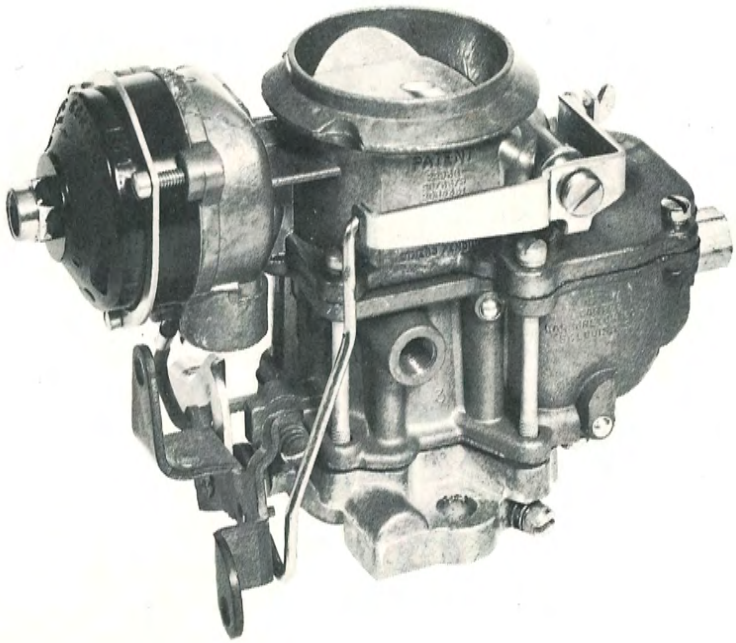
BBS
SERVICE MANUAL
CARTER CARBURETOR



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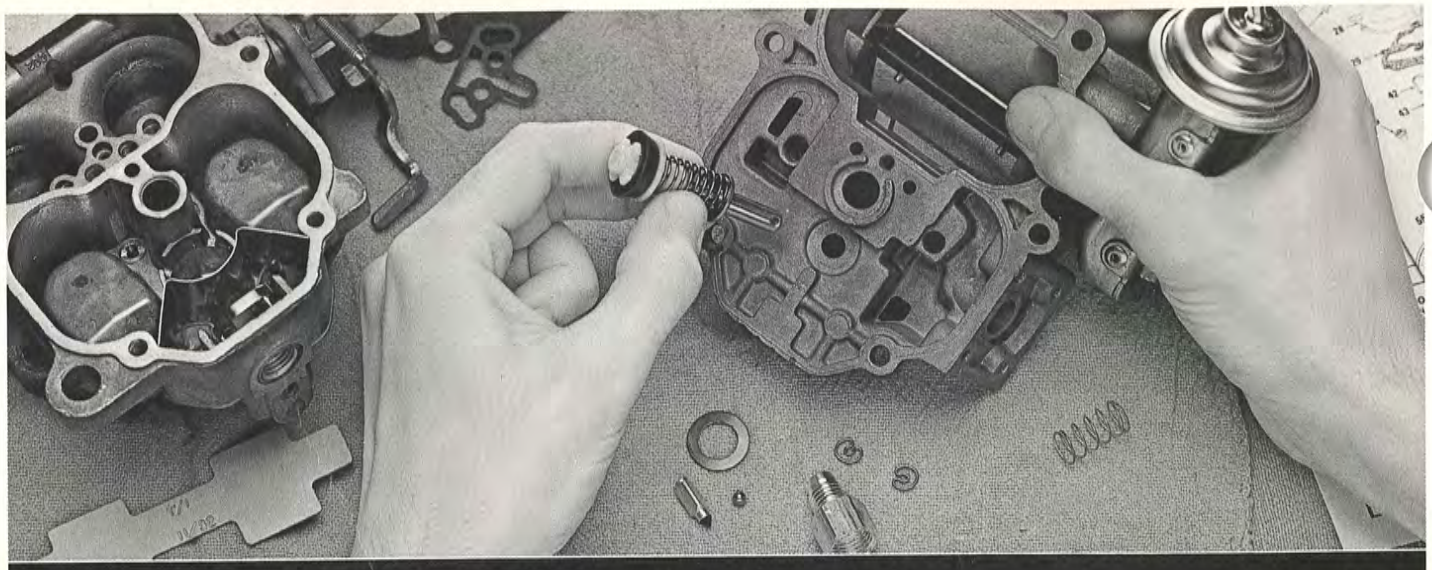

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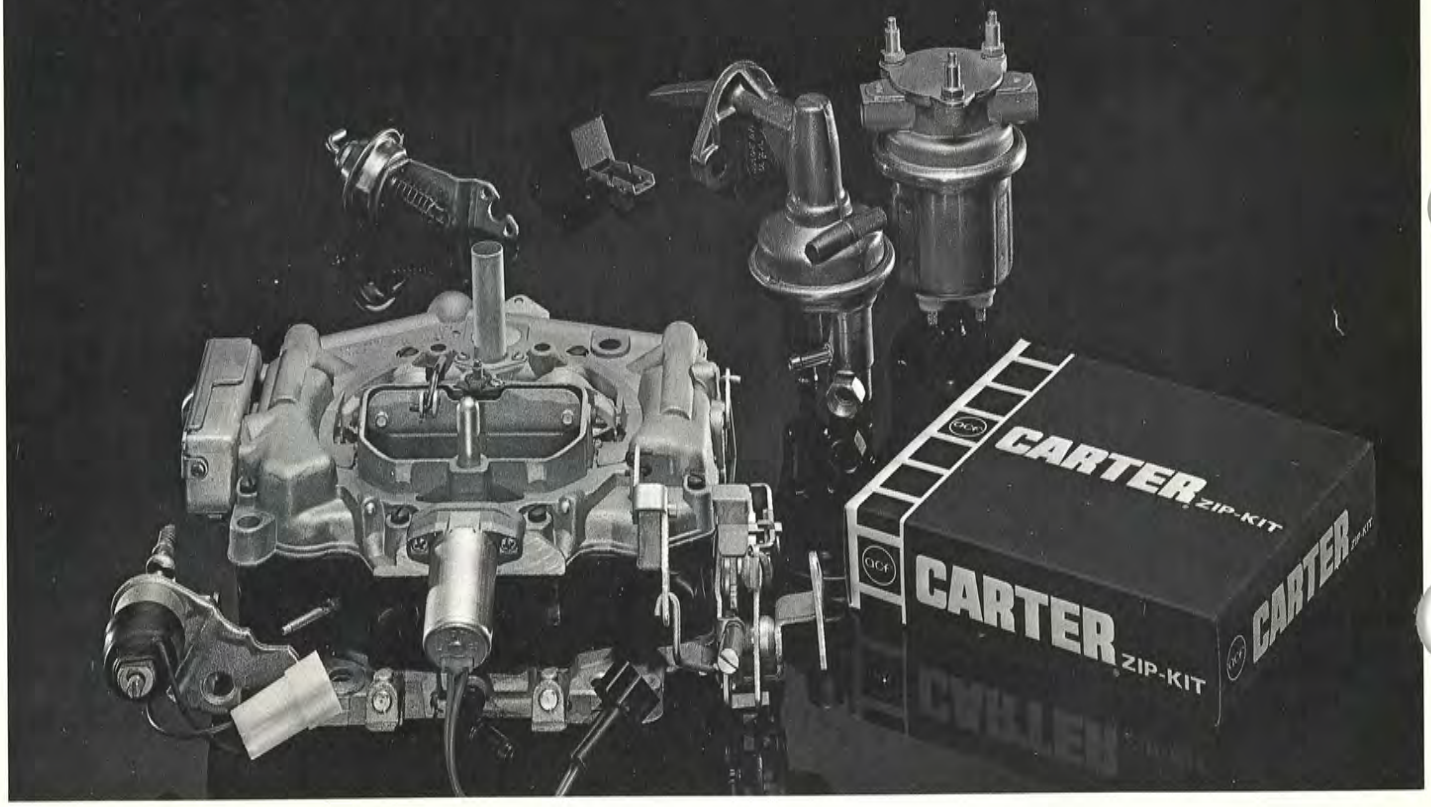

TABLE OF CONTENTS

Description 2
Float Circuit 2
Venting The System 3
Low Speed Circuit 3
Idle Adjusting Screw 4
High Speed Circuit 4
Pump Circuit 4
Automatic Choke 5
Cross-Over Choke 6
Diaphragm Type Choke Pull-Off 6
Dashpot 6
Idle Solenoid 6
Exploded View 7
Adjustments 8

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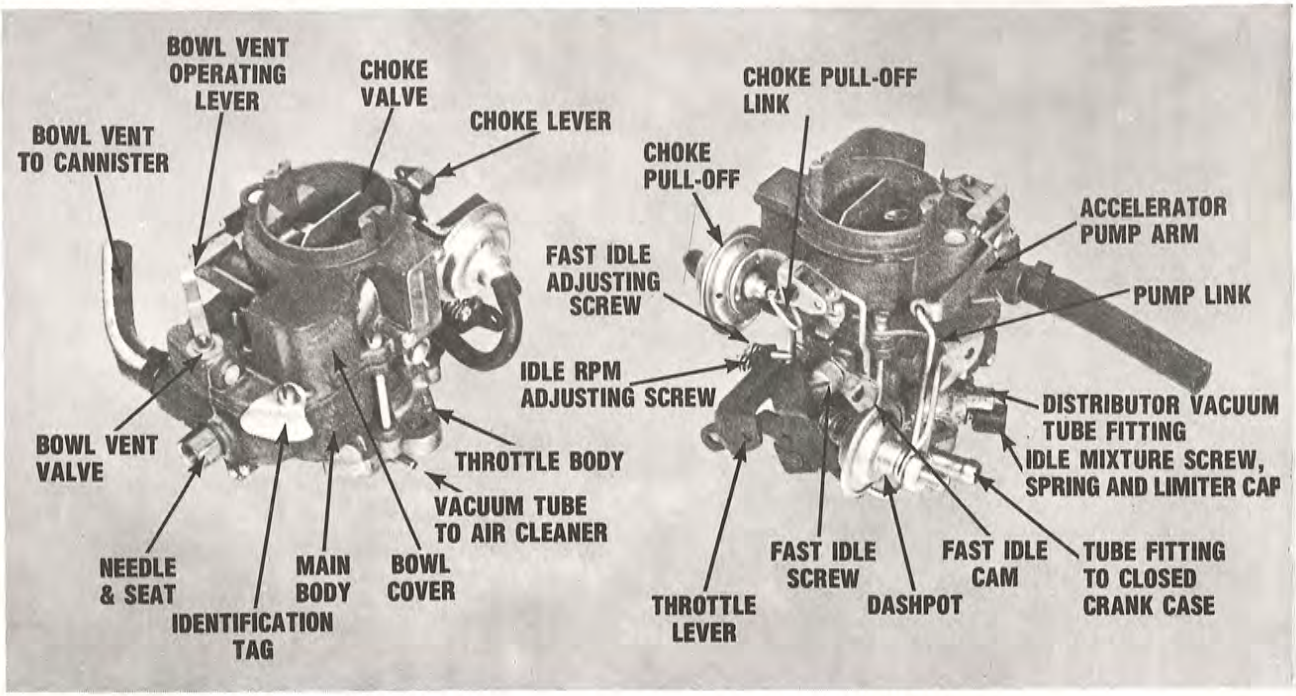
MODEL BBS



DESCRIPTION

The model BBS carburetor is a BB design, single barrel unit. It combines many of the desirable features of the previous BB models, plus several new features all in one easy to service assembly. Reduced overall height, accessible adjustments and removable sub-assemblies are a few of its finer points.

Five conventional circuits are to be found in this unit. They are:

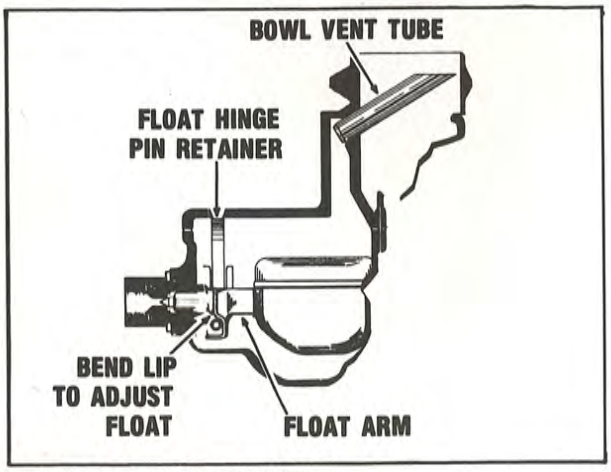
1. Float circuit
2. Low speed circuit
3. High speed circuit
4. Pump circuit
5. Choke circuit

The BBS low speed circuit is of the "4-point" design. They are:

1. Idle jet
2. Idle air bleed
3. Idle restriction
4. Idle port

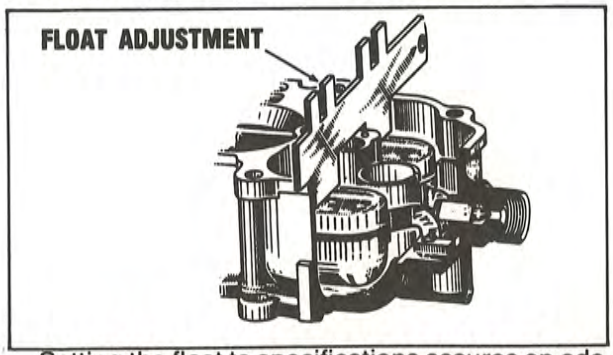
Being an air bled design, it uses a main vent tube to bleed air into the high speed well.

CIRCUITS



FLOAT CIRCUIT

The purpose of the float circuit is to maintain an adequate supply of fuel at the proper level in the bowl for use by the low speed, high speed, pump and choke circuits. The twin floats, which follow the contours of the fuel bowl, are designed to provide a stable fuel supply under all operating conditions. Only a minimum of fuel is maintained in the carburetor, preventing excessive fuel vaporization and tending to improve warm engine starting.



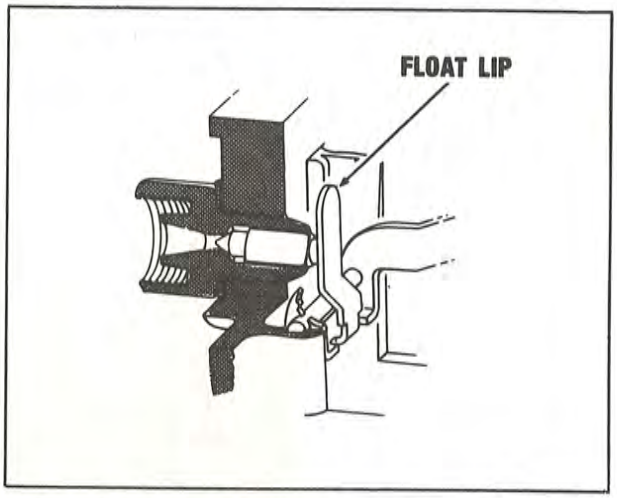
Setting the float to specifications assures an ade-

quate supply of fuel in the bowl for all operating conditions. Float adjustment must be made with the bowl cover gasket and float pin retainer removed.

NOTE: Never allow lip of float to be pressed against needle when adjusting.

The float setting is measured from the top surface of the bowl to the top of each float shell. If both floats require the same correction, adjust by bending lip on float arm.

If one float is lower than the outer, equalize by bending the float arm. The floats must not rub anywhere against the inner walls of the bowl. If necessary, bend float arm slightly to provide clearance on all sides of float shells.

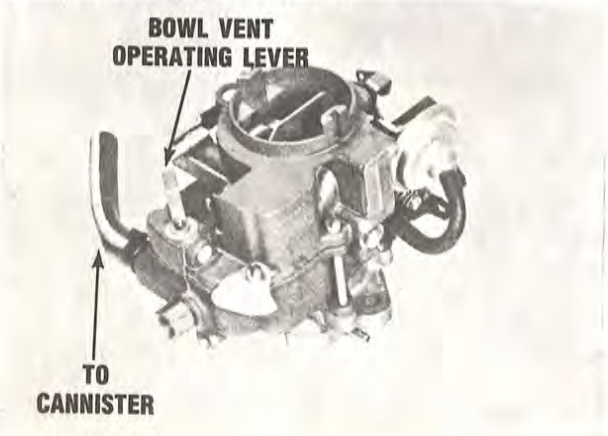


After the float adjustment has been made and set to the manufacturer's specifications, the float lip must be in the vertical position with the needle lightly seated.

Inspect the intake needle and seat, and float assembly for wear. The carburetor bowl should be clean and free of dirt, gum or other foreign matter.

VENTING THE SYSTEM

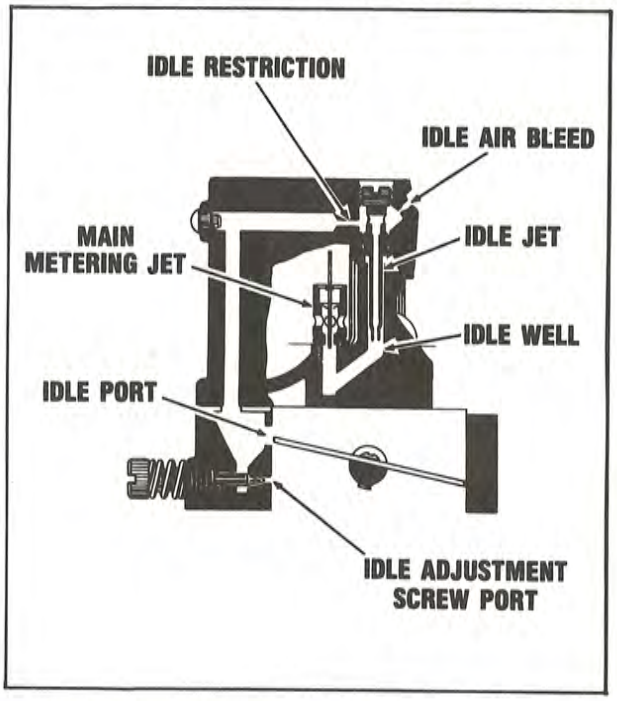
The bowl is vented to the inside of the air horn. The bowl vent is calibrated to provide proper air pressure above the fuel at all times. To assure a positive seal, always use a new bowl cover gasket when reassembling. An air leak at this point can result in a mileage complaint.



Late model carburetors are vented to a cannister at closed throttle. This allows vapors to escape from the bowl, giving easier starting and preventing evaporative emissions.

There are two different types of vents used; however, they accomplish the same thing and are all operated directly from the throttle shaft.

Bowl vapor vent adjustment must be to specifications. If valve doesn't open to specifications with throttle valves seated, bowl vapors cannot escape freely and this may cause "hard-hot-starting." If it opens too far, or hangs open, it will allow an external vent to the bowl. This increase in bowl pressure causes a rich mixture resulting in a loss of mileage.



LOW-SPEED CIRCUIT

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

Fuel enters the idle well through the main metering jet. The idle jet meters the amount of fuel for idle and early part throttle operation. The idle air bleed and idle restriction are carefully calibrated and serve to break up the liquid fuel and mix it with air as it moves through the passage to the idle port and idle adjustment screw port. Turning the idle adjustment screw toward its seat reduces the quantity of fuel mixture supplied by the idle circuit.

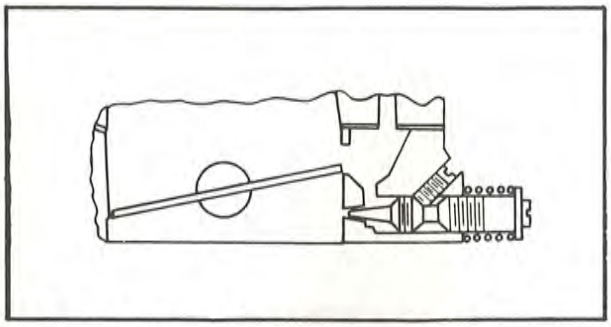
The idle port is slot shaped. As the throttle valve is opened, more of the idle port is uncovered allowing a greater quantity of fuel and air mixture to enter the carburetor bore.

The idle bleed; idle restriction, idle jet, idle port, idle adjustment screw, as well as the bore of the carburetor must be clean and free of dirt and carbon. Obstructions will cause poor low speed engine operation.

Air leakage at the gasketed surface surrounding the low speed mixture passages or between the flange and manifold may cause poor idle and low

speed operation. Tighten bowl cover to flange attaching screws and flange to the manifold stud nuts evenly and securely to avoid distorting castings. Always use new gaskets.

Idle air bleed and restriction bushings are pressed in place and should not be removed in service. Use care in handling the carburetor during servicing to avoid damaging the throttle valve as the throttle valve projects below the flange in open throttle position.

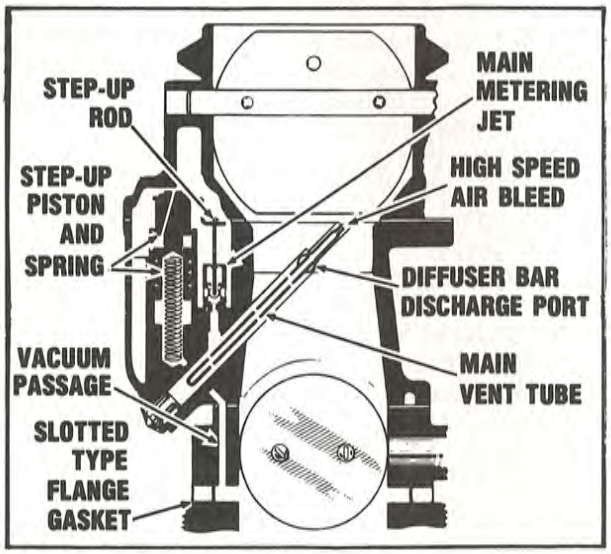


IDLE ADJUSTING SCREW

An idle adjusting screw is used for trimming the idle mixture to individual engine requirements for satisfactory idle. Emission Laws require use of an idle adjusting screw with limited adjustability. This allows for proper idle adjustment while assuring the emission limits will not be exceeded. To meet these requirements, one design uses an allen screw as a stop as it makes contact with the shoulder on the recessed portion of the idle adjusting screw.

On flow test, the idle adjusting screw is turned in the counterclockwise direction to the mean rich limit. The allen screw is then turned in against the recessed shoulder of the idle adjusting screw. The allen screw hole is then filled with a lead plug.

Later models use a plastic limiter cap to prevent over-rich idle adjustment.



HIGH-SPEED CIRCUIT

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

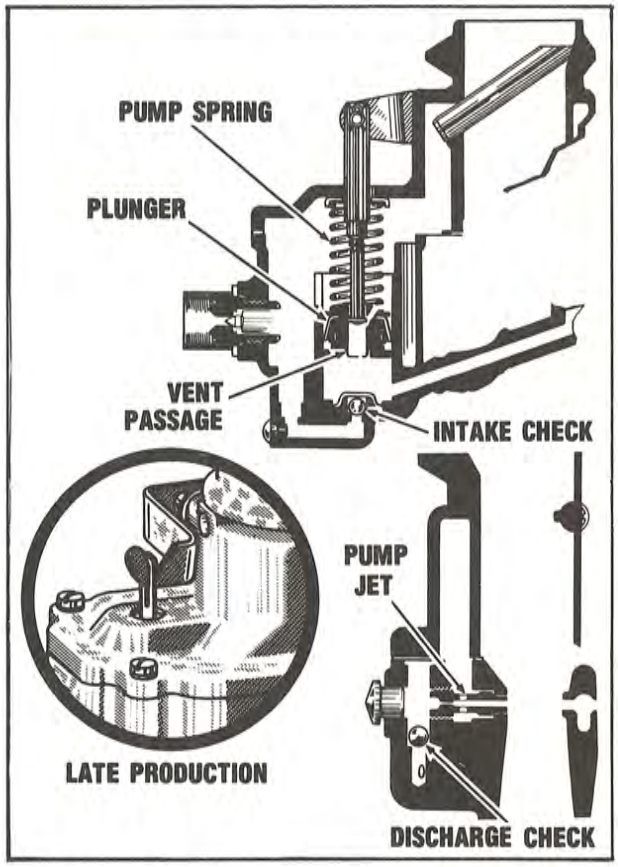
The position of the step-up rod in the main metering jet controls the amount of fuel admitted to the diffuser bar discharge ports. The position of the step-up rod is controlled by the manifold vacuum applied to the vacuum piston.

During part throttle operation, the manifold vacuum pulls the step-up piston and rod assembly down, holding the step-up rod in the main metering jet. This is true at all times that the vacuum under the piston is strong enough to overcome the tension of the step-up piston spring. Fuel is then metered around the step-up rod in the jet.

Under any operating condition, when the tension of the spring overcomes the pull of vacuum under the piston, the step-up rod will move out of the jet into the wide-open throttle or power position. This allows additional fuel to be metered through the jet. The step-up rod does not require adjustment.

The main vent tube mixes air drawn through the high speed air bleed with the fuel before it passes out of the diffuser bar discharge ports.

A clogged main vent tube may cause excessively rich mixtures.



PUMP CIRCUIT

The accelerating pump circuit provides a measured amount of fuel, which is necessary to assure smooth engine operation for acceleration.

When the throttle is closed, the pump plunger moves upward in its cylinder and fuel is drawn into the cylinder through the intake check. The discharge check is seated at this time to prevent air being drawn into the cylinder. When the throttle is open-

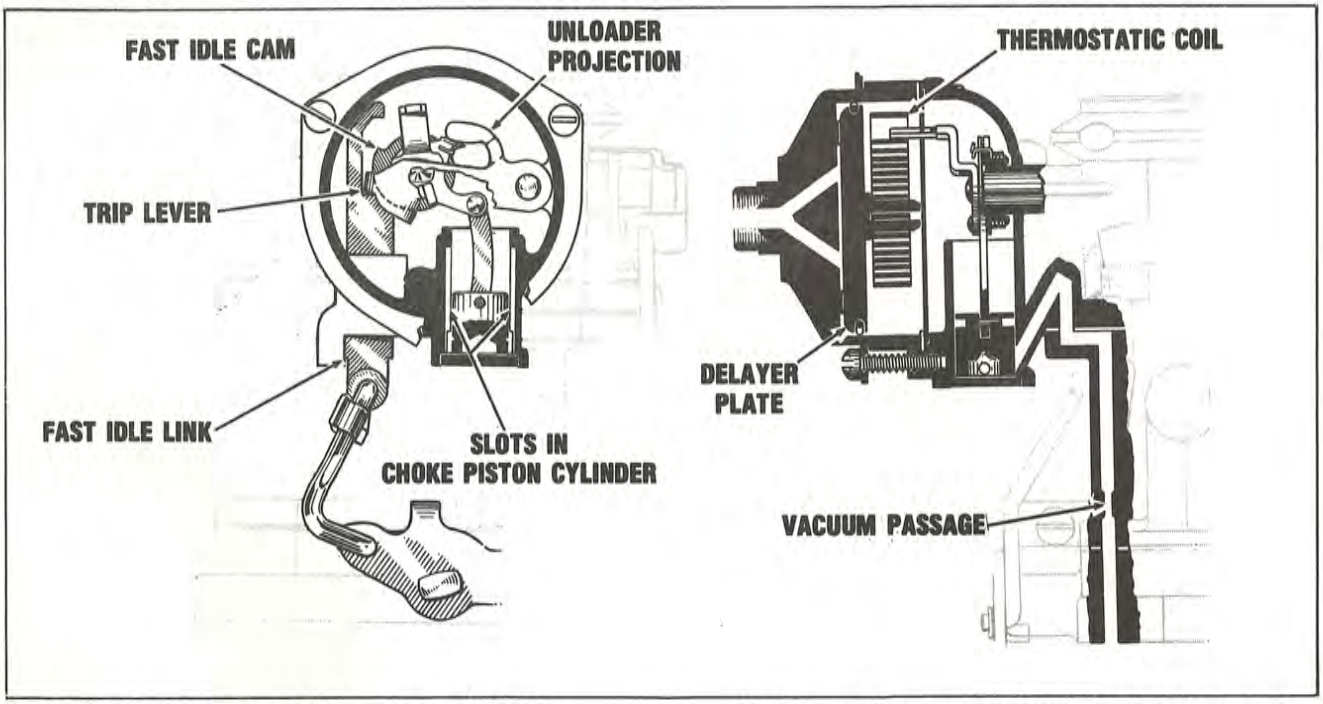
ed, the pump plunger moves downward forcing fuel out through the discharge passages, past the discharge check and out of the pump jet. When the plunger moves downward, the intake check is closed preventing fuel from being forced back into the bowl. The calibration of the pump spring and the size of the jet provide a pump discharge of the desired amount and duration.

During high speed operation a vacuum exists at the pump jet. To prevent fuel from being drawn through the pump circuit, the pump jet air bleed is vented by a passage in the air horn to the carburetor bowl vent tube. This prevents fuel from being drawn through the pump jet.

Fuel vapor pressure in the pump circuit caused by heat is relieved through the calibrated vent passage in the pump plunger.

The accelerating pump adjustment provides a means for securing proper pump discharge. This adjustment should be made as instructed on the parts and service specification sheet for each model carburetor. The pump setting is measured from bowl cover to the top of the pump plunger. Adjustment is made by bending the connector rod at the lower angle.

An intake or discharge check that is not seating, a worn pump plunger or improper pump stroke will cause hesitation on acceleration.



AUTOMATIC CHOKE CIRCUIT

The automatic choke circuit provides a correct mixture necessary for quick cold engine starting and warm-up.

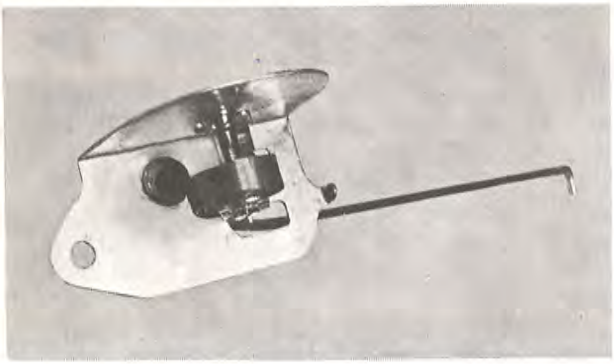
When the engine is cold, tension on the thermostatic coil holds the choke valve closed. When the engine is started, air velocity against the offset choke valve causes the valve to open slightly against the thermostatic coil tension. Intake manifold vacuum applied to the choke piston also tends to pull 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 air passing through the air horn against the offset valve.

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

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

During the warm-up period it is necessary to provide a fast idle speed to prevent engine stalling. This is accomplished by a fast idle cam connected to the choke shaft. The choke trip lever connects the fast idle cam. The fast idle link attached to the throttle lever contacts the choke trip lever and prevents the throttle valve from returning to a normal warm engine idle position while the choke is in operation.

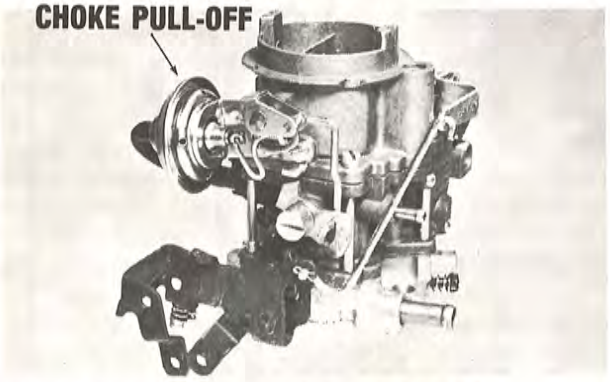
If during the starting period the engine becomes flooded, the choke valve may be opened manually to clean out any excessive fuel in the intake manifold. This may be accomplished by depressing the accelerator pedal to the floor mat and engaging the starter. The unloader projection on the fast idle link will contact the unloader lug on the choke trip lever and in turn partially open the choke valve. To prevent over-choking a warm engine, the heat retaining delayer plate prevents the thermostatic coil from cooling off too quickly and bringing the choke into operation before it is needed.



CROSS-OVER TYPE CHOKE

Later models use a cross-over (remote mounted) choke which is mounted in a heat pocket of the exhaust manifold.

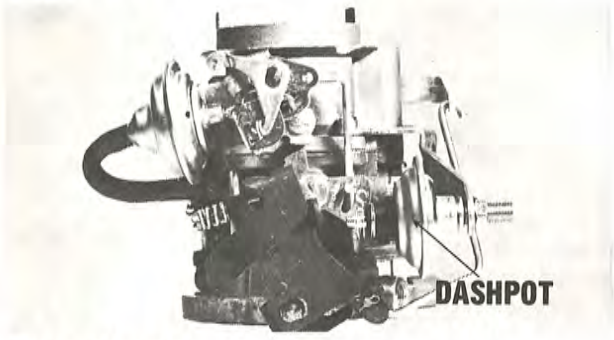
When the cross-over type (remote mounted) choke is used, the carburetor mounting gasket is most important. If it's not to specified thickness, it upsets choke calibration due to the fixed length of the choke rod.



DIAPHRAGM TYPE CHOKE PULL-OFF

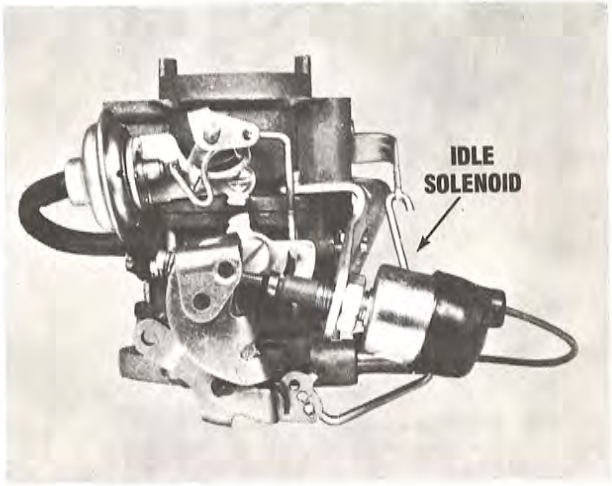
A diaphragm type choke pull-off is used with the cross over type choke. It replaces the choke piston mentioned previously. Adjustment for a proper pull-off must be made. Too much choke pull-off results in false starts, too little choke pull-off causes a rich condition during engine warm up.

Some applications use a manual choke which also incorporates the fast idle features.



DASHPOT

Some applications use a slow closing throttle device commonly called a dashpot. They are used to delay or slow the throttle closing the last few degrees to prevent engine stalling at the lower speeds and also to eliminate a sudden peak of hydrocarbon emissions on sudden deceleration. At idle, the manifold pressure is very low and results in good vaporization of the air-fuel mixture in the intake manifold. When the throttle valve is opened, manifold pressure increases. This increase in pressure increases the boiling point of the liquid and prevents 100% vaporization of the air-fuel mixture. During these periods of high pressures, there are some wet particles of fuel clinging to the inside of the intake manifold which is known as "wet manifold." During sudden deceleration, the manifold pressure goes back to a low pressure state, the wet particles clinging to the inside of the intake manifold go back to a vapor state and are taken into the engine as a rich mixture. This known as "manifold flash" and can cause the engine to die out, especially at low speeds. The dashpot slows the closing of the throttle the last few degrees to give the engine time to clear itself of manifold flash.



IDLE SOLENOID

Many carburetor models use an idle solenoid to prevent "dieseling" or "after run."

Many things that have been done to lower emissions have enhanced the possibility of dieseling. Higher idle speeds, leaner air-fuel mixtures, retarded ignition timing, higher operating temperature, all contribute to dieseling.

When the ignition is turned on, the solenoid is energized moving the plunger outward. The idle RPM is adjusted at the solenoid. When the ignition is turned off the solenoid is de-energized, the plunger moves inward allowing the throttle valve to close enough to virtually shut off the air supply, causing the engine to stop running immediately.

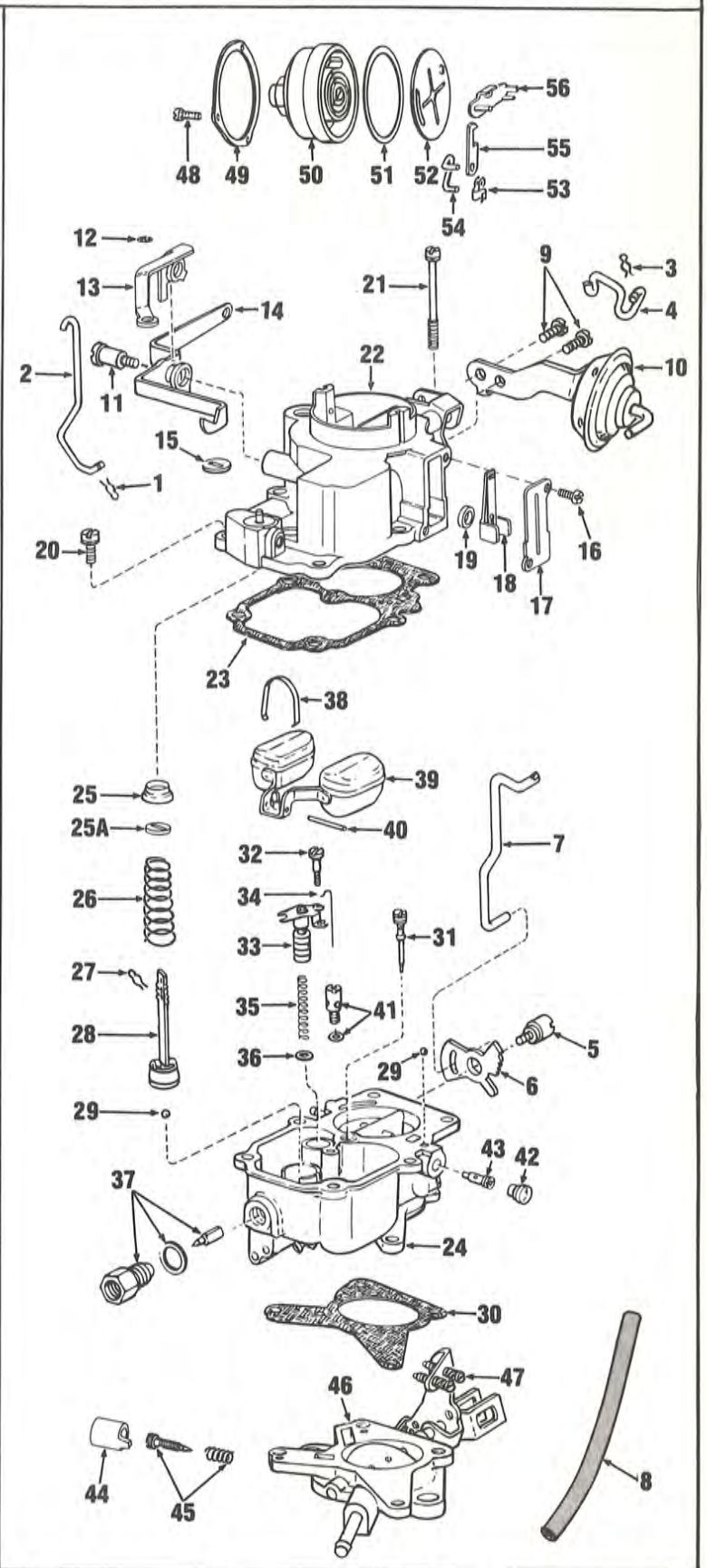
EXPLODED VIEW

PARTS LIST

1. Throttle rod pin spring (large)
2. Throttle rod
3. Choke pull-off rod pin spring (small)
4. Choke pull-off rod
5. Fast idle cam screw
6. Fast idle cam
7. Choke rod
8. Hose
9. Choke pull-off & bracket screw (2)
10. Choke pull-off & bracket
11. Pump lever screw
12. Vent valve lever retainer
13. Vent valve lever
14. Pump plunger lever
15. Vent valve
16. Cover screw (2)
17. Cover
18. Compensator valve
19. Compensator valve gasket
20. Air horn screw (2) (short)
21. Air horn screw (4) (long)
22. Air horn
23. Air horn gasket
24. Main body
25. Pump plunger bushing

25A. Pump plunger washer

26. Pump plunger spring
27. Pump plunger pin spring (small)
28. Pump plunger assembly.
29. Pump intake & discharge check ball (2)
30. Throttle body gasket
31. Low speed jet
32. Step-up piston plate screw
33. Step-up piston plate
34. Step-up rod
35. Step-up piston spring
36. Step-up piston gasket
37. Needle & seat assembly
38. Float pin retainer
39. Float
40. Float pin
41. Main metering jet & gasket
42. Rivet plug
43. Pump jet
44. Idle limiter cap
45. Idle mixture screw & spring
46. Flange assembly
47. Throttle speed screw
48. Retainer screw
49. Coil housing retainer
50. Coil housing assembly
51. Coil housing gasket
52. Baffle plate
53. Connector rod retainer
54. Connector rod
55. Fast idle link
56. Choke trip lever



ADJUSTMENTS

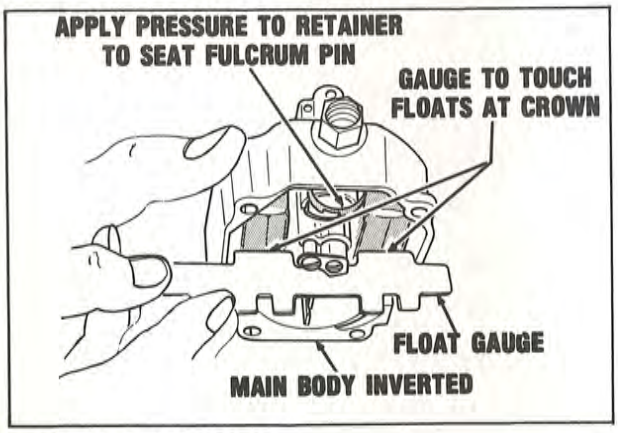
DISASSEMBLY

Some variation in shape, omission, and addition of some parts will occur between models in this group. **NOTE:** The idle mixture screw on the CAP (Cleaner Air Package) carburetors have limited travel and are not removable. The idle limiter cap if so equipped, should not be removed, unless the new service limiter cap is included in repair kit.

To disassemble the integral choke parts (if equipped) from the air horn, refer to insert at top of exploded view.

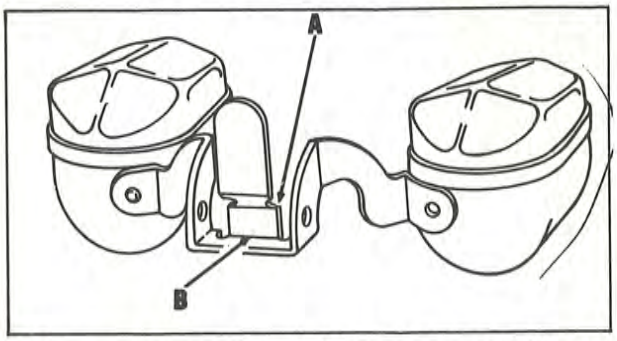
CLEANING

Clean all parts thoroughly in an approved carburetor solvent or lacquer thinner. Special attention should be given to carbon deposits in the throttle bore and passages. Blow out all passages with compressed air. *Do Not immerse choke diaphragm, leather, plastic, rubber or other similar materials in cleaning solvent if they are to be reused.*

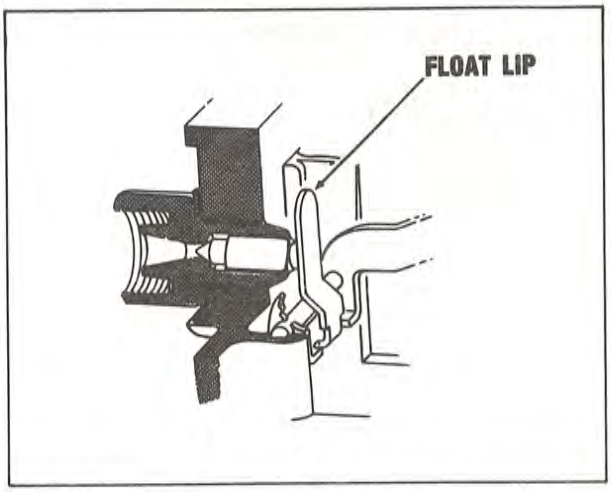


FLOAT LEVEL

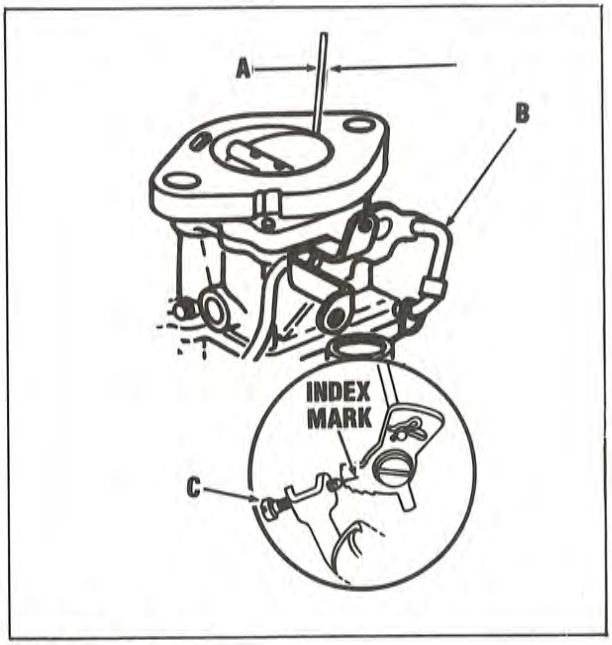
1. With gasket removed, invert carburetor and hold retainer against float in bottom of guide slots.
2. Bend float lip to obtain the proper dimension between top of each float (at center of float) and top surface of body casting. **NOTE: Never allow needle to be pressed into the seat.**



Remove float to adjust. **NOTE:** To obtain the proper alignment it may be necessary to bend float lip at either or both arrows "A" and "B".



After the float adjustment has been made and set to the manufacturer's specifications, the float lip must be in the vertical position with the needle lightly seated.



FAST IDLE
TYPE 1-OFF ENGINE

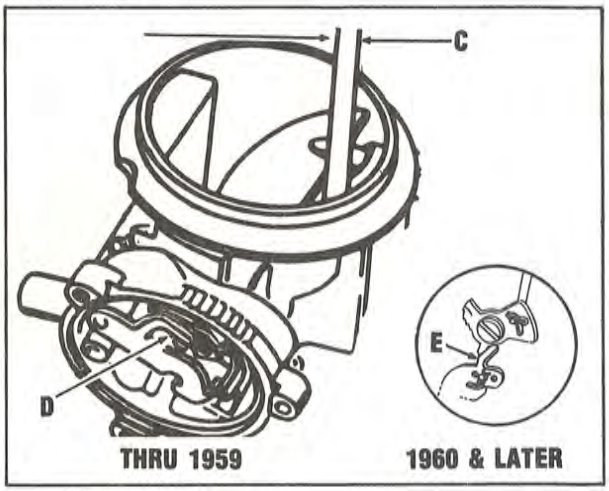
Open throttle valve and hold choke valve fully closed to allow fast idle cam (in piston housing) to rotate to the fast idle position. The dimension (A) between lower edge of throttle valve and bore of casting should be as specified. To adjust, bend connector rod (B).

TYPE 2-OFF ENGINE

Close choke valve and align fast idle screw (C) with index mark of cam. Adjust the fast idle screw (C) to the dimension (A) as specified between lower edge of throttle valve and bore of casting.

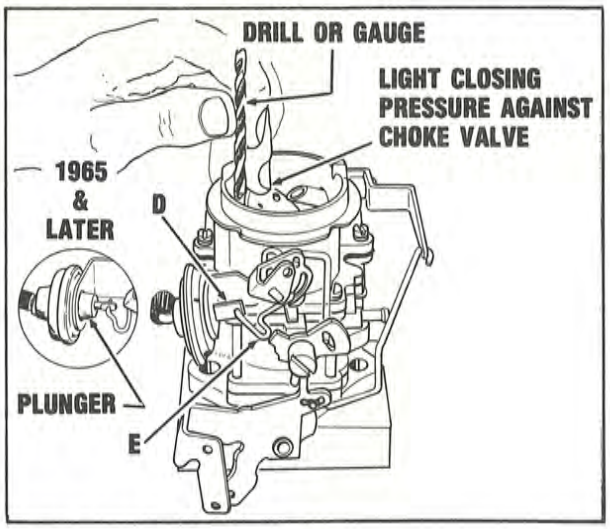
TYPE 3-ON ENGINE

With engine running, place fast idle screw on the proper fast idle cam step as shown in specifications and turn fast idle speed screw to set the engine RPM as specified.



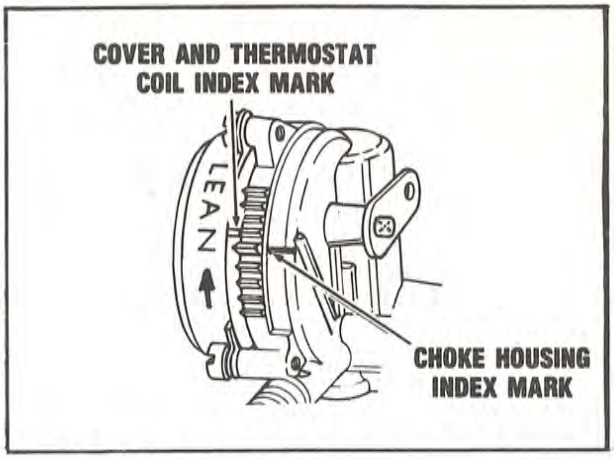
UNLOADER

Open throttle valve wide open, close choke valve as far as possible without forcing. The dimension (C) between top edge of choke valve and inner wall of air horn should be as specified. To adjust early carburetors through 1959, bend trip lever arm (D) in piston housing. 1960 and later carburetors, adjust tang (E) on the throttle lever (See insert).



CHOKE PULL-OFF

1964 carburetors, press diaphragm stem (D) inward until bottomed. 1965 and later (see insert) use an outside vacuum source to retract diaphragm stem fully. Apply a light closing pressure to choke lever to move the choke valve toward the closed position as far as possible without forcing. The dimension between the upper edge of choke valve and wall of air horn should be as listed in specifications. To adjust, open or close the "U" bend of connector rod at (E).



AUTOMATIC CHOKE INTEGRAL TYPE

Rotate cover against spring tension until specified mark on thermostatic coil housing is aligned with mark on choke piston housing.

CROSS-OVER TYPE

Remove unit from manifold at base of carburetor. Loosen locknut and turn mounting post with screwdriver until index mark on disc is aligned with specified mark between "L" and "R" scale marks.

Tighten locknut and reinstall unit.

NOTE: 1972 and later are not adjustable.

IDLE SPEED AND MIXTURE

(SEE EXPLODED VIEW—PAGE 7)

NON-EMISSION CARBURETORS

1. Turn mixture screw (45) clockwise to seat lightly then back out approximately 1 to 2 turns.
2. Turn throttle speed screw (47) clockwise until it just touches the stop in casting, then turn in one full turn.
3. Start engine and allow to reach normal operating temperature
4. With the aid of a tachometer readjust the idle mixture screw to obtain the highest RPM with transmission in "neutral." Alternator equipped engines turn headlights on.
5. Readjust the idle speed screw to obtain between 500-600 engine RPM.

EMISSION CARBURETORS

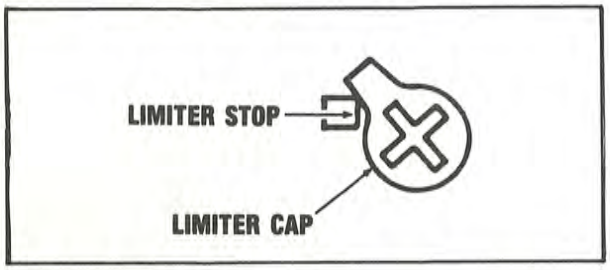
Follow the idle mixture adjustment procedure as outlined in the manufacturers service manual. If not available make temporary adjustment as follows:

1. Check ignition timing.
2. With engine at normal operating temperature, air conditioner off, headlights turned on, the air cleaner installed where possible.
3. Turn throttle speed screw (47) for speed of 550-600 RPM. Transmission in neutral. The Clean Air Package (CAP) carburetors, set idle speed

screw for engine speed of 600-700 RPM, 1968 and later carburetors see tune-up decal in engine compartment for specified RPM. Use a tachometer for this adjustment.
4. Turn idle mixture screw for the highest RPM.
5. Readjust speed screw if necessary.
6. Turn idle mixture screw inward (lean) until speed drops 10 to 15 RPM then turn mixture screw out ¼ turn for final setting.

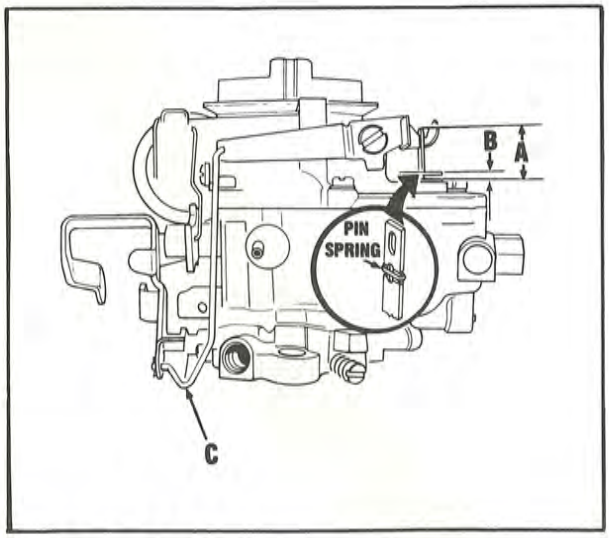
CURB IDLE SPEED SOLENOID

With solenoid wire disconnected and plunger fully depressed, the distance from the solenoid bracket to the end of the plunger should be 7/8". To adjust, loosen lock nut and turn solenoid, then tighten lock nut. With solenoid activated, adjust screw to obtain RPM as indicated on decal in engine compartment.



IDLE LIMITER CAP INSTALLATION (IF EQUIPPED)

1. Soak cap in hot water to aid in installation.
2. Place cap on mixture screw head and press firmly using care not to turn mixture screw when forcing cap in place.
3. The tab on limiter cap should be in the maximum counterclockwise position against the limiter stop after installation. (See illustration).



PUMP TYPE 1

With throttle valve closed (at curb idle), the connector rod and pin spring installed in the proper position as shown in specifications, proceed as follows:

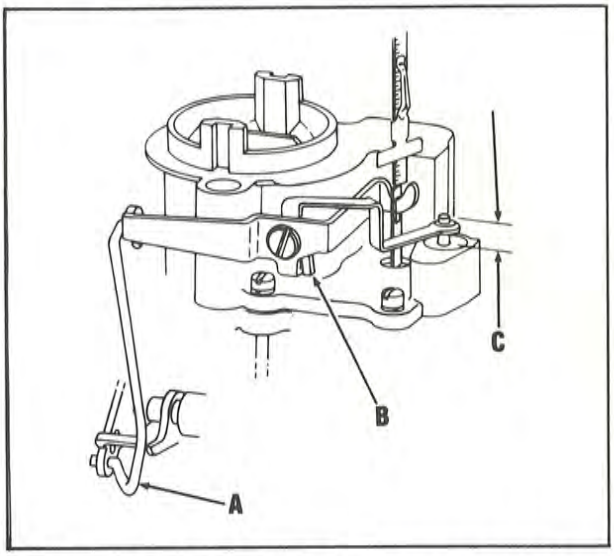
The dimension (A) should be as listed in Data Chart from the top of the bowl cover to the top of plunger shaft. To adjust, bend connector rod (C).

TYPE 2

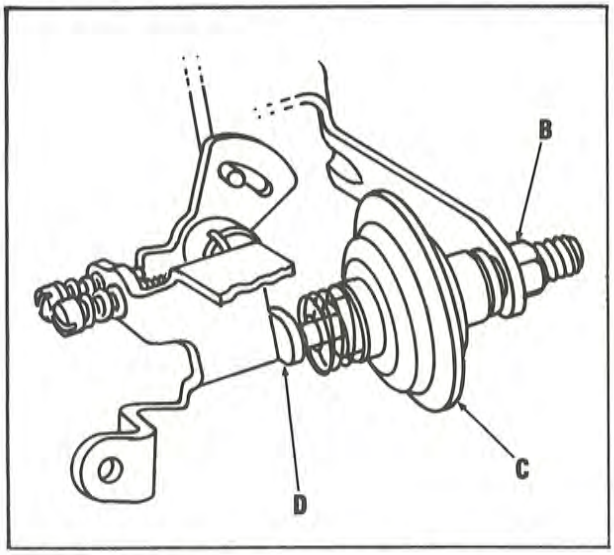
The dimension (B) should be as shown in specifications between vent and bushing in bowl cover. To adjust, bend connector rod (C).

TYPE 3

Step A. The dimension should be as shown in specifications from top of plunger shaft to shoulder of air horn as shown by scale. To adjust, bend connector rod (A).



Step B. The dimension (C) should be 9/32 inch from bowl cover to top of vent valve shaft. To adjust, bend tang (B).



DASHPOT (IF EQUIPPED)

Loosen locknut (B), connect a tachometer and position throttle valve at 2,000 RPM. Adjust dashpot (C) until the stem just contacts tang (D) on throttle lever. Tighten locknut.

NOTES

BUILT TO MEET OR EXCEED O.E. SPECS.

ELECTRIC PUMP

- Weight - 2 lb., 6 oz.
- Rotary Vane design
- Pressure Regulated
- No inlet or outlet valves
- 72 gph Free-Flow
- Operates at 160° temperature
- 1/4" inlet and outlet fittings
- Lift - 8'
- P4070 - 12 volt, 5 psi
- P4259 - 6 volt, 5 psi
- P4389 - 12 volt marine, 5 psi
- P4594 - 12 volt, 7 psi

MECHANICAL PUMP

- Aluminum castings to dissipate heat
- Light weight
- Channel steel levers
- Unitized diaphragm/shaft/spring/seal
- Resilient valves, self conforming to seat
- Rolling-Loop diaphragm
- Delivers 45 gph with 4 psi restriction

12 VOLT IMPORT APPLICATIONS

- Universal mounting bracket and hardware
- Bayonet fittings for either 5/16" or 1/4" hose
- Single screw for pressure adjustment
- Pressure adjustable from 1-3/4 psi to 6 psi

IN-TANK ELECTRIC PUMP

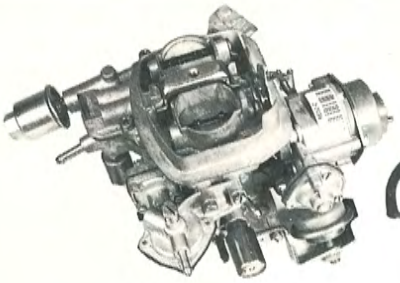
- For carburetor equipped vehicles
- Current draw - 1.4 amps
- 20 gph at 4 psi

IN-TANK ELECTRIC PUMP

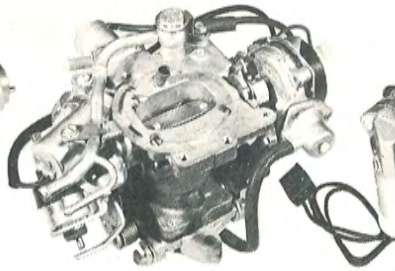
- Used with Throttle Body Injection
- Current draw - 4 amps
- Continuous delivery - 20 gph at 12 psi
- Excess fuel returned to tank

TECH. MANUAL		WITH COLOR SLIDES
TYF	FORM #3560	CTP-21
740	FORM #3624	CTP-20
BBS	FORM #3620A	CTP-5A
BBD-1¼"	FORM #3576A	CTP-6A
YF-YFA	FORM #3608B	CTP-22
RBS	FORM #3625	CTP-8A
TQ	FORM #3623A	CTP-1A
AFB-AVS	FORM #3703A	CTP-23
BASICS	FORM #3630A	CTP-2A

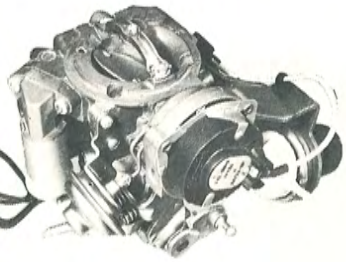
BBS
SERVICE MANUAL
CARTER CARBURETOR



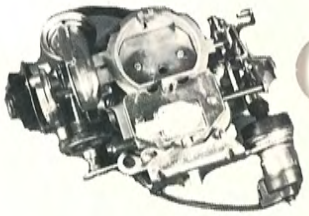
CARTER-WEBER 740



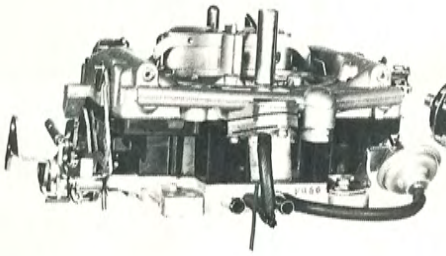
CARTER-WEBER TYF



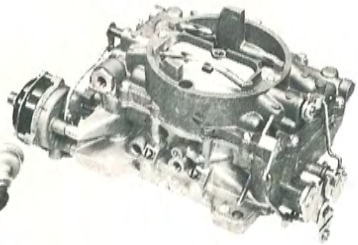
CARTER YF-YFA



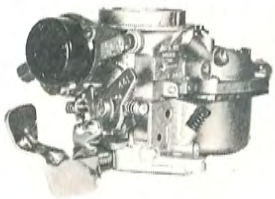
CARTER BBD 1-1/4"



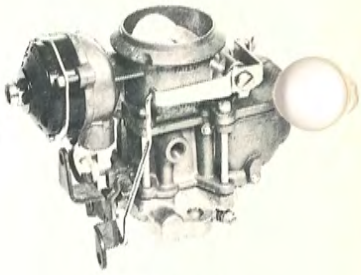
CARTER THERMO-QUAD™



CARTER AFB-AVS



CARTER RBS



CARTER BBS

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