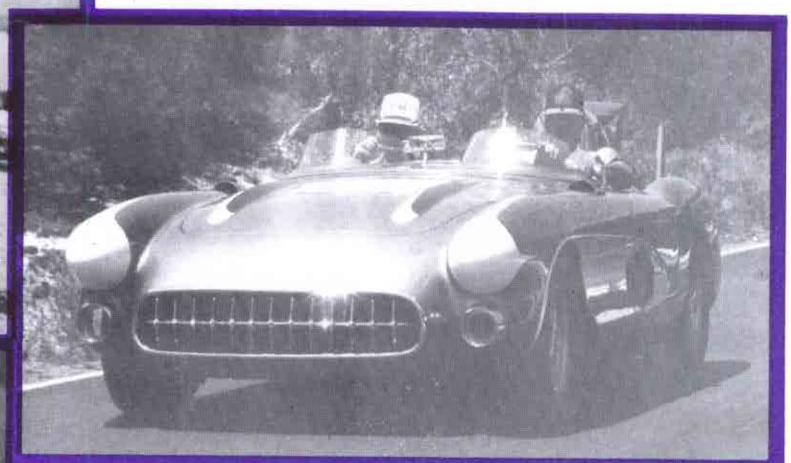
STRAIGHT TALK

VOLUME 2 NUMBER 1

CONVENTION FUN

Rick Mason's SR-2 car



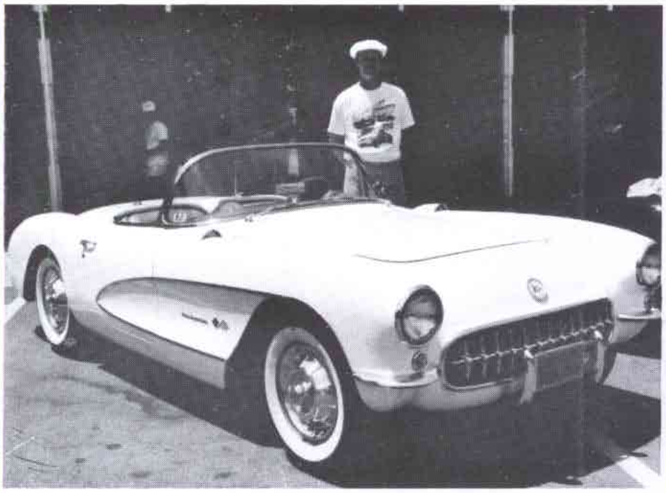
SR-2 on road tour

Editor standing with Chuck Yeagers Indy 500 Vette, wearing helmet signed by all Indy drivers and given to Chuck

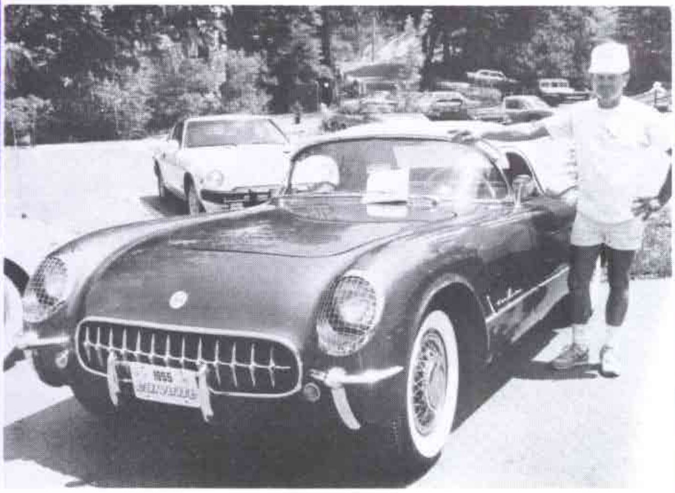
Noland Adams in Pace Car

KEN LaBELLA, BLACK 1962

JACK CRINNION, WHITE 1961



KEN WIECHMAN, WHITE F.I. 1957



ROY BRAATZ, 1955

RICH & SHAR MASON SR-2 METALIC BLUE
ONLY ONE OF TWO MADE IN 1956

RICH LANG, RED 1959

CONTENTS

Photography by: Bob Bacon

PRESIDENT'S PAGE

By Noland Adams

SACE's second convention was a success, as we knew it would be. Since that event is covered elsewhere in this issue, I will go on to other important issues.

We were able to attend the Western Regional meet of NCRS, hosted by the Northwest Chapter of NCRS. As before, it was held at the Inn of the Seventh Mountain in Bend, Oregon.

The weather cooperated - it was perfect. The cars were great, the meet was well-planned and well-attended. This is a great resort area with activities for the whole family. From August 11-14, 1989, this will be the site of the NCRS Nationals, so if you live nearby, plan ahead.

During one of the in-between times at Bend, I called a meeting of SACE members. While many SACE members were there, many were around their cars or enjoying the weather and the resort. About 12 SACE members were present to hear the progress report on judging forms. The basic Classic Chevy Club International (CCCI) '55-'57 judging forms were ready, and we discussed them in detail.

Then one team agreed to work on finalizing the CCCI judging forms. For our own SACE 1953-62 forms, we were fortunate to have experienced judges present for each year group. If all goes as planned, we'll have our own judging forms for next years' National in Virginia!

Just a short time ago, at the '88 National SACE meet, the Northeast and Northwest areas were in contention to be the first SACE chapter. Bill Eldridge won, and has informed Roy Braatz by letter that the Northwest Chapter of SACE is officially formed. It covers the states of Oregon, Washington and British Columbia. Congratulations to all in the Northwest chapter!

But not far behind is Klas Anderson, and the Northeast chapter. Although not officially off the ground, they plan to be there soon. Rumblings have been heard to start a California chapter, but so far, nothing definite.

This means SACE is off to a fine start, gaining members all the time. Have fun enjoying those old Corvettes!

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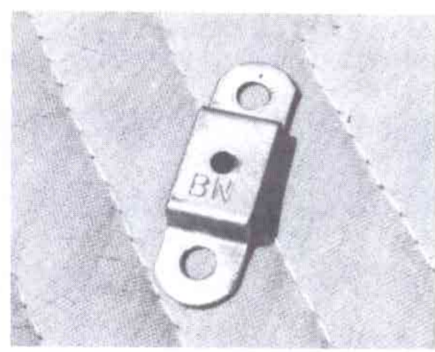
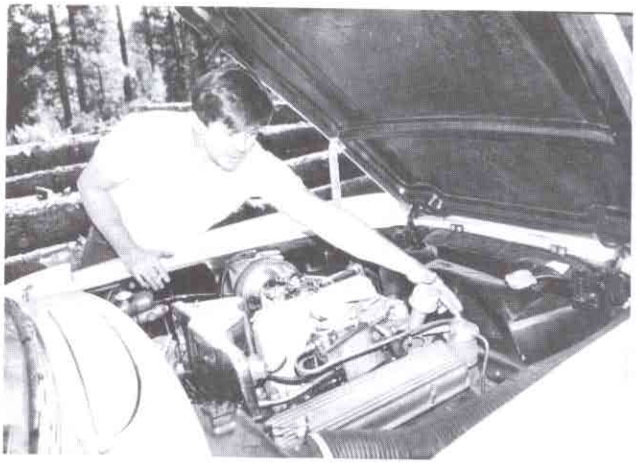


1956 ONLY POWER TOP FRAME RETAINER THAT IS SCREWED TO THE R/S FRAME WHERE THE FUME SWITCH WIRE WOULD ATTACH.



EDITOR'S PAGE

By Roy Braatz

Our second National Convention again was fantastic. We had 16 Corvettes judged, 45 people attended the banquet and 15 Corvettes took the tour to Donner Lake.

Rick Mason drove his SR-2 '57 Corvette in the tour of 120 miles - round trip. It was the SR-2's first time out being driven. "Driving a vintage Corvette is where it's at," said Rick. He also brought two big brake Corvettes driven by his two daughters. (Thanks, Rick). My family and I were invited to attend and headed up the Corvette judging division for the Western National Meet in Oregon, of Classic Chevy Club out of Florida. Larry Richter was our host and while there, I met Danny Howell, editor of Classic Chevy World, P.O. Box 17188, Orlando, FL 32860. He asked if SACE would help put together a new Corvette judging manual for CCCI Corvette division, and could they use articles from our magazine. In exchange they would help put out the word about SACE. I presently encourage anyone to become a member of CCCI. They put out a great magazine 'monthly', (I try to copy it), and have a large inventory of NOS parts and reproduction parts that apply to Corvettes. Their services include everything from rebuilding any power train part to reconditioning any outside part. They have 65,000 members and only recognize '55-'57 cars, trucks and Corvettes. Try CCCI, you'll like them.

My family and I also attended the Western Regional NCRS Meet in Bend, Oregon. It was great as always. Those Oregon NCRS members have it all together. I've been attending for six years now. While there, Noland held a SACE business meeting in his room. Changes were made, which include:

1. To include an original unrestored class
2. To complete our own judging manuals by next year.
3. To aid CCCI in writing a new judging manual for them.
4. Our magazine has a new name - Straight Talk.
5. We recognized our first chapter, now being organized by Bill Eldridge and Tony Catilano, which includes Washington, Oregon and British Columbia as our Northwest chapter. Those members wishing to help or join, contact Bill or Tony.

Know Your Officers

President .... Noland Adams
Vice President/Editor .... Roy Braatz
Treasurer/Secretary .... Lucy Badenhoop
Photographer .... Roy Braatz, Jr.

ANSWERING CLASSIC CHEVY WORLD

By Noland Adams

Regarding the exchange of information between CCCI and SACE, we have much to report.

First, Roy Braatz came to my house for a meeting on Saturday, August 20. Roy and I began CCCI judging forms by addressing and solving past problems we had experienced. Then we agreed on the basic format, and began to actually design the forms.

That evening and for several days I worked at the computer to get the basic outlines completed. With several copies of the judging forms' outlines in hand, we all met again the next weekend for a Corvette meet in Bend, Oregon. I called a meeting of interested SACE members Saturday morning, August 27.

At this meeting I explained the forms and their objectives. To my delight, all in attendance agreed to examine the forms and complete what Roy and I started. We were fortunate to have several experienced Corvette owners present like CCCI's own judge Larry Richter.

We agreed on a time period of one month to give all a chance to fill in the spaces on the forms' outlines. Then forms will be sent to me for review. I will send them to Roy for another review, then they will be on their way to you.

The project is well under way. I'll keep you advised of progress.

Sierra Scenery Enhanced By Addition of Fiberglass

By Steve Banich

The SACE second national convention road tour was an exciting and rewarding drive for all those partaking in it. After gathering Friday morning, our group of classic plastic on Chevy chassis left Nevada City bound for Donner Pass, and a day of Sierra sunshine. This glimmering caravan consisted of numerous years of Corvettes from '54 to '85, and made a colorful band of fiberglass touring the black asphalt roads of the California mountains. The majority of vehicles were straight axle cars, a couple of newer Corvettes, with the additional enhancement of Rich Mason's SR-2.

The freshly redone SR-2 is an eye catcher wherever it goes; its large shark-like fin, gleaming blue paint and pale blue metallic upholstered interior give it the appearance of a spaceship. I found being a participant in the road tour with one of these Chevrolet engineering beauties along adds to the enjoyment of the scenery.

Our group motored up state highway 20 and traced the path of the Bear River Canyon out of Nevada City, enjoying the ridge top vistas and climbing through the oak, cedar and pine forests to join with U.S. 80. We traversed this highway only briefly before retreating to lesser traveled roads. Winding our way through the granite peaks and sparsely forested slopes of the High Sierra, to an overlook of the Donner Lake landscape, we then coasted down and skirted the shores of the lake to reach our stop at the site of the Donner party's tragic winter encampment.

Within a mile of this site, where more than twenty members of the gold rush party starved or resorted to cannibalism for survival, now stands a McDonald's restaurant. Some of our group headed to there for lunch, while others of us opened our picnic baskets, relaxed and socialized. After lunch, we toured the Memorial museum, grounds and ruins of the Donner party's stay. There are tree stumps still standing here, cut by the freezing pioneers, which attest to that harsh winter's twenty-two foot snowpack.

On the return leg of our tour, I had the great fortune to have Joe Calcagno, the owner of the convention's only trailered car, as my passenger.

I have always driven my '60, and in the past I have harbored some disfavor for towed Corvettes; I feel they are meant to be driven. Joe enlightened me to the benefits and drawbacks of owning an unused and pampered vehicle. Unlike some owners of trailered cars who are interested in investment only, Joe has owned and driven other Corvettes, but to take his finely restored Bloomington Gold and first flight car on the road would instantly and severely detract thousands from the value of the car. He lamented the lack of a vehicle he could drive without misgivings, to benefit from the full pleasure Corvettes are capable of giving. He seemed to have foregone the pleasure of driving a Vette for too long a time. His love of the open road was evident in his praise of the day, the scenery and the roadability of my car. His desire for a Corvette to tour the paved byways was to be assuaged the next day; he purchased a '62, brought to the convention for sale. I hope to see him at some local functions with this jewel.

I am glad so many people took the time to attend this year's convention, though promoted essentially as a gathering of Corvettes for judging, this is a social event. The tour was an enjoyable and scenic addition to the agenda. The programs and comradery of the convention make a lasting memory, and a tantalizing inducement to repeat the experience next year.

YOUR TURN

QUESTION: Can you tell me which tack drive gears, metal or fiber, are correct for a '58?
ANSWER: All are the same. '55-'61 have 46 teeth, 1930852 Drive - 1930853 Driven.

QUESTION: Where can I find clips that hold the upper and lower moldings on the center console between the seats?
ANSWER: Try a body shop.

QUESTION: What can be substituted for the neutral kill switch on a '58 automatic shifter linkage?
ANSWER: A four speed back-up switch.

QUESTION: Where can I find the replacement bushings for the brake and clutch pedal assembly part #3709591 and 3709580?
ANSWER: Try Classic Chevy Club, uses same car or Vette.

QUESTION: Did any other model Chevrolet have the same window crank handle as a '58 Vette?
ANSWER: Cad, Buick, but GM still services them. #3725377

FUEL INJECTION

EXTRACTED FROM CORVETTE V8 OWNERS HANDBOOK

The following pages provide theory of operation and maintenance procedures for all Chevrolet fuel injection units which have been used since their introduction in 1957.

The theory of operation and specific overhaul procedures cover the 7014800 units. This injection unit is the simplest unit of the various models that have been used. An understanding of the functions of the individual components is a "must" for practically all diagnosis. Once the 7014800 unit is understood, the refinements of manufacture included in later units are easily understood and are described briefly.

For repair procedures, only the 7014800 is fully covered, but the differences between the 7014900 unit (which is the basis of all later units except 7017300 and 7300 R units) and this original unit are fully described and illustrated. Actually, the physical differences are so slight that even a complete novice should not encounter any confusion working from the 7014800 procedures.

Fuel flow recalibration, which must be performed after any fuel meter overhaul, is completely described and data for all units ever produced by Chevrolet is listed at the end of this section.

As all units produced to date by Chevrolet are basically modifications of either the 7014800 or 7014900 units, a brief description of each later unit will be found following the complete procedures for the 7014800 unit. This capsule information will tell you for example, that the 7017200 or 7250 unit operates and is repaired exactly like a 7014900 unit as its primary difference is only that a siphon-breaker has been incorporated into the fuel meter casting. Knowing this and understanding the slight differences between the 4800 and 4900 units, the unit can then be diagnosed and repaired by following the procedures provided.

ADVANTAGES OF FUEL INJECTION

Fuel injection has been a Chevrolet production option on Corvette and passenger car 283-cubic-inch V-8 engines since 1957 (fig. 93). Used in conjection with hydraulic valve lifters and 9½-to-1 compression ratio cylinder heads, the engine produces 250 hp. @ 5000 rpm (275 hp for 1960) whereas when combined with a special camshaft, mechanical valve lifters, and high compression ratio cylinder heads, the rating is increased to 290 horsepower @ 6200 rpm, (283 hp for 1957, 290 hp for 1958 and 1959, and 315 for 1960).

The potentialities of fuel injection are based on elimination of some of the more apparent limitations of carburetor equipped engines, these being equal fuel distribution, air supply, mixture heating, and horsepower. Let's examine these one at a time.

Fuel Distribution

One of the most important advantages of fuel injection is its abilty to divide the fuel equally between all cylinders. From the illustration showing an exaggerated 8-cylinder manifold (fig. 94), it can be seen that when the manifold carries fuel/air mixture to a variety of sizes and lengths of passages, it is very difficult to feed each cylinder in equal amounts. As a matter of fact, it would not be uncommon to have 15% difference in fuel/air ratio between the leanest cylinder and the richest cylinder of a given engine with a carbureted fuel system. The main difficulty is that air is quite willing to flow around corners and through various shaped passages but the fuel, being heavier, is bothered by obstructions, curves, etc. In fuel injection fuel can be fed under pressure through a set of calibrated nozzles, one for each cylinder so that the fuel charge for each cylinder is virtually equal.

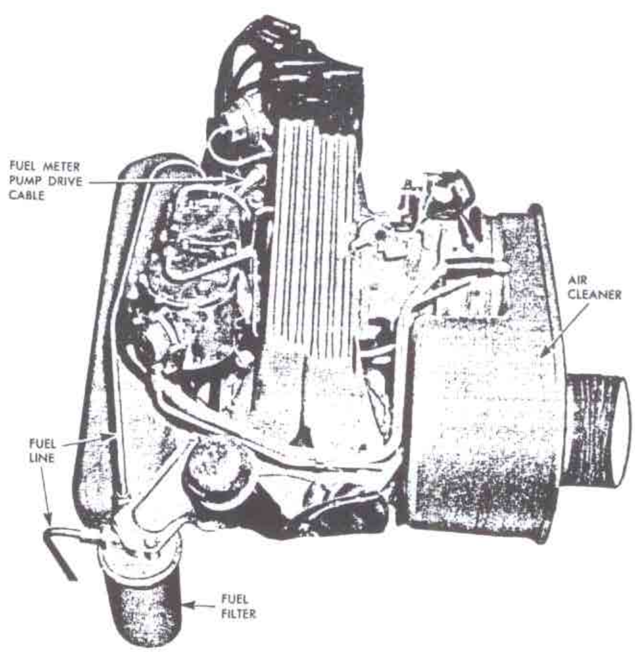


Fig. 93—Fuel Injection Installed on Engine

You can see that in the carbureted system it would be necessary to supply mixtures rich enough so that no cylinders were too lean, which means that there would be waste in the cylinders which were already rich enough. The engine equipped with fuel injection can often be run as much as 10% leaner than it would have to be with a carburetor and manifold.

Air Flow

In a carbureted fuel system, the intake manifold must strike a happy medium between low and high speed requirements (fig. 95). At idle, for instance, air flow is very slight and in order to keep the gasoline mixed with the air it is necessary to have small passages to keep up the air velocity. On the other hand, when power is required, we would like to have as big a manifold passage as possible to allow maximum breathing of the engine. Naturally, to supply both of these requirements, the manifold must be compromised between small and large passages which results in passages of medium size which limit both the low and high speed performance, but provide enough of each to get by.

In the case of fuel injection, the manifold (fig. 95) does not have to carry a fuel/air mixture and, therefore, can be designed to give the best breathing possible. In fact, the manifold can be made to actually supercharge the engine at certain speeds. This is done by having a ram pipe for each cylinder so that the air on its way to the cylinder will be traveling in a long column, while the valve is open and air is entering the cylinder, the air flow gets quite a lot of momentum in the ram pipe. As the piston reaches bottom dead center and starts back up, air will continue to flow into the cylinder because of air velocity in the ram pipe. At the particular engine speed where the valve just closes as the air stops flowing, an extra charge of air has been trapped in the cylinder. This effect is called dynamic super charging. By design of the ram tubes, a particular engine speed can be picked for this effect to occur and quite a boost results at that particular point.

Mixture Heating

Mixture heating is a fuel distribution problem in many respects. First, it is necessary to heat the carburetor from the intake manifold to assist initial fuel vaporization and to overcome fuel condensation from the mixture striking cold surfaces of the intake manifold during delivery to the combustion chambers. However, this same heat creates carburetor problems because the heat continues when the engine is warmed, creating vapor problems plus requiring periodic service to keep the heat passages clear.

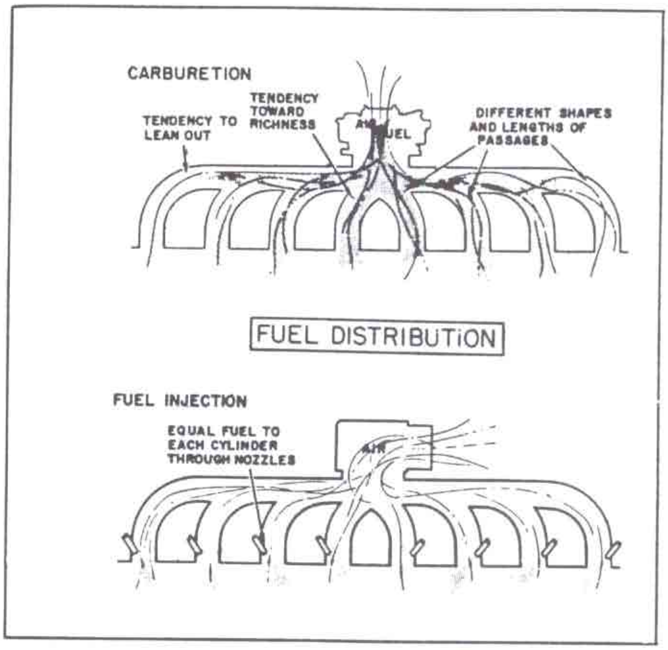


Fig. 94—Fuel Distribution Comparison Diagram

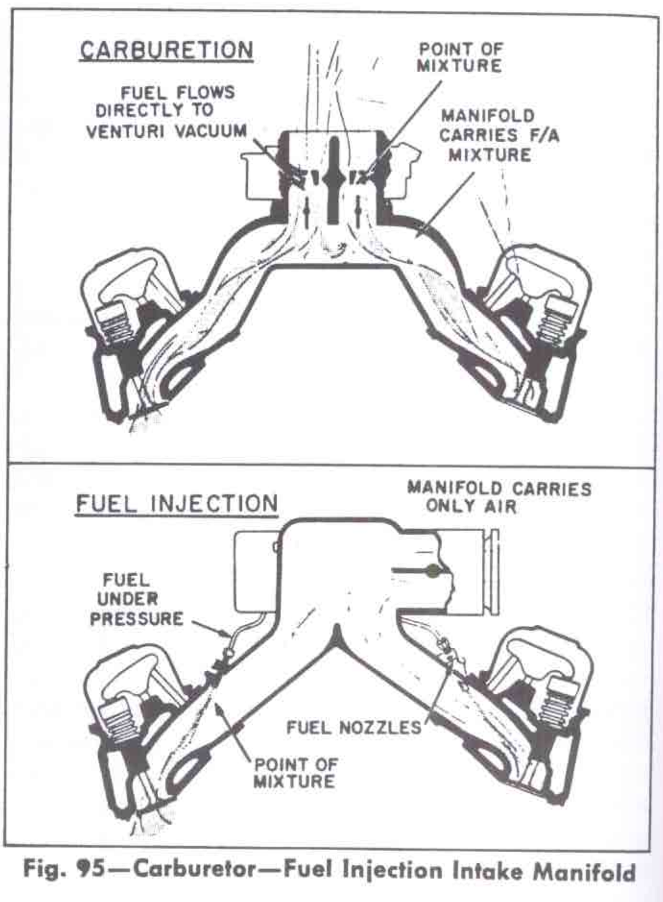


Fig. 95—Carburetor—Fuel Injection Intake Manifold

In fuel injection, the need for mixture heating is virtually eliminated because of the separation of air and fuel until induction into the combustion chamber. Since the combustion chamber area heats quickly after initial starting of the engine, the period in which richer fuel mixtures are required is shortened considerably due to the excellent varporization conditions at the point of air-fuel mixing.

Horsepower

Many engineers feel that we are approaching practical limits of carburetion in size of venturi, number of cores, etc., and, of course, the farther we go in this direction the more difficult it becomes to maintain efficiency in the part throttle operation.

Since a fuel injection system could supply almost unlimited quantities of fuel and air, more efficient engine performance can be realized with today's engines. This allows considerable room for further advances in engine design.

Other Advantages of Fuel Injection

Since fuel delivery does not depend on level of fuel injection system is very little affected by maneuvers like tight turns and steep hill climbing.

Since the fuel is sprayed into the warm part of the engine, much less extra fuel is required before the system is operating at normal performance.

Response to the throttle is instantaneous since the fuel is under pressure at all times and needs only to be released for acceleration. With the current interest in sports cars and stock car racing, this, in itself, has created one of the major demands for fuel injection.

Another possibility in fuel injection is that fuel, since it is supplied separately from the air, can be shut off completely during deceleration if desired. This could reduce the amount of unburned hydrocarbons exhausted to the air and could also offer some improvement in fuel economy. Chevrolet units do not provide any coasting shut-off device at this time. Finally, fuel injection offers definite engine height reduction possibilities for continuing lower trends of automobile styling.

Types of Fuel Injection

Three basic types of fuel injection are in use today. These are direct timed injection, timed port injection and continuous flow port injection.

Direct timed injection is that used in the diesel engines. In this system, the nozzle sprays fuel directly into the combustion chamber at the instant that the piston reaches top dead center and the mixture is fired.

Time port injection systems mount the nozzle outside the combustion chamber and the fuel is sprayed into the combustion chamber at the moment the intake valve is opened.

Continuous flow port injection systems, which we use, mount the injection nozzle outside the combustion chamber as in timed port injection systems. However, with this system, fuel flows from the nozzle continuously at such a rate that the desired charge had accumulated by the time the intake valve opens at the start of the cylinder. The built-up fuel charge is carried into the combustion chamber with the air flow created by intake valve opening and by direct spray from the nozzle during the valve opening period.

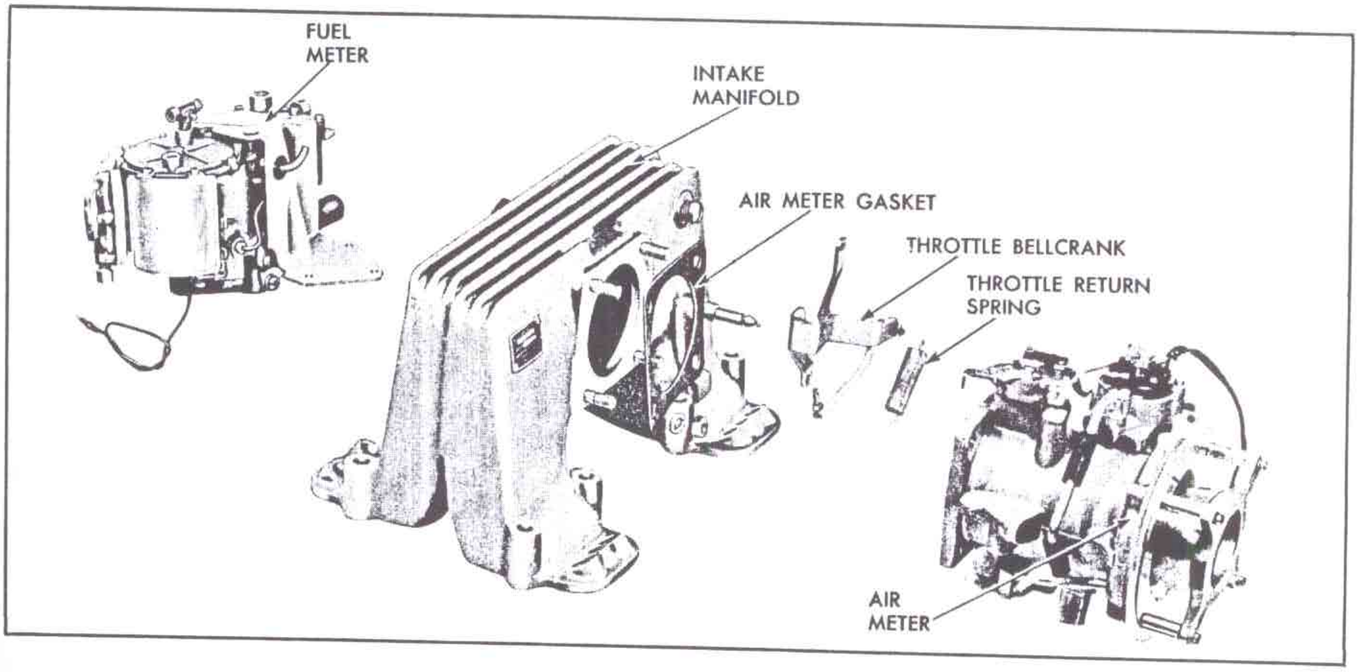


Fig. 96—Fuel Injection Components

Tests conducted by G.M. engineers during development of our fuel injection system failed to show any economy advantage of timed injection as compared to continuous flow injection. This allowed elimination of the expensive and complicated timing devices without sacrifice of efficiency. Direct combustion chamber injection is not practical from an optional production standpoint due to the engine adaptations which would be required to mount the injection nozzle in the combustion chamber plus the timing devices that would be needed.

FUNDAMENTALS OF OPERATION

Fuel Injection Components

Three basic assemblies comprise the G.M. fuel injection system (fig. 96). These are (1) the fuel meter, (2) air meter, and (3) the intake manifold. Let's look at the roles of each of these units.

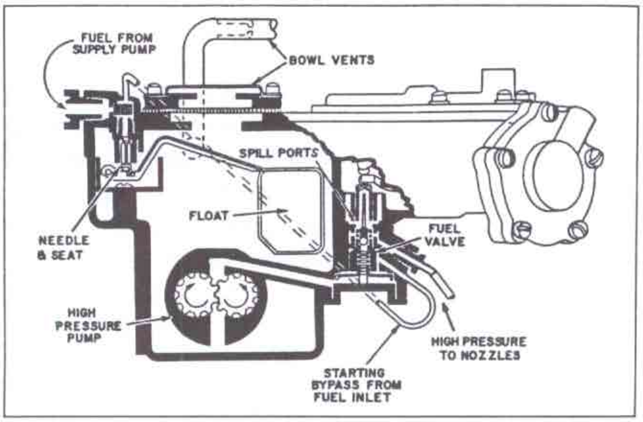


Fig. 97 - Fuel Supply and Regulation

Fuel Meter

As the name indicates, the job of the fuel meter is to supply the desired fuel delivery to the engine for all operating conditions (fig. 97). The fuel meter contains a fuel reservoir, high pressure pump, and fuel control system plus diaphragms which control the fuel rate according to speed and load. Also in the fuel meter are auxiliary controls for starting. Fuel from the fuel meter goes through a distributor to eight nozzles, one for each cylinder.

Fuel Supply

The fuel meter (fig. 97) contains a float controlled fuel bowl, very similar to those used in carburetion. Fuel is supplied to the fuel meter by a conventional diaphragm type fuel pump and passes through a ten micron filter before it reaches the fuel meter. Incoming fuel from the needle valve splashes directly into a nylon cup where it spills over more evenly into the fuel bowl to avoid getting bubbles in the fuel which might be picked up by the gear pump. Float level, although important, is not as critical as in carburetion because the reservoir is merely a supply for the gear pump and does not affect final delivery to the engine.

Gear Pump

Submerged in the fuel reservoir is a gear pump (fig. 97) driven by a flexible cable from the engine distributor at one-half engine rpm. The gear pump picks up fuel from the reservoir and delivers it at high pressure through a passage to the fuel valve where fuel delivery rate to the nozzles is determined by a fuel control valve. Excess fuel is spilled back to the main fuel reservoir. Although the gear pump is manufactured to very close tolerances, its delivery rate is about twice engine requirements at any speed to prevent any losses in effectiveness due to pump wear. Pump delivery pressures can be as high as 400 psi.

Fuel Valve - Normal Operation

As mentioned, the rate of fuel delivery to the nozzles is governed by a fuel valve (fig. 98), which in turn is controlled through linkage by venturi vacuum signals from the air meter. The incoming fuel from the gear pump passes through a filter screen and travels upward through the center of the fuel valve where it lifts a check ball and flows through small holes into the metering chamber. At this point, the fuel flow splits: Some fuel flows through holes directly to the line supplying the nozzles and the remaining fuel flows upward into the area beneath the spill plunger. Of this fuel, some will be spilled back into the fuel bowl through the spill ports with the amount of spill depending on the position of the spill plunger. As a result, the total fuel delivery to the fuel nozzles becomes the difference of two factors:

The rate of fuel delivery by the gear pump which runs at one-half engine speed.

Less the amount of fuel spilled back to the fuel reservoir by the position of the spill plunger.

By this means, it is easily understood that for a given pump output the fuel delivery to the nozzles can be decreased by increasing the amount of spill or increased by decreasing the amount of spill. Obviously, when the spill plunger is up as shown in figure 99, the spill rate will be high and fuel flow to the nozzles will be lowered. Conversely, depressing the spill plunger covers the spill ports and fuel delivery to the nozzles increased (fig. 100).

This description covers operation of the fuel valve in all operational phases while the engine is running. During starting however, fuel delivery must be altered to meet and overcome conditions present at only that time.

Fuel Valve Operation - Starting

During normal operation, all fuel must enter the metering chamber by lifting the fuel valve check ball off its seat. However, at engine cranking speeds the fuel pressure delivered by the gear pump is insufficient to lift the check ball, therefore other means must be used to supply fuel for staring (fig. 101).

During engine cranking, the spill plunger and fuel valve are fully depressed by a lever activated by a solenoid energized by the starting circuit. This action does two things: First, the fuel valve depression opens a passage for fuel delivery to the nozzles from the fuel tank fuel pump and second, the spill ports are fully closed off at the same time so that the rich fuel mixture required for starting will be delivered. A small external fuel line delivers fuel from the fuel tank fuel pump to a port in the fuel meter normally closed off by the fuel valve which is held up by a small spring. When the fuel valve is depressed by the solenoid activated linkage during cranking, this port is uncovered which allows engine fuel pump pressure to be delivered directly to the nozzles. As soon as the engine starts and the ignition switch is returned to its "RUN" position, the solenoid linkage releases and the fuel valve moves back up to once again close off the by-pass fuel passage.

To provide unloading in the event of a flooded engine, a small micro switch is provided which cuts the electrical circuit to the solenoid when the throttle blade in the air meter is held ¾ open or more. By this means, almost all fuel supply to the engine is cut off while the maximum amount of air is admitted for fast restarting.

Summarizing the operation of the fuel valve, one could consider that the driver is actually controlling its position with his foot. That is, at light throttle the spill plunger is up, and spill rate is high, and fuel delivery to the nozzles is relatively low. As the accelerator is depressed, the spill plunger moves downward to increase fuel delivery to the nozzle by reducing the spill rate. While this analogy is not quite true as there is no direct connection between the spill plunger and the accelerator pedal, the driver does control the spill plunger indirectly as the position of throttle valve in the air meter controlled by the driver causes a venturi vacuum signal relative to the throttle position and this vacuum, in turn, controls the position of the spill plunger.

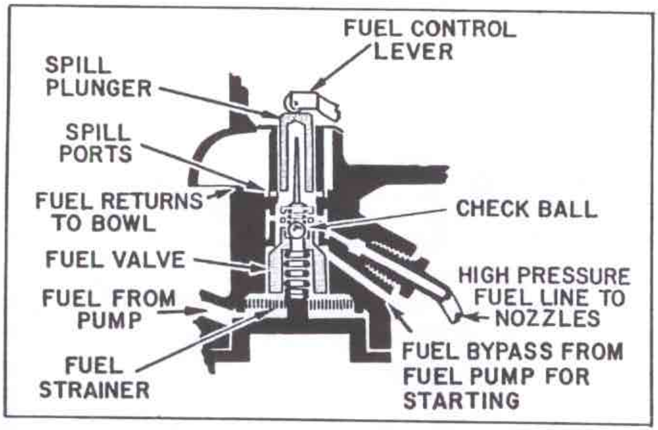


Fig. 98—Fuel Valve Components Identification

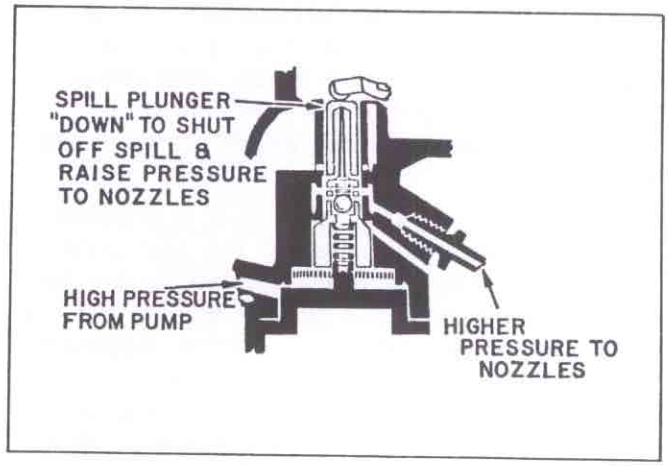


Fig. 100—Fuel Valve—High Fuel Flow

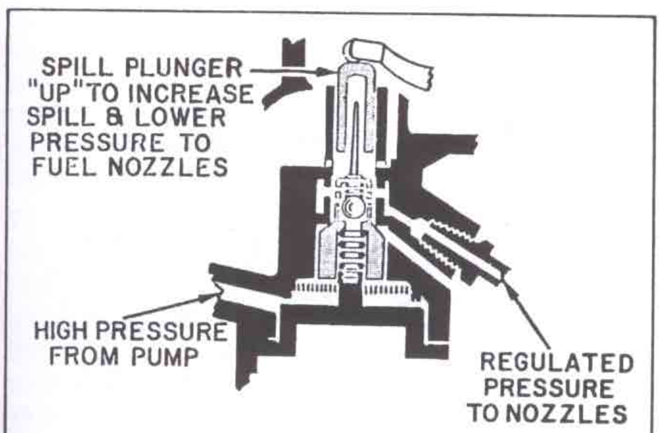


Fig. 99—Fuel Valve—Low Fuel Flow

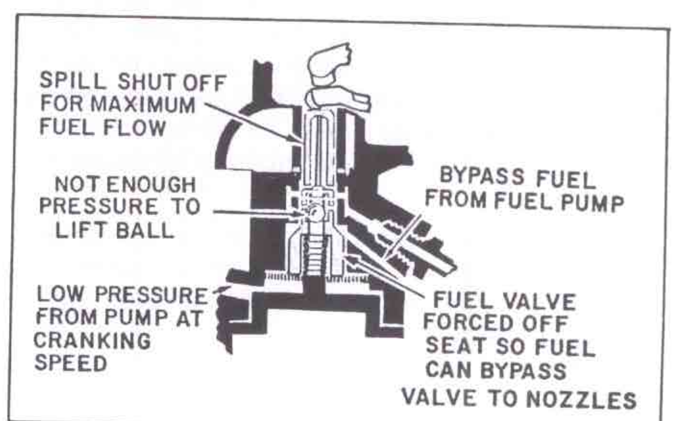


Fig. 101—Fuel Valve—Starting By-pass

Fuel Control Linkage

The position of the spill plunger is always the direct result of two opposed forces and thus becomes a state of balance. From below, pressure from the fuel meter gear pump pushes upward on the spill plunger and this pressure increases and decreases with engine speed. Opposing the force is downward pressure exerted by a lever actuated by a venturi vacuum controlled diaphragm.

As shown (fig. 102), one end of the fuel control lever rests directly on the spill plunger and controls spill plunger position. The other end of the lever is connected by a link to the control diaphragm and the lever pivots around another part which is called the ratio lever. When the diaphragm pulls the link upward due to increased venturi vacuum, the lever end pushes downward on the spill plunger to increase fuel pressure. As venturi vacuum decreases due to lower air flow into the engine, the diaphragm allows the link to fall and fuel pressure forces the spill plunger upward to open the spill ports and lower fuel pressure. This linkage system is so designed that it will balance at the particular point where the fuel pressure is correct for the amount of vacuum "pull" on the diaphragm. The linkage system is carefully counter-balanced so that the only forces acting are fuel pressure and diaphragm vacuum. the small counterweight balances the weight of the fuel control lever itself and the large counterweight compensates for the weight.

For normal driving, the ratio lever is positioned at the approximate center of the fuel control. This means that the force applied by the fuel control lever to the spill plunger will be just the force applied to the main control diaphragm which will result in a high rate of spill. During power operation, the ratio lever is moved closer to the spill plunger. With the same vacuum applied to the diaphragm, the spill plunger will be depressed further due to the increased leverage and the spill rate will be reduced. It is easily seen that by changing the fulcrum we can directly control fuel delivery for a given venturi vacuum signal thus allowing us direct control of the air-fuel ratio. Power mixtures are obtained by moving the ratio lever closer to the spill plunger and economy mixtures are obtained by centering the ratio lever.

The position of the ratio lever is controlled through linkage by a diaphragm actuated by manifold vacuum and a spring. The tension holds the diaphragm in the power position but whenever manifold vacuum is above 9" Hg, the spring tension is overcome and the ratio lever is held in its economy position. By this means, the fuel meter is able to delver the best mixture for

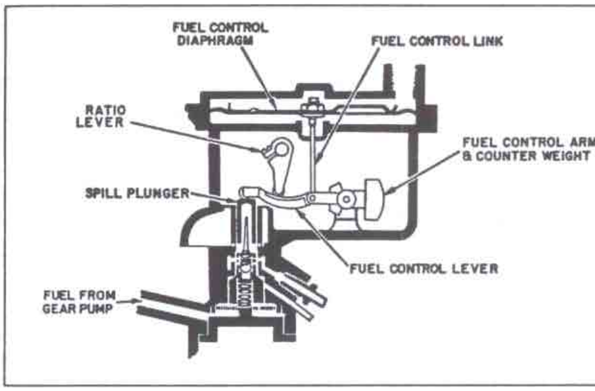


Fig. 102 - Fuel Control Linkage

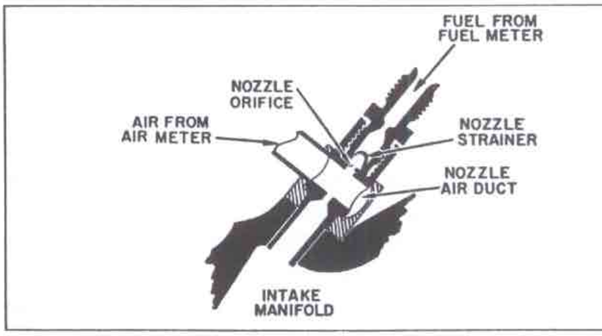


Fig. 103 - Fuel Nozzle

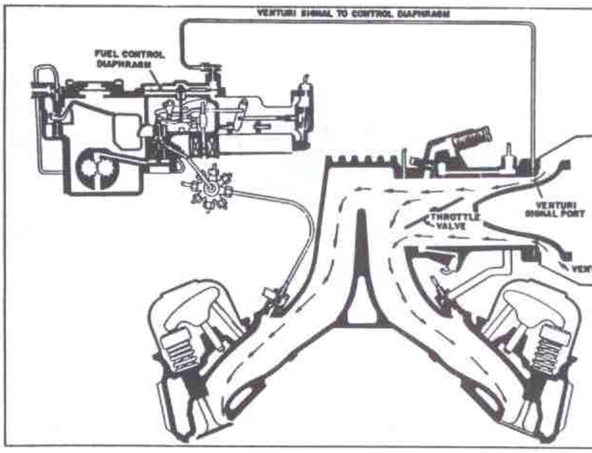


Fig. 104 - Air Supply and Control

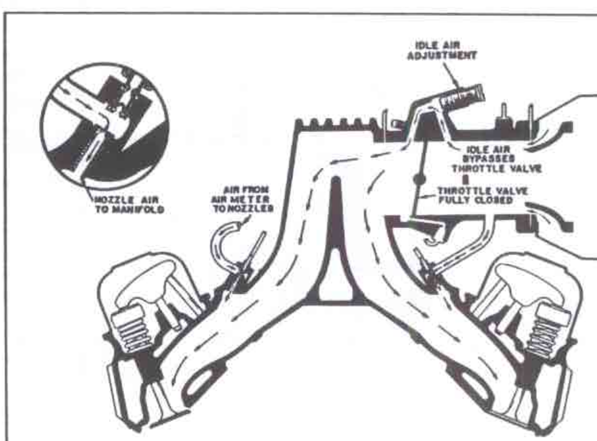


Fig. 105 - Idle Air Flow

the drivers demand; when manifold vaccum drops below 9" Hg due to extreme throttle opening, the fuel meter automatically delivers the power mixture required for best power and acceleration. However, as soon as the engine catches up to the throttle demand, manifold vacuum increases which moves the ration lever to the lean stop and the fuel meter once again delivers economy mixtures. Manifold vacuum is prevented from reaching the diaphragm during engine warn-up thus helping provide the richer fuel mixture required at that time by keeping the enrichment lever on the rich stop.

Fuel Nozzles

The design of the fuel nozzles is one of the prime factors in the success of the G.M. continuous flow injection system. In the past attempts at continuous flow injection, control of fuel delivery became a problem due to percolation in the nozzles and erratic flow at lower engine rpm due to vacuum pulsations.

As shown in the nozzle cross section (fig. 103), the nozzle in the G.M. system discharges to atmospheric pressure by means of air ducted to the nozzles from the air meter. By this means, the ducts act as a suction breaker to effectively nullify vacuum pulsations plus providing an anti-percolation feature by venting the nozzles to atmosphere during heat soak periods.

Fuel entering the nozzle passes through a domed strainer screen and then is squirted through a metering orifice drilled in a small disc, across the air duct through a larger nozzle opening and on into the area immediately above the intake valve. As covered previously, fuel is delivered continuously at such a rate that the desired furl change has accumulated for induction by the time the intake valve is ready to open.

Air Meter

The primary purpose of the air meter, in conjunction with the intake manifold, is to measure, control and deliver all air used for combustion (fig. 104). As in the carburetor, air flow is measured by a venturi and air flow is controlled by a throttle valve operated through linkage by the accelerator pedal. Air is delivered to the cylinders via individual ram tubes housed in the intake manifold fed from a common plenum by the air meter.

To reduce air meter length, an annular venturi is formed by a cone-shaped diffuser mounted at the mouth of the air meter. Incoming air causes a low pressure or vacuum at the venturi just as in the venutri of a carburetor and the amount of vacuum will be an indication of the amount of air entering the air meter. In a carburetor, this venturi vacuum is used to draw fuel from the fuel bowl into the air stream. In the injection system, this vacuum is used instead as a signal to the main control diaphragm in the fuel meter which, as we just covered, controls the position of the spill plunger to regulate fuel flow. In effect then, the amount of air flow is sensed at the venturi signal port and this signal is passed along through the venturi signal line to the main control diaphragm so that fuel can be fed in the right proportion for the air flow into the engine.

Idle Air

During idle operation, the throttle valve is closed against the bore within .0015-.112" of the air meter and air is introduced to the manifold through a by pass system (fig. 105). Air is taken into the by pass system above the throttle valve and is fed through passages to a point below the throttle valve. Idle speed adjustment is obtained by turning the idle air screw to regulate the amount of air allowed to flow through the by-pass system. In addition to this air through the air meter, one-third of the air for idle is taken in directly through each of the eight fuel nozzles via the nozzle block air ducts mentioned earlier.

Idle Fuel Control

The venturi signal is naturally very slight at idle speeds because the throttle is almost tightly closed (fig. 106). Since a higher signal is required to provide the richer fuel mixtures required for idle, the venturi signal must be strengthened. This is done by the addition of a regulated amount of manifold vacuum. Vacuum is applied to this system at the idle needle hole and is controlled by turning the needle in or out to obtain the best operation. This auxiliary signal vacuum is transmitted through a tube to a "T" at the main control diaphragm where it passes a restriction and combines with the main venturi signal to operate the control diaphragm. Thus the fuel flow is increased by strengthening the effective venturi signal at the main control diaphragm.

As the throttle valve is opened, vacuum is introduced to the system through an off-idle signal port and, at this point, the vacuum is controlled by the restriction in the tube. As the throttle valve continues to open, vacuum at the auxiliary signal ports decreases until there is no noticeable auxiliary signal and the main venturi signal operates the diaphragm. This decrease of idle and off idle port signals is comparable to the transfer between idle and main metering system operation in carburetors.

Because the strength of the manifold vacuum signal which can be picked up at the off-idle port is far stronger than those which can usually reach the main control diaphragm, a signal bleed is drilled into idle signal channel in the air meter. This allows air to bleed into the line and thus weaken the off-idle vacuum signal to a safe level.

This bleed is effective during all operational phases, therefore any partial blockage will result in stronger vacuum signals and reduce fuel economy.

Acceleration

For acceleration, an extra charge of fuel is added to make up for any lag in the fuel control system in answering the highter venturi signal (fig. 107). Here again the idle signal system is used. It can be seen that the signal on the fuel control diaphragm at any time will be a combination of the main venturi signal and the signal from the idle and off-idle ports. As the throttle valve is opened for acceleration, the air flow and the main venturi signal increase immediately. Because of the wider opening of the throttle valve, vacuum on the signal system decreases and if some measure were not provided, the idle and off-idle ports would back-bleed air and reduce vacuum signal at the main control diaphragm. However, the restriction at the signal end of the "Tee" fitting delays the loss of idle vacuum signal above the main control diaphragm momentarily. Since the venturi vacuum signal increased immediately, the total vacuum above the control diaphragm becomes momentarily high to provide the richer fuel mixture required for smooth acceleration to higher speeds. By the time the engine reaches speed, the excessive vacuum has bled back through the restriction and only the normal control signal remains.

Power

As mentioned earlier, the ratio lever in the fuel control linkage system controls the fuel air mixture, thus for power operation, the ratio lever must be moved to its rich position to supply the required richer mixtures for power operation (fig. 108). The ratio lever is connected by a shaft to an outside enrichment lever which, in turn, is connected by a rod to a diaphragm exposed to manifold vacuum. The power enrichment diaphragm operates much as the power valve and power piston in a carburetor. When manifold vacuum is high and lean mixtures can be used, the diaphragm is held in the lean position. When power is called for and engine vacuum drops below 9" Hg, a calibrated spring moves the diaphragm to the rich position and holds it there until manifold vacuum rises above 9" Hg, at which time power ratios are no longer required. Stops on the fuel meter casting which determine the rich and lean ratios are adjusted at the factory to provide proper fuel flow to a matched set of nozzles. These stops should not be moved in the field unless the need for recalibation is indicated through the use of test equipment described later in these pages.

Application of manifold vacuum to the power enrichment diaphragm is limited to periods when

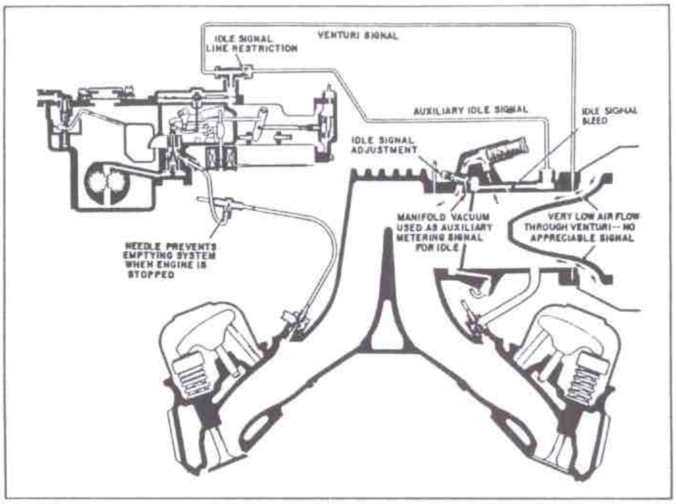


Fig. 106 - Idle Fuel Metering Signal

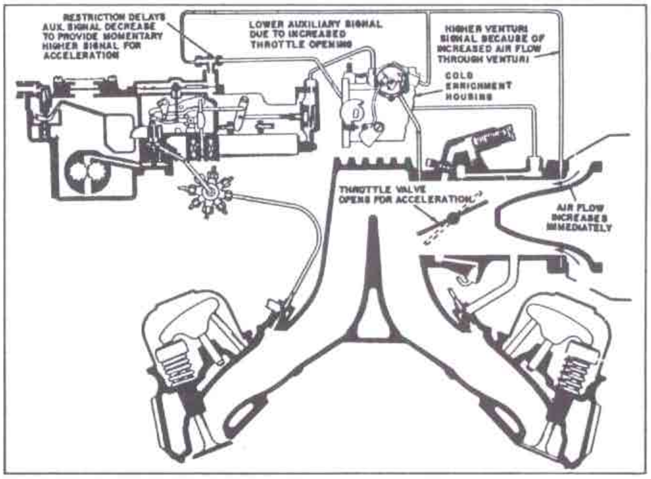


Fig. 107 - Acceleration Fuel Metering Signal

the engine is warmed up as the vacuum apply to the diaphragm is controlled by a valve in the cold enrichment housing. During warm-up, the power enrichment valve remains closed which keeps the enrichment lever on the rich (power) stop due to power enrichment diaphragm spring tension. As the engine warms up, a bimetal thermostat spring in the cold enrichment housing opens the power enrichment valve and allows manifold vacuum to reach the power enrichment diaphragm. Once the coil is heated, the valve remains open so long as the engine is kept running and the position of the power enrichment diaphragm is controlled entirely by manifold vacuum; at signals of 9" Hg or above, the diaphragm holds the enrichment lever on the economy (lean) stop whereas at lower vacuum the lever is moved to the rich (power) stop by tension of the power enrichment diaphragm spring.

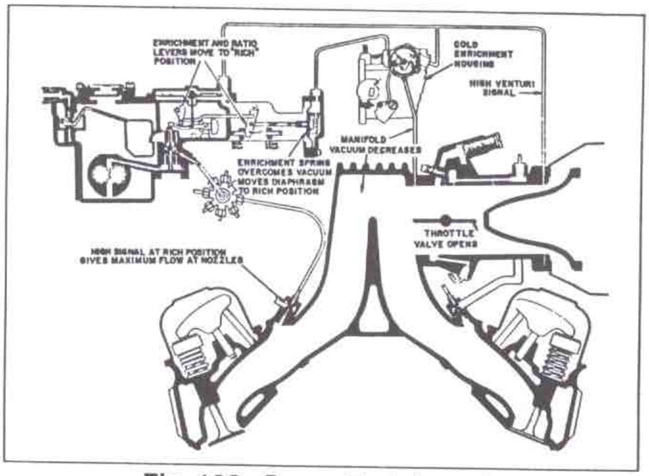


Fig. 108 - Power Enrichment

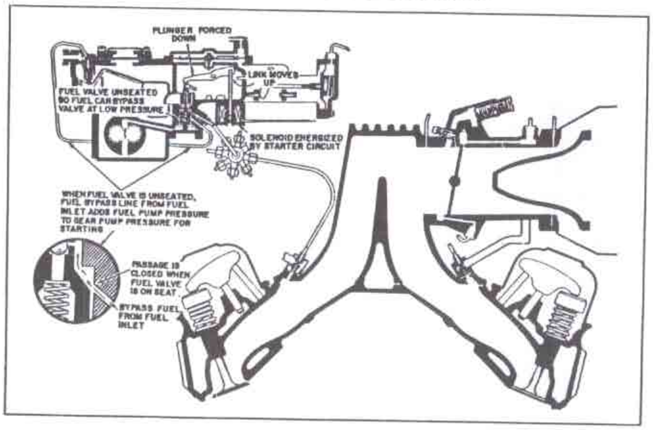


Fig. 109 - Starting

Starting

While the operation during starting was basically covered during discussion of fuel valve operation, it is reviewed at this time so that the attitudes of all components can be seen (fig. 109).

At cranking speed, there is very little fuel pressure from the gear pump due to the fact it runs at one-half engine rpm. A special provision must be made to feed sufficient fuel to the nozzle at cranking rpm so that the engine can start. To obtain the maximum amount of fuel at these low pressures, the fuel valve is mechanically forced off its seat so that fuel can bypass the valve and flow directly to the nozzles. This action is accomplished by a solenoid which is energized by the starting circuit and which operates through linkage to force the spill plunger downward until it forces the fuel valve off its seat.

When the fuel valve is unseated, it uncovers a special bypass fuel line from the fuel meter intake which delivers engine fuel pump pressure to the metering chamber to combine with gear pump pressure in supplying sufficient fuel for starting. As soon as the engine has started and the ignition switch is returned to "RUN" position, solenoid current is cut off and the fuel valve returns to normal position, shutting off all bypass fuel flow.

Unloading

To allow cranking without use of the fuel bypass, a solenoid cut-off switch (fig. 110) is attached to the air meter next to the throttle lever. Whenever the throttle valve is opened ¾ or wider, a cam on the throttle lever operates the micro switch to break the circuit to the fuel bypass solenoid. Thus, by opening the throttle wide, a flooded engine can be "unloaded" and restarted as starting bypass fuel flow is cut off and air intake is maximum.

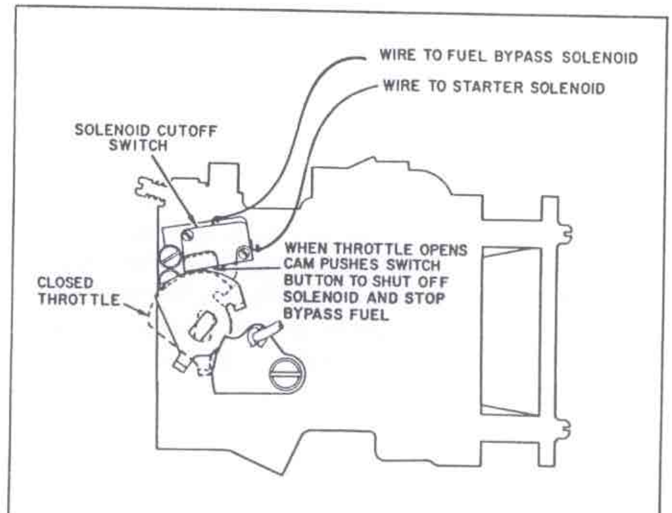


Fig. 110—Starting Fuel Cut-Off (Unloading)

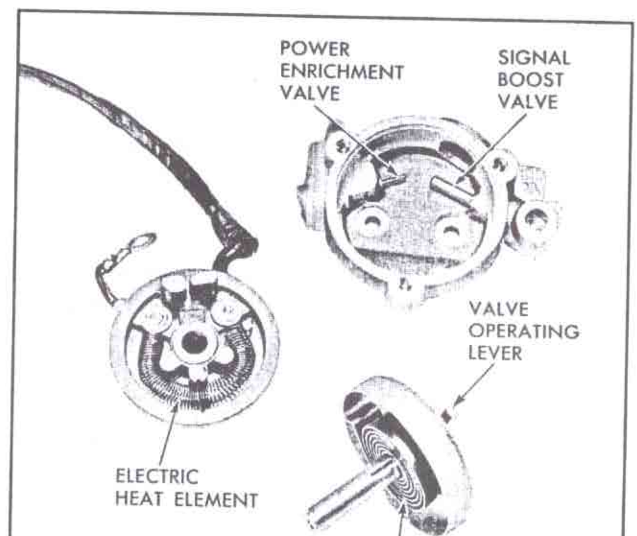


Fig. 111—Cold Enrichment Housing Components

Cold Enrichment

Fuel enrichment and higher initial idle speeds to provide smooth engine operation and prevent stalling during warm-up is accomplished through use of a cold enrichment housing and a fast idle linkage much like that used on carburetors. In effect, the cold enrichment assembly is the counterpart of a carburetor choke, however it enriches fuel mixture delivery without restricting air flow.

The cold enrichment housing, mounted on top of the air meter, contains four parts (fig. 111). These are (1) signal boost valve, (2) power enrichment valve, (3) thermostatic coil, and (4) an electric heat element. The thermostatic coil is mounted on a shaft, the lower end of which has an arm that operates the boost valve and the enrichment valve. Mounted on the upper end of the shaft are a trip lever and counterweight which operate the fast idle cam to control idle speed during engine warm-up.

The thermostatic spring, as mentioned, is heated electrically as compared to the exhaust manifold heat applications used on choke thermostatic springs for carburetors. Electrical heating is possible due to shorter warm-up required by fuel injection-equipped engines because of the direct fuel delivery to the combustion chamber area. The electrical source for the heat element is the 12 volt side of the ignition resistor on the dash. By this connection, current flows to the heat element at all times when the engine is running or the ignition switch is in the "ON" position.

Operation

The cold enrichment housing has a twofold purpose. First, it "boosts" the vacuum signal to the main control diaphragm during warm-up by supplementing the usual signals with manifold vacuum through a bleed valve. During the "boost" stage, it prevents manifold vacuum from reaching the power enrichment diaphragm, thus keeping the enrichment lever on the rich stop. Second, once signal boost is no longer needed, the boost signal is shut off and manifold vacuum is allowed to react on the power enrichment diaphragm to move the enrichment lever from the power stop to the economy stop. Manifold vacuum is constantly fed to the cold enrichment housing through a hole in its base connected to a passage in the air meter open to manifold vacuum. This sequence is easily understood by following the basic stages of operation.

1st Stage

The first stage of operation shown in figure 112 illustrates the attitudes of all parts when the engine is first started. The bi-metal thermostat coil, being cold, is under tension and holds the boost valve in cold enrichment housing open by means of an attached lever. This allows manifold vacuum, after passing through a restriction in the lower hose of the boost tube, to combine with the venturi vacuum to strengthen the signal and cause richer fuel mixtures. With the enrichment vacuum valve closed, the enrichment lever is held against the power stop by spring tension. This first, or "boost", stage of operation continues so long as the fast idle screw remains on the high step of the cam although the boost vacuum declines slowly as the coil heats and the cam rotates toward the second step.

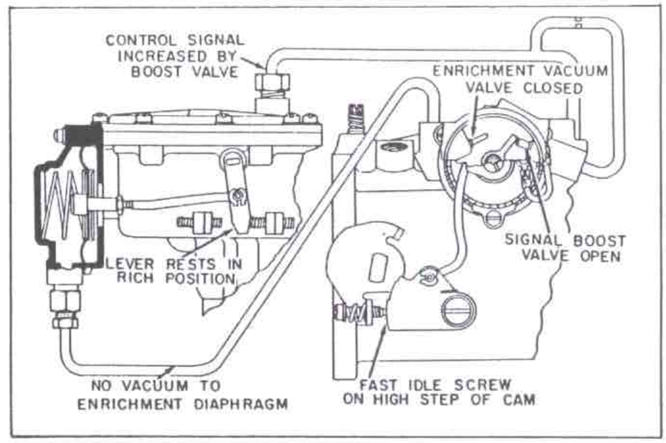


Fig. 112—Cold Enrichment 1st Stage

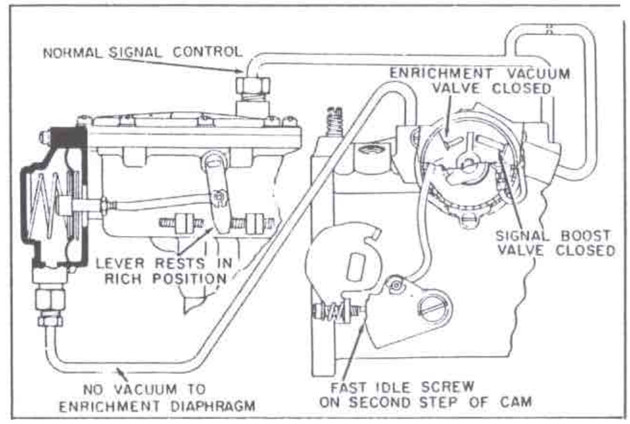


Fig. 113—Cold Enrichment 2nd Stage

2nd Stage

When the thermostat coil heats sufficiently to rotate the cam so that the fast idle screw rests on the second step, signal boost ceases. As shown in figure 113, the signal boost and enrichment valves are both fully closed during this second stage so the main control diaphragm will receive only the normal venturi and idle signal. Since the power enrichment valve remains closed, the enrichment lever on the fuel meter remains on the rich, or power stop. Actually, the only effect caused by the cold enrichment housing at this time is to keep the throttle blade at a slightly greater opening by means of the second and third cam steps to maintain a higher idle speed and prevent manifold vacuum from reaching the power enrichment diaphragm until the engine warm-up is complete.

3rd Stage

Further heating of the thermostat coil finally rotates the fast idle cam completely clear of the fast idle screw. This is the third stage or normal operation (fig. 114). With the coil completely relaxed, its operating lever depresses the enrichment vacuum valve to allow manifold vacuum to react on the enrichment diaphragm. At any vacuum of 9" Hg (mercury) or above, the tension of enrichment diaphragm spring will be overcome and the enrichment lever will rest on the economy stop. Only normal control signals

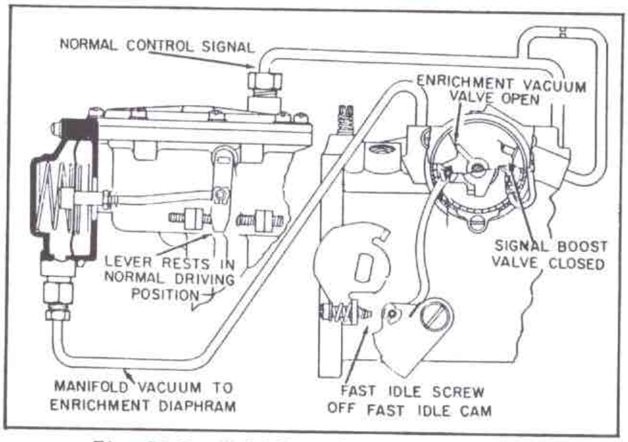


Fig. 114—Cold Enrichment 3rd Stage

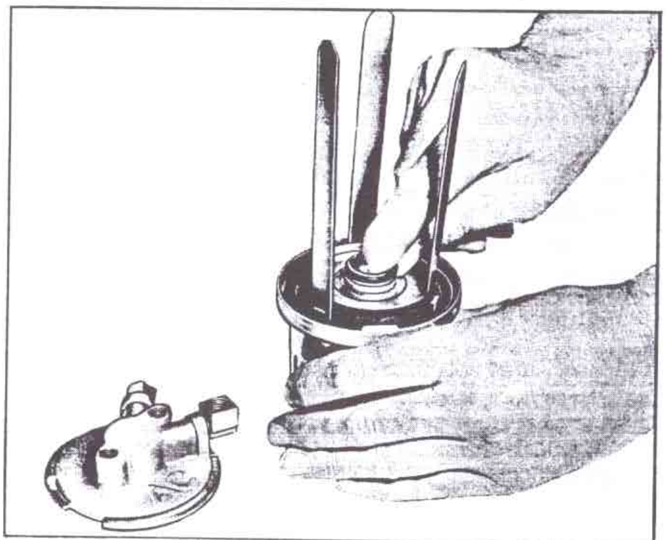


Fig. 115—Replacing Fuel Filter Element

from the venturi will react of the main control diaphragm for driving or from the needle controlled orifice behind the throttle blade during idle as the boost valve is closed. Since engine vacuum generally stays above 9" Hg, the enrichment lever will nearly always be on the economy stop except for those momentary demands when the driver suddenly opens the throttle wide for acceleration from a standstill or for passing.

7014800 Fuel Injection Service Procedures

MAINTENANCE AND ADJUSTMENTS

Periodic maintenance requirements of the Chevrolet Fuel Injection are limited to replacement of fuel and air filter elements. Adjustments are limited to idle fuel and idle air (idle speed), cold enrichment rod length, cold enrichment coil index setting, and fast idle speed.

Fuel cleanliness is a major factor in maintaining the Chevrolet Fuel Injection unit at peak operating efficiency. The best assurance of fuel cleanliness and a reduced tendency toward gasoline gum and varnish formation is to use a reputable, premium fuel.

Serving The Air Cleaner

The element should be replaced each 15,000 miles or oftener in dusty areas. To replace air cleaner element, perform the following steps:

1. Remove aid cleaner flexible duct.
2. Remove fuel bowl vent pipe at air cleaner.
3. Remove wing nut attaching cleaner to stud in air meter.
4. Remove wing nut attaching air cleaner stud to bracket at front of engine, lift out air cleaner, then remove nut from opposite end of stud to allow removal of element.
5. Replace element and reinstall air cleaner by reversing the preceding steps.

Servicing The Fuel Filter

The fuel filter element should be replaced semiannually - in the spring the fall. To remove the element, remove the filter cover and insert three pieces of shim stock about .040" thick between the element and the clips inside the filter as shown in figure 115. Now the element can be removed by simply pulling upward. Install new element in the same manner.

Idle Speed and Mixture Adjustment

Before attempting to adjust the idle speed and mixture, allow the engine to warm-up so that the throttle tab is completely off of the fast idle cam. If these adjustments are being performed after servicing the Fuel Injection unit, fully close both the idle air and idle fuel adjusting screws (fig. 116), and then back off each screw approximately two(2) turns as an initial setting for warm-up. A tachometer and vacuum gauge should be used to obtain the best possible adjustment.

1. Once engine is warmed-up, adjust idle air screw as required to give a moderate idle speed.
2. Adjust the idle fuel screw as required to give the highest steady vacuum reading and highest engine rpm. If instruments are not available, adjust idle fuel needle as necessary to obtain the best engine operation.
3. Reduce idle speed by turning the idle air screw inward. Idle speed should be finally adjusted to 500 rpm in "Drive" range on Powerglide and Turboglide models and to 600 rpm in neutral on standard transmission jobs.
4. Repeat the avove adjustments as required to obtain the highest vacuum, and smoothest idle possible at the specified idle speeds.

Cold Enrichment Adjustments

These adjustments will normally only be required at the time of rebuild by the adjustments may be checked as follows:

Cold Enrichment Coil Setting

Scribe mark on the coil cover should be set 1½ notches rich from the scribe mark on the cold enrichment housing. (Notches are small radial marks on flange of coil cover.)

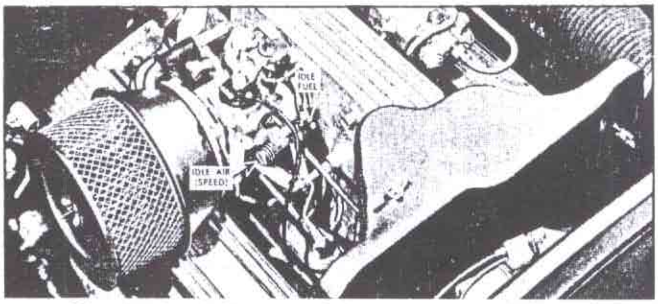


Fig. 116—Adjusting Idle Mixture and Speed

Cold Enrichment Adjustment

1. With the engine off and cool, disconnect the rubber sleeve from the cold enrichment housing signal boost tube and install a short length of rubber hose over the tube such as windshield wiper hose.

2. Crack the throttle valve as necessary to place the throttle tab just on the high stop of the fast idle cam, then close the throttle.

3. Holding the trip lever against the counterweight tab as illustrated in Figure 117, blow into the hose while listening at the air meter. If choke rod length is correct, slight air flow should be heard. Repeat check but with throttle tab on second step of fast idle cam. No air flow should be heard. If necessary, bend rod as required with bending Tool J-6492 to shorten or lengthen rod in order to meet the above requirements.

Fast Idle Speed Setting

1. Normalize the engine to operating temperature.

2. With tachometer hooked up to measure rpm, start engine and place throttle tab on high step of fast idle cam.

3. Speed should be 1660-1700 rpm in neutral. If unit does not meet this specification, bend the throttle tab in or out as required.

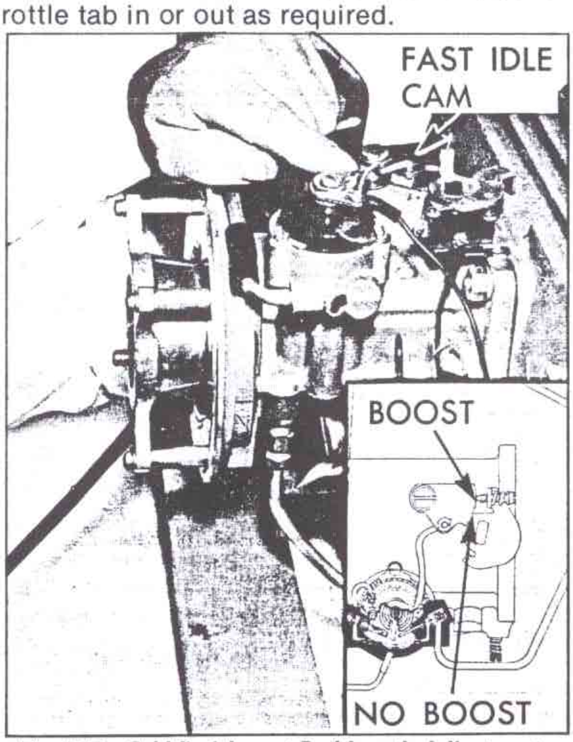


Fig. 117—Cold Enrichment Rod Length Adjustment

TROUBLESHOOTING

In general, the following procedures cover most of the malfunctions which may be encountered with the 7014800 Fuel Injection unit and basically apply to the two preceding models, 7014520 and the later 7017300 units.

Probable causes of trouble are listed under each complaint heading by the order in which they should be checked.

Always make sure that the engine and ignition systems have been eliminated as the trouble possibilities by thorough checks before blaming the Fuel Injection systems.

In many instances in the following trouble possibilities, it is necessary to check for air leaks at the signal line connections and nozzle blocks, or to check for leaks in the enrichment or main control diaphragms. The following procedures should be used to make these checks:

CONNECTION LEAK CHECK

The quickest check for possible air leakage into vacuum signal lines, nozzle blocks, and rubber sleeve-type connections is to spray the connections, one by one, with water from a pump-type oil can while the engine is idling. If leaks are present, a sucking sound will be heard as the water is pulled in by the vacuum.

Diaphragm Leak Check

To check for leaks in the enrichment or main control diaphragm, disconnect the vacuum signal line at the end opposite the diaphragm connection end and attach a hose from a manometer dial needle will slowly slip to lower readings. When testing the main control release valve on the manometer unit shut, apply and hold a vacuum on the diaphragm and watch the manometer dial. If the diaphragm leaks, the anometer dial needle will slowly slip to lower readings. When testin the main control diaphragm, disconnect the vacuum signal line from the opposite end of the tee and install a plug. If a main control diaphragm leak is found, replace the fuel meter; if the enrichment diaphragm leaks, replace the diaphragm.

Never apply a vacuum greater than 4'' Hg (mercury) to the main control diaphragm as this may damage fuel meter! The enrichment diaphragm should be checked by applying 12-16'' Hg. (Mercury).

If an instrument such as shown in Figure 118 is not available, a substitute set-up may be made.

1. Connect a "Tee" fitting to the signal tube with windshield wiper hose.

2. Connect a sensitive vacuum gage or manometer to one outlet of the tee.

3. Connect a vacuum pump to the other outlet of the tee. The vacuum pump that is a part of most Distributor Analyzers will work satisfactorily.

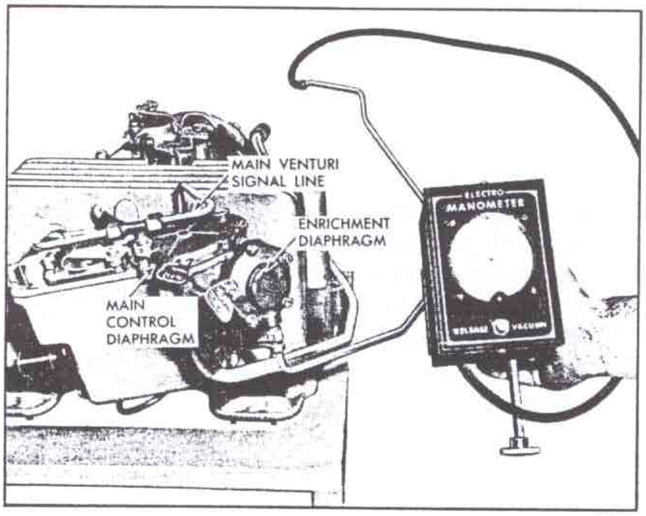


Fig. 118—Checking for Diaphragm Leaks

4. Turn on the vacuum pump and allow the vacuum to reach the levels specified above.

CAUTION: It is mandatory that the specified levels of vacuum are not exceeded even momentarily. Excessive vacuum on the main control diaphragm may irreparably damage the fuel meter.

5. When the desired vacuum is obtained, tightly close or seal the line leading to the vacuum pump. The best means of closing the vacuum line is to double the hose.

6. Observe the vacuum gauge connected to the tee. Any drop of vacuum indicates a ruptured or leaking diaphragm. Recheck the test equipment for leakage to be certain the diaphragm is a fault.

DIAGNOIS

Won't Start

1. Check for correct cold starting procedure: The accelerator should be depressed once to index the fast idle cam, then the accelerator should remain released until the engine has started. If hot starting trouble is encountered, check that the starting cut-off switch (micro-switch) is being actuated by the throttle cam at approximately ¾ throttle. Bend the switch bracket as necessary. Also make certain that the driver understands that holding the throttle wide open during cranking will unload the system.

2. Observe the starting solenoid on the fuel meter to make certain it operates when the starter is engaged (closed throttle). If it does so, check out the starting cut-off switch and solenoid.

3. Check that fuel is flowing to the fuel distributor by loosening the distributor line at the fuel meter. Fuel should leak from the loosened fitting during cranking; otherwise the fuel valve is sticking and should be cleaned. Push the solenoid plunger to free fuel valve or remove valve and clean thoroughly.

4. To check that the fuel line to the fuel distributor is not clogged, remove one set of nozzles from a nozzle block and check for fuel flow while cranking the engine. If fuel flow is not observed, check the fuel distributor check valve for sticking or a clogged fuel meter-to-disctributor fuel line.

5. If fuel flows from the nozzles and the car still won't start, check for large air leaks, such as loose or cracked nozzle blocks. If the system is tight and fuel is present, there is either a very unusual flooding condition or the trouble is not in the fuel system.

Starts and Dies

1. The problem is often the result of residual vapors in the engine and exhaust system. In all cases after initially starting the engine, accelerate the engine several times to purge the system. This procedure is especially important to hot weather.

2. If engine will not take throttle as in Step 1 above, check for a broken or improperly connected fuel meter pump drive cable. Also, check that the enrichment lever rests on the power (rich) stop. In all cases when the engine is stopped, the enrichment lever should rest on the power stop. After the engine is started, the enrichment lever should remain on the power stop as long as the throttle tab is on the fast idle cam; otherwise check for leakage past the enrichment housing as described in "CLEANING AND INSPECTION." If leakage exists, attempt to remedy by cleaning; otherwise replace cold enrichment housing.

3. Be sure the solenoid releases after engine starts; otherwise check for binding or improper wiring.

4. Check for vacuum leaks, especially the vacuum line to the main control diaphragm.

5. If trouble occurs on a cold start, check the cold enrichment coil cover for proper index (1½ notches rich) and check fast idle cam rod adjustment. Also check that the cold enrichment linkage is free to move and that the throttle tab rests on a stop of the fast idle cam for the first few minutes of engine operation. If the engine seems to be "starving," disconnect the enrichment line at the cold enrichment housing and start the engine. This will provide full enrichment. If disconnecting the enrichment line eliminates the trouble, the enrichment valve in the cold enrichment housing is not seating properly; clean or replace the cold enrichment housing as required.

6. The spill plunger may be sticking. It can be moved manually by pushing on the solenoid plunger. If the condition persists, the spill plunger can be checked only by partial disassembly of the fuel meter.

7. Check for a leak in the main control diaphragm. Disconnect the main control diaphragm line and impose a vacuum of not over 4" Hg on the diaphragm and check for leakage

by observing manometer. If leak is found, the fuel meter must be replaced as changing the main control diaphragm requires recalibration of the Fuel Injection unit which is not possible currently in field service.

8. Check the engine fuel pump for capacity and pressure as described in the Chevrolet Passenger Car Shop Manual. The pressure specification is 5¼ to 6½ psi.

Hesitation or Flat Spot

1. Check for vacuum leaks in the signal lines and fittings.

2. In the air meter, check the main control diaphragm venturi signal passage for cleanliness and see that the auxiliary signal passages are clean.

3. Check that the restriction in the main control diaphragm tee is clear.

4. Check the main control diaphragm for leaks with a manometer.

5. Check for sticking spill plunger.

6. Apply a vacuum of 12-16" Hg to the enrichment diaphragm to check for leakage.

7. Check that the enrichment control diaphragm rod length allows proper cut-in for power and economy as described in Step 2 of "Assembly of Fuel Meter." Enrichment lever should leave the economy stop at 9" Hg or below and reach the power stop at 3" Hg or above.

8. Check to be sure the enrichment diaphragm is receiving vacuum from cold enrichment housing. If not, look for trouble in the cold enrichment housing such as broken heat element posts, burned out heat element, or a stock ball in enrichment valve.

Surge

1. Check the engine fuel pump and the ignition system, especially the spark plugs, for proper operation and adjustment. If the engine is equipped with a vacuum advance distributor, the spark advance must be set with the vacuum disconnected to 4° BTDC @ 500 rpm idle speed.

2. Check that the fuel filter in the fuel supply line to the Fuel Injection unit is not obstructed and causing spasmodic fuel flow.

3. Check for vacuum signal line leakage.

4. If surge seems to result from over enrichment, check the enrichment control diaphragm for leaks. If surge is caused from too lean a mixture, check the main control diaphragm for leaks. If the main control diaphragm is leaking it is necessary to replace the fuel meter assembly

5. Check the spill plunger for free operation as described under "Starts and Dies."

Rough Idle

1. Check for correct idle speed and mixture adjustments and correct distributor spark advance setting.

2. If adjustment of the idle fuel adjusting screw has little or no effect on engine operation, check for a sticking spill plunger.

3. Check that there is no perceptible vacuum signal from the boost tube at the cold enrichment housing when the rubber sleeve is disconnected and a finger is placed over the tube. This check must be made when the throttle tab is completely off the fast idle cam.

4. Check for leaks in the signal and fuel lines as described previously.

5. Check for a plugged nozzle by shorting out one spark plug at a time. If a plugged nozzle is present, there would be no change in engine operation when the spark plug to that cylinder was shorted out. Remove the nozzle and clean as described in "Cleaning and Inspection." This is likely to be extremely rare and a check of the spark plugs and leads should be made first.

6. Check that the enrichment lever leaves the economy stop at 9" Hg vacuum or below and arrives at the power stop at 3" Hg or above with a manometer as described under "Fuel Meter - Assembly."

7. Check for VACUUM LEAKS, ESPECIALLY AROUND THE NOZZLE BLOCKS AND VENT TUBES. If a vacuum leak was not found by the water method but the nozzle area is still suspected, it will be necessary to remove the nozzles in sets and check the small nozzle as described in "Installation of Signal, Fuel and Vent Lines."

8. Check for obstruction in the nozzle block vent tubes.

Poor Fuel Economy

1. Be sure the enrichment lever rests on the economy stop during normal operation after a 5-8 minute warm-up period.

2. After the throttle tab is completely off the fast idle cam, check that there is no perceptible signal at the signal boost tube by disconnecting the rubber sleeve and placing a finger over the tube. If suction is felt, the signal boost valve in cold enrichment housing is leaking and should be cleaned so that complete signal boost valve seating is obtained; otherwise replace the cold enrichment housing.

3. Check that accurate manifold vacuum signals are reaching the enrichment diaphragm by first taking an engine vacuum check and then by performing the same check at the enrichment signal line connection at the cold enrichment housing. Signal indications at the cold enrichment housing should be within 1" Hg of manifold vacuum reading; otherwise check for partially closed enrichment valve in the cold enrichment housing or a leaking gasket between the cold enrichment housing and air meter.

4. Check for an enrichment diaphragm leak by applying approximately 12-16" Hg to enrichment diaphragm signal tube with a manometer and vacuum source. Manometer indications should hold steady; otherwise a diaphragm leak is indicated.

5. Visually check at the ratio stop screw positions have not been altered. These stops are pre-set at the factory and their positions should never be altered in the field unless fuel flow recalibration set J-7090 is available.

MAJOR SERVICE OPERATIONS

Removal Of Fuel Injection Unit From Engine

1. Disconnect and remove fuel injection pump drive cable by unscrewing nut attaching cable housing to distributor, pull housing and cable out of distributor, and then pull housing and cable free of fuel injection pump (fig. 119). Use care not to lose small fiber washer from drive cable assembly.

2. Disconnect fuel line at the fuel meter.

3. Remove air cleaner as described under "MAINTENACE AND ADJUSTMENTS."

4. Disconnect the accelerator control rod and transmission TV rod (if automatic transmission) from the bellcrank on the Fuel Injection manifold.

5. Disconnect electrical connector (fig. 119) for the starting cut-off switch and cold enrichment coil.

6. Loosen the spark control pipe (fig. 119) at the distributor, then disconnect pipe at air meter end. Pipe should be loosened to allow its movement during removal of the Fuel Injection unit.

7. Remove the eight nuts and lockwashers attaching Fuel Injection intake manifold to adapter plate on engine and lift off Injector. Ports in adapter plate should be sealed off with masking tape immediately after removal of the Fuel Injection unit to prevent loose nuts etc., from falling into the combustion chambers.

Fuel Injection Flow Check

When the Fuel Injection unit is removed from the engine, it may be worthwhile to perform a fuel flow check. This is accomplished by filling the fuel meter with fuel and spinning the fuel meter pump (fig. 120). It is recommended that a geared hand-drill or air-powered drill be used to minimize any fire hazard. If a hand drill is used, it will be necessary to push up on the starting bypass solenoid plunger to permit full flow. Full fuel flow may also be obtained by disconnecting the main control diaphragm venturi signal line and applying a very light vacuum to the main control diaphragm. This may be done by applying oral vacuum to the main control diaphragm.

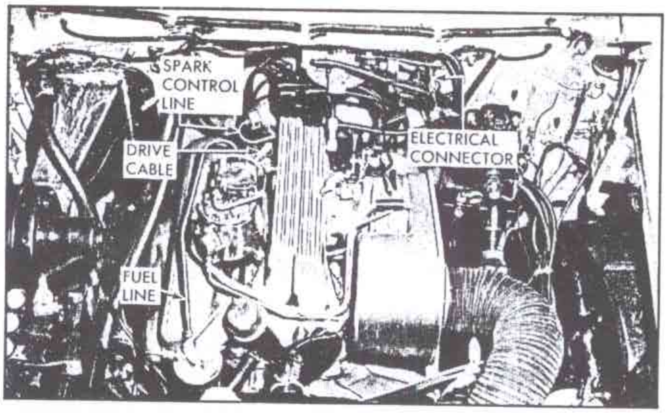


Fig. 119—Fuel Injection—Installed View

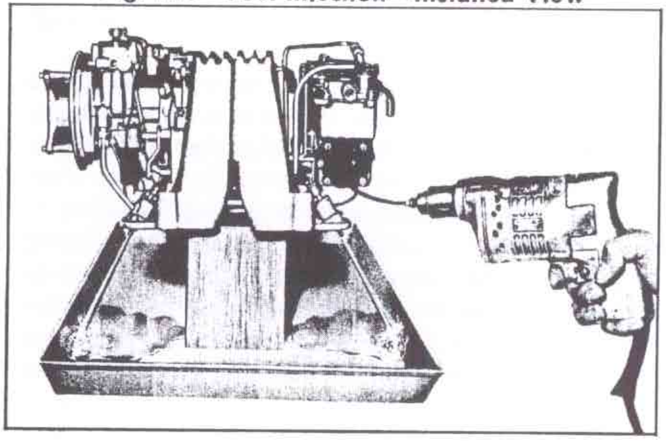


Fig. 120—Fuel Injection Fuel Flow Check

Properly operating, the streams of fuel from the nozzles should be practically perfectly aligned as viewed from the end of the unit and of equal volume.

This test should be performed after any rebuild of the unit and is sometimes helpful as a final diagnostic check of the complaint stemming from poor or erratic fuel flow. The following are the most probable causes if all fuel streams are not in alignment:

A. Kinked nozzle fuel lines.

B. Partial blockage of one or more fuel distributor outlets.

C. Partial blockage of the affected nozzles.

D. Unlike coded nozzle installed in error during replacement.

Less probable possible causes are miscoded nozzles and odd size apertures in one or more fuel distributor outlets. The above check will reveal only differences in fuel flow from the nozzles. It will not aid in uncovering problems arising from excessively lean mixtures, as all fuel flowing into the distributor, regardless of quantity, is distributed equally to all eight nozzles.

REMOVAL OF ASSEMBLIES

Throttle Control Linkage

1. Remove throttle return spring.
2. Remove nut and external toothed washer securing linkage to the throttle valve shaft lever beneath the air meter.
3. Remove hairpin retainer attaching accelerator linkage levers to post and manifold casting and remove linkage. Do not further disassemble.

Signal, Fuel and Vent Line (figs. 121 and 122)

1. Remove enrichment vacuum signal line by disconnecting the rubber sleeve at the cold enrichment housing on the air meter and at the enrichment diaphragm on the fuel meter (fig. 121).
2. Disconnect main diaphragm vent tube at the rubber sleeve at the fuel meter and remove tube. Do not remove short tube fixed in the fuel meter.
3. Remove the fuel meter-to-distributor fuel line, leaving the brass adapter fitting installed in the fuel meter casting (fig. 122). This fitting should not be removed from the fuel meter unless replacement is required. Exercise caution in removing this line at fuel meter end. Tube extends through adapter fitting into casting about 1¼".
4. To remove the venturi signal vacuum line, pull line out of its rubber sleeve at the air meter end and unscrew the fitting on top of the main control diaphragm cover.
5. Remove idle signal vacuum line by unscrewing fittings at both the air meter and main control diaphragm cover ends. Do not remove adapter from air meter casting unless replacement is required.
6. Remove the signal boost line (fig. 121).

CAUTION: Lower hose contains a calibrated restriction. If a replacement hose is required, press restriction out of old hose and install in new hose. On 7014800 units, this restriction should be .036" in diameter.

7. Remove nozzle block vent tubes from both the fuel meter and air meter sides.
8. Unscrew the cap screw securing the nozzle retainer, then lift the nozzles clear of the intake manifold and nozzle blocks. Remove nozzle blocks and gasket, then remove the other three sets of nozzles in the same manner.
9. Invert unit and carefull push fuel distributor toward air meter side to free from its retaining bracket. Remove distributor, fuel line and nozzles as an assembly, using care not to break or sharply kink lines. This completes the removal of the signal, fuel and vent lines.

Air Meter

1. Disconnect lead from solenoid at starting cut-off switch (fig. 123).
2. Remove four nuts and lock washers securing air meter to the intake manifold and remove the air meter assembly and gasket (fig. 124).

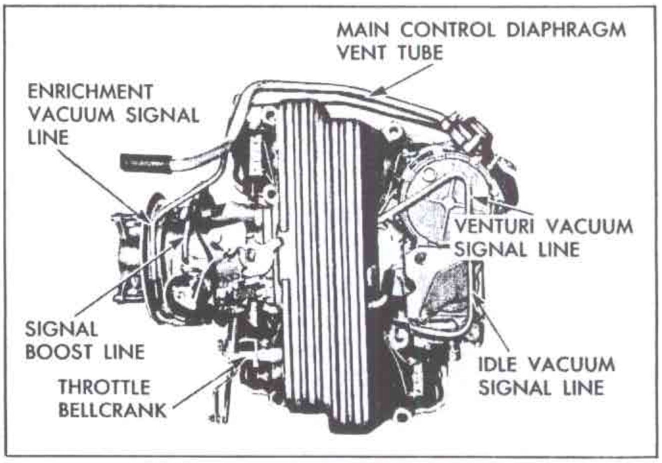


Fig. 121—Signal and Fuel Meter Vent Lines

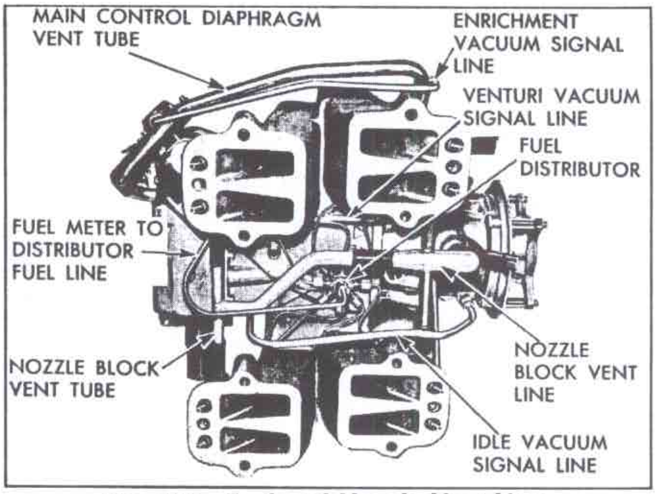


Fig. 122—Fuel and Nozzle Vent Lines

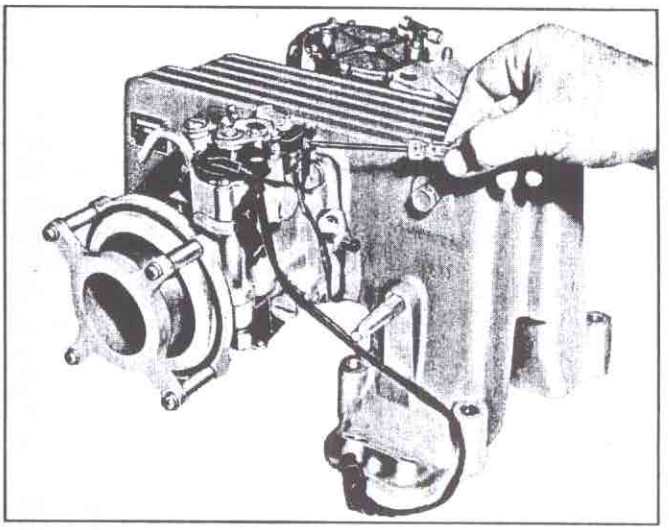


Fig. 123—Disconnecting Starting Cut-Off Switch

Fuel Meter

To detach fuel meter, place intake manifold on end and remove three cap screws and lockwashers fastening the fuel meter bracket to the manifold (fig. 125). Complete removal by pulling fuel bowl vent tube free of rubber sleeve connecting it to the intake manifold.

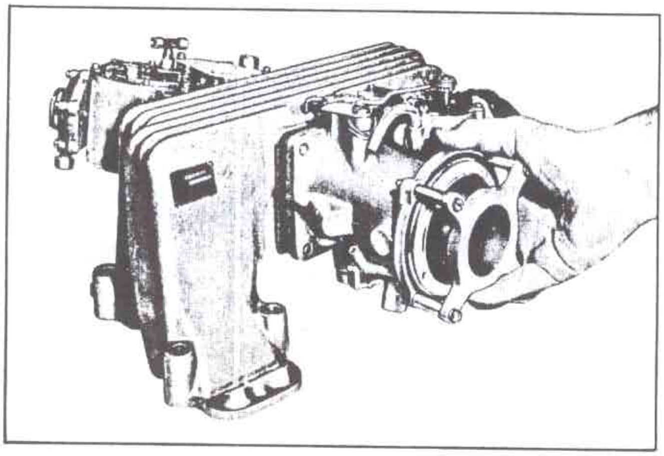


Fig. 124—Removing Air Meter

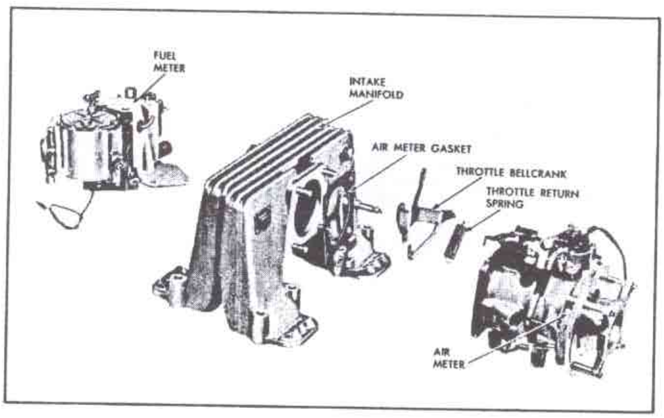


Fig. 125—Fuel Injection Basic Components

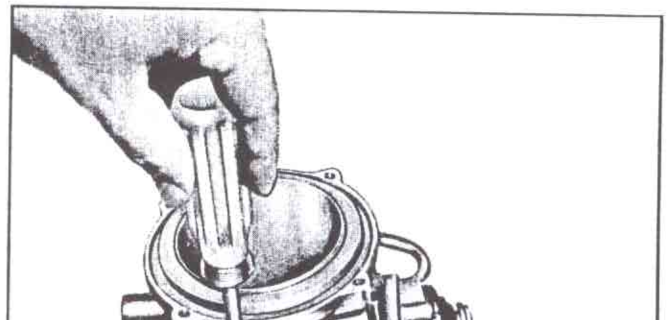


Fig. 126—Removing Idle Fuel and Idle Air Adjusting Screws

DISASSEMBLY

Air Meter

1. Remove the idle air and idle fuel adjusting screws and springs (fig. 126).

2. Unscrew four diffuser cone attaching screws and remove diffuser cone, spacers, venturi ring, rubber gasket and attaching screws (fig. 127).

3. Remove the fast idle linkage and cold enrichment coil as an assembly by first removing the screw attaching the fast idle cam (fig. 128). Then remove three screws and retainers securing thermostatic coil to the housing and lift out the cam, spring, linkage, and coil as an assembly. Further disassembly of these components is unnecessary unless replacement is required.

4. Remove both the starting cut-off and its bracket by removing the two screws and lockwashers securing the bracket to the boss on the air meter.

5. The above operations complete usual air meter disassembly. Under no circumstances should the throttle valve, throttle valve shaft lever, or lever stop screw be removed as these parts are not serviced separately and their position should not be altered. To prevent possible thread damage to the air meter casting, neither the 45-degree spark control pipe fitting nor the female fitting at the auxiliary idle signal location should be removed unless replacement is required.

FUEL METER

1. Remove fuel meter mounting bracket by removing four attaching screws (fig. 129). Be careful not to lose the spacers used at the bowl cover attachment.

2. Remove starting by-pass fuel line (fig. 130).

3. Remove high pressure fuel pump and gasket (fig. 131) by removing five attaching screws. **Do not further disassemble fuel pump!**

4. Invert the fuel meter and remove the four screws and lockwashers securing the fuel valve cover. Remove the cover and "O" ring, then remove the filter, fuel valve, spring, and the spill plunger (fig. 132). Be especially careful not to drop or lose the spill plunger as it is individually matched to the fuel meter casting and is not serviced separately.

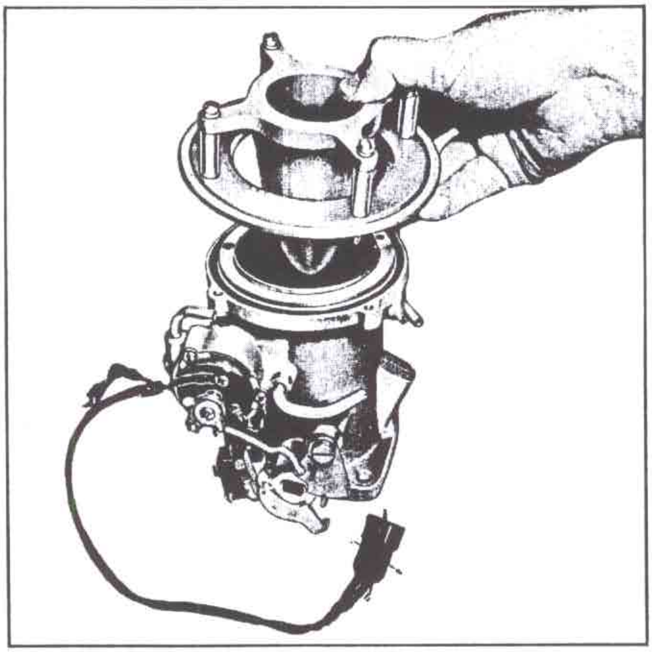


Fig. 127—Removing Diffuser Cone and Venturi Ring

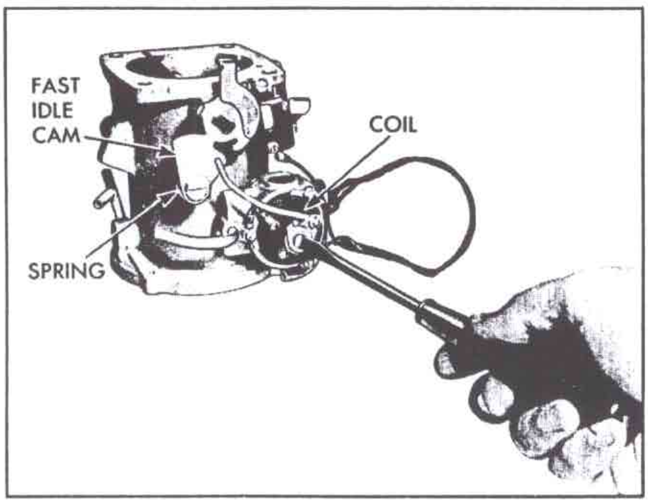


Fig. 128—Removing Cold Enrichment Coil

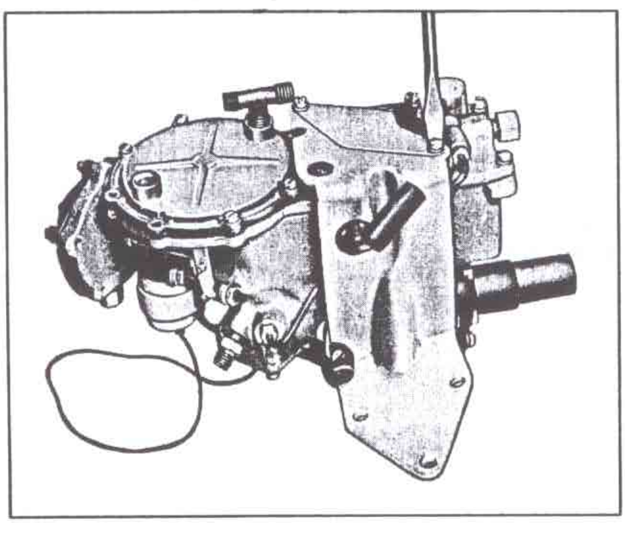


Fig. 129—Removing Fuel Meter Mounting Bracket

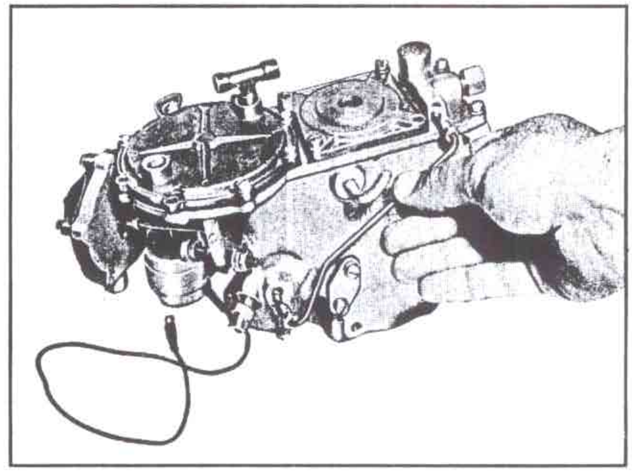


Fig. 130—Removing Starting By-pass Fuel Line

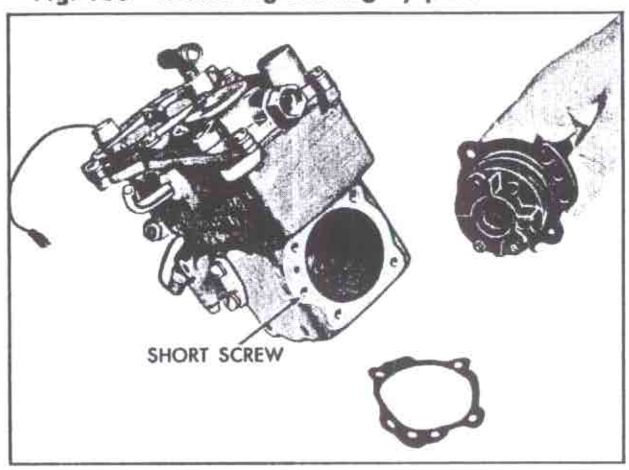


Fig. 131—Removing Fuel Meter Fuel Pump

5. Detach the fuel passage cover plate by removing the two attaching screws and lock-washers (fig. 132).

6. Remove the two remaining screws attaching the bowl vent cover and remove the cover and screen (fig. 133). It is good practice to inspect and clean the screen and replace immediately to minimize the possibility of dirt entry to the fuel meter.

7. If checks performed during "Trouble Shooting" indicate that the enrichment diaphragm is leaking and requires replacement, remove the two screws securing the shield to the main control diaphragm cover and remove the shield.

8. To remove the enrichment diaphragm, first remove the hairpin retainer securing the diaphragm rod to the enrichment lever. Then remove the five screws securing the enrichment diaphragm cover while holding the cover in place to prevent losing the spring when the cover is released (fig. 134). Once the cover is removed, turn the diaphragm slightly to free the rod from the enrichment lever.

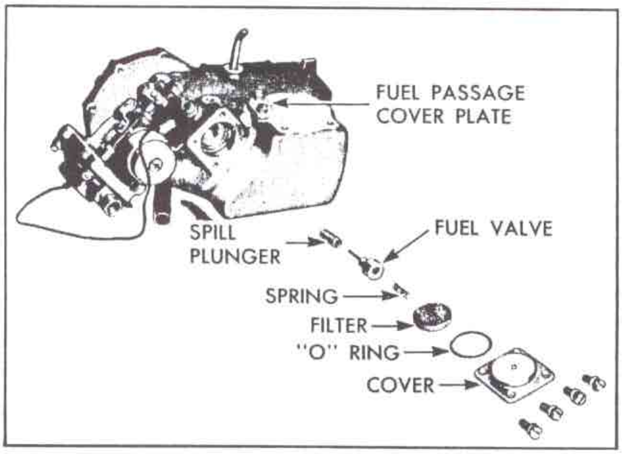


Fig. 132—Fuel Valve Components—Exploded View

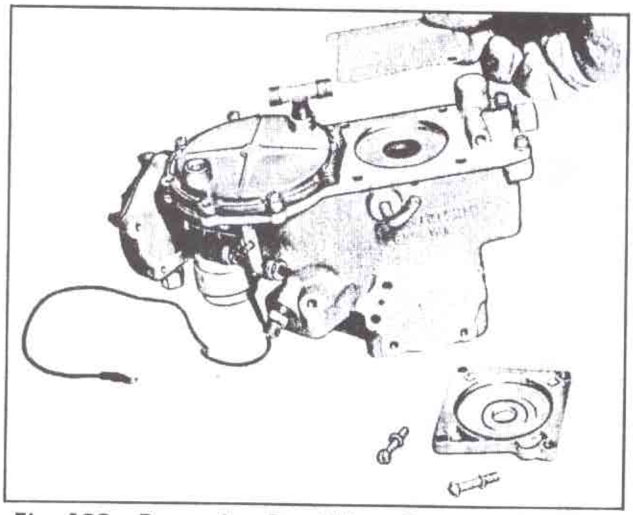


Fig. 133—Removing Bowl Vent Cover and Screen

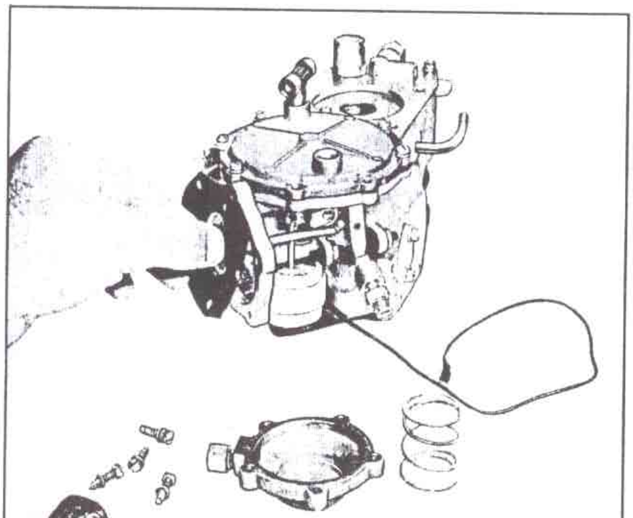


Fig. 134—Removing Power Enrichment Diaphragm

Fig. 135—Removing Main Control Diaphragm Tee

9. If replacement is required, remove tee fitting from main control diaphragm cover by using two wrenches as illustrated in figure 135. It should be noted that the restriction in the tee is toward the rear of the fuel meter assembly.

10. Remove eight screws and lock washers attaching main control diaphragm cover and remove cover and cover gasket. Discard gasket.

11. Using a small screwdriver and a 7/32" wrench, remove the nut securing the main control diaphragm to the link (fig. 136). It is imperative that the link be held fast while removing the nut to prevent damage to the fuel control linkage. Remove the main control diaphragm.

12. Remove the nylon shield from the link by lifting and tipping it to one side so that the slot in the shield will clear the link (fig. 137).

13. Remove the fuel meter cover by unscrewing the three self-locking screws at the main control diaphragm location and the two cover attaching screws at the fuel inlet end of the assembly. Lift cover up and then slightly rearward to prevent damage to the float (fig. 138). Remove and discard cover gasket.

14. Remove nylon splash cup (fig. 138) from fuel bowl by removing attaching screw.

15. Loosen set screw in ratio lever (fig. 139), then remove ratio lever by pulling enrichment lever shaft out of fuel meter housing.

16. Using a ¼" wrench, remove elastic nut securing solenoid inner lever (fig. 139). Remove inner lever and small brass washer from solenoid out lever shaft.

17. Remove hairpin clip (fig. 140) securing solenoid shaft to solenoid outer lever, disconnect shaft and outer lever, then complete removal by removing two screws attaching solenoid to fuel meter.

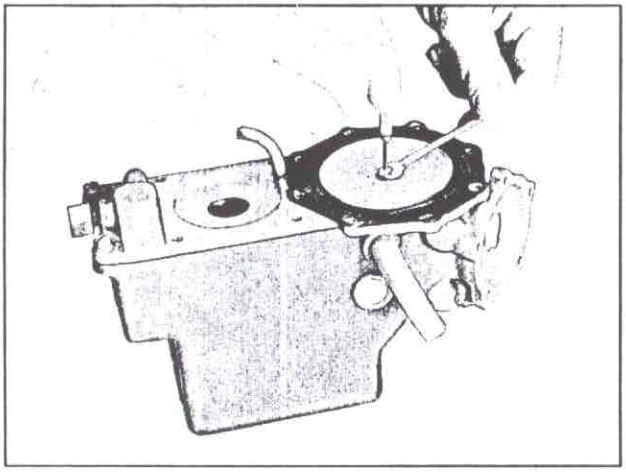


Fig. 136—Unfastening Main Control Diaphragm

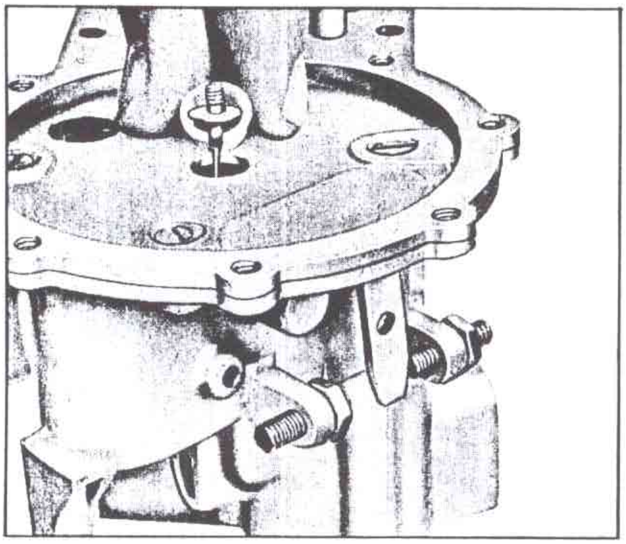


Fig. 137—Removing Nylon Shield

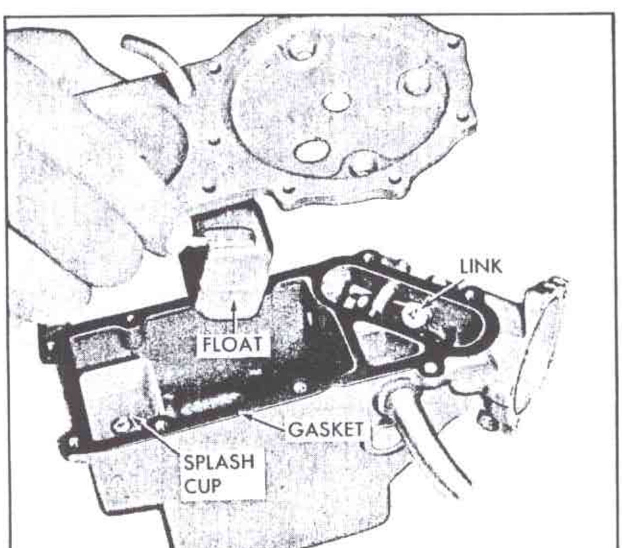


Fig. 138—Removing Fuel Meter Cover

18. Remove the float hinge pin and lift out the float and inlet needle. Using a wide screwdriver, remove the needle seat and gasket.

19. To remove fuel strainer screen remove nut at inlet port.

The above steps complete the usual fuel meter overhaul. However, if the fuel control linkage (fig. 139) is broken or otherwise damaged, the linkage can be replaced by forcing the linkage shaft through the side of the fuel meter housing with long nosed pliers from the inside.

Reinstall the new linkage in the same manner and check that it is free on the shaft and does not bind against the side walls. If binding exists, polish the brass bearings of the new linkage with crocus cloth until the required clearance is obtained.

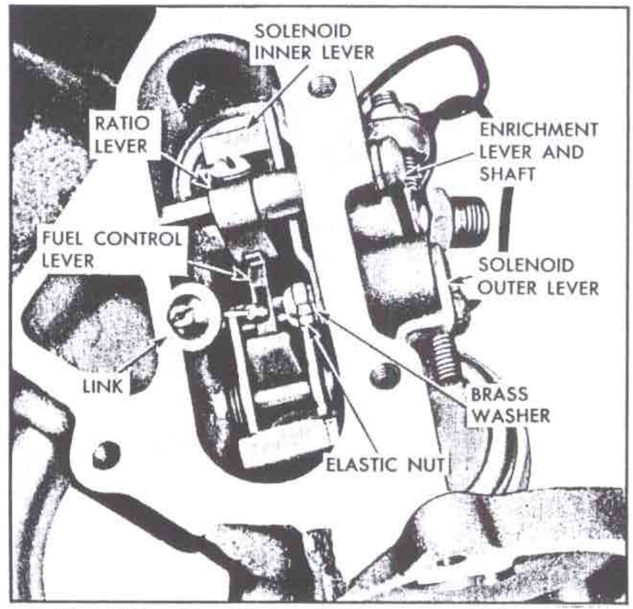


Fig. 139—Fuel Control Components Linkage

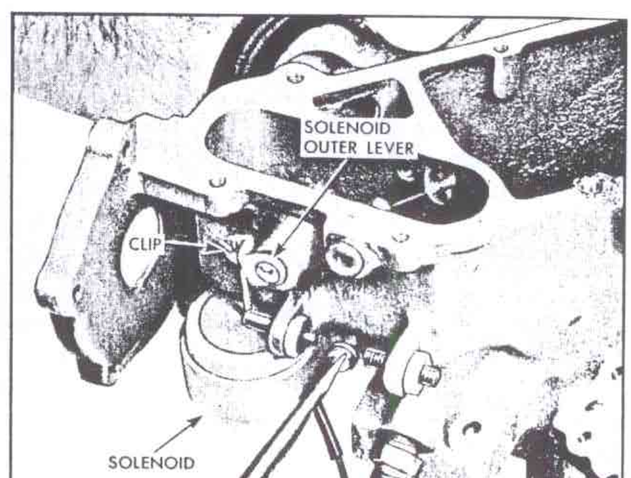


Fig. 140—Removing Solenoid and Outer Lever

Cleaning and Inspection

All metal parts should be thoroughly washed in clean solvent and blown dry. Under no circumstances should wires or drills be passed through any orifice as this would enlarge the openings and upset calibration. All gaskets should be discarded and replaced with new ones except the intake manifold-to-adapter plate gasket.

The rubber hose sleeves used to attach various vent and signal tubes may be reused after a careful check of condition. It is always best to replace any hose connection which shows the slightest sign of deterioration.

CAUTION: If it is necessary to replace the rubber hose connecting the signal boost line to the venturi signal line, be sure to remove the restriction plug from the old hose and install it in the new one.

Vent, signal and fuel lines should be checked for cracks and plugging. Blowing into the tubes is the simplest check for obstructions.

Check nozzle blocks closely for cracks. A very slight over-tightening of the nozzle block can start fine cracks which will enlarge by vibration and cause an air leak, resulting finally in missing and rough idle.

The filter screen should be checked very closely for holes or plugging.

Free operation of the spill plunger is imperative as this regulates the amount of fuel delivered to the nozzles as signaled by the main control diaphragm. Because the fuel plunger is continually immersed in gasoline, sticking can result from gasoline gum and varnish formations. Thoroughly clean the fuel valve and the valve sleeve in the fuel meter with clean solvent and a small bristle brush. Dry with compressed air to protect against introduction of lint or dirt.

If a fuel flow or Troube Shooting check reveals one or more faulty nozzles, remove faulty nozzle and adjacent nozzle and observe flow from nozzle lines. Also interchange nozzles and again observe fuel flow. If nozzle is definitely established as being faulty, disassemble as follows:

Hold the nozzle holder body with a 3/16" or slightly small drill or rod, and unscrew the upper half. Carefully remove the filter screen and the orifice disc. Inspect the disc for cleanliness. Do not attempt to clean the orifice with drills or wires. Clean the filter screen and reassemble as shown in Figure 141. The disc must be placed in the nozzle body with the bright surface down.

If it is necessary to replace a nozzle due to lost parts or from mutilation, check the nozzle code and replace with a like letter coded nozzle as shown in the following chart. Each nozzle carries a letter and number code at the upper end.

Production Nozzle Code	Use Replacement Nozzle	Part Number
Q-11 or Q-12	Q-12	7014856
R-12 or R-13	R-13	7014857
S-13 or S-14	S-14	7014858

After carefully washing the air meter casting, check that the small drillings near the throttle blade are not clogged. These too should be cleaned by using a small bristle brush and cleaning solvent.

Checks should also be made to be sure that the two valves in the cold enrichment housing fully open and close. The simplest check is to blow into the base of the housing while depressing the signal boost valve. Air flow should be out of signal boost tube. Then repeat the check while depressing the enrichment vacuum valve. Air flow should be from the enrichment outlet. As a final check, blow into the housing without depressing either valve. No air should flow; otherwise reclean the housing until valves fully seat. Replace housing if necessary.

Check thrust member of fuel pump flexible drive cable. Thrust member should be firmly secured to the cable 17/32" from the end (fig. 142). If loose, replace drive cable with a new one or if a new part is not available, carefully braze the thrust bearing in place.

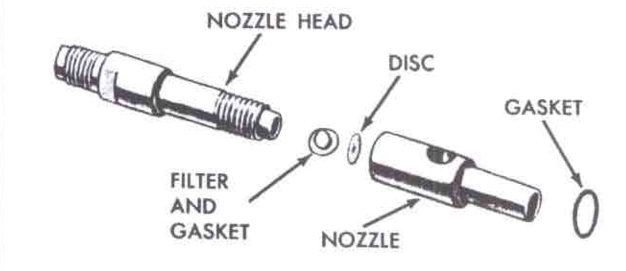


Fig. 141—Injection Nozzle—Exploded View

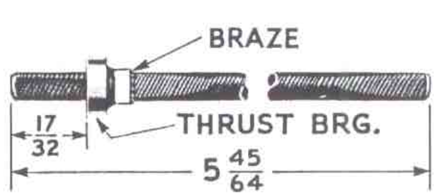


Fig. 142—Fuel Pump Drive Cable Dimensions

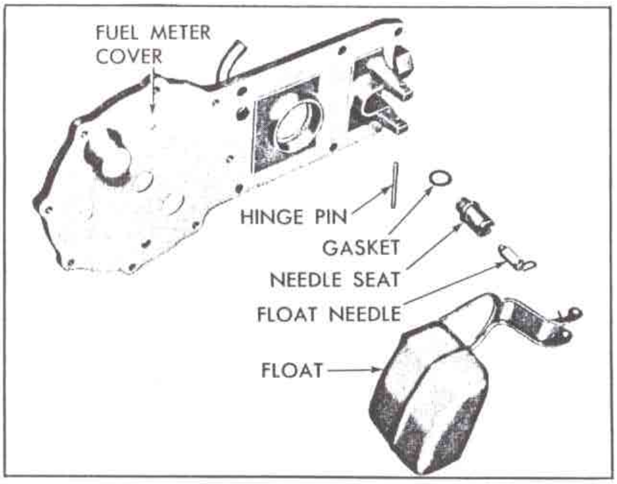


Fig. 143—Float Components—Exploded View

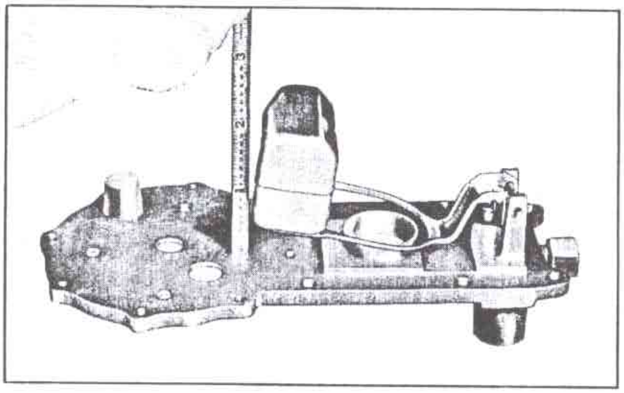


Fig. 144—Measuring Float Level

ASSEMBLY

Fuel Meter

1. Install fuel strainer screen in fuel meter cover inlet port and install fuel fitting nut.

2. Using a new gasket, install needle seat (fig. 143) in fuel meter cover with a wide blade screwdriver. Then hook float needle onto float and install float by inserting hinge pin through mounting bosses.

3. Check float level and drop adjustment as follows:

   a. **Float level.** With the fuel meter cover inverted measure the distance between the cover and the bottom of the float (fig. 144). If float level is correct this dimension will be 2 9/32". Bend float arm as required to adjust.

   b. **Float drop.** Holding the cover upright, measure the distance from the bottom of the cover to the lowest point on the float (fig. 145). Correctly adjusted, this distance would be 2 27/32". Bend float tang to adjust, if necessary.

4. Insert solenoid shaft through hole in solenoid outer lever (fig. 146) and connect with hairpin clip. Then insert shaft of solenoid outer lever into hole in fuel meter casting and secure the solenoid assembly to the fuel meter with two screws.

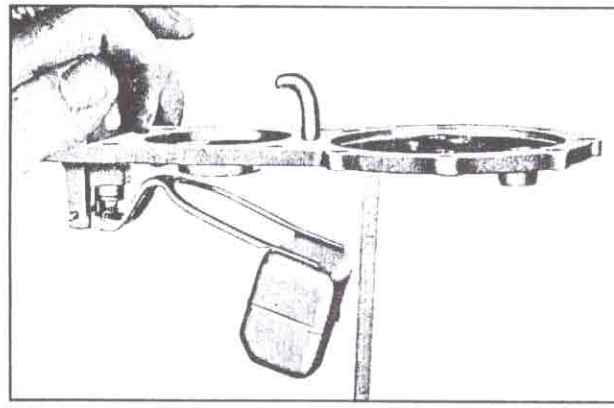


Fig. 145—Measuring Float Drop

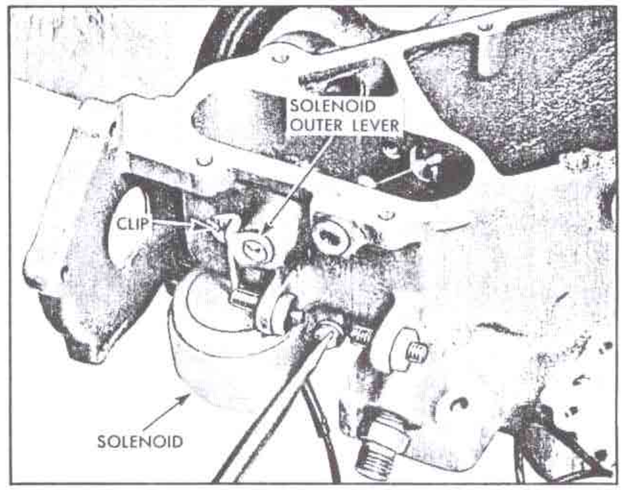


Fig. 146—Installing Solenoid and Outer Lever

5. Position small brass washer (fig. 147) and solenoid inner lever on the outer lever shaft inside fuel meter and secure inner lever with ¼" elastic nut.

6. Position ratio lever (fig. 147) inside fuel meter, then insert enrichment lever shaft through side of fuel meter and through ratio lever. Be sure enrichment lever shaft is inserted its full distance and that ratio lever is centered over fuel control lever, then tighten set screw in ratio lever.

7. Position nylon splash cup (fig. 148) in fuel bowl and secure with attaching screw.

8. Position a new fuel meter cover gasket (fig. 148) on the fuel meter, then carefully lower the fuel meter cover assembly onto the fuel meter being careful not to bend the float and being sure that the fuel control link is through the hold at the center of the main control diaphragm location (fig. 149). Carefully align attaching screw holes in cover, gasket, and fuel meter. Then install three self-locking screws at the main control diaphragm location and two screws at the fuel inlet end of the assembly.

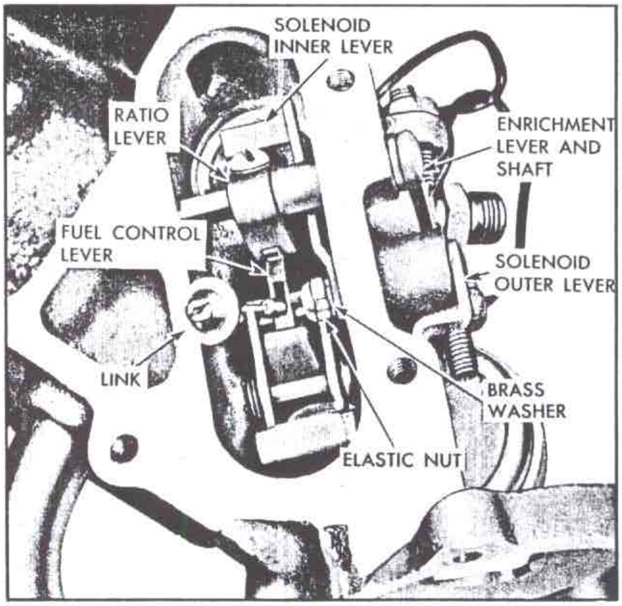


Fig. 147—Fuel Control Components

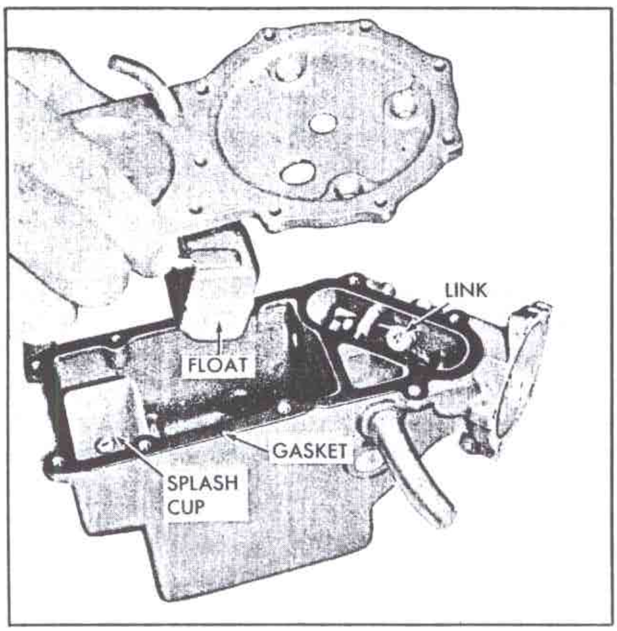


Fig. 148—Installing Fuel Meter Cover

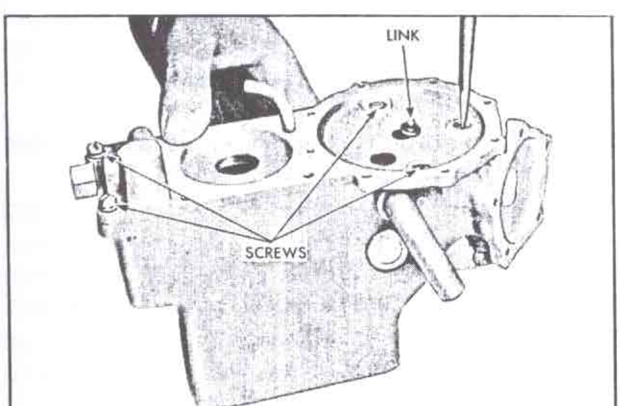


Fig. 149—Fuel Meter Cover Attachment

9. Insert nylon shield (fig. 150) onto main control diaphragm link and push it flush into hole in fuel meter cover.

10. Position main control diaphragm onto link, turn diaphragm so that elongated holes are centered on attaching holes in fuel meter and secure with diaphragm nut while holding link with a screwdriver as shown (fig. 151).

NOTE: Be sure to install nut with countersink upward to allow clearance to hold link with screwdriver.

Once the diaphragm nut is fully tightened, recheck for centering of diaphragm holes and loosen nut and readjust if required. It is important that the diaphragm holes be perfectly centered so that it will not be necessary to stretch the diaphragm when the cover is installed.

11. Before installing main control diaphragm cover, check for full travel of the main control diaphragm and link. Lift assembly gently be diaphragm nut and drop. Diaphragm should bottom completely of its own weight. If it does not, loosen nut and rotate diaphragm until it will bottom on a free fall.

12. Position a new main control diaphragm cover gasket (fig. 152) on main control diaphragm cover, making sure that the holes in diaphrgam and gasket align with attaching holes in fuel meter. Then position main control diaphragm cover and secure with eight screws and lockwashers tightened evenly in a criss-cross pattern.

13. If the restriction tee was removed from the main control diaphragm cover, reinstall it, using two wrenches as shown earlier in figure 135. Tee should be finally positioned so that the restriction end of the tee is toward the read (fuel inlet end) of fuel meter assembly.

14. Connect enrichment diaphragm rod by slightly twisting the enrichment diaphragm rod to hook into enrichment lever, then secure rod with hairpin retainer (fig. 153). Complete installation by placing diaphragm return spring between enrichment cover diaphragm and secure with five attaching screws. Use care to align diaphragm holes with holes in fuel meter to prevent a twisted diaphragm installation.

15. Check length adjustment of enrichment diaphragm rod by connecting a manometer with vacuum source to the enrichment vacuum line which should be temporarily installed for this adjustment. Apply and hold a vacuum of 12-15"Hg (mercury), then slowly release the vacuum, noting the readings at which the enrichment lever leaves the economy stop (forward) and arrives at the power stop (rear). If rod length is correct, enrichment lever should leave the economy stop at 9" Hg or below and arrive at the power stop at 3" Hg or above. At 6" Hg, the lever must not be touching either stop. Adjust rod

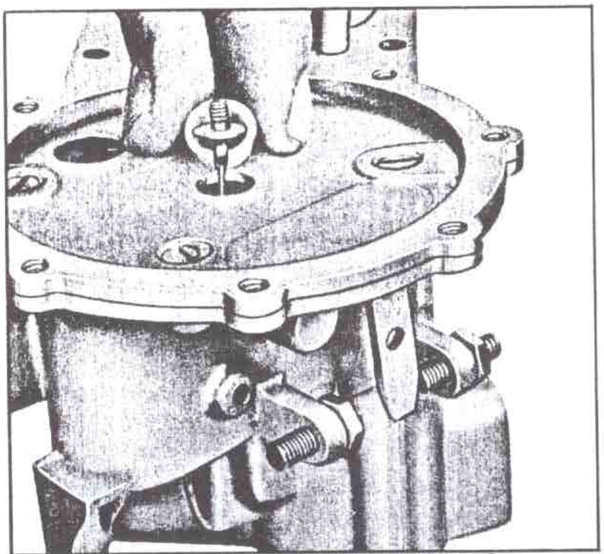


Fig. 150—Installing Nylon Shield

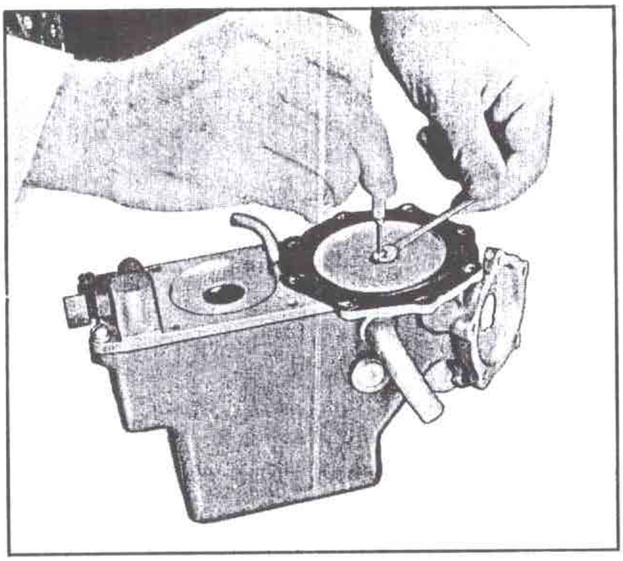


Fig. 151—Installing Main Control Diaphragm

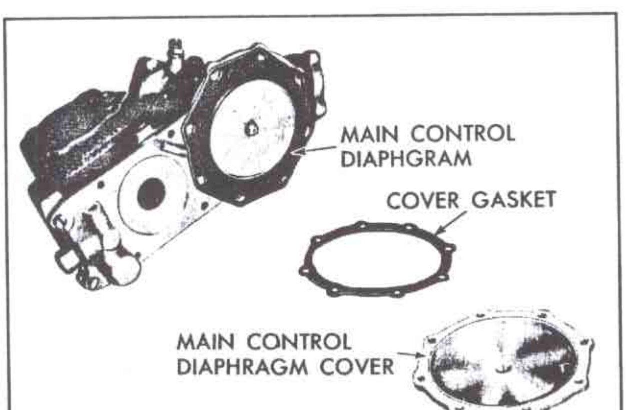


Fig. 152—Main Control Diaphragm Gasket and Cover

length by removing the enrichment diaphragm cover and lengthening or shortening the rod length as necessary to meet the above requirements.

16. Position shield on main control diaphragm cover and secure with two screws.

17. If the bowl vent screen and cover were not cleaned and immediately installed during "Disassembly", they should be reinstalled at this time.

18. Using a new gasket, install fuel passage cover plate (fig. 154) on side of fuel bowl with two screws and lockwashers.

19. With the fuel meter upside down, install the spill plunger, fuel valve, spring, and filter (fig. 154). If the original filter is being reused, it must be reinstalled with the same side toward the spill plunger to prevent any back-wash effect. This can be checked by touch as the filter side which was toward the cover will have a noticeable depression at the center. Install a new "O" ring on the spill plunger cover and lubricate with light engine oil - not grease. The addition of oil is important to prevent cutting the "O" ring during installation. Carefully push the cover into place until it is fully seated, then install the four screws and lockwashers in a criss-cross pattern.

20. To check adjustment of the solenoid, fully depress the solenoid plunger and blow smoke through the starting bypass fuel line port at the spill plunger area. Smoke should come out the fuel distributor line hole in the fuel meter. Repeat this check without depressing the solenoid plunger; smoke should not come out of the fuel distributor line hole. These checks simulate the operation of the fuel valve components during starting. It is necessary that the solenoid provide sufficient throw to unseat the fuel valve when the solenoid plunger is depressed and yet allow the fuel valve to seat when the solenoid is released. Solenoid plunger travel is adjusted by inserting a screwdriver in the plunger slot and turning clockwise to decrease travel or counter-clockwise to increase travel.

21. Using a new gasket held in place with light engine oil, carefully position the high pressure fuel pump into the fuel meter and secure with five screws and lockwashers (fig. 155).

NOTE: One screw is shorter and must be installed in hole at 9 o'clock position (fig. 155).

22. Reinstall starting by-pass fuel line (fig. 156).

23. Position two spacers on bowl vent cover, position mounting bracket (fig. 157) and cover plate on spacers, and secure with two screws and lockwashers. Attach bracket to side of fuel meter with two large screws and lockwashers to complete assembly of fuel meter.

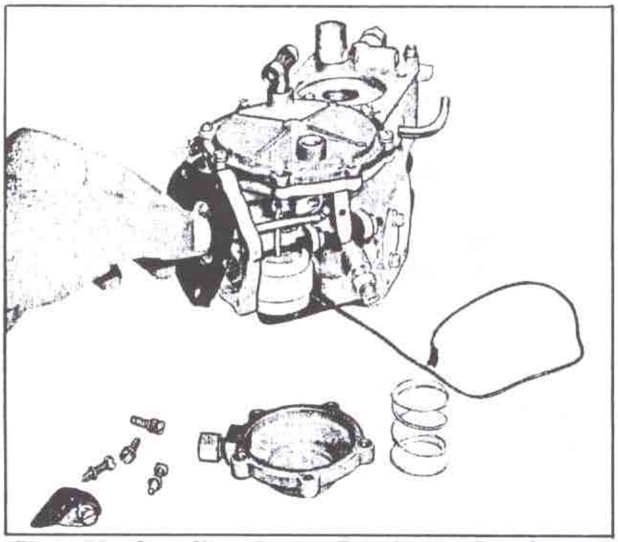


Fig. 153—Installing Power Enrichment Diaphragm

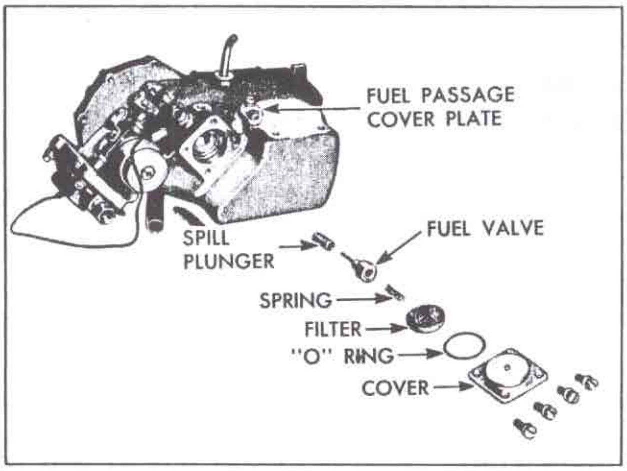


Fig. 154—Fuel Valve Components—Exploded

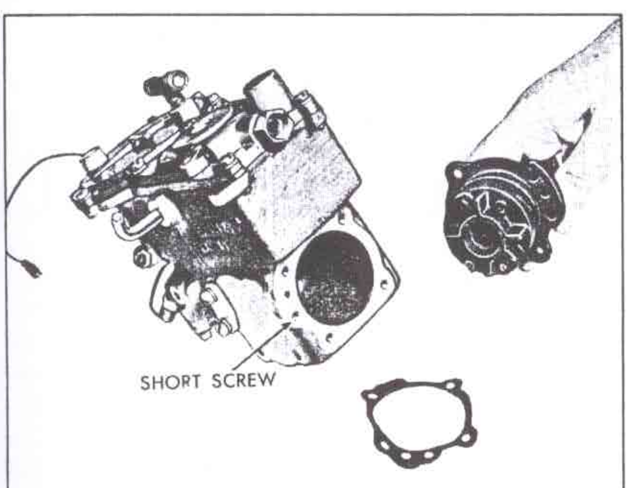


Fig. 155—Installing Fuel Valve Fuel Pump

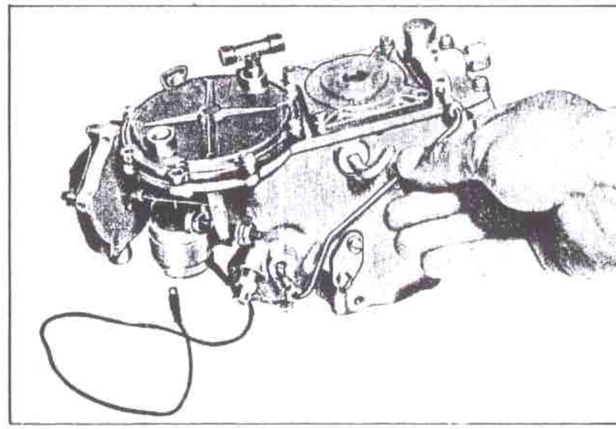


Fig. 156—Installing Starting By-pass Fuel Line

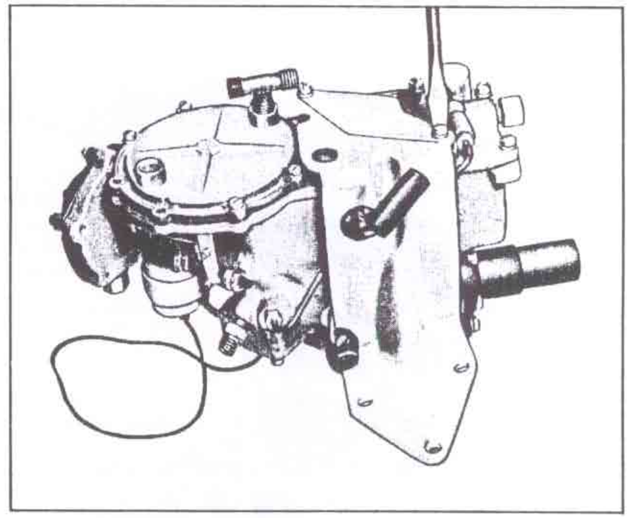


Fig. 157—Installing Fuel Meter Mounting Bracket

Air Meter

1. Position the starting cut-off switch on its boss on the air meter casting and secure with two screws and lockwashers.

2. Using a new gasket, position the cold enrichment housing on the air meter and secure with attaching screws.

3. Insert the cold enrichment coil (fig. 158) into the cold enrichment housing so its operating lever is between the enrichment and signal boost valves. Loosely install three screws and retainers, position cover so scribed index is set 1½ marks rich, and tighten three screws securely. Be sure coil ground wire is fastened by one of the screws.

4. Place fast idle cam return spring on air meter boss with the spring leg away from the cold enrichment housing (fig. 158). Hook spring tang against the cold enrichment side of the fast idle cam, center cam on boss, and secure with attaching screw. Properly installed, the spring tension should be forcing the fast idle cam away from the cold enrichment housing when the throttle is open.

5. Install new gasket on the venturi ring, then preassemble and install venturi ring and diffuser cone as follows:

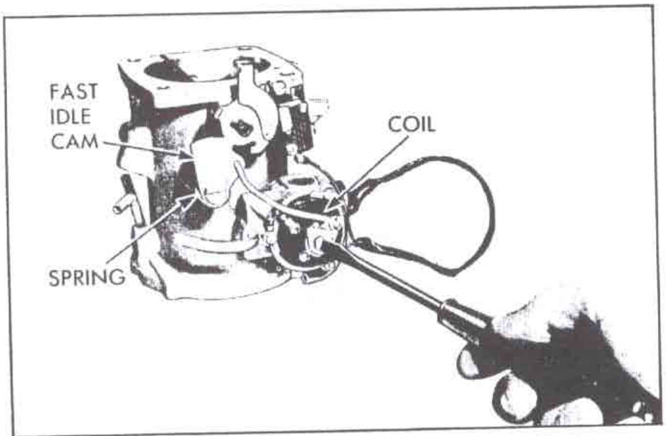


Fig. 158—Installing Cold Enrichment Coil

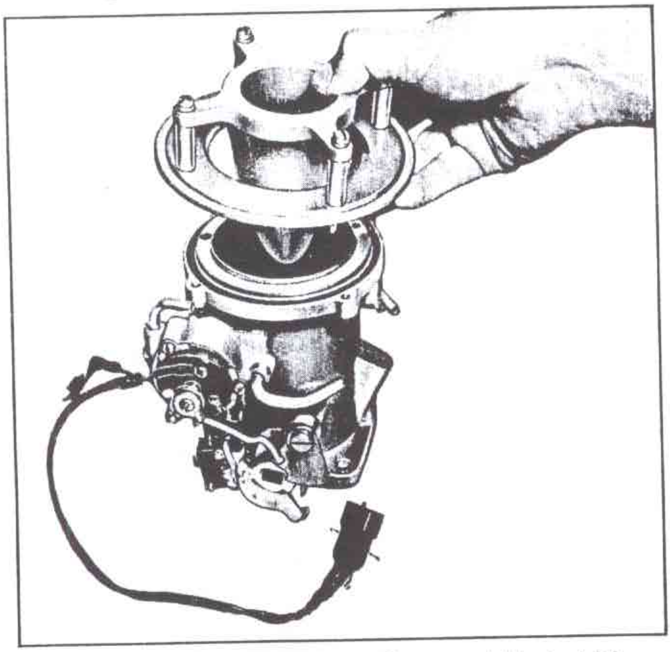


Fig. 159—Installing Diffuser Cone and Venturi Ring

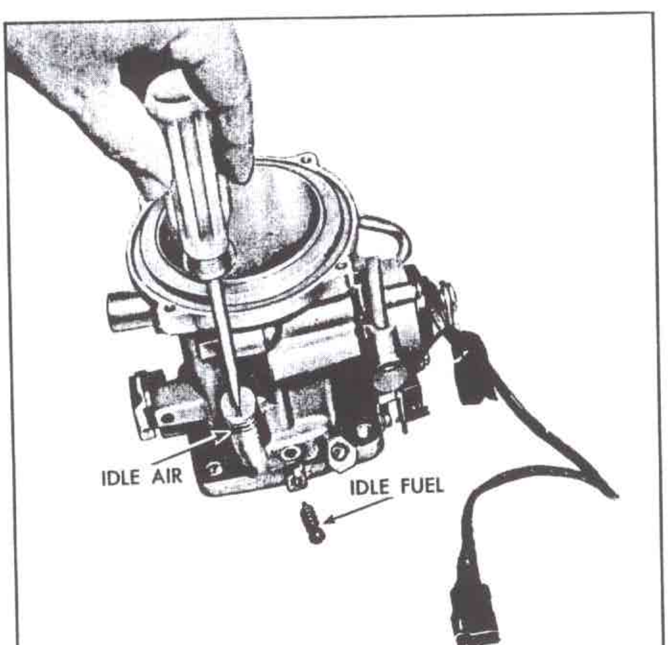


Fig. 160—Installing Idle Fuel and Idle Air Adjusting Screws

a. Insert the four screws and lockwashers through the diffuser cone, then place a spacer on each of the four screws.

b. Place venturi ring on screws and spacers as shown in figure 159.

c. Holding the diffuser cone and venturi ring, position against air meter casting and tighten the four attaching screws.

6. Install idle air and idle fuel adjusting screws and springs (fig. 160), and back-off two turns as an initial adjustment. This completes assembly of air meter.

INSTALLATION OF ASSEMBLIES

Fuel Meter

To install fuel meter, place manifold casting on end, position mounting bracket over holes in underside of manifold, and install two cap-screws and lockwashers. The third, or center bolt, should not be installed at this time as it is also used to secure the fuel distributor mounting bracket. Complete assembly by sliding fuel bowl vent rubber tube onto tube in intake manifold.

Air Meter

Using a new air meter-to-intake manifold gasket, position air meter on intake manifold studs and secure with four nuts and lockwashers. Wire from solenoid on fuel meter should be run beneath the intake manifold to the starting cut-off switch and attached with small screw and external tooth lockwasher (fig. 161).

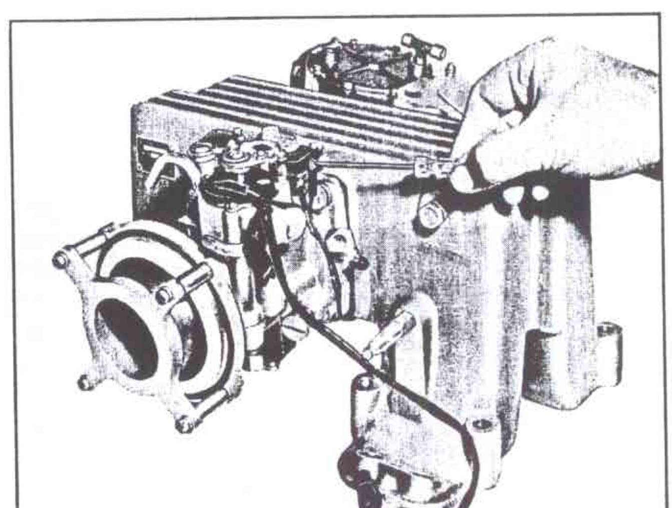


Fig. 161—Connecting Starting Cut-Off Switch

Signal, Fuel and Vent Lines

Refer to Figures 162, 163 and 164.

1. Install venturi vacuum signal line to the front side of the restriction tee in the main control diaphragm cover. Complete installation by connecting signal line to pipe pressed into air meter with rubber sleeve.

2. Attach fuel distributor mounting bracket to base of intake manifold and secure with capscrew and lockwasher. Push fuel distributor into mounting bracket being careful not to kink nozzle fuel lines. Adjust fuel lines to their approximate positions.

3. Install fuel meter-to-distributor fuel line. Line must extend through brass fitting.

4. Install nozzles and nozzle blocks as follows:

   a. Install new nozzle gaskets on nozzles using light engine oil to hold in place.

   b. Slip two nozzles into slots of nozzle block retainer and install nozzles and retainer in nozzle block as an assembly. It is best to insert the nozzles while holding the nozzle block upside down to insure that the nozzle gaskets form a perfect seal.

   c. Install assembled nozzles and nozzle block on intake manifold using a new nozzle block gasket. Insert bolt into nozzle block, then slip a .002" feeler gauge between the nozzle block and retainer adjacent to the bolt location (fig. 165). Tighten bolt until .002" feeler gauge can just be removed. Properly installed, the nozzle block will be retained by the tension against the nozzles; the retainer should not touch the nozzle block. Over-tightening will probably cause nozzle block cracking.

   d. Install three remaining sets of nozzles in the same manner.

5. Connect fuel lines to nozzles. Do not over tighten. After line to nozzle connections are completed, check that fuel lines do not contact intake manifold at any point. If necessary, pry lines away from manifold with a small screwdriver.

6. Install nozzle block vent tubes.

7. Connect idle signal vacuum line to the air meter and to the rear (restriction side) of the restriction tee on the fuel meter. With the fuel meter inverted, the line should pass over the nozzle block vent tube on the air meter side, then up along side of intake manifold casting on the fuel meter side to the restriction tee.

8. Thread enrichment vacuum line into fitting on the enrichment diaphragm housing, then connect opposite end of line to the enrichment tube on the cold enrichment housing using a rubber sleeve.

9. Connect main control diaphragm vent tube to fuel meter, using rubber sleeve. The other end of this tube attaches to the air cleaner, when installed.

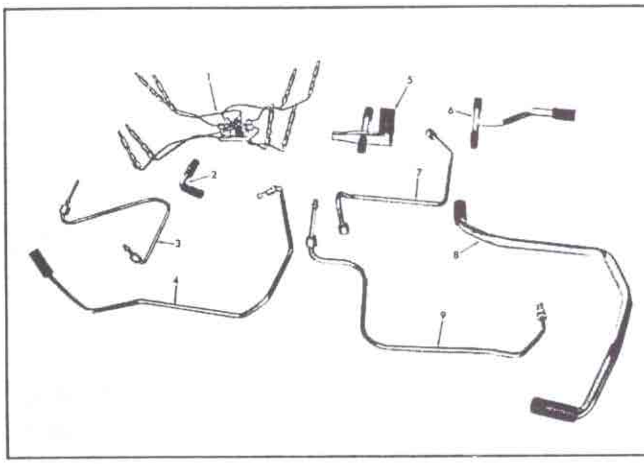


Fig. 162—Identification of Fuel, Signal, and Vent Lines

1. Fuel Distributor with Lines and Nozzles
2. Signal Boost Line
3. Fuel Meter to Distributor Fuel Line
4. Enrichment Vacuum Signal Line (Enrichment Housing to Enrichment Diaphragm)
5. Nozzle Block Vent Tube (Air Meter Side)
6. Nozzle Block Vent Tube (Fuel Meter Side)
7. Venturi Vacuum Signal Line (Venturi Cone Ring to Main Control Diaphragm)
8. Main Control Diaphragm Vent Tube (to Air Cleaner)
9. Idle Signal Vacuum Line (Air Meter to Main Control Diaphragm)

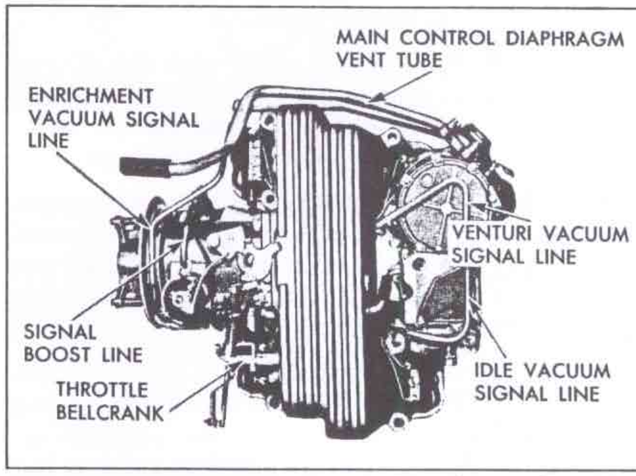


Fig. 163—Signal and Fuel Meter Vent Lines—Top View

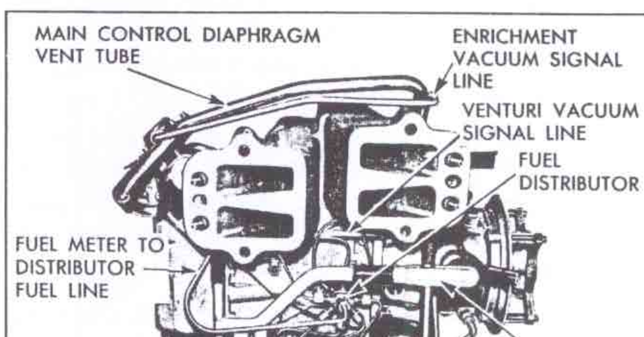


Fig. 164—Fuel, Signal, and Nozzle Vent Lines (Bottom View)

10. Connect signal boost line from venturi line to cold enrichment housing making certain restriction is in lower hose of boost line. This completes installation of the signal, fuel and vent lines.

Throttle Control Linkage

1. Position throttle bellcrank on intake manifold post and secure with hairpin retainer.
2. Insert bellcrank rod swivel into throttle valve shaft lever and secure with nut and external tooth lockwasher.
3. Hook throttle return spring onto throttle valve shaft lever and throttle valve crank mounting post to complete assembly.

FUEL INJECTION ARTICLE CONTINUED
IN NEXT "STRAIGHT TALK".

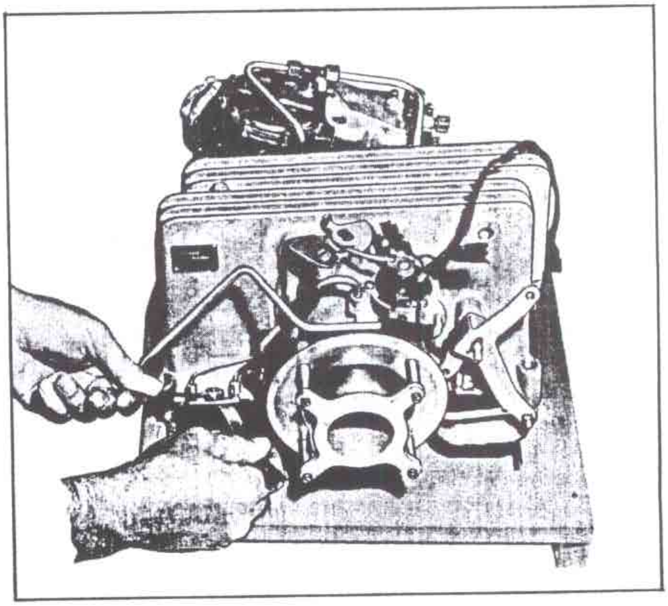


Fig. 165—Tightening Nozzle Retainer

GLOVE BOX LOCK

By Lanny Johnson

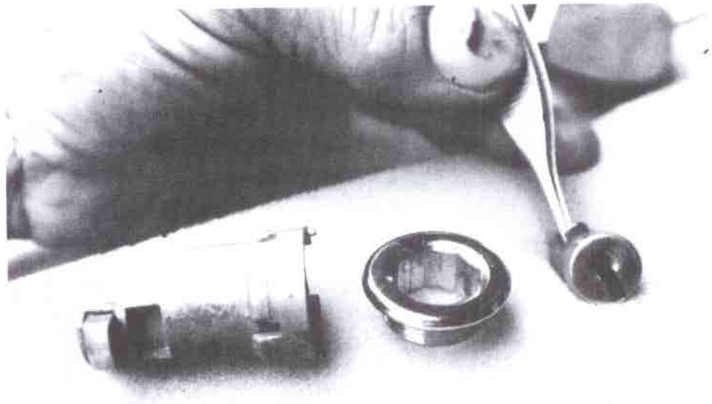
If you've tried to remove the glove box lock from a '56-'62 and couldn't figure out how, read on. I once used a pair of pliers to unscrew the bezel while trying **not** to chip paint from the cover.

You will notice the key housing has two axeous holes near the back front. Using a small screwdriver, insert it into the hole that the key cylinder slot "top" is pointing to. You should feel a spring action as you push down.

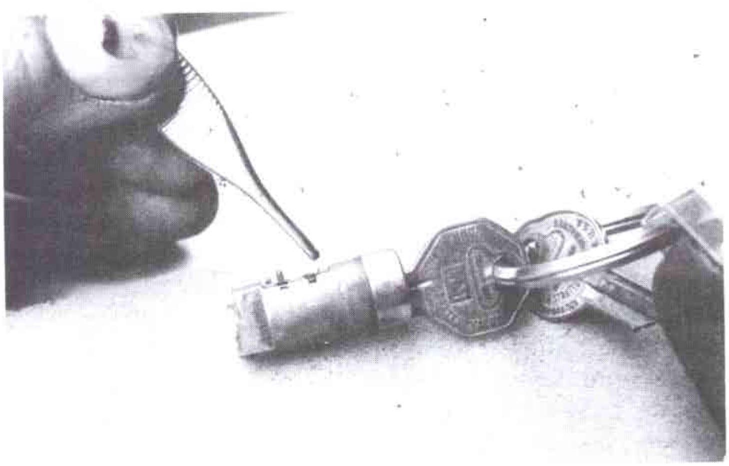
While holding down the lock plate spring, insert the key in. With the key in the lock plate, spring will be held down, then remove the screwdriver and the key cylinder will come out. Unscrew the bezel from the housing and you have it! To replace the key cylinder, push down on the lock plate spring, insert the key, place the key cylinder back into the housing, and while holding the cylinder in, remove the key and that's it.

If you bought a complete used glove box door that has the lock assy with it or your Vette is missing the right key, using any key that will just go into cylinder, the spring lock plate will be held down.

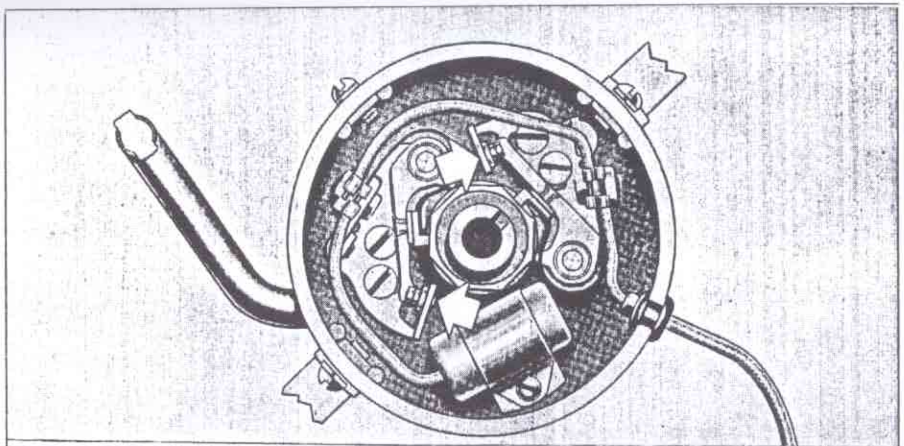
All key cylinders have key code numbers stamped into it so you can have a key made for that assy. You need to remove the cylinder to see the number.



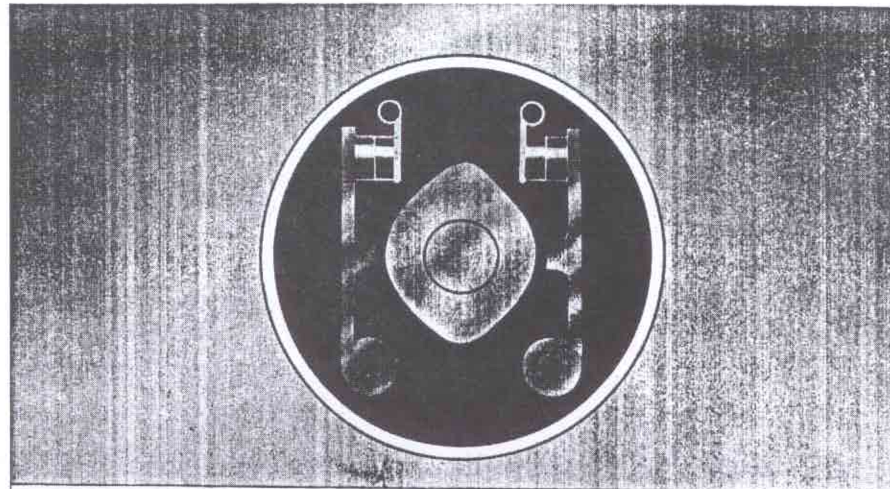
LOCK PLATE IN KEY ASSY
SHOWN BY TWEEZER



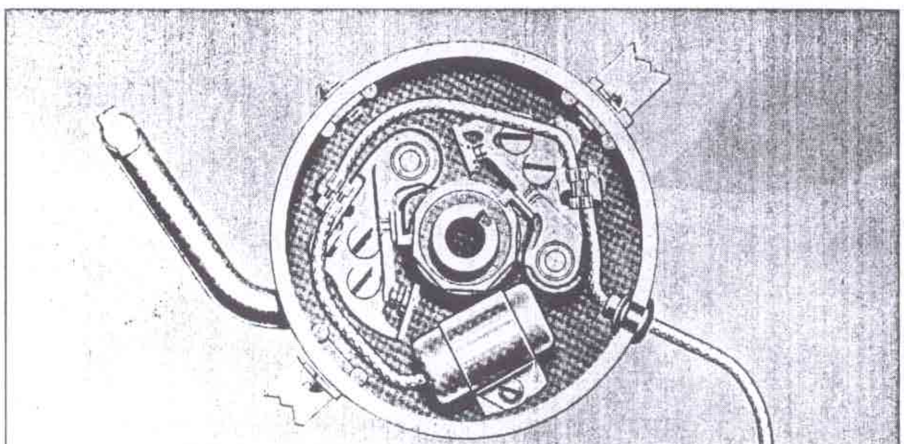
LOCK PLATE HELD DOWN
WHEN KEY IS INSERTED



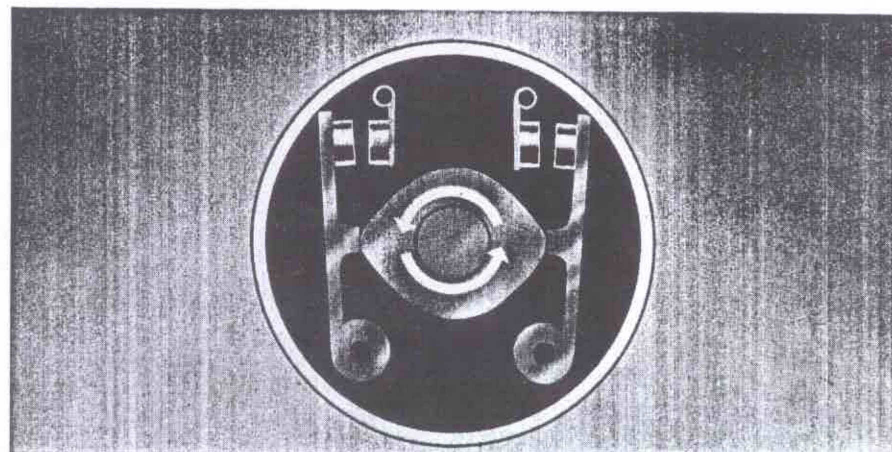
Several Corvette engines are equipped with a dual-point distributor, which permits flatter cam lobe contour and therefore reduces point bounce at the very high RPM attained by Corvette engines.



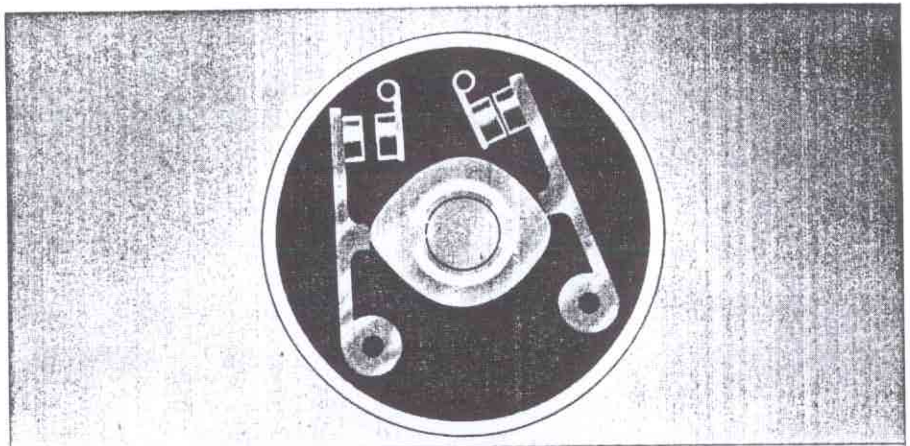
To simplify the demonstration, let's reduce the number of cam lobes from the actual eight to two. Now, if the points were located exactly opposite, as shown here—



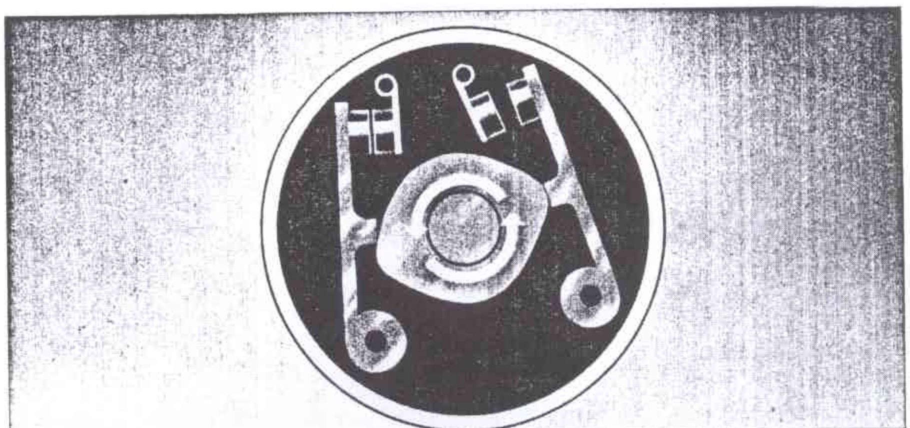
The two sets of points in the Corvette distributor are connected to a common electrical lead. Therefore, as long as either set is closed, current is flowing through the coil. Following is the principle of operation—



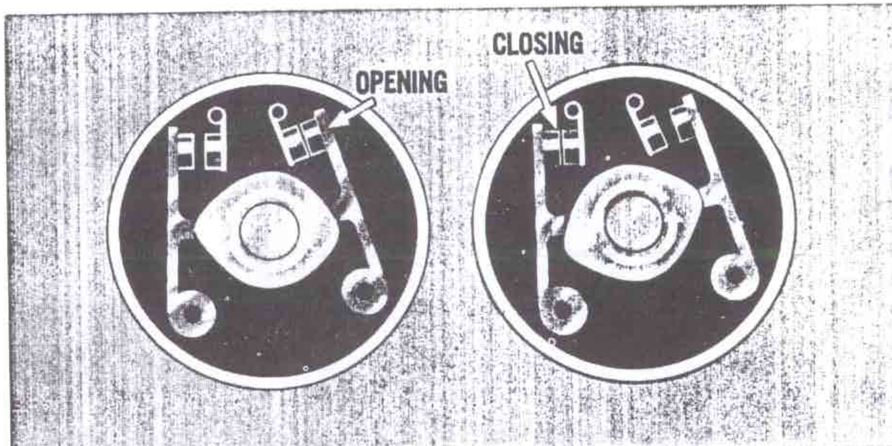
—both sets of points would open and close at exactly the same time as the cam rotated, and there would be no advantage over the conventional single-point distributor. However—



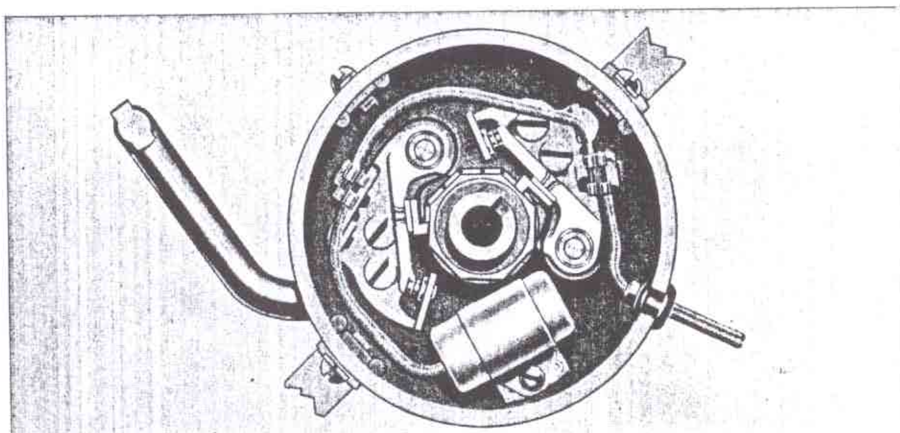
—if one set of points is moved slightly away from opposite, in the direction of cam rotation, it will open later than the other set and therefore provide a longer period of coil saturation.



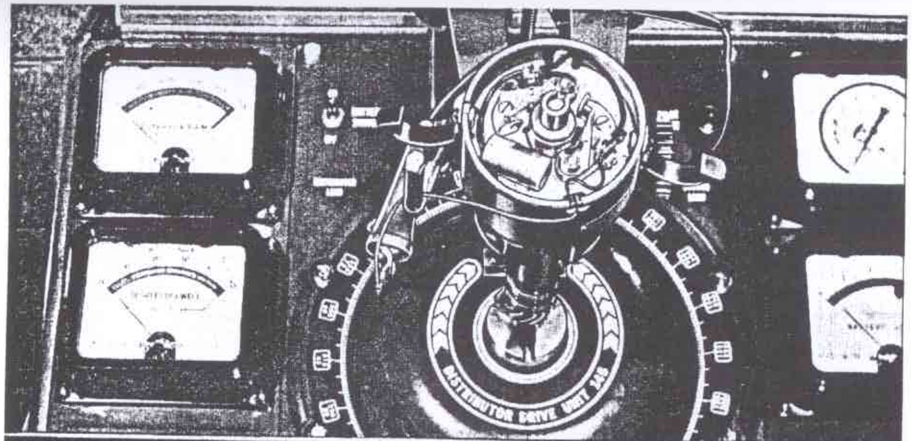
The set of points on the left, in the original position, will close *sooner* than the set on the right as the cam rotates, and therefore start coil saturation sooner after each plug is fired.



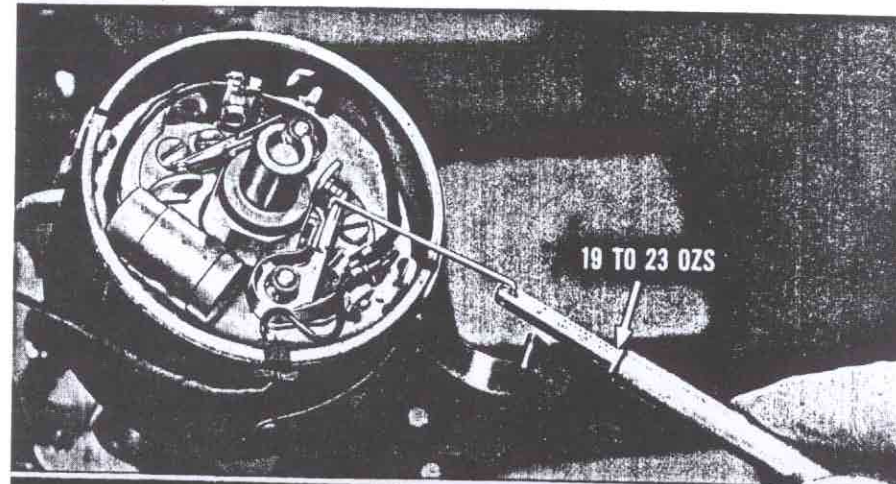
Thus, with one set of points <u>opening</u> the coil circuit and the other <u>closing</u> the coil circuit, an adequate period of coil saturation is provided with flatter cam lobes than are possible in a single-point distributor.



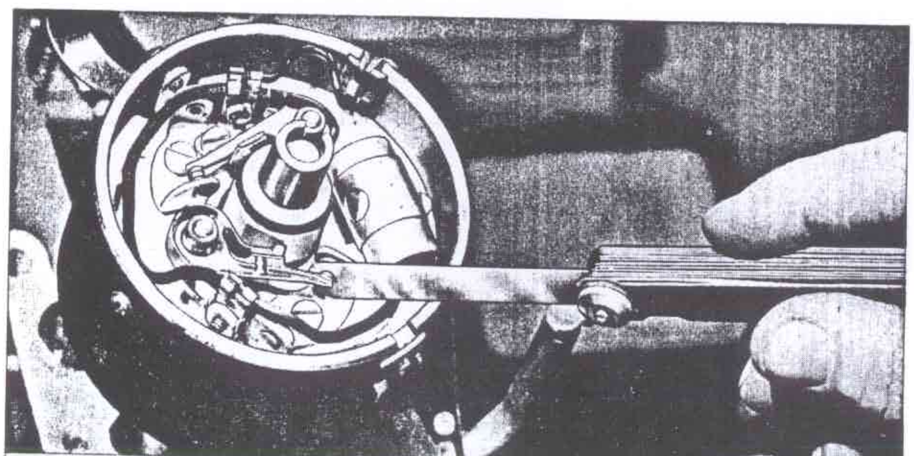
In the actual distributor, the points are spaced three cam lobes apart instead of approximately opposite. This provides room for the condenser, and does not change the basic principle of operation we have just seen.



Servicing the Corvette distributor is very simple. You may wish to remove the distributor from the engine and mount it in a tester. Or, all necessary steps can be performed easily on the engine.

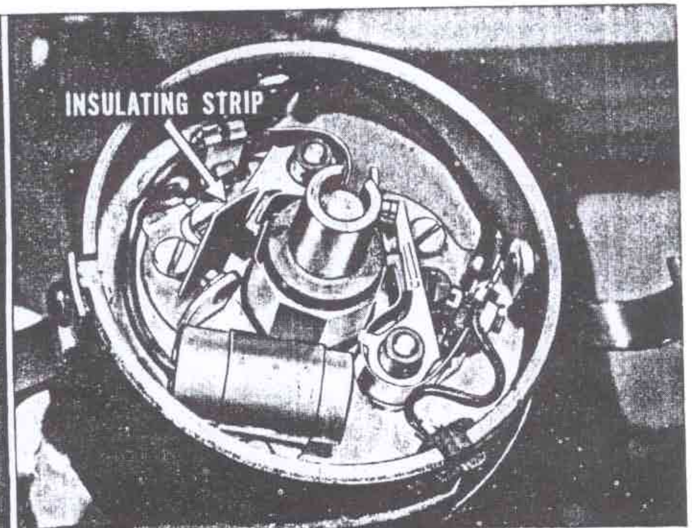


Check the breaker arm spring tension of each set of points with cam follower between lobes of cam. Tension range is 19 to 23 ounces. If more or less, adjust as follows—

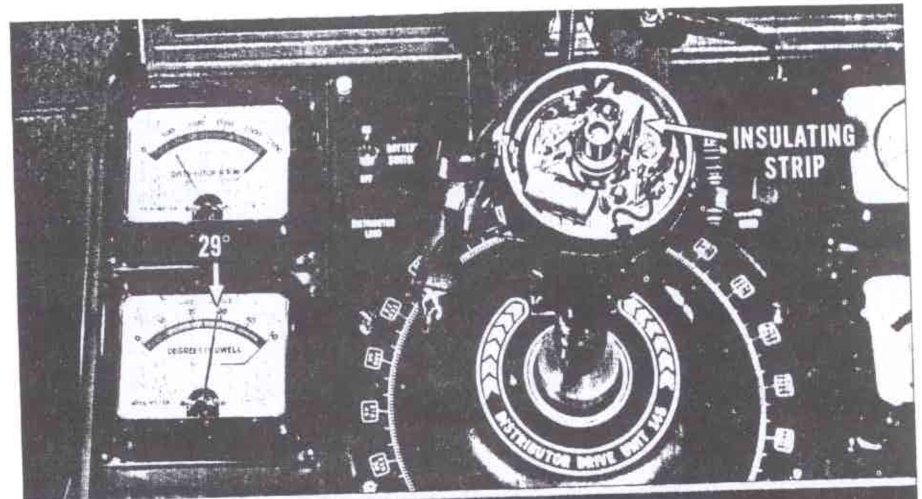


Inspect the point contact surfaces and replace points if necessary. Clean and align points. Adjust the point gap to .014″ for used points and .018″ for new points as an initial setting. Test the condenser.

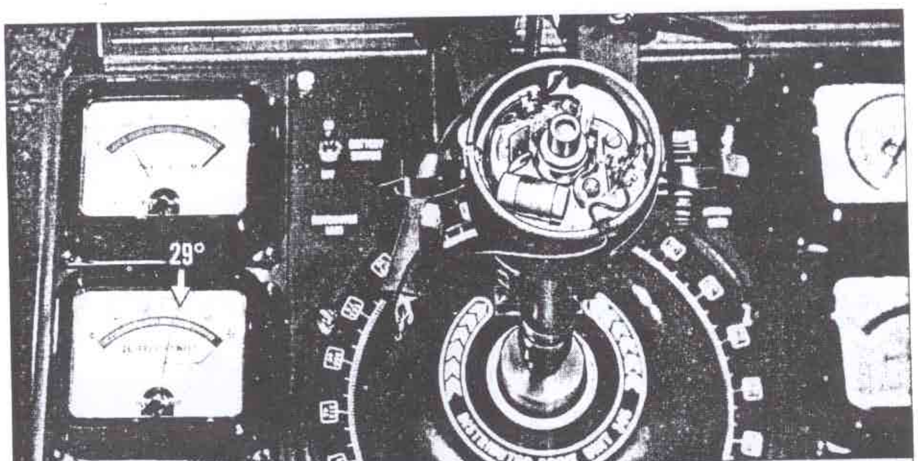
Loosen the primary lead retaining nut on the stationary point. Shift the spring to _shorten_ its effective length to _increase_ tension. _Lengthen_ the spring's effective length to _decrease_ tension. Tighten the nut and recheck tension.



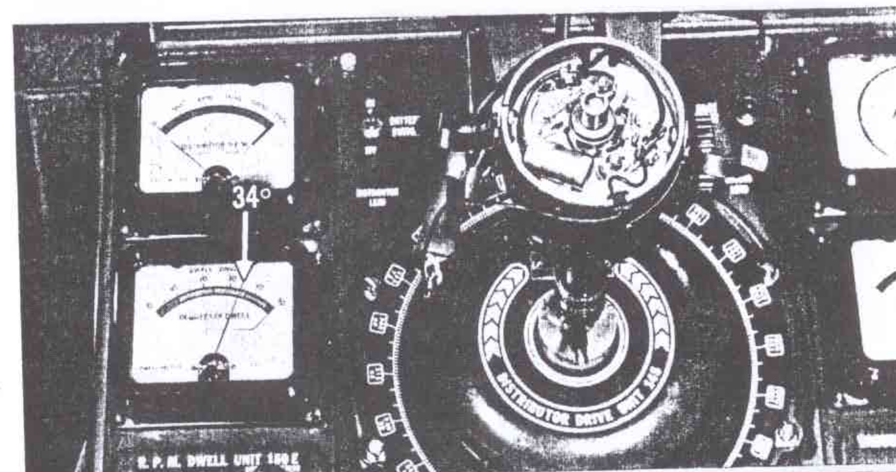
Checking cam dwell precisely is extremely important on Corvette distributors. Block either set of points open with a strip of insulating material at least .025" thick. Then—



Shift the insulating strip to the *adjusted* set of points and check the dwell angle of the second set. Again, adjust if necessary, to 29-degree reading.

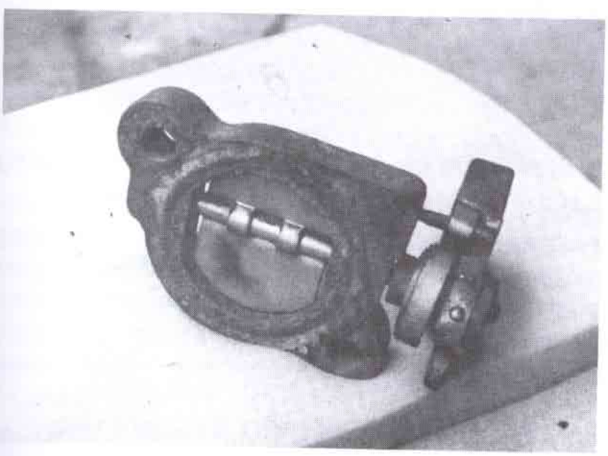


—check the dwell angle with only one set of points operating. It should be 29 degrees. If necessary, adjust gap of operating set of points to obtain this reading as precisely as possible.



Remove the insulating strip. Total dwell angle with both sets of points in operation should be 34 degrees, plus or minus one. If not, recheck dwell of each set of points separately and adjust as necessary.

ORIGINAL '55 HEAT RISOR THAT HAS PART NO. CAST INTO THE COUNTER WEIGHT #3721512 "SAME AS '55 CAR"

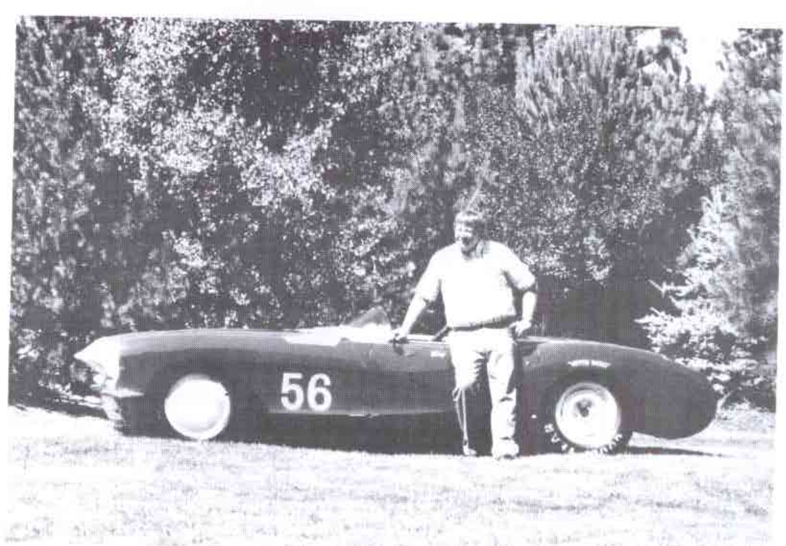


Following are the recommended ignition timing settings

	Degrees BTDC at Idle
ALL SINGLE CARBURETORS	4°
1956 DUAL CARBURETORS	8° to 12°
ALL 1957 DUAL CARBURETORS AND 1957 FUEL INJECTION WITH HYDRAULIC VALVE LIFTERS	12° to 14°
1957 FUEL INJECTION WITH SOLID VALVE LIFTERS	4° to 8°

Where a range is given, the maximum setting is permissible only with the very highest octane fuels available. All settings must be made at slowest possible idle. If distributor has vacuum advance, it must be disconnected while setting timing.

While in Bend, Oregon I met Forrest Shropshire from Georgia. He had brought his '56 Corvette to the NCRS Meet in Oregon. He was retired, "Sold the farm, literally," and made a hobby of having the fastest stock '56 Corvette in the world.



METERING RODS

By Roy Braatz

A friend, named George, bought a nice 1956 duel four barrel Corvette. He always complained that his gas mileage and smokey black exhaust was driving him nuts. George had them rebuild twice and tried different things but didn't get any better.

I asked if he had the metering jets and power rods calibrated. His answer was, "What do they do?" After explaining, I thought others may be interested. Many different cars used the same "Carter" carburetor as Corvette and over the years many people modified or drilled the jets out to so-called "hot rod" their cars.

Figure 1 shows how the metering rods go through the jets. While the engine is off the rods are held up by a spring.

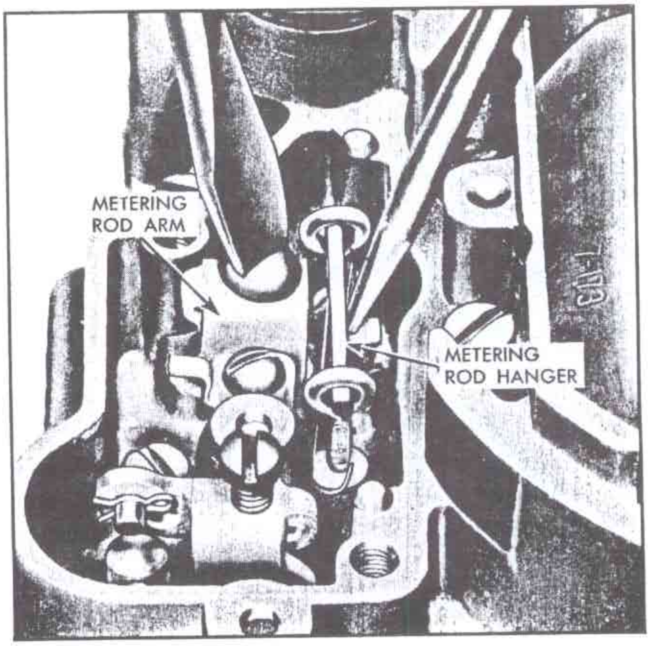
When the engine starts and only while idling, the rods are pulled down by manifold vacuum and held there decreasing the hole diameter of the jets, limiting fuel flow to the engine.

As you accelerate, the carburetor linkage manually raises the metering rods increasing the jet hole size giving more fuel flow to the engine.

Now, if the jets were drilled larger, or different "Carter" carburetor parts were used to make up yours for resale, you may have the wrong combination for your cubic inch engine.

I didn't have a chart to reprint telling which jet or rods belong in each Corvette application. The thing to understand is that there were many sized jets and different thicknesses of rods. Most jets were No. 21 so by decreasing the rod thickness, you increase the fuel flow. Increasing the rod thickness decreases the fuel flow.

Now you can dial in your carburetor knowing how they work. Using other "Carters" from other model cars that can be bought cheap at swap meets.



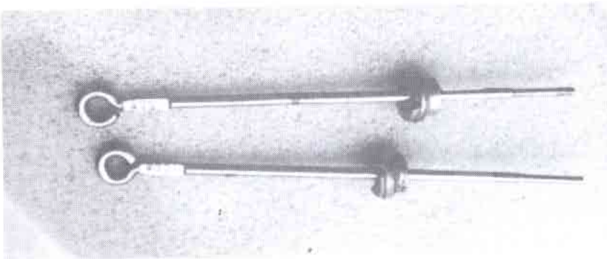


FIG. 1

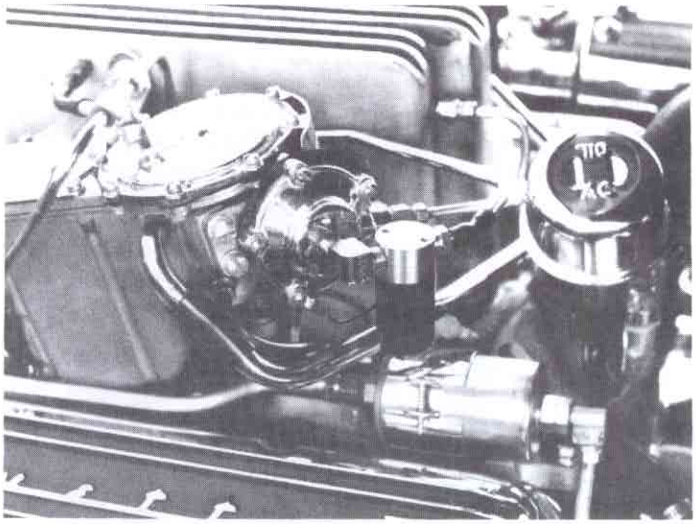
12 VOLT DC SKINNER VALVE

By Tom Parsons

On my 1956 Corvette, I have an F.I. unit that is somewhat modified. Basically, it is a '62 unit but with an early finned top air plenum that was cut in half at one time, ported out and welded back together again. After many hours of tinkering, tuning, disassembling, re-assembling and expermenting, I just could **not** get it to work right or calibrated satisfactorily unless I disconnected the cranking signal valve. Then it worked beautifully! I have tried NOS and rebuilt cranking signal valves but still at times they leaked. It has always seemed that there must be a better way, and there is! I have discovered that my idea for replacing the cranking signal valve with some sort of electric solenoid has been in use by F.I. owners for some time. But none of the literature I have read gives this information, so for those of you who want a sure fix for that expensive and leaking CSV, here is what you need: a 12 volt DC Skinner Valve, part no. B2DA1026 (this electric solenoid valve looks identical to some valves used with the smaller nitrous oxide kits -- probably is). If you can't find it in your local area, contact Skinner Valve Divd., Honeywell, Inc., 95 Edgewood Avenue, New Britain, Conn. 06051, (203) 827-2300.

Some CSV's are mounted directly to the plenum and others are mounted to the enrichment diaphragm housing. The above valve has 1/8 inch pipe threads, same as a CSV. You can find the necessary brass fittings at a hardware or auto parts store that stocks a good selection of brass fittings.

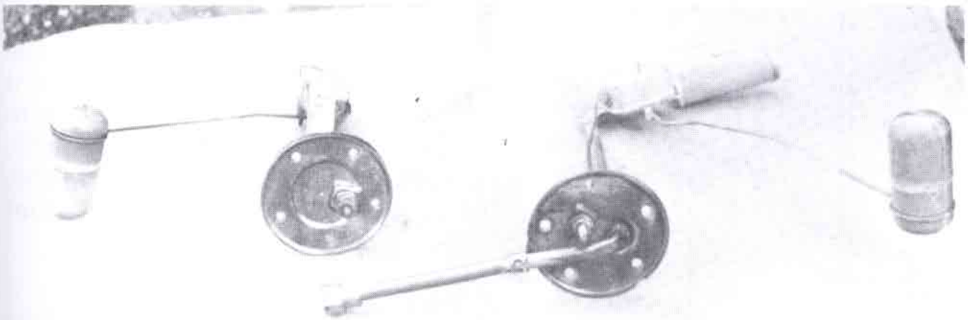
Once you have determined which fitting suits your need, coat the threads with sealer or use teflon tape to seal the threads. Now, replace the CSV with the new solenoid, making sure all connections are tight. The solenoid has two wires. I crimped a wire terminal to one wire and attached it to one of the screws on the fuel meter for a ground (either wire will work). The other wire is a hot wire. It needs to have a length of



wire added to it to reach the starter. I ran my wire through the temp wire insulation, down the back of the engine and attached it to the starter solenoid terminal that is hot **only** when the ignition switch is in the start position. When you turn the key to start, the Skinner Valve is opened and manifold vacuum is applied to the main diaphragm for starting. Release the key, the valve closes -- NO LEAKS. These valves are quality mechanisms because they are made of stainless steel. Since the valve is energized only during starting, it should last indefinitely because it remains in the closed position by spring pressure at all times, unlike the CSV which is open at all times until vacuum is applied -- maybe the diaphragm will seal, maybe not.

I paid $31.25 plus tax and shipping for my valve, less that $5.00 for the necessary fittings and took my time installing it in about 2 hours. Now I can install one in less than 30 minutes.

Compare the price of this permanent fix for a leaking CSV to the price of a NOS or rebuilt CSV which may leak when you get it, or someday will leak, especially if your engine ever backfires. This is just one of the modifications I have made to my non stock F.I. unit and now, finally, it works as sure as the sun rises every day. I thank John Eyestone for telling me about the Skinner Valve



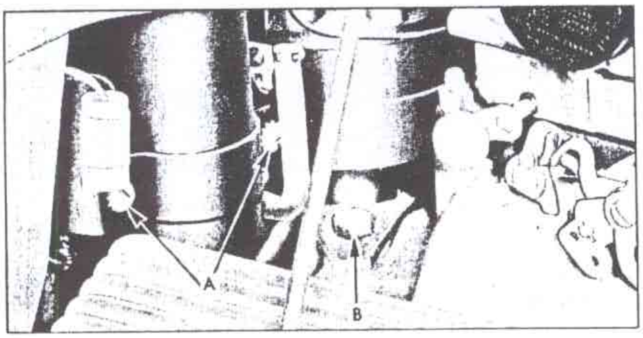
GAS TANK SENDING UNIT
Left '53-'55 Right '57-'60

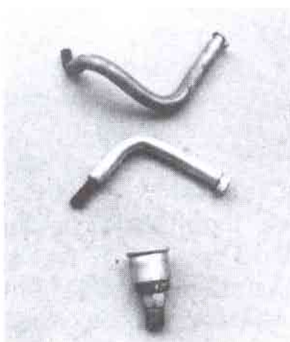
Distributor Oil Tube

By Roy Braatz

1953-54 and some early '55 V-8's used the "GREASE CAP" design to lubricate the distributor shaft. You unscrewed the cap, placing grease into the cap cup and screwed it back on.

'56-'62 radio option Corvettes without F.I. used a long two bent oil tube. The reason was to clear the shielding making it easy to oil.





CORVETTE

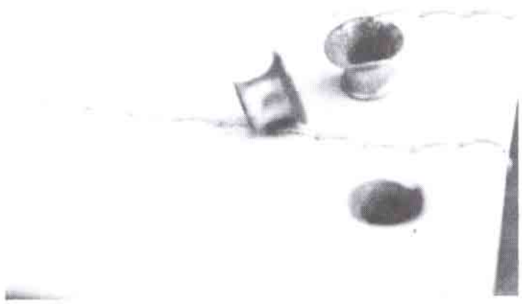
CAR

1953-54

Door Screw Retainers

By Roy Braatz

Picture shows the original kick and door panel screw retainers used on early Corvettes. They were factory pressed into the panels so not to dipple or tear the upholstery when the screws were installed. That is the reason you see many Corvettes using the wrong large washer type bezels of today. Most original panels are thrown away with them still in the panel but by finding some old ones, you can work them out. By grinding the back lip off and glueing them into your new panels you have the original appearance needed for the right-on job. Someone should reproduce them, there s/s.



PARTS FOR SALE

FOR SALE: SMALL BLOCK - BARE HEADS: 3911032 C-18-8 & C-22-8; 3795896 K-10-63 & K-20-63; 3884520 J-15-5 & I-20-6 ALL $50.00/PR; 3755549 A-12-9 & A-15-9 $80.00/PR; 3932441 L-30-9 & A-8-70 FRESH GRIND & GUIDES, COMPLETE $300.00/PR. INT. MANIFOLDS: 3738244 E-3-2 $100.00; 3837109 C-15-6, 2746829 D-15-1, 346250 H-18-6, 3987771 L-8-72 $35.00/EA. BIG BLOCK - BARE HEAD 3931083 B-21-9, ONE ONLY $30.00. INT MANIFOLD 3931067 B-14-9 $35.00. LARGE AC DOME F/FILTER $50.00 60 CARB RETURN SPRING BRACKET $10.00 60 T/STAT HOUSING $20.00. UPS AVAILABLE.

WANTED:
REBUILDABLE HEADS 3774692 DATED A-1-0 THRU D-15-9. BELLHOUSING 3764591, WATER PUMP 3736493, 4 CORRECT 1960 WHEELS, LONG STYLE LARGE AC F/FILTER. ALL MUST BE REASONABLY PRICED. **THIS IS A SPECIAL REQUEST:** DO YOU HAVE ANY CORVETTE SLACT BOOKS THAT YOU NO LONGER NEED? I AM TRYING TO USE A SIMILAR IDEA FOR '55-'57 T-BIRDS AND I NEED EXTRA COPIES OF THE BLACK BOOK TO DISTRIBUTE AS EXAMPLES TO THE BOARD OF DIRECTORS IN THE CLUB. ANY CONDITION WILL DO! I WILL APPRECIATE YOUR HELP.

Greg Ellis W (206) 584-0222 H (206) 584-5663
10704 Wooddale Ln., S.W. Tacoma, WA 98498

FOR SALE: NOS PARTS - one 1953-62 lower R.H. A frame $225, two 1953-62 upper A frames $100, one 1955 6 volt seal beam retaining ring $4.00, one 1954 door jam switch $15.00, one 1955 6 volt switch assy less cyl & keys $20.00, one 1958-59 switch assy less cyl & keys $15.00, one 1962 modulator tran vacuum $20.00, one 1958-62 modulator tran vacuum $20.00, three 1960-62 lower shock mount brackets $75.00, one 1953-55 steering knuckle support upper control arm shaft $25.00, 1960 FI inlet valves $20.00, 1955-62 8 cy. low HP inlet valves $20.00. MANY 1953-? Cast iron powerglide internal parts like shafts, bands, bushings, etc. **USED PARTS FOR SALE:** one 1953-61 master cylinder cap $20.00, one 1958 flasher on brake arm $12.00, two turn signal cromes late design $10.00, two 1957 front license mount spampe guide $25.00, two U brakets for turn signals 1957 for 1957 need rechroming $12.00, one outside mirror $20.00, three spinners $60.00, two front cresent bumpers $20.00, two front bumpers $20.00. All parts plus shipping.

Jay Williams (701) 763-6345
RR 1, Box 23, Cleveland, N.D.

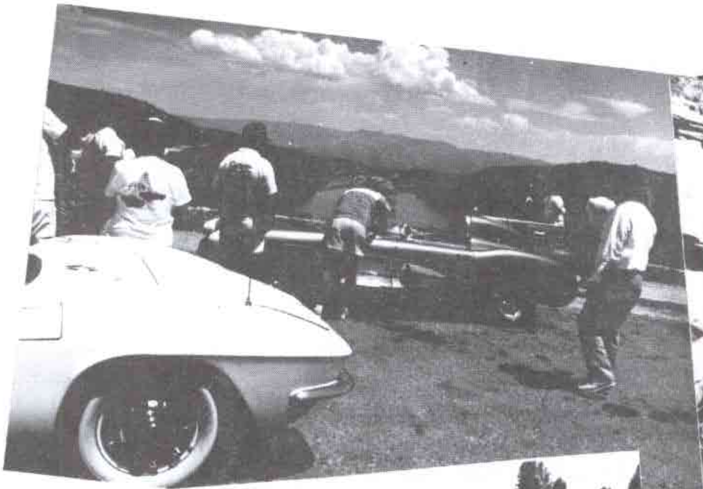
PARTS FOR SALE

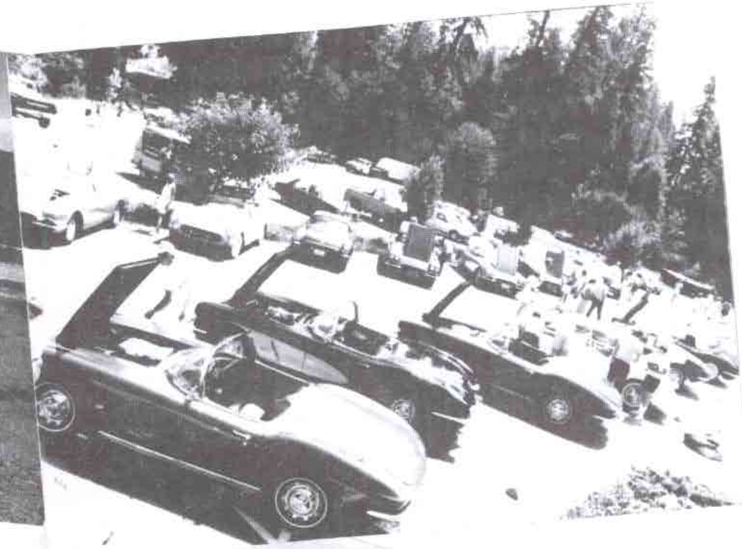
FOR SALE: DISTRIBUTOR, 1955 V8, 2nd DESIGN, JULY 6th DATE, $50. SEAT BELT SET, '61-'62, NEW REPLACEMENT, BLACK $50. BRACE SET, REAR BUMPER, 1958 ONLY? $25. SHOCKS, PR. FRONTS, JAN. 1961 DATES $50. **WANTED:** ITEMS WITH STRAIGHT AXLE DATES - STEEL WHEELS, SHOCKS, LEAF SPRINGS, ETC. ALSO R.P.O. ITEMS - ANYTHING.
Lanny Larsen (707) 446-9638
P.O. Box 5202, Vacaville, CA 95696

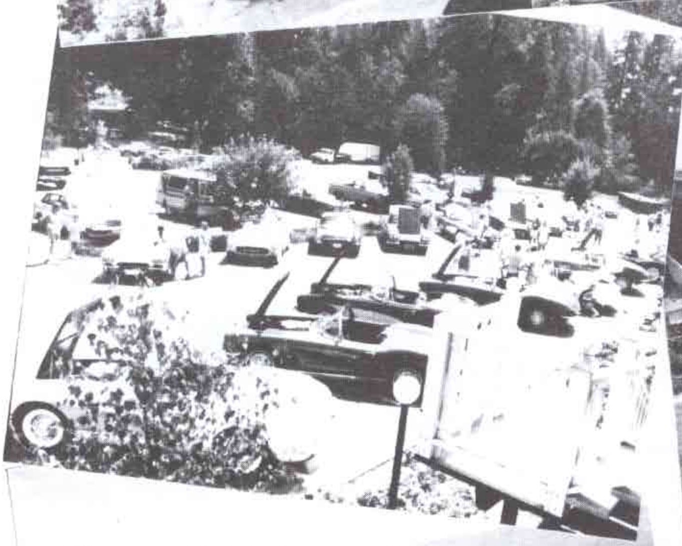
WANTED: 1954 CORVETTE PARTS FULL NOSE FRONT CLIP, CORRECT ENGINE AND HEAD. 2 STAINLESS PIECES BEHIND SEATS. 1 CAST IRON EXHAUST FLANGE. RIGHT DOOR TOP CHROME. I HAVE A CHOKE CABLE WITH KNOB TO TRADE OR SELL.
Mark Cieply (412) 821-8244 7-11 p.m.

WANTED: INFO ON '60 CORVETTE VINTAGE NO. 008675106556 WITH 290 HP F.I. AND RPO 687 BRAKES. **PARTS WANTED FOR '60 CORVETTE:** SOFT TOP FRAME, SEAT BELTS 7017320 F.I. UNIT, F.I. AIR CLEANER, 914 DIST., LOWER FRONT VALANCE PANEL (RIGHT TO LEFT HEAD LIGHT), LEFT ROCKER PANEL (FIBERGLASS) (5) 15x15½ WIPE WHEELS PRE '62, RPO 276 HUBCAPS, RPO 687 DRUMS, FRONT SCOOPS, RIGHT REAR SCOOP AND FRONT BACKING PLATE COVERS. DOES ANYONE KNOW HOW TO REBUILD WORN OUT BRAKE DRUMS????
Alan Willms (415) 349-4050
137 W. 40th Ave., San Mateo, CA 94403

WANTED: Fuel Injected 1958 Corvette, any condition (non-restored). Only requirement is that it has an original "C.S." '58 engine block.
Blair Van Orden
2405 Parkway Dr., Reno, Nev. 89502







SACE CONVENTION SNAPSHOTS

MEMBER'S COMMENTS

A comment on your article on "Corvette Yoke '53-'62" in SACE Vol. I, No. 4. As usual, you didn't cover all the items. The part you mentioned "3712379" was used only on V-8s, therefore '55-'62. The six cylinder cars used part number 3706135 forged 3706107, forged on the front, also made by Spicer. This part is significantly larger and NOT interchangeable with the V-8 yoke.

Dave Ferguson

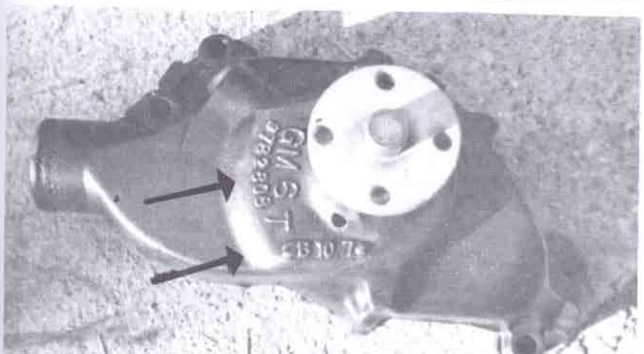
I own what is left of Corvette number 784. This is a 1961 Vette. When I scraped off the paint in the trunk, the word RED came through. When I scraped behind the passenger seat the letters HT and the number 30 came up. This car is set-up for both hard top and soft top. The soft top hardware appears to be original, as all the paint in this area is the same dull red. Also, the number 283 appears on the inside of the passenger side door. All words, letters and numbers look to be written in green crayon. I enjoy reading your articles in SACE. I hope this information will be helpful.

Dan Konschak

My '56 Corvette **does have** the muffler shields.
E56S002434 Al Nestlerode

This is an addition to my original letter in Vol. I, No. 3, also, an apology to **anyone** who may have been offended by my comments as suggested by Mike McCagh. I was NOT making accusations about anyone or any club, I was expressing how I had **felt** after attending functions of other organizations with my **personalized** rather than **stock** 1956 Corvette -- kind of like a stepchild at a family reunion. If I made anyone upset, I'm sorry! I **like** all Corvettes, race, stock, show chrome or painted, but I **love** straight axles!

Tom Parsons



3782808 DATE CODE
B107 = FEB. 10, 1957. I HAVE MANY 808's WITH DATES UP TO 1961.
CAN ANYONE COMMENT?

I have received my first issue of the SACE magazine (Vol. I, No. 3). I am very enthused about the information generated by this publication. I am pleased to have joined an organization which seems to reflect my ideas concerning older Corvettes. I would like to submit some articles at a future date for publication in the magazine. My problem is always finding the time in which to write, but I will have to make some time in order to share my ideas and opinions.

J.J. Pabis

Let me tell you how thrilled I am that you have answered the need for an early Corvette organization! I have written an article for your consideration and possible publication in the SACE magazine. I am looking forward to a long and prosperous life for the club.

Gregory L. Ellis

I took my car to Bloomington to get certified; I missed a Gold by 21 points. Boy, they sure get picky down there, but I'm enjoying the car now that it's done. Maybe, someday I can bring it to a SACE convention. You have a good magazine. Keep up the good work. If there's anything I can do out here, let me know. My car is artic blue and silver, has 245 hp, power top and windows, automatic and has all the other options.

Jay Williams

VIEW OF SOFT TOP RETAINER ORIGINAL DESIGN FOR '53 TO '62. THERE IS A LEFT AND RIGHT DIFFERENCE.

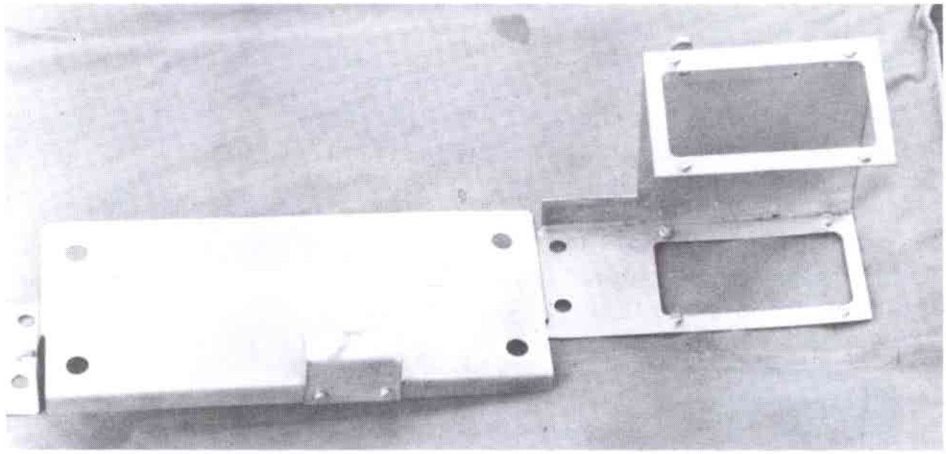
1953 - 1961
Valve Cover Seals

By Roy Braatz

Figure 1 shows the early valve cover support plate used on all steel valve covers. Notice the black rubber gasket that was also used to keep the oil from getting past the bolt threads. They're hard to come by in today's gasket set, but you can make them easily by using the plate as a pattern. Bottom design is '62 and later.

FIG.1

PICTURE OF POWER TOP SUPPORT THAT HOLDS CONTRAL VALVES AND MOTOR IN TRUNK AREA. 1956-62



REPLACEMENT FUEL FILTER FOLLOW-UP

By Greg Ellis

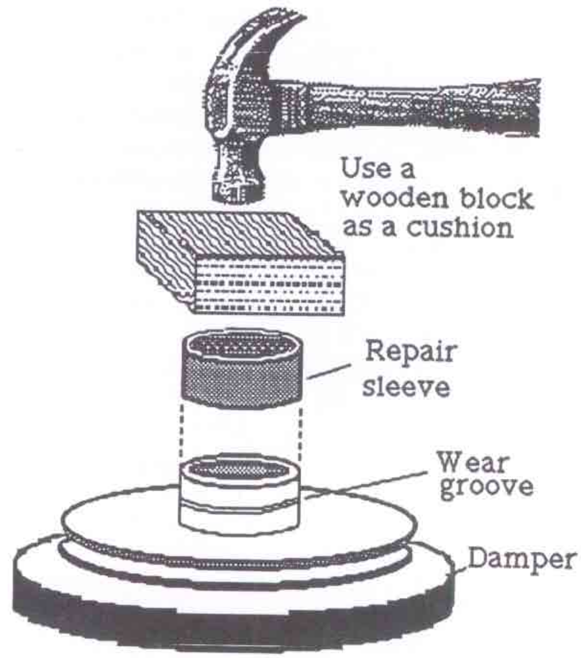
A previous issue of this publication printed an article from Robert Viegas which stated that although discontinued, Purolator #EP-124 was an excellent replacement filter for the glass fuel filter bowls. Actually this part number is still available from Purolator with one major flaw. It's now manufactured as a pleated paper element rather than the necessary ceramic element. The list price of this filter is $3.34.

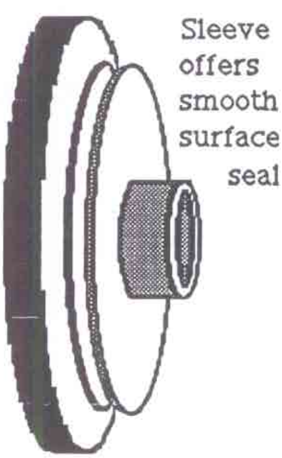
The same article stated the Fram #CG-3 was also discontinued. However, it is also still available. It has been back ordered at the factory but should be available by the time you read this. So be careful. If you do find one of these filters, be sure it is built the way you want!

DAMPER LEAK REPAIR

By Steve Banich

There is a small oil leak that may be overlooked on many engine rebuilding jobs. Where the damper rubs against the timing gear cover seal, the damper pulley will be grooved. This will cause an oil leak that can be a detriment to an otherwise fine rebuilding job. This is easily rectified by installation of a sleeve which fits over the shaft offering a smooth surface to the seal. This sleeve is offered by at least two companies in conjuction with the timing cover gaskets and seal, or by itself. The damper pulley can be removed from the engine without major surgery, allowing easy installation of the sleeve. Then it's a simple matter to hammer it into position by striking a wooden block used as a driver.





'53-'55 Corvette WIRING ERROR

By Bart Pevey

If you happened to have a '53-'55 Vette which still has the **original** (factory installed) main wiring harness in place, you might want to check on the following condition:

The wiring diagram (Fig. 1) shows two wires connected to the courtesy light switch; one 16 ga. (hot) white and one **10 ga.** (grd) black. Electrically speaking, this makes no sense, as maximum current through a switch is limited by the smallest wire; in this case, 16 ga. Unfortunately, this error was passed along to the installation of the car's main wire harness.

On the back (or forward) side of the dash is a metal frame which provides the common electrical ground for all dash instruments. The electrical grounding wire for this frame is located behind the dash near the courtesy light switch on drivers side, usually directly below the headlight switch (Fig. 2). This wire provides the battery ground return path for all instruments on the dash (dash lights, clock, cigarette lighter, etc.) and also the radio. This ground path requires a large diameter wire; in this case, 10 gage (with current-carrying capactiy of 25 amps).

Of four 6-cylinder Vettes inspected recently, it was found that three of the cars had only a 16 gage wire used for the dash instrument ground. One of those cars had the insulation melted from around this ground wire!

Nominal current-carrying capacity of a 16 gage wire is only 6 amps. This is totally inadequate to provide ground current for all dash instruments and radio (the radio itself is fused at 14 amps). Apparently when the cars were assembled at the factory, the two wires had been reversed; the smaller 16 gage should be used for the courtesy light switch and the larger 10 gage should be the dash instrument ground wire.

To correct this condition, simply reverse the two connections, so that the smaller black wire is connected to the courtesy light switch. It may be necessary to install new terminals on the ends of the wires. When installing a new repro wiring harness, be sure that the larger (10 gage) wire goes to the dash frame.

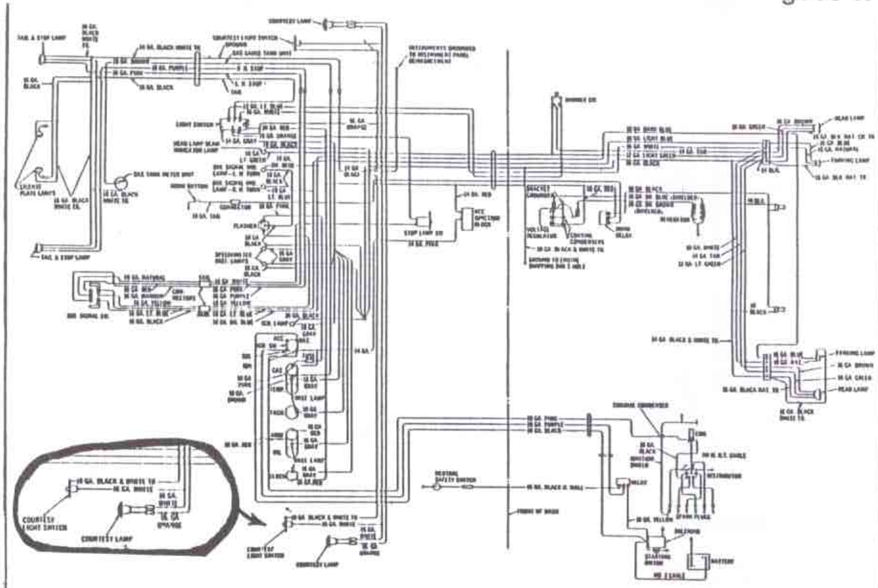


FIG. 1

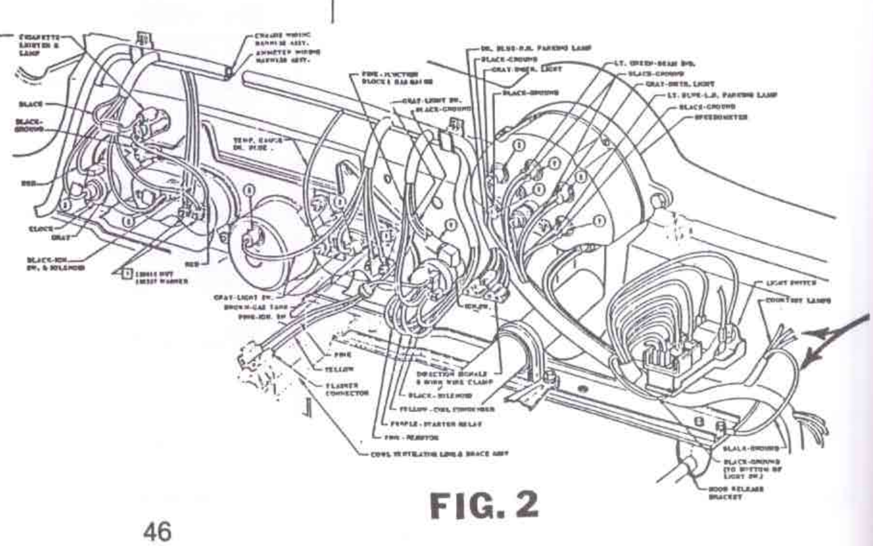
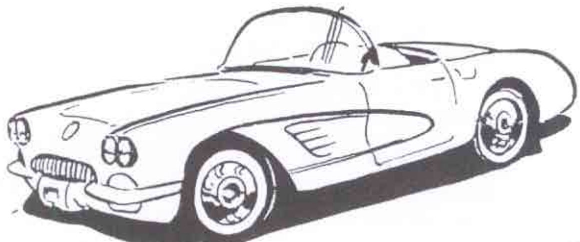
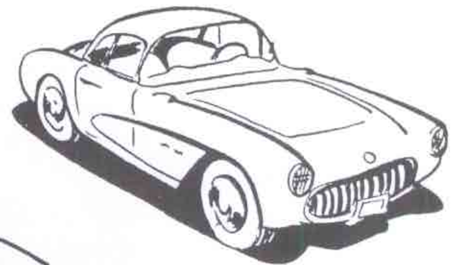


FIG. 2





STRAIGHT-AXLE CORVETTE ENTHUSIASTS
THIRD ANNUAL NATIONAL CONVENTION
MEMORIAL DAY WEEKEND, 27-29 MAY 1989

STRAIGHT-AXLE CORVETTE ENTHUSIASTS (1953-62) AND THEIR FAMILIES ARE INVITED TO TAKE ADVANTAGE OF A RARE OPPORTUNITY TO VISIT THE WASHINGTON D.C. AREA. THE 1989 NATIONAL CONVENTION IS SCHEDULED FOR SAT-SUN-MON AT THE OLD COLONY INN IN ALEXANDRIA, VIRGINIA.

THE INN IS 5 MILES FROM DOWNTOWN D.C. WITH FREE SHUTTLE SERVICE TO THE NATIONAL AIRPORT AND THE METRO TRAIN STATION EVERY 15-30 MINUTES FROM 6:15 AM TO 11:00 PM. IT IS LOCATED TWO BLOCKS FROM THE POTOMAC RIVER, ADJACENT TO JOGGING TRAILS AND PROVIDES A FITNESS CENTER, SAUNA, AND INDOOR/OUTDOOR POOL, HBO AND CABLE TV AT NO ADDITIONAL CHARGE.

SPECIAL RATES OF $59 PER NIGHT (SINGLE OR DOUBLE) HAVE BEEN OBTAINED FOR FRIDAY THROUGH MONDAY NIGHTS. THOSE WISHING TO EXTEND THEIR VISIT AND TAKE ADVANTAGE OF THE MANY CULTURAL AND HISTORICAL SIGHTS IN THE AREA MAY DO SO AT THE REGULAR ROOM RATES (1988 IS $92-140). RESERVATIONS SHOULD BE MADE BEFORE 5 MAY 89 DIRECTLY WITH THE HOTEL BY CALLING (703) 548-6300 OR THEIR BEST WESTERN TOLL FREE LINE (800) 528-1234.

THIS SCHEDULE OF EVENTS IS TENTATIVE AND SUBJECT TO REVISION:

SAT	8:00 AM - 12:00 AM	SWAP MEET & CONVENTION REGISTRATION
	12:00 AM - 4:00 PM	SWAP MEET & TECHNICAL SEMINARS
	4:00 PM - 7:30 PM	DINNER (YOUR CHOICE OF LOCATION)
	7:30 PM - 8:30 PM	NOLAND ADAMS GUEST SPEAKER
	8:30 PM - 9:30 PM	ANNUAL BUSINESS MEETING
SUN	10:00 AM - 11:00 AM	JUDGES/OWNERS MEETING
	11:00 AM - 5:00 PM	JUDGING AND TABULATING
	7:00 PM - 7:30 PM	NO HOST COCKTAILS
	7:30 PM - 9:30 PM	AWARDS DINNER AT THE INN
MON	10:00 AM - 11:00 AM	CARAVAN
	11:00 AM - 12:00 AM	LUNCH & DEPART

IF YOU'RE NOT A MEMBER OF SACE AND WOULD LIKE MORE INFORMATION,
CALL: LUCY BADENHOOP (703) 780-3210
OR WRITE: SACE
8237 CEDAR LANDING COURT
ALEXANDRIA, VA 22306-3234

TREASURER'S REPORT

By Lucy Badenhoop

The annual membership meeting was held on 22 July 1988. Several important issues were voted upon.

1. Our quarterly magazine has an official name, "Straight Talk." Look for it on the cover.

2. A committee was formed to revise and formalize our judging procedures, forms, etc. Hopefully, these will be ready for the 1989 convention.

3. The national officers were elected:

President, Noland Adams
Vice President, Roy Braatz
Treasurer, Lucy Badenhoop

4. Our first two chapters are forming up, one on each coast. Bill Eldridge of Washington and Klas Anderson of Pennsylvania are busily organizing in their regions. It will be interesting to see who gets established first.

5. The 1989 convention will be held on the East Coast on Memorial Day weekend, May 27-29 (Sat.-Sun.-Mon.). Details are still being worked and registration forms will be available in our next issue. In the meantime, check out the enclosed flyer and let your East Coast friends know you're coming for a visit.

One of the highlights of this year's convention was the mountain drive up to Donner Lake. The view was spectacular. The lake is near Donner Summit (elevation over 6000 feet) where pioneers were trapped for the winter when they attempted a late crossing.

This year's convention was another success, thanks to the efforts of the Braatz family. For two years they have opened their hearts and home to the club. They did it again by letting us use their nearly completed workshop building to hold technical sessions. This permitted realistic seminars in which a transmission was actually torn apart and other similar projects could be closely observed.

The weather was a bit warmer than usual, along with the rest of the country, but the show and judging were big hits. The cars were about equally divided between restored and contemporary classes with awards listed below.

CONVENTION AWARDS

Restored Driven

'55	1st	Roy Braatz, Sr.
'56	2nd	George Marra
'57	1st	Ron Smith
'57	1st	Roy Braatz, Jr.
'57	1st	Ken Wiechman
'58	1st	Lucy Badenhoop
'60	2nd	Steve Banich
'61	1st	Don Maich
'62	1st	Joe Calcagno
'62	1st	Ken LaBella

Contemporary

'54	3rd	Rich LaValley
'59	1st	Diane Kelley
'59	1st	Tony Hoskins
'60	2nd	Steve Harris
'61	1st	Jack Crinnion
'62	1st	Chuck Cunningham
'62	2nd	Al Fraumeni
'62	2nd	Stan Kolb

Custom

'59	1st	Rich Lang

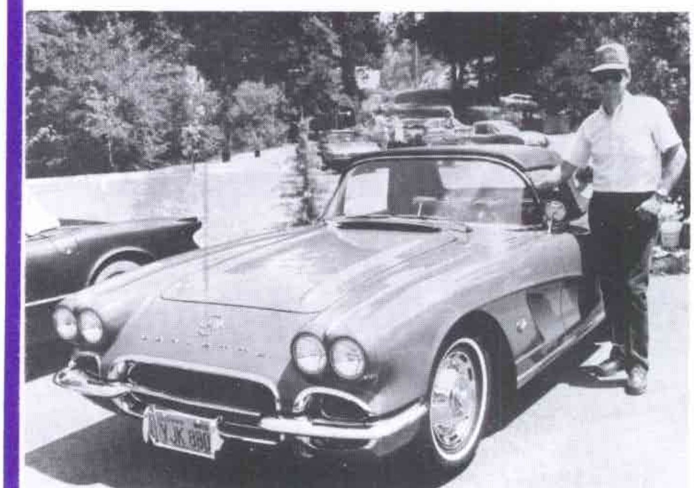
Special Interest

Two 1960 Big Brake, Rich Mason
SR-2, Rich Mason

CHUCK CUNNINGHAM, 1962

TONY HOSKINS, 1959

RICH LaVALLEY, 1954 WHITE



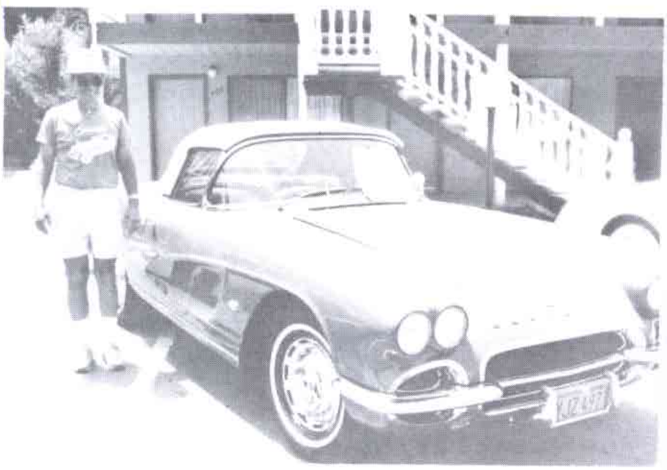
STAN KOLB, ROMAN RED 1962

LUCY BADENHOOP, CHARCOL 1958

STEVE BANICH, 1960

DIANE KELLEY, FROST BLUE 1959

RON SMITH, RED 1957



JOE CALCAGNO, ROMAN RED 1962

GEORGE MARRA, 1956

AL FRAUMENI, 1962

DON & PAT MAICH, WHITE 1961