

# FITTLE BSA TWINS

*Cake Street Classics, a restoration and parts specialist in Suffolk, focuses on pre-unit BSA twins, mainly post-1953 650cc A10s and 500cc A7s from 1950-1954. Proprietor Roger Sharman passes on some of the expert knowledge he's gained over 20 years*

Words: Mick Duckworth. Photography: John Noble

## Crankshafts

From 1958, A10 engines were built with the 'big bearing' crankshaft. Its big-end journals are of 1.686in (42.85mm) diameter instead of the earlier 1.460in (3.71mm). I've never had a problem with the earlier crank, but it only has a 1/4in oilway through it without a sludge trap. Nearly all of the big-bearing type have a proper trap. It always fills up with gunge and should be cleaned out during any bottom-end work. Something I didn't notice for years is that the smaller diameter big-ends on earlier shafts have wider shells, so the actual bearing surface areas are probably not that much smaller than on the later cranks.

## Anti-drain valve

I am always surprised how many people don't touch the slotted screw in the inside wall of the timing-side crankcase because they think it is just there to blank off an oilway. It is popped-over with a punch at the factory but should be removed during any bottom-end overhaul. Taking the screw out will reveal the anti-drain valve on the feed side of the lubrication system that prevents wet-sumping. It consists of a spring-loaded ball and invariably gets gunged-up, making it stick.

## Cams

BSA's 67-357 high-lift camshaft, called the Spitfire cam because it was first fitted to the Spitfire Scrambler variant of the Super Rocket, is the one that most owners want to fit if they are looking for the best

performance from a six-fifty. Supplies of originals have run out, but I have had 50 copies of the 357 made in the UK, selling for £150. When it is fitted, there is a very limited clearance between the lobes and the crankcase metal. This means that oil, which is subject to centrifugal force, is likely to be wiped off the cams. So I always machine out the gallery for better clearance, although it is tricky to do.

## Cam followers

I carry out a modification that ensures the best possible oil supply to the cams. Oil normally drains down from the rocker boxes through a passage at the rear of the cylinder barrel. I block it off with a threaded plug (I have also successfully filled it with MIG weld) and machine a groove along the length of each cam follower. The oil then has to drain along the grooves and hits the cams, which is exactly where you want it to be. I don't know why BSA didn't do that.

## Oil pump

The pump's zinc-alloy body is liable to distort over time, but I can get most of them working properly again. I have a test rig powered off a lathe for checking if a pump is performing well and if it is, there's no harm in putting it back on. Some people don't realise that a fibre washer is meant to fit over the front mounting stud, sandwiched between the pump body and the crankcase. If it is left out, the pump body distorts when you tighten it down. The A10 pump was changed during

production and you get better flow from the later type with fewer teeth.

## Cylinder head

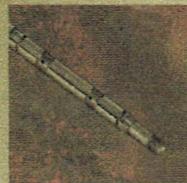
Over time, the cylinder head retaining bolts and their washers recess down into the alloy head casting, which can be the cause the bolts to loosen off, so I resurface around the holes on a milling machine. Another milling operation is to re-finish the rocker box joint faces. I don't make them perfectly smooth but machine a slight texture onto them, which keys onto the gasket material when the joints are tightened down, making for a good seal.

The copper head gasket can be reused after annealing, which is done by making it red hot then dropping it in cold water. After the first tightening-down of the head to the book figure of 28lb.ft, I warm up the whole top-end with a heat gun before giving it a final tightening to 30lb.ft. I find that heads from 500cc engines are always in better shape than those from 650s.

## Timing side main

The plain bush timing-side main bearing is considered a weak point on these engines but it can give satisfactory service. I've stripped high mileage engines and found bushes in near-perfect condition. People don't realise that this bearing runs in a copious supply of oil. The drain for returning oil from the timing chest into the crankcase determines the level, which is well above the lowest point of the bush. A new bush should be checked against the crankshaft before it is fitted. With the

## Tools of my trade Roger Sharman



### ROCKER TOOL

Lining up the rockers, spring washers and flat washers in the rocker box can be fiddly but with this tool you can get them in position so

that the spindle can be pushed in easily. It's a spare spindle with a taper ground at the thread end.



### FRAME FLARER

My frame spreader is used to ease the downtubes on a BSA duplex frame apart, making it easier to slot the engine into its mounting and helping prevent

damaged paintwork. The two pieces of half tube lined with rubber are prised apart by turning a nut on a thread.



### BUSH FINISHER

I always use this little scraping tool to finish the inside diameter of the timing-side bush, carefully relieving any high spots to ensure uniform

clearance all round, which is filled up by oil under pressure when the engine is running.