03.124 Electrolysis Auxiliary Canister Swapout
(03. HSS Procedure)

NOTE
Starting MD16, when this procedure calls for you to request authorization from MCC for an action, you may proceed on your own go.

OBJECTIVE:

To perform a swap out of the Auxiliary Electrolysis Canister for the Solid Polymer Electrolysis (SPE) system in the event of a failure

EQUIPMENT:

Auxiliary electrolysis canister
PPE safety glasses
PPE static wrist tether
Coolant Pump Syringe Kit
Paper towels
Water Recovery Systems (WRS) Kit
Flathead screwdriver
Water containment bucket
Portable anemometer
Alkaline Water Container

REFERENCES:

03.111 Electrolysis System Deactivation
03.108 Electrolysis System Activation
Serial Number Tracking Spreadsheet
Airflow Tracking Spreadsheet

NOTE
Power removal of the system must be performed in the correct sequence to ensure H_2O does not enter the coolant water pump from the Auxiliary Electrolysis Module.

L2C 1. DEACTIVATE ELECTROLYSIS SYSTEM

1.1 Don static wrist tether and attach to any unpainted metallic surface.

1.2 Don PPE safety glasses.

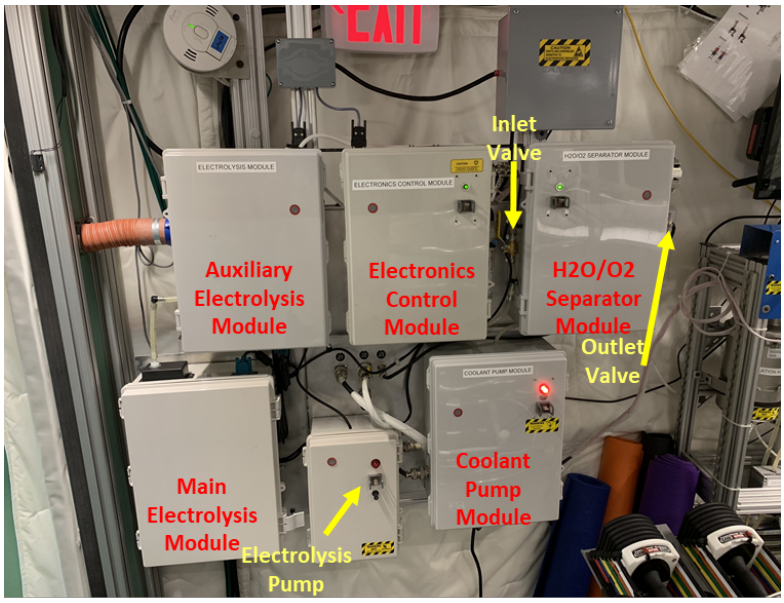

Figure 1: Solid Polymer Electrolysis System

1.3 Gather portable anemometer and take reading of exhaust flow to the right of the H2O/O2 Separator Module (see Figure 1). Set anemometer to m/s and hold anemometer within an inch of the outlet valve, left of center, for 10 seconds to gather an accurate reading.

1.4 Record in Airflow Tracking Spreadsheet confirming that O2 exhaust flow on the right side of the outlet valve of the H2O/O2 Separator Module is within expected range by reporting the flow with the portable anemometer.

-Reading should be between 0.6 – 0.8 m/s.

1.5 Turn off portable anemometer.

1.6 Switch inlet valve located to the left of the H2O/O2 Separator Module to “CLOSED”. (see Figure 1).

-Confirm inlet water valve is perpendicular to hose.

1.7 Switch outlet valve located to the right of the H2O/O2 Separator Module to “CLOSED”. (see Figure 1).

-Confirm outlet water valve is perpendicular to hose.

1.8 Flip power switch of Electrolysis Pump to “OFF”. (see Figure 1).

-Confirm Electrolysis Pump Module light is off.

1.9 Flip power switch of Electronics Control Module to “OFF”.

-Confirm Electronics Control Module light is off.

1.10 Flip power switch of H2O/O2 Separator Module to “OFF”.

-Confirm H2O/O2 Separator Module light is off.

1.11 Unlock both latches on Auxiliary Electrolysis Module and open door.

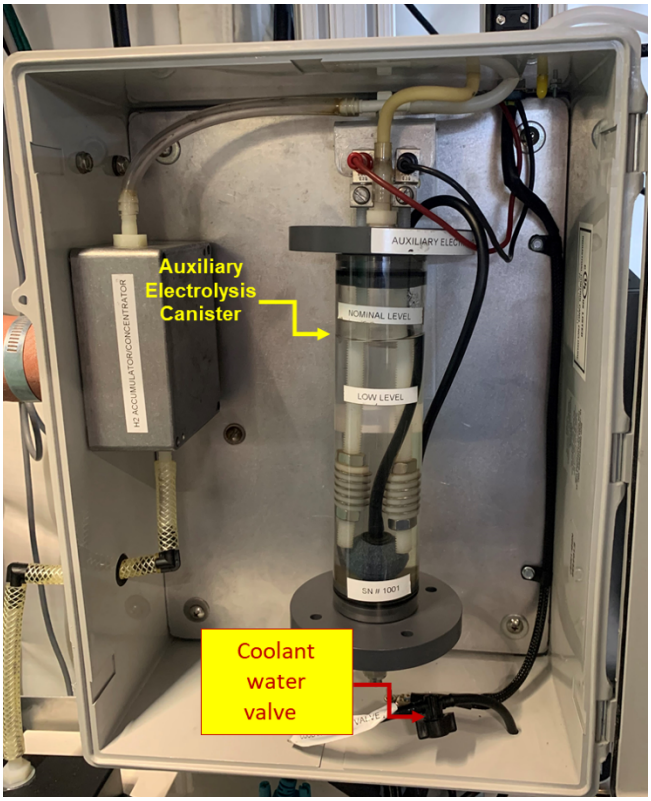

Figure 2: Coolant Water Valve

1.12 Turn coolant water valve (located on black tube behind the Auxiliary Electrolysis Canister) 90 degrees clockwise to “CLOSED”. (see Figure 2).

-Confirm coolant water valve tabs are perpendicular to hose.

-Confirm no more bubble formation.

1.13 Flip power switch of Coolant Pump to “OFF”.

-Confirm Coolant Pump light is off and motor stops humming.

1.14 Flip Main Pump Power switch on Water Recovery System (WRS) to “OFF”. (WRS is located next to the SPE System.) (see Figure 3).

-Confirm WRS Main Pump Power light is off.

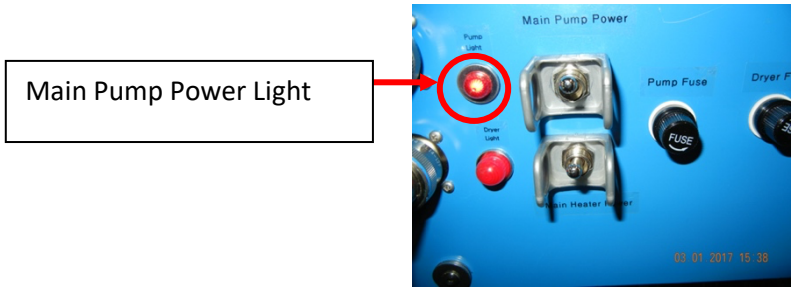

Figure 3: Main Pump Power Switch

1.15 Flip power switch of power strip behind Electronics Control Module to “OFF”.

-Confirm power strip light is off.

L2C 2. <u>DRAIN DEFECTIVE AUXILIARY ELECTROLYSIS CANISTER</u>

Figure 4: Auxiliary Electrolysis Canister within the Auxiliary Electrolysis Module

2.1 Disconnect coolant pump hose at the elbow joint connector from the black hose connected to the top of the Auxiliary Electrolysis Canister. (see Figures 4 and 5).

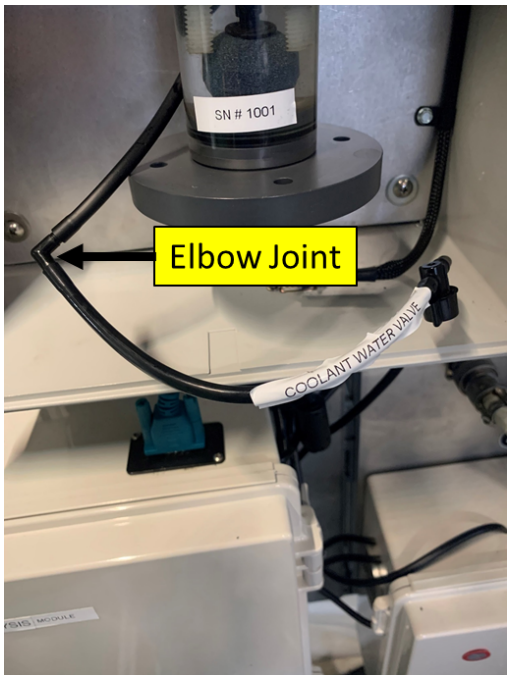

Figure 5: Elbow Joint

2.2 Disconnect black and red power plugs by pulling from the top of the Auxiliary Electrolysis Canister

2.3 Remove beige hose from the top of the Auxiliary Electrolysis Canister

2.4 Hold canister and use flathead screwdriver to remove lug nuts from the top of the Auxiliary Electrolysis Canister. Temp stow lug nuts and screwdriver

2.5 Pull Auxiliary Electrolysis Canister down to disengage from Auxiliary Electrolysis Module Box

2.6 Retrieve water containment bucket from Water Recovery System Kit and temp stow on top of the Auxiliary Electrolysis Module

2.7 Invert canister into water containment bucket and allow electrolyte to fully drain into water containment bucket

2.8 Temp stow water containment bucket away from the SPE system or any other electronics

L2C 3. INSTALL SPARE AUX ELECTROLYTE CANISTER

3.1 Retrieve Spare Auxiliary Electrolysis Canister from the WRS kit.

3.2 Stow defective auxiliary electrolysis canister in a Ziploc bag labeled "Used Auxiliary Electrolysis Canister" in the Water Recovery Systems Kit

Figure 6: Coolant Pump Syringe Kit

3.3 Fill new canister before inserting into fixture by using the electrolysis water syringe from the Coolant Pump Syringe Kit (see Figure 6).

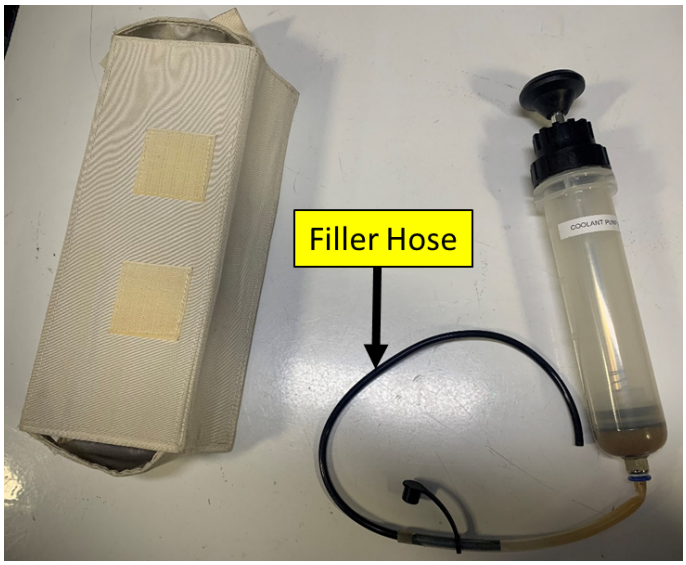

Figure 7: SPE Syringe and Filler Hose

3.4 Attach filler hose and extension (black tubing) to syringe and pull water into syringe from the alkaline water container (see Figure 7).

3.5 Attach syringe and contents to canister port and push syringe to expel water into canister.

3.6 Once filled to “Nominal Level” line on canister, install canister into Auxiliary Electrolysis Module.

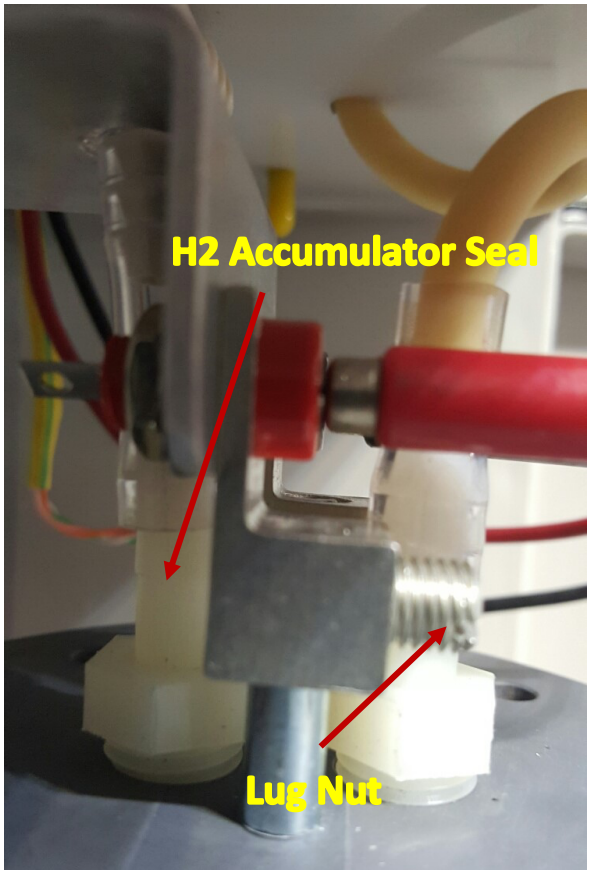

Figure 8: Side view of Auxiliary Electrolysis Canister Top

3.7 Push H2 Accumulator down while pushing Spare Auxiliary Electrolysis Canister up into Auxiliary Electrolysis Module Box and pull up until Cathode/Anode rods slide into slider joints (see Figure 8). Visually ensure tight seal with H2 Accumulator and clear plastic hose in back of Electrolysis Module

3.8 Use flathead screwdriver to tighten lug nuts to Cathode/Anode slider joints.

3.9 Temp stow screwdriver

3.10 Call MCC to report and record in Serial Number Tracking Spreadsheet the new Auxiliary Electrolysis Canister S/N.

3.11 Reinstall black and red power plugs to Module Top.

3.12 Reinstall beige hose to Module Top. Ensure there is a tight seal with clear plastic hose.

3.13 Reinstall black hose to elbow joint of the Coolant water valve.

3.14 Dispose of wastewater in the water containment bucket in Hygiene Module. Do not pour into galley wastewater drain.

L2C 4. ACTIVATE SPE SYSTEM

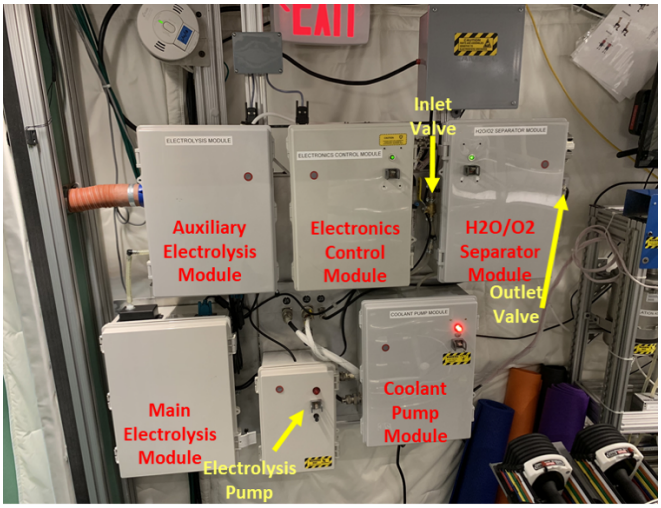

Figure 9: Solid Polymer Electrolysis System

4.1 Switch coolant water valve (located on black tube behind the Auxiliary Electrolysis Canister) to “OPEN”.

4.2 Move power switch of power strip behind Electronics Control Module to “ON”.

Confirm power strip light is on.

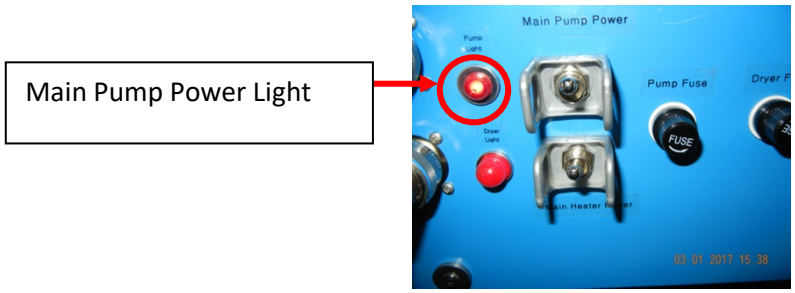

Figure 10: Main Pump Power Switch

4.3 Flip Main Pump Power switch on Water Recovery System (WRS) (located to right of SPE System) to “ON” (see Figure 10).

Confirm WRS Main Pump Power light is on.

4.4 Flip power switch on Electrolysis System Pump to “ON” (see Figure 9).

Confirm Electrolysis Pump light is on and pump motor is humming.

4.5 Flip power switch of H2O/O2 Separator Module to “ON”.

Confirm H2O/O2 Separator Module Power light is “ON”

4.6 Flip power switch of Electronics Control Module to “ON”.

Confirm Electronics Control Module light is on.

4.7 Flip power switch of Coolant Pump Module to “ON”.

Confirm Coolant Pump Module light is “ON”.

4.8 Switch outlet valve to H2O/O2 Separator Module to “OPEN”.

Confirm outlet water valve is parallel to hose.

4.9 Switch inlet valve to H2O/O2 Separator Module to “OPEN”.

Confirm inlet water valve is parallel to hose.

4.10 Close Auxiliary Electrolysis Module door and lock both latches.

4.11 Unlock both latches to Main Electrolysis Module and open door.

4.12 Visually inspect each of the (4) Main Electrolysis Canisters to confirm electrolysis reaction is occurring by verifying gas bubble formation.

If no bubble formation, inform MCC.

4.13 Close Main Electrolysis Module door and lock both latches.

4.14 Gather portable anemometer to take reading of exhaust flow to the right of the H2O/O2 Separator Module. Hold anemometer within an inch of the outlet valve, left of center, for 10 seconds to gather an accurate reading. Confirm O2 exhaust flow on the right side of the Outlet Valve of the H2O/O2 Separator Module is within expected range.

Reading should be between 0.6 – 0.8 m/s.

4.15 Inform MCC if off nominal and record in Airflow Tracking sheet.

4.16 Turn off portable anemometer.

4.17 Doff PPE safety glasses.

4.18 Doff and detach static wrist tether.

4.19 Stow all tools.