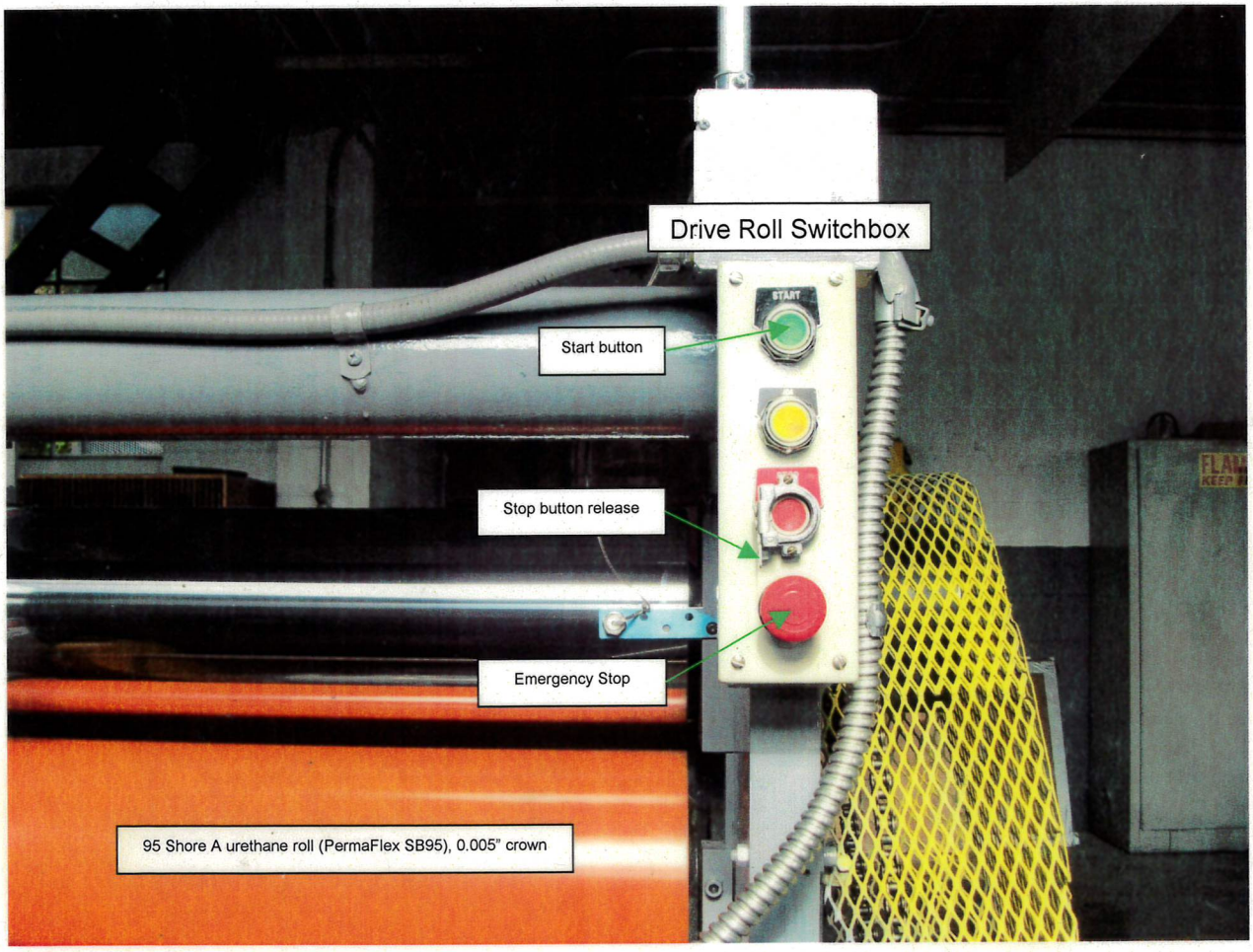
II. Heat the steel drive roll to the desired operating temperature:

1. On the breaker box for the Heating Unit, turn the "CONTROL PWR" switch to ON.
2. Turn the "HEAT ALLOW" switch to ON. This will start heating the roll.
3. Adjust the Watlow controller to the desired temperature using the up/down arrows. (It takes about 30 minutes to heat to 200 degrees F)

III. Start the drive roll:

1. Locate the switchbox on the backside of the calender to the right.
2. Make sure the STOP button is released from its safety lock. (Lift the release)
3. Press START. The roll will start turning. Roll should be turning while heating.



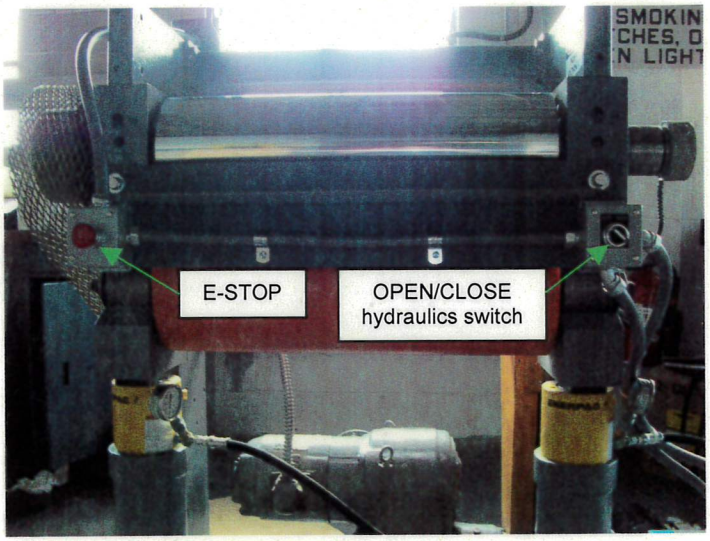
V. Calender Shut down:

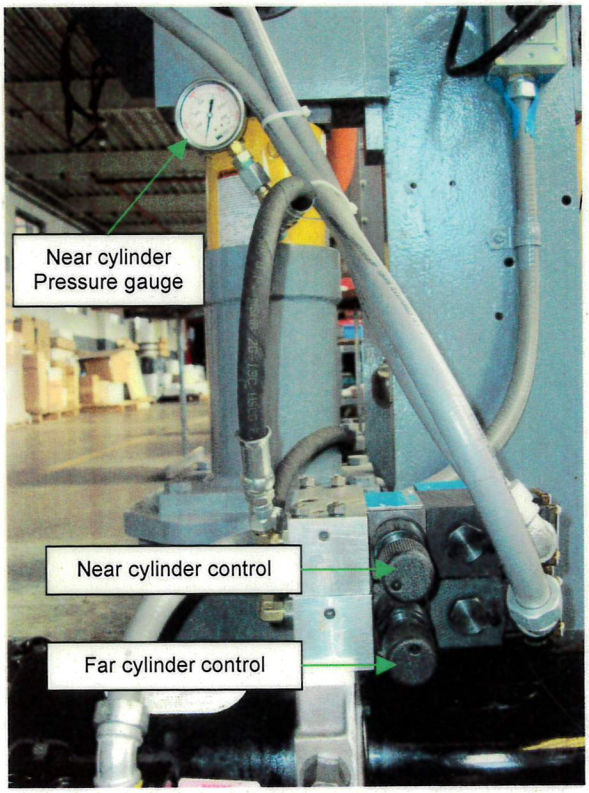
1. **IMPORTANT**: Unload the hydraulics by switching the hydraulics OPEN/CLOSE switch to OPEN. If you have loaded the hydraulics significantly, reduce the pressure using the Vickers Valve control knobs before opening the nip.
2. Press the PUMP STOP button on the Hydraulic Pump breaker.
3. Turn the ALLOW HEAT switch on the Heating Unit breaker to OFF.
4. Turn the CONTROL PWR switch on the Heating Unit breaker to OFF.
5. Press the STOP button of the drive-roll controls on the backside of the calender.
6. Shut OFF the Hydraulic Pump breaker. Switch in the "down" position.
7. Shut OFF the Main Drive Roll breaker. Switch in the "down" position.
8. Shut OFF the Heating Unit breaker. Red switch to horizontal, "OFF" position.
9. Shut OFF the Main Breaker. Switch in the "down" position.

IV. Engage the hydraulics:

(Once you are up to the desired temperature, you can engage the hydraulics)

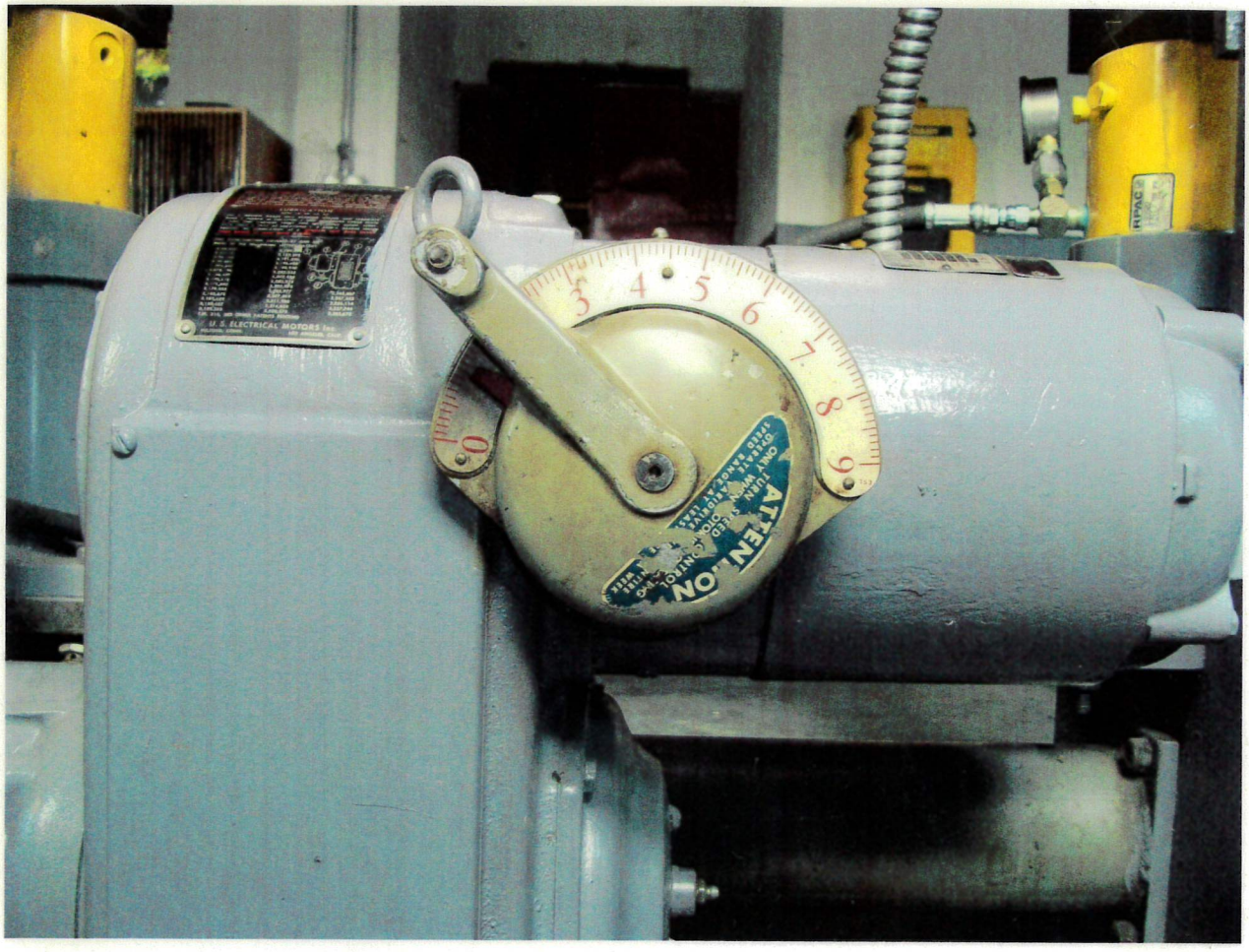
1. Press the GREEN START button on the Hydraulic Unit Breaker to start the hydraulic pump.
2. Locate the OPEN/CLOSE switch for the nip at the front of the unit on the right.
3. Turn the switch to CLOSE. This will load the hydraulics to raise the hard rubber roll up to engage with the steel drive roll. It takes about 10 seconds to close.
4. The hydraulics will load to whatever the previous settings were on the Vickers Control Valves. These are black knobs on top of the hydraulic reservoir.
5. Adjust the Vickers Control Valves to balance the side-to-side hydraulic load.
6. Then, adjust the Vickers valves evenly to get to the desired loading.
   The top Vickers valve controls the near Enerpac hydraulic cylinder.
   The bottom Vickers valve controls the far Enerpac hydraulic cylinder.





A chart showing pli across the full nip at various gauge pressures is attached in the Appendix of this document.

4. The speed control for the drive roll is a hand-crank adjustment, located on the drive motor underneath the unit. The Varidrive speed control should be adjusted only when the motor is operating. The Varidrive should be operated over its entire range at least once per week.



5. A chart of dial setting vs. speed (fpm) is included in the Appendix of this document.

Dial setting	Speed (fpm / ypm)
0	19.4 / 6.47
0.5	24.5 / 8.17
1.0	29.9 / 9.97
1.5	35.4 / 11.8
2.0	41.1 / 13.7
2.5	46.4 / 15.47
3.0	52.7 / 17.57
3.5	58.6 / 19.53
4.0	65.0 / 21.67
4.5	72.0 / 24.00
5.0	78.6 / 26.20

pli vs Gauge Pressure for ProtoLab Calender

Dial Setting vs Speed
ProtoLab Lab Calender