The Carter Model WCD-3322S Climatic® Control Carburetor is used as optional equipment (POWER PAK) on the 10 Series.

The carburetor model number is stamped on a triangular identification tag attached to the carburetor. This tag also contains other important information and should always be installed on the carburetor.

This carburetor is a two barrel downdraft type and contains the conventional five circuits: Float Circuit, Low Speed Circuit, High Speed Circuit, Pump Circuit and Choke Circuit.

**Float Circuit**

The float circuit maintains an adequate supply of fuel at the proper level in the carburetor bowl for use by the other circuits. The twin floats, which closely follow the contours of the bowl, are designed to provide a stable supply of fuel under all operating conditions.

Fuel enters the carburetor through the needle and seat assembly. When the fuel reaches a predetermined level in the bowl, the float lever pushes the needle into its seat to shut off the flow of fuel. The fuel level is thus maintained by the opening and closing of the needle.

**FIGURE 31 — Float Circuit**

1. Needle and Resilient Seat Assembly
2. Fuel Strainer
3. Bowl Vent
4. Float Assembly
the float travel in the bowl for proper side clearance. Adjust as needed by bending the arms and recheck float level.

CAUTION: Whenever any bending adjustment is required on the float assembly, float holding tool J.9643.1 must be used to protect the resilient seat from damage.

FIGURE 26 — Float Adjustment

Pump Adjustment

Open throttle valve to wide open position. Top of pump arm on lifter link should be parallel to top surface of bowl cover. To adjust bend pump arm (Fig. 27).

FIGURE 27 — Pump Adjustment

Metering Rod Adjustment

The metering rod adjustment must be made after pump adjustment.

With throttle valve wide open, the metering rod should just bottom in carburetor casting.

If the rod is properly adjusted, some movement can be noted around rod in the eye of metering rod retainer clip when throttle is moved slightly from wide open position (Fig. 28 “A”).

If rod is too low, it will tend to push the metering rod retainer clip up (“B”).

If rod is too high, it will be possible to push the rod down (“C”).

To adjust, bend metering rod arm (“D”).

FIGURE 28 — Metering Rod Adjustment
Fast Idle Adjustment

Remove the thermostatic coil housing gasket and baffle plate. Crack the throttle valve and hold the choke valve closed to rotate the fast idle cam to the fast idle position. Close the throttle. There should be .033" to .037" opening between edge of throttle plate and carburetor bore (side opposite idle port). Use Tool J-5496 and bend connector link (Fig. 29).

Unloader Adjustment

Unloader adjustment must be made after the fast idle adjustment.

Hold the throttle valve wide open and close the choke valve as far as possible without forcing. The clearance between the upper edge of the choke valve and the inner wall of the carburetor air horn should be 1/8". Use Tool J-9293. Use Tool J-5496 and bend the lever (Fig. 30).

CARBURATOR

CARTER MODEL WCD-3322S

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This carburetor is a two barrel downdraft type and contains the conventional five circuits: Float Circuit, Low Speed Circuit, High Speed Circuit, Pump Circuit and Choke Circuit.

Float Circuit

The float circuit maintains an adequate supply of fuel at the proper level in the carburetor bowl for use by the other circuits. The twin floats, which closely follow the contours of the bowl, are designed to provide a stable supply of fuel under all operating conditions.

Fuel enters the carburetor through the needle and seat assembly. When the fuel reaches a predetermined level in the bowl, the float lever pushes the needle into its seat to shut off the flow of fuel. The fuel level is thus maintained by the opening and closing of the needle.

FIGURE 31 — Float Circuit
Fuel flowing into the carburetor passes through a fuel strainer located at the fuel inlet fitting. The fuel supply is also filtered by a fuel filter at the fuel pump. The importance of clean fuel cannot be over emphasized. Even a tiny speck of dirt lodged between the needle and seat will cause the carburetor to flood. Replacing needles and seats or readjusting floats will not in itself stop flooding due to dirt.

The needle and seat assembly consists of a solid metal needle and a resilient seat. This synthetic material seat insert provides a more positive seal and therefore maintains a more constant fuel level in the carburetor bowl. It is not readily affected by small particles of foreign material.

The bowl is vented by a vent tube located inside the air horn to assure proper air pressure above the fuel at all times.

To avoid air or fuel leakage, the castings must seal tightly at the various passage connections and between the bowl and the carburetor bore. Always use a new bowl gasket to assure this positive seal to prevent stalling or erratic idle and low speed performance.

**Low Speed Circuit**

Fuel for idle and early part throttle mixtures is metered through the low speed circuit.

Gasoline enters the idle wells through the metering rod jets. The low speed jets meter the fuel at the lower end of the tube. Fuel flows up through the tube into the passage in the bowl cover where air, metered through the by-pass, mixes with the fuel. Both air and fuel then pass through the economizer, and move downward in the passage where additional air, metered by the idle bleed, mixes with the fuel to attain an ideal combustible mixture. This idle mixture is then discharged into the manifold below the throttle plates through the idle port opening and the idle adjusting screw port.

Adjusting the idle mixture screw controls the amount of mixture discharged into the manifold. Turning the screw toward its seat reduces the amount of mixture; turning the screw out increases the amount of mixture admitted to the manifold.

The idle port is slot shaped and as the throttle valves are opened, more of the idle port is uncovered to the low pressure in the manifold which causes a calibrated increase in the amount of idle mixture to flow to the manifold.

The idle jet, by-pass, economizer, idle bleed, and idle port hole, as well as the bores of the carburetor are all metering points and must be free from dirt and carbon deposits. Restrictions will cause poor low speed performance. Worn or damaged idle adjusting screws should be replaced.
Vapor vent holes drilled into the body flange above the throttle plates aid in quick hot engine starting. They prevent fuel vapors from accumulating in the bores of the carburetor by allowing them to escape to the atmosphere (Fig. 32).

High Speed Circuit

Fuel for most part throttle and all full throttle operation is supplied through the high speed circuit.

The position of the metering rods in the metering rod jets, controls the amount of fuel admitted to the high speed nozzles.

The metering rods are smaller in diameter at the lower end, and therefore as they are moved upward in the stationary jet will allow a large amount of fuel to flow through the increased opening between the metering rod and the jet. The metering rods are actuated both mechanically and also by changing manifold vacuum.

The metering rods are raised mechanically in direct proportion to the movement of the throttle plates by means of mechanical linkage from the throttle lever to the pump operating lever. It requires a predetermined amount of manifold vacuum to overcome spring tension below the vacuum meter piston to lower the metering rods. Therefore, under normal driving conditions the metering rods would be controlled mechanically with the throttle linkage. However, when a load is placed on the engine and manifold vacuum drops the spring tension below, the vacuum meter piston will push the metering rods upward to allow a greater amount of fuel to be metered through the jets.

The metering rod position must be synchronized with the throttle valves, so that the correct diameter of the rod in the jet will meter fuel in proportion to the volume of air flowing through the carburetor. This synchronization is known as metering rod adjustment and should be checked whenever the carburetor is disassembled and during each tune-up.

During idle operation or particularly with the engine shut off (with hot engine on a warm day) fuel sometimes boils and expands in the bowl and the various passages in the carburetor. When these vapor bubbles in the high speed passage force liquid fuel out of the nozzle, the carburetor is said to be percolating.

An anti-percolator bushing is located at the top of the idle well in a diagonal passage to the main nozzle to allow these bubbles to bleed back to the idle well rather than be forced out the main nozzles.

1. Main Nozzle
2. Anti-Percolator Bushing
3. Low Speed Well
4. Metering Rod
5. Metering Rod Jet
6. Vacuum Link
7. Vacuum Meter Piston and Spring

FIGURE 33 — High Speed Circuit
Pump Circuit

The accelerating pump circuit provides the increased amount of fuel necessary to assure smooth engine performance during the acceleration at lower car speeds.

As the throttle is closed, the pump plunger moves upward in its cylinder, compressing the pump spring. Fuel is drawn into the cylinder through the intake check ball located at the bottom of the pump cylinder. The pump discharge needle, seated at this time, prevents air from being drawn into the cylinder. As the throttle is opened, the pump plunger is moved downward through the mechanical linkage from the throttle lever, forcing fuel through the discharge passage past the discharge needle and out through the pump jets. As the plunger moves downward, the intake check ball seats to prevent fuel from being discharged back into the bowl. The calibration of the pump spring and the size of the pump jets provide a pump discharge of the desired duration.

The size and weight of the pump discharge needle prevents fuel from being drawn out of the pump circuit during high speed operation. (Fig. 34).

Choke Circuit

The Climate® Control provides the correct mixture necessary to assure quick cold engine starting and proper warm-up performance. When the engine is cold, tension of the thermostatic coil holds the choke valve closed. When the engine is started, air velocity against the offset choke valve causes the valve to open slightly against the thermostatic coil tension. Intake manifold vacuum applied to the choke piston also tends to pull the choke valve open. The choke valve assumes a position, where tension of the thermostatic coil is balanced by the pull of vacuum on the piston and force of the incoming air against the offset choke valve.

When the engine starts, slots located in the choke piston cylinder, Figure 33, are uncovered to allow intake manifold vacuum to draw air, heated by the exhaust manifold, through the choke control housing. The flow of warm air in turn heats the thermostatic coil and causes it to gradually lose its tension until the choke valve reaches full open position.

If the engine is accelerated during the warm up period, the corresponding drop in manifold vacuum allows the thermostatic coil to momentarily close the choke, providing the required richer mixture.

The choke baffle plate prevents particles of dirt and carbon (carried in with the hot air) from depositing on the vacuum cylinder walls. This would retard choke piston action and eventually cause the piston to stick.

Disassembly

The following disassembly procedure applies to complete overhaul only, and with carburetor removed from the engine. A complete carburetor overhaul includes: thorough cleaning and inspection, re-
placing worn parts, replacing all gaskets, gauging or sizing calibrated passages and replacing when not to specifications, assembly and final adjustments. A complete tear down of this carburetor is not necessary for adjustments only. See Adjustments.

Remove the two screws and lift the dust cover from the bowl cover. It may be necessary to move the throttle linkage slightly to facilitate removal (Fig. 36).

**FIGURE 36 — Removing Dust Cover**

Remove the upper and lower throttle connector rod retainers and remove the throttle connector rod (Fig. 37).

**FIGURE 37 — Throttle Connector Rod Retainers**

Remove the lower choke connector rod pin spring retainer. Rotate the rod and slide it out of the key hole slot in the choke shaft lever (Fig. 38).

Remove the four air horn screws and separate the air horn from the bowl cover. Discard the gasket (Fig. 39).

**FIGURE 38 — Choke Connector Rod Removal**

**FIGURE 39 — Separating Air Horn from Carburetor**

Remove the bowl cover screws and separate the cover from the bowl (Fig. 40).

Remove the pump and vacuum meter piston springs.
FIGURE 40 — Separating Cover From Bowl

Remove the four body flange screws and separate the flange from the bowl. Discard the gasket (Fig. 41).

FIGURE 41 — Separating Flange From Bowl

From the flange body remove the idle adjustment screws (2) (Fig. 42).

Remove the throttle lever stop screws. The throttle plates need not be removed for normal overhaul. However, if they are damaged or if the throttle shaft is worn or bent they can be removed by first filing off the staked portion of the retaining screws and then removing the screws.

Remove the pump jet and discard the gasket from the carburetor bowl (Fig. 43). Invert the bowl and the discharge check needle will drop out (Fig. 44).

FIGURE 42 — Removing Idle Adjustment Screws

FIGURE 43 — Removing Pump Jet
FIGURE 44 — Pump Discharge Needle

Remove the metering rod jets (2).
Remove the pump intake check ball retainer and ball.
Remove the pump passage plug (Fig. 45).

FIGURE 45 — Interior of Fuel Bowl

1. Pump Passage Plug
2. Metering Rod Jets
3. Pump Intake Check

FIGURE 46 — Removing Float Lever Pin

Remove fuel needle and using Tool J-816-4 remove the fuel needle seat. Discard the gasket.

FIGURE 47 — Removing Fuel Needle Seat

Remove the bowl cover gasket and discard.
Remove the metering rods off the vacuum meter piston link and push out through top of bowl cover. Remove metering rod disks.
Using needle nose pliers remove pump connector link pin spring retainer (Fig. 48). Slide the pump plunger assembly out through bottom of bowl cover.
FIGURE 48 — Removing Pump Link Retainer

Remove the fuel strainer and nut. Discard the gasket (Fig. 49).

FIGURE 49 — Fuel Strainer Removed

With a ¼" wrench remove the two low speed jets (Fig. 50).

FIGURE 50 — Removing Low Speed Jets

Remove the choke cover, gasket, and baffle plate.

FIGURE 51 — Separating Choke

In the event the choke plate or shaft is damaged they can be replaced by removing the choke plate retaining screws. To replace the choke shaft remove the choke lever and rotate the shaft so that the choke piston slides out of its cylinder and pull the choke shaft out of the choke housing as an assembly.

**Inspection and Cleaning**

All metal parts and assemblies should be thoroughly cleaned with a good carburetor cleaning solvent following the solvent manufacturer’s instructions. After the parts have been cleaned, visually inspect the castings for cracks, nicks, water damage, deposits of dirt or carbon. Blow out all passages with compressed air. Check all passage plugs to make sure they fit.
tightly. Check all the calibrated passages against specifications using approved accurate gauges. Inspect the choke plate and throttle plates for nicks binding and proper alignment. Check the floats for leaks or other damage. Check the idle adjustment needles for nicks, grooves or wear. Replace any screws that might be stripped or damaged. Replace all gaskets and worn or damaged parts.

CAUTION: Do not use sharp tools to scrape deposits from the carburetor, or attempt cleaning calibrated passages with wire or similar objects.

Assembly

Install the choke shaft assembly into the air horn. Position the choke plate on the choke shaft and install the choke plate screws. Before final tightening of the screws check the choke plate operation for proper alignment.

Install choke shaft lever but do not tighten. Final adjustment must be made after the carburetor is assembled. See Adjustments.

Install the choke baffle, gasket and choke cover. Set choke on index.

Install the two low speed jets.

Install the fuel strainer nut. Use a new gasket.

Slide the pump plunger assembly into the bowl cover. Insert the pump connector link into the pump rod and top hole of the lever. Retain with pin spring.

Install the needle and seat assembly using Tool J-816-4. Use a new gasket.

Position the float and lever assembly on the bowl cover and insert the float lever pin.

Using float gauge J-4773 check float level with bowl cover inverted and reset by bending float arms as needed. See Adjustments.

Remove float and lever assembly and install bowl cover gasket. Install float assembly.

Install the pump intake ball check and retainer.

Install pump passage plug, use new gasket.

Install the two metering rod jets.

Insert the pump discharge check needle into the pump passage and install pump discharge jet and new gasket.

Slide the throttle shaft into the body flange. Install the throttle plates on the throttle shaft.

NOTE: It is imperative that the throttle plates are aligned properly on the shaft. In the closed position the plates must completely close off the throttle bore.

To properly align the plate on the shaft and in the bore, rotate the plates until they fit snugly prior to tightening the screws. Recheck the alignment after tightening by holding up to a light. With the throttle in the closed position little or no light should pass between the plates and the bore. Stake the throttle plate screws and check the shaft for binding.

CAUTION: The throttle lever stop screw must be backed out to allow the throttles to close completely for this check.

Install the idle adjustment screws and springs. Turn the screws in until they just bottom lightly; then back out one turn. This adjustment must be rechecked with the engine running.

CAUTION: Do not turn the idle adjustment screws in too tightly onto the seat. This may groove the needle and cause an erratic idle condition.

Assemble the carburetor bowl to the body flange. Use a new gasket.

Insert the pump lower spring and the vacuum meter piston spring into their respective passages.

Attach vacuum meter piston to the vacuum metering link.

Install the bowl cover on the carburetor bowl.

Make certain the pump plunger and the vacuum metering piston align properly into the bowl.

Tighten the bowl cover screws down evenly to prevent distorting the bowl cover.

Install the air horn and torque the retaining screws.

Drop the metering rod disks down into place and install the metering rods on the vacuum metering link. Make certain the spring retainer engages the metering rods to prevent them from coming off the vacuum metering link.

Insert the choke connector rod into the keyhole slot in the choke lever and install the lower end into the cam trip lever. Retain with pin spring.

Install the throttle connector rod into the throttle lever. Insert the top end of the rod into the pump operating lever and retain with spring and retainer.

This completes the assembly with exception of the dust cover which must be installed after the carburetor adjustments are completed.

Carburetor Adjustments

Carter Model WCD-3322S

Float Adjustment

Two separate float adjustments must be made, lateral and vertical.

LATERAL ADJUSTMENT: With bowl cover assembly inverted, bowl cover gasket removed, place float gauge (J-4773, Fig. 52), directly under floats with notched portions of gauge fitted over edges of casting. Sides of floats should barely touch the vertical uprights of float gauge. Adjustment should be made by bending arms of floats.

VERTICAL ADJUSTMENT: With float gauge in same position, floats should just clear the horizontal portion of gauge. Vertical distance between top of float and machined surface of casting must be 3/8"
(Gauge J-1773, Fig. 52). Adjust by bending float arms. Remove floats, install bowl cover gasket, and then install floats.

FIGURE 52 — Float Adjustment

Float Drop Adjustment

With bowl cover held in upright position, the distance between top of floats at center and bowl cover should be ⅛". Adjust by bending stop tab on float bracket.

Pump Adjustment

Install pump connector link in outer hole (long stroke) of pump arm with ends extending away from countershaft arm. Back out throttle lever set screw until throttle valves seat in bores of carburetor. Be sure fast idle adjusting screw does not hold throttle open. Hold straight edge across top of dust cover boss at pump arm (Fig. 53). The flat on top of pump arm should be parallel to straight edge. Adjust by bending throttle connector rod at upper angle. Use Tool J-5496.

Metering Rod Adjustment

Metering rod adjustment is important and must be made after completing the pump adjustment. No metering rod gauges are necessary. Procedure is as follows: Back out throttle lever set screw to allow throttle valves to seat in bores of carburetor and loosen metering rod arm clamp screw. With metering rods in place, press down on vacuometer link until metering rods bottom in carburetor body casting. Holding rods in downward position and throttle valves seated, revolve metering rod arm until finger on arm contacts lip of vacuometer link. Hold in place and carefully tighten clamp screw (Fig. 54).

FIGURE 54 — Metering Rod Adjustment

Fast Idle Adjustment

STEP 1: Loosen choke lever clamp screw on choke shaft. Insert .010" gauge (J-5640) between lip of fast idle cam and boss of flange casting (Fig. 56).

Hold choke valve tightly closed and take slack out of linkage by pressing choke lever toward closed position; hold in place and tighten clamp screw.

STEP 2: With choke valve tightly closed, tighten fast idle adjusting screw until there is .020" (Gauge J-1388) opening between throttle valve and bore of carburetor (side opposite idle port) (Fig. 57). Be sure fast idle adjusting screw is on high step of cam while making this adjustment.
Unloader Adjustment

With throttle wide open, there should be ⅜" (Gauge J-818-3) clearance between upper edge of choke valve and inner wall of air horn (Fig. 58). Adjust by bending unloader lip on throttle shaft lever. Use Bending Tool J-1137.