The Mikuni carbs on GK76a use O ring seals in 3 different locations, any or all of which cause carburation mayhem as they harden with age, heat and fuel immersion. GK73a and GK71f types may or may not be similar, beyond my experience I'm afraid.

Symptoms of leaky O rings and poor carb setup include:-

- cold starting without choke
- rich running/poor MPG/sooty exhaust/spark plugs

Both the above need attention quick. The O rings are almost certainly leaking and WILL allow excess fuel to wash the bores, which WILL result in excessive and rapid piston/bore wear and a totally knackered engine that needs £hundreds spent on a rebore.

- stumbling and jerky pickup from low revs
- hard hot starting
- poor low/mid throttle response, but OK at higher revs

May just be carb balance and slow-run mixture adjustment. But if accompanied by rich running and no need for choke when cold, you're looking at a carb rebuild.

Carb removal and strip:-

This isn't hard. BUT BE AWARE THAT PETROL IS EXPLOSIVE AND WILL KILL YOU GIVEN HALF A CHANCE. You have to get the carbs off which looks an impossible task. Obviously tank, seat, fairing need to come off. Disconnect the battery to avoid spark risks. There's a rats nest of hoses, breathers and cables and sh*t to be disconnected. Everything can be left connected at the carb ends. Take a picture/make a sketch so you know where it all goes back.

- undo jubilee clips between carbs and inlet stubs, and carbs and airbox stubs
- release throttle cable at the handlebar end
- release choke cable at carb end
- unplug TPS (SP only)
- withdraw the 2 large wire clips that retain the airbox stubs, and push the stubs back into the airbox (pushing them back onto the carbs later is easier with the filter removed).
- this will give you enough room to pull the carbs off the inlet stubs and feed them to the offside and remove the entire bank, along with the attached hoses etc.

Unless you need to for other reasons, don't separate the carbs, leave them in a bank. You need to get the float bowls off and also the diaphragm covers. Be warned : these Philips head screws are sods, and apt to corrode in place. At the very least you need a decent, properly-fitting screwdriver, but gentle use of an impact driver is far more likely to work without mashing the heads. Altec also sell caphead M5x12mm stainless steel bolts (code 114-6444, £10 for 50) which you can use to replace the OE Philips rubbish.

The offending O-rings are:-

- around the body of the float perch/shutoff valve holder, the pinky/orange plastic piece. If this leaks, petrol simply bypasses the shutoff valve and overfills the float bowls. IME this is the most problematic of the 3 locations, since the plastic body is a loose fit and the single securing screw allows it to wobble around if the O-ring is knackered.

- around the slide holder base, the large plastic piece that the plastic slide runs in. A leaky O ring here will bugger up differential pressure on the diaphragm and mess up throttle response and mixture progression

- around the main jet, sealing it into the carrier. Another potential disaster, as leaks here will be like having an oversize main jet fitted.

'What O-rings do I need?'

Our bike is a 1994 GK76a SP with Mikuni 35mm carbs with TPS, but all other GK76a's 33mm carbs use the same O-rings. Any other models I DON'T KNOW - you must make your own inquiries.

You can buy OE replacements from Suzuki but they cost a mint and are exactly what caused the problem in the first place.

Wherever you get them, obtain Viton rather than Nitrile rubber at least for the perch and mainjet O rings. Viton is petrol and heat proof.

http://www.altecweb.com are a UK site who sell 2 out of the 3 types

Altecweb quickorder codes for Viton O rings
ORV BS010 mainjet holder
ORV BS011 float perch
These are £4.05 each for a pkt of 50, a lifetime's supply. You only need 4 of each type.

These are Imperial sizes and a bit snugger and fatter than the OE metric, which is a GOOD THING - especially in the case of the float perch, where the OE O-ring is a poor seal in the carb body even when new.

You will also need 4off 10mm ID x 1mm for the slide holders. Altec don't sell this size in Viton or Nitrile.

Nitrile (standard material for O-rings) seems OK in this location as they aren't immersed in petrol. Halfords and B&Q sell mixed packets of O rings, one of which contains some 10mm x 1mm. Unfortunately I can't now remember which shop - B&Q medium size assorted O rings, I think. They're cheap enough, a quid or so per pack.

DO NOT be tempted to use any of the other nitrile O-rings in the pack that might fit the mainjet and float perch, nitrile is NOT good for immersion in hot petrol and they'll deteriorate rapidly and you'll end up doing them again in a few months.

Using these O-rings has worked well here. The bike continues to run like a watch and be completely free of carb problems 6m later.

PLEASE NOTE : assuming good engine condition, good plugs and aircleaner, you will need to check the valve clearances AND balance the carbs as accurately as possible AND adjust idle mixture on each carb VERY carefully in order to resolve carb problems. In that order.

Do NOT f$ck with float height settings unless they're wrong. Unfortunately a lot of people try and fix excessive richness (due to leaky O rings most often) by messing with float height. It won't work. It just makes things more confusing. Unfortunately #2, the Jap manual for these bikes (GK76a) contains no intelligible information about float height, so once someone had messed with them there's no way of knowing what they should be. The occasionally-quoted 2-4mm at the perch is impossibly vague. All I can tell you is that the float heights on our GK76a SP are 20.5mm measured in the conventional manner (float bottom to carb flange when shutoff valve just touching seat), and this works fine here. Other models may be different.

These bikes are just amazingly sensitive to carburation. Small adjustments make large differences on these bikes. The patience of a saint, accuracy and perseverance are essential. The difference, once sorted, is remarkable - even the SP is able to pull cleanly from tickover. Skip anything, and you're liable to get nowhere.

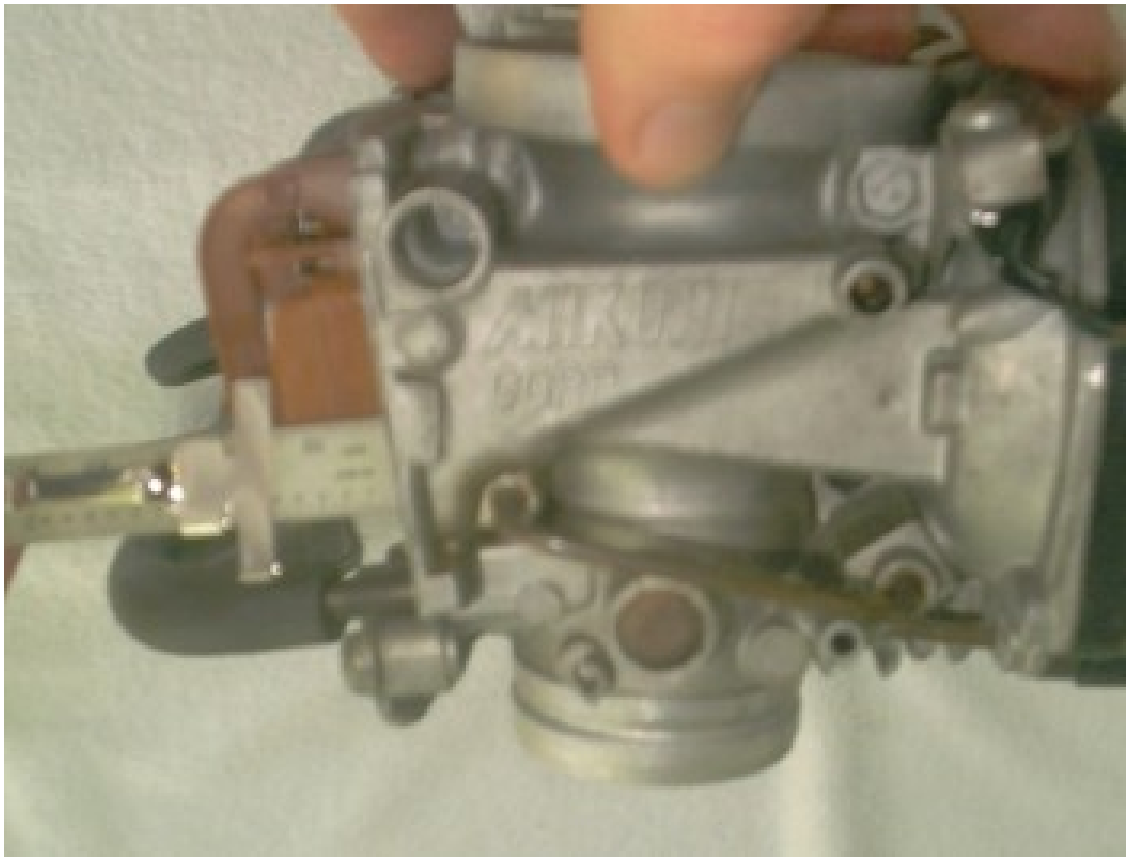
I can balance and set the carbs on my GSXR1100J in <10minutes, the same on the 400 took me most of last summer through lack of info and trying to cut corners. I had the carbs on and off more times than I can count - 3 times in one day was my record. Take it from me, it's worth doing it once thoroughly and properly.

Carb balance is tricky to achieve (I use Morgan Carbtunes inverted - excellent kit), but the breakthrough insight is that idle mixture HAS to be set on each carb too. Most bikes don't need that messing with. After experimenting with Colortune I realised it just wasn't accurate enough, and found it much better to just adjust each slow-run screw by ear for the most even running. It's then worth going back and readjusting balance.

If you run a race can and/or aftermarket aircleaner, you will also need the assistance of someone with a dyno to sort out mainjet and needle issues. Unless you do that, it's unlikely you'll be able to get the bike to carburette properly - unless you're sufficiently skilled that you don't need any of the above advice.

# Setting float height

**Setting float height can be kind of intimidating for some people, but it's not hard to get it right. The trick is to hold the carbs as they would normally be positioned, then slowly tilt them until the float just "flops" down. The height should be measured at that exact spot. You may have to do it a couple of times to get that "sweet spot", which should be at the point where the carbs are almost horizontal. (This pic might be a little misleading in that you won't have the carbs this far over, but maybe closer to 45 degrees.)**
**The floats are connected to a valve that feeds gas to the bowls. Inside that valve is a spring. You want to measure with the little metal tang touching the valve, but not compressing the spring. Measure the distance from the gasket surface to the highest part of the float.**
**The factory shop manual lists the recommended float height at 13.5 - 15.5mm. My bike likes the floats at about 15.5-16mm. Normally, if you are within the factory spec, you'll be fine.**



**If you find that your floats are not within spec or you're experiencing a float height related problem, the height is altered by bending the metal tab. Go easy here. A little bit goes a long way. You don't have to remove the float assembly to alter the height, I just did that in this picture for the sake of clarity.**
**When you're measuring the height, be sure that the float assembly is "seated" in the carb body. If you hold down the "frame" of the assembly with your finger, you will get a more accurate measurement. Be careful that you don't push down too hard and cause the assembly to be distorted, though.**

**Improper float height can cause a number of problems, primarily in the lower midrange, say 2-4K RPM. Bear in mind that increasing the float height measurement will actually lower the fuel level in the bowl and decreasing the float height number will increase the fuel level in the bowl. Remember, the floats are mounted upside down in the carb.**

**Lower float height / increase the measurement to counter a rich condition.**

**Raise float height / decrease the measurement to counter a lean condition.**

**If you think you have a problem that appears to be carb related, go to the Factory Pro tuning page. This page is the absolute best carb tuning resource I have found and it will save you hours of time and frustration.**

# Important notes about CV carb tuning!

## To properly tune, you MUST:

**1.** Have selected the **BEST main jet** **for full throttle power** (not just a "good" main jet - we mean "the BEST main jet" for power at high rpm).
That eliminates the common severe tweaking of the midrange and lower tuning ranges to compensate for a "wrong" main jet.

**2.** Then - select the **BEST needle height / clip position** for power at FULL THROTTLE / MIDRANGE **after** selecting the BEST main jet -
That almost eliminates weird problems at cruise caused by tweaked needle heights that were required because the main jet wasn't correct.....

**3.** Then, adjust the **BEST Float Height** for BEST FULL THROTTLE / LOW rpm (many Honda's excluded because floats are not adjustable) -
You should be able to apply FULL THROTTLE at LOW RPM in TOP gear without ANY misfire of bogging or stumble.....

If you follow that order, you will have:

1. Best **topend.**
2. Best midrange.
3. Best low rpm power.

Then - all you have left is **dialing** in the pilot circuit - i.e. mixture screw and pilot jet size - That's IT - Don't tweak needle heights and throw away full throttle midrange to try to fix a cruise issue!!! **(Unless you want to!)**

If you reach an impasse in steps 1,2 and 3 in the FULL THROTTLE tuning, STOP!!!!! and call TECH SUPPORT!!!

415 491-5920 and 800 869-0497, ask for TECH SUPPORT –

# *Follow steps in order....First, dial in:*

- ***1. Top end (full throttle / 7.5k to redline -***

***Best Main Jet must be selected before starting step 2 (needle height)!***

  - ***Select Best Main Jet***
    - To get the best, most even top end power (full throttle/after 7500 rpm), select the main jet that produces the hardest pull at high rpm.
      - If the bike pulls harder at high rpm when cold and less hard when fully warmed up, the main jet is too large. Install a smaller main jet and retest until you find the main jet that pulls the hardest at high rpm when fully warmed up. This must be done first - before moving on to the other tuning ranges.

      - If the bike doesn't pull well at high rpm when cold and gets only slightly better when fully warmed up, the main jet is too small.
        - In order to properly tune the midrange and low rpm carburetion, THE MAIN JET MUST FIRST BE PROPERLY SELECTED after 10 to 15 minutes of hard use!
          - Do not pay too much attention to the low-end richness when you are changing main jets - you still need to be using the main jets that produce the best power at high rpm. You will deal with the low-end / cruise later - after step 2.

## *2. Midrange (full throttle /5k-7k)*

***Step 1 (Best Main Jet) must be selected before starting step 2!***

  - ***Select best needle clip position***
    - To get the best power at full throttle / 5k-7k rpm, adjust the needle height, **after you have already selected the best main jet.**
      - If the engine pulls better or is smoother at full throttle/5k-7k in a full throttle roll-on starting at <3k when cool but soft and/or rough when at full operating temperature, it is too rich in the midrange and the needle should be lowered.
      - If the engine pulls better when fully warmed up but still not great between 5k-7k, try raising the needle to richen 5k-7k.
      - If the engine pulls equally well between 5k-7k when cooler as compared to fully warmed up, the needle height is probably properly set.
        - Do not pay too much attention to the low-end richness when you are changing needle clip positions - you still need to be using the clip position that produces the best full throttle / 5k-7k power in conjunction with the main jets (Step 1) that produce the best power at high rpm. You will deal with the low-end / cruise next.

## *3. Low end (full throttle / 2k-3k)*

***Step 1 (Best Main Jet) and Step 2 (needle height) must be selected before starting step 3!***

- ***Float height (AKA fuel level & how to..)***

o To get best low-end power, set **float height (fuel level)** so that the engine will accept **full throttle,** without missing or stumbling, in 2nd gear from 2.5k to 3k rpm at minimum.

- Float heights, unless otherwise specified in the installation guide, are measured from the "gasket surface" of the carb body to the highest part of the top of the float - with the float tang **touching but not compressing** the float valve spring.
- If the engine has a "wet" rhythmic, soggy area at full throttle / 3k-4k rpm, that gets worse as the engine heats up, lower the fuel level by resetting the float height 1mm greater (if the original was 13mm - go to 14mm). This will lower the fuel level, making full throttle / 2k-3k rpm leaner.
- If the engine is "dry" and flat between 2k to 3k rpm, raise the fuel level.
- Example: change float height from 15mm to 14mm to richen up that area.

- REMEMBER, since the main jet WILL affect low speed operation, the MAIN JET has to be within 1 or 2 sizes of correct before final float setting.
  - Warning: If the engine is left with the fuel level too high,, the engine may foul plugs on the street and will be "soft" and boggy at part throttle operation. Adjust Floats to raise/ lower the Fuel Level.
    - Base settings are usually given if a particular application has a history of fuel level criticalness. The Fuel level height in the float bowl affects full throttle/low rpm and, also, richness or leanness at cruise/low rpm.
  - **Reference:** a bike that runs cleanly at small throttle openings when cold, but starts to show signs of richness as it heats up to full operating temperature, will usually be leaned out enough to be correct if the fuel level is LOWERED 1mm. Check out and RESET all: Suzuki (all), Yamaha (all) and Kawasaki (if low speed problems occur). Needless to say, FUEL LEVEL IS EXTREMELY IMPORTANT!!!
- If there are low-end richness problems, even after lowering the fuel level much more than 1.5mm from our initial settings, check for needle wear and needle jet (part of the emulsion tube). See Worn Needle and Worn Needle Jet diagram. It is VERY common for the **brass** needle jets (in the top of the "emulsion tube") in 36mm, 38mm and 40mm Mikuni CV carbs to wear out in as little as 5,000 miles. Check them for "oblong" wear - the needle jet orifice starts out round! Factory Pro produces stock replacement needle jets / emulsion tubes for 36mm and 38mm Mikuni carbs. Click here

## *4. Idle and low rpm cruise*

- ***Fuel Screw setting (AKA mixture screws)***
  - There is usually a machined brass or aluminum cap over the fuel screws on all but newer Honda. It's about the diameter of a pencil. Cap removal details. Newer Honda carbs have no caps, but use a special "D" shaped driver, usually supplied in the carb recal kit. We do have them available separately, too. 800 869-0497 to order -
- Set for smoothest idle and 2nd gear, 4k rpm, steady state cruise operation. Set mixture screws at recommended settings, as a starting point. For smoothest idle, 2nd gear 4000 rpm steady state cruise , and 1/8 throttle high rpm operation. (pj tuning information)

        - Pilot fuel mixture screw settings, float level (but, you've "fixed" the fuel level in Step 3 - which you have already done!) AND pilot jet size are the primary sources of mixture delivery during 4000 rpm steady state cruise operation.
            - If **lean** surging is encountered, richen mixture screws (turn out) in 1/2 turn increments. Alternative pilot jets are supplied when normally required.
            - Pilot fuel mixture screw settings, float level and pilot jet size also affect high-rpm, 0 to 1/8 throttle maneuvers. Too lean, will cause surging problems when the engine is operated at high rpm at small throttle openings! Opening the mixture screws and/or increasing pilot jet size will usually cure the problem.
                - **NOTE:** A **rich** problem gets worse as the engine heats up.
                    - If the throttle is lightly "blipped" at idle, and the rpm drops below the set idle speed, then rises up to the set idle speed, the low speed mixture screws are probably set too rich: try 1/2 turn in, to lean the idle mixture.
                - **NOTE:** A **lean** problem gets better as the engine heats up.
                    - If the throttle is lightly "blipped" at idle, and the rpm "hangs up" before dropping to the set idle speed, and there are no intake leaks and the idle speed is set at less than 1000 rpm, the mixture screws are probably too lean: try 1/2 turn out, to richen mixture. Be sure there are no intake leaks and the idle speed is set at less than 1000 rpm!

- **Carb Kit Design is a combination of science, art, intuition and and at times, a fair dose of wizardry. There is no dyno that "tells" one how to assemble or modify the carb to deliver proper power and response.**
- **Perfect Carb Kit TUNING requires patience and perseverance and "reasonable" feel to feel the changes - of which - most motorcycle riders have a good ability to do.**
  When a dyno "operator" says he/she has to ride the bike after dyno tuning to do the final tune for cruise smoothness - that's what they are doing**. Avoid any dyno operator who says that they don't have to do that!!!**
  The only dyno that I know of that will duplicate and visually display the engine smoothness is the EC997 dyno (yes, I know, we make it) - that's one reason why, if you can, you'd like to use one for tuning - a smoother engine IS getting the best mixture. Other dynos claim to "tune to an "A/F Ratio" - probably the biggest marketing scheme in the dyno industry at this time - and they never can equal the quality of tune as designed -
  These tuning kits have been thoroughly tested to ensure easy, trouble-free, optimized performance.
- Please note: If you have installed the kit and gone through the optional screw settings, clip positions and main jets, and still have a persistent flat spot/problem, we ask you to call us. Unique engine / exhaust / filter / altitude / temperature combinations may require individualized setups. We are here to help. The information gained to your solution will be installed in our computerized reference database. PLEASE CALL!
- We ask that upon completion of installation and tuning, that you call us with specifications of your installation, (pipe brand, filters, advancer, altitude, humidity, temperature and final carb settings) to be entered in our TUNING DATABASE. The database allows us to include the "most used" jet sizes and setup specifications in every kit.
- Use (415) 491-5920, (800) 869-0497 or fax (415) 492-8803.

  Thanks!

  Marc W. Salvisberg