Tension retention

Chain and belt drives are prone to gradual permanent elongation. But the whole concept of flexible drives requires that they remain taut. A well-chosen drive tensioner can make loads of difference.

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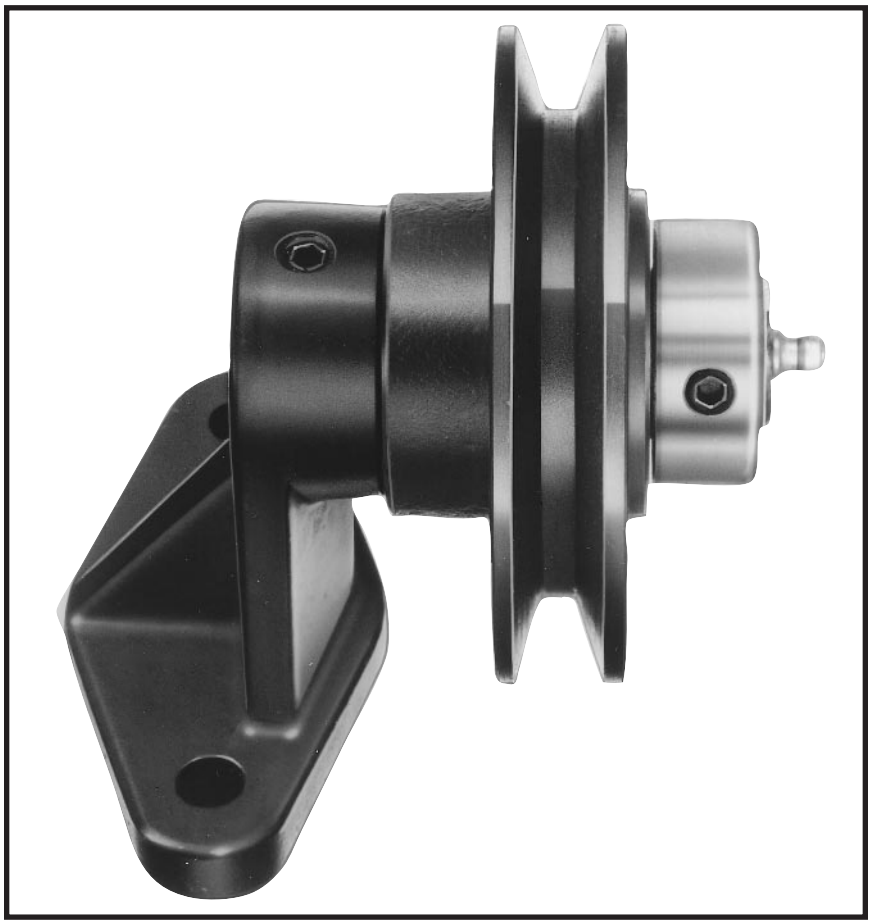
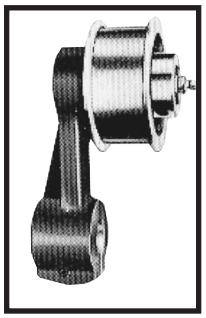
Under normal operation, stretched chains and belts begin to relax. As slack sets in, the drive transmits power less efficiently, and the flexible elements fatigue faster. Loose belts slip and cause burns, wear, and overheating to surrounding components. Chains that aren't tight slap, rattle, and vibrate, delivering shock to the system.

Tensioners are based on a simple concept: a sprocket or pulley that can be adjusted or repositioned to restore and maintain the preferred drive tension. But the wide range of styles reflects the many power train configurations out there, and suggests insight and deliberation to make a good match.

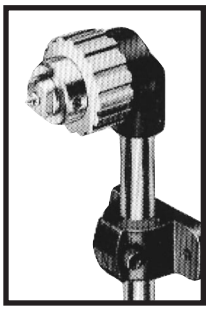


A fixed, angle mount tensioner with a V-pulley idler head.



A shaft mount belt drive tensioner permits 360° head rotation and axial positioning.

A slide adjustment tensioner with a synchronous belt drive idler head. The range of position on this device is analogous to that of a shaft mount.



A show of tensioners

The different types of tensioners can be divided into three general categories.

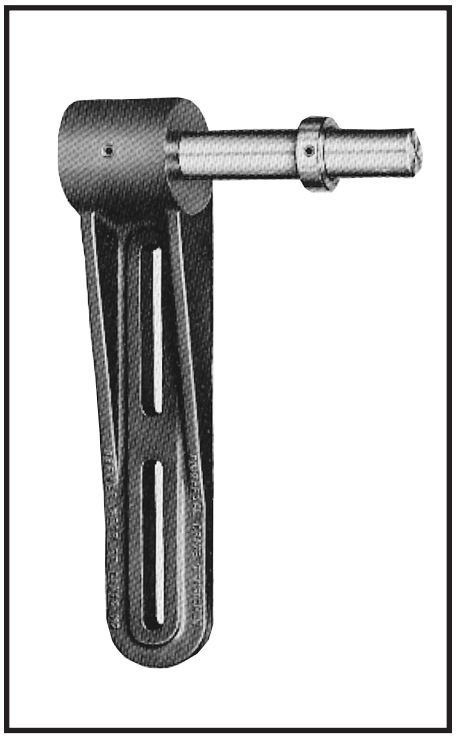
Fixed tensioners, once mounted, cannot be adjusted further. You must remount the device to alter the tension. Variations in this basic category include flange mounts, which attach vertically relative to the drive, and angle mounts, which attach horizontally.

Adjustable tensioners contain mechanisms that allow sprockets and pulleys to pivot or slide with relative ease. Such devices provide tension readjustment without being disengaged and remounted. This class represents a wide range of styles:

Single adjustment and *double adjustment* tensioners accommodate repositioning through basic schemes like slots and pivot arms.

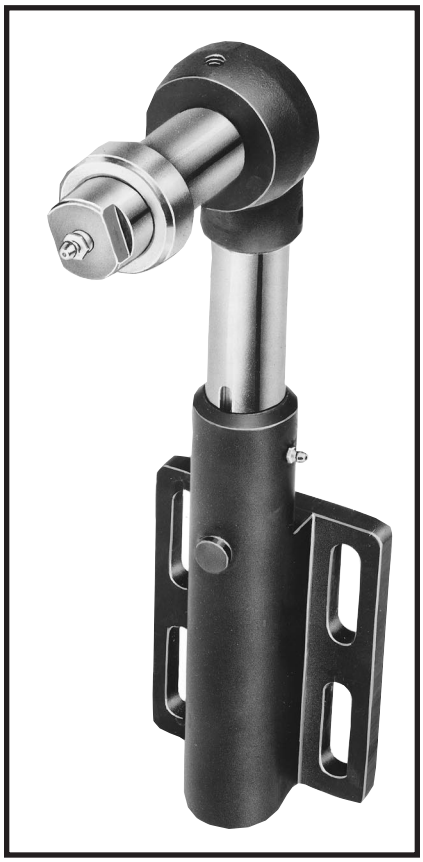
Screw adjustment tensioners allow precise linear positioning. In a typical configuration, the idler assembly travels along a screw and along a guide shaft parallel to the screw.

Slide adjustment and *shaft mount* tensioners have considerable freedom, providing linear positioning

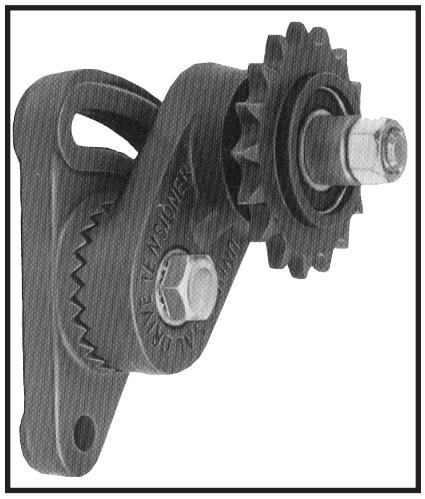


A heavy duty, horizontal mount tensioner (with adjusting grooves), for heavy engineering class belts or chains.

A standard duty, vertical mount tensioner with adjusting grooves and an idler sprocket.



A spring loaded tensioner; this one is in a piston arrangement, similar to a pneumatic tensioner. The idler head rotates completely, and slots in the cast base allow linear adjustment.



This double adjustment chain drive tensioner has a 360° rotating arm and an adjusting slot.

and complete rotation around the guide shaft.

Heavy duty tensioners are for heavy engineering class belts and chains. Typical heavy duty models provide slots for single adjustment capability.

Automatic tensioners respond to certain system dynamics. There are various automatic tensioners to handle different operating conditions:

Spring loaded tensioners protect the drive from shock and pulse, absorbing the energy spike and returning the belt or chain to its proper tension.

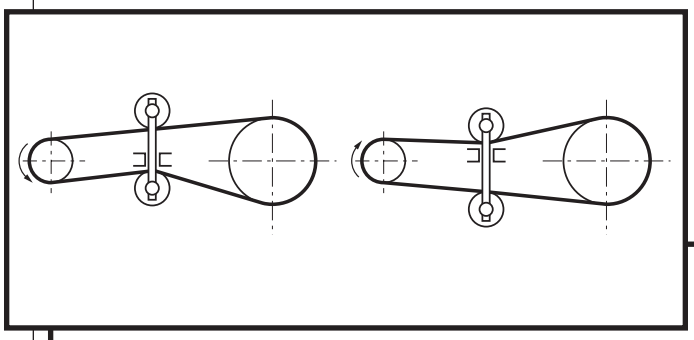
Floating mount tensioners shift to accommodate drive geometry changes when direction is reversed. The device maintains set tension for both directions.

Pneumatic tensioners are attractive for very precise tension control as well as for shock absorption. They consist of an air cylinder that can be finely adjusted by a regulator. After soaking up a shock or pulse, the air piston returns to its set position.

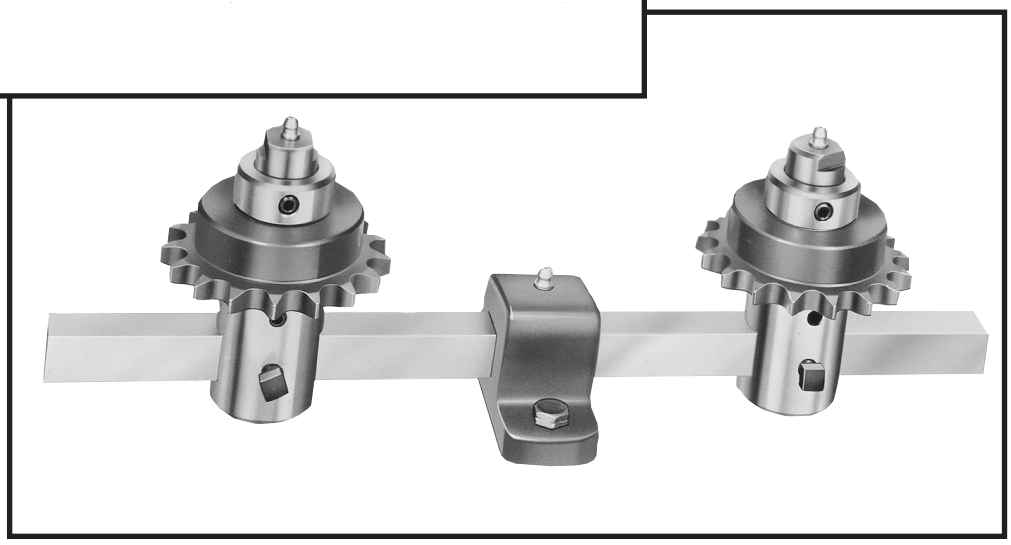
The tensioner mounts

It's not a simple matter of "slapping it on." Proper orientation with the rest of the drive is essential. Here are a few key points for applying tensioners and idlers.

- Always place a tensioner on the slack side of the drive.
- An idler on the outside should be 1/3 of the center distance from the small sprocket or pulley. On the inside, the idler should be 1/3 of the center distance from the large sprocket or pulley.
- On chain drives, at least three idler sprocket teeth must be engaged.
- If an idler is placed on the inside of a belt drive, the reduced arc of contact leads to a loss of horsepower. Outside idlers on the back of V-belts cause reverse bending, which can shorten belt life. ■



A floating mount chain drive tensioner. The segment of rod between the pre-positioned idlers is free to slide.



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