

WINDLETTER

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SMALL TURBINE COLUMN:

BUYING USED WIND EQUIPMENT

Have you ever considered buying a used wind system for installation at your home or farm? At first glance, these offers might seem like bargains compared to the cost of a new wind system. However, the buyer should beware that sometimes the extra installation and maintenance costs can eat away all the up-front savings.

Occasionally, wind systems are advertised in the classified ad section of the local newspapers, in the ad sections of renewable energy magazines like Home Power or Solar Today, on internet sites like eBay (www.ebay.com), or on e-mail list-serves that cater to the self-generation crowd, such as awea-wind-home@yahoogleroups.com.

You should consider any used wind turbine as a rebuilding project, and not as something you will merely install on a tower. While wind turbines are relatively simple mechanical devices, they are highly engineered, and the mechanical parts wear out. This doesn't mean that you shouldn't consider buying a used wind generator. But you most likely won't be able to just install a used turbine on a tower without doing anything to it.

I wouldn't consider installing any used wind turbine without completely rebuilding the entire machine prior to installation. Remember that wind generators live 80 to 120 feet in the air. That makes them relatively inaccessible for most major repairs that might be required. Inspections and minor service work are easily performed atop a tower, but replacing bearings, for example, might be impossible.

All mechanical components should be checked for wear or fatigue. Any part that is even questionable should be replaced. If the manufacturer is still in business, order original replacement components from them. If the manufacturer is long gone, which is more likely with used equipment, find a wind system dealer who has a reputation for being proficient with your particular turbine. As a last resort, you may be able to find a local machinist to make whatever parts you require.

Bearings and bushings should all be replaced, regardless of their function or condition. Replacements should be of at least as good a quality as the originals. While these parts might seem to be in good condition, you have no way of testing them under the dynamic stresses they experience during operation. It's far easier to replace them on the ground in your shop than to wrestle with them on top of the tower.

All bolts and fasteners should also be replaced, regardless of condition. Do not skimp on quality replacements. Welds should be inspected for integrity. If they have broken due to vibration or fatigue,

determine what went wrong and rectify the problem. If you are not proficient at welding, find a professional who is.

Electrical components and windings should also be checked for integrity. Wire insulation should be tested for breakdown. When in doubt, reinsulate windings before putting them back into service. Small motor rewinding shops often specialize in this type of service.

Finally, sandblast all metal parts. Prime and paint these with an excellent grade of paint. A good job done now will pay for itself in the years to come.

This is also the time to rebuild the blades, which usually show the most visible wear on the entire system. Rebalance the blades as a set with the blade hub. Repaint the blades with automotive or marine grade finishes, both of which are expensive, but are formulated to withstand the harsh environment that a wind turbine experiences. The leading edge tape on the blades will need to be replaced after painting. This material is available from companies who specialize in wind turbine rebuilding.

If you have purchased a used tower with the wind generator, pay particularly close attention to its condition. Replace all used components that show any sign of rust. Bent components must also be replaced, not straightened. The stresses resulting from a bend could seriously jeopardize the integrity of a vital component. Welds must be inspected for stresses and fatigue breaks.

All tower fasteners must be replaced with quality parts of at least as good a specification as the originals. If you have a guyed tower, carefully inspect all guy cables, turnbuckles, and hardware, and replace anything with even the hint of rust, damage, or fatigue. The tower is one area where you really do not want to cut corners. Doing so could result in a catastrophe.

Used towers rarely come with anchors, as these are usually left in the concrete at the tower's original home. Obtain a set of blueprints for the tower anchors and have them fabricated to the original specifications. This will include having them galvanized for a long life in the ground.

Occasionally, someone advertises a "remanufactured" wind system for sale. Be especially wary of such equipment. While there are a few companies doing business who are qualified to remanufacture wind turbines, the vast bulk of these turn out to be what I call "rustoleum rebuilds". That is, someone shot a fresh coat of paint on the machine and put it up for sale.

I know of someone on the west coast who bought a "rebuilt" wind generator through the Internet from a party several thousand miles away. The seller literally painted over dirt and grease. While it was true that the machine was rebuilt, the seller failed to specify exactly how long ago that took place. Inspection of the unit after it was purchased indicated that it likely had at least 10 years of service on it after it was rebuilt. This was never disclosed. The buyer, having no recourse, ended up having a bona fide wind turbine remanufacturer completely go through the machine, essentially paying for this twice.

If you find a remanufactured wind turbine for sale, closely investigate the party selling the system and their qualifications for rebuilding such equipment. If they have no reputation that you can unearth, proceed carefully. A few "satisfied customers" may be no more than shills set up by the seller. However, this is a small industry, and word gets around as to who is doing quality work and who is not. Keep digging until you find the information you need to help you make an intelligent decision.

If the remanufactured wind machine does not come with a warranty, be even more cautious. Remember the old adage: "If it sounds too good to be true, it probably is." While quality remanufactured

equipment is available, it will likely not be purchased at "bargain prices". It takes time and money to correctly remanufacture a wind turbine, to say nothing of putting a warranty on it.

If all of this sounds like I'm trying to steer you away from used and rebuilt wind equipment, I am, to an extent. Just make sure you understand what you're getting into. I know of a few people who have successfully rebuilt and installed a used wind system. What they all shared in common were excellent welding skills, machining ability, and a familiarity with mechanical systems. This doesn't mean, however, that you cannot also be successful. Just be prepared for a long and involved, albeit rewarding, project.

--Mick Sagrillo, Sagrillo Power & Light

[Editor's Note: The opinions expressed in this column belong solely to the author.]