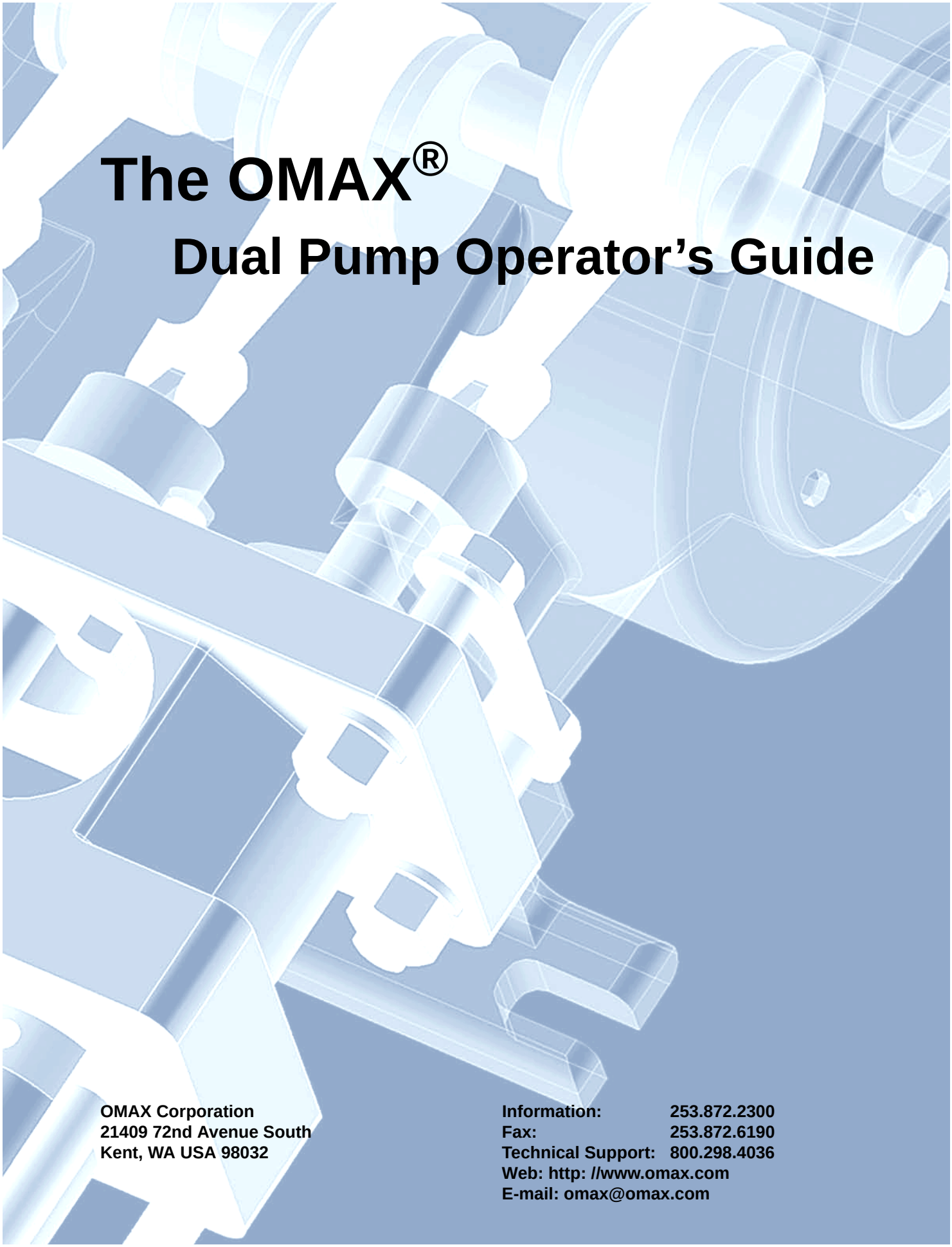
The OMAX®

Dual Pump Operator's Guide



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You can also receive technical support on-line at: http://www.omax.com/support (user name and password required for access)

The OMAX Machine tool apparatus and linear motion track are covered by U.S. patent number 5,472,367. Other patents pending.
The OMAX motion control with precompilation is covered by U.S. patent number 5,508,596.

March 2010

Dual Pump Operation

The OMAX Dual Pump package joins together two P4055V pumps that provide power for either two standard nozzles or one large single nozzle. It is designed for shops with high capacity production demands to cut thick materials and utilize multiple nozzle operation.

Contents

Overview

There are three operational modes for the OMAX Dual Pump system: normal dual pump operation using both **Pump #1 and #2;** operation using **Pump #1** only; or operation using **Pump #2** only. This document provides instructions for setting up and operating your Dual Pump OMAX JetMachining Center using any of these three modes.

In the OMAX Dual Pump system, three power ON/OFF switches are available: a power switch for each of the two OMAX pumps and one more power switch for the PC controller. Each switch must have power available before they can be latched to their ON positions. Because the PC controller must receive its power from either of the two pumps, at least one pump must be powered ON before the PC controller can be powered ON.

Caution: ***The PC controller receives power whenever either of the two pumps are first powered ON. The controller always remembers which pump was powered ON first and provided it with power. The controller will shut OFF whenever the first pump turned ON is shut OFF, even if the second pump turned ON remains powered ON.***

Dual Pump System Setup

Prior to using your OMAX Dual Pump system, ensure that the following equipment requirements are met:

1. A properly sized orifice matching your cutting mode (single or dual pump) has been installed in the nozzle. Refer to the OMAX Orifice/Mixing Tube Selection Guide, Document # 400540, for the required size.
2. For pumps with fixed orifice dump valves, install the orifice size required for the nozzle orifice in use. Refer to procedures provided in the OMAX JetMachining® Center Operator's Guide, Document #4000433.
   For pumps with the Adjustable Dump Valve (ADO), refer to *Setting the ADO Pressure in Dual Pump Systems* on page 6 of this document.
3. A correctly sized flow orifice has been installed in the gate of the abrasive hopper as determined by your cutting mode (single or dual pump). Refer to the OMAX Orifice/Mixing Tube Selection Guide, Document # 400540, for the required size.
4. Your abrasive flow rate has been measured by following the procedures provided in the OMAX JetMachining Center Operator's Guide, Document #4000433.
5. Using the **Pump & Nozzle Configuration** dialog box (see example below) in **Make,** you've entered your machine's water pressure, jewel (orifice) diameter, mixing tube diameter, abrasive flow rate, etc., allowing **Make** to accurately calculate optimum cutting speeds. Be sure to click **OK** when finished.

Note: *Use the **Test** button to open the Test Pump and Nozzle dialog box allowing you to determine your water pressure, abrasive flow rate, etc.:*

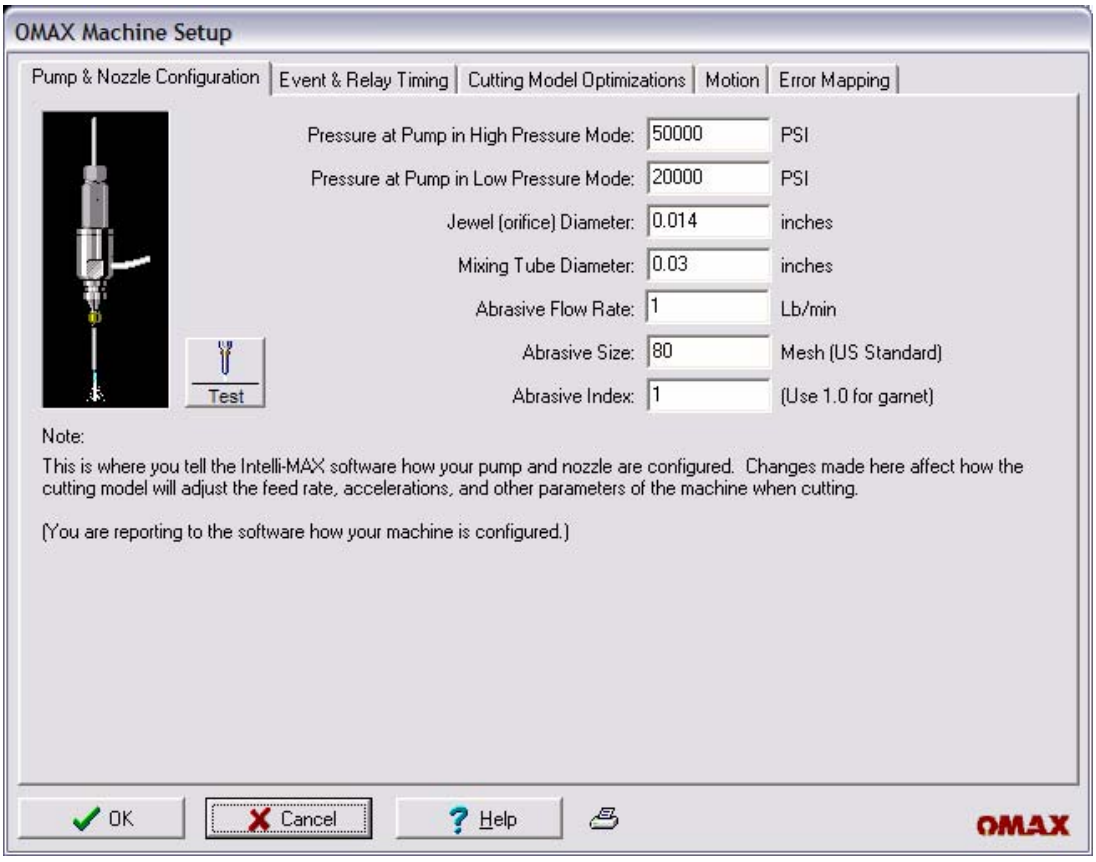

Figure 1: Enter in the correct data for your machine

Dual Pump System

Pump Mode Selection Switch

A selection switch (Figure 2) installed in dual pump systems determines the operational mode of the OMAX pumps: pump #1 only = ①; pump #2 only = ②; dual pump operation = ①②.

Figure 2: Pump Mode Selection Switch Showing Dual Pump Mode

When both Pumps #1 and #2 (①②) are selected by the Dual Pump switch, the pump start signal is sent to both pumps. Either pump can be powered **ON** while the switch remains in this position.

When only one pump (① or ②) is selected by the Dual Pump switch, the pump start signal is blocked to the pump not selected, preventing it from being powered **ON** while the switch remains in this position.

Water Isolation Valves

Isolation valves are installed in the high-pressure plumbing lines for both pumps. These valves block water flow from one or both pumps to allow single pump operation or to set the adjustable dump orifice (ADO) pressure for each pump.

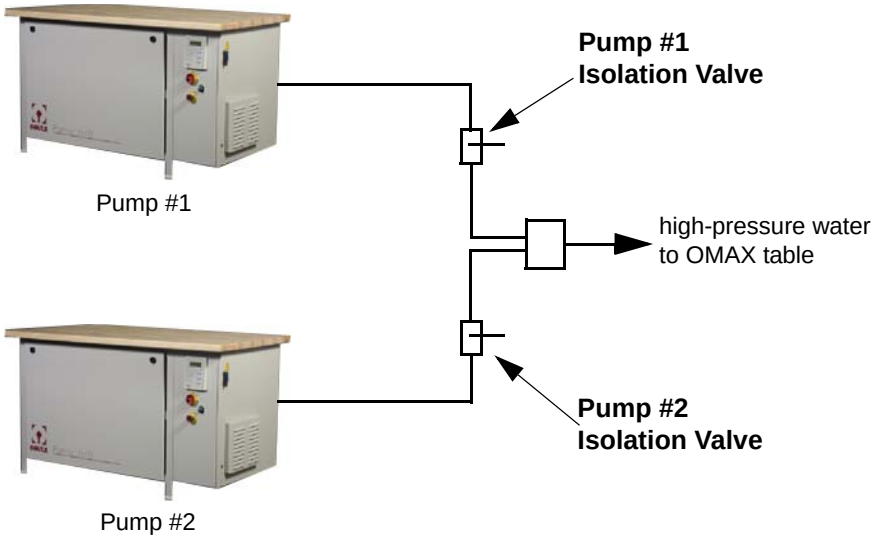

Figure 3: The Isolation Valves in the High-Pressure Plumbing for Dual Pump Systems

Operational Modes

Operating in Dual Pump Mode

Follow these steps to operate your OMAX in Dual Pump mode:

1. Ensure that the “Dual Pump Setup” instructions were followed (page 2).
2. Ensure that both pumps and PC controller are powered **OFF**.
3. Manually **OPEN** the Pump #1 isolation valve.
4. Manually **OPEN** the Pump #2 isolation valve.
5. Place the Dual Pump switch in the Pump ①② position:

6. Verify that your Dual Pump switch and Isolation Valves are now configured as follows:

Operational Mode	Dual Pump Switch Position	Isolation Valve #1	Isolation Valve #2
Dual Pump	①②	OPEN	OPEN

7. Power Pump #1 **ON**.
8. Power Pump #2 **ON**.
9. Power the PC controller **ON**.
10. You are ready to cut parts with your OMAX JetMachining Center using dual pumps.

Changing from Dual Pump to Single Pump Mode

Follow these steps to change operation of your OMAX from Dual Pumps to Single Pump operation:

1. Ensure that the pumps and PC controller are powered **OFF**.
2. Install the correct orifice size in the nozzle that matches your **single pump** cutting mode. Refer to the OMAX Orifice/Mixing Tube Selection Guide, Document # 400540, for the required size.
3. Install the correct orifice size in the gate of the abrasive hopper as required for **single pump** operation. Refer to the OMAX Orifice/Mixing Tube Selection Guide, Document # 400540, for the required size.
4. Manually **OPEN** the isolation valve for the one pump to be used (#1 or #2).
5. Manually **CLOSE** the isolation valve for the pump **not being used**.
6. Place the Dual Pump switch in the position of the pump being used (① **or** ②).

or

Note: *When only one pump is selected by the Dual Pump switch, the pump start signal is blocked to the pump not selected, preventing it from being powered **ON** while the switch remains in this position.*

7. Verify that your Dual Pump switch and Isolation Valves are now configured as follows:

Operational Mode	Dual Pump Switch	Isolation Valve #1	Isolation Valve #2
Pump #1 only	①	**OPEN**	**CLOSED**
Pump #2 only	②	**CLOSED**	**OPEN**

8. Turn **ON** the power switch for the pump selected on the Dual Pump Switch.
9. Turn the power switch for the PC controller **ON**.
10. Using the **Pump & Nozzle Configuration** dialog box (Figure 1) in **Make,** ensure that your machine's water pressure, jewel (orifice) diameter, mixing tube diameter, abrasive flow rate, etc., are accurate for the new single pump operation. Click **OK** when finished.
11. You are ready to cut parts with your OMAX JetMachining Center using just one pump.

Changing from Single Pump to Dual Pump Mode

Follow these steps to change your OMAX from Single Pump to Dual Pump mode:

1. Ensure that the pumps and PC controller are powered **OFF**.
2. Install the correct orifice size in the nozzle that matches the new **dual pump** cutting mode. Refer to the OMAX Orifice/Mixing Tube Selection Guide, Document # 400540, for the required size.
3. Install the correct orifice size in the gate of the abrasive hopper as required for **dual pump** operation. Refer to the OMAX Orifice/Mixing Tube Selection Guide, Document # 400540, for the required size.
4. Manually **OPEN** the Pump #1 isolation valve.
5. Manually **OPEN** the Pump #2 isolation valve.
6. Place the Dual Pump switch in the ①② position:

7. Verify that your Dual Pump switch and Isolation Valves are now configured as follows:

Operational Mode	Dual Pump Switch Position	Isolation Valve #1	Isolation Valve #2
Dual Pump	①②	OPEN	OPEN

8. Power Pump #1 **ON**.
9. Power Pump #2 **ON**.
10. Power the PC controller **ON**.
11. Using the **Pump & Nozzle Configuration** dialog box (Figure 1) in **Make,** ensure that your machine's water pressure, jewel (orifice) diameter, mixing tube diameter, abrasive flow rate, etc., are accurate for the changed dual pump operation. Click **OK** when finished.
12. You are ready to cut parts with your OMAX JetMachining Center.

Setting the ADO Pressure in Dual Pump Systems

Matching the size of the cutting nozzle orifice with the pump's adjustable dump orifice (ADO) is important in preventing damage to your high-pressure components.

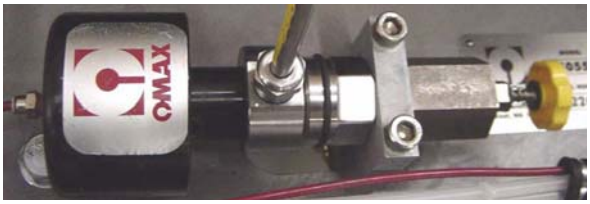

Figure 4: The OMAX Adjustable Dump Orifice

Follow these steps when readjustment of the ADOs in a dual pump system becomes necessary:

1. Prepare your system for dual pump mode by setting the dual pump switch and isolation valves as follows:

Operational Mode	Dual Pump Switch Position	Isolation Valve #1	Isolation Valve #2
Dual Pump	①②	OPEN	OPEN

2. Power Pump #1 **ON**.
3. Power Pump #2 **ON**.
4. Power the PC controller **ON**.
5. Launch the **Make** cutting software.
6. Position the nozzle at a table location where a nozzle pressure test can be done safely.
7. In **Make**, click the **Test** key to open the **Test Pump and Nozzle** pop-up window (see Figure 5).

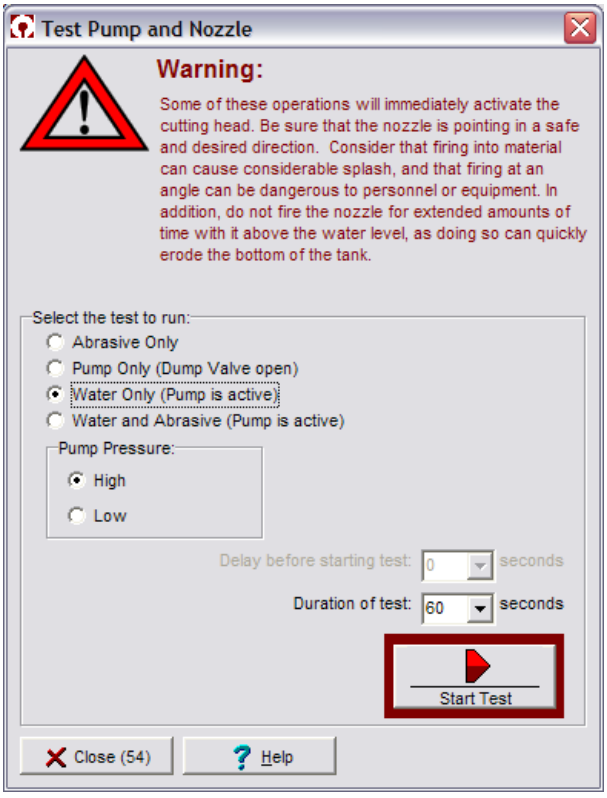

Figure 5: The Test Pump and Nozzle Options

8. Select “**Water Only** (Pump is active)” for the test to run, and “**High**” for Pump Pressure.

WARNING! ***The cutting head is about to be activated!***

9. Click the **Start Test** button to begin the Water Only nozzle test.
10. Adjust the RPM of both pumps until your desired water pressure is achieved.
11. Carefully adjust the RPM of both pumps until they are both **equal** at your desired pressure.

Caution: ***It is important that the RPM for both pumps be adjusted to obtain no more than a 10 RPM difference between the two.***

12. Record both the **water pressure** and pump **RPM**.
13. After the Water Only test times out, change your test selection to “**Pump Only** (Dump Valve open)”:

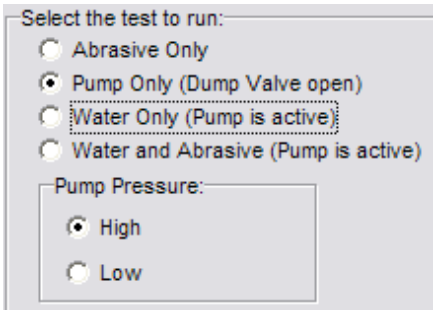

Figure 6: Change Setting to “Pump Only” to Adjust ADO Pressure

14. Close one of the Isolation Valves in the high-pressure plumbing to isolate the two pressure systems.
15. Click the **Start Test** button to begin the **Pump Only** pressure.
16. For pump #1, adjust the ADO knob until the pressure for pump #1 matches the pressure recorded in step #**12** above.

Caution: ***Ensure that the pump RPM has not changed from that recorded in step #12 above.***

17. For pump #2, adjust the ADO knob until the pressure for pump #2 matches the pressure recorded in step #***12*** above.

Caution: ***Ensure that the pump RPM has not changed from that recorded in step #12 above.***

18. Tighten the locking nut for both ADO adjusting knobs, ensuring that the pump RPM and pressure are not changed.
19. After the Pump Only test times out, open the Isolation Valve closed in step #***14***.
20. ADO pressure is now correctly adjusted for dual pump operation and the system is ready for use.

Customer Support

For assistance with your Dual Pump operation, contact:

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