

Name: Nae

Date: 8/22/23

Motor Control FWD/REV with Contact Interlock

Using NEMA electrical symbols draw a circuit that will produce the following sequence of operation.

Start (M) FWD
Pressing a forward pushbutton button to run the motor in the forward direction.

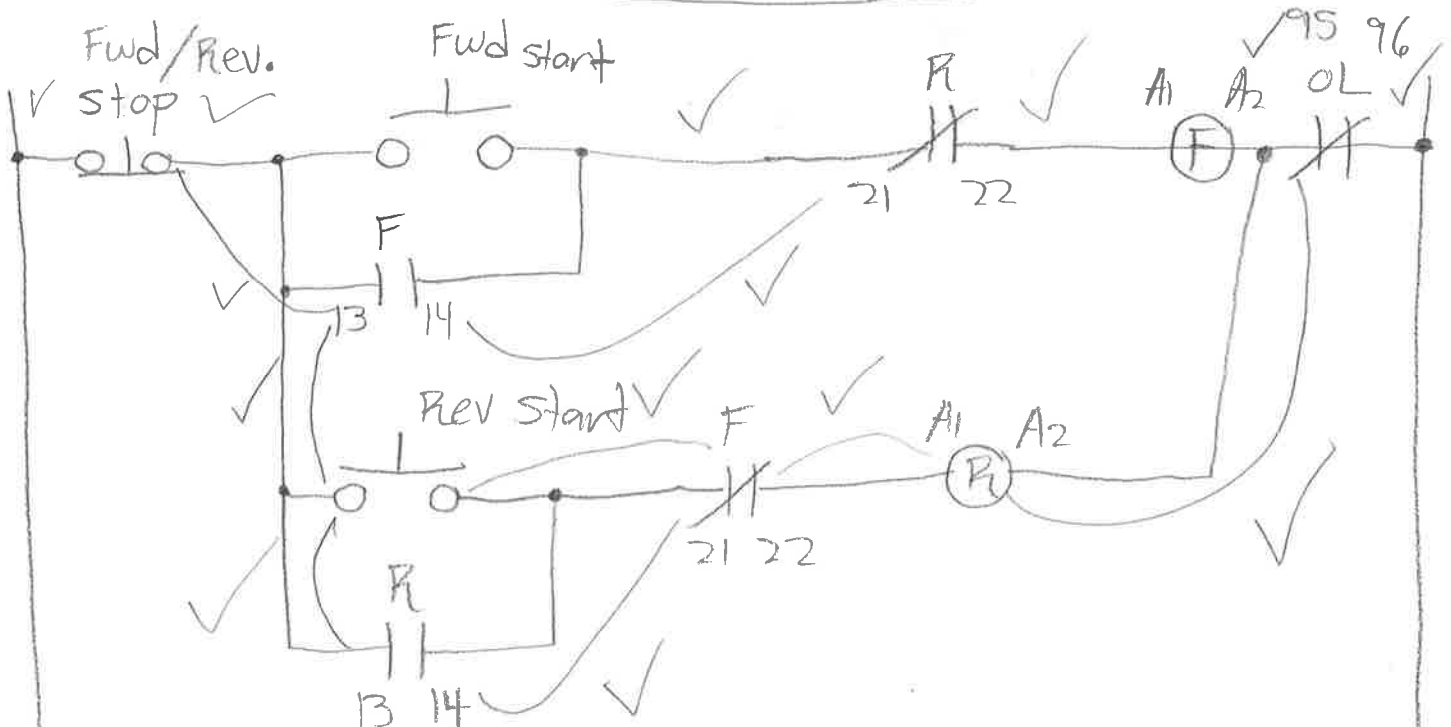
Press the stop to de-energize the forward direction.

REV
If the reverse direction is running, forward direction cannot start. X

REV
Press the reverse pushbutton to run the motor in the reverse direction.

Press the stop to de-energize the reverse direction.

FWD
If the forward direction is running, reverse direction cannot start. X



8/29/23

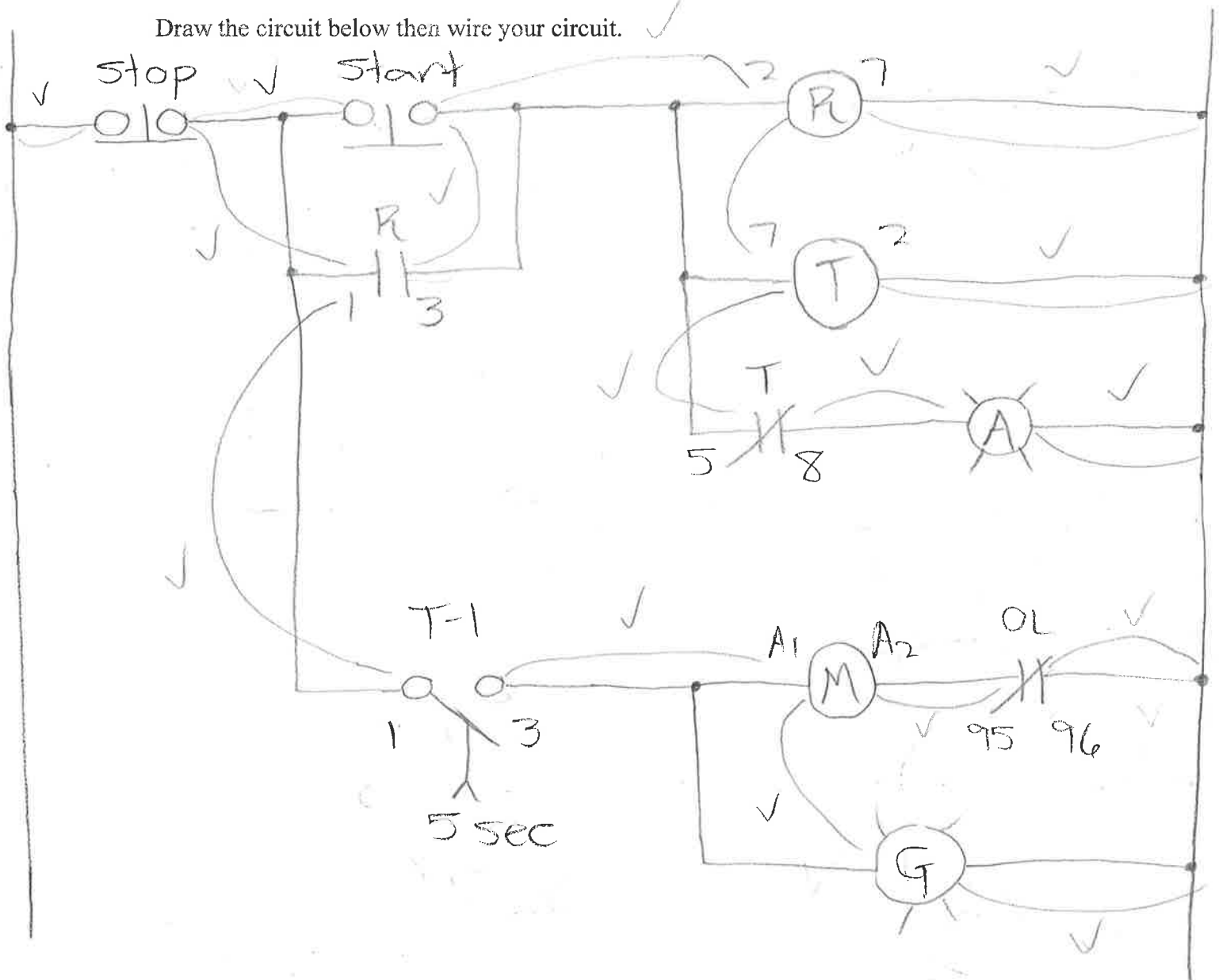
On-Delay Timed Start Circuit

Due Date: **TODAY**

Design a circuit using one on-timer and two relays.

1. When the start pushbutton is pressed and released the machine start-up cycle will begin.
2. A yellow light will illuminate after the start pushbutton has been pressed and released. This light will be a start-up warning light.
3. After 5 seconds the yellow warning light will de-energize and the machine will start. A green or red light will illuminate indicating that the machine is running. The motor will energize when the green light is energized.
4. Depressing the stop pushbutton will stop all circuits.

Draw the circuit below then wire your circuit. ✓



Name: Nae

Date: 8/31/23

Motor Control ON-Delay for Forward or Reverse

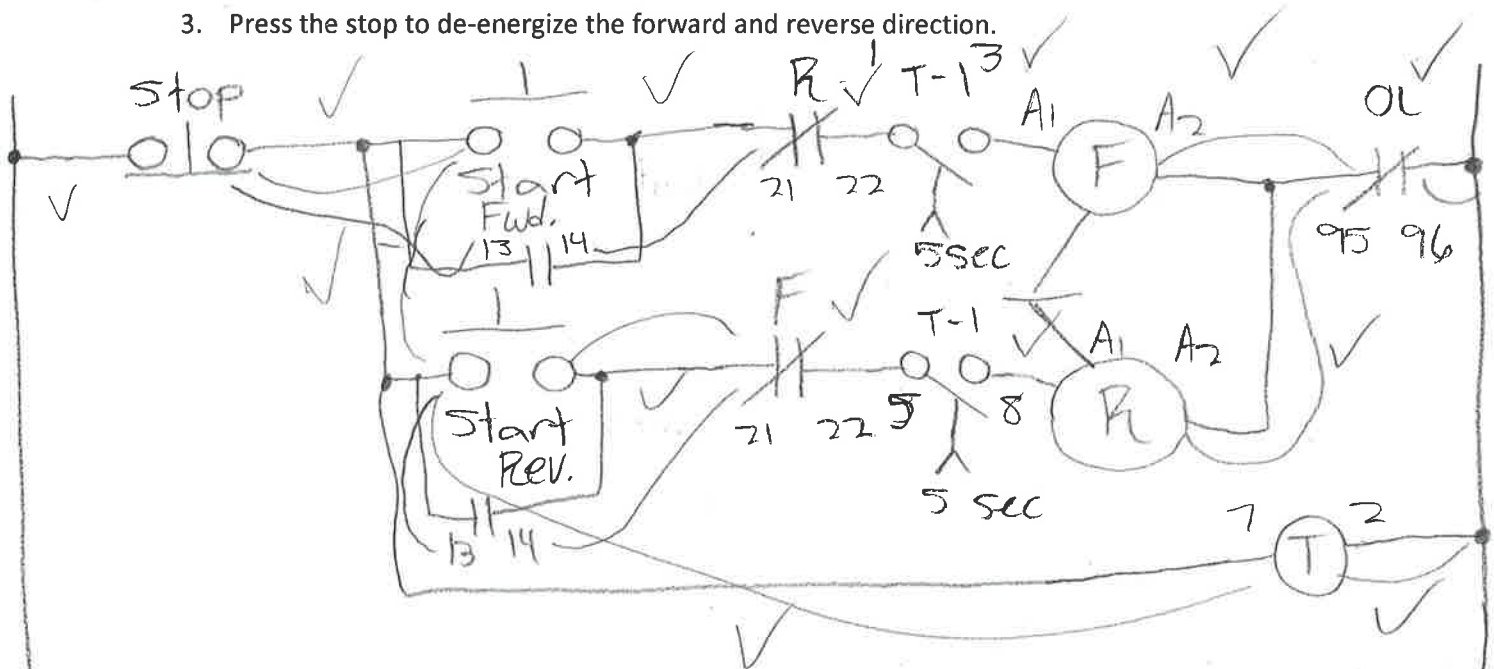
Using NEMA electrical symbols draw a circuit that will produce the following sequence of operation.

1. Pressing a forward pushbutton button to run the motor in the forward direction.
2. Press the reverse pushbutton to run the motor in the reverse direction.

If the motor is currently running in the forward direction, reverse cannot run for 5 seconds after forward has been de-energized.

If the motor is currently running in the reverse direction, forward cannot run for 5 seconds after reverse has been de-energized.

3. Press the stop to de-energize the forward and reverse direction.



Solenoid Coil with PB

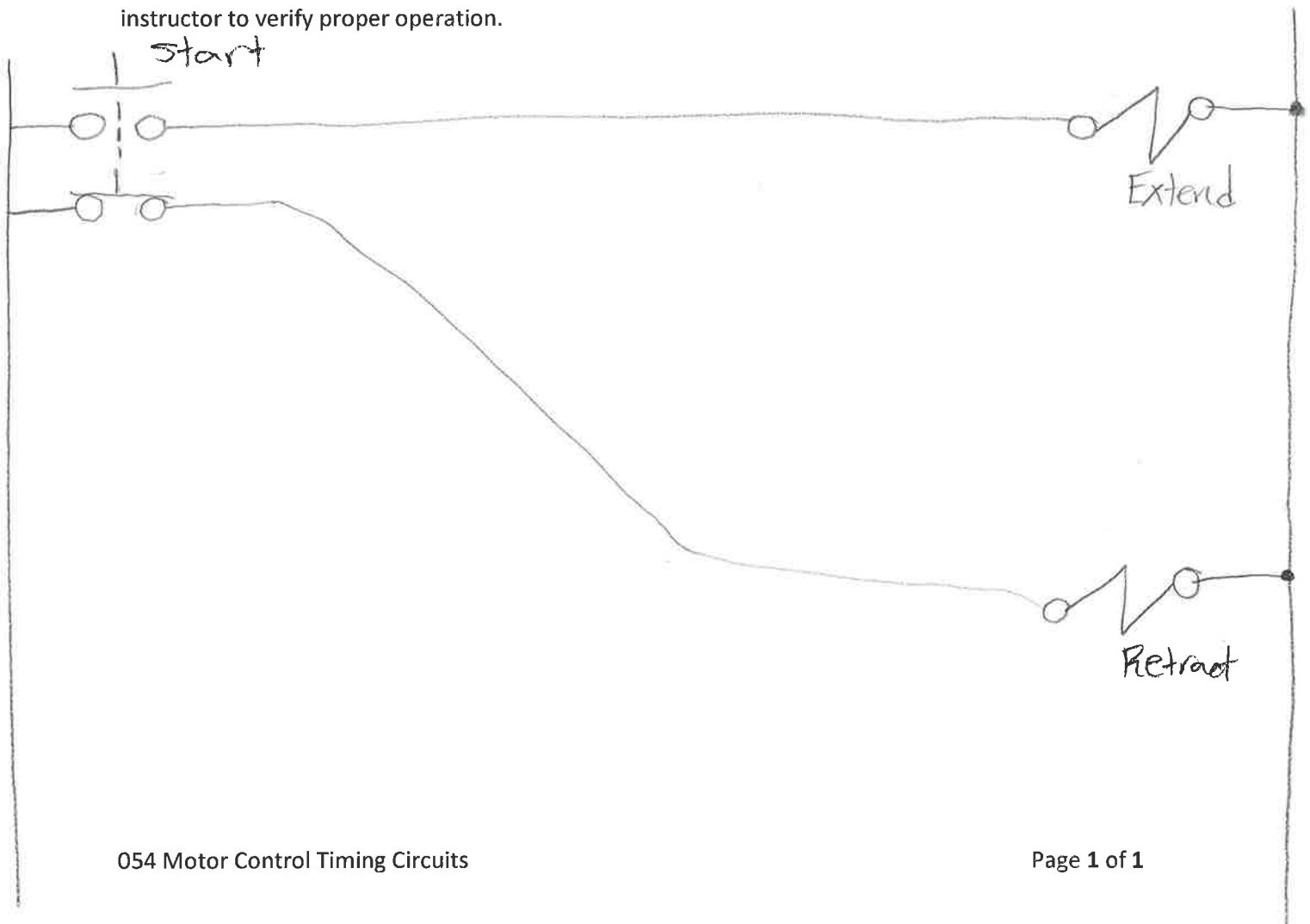
Goal: This lab requires the student to draw a schematic and wire their lab using their schematic as required below.

Process (SOP):

1. When the operator depresses the pushbutton the air cylinder will extend.
2. When the pushbutton is released the air cylinder will retract.

SCHEMATIC:

Draw your schematic design below. Wire your schematic using your drawing. When complete ask the instructor to verify proper operation.



9/5/23

Ferguson
v.0600512

Solenoid Coil with Limit Switch

Goal: This lab requires the student to draw a schematic and wire their lab using their schematic as required below.

LS → black  black

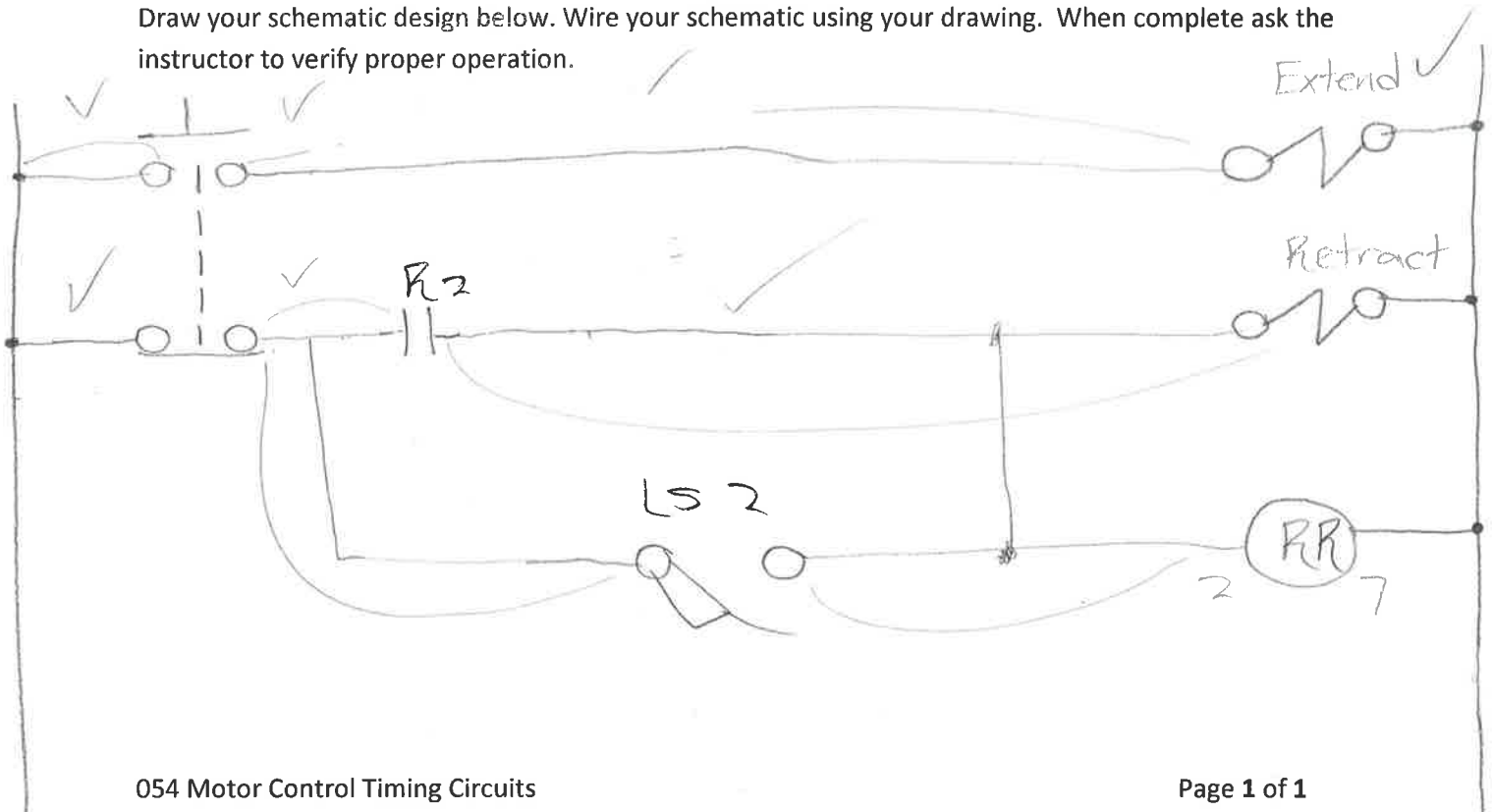
Process (SOP): Brown  Blue

Limit switch
↑

- When the operator presses a pushbutton the air cylinder will extend.
 - The PB must be held until the cylinder rod has struck the "Fully Extended LS".
 - Releasing the PB during mid-stroke will stop the rod in place.
- If the "Fully Extended LS" is made, when the operator releases the pushbutton the air cylinder will retract until the cylinder rod has been fully retracted.
 - In order for the cylinder rod to retract the operator must release the "Extend Pushbutton".
- When the cylinder is fully retracted no air valve solenoids will be energized.

SCHEMATIC:

Draw your schematic design below. Wire your schematic using your drawing. When complete ask the instructor to verify proper operation.



Motor Starter with Jog PB

Goal: This lab is designed so that the student will use motor starters and pushbuttons.

Process:

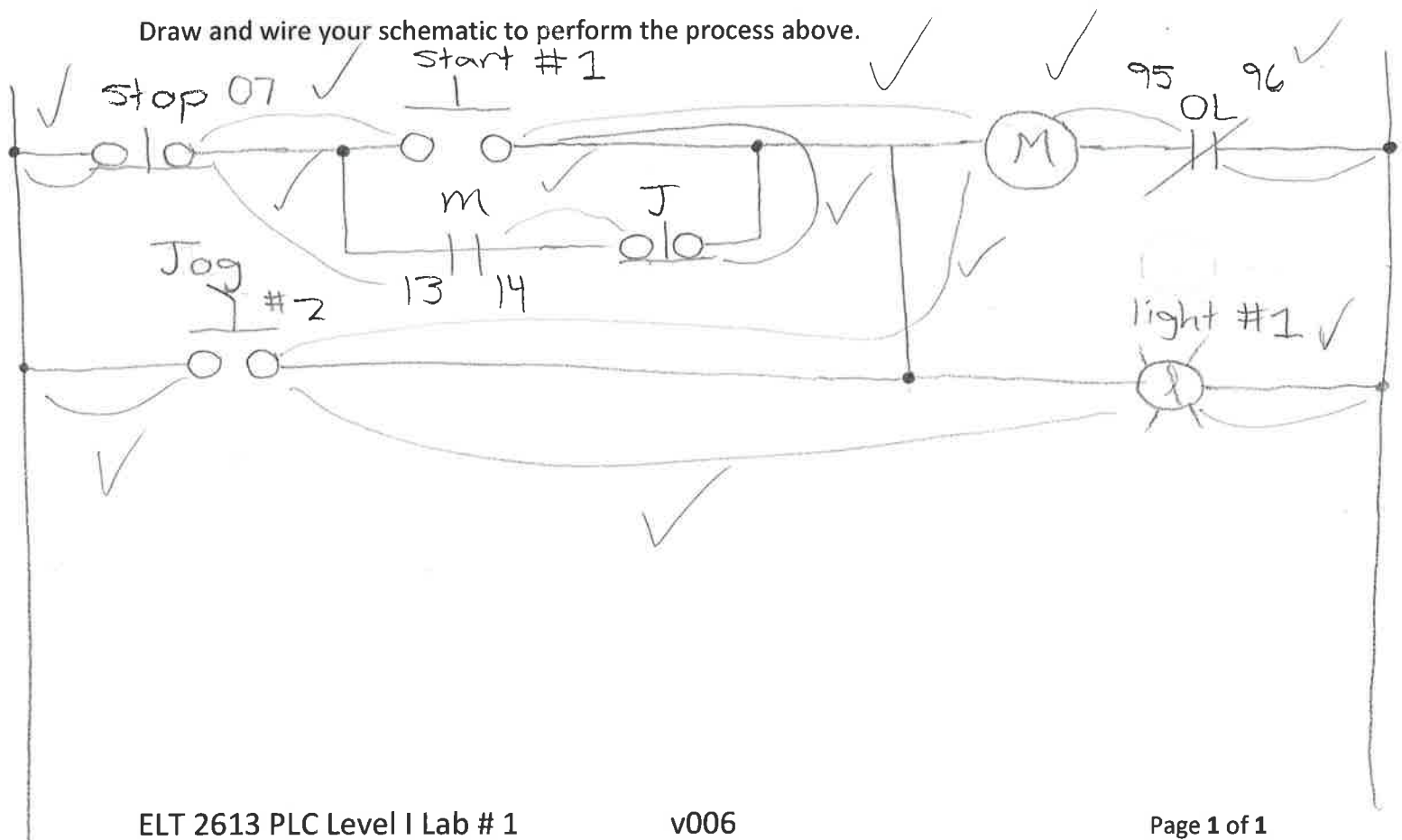
When a pushbutton #1 [START #1] is pressed a motor starter will energize and seal. When the motor running the light on pushbutton #1 will illuminate.

When pushbutton #2 [JOG] is pressed the motor starter will energize but not seal. When the motor is running the light on pushbutton #1 will illuminate.

When pushbutton 07 (I:002/07) [STOP] is pressed all outputs de-energize.

Instructions:

Draw and wire your schematic to perform the process above.



Goal: This lab requires the student to draw a schematic and wire their lab using their schematic as required below.

1. When the operator presses two pushbuttons simultaneously a motor will energize and seal.
2. Pressing the stop button will de-energize the motor.

Draw your schematic design below. Wire your schematic using your drawing. When complete ask the instructor to verify proper operation.



Two Start PB with Relay

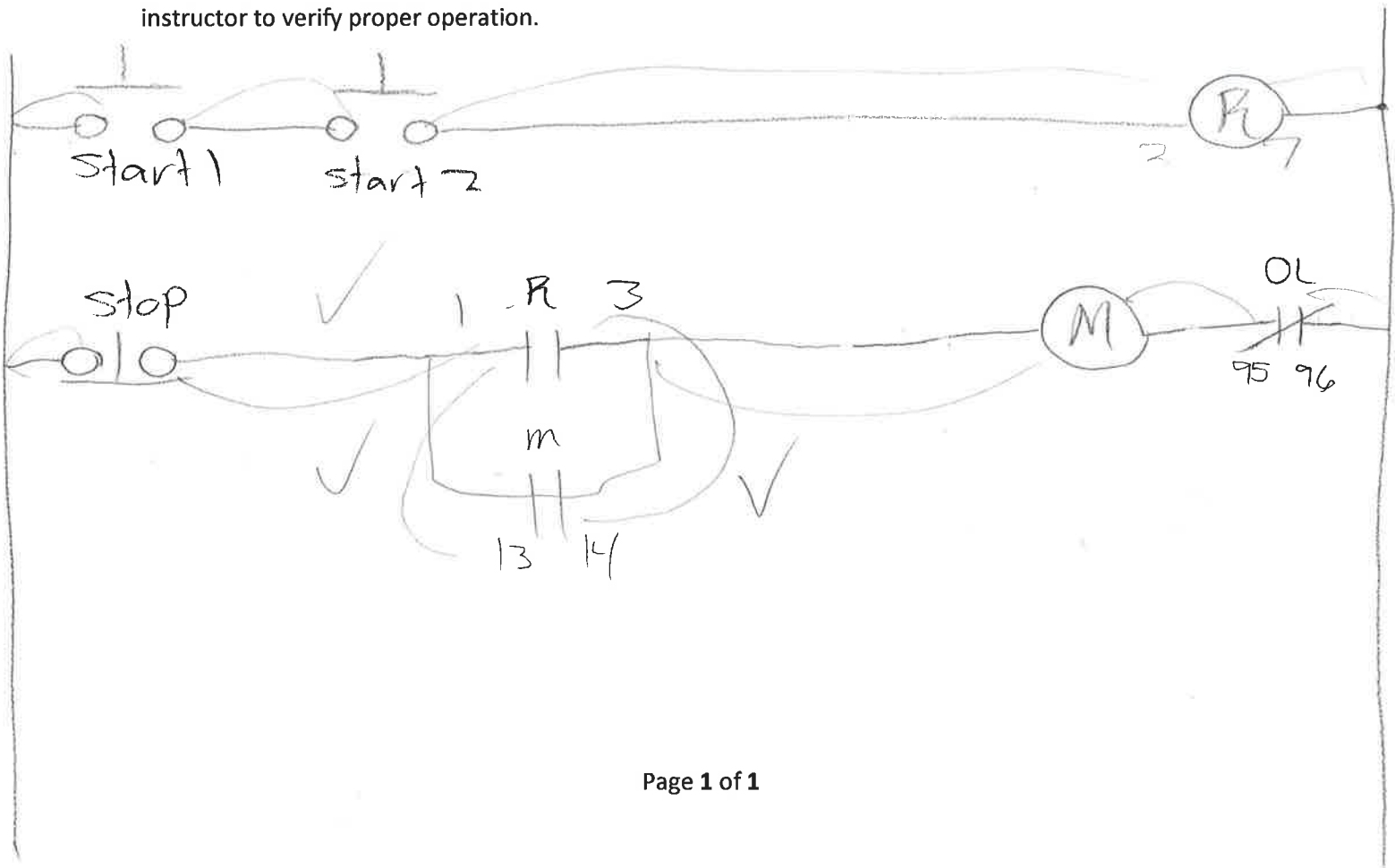
Goal: This lab requires the student to draw a schematic and wire their lab using their schematic as required below.

Process (SOP):

1. When the operator presses two pushbuttons simultaneously a relay will energize.
 - a. Releasing the pushbuttons at any time will de-energize the relay.
2. The relay will cause a motor will energize and seal.
3. Pressing the stop button will de-energize the motor.

SCHEMATIC:

Draw your schematic design below. Wire your schematic using your drawing. When complete ask the instructor to verify proper operation.



9/12/23

Ferguson
v.0600142

Two Start PB with Safety Lockout Timers

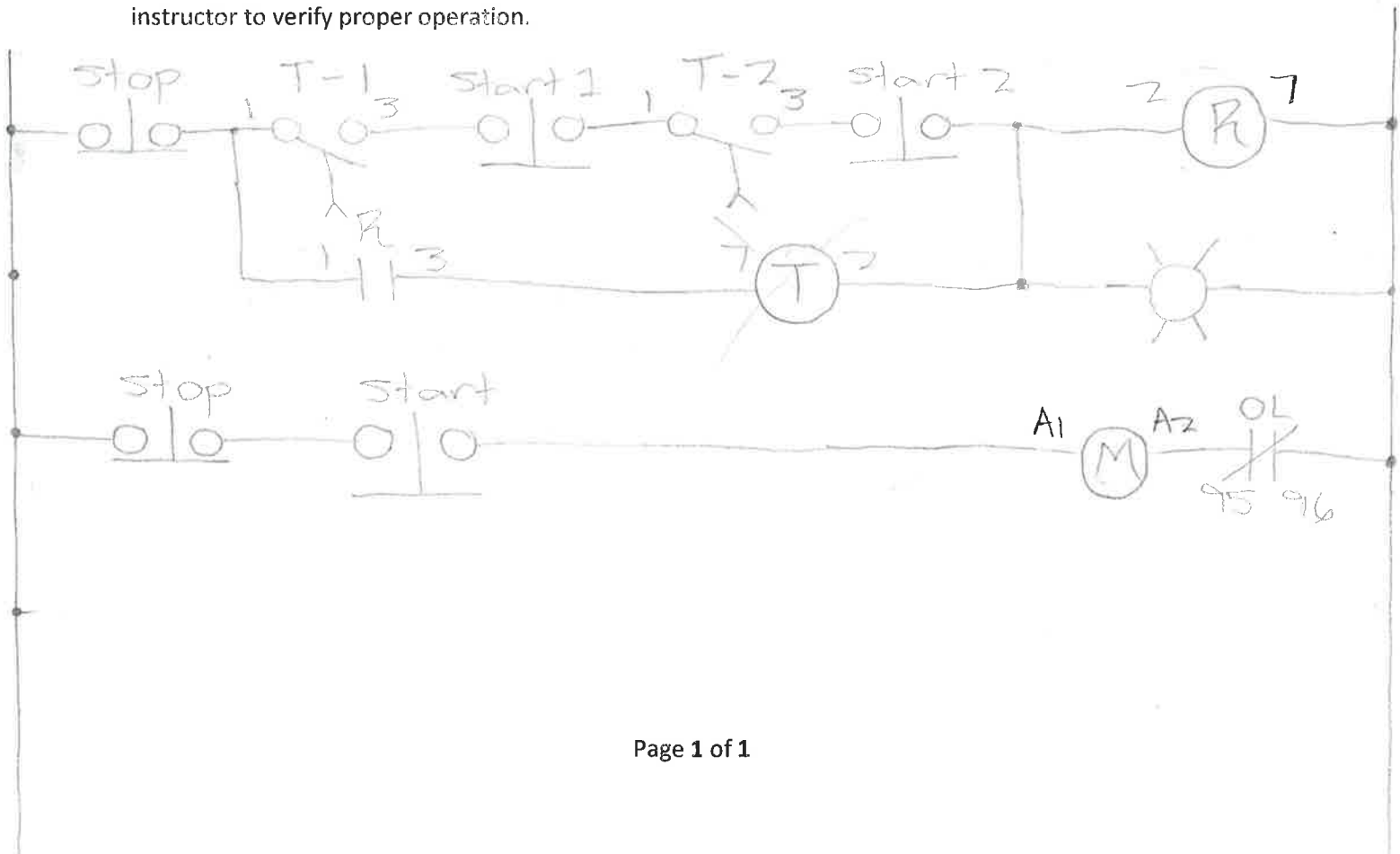
Goal: This lab requires the student to draw a schematic and wire their lab using their schematic as required below.

Process (SOP):

1. When the operator presses two pushbuttons simultaneously (within 1 second) a relay will energize and seal.
 - a. If start button #1 is held down for longer than 1 second the relay will not energize.
 - b. If start button #2 is held down for longer than 1 second the relay will not energize.
2. When the relay is energized a red light will energize.
- 3. Pressing the stop button will de-energize the motor.

SCHEMATIC:

Draw your schematic design below. Wire your schematic using your drawing. When complete ask the instructor to verify proper operation.



Drill Press with Pneumatic Clamp

Process:

With the cylinder fully retracted, when the start button is pressed the air cylinder will extend. When the cylinder reaches full extension, the motor will energize. The motor will run for 5 seconds and then de-energize. After the motor turns off the air cylinder will retract. Once the cylinder is fully retracted all circuits will de-energize until the start button is pressed again.

When the stop button is pressed all circuits will de-energize.

1 stop PB 1 motor
1 start PB air cylinder

Instructions:

Design, draw and wire your schematic to perform the process above.

