Locate'n'Spray™ - Periodic Cleaning Protocol.

REVISON	DATE	PAGES	AUTHOR	CHECKED BY
A	08/12/2017	4	FR	

A system flush should be carried out at least once a year; a recommendation would be quarterly. Make sure to always clean the system if a change in chemical is to occur; flushing the system with fresh/warm water will help reduce the risk of contamination between different chemical solutions.

Personal Protective Equipment (PPE)

When working on the system, please ensure you take the necessary precautions and evaluate the potential risks associated with the task; always wear the correct protective clothing as necessary. Gloves and Safety Goggles are a necessity in this particular task.

Time Required:

- This task must be completed in between milking hours or in parlour downtime at the end of season.
- If you are planning to clean in-between daily milkings, therefore working to a deadline, we recommend as many technicians as possible to assist in removing and replacing the nozzle blocks and O-rings.

Tools required:

- Tx20 Torque Screw driver/drill attachment (if using drill ensure slow speed and low torque setting)
- Long nose pliers for removing nozzle blocks.
- Brush to clean nozzle blocks and nozzle block housing.
- Provision to clean/rinse nozzles whilst flushing (optional).
- Laptop with Locate'n'Spray™ software loaded and USB A to USB B lead for connecting to the Master PCB.

Please ensure the Rotary is in its park position, milking has finished and all the relevant precautions are taken before commencing work.

1. Step 1 – Draining the system

1.1. Please ensure the System is powered on and the pump unit is pressurised. You can increase the pressure on the pressure regulator within the pump unit to max 60psi to speed up the draining process; remembering to reset to the farm's set pressure after the process is complete.

1.2. Using the Pressure Drain Tap (pictured below), turn these valves to start the draining of the chemical in the delivery lines. This chemical can be collected and re-used when the cleaning process is complete.

1.3. The pump unit will keep on pumping until the tanks have emptied. You can increase the pressure on the pressure regulator within the pump unit to max 60psi to speed up the draining process.

1.4. When the tank is almost empty, the compressed air supply to the pump unit can be isolated. This will stop the pump from running further and sucking air into the system.

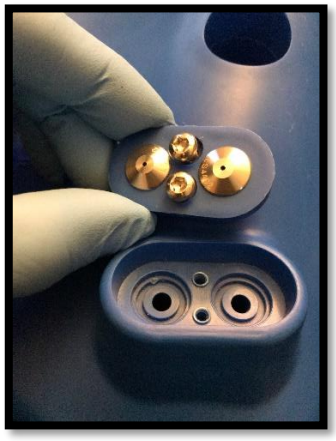
2. Step 2 – Cleaning the Tanks and Cartridge Filters

2.1. The remaining chemical can now be drained from the tank via the drain valve or can be tipped out if removing the tank to clean it.
2.2. The tanks can then be cleaned internally by hand; this can be done by scrubbing the internal walls and base with a cleaning solution of your choice to remove any residue or sediment that may be present. Make sure the tanks are fully rinsed with fresh water afterwards.
2.3. The in-line cartridge filters should also be cleaned and rinsed at this point. There is no need to isolate these to clean as the system will already be drained.
2.4. When you are satisfied the tanks are sufficiently cleaned and rinsed and the in-line filters are reassembled and allowing the flow, fill the tanks with fresh water or warm water ensuring it is full.

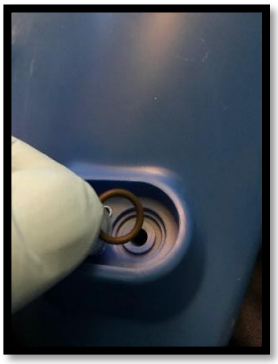
3. Step 3 – Preparing for the system flush.

We recommend removing the nozzle blocks from the L'n'S modules to achieve a better system flush. Removing the blocks helps any larger particles/debris escape which would otherwise be hampered by the nozzles.

3.1. Make sure the Pressure Drain Tap/s are closed.
3.2. You can now turn on the compressed air supply to the pump units; this will prime the delivery line up to the solenoids.
3.3. The pump units should stop pumping when the system reaches the set pressure; this will verify there are no leaks in the system.
3.4. For more effective flushing the pressure can be increased to a maximum of 60psi/4bar
3.5. Remove all the nozzle blocks using the Tx20 Torque driver or drill bit attachment. Remember if using a drill, use a slow speed and torque setting. Keep the screws safe.



3.6. Use Long Nose pliers to lift the nozzle block from its housing by inserting the pliers into the screw holes and lifting upwards.
3.7. Ensure all the O-rings that sit at the base of the nozzles are collected at this point. It is important to keep all these safe.



3.8. The nozzle blocks can be cleaned or soaked in a bucket whilst the system is flushing, this may help remove any small particles that could be partially blocking the nozzles. Note. If you are milking a seasonal herd and the parlour has sufficient downtime, the nozzles may be soaked for a longer

period in a descaling solution to break down any matter internally. Please remove the nozzles from the blocks if soaking for a longer period to avoid any discoloration of the block.

3.9. The system should now be primed with fresh water up to the solenoids and the nozzle blocks removed.

4. Step 4 - Flushing the Locate'n'Spray™ system

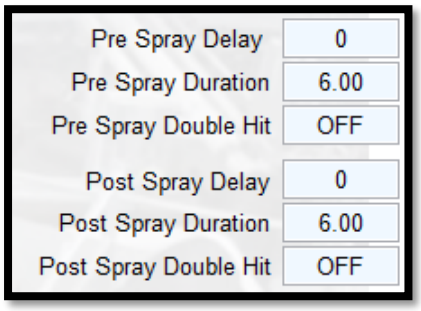
4.1. The next step is to connect the Laptop loaded with the Locate'n'Spray™ software to the Master PCB

4.2. When you have a successful connection, you are ready to start the fresh water rinse.

4.3. When connected Re-Scan Network to ensure you have a data connection across all PCBs.

4.4. When the system has successfully found all Locate'n'Spray™ units, you are now ready to alter the system settings for flushing. **Important.** Please make a note of the current system settings before changing.

4.5. Please change the system settings as shown below: This can only be done from the Master unit (usually no.1 serial number)



4.6. After you have entered the values click Update Settings to save the changes to all PCBs.

4.7. The flushing is achieved by running multiple solenoid tests. The new settings will trigger each individual solenoid to open for 6 seconds at a time allowing the flow of fresh water. The solenoid tests are repeated until the tank is empty or you are satisfied that the system has had a sufficient rinse with fresh water.

4.8. Before you start the first test please make sure that the area around each L'n'S module is clear of anything that can be damaged by water and all PPE is worn by any technicians involved in the task. Please stand back when running the solenoid tests.

4.9. You can now start the first solenoid test by clicking Solenoid Test

4.10. This will start triggering all the solenoids.

4.11. At first you will hear air releasing with each spray until the system is fully primed and all the air in the system has been removed. It may take a couple of solenoid tests to fully expel the air.

4.12. Repeat the solenoid tests until the tank/s are empty and you feel satisfied with the flush, so no cross contamination between can occur is swapping to a new chemical solution.

4.13. When satisfied with the fresh water flush, you can once again drain the system. This is done by repeating **Step 1.**

4.14. Any remaining water left in the tanks may be drained.

5. Step 5 - Replacing the Nozzle Blocks and re-filling the Tanks

5.1. After you have drained the fresh water from the system, you may now re-install all the nozzle blocks. Please ensure all the O-rings are inserted correctly and the screws are not overtightened. Due to the soft properties of the material of the module it is easy to rip the threads if using too much torque.

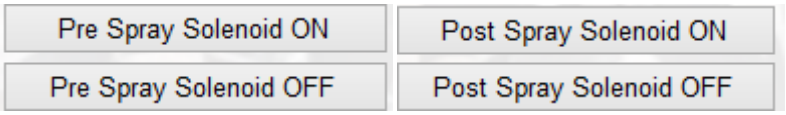
5.2. When you are satisfied all the nozzle blocks are re-installed correctly you may proceed to refill the tank/s with Chemical; making sure you are satisfied with the flush.

5.3. After the compressed air supply is returned to the pump units, the system will again prime up to the solenoids.

6. Step 6 - Priming the Chemical

6.1. To avoid wasting valuable chemical, each L'n'S module must be primed individually. This is done using the Locate'n'Spray™ software.

6.2. Starting at the Master unit, manually trigger each solenoid at each bail until chemical is present at all nozzles and any trapped air is released:



6.3. If the parlour is operating pre- & post- spray, this is also a good opportunity to check that all the solenoids are operating the correct spray. This can be checked by visually confirming that the pre spray is spraying from the four outer nozzles and the post spray is spraying from the four inner nozzles.

Note. This will require at least two technicians as one technician will be required to walk round and call out as soon as chemical is spraying. This will ensure you limit the amount of chemical wasted during the priming process.

7. Step 7 – Finalising the process

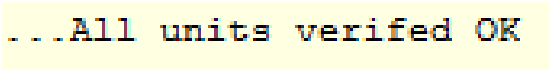
7.1. When the system is fully primed with Chemical and free from air, then the flushing task is complete.

7.2. You must now revert back to the Farm's existing system settings that you noted down prior to changing them for the filling process

7.3. With the Laptop still connected, please enter the existing system settings back into the software. Always remember to press 

to save these settings to all L'n'S PCBs.

7.4. If all settings have been updated correctly you will see this message:



7.5. Cleaning protocol complete. You may now disconnect you Laptop from the PCB and replace the cover.

7.6. To ensure all L'n'S units are ready for a Pre Spray at the next milking, please power down the system at the power transformer for a brief moment.

7.7. Power up the system again, a red LED will start flashing for a moment on all PCBs, when this LED stops flashing on all PCBs the system has fully initialized and is ready for the next milking.

8. Step 8 – Verifying

8.1. It is important to verify that the system is working to the best of its ability after any work has been carried out. We always recommend observing the system performance throughout the following milking to double check the system has been re-assembled correctly.

8.2. Pay particular attention to the nozzle blocks and any possible leaks that may be present from missing O-rings.

8.3. This is a good time to make a note of any remaining nozzles that are not performing as they should. These can then be noted for further investigation.

8.4. Ensure the Tanks are sealed and any filling equipment returned to its place within the parlour.