



P6 Series II



My car is a 2200TC with PAS and uses a Series II 3500 wiper system with motor on LHS. This is the rack and pinion type.

I have found that not many people are aware of how the wiper system works and although this appears to be very reliable, the youngest cars are now nearly 30 years old and some have problems. Cheap spares are no longer in the nearby dismantlers so an understanding is now more important. Many of the faults can be rectified easily.

My car was off the road for some years and the wipers would not now self park and the intermittent wipe was gone. Sadly Lucas agents do not have even spare brushes and persist in getting wrong ones which are very loose in the brush box. I found larger French ones at Newark autojumble and filed these to fit.

I have several spares so I could have just fitted one and hope for the best. Having been caught out with this approach on more than one occasion, I decided to do a proper electric bench test check select the best one and also to confirm and understand the system. Terminals are referred to as 'wiper switch T5' etc.

DELAY GOVERNOR MOUNTED ON MOTOR

This can be stripped down but before doing this check that the black vacuum tube has not become detached at the wiper motor end. Also clean and vaseline, (petroleum jelly) all the terminals at the motor end first. My 47 years of motoring has shown that cleaning terminals and a light coat of vaseline has solved the vast majority of electrical faults.

This part may surprise you. Although it is an on/off switch, the delay operation is controlled by an air diaphragm and small steering column mounted air control valve which acts to vary the time between switching the wipers on and off. The air valve is plastic and can become loose and imprecise and let all the air leak giving no delay interval. There is also a white plastic sliding cam mounted externally in a slot on the wiper motor push pull housing which moves up and down to reset the diaphragm. This can get dirty and it is possible but unlikely that the drive tooth could break off.

To strip down the delay governor detach it from the wiper motor and pull off the four spring clips releasing the cap to reveal the rubber diaphragm which may perish but a more likely fault is the small non return valve on the delay valve cap. Removing the visible shiny steel retainer will reveal a black foam rubber pellet which is used as a 'spring' to lightly press the round flat rubber valve against it's seating. The foam rubber deteriorates to a sticky blob or dust which ceases to hold the valve closed. My three spares were all bad. This can be replaced by scissor cut foam rubber or a very light coil spring. If your foam is closed cell, I think a thorough stabbing with a pin should help.

After re-assembly, check operation by holding up the plunger and place a finger over the air nozzle and release the plunger which should fall very slowly. Then connect to the black vacuum tube and try varying the steering column air valve. The switch points are also inside the delay valve and may be burnt due to spark erosion. These should be checked for continuity and if necessary, can be cleaned by careful use of a small strip of very fine emery paper - grade 800 +. I also found that some of the motor connector block female terminals were very green and slack fitting. These are latched and may need tightening or renewing. A 1mm pin is needed to release these.

WIPER MOTOR

This is a permanent magnet motor with three brushes giving two speed operation. The drive consists of a worm and large gear with a connecting rod pushing and pulling a coiled wire through a steel tube to two geared drive boxes which are connected to the wiper arms. The motor gears are usually well greased and OK but the push pull drive boxes can seize up through lubricant drying up. Oddly there is no regreasing or oil hole so I drilled one 3mm diameter. This is then taped over to stop rain getting in. The motor unit main gear has a face cam at the back to operate the self parking switch plunger which is mounted under the 5 terminal plastic connector block which is fixed to the motor body.

ELECTRICAL SYSTEM OPERATION

The various manuals give no information on the system logic and there appears to be confusion between the earlier and later units. The various manuals add nothing to this. One manual wiring diagram does show a very small wiring detail which I redrew larger (see sketch). The wire colours are not all the same as my 1974 Series II unit but eventually I managed to correlate everything by going over all connections with my multimeter. I also used a spare dashboard wiper switch which has the same numbered terminals but in a different order. My sketch shows the actual positions.

There are two power feeds. One goes to the wiper switch and controls the speeds through motor T5 low and T3 high. The other (secondary) goes to the motor T4 and is for the self parking feature which keeps the motor running towards full left wipe after the main feed is switched off. This is finally switched off when the motor gear cam comes round into the park position and pushes the switch plunger in (off). This works by cutting the power feed from motor T4 to T2 therefore cutting power to wiper switch T6.

WIPER SWITCH POSITIONS AND CIRCUIT LOGIC

Delay – Power is supplied to wiper switch T3 which powers T5 to delay switch T3/1 and then to motor low speed T5 which starts the motor turning. This does two things simultaneously. The plunger is lifted switching off the delay switch but as the self park position is now passed, the motor runs on the self park circuit power at motor T4 for one wiper cycle.



Wiping then stops for a delay period set by the air valve clockwise (shut) for long.

Off – There is no supply from the wiper switch but the other (secondary) power line feeds motor T4 then through on/off self park switch to motor T2 which then feeds back to wiper switch T6 and T5. This feeds the delay switch T3/1 to feed motor low speed T5 until the main gear cam comes round to self park position and switches off.

Low speed – Power goes from wiper switch T3 to T1 and then to delay switch T2/1 and then to motor low speed T5

High speed – Power goes from wiper switch T2 to motor high speed T3.

BENCH TESTING

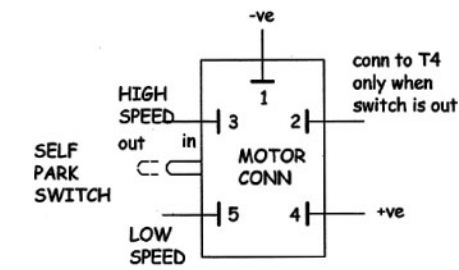
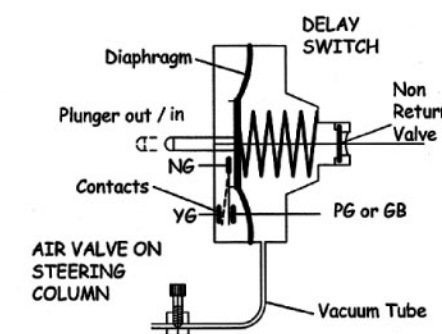
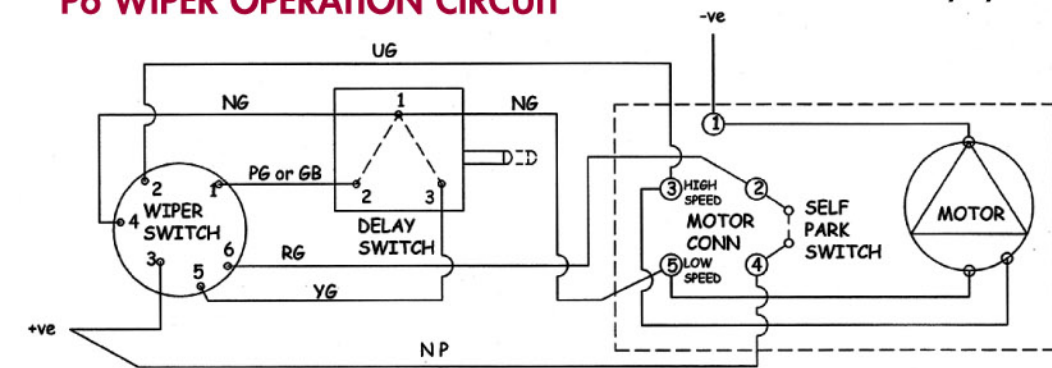
Test the delay, low and high speed positions for running. My best motor is okay in use so it appears that speeds of Low 40-50 and High 60-70 strokes per minute should be OK.

Test the off position as follows – Supply power to motor switch T4 and motor earth T1. Connect motor T2 to T5.

The motor should now run for less than one wiper cycle or revolution and then stop in full left park (RHD) position.

P6 WIPER OPERATION CIRCUIT

Anthony Ryalls



NOTE SWITCH IS UNDER CONN INSIDE MOTOR BEHIND GEAR