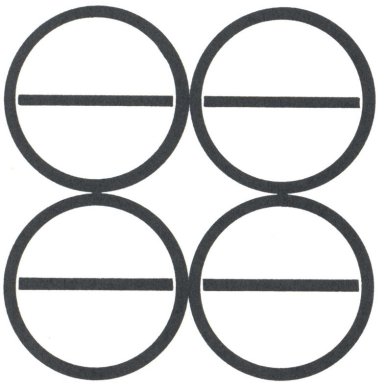
MASTER
TECHNICIANS
SERVICE
CONFERENCE

REFERENCE BOOK 69-9

FINER POINTS OF FOUR-BARRELS



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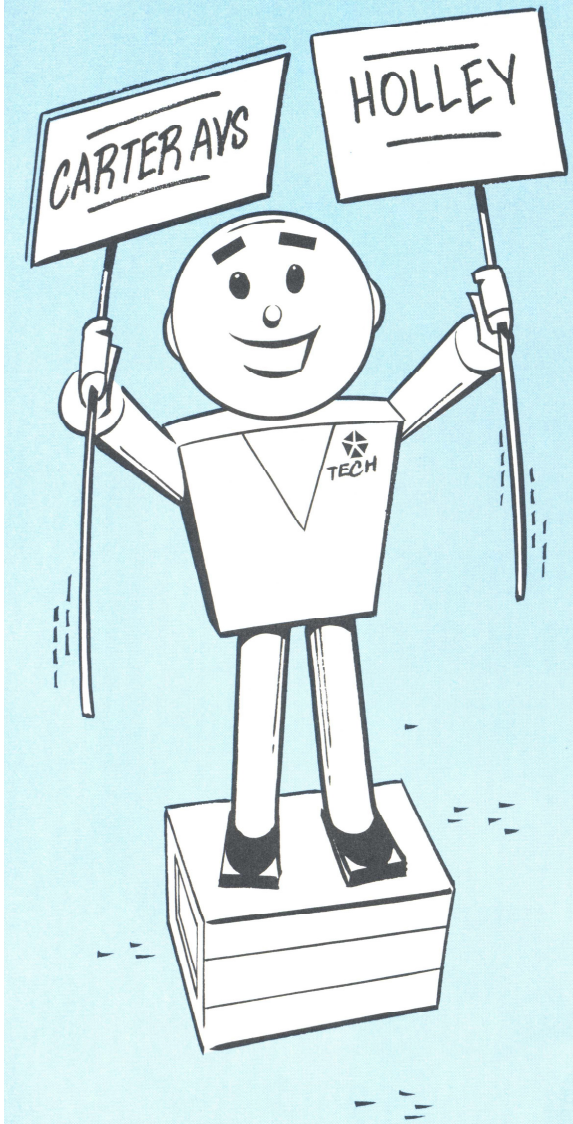


I'm sure you all remember that last month's session was loaded with double-barreled carburetor facts. This month's session will probably give you answers you've been looking for about four-barrel carburetors. You should remember also that the great majority of all carburetor problems are caused by dirty, sticking external linkages or incorrect external adjustments.

Don't let the four-barrel carb scare you. Just because it has twice as many barrels doesn't mean that it is twice as complicated. The problems and causes are basically the same as the two-barrels, although the remedies and physical adjustments may be a little different. The secondary portion also requires some adjustments for good performance. If you read this Reference Book very carefully, you shouldn't have any trouble ironing out any problems you may come across.

We're going to cover two different carbs this month—the Carter AVS and the Holley.

We'll cover all the adjustments on the AVS first and then do the same on the Holley. Some internal parts and assembly precautions will be covered on the Holley, also. You'll find a lot of extra information in this month's Reference Book that we didn't have time to cover in the film, so read it very carefully.

TABLE OF CONTENTS:

INTRODUCTION

I'll start out by repeating something one more time. The great majority of *all* carburetor problems are caused by dirty, sticking external linkages and incorrect external adjustments. Keeping the linkage clean and properly adjusted is most important to good performance. Don't be anxious to tear the carburetor apart. If the car is running at all, chances are that the problem *is not internal*. About the only internal adjustment you might check is the float level.

You just might save yourself a lot of work by making one little check. A small air or fuel leak can act just like carburetor trouble; so make sure the air horn screws on the AVS and the fuel bowl screws on the Holley are tight. Also, check the carburetor mounting nuts and the manifold cap bolts to make sure they are tight and correctly torqued.

AVS CHOKE AND VACUUM KICK

CHOKE OPERATION AND MAINTENANCE

The automatic choke units used on today's engines are set at the factory with precision calibration equipment. The choke coil unit is virtually trouble-free and very seldom needs service or replacement. The choke setting should not be changed in an attempt to correct some other service problem. Don't be quick to blame the choke unit when the problem could easily be incorrect vacuum kick adjustment, dirty sticking choke linkage, or even a gummed-up choke shaft. If the unit works at all, the original setting is probably correct.

DON'T TINKER WITH IT!

The "L" and "R" markings on the choke coil bracket were not put there for service adjustment, so get that idea out of your head. Those markings are there for the purpose of setting the choke coil at the factory. The setting should not be changed unless the Service Bulletin calls for a new setting or if you find one that is not set to specs.

CHECK THAT NUMBER

Most choke units look pretty close to the same and can be easily mistaken for another unless you check the part numbers. If you have to install a new choke unit, make sure it's the right one for the job. The choke coil units are calibrated specifically for a particular application. And don't try to get by with a substitute that happens to be available.

VACUUM KICK UNIT

The vacuum kick unit on the AVS carburetor is the same type as the one on the two-barrel models. It has a modulating spring and works with the thermostatic choke coil to give much better choke control during warmup. When the vacuum kick unit is correctly adjusted, the vacuum diaphragm pulls the choke valve partly open to allow just enough air to keep the cold engine running properly during warmup. The vacuum kick modulates the choke action and provides better control. This greatly improves engine warmup performance.

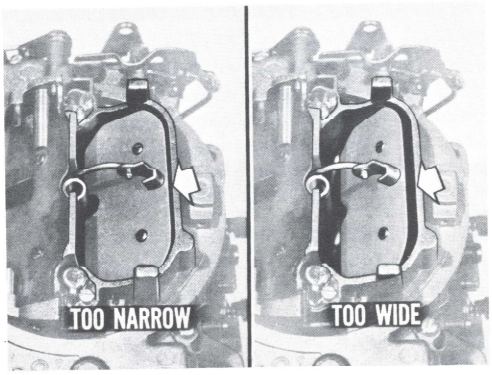


Fig. 1—Wrong vacuum kick setting

If the choke opening is too narrow, the engine will load up and roll. If it's too wide, the mixture will be too lean and the engine will stall or backfire. The Service Manual has detailed instructions for adjusting the vacuum diaphragm unit. Just make sure that the choke modulating spring is fully compressed. If you are going to set the vacuum kick with the carburetor off the car, make sure that you don't bang the kick unit. If the vacuum kick unit bracket or link is bent, the adjustment will be affected.

MANIFOLD HEAT CONTROL VALVE

The manifold heat control valve can cause problems very similar to carburetor problems. In fact, it's a good practice to check the manifold heat control valve just for good measure whenever performing any carburetor service operations. All of the carburetor adjustments can be right on the nose and you will still have hot-starting problems or poor warmup performance.

A manifold heat control valve that is stuck in the open position will give the customer poor fuel economy and high emission rates. A valve stuck in the closed position will probably cause hot-starting problems; however this condition is not as common as the valve stuck open. The best way to avoid manifold heat control valve problems is to periodically apply the proper solvent recommended in the Service Manual and the Owner's Operating Manual.

AVS FAST-IDLE ADJUSTMENTS

The fast-idle speed cam position adjustment may be made either on or off the vehicle. The fast-idle cam position guarantees the right idle speed for the amount of choke opening during warmup. When properly adjusted, the cam will index properly and the idle speed will drop off at the proper time during warmup.

FAST-IDLE SPEED CAM POSITION

Correct fast-idle cam position is obtained by bending the fast-idle cam rod. To get the correct choke opening for fast-idle speed, the first thing to do is set the fast-idle speed adjusting screw against the shoulder on the second highest speed step of the fast-idle cam.

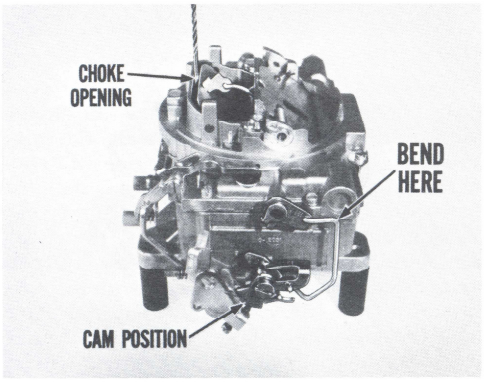


Fig. 2—Fast-idle cam guarantees right idle speed

Move the choke valve toward the closed position with light pressure on the choke shaft lever. Insert the specified drill between the choke valve and air horn wall. You should feel a slight drag when removing it. If not, you'll have to bend the fast-idle connector rod at the upper angle to get the right opening. The fast-idle cam position *must* be adjusted before adjusting the fast-idle speed.

A LITTLE WARNING

There's one thing to be sure of when setting the fast-idle cam position. Make sure that the fast-idle adjusting screw is resting *against the shoulder* of the proper fast-idle cam step. This guarantees that the fast-idle cam will be indexed properly. If not set against the shoulder, the fast-idle cam will move to the next step too soon as the engine warms up.

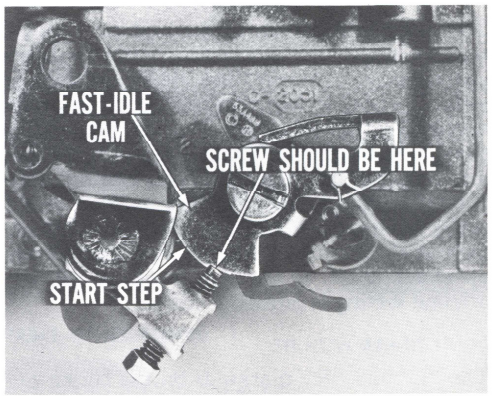


Fig. 3—Adjusting screw against shoulder

FAST-IDLE SPEED

Adjusting the fast-idle speed is accomplished by using a tachometer and turning the fast-idle adjusting screw. However, before this is done, the curb-idle speed and mixture must be set properly. (These adjustments are covered later in the book.) Just make sure that the engine is fully warmed up and that the adjusting screw is resting on the second step of the fast-idle cam

—*not the start step.* Check the Service Manual for the correct r.p.m. and adjust the fast-idle speed screw until the tachometer gives you the correct reading.

AVS ACCELERATOR PUMP AND BOWL VENT

The accelerator pump, pump linkage, and bowl vent are the next items to be covered. The accelerator pump and bowl vent are both operated by the same lever but must be adjusted separately. The pump adjustment affects the bowl vent opening so should be done first.

IT'S DIFFERENT FROM THE TWO-BARRELS

The first thing to notice is the accelerator pump linkage. The three holes which change the pump stroke are in the pump lever instead of the throttle lever, as on the two-barrel carbs. The other difference is that the holes affect the pump stroke oppositely from the two-barrels. The outer hole provides the shortest stroke, the middle the medium stroke, and the inner hole the long stroke. The middle hole is used for normal operating conditions. In extremely hot climates, the outer hole, which gives you a short stroke, may be used. For very cold conditions, you may want to use the inner hole for a longer stroke.

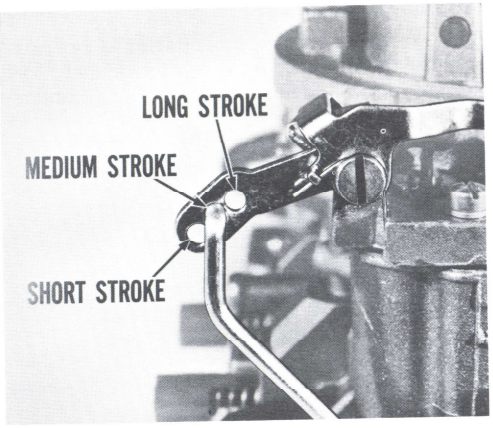


Fig. 4—Holes affect length of pump stroke

MEASURE WITH A T-SCALE

Before checking the accelerator pump stroke, open the choke valve enough to release the fast-idle cam. The throttle valves must be fully seated in their bores, so back off the curb-idle speed adjustment screw. You'll need a T-scale to measure the pump stroke. The accelerator pump stroke is checked by measuring from the top of the pump plunger stem to the top of the air horn. If adjustment is needed, bend the accelerator pump rod just below the pump lever.

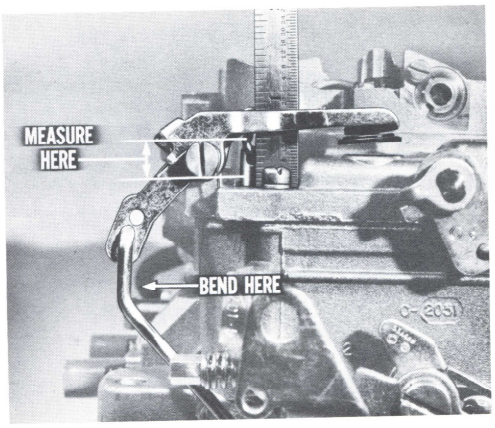


Fig. 5—Measure pump stroke; bend pump rod to adjust

NOW YOU'RE READY FOR THE BOWL VENT

Remember that adjusting the accelerator pump stroke affects the bowl vent opening, so the vent opening must *always* be adjusted *after* the pump stroke. The accelerator pump rod must be in the middle hole for proper adjustment of pump stroke. But if you're changing the pump stroke for extreme conditions don't adjust the bowl vent until after you relocate the pump rod in the inner or outer hole.

Incorrect adjustment of the bowl vent can cause performance problems at idle and off-idle conditions. If the vent doesn't open when the throttle is closed, it could contribute to rough idle stalling, or hot-start problems. If the vent does not close as the throttles are cracked, the off-idle mixture will be too rich. The right place and way to check the bowl vent opening is to insert the specified drill or gauge between the vent and the air horn. Make sure you check at the end of the bowl vent lever where the opening is greatest. To reset the vent, bend the short tang on the vent valve lever.

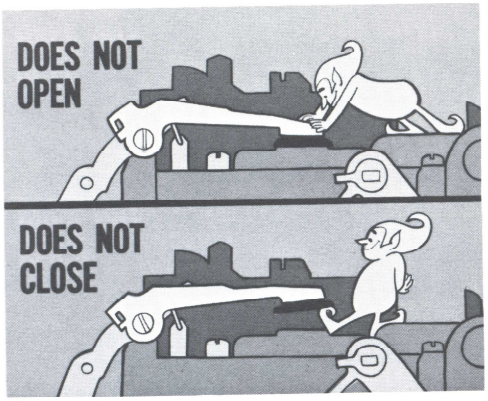


Fig. 6—Incorrect bowl vent adjustment

THE AVS CHOKE UNLOADER

The choke unloader is one item generally misunderstood by most drivers. Yet, it can be one of the most helpful parts of the carburetor when they have starting problems. If the engine becomes flooded while the carburetor is in a choke condition, the choke unloader compensates for the flooding when the driver holds the throttle wide open and makes starting possible. However, to operate properly, it must be adjusted properly.

CHOKE UNLOADER ADJUSTMENT

To check the choke unloader, hold the throttle valves wide open. Insert the proper size drill between the choke valve and inner wall of the air horn. With light pressure on the choke shaft lever, the drill should have a slight drag when you remove it. To adjust the unloader, bend the unloader tang on the fast-idle cam. You may have been instructed at one time to adjust the unloader by bending the tang on the throttle bellcrank. The reason for this was that there may have been the possibility of upsetting the balance of the fast-idle cam. However, this did not prove to be true. So follow the instructions as they are above and bend the tang on the fast-idle cam.

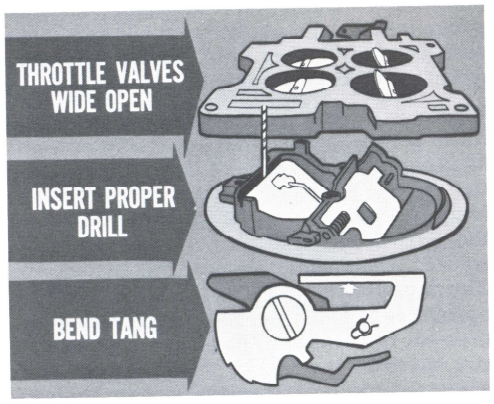


Fig. 7—Choke unloader adjustment

USE A LITTLE MUSCLE

You'd better be sure when opening the throttle valve to use enough pressure to overcome the override spring on the secondary throttle shaft. This spring is very stiff and if the primary throttle valves aren't completely open, the choke unloader adjustment will be wrong.

AVS SECONDARY SYSTEM

Up until this point, all the adjustments that have been covered have been on the primary side of the carburetor. However, the secondary part of the carburetor is just as important to good performance as the primaries.

SECONDARY AIR VALVE

The air valve in the secondaries is operated strictly by air flow. As a matter of fact, AVS stands for *air valve secondary*. The secondary

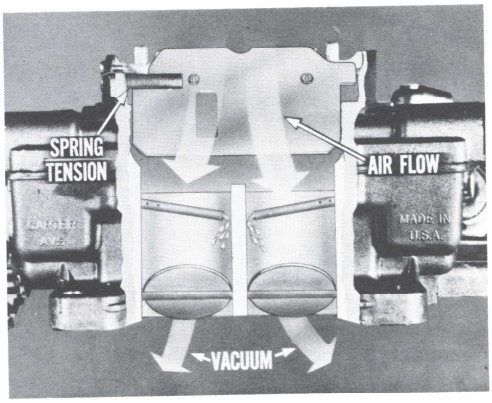


Fig. 8—Air valve spring tension must be sufficient

air valve doesn't operate until the velocity of the air flow is great enough.

The spring tension on the air valve must be just sufficient to hold it closed as the secondary throttle valves start to open. This creates a vacuum in the secondary air horn to start fuel flowing in the secondary nozzles *before* the air flow opens the secondary air valve.

THE TENSION'S GOTTA BE RIGHT

If the tension of the air valve spring isn't right, here's what happens. Too *little* tension allows the air valve to open too soon when the throttle valves are opened quickly. If the air valve opens too quickly, you don't get that increase in vacuum to start fuel flow in the secondary nozzles. This can cause a hesitation, flat spot, or even backfire, from a lean mixture. Too *much* tension will delay opening the air valve. As a result, the mixture will be too rich until the valve opens. This may affect both economy and performance.

AIR VALVE ADJUSTMENT

Adjusting the spring tension on the secondary air valve is quite easy. Loosen the lock screw at the slotted sleeve of the air valve shaft and let the air valve position itself wide open. With the valve in wide-open position and spring just touching valve, turn the slotted sleeve *two full turns* counterclockwise. Hold it in this position with your finger and tighten the lock screw securely. After adjusting spring tension, check the valve for freedom of movement.

THE SECONDARY THROTTLE LINKAGE

There are two things which affect the operation of the secondary throttle valves. The secondary lockout and the secondary throttle linkage must both be properly adjusted to operate correctly. The lockout can be adjusted while the carburetor is on the car. To adjust the secondary throttle linkage, the carburetor must be removed from the car.

SECONDARY LOCKOUT SHOULD FREELY ENGAGE

The purpose of the secondary lockout is to keep the secondary throttle valve closed during engine warmup. The secondary lockout tang engages the secondary throttle shaft tang until the fast-idle screw is completely off the fast-idle

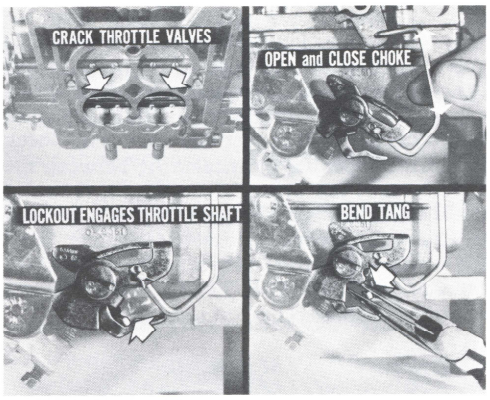


Fig. 9—Secondary lockout adjustment

cam. If the secondary throttle valve were able to open during warmup, *poor performance* would be the result. To check the secondary lockout, crack the throttle valve partly open. Then open and close the choke valve. The lockout tang should freely engage the tang on the secondary throttle shaft. If it doesn't, bend the tang on the secondary throttle shaft until engagement is made with the lockout tang.

PRIMARY AND SECONDARY OPENING SEQUENCE

The secondary throttle linkage has a connecting rod that may require adjusting to get the proper opening sequence between the primary and secondary throttle valves. The secondary

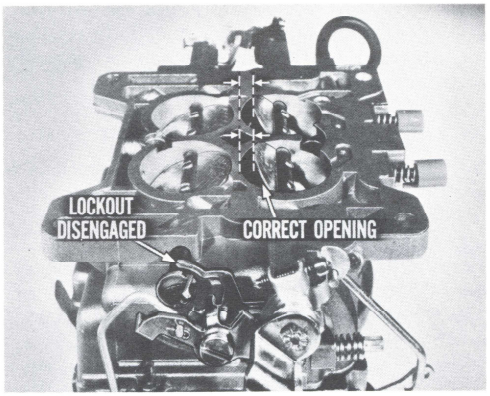


Fig. 10—Proper secondary opening sequence

throttle lever should start to open after the primaries have opened about sixty degrees. To check whether they're opening properly, invert the carburetor and make sure the lockout is disengaged. Open the primary throttle valves until the secondary valves just start to open. Check for correct opening by measuring between the lower edge of the primary throttle valve facing the secondaries and the bore. If it is necessary to adjust the secondary throttle opening, bend the connecting rod between the secondary throttle levers. To avoid damage to other parts, remove the connecting rod to bend it.

CLOSING SHOES MAY BE AFFECTED

Adjusting the secondary throttle linkage may affect the clearance between the positive closing shoes, so be sure and check it. To do this, close the primary throttle valves all the way. The clearance between the positive closing shoes should be twenty-thousandths. Check the clearance, and if necessary, adjust it by bending the shoe on the secondary throttle lever. After you adjust the closing shoes, make sure that the shoes do not interfere with each other as the primary throttle valves are opened.

IDLE SPEED AND MIXTURE ADJUSTMENTS

The usual precautions apply when adjusting idle speed and mixture. The engine must be fully warmed up, the ignition timing must be correct, and you must use an accurate tachometer and an exhaust analyzer. Watch the exhaust analyzer very closely. As the mixture gets very lean, the analyzer may indicate that the mixture is getting richer, when it is actually getting leaner.

ONCE YOU ESTABLISH A RICH CONDITION

Adjust each mixture screw one-sixteenth of a turn at a time. You should always adjust from *rich* to *lean*. The exhaust analyzer is so sensitive that the ratio must be changed in very small increments. So, never turn the mixture screw more than one-sixteenth at a time. Each time you turn the screw, wait ten seconds before reading the meter. Check idle speed and readjust to specifications if necessary and then readjust mixture until the proper air/fuel ratio is obtained at proper idle speed.

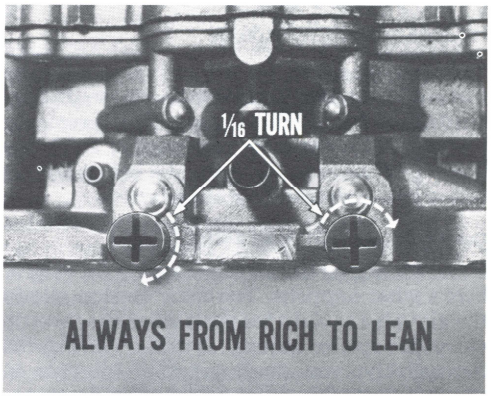


Fig. 11—Watch exhaust analyzer closely

RESETTING IDLE BALANCE

If everything else is okay and you still have rough idle or low-speed surge, you've probably got an imbalance between the bores. On late production models, remove the plastic stop tabs (limiter caps). Turn the mixture screws in until they are seated. As a starting point, turn the screws counterclockwise two to three turns. From this point follow the idle speed and mixture instructions until the right air/fuel ratio is obtained. Make absolutely sure that both screws are turned the same amount at each adjustment. Install new plastic limiter caps on the mixture screws at midpoint of their travel. On the earlier production models the

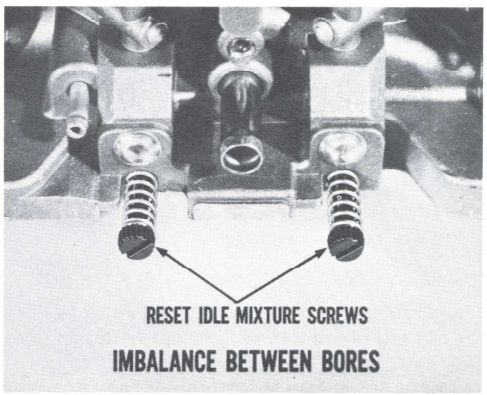


Fig. 12—Remove plastic limiter caps

plugs at the base of the carburetor must be removed to get at the limiter screws to balance the two primary bores. The procedure is the same as on the late-model jobs with the exception of one thing. Seat the single idle mixture screw and then turn it three-quarters of a turn clockwise before adjusting the limiter screws.

AVS AUXILIARY SYSTEMS

STUCK STEP-UP PISTONS CAUSE PROBLEMS

If you get a complaint about poor economy or acceleration you might want to check the step-up pistons. Hold the cover plate with your finger and remove the screw. This will keep the spring-loaded piston from flying out. To eliminate the sticking, clean the piston, spring and metering rod with solvent and if necessary, polish the piston with crocus cloth. Don't use anything but crocus cloth and be careful not to remove any metal or round the lands.

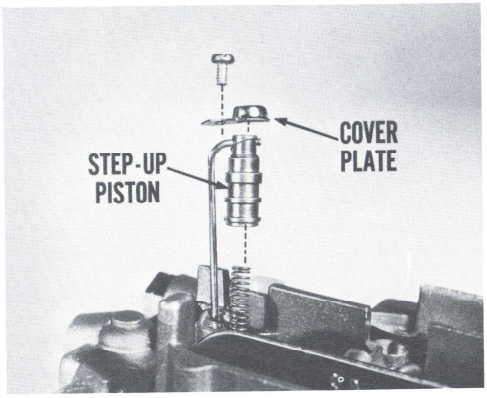


Fig. 13—Check the step-up pistons

ONLY ON AIR-CONDITIONED CARS

The hot-idle compensator valve is in the secondary bores and leans out rich mixtures which result from high under-hood temperatures. Don't tinker with it either, or you'll upset the calibration.

THE HOLLEY FOUR-BARREL

For 1969 the Holley four-barrel carburetor is being used on the 383 C.I.D. engines as well as on the 440 C.I.D. There have been minor changes made since the Holley was first used in 1967; however, basic circuits are still the same. If you dig back in your Reference Book files and find the one for Session 67-5, you might find that a review of that session might be worthwhile.

Since there are minor changes made occasionally, always check your Service Manual and Service Bulletins for the latest specifications. Because of this, any time a drill size or dimension is used to check an adjustment, it will not be specified in this Reference Book.

QUALIFYING THE CHOKE CONTROL LEVER

Before making any adjustments on the Holley four-barrel carburetor, the choke control lever must be qualified. *Qualifying* the choke control lever is a starting point for any other adjustments which may have to be made. Proper adjustment of the choke control lever provides the correct relationship between the choke valve, thermostatic coil spring and the fast-idle cam.

PROPER DISTANCE

It's pretty easy to qualify the choke control lever. All you want to do is to make sure that the choke control lever hole is the proper distance above the carburetor base with the choke closed. If the carburetor is on the car, measure from the top of the choke control rod hole in the choke control lever to the top of the choke unit. If you're making the adjustment on the bench, measure to the base of the carburetor.

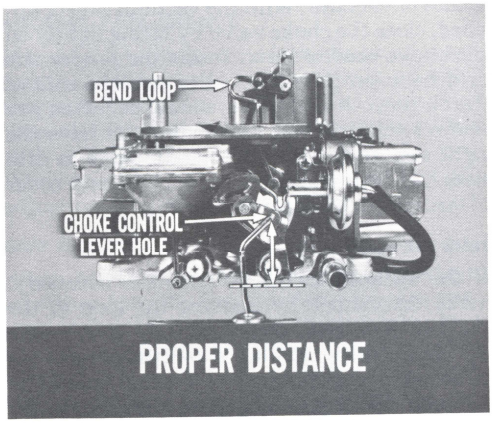


Fig. 14—Starting point for other adjustments

Check your Service Manual for the right dimension. Remember, qualifying the choke control lever is a starting point for all other adjustments; so if necessary, adjust the choke control rod *before* making vacuum kick, fast-idle speed and cam position, or choke unloader adjustments.

KEEP IT STRAIGHT

Bend the loop at the upper end of the choke shaft rod to get the correct measurement. If the choke control rod is bent improperly, it may cause binding. Check for free movement between open and closed choke positions and rebend the rod to eliminate any interferences.

VACUUM KICK UNIT

The vacuum kick unit on the Holley carburetor is basically the same as on other carburetors. It may look a little different, but don't let that throw you. It does the same job, the same way; and is also adjusted the same way. The correct amount of choke opening is different from the AVS, so check your Service Manual. The vacuum kick unit is different for the different applications, so check the part numbers carefully when replacing the unit.

VACUUM KICK ADJUSTMENT

The vacuum kick adjustment is made with at least ten inches of vacuum applied to the vacuum kick diaphragm. You can use any external vacuum source that will provide at least ten inches of vacuum. With the vacuum source applied, close the choke valve by lifting lightly on the choke control lever. Insert the proper size drill between the choke valve and the wall of the air horn. A slight drag should be felt as you remove the drill. To make sure you have the right size drill, check the handy guide to drill sizes and decimal equivalents on the back cover of last month's Reference Book.

BEND THE LOOP

If the vacuum kick adjustment is necessary, make the change by bending the loop in the vacuum kick link. Open the loop to decrease the choke valve opening; close the loop to increase choke opening. A very small change in the loop opening makes quite a change in the choke opening, so be very careful. The vacuum

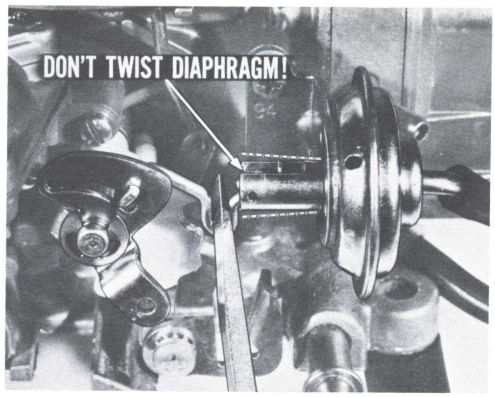


Fig. 15—Change link opening carefully

kick adjustment is critical to good warmup performance, so make sure it's right—even if you have to recheck it a couple of times.

TAKE IT EASY

Two things are pretty important when setting the vacuum kick adjustment. First, make sure that the modulating spring is *fully* compressed. Otherwise your adjustment will be incorrect. The other thing is . . . be careful not to twist the diaphragm when adjusting the vacuum kick. It doesn't take much to twist the diaphragm and damage it. And be careful not to bend the mounting bracket either.

HOLLEY FAST-IDLE SPEED AND CAM

There is no fast-idle speed-adjusting screw on the Holley four-barrel carb. The fast-idle speed is controlled by the fast-idle tang resting on the fast-idle cam. It's pretty obvious that the fast-idle speed adjustment must be made on the vehicle but there's two things that should be done before adjusting fast-idle speed. First, the odometer should indicate over 500 miles to insure a normal engine friction level. Second, you should thoroughly warm up the engine by driving at least five miles. Connect a tachometer and set the curb-idle speed and mixture before proceeding.

SET THE SPEED

To check the fast-idle speed, position the fast-idle tang on the second highest step of the fast-

idle cam. Use a tachometer to check the engine speed. To adjust the fast-idle speed, insert a screwdriver in the slot of the fast-idle speed-adjusting tang. To increase the fast-idle speed, turn the screwdriver to the right. To decrease the speed, turn to the left. Hold the fast-idle cam in position and flash the throttle. The engine should level out at the proper r.p.m.

TANG DOES TWO JOBS

The fast-idle speed tang can also affect the fast-idle cam position. If you bend the tang to increase or decrease the fast-idle speed, be sure not to bend the tang in any other direction. Bending the tang up or down will change the fast-idle cam position. In fact, it's a good practice to always check the fast-idle cam position after adjusting fast-idle speed.

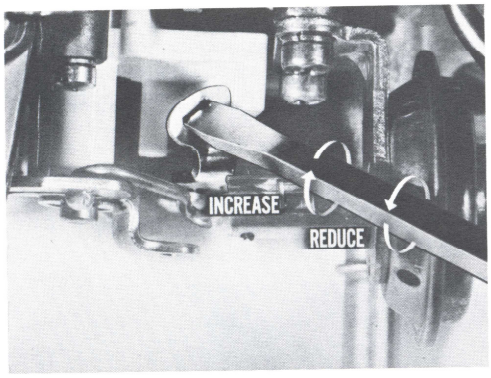


Fig. 16—Can also affect cam position

DIFFERENT FOR 383's

The Holley four-barrel was recently made available on the 383 C.I.D. engine along with the 440 C.I.D. The fast-idle specification is different, so don't follow the Service Manual on these jobs. The Manual was printed long before the Holley was available on the 383's. The fast-idle speed for the 383 application is a bit lower at 1500 r.p.m. than the 1600 setting for the 440. Until you receive a Service Bulletin, you'll have to refer back to this Reference Book specification.

FAST-IDLE CAM POSITION

The fast-idle cam position can be adjusted while the carburetor is on or off the car. The position of the fast-idle cam assures proper engine speed at each step of the fast-idle cam during warmup. To check cam position, place the fast-idle tang on the second highest speed step of the fast-idle cam. Then lift the choke control lever lightly to close the choke.

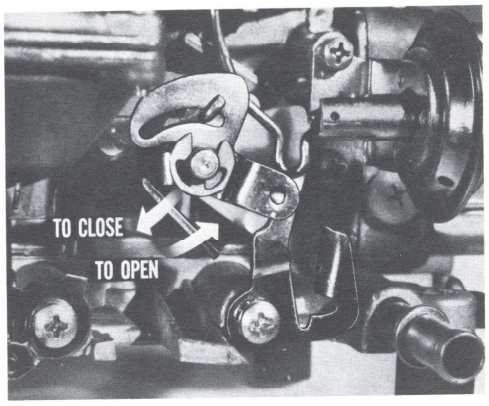


Fig. 17—Adjust for correct choke opening

Insert the specified drill or gauge in the choke valve opening. You should be able to feel a slight drag when removing the drill. The fast-idle cam position is adjusted by bending the cam position adjusting tang until you have the correct choke valve opening. Bend the tang toward the cam to widen the opening and away from the cam to narrow the opening.

ANOTHER PART CHANGE

If you have to replace the fast-idle cam for any reason, be sure not to replace it with an obsolete part. Both the black and red cams have been obsoleted, the right one to replace them with is colored white for easy identification. When the white cam is used, a new fast-idle adjusting tang must also be used.

GIVE IT ROOM

When bending the fast-idle adjusting tang to set either fast-idle speed or fast-idle cam position, make sure it does not rub against the back surface of the fast-idle cam. This is a quick check that is made by sight. If the tang is rubbing against the cam, it can prevent the cam from indexing properly or prevent the throttle

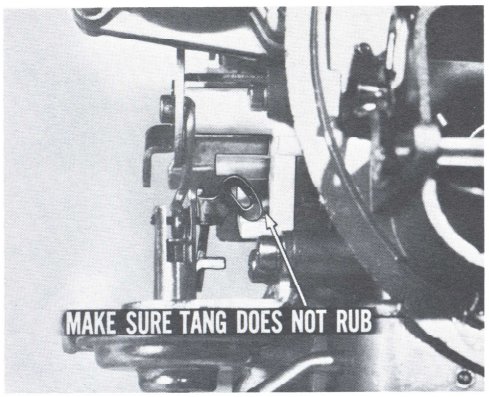


Fig. 18—Can prevent cam from indexing

from closing all the way. Of course, if you bend the tang away from the cam, you'll have to recheck the fast-idle speed and cam position.

HOLLEY UNLOADER, PUMP AND VENT

I'm sure you know that the choke unloader provides a means of clearing a flooded engine during start-up before the engine is fully warmed up. The choke unloader will open the choke valve enough to allow sufficient air to mix with the over-rich mixture caused by flooding. To check the choke unloader adjustment, move the throttle valves wide open and hold the valve closed with light pressure on the choke control lever. Use the proper size drill

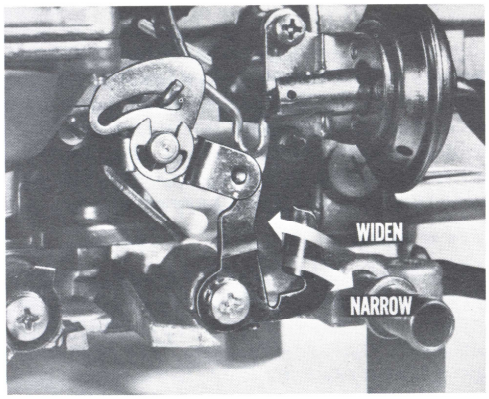


Fig. 19—Opens choke valve to relieve flooding

or gauge listed in the Service Manual to check the amount the choke valve is open. To widen the choke opening, bend the choke unloader tang toward the pin on the fast-idle cam. If the opening is too wide and you have to narrow it, bend the tang away from the cam.

A LITTLE HINT

You can use either a drill or gauge to check these dimensions. But remember, when you check the opening, *always* be sure that the drill or gauge is resting flush against the wall of the air horn. If not, the adjustment will be wrong.

Along with the choke unloader, the vacuum kick and fast-idle cam position adjustments call for a specific amount of choke opening.

ADJUST THE ACCELERATOR PUMP . . .

The accelerator pump and bowl vent are two separate adjustments on the Holley. Unlike the AVS, adjusting the accelerator pump will not affect the bowl vent opening, and the pump is adjusted with the primary throttle valves wide open. Hold the throttle valves wide open and move the pump diaphragm lever down as far as it will go. Check the clearance between the diaphragm lever and the adjusting screw. To adjust the clearance, turn the screw in or out.

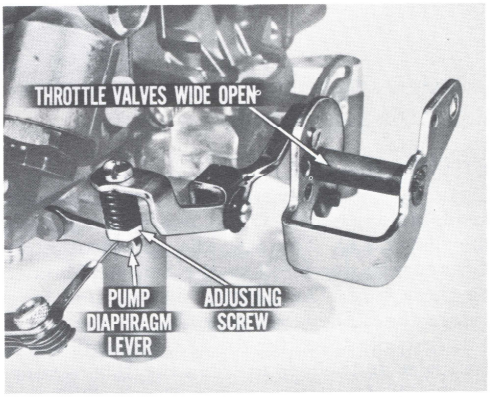


Fig. 20—Primary throttle valves wide open

. . . AND THEN THE BOWL VENT

The bowl vent adjustment is checked when the throttle is at curb idle. Check the Service

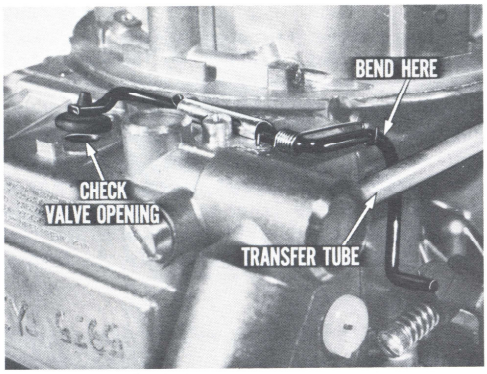


Fig. 21—Throttle at curb idle

Manual for the specs and use a drill or gauge to check the bowl vent opening. Bend the curved part of the bowl vent operating rod if you have to adjust the vent opening. When you bend the bowl vent rod, make sure that the transfer tube alongside of it doesn't interfere with the rod.

AFFECTS PUMP STROKE

There are two holes in the throttle bellcrank. They position the accelerator pump cam. The cam screw should be in the upper or number one hole when you adjust the pump lever clearance for normal operating conditions. The second hole is used to position the pump lever cam for high-temperature conditions.

SOME OTHER IMPORTANT THINGS TO CHECK

SECONDARY THROTTLE DIAPHRAGM

The secondary throttle valves are operated by vacuum. The secondary throttle diaphragm unit opens the throttle valves when air flow through the venturis creates enough vacuum to overcome the diaphragm spring. There is no adjustment required for the vacuum diaphragm unit. The vacuum diaphragm units do differ however between the 383 and 440 engines. So, if you have to replace the unit, make sure you have the right one for that carburetor. Of course they have different part numbers, but the easiest way to check is the color of the diaphragm spring. The one for the 440 C.I.D. engine is *purple;* the one for the 383 C.I.D. engine is *pink*.

IDLE MIXTURE AND SPEED

Setting the idle mixture and speed is a relatively simple job, but is very important and should be as exact as possible. The new emission control standards make it even more important. You'll need a tachometer and a gas exhaust analyzer to do the job. The procedure for adjusting the idle speed and mixture is generally the same as for the AVS carburetor. The late-production Holley carburetors have an idle mixture adjusting screw in each side of the primary metering block. If you have to reset the idle mixture screws for proper balance, remove the plastic stop tabs (limiter caps). Follow the procedure outlined in the Service Manual to achieve proper balance between the primary bores.

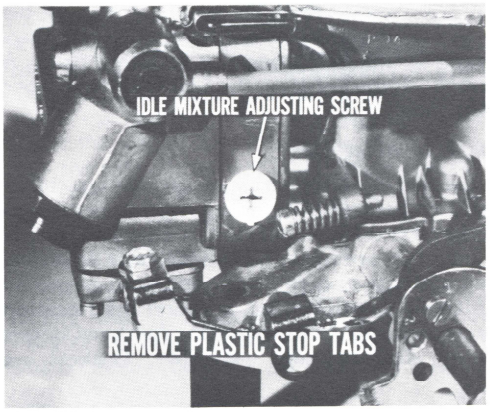


Fig. 22—Late-production Holley

OLD MODELS

On early production models, the idle mixture adjusting screw is in the air horn. This means that you'll have to adjust the idle mixture with the air cleaner removed. When the air cleaner is installed, the idle speed will change, so recheck it *after* installing the air cleaner. The best thing to do is to adjust the idle on the lean side so that a slight decrease in idle speed is noted on the tachometer. When the air cleaner is installed, the idle speed should increase to the maximum speed obtainable by fuel mixture adjustment. If the speed decreases, the idle mixture is too rich and should be readjusted.

Fig. 23—Early-production Holley

If you have to reset the limiter screws on the early models, you'll find them under the plugs in each side of the primary metering block. A small, sharp punch is the best way to remove the plugs.

FUEL BOWL SCREWS

The fuel bowl screws can cause idle instability if they become loose or are not torqued properly after a kit is installed. If all the other adjustments are right and you still have an erratic or unstable idle, re-torque the bowl screws to fifty inch-pounds. Due to gasket deterioration and shrinkage, re-torquing the fuel bowl screws may eliminate idle instability. Gaskets are critical on Holley carburetors because they perform a sealing function whereas on other carburetors, this may not be the case. And speaking of gaskets, when you install the fuel bowls, make sure you use the new bowl screw gaskets, or seals, included in the kit. The screw seals should be installed on the screw before you install the screws. If you install them in the cavity in the bowl and thread through them, you will get bits of the seal in the fuel bowl. This can cause problems in the future.

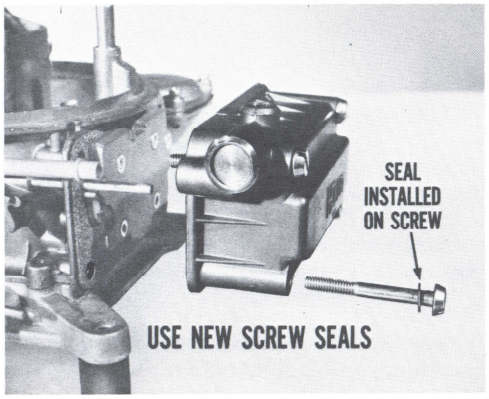


Fig. 24—Must be properly torqued

RIGHT AND TIGHT

If you replace the power valve, make sure you use the right one. The part number has not been changed even though the part has. It's pretty easy to spot the obsolete one, because the diaphragm is exposed. The new one has a metal shield over the diaphragm. *Always* use a new gasket and tighten the valve to the correct torque which is 100 to 120 inch-pounds. If you run across a carburetor with the obsolete-type power valve, it's a good idea to replace it whether it needs it or not.

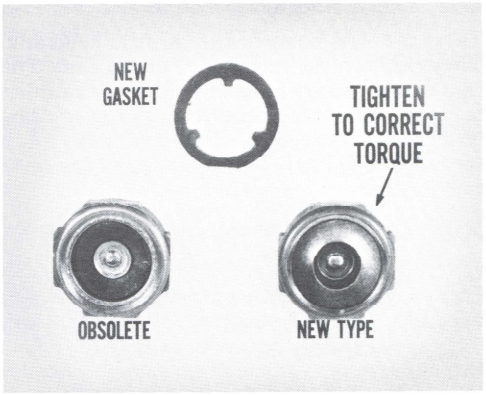


Fig. 25—Part number has not been changed

MORE ABOUT GASKETS

When assembling the carburetor, make sure you have the right primary metering body gasket for the carburetor you're working on. The location of the passage holes is different and if you use the sixty-eight gasket on a sixty-seven model, the projection will prevent proper sealing at the metering body.

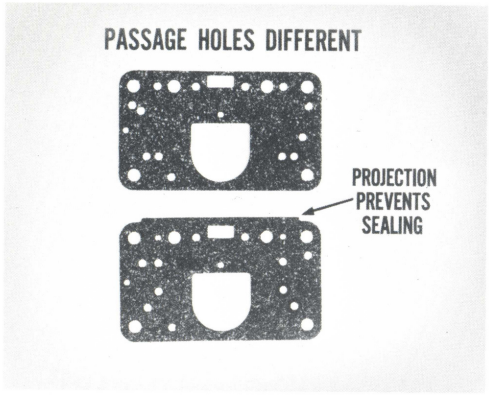


Fig. 26—Right gasket for right carb

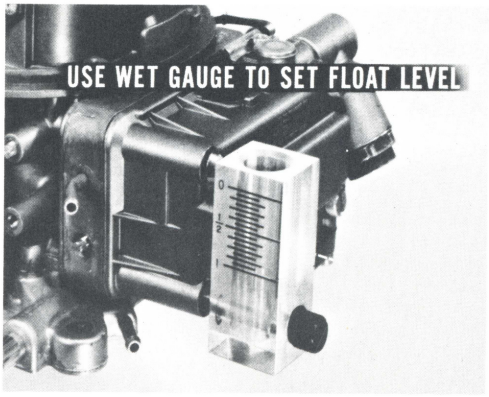


Fig. 27—Wet level gauge doesn't lie

TORQUE TALK

The secondary metering block screws and throttle body screws can cause a lot of trouble if they're not tightened properly. If you have a problem with the carburetor flooding or leaking, check the gaskets and if necessary, replace them. Then make sure that the secondary metering block screws and throttle body screws are tightened to the correct torque. The right torque for the throttle body screws is the same as for the fuel bowl screws—fifty inch-pounds. The secondary metering block screws must be torqued to eighteen to twenty-four inch-pounds. These screws should be torqued evenly in very small increments.

WET 'N DRY

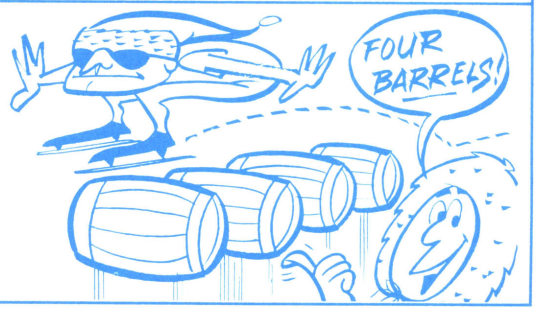
The float level specifications have been revised after the Service Manual went to press. This is one case where you should refer to your Service Bulletins for the latest float level information. As a matter of fact, checking your Service Bulletins is always good practice. Set the float level to the specified clearance between the float and fuel bowl wall. The most accurate way to measure is to use a drill or float gauge of the correct size. Using a scale to measure won't be very easy and less accurate.

WHY RECHECK IT?

If you have a wet gauge, be sure to check the float level *after* it is all buttoned up and installed on the car. You may wonder "why bother rechecking the float level?" The reason is that the float is subject to some variables, such as weight from excess solder, fuel pressure, and variations in the softness of the needle tip. But, the wet level gauge doesn't lie about the actual fuel level. The scale etched into the side of the wet level gauge makes it real easy to read. Again check your Service Bulletins for the right specs.

RETAINER CLIPS

There are two spring retainer clips on the Holley that you should be careful about. They're commonly referred to as "E" clips. One holds the choke control lever and fast-idle cam on the choke control shaft. The other holds the accelerator pump lever on its shaft. If you remove either one, make sure you crimp the clip tightly when you put it back on. It usually spreads a little when it's removed and may not stay on when reinstalled.



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