

TECHNICAL TALK



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Early 99 fuel systems

There has been a lack of articles lately pertaining to early 99s, i.e. pre-'74. The following describe the fuel systems of those models. They are reprinted from the January and April, 1976 issues. - TW

Throttle Position Switch

There seems to be an absence of knowledge about the workings of the Throttle Position Switch (TPS) in 99s with Bosch Electronic Fuel Injection (EFI), and I hope the following will be informative, if not helpful.

This pertains to '70 - '74 99s, and while two different units are used, one for 1.7 & 1.85 liter engines, and one for 2.0 liter engines, they perform the same basic functions.

The throttle position switch or throttle valve switch as it is also called, serves both as an acceleration pump (on a typical carb) and as a deceleration valve, (such as that used on the later V4's).

Because of the design of the small printed circuit inside the switch, upon depression of the accelerator, the control box (computer) signals the injectors to spray, in very rapid succession, small amounts of fuel, which makes for a momentary lag in response. Additionally, the TPS on the 2.0L engine provides for full throttle enrichment, in an effort to suppress detonation.

On the Decel side of the switch, there are points which are normally open during cruise, but with trailing throttle the points close and allow the injectors to cease injecting (no signal from trigger points) and the engine decelerates both smoothly and without polluting the air during this, the next most dirty mode of operation. (Idle is worse). In the long run, it also improves one's gas mileage, especially if a great deal of city driving is done.

Very often the TPS will be out of adjustment in such away that even during Decel the injectors are still operating. It

does not get out of adjustment by itself. There are those owners and mechanics who have insufficient data as to the care and feeding of the switch, and since they cannot adjust it properly, put it way out in left field as to forget it. When I say that they can't adjust it properly, it's actually a matter of patience and a thorough road test to see that it is correct. If it is not right, one will either have the injectors "on" all the while, or even more fun, will have it in such a position that at city cruising speed, in 2nd or 3rd gear, if the throttle is opened and closed lightly the vehicle will begin a sort of ground resonance that will put you through the windshield and give you whip-lash almost simultaneously. A truly enjoyable experience. A homespun method for adjusting the TPS will get it in the ball park, and the following method may be utilized.

We will assume that the setting is incorrect, and therefore the two Phillips screws may be loosened first. Then remove the capacitor lead from the ignition coil (primary lead) to keep from cooking the points. Turn the ignition switch to the K position and turn the TPS back and forth, and you will notice a clicking noise coming from two of the injectors. For easier orientation, I shall describe the procedure first for the 1.7 and 1.85 liter engines.

The shaft that the throttle position switch is keyed to runs along the longitudinal axis of the vehicle, so that the plastic cover on the switch faces forward. In this position, movement of the switch will be left or right, as seen from the drivers seat. Basically, rotating the switch right causes the injectors to operate constantly, while rotating it to the left causes them to shut off during deceleration. Further rotation to the left will cause jerking at cruise (as described above) and at the left stop, the engine will "hunt" at idle, if it will idle at all.

The procedure for the 2.0L engines is the same except for the orientation of the TPS. In this case, the throttle shaft which the switch is keyed to runs along the lateral axis. The cover for the TPS will face the

right hand side of the car, or towards the cam cover. If we transfer the movements above to the 2.0L TPS, we will have injectors in continuous operation if the switch is rotated towards the rear of the vehicle. Conversely, rotation towards the front results in operating characteristics the same as those described for "rotation to the left" as noted above.

Earlier I mentioned a clicking noise upon rotation of the TPS. It will normally occur about in the center of the travel. As a rule of thumb, one will be safe if the TPS is set just on the off side of the click. 1.7L & 1.85L: left; 2.0L forward.

After you've done this, tighten lock screws, run engine and listen closely for the injector sound at idle. Bring RPM's to 3000 and close throttle. At this point the injector click should disappear, and only resume after the engine has reached no higher than 1600 RPM's. A lower engine speed is OK, as long as there is not too great a tendency to stall.

One more check can be made, and it goes like this: If the above has been successful, open the throttle (again by hand) and bring the RPM's up to about 2,000, then ever so slightly close the throttle until RPM's begin to drop off, then hold the throttle position. If the engine hunts at this setting, it is adjusted too far towards the off position and must be moved a few degrees in the opposite direction.

Again, with patience and understanding, this procedure will take only a short time, all in the interest of reduced emissions, better fuel economy, and the knowledge that you did the job right, yourself!

John S. Fog
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Injectors

Let's look at two other components of the EFI in the ongoing effort to supply a degree of technical enlightenment for those who desire it.

The injectors are solenoid operated valves which are made up basically of a valve

Fluctuating idle - 99 carb

Should your '69 - '74 99 equipped with a Zenith Stromberg 175 CD exhibit a fluctuating idle (up and down) one can generally assume it is because of a malfunctioning deceleration valve. First, one should try to adjust it by turning the adjusting screw out counter clockwise (CCW), which displaces a plunger in to increase tension on the spring to push the brass valve tighter on its seat. Should that fail, disassemble and clean the valve and try again. If that doesn't do the job, replace the decel valve (it causes problems with regular and frequent monotony). It is also referred to as the "overflow valve".

Another accessory on your Zenith Stromberg is the Temperature Compensator. This rarely causes trouble, but after high mileage may get carboned up, and it can be cleaned. It is closed when cold, open when warm.

On the early 175's ('69 - '72) the CO is adjusted by raising or lowering the metering needle. On models '73 - '74 the Main Jet is threaded and can be raised or lowered as needed. The knob is on the bottom of the float bowl, and raising it (clockwise) leans the mixture, while lowering it (counter clockwise) richens the mixture. These adjustments are best made with the aid of an exhaust gas analyzer, to insure a compromise between fuel economy and engine power, especially at full throttle.

Should one have one's carb apart, it is to be noted that the correct float level is obtained when the mold line on the plastic float is parallel with the casing. Incorrect (high) float level may cause stalling around corners. The carb vent hole should be on the portion of the carb towards the driver.

Also, if the ZS 175 CD equipped vehicle refuses to run past idle, or will run only with the choke on, one may very well suspect the diaphragm has split. Therefore, the piston, which must move up and down to act as a variable venturi, will in this case remain stationary, hence the reluctance to run properly.

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