

## The Restoration of a Petter M

### An Unending Story

#### Part 1

In 2012 I purchased (almost a gift) a Petter M from a friend John Touzel in Victoria. I have always had an interest in these unusual looking 2 stroke engines with their sausage shaped exhaust pot and unique exhaust sound. The fuel is stored in the cast base and is pumped to the fuel chamber using a diaphragm pump relying on changes in crankcase pressure. Although a two stroke, the engine runs on straight petrol / kerosene fuel. Lubrication of the main bearings is carried out by oil reservoirs on the white metal bearings. Oil is pumped to the big end bearing via a spiral groove on the crankshaft. And the cylinder is spray fed from the excess oil in the sump. This unit was made in 1925.

The engine was complete but John informed me that it had not been used for many years and had a broken fuel nozzle. The outside of the engine had a large amount of surface rust and bolts and nuts quite corroded.

After sitting on the bench for nine months with its only attention being a squirt of WD40 each time I went past. With the weather getting better it was time to make a start on the restoration. The broken fuel



nozzle was removed and after discussion with technical advisor Peter Daw, it was decided that we would leave this repair till later.

The first job was to remove the flat belt pulley. With the liberal application of WD40 over months, the bolts came out easily exposing the gib key on the drive side flywheel. To explain, a gib key is a piece of tough steel that is tapered and locks a flywheel onto a shaft by being driven into a slot in the flywheel and shaft. In a previous life I was a fitter who worked on electric motors and alternators that weighed up to 80 tonnes. Removal of gib keys was a routine task. No problem there. Famous last words! After two days of wedging, heating and slide hammering the offending object was still in place as solid as ever. Time for a rethink!

On closer examination a surplus driving sprocket on the inner side of the flywheel seemed to be facing up to the flywheel. Careful probing with a steel rule seemed to indicate that the gib key projected into the sprocket. A stronger pair of reading glasses indicated a broken grub screw in



the sprocket. Two hours of very careful cutting with an angle grinder released the sprocket with only a tiny nick in the shaft. More disappointment. The offending key only projected into sprocket by a couple of millimetres and was not being held by the grub screw. More heat and wedging and then the inevitable. The head came off the key.

I originally gave up golf due to my quick temper which hasn't improved over the years. When I realised that the

sledge hammer in the corner was looking good I sensed that the time had come to leave it and go inside to look for consolation and have a sulk. My sympathetic daughter in law arrived about this time and asked what was wrong. I explained that I had spent days trying to remove a key from an engine. Her well-meaning suggestion of, "why don't you give up and pay a locksmith to come out and remove the key" broke the ice and put things back in perspective.

The only alternative was to drill the key out. This entailed a ¼" hole 2 ½" deep using a hand held drill which hopefully does enter the shaft or the flywheel. The first ½" was easy and only took a few minutes. Resharpen the drill, more lubricant and the progress was steady but extremely slow. When I estimated that we had about a quarter of an inch to go I could hear the voice of my long departed apprentice instructor, Mr Hudd, urging me to back off the pressure in case the drill broke as it came through. I didn't pay attention forty five years ago and things probably haven't changed that much, so thirty seconds later there was the distinctive sound of the drill breaking. Now I have a hard piece of tool steel 2" down an almost blind hole. Grinding up an old thin screw driver into a "u" shaped flat punch the broken bit was driven back out of the hole. A new drill bit with more care and the hole was finally through. Using a variety of tungsten blades, ground down hacksaw blades and needle files, enough of the key was removed to enable it to be tapped out. The cutting and filing took two days. Removal of the key from the second flywheel was achieved in two minutes and two bumps from the slide hammer. An hour and a half later the engine was completely dismantled. The engine appears to be restorable with the main problem being a worn big end bearing and the broken fuel nozzle.

Next stage cleaning, de-rusting and consultation with Peter Daw.



Remains of key



Remains of the sprocket



Engine in pieces