

# Malcolm's sixth sense for invention

**A** SELF-TAUGHT Bordertown engineer is planning his next moves to prove his revolutionary "six-stroke" engine. Malcolm Beare, who has devised a system which does away with the conventional valve gear of a four-stroke motor, wants to use the system in a racing bike and, if these trials prove successful, to demonstrate it at the annual Isle of Man bike race meeting which attracts enthusiasts from all over the world.

The basis of his system is a cylinder head with an intake and exhaust system which uses a small piston to form the roof of the combustion chamber. The head bolts on to the top of a conventional engine.

The small piston runs in a sleeve into which are cut intake and exhaust ports, which the small inverted piston blocks off and opens in much the same way as a conventional piston opens and closes the ports in a conventional two-stroke engine.

With the cylinder head having been proven to work when bolted to the top of a converted Yamaha XT500 motorcycle engine, Mr Beare's next move is to use a pair of heads on a V-twin Ducati engine.

The small piston of the unique cylinder head is operated by a connecting rod mounted on a shaft which runs in the head and is chain driven from the end of the main crankshaft.

On the firing stroke, the expansion of gas also works on the small piston and is driven up-

wards, transferring power through the chain drive to the main crankshaft.

The inlet port of the head is fitted with a reed valve, and the exhaust port has a disc valve, but the head of the small piston takes the brunt of the explosive forces.

The disc valves prevent waste exhaust from being sucked back into the engine on the intake stroke, while the petals of the reed inlet valve open on demand as soon as the pressure in the engine drops.

Compared to a conventional engine, there is the opportunity for larger inlet and exhaust port sizes, there is no restriction due to conventional poppet valves and there is a much reduced opportunity for the cylinder head to develop hot spots which can lead to detonation.

According to Mr Beare, who has been working for 14 years to perfect the system, there are significant improvements in mechanical, thermodynamic, and volumetric efficiency.

The shaft which drives the small, overhead piston runs at half engine speed, and the engine derives its name from the fact that the main piston does four strokes a cycle and the secondary piston does two more, giving the engine a "six-stroke" action.

With the latest prototype already working well on the Yamaha bike, Mr Beare is now seeking support to further develop and manufacture the six-stroke system.



Malcolm Beare . . . a revolutionary "six-stroke" engine.