



Enabling Your Ideas

Technical Document

Switchable Outlet Kit Install

Product Identification: Switchable Outlet Kit (PN 33043)

Purpose: This document details installation of a switched outlet to PCNC 1100 and PCNC 770 stands, primarily for coolant control.

Overview

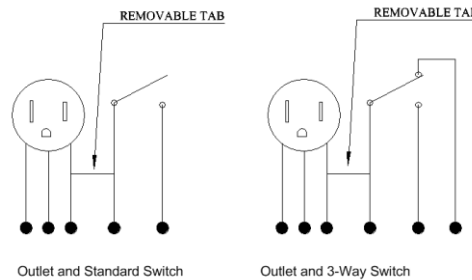
This document describes a method for adding a switched outlet to the stand of a PCNC milling machine, primarily for coolant control. The standard Tormach mill configuration provides an AC switched outlet at the bottom of the control cabinet which can be operated either under manual control from the console or via automatic control using the M codes (M7, M8, M9). By adding a switched outlet this AC power can be directed to either the internal flood coolant or to a surface outlet where any low current AC device can be controlled.

Limited to Low Power Devices: The coolant control circuit is designed to handle very low power devices, less than 1/6 hp (125 watts). Larger pumps, shop vacuums, or other high current devices will blow a fuse in the machine cabinet. If you wish to control larger current devices, we recommend the External Contactor Kit (PN 33044).



Beware of Inductive Devices: Using this outlet to switch inductive loads may induce electrical noise and create problems with machine control. This would be things such as pneumatic valves, electrical motors, or contactors. This issue is further explained in Tormach Service Bulletin *Problems from Electrical Noise* (SB0039) and potentially resolved by the Tormach Electrical Noise Suppression Kit (PN 33059).

Variations: This document is intended as an instruction for installation of the Switchable Outlet Kit, but may also be used as inspiration for those who wish to create their own machine enhancements using common hardware items. If you decide to assemble a kit using your own parts, be aware that the switched outlet device is a combination grounded outlet and 3-way switch. It looks similar to the commonly available combination devices however most building supply outlets only offer combination outlet and standard switch. A standard switch can only turn power on and off. A 3-way switch is necessary for directing power to one of two devices in a mutually exclusive manner. They look similar but act very differently. Comparison photos and schematics are shown below.



Required Tools:

- Phillips screwdriver
- Wire stripper
- Electric drill
- Pliers
- Wire terminal crimping tool

Procedure

Begin by installing the cord grips in the outlet box. Note that two locknuts are used on each in order to keep the threaded section from taking up too much space inside the box.



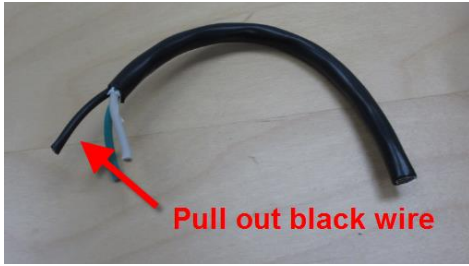
Next cut the power cord in half and cut off a short section to be used later for a jumper.



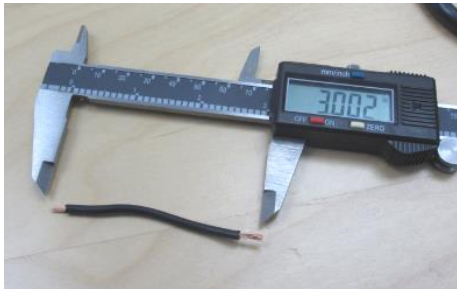
Then run the cords through the cord grips. Leave the cord grips loose.



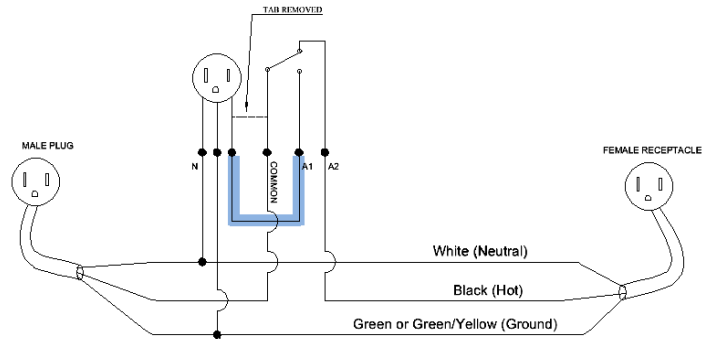
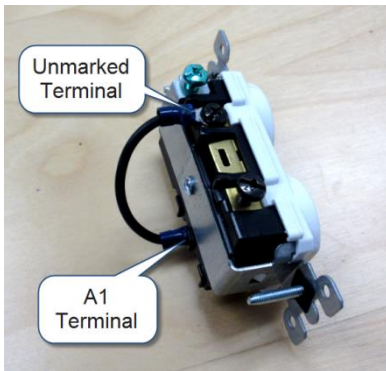
Now pull out the black wire from the short piece of cord.



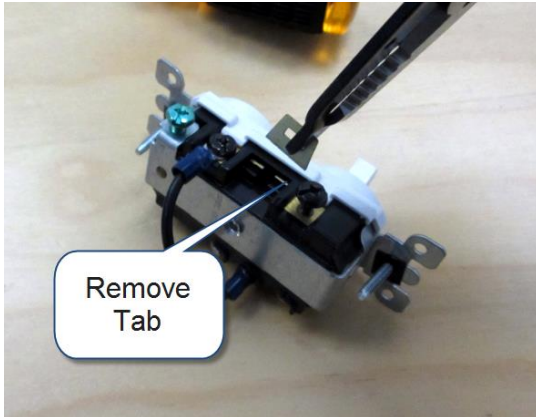
Cut it to about 3" in length and crimp a terminal on each end.



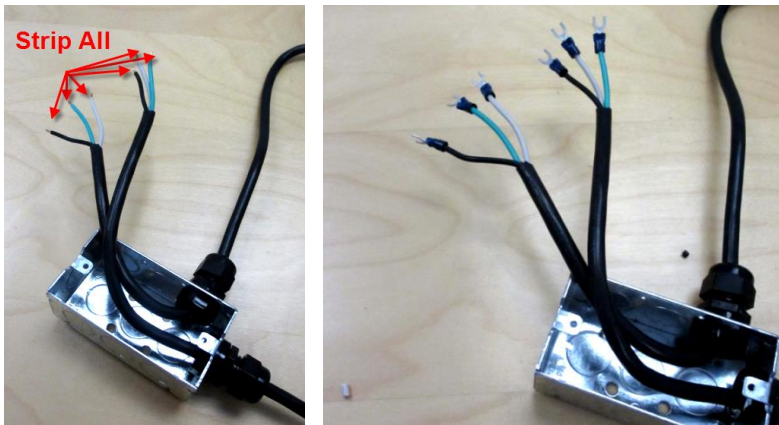
Now add this jumper between the A1 terminal and the unmarked terminal next to the green screw. This is seen in the photo below and creates the blue highlighted section of the schematic.



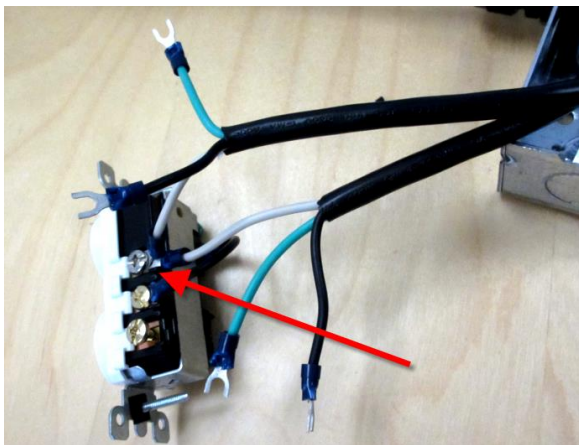
Next, remove the jumper tab.



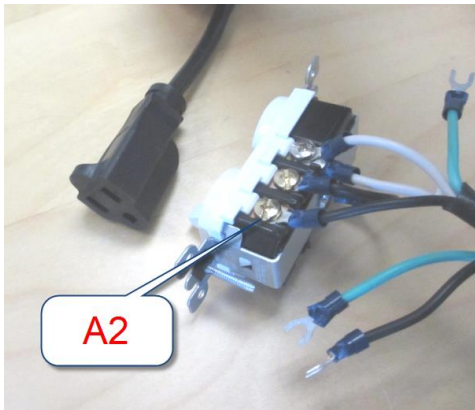
Now strip all of the wires on the cord ends and add a crimp connector to each wire.



Both white wires will go to the terminal with the silver colored screw marked as terminal N.



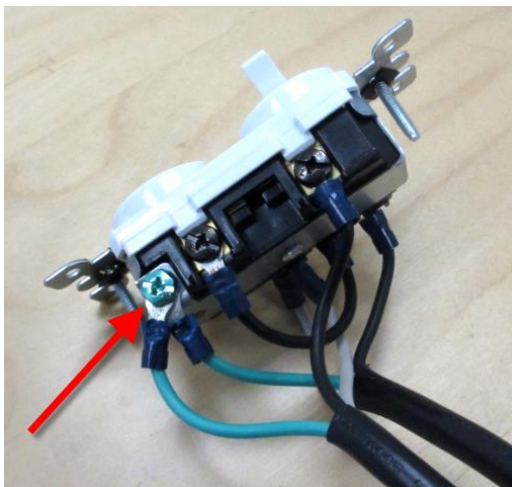
The black wire from the female end of the cord will go to the terminal marked A2. This is a brass colored screw.



The black wire from the male end of the cord will go to the terminal marked COMMON. This will be a black screw.



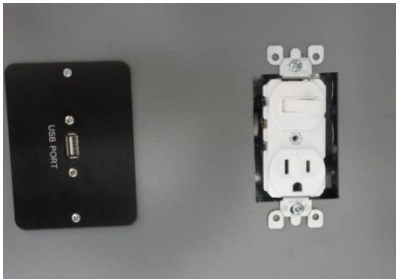
The green wires from both cords go to the green screw.



To install the outlet you will likely need to drill out the holes in the PCNC cabinet. These will have a 6-32 thread but the combination outlet will screw into the box, not the cabinet. The holes in the cabinet need to be clearance holes.

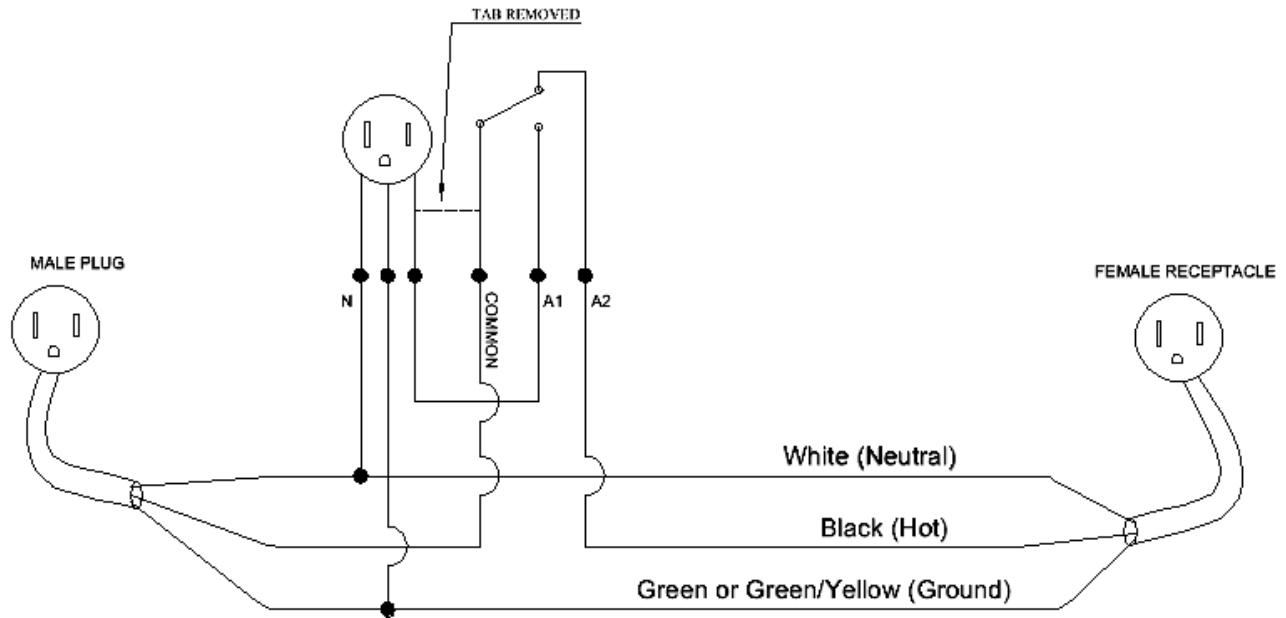


Now screw the combination device into the electrical box, with the cabinet between the box and the device.



Reach around inside the cabinet to tighten the cord grips and you're all done with the wiring.

This is what you have created.



Before this enhancement the coolant pump would have been plugged into the outlet at the bottom of the machine cabinet, as shown in Section 2.6 of the PCNC manual. With this enhancement you'll plug the internal coolant pump into the female end of the system you just added and plug the male end into the cabinet where the pump was originally plugged in.

If you have completed the assembly correctly then the switch position toward the operator provides conventional internal coolant pump and switched away from the operator will power the new outlet. Remember to only use pumps or devices that are 1/6 hp (125 watts) or less. For controlling larger power devices you'll need to add an external contactor kit.