OPS PRO

Colin Leake has been running the latest engine from *OPS*

It seemed like a good idea at the time. I'll do a track test on one of the latest *OPS* 'Pro' engines I thought. Now in the cold light of day, having completed the test, I sit here looking at a blank word processor screen, wondering just what I can find to say about such a well known, well developed and thoroughly competent engine.

Of course the engine has been around for a long time, and during almost the whole of that time results have spoken for themselves as the engine has notched up a string of successes. It must be a constant source of irritation to rival manufacturers, who have tried every possible technical innovation to knock the innocuous OPS off its perch, to find that this classically simple three port design just goes on and on winning. In many ways it is reminiscent of the Coventry Climax engine of yesteryear used in full size Formula One Cars, or more recently the success achieved for so long by the Ford Cosworth engine.

Although the engine has been around for so long, and may still look like one of those in use a couple of years ago, make no mistake, to retain its dominent position around the world tracks, it has undergone constant development and now is a vastly improved motor.

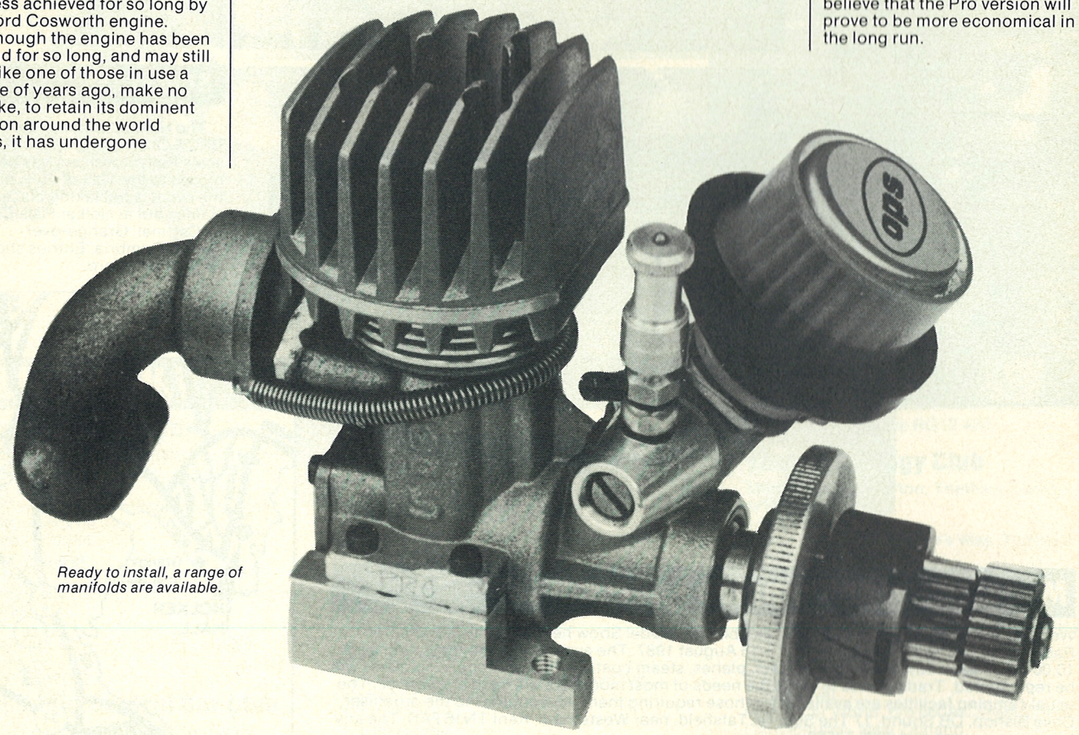
We used to run *OPS* engines two seasons back. Now, handling this engine, it's like being united with an old friend, only to find that he has much improved during his absence.

On the straight technical front *OPS* have done much to improve the longevity of the engine. I use the word longevity quite deliberately, rather than reliability, as *OPS* engines have always enjoyed a fine reputation for reliability. Indeed that very factor has been one of the features that has contributed to the unequalled competition success of the engine.

The basic engine is so well known that it would be pointless for me to embark on a detailed technical description of it. Instead it is perhaps more pertinent to concentrate on the changes that have been made, and the benefits, that have accrued from those changes.

First off, in my mind at least, are two changes that have been made to extend its useful working life. With the original engines there was a tendency for said life to end with an audible, and inevitably, catastrophic bang. The problem was that the engines were so reliable that many of us took them for granted and after a few races neglected to check the big end bearings. The result of this, admittedly sloppy approach, was that we often failed to notice that one of two things was happening. Either the big end bearing would begin to rotate in its housing or the crankpin would wear to a taper. The engines could tolerate these conditions for a long time but sooner or later the result was inevitable. "Ping — look Mum, no engine."

With the 'Pro' engine *OPS* have drastically reduced crankpin wear by fitting a chrome plated crankshaft, and have prevented the big end bearing rotating by serrating the outside of the bearing. In my opinion these two changes alone make it worth paying the extra money that is charged for this version of the engine. I personally would never now settle for the standard competition engine, since I believe that the Pro version will prove to be more economical in the long run.



Ready to install, a range of manifolds are available.

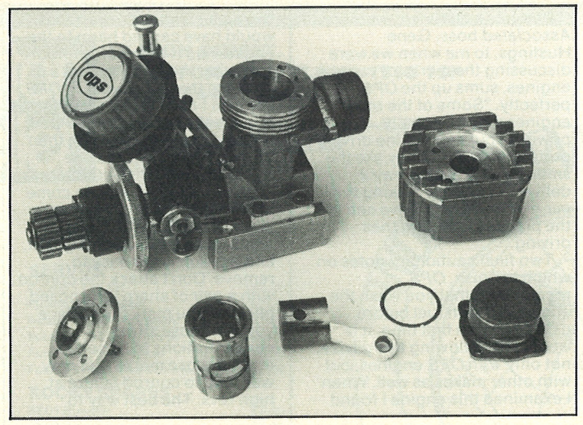
Carburettor improvements

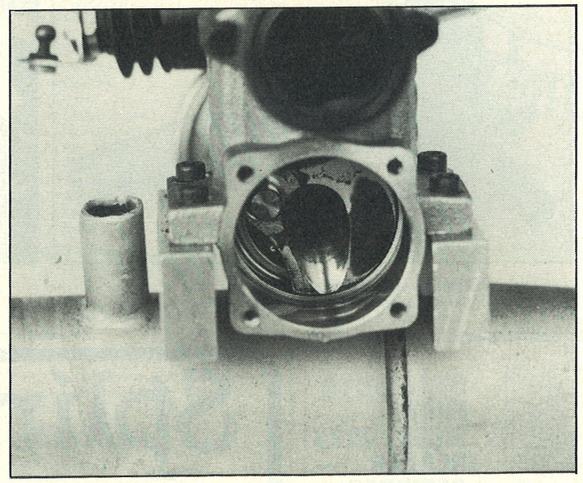
Next on the list of improvements that have been made comes the carburettor. When we used to run *OPS* engines this was not one of their strong points. I still have a bit of paper that *OPS* used to pack in with the engines suggesting wrapping 'PTFE' tape round the slow running jet adjuster to stop air being drawn in. Even this did not always work, and many of us found that we needed to us a thread locking compound round the rest of the screws to try and cure the problem.

With the latest carburettor there are no such problems. We followed our normal practice of putting a smear of silicon rubber round the spigot when fitting the carb and experienced none of the old problems. Indeed we found this engine to be one of the easiest to set up we have ever come across. We spent 20 minutes running the engine in on a rich mixture, then gradually leaned it out and that was that. It was noticeable that the mixture control was near perfect right through the rev range. As the car went round the track there was just a thin trail of blue smoke from the exhaust all the way round. It was not necessary, as it is with some rival makes of motors, to run the car at all lean to obtain maximum performance. We did try leaning it out further but found no gain was to be had in terms of performance so quickly reverted to the original setting. It was also remarkable that despite the fact that the trail of smoke, and the sound of the engine suggested that it was running a touch rich, the fuel economy was extremely good. Steve was not hanging about, yet he was finishing each five minute heat with 35 to 40cc of fuel left. Now we know how Steve White manages to go so fast yet stretch his fuel stops.

Finally on the subject of the carburettor's good points we were able to confirm the remarks made to us by other drivers regarding the ability of this carb to hold its settings. Although the weather was very changeable over the weekend we did not once find it necessary to adjust the mixture.

Having covered the carburettor with praise it's only fair to mention a couple of negative points, *OPS* provide a linkage with a little brass ball on the end that fits into the end of the slide. It is intended to ensure that the pull on the slide is always on the centre line. The problem is that in use the ball wears quite rapidly and you are suddenly apt to find that you are not getting full travel on the slide, or even worse the ball has actually pulled out. It's not a serious problem, most drivers are familiar with it and simply cut the wire short and make a small angle bracket to take a hardened steel ball joint. If you do this remember that it is important to ensure that the ball is on the centre line of the slide,





Above: the internals, note the 'O' ring seal of the backplate.
Below: the large cut-out in the crank is taken right to the edge.

or excessive wear make take place. The second thing that I don't like is the fact that the slide is made of plain brass and in use (we use these carbs on another make of engine) has a tendency to wear. That is not to say that it will be worn out by the second time you run the engine, it won't, it's just that they don't last as long as the slides of some other carburettors. I would have thought that on an expensive engine such as this the slide would be chrome plated to extend its life. To be fair I have asked other drivers if they have experienced the same problem and many of them claim that they have had no such trouble.

Performance improvements

The other modifications that have been carried out are to improve the engine's performance. *OPS* claim 1.95hp. We have no way of measuring this, so can neither dispute nor confirm the claim. All we can say is that the power available is adequate. Steve drove the car fitted with the engine for the first time at Wombwell. He was in the same heat as such notable drivers as Walt Bialey, Steve White and Gary Culver, all of whom are noted for the power of their engines. After the first corner they were away from him simply because they are better and more experienced drivers, but it was noticable that in the race down the straight to the first corner he was in most cases actually ahead of the pack. At this point it is pertinent, and relevant, to state that the only work we carried out on the engine was to remove the sharp edge from the top of the piston with a little very fine emery paper.

The increased power comes mainly from three changes that have been made to the engine. Firstly the back end of the crank has been worked to improve the gas flow, particularly at high revs. Secondly there appears to have been a change to the inlet timing which has been slightly advanced and thirdly, and most importantly, the engine is delivered with a 0.3mm thick steel shim that can be placed under the liner to increase the timing of the transfer and exhaust ports. If this is used then a corresponding thickness of gaskets must be removed from the head to reduce the squish band clearance and restore the compression ratio to the correct level. It was the advisability of this simple modification that finally decided me to embark, at this point in time, on a track test of the engine. In the past I have always been aware that, whilst the engine was winning everything in sight, most of the engines that were doing the winning, were doing so with changes made to the port timing by drivers who knew exactly what they were doing. I was becoming increasingly horrified by the number of engines that were being blown up by less experienced racers wielding grinding wheels trying to make their engines go as fast as those of the star drivers, without properly understanding what they were doing. Now all that is a thing of the past. Use the shim provided, follow the four simple lines of instructions at the bottom of the page, and you will have an engine that is a match for any other on the track.

OPS tuned pipe

Our engine was delivered with the new *OPS* tuned pipe. The instructions that came with it say, "The new car exhaust system has been developed especially to increase engine torque at low rpm without sacrificing the performance at high rpm." "Furthermore the new exhausts have been conceived not to thermally stress the engine's vital components with the use of high nitro fuels." "The exhaust must be used with the adaptors thereby obtaining the right length of 295/300mph from the glowplug to the end of the silencer."

In the light of this we tried to follow their advice, but found that it was necessary to remove a few millimetres from both the manifold and the pipe to enable the assembly to fit between the wheels. We were also worried about the length of the outlet pipe which we thought was rather vulnerable, so we cut a little of this as well.

The manifold supplied with our engine consisted of a stub that fitted onto the engine over which fitted a spring type manifold. It's a matter of personal preference, some people like this arrangement, claiming that the rigid bolt on type of manifolds are prone to break off with metal fatigue. I personally don't like it, since it is possible for the manifold to pivot backwards, fouling the back wheel, or even becoming disconnected from the pipe. We used it for the track test but I have now changed it for one that bolts directly onto the engine. Whatever your

preference it presents no problem s *OPS* make both types.

The silicon rubber joint is worthy of a mention. It is a specially moulded affair that works very well indeed. If you clean the end of the pipe and manifold and the inside of the silicon rubber joint with a suitable cleaner it actually sticks to the metal in use and makes a very secure joint.

The tuned pipe works very well indeed and is strongly made, if a little on the heavy side. I would like to have seen a fixing boss on the end so that the pipe can be really securely mounted, I have seen too many races lost because of the pipe becoming detached from the manifold.

Conclusions

With the exception of the few relatively minor items I have mentioned it is difficult to fault this engine. The most impressive thing is the smooth way the engine delivers its power. It's so smooth that the engine never looks particularly fast, it's only when it is pitted against other engines in competition that you realise just how much power is available. Whenever you need it, it's there in a smooth continuous stream all the way round the circuit. The smooth fuss free manner in which the engine goes about its business engenders a great deal of confidence in its users.

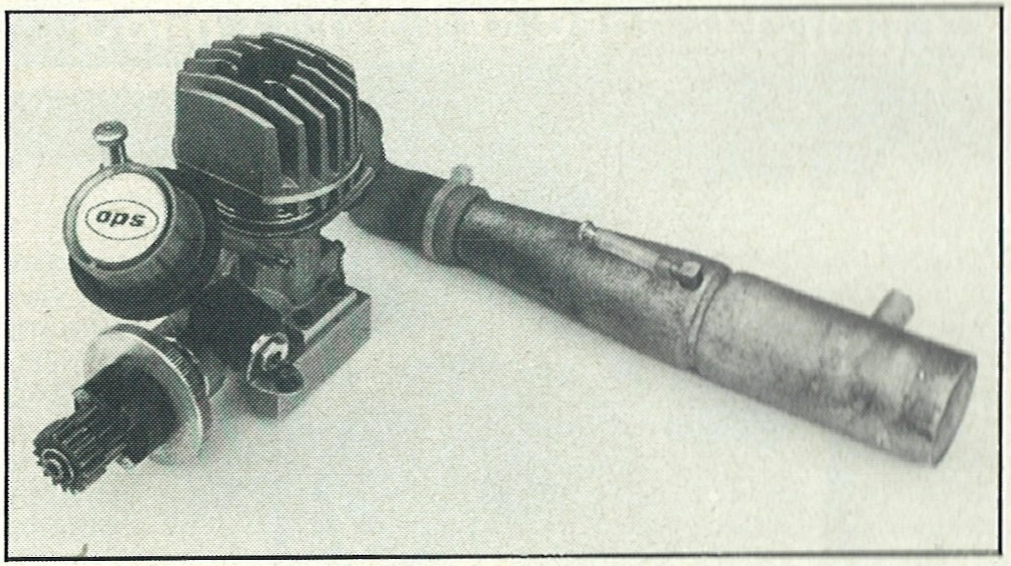
Perhaps a comment made by *Associated* boss, Gene Hustings, to me when we were discussing the merits of various engines, sums up the *OPS* perfectly. "Some of the other engines may be equally powerful but most of the drivers prefer the *OPS*." "They like the smooth controllable way it delivers its power, making the car much easier to drive and in the process flattering their driving."

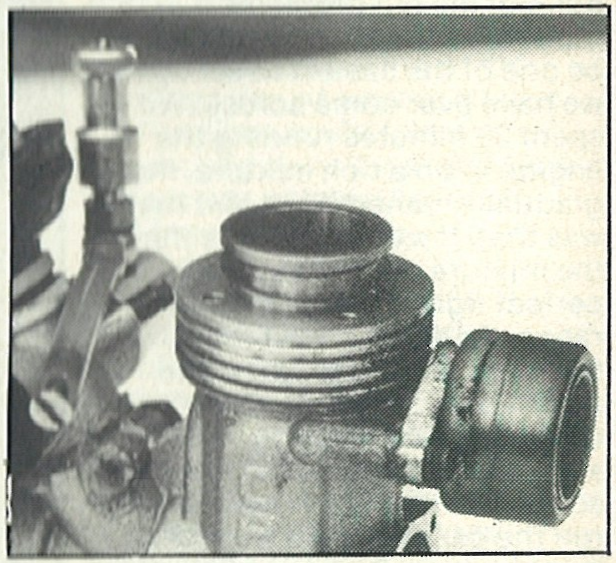
Two final cautionary notes on which to finish. *OPS* recommend that you wash the engine out with fuel before using it for the first time. It is well worth following this advice, not only with *OPS* engines, but with other makes as well. When I examined this engine I found two small pieces of swarf that would have caused harm to the engine had it been run without removing them. This is not a problem that is peculiar to *OPS* engines I have found swarf in other makes of engines as well, in some cases much more than the two tiny pieces that we found this time in the *OPS*.

Secondly when you do come to strip the new engine down you will find that the big end bearing is an extremely tight fit, and as such is not easy to remove. Don't attack the conrod with a pair of sharp long nosed pliers. If you mark the surface you will cause stress concentrations to be set up around those marks that may well lead to conrod failure at high revs. The best way to remove the conrod is to take a small Allen key and wrap the small end with a few layers of insulating tape. This can then be hooked behind the conrod so that it may be pulled off the crankpin without causing any damage. If the bearing is particularly tight it has the added advantage that you can exert extra pressure on the rear of the conrod by making the Allen key act as a lever.

Imported by: MacGregor Industries Ltd., Canal Estate Langley, Slough. Available through most good model shops.

Retail list prices: Engine: £158.00. Pipe: £21.35. Manifolds from £12.00.





Left: the motor with tuned pipe length correct.
Right: the engine less head, OPS-*air filter is also fitted.*