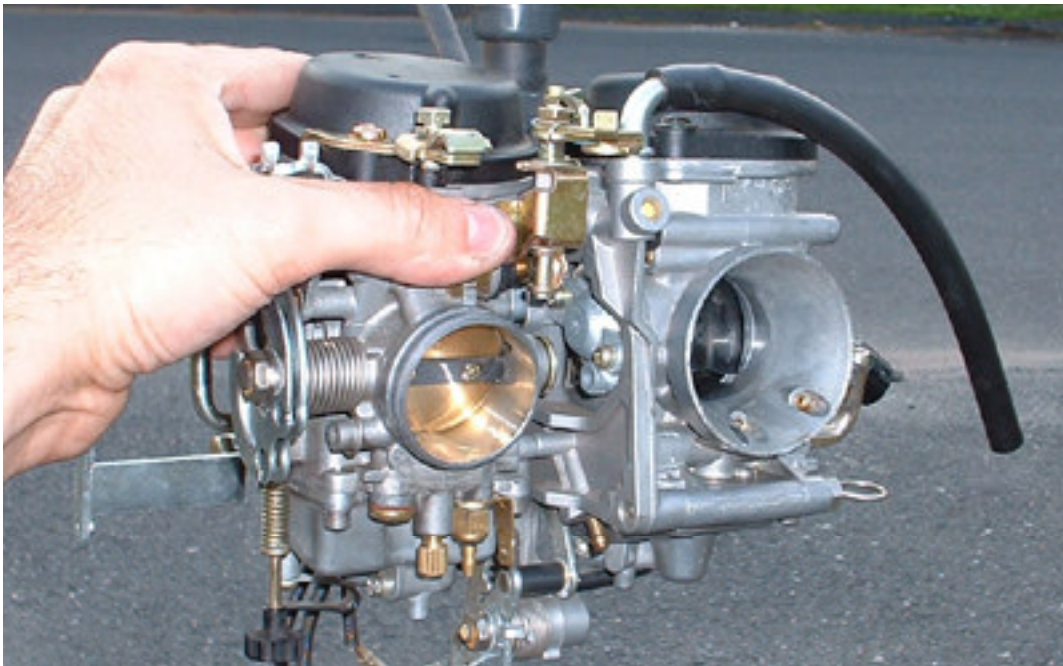


Jetting the Carburetors on a Yamaha V-Star 1100.

--By Steve Schneider
CycleForay



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Revision Level: 1

Contributors: Steve Schneider (Author), Larry,

From the Author:

This guide has been compiled so that a person can make an educated decision before deciding to jet his or her own carburetors. I hope that it acts as a tool for encouragement. The process is a simple one but a delicate one. If you can hold a baby, you can jet your own carburetors. Whatever air kit you decide to purchase or if you are jetting the carburetors because of a new exhaust system, you should read this guide before spending money having a mechanic perform the jetting process. You will, at the very least, understand what is involved and what the mechanics are going to be doing to your motorcycle. You may be the type of person that only trusts their bike to a trained mechanic... this is fine... think of this guide as educational only. But, if you are the type who likes to work on their own bike... use this guide as a tool to allow you to perform the operation without confusion. I hope that you find this guide informative and, more importantly, accurate. If you do find any errors, I would like to correct them. Please email questions or comments to cycleforay@comcast.net. Thanks and enjoy the guide.

Use disclaimer:

This comprehensive guide will attempt to cover all aspects of performing a complete rejetting of the V-Star 1100's carburetor system. If you decide to move forward and perform your own rejetting, you do so at your own risk. Portions of this guide describe removing, disassembling, and even drilling your stock carburetors. One slip could be the difference between a successful rejetting and a trip to the dealer to order new carburetors. Just promise me that you won't hold me responsible for your own mishaps. Thanks... shall we move on? Yes.

Prologue:

When thinking about rejetting the carburetors on your V-Star 1100, I think about it as a 2-stage process with many intermediate steps. The first stage is getting the carburetors off the bike. The second stage is performing the actual rejetting. This comprehensive guide will walk you through the process step by step. First we will discuss removing the carburetors and every step involved and second we will cover the rejetting process. The turning of every screw will be addressed. When you have read this entire guide, you will be ready to perform the rejetting process. Once finished, you will be proud of yourself. A new understanding of how the motorcycle breathes, will give you the confidence to try just about anything pertaining to the maintenance of your 1100. If you will gather up the following tools on the tool list... we can get started.

Tool List:

- 3mm Allen wrench
- 5mm Allen wrench
- 10mm wrench or socket
- 12mm wrench or socket
- #2 Philips head screwdriver
- Flat tipped screwdriver
- Pliers
- Needle nosed vise grips
- Battery powered drill
- Drill bit
- Small flat tipped screwdriver
- Others...



If you are savvy enough to stop reading here... this is a quick list that shows the basic chronology of the process.

Remove air filter housing
Remove the seat or seats
Disconnect Fuel Lines (also the vapor line from tank to charcoal canister on California models)
Disconnect instrument connectors from the fuel tank
Remove fuel tank
Remove air box
Disconnect TPS and heater connectors
Remove chrome carb cover
Disconnect Fuel Lines
Remove rubber carb elbows
Disconnect throttle cables from carbs
Remove the carbs
Perform the jetting

1. Remove the Chrome air filter housing.

To remove the chrome dog-dish (air filter housing) from the right side of the bike, you will need to remove the two mounting bolts and loosen the clamp that holds the air duct to the back of the housing. You will need a 5 mm Allen wrench and a #2 Philips screwdriver.

2. Remove the seats.

This can be accomplished by using a 5 mm Allen wrench and removing the Allen head bolt from just behind the rear seat and the bolt just behind the front seat. Pulling up and back will free the seats. One smooth motion will do it.

3. Gain access to the dashboard plug and unplug it (It is white)

Note: Your trip odometer will lose its count, please record the number if you wish to save your current mileage for this tank of gas.

Figure A shows the three plastic rivets that need to be removed to gain access to the dashboard plug. Using your Philips head screwdriver, press the small circle in the middle of the rivets down... a click is felt. Remove the rivets by hand. You have freed the cover and you may lift it up to expose the electrical connector that needs to be unplugged. Figure B shows the plug.

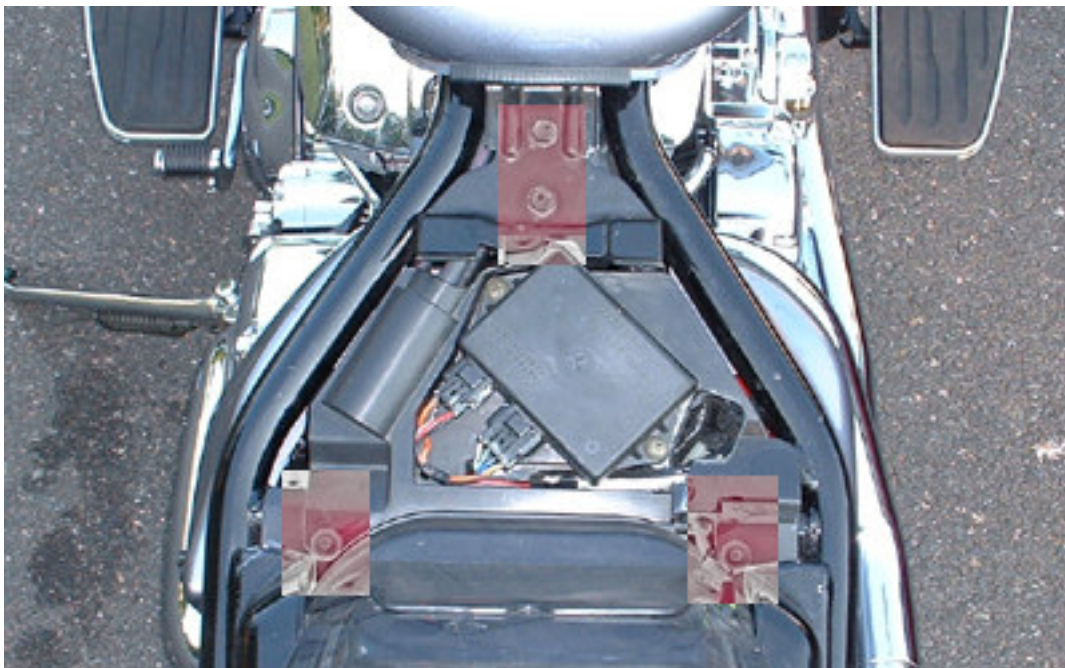


FIGURE A



FIGURE B

4. Remove the gas tank

Refer back to Figure A to see the two bolts that hold the gas tank to the frame. These can be removed with your 12 mm wrench or socket. Now you must remove the fuel line from the selector switch on the left side of the tank. Figure C shows the selector switch and the fuel supply hose. Turn the selector to the OFF position and use your pliers to relocate the hose clamp. With a container in hand to catch the fuel, remove the hose from the selector switch. A small amount of fuel will need to be collected from the hose. Now you can remove the fuel tank by placing one hand on the bracket that held the tank down and the other on the front of the tank... pull up gently and back and forth... the tank will come off to the rear of the bike. Be careful not to hit the triple tree or the risers. Tank removal is best performed while low on fuel. Place the tank somewhere to prevent accidental damage.

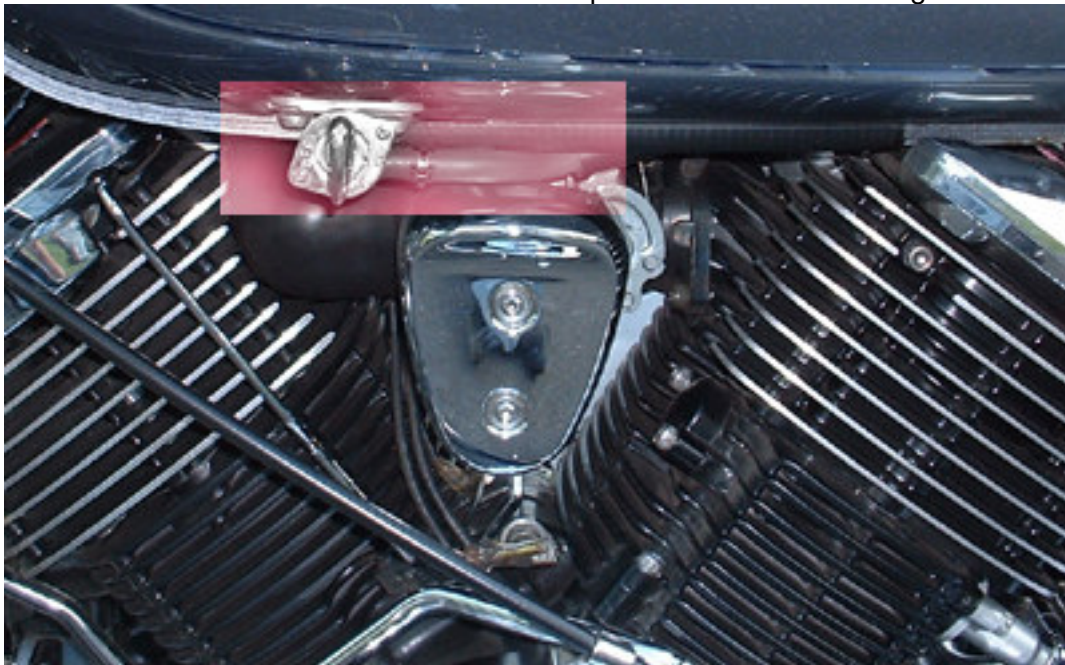


FIGURE C

5. Remove the air-box

In order to remove the airbox, first remove the duct that connected the air filter housing to the air-box. This can be done by loosening the clamp that holds the duct to the air-box. A Philips head screwdriver is used to accomplish this. Once the duct is removed, the air box can be removed by removing the bolt. This bolt is located at the rear of the airbox. A 10 mm wrench or socket is used here. Before lifting the airbox up and off, you will need to loosen the clamps that hold the airbox to the rubber carburetor elbows. A #2 Philips screwdriver is used here. The clamps are under the airbox and they are accessed one on either side of the bike. Now lift off the box and remove the breather hose from the bottom of the airbox. The airbox is now free... please set it aside.

Note: You may notice oil... motor oil... everywhere! Just wipe it away with a clean rag. Having the crankcase slightly over-filled with oil usually causes the presence of oil here. Check the level if you feel you have excessive oil residue. This is nothing to worry about.

6. Disconnect the choke and throttle cables from the carburetor assembly.

Before removing the cables you will need to unbolt the chrome cover that hangs on the left side of the bike. This is the decorative carburetor cover. To remove this cover use your 3 mm Allen wrench. Refer back to Figure C if you have trouble locating the cover. The V-Star 1100 has one choke cable and two throttle cables. Figure D shows the screw that holds the choke cable. Loosen this screw with your Philips screwdriver, and then the cable can be released by actuating the choke linkage, shown red in Figure D, by hand and sliding the cable end out through the bottom of the choke cam. The throttle cables are removed from the carburetors by using your 10 mm wrench. Figure E shows the nuts that need to be loosened to remove the cables. The cable A as shown in Figure E can be removed by loosening the bottom nut and then pulling the cable up and over the mounting bracket. Slide the cable end out of the throttle cam. Cable B, as shown in Figure E, can be removed by loosening the tall nut on the top of the bracket and then removing the cable end from the throttle cam. Reinstallation of cable A may require you to slacken the cable at the throttle end of the cable.



FIGURE D

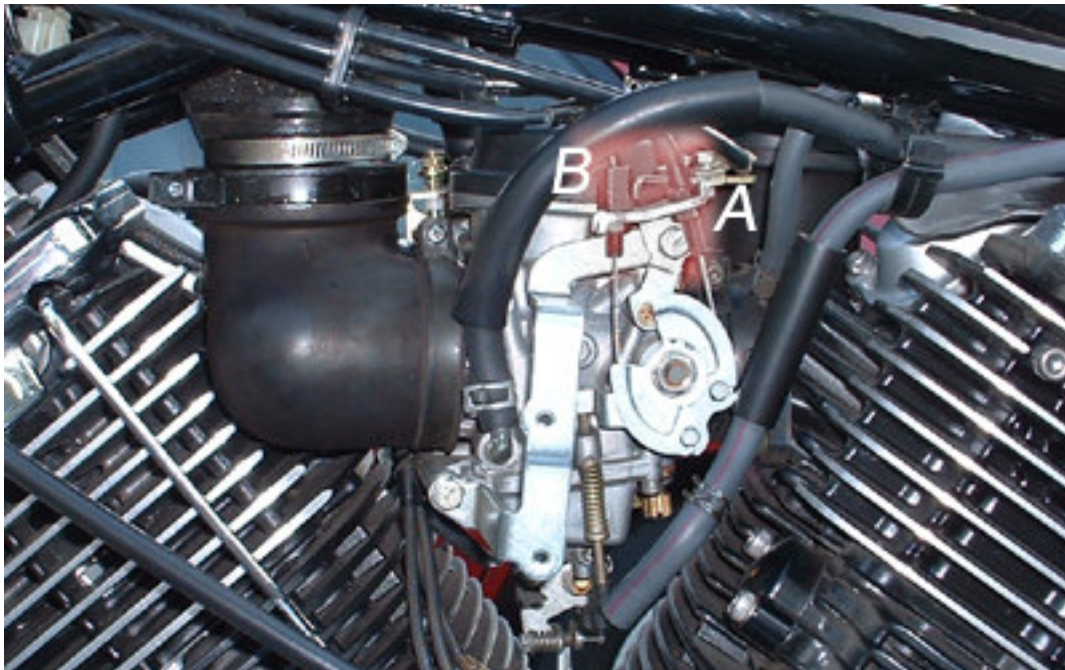


FIGURE E

7. Remove the rubber intake elbows from the carburetors

Using your Philips screwdriver, loosen the clamps on the carburetor side of the elbow ducts and remove them from the carburetors. Wipe any oil out of them and set them aside. Figures F and G show the elbows.

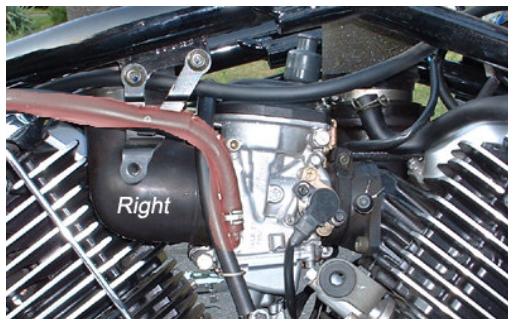


FIGURE F

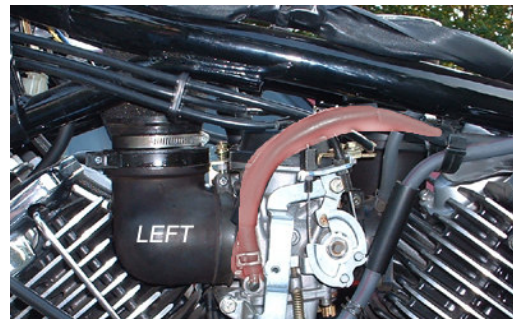


FIGURE G

8. Remove the fuel lines

There is a fuel line on each carburetor that needs to be removed. You will need your small container to catch any fuel that may come out of the hoses once they are removed. The fuel lines are highlighted in Figure F and Figure G. Your pliers will be used here to relocate the hose clamps.

9. Unplug the carburetor heaters and the TPS (throttle position sensor)

Figure H shows the two plugs that need to be unplugged before removing the carburetors. There is a small tang near the tappet cover that needs to be bent a little to free the wiring so the carburetors can be removed. We are getting close to removing the carbs... take a break.

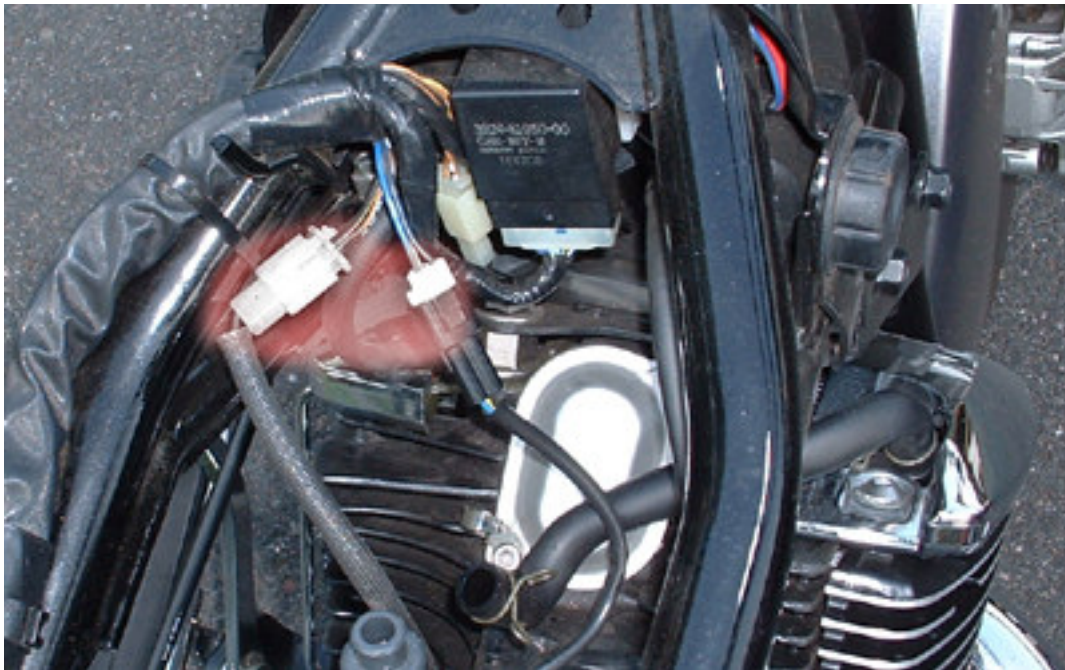


FIGURE H

10. Remove the carburetors

You are now ready to remove the carburetors from the motorcycle. It is necessary to loosen the clamps that hold the carburetors to the intake boots. You will need your 3 mm Allen wrench to perform this operation. Once you have the clamps loose, you can take hold and remove the carbs. The carburetors will be removed from the left of the motorcycle. To remove the carburetors from the boots, take them with both of your hands and turn the whole assembly counter-clockwise while rotating the carburetor in your right hand up and the carburetor in your left hand down. You will be able to see how both carburetors will be freed from the intake boots simultaneously. Once you have them free, maneuver them out to the left of the motorcycle. A small amount of fuel may leak out because the bowls are still full. You may put rags over your gearbox to absorb any dripped fuel. You may drain the bowls before removing the carburetors, but we find that not much fuel leaks out and it is easier to drain them while on the bench. Once you have the carburetors out, try to keep them level so that no fuel leaks out. Figures I and J show the carburetors before and after removal.

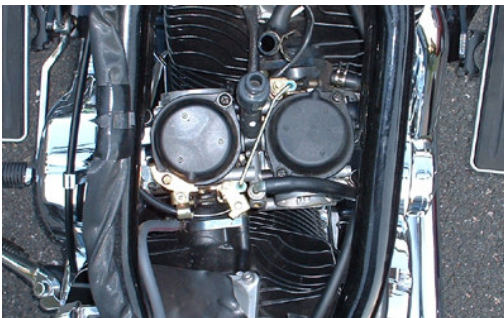


FIGURE I

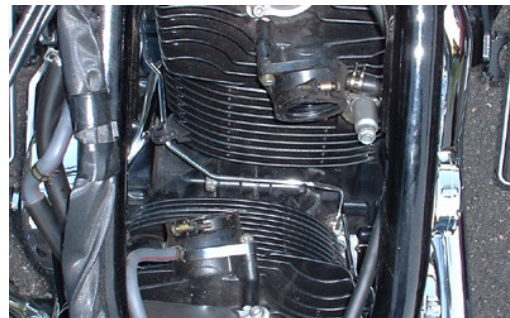


FIGURE J

11. Drain the fuel from the carburetor bowls

Figure K shows the carburetor assembly after it has been removed from the motorcycle. Figure L identifies the carburetor drain screws. The float bowls will need to be drained, one at a time, into a small container... such as an empty coffee can. It is easier to grasp the screws with a needle nosed vise grip rather than a Philips screwdriver due to the fact that the screws are soft

and they will damage easily. So, grasp the drain screw and turn it counter-clockwise to loosen it. Once you get it started, you can continue to loosen it with your Philips screwdriver until the fuel begins to drain. While holding the carburetors over the container, the fuel will begin to flow from the bottom of the carburetor. Repeat this for both carburetors.

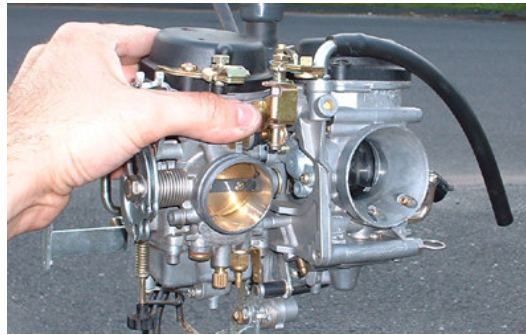


Figure K

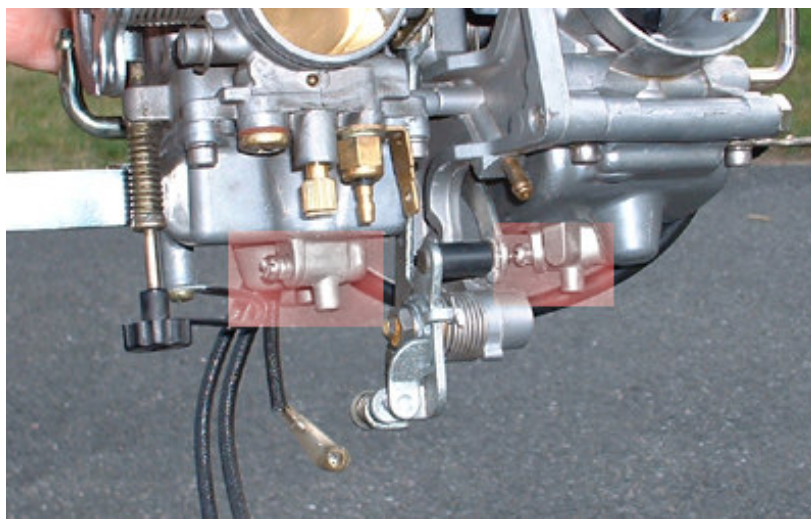


FIGURE L

Prologue to the actual jetting process

Now that you have the carburetor out and drained. Place them on the bench while keeping them upright. You may have to prop them up somehow. Use your imagination here. We need to discuss the process before we go inside the carburetors.

There are many reasons that you may want to rejet your carburetors, but the only jets we will be concerning ourselves with are the pilot jets, the main jets, the metering needles, and the PMS (pilot mixture screw). The V-Star 1100 comes from the factory equipped with Mikuni carburetors. They are jetted as follows... again speaking only about the jets mentioned.

Front cylinder carburetor:

- 112.5 Main Jet
- 17.5 Pilot Jet
- (1) 0.020" thick shim washer under the needle
- PMS setting apparently varies from bike to bike... but it should be 2.5 turns

Rear cylinder carburetor:

- 110 Main Jet
- 17.5 Pilot Jet
- (1) 0.020" thick shim washer under the needle
- PMS setting apparently varies from bike to bike... but it should be 2.5 turns

You probably noticed that the front cylinder is equipped with a larger main jet than the rear. This is the way the 1100's are set up from the factory and it is not a mistake. Depending on what you are doing, your choice of jet sizes may vary. If you have simply added slip-on mufflers to improve the sound of your V-Star, you probably don't need to rejet. If you have added a full exhaust system, you can probably get away with putting a 115 main in the front carburetor and moving your 112.5 main jet from the front carburetor to the rear carburetor. Then you can turn your PMS out to 3 turns. To adjust the PMS you simply turn it all the way in and back it out the prescribed number of turns. The location of the jets will be covered shortly. Another reason to rejet your carburetors would be if you were installing an "air kit". These kits, available from various manufacturers, are designed to allow the intake of your motorcycle to breathe easier. This results in more airflow, which results in more power. Flow becomes a major factor here and all of the various air-kits should come with the recommended jets to make the required changes to the carburetors. Instructions should also be included, which means that this article can act as a supplemental resource while you are performing the work. The jets inside the carburetor all perform certain roles in the fuel delivery process, but it all boils down to the throttle range that the motorcycle is operating at. The PMS screw simply allows you to adjust the mixture for efficiency while idling. The pilot jet is a low range jet, where the main jets work in conjunction with the metering needles to keep the mixture optimal at the mid to high range and at wide open throttle. The needles meter the fuel through the main jets by moving up and down with the diaphragm that resides under the black covers on the top of the carburetors. There is also a throttle valve connected to the diaphragm. We won't get any more technical than this right now. Lets talk about performing the actual work. Here we go...and remember... do not separate the two carburetors during this procedure.

12. Accessing the needles

The needles are accessed by removing the top covers from the carburetors. Needle adjustments should be performed one carburetor at a time. Figure M shows the covers.

Note: Needle adjustments can be performed while the carburetors remain installed on the motorcycle, but for the purpose of this guide, we have removed the carburetors.

Each cover has two Philips screws that need to be removed. Once removed, lift the cover slowly because there is a large spring under there. Set the cover aside and remove the spring. Figure N shows the cover off and the spring. Now, gently loosen the rubber diaphragm around the edges so that the throttle valve can be removed from the carburetor. Figure O shows the throttle valve assembly. You must now get the needle out by pulling out the white needle retainer. Figure P shows the needle retainer as installed in the throttle valve. Using a needle nose pliers, you can pull up while twisting to gently remove the retainer. It is just, sort of, a snap fit. BE CAREFUL HERE! There is a small spring under the retainer. You may want to perform this operation with the throttle valve inside a plastic bag. This way, if the spring goes flying, it will be contained in the bag. Figure Q shows the needle retainer and spring as removed from the throttle valve. You may get lucky and have the spring remain intact on the retainer. Once you have this out, set the retainer and the spring aside and get ready to remove the needle. The needle is removed from the top. Place your finger inside the throttle valve and cover the needle hole. Now you can turn the throttle valve upside down and carefully remove the needle. Figure R shows the anatomy of the needle.

Note: The needle in Figure R has two, additional shim washers present because the motorcycle used to take photographs is equipped with an air-kit that required these.

If you are installing an aftermarket needle, follow the manufacturers instructions pertaining to how to configure it before reassembly. If you are simply shimming the stock needle, the shims go over the tip of the needle to raise it up when assembled. Installation of the needle is the reverse.

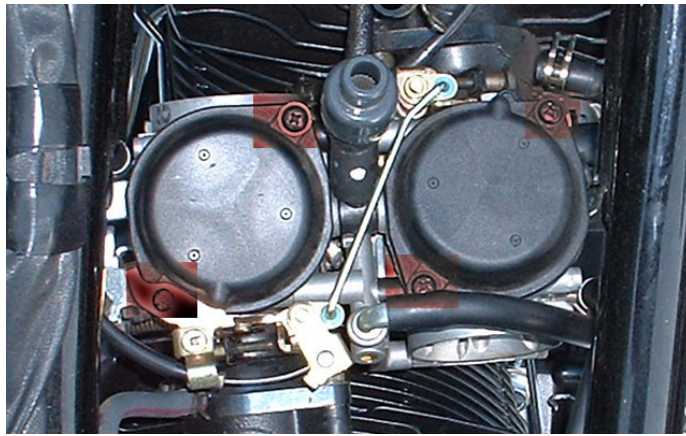


FIGURE M

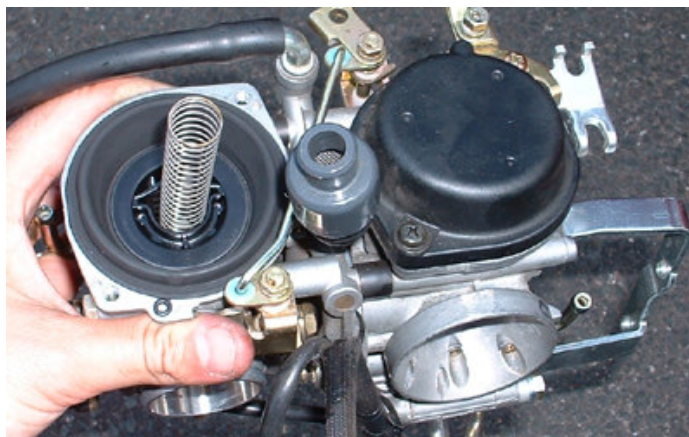


FIGURE N



FIGURE O



FIGURE P



FIGURE Q



FIGURE R

You have now successfully shimmed the needles or replaced them. Reinstall them into the carburetors and put the covers back on. When reinstalling the throttle valve assembly, be sure to get the edge of the diaphragm down evenly and put the cover on carefully. A mistake here may cause the motorcycle to run badly. We will be moving on the main jets and the pilot jets next.

13. Remove the float bowl

This is probably going to be the most frustrating portion of the entire process. It will be difficult to remove the float bowl screws without damaging them. If your kit didn't come with any, I suggest that you purchase some. The best choice would be a stainless steel Allen head cap screw... M4-.7 pitch, 10 mm long. You will need (8) of these total. Don't forget to get (8) lock washers too. Using your needle nose vise grips, break free the four screws that hold the bowl on. Once free, you can use your Philips screwdriver to remove them completely. Take off the carburetor bowl and set it aside. Figure S shows the bottom of the carburetor. Figure T shows the arrangement of the jets.

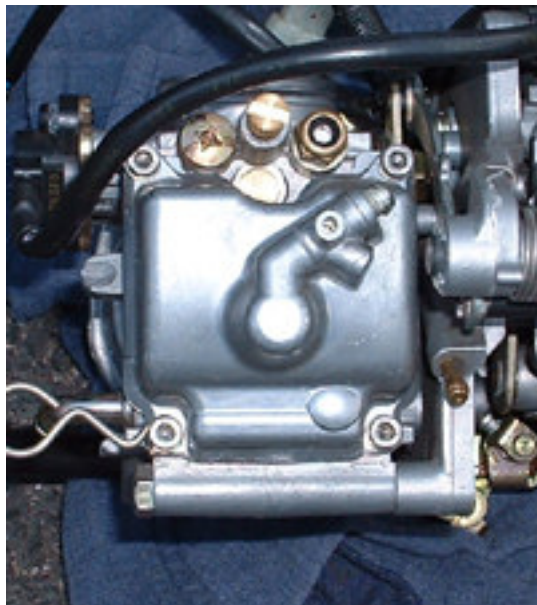


FIGURE S:

This carburetor has been jetted before, therefore, the float bowl screws do not look like the ones supplied from the factory. Also, you may notice that the carburetor heater is broken.

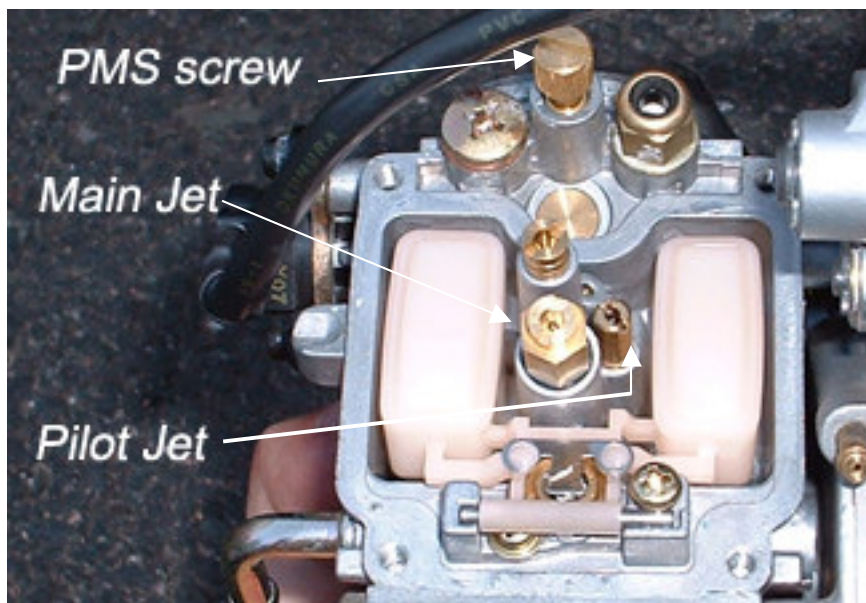


FIGURE T

This carburetor is equipped with an aftermarket PMS screw that has incorporated a thumb adjustment, so it will not look like your stock carburetor.

14. Remove and replace the main jets and the pilot jets

Refer to Figure T, unscrew the appropriate jets and replace them. Installation is reverse of removal. Only the small, top portion of the main jet needs to be removed. A flat tipped screwdriver can be used to accomplish this. You have now rejetted and are ready to put everything back together.

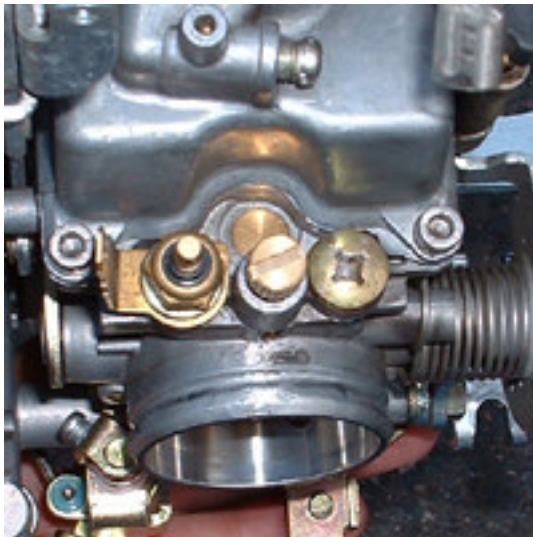


FIGURE U

15. Drill out the PMS plug, if equipped, and adjust the idle screw

Once you have installed the jets and have the carburetors back together, you must drill out the PMS plug so that you may make your idle circuit adjustments. There are two plugs visible on the bottom of the carburetor. Figure U shows the location of the PMS plug. The correct plug to drill out is the one that sits higher and that has the little hole in it. It is directly between the carburetor heater and the big Philips screw. **NOTE: THE CARB IN THE PICTURE SHOWS AN AFTERMARKET PMS SCREW... SO DO NOT DRILL THE PLUG THAT IS RECESSED.** This operation is, by far, the most delicate procedure of the entire job. For best results, a battery-powered drill that stops immediately upon releasing the trigger is required. The plug is about a $\frac{1}{4}$ inch thick so it may feel like you are drilling deep, but if you go slowly you will be OK. Make small, short runs and be sure not to hit the PMS screw hiding below the plug. Once you have the plug drilled out you will be able to see the PMS screw. This can be adjusted with a narrow flat tipped screwdriver. To adjust it... turn it all the way in (clockwise)... and then turn it out the prescribed number of turns. The number of turns will vary depending on what your air kit setup is like.

16. Initial startup

You have completed everything now and are ready to start the bike, huh. Well, if you have followed all the instructions it should start right up. You will hear the fuel pump ticking as it pressurizes and fills the float bowls up. Before you do any extensive riding... you should synchronize the carburetors... although... the bike will normally run fine, it is still recommended to perform this additional operation. Carburetor synchronization will not be covered here.

Additional tips and photos...



This photo shows the PMS screws (top left), the pilot jets (top right), the main jets (bottom left) and the M3, 0.020" thick brass shim washers (bottom right)

Part numbers for the jets are as follows...

Mikuni Main Jets: KN102.221-110 the last number is the size

Mikuni Pilot Jets: KVM28/486-17.5 again, the last number is the size.

Also, do not separate the two carburetors during this procedure.

Contributor tips:

- When drilling out the PMS plugs, you can make a drill stop by slipping a piece of 1/4" copper tubing over the drill bit so only a 1/4" of the length of the drill is exposed. (Larry)