

## Applying the Power

AC is the width of the blade; CB a vertical line from the leading edge, and AB the width projected to a horizontal line. In turning the distance AB the advance neglecting slip is equal to CB.

The circumference of a circle through P is equal to the diameter at  $P \times \frac{22}{7}$ , and as the pitch is the advance during one revolution, the pitch will bear the proportion to BC that the circumference has to AB, or

$$\text{Pitch} = \frac{BC \times \text{circumference}}{AB}$$

### Calculating Horse-power

The motor boat owner who puts a converted vehicle or industrial engine in his boat, is often puzzled as to the power output at a given number of revolutions. The following is the formula by means of which the horse-power of a petrol engine can be obtained approximately:

$$\text{Four-stroke hp} = \frac{B \times B \times S \times C \times \text{rpm}}{13,440}$$

$$\text{Two-stroke hp} = \frac{B \times B \times S \times C \times \text{rpm}}{8,400}$$

where B = bore in inches, S = stroke in inches and C the number of cylinders.

The following formula, on the same basis, gives the approximate horse-power of four stroke high-speed diesel engines:

$$\frac{B \times B \times S \times C \times \text{rpm}}{11,800}$$

### Powers, Speeds and Propeller Sizes

The following formula gives a good idea of the power required to drive planing boats at a given speed, and of the speed likely to be obtained from a given power:

$$\text{Speed in knots} = K \times \sqrt{\frac{\text{bhp}}{\text{Displacement (tons)}}}$$

### Measuring Propeller Pitch

As has been mentioned, the common practice when measuring the pitch angle of propeller blades is to refer to the angle at two-thirds diameter.

In order to obtain the pitch the propeller is laid on a flat surface with the boss vertical. The pitch at P (Fig. 7.23.), which represents two-thirds the diameter of the blade, may then be found as shown in the accompanying drawing.

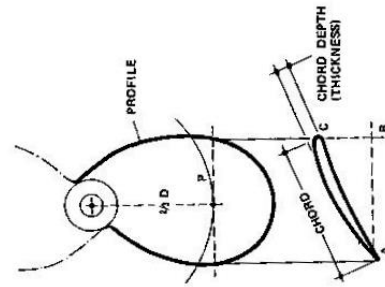


Fig. 7.23 Calculating propeller pitch.