

### Assembly Instructions - Schatten Design Coil Winding Machine Model B - Kit

**Tools you'll need:** rubber band, small phillips head screw driver, small flat head screw driver, ruler, needle nose pliers, small adjustable wrench, X-Acto or other sharp knife, 8" of electrical tape, wire cutter/ wire stripper, rosin core (radio/tv) solder, small soldering iron 15 to 35 watts or soldering station set to approx. 750F. Optional tools - 10 mm socket (toggle switches), 15 mm socket or wrench (power jack), 13mm or 1/2" wrench (speed control).

| QTY  | PARTS   | PART NUMBER                 | QTY                                | PARTS                                       | PART NUMBER       |
|--|---|-----------------------------|------------------------------------|---|-------------------|
| <b>ASSEMBLED</b>                           |   |                             | <b>KITTED PARTS</b>                |   |                   |
| <b>ENCLOSURE</b>                           |   |                             | <b>ELECTRICS-1 BAGGED TOGETHER</b> |   |                   |
| 1  | ENCLOSURE, PRE-DRILLED  | 1594DSBK                    | 1                                  | 100K WIRE WOUND SW POT w/lock washer, nut   | CT3020-ND         |
| 1  | IR REFLECTIVE SENSOR w/ 6" 3 conductor wire -PRE MOUNTED TO ENCLOSURE | 958                         | 1                                  | MOTOR w/ PULLEY                             | TS840             |
| <b>PINK BAG</b>                            |   |                             | <b>ELECTRICS-2 BAGGED TOGETHER</b> |   |                   |
| <b>CIRCUIT BOARD ASSEMBLY</b>              |   |                             | <b>IR REFLECTOR Rotary Part</b>    |   |                   |
| 1  | SWITCH CIRCUIT BOARD  | SW BD MODEL B - REV 4A      | 1                                  | IR REFLECTOR                                | IR REFLECTOR      |
| 1  | DIR SWITCH DPDT ON/OFF/ON   | EG2414-ND                   | 2                                  | O-RING DRIVE BELTS 2 1/8 x 2 1/4 x 1/16     | OR-034N           |
| 1  | CT RESET SWITCH SP MOMENT.  | 432-1170-ND                 | 1                                  | WIRE CLIP GREY                              | WIRE CLIP         |
| 1  | 3.3 VOLT REGULATOR  | 296-21633-5-ND              | 1                                  | 2.1 mm POWER JACK                           | 27931-134-0       |
| 1  | 22uf CAPACITOR -C1  | P5162-ND                    | 1                                  | POINTER KNOB                                | POINTER KNOB      |
| 1  | 1uf CAPACITOR -C2   | P5174-ND                    | 1                                  | COUNTER                                     | MINI CAL 1        |
| 1  | HEAT SINK   | HS198-ND                    | <b>MECHANICALS BAGGED TOGETHER</b> |   |                   |
| <b>MOUNTING BASE</b>                       |   |                             | 1                                  | WINDER ARM w/ 10-24x3/8 soc set screw       | ARM               |
| 1  | BOARD WHITE 6" x 6" x 5/8" PRE-DRILLED                                | BASE                        | 2                                  | BEARINGS                                    | FR4ZZ             |
| <b>KITTED PARTS</b>                        |   |                             | 1                                  | MAIN SHAFT PULLEY w/8-32x3/16 soc set screw | MAIN SHAFT PULLEY |
| <b>CROSS FEED ASSEMBLY BAGGED TOGETHER</b> |   |                             | 2                                  | 1/4" COLLARS                                | 1/4" COLLAR       |
| 1  | LIMIT SHAFT   | 4" STAINLESS                |                                    | MAIN SHAFT 1/4" x 4 1/4"                    | ALLEN KEY 5/64"   |
| 1  | ALUM FLAT, STAND OFF  | 1/4 X3/4 X 6"               | 1                                  | ALLEN KEY 5/64"                             | ALLEN KEY 3/32"   |
| 2  | 1/4" FLAT WASHER  | 1/4" FLAT WASHER            | 1                                  | ALLEN KEY 3/32"                             |                   |
| 1  | 1/4" LOCK WASHER  | 1/4" LOCK WASHER            | <b>WIRE BAGGED TOGETHER</b>        |   |                   |
| 2  | 1/4" NUTS   | 1/4" NUT                    | 1                                  | WIRE BLACK 22 GA - 12"                      | BLACK             |
| 2  | 1/4" COLLARS  | 1/4" COLLAR                 | 1                                  | WIRE WHITE 22 GA - 12"                      | WHITE             |
| <b>SCREWS BAGGED TOGETHER</b>              |   |                             | 1                                  | WIRE RED 22 GA - 12"                        | RED               |
| 2  | 1/4 x 20 x 1" FLAT HD PAN PHIL  | MACHINE TO BASE MTG SCREWS  | 1                                  | WIRE GREEN 22 GA - 12"                      | GREEN             |
| 2  | M3 x 5 MACHINE SCREWS   | MOTOR MOUNTING SCREWS       | 1                                  | RIBBON WIRE, 4 CONDUCTOR - 4"               | MULTI             |
| 4  | NUTS FOR TOGGLE SWITCHES  | ---                         |                                    |   |                   |
| 2  | LOCK WASHERS FOR TOGGLE SWITCHES                                      | ---                         |                                    |   |                   |
| 2  | TABBED WASHERS FOR TOGGLE SWITCHES                                    | ---                         |                                    |   |                   |
| 2  | #4 x 1/2" PAN PHIL STAINLESS  | CROSS FEED LIMIT MTG SCREWS |                                    |   |                   |
| 4  | SELF TAPPING SCREWS - BAGGED  | COVER MTG SCREWS            |                                    |   |                   |

### Counter Installation:

- 1) Unpack the counter, remove the black plastic mounting halves and set them aside. Remove the protective film covering the counter face.
- 2) Re-install the two black plastic mounting halves onto the counter.
- 3) Install the counter into the machine cover with the four solder pins to the left side as shown (fig's 1 & 3). Note that there is a small plastic tab on each half of the mounting that has to gently be pried outward to secure the counter.
- 4) Insert the tip of a small flat head screw driver behind each edge of a tab and pry (fig 1).

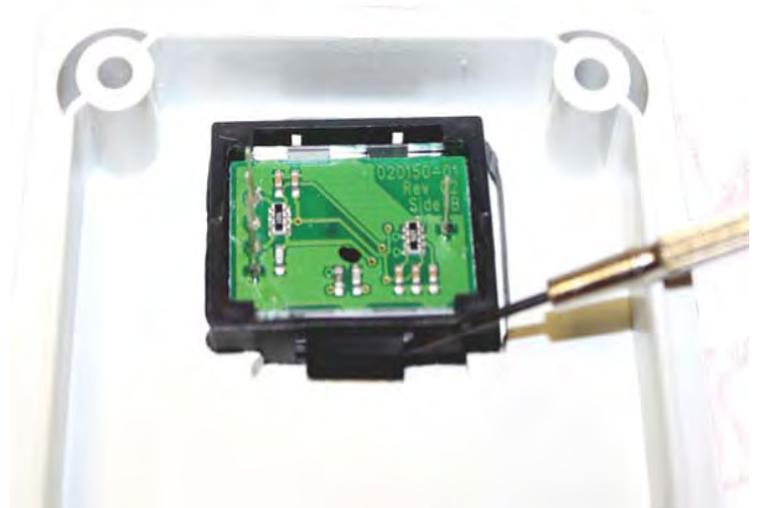


Fig 1

### Circuit Board Installation:

- 1) (fig 2) Install a nut onto each toggle switch. Rotate the nut all the way to the bottom of the switch.
- 2) Install a lock washer on top of each nut.

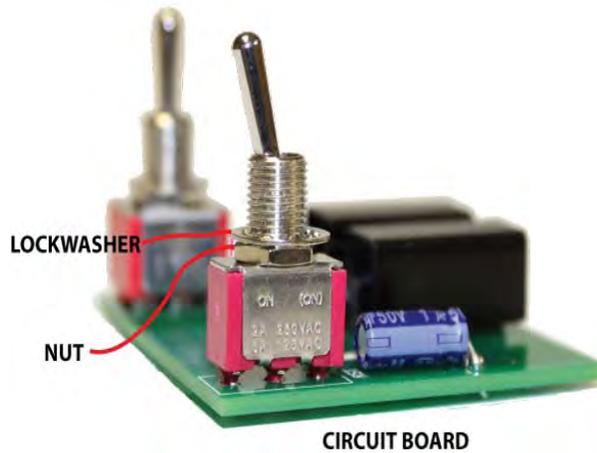


Fig 2

- 3) Mount the circuit board to the cover by inserting the toggle switches through the holes in the cover. Note the alignment of the circuit board as shown (fig 3).

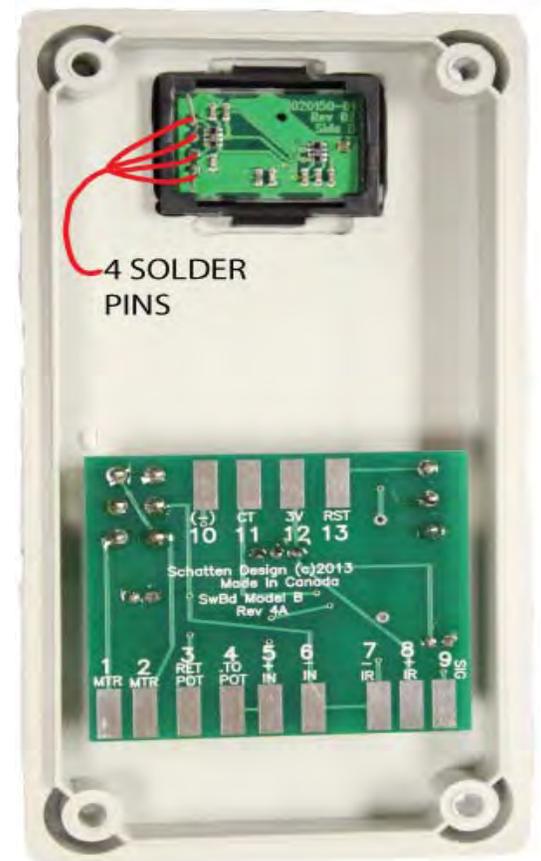


Fig 3

- 4) Note that the toggle switches have a slot or keyway down their threaded surface (Fig 4). Install a small tabbed flat washer (tabs should face away from the surface of the cover) and a nut on the toggle switches and using a 10mm socket or wrench tighten the nuts to mount the circuit board.



Fig 4

### Counter Wiring:

1) A four inch piece of 4 conductor ribbon wire is provided to wire the counter to the circuit board. The color of the wires shown does not necessarily correspond to the ribbon wire in your kit.

2) The four different wires that make up the ribbon have to be separated from each other for one inch at each end.

3) (fig 5) By inserting the tip of the X-Acto into the space between the colored wires and gently pulling the ribbon wire away from the knife you can separate the wires as shown.

4) Strip 1/4" and tin both ends of all four wires.



Fig 5

5) (fig 6) As delivered, pins A, B, C, D on the counter are straight up and down and are very close together, which can make soldering to them difficult. With your finger, very gently bend the pins to separate them to provide more working room.

6) **IMPORTANT!** - Cover the back side of the of the counter (where its' circuit board is exposed) with 3 or 4 layers of electrical tape to guard against any solder dripping or spatter that may occur in the next 2 steps.

7) Carefully tin each of the four pins on the left side of the counter.

8) Solder the four wires from the ribbon, one each, to a counter pin. Remove the protective electrical tape.

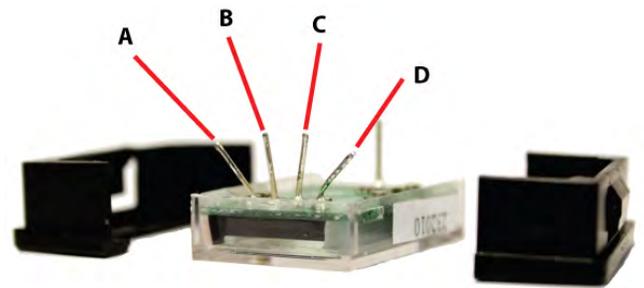


Fig 6

9) The ribbon wire is now soldered to the circuit board as follows:

#### Wire Assignments:

Wire from pin A to pad 13 on circuit board

Wire from pin B to pad 12 on circuit board

Wire from pin C to pad 11 on circuit board

Wire from pin D to pad 10 on circuit board

10) Tuck the excess ribbon wire between the circuit board and the cover. Place a piece of tape over the ribbon as shown (fig8) to secure it.

11) **Important!** - Make sure that the pins on the counter do not come into contact with each other.

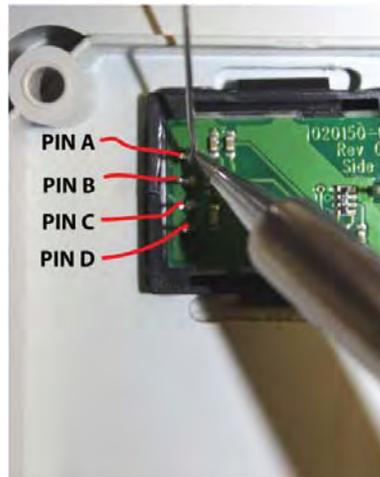


Fig 7



Fig 8

### Speed Control Pot Wiring

1) Tin Lugs 1 through 4 on the control pot. (Lug 5 is not being used)

2) Cut a 1 1/2 inch piece of black wire, strip 1/4" from each end and tin. Solder the wire from Lug 1 to Lug 3.

3) Cut an 8 inch piece of green wire, strip 1/4" from each end and tin. Solder one end to Lug 2.

4) Cut an 8 inch piece of red wire, strip 1/4" from each end and tin. Solder one end to Lug 4

5) Twist the green and red wires together along their length to keep them paired.

6) Set the unit aside.

7) Make sure that after soldering and upon assembling the machine, that none of the lugs bend and come into contact with the pot body.

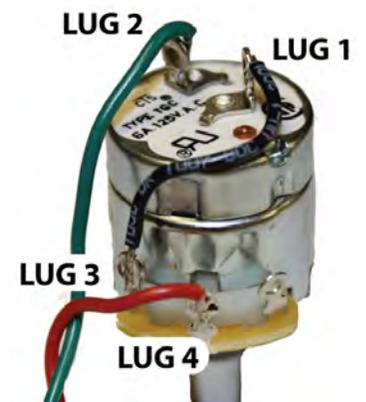


Fig 9

### Motor Wiring

- 1) Tin the two lugs on the back of the motor.
- 2) Cut a 4 inch piece of white wire, strip 1/4" from each end and tin. Solder one end to the motor lug with the red dot next to it.
- 3) Cut a 4 inch piece of black wire, strip 1/4" from each end and tin. Solder one end to the other motor lug
- 4) Twist the white and black wires together along their length to keep them paired.
- 5) Set the motor aside.



Fig 10

### Power Jack Wiring

- 1) Tin Lugs 1 and 2.
- 2) Cut a 4 inch piece of white wire, strip 1/4" from each end and tin. Solder one end to Lug 1
- 3) Cut a 4 inch piece of black wire, strip 1/4" from each end and tin. Solder one end to Lug 2
- 4) Twist the white and black wires together along their length to keep them paired.
- 5) Insert the power jack through the hole in the back wall of the box and tighten the nut on the outside of the box using a 15mm wrench (fig 12).

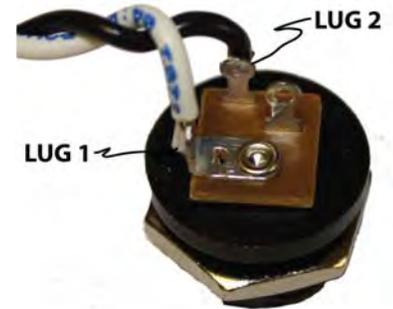


Fig 11

### Mount The Motor

- 1) (fig 13) Insert the pulley end of the motor through the larger hole in the lower right wall of the box.
- 2) Slide the motor toward the rear of the box into the smaller opening.
- 3) There are two threaded holes in the face of the motor. Line up a threaded hole with the upper mounting hole of the box. Insert an M3 x 5 philips head machine screw and tighten about 3 turns. There is limited clearance between the motor pulley and the motor mounting screws; do not tighten this first screw down all the way yet.
- 4) Line up the lower threaded hole in the motor with the lower mounting hole of the box, insert the second M3 x 5 machine screw and tighten completely.
- 4) Now finish tightening the upper mounting screw.



Fig 12



Fig 13

### Mounting The Speed Control Pot

- 1) Place a lock washer onto the pot shaft.
- 2) Note the alignment of the pot (fig 12).
- 3) There is a small vertical tab on the upper surface of the pot. This tab will protrude very slightly through small hole next to the pot shaft hole in the upper surface of the box.
- 4) Install the nut and tighten using a 13mm wrench or socket.

### IR Sensor:

1) The main box of the machine has the IR Sensor installed and partly pre-wired.

### Main Shaft Bearings:

1) Press the main shaft bearings into place in the holes provided in the box side walls. They are pressed from the outside of the box.

2) Put a piece of tape over each bearing on the outside of the box. The bearings are a very light press fit. They will be held securely in place when the main shaft and cover are installed later.

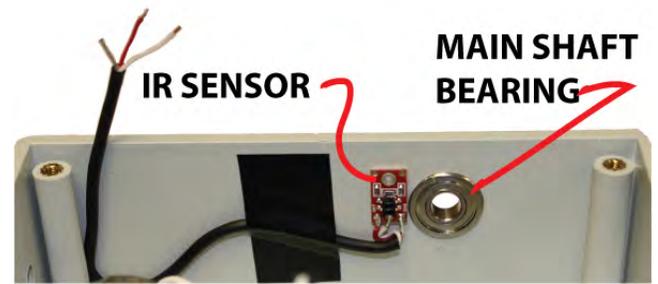


Fig 14

### Main Circuit Board Wiring

As shown in fig 15, align the winder cover to the right and the winder box to the left.

- 1) Solder the black wire from the motor to pad 1
- 2) Solder the white wire from the motor to pad 2
- 3) Solder the red wire from the pot to pad 3
- 4) Solder the green wire from the pot to pad 4
- 5) Solder the white wire from the power jack to pad 5
- 6) Solder the black wire from the power jack to pad 6
- 7) Solder the white wire from the IR sensor to pad 9
- 8) Solder the red wire from the IR sensor to pad 8
- 9) Solder the bare wire from the IR sensor to pad 7

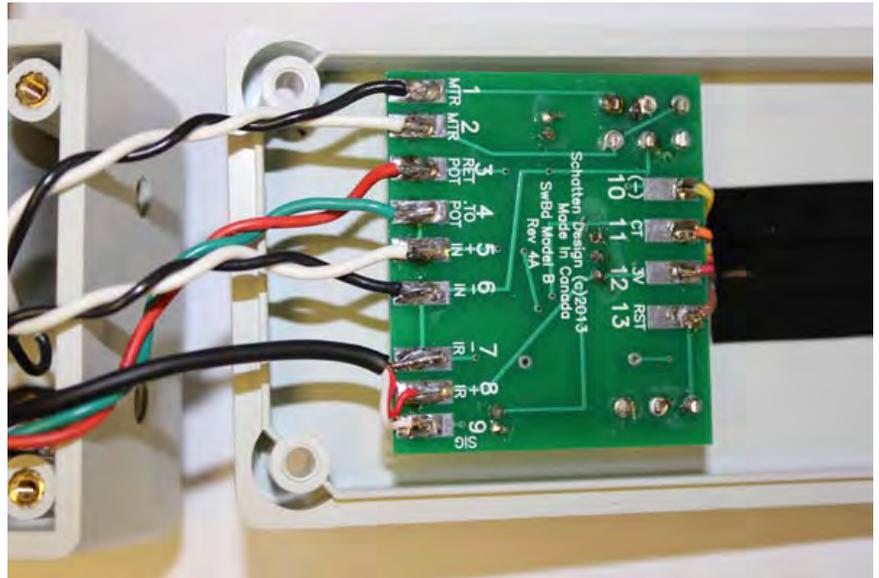


Fig 15

### Installing The Main Shaft

Note: The main shaft has a flat surface on one 'side'. When securing collars, IR reflector, and pulley, make sure that all of the allen screws are tightened down onto this flat surface.

- 1) Install a wire clip on the inside of the main box as shown in the photo. Make sure that it is placed so that it will not interfere with the IR reflector.
- 2) Slide the red and green wires from the control pot into the wire clip.
- 3) Install one collar at one end of the end of the main shaft. Line up the allen with the flat of the shaft and tighten the collar.
- 4) Remove the tape holding the bearings in place. Insert the main shaft through the bearing on the IR wall side of the box.
- 5) Slide the IR reflector onto the main shaft with the collar part away from the IR sensor as shown.
- 6) Holding the IR reflector so that it doesn't jam against the control pot, slide the main shaft through the bearing on the opposite wall of the box.

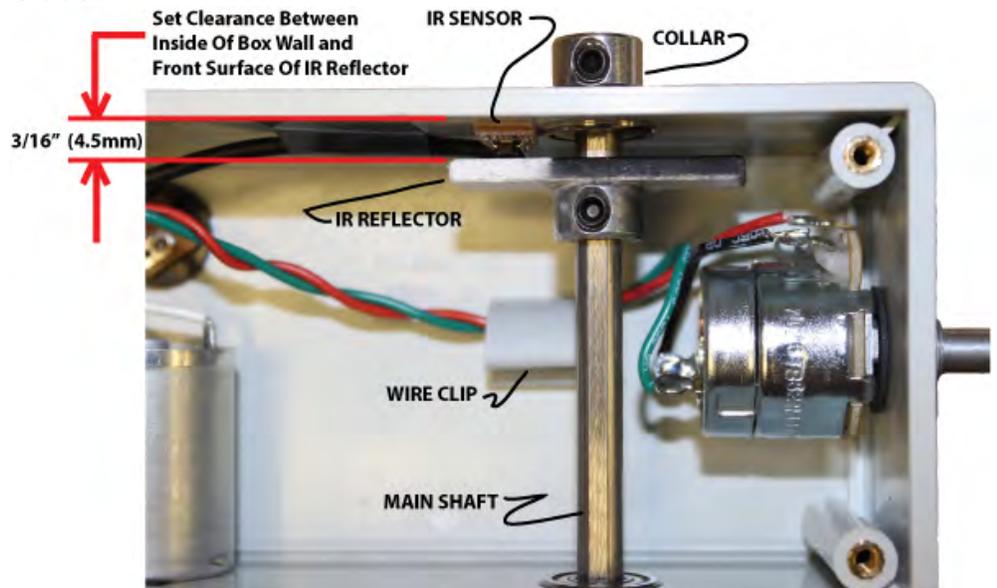


Fig 16

7) Fold the wires to the circuit board so that you can put the cover on the box. Take a rubber band and place it around the box and cover.

8) Install the second collar onto the main shaft and slide it down flush with the bearing. Do not exert any real pressure or squeeze the box as this collar is installed. Tighten the allen on the collar. The main shaft should turn freely with no side to side slop.

9) Remove the rubber band and open the cover. The IR reflector now must be distanced properly from the IR sensor.

10) As per upper photo, the face of the IR reflector should be set so that it is 3/16" (4.5mm) from the inner box wall. Position the IR reflector at the proper place, make sure the allen will contact the flat of the main shaft and tighten the allen.

11) Install the 4 self tapping screws to secure the cover to the box.

12) Slide the main shaft pulley onto the main shaft. Install the drive belt around both pulleys. Position the main shaft pulley so that the drive belt is in a straight line with the motor pulley. Make sure that the allen on the main shaft pulley is aligned on the flat of the main shaft. Tighten the allen.

13) Install the winder arm flush at the end of the main shaft.

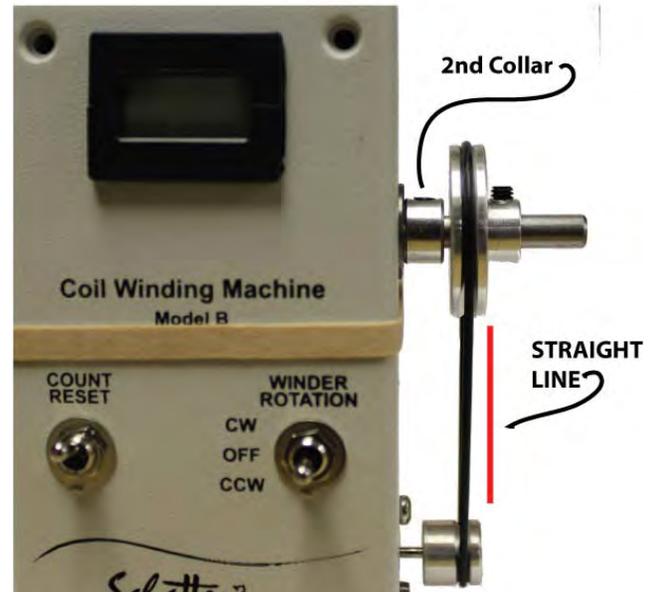


Fig 18

### Cross Feed Assembly

1) Thread a 1/4" nut all the way down onto the cross feed shaft and tighten.

2) Install a 1/4" flat washer onto the shaft.

3) Insert the shaft through the aluminum stand-off.

4) Install a 1/4" washer,

5) Install a 1/4" lock washer.

6) Install a 1/4" nut and tighten.

7) Set aside the two 1/4" collars from this kit.

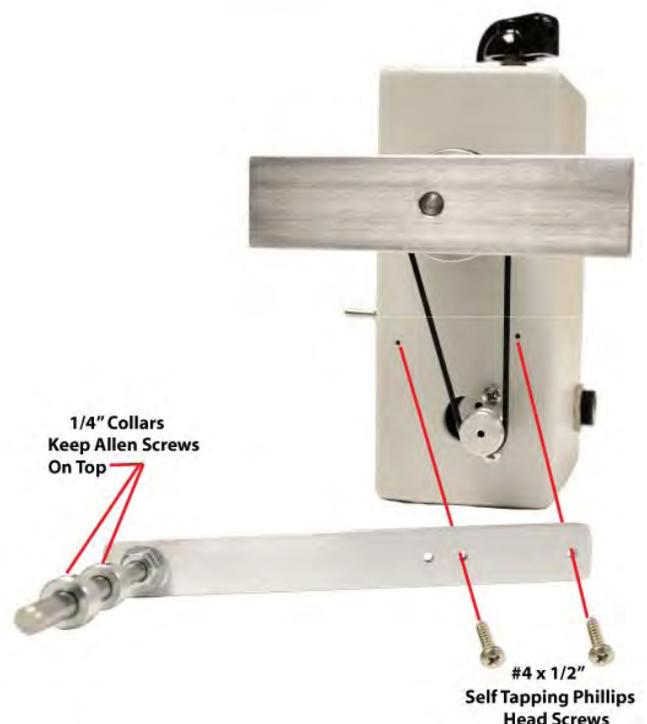
### Mounting The Winder

1) Line up two holes in the Cross Feed Assembly with the two pre-drilled holes on the side of the box and cover. Install the assembly using the two 1/2" self tapping screws provided.

2) Attach the machine to the white base using the two large 1/4 x 20 screws provided. Insert the screws from the counter-sunk side of the board and tighten into the pre-tapped holes in the bottom of the machine.

3) Install the two 1/4" collars from the cross feed assembly kit onto the cross feed shaft. The allens on the collars should be positioned so that they will come into contact with the upper surface of the shaft only. Since the coil wire will pass under and against the lower surface of the limit shaft, it is imperative that the lower surface of the bar remain unmarked and smooth.

3) Install the speed control knob.



## Attaching A Bobbin To The Winder Arm

We have found that the simplest and usually the best method for securing a bobbin to the winding arm is by using a piece of double sided tape. Supplied with the machine is a sample of this type of tape. It can be a cloth or a fiber glass woven double sided tape (usually marketed as a carpet tape) and can be found in most hardware stores. Notice from the sample that the tape is folded in two to provide the best conformity. The same piece of tape can normally be used numerous times.

Before pressing the bobbin into place, visually make sure that the bobbin is centered on the arm so that the coil winds evenly.

## Starting A Wind

- 1) Place your spool of coil wire about 3 or 4 feet behind you and about on the level of the winder base so that the wire may unspool end on. It will help if the leading edge of the spool is tipped up about 15 degrees.
- 2) Take a bit of masking tape and tape the end of the coil wire to underside of the winding arm. This should provide enough 'free' wire after the wind is completed to solder to the bobbin's eyelets or to the lead out wires.
- 3) Rotate the winder arm by hand to run the coil wire around the bobbin about 6 turns.
- 4) Run the wire under the limit shaft and adjust the inner limit collar so that the wire winds inside of the inner bobbin edge. You should be rotating the winder by hand to make this adjustment.
- 5) Repeat the same procedure to set the outer limit collar.
- 6) The coil wire is grasped lightly between thumb and forefinger so that it may be controlled and moved between the set limits. The pressure that is exerted on the wire by the thumb and forefinger provides the winding tension.
- 7) When you are satisfied that the limits are properly set, turn the machine on at low speed. Slowly move the wire back and forth between the limits to again check that the wire is winding properly within the bobbin.
- 8) If everything is satisfactory, increase the speed as required.

