

Tuning work – MB TS1, 5 Speed 230

TUNING WORK MB TS1 5 SPEED 230

There has been 5 speed gearboxes for years way back to the 70's! All Italian and all very err crap! They didn't last 2 minutes before the teeth or selector would strip and that would be it. They got resurrected by Tino Sacchi and Cambridge, but the news was they couldn't get off their estate before they broke, anyway our 5 speed gearbox has nothing to do with the Italian versions.

I commissioned them to be designed and manufactured in the UK. I wanted them to be a semi mass produced gearbox for everyone but it wasn't that easy! First off there is very limited space to add a gear! Then you need to get the gear ratios where we need them.

It's quite a story, all very technical, interesting for some and boring for others.

When something like this gets designed there are so many things to think about, I entrusted the tech design to a company who makes one off race gearboxes for lots of bike engines, they have even made parts direct for Japanese bike manufacturers when they have needed one off gearboxes for certain tracks in Europe along with IOM TT bikes so the manufacturers know their stuff!

This does not come cheap! The company didn't know how a Lambretta engine worked. It got complicated between road-race engines, motocrossers and enduro bikes. Luckily I knew a little about Lambretta engines so we designed on paper a few scenarios and went from there!

So how do you squeeze an extra gear in? Well I cut up a casing! Then this is where the company came in and using their experience they designed a cluster where the 5 gears were pressed onto a shaft and vacuum welded together, there is no gap between each gear. This gap on a standard cluster is where the gear hopper pushes metal away so you need the gap! Add the gaps up and there is an extra gear, easy! Then it was a case of using an existing 1st gear modified for the slightly thinner 5 speed selector! Apparently my Lambretta gears are the same width as these 200bhp monsters so should be strong enough!

I never even asked for a quote when I commissioned them! When they turned up the cluster, 4 new gears, modified 1st gear and gear selectors were a work of art! They didn't just do one box but two and some spares! And then the price..... wow it was a shock! There is no way at this point that we can put them into production, they are too expensive! For me the price didn't matter the quality was superb!

Moving on I fitted it to my 30+bhp TS1 which was transformed into a motocross Lambretta, on about fun! I thrashed it wherever I went, just to try and break

it, I couldn't. It was a bit silly really, flat out in every gear on little country roads over taking all the cars with ditches either side, I wouldn't have had a chance if it locked up, but these things you don't think about at the time, if you did you wouldn't ride a Lambretta.

It needed a road test or two to work out power spread and power delivery to work out how gear ratio rises and drops. This needs doing to suss out when you change gear you don't drop out of the power band. The high powered peaky TS1 engine was perfect for this. Add to it the extra benefit of an engine with a wider power band you can see the potential of a 5 speed gearbox.

I asked the company to remake some different gears with different ratios to spread the gear percentages, which they did in a few weeks amazing! These I fitted to my Pushpak ready for the Spanish Euro..... that ended up having dodgy electronics and I didn't do the Euro, hey ho!

Anyway a very good customer of ours found out I had a spare gearbox and begged and begged and offered a very good price! Well along with a full MB engine I sold it. So now there are two people who own these very special gearboxes, I'm one and the other is our customer. If I was going to sell my 5 speed box then I wanted to build the engine, obvious really, I just wanted it to be right for the customer, it's not one of those parts you just fit!

As it happens it did just that..... every part fitted perfect, the 5 loose gears, the cluster, gear selector and all went on our MB layshaft, it assembled perfect, the gear shimming was perfect at 2mm, amazing but that's what hard graft, design, testing and knowledge does to he who waits!

The engine spec is

- TS1 cylinder
- Thicker modified side plug head
- MB Race-Tour piston kit
- MB Race-Tour 60mm x 110mm crankshaft
- MB road tune
- Early AF flywheel
- BGM stator
- MB Race-Tour 46 tooth 5 plate clutch
- MB 5 speed gearbox
- 19 x 46 sprockets
- MB top slipper
- 35mm TMX Mikuni
- And all the usual MB internals

When I do engines I spend time interviewing the customer to find what he really wants from an engine! When you find out the customer is 17 stone, you don't go ahead and make a peaky engine, he wanted a MB Dev-Tour to spread or lower the power as well. So it was a case of design the porting spec to spread power, make the engine ride-able, pull the weight and work with the 5 speed box.

To prove it, we set the engine up in our jig and swap pipes to show exactly

what the customer can expect when fitted in the frame. As part of the Big Box Clubman development I planned this engine to be finish at the same time as the RT reed engine shown elsewhere in the Clubman information pages.



5 speed assembly



5 speed on the layshaft



MB Race-Tour layshaft



✘ 5 speed cluster ✘



Each gear is marked up

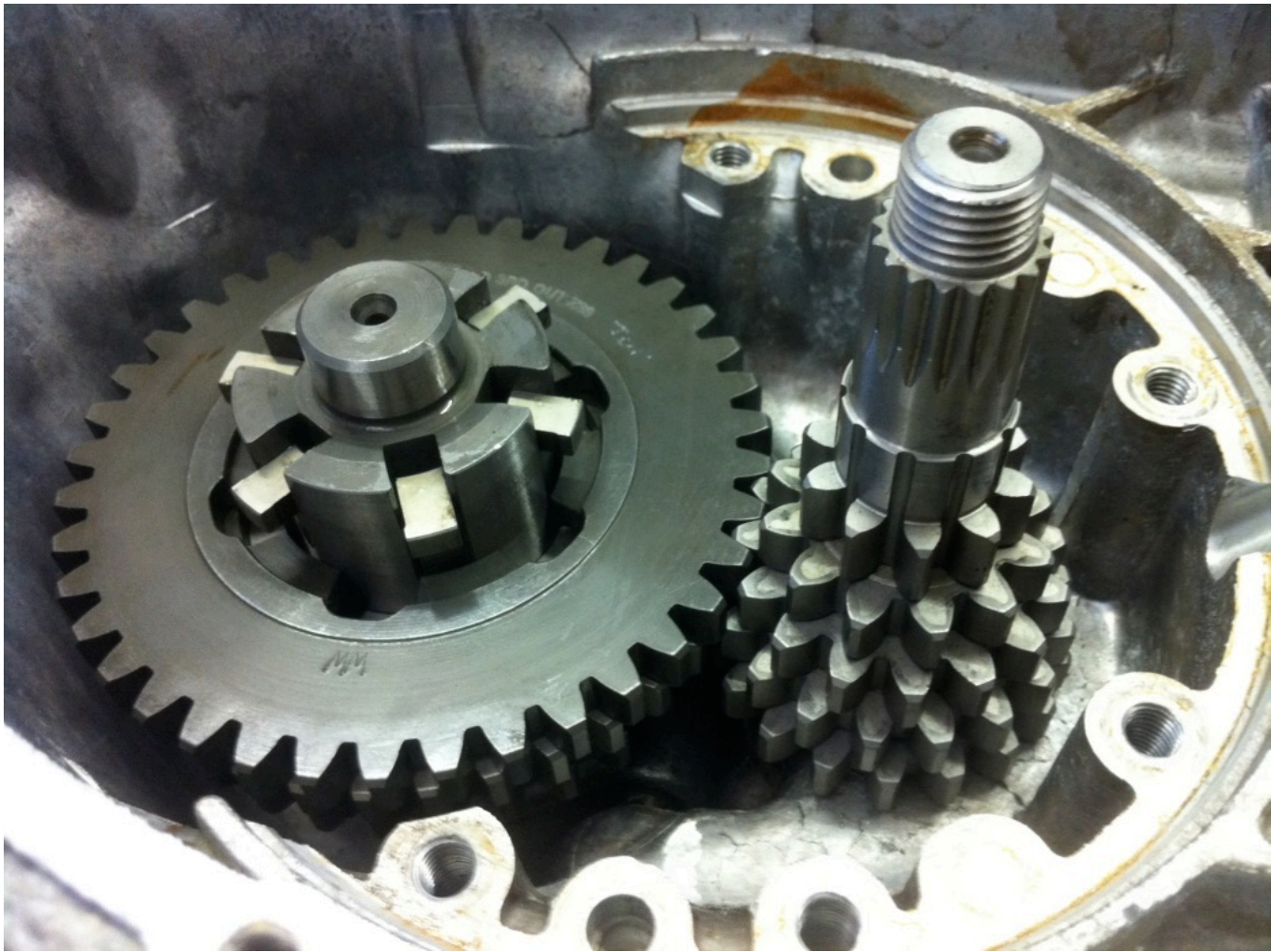


Road tuned exhaust port showing the MB forged piston





Old early AF Rayspeed flywheel, nice and light which gives power



MB5 part fitted



Completed MB5 TS1 rebuild

Mark Broadhurst. If you have a question then please Email Mark on mark@scooters.co.uk