



## It's Exhausting !

As I'm sure many of you know; the exhaust system of any internal combustion engine vehicle performs a very important function and this applies even more so where a two-stroke engine is concerned. If you didn't know this, then there's plenty of information on the web that will explain why. If a correctly timed/tuned exhaust system is used, the extra power that can be realised is amazing. The calculations that are involved in getting the exhaust to work correctly/give maximum power at a given RPM, are very involved. One important aspect of design is the length and bore of the header pipe i.e. the bit that bolts onto the cylinder block and leads into the rest of the exhaust. The GT750 was designed as a tourer and as such, didn't require a peakily tuned exhaust, unlike most sporting two strokes. The Kettle's system was designed to give a smooth power curve from low down through to its upper limit of 7,000 RPM, which is quite low for a two stroke engine. Now, I won't go into why but I've recently cut the header pipe off a Kettle exhaust, just before where it is welded to the silencer and I was quite surprised at what I found! Although the header pipe looks perfectly round, it normally isn't (I've cut a few up in the past). It's not far off, but it varies by a couple of mm, probably due to how they bent/formed the tube in the factory. Anyway, using an average of 43mm internal diameter gives a cross sectional area within the Header of 14.52 cm<sup>2</sup>. This would have been taken into account by the Suzuki engineers all those years ago. The header pipe is formed from roughly 2.5mm thick, welded seam, steel tubing, which would make it quite a job to form into a header to start with. And that's fine and dandy if the pipe remains the same size/diameter throughout its life, but it doesn't! I'm not referring to the expansion and contraction that occurs due to heating and cooling during normal use. No, I'm referring to the carbon/oil build up that decreases the bore diameter of the Header over its life. As anyone who has tried to have their pipes re-chromed will tell you, many chrome platers won't touch two-stroke pipes

because the carbon and oil contained within contaminate their chemical baths. The only time that some firms will entertain the idea is when they are due to renew their chemicals and then it doesn't matter.

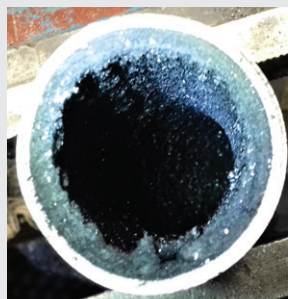
But I digress; back to the bore size etc...The pipe I've recently cut had a large deposit of hard carbon (difficult to remove) of surprising dimension. A layer roughly 5mm thick, coated the whole internal circumference of the header (refer to photo). So, using this as an example; if we once again take an average of the inside diameter of the carbon at 34mm, we end up with a reduction in cross section that is only 62% of what it should be! This will without doubt, adversely affect an engine's performance.

So as you may have been told in nursery all those years ago; you need to go regularly to keep your passages clear! There are many ways of doing this, Caustic soda and/or a hot air gun are just 2 methods and I'm sure there must be others. May the force be down your pipes and may your passages always be clear!

**Nick Lowe**



*This is typical of what you might see at the end of the header upon removal of the exhaust.*



*This is what I found deeper down, when the Header was sectioned. It may look like a rubber sleeve inside the pipe but it's a really hard, baked on oil and carbon mix.*