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The 32NDIX Carb is very similiar to the Pinzgauer 36 NDIX and therefore the tuning procedures listed below are applicable.Â Special thanks to Ron LaDow for permission to use his work.

Zenith 32mm NDIX Carburetor Tuning

Text and photos by Ron LaDow, Precision Matters

INTRODUCTION

With very few exceptions, Zeniths tolerate all sorts of strange jetting and adjustments and still work OK. They work far better than OK if you spend some time to tune and optimize them. To tune them, you'll need:

- A good tool set
- A synchronizing tool
- Some method of measuring the accelerator pump volume (more later)
- Gasket kits
- Base/manifold gaskets (if you want to remove them for work)
- 32NDIX carb data reference (factory or aftermarket manual)

Buy three gasket kits for two carbs; when one washer goes missing, you won't need to wait until next weekend to complete the job, and spares will come in handy one day or another. For similar reasons, do not throw out any sealing/crush washers you remove while working on the carbs.

For good reason, carb tuning is the last task in a standard tune-up. It is impossible to tune carburetors if any other portion of the engine is damaged or out of tune. If your engine has some miles on it, just do the tune up as close to factory specs as you can. No magic; the tune (and tuned carbs) won't give you a new engine, just one that runs better. But the engine must be in good tune; proper valve clearances, full ignition tune and new ignition parts as required.

I'll mention this again, for those who missed the paragraph above; the engine MUST be tuned up before you fiddle with the carbs. Once you do that, there's a very good chance your carburetion problems just disappeared and you've hit a home run. But please, when you brag about your carb-tuning abilities, tell your buddies to tune up their cars.

If this is your first effort at tuning carbs, allow a couple of days so you don't end up rushing one task or another and wasting your time. As a tease, there is a tip at the end which adds at least 10HP to about 50% of the cars on the street. But it won't do you a bit of good unless you've already done the other work.

The part numbers included are indexed to the parts sheet packed in every Zenith gasket kit ever made.

PARTS

Venturis (part #29) came in two sizes and were modified to many others; we will ignore the others. You should be able to read the size cast into the venturis just below the upper edge; either 24 or 28; the working diameter in mm. Normals got 24s, all others 28s.

Jet numbers should be visible on the 'open' end of all the jets. If any have been modified by someone with manners, the stock number will have been ground off and a new number scribed somewhere on the jet.

Jets are part numbers 36, 37, 38, 43 and 46. Check your reference manual for the correct sizes.

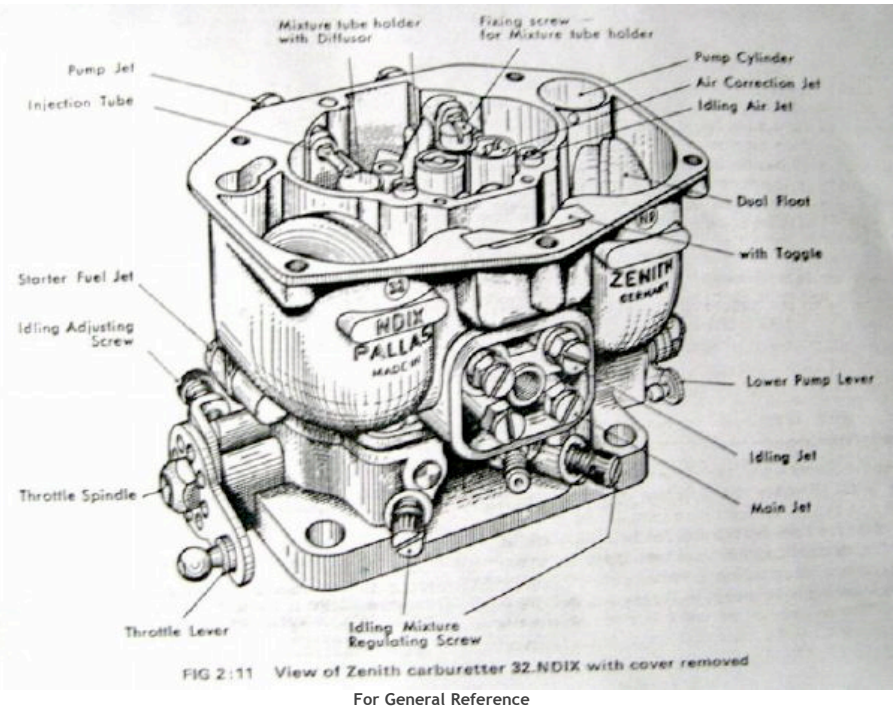

FIG 2:11 View of Zenith carburetter 32 NDIX with cover removed

For General Reference
(This is Not the Illustration Included with Gasket Kits) WHICH PARTS?

Which parts should be used remains an open question. For reasons which are probably a mystery even to the designers, none of the odd-ball combinations seem to make for bad carburetion. But the parts can be selected and optimized for your engine and "optimized" can mean a big difference in power at any RPM range.

Obviously, bigger venturis deliver power higher in the RPM range and favor bigger jets, smaller venturis being the opposite.

Generally, if you have a stock engine, stick with stock carb specs. Any engine with a big-bore kit can use "S"- or even "C"-spec carbs. "N"-spec carbs will work on a big-bore engine, but the mileage numbers suggest they are on the lean side; watch the engine temps on high-speed, high-load runs. Whatever set of specs you chose, match all the venturis and jets to that spec prior to any adjustment. Unless you have a dynamometer and time, mixing them up is likely to be a poor choice.

ADJUSTMENTS

Getting Started

Remove the accelerator pump links (assemblies of part numbers 18 through 25). This is simple enough on the right hand carb, but the left is more difficult. Similarly, access to the main and idle jets (parts 37 and 38) is not easy on either carb, as-installed. You can R&R the carb(s) if you find it easier than working in place, but they will require R&Ring in the plural.

Be very careful with the wrench on either removal or replacement; if the wrench travels too far, the idle mixture screws (part number 13) can be bent or broken. "Broken" presents a serious problem in removal of the broken part.

Start the engine and get it warm enough to idle with disconnected throttle linkage. You want 750-1,000RPM and may need to increase the idle speed; if so tighten the stop screws (#8) on both carbs as equally as you can.

NOTE: All left-hand and most right-hand carbs have the stop-screw #8 as shown on the parts diagram. Some very few right-hand carbs have a stop-screw and washer, numbers 82 and 84. The process is the same regardless.

Disconnect the throttle linkage; a small open-end wrench, levered pickle-fork-fashion, removes the links from the ball-ends easily.

Float Level Adjustment

Adjusting the float level is first and very important. It is measured with a special tool or the 'tail' of a caliper after removing the carb top. It is also measured to the top of the meniscus; at the top where the edge of the fuel fades in to the wall of the container or 'jumps' to the tail of the caliper. The spec for all Zeniths is .728" (18.5mm) +/- .04" (1mm) below the carb body gasket surface

Regardless of your method, first remove the fuel lines and carb tops. Disconnect the accelerator pump pistons (assembly; #49-53) from the internal levers. Leave the pistons in their cylinders, in the carb bodies. Refit the tops and fuel lines with used gaskets at this time.

It is possible to fill the float bowls on the starter only, but preferable to fill them with the engine running. Shut off and read or measure the fuel height in the bowls.

Adjustments are made by changing the washers (#66) where the float valve (#65) screws into the carb top. Typically the one 1mm washer supplied in the gasket set won't be enough; start with some stack of washers approximating .06"

(1.5mm). The ratio between the float valve washer and float level is ~1:4, such that a .04" (1mm) washer will alter the fuel height by .160" (~4mm). Adding washers lowers the level and vice-versa. Add or subtract washers until you get within .04" (1mm) of the spec. Fiber, aluminum, or copper washers will do, but make sure the float valve seats properly with the selected washers installed.

At some time while the carb tops are off, cycle the accelerator pump pistons up and down. Both accelerator pump nozzles (#48) should deliver visually-equal squirts of fuel. If not, you'll need to check the nozzles and the jets (#46) for blockage.

If you have no output, first try stretching the leather 'skirt' on the pump piston. If there is still no output, one of the valves, the circuit or both the nozzles/jets are blocked with dirt; time for a full disassembly.

If all is well, you can now re-connect the accelerator pump pistons to the internal levers and fit the carb tops with new gaskets.

Accelerator Pump Volume Adjustment

For stock (or near-stock) engines, something less than .3cc/two full strokes/nozzle is fine.

If you have 24mm venturis, most of the available vials will not fit in the space. A very simple replacement tool is available as follows:

Your local market will have plastic soda straws; every one so far has been fuel-proof. Get one, bend it double about 2" from one end and tape-wrap the bend at the top of the bent section to hold it in place. The bend itself becomes a very effective seal against leakage. Calibrate it with an eye-dropper or whatever other method you have.

Loosen the lock nuts (parts #20 and 22) on the pump links; 5.5mm wrench. One end of the link has right-hand threads and the other (with a groove in the hex coupling) has left-hand threads; adjust them to approximately 3" long, overall, with the ends pointing in opposite directions. Fit them to the carb levers (numbers 7 and 71 on the left-hand carb, 81 and 71 on the right-hand), either loosely or finally depending on your confidence. They are installed with the lower ends pointing toward the carbs and the upper ends pointing away from the carbs. Also, they are installed with the left-hand threads at the bottom.

With the float bowls full, cycle the throttle levers and measure the output at each nozzle at two full cycles of the levers. To increase the volume, shorten the links; lengthen them to decrease the volume. Once you find the proper amount, tighten the lock nuts. If you haven't already, fit the springs, washers and clips (parts #23, 24 and 25) at all four locations.

Another Cheap Measuring Vial

Buy a plastic nose dropper from a local drug store and discard the rubber bulb. Glue shut the small end with super glue or a hot clothes iron. Pierce the side of the vial near the big end and attach about 6" of small wire as a handle. From a local swimming pool supply company or Home Depot buy a small (2") bottle of red or yellow chlorine or pH testing chemical. When turned completely upside down 1 drop of either chemical equals 0.1 cc. Mark your new vial accordingly.

Submitted by Tony Ryan

Idle Mixture Adjustment

Remove and inspect all four idle mixture screws (part #13). They should have a clean taper on the end and not be bent. Re-install them until they lightly seat (by feel), back each one out 1-1/4 turn.

Start and warm the engine. Again, get an idle speed of 750-1,000RPM. Back one mixture screw out, say 1/4 turn, listen. If the idle speed increased, turn it out a bit more. If it decreased, turn it in. The aim is the highest idle speed from each screw; keep at each screw until it is found.

Unless you are very skilled or very lucky, it will take several tries at each screw to find the optimum. Do them as 'rounds', starting with one screw and ending with the forth.

If you find that one is simply causing no change at all, either the idle jet or circuit is blocked and will need cleaning. Or you did not tune the engine first and have a duff ignition on one cylinder.

Idle Speed Adjustment/Matching

Start the engine, allow it to run at the current idle speed. Fit the flow meter to one carb at a time and check the reading. On the carb with the highest draw, back the stop-screw (part #8) out. Re-check the draw on both carbs. You may end up having to run one stop-screw in to get the balance, but find a smooth idle and an even draw between the carbs.

A fresh, well-tuned engine with Zenith carbs can idle smoothly at speeds lower than the tach registers; chose the speed you want or that which the engine will tolerate, but make sure the carbs draw balanced air at that speed.

Iterate

A very talented mechanic will get the mixture, balance and speed set with one try at these adjustments. I haven't met him or her. Go back, try the mixture screws again. Set the balance and speed again. And maybe once more. Or drive it a bit and try again next weekend. Once you do find the sweet spot, you can ignore them for 10,000 miles or so.

Linkage Adjustment

Once you're satisfied with the above adjustments, and the carbs are tight on the manifolds (no gorilla moves; there is very little warpage on Zenith bases or manifolds. A bit beyond snug is fine), try fitting one of the drop links to one of the carb throttle levers. If it moves the lever, loosen the lock nuts and adjust its length until it does not, but just snaps on. Note that the end of the link with the welded-on nut has right-hand threads and the other end (grooved nut) has left-hand threads; all nuts needing a 9mm wrench. The left-hand threads were at the bottom when the car left the factory.

Go to the other carb and do the same until the links show the same 'drag' when rotated by finger on the ball-ends. Re-check the balance.

Reach over the fan housing and operate the linkage slightly at the front drop link. If you were born with certain anatomical skills, you can focus one eye on each of the carbs and see that both levers begin to move at the same time. The rest of us will iterate until we are sure they are both opening at the same time.

If the linkage shows signs of stiffness, you might remove front drop link and the cross-shaft from the fan housing. Lube the obvious locations lightly, along with the bell crank you can feel but not see on the front side of the fan housing.

Enlist some assistance at this point. With an educated foot on the throttle pedal, check the balance at some speed above idle, say 2,000RPM or so. Adjust the drop links as required to balance the carbs at both speeds.

A random block of wood under the throttle pedal and an un-educated foot will suffice.

Free 10 Horsepower Adjustment

There is a very good chance that wear in the throttle linkage parts has reduced the travel at the carbs to less than full throttle when the pedal is fully depressed. In some cases, quite a bit less. With the engine off, have an assistant gently push the pedal to full throttle and check the butterflies for opening.

If the butterflies are less than fully open, adjust the stop screw under the pedal until you find something like 99% opening at the carbs. Under no circumstance do you want to find 100%, since the carbs then act as the pedal stop with all sorts of bad results.

Completion

Snap off the drop links and lube the ball ends lightly; refit. Refit the air cleaners. Make sure the throttle return springs are properly installed. Check the fuel lines for leakage; snug the banjo bolts. Check for other obvious leaks; snug up the bolts or plugs as required. Do a short road test; swing by the local market and pick up a beer. If all is well, you can drink the beer or you can go for a longer ride. If not, see which bolt you missed tightening, tighten it and then go for the ride or drink the beer. And if you're not sore from all the leaning over, give yourself a well-deserved pat on the back.