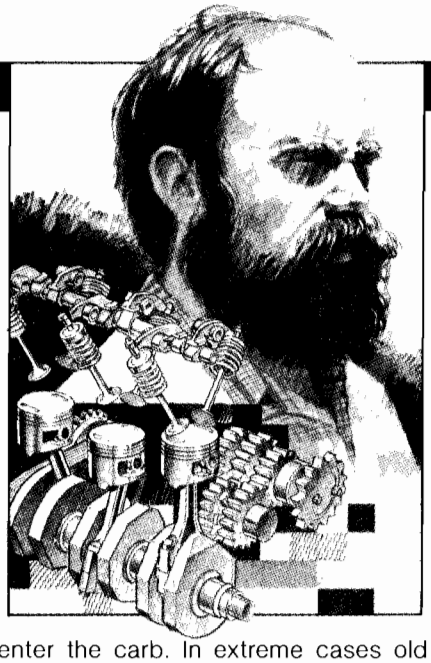
Kevin Cameron

Carburetors



☐ I remember walking into a friend's garage the night before he planned to race his Superbike. On his workbench were spread about a yard of small parts—an entire gang of four Mikuni carbs completely disassembled. He looked up at me. "You know what 'carburetor' means in French? Leave it the hell alone."

Poor fellow—if he had considered the sophistication of the job they do, he'd have realized carburetors are really remarkably simple, straightforward devices. Their functioning depends on the flow of air and fuel through restrictions; anything other than air and fuel invading these areas invites malfunction.

Motorcycling is seasonal in many parts of the world, and our machines get put up in the fall, reborn in the spring. Meanwhile, fuel left in carburetor bowls evaporates, leaving behind anything—fuel additives of various kinds and any corruptions dissolved in water that may have contaminated the fuel. The problem becomes worse if the carbs are left connected to a full tank and the petcock leaks: then large amounts of fuel can now run down and evaporate, leaving behind record quantities of whitish powdery residue to block small jets and air orifices. Mere washing of parts in gasoline and even blasting with air pressure cannot clear this cement.

The most effective cure is replacement of the blocked jets, but in modern air-pollution-abatement carburetors such jets are often pressed or actually drilled into the body casting, making replacement impractical. Don't despair. British bike manuals of years past contained good advice on this problem, a method that worked as well in a dark barn in northern Scotland as it does today in a well-lit shop in New York. Clear those tiny holes by using tiny slivers of hardwood, shaved to shape with a penknife. The wood, softer than the brass of the jet bodies, won't enlarge the jets as drills or wire might, yet is strong enough to force out the corruption. Follow up this treatment with a blast of compressed air if possible.

Carburetor parts can wear away by vibration—not only the vibration of engine pieces churning, but induced vibration caused by the starting and stopping of the air column with every opening and closing of the intake valves. Small wonder an image of the carb bore becomes engraved on the throttle slide after many hours of operation. This process accelerates greatly if the absence of an air filter allows grit to enter the carb. In extreme cases old carbs have such a notch at the most usually used slide height that it becomes difficult to lift the slide past it.

The single most important determinant of carburetor mixture strength is the fit of the needle in the needle jet. The needle jet is actually more important than main jet—most people ride in the middle-throttle positions where the needle is king. And what happens here? With every pulsation in the intake, the needle beats back and forth in the jet, slowly hammering it away and enriching mid-range carburetion in the process. On race bikes, yearly replacement of needle and jet is the rule; on street machines, replace them when buying a used bike of unknown history or when undertaking a major engine overhaul.

Float valves suffer similarly. As they wear, float level rises, enriching carburetion at idle and at low revs. Reset float height every few tune-ups to stay ahead of the process. Floats made of sheet brass often break off where they are soldered to the valve operating lever. Inexperienced service personnel like to apply air pressure to fully assembled carbs, crushing these brass floats and making them ride low in their bowls, again creating rich conditions. The black plastic floats used in many current machines can absorb certain constituents of gasoline, eventually becoming so fuel-logged they sink—rich running again. Such floats must then be replaced; they won't dry out in any reasonable time, and if you try to hasten the process, even in a low oven, they will pop!

Float needles are often tipped with a rubberlike material that seals well after even long use, but the metal variety can wear to a point of leakage. Check for leaks by connecting a bowl-less carb body to the fuel tank and holding the float lever up in the closed position. Drips? Replacement is the best medicine, and only with the same size as your machine's original float valves.

A dirty, damaged, or absent fuel filter means all your cleaning will be cancelled in a few hours' running. Many filters now are built into the tank petcock assembly where you can't easily examine them. If you have the least suspicion, particularly with a used bike, inspect.

Constant-vacuum carburetors are a very popular way to provide reasonable throttle response with acceptable exhaust emissions levels. CVs connect a butterfly throttle to the rider's twistgrip; upstream from this lives a slide-throttle controlled by engine vacuum. The vacuum acts, usually, on a perilously thin diaphragm—one that's easily ripped or holed in disassembly. Because you can't make a workable replacement from a party balloon, it's wise to have new parts on hand before digging in this deep. The vacuum-operated slides are *very* sensitive to dirt, so carefully clean these parts indoors.

Metering needles are held down in the throttle slide (in modern carburetors) by a plate retained by a screw. The needle is held at the correct height by an E-clip that clicks into one of several grooves in the needle's shank. All these parts can make themselves scarce in the twinkling of an eye—especially the E-clip. If you have a history of buttery fingers, keep a supply of E-clips at hand, or at least work in a place where a flying clip has some chance of being found.

Previous owners of used machines may have tightened idle air screws until they resemble anteater snouts—twisted and bent, poorly adapted for regulating anything but the flow of ants to the insectivore's tummy. Fit new ones. Obey instructions that suggest *lightly* bottoming the air screw then backing it out the recommended number of turns to the correct setting.

Small screws often retain bowls and tops, and these screws thread into the light, soft metal of the carb body. Like to really torque your bike's fasteners down? You'll have trouble finding a three-millimeter Helicoil.

Remember that carburetors are frequently replaced at the insistence of mechanics who receive part of their pay from the parts department. When you hear, "Yer cobbretta's shot; gotta put a new one on," be skeptical. Individual parts inside the carbs can fail, but they can also be replaced by a person who knows what to look for. Replace an entire carburetor only when all else fails, but don't be so intimidated that you just leave them alone. ■