



Nauticraft Quadritwist Belt

We are asked from time to time by prospective new customers just what our drive units are like and what is meant by the term "Quadritwist".

As far as what our drive units are like, the first impression on seeing one in a Nauticraft boat is that it "belongs there". This visual impression comes from the drive unit housing being made from the same material as the boat – a white plastic with black specks (we had the black specks incorporated into the material a few years ago).

On our original drive unit (which we now also call our "inboard unit") the driving belt twists four times going through its path, from the pedaling sprocket to the driven sprocket, over the idlers, and then back around to the start – hence the term "Quadritwist". We have a very positive regard for this system because it gives us the required directional change as well as the required speed increase (a 1:4 increase) with no energy robbing torsional or axial side effects; with this type of layout the twists of the belt are actually "natural" ones.

Looking further at the drive unit it is obvious that the pedal cranks come from the bicycle industry, and this is so, as we purchase these cranks as well as its axle assembly (known in the industry by the unlikely term "bottom bracket") from a bicycle parts supply house. The pedals also come from there and, because they are often used that way, are of the "barefoot" type (some sophisticated customers, familiar with upscale bicycling, sometimes change these pedals for their own particular choice).

An even closer inspection of the drive unit shows that the mechanical aspects (all of the moving parts) are located on the outside of the drive housing. Our drive unit is designed this way because the mechanical parts (particularly the belt and sprockets – being of plastic materials) do not need oil or grease lubrication as do metal parts (the plastic materials also are not susceptible to water corrosion as are metals). Also, because all mechanical assemblies need care and maintenance from time to time, it is far easier to service an assembly that is out in the open. For instance, although it will serve for a long time, the drive belt can be changed for a new one without removing the drive unit from the boat – and without requiring any tools.

We designed this system ourselves (using the quadritwist philosophy originally proposed to us by Phil Thiel, a marine engineer from Seattle) and have been happily using it in our boats for over 15 years now, with only incidental changes. We manufacture it right here in our own shop – from rotational molding the housing through all of the subsequent assembly steps.

Next time I'll talk about the "swing down" drive unit used in our Sprite model – why it doesn't use the quadritwist system, but how it is similar to it as well as how it is different.

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