

# 2HP Witte Headless Stationary Engine

## A brief history of the Witte Iron Works

August Witte, organized Witte Iron Works at Kansas City in 1870. His son, Ed Witte served his apprenticeship in the foundry as a brass moulder, iron moulder, machinist, metallurgist, and finally as a steam engine designer.

By the time August Witte retired in 1886, Ed Witte had already built a crude but workable gas engine using hot tube ignition. Company records indicate however, that actual production of the Witte standard and Star engines did not begin until August, 1894. Witte standard and Star engine styles were built until November, 1914. A 1900 catalogue indicates that these impressive side shaft engines were available in 4, 6, 8, 10, 12, 15, 20, 25, 30, and 40 horsepower sizes for stationary use. Portables could be supplied in any size up to and including 25 horsepower.

1911 Witte embarked on an entirely new engine line. The model of simplicity, these engines were the first Witte models to carry the walking beam valve mechanism that characterized the entire Witte line until November, 1923.

Witte's Junior engine series (now affectionately known as the "headless Witte") included the cylinder and base in a single casting. Likewise the cylinder head was integral, eliminating problems from leaky gaskets and lowering production costs. Both valves were located in a single casting that was easily removed from the cylinder for occasional repairs.

Witte portables for 1916 were also available in 6, 8, 12, 16, and 22 horsepower sizes.

## The Restoration Project

I heard about a 2 hp Witte headless open crank, hit and miss engine for sale and after a protracted negotiation period, a sale price was settled upon and seller delivered it from Victoria to the 2011 Callington Show for me. The seller could not give any history of the engine except that it came from the east of Vic. with other engines that he purchased about four years ago. The serial number indicates that it was manufactured in 1921.

The condition of the engine was poor, but restorable, with some parts missing and the piston not stuck.

## As Found

The engines were not painter red but from seeing Witte engines running on YouTube, they were painted black, charcoal, a light grey and two shades of green. The Stationary Engine magazine says that in Britain they were painted green. I will need to find out the correct colour later.

The first job was to dismantle the engine and have it sandblasted, and this was done by Access Sandblasters, Wingfield, charging \$30 for doing the body and the two fly wheels. A coat of etching paint was sprayed on at home to prevent rusting. The block/hopper was separated from the base so to make easier handling.

The photo below shows the parts of the engine, not much. There is no muffler, only a one inch pipe with a cap drilled with a lot of small holes. This is all they used after finding other Witte engines with the same on YouTube. The instruction book shows the same.



## Parts laid out less Cam Gear

The cylinder block was immersed in the electrolysis bath for two days to remove any other rust that the sandblasting could not get to. All the other engine parts that were painted were also put into the tank and cooked for about four hours each. There are parts missing and these included the cam gear, fuel tank, exciter coil (T Ford type) and a six volt battery. I was



able to find an instruction book on the net from the USA and this was purchased, well worth it. I was also able to source a second hand cam gear of unknown condition, but usable, so the seller informed me and new inlet and exhaust valve springs. Also able to find a fibre switching block and spring for the low tension wiring controls.

The cylinder block and base castings are very rough and it was decided that they were to be all sanded back to remove any high spots and then partly filled with two part filler. After sanding back, the block and base were sprayed with a etching primer paint.

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After Xmas I made up a transporter one meter long to accommodate the engine, fuel tank and a wooden box to house a T Ford buzz coil and battery. This was varnished and then put to one side for later use when the engine is completed. I now started on bedding in the crankshaft as after closed inspection of the bearings, the surfaces have oxidised badly so a considerable time was spent to scrape the bearings. The two main bearings took about fifteen hours to complete. Next came to check the piston and conrod bearings. It was found that the gudgeon was worn and would need replacing. **It is solid 15/16 inch dia. and had about .010" wear. It was decided to make a new gudgeon pin using 24 mm dia and reaming out the piston and the conrod small end to suit a .010" oversize.**

Next came the manufacture of a new cam gear bearing shaft which also incorporates a slot to house the hit and miss latching lever. The latching lever was found to be usable, just new adjusting bolts and a spring.

The valve/combustion box on the side of the block was in reasonable condition with only the valves needing lapping in and a new fuel needle valve made. A gasket was made and the box bolted onto the engine.

A T Ford buzz coil was wired up and tested and through a good spark, so now to try starting the engine.

After many tries to start and no response, retimed the engine and again tied.

**This time it fired twice using "Start-you-bastard" so then tried using fuel from a makes-shift line and funnel.** This time it ran for about five seconds before the fuel ran out. Tried again and it fired ok but disaster then struck.

Exhaust fumes were coming out of the water hopper, not what you want to see. After considerable checking it was established that the machined faces between the valve box and the cylinder block were uneven and JB Weld was used to **rectify this problem. See Dick Turpin's article on plastic weld in the Tappet Chatter. To repair the faces it was necessary to** dismantle the engine again.

The engine was reassembled again and painted using a dark grey, then mounted onto the purpose built transporter, bolted down with the fuel tank and copper line installed. The new fuel tank was made by Frank Delaney of Aldinga.

The buzz coil setup was installed temporarily as a box had to be made later to house the coil, battery and switch.

On Friday 13th April 2012 !!! a test starting took place and the engine fired to life though grudgingly.



On checking, the timing needed adjusting and a multi meter was used to check the firing timing. Tried again to run the engine but still not running satisfactory. I decided to replace the fuel non return valve on the carbie. A new copper fuel line and non return valve were made together with a new needle throttle valve in the carbie. Tried the engine once again and hey presto, it ran for about a minute OK till I turned it off.

Picture left shows trial run setup.

Trial run in shed  
The springs on the speed control for the hit and miss mechanism needed to be made as the ones

which came with the engine were too heavy and would have the engine it running to fast. Joined two light springs together and the engine was fired up again and ran at 390 RPM. The box for the buzz coil and battery has been made with styrene packers to stop movement of the components and fitted to the transporter and wired up to a diagram emailed to me by Ben Wye.

The engine still needs fine tuning but I am very pleased with the result of restoring this Headless Witte and I hope to take it on a outing soon.

These engines were also imported by an Australian distributor and were known as an Emu.

Completed Engine

