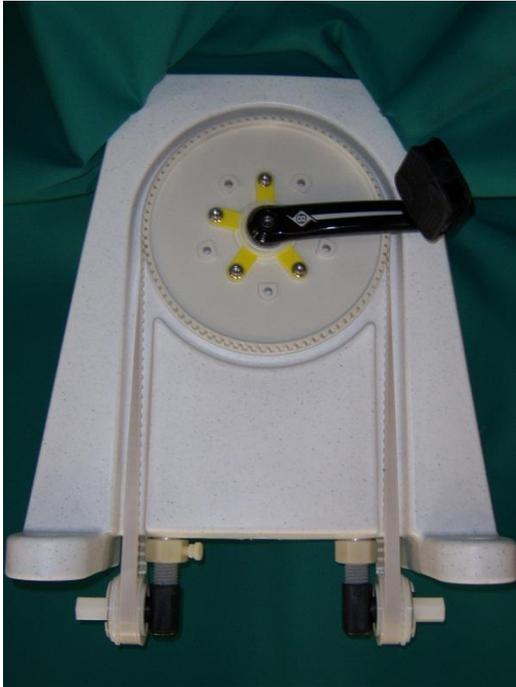


# Nauticraft Pedal Drive System

---



The Nauticraft Drive Unit has many unique features. Its rotationally molded housing aesthetically matches the rotomolded boat hulls it is used in. The rotational molding process also gives a rigid, boxy structure, and is further reinforced by a molded-in assembly of aluminum tubing.

The functional aspect of the drive unit is provided by parts which are mounted outside of the housing rather than being internally incorporated. This type of design gives less complicated assembly and then simpler and easier maintenance/service. However,

because the mechanical parts are out where they are exposed to the elements, materials are used that are resistant to corrosion.

An industrial timing belt and mating injection molded plastic sprockets are used as the transmission system. Belt and sprocket systems (as are chains and their sprockets) have the advantage over other mechanical transmission types – such as gears - in that they do not require precise alignment. And belts have the advantage over roller chains (bicycle type) in that they are easily twisted. (It should be noted that many successful pedal boat drive units have been built where the chains are twisted, but the twist is not easy or natural.)

The disadvantage of belts is that generally they are “endless” designs; that is, they come manufactured in a defined circular length. This is opposed to a bicycle chain which can be taken apart, put through the frame of the bicycle and then assembled together again.

Although the Nauticraft drive unit uses an “endless” drive belt, the outside mounting of the mechanical components makes it not necessary for the belt to go through the housing at any point. Further, this design enables the belt be able to be replaced while the drive unit is

# Nauticraft Pedal Drive System

---

mounted in the boat, and without the need of tools. Another advantage of belt and sprocket systems is that they do not require oil/grease lubrication.

The Nauticraft drive unit design is based on what we call the “quadritwist” system. Although it is beyond the intended scope here to go into the complexity of its geometry, the basic design has strategic positioning of the sprockets such that the belt goes through four “natural” 90 degree twists.

An important aspect of this system is that only radial loads are imposed on the bearings of the sprockets. This means that there are no undesirable angular or axial forces that need to be compensated for with specialty bearings. A plastic roller bearing system functions on the two smaller sprockets. The large idler sprocket uses a strip Teflon bushing, while the large driving sprocket is mounted to a bicycle crank and axle (bottom bracket) assembly.

The axial load generated by the propeller pushing the boat forward through the water is taken by a plastic thrust bushing at the point where the propeller comes up against the boat’s keel. Because this point is down in the water this bushing is always “water lubricated”.

The Nauticraft drive unit was designed in the mid 1990’s specifically for the rotationally molded Escapade pedal boat. A few years later the Encore pedal boat was designed to incorporate this same basic drive unit as an independent, two-person side-by-side pedal system. The success of these Nauticraft boats with this drive system has been established over the years.