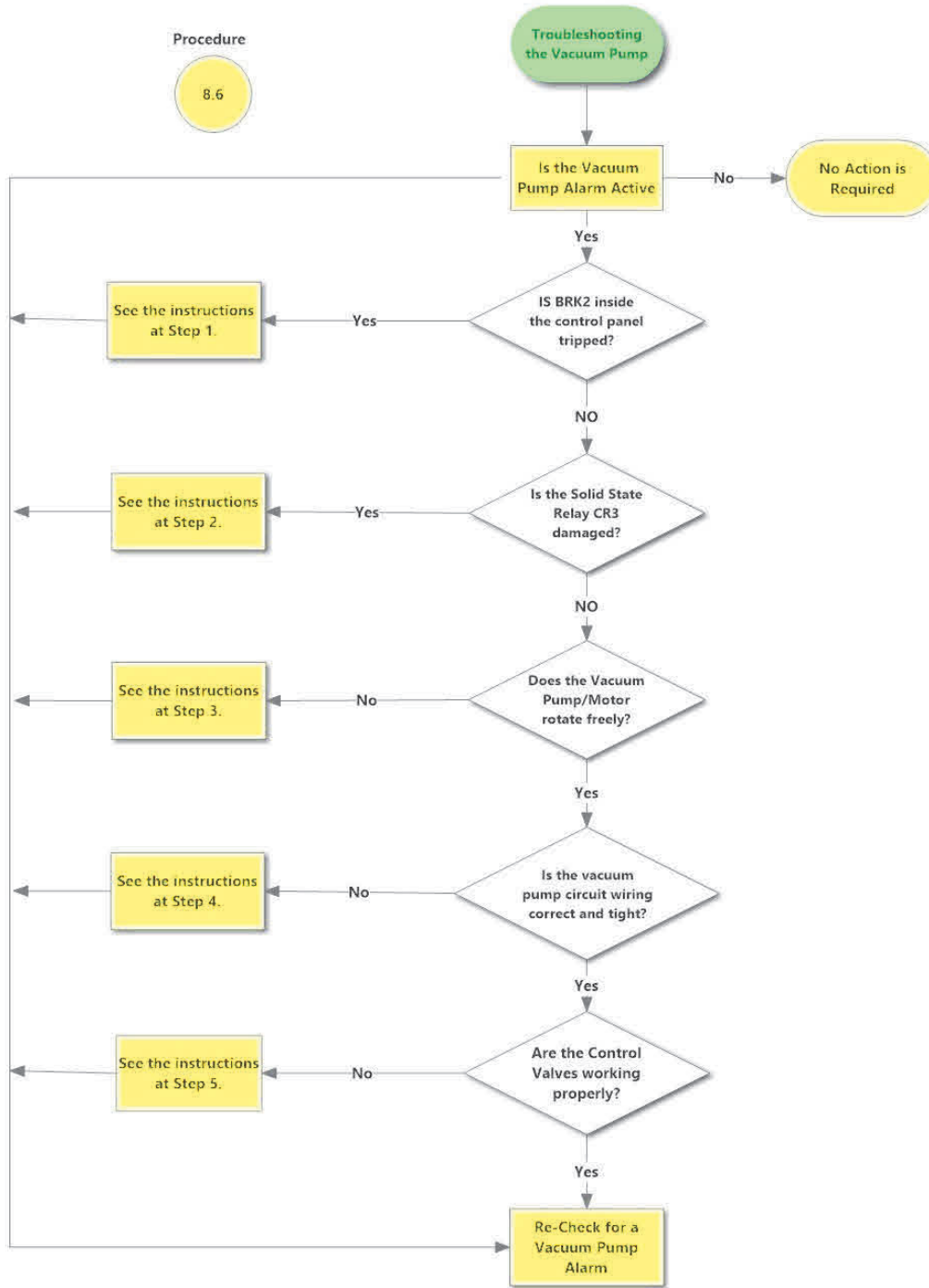




8.6 Vacuum Pump Alarm

Vacuum Pump Alarm



Vacuum Pump Motor Alarm, 3-8-2018

Figure 8-13: Vacuum Pump Troubleshooting Procedures



8.6.1 Vacuum Pump Alarm: Troubleshooting Steps

Steps	Procedures
1.	<p>Check to see if the Vacuum Pump breaker (BKR2) in the Control Panel has tripped. See Figure 8-14.</p> <ul style="list-style-type: none">a) Turn OFF power to the VST Control Panel at the Power Switch located on the front of the VST Control Panel. (The power, ground, and neutral will be completely disconnected from the GREEN MACHINE).b) Follow lockout & tagout procedures prior to starting work.c) Open the Control Panel front doord) Check the breaker BRK2 to see if it tripped:<ul style="list-style-type: none">● If the breaker lever is up and the window is RED, the breaker has not tripped.● If the breaker lever is down and the window is GREEN, the breaker has tripped.e) If the breaker has not tripped, go to Step 2.f) If the Vacuum Pump breaker has tripped, move the lever up to reset the breaker.g) Close the Control Panel front door.h) Turn on the Power Switch on the front of the Control Panel and re-install the carabiner clip. The PLC will turn ON in the Main Screen.i) Push the Maintenance button on the PLC touch screen.j) Enter 878 then push the return button.k) You will now be in the Maintenance Screen.l) The Reset Motor Alarm button will be RED. Push the Reset Motor Alarm button so the alarm resets.m) Push ESC on the PLC to go back to the Main Screen and the alarm will be cleared.n) The GREEN MACHINE is now in a Normal Operating Mode and will operate if the UST pressure is above 0.2 IWC.o) NOTE: IF THE VACUUM PUMP BREAKER CONTINUES TO TRIP, GO TO STEP 2.



Troubleshooting Procedures, continued

Steps	Procedures															
2. Check to see if the Vacuum Pump Solid State Relay is damaged.	<p>a) Turn OFF power to the VST Control Panel at the Power Switch located on the front of the VST Control Panel. (The power, ground, and neutral will be completely disconnected from the GREEN MACHINE.</p> <p>b) Follow Lockout/Tagout procedures prior to starting work.</p> <p>c) Open the Control Panel front door.</p> <p>d) Turn the Power Switch on the inside of the Control Panel to the ON position. **CAUTION: You are now working in a hot panel**</p> <p>e) Push the Maintenance button on the PLC touch screen.</p> <p>f) Enter 878 then push the return button.</p> <p>g) Push the Reset Motor Alarm button to reset the motor alarm. Without resetting the alarm, you will not be able to do the next step.</p> <p>h) Push the Manual ON button. This button runs the GREEN MACHINE which allows you to check the voltage on each of the terminals of the solid-state relay. See the table below for expected voltage values of each terminal.</p> <table border="1" data-bbox="469 934 1416 1138"><thead><tr><th>Wire Number</th><th>Terminal Location</th><th>Expected Voltage</th></tr></thead><tbody><tr><td>02051A</td><td>Top Left to 115 VAC ground</td><td>~120 VAC</td></tr><tr><td>02052</td><td>Top Right to 115 VAC ground</td><td>~120 VAC</td></tr><tr><td>02093 05051</td><td>Bottom Left to Bottom Right</td><td>~24 VDC</td></tr><tr><td>05051</td><td>Bottom Right to 24 VDC ground</td><td>~24 VDC</td></tr></tbody></table> <p>i) </p> <p>j) If any of the voltages are not correct, check the associated breakers, fuses, and wiring for proper connections. If the voltages are correct, go to Step m).</p> <p>k) If the wiring connections are all tight, replace the relay. Note the wire numbers and location.</p> <p>l) After the relay is replaced, close the Control Panel front door. Go to Step h) to retest.</p> <p>m) Turn OFF the Power Switch inside the Control Panel.</p> <p>n) Close and latch the Control Panel door.</p> <p>o) Turn ON the Power Switch on the front of the Control Panel and re-install the carabiner clip. The PLC will turn ON in the Main Screen.</p> <p>p) Push the Maintenance button on the PLC touch screen.</p> <p>q) Enter 878 then push the return button.</p> <p>r) You will now be in the Maintenance Screen.</p> <p>s) The Reset Motor Alarm button will be RED. Push the Reset Motor Alarm button so the alarm resets.</p> <p>t) Push ESC on the PLC to go back to the Main Screen and the Alarm will be cleared.</p> <p>u) The GREEN MACHINE is now in a Normal Operating Mode and will operate if the UST pressure is above 0.2 IWC.</p> <p>v) NOTE: IF THE VACUUM PUMP CONTINUES TO ALARM, GOTO STEP 3</p>	Wire Number	Terminal Location	Expected Voltage	02051A	Top Left to 115 VAC ground	~120 VAC	02052	Top Right to 115 VAC ground	~120 VAC	02093 05051	Bottom Left to Bottom Right	~24 VDC	05051	Bottom Right to 24 VDC ground	~24 VDC
Wire Number	Terminal Location	Expected Voltage														
02051A	Top Left to 115 VAC ground	~120 VAC														
02052	Top Right to 115 VAC ground	~120 VAC														
02093 05051	Bottom Left to Bottom Right	~24 VDC														
05051	Bottom Right to 24 VDC ground	~24 VDC														



Vacuum Pump Alarm: Troubleshooting Steps, continued...

Steps	Procedures
3. Check to see if the Vacuum Pump/motor rotates freely.	<ul style="list-style-type: none">• Physically check the Vacuum Pump to make sure the pump, motor, and drive couplings are functioning correctly.a) Remove the carabiner clip and turn the Power Switch on the front of the VST Control Panel OFF.b) At the GREEN MACHINE, turn OFF the Safety Disconnect Switch.c) Use Lockout/Tagout Safety procedure.d) Remove the cover on the GREEN MACHINE.e) Remove the fan guard over the Vacuum Pump / motor drive coupling.f) Turn the motor/Vacuum Pump by hand to see if it is seized (cannot rotate).g) If you cannot turn the shaft between the pump and the motor, loosen the set screws on the motor side of the rubber flange sleeve and slide the coupling towards the motor.h) Turn both the motor and Vacuum Pump sides of the shaft.g) If the Vacuum Pump is seized, REPLACE THE VACUUM PUMP.h) If the motor is seized, REPLACE THE VACUUM PUMP MOTOR.i) If the drive coupling rubber flange sleeve is damaged or jammed, or if you replace either the Vacuum Pump or the Vacuum Pump motor, REPLACE THE RUBBER FLANGE SLEEVE.j) See Chapter 9 for Replacement Parts Procedures.n) Push the Maintenance button on the PLC touch screen.o) Enter 878 then push the return button.p) You will now be in the Maintenance Screen.q) The Reset Motor Alarm button will be RED. Push the Reset Motor Alarm button so the alarm resets.



Vacuum Pump Alarm: Troubleshooting Steps, continued...

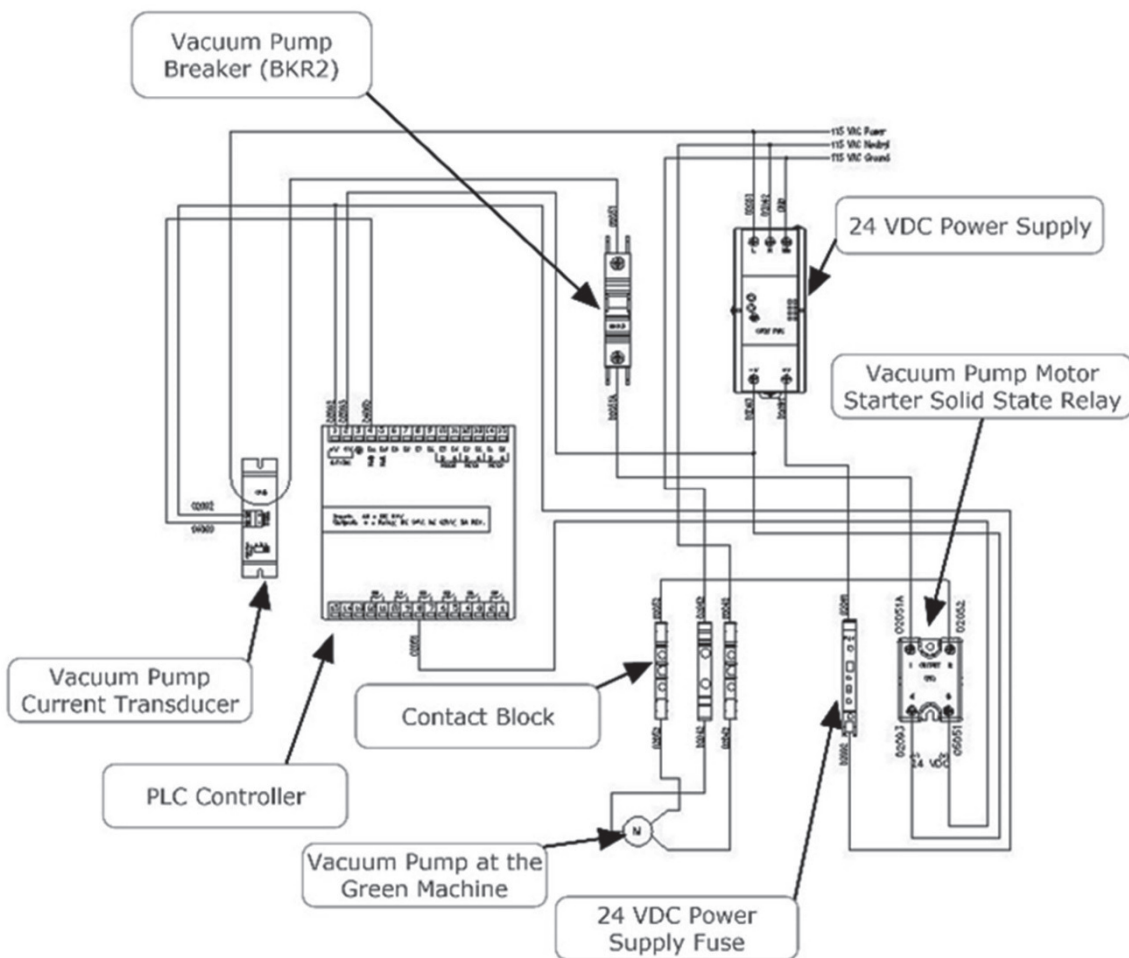
Steps	Procedures
4. Check the Vacuum Pump wiring circuit inside the VST Control Panel. See Figure 8-14.	<ul style="list-style-type: none">• Physically check the Vacuum Pump wiring connections at the Vacuum Pump junction box and at the VST Control Panel to make sure the connections are tight and wired correctly.
5. Check the Control Valves	<ul style="list-style-type: none">• Control Valve Operation Check – See Figures 8-15 & 8-16.• Check the operation of the control valves (A thru E) to see if any of the control valves have malfunctioned. A malfunctioned control valve may cause the Vacuum Pump motor to trip out on thermal overloads.• Purpose of the Test<ul style="list-style-type: none">• The purpose of this test is to check to see if there is power at the control valves and the control valves are working properly.• This test is also used for the Leak Check.• When the F1 button is pushed, all the control valves are energized (open), which will allow the technician to see if all 5 of the control valves have power and are working. (The Vacuum Pump will not run.)• Preparation<ul style="list-style-type: none">• Make sure power is ON to the VST Control Panel.• At the Main Screen, push the Maintenance button to access the Password Screen.• Enter the password 878 to access the Maintenance Screen.• The GREEN MACHINE is now in the OFF mode and will not operate.• Push the Reset Motor Alarm button to reset the motor alarm. Without resetting the alarm, you will not be able to do the next step.



Vacuum Pump Alarm: Troubleshooting Steps, continued...

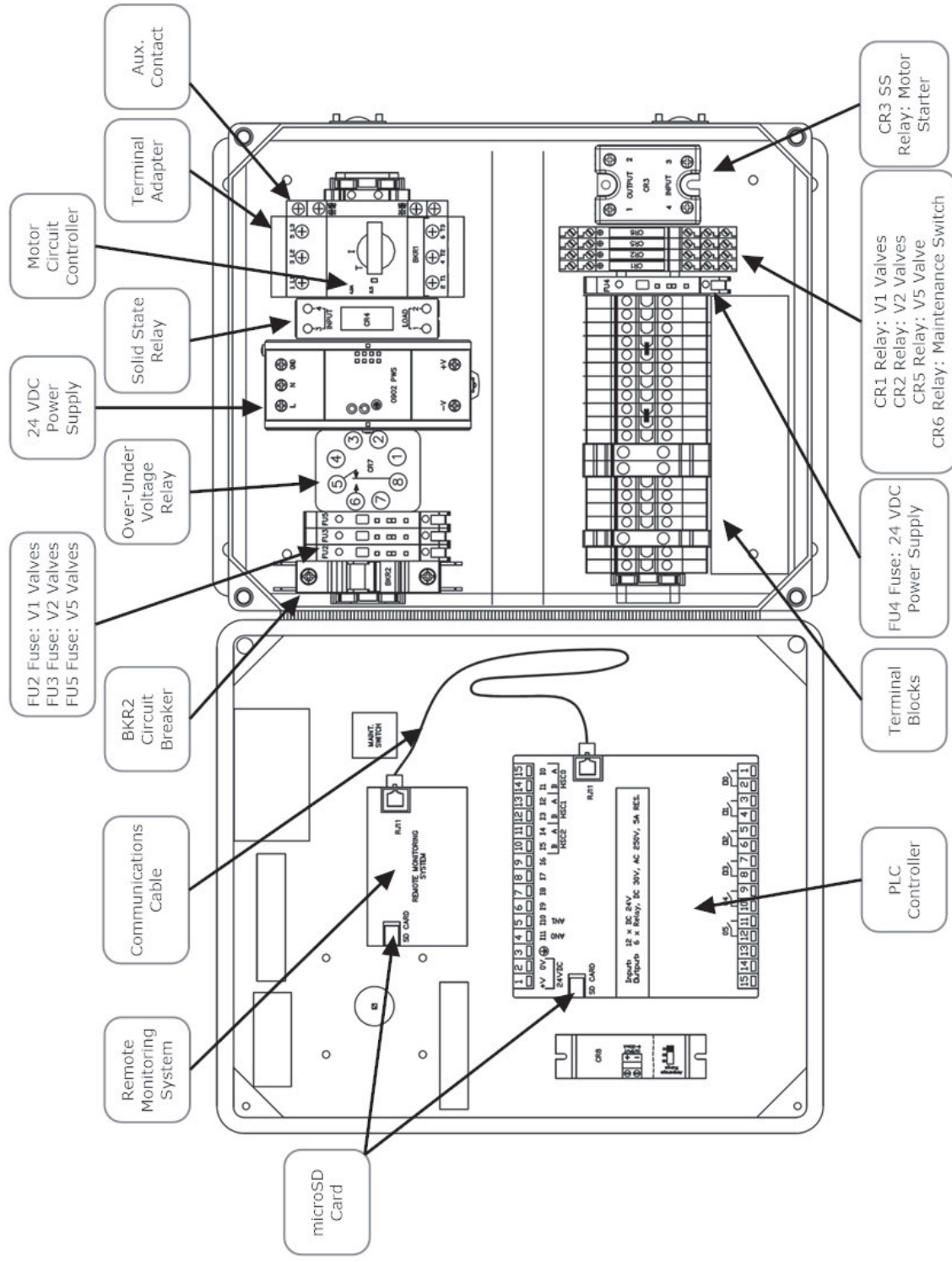
- **Procedure**

1. To start the test, push the F1 button on the Maintenance Screen. Press the Start Button to energize all the control valves.
2. Check for a magnetic field at the retaining clip in the center of the valve operator.
 - a) Take a small non-magnetized screwdriver that will be drawn to the magnetic field, if one is present, and see if the screwdriver is drawn to the general location of the retainer clip.
 - b) If a valve is not energized, the screwdriver will not be drawn to the retainer clip.
 - If valve A or C and fuse FU2 has 115 VAC power and is not energized, replace the bad valve core.
 - If valve B or D and fuse FU3 has 115 VAC power and is not energized, replace the bad valve core.
 - If valve E and fuse FU5 has 115 VAC power and is not energized, replace the bad valve core.
 - c) If the magnetic fields are present, listen for any of the control valves making a chattering sound. If chattering is heard, replace the valve core.
 - d) Replace the valve core using the Core Rebuilt Kit as shown in the Replacement Parts Section. See Chapter 9 for Replacement Parts Procedures.
3. After checking and replacing the Control Valves, push the F4 button to return to the Maintenance Screen.
4. At the GREEN MACHINE Controller, push the ESC button to return to the Main Screen where the GREEN MACHINE will go into a Normal Operating mode.



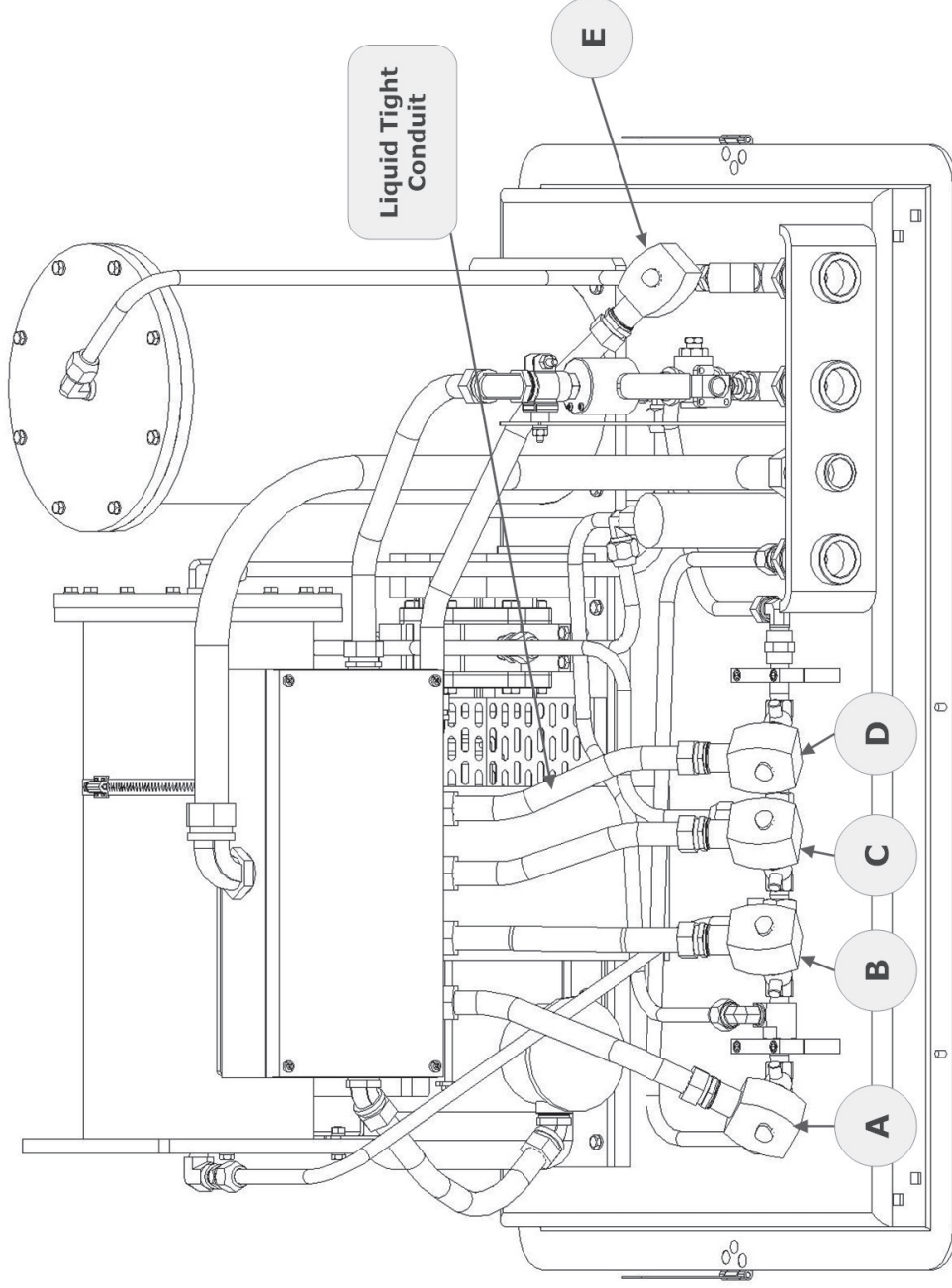
Vacuum Pump Power and Control Circuit, 3-9-2018

Figure 8-14: Vacuum Pump Power and Control Circuit



VST Control Panel Components, 3/8/2019

Figure 8-15: VST Control Panel Electrical Components



GM Dual Canister Control Valve Replacement Diagram, 09-20-2019

Figure 8-16: GREEN MACHINE isometric with Control Valves Identification Labels