

Drive Chains

Design Considerations

Drive chains are used for power transmission and speed reduction. Horsepower, which is 33,000 foot-pounds of work per minute, is the unit of measurement of power.

Horsepower (mechanical)

$$HP = \frac{T(RPM)}{63,000}$$

$$HP = \frac{P(FPM)}{33,000}$$

Where:

T = Torque (in.-lb.)

P = Net chain pull (lbs.)

RPM = Shaft speed (rev./min.)

FPM = Chain speed (ft./min.)

Chain Speed (In FPM)

$$FPM = \frac{RPM \text{ (no. of teeth) (pitch in inches)}}{12}$$

Horsepower (electric motor)

$$HP \text{ (3 Phase)} = \frac{\text{Volts} \times \text{Amperes} \times 1.732 \times \text{Efficiency} \times \text{Power Factor}}{746}$$

$$HP \text{ (1 Phase)} = \frac{\text{Volts} \times \text{Amperes} \times \text{Efficiency} \times \text{Power Factor}}{746}$$

Alignment

Accurate alignment of shafts and sprocket tooth faces provides uniform distribution of the load across the entire chain width. Uniform distribution of the load contributes substantially to optimum drive life. Be sure that the shaft, bearings, and foundations are suitable to maintain the initial alignment. Periodic maintenance should include an inspection of alignment to ensure optimum chain life.

Arrangement

Drive chains are ideally installed with the shaft in the horizontal position, as shown in Figures 1 and 2.

Figure 1

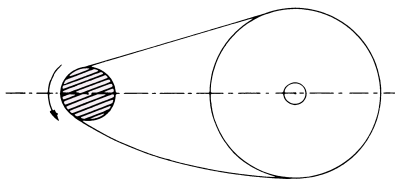
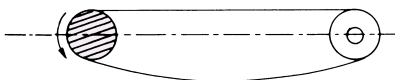


Figure 2



When chains are installed at angles approaching the shaft vertical position, they elongate quickly and may slip off the sprockets. In such cases, make sure the sprockets are adjusted properly. (See Figures 3 and 4.)

Figure 3

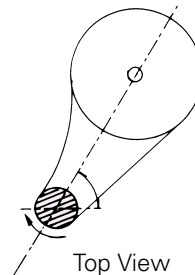
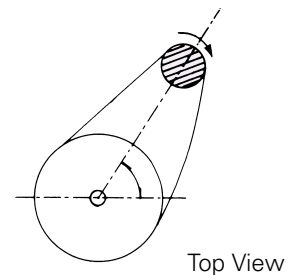


Figure 4



Position of Sprockets

The two shafts should be parallel and the sprockets should be firmly installed. Use a straight edge to check that the two sprockets are installed along the same horizontal level. This is illustrated in Figures 5 and 6.

Figure 5

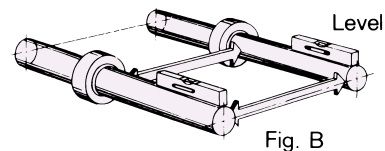


Figure 6

