PRACTICAL APPLICATIONS

CHECKING FANS FOR PULLEY ALIGNMENT

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Wearing fan belts out prematurely? Check fans for pulley alignment.

There are many tasks associated with keeping poultry exhaust fans in top performing order during hot weather and extended hours of fan operation. We often promote replacing worn belts, tensioner servicing, checking pulleys out for wear and cleaning shutters, but sometimes we forget to mention the importance of pulley alignment. We have been on farms recently that have had several motor pulleys out of alignment. Time spent on this preventative maintenance task can save you a lot of time and money in the long run.

What tools can be used to test for pulley alignment?

There are several different ways a producer can check for pulley alignment. The string method, yardstick method or laser alignment method. Below are a couple of examples of us conducting pulley alignment checks in the field. This can easily be done and can save a lot of money in replacement belts and dollars lost in inferior fan performance and windspeed this summer.

How do I check for pulley alignment?

String or yardstick method. Disconnect power to each fan being tested. Remove fan shutter or inlet screen cover. Stretch a string from both outside edges of the motor and fan pulleys, Figure 1. This can be done on the side of easiest access. Check to make sure the string has two points of contact per pulley, four total points of contacts, the yellow arrows in Figure 1. If you only have three points of contact, this would indicate a potential misalignment. The yardstick method, Figure 2, would be the same as the string method, and again, you are looking for four total points of contact on the same side of the pulleys.

Figure 3 shows the use of a string and Figure 4 shows the use of a yardstick to assess pulley alignment. The left photos of both Figures 3 and 4 show that this tunnel fan pulley is roughly 5/8 inch out of alignment. We loosened the set screw holding the pulley on the fan shaft and adjusted the pulley until the string and ruler made the correct contact, as shown in right photos in Figures 3 and 4.

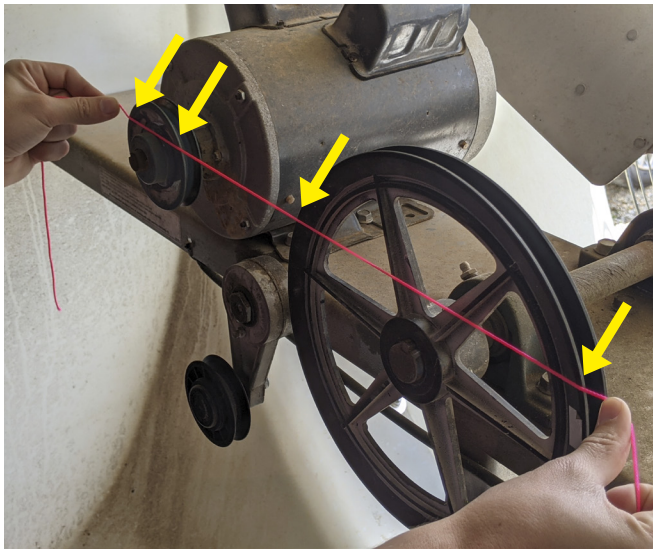

Figure 1: Use a small length of string to stretch across both the fan and motor pulleys. You want to have four points of contact shown by the yellow arrows. Make sure to not lap over the raised area near the shaft, as this will give a false reading.

Figure 2: Use a yardstick or something with a straight edge to span across both the fan and motor pulleys. You want to have four points of contact shown by the yellow arrows. Make sure to not lap over the raised area near the shaft, as this will give a false reading.

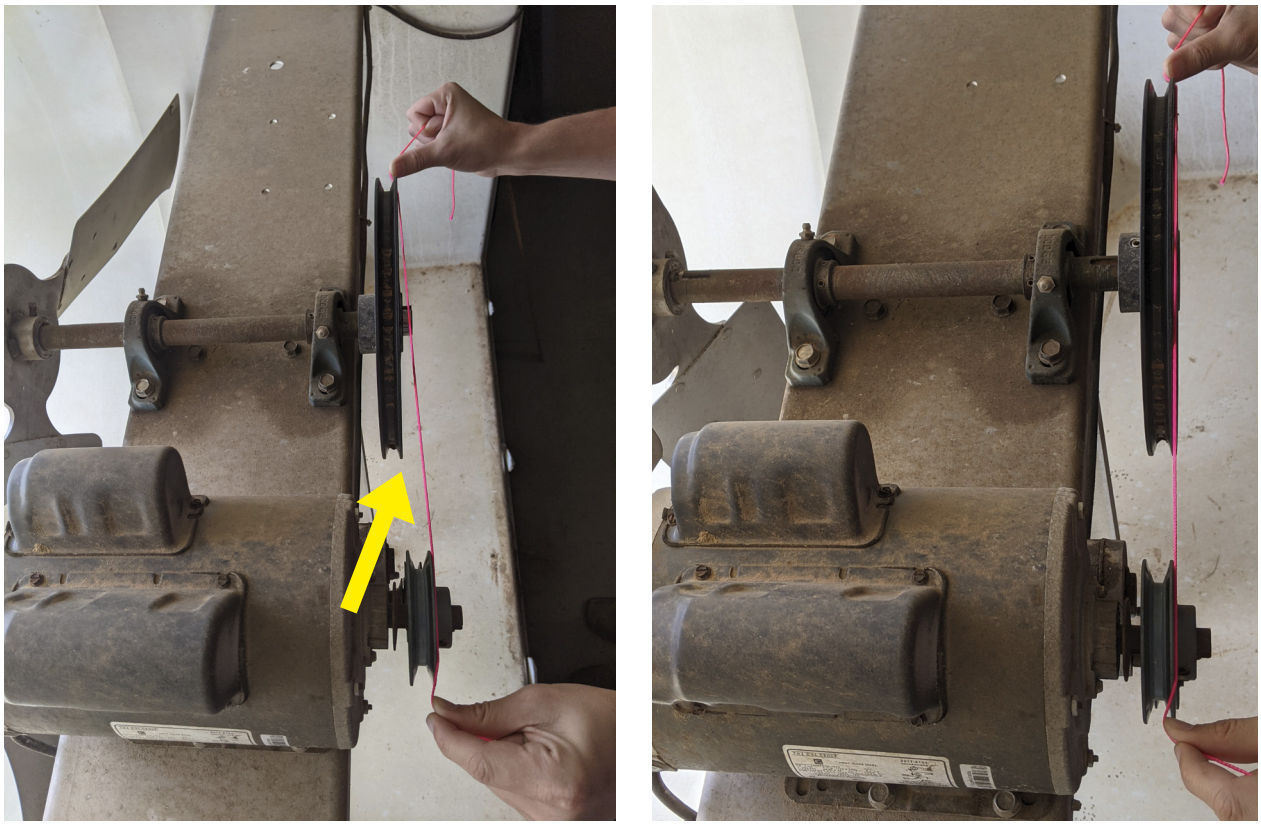

Figure 3: Left, the string method used on a fan where the pulleys are out of alignment approximately 5/8 inch. Right, the string method showing four points of contact and that the pulleys are in correct alignment.

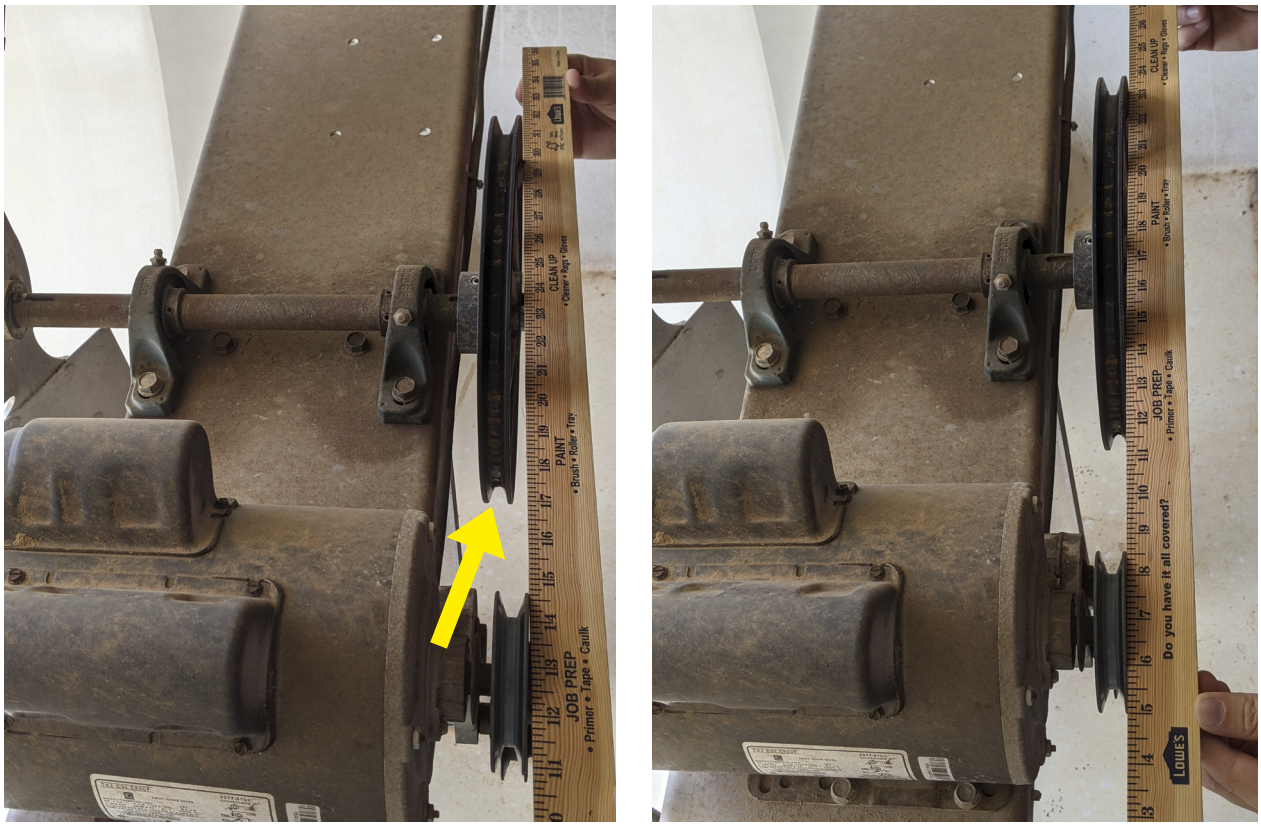

Figure 4: The yardstick method used on a fan where the pulleys are out of alignment approximately 5/8 inch, at left, while, right photo, the yardstick method shows four points of contact and that the pulleys are in correct alignment.

Laser method. Not all fans are designed so that a yardstick can be used, and sometimes the simple string method is difficult to implement due to motor, frame and other obstructions. There are several tools that can be purchased that use a laser to align the pulleys. One of these tools is a laser alignment kit (Grower Select, model #HS783) that can be purchased for about $20. There are other equivalent kits varying in price. This unit comes with simple instructions to check the pulleys for both alignment and wear. You place the laser body on one pulley and a target body on the second pulley. If properly aligned, the laser should hit within a yellow band that is acceptable. Figure 5 shows the laser body on the motor pulley and the target body on the fan pulley. You can see the laser hitting the black band on the target that is outside of the yellow acceptable band.

Figure 6, below, shows the use of the laser kit to check the pulley alignment. The fan pulley is roughly 5/8 inch out of alignment, which means the laser is off the target. We loosened the set screw holding the pulley on the fan shaft and adjusted the pulley until the laser hits inside the yellow acceptable band, on right.

Figure 5: A laser alignment kit is placed on a tunnel fan to evaluate alignment. The laser body is placed on the motor pulley, and the target body is placed on the fan pulley. The laser is hitting to the right of the yellow acceptable band.

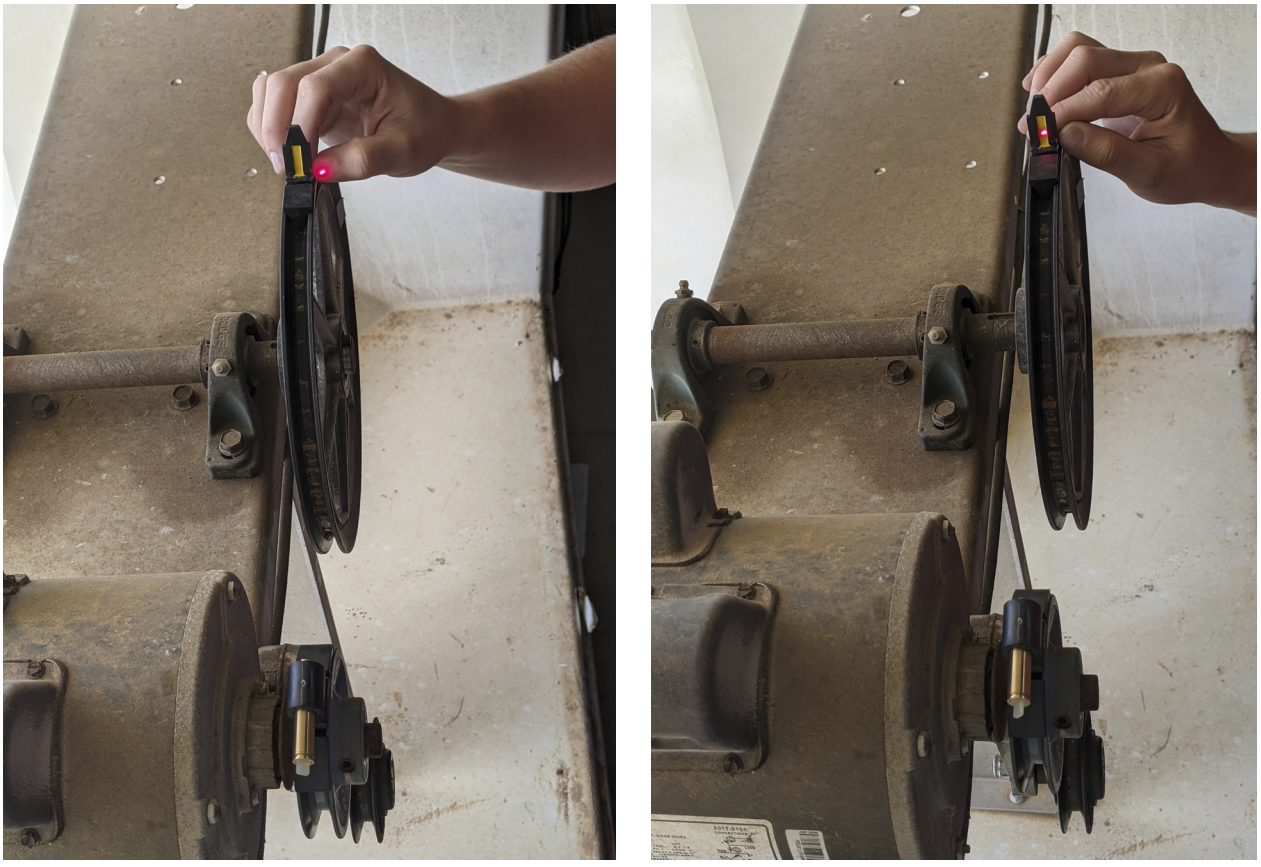

Figure 6: Left photo, the laser method is used on a fan where the pulleys are out of alignment approximately 5/8 inch. Right photo,the laser is hitting inside the yellow acceptable strip, showing the pulleys are in correct alignment.

How often should pulley alignment be checked?

Safety first: Do not attempt to check pulley alignment without making 100 percent sure fan power has been disconnected. This test requires direct contact with potentially moving fans parts that may be energized without notice unless totally disconnected.

Fan alignment should be checked at least once per year for each fan during spring for tunnel fans, at least twice a year for fans used for minimum ventilation and power ventilation fans, and any time you notice that a specific fan seems to wear more than others on the farm in the same ventilation sequence. Fans used during minimum ventilation wear faster than the last tunnel fans belts do. Fan motor pulley alignment must be verified after the fan motor, tensioner or pulley is replaced. This is arguably the most frequent occurrence and instance when this problem is created by mistake. Next time you replace a fan motor, do not forget to check for pulley alignment before tightening the bolts on the motor mounts.

THE BOTTOM LINE

Fan pulley alignment is a meaningful maintenance task, is important for fan performance and can easily be corrected with the right knowledge of the service. Next time you see a worn belt, or a motor goes out and must be replaced, make sure pulley alignment is verified so the fan performs properly and runs efficiently and belt wear is minimized. Thanks, and good luck from the National Poultry Technology Center at Auburn University.

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