

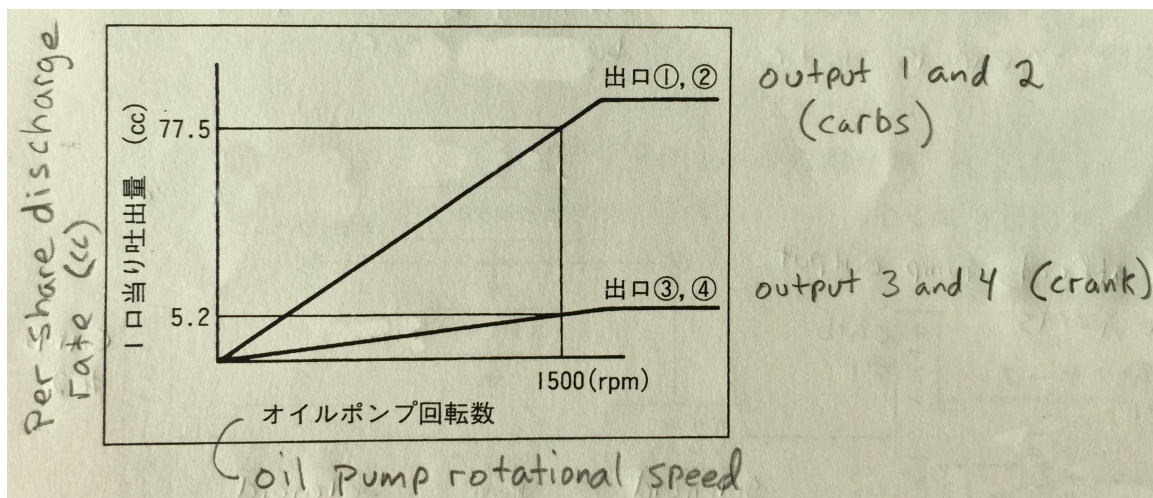
VJ23 2-Stroke Oil Injection System

Formally known as SLCS (Suzuki Lubricate Control System).

According to the manual (2-15), "The amount of oil supplied to the engine is controlled by a computer, and it sets an appropriate amount of oil according to the engine speed and throttle opening. By doing this, we are trying to reduce oil consumption."

The first thing that comes to mind when reading that statement is how does "throttle opening" affect the amount of oil since there are no throttle cables connected to the oil pump like the previous generations? This is because the VJ23 has a throttle position sensor on one of the carburetors and that input is used by the computer to help decide how much oil to allow to pass through the solenoids towards the carbs. The computer may also use the engine speed along with the throttle position but it may not be necessary because the pump itself discharges more or less oil depending on engine speed.

I have attached the diagram from the VJ23 service manual, which shows oil pump output, and how the amount of oil discharged from each connector is affected by engine speed. There are 4 outputs from the oil pump. Two of them (eventually) feed the lines to the carburetors and the other two feed the lines which supply oil to the crank bearings. The "MOST IMPORTANT" part is that the lines that feed the crank bearings don't supply all that much oil. At full engine speed they only supply 5.2cc per time period whereas the two outputs to the carburetors provide 77.5cc per time period. (Manual doesn't say what the time period is). That means that the outputs to the carburetors supply nearly 15 times more oil than the outputs to the crank! So, it is extremely critical that the hoses are connected properly.



The second attached diagram is also from the VJ23 service manual and shows how the SLCS (Suzuki Lubricate Control System) is to be assembled along with arrows that show the direction the oil flows through the check valves.

The important things to note here are: The outputs #3 and #4, that are at the top side of the oil pump, feed oil to the crank bearings. The lower two outputs (#1 and #2) supply as much as 15 times more oil and feed oil to the sides of the oil solenoids. The ignition box controls the solenoids and decides whether the oil should go to the carburetors or should be fed back into the input of the oil pump to reduce oil consumption. Take special note of the direction of the oil check valves. I've seen posts where people didn't understand how the whole system was working and they wondered whether they had the check valves installed

correctly. They are setup so that the oil diverted back into the system flow back through the filter to the oil pump. Oil from the oil tank is NOT allowed to gravity flow towards the solenoids.

It is also CRITICAL to connect the hoses to the solenoids correctly. The lines connected to the bottom of the solenoids feed oil to the carburetors. The lines at the top of the solenoids feed oil back through the check valves, oil filter, and back into the pump's input. Connect them wrong and you will feed lots of oil to the engine when none is needed and no oil when lots of oil is needed.

For the system to function properly, you MUST use the correct hoses, which are still available new from Suzuki. The inside diameter of the hoses AND THE LENGTH of the hoses are important. If the hoses are too long the oil pump may not be efficient enough to pump the correct amount of oil through them! If you want to know the proper length of the hoses then the parts manual gives you all of the information you need. For instance, Figure #10 shows the diagram for the oil pump parts. You will notice that many of the part numbers are the same. For instance item #12, #13, #14, #15, #16, #17, #18, and #19 all have the same part number and description ("09352-20503-600 HOSE (2X5X600)"). If you order one of these you will get a hose that is 600mm long. The "Remarks" column next to each says something like: "L600->35". This example says to cut a piece of the 600mm hose off to a length of 35mm and use the 35mm piece for this part. Each piece is specified to its own length and should be cut to the proper length before installing. So, you would only need to order 2 lengths of this hose to provide enough hose for parts 12 to 19...

Part #20 in the parts manual is unique in that it comes already assembled with 2 oil feed hoses cut to length and they are glued inside of the larger protection hose. No measurements are given in the parts manual which would make it difficult to make one of your own if they stop selling this very unique part. I have bought a brand new one and have written down the measurements but cannot find them right now. I'll update this post at a later time with the measurements and also update the English version of the parts manual that you can find pinned in this forum somewhere. In the mean time, I would suggest retaining your original part for future reference. (Note that part #20 connects the bottom of the oil solenoids to the carburetors)

Bleeding the entire oil pump system and all of its hoses is important to do if you are installing new hoses, filters, solenoids, etc. Service manual page 2-15 contains a very good mechanical drawing of how the oil flows through all of the hoses and pump. The diagrams on page 3-26 through 3-27 in the manual show how to bleed the system. I ordered a package of 10 industrial syringes with a flat blunt tip to push oil through the tubes. Here is a link to ones I found on amazon:

https://www.amazon.com/gp/product/B00DXPRTHG/ref=oh_aui_search_detailpage?ie=UTF8&psc=1

Search for "Industrial Syringes with Blunt Tip" if the link doesn't work. Try to get the 12gauge if you can find it. The smaller gauge (bigger number) doesn't seal in the tube as well. The blunt tip means that it is cut off square and won't poke through the sides of the tubes.

As a final note, the oil solenoids are in a resting position where the full amount of oil from the pump flows to the carburetors. This means that if the wires are disconnected or the power is lost to the solenoids then the engine will receive the full amount of oil as none is diverted to recycling. You will go through oil very fast in this state and will probably create a lot of excess smoke from the exhaust. But, at least you won't seize the engine due to lack of oil as long as your oil tank contains some oil.

The special tool that you can buy from Suzuki to test the oil solenoids is still available. I have bought one and there is nothing special besides clips to attach to the battery and the same connector that plugs into the side of the oil solenoids. The solenoids do get warm rather quickly when attached to the battery so I would leave it connected for short periods of time. If you blow into the side connector of the solenoid then you

can see that the air flows out the bottom until you connect the power to the solenoid and then the air flows out the top. If this works then your solenoid is working correctly. You can make your own special tool but if you want to buy one the part number is: 09913-14210

