

Control Relocation Kit

Product Identification: Control Relocation Kit (PN 33302)

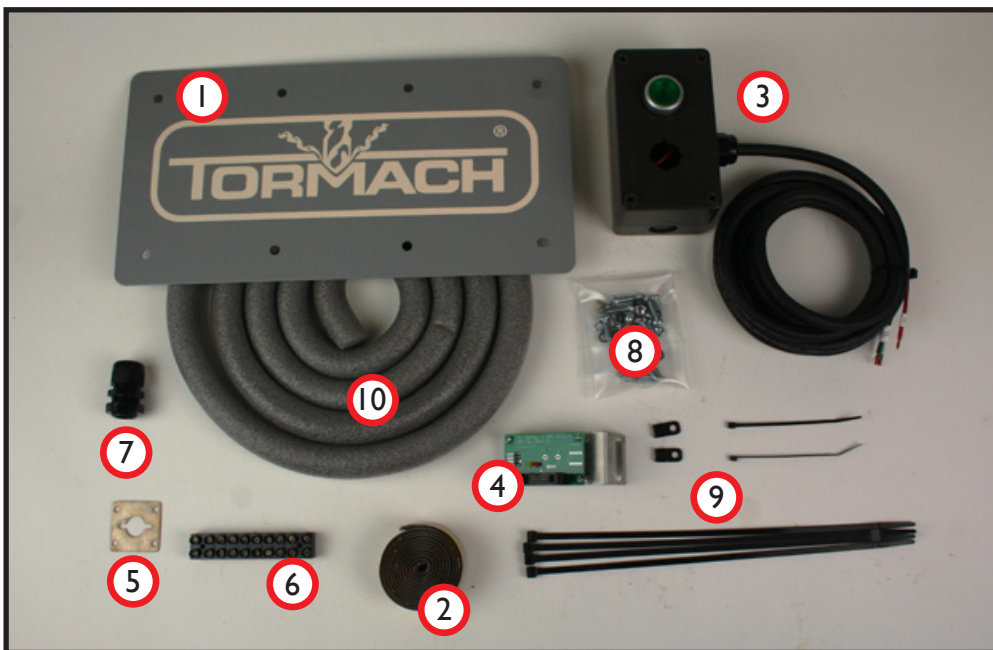
Purpose: This document details relocation of power controls for either the PCNC 1100 or the PCNC 770 when the full enclosure is installed. This installation removes the Operator Control Panel from the machine's electrical cabinet and is important for users wishing to move the E-stop and cycle start controls outboard. It also ensures there is no coolant contamination to the non-waterproof factory controls.

Item # Control Relocation Kit (PN 33302)

1	Cover plate
2	Butyl Rubber Tape
3	Remote Box with Cord
4	Circuit Board with Mounting Bracket
5	DIN Port Mounting Plate
6	Terminal Strip

7	Cord Grip
8	Miscellaneous Fasteners
9	Wire Ties
10	8' of 1" Round Backer Foam
11	1/8" Drill
12	3/16" Drill

NOTE: If any of these items are missing, contact Tormach Customer Service for a replacement at (608) 849-8381.



Required Tools

- 1" Hole Saw or UniBit
- Electric Drill
- Screw Drivers
- Wire Stripper Tool
- 7/8" Hole Saw or UniBit
- Razor Blade


IMPORTANT! After installing this product, the following changes apply:

- You will no longer be able to turn your coolant pump on manually. Use the software control for this (coolant will be wired in Auto mode permanently).
- With no controller On/Off switch, the operator must power off the controller and monitor (after following the *Power Off/On Procedure*, detailed below) by turning off the Main Disconnect on the side of the cabinet. The controller will power back on once the Main Disconnect is turned on. Machine and Controller LED's will be replaced.
- The Series 3 Load meter (PN 32096), is not compatible with this kit.

NOTE: Some parts will be removed from your machine during installation; set aside for later use.

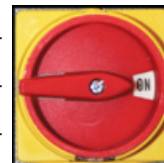
Installation

1. Power off mill according to *Power Off/On Procedure* detailed below.

 **WARNING! Electrical Shock Hazard:** Be sure to power off machine before making any electrical modifications. Failure to do so may result in serious injury or death.

Power Off/On Procedure

Power Off	1. Push red E-stop button in
	2. Click <i>Exit</i> on screen; when prompted click <i>OK</i> to power off
	3. Turn Main Disconnect <i>Off</i> (see image at right)
Power On	1. Turn Main Disconnect <i>On</i> (see image at right)
	2. After software loads, turn red E-stop clockwise to release
	3. Press green <i>Start</i> button
	4. Click <i>Reset</i> on screen



2. Open up the wire tray cover and disconnect all wires from the two locations in the back of the Operator Panel, as seen in **Figure 1**. The PCNC 1100 Series 3 is shown, other machines are similar.

NOTE: If your machine did not come equipped with a terminal strip mounted just inside the door, then disconnect each wire at its termination point on the buttons and other components mounted to the back of the Operator Panel.

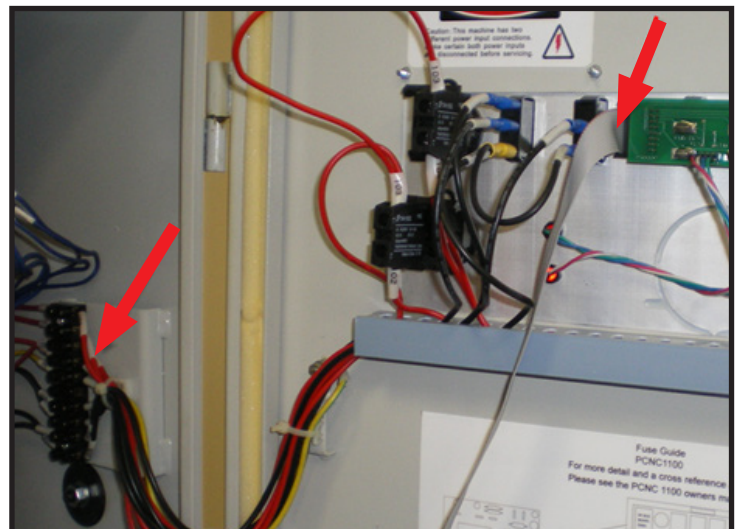


Figure 1

2. Unplug the DIN connector; unscrew and remove the DIN socket (see **Figure 2**).
3. Using a small screwdriver, pull up on the E-stop lock tab to release the E-stop switch (see **Figure 2**). Unscrew the plastic nut holding the E-stop to the panel.

NOTE: The items in Steps 2 and 3 will be reused; set them aside. The remaining Operator Panel and its components can be discarded.

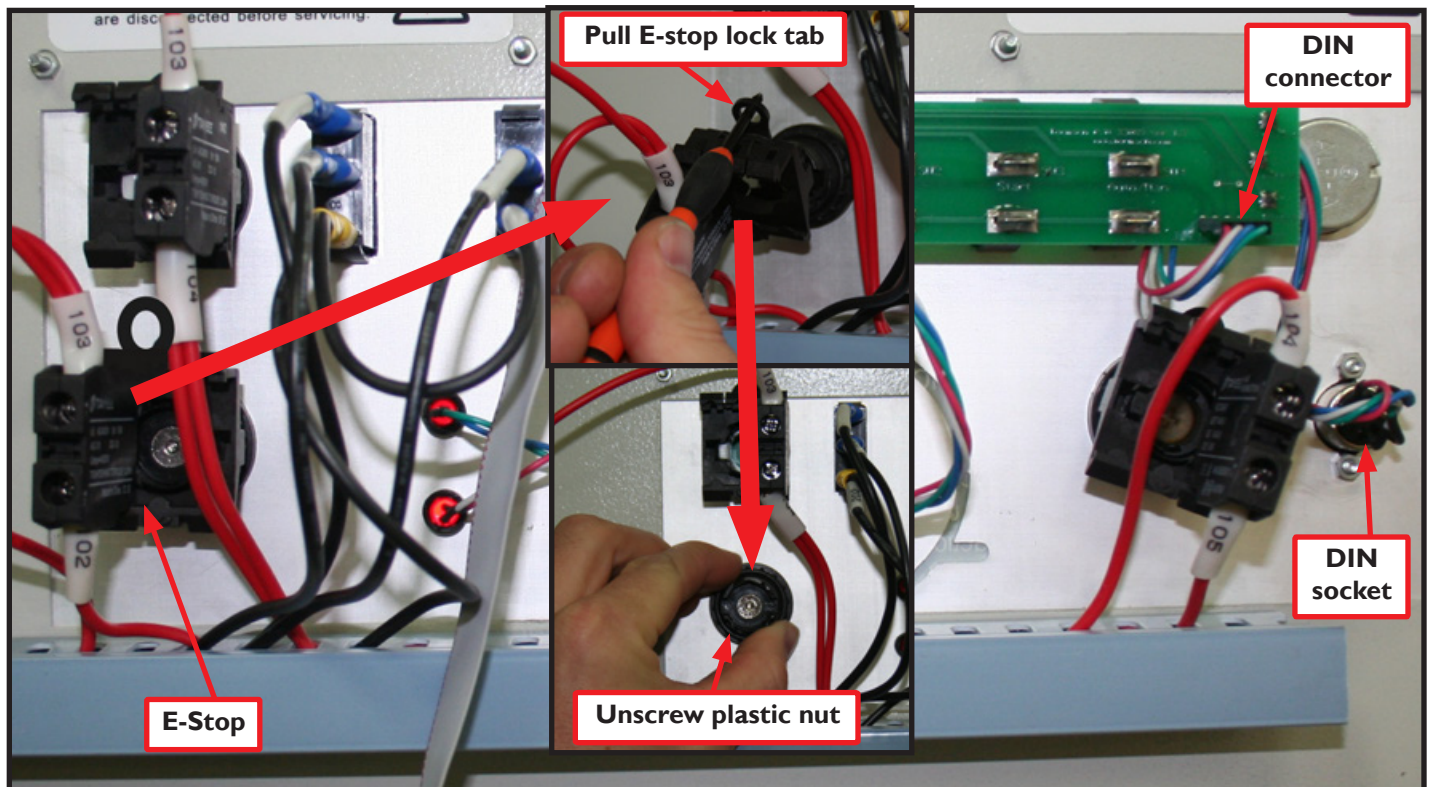


Figure 2

4. Unroll the butyl tape and apply to the perimeter of the new cover plate, on the back surface (see **Figure 3**). Peel back the paper from the tape. Visually inspect to ensure that a complete seal is made around the outer edge, particularly near the top.

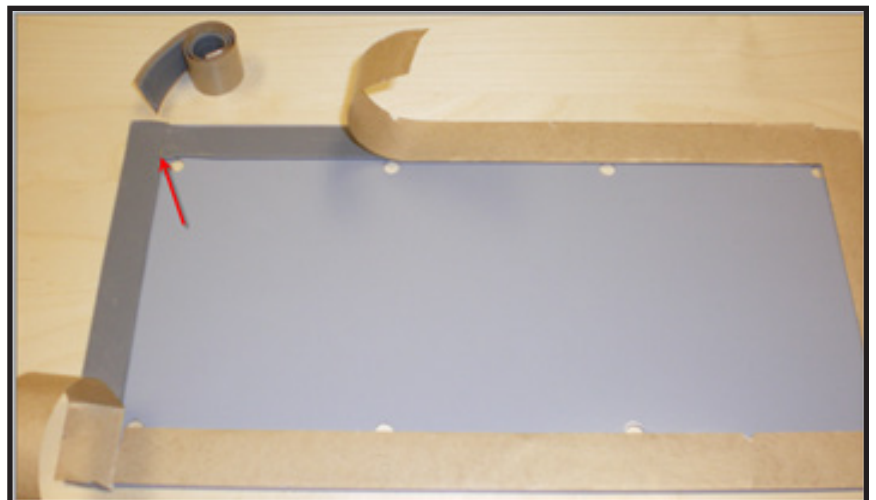


Figure 3

5. Install the cover plate to outside of the electrical cabinet door using the eight M5 Phillips head screws, lock washers and hex nuts (see **Figure 4**). The nuts should be snug to ensure a good seal. Some trimming around the outer edge may be required.
6. Mount the DIN socket at mid height on the right side of the cabinet (see **Figure 5**). Note the ribbon cable (disconnected in step #1) must be able to reach the new PCB, and the cabinet door must be able to close without hitting the ribbon cable plug. Drill a 1" diameter hole using a hole saw or Unibit.

IMPORTANT: Be careful not to damage electrical wiring located on the inside of the cabinet. Also make sure metal drill/saw shavings do not damage wiring.

7. Mount the DIN socket (removed from your Operator Panel in step #3) to the DIN Port Mounting Plate (Item #5) as seen in Figure 5. Using the DIN connector and plate as a template, mark the positions for the four mounting screws. Using a 1/8" drill bit, drill the four mounting holes. Use the four provided screws and nuts to mount the DIN Connector, Mounting Plate and Circuit Board with Bracket (Item #4) as seen in **Figure 5**. Finally, connect the four wire DIN plug and the ribbon cable.

IMPORTANT! Be sure to connect the DIN as shown in **Figure 5** (green wire in the top position).



Figure 4

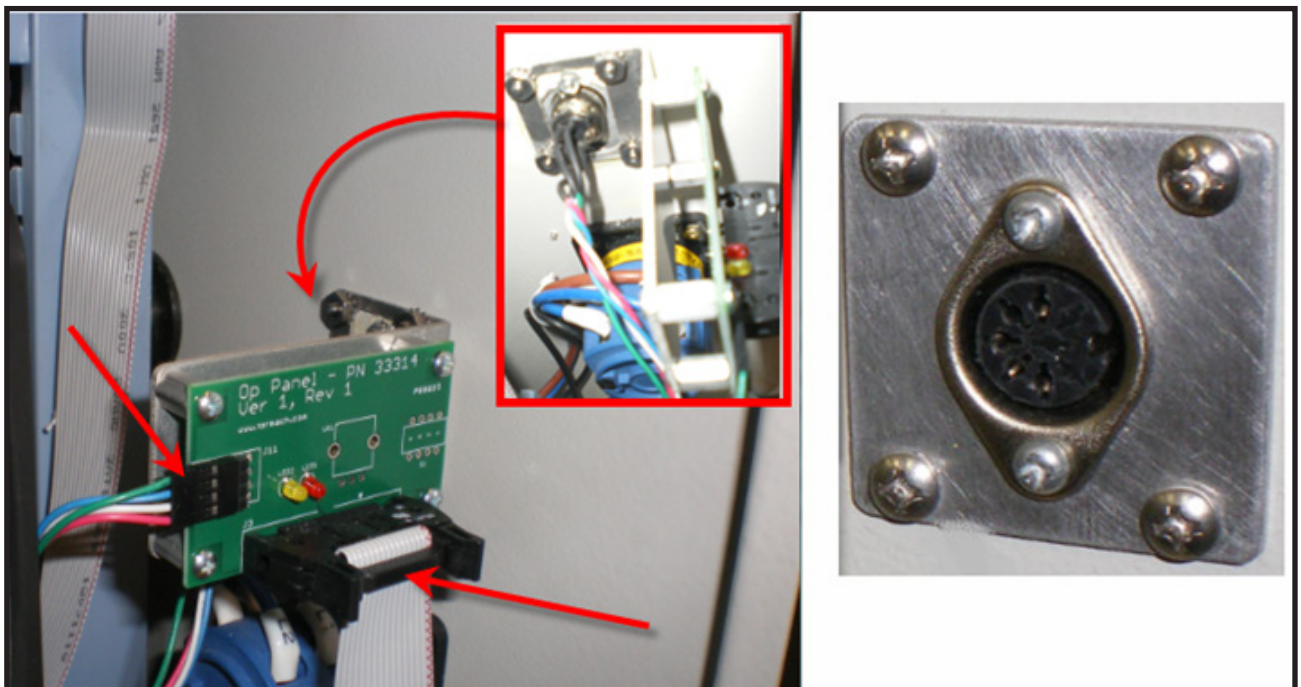


Figure 5



Technical Document

8. Mount the E-stop button base, and contact block (removed in step 3) into the open hole in the Remote Box (Item #3) as seen in **Figure 6**. Connect the contact block to the Red (102) and Black (103) wires. Polarity is not critical.

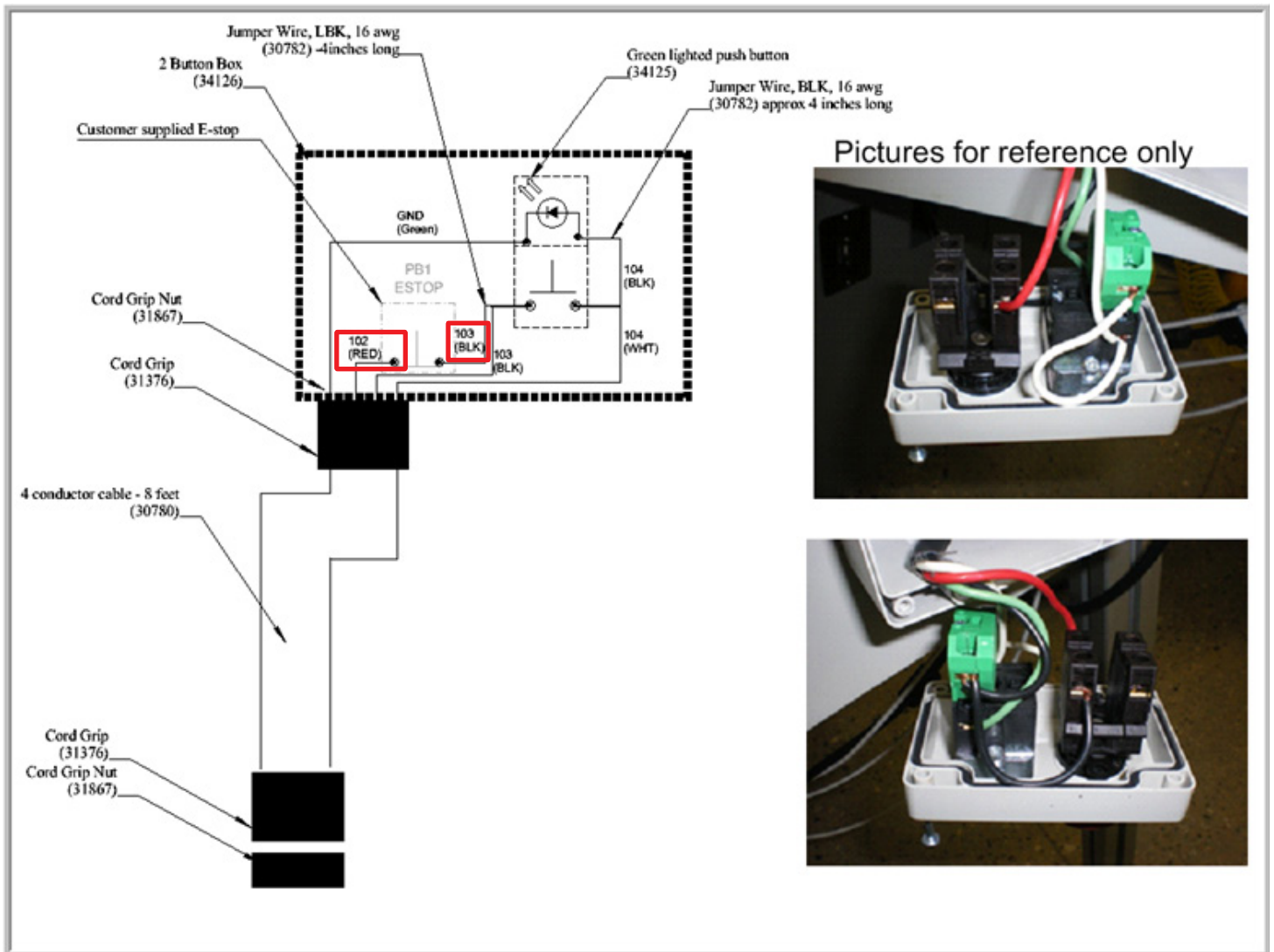


Figure 6

9. Before screwing the box together, first mount it (see **Figure 7**). Choose a surface that is easily accessible and won't be accidentally bumped. Drill 1/8" holes through the bottom of the box, taking care not to damage the wires. Use the mounting screws provided.



Figure 7

10. Mount the box lid and tighten down the four screws.
11. Route the cable in a convenient manner towards the electrical enclosure. Some machines may already have an extra hole and cord grip mounted in the bottom of the cabinet, if not, use a 7/8" hole saw or Unibit to drill a hole through the cabinet wall.

IMPORTANT! Be careful where you drill and avoid damaging electrical components/wiring. Keep debris and metal chips away from electrical components.

12. Route the Remote box cable through the hole. Do not tighten down the cord grip at this time, as some adjustment may be needed to reach the connection points.
13. Three Terminal Strip wires need to be relocated as indicated in Figure 8. Also refer to the final wiring images shown in **Figures 9 and 10**. The purpose of relocating these wires is to replace the following hard switches in the old Operator Panel: Controller ON/OFF, Coolant ON/OFF/AUTO, Spindle Lock Out ON/OFF

IMPORTANT: Be sure to follow the rewiring instructions in Figure 8 that are specific to your mill (either PCNC 1100 or PCNC 770).

NOTE: If your machine does not have a terminal strip, drill two 3/16" holes and mount the included Terminal Strip.

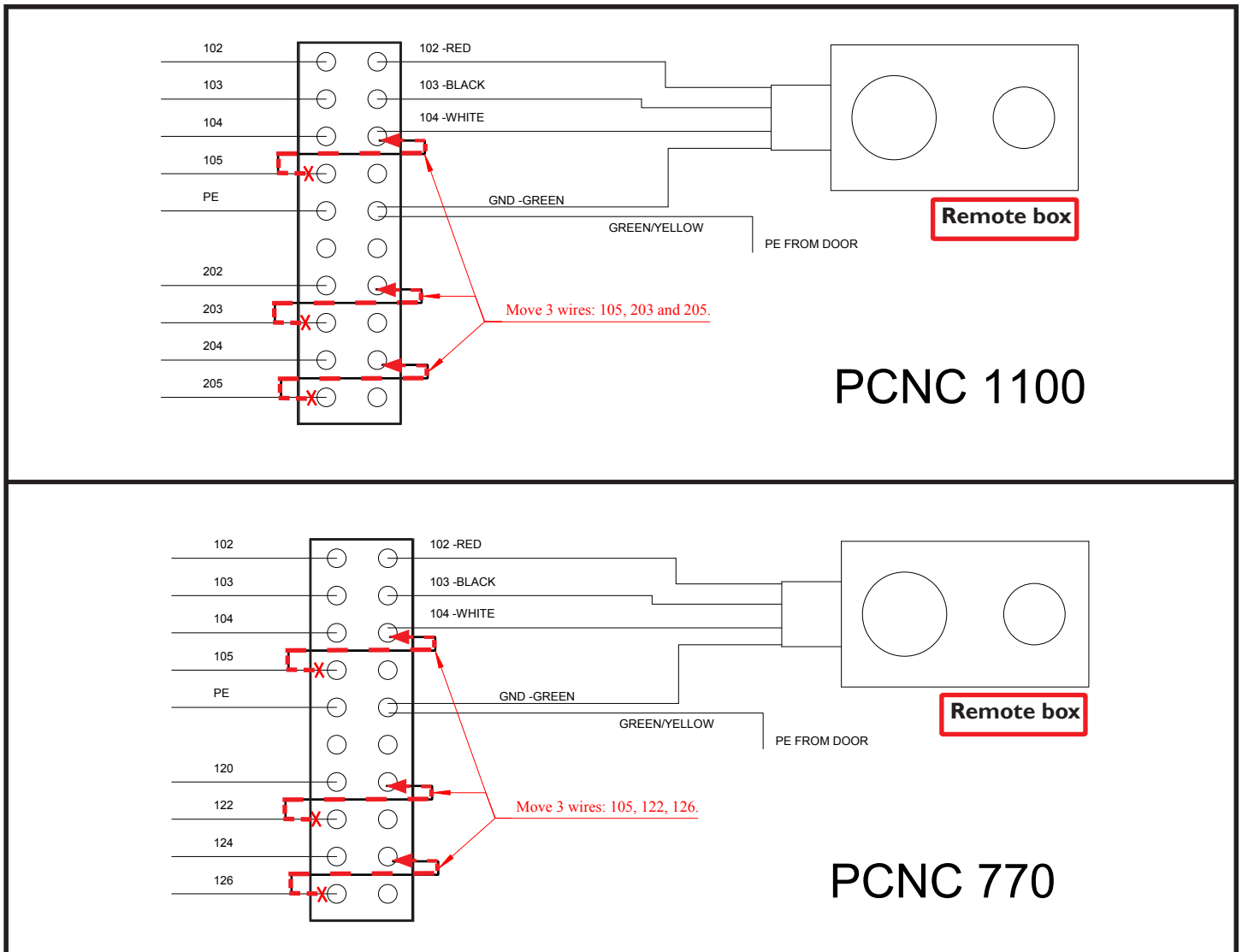


Figure 8

14. Drill an 1/8" hole near the terminal strip for mounting a cable tie (if one is not already in place). When your wiring is complete, the inside of your electrical cabinet should look as seen in **Figure 11**.

15. Next, disconnect yellow-green ground cable from cabinet door (see **Figure 11**).

16. Remove cabinet door by lifting up and off hinges.

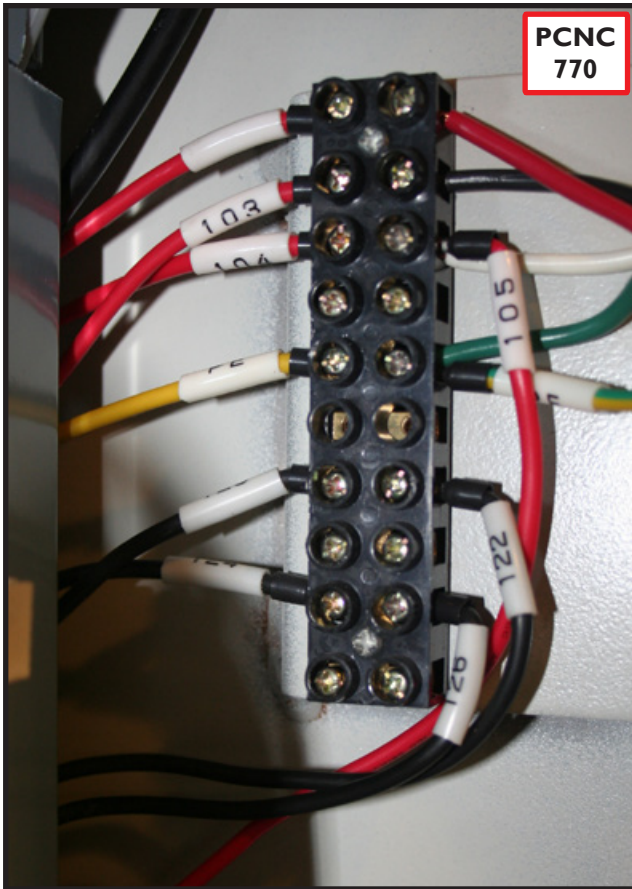


Figure 9

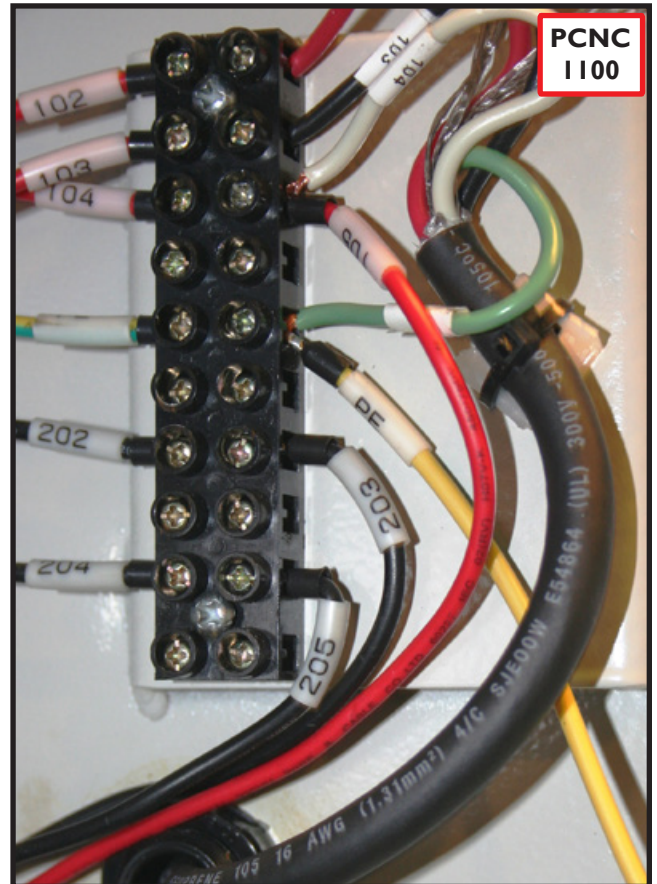


Figure 10

NOTE: LEDs: The machine and controller LED's are not critical to the day-to-day usage of your PCNC 1100 mill, but are very handy when trying to troubleshoot problems. For this reason, we have replaced panel-mounted (red) LEDs with two smaller board-mounted LEDs (see Figure 14).

For your reference:

RED = Machine

YELLOW = Controller

This kit involved significant changes to the general machine electrical schematic. Due to the numerous machine configurations offered by Tormach over the years, it is not feasible to re-issue appropriate schematics for your individual set up.

Test procedure to ensure all functions work properly

1. Pushing the E-stop button should shut down all internal components (nothing lit up in the cabinet)
2. Pushing the Green start button (after pulling out the E-stop button) should power up the cabinet.

NOTE: VFD should not power up at this point. The green start button should now illuminate.

3. Check that the coolant pump starts by clicking the Coolant button on the screen.
4. Check that the red machine LED is lit on the new circuit board.



Figure 11

18. With electrical cabinet door laid on a flat surface, remove existing door foam and replace with 1" Round Backer Foam; press into the slot around entire door perimeter (see **Figure 12**).

NOTE: To make this process easier, use a blunt tool like an Allen wrench.

19. Using a sharp razor blade, trim the backer foam off flush with door surface (see **Figure 13**).

NOTE: To allow door to close easily, it may be necessary to trim backer foam below door surface.

20. Re-attach door to mill and reconnect yellow-green ground cable to cabinet door (see **Figure 11**).



Figure 12



Figure 13

5. Click the *Reset* button on your control screen, and verify that the yellow controller LED is lit on the new circuit board (see **Figure 14**).
6. If you have a probe, or other accessory that uses the Accessory DIN port, verify that this functions properly.
7. Verify that the controller/monitor outlets shut down when turning off the main disconnect.

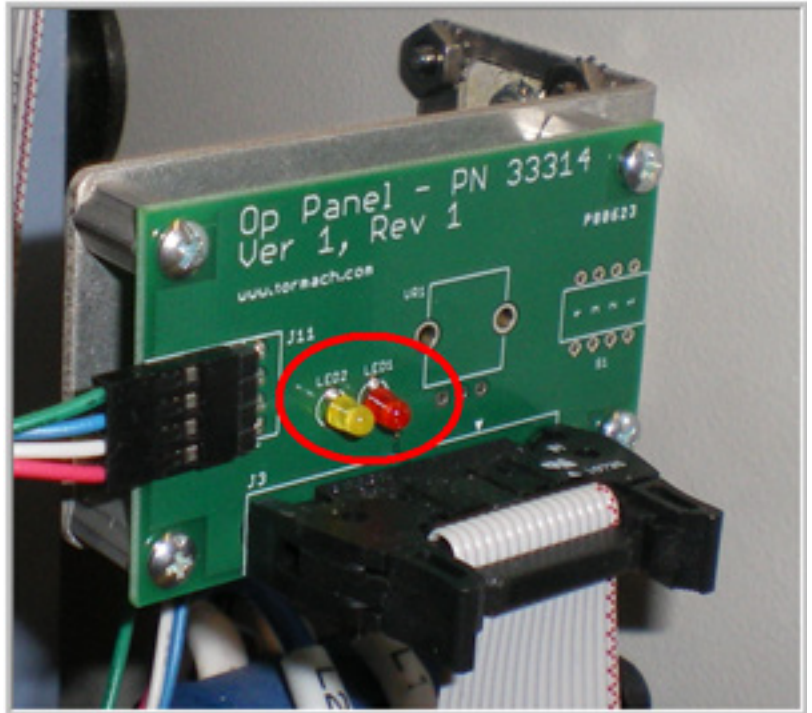


Figure 14