Fine Offset WH1081PC

Anemometer repair

Contents

(hyperlinked)

Issue 2, 26 February 2012

Introduction

I live right next to the ocean, where we experience wind gusts up to (at least) 140kph. So we get a lot of direct salt spray, which is not conducive to longevity for anything outside the house. Even the bricks of the house are severely eroded!

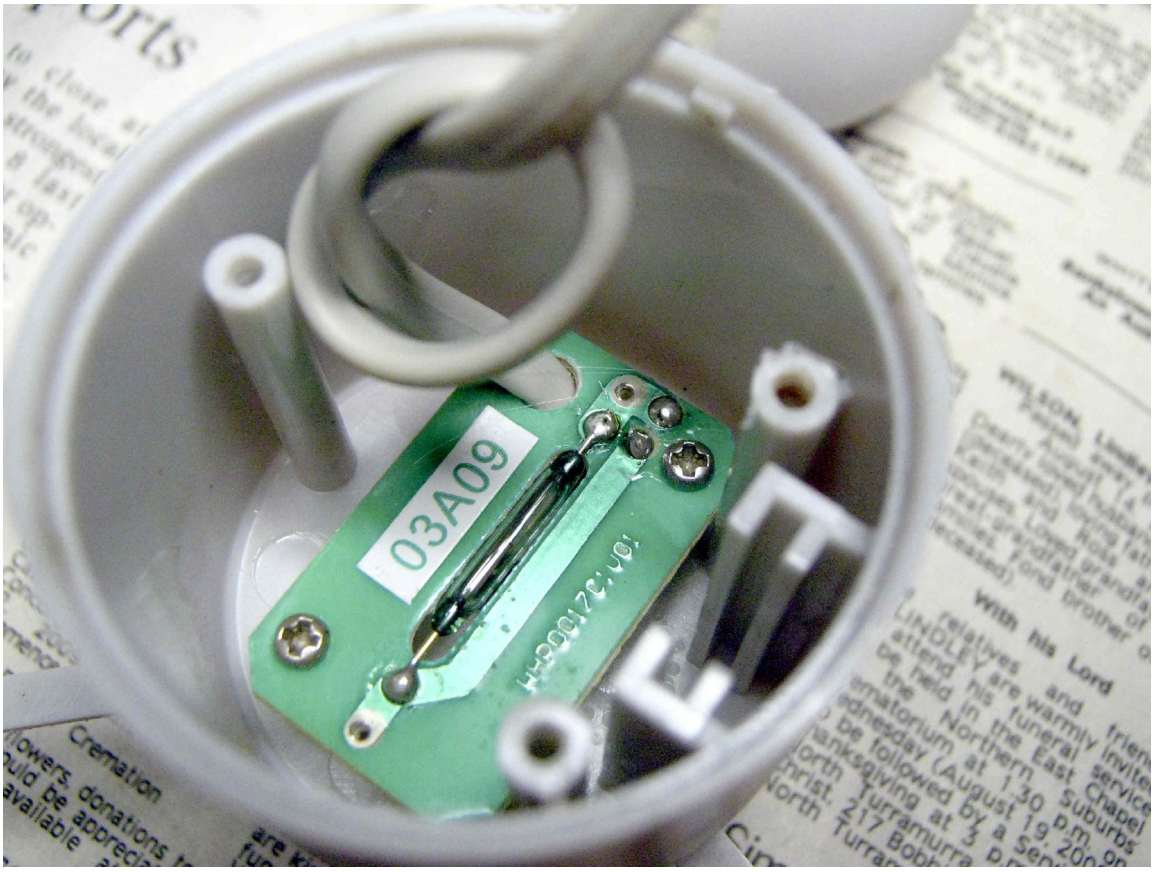
My first WH1081PC worked for about 3 months before the anemometer cups stopped spinning in light winds. When turning it by hand, I could feel a 'tight spot' where it would stick if not driven hard. Being under warranty, I returned the whole weather station to the supplier and received a new one.

About nine months after installing that, the same thing happened to the replacement. Being now out of warranty, I decided to try to fix it myself. I took some photos along the way, in case anyone else has the same problem and wants to try their own repair.

I read on some forum post that the cups assembly is just a push-fit, and can be removed by carefully working it upwards. I initially tried this with the anemometer still mounted on its bracket. But after making only small progress, and noticing three screws on the underside, I thought maybe there was something inside that needed to be undone first. So I took the anemometer down to the workshop for a more careful disassembly…

What's inside the body's underside

After removing the three small screws from the bottom panel, inside was revealed a small printed circuit board (PCB) containing just a small reed-switch:



Thinking there was probably a magnet on a shaft coming into this chamber from the cups on top, I removed the PCB:

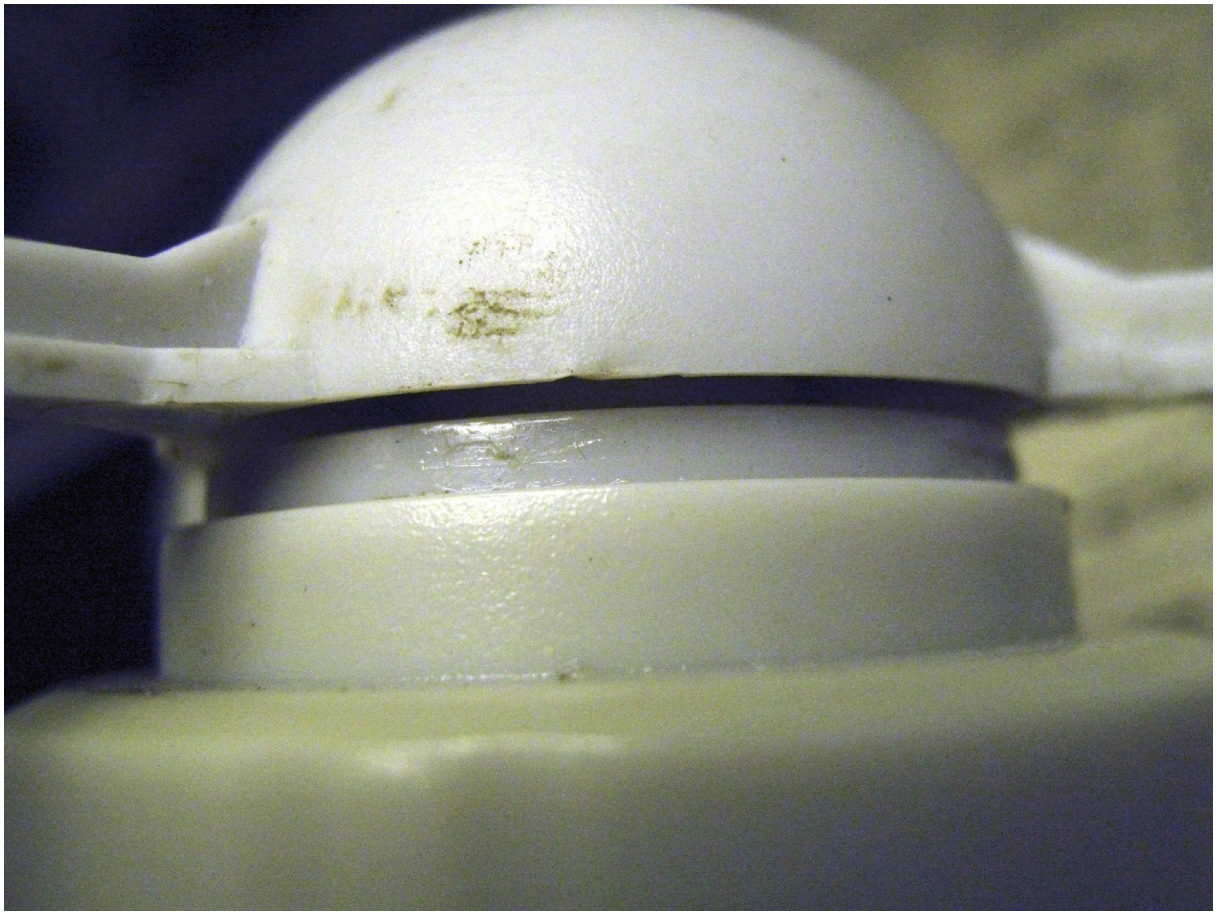
But there was no connection between the cups and the ‘electronics’ chamber (that ‘hole’ at the top [this photo has the chamber upside-down] is sealed).

So obviously the cups assembly comes off only from the top, as the other forum poster implied.

Getting the cups off

Having managed to move the cups up by a millimetre or two, using a knife to prise evenly side by side (that was when it was still mounted on its bracket on the roof), and having it now in my hands in the workshop, I decided to try 'working' it off with my hands.

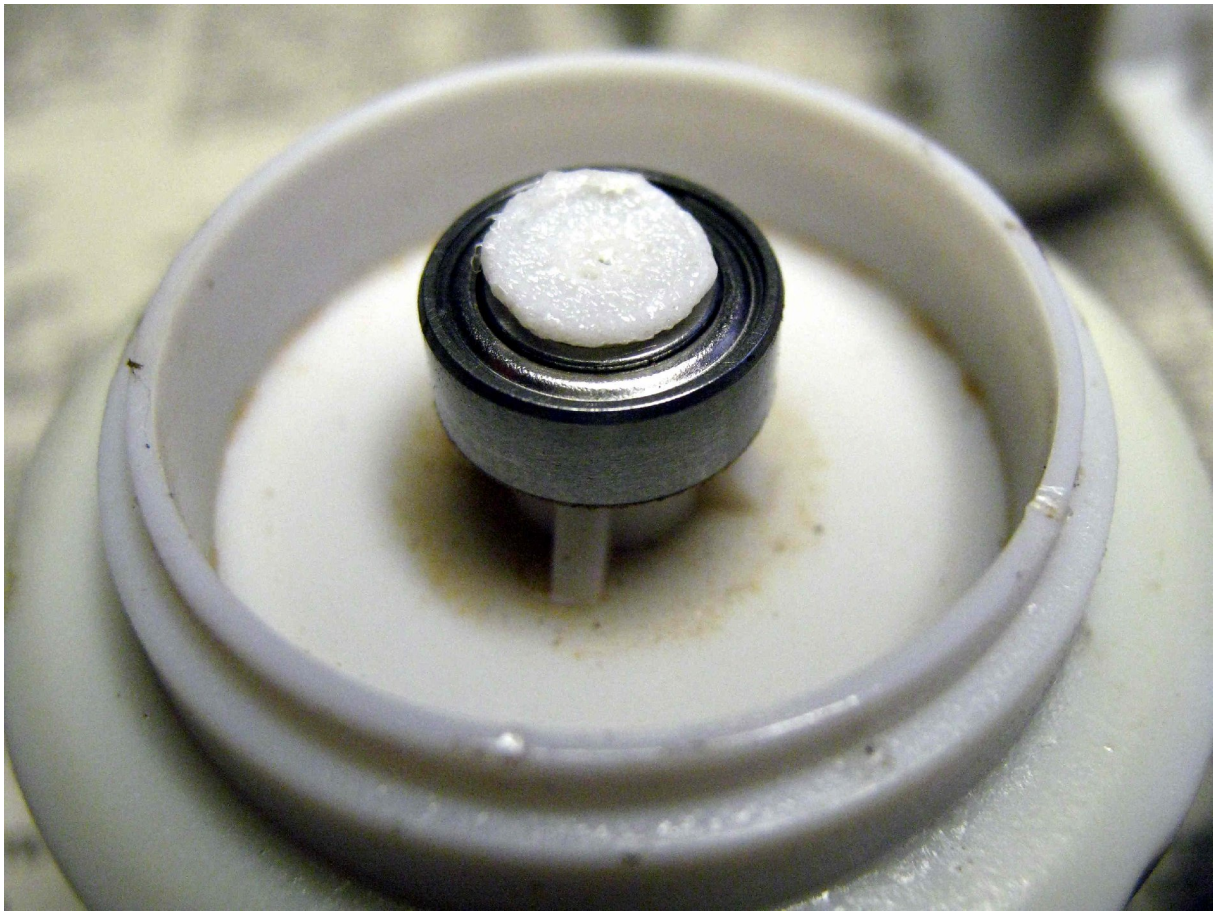
Holding the base in one hand, and placing fingers of the other hand under each of the three arms of the cups assembly, I gently but firmly rocked the cups while pulling upwards (away from the base). It was very tight, but eventually I got it up sufficiently that I could see the top of the lip under the cups' domed middle section ('cap'):



At this stage I used a bit of brute force and stuck a small screwdriver under the 'cap' and levered it up while pushing up on the other side with a finger (you can see some of the resulting 'dints' in the photos!). A bit more of this and the cap popped off, revealing…

What's inside the top side

… the ball bearing the cups assembly was sitting on (a tight push-fit):



I sprayed the bearing with WD-40 and spun it round many times to ensure it was running freely.

What's under the cups

Flipping the cups over shows a magnet mounted on its underside:

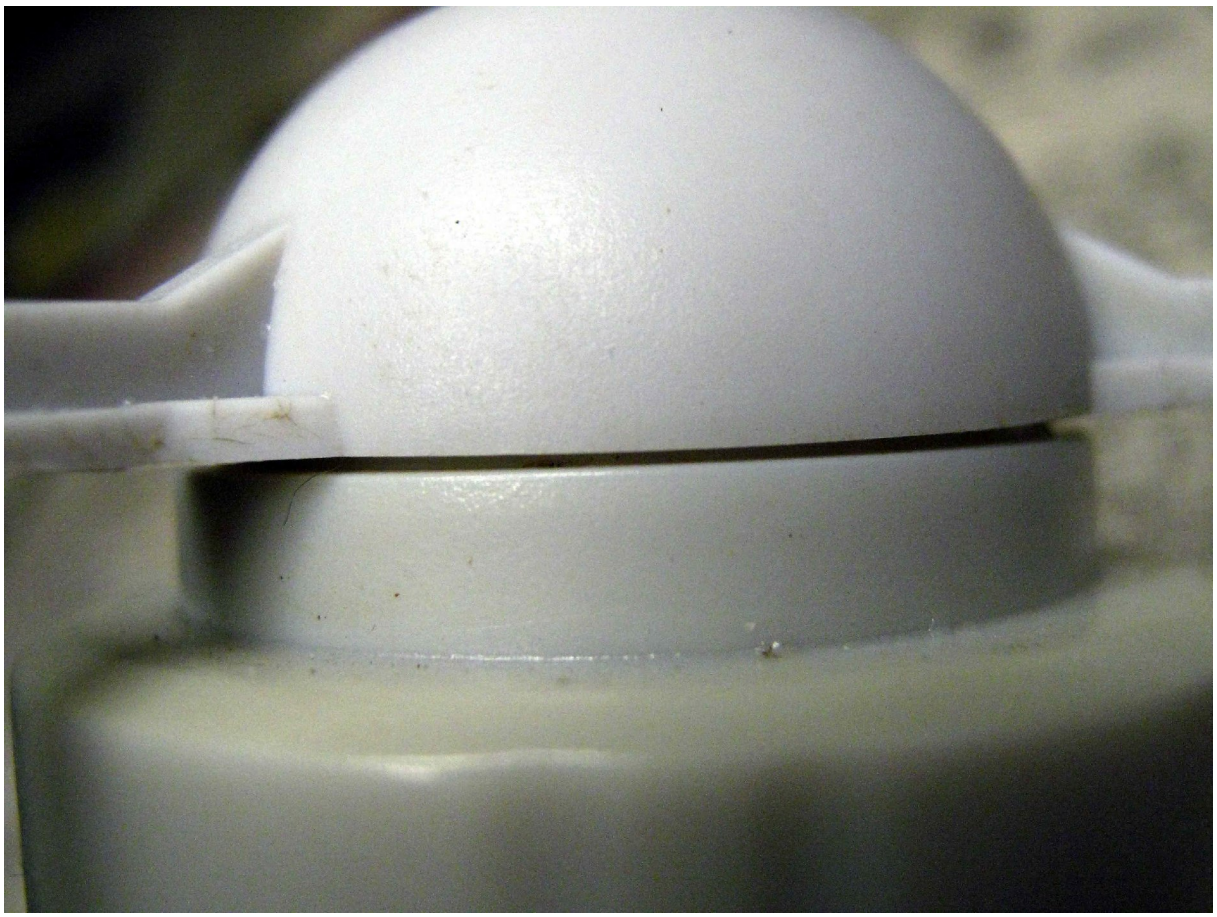
Notice the lip inside the centre hole – this is where the ball bearing seats.

Clearly the way the anemometer works is by the reed switch closing (as the magnet passes) twice each revolution of the cups, and the microcontroller in the thermo-hygro module measures the closing frequency.

Reassembly

Having refitted the PCB inside the body and refitted the base plate, it was simply a matter of pushing the cups assembly evenly down onto the bearing until the bearing was seated on the lip inside the cap's centre spigot.

When this is finished, there should be only a very small gap between the bottom of the cups 'cap' and the top of the body ledge:



And of course the cups should now spin freely!

After that it's just a matter of mounting the anemometer back on the bracket (noting the locating-key orientation), refit and tighten the screw, run the wire along the bracket and plug it into the direction vane assembly.

Aug-2011: A follow-up to my anemometer repair...

A few months back my wind direction vane became stuck. Unlike the anemometer, which just had a 'sticky' spot, but would still turn in a moderate wind, the direction vane was stuck fast – couldn't even move it by hand! It was rusted solid (remember I live right on the ocean!).

Getting it apart is the same process as for the anemometer, and its construction is identical for the top half. I prised the bearing up off the post, and found no numbers on it (it's pretty small – where would they fit a number?), so I measured it with my vernier caliper.

I found a **stainless steel** sealed bearing with the same dimensions, bought online and fitted it, and now everything's working well again. The supplier listed below is in Australia, so postage would probably kill this source for those of you overseas, but it may be of use to other Australians experiencing this problem, and others might find the same part number overseas somewhere. The anemometer bearing is identical.

Supplier: http://www.smallparts.com.au (sales@bearingshop.com.au)

Bearing part number: SMR105A-ZZMC3
ID: 5.000 mm
OD: 10.000 mm
Width: 4.000 mm

They were $5.36 each incl. GST (I bought 4 in July 2011), with $9.35 total postage (within Australia), though the current price seems to have risen slightly since then.

Bearing lubrication

After posting my initial article on the *Cumulus* website forum, a number of members suggested that WD-40 is not the best stuff to use for bearings, as it can become sticky after some time. They suggested light oil would be much better, and after evaluating their comments, I'm inclined to agree. (There was quite a bit of discussion on this lubrication issue; it's here if you're interested:
http://sandaysoft.com/forum/viewtopic.php?f=16&t=2474.)

The '**3-in-One**' multi-purpose oil sold by hardware shops (in Australia) would be very suitable.