

MRI Mallard Anesthesia Ventilator Machine

New User Step-by-Step Guide

M354 Rev 07-1-26

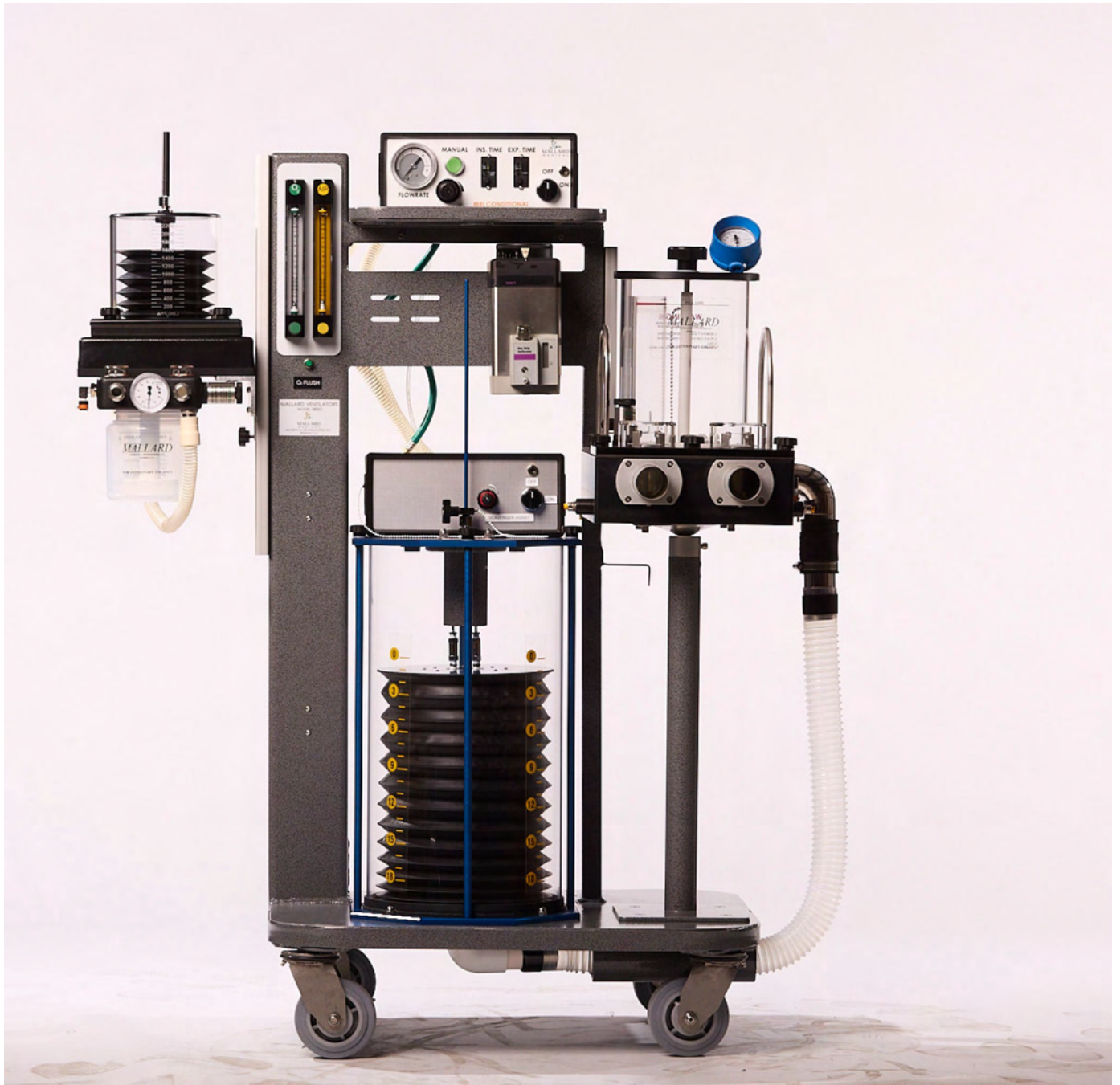


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Mallard Large Animal Breathing Circuit



Once connected to the absorber circuit, use a tapered plug to seal the Y-connector. Ensure the luer cap is installed before performing pressure testing.

Pre-Anesthetic Checklist Large Animal System

1. If the valve plate has been removed for cleaning, replace the valve plate and secure with the 6 screws as shown in Figure 1.
2. Make sure each knob is evenly tightened and secured with the same pressure.



Figure 1:

Unidirectional valves exposed by removal of the valve plate. Secured by means of the 6 threaded knobs pictured.

3. Correctly fill and replace the soda lime canister (Figure 2) if necessary. If refilling, remove the canister from the base and place on paper towel as shown in Figure 2A. Place the white cap over the central narrow tube. Ensure that the inner clear plastic tube is NOT filled (this is the expiratory limb of the system).



Figure 2A:

Figure 2B:

Adult soda lime canister. Note the inner limb which should not be filled with soda lime.



4. If the bellows have been raised for cleaning/drying, collapse the bellows by releasing the rod clamp attached to the blue rod that protrudes out of the bellows (Figure 3). Remove the rod clamp completely from the blue rod, as it tends to catch during functional operation and can result in damage to the ventilator components. Refer to Operator's Manual for cleaning and disinfecting the bellows.
5. Note: The bellows are NEVER removed for cleaning.

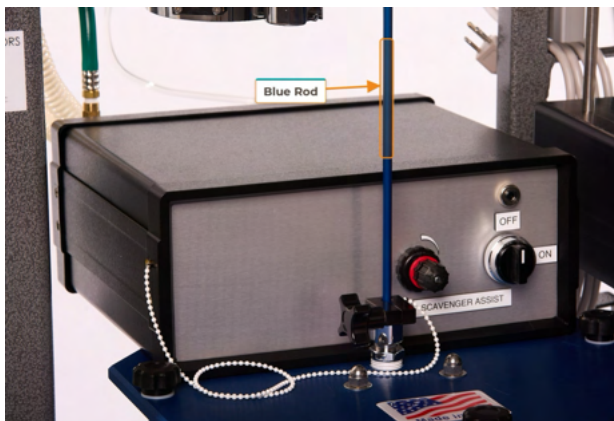


Figure 3:

The rod clamp that is attached to the blue rod is used to hold the bellows up for drying. **Remove the rod clamp before cycling ventilator.**

6. Connect the gas line and the scavenger to the wall or overhead connectors and plug in the power cord.
7. Connect the breathing hoses and ensure the APL spill valve (or pop-off valve) is closed (Figure 4) and that the exhaust gases are collected from the back of the bellows housing at the scavenger port (Figure 5). The APL valve is never scavenged from unless a bag is fitted and the patient is allowed to breathe spontaneously.

Figure 4:



Figure 5:



- Adjustable pressure-limiting (APL) valve should remain closed at all times (unless a reservoir bag is being used instead of the bellows).
- The scavenger outlet is on the rear panel of the lower control box.

8. Connect the desired vaporizer by fitting the black hose elbows to the inlet and outlet (Figures 6A, 6B below).

Figure 6A:



Figure 6B:



9. Check the ventilator flow rate gauge on the front of the ventilator; the needle should sit in the M (medium) range (Figure 7 below).

Figure 7:



The gauge needle indicates the gas pressure level. The maximum point of the needle (and therefore maximum flow) is limited by the supplied gas pressure coming into the back of the machine.

Caution:

Over-tightening this control after the needle stops moving can damage the regulator over time. **Stop turning** the regulator as soon

10. Perform a leak test using the following steps:

- Insert the supplied tapered plug into the Y-piece, cap the gas sampling port, and confirm the APL valve is closed.
- Partially fill the bellows using the O₂ flush valve (located above the flowmeters), then set the O₂ flow meter to 3 L/min.
- As the bellows reach 0 L, verify that the circuit pressure (manometer) on the absorber reads between 4–6 cm H₂O (see Figure 8). Pressure should not exceed this range, as relief valves will automatically vent excess gas (refer to pressurized leak testing).
- Press the manual breath button (see Figure 9), ensuring airway pressure does not exceed 60 cm H₂O. This action should compress the bellows and increase pressure until the button is released.

Figure 8:

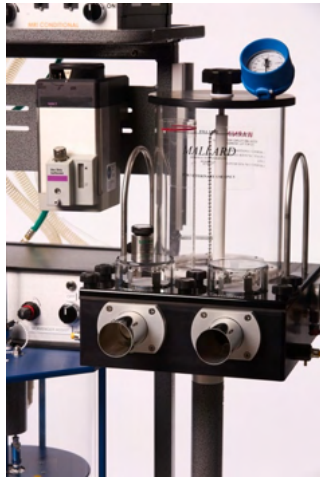


Figure 9:



11. Once the leak test is performed, the oxygen is turned off. Pressure is released by opening the breathing circuit and the bellows will collapse.

Pressurized Leak Testing Large Animal System

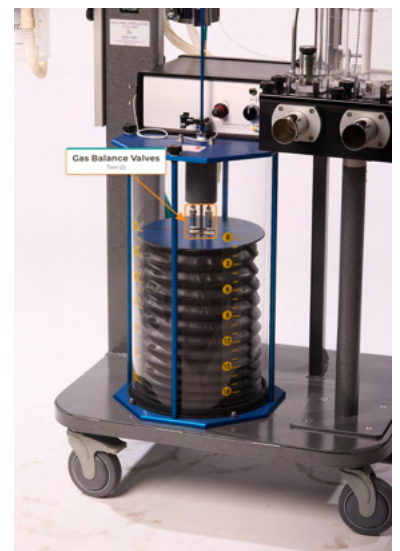
- Insert the supplied tapered plug into the Y-piece, cap the gas sampling port, and confirm the APL valve (pop-off valve) is closed.
- Partially fill the bellows using the O₂ flush valve.
- Firmly grip the blue rod extending vertically from the bellows, taking care not to bend it.
- Depress the bellows to the 2 L mark (see Figure 10).
- While holding the bellows in this position, continue filling the system until a pressure of 25–30 cm H₂O is reached.
- Stop filling and monitor the manometer to ensure there is no pressure loss.
- If the bellows are not restrained and reach the top of the chamber, the gas balance valves (see Figure 11) will automatically open to vent excess gas.
- Alternatively, attach a plug in place of the hose connected to the bellows. A standard leak test can then be performed by closing the APL valve, pressurizing the system with O₂, and observing the manometer for any pressure drop over time.

Figure 10:



Gripping blue rod to stabilize the bellows during a circuit pressure test.

Figure 11:



Gas balance valves. These open automatically when the bellows reach 0 L to vent any excess gas.

Tips For Clinical Use Large Animal System

WHEN USING THE BELLOWS DURING SPONTANEOUS BREATHING, THE APL VALVE (OR POP-OFF VALVE) REMAINS COMPLETELY SHUT

When beginning to cycle the ventilator, turn down the flow rate control to its lowest setting. This prevents an excessive tidal volume from being delivered to the patient when first turning on the ventilator. This also applies when using the manual breath button. Turn on the ventilator and set the desired inspiratory time. The tidal volume can now be adjusted by turning the flow rate control knob clockwise (Figure 12). This is based on the following equation:

Figure 12:

Adjusting the flow rate control to set the tidal volume.

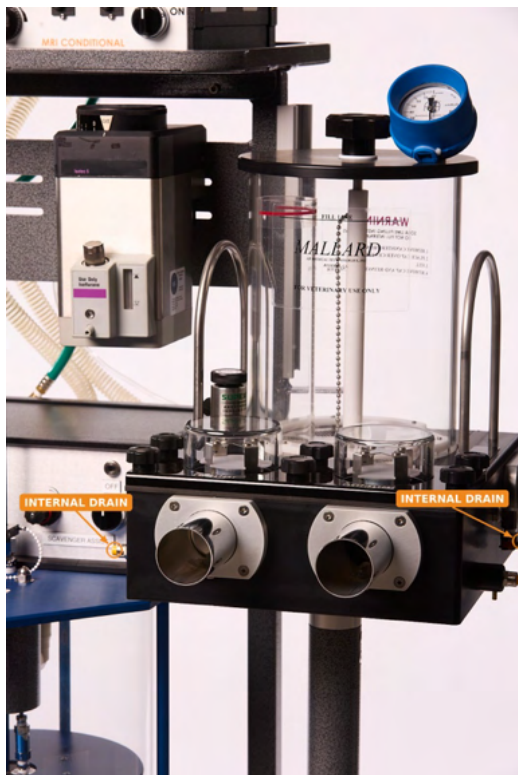


$$\text{INSPIRATORY TIDAL VOLUME} = \text{INSPIRATORY TIME} \times \text{INSPIRATORY FLOW RATE}$$

Mallard Post-Anesthetic Checklist Large Animal System

1. Remove entire breathing circuit as one piece. Wash the entire assembly in mild dishwashing detergent and rinse with tap water. Disinfect if required. Place a plug over the gas sampling port on the Y piece and hang the entire assembly to drain and dry.
2. When needed, remove the valve cover and wipe clean.
3. If moisture has collected in the drain valve housing, press the yellow buttons (Figure 13) around the absorber unit to activate the drains.

Figure 13:

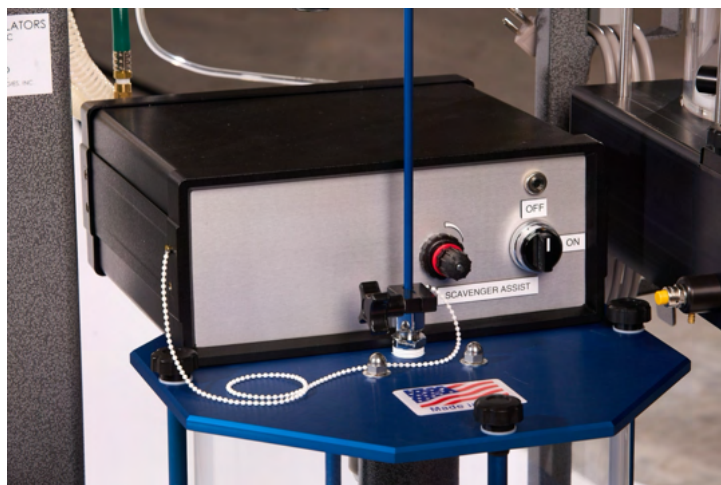


Depression of yellow button to open internal drains after use. There are three located around the base of the absorber block.

4. Empty the soda lime canister if necessary. If refilling, ensure that the inner clear plastic tube is not filled (this is the expiratory limb of the system), and place the white cap over the central narrow tube, (see Page 3, Figure 2A/B).
5. Gently grasp the blue rod that extends upward from the bellows, then slowly pull it $\frac{3}{4}$ of the way up to raise the bellows. Secure the rod with the rod clamp (attached with a white chain). This opens the bellows to allow draining/drying between uses.
6. During clinical use, moisture tends to accumulate at the bottom of the bellows. To address this, detach the black coupler from the absorber's elbow and place it on the floor, allowing the moisture to drain into the floor drain. If needed, detach the drain hose found just below the bellows to clean it separately.

Figure 14:

The bellows held in an expanded position by use of the blue rod and rod clamp.



7. Disconnect the power cable and pipelines from the wall and use the brackets provided on the back of the machine to store them.

Pediatric Bellows Assembly (PBA)

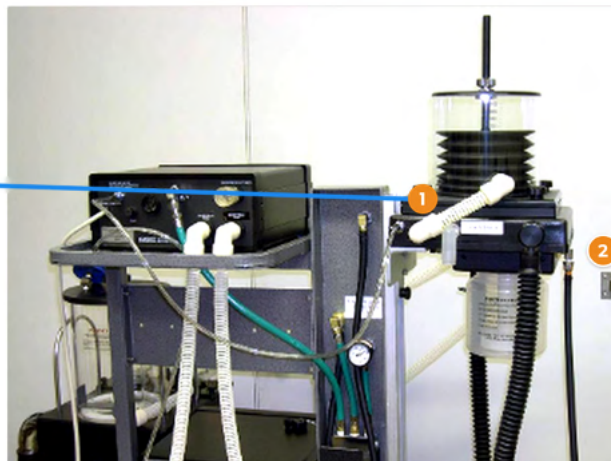


Pediatric Bellows Assembly (PBA) Changeover

Converting from the large-animal absorber circuit

1 Exhalation Valve Drive Line

Disconnect the 1/8" (0.32 cm) exhalation valve drive line from the top-left corner of the back of the lower box. When changing over to the PBA, remove it from the lower box and reinstall it in the **bottom-left corner of the PBA**.



2 Fresh Gas Hose

Disconnect the orange color-coded 1/4" (0.64 cm) black hose from the large-animal absorber circuit, next to the chrome elbow. Connect this bayonet fitting to the **fresh gas inlet** on the PBA small-animal absorber block — the orange mating connector on the outer edge.

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Mallard Pre-Anesthetic Checklist

Pediatric Bellows Assembly System

(Only For 2800CP Systems)

1. Change over to the pediatric bellows as follows:

- Disconnect the adult exhalation valve drive line (clear tubing with the blue collar fitting) from the back of the ventilator by pressing the catch at the base of the collar (Figure 15). Do not pull the line out forcefully.
- Install it onto the pediatric exhalation drive line on the back side of the PBA, located left of the scavenger outlet below the bellows at the blue collar fitting and push it securely into the back of the ventilator until it clicks (Figure 16).
- Disconnect the black hose (orange collar fitting) from the large animal absorber circuit (Figure 17) and connect it to the fresh gas inlet (also color-coded orange) on the pediatric absorber (Figure 18). Push the hose fitting in until it clicks.
- Ensure the large animal bellows are fully down before turning on the PBA side.

Figure 15:



Remove the blue collared fitting from the back of the lower control box. Press the release catch as shown to free the tube.

Figure 16:



Connect the blue collared fitting to the pediatric circuit in the back left corner. Push the fitting in until it clicks.

Figure 17:



Remove the fresh gas supply tube from the adult circuit. Push in the catch to release the tube.

Figure 18:



Connect the fresh gas tube to the pediatric circuit. Push the bayonet fitting in until it clicks.

2. Fill the soda lime canister following the directions printed on it.

Figure 19:

The pediatric soda lime canister.



3. Connect the machine to the gas wall outlets and electrical supply.
4. Connect the desired vaporizer by fitting the black hoses to either side of the vaporizer (Photos 6A, 6B and 6C).
5. Check the flow rate gauge on the ventilator; the needle should sit in the lower range.
6. Leak test the system as you would for a normal small animal system. It is possible to pressure test the pediatric system when the bag is not in the circuit (Figure 20).



Figure 20:

Pressure/leak testing the pediatric circuit.

Tips For Clinical Use – Pediatric System (Only For 2800CP Systems)

1. The patient can breathe from the bag during spontaneous breathing. The APL valve (pop-off valve) should be fully open for a spontaneously breathing animal, and the scavenge hose should be attached as shown below in Figure 21.



Figure 21:

Scavenge hose attached to the pediatric APL valve during spontaneous breathing.

2. To ventilate the patient, remove the bag and connect the white/cream colored hose leading from the back of the ventilator to the bag outlet (Figure 22). Close the APL valve. Change over the scavenge hose to the back of the ventilator (Figure 23).

Figure 22:



Disconnection of the bag (to the right) and re-attachment of the ventilator bellows (white/cream hose on the left).

Figure 23:



Scavenge hose connected to the outlet on the rear of the pediatric bellows.

3. The patient's tidal volume can be set using inspiratory flow rate and inspiratory time as follows:

$$\text{INSPIRATORY TIDAL VOLUME} = \text{INSPIRATORY TIME} \times \text{INSPIRATORY FLOW RATE}$$

The patient's tidal volume can be limited by the adjustable rod that protrudes vertically from the pediatric bellows (Figure 24). Turn the chrome nut to loosen the rod. Push the rod down onto the bellows until the desired tidal volume is reached, and tighten the chrome nut to secure the rod in this position.



Figure 24:

Adjustable vertical rod for limiting the tidal volume delivered when using the pediatric bellows.

Mallard Medical – Support Videos

<https://mallardmedical.com/support/>

