

PACKARD DIVISION

OF

STUDEBAKER-PACKARD CORPORATION



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WCFB Carter Carburetor

Model 2232S

A new 4-barrel carburetor, known as the "WCFB" Carburetor, Model 2232S, is used on 1955 Clipper Deluxe and Clipper Super Models (5540).

The 4-barrel carburetor provides the advantages of a compound installation of two 2-barrel carburetors in one compact unit. It is possible to use smaller venturis, leaner metering rods and jets when a carburetor only takes care of speeds up to approximately 4 throttle opening. Greater throttle opening requires additional air and fuel which is supplied by the additional 2-barrels; therefore, the overall performance and efficiency are improved.

The 4-barrel carburetor is divided into a primary section and a secondary section.

The primary section is composed of the 2-barreled forward half of the assembly. This section is essentially a complete 2-barrel carburetor containing a float system, low speed system, high speed and power system and accelerating system. This section also includes the climatic control (automatic choke) mechanism.

The secondary section includes the 2-barreled rearward half of the carburetor assembly. This section is essentially a supplementary 2-barrel carburetor which cuts in to assist the primary section when a greater throttle opening or a greater engine load is reached. This section contains a float system, a high speed system (no metering rods). It has a separate set of throttle valves.

The primary throttle valves are operated by the accelerator pedal and the connecting throttle linkage. The secondary throttle valves are operated by the primary throttle valve shaft through delayed action linkage which permits an approximate 3/4 opening of the primary valves before the secondary valves start to open. The geometry of the linkage then causes both sets of throttle valves to reach the wide open position at the same time.

The following paragraphs describe the adjustments necessary to service the 4-barrel carburetor. To dis-

assemble the carburetor for cleaning and adjusting, follow the procedure outlined. It is important that the following adjustments be performed in the exact sequence given:

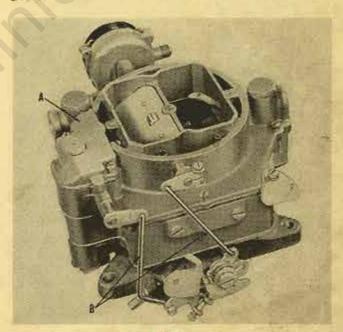
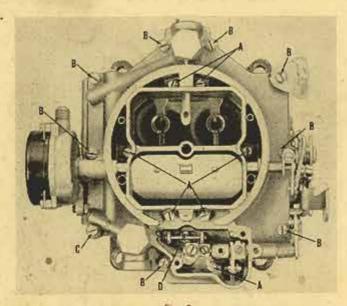


Fig. 1

1. Remove the metering rods dust cover, "A" Fig. 1. Disconnect the metering rods from the vacumeter link by using a scratch awl or a pointed instrument and pushing outward on the eye of the rod and then extract the rod.

Unsnap the clips and remove the choke rod and the accelerator pump rod, "B," Fig. 1.

Remove the air horn and floats assembly. NOTE: 7 long screws, "A," 8 short screws, "B," and 1 medium



length screw, "C," attach the air horn to the carburetor main body as indicated in Fig. 2.

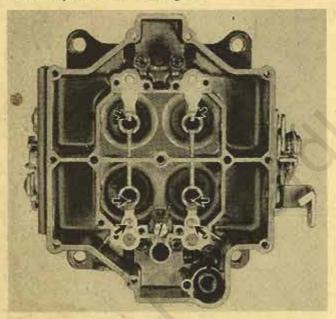


Fig. 3

CAUTION: Under no circumstances should the discharge nozzles or the anti-percolator well plugs be removed when servicing this carburetor, indicated by "Arrows" in Fig. 3.

2. Float Settings: Do not mix up the floats or float needles from one side to the other as float needles and seats are mated and flooding may occur if the needles are not installed in their original seats. The float level adjustment is made with the bowl cover (air horn) gasket removed.

A. Float Level: Two separate float adjustments must be made—lateral and vertical.

Lateral Adjustment: With bowl cover assembly inverted and float resting on seated needle, place float gauge under floats with notched portion of gauge fitted over edge of casting. Side of floats should just clear the vertical uprights of the float gauge, "B," Fig. 4. Adjustment is made by bending arms of floats.

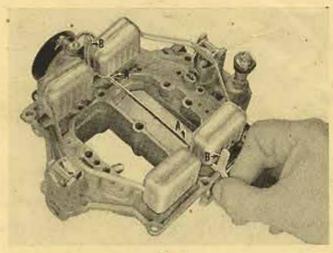


Fig. 4

Vertical Adjustment: With float gauge in same position, floats should just clear the horizontal portion of gauge "A," Fig. 4. Vertical distance between top of float and machined surface of casting must be \(\frac{1}{2} \) inch (gauge T 109-232) for primary floats and 5/32 inch (gauge T 109-236) for secondary floats. Adjust by bending float arms as shown in Fig. 5.

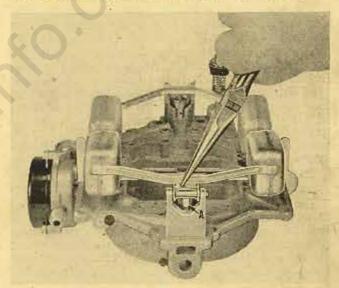


Fig. 5

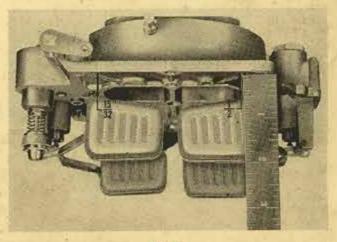
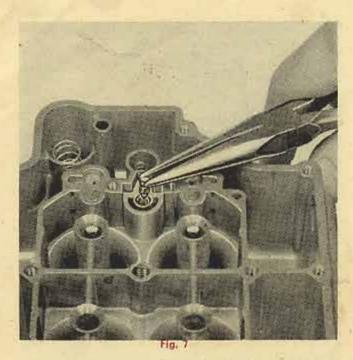
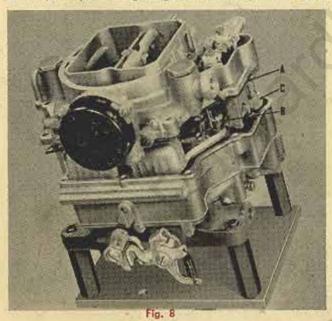


Fig. 6



B. Float Drop Adjustment: With the bowl cover (air horn) supported in an upright position, the distance from the machined surface of bowl cover to the top of the secondary floats should be ½", Fig. 6. The distance for the primary floats should be 15/32", Fig. 6. Adjust by bending tangs indicated by "A," Fig. 5.



Be sure to install the accelerator pump check needle shown in Fig. 7, before installing the pump jet gasket, jet housing and retainer screw. Install a new bowl cover gasket "A," Fig. 8.

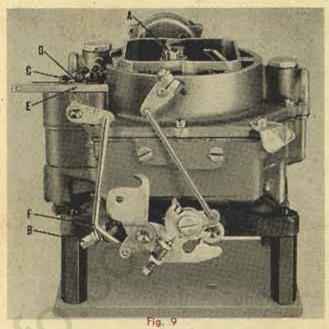
IMPORTANT: Vacumeter link must be installed with lip toward air born. (See "D," Fig. 2.)

Place the accelerator pump plunger spring in its well and the vacumeter piston spring in its well. Attach the vacumeter piston to the vacumeter link "B", Fig. 8. Carefully start the accelerator pump plunger in its bore "C," Fig. 8. Install the bowl cover

assembly to the carburetor body, and secure it with the screws "A," "B," "C," Fig. 2.

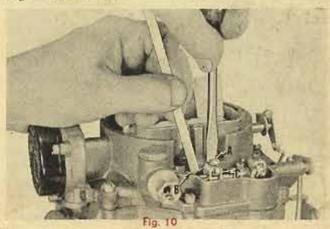
3. Accelerator Pump Adjustment:

A. Block choke valve open with cardboard "A," Fig. 9.



B. Back off idle speed screw "B" approximately two full turns so that the throttle valves seat tight in the bores of the flange body. Be sure pump connector link is in outer hole (long stroke) of pump arm "C."

C. Hold straight edge across top of dust cover boss at pump arm. The flat on top of pump arm "D" should be parallel to straight edge "E," Fig. 9. Adjust by bending pump rod at lower angle "F," using bending tool T 109-213.



4. Metering Rod Adjustment: The metering rods must be adjusted after the pump adjustment has been made. First, loosen the screw "A," Fig. 10. With the idle speed screw backed out and the throttle valves seated in the bores of the flange body, press down on the vacumeter link with a scale "B" until the metering rods bottom. While holding the rods in this position, revolve the clamp "C" forward away from the air horn until lip of clamp contacts the vacumeter link, then tighten the clamp screw. To check for proper meter-

ing rod adjustment hold the vacumeter link and rods at their bottomed position and open the throttle. There should be no lost motion before the link and rods move upward when the throttle lever is moved from its closed position. Install the dust cover using a new gasket.

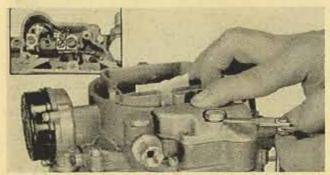


Fig. 11

5. Bowl Vapor Vent Adjustment: With the throttle valves closed and the choke blocked open, the vapor vent should open .062". Using a feeler gauge, measure between the metering rod dust cover and the lower edge of the vapor vent cover Fig. 11. Adjustment of the vapor vent valve can be made by bending the tang on the vapor vent arm, "Insert Fig. 11."

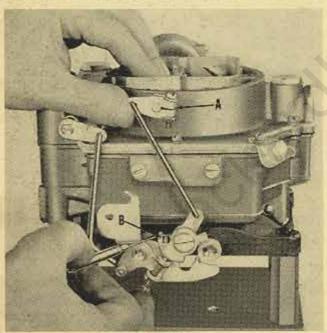


Fig. 12

6. Fast Idle Adjustment:

A. Loosen choke lever clamp screw on choke shaft "A," Fig. 12. Insert .020" wire gauge Tool No. T 109-29 between lip of fast idle cam and boss of flange casting "B," Fig. 12. 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 "A."

B. With choke valve tightly closed, adjust fast idle adjusting screw "A," Fig. 13, until a .030" wire gauge Tool No. T 109-29 can be inserted between the rear side of the primary throttle valves and the throttle body bore "B," Fig. 13. Be sure fast idle adjusting

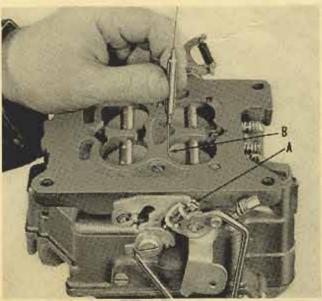


Fig. 13

screw is on high step of the cam while making this adjustment.

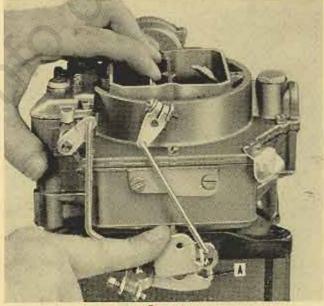
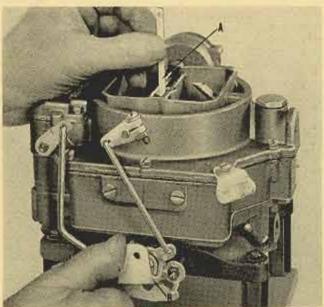


Fig. 14

7. Unloader Adjustment: First hold the choke valve wide open, then push the throttle wide open, Fig. 14, release the choke so it will close. While holding the throttle wide open, there should be 3/16" clearance (Tool No. T 109-28) between the upper edge of the choke valve and the inner wall of the air horn. "A," Fig. 15. Bend unloader lip "B" to get the proper choke valve clearance. Use bending Tool T 109-41.

 Secondary Throttle Lever Adjustment: Primary and secondary throttle valves should reach wide open position at the same time. To adjust, bend throttle operating rod at upper angle indicated by "arrow," Fig. 16. Use bending Tool T 109-213.

 Secondary Throttle Lock-Out Adjustment: The secondary lock-out is provided to prevent the possibility of opening the secondary throttle valves with the choke closed or partially closed with a cold engine.



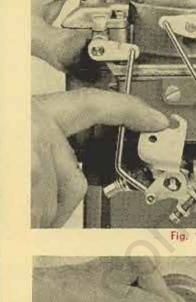


Fig. 17

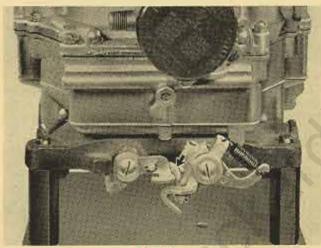


Fig. 16

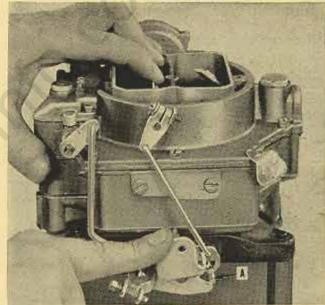


Fig. 18

A. Crack throttle valves and hold choke valve tightly closed. Then close throttle. Tang "A," Fig. 17, on secondary throttle lever should freely engage in notch of lock-out lever. If necessary to adjust, bend tang on secondary throttle lever.

B. Hold choke valve in wide open position. Open primary throttle valves all the way. With carburetor in upright position, the lock-out lever should fall free allowing secondary throttle valves to be opened before

primary throttle valves are fully open. If necessary, bend tag "A," Fig. 18, on secondary throttle lever to provide clearance for proper operation of lock-out lever.

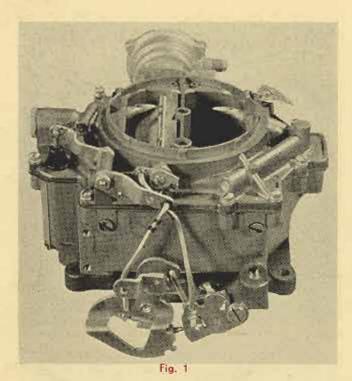
Rochester Carburetor

Model 4GC

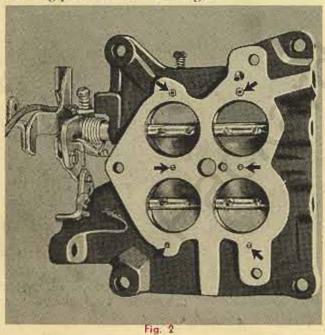
The 4-barrel Rochester Carburetor, Model 4GC, (Fig. 1) is used on all 1955 Clipper Custom and Packard Models (5560 and 5580).

It consists basically of two dual carburetors and is divided into a Primary Section and a Secondary Sec-

tion. The Primary Section controls the metering to the engine throughout the idle and part throttle range. The fuel from the Primary Section is supplemented by fuel from the Secondary Section throughout the power or wide open throttle range.



However, this carburetor incorporates many new and distinctive features which provides smooth outstanding performance in all ranges.

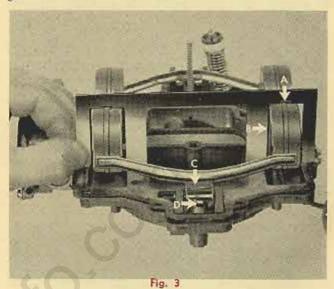


 The idle system supplies fuel from openings below all 4 throttle valves which provides an even mixture to all cylinders. See idle restriction passages in Fig. 2.

The power system is vacuum operated. In this
way proper power mixtures are readily available upon
a drop in manifold vacuum, regardless of the degree of
throttle opening, therefore, it is not necessary to open
the throttle completely to enrich the mixture for power
operation.

3. The accelerator pump employs the use of a vented type pump plunger. By means of a vent ball in the plunger, fuel vapors pass from the pump well to the float bowl. This insures that the pump well will be primed with solid fuel at all times for rapid acceleration.

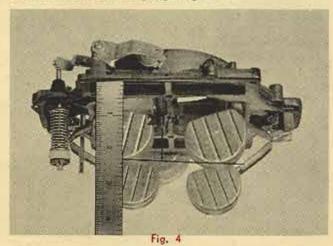
The following paragraphs describe the adjustments necessary to service this carburetor. It is important that these adjustments be performed in the exact sequence given:



 Both sets of floats are adjusted in the same manner and to the same dimensions. Place the air horn assembly in an inverted position on a flat surface, leave the air horn gasket in place while adjusting the floats:

a. Float Level: Place float level gauge J-5399 in position as shown in Fig. 3. Lift the floats until the needle is seated. The floats should just touch the top portion of the gauge "A," bend float arms at "C" as required. (The scale dimension from the bottom of floats to the air horn gasket should be 15%".)

b. Float Alignment: With gauge in position, the float arms should be bent sideways until each float is centered between the gauge legs "B."



c. Float Drop: With the air horn supported in an upright position, the distance from the air horn gasket to the bottom of the floats should be 2½", Fig. 4. Adjust as necessary by removing float and bending the

small tang which contacts the float needle seat, "D," Fig. 3. Bend tag towards needle seat to lessen drop, or away from seat to increase drop.

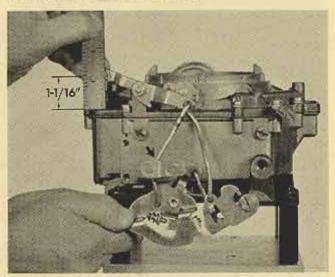


Fig. 5

2. Pump Rod Adjustment: Back out both the throttle stop screw and the fast idle adjusting screw so that the throttle valves are tightly closed. With the throttle lever held in this position, carefully bend the pump rod (see arrow) until the dimension from the top of the air horn surface to the bottom edge of the pump plunger rod is 1 1/16", as shown in Fig. 5.

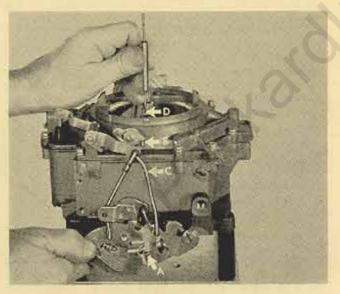


Fig. 6

3. Choke Rod Adjustment: With the choke thermostat cover set at index mark, adjust and locate the fast idle screw against the second step on the fast idle cam "A," Fig. 6, the side of the screw being against the side of the highest step.

Be sure that the choke trip lever is in contact with the choke counter weight lever "B." With the fast idle screw and fast idle cam in this position, carefully bend the choke rod "C" to obtain a clearance of .053" (Gauge J-6056) between the top edge of the choke valve and the dividing wall of the carburetor air horn "D," Fig. 6.

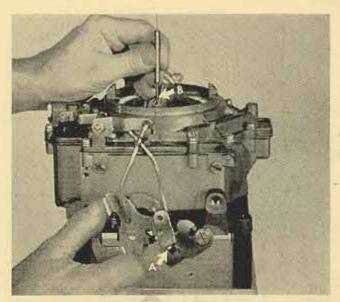


Fig. 7

4. Unloader Adjustment: With the choke thermostat cover set at index, and trip lever in contact with choke counterweight lever "B," Fig. 6, move the throttle lever to full wide open position. Hold the throttle lever in this position and carefully bend the tang "A," Fig. 7, on fast idle cam to obtain a clearance of .115" (Gauge J-6057) between the top edge of the choke valve and the dividing wall of the carburetor air horn "B," Fig. 7.

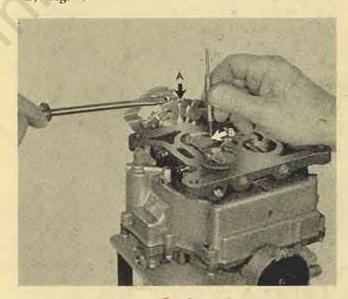


Fig. 8

5. Fast Idle Adjustment: With the choke thermostat cover set at index, move the fast idle cam so that the choke valve is fully closed. Hold the throttle lever in the closed position so that the fast idle adjusting screw rests on the highest step of the fast idle cam "A," Fig. 8. Adjust the fast idle screw to obtain a clearance of .024" (Gauge J-6057) between the throttle valves and the primary bores of the throttle body on the side opposite the idle adjusting needles "B," Fig. 8.

6. Atmospheric Idle Vent Adjustment: Insert a .040" gauge (Gauge J-6061) between the throttle valves and the primary bores of the throttle body on

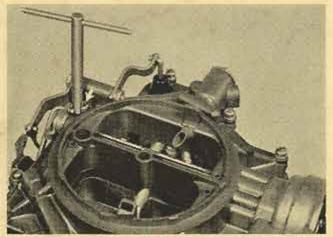


Fig. 9

the sides opposite the idle adjusting needles. With the throttle valves closed against this wire gauge, bend the atmospheric vent contact arm, using Tool J-5197, until it holds the atmospheric vent valve in the carburetor air horn open approximately 1/64°. "See arrow" Fig. 9. This adjustment assures proper vent opening at various throttle positions.

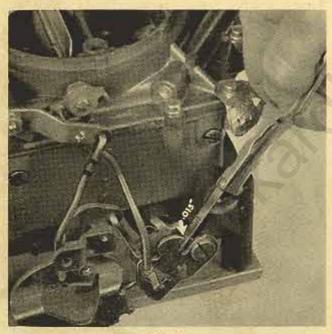
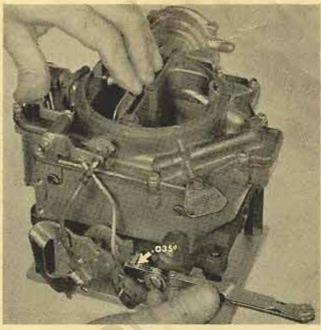


Fig. 10

- 7. Secondary Throttle Lock-Out Adjustment: With the choke valve partially closed and the fast idle cam and secondary lockout lever in position as shown in Fig. 10, there should be a clearance of .015" between the tang on the lever and the cam. Using Tool J-4552, bend the tang of the lever horizontally to obtain this .015" clearance.
- 8. Secondary Throttle Contour Adjustment: With the choke valve wide open and the fast idle cam and secondary lock-out lever in position as shown in Fig. 11, there should be a clearance of .035" between the tang on the lever and the cam. Using Tool J-6058, bend the lever tang to obtain this .035" clearance,



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"Tips From The Editor"

DIRECT DRIVE CLUTCH ENGAGEMENT

Twin Ultramatic

Late engagement of the direct drive clutch may be encountered occasionally in the Twin Ultramatic Transmission because of no oil pressure to the clutch until a high speed is reached.

When this condition is encountered, a direct drive clutch pressure test should be made. If low pressure or no pressure is indicated at approximately 20 MPH with a normal throttle opening, but does show a normal pressure at high speeds, the difficulty is probably in the direct shift valve piston.

Please refer to the hydraulic charts on pages 67 and 69 in your "Gear-Start Ultramatic Book," you will note on page 67 that the governor pressure has not moved the valve to connect the passage to the direct drive clutch. Page 69 shows the valve moved to the right, compressing the spring and the passage has opened to the direct drive clutch.

The spring cavity in the piston has very sharp edges at the outer end and in some instances, the spring catches on the edge of the piston requiring an extreme high governor pressure to move the valve resulting in late direct drive clutch engagement.

The sharp edges of the inner diameter of the piston can be removed with a small stone, grind the edges to approximately a .015" width.

The inner edge of the piston is now being chamfered in production, also a spring seat, Part No. 470208, is used at the outer end to center the piston spring.