

## THE PREVENTIVE MAINTENANCE SERIES

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### Primary Carburetor Balance

Two related symptoms that can both be caused by carburetors not being balanced (synchronized) through the complete travel of the linkage are hesitation and pinging. Since the Corvair engine has two separated heads it follows that all mechanical operations must be the same from side to side and that the fuel supply to the two heads must be identical. If you accelerate the car without having equal fuel supplied by the carburetors (i.e. one side leads the other), you risk both a hesitation and a pinging as one side runs lean and also hotter. Gas mileage also suffers.

The balance between two primary carburetors at idle should be achieved by using the two idle speed screws but as soon as you step down on the accelerator pedal those two screws are no longer in use. Balance is then governed by the overall adjustment of the linkage, which is where the above mentioned problems arise.

To complicate the matter, the primary carburetors' linkage has two pivot points on the cross shaft that wear, two vertical links each with two ends that wear, two levers for the throttle shafts that have link holes that wear and two holes in the cross shaft levers that wear. Add that to the two throttle shaft levers that are peened on to the throttle shafts and can come loose and you have a total of 12 wear areas that can contribute to a change in balance as you move the linkage from idle through full throttle. The right carburetor can easily fall behind the left as linkage parts move across worn spaces. The cross shaft may move across its length if the pivot points are worn and the shaft is not perfectly straight.

The obvious first step is to correct as many of the worn areas as possible, keeping in mind that the fit cannot be so tight so as to bind the linkage and cause hang ups at some point in the travel. Some vendors offer rebuilt linkage, including cross shafts, and adjustable vertical links for both sides. You can make many changes yourself by doing things like finding better used parts, braising the holes shut and re-drilling them, braising the ends of the links and dressing them up to fit the newly drilled holes, slightly bending the right cross-shaft support to limit the movement of the shaft, and braising the lever on the throttle shaft if the peening is loose. If you switch carburetors from side to side you will move the vertical links to the unused holes – if they are good.

Once you have made the corrections to limit slack in the linkage, you will need two tools to do the “off idle” balance. The first is a Uni-Syn gauge or a vacuum gauge with a “T” to hook up to both carburetors at the choke pull off port. The second is a device to pull and keep the linkage open at various rpm levels while you check the balance.

Pictured nearby is what I constructed to hold the rpm constant above idle; it consists of a screen door turnbuckle cut to the proper dimensions. It hooks between the cross shaft throttle rod lever and a convenient gas line. Adjusting with your fingers gives variable rpm.



Use the Uni-Syn gauge or use the vacuum gauge with a T connected in the hose as follows: hook it up to both of the horizontal ports where the choke pull off hose fits at the base of the carburetor. With the engine running you can pinch off first one hose and then the other while you watch the gauge. Try for the least amount of drop in the needle. You could also use two vacuum gauges but calibration could be an issue so I prefer using one.

Start the balance procedure by making sure all your other vacuum hoses are secure, the carburetors are tight with no leaks at the base, vent system in good condition and other tuning items, including valve adjustment, are correct. Unhook the throttle rod from the transmission and hook the return spring in the vacated hole. Be sure chokes are fully open and the fast idle links are free. Balance the carburetors at idle by use of the idle speed screws and also adjust the idle mixture for the highest rpm you can obtain with the mixture screws. Next hook your screen door turnbuckle between the cross shaft throttle rod hole and a gas line and adjust to various rpm levels to check the balance the same as at idle. To correct an imbalance you would adjust the left side vertical link. Avoid running the engine over 2500 rpm unloaded for longer than the few seconds it takes to check the balance. If you find that the carburetors are balanced at 1000 rpm but out of balance at 2000 rpm then you have a cross shaft that is bent and not rotating on its own axis. Usually you can see this with your eye or use of a straight edge; some gentle bending will correct the issue.

As mentioned earlier, careful adjustment of carburetor balance will improve drivability, lower engine temperature, reduce the probability of pinging, and improve gas mileage.