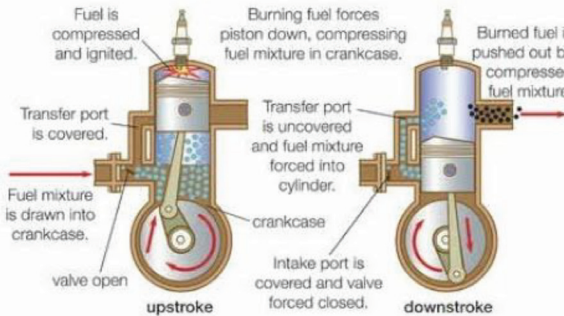


# WHY WAS THE KETTLE THE LAST OF THE 2-STROKE SUPERBIKES?

One of the main advantages of a 2-stroke engine is mechanical simplicity; comprising essentially of only three moving parts; a crankshaft, piston and connecting rod. This makes them cheap to produce and light. But its biggest advantage is, that once ignition has occurred, it can achieve the suck-squeeze-bang-blow operating cycle in only 2 piston strokes (hence the name) instead of the 4 movements required of a 4-stroke. That means twice as many power strokes per RPM and potentially more power per cc. So have you ever wondered why there are no modern 2-stroke superbikes?

I have, and the answer lays in understanding how a two stroke engine works. Although this is shown diagrammatically below, I'll offer an additional brief explanation as follows.



Before the 2-stroke cycle can begin, the fuel mixture needs to be introduced, which requires an initial upward movement of the piston, initiated by either a starter motor or kick-start. This upward movement creates a slight suction in the crankcase and uncovers the intake port, so that fuel mixture is drawn from the carburettor into the crankcase. After reaching top-dead-centre, the piston begins its downward stroke (the beginning of the 2-stroke cycle),

closing the intake port and slightly pressurising the mixture in the crankcase such that when the top of the piston passes the transfer port, the mixture is forced into the area above the piston. After it has reached the bottom of its stroke, the piston begins to move upward again, with the intent of compressing the charge of mixture and ignition (the end of the 2-stroke cycle). The trouble is however, that by design; until about a quarter way through its upward stroke, the exhaust port is open at the same time as the transfer port and some of the mixture (potentially up to 25%) escapes through the open exhaust port before both are covered by the piston and therein lays part of the problem with 2-strokes - wasted fuel. Back in the seventies this wasn't much of an issue for us as owners, as petrol was relatively cheap. Some manufacturers got around this 'lost' mixture issue by using direct fuel injection, but this was generally only employed in applications such as snowmobile and marine outboard engines.

The other problem with 2-strokes, was their reliance upon what was effectively a 'total loss' lubrication system. Although manufacturers tried ways of reducing the resultant pollution produced – (Suzuki used what it called [SRIS] *Suzuki Recycle Injection System*), but it wasn't enough and as owners of old bikes with poorly maintained systems can testify, they don't work all that well! So by the early eighties the large capacity 2-stroke road bike was dead.

One can only imagine what a Suzuki GT750 would be like if built in 2021 with modern technology. I have read that a modern fuel injected two stroke 750 could easily and reliably produce over 100bhp. The engine would be extremely light compared to the four stroke equivalent.

Dare to dream eh?

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