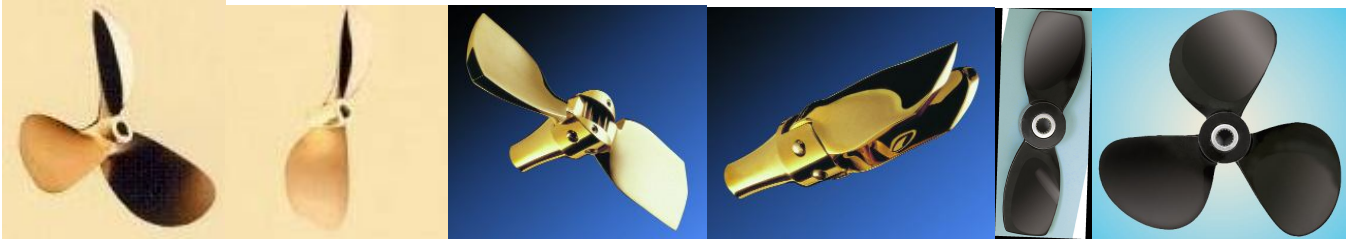


PROPELLERS – By Ad



The propeller is really a very important item in your propulsion system. Choosing the wrong one can lead to insufficient speed, engine power loss or even engine damage.

Therefore the propeller choice preferably should be done by a propeller specialist. Not all engine suppliers are real specialists on this item so it's better to go to a dedicated propeller supplier. There are several suppliers on the internet e.g.:

<http://www.sillette.co.uk/>

<http://www.bruntons-propellers.com/>

An other site of a major propeller producer is:

<http://www.elicheradice.com/home/eng/>

For people who want to spend some time studying on this item lots of information can be found on the internet.

A very comprehensive example is:

<http://www.mh-aerotoools.de/airfoils/index.htm>

For those who want to do some propeller calculations there are a few programs available at the LOA site:

<http://leisureowners.memberlodge.org/Content/Documents/Document.ashx?DocId=71376>

The following one however is really for experienced users!

<http://leisureowners.memberlodge.org/Content/Documents/Document.ashx?DocId=77918>

And another really good propeller design program at the internet:

http://www.vicprop.com/displacement_size.php

And for the real bibliophile there is a nice and cheap book available:

<http://www.amazon.co.uk/Propeller-Handbook-Installing-Understanding-Propellers/dp/0071381767>

SOME PROPELLER CHOICE THEORETICS

For the technicians among us here is some more information about propeller choice.

After an engine is chosen (or already installed in the boat) you will have to choose the right propeller. Ideally this should be done by specialists but understanding some of propeller basics can be of help when talking with them. (Not all suppliers really are specialists!!).

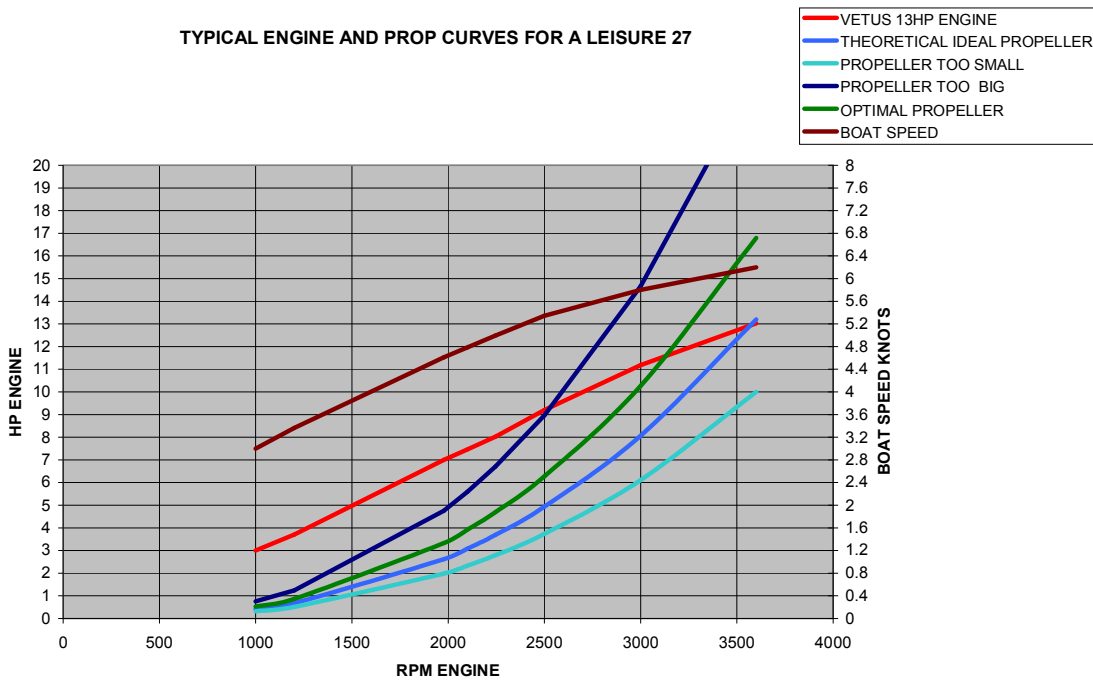
The power curve of a typical diesel engine increases close to linear to the revolutions and less than linear near the maximum rpm.

Because the engine power is put into the water by a propeller there is a second curve which describes the power needed for a propeller to reach a certain rpm when mounted on the boat, the so-called propeller curve. This curve describes the power needed to turn it at a given rpm and is, in fact, equal to the power needed to run the boat at a certain speed.

A power curve for an ideally designed can be made making use of the fact that the hull speed power is known and a propeller curve has about a $\wedge 2.7$ power rating for displacing hulls. Ideally this curve will cross the engine power curve at 85% to maximum rpm.

This total system can be viewed graphically in the following graph

TYPICAL ENGINE AND PROP CURVES FOR A LEISURE 27



In this graph you can see the engine power curve for the actual engine in my own L27 engine (VETUS 13 HP), the boat speed curve for this engine and three propeller curves.

As you can see ideally the engine power crosses the propeller curve at maximum engine power. Below maximum speed the engine power is more than needed which indicates the power available to accelerate and get forward into a choppy sea.

A too big prop (too large pitch and/or diameter) crosses at a lower engine power.

Therefore the engine cannot reach its maximum rpm because the power to increase the propeller rpm is more than maximum engine power. Therefore the engine has less power which reduces the maximum boat speed (the same as a smaller engine would do!).

Also the engine will overload (too much fuel without more rpm) when trying to get more speed by giving full throttle which eventually may damage it.

A too small prop also reduces the available engine power (because the propeller can simply not put the engine power into the water) so the boat also will be slower.

In that case the engine is under loaded which may lead to overheating and/or "bore glazing" and eventually also damage it.

So you may be tempted to choose the "theoretical ideal propeller"

Of course things are never only theoretical

Because normally the engine should be running at about 85-90% of maximum rpm at cruising speed a propeller should be chosen whose prop curve crosses at 85-90% rpm.

A good propeller supplier will do all calculations for you and choose the right prop for your boat. But he needs all values from your boat otherwise the supplied propeller will only be a "guess" which may lead to disappointments.

Two Blade Fixed prop breakdown

