

# Zenith-Stromberg Carburetors Introduction

by Bill Unger, Newsletter Editor

North American spelling; *carburettor* or *carburetter* in British speak) were original equipment on many classic car engines used by Jaguar, Saab, Volvo, Triumph, Morgan, and MG sports cars. The Z-S carburetor has a single fixed jet pressed into the carburetor housing and provides variable fuel flow through an orifice with a variable diameter controlled by a sliding tapered needle. This is in contrast to other commonly used fixed venturi carburetors (think Carter or Weber) where varying air velocity in the venturi alters the fuel flow via a series of fuel ports.

The Z-S carburetor consists of three light alloy body parts: a lower float bowl chamber with the jet and fuel level float, the middle air venturi housing, and an upper suction chamber (aka. dashpot or damper) housing a sliding piston-like air valve with an attached tapered jet needle. The carburetor also has an externally attached temperature compensator that maintains a constant fuel-air mixture regardless of temperature. (NOTE: Be aware that different manuals and sources may use different names for the same component.)



## What does CD Mean?

CD stands for "constant depression". The piston in the top dome of the carburetor has a long, tapered, conical metering needle attached to the bottom which slides in and out of the top of the metering jet. As the piston rises and falls according to air flow controlled by the throttle butterfly, the tapered metering needle either increases or decreases the diameter of the metering jet orifice, thus regulating how much fuel can be sucked into the carburetor venturi by the negative pressure of air passing through it.

## Carburetor Identification

The size and type of carburetor is designated by numbers and letters. CD125, CD150 and CD175 correspond to the choke diameter ( $1\frac{1}{4}$ ",  $1\frac{1}{2}$ ", and  $1\frac{3}{4}$ "). Although they all look similar, details such as throttle linkage will vary from car to car.

## Why Z-S Carburetors Instead of SUs?

The basic Zenith-Stromberg is actually simpler and more reliable than the SU carburetor that it replaced. While later Z-S models used a large number and variety of "add on" features to meet pollution control requirements, the basic "heart" of these carburetors remained relatively simple.

## Leaking Carburetors

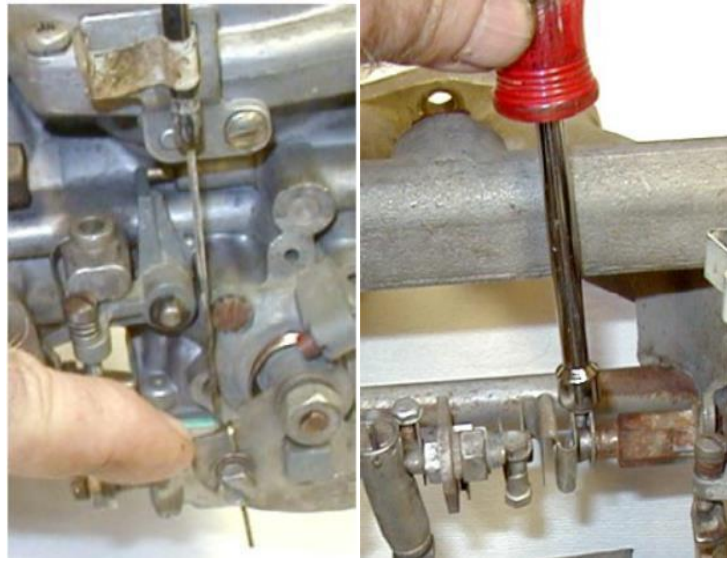
Every Brit car owners torment ... the leaking carburetor. Gasoline leaks may occur following a period of inactivity. Fuel sitting in the carburetor evaporates, causing the float to drop and the needle valve to stick open. When the ignition switch is turned on, the electric fuel pump pushes fuel past the needle valve and into the float bowl. But the stuck needle valve does not close when the chamber is full thus allowing fuel to overflow possibly onto the starter motor or a hot exhaust pipe. Not good!

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## Disassembly

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1. Disconnect the crankcase breather hoses and remove the air cleaners
2. Disconnect the choke cables using a needle nose vise grip to hold the swivel through which the inner cable is threaded and loosen the screw sufficiently to free the cable. Remove the clip retaining the cable to the upper part of the carb.
3. Disconnect the fuel hoses.
4. Loosen the screws securing the spring couplings to the throttle shafts with a  $\frac{1}{4}$ " nut driver and slide the couplings across the shaft.
5. Remove the  $\frac{1}{2}$ " nuts from the mounting studs and slide the carbs off.
6. Remove the damper piston cover and pull out the piston with rubber diaphragm and spring.



7. Invert carb body and remove the float bowl screws to lift off the float bowl cover.
8. Pry up the float pivot spindle to remove the float.



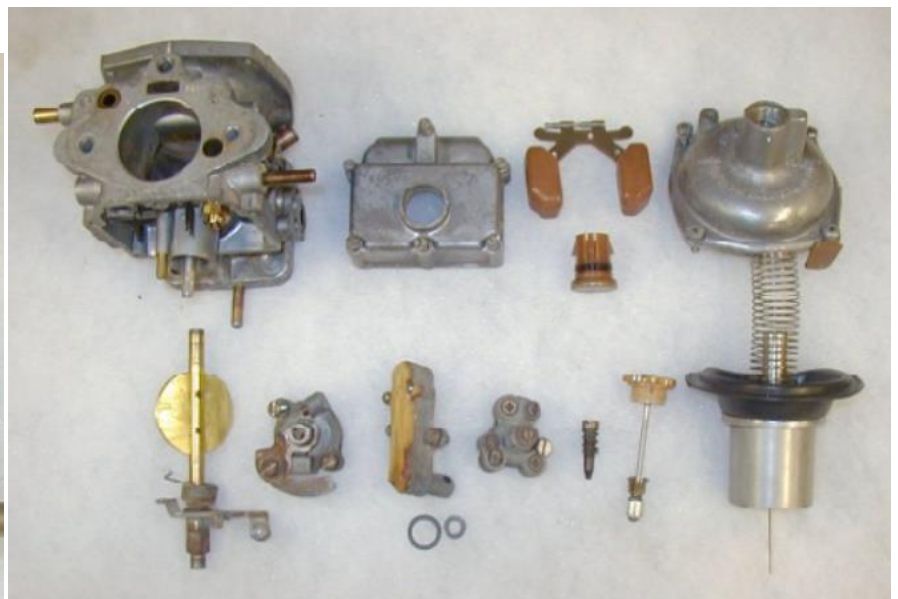
9. Remove the cold start valve (choke) assembly. Remove two screws securing the temperature compensation assembly and pry out with a screw driver preserving the one external and one internal seals.



10. Remove the bypass valve assembly (three slotted screw) and the idle trim adjuster screw.



11. Remove the float bowl valve and aluminum washer.



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## Overhaul Part 2

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Cold Start Valve (Choke)

The cold start valve provides a richer fuel air mixture when starting and operating a cold engine.

The backside of the carb body with the cold start valve removed is shown with a scribe pointing to a passage to the float chamber. 180° across from this hole is a recessed slot with an orifice into the mixing chamber. Air passing this orifice creates a depression over the end on the hole like the depression created over the main jet.

The disk provides the fuel control. There is a passage inside the disk from the slot to the four small holes. The disk is held against the carb body by a spring.

When the cold start valve is "off", the solid surface of the disk covers the hole and the slot in the carb body, and no fuel flows through these passages.

When the cold start valve is rotated "on", passages are exposed between the hole and the slot, and fuel is sucked out of the float chamber and into the mixing chamber of the carb.

In the minimum "on" position, the slot on the disk is over the hole in the body and one of the holes in the disk is over the slot in the body allowing extra fuel to flow. Rotating the disk further, the slot on the disk will still be over the hole in the carb body, but either two, three, or four holes on the disk will be over the slot in the carb body thus allowing more fuel to flow.

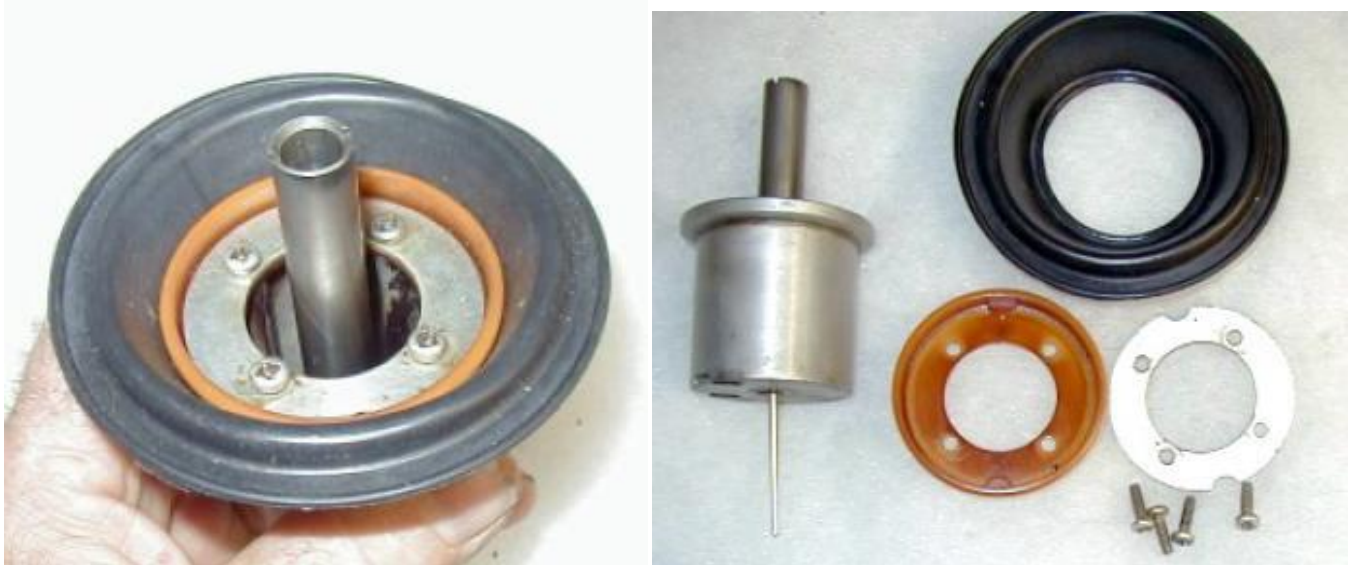
1. Disassemble by removing the nut.
2. Inspect and clean components and passages.
3. Correctly reassemble the disk in the "off" position with the holes in the disk facing the slot in the carb body and the slot in the disk facing the hole in the carb body. (Note that it is possible to incorrectly assemble the valve with the disk rotated 180° out of position.)



## Damper Assembly

The damper assembly consists of the damper piston, air valve, air valve return spring, the diaphragm, and the metering needle.

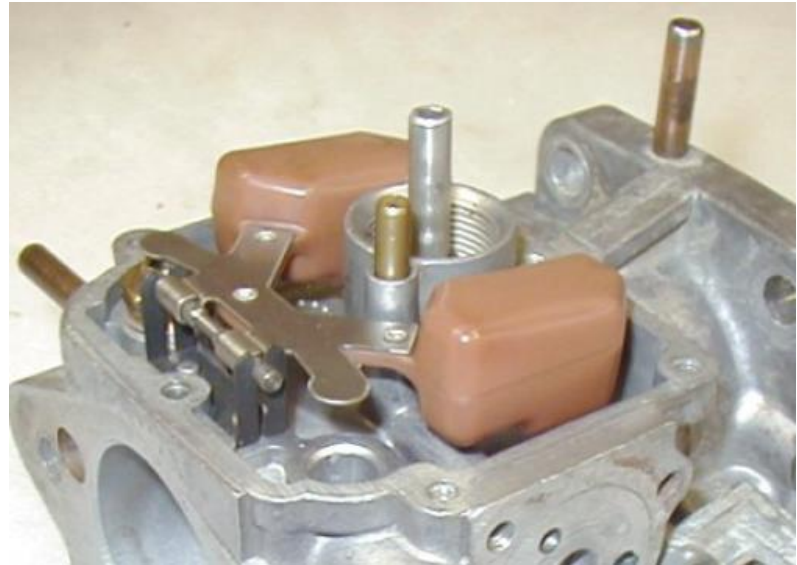
1. Unscrew the damper piston and lift out of the suction chamber cover.
2. Remove the suction chamber cover screws and lift off the carb body.
3. Pull out the air valve.
4. Remove the four sealing ring screws that secure the rubber diaphragm to the air valve. Carefully examine the folds in the rubber diaphragm as this is where tears and cracks will appear.



5. When reassembling the diaphragm to the air valve, align the slot on the top of the air valve with the tab on the diaphragm. Hold in position while installing the sealing ring and tightening the screws.
6. Lubricate the air valve with light oil and insert in the carb body, making sure that the needle slides into the jet. Align the tab on the diaphragm to the slot in the carb body. The two vent holes in the bottom of the air valve will now be facing the manifold side of the carb body.
7. Insert the air valve return spring over the air guide rod.
8. Reattach the suction chamber cover with the alignment mark cast on one side of the cover positioned toward the air filter side.
9. Insert and screw in the damper piston into the top of the suction chamber cover.

## Float Bowl

1. Reinstall the float bowl valve with the correct thickness 1/16" aluminum washer.
2. Insert the pivot spindle through the float fork and snap the assembly into the steel clips with the flat side of the floats towards the bottom of the float bowl. Assure that the clips grip the pivot spindle securely. If needed, pry off and squeeze the clips together with pliers. Assure the float moves freely and the fork tab is against the float valve.



3. Measure and adjust the float fork tab by bending so that the highest point on each float is 17.5mm (+ 0.5mm) = 11/16" = 0.6875" above the face of the carb body. Assure that the tab contacts the valve at a 90 degree angle.
4. Reinstall the float bowl cover with a new gasket.
5. Lubricate a new O-ring and slip it on the sealing plug. Insert the plug into the hole in the bottom of the float bowl cover.

