5 Key Criteria to Consider When Choosing a Tail Winch

- **Mechanical/PTO vs. Hydraulic** – For tractors that have mechanical PTO options, PTO winches deliver maximum power to the hook and are extremely efficient, while hydraulic winches offer superior load control, overload protection and less overall required maintenance.
- **Line Pull** – The line pull, or load capacity, of the winch is generally matched to the size of the host equipment as well as the intended application.
- **Line Speed** – Line speed is a critical consideration, depending on intended usage. When the winch is an integral part of business productivity, high line speed may be important, with or without load. Lower line speeds may suffice for intermittent applications.
- **Cable Capacity** – How far do you have to be able to reach in a single pull? Spoiler: You should always choose the shortest length of the smallest diameter rope that provides the strength you need.
- **Drum Release Functions** – Make sure you have the appropriate drum release functions—freespool and/or drive-away—for your applications. Freespool and drive-away operate very differently and must not be treated interchangeably.

A tail winch can be an invaluable piece of equipment on the jobsite. From incidental recovery needs to continuous use applications such as cable plowing or steep slope traction assist (yo-yoing), there is a wide range of options to choose from to make sure you select the right winch for your needs.

This guide discusses five key criteria to consider when choosing a tail winch. The intended application should drive the selection of your winch. By considering these basic factors, you can understand the differences and narrow your selection based on the job you want the winch to do.

Mechanical/PTO vs. Hydraulic

For tractors that have mechanical PTO options, mechanical input (power take off or driveshaft) from the tractor drives the winch drum, providing full tractor horsepower to the winch.

There are two types of PTO drives:

Direct Drive PTO (similar to a manual transmission)

- **PTO has a direct or solid connection to the engine flywheel**
- **PTO speed is either exactly engine speed or a fixed gear ratio relative to engine speed**

Torque Converter PTO (similar to a traditional automatic transmission)

- **PTO is connected to the output side of the torque converter of a "powershift" transmission**
- **PTO speed is variable based on both engine speed and PTO load**

PTO winches are often used when speed and productivity are priorities, such as for general forestry applications. Direct drive PTO winches deliver maximum power to the hook and are extremely efficient to operate. However, smooth engagement and precise load positioning are difficult to achieve. Torque converter PTO winches offer better control characteristics, offering a combination of power and control that is usually superior to other PTO and open-loop hydraulic winches in appropriate applications.

Conversely, hydraulic winches utilize pressurized fluid to power an internally housed hydraulic motor.

Hydraulic power to the winch motor may be provided by Open-Loop or Closed-Loop hydraulic systems:

Open-Loop – Ripper Control

- **Utilizes existing ripper circuit of tractor hydraulic system**
- **Simple installation and removal (can swap between ripper and winch)**
- **Usually delivers the same line pull as High Performance but with lower line speed**

Open-Loop – High Performance

- **Requires optional tractor manufacturer-provided specialized winch power/control system**
- **Offers superior power and speed compared to open-loop ripper style winch**

Closed-Loop – Hystat (Hydrostatic)

- **Winch kit includes dedicated hystat pump to provide hydraulic power to the winch**
- **Delivers highest overall performance, combining the power of a PTO winch with the control of a traditional hydraulic winch**

Hydraulic winches offer superior load control, overload protection and less overall required maintenance. The ability to place loads within fractions of an inch allow hydraulic winches to be utilized in a wide variety of precision applications, including steep slope operations, powerline rigging, oilfield and pipeline installation.

However, it is important to keep in mind that not all hydraulic winches provide the same performance. Open-loop winches offer less power than PTO or Hystat winches and are better suited to intermittent rather than high cycle applications because they can overheat the hydraulic system. Closed-loop winches offer a balance of both power and control, making them the ideal choice for high energy applications where precision and high duty cycle is important, such as yo-yoing.

Finally, all PTO winches have internal wear parts, which creates the need for more regular service intervals than for hydraulic winches. Under normal use, maintenance for PTO winches may include periodic replacement of reel in/reel out clutches and brakes as well as scheduled oil changes. The only regular expected maintenance for hydraulic winches is changing the oil.

Line Pull

The line pull, or load capacity, of the winch is generally matched to the size of the host equipment as well as the intended application. Most of the time, the line pull of an installed winch will be between 1.5 and 2 times the operating weight of the tractor, since that is typically what is necessary for reliable self-recovery.

However, some applications will require more or less line pull so you should study the overall line pull needed to move the intended load. Remember that the line pull needed may be considerably more or less than the weight of the load depending on the specifics of the work and/or operating conditions.

Line Speed

Line speed may be a critical consideration, depending on intended usage. When the winch is an integral part of business productivity, high line speed may be important—with or without load. Lower line speeds may suffice for intermittent applications.

In a low energy steep slope application, such as lowering an equipment down a hill intermittently, line pull is a key factor but line speed at load may not be. In other words, the winch must be able to hold the load securely, but the rate at which it is lowered might not be critical.

However, when the equipment needs to travel back up the hill, the winch must have sufficient no load line speed to keep pace. Otherwise, the equipment will have to wait on the winch or slack will be created in the line.

In a high energy steep slope application with continuous winch movement, such as yo-yoing, line speed at load may be crucial when the winch is supporting the entire load during the process.

Cable Capacity

The basic question is how far you must be able to reach in a single pull. You should determine how much cable you need to pull the load with the tractor in a stationary position. This could mean recovering or dislodging a piece of equipment from a short distance, prior to dragging it by moving the tractor. Or it could involve winching a dozer 200 feet or more up a hill to a landing point.

Keep in mind that winch performance, wire rope handling and cable life can be maximized by selecting the smallest diameter rope that provides the load strength you need and the shortest length that provides the necessary stroke distance.

Drum Release Functions

Make sure you have the correct drum release functions—freespool or drive-away—for your applications. Freespool and drive-away operate very differently and must not be treated interchangeably.

Freespool

- Disconnects the cable drum from the gear train
- Allows cable to be removed by hand with low resistance
- Resistance is precisely regulated and user-adjustable on most models
- NOT a shift on the fly operation
  - > Gear train will be damaged if freespool is engaged when drum is moving
  - > For use only when there is no load on the cable

Drive-Away (also called Brake Off or Drum Clutch Release)

- Intentionally provides more drag than freespool (2-3% of rated line pull)
- Maintains cable tension and proper spooling at various tractor speeds (cable stays tight when driving away from load)

Ultimately, understanding and selecting the correct tail winch can be a complex process. If you have questions, or are ready to take the next step toward purchasing a tail winch, please visit www.arrowheadwinch.com to find a CARCO distributor near you or contact Arrowhead Winch for more information.