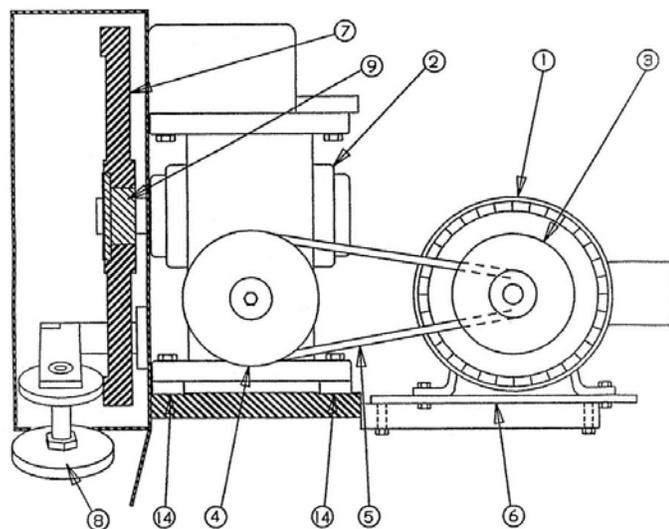


HEM[®] & SAW

—The saw that cuts straight.—

VARI-DRIVE UNIT HORIZONTAL AIR SAWS

Vari Drive Assembly



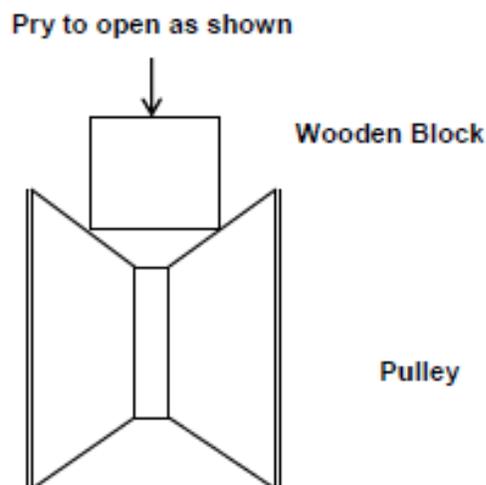
VARI-DRIVE SYSTEM (HORIZONTAL AIR SAWS)

BELT REPLACEMENT:

1. The vari-drive belt on the HE&M Saws can be replaced without removing the drive pulleys. To remove the belt, turn on the band motor and raise the speed to the maximum speed for the saw model. Turn the band motor off and disconnect the power.
2. Remove the sheet metal cover over the vari-drive assembly.
3. With the band motor OFF, turn the vari-speed handle counter-clockwise to open the motor pulley. This will allow the belt to loosen between the two pulleys.
4. With the motor pulley opened as far as possible slip the belt off the two pulleys.
CAUTION! The gear reducer pulley is spring loaded and the spring pressures are considerable.

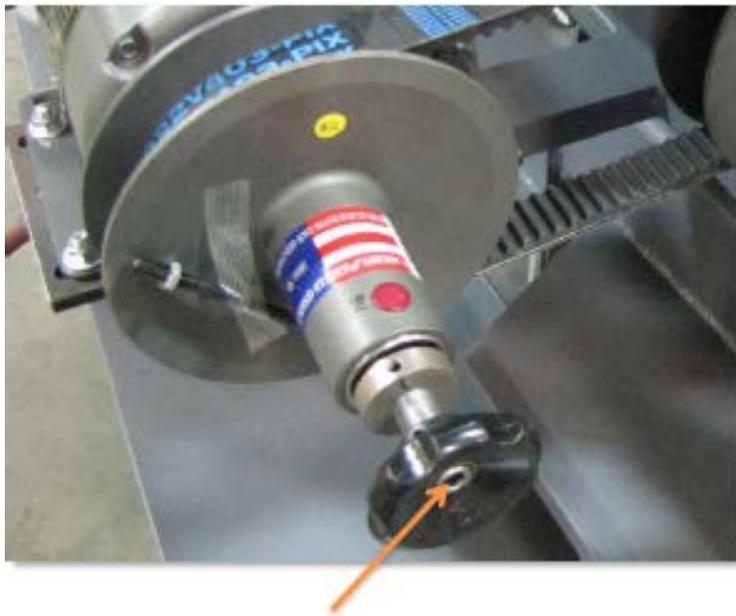
BELT INSTALLATION:

1. To replace the belt, slip the belt sideways into the gear reducer pulley and then over the motor pulley. Turn the pulleys by hand until the belt aligns itself between the two pulleys.
2. Pry open gear reducer pulley. The pulley must be able to accept the vari-drive belt.
3. Replace the sheet metal vari-drive cover, making sure that the speed indicator rod is located in the Blade Speed slot on the handle cover.



ADJUSTABLE PULLEY REMOVAL

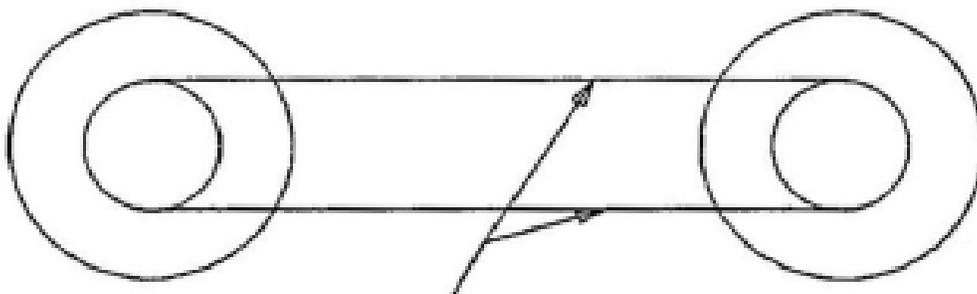
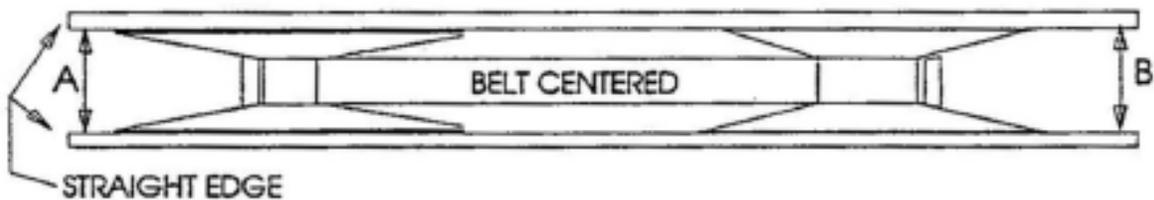
1. Block the arm mechanically.
2. Turn on band motor and raise the blade speed to maximum.
3. Shut off the electrical power to the machine and lock it out.
4. Remove the sheet metal cover over the vari-drive assembly.
5. Remove the belt.
6. Loosen the collet that holds the pulley into the motor shaft. Use an allen wrench. Slide it into the hexagon hold at the end of the pulley shaft. If necessary, tap the end of the allen wrench to break the bolt free.
7. The adjustable pulley is now free to be removed.



**Insert Hex Key and turn counter-clockwise
to remove pulley from shaft**

ADJUSTABLE PULLEY INSTALLATION

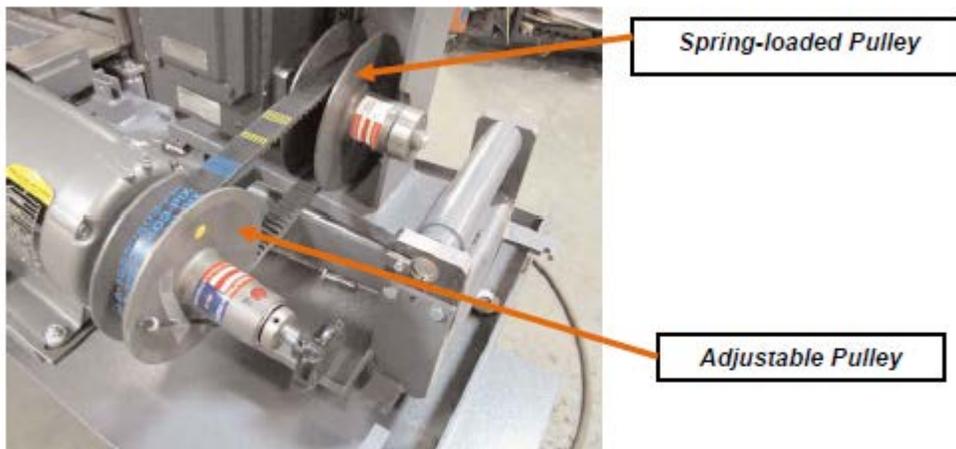
1. Block the arm mechanically if necessary.
2. Slide belt onto the pulley then the pulley onto the shaft.
3. Re-tighten the collet with the 3/16" allen wrench.
4. Turn pulley by hand until belt seems to be tight between the two pulleys. Now turn the motor on and adjust the band speed until the "A" dimension equals the "B" dimension. (Belt is parallel). Now we have both pulleys turning at the same RPM. See picture below.
5. Moving the straight edge from one side to the other, check the alignment of the pulleys. It may be necessary to loosen the spring loaded pulley and move it in or out.
6. If the pulleys do not line up it may be necessary to loosen the motor and turn it until the pulleys are parallel to each other, and repeat steps 2 and 3.
7. Insert the 3/16" allen wrench into the hexagon hole at the end of the pulley and tighten till snug, ten turn 90° more.



Adjust pulleys until belt is parallel
Same pitch diameter

SPRING-LOADED PULLEY REMOVAL

1. Block the arm mechanically.
2. Turn the blade motor on and raise the blade speed to the maximum.
3. Shut off all electrical power to the saw and lock it out.
4. Remove the sheet metal cover over the vari-drive assembly.
5. Remove the drive belt.
6. Loosen the bolt at the end of the pulley and tap it with a hammer to loosen the pulley.
7. When loose, the spring-loaded pulley is now ready to be removed.



SPRING-LOADED PULLEY INSTALLATION

1. Block the arm mechanically.
2. Slide the belt onto the pulley then slide the pulley onto the shaft.
3. Turn the pulley by hand until the belt seems to be tight between the two pulleys. Now turn the motor on and adjust the band speed until the “A” dimension equals the “B” dimension (see the diagram on the previous page.) Now both pulleys should be turning at the RPMs.
4. Moving a straight edge from one side to the other, check the alignment of the pulleys. It may be necessary to loosen the adjustable pulley and move it in or out.
5. If the pulleys do not line up it may be necessary to loosen the motor and turn it slightly until the pulleys are parallel to each other, then repeat steps 2 & 3 above.
6. Re-tighten the bolt that holds the pulley onto the shaft.

ALIGNMENT PROCEDURE FOR THE VARI-DRIVE

1. Set the speed of the saw to its middle setting, ensuring that the spaces between the two sides of the belt are equal-distance from each other at both pulleys.

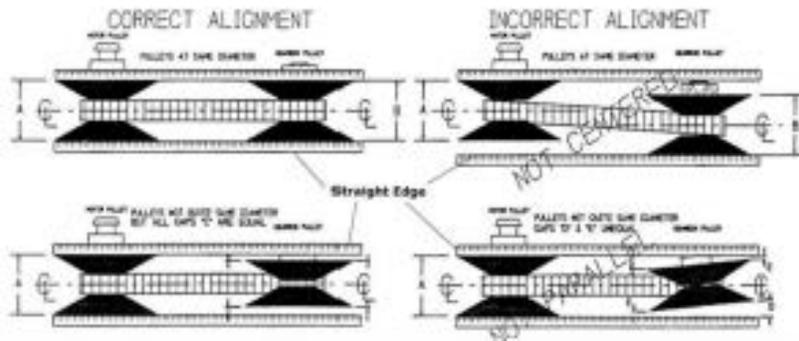


2. Check the alignment of the pulleys to each other with a straight edge on each face of the pulleys. If the pulleys are parallel the straight edge will form the same line between both the front and back of the pulleys.



3. If this is not the case, determine the cause of the misalignment. It could be that the pulleys themselves are straight but are not aligned on the same plane. This will appear as the straight edge being parallel to the motor pulley face but not striking on the same line on both sides of the opposite pulley.

It is also possible that the motor itself is not square. This will appear as the straight edge forming an ever increasing (or decreasing) gap when placed on the motor pulley and compared to the opposite pulley.



4. If the pulleys are straight but not set on the same plane as stated in the first example above. Adjust the pulleys in the following manner.

- A. Locate the set screws on the motor side of the motor pulley (at the time of the writing there are two), one located on the key way and one located 180 degrees opposite on the shaft itself.



- B. Loosen the set screws to allow for manual adjustment of the pulley. Adjust the pulley in small increments and then check placement with a straight edge as shown above. If the pulley now shows proper alignment, tighten the set screws.



5. If the motor pulley is not straight, the straight edge placed on the motor pulley face shows an increasing or decreasing angle to its opposite pulley) the motor will have to be made square. This is done by loosening the bolts mounting the motor to the saw and adjusting the motor until the motor pulley is square to its opposite pulley. When this is accomplished tighten the motor bolts.

(NOTE: If the motor has been adjusted to put the pulley back to square, there is a possibility that the motor pulley will now have to be adjusted laterally as stated in step 4.)

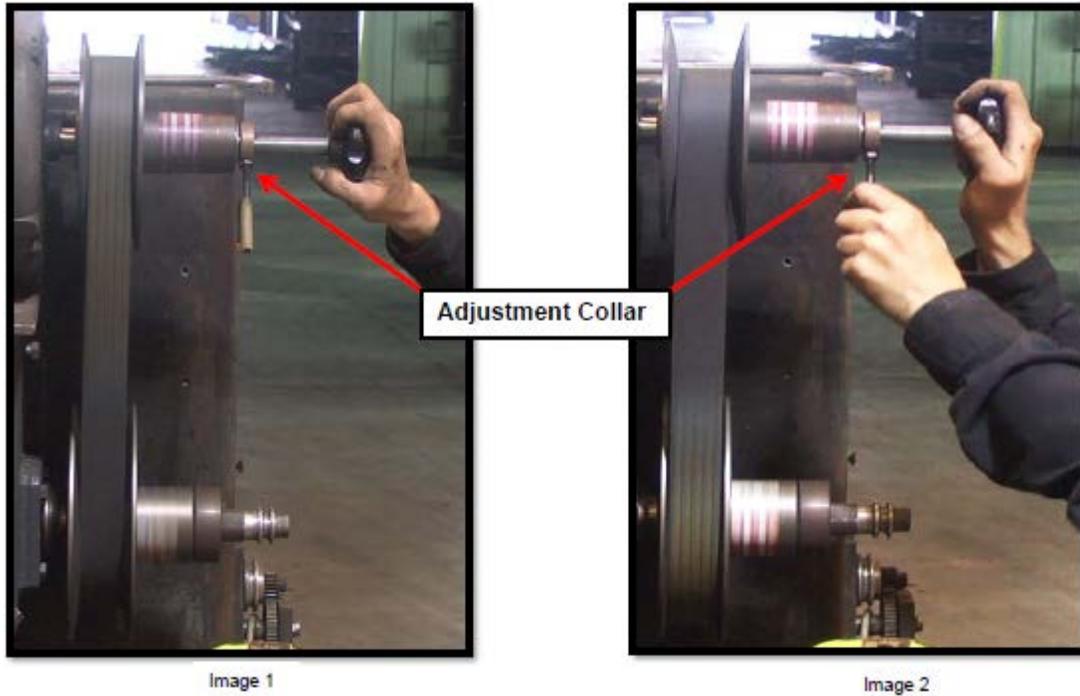


6. After any and all adjustments have been made, repeat step one. If both sides measure correctly then the pulley is properly aligned. This can further be confirmed by checking the evenness of the belts as they pass through the pulley.



VARI-DRIVE ADJUSTMENT

To increase or decrease the speed of the vari-drive (also referred to as loosening or tightening), the tech should grasp the black handle on the adjustable vise (image 1) and the bar that would normally serve as the blade speed indicator (referred to from here on as the adjustment collar) (image 2).



Turn the black handle while holding the bar stationary. Turning the handle clockwise will increase the speed of (tighten) the vari-drive. Turning the handle counter-clockwise will decrease (loosen) the speed of the vari-drive.

REMOVING THE ADJUSTABLE (MOTOR SHAFT) PULLEY



1. Remove the bolts holding the front cover to the machine guard.



2. Remove the bolts from the side cover of the machine guard.



3. Remove the main machine guard from the vari-drive assembly.



4. Remove the fan, if present.

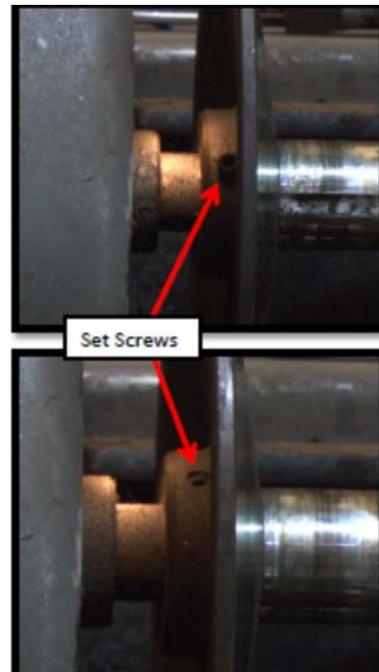
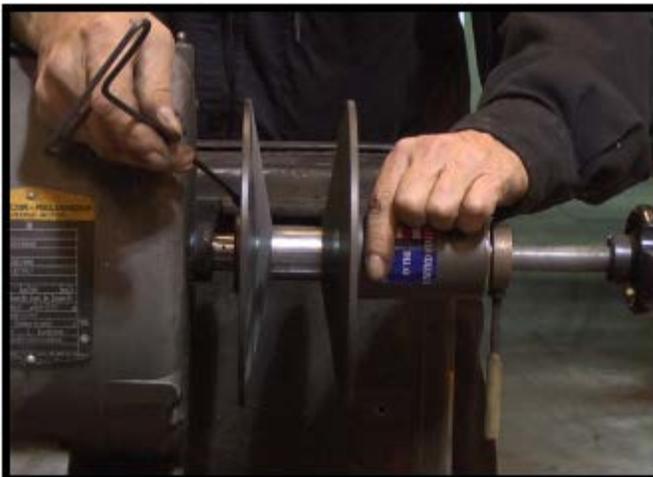


5. Loosen the vari-drive.



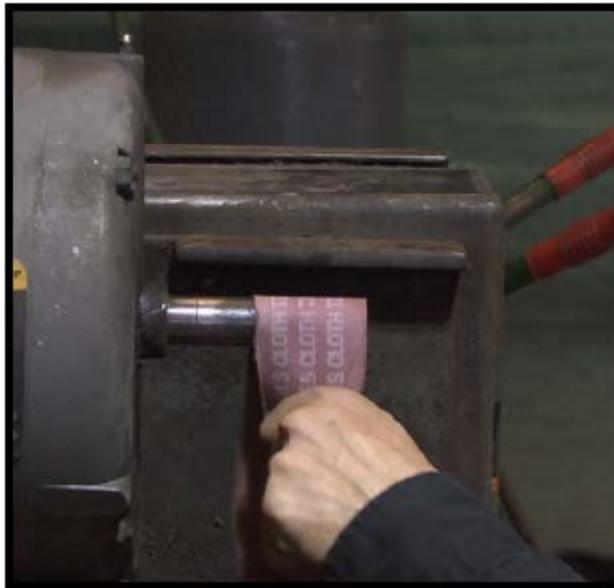
6. Remove the belt from the vari-drive.

7. Remove the set screws from the adjustable pulley (attached to motor shaft).





8. Remove the adjustable pulley.



9. Smooth the motor shaft just enough to allow the pulley to slide on and off freely.

REPLACING THE ADJUSTABLE (MOTOR SHAFT) PULLEY



1. Make sure the motor shaft is not broken or marred.



2. Add the key to the shaft.

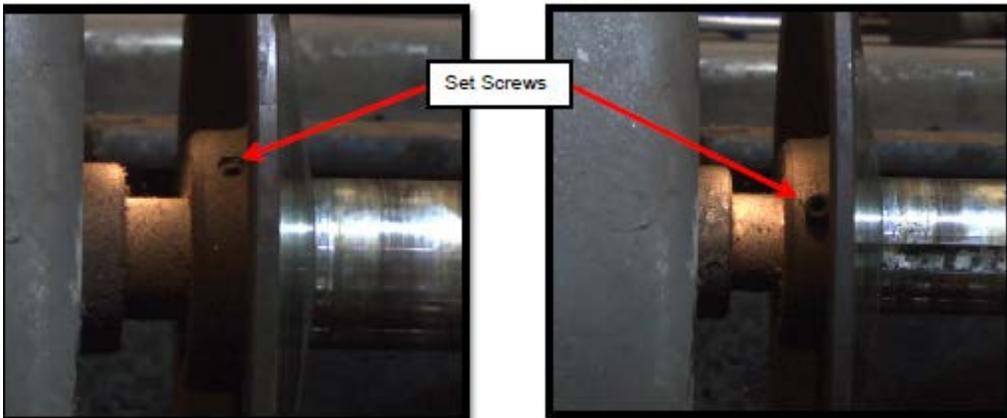
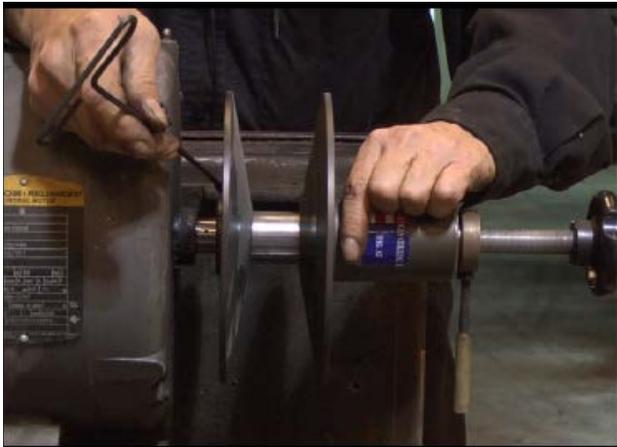
3. Align the motor shaft key with the keyway in drive pulley.



4. Ensure the pulley moves smoothly onto the shaft and seat it in place.



5. Place the set screws.



REMOVING THE SPRING-LOADED PULLEY (GEARBOX)



1. Remove the bolts holding the front cover to the machine guard.



2. Remove the bolts from the side cover of the machine guard.



3. Remove the main machine guard from the vari-drive assembly.



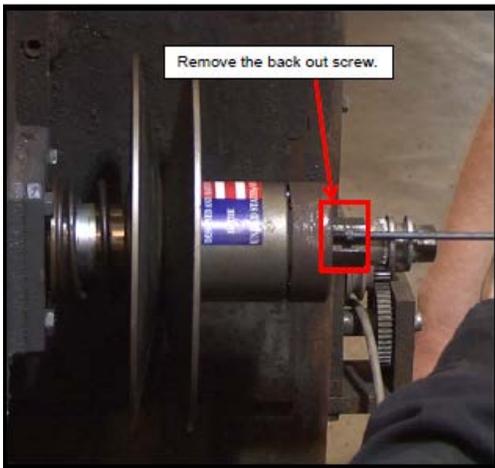
4. Remove the fan, if present.



5. Loosen the vari-drive.



6. Remove the belt from the vari-drive.



7. Remove back out screw and loosen the retaining nut.



WARNING! After loosening the retaining bolt the operator must take care to ensure that the pulley moves freely before removing retaining nut.

Pulley brake assembly contains two springs, a spacer, and a key block



8. Removing the retaining nut and spring loaded pulley.

WARNING! Do not stand in front of the spring-loaded pulley assembly while removing retaining nut and pulley assembly. Spring pressure could cause the pulley to move dangerously away from the saw.



9. Checking the inside bearing of the pulley for any wear, marring, or signs of damage.

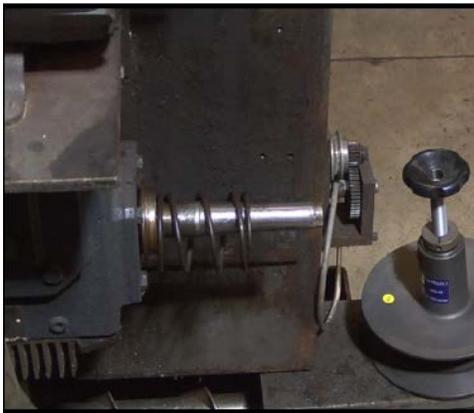


10. Check the gear shaft for any wear, marring, or signs of damage.

REPLACING THE SPRING-LOADED PULLEY (GEARBOX SHAFT)



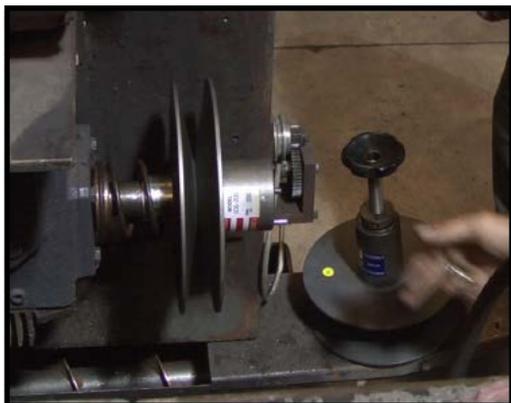
1. Make Sure the Gearbox shaft is not broken or marred.



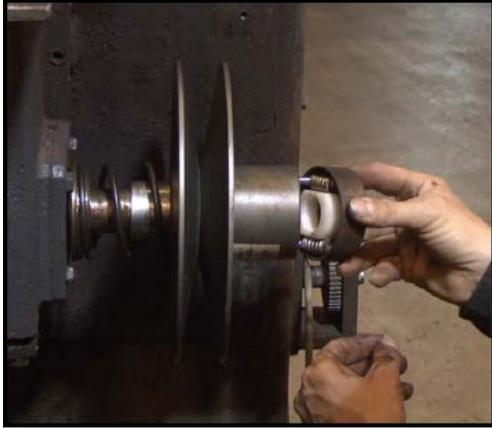
2. Replace/Reinstall spring.



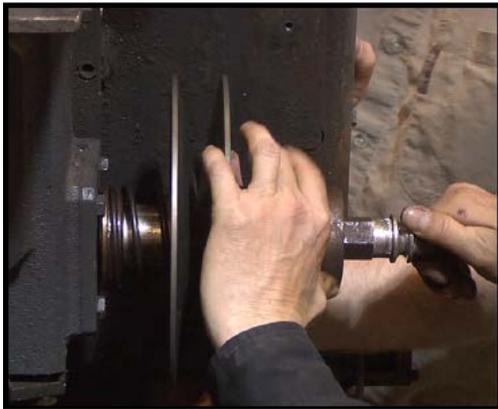
3. Replace/reinstall springs, spacer, and key to the end cap assembly.



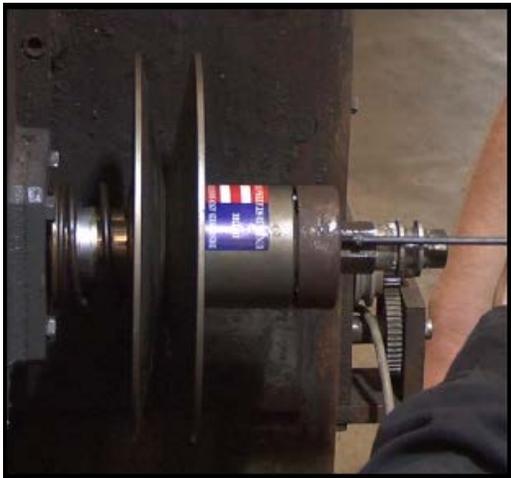
4. Align the gearbox shaft keyway with the key in driven pulley cap.



5. Place brake cap on spring-loaded pulley.



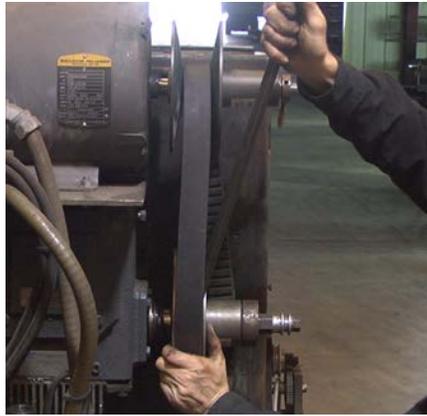
6. Replace/Reinstall retaining bolt.



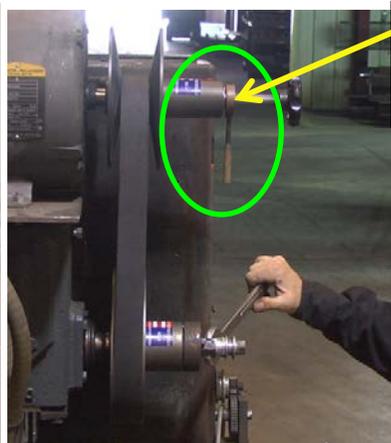
7. Replace/Reinstall back out screw.

REPLACING THE DRIVE BELT AND SETTING SPEED STOPS

1. Place belt on the vari-drive. (Open the spring-loaded pulley (attached to the gearbox) preferably with a firm but relatively soft material such as a wooden lever. However if something like a steel lever is used, the operator should take great care not to scratch the inside of the pulley.)



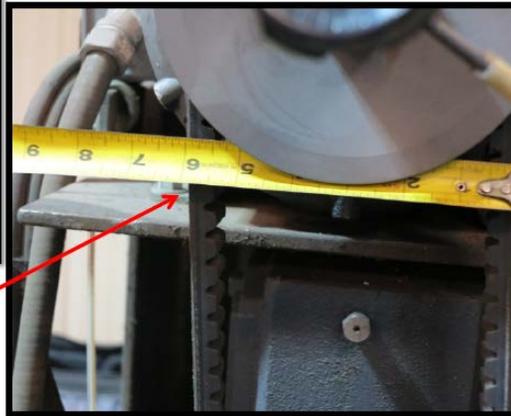
2. Loosen the adjustable pulley (pulley attached to the motor shaft) to the width or wider than the belt by holding the adjustment collar and turning the black handle counter clockwise and roll the belt until flush with the spring-loaded pulley.



**ADJUSTMENT
COLLAR**



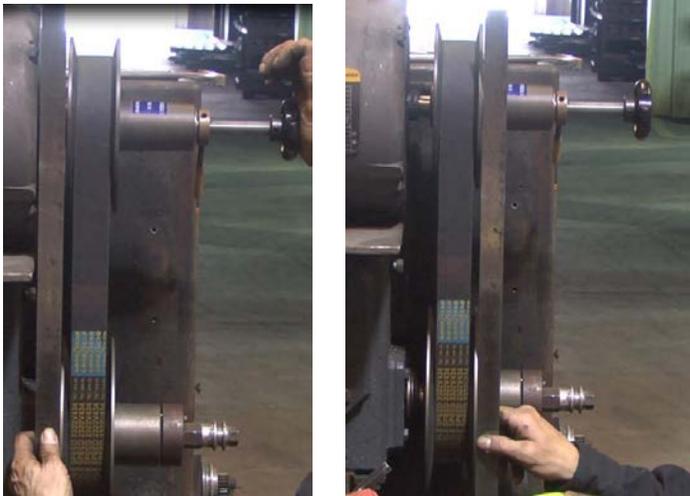
3. Start the blade motor and adjust the adjustable pulley to the point where the sound of the belt slipping stops. After this point has been reached, turn the adjustment collar on the adjustable pulley 1-1/2 rotations.



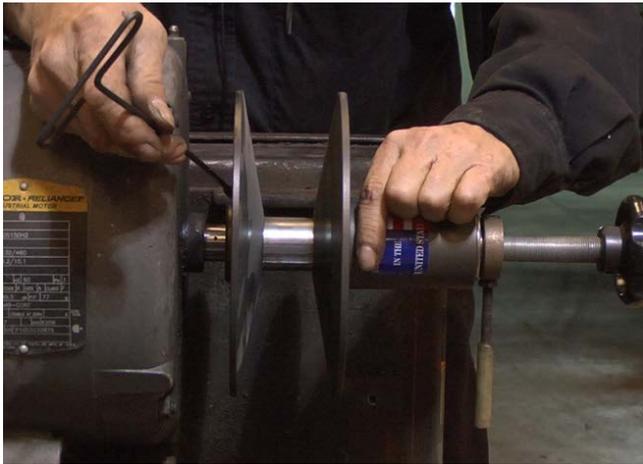
Belt is six inches across and is the same top and bottom.



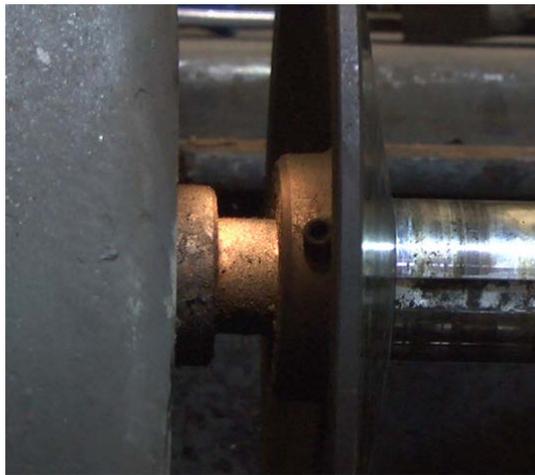
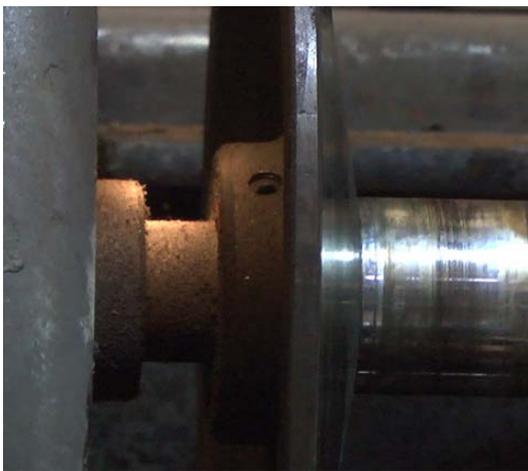
4. Adjust the adjustable pulley until the belt is parallel (the distance measured from edge to edge between the belt is consistent from one pulley to the other). Be sure to measure the distance and have the distance to be as close to equal as possible.



5. Check the flanges to check the alignment of the pulleys.



6. Loosen both of the set screws on either side (one touching the shaft and the other touching the key) the adjustable pulley.

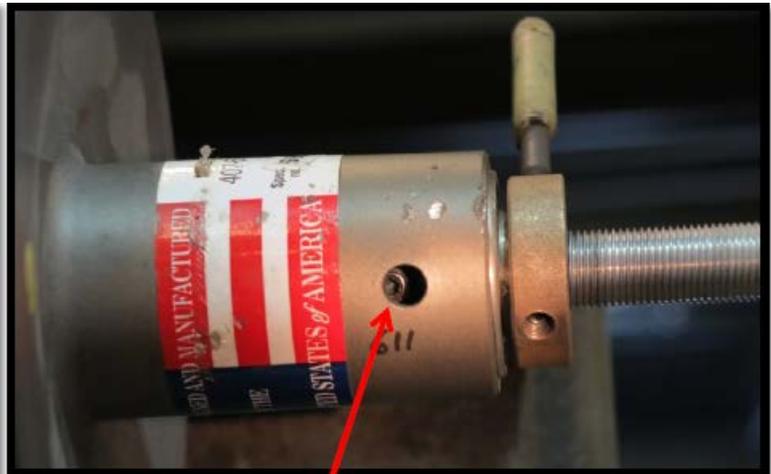
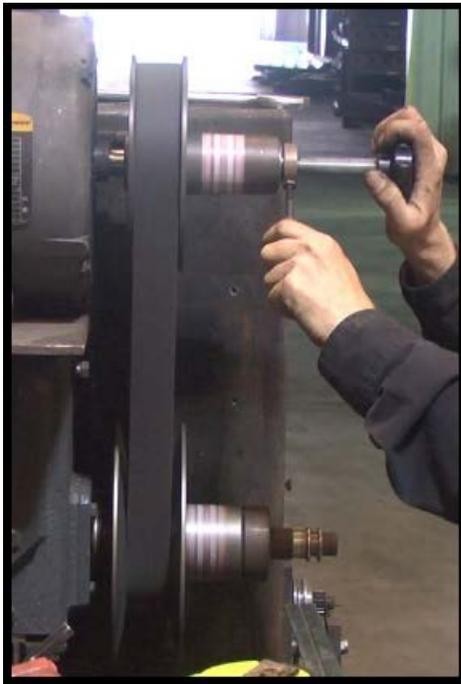




7. Move the adjustable pulley along the shaft until the flanges are equidistant from each other on all sides. Place a straight edge along the pulley flanges to check parallel. Tighten both of the set screws on the adjustable pulley afterward.

HIGH SPEED STOP

1. Adjust the vari-drive speed until the belt is level with the flanges and back it off slightly. This should align the pulley with the high speed stop.



High speed stop



2. Loosen the high speed spot set screw.

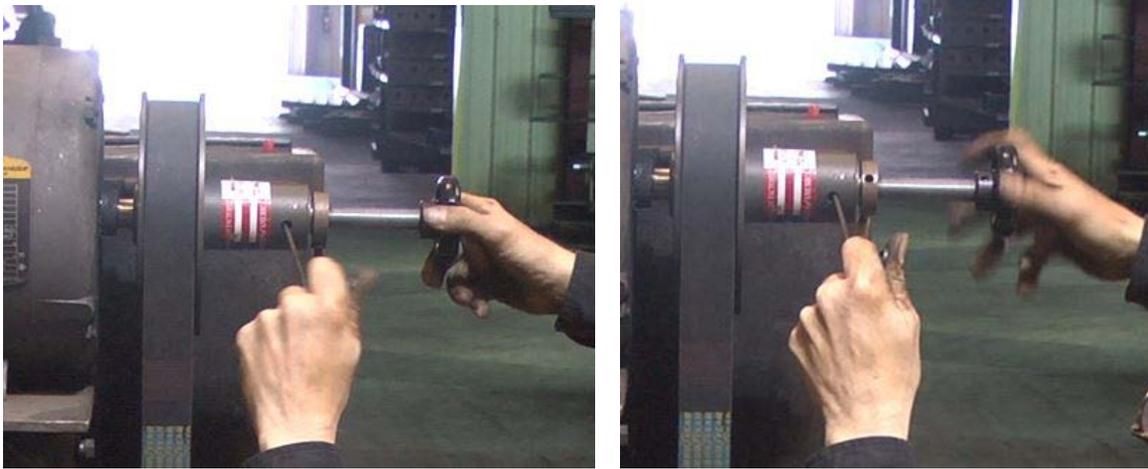


3. Keep the “T” handle in the set screw and adjust the pulley until the screw is touching the inside bearing (the bearing furthest away from the motor) and retighten the screw just enough so that it does not wander during the next actions.

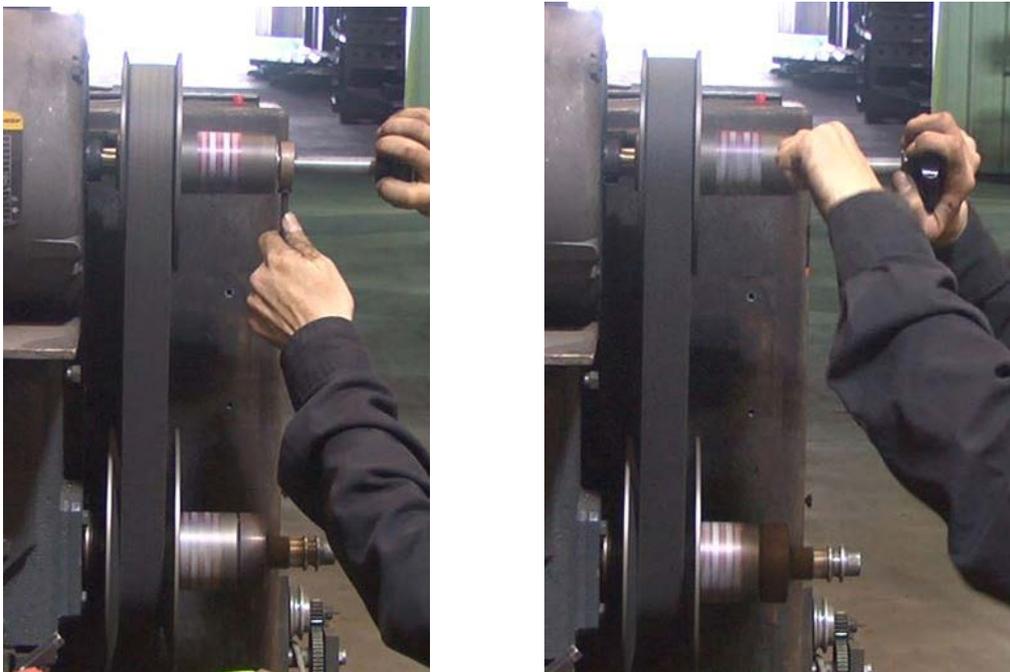


4. Lower the speed of the vari-drive slightly and repeat steps 2 and 3 until desired speed is reached.

5. Place the “T” handle into the set screw and back the adjustable pulley to the bearing and tighten the set screw.



6. Test the set screw by moving the adjustable pulley to a lower speed and then move the pulley back to a higher speed and try to go above it.



LOW SPEED STOP



1. After the High Speed Stop has been set move the adjustable vise so that the belt is flush with the flanges of the spring-loaded pulley (around 60 fpm).

2. Loosen the set screw on the black handle and run it down on the collar.

