MOTOR TEST UNIT FOR OLDER MODEL WHIRLPOOL STYLE WASHERS.

INTRODUCTION

We have had an older model Whirlpool washer for probably 30 years. It is a two speed model with suds return, which my wife loves. (Model 6LSS5232DQ2). Previous washer technicians have said that the machine is almost indestructible, and to keep it going as long as possible.

Lately it has developed three minor faults, as well as showing quite a bit of cosmetic ageing, so it was time for an overhaul. The problems were timer issues, leaking tub seal and failed neutral drain, although at the time I had no idea what the latter problem was called or how to fix it. The timer issue was a broken detent spring inside the timer which held the knob out, and I was able to steal the spring off the donor machine mentioned in the next paragraph. It was fun pulling those timers apart though ! !

To make a less rushed job of reconditioning the machine, I purchased a working similar machine, with a view to later using the parts from that machine as spares. While the spare machine was working, it had been sorely neglected and was seriously rusted, so it was of little ultimate use apart from spares.

I started the overhaul of the washer, and, learning as I went by making lots of mistakes, managed to get it mostly looking and working well - except that I didn't know why the tub was still spinning during pump out. After some searching, I found Chip's excellent YouTube channel where he explained in great detail how to fit a neutral drain kit. Magic! I was able to get the kit, finish the job and get the original washer back into service. So far it is working perfectly – thanks Chip !

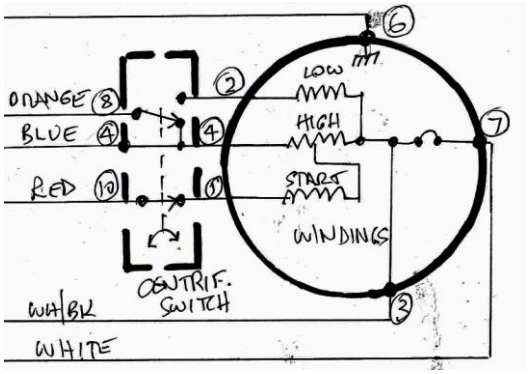
I pulled the donor machine apart and kept the useful spares, then I saw Chip's video of the Motor Test Box. I am a retired electronics technician – early in my working life I used to repair TVs and in my later years I repaired Pottery Kilns, and I am an inveterate "fiddler", so the test box interested me.

THE TEST BOX.

As we are located in Australia, there were a few differences in the wiring from the US machines. Our supply voltage is 240 volts, and the motor is slightly different, but the principle was the same. The motor gearbox assembly is shown left, the motor is part number 3363190.

I decided to make a test box with Wash/Off/Spin and a High/Low capacity, so all facets of the motor's operation could be checked. I had a spare motor plug and motor start capacitor from the dismantled machine, but it took a few tries before I got the proper wiring worked out.

The two speed bi-directional motor has an unusual setup. It is fitted with the normal centrifugal switch which connects the start winding via a capacitor to provide the additional out of phase current to get the motor rotating in the required direction. Reversing the start winding connections starts the motor in the opposite direction. When the motor reaches operating speed, the centrifugal switch operates and disconnects the start winding.



When the two speed motor starts in low speed, the rotational speed is not enough to operate the centrifugal switch, so the start winding is energised continuously. Apart from a nasty noise, this causes excessive heat in the winding and the capacitor. During my learning phase, I destroyed one capacitor this way.

The centrifugal switch on these motors has an additional changeover contact. When the low speed input is energised, the changeover contact passes the current to the high speed winding to get the motor up to speed and operate the switch, then the contact is switched over to the low speed winding to run.

The image on the left show the workings of the centrifugal switch in its stationary position. The plug pins are numbered 1 – 10 from the top of the image (pins 1 and 9 are unused). Note that pin 8 is connected to pin 4 via the changeover contact. Referring to the motor wiring left, power is applied to the orange wire pin 8 for low speed, which is switched to pin 4 and energises the high speed winding. Note also that pin 10 is connected to pin 1, the start winding.

The next image shows the contacts when the motor is running in low speed and the centrifugal switch is operated. Note that pin 8, which is energised for low speed, is now connected to pin 2 which is the low speed winding. Note also that pin 10 is now disconnected from the start winding, pin 1.

It took a bit of brain work to get the correct wiring worked out, but now I think I have it right.

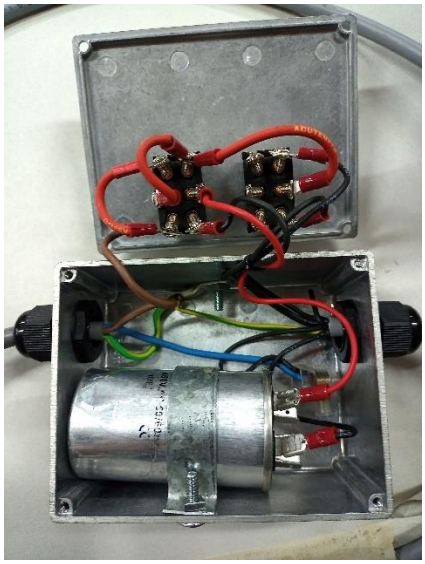
MAKING THE TEST BOX

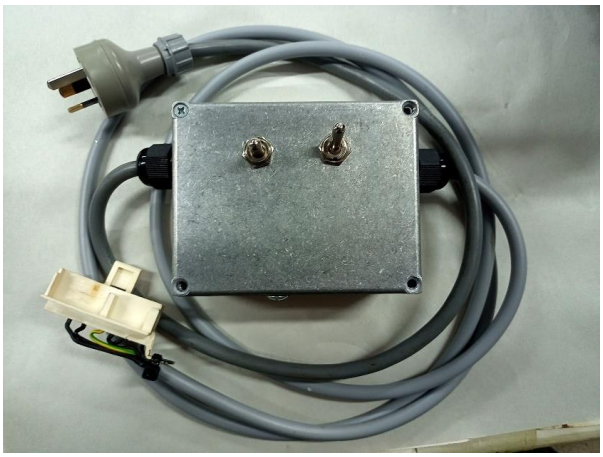
I made a prototype model using parts from the old machine, then decided I would make a couple more to see if there was any interest from washing machine techs. However, there was an insurmountable problem with that plan.

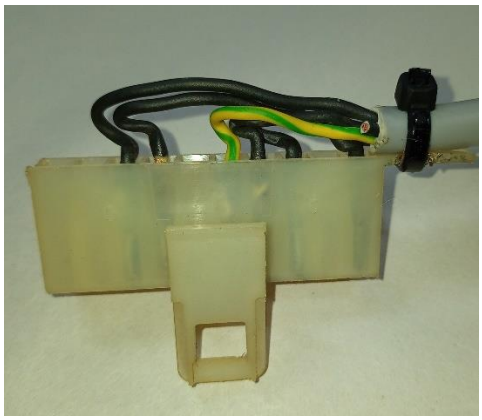
The motor plug and plug contacts are not available in Australia at all, and barely available in the US. Due to international massive postal charges, importing them is completely out of the question. Chip gave me a couple of old motor plugs (postage costs were still scary) and I got some plug contacts from the US, but just enough to make up two final units, which will be the only ones.

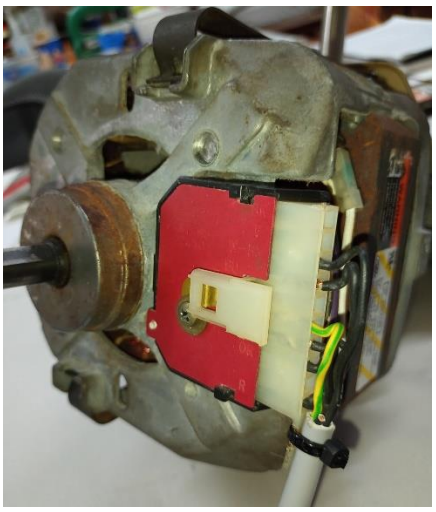
I was able to get some multicore wire for the motor wiring, other parts were readily available here. I now have two units almost completed and working well. Originally I bought some standard 20 uF motor start capacitors, but found the start was a bit sluggish, so I have moved to using 100 uF capacitors, which makes the starts a bit snappier.

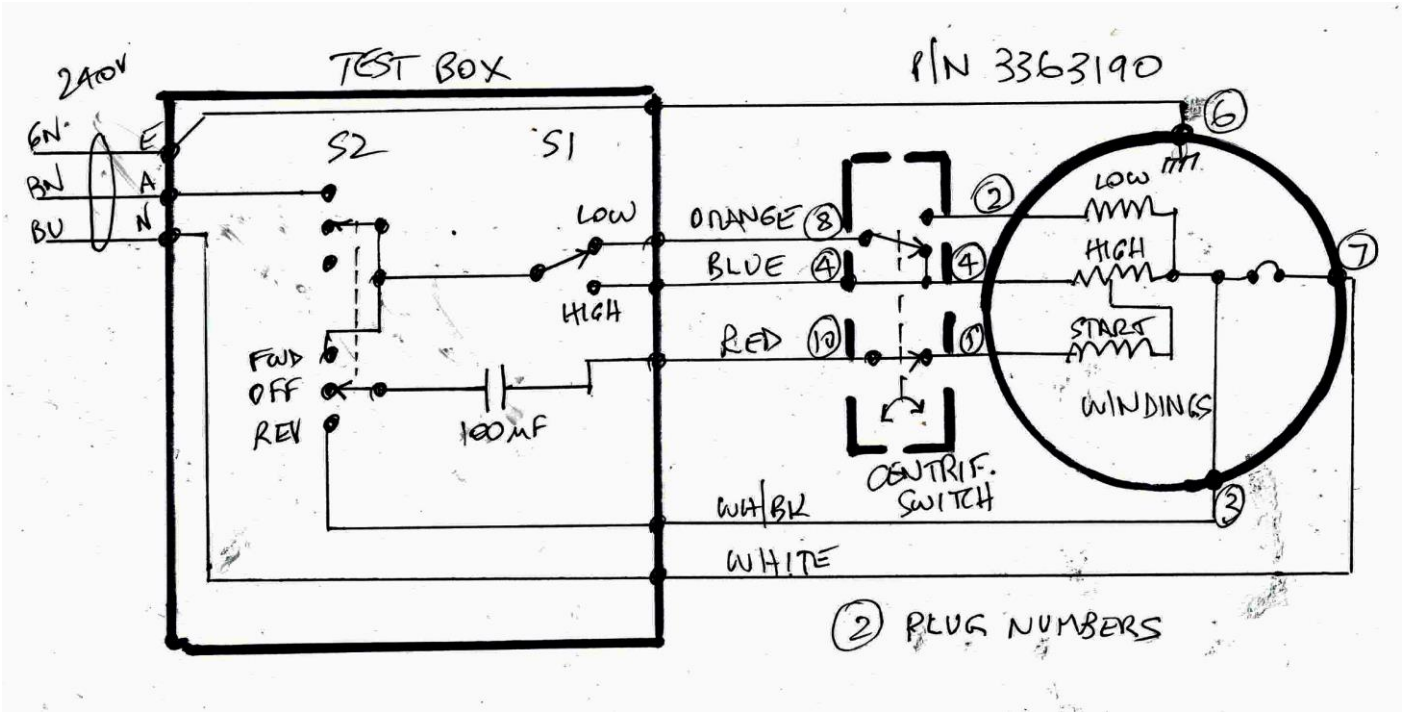
The only remaining job is to tidy them up and fit labels. I'm not sure if I'll find any buyers, but we'll have to wait and see.










240V
TEST BOX
P/N 3363190
GN
BN
BU
E
A
N
S2
S1
LOW
HIGH
FWD
OFF
REV
100MF
ORANGE
BLUE
RED
WH/BK
WHITE
CENTRIF. SWITCH
LOW
HIGH
START
WINDINGS
(2) PLUG NUMBERS