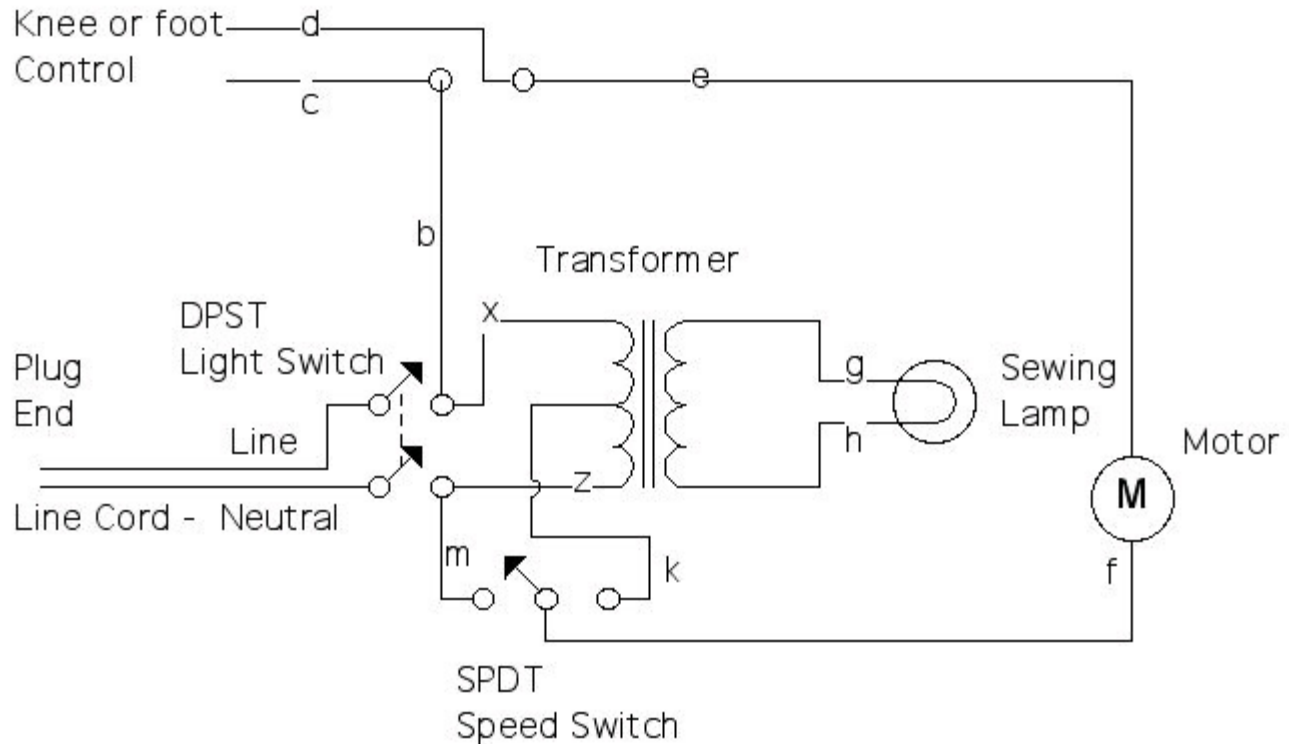


## Necchi BU Mira Wiring Diagram

See text message for detailed explanation



Refer also to the JPG diagram.

Each conductor (wire) and component is plainly shown. Each conductor has a lower case letter for identification. Each component is labeled. The plug and socket for the knee or foot control may be thought of as being at the circles where conductors 'b' and 'c', and conductors 'd' and 'e' join. Conductors 'd' and 'e' are usually attached together at the third pin of the plug device as explained below.

The original power cord for this sewing machine had only two blades or prongs of equal size such that it could be plugged into a power receptacle either way (by rotating 180 degrees). It is strongly suggested that this original power cord be replaced with a modern cord having three wires with two blades and a round pin at the powered end.

A modern cord may be either round with a polymer jacket enclosing three conductors, or flat like the original two conductor cord, but having three conductors in parallel. Either style is acceptable. The flat style cord would be neater overall and easier to use as a replacement and one may choose the proper overall length.

One would request a 'power cordset' of the appropriate length at a hardware or home center store. Conductor size desired would be #18AWG; larger conductors are not recommended because one will have trouble fitting the conductors where they need to go, as explained further below.

In the event that the appropriate length of 'power cordset' is not available one may purchase an 18-3 extension cord and cut off the female end. A 'power cordset' is merely an extension cord without a female end. One would therefore expect that a 'power cordset' would be less costly than an extension cord of comparable length since it is easier to manufacture, having fewer parts and uses less material. Such is not always in fact the case.

In a round cord style, one will find conductors with three different colors of insulation. One will observe black (line), white (neutral), and green (ground) (or green with a yellow stripe). One may also find some fibrous or flossy type filler present; this material may be trimmed away as required.

Of the three parallel conductors, the center conductor would be the "ground" conductor. Ultimately this conductor will be attached to the frame of the machine under any convenient screw, most likely in the space below the motor where the switches are mounted. This may require some extra length of the center 'ground' conductor to reach that location, so the other two conductors could be cut back 8-12 inches for neatness and to make life easy. One must carefully strip or remove some insulation, perhaps 0.5 (1/2) to 0.75 (3/4) inch from the end of this conductor in order to wrap the conductor about its loosened clamping screw. Try not to damage strands of the conductor when removing insulation. Firmly tighten clamping screw.

Of the remaining two conductors on either side of the "ground" conductor, one conductor should exhibit one or more very small beads or striations running along the entire length of the cordage. Such a striation(s) can be felt as well as seen. That conductor, the "identified" conductor, would be the "neutral". The remaining conductor, by default is the "line" conductor and the polymer insulation enclosing it would be basically smooth and round, except where it contacts the center conductor.

The wife of the writer has this model of Necchi machine and it has a detachable cord. The two conductors of the original power cord end within a plug device that connects to the housing just below the motor. One removes this device from the housing, after removing the plug from the power receptacle, of course. It may take a lot of coaxing, or careful prying, pulling straight back from the rear of the machine. One will then see three round pins when looking at the back side of the machine below the motor.

On the machine residing here, the plug device from below the motor may be disassembled by removing two screws. After the cover is off, two channels for each of the two conductors will be seen. The circuitry of the sewing machine is insulated, mostly within the motor, by the switch material, and within the transformer, so it does not matter which conductor, line or neutral, is placed in which groove of the plug device. The line and neutral conductors should be laid in these two channels. No stripping of conductors is necessary. The device itself will pierce the conductor insulation when it is reassembled. Apply hand pinching pressure, or even pinch using a vise, in order to reassemble the device. Then replace the two screws firmly. Do not use the two screws alone to pull the device together, for the polymer of which the device is made may have become brittle with age and break.

Once the cord has been removed from the rear, then one may detach the motor assembly from the machine by loosening two cap screws (or bolts) from the right end of the machine below the handwheel and near the baseplate. This will release the motor and its bracket assembly from the machine and from the machine drive belt.

The motor assembly will still be attached to the machine by four polymer insulated conductors that pass through a small round hole in the baseplate below the motor. Two of these conductors, shown as 'g' and 'h' on the diagram, travel from the transformer only a short distance below the baseplate. These are the conductors that provide power to the sewing light. Their ends are clamped in an insulating device that has four small setscrews plus a bolt to hold this device in a fixed position on the bottom of the baseplate. One will observe that only one conductor extends from the opposite end of this device towards the needle area. The fourth set screw holds a grounding item (or perhaps a conductor) that is tucked between the device and the baseplate, perhaps about the mounting screw. The sewing light uses the metal of the machine itself as the conductor from the sewing light back to this device. This scheme is rather safe in that the bulb operates on a low voltage, which is not likely to shock a person. (There are those who are especially sensitive to low voltage and may feel a 'tingle' when operating their machine. One cure is to reverse the plug of a machine with a two-conductor cord in the socket. Another most reliable cure is to ground the frame of the machine with the 'ground' conductor of the recommended three-conductor power cord.)

The other two conductors of the four that pass through the baseplate are 'c' and 'd' on the diagram, which lead to the knee or foot control. In fact, conductor 'b' on the diagram may not physically exist because 'c' is soldered directly to the light switch along with conductor 'x'. The fourth terminal of the light switch is where conductors 'm' and 'z' will be found. The DPST 'light' switch really controls all power to the machine: light, knee or foot control, and motor.

The 'transformer' is not only for the sewing lamp. In addition to its normal conductors of 'g' and 'h' for the lamp circuit, it has conductors 'x' and 'z' in order to provide power. Conductors 'g' and 'h' would share the same color insulation, as would 'x' and 'z' share a second color. The primary winding of the transformer also has a "center tap" shown as 'k' (of a third color) which provides half of the voltage found across conductors 'x' and 'z', nominally 60 volts. Conductor 'k' leads to the 'speed switch' and provides the 'slow' motor speed when connected to conductor 'f'. If the SPDT switch goes the other way for 'high', then conductor 'f' is connected to conductor 'm' for full voltage, nominally 120.

The 'line' and 'neutral' conductors attach to the first two pins of the plug device (from right to left as one faces the rear of the machine). Within the space below the motor one will find that there are two short jumper conductors that lead to the power switch, which is labeled, on the outside as "Light". These short wires are not shown as such on the Wiring Diagram. This is a two-pole single throw (DPST) switch, which has at least four terminals to connect conductors. Note: some switches of this nature may have six terminals, but two are not and should not be used for any purpose. The connections at these switches are usually done by soldered joints.

The third pin at the left end of the plug device here is used only to connect two conductors, shown as 'd' and 'e' on the drawing. One conductor is from the knee or foot control, the other is from the motor. On the diagram, the switch is depicted by a symbol with four small circles having two arrows with a dashed line connecting the arrows. At the left of the diagram 'Line' and 'Neutral' represent the two short conductors from two of the three pins of the plug device. The plug device is polarized or keyed (by pin spacing) so it will only engage in the correct position.

Do not be discouraged by all of this text. One can easily trace each conductor within the machine. Starting at 'line', one finds conductor 'x' to the transformer and 'b' or 'c' to the control. Returning from the control is another conductor 'd' that meets with a motor conductor 'e'. The other motor conductor 'f' is found at the center of the speed switch, flanked by conductors 'k' and 'z' from the transformer (each of a different color). Conductor 'm' merely joins the two switches, and the neutral is achieved through the switch. All seven switch conductor locations are soldered joints, with short jumper conductors from light switch to internal end of the pins of the plug device. At those pins, the conductors have terminals that fit over the threaded pins with retaining nuts. The pins are very close together and the nuts are difficult to remove if one must; a socket wrench or nut driver would be the best tool for that task.

Near the control there is usually a separable plug and socket device. If the control conductors are damaged between that socket and the housing below the motor, one may replace those conductors with a length of 18-2 cordage (lamp cord). Here the sleeve over the socket conductors was slid up the conductors exposing the blades in order to replace the conductors. There will be at least one solder joint necessary to replace that pair of control conductors. If the conductors from that plug to the knee or foot control are in need of replacement, look for silicone rubber or type HPN (high heat) resistant conductors. The replacement conductors need not be of a pair in nature; two single conductors will do.