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Retrofitting the Speed Control Unit for the Sherline/MASSO CNC Controller

Before you can use the Sherline/MASSO CNC controller to control the spindle speed of you machine, you need to upgrade the speed control unit (S/C) to interface with the new controller system. There are a few things you have to do with the speed control unit in order for the controller to actually take control of your DC motor. You will be replacing the potentiometer with a speed control cable.

Before You Begin the Retrofit

- 1. First and foremost, turn the S/C power switch off and remove the plug from the electrical outlet! Failure to do so will damage the S/C unit, and may lead to electrical shock.
- 2. Assemble your tools:
 - A. T-hex driver (5/32" Allen wrench)
 - B. Small Phillips screwdriver
 - C. Small flat-blade screwdriver
 - D. Needle nose pliers
 - E. Wrench (either 1/2", 13 mm, or adjustable wrench)

Removing the Potentiometer

1. Use the T-hex driver to remove the 10-32 SHCS that holds the speed control in place.



FIGURE 1

2. Lift up the speed control unit and pop the bracket pins out of the belt guard holes. The ears will just flex outward with minimal force so you can remove the bracket pins from each side.



FIGURE 2

3. Remove the four Phillips screws that hold the retaining plate onto the housing.



FIGURE 3

4. Use a flat-blade screwdriver to pry the side of the speed control case away from the control board. Then lift the side of the control board up and out of the control cover.



FIGURE 4

- 5. You will need to remove the potentiometer. Take your flat-blade driver and loosen the small screw in the side of the S/C knob and remove it.
- 6. Use your wrench to remove the exposed nut and push the potentiometer shaft through the plastic housing.
- 7. Take your needle nose pliers to carefully remove the pigtail connectors from the S/C board by using a wiggling motion, so nothing gets broken or pulled apart.

Installing the New MASSO Speed Control Cable

- 1. Your new Sherline/MASSO controller kit came with a speed control cable (P/N 87826). This is what replaces the potentiometer (see Figures 5 and 6).
 - A. Connect the black wire to the P1 pin on the S/C board.
 - B. Connect the red wire to the P2 pin on the S/C board.
 - C. Connect the white wire to the P3 pin on the S/C board.



FIGURE 5—Shows the wire colors and their corresponding connections.



FIGURE 6—The red outlines show the S/C board connections.

Make sure the connections are tightly seated employing the same wiggling motion you used to remove the connectors. Use your needle nose pliers if necessary.

CAUTION

The cables have a specific connection. Do NOT mix up the connections or you will blow the S/C unit and you will do severe damage to the MASSO board.

2. You will need to route the new S/C cable into the housing. To do this, remove the little cord retainer that holds the power cord in place.



FIGURE 7—Remove the cord retainer from the position denoted by the dashed lines.

3. Fish the S/C cable into the recess with the power cord and replace the cord retainer (see Figure 8). It is a snug fit but it will go in. You can use a screwdriver on the L-shape portion of the retainer to help push it down, if necessary.



FIGURE 8—The main photo shows the S/C cable tucked in with the power cord. The inset photo shows the L-shape of the cord retainer.

4. CAUTION!

A. Be very careful when reinstalling the cord retainer into the S/C housing. The retainer can pinch the S/C wires if you press down too hard on it, as seen in Figure 9, and this might damage the wires, and you will lose the signal to your controller.



FIGURE 9—The red arrow shows the damage that can be done if the S/C wires get pinched. The red and white wires are bent, but the black wire is actually cut.

B. Make sure there is an adequate amount of slack in the three-wire cable (see Figure 10). Please note that the cord retainer does not need to be pushed in flush with the S/C housing (as it was with the power cord only).



- 5. Carefully install the S/C board back in the housing.
- 6. Put the retaining plate back on. Make sure it has the correct side up. The back side of the plate (toward the cords) are for the flat-head screws. Just snug the screws down; don't overtighten them. They are just in plastic. If you tighten too much you will strip the screws out.
- 7. Put the S/C housing back on by inserting the bracket pins into the hinges.
- 8. Put the 10-32 SHCS retaining bolt back in (don't forget the washer) and tighten it down.
- 9. Complete the process by adding the small black button that is provided into the hole previously occupied by the potentiometer.

You are now ready to hook up the S/C cable to your new Sherline/MASSO controller.

Troubleshooting

If you are having issues with the spindle motor after assembling your speed control wiring, first follow the retrofit instructions and make sure that the color wires are on the correct pins on the control board. Then check the plastic wire connector from the speed control unit to the tach/spindle control cable bundle (P/N 87820). The connector has a (1) and a (3) molded into it. The (1) should be black, the middle should be white, and (3) should be red (see Figure 11). If the wires are not installed correctly, you will need to contact Sherline for the correct speed control connection wire. Do not attempt to turn on the speed control until the wiring is correct.



FIGURE 11—The red circles show the numerals molded into the plastic connector.

Thank you, Sherline Products Inc.

FIGURE 10