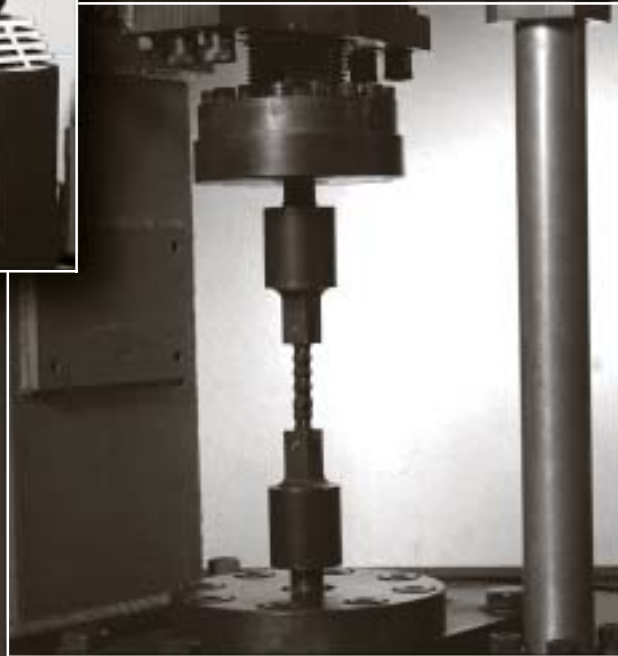




Drives, Incorporated Engineering Information



Installation and Drive Arrangements

Speed Ratio and Chain Wrap

The speed ratio of 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 being 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 in a horizontal position. If the chain drive must be in a vertical position the wear life of the chain will be reduced because of the effect of gravity.

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:

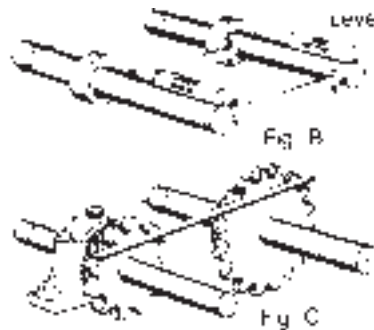
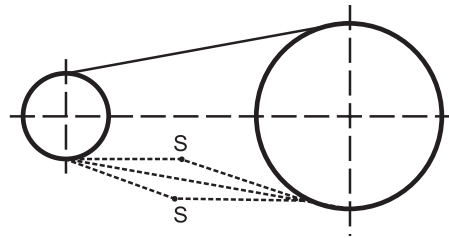
- Vertical drive or close to vertical drive.
- Center distance between two shafts is greater than 3 Ft.
- Chain is operated under heavy load and high frequency of on and off drive.
- Direction of the drive is often changed.

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. A



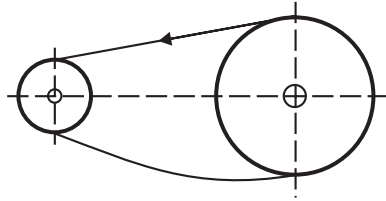
Encourage customers who are replacing worn chain to also replace sprockets. Chain life is reduced when chain and sprockets are not replaced at the same time.

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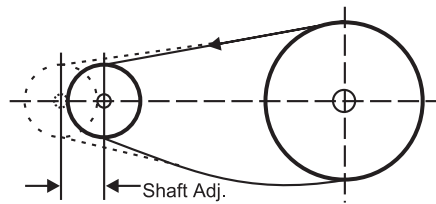


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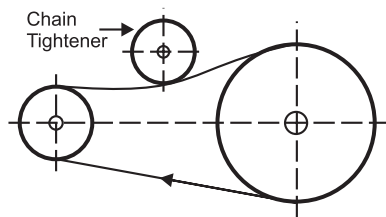
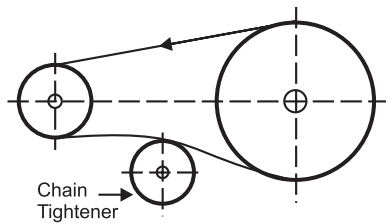
Arrangements



Satisfactory arrangement for drives with short centers.

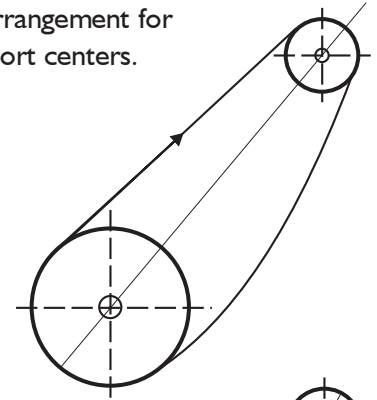


It is best to have one shaft adjustable as shown directly above, or use chain tightener as shown in lower arrangement.

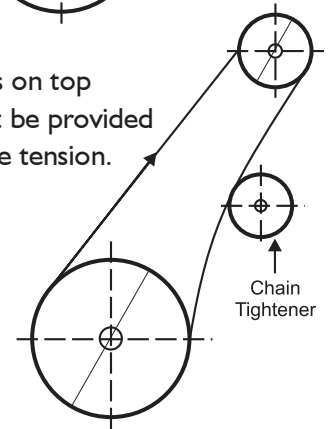


When slack side is on top some means must be provided to adjust slack side tension.

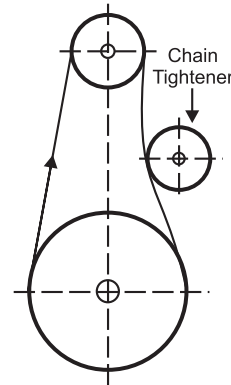
Satisfactory arrangement for drives with short centers.



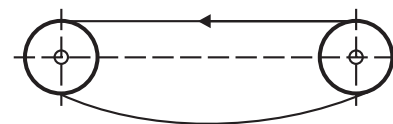
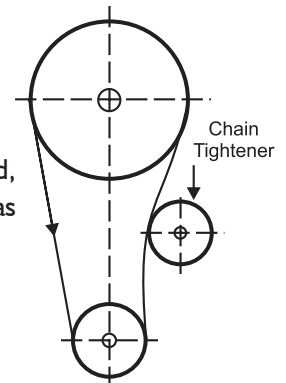
When slack side is on top some means must be provided to adjust slack side tension.



Best arrangement for vertical drives where means for adjusting slack is possible.



This arrangement, while sometimes used, is not as satisfactory as that shown above.



Unsatisfactory arrangement (no adjustment is provided.)

Drives, Incorporated Product Managers and Engineers are available to answer your questions.

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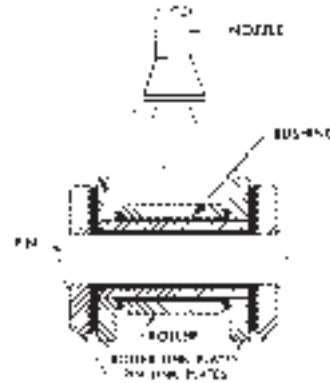
Drives, Incorporated Engineering Information

Lubrication Increases the Service Life

One of the most important factors in getting the best possible performance out of your roller chain is proper lubrication. No matter how well a transmission system is designed, if it is not properly lubricated, its service life will be shortened.

Lubrication

Wear between the pin and bushing causes the roller chain to elongate. These parts should, therefore, be well lubricated. The gap between the pin link plate and the roller link plate on the slack side of the chain should be filled with oil. This oil forms a film which minimizes wear on the pin and bushing, thus increasing the chain's service life. It also reduces noise and acts as a coolant when the chain runs at high speeds.



Manufacturer of:

USA ANSI

Power Transmission
Roller Chains

Conveyor Chain
Products

Pintle Chains

Auger Products

Engineering Class
Chains

Suggested Lubricants

Only high quality oil should be used to lubricate the roller chain. Neither heavy oil nor grease is suitable. The viscosity of the oil used will depend on the chain size, chain speed and ambient temperature. The lubricants suggested for specific temperature ranges are given in the table to the right

| Temperature Degrees F | Recommended Lubricant |
|-----------------------|-----------------------|
| -20 - +20 | SAE 10 |
| 20 - 40 | SAE 20 |
| 40 - 100 | SAE 30 |
| 100 - 120 | SAE 40 |
| 120 - 140 | SAE 50 |

Table V

The number of supply holes should equal $Z + 1$ where Z is the number of strands of chain. The amount of oil supplied to each hole is constant.

Regardless of the lubricating system used, the roller chain must be cleaned periodically. Examine the pin and bushing after removing the chain. Any damage or reddish-brown color on their surfaces indicate that the system is not being adequately lubricated.

| Chain Speed Ft./Min. | Chain Number | | | |
|----------------------|----------------|----------------|----------------|----------------|
| | 60 and under | 80 - 100 | 120 - 140 | 160 and over |
| 1,600~2,600 | 0.26 Gal./Min. | 0.40 Gal./Min. | 0.53 Gal./Min. | 0.66 Gal./Min. |
| 2,600~3,600 | 0.53 Gal./Min. | 0.66 Gal./Min. | 0.79 Gal./Min. | 0.92 Gal./Min. |
| 3,600~4,600 | 0.79 Gal./Min. | 0.92 Gal./Min. | 1.06 Gal./Min. | 1.19 Gal./Min. |

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The following three lubricating systems are suggested:

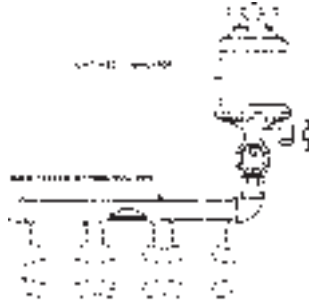
System A



Manual Lubrication (System A - top)

Oil is applied with an oil filler or brush in the gap between the pin link and roller link on the slack side of the chain. It should be applied about every eight hours or as often as necessary to prevent the bearing area of the chain from becoming dry.

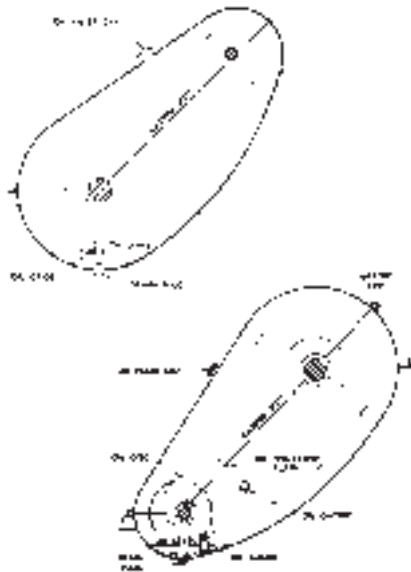
Always turn off and lockout the power switch before lubricating or servicing a chain system.



Drip Lubrication (System A - bottom)

A simple casing can be used. The oil is supplied by drip feed. Each strand of chain should ordinarily receive 5 to 20 drops of oil per minute, according to increases in the chain speed.

System B



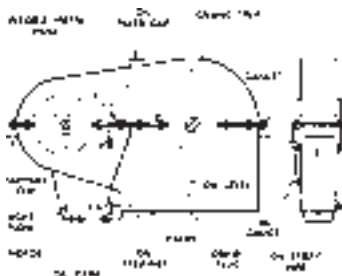
Oil Bath Lubrication (System B - top)

A leak proof casing is required. The chain dips into the oil at bottom of casing. The sprocket should dip into the oil approximately 1/2". If the sprocket is immersed more than 1/2" too much heat is generated.

Lubrication by Slinger Disc (System B - bottom)

A leak proof casing is required. The chain does not need to dip into the oil at the bottom of casing. The slinger disc should dip into the oil from 1/2" to 1".

System C



Lubrication Using a Pump (System C)

Use a leak-free casing. A pump is used to circulate the oil which is then cooled. (See Table V for lubrication supply holes.)

Customer Service provides immediate feedback on lead times. Sales service and product managers await your call.

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Drives, Incorporated Engineering Information

Troubleshooting Guide

| Problem | Possible Causes | What to Do |
|---|--|--|
| Excessive noise | <ul style="list-style-type: none"> • Misalignment of sprockets • Loose casings or bearings • Too little or too much slack • Chain and/or sprocket wear • Inadequate lubrication or no lubrication • Chain pitch size too large | <ul style="list-style-type: none"> • Realign sprockets and shafts • Tighten set-bolts • Adjust centers or idler take-up • Replace chain and/or sprocket • Lubricate properly • Check chain drive selection |
| Chain vibration | <ul style="list-style-type: none"> • Resonance to the vibration cycle of machine to be installed • High load fluctuation | <ul style="list-style-type: none"> • Change vibration cycle of chain or machine • Use torque converter or fluid coupling |
| Wear on inside of link plate and one side of sprocket teeth. | <ul style="list-style-type: none"> • Misalignment | <ul style="list-style-type: none"> • Realign sprockets and shafts |
| Chain climbs sprockets | <ul style="list-style-type: none"> • Excessive chain wear • Excessive chain slack • Heavy overload | <ul style="list-style-type: none"> • Replace chain • Adjust centers or idler take-up • Reduce load or install stronger chain |
| Broken pins, bushings or rollers | <ul style="list-style-type: none"> • Chain speed is too high for pitch and sprocket size • Heavy shock or suddenly applied loads • Material build-up in sprocket tooth pockets • Inadequate lubrication • Chain or sprocket corrosion | <ul style="list-style-type: none"> • Use shorter pitch chain or install larger diameter sprockets • Reduce shock load or install stronger chain • Remove material build-up or install side gashed sprockets (mud relief) • Lubricate properly • Install anti-corrosive chain or sprockets |
| Chain clings to sprocket | <ul style="list-style-type: none"> • Center distance too long or high load fluctuation • Excessive chain slack • Excessive chain wear | <ul style="list-style-type: none"> • Adjust the center distance or install idler take-up • Same as above • Replace chain |
| Chain gets stiff | <ul style="list-style-type: none"> • Misalignment • Inadequate lubrication • Corrosion • Excessive load • Material build-up in chain joint • Peening of link plate edges | <ul style="list-style-type: none"> • Realign sprockets and shafts • Lubricate properly • Replace with anti-corrosive chain • Reduce load or replace with chain or suitable strength • Shield drive from foreign matter • Check for chain interference |
| Breakage of link plate | <ul style="list-style-type: none"> • Subjected to shock load • Vibration • Moment of load inertia is too large | <ul style="list-style-type: none"> • Reduce shock (e.g., install a shock absorber) • Install a device to absorb vibration (e.g., tensioner idler wheel) • Chain section should be checked (increase number of strands or select next larger size chain) |