

The Sensible guide to completely rebuilding a set of Mikuni Mark 2 carburettors for the XS750.

## The Basics

Probably the single most important aspect to getting a Yamaha triple to run well is the carburettor. It's not the only thing to get right, but it's probably the biggest source of problems people have with their bikes. Over the years the rubber parts get attacked by fuel, the metal parts corrode and the important-but-oh-so-tiny passageways get blocked by gummy deposits.

The picture at the top of this page shows a set of carbs I bought on eBay, which had allegedly been cleaned and restored, ready to use. They were OK, but nowhere near the standard I wanted. They were also suffering various nasty bodes and temporary fixes, the details of which are too depressing to recount here.

You can do various things to freshen up your carbs temporarily, but eventually you are going to have to strip them apart and do it all properly. This guide is for those who want to do it properly, from the ground up, no expense spared, so that they are as near as possible to when they left the factory.

I haven't described the detail of taking them apart because (apart from seized threads) that's the easy bit. This guide is really more about putting them together again after you've forgotten what goes where.

I'll start with the #1 carburettor, which is the one on the left side of the bike if you are sitting on it and facing forwards. The others are almost the same, but I'll show the differences later on.

## Cleaning

Ideally, this is what you want to start with:



There are some people who clean their carbs in lemon juice or various other chemicals, but for a really top quality finish I have never seen anything better than a combination of ultrasonic cleaning and vapour blasting. I sent my carb bodies to [CC's Carburettor Cleaning](#), near Guildford. The proprietor, Chris Clayden, does great work and is a nice guy as well.

# Fitting The Butterflies (Throttle Flaps)

Start by fitting the butterfly shafts, which of course should have new seals. These were never listed as an individual part by Yamaha, but luckily these are being made by various people now. I got mine from [Mikes XS](#) (part #48-5021). You really don't want to re-use the original seals, as they will be brittle and crispy after 30+ years of service.

As you can see from the picture, the shaft slides in from the choke side of the carb and the open part of the 'U' shaped seal goes towards the outside.



Next fit the throttle butterfly itself. This has to be oriented correctly because the edge of the flap is chamfered at an angle to match the throttle body. It's hard to see because of the camera flash, but there are some numbers stamped into the flap - these should face the front, underneath the shaft.

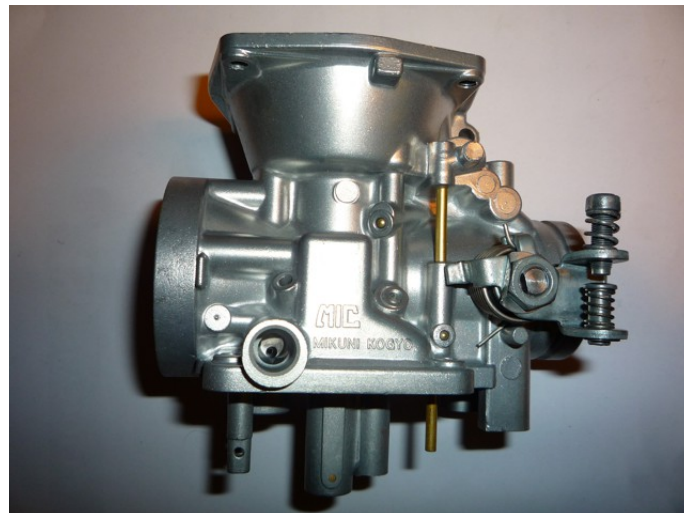
When refitting the countersunk screws in the throttle butterfly, use a small amount of thread lock - if one of these should fall out and get sucked into the engine, the damage could be serious.



Next fit the other shaft seal, the spring, washer and actuating arm, with the lock washer and nut - in the order shown below. Note that the actuating arms are not the same on each carb. The arm on carb #1 is slightly shorter than the one on carb #3, so take care to put the right one in place.



And this is what it looks like when the nut is fitted and the lock washer is bent over:



## Jets

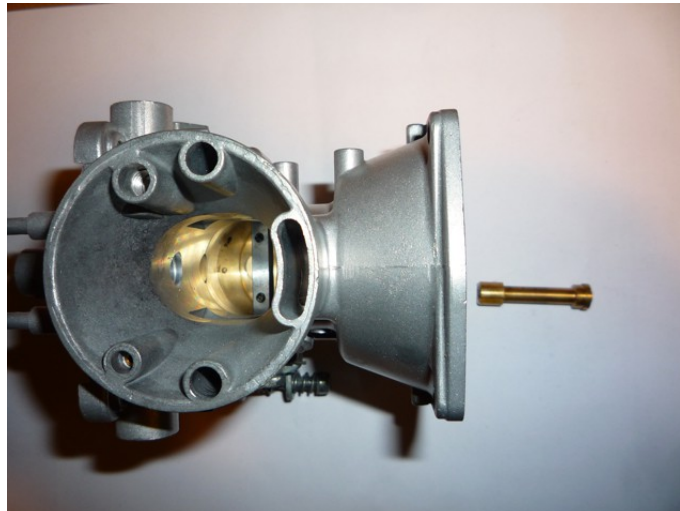
We want to put the jets in next, so it's time to break open the carb rebuild kit. I got this one from a

seller called georgefix on eBay. It's a K&L kit, made in Japan. The quality is pretty good but there is a small problem, which I'll mention later.

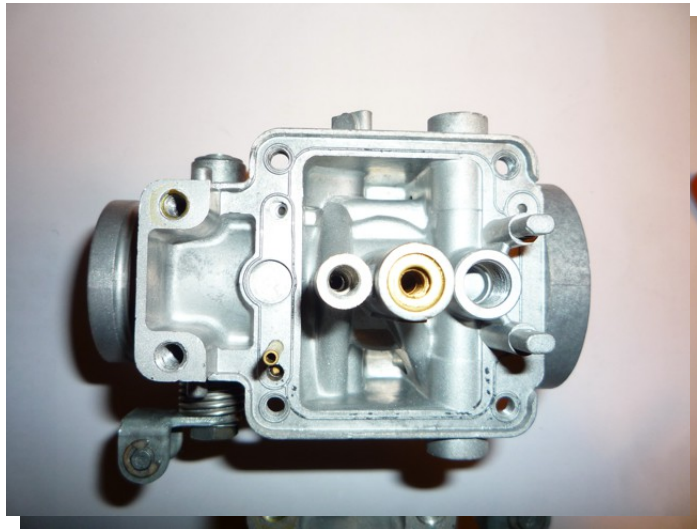


## Emulsion Tube

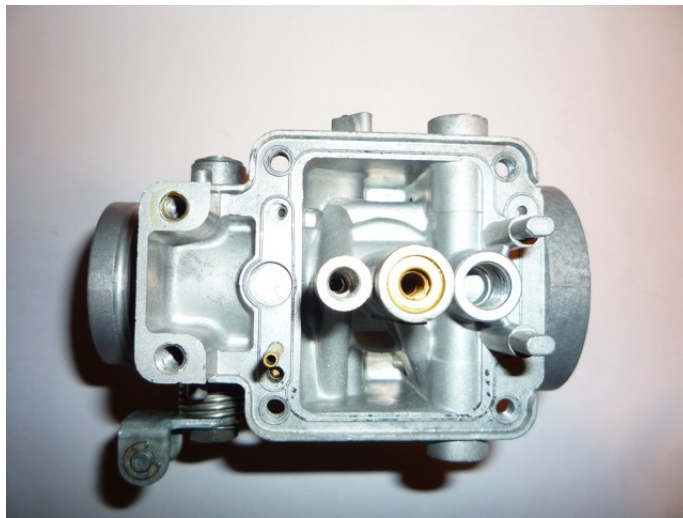
The emulsion tube (sometimes called the needle jet) is the perforated jet which goes into the long tube in the carb body. You don't get a new one in the carb kit, so clean and refit the old one. There is a locating groove in this jet which must be lined up with a small brass peg when you insert it into the carb. You insert it from the top like this:



This is a view of the emulsion jet inserted, showing the locating peg:

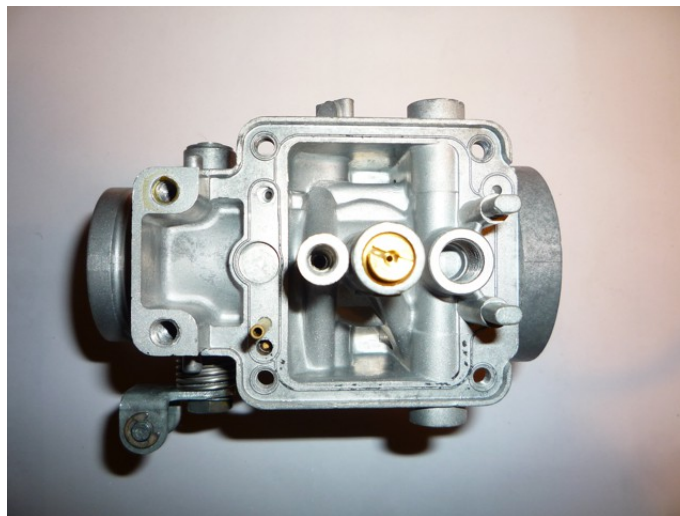


Now from the carb kit, fit the small brass washer:



Main Jet

The main jet screws in next and holds the emulsion tube in place.

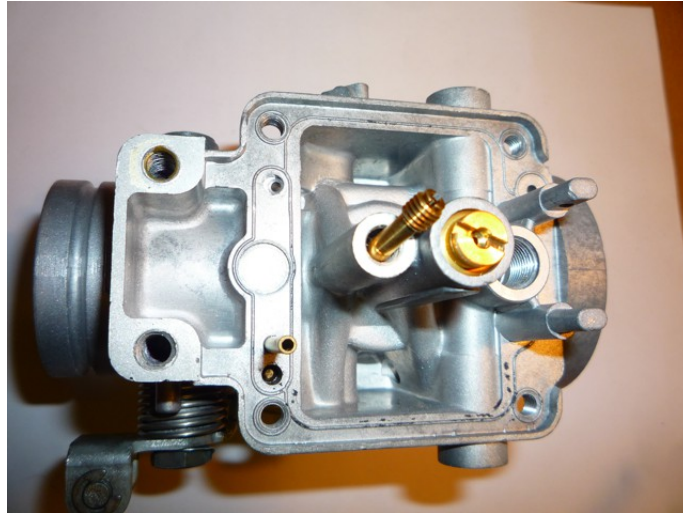


When fitting jets, make sure that the screwdriver is a good fit for the jet and don't over-tighten. The brass material is quite soft and easy to damage.

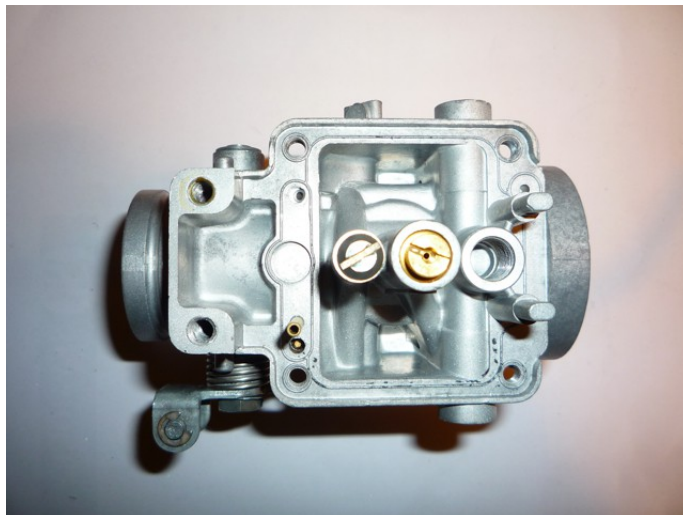


## Pilot Jet

After the main jet we can fit the pilot jet. The originals have perforations running along them, but solid tips, whereas the ones in the kits have solid sides and a perforated tip. However they are supposed to be functionally equivalent so don't worry.

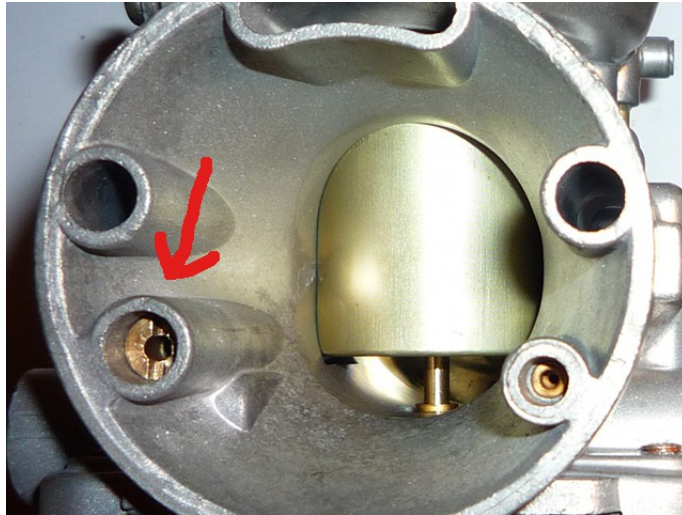


The pilot jet is covered by a cap screw and washer:



## Pilot Air Jet

This one goes in at the back of the carb, as shown (I drew a big red arrow to highlight it).



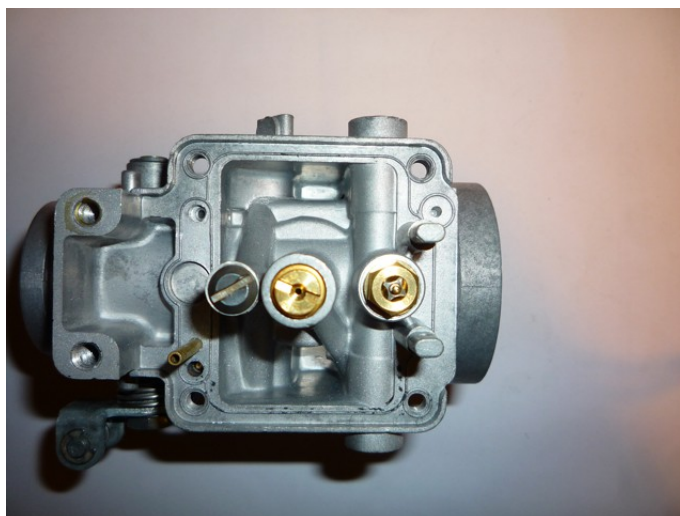
Annoyingly, the replacement jet in the K&L kit doesn't fit. The outside diameter is 6.5mm, whereas the diameter of the original Mikuni part is 6mm. It might be possible to turn the new ones down in a lathe, but I don't have access to one so I just cleaned and reused the originals.

## Float Valve And Float

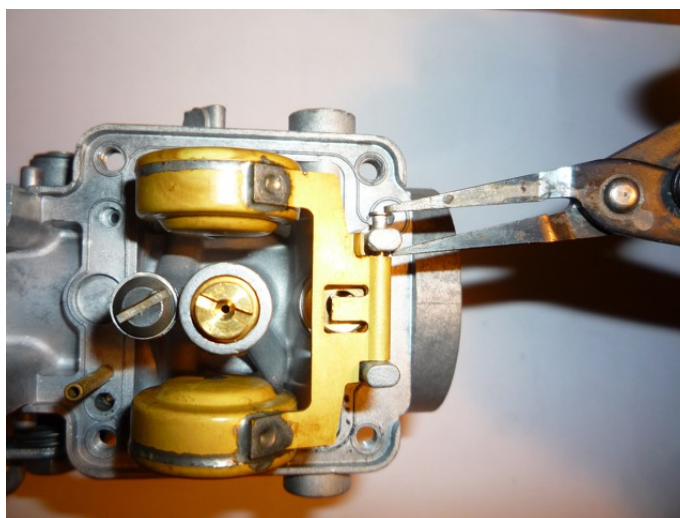
The float valve is vital for keeping the correct level of fuel in the float bowl and for preventing fuel spillage into the engine. These parts do wear out, so you get a new one in the kit. You don't get a new filter screen though, so you have to re-use the original (cleaned if necessary). The picture shows the float valve and filter, ready to fit.



Fitting the float valve is a simple case of screwing it in and tightening (gently) with a 10mm spanner.

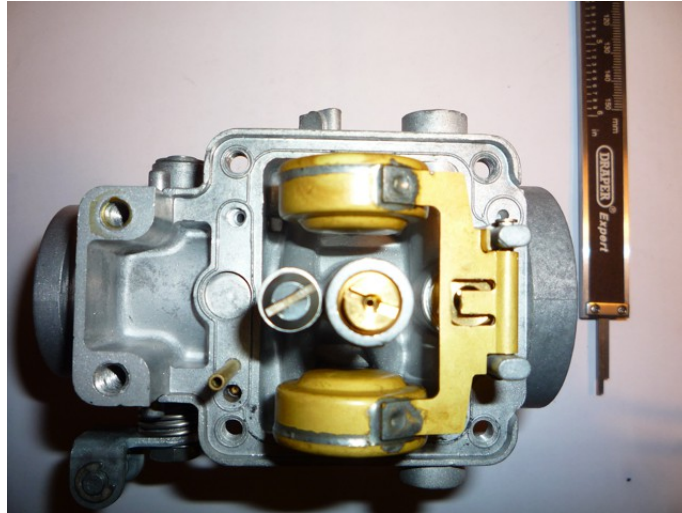


Fit the float next. This is the first point at which things can go horribly wrong, because the float posts are easy to break. Don't ever be tempted to hit the float pin in, instead squeeze it home with suitable pliers.





You have to set the height of the floats by bending the central tang which touches the needle valve. The top of the float should be  $25.7\text{mm} \pm 1.0\text{mm}$ , measured from the body of the carb to the top of the float. I use a vernier caliper to do this, set to 25.7mm and locked. I couldn't take a picture of this work in progress because I didn't have any spare hands, but you get the idea.



## Mixture Screw And Choke Plunger

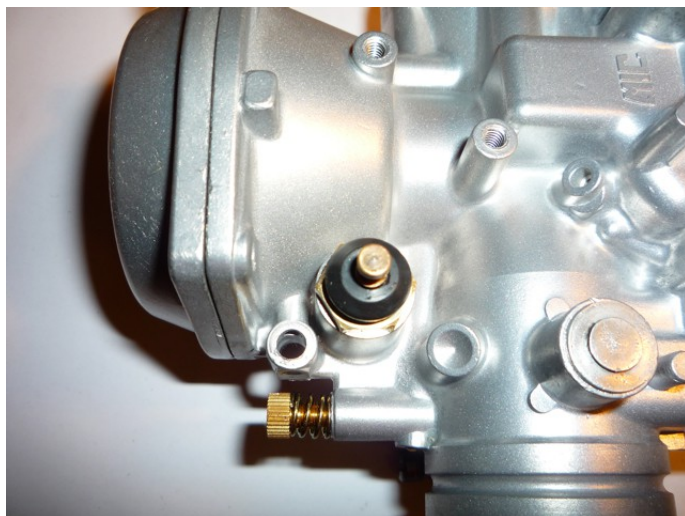
You can see the mixture screw in the top left part of this picture. You have to be *very gentle* when you fit this screw, because if you tighten it too much the tip will break off and lodge itself into the carb body, after which it becomes almost impossible to remove. Make sure the threads are absolutely clean and screw it in by hand until you feel what they call a "soft seat" - in other words the tip is resting softly in the carb body and you feel some resistance to further movement.

After that, unscrew the mixture screw by  $2\frac{1}{4}$  turns. This may not be the perfect setting yet, but it's a good starting point.

The choke plunger is a really simple mechanism. Just insert it from the side and tighten with a 14mm spanner.

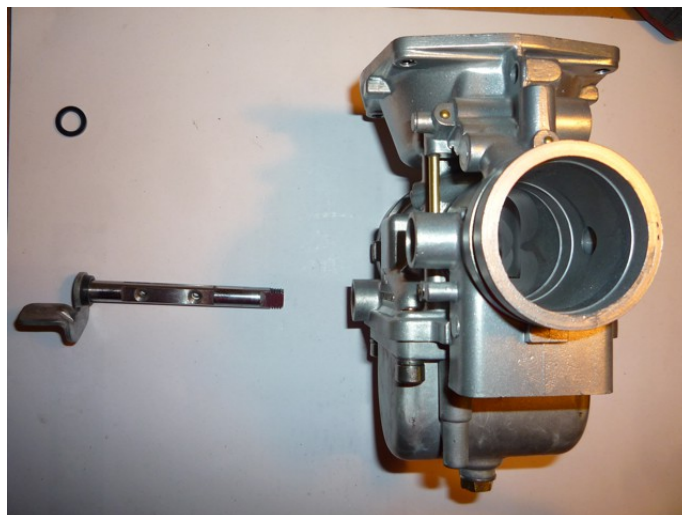


I took the opportunity to fit new rubber seals, again from [Mikes XS](#) (part number #48-5040).

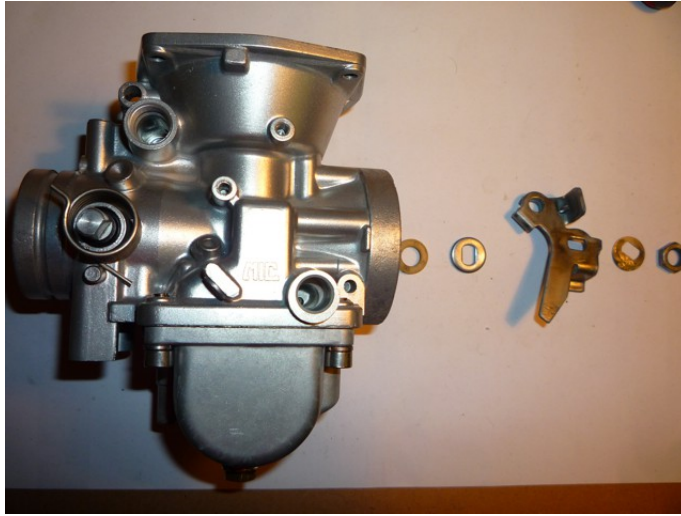


## #2 Carburettor Differences

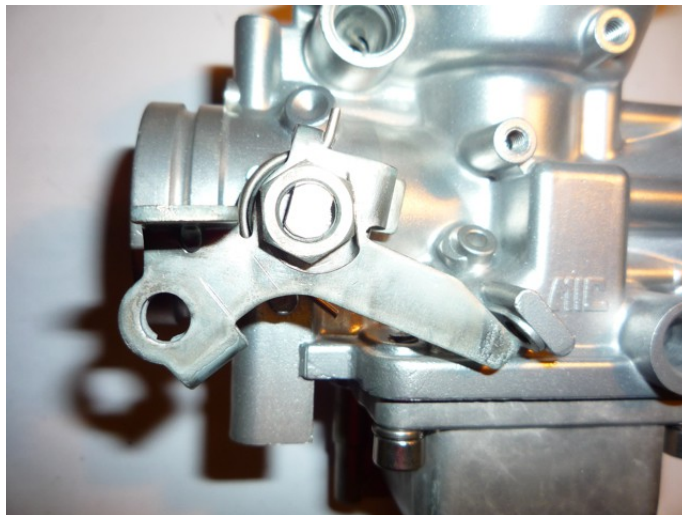
The butterfly shaft is different on the centre carb and it is inserted from the right side of the carb body.



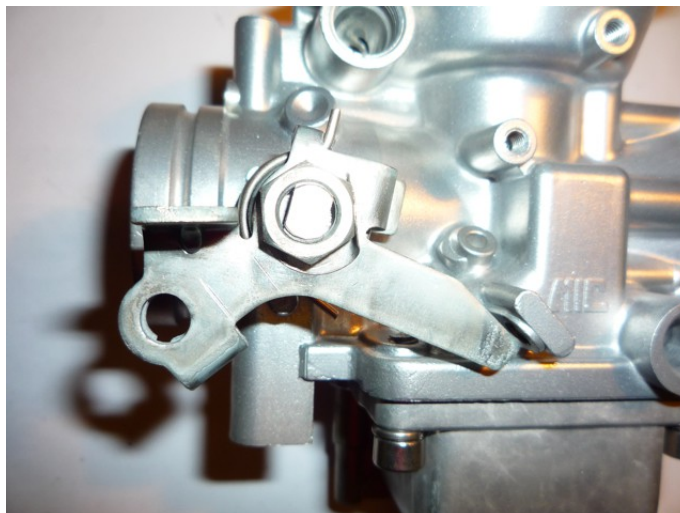
The actuating arm is also different compared to the #1 carb because it has an extension which rests on the throttle stop. Here I have lined up the parts in the order in which they are fitted to the shaft. Note that the plastic spacer goes on first, before the metal washer.



This shows how it bolts together:



A shot of the nice shiny spring:



# #1 Carburettor Differences

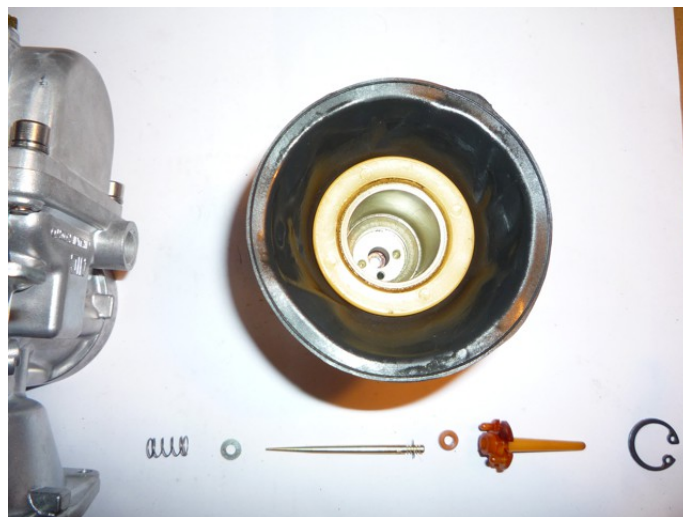
The #1 carb goes together just like the #2 carb, except that there is a choke actuator instead of a throttle stop on the left side of the body. Here's a preview shot of the finished item for reference:

## Diaphragm, Jet Needle And Slide

The diaphragm needs to be in perfect condition for your carbs to work properly. You can buy NOS replacements but after 30 years of sitting around on a dealer's shelf there's no guarantee that they will be like new. So I chose to have mine replaced by [NRP](#) in Manchester. It's a painless process, you just send off the old ones, they replace them and send them back in the post.

Using the new jet needle and clip from the rebuild kit, insert the needle back into the slide. The picture below shows the parts laid out in order of insertion - spring first, then washer, then clip, then plastic sleeve / spacer thing. The "wizard's hat" shaped thing goes over the top and is held in place by the circlip.

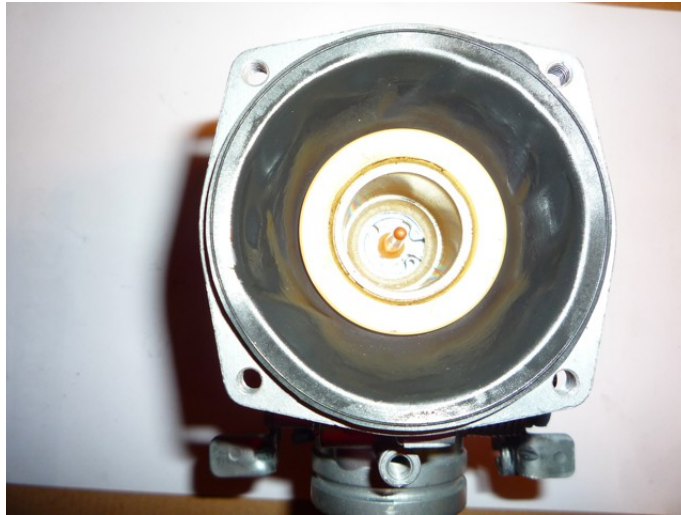
The clip normally goes in the third (centre) groove of the needle if your bike is standard, but you can richen the mixture by moving the clip towards the pointed end. Conversely if you need to make the mixture leaner, move the clip away from the pointed end.





This is what the diaphragm looks like when everything is assembled. Note the locating tab on the edge of the rubber, which fits into the corresponding part of the carb body.

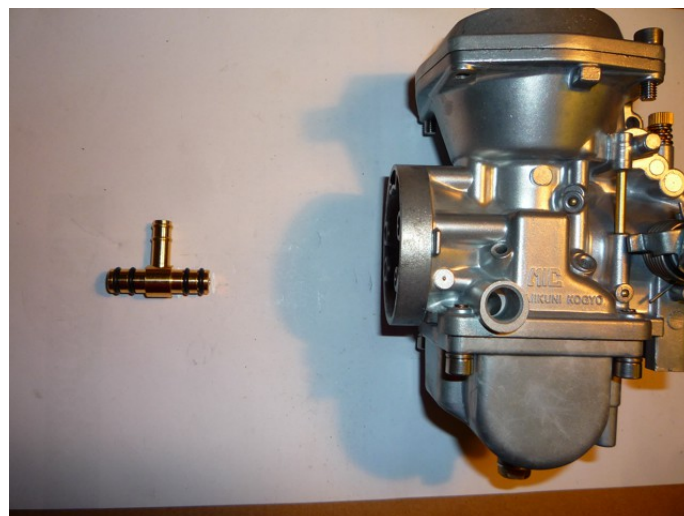
The circlip can be quite difficult to fit with conventional circlip pliers; I recommend using the kind of long-nosed right angled snap ring pliers that are used on master cylinders. These make it much easier to hold everything together and fit the circlip.



Finally you can fit the spring and the lid of the carburettor.

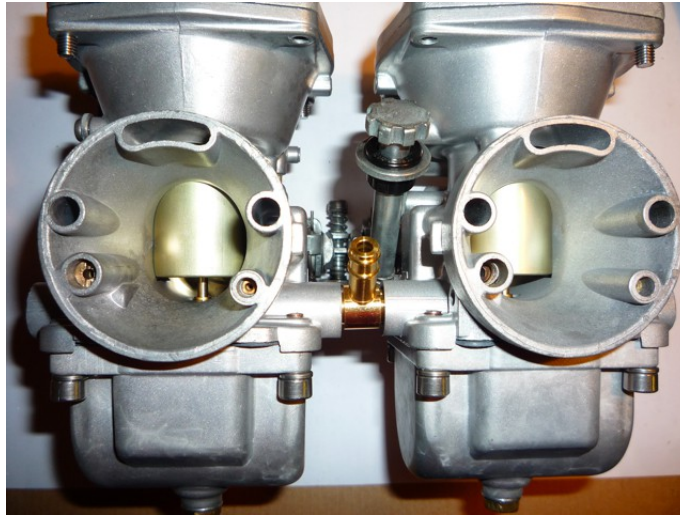
## Putting The Carbs Together

When all the carbs have been rebuilt, it's time to put them together into a set. First you need to insert the fuel tees (the 'T' pieces which allow fuel to flow between the carbs). I replaced the standard ones with these lovely items from [Sirius Consolidated](#) in Canada. They aren't cheap but the quality is superb - and, unlike the standard parts, they have replaceable o-ring seals.





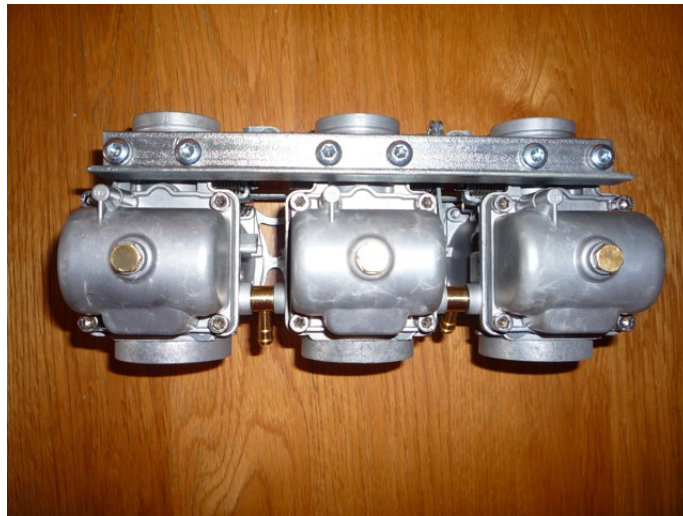
You need to gently insert the fuel tees into the fuel inlets. I recommend using good old silicone spray, as the rubber seals are very tight and easily damaged.



Here I have all 3 carburetors joined together by fuel tees. I temporarily covered the mouths with duct tape just to stop random workshop dust getting in there, but you don't have to do this if the environment is clean.



Next the mounting bracket, which holds the carbs firmly in place. I used Torx screws in place of the Philips screws that were there originally, mainly because I happened to have some lying around and because they don't chew up as easily as the originals.



Fit the throttle cable mounting bracket and the other carb bracket like this:



And finally the choke operating bar. The #1 and #3 carbs have tiny springs and steel balls which press on the choke bar. Insert these first, then slide the choke operating bar from the right side as seen on the picture below. As the choke operating bar slides along, fit the choke operating brackets loosely so that they engage on the choke plungers as shown. Finish off by fitting the white plastic bobbin and retaining circlip, then tighten the grub screws in the choke operating brackets so that they locate in the 3 dimples on the front side of the choke operating bar.



# Adjusting The Butterflies

The carbs should be balanced so that each cylinder gets the same amount of fuel / air mix. This is normally done with a set of vacuum gauges when the bike is running, but we aren't at that stage yet so we need to set an initial position so the bike will start and run reasonably well.

I use some thin strands of copper wire stripped from an old cable. Insert a strand of wire in the middle carb as shown and let the throttle close to pinch it in place (if the other flaps are closing first, adjust them so that they are out of the way).

Then, using some more lengths of the same wire, adjust the other throttle flaps so that they close and just pinch the wire in the same way. Copper wire is ideal for this job because it's very soft and won't damage the flap or the carb body.



## The Finished Article

When the carbs are all back together they should look nice and more importantly they should work well too. Here are some shots of mine for reference.





