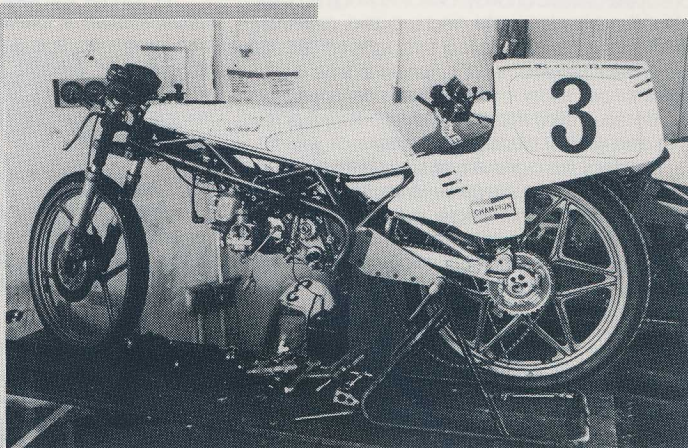




Number One, the world champion Stefan Dorflinger on the Monza grid.

RIGHT: It may say Kreidler on the tank but the only Kreidler part remaining is the clutch with its five friction and six steel plates. There are three possible ratios for each of the six gears.



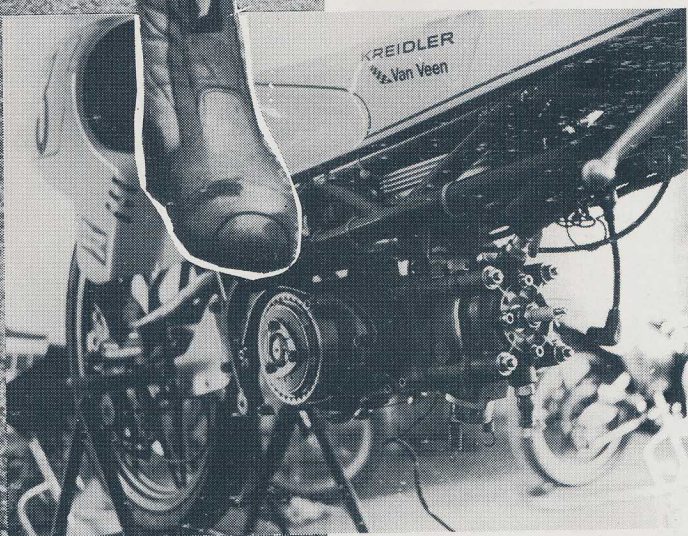
ABOVE: A small plastic breather bottle and the 28mm Mikuni carb completely hide the tiny engine. The four-spine frame is made in chrome moly.

EVEN before they were restricted to 30mph no one could pretend that road-going fifties were not sluggish machines. Unbelievably, the same one twentieth litre capacity, the size of a tube of toothpaste, in the right hands can produce 21bhp and propel man and machine along at 125mph.

The crowned masters of 50cc grand prix racing are Herbert Rittberger and Stefan Dorflinger. Rittberger has a genius for providing motive power and Dorflinger knows better than anyone how to use every ounce of torque and engine revolution.

The pair won the 1982 50cc world championship, won the French Grand Prix this year and were fastest in practice for the Italian round, although Dorflinger got a puncture in the race. In the paddock at Monza, I spent some time with the team to find out just how they make so little go so fast.

Rittberger, 34 years old, made fast 50cc racing engines long before he linked up with Dorflinger and gained sponsorship from the likes of Krauser that enabled him to produce such professional machines. He raced himself for ten years, and his race-winning engines are built thanks to his accrued knowledge and complete dedication to the task.



Beneath his house is his workshop with dynamometer, lathes, milling machines etc. That's very useful because, as his wife points out, many of his best ideas come to him in the middle of the night. "He wakes up", she said, "goes downstairs to the workshop and his drawing board and stays there until he has worked through the idea and committed it to paper."

It is very difficult to say how Rittberger extracts so much power from the engine. They are, after all, simple units restricted by FIM regulations to a single cylinder and six speeds. There can be nothing simpler than a single cylinder two-stroke, although the engine does have disc-valve induction.

Rittberger's not about to show everyone his cylinder design and tell you the port timing but he does use six transfer and three exhaust ports. The bore and stroke is 41.5mm by 36.8mm, making a total capacity of 49.78cc.

Although the engine must obviously be jetted correctly, Rittberger does not spend an inordinate amount of time fiddling with jet changes during practice. Carburation is not ultra critical and more attention is given to gearing as this is seen as the most important factor. Internal ratios are changed to make the very best use of the power.

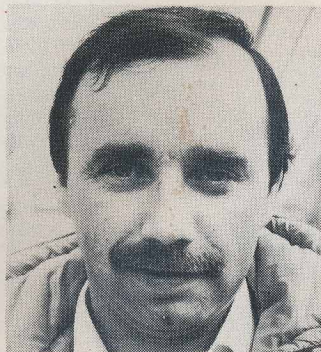
Rittberger has different exhaust pipes and modified cylinders with slightly different power characteristics, but there is no real chance to use a bigger spread of power as that would sacrifice peak power.

It's because of this that the same combination of pipes are used almost all the time. This produces a power band from 12,000 to 16,000rpm with the real power above 14,000.

For most circuits, Dorflinger uses a long gap between first and second which explains why he is sometimes not first away from the start line.

This long first gear means that the other ratios can be close and specifically chosen so that the engine only loses 1000 revs on a

HALF PINT WITH A QUART OF POWER!



Herbert Rittberger—getting more from less.

Herbert Rittberger, the designer behind Stefan Dorflinger's 21bhp 50cc championship winning machine talks to Technical Editor Peter Clifford

change.

Some circuits are different; Jarama in Spain for example requires a closer first to jump because of the hairpins but the main straight is downhill so the gap between fifth and sixth can be greater.

Top speed is a battle against the air and the fairing on Dorflinger's machine is rather special. It was designed in Mercedes' wind tunnel along with the seat.

The very narrow radiator that runs from under the steering head to the bottom of the fairing allows for minimum fairing width thus the machine has a tiny frontal area and makes a minimum disruption in the air.

The efficiency of the radiator is very important because Rittberger insists on controlling the engine temperature at 60 degrees centigrade. He claims that either side of that temperature figure the power drops off quickly.

Water is circulated by a small electric pump slung under the engine. This avoids the power

loss inherent in an engine-driven pump.

Internal losses in the engine are obviously important when you only have a little over 20bhp to start with and Rittberger puts a great deal of effort into careful design and manufacture of the gear primary drive and the gearbox to minimise power loss. It's impossible, he says to get much better than about 1½ horsepower loss from crankshaft to engine sprocket.

His engines that produce about 21 horsepower are measured at the gearbox. That is an impressive figure. It doesn't require a maths degree to work out that 21bhp from 50cc is a much better horsepower per litre figure than 135bhp from a 500.

Rittberger says that he would very much like to try his hand at building a 250 or a 500 if someone was to finance it, but he is convinced that the 50cc class—and the 80cc category that will soon replace it—have something to offer over the larger capacity machines.

"Building a fast 50 or 80 is

more to do with hard work, knowledge and skill because there is not a lot of money involved. I also like it because it is a very good test of an engine designer.

"With the 500 class, there are very few riders that can use the power properly and there are problems with tyres and frames. With the 50s, it's obvious whose engine is best because that machine will be fastest."

If Rittberger sees the 50cc class as a pure test of engineering I think he has undersold the talents of Stefan Dorflinger, who, when I spoke to him, was considering tactics for the following day's race.

"Lazzarini's Garelli handles better than my bike through the long fast corners where my frame seems to twist, but I can make up ground through the chicanes."

Dorflinger knew that he would have to get his tactics right because if it came down to a last-lap effort, the long fast 'Parabolica' turn onto the finish straight would be to Lazzarini's advantage.

"Slipstreaming is obviously very important. You can gain a lot by using the tow effect as you change gear. Not just Lazzarini's slipstream but slower riders as you come up to lap them."

To help Dorflinger cheat the wind, he had a new riding suit made, not of leather but a synthetic material said to be much stronger. It was thin and clung to his body. There were no sponsors patches on it to disrupt the airflow, instead names were printed on. It weighed 2kgs (4.4 lbs) less than his leathers and the world champion commented that he could feel the wind across it and was able to judge how well he was creating a smooth airflow.

Between Rittberger's efforts on the dynamometer and Dorflinger's efforts on the machine, the 50cc world championship is in the hands of a very capable pair who will take a lot of beating

Rittberger is well advanced with the 80cc machine he is building for Zundapp and Dorflinger has tested it. Next year that will be something to watch.

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