

# Fixing Saeco Magic / Royal espresso machines

The steps detailed below apply to: Magic Deluxe, Magic Comfort Plus, Royal Professional, Royal Coffee Bar, Royal Office, Royal Digital and Gaggia Synchrony Digital models.

For parts location in these machines, see exploded diagram of the models, made available on our web site [www.partsguru.com](http://www.partsguru.com)

## **A reminder for any repair work undertaken using the following instructions:**

Make copious notes to help put things back as they were. This is especially for electric wires. Tag them, color mark, make notes and even take a picture or two.

**(Instructions below are for handy or experienced persons only. Services Unlimited, Inc./ Parts Guru or all associates & staff do not accept any liability for errors or lack of experience in such repairs).**

The following tools are required for removing the top cover:

- 1- Torx screw driver (star shape screw head instead of Philip head)
- 2- Philip screw driver (One long and a short arm)
- 3- Nose Pliers
- 4- A test meter (analog or Digital)
- 5- A small magnet that is strong enough to pick weight of a quarter.
- 6- A 1/4" plastic tube, 3 to 4 ft long.
- 7- Vacuum cleaner with narrow long nozzle.
- 8- Exploded diagram of internal parts 9- Wiring diagram

**Removing the top cover:** Steps to remove the top cover:

- 1- Remove water tank.
- 2- Remove two philip screws to lift the bean hopper out.
- 3- Remove the grind adjustment lever. Place index fingers on either side under the bottom of the lever and pull up from both sides. (for help, see instructions for adjusting and cleaning the Magic/Royal grinder for illustrations, on this web site).
- 4- Remove two Torx screws located on the rear edge, under the water tank.
- 5- Remove two philip screws, under each corner in the front, below the top cover.

Pull the cover up by lifting it about 1/2" from the back, then move it to the front a 1/2", to free it from the bent edge in the front, the steam knob and the touch pad. Lift the steam pipe to its top to slide it out through the slot as you lift the top cover out. A wire connecting the hot plate with electronic board will still be attached and will limit the complete removal of the top. Do not disconnect the wire. If you have to, then make note of which end you disconnect and where to re-connect the wire back. Lay the top towards the back of the machine. Now the entire machine is exposed for open-heart surgery!

To find leaks, look for the obvious white calcium deposits first. For other malfunctions, machine has to be operated. To operate the machine with the top

removed, a water source has to be connected and the water level sensor activated (cheated) with a magnet placed next to the location of the level sensor.

To connect the machine with source of water:

- 1- take the 24" long plastic or silicone tube.
- 2- disconnect the hose from the water inlet (from under side of the top cover).
- 3- connect the hoses 1 & 2. Make sure that the connection is air tight.
- 4- dip the loose end of the extension tube(1) in a clean water container. Make sure that the tube stays immersed inside the water container all the time.

Replace the brew group. Close the door. Slide the waste box in. Plug the machine in the electric outlet. Make sure there are no loose wires inside the machine that were accidentally or otherwise disconnected and there is no metal object touching the naked wires of the machine, before plugging the machine into electric outlet. Turn the power switch on. No water sign will come on.

To remove the no water sign, place the magnet next to the water level sensor. The water level sensor is a white rectangular piece (1" x 1/2" x 1/4") located between the water tank and the grinder. Move the magnet around the sensor, on its left or the rear to find the location where the "no water" light turns off and leave the magnet clinging at the spot to the metal body of the machine.

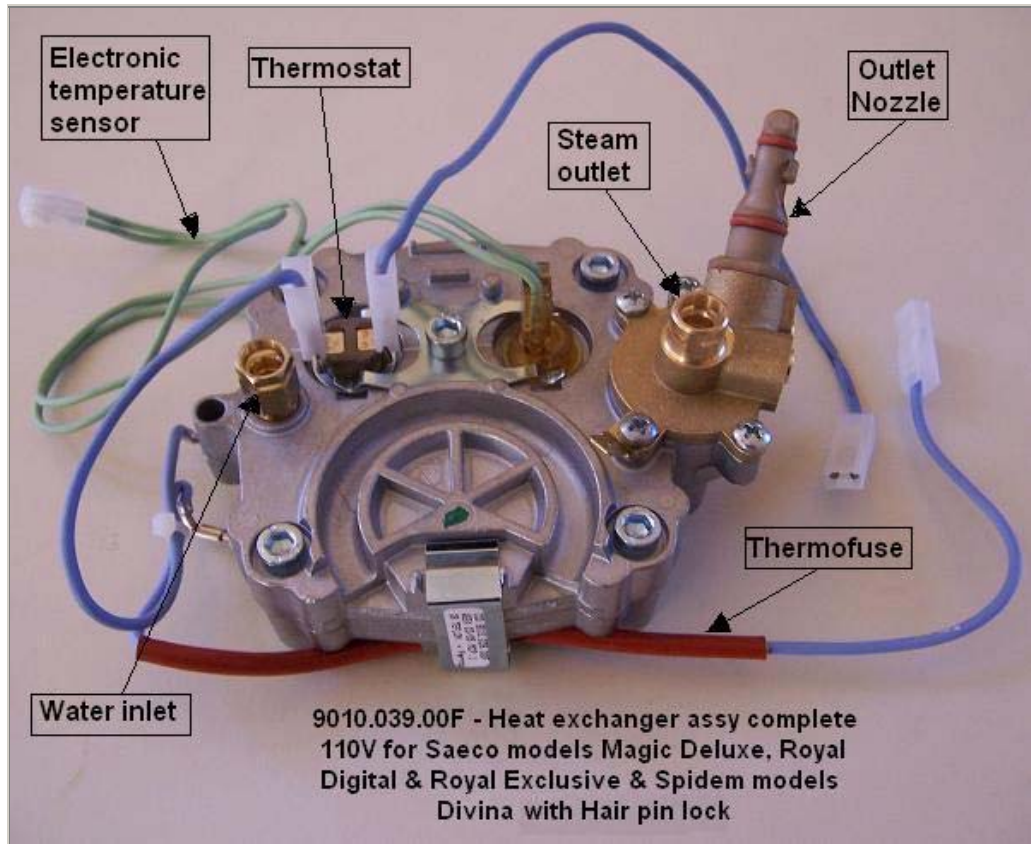
You will hear the machine reset as you turn the power switch of the machine on. Next, prime the machine by opening the steam knob and purging about 2 to 3 oz. of water. If water does not purge, then check the warning lights on the touch pad if the machine will tell you why? (No water, no dump box, no brew group light may be on. If these lights are not lit, then there may be other parts malfunctioning. It could be the pump, the flow meter or the blocked hydraulic system that will prevent water flowing through the machine. The machine should not be left on when water is not pumping through the system. Turn the machine off. Disconnect the wires to the heating element (tag the loose ends) and wrap the naked ends with electricians tape. Now the machine can be turned on and left on for longer duration while other parts are checked for malfunction.

When the pump operates, the water pressure will show the spot where leakage is occurring. Protect the electronic board from sudden stream of water or steam spilling on it. Once warmed up, test by making a fake espresso (pre-ground cycle without adding coffee in the shoot) to see if any leakage of water or steam can be spotted. Look for the hose connections, seams of heat exchanger, steam valve, solenoid valves (when seen in the machine) & brass fittings.

Look for any other functional faults and unusual noise during the cycle. To find leaks, two or more espresso cycles have to be worked. Replace seals/ O-rings causing leakage. Replace faulty parts as necessary.

If the machine is not heating , check the following:

- a- the thermostat (mounted on the heat exchanger and steam boiler if present).
- b- the heating element (on the lower side, not seen in the picture).
- c- the thermofuse use



- d- the electronic sensor that initially brings water to temperature for espresso.

Finally, before replacing the top cover, make an espresso with coffee. To do so, use the preground cycle with ground coffee or hold the bean hopper on the grinder inlet and add beans in the bean hopper just enough for one espresso (excess beans will spill around and inside and be difficult to clean, especially from around the doser assembly. (Vacuum the spilled beans out)

If all functions are working good, the coffee grind is like the table salt grain, and still the espresso is not dispensed, the chances are that the

- 1- pump is weak and unable to exert the pressure necessary to pump water through the tamped coffee grounds. Replace the pump.
- 2- the heat exchanger outlet nozzle is blocked or its lower end is broken. Replace the nozzle.
- 3- Th brew group is blocked. Clean the shower screen & the valve under the outlet nozzle flange.

**To remove the pump**, avoid removing the pump mounting pads (it is a lot of work).

- 1- Disconnect the 90 degree plastic water inlet connector from the rear of the pump.
- 2- Slide the rear mounting pad off of the water inlet of the pump.
- 3- With the rear end of the pump free, hold the front brass nozzle of the pump with pliers and unscrew the front pressure release valve. (Make sure that the body of the pump does not spin on its outlet nozzle).
- 4- Remove old O-rings and clean space around o-rings. Use new O-rings. Use light coating of lube for easy connection without twisting O-rings.
- 5- Install new pump by reversing the above steps. To connect hoses, slide O-rings on the hose end first, and wet new O-rings with lube, before inserting.

Use new O-rings on the Teflon hose connections. Replacing O-rings will be easy if the heat exchanger is taken out from the machine. The heat exchanger is mounted with only one supporting bracket and two screws. The screws are visible from inside the door when brew group is removed.

If the heat exchanger is to be replaced, disconnect wires going from heat exchanger to the electronic board. Make copious notes and take two or three pictures to remember each wire disconnected from the heat exchanger or the electronic circuit board. There can be no help available, if a loose wire is left out without knowing where it re-connects. In such a case the only choice is finding the path by a lengthy process with an electrical diagram.

Below: Diagram showing opened brew drive gear box. Picture shows position of gears and timing switches in the Home position.

Below are some links to additional information:

- 1-Our web site: <http://www.partsguru.com/MaintenanceofEspressomachines.html>
- 2- Our secure web site & shopping cart:  
<http://www.shop.partsguru.com/category.sc?.welcome=1>
- 3- Information on Espresso: <http://www.partsguru.com/FAQaboutEspresso.html>

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