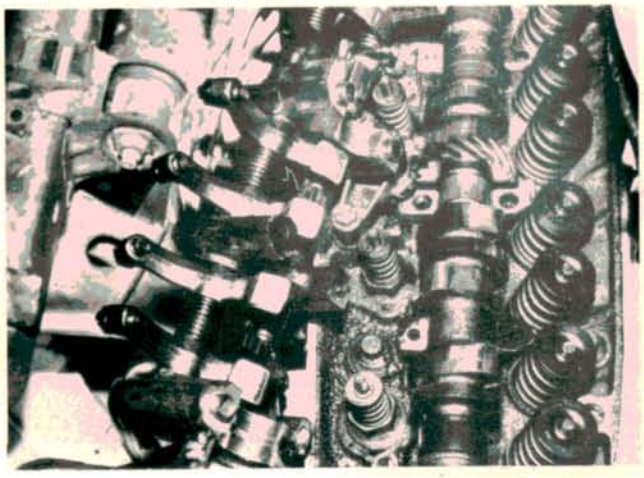
Honda Auxiliary Valve

Honda CVCC engines have a third valve on each cylinder. It's a tiny valve compared to the normal intake and exhaust valves. Like the intake and exhaust valves, it's cam operated and has an oil seal to meter oiling at the top end. And like any valve seal, this auxiliary valve seal can harden and crack over a period of time. As a result, oil is sucked into the cylinder to a point where it can foul plugs.

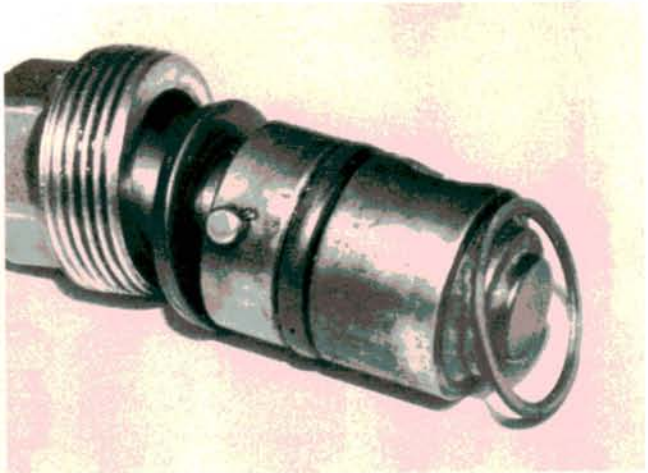
If you find an oil soaked plug in one of these engines, this procedure will help you determine whether or not the auxiliary valve or its seal is causing this fouling condition.

Start with basics. Make sure you have all the essentials for proper combustion—good compression and good spark all the way down to the plugs. Also check for proper crankcase ventilation or an overfull crankcase.

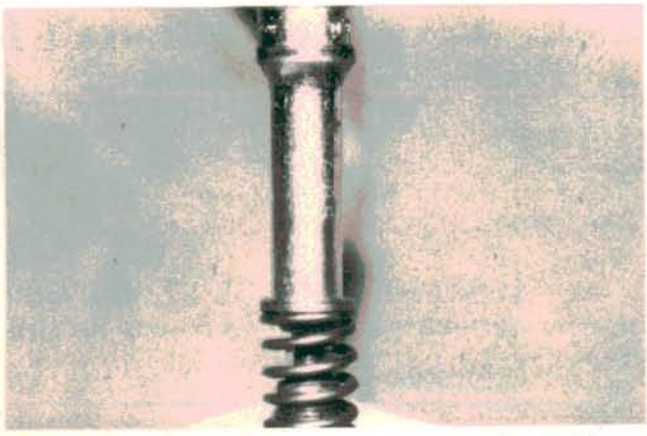
Assuming everything else is okay, remove the auxiliary valve from the offending cylinder and install a new oil seal. If this is a high mileage car, you may choose to replace all the seals while you're in there.



Remove the rocker shaft assembly and lay it aside. Unscrew the valve holder from the cylinder head and remove the valve assembly. Pull the valve chamber now and install new crush-style sealing washers or you may have a compression leak later.



If your engine is as carboned as this, you may have to fabricate a small hook and dig for this copper seal that goes between the auxiliary valve and the combustion prechamber. An old bicycle spoke with a small hook on the end will work. Always replace the seal with a new one.



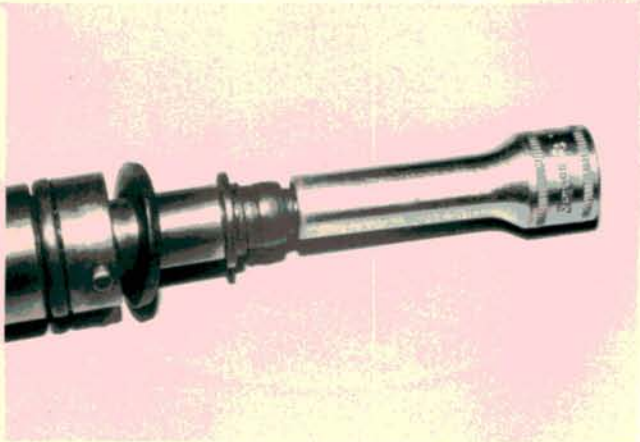
You can hunt for a valve spring compressor if you like or you can just put a socket over the valve spring retainer and rap it with a small mallet. The impact will break any carbon loose, and will usually cause the valve keepers to pop free. Remove the retainer and spring to expose the seal.

If you replace one or all, don't just put the valve that was originally in the fouled cylinder back in the same cylinder. Swap the resealed valve from the fouled cylinder with a valve from a cylinder that wasn't oil fouled. Test drive the car. (In some cases where the fouling only occurred over an extended period of time, you may have to simply return the car to the customer and let him drive it. For example, if the car only fouled a plug every 3000 miles or so, have the customer drive it that long before returning to double check the job.)

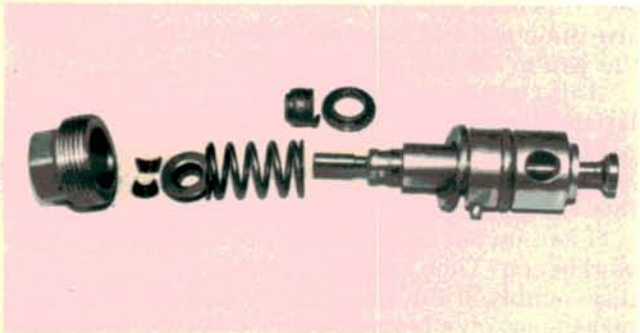
One of three things should happen:

1) The plugs will all be clean this time. The new seal(s) you installed did the job. You're done.

2) The same cylinder that was fouled before is fouled again. This indicates a more serious problem with that cylinder than just a leaking auxiliary valve oil seal, since the air valve we installed hadn't been fouling the cylinder it came from.



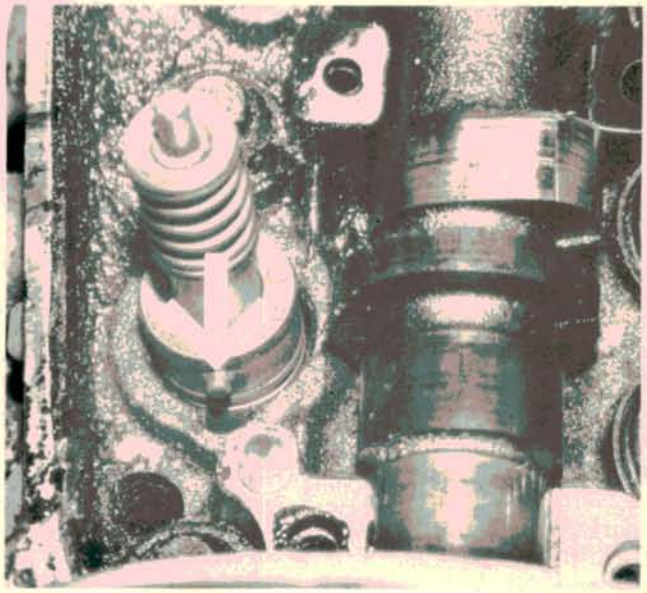
Remove the old seal with a pair of pliers. We found that a deep-well socket worked nicely as a seal installation tool. Don't loose the lower spring seat while the seal is off. If the seat and spring washer do fall off on the bench, the spring washer is marked with the word "up."



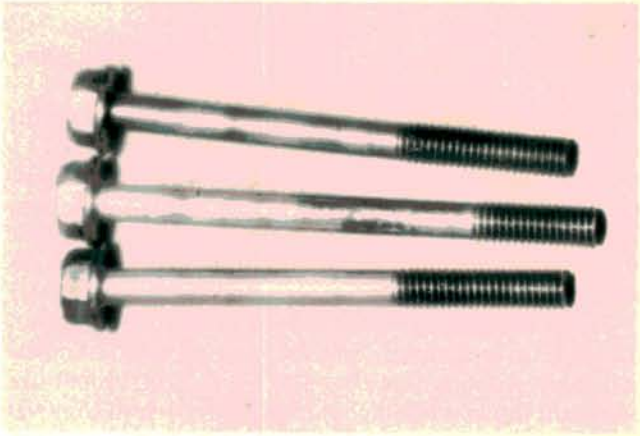
Here is an exploded view of the valve assembly. Always replace that o-ring on the valve holder. Clean the valve itself with a wire brush. Check the valve and valve holder sealing faces. Also check the valve stem where it rides in the seal for any roughness that could cut or ruin the new seal.

3) The cylinder that was fouled before is clean. The cylinder that got the valve assembly transplant from the originally fouled cylinder is now the cylinder with the fouled plug. This indicates a problem with the auxiliary valve assembly itself—perhaps too much wear between the valve stem and valve holder.

If you don't swap valves after replacing the seal or seals and the same cylinder fouls, you won't know if you have a recurrence of the same problem, or a different problem altogether.



Reinstall the valve chamber with new seals. Reinstall the auxiliary valve assembly in the head. The valve assembly locates in the head with a locator pin. Reinstall and properly torque the valve assembly caps to 80Nm (54 ft/lb). This will crush those new sealing washers and seal the chamber.



Clean the mating surfaces between the rocker assembly caps and the head. Put a small amount of non-hardening sealer on the mating surfaces of the end caps. Reinstall the rockers. The three bolts front and center on the rocker assembly are not the same length. The long one goes in the center hole.