INTRODUCTION

Your Edelbrock Performer RPM Series Q-Jet carburetor was calibrated using Edelbrock Performer RPM Power Packages. The carburetor metering was developed on Edelbrock engine dynamometers, chassis rolls, and a variety of development vehicles. Although in most applications you will not need to recalibrate your carburetor, you may wish to change the factory calibration to best meet any unique needs of your engine.

The following manual consists of 2 sections; Theory of Operation and Tuning Procedure. Upon review of Section 1, Theory of Operation, you will be prepared to develop your own individualized calibration. Section 2, Tuning Procedures will take you through a step-by-step procedure that will enable you to achieve a desirable calibration. For added ease of tuning, a Calibration Reference Chart for your carburetor has been included.

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SECTION 1: THEORY OF OPERATION

BASIC ENGINE REQUIREMENTS

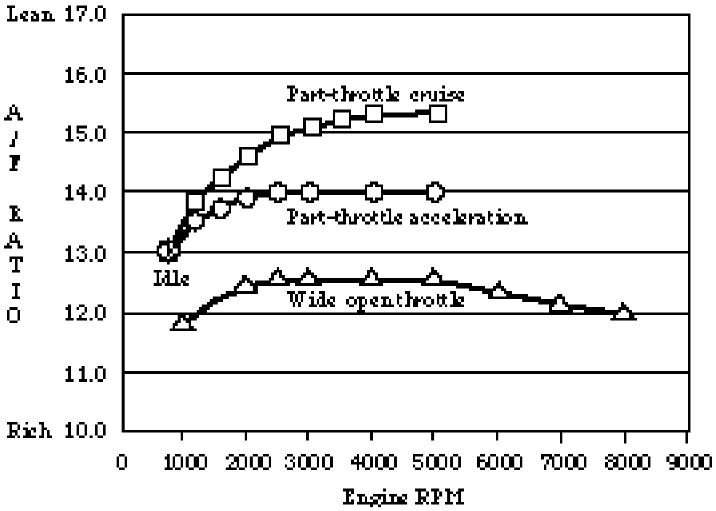
The spark ignition 4 cycle engine burns a mixture of AIR and FUEL. The air is controlled by the driver's operation of the throttle. The fuel is mixed with air by the carburetor. The ratio of air to fuel is the AIR/FUEL Ratio (A/F). This is a ratio by weight; if 12 pounds of air are combined with 1 pound of fuel the A/F is 12:1, or more commonly, A/F = 12.

Despite the enormous variety in engine designs, virtually all (spark - ignition 4 cycle) engines have very similar A/F Ratio requirements. For fully warmed up engines, the range of A/F is:

A/F RATIO CHARACTERISTICS

5	RICH BURN LIMIT: Combustion is weak / erratic.
6-9	EXTREMELY RICH: Black smoke and low power.
10-11	VERY RICH: Some supercharged engines run in this range at full power as a means of controlling detonation.
12-13	RICH: Best power A/F: Unsupercharged WOT (Wide Open Throttle).
14-15	CHEMICALLY IDEAL: At 14.6 the A/F is at the theoretical ideal - no excess fuel or oxygen after combustion. Good A/F for part-throttle cruise and light to moderate acceleration.
16-17	LEAN: Best economy A/F ratio. Borderline for part-throttle driveability (worse than borderline if EGR is used).
18-19	VERY LEAN: Usual lean limit (driveability).
20-25	LEAN BURN LIMIT: Varies with engine and system.

Even though engines will run anywhere between 5 and 25 A/F, the usual target values for an unsupercharged engine are in a fairly narrow range. (Fig. 1). A/F is about 12.5 for WOT and 14.0 to 15.5 at part throttle cruise. An intermediate value of 13.5 to 14.0 is usually used for mid-range power (short of WOT).



Typical Engine A/F Ratios

Figure 1

METERING SYSTEMS

The Edelbrock carburetor has 3 basic systems that meter fuel to the engine: The Idle System, Primary Main System, and Secondary Main System. By understanding the operation of each you will be better prepared to calibrate your carburetor.

Idle System: The Idle System delivers 100% of the idle fuel. It also meters fuel at off-idle throttle positions; a large percentage at just off idle decreasing to a minor influence as the throttle is opened wider. The idle setting is critical to both a smooth idle at proper rpm and to a smooth transition to part-throttle operation.

Fuel is drawn through the Idle System (Fig. 2) by intake manifold vacuum that is communicated at the Idle Discharge Hole (A) and the Off Idle Discharge Port (B). Fuel in the bowl passes through the Primary Main Jet (PMJ) and Primary Metering Rod (PMR) restriction (C) into the Primary Well. It is picked up in the main well by the Idle Tube (D), and crosses over to the idle down channel. At this cross over point, additional air is mixed with idle fuel from the side idle air bleed. The mixture continues through the Idle Channel Restriction at the top of the down channel, past the Lower Idle Air Bleed (E) and Off Idle Port (or Transfer Slot), where it is further mixed with air. The idle mixture then moves past the adjustable Idle Mixture Screw and into the throttle bore through the Idle Screw Port. The Transfer Slot is a large air bleed when the throttle is closed, but as the throttle is opened the slot is exposed to manifold vacuum and becomes a discharge port for Idle System fuel. The Idle Screw Port is a variable discharge restriction that is adjusted by the engine tuner to achieve the desired A/F Ratio at idle.

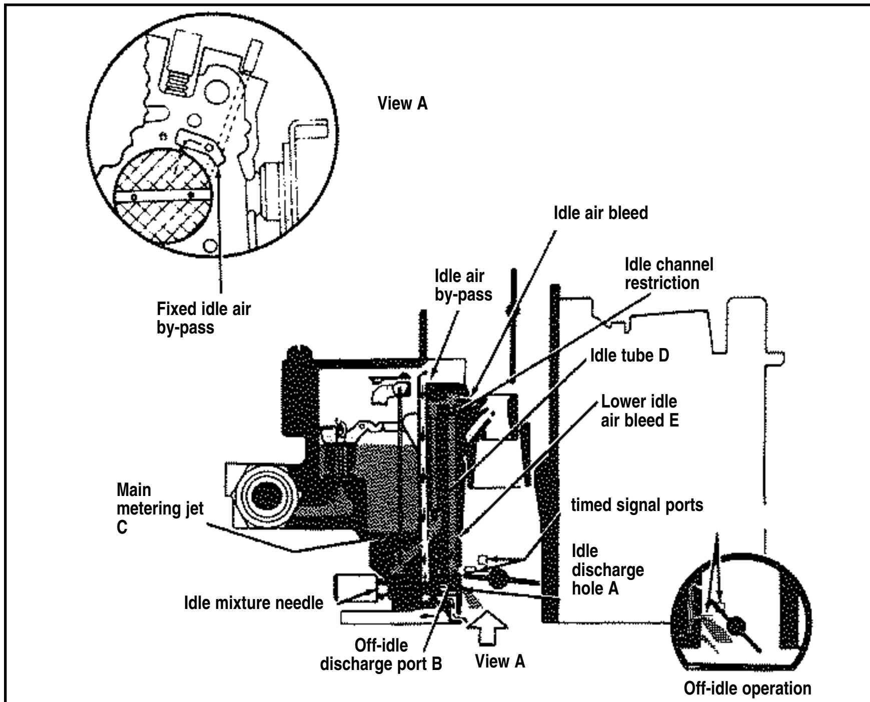


Figure 2– Idle System

Primary Main System: The Primary Main System delivers an increasing percentage of the fuel as the throttle opens (phasing over the Idle System) and varies fuel delivery in response to airflow and manifold vacuum.

Fuel is drawn through the Main System (Fig.3) by the pressure drop that occurs when the incoming air flow must increase in velocity in order to pass the reduced throat area at the Main Venturi (A) and the Boost Venturi (B). This pressure drop (or suction) is communicated to the system by the Main Discharge Nozzle, a brass tube that opens into the inside of the Boost Venturi (C).

The fuel must pass through the restriction at the PMJ (Primary Main Jet) and PMR (Primary Metering Rod), (D). The rod extends through the jet, reducing the amount of area available for fuel flow. As the diameter of the rod is increased, the fuel flow is diminished, and vice versa.

After the rod and jet, the fuel enters the Primary Main Well, which extends up to the nozzle area. Fuel drawn up the Well is further mixed with air from bleeds located at the top of the well and nozzle tip. When the pressure drop becomes great enough (due to manifold vacuum or flow velocity) the fuel will be drawn into the Boost Venturi through the Nozzle and discharged into the airstream.

The fuel flow rate in the Main System is proportional to the air flow rate; as air flow increases, from either an increase in throttle opening or an increase in engine speed at the same throttle opening, the fuel flow increases at nearly the same degree.

At higher engine loads, such as in heavy part throttle acceleration, there is a need for a richer mixture. This enrichment is provided by the Metering Rod and Step-Up function (Fig. 3) A drilled passage communicates manifold vacuum to the underside of the Step-Up or Power Piston (E). This vacuum tries to hold the piston toward the bottom of it's bore against the Adjustable Part Throttle (APT) stop, by working against the force of the Step-Up Spring (F).

When the manifold vacuum is high, indicating a low load such as idle, cruise, or light acceleration, it is able to overcome the force of the Step-Up Spring and hold the Step-Up Piston at the bottom of it's travel. At this point, the large diameter portion of the rod tip is positioned in the jet, reducing the area for fuel flow, thereby creating the lean A/F Ratio desired for idling and cruising (low load/low power). This portion of the rod is known as the “Lean Step” of the rod.

When the manifold vacuum is low, indicating a high load such as heavy part throttle or WOT acceleration, the Step-Up Spring is able to force the Step-Up Piston to the top of it's travel against the Piston retainer. This action is called “Power Mode Staging”. The small diameter portion or tip of the rod is now positioned in the jet, increasing the area for fuel flow, thereby creating the rich A/F Ratio desired for heavy acceleration (high load/high power). This is known as the “Rich Step” or “Power Tip” of the rod.

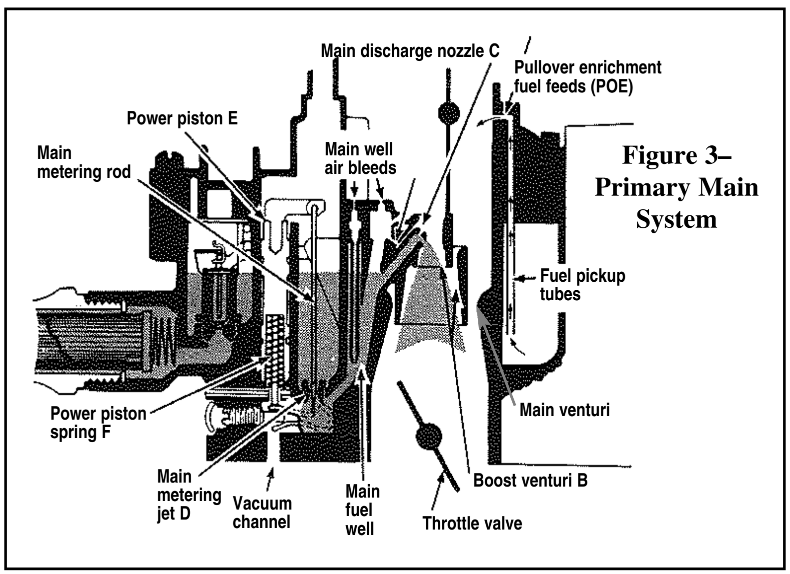


Figure 3– Primary Main System

Secondary Main System: The Secondary Main System delivers fuel only when the secondary throttles are open. It ensures that fuel delivery varies with air flow. (Fig.4)

The Secondary Throttles (A) begin to open when the Primaries reach about 60% of their travel. The Primary and Secondary throttle plates arrive at WOT at the same time.

As the secondary throttles open, the Air Valves (B) are exposed to manifold vacuum, which opens the air valves by overcoming the force of the torsion spring on the end of the Air Valve Shaft.

Fuel flows from the float bowl past the restriction at the Secondary Metering Rod (SMR) and jet-like Secondary Orifice Plate, up the Secondary Well where it is mixed with air from the Secondary Main Well Tubes (C) and continues to the Secondary Discharge nozzle, where the fuel is discharged beneath the Secondary Air Valve into the air stream (D).

The air valve opening increases as engine RPM and or secondary throttle opening increase. The Air Valve Shaft has a plastic cam attached to it. As the air valve opens, the shaft and cam rotate. As the cam rotates, it lifts the SMR out of the orifice plate via the Metering Rod Hanger and lever which follow the cam. As the SMR is tapered, the area open to fuel flow increases as the rod is lifted. This ties air valve position, which is determined by air flow, to fuel flow area, thereby maintaining the desired A/F Ratio as speed and load vary.

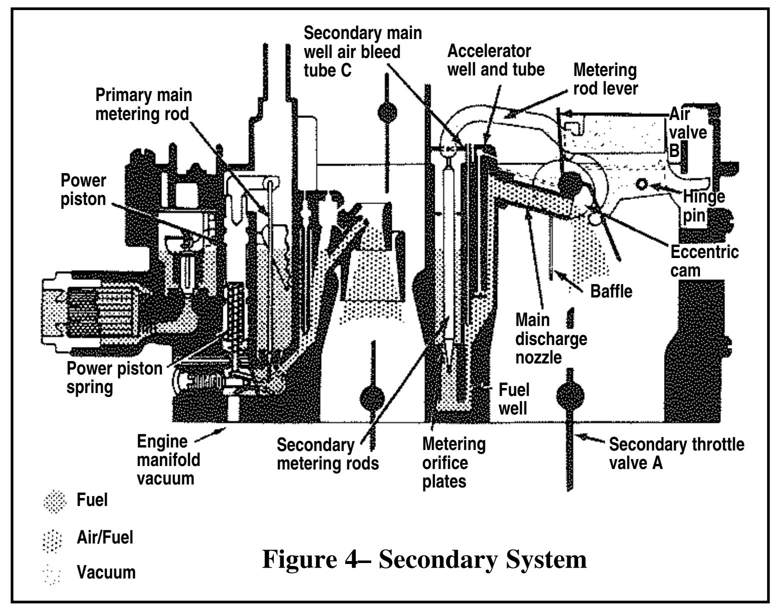


Figure 4– Secondary System

TRANSIENT CONTROL SYSTEMS

In addition to the three (3) basic Metering Systems, there are two (2) Transient Control Systems; The Pump System and Secondary Accelerator Well System.

Pump System: When the throttle is open rapidly, the air flow through the engine will increase immediately. The fuel, since it is much heavier than air, will "lag" behind. This contributes to a temporary lean A/F condition. Regardless of cause, a solution is to temporarily enrichen the A/F Ratio by mechanically pumping a small quantity of fuel into the throat of the carburetor (Fig. 5). The Edelbrock Q-Jet has a piston that draws fuel into the pump cavity past the plunger lip-seal when the throttle is closing. Upon opening, the lip-seal seats, allowing the plunger to force the fuel through a one way valve, the Pump Discharge Ball (A), and the Pump Jets (B) into the primary throats.

The pump plunger is not driven directly by the throttle, but through an intermediate Pump Duration Spring (C) that extends the duration of the "pump shot" past the time the throttle stops moving. The Edelbrock Q-Jet has an external pump lever with two (2) hole locations for link attachment providing 2 distinct pump delivery curves. This is further explained in "Calibrating the Pump".

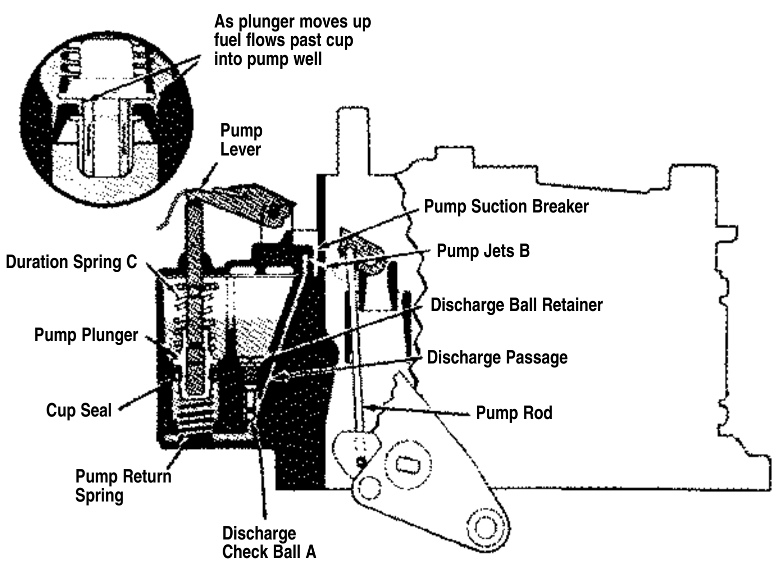


Figure 5– Accelerating Pump System

Secondary Accelerator Well System: When the secondary throttles are opened rapidly, fuel "lag" is present as described above, even though the secondary system employs an air valve to modulate sudden increases in air flow. Temporary enrichment here is provided by the Secondary Accelerator Wells, (Fig.4-E) which are located on either side of the float bowl, directly in front of the secondary throttle bores.

When the air valve just begins to open, the leading or upper edge of the air valve sweeps past the accelerator well discharge port, exposing the port to manifold vacuum. The volume of fuel in the well is immediately discharged into the air stream, providing enrichment when the secondaries are engaged. Fuel in the well is replenished through an orifice from the float bowl, which also provides a steady but minimal flow of fuel into the secondary airstream via the accelerator well discharge port.

EXTERNAL DEVICES

The function of your Edelbrock Performer RPM Q-Jet is also dependent on several external devices; the fuel pump, fuel filter and air cleaner.

Fuel pumps and pressure: Avoid extremes in fuel pressure. At IDLE, there should not be more than 6.0 psi. With most fuel pumps the minimum fuel pressure is encountered at high RPM and WOT. Fuel pressure should not drop below 2.0 psi. If it does, a fuel pump with more capacity may be required. Note that some later model vehicles have mechanical pumps that will give more than 6.0 psi at IDLE. The vehicle will perform well, but may be prone to stalls on quick turns and stops with the clutch disengaged. If this problem occurs, check the fuel pressure. If it is more than 6.0 psi at IDLE, it should be reduced through the use of a regulator, such as Edelbrock #8190, or by creating a restricted bypass bleed to the fuel return line. Edelbrock Street Fuel Pumps are highly recommended for all Edelbrock Performer Series carburetor installations.

Fuel Filter: Always use a fuel filter. Q-Jet carburetors have an internal filter located behind the inlet fitting. For racing or maximum performance, the internal filter can be replaced with a large in-line filter such as Edelbrock #8873, located between pump and carburetor. Note that a good filter is large in area, so it may be able to transmit a significant amount of heat to the fuel. It is good practice to keep the filter away from heat and not allow it to come in contact with any part of the engine.

Air Cleaner: Your Edelbrock carburetor was originally calibrated with an open element low restriction air cleaner configuration; a 14"x 3" Edelbrock Signature Series unit. It was also evaluated for proper metering and vehicle performance using a variety of other air cleaner designs and will perform as intended with nearly any reasonable air cleaner design. While the Edelbrock Performer Series carburetor does not exhibit excessive sensitivity to the air cleaner, there are several guidelines you should follow:

* Running without an air cleaner is strongly discouraged for a street driven vehicle. Dirt and varnish will accumulate in critical bleeds and upset the metering. Dirt and debris may easily get into the fuel bowl through the bowl vents and large bleeds and cause a multitude of problems.

* Any calibration should be performed with the air cleaner in place. Depending upon the air cleaner used, the metering typically can and will be shifted with it in place.

— Large 14"x 3" open element air cleaners, such as Edelbrock Elite Series, Signature Series and Pro-Flo air cleaners, are extremely efficient. Flow bench tests show virtually no loss in air flow. Also this design should cause no change to fuel metering.

— A 10"x 2" open element design will cause some air flow restriction, but little change to fuel metering.

— Elements smaller than 10"x 2" are more restrictive and have the most effect on metering. The fuel metering at WOT will be shifted, especially at higher RPM.

* If you have a dual purpose vehicle that is sometimes used in competition without an air cleaner, it may be necessary to have two separate calibrations. If you are running a smaller air cleaner and have optimized the WOT with it in place, do not be surprised to find that the metering shifts when the air cleaner is removed. This may require you to recalibrate with jets or rods at the drag strip.

* **DO NOT** allow the vehicle air stream to blow across the top of the carburetor such as on an open body car or a full body car with a tunnel ram manifold [carburetor(s) through the hood]. The flow of air across the top of the carburetor will result in an upset to the fuel metering that cannot be accommodated by recalibration since the changes to A/F Ratio will be different for every vehicle speed.

SECTION 2: TUNING PROCEDURE

Before proceeding please ensure you have installed your Edelbrock Performer Series carburetor according to the Carburetor Installation Instructions included with the carburetor.

CAUTION: Be alert to carburetor flooding when fuel is first applied. Flooding can be caused by dirt, small particles of hose cuttings, floats and needles which have settled during shipping, or by other debris in the fuel system “washed” loose as the fuel rushes in to fill the bowl. Each Edelbrock Performer Series carburetor is tested in the factory so flooding is rare. However, for safety sake please observe this caution. When the fuel pump is turned on or the engine is first started, watch closely for signs of flooding. If flooding is apparent, tap the body of the carburetor lightly with the wooden handle of a small hammer. If flooding continues, stop the engine. Clean up any raw gasoline and refer to the “Trouble Shooting” section of the Owner’s Manual.

REVISING THE CALIBRATION

The Edelbrock Performer RPM Q-Jet is designed to allow quick and easy changes to the fuel metering. Virtually any change to metering can be performed without removing the carburetor from the manifold or disconnecting the fuel line. The most common changes can be made in minutes without removing the airhorn (bowl cover/carb top).

To help you calibrate your carburetor, a Calibration Reference Chart has been designed for the Performer RPM Q-Jet.

This chart (pages 28-30) consists of two sections: A Calibration Table and a Rod/Jet Reference Chart for the primaries, plus an “Effect of Rod and Hanger” graph for secondary calibration.

After reading the Calibration procedures, the next step is to look at the Calibration Table. Determine if you would like to go richer or leaner in the Cruise Mode and do the same for the Power Mode. Select the number that is closest to the intersection of your Cruise and Power Mode selections. This is your calibration reference number. Now refer to the Rod/Jet Reference Chart. Locate your calibration reference number to determine the rod/jet combination for your application.

Likewise, determine if you would like to go richer or leaner on the secondary side, and use the graph to select the appropriate secondary rod and rod hanger for your for your application.

Before attempting to revise the calibration, be sure that the engine is in a sound state of tune. All ignition items must be in proper working order, including reasonably fresh spark plugs of the correct heat range. Timing should be properly set and the air and fuel filters should be clean.

Proper fuel pressure should be verified and cracked or brittle vacuum lines should be eliminated. Many so-called "carburetor calibration" problems have been traced to another part of the engine system that was not functioning properly.

Parts and Equipment: Aside from ordinary hand tools, the following items are recommended.

- Edelbrock #1992 Race Calibration Kit, or other rod and jet assortment.
- Edelbrock airhorn gasket(s).
- Tachometer. If vehicle is not so equipped, a dwell meter type will be adequate. If neither is available, you will be able to use the speedometer in place of the tach for some procedures, but it will not be as convenient.
- Vacuum Gauge. Without a vacuum gauge to read the engine manifold vacuum, some of the calibration procedures will be more difficult.
- Tools. Be sure to have the following items: Torx T-9, T-10, T-20 and T-25 drivers or bits. You will need a small hammer and 1/16" flat punch.

Changing Components: Secondary rod and hanger changes as well as primary cruise adjustments can typically be made in less than 5 minutes. First, the secondary metering can be revised by removing the T-9 screw that retains the secondary hanger, and lifting the rods and hanger out of the carburetor. Slip the rods out of the hanger, and replace the rods or the hanger with the appropriate pieces for your calibration. Carefully lower the rod/hanger set into place (rods through the airhorn gasket into the bowl and through the orifice plates in the bottom of the bowl). Replace the T-9 retaining screw.

To adjust the primary cruise A/F, you do so by adjusting the depth of the primary rod in the primary jet. To accomplish this, (after reading "Calibrating the Part Throttle") lift the air cleaner gasket off the carburetor and remove the hex plug just in front of the choke tower. You now have access to the A.P.T. or adjustable part throttle. With a small screw driver, you may adjust leaner by turning the APT screw clockwise, or richer by going counter clockwise, based on the Calibration chart and desired rod/jet combination for your application. Be gentle with the APT screw as it is by necessity quite small. Replace the hex plug and air cleaner gasket. DO NOT use excess force on the plug as it will damage the airhorn casting! Install plug flush with the surface of the carb or slightly below, just enough to be snug.

To replace primary main jets, primary rods, step-up springs, or adjust the float, you must remove the airhorn as follows.

1) Remove accelerator pump arm. Push roll pin inward with 1/16" flat punch until arm is free, it will "pop up". DO NOT punch pin all the way to the choke tower, leave space to insert a screwdriver behind pin for reassembly. If pin gets pushed to far and cannot be pried back, cut it with a side cutter and push remainder all the way through. Replace with new pin available in Edelbrock Race Calibration Kit or Hardware Kit.

2) Remove secondary rod and hanger as described above.

3) Remove Vacuum Break Diaphragm (see exploded view), by removing the two screws from the side, unplug vacuum hose, and slide link out of air valve lever.

4) Remove screw and lever from choke shaft.

5) Remove airhorn screws, Seven (7) are T-25 and two (2) are T-20 located inside the choke tower.

6) Lift airhorn off the mainbody, be careful with the tubes pressed into airhorn.

7) Remove gasket from main body, be very careful where primary metering rods and hanger go through slot in gasket. Discard gasket, a new one is required.

8) Remove primary rod/hanger/piston assembly. To do so, depress piston all the way down and let it pop up against the plastic retaining collar. On a brand new carburetor, you may have to do this ten times or more! Don't give up! BUT ABSOLUTELY DO NOT PULL ON HANGER with pliers or pry with a screwdriver!!!!! Just be patient, it will come loose. After the first time, it usually comes apart with 3 or 4 pops. Lift rod/hanger/piston out when free.

9) Lift out black plastic "bowl stuffer".

10) Lift out float and inlet needle.

You now have access to the step-up spring, and the primary main jet.

After making desired changes, re-assemble in reverse order to the above, following a few simple procedures;

1) To re-install the rod/hanger/piston unit, carefully guide the rods through the primary jets. Depress the piston down and hold. With the other hand, line up and start the plastic collar into place. Once partially in place, it will retain the piston against the step-up spring. You can now (using the same punch as used to remove accelerator pump arm) GENTLY tap the plastic retaining collar flush with the main body.

Again, follow reverse order of above to re-assemble.

When you get to airhorn screws, install and tighten the two (2) T-20 screws inside the choke area first. This locates the airhorn in the proper place, then install the remaining seven (7) T-25 screws.

To re-install the accelerator pump arm, insert it into the guide slot. With a small screwdriver, pry the roll pin back into position through the pump arm. Push the arm down against the force of the accelerator pump return spring to line up the hole in the arm with the roll pin. If the pin was pushed out to far to pry back, or cannot be returned to position for some other reason, cut and replace as described in #1) under disassembly.

IDLE MIXTURE

The Edelbrock Performer RPM Q-Jet has conventional idle mixture screws (IMS) that provide a leaner A/F when turned clockwise and richer when turned counterclockwise. The idle airflow is controlled by a conventional screw that opens the primary throttles. The following procedure should be used to set the idle mixture and speeds.

1) Fully warm engine and ensure choke is fully open.

2) Air cleaner in place.

3) Set desired speed with air screw.

4) Adjust the IMS on ONE side to get the maximum possible RPM.
Do not go rich beyond the maximum speed point.

5) If the above changed the idle speed more than 40 RPM, then readjust the speed.

6) Adjust the OPPOSITE of that in step 4 to get maximum RPM.

7) Reset the speed.

8) Carefully trim each IMS to again get the maximum idle RPM.

9) Go leaner just enough to get a 20 RPM drop in speed.

10) Reset the desired RPM. This is a Lean-Best Idle Set. Setting richer than this will not improve idle Quality or performance, but could tend to foul spark plugs.

Winter Fuel Idle Sets: During the winter months (in most parts of the country) the local fuel will be a "winter" blend that is very volatile, as an assist to cold engine starting and driveability during warm-up. The high volatility can allow excessive vaporization of the fuel if the vehicle is operated in a heated area such as a garage. This can result in idle set problems due to excess vapor entering the carburetor throats via the internal bowl vents. The idle can be erratic and seem not to hold a set. A solution to this problem is to perform the final idle settings outdoors after the vehicle has been stabilized by driving several miles.

Long Duration Camshaft: If the engine has a fairly radical camshaft it may require an excessive amount of throttle opening for idle and/or have low idle vacuum levels.

To minimize the above cam effects, several things can be done:

1) If the distributor has vacuum advance, connect it directly to manifold vacuum. The idea is to run as much spark advance at idle as possible. If you are not able to employ vacuum advance, then the mechanical curve should have a low limit, which will allow plenty of initial spark advance.

2) Measure the manifold vacuum at idle. If it is below 6" hg, there is a good chance the metering rods are in the up or rich position. When combined with a high idle airflow rate, this can cause the nozzles to discharge fuel at idle. Use a weaker step-up spring to keep the rods down at idle (see Step-UP calibration).

CALIBRATING THE WIDE-OPEN-THROTTLE (WOT)
Part 1: RODS

The best place to perform your WOT calibration is on a chassis dyno. If one is not available then consider a safe, legal driving space, such as a drag strip where you are given E.T. and MPH data.

1) Select an RPM range to use in evaluating the WOT power. As a rule, use the highest 50% of the real power band. If your engine makes good power to 5000 RPM, then 2500-5000 is a good range. If peak power is at 6500, then 3500-6500 would be a good pick. Do not use an RPM level higher than the engine's useful power band.

2) Accelerate at WOT from 1000 RPM below the range you have selected to a few hundred over the range. Time the acceleration with a stop watch, and time only the interval while the engine is "sweeping" through the selected range. Make enough timed accelerations to get a good average that is not affected by wind or grade.

3) Refer to the "Effect of Rod and Hanger" graph on page 30. Select the richest SMR. You will find they are only 4% richer than the base SMR. The Edelbrock Performer RPM Q-Jet is intended to be a performance carburetor and is calibrated quite rich to begin with.

Being a "spread-bore" type carburetor, the secondaries deliver close to 75% of the intake charge at WOT, therefore, the SMR has by far and away the most effect on WOT calibration, and the primary "Power Mode" metering would have to be exaggerated to make meaningful changes in WOT metering. Stay with SMR changes at this point,

Secondary Hanger selection will be addressed next.

4) Change to the indicated SMR. Perform timed accelerations as in step 2. Compare the times. Do not be surprised if there is no difference. After comparing times, refer to the following case that best describes your position:

Case 1: Faster than base calibration

Proceed to "CALIBRATING THE WOT part 2", with new SMR.

No difference, re-install original rods and proceed to part 2.

Case 2: Slower than base calibration

Go 2 steps leaner than the base and re-run step 4. Compare times. If faster, go leaner and re-run. If faster yet, go to part 2. If slower, go back richer to best performance. Go to Part 2.

CALIBRATING THE WOT
Part 2: HANGERS

Part 2 is tested in the same manner as part 1 except at lower RPM ranges. The SMR establishes A/F calibration at high RPM once the Air Valves are fully open. The hanger tailors the bottom of WOT where the air valves are in a transient condition. The point of full air valve opening can occur between 2500-4500 RPM depending on engine displacement, camshaft and manifold design, even with the same calibration settings. The air valve opening is also affected by the Air Valve Spring Adjustment, which will be covered in Calibrating the WOT part 3.

The Secondary Metering Rod Hanger positions the SMR in relation to the air valve rotation. The function of the secondaries is described in detail in "Theory of Operation".

The SMR will arrive at it richest point near the full opening of the air valve. The WOT RPM climb can begin just above idle speeds, especially on manual transmission vehicles. From this beginning point to fully open air valve attainment, the A/F can be individually calibrated once the high RPM is (SMR) is optimized. Two examples follow, one manual trans and one automatic.

Manual Transmission: Depending on camshaft, there are practical limits of how low an RPM the engine will pull at WOT. A fairly radically cammed engine will be unresponsive below 2500 for example. It is up to the vehicle driver to select a lower limit for his particular combination. An engine with useful power to 6500 RPM might be looked at in the 2500-4500 RPM range, where a 5000 RPM engine might be looked at in the 1500-3500 RPM range. With a manual transmission, select 2nd or 3rd gear, (use highest gear possible while keeping vehicle speed in a safe legal range). Start 250-500 RPM below your selected speed range, and go to 500 RPM higher, while timing the RPM "sweep". Make several runs, just as was done in part 1.

Automatic Transmission: With an automatic, this portion of the test is performed almost the same as with a manual. If the torque converter, camshaft and rear axle ratio are correctly matched, the drivetrain will form the lower boundary of the "sweep" RPM. Keep in mind too, if the engine/converter/axle ratio are poorly matched, all the carburetor tuning in the world will not "fix" it. With sufficient traction dead stop starts will work. Floor the throttle and watch the tach. The tach will jump from idle to an RPM near torque converter stall speed where it stabilizes then begins to pull as the car accelerates. About 200 RPM above this stabilization point is your bottom RPM where you start the stop watch. Accelerate past the RPM point you've selected to stop the watch, just like the other WOT tests so far.

If traction is a problem begin your timed runs from a low speed roll. Also avoid "Smashing the Gas Pedal" - BUT, be sure to achieve WOT quickly, before starting the clock. The idea is to prevent wheel spin from becoming a variable. Consistency from run to run is important!

The Edelbrock Performer RPM Q-Jet can be equipped from the factory with one of several hangers. Their purpose has always been to "fine tune" the WOT A/F calibration in production. This fine tuning involves hangers in minuscule .005" increments, which compensates for production tolerances. The #1992 Edelbrock Race Calibration Kit includes 5 hangers in .020" increments which allow you to make significant calibration changes.

Run your acceleration tests as described. Once you have your baseline established, proceed to go 2 steps richer (higher) with the hanger. Rerun and compare. If your times improve, go to the next richest hanger, and rerun again. If you see no improvement, you're done and can proceed to part 3, Air Valve Spring Adjustment. If you slow down, go to a leaner (lower) hanger than base and re-run. When you've found the optimum hanger you're ready to go to part 3.

CALIBRATING THE WOT
Part 3: AIR VALVE SPRING ADJUSTMENT

The last portion of the WOT calibration affects the opening rate of the Air Valve. The factory setting of the air valve spring is 1.0 or one full turn. Additional response to WOT may be gained by loosening the air valve spring tension on some installations.

The air valve spring tension is adjusted by changing the amount of wrap on the spring. This is accomplished by rotating the screw the spring is engaged to (Fig.6). Prior to adjustment, mark the position of the screw slot on the airhorn with a pencil for reference. If you lose the reference, it can be re-established by rotating the adjuster counterclockwise until the air valves begin to open, then rotate the screw clockwise until the air valves barely close. This is zero "0" turns. The Edelbrock Performer RPM Q-Jet has the adjuster turned one full turn clockwise from this point for example. (**CAUTION:** the air valves will "flop" open if the adjustment screw is simply released, at which point the spring and screw can fall out onto the intake manifold, requiring removal of the carburetor and turning it upside down to reassemble).

Release the lock screw (A) with a T-10 Torx, while holding the position of the adjuster screw (B) with a small conventional screw driver . After making an adjustment, tighten the lock screw before removing screw driver (see above "caution"). Start with the factory setting (1.0) and back off spring tension in 1/8 turn increments, until a bog occurs as described below, then tighten the tension (clockwise) until desired performance is attained.

The performance is quantified with the following procedure;

Test a). Behavior on maximum acceleration from a dead stop. The goal is immediate acceleration without bog or hesitation.

Test b). Hold vehicle in 1st gear at about 3000-3500 RPM, then go to WOT. Again solid acceleration is desired, with minimal hesitation and no bog.

However, in some situations such as a car set up for drag strip performance where low 1/4 mile ET as well as 60 foot times are the main goal, the optimum air valve spring setting for dead stop launch may result in a slight hesitation in the 3500 RPM test. This is not unusual for many carburetors when optimized for 1/4 mile use.

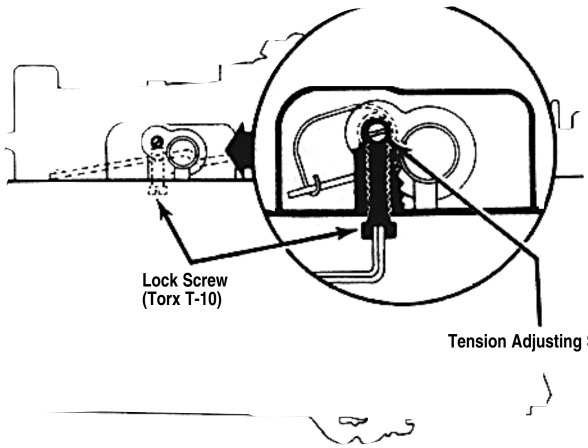


Figure 6– Air Valve Spring Adjustment

CALIBRATING THE PART-THROTTLE

The Adjustable Part Throttle (APT) feature in the Edelbrock Performer RPM Q-Jet allows easy calibration of the part throttle without change to the WOT metering. Cruise mode has roughly a 15 to 20% adjustability window, depending on the rod/jet combination. From the lean limit (fully clockwise), where the APT screw is "bottomed", seven full turns counterclockwise bring you to the rich limit where the range of authority runs out. Continued turning of the APT adjuster will not further enrich the calibration, however the APT screw will run out of threads and disengage perhaps requiring disassembly of the carburetor to correct. The Edelbrock Performer RPM Q-Jet is typically set at two (2) turns counterclockwise from the lean limit, and is the point of reference for a baseline.

Power Mode is calibrated via a jet change, which may or may not require a rod change to maintain the Cruise Mode. Major changes to the Power Mode may move the Cruise Mode window away from the baseline. See Calibration Reference Chart.

- **Cruise Mode:** The power output is low, Manifold Vacuum is High and the rods are down. These are steady state and light acceleration conditions.

- **Power Mode:** The power output is high, Manifold Vacuum is low and the rods are up. These are heavy but well short of WOT acceleration conditions.

As explained in the "Theory of Operation" the Step-Up function modulates the Primary Metering Rods between Cruise and Power positions.

The part-throttle calibration is more "individualized" than is the WOT. It is not measured in absolute numbers, but reflects the driver's feel for their particular combination.

Carefully evaluate the driveability with the carburetor at the calibration level developed from the WOT exercise. Drive at a variety of engine speeds and throttle openings looking for any flat spots or lean surge conditions.

Cruise Mode: If there are any surge or flat spot conditions in steady cruises or light accelerations, a lean condition probably exists. Adjust the APT two (2) turns counterclockwise from its current position. If it gets better but not completely fixed, keep going in the rich (counterclockwise) direction, but not more than 7 turns from full lean limit as described previously.

If the light throttle is satisfactory, try adjusting leaner (clockwise). As the APT is set from the factory at approximately 2 turns from full lean, you may have to go to a leaner rod. Once you find the onset of surge or flat spots, use the APT to enrichen just enough to drive well. This will give you optimum fuel economy from your vehicle, as well as keep spark plugs clean.

Power Mode: Accelerations at part throttle with low manifold vacuum (less than about 5" hg on a vacuum gauge) are metered by the Power Mode. Avoid calibrating this portion of the engine's operating range too lean as spark knock (detonation) and piston/valve burning can occur. If this mode has any lean driveability symptoms (surge or flat spots), it is too lean and should be recalibrated at least 1 stage richer.

CALIBRATING THE POWER MODE STAGING

The Step-Up function, which moves the Metering Rod to the Power Mode, is controlled by the Step-Up Spring. The base calibration has a spring which “stages” rich at 5" hg manifold vacuum.

If your vehicle has a mid-throttle driveability problem that is encountered as the throttle is gradually opened, but then goes away upon further opening, it may be possible to eliminate the lean spot by using a stronger Step-Up Spring. The available Step-Up Springs are listed in the following chart along with their respective “staging” point. It is best to select a new spring on the basis of vacuum readings, but in the absence of a gauge, try the strongest spring (highest vacuum rating) to see if the problem goes away. If the problem is cured by the strongest one, try the next weakest spring as well. If the strongest one does not help, then the problem is related to the A/F metering stage of either Cruise or Power Modes. Try changing the APT setting, or refer to the calibration chart to help select another combination.

SPRING COLOR:	Golden	Orange	Black	Bright Yellow
STAGING VACUUM:	4" hg	5" hg	6" hg	8" hg

A complete set of these springs is available as Edelbrock part #1994, and are included in Edelbrock Race Calibration Kit part #1992.

CALIBRATING THE PUMP

The Edelbrock Performer RPM Q-Jet has a high capacity accelerator pump, and as a performance carburetor, has the pump adjustment at maximum stroke. In the event this unit is installed on a mild small displacement (305/5.0L for example) engine, on which it will run just fine, a slight fuel economy benefit and crisper throttle response may be realized by decreasing the pump capacity. This is done by shortening the pump stroke and can be accomplished moving the pump link to the outer hole. To do this requires removing the accelerator pump arm by pushing the pin out (as described under “Changing Components”),
slipping the link out of the inner hole and placing it into the outer hole and
re-assembling.

CHOKE ADJUSTMENT

The Edelbrock Performer RPM Q-Jet has a fixed electric choke that requires little adjustment. The choke pull down dimension is .140” measured at the upstream or leading edge of the choke plate between the choke plate and choke tower casting (Fig.7). The de-choke or wide open unloader dimension is .170” measured in the same place as the pull down. To set the pull down, apply vacuum to the vacuum break diaphragm, at a temperature of 75°F or less. Since the choke cap is “fixed” in place, a cold (<75°F) carburetor is required so that the choke coil bi-metal (spring) supplies closing force to the choke plate. The de-choke is also measured at <75°F, by simply going to WOT (Engine Off!) to attain the dimension. De-choke is set by bending the small tab next to the fast idle speed screw.

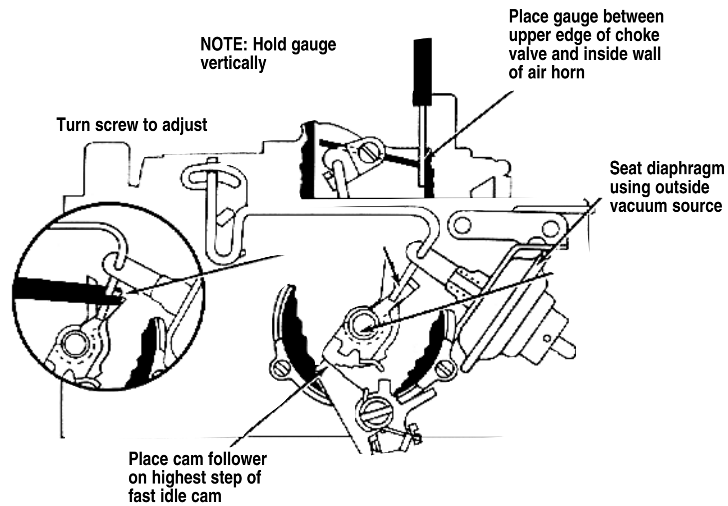


Figure 7– Choke Adjustment

FLOAT ADJUSTMENT

To properly set the float level in the RPM Q-Jet, remove airhorn as described in "Changing Components". Remove the rod/hanger/piston assembly and the bowl stuffer. Set float as shown in (Fig.8). The dimension is .300" from top of casting to end of float. Re-assemble in reverse order of disassembly. Be sure to replace airhorn gasket with new one.

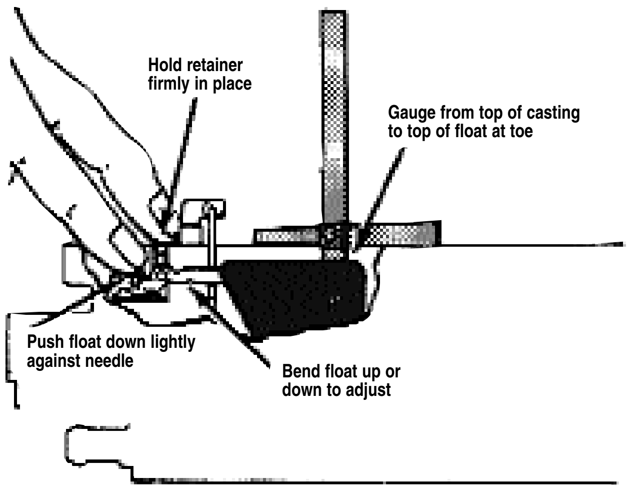


Figure 8– Float Level Adjustment

SPECIAL CALIBRATIONS

High Altitude: Altitude has a direct effect on the operation of most carburetors. As the altitude increases, the air becomes less dense so a carburetor, originally calibrated at low altitude, delivers too much fuel and the engine runs richer. If the vehicle was calibrated at lower altitude, and is to be driven at high altitude temporarily, it is not necessary to repeat the complete calibration procedure. Instead, use the rule of: "2% leaner per 1500 feet" and the calibration reference chart. For example, with a #1910 at baseline calibration (location #1 on the chart) and intended operation at 6000 ft. altitude, you would want 6000 divided by 1500 x 2% = 8% leaner calibration. That would be location #7 on the chart which require a rod and jet change.

Blended Fuels

Typically, two types of blended fuels are available: Gasohol and gasahol. Gasohol is a blend of not more than 10% ethanol and gasoline. As long as there is no more than 10% ethanol mixed with the gasoline you carburetor will function properly. As the percentage of ethanol climbs above10%, a richer A/F ratio will be required. Also, because gasohol is more volatile than gasoline, hard hot starting and poor hot weather driveability may result.

Gasahol can be a blend of either ethanol, methanol or other alcohol with gasoline. Methanol blended fuel should not be used in your Edelbrock Performer Series carburetor as it will cause corrosion of the fuel system components. It can also cause rapid failure of seals, gaskets, diaphragms and pump plungers.

Always check to see if you are using a blended fuel. Although the pump may not indicate the fuel is blended, it is always advisable to verify the type of fuel the station carries.

CARBURETOR SPECIFICATIONS
EDELBROCK PERFORMER RPM Q-JET #1910

Air flow capacity	850 cfm
Primary Main Jet (PMJ)	.074" (#1974)
Primary Metering Rod (PMR)	50M (#1943)
Secondary Metering Rod (SMR)	CE
Step-Up Spring	5" (orange)
Needle and Seat	.145"
Float Level	.300"
Secondary Air Valve Spring Set (turns)	1
Venturi Diameter- Primaries	1.218"
Throttle Bore Diameter- Primaries	1-3/8"
Throttle Bore Diameter- Secondaries	2-1/4"

Troubleshooting Chart

Possible Solution

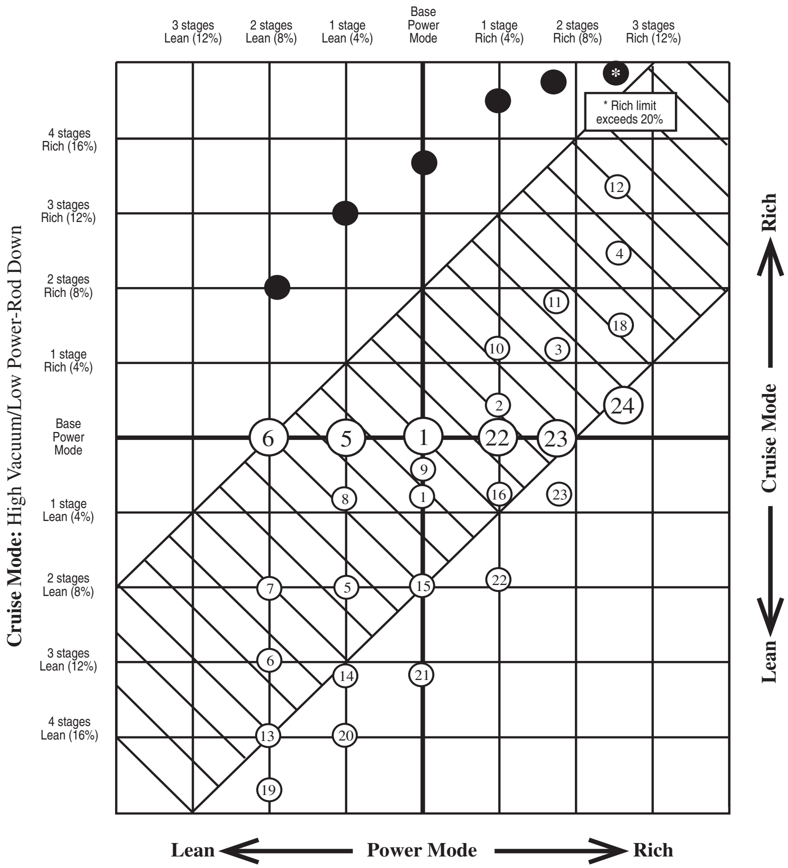
(Symptoms on opposite page)

Symptoms

Possible Solution	*Carburetor doesn't adjust properly*	*Carburetor floods*	*Fuel leaks at shaft*	*Internal fuel leak*	*Misses or surges*	*Stumbles or loads up*	*Engine won't idle*	*Rough idle*	*Backfires*	*Bogs*	*Hard starting*	*Lack of power*	*Pinging at moderate cruise just off idle*	*Engine stalls on hard braking*	*Low fuel economy*
Check for air leaks. Make sure carburetor and manifold gaskets seal properly. All outlets must be plugged or connected.	X				X		X	X	X	X		X	X		X
Check ignition system. Replace parts as necessary. Adjust timing to proper specifications.	X				X		X	X	X		X		X		X
Check choke adjustment. See page 23.					X	X	X	X	X			X			X
Change carburetor fuel filter and/or in-line fuel filter.		X				X					X	X	X		
Too lean. See *Tuning Procedure*.					X					X		X	X		
Check float level and drop. See page 24.		X	X			X								X	X
Check idle mixture screw adjustment. See page 15.	X						X	X							X
Too rich. See *Tuning Procedure*.						X				X					X
Increase accelerator pump stroke. Pump squirter size change may be needed. See page 22.						X						X			
Check for dirt or metal in needles and seats. Needles and seats may need replacement. See page 32.		X		X											X
Check for dirt blocking the low speed circuit. Clean unit and apply air pressure. Install in-line fuel filter #8873.	X						X						X		X
Check floats for leakage. Replace if necessary.		X		X										X	X
Check air horn gasket. Replace if deterioration or breakage is present.		X		X										X	X
Fuel is boiling due to excessive under hood temperature. See page 32.			X								X				X
Fuel pressure too high. Fuel regulator may be needed. See page 9.		X		X										X	X
Fuel pressure too low. Check fuel system. See page 9.					X							X			
Check secondary latching device and rod for proper movement.												X			
Fuel Bowl Stuffer removed. Replace Fuel Bowl Stuffer.														X	

#1910 Calibration Reference Chart/ Primary Metering

Power Mode: Low Vacuum/High Power-Rod Up



(#) Numbers in large circles represent base calibration for that step

(#) Numbers in small circles represent lean limit for that step

● Black circles represent rich limit for all steps in that column

To use this chart, decide first approximately where you want to go with your calibration. For example, if you wanted to go 4% richer on your Power Mode and 4% leaner on your Cruise Mode, the closest you would come would be #16. If you wanted to richen the Cruise Mode somewhat you adjust your APT counterclockwise. To get leaner from this point in Cruise Mode, you would go to #22 and maybe come back slightly richer with the APT if necessary. Normal calibration changes will be within the gridded diagonal area.

Cruise mode has roughly a 15 to 20% adjustability window, depending on the rod/jet combination. From the lean limit (fully clockwise), where the APT screw is “bottomed”, seven full turns counterclockwise bring you to the rich limit where the range of authority runs out. Continued turning of the APT adjuster will not further enrich the calibration, however the APT screw will run out of threads and disengage perhaps requiring disassembly of the carburetor to correct. The Edelbrock Performer RPM Q-Jet is typically set at two (2) turns counterclockwise from the lean limit, and that is the point of reference to return to baseline.

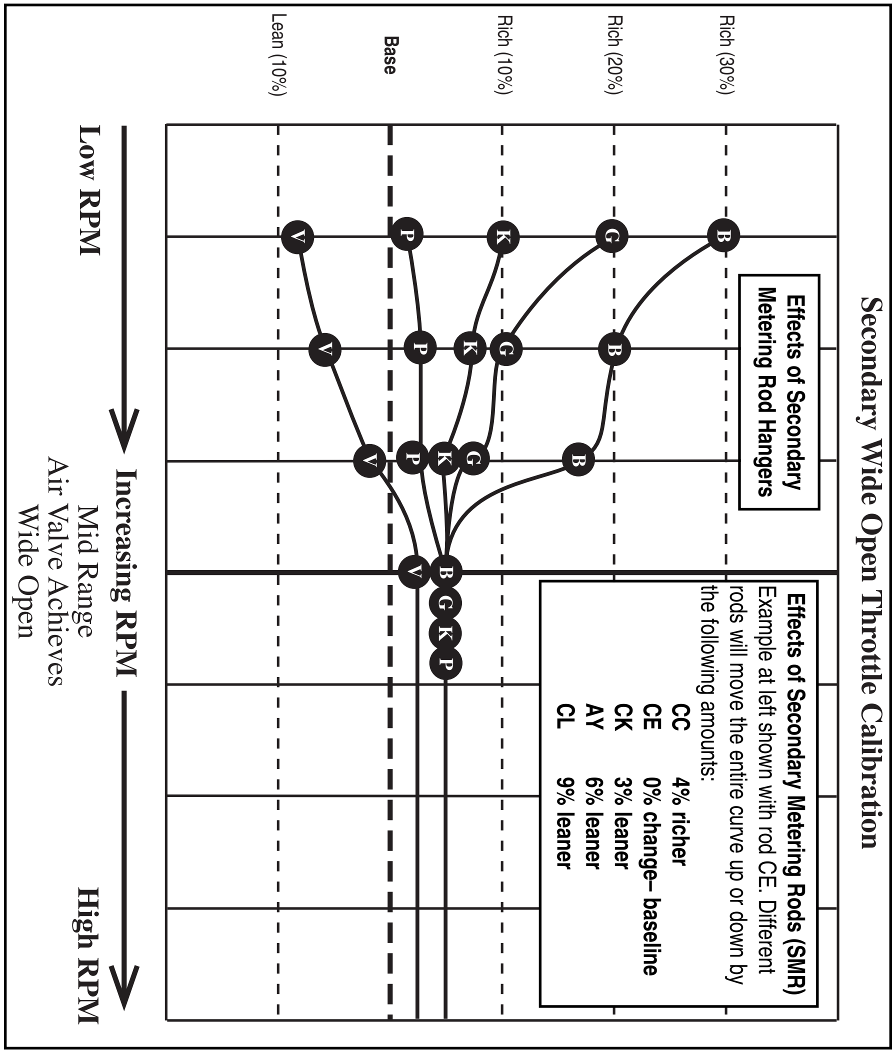
CALIBRATION REFERENCE CHART

		ROD	Part #	JET	Part #
Location	#1	50M	1943	74	1974
	#2	50M	1943	75	1975
	#3	50M	1943	76	1976
	#4	50M	1943	77	1977
	#5	50M	1943	73	1973
	#6	50M	1943	72	1972
	#7	48M	1941	72	1972
	#8	48M	1941	73	1973
	#9	48M	1941	74	1974
	#10	48M	1941	75	1975
	#11	48M	1941	76	1976
	#12	48M	1941	77	1977
	#13	52M	1945	72	1972
	#14	52M	1945	73	1973
	#15	52M	1945	74	1974
	#16	52M	1945	75	1975
	#17	52M	1945	76	1976
	#18	52M	1945	77	1977
	#19	54M	1947	72	1972
	#20	54M	1947	73	1973
	#21	54M	1947	74	1974
	#22	54M	1947	75	1975
	#23	54M	1947	76	1976
	#24	54M	1947	77	1977

Cruise Mode locations in circles (not base) are lean limit of each rod/jet combination. Black dots (solid) show rich limit, which only varies with PMJ (Primary Main Jet), as all PMRs (Primary Metering Rods) have same “Rich Step”. All percentages are in reference to Edelbrock Performer RPM Q-Jet base (#1910) calibration.

Remember that the APT (Adjustable Part Throttle) feature can be used to adjust the cruise calibration up and down the scale between the rich limit and lean limit.

#1910 Calibration Reference Chart
Secondary Metering



Troubleshooting Information

Dirt/metal shavings between the needle and seat or a "sticking float": To correct either of these problems, lightly tap the carburetor fuel inlet area with the handle of a screwdriver. If flooding continues, pinch the fuel line (if possible). Start the engine and let it run until it stops. Release line and restart engine. If flooding persists examine the needles, seats, float level, and float drop. Adjust or replace parts if necessary.

Excessive under hood temperature: Ensure fuel line is not located too close to heat sources such as the exhaust or block, causing expanding fuel to be forced past the needle and seat. Fuel can also boil inside the carburetor due to missing gaskets, spacers, or heat shields. Also check to see if the exhaust heat riser is stuck, allowing excessive heat under the carburetor. Use the Edelbrock carburetor base gasket
supplied with your carburetor for proper heat control.

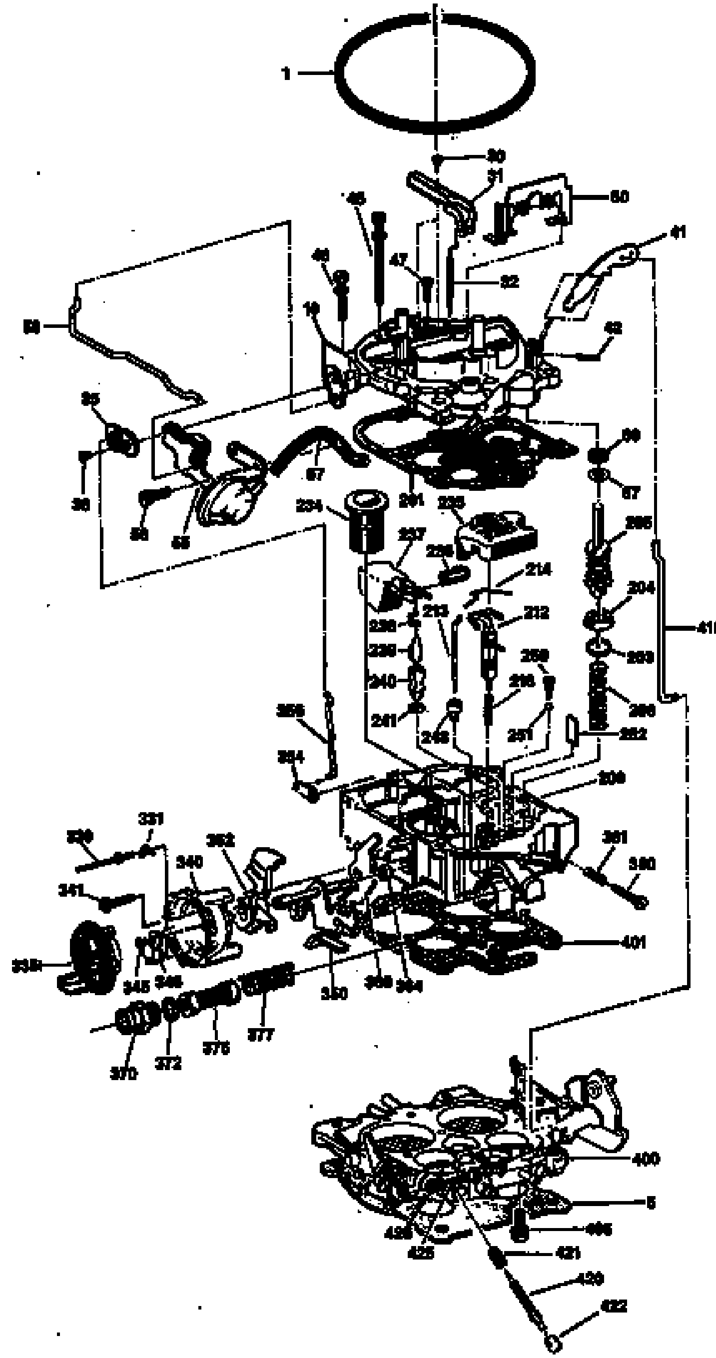
Excessive fuel pump pressure: See page 9.

See Trouble Shooting Chart on pages 26-27 for additional information.

For further information contact
Edelbrocks Technical Department:
Between 7:00 am — 5:00 pm PST,
Monday through Friday
Tech Line: 800-416-8628 • Offices: (310) 781-2222
FAX (310) 972-2730

Edelbrock #1910

1. Gasket— air cleaner
5. Gasket— flange
10. Air horn assembly
30. Screw— secondary metering rod holder attaching
31. Holder— secondary metering rod
32. Rod— secondary metering
35. Lever— choke
36. Screw— choke lever attaching
41. Lever— pump
42. Pin— pump lever hinge
45. Screw assembly— air horn to throttle body
46. Screw assembly— air horn to float body
47. Screw— air horn to float (countersunk)
55. Vacuum break assembly— primary side (front)
56. Screw— primary side (front) vacuum break assembly attaching
57. Hose— primary side (front) vacuum break
58. Link— primary side vacuum break— air valve lever
67. Retainer— pump stem seal
68. Seal— pump stem
200. Float bowl assembly
201. Gasket— air horn to float bowl
203. Spring— pump plunger
204. Cup— pump plunger
205. Pump assembly
206. Spring— pump return
212. Power valve piston assembly
213. Rod— primary metering
214. Spring— primary metering rod
218. Spring— power piston
221. Screw— solenoid connector attaching
234. Insert— aneroid cavity
235. Insert— float bowl
236. Hinge pin— float
237. Float
238. Pull clip— float needle
239. Needle— float
240. Seat— float needle
241. Gasket— float needle seat
248. Jet— primary metering
250. Plug— pump discharge (retainer)
251. Ball— pump discharge
252. Baffle— pump well
331. Retainer— choke cover
335. Electric choke cover and stat assembly
340. Choke housing assembly
341. Screw and washer assembly— choke housing to afloat bowl
345. Screw— choke stat lever attaching
348. Lever— choke stat
350. Intermediate choke shaft, lever, and link assembly
352. Fast idle cam assembly
354. Lever— intermediate choke
356. Link— choke
360. Lever— secondary throttle lockout
364. Seal— intermediate choke shaft
370. Nut— fuel inlet
372. Gasket— fuel inlet
375. Filter— fuel inlet
377. Spring— fuel filter
380. Screw— throttle stop
381. Spring— throttle stop screw
400. Throttle body assembly
401. Gasket— float bowl to throttle body
405. Screw assembly— float bowl to throttle body
410. Link— pump
420. Needle— idle mixture
421. Spring— idle mixture needle
425. Screw— fast idle adjusting
426. Screw— fast idle adjusting screw



Exploded View- Edelbrock #1910

Edelbrock Carburetor Data Log

In order to get the most from your Edelbrock carburetor purchase, please complete and mail the enclosed warranty card. Also, you may want to record your calibration settings in the table below and keep it with your vehicle records.

Model#: ____ Purchase Date: ________________

DATE	PRI. ROD	PRI. JET	SEC. ROD	STEP-UP SPRING	PUMP DRIVE LINK LOCATION	SEC. ROD HANGER	NEEDLE AND SEAT	REFERENCE CHART LOCATION #

Comments:

WARRANTY

EDELBROCK warrants its *Performer RPM Q-Jet Carburetor* to be free from defects in material or workmanship. This warranty is valid provided that the product is properly installed, subjected to normal use and service and is not modified or changed in any way, or used for racing or competition purposes. This warranty is extended to the original consumer purchaser and has a duration of 90 days from date of original purchase by such consumer. Any implied warranty determined to be applicable is limited in duration to the duration of this warranty. Some states do not allow limitations on how long an implied warranty is so the above limitation may not apply to you.

In the event of a defect in material or workmanship, **Edelbrocks** sole responsibility is to repair or replace the defective product. This warranty covers the replacement or repair at Edelbrock's option of the product only and does not cover the cost of removal or installation of the product. Final warranty determination will be the decision of **EDELBROCK**.

EDELBROCK does not warrant products which have been modified or altered outside factory specifications; subjected to conditions such as misuse, neglect, accident, improper installation or adjustment, dirt or other contaminants, weather or corrosion, gum or varnish, use of improper or poor quality fuel or fuel additives, improper fuel pressure and faulty repair or use in other than those automotive applications recommended in a current **EDELBROCK** catalog. Further, there are no warranties which extend beyond those stated here.

EDELBROCK shall not be responsible for (a) actual or alleged labor, transportation or other incidental charges or (b) actual or alleged consequential or other damages incurred by use of **EDELBROCK** *Performer RPM Q-Jet Carburetor*. Edelbrock Corp shall not be liable for any and all consequential damages occasioned by the breach of any written or implied warranty pertaining to this sale in excess of the purchase price of the product.

Warranty claims will be initiated by returning the alleged defective product to the place of purchase with dated purchase receipt and with completed applicable **EDELBROCK** warranty claim tag. Do not send the product directly to **EDELBROCK**.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

The general limited Warranty supersedes all prior warranty statements. Inquiries concerning this warranty should be directed to:

EDELBROCK CORP.
2700 California St.
Torrance, CA 90503

Notes