Reprinted from "Motor Cycling," April 21, 1949

CONCERTO FOR FOUR "POTS"!

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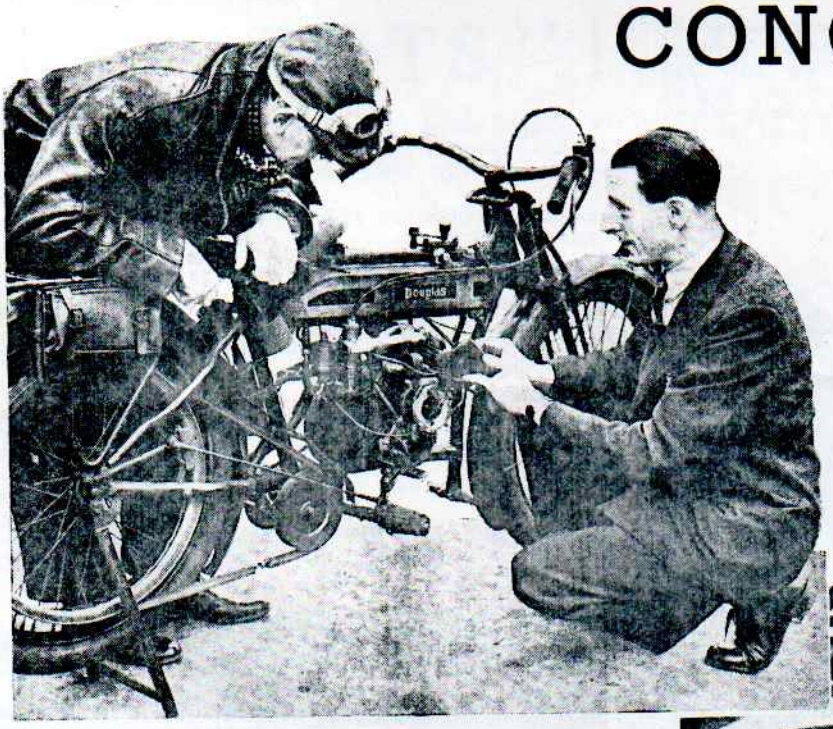
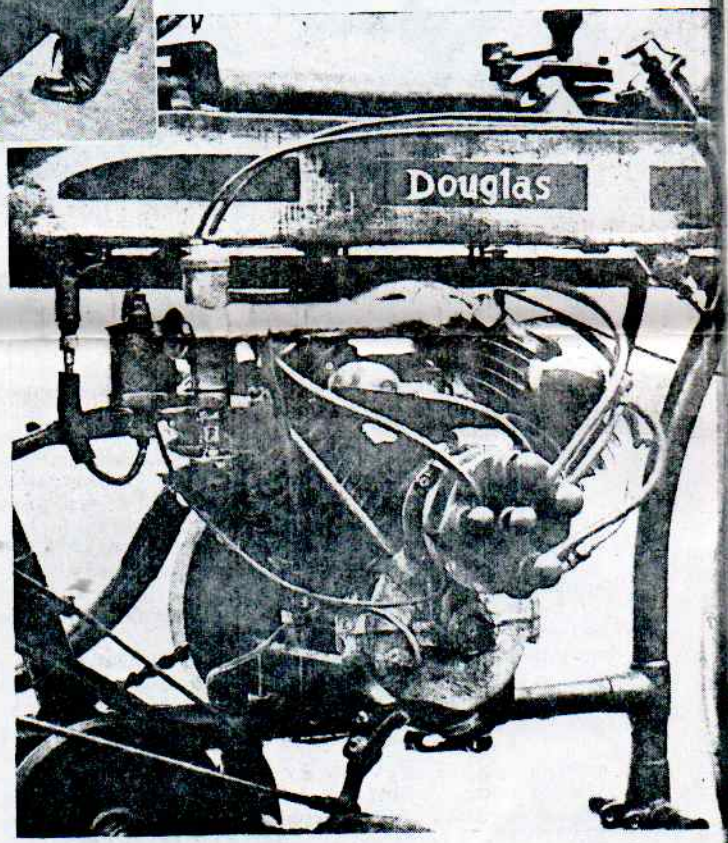
The Story behind "No. 44" in the 1949 Sunbeam Pioneer Run—the 1907 696 c.c. Vee-four Douglas

told by

C. P. READ



"And that is what we had to do!" On the left Eddie Withers explains the ignition conversion. (Below) Two views of the four-cylinder Douglas engine showing (left) the mounting for the carburetter, the 1913 De Dion car distributor and the main crankshaft bearing. On the right appears the flywheel side of the unit.



A NEIGHBOUR of mine has a motorcycle. It takes him, with the help of his son, 20 minutes to start the engine every morning. And he complains! But the engine that you see on these pages took 42 years to start and but for the concerted efforts of eight people it would never have been seen in action at all!

There was the real hero of the story, Eddie Withers, the Douglas distributor of Knight's Hill, Norwood, who is fanatically enthusiastic on anything remotely connected with the name. He, aided by his works manager, Jack Clapham, did most of the work. There was the great Freddie Dixon who brought his vast wealth of experience and knowledge to solve apparently insuperable problems. Colleague Bob Holliday unearthed the beginnings of the thing. Bill Corbett, Ted Townshend and Graham Parry, of the Bristol factory, put me in touch with the job. Cyril Quantrill made history with it and, I suppose, I should include myself, because I thought of it!

* * *

ALL this may sound rather disjointed so I had better start the tale at the beginning.

A very new motorcycling journalist, I was combing the 1930 Show at Olympia for "Jottings." On the Douglas stand I saw a tiny, vee-four air-cooled engine, labelled "an early Douglas design." Nobody seemed to know very much about it and I mentally filed the unit for further reference when I had more time to think about it.

Believe it or not that time did not arrive until 15 years later! Rejoining "Motor Cycling's" staff, after the war, I went up to Bristol to try the prototype transverse "350" and, in conversation with Graham Parry, mentioned this old engine. Graham thought he had seen it somewhere, but could not be certain. Anyway, he would inquire.

Three more years went by and I raised the matter with Bill Corbett, sales manager for the Douglas concern. He had never heard of the engine, but thought that there must be someone in the factory who would know.

A little later, this year, when I visited the Works, it was Ted Townshend, service manager, who, with a flourish, took me into one of the shops and there, on the bench, I saw for the first time for 18 years this beautiful little unit. We took it partly to pieces—mostly with a screwdriver—for that was the tool required to remove the sump-bolts and the big-end caps. It was like a little watch with solid silver-steel crankshaft (the two main bearings slightly off-centre!) and silver-steel connecting rods with no big-end linings at all! There were two throws on the crankshaft, each crankpin had two connecting rods to it and the cylinders were arranged at 80 degrees. Thus, when one piston was at top dead centre, its opposite number in the other bank was not quite at bottom dead centre. The power impulses looked as thought they might conceivably be somewhat erratic!

Both the main bearings were split brass bushes: the exhaust valves, toward the centre line of the engine, were mechanically operated by means of a completely exposed camshaft and the inlet valves were of the automatic type. One of the latter, with its spring was missing entirely and, owing to an obvious piece of carelessness perpetrated in some far-distant decade, one of the inlet domes was cracked.

At one end of the camshaft was a queer device, running at half-engine speed, which looked as if it ought to have something to do with the ignition, but nobody could be clear on the subject. Anyway there was a terminal on it and an irregular-looking cam with four lobes. The induction tract was a minute affair with a complicated system of air valves at each end and the exhaust manifold was a very modern-looking casting, heavily finned.

One of the great mysteries of the engine was how oil could be introduced into the crankcase as there was no

FOUR "POTS"!

The writer, robbed of his ride in the Pioneer Run, tries out the Douglas and finds it surprisingly flexible on a 5.125 to 1 gear.

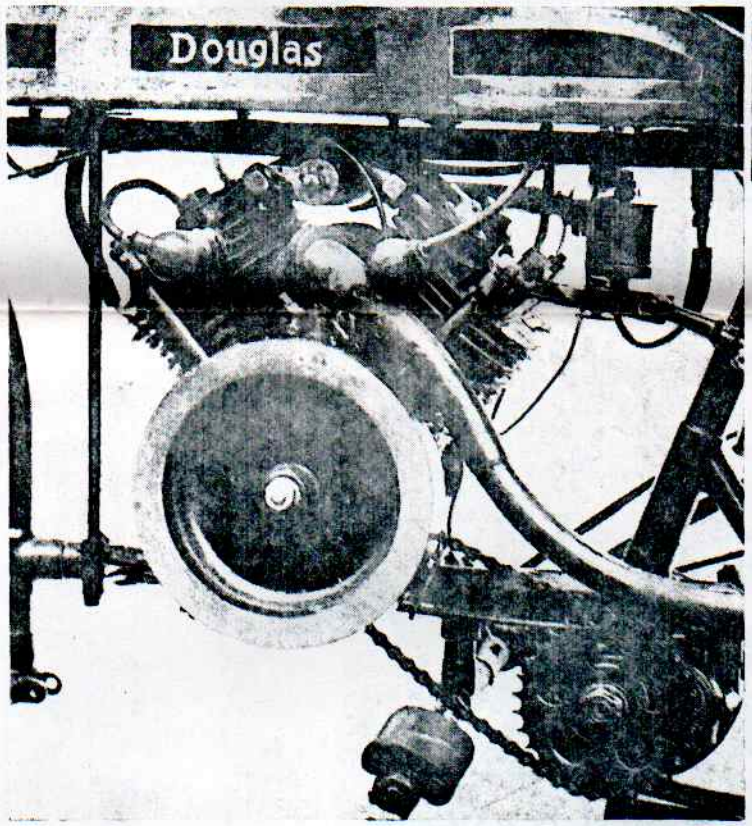
apparent means of doing this at all! In the opinion of everybody the engine had never run and it certainly did not look as if it *could* run without some very considerable rehashing.

However, we thought it would be nice to have the engine at the office to show Bob, who was then doing the story behind the Douglas name. And, in the course of his researches, he turned up the vital information . . .

In an early report, he found a description of the 700 c.c. vee-four Douglas which had appeared in a machine exhibited at the 1907 Stanley Show at Earls Court!

Clearly something had to be done with this engine. It was far too interesting to leave lying on a shelf. So I did the obvious thing. I rang up Eddie Withers. Within half-an-hour, Eddie had come down from Norwood and was saying "My! my!" over the engine on my desk. He took it back with him to his premises and after that I do not think he ate or slept until he had got it running.

The burden of our plot was that I should ride a machine fitted with this engine in the Pioneer Run on March 20, only



a matter of a fortnight thence. Withers was so confident that he could (a) find a suitable frame and (b) make the engine work that I sent in my entry to the Sunbeam M.C.C. For the best part of a week Withers travelled Surrey, Sussex, Hants and Kent, searching for the frame. He even phoned up the registration departments of county councils to see whether they knew of any pioneer machines still extant.

He found three. One was a 1919 job which was too modern; the second was a 4 h.p. "Douggie" which was too big, but the third was a 1911 "350" with the best part of its original components still there. It had been standing in a field for 22 years and a bird had nested in the back wheel! Eddie paid 10s. for it to the Edenbridge garage owner who possessed it and when he got it back to Norwood he and his staff worked like Trojans doing the necessary reconditioning—and that meant nearly everything!

New bushes were fitted to the gearbox, and the sprocket on the latter was ground to match the ½-in. by ¼-in. pitch sprocket on the crankshaft of the vee-four engine. In record time Dunlops produced a brace of 26-in. by 2-in. beaded-edged tyres and Graham Walker conjured, from seeming fresh air, a suitable rear belt of the correct length.

But the real hard labour was to come. In the Withers's workshop the old Douglas vee-four engine was completely stripped and the condition of the cylinders and pistons gave further evidence that it had never before fired. Furthermore, the cams, which were pressed on to the shaft, were incorrectly mounted. Then Withers had a brainwave.

He phoned up Freddie Dixon at Reigate, who immediately came down to Norwood, looked at the engine, said "Ah!" and put it in the boot of his car. With Withers he took it back to his own workshop, where so many strange and wonderful things have happened to internal-combustion engines.

For a whole day the two of them worked on the drawing board and finally decided a firing order which was mechanically sound and which would not break the crankshaft.

It was then found that the exhaust valve stems were too short to reach the cam rockers and they had to be built up by welding. The cams themselves were removed and ground to provide a reasonable valve "dwell" and rearranged to give an exhaust opening point 60 degrees early and a closing point 20 degrees late.

The next problem was ignition. The original mystery piece was converted to take a high-tension contact breaker and distributor. The latter was "vintage" and was originally fitted to a 1913 De Dion car owned by Freddie Dixon and was selected because its very long, brass segments would just "pick up" the peculiar firing order of the Douglas four. A Lucas coil, a condenser and a battery followed.

The original induction system was modified to take the carburetter, which had formed part of the 1911 machine into which the engine was now being fitted, and an inlet pipe to carry the carburetter out of the way of the distributor was made up from an old handlebar.

To provide lubrication to the engine, Withers drilled the crankcase, fitted a non-return valve and linked up the 1911 hand pump. The sump was so small that one pumpful would over-oil the engine, consequently a suitable oil level was decided and a drain-away pipe, later used to lubricate the driving chain, fitted. Originally there was no means of lubricating the camshaft, so Withers drilled four holes in the top of the crankcase, and through these holes oil mist was blown up between the cylinders to lubricate everything within sight—including the camshaft.

The next question was the mounting of the engine. The crankcase had only one visible lug—offset at the front—and there were, as well, two ¾-in. studs at the back of the

sump. With this unpromising material Withers and Dixon set about fixing the unit into a frame which was never made to receive it: But they did it—and it stayed put.

To give clearance to the flywheel and other bits the footrest hanger was unbrazed and refitted farther back. The under-tank rail had to be "scolloped" to miss the top of the engine, and on the Friday night before the Pioneer Run, the frame and the engine were "married" in Eddie's works.

All Saturday and Saturday night they worked. Hundreds of snags arose. The bulkhead between the oil and petrol compartments of the tank was rusted through, the whole tank had practically to be rebuilt, and an exhaust system had to be made up from all manner of things found lying about the works.

At three o'clock on the Sunday morning, seven hours before the run was due to start, they filled up the tanks, checked over everything and, wearily, Freddie said to Eddie, "Give her a pull, I don't suppose anything will happen!"

So Eddie spun the back wheel—and things happened with such terrific suddenness that he nearly lost a thumb and three fingers! Silent for 42 years, the Douglas "four" found its voice, and hardened veterans though they both are, Withers and Dixon felt as excited as a youngster with his first machine. The seemingly impossible had been possible after all!

A brief run up and down the road just to see that it really did function and the Douglas was put into the van ready for the run.

And this is where my tragedy occurred.

According to schedule I was due to fly back from the Geneva Show at lunch time on pre-Pioneer Saturday. Can you imagine my feelings, then, when the B.E.A. people at Cointrin Airport told me that conditions were too bad for the aeroplane to take off, and that I should have to stay in Switzerland until lunch time on Sunday?

How I made the wires burn! I cabled everybody I could think of and the result was that on the Sunday morning Cyril Quantrill, stout fellow, who was covering the Pioneer Run for "Motor Cycling," like the organist in the famous ballad, volunteered to play instead.

With no previous acquaintance of even the remotest kind with the Douglas 4 he got aboard and, obeying Withers's instructions to stay in top gear, rode "No. 44" all the way to Brighton, with Freddie Dixon every now and then driving up alongside to shout warnings of what to do and what not to do.

Cyril got to Brighton non-stop. In fact, he went so fast that he exceeded the scheduled speed for his class and lost his award, but that was only incidental. The thing was that the Douglas was proved to be capable of covering a 50-mile run "straight off the hook"—and did not shake loose a single nut or bolt—a marvellous testimony to the skill and workmanship of those good fellows at Norwood. The almost traditional wizardry of Dixon requires no further tribute.

That the Douglas was the showpiece of the 1949 Pioneer Run is history. Both before and after the run it was difficult to get near the machine at all and it was said by many that it was the most interesting engine which the run had yet produced—a rather sweeping statement.

For those people who like facts here are a few: the petrol consumption is estimated to be 104 m.p.g.; the cruising speed is from 30-35 m.p.h., with a maximum of 45-50 m.p.h. (I achieved the latter speed when, after the Pioneer Run, I managed to get in a trip on the old Douglas); the bore and stroke are "square"—60 mm. each, equalling 696 c.c., and the compression ratio is 4.2 to 1; at the present moment the top gear is 5.125 to 1 and the engine is so flexible that it can be ridden round and round in the road on that ratio. There is, of course, no clutch.

In all, Eddie Withers and his staff put in 250 hours' work on the Douglas and he has asked me, on his behalf, to offer apologies to those of his customers who might have felt themselves neglected in the immediate pre-Pioneer period.

It is anticipated that the vee-four Douglas, probably mounted in a frame somewhat nearer to the original, will figure in forthcoming Pioneer Runs—*and it is definitely not for sale!*

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