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Controller Upgrade Kit

This kit upgrades the motor controller on Grizzly, Micro-Mark, Harbor Freight, and Homier mini lathes.

The motor controller in this kit is the standard speed control for the mini mill. It is designed for a 350-watt motor. The mini lathe has a 250-watt motor, so this provides some extra capacity. This controller has built-in overload protection and an interlock that forces you to turn the speed control to zero to start the motor.

There are two versions of this kit. One is for lathes with the big red emergency switch, and the other is for lathes with the illuminated rocker power switch.

Identifying your needs

This information will help you determine which kit is right for your lathe.

Grizzly, Homier, and Micro-Mark mini lathes

All Grizzly, Homier, and Micro-Mark mini lathes have the big red emergency switch, so you should select the basic kit, part number 1815.

Harbor Freight mini lathes

Recent Harbor Freight mini lathes have the big red emergency switch. Use the basic kit, part number 1815 for these lathes.

Earlier Harbor Freight mini lathes have an illuminated rocker power switch. These lathes do not have an interlock that forces you to turn the speed control to zero to start the lathe.

If you want to add the interlock, get the “HF” version of the kit, part number 1817. This kit includes a new speed control potentiometer and a new F/O/R switch with interlock contacts.

If you don't care about the interlock feature, use the basic kit, part number 1815. These instructions tell you where to add jumpers to eliminate the interlock.

Kit Contents

The basic kit, part number 1815 includes the motor controller board and instructions.

The “HF” kit, part number 1817 includes the motor controller, a speed control potentiometer, a F/O/R switch, and instructions.

Installing the Kit

Follow these instructions to install the motor controller upgrade kit.

Teardown

1. Unplug the power cord.
2. Detach (but don't disconnect) the control box. There are four Phillips head machine screws, two on top and two on the bottom.
3. Make a note or draw a picture of the wiring connections so that you will be able to reconnect the four wires that go into the control box. The wires from the motor connect to the forward / off / reverse switch. The power cord connects to the illuminated power switch.

On my lathe (an early Harbor Freight mini lathe), the connections are as follows. (Mark up this table to reflect the connections on your lathe.)

Black motor lead	Outboard connection on center of F/O/R switch
White motor lead	Inboard connection on center of F/O/R switch
Black power cord lead	Far connection on illuminated power switch
White power cord lead	Near connection on illuminated power switch.

4. Disconnect the ground wire from the control box from the front of the headstock by removing the Phillips head machine screw.
5. Disconnect the four wires that go to the control box by pulling off the slip-on connectors. Two of the wires are from the motor and two from the power cord.
6. Remove the circuit board (or boards) from the control box.

Reassembly

1. If you have the “HF” kit, replace the speed control potentiometer. You might need to re-solder the leads to the new potentiometer. Add leads to the two switch terminals on the back of the potentiometer.
2. If you have the “HF” kit, replace the F/O/R switch. Replace the existing wires on the left six terminals. The right three terminals are for the interlock.

3. Replace the motor control circuit board. The mounting hole locations are the same, even though the new circuit board is slightly longer than the old one. (I do not know if the hole locations are the same on Homier mini lathes.)
4. Connect the circuit board as shown in the appropriate wiring diagram. For Grizzly, Micro-Mark, and new Harbor Freight mini lathes you simply reconnect the wires to the same numbered terminals. For earlier Harbor Freight, and Homier mini lathes some rewiring might be required.

If you have a “P4” wire, with nowhere to connect it, simply tape it off. The P4 wire slows the lathe in reverse. You can control this with the speed control.
5. Reconnect the ground wire from the control box to the headstock casting. Use a M5x10 Phillips head machine screw, M5 lock washer and M5 star washer. The lock washer goes on the screws first, then the terminal, with the star washer between the terminal and the casting.
6. Reconnect the wires in the control box. Refer to the notes you made during disassembly.
7. Mount the control box using two M5x10 round head Phillips machine screws in the top mounting holes.
8. Plug in the power cord.

Test

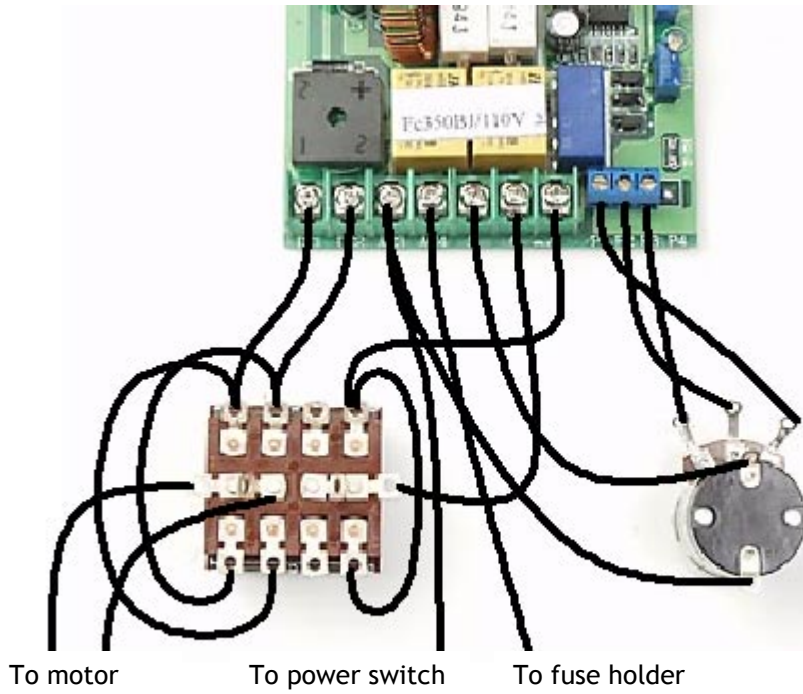
1. Turn the speed control knob to zero.
2. Move the F/O/R switch to F (Forward).
3. Turn on the power.
4. If the lathe starts at full speed, reverse the two outer connections on the side of the speed control potentiometer.
5. Advance the speed control.
6. If the motor turns the wrong way, reverse the connections on the two leads from the motor.

Wiring Diagrams

There are two different wiring diagrams. The normal wiring diagram is for all mini lathes with the big red emergency switch, and early Harbor Freight mini lathes when you are adding the safety interlock. The bypass wiring diagram is for earlier Harbor Freight mini lathes when you do not want to add the safety interlock.

Normal Wiring Diagram

Following is the normal wiring diagram, used for all mini lathes with the big red emergency switch. Use this wiring diagram for earlier Harbor Freight mini lathes when you are using the “HF” kit to add the safety interlock.



Bypass Wiring Diagram

For early Harbor Freight mini lathes, with the illuminated rocker switch, where you do not want to add the interlock, use the following wiring diagram.

