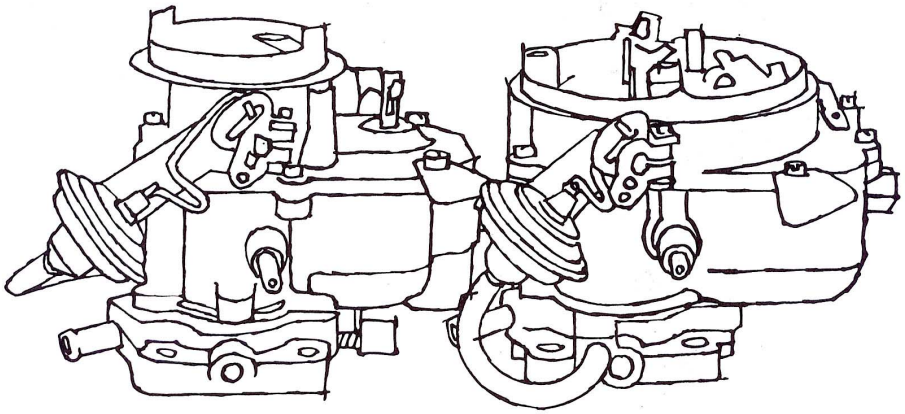
MASTER
TECHNICIANS
SERVICE
CONFERENCE

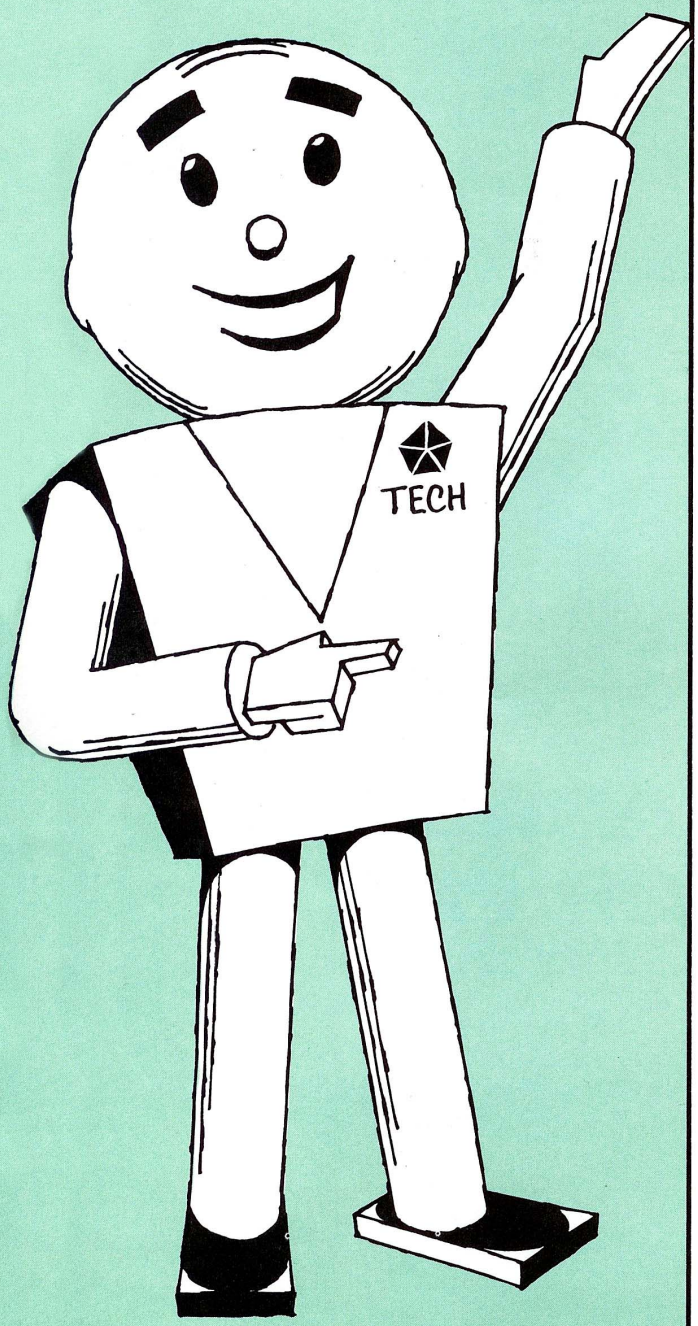
REFERENCE BOOK 69-8



DOUBLE-BARRELED CARBURETOR FACTS

PLYMOUTH
DODGE
CHRYSLER
IMPERIAL
DODGE TRUCK

CHRYSLER
MOTORS CORPORATION



TECH SEZ:

The carburetor and the automatic choke are probably two of the most frequently misunderstood, neglected, tinkered with and unnecessarily overhauled parts of the automobile. If a carburetor is correctly assembled in the first place, there is very little that can wear or get out of adjustment *inside* the carburetor. As a matter of fact, the only thing inside the carburetor that is actually adjustable is float level. All other service adjustments are external.

Of course, if someone feeds the carburetor a slug of water or a diet of dirty fuel, all kinds of undesirable things can happen inside the carburetor. However, thanks to fuel filters in both the car and at the gas station pump, dirt and water problems aren't at all common these days. And, this kind of trouble isn't difficult to diagnose when it does happen.

The automatic choke and the carburetor aren't completely foolproof and trouble-free by any stretch of the imagination. As a matter of fact, fuel system problems are more common than they should be. However, more often than not the trouble is caused by some simple external misadjustment or by dirty or sticking carburetor levers or linkages. That's why this session is mostly about the external adjustments and services that are essential to the correct operation of the Carter BBD carburetors.

Incidentally, some of you have probably needed a small carburetor part and had trouble finding a replacement for this "nuisance" part. If so, you'll be glad to learn that the Chrysler Parts Division has released *all* of the component replacement parts for *all* of our production carburetors. So, the next time a small carburetor part bounces down the nearest floor drain, don't exercise your vocabulary . . . talk it over with your Parts Manager!

INTRODUCTION TO THE BBD'S

The two Carter BBD carburetors used on Chrysler-built cars and trucks are quite similar in some ways. The main differences are in the accelerator pump linkage, the bowl vent arrangement, the fast-idle mechanism and the idle mixture adjusting screws.

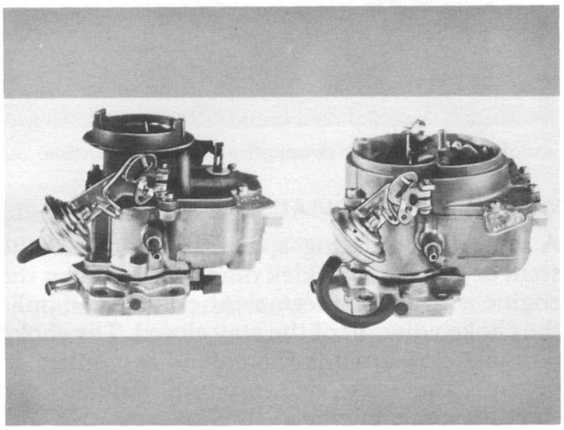


Fig. 1—The Ball and Ball dual-barrel carburetors

To simplify arrangement of the information in this reference book, the 1¼" BBD and the 1½" BBD carburetors will not be covered in separate sections. Common features of these models will be covered and where there are significant differences in the operation or adjustment, these differences will be called out under separate headings.

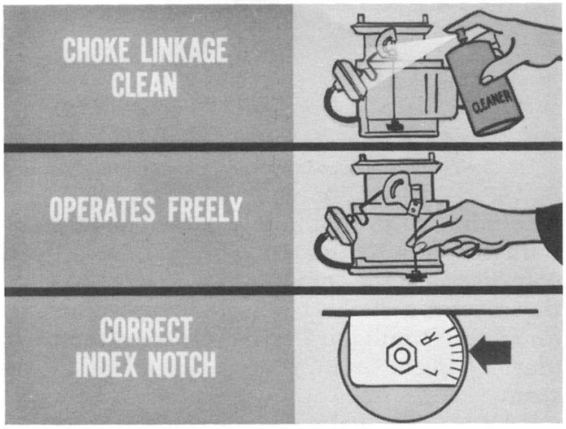


Fig. 2—Check automatic choke and linkage

THE WELL-TYPE CHOKE

A well-type choke is used on current model Chrysler-built vehicles. The choke mechanism itself is virtually foolproof. Probably the most common cause of choke unit trouble is deliberate misadjustment of choke coil tension in an attempt to correct some other problem.

An all too common mistake is to blame the choke unit when the trouble is actually incorrect vacuum kick adjustment; dirty, sticking choke linkage; or gum deposits on the choke valve shaft.

No periodic service is required for the choke unit itself. When servicing the carburetor, make sure the choke linkage is clean and move the choke rod up and down to make sure it moves freely without binding. If the choke unit is removed for any reason, make sure it is set at the correct index notch specified in the Service Manual or the latest Service Bulletin. Choke settings are not the same for all BBD carburetors, so check the specifications for the model you are servicing. Also, whenever you install a choke unit, check to make sure it is correctly positioned in the manifold well so that there is no possibility of binding.

NO OIL OR LUBRICATION, PLEASE

All carburetor linkages should be clean and dry. *Never* lubricate a carburetor link or lever because the dirt that is bound to stick to the lubricant will cause real trouble. Plenty of operating clearance is designed into carburetor linkages so that they will operate freely if they are kept clean. The new aerosol-type cleaners available are ideal for cleaning the outside of the carburetor.

MANIFOLD HEAT CONTROL VALVE

The manifold heat control valve is another unit that can cause engine performance problems that are easily mistaken for carburetor problems. Although a stuck manifold heat control valve doesn't cause *carburetor* trouble, it does cause *carburetion* problems.

If the manifold heat control valve freezes up, it usually sticks in the open position. Lack of carburetor heat will result in very poor performance during warm-up. As a matter of fact, the engine may behave like a cold engine even after it is fully warmed up. A heat control valve

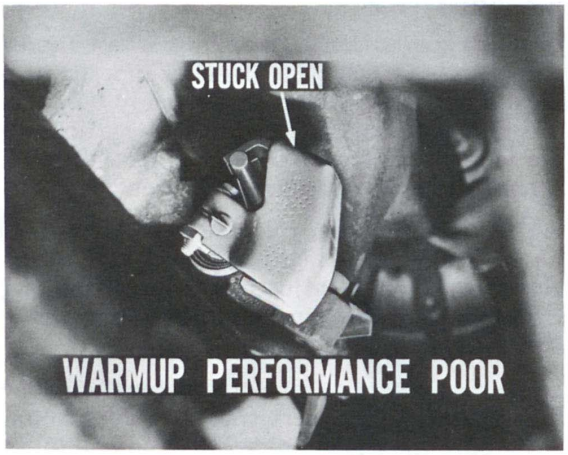


Fig. 3—Check manifold heat control valve operation

that is stuck in the open position will reduce fuel economy and increase exhaust emissions.

Although it is not a common condition, the heat control valve can stick in the closed position. This is most apt to happen if someone tries to free a stuck valve and forces it from the open to the closed position without actually freeing up the heat control valve shaft. A valve that is stuck in the closed position can cause hot-engine starting problems. The best insurance against this kind of trouble is periodic application of manifold heat control solvent as recommended in both the Service Manuals and the owner's Operating Manual.

THE CARBURETOR VACUUM KICK

When the vacuum kick is correctly adjusted, the vacuum diaphragm pulls the choke valve open just far enough to provide the right amount of air flow past the choke valve. This allows the cold engine to keep running during warm-up. If the vacuum kick doesn't open the choke valve far enough, the engine will load up and roll. If the vacuum kick opens the choke too much, the mixture will be too lean during warm-up, engine performance will be very poor and frequent stalling may result.

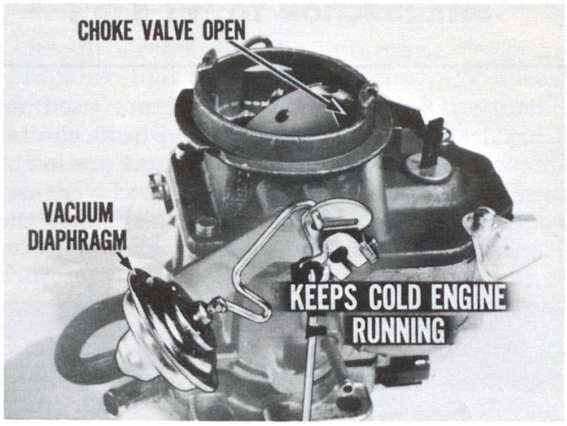


Fig. 4—Vacuum kick adjustment is very important

VACUUM KICK MODULATING SPRING

A choke modulating spring is built into the stem of the vacuum kick diaphragm. When the engine is cold, the thermostatic choke coil pulls the choke valve all of the way closed. The choke remains closed while the engine is cranked to provide the very rich mixture required for starting a cold engine.

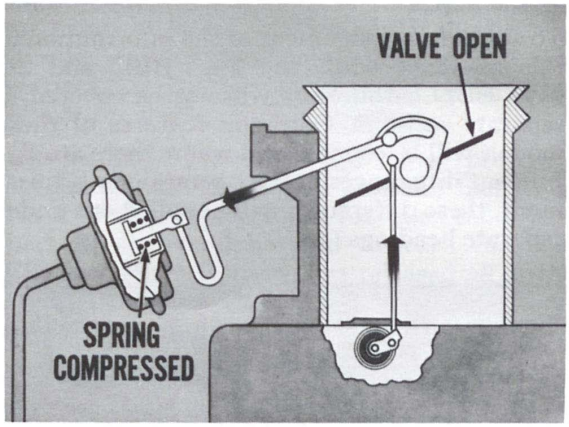


Fig. 5—Vacuum kick compresses the modulating spring

The minute the engine starts, the vacuum diaphragm pulls the choke valve part-way open, compressing the modulating spring. As the thermostatic choke coil warms up, it relaxes and doesn't pull hard enough to keep the modulating spring compressed. As a result, the spring helps open the choke as the engine warms up. The balance between the modulating spring and the thermostatic choke coil gives

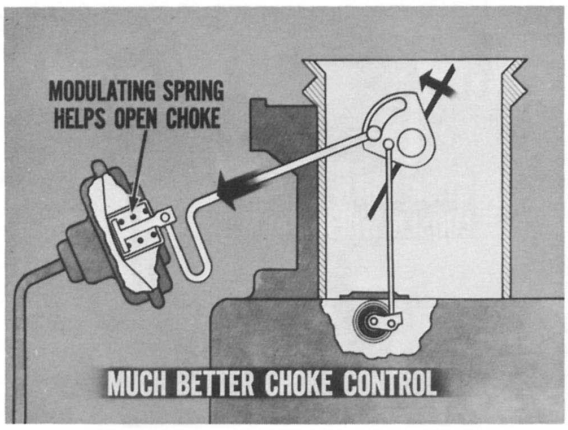


Fig. 6—Modulating spring improves warm-up performance

much better choke valve control and greatly improves warm-up performance.

VACUUM KICK ADJUSTMENT

The Service Manual has detailed instructions for adjusting the vacuum kick. However, there are a couple of important tips and warnings that should be added to these instructions.

For example, the choke modulating spring must be fully compressed when checking the choke valve opening. Here's what will happen if the spring wasn't compressed when setting vacuum kick. When the cold engine is started, the vacuum diaphragm will pull against the closing force of the thermostatic choke coil. This pull *will* compress the modulating spring before it starts to open the choke valve. As a result, the vacuum kick won't open the choke far enough to let the cold engine breathe properly during warm-up.

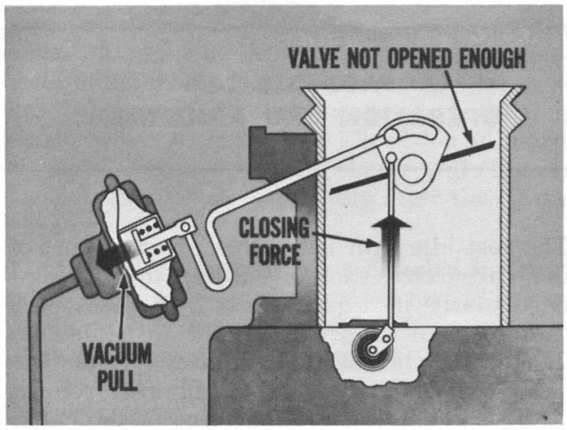


Fig. 7—Pull compresses spring instead of opening choke

When adjusting vacuum kick, a pair of pliers works fine for squeezing the loop in the vacuum kick link to increase choke valve opening. A twist of a broad-bladed screwdriver easily opens the loop to decrease choke valve opening. When adjusting vacuum kick, remember that a very small change in the bend of the loop makes a big change in the choke valve opening, so take it easy. And don't underestimate the importance of precise vacuum kick adjustment. Be very careful when you make this adjustment even if you have to bend the loop and check the choke valve opening several times to get it *exactly* correct.

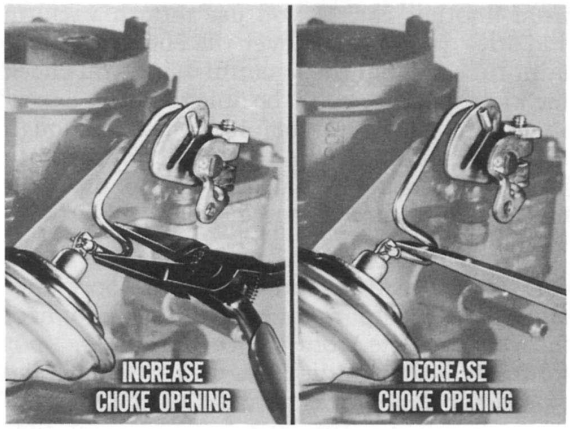


Fig. 8—Increasing or decreasing vacuum kick opening

VACUUM DIAPHRAGM VACUUM

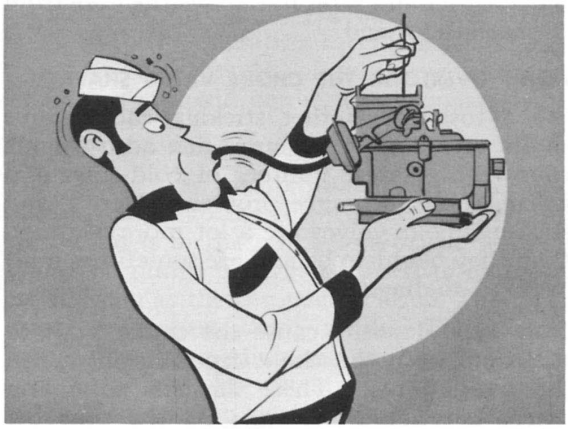


Fig. 9—Mouth vacuum retracts vacuum kick diaphragm

The Service Manuals specify that you must apply ten inches of vacuum to the diaphragm when checking vacuum kick. Next, you close the choke valve just far enough to compress the modulating spring in the stem of the vacuum diaphragm. Finally, you use the specified gauge to measure the amount of choke valve opening. Ten inches of vacuum is specified to make sure the diaphragm will be fully retracted when measuring the kick opening. However, with a little practice you can use "mouth vacuum" in place of a mechanical vacuum source.

The important thing is to make sure the diaphragm is fully retracted when gauging the choke opening. Mouth vacuum has one advantage over vacuum from a distributor test stand, and air-conditioning vacuum pump or vacuum from another car. If you use mouth vacuum and stick your tongue over the end of the vacuum tube to hold the vacuum while you check the kick opening, you'll be able to detect a very slight diaphragm leak before it gets big enough to cause trouble. A small leak will not show up if you are using a vacuum pump or other mechanical vacuum source capable of providing high vacuum.

One more warning is in order. To apply vacuum to the diaphragm you must disconnect the vacuum line from the carburetor . . . not from the vacuum diaphragm kick unit. The reason for this is the tight fit of the vacuum hose. Frequently the hose fit is so tight that you can damage the diaphragm unit or bend its bracket when trying to remove it. It is much easier and safer to remove the hose from the carburetor end.

DON'T OVERLOOK THE CHOKE VALVE SHAFT

It's a toss-up whether sticking choke valve shafts or incorrect vacuum kick adjustments cause the greatest number of cold-start and warm-up performance problems. Here's why sticking choke valves are a lot more common than they ought to be and are sometimes a bit "sticky" to diagnose.

Gum-type deposits cause the choke shaft to stick and keep the choke from closing when the engine's cold. These deposits soften up when the engine is warm. By the time the owner gets to the Service Department, the

Fig. 10—Gum-type deposits cause choke and cam to stick

choke shaft is completely free and the mechanic can't find anything wrong. Besides, squirting solvent on the choke shaft when the engine is hot won't cure the problem because the solvent evaporates before it gets a chance to flush out the gum. The best cure for choke shaft trouble is prevention. Flush out the choke shaft every six months. Many service departments make it a practice to perform this service on every job that requires removal of the air cleaner. This only takes a minute or two and is real satisfied-customer insurance.

Be sure and use a solvent that doesn't leave a sticky or oily film. Don't ever use penetrating oil or any other kind of lubricant and be careful not to get solvent inside the vacuum kick unit because it could damage the vacuum diaphragm.

FAST-IDLE CAM OPERATION AND ADJUSTMENT

The fast-idle cam is another external part of the carburetor that is subject to sticking—particularly if it is neglected. It takes very little gum or dirt to cause the fast-idle cam to stick in the fast-idle position. That's because the cam is designed to fall open from its own weight as the closing force of the choke coil is relaxed. If the cam sticks, the engine

will continue to race after it is warmed up. In addition to being very annoying, this can waste a lot of gasoline and can contribute to abnormal brake lining wear.

FAST-IDLE CAM INDEXING

Correct indexing of the fast-idle cam is very important because this adjustment insures that the fast-idle screw will be on the right step of the cam for the amount of choke opening during warm-up. Fast-idle cam indexing must be checked before adjusting fast-idle speed. The importance of this adjustment is frequently misunderstood or overlooked.

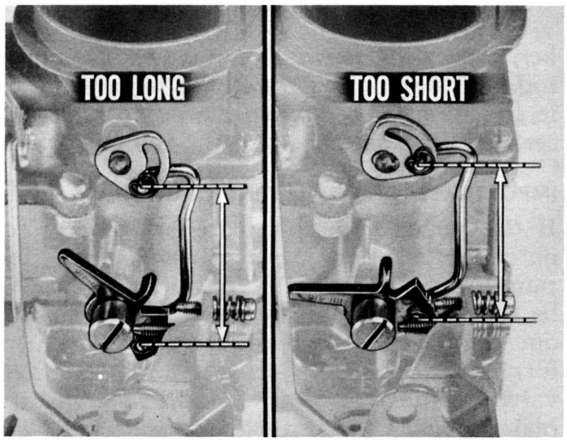


Fig. 11—Incorrect cam position can cause stalling

Incorrect fast-idle cam position is a common cause of stalling during warm-up. If the fast-idle rod is too long, idle speed will drop off too rapidly and be completely off fast-idle before the engine is warmed up enough to run smoothly at curb idle. This is particularly objectionable when conditions are right for carburetor icing and only makes a bad icing situation worse. If the fast-idle rod is adjusted so that it is too short, the engine will stay on fast-idle too long . . . possibly after the choke has opened.

Your Service Manuals have detailed instructions for checking and adjusting fast-idle cam position and fast-idle speed. These instructions are easy enough to understand and to follow, however, a couple of common errors that are made in connection with these adjustments are worth calling to your attention.

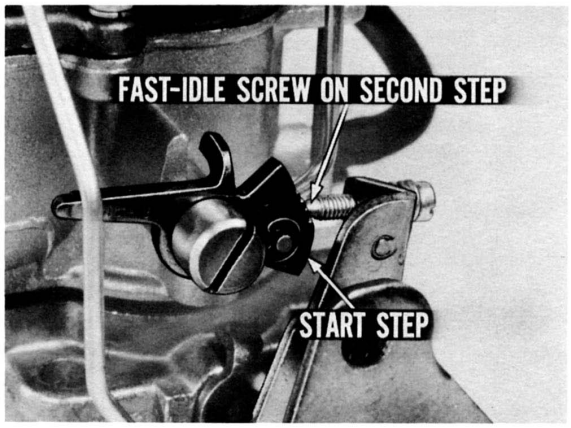


Fig. 12—Position fast-idle screw on second cam step

When checking cam position, or indexing, make sure the fast-idle screw is on the highest fast-idle step and *seated against the shoulder* of the starting step. Incidentally, the first step on the fast-idle cam is the "start" step, the second step is the highest fast-idle step. If the fast-idle screw is not against the shoulder between the highest fast-idle step and the start step, cam indexing will be incorrect and the carburetor will come off fast idle too soon. When adjusting fast idle, make sure the engine is fully warmed up, and the fast-idle screw is resting on the fast-idle step . . . not the "start" step.

ACCELERATOR PUMP AND BOWL VENT 1¼" BBD

The 1¼" BBD and the 1½" BBD carburetors do not have the same type accelerator pump and bowl vent operating mechanisms. Therefore, the adjustments for these two carburetors differ and will be discussed separately.

ACCELERATOR PUMP STROKE

The accelerator pump linkage connects the pump plunger to the throttle lever. When the pump rod is in the outer hole of the throttle lever, the pump plunger is raised to its highest position as the throttle is closed. This provides the longest pump stroke. The middle hole is for the medium stroke and the inner hole is for the shortest stroke. On the 1¼" BBD, the pump rod should be installed in the middle hole for all normal operating condi-

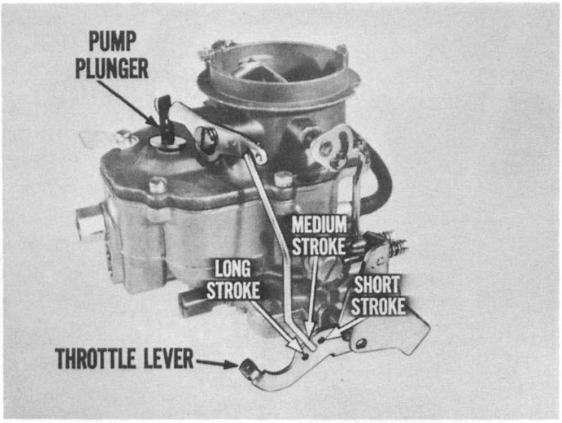


Fig. 13—1 ¼" BBD accelerator pump linkage

tions. The long-stroke outer hole may be used for extremely cold climates and the inner hole for very hot climates.

ACCELERATOR PUMP STEM NOTCHES

The accelerator pump has three notches near the upper end of the stem. These notches retain the hairpin clip that is used to position the bowl vent valve and lift this valve off its seat when the throttle is closed.

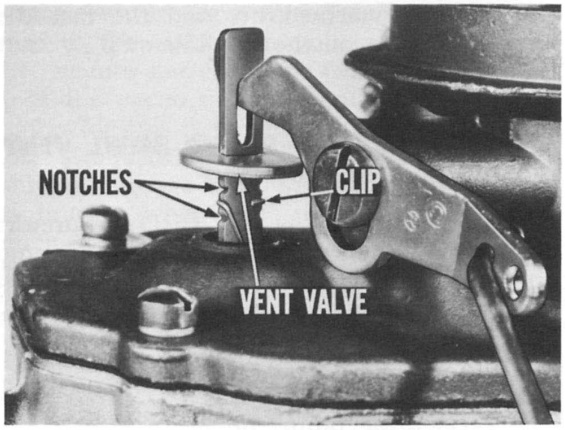


Fig. 14—Hairpin clip positions bowl vent valve

Before making any accelerator pump adjustments, make sure the spring clip is in the correct notch of the pump stem. The upper notch is used when the pump rod is inserted in the inner hole of the throttle lever. The middle notch positions the clip when the middle hole of the throttle lever is used. Remember, this is the normal position for the pump rod and the pump stem clip. The lower notch in the stem is used when the pump rod is inserted in the outer hole of the throttle lever.

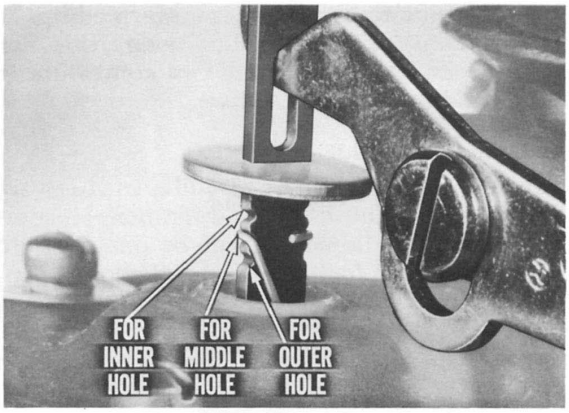


Fig. 15—Install spring clip in correct notch

IMPORTANCE OF BOWL VENT OPENING

If the spring clip isn't placed in the correct notch of the pump stem before adjusting the pump stroke, the effective pump stroke will be too long or too short. Incorrect bowl vent opening will cause a variety of engine performance problems. For example, if the vent valve opening is too great, the vent will remain open as the throttle is cracked and atmospheric pressure on the fuel in the float bowl will cause the off-idle mixture to be too rich. As a result, low-speed economy will suffer and exhaust emissions will be higher than they should be.

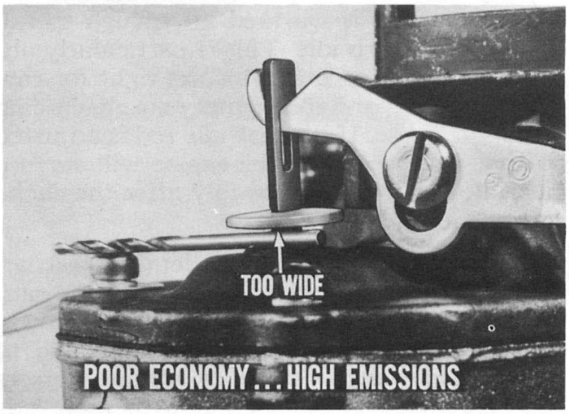


Fig. 16—Correct bowl vent opening is important

If the bowl vent opening is too narrow or the vent valve doesn't open at closed throttle, vapor pressure will push fuel out of the fuel bowl and into the intake manifold. This condition will contribute to rough idle, stalling and hot-start problems.

ACCELERATOR PUMP LEVER HOLES

The elongated pivot hole in the accelerator pump lever and the two pump lever holes in the outer end of this lever frequently prompt questions and cause some confusion. The elongated hole in the pump lever makes it possible to rapidly floorboard the accelerator without overloading the pump linkage. The pivot point of the lever is normally at the top of the elongated hole. When the throttle is suddenly floorboarded, the plunger-end of the lever becomes the pivot point and the elongated hole lets the entire lever move upward. This freedom of movement keeps the lever from overloading the pump linkage.

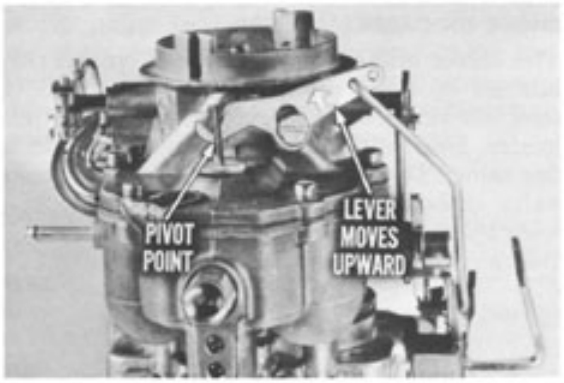


Fig. 17—Elongated hole lets lever move upward

Although there are two pump rod holes at the outer end of the pump lever, the pump rod should always be assembled in the inner hole. The hole at the outer end of the pump lever is not used on any of our current model carburetors, so just pretend it isn't there.

ACCELERATOR PUMP AND BOWL VENT 1½" BBD

On the 1½" BBD carburetor, the pump stroke and the bowl vent are separate adjustments. The pump stroke must be adjusted first and then the bowl vent opening is set.

ACCELERATOR PUMP STROKE ADJUSTMENT

On the current model 1½" BBD, the pump connector rod is normally installed in the outer hole of the throttle lever . . . not the middle hole. Be sure and back off the idle-speed adjusting screw and open the choke valve so that the throttle valves can be completely seated in the throttle bores.

With the throttle valves tightly closed, the pump stroke specification is determined by measuring from the upper end of the pump plunger to the top of the air horn. Pump stroke is adjusted by bending the angle at the lower end of the pump connector rod.

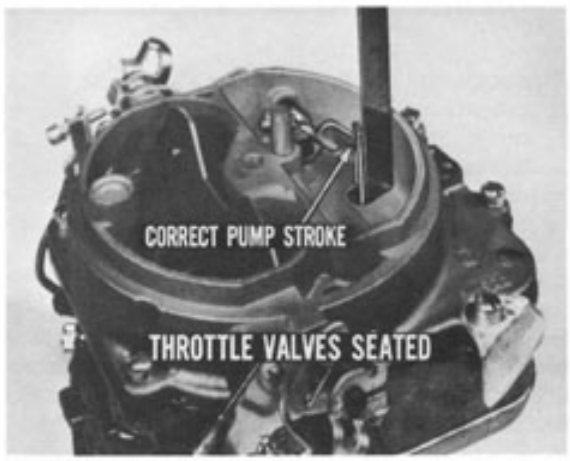


Fig. 18—1 ½" BBD accelerator pump stroke measurement

BOWL VENT ADJUSTMENT

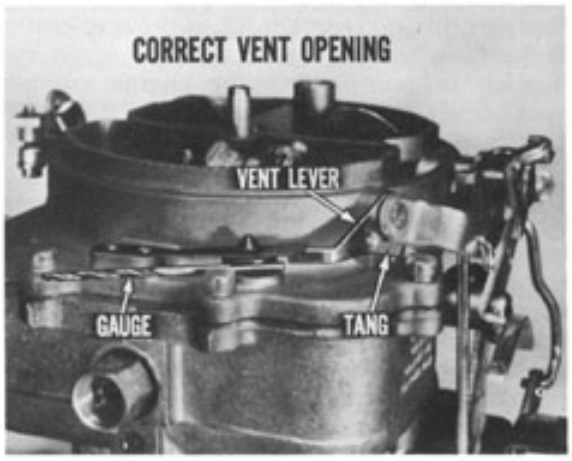


Fig. 19—Vent opening adjustment on 1 ½" BBD

The separate bowl vent opening adjustment must be made after establishing correct pump stroke. With the throttle valves at curb idle, bowl vent opening is specified as the space between the vent valve and the air horn. This measurement is taken at the outer-most edge of the valve . . . this is the point of greatest valve opening. Vent opening is adjusted by bending the short tang on the vent valve operating lever.

THE CHOKE UNLOADER MECHANISMS

Although the choke unloader should be set to specifications, this dimension is not as critical as most other carburetor adjustments. Misunderstanding or improper use of the choke unloader by the owner is undoubtedly more common cause of trouble than incorrect unloader adjustment. If a customer has starting problems because of engine flooding, maybe the driver's engine starting habits need fixing. Be sure that an owner with this kind of trouble understands that he must hold the accelerator wide open and do quite a bit of cranking to clear a flooded engine.

All too frequently, an owner doesn't crank the engine long enough with accelerator fully depressed. Another common mistake is to release the throttle every time the cranking is temporarily interrupted. When the accelerator is floorboarded and cranking started again, the accelerator pump gives the engine another shot of fuel which only aggravates the flooded condition.

TRY READING THE OWNER'S MANUAL

Although owner education isn't normally part of a Master Technician's responsibility, here is a case where a little owner education will do more good than a lot of carburetor and choke tinkering. If you have set everything to specifications and owner still has hot- or cold-start problems, you better have your Service Manager or Service Salesman make sure the owner has read and understands the starting recommendations in his Owner's Manual.

CHOKE UNLOADER—1 ¼" BBD

The choke unloader on the 1¼" BBD is adjusted by bending the unloader tang on the throttle lever. With throttle valves wide open, the unloader should open the choke one-quarter inch.

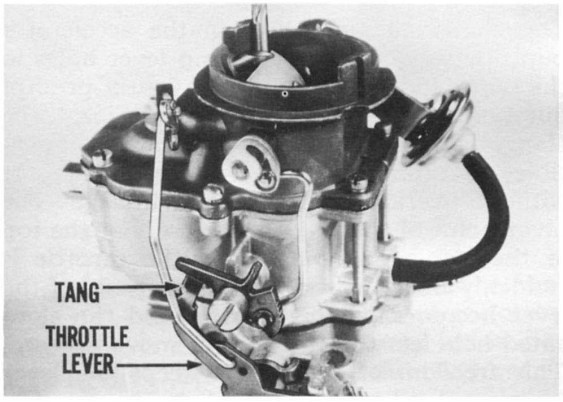


Fig. 20—Choke unloader adjustment on 1 ¼" BBD

CHOKE UNLOADER—1 ½" BBD

The choke unloader arrangement on this carburetor is a bit different. On this model, a tang on the fast-idle lever actuates the unloader. However, the unloader specification is the same. The unloader must open the choke valve one-quarter inch when the throttle is wide open. To change the choke opening, bend the tang on the fast-idle lever.

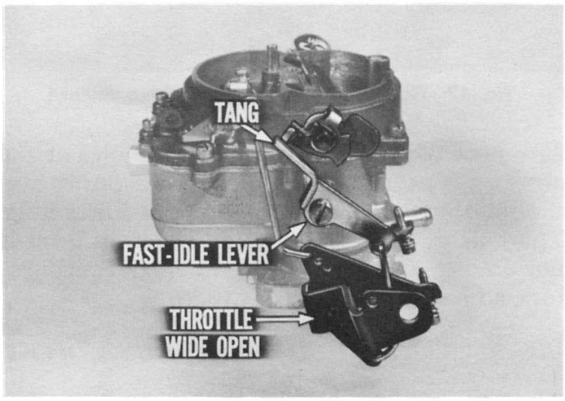


Fig. 21—Choke unloader adjustment on 1 ½" BBD

IDLE SPEED AND MIXTURE—1¼" BBD

Idle mixture and idle-speed adjustment go

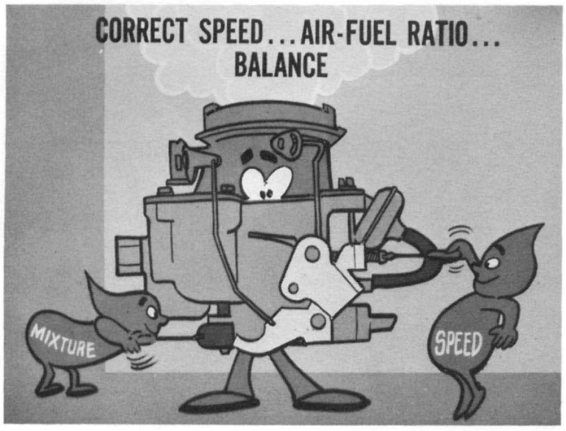


Fig. 22—Coordinate idle speed and mixture adjustments

hand in hand. The objective is to arrive at the correct idle speed, correct air/fuel ratio, acceptable idle quality and correct balance between the two idle systems of the dual-barrel carburetor. Your best bet is to follow the Service Manual procedure to the letter. There is no point in repeating those instructions word for word, however, a review of the idle-speed and idle-mixture adjusting recommendations will help explain why certain steps and precautions are very important.

FIRST THINGS FIRST

To begin with, the engine must be properly warmed up, the ignition timing must be correct . . . if you're not sure, check it before you fool with the carburetor. You must use an accurate tachometer to arrive at correct idle

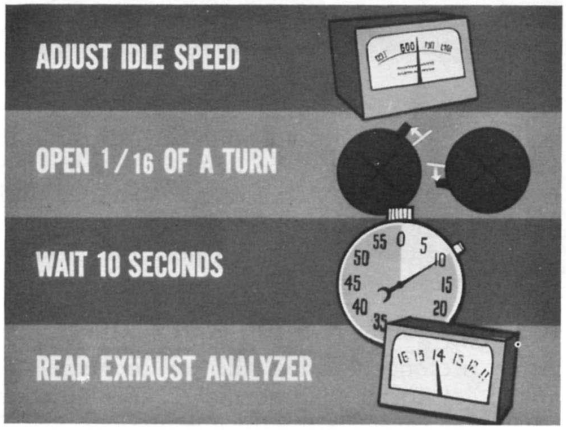


Fig. 23—Make sure exhaust analyzer is reading right

speed and an exhaust analyzer to obtain the correct air/fuel ratio. The first step is to make sure the exhaust analyzer is indicating correctly. To accomplish this, open each idle-speed screw an additional 1/16 of a turn. Wait ten seconds to make sure the analyzer is registering the resulting change in the air/fuel ratio and then read the analyzer meter. The reading should be numerically lower than it was, indicating that this initial adjustment did increase the richness of the mixture.

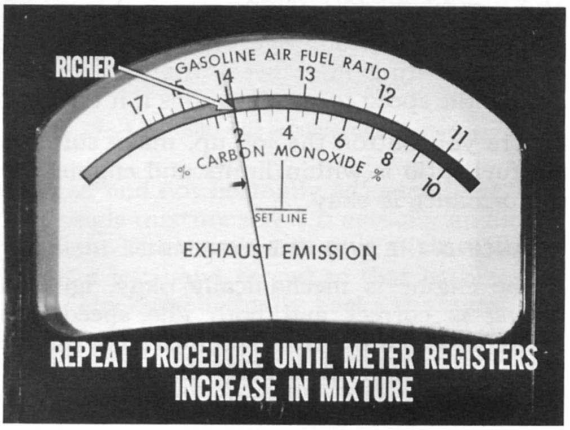


Fig. 24—Establish a too-rich condition first

If 1/16 of a turn doesn't produce a richer mixture reading, turn both of the mixture screws another 1/16 of a turn richer. Wait ten seconds and check the air/fuel ratio reading again. Repeat this procedure, as necessary, until the analyzer meter registers a definite increase in richness. Perhaps it would be well to explain why this initial step is important.

LEAN MIXTURES CAN FOOL THE METER

As the air/fuel mixture becomes very lean, there is a point where the analyzer indicates that the mixture is getting richer when it is actually becoming leaner as the mixture screws are closed. To eliminate this possibility, always increase the richness 1/16 of a turn at a time until the meter moves in the richer direction and the mixture is on the too-rich side rather than the too-lean side. Make your final adjustment by going from rich to lean.

CORRECT AIR/FUEL RATIO ADJUSTMENT

Once the too-rich condition has been estab-

lished, lean out the mixture by adjusting both mixture screws 1/16 of a turn at a time until you bring the air/fuel ratio within specifications. The important things to remember are: adjust both screws the same amount each time; don't adjust more than 1/16 turn at a time; and wait ten seconds after each adjustment before you check the meter reading. The acceptable air/fuel ratio range is from 14.0 to 14.4. Actually, 14.2 is the preferred ratio for most of our engines.

AND WATCH THE IDLE SPEED

You must keep one eye on the tachometer when adjusting idle speed mixture and re-adjust idle speed to specifications if it changes.

Before you button the job up, make sure the air/fuel ratio is within limits and engine idle performance is okay.

BALANCING THE TWO IDLE SYSTEMS

If the engine is mechanically okay, ignition timing is correct and both idle speed and air/fuel ratio are within specifications, engine idle operation will usually be satisfactory. However, if engine idle cannot be smoothed out within the range permitted by the idle screw limiting tabs, you may have to balance the two idle systems.

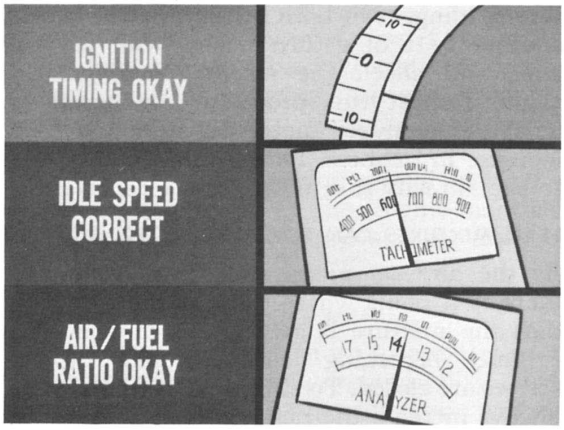


Fig. 25—If idle is rough, check idle-system balance

If the two idle systems are out of balance you must remove the plastic caps from the mixture screws so that you can turn them in a clockwise direction until they are fully seated. Next, open both screws 1½ turns to establish

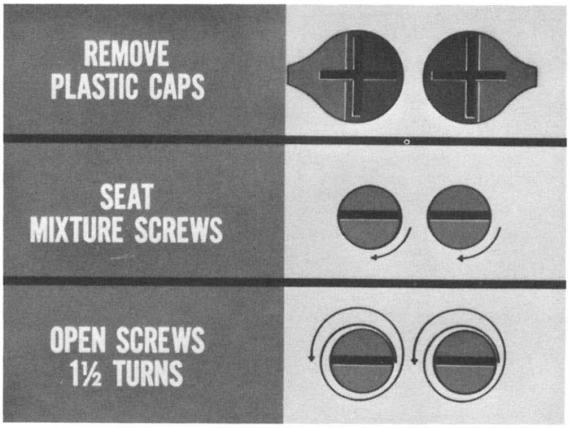


Fig. 26—Establish balance between idle systems

a starting point. From there on follow the same idle mixture and speed adjusting procedure outlined previously . . . just as you would if the plastic caps were in place.

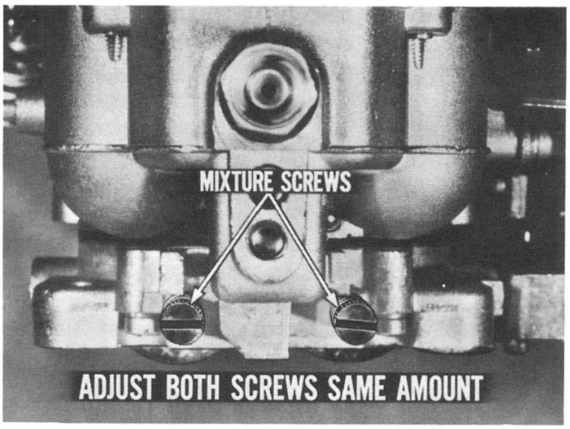


Fig. 27—Maintain balance between two idle systems

Just be very careful to always turn each screw exactly the same amount on each adjustment so that you maintain the balance between the two idle systems. After correct balance and air/fuel ratio are obtained, re-install the plastic limiting tabs in their mid-position . . . halfway between their stops.

TOO HOT ENGINES AND TOO LEAN MIXTURES

After prolonged idling the entire engine is apt to get hotter than normal. If this happens when you are adjusting the idle mixture, you'll wind up with an air/fuel ratio that is too

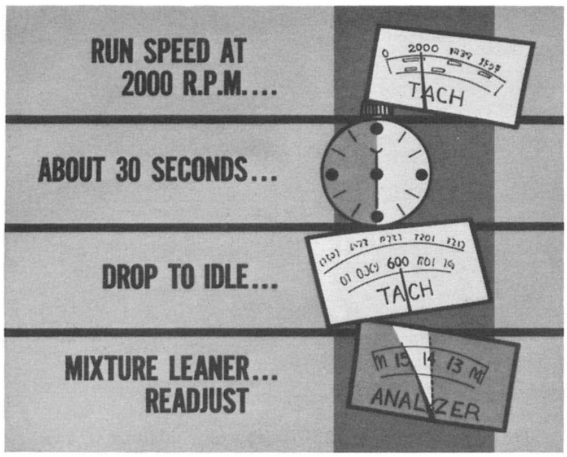


Fig. 28—Mixture may be too lean at normal temperatures

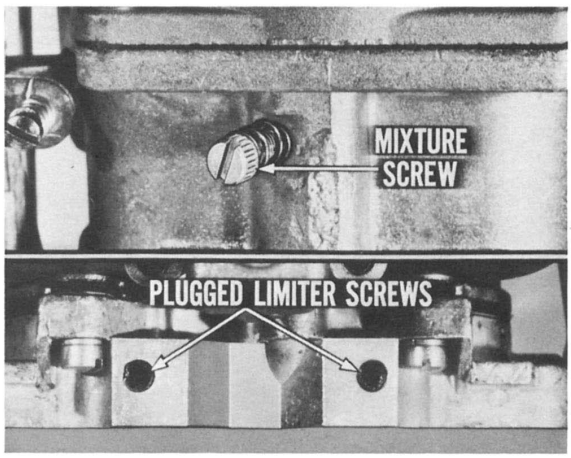


Fig. 29—1 ½" BBD idle mixture and limiter screws

lean. Here's how that comes about. If the carburetor gets abnormally hot, the fuel tends to boil and push an abnormal amount of fuel vapor out of the carburetor and into the intake manifold . . . along with the regular idle mixture. The exhaust analyzer will show that the engine is being supplied the right air/fuel ratio. Then, when the carburetor cools down to normal operating temperature and stops supplying this extra fuel vapor, the mixture will actually be too lean.

To spot this condition when tuning an engine, remove the exhaust analyzer probe from the tail pipe so the analyzer won't be damaged. Run the engine at about 2,000 r.p.m. for about 30 seconds to get rid of some of the excess heat and vapor pressure in the carburetor. Then, let the engine speed drop back to idle. If the analyzer meter now shows that the mixture is leaner than it was, you better readjust it.

This too-lean mixture condition from an abnormally hot engine is most apt to happen in very hot weather or where air circulation in the service bay is restricted. The important thing is to recognize the condition and understand the problem so that you don't turn out tune-up jobs with carburetors that are too lean for decent idle performance.

IDLE SPEED AND MIXTURE—1½" BBD

The idle mixture setup on the 1½" BBD is a little different. There is a single mixture screw and the two idle mixture limiter screws are plugged and not normally adjusted in service. The single mixture screw is actually an air adjustment screw rather than a mixture screw. It has a left-hand thread so that turning this screw clockwise actually backs the screw out, adds more air to the mixture and leans the mixture out. Turning the screw counterclockwise, reduces air flow to the idle system, increasing the richness of the idle mixture.

All of the general precautions and instructions for adjusting the 1¼" BBD apply to adjusting idle mixture on the 1½" BBD. The engine must be warmed up, specified idle speed must be maintained, an exhaust analyzer must be used to determine the correct air/fuel ratio, final mixture adjustment should be made from rich to lean and mixture adjustment should be made 1/16 of a turn at a time. The single mixture screw simplifies the air/fuel ratio adjustment. However, if idle is objectionably rough, or you can't get rid of a low-speed surge, you may have to unplug the limiter screws and readjust them to obtain correct balance between the two idle systems.

LIMITER SCREW ADJUSTMENT—1 ½" BBD

If limiter screw adjustment is required, you start by establishing mixture screw position. To accomplish this, you turn the mixture screw counterclockwise until it is fully seated, then turn it clockwise ¾ of a turn to open it.

The next step is to unplug the limiter screws and adjust them. Turn both of the limiter

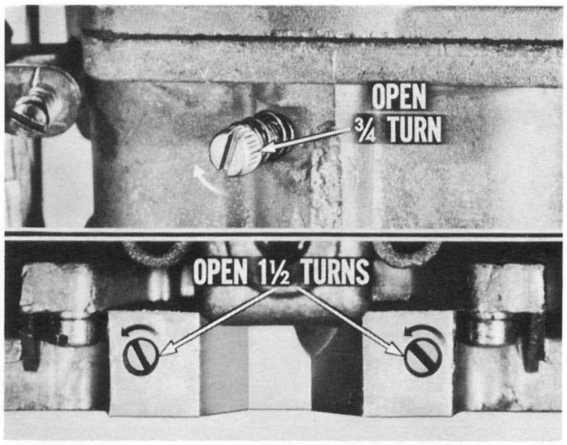


Fig. 30—Establish balance between two idle systems

screws clockwise to seat them and then open them 1½ turns. These initial adjustments of the single mixture screw and the two limiter screws establish a basically balanced condition between the two idle systems and provide a starting point for final mixture adjustment.

FINAL MIXTURE ADJUSTMENT

The final adjustment of the limiter screws is accomplished in exactly the same way as the adjustment of the mixture screws for the 1¼" BBD. In other words, you adjust both limiter screws 1/16 of a turn at a time to obtain an air/fuel ratio and engine idle speed that is within specifications. Be sure and adjust each limiter screw exactly the same amount each time so that you maintain the correct balance between the two idle systems. Once balance is established and you are within specifications, use the single mixture screw to obtain smooth engine idle and precise air/fuel ratio.

SOME CHANGES ARE IN STORE

Some changes are being made in the 1½" BBD carburetors. Before the end of the model year you'll probably see some of the 1½" BBD's with the single mixture screw eliminated and the two limiter screws replaced by two new idle mixture screws. These new mixture screws will have plastic limiting tabs, just like the ones on the current 1¼" BBD's. As a matter of fact, when these new carburetors arrive on the scene, just follow the Service Manual instructions for 1¼" BBD idle speed and mixture adjustment.

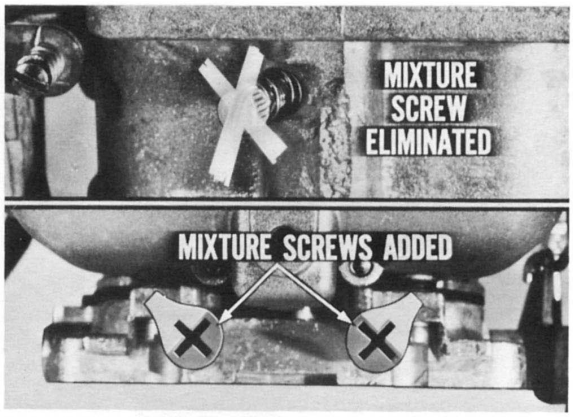


Fig. 31—New 1 ½" BBD carburetor mixture screws

GENERAL CONSIDERATIONS AND COMMENTS

Your Service Manuals and current Service Bulletins are always your best source of service information and specifications. This reference book is not intended as a substitute or replacement for these publications. Rather, its purpose is to give you a better understanding of why these procedures and specifications are so important. It also gives you some interesting and useful sidelights on servicing the BBD carburetors. Of course there are a few precautions that apply to all carburetors and should be mentioned before we wrap this up.

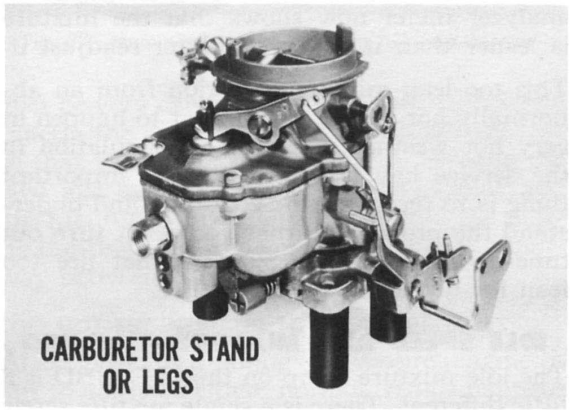


Fig. 32—Carburetor legs protect throttle valves

USE A CARBURETOR STAND OR LEGS

It is impossible to overemphasize the importance of installing a carburetor stand or legs as soon as you remove a carburetor from the engine. The throttle valves are particularly vulnerable if they are not protected. And on some carburetors, the carburetor stand or legs protects the linkage against accidental bumps that could throw it out of adjustment.

THROTTLE VALVE ALIGNMENT

It doesn't take much of a bump to nick the throttle valves or knock them out of alignment. If this happens, it will be impossible to get the two sides of the carburetor balanced or the engine idle smoothed out.

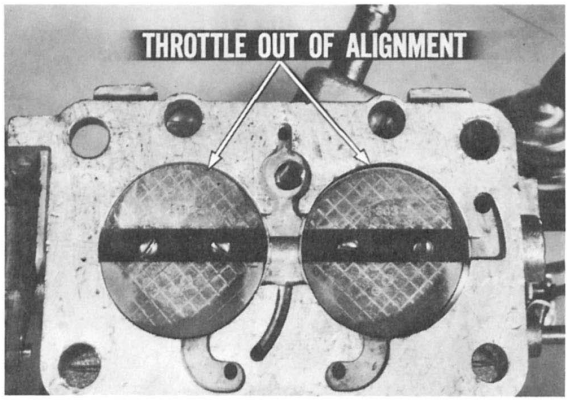


Fig. 33—Misaligned valves upset carburetor balance

If the throttle valve alignment is upset or one throttle valve doesn't close as much as the other, ignition vacuum advance will be affected because the throttle valve won't be correctly located with respect to the vacuum advance port. Here is a good clue to that condition. If, after adjusting idle mixture and speed, there is enough vacuum to advance ignition timing at idle, it means that too much of the vacuum port is exposed at closed throttle.

To check this possibility, the engine should be warmed up and operating at specified idle. Next, disconnect the vacuum advance line and plug it while you check ignition timing. Then, reconnect the vacuum line and again check timing. If connecting the vacuum line causes an ignition advance and you've had trouble smoothing out engine idle, you better check throttle valve alignment.

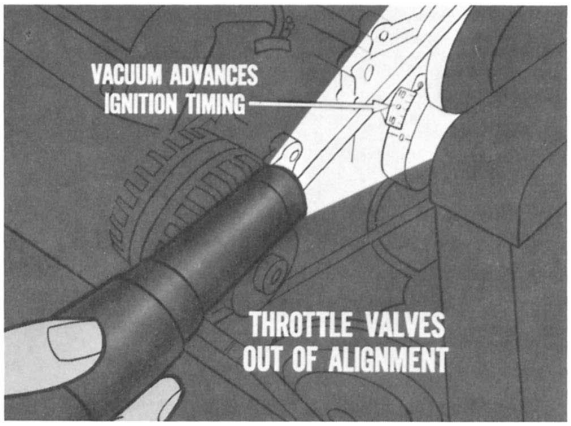


Fig. 34—Exposed vacuum port advances ignition timing

AND THEN THERE'S FLOAT LEVEL

As we said at the beginning, float level is the only internal service adjustment. Needless to say, correct float level is extremely important and float level specifications and adjustment procedures are covered in the Service Manuals. However, one possibility that is frequently overlooked is the accidental misadjustment of the float level. If someone disconnects a fuel line from the carburetor without using a second wrench to hold the fuel inlet fitting, chances are the float level will be upset. That's just about the only way that float level can be upset without taking the carburetor apart.

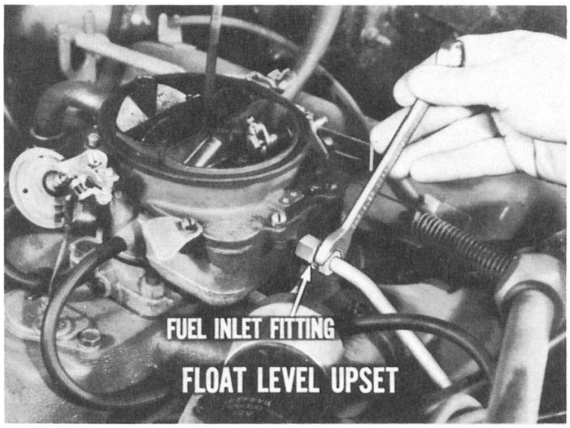


Fig. 35—This can upset carburetor float level

DON'T MISS THE HANDY GUIDE TO DRILL SIZES AND DECIMAL EQUIVALENTS ON THE OUTSIDE BACK COVER.

DRILL SIZE AND DECIMAL EQUIVALENT CHARTS

DRILL SIZES

Letter Sizes	Drill Diam. Inches	Wire Gage Sizes	Drill Diam. Inches	Wire Gage Sizes	Drill Diam. Inches	Wire Gage Sizes	Drill Diam. Inches
Z	0.413	1	0.2280	28	0.1405	55	0.0520
Y	0.404	2	0.2210	29	0.1360	56	0.0465
X	0.397	3	0.2130	30	0.1285	57	0.0430
W	0.386	4	0.2090	31	0.1200	58	0.0420
V	0.377	5	0.2055	32	0.1160	59	0.0410
U	0.368	6	0.2040	33	0.1130	60	0.0400
T	0.358	7	0.2010	34	0.1110	61	0.0390
S	0.348	8	0.1990	35	0.1100	62	0.0380
R	0.339	9	0.1960	36	0.1065	63	0.0370
Q	0.332	10	0.1935	37	0.1040	64	0.0360
P	0.323	11	0.1910	38	0.1015	65	0.0350
O	0.316	12	0.1890	39	0.0995	66	0.0330
N	0.302	13	0.1850	40	0.0980	67	0.0320
M	0.295	14	0.1820	41	0.0960	68	0.0310
L	0.290	15	0.1800	42	0.0935	69	0.0292
K	0.281	16	0.1770	43	0.0890	70	0.0280
J	0.277	17	0.1730	44	0.0860	71	0.0260
I	0.272	18	0.1695	45	0.0820	72	0.0250
H	0.266	19	0.1660	46	0.0810	73	0.0240
G	0.261	20	0.1610	47	0.0785	74	0.0225
F	0.257	21	0.1590	48	0.0760	75	0.0210
E	0.250	22	0.1570	49	0.0730	76	0.0200
D	0.246	23	0.1540	50	0.0700	77	0.0180
C	0.242	24	0.1520	51	0.0670	78	0.0160
B	0.238	25	0.1495	52	0.0635	79	0.0145
A	0.234	26	0.1470	53	0.0595	80	0.0135
		27	0.1440	54	0.0550		

DECIMAL EQUIVALENTS

1/64	.0156	17/64	.2656	33/64	.5156	49/64	.7656
1/32	.0313	9/32	.2813	17/32	.5313	25/32	.7813
3/64	.0469	19/64	.2969	35/64	.5469	51/64	.7969
1/16	.0625	5/16	.3125	9/16	.5625	13/16	.8125
5/64	.0781	21/64	.3281	37/64	.5781	53/64	.8281
3/32	.0938	11/32	.3438	19/32	.5938	27/32	.8438
7/64	.1094	23/64	.3594	39/64	.6094	55/64	.8594
1/8	.125	3/8	.375	5/8	.625	7/8	.875
9/64	.1406	25/64	.3906	41/64	.6406	57/64	.8906
5/32	.1563	23/32	.4063	21/32	.6563	29/32	.9063
11/64	.1719	27/64	.4219	43/64	.6719	59/64	.9219
3/16	.1875	7/16	.4375	11/16	.6875	15/16	.9375
13/64	.2031	29/64	.4531	45/64	.7031	61/64	.9531
7/32	.2188	15/32	.4688	23/32	.7188	31/32	.9688
15/64	.2344	31/64	.4844	47/64	.7344	63/64	.9844
1/4	.25	1/2	.5	3/4	.75	1	

LITHO IN U.S.A.