

# Keihin carburator repair #4

A 4-part video series guides you through the process. Part #4, epilog.

## The tips and tricks:

1. Replace the craptastic plastic fuel inlet with brass.
2. There are check-balls in the float bowl and accel pump cap.
3. Don't forget the rubber plug over the intermediate jet.
4. Choke headaches
  - a. Braze a loose choke lever to the shaft.
  - b. Put an 0-80 screw in the choke lever to keep it open.
  - c. Assemble to the choke cable with the screw pointing up.
5. Use silicone on the Welch plugs. Clean the idle circuit.



Air leaks turned my new 1970 pipe blue. Rebuilt carb did not fix ignition problems. (Click for video.)

6. Use a rebuild kit with Viton rubber.
7. Choke and adjustments
  - a. Use the factory choke cable, not a coat hanger.
  - b. Adjust accel pump volume.
  - c. Dial in idle speed and idle mixture screws.
8. Manifold headaches
  - a. Use support bracket on rubber-band style manifold.
  - b. Use S&S style manifold clamps.
  - c. O-rings come in Viton too.
  - d. Put manifold on by itself before mounting the carb.
  - e. Tighten manifold clamps before head and cylinder.
9. Use a Fram CA77 in the early Harley air filter.

Hi. I'm SportsterPaul. This is the fourth video, the final video, in our Keihin butterfly carb rebuild series. The first part, we'll talk about all I learned about float bowls. I got these six carbs here. I'll show you the differences-- early and late model float bowls. And then, the second part, the misery getting that '79 Sportster started with the rebuilt carb I put on. All kinds of grief with ignition. I had air leaks. I'll show you that. I'll label the ... I'll put a big label up, carb, when I'm talking about the carb, and I'll change the label to start up or something short that'll fit up there for getting the bike right.

So let's go now. This is earlier stuff I took of my testing all of these. And then we'll come back and talk about the problems I had getting that '79 started, with the rebuilt carb that I put on. Okay? All right. Now, let's look at water squirting out of accelerator pumps.

Push it all the way on. It's easier now, it's all wet. Okay. I don't think I've gotten air into the system, but let's see what happens. There's a squirt. Wow. It came halfway up this tube. One depression. That's a lot of gasoline. That surprises me. Second one. So we know this tube is a two-squirt. I'm gonna start building all these others. I'm gonna stop the cameras. I don't want to bore you. And then I'll build a bunch of others. I'll use used parts.

Okay, we're back. This is always the case, the bowl that I rebuilt with the brand new Custom Chrome rebuild kit works the best. Kind of expected that. I did have enough old parts, junky hard rubber and stuff, to actually build the little test on all

these others, all one, two, three, four, five, six other carbs. I learned a lot. Keihin ... I told you they had good engineers. Well, except for that one middle manager that insists on the fuel inlet, this, being a cheap piece of plastic over a chunk of brass to save a tenth of a penny. And he stayed with them a long time, because my '96 Sportster that I had in California, had the same goofy thing, and it cracked and leaked. And that one I just glommed JB Weld over. Hopefully it's still okay. Gave it to a buddy. We'll see.

So, the clever thing these engineers did, I told you on one of them, this one here, has a little bleed hole. Right down here. Let's see if I can get a pointer. Here we go. Nice shiny one. Right there, there's a little bleed hole that they put back into the carb. And that's on the same circuit that goes to the squirter here. I got my plastic tube over it for our test. And, sure enough, when you run the accelerator pump, you can see it squirting up. So, that was to reduce ... pollution controls are coming in the late '70s ... that was to reduce the amount of fuel delivered on an accelerator event. They just recycled some into the float bowl. And that's nothing smart about that. I think it's dumb, 'cause they do give you this screw right here that limits ... let me operate the throttle. Whoops, wrong way. Can't ... Oh, throttle doesn't work. All right. There we go. See how it goes forward? This lower black plastic part is what is connected to this rod that does the accelerator pump action. So, if you screw this in, it stops sooner, and you don't squirt as much. A lot of guys have way too much gas, and the bike really isn't accelerating the best it can.

So, this one has the little thing. Because of the dry o-rings I used in here, this is gonna leak all over, but well, take my word, just Cuisinart tea-making electric kettle. I shoulda got the paper towels ahead of time. And we already got our operating rod in this one. And so, see the air coming out of where the float bubble ... where that bleed hole is? Again. Okay, now a little bit of water came up, about a quarter inch above the brass. Now this does less than half. And you can see it bubbling up here, 'cause it's squirting back into the float bowl from that bleed hole. But it's working.

Oh, and I should tell you. They all bleed back. Every one of these. So either, once they get a little old, the check valve doesn't seal completely, or more likely, they didn't think it was important. The level in this brass thing is only gonna go down as low as the level of the gas in the bowl, which isn't that far, maybe a half an inch, tops. So when you squirt it, it just got a little ways up to go. It's just a restriction that they put in. They're not trying to make a valve. And that makes sense, 'cause there's no spring. You can hear it just rattles around in there.

But that was the deal. Now we're not to the clever part, yet, where some engineer did a genius cost reduction. Okay, we'll put that one back here and which one is ... oh, I customized this one for that third missing long screw that actually holds the bowl, it's one of the four that holds the bowl to the thing. I put a c-clamp. Since there's an o-ring, it's not really clamping against the gasketed surface.

So, let's take this. Let's get our little operating rod, get it ready.

Now this one bothered me 'cause the little cap, I shook it. Oh, it's stuck. It doesn't exist. They took the check valve out of the cap and this is why. Oh, before I fill it. Ah, maybe too late. You'll notice this one has the bleed hole, too, just like this one I showed you. But, it's bleed hole is built a little different. It's got a little boss, a little flat spot for the drill to hit. I assume they would drill it from the other side, but maybe they drilled it here. And it's got this flat boss. And okay, so this is even later. And it's got numbers on it. When I pour the water out I'll hopefully find the numbers for you.

So this one, it's like, how does it work without the check valve? Well, think about it. It's incredibly clever. Some guy shoulda gotten a promotion. Because of this little bleed hole they added in, that's added into the fill side, to the pump out side. So, sitting here, it's filling. Right now it's going through that little, tiny hole and filling that whole passage. And the passage is coming up to level with water I just put in. And so, when you let off of it, well the check valve kinda works, keeps too much gasoline from being drawn back from the brass part, and instead draws the gas from the float bowl. So it's like having two outlets, a tiny one on the brass, and the bleed hole that's in the bottom of the float bowl. And they could save the machining and the little check ball, and the little swedge-down ball on the end cap.

So let's watch this one work. Not too dramatic from the top, I'm sorry, but okay, more bubbles, more bubbles coming out that bleed hole.

Oh, there's a little action. And this one went up a little higher, about a half inch above the brass, second one. Now it's another half inch. Third one, fourth one. You'll remember, on the one I built yesterday, it only took two squirts to fill the hose. I made all the hoses about the same length. But it works, and it's brilliant.

So, let's pour this out, and I'll be able to show you the difference. That little boss should tip you off. While I'm here, it's a good time to get the ... God, I love these shop towels. Whoever invented this, Kimberly-Clark, I don't know who did it, Scott. Thank you so much. All right. So we'll get that. Now, safety reading glasses. 3M Muvo. M-U-V-O. You gotta love them. Here it is. Again, you got this auto focus, crappy camera. And I believe it's for use... It says something, 79A. First letter, I'll be able to see it. You'll be able to see it. So, is it a B? Yes. B79A. So we could figure about then is when they came up with this genius thing. Look ... spilling more water. Okay, where'd this come from? Here. Paper towel.

Look at the cap. See here's an older conventional cap. See how they got this little ball swedged in here for the check valve? This one rattles. Here's another one. See? Ball check valve, rattles. They didn't drill this. And if you take it apart, there's no passage for the entry side. The float bowl is different, as well, 'cause you can see, right here is where they drill the inlet side of the float bowl. They don't need it now, 'cause the outlet has a extra hole. It lets the gas in. So, put this back here. Bring ... this is the float bowl we're rebuilding for the '79. See right there? Wish the lights were better. Right here, that's where it's drilled through.

You can see right through it. Air. So that's where it filled. That's the fill side of this little diaphragm pump. This was a pointer. We'll put that back. So, live and learn. Got a little water on my gasket. Not good.

So, I tried all of these. I did two. I don't think ... is it entertaining? Do you want to see the other ones? This is a conventional one. All the other ones are conventional. I notice they're working better. Last night they were leak... Some of it has plugged passages, like this one had from that was, or paraffin, the bad gas. Mostly air. Little bit higher. About three quarters or an inch. Another three quarters. This is because the diaphragm is so stiff. Here's the bad diaphragm that was in some old rebuild that I've kept for sentimental value. Some of these are so stiff. This one looks bad, but is actually better ... Here ... Oh, you probably didn't hear it crack. That can't be good, right? So use Custom Chrome or some other ... Drag Specialties rebuild kit. Okay. That's all filled up again. One ... oh, look at that. It really did a number. It's interesting, 'cause it's putting more air out. It's not leaking from here. So, ... I can hear it.

This one's got a check valve problem in the ball, 'cause it's just drawing itself down. It squirts. I'm not seeing the ... okay. But it's not delivering. So this has a problem. Now you'll know, if you do the same thing at home, with you're ... it's like, "Okay. Something's wrong with this." It's not working. Oh, I'll have the movie to show. The yellow bowl, got a problem. We did that one. Have we done this one? For some reason, I put a much longer one ... maybe this one works better than the others. Let's watch this one work.

Interestingly, they were all leaking through the ... out here, because of the dry little ... those little, tiny o-rings. Yeah, this one's doing it. I knew one of them had a problem. Now this one might have a blocked passage, just like the carb for the '79 did, where there was tar and gradoo and all kinds of crap in it in this passage here, 'cause it's squirting out the sides, and, okay, it's missing a screw here. See that? Get maximum dramatic effect there. Not good. So this one has a problem. Where'd this one come from? The glass bowl. Okay. We'll have video proof to help me figure out what to mess with.

Same thing. We will go into the Berryman's Chem-Dip. I should call it by its real name. Berryman's Chem-Dip Carb Cleaner. Great stuff. I'll leave it there overnight or longer. Could leave it there for three days. And make sure that this passage is clear. I'm pretty confident that this has that same problem as this one did. Same trick. After the Berryman's, blow it out and make sure that it's passing air, like I showed you in the disassembly. And then ... just carb cleaner, the spray can carb cleaner. Gloves, glasses. Spray a little in there. Pfft. Blow the air and just do that several times to make sure that passage is nice and clean. I won't do any others. Let's ... I'm excited. I want to get this bike running.

Okay. That was all about float bowls. I recommend you maybe do the same thing, especially if you want to be ultra-thorough or you've had recurring problems. Get some water. First check the float bowl and the accelerator pump. Make sure it's squirting. You don't have to use the tube if you don't want.

Just make sure it feels right, squirts right. If you want, you can put the whole carb together. I was too excited. I blew that off. Put the whole carb together, and then use water to make sure that the float works, that it's coming up and the needle's sealing. I felt good just sucking or blowing into the fuel inlet, and then rocking the carb so the float falls and falls back down on the needle, like ... It was in the earlier videos. So that all worked.

Next. Now we're gonna talk ... I'll change the little title ... about getting that '79 started with the rebuilt carb. Everything had to come back apart. Air leaks. Ignition problems. I wasn't thorough. I was so excited. Oh, I was gonna go get that running. Finally it'll be running good. I fixed it. I rebuilt the carb. [Sigh] Had an air leak. I shoulda known. It was screaming to me the whole time. I got it started. Well, it wouldn't start at all. Okay. That just off the top. Wouldn't start at all. Pulled the plugs, pull the plugs down. Crank it. Take a screwdriver and push the points by hand. No spark. Okay. Where have I seen this before? Could be the coil. Could be the condenser, 'cause you can see the points. They're making little sparks. Get a used condenser I had laying around. Ah, now a nice, decent spark. I figured, aw, the plugs were used, but they looked okay. But get new plugs. A little anti-seize around the threads, careful not to get it on the insulator. Screw the plugs in. Get it ... now we're getting some action, a little chug or two.

It starts, and it's idling really fast. And I back off the screw. And I should tell you about a trick I had to do. See if I can find one. This is the idle mixture screw.



This is the idle speed screw. All this screw does is push down on the plate and crack it open. You can even see the threads if the camera focus is working on us. The problem I had is, I couldn't ... see, you can feel this one, too. It's so clean, and the aluminum gets dug into here from wear, and you can't unscrew it. So you can speed it up, but you can't slow it back down so you can play with the idle mixture and get that dialed in. So, what I end ... I put anti-seize there. None of that made a ... What worked is I found a nice little washer, might have been a #12 ... I think it was bigger than a #10 ... that this fit on. And then a steel washer down against the aluminum. I put anti-seize here, put anti-seize there. Got the spring and made sure where it ends it wasn't just a blunt cut off like it was. I took it on the belt sander and sanded both ends with a nice little ramp, so it's flatter and doesn't have anything to dig in. So now, at least, you can slow down as well as speed up the idle speed.

I back it all the way off. That's telling you, it's an air leak. I warned you about air leaks. I warned you about these crappy rubber band manifolds that I hate. Okay. Two kinds of manifolds. This was 1979. First year for the rubber band style. Rubber band style has this big fat rubber band, and it goes here. And then the carb ... or, I'm sorry, the heads are the same way. This is the earlier manifold. It's an O-ring manifold, like they used for decades. Probably since '57. Here's ... it's got this lip here. And just a plain, simple O-ring. They come in Viton, too. Buy them. And then the heads, looks the same thing. You put the O-ring in. You use these kind of clamps. These are the factory clamps with the Phillips. Not too good.

Do like I said in the tips and tricks first video. Get an S&S with a nut driver, and you can reef those nice and tight. Well, guess what kind of clamps I had. I had ... on the rubber band one. I had the factory kind of clamps. They're Mickey Mouse for two reasons. They're Mickey Mouse because they've got a Phillips head, which means you can't really torque them enough to compress this rubber enough to get you a nice, tight seal. I also noticed one of the heads had a little nick in it. You want to feel around the head and the manifold, make sure there's no flash, wedges, crap ... casting wasn't that good back in the '70s.

So, okay. I figure really reef down. I had, right in my stash, S&S clamps. I think I've got some pictures I could show you of those. But these are Mickey Mouse, not only because you can't get enough torque in a Phillips head screw to really close down on the rubber. They're also Mickey Mouse because they got this assembly, and this little shield thing that, if you're not careful, you don't pay attention, you could put it on, click it in ... you put it on like that. You're guaranteed to have an air leak then. So, you're supposed to swing it all around, like this. And there's actually, all the way forward, and then there's little lips on this part that pick up the edge of this, and it's all high tech and high zoot. And then it goes together. And then you make sure that it doesn't move around. None of those problems with an S&S style. They have style for the early O-ring style. I'm not sure if these come in Viton or not. My thinking is, maybe swelling would be good. And of course, if you do have this '79 and later abomination, you have to have that strap that goes down from the

air filter down to the lifter block, the number ... what is it? ... one, two, three, the number three lifter block that supports it all, because there's no amount of reefing, even with the S&S clamps, where the weight of the carb isn't gonna loosen this up, crack it, and you blow up your bike. You blow the pistons. You burn a hole in the piston, 'cause that air leak gets into that front cylinder and burns it up. Front cylinders run hotter. We can argue why later.

So, got all that off. Did what I told you. Now I'm starting to pay attention to my own lecture. Took the carb off separate. I wasn't gonna try to half-clown it. Took the manifold off. I'll put pictures up. You could just see it wasn't really sealing right. Got brand new ... I had in my rebuild stuff, brand new rubber bands. Put those on. Got the S&S clamp on. Reefed down. Got a nut driver. Reefed down both sides, of course feeling inside, yeah, looking, making sure the tilt ... Some of it's just eyeballing. It should be dead level in plane with the center of the motorcycle. I also looked, I could see it would pop down, and it would close up on the bottom. So just, okay, right about there, reef them down good and hard. Carb back on, throttle cable back on, fuel line back on. I was right about, yeah, the entire fuel tank had drained into that float bowl. Here's a picture of the little cone thing in the petcock. You had to take that petcock closed and blow through it. It's like, all right. That's what happened. The whole tank ... maybe Racetrac gas isn't the best ... but a whole tank of gas, over the Florida summer, dripping into that float bowl, evaporated off, tarred up the bottom, and caused the carb problem.

So, I got that squared away. I put the used condenser on and said, "Well, let's go get a new condenser." Advance Auto's right down the street. I go to Advance Auto. I buy a brand new condenser. Let me get my 3M MUVO reading and safety glasses on. Highly recommended. The condensers that used to cost us a dollar and a quarter, 12.99, with 91 cents Florida tax, \$13.90 for a condenser. 'Course, in defense of United Auto, it was on the shelf, the young guy knew how to figure it out and find the right one. So, okay, new condenser. I put new plugs in it, I may have mentioned, just because why not?

Static timed the bike, because I retarded it to get it to go around the block. And when it came back I had a bright blue front pipe. If I ... I should have known when the carb didn't idle up right. But no. I had to drive it a little, all excited, and turned the front pipe bright blue. All right. I knew I had a air leak then. So I got the air leak situation fixed, got a new condenser in it, 'course then took it back out, 'cause I wanted to static time this bike. And it's a good thing I did. What I'd done initially, you know the breaker plate with the points on it, you say, "Well, there's this slot where the two bolts go in. Just center it, and you'll probably won't be too far off. Well not true. I ended up all the way at the end of the slot. And you can ... there's plenty of stuff on the web, static time, you take the timing plug out of the left side of the crankcase. Right where the cylinders come together there's a plug. A lot of confusion, 'cause this wasn't an original flywheel. I'd replaced the flywheels.

Some early years, the big long notch, that means advance. That's your advance mark. Other times it's top dead center.

Good luck figuring out what you got. I took the spark plugs back out and put a little screwdriver down there and, very slowly and very carefully ... don't bend anything ... brought it up. It's like, "Oh, okay." So the TDC mark, I think, on the particular flywheels that was in this particular bike were two dots. And went back around, felt it coming up just ... oh, okay. Here's 40 ... some years were 40, some were 45. Who knows. There's no way I can tell. They were both just a groove. So the long groove in the middle, that's full advance. And you go back around, I think it was a 12mm metric wrench. You take the condenser out, you can get that on the lobes of the spinning part, the cam that operates the points. And you can go down. In other words, you're trying to move, you're trying to advance it. You're trying to move it counter clockwise, which brings it up sooner. The point ... it brings it closer to the little block on the points. And then you adjust the plate so that it just cracks the points. You got it ... you got the full advance timing mark set on the flywheel. Oh, and make sure when you kick it you get a poof. It's on the compression stroke. Otherwise, none of this makes sense.

So poof, you feel the air coming out. Okay. Now the front cylinder's on compression stroke. You go and sometimes you can just put a screwdriver in, straight slot, as you kick it, and it'll catch that slot. Life is good. Get it back centered, pry it back centered.

Then you go to the point side. If you got a buddy, then life's a lot easier. But I was by myself. So then, 12mm, I think it was, metric wrench.

You can fit them over the lobes and push down. Some guys ... I used to use needle nose pliers. A little Mickey Mouse. But the wrench worked good. And what you're doing is you're expanding the flyweights. You're making it full advanced, like the thing was spinning, and the flyweights are all the way out. That's just when you want the points to open. That's full advance. That's when that mark and the ... I added high tech. I had a multimeter hooked up, disconnected the coil, 'cause then you're just going between coil resistance and shorted, when the points close. So then you can see the points. They're closed, they're closed. You spin the plate. Oops, they just opened. And you get a feel. It's miserable, but everything is. The right way, of course, is you put the clear plug in where that timing plug goes. You start the bike. You run it up to 2000 RPM and make sure you can see that ... make sure that groove, that channel in the flywheel is dead center. This was good enough.

Got that. Like I said, the plate was all the way on the edge of its ... I think in the all the way advanced, which is good. Too much advance, it kicks back. And if you know how to kick you won't break your leg. Too much retard, you burn valves, you burn holes in pistons. So, always err to the advance side. So, I said, "I don't like any of this." Of course, I'm thinking, "Did I get the cams in right? It's why the have a tooth off on the cam. People tell me, "you know right away."

Well, the bike started. The instant it started I could see happy bike. It acted like the '77, which you would expect. I just rebuilt that one. Got ... it idled up. Now the idle speed screw works.



When ... since there's no air leak, and an extra, when you close, back that screw off, it slows down so much, and you just get it idling. Then mess with that mixture screw on the top. First this one to get it close. Here's a factory one with a hex head. First the mixture one to get it close ... I'm sorry. First the idle speed one, just to get it down below the advance curve, so it's kinda idling. Then you mess with the mixture screw. Get the maximum RPM, a little this way, a little that way, figure where you are. Maximum RPM. Most guys like to open it up a little. Quarter turn, half a turn. I'm still experimenting with that, 'cause it still chugs just a little.

And I did, of course, adjust the valves now, 'cause I'm doing it right. What I should have done, instead of getting so excited, thinking I solved the problem, I just had a carb problem. I had multiple problems on this bike. So, I had pulled the valve covers, got the push rods all squared away, and made sure everything was loose and the valves weren't ... they were closing. The valve lash was okay. Got that. Got the ignition. New spark plugs. New \$13, almost a \$14 condenser. Fixed the air leaks, and first kick, it almost started completely. It ran on a little, and then, because the mixture and stuff isn't adjusted, it died. Second kick, it's running. And you can just tell. It's running right. Vroom, vroom. There's no backfiring through the carb, like what's happening before. I take it around the block. Warm it up. Now we'll get the mixture dialed, get that happy, get the idle speed ... I used to try to go thump, thump. All that does is stop ... stall at a light. Then you gotta kick it. And you go around, and you're kicking it, or you get killed in the middle of the night,

'cause nobody can see you, especially a magneto bike where you lose the tail light and the headlight.

So, it just ran great. Still chugs a little on the carb. The jets are 88 intermediate, 165 main. I'm gonna play with that. It's got this 1970, one-year-only, ultra-quiet exhaust. It's a retirement community, give me a break. Anybody can make a bike loud, you take the mufflers off. So, I'll hopefully Simichrome up that front pipe and make the blue a little less obvious, I hope, 'cause it's pretty embarrassing. And then, get it on the road and start running it, bigger and bigger circles. 3 mile trips, 10 mile trips, 20 mile trips, until it's good and reliable, the way it was in California before I moved here.

So that was the misery, getting this stuff started. Intake problems, ignition problems, everything. At least the valves were loose enough, so I didn't have that wrong. Be thorough. Don't do what I did, get all excited thinking, "Oh, the carb's rebuilt. Now I expect the bike to run perfect." Check ... I may have been able just to tighten these Mickey Mouse factory clamps and gotten the air leaks gone, but why bother? You could see there's ... the pictures might have shown you. There's a groove in some places where the gap was between the head and the manifold. In other places it was smooth. So maybe just not touching it, reefing on it. Those clamps had to go. I had S&S clamps. Problem solved. Bike's happy.

I think the next big seminar we'll have will be on the ignition stuff. By reading up, I burned ... the reason this bike started having problems is I burned a piston. I had a, I think, a Compufire, or maybe a Dyna electronic ignition. Electronics guy.

I didn't really understand the advance. I had the ... set wrong. And on a trip to Hollister back in the day, it burned a hole in the piston. So Wiseco pistons and jugs. Got it put all back together. And now, I think, finally, it's gonna be running like it did five years ago, 'cause it's never been quite right.

So, we'll talk about ignitions next. Then we got stuff for LED headlights, LED tail lights. Lots to talk about here. Not just fixing stuff, but customizing, repair, maintenance, all those issues. All right. Sportster Paul, signing off. Thanks for your patience. Hope you watched all four. But if not, at least hope you learned something to make your Iron Sportster run a lot better.

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