

The ACME Pipe Winch Operations Manual

TABLE OF CONTENTS

1. Introduction
2. General Safety Precautions
3. Equipment Safe Maintenance and Operation
4. The ACME Pipe Winch Basics
5. The Pipe Pulling Operation
6. Maneuvering With The ACME Pipe Winch Attached To The Excavator

1. Introduction

The ACME Pipe Winch Model M2060 is a patented, hydraulically powered pipe-pulling winch that attaches via a quick coupler to your excavator or backhoe. It is designed specifically for utility excavators and municipal crews to enable the efficient trenchless replacement of utility laterals, simplifying the process while minimizing surface disruption.

While the ACME Pipe Winch enhances productivity, safety must always be the top priority before and during operation. There are inherent risks associated with its use, which must be mitigated through strict adherence to safe work practices.

To ensure safe operation, every operator must read and fully understand the operating instructions manual before using the ACME Pipe Winch. This manual should be readily available at the worksite for reference as needed throughout the operation.

2. GENERAL SAFETY PRECAUTIONS

The ACME Pipe Winch Operator Safety Statements



Protect your EYES during use



Protect HANDS while touching the cable



Protect your HEAD while using



Protect your BODY from High Pressure Fluid

- b. **While pulling, keep a safe distance:** Keep crew members and bystanders away from the winch, standing clear a minimum 8 FEET whenever the pulling cable is under tension.
- c. **Manage health and safety risks associated with excavation work.** Follow federal, state, and local regulations for promoting safe site conditions.

3. Equipment Safe Maintenance and Operation

- a. **Maintain the winch:** Regularly lubricate moving parts and replace worn components.
- b. **Check the winch:** Before each use, inspect the winch for damage. Don't use a damaged winch. If the winch makes unusual sounds or behaves abnormally, stop using it and check for damage.
- c. **Inspect the pulling cable:** Before each use, inspect the pulling cable for damage. Don't use a pulling cable that has twists, kinks, deformations, or broken wire strands. Remove the cable from service and destroy it to prevent further use.
- d. **Do not exceed the pulling capacity of the winch:** Do not exceed the maximum hydraulic pressure of 2850 psi as indicated on the winch hydraulic pressure gauge.
- e. **Wrap the cable to The ACME Pipe Winch drum a minimum of 5 wraps.** A minimum of 5 wraps of MAX Pulling Cable must be on the drum barrel before tensioning to achieve the winch rated load. Fewer wraps may cause the MAX pulling Cable to pull free and cause sudden and unexpected release of tension which could lead to serious injury or equipment damage. Ensure the cable is wrapped around the winch drum at least five (5) times before beginning any pulling operation.
- f. **Use a spotter:** Have a crew member spot the winch operation, signaling when to reel in, reel out, and stop. Use hand signals and/or headset radio to communicate with the operator of the winch controls.

- g. **Monitor the pull:** If the winch is twisting or is off-center to the cable, stop and re-set the winch so it is square and firm against the pit wall. Keep the cable tracking in the center of the sheave during the pull.

4. The ACME Pipe Winch Basics

The ACME Pipe Winch model M2060 is a patented, hydraulically powered pipe pulling winch designed with the Utility Excavator or Municipality crew in mind to perform trenchless replacement of utility laterals. Proudly made in the USA, and engineered for versatility, it is compatible to a 3.5 T and larger excavator, or backhoe. The ACME Pipe Winch delivers powerful performance with a line pull capacity of 20,000 lbs. and a line speed of 28 feet per minute. Its innovative 360-degree full-rotation capability, lockable in 6-degree increments, ensures precise alignment in various operational conditions. The ACME Pipe Winch has a slender, compact size which makes it ideal for use in congested site access pits, allowing operations to proceed seamlessly even when in close proximity to other utilities.

Additionally, Acme provides all necessary pulling cables and tooling options to ensure unmatched flexibility, accommodating a wide range of pipe diameters and materials.

5. The Pipe Pulling Operation

a. Expose the host water line in the access pit.

To accommodate the ACME Pipe Winch, the vertical wall of the access pit that faces the direction of the pull shall be dug to have a firm and flat surface. It should be at a right angle to the host pipe as the Acme Pipe Winch face plate will contact and exert its pulling force to that area.

The access pit shall be excavated to expose the host water line, affording clearance of 8" or more from the exposed host water line to the left, 8" or more clearance to the right and 8" below.

If you find there is a conflict with a utility, i.e. a sewer lateral being close by, you may choose to remove either the left or right winch foot from The ACME Pipe Winch and install the face plate to match the configuration.

b. Determine the Pulling Cable length

Once exposed, determine the proper length of pulling cable to select for the job by measuring the length of the existing host pipe to be replaced from end to end and add 15' to that length. The extra 15' is comprised of the 5' of vertical travel of the pulling cable from the

bottom of the winch sheave to the winch drum, plus the length required to provide a minimum 5 wraps of the pulling cable to The ACME Pipe Winch drum.

The MAX pulling cables are available in standard lengths of 35', 50', 65', 80', 95', and 110'.

The pulling cable must be on the first wrap, being in contact with the drum when the pull begins. Avoid using a pulling cable that is excessively long as if the pulling cable is on the second wrap when tensioning, permanent damage in the form of kinking to the pulling cable may occur.

The MAX Pulling Cables are supplied with one end fitted with a pulling eye, and the other end finished with a weld and taper. The pulling eye is used to land the pulling cable, and the weld and taper end is finished to accept the splitter or puller head wedge set.

c. Pulling Head or Splitter Head - Select the proper tooling

When replacing water lines, you will choose between two different methods - you can either **Pull** or **Split**.

The **Pipe Pulling** method may be chosen if:

- The pull is short, and the soil is conducive to pulling; compressive, moist, and displays clay content.
- Or you are replacing hard pipes such as galvanized or copper.

This method is used to remove the entire length of the host water line.

The **Pipe Splitting** method may be chosen if:

- The pull is long, or if the soil type is gravelly, dry, and with little, or no compressibility.
- Or you are replacing Plastic

This method will split the host pipe by using either a single or double blade splitter head. Splitting leaves the host pipe in the ground. As Splitting does not require the entire length of the pipe to break loose, it may require less pulling force.

When replacing **Lead Water Lines**, Recommended - **Split**. Choose the 1 blade Splitter Head. Or **Pull**. Choose the Puller Head.

When replacing **Plastic Water Lines**, Recommended - **Split**. Choose the 2 blade Splitter Head.

When replacing **Galvanized Water Lines**, Recommended - **Pull**. Choose the Puller Head.

When replacing **Copper Water Lines**, Recommended - **Pull**. Choose the Puller Head.

NOTE – When splitting, it is **always** recommended to lubricate the entire interior length of the host pipe before the pull with vegetable oil or liquid dish soap. The ACME Suction Machine is the best tool for this task as the high suction will pull the lubricant through the entire length of the host pipe. The lubricant allows the splitter head to glide through the pipe. Without a lubricant, friction between the scale of the host pipe ID and the Splitter Head may cause the Splitter Head to bind. When this happens, the function of a splitting process reverts to a pulling process.

d. Select the Pulling Cable size.

Acme MAX Pulling Cables are offered in the following diameters:

- MAX 7/16 For 5/8 and 3/4 lead lines, copper and galvanized lines
- MAX 1/2 For 3/4 lead lines, 3/4 and 1” plastic and copper lines
- MAX 9/16 For 1” plastic and copper lines
- MAX 11/16 For 2” plastic lines.

e. Landing The Pulling Cable to The Host Pipe

Many times, the most difficult step in pipe pulling is getting the pulling cable landed to the host pipe. We recommend the following processes to accomplish the required outcome.

1. First, try simply pushing in the MAX pulling cable. If it gets through, mission accomplished.
2. If that doesn't work, try pushing in a Fiberglass Duct Rodder. Once through, connect the Rodder to the 1/4” Leader Cable or to the MAX Pulling Cable and pull in the attached cable.
3. If that doesn't work, use the ACME Suction Machine. It will apply an extremely strong suction to the host pipe, allowing
 - a) a leader cord to be landed, which will then pull in
 - b) a leader cable, which will then pull in
 - c) the MAX Pulling Cable.

Refer to The ACME Suction Machine Operating Instructions for details.

f. Make the inside connection of the new pipe to the MAX Pulling Cable

Attach the new pipe to the swivel at the back of the Splitter or Puller Head. Also attach a tracer wire if required.

g. Attach The ACME Pipe Winch to the Excavator or Backhoe

Be certain the excavator or backhoe quick coupler is a correct fit to The ACME Pipe Winch coupler. Verify the coupler is properly and fully engaged and is mechanically locked in place as designed to the attachment before lifting.

h. Connect the hydraulic hoses

Connect the hydraulic hoses from The ACME Pipe Winch to the excavator or backhoe hydraulic couplers located on the stick. Start with the male end from the winch as it is supplied with an internal pressure release needle valve. Optionally, you may use a portable hydraulic power unit.

i. locate The ACME Pipe Winch to the host pipe in the pit.

Lower The ACME Pipe Winch into the pit vertically, getting close to the host pipe. Remove the orange locking pins at the top of The ACME Pipe Winch to allow the winch to rotate. You will want to align the winch until it is perpendicular, being at a right angle to the host pipe. When aligned, insert the 2 locking pins into the corresponding holes.

Lower the winch over the host pipe until it is 2” to 6” above, and in line with the sheave groove. Drive forward if practical or curl open until The ACME Pipe is vertical, and the winch face plate is firm to the pit wall.

j. Secure the pulling cable to the winch drum.

With gloved hands, grasp the MAX pulling cable end and remove any curls in the length. Route the MAX pulling cable end to the winch drum, taking note that the cable is not looped around anything in the pit such as shoring or a gas pipe that will prevent a straight shot of the cable from the sheave to the drum when tensioned. Insert the cable into the drum anchor pocket, just to where the cable is at the back of the pocket without protruding. Lock in the cable with the setscrews.

k. Take up the cable slack to the winch drum.

With the aid of the Cable Drag Tool, wrap the cable to the drum in an orderly right to left fashion. Avoid crossovers as they may cause a permanent and damaging kink in the pulling cable when under tension. When the cable is just at tension, stop rotating the winch drum and remove the Cable Drag Tool.

Note - When the slack cable is wrapped to the drum, the pulling cable must be on the first wrap, being in contact with the winch drum when the pull begins. Avoid choosing a pulling cable that is excessively long as if the pulling cable is on the second wrap when tensioning begins, permanent damage in the form of kinking to the pulling cable may occur.

A minimum of 5 wraps of MAX Pulling Cable must be on the drum barrel before tensioning to achieve the winch rated load. Fewer wraps may cause the pulling Cable to pull free and cause a sudden and unexpected release of tension which could lead to serious injury or equipment damage.

l. Stand Clear

Be certain all crew members and bystanders are at least 8' clear of the pulling cable when it is under tension.

m. When your team is ready, make the pull.

Confirm the inside crew is standing by and ready to feed in the new pipe. Begin the pull. Apply a smooth steady hydraulic flow to The ACME Pipe Winch. Monitor the hydraulic pressure. Note that the cracking pressure to release the brake is 750 psi. Typical pulling pressure will be less than 2,000 psi. indicating the pull is going well.

Note - If the hydraulic pressure at the winch pressure gauge is reaching 2000 psi, proceed with caution. High pressure could be due to difficult soil conditions or there could be an element or obstacle obstruction of some sort that is making the pull difficult. If you encounter high pressure, slow down and pull steadily. If the pressure continues to increase, a stalled winch or cable break may be imminent. Announce the need for caution, monitor the situation, keeping crew members and bystanders more than 8' away from the pulling cable. You may prudently choose to halt the pull and establish where the cable head is and dig it up. Clear the obstruction and then continue the pull.

Observe the pulling cable (and pipe) as it rounds the sheave to confirm the cable is tracking in the center of the sheave groove. If the cable (and pipe) is riding to the left or right edge, you may want to stop the pull, reverse the winch drum to allow some slack and shift the winch left or right to re-center the cable (and pipe) until it is tracking in the sheave groove.

Pull until you have the new pipe landed to the pit. Reverse the winch drum to relieve tension a bit and uncouple the new pipe from the pulling cable at the pulling or splitter head shackle. Lift the winch from the pit. Bringing the winch to rest on the excavator blade while transporting on the job site will prevent unnecessary strain to the ACME Pipe Winch slew ring.

n. Clearing The ACME Pipe Winch drum

If you pulled a Lead Pipe, remove the combined cable and lead pipe from the winch drum. You can use either the hydraulic reverse (Power off) or use the free spool option and pull the cable / Lead off by hand or anchor the cable to an anchor point such as a heavy truck, and back away. Once the cable / Lead Pipe is laid out to the road or other safe place to work, pull the Lead Pipe off the cable. It may be helpful to cut the lead to short sections while still on the cable to make the process easier. Or attach a grip (aka Chinese Finger) to the lead line and pull it off with the excavator or backhoe.

If you replaced a Plastic Pipe, and the Plastic Pipe is on the pulling cable, remove the cable and Plastic Pipe from the winch drum. You can use either the hydraulic reverse (Power off) or use the free spool option and pull the cable / Plastic off by hand, or tie off the cable to a truck, etc. and back away. Once the cable / Plastic Pipe is laid out onto the road or other safe place to work, pull the Plastic Pipe off the cable.

If you replaced a Galvanized or Copper Pipe, remove the cable and Galvanized or Copper pipe from the winch drum. You will want to use the hydraulic reverse (Power off) direction of the winch. Tie off the cable to a truck, etc. and back away at a pace consistent with the winch as the winch is spooling off. Expect you may or may not be able to retrieve the pulling cable.

6. Maneuvering With The ACME Pipe Winch Attached To The Excavator

To prevent unnecessary strain on The Acme Pipe Winch Slew Ring it is recommended that the Acme Pipe Winch be either in a vertical position or curled back and allowed to rest on the excavator blade when moving about the jobsite. Resting the Acme Pipe Winch on the excavator blade provides a 2-point contact which will reduce flex strain to the parts.