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Service Bulletin 1002 Troubleshooting the Brushless DC Drive System

Date

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Product

3900 HiTorque Mini Mills serial numbers **00175 and up**

4100 HiTorque Mini Lathes serial numbers **00175 and up**

Issue

Motor does not run when speed knob is turned clockwise.

Tools Needed

Volt/Ohm/Meter

#2 Phillips screwdriver

Solution

Follow these steps to troubleshoot this issue:

Test	Expected Result	Possible Results
1. Unplug the power cord. Check the voltage at the receptacle.	110 VAC to 120 VAC. Go to next step.	No voltage present. Check circuit breakers, plug strips, extension cords, and fuses.
2. Plug in power cord. Press and hold green ON button.	Green light glows. Go to next step.	If green light does not glow replace the ON/OFF switch.
3. Release green ON button.	Green light glows. Go to step 11.	Green light does not glow. Go to next step.

Test	Expected Result	Possible Results
4. Close chuck guard	Chuck guard closes. Go to step 2.	Chuck guard is broken. Repair chuck guard.
5. Check fuse	Fuse is in good shape and has continuity. Go to next step.	No continuity or fuse is damaged. Replace fuse.

Unplug the power cord. Remove the four screws retaining the control box. Turn the control box so you can access the contents. Plug in the power cord. Press the Green ON button.

Caution: Full line voltage is exposed when the control box is off the headstock. Be careful when making the following tests.

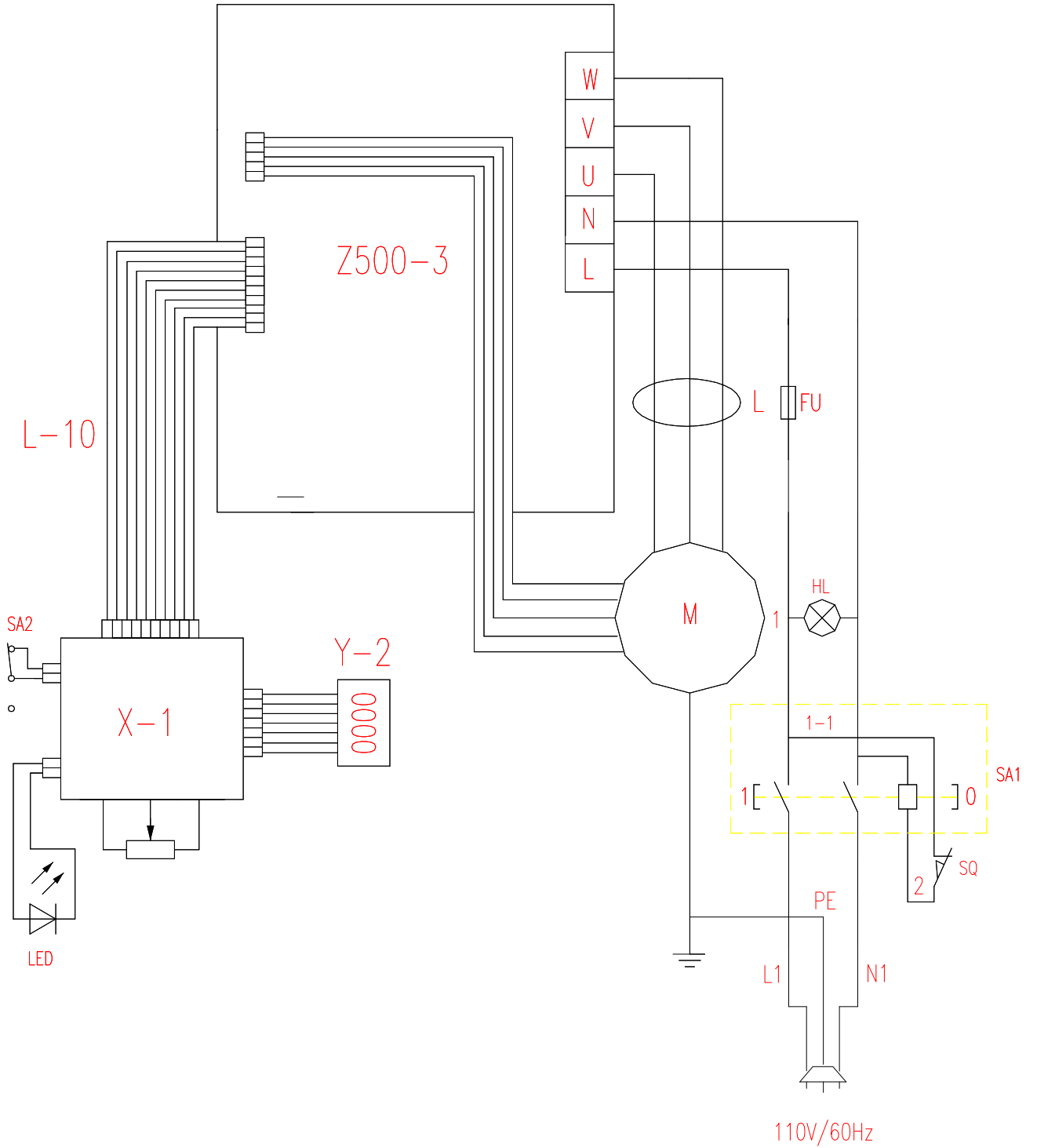
6. Check the voltage between pin 14 on the ON/OFF switch and the side terminal on the fuse holder	110 VAC to 120 VAC. Go to next step.	No voltage. Replace fuse holder.
7. Check the voltage between pin 14 on the ON/OFF switch and the end terminal on the fuse holder	110 VAC to 120 VAC. Go to next step.	No voltage. Replace fuse holder.
8. Check the voltage between pins 14 and 24 on the ON/OFF switch.	110 VAC to 120 VAC. Go to next step.	No voltage. Replace ON/OFF switch.
9. Check that all the connector plugs are secure. There are 4 plugs on the X-1 board on the back of the speed control knob. There is one connector on the circuit board and one connector on the daughter board.	All connectors are secure. Go to next step.	Connector or connectors are loose. Secure connectors.
10. Check that the daughter board is plugged securely into the circuit board.	The connectors are secure. Go to the next step.	Connectors are not secure. Secure the connectors.

Unplug the power cord and wait **10 minutes** for the power capacitors to drain. Remove the four screws retaining the circuit board. Lift the circuit board from the control box so you can access the screw terminals on the side. Plug in the power cord. Press the Green ON button.

Caution: Full line voltage is exposed when the control box is off the headstock. Be careful when making the following tests.

11. Check the voltage between pins L and N on the Z500-3 PC board	110 VAC to 120 VAC. Go to next step.	No voltage. Repair the wiring from the fuse holder and the switch to the circuit board.
12. See if the yellow LED on the circuit board is lit.	LED glows. Go to next step.	LED is not lit. Replace the circuit board.
13. Turn the speed control potentiometer to about half speed. Check the voltage between terminals U and V on the circuit board.	15 to 25 VAC. Go to next step	No voltage. Replace the circuit board.
14. Turn the speed control potentiometer to about half speed. Check the voltage between terminals V and W on the circuit board.	15 to 25 VAC. Go to next step	No voltage. Replace the circuit board.
15. Turn the speed control potentiometer to about half speed. Check the voltage between terminals U and W on the circuit board.	15 to 25 VAC. Go to next step	No voltage. Replace the circuit board.
16. Check the motor connections to terminals U, V, and W on the circuit board.	Connections are tight and in good shape. Replace motor.	Connections are loose. Repair connections.

4100 HiTorque Mini Lathe Wiring Diagram



3900 HiTorque Mini Mill Wiring Diagram

