ST106 ADJUSTABLE HEAD

DISCONNECT YOUR MACHINE FROM THE POWER SOURCE!!!! *Read this completely before beginning*

1. Open and inspect your package, you should find:
1 adjustable mill head assembly and sheet metal shield
1 set of hardware including 4 10mm X 25mm button head cap screws, 4 10mm X 30 mm button head cap screws, 6 1/4-28 socket head screws and washers, 1 cable strain relief,4 motor mount extension studs, 4 8mm hex head nuts, 2 10mm hex nuts and washers, 1 steel mill cover support bracket, and 1 3L 460 belt.
2. Remove the cover from the center of your mill motor, and disconnect the 4 wires , being sure to check the small tags on each wire which designate the proper terminal.
3. Pull the cable back through the hole in the sheet metal housing until it is inside the housing. FOR SECURITY, TAPE ALL THE EXPOSED ENDS WITH ELECTRICAL TAPE!
4. From the top front of the sheet metal housing measure to the center of the width and back 3.25" and punch mark. At this point, drill a 7/8" hole and install the electrical strain relief from your hardware set.(THIS HOLE IS ALREADY DONE ON SHOPMASTER 2000 MACHINES) The clamp screws should be on the top and the locking nut inside the housing. NOTE; IF YOU COVER THIS AREA WITH MASKING TAPE PRIOR TO MARKING AND DRILLING, YOU WILL HAVE LESS CHANCE OF CHIPPING THE PAINT.
5. Now feed the mill motor cable up through the strain relief, but do not tighten the clamp screws yet.
6. Loosen the mill motor adjuster knobs and remove both drive belts.
7. Pull the motor completely out of the casting and set it aside.
8. Remove the center idler pulley assembly and set it aside.
9. Remove both drill press handles and set them aside.
10. Loosen the front mill head lock and the rear mill head clamp.
11. You can now remove the entire mill head assembly, by lifting straight up and turning it back and forth . You will see that it has a large steel pin that goes into the casting. WE ADVISE THAT YOU GET SOME HELP AT THIS POINT, BECAUSE THE HEAD IS HEAVY AND WHEN IT COMES FREE FROM THE CASTING A SINGLE PERSON COULD LOSE HIS BALANCE.
12. Once the head is free of the machine, carefully set it aside.
13. Open the door to the main drive housing and look just above and behind the spindle pulley. You will see 2 socket head screws about 2" apart. Remove these screws and set them aside they will no longer be used.
14. Now remove the aluminum cover band that wraps around the casting.
15. Remove the 4 hex head bolts holding the cast block to the main spindle base.
16. Remove the cast block and set it aside- this will no longer be used.
17. Clean the top surface of the main spindle base to be sure nothing falls inside.
18. Bring your adjustable head assembly to the machine, being sure that the bottom plate is clean as well.
19. Lift the adjustable head assembly onto the main spindle base with the cutouts on the plates facing the chuck. ONCE AGAIN, THIS IS BEST DONE BY TWO PEOPLE DUE TO THE WEIGHT OF THE ASSEMBLY AND THE HEIGHT TO WHICH IT IS LIFTED.

20. Take 4 of the button head cap screws and bolt the unit to the main spindle base, but only lightly tighten the bolts.
21. Using a pencil, trace the outline of the bottom plate of the adjustable head assembly on the main drive housing where they meet.
22. Now remove the 4 button head screws and either remove the adjustable head, or if your helper is still there, simply slide it forward far enough to see the 2 threaded holes in the edge of the lower plate.
23. Measure the location of these 2 holes and mark their corresponding position within your pencil tracing on the main drive housing. (THESE HOLES ARE ALREADY DRILLED ON SHOPMASTER 2000 MACHINES)
24. Punch mark these two points and drill them to 5/16". (BE CAREFUL NOT TO ALLOW CHIPS TO FALL INTO THE MAIN SPINDLE DRIVE..)
25. Now replace the adjustable head assembly and re-install the 4 10mm X 30mm button head cap screws.
26. Open the door to the main drive housing and thread 2of the 1/4-28 socket head screws through the holes and into the tapped holes of the adjustable head assembly base plate.
27. The moveable plate with 4 holes in it will normally clear the sheet metal housing with little room to spare. If any rubbing occurs, you can remove the 1/4-28 socket head screws and insert a flat washer between the housing and the plate to increase the clearance.
28 Now you are ready to install the mill head.
29. First, remove the studs which support the sheet metal belt guard and set them aside for modification.
30. Now, remove the swivel plate from the base of the mill head and set it aside- it will no longer be used.
31. Using a square or caliper, measure the thickness of the mill head from the base where the swivel plate was attached, to the top of the cast boss where you removed the stud. This distance is fairly uniform from the factory, but some variations can occur.
32. Now, measure the distance between the 2 plates on your adjustable mill head assembly, that move up and down together. If the distance between the plates is greater than the thickness of the head, make a note of the difference. If it is less than the head thickness, you will need to file or grind the boss until the distances are equal.
33. Take the 2 mill cover mounting studs and on one end of each, turn them back so that you have another 0.375" of stud length (threading is not necessary). Then turn the other end of only one of the studs so you have another 0.25" stud length.
34. Now its time to lift the mill head into position. Raise the assembly until you have about 8" distance from the main base plate to the bottom of the lower moveable plate. Also, be sure that the 2 motor adjustment locking knobs are still in the head casting.
ONCE AGAIN, 2 PEOPLE WILL MAKE THIS PROCESS MUCH SAFER AND EASIER.
35. Have 4 10 mm X 25mm button head cap screws close at hand, and you and your assistant lift the head into place and slide it between the 2 moveable plates on the adjustable head assembly.
36. Screw the 4 socket head screws into the head casting from below, and screw the stud which was turned on both ends through the upper moveable plate and into the threaded boss on the casting. (thread the end in which was turned back ¼") Now thread the other stud back in place with the turned end up.
37. If the head thickness was ok, or if you filed it to match, you can go ahead and tighten the 4 button head screws first, followed by the upper stud. However, if your head thickness is less than the plate distance, tighten only the 4 button head screws first,

and then find a washer the proper thickness to fill the gap prior to tightening the upper stud. You can turn a washer to the exact dimension on your lathe. Once this is done and inserted in the gap, tighten the stud. CAUTION- TIGHTENING THE UPPER STUD OVER A GAP WILL WARP THE PLATE.

38. Now you can replace the drill press handles, and the center idler pulley assembly.

39. With the weight of the head in place, run the assembly up and down a few times to further test its operation.

40. Now its time to re-install the mill motor. AT THIS POINT, UNPLUG YOUR MACHINE FROM THE POWER SOURCE.

41. Remove the mill motor from from its mounting plate, noting that the plate is not symetrical, and that in the standard position, the long leg points down.

42. Set the motor mount on the table and thread the 4 motor mount extensions into the motor mount. Put the threaded ends through the motor flange and attach with the 4 8mm nuts.

43. Now lift the entire motor mount assembly up and slide it into the holes in the mill head casting.

44.You are now ready to- install your belts, put one of the original belts around the idler and spindle pulley and the 3L 460 from the idler to the motor pulley.

45. Now take the steel bar with the 3 button head bolts attached and place it over the 2 mill support studs with the threads of the bolts facing up. Attach the bar to the studs with the 2 10 mm hex nuts.

46. DOUBLE CHECK TO BE SURE YOU ARE DISCONNECTED FROM THE POWER SOURCE!!

47. Now re- attach the motor cable to your mill motor.

NOTE: ALL NEW SHOPMASTER MACHINES HAVE A LONG CABLE TO ALLOW FOR THE LIFT OF THE HEAD. OLDER MACHINES MAY REQUIRE THAT YOU SPLICE IN SOME WIRE TO LENGTHEN THE MILL MOTOR CABLES.

48. Now replace the motor terminal block cover, and plug the machine back into the wall.

49. Now install the sheet metal cover using the 4 remaining 1/4-28 allen bolts and washers.

50. Test the mill and lathe motors once again to be sure all is ok.

51. Now its time to modify your mill drive cover. You will note that it now will not fit back in place.

THIS IS A VERY IMPORTANT SAFETY ITEM, SO DO NOT BE TEMPTED TO SKIP THIS PART AND LEAVE THE BELTS EXPOSED.

52.Modifying the guard is not difficult, please follow the directions.

53. Measure back from the front of the mill cover toward the rear 13.5"" and draw a line across the top. Now measure from the rear of the guard forward 12" and draw a line across the top.

54. Using a square, transfer these lines down each side.

55. Using a hack saw, or a bandsaw, cut the guard across these lines. NOTE: PUTTING MASKING TAPE OVER THE AREA TO BE MARKED AND CUT WILL HELP TO PREVENT PAINT CHIPS AND SCRATCHES.

56. Now measure 4" along the centerline of the cover from each original hole and drill another hole 12mm in diameter.

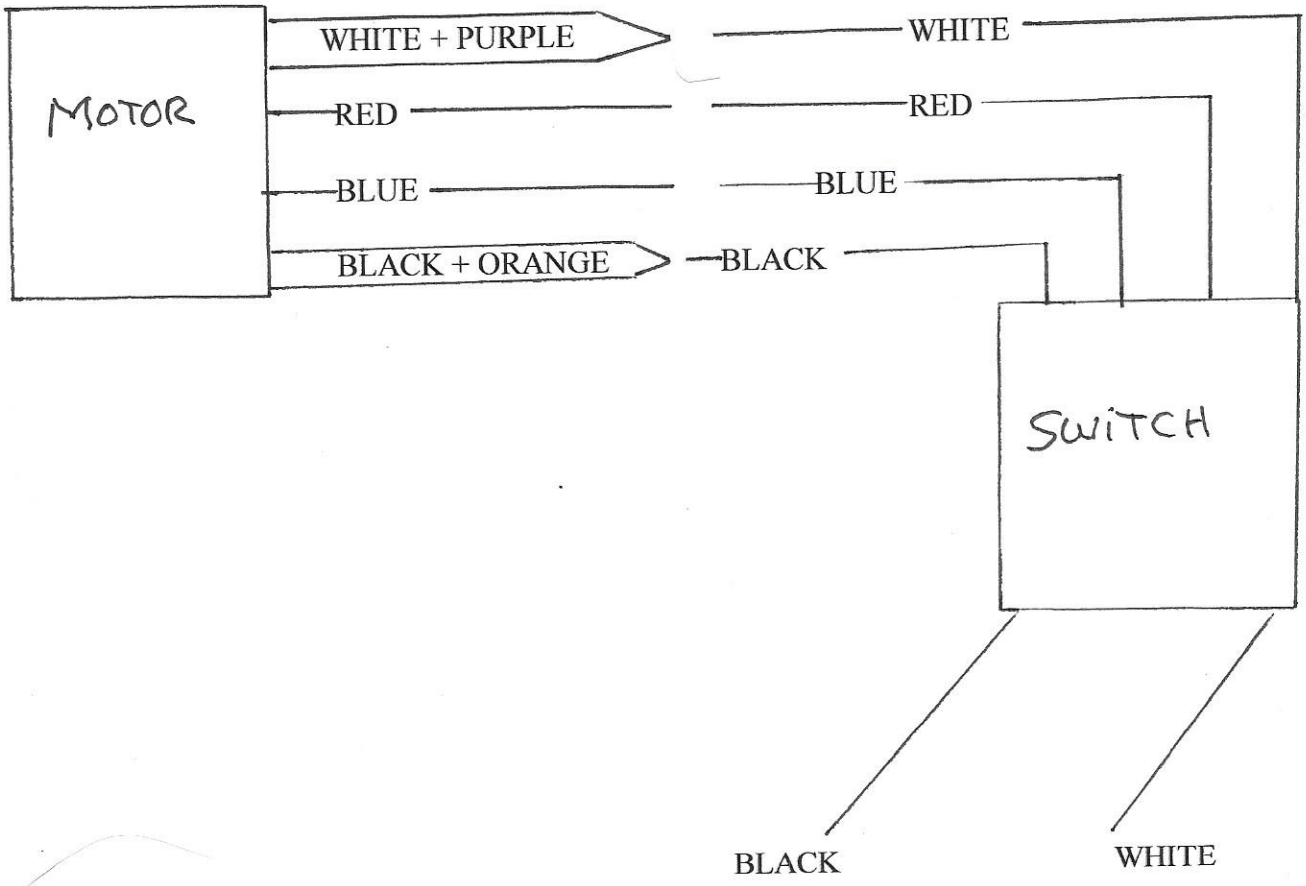
Your guards will now be supported by the steel support bar with the original stud acting as a locator at the mill spindle end, and the bolt accepting the plastic knob. At the rear, the stud will hold the bar in place and one bolt acts as a locator and the second accepts the plastic knob.

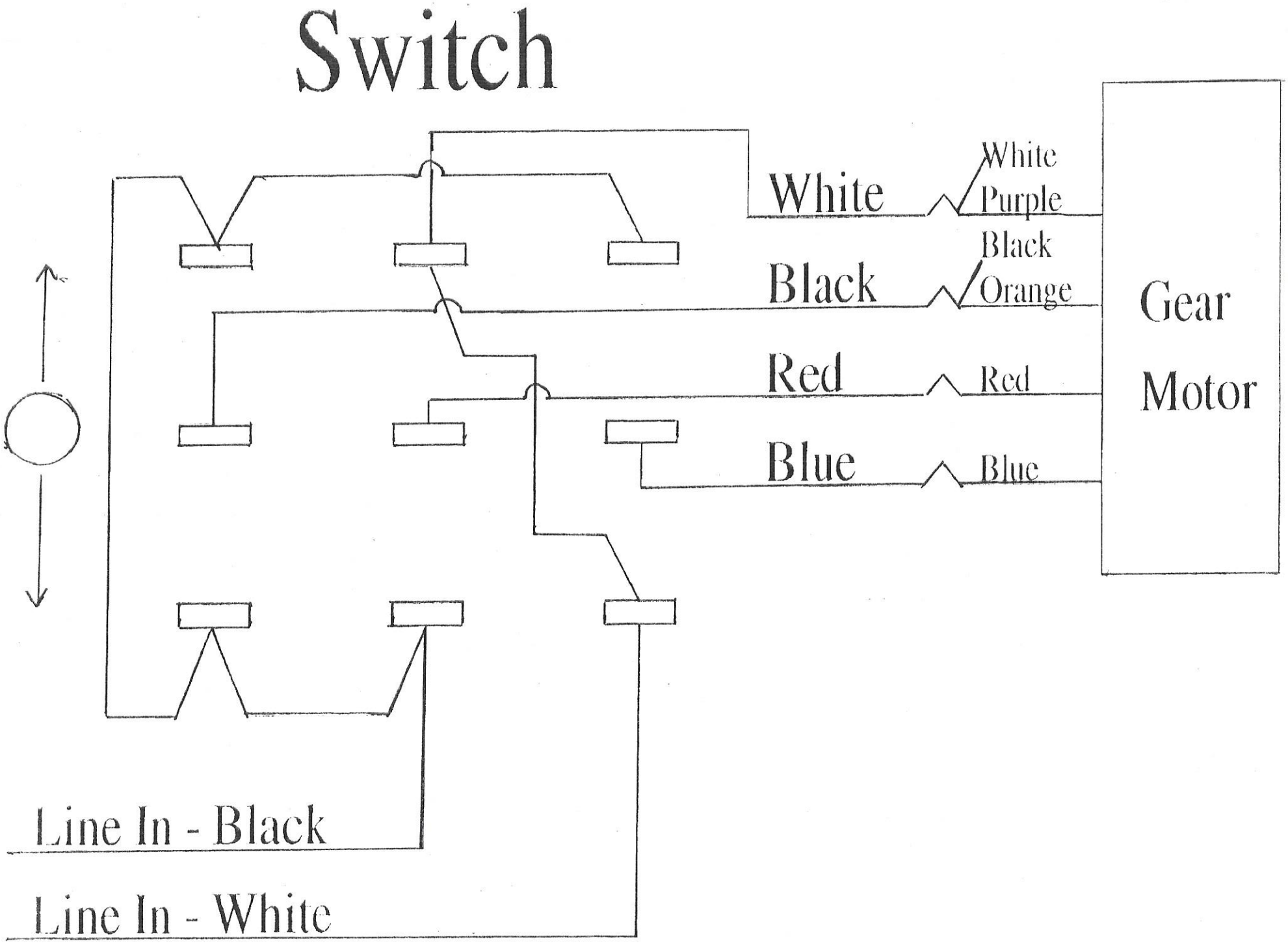
INSTALLING THE OPTIONAL ST 106P LIFT MOTOR

DISCONNECT THE MACHINE FROM THE POWER SOURCE!!!!!!

1. The lift motor mounts to the rear of the quadra lift assembly just above the lathe motor. Due to changes in the motor design, it is now necessary to remove the oil filler plug and machine it down to clear the motor. Or you can replace it with a short allen set screw with 16mm X 1.5 threads.
2. The quadra lift motor came with a lovejoy coupling already in place. Remove the collar from the lead screw and slide the motor and lovejoy coupling over the shaft end and tighten the set screw on the lovejoy coupling. Attach the motor standoffs to the main plate with the 4 10-32 allen screws supplied with your hardware kit. It may be necessary to loosen the lathe motor mount to get clearance for the installation of the ST106 lift motor. After the St 106 lift motor is installed and tested, re-adjust the lathe motor.
3. After the motor is secured, tighten the set screw on the lovejoy coupling onto the motor shaft.
4. Open the door to your main drive housing and install the toggle switch through the hole between the lathe and mill switches. (On older machines you will need to drill this hole to accept the switch)
5. Feed the long loom of wires up and through the strain relief along with your mill motor cable. You may also feed the loom out the hole with the power cord and under the machine to the motor.
6. Route the wires to the motor and attach them according to the enclosed diagram.
7. Attach the black and white wires to the terminal block below the switch.
8. Re-connect your machine to the power supply and test your up and down motion.
9. Once all is working, be sure to tie your wire looms to prevent them from being caught between the moving parts or snagging during the up and down motion of the mill head.

WIRING ELECTRIC LIFT MOTOR




Switch
White
White
Purple
Black
Black
Orange
Red
Red
Blue
Blue
Gear
Motor
Line In - Black
Line In - White