9.7 Leak Test

9.7.1 Purpose of the Leak Test

- The purpose of the Leak Test is to ensure that all the GREEN MACHINE tubing fittings and tubes located inside the GREEN MACHINE are leak free.

9.7.2 Preparation for the Leak Test

1. At the GREEN MACHINE, remove the locks from the three ball valves, close the three valves, and remove a cap from one of the tees. (Only one open tee is required for this test.) **See Figure 9-25**.
2. Make sure the Maintenance Screen is showing on the PLC. **See Figure 9-26 and 9-27**. (The GREEN MACHINE is now in the Manual OFF mode and will not operate.)

   If the PLC is not in the Maintenance Screen: At the Main Screen, push the Maintenance Screen button to access the Password Screen, then enter the password to access the Maintenance Screen: 878.
3. Compressed Nitrogen bottle with a regulator is required for the Leak Test.
4. A Leak Test Fixture is required for the Leak Test. **See Figure 9-28.**

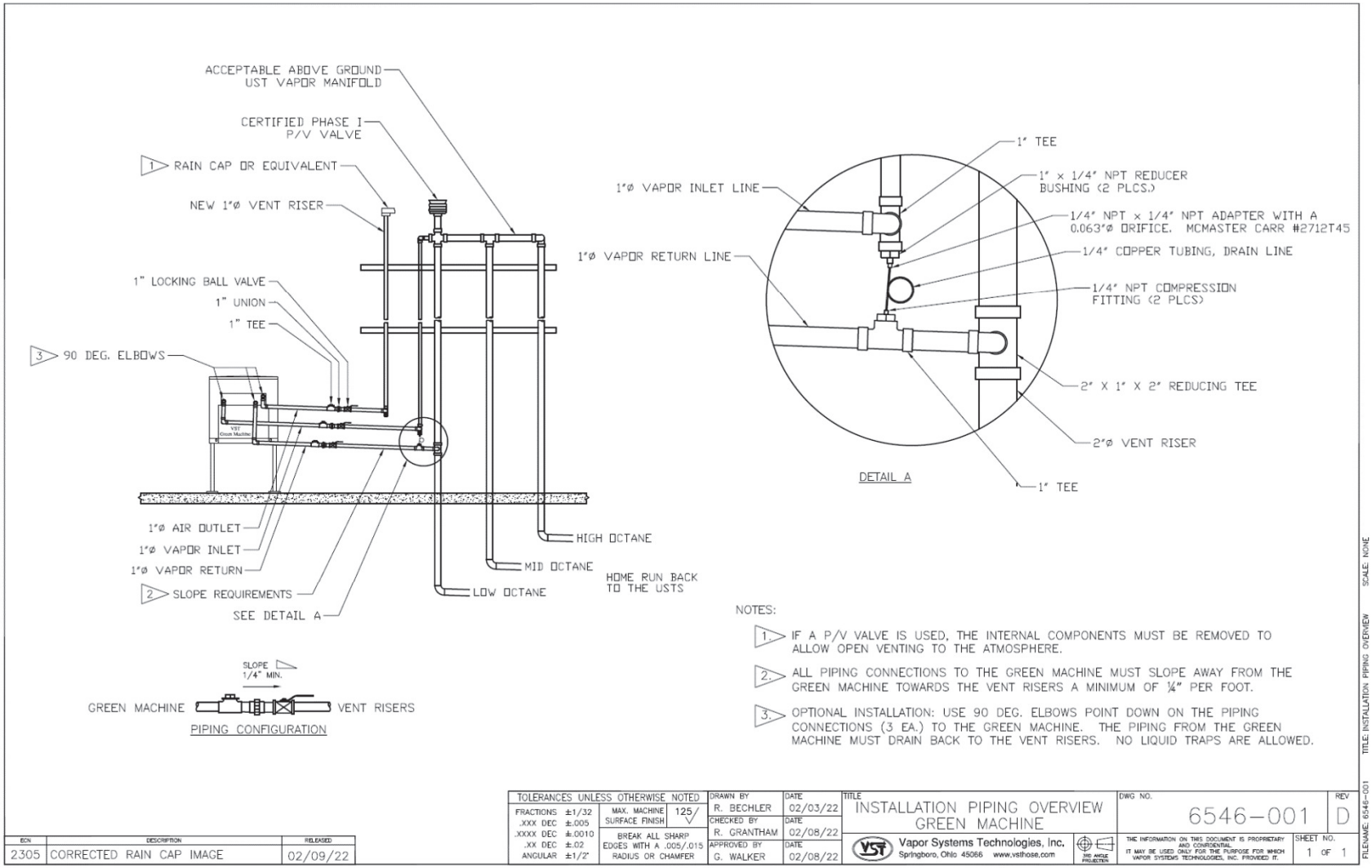

Figure 9-25: Vapor Piping Overview

Figure 9-26: Maintenance Screen

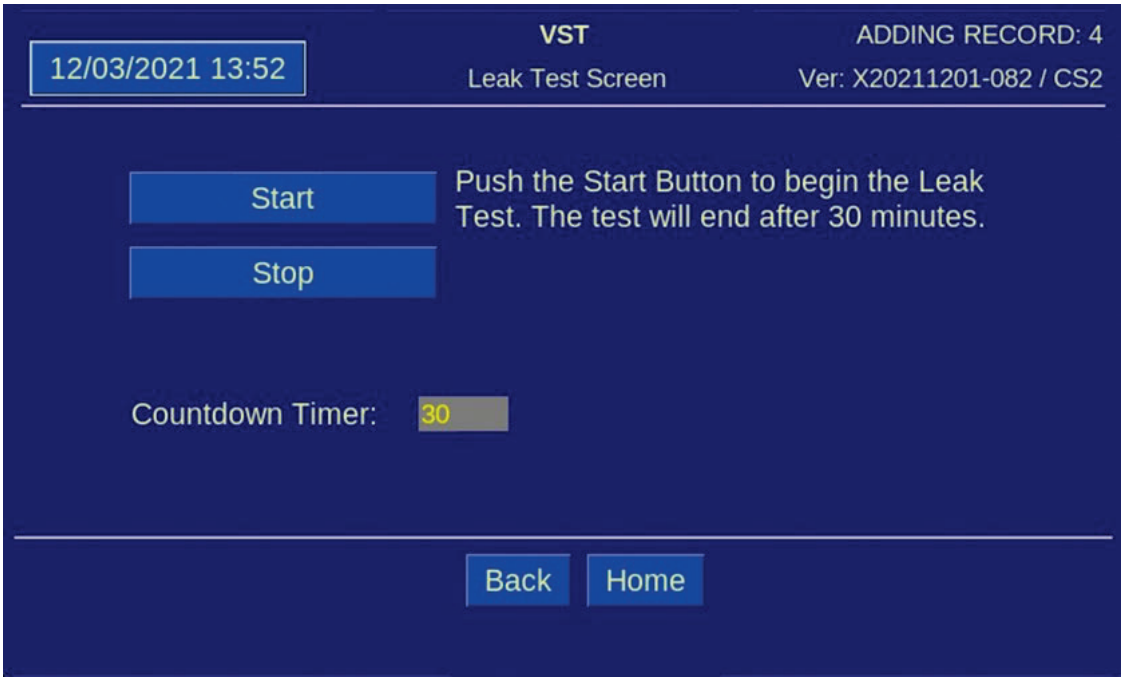

Figure 9-27: Leak Test Screen

Leak Test Procedure, continued…

9.7.3 Leak Test Procedure

1. Install the Leak Test Fixture in any empty 1” pipe tee on the GREEN MACHINE. **See Figures 9-25.**
2. The Leak Check is conducted with 1.0-PSI nitrogen.
3. Make sure the isolation valve on the Leak Test Fixture is fully closed.
4. Make sure the Leak Test Fixture pressure regulator is fully closed.
5. Make sure the nitrogen regulator is set to 2.0-PSI outlet pressure.
6. Slowly open the isolation valve on the Leak Test Fixture to provide pressure to the regulator.
7. Slowly open the Leak Test Fixture pressure regulator until the pressure gauge reads 1.0-PSI.

   CAUTION: PRESSURIZING THE GREEN MACHINE OVER A MAXIMUM OF 2.0 PSI MAY CAUSE DAMAGE TO THE GREEN MACHINE O-RINGS AND/OR PUMP SEALS, WHICH WILL VOID ALL WARRANTIES OF THE GREEN MACHINE.
8. At the GREEN MACHINE PLC, enter the Maintenance Screen with the password 878. Enter the Test Screen and select Leak Test. **See Figure 9-26 and 9-27**.

   - The Leak Test will continue until one of the following conditions is met:
     - The Stop button is pushed -OR-
     - The GREEN MACHINE PLC internal timer times out at 30 minutes.
9. With the GREEN MACHINE pressurized at 1.0-PSI nitrogen, spray a soapy solution on each fitting to check for bubbles:
   - If bubbles do not appear, the connection is tight.
   - If bubbles do appear, tighten the leaking fitting 1/8” turn (maximum) and re-check for leaks.
   - If the fitting cannot be tightened so that the connection is leak free, replace the 45° flare tube assembly that is leaking with a new tube assembly.
10. Continue this process until all the internal tube fittings have been checked and found leak free.
11. If additional time is needed to conduct the Leak Test, push the Leak Test button again to re-start the 30-minute timer.

Leak Test Procedure, continued…

12. After the Leak Test 30-minute timer expires and the test is complete:
    1. The GREEN MACHINE PLC will show the Maintenance Screen where the GREEN MACHINE is in the Manual OFF mode and will not operate.
    2. Remove the nitrogen from the Leak Test Fixture.
    3. Remove the Leak Test Fixture from the GREEN MACHINE.
    4. Re-install the cap in the tee.
    5. Put the cover back on the GREEN MACHINE and screw on the 8 cover screws.
    6. Open the 3 ball valves at the GREEN MACHINE and place the locks on the valves.
    7. At the GREEN MACHINE PLC, push the home button to return to the Main Screen where the GREEN MACHINE will go into a Normal Operating Mode.

CAUTION: DO NOT PUSH THE HOME BUTTON UNTIL THE BALL VALVES BETWEEN THE GREEN MACHINE AND THE VENT RISERS ARE OPENED. PUSHING THE HOME BUTTON WHEN THE VALVES ARE CLOSED WILL NOT ALLOW THE GREEN MACHINE TO OPERATE PROPERLY AND MAY CAUSE DAMAGE TO INTERNAL COMPONENTS.

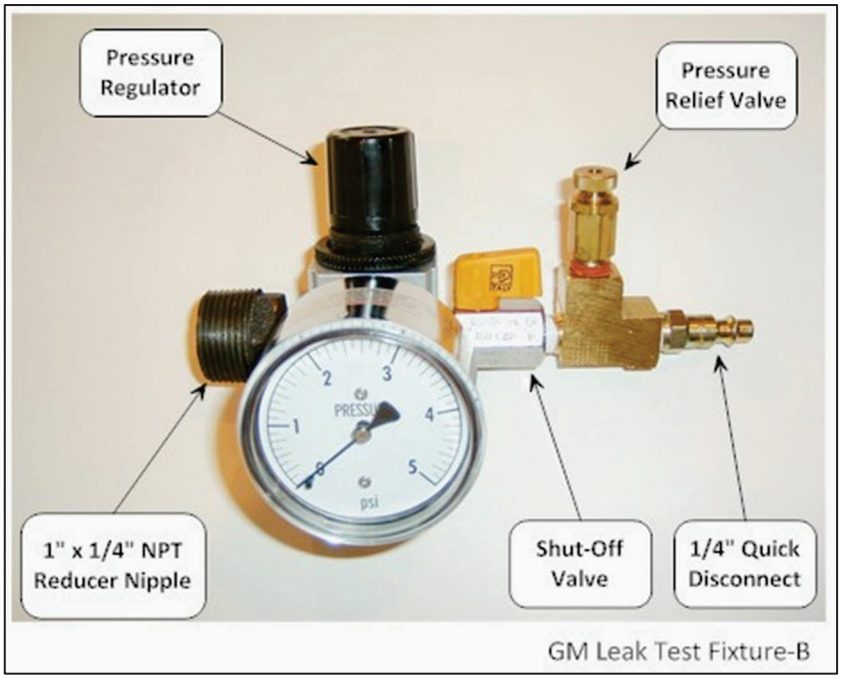

Figure 9-28: Leak Check Fixture

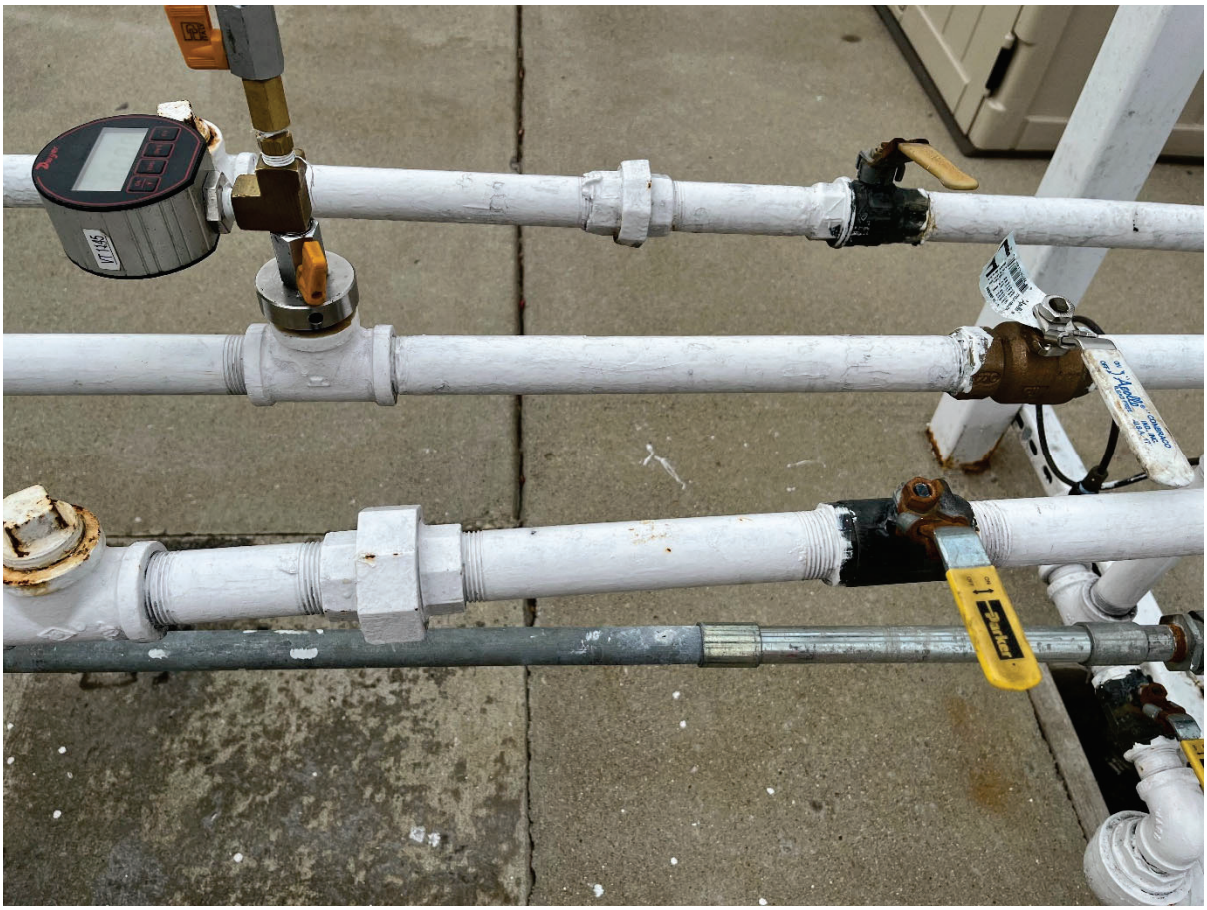

Figure 9-29: GREEN MACHINE leak test