

## Introduction by Glen Morgan - 1999

In the process of working on my own T500 project I've met a few others with similar intentions. The exhaust system seems to have presented a problem for a few people. The wide spacing of the frame cradle tubes under the motor make it quite hard to simply attach chambers to the existing header pipes and go racing.

Long slim chambers will work and some people have gone down this road. The original exhausts are a kind of long slim chamber with silencers built in. They work quite well, as the performance of the standard road bikes testify.

Standard, welded up and hydraulically formed T500 pipes



The main advantage to making your own chambers similar to the stock "mufflers" will probably be the weight saving. One of the problems, however, will be that your chambers will scrape on the ground just as the stock items do. Take heart though, they will not be any worse than standard pipes and probably better if you tuck them up well.

Having said that, if you are after more mumbo you are going to need chambers with a bit of volume to offset the peakiness that power improving changes to the exhaust ports can bring.

In most cases, a volume increase either means longer pipes or fatter pipes. Longer pipes give peak power at lower revs and they may stick out behind the bike to an unacceptable degree (even on a bike as long as a T 500). There are structural problems associated with this, and if you shorten the bike in search of quicker handling it all gets a bit awkward.

Properly designed, shorter, fatter pipes are better if you are searching for more get up and go. However, it has been said that you will know when an expansion chamber design is right because it will drag on the ground or burn your leg! The truth of this was never more evident than it is in the case of the T500. Mount a chamber of reasonable diameter conventionally on a T500 and you will almost be able to park it in the pits by leaning it over on one of its chambers! This is not conducive to cutting a swathe through the swervery, leaving lesser mortals falling off their bikes in admiration. Nope! You're going to have to convince the bloody things to nestle up under the engine, between the cradle tubes. This takes a bit of bending of header pipes, but it can be done without too many tears. However, you then have to induce the chambers to diverge again so that there is room for the back wheel between them. This is particularly so if you have shortened the swing arm or fitted one from a T250/350.

## Ooops! The back wheel don't fit

Bending chambers every which way takes some technical savvy and a lot of recourse to the old saying: "Think twice - cut once!" - only I find that I have to think several times. Creating your first chamber all by yourself is quite an achievement and stuffing the thing up is not what you want to do.

If it doesn't worry you aesthetically, you can extend long header pipes forward, then back under the bike. This will move the chambers sufficiently far forward that the divergence of the baffle cones may give you enough clearance at the rear wheel, or at least minimise the amount of bending required. If you haven't radically shortened the swing arm, this could be the way to go.

Keep in mind that long header pipes change the power characteristics produced and that the chambers will need to be correspondingly shorter if your chosen tuned length is to be preserved. A long header pipe is not necessarily a bad thing. It can help spread the power delivery of your bike, though it may dampen peak power unacceptably if you over do it.

*There are also some problems with conflicting resonances if components of a tuned two stroke exhaust system fall outside certain limits. This article is more concerned with practice than theory, and if you want to know how to go about designing your chambers, get a book like Gordon Jennings' Two Stroke Tuner's Handbook or the later Two Stroke Performance Tuning, by Graham Bell.*

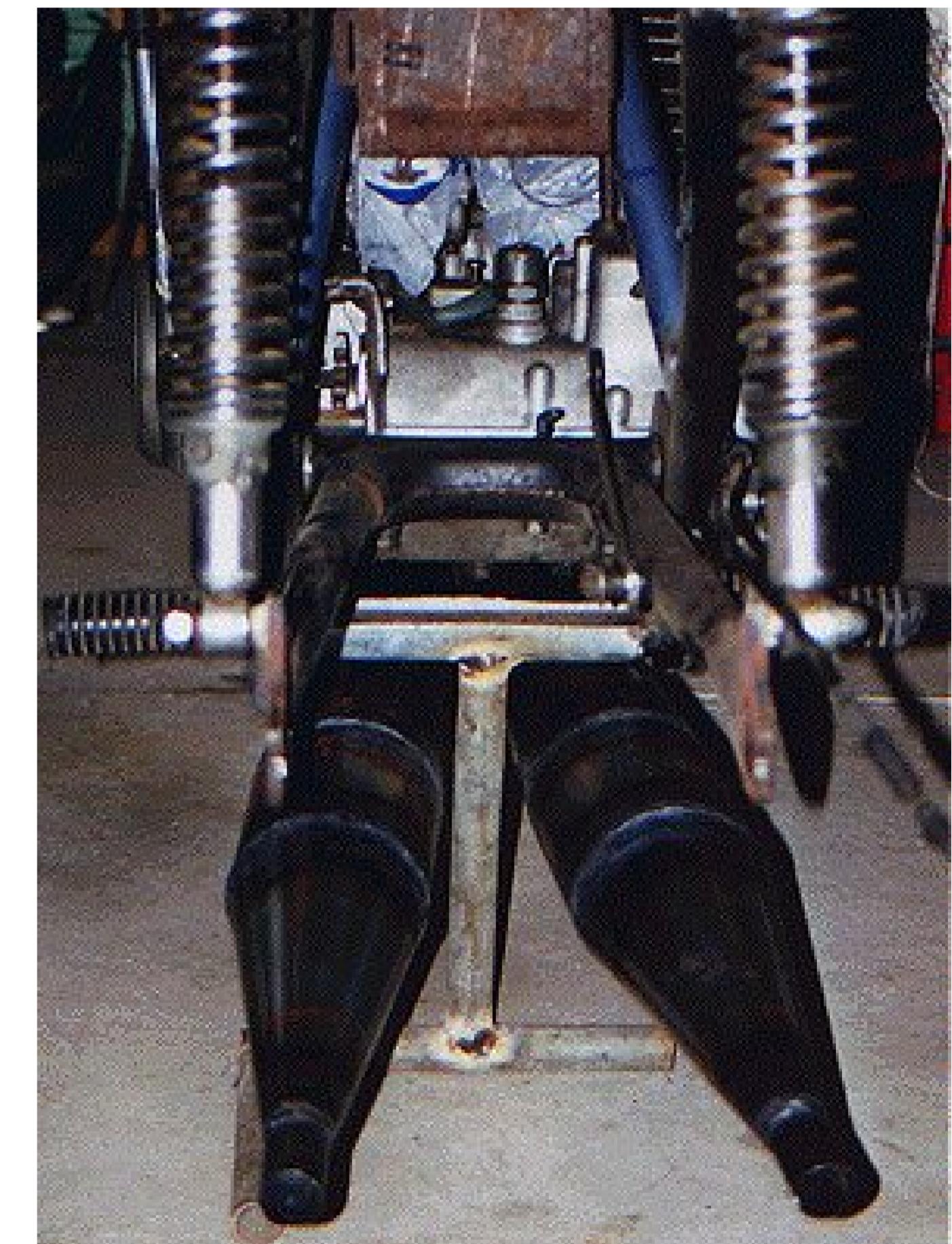
*Bell's book is a sort of practical up-date of Jennings' book, without as much theory. Both are excellent and I would recommend Bell to those who just want to do it, not understand it in great depth. Read Jennings for interest, in fact get your hands on anything written by Jennings if you want to really expand your knowledge*

The other alternative is to use the chamber dimensions that Murray has made available on his T500 Fanatics web site.

You should be trying to achieve performance which is within your technical and riding expertise or your pocket. You will want your expansion chambers to give you power that you can use.

Theoretically you should be able to get over to 45 degrees with the suspension fully bottomed out, without dragging bits of the bike on the ground. 50 degrees may be possible (transiently). In practice, on the tyres we are allowed to use in post classic racing, scraping the pipe could be a timely reminder that we are about to get bits of our anatomy bounced up the road in loose formation.

The picture shows my T500 with the fork springs removed, the stanchions pushed through the triple clamps, the rear shocks replaced by wooden struts and the tyres flattened. This was done to see whether the chambers were giving enough clearance to achieve 45 degrees. They do - just; but I have room to raise the chambers another half inch and I probably will.



Right! Before we get into a bush mechanic's guide to cobbling up some pipes, a comment about stuff on the net, and I don't mean the ladies and gentlemen in exotic positions.

There is a lot of excellent stuff written by people who are sharing their knowledge in the spirit which makes motorcycling a fun thing. There is also some stuff on chambers that has me scratching my head. Still, there is more than one way to skin a cat, and there are doubtless other, better ways to do things than those I have suggested.

I am going to assume that you have minimal expertise, cash and equipment. You will need things like tinsnips, pliers, hammer, hacksaw, a firmly mounted bench vice, some scrap water pipe, a bit of patience and access to a gas, TIG or MIG welder.

