

LEVEL TWO FULL ANAESTHETIC MACHINE CHECK NZATS

This guideline describes the machine check on the Lamtec Anaesthetic Machine and Datex Monitor to comply with NZATS standards – (April 2006)

1. PRELIMINARY

- Check bulk gas warning lights or medical gas alarm panel.
- Check there is a current and prominent service label on all anaesthesia delivery systems
- Turn Monitor on
- Check gas sampling line and return line is clean and free from defects
- Check patency and date of sampling line water trap.
- Open sampling line to room air – reads 21% +/- 3%
- Check Datex low oxygen alarm set at 18%
- Check uninterrupted power supply is okay.
- Attach gas-sampling line and filter to CGO with a filter.
- Check machine moves freely.
- Check that scavenging is connected correctly and connections are secure.
- Ensure resuscitation bag is patent, has a rebreathing bag, mask and oxygen tubing is attached
- Remove Vaporiser

2. BULK GAS SUPPLY AND RESERVE CYLINDERS

High Pressure System – one gas, leak, contents and analysis

High Pressure Leak Test

- Disconnect wall supply, open all flowmeters. Drain machine of all gases.
- Close all flowmeters
- Open then close both gas cylinders. (Allow several seconds for the reservoir tank to fill before closing the oxygen)
- Check gauges of cylinder – a falling gauge indicates a high pressure leak.
- Open flowmeters and drain the machine again

Contents and Gas Analysis

Open the Oxygen cylinder

- Check contents of cylinder (replace if 5000kPa or below)
- Flow only in Oxygen flowmeter adjust flows to 2L/min
- Analyser confirms oxygen 100% +/- 3%
- Turn off cylinder.
- Drain machine using the 'flush'. (The flush may be used appropriately through out the machine check when oxygen is not being used as a check).

Open the Nitrous oxide cylinder

- Check Contents of Nitrous Oxide cylinder (replace if 5000kPa or below)
- Nitrous Oxide is available but is not flowing
- Open Oxygen cylinder
- Flow only in Oxygen and Nitrous Oxide flowmeters
- Adjust flow settings to 2L/min Oxygen 2L/min Nitrous Oxide
- Analyser confirms 50% Oxygen, 50% Nitrous Oxide +/- 3%
- Turn off the oxygen cylinder – drain. Turn off the Nitrous Oxide cylinder - drain
- Ensure key is returned to the Oxygen cylinder

Low Pressure System – one gas, contents and analysis

Plug the Oxygen probe into the wall outlet – Tug Test

- 400kPa available
- Only flow in Oxygen Flowmeter adjust flows to 2L/min
- Analyser confirms oxygen 100% +/- 3%
- Oxygen bobbin spins freely at high and low flows and movement is smooth
- Auxiliary oxygen – test flowmeter to maximum flow
- Disconnect Oxygen probe and drain machine

Plug the Medical Air probe into the wall outlet – Tug Test

- 400kPa available
- Only flow in Medical Air Flowmeter adjust flows to 2L/min
- Analyser confirms oxygen 21% +/- 3%
- Medical Air bobbin spins freely at high and low flows and movement is smooth
- Disconnect Medical Air probe and drain machine

Plug the Nitrous Oxide probe into the wall outlet – Tug Test

- 400kPa available
- No flow in flowmeters
- Plug the Oxygen probe into the wall outlet
- Only flow in Oxygen and Nitrous oxide Flowmeters adjust flows to 2L/min each
- Analyser confirms Oxygen – Nitrous oxide 50% - 50% +/-3%
- Nitrous Oxide bobbin spins freely at high and low flows and movement is smooth

ANTI-HYPOXIC DEVICE AND NITROUS CUT OUT DEVICE AND OXYGEN FAILURE ALARM***Anti hypoxic device***

- Set Oxygen to 2L/min
- Increase nitrous oxide should not go above 6L/min
- Confirm 1:3 ratio on the gas analyser
- Adjust Oxygen to low flow
- Confirm 1:3 ratio on the gas analyser

Nitrous cut out and oxygen failure alarm

- Adjust oxygen flow to 6L/min
- Adjust Nitrous Oxide flow to 2L/min
- Disconnect Oxygen probe from pipeline
- Nitrous should cut out as Oxygen depletes
- Oxygen failure alarm sounds visual indicator changes from green to red
- Plug in all pipeline gases
- **Tug Test All**

3 BACK BAR, VAPORISER CONTENT AND VAPORISER LEAK TEST

- Check back bar o rings and place first vaporiser
- Set Flow to 2L/min Medical Air
- Place first vaporiser, check content and that filling ports are closed
- Occlude Common gas Outlet bobbin falls, release, bobbin will bounce
- Occlude Common gas Outlet bobbin falls, release, bobbin will bounce
- Check vaporiser turns to maximum setting then set at low flow
- Occlude Common gas Outlet bobbin falls, release, bobbin will bounce
- Turn off and remove first vaporiser
- Place second vaporiser, check content and that filling ports are closed
- Occlude Common gas Outlet bobbin falls, release, bobbin will bounce
- Check vaporiser turns to maximum setting then set at low flow
- Occlude Common gas Outlet bobbin falls, release, bobbin will bounce
- Turn off vaporiser, turn off flow

4 OXYGEN FLUSH

- Attach test lung to the common gas outlet. Using flush fill test lung - should fill within 4 seconds indicating a 35 – 70L/min delivery of oxygen.
- Remove test lung from common gas outlet and reattach common gas hose.
- Attach filter with sampling to the distal end of the breathing circuit.
- Attach test lung to filter.

5 CIRCLE ABSORBER

- Check colour of soda lime and close APL valve

6 CIRCUIT LEAK TEST

- Extend breathing circuit and ensure circuit is connected correctly
- Using the flush, fill the circuit, re breather bag and test lung to a pressure of 30cmH₂O on the airway pressure gauge
- Confirm pressure holds for atleast 5 seconds.

7 TWO BAG TEST, APL VALVES FUNCTION & SCAVENGING FUNCTION TEST

- Open APL valve. Observe spilling of both the re breathing and test lung bag, but ensure they do not empty completely. (scavenging activity test)
- Close APL valve. Apply positive pressure to both bags alternately observing free movement of both uni directional valves, and that there is no resistance detected in the circuit.
- Open APL valve and ensure even and easy gas spill when the re breathing bag and test lung are squeezed simultaneously. (scavenging dump test)

8 VENTILATOR TESTS

Leak test

- Set the Bag / Ventilator switch to Ventilator
- Push the flush and fill bellows
- Squeeze 100mls out of bellows and observe for leak no less than 5 seconds

Peep Test

- Set Oxygen to 6 L/min
- Observe pressure gauge does not go over 3cm H₂O
- Set oxygen to 2 L/Min

Cycle Test

- Turn on ventilator and cycle six times
- Ensure the bellows inflate and deflate through each cycle
- Set the controls as per hospital policy

Ventilator mode	Volume control
Tidal Volume	500mls
Rate	10
I:E ratio	1:2
- Ensure the tidal volume is 500mls after 4 – 6 breaths

High Pressure Alarm

- Apply pressure to re breathing bag to simulate high airway pressure
- Alarm should be seen and heard when airway pressure reaches approx 60 cm H₂O

Low Pressure Alarm

- Remove re breathing bag from circuit to simulate low pressure / disconnect.
- Alarm should be seen and heard within three cycles.
- Turn off Ventilator
- Set the Bag / Ventilator switch to Bag

9 SUCTION

- Tubing should be approx 2 – 3 m in length
- When occluded should reach a pressure of – 60kPa within 4 seconds
- Check suction unit is assembled correctly
- Check the regulator is functioning correctly on both settings

10 AIRWAY EQUIPMENT

- Selection of Guedal airways
- Sizes 3 and 4 Macintosh laryngoscopes.
- Syringe
- Magill's forceps
- LMA's selection and sizes
- Endotracheal tubes – selection of sizes

11 CHECK EMERGENCY DRUGS INCLUDING SUXAMETHONIUM**12 MONITORING EQUIPMENT**

- Check pulse oximetry is functioning and available
- Check that ECG leads are available
- Check that blood pressure cuff is available and of appropriate size for the patient.
- Stethoscope
- Temperature probe and cable
- Nerve stimulator
- Pressure cables

13 OTHER APPARATUS TO BE USED

- Intravenous Cannulation equipment and infusion equipment
- Warming equipment
- Transport Oxygen and Hudson mask