

## Technical Note: PQ200 Leak Test

**Note: YOU SHOULD NEVER DO A LEAK CHECK WITHOUT THE INLET PLUGGED.** The pump will continue ramping up until 95cm of static pressure is achieved. If the inlet is not plugged this will send the pump out of control, causing the board to lock up.

### **To Perform a Leak Test:**

Remove the inlet head and place the Flow Audit Adapter on the downtube. Turn the valve to the closed position (90° to the downtube).

Ensure the Flow Audit Adapter is firmly seated on the downtube because improper seating can cause a failed leak test.

In the first screen in the leak test mode, it displays: PQ200 LEAK CHECK: In Progress!

The leak test starts with the processor driving the pump to draw a vacuum in a sealed PQ200 flow path from the inlet at the top, capped by the Flow Audit Adaptor. The processor will stop the pump when the vacuum has reached over 100cm. Then, it waits 2 minutes to see if there is a drop in vacuum pressure. If the drop exceeds a certain level, it will result in a failure.

If the pump starts up and speeds up quickly, and it does not seem to be drawing a vacuum at all, most likely there is a leak in the flow path. If it does not seem severe but is struggling, the leak may be a smaller leak. Either way, this means it is not achieving the condition necessary to run a leak test. To proceed, you will need to find the leak.

If the necessary vacuum level was reached, but the system waited for 2 minutes and detected an excess drop, then there is a small leak in the flow path. To determine whether the leak is before or after the filter cassette, perform an internal leak check using the leak test cassette (standard filter cassette with an impermeable membrane installed).

If the initial leak test fails, but the second internal leak test passes, the leak is within the downtube or cyclone. Check that the mechanical filter assembly was fully closed during the test. Then examine the o-rings in the downtube and cyclone for wear.

Replace any o-ring exhibiting wear.

If the internal leak test fails, this means that there is a leak somewhere in the path from the filter cassette to the pump. First, examine the filter cassette and look for any cracks or leaks. If they are present, you need to replace it. If not, use the following diagnosis sequence to find the location of the leak.

Diagnose a Leak in the Flow Path Sequence:

Block the air intake using a hemostat at the following components and connecting hoses, sequentially, to isolate the point of leakage.

- i. Water Trap
- ii. Water Drain Valve
- iii. Flow Sensor
- iv. Air Baffle
- v. Solenoid Valve

- vi. Static Pressure Sensor Tube
- vii. Pump

When you perform the diagnostic steps, you can do one of (2) methods:

- In a linear search, test one component at a time and proceed down the flow path.
- A binary search can cut down the time a great deal. This should start in the middle of the flow path. Clamp the hose there. If it passes the leak test, then the problem is at the top of the clamp. If it still fails, then the leak is at the lower end, towards the pump. Once you have identified which half, proceed to identify which quarter of that suspected half. *Remember, each trial requires a leak test to be run!*

The pump can be worn out if the initial vacuum is not reached. The processor board can also be bad. You can swap out these components, one at a time, with another unit to see if the problem persists.

The following is another diagnostic. It applies to the older systems as well (before the current revision "T" design):

The first step is to tighten the knurled ring/adjustor for the sampling train located under the filter cassette housing. Make sure not to over-compress the o-rings after tightening. Then, replace the leak check adapter and down tube with spares to isolate potential sampling train upstream issues. Perform an internal leak check using solid filter medium in the sampling train to isolate potential upstream issues. Check the integrity of all internal sample train o-rings and re-grease or replace if necessary.

If the leak check failure still persists, remove the leak check solenoid apparatus/valve from the unit, disassemble and clean out any debris, and re-grease. Re-seat the solenoid in BGI housing. If the leak check continues to fail, replace the solenoid assembly (Part #: VA 3012).

Please contact a Mesa representative with any questions.

