Propeller Update, Calculation of Propeller Size of Folding Propellers

Models: Marine Transmissions

Distribution: Parts Date: 06-2007 Binder: Parts Replaces:

The following example shows calculation of the new 2-bladed folding propeller. The principle is the same for 3- and 4-bladed propellers.

Attached are performance charts for 2-bladed folding propellers. Performance charts for 3- and 4-bladed propellers are shown in Parts Bulletin p-44-7-6.
CALCULATION OF PROPELLER SIZE OF 2-BLADED FOLDING

To select the right propeller size for both S-drive and shaft installations, a propeller selection chart has been developed. The propeller size decides as follows:

1. Gather engine data. Here we select as an example a Dl-13 engine with a 130S sail drive:
   - Propeller shaft power: 8.6 kW
   - Engine speed: 3200 rpm
   - Gear ratio: 2.19:1

2. Calculate propeller speed.
   \[ \text{Propeller speed} = \frac{\text{Engine speed}}{\text{Gear ratio}} = \frac{3200}{2.19} = 1461 \text{ rpm} \]

3. Estimate boat speed in knots. A first approximation can be the length of the waterline of the boat, measured in meter. In our example the waterline length is about 6 m and we estimate:
   - Boat speed: 6 knots

4. Select propeller from propeller select diagram. From the diagram of a speed of advance of 6 knots the most suitable propeller is selected as follows:
We find the propeller to be between 15x8 and 15x10 (diameter x pitch in inches). Of these two propellers we select the largest, which is 15x10, because it will give an engine speed which is slightly less than 3200 rpm, resulting in less risk for over speeding at full throttle. Thus

The most suitable propeller is 15x10

Warning: Engine power and propeller speed should always be below the cavitation limit. The blades of the propeller may otherwise suffer from cavitation erosion. In addition noise and vibration may also occur.
2-BLADED FOLDING PROPELLER WITH SKREW
SPEED OF ADVANCE = 8 KNOTS

VOLVO PENTA

PROPELLER SPEED (RPM)

DIAEMTER & PITCH (INCHES)