

**Speed Ratio and Chain Wrap**

The speed ratio of the roller chain can range up to 7:1 under normal operating conditions. However, a speed ratio of 10:1 is possible if the speed is very slow. Chain wrap on the small sprocket must be at least 120 degrees.

**Distance Between Shafts**

Sprockets can be separated by any distance as long as their teeth do not touch. Optimum distance is 30 to 50 times the pitch of the chain used except when there is a pulsating load. In such cases, the distance should be up to 20 times the pitch of the chain used.

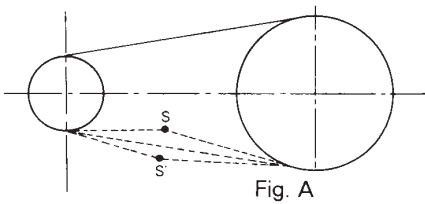
**Position**

Roller chains are ideally installed horizontally. When chains are installed at angles approaching the vertical, they stretch quickly and may slip off the sprockets. In such cases the sprockets should be adjusted properly.

**Slack**

Generally, the slack of a roller chain should be on the lower side (see Fig. A). Adequate slack (SS') is 4% of the span for normal drives. In the following cases, the slack should be about 2% of the span.

- a. Vertical drive or close to vertical drive.
- b. Center distance between two shafts is greater than 3 ft.
- c. Chain is operated under heavy load and high frequency of on and off drive.
- d. Direction of the drive is often changed.



**Position of Sprocket**

The two shafts should be parallel and preferably in a horizontal position. Sprockets should be firmly installed. (See Figs. B and C) Use a straight edge to check that the two sprockets are installed along the same horizontal plane.

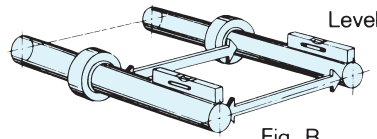


Fig. B

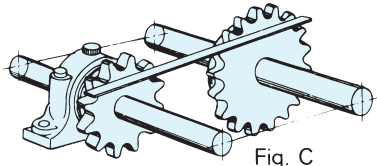


Fig. C

**Arrangement**

When designing roller chain drives, the centerline of both sprockets should be close to horizontal (see Figs. D and E). The angle of inclination can be up to 60 degrees as shown in Figs. F and G.

If installation is close to vertical, it is desirable to install an idler or a guide stopper to maintain smooth engagement of the chain and sprocket.

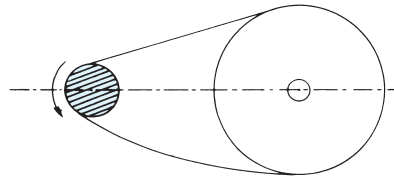


Fig. D

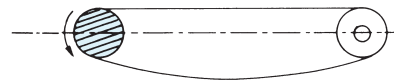


Fig. E

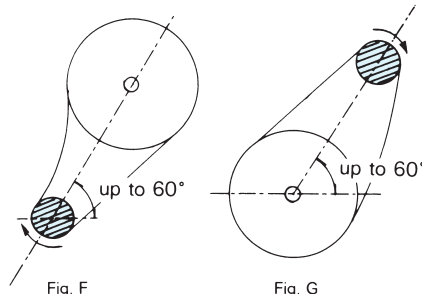


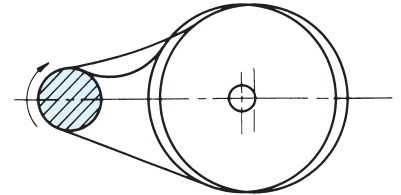
Fig. F

Fig. G

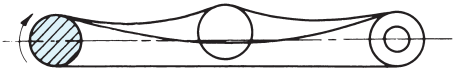
**Attention should be paid to the following arrangements.**

If the slack side is on the top, it is necessary to eliminate excessive chain slack.

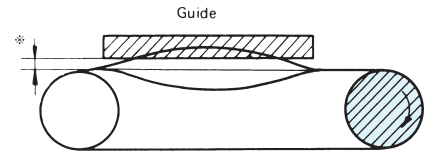
A-1. When the center distance is short, chain slack should be adjusted by increasing the center distance.



A-2. When the center distance is long, chain slack should be adjusted by installing an idler.



B. If vibration occurs due to high chain speed, install a guide.



\* Clearance between chain and guide should be 5/64" to 5/32"

C. If the centerline is vertical, install an idler which functions automatically to eliminate extra chain slack. If the driving shaft is on the lower side, an idler must be installed.

