





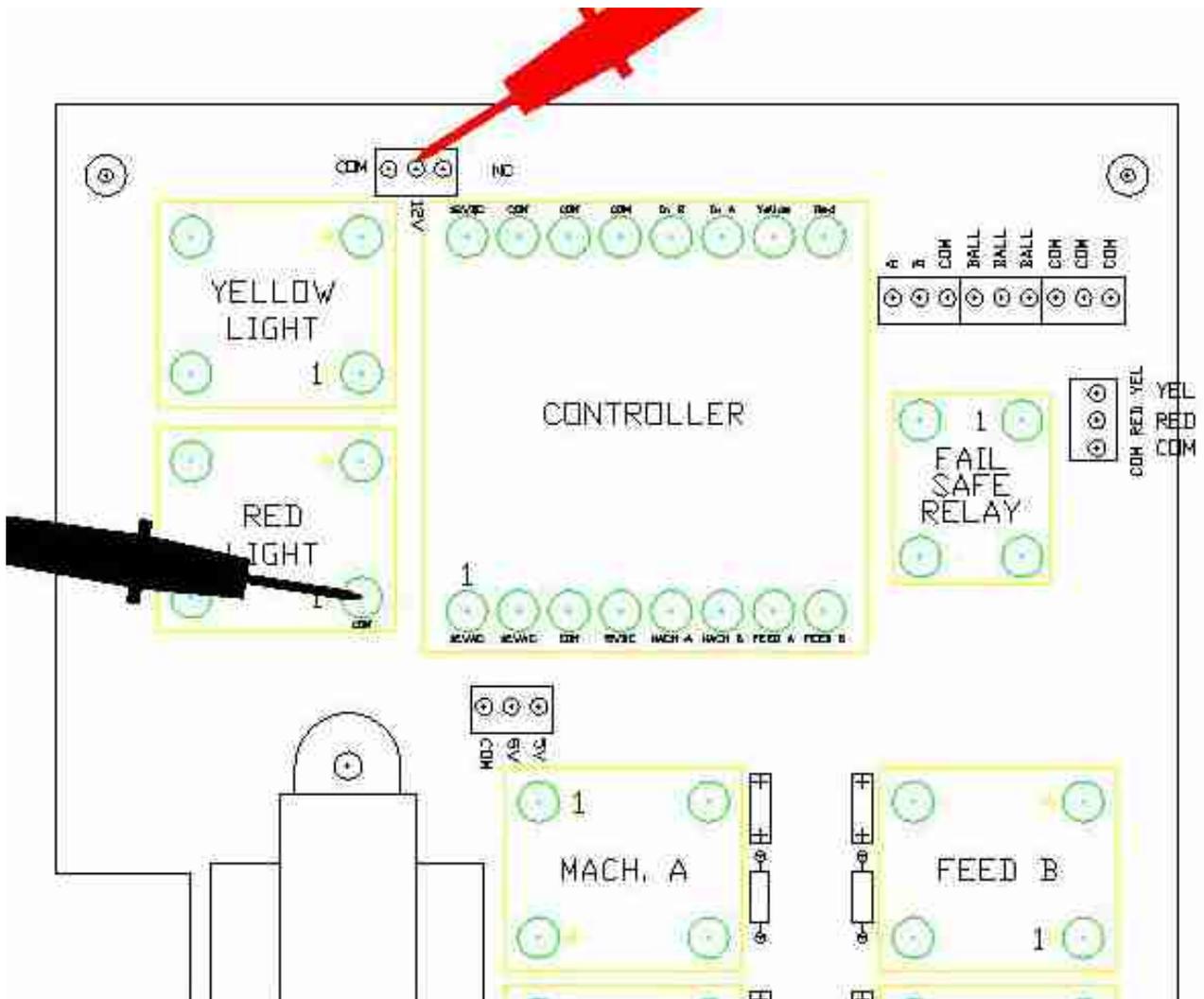
# PT4 Light Box Complete Testing Instructions

- In order to test the PT4 light box control, you will need a multimeter with volts DC and volts AC. The relays need to be connected properly and the PT4 needs to have 120VAC power in order to test it.
  
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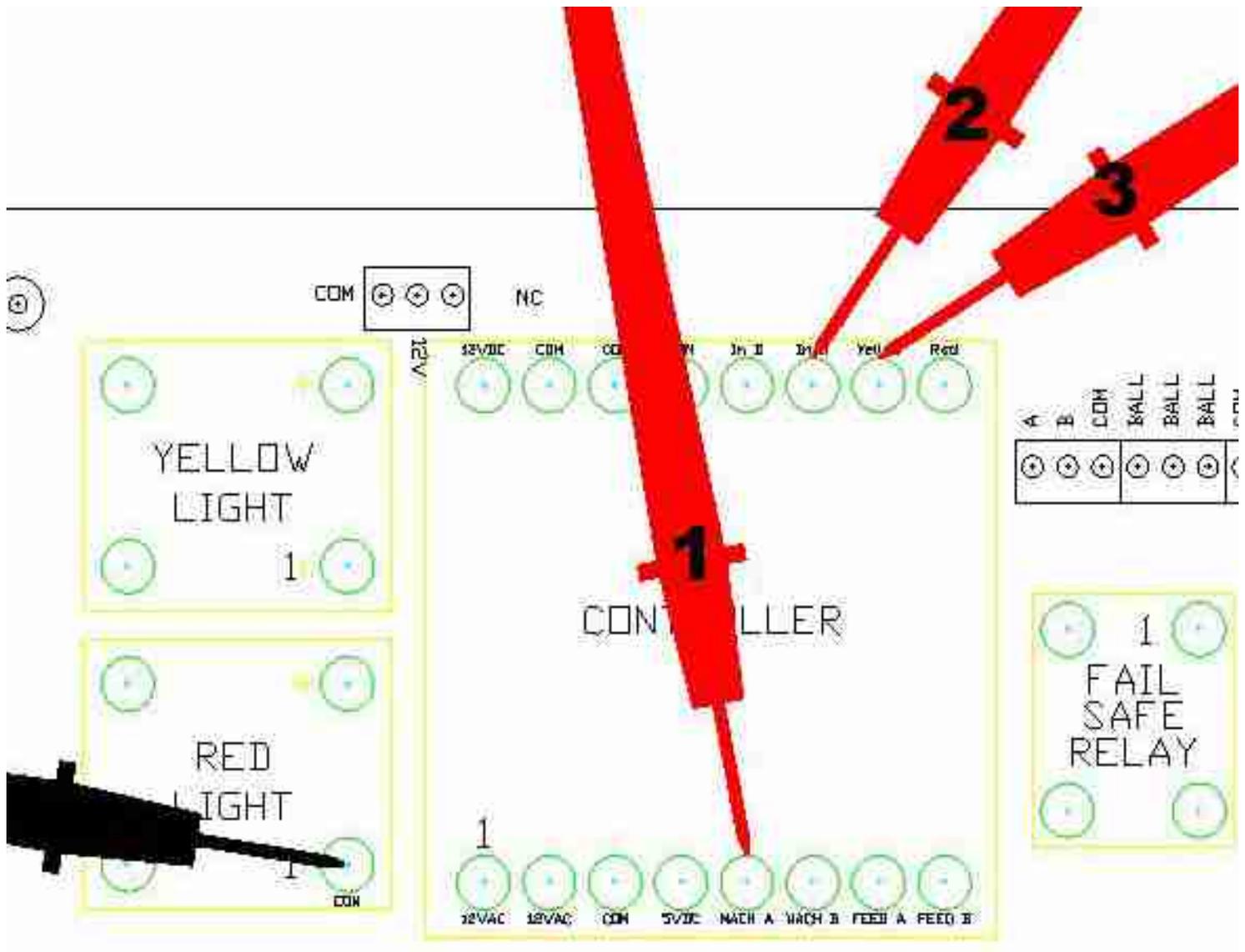
### 2. Test controller and main board 12 volts DC

- With meter still on volts DC, check the 12VDC terminal. The 12V terminal comes from the power transformer and goes through the controller and is not regulated, so the meter will read anywhere between 15VDC and 20VDC. Anywhere in that range should be acceptable. If you don't see DC volts in that range, check the controller for connection to the main board or replace the controller. Again in rare cases the power transformer could be bad.



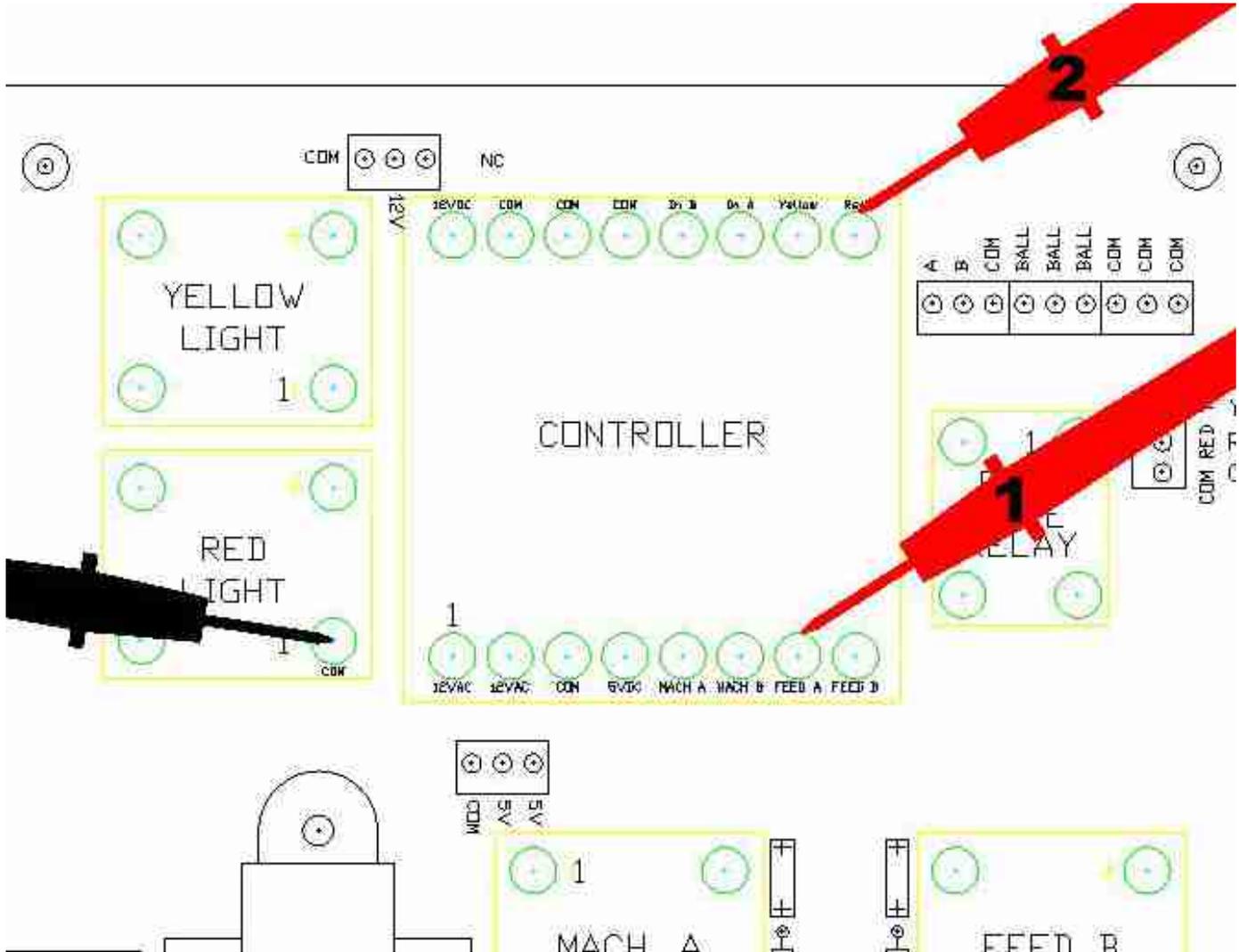
### 3. Test controller with game starting voltages

- Next check voltages when a game starts. Depending on the distance from the bating cage processor box, approximately 5VDC is applied to the A or B terminals, the A input activates the A relays for an A game, and the B for a B game. For an A game, check for the A voltage on the input A “In A” terminal of the controller (probe position 2). Once 5VDC is applied to the “In A” screw on the controller, the yellow light output terminal (probe position 3), and the mach A output terminal (probe position 1), go from zero volts to about 4.3 Volts DC. Use the meter’s red probe to check each terminal for the correct voltage.



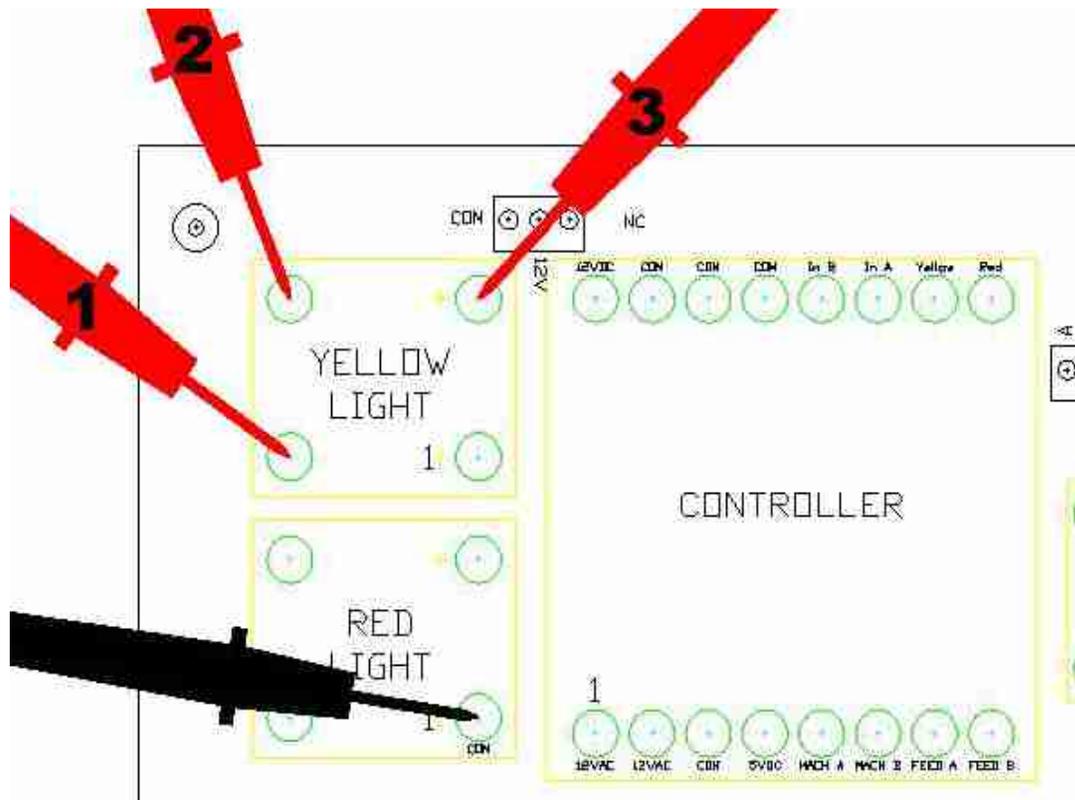
### 4. Test controller with game running voltages

- Once the controller voltage on the yellow and mach A terminals are present, then after about 8 seconds the red screw terminal on the controller (probe position 2) will go to about 4.3 volts DC and the feed A screw terminal will go to about 3.75 volts DC (probe position 1). If the voltages in testing step 3 and step 4 are all correct, the controller is working correctly, they should all be at the test voltages when a game is running. The voltages will be different if you have a bad controller or bad relays.



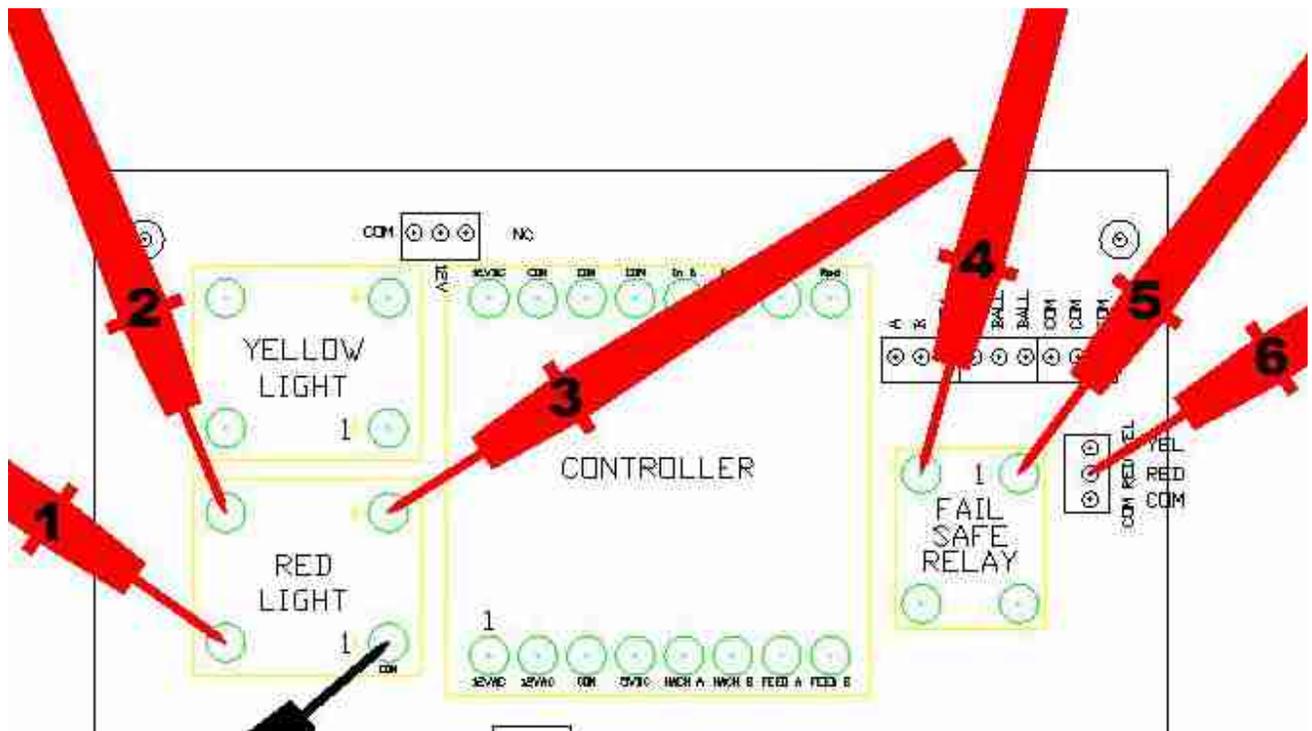
### 5. Test yellow light relay voltages

- The next test is for the yellow light relay function. With the meter on volts DC check to see if the controller voltage from the yellow terminal on the controller is also present on the + terminal of the yellow relay (probe position 3). This should be at 4.3 volts DC.
- Now switch the multimeter to volts AC. Keep the black probe on the common terminal and test the upper left terminal of the yellow relay (probe position 2). This is the 12VAC to this relay, and depending on the 120VAC supply, this can read on the meter from about 12VAC to 15VAC. The voltage on the upper left screw terminal of the yellow relay should always be there unless there is a bad connection or the power transformer is bad.
- The **lower left** terminal (probe position 1) of the yellow relay is the switched terminal. It will read zero volts when the yellow relay is off. It will read about half a volt less than the upper left terminal when yellow light is supposed to be turned on. The connection terminal on the far right of the main board, where the yellow warning light wire actually connects, is directly connected to the lower left terminal of the yellow relay and should read the same AC voltage.



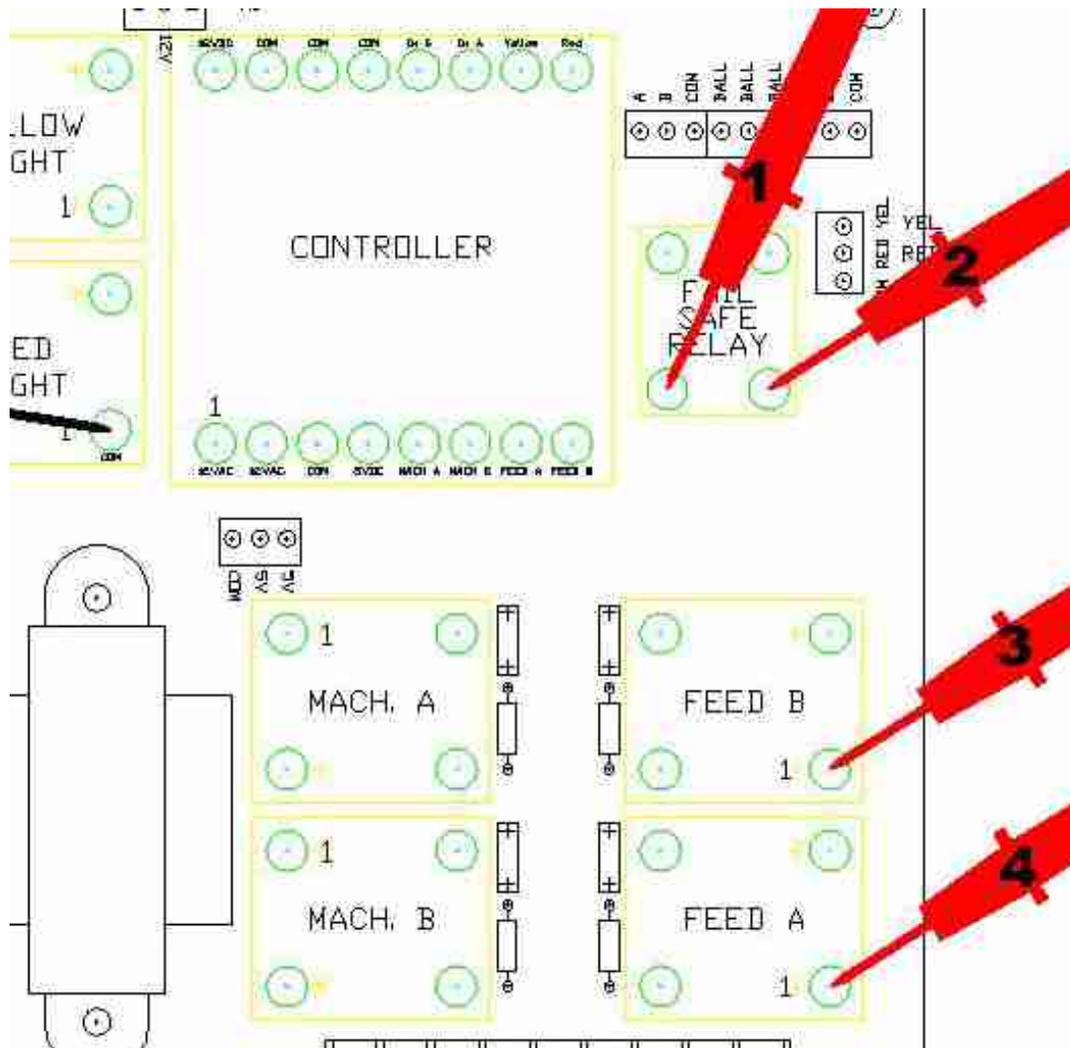
### 6. Test red light relay voltages

- The red light relay functions similar to the yellow light relay. The upper right terminal “+” (probe position 3) should have about 4.3 volts DC on it when activated.
- For the red light relay, however, the lower left (probe position 1) is the 12VAC supply from the power transformer and should read between 12VAC and 15 VAC always with the multimeter set to volts AC.
- And the **upper left** screw terminal (probe position 2) on the red light relay is the switched terminal. This terminal should be at zero then go to the 12 to 15 VAC when the relay is activated, and about half a volt less than the lower left supply terminal voltage, so if the supply is 14 volts AC, this will read about 13.4 volts AC. This terminal is directly connected to the **fail safe relays upper left** terminal (probe position 4), so it will read the same voltage.
- The fail safe relay has about another half volt drop across it, so the voltage at the **upper right**, marked “1” (probe position 5) should be just less than the upper left terminal. If there is 13.4 volts on the upper left of the fail safe relay, the upper right “1” terminal will read about 12.6 volts AC. The “1” terminal is connected to the red connector (probe position 6) that wires to the red warning light itself.



### 7. Test fail safe relay voltages

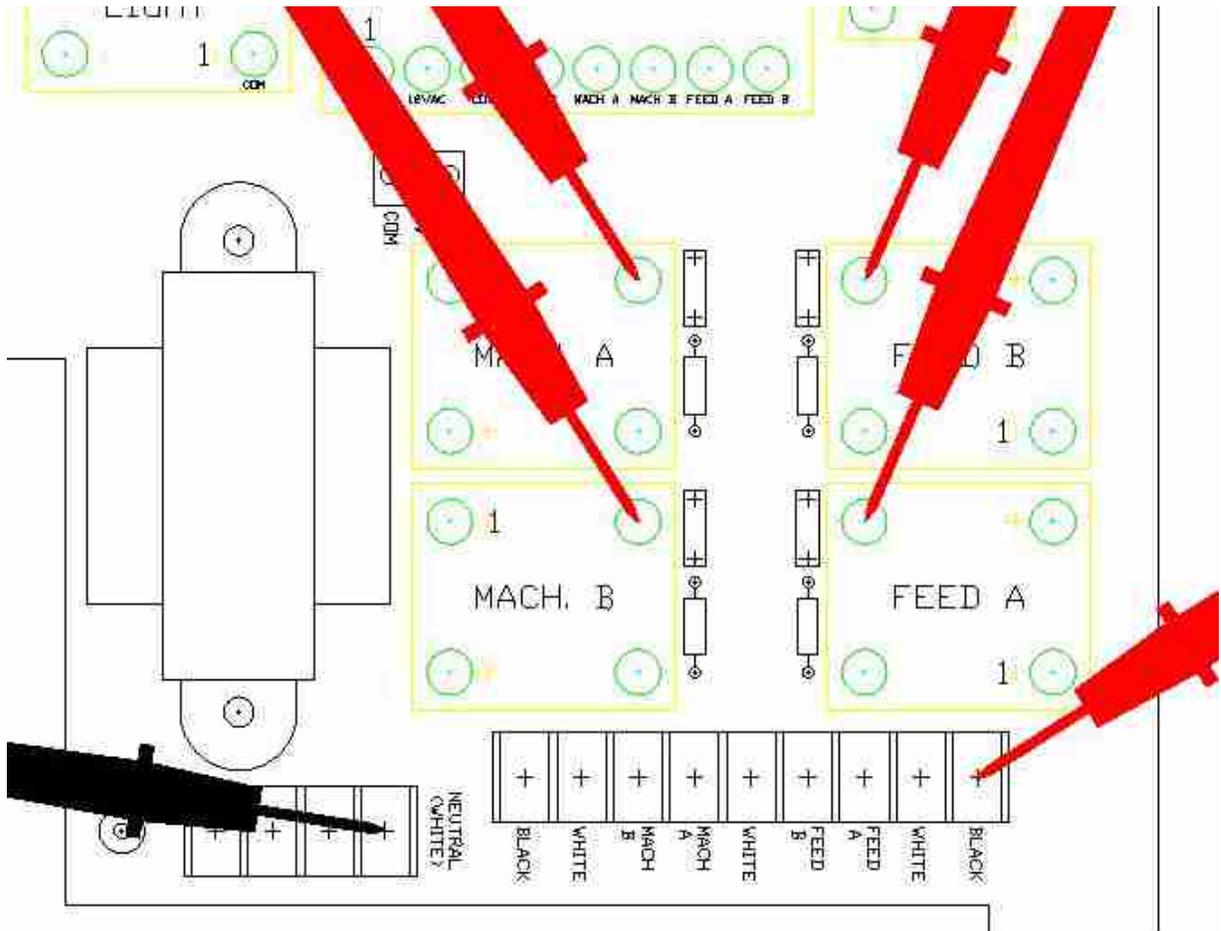
- If the red warning light is working and all voltages check out from step 6, then the output of the fail safe relay can be checked. With the meter on volts DC, the lower left terminal (probe position 1) is connected to common, so should always read zero volts DC. The **lower right** terminal (probe position 2) should read .5 volts DC when not activated and drop to .1 volts DC when activated. The fail safe relay connects the common to the feed relays as long as the red light is working.
- The “1” terminals (probe position 3 and 4) on feed A and feed B relays are directly connected to the fail safe lower right terminal and will read the same voltages. These voltages assume that relays are connected properly and are working.





### 9. Test supply high voltage on machine and feed relays

- With the multimeter set to volts AC, check to see that all high voltage relays have 120VAC.
- The black probe is now put on neutral (white), and the voltage at the supply input is checked. This is the very bottom right terminal on the connection strip labeled “black”
- This should read close to 120VAC and all probe positions indicated in image below as well should read the same. The positions are the inside upper terminals of each relay. These are the supply voltages to the relays, and should always read 120VAC if proper connection is being made to the supply and the relays screws.



10. Test output high voltage on machine and feed relays
- With meter on volts AC, now check the output voltages for the mach A, mach B, feed A and feed B relays. These should be at low AC voltage, ~1 volt AC, then go to 120VAC when the relay is activated.
  - The image below shows the red probe on the output of the feed A relay. The inside lower terminal is the output for each relay, and should read 120VAC when the relay should turn on the pitching machine or feed roller motor.

