

Causes of Premature Chain & Sprocket Wear:

Vertical Run-Out (perpendicular to the bore) on any portion of the drive sprockets and idlers causes premature wear, as the chain tightens and loosens in small amounts on the slack side. It's not uncommon to find run-out on a chain measured on the rollers as it is engaged on the sprocket to be .010" or more. In a 3-foot center-to-center distance between sprockets with a .006" run-out on both sprockets, the maximum center point of deflection is about ½ inch.

Consider all the sprockets and idlers in the system. Due to the drive and driven sprockets and idlers having different diameters, run-out may require more chain. At that point a spring-loaded tensioner may be used. This may seem like a reasonable solution, but many times it decreases chain life since it flexes the chain more and increases roller spin. However, in many drives it becomes necessary.

The greater the number of sprockets in contact with the chain drive, the greater chance of more movement of the spring-loaded chain tensioner, causing more wear. A rhythm develops as the chain runs, and the sound becomes more noticeable as time goes on.

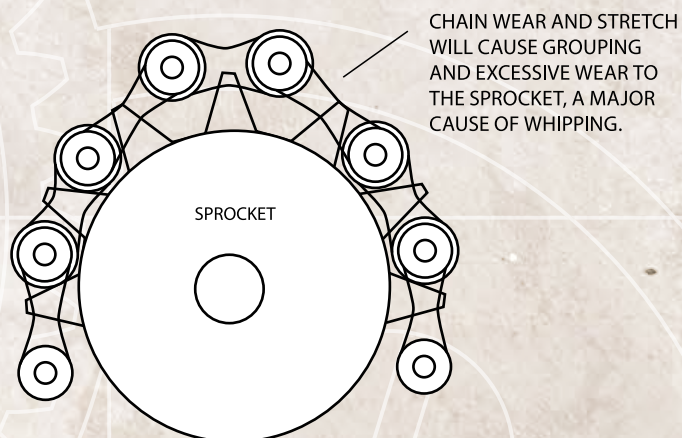


IdleMasters® reduce noise and increase life of chains and belts.

Lateral Run-Out (parallel to the bore) of the drive sprockets moves the chain from side to side, greatly diminishing the life of the roller chain. By engaging the inside sidebars of the chain against the sprocket teeth, heat is created, causing the chain to slightly bend. In addition, this causes uneven stress as the chain is deflected from side to side, weakening the strength of the chain, shortening its life and causing premature failure. Lateral run-out usually occurs in large diameter sprockets caused by a slightly warped plate, bent shaft, idlers or poor alignment.

Roller Spin occurs when the chain enters and exits a sprocket, and increases as the chain begins to wear. This condition wears the internal portion of the roller and the pin of the roller chain, making it impossible for the chain to be firmly seated into the root of the sprocket. This causes chain grouping and a slight whipping action. As the roller of the roller chain begins to enter into the sprocket, it may roll very slightly into the sprocket root position under a high load. When the roller chain exits the sprocket an instant acceleration of the roller occurs as it rolls off the sprocket tooth, causing roller spin, increased noise and heat as the chain wears.

The greatest contributors to roller spin are solid chain slides. After the sidebars of the chain wear into the slides, the rollers are in full contact with the slide, causing the rollers of the chain to spin. For every 100ft per minute that the chain travels, an 80-pitch roller chain will turn at about 500 rpm. Many roller chains run faster, causing the rollers of the chain to accelerate wear and increase noise.



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Troubleshooting

On a long drive with several sprockets, it's important to keep sprocket run-out to a minimum. Even very slight run-out creates noticeable movement on a chain tightener.

Problem

The chain is whipping on the power side. It makes a vibrating, snapping sound.

Possible Causes

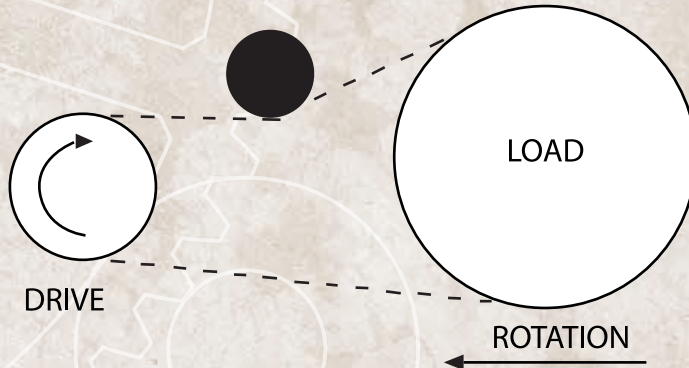
The chain or sprocket is worn, causing chain grouping.

When chain pitch is greater than the pitch of the sprocket tooth, some chain rollers fail to come in contact with the bottom of the tooth. As this section of chain comes off the load sprocket, the sudden excess of chain causes a momentary slack. The drive sprocket takes it up quickly and forcibly, creating a snap or jerk accompanied by noise, vibration and undue stress on the entire drive chain.



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Chain wear and stretch will cause grouping and excessive wear to the sprocket, a major cause of whipping.



Poor Sprocket Alignment creates heat and may even bend the shafts on the drive system, causing great damage.

Poor Pitch Integrity of chain and sprockets also causes premature failure. Because they are dependent on one another, good chain life will also result in optimal sprocket life.

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