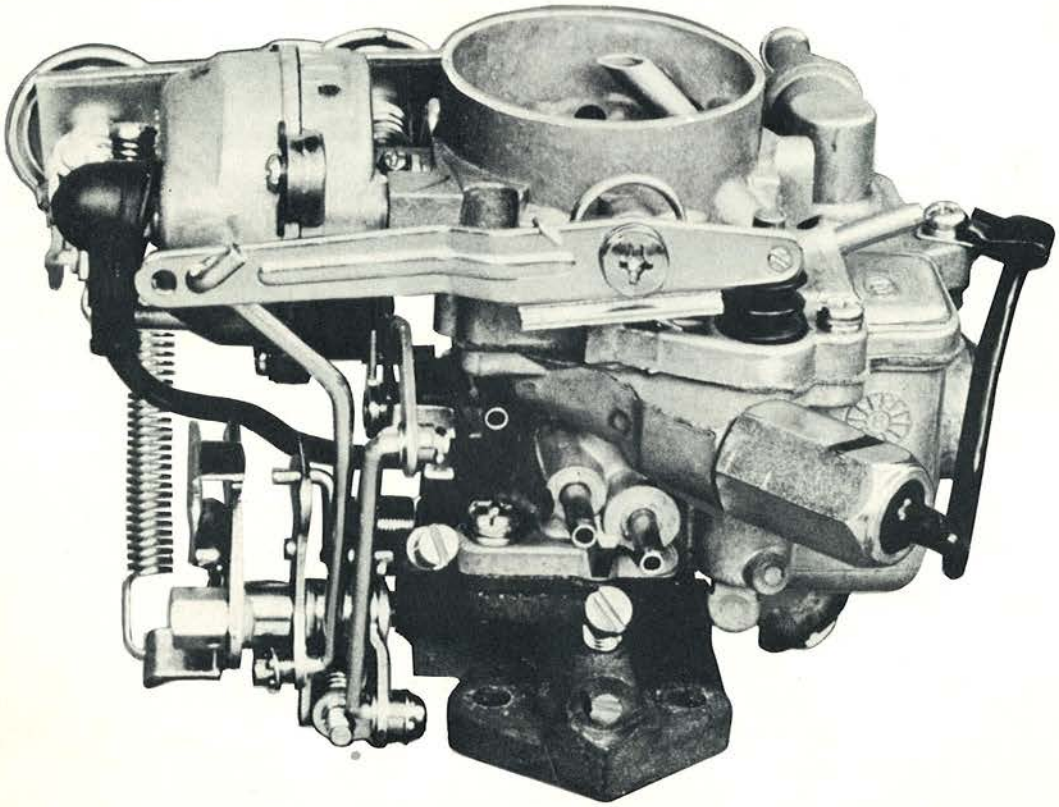
SUBARU

CARBURETOR THEORY, OPERATION, and SERVICING



SERVICE TRAINING

MSA AV1118

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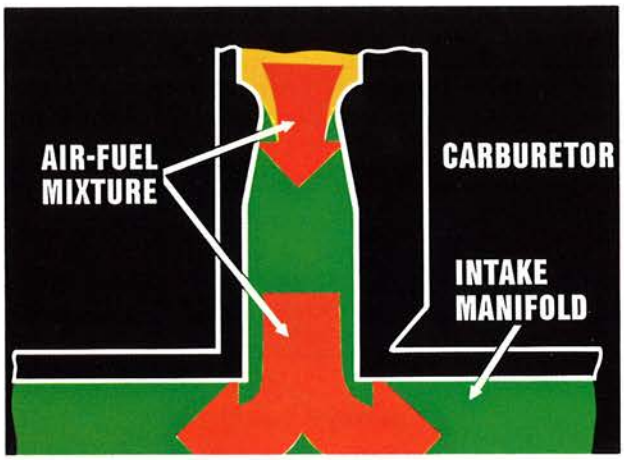
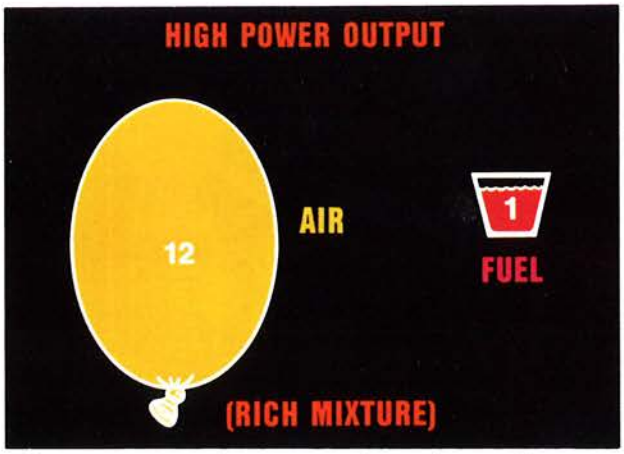
THEORY OF CARBURETION

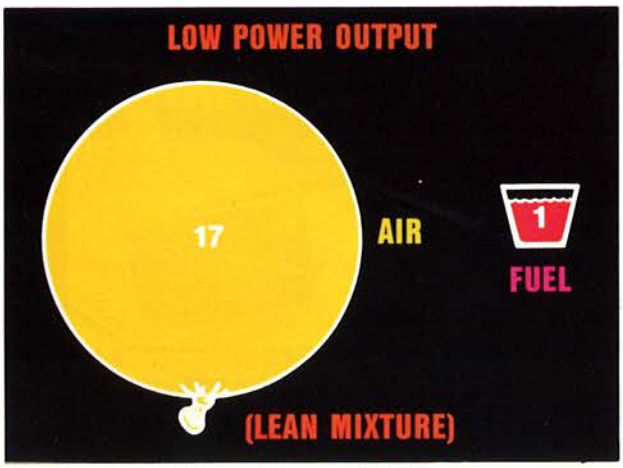
This Subaru Service Training Booklet reviews basic carburetor theory, and the operation and servicing of the Subaru carburetor. We will begin by reviewing the basic theory of carburetion.



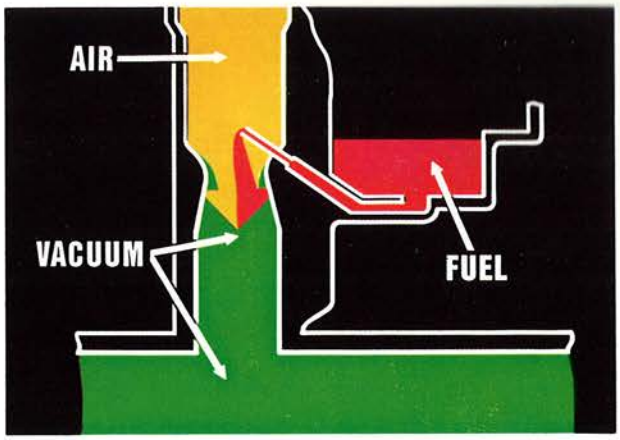
The purpose of the carburetor is to mix air and fuel into a combustible mixture, and supply it to the engine intake manifold.



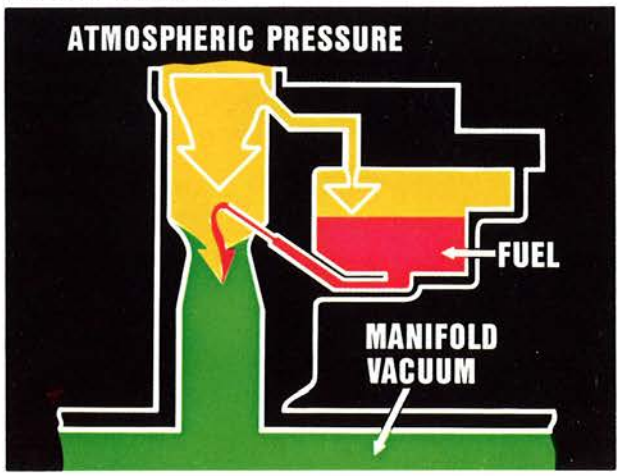
The proper mixture varies, depending on power output. A mixture of 12 parts of air to 1 part of fuel is needed for high power output.



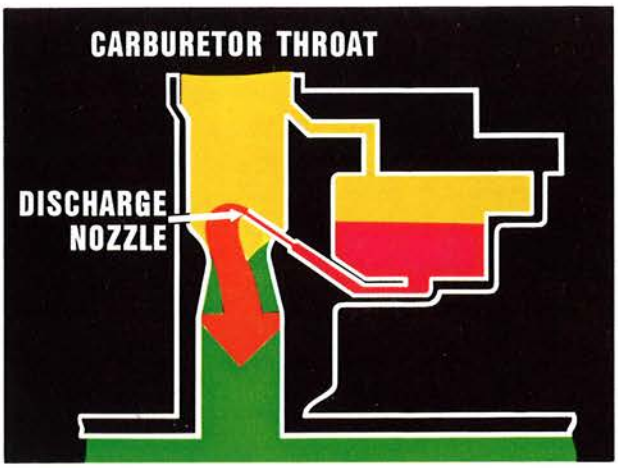
A mixture of 17 to 1 is needed for lower power output.



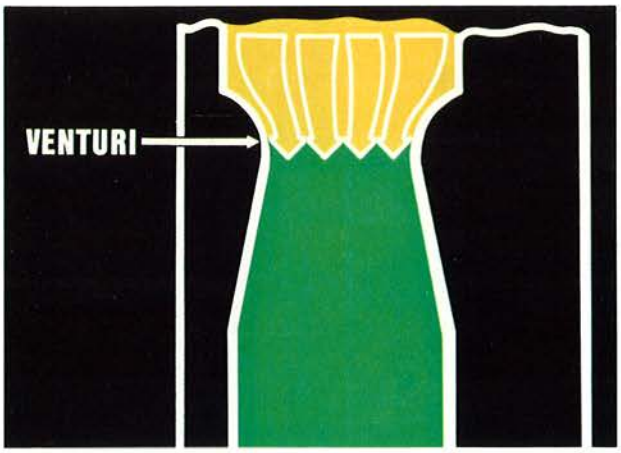
Both air and fuel are drawn through the carburetor by vacuum in the intake manifold. Air at normal pressure is shown above in yellow, fuel is shown in red, and vacuum is shown in green.



Actually, outside air pressure pushes both air and fuel through the carburetor. The air pressure inside the intake manifold is lower than the outside air pressure.



The fuel is mixed with the air in the throat. The air enters from the top of the throat, and mixes with the fuel coming out of a discharge nozzle. The mixture is shown above in orange.



By shaping the carburetor throat like an hourglass, the vacuum at the nozzle is increased. The hourglass shape is called a venturi.

The only other part needed for a basic carburetor is the throttle valve. It controls the amount of air and fuel that flows to the intake manifold.

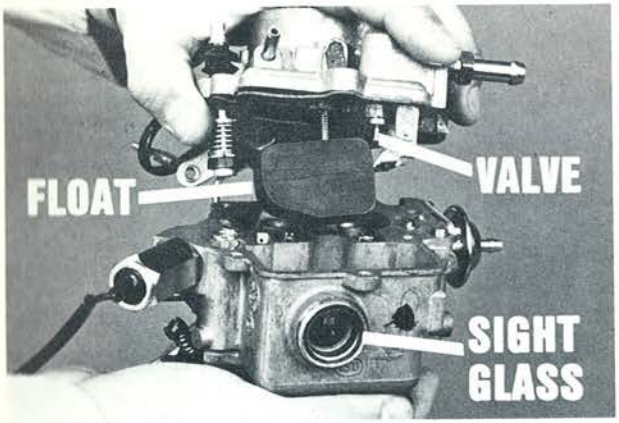
Operating Conditions Vary

In its simplest form, that is all a carburetor does. If your car never changed its speed, temperature, load, and altitude, that would be all you would need to provide the ideal air-to-fuel mixture. Changes in operating conditions, however, require extra controls to be added to this simple system. The Subaru carburetor has been carefully designed to handle different driving conditions.

OPERATION OF THE SUBARU CARBURETOR

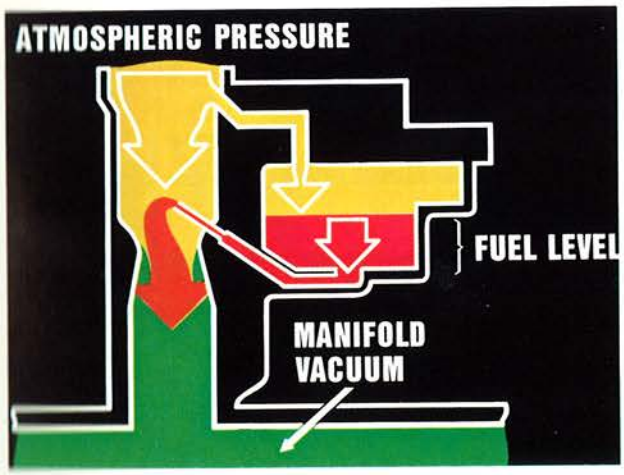
INTRODUCTION

The Subaru carburetor is a downdraft, two-barrel design. It has a single float bowl system.

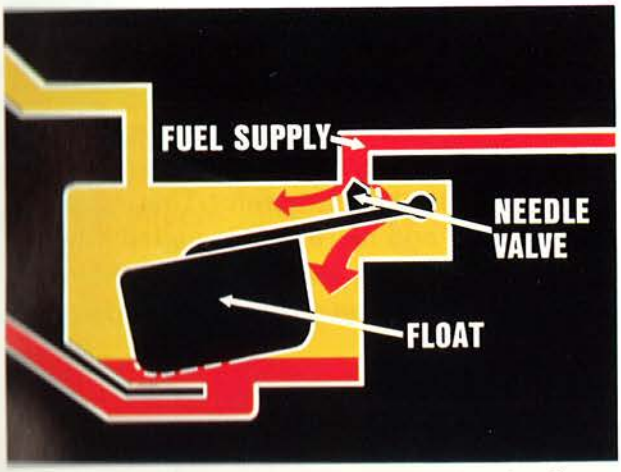


Float Bowl System Parts

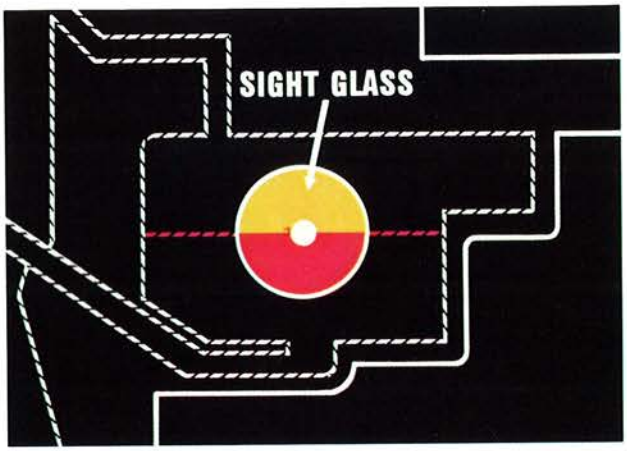
The float bowl system includes a float bowl with sight glass, a float and a valve.



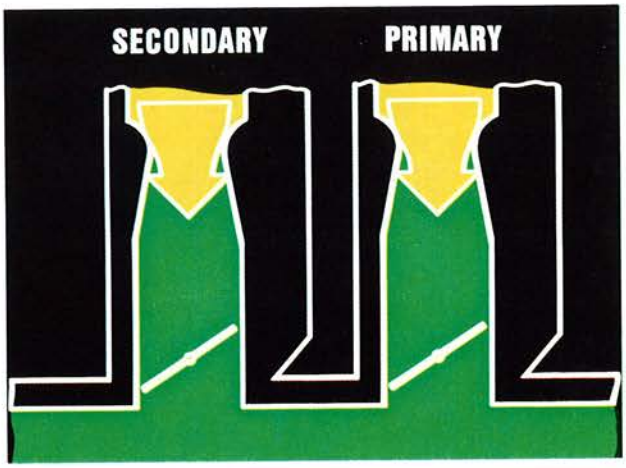
Fuel flow depends on manifold vacuum, outside air pressure, and the level of the fuel in the bowl.



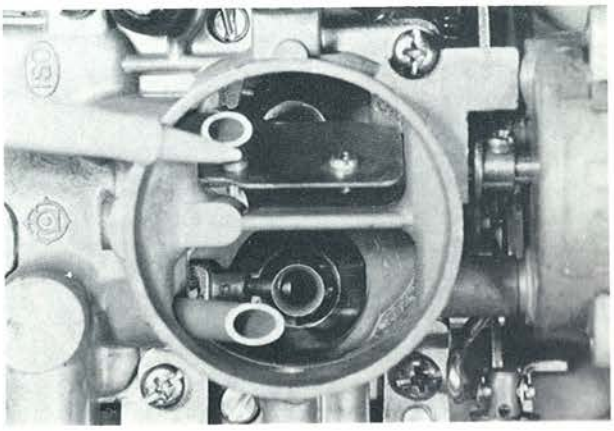
The level of the fuel is controlled by the float. When the level is low, the float opens the needle valve to resupply the bowl.



The sight glass lets you easily check the level of fuel in the bowl. If the level is too low, the air-to-fuel ratio will be too lean. If the level is too high, the ratio will be too rich.



The two-barrel design includes a primary and a secondary side.

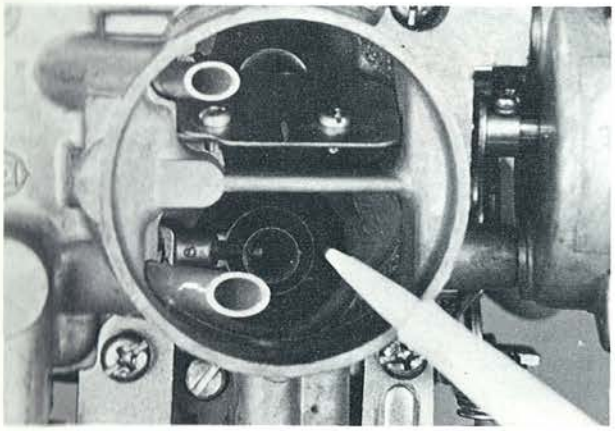


Primary Side

PRIMARY SIDE

- CHOKE CIRCUIT
- IDLE/SLOW SPEED CIRCUIT
- MAIN CIRCUIT
- ACCELERATION CIRCUIT
- POWER CIRCUIT

The primary side contains: the choke circuit, the idle/slow speed circuit, the main circuit, the acceleration circuit, and the power circuit.



Secondary Side

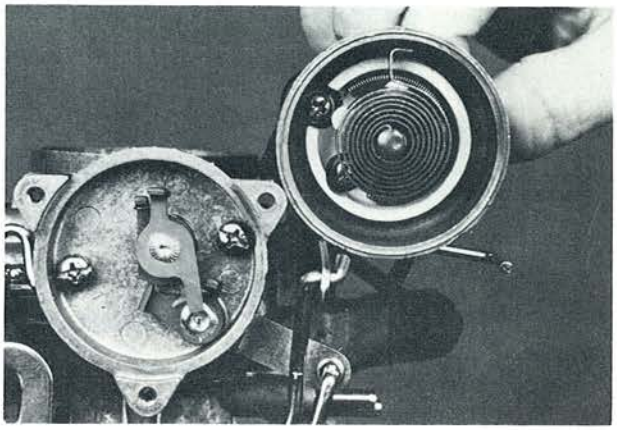
The secondary side contains: the auxiliary valve, the secondary slow circuit, and the secondary main circuit.

SECONDARY SIDE

- AUXILIARY VALVE
- SECONDARY SLOW CIRCUIT
- SECONDARY MAIN CIRCUIT

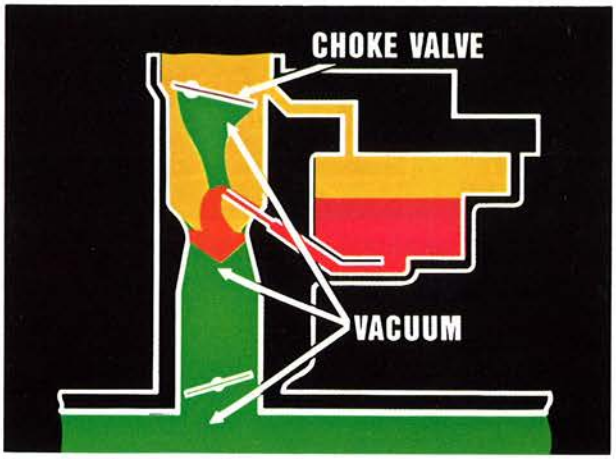
CHOKE CIRCUIT

During most normal driving, fuel is supplied only through the primary side. The first primary circuit we will examine is the choke circuit.



Automatic Choke Parts

The automatic choke is one of the most important of the carburetor circuits. It depends on a series of cams, springs, pawls, and electrical current flow, to achieve its goal. In theory of fuel flow, however, the choke is a very simple circuit.

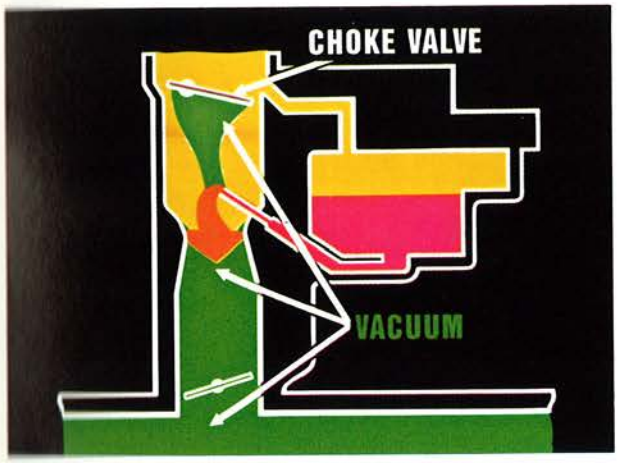


To start a cold engine, the choke circuit provides a rich mixture by decreasing the air flowing through the carburetor. This increases the vacuum, and more fuel is pulled into the throat to mix with less air. The colder the engine, the richer the mixture required to start the engine.

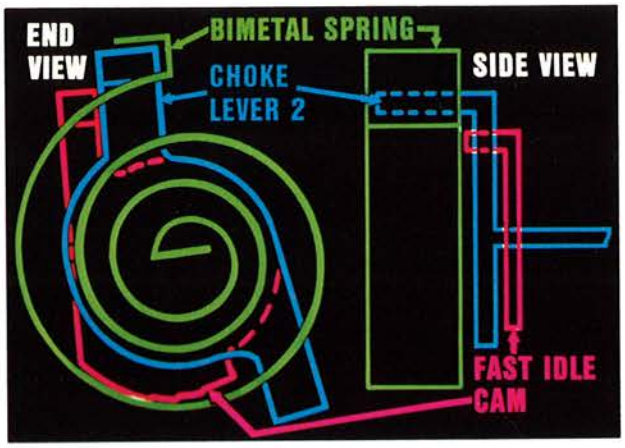
CHOKE SYSTEMS:

- COLD START
- MAIN VACUUM BREAK
- AUXILIARY VACUUM BIMETAL COMPENSATION
- CHOKE HEATER
- THROTTLE AND CHOKE INTERLOCK
- CHOKE UNLOADER

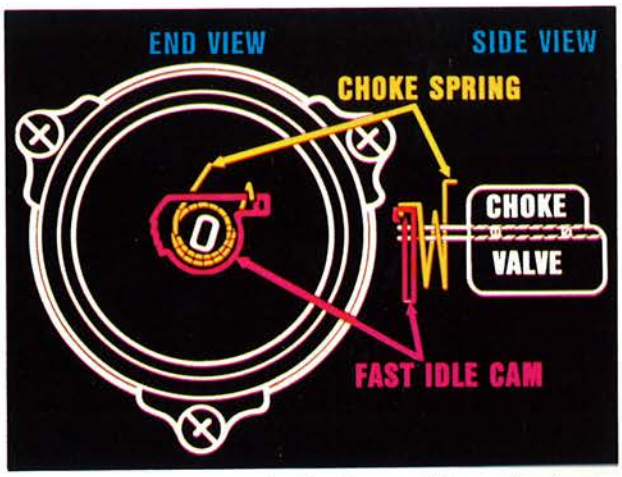
Of course the choke is not just an "on" or "off" device, but includes systems which gradually open it further as the engine starts and warms up. The basic choke systems are the "cold start" position, main vacuum break, auxiliary vacuum bimetal compensation, choke heater, throttle and choke interlock, and choke unloader.



We will look at the "cold start" position first. This position provides a maximum choking action of the choke valve (called the "closed choke" position). It combines this with a slight opening of the throttle valve (called the "fast idle" position). This combination creates a vacuum all along the throat below the choke valve. The vacuum pulls a rich mixture down past the throttle valve and into the engine.

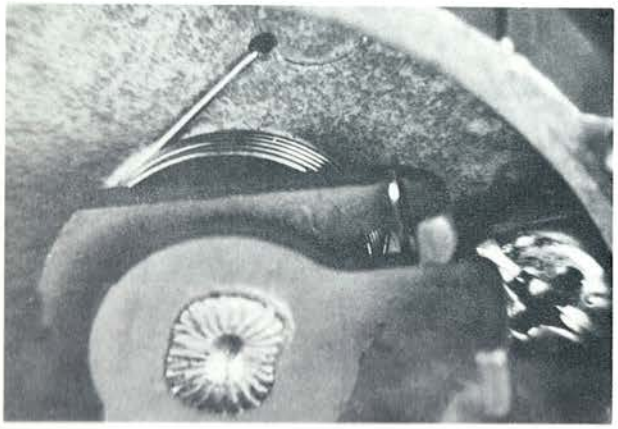


For the moment, let's concentrate on the choke valve. The valve is controlled by the action of five other parts, three of which are shown above. The choke valve is connected by a shaft to choke lever 2. When the engine is cold, the bimetal spring tries to close the choke valve by pulling counterclockwise on choke lever 2. Choke lever 2 in turn presses against the fast idle cam. Both end and side views are shown above of the bimetal spring (in green), choke lever 2 and choke shaft (in blue), and the fast idle cam (in red). The green spring pushes against the blue lever, which turns the shaft to close the choke valve. Because the metal cam and lever overlap, when the blue choke lever 2 turns, it also moves the red fast idle cam. The position shown above is the "closed choke" position, and the choke of course would be closed for cold starting.



At the same time choke lever 2 is pulled one way by the bimetal spring, the choke spring is attempting to pull the fast idle cam the other way. The choke spring continuously exerts pressure to open the choke valve. The above drawing shows the fast idle cam (in red) and choke spring (in yellow) in both end and side

views. These two pieces are shown in the "open choke," or normal operating position for a warm engine.



Choke Spring

The coiled metal spring you see above is the choke spring. Notice that it coils around the choke shaft, and ends by hooking around the pawl end of the fast idle cam. The other part you see above in front of the fast idle cam is choke lever 2. These parts are in the "open choke" position, because there is no bimetal spring connected here to force them closed.

"Fast Idle On" Position

The only other part which directly controls the fast idle cam is the cam adjusting lever. The lever is shown above in the closed choke "fast idle on" position. In this position it presses tightly against the cam, and prevents either of the two springs from moving the cam at all. The choke would be closed in this position, and the throttle would be held slightly open by the position of the cam adjusting lever and fast idle cam.

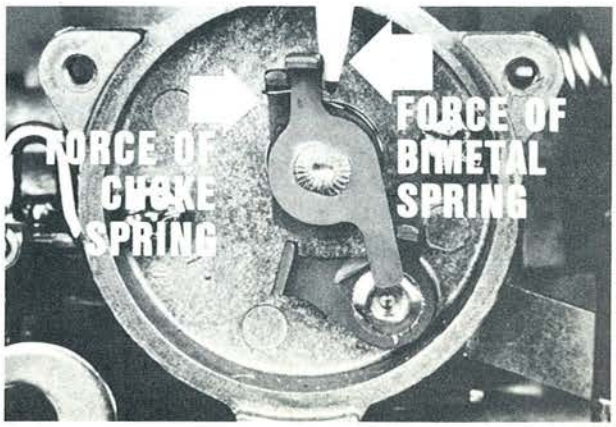
CHOKE SYSTEM PARTS:

- CAM ADJUSTING LEVER
- FAST IDLE CAM
- CHOKE LEVER 2
- CHOKE SPRING
- BIMETAL SPRING
- CHOKE VALVE

Now let's take a look at how these 6 parts work together in sequence to operate the choke automatically.

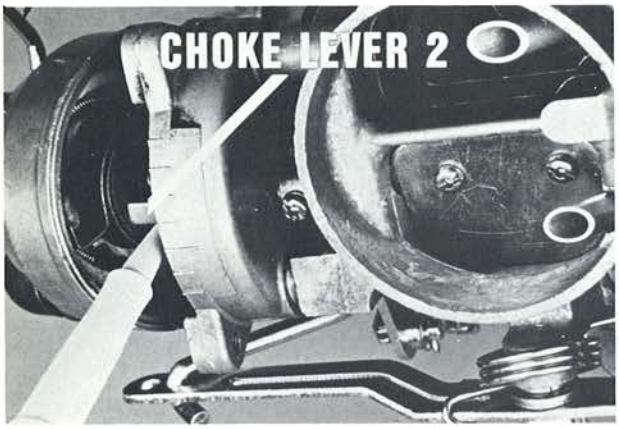
Depressing Accelerator Pedal

To start a cold engine, momentarily depress the accelerator pedal. This moves the cam adjusting lever away from the fast idle cam as shown by the arrow. The pen shown above is holding choke lever 2 in the closed choke "cold start" position, just as the bimetal spring would if the thermostat cover were still on.



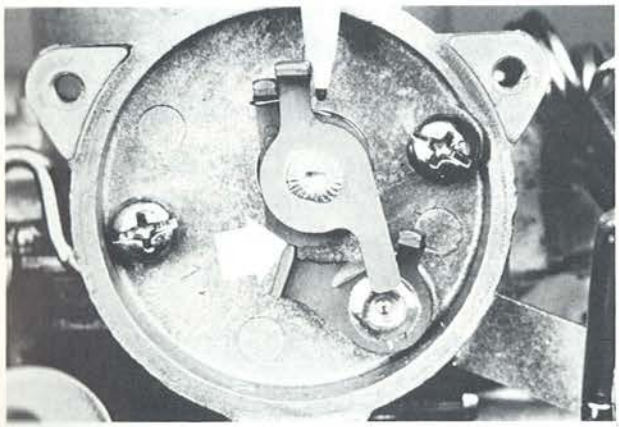
Setting Choke Valve

The choke spring and bimetal spring positon the choke valve by pushing in opposite directions on the fast idle cam and choke lever 2, respectively.



Choke Closes For Cold Starting

When both the engine and the outside air are cold, the bimetal spring overcomes the choke spring and rotates both choke lever 2 and the fast idle cam counterclockwise. This closes the choke valve. The pen is again shown above holding choke lever 2 in the "closed choke" position, just as the bimetal spring would, if the thermostat cover were still on. Notice the hooked end of the bimetal spring, designed to wrap around the pawl of the lever.



Adjusting Lever Presses Against Cam

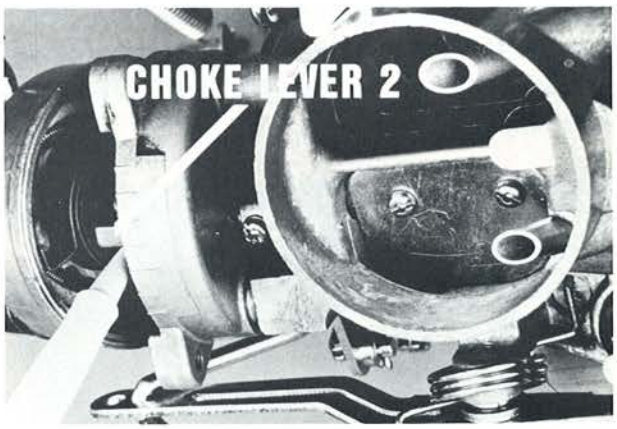
The fast idle cam is held in this cold starting position by the cam adjusting lever, which contacts the cam again as shown by the arrow when the accelerator pedal is released. Choke lever 2 is held between the pressure of the spring and the fast idle cam. This holds both choke lever 2 and the choke valve in this closed position.

CHOKE SYSTEM PARTS:

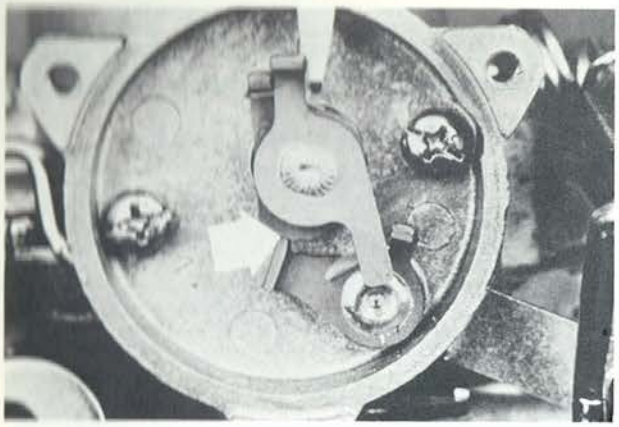
- CAM ADJUSTING LEVER
- FAST IDLE CAM
- CHOKE LEVER 2
- CHOKE SPRING
- BIMETAL SPRING
- CHOKE VALVE

Let's review for a moment how these six parts work together to set the choke for cold starting.

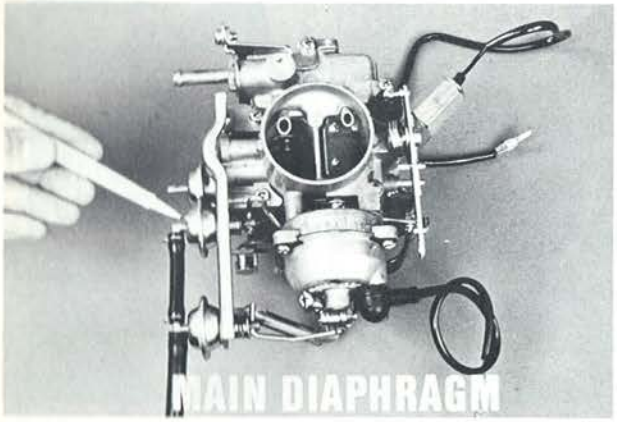
The cam adjusting lever is pulled away from the fast idle cam.



The cam is then pulled counterclockwise by the bimetal spring and choke lever 2. This closes the choke valve.

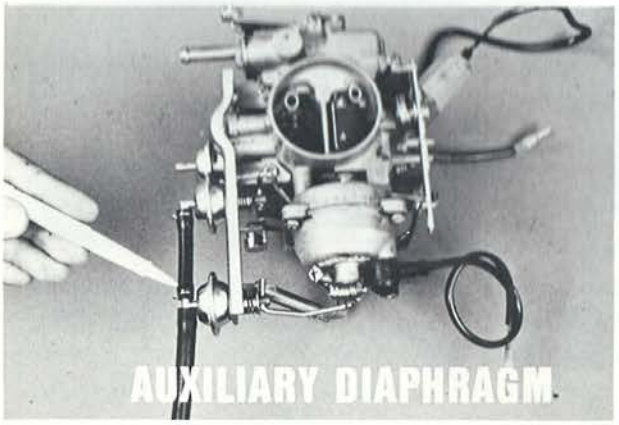


The cam adjusting lever then returns to contact against the fast idle cam. This holds the throttle in an open position.



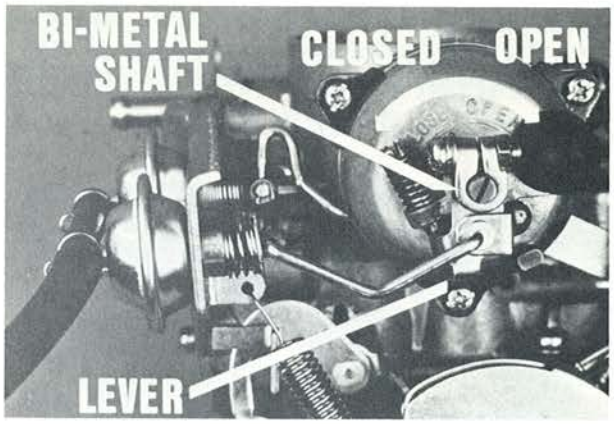
Main Vacuum Break

When the engine starts, the main vacuum break system is triggered. Manifold vacuum operates the main vacuum diaphragm. This opens the choke valve far enough to prevent overchoking.



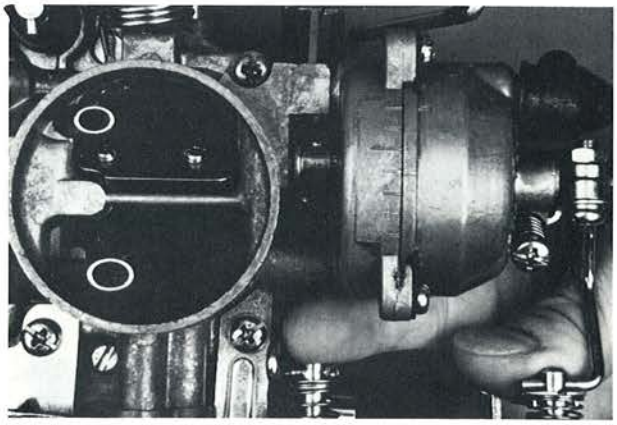
Auxiliary Vacuum Break

Manifold vacuum also operates the auxiliary vacuum diaphragm, and brings in the auxiliary vacuum bimetal compensation system.



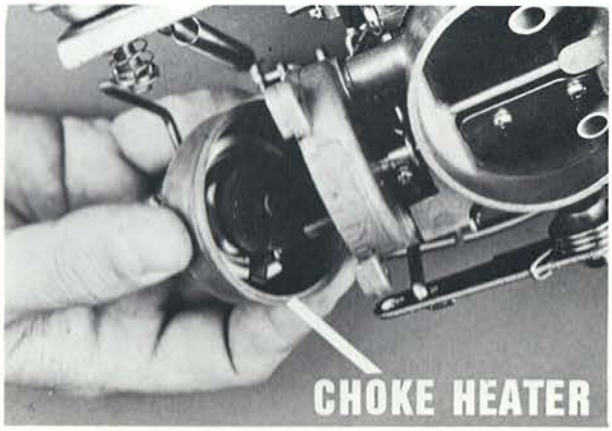
Auxiliary Vacuum Break Linkage

The diaphragm pulls on a connecting rod attached to the bimetal lever. This rotates the bimetal shaft, opening the choke valve more. This additional opening prevents a too-rich mixture as the engine first starts to warm up.



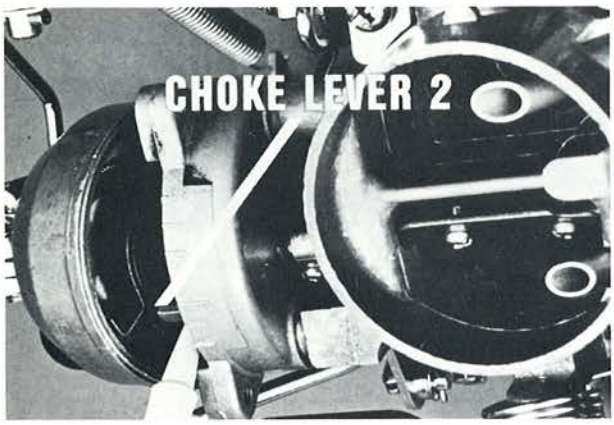
Choke Valve After Initial Adjustments

Those first three systems provide the initial choking and choke adjustment. As the engine warms up, it needs a further gradual reduction in the choke setting.



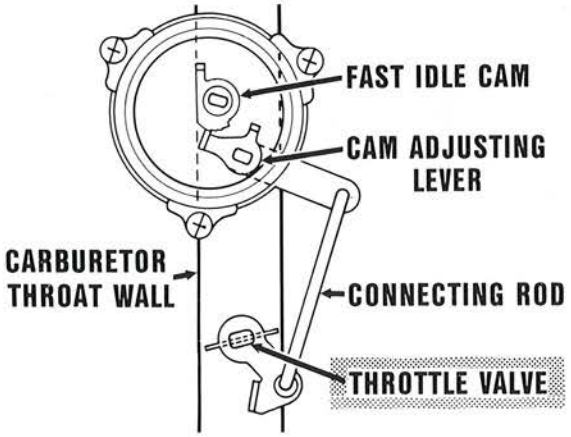
Heater Coil Is Inside Thermostat Cover

With the engine running, electric current flows through the choke heater. This slowly heats up the bimetal spring. As the spring heats up, it rotates clockwise.

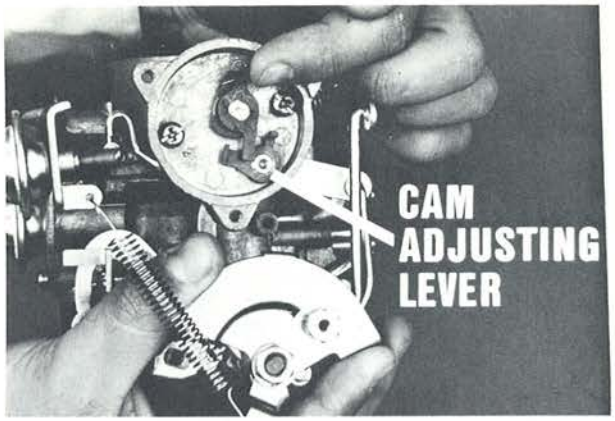


Choke Valve Gradually Opens

Remember, it was only the bimetal spring pushing on choke lever 2 that held the choke closed. Therefore, as the spring loosens, choke lever 2 and the choke valve move to a more open position.

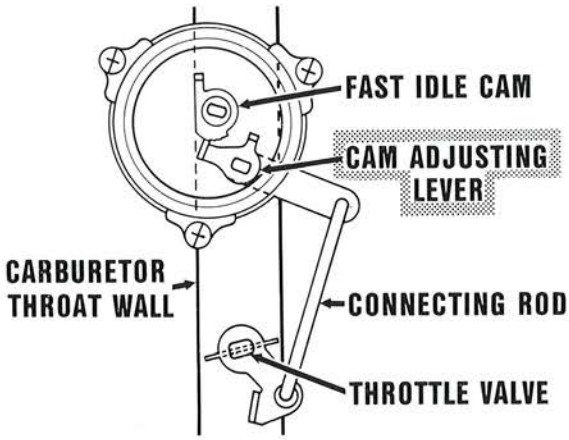


This movement of the bimetal spring and choke lever 2 also affects the throttle valve through the interlock linkage. The throttle valve was set in a fast idle position during the "cold start" procedure. This fast idle position is shown above. It helps provide enough air-fuel mixture to the engine when cold so that it doesn't stall. As the engine warms up, however, it will "race" to a higher and higher idle speed unless the throttle valve is allowed to return to a normal idle position.

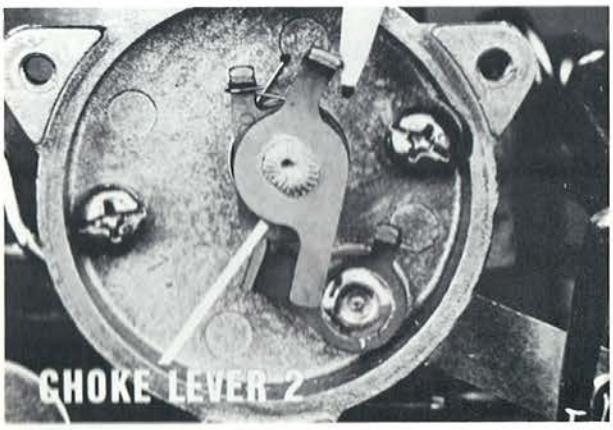


Depressing Accelerator Pedal

The key to the gradual reduction of the fast idle setting is the cam adjusting lever. It moves away from contact with the fast idle cam each time the accelerator pedal is depressed.



When the accelerator pedal was depressed and released before starting the engine, the throttle valve was set in an open position by the cam adjusting lever resting on the fast idle cam.

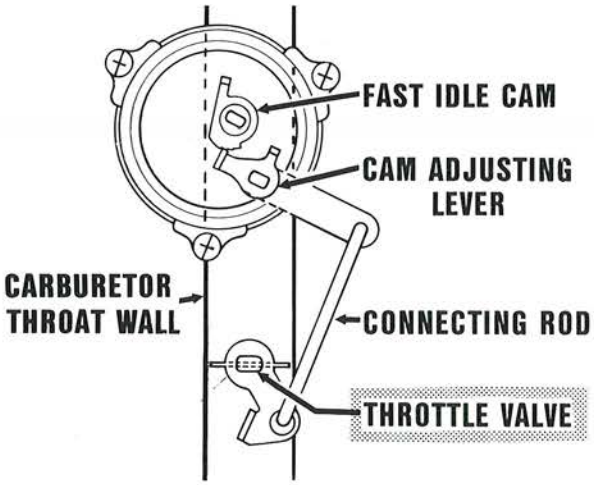


Lever Holds Cam In Place

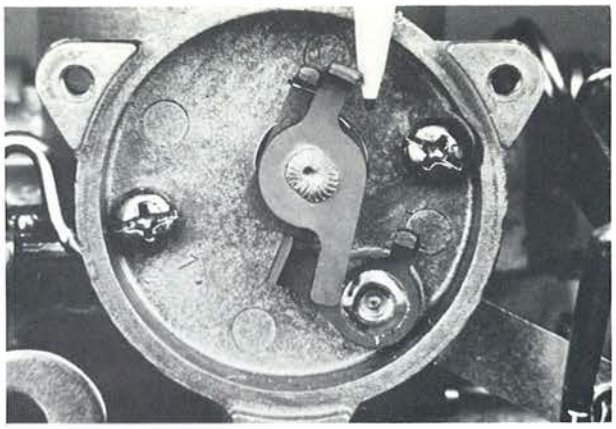
As the bimetal spring gradually rotates clockwise, choke lever 2 moves away from the fast idle cam. The cam is held in place, however, by pressure from the cam adjusting lever.

Choke Spring Moves Cam

Whenever the accelerator pedal is depressed, the cam adjusting lever moves to the position shown above. If choke lever 2 has moved away, the fast idle cam will be pressed against it again by the choke spring.

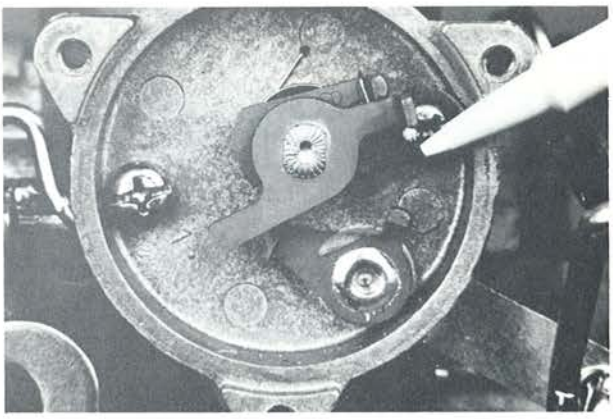


The final result is that the movement of choke lever 2 closes the throttle valve through the fast idle cam and cam adjusting lever.



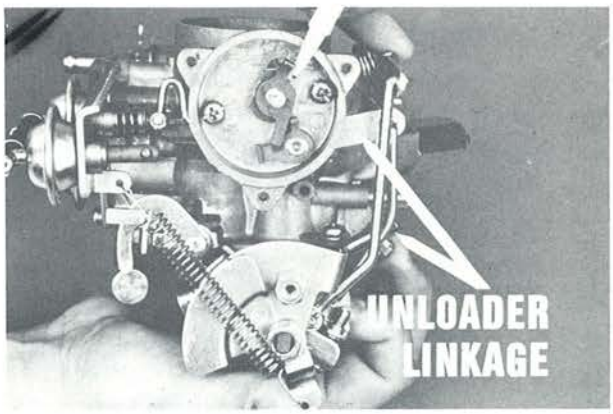
Lever Now Contacts A New Cam Step

When the accelerator pedal is released, the contact with the adjusting lever is remade on a different step of the fast idle cam.



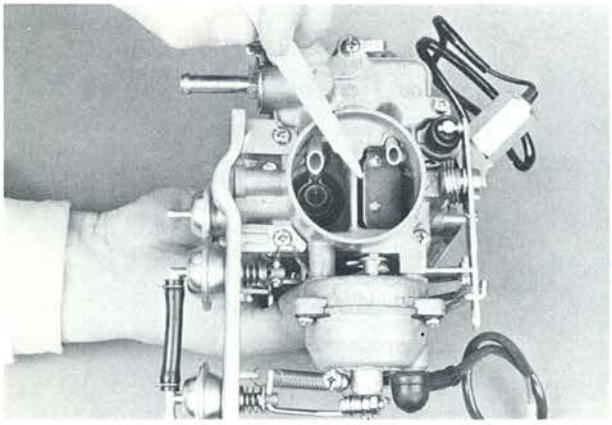
Choke Is Open And Fast Idle Is Off

This process repeats itself through the steps on the cam until the fast idle is completely off, and the choke is completely open.



Cam Adjusting Lever Opens Choke Valve

The choke circuit also includes an unloader linkage. By depressing the accelerator pedal fully when the choke is closed, the cam adjusting lever is pushed against choke lever 2. The choke valve is forced open regardless of the position of the bimetal spring.

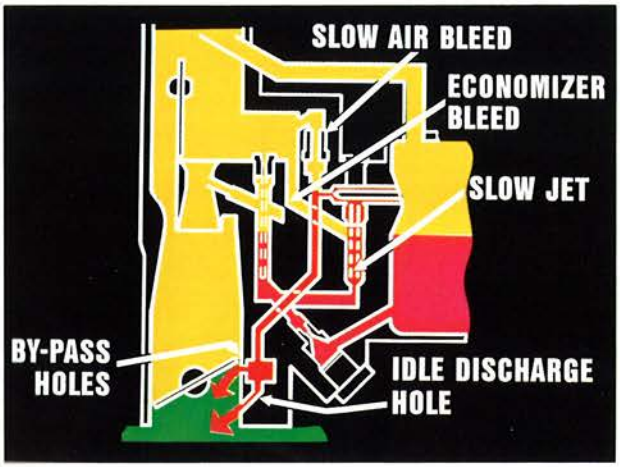


Choke Unloader Allows Air Flow

This allows air to enter the cylinders and clear a flooded engine.

IDLE/SLOW SPEED CIRCUIT

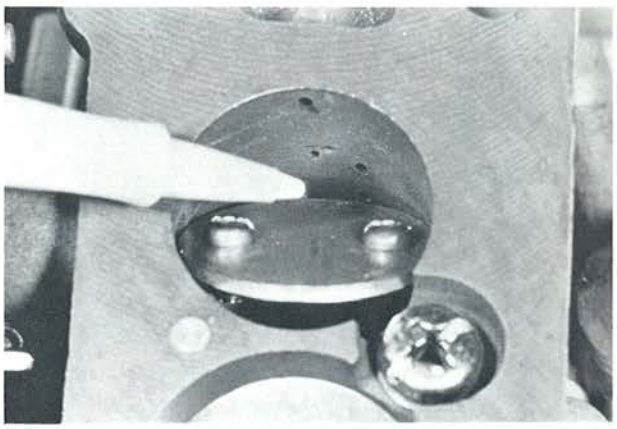
The second primary circuit is the idle/slow speed circuit. This circuit provides fuel at low engine speeds with light loads.



The major parts of the idle/slow speed circuit are the slow jet, economizer bleed, slow air bleed, by-pass holes and idle discharge hole.

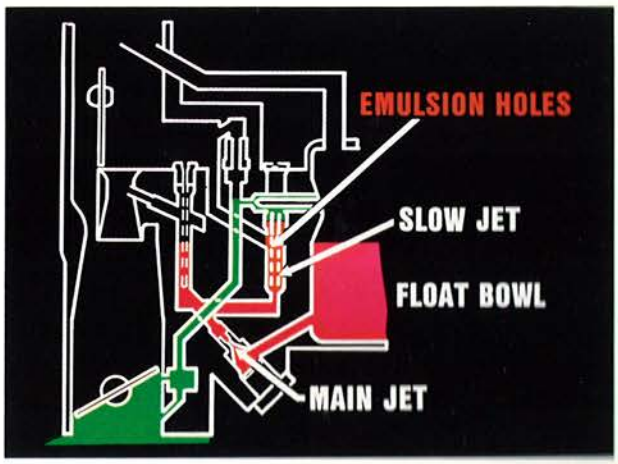
Idle Hole

Since there is little vacuum at the main nozzle during low speed operation, the idle/slow speed circuit supplies fuel. The idle hole is located just below the closed primary throttle valve.

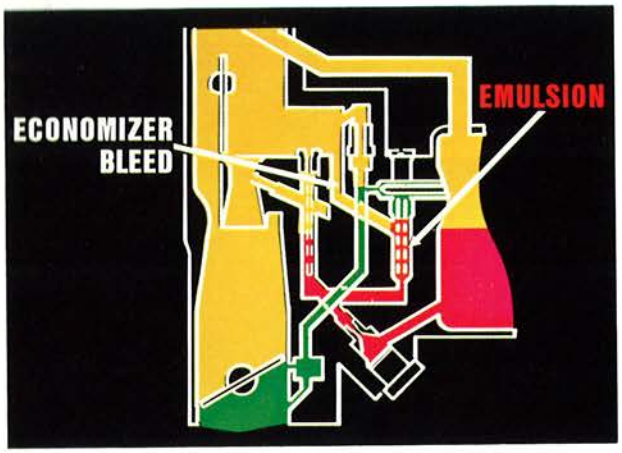


Bypass Holes

The bypass holes are just above the throttle. This is the point of greatest vacuum when the throttle is just opening.

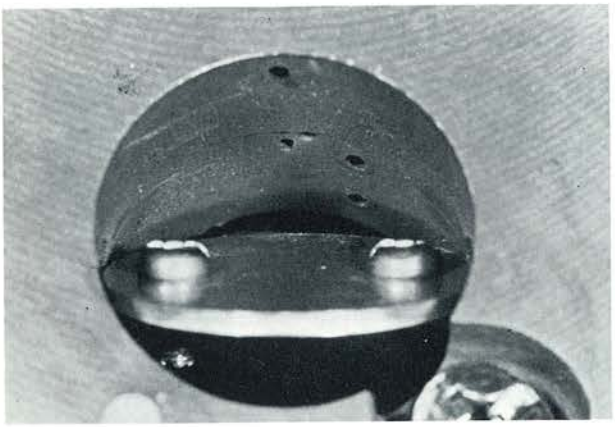


The fuel flows from the float bowl through the main jet and slow jet. The slow jet includes emulsion holes.



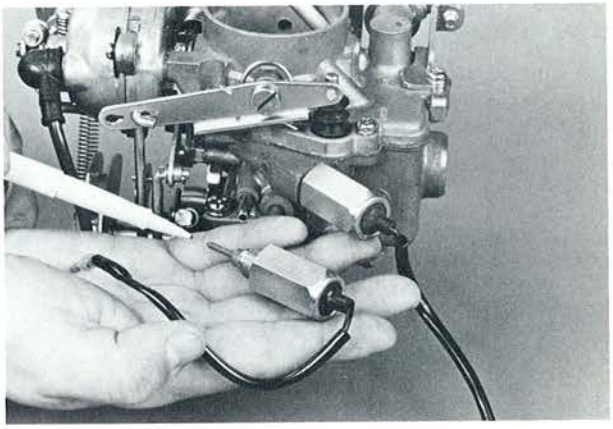
In the slow jet fuel mixes with air coming in through the economizer bleed. This mixture of air and fuel is called an emulsion.

The emulsion is pulled up past the anti-dieseling valve and mixes with more air from the slow air bleed. This mixture is then pulled down and out the by-pass holes and the idle discharge hole.



Bypass Holes Provide Smooth Transition

The bypass holes are needed in the circuit to provide a smooth transition of fuel. As the throttle opens further and further, the main circuit finally takes over and fuel is flowing through the main nozzle. When the throttle opens, the point of greatest vacuum moves from the idle hole, to the bypass holes, and then up to the main nozzle.

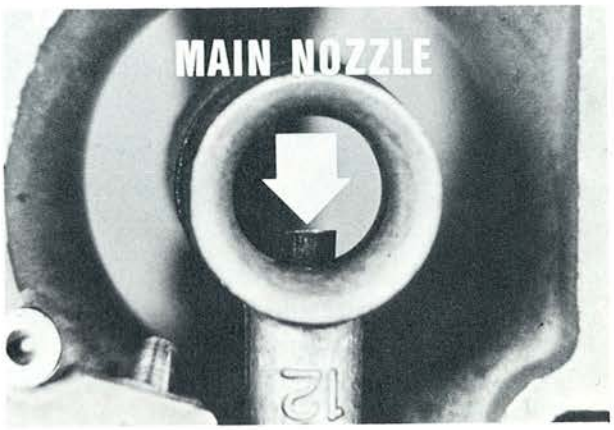


Anti-Dieseling Solenoid Valve

The idle/slow speed circuit includes an anti-dieseling valve to stop engine dieseling, also called "run-on". The anti-dieseling valve opens whenever the ignition switch is on. The valve must be open for the fuel to flow from the slow jet on to the idle and by-pass holes.

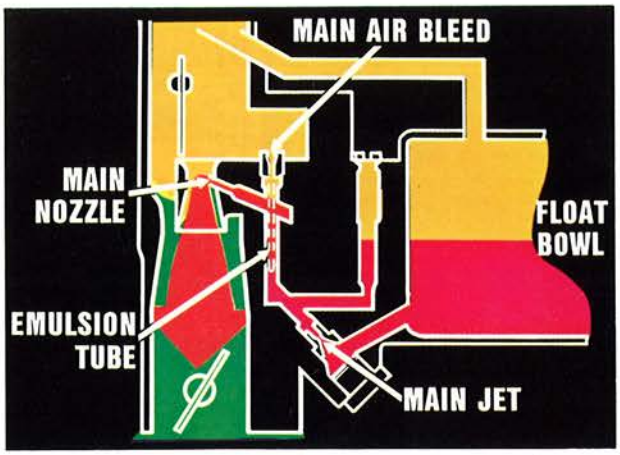
MAIN CIRCUIT

When the throttle opens far enough for vacuum to draw fuel from the main nozzle, the main circuit supplies the fuel.



Vacuum Draws Fuel From Main Nozzle

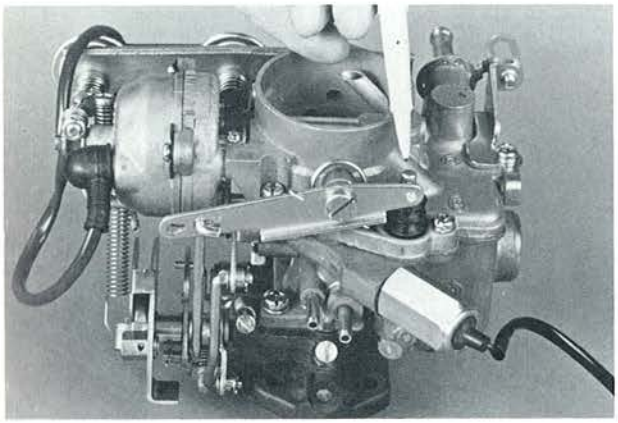
The main nozzle is located in the boost venturi, which is in the center of the large venturi.



Fuel flows from the float bowl through the main jet, emulsion tube, and main nozzle. Air from the main air bleed mixes with the fuel in the emulsion tube to make it burn more easily.

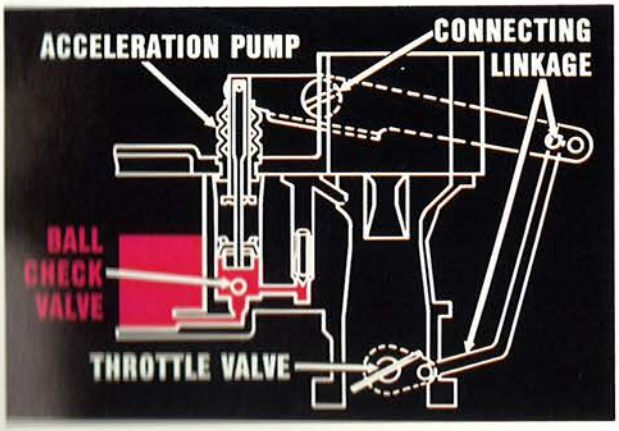
ACCELERATION CIRCUIT

The main circuit handles fuel flow needed for normal-speed driving. For quickly speeding up to a higher speed, however, an acceleration circuit is used in addition to the main circuit.

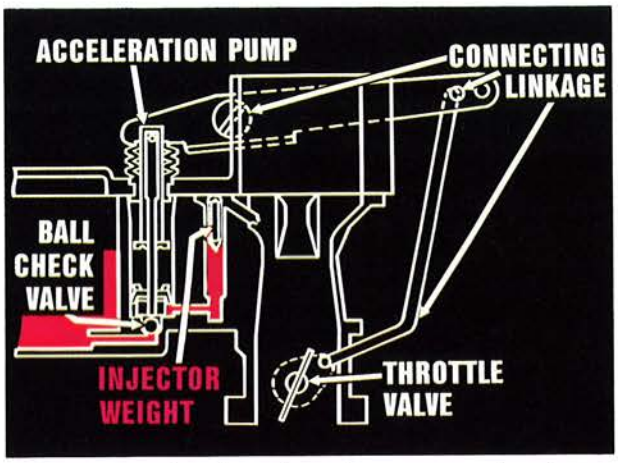


Acceleration Pump

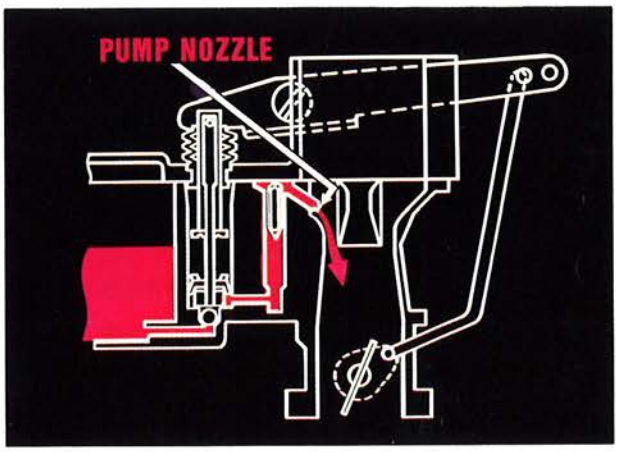
The external parts of the acceleration circuit are the acceleration pump and connecting linkage to throttle.



Whenever the throttle valve closes, the piston moves up, and lets fuel from the float bowl enter the pump cylinder through a ball check valve.



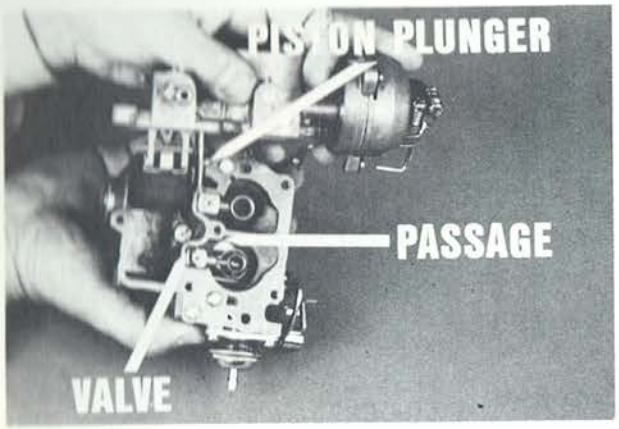
Whenever the throttle valve opens, the piston moves down. This closes the ball check valve, and pushes down on the fuel in the pump cylinder, lifting the injector weight.



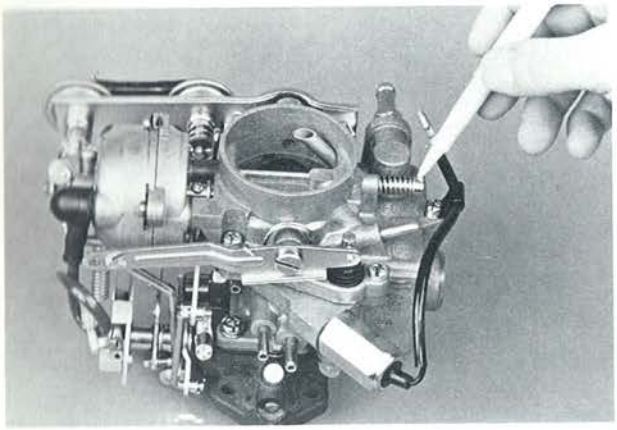
This fuel then goes out the pump nozzle into the large venturi, and provides a richer mixture than the main system by itself.

POWER CIRCUIT

During low-speed driving under heavy load, the short burst of fuel from the acceleration circuit may not be enough to overcome the load. In this case, the power circuit comes into play.

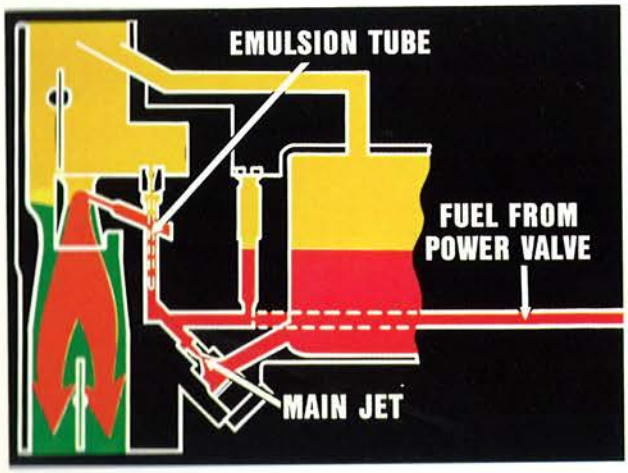


Main Parts of Power Circuit

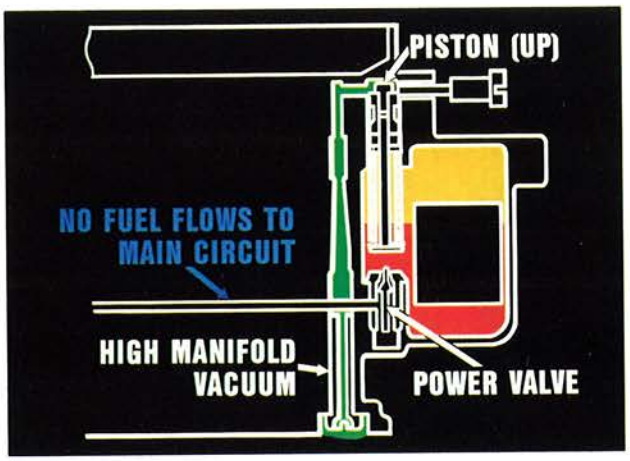


Enrichment Screw on High Altitude Models

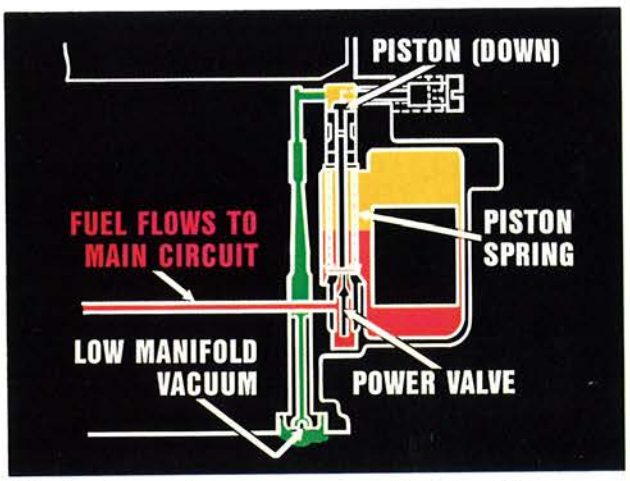
The main parts of the power circuit are the power valve, vacuum passage, piston plunger assembly, main nozzle, and, on some models, fuel enrichment screw.



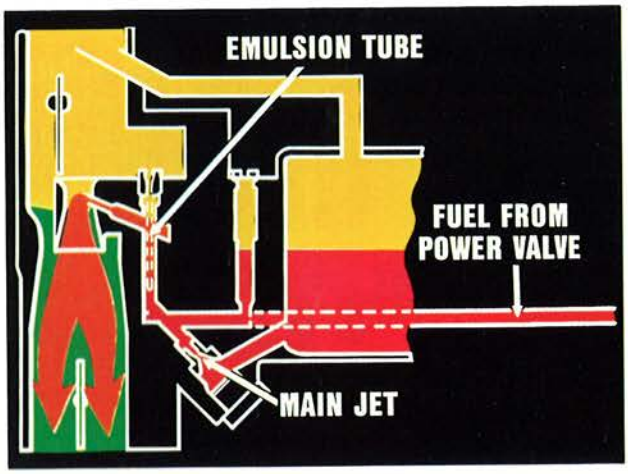
The power circuit increases the flow of fuel, but it does not have a separate nozzle as the acceleration circuit does. The power valve, located in the bottom of the float bowl, feeds fuel into the main circuit between the main jet and emulsion tube.



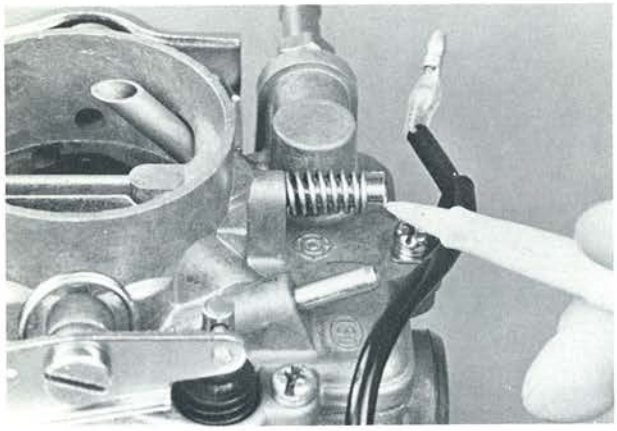
Fuel flow is controlled by the power valve. The power valve is operated by manifold vacuum through the piston. The valve and piston are shown above in the up (closed) position. During low-speed light load driving, the manifold vacuum is high because the throttle valve is not open very far. This vacuum pulls the piston up and keeps the spring-loaded power valve closed.



Under heavy load, however, the throttle opens wider and manifold vacuum drops. This allows the piston spring to push the piston down, and the power valve opens.

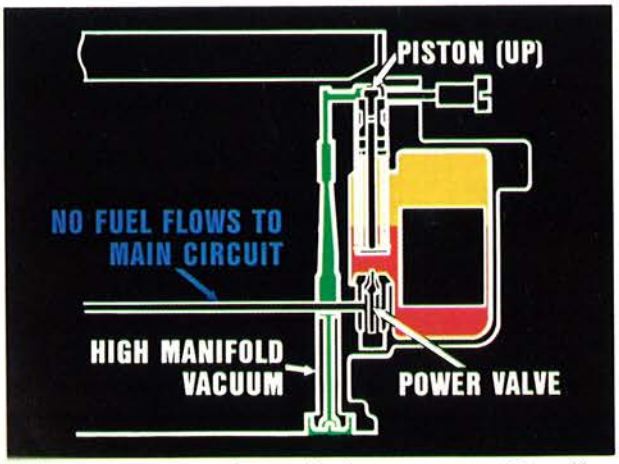


Extra fuel now flows through the power valve, and joins fuel coming from the main jet as it enters the emulsion tube.

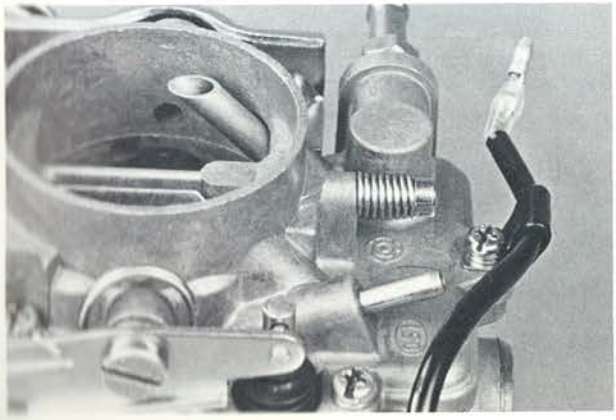


Fuel Enrichment Screw

On high altitude model carburetors, a fuel enrichment screw is included in the power circuit.



When the screw is set in its outer position (for high altitude), it does not interfere with the operation of the power valve.



Screw Holds Power Valve Open

If the car is then driven to a low altitude area, however, it can be "turned in" until it seats. In that position, it will keep the power-valve piston lowered, and the circuit will constantly supply fuel to the main system.

PRIMARY SIDE

- CHOKE CIRCUIT
- IDLE/SLOW SPEED CIRCUIT
- MAIN CIRCUIT
- ACCELERATION CIRCUIT
- POWER CIRCUIT

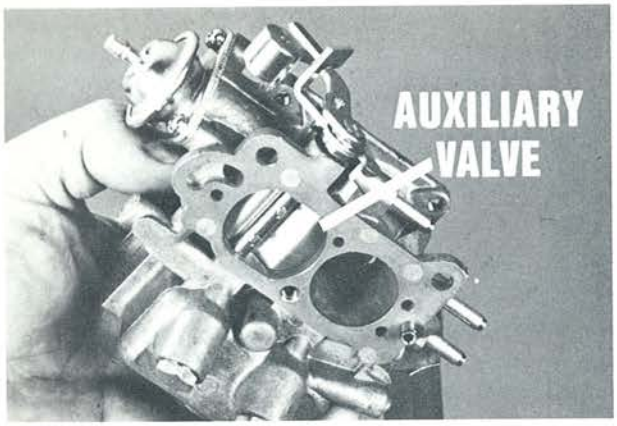
These five circuits of the primary side allow the carburetor to maintain the ideal air-to-fuel ratio in all cases except high-speed driving.

AUXILIARY VALVE

SECONDARY SIDE

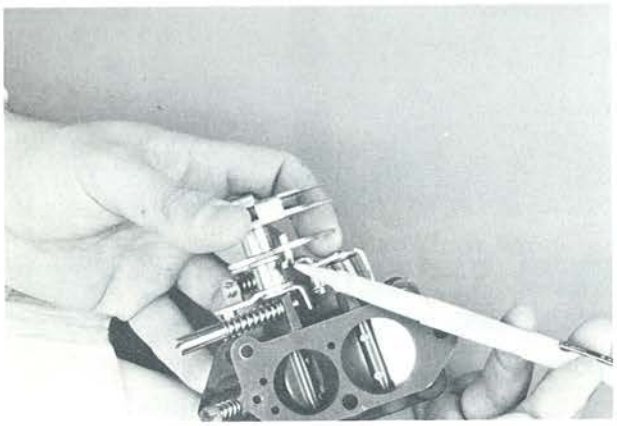
- AUXILIARY VALVE
- SECONDARY SLOW CIRCUIT
- SECONDARY MAIN CIRCUIT

During high-speed driving, fuel is also supplied through the secondary side. The secondary side uses three circuits: auxiliary, secondary slow, and secondary main. These control air and fuel flow through the secondary throat.



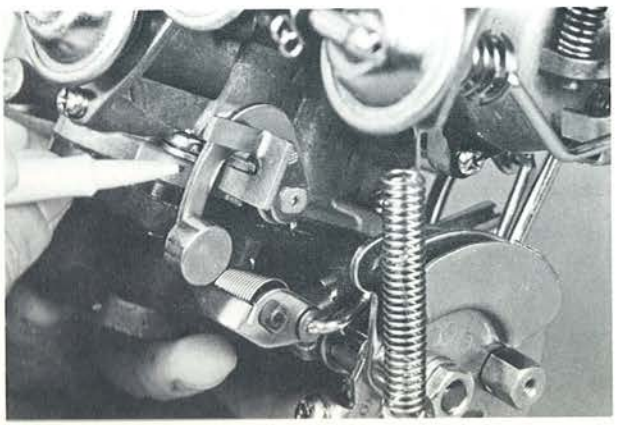
Closed Valve Prevents Air Flow

The auxiliary valve's purpose is to stop air flow through the secondary throat during low-speed operation. This forces all of the air through the primary throat and maintains proper vacuum there.



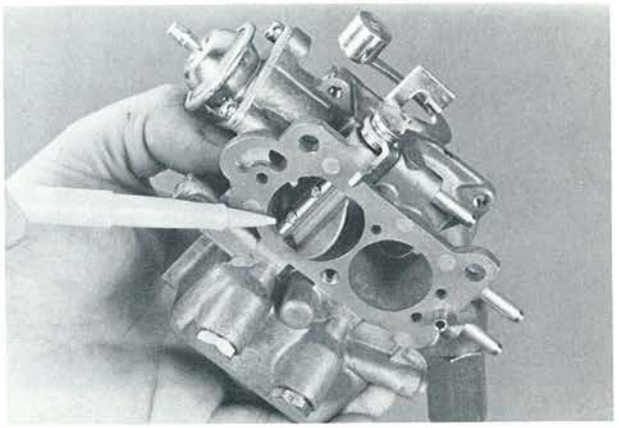
Throttle Valves Are Interlocked

The throttle valves of both throats are mechanically interlocked. This means that the secondary throttle valve may sometimes open due to its link with the primary throttle valve, but be unable to supply fuel because the auxiliary valve prevents air flow.



Counter Weights Hold Valve Closed

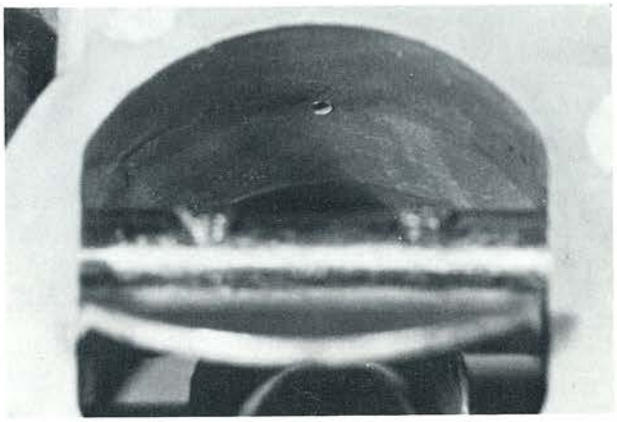
The auxiliary valve is attached through its shaft to two counterweights, shown above. These weights keep the valve closed at low speeds.



Vacuum At High Speed Opens Valve

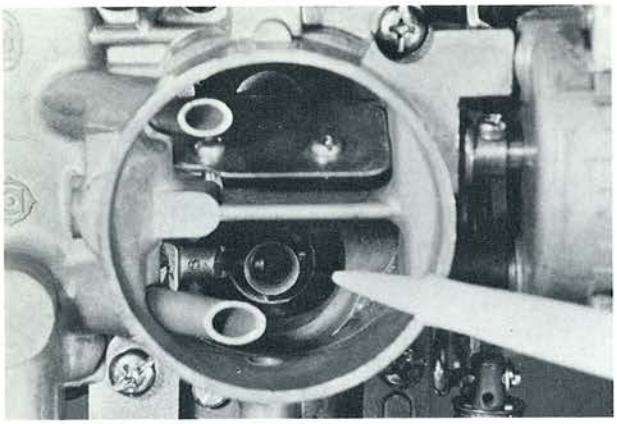
As engine speed increases, however, and both throttle valves are open wide, the manifold vacuum becomes so strong that the auxiliary valve is pulled open in spite of the counterweights.

SECONDARY SLOW CIRCUIT



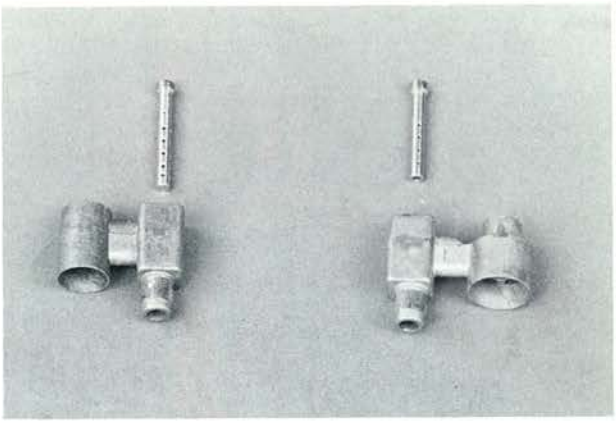
Secondary Slow Hole Above Auxiliary Valve

As the auxiliary valve begins to open, the secondary slow circuit supplies fuel through the secondary slow hole near the valve.



Secondary Slow Hole Provides Transition

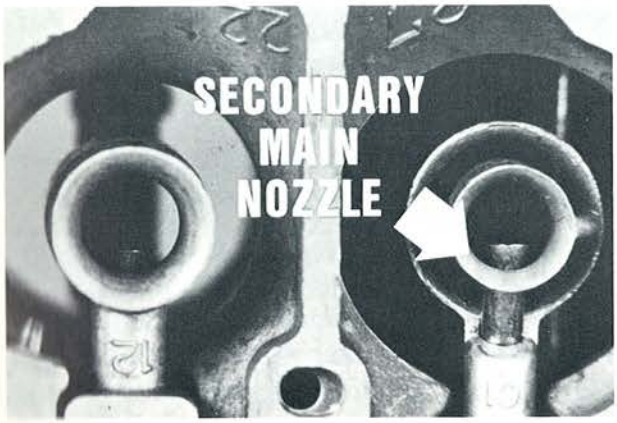
This secondary slow circuit is much like the slow circuit on the primary side, and smooths out the change in engine power caused by feeding fuel through the secondary throat.



Emulsion Tubes With Boost Venturis

The secondary main circuit works in almost the same way as the primary main circuit, although there is a slight difference in their emulsion tubes. These three circuits complete the secondary side.

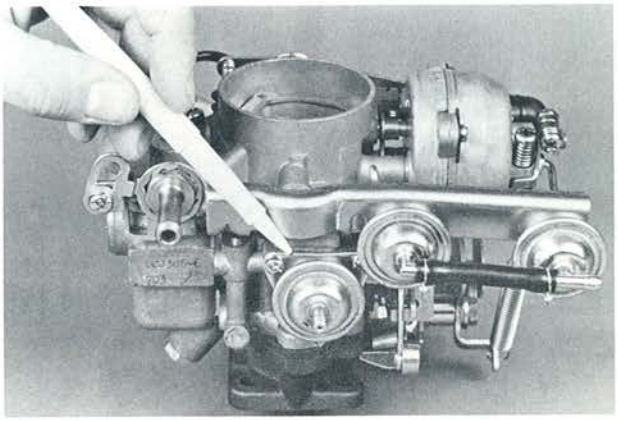
SECONDARY MAIN CIRCUIT



Vacuum Draws Fuel From Secondary Main Nozzle

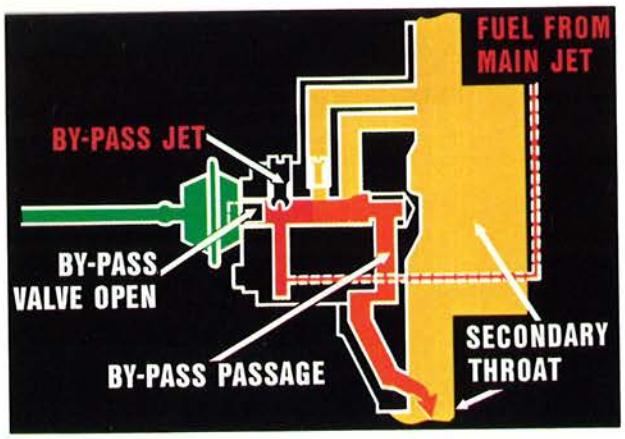
When the auxiliary valve is pulled open further, the secondary main circuit supplies fuel through the secondary main nozzle. This is located in the boost venturi of the secondary throat.

COASTING BY-PASS SYSTEM

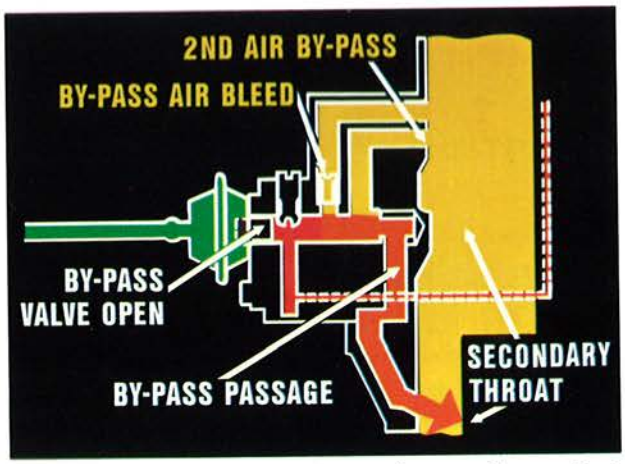


Servo-Diaphragm

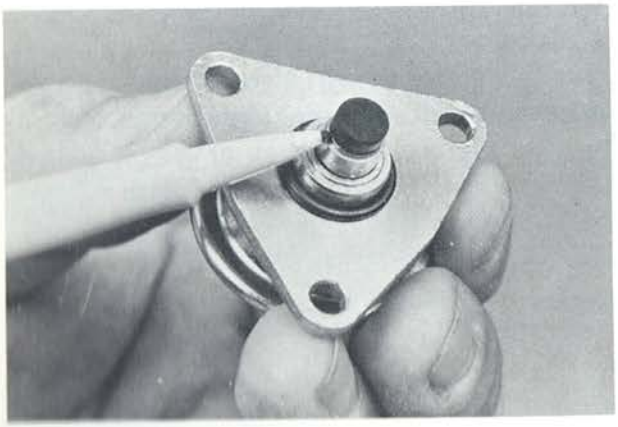
This carburetor design also includes a servo-diaphragm and other elements of the coasting by-pass system. This is an emission control system which provides a lean air-fuel mixture to the engine when the car is decelerating, and the primary throttle valve is closed.



When the car is decelerating, the by-pass valve opens. Fuel from the float bowl is pulled through the main jet, by-pass jet, and by-pass passage into the secondary throat and intake manifold.

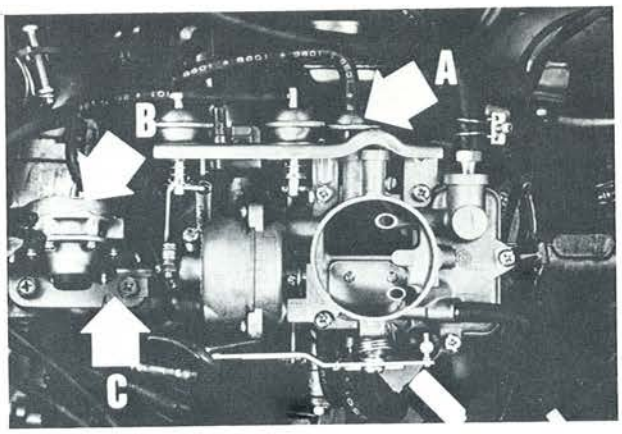


Air from the secondary throat is pulled through the by-pass air bleed, and 2nd air by-pass. This air mixes with the fuel in the by-pass passage.



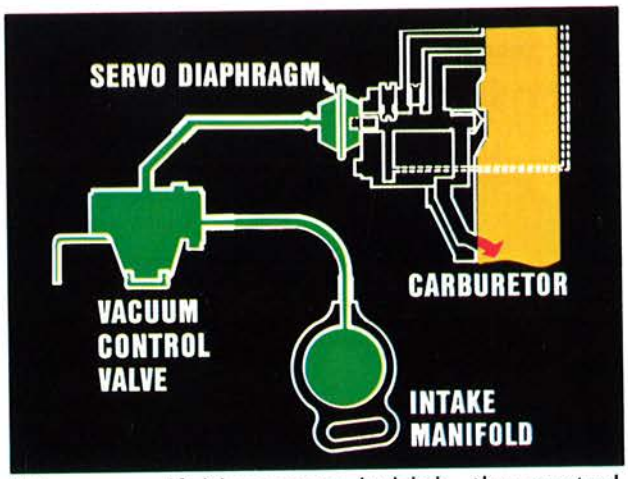
By-Pass Valve

This flow of air-fuel mixture is turned on or off by the action of the by-pass valve, which is part of the servo- diaphragm.



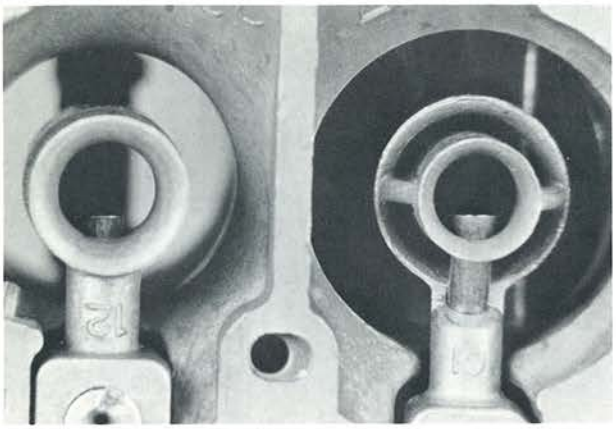
Coasting By-Pass System Parts

The servo-diaphragm "A" is connected by a vacuum hose to the vacuum control valve, "B" which in turn is connected to the intake manifold "C".



When manifold vacuum is high, the control valve operates. Vacuum is applied to the servo diaphragm. The diaphragm opens the by-pass valve, and the by-pass system supplies air-fuel mixture to the engine.

SUMMARY



To summarize, the Subaru carburetor maintains the proper air-to-fuel ratio by mixing air and gas within two throats.

PRIMARY SIDE

- CHOKE CIRCUIT
- IDLE/SLOW SPEED CIRCUIT
- MAIN CIRCUIT
- ACCELERATION CIRCUIT
- POWER CIRCUIT

The primary side uses a total of five circuits to supply fuel to the engine: the choke circuit, idle/slow speed circuit, main circuit, acceleration circuit, and power circuit.

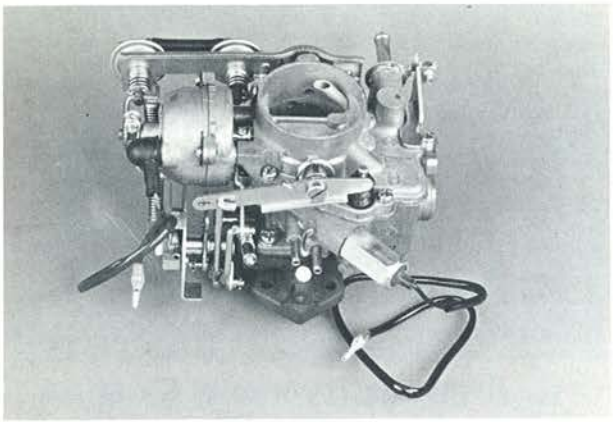
SECONDARY SIDE

- AUXILIARY VALVE
- SECONDARY SLOW CIRCUIT
- SECONDARY MAIN CIRCUIT

The secondary side uses a total of three circuits to supply fuel during high speed driving: the auxiliary circuit, secondary slow circuit, and secondary main circuit.

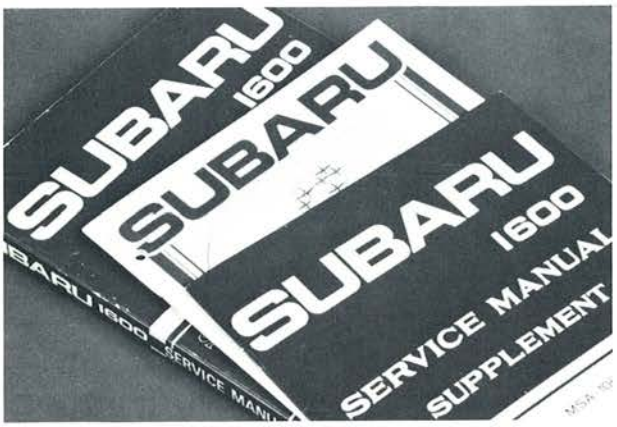
The carburetor design also includes a single float bowl, and a coasting-bypass system for exhaust emissions control.

INTRODUCTION



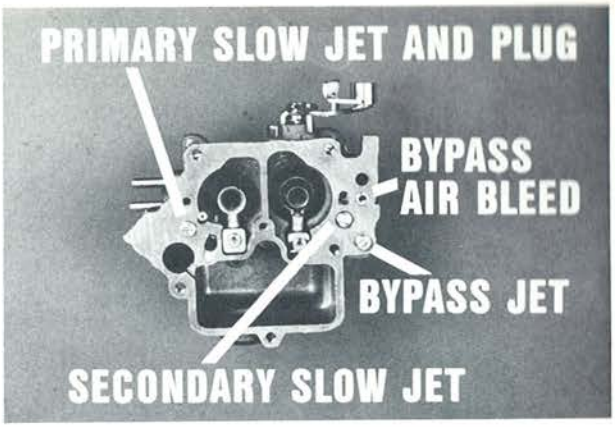
Carburetor Ready For Disassembly

This section reviews carburetor servicing, including disassembly, inspection, reassembly, adjustments, reinstallation, and trouble-shooting hints. Begin disassembly by loosening the radiator cap, and removing the carburetor from the car.



Check Specifications In Service Documents

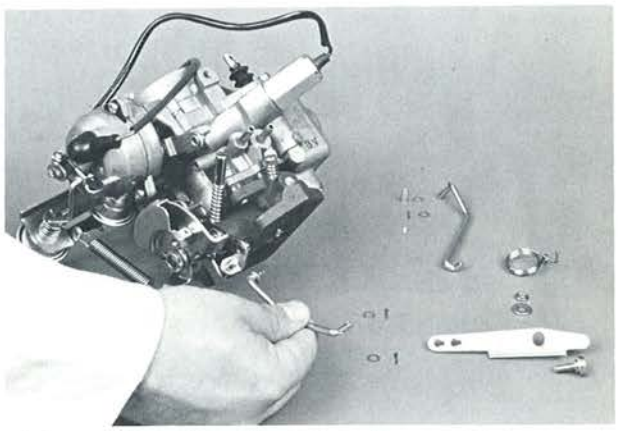
While overhauling all carburetor components, you must refer to the Subaru Service Manual, applicable Service Bulletins, and the Program Retention Booklet. These documents list all tolerances, specifications, testing procedures, and adjustments.



Check Component Locations Carefully

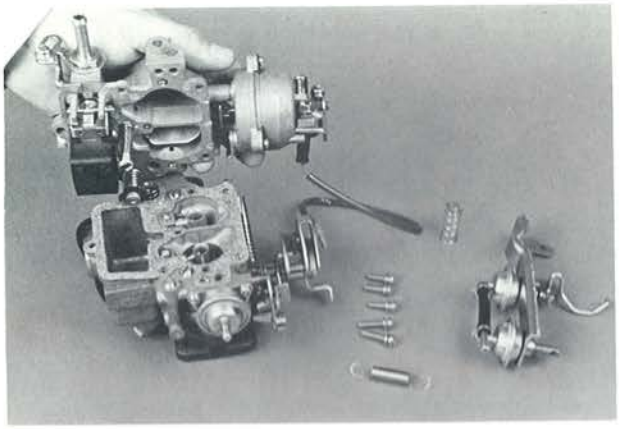
Pay close attention to all component locations and sizes as you remove them, because many of them are very similar. It is very important to reassemble the parts in the proper order and location. The float chamber is a good example of this problem.

DISASSEMBLY



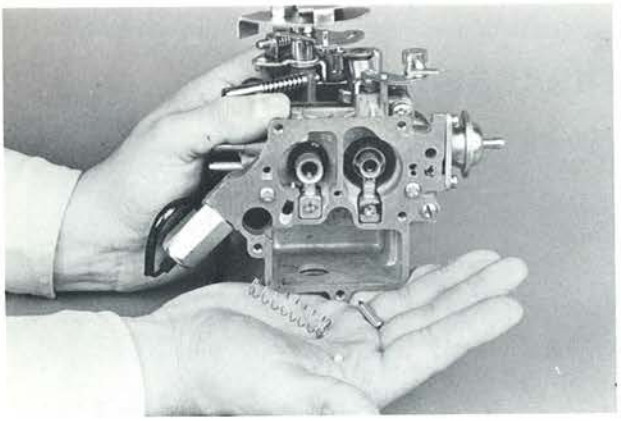
Removing Acceleration-Pump Linkages

Now start disassembly of the carburetor itself by removing the throttle and acceleration-pump linkages.



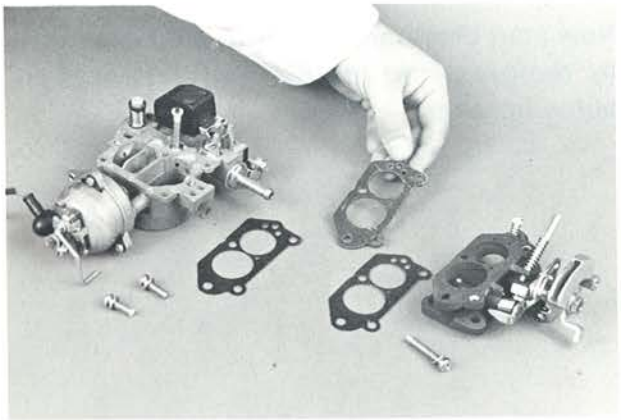
Separating Choke Chamber From Float Chamber

Next remove the throttle return spring. Take off the choke bracket assembly and choke chamber, being careful not to damage the float.



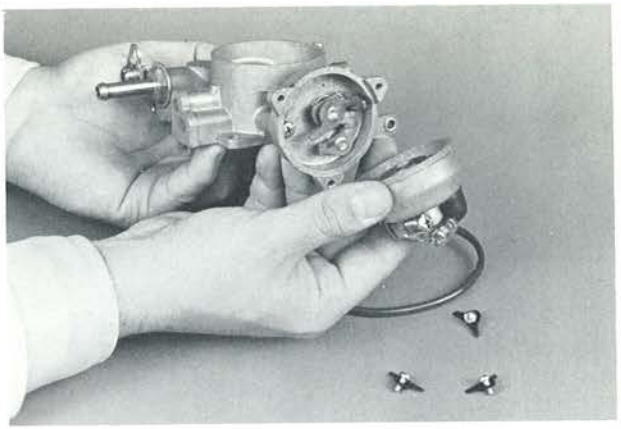
Removing Spring, Ball And Weight

Remove the acceleration-pump parts from the float chamber.



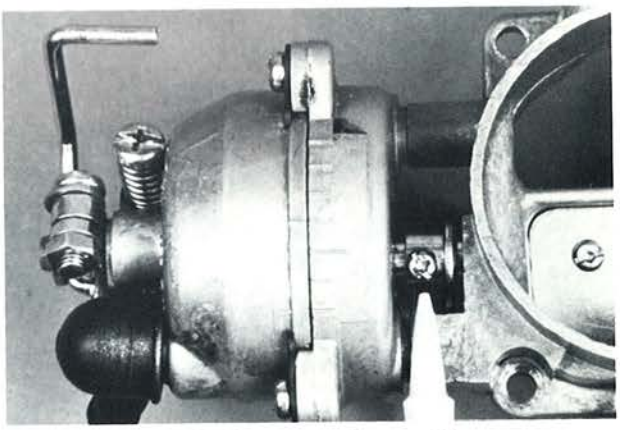
Separating Float And Throttle Chambers

Separate the float chamber and throttle chamber.



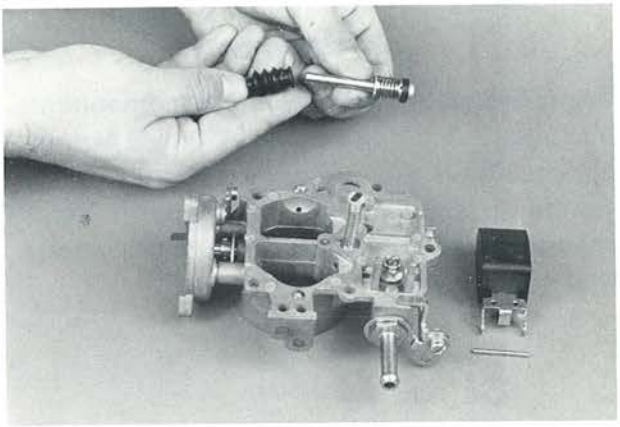
Removing Thermostat Cover

Now take the choke chamber apart. Begin by removing the thermostat cover.

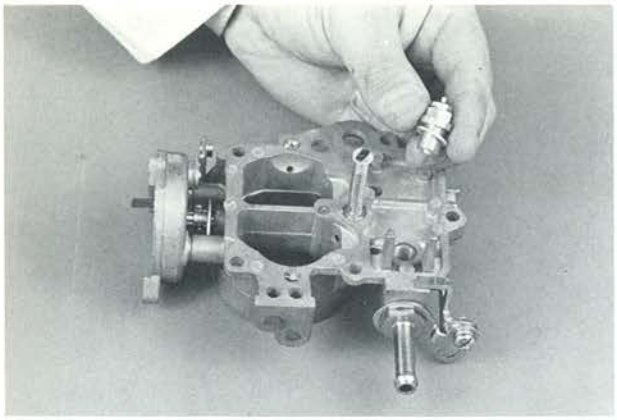


DO NOT Loosen 3mm Screw

Be careful not to loosen the 3mm screw, which attaches the choke lever onto the shaft. Remove the thermostat cover by removing the 4mm screws *only*.

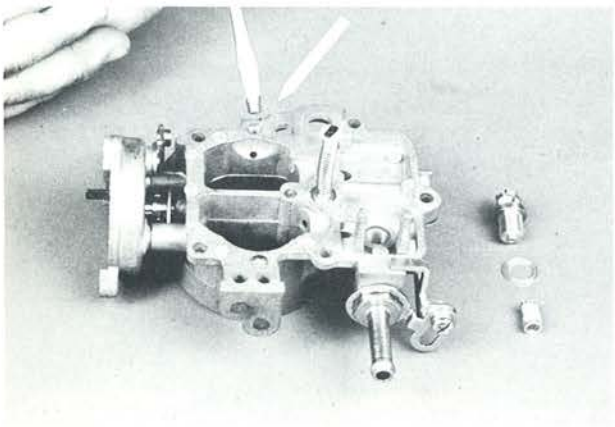


Removing Acceleration Piston And Float

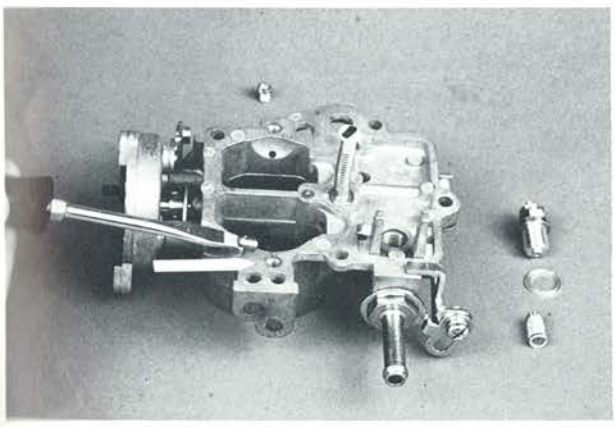


Removing Needle Valve And Washer

Also remove the acceleration piston, float, and needle valve and 10mm washer. The needle valve also has a screen filter, but it can be left installed, and should not be forced out.

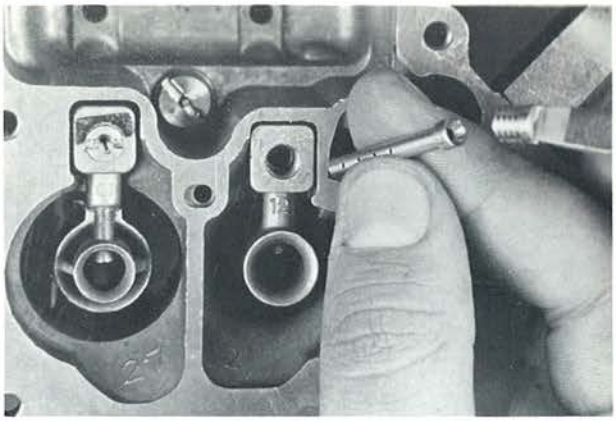


Removing Primary Slow Air Bleed

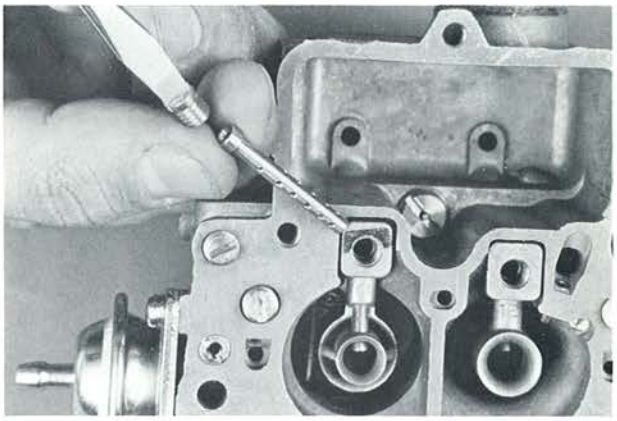


Removing Secondary Slow Air Bleed

Also, remove the primary slow air bleed, and secondary slow air bleed.

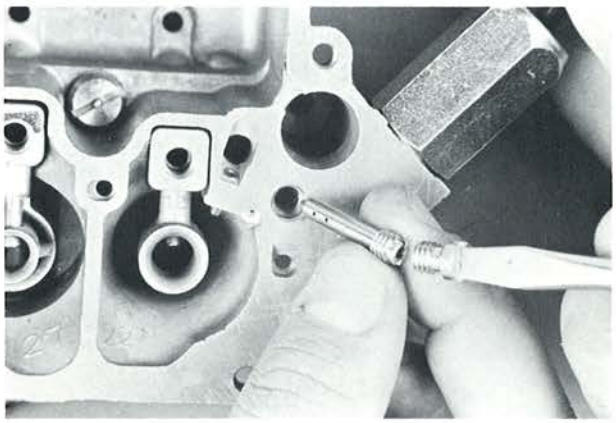


Removing Primary Main Air Bleed And Tube

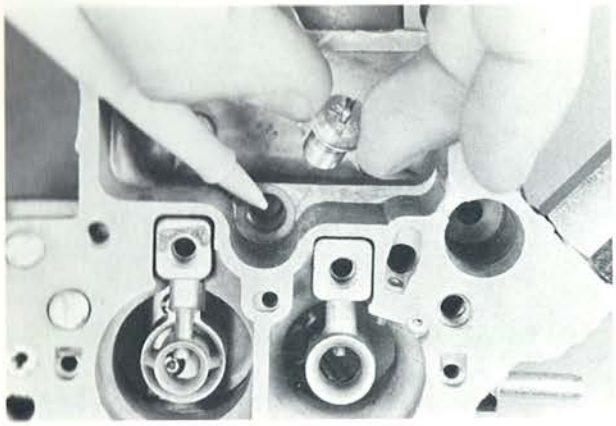


Removing Secondary Main Air Bleed And Tube

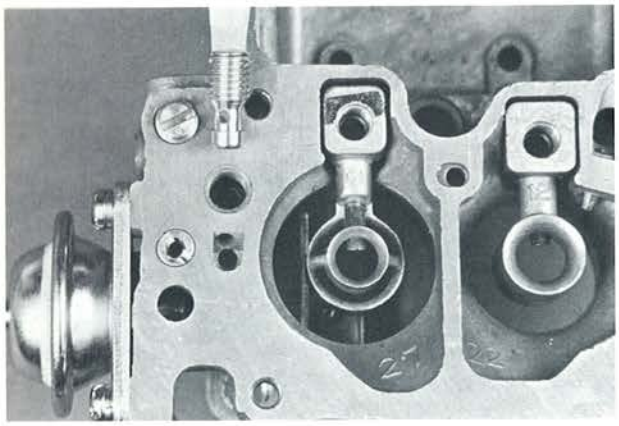
Remove the primary main air bleed and emulsion tube, and secondary main air bleed, and emulsion tube.



Removing Primary Slow Jet And Plug

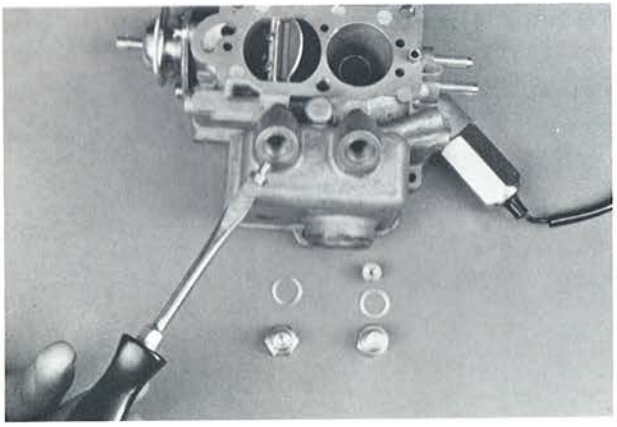


Removing Power Valve

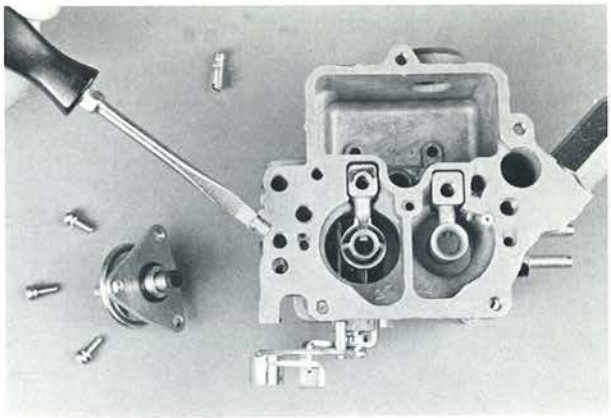


Removing Secondary Slow Jet

Remove the primary slow jet and plug, power valve, and secondary slow jet.

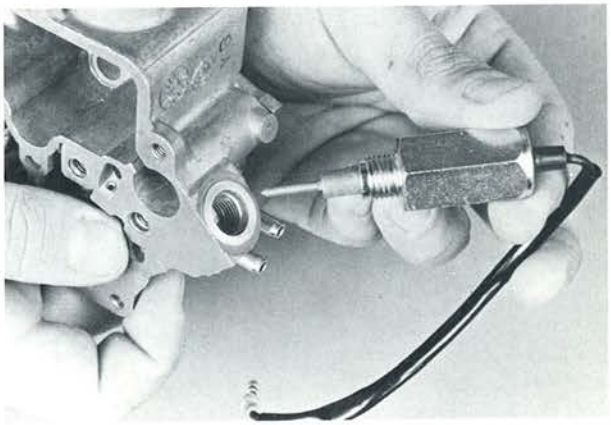


Removing Secondary Main Jet



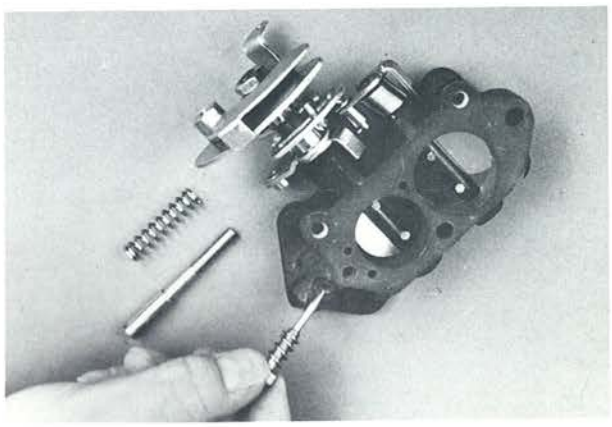
Removing By-Pass Air Bleed

Also take out the drain plugs and main jets, and the servo diaphragm, by-pass jet, and by-pass air bleed.



Removing Solenoid And Valve

Finally, remove the anti-dieseling solenoid, valve, and washer.



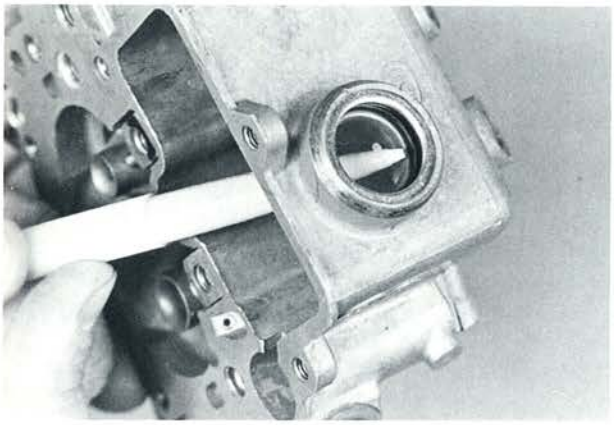
Removing Idle Adjusting Screw

Finish disassembly by removing the throttle and idle adjusting screws.

INSPECTION

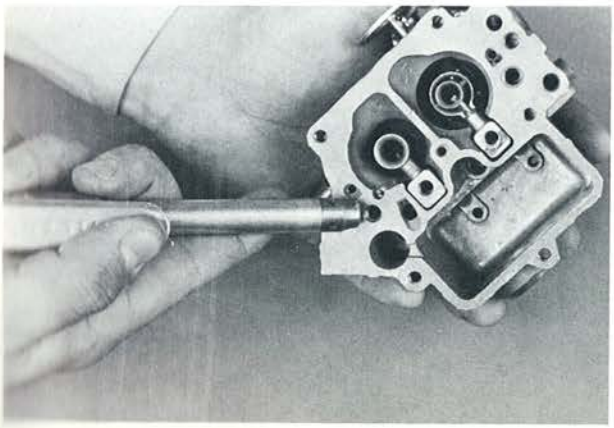
Solvent Can Damage These Parts

Carefully follow inspection procedures for the disassembled parts. Do not soak any plastic, rubber, or electrical parts, or any of the vacuum diaphragms. Soak all other parts in carburetor solvent before inspection. Clean the parts with water after soaking.



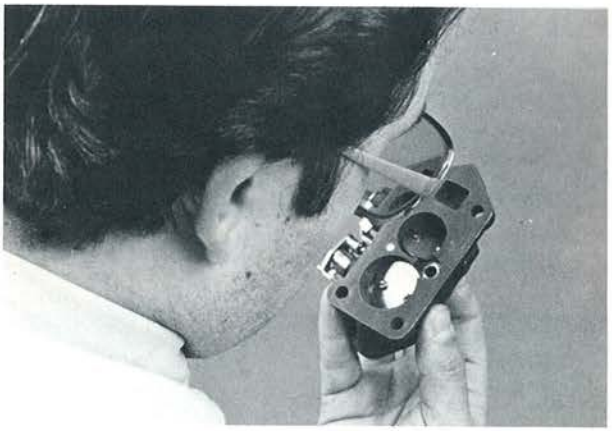
Do Not Loosen Sight Glass

Do not soak the carburetor body for prolonged periods, or you may loosen the sight glass.



Clean With Compressed Air

Small holes and hollows such as fuel passages must be blown with compressed air to remove sediment. Do not damage these passages by using drills or wires to clean them.

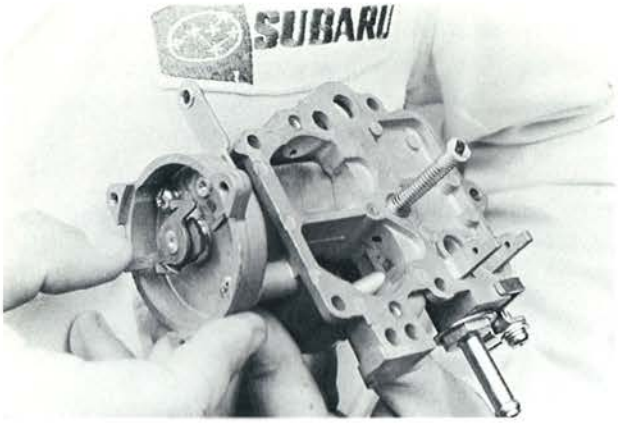


Inspecting Throttle Chamber

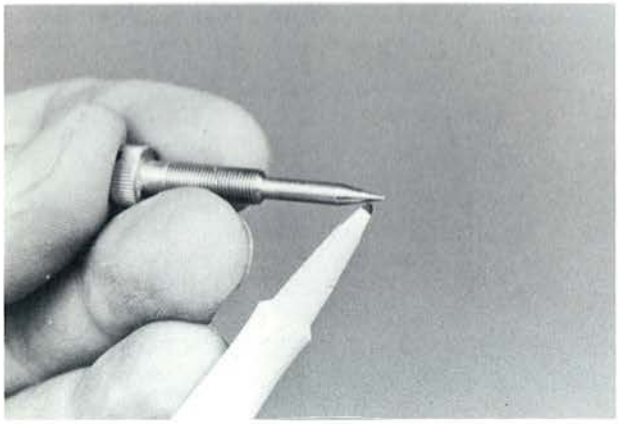
Now inspect all of the disassembled parts for damage or wear. Pay special attention to mating surfaces, contact areas, and threads.

Inspecting Body And Choke Housing

Checking For Wear On Throttle Shaft



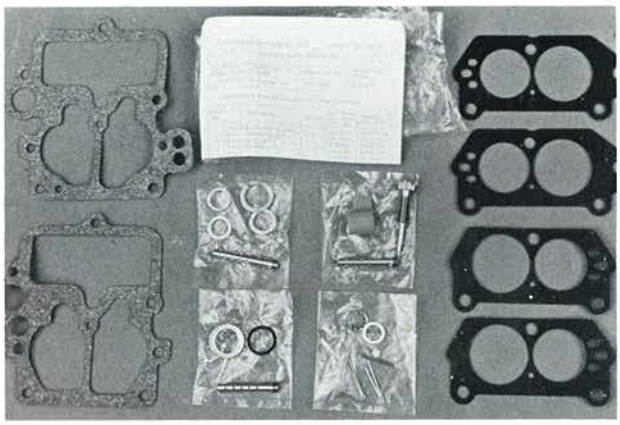
Checking For Free Movement



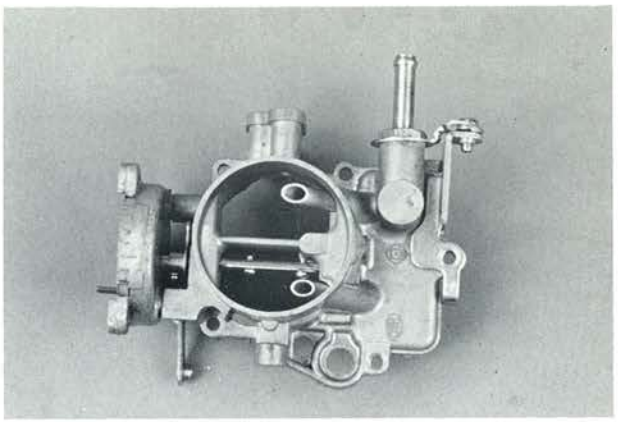
Idle Adjusting Screw

Look carefully for cracks on the body and choke housing. Check for wear on the throttle and choke shafts. Check that all moving parts can still move freely. Look for damage on the tip of the idle adjusting screw.

REASSEMBLY

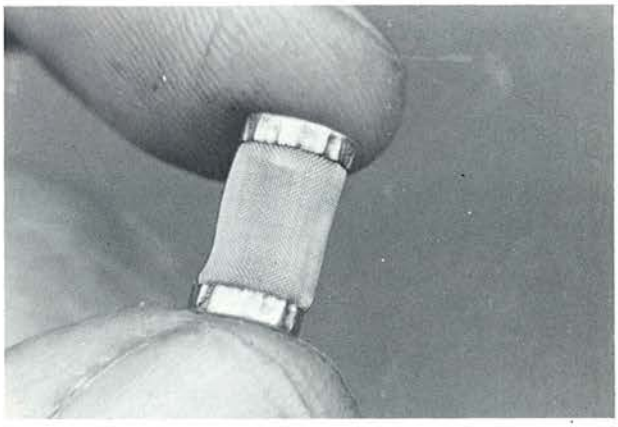


Overhaul Kit



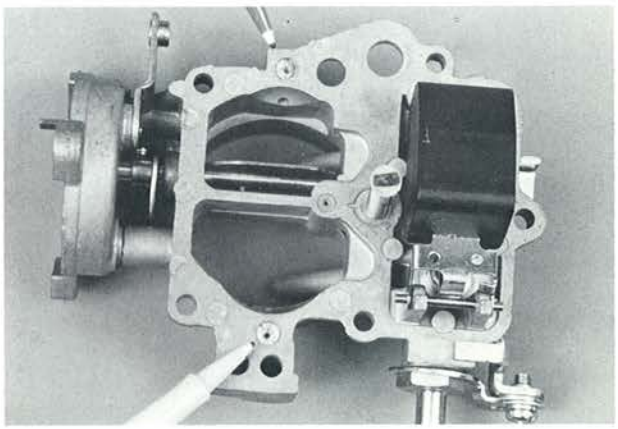
Choke Chamber

Now reassemble the carburetor. Be sure to use a Subaru Carburetor Overhaul Kit. Check your Shop Manual and Retention Booklet for the proper size and location of jets and air bleeds. Start with the choke chamber.



Needle Valve Filter

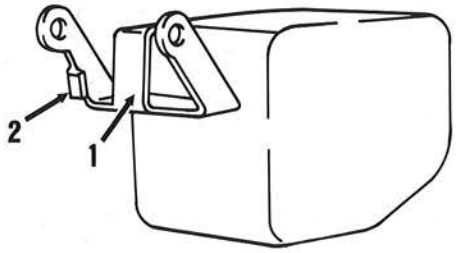
Check that the needle valve filter is still firmly in place. If it was removed earlier, replace it before you reinstall the needle valve and seat.



Don't Mix Up Slow Air Bleeds

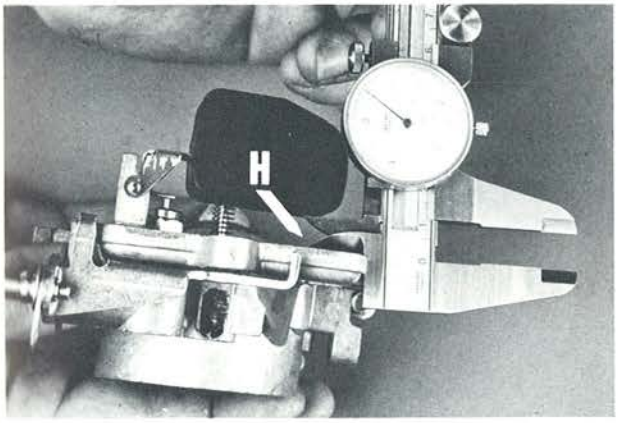
Now install the primary slow air bleed (shown above at top), secondary slow air bleed (shown above at bottom), the needle valve with the 10mm washer, and the float with the float shaft.

FLOAT ADJUSTMENTS



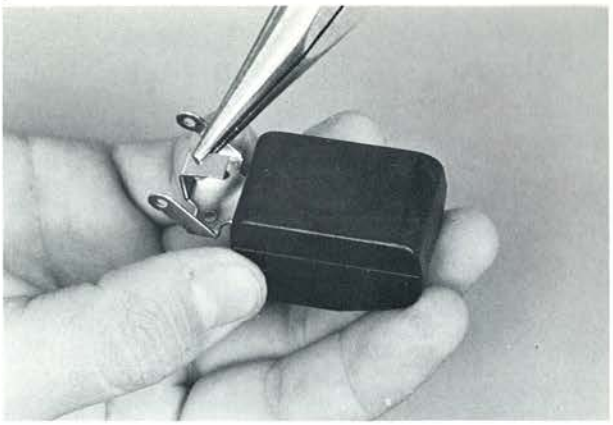
1. FLOAT SEAT **2. FLOAT STOPPER**

Check the float adjustments, and correct them if necessary. These adjustments set float level and float drop, also called valve stroke. You can change float level and float drop by bending the seat and stopper.



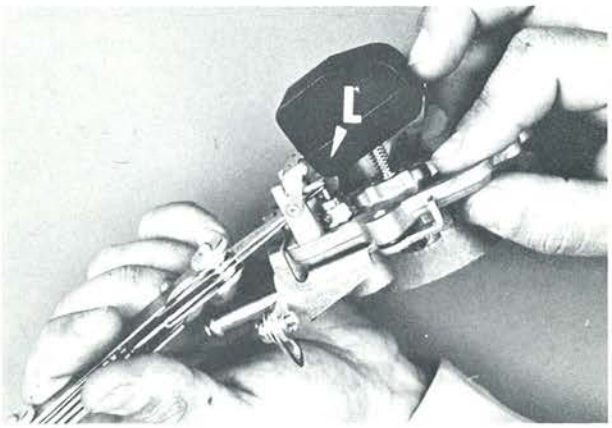
Checking Float Level

To check float level, turn the choke chamber upside down. Measure the distance between the float body and the choke chamber (shown above) with the float seat in contact with the valve stem. This is clearance H. Check your Service Manual for the correct measurement.



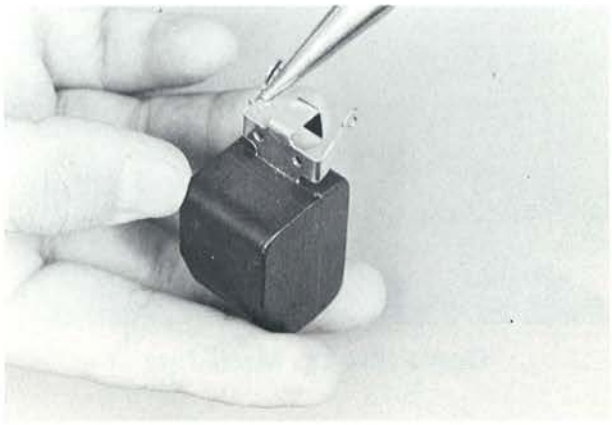
Bending Seat To Change Float Level

If the clearance is not correct, bend the float seat to change the float level, and recheck clearance H.



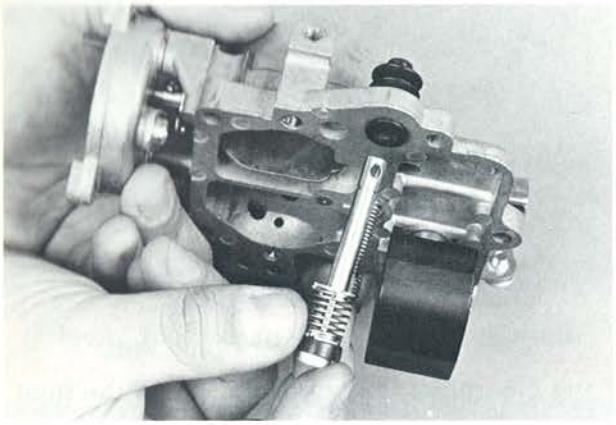
Checking Float Drop

To check float drop (also called valve stroke) lift the float fully and measure the distance between the float seat and valve stem. This is called distance L. Check your Service Manual for the correct clearance.



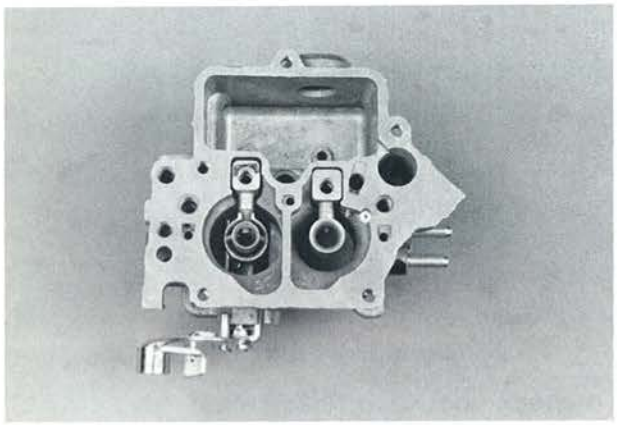
Bending Stopper To Change Float Drop

If the clearance is not in this range, adjust float drop by bending the float stopper.

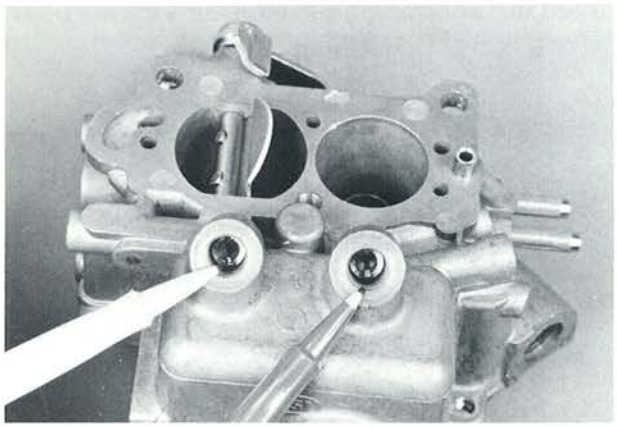


Installing Acceleration-Pump Piston

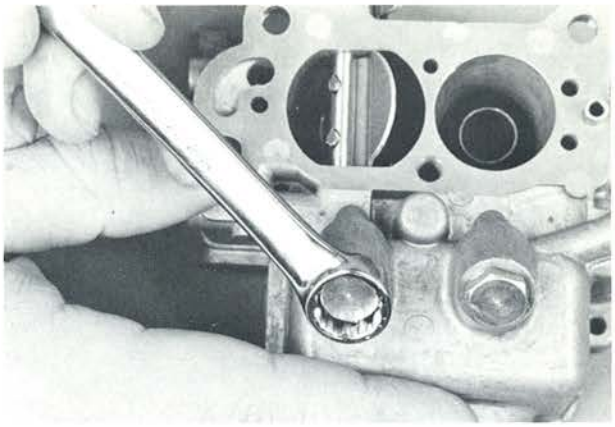
With the float adjustments complete, install the acceleration-pump piston and pump cover.



Float Chamber

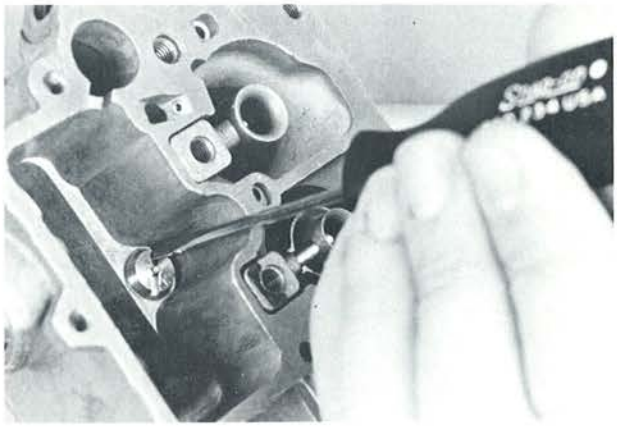


Don't Mix Up Main Jets

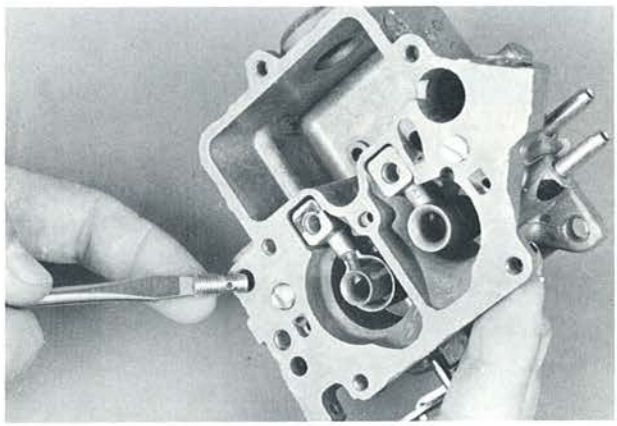


Tightening Secondary Drain Plug

Now reassemble the float chamber. Install the primary and secondary main jets. Make sure you put the proper size jet in its proper location. Then add the float chamber drain plugs with the 9mm washers.

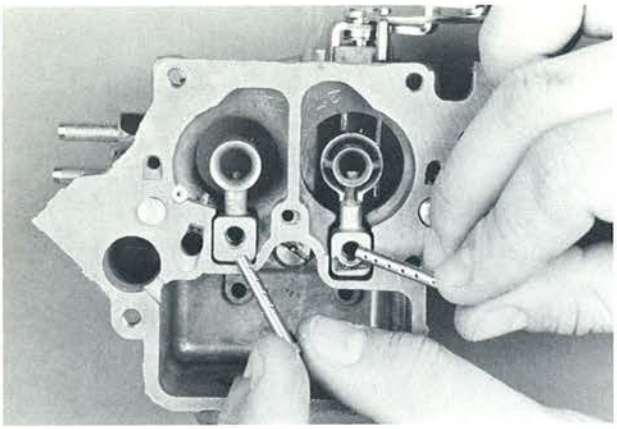


Installing Power Valve



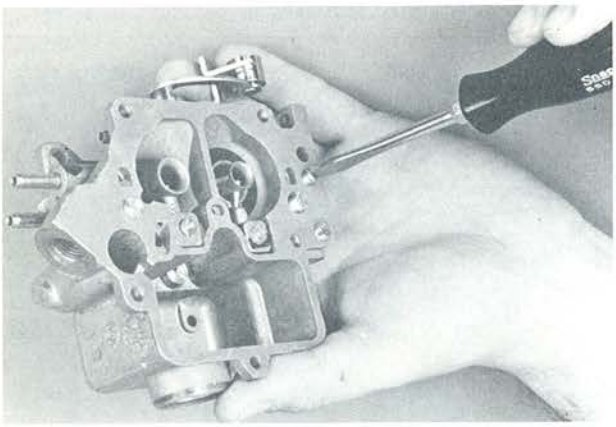
Installing By-Pass Jet

Install the power valve and the 8mm washer. Now install the primary slow jet and slow jet plug, the secondary slow jet, and the by-pass jet.

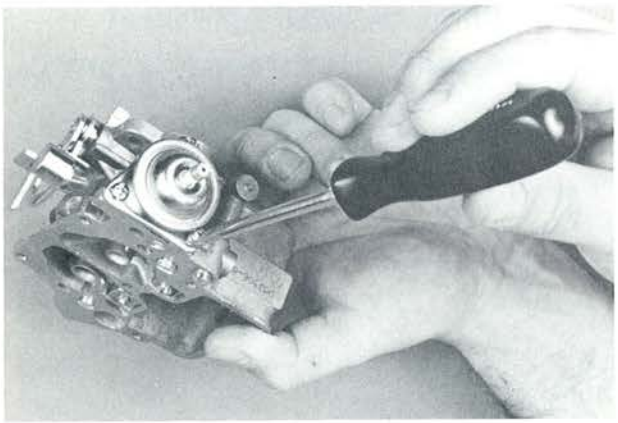


Installing Emulsion Tubes

Install the primary and secondary emulsion tubes. Count the number of holes in each tube to tell them apart.

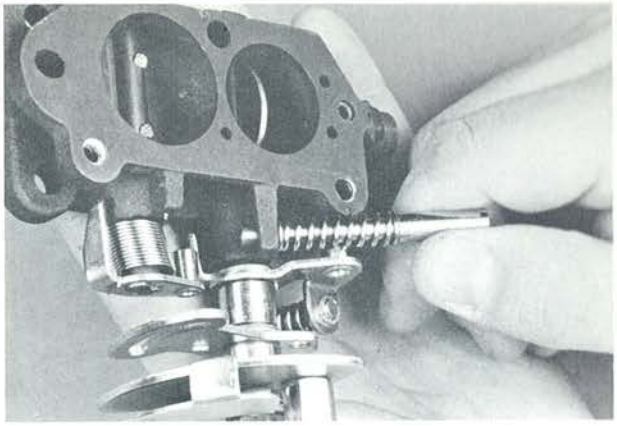


Installing By-Pass Air Bleed

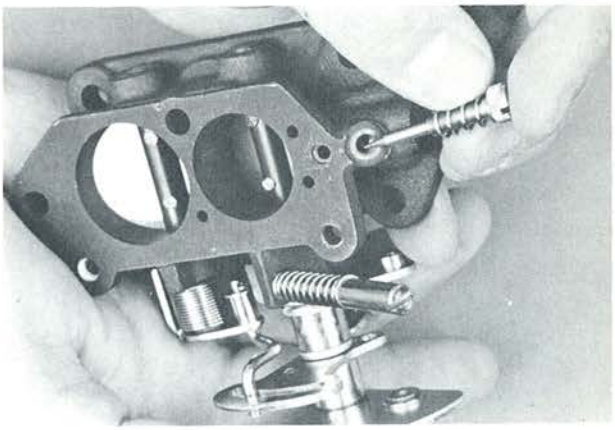


Installing Servo-Diaphragm

Now add the two main air bleeds, and by-pass air bleed. Finally, position the servo diaphragm with the O-ring, three 4mm screws, and spring washers.

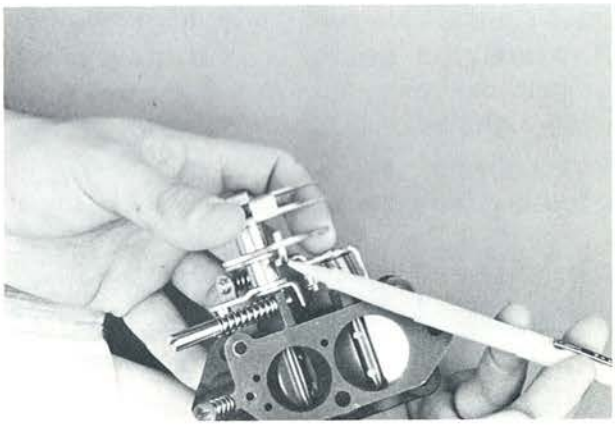


Installing Throttle Screw And Spring

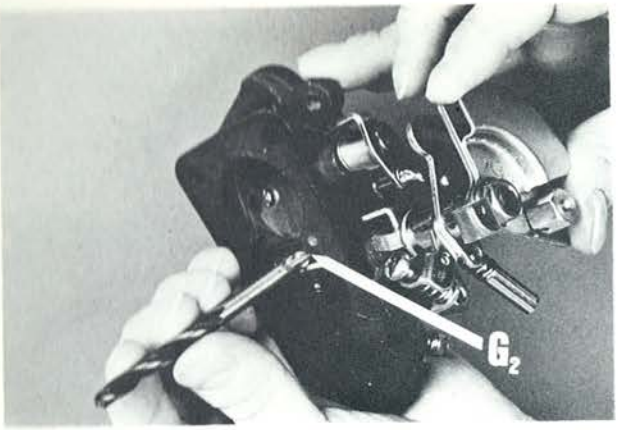


Installing Idle Screw And Spring

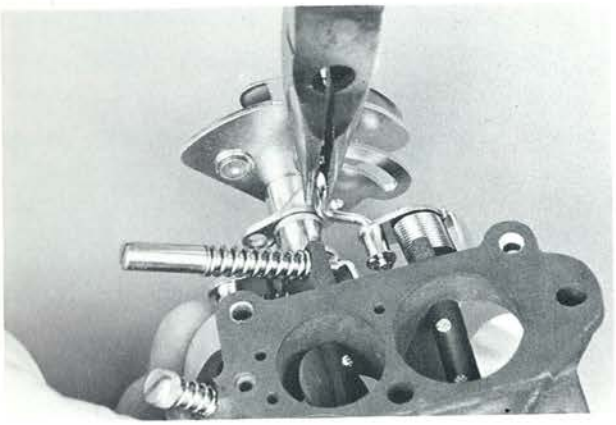
Now begin work on the throttle chamber. Install the throttle adjusting screw and spring. Next, install the idle mixture adjusting screw and spring.



Throttle Interlock Linkage

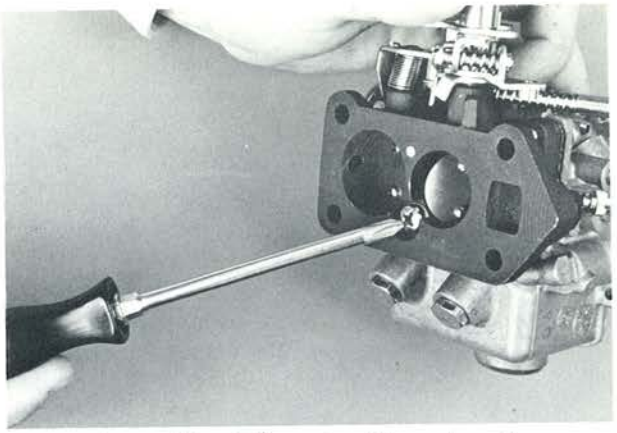


Measure Between Valve And Throat Wall



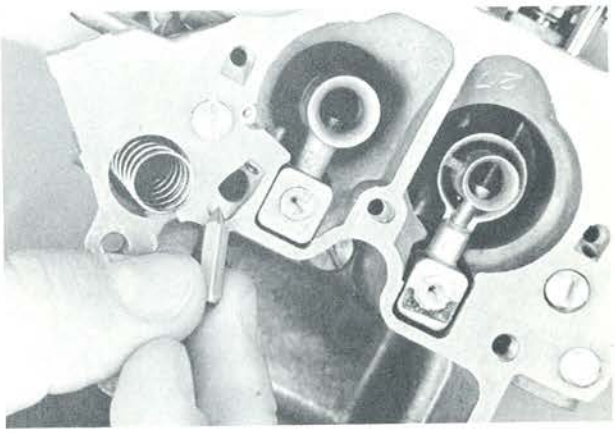
Bending Connecting Linkage

Now you are ready to check interlock of the primary and secondary throttle valves. The secondary throttle valve should start to open when the primary-valve opening angle reaches 47°. At that point you should measure the distance between the primary throttle valve and the throat wall. This is called standard clearance G_2. Use a drill bit or wire gauge. Check your Shop Manual for the correct clearance. Adjust clearance G_2, if necessary, by bending the connecting linkage.

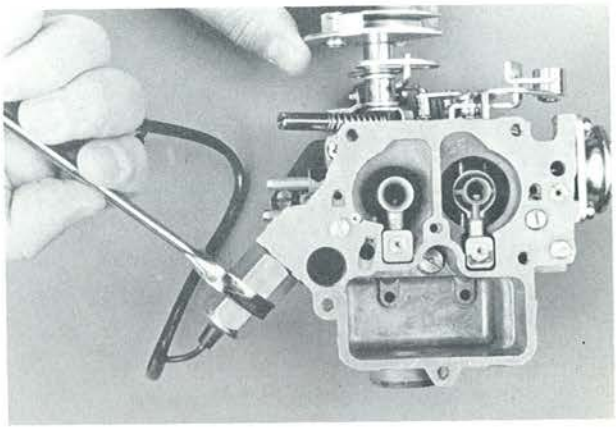


Attaching Throttle Chamber To Choke Chamber

Now put the float chamber and throttle chamber together with the three 6mm screws and washers, placing the insulator and gaskets between the two chambers.

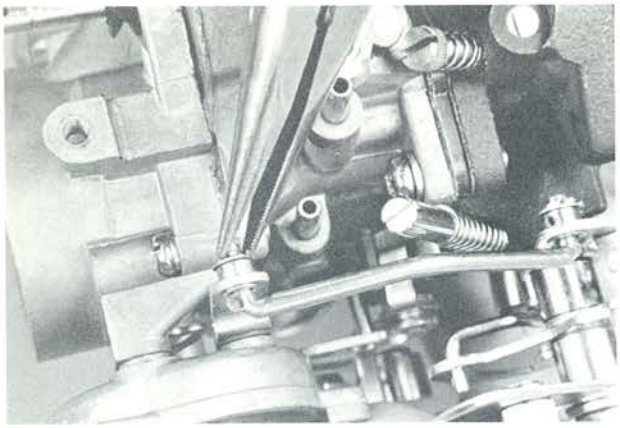


Installing Injector Weight



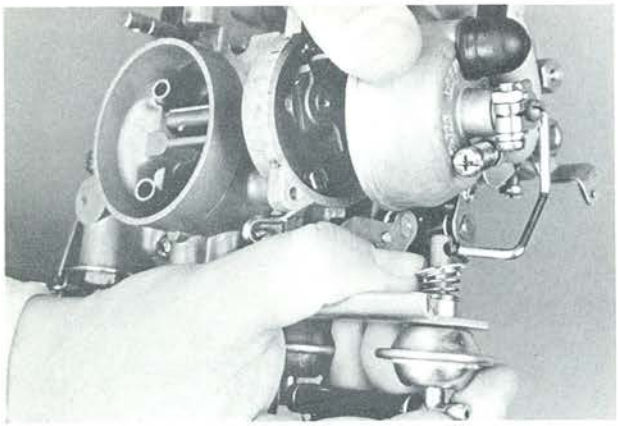
Installing Anti-Dieseling Solenoid Valve

Next install the acceleration-pump check ball, and then add the piston return spring. Now install the injector weight. Install the anti-dieseling solenoid valve.



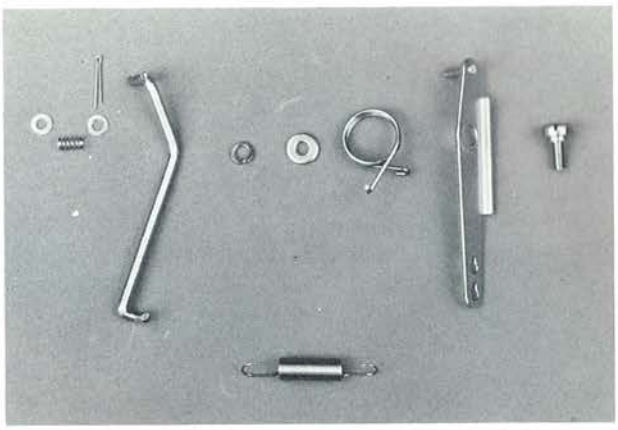
Installing Fast Idle Cam-Connecting Rod

Now attach the choke chamber to the float chamber with the gasket between them. Install the fast idle cam-connecting rod. Be careful to not damage the float, and use a new gasket.



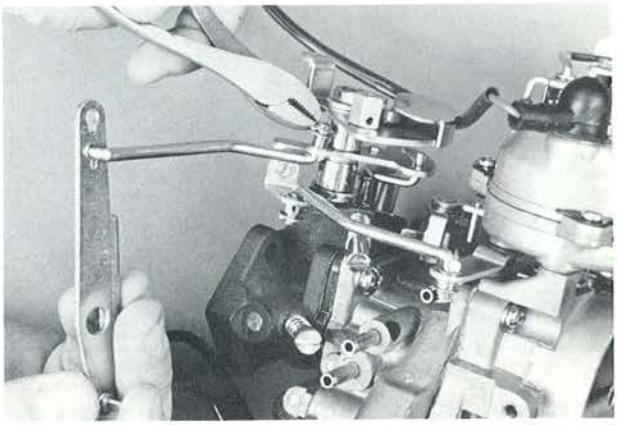
Replacing Thermostat Cover

Place the diaphragm bracket and thermostat cover on the choke chamber, connecting the diaphragm rods at the auxiliary diaphragm with the spring and plate, and at choke lever 1. Secure the thermostat cover with only one or two screws at this stage, since you will have to loosen it later for adjustments.

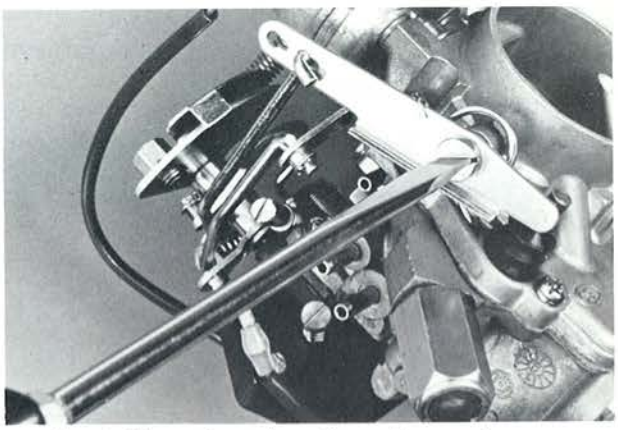


Linkage Parts

The last step in reassembly of the parts is connecting the linkages and component parts.

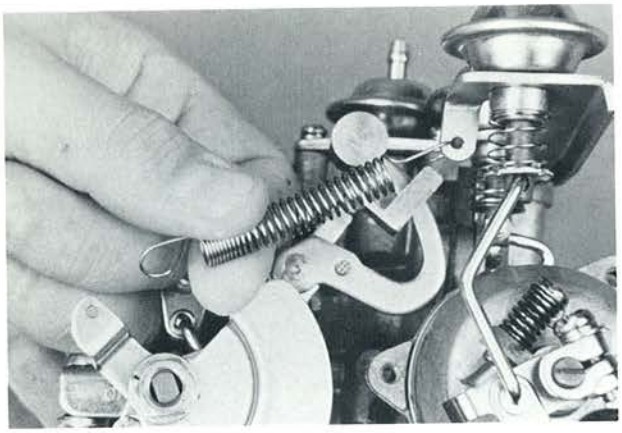


Attaching Connecting Rod To Throttle Linkage

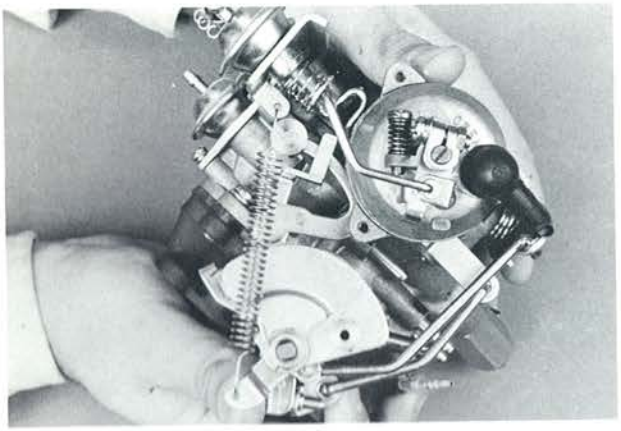


Installing Acceleration-Pump Lever

Connect the acceleration-pump connecting rod to the pump lever by inserting the rod end into the standard position hole in the pump lever. Also attach the connecting rod to the throttle linkage assembly. Install the pump lever with the pump-lever shaft, spring, plain washer, and spring washer.



Adding Throttle Return Spring



Checking Throttle Linkage

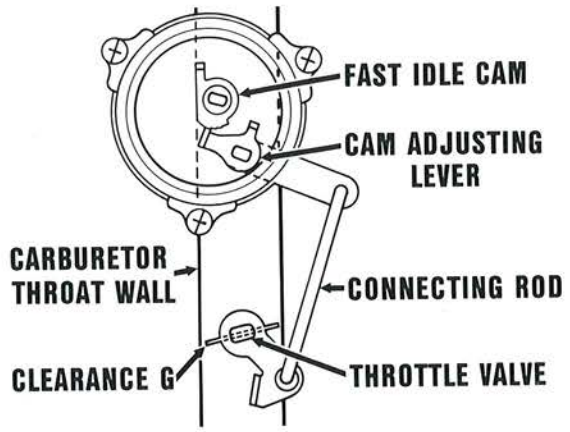
Now add the throttle return spring to the diaphragm bracket and throttle lever. With reassembly completed, make a final check of all linkages to see if they work smoothly.

CHOKE ADJUSTMENTS

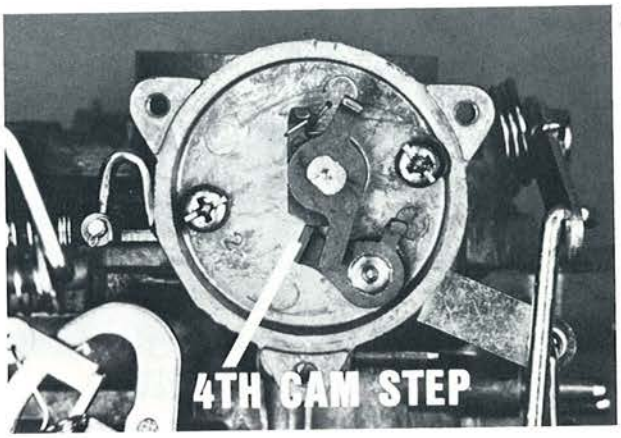
AUTOMATIC CHOKE ADJUSTMENTS:

- FAST IDLE
- VACUUM BREAK
- THROTTLE AND CHOKE INTERLOCK
- BIMETAL SPRING
- BIMETAL COMPENSATION

At this time make these five adjustments to the automatic choke mechanism: 1) fast idle adjustment, 2) vacuum break adjustment, 3) throttle and choke interlock adjustment, 4) bimetal spring adjustment, and 5) bimetal compensation adjustment.

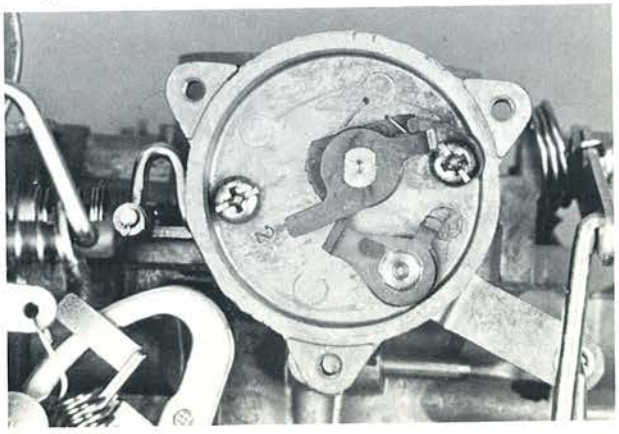


The automatic choke positions the throttle valve to a slightly open position through the fast idle cam, cam adjusting lever, and connecting rod. This is called the fast idle-opening angle, and is used for cold starting. The clearance between the throttle valve and throat wall for this angle is clearance G.

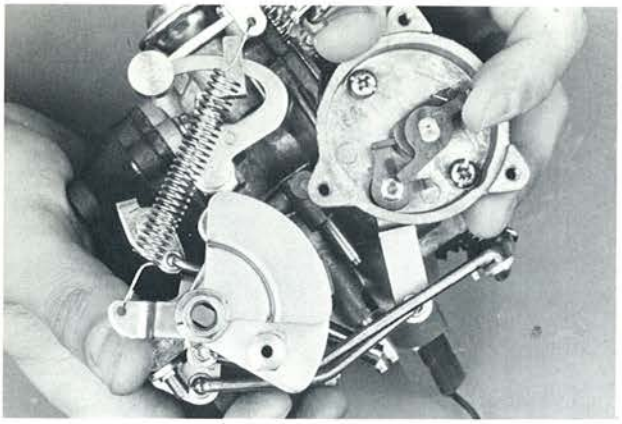


Positioning Lever Onto Fourth Cam Step

With the thermostat cover off, operate the throttle and fast idle cam by hand to position the cam adjusting lever onto the fourth cam step, as it would be during cold starting.

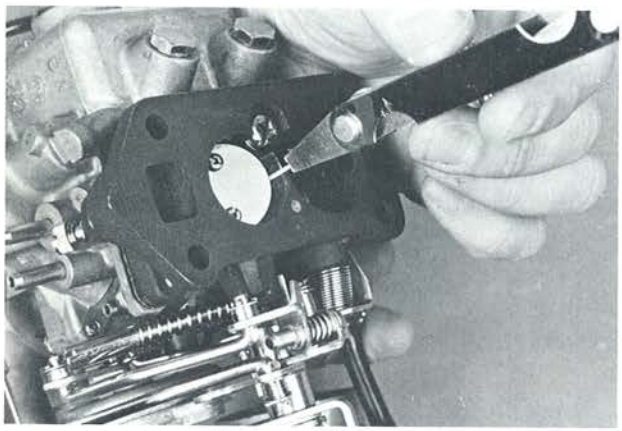


Check For Free Movement

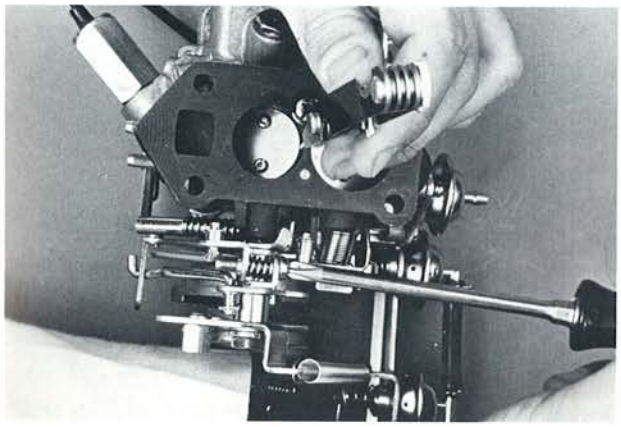


Resetting Lever To Fourth Cam

Next, operate the throttle by itself. Watch to be sure that the choke spring quickly pulls the fast idle cam away from the lever when contact between the lever and cam is broken by the throttle action. Finally, reset the lever to the fourth step on the cam.



Measuring Clearance G



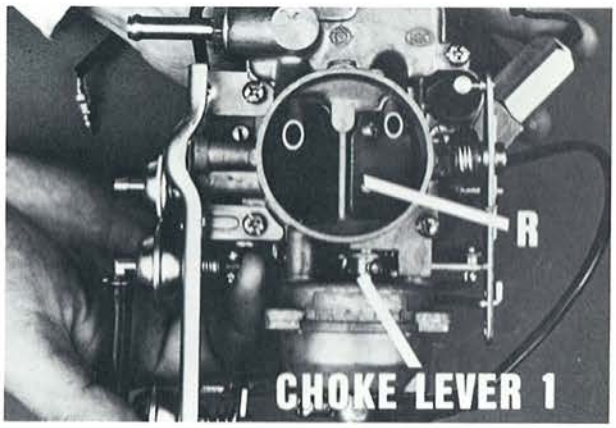
Adjusting Clearance G

Now measure clearance G with a drill bit or wire gauge. It should match the setting listed in the Service Manual. The clearance can easily be adjusted using the fast idle adjusting screw.

1978 1600 cc Engines		
Item / Model	Clearance G	Fast Idle Opening Angle
49-State (low altitude) and Canada	1.20 mm (0.047 in)	16°
California	1.53 mm (0.060 in)	19°
49-State (high altitude)	1.53 mm (0.060 in)	19°

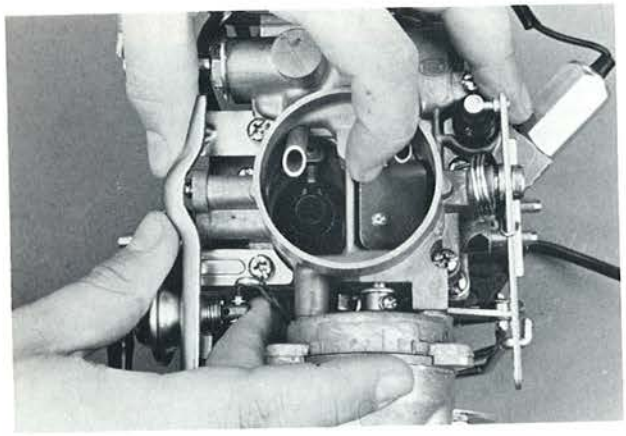
1979 1600 cc Engines		
Item / Model	Clearance G	Fast Idle Opening Angle
49-State and Canada	1.05 mm (0.041 in)	14°
California	1.38 mm (0.054 in)	17°

Note that on some models, the low altitude models are set differently than high altitude and California models. Replacement carburetors are usually preset to the low altitude clearance.

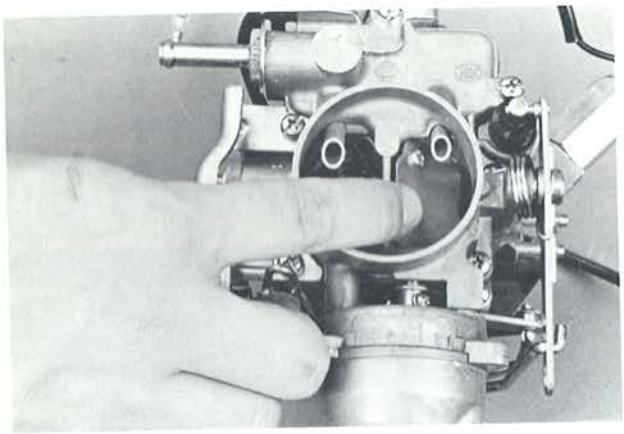


Clearance R

The vacuum break adjustment affects the choke more directly. When the engine starts, the main vacuum diaphragm opens the choke valve by pulling on the connecting rod and choke lever 1. This rotates the choke valve. The main diaphragm is being operated by hand in the above picture. The clearance between the choke valve and throat wall is called R. You should measure R, and adjust it if necessary by slightly bending the choke connecting rod.

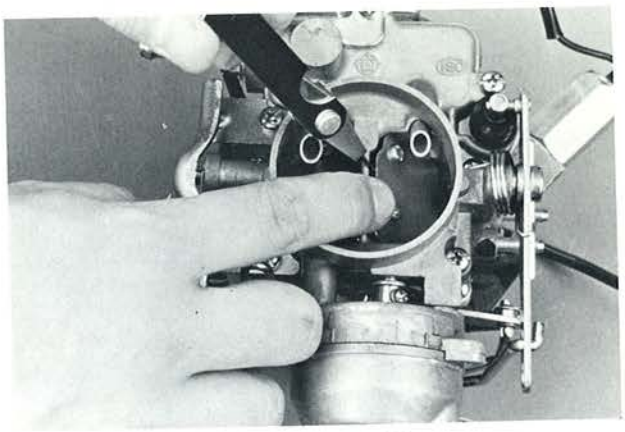


Positioning Choke With Both Hands

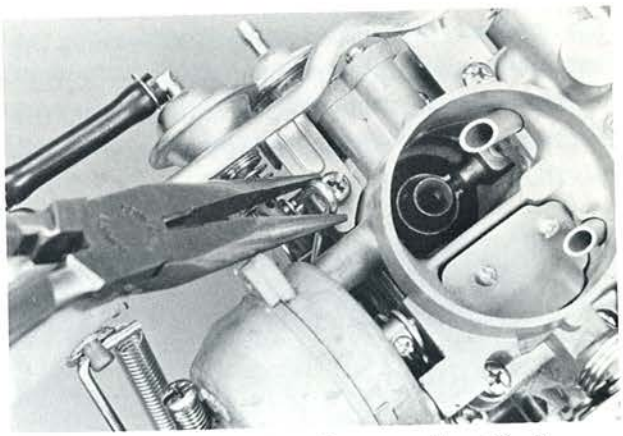


Holding Positions With Right Hand Only

To measure R you should first hold the choke plate closed with the fingers of your left hand. Then operate the main diaphragm and choke-connecting rod with the thumb and middle fingers of your right hand. Next you should place the index finger of your right hand against the choke plate. This holds it against the pressure of the connecting rod, and the left hand is now free.

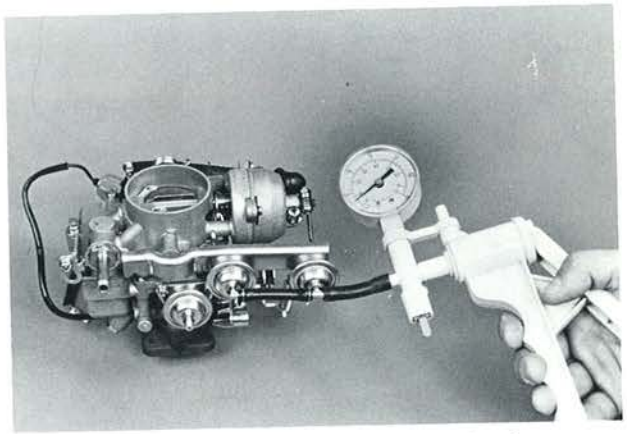


Measuring R



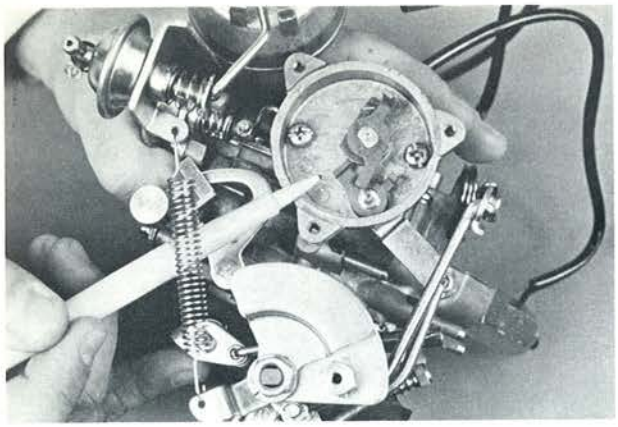
Bending Choke Connecting Rod

Use a drill bit or wire gauge to measure clearance R. If R is not correct, adjust it by bending the choke-connecting rod.



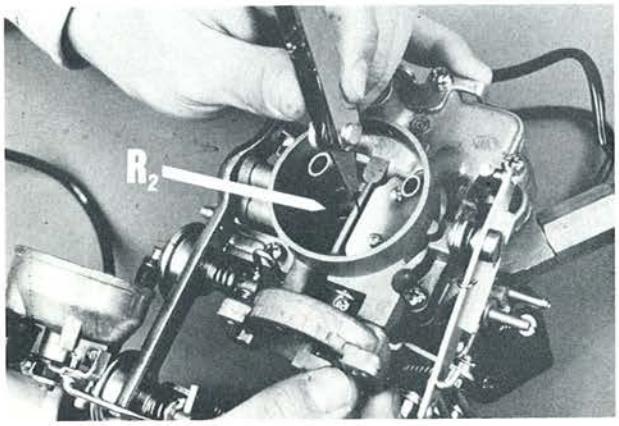
Checking Vacuum Required

Using a hand-vacuum pump, also check the amount of vacuum required to operate the diaphragm.

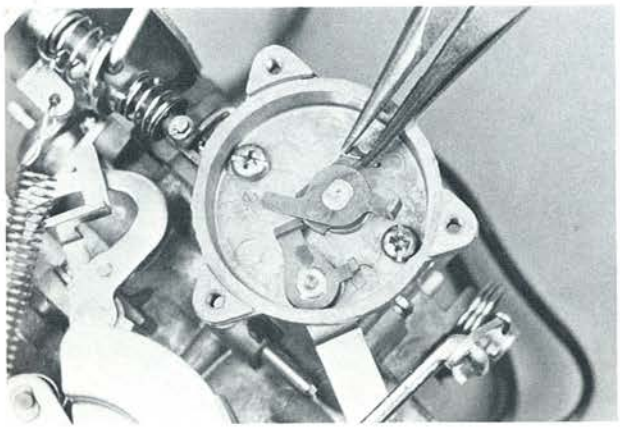


Lever Resting On 3rd Step Of Cam

The third automatic choke adjustment is the throttle and choke interlock adjustment. This is measured with the cam adjusting lever resting on the third step of the fast idle cam.

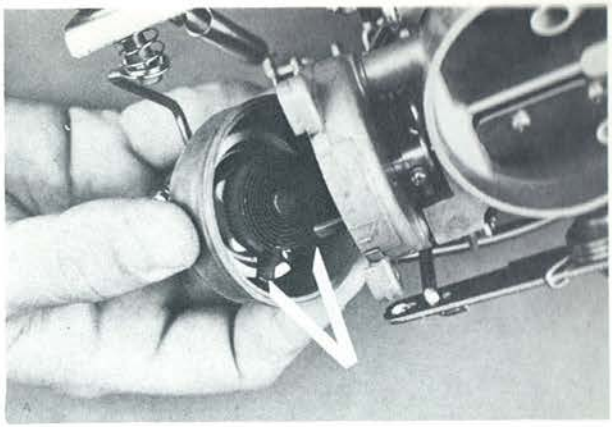


Measuring R_2



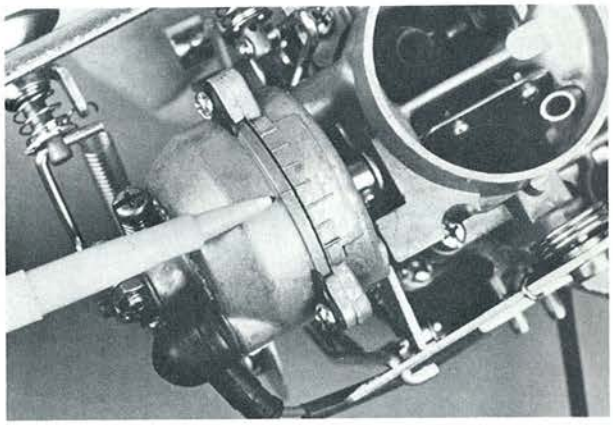
Bending Pawl Of Fast Idle Cam

Set the lever to this position by hand, and check clearance R_2. R_2 is the new distance between the throat wall and choke valve. If it is not correct, it can be changed by bending the pawl at the top of the fast idle cam. Bending the pawl to the right will increase the clearance.



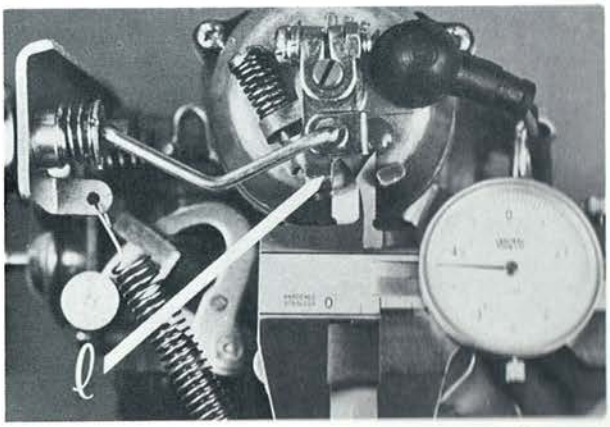
Replacing Thermostat Cover

The fourth automatic choke adjustment is the bimetal spring adjustment. Replace the thermostat cover on the housing, making sure that the bimetal exerts its spring tension against the pawl of choke lever 2.

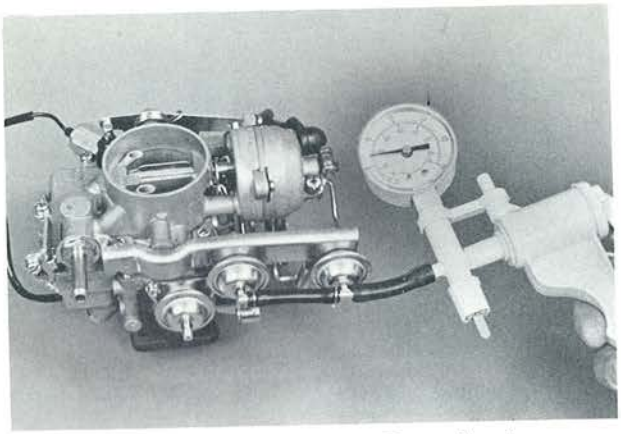


Embossed Set-Position Line

Rotate the cover to line up its embossed set-position line as shown. Retighten the 4mm screws.

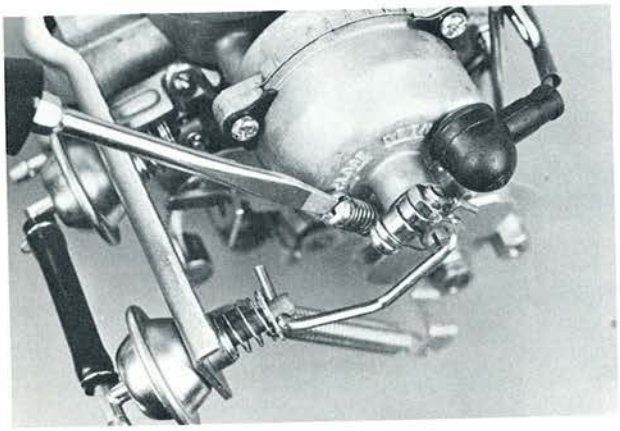


Measuring Travel Distance ℓ

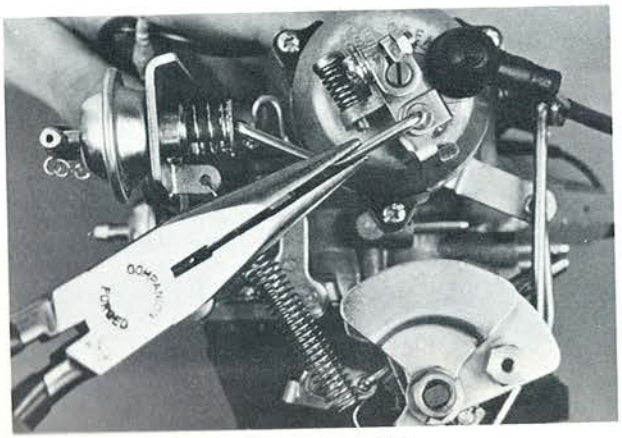


Checking Vacuum Required

The final automatic choke adjustment is the bimetal compensation adjustment. When the thermostat housing and cover are correctly aligned, use a caliper to check the travel distance of the bimetal lever. Measure the distance between the stopper of the bimetal lever and the stopper of the thermostat cover. This is called distance small ℓ. Also check the vacuum required to move the bimetal lever over this distance.

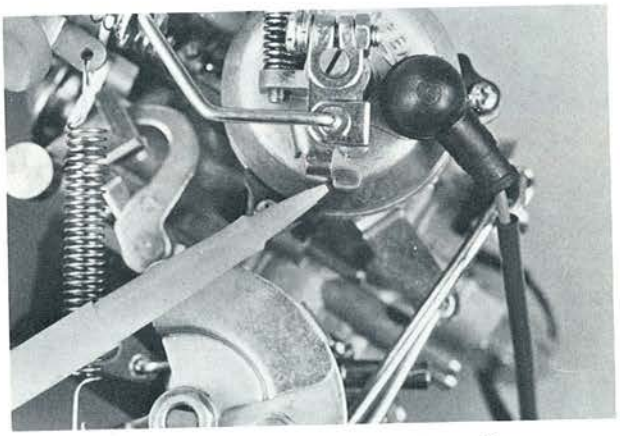


Adjusting Travel Distance



Changing Required Vacuum

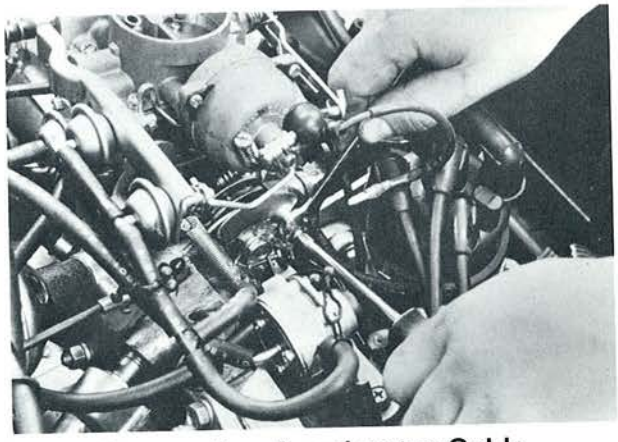
Adjustments to the travel in the direction of the auxiliary vacuum diaphragm can be made with the adjusting screw. Changes in the amount of vacuum required to make this shift are made by slightly bending the diaphragm rod. You can reduce the vacuum required by shortening the rod.



Checking Lever Travel Against Stopper

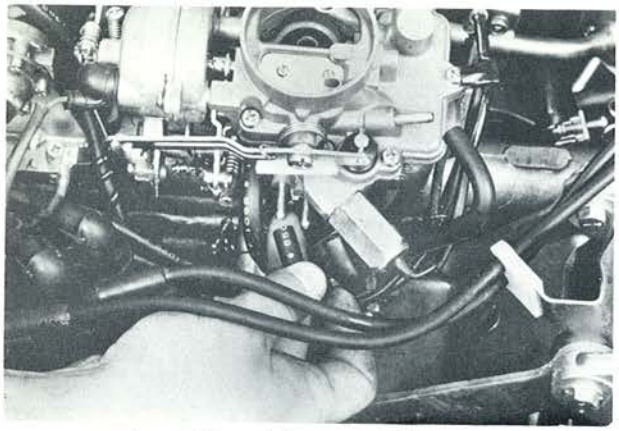
After you are finished, make sure that the bimetal lever is pressed against the stopper of the thermostat cover whenever the vacuum diaphragm is fully released.

REINSTALLATION



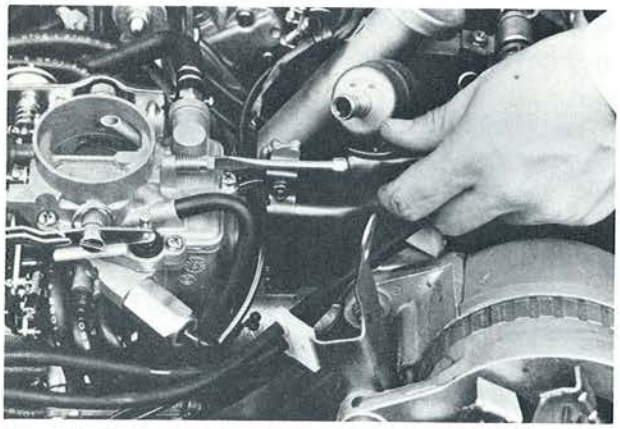
Connecting Accelerator Cable

Now the carburetor is ready for reinstallation and final adjustment. Install the carburetor and replace the coolant fluid. Connect the fuel hose, wires to the anti-dieseling valve and choke heater, and pay special attention to the accelerator-cable adjustment.



Installing Vacuum Hoses

Take care to install each vacuum hose to its proper fitting. Start the car, and check for vacuum and fuel leaks.

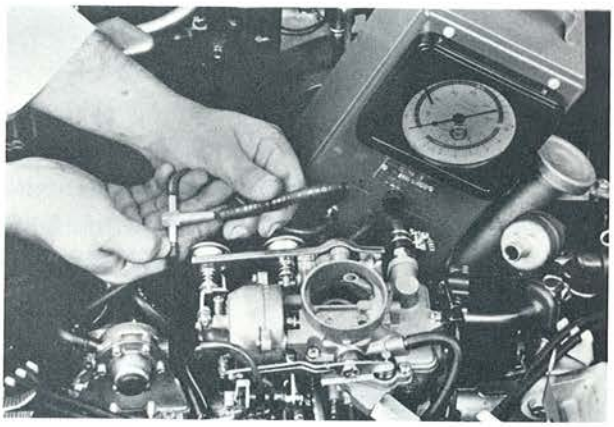


Adjusting Fuel Enrichment Screw

On models with high altitude carburetors, you must set the fuel enrichment screw for proper altitude. Specifications for this adjustment are listed in your service manual.

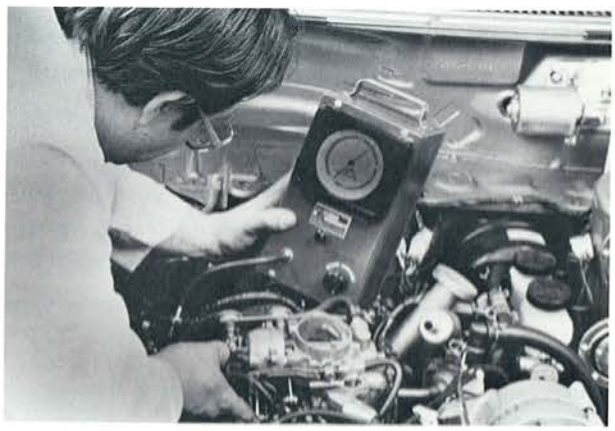
Checking Fuel Level

Also look through the sight glass and measure the fuel level in relation to the point mark. Fuel must be within 1mm above or below the mark. If the level is outside the correct range, re-adjust the float level as previously detailed. Caution should be used when removing the choke chamber while the carburetor is on the vehicle. The float-shaft pin may drop into the intake manifold.



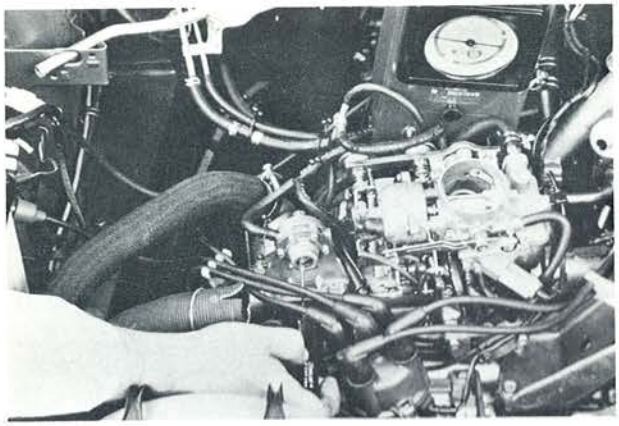
Connecting Vacuum Gauge

After the fuel level is set correctly, check the servo-diaphragm and vacuum control valve in the coasting by-pass system. Begin by connecting a vacuum gauge to the control valve in the vacuum line which connects the valve to the manifold.



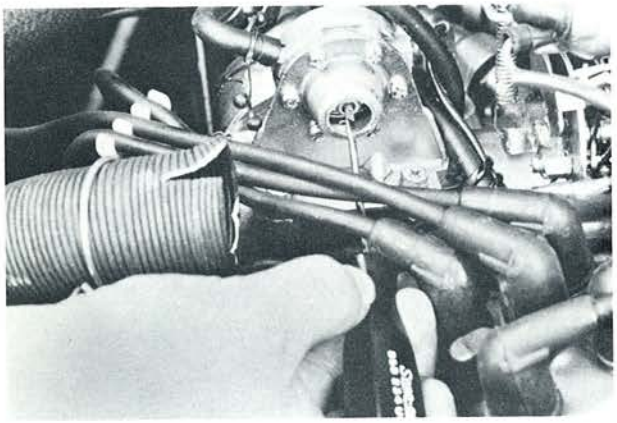
Measuring Vacuum

Warm up the engine with the air cleaner off. Now run the engine without load at 3000 to 4000 rpm, and release the throttle valve. As soon as the system begins to make a fizzing noise, measure the vacuum.



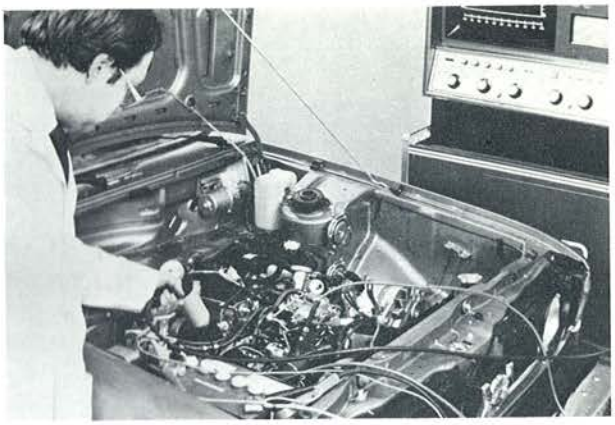
Adjusting Vacuum Control Valve

If there is no fizzing noise at all, turn the adjusting screw inside the vacuum control valve clockwise until you hear the noise at the proper time. If the noise is heard continuously at idle, however, turn the screw counter-clockwise until it stops.



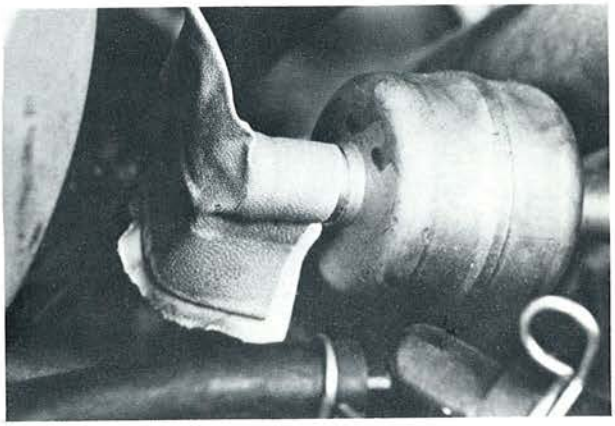
Making Final Control Valve Adjustment

After the vacuum pressure is set, you still must turn the adjusting screw to reach the correct operating pressure. Check your Service Manual for this final adjustment. If you do not have a vacuum gauge available, the Service Manual gives an alternate adjustment procedure.



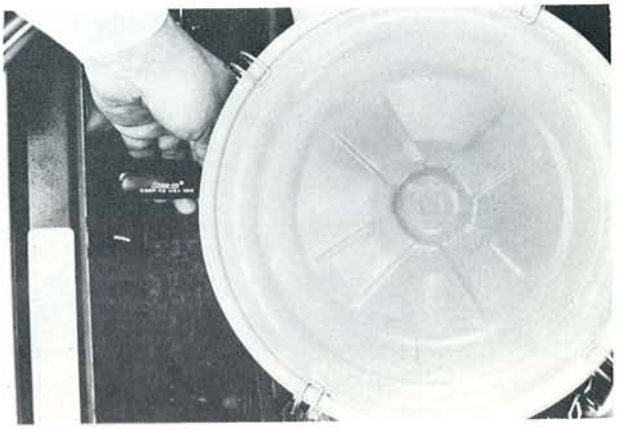
Making Engine Adjustments

Now adjust the engine idle speed, and the percentage of carbon monoxide in the exhaust emissions. Do this only after ignition timing and valve clearances are correctly adjusted. Compression testing and readjustments are not covered in this program.



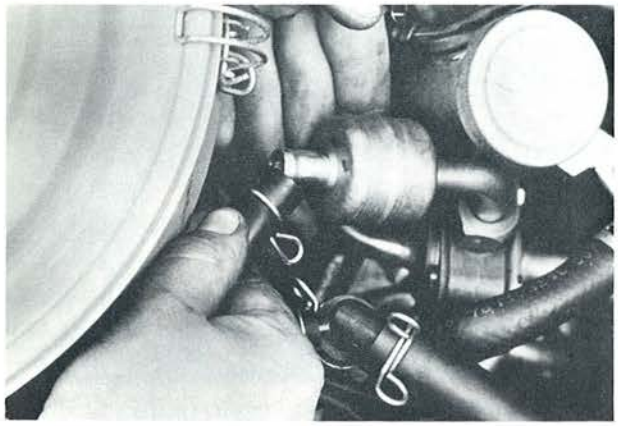
Plug The Air Suction Hose

Warm up the engine, and install the air cleaner. Disconnect and plug the air suction hose between the silencer and air cleaner.



Adjusting The Throttle Adjusting Screw

Adjust the throttle adjusting screw and idle mixture adjusting screw to meet the specifications in the Service Manual. For some models, these specifications are different for 49 state and California model cars.



Reconnecting Air Suction Hose

Now unplug the silencer and reconnect the air suction hose between the silencer and air cleaner.

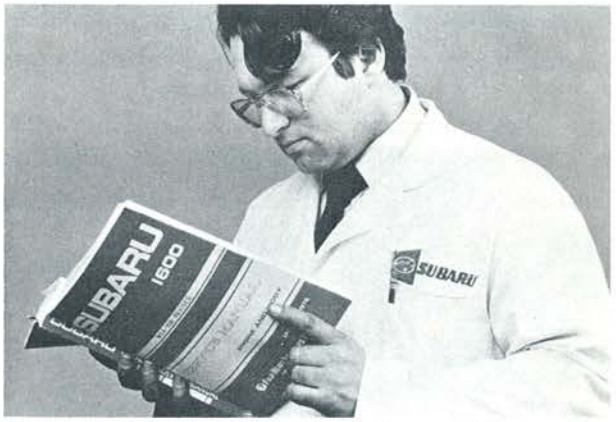
Re-Checking CO Percentage

Recheck idle speed and carbon monoxide percentage to see if they meet the specifications in the Service Manual. Carbon monoxide percentage will now be lower, indicating proper operation of the air suction valve. If fuel and emissions systems are operating properly, all values should be correct. Carburetor overhaul is complete.

TROUBLESHOOTING HINTS

Consulting With Customer

In most cases a carburetor overhaul is not necessary. If the customer has a carburetor problem, the first goal should be to correct it with the least time and effort possible.



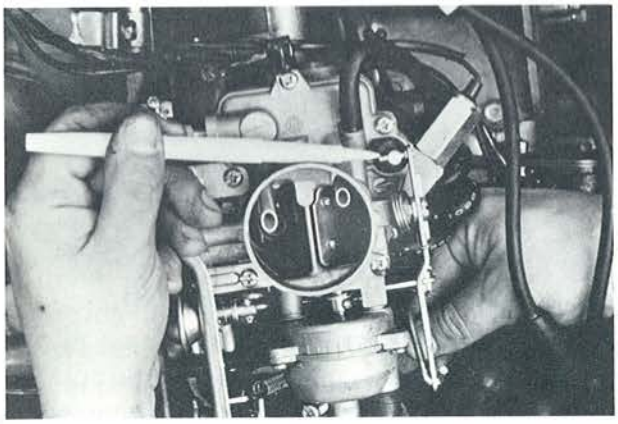
Checking Service Information

Many common problems can be quickly diagnosed with the aid of the information in this book, and a little experience. Here are some typical symptoms, and their most common causes.

POSSIBLE CAUSES OF ENGINE HESITATION:

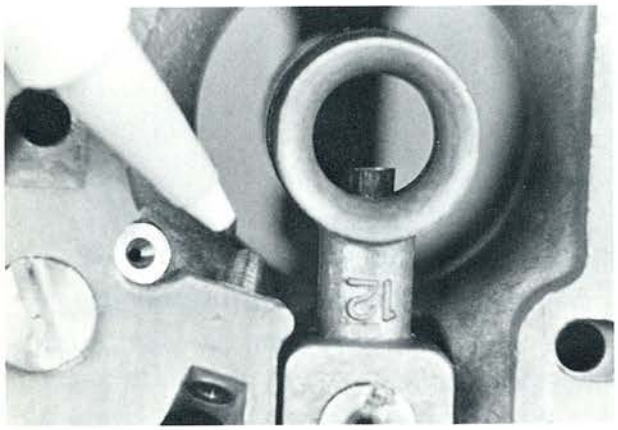
- FAULTY ACCELERATION PUMP
- FAULTY CHECK BALL
- IMPROPER FLOAT LEVEL
- IMPROPERLY ADJUSTED MIXTURE SCREW

One symptom is engine hesitation when the throttle is depressed. This can be caused by a faulty acceleration pump or check ball, improper float level, or improperly adjusted mixture screw.



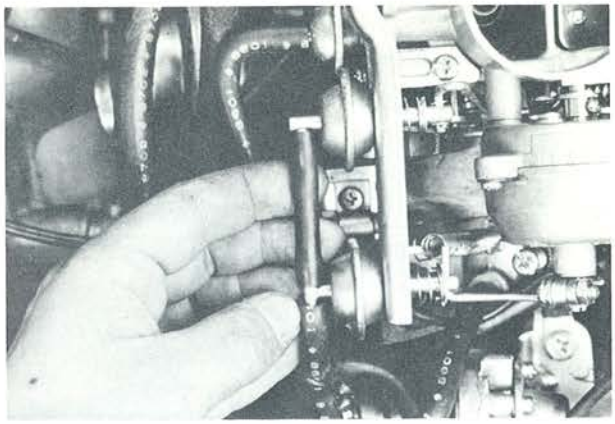
Manually Operating Acceleration Pump

Manually operate the acceleration pump, and watch for fuel coming from the pump discharge nozzle.



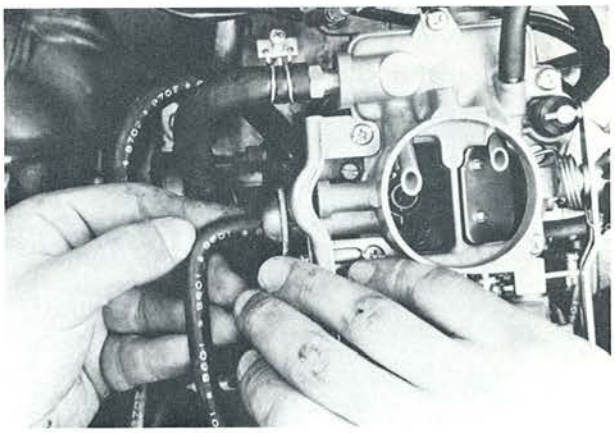
Discharge Nozzle May Be Clogged

If there is no stream of fuel coming from the nozzle, this may indicate a clogged discharge nozzle.



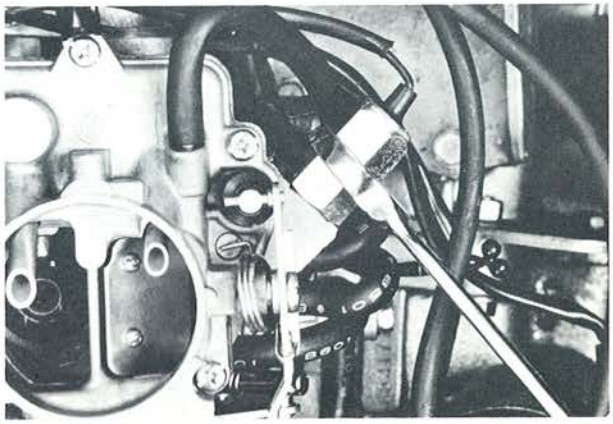
Checking Choke Bracket For Vacuum Leaks

If the engine runs lean or has a rough idle after it has warmed up, check the choke bracket assembly for vacuum leaks.



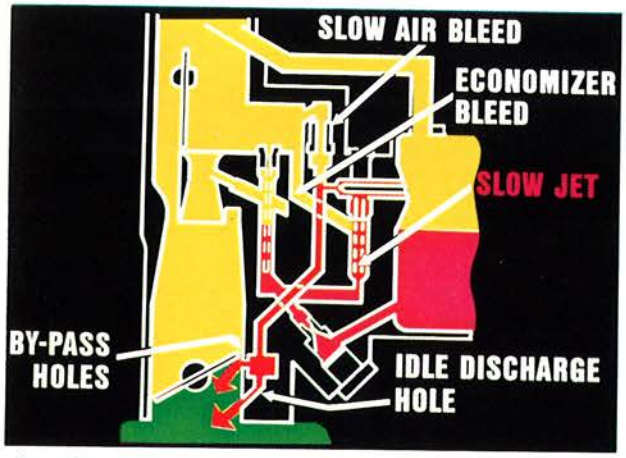
Examining Servo-Diaphragm For Vacuum Leaks

If the engine runs lean and occasionally backfires loudly, examine the servo-diaphragm of the coasting by-pass system for leaks or improper adjustment.

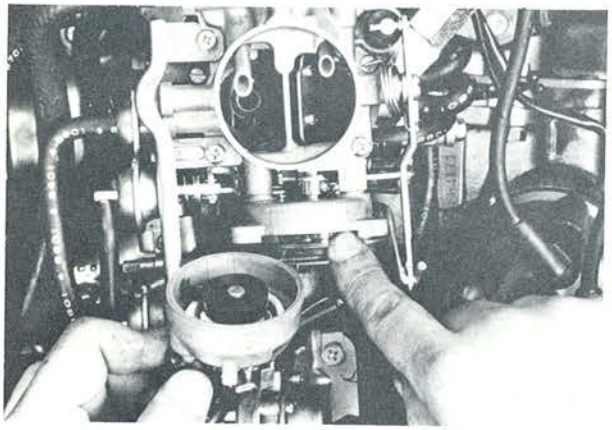


Checking Anti-Dieseling Valve

If the engine will not idle, check to see if the anti-dieseling valve is closed. The solenoid should open the valve whenever the engine is running.

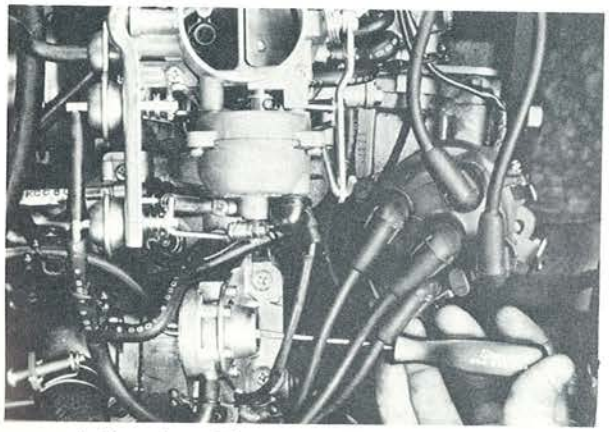


Another cause of no idle could be dirt clogging the slow jet.



Checking Automatic Choke Adjustments

If you have no idle only with the engine cold, check the automatic choke adjustments.



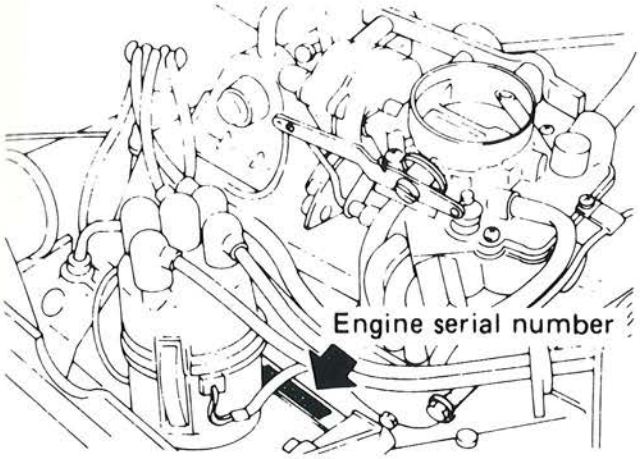
Adjusting Vacuum Control Valve

Another trouble symptom is a high idle speed which is not affected by adjustments to the throttle adjusting screw. This may be accompanied by a popping sound in the exhaust system. This could be caused by an improperly adjusted vacuum control valve in the coasting by-pass system. If the car is equipped with one, adjust it to specifications.

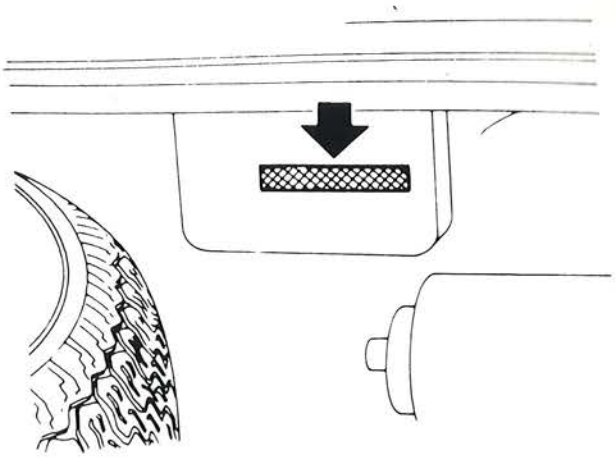
Check Specifications In Service Documents

With the basic review of carburetor overhaul and troubleshooting in this book, you should be able to tackle these procedures in the shop. Always check specifications and procedures in the Subaru Service Manual, and applicable Service Bulletins. It is important to keep in mind the theory of operation which is reviewed in the first two sections of this book.

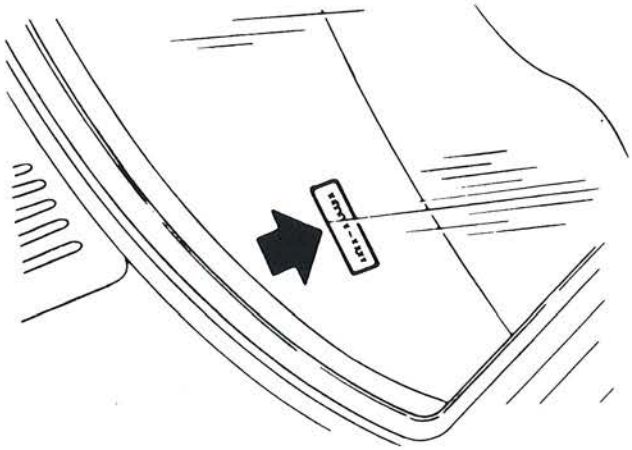
INDENTIFICATION NUMBERS



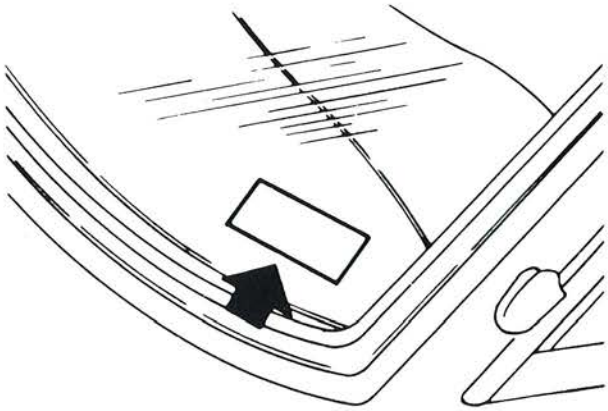
Engine Serial Number



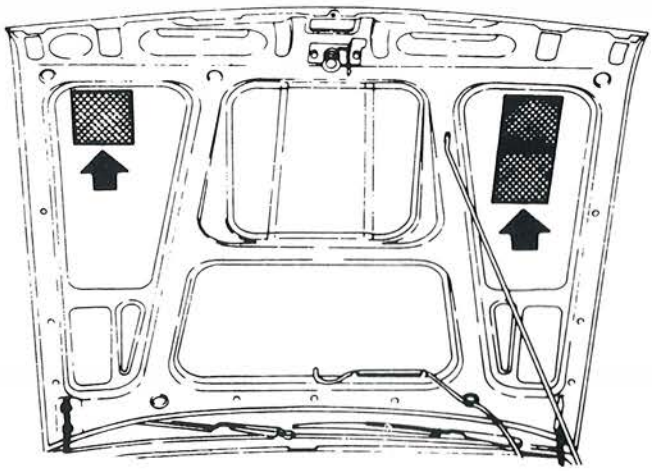
Chassis Serial Number



V.I.N. (Vehicle Identification Number Plate)



Emissions Data Label (Calif.)



Tuneup Information Label

1979 1600 CC ENGINES

Vehicle		All models except California models		California models	
Carburetor		DCJ306 – 13		DCJ306 – 12	
		Primary	Secondary	Primary	Secondary
Venturi	Air horn dia. (Inner dia. x Outer dia.)	55 x 59 mm (2.16 x 2.32 in)			
	Throttle bore	26 mm (1.02 in)	30 mm (1.18 in)	26 mm (1.02 in)	30 mm (1.18 in)
	Venturi dia. (Large x middle x small)	22 x 8 mm (0.87 x 0.31 in)	27 x 13 x 7 mm (1.06 x 0.51 x 0.28 in)	22 x 8 mm (0.87 x 0.31 in)	27 x 13 x 7 mm (1.06 x 0.51 x 0.28 in)
	Main nozzle dia. (Inner dia. x Outer dia.)	2.1 x 3.0 mm (0.083 x 0.12 in)	2.8 x 3.5 mm (0.11 x 0.14 in)	2.1 x 3.0 mm (0.083 x 0.12 in)	2.8 x 3.5 mm (0.11 x 0.14 in)
	Main nozzle end surface angle	–5°	0°	–5°	0°
Jet	Main jet	#106	#150	#112	#145
	Slow jet	#48	#65	#52	#70
	Main air bleed	#75	#80	#75	#80
	Slow air bleed	#170	#70	#170	#70
	Power valve	#45		#35	
	By-pass jet	#43		#40	
	By-pass air bleed	#200		#260	
	Emulsion tube dia. (Inner dia. x Outer dia. x Length)	2.2 x 3.8 x 32 mm (0.087 x 0.15 x 1.26 in)	2.0 x 3.6 x 30 mm (0.079 x 0.14 x 1.18 in)	2.4 x 3.6 x 33 mm (0.094 x 0.14 x 1.30 in)	2.0 x 3.6 x 30 mm (0.079 x 0.14 x 1.18 in)
	Emulsion hole (Dia. x number of holes)	1.1 mm x 4 (0.043 in) 1.0 mm x 16 (0.039 in)	0.8 mm x 16 (0.031 in)	0.7 mm x 2 (0.028 in) 1.0 mm x 20 (0.039 in)	0.8 mm x 16 (0.031 in)

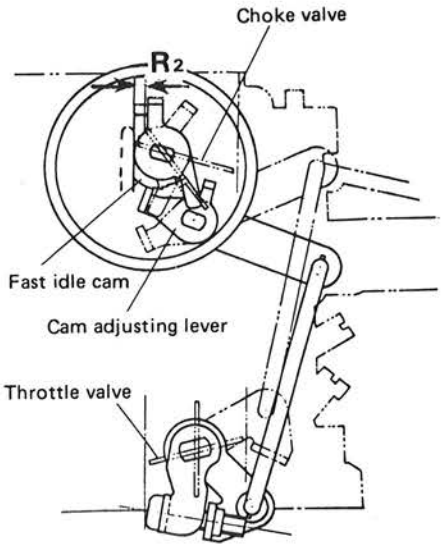
Vehicle		All models except California models		California models	
Carburetor		DCJ306 – 13		DCJ306 – 12	
		Primary	Secondary	Primary	Secondary
Accelerating pump nozzle dia.		0.4 mm (0.016 in)			
Fuel level from upper mating surface of float chamber		20 – 22 mm (0.79 – 0.87 in) with fuel pressure of 0.175 kg/cm^2 (2.49 psi)			
Float adjustment	Clearance between float and upper mating surface of float chamber when float seat comes in contact with valve stem	10.5 mm (0.413 in)			
	Clearance between valve stem and float seat when float is fully lowered	1.3 – 1.7 mm (0.051 – 0.067 in)			
Inner diameter of needle valve		1.5 mm (0.059 in)			
Weight of accelerating pump injector		2 g (0.07 oz)		4.4 g (0.16 oz)	
Throttle valve angle when fully closed – Thickness of throttle valve		12° – 1.0 mm (0.039 in)	20° – 1.5 mm (0.059 in)	12° – 1.0 mm (0.039 in)	20° – 1.5 mm (0.059 in)
Fast idle opening angle and clearance of primary throttle valve		14° – 1.05 mm (0.041 in)		17° – 1.38 mm (0.054 in)	
Primary throttle valve opening angle and clearance when secondary throttle valve starts to open (Primary and secondary throttle valve interlock)		47° 5.98 mm (0.235 in)			
Choke system		Automatic choke			

NOTE: 1978 MODELS ONLY

Spare carburetors (DCJ306 – 8) to be used on all models except 49 state (high altitude) models are set for 49 state (low altitude) use, the fast idle opening angle being adjusted to 16°. Therefore, when installing a new carburetor (DCJ306 –8) on a California model, readjust the above angle to 19° by turning the fast idle adjusting screw clockwise until the throttle valve clearance becomes 1.53 mm (0.060 in).

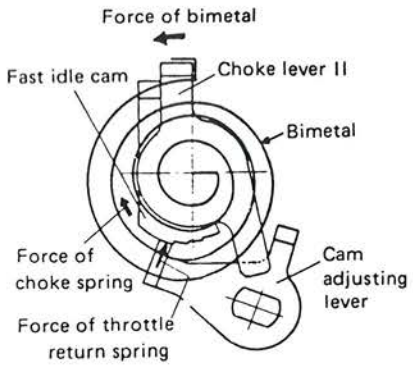
CHOKE OPENING ANGLE AND CLEARANCE "R_2"

Model	Choke opening angle α	Clearance R_2
49-state and Canada	35°	2.59 mm (0.102 in)
California	35°	2.59 mm (0.102 in)

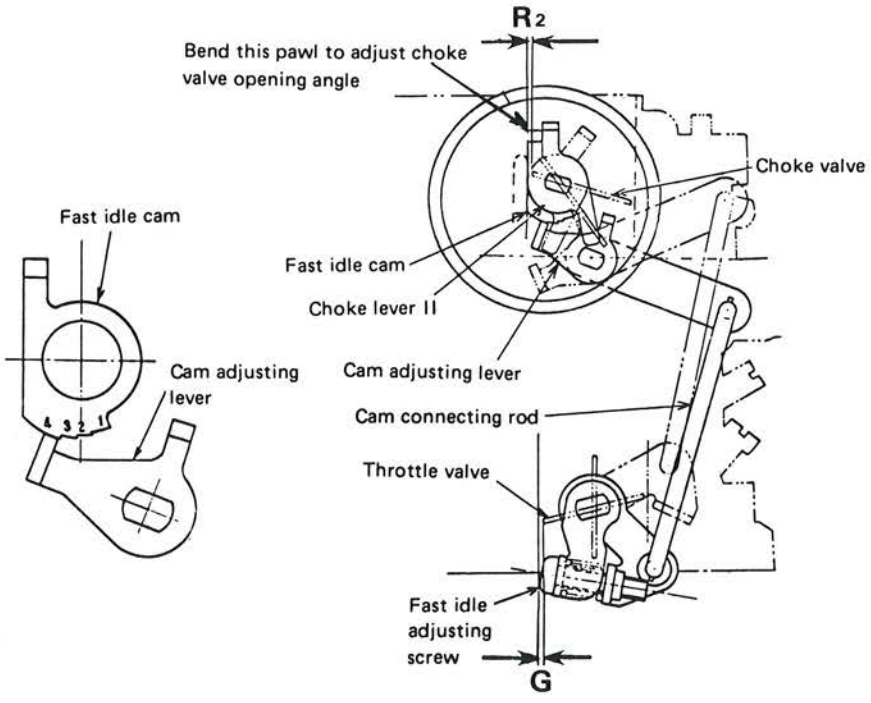


CHOKE FAST IDLE OPENING ANGLE AND CLEARANCE "G"

Item / Model	Clearance G	Fast idle opening angle
49-state and Canada	1.05 mm (0.041 in)	14°
California	1.38 mm (0.054 in)	17°



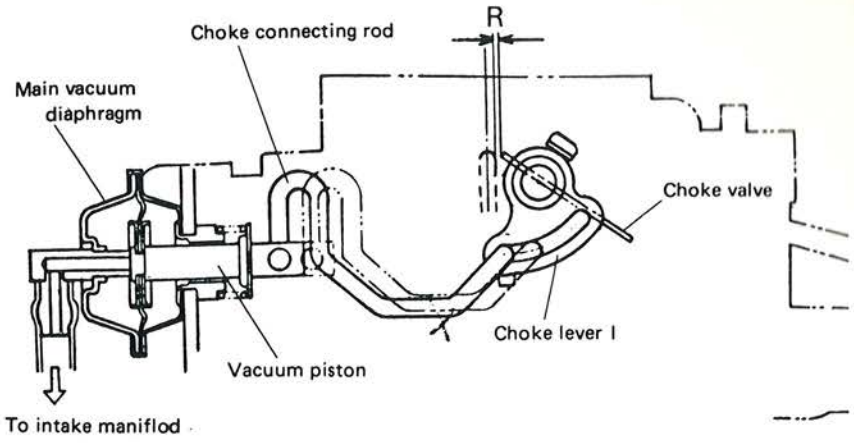
Fast Idle Mechanism



Fast Idle Mechanism

CHOKE CLEARANCE "R" (Vacuum Diaphragm Shaft Full Left)

Clearance R	1.28 – 1.52 mm (0.05 – 0.06 in)
Vacuum required	–145 to –195 mmHg (–5.71 to –7.68 inHg)



Main Vacuum Diaphragm

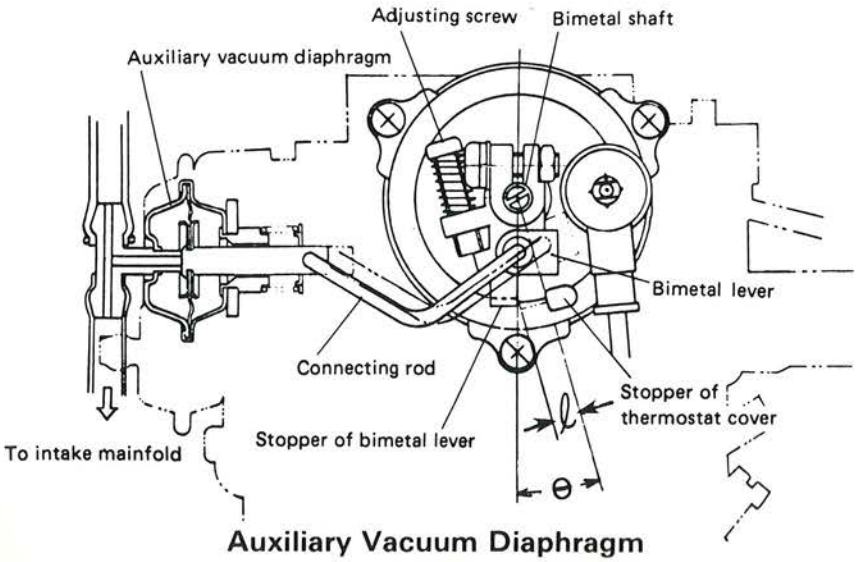
CHOKE CLEARANCE "R_2" (Cam Adjust Lever On 3rd Step of Fast Idle Cam)

Clearance R_2	0.65 – 0.95 mm (0.0256 – 0.0374 in)

(See Diagram for Fast Idle Mechanism on previous page.)

THERMOSTAT COVER STOPPER TRAVEL "ℓ" AND ROTATING ANGLE

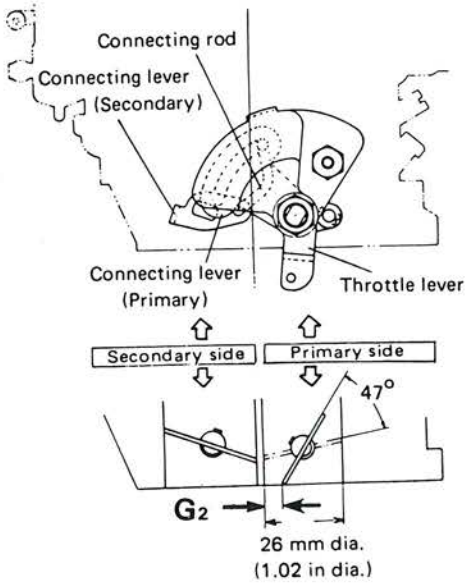
	49 state and Canada	California
Rotating angle (θ)	26° – 28°	32° – 34°
Travel (ℓ)	9.2 – 9.8 mm (0.362 – 0.386 in)	10.7 – 11.3 mm (0.421 – 0.445 in)
Vacuum required	–175 to –235 mmHg (–6.89 to –9.25 inHg)	



Auxiliary Vacuum Diaphragm

PRIMARY & SECONDARY THROTTLE VALVE INTERLOCK CLEARANCE "G_2"

Primary and secondary throttle valve interlock	
Standard clearance G_2	5.98 mm (0.235 in)
Primary throttle valve opening angle	47°



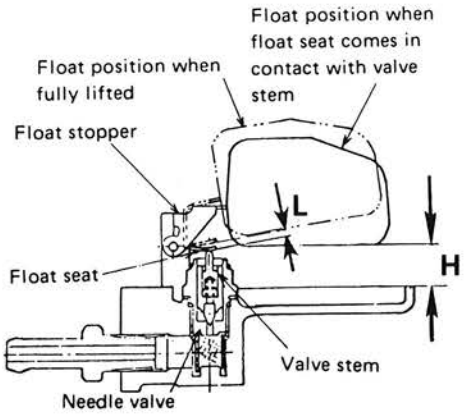
Primary and Secondary Throttle Valve Interlock

FLOAT SEAT ADJUSTMENT "H"

Clearance H	10.5 mm (0.413 in)

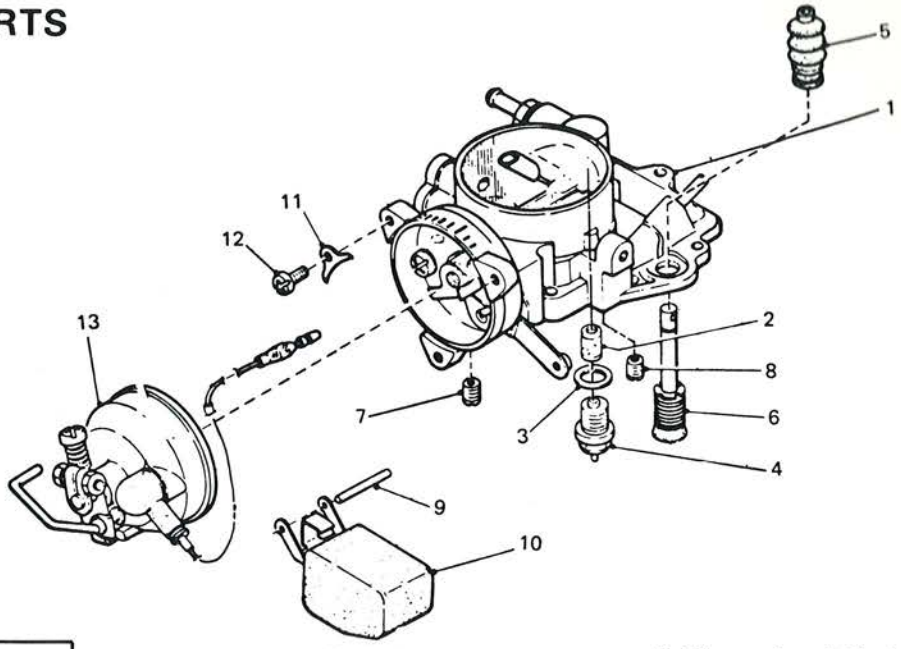
FLOAT STOPPER ADJUSTMENT "L"

Clearance L	1.3 – 1.7 mm (0.051 – 0.067 in)



Float Level Adjustment

CHOKE CHAMBER PARTS & SIZES



Vehicle	All models
Primary slow air bleed	#170
Secondary slow air bleed	#70

1 Choke chamber
2 Filter
3 Washer
4 Needle valve
5 Pump cover
6 Piston
7 Secondary slow air bleed
8 Primary slow air bleed
9 Float shaft
10 Float
11 Spring washer
12 Pan head screw
13 Thermostat cover

Choke Chamber Parts

FLOAT CHAMBER PARTS & SIZES

Vehicle	All models except California models	California models
Primary main jet	#106	#112
Secondary main jet	#150	#145

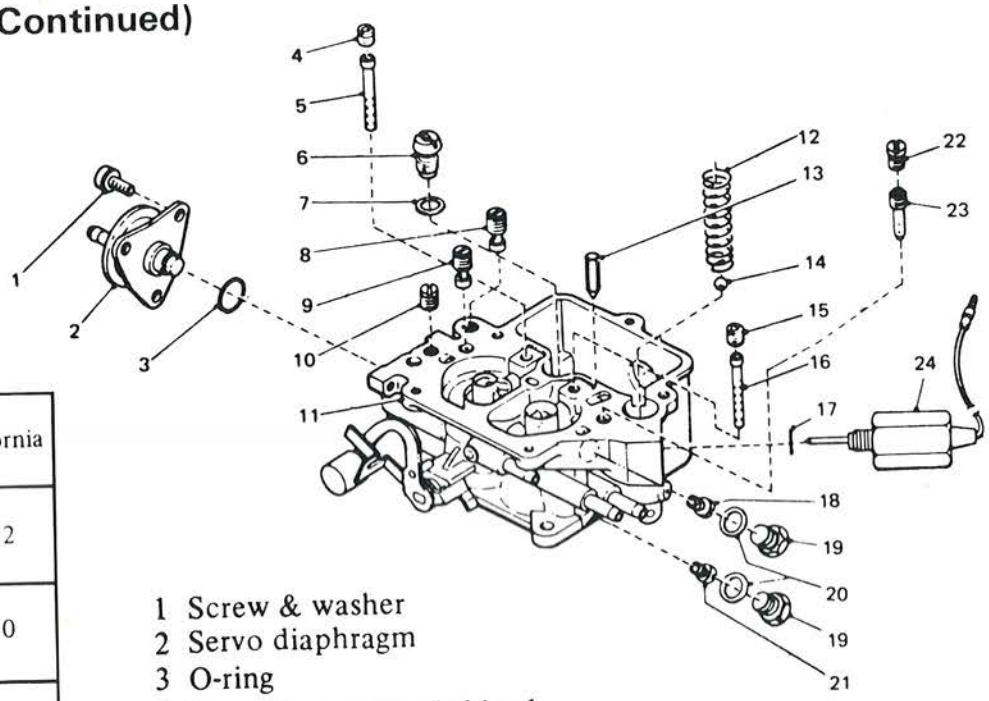
Vehicle	49 state & Canada	California
Power valve	#45	#35

Vehicle	Number of holes in emulsion tube	
	49 state & Canada	California
Primary	1.1 mm (0.043 in) hole ..... 4 1.0 mm (0.039 in) hole 16	0.7 mm (0.028 in) hole ..... 2 1.0 mm (0.039 in) hole 20
Secondary	0.8 mm (0.031 in) hole 16	

FLOAT CHAMBER (Continued)

Vehicle	49 state & Canada	California
Primary slow jet	#48	#52
Secondary slow jet	#65	#70
By-pass jet	#43	#40

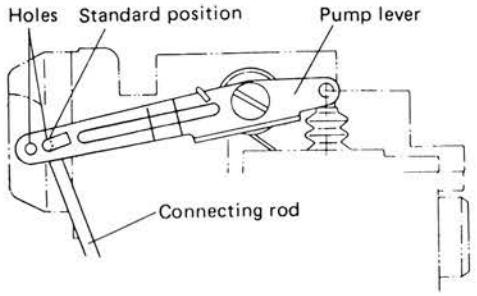
Vehicle	49 state & Canada	California
Primary main air bleed	#75	
Secondary main air bleed	#80	
By-pass air bleed	#200	#260



1 Screw & washer
2 Servo diaphragm
3 O-ring
4 Secondary main air bleed
5 Emulsion tube
6 Power valve
7 Washer
8 By-pass jet
9 Secondary slow jet
10 By-pass air bleed
11 Float chamber
12 Piston return spring
13 Injection weight
14 Ball
15 Primary main air bleed
16 Emulsion tube
17 Washer
18 Primary main jet
19 Float chamber drain plug
20 Washer
21 Secondary main jet
22 Plug
23 Primary slow jet
24 Anti-dieseling switch

Float Chamber Parts

ACCELERATION PUMP LINKAGE POSITIONS



Acceleration Pump Lever And Connecting Rod Standard Positions

Identification Numbers

— Engine, chassis, and other I.D. numbers are important. (They are needed for factory communications: Technical Reports, Service Bulletins, etc.)

Component Locations and Sizes

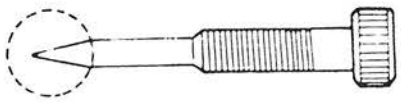
— Pay close attention to all component locations and sizes as you remove them, because many of them are very similar. It is very important to reassemble the parts in the proper order and location. The float chamber is a good example of this problem.

Disassembly

— When removing carburetor from engine, first loosen radiator cap to de-pressurize coolant system. If you do not, the pressurized coolant will flow out and spill over the engine.
— After removing carburetor, cover intake manifold to prevent internal comtamination and damage to the engine from dirt or small parts.
— Handle all parts carefully to avoid damage. Plastic parts like the carburetor float are easily broken.
— Select workplace clean and free of dust.
— Arrange related parts in order, or label them, for easier reassembly in their proper locations.
— When removing the thermostat cover, do not loosen the 3mm screw which attaches the choke lever to the choke shaft. This is a permanent factory setting, and should not be changed.
— When removing the needle valve and 10mm washer, do not attempt to remove the metal screen filter. It is easily damaged and is better left installed.
— When separating float and throttle chambers, make sure you do not damage the longest 6mm screw. It includes a hole up the center which is vacuum passage for the power valve.

Inspection

— Soak metal parts in carburetor solvent only. Do not use gasoline or other substitutes. Clean the parts with water after soaking.
— Do not soak any of the plastic, rubber, or electrical parts in solvent. This includes the vacuum diaphragm.
— Do not soak the carburetor body for prolonged periods, or you may loosen the sight glass.
— Use only compressed air to clean out fuel passages. Drills and wires can permanently deform these passages.
— Check all parts for wear. Even small distortions can affect fuel flow through the carburetor.
— Check for damage on tip of idle mixture adjusting screw.



Idle Mixture Adjusting Screw

Reassembly

— Replace all parts included in the Carburetor Overhaul Kit.
— Even if necessary inspections have been made, check your work during reassembly.
— Cleanliness is very important. Use work area free of dust.
— Check specifications for proper location and position of each part.
— Make necessary adjustments during reassembly if appropriate. These include float adjustments, and throttle valve interlock.

Reinstallation and Final Adjustments

— Make the 5 choke adjustments after reassembly is completed.
— Be sure to reconnect all hoses, wires, and cables properly when installing carburetor on car. Check for vacuum and fuel leaks with engine running.

- On models with high altitude carburetors, you must set the fuel enrichment screw for proper altitude. Specifications for this adjustment are listed in your service manual. Make sure you turn off the engine before adjusting the fuel enrichment screw, or you may damage the power valve.
- Check fuel level after reinstallation.
- After checking fuel level, check vacuum in coasting by-pass system, and check CO percentage in exhaust.
- If you remove the choke chamber from the carburetor while installed on the engine, be careful that the float shaft pin does not drop into the intake manifold.