



Minimum Quantity Lubrication - How it Works and Troubleshooting Guide

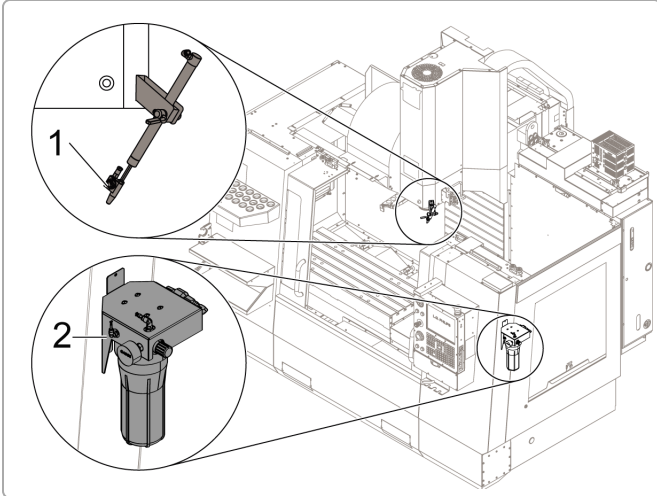
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How it Works



The Minimum Quantity Lubrication (MQL) system delivers a steady flow of compressed air and a small quantity of cutting oil directly to the cutting tool or tap.

The MQL system consists of two parts: a spray nozzle atomizer with a needle valve [1], and an oil reservoir with a pressure regulator and gauge [2]. You control the necessary flow of oil using the atomizer needle valve. The air pressure regulator at the oil reservoir controls the MQL air pressure and is used for fine adjustment.

The AAG solenoid in the lube panel provides air pressure for the AAG and also supplies pressure to the MQL reservoir. The MQL system mixes cutting oil with the stream of air at the AAG on the spindle head. The oil and air mixture then sprays the cutting zone.

To manually start and stop the AAG/MQL:

Press **[SHIFT]** and then **[COOLANT]**. Repeat this command or press reset to stop the air/oil flow.

Start and stop in Program Mode

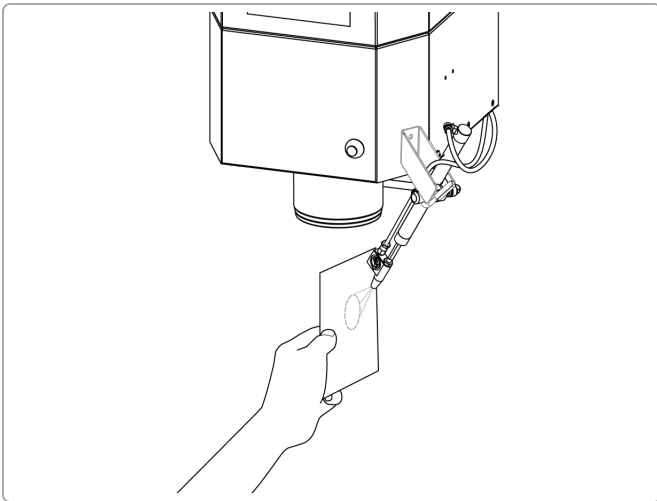
The M83 code starts the AAG/MQL. M84 stops the AAG/MQL.

An M83 Pnnn code can also be programmed. This starts the AAG/MQL for nnn milliseconds, and stops the AAG automatically.

Example: M83 P5000 will turn on the AAG/MQL for 5 seconds.

Symptom	Possible Cause	Corrective Action	Section
Low or no oil from MQL nozzle	Needle valve not properly adjusted.	Adjust needle valve	1
	Clogged filter	Service the MQL filter	3
	MQL reservoir air regulator not properly adjusted	Adjust air pressure at the reservoir	1
	The reservoir is out of oil.	Fill the reservoir with oil.	4
Too much oil from MQL nozzle	Needle valve not properly adjusted.	Adjust needle valve	1
	MQL reservoir air regulator not properly adjusted	Adjust air pressure at the reservoir	1
No air pressure to reservoir or from the AAG	Solenoid does not operate.	Check solenoid power.	2

Section 1



Symptom: Low or no oil from MQL nozzle.

Possible Cause: Needle valve not properly adjusted


Corrective Action:

Close the atomizer needle valve. Then open it 1/2 to 1 turn.

Set the pressure for the MQL oil regulator to 30 psi (2.1 bar).

Press **[SHIFT]** and then **[COOLANT]**. Press **[RESET]** to stop the air/oil flow.

With the system on hold, place a small piece of paper or cardboard approximately 3" from the atomizer. A round wet pattern will show if oil is being supplied from the MQL nozzle.

 **Note:** Some oils have a higher viscosity. Oils with higher viscosity flow slowly. The oil flow may need to be adjusted for different tools, workpieces, programs and the type of oil that you use. Adjust the reservoir air pressure high enough to atomize the oil and carry the oil to the tool. To correct oil flow, adjust the air pressure at the regulator on the reservoir and the atomizer needle valve as needed until the correct flow is achieved.

Section 2

Symptom: No air pressure to reservoir or from the AAG.

Possible Cause: Solenoid does not operate.

Corrective Action:

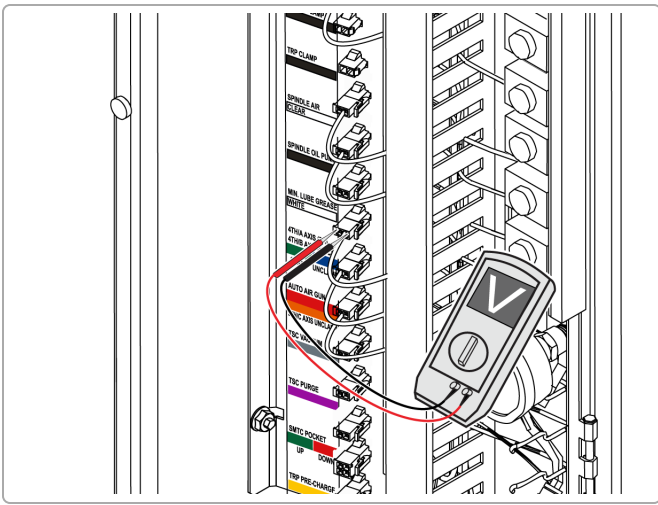
receives 120 VAC.

Measure the voltage to the solenoid. Make sure the solenoid

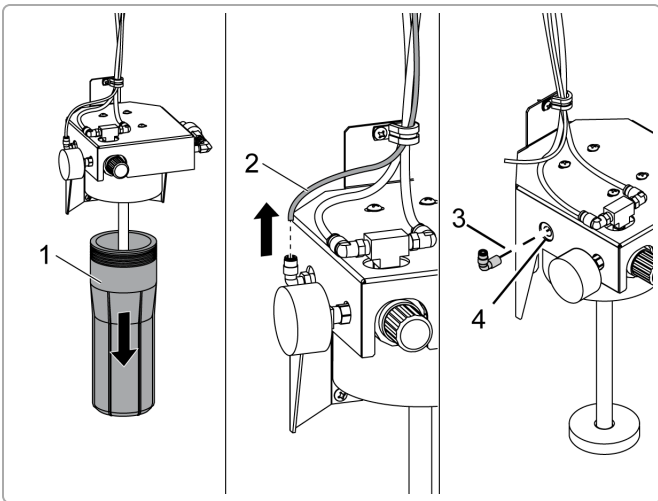
[Works and Troubleshooting Guide](#) to troubleshoot the solenoid.

If the solenoid does not receive voltage, go to [I/O PCB - How it Works and Troubleshooting Guide \(Classic Haas Control\)](#) to

troubleshoot the I/O PCB.



Section 3



Symptom: Low or no oil from MQL nozzle.

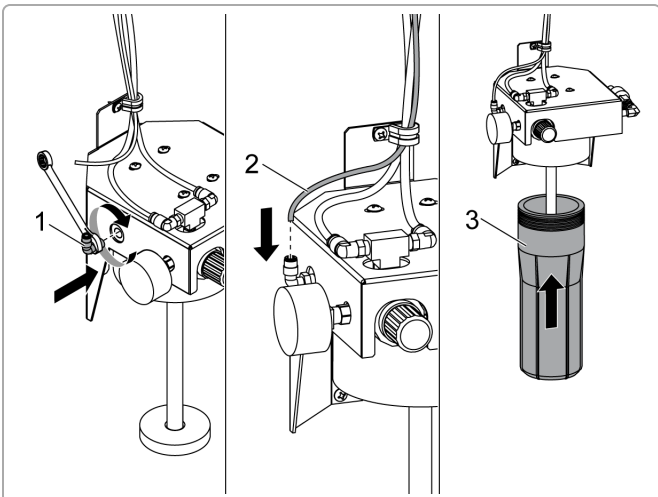
Possible Cause: Clogged filter

Corrective Action:

Lock out and tag out the machine and wear proper PPE (personal protective equipment)

Remove these components: the reservoir bowl [1] from the oil-reservoir assembly for the MQL, the oil hose [2], and the fitting [3] for the oil hose.

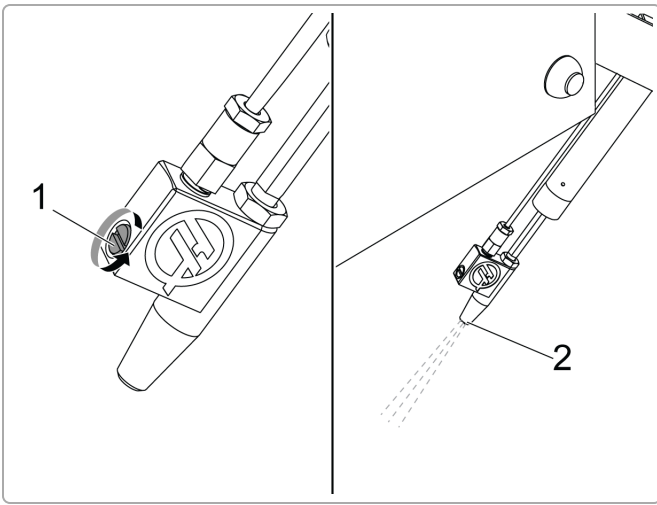
Blow debris out of the filter. Use compressed air and hold a towel under the reservoir to catch the debris.



Install these components: the fitting [1] for the oil hose, the oil hose [2], and the reservoir bowl [3] for the MQL assembly. Fill the reservoir bowl with oil before the installation.

Power on and zero return the machine. Purge the air from the system:

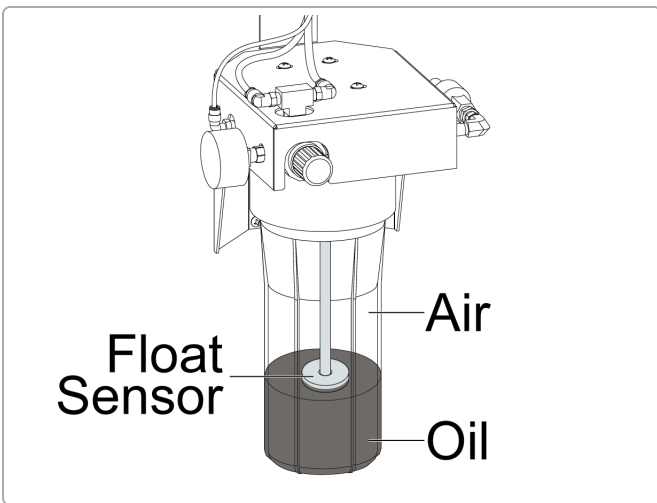
1. Find the atomizer needle valve [1].
2. Turn the needle valve counterclockwise (2) full turns from the closed position.
3. Set the oil regulator pressure to 40 PSI (2/8 bar).
4. Command this code in **[MDI]** mode: M83;
5. Run the MQL system [2] until no air is in the system.



Operate the purge until the spray nozzle disperses mist continuously for (20) seconds.

Press **[RESET]** to cancel the purge cycle.

Section 4



Symptom: Low or no oil from MQL nozzle

Possible Cause: The reservoir is out of oil.

Corrective Action:

Visually check the oil level in the reservoir. If the oil level is too low, or empty, the MQL nozzle will not spray oil. Fill the reservoir with oil.