

GS450 Owner Information

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1 Introduction

This is a source of information for the 1980 and 1981 Suzuki GS450 from the perspective of a modern owner or new purchaser. I hope that this information can be useful to anybody who owns a GS450, particularly those who are buying one as a first motorcycle and are interested in learning about how they work and how to keep up with the maintenance. This is **not** intended as a replacement for a full shop manual, but instead meant to serve as a reference for those who need to get up to speed on what often amounts to 30+ year of neglected maintenance. The idea behind creating this was to combine manufacturer information and tutorials that were created at around the same time of the bike (i.e shop manuals) with *practical experience* and knowledge gathered from many people who have maintained these bikes over many years and my own experience working on the GS450. The information included has been pieced together from several sources and in some cases created by me for modifications from the stock bike. Most of the content applies to any 1980-1981 GS450 (or in some cases most GS series bikes) while some of it has been added to document changes I have made to this specific bike.

I really need to give a shout out to the GS Resources site which holds an incredible wealth of information on the entire GS series of motorcycles. It's safe to say that there are many thousands of years of combined experience working on these bikes. Pretty much any question one might have about these bikes can be answered there.

1.1 This GS450

Included is some information specific to this particular bike. The main change from a stock configuration, cosmetics aside, is the electrical system for which a whole new diagram was designed and implemented for purposes of improvement and simplification. The engine was replaced with S miles indicated on the tachometer with an engine with O miles. This was done only to put the lower mileage engine in the bike. The engine is from a 1980 GS450L and is essentially identical.

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2 Regular Maintenance and Procedures

Below is a list of maintenance actions which should be performed at least as often as indicated or whenever an inspection warrants it. The two most important items which are **mandatory** for preserving the engine are replacing the oil and performing the valve adjustments. Of course there are many more maintenance tasks

Regular maintenance items include:

- Oil and filter change. (3,000 miles)
- Bleeding the brakes and replacing fluid (Once a year)
- Air filter cleaning and re-oiling (5,000 miles)
- Valve Adjustment (3,000 miles)
- Rear wheel alignment (Once a year or whenever necessary)
- Chain and sprocket replacement (10,000 miles)
- Tire replacement
- Change Fork Oil

2.1 Oil Change

2.2 Bleeding brakes and replacing fluid

2.3 Air filter cleaning and re-oiling

2.4 Valve shim adjustment

This is the most neglected piece of maintenance on the GS bikes. The valves will ‘tighten up’ over time leading to hard starting and if a valve clearance is allowed to become too tight, it can remain open and causing the valve to burn and leading to loss of compression in that cylinder.

The clearance is adjusted by checking the gap between the top of the shim and the cam lobe, with the lobe pointing directly away from the bucket/shim and with the engine **completely cold** (recommended 24 hours since last ran). The gap tolerances are between .03 and .08mm but a slightly larger gap is better than one too small. Since the shims are only available in .05mm increments, there should exactly one shim that will fit correctly. That being said, a gap of .09mm will be fine and will stay in spec. longer than one of .04mm.

You can easily tell if a particular gap is too small if you are not able to spin it with the cam lobe pointing away from the bucket (i.e there is no clearance).

Things you will need:

1. 10mm socket/wrench
2. 19mm Socket/wrench

3. Suzuki valve tool or zip ties
4. New valve gasket
5. Feeler gauges going down to at least .03mm
6. Tweezers for removing shims

Caution: DON'T rotate the engine if any of the buckets are empty (i.e no shim)! Doing so will scratch the surface of the cam lobe.

Steps:

1. Remove the 10mm bolts from the valve cover and remove the gasket.
2. Remove the right side engine cover plate (3 screws).
3. Remove spark plugs.
4. Remove the valve cover. If possible, you can try and salvage the existing gasket if it is not too old and the valve cover was not previously over-tightened.
5. For each valve:
 - (a) Rotate the engine by turning the 19mm nut under the right side cover (don't use the smaller nut!) until the lobe is pointing directly away from the bucket/shim.
 - (b) Measure the gap between the top of the shim and the lobe with the feeler gauges. There are three cases:
 - i. If no gauge fits in - Clearance is too tight. In this case it can be hard to measure exactly what size shim you need. Replace the shim with one several sizes smaller in order to calculate exactly which shim to use.
 - ii. The largest feeler that fits is within the tolerance of .03 - .08mm. Move on to the next valve.
 - iii. The largest feeler that fits is larger than .08mm. Your gap is too large and you need a larger shim to reduce the distance to the cam lobe.
 - (c) To remove a shim, hook the valve shim tool around the camshaft and wedge it on the edge of the bucket. The buckets rotate if there is some clearance, so it helps to first rotate the bucket until the notch is accessible to pry out the shim. Use the valve tool as a lever to depress the shim bucket. Pry out the shim and use tweezers to pull it out. *Be weary of the valve tool slipping causing the valve bucket to slam closed. It has been reported that the shim can shatter if slammed against the cam lobe.* Replace with the correct sized shim.
 - (d) Once the correct shim has been installed, rotate the engine several times to make sure that it is seated correctly and measure the gap again to verify that it is now within tolerance.
6. Once all shims have been checked/replaced, lightly oil and re-install the cylinder head cover gasket (preferably with a new one).
7. Replace the cylinder head cover. The 10mm bolts do not need to be overly tightened. Reinstall the 12 bolts starting with the inner four, then the middle four and finally the outer four by finger tightening only. Go back and finger tighten from the inside out one more time. Once all 12 bolts are finger tight, use a 10mm wrench to tighten the bolts another 1/4 turn or so. Over tightening can cause the gasket to leak and makes it less likely the gasket can be reused the next time the cylinder head is removed.

2.5 Rear wheel alignment

2.6 Chain and sprocket replacement

2.7 Fork oil replacement

2.8 Removing and Installing the Cam Chain Tensioner

The cam chain tensioner is located underneath the carburetors and it's installation procedures in the manuals is unclear. If the tensioner is not installed correctly, then either too much or too little tension will be applied to the cam chain which can lead to binding/breaking or jumping from the camshaft sprockets, respectively. The tensioner can be removed and installed without removing the carburetors although I have found it helpful to remove the starter motor cover.

To remove the tensioner:

1. Loosen the 12mm locknut.
2. Tighten the lockscrew to lock the plunger into place.
3. Loosen the 10mm bolts (can also use screwdriver) to remove the tensioner assembly from the cylinder.

To install the tensioner:

1. Push down on the plunger while turning the knurled nut CCW until it is FULLY DE-PRESSED. *At this point the spring loaded knurled nut should be backed out quite a bit. If you were to release the plunger it should freely extend but should not retract without you turning the knurled nut CCW.*
2. While the plunger is fully depressed tighten the lockscrew to hold it in place.
3. Install the assembly into the cylinder head.
4. Here is the tricky bit: Back the lockscrew out 1/4 - 1/2 turn. You will hear the plunger release and hit the cam chain guide. There is a flat portion on the plunger rod that the screw tightens against and backing the screw out too much can cause the rod to over extend

3 Air intake, fuel delivery and exhaust

3.1 Petcock

The petcock is vacuum operated and for this reason has no 'Off' position. It has three settings:

1. On - While in this position, the petcock flows fuel while vacuum is applied to the vacuum line going to the LH carburetor. When the engine is not running, the petcock is essentially 'Off'.
2. Reserve - This operates in the same way as 'On', except is fed fuel through a tube whose mouth sits lower in the tank. There is approximately 1/2 gallon of fuel available exclusively to the petcock reserve (approx. 20-30 miles).
3. Prime - Allows fuel to flow freely to the carburetors. If the bike has been sitting for more than a day, it helps to 'Prime' the float bowls by moving the lever to this position for several seconds prior to starting.

3.2 Carburetors

The carburetors are Mikuni BS34's preceded by UNI foam air filters. The carburetors have been rejettted to the following configuration:

INSERT JETTING TABLE

4 Electrical

4.1 Overview

The electrical system and wiring are the most customized part of the bike. A whole new wiring harness was created to simplify and improve the stock one. Improvements include an upgraded charging system (based on a series type Rectifier/Regulator), a Single Point Ground (SPG) to ensure currents have a clear return path the battery, an updated and smaller dashboard, auxilliary lighting, a coil relay mod to supply the coils with power directly from the battery and an upgraded fusebox to isolate different systems and allow for additional accessories to be easily added.

The fusebox seperates different systems onto different circuits. The circuits broke the wiring system into are:

1. Ignition - Ignitor, coils, etc.
2. Lights - Headlight, Taillight
3. Aux. Lights and accessories - Turn signals, brake light, auxiliary headlight

4.2 Component Descriptions

The main electrical components in this GS450 are listed below:

1. Battery
2. Regulator/Rectifier (R/R) - Takes the DC current from the stator and converts it to AC current. This is pushed into the main power circuit and charges the battery when it's output exceeds that of the battery at higher RPM's. The unit installs is an SH775 series type that is highly recommended for the GS series bikes.
3. Fusebox - This is a Powerwerx 6 Circuit unit used to distribute power to multiple systems
4. Ignitor - The ignitor takes input from the Signal Generator and uses it to control when the coils fire the spark plugs.
5. Signal Generator - The ignition system was left unchanged and is an electronic type. The signal generator lives behind the right engine subcover (round) and sends a signals to the ignitor unit with each turn of the crankshaft. The signal generator sends the 'signal' to the ignition system telling the spark plugs when to fire.
6. Stator - Charged by a permanent magnet attached to the crankshaft, the stator feeds the R/R DC current which in turn is used to charge the battery.
7. Starter Solenoid - A relay triggered by the starter button which sends power from the battery to the starter motor.
8. Coil Relay - This relay is triggered by the kill switch and supplies power directly from the battery to the coils. This eliminates any loss in current from traveling through the rest of the harness (and the kill switch) giving a hotter spark for better combustion.

4.3 Wiring Diagram

5 Storage

There are lots of ways to store a motorcycle over the winter or for longer periods of time. Here is what I have done with success.

1. Pick a last day to ride the bike and bring it to operating temperature.
2. Fill the gas tank with fresh gas and 1/5 - 1/4 bottle of SeaFoam.
3. Ride home and immediately change oil and filter (to prevent particles from settling at the bottom of the crank case from sitting).

4. Lubricate the cylinder walls. To do this pull both spark plugs and put a small amount of oil (clean motor oil or Marvels Mystery Oil). Then, with BOTH PLUGS OUT, hold a rag over each spark plug hole and hit the starter button. Doing this will shoot the oil out of the plugs while lubricating the cylinder walls. Replace the spark plugs (with new ones if you like).
5. Drain the float bowls by removing the drain plug (catch the gas with something and dispose). Make sure the petcock is set to 'On' and functioning correctly.
6. Store on center stand and put a piece of wood under the front wheel so that it is not touching cement floor.
7. Attach a trickle charger to the battery, or remove it altogether and store it inside.

6 Parts and vendors

6.1 Part numbers

7 Vendors/stores

8 External links

1. The GS Resources: www.thegsresources.com -
2. Basscliff site: <http://members.dslextreme.com/users/bikecliff/> -