INSTALLATION OF NEW CARBURETOR:

WARNING! Holley Performance Products highly recommends that a quality fuel filter be installed with any replacement carburetor to catch any dirt that may still remain in the system. Any dirt that may enter the carburetor can cause the carburetor to flood or malfunction. A carburetor that has a malfunction caused by dirt in the system due to negligence of the owner will void the warranty.

1. Install a flange gasket on the manifold. If a spacer is being used the installation order will be flange gasket, spacer and another flange gasket over the manifold stud bolts.

WARNING! The carburetor should be installed directly onto its manifold without an adapter whenever possible. Sometimes an adapter can create problems with hood clearance, airflow, throttle linkage, fuel line attachment and/or fuel mixture distribution.

2. Place the carburetor in position over the four stud bolts and secure in place. To avoid warping the carburetor flange, tighten each bolt gradually. Tighten in a criss cross pattern to 60 in./lbs. Be careful not to overtighten the nuts.

WARNING! Over tightening the carburetor manifold flange hold-down-nuts may result in a warped or cracked carburetor throttle body. The carburetor hold down nuts should be tightened down progressively in a criss-cross pattern to 60 in./lbs., so that vacuum leaks are prevented and to avoid causing damage to the throttle body. A carburetor that has been damaged due to negligence of the owner will void the warranty.

3. Connect the fuel lines, throttle linkage and return springs. Operate linkage to assure correct travel by fully opening and closing the throttle by hand.

4. Attach all vacuum lines, where necessary. Not all model 4150's have vacuum connections, however, some model 4150s are equipped with three vacuum tubes. The larger tube at the base of the carburetor provides full manifold vacuum at idle. Use this for PCV, power brake etc. The smaller tube attached to the metering block is timed spark (vacuum provided anytime after off idle). The distributor is usually attached here. Plastic "T's" (available through the Holley Performance Catalog) may be used to complete the installation.

STARTING:

1. Without operating the throttle, crank the engine. It may take 15 to 30 seconds of cranking to allow the fuel bowls of the carburetor to fill. If the engine does not start, stop cranking, open and close the throttle twice and crank again until the engine starts.

WARNING! DO NOT crank the engine for more than 15 seconds at a time. Cranking longer than 15 seconds can overheat the starter, resulting in premature starter failure.

2. After starting the engine check fuel lines and inlet fittings for possible fuel leaks.

WARNING! If any fuel leakage or weeping is detected, shut off the engine immediately, and wipe up any fuel. Locate the source of the leak and correct before proceeding any further.

TUNING AND ADJUSTMENT:

Before you begin to tune your carburetor for your particular vehicle, you must get a "feel" for your vehicle's performance so that any changes you make (Good or Bad) will be readily apparent. Be patient and **make only one change at a time** so that only that change can be fully analyzed. This cannot be overemphasized, as there are no "short-cuts" to peak performance. Recording each change and the resulting performance increase or decrease will provide you with a "Handbook" of how vehicle performance is affected by individual carburetor adjustments. This may be helpful in the future or on other applications.

FUEL LEVEL (FLOAT LEVEL):

The float(s) controls the fuel delivery, however if the float(s) are not properly adjusted a fuel starvation or a flooding affect could result. This operation is difficult to do accurately on a rough-idling vehicle.

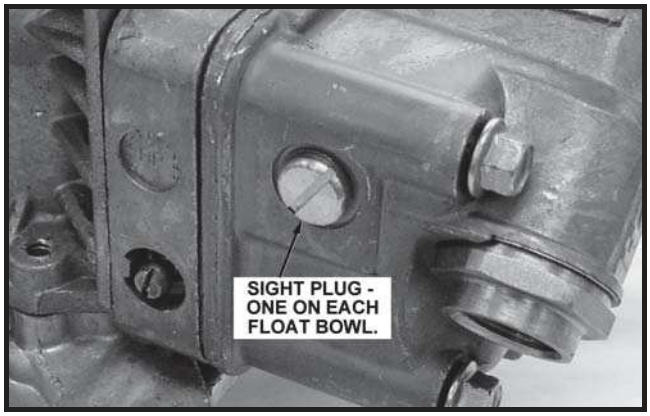

Figure 1

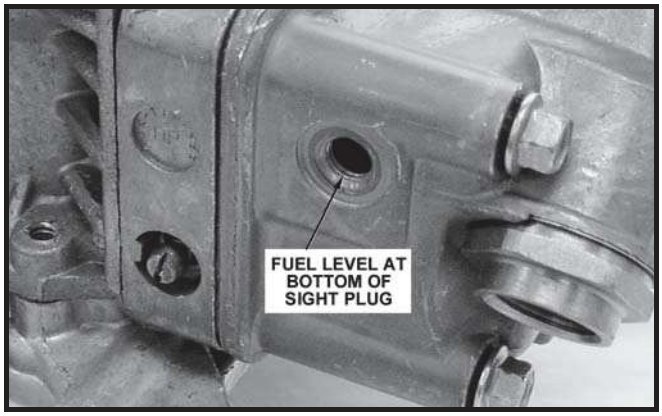

Figure 2

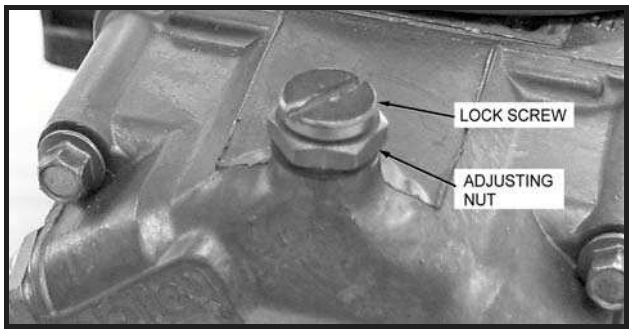

Figure 3

1. For a mechanical fuel pump, remove coil wire and crank engine over for 10 seconds to allow fuel bowls to fill. This procedure can prevent a power valve blow out. Reconnect coil wire when finished. For electric fuel pumps, let the fuel bowls fill in stages by turning the ignition on and then off, let fuel pump run for a few seconds at a time. This procedure can prevent the needle from being forced up at an angle not allowing the needle to seat properly.
2. Remove the sight plug from the fuel bowl.
3. Start the vehicle.
4. Loosen the lock screw at the top of the assembly.
5. Turn the adjusting nut while holding the screw in place until the fuel level is at the bottom of the sight plug hole. A *slight* trickle should be seen at the threads. Turn the adjusting nut **clockwise to lower** the fuel level and **counter-clockwise to raise** the fuel level.
6. Tighten the lock screw while holding the adjustment nut.
7. Replace the sight plug and lightly tighten with a screwdriver.
8. Flush the fuel bowl by revving the engine a few times with the transmission in neutral.
9. Remove the sight plug to confirm your setting. A slight trickle should be seen at the threads. Adjust, if necessary. Replace the sight plug and tighten.

IDLE SPEED SCREW:

The idle speed screw in most cases is the only screw you should adjust. The Idle screw controls the throttle plate position at idle, which in turn raises or lowers the engine rpm by allowing more or less air/fuel mixture into the engine. It does not control the air/fuel mixture. Here are the proper steps for setting the engines idle speed.

1. Find the proper idle rpm on the underhood decal of your vehicle. If this decal is not available, find a service manual that references your vehicle and engine and find the recommended idle rpm.
2. Start the engine and allow it to warm up.
3. Connect a tachometer, if your vehicle is not so equipped.

4. Make sure the parking brake is on and the wheels are blocked. Place the automatic transmission in drive, the manual transmission in neutral or as stated on the underhood decal.

5. If the idle speed is slower than recommended, turn the screw clockwise to speed up the rpm. If the idle speed is too fast, turn the idle screw clockwise to slow down. This adjustment should be made to both the primary and secondary screws in equal amounts, so that the throttle plates are opened the same amount.

NOTE: There is a Holley secondary idle adjustment lever, P/N 26-137, that allows the secondary throttle plate to be adjusted without carburetor removal.

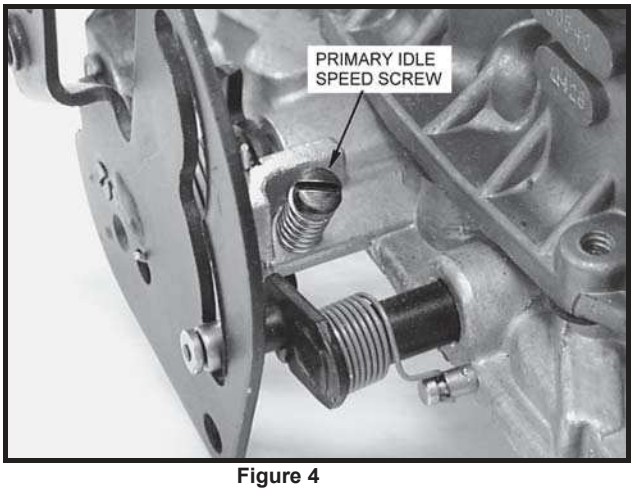

Figure 4

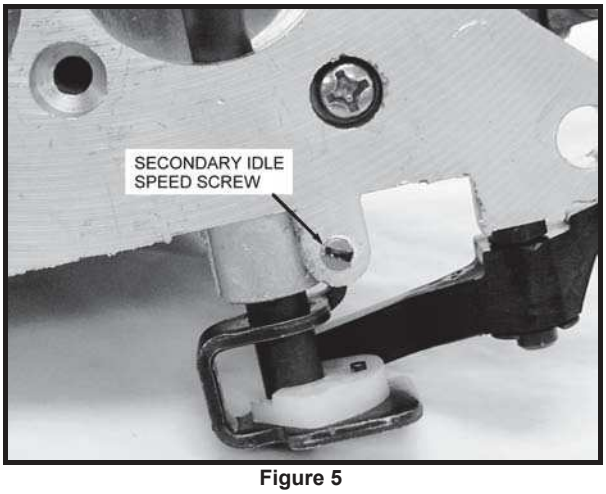

Figure 5

IDLE MIXTURE NEEDLES:

Idle mixture needles control the air/fuel mixture at idle. The amount of air/fuel mixture used at idle is controlled by engine vacuum. So, when tuning the idle mixture, you are actually tuning for the best manifold vacuum. Idle mixture needles are found on the metering blocks. Your carburetor will have four idle mixture needles; one for each venturi. This is known as four-corner idle. If you change one idle mixture needle, you are required to change the other idle mixture needles the same amount. Here are the proper steps for setting the idle mixture needles.

1. Attach the vacuum gauge to the manifold vacuum port usually at the rear of the carburetor and on the throttle body.

2. Adjust each idle mixture screw the same amount to achieve the highest possible vacuum reading without increasing the idle speed screw.

3. Now that the idle mixture is set, it may be necessary to go back and reset the idle speed using the idle speed screw. Continue back and forth between the tuning of the idle mixture needles and idle speed screws until little change is noticed in manifold vacuum and idle speed is correct.

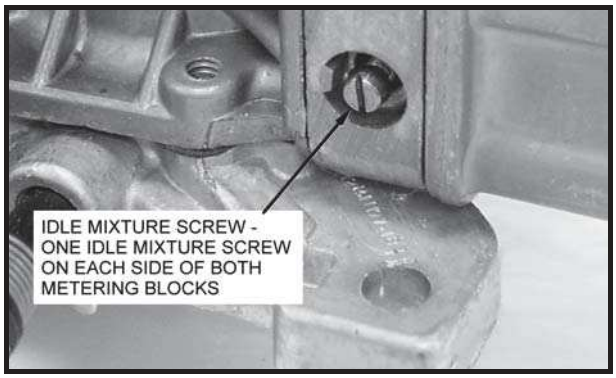

Figure 6

ACCELERATOR PUMP:

The accelerator pump's purpose is to make up for the lag in fuel delivery to enable the engine speed to increase in response to throttle opening. Differences in vehicle weight, transmissions, and rear axle ratios affect the amount of fuel and the delivery rate that should be provided by the accelerator pump. This may necessitate the customizing of your accelerator pump to your vehicle and its use.

NOTE: The old saying, "if a little is good, a lot is better", does not apply to the proper tuning of the accelerator pump. Your car's performance can be just as bad if it receives "too much fuel too soon" as if it receives "too little fuel too late."

Two factors that affect the accelerator pump's delivery are the pump cam and the pump shooter (discharge nozzle). The pump cam determines the total volume of fuel and affects delivery rate; the pump shooter affects delivery rate and helps determine the duration of the shot.

In general, the #1 locations on the pump cams provide a moderate initial delivery and have a greater final delivered volume. The #2 locations on the pump cams provide a greater initial delivery and have a lesser total delivered volume. The pump shooters have a number stamped on their casting, which designates the shooter size in thousandths of an inch, i.e., a #25 shooter has a .025" discharge orifice. The smaller diameter nozzles lengthen the pump shot duration and are used with heavier vehicles or with vehicles equipped with lower numerical rear axle ratios. Larger diameter nozzles (.035 - .037) shorten the pump shot duration, but deliver a greater initial volume of fuel. These sizes should be used on applications where engine speed will increase rapidly (vehicles with good power-to-weight ratios). Best acceleration is achieved when the accelerator pump delivers the lean, best-power, air/fuel ratio to the engine; not when the maximum volume of fuel is supplied.

An important point should be kept in mind when tuning a Double Pumper, the secondary accelerator pump must supply fuel for a sufficient time so that the secondary main nozzles can "start up" and deliver fuel to the engine after the secondary throttle plates are opened. If the nozzles do not start by the time the pump shot expires, bogging will result. To apply the information above, follow these steps for tuning the accelerator pump.

Best starts or racing starts usually result when the rear tires break loose for the first 10 to 25 feet, this allows engine speed to increase rapidly to get the secondary main nozzles started. If wide tires, which provide extremely good traction, do not permit the rear tires to break loose, bogging can result. Best times may be recorded with narrower tires. Tire size may have as significant an affect on vacuum operated secondary carburetors since the secondary throttle plates will not open until the secondary nozzles are exposed to enough vacuum to get them started.

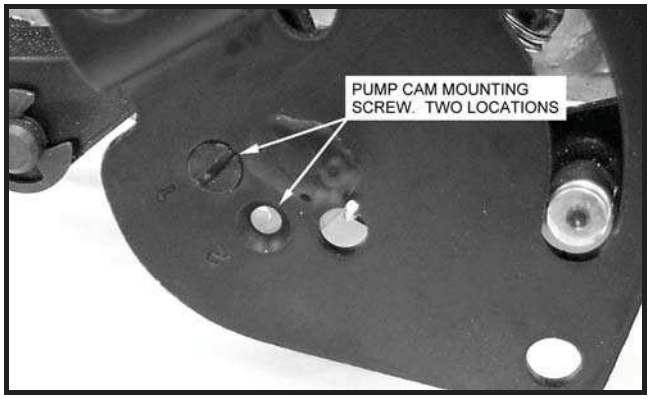

Figure 7

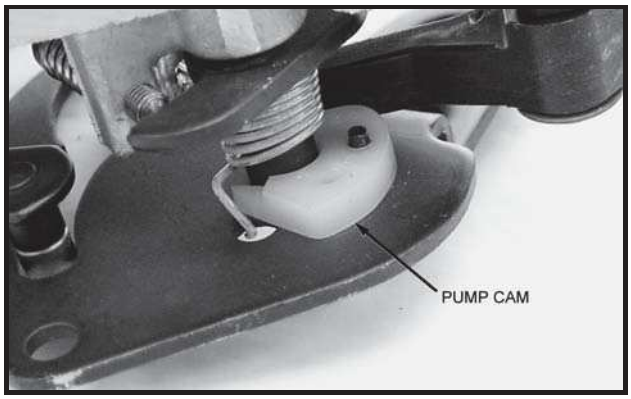

Figure 8

1. Change pump shooters until the smallest diameter nozzle that provides the crispest response is found.

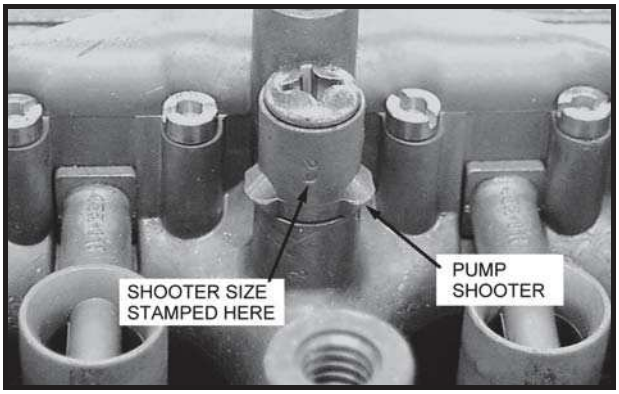

Figure 9

2. Then change the pump cams and locations until the right cam is found that provides even more response.

3. Finally, change the pump shooter once again, until the crisp response is maximized.

NOTE: If a nozzle size is desired that seems "in between" the nozzle sizes provided, then the nozzle can be drilled to the desired size by using a wire drill held in a pin vise.

4. At this point, there should be no bogs, flat spots or black smoke (indicating excessive richness) when accelerating at wide open throttle from a standing start.

VACUUM OPERATED SECONDARY THROTTLES:

Many people have the misconception that opening the secondary throttle plates sooner will provide increased performance and quicker drag strip times. Others think they must "feel" a kick when the secondaries engage. Still others believe that they should disconnect the vacuum diaphragm and make the secondaries open mechanically.

Let's discuss these points in a reverse order. First, if we could make our vacuum operated secondary carburetors perform better by opening the secondaries mechanically, it would be to our advantage to do so since all that vacuum actuating hardware is expensive and requires much time and money to calibrate. Mechanical secondary carburetors all utilize a pump shot to prevent bogging when the secondaries are opened. Secondly, those

who “feel” a kick when the secondaries engage are actually feeling a flat spot during initial acceleration because the secondaries have already begun to open and have weakened the fuel delivery signal to the primary boosters. The engine is struggling to increase speed and what they actually feel are the secondary nozzles “crashing in” as the engine finally reaches the speed where it provides the proper fuel delivery signal to primary and secondary venturi. Third, opening the secondaries early causes the situation described above. The secondaries must not open until the engine requires the additional air. This allows torque to increase along the peak torque curve. Performance is compromised less by holding the secondaries closed a little longer than by opening them a little too soon. If the opening rate of the vacuum operated secondaries is properly calibrated there should not be a “kick”, only a smooth increase in power should be felt.

In general, heavier cars require stiffer secondary diaphragm springs than light cars. Air cleaner configuration and restriction plays an important part in spring selection also, so make sure to use your air cleaner when evaluating your vehicles performance after each change. **DO NOT** expect to “wing” the throttle and see the secondary begin to open. If they do they will probably open too soon. Secondaries should open only when the engine is under a load. **DO NOT** clip a spring in an effort to make a spring lighter so that the secondaries will open sooner. Strange as it may seem, clipping springs actually increases spring rate and will delay opening. So in order to tune the secondaries follow the steps below. The secondary springs are available from your local Holley retailer.

1. All vacuum secondary **4150 HP Pro-Series** carburetors come with quick change vacuum secondaries. Remove the two screws holding the spring over to the vacuum secondary housing.

2. Remove the secondary spring cover. The spring will be attached to the cover. Avoid damaging the diaphragm under this cover.

3. Remove and change the spring. The stiffer the spring, the later the secondaries will open. The lighter the spring, the earlier the secondaries will open.

4. Reassemble in reverse order. Avoid damaging the diaphragm between the secondary housing and the secondary spring cover.

JETTING (MAIN JETS):

Due to varied applications that a universal performance carburetor will work with, no additional tuning jets have been included. However, a few tips on jetting are provided to help you understand their purpose. Holley’s Quick Change Fuel Bowls are recommended if repeated changes or experimentation with the main jets will be performed.

- Out of the box jetting is extremely close for most applications.
- In most cases it will be unnecessary to increase jet size more than four numbers greater than out of the box jetting. However, exceptions could arise when the carburetor is mounted on a very large volume, plenum-ram manifold.
- Carburetors are calibrated at 70° at sea level. Decrease the jet size one number (approx. .002) for approximately every 2000 ft. increase in altitude. Increase jet size one number for every 35° drop in temperature.
- Holley jets are broached, flowed and stamped according to flow rate. **Never drill jets**, this seriously alters flow characteristics. Stamped numbers are reference flow numbers and **DO NOT** indicate drill size.
- Spark plugs provide the best indication of proper jetting. Allow plugs to cool before jumping to conclusions.
- **Alcohol jets:** Holley alcohol jets are required with the following HP carburetors: 0-80498-1 950 CFM and 0-80535-1 750 CFM. These carburetors are built with unique metering blocks designed to accept the physically larger size of the alcohol main jet. Two lengths are available: a "standard length" jet and a "extended" length jet. The standard length jet can be used with a stock unmodified float; the extended length jet is like a jet with a built-in slosh tube, and must be used with a special "notched" float, for clearance. Holley has such a notched float available under P/N 116-11.

Use the root jet part number "122-" followed by the suffix "Jet Number". The following sizes are available:

Basic Part No. 122-								
Standard Length Jet No.	Extended Length Jet No.	Drill Size	Standard Length Jet No.	Extended Length Jet No.	Drill Size	Standard Length Jet No.	Extended Length Jet No.	Drill Size
132	1132	.132	150	1150	.150	172	1172	.172
136	1136	.136	152	1152	.152	176	1176	.176
138	1138	.138	154	1154	.154	180	1180	.180
140	1140	.140	156	1156	.156	184	1184	.184
142	1142	.142	158	1158	.158	188	1188	.188
144	1144	.144	160	1160	.160	192	1192	.192
146	1146	.146	164	1164	.164	196	1196	.196
148	1148	.148	168	1168	.168	200	1200	.200

NOTE: A special Alcohol Jet Kit, P/N 36-201 is also available. This kit consists of 4 of each of the 24 alcohol jet sizes that range from .132" to .200". These jets will not fit the standard Holley metering block.

AIR BLEEDS:

WARNING! Adjustment of the air bleeds is not recommended. A competent mechanic with a complete and thorough knowledge of carburetors, fuel systems, and engine requirements should only perform air bleed adjustments. Failure to follow these recommendations may result in a lean fuel/air mixture causing severe engine damage, property damage, serious injury, and/or death.

WARNING! Air bleed sizes should not be adjusted more than six (6) sizes in any one direction from the original air bleeds as shipped from Holley. Air bleed adjustment beyond six (6) sizes could result in a lean fuel/air mixture causing severe engine damage, property damage, serious injury, and/or death.

Experimenting with air bleeds is not recommended and should only be attempted by an expert carb tuner. Countless hours of testing have been performed on expensive flow stands to obtain the proper bleed size for a given calibration. It is unlikely that a better air bleed calibration can be obtained, however the **4150 HP Pro-Series** are equipped with removable air bleeds. Here is some basic knowledge of how air bleeds work.

The main or high-speed air bleeds affect the entire range of the main-metering system. The purpose of the main metering system and main air bleeds is to emulsify the fuel before entering the discharge nozzle to be discharged into the air stream in the venturi. The fuel/air mixture becomes leaner as air bleed size is increased. Decreasing the size of the main air bleeds will decrease pressure across the main jet, which in turn will pull more fuel through the main system creating a richer fuel/air mixture. The main or high speed air bleeds also act as an anti-siphon or siphon breaker so fuel does not continue to discharge or dribble into the venturi after airflow is reduced or stopped. At high speeds the fuel/air mixture must be on the rich side to prevent damage to the engine.
The idle system supplies fuel at idle and low speeds. The idle system requires a richer mixture than at cruise speed. Unless the idle mixture is richer a slow and irregular combustion will occur known as a rough idle. Decreasing the idle air bleed size richens the idle mixture by increasing the pressure drop in the system. Increasing idle air bleed size leans the idle mixture by reducing the pressure drop across the idle air bleeds. The same conditions can be created by backing out the idle mixture screws, which will increase the pressure across the idle air bleeds, pushing more fuel from the idle well creating a richer fuel/air ratio. The Idle mixture screw is the only adjustment recommended for controlling the idle fuel/air mixture richness or leanness.

NOTE: See Figure 10 for air bleed locations and identification. It is recommended that all jet sizes be documented before any tuning of the air bleeds or main jets is started. Below is a chart for recording the jet and air bleed sizes for your 4150 HP Pro-Series carburetor as shipped from Holley. Should you adjust the air bleed size or main jet size, this chart will allow the tuner to return the carburetor to the original jetting. Please place this information in a safe place along with any other documentation for your carburetor.

P/N	*PRIMARY JETTING*			*SECONDARY JETTING*		
	Main	**Idle**	**High Speed**	**Main**	**Idle**	**High Speed**
0-80507-1						
0-80540-1						
0-80575						
0-80541-1						
0-80528-1						
0-80529-1						
0-80535-1						
0-80576						
0-80509-1						
0-80511-1						
0-80496-1						
0-80498-1						
0-80577						
0-80513-1						
0-80514-1						

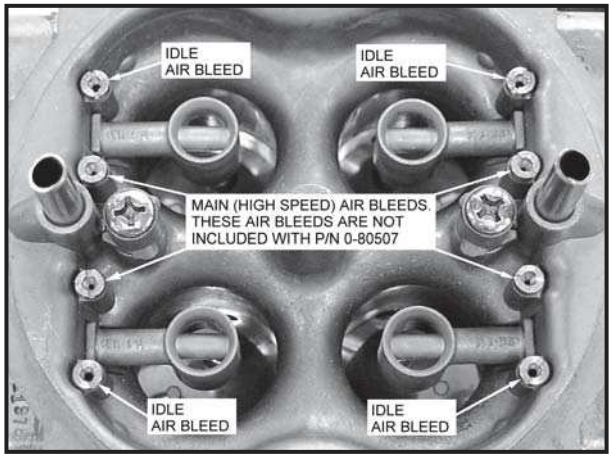

Figure 10

POWER VALVES:

The number stamped on a power valve, such as 65, indicates the manifold vacuum below which the power valve is operational. In this case, all manifold vacuums below 6.5" Hg., the power valve is operating. Generally, a 65 power valve is sufficient for most high performance applications that have a manifold vacuum of 12" Hg or higher. However, some problems can result with radically cammed, full-race machines equipped with automatic transmissions. These vehicles often "idle" at 2000 rpm, approx. 6.0" Hg. At this point the main nozzles are starting to feed and richen the mixture (supplied by the power valve) and the engine will probably "load up". To correct this problem, install a 45 or 35 power valve. If the engine has a manifold vacuum of 12" Hg or less, a good way to determine power valve size is take the manifold vacuum at idle and divide that number by two. The answer is the power valve size. This will provide idling and proper fuel flow under wide open throttle conditions when manifold vacuums seldom rise above 1" Hg.

SLOSH TUBES:

Slosh tubes can be used in the secondary jets to prevent the secondary main jets from being uncovered as fuel rushes to the back of the fuel bowl during extreme accelerations.

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Fax: 1-270-781-9772
For online help, please refer to the Technical Information section of our website: www.holley.com

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