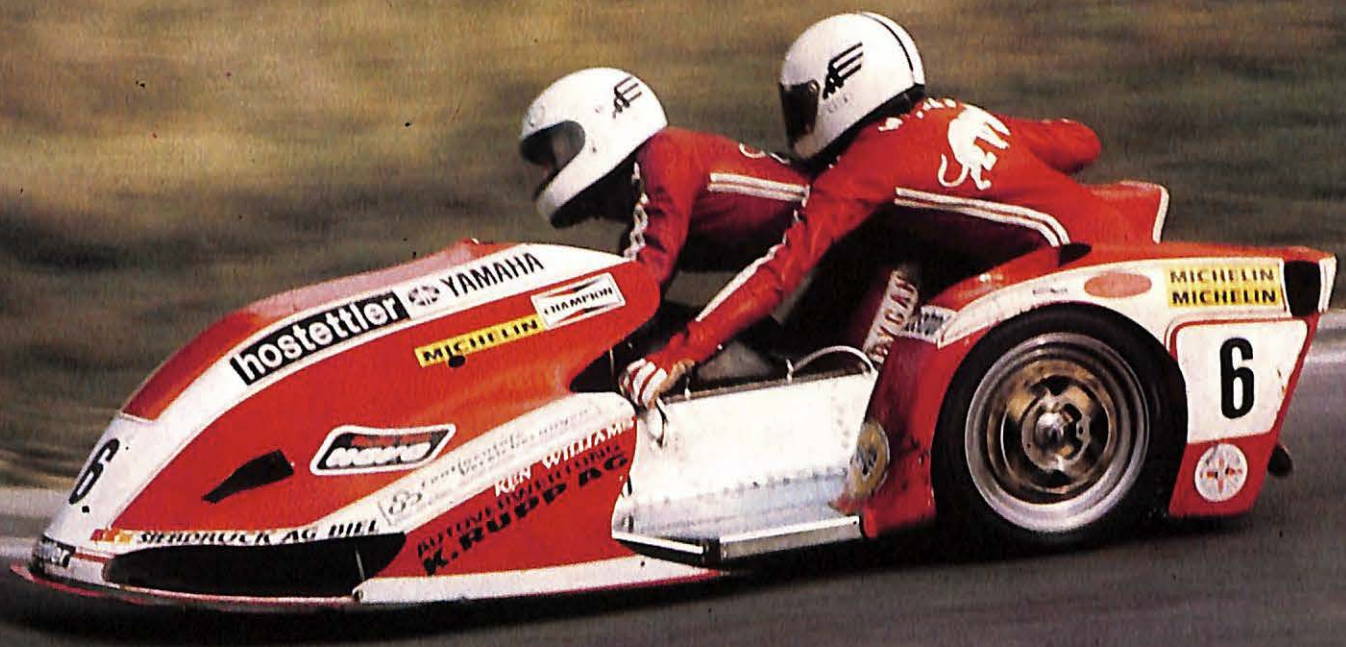


Motorcycle Sport

MARCH 1977

VOLUME 18 NUMBER 3

PRICE: 25p



BMW R100S Tested ★ A Year's Riding — and Racing
Yamaha RD400 in Production Racing
Sport Commentary ★ Trial and Terror ★ One Track

Another source for Yamaha piston rings

THERE IS a large number of racing Yamahas of various types to be seen on the circuits in the UK. Every one of these is a potential customer for piston rings and pistons, and it was inevitable that AE Auto-parts—the makers of Hepolite pistons—should take an interest. For some years the price of Yamaha pistons and rings has been too low for the limited production runs that AE would require to be economic. In the last year or so there has been a frightening acceleration of prices for spare parts, and indeed for the machines themselves. The pistons produced by Yamaha for the TD series of racers are still priced at too low a level for AE to compete, but the rings are a different matter. Early in 1973 the AE caravan began to appear at meetings offering a range of racing piston rings. Other manufacturers have also made rings for Yamahas, notably the Omega concern, but now AE were sure that they had the right product at the right price. There are ring sets for TD2, TR2, TD3 and TR3 models. Due to the common features of most of the current range of Yamaha racers, the TD3 and TR3 ring sets are equally applicable to TZ250, TZ350, and TZ750 models.



The TR3, TZ350, and TZ750 all share the same bore and stroke—and indeed pistons as well.

I bought several sets of rings for my TR3. and used one set in the practice sessions of the Manx GP. The ring set was numbered R26320, and is available from AE Autoparts at their Bradford address where a keen and energetic man will deal with your request if you cannot catch him on the circuits that he visits. The address is: PO Box 10, Legrams Lane, Bradford BD7 1NQ. After using the rings for a while, I sent them back to Mr. Whitley at Bradford for a laboratory check to see what had happened during their use under defined conditions.

The ring set was packed with a slip that stated firmly that the rings were tapered in cross-section, and *must* be fitted the right way round. Several of us squinted at the rings until we had all hypnotised ourselves into agreement. In point of fact there is no taper on these rings, and the packing slip is incorrect. With TR3 barrels at the price they are, and in the Isle of Man, I was not very keen to find that I had put rings in the wrong way round in error: It could have been my last. It is interesting to note that the genuine Yamaha rings are marked with a small "n" to indicate the top face, so presumably the Yamaha rings are tapered, although I have never been able to detect any such taper by eye. AE have now

changed their packing slips and their boxes as a result of my complaint. My TR3 barrels are completely standard with no modification of the post shapes or angles at all. The rough edges of the port entry are smoothed out to minimize ring trapping: this gives no change in shape as only the irregularities in the radius into the port are removed. These details are very important if anything is to be deduced from my experience with the rings: changes in port timings or profiles can drastically shorten ring life.

Seven laps of the Isle of Man were completed using r.p.m. up to, but not exceeding, 10,000; normally about 9,800 was used as a limit. This is a mileage of about 280, and is roughly the normal life of a set of rings, albeit under more severe usage.

When removed from the pistons one appeared to have lost its tension, and there appeared (from the visual check) to be loss of ring edge. The pair of rings were then set aside to be sent back to AE for inspection.

Recently I received the report: it makes pleasant reading, as the wear after 280 miles was minimal. AE rings are made of a material with a greater ductility than Yamaha rings, and certainly seem to be a little more flexible.

Neither ring was fully bedded in: a far cry from being worn out to say the least, and both were still at closed gaps of 0.017 in. Although one ring seemed, when removed from the motor, to have quite lost its tension, the laboratory check confirmed that both were exerting the same (correct) wall pressure.

The edge of the ring is a key factor in performance of the ring, and a certain amount of radiusing had taken place due to the usual slight entry into the ports. The rings were sent to the AE standards room for inspection and copies of the projection are reproduced above. The radius extends about 0.010 in. across the width of the ring, and is 0.002 in. deep. Projections across the width of the rings revealed that the edges were in fact broken by tumbling during manufacture as is specified for the production process. When the AE rings were compared with Yamaha's own rings it was noted that Yamaha, too, supplied rings with a slight radiusing on the outside edge, and this radius is comparable with that specified for the AE articles.

Those who ride Yamahas will be as surprised as I was at this lab. report, as the rings had covered 280 miles at 8,500-10,500 r.p.m., with long periods at 9,500 and above on the Isle of Man circuit. The barrels were absolutely standard, and the machine was warmed up well before use. The fuel mix was 16:1 Shell Super MR30 grade, and the jet size in the carburettor was 360. Standard heads were used with a slight *decrease* in the combustion volume produced by a light wiping with emery paper while the heads were spun in a lathe. Less than 3 c.c. was removed in the process which slightly altered the squish band radiusing.

The testing of mechanical components is always difficult, but the help of the AE Technical Services Department has given us the opportunity to report on one expensive racing consumable item with some precision. I shall be buying more rings (TD3 this time) as a result.—M.R.W.

Personally I would like to try a galvanized exhaust system—I once had a pair of rusting chromium-plate mudguards grit-blasted and zinc-sprayed, they were perfect 18 months later when I sold the bike.

I realize the complete bike is going to look rather odd, not to say ugly, but as you may have gathered now, I have motorbikes to use, not to look at.

I expect your biggest problem is going to be eliminating engine vibrations, but my Velos were not bad at all, and the Vincent Comet is very smooth; so we know it can be done without counter-balance shafts, and I don't want rubber mountings. Your best bet is to extract the power at low revs, after all you will only need about 30 b.h.p. DIN.

In spite of the fact that there is not one idea which has not been used successfully before I do feel that designing this machine to be light, cheap and easy to work on is going to be more of a challenge than the 32-valve V8 I expect you to announce at any moment.

If you try hard you should be able to get the price down to that of a Japanese 250, and the weight very little more; and then I think there may be a number of others who would buy this modernized old banger. Until it is available I look forward to selling (oh! how I look forward to selling) the MZ ET5 250 at the end of my tour here in Cyprus and returning to my Vincents.

MIKE BARRETT