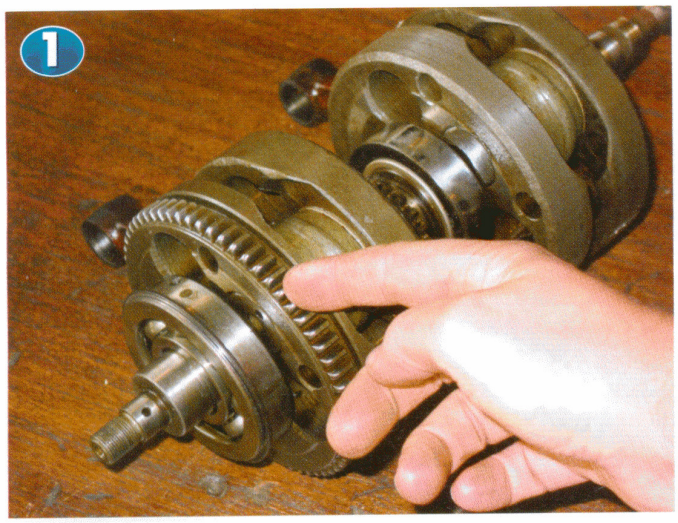
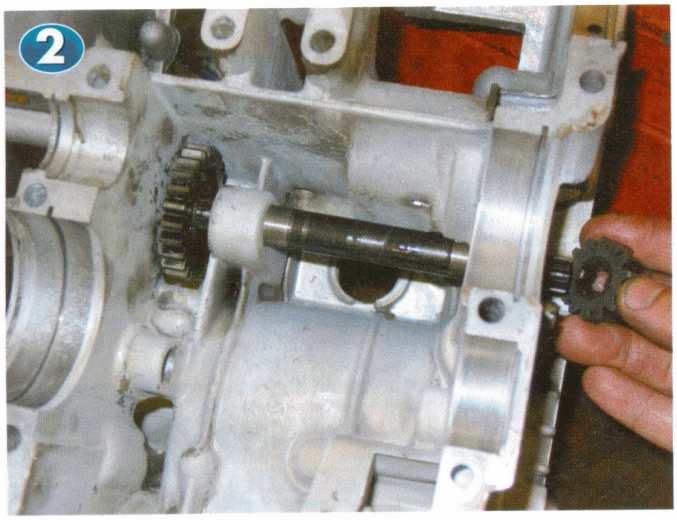
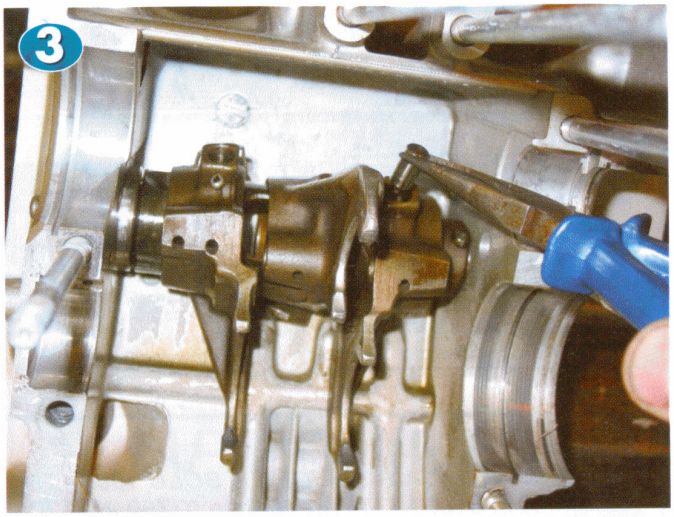


Looking so good. Now for the chassis

Rod Gibson completes the engine rebuild but it's not back in the frame - his friend Lorenzo is so pleased with the motor that he's now going for a full restoration.





LORENZO'S engine proved last month to be in pretty good condition having been stored in a damp cellar for over five years. A full strip of the engine revealed no major problems, only the front camchain slipper blade being urgently in need of replacement.

I've had the head and barrels bead blasted and we've opted to replace the camchain. So, armed with a gasket set and a full set of replacement oil seals I'm now ready to rebuild the engine.

Picture one: The roller bearings fitted to the main and big ends are more or less bulletproof unless a major lubrication failure has occurred. The crank has shown no signs of distress so I'm happy about re-fitting it. The starter drive gear, indicated, shows some signs of wear but this is not excessive.

Picture two: Before assembling the crankcases I start by re-fitting the starter crossover shaft and its drive gears. This can be really difficult to engage later, as I discovered during the engine strip.

Picture three: The gear selectors also need to be assembled into the top crankcase half at this stage. I've been careful to keep the three selector forks in order and can simply slip them over the selector drum as I slide it into the crankcase. Each selector fork then needs its respective pin sliding into place until it engages with the track on the selector drum. Then I slide a cotter pin into place and bend the ears over to secure the pin.

Picture four: This cross shaft also serves to locate the three selector forks in the correct position. There's a fair amount of movement in the selector forks with everything correctly engaged. This undoubtedly helps gear selection but is also probably responsible for the traditional Yamaha 'clunky' gearbox.

Picture five: Now I can position the crankshaft and the two gearbox shafts into position in the upper crankcase half. I've placed new oil seals on each end of the crank and on the gearbox output shaft at this stage, and made sure the gearbox bearings are engaged with their respective locating rings in the crankcase. I'm fitting a new camchain too, so I've hooked it around the crankshaft before proceeding.

Picture six: After applying a thin smear of Blue Hylomar to the jointing faces, I can now fit the crankcase halves together and refit and tighten the bolts. The workshop manual gives a tightening sequence but if in doubt I always tighten the bolts in a diagonal pattern working from the centre of the engine outwards.

Make sure the shafts rotate easily in their bearings before proceeding. The starter motor fits underneath the XS650 engine so I refit it now to save problems later. The starter reduction gears can then be fitted as an assembly to the left side of the crankcase.

Picture seven: Turning the engine right way up, I can now lower the barrels into place after greasing and fitting a new base gasket and O-rings. Many people like to use ring compressors for this job but I prefer to gently ease each ring into the freshly oiled bore with the aid of a small screwdriver. Once all the rings are engaged the barrels should tap gently home with a rubber mallet.

Picture eight: With the barrels seated on the crankcase mouth I can fit the new front slipper blade into position and bolt it up with the two M6 bolts. The cylinder head then simply slides into place over the studs, having first made sure all dowels are in place, and I'm ready to refit the camshaft.

Picture nine: As with all engines, the valve timing needs to be spot-on and it's worth taking time to check and double check the