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# Service Bulletin

## Title: Belt Position Change

**Number:** SB0002      **Date:** Saturday, October 22, 2005

**Product Identification:** PCNC 1100 Milling Machine, Serial Numbers 0006 to 0023

### Background:

Changing the belt from one speed ratio to another requires clearance around the motor belt pulley. The machine design allocates a generous clearance, allowing a belt position change in about 30 seconds. One component used in effected machines had missed a manufacturing step that increases the clearance around the motor pulley. On those machines the time required to change the belt position is typically 90 seconds, not 30 seconds. This is less convenient and outside of the machine specifications.

The clearance in question is between the motor pivot mount and left side of the motor pulley, shown in Figure 4. This is an issue of convenience and functional specification. This issue does not affect safety or precision of machine operation.

### Resolution:

There are two alternatives for resolution. On most machines the geometry allows the use of a longer V-belt. The longer belt swivels the motor away from the pivot point, thus increasing the clearance and allowing belt changes to be accomplished within specification.

The sheet metal guards are fabricated by skilled craftspeople and vary slightly in geometry. On certain machines there may not be enough room for the motor move away from the spindle and properly tension the drive belt. In those cases is not possible to substitute a longer V-belt. In those instances we recommend making the cut that had been overlooked during manufacture.

#### Resolution #1: Will the Longer Belt Fit?

A simple measurement can determine which of the two alternative solutions should be applied. The issue in question is how far can the motor be swiveled away from the spindle when there is no belt in place. In order to check this, simply remove the belt and swivel the motor away from the spindle, toward the column, then measure the gap between the top of the motor pulley and the top of the spindle pulley. The photos below show the use of a telescoping gage set to take the measurement, but other methods could be used as well.



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Figure 1 -Telescoping Gage



Figure 2 – Measuring Gap

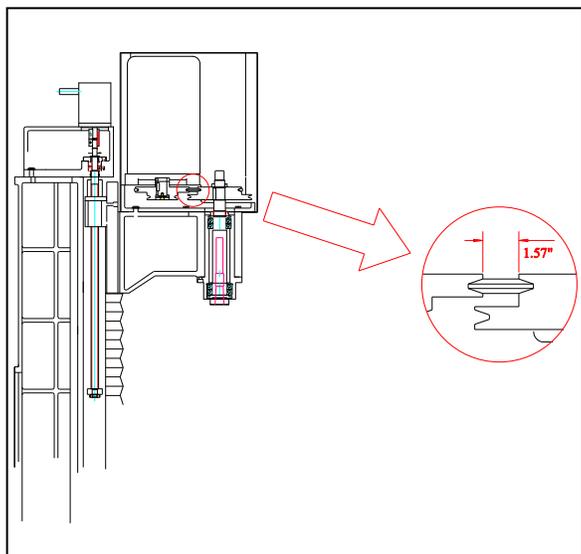


Figure 3 – Gap Location

The required distance is 1.57". If there is less than 1.57" then the larger size belt cannot be properly tensioned. Contact [support@tormach.com](mailto:support@tormach.com) and request the 3V300 belt if the gap is at least 1.57". We will ship a belt via USPS Priority Mail.

## Resolution #2: Trim the Casting

If you cannot use the longer belt, but you still want the convenience of a 30 second belt change, then the best solution is to make the cut that was overlooked in manufacturing. Figure 4 is a view from above, looking down on the spindle head. The belt clearance issue is between the motor pulley and the motor pivot point.

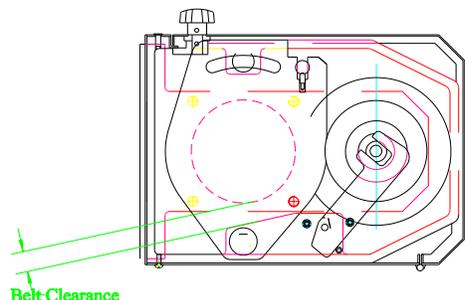


Figure 4 – Clearance Area

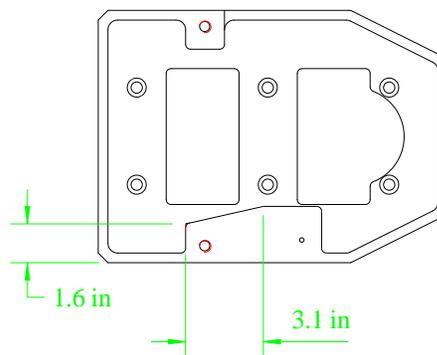


Figure 5 – Motor Base Dimension

Figure 5 shows the dimensions needed to trim motor base. The motor base is part #20 in the upper exploded view shown on page 10-2 of the manual<sup>1</sup>. There are 8 steps to the process.

1. Remove power to the machine.
2. Remove electrical connection to the motor.
  
3. Remove the motor and motor subplate. This requires unscrewing the motor lock handle on the right and the motor pivot on the left. The motor pivot is a 10 mm socket head cap screw. The photo shows the pivot being removed with an Allen bit on a socket drive extension. The motor and subplate will lift out as one piece.
  
4. Mark out the required cut using the dimensions of Figure 5. This is not a precision cut, layout dye is not necessary.



<sup>1</sup> Exploded view is also available online at [http://www.tormach.com/document\\_library/PCNC1100-Exploded-Upper.pdf](http://www.tormach.com/document_library/PCNC1100-Exploded-Upper.pdf)



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5. Protect machine from abrasive grit. In the photo you can see a plastic bag covering the spindle pulley and duct tape all around. Also important but not shown is protection of the lower section of the machine. You do not want the grit released from an abrasive wheel to get into any slideways, bearings, or end up in the bottom of your coolant reservoir tank.



6. Make the cut. The photo shows the use of a hand held die grinder. We find the cut may take 10 minutes with a small pneumatic die grinder. An electric angle grinder takes about 60 seconds to make the cut. You will be trimming off about 0.1" to 0.3" of iron. The casting is about 0.7" thick at this point.



7. Clean all abrasive grit. Don't just brush it out. Vacuum it clean with a shop vac. Wipe everything down with an oiled cloth before reassembly. The photo at right shows the completed cut and cleaned cabinet.



8. Reassemble in reverse order.

The entire process should not take more than 20 minutes if the tools are readily available. If you do not want to make this trim cut yourself, you can remove the part from the machine and ship it back to Tormach.