

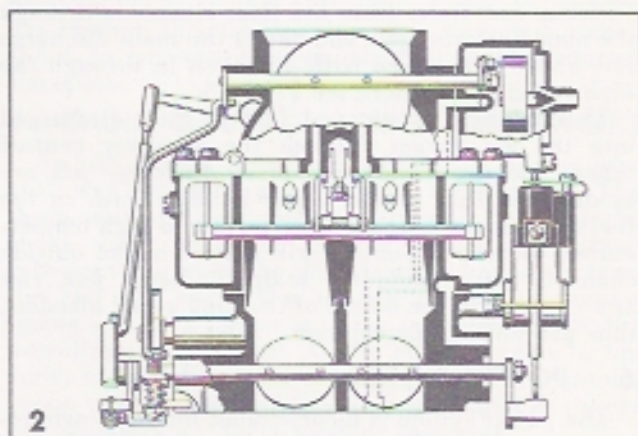
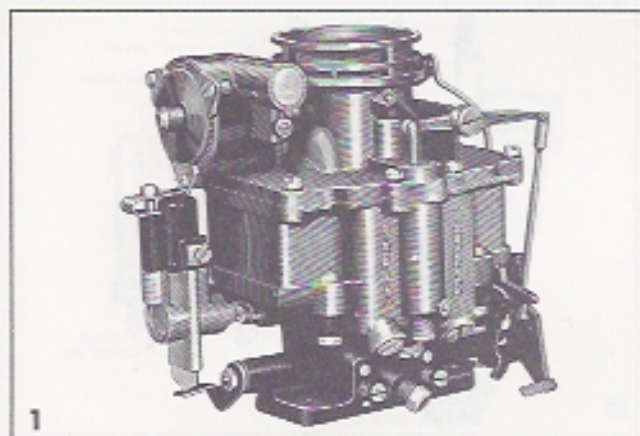
BENDIX STROMBERG CARBURETOR SERIES AA DESCRIPTION AND OPERATION

INCLUDES 1955
BUICK INFORMATION
(Supersedes Issue Dated
June, 1954)

GENERAL DESCRIPTION

The Stromberg Series "AA" Carburetor is a double-barrel downdraft type with each barrel having its own idle system (with adjustable needle), main metering system and throttle valve, see Figs. 1 and 2. The idle system and main metering systems are supplemented by the float system, the accelerating system and the power system. Also incorporated in some models of the carburetor is an automatic choke control of the hot air type, a starting switch or a kickdown switch.

All series "AA" Carburetors have the identification code number stamped on the air horn cover. Before attempting to repair or overhaul a carburetor, refer to the identification code number and secure the correct Repair Kit for the carburetor that is to be repaired.



PRINCIPLES OF OPERATION

3 THE FLOAT SYSTEM

The function of the float system is to maintain a constant level of fuel in the float chambers at all times and under all conditions of operation. Fuel enters the carburetor at the fuel inlet, flowing through the float needle valve and seat into the float chambers, see Figure 3.

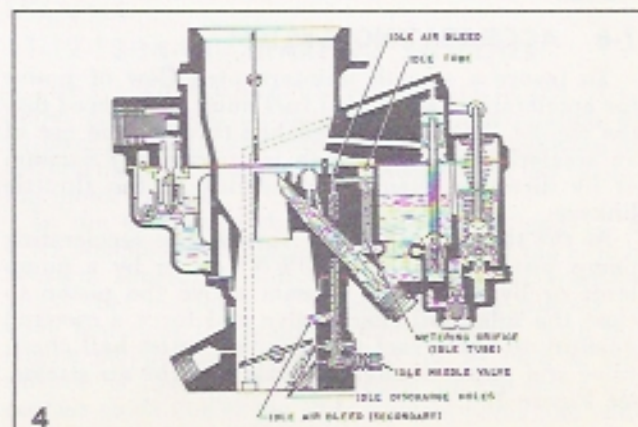
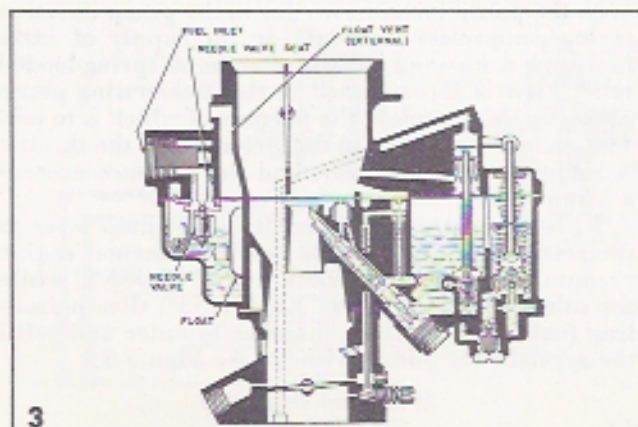
When the fuel reaches a given level, the floats shut-off the fuel supply at the needle valve. The float chambers are vented internally by a vent tube which connects the float chambers with the air horn.

On some models the float chambers and throttle body are vented externally to permit the escape of gaseous vapors which accumulate due to high operating temperatures.

3-4 THE IDLE SYSTEM

With the throttle valves closed and the engine running at slow idle speed, fuel from the float chambers is metered into the idle tubes through an orifice at the base of each idle tube, see Figures 3 and 4. The air taken in through the idle air bleed holes mixes with the fuel at the top of the idle tubes.

(Continued on page 2)



PRINCIPLES OF OPERATION

(Continued from page 1)

This mixture of air and fuel then flows down the channels where it is mixed with additional air entering through the secondary idle air bleeds. The mixture is then discharged at the lower idle discharge holes. The quantity of fuel discharged is controlled by adjustable idle needle valves. As the throttle valves are opened slightly, the air-fuel mixture is also discharged from the upper idle discharge holes to supply the additional fuel required for increased engine speed, see Figure 4.

5 MAIN METERING SYSTEM

The main metering system controls the flow of fuel during the intermediate or part throttle range of operation. With the throttle valves in a partially open position, fuel flows from the float chambers through the main metering jets and enters the main discharge jets where it is mixed with air taken in through the high speed air bleeders, see Figure 5.

This mixture of air and fuel is then discharged into the air stream through the auxiliary venturi tubes. The main body and main discharge jets are so designed that should vapor bubbles form in the fuel in the main discharge system, due to high temperatures, the vapor bubbles will collect in the outside channels surrounding the main discharge jets, rise and vaporize in the domes of the high speed bleeders, thus preventing "percolation."

6 POWER SYSTEM

The power system is incorporated into the carburetor to provide a richer mixture for maximum power and high speed operation. The extra fuel for power is supplied by a vacuum controlled power piston which automatically operates the power by-pass jet in accordance with throttle opening.

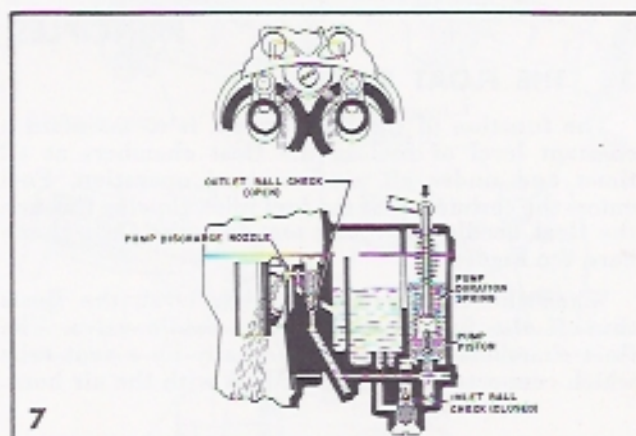
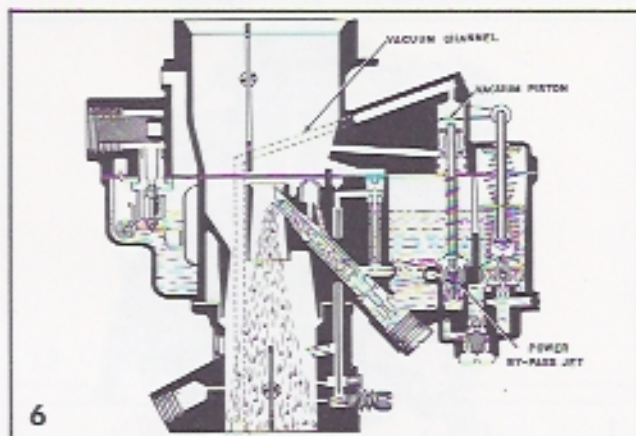
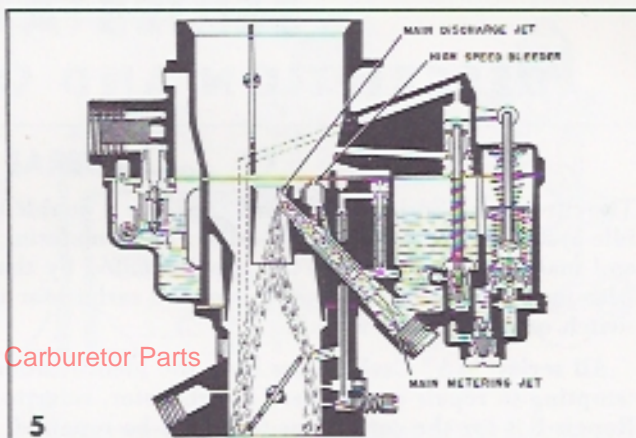
Intake manifold vacuum is maintained above the vacuum piston through a vacuum channel which leads to the manifold flange of the carburetor, see Figure 6. During partial throttle operation, the vacuum above the vacuum piston is sufficient to overrule the compression spring and hold the piston in the "UP" position.

When the throttle valves are opened to the point where the manifold vacuum drops to approximately four to five inches Hg., the compression spring then moves the piston "DOWN" to open the power by-pass jet and meter additional fuel into the main metering system.

7-8 ACCELERATING SYSTEM

To insure a smooth uninterrupted flow of power for acceleration, additional fuel must be metered into the engine. This is accomplished through the use of an accelerating pump which is operated by vacuum or by direct mechanical connection to the throttle linkage.

As the throttle valves are opened, the accelerating pump piston is moved "DOWN" either by a pump lever or by a drop in vacuum above the piston to close the inlet ball check valve and force a metered quantity of extra fuel through the outlet ball check valve and pump discharge nozzle into the air stream, see Figure 7.



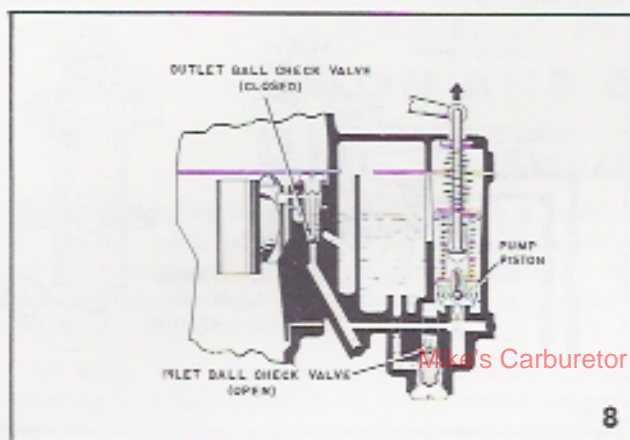
As the pump lever moves down, the pump duration spring compresses to distribute the supply of extra fuel over a metered period of time. A spring-loaded relief valve is incorporated in the accelerating pump piston on some models, the purpose of which is to prevent excessive pressure in the system when the throttle is snapped open suddenly, and the pressure exceeds a given value.

With the return of the accelerating pump lever to the released position or the return to normal engine vacuum, the outlet ball check valve "CLOSES" while the inlet ball check valve "REOPENS", thus permitting fuel from the float chamber to enter and refill the accelerating pump cylinder, see Figure 8.

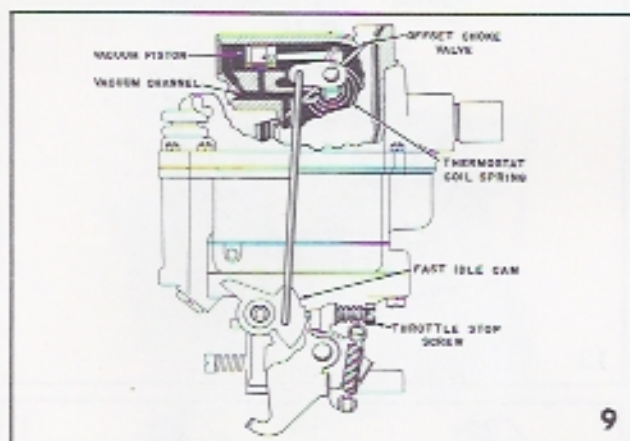
(Continued on page 3)

PRINCIPLES OF OPERATION

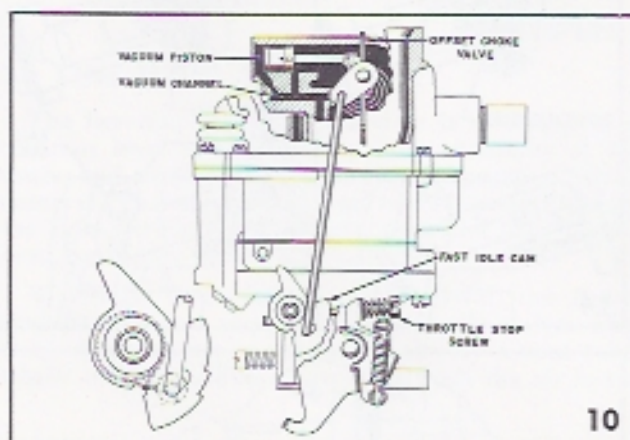
(Continued from page 3)



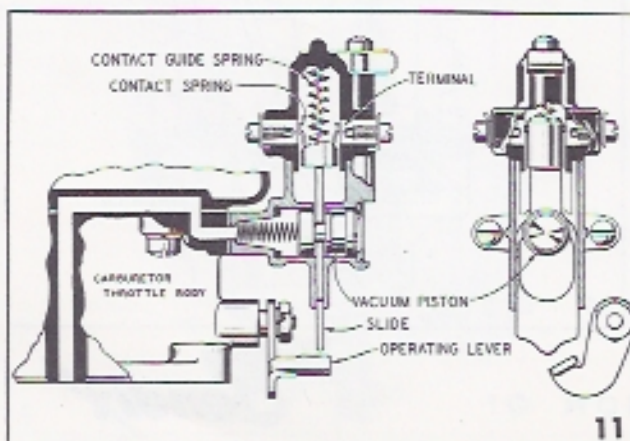
8



9



10



11

THE AUTOMATIC CHOKE CONTROL

The automatic choke control incorporated in some models is of the hot air type. Its operation is based upon the combination of intake manifold vacuum, an offset choke valve, and a thermostat coil spring, which is controlled by heat from the exhaust manifold. The vacuum operated piston is connected directly to the choke valve through a connecting link.

The thermostat coil spring, which engages a pin on the connecting link, controls the operation of the choke valve under varying temperatures and throttle positions. The heated air which governs the tension of the thermostat spring is supplied through a heat tube that connects the thermostat cover with the exhaust manifold "stove." A fast idle cam operates in conjunction with the automatic choke to provide the correct throttle opening and increased engine speed to prevent the engine from stalling during warm-up.

9 CHOKE CLOSED—FAST IDLE—COLD ENGINE

As the engine cools, the thermostat spring also cools and gradually gains tension, see Figure 9. The thermostat spring, however, is unable to close the choke valve until the throttle valves are opened sufficiently to move the throttle stop screw away from the fast idle cam. The tension on the thermostat spring will then close the choke in accordance to the prevailing temperature. As the engine begins to operate, manifold vacuum exerts a pull on the vacuum piston to open the choke valve just enough to supply the necessary air for a running mixture.

9-10 ENGINE WARM—CHOKE OPEN—SLOW IDLE

As the engine warms, the amount the choke valve opens is governed by the pressure of air against the offset choke valve, see Figures 9 and 10. The heat from the exhaust manifold gradually decreases the tension of the thermostat coil spring until the spring offers no further resistance to the opening of the choke valve.

With the engine partially warm, the throttle stop screw will rest on a lower step of the fast idle cam when the accelerator is released to cause the engine to idle at a slower idle speed, see Fig. 10.

When the engine reaches normal operating temperature and the accelerator is released, the throttle stop screw will rest on the lowest step of the fast idle cam, permitting the engine to return to its normal slow idle speed.

11-12-13-14-15 STARTING SWITCHES

Two types of starting switches are used on the "AA" Series Carburetor. In both types a combination of vacuum and manual control govern the operation of the starting switch which is connected into the cranking motor circuit.

In the slide type shown in Figures 11 and 12, a lever attached to the throttle shaft actuates the switch contacts through a flat slide, a cylindrical contact guide that carries a "U" shaped spring contact to open and close the cranking motor circuit. With the engine stopped and the ignition on, as soon as the throttle is opened, a compression spring above the contact guide moves the slide, contact guide and con-

(Continued on page 4)

PRINCIPLES OF OPERATION

(Continued from page 3)

tact spring down to engage the stationary contacts in the terminal cover to "CLOSE" the cranking motor circuit.

As soon as the engine starts, and the throttle is partially released, the vacuum operated piston is moved in against its seat by manifold vacuum. As the throttle is opened, the slide can move down only to the point of contact with the piston to hold the cranking circuit "OPEN" and prevent cranking the engine.

In the ball type shown in Figures 13, 14 and 15, a flat on the throttle shaft actuates the contact spring through a ball, a plunger and contact guide. With the throttle closed and the engine stopped, the ball rests on the lower lip of the switch plunger and against the flat on the throttle shaft. A return spring between the contact guide and terminal cap holds the contact spring away from the stationary contact in the terminal cover to "OPEN" the cranking motor circuit, see Figure 13.

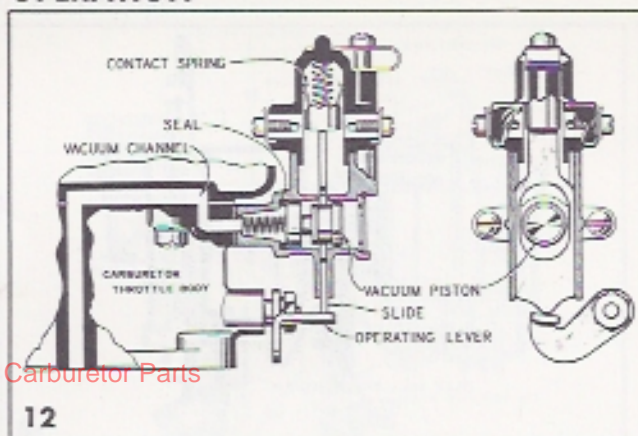
As the throttle is opened, the flat on the throttle shaft serves as a cam to push the ball, plunger, contact guide and contact spring to engage the stationary contacts in the terminal cover to "CLOSE" the cranking motor circuit, see Figure 14.

As soon as the engine starts, and the throttle is released, manifold vacuum raises the ball against its seat in the main body flange, and the return spring pushes the contact spring away from the stationary contacts to "OPEN" the cranking circuit, see Figure 15. As long as the engine continues to operate, the ball is held away from the throttle shaft and the cranking circuit remains "OPEN".

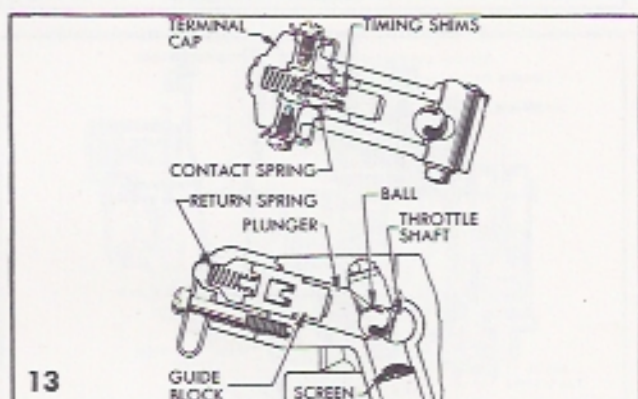
16 KICKDOWN SWITCH

One model of the Series "AA" Carburetor has a kickdown switch attached to the carburetor, see Figure 13. The function of this switch is to provide a means of automatically shifting from 4th gear to 3rd gear by merely depressing the accelerator pedal to the floor at car speeds below 50 M.P.H. Depressing the accelerator to the floor when the car speed is below 50 M.P.H. causes a sudden drop in "venturi vacuum" which permits the compression spring (1) to move the piston (2) down and bring the contact (4) between the end of the plunger (3) and the terminal block (5) to complete the circuit. This causes the transmission to shift "DOWN" into 3rd gear where it remains until the accelerator pedal is released, or sufficient "venturi vacuum" is developed to move the piston and contact away from the terminal block.

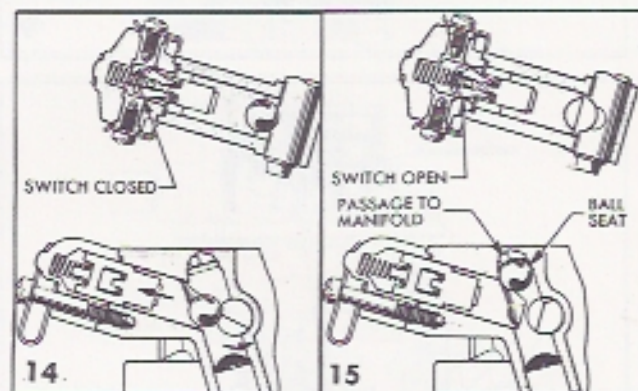
On car speeds above 50 M.P.H. there is sufficient "venturi vacuum" to overrule the compression spring and hold the circuit open to keep the transmission in 4th gear.



12

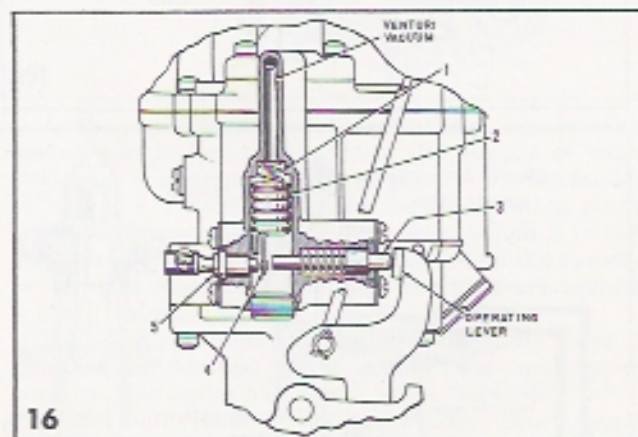


13



14

15



16

SERVICE SALES DEPARTMENT
BENDIX PRODUCTS DIVISION OF
SOUTH BEND 20, INDIANA

Bendix
AVIATION CORPORATION