



NEW SERIES

Definitive guide to Bike carbs

Everything you ever wanted to know about bike carbs, from buying the right ones to getting them set up.

Words Simon Holmes Photos Chris Wallbank

Welcome to the start of a new series that's designed to categorically bust myths and deliver just the hard facts. When it comes to things like bike carbs for instance, all too often you will hear contrasting information from different sources. We've all heard the rumours and what people have to say about driveability, awkward fittings and increased or decreased performance, but who actually knows for sure what's true and what isn't?

We went down to see the people in the know when it comes to bike carbs: the Bogg Brothers. They've been dealing with bike carb conversions for the best part of a decade now. Steve Bogg, who looks after

the bike conversion side of the business, was happy to answer our many, many questions in detail and explain to us everything there is to know about bike carbs, good and bad. From how they work, to what they fit, to what you need and what you don't; it's all covered here. And you may be surprised to learn what we found...

Why fit them?

There's a lot to be said for what bike carbs can offer compared to alternative set-ups. For some people, they are chosen due to budget constraints; they see the conversion as a cost-effective way of increasing power but there are actually many other benefits to

Info

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the way the car will drive. And then there's the fact they are still easy and cheap to get hold of and relatively easy to fit.

The message from Steve is clear though: if you have a pair of Webers in perfectly good working condition then there isn't much to gain by going over to bike carbs. If however, your current carbs are tired, worn out (as they often are) or you are fed up with them constantly going out of balance then these could well be the practical answer for you. Similarly, if you're looking for an upgrade or if you're still building a project and haven't chosen anything for the induction side of things yet, then they offer great value for money for the performance. →

What are the benefits?

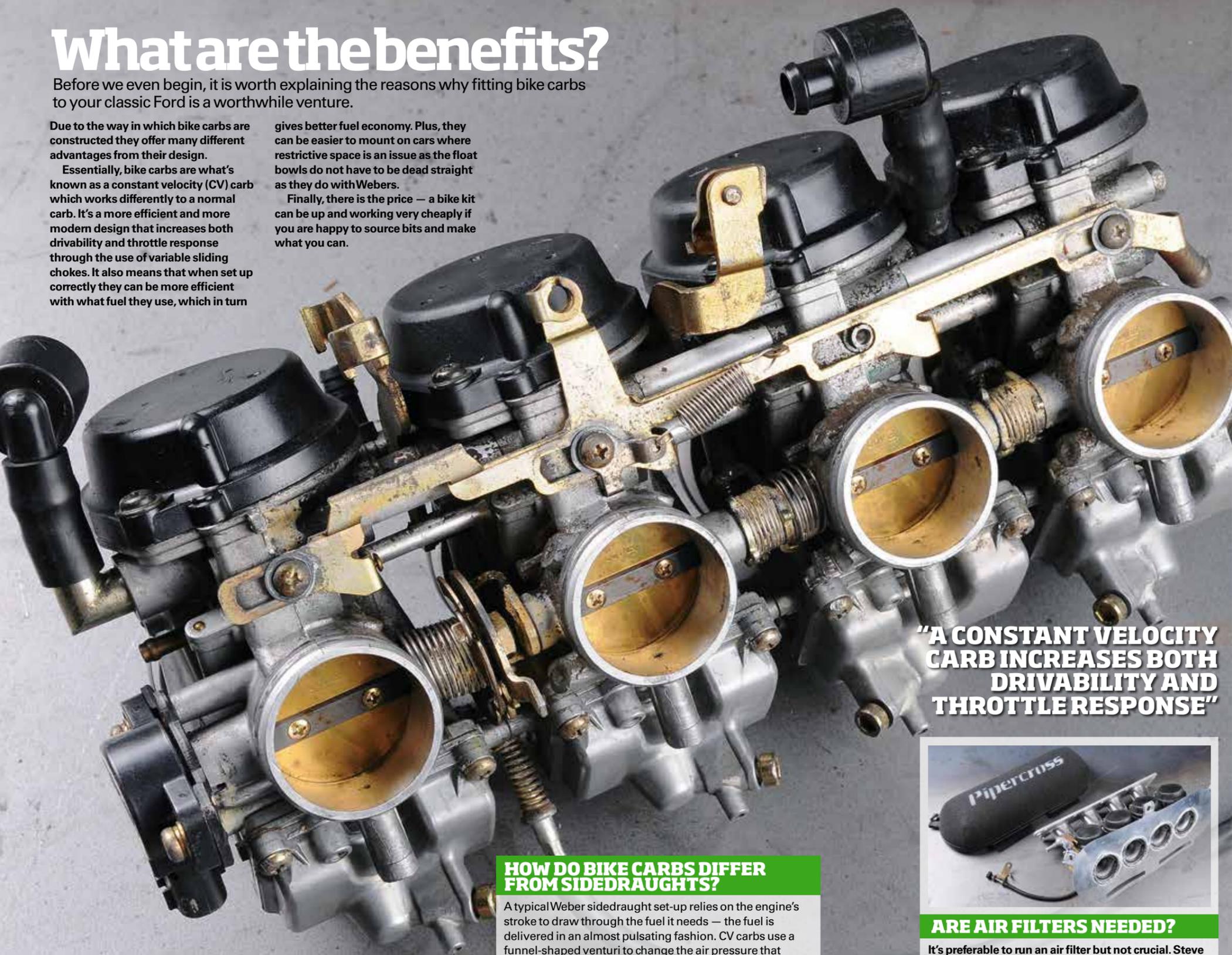
Before we even begin, it is worth explaining the reasons why fitting bike carbs to your classic Ford is a worthwhile venture.

Due to the way in which bike carbs are constructed they offer many different advantages from their design.

Essentially, bike carbs are what's known as a constant velocity (CV) carb which works differently to a normal carb. It's a more efficient and more modern design that increases both drivability and throttle response through the use of variable sliding chokes. It also means that when set up correctly they can be more efficient with what fuel they use, which in turn

gives better fuel economy. Plus, they can be easier to mount on cars where restrictive space is an issue as the float bowls do not have to be dead straight as they do with Webers.

Finally, there is the price — a bike kit can be up and working very cheaply if you are happy to source bits and make what you can.



"A CONSTANT VELOCITY CARB INCREASES BOTH DRIVABILITY AND THROTTLE RESPONSE"

HOW DO BIKE CARBS DIFFER FROM SIDEDRAUGHTS?

A typical Weber sidedraught set-up relies on the engine's stroke to draw through the fuel it needs — the fuel is delivered in an almost pulsating fashion. CV carbs use a funnel-shaped venturi to change the air pressure that passes through the carb. This means that rather relying on the pumping action of a normal carb, bike carbs provide a constant and continuous supply of fuel at all times which gives better and smoother drivability and an increased throttle response.

Also, as they are all bolted and linked together they tend to stay in unison and balance with each for much longer compared to Webers which are not linked in the same way.

WHAT ARE THE DOWNSIDES?

Due to the nature of CV carbs they can be tricky to set up and not many rolling roads understand them or are even willing to touch them, so you can be limited to where you can take your car. Correct installation is critical

too; it can make or break how well the conversion works as a package and although bike carbs are cheap and easy to find, new and replacement parts are notoriously expensive so be very careful what you buy.



ARE AIR FILTERS NEEDED?

It's preferable to run an air filter but not crucial. Steve recommends using one for the safety of the engine and prefers using a Piper-Cross single filter. Not only do they look neater, he finds that individual sock filters can occasionally cause slight issues with fuelling when setting them up. A universal backplate will need to be cut to fit the inlets and some carbs have awkward shaped inlets, so be prepared to make one if needs be.

TYPICAL SET-UP FOR FORD ENGINES

This is often confusing and for no good reason. It's a lot simpler than you may think as pretty much any carb will work with any size engine within reason. CV carbs feature self adjusting chokes that effectively adapt

to the amount of air passing through them and in doing so adapt to the engine, ensuring drivability. With this in mind, virtually any carb will work on any engine, although Steve gave us some rough guidelines to keep to.



Kent

A Pre-Crossflow or Crossflow works best on a set of 36-38 mm carbs from something like a Honda CBR600 or Kawasaki ZX-6R. If it's a wild-spec engine they need to be bigger.

Pinto

As Pintos are known for their large inlet ports it's best to go as big as you can get your hands on. 40 mm Yamaha R1 carbs or larger Honda Fireblade carbs work well.



Zetec

This depends on the spec of the engine is there are a lot of race-spec heads about that need as big as 42 mm carbs. The average road-going or standard Zetec is happy on 36-38 mm carbs.

What bits do you need?

There's not as much needed to get bike carbs on your classic Ford's engine as you think.

Bogg Bros sell a complete kit for around £650 all-in, which comes with rebuilt and checked carbs and a custom-made inlet. If you are intending to source the parts separately, then Bogg Bros can supply individual parts and their top-quality CNC machined inlet manifolds are a good starting point to base a home-made conversion on.

Here's a breakdown of what else you need and roughly how much it will cost, although prices will vary in the second-hand market.

- Bogg Brothers custom inlet manifold** – £211
- Suitable bike carbs** – from £20-£200
- Air filter and base plate** – £100
- Throttle cable** – £7
- Universal choke cable** – £7
- Bike fuel pump** – from £20-£100
- Mappable ignition system** (for EFI-based engines such as Zetecs) – £180

WHAT ABOUT THE THROTTLE LINKAGES?

This is simpler than you would think, as all you need is some form of suitable cable. Something as simple as a pushbike gear cable will work as a throttle linkage, and the same is true for a choke cable. Any cycle shop can sell you these along with the outer shield and ferrules for the each end of the cable.

As each application is different they can be cut to size in order to suit and only one cable is needed for throttle and one for choke as the carbs are linked.

"SOMETHING AS SIMPLE AS A PUSHBIKE GEAR CABLE WILL WORK AS A THROTTLE LINKAGE"

CAN YOU RETAIN THE ORIGINAL DISTRIBUTOR?



The distributor system found on most carb-fed engines will be fine. Ideally it will need to be set up and timed properly to see best results. You can upgrade to a non-vacuum electronic ignition to see better results, or use complete aftermarket ignition systems from MegaJolt or Weber Alpha.

For an EFI engine, such as the Zetec, then the latter will be the only option, and Chester Sports Cars can help you out here with kits designed to work with bike carbs on specific Ford engines. For a complete DIY ignition system try triggerwheels.com who can supply everything you need to

convert an engine to run standalone ignition, whether it came with injection or a distributor. Some carbs come with throttle position sensor and wiring still attached; this isn't needed unless you plan to use a more complex 3D mappable stand-alone ignition system such as Weber Alpha.

WHAT FUEL PUMP DO YOU NEED?

It's very important that bike carbs run no more than 3 psi of fuel pressure. There are two options to cater for this depending on what your current set-up is. Firstly, there's the usual solution of an electric Facet pump or similar with an adjustable fuel pressure regulator.

The preferred route for ease of use is to fit a bike fuel pump. It delivers the correct pressure, is small and easy to mount and normally cheap to get hold of. Most bike breakers will have a stock of these and they are all made by Mitsubishi so don't worry about which model of bike it came from, as long as it was fitted with carbs.

Steve recommends mounting the bike pump close to the tank as they push better than they pull and he's seen them burn out by being overworked. They run a simple 12 volt positive and negative.



ARE THEY DIFFICULT TO SET UP?

There is a simple procedure you can follow to get the carbs working on your engine straight away. This will only give you a good basis on which to get the car driving so you can take it somewhere to get set up properly.

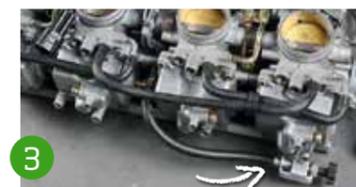


1 Once the carbs have been stripped and cleaned they need to be drilled out to the correct 1.6-1.7 mm, which Steve recommends as a good starting base. They then need to be reassembled carefully and if you are not using a bike fuel pump then make



sure you are running the correct 3 psi fuel pressure and no more.

2 You then need to locate the air screws of which each separate carb will have one. They will be mounted to the body of the carb itself and should be easy to find. With a flat bladed screwdriver, screw these in all the way in and then adjust them by winding them three turns out so adjustments can be made later.



3 For tickover adjustment, there is a screw that is often remotely housed on a cable that is linked to just one carb. This is the master carb, which controls the other carbs and will adjust the position of the butterfly to those simultaneously. In order to balance them, a carb vacuum gauge is needed to take a reading off just the master carb, the others do not need to be touched.

HOW DO I PREPARE THE BIKE CARBS?

There's a step by step process that you need to follow in order to adapt a set of bike carbs to work, and this is it...

Before fitting the bike carbs to your engine, you have to do a few things in advance. This includes a necessary stripdown to check the condition of vital components and also requires you to drill out the main jets. However, if you are not confident doing this the standard sized jets will still allow the car to start and drive enabling you to take to it a professional such as Bogg Bros to be set up. The bike carbs we stripped down were the common Yamaha R1 variants, but be aware: not all carbs will be exactly the same as this.



1 First of all you need tools for the job — a set of decent screwdrivers, a pair of pliers and a pin removal tool. Make sure you have a clean space to carefully lay out in order what you remove.



2 Begin by unscrewing the carb tops — make sure you use a good fitting screwdriver to avoid damaging the threads as these are often tight. Carefully lift out the spring, diaphragm and sliding needle assembly.



3 Flip the carbs over then unscrew and remove the float bowls. Again be careful to use the correct sized screwdriver. Clean the bowls out carefully to remove any residue from petrol or dirt that may be in there.



4 Remove the main jets, again using a good fitting flat-bladed screwdriver. These are the jets that need to be enlarged. Steve suggests drilling them out to 1.6-1.7 mm as a starting base so carefully use a drill and a vice or borrow a pillar drill.



5 Remove the smaller pilot jets with a good fitting flat bladed screwdriver. These only need to be checked for dirt or blockages so hold them up to light and check. Clean through carefully with the strand of a wire brush if it needs it.

MYTHS

1 'Bike carbs need lots of work before they can be used on a car'

Most carbs will work on any engine without anything done to them, as long as they are in good condition.

2 'You need to fit a mappable ignition set-up'

Not true. Any standard ignition system will work fine including a distributor, but engines that ran injection previously will need some form of separate ignition set-up.

3 'Plumbing and installation is complicated.'

Despite having what appear to be many inlets and outlets, only the fuel feed needs to be connected. They don't need a fuel return and coolant pipes aren't needed for car applications.

4 'They don't drive nicely on the road.'

They won't drive perfectly if they haven't been set up correctly, but will when they have.

5 'They won't run without an airbox fitted'

A total myth with no credibility, but it's better to run a filter.



Buying used bike carbs What to look for?

When buying used bike carbs, the most important thing to check is the external condition — remember, second-hand carbs come from second-hand bikes that are have normally been crashed, dropped and broken for parts, so damage can be commonplace.

Check very carefully for cracks, broken fittings or mounting points and anything else as although you

may not necessarily be using these bits on your application, they can cause problems with fuel or air leaks when you go to fit them.

Next, check that the slides inside the carb move easily and smoothly on all four carbs as this is an early indication to show the condition of the needles. Look carefully for dirt or grit on the needles too.



Check used carbs carefully for crash damage. This one is now scrap.

AREN'T THEY TOO SMALL?

Bike carbs are designed for small-capacity bike engines, so it seems odd that they can be big enough for the average Ford engine. However, this should be easier to understand now you have some knowledge of how a CV carb works.

But there are other factors: superbikes use high performance engines that have wild cams and very high rev ranges, meaning they consume more air than you think they might. Also, due to the way the sliding chokes open up to work, they tend to maintain a larger port size the whole way down the body of the carb, unlike a Weber which has chokes in the way.

However, Steve points out that bike carbs become a limiting performance factor at some stage and may be no use on a very high performance race engine.

CAN YOU MAKE YOUR OWN MANIFOLD ?

The short answer is yes. They can be made in either alloy or steel and they need to be totally airtight and angled correctly to avoid problems. However Steve has seen many flawed manifold designs over the years, so there are a few things that need to be done right.

Most of the problems are from warped and distorted flanges which aren't straight and cause leaks when bolted up to the head. If you are attempting to make one from scratch then it's important it is bolted to a jig, welded on a flat surface and left to cool down properly. A good weld on the inlet pipes to the flange is crucial as air leaks here are common place.

To join the carbs to the manifold make sure you use the correct fluoro lined silicone fuel hose as normal hose will corrode. Avoid dismantling the carbs to space them differently as linking them again is troublesome.

Steve spends a lot of time hand fabricating his own manifolds to ensure good fitting and uses only very small sections of hose to join them as he angles his manifolds to line up perfectly with the carbs — using large or ill-fitting angled sections of hose will cause the carbs to fall off. He also ensures the float bowls sit around 30 degrees and there are no restrictions in the inlet tracts, so the joins are welded inside and out then hand finished to give a smooth surface.



WHO ARE BOGG BROS?

The Boggs performed their first bike carb conversion around 2002 — Steve's father, Dave, who's been setting up carbs as a mechanic and tuner for years, first considered using a set of bike carbs and was convinced they would work. So a Nissan Micra grasstrack car that the company looked after was given a set of adapted carbs from a Honda Fireblade, the results were good and the rest is history.

Not long afterwards the Boggs saw a letter appear in the technical section of a magazine asking if bike carbs could be used on a regular car engine; the magazine's answer was no. So the Boggs informed the magazine they had not only performed the conversion but it had worked well and

a feature was written about what they had achieved.

Word spread and it wasn't long before the Boggs were producing 250-300 kits a year and sending them out all over the world.



HOW TO PREPARE THE BIKE CARBS... CONTINUED



Carefully remove the floats. On these R1 carbs they are held on with a sliding pin but other makes of carbs have different designs such as small bolts keeping them in place.



Inspect the end rubber seals for damage as they stop fuel from seeping through when the engine isn't running. If fuel pressure is higher than 3 psi this is where they will leak from.



At this stage carefully check each of the parts you have removed for damage, particularly on the rubber diaphragms which need to be in good condition. The smallest of rips or tears here causes big problems as the vacuum will be lost.



Next the needles to be inspected. Carefully remove them from the diaphragm by using your thumb to cover the top of the needle, as it houses a small spring that can easily shoot off, so very slowly feed the needle through from the bottom.



Remove the push-on spring and bush from the top of the needle. Check that the circlip is on the middle locating groove on each of the needles. Carefully refit the needle back into the diaphragm. Not all carbs have adjustable grooved needles.



There's no need to strip them down any further, so once all of the parts are properly cleaned and inspected for damage or dirt then reassembly can begin. Locating lugs on the diaphragm covers ensure you can't get it wrong but take your time.