

Anchor Windlasses

What they do

As boats become larger, the size of their anchors increases roughly proportionately, to the point at which they cannot be weighed conveniently by hand. Rather than down-size your yacht, or buy an anchor that is inadequate for your use, you should consider buying a windlass. Windlasses, either manual or electric, reduce the burden of lowering and weighing your anchor and rode using electrical power, or by adding mechanical advantage to your muscle power.

How They Work

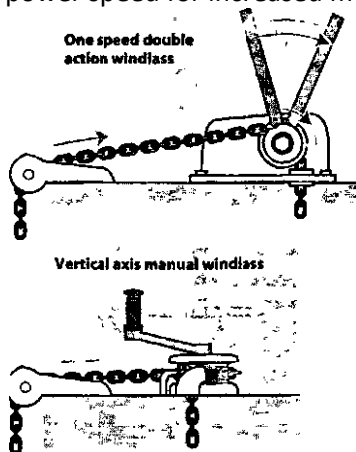
Windlasses generally mount in the center of your boat's foredeck, and are aligned with an anchor roller of some sort. Most boats will have an anchor roller/mount that stores the anchor when it is not in use, while other boats store the anchor in chocks or a locker on deck. All boats will need a roller to pass the anchor rode smoothly over the rail of the boat.

Windlasses are powered by three methods: muscle power (manual), electricity, and hydraulic. We'll examine the first two types, as hydraulic windlasses are generally used on large vessels.

Manual Windlasses

Manual windlasses do two things: they multiply your strength through mechanical advantage, and they ratchet in one direction so that the rode does not run backwards. They require that you go forward to raise or lower your anchor, which generally limits their use to small to medium length boats. Their chief advantages are low price, no electrical wiring needed, and relative simplicity to reduce maintenance or failures when cruising.

Manual windlasses come in one and two-speed models, and most are double action, meaning that the windlass pulls on both the forward stroke and the back stroke. Two speed windlasses are similar to two . speed sheet winches: they have a fast' low-power speed for easy pulling, and a slow, high-power speed for increased muscle.



Some manual windlasses rotate around a vertical axis like a sheet winch. This limits the amount of power that they can develop, based on length of the handle, but it allows them to be more compact and very simple in construction.

Electric Windlasses

By using a 1/2 to 2 HP electric motor to help weigh anchor, anchoring becomes a push-button operation—mostly. Electric windlasses will raise an anchor at 35 to 100 feet per minute, and can exert tension between several hundred and several thousand pounds on your anchor rode. More and more windlasses can lower your anchor by push button as well, and some even drop anchor faster

than they retrieve to reduce the time you spend with your finger on the button, either by clutching the shaft so that it free falls, or with a gear change mechanism. Most electric windlasses have a clutch that can be released to allow the anchor line to pay out if they are not a dual direction type. This requires someone to operate the clutch on the foredeck, however.

What to Look For

The Ideal

Ideally, windlasses should raise and lower anchor line without operator intervention except to push a button. Anchor rodes can be under great tension, and they pose risks to fingers, feet, hands, etc. We do not like the idea of transferring a line under tension from a capstan to a chain wildcat in the middle of weighing anchor, or clearing a jam from a balky system. Furthermore, we believe that windlasses should pass the line below decks to a locker, rather than pile the line on deck so that you have to stow it

For these reasons, we prefer a self-tailing/self-stowing windlass that does not require the operator to come in contact with the rode. Self-tailing windlasses come in three types: rope only, rope and chain, and chain only.

Note: A self-stowing windlass requires that your anchor locker be setup correctly. Specifically, the anchor rode must have a long "fall" so that it doesn't stack up under the incoming rode. A poor anchor locker design will render the installation of an otherwise ideal windlass useless.

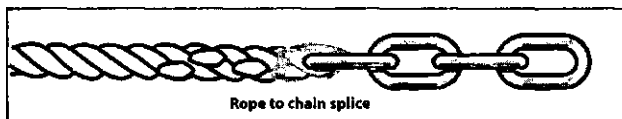
Rope Only

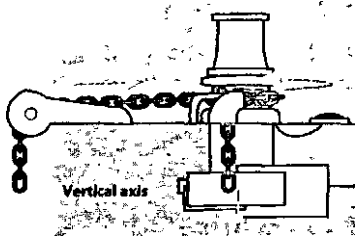
Simple rope capstans let you wrap the rode around a drum and use the electric motor for power. By pressing a button on the deck or case of the windlass, you haul the rode in by hand much in the same way that one would tall a sheet winch. You end up with a pile of line on deck which must be cleared and stowed, and you have to go forward to operate the windlass. While helpful when anchors are stuck in the bottom, or when singlehanded a boat in lots of wind, we don't find rope-capstan windlasses to be much of an advantage.

Rope-only self-tailing windlasses wrap the line around an internal pulley and deposit it below, and are generally restricted to one or two sizes of 3-strand anchor line. You are limited to a length of chain that does not exceed the distance from the windlass to the anchor roller, generally a few feet or less, which we think is inadequate for most rodes.

Rope-chain

Rope-chain wildcats have been a Simpson Lawrence exclusive for many years, but there have been a number of new models from other manufacturers since S/L's patent expired in 1992. The concept is to use a single gypsy with normal chain pockets on the perimeter, and V-shaped grooves in the center to handle rope. This method requires that you splice your anchor line directly to the last link of chain, which is a source of concern to some boaters, although we feel comfortable with this approach if the splice is regularly checked for chafe.





All-chain

All-chain gypsies are self-tailing, due to the nature of the chain as it engages the pockets in the gypsy, and are self-stowing, since the weight of the chain causes it to fall through the chain pipe into the rode locker. This approach assumes that you use all-chain rode, which is favored by many cruising boaters. It is highly abrasion resistant, lies on the bottom in most conditions, and is strong. It is also heavy, expensive, and collects mud.

Orientation

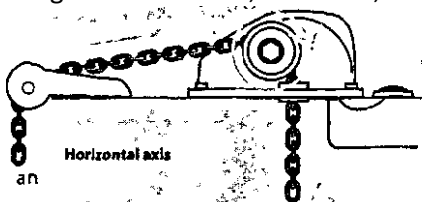
Windlasses are categorized as being horizontal or vertical axis. Vertical axis windlasses, with the motor mounted belowdecks, are very popular aboard both sail and power boats. The line from the anchor roller leads back to a capstan, or gypsy, wraps around 180°, and leads through a deck pipe to the anchor locker. Most manual windlasses are horizontal. The side-to-side alignment of horizontal windlasses is critical; they cannot accept a rode that leads from offcenter angle.

Pulling Power

The pulling power of windlasses is hotly debated. Windlasses are not intended to pull a boat against 25 knots of wind and 2' chop with the engine in neutral. Windlasses are not designed to break out a 35-lb. Dan-forth-type anchor that is embedded 3' in hard sand. They are designed to weigh an anchor and rode which is not under strain, and to provide some tension to break out a firmly embedded anchor. But, as any text on the subject will tell you, it is the engine's power which moves the boat upwind, and the motion of the boat that breaks out the anchor—not the windlass.

Whoops! We drifted off into the ideal world, and out of reality. The real world lies somewhere in between.

The strain on the windlass should be limited to the hanging weight of the anchor and rode. In reality, it is greater than this, of course, due to boaters who violate the paragraph above. So manufacturers



tend to encourage windlasses with hefty pulling power so that you have the power "if your engine is out, or it is blowing like stink, or your anchor is firmly stuck. Maxwell recommends that the pulling power of the windlass be three times the weight of the anchor and rode, a rule which has served them admirably for many years. That is, a boat with 250' of 5/16" High Test chain and a 35-lb. CQR would select a windlass with at least 900 lbs. of tension. (265 lbs. of chain, 35 lbs. of anchor, times three). Other manufacturers recommend boat size ranges, which works as well as any simple rule covering the wide variety of boat types.

Chain Size

Since gypsies have to fit the chain they are hauling, windlasses come with gypsies appropriate for the chain that a certain size of boat would be most likely to use. In other words, you won't find a gypsy for 1/2" chain on a small windlass. This encourages boaters to buy the correct size: if you would normally use 5/16" chain, and the windlass will handle it, it will probably work on your boat.

So Which One?

Powerboats under 25': Use a Powerwinch 500 series. Horizon 500, Sprint 500, or Maxwell R-600. Of these, we prefer the latter three since they can be operated remotely, and we like the rope-chain versatility of the Horizon and Sprint.

Powerboats from 25 to 35': We like the Horizon 500 and Express, Sprint 500 and 900, Concept 1, Maxwell R-600, RC-500, and VWC 800.

Powerboats from 35 to 55': You have a wide variety of windlasses to choose from, but you should get one that is electrically operated up and down, and remotely operated. Choose from the Lewmar Concept 2, Maxwell VWC series, and Simpson-Lawrence Horizon 1500.

Small cruising sailboats to 30': If the idea of weighing your anchor by hand doesn't exactly make you want to spring out of your berth, get a manual windlass from Simpson Lawrence. The Anchorman Low Profile or Hyspeed work nicely with rope-to-chain or all-chain rode.

Cruising sailboats from 30 to 55': There are a bunch of really nice windlasses in this size range. Lewmar Concept 1 and 2, Maxwell VWC 800, 1200 or 2200, or a Simpson Lawrence Horizon 500-1500, or Sprint would all be great choices. They have more than enough power and are relatively easy to install, and make anchoring a pleasant operation rather than a back-breaking chore. We recommend a remote control for versatility.

Chain Compatibility Issues

Anytime you haul chain with a windlass, you should use short-link chain. BBB and High Test chain, in particular, are close to the ideal "pitch" of 3:1. Pitch refers to the ratio of the interior dimensions of the chain link. While the rest of the world is reasonably standardized on chain dimensions, the U.S. uses an enormous variety of chain standards which have evolved from different industry's needs.

Windlass manufacturers are challenged by having to deal with ISO, NACM, proof coil, high test, Grade 70, BBB, and other chain standards. In addition, 1/4" chain does not measure 1/4" across the wire diameter, but actually 0.276". What a hassle!

Unfortunately, the windlass market uses only a tiny fraction of the chain produced annually, so windlass vendors are in a poor position to influence standardization. Gordon Lyall, Technical Director of Simpson Lawrence, recommends that there be one "shape" of chain used in windlasses, regardless of the strength of the material. The three sizes which would cover the vast majority of boating applications would be as follows:

Name	Actual Size	Internal Length	Pitch
1/4"	7mm	21mm	3:1
5/16"	8mm	24mm	3:1
3/8"	10mm	30mm	3:1

This standardization would accomplish two goals:

1. It would provide a standard short link chain dimension that would work well in windlasses.
2. It would greatly reduce the number of gypsies required to accommodate chain.