. Use the correct size blade that corresponds with the diameter of the lead service.

1. Reference the information on the card provided with the kit to identify the correct blade.
  - ii. Face the flat cutting edge of the blade away from the end of the cable and towards the lead pipe.
- b. Cone
- i. Use the larger expander cone for 5/8" – 1" diameter lead pipe.
  - ii. Use the smaller expander cone for 1/2" diameter lead pipe.
- c. Separation tube
- i. There is only one type of separation tube. It can be used for any diameter lead pipe from 1/2" – 1".
- d. Expander Assembly
- i. Use the correct size expander that corresponds with the diameter of the new pipe being installed.
  - ii. Make sure jaws being used with the expander correspond with the diameter of the cable being used. The size is stamped on the reward face of the jaws.
  - iii. ***Be sure to coat jaws with thin layer of the anti-sieze supplied with the expander assembly.***
    1. ***Failure to do so will result in the jaw set being lodged in the expander cone making removal very difficult and, in some instances, impossible.***
  - iv. Begin by slipping the cable through the nose of the expander.
  - v. Place the anti-sieze coated jaw over the cable leaving a 1/4" length of cable protruding from the reward face of the jaws.



- vi. Slide jaws down the internal taper of the expander cone



- vii. Use two wrenches to tighten the retention nut until it is fully shouldered to the back of the expander cone.

e. Pipe Grip

- i. Use a pipe grip that corresponds with the size of the diameter of the new product pipe being pulled in.
- ii. The pipe size the grip is designed for is stamped on the aluminum stop under the loop.



- f. The assembled tooling string should match the order shown in the example below.

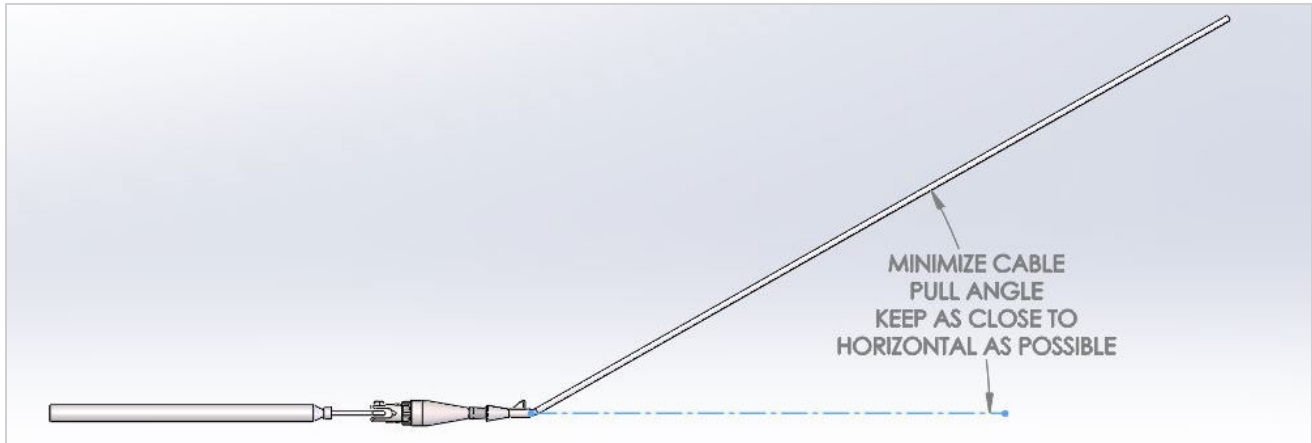


- g. With the tooling properly installed, hand pull the 5' of cable remaining in the entrance pit until it contacts the host pipe.
  - i. Make sure the lead pipe is as straight as possible and there is proper clearance past the foundation floor or wall.

13.) Exit pit equipment set up



- a. Begin by attaching the appropriately sized cable puller to the excavator arm.
- b. Attach the cable puller to the cable as close to the host pipe as possible while maintaining a low pulling angle. This helps ensure the new pipe stays at an appropriate depth while reducing necessary pull force.
  - i. The pulling angle is most commonly 45 – 60 degrees, but if a smaller angle is safely achievable the efficiency of the pull will increase.



#### 14.) Pulling and Slitting

- a. Start pulling slowly, with personnel watching the entrance pit for any disruptions while the tooling and new product pipe enter the ground.
- b. If you need to reset to pull further, complete the following steps.
  - i. Release tension on the cable.
  - ii. Remove the cable puller from the cable.
  - iii. Re-attach the puller on the cable in the pit as close to the host pipe as possible.
  - iv. Clear the pit of personnel.
  - v. Slowly pull again.
- c. Repeat this process until the tooling string and new product pipe are pulled far enough to establish the new connection in both pits.

#### 15.) Job completion

- a. Release the tension on the cable.
  - i. Detach the cable puller from the cable.
  - ii. Disassemble the tooling string in reverse order.
  - iii. Inspect all tooling for any damage or wear and replace if necessary.
  - iv. Re-coil cable into the supplied drum beginning with bare cable end (no eye) while inspecting for any kinks, frays, or other damage along the length.
  - v. ***It is imperative that, when the jaw set in the expander cone is removed, it is cleaned thoroughly with acetone or brake cleaner and a wire brush.***

# TROUBLESHOOTING

## 1.) Difficulty sliding tooling over the cable.

- a. Verify tooling components and cable being used are the correct size.
  - i. Reference the tooling chart for further information.
- b. Confirm the tooling components and cable are clean and free of debris.
  - i. If not, clean with acetone or brake cleaner to remove any dirt.
- c. Check if the cable end is frayed or damaged.
  - i. Cut off the damaged section.
  - ii. Braze and/or grind the cable end to a smooth and flush finish.
    1. Always rotate the cable or grinder in the same direction of the cable lay. This will minimize cable fraying during the process.
  - iii. Replace if necessary.

Before grinding taper/polish



After grinding taper/polish



## 2.) Unable to push cable through pipe.

- a. If the cable is unable to navigate through the pipe, lubricating the pipe ID at entrance pit may resolve the issue.
- b. Push the cable through 1-3 inches at a time to clear blocked sections. Pushing large sections quickly may make the blockage worse.
- c. Remove the cable and push the duct rodder slowly (1-3 inches at a time) from the exit pit through the host pipe to the entrance pit.
- d. If the options above fail, the blockage can be pot-holed (small excavation) and removed.
  - i. Insert the rodder or cable into the lead service pipe until it reaches the blockage.
  - ii. Mark the rodder or cable with tape where the cable enters the pipe.
  - iii. Remove the rodder or cable from the pipe and measure the length that was inserted into the pipe.

- iv. Transfer the tape mark from the cable or rodder to the ground to mark the location to pothole.
- v. After digging a pothole, remove the section of pipe or the fitting/coupler creating the blockage.
- vi. Insert the cable into the pipe and complete the pull.
  1. Insert the cable from the entry pit and guide it through the open portion of the pothole.
  2. The cable can also be inserted at the pothole location first to pull the two separated lengths independently in two separate pulls.
- vii. If space does not accommodate digging out the blockage, we recommend using a different replacement method.

3.) Lead service pipe pulls out of the ground.

- a. Continue to pull as far as possible, extracting the lead service length.
- b. If space is limited and more than one pull is necessary...
  - i. Release tension on the cable.
  - ii. Carefully cut or twist exposed lead pipe off the cable.
  - iii. Slide the cut section of lead pipe off the cable.
  - iv. Reset the wire rope grip and begin to pull again.

4.) Slitting force slowly increases during pull.

- a. This indicates that the lead could be balling up under the ground. Continue increasing force until progress stalls.



- b. To avoid this issue:
  - i. Check the local municipalities residential records for any previous repairs to the service that may have required the use of couplers.
  - ii. Always use properly sized blades, expanders, and cones.
  - iii. Always pull slowly and avoid pulling in short quick bursts.
- c. To remedy the issue:

- i. Measure the distance of cable already pulled and subtract that length from the total pulling distance.
- ii. Excavate at the determined distance to expose the fitting, coupler, or balled up section of lead.
- iii. Remove cable and tooling if possible.
- iv. Cut the fitting, coupler, or ball of lead out of the service
- v. Inspect tooling for damage and replace any necessary components
- vi. Re-install the cable and tooling string and continue the replacement.

5.) Cable is moving but new product pipe is not being pulled in.

- a. **Stop immediately.**
- b. Release tension on the cable.
- c. If the tooling is still visible, pull it back and remove it from the pipe.
  - i. If tooling is already underground, it will need to be excavated and retrieved.
- d. Check the expander assembly...
  - i. If the cable has slipped out of the internal jaw set, reinstall the cable leaving  $\frac{1}{4}$ " past the rear face of the jaw set.
  - ii. If the retention nut is loose, confirm the cable is a  $\frac{1}{4}$ " past the rear face of the jaw set and tighten the retention nut until it is flush with the expander cone.
  - iii. If the fastener on the retention nut is loose, retighten.
  - iv. If any of the components are broken or damaged, repair and/or replace.

HOST X NEW PIPE	BLADE	CONE	SEPARATION TUBE	EXPANDER ASSEMBLY	EXPANDER OD (in)	CABLE ASSEMBLY	JAW ASSEMBLY		
							1/4" CABLE	3/8" CABLE	PIPE GRIP
.5 X .75 CTS	912-7138	912-7140	912-7139	912-5538	1.5	912-7115	912-5512	-	912-5579
.5 X .75 IPS	912-7138	912-7140	912-7139	912-5538	1.5	912-7115	912-5512	-	912-5580
.5 X 1	912-7138	912-7140	912-7139	912-5539	1.75	912-7115	912-5512	-	912-5580
.5 X 1.25 CTS	912-7138	912-7140	912-7139	912-5541	2.25	912-7115	912-5512	-	912-5580
.5 X 1.25 IPS	912-7138	912-7140	912-7139	912-5541	2.25	912-7115	912-5512	-	912-5581
.625 X .75 CTS	912-7137	912-7141	912-7139	912-5538	1.5	912-7118	-	912-5552	912-5579
.625 X .75 IPS	912-7137	912-7141	912-7139	912-5538	1.5	912-7118	-	912-5552	912-5580
.625 X 1	912-7137	912-7141	912-7139	912-5539	1.75	912-7118	-	912-5552	912-5580
.625 X 1.25 CTS	912-7137	912-7141	912-7139	912-5541	2.25	912-7118	-	912-5552	912-5580
.625 X 1.25 IPS	912-7137	912-7141	912-7139	912-5541	2.25	912-7118	-	912-5552	912-5581
.75 X .75 CTS	912-7135	912-7141	912-7139	912-5538	1.5	912-7118	-	912-5552	912-5579
.75 X .75 IPS	912-7135	912-7141	912-7139	912-5538	1.5	912-7118	-	912-5552	912-5580
.75 X 1	912-7135	912-7141	912-7139	912-5539	1.75	912-7118	-	912-5552	912-5580
.75 X 1 .25 CTS	912-7135	912-7141	912-7139	912-5541	2.25	912-7118	-	912-5552	912-5580
.75 X 1 .25 IPS	912-7135	912-7141	912-7139	912-5541	2.25	912-7118	-	912-5552	912-5581
1 X 1	912-7136	912-7141	912-7139	912-5539	1.75	912-7118	-	912-5552	912-5580
1 X 1 .25 CTS	912-7136	912-7141	912-7139	912-5541	2.25	912-7118	-	912-5552	912-5580
1 X 1 .25 IPS	912-7136	912-7141	912-7139	912-5541	2.25	912-7118	-	912-5552	912-5581

CTS – Copper Tube Sizing, IPS – Iron Pipe Size

