

# SteamTeam®

Bell & Gossett®  
McDonnell & Miller™

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Steve Almgreen  
Assistant Product Line Manager -  
Steam Products

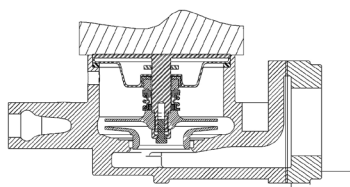
## Help! I can't take apart my Watchman pump.

You're ready to disassemble the Watchman pump and motor for servicing when you notice that the instructions say to loosen the fasteners—but the parts list refers to capscrews. Now what?

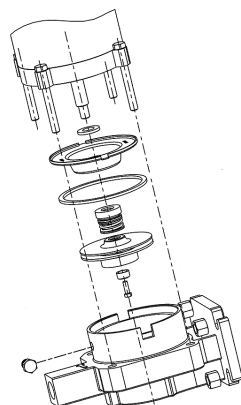
First, note that we use "fastener" to cover all the possibilities. Current assemblies use capscrews, but versions from 1982 through early 1984 sometimes use studs and nuts. You have to remove the nuts from the bottom of the volute to lift away the motor and studs.

Start by loosening the nuts or capscrews after you isolate the Watchman unit from the system at both the pump discharge and the inlet to receiver. Drain the receiver as much as possible. The static height of any residual water can create pressure that forces the water out of the pump. Loosening the fasteners first relieves this static water column pressure and helps prevent injury or damage from residual hot water.

Second, be sure you know the vintage of your Watchman. That can help you determine what to do if you're having difficulty lifting the motor and impeller out of the pump volute.



**B&G Hoffman Specialty  
Watchman Pump Cut Away**



**B&G Hoffman Specialty  
Watchman Pump Exploded View**



**B&G Hoffman Specialty  
Watchman WCD 12-20B**

The original 1982 pump used a seal holder and wire spacer, shown in the upper pictures. Note that the wire spacer's ear protrudes through a slot in the volute, providing a weep path to help customers see that the seal had failed in time to prevent motor damage.

Since 2001, the design has used the DP1966 seal holder with integral spacer, shown in the lower pictures. Notice the tabs at 10 o'clock and 4 o'clock, with the rest of the edge formed vertically to create spacer dimension for assembly.



Seal holder and wire spacer used from 1982 through 2001.

Seal holder part number DP0290

Wire spacer part number DP0291

Replaced in 2001 by part number DP1966 shown below with integral spacer.



DP1966 seal holder with integral spacer design.

Customers with the older seal holder/wire spacer design may find the pump more difficult to disassemble because the wire spacer, slightly larger than the impeller opening, acts like a snap ring to keep the pump together as you tighten capscrews or nuts and studs.

- If you see the ear of the wire spacer on only one side of the volute, you have this design. Grasp the ear gently with a vice grip pliers and push in slightly while lifting. This causes the two ends of the wire spacer opposite the ear to close slightly and makes it easier to remove the motor and impeller assembly.

- If you see the two tabs of the DP1966 seal holder with integral spacer on both sides of the volute and no wire ear in the slots, you have the current design. Lodged material may be binding the pump in the volute. Gently insert two blade screwdrivers between the bronze tab and the cast iron of the volute slots, twisting gently to dislodge the material. Be careful; inserting the screw driver blades too deeply can cut the volute gasket, necessitating its replacement (one is included with the seal and gasket kit).

Pumps made before 1982 use the older "A" design pump. You can find instructions for that design in current parts lists and service manuals.

Jarek Berezowski  
McDonnell & Miller Product Specialist

## What is a float block?

A float block secures the float and operating mechanism to prevent damage during shipping. It's installed at the factory, in one of the equalizing tappings and needs to be removed when you install the control.

Controls installed by boiler manufacturers also have a float block. It's located in an extra tapping (see Figure 1) so the manufacturer can use the equalizing tappings to install the control. These controls have a "B" in the model or catalog number (e.g., 150S-B)—but note that our price sheets may not show the "B." The only difference between a standard unit and one with a "B" is the extra tapping. The operation and the replacement parts are the same.

The easiest way to determine what control or parts to purchase is to drop the "B" from the model number, then check the price sheets and parts catalog for a standard unit. For instance, a 150S-B-MD becomes a 150S-MD, and a 25A-B becomes a 25A. Always refer to the McDonnell & Miller Replacement Parts Catalog, MM-701, for a complete breakdown of repair parts. Get it in print or access it online at [www.mcdonnellmiller.com](http://www.mcdonnellmiller.com).

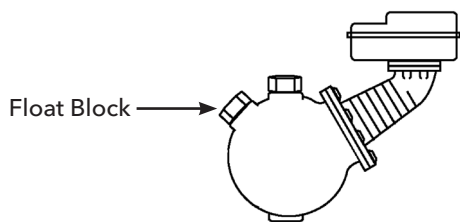


Figure 1  
Series 157S Low Water Cut-Off Pump



McDonnell & Miller  
Series 157S Low Water Cut-Off with Pump Controller

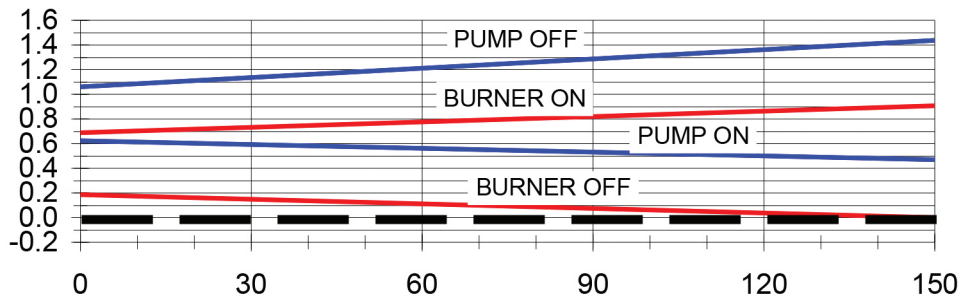
## Why do the switch setpoints change?

The bellows on Series 150/150S units (mercury or snap switch) is pressure-sensitive. At higher pressures, the bellows is stiffer, requiring more force to move it. At lower pressures, the bellows is more pliable, requiring less force to move it. Consequently, at lower pressures, the on/off points tend to narrow. The chart shows how setpoints narrow or change from factory settings at 150psi, as the bellows reacts to pressure. Narrowing happens in both original mercury switch units and snap switch units.

The lower burner-off setpoint for the MD unit is intended to reduce burner cycling. This lower setpoint provides extra distance to help prevent nuisance burner shutdowns.

## How long have MD models been available?

The Series 150-MD models were created in the mid-1980s, providing a control with factory settings to compensate for setpoints narrowing at lower pressures. Introduced on mercury switch units when the knurled



**Series 150S/157S have a monel bellows which is pressure sensitive.  
The operation points will shift as pressure decreases.**

adjustment screws were changed to nonadjustable screws, they are also offered with the new snap switch Series 150S.

It's common—but wrong—to think that burner cycling occurs only with Series 150S (with snap switch). Remember, it's the pressure the bellows senses that changes the setpoints, and that happens with both types of units.

### What's a good starting point for troubleshooting?

Troubleshooting steam system problems can be difficult and frustrating. The control reacts to the water level in the boiler and may be doing its job. However, some other system component may not be operating properly. Start the troubleshooting process with these questions.

- Is the pump sized properly and operating at full capacity?
- Have the system dynamics changed from original installation?
- Is the feedwater piping clean, without obstructions?
- Are feedwater valves working properly?

### Troubleshoot the whole system, not just the LWCO.

Additional information about the relationship of steam, make-up water and level controls is available in General Catalog MM-825 at [www.mcdonnellmiller.com](http://www.mcdonnellmiller.com). In "Basic System Operation," see "Meeting the Needs of Systems with Multiple Boilers."