The Carter WO Carburetor

Description and set up

from the

1944

MoToR Auto Repair Manual

originally published by
Automotive Business Magazine
(Hearst Magazines, Inc)
572 Madison Ave.
New York 22, NY
1944

The following pages were reproduced from the 1944 *MoToR Auto Repair Manual*, published by the Automotive Business Magazine division of Hearst Magazines, Inc. They are reproduced here for the purpose of sharing out-of-print technical information with Willys Jeep owners on the set up of the Carter WO carburetor.

• The index section of the book indicates that up to 1944, when the book was published, the Carter WO carburetor was also used by Studebaker on vehicle models G and 2G.

• The introductory page, beginning with the Carter W1 (pg 18), has an overview of the WA1, WO, WCD, and WDO carburetors stating that "all these are basically the same." Specific details relating to the WO carburetor begin on pg 23 and end with descriptions of the WDO carburetor on pg 24.

• An editorial correction was made at the bottom of page 20 (two lines of type were in the incorrect sequence in the same galley).

CARTER ADJUSTMENTS

Car and Model	Type	Part Number	Float Setting and Tool	Idle Screw Setting Turns Open	Pump Travel, Adjust. ①	Metering Rod Gauge	Anti-Percolator Setting and Tool ②	Unloader Adjustment and Tool ④	Fast Idle Adjustment and Tool ⑤
TERRAPLANE									
G	W1	311S	3/8"—T109-80	3/8 to 1	No Spec.	T109-25	None	None	None
GU	W1	309S	3/8"—T109-80	3/8 to 1	No Spec.	T109-25	None	None	None
61	W1	331S	3/8"—T109-80	1/4 to 1	No Spec.	T109-25	.030"—T109-29 .005"-.015"—T109-71	None	None
62	W1	329S	3/8"—T109-80	1/2 to 1	No Spec.	T109-25	.030"—T109-29 .005"-.015"—T109-71	7/16"L—T109-81	None
71	W1	348S	3/8"—T109-80	1/4 to 1	No Spec.	T109-25	.030"—T109-29 .005"-.015"—T109-71	None	None
72	WDO	344S	15/64"—T109-32	1/4 to 3/4	15/64"-S	T109-27	.015"—T109-72	1/4"U—T109-31	.018"—T109-44
72	WDO	377S	15/64"—T109-32	1/4 to 3/4	15/64"-S	T109-27	.015"—T109-72	1/4"U—T109-31	.018"—T109-44
81	W1	397S	3/8"—T109-80	1/4 to 1	7/32"-M	T109-25	.025"—T109-114 .005"-.015"—T109-71	None	None
82	WDO	402S	15/64"—T109-32	1/4 to 3/4	15/64"-S	T109-27	.015"—T109-72	1/4"U—T109-31	.018"—T109-44
WILLYS									
1940	WO	450S	3/16"—T109-28	1/2 to 2 1/2	17/64"	T109-26	None	None	None
1941-42	WO	507S	3/8"—	1/2 to 1 1/2	7/32"	T109-26	None	None	None

①—Use Tool No. T109-117S.—"S" means Short Stroke; "M," Medium Stroke; "L," Long Stroke. "NO SPEC." means no specified setting other than seasonal.
②ANTI-PERCOLATOR SETTING: For the saxophone type, 2 gauges are required: The wire gauge is used between the throttle valve and the bore of the carburetor on the side opposite the idle port opening; the feeler gauge is used between the anti-percolator lip and the pump arm, with the anti-percolator cap seated. . . . For the plunger type, the gauge listed should be placed between the plunger and the operating lip to give the dimension indicated. . . . Where "FLUSH" is shown, the indicator line should be even with the top of the anti-percolator plug without using a gauge.
③—The measurement shown is the distance between the lower edge of the choke valve and the air horn wall, with the throttle lever adjusting screw seated against (not on) the first (upper) step of the fast idle cam and the throttle valve closed.
④Measurement taken between the edge of the choke valve and the wall of the air horn. "U" means Upper Edge, and "L" means Lower Edge of the choke valve.
⑤Measurement taken between the throttle valve and the bore of the carburetor with the choke valve seated.

IT IS well to remember that any change in carburetor action will usually come gradually. Therefore, if the carburetor operated properly when last used, it is reasonable to assume that some other part of the engine is at fault, and the trouble should be located and corrected before attempting alterations to the carburetor. See the ENGINE TUNE-UP chapter for the proper steps to take in order to eliminate the trouble.

Dirt is the great enemy of good carburetion; it not only fills up air and gasoline passages, but it also accelerates the wear of delicate parts. How often a carburetor should be cleaned depends upon the conditions under which it is used. In dusty areas, the carburetor should get more attention than in parts of the country where this condition is not prevalent.

Never use a wire to clean out restrictions in jets as this practice will destroy the calibrations of these parts. Always use compressed air.

The perfect carburetor delivers the proper gasoline and air ratios for all speeds of the particular engine for which it was designed. By proper cleaning and replacing of all worn parts, the carburetor can again function in the original condition, and will then deliver the proper air-fuel ratios as it did when new.

The many other factors which affect performance and economy cannot be changed in any way by the carburetor.

In servicing the carburetor, it is well to divide the unit into its various systems or circuits. These circuits are: float or gasoline level system, low speed system, high speed system, pump or acceleration system and the choke system. By treating each system separately, repairs to the unit are made easier.

When disassembling the carburetor, it is well to have a separate pan for the parts which comprise each circuit. Inspect the carburetor for its general condition, evidence of previous repair, and the relation of parts.

If any of the parts are too tight to remove without mutilating the slots, place the proper size screwdriver in the slot and rap its handle with a hammer. This will loosen the part in its seat so it can be removed. When this is done to jets, it generally changes the size of the metering hole, besides damaging the part.

After the parts have been removed, inspect all holes in the casting to be sure they are not restricted. Wash the casting in gasoline with a brush and blow out all the openings with compressed air. Any gum or foreign matter which cannot be removed with gasoline, can generally be removed with lacquer thinner.

A complete check of all parts should be made since, usually a complaint is caused by two or more sources, and by replacing one part will not restore the carburetor to perfect condition. Use new gaskets, since used gaskets are generally compressed and usually will not seal again.

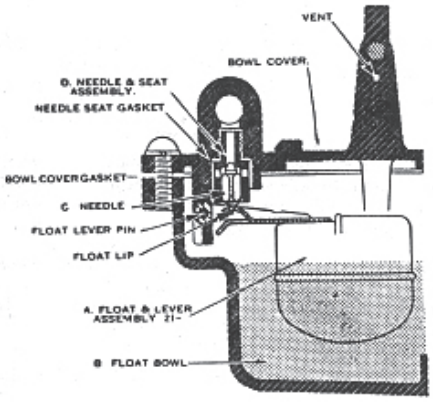
CARTER W1

The following paragraphs describe the operating principle and service instructions for the W1 unit, but will also serve to describe the WA1, WO, WCD and WDO carburetors, as all these units are basically the same. Consult the paragraphs which are devoted to these units for details in construction, service and adjustments.

FLOAT SYSTEM

The float system consists of gasoline pressure or fuel pump pressure, needle valve and its seat, needle seat gasket, float and lever assembly, float bowl, bowl cover and gasket, and vent.

The float system controls the gasoline level in the float bowl and also in the nozzle. A gasoline level which is too high or too low will cause trouble in both the low and high speed systems, and will make complaints hard to trace.



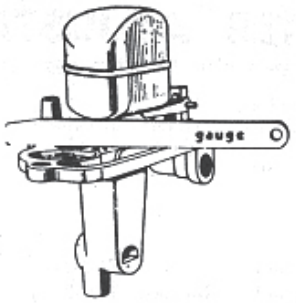
CARTER W1—Float System

The float bowl acts as a reservoir to hold a supply of gasoline throughout the entire range of performance of the engine.

FLOAT SYSTEM SERVICE

FLOAT LEVEL—A high float level can generally be determined by looking down through the throat of the carburetor with a flash light while the engine is idling. If the end of the main nozzle flushes alternately wet and dry, it is a true indication of a high liquid level in the float bowl, which must be corrected before the engine will idle smoothly.

Consult the CARTER ADJUSTMENT CHART for the proper setting of the float level. When making a change in the float level, press down with a screwdriver on the brass lip of the float while holding up on the float assembled to the cover of the carburetor. Bending the lip in this way allows it to retain its curvature which is necessary for the correct operation of the float valve.



CARTER W1—Showing method of checking float level

FLOAT & LEVER ASSEMBLY—If the float is loaded with gasoline, damaged, or if the holes for the float pin are worn egg-shaped, this will cause the carburetor to flood or leak, in which case, replace the assembly. Poor action of the intake needle will result if the lip of the float bracket is ridged. If this is the case, it can be smoothed with emery cloth; never use a file. If the float pin, or the hole in the float pin bracket is worn, it will cause erratic action of the float, and will have the same effect as a high float level.

NEEDLE & SEAT—If the needle is worn so that you can feel or see a ridge, or if the needle and seat leaks, or is damaged, or sticks in the seat, it will cause the carburetor to flood or leak; replace both the needle and seat, as they are sold in matched sets.

FUEL PUMP PRESSURE—Regardless of the height of the float, the height of the liquid in the float bowl rises as the fuel pump pressure is increased. If the pressure is too low, insufficient fuel will be supplied at top speed. In either case, the fuel pump will have to be repaired. Standard pump pressures vary from 1½ to 4½ pounds according to the model of the pump.

LOW SPEED SYSTEM

The idle or low speed circuit completely controls the supply of gasoline during idle and light-load speeds up to approximately 20 MPH and it partially controls the light-load speeds between 20 and 30 MPH.

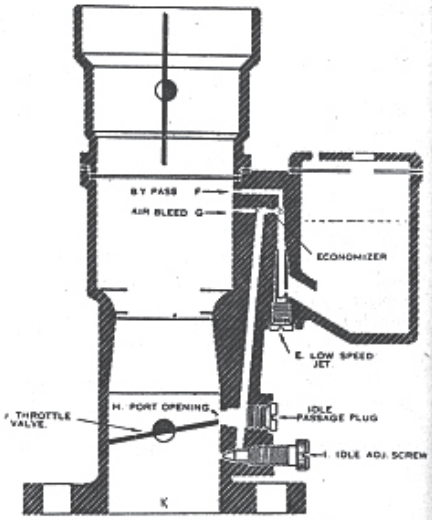
During idle and low speed operation of the engine, gasoline flows from the float bowl through the idle speed jet to the point where it is combined with a stream of air coming in through the by-pass. The combining of the air and gasoline tends to atomize or break up the gasoline into a vapor.

This mixture of air and gasoline continues on through the economizer until it begins to pass the point where it is further combined with a stream of air coming in through the lower air bleed. This again tends to break up the gasoline particles into a finer vapor. The gasoline and air mixture that flows downward in the passage from the lower air bleed, is still richer than an idle mixture needs to be, but when it mixes with the air which has come past the throttle valve, it forms a combustible mixture of the right proportions for idle speed.

The idle port is made in a variety of slotted shapes so that as the throttle valve is opened, it will not only allow more air to come in past the valve, but will also uncover more of the idle port, allowing a greater quantity of the gasoline and air mixture to enter the carburetor throat from the idle mixture passage.

The idle position of the throttle is such that at an idle speed of 6 MPH, it leaves enough of the slotted port as reserve to cover the range in speed between idle and the time when the high speed system begins to cut in. The idle adjusting screw varies the quality of the idle mixture.

All the gasoline flowing from the



CARTER W1—Low Speed System

float bowl during the idle period and at no-load speeds up to 20 MPH, flows through the small metering hole in the low speed jet. The outside of the barrel of a new low speed jet is straight from the base to the tip, but, as it is installed in the carburetor, the tip of the barrel contacts the tapered seat in the body of the carburetor between one and two complete turns of the jet before it is fully installed.

As the jet is screwed into place, a gasoline tight fit is made between the tip of the jet and the body of the carburetor, by the rolling and tapering action of the tapered seat.

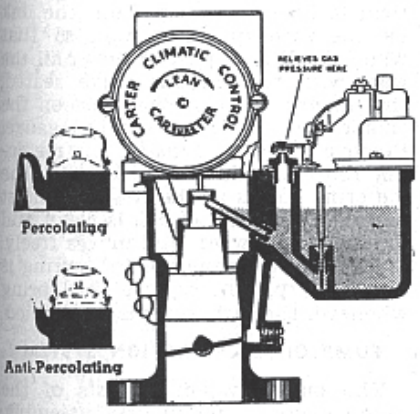
LOW SPEED SYSTEM SERVICE

LOW SPEED JET—Trouble may be due to any of the following: The metering hole in the low speed jet may be too small or too large; it may be installed without a gasket, or, it may be installed from another carburetor.

When a low speed jet is removed, its copper gasket generally remains in the

carburetor body. If for any reason this should drop out of the recess in the carburetor during re-assembly, and the jet is installed without the gasket, the jet will be installed in too far. This will cause a further rolling action of the cast-iron taper on the jet. Installing the jet without the gasket will likely cause a gasoline leak at the seat of the jet; and if it is then removed and replaced with a gasket, a space will be left between the tip of the jet and the cast-iron taper. This will allow gasoline to go into the idle passage past the outside tip of the jet without passing through the small metering hole in the side. This will destroy the calibration of the carburetor and will affect gasoline economy. If the metering hole in the side of the jet is too large because of improper cleaning, or if it is clogged so that it cannot be cleaned with compressed air, the jet should be replaced.

In cases of an unsteady idle, low gasoline economy, or poor low speed performance, if it is doubtful whether the low speed jet is right, it should be replaced with a new one.



CARTER W1

BY-PASS & AIR BLEED HOLES—The black carbon deposit which forms in the throats of carburetors may restrict the air bleed holes to such an extent that insufficient air will be supplied to mix the gasoline before it reaches the idle port. This condition will generally be indicated if it is necessary to screw the idle mixture adjusting screw in closer than the minimum limit. If the condition is bad, a "loping" idle may continue even after the idle mixture adjusting screw is screwed entirely in against the seat. These air bleed holes may be cleaned with wire or the proper size drills.

IDLE MIXTURE PASSAGE—A passage restricted with carbon is unusual but it may be found as the cause of an unsteady idle when no other remedy seems to correct the trouble. The passage should be cleaned by removing the plugs from the carburetor body and using a wire and compressed air.

IDLE PORT—Make sure it is clean and unrestricted. If the port is damaged, the engine will not perform properly at low speed and a new casting will have to be installed. Consult the calibration chart for the size of the idle port.

IDLE ADJUSTMENT SCREW & SPRING—The point of the screw must be free of burrs and must also be smooth. The spring must have the proper tension to hold the adjustment.

THROTTLE VALVE—A captial "C" enclosed in a circle is stamped on the face of the valve. When installed in the carburetor, the "C" should be on the side of the valve toward the idle port, and facing the manifold.

To center the valve properly in the carburetor throat, the screws should be started in the shaft, and then, with the valve closed, it should be tapped on the upper side. Pressure should be maintained with the finger until the screws are tightened. If the valve is worn or bent it should be replaced as it affects the idle port relation.

Valves are made with two opposite edges beveled so as to fit the carburetor throat when the valve is closed. Always make sure that the valve is installed correctly as poor performance at low speed will be the result otherwise.

THROTTLE SHAFT & LEVER—If the shaft is badly worn it will affect port opening. If the lever is loose on the throttle shaft, the carburetor will idle slow one time and fast another; in both cases, it will have to be replaced. Do not try to tighten a lever that is riveted on the shaft as this will damage other parts of the shaft.

CARBURETOR BORE—If the carburetor bore is restricted with a carbon deposit, it will make it necessary to open the throttle wider than the specified opening to obtain the proper idle speed. This will uncover more of the slotted idle port than was intended in the calibration of the carburetor, which will result in leaving an insufficient amount of idle port as reserve to cover the period between idle and 20 MPH when the high speed system begins to cut in. This will result in a flat spot. The bore can be cleaned with emery cloth or by scraping.

ANTI-PERCOLATOR, ADJUST

An anti-percolator valve that opens early upon deceleration may allow a quantity of air to be drawn into the high speed system, which will result in a flat spot as the car is accelerated immediately after deceleration. If the valve does not open at all, it will fail to relieve the vapor pressure, and hard starting will result with a hot engine.

SAXOPHONE KEY TYPE—Open the throttle .030" by placing Tool No. T109-29 gauge between the throttle valve and the bore of the carburetor on the side exactly opposite the port. Bend the anti-percolator arm to give a clearance of from .005" to .015" between it and the pump arm. A few carburetors require from .010" to .020"; consult the CARTER ADJUSTMENT CHART.

POPPET VALVE TYPE—Back out the throttle lever adjusting screw. The anti-percolator should be checked, after setting the metering rod.

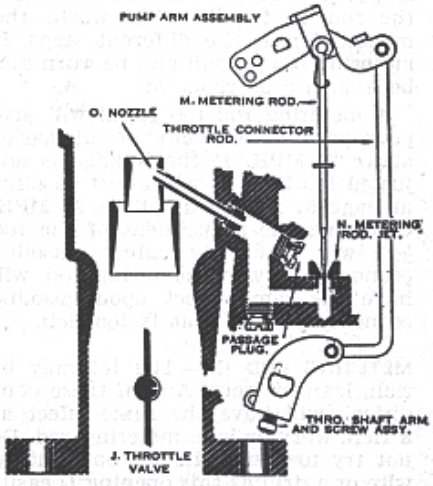
The adjustment of anti-percolator on early carburetors that do not have an indicator line on the anti-percolator valve and plug assembly should be adjusted as follows: Use Tool No. T109-29 and insert .020" gauge between the throttle valve and the bore of the carburetor on the side exactly opposite to the port. The lip on the pump arm should be adjusted to obtain .005" clearance between the lip and the anti-percolator valve stem. Use a feeler gauge to obtain the proper setting.

For units which have the indicator line on the valve stem, adjust as follows: With the throttle valve tightly closed, adjust the lip on the pump arm to depress the anti-percolator stem so that the indicator line is flush with the top of the anti-percolator plug. Do not use gauge No. T109-29.

HIGH SPEED SYSTEM

The intermediate speed and high speed system consists of the metering rod, metering jet, nozzle and gasket, throttle valve, and metering rod spring and disc.

As the throttle is opened wide enough for a speed of a little more than 20 MPH, the velocity of air flowing down through the carburetor throat creates a pressure slightly less than atmospheric at the tip of the main nozzle.



CARTER W1—High Speed System

Since the gasoline in the float bowl is acted upon by atmospheric pressure, the difference in pressure between the two points causes gasoline to flow from the bowl, through the metering jet, and out the main nozzle into the throat of the carburetor.

As the speed increases from 20 MPH the high speed system continues to cut in more and more, and the idle or low speed system to cut out until the high speed system is carrying the entire load and the idle system is carrying none of the load.

At higher speeds, the area of the opening between the metering jet and the metering rod governs the amount of gasoline going into the engine. At top speed, the smallest section of the metering rod is in the jet.

HIGH SPEED SYSTEM SERVICE

MAIN NOZZLE—When a restricted main nozzle cannot be cleaned with compressed air, or the hole in the end of the nozzle is too large or is damaged, or the installation of a new gasket will not overcome the leak at the base of the nozzle, a new nozzle and gasket must be installed.

If the holes in the nozzle are restricted, it will change the mixture throughout the range. A nozzle cannot be dipped in acid in an attempt to brighten it, nor buffed without danger of causing damage to the nozzle. Never install more than one gasket under the main nozzle and be sure that the old gasket is removed.

METERING ROD—If the carburetor has been in service for some time or has been tampered with, you may find that the metering rod has been improperly adjusted, worn, or the wrong metering rod installed. A worn metering rod will have the same effect as one that is too small. In any case, the correct rod should be installed.

To determine if the metering rod is worn, it may be measured with a micrometer at the different steps. If the rod is found to be worn, the metering rod jet will also be worn and both should be replaced.

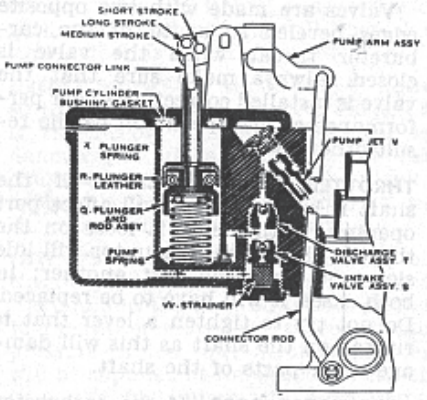
A metering rod too small will give poor gasoline economy at all speeds above 20 MPH. If the linkage is adjusted too high, it will affect gasoline mileage at all speeds above 20 MPH. Changing the adjustment of the rod 1/16" will definitely affect gasoline economy. A worn metering rod will have the same effect upon gasoline economy as one that is too rich.

METERING ROD JET—The jet may be rich, lean or worn. Any of these conditions will have the same effect as a rich, worn or lean metering rod. Do not try to gauge the jet hole with a wire or a drill as this opening is easily damaged; always replace the jet.

METERING ROD, ADJUST

The metering rod position should be checked when carburetors are serviced or when leaner than standard rods are installed. Consult the CARTER ADJUSTMENT CHART for the correct gauge to use.

For 1936 and earlier W1 units, back out the throttle adjusting screw so that the throttle valve seats tight. Insert the gauge in place in the metering rod jet. Hold the gauge vertical to insure its seating. The metering rod pin in the pump arm should rest at the bottom of the notch in the gauge with the throttle fully closed and the upper end of the connector rod centering freely in the hole in the pump arm. If it does not center freely, use Tool No. T109-75, and bend the connector rod at the lower end (where it right-angles), so that the top end centers freely in the hole in the pump arm with the throttle fully closed. After replacing the metering rod, spring and disc, lubricate the pump arm with graphite grease.



CARTER W1—Pump System
This type pump jet is not vented

VACUMETER UNITS

For 1937 and later W1 units having a specified pump setting or vacumatic metering rods, it is well to understand the principle of operation.

Under part throttle acceleration and for hard pulling at part throttle, the power mixture is required for a short time. Their requirement always coincides with a drop in manifold vacuum. The carburetor meets this demand by allowing the drop in manifold vacuum to permit a spring to move the metering rod to the proper step and give the required richer mixture the instant it is needed, regardless of throttle opening. As soon as the demand is passed, as shown by the rise of manifold vacuum, the metering rod moves down against the pin attached to the pump arm, and it is then controlled mechanically until another such demand arises.

The vacumeter control consists of a small brass piston beneath which is a spring fitted into a cylinder, bored into the carburetor casting. The lower end of the bore has a drilled passage, opening into the carburetor throat below the throttle valve. The vacuum acting upon this piston through this passage holds the piston down and compresses the spring as long as the vacuum is stronger than the spring. The spring under the piston is calibrated to force the piston up to a predetermined point (not the top of the cylinder) when manifold vacuum drops below 3 inches of mercury. This spring varies in length for different carburetors, and the correct spring must be used. With the manifold vacuum above 3 inches of mercury, the piston is pulled down until the arm to which it is attached rests on the pin attached to the pump arm. When the piston is down, this pin lifts the metering rod in direct ratio to the throttle opening, without regard to vacuum.

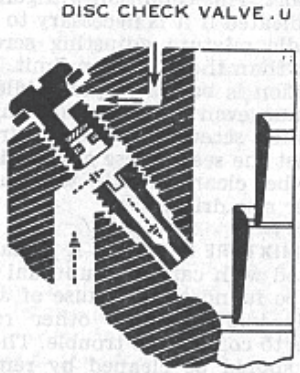
METERING ROD, ADJUST

To adjust the metering rod, insert the gauge in place of the metering rod, seating the tapered end in the metering rod jet. Hold the gauge vertical to insure seating. Bend the link on the step-up piston link so that when the link is pushed down all the way, with the throttle valve seated, the metering rod pin will rest on the shoulder in the notch of the gauge. Remove the gauge, install the metering rod disc and spring. Be sure the metering rod is in the jet. Care must be taken that the piston is clean and dry, shows no wear, and moves freely. Make sure the proper length spring is under the piston; replace this spring whenever the carburetor is overhauled.

PUMP OR ACCELERATION SYSTEM

The pump system consists of the pump cylinder, pump arm assembly, connector link, pump plunger and rod assembly, plunger leather and spring, intake valve, discharge valve, pump strainer screen, pump disc check valve (Chevrolet), pump jet, connector rod and pump spring.

When the pump plunger and leather are first installed in the pump cylin-



CARTER W1—Showing pump jet vented by a disc check valve

der, a small amount of air is trapped between the piston and the top of the liquid gasoline. As the accelerator pedal is depressed, the pump plunger and leather are forced downward. This compresses the trapped air, forces the gasoline to leave the cylinder, closes the inlet valve, opens the discharge valve, closes the disc check valve (Chevrolet), and discharges gasoline into the carburetor throat.

The discharge is prolonged, since the hole in the tip of the pump jet is small enough to restrict the flow so long as it is being forced out by the pump travel, plus the expending of the trapped air. The prolonging of the pump discharge gives the gasoline in the high speed system sufficient time to flow fast enough to satisfy the demands of the engine.

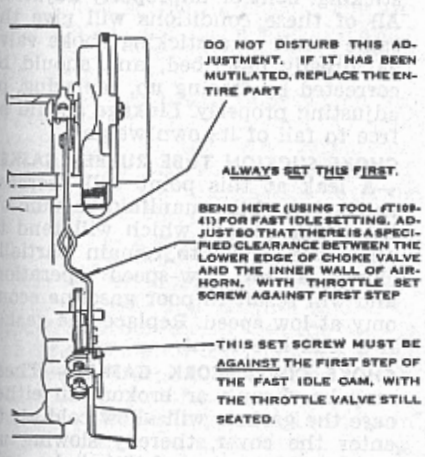
As the accelerator pedal is allowed to return to its original position, the accelerating pump plunger is lifted upward by the link. This creates a partial vacuum in the pump cylinder, which opens the inlet valve, closes the discharge valve, and draws in a charge of gasoline.

Since the discharge valve is below the liquid level of the carburetor, gasoline would be drawn into the throat of the carburetor through the pump jet from the acceleration system, during fixed throttle intermediate speeds and high speeds, if it were not for the pump disc check valve (Chevrolet), or, air bleed to the outside air on other units. This breaks the vacuum of the acceleration system by bleeding in air from the float bowl.

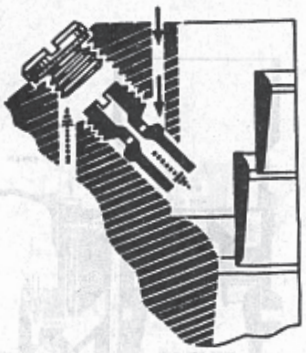
Pump jets are made in three types: One type is vented by means of the disc check valve already referred to; one type is vented directly to the outside air, while some other units are not vented and the carburetor is calibrated accordingly.

PUMP SYSTEM SERVICE

Some carburetors have specified



CARTER W1
Showing method of making fast idle and unloader adjustments



CARTER W1—Showing pump jet vented directly to outside air

pump settings; consult the CARTER ADJUSTMENT CHART.

PUMP PISTON—If the piston is worn or sticks, or if the spring has lost its tension, replace both, as it will affect the action of the pump.

PUMP INTAKE VALVE (BALLCHECK)—If the inlet valve leaks, part of the discharge of the pump will be forced out through the valve, back into the gasoline well in the base of the carburetor, thereby causing an insufficient amount of gasoline to be discharged into the throat of the carburetor upon acceleration. If the valve cannot be cleaned so that it works properly, it must be replaced.

PUMP DISCHARGE VALVE (BALLCHECK)—If this valve leaks, air will be drawn into the pump cylinder on the up stroke of the pump plunger. This gives an insufficient charge of gasoline into the throat of the carburetor upon acceleration, causing a flat spot. If the ball cannot be cleaned so that it works properly, it must be replaced.

PUMP PISTON LEATHER—If the piston leather leaks, the charge of air in the pump cylinder will be lost. Without the compressed air in the cylinder, the charge will not be sufficiently prolonged to allow the gasoline in the high speed system to catch up and a flat spot will result.

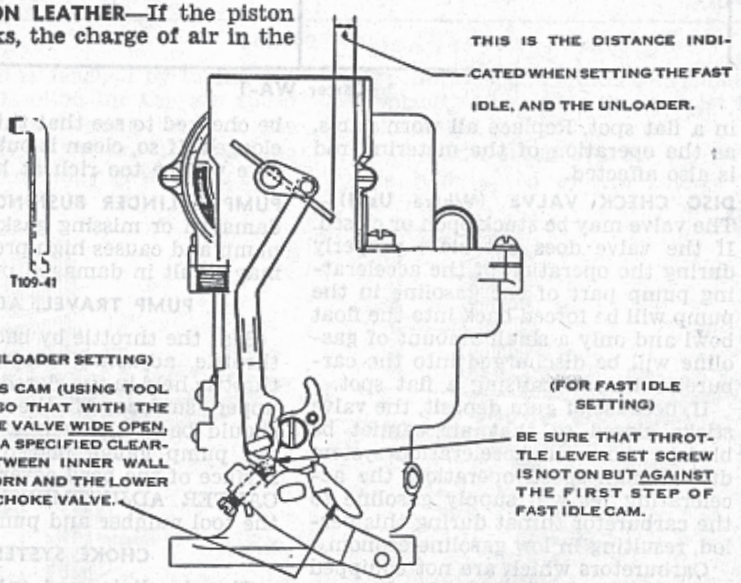
A plunger leather can rarely be cleaned or repaired. Since this is a specially treated leather for this use, both the leather and the expanding spring must be replaced.

BALL CHECK STRAINER SCREEN—A restriction will allow an insufficient charge of gasoline to be drawn into the pump cylinder, causing a flat spot. The screen can generally be cleaned, but if damaged, it must be replaced.

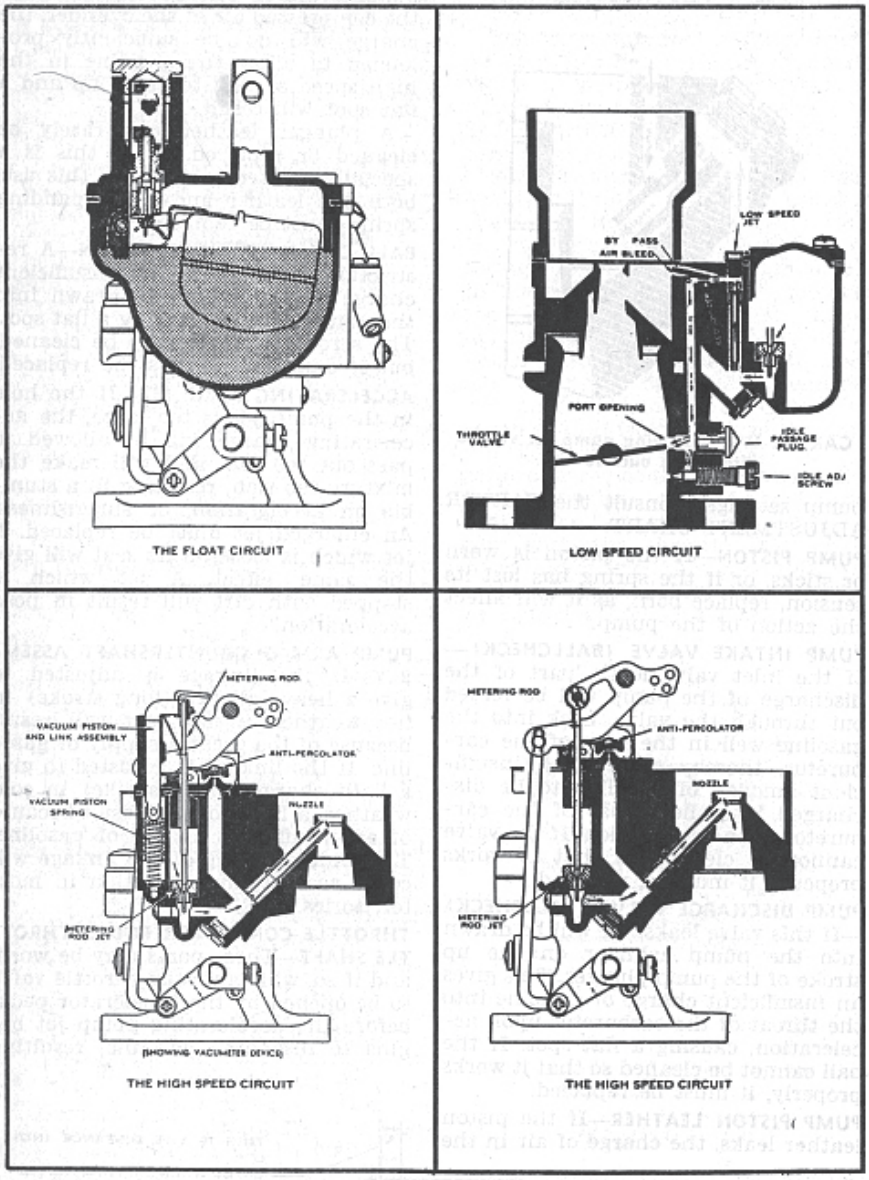
ACCELERATING PUMP JET—If the hole in the pump jet is too large, the accelerating charge will be allowed to pass out too fast and will make the mixture too rich, resulting in a stumble on acceleration, or sluggishness. An enlarged jet must be replaced. A jet which is loose on its seat will give the same effect. A jet which is stopped with dirt will result in poor acceleration.

PUMP ARM & COUNTERSHAFT ASSEMBLY—If the linkage is adjusted to give a heavy charge (long stroke) in hot weather, a flat spot will result because of too great a supply of gasoline. If the linkage is adjusted to give a light charge (short stroke) in cold weather, a flat spot will result because of an insufficient charge of gasoline. The middle setting of the linkage will cover year-around operation in most territories.

THROTTLE CONNECTOR ROD & THROTTLE SHAFT—These parts may be worn, and if so, will cause the throttle valve to be opened by the accelerator pedal before the accelerating pump jet begins to discharge gasoline, resulting



CARTER W1—Showing method of making fast idle and unloader adjustments



Carter WA-1

in a flat spot. Replace all worn parts, as the operation of the metering rod is also affected.

DISC CHECK VALVE (Where Used)—The valve may be stuck open or closed. If the valve does not close properly during the operation of the accelerating pump part of the gasoline in the pump will be forced back into the float bowl and only a small amount of gasoline will be discharged into the carburetor throat, causing a flat spot.

If, because of gum deposit, the valve sticks closed so that air cannot be bled in above the acceleration system during high speed operation, the accelerating jet will supply gasoline to the carburetor throat during this period, resulting in low gasoline economy.

Carburetors which are not equipped with a disc check valve, but have a vent to the outside atmosphere, should be checked to see that this vent is not clogged. If so, clean it out or the mixture will be too rich at high speed.

PUMP CYLINDER BUSHING GASKET—A damaged or missing gasket floods the pump and causes high pressure, which may result in damaged pump linkage.

PUMP TRAVEL, ADJUST

Seat the throttle by backing out the throttle adjusting screw. With the throttle held in the closed position, the upper surface of the pump shaft should be at the height indicated by the pump gauge placed on the flat surface of the bowl cover. Consult the CARTER ADJUSTMENT CHART for the tool number and pump setting.

CHOKE SYSTEM

The circuit is used only in starting and warming the engine; its purpose being to supply a rich mixture when starting. It consists of the choker shaft and lever assembly, choker valve, and a means of controlling the position of the valve.

In the manual choke a wire from the dash is connected to the choker shaft and lever assembly.

In the climatic control or automatic choke, carburetor choke action is controlled by a spring of thermostatic metal. See the AUTOMATIC CHOKE chapter for details of the climatic control operation.

CHOKE SYSTEM SERVICE

CHOKER SHAFT & LEVER ASSEMBLY—If the shaft is bent, or the lever is loose on the shaft, or the wire clamp and screw is worn, it will be necessary to replace these parts as they may bind or break off anytime while in this condition.

AIR CLEANER SCREEN—If this is clogged it will restrict the flow of warm air from the manifold and will cause slow opening of the choke, resulting in poor gasoline economy at low speeds. If badly clogged, the choke will not fully open at the regular idling speed and temperature, causing a loping idle. A clogged screen must be washed thoroughly with gasoline and blown out with compressed air.

CHOKE VALVE—A sticking valve may be caused by a bent shaft, an improperly installed choke valve, or a warped air horn which may be caused by clamping the air cleaner to horn too tightly.

If the choke valve sticks open, it will result in hard starting; if it sticks closed or partly closed, it may result in hard starting and will undoubtedly cause poor gasoline economy and will affect all engine performance. Sticking parts should be freed up, and damaged parts should be replaced.

CHOKE LINKAGE—The linkage may be sticking, bent or improperly adjusted. All of these conditions will give the same result as a sticking choke valve as already described, and should be corrected by freeing up, replacing, or adjusting properly. Linkage should be free to fall of its own weight.

CHOKE SUCTION TUBE RUBBER GASKET—A leak at this point will decrease the action of the manifold vacuum on the choke piston, which will tend to allow the choke to remain partially closed during low-speed operation, and will result in poor gasoline economy at low speed. Replace the gasket if a leak is evident.

CHOKE COVER CORK GASKETS—These may be shrunk or broken; in either case the gaskets will allow cold air to enter the cover, thereby slowing up the opening action of the choke.

CHOKE HEATER TUBE—A leaking tube or connection should either be replaced or tightened.

Consult the AUTOMATIC CHOKE chapter for the operation and service details on the climatic control.

FAST IDLE & UNLOADER SETTINGS

Consult the CARTER ADJUSTMENT CHART for these settings and see the illustration for details.

CARTER WA

While this unit differs somewhat in appearance from the WI carburetor, it contains all of its desirable features, including the vacumeter device (some units).

The air horn contains only the choke mechanism. The sides of the choke valve are not quite parallel, and there is a ridge in the air horn which acts as a stop for the valve in the wide-open position. This new construction makes assembly easier and eliminates the possibility of the valve rubbing on the inside of the air horn when it is not carefully assembled, thus minimizing the possibility of sticking choke valves.

The accelerating pump system consists of a die-cast cylinder in the carburetor body, and intake and outlet ball checks seated in the body. The intake ball is held in place by a screen under the pump spring, and the outlet ball by an extension on the plug above the ball.

The low speed jet is inserted through the top of the float bowl. These details in construction have removed two external screw plugs below the fuel level, leaving only the plug behind the nozzle.

The bowl cover carries the complete anti-percolator, pump arm, and the vacumeter arm (if equipped). The seat of the anti-percolator is cast as a part of the cover, and is located to cover the vertical passage through the body.

The anti-percolator valve is of the saxophone type and is held on its seat by a coiled spring in tension. The anti-percolator cap has a special leather base and a resilient felt pad beneath the leather.

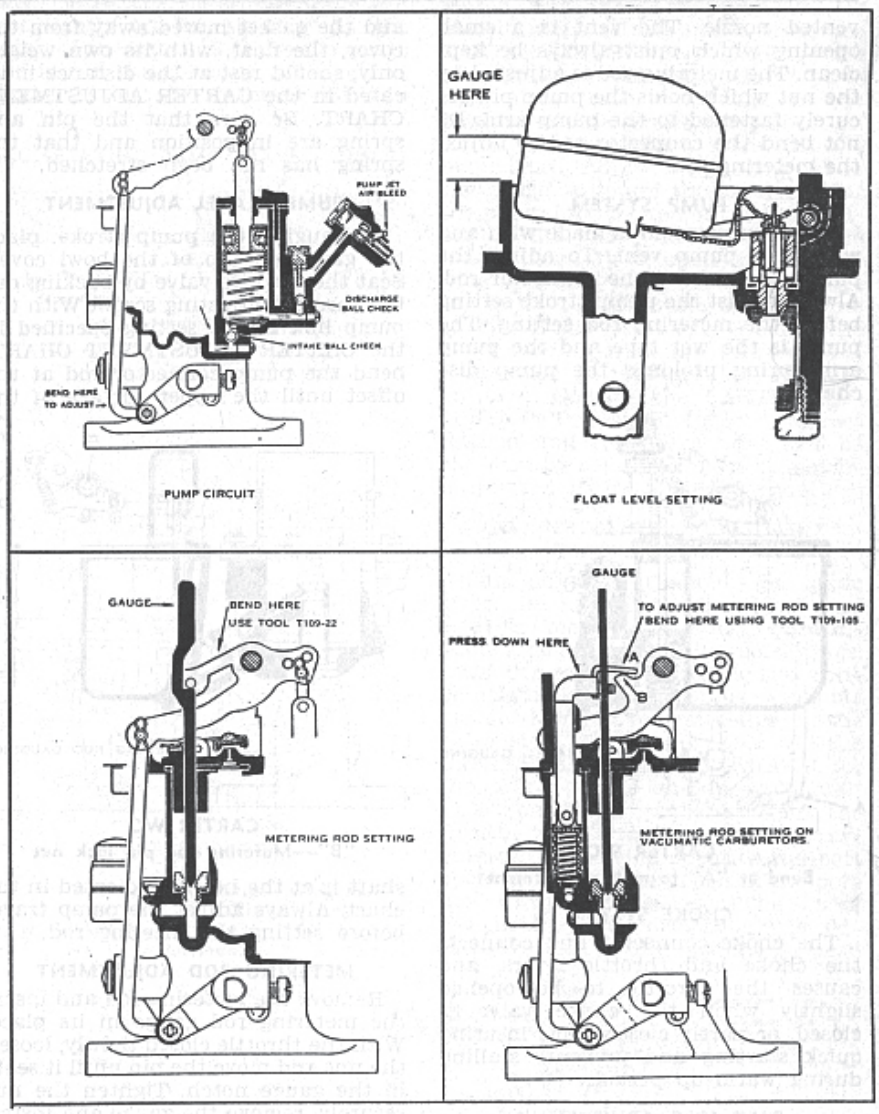
The service instructions which are described in detail for the WI unit apply also to the WA carburetor. Consult the CARTER ADJUSTMENT CHART and the illustrations covering this unit for the proper settings.

CARTER WO

Except for small differences in construction, this unit is quite similar to the WA carburetor, in that the body is of die-cast metal. It is made with and without a balanced vent. Some models have the conventional needle and seat, while others have a special needle in which is inserted a pin and a spring. These needles are not interchangeable and should be used only with the proper needle seat.

LOW SPEED SYSTEM

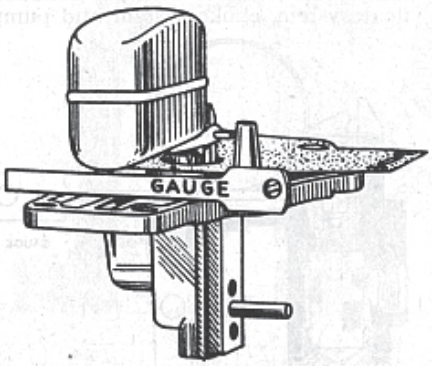
The low speed jet is inserted through the top and is reached by taking out the plug. Gasoline for the low speed system does not come through the main metering jet, but through the well jet, the opening of which is carefully calibrated, and if damaged should be replaced. Make sure the well jet is always seated tightly.



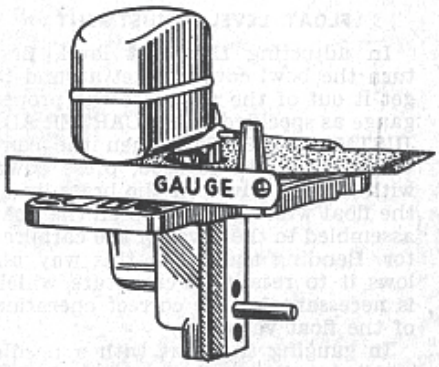
CARTER WA-1

HIGH SPEED SYSTEM

The high speed system carries a



CARTER WO
Showing method of checking float level

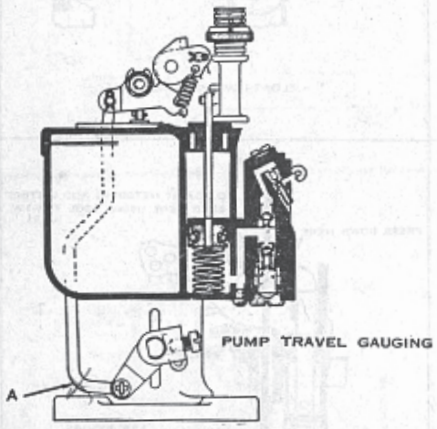


CARTER WO
Showing method of checking float level

vented nozzle. The vent is a small opening which must always be kept clean. The metering rod is adjusted by the nut which holds the pump pin securely fastened to the pump arm. Do not bend the connector rod to adjust the metering rod.

PUMP SYSTEM

The pump system is made with and without a pump vent. To adjust the pump stroke, bend the connector rod. Always adjust the pump stroke setting before the metering rod setting. The pump is the wet type and the pump arm spring prolongs the pump discharge.



CARTER WO
Bend at "A" to make adjustment

CHOKE SYSTEM

The choke connector link connects the choke and throttle levers, and causes the throttle to be opened slightly when the choke valve is closed, or partly closed, thus insuring quick starting and prevents stalling during warm-up periods.

FAST IDLE ADJUSTMENT

With the choke fully closed, bend the choke connector link at the offset to give the proper throttle valve opening. Be sure the bending is done at the offset and the ends of the link are parallel so that no binding occurs at either end.

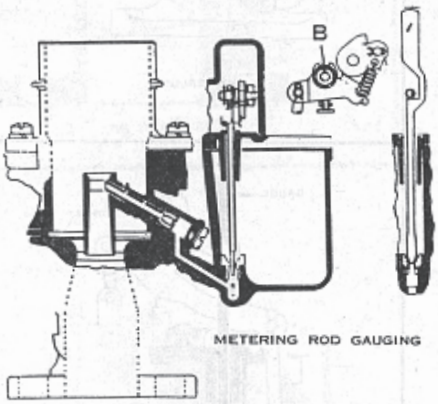
FLOAT LEVEL ADJUSTMENT

In adjusting the float level, first turn the bowl cover gasket around to get it out of the way. Use the proper gauge as specified in the CARTER ADJUSTMENT CHART. When the conventional needle is used, press down with a screwdriver on the brass lip of the float while holding up on the float assembled to the cover of the carburetor. Bending the lip in this way allows it to retain its curvature which is necessary for the correct operation of the float valve.

In gauging the float with a needle which has the spring and pin, do not place any weight on the top of the float. With the bowl cover inverted and the gasket moved away from the cover, the float, with its own weight only, should rest at the distance indicated in the CARTER ADJUSTMENT CHART. Be sure that the pin and spring are in position and that the spring has not been stretched.

PUMP TRAVEL ADJUSTMENT

In gauging the pump stroke, place the gauge on top of the bowl cover. Seat the throttle valve by backing out the throttle adjusting screw. With the pump link in the setting specified in the CARTER ADJUSTMENT CHART, bend the pump connector rod at the offset until the upper surface of the



CARTER WO
"B"—Metering rod pin lock nut

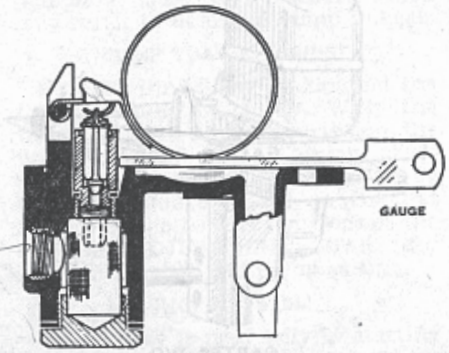
shaft is at the height indicated in the chart. Always adjust the pump travel before setting the meeting rod.

METERING ROD ADJUSTMENT

Remove the metering rod and insert the metering rod gauge in its place. With the throttle closed tightly, loosen the nut and move the pin until it seats in the gauge notch. Tighten the nut securely, remove the gauge and install the metering rod, spring and disc. Lubricate the pump arm shaft with graphite grease.

CARTER WDO

This carburetor is really two WI units built together with one common float system, choke system and pump



CARTER WDO
Showing method of checking float level

system. Therefore, if you consult the description and service instructions described for the WI carburetor, little trouble will be encountered in locating the various system and the servicing of them.

Since both sides of the carburetor are operated from a common shaft, the two metering rods must be set exactly the same, also the two anti-percolators.

The following paragraphs cover the various settings in the order in which they should be made on the WDO carburetor. Consult the CARTER ADJUSTMENT CHART for the proper gauges to be used when making these adjustments. Where the procedure for these adjustments differ between units, the units for which the information applies will be specified.

FLOAT LEVEL ADJUSTMENT

The float level should always be checked whenever the carburetor is serviced, as worn parts of the carburetor usually result in a raised float level.

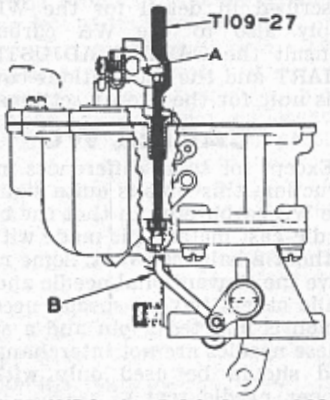
Remove the bowl cover and turn it upside down. Remove the bowl gasket. See the CARTER ADJUSTMENT CHART for the proper gauge and setting you desire, and lay the gauge on the flat portion of the bowl cover. Always gauge the float at both ends, making sure the needle is seated.

If the float level is too high, place a finger under the float to raise it from contact with the needle, and then press down on the float lever lip with a screw driver. Do not use pliers to bend this lip, and bend only a small amount at a time.

METERING ROD ADJUSTMENT 317S, 328S, 341S

Consult the CARTER ADJUSTMENT CHART for the proper gauges to use when making adjustments.

Remove the air horn and climatic control assembly, and disconnect the upper end of the throttle connector rod. Back out the throttle adjusting screw so that the throttle valves are tightly closed.



CARTER WDO, 1935-36. Partial 1937-38 Showing metering rod tool in position. "A" —Metering rod arm pin. Bend at "B" to adjust