Villiers Two-Stroke Engines (Part 2)

The Villiers carby

Before 1925 customers supplied their own carby for a Villiers engines. For instance Atco made their own carby for 147cc engines and fitted the Senspray carby to larger engines. Also the Mills carby was used and Villiers found them to be the most suited to their engines. So from mid 1925 Villiers made carburetors under Mills Patents, it is also said Villiers purchased the Mills Company not sure which is correct?

Lightweight Model (fits 1 inch inlet stub) single lever model suitable for 1¼hp & 1½hp models.

Middleweight Model fits a 1⅛ inch inlet stub single lever model suitable for engines from 172cc to 350cc.

Single lever means a lever on top of the throttle slide turned in a clockwise direction lowers the needle to weaken the mixture. Turned anticlockwise the needle is lifted richening the mixture. On motorcycles a Bowden cable was attached to the needle that was raised and lowered by means of a lever on the handle bars, this was call the two lever type. The 250cc & 350cc Mk.IX's & X's were ungraded versions of the Mk.VIII's From 1924 Villiers started to produce higher performance engines for motorcycles that differed from the stationary engines.

Engines from 1925 onward

Produced in 1926-27 was the Mk.VI-D or 1¼hp engine with a 50mm bore by 62mm stroke was a 125cc for motorcycles, it had a one piece head & cylinder casting with twin exhaust ports. It was not a success so it is said all remaining engines were sold to Monarch for one of their mowers. A 125cc was not produced again until the 3 speed unit construction Mk.VIII-D prefix AA was released in 1936

Listed in parts list No 22R of 1948 is a Mk.XII-A prefix GX, it looks to be a utility motorcycle engine produced 1930/32? The inlet pipe is cast on the one piece cylinder-head casting faces to the rear instead of the front on the Mk.VII-A. I can find no evidence of it being used in a motorcycle but I have seen one of these engines in a lawn mower with a fan and alloy cowl

In the UK they say the W-XII, a water-cooled Mk.XII was released in 1927? I say this is wrong for the following reason. The patent for the water cooled the one piece cylinder/head casting was not applied for until 1930 so I say this is when this engine was first produced.

This 247cc engine looks to be based on the Mk.VII-A and produced 1•3hp @ 1000 rpm. It had the prefix LZH for Hooper cooled engines and LZ for those that were tank cooled.

From 1933 a detachable cylinder head made alloy or bronze were fitted to the water cooled engines and a 343cc version was also produced, it shared the same 70mm crank and crankcase with the 247cc engine. The prefixes are as follows;

247cc - 1½ h p Hopper cooled - WAH, Tank cooled – WAT 343cc - 2½hp Hopper cooled - WBH, Tank cooled – WBT

This is the only range of pre war engines that the prefixes are easy to breakdown.

W – water cooled, first letter

A or B – 247cc or 343cc engine, second letter.

H or T – type of cooling, third letter

The fourth letter

A - The base/secondary exhaust expansion box was not used on these engines; they were generally direct coupled to a centrifugal pump.

M - On the tank cooled engine it meant it was a boat engine.

Fig. 8

In 1930 a very interesting prototype motorcycle engine was produced, it was a 500cc four stroke twin cylinder engine identical the Triumph Speed Twin produced six years later. The timing cover is identical to the Triumph but had Villiers cast in it.

Three prototypes were built with one supplied to Brough, a second Monet Goyon and a third one to SOS. It is said the Brough prototype still exists? In a letter to Monet Goyon dated May 29, 1931 Villiers said they were unable to produce any more 500cc twins because they were in full production with the new 98cc Midget. In August 1931 Monet Goyon were sent the plans of the 500cc twins, I don't think another engine was built?

In 1931 the 98cc Midget engine was released, it was used on cheap utility motorcycles costing around £15, making them affordable during the depression. They also started to be used on mowers, see fig 8.

Fig. 9

The 147cc Mk.VIIIC was produced from 1924 until 1940 had a one piece cylinder/head casting with the cast on inlet pipe facing forward in the same direction as the exhaust port. In 1932 the 147cc Mk.X1C was released that was identical to the 8C except cast on inlet pipe faced to the rear. Fig 9 shows the two types of cylinder.

In 1932 the timing side crankcase if various engines were redesigned with a spigot to locate the magneto armature plate on and it was held in place by two screws. The modified crankcase is shown on the engine on the right in fig 8. With the original flywheel magneto the armature plate clamped on the plain main bearing.

The older method of locating the armature plate was still used on some two-stroke engines until 1947-48.

This method of mounting the armature plate is donated by the letter "F" for "Fixed Ignition" timing in the engine prefix. With the older armature plate it could be moved around on the main bearing to advance or retard the ignition. The 147cc Mk.XI-C had fixed ignition

A Mk.XIC with fan and alloy cowling was used on the Allen scythe first produced in 1936, it had a prefix WZFC. WZ could mean this engine was made for the Allen scythe? **F** = fixed ignition. **C** could mean it has a fan and cowl for cooling?

This engine was used on the Allen after the war until 1949 with a Specification Number 278. I am still not sure when Spec No's were first used; possibly in 1945?


Fig 10

All Villiers engines had metric bore and stroke but there is one exception that is the 77cc Mar-Vil, see fig 10. It is a copy of the Johnson Utilimotor made from 1928 to 1932; Villiers purchased the rights to produce this engine in 1933. It has a 2inch bore and 1½ inch stroke; this is the same bore and stroke as the first Johnson Outboard motor produced in 1921.

The 94cc Century is larger version of the Mar-Vil unique to Villiers in having the stroke increased to 2 inches; it looks to have come out in the mid 1930's and was used to drive pumps and generator etc.

The Mark.XA had a prefix of JZ and had auto lube, a similar Mark.XA had the prefix JZPF with last two letters meaning.
P = petroil mix used on this engine, F = fixed ignition as described.

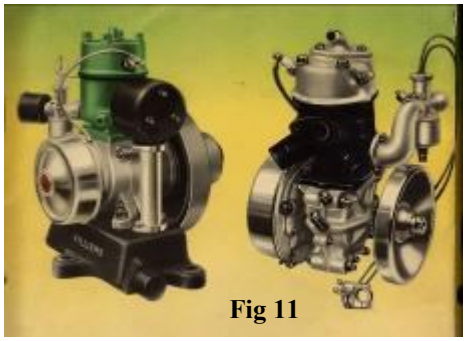
Fig 11

As far as I can see there are no prefix letters for auto lube or the older type ignition where the armature plate clamped on the main bearing.

All the engines until 1931 had a deflector piston, single inlet and transfer ports, and single exhaust port was used except on some motorcycle engine with two exhaust ports from 1925. The deflector piston and one piece head and cylinder casting was used on the 98cc Midget and 147cc Mk.25C until 1960 when production of two-strokes stopped except for the 98cc vertical shaft Mk.7C.

A motorcycle 346cc engine with a flat top piston and seven port cylinder came out in 1931. The 247cc. version of this engine came out in 1934. A 247cc stationary version of this engine did not come out until the late 1930's.


Fig 12

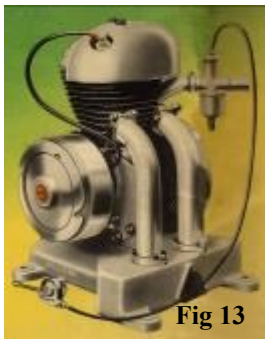
Fig 13

Villiers 1933 Brochure

Figures 11, 12 & 13 show engines on three pages in the 1933 brochure.
Fig 11 shows a tank cooled W-XII on the left with detachable head prefix WA or BT .
The second engine on this page is a 63mm bore x 80mm stroke = 247cc or a70 x 90 = 346cc water-cooled motor cycle engine. both are now long stroke engines.
Fig 12 shows a hopper cooled W-XII with detachable head prefix WA or BH on the left.
The engine on the right is a throttle governed 98cc Mk.1 Midget with fan an alloy cowl for cooling. It is mounted on an alloy base that serves as the expansion box for the exhaust like the W-XII. I have not seen one of these engines in this configuration and have no information about it
Fig 13 this looks to be a stationary version of the 196cc motor that is a throttle governed and has fan an alloy cowl for cooling. Again it is mounted on an alloy base that sever as the expansion box for the exhaust like the W-XII. It looks to based on the prefix 1E on a motorcycle engine and again I have not seen one of these engines and have no information about it.

The rarest Villiers two-stroke


Fig 14

About 10 years ago I came across a 1916 Villiers patent for an engine water pump encased in a tubular frame. I assume it was designed to be used to pump water out of trenches in France during WW1? Whether this pump unit was ever built is open to question, the engine would have been a water cooled Mk,II?


Fig 15

Just before the 12th national rally at Murray Bridge I was contacted by a person who had what turned out to be a water cooled Mk.III with Villiers flywheel magneto. The water cooled cylinder was identical to the one in the 1916 patent drawing, see fig 14
The engine dated from around 1920 and had an 8 inch two pole flywheel magneto; the points and condenser assembly are like nothing I have seen before, see fig 15. I think the round points and condense box was standardized on the Mk.VI range in 1922. I have a 1922 Mk.VIA and the original points and condense box can be replaced by one from say the 1950's without any modification. I was told this type of water cooled engine was fitted to a mower but so far I have failed to find any more information, I always live in hope.

As you have seen the early Villiers two-stroke engines are very interesting and seem to be harder to find.
Ron Wiley. Ph 8552 4954 or email ronwiley@bigpond.com