

CP-10: TIGHT PISTONS

Low product flow with high feed pressure is commonly caused by clogged up membranes and/or pre-filters. However, some 700 and 1000 model watermakers may exhibit these symptoms due to “tight pistons”. The pistons and/or the piston bushings, can swell slightly especially in very warm waters which will cause the piston assembly to expand inside the cylinder, slowing the Clark Pump and causing the feed pressures to rise and production to fall. In most cases the system will also be erratic, operating normally for a time and then shutting down on “System Stalled” or “High Pressure” and/or showing varying system pressures.

To fully diagnose and repair this problem remove the cylinders from the center block. Remove the end caps and J-tubes (by loosening the nuts on the high pressure fittings and remove the J tube as an assembly). Push on each of the pistons with the handle of a hammer (or a wood stick), they should take quite a bit of force to move but you shouldn't need drive the pistons out using the wooden stick and a mallet, if they are that tight then you have “tight pistons”.

New pistons from Spectra Watermakers have been redesigned to allow for more clearance, which will eliminate this problem. Note that there are two different piston designs depending on the Clark Pump model, it's either a 15% or 20% pump. Newport 700 units built prior to 2007 used 15% pumps and all other Newport 700 or 1000 units use 20% pumps. The Clark pump model can be determined from the serial number engraved on the front of the center block, numbers ending in “-15” are 15% pumps and serial number ending in “-20” are 20% pumps. Order two p/n KIT-HP-15PAs for 15 percent pumps or two p/n KIT-HP-20PAs for each 20% model.

If you need to get the watermaker working while waiting for replacement parts first determine what is rubbing. If there are scuff marks on the outside edge of the black pistons then remove the white piston rings and the orange O-ring and take the pistons to a machine shop to have the outside diameter turned down to 2.730 inches (69.35mm). Do not machine inside the piston ring grooves. In a pinch you could carefully sand or file the outside diameter down until the piston slides into the cylinder easily. Be very careful to clean off any abrasive particles from the piston as they will permanently damage the cylinders.

If the piston is not showing any signs of rubbing then the piston bushings (the flat white split rings) are causing the issue. You can reduce the thickness of these bushings by holding them as shown and scraping them with a razor blade (as show in the photo below). Hold the razor blade perpendicular to the surface of the bushing and push it away from you. This scraping motion will pull off a thin layer of plastic each time you do it, you are not trying to cut the material but scrap it. You can see the small chips that

have been scrapped off. Do this about 10 times on each edge and then reassemble the pump.

Note: if you mark the surface of the bushing with a felt tip marker pen then you will be able to see exactly where you are removing material. It looks a little crude but it does work.

