

General fitting instructions for the Pierburg 2E3 Carburettor as fitted to VW Golf and Transporter

IT IS ADVISABLE TO READ THESE INSTRUCTIONS IN FULL PRIOR TO COMMENCING WORK ON YOUR VEHICLE IN ORDER TO GET AN OVERALL APPRECIATION OF THE VARIOUS POTENTIAL PROBLEMS

HEALTH AND SAFETY WARNING

You will be dealing with boiling water and very hot manifold and engine temperatures. Do not disconnect any water connection without first slowly releasing pressure of the system and ensure that you are wearing protective equipment and clothing in order to avoid burns from contact with boiling water and contact with very hot surfaces. DO NOT carry out the work unless you have the correct equipment. (NB There will be variations in arrangements in throttle, water and air connections for T25 engines not covered in these instructions)

On fitting your refurbished Pierburg carburettor it is essential that you follow the advice given below. It is possible that adjustment will be required of mixture and idle speed once the engine is hot but it is essential that no adjustment is made until it is established that there are no external faults to the carburettor. It has been set to run at the correct idle speed and with the correct mixture control on a test engine of 114k miles and will possibly, therefore, require adjustment of mixture and idle speed of engines that vary and subject to the degree of wear. (See page 2)

The critical factor for consideration initially is the start up from cold and, upon fitting the carburettor, if the car does not perform in the manner stipulated from a cold start please do not automatically assume that the fault is with the carburettor. Please bear in mind that the carburettor has been tested extensively actually on an engine and if the carburettor is not functioning correctly, it is more than likely to be external to the unit.

Six initial points for the fitting person to take particular note :-

1. Do not even consider this start up operation without having a fully charged battery
2. Check the condition of the manifold. Ensure that the connection face for the carburettor is clean and even.
3. Ensure that you have made the vacuum pipe connections for the air filter and distributor at the base of the carburettor, but see the next paragraph. Ensure also that the other external vacuum hoses and connections are in good condition.
4. Check that the blue/brown earth lead is securely connected to the cylinder head cover stud or distributor lug. Ensure that the connector for the rear item, the solenoid valve, has electrical supply of 12 volts.
5. Make the water pipe connections. Make the connection to the manifold secure but leave the other un-tightened. There will, initially, be air in the system and the loose connection will allow this air lock to escape and as such allow correct water flow through the choke unit.
6. Fill up the cooling system and continue to check the level as air is removed after the engine has been started.

It is preferable to exclude the air filter and the throttle linkage at this stage until after the engine is running correctly and that you are satisfied with the installation. Plug the end of the vacuum hose, at the air filter end, temporarily. If you ignore this advice there is potential risk of immediately contaminating the carburettor again. This risk is also via the fuel supply if rust or dirt particles sit

within the fuel pump, pipes or tank. If there is any doubt on this issue, it is highly recommended that a separate in-line fuel filter is installed. The same principle applies to any oil contamination getting to the top of the carburettor.

For the purpose of this initial start up, as the carburettor will have no fuel in initially on the first start of the engine, leave off the electrical connection to the choke and set the choke flap locked fully open by pressing down on the flap and operating the throttle lever fully with the right hand and then releasing.

This action will enable the float chamber to fill without flooding the engine cylinders. Leave off the connection to the choke at this stage and operate the key start for about 5-10 seconds and then stop.

(It is worth mentioning at this point, for those not familiar with the requirements of this 2E3 carburettor, that under normal conditions the engine is started by first setting the choke flap of the carburettor. This is achieved by depressing the throttle pedal relatively SLOWLY half-way to the floor and releasing relatively SLOWLY in order to automatically set the choke flap position to suit the water temperature of the engine. If you operate the pedal too quickly when setting the choke flap, for when the engine is cold, it will not set correctly. This is a single action and the throttle pedal should not be 'pumped'. Once the engine has fired, the idle speed will build up to a high 2400 rpm. Allow this to happen for a good 5 seconds and then touch the throttle pedal again. This action will reduce the idle speed to approx-1500rpm)

***Additionally please see the note at the end of these instructions

You are now ready to fire up the engine normally

Operate the throttle lever to reset the choke flap and then start the engine as normal. Once started, allow to run at the high idle speed for about 5-10 seconds and then blip the throttle lever.

The idle speed will reduce to a more reasonable high idle speed and then the idle speed will progressively drop to the normal idle speed as the water heats up and as you use the throttle lever to allow the mechanism to reset down to the next stage.

(NOTE HOWEVER : If the ambient temperature IS greater than 10 Degrees C the choke flap will not close fully and the initial start up speed will not be the very high rpm as would correctly occur with cold temperatures)

If the correct HOT idle speed is not obtained:-

- 1) Confirm that there is full water flow through the choke by checking at ONLY the remote connection. Run the engine at 1200rpm to confirm this.
- 2) Ensure that the engine reaches full working temperature. For the Pierburg 2E3 carburettor, the correct hot idle speed WILL NOT be obtained until this is achieved.

The carburettor has been set for a mixture setting of CO =0.75% approx by volume on the test engine with 114K miles but your own engine characteristics will be different. If, when the engine is hot, this being the temperature at which the radiator fan has cut in at least once, the idle speed is

too low and if the engine does not run smoothly it may be necessary to adjust the mixture control. Only do so at hot idle, and adjust it with definite + or- 1/4 turns and always knowing your reference start point. As a rough guide to the correct setting, adjust to the maximum idle speed and then set screw at + 1 /8th turn.

Once satisfied that everything is correct, complete the installation of the air filter and connection to the choke unit.

NB. The condition and installation of the hot air hose is important, and also the operation of the flap within air filter tube.

The following is most important and please take particular note:-

For the initial start it is advisable to leave the electrical connection to the choke unit disconnected and, therefore, allow the choke flap operation to be solely controlled by the water flow through the choke unit as it heats up. If you do then have a problem with bad starting, the electrical heater will then not open up the choke flap prematurely. (Under normal circumstances, the choke works in combination with the water temperature during the initial stages of the warm- up period.)

Once you have got the engine to the hot working temperature, if the engine is not running correctly, you may need to adjust both the mixture and idle speed settings.

When the engine is thoroughly hot and the radiator fan has operated at least once, adjust the mixture control first in order to obtain a faster engine speed and a smooth running engine, and then adjust the idle screw to obtain the correct idle speed. Re-check the mixture setting and then re-adjust the idle speed if necessary. The mixture screw and the hot idle speed adjustment screws are shown below for the different vehicles.

Please note:

When setting the idle speed at hot, for the T25 carburettor, it is essential that the adjustment screw is touching its throttle plate arm and so actually controlling the speed. If you leave a gap and so allowing the butterfly valve itself to close completely to control the speed, you will cause minor jamming of the butterfly and create an unnecessary restriction at the start of the movement. This would cause rapid wear of the butterfly valve and venturi.

Additional information re 2E3 carburettors for T25 Vans :

If your carburettor is of the earlier type for the T25 the float valve arrangement is not as good as the later type. In a normal upright position, as would be when fitted, there is no problem but there is always the chance of the valve sticking Open if the carburettor is inverted or shaken around such as when with the Courier. The box will always be labelled in an effort to avoid this.

The DG engine has possibly the worst record for fire occurrence at the engine. A great deal is written on the checking and replacement of the fuel hoses and connections but unfortunately no-one has picked up on the actual trigger for the fires. Within the design, there are electrical items on the carburettor that require an earth path as a return. This path is via the 3 main studs from the manifold and the earth connection is made with nuts and the steel washers which, over time, rust

and therefore reduce the effective clean earth path. This creates conditions for electrical sparks at the top of the carburettor.

Your carburettor has been sent to you with a brown or blue coloured earth connection lead attached to the front end of the unit. Please attach the remote end to the spare earth lug on the side of the Distributor ensuring that the connection is clean and tight. This then provides a separate earth return path for the carburettor. Include the integrity of this connection with all service inspections for the vehicle.

**** As complimentary information regarding the normal starting operation for this carburettor, you should appreciate that the procedure of depressing the throttle pedal once in order to reset the choke flap before starting the engine is a procedure that should be carried out each and every time that you wish to start the vehicle irrespective of the temperature of the engine. This action then sets the choke flap and the throttle opening automatically and so provides correct starting at whatever engine temperature exists

****Also please bear in mind that, during the engine warm up period and before the engine reaches the fully hot working condition, you will probably find that the engine speed rises before it reduces for each of the steps of the warming up process. This is a completely normal behaviour for this carburettor and occurs because the engine becomes more efficient as the temperature rises. As an example, if you had a 2nd phase speed of 1500rpm at cold, unless you operated the progressive operation of the throttle then that speed would increase to 2000 rpm simply because the engine warms up.

What is critical is the fact that - AT HOT, you do get the idle speed to drop down to the correct 900/950 rpm.

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