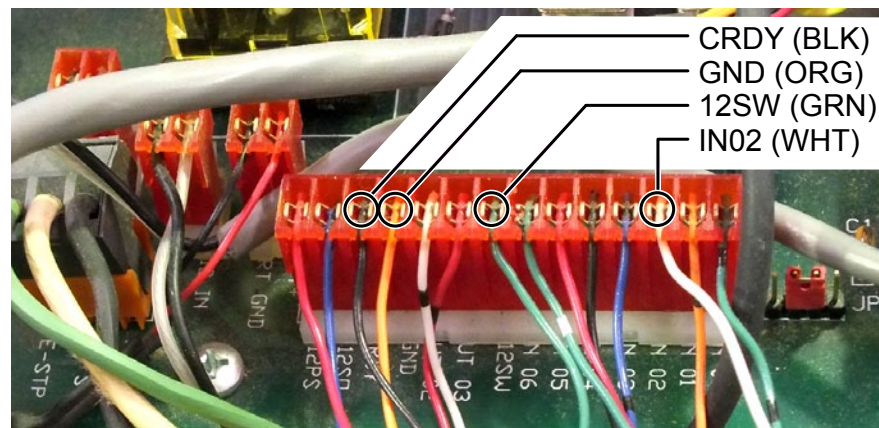
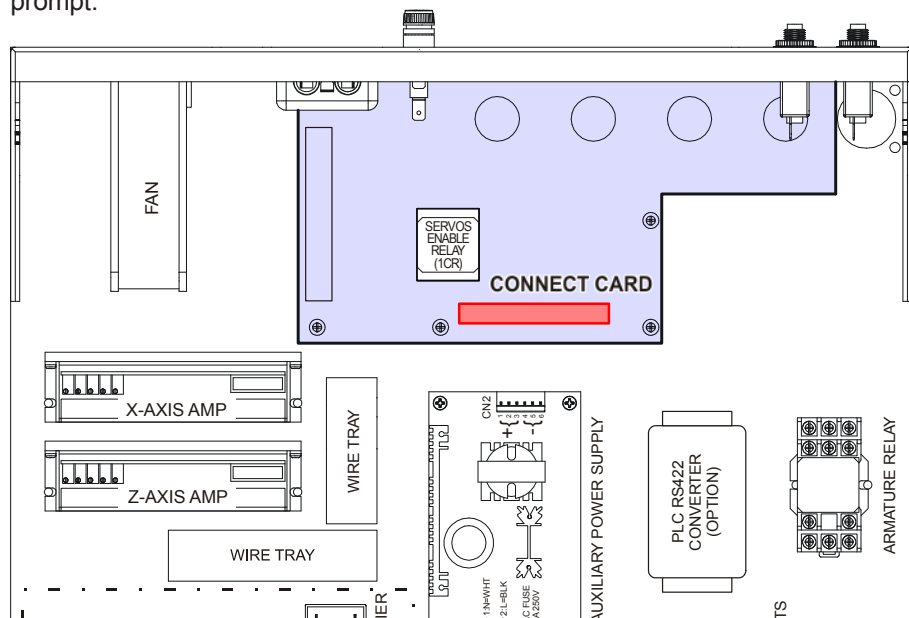


G3 CNC: Troubleshoot Can't Turn Servos On

First verify E-Stop switches on CNC and on Palm Box (Operator's Station) are dis-engaged.

Next, swap the Servo Enable Relay (1CR) with the M08 Relay in the Spindle Drive cabinet.

If the E-Stop switches are disengaged, and you've swapped 1CR with M08, but you still cannot turn on the servos, you will need a voltmeter to troubleshoot the problem. Remove the blue cover of the CNC and locate the red header connector on the Connect Card. Measurements are taken at the “Turn Servos On” prompt.



At “Turn Servos On” prompt:

First verify E-Stop switches on CNC and on Palm Box (Operator's Station) are dis-engaged; next, swap 1CR with M08 in spindle drive cabinet.

1. Put black meter lead at GND and red meter lead at 12SW; the meter should read about +12VDC. (GND to 12PS)
2. Leave red meter lead at 12SW and move black meter lead to CRDY; meter should read about 11VDC. (CRDY to 12SW)
3. Move black meter lead to GND and red lead to CRDY; meter should read about 1VDC. (GND to CRDY)
4. Write down the readings and read the description below for more information.

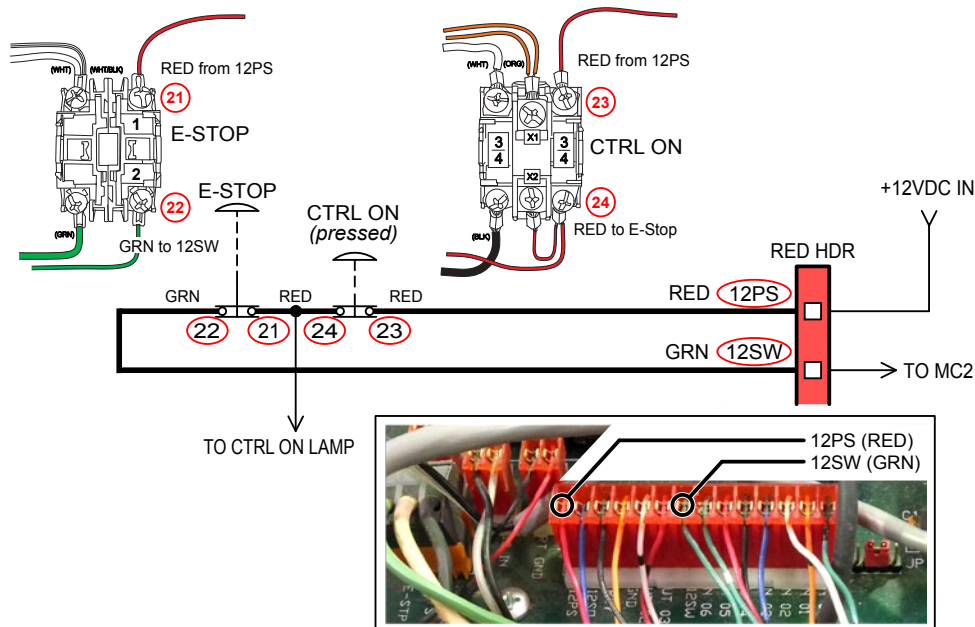
Description:

If the 12VDC is NOT present from GND to 12SW (#1 above), there is open circuit between 12PS and 12SW. See next page for continuity testing.

If the 12VDC IS present from GND to 12SW (#1 above) but CRDY to 12SW is NOT about 11V (#2 above), the wide ribbon cable may not be connected properly, or the ribbon cable or connect card has a bad connection. It is much more likely to be a connection problem than a malfunction of the MC2 card, since if the card fails to initialize you don't get the “Turn Servos On” prompt. Unplug and replug the wide ribbon cable at both ends; examine both ends to insure that the wires are all seated firmly between connector body and top.

If the CRDY to 12SW is about 11V (#2 above), there is an open connection in the wiring to the Servo On switch, or a bad contact on that switch. To verify Servo On switch circuit, put black meter lead at GND and red lead at IN02; the meter should read about +12VDC. Press the Servos On button; the voltage should drop to about +1VDC. If the voltage drops to +1VDC, and the servos don't turn on, 1CR is bad. If the voltage doesn't drop, but stays at about +12VDC, the Servos On switch is bad, or there is bad connection to or from the switch. See next page for continuity testing.

Continuity Tests

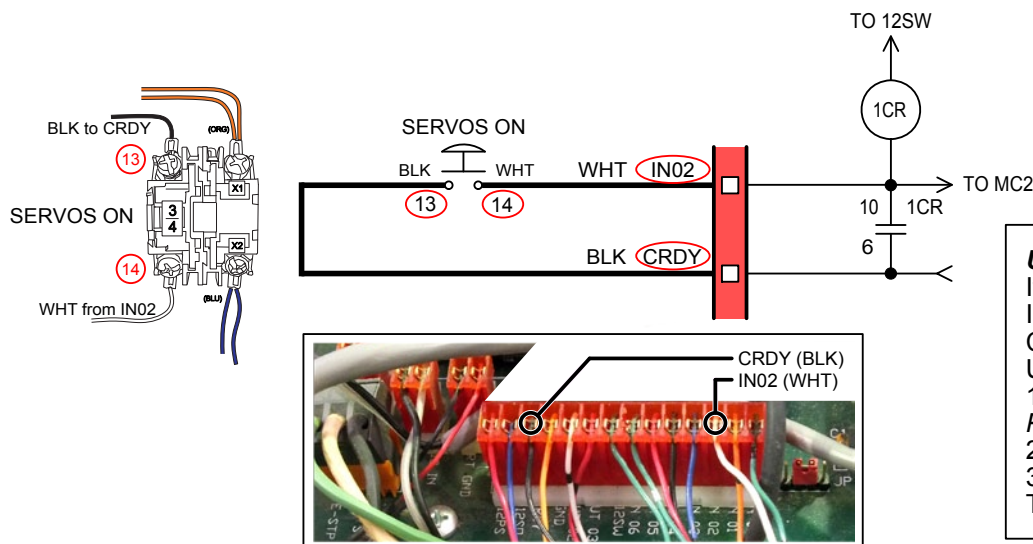


UNPLUG THE CNC FROM THE POWER RECEPTACLE!

If the 12VDC is NOT present from GND to 12SW (#1 prev page), then there is open circuit between 12PS and 12SW. **UNPLUG THE CNC FROM THE POWER RECEPTACLE**, press Ctrl On switch, dis-engage front panel E-stop, then use your continuity tester or ohm meter to check:

- 1 - 12PS (RED) to Ctrl On switch 23 (RED)
- 2 - 12PS (RED) to Ctrl On switch 24 (RED)
- 3 - 12PS (RED) to Estop switch 21 (RED)
- 4 - 12PS (RED) to E-stop switch 22 (GRN)
- 5 - 12PS (RED) to 12SW (GRN)

The open circuit is wherever you didn't get continuity



UNPLUG THE CNC FROM THE POWER RECEPTACLE!

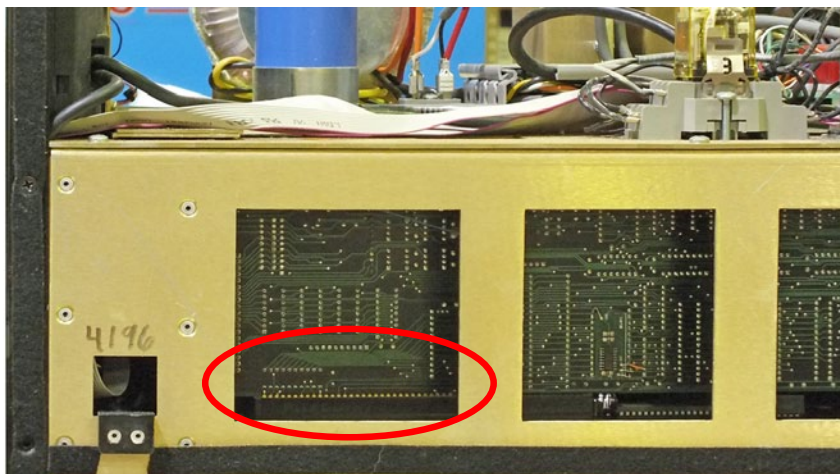
If CRDY to 12SW is about 11V (#2 prev page) but GND to IN02 stays at about +12VDC, there is open circuit between CRDY and IN02.

Use your continuity tester or ohm meter to check:

- 1 - IN02 (WHT) to Servos On switch 14 (WHT)
- Press and hold Servos On switch
- 2 - IN02 (WHT) to Servos On 13 (BLK)
- 3 - IN02 (WHT) to CRDY (BLK)

The open circuit is wherever you didn't get continuity

To Check the CRDY signal at MC2



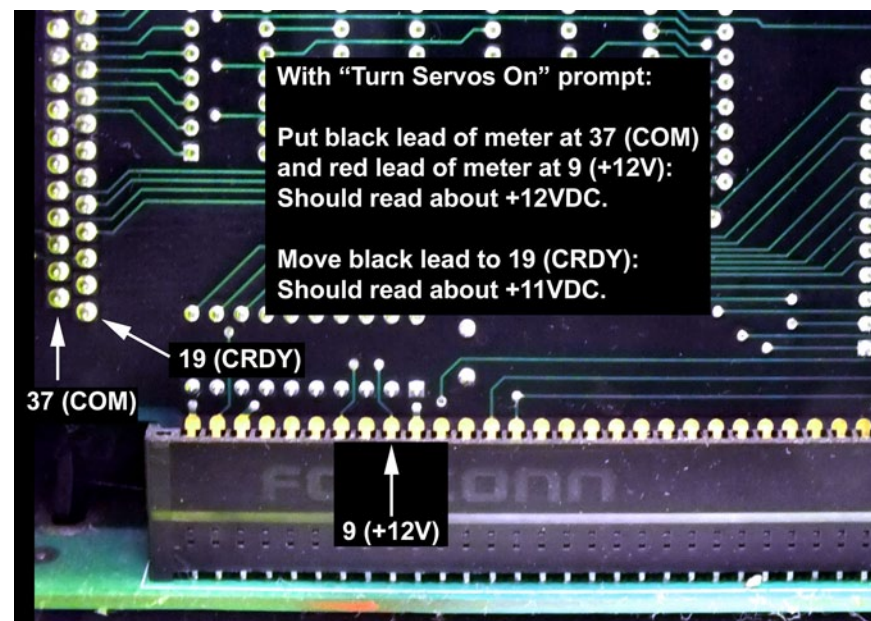
Locate MC2

Turn on the control and get to the "Please turn on servos" prompt. (Since you're here, press the Servos On pushbutton, just to see if the issue 'fixed itself').

If the servos don't come on, remove the blue cover and look at the exposed printed circuit card. This is the backside of the MC2 card.

At "Turn Servos On" prompt:

- Put black lead of meter at 37 (COM) of vertical row of pins, and red lead of meter at 9 (+12V) of horizontal row of pins: Should read about +12VDC.
- Move black lead to 19 (CRDY): Should read about +11V.
- If it isn't about +11V, the MC2 card is not producing it. The output IC that produces the signal may have failed. If the MC2 failed to initialize, you'd never see the "Please turn servos on" prompt. See *next page for instructions to replace the output IC*.



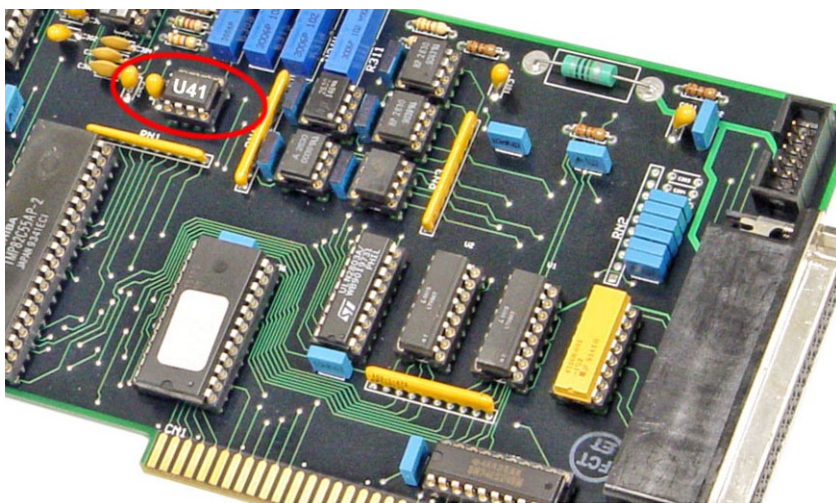
To Replace U41

To access the MC2 card you must remove the top chassis from the control.

Remove U41 by slipping a small screwdriver under one end of the IC, then the other, alternately lifting each end of the IC by a small amount so as not to bend the leads.

Replacement U41 (SN75452BP) is available at DigiKey:
<https://www.digikey.com/en/products/detail/texas-instruments/SN75452BP/277393>

When installing the new one, be sure you orient it correctly. Pin 1, which is marked by either a dot or a half-circle depression in the plastic case of the chip, goes to the left (away from the 37-pin connector). Be sure all the pins on the chip are well aligned with the socket when you push it in, making sure that no pins get bent under the body of the chip. It's easy to bend them but hard to straighten them w/o breaking them off.



To access "Lower Half"

