The BST-40 Bible

Written by Laramie LC4

This .pdf has been compiled and edited by dorkpunch. Please feel free to use and distribute this! My goal is to eventually have enough threads edited and formatted to make an actual service and repair manual for the LC4. If you would like to help, donations can be sent by paypal to:

smallenginecutaways@yahoo.com.

Before we begin:

1. If your carb is not out of your bike yet, don't go any farther until it is. If you don't know how to do that, refer to the carb removal section.

2. Once again, if you are scared to do this after reading and studying all the info available PLEASE STOP NOW!!! I don't not want to be responsible for your carb because you rushed, didn't listen, didn't fully understand something, or didn't bother to ask a question. The process is pretty easy to follow. If you got the carb out of the bike, we should be fine.

3. You need a clean, dirt free, environment to perform this job. It is also a good idea to have good ventilation to remove fumes. You will be using cleaning agents on the carb. OK, here we go!!!

BST-40 Cleaning

Tool List

- #4 Allen Head
- larger flat head screwdriver
- long thin flat head screwdriver
- cleaning towel
- Q-tips
- carburator cleaner

1. Remove the top of the carb. This will grant you access to the slide and needle. The carb comes stock with some phillips head screws. I highly recommend that you replace these with a higher grade, allen head. The screws can and will strip out. Don't worry if they do or already have though, grab them with a pair of vice grips and out they come.

In **figure 1** you can see I have already replaced these with the allen heads. Either way, remove these 2 bolts.

Figure 1

Once those 2 bolts are out, carefully lift up on the top of the carb. Be careful not to let the spring get away from ya. See **figure 2**.

2. Remove the cap and spring from the carb. You will now be able to see the diaphragm on top of the slide. This is the reason they call this carb a "CV" (constant velocity) carb. This carb lifts its slide by a vacuum. it is not directly connected to the throttle. (if you look down into the slide, you will see the top of the needle

Figure 2

and the 2 holes that are used to transfer the high/low pressure back and forth. This is what lifts the slide. One of the mods done later in this post involves increasing the size of these 2 holes to allow the transfer to happen quicker, thereby increasing throttle response. It is often referred to as "drilling the slide".)

3. Pull up on the diaphragm to remove the slide from the carb (**figure 3**).

4. Once the slide is removed, remove the needle by turning the slide to an angle (**figure 4**). Make sure to set the needle in a safe place. I usually have a plastic case or baggie that I put all of the small pieces of my carb into. this way, nothing gets lost. Now you should have something that looks like **figure 5** sitting in your work area.

Figure 3

Figure 4

Now that you have the top end off the carb, there are a

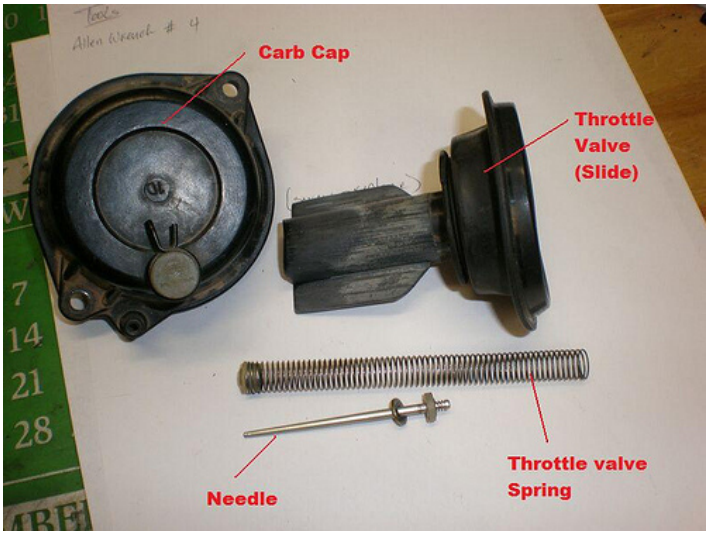

Figure 5

few things to inspect.

1-Inspect the top of carb. Chances are if you have never pulled your carb, or do lots of off-road riding, the top of your carb is full of dirt! Don't freak out, this happens. It is also the major reason you need to be cleaning your carb often. As usual though, our Buddy Creeper has already solved this problem. I would HIGHLY RECOMEND that everyone reads Creepers **BST 40 Carb Venting** and follow his instructions. If you do you will eliminate many of the issues that this carb can develop over time. This is what my carb looked like. I clean it every oil change and ride in extremely dusty conditions. If yours looks worse than **figure 6**, you need to clean it way more often.

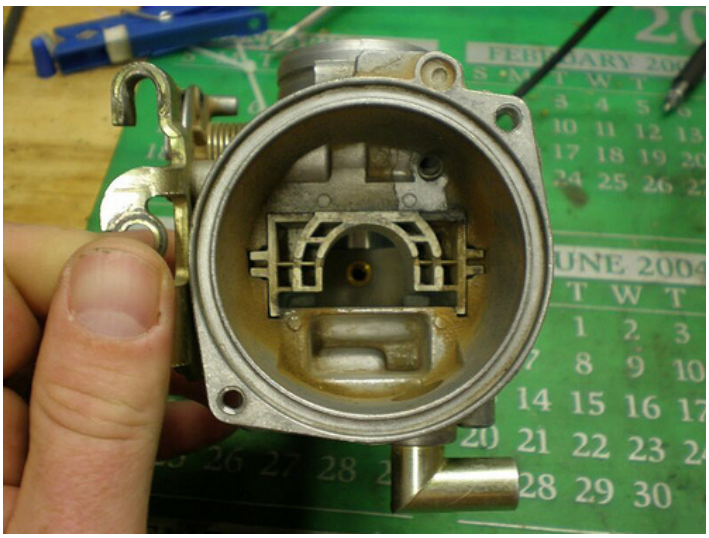

Figure 6

2- Check that your cap-sealing surface is flat (there have been some people who have found that their cap became warped due to the stupid 2 bolt design. This allowed even more dirt to enter the carb and started causing problems). To check if it is flat, find any level straight surface (small piece of glass is the best) and check. You can also use a straight edge to check for flatness as well (**figure 7**). If you find your cap is warped, sorry but ya gotta buy a new one.

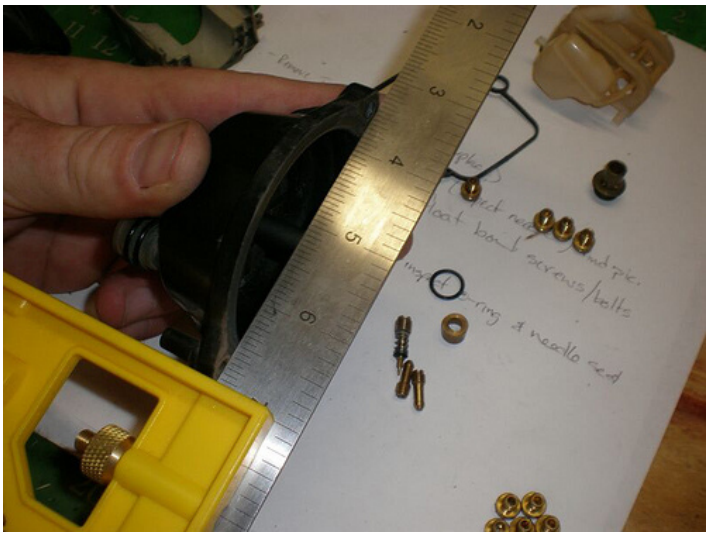

Figure 7

3- Check the diaphragm and slide for any wear or damage. Unroll the diaphragm and look at the inside and out, check the seal edge for tears, cracks, or anything else that doesn't look good. Check the face of the slide for wear and gouging. Once again, as a result of venting to atmosphere without filters, the slide takes a beating from the dirt that gets into the top of the carb. A small amount of wear is to be expected, but serious gouges or slots in the slide are a sign of wear and you need to replace the slide.

4- Check the needle for wear. Believe it or not, these needles have been known, due to vibration, to wear themselves to the point of breaking. When this happens the needle falls into the needle jet and plugs all the fuel flow. This basically disables your bike, so make sure you check. Sorry for the bad picture (**figure 8**) but once you see the second one of a damaged needle (**figure 9**) you will understand.

Now we move onto the bottom of the carb and removal of the float bowl. This is where we really get to the heart of the carb and gain access to the jets and the float. The first thing you need to do is remove the 2 allen head screws as shown in **figure 10**.

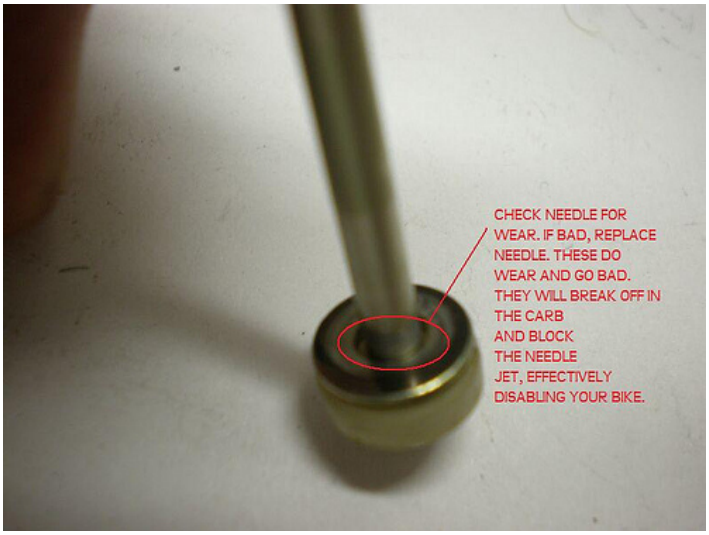

Figure 8

Figure 9

Figure 10

Once those 2 bolts are removed you can lift up on the float bowl and expose the floats and main jet (**figure 11**).

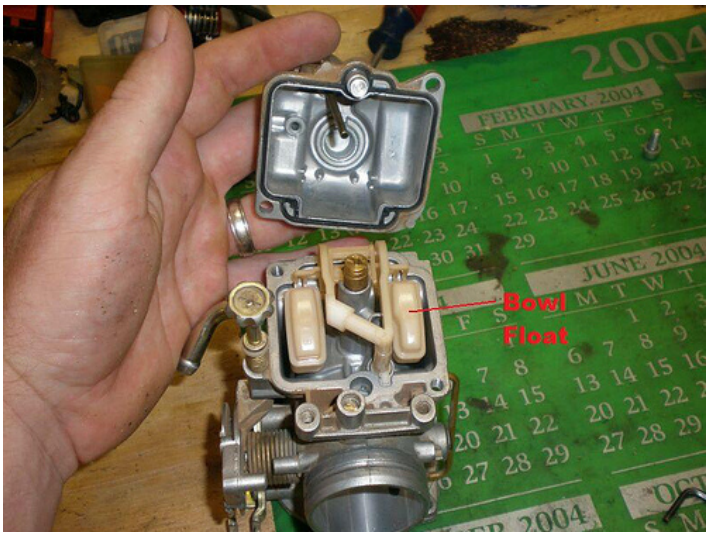

Figure 11

Set the float bowl aside and take a look inside the carb. You should be able to see just about everything now. Take the time to locate the float weight (**figure 12**) before proceeding to the next step.

Figure 12

To remove the floats, pinch with your fingers and pull up. BE EXTREMELY CAREFUL NOT TO LOOSE THE FLOAT WEIGHT (**figure 13**)!

Lift the float up and out of the carb (**figure 14**).

Once the float is removed, inspect it for integrity, check the o-ring for wear, and place the weight someplace safe (**figure 15**).

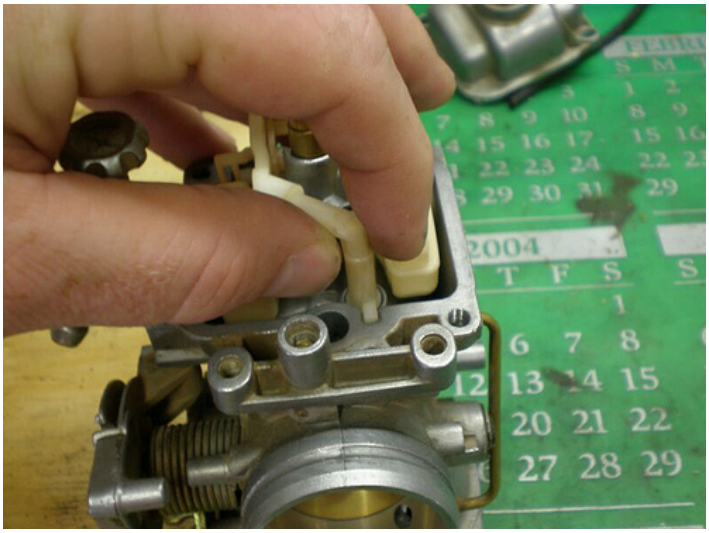

Figure 13

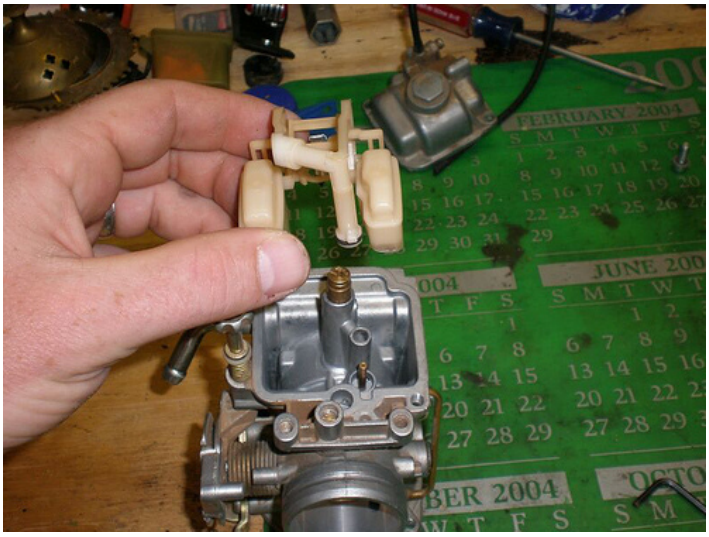

Figure 14

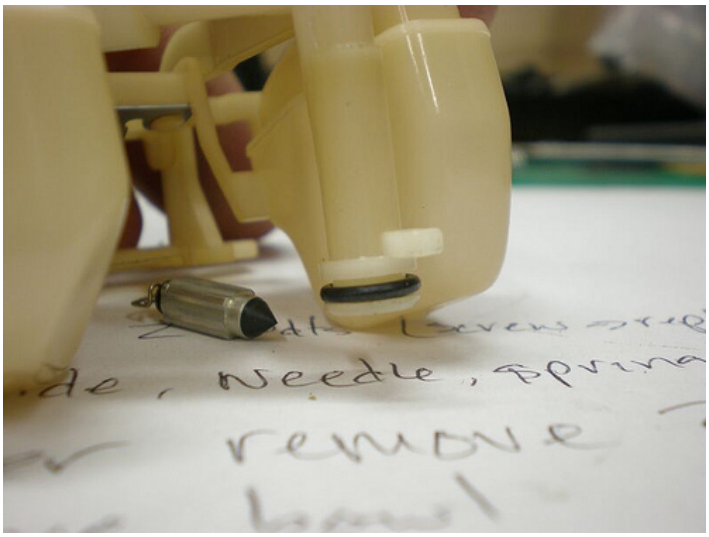

Figure 15

Now with the float out of the carb you should be able to locate all of the major components inside of the float bowl. Take the time and find; the main jet, idle jet, fuel/air screw, the needle valve, and idle screw (**figure 16**).

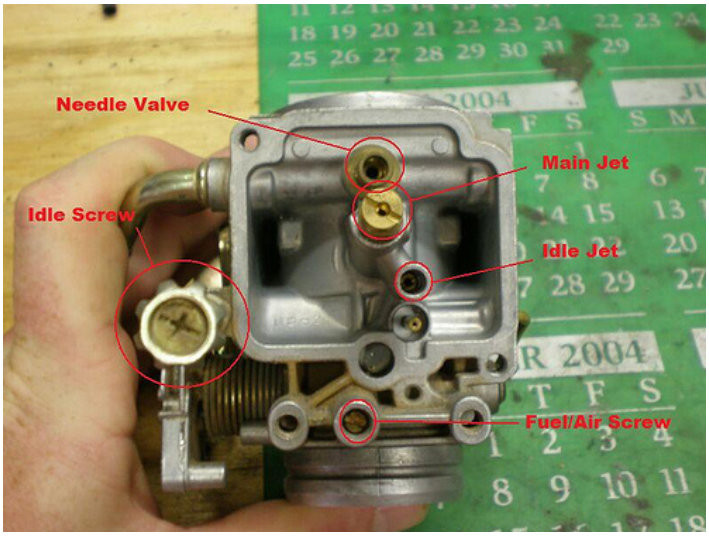

Figure 16

The next step is for you to remove the needle valve (**figure 17**). All you have to do is pull up on it and it will come out as it is only held in-place by tension from an o-ring around its base. Once removed, inspect that o-ring to make sure it seals well enough, isn't flattened, or showing signs of cracking. If it is, replace before you reinstall it in the carb. Chances are if you have a good hardware store near you can find an o-ring that size to match and save the hassle of ordering one. Just make sure that the one you buy is rated for fuel systems.

Figure 17

Now we will remove the main jet (**figure 18**). Use a large fat screwdriver to remove this jet. Be careful, there is more than just the jet!

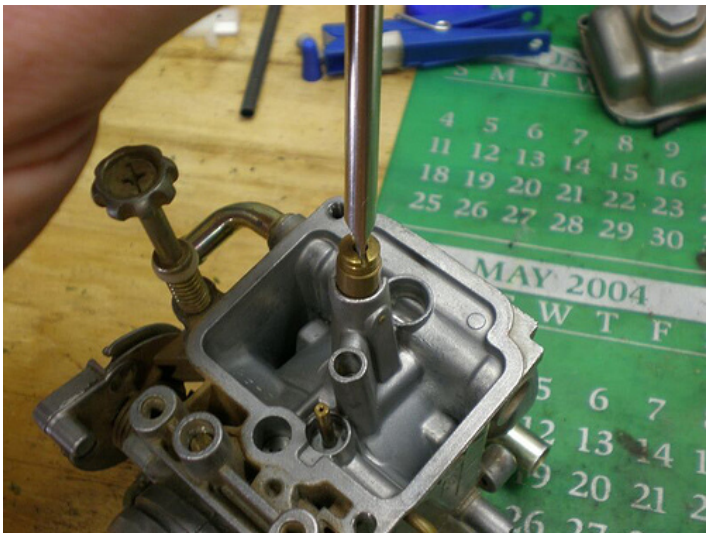

Figure 18

You should now have the main jet and the brass spacer in your hands (**figure 19**). Once again, DO NOT LOOSE THE SPACER!!! Put it in the baggie with all the other small pieces.

Figure 19

Now with the main jet removed you will be able to remove the slide support and the needle jet. The slide support is a plastic piece that holds the slide in position inside the bell of the carb. It also houses the top of the needle jet. To remove, press downward on the place the main jet just came off of (**figure 20**).

This will push the slide support out the other side (top) of the carb (**figure 21**).

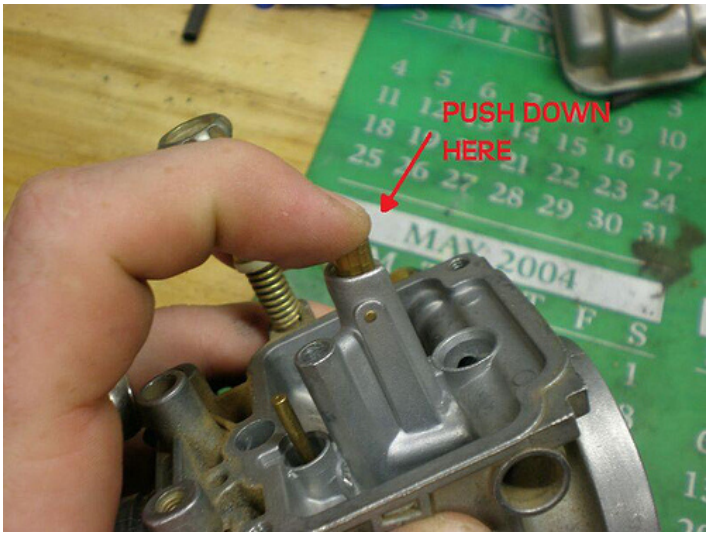

Figure 20

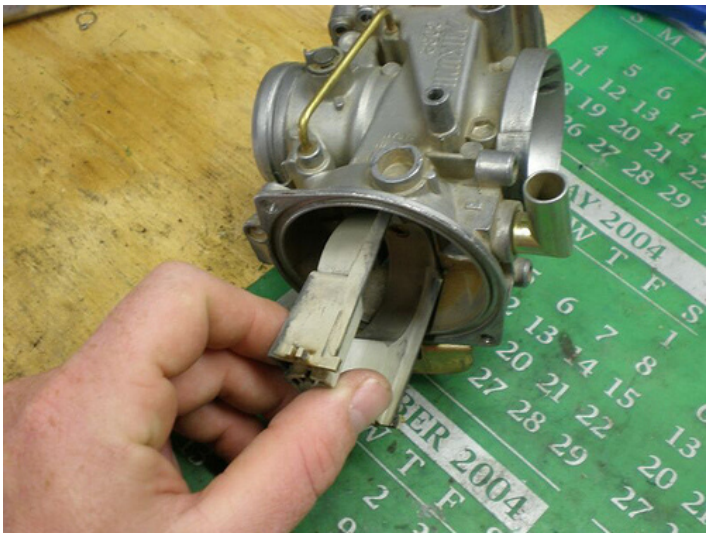

Figure 21

You should now have the slide support and needle jet sitting on your workspace (**figure 22**).

While you are looking at your slide support, check to make sure that their is an O-ring seated at the topside (**figure 23**). If not, it is still in the carb and needs to be pulled out. Mine likes to stick so I usually end up fishing it out.

Alrighty then!!! Now we are having some fun! Next step is the removal of the idle screw (**figure 24**). You will need a small thin flat-head screwdriver to get this one out. Be careful you don't try and force anything (and of course, its righty-tighty and lefty-loosy).

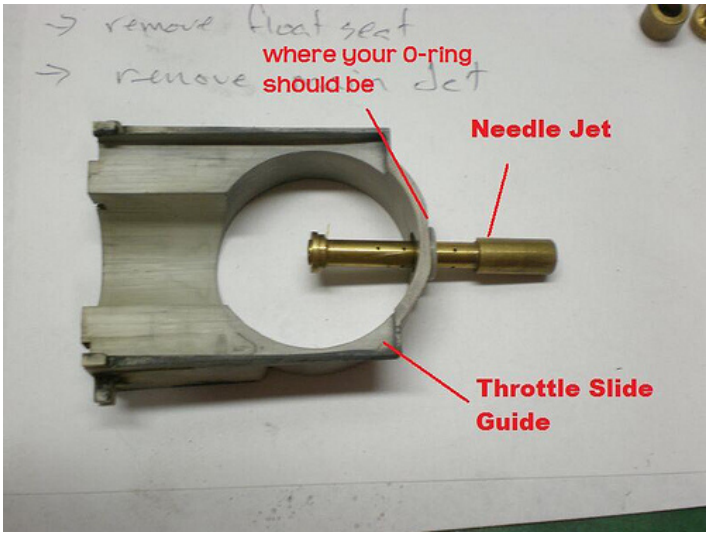

Figure 22

Figure 23

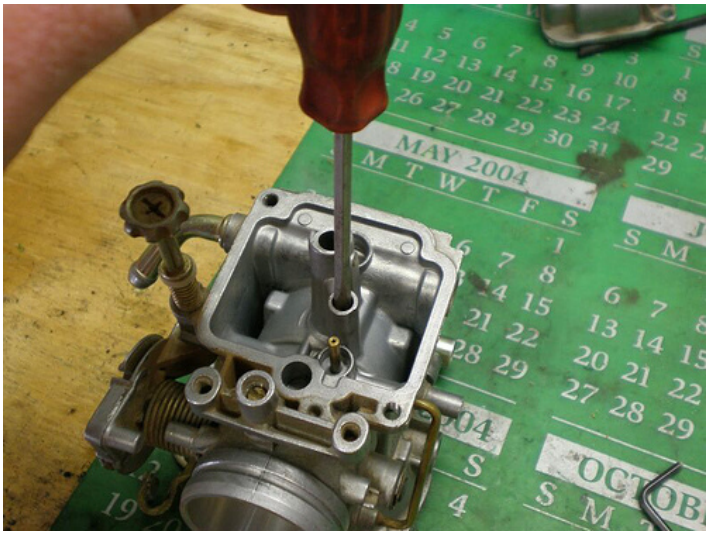
Figure 24

You should now have one a jet similar to the one shown in **figure 25** sitting in front of you. There are basically 2 idle jets for this carb and these bikes. The stock is a 45, the other is a 47.5. If you have opened your airbox and have an aftermarket exhaust, chances are you should be running the larger jet.


Figure 25

Remember to put that idle jet in your safe place with all the other small pieces!

The next thing we will remove is the fuel/air screw. To remove this screw you first need to find out how many "turns out" you are. This tells you how to re-set the screw when your done cleaning and putting the carb back together. Use the same small screwdriver you used on the idle jet and begin counting the turns in (**figure 26**) (righty tighty). You will probably end up with something in the 2-1/4 to 2-3/4. When you have you number, write it down somewhere so you don't forget.

Once you have the number written down, you may now reverse directions and remove the screw from the carb. Be careful not to loose the spring, washer, or O-ring from the screw (**figure 27**).

I would also like to add that replacing this fuel/air-screw with a custom made, and much easier to adjust Stenhouse Fuel / Air screw would be a good idea. One can be purchased from Loaded at the following link. - http://www.stenhouseracing.com. If you do purchase one of these new screws, the only change in procee-dure will be that it has to come out before you are able to remove the float bowl. It will also be the last thing installed when re-assembling the bottom of the carb.

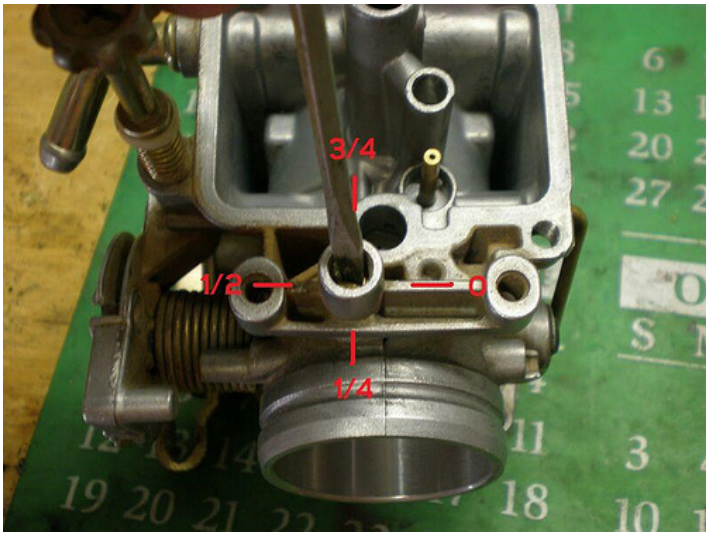

Figure 26

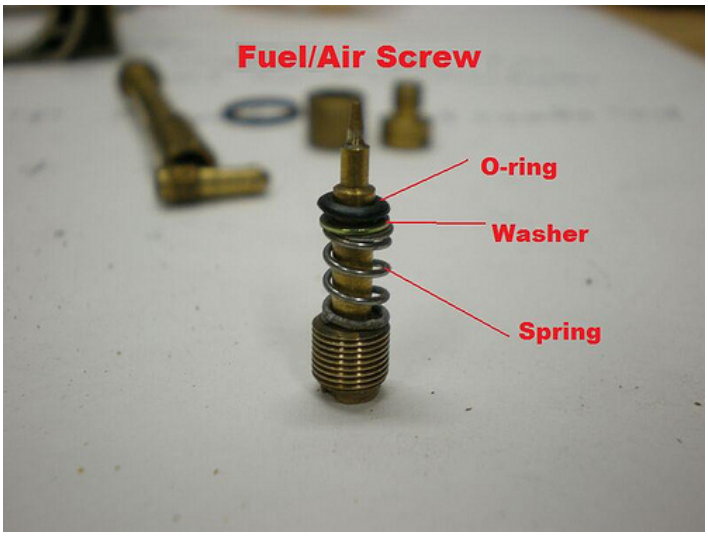

Figure 27

Finally, the last step you need in stripping down the carb is the float bowl gasket (**figure 28**). Depending upon how you are cleaning the carb, you may or may not need to remove this. I plan on a long soak in cleaning solvent for this one, so I'm taking out the O-ring to save it. If you do choose to remove it, just be careful.

And that my friend is that! You have just finished taking your carb a part! Now, we get to start playing with the cleaners.

Figure 28

-CLEANING THE CARB-

Depending upon how you choose to clean your carb there are a few things that you will need to make sure of.

1) Spray out all jets and confirm their passage is clear of dirt and debris.
2) Spray out all parts and passages of the carb body.
3) Clean all plastic parts in hot, soapy water with cleaner.

I have a tendency to be a little lazy and usually just deposit the carb body in a bowl of cleaning solvent overnight, then clean the insides the next day. I usually use a clean, new, shop towel and some Q-tips for the hard to reach places.

While cleaning, remember to keep and eye on everything. your not just cleaning, you're inspecting. make sure that everything looks good. if something is odd or out of place, stop and check. chances are you can find a pic or something that will help you out. you can also just ask a question, chances are someone will answer pretty quickly.

When you are done, the carb should look nice and new (**figures 29, 30, 31, and 32**)

At this point in the juncture if all you're doing is cleaning, then your done. Just follow the instructions in reverse to reinstall everything. I told you it wouldn't be that bad.

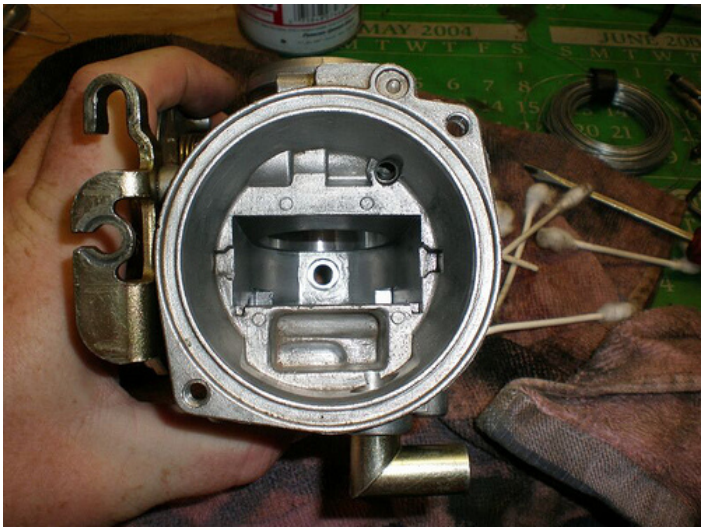

Figure 29

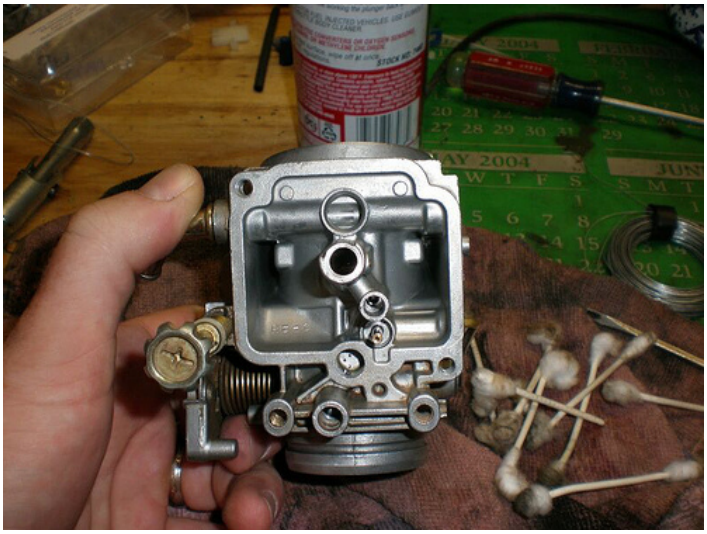

Figure 30

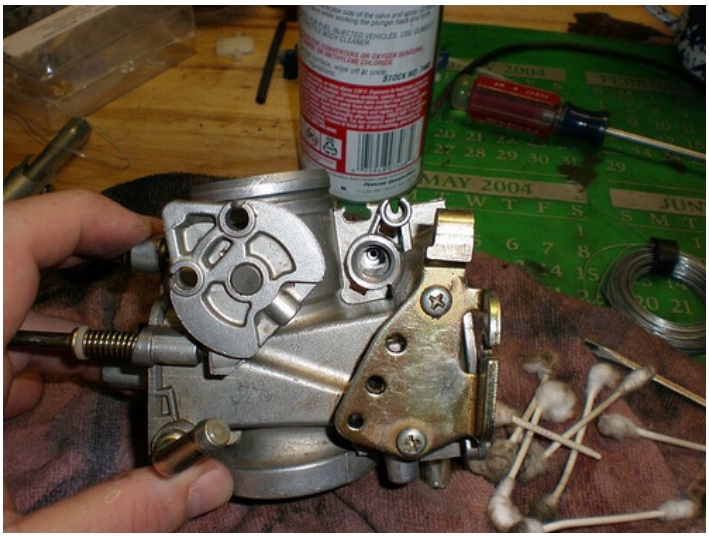

Figure 31

Figure 32

-the only real thing you need to know to put things all together is the needle jet. when you reinstalled the slide support and needle jet (with O-ring) you have to make sure that the slot in the needle jet lines up with the pin on the carb body (**figure 33**). once it is, it will slide right in. if you do not line this up properly, the slide support and needle jet will not fit in the carb.

Figure 33

-CARB MODIFICATIONS-

The following modifications have been done by numerous individuals (including myself) with great success. Most focus on the ability of the carburetor to "lift" the slide faster, thereby increasing throttle response. One of the big gripes people have about the CV carb is that it doesn't have an accelerator pump, and therefore cannot have the same throttle response. To respond to this you need to understand the purpose of the accelerator pump and what a CV carb actually does.

-CARB 101-

What happens when you quickly open your throttle? The answer to that question is both the reason for the accel pump on the FCR carbs and the idea behind the CV carb.

When you quickly open the throttle in the carb, a large increase in airflow passes through the carb to match the throttle position. This creates an extreme lean condition momentarily because the fuel delivery system has not been able to keep up with the rapid increase in airflow. The accel pump covers this by directly injecting (squirting) a stream of fuel into the airflow on rapid throttle opening. The CV carb, on the other hand, does not allow the slide to open quickly enough to create this condition due to the fact that the slide is NOT directly connected to the throttle and instead relies on a change in atmospheric pressure (the fast moving air in the carb creates a high pressure) to lift the slide. this process takes a moment in which the lean condition is avoided.

-DRILLING THE SLIDE-

One of the ways in which to reduce the amount of time for the atmospheric pressure to equalize is to increase the size of the holes through which it passes. This is a balance between to large of holes equals no vacuum, and to little equals slow throttle response. it is the general consensus that the best size for these holes is 0.125"

-To perform this mod find the correct sized drill bit, then carefully drill the 2 holes shown in **figure 34**. make sure not to drill the center needle hole!!!!

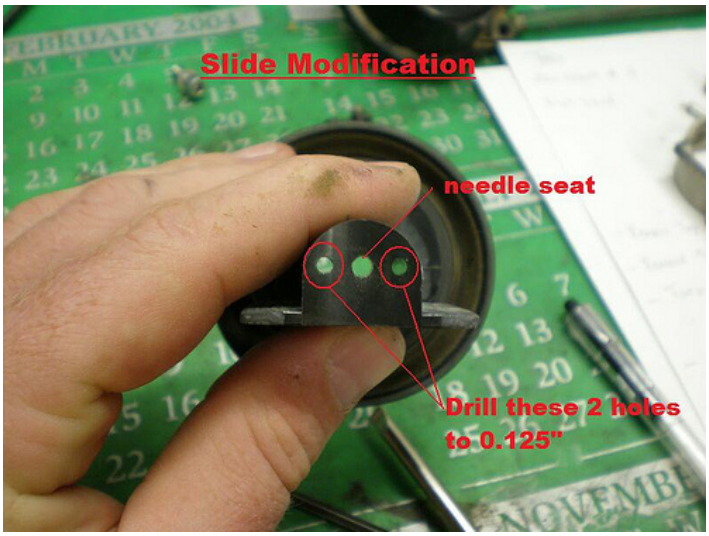

Figure 34

-CLIPPING THE SPRING-

The second way in which to increase throttle (slide) speed is to reduce the pressure placed upon the slide by the spring. This is referred to as "clipping the spring" and involves cutting 2 coils off of the spring. The thought behind this is that the reduced spring rate will allow quicker opening resulting in sharper throttle response.

To perform this mod simply cut 2 coils off the end of the spring as shown in **figure 35**.

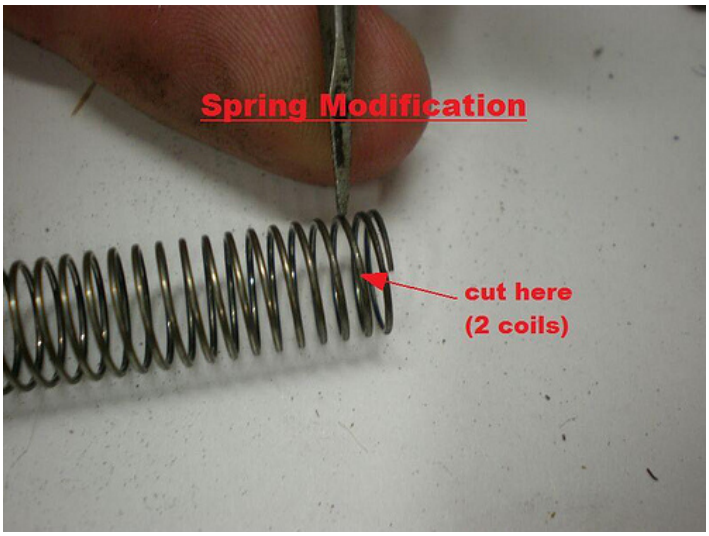

Figure 35

The cutting of the spring mod is a hotly contested mod. Some do it, some don't. I personally never did

but felt that since many had, and had reported positive results that it needed to be included. For more information about the spring dilemma, visit ADVRIDER where there is a thorough discussion which culminates in Creeper giving his $.02. Well worth the read.

-AIRBOX MODIFICATIONS-

Now that you have increase the ability of your carb to get fuel into the system more rapidly, you need to make sure your getting enough air as well. One of the things KTM does to these bikes to make them meet California Emissions is choke them up in the airbox and lean factory jetting. You've taken care of the jetting, now its time to open the airbox.

There are 2 ways to open the airbox;

1) Remove the snorkel from the top of the airbox. This is located just under the seat and will pull out with a tug. This is once again a hotly debated topic. Some say leave the snorkel on, some remove it. I say try it both ways and see what you think, after all, isn't that what its all about?

2) Remove the left side panel from the bike and remove the plastic cover. Replace this cover with the KTM Racing Airbox Cover (pn#58406003200). This I believe is one of the best mods that can be done to this bike. The smile vs. dollar factor heavily favors the smiles. This is a very simple mod that consists of removing one piece and replacing it with the other. I have also seen many people run with just the airbox cover and no side plastic piece. This is just another possible option for you. I chose against it due to the high dust areas here, but maybe for you...

-JETTING THE BST-40-

If you have just done the above-mentioned mods or have just bought your bike and need to remedy the horrible lean factory settings, this is the place for you. This carb is soooooooooooooo forgiving with it settings. Once you find the sweet spot, your good for almost anywhere. One of the real advantages to having this carb is that you can set off for your adventure at 4,000ft and end at 11,000ft and still have the same jetting. I dare you to try that with an FCR carb, it would be dying before it hit 8,500ft.

The main jets for the mikuni BST-40 carb work in increments of 2.5. My bike came stock at 142.5. From there they increase by 2.5, example 145, 147.5, 150, 152.5, ... I spent most of my time jetted at 157.5.

I will not sit here and tell you which Main Jet is best for your conditions. Invest some time and read, I promise you that others have had the same issues. If you cant find anything, ask. Chances are we can get ya really close. So, enough about the main jet.

The idle jet has already been discussed. If you have done the airbox mods, slide mod, and spring, then you need to be using the larger 47.5. pretty simple and straight forward.

The only other option is the needle. This is responsible for the throttle range from 1/4-3/4 throttle. It is a big deal having the correct needle and clip position. Most LC4's come stock in the 3rd clip. To richen the flow, lower the clip (**figure 36**). This allows more space around the needle in the needle jet, which allows more fuel into the air. To lean the needle, raise the clip. Make sure that while you do this, you don't loose any parts!

Figure 36

The jet needle (**figure 37**) – Has the greatest effect between 1/4 and 3/4 throttle. It's attached directly to the throttle valve. As the throttle is rolled open or closed the jet needle moves through the needle jets bore exposing different sections of the jet needle's profile to the needle jet's inner bore.

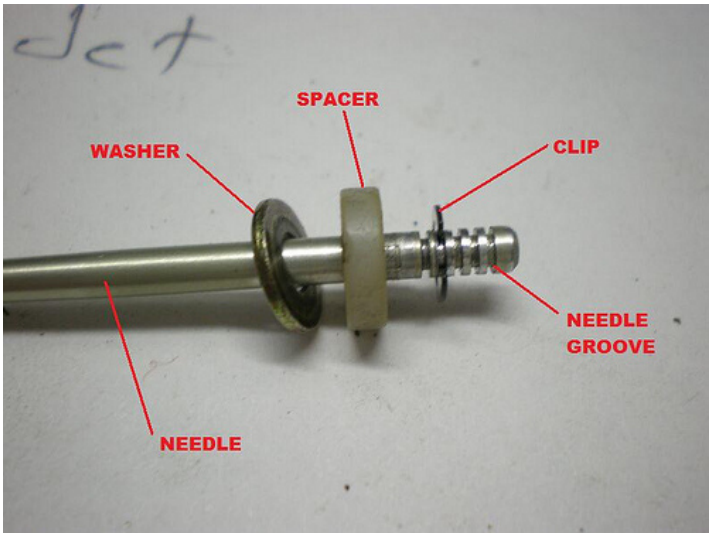

Figure 37

Six major elements determine the jet needle's effect on fuel delivery - the diameter of the straight section, the length of the straight section, the jet needle's taper, the clip position, and the number of tapers and the length of each tapered section (**figure 38**). The number of tapers is normally not changed from what was supplied from the factory.

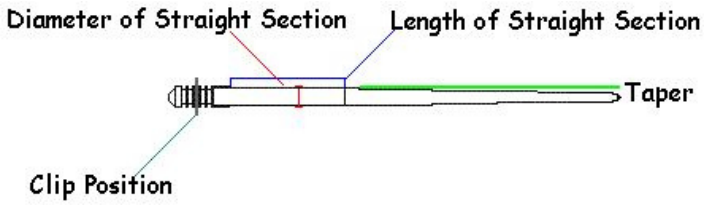

Figure 38

-FLOAT HEIGTH-

One of the other major factors that can cause problems with the BST-40 carb is an improperly set float height. This results in bogging, poor performance, and poor gas mileage.

To set the float height you need to hold the carb inverted with the float and weight installed. you will be trying to align 2 edges to form a parallel line (**figure 39**).

As you slowly rotate the carb vertically, the float will drop into the bowl. when this happens you want the 2 edges in **figure 40** to be straight.

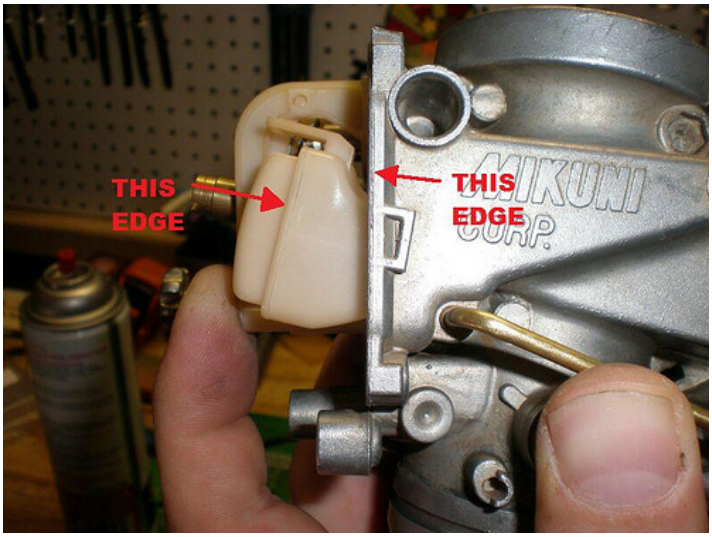

Figure 39

Figure 40

If yours doesn't look straight, adjust the tab that the float weight is resting on and then try again. This can be frustrating. Take your time and make sure you do it right. If not you will be doing it all over again.

Be careful that you don't freak out when the float drops all the way in. If you turn the carb all the way, it will sink in as shown in **figure 41**.

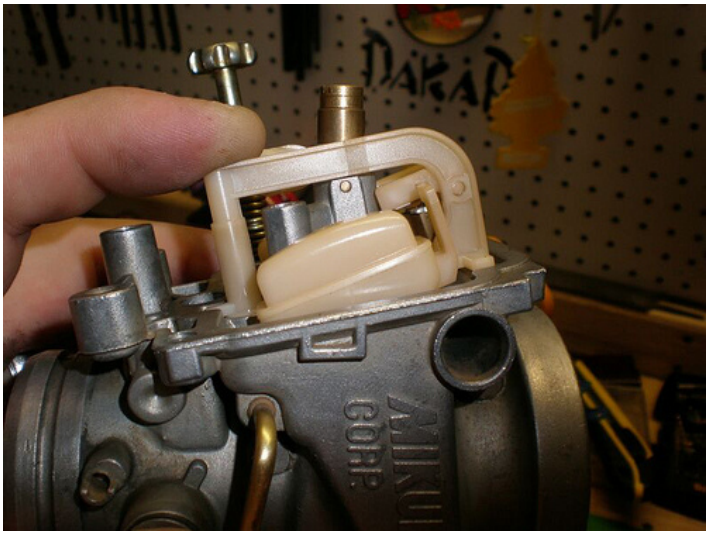

Figure 41

-THE CHOKE-

The choke on the BST-40 is NOTORIOUS for stripping out. The $hitt-y plastic nut strips if you even look at it funny. The problem is that if this is not sealed well, it can create a problem. Make sure that you are getting yours to seal correctly and fully when reinstalled.

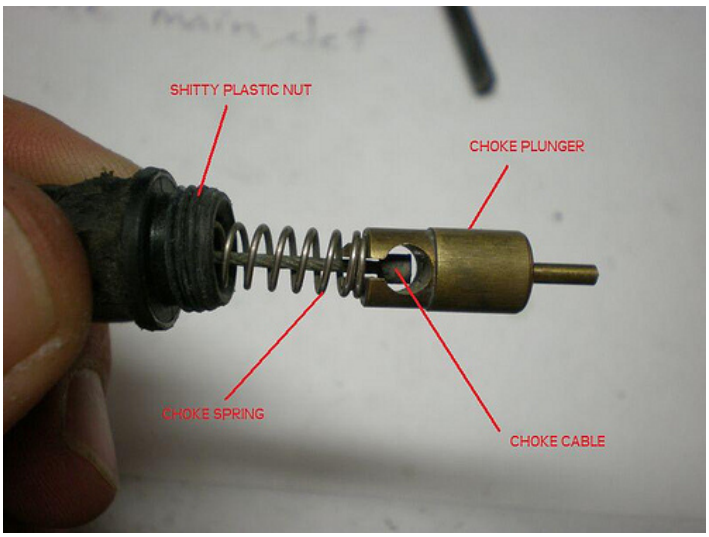

Figure 42

If you are one of those that do strip out that nut, don't worry. you can buy a new one, but of course the price keeps going up.

Part Number: 58431050000
Description: SCREW M12 STARTSYSTEMN
Retail: $7.16

Well my friends, that brings us to the end of another exciting adventure in motorcycle maintenance. I recommend that you grab another cold beer and celebrate your success. After all, what's the worse that could happen ? You have to spend all day tomorrow working on your bike as well!

Take care guys!!!

laters,
laramie