

# *Poultry Engineering, Economics & Management*

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## Tensioner Failure – Serious Problem, Easy Fix

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An integral part of many, if not most, modern poultry house fans is a spring loaded belt tensioner. Tensioners have an important role in helping maintain proper belt tension and allowing the fan motor to transfer all its power to the fan blades – insuring maximum air moving capabilities. However, if tensioners fail to work properly the result is likely to be serious losses in ventilation rate and windspeed. Given the environment they have to work in, with all the moisture and dust that cannot be avoided in a poultry house, it is no wonder that one of the most common and problematic issues is tensioners freezing up and thereby robbing the fan of much of its power to move air. Luckily, this can be a simple problem to remedy.

In the photos below, you see a typical frozen belt tensioner and the obvious loss of fan power that results, seen in the fan's not being able to fully open the butterfly shutter and amounting in this case to a loss of about 2,270 cfm's. After a simple repair, full rated fan power was restored.

One quick way to become aware of this problem is to notice whether the shutter louvers of a fan (in this case - butterfly shutter) are opening fully – if not, you know something is not fully operational, and it may well be a stuck tensioner. You may also notice slack in the belt as it runs. This slack can be seen by watching the fan operate and noticing the belt jump as it runs back to the motor pulley. With the fan



On this fan, the tensioner was frozen at about 12:00 o'clock and did not move when the belt was removed. Photo taken from outside of fan operating with the frozen tensioner shows fan has lost power and cannot fully open the butterfly shutter. RPM meter reading shows fan turning at only 491 RPM (1472 meter reading divided by three blades).



After simple repairs freed the tensioner, allowing it to apply proper pressure to the belt, this fan was able to fully open the butterfly shutter, running at its full rated 542 RPM. The frozen tensioner had robbed 10% of the fan power, about 2,270 cfm – but the loss was easily restored by a simple two-minute repair.

unplugged, you can see and feel the slack belt with very little pressure being applied by hand. Once you take the belt off – which may not be easy with the frozen tensioner – you can see whether the tensioner springs back into position away from the center of the fan, or is stuck.



**A properly tensioned belt should not be easily deflected and the tensioner should move with a spring action when you use moderate pressure. If the belt easily flexes and the tensioner is not moving, check to see if the tensioner is frozen up.**

The cure for a stuck tensioner usually is applying some corrosion cutting spray (WD-40, Break-free, PB Blaster, etc.) and gently tapping on the mounting bolt until it comes free. Applying more lubricant and working it gently back and forth will usually get the tensioner back in working order. This routine worked well on the frozen tensioner shown on the front page, and the result was restoring about 2,270 cfm's of previously lost airflow. As it turned out, every fan in this house suffered from a frozen tensioner.

Assuming an equal increase in fan power by unsticking them all, this grower was losing the equivalent of one whole fan due to frozen tensioners. The hour it would take to un-freeze the other nine belt tensioners would be time well spent.

### The Bottom Line

Not all stuck tensioners will un-freeze so easily. Some may even need to be replaced. This can easily be a \$40 repair per tensioner, but given the potential gain, it is a maintenance expense worth spending. If and when you do replace belt tensioners, we recommend using ones with a grease fitting installed and regularly greasing them, making this wind-speed robber a thing of the past. When choosing fans for replacement, a belt tensioner with grease fitting is definitely a positive feature on any fan.

Either way, there are not many quicker, more simple, maintenance repairs that a grower can do that stand to so easily yield 10% increase in air moving power on a single fan. The next time you are at the fan end of your houses – check your belt tensioners!

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