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ECW Winder conversion to Model B electrics and parts

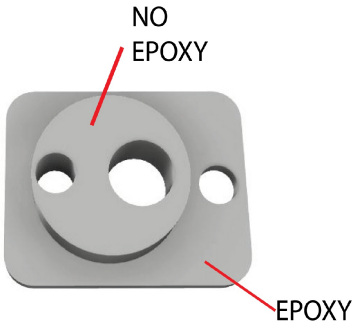

fig 1


fig 2

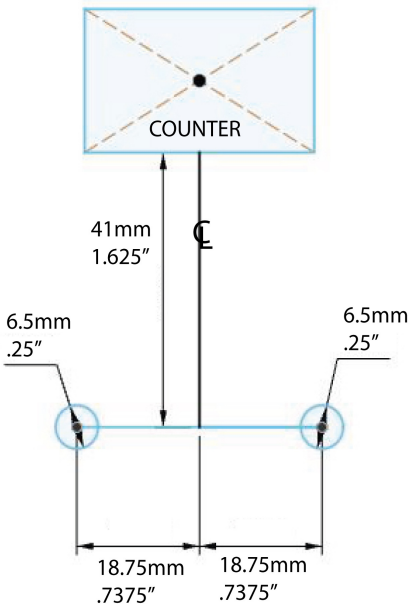

fig 3

1) Remove all electronics, counter, motor and all hardware from the machine so that we have a bare box.
2) Mix a small quantity of equal parts of A and B of the supplied 5 minute epoxy and apply it to the flat surface of the Motor Mounting Plug as shown (fig 1). Do not put any epoxy on the protruding round surface of the Plug. Save the remaining unmixed epoxy.
3) On the outside of the box, insert the round portion of the plug into the motor through hole. Align the mounting plug as shown (fig 2). Allow the epoxy to dry for 15 minutes.
3a) On the mounting plug one of the holes must be drilled through the box wall. Drill a 4mm (5/32") hole.
4) Two holes are to be drilled in the lid of the box as per the drawing (fig 3).
5) Reinstall the counter.

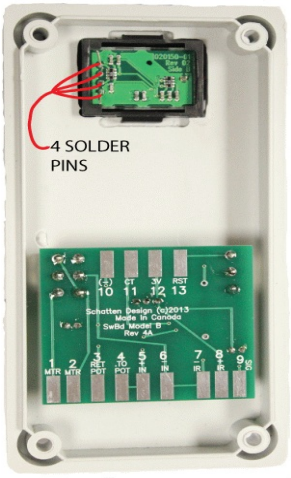

fig 4

Circuit Board Installation:
1) 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.
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 4).
4) Note that the toggle switches have a slot or keyway down their threaded surface. 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.

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


fig 5

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.
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.

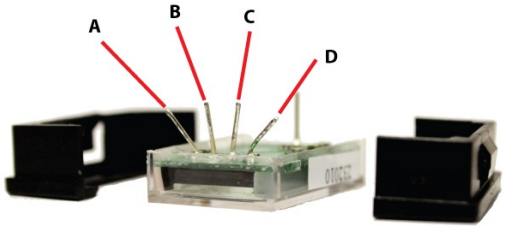

Fig 6

6) **IMPORTANT !** - Cover the back side of the of the counter (where its' circuit board is exposed) with a couple of layers of masking 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 masking tape.

9) The ribbon wire is now soldered to the circuit board as follows:
<u>Wire Assignments:</u>
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.

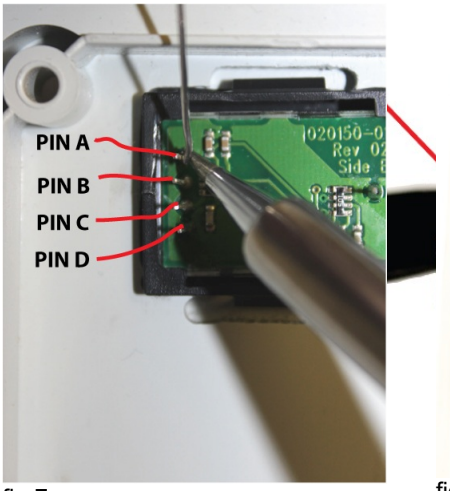

fig 7

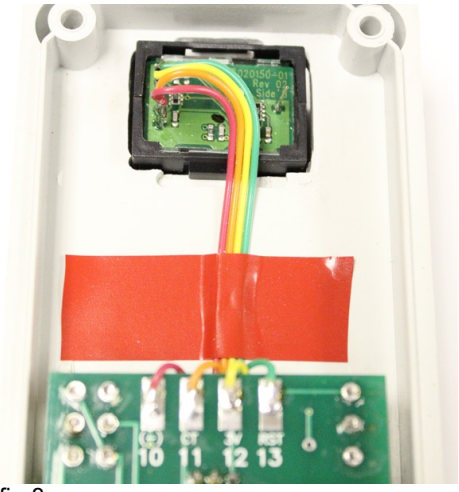

fig 8

<u>Speed Control Pot Wiring</u>
1) Tin Lugs 1 through 4 on the control pot. (Lug 5 is not being used)
2) Cut a 1 ½ 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.

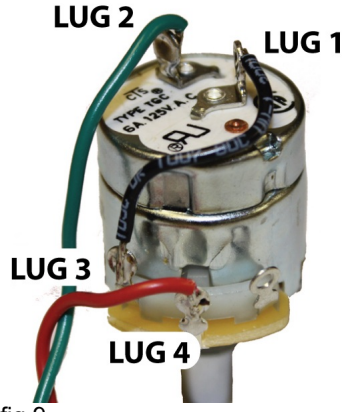

fig 9

<u>Motor Wiring</u>
1) Tin the two lugs on the back of the motor.
2) Cut a 6 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 6 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.

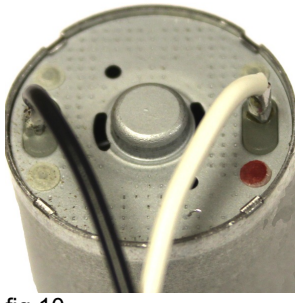
fig 10

IR Sensor:
1) Remove the VHB backing paper from the underside of the IR Sensor and adhere it to the box wall by pressing it firmly into place just below the main shaft bearing.
2) Place a piece of tape over the IR Sensor lead wire about an inch from the sensor.

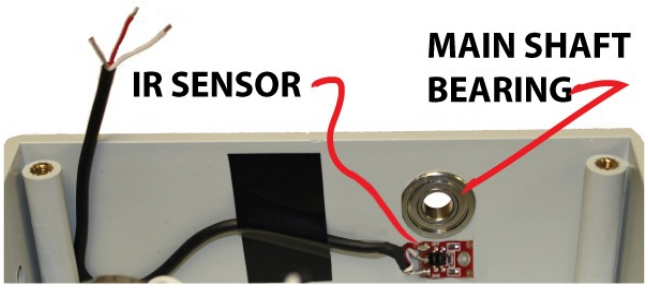

fig 11

Power Jack Wiring
IMPORTANT NOTE: As originally supplied, the ECW winders came with a 9v 500ma Center Negative power supply. This meant that Lug 1 was negative and Lug 2 was positive. If you are using the original power supply note that the colors of the wires do not necessarily indicate polarity.

Power Jack Wiring
1) Tin Lugs 1 and 2.
2) Cut a 6 inch piece of wire, strip 1/4" from each end and tin. Solder one end to Lug 1
3) Cut a 6 inch piece of wire, strip 1/4" from each end and tin. Solder one end to Lug 2
4) 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).

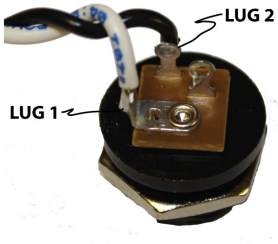

fig 12

Mount the Motor
1) Using the two 3mm x 8mm phillips head screws to mount the motor inside the box.
2) Mix a tiny amount of the A and B parts of the epoxy. Coat an eighth of an inch of the tip of the motor shaft with an almost invisible amount of the epoxy. The aim is to use so little epoxy that none of it squeezes out and binds things up. Supporting the motor, press the motor pulley onto the motor shaft as far as it will go.

Mounting The Speed Control Pot
1) Place a lock washer onto the pot shaft. Install the nut and tighten using a 13mm wrench or socket.

Note: The switches on the circuit board provide a counter reset (the momentary switch) and a winder direction switch (clockwise / off / counter clockwise).

Main Circuit Board Wiring
As shown in fig 13, 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 **POSITIVE** wire from the power jack to pad 5
6) Solder the **NEGATIVE** 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

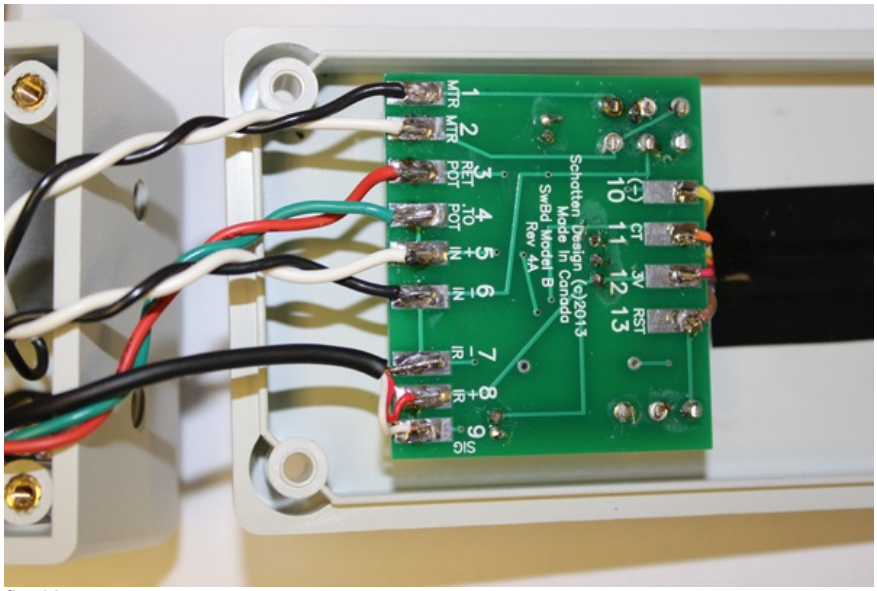

fig 13

Re-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.

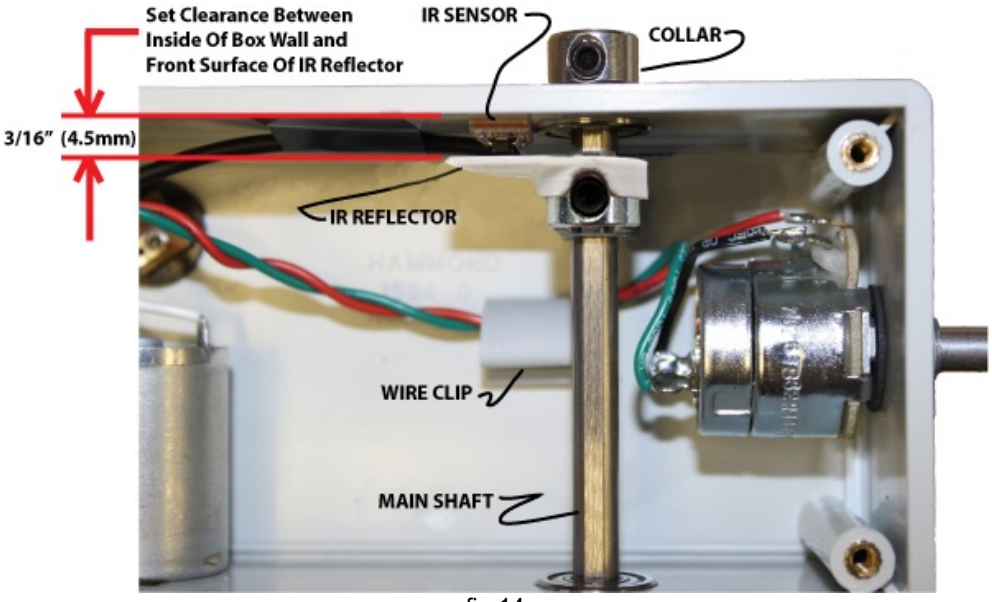

fig 14

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) Re-Install the left side winder arm and collar in the same positions on the shaft as they were previously.
4) Slide the IR reflector onto the main shaft with the collar part away from the IR sensor as shown.
5) 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.
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. Snug the allen. Do Not Over Tighten It.
13) Install the winder arm flush at the end of the main shaft.

1 - Model B circuit board	12 in. each Black, White, Red, Green wire
4 - Nuts, 2 Flat washers, 2 Lock washers	1- Speed control pot
2- Screws 3mm x 8mm	1- Knob
1- IR sensor with lead, 6 in.	
1- IR reflector with VHB	
1- Packet of epoxy	
1- Motor mounting plate	
1- Model B motor	
1- Motor pulley	