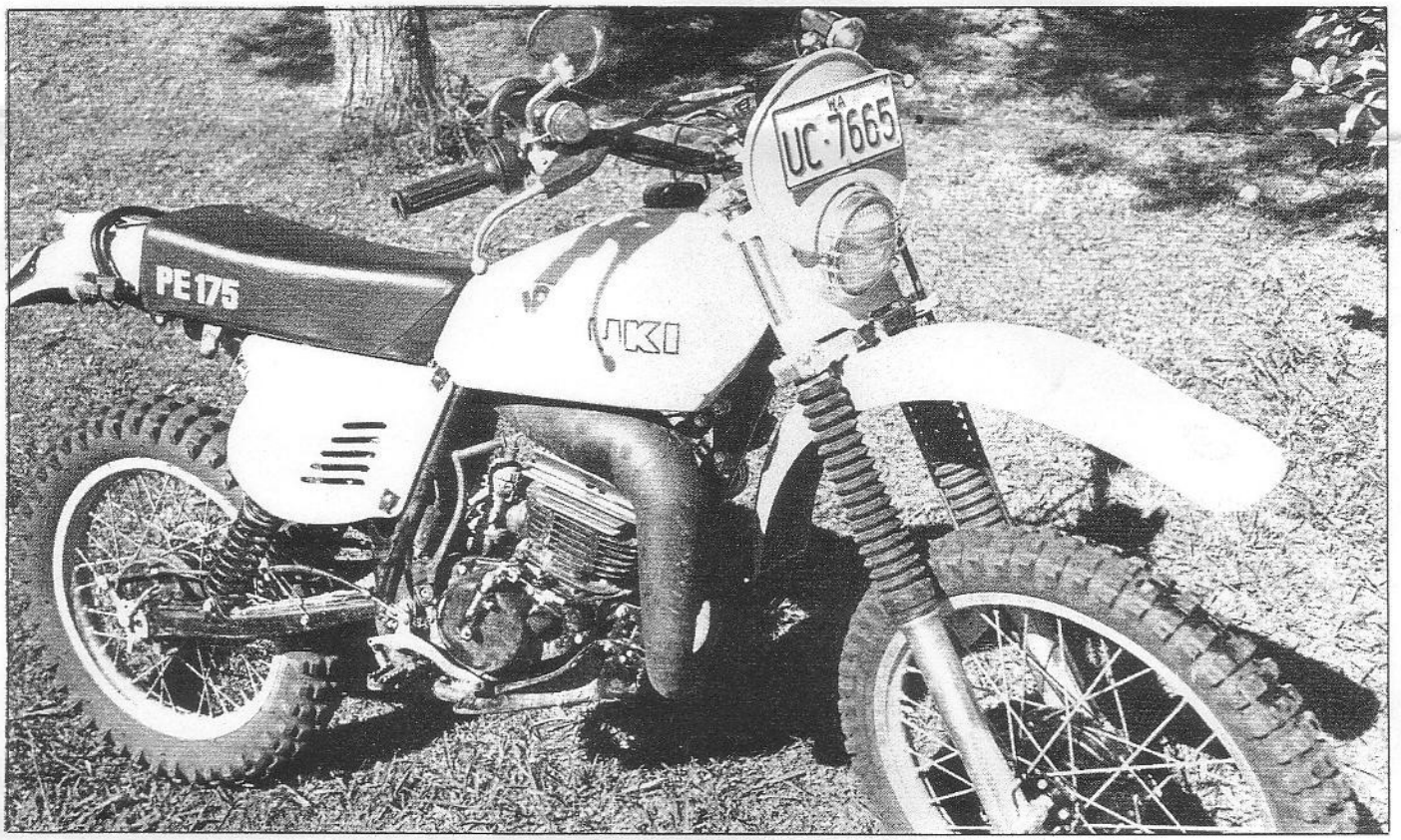
TURNING THE PE175 SERIOUS

Off the showroom floor, the PE175N was an excellent choice for both trailriders who didn't want the weight and poor suspension of a trail-bike, and enduro riders who wanted to get into enduros with the minimum cost and hassle. But the engine, standard, needed some more muscle to challenge the leaders of the class. In this project, **GARRY TREADWELL** *brings the PE up to par.*



Most 175 enduro bikes are a compromise as far as engine design is concerned. They are either stretched 125 engines, or scaled down 250 engines. Neither of these approaches is ideal for power, although they are ideal for cost: it is easier to tool up to produce a 175cc barrel, piston and crank which fits onto a 125 than it is to begin from scratch and build a good 175 in the first place.

Yamaha's IT175F (and now the G) is a good example of a stretched 125cc engine. The IT's engine is basically the same as a YZ125, except for different gearbox ratios to allow a wider speed range, and an ignition system with an external flywheel to provide more flywheel effect for slow running as well as allowing room for lighting coils.

The extra capacity of the IT175 has been obtained by simply increasing the bore size — the stroke is the same as the 125. The result is an engine which must have fairly wild port timing to get the power it does, because the short stroke reduces the effective port areas. Wild port timings are not all that desirable in an enduro engine as they reduce bottom-end power. The IT has reed valve induction, which overcomes this and gives it reasonable bottom-end. But at the same time, when it hits the powerband it really lets loose, making some owners call them a pipey engine.

The best example of a scaled-down 250 is the KTM175. This engine's nearly square bore/stroke relationship is ideal for horsepower all the way through the rev range. However, the KTM175 is far heavier than it need be, and it suffers greatly

in bottom-end because the engine doesn't have a reed valve induction. The manufacturer has also tried to make the bike stronger in midrange and top-end by the way the ports are designed, so the KTM is an experts only bike, which not everyone is.

On the other hand, Suzuki's PE175 is a rarity because it was designed from the ground up as a 175. The PE engine is a similar design to the RM series engines — the cylinder has six transfer ports, bridged inlet and exhaust ports, and the now familiar crankcase reed induction. The port timings are mild to provide good bottom-end power.

As it sits, the PE has the potential to produce a lot more power, power to suit the expert rider. The aim of this project was to do just that, and at the same time get the best results in midrange, the best area for an enduro engine. This, hopefully, would be done without sacrificing too much bottom-end.

The main problem with the stock PE barrel is that the intake area is too small: this is one area which needs attention. A second problem with the PE is that the engine overheats badly after only a short period of running, and power drops off drastically when it does. After the engine is changed in the port timing, the standard pipe will not work well at all, either.

increased too much, bottom-end power suffers greatly from increased blow-back through the carburettor at low speed. The Suzuki has a crankcase reed, so it does not need to use as much intake timing as, say, a KTM, which only has piston-port induction.

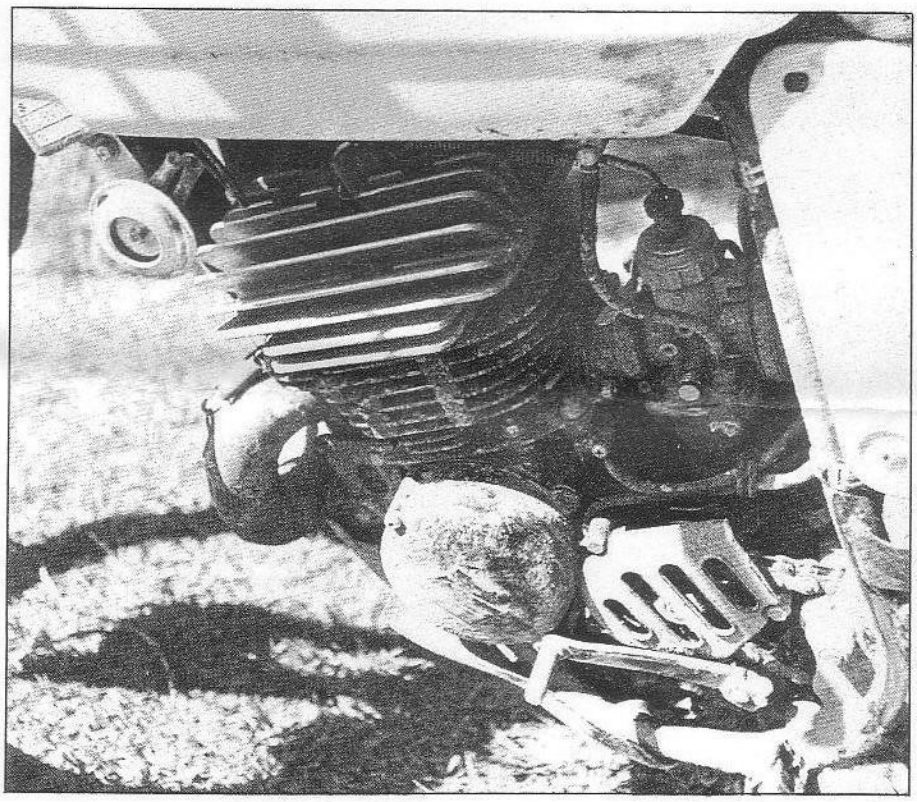
Two ways to increase inlet area are to increase the port timing (which means to enlarge the ports so they are covered and uncovered by the piston at different times during its stroke), and increase the size of the reed valve. This latter method is much better because the intake area is increased without blowback. For this reason, a DG six-petal reed block was installed: this reed gives 100% more area than the stock block, and achieved the desired effect.

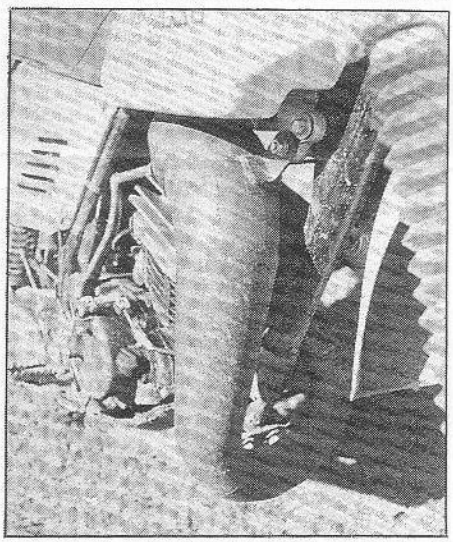
But once this was done, the overheating of the engine was noted even more, so a DG radial head was installed. This head has much greater fin area than the standard head, and also gives a higher compression ratio. Testing showed a power increase of about 2 horsepower at the rear wheel. Power did not drop off anywhere near as much as it did with the standard head, something which all the riders who rode it commented on. This head also allowed the use of a B9EV plug in place of the standard B1OEV.

Carburetion changes were necessary with the modified cylinder, the DG reed and the new pipe. The pipe was added after the ports were mildly treated, because the standard pipe just doesn't work with the modified

BELOW

Another silencer had to be made for the PE because the new pipe needed a larger stinger diameter. A PE250 silencer will fit, but costs more than this one (see the prices of the Stage 2 components).





ABOVE

The DG head is almost a must for anyone with a PE175. In stock trim, the PE loses a lot of power due to overheating, because the finning is so small. With the modified engine, it is even more necessary. It is a gold anodised colour, which looks trick.

ABOVE

Pipe is a Treadwell design to increase mid-range power, and add even more at the top. It is master-crafted by Trevor Levesage, who builds pipes in between playing beautiful music on his violin.

engine. Riding the bike for two successive runs, the first using the standard pipe, the second using the modified pipe, showed an incredible increase in power right through the range.

Taken all together, the DG reed, the porting job, the DG head, the new pipe and the re-jetted craburettor, the PE engine put out six more horsepower than stock at the rear wheel. Riding the bike showed a slight loss, hardly noticeable, in bottom end but a big gain in midrange and top-end. With everything done, the PE175 was turned into a bike which could easily dominate the class, engine-wise. It pulled well, and accelerated as fast as most 250s, better than some (eg, the PE250). Combined with the light weight of the bike, this makes the PE175 into a furious little machine able to look at outright positions, and that's what the project was all about.

In fact, the increased horsepower points up the deficiencies in the standard soft suspension, and the next step would be to consider ways of improving it. Does it ever stop?

For anyone interested in having this work done to their PE175, contact Garry Treadwell, c/— Top Rider, Cnr Lane Cove and Blaxland Road, Top Ryde, NSW. Phone (02) 800504. Garry has divided the job into two possible stages, details of which are shown below.

STAGE 1

— mildly ported cylinder $60
— DG six-pedal reed $60
— DG head $75

This stage raised the horsepower from 19.5 hp to 22.5 hp, and makes the PE an excellent bike for the average rider, with a good increase in power in the midrange especially. The power loss due to overheating is greatly reduced, too, by the accessory head.

STAGE 2

— fully ported cylinder $100
— DG six-petal reed $60
— DG head $75
— all new pipe and muffler $140
— rejetted carb $10

Carburettor settings were an R-5 needle jet to cure midrange leanness, and a No. 220 mainjet. This stage is good for a horsepower output of 25.5 hp, compared to the stock output of 19.5 hp, and it makes the bike suitable for the expert rider.