

**Experiment Number – 5****Duration - 2 Hours****Title of Experiment –**

1. Understanding Function of using Timers to Control the Hydraulic Circuit with interlock of Limit Switch and Level Sensor
2. Understanding Function of using Timers, Level sensors and Motors to make Tank Empty and Full

**Objective of the Experiment**

The students are required to understand the following –

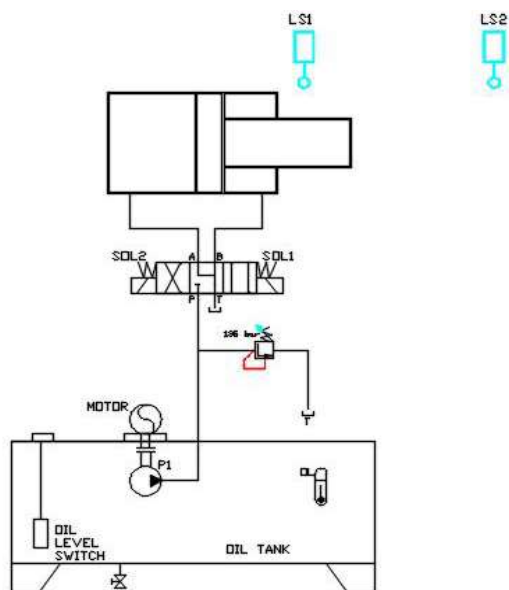
- Functioning of Timers / Limit Switch / Level Sensors / Motors

**Intended Learning Outcomes :** At the end of the experiment the student should be able to do

1. PLC Programming – Using Timers, Sensors for Control of Hydraulic Circuit and Making Tank Empty and Full.

**Software/Equipment/Tools Required:**

PC, PLC Software,

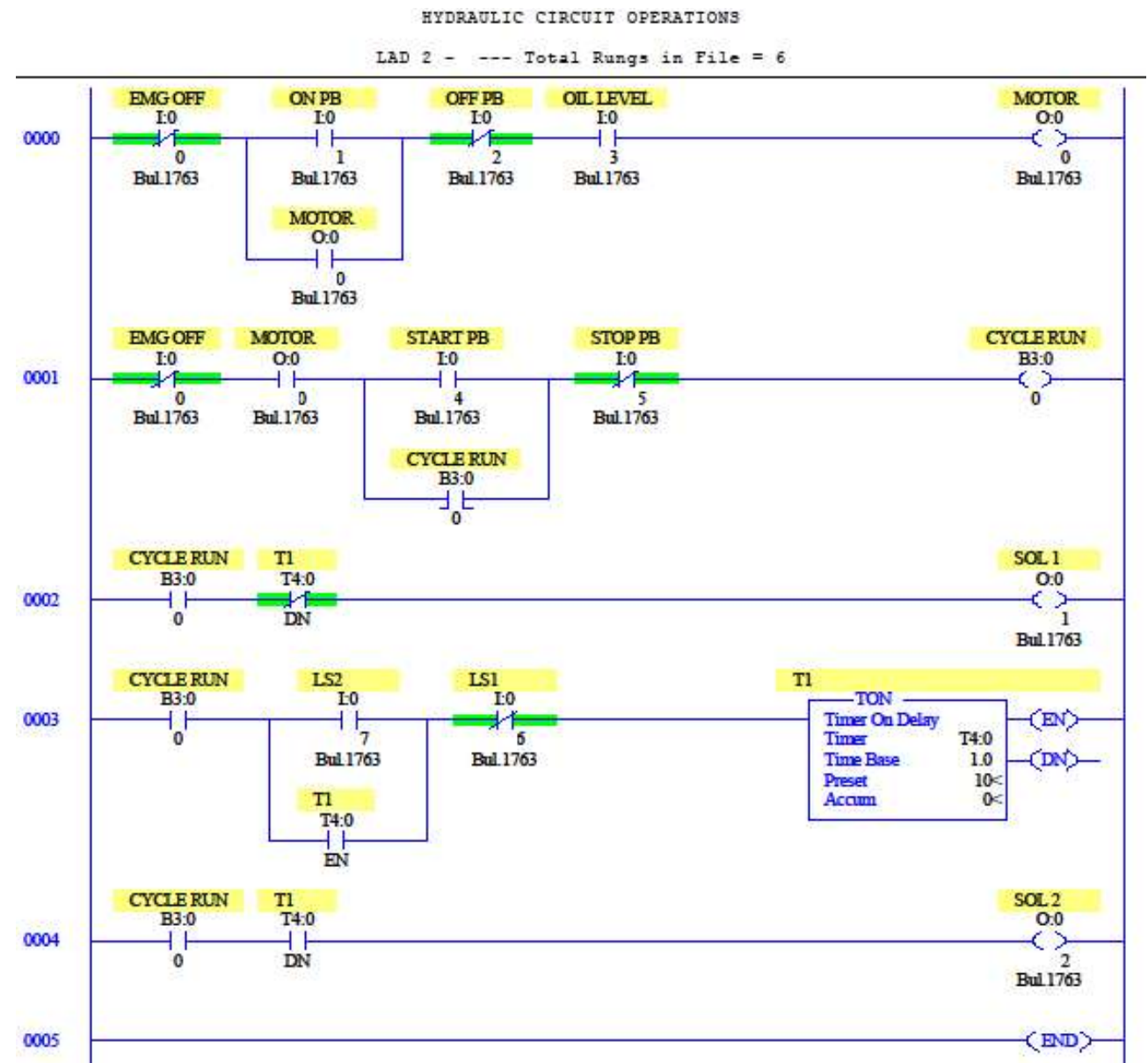
**Problem 1 – Hydraulic Circuit Operations**

Write the program for the above hydraulic circuit.

1. The Motor can start and stop using the push button ON and OFF.
2. Always check the oil level before starting the Motor.
3. For cylinder forward operation, energize the solenoid-1.
4. For cylinder backward operation, energize the solenoid-2.
5. Solenoids should not energize when the Motor is OFF.

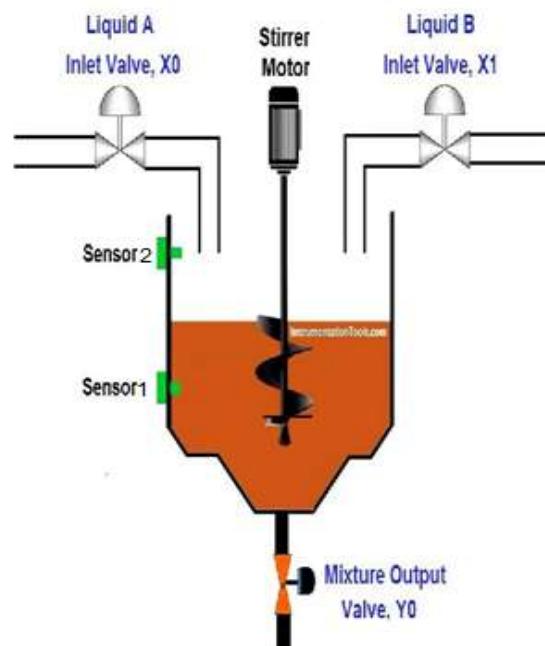
6. Start the cycle with the Start push button.
7. The cylinder starts moving forward till the LS-2 trips.
8. After 10 seconds of the LS-2 trip signal. The cylinder moves backward till the LS-1 trips.
9. Repeat points 7 & 8 till brake the cycle using the stop push button.

### Write the Ladder Programme -



### Problem 2 –

The automatically infusing the container with liquids A and B in order when **START** is pressed. When it reaches the set level, mix the two liquids evenly, then open the valve to let out the mixture.



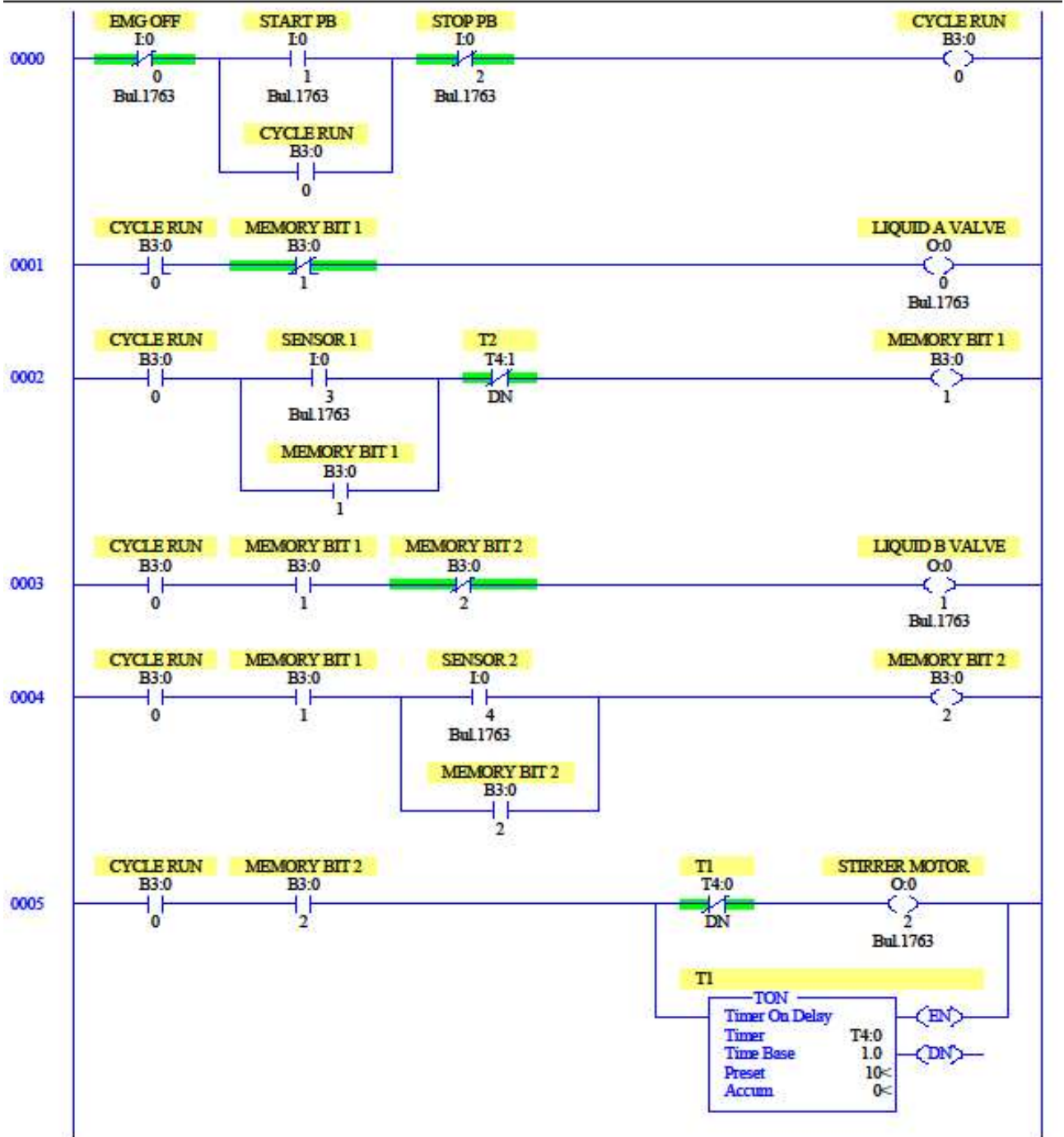
### Sequence of Operation -

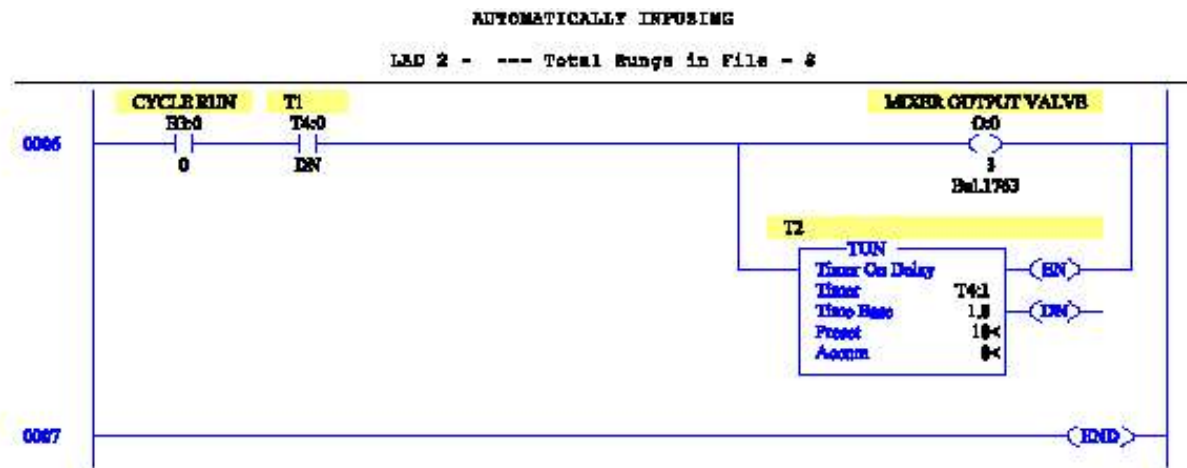
1. Assume the tank is empty starting of the cycle
2. Start the cycle with the Start push button. Liquid A valve should be ON till Sensor 1 activates
3. Liquid B valve should be ON once Sensor 1 activates, till Sensor 2 activation.
4. After Sensor 2 activation, the Stirrer motor should be ON for 10sec for the stirring process.
5. After stirring, the Mixture output valve should open for 10sec.
6. Continue the process till brakes the cycle using the push button.

### Write the Ladder Programme -

# AUTOMATICALLY INFUSING

LAD 2 - --- Total Rungs in File = 8





**Precautions:** Students must use proper type and range of the meters. They must show the wiring connections before switching the supply on.

**Conclusion/Critical Observation:** Students learn the following

1. Basic PLC Programming – Timer Blocks