Testing the SAV03 valve unit for leaks

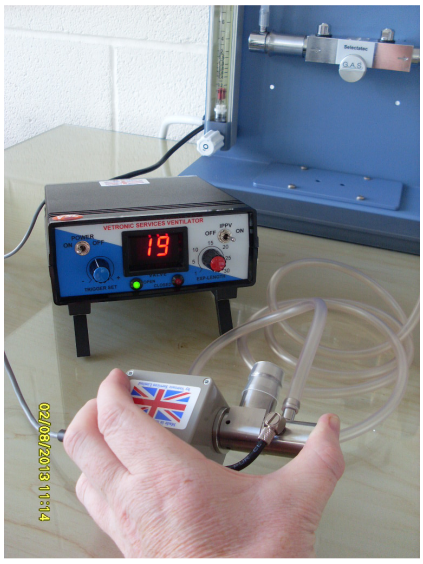
The valve unit of the SAV03 consists of a mechanical solenoid forcing a stopper against a sealing rim to prevent outflow of gas. This seal must be perfect to allow ventilation of very small patients with small tidal volumes. Any misalignment of the solenoid actuator or collecting of debris within the valve unit can lead to leaks that prevent the ventilator from functioning properly.

A leak in the circuit should be suspected if during use it is noted that the Pressure Values on the screen fall during the Inspiration period but do not reach zero. For practical purposes during a surgery, increasing the Fresh Gas Flow rate will overcome the leak and allow surgery to continue.
Please note that although a faulty valve can be a cause of leaks, the most common source of leaks is in the Patient Circuit, especially around the ET tube or sidestream capnograph connections.

If a valve is suspected of leaking then there are 2 simple tests that can be performed.

1. Test for solenoid action, movement and sealing

- Turn on the SAV03.
- Set the Trigger Value to 20
- Set the Expiratory time to minimum (fully anti-clockwise)
- Connect the Fresh Gas Flow (FGF) from the anaesthetic machine and set this at 200mls/min
- Place your thumb fully over the end of the valve piece, where the ET connector would normally go.
- Set IPPV to ON



The ventilator should repeatedly open and close the solenoid valve at around once per second. This should result in a healthy click-click as the solenoid opens and closes. If you do not observe this result, check the gas connections and ventilator settings and repeat.

Now reduce the FGF to 100ms/min. The solenoid cycling rate will slow down. Continue reducing the FGF to the minimum the Flow Meter will allow. Solenoid cycling action should continue.

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If the above results are observed, then proceed to Test 2. If you do not observe this normal solenoid action, then your SAV03 should be returned to your supplier for a Service.

2. Test for low volume leak

The following test is very sensitive and will not work if there is even the slightest leak in the valve unit.

- Turn on the SAV03.
- Set the Trigger Value to 10
- Set the Expiratory time to minimum (fully anti-clockwise)
- Disconnect the Fresh Gas Flow (FGF) from the anaesthetic machine and seal the small FGF port on the valve unit. Use the stopper provided in the SAV03 Extension Tube Kit.
- Set IPPV to ON

Now place your thumb fully over the end of the valve piece, where the ET connector would normally go to form a seal.
Then continue to press your thumb firmly against the opening.

This small change in volume caused by the body of your thumb pressing into the valve opening should be enough to trigger the ventilator. If it does not then check the settings and connections as described above and repeat the test.

Remove your thumb from the opening and repeat.
If you can achieve repeated cycling of the solenoid valve using the above procedure then the valve seal is fine

If the above test fails, then you can assess the severity of the leak from the results of Test 1. A leak at less than 50mls/minute is not too severe and should result in normal operation when used on patients that have FGF rates in excess of 500mls/minute. If in any doubt about the operation of your SAV03 valve, please contact your supplier for advice.

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