How to tune a Quadrajet

Technical Information Bulletin Rev. AB 9-26-07
How to Tune a Q-Jet (basic)

by Lars Grimsrud
Lafayette, CO

This tech paper will discuss basic set-up and tuning of QuadraJet carbs for optimum street performance and drivability.

The procedure outlined here differs from other I have seen, and is based on my years of experience doing this work in the quickest, least painful, most economical way. It is recognized that other people will have different methods of doing things, and may disagree with specific methods and procedures that I use.

Overview
The Rochester QuadraJet, in its various forms and configurations, has been used by various GM Divisions for various applications since the mid sixties. The last passenger car version of the carb appeared as an ECM-controlled carb in 1981 (1980 California Q-Jets were also ECM-controlled).

The Q-Jet is a highly versatile, tunable carb that will provide outstanding performance and reliability once set up correctly. This paper will discuss the tuning and setup, and will provide you with adequate data to make good decisions when jetting and adjusting the carb. This paper will not discuss basic rebuilding sequences, nor will I discuss operations involving machining operations and other severe alterations to the carb. There are many books on the market that deal with these subjects in depth. Rather, I will describe the various systems, their purpose, and a good tuning sequence to help you get each system and parameter set up correctly in the easiest way possible.

QuadraJet carbs have three basic tuning variables, and these get people all confused: Primary Metering Jet, Primary Metering Rod, and Secondary Metering Rod. Attempting to cure problems by tuning the wrong variable results in lots of frustrations for tuners and car owners.

These systems at times overlap in their operation. Not only does each system need to be properly tuned, but its timing and “overlap” with other systems is critical to proper performance.

When tuning, we think of each of these variables as controlling a different operating range: The primary jet size determines the fuel mixture at Wide Open Throttle (WOT). The primary metering rod determines fuel mixture at cruise speed and determines responsiveness of the idle mixture screws and off-idle performance. The secondary rods are a high-rpm compliment to the primary side, and are used for final “tweaking.”

On a Q-Jet, we see that we can control the fuel mixture throughout the operating range. This is

different from a Holley: A Holley has a given main jet size which meters fuel throughout the rpm range, including cruise. At WOT, the power valve unseats, and opens a fixed orifice, dumping a fixed amount of fuel in addition to the main jet. Crude, but simple and effective.

The Q-Jet meters fuel through the main jets. Metering rods, suspended from a power piston, "plug off" part of the area of the main jets by being inserted into the jets. These rods have a "fat" diameter and a "skinny" diameter: The number stamped into the side of every metering rod is the "fat" diameter indicated in thousands of an inch. This part of the rod is pulled into the main jet at cruise, at idle and at other high-vacuum operating conditions (light throttle). It produces a lean operating condition for good fuel economy and good throttle response. When engine vacuum is lost, indicating a high-power condition, the rods are pushed out of the jets by spring pressure, and only their "skinny" tips, or power tips, remain in the jets. This richens the fuel mixture for peak power. All primary metering rods have the same power tip diameter (.026"). This fact is crucial to remember when tuning: Primary metering rod sizes have no effect on WOT performance. (NOTE: Some post-1975 Q-Jets for truck applications have metering rods stamped with an "M" designation following the number size. The "M" rods have .036" diameter power tips, and are not suitable for performance tuning unless the tuner takes this larger power tip diameter into consideration when calculating resultant metering area at WOT.)

Identification

Q-Jets are identified by a number stamped into the Float Bowl casting on the driver's side of the car just above the secondary throttle linkage. If the carb is a Carter manufactured under license from Rochester, the number will be inside a round metal foil tag on the driver's side of the carb just above the primary throttle linkage.

Metering Area

WOT fuel mixture is controlled only by the main jet size. Performance at cruise and at idle is then controlled by the rods. We can establish each of these mixtures independently of the other by knowing and understanding the concept of Metering Area.

Jet and rod sizes are always referred to by their diameter in thousands of an inch. But fuel flow doesn't "see" diameters: The fuel "sees" the total metering area. So we must convert the diameter into a resulting area. We remember that the formula for area is $\pi r2$. Thus a jet with a diameter of .070" has a metering area of:

Radius = ½ diameter

Radius = .035"

$\pi .0352 = .00384$”

Thus, the metering area of a #70 jet is 3.84 thousands of a square inch.

But wait! There is a rod inserted into the jet, so we must subtract the area of the rod. Let’s say we have a #40 rod in that #70 jet. The area of the rod is:

Radius = ½ diameter

Radius = .020”

$\pi .0202 = .00125$”

Thus, the area that a #40 rod “plugs off” is 1.25 thousands of a square inch.

The resulting metering area of the #70/#40 combination is thus 3.84 minus 1.25. The total metering area is 2.59 thousands of a square inch. This is the metering area of this rod/jet combination with the rod fully inserted in the jet. In other words, this is the metering area at cruise speed and at idle.

To see the metering area at WOT, we know that all rods have a .026” diameter power tip (except as noted with the “M” series rods). So we run the same calculation for a .026” diameter rod inserted in the jet.

It is these numbers that we will use in all comparisons when making jet changes. We will use these numbers also to look at the percent differences in jet changes.

So that you won’t need to run around with a calculator, my Carb Listing in Table 1 shows the metering areas for every carb listing at both cruise and at WOT (assuming rods with .026” diameter power tips). The number is the metering area in thousands of an inch for a single jet/rod in the carb. This number is effectively how rich/lean the carb is really jetted, and you can directly compare these numbers to see how the various carbs were set up by the factory. By dividing one area into another area, you can see the percentage difference in the jetting.

Figure 2 is a table showing you what the metering area is for every possible jet/rod combination. Each grouping of jets starts off with the rod power tip diameter of .026” so you can see the WOT metering area of that jet size. It then jumps to the first usable rod size.

Tech Tip #1
Before you go trying to fix all the errors of the previous carb tuner, set your carb up to the stock spec for your carb part number. A carb jetted and set up to its stock specs will usually run pretty good on just about any application, and this gives you a good starting point. From there, you can start doing refinements as outlined in this paper.

The carb number on a Q-Jet is usually stamped into the bowl casting on the driver’s side of the carb in the area above the secondary throttle shaft. The number starts with either “70…” or

"170…". If the carb is a Q-Jet manufactured under license by Carter, it will sometimes have the carb number stamped into a foil circle on the driver's side of the bowl just above the primary throttle shaft.

The carb listing (Figure 1) is a partial listing of popular Q-Jets that I have compiled over the years. It is not a complete listing of every Q-Jet carb. Most notably, I have very few of the truck carbs listed, yet there are many truck carbs running around on passenger cars. I also have not started compiling all the Cadillac, Olds and Buick applications in this chart, but I do update it at irregular intervals. For the latest version with latest updates, drop me an e-mail on occasion to make sure you have the latest chart.

Tech Tip #2
What has a greater effect on performance: primary or secondary jetting? I constantly see people swapping around secondary rods, trying to get the best performance out of their cars. The secondary rods are very easy to change, and since the secondaries are so BIG, the secondary metering has to be the most important, right?

Wrong.

Most Q-Jets are 750 cfm carbs. This is more airflow than most small block engines can ever handle. Yet, GM used Q-Jets on everything from Overhead Cam 6-cylinder Pontiacs and Buick V-6's, to 500 cube Caddys. How?

The secondary airvalve on the Q-Jet effectively makes the Q-Jet a variable-cfm carb. The spring windup of the airvalve combined with the bleed-off of the choke pulloff diaphragm allow the secondaries to open only as much as the engine can handle. Thus, if the engine can't handle all of the cfm, the secondaries simply don't open all the way.

The primary side, however, is used throughout the rpm range. It is always in use, and provides the metering for the majority of the power produced by the engine. Let's look at the scenario:

You're at the stoplight. You bring the rpm up slightly against the torque converter – 1500 rpm. You're on the primary side of the carb only, and this is what is producing all of your torque right now. The light changes, and you put the pedal to the metal. All of your torque at launch is being produced by the primaries only, as the secondaries don't see enough airflow to open. The rpm comes up quickly: 2000, 2500, and now the secondaries might be starting to crack. Almost all of the air is still passing through the primaries, and the secondaries are now starting to compliment it just a tad. 3000, 4000 rpm, and the secondaries might be half-way open. The primaries are still providing most of the airflow and metering. 5000, 5500 and you hit redline just as the secondaries hit about ¾ open. Second gear, your rpm drops, partially closing the secondaries back up, and you're back to sucking the majority of the air through the primaries once again.

So we see, the secondaries provide only a compliment to the primaries. The primaries provide the vast majority of the fuel metering, and primary jetting is absolutely the most critical to proper performance. You cannot compensate for poor primary jetting by re-jetting the secondaries. So we are going to concentrate on jetting the primary side for peak performance, and then we will

set up the secondary side to provide a proper compliment to the correct primary jetting.

Tech Tip #3
How can you tell if an off-idle stumble is caused by a lean or a rich condition?
A carb running rich, as well as a carb running lean, can cause an off-idle stumble or hesitation upon acceleration. To narrow it down, tap the roll pin out of the accelerator pump lever by using a small pin punch or a small finish nail. I actually use a small, broken drill bit that's just the right size. Using a hammer, gently tap the roll pin in towards the choke air horn wall. Don't jam the pin right up against the wall: Leave just a little bit of a gap so you can get a screwdriver blade in between the wall and the pin to pry it back again. With the pin tapped out, remove the accelerator pump lever. I like to do this with the engine running so I won't have any trouble starting the engine without the accelerator pump. Now, rev the engine a little with the throttle. Notice if the engine seems quicker and more responsive, or if the hesitation & stumble is worse. If the engine actually feels more responsive with the accelerator pump disconnected, you have a rich condition. If the hesitation is worse than before, you have a lean condition. If there is no change whatsoever, you have a non-functional accelerator pump.

To verify a suspected lean condition after this test, simply hold your cupped hand lightly over the choke air horn area with the engine running at idle, restricting the air flow. If the idle speed and idle quality momentarily increases, you have a verified lean condition. You need to select a jet/rod combination that will give you a little more Cruise Metering Area. Make these changes in less than 10% increments using the Figures provided in this paper.

Tech Tip #4
How can you tell if your power piston spring is too stiff and not allowing the power piston to "seat" at idle?
If your engine does not produce enough manifold vacuum at idle and/or cruise (due to a lumpy cam or other engine parameters), it is possible that the power piston is not being pulled all the way down to its seated position due to the power piston spring being too stiff. The result is that the car will run very rich at idle, and the idle mixture screws will have little effect or response. Idle speed may also "float," with idle speed starting high and gradually decreasing until the engine stalls due to the engine getting "loaded up." There will typically be a puff of black smoke out the tailpipes when you "flick" the throttle.

To test for this, pop the top off the carb, remove the power piston/rod assembly, and remove the power piston spring from its bore. Re-install the rod/piston assembly without the spring and put the carb back together. The carb will now run in the full-lean condition all the time, and you can actually test drive it in this condition. You can also test for this condition very quickly (although you cannot actually drive the car) by inserting a long pin punch or a small long screwdriver down through the vent tube: Angle the pin punch slight forward, and you will hit the top of the power piston. You can now depress the power piston and/or verify if it is pulled down into its fully seated position. Be very careful when doing this so you do not jam the punch or screwdriver through your float. If this clears up the idle, improves idle mixture screw response, and eliminates the black smoke when you flick the throttle, you need to install a softer spring. Edelbrock has a complete power piston spring assortment available. You can also get many of the springs from GMPartsDirect using the GM part number shown in the carb listing chart.

Tech Tip #5
How can you tell how stiff the power piston spring needs to be, and how can you tell one spring from another?

If you have a few springs of various kinds laying around, it is not readily apparent which spring is stiffer than another. You can arrange them and order them from softest to stiffest as follows:

Using your carb, or a junk float bowl from another carb, as a testbed, remove the carb air horn (the "top" of the carb) and remove the power piston and its spring. Remove the primary metering rods from the piston. Now, drop a spring into the power piston bore and install the piston. Find a Phillips screwdriver, and place the handle of the screwdriver on top of the power piston with the shank of the screwdriver pointing straight up. Use a screwdriver that is light enough to NOT compress the power piston and its spring, but close. Now, drop flat washers onto the shank of the screwdriver and keep stacking them up until the piston compresses the spring and seats in the bore. Count the number of washers it took to compress the spring and label the spring as a "6-washer spring," for instance. Do the same with the other springs you want to test. You'll end up with a comparative rating of springs, like "4-washer," "6-washer," or "10-washer" springs. You now know exactly how to arrange them from softest to stiffest.

But which one should you use? You'll need a junk Q-Jet float bowl for this test, and you'll need to have your engine in running condition.

Using a stripped down, bare Q-Jet float bowl, you'll notice that there is a hole in the bottom of the bowl right underneath the power piston bore. This is the vacuum hole that applies manifold vacuum to the power piston. Hook up a long vacuum hose to a manifold vacuum source on your engine. Now, install a power piston spring from your arranged spring selection into the piston bore and install a power piston on top of the spring. Start your engine, and stick the end of the vacuum hose onto the hole in the bottom of the stripped down float bowl. With the engine at idle, the vacuum applied to the bowl should immediately pull the power piston down against the spring pressure and seat the power piston firmly in its bore. If the piston does not fully seat, you need a softer spring from your arranged spring selection. If you have an automatic, put the transmission in "drive." Make sure the power piston stays seated.

If you really want to do some testing, you can string the vacuum hose into the car, and with an assistant, drive the car around and observe under what conditions the power piston starts to unseat: While you drive, have the assistant stick the vacuum hose onto the bottom of the bowl, and observe what the piston does under various engine loads. Make sure you have a spring that's stiff enough to make the piston pop up when your engine is under load, yet soft enough to keep the piston fully seated at idle, at cruise and under light acceleration. This makes for some really fun testing, and the results will pay off in a precisely matched power valve spring for some outstanding throttle response.

Of course, if you buy the power piston spring assortment kit from Edelbrock, the springs will be identified and labeled as to their vacuum rating. Select and use a spring with a rating about 1.5" to 2" lower than the idle vacuum of the engine (in drive).

Tech Tip #6

The idle metering circuit on a Q-Jet is not an independent, stand-alone circuit. The idle mixture screws in the throttle plate receive their fuel through the main metering jets. Thus, a change in the main metering circuit (jets and/or rods) will affect the idle circuit. The idle mixture screws cannot meter more fuel than the main jets/rods will allow. Thus, if your Cruise Metering Area jet/rod combination is too lean, you may find that your idle mixture screws are ineffective. If your idle surges, is rough & unstable, and adjusting the screws seems to make no difference (but you can kill the engine by turning them all the way in), chances are good that your cruise metering area is too lean. You can verify this by running your mixture screws out to the point where additional turns have no effect on idle. Then cover the choke area of the carb with your hand. If idle speed & quality increases as you restrict the air flow, your jet/rod combination is too lean.

Procedure

Here is my recommended sequence and procedure for doing a basic Q-Jet set-up:

1. Set the float level.

You'll be amazed how many people try tuning a Q-Jet without ever checking the float level. An incorrect float level can give you all kinds of symptoms and problems, so get this one set right off the bat. Also, many commercially rebuilt Q-Jets have brass floats. I do not recommend use of a brass float in a Q-Jet. Use the correct "NitroFill" float available from NAPA/Echlin. Part number for most pre-75 Q-Jets is 2-440. Part number for most 75-80 Q-Jets is 2-442.

You have to pull the top of the carb off to set the float level. With the top removed, remove the big phenolic spacer that covers the area around the needle/seat. Hold the float hinge clip firmly seated and push down lightly on the float where it contacts the needle. Measure from the top of the float bowl to the top of the float at the rear edge of the float. Float level should be .375" for a street-driven car using a 1968 – 1974 carb; you can run it at .250" for racing. Early Q-Jets (1968-1972) can be successfully run on the street with the high float level, but you may see some fuel saturation of the air horn gasket with associated gas fumes. Later carbs (1975 and newer) do not run well in street applications with the high float level – run the 1975 + carbs at .420" on the float level. Adjust the float level by removing the float and bending its lever arm. Never raise the float level by forcing the float against the needle/seat to bend it – this will damage the needle.

2. Determine main jet size.

If you have a stock engine, always start with the stock jet size for the carb number you are using and work from there. If you have the typical street modifications like headers, good exhaust system and a free-flowing intake, you can start with a main jet size 2 sizes larger than stock.

Since we want to work on the primary side only, we don't want the secondaries interfering with the jetting process. Chevy Q-Jets have a secondary lockout lever on the passenger side of the carb right at the secondary throttle shaft. This lever is actuated by the choke linkage, and prevents the secondaries from opening when the engine is cold. I call this the "primary jet tuning

lever." Use a piece of wire or string to engage the lever with the secondaries so that the secondaries cannot be opened.

You now need to find a short flat stretch of road to test drive the car. You need to be able to measure time-to-distance and/or speed-at-distance. I usually find a repeatable stretch of road about 300 feet long. This gets me through 1st gear and into 2nd. Make two or three runs on the car through this stretch and make note of time and speed to distance. Also note the seat-of-your-pants feel of the car (it's going to feel pretty slow with the secondaries locked out…).

I recommend making jet changes in less than 10% increments. Go to Figure 2 and determine your WOT metering area for your current jet size. This will be the metering area of the jet with the .026" rod. With this number, go to the Jet % Change Chart and find the closest metering area match in the left vertical Metering Area column (Use the "Area" column and not the Jet Size column. The Jet Size column can only be used on carbs that do not employ a metering rod, such as Holley and Weber.). Follow the row across until you get into the "green" zone and find the closest number to 10%, but not greater than 10%. Now go straight up until you get to the new metering area number. This is your target. Take this number and go back to Figure 2 and find the closest jet size that will produce this metering area with a .026" rod. This is the first jet size you want to try, and this will increase your fuel mixture by the percentage indicated in the chart.

Now, to keep your off-idle mixture unaltered, you also need to check your cruise metering area. Go to Figure 2 and find your old main jet & rod combination. Note the resulting metering area for this combination. Now, go to your new main jet size that you're going to be using and find the rod needed to produce the same cruise metering area you had before. Use this rod with the new jet.

By doing this, you are now changing only 1 parameter at a time: WOT mixture only. Idle, off-idle, and everything else is now unchanged, and you will be able to see the results from the mixture change at WOT only. With the secondaries still locked out, run the car 2 – 3 times down the same stretch and record results. If the numbers get better, you're going the right way with the main jet size. If the numbers are worse, you need to make changes to the lean side instead of rich. Repeat this operation until you determine the main jet size that produces the best numbers. On many stock cars, you may be surprised to learn that you end up with the stock jet size. You have now optimized main jets.

3. Determine main metering rod size.

NOTE: There are two different "series" of primary metering rods. Q-Jets up through 1974 (the "4MV" series carbs) use the early series rods. 1975 and later Q-Jets (the "M4M" series carbs) use the second series rods. Pre-'75 (up through '74) Q-Jets use metering rods that are approximately 2.47" long overall (total length from the metering tip to the extreme top of the rod). 1975 and newer Q-Jets use rods that are about 2.40" long. You cannot interchange the two different rod series. The late style rods are also available in the "M" series rods, designed for truck applications. These have fat, .036" diameter power tips on them, and should not be used unless you re-calculate the resultant WOT metering areas and account for this in your tuning. For example: A regular '76 Vette carb might have a 77/48 jet/rod combination with the correct .026"

diameter power tip rods. This gives you a WOT metering area of 4.12 thousands of an inch. If you use a 48M rod in the same carb, you end up with a WOT metering area of only 3.63 thousands. This is the same as if you dropped the main jet size down to a size 73 with the standard-tipped rods. Keep these relationships in mind when playing with rods. Currently, there are no second series .026" power tip primary rods available from any source – all second series rods are "M" series truck rods, including those sold by Edelbrock.

When switching main jets around in Section 2 above, you were also swapping out metering rods to keep the cruise metering area unchanged. You did this to make sure that your off-idle throttle response remained unchanged so that the throttle response off idle did not affect the tuning results from the main jet re-sizing. Now, with your new main jets, your cruise metering area is exactly the same as it was before, but that's not to say it's right.

There are several indicators of correct cruise metering area. First, check out Tech Tip #5 regarding the idle circuit. This is a good indication of a lean condition. But here's another good indicator of correct cruise metering area:

A Q-Jet, when set up with the correct metering rod for cruise & idle, will produce a slight hesitation upon acceleration if the accelerator pump is disconnected. Using a small pin punch or a finish nail, carefully knock out the roll pin securing the accelerator pump arm to the top of the carb. I do this with the engine running so I don't have any trouble starting the engine without the accelerator pump. With the pump disconnected and with the engine running in neutral, "flick" the throttle just a little. If the engine actually feels more responsive with the pump disconnected, your cruise metering area is too rich, and you need to install a fatter set of rods. If you get a severe stumble, or if the engine dies, you're on the lean side and need smaller rods. When the rods are correct for the jets in use, you will get a slight hesitation when the pump is disconnected.

Once you have set the rod size up like this, verifying both the idle as shown in Tech Tip #5 and using the disconnected accelerator pump, a road test is in order. If the car is a little "flat" on light acceleration, or if it has a slight "surge" at steady cruise, you need to richen up the metering area slightly. If it is smooth and responsive on light acceleration, and feels smooth at cruise, you have the rod size nailed down.

Again, use the charts to keep all changes limited to 10% at a time. This will prevent you from "over-shooting." Remember, with the main jet size determined, your rod sizing is affecting idle, off-idle, light acceleration, and cruise. In most cases, when there are problems with stumbles, poor idle, idle speed that starts out high and then degrades, and surging at cruise, the rods are too big and are causing a lean condition. On the other hand, if the rods are too small, causing a rich condition, the throttle will feel "lazy" or "slow" when you rev the engine, and you may get a puff of black smoke with a hesitation when you "flick" the throttle. Correct rods will produce crisp, clean and instant throttle response.

4. Determine secondary rod size.
You are now finally ready to unlock the secondaries. But before you start changing the rods, you want to get the secondary opening rate set up. This is determined by the spring windup.

It is a very common “speed trick” to loosen the secondary windup spring so that the secondaries will open very quickly. This is the single most common cause of a severe stumble or hesitation upon acceleration or transition into the secondaries.

The secondary spring windup is adjusted with a small, slotted-head screw on the passenger side of the carb, right at the top of the carb on the secondary side. The screw head points right out to the side. 90 degrees from this, on the bottom, there is an allen-head lock screw that keeps the slotted screw from turning. If you have trouble seeing it, place a mirror under the area until you spot it. With a small slotted screwdriver holding the adjustment screw, loosen the allen screw about ¼ turn. This will allow you to turn the slotted adjustment screw. Counting the turns, allow the slotted screw to slowly unwind until all spring tension is gone. You can use your mirror to see the spring disengage contact from the pin lever underneath the air horn. If the spring tension was lost after only ½ turn, the windup was too loose. Bring the spring into contact with the lever. Note when it just barely touches. From this point, wind the spring up between ¾ turn and 7/8 turn. This is a good starting point, and will prevent any bogs or hesitations due to premature secondary opening.

Now, you need to adjust the secondary rod hanger height. You’ve read all about the different letter numbers for the secondary hangers, and how a “Y” hanger will make your car faster than an “M” hanger or whatever. Fact is, you can bend and adjust any hanger to any hanger height you want, so it doesn’t make a heck of a lot of difference what hanger you choose to use. Just get it set up right:

With the secondary airvalve held wide open and the secondary rods pulled all the way up, measure the distance from the top of the rear wall of the choke horn to the secondary rod hanger hole in the hanger. This distance should be 41/64”. Bend the hanger to adjust – you have to adjust each of the two sides independently. You now have a “performance” rod hanger.

With this set, you can now play with secondary metering rods. A common speed trick mistake is to always install thinner (richer) secondary rods. Some engines and carbs will produce a secondary “lag” if the rods are too thin. On about half of the engines I work on, I obtain better performance by installing fatter “non-performance” rods. Again, a quick road test is the only way to set this up, so go back to your 300-foot stretch and make a few runs with rods both richer and leaner. Once you have found the rods producing the smoothest secondary transition and the best numbers, you can start unwinding the secondary airvalve spring. Relax the spring tension in 1/8 turn increments until the car stumbles on acceleration, then tighten up 1/8 turn again. You have now determined the quickest secondary opening rate that your engine can handle, and your secondary mixture is set.

Note that secondary metering rods come in three different tapers: long tip, short tip, and medium tip (see Figure 3). Most of the available after-market metering rods have the long tips, and these will produce a full-rich mixture upon the slightest opening of the secondaries. Many street engines will produce better performance by using the short tipped rods. A short tipped rod does not allow a full-rich mixture until the secondaries are opened quite a ways, keeping the mixture a little lean initially. This can produce smoother and crisper performance in many applications. Next time you see a junk Q-Jet laying around, make sure you yank the rods and jets out of it:

many old truck carbs have some really good short-tipped secondary rods in them. Figure 3 lists all the secondary rod letter codes, part numbers, and measurements.

Parts

If you don't have a stash of used Q-Jets in your basement to rob jets and rods out of, you can get parts from Edelbrock. Your local parts store should be able to order them for you. Following is a partial listing of Edelbrock Q-Jet parts and part numbers:

Primary Metering Rods (pairs) for 1974 & earlier:
.035" #1936 .039" #1939 .043" #1944
.037" #1937 .041" #1942 .045" #1946

Primary Metering Rods (pairs) for 1975 & later (NOTE: These are "M"-series rods with .036" power tips!):
.048" #1941 .052" #1945
.050" #1943 .054" #1947

Secondary Metering Rods (pairs) for all years:
CC #1950 CK #1952 CL #1954
CE #1951 AY #1953

Primary Metering Jets (pairs) for all years:
.068" #1968 .072" #1972 .076" #1976
.069" #1969 .073" #1973 .077" #1977
.070" #1970 .074" #1974
.071" #1971 .075" #1975

You can also order a very few original GM parts from GMPartsDirect on the Internet. The following is a complete listing of the GM part numbers for all available Q-Jet jetting components. These parts are being discontinued quickly, so some parts may no longer be available. Any parts available from GMPartsDirect are also available from any GM dealer (if they want to order them for you). You can also get most of these parts from Carbs Unlimited, although they only offer the early primary metering rods:
Primary Metering Rods, '74 & earlier:
All rods have been discontinued
Primary Metering Rods, '75 and later:
There are no post-'75 passenger car (.026" power tip) available from GM at this time.
Secondary Rods:
Code P/N Dia of Tip Tip Length (Short, Medium, Long)
AX 7033549 0.0400 S
BG 7034822 0.0400 M
AH 7033812 0.0530 M
AN 7034320 0.0700 S

Primary Metering Jets:
7031969
7031970
7031971
7031973
7031974
7031975
7031978

The last good aftermarket source for Q-Jet parts is from Carbs Unlimited. They carry a full line of jets and the rods for the early applications. They also carry parts such as choke pulloffs, inlet fittings, springs, and linkages. Go to their website to see a full line of parts.

Questions, Comments & Technical Assistance
If you have questions or comments regarding this article, or if you notice any errors that need to be corrected (which is quite possible since I'm writing this from memory…), please feel free to drop me an e-mail. Also, if you need any technical assistance or advice regarding this process, or other maintenance issues, feel free to contact me:

V8FastCars@msn.com

Figure 1: Carb part number listing & stock jetting
(Green highlights show parts that are still available from GM)

Carb # Application Main Jet Main Rod Spring Sec. Rod Jet Area Jet Area
As of 9-26-07: (1 Jet, .001") (1 Jet, .001")
Green highlight = GM parts still available Cruise WOT

7025200 Chev 65 396 AT EARLY 71 44 7029922 7031208 2.4387 3.4283
7025201 Chev 65 396 MT EARLY 71 41 7029922 7031208 2.6389 3.4283
7025220 Chev 65 396 AT LATE 71 44 7029922 7031208 2.4387 3.4283
7025221 Chev 65 396 MT LATE 71 44 7029922 7031208 2.4387 3.4283
7026200 Chev 66 396 AT 71 44 7029922 AX 2.4387 3.4283
7026201 Chev 66 396 MT 71 41 7029922 AX 2.6389 3.4283
7026202 Chev 66 327 AT EARLY 71 45 7029922 AK 2.3688 3.4283
7026203 Chev 66 327 MT 71 43 7029922 AK 2.5070 3.4283
7026204 Chev 66 427 AT 71 46 7029922 AX 2.2973 3.4283
7026205 Chev 66 427 MT 71 41 7029922 AX 2.6389 3.4283
7026210 Chev 66 327 AT LATE 71 45 7029922 AK 2.3688 3.4283
7027200 Chev 67 396/427 AT W/O A.I.R. 71 44 7029922 AX 2.4387 3.4283
7027201 Chev 67 396/427 MT W/O A.I.R. 71 41 7029922 AX 2.6389 3.4283
7027210 Chev 67 396/427 AT 71 44 7029922 AX 2.4387 3.4283
7027211 Chev 67 396/427 MT 71 41 7029922 AX 2.6389 3.4283
7027216 CHEV 67 396/427 W/O A.I.R. 71 44 7029922 AX 2.4387 3.4283
7027218 CHEV 67 327/350 W/O A.I.R. 71 45 7029922 AX 2.3688 3.4283

7027262 Pont 67 400 AT & MT GTO 70 41 7002071 BF 2.5282 3.3175
7027263 Pont 67 400 MT w/o A.I.R. 70 39 7002071 BF 2.6539 3.3175
7028207 Chev 68 327/350 MT VETTE 71 46 7036019 AN 2.2973 3.4283
7028208 Chev 68 327/350 AT VETTE 71 46 7036019 AN 2.2973 3.4283
7028209 Chev 68 427 HIGH PERF MT VETTE 71 45 7036019 AX 2.3688 3.4283
7028210 CHEV 68 396 & 427 STD AUTO 71 49 7036019 AX 2.0735 3.4283
7028211 CHEV 68 396 & 427 STD MANUAL 71 45 7036019 AX 2.3688 3.4283
7028212 Chev 68 327/350 AT 71 46 7036019 AN 2.2973 3.4283
7028213 Chev 68 327/350 FULL-SIZE & TRUCK MT 71 46 7036019 AN 2.2973 3.4283
7028216 Chev 68 427 HIGH PERF AT VETTE 71 47 7036019 AX 2.2242 3.4283
7028217 Chev 68 396 HI PERF MT VETTE & TRUCK 71 45 7036019 AX 2.3688 3.4283
7028218 Chev 68 396 HIGH PERF AT VETTE 71 47 7036019 AX 2.2242 3.4283
7028219 Chev 68 HIGH PERF MT VETTE 66 36 7036019 BG 2.4033 2.8903
7028229 Chev 68 HIGH PERF MT CHEVY II 66 36 7036019 BG 2.4033 2.8903
7028240 Buik 68 430 AT 70 44 7011957 AY 2.3279 3.3175
7028262 Pont 68 400 STD AT 73 43 7037305 BE 2.7332 3.6545
7028263 Pont 68 400 MT GTO 72 40 7037305 BE 2.8149 3.5406
7028267 Pont 68 400 H.O. MT GTO 72 41 7037305 BE 2.7512 3.5406
7028268 Pont 68 400 & 400 H.O. AT GTO 73 42 7037305 BE 2.7999 3.6545
7028268 Pont 68 GTO Best Tuned Condition 71 42 7037305 DA 2.5737 3.4283
7028270 Pont 68 400 RAM AIR AT after Jan 68 72 41 7037305 BE 2.7512 3.5406
7028270 Pont 69 400 AT RAM AIR III 72 41 7037305 BE 2.7512 3.5406
7028273 Pont 68 400 RAM AIR MT after Jan 68 72 42 7037305 BE 2.6861 3.5406
7028273 Pont 69 400 MT RAM AIR III 72 42 7037305 BE 2.6861 3.5406
7028274 Pont 68 400 AT EARLY RAM AIR 73 41 7037305 BE 2.8651 3.6545
7028275 Pont 68 400 MT EARLY RAM AIR 72 40 7037305 BE 2.8149 3.5406
7029200 CHEV 69 CAMARO, VETTE 396/427 AUTO 71 49 7036019 BC 2.0735 3.4283
7029201 CHEV 69 CAMARO, VETTE 396/427 MAN 71 45 7036019 BC 2.3688 3.4283
7029202 Chev 69 350 300HP AT VETTE 67 42 7036019 AN 2.1402 2.9947
7029203 Chev 69 350 300HP MT VETTE 67 38 7036019 AN 2.3915 2.9947
7029204 CHEV 69 CAMARO, VETTE 396/427 AUTO 71 47 7036019 AX 2.2242 3.4283
7029207 Chev 69 350 325HP VETTE 66 36 7036019 BG 2.4033 2.8903
7029214 CHEV 69 396 TRUCK 71 45 7037851 BC 2.3688 3.4283
7029215 Chev 69 396/427 MT 71 45 7036019 AX 2.3688 3.4283
7029223 CHEV 69 350 TRUCK M/T 67 38 7037851 AN 2.3915 2.9947
7029224 CHEV 69 350 TRUCK A/T 67 38 7037851 AN 2.3915 2.9947
7029230 CAD 69 472 STD W/O A/C 70 44 7037298 BH 2.3279 3.3175
7029231 CAD 69 472 STD A/C 70 44 7037298 BH 2.3279 3.3175
7029232 CAD 69 472 EL DORADO W/O A/C 70 42 7037298 BH 2.4630 3.3175
7029233 CAD 69 472 EL DORADO A/C 70 42 7037298 BH 2.4630 3.3175
7029263 Pont 69 400 MT GTO 71 44 7037305 BE 2.4387 3.4283
7029268 Pont 69 400 AT GTO 71 44 7037305 BE 2.4387 3.4283
7029270 Pont 69 400 AT RAM AIR IV 69 38 7037305 BP 2.6052 3.2084
7029273 Pont 69 400 MT RAM AIR IV 69 37 7037305 BP 2.6641 3.2084
7037200 Chev 67 396/427 AT A.I.R. 71 46 7029922 AX 2.2973 3.4283
7037201 Chev 67 396/427 MT A.I.R. 71 41 7029922 AX 2.6389 3.4283

7037210 CHEV 67 396/427 aT A.I.R. LATE 71 46 7029922 AX 2.2973 3.4283
7037211 CHEV 67 396/427 MT A.I.R. LATE 71 41 7029922 AX 2.6389 3.4283
7037213 Chev 67 327 & 350 2nd type MT w/o A.I.R. 71 43 7029922 AN 2.5070 3.4283
7037216 CHEV 67 396/427 A.I.R. 71 46 7029922 AX 2.2973 3.4283
7037218 CHEV 67 327/350 A.I.R. 71 45 7029922 AX 2.3688 3.4283
7037262 Pont 67 400 AT w/A.I.R. GTO 70 40 7002071 BF 2.5918 3.3175
7037263 Pont 67 400 MT w/A.I.R. GTO 70 38 7002071 BF 2.7143 3.3175
7037271 Pont 67 400 RAM AIR after 6 Feb 67 70 38 7002071 BF 2.7143 3.3175
7040200 CHEV 70 CHVL, VETTE BB AUTO 78 49 7036019 BG 2.8926 4.2474
7040201 CHEV 70 CHVL, VETTE BB 4-SPD 78 48 7036019 BG 2.9688 4.2474
7040202 CHEV 70 CHEVELLE, CAMARO 350 AUTO 76 44 7036019 BA 3.0159 4.0055
7040203 CHEV 70 CHEVELLE, CAMARO 350 4-SPD 76 44 7036019 BA 3.0159 4.0055
7040204 CHEV 70 CHVL, VETTE BB AUTO 78 49 7036019 AX 2.8926 4.2474
7040205 CHEV 70 CHVL, VETTE BB 4-SPD 78 49 7036019 AX 2.8926 4.2474
7040206 CHEV 70 TRUCK 396 FED 75 42 7036019 BG 3.0324 3.8869
7040207 CHEV 70 350 FEDERAL VETTE M/T 76 44 7036019 BA 3.0159 4.0055
7040208 CHEV 70 TRUCK 350 FED 75 39 7036019 BA 3.2233 3.8869
7040213 CHEV 70 VETTE 350 4-SPD 76 44 7036019 BA 3.0159 4.0055
7040221 CHEV 70 CHVL, VETTE BB 4-SPD 78 48 7036019 BG 2.9688 4.2474
7040253 OLDS 70 CUTLASS & 442 455 69 7040699 7037734 AU ########## 3.2084
7040263 Pont 70 400 MT FEDERAL GTO 71 44 7037305 CC 2.4387 3.4283
7040264 Pont 70 400 AT FEDERAL GTO 70 41 7037305 BP 2.5282 3.3175
7040267 Pont 70 455 MT FEDERAL GTO 71 42 7037305 CC 2.5737 3.4283
7040268 Pont 70 455 AT FEDERAL GTO 71 42 7037305 CC 2.5737 3.4283
7040270 Pont 70 400 & 455 RAM AIR AT GTO 70 39 7037305 CC 2.6539 3.3175
7040273 Pont 70 400 & 455 RAM AIR MT GTO 70 39 7037305 CC 2.6539 3.3175
7040500 CHEV 70 CHVL, VETTE BB AUTO CALIF 78 49 7036019 BG 2.8926 4.2474
7040501 CHEV 70 CHVL, VETTE BB 4-SPD CALIF 78 48 7036019 BG 2.9688 4.2474
7040502 CHEV 70 CHVL, CAM 350 AUTO CALIF 76 44 7036019 BA 3.0159 4.0055
7040503 CHEV 69 350 300hp CAMARO Best Tuned 74 43 7036019 AK 2.8486 3.7699
7040503 CHEV 70 CHVL, CAM 350 4-SPD CALIF 76 44 7036019 BA 3.0159 4.0055
7040504 CHEV 70 CHVL, VETTE BB AUTO CALIF 78 49 7036019 BG 2.8926 4.2474
7040505 CHEV 70 CHVL, VETTE BB 4-SPD CALIF 78 49 7036019 BG 2.8926 4.2474
7040507 CHEV 70 VETTE 350 4-SPD CALIF 76 44 7036019 BA 3.0159 4.0055
7040509 CHEV 70 TRUCK 396 CALIF 78 49 7036019 BG 2.8926 4.2474
7040511 CHEV 70 TRUCK 350 CALIF 76 44 7036019 BA 3.0159 4.0055
7040513 CHEV 70 VETTE 350 4-SPD CALIF 76 44 7036019 BA 3.0159 4.0055
7040521 CHEV 70 CHVL, VETTE BB 4-SPD CALIF 78 48 7036019 BG 2.9688 4.2474
7040563 Pont 70 400 MT CALIFORNIA GTO 68 36 7037305 BU 2.6138 3.1008
7040564 Pont 70 400 AT CALIFORNIA GTO 68 38 7029922 BU 2.4976 3.1008
7040567 Pont 70 455 MT CALIFORNIA GTO 70 40 7029922 BU 2.5918 3.3175
7040568 Pont 70 455 AT CALIFORNIA GTO 69 37 7029922 BU 2.6641 3.2084
7040570 Pont 70 400 & 455 RAM AIR CALIF. 67 33 7037305 CC 2.6704 2.9947
7040573 Pont 70 400 & 455 RAM AIR MT CALIF. 67 33 7037305 CC 2.6704 2.9947
7041200 CHEV 71 CHEVELLE 402/454 AUTO 77 49 7036019 BG 2.7709 4.1257
7041201 CHEV 71 CHEVELLE 402/454 MAN 77 49 7036019 BG 2.7709 4.1257

7041202 CHEV 71 CHEVELLE 350 AUTO 74 44 7036019 AR 2.7803 3.7699
7041203 CHEV 71 CHEVELLE 350 MAN 74 44 7036019 AR 2.7803 3.7699
7041204 Chev 71 454 AT VETTE 77 49 7036019 BG 2.7709 4.1257
7041205 Chev 71 454 MT VETTE 77 49 7036019 BG 2.7709 4.1257
7041206 CHEV 71 402 SERIES 20 & 30 TRUCK 74 42 7036019 BG 2.9154 3.7699
7041208 CHEV 71 350 SERIES 20 & 30 TRUCK 74 39 7036019 BA 3.1062 3.7699
7041209 CHEV 71 402 SERIES 10 TRUCK 77 49 7036019 BG 2.7709 4.1257
7041211 CHEV 71 350 SERIES 10 TRUCK 74 42 7036019 BA 2.9154 3.7699
7041212 CHEV 71 Vette 350 A/T 74 44 7036019 AR 2.7803 3.7699
7041213 CHEV 71 Vette 350 M/T 74 44 7036019 AR 2.7803 3.7699
7041230 CAD 71 472 & 500 STD 71 47 7036019 CE 2.2242 3.4283
7041231 CAD 71 472 & 500 LIMO 71 47 7036019 CE 2.2242 3.4283
7041232 CAD 71 472 & 500 EL DORADO 67 39 7036019 CF 2.3311 2.9947
7041262 Pont 71 455 AT GTO 71 43 7037305 BU 2.5070 3.4283
7041263 Pont 71 400 MT GTO 75 47 7037305 BU 2.6829 3.8869
7041264 Pont 71 400 AT GTO 71 46 7037305 BP 2.2973 3.4283
7041267 Pont 71 455 H.O. MT GTO 73 38 7037305 BP 3.0513 3.6545
7041268 Pont 71 455 H.O. AT GTO 74 43 7037305 BP 2.8486 3.7699
7041270 Pont 71 455 AT RAM AIR 74 43 7037305 BP 2.8486 3.7699
7041273 Pont 71 455 MT RAM AIR 73 38 7037305 BP 3.0513 3.6545
7041273 Pont 71 455 H.O. Best Tuned Condition 72 38 7037305 BP 2.9374 3.5406
7042202 CHEV 72 350 CHVL & VETTE FED A/T 74 45 7036019 DA 2.7104 3.7699
7042203 CHEV 72 Vette Fed M/T 350 74 45 7036019 DA 2.7104 3.7699
7042206 CHEV 72 402 TRUCK SERIES 20 & 30 A/T 72 43 7036019 DA 2.6193 3.5406
7042207 CHEV 72 402 TRUCK SERIES 20 & 30 M/T 72 43 7036019 DA 2.6193 3.5406
7042208 CHEV 72 350 TRUCK SERIES 10 FED A/T 71 36 7036019 CP 2.9413 3.4283
7042210 CHEV 72 350 TRUCK G-10 FED ALL 74 43 7036019 DA 2.8486 3.7699
7042211 CHEV 72 350 TRUCK SERIES 10 FED M/T 74 43 7036019 DA 2.8486 3.7699
7042215 CHEV 72 CHEVELLE MAN 77 45 7036019 CM 3.0662 4.1257
7042216 CHEV 72 Vette A/T 454 77 49 7036019 CM 2.7709 4.1257
7042217 CHEV 72 Vette M/T 454 77 45 7036019 CM 3.0662 4.1257
7042218 CHEV 72 402 TRUCK SERIES 10 A/T 77 45 7036019 CM 3.0662 4.1257
7042219 CHEV 72 402 TRUCK SERIES 10 M/T 77 45 7036019 CM 3.0662 4.1257
7042220 CHEV 72 CHEVELLE AUTO 77 49 7036019 CM 2.7709 4.1257
7042238 cad 72 LIMO 472 & 500 CI 69 43 7029529 BC 2.2871 3.2084
7042262 Pont 71 455 AT CALIFORNIA 72 43 7037305 CR 2.6193 3.5406
7042263 Pont 72 400 MT GTO 72 45 7037305 CS 2.4811 3.5406
7042264 Pont 72 400 AT CALIFORNIA 74 47 7037305 CR 2.5659 3.7699
7042270 Pont 72 455 H.O. AT 71 45 7037305 CR 2.3688 3.4283
7042272 Pont 72 455 AT GTO 72 43 7029922 CR 2.6193 3.5406
7042273 Pont 72 455 H.O. MT 71 43 7037305 CR 2.5070 3.4283
7042273 Pont 73 455 S.D. MT Early 71 43 7037305 CR 2.5070 3.4283
7042274 Pont 72 400 AT FEDERAL 74 47 7029922 CS 2.5659 3.7699
7042276 Pont 72 455 AT HI ALTITUDE 71 43 7037851 CR 2.5070 3.4283
7042278 Pont 72 400 AT HI ALTITUDE 72 46 7037851 CS 2.4096 3.5406
7042902 CHEV 72 Vette Fed A/T 350 74 45 7036019 DA 2.7104 3.7699

7042903 CHEV 72 Vette Calif. M/T 350 74 45 7036019 DA 2.7104 3.7699
7042910 CHEV 72 350 TRUCK SERIES 10 CA A/T 74 43 7036019 DA 2.8486 3.7699
7042911 CHEV 72 350 TRUCK SERIES 10 CA M/T 74 43 7036019 DA 2.8486 3.7699
7043200 CHEV 73 454 all A/T & Truck 77 50 7036019 DA 2.6931 4.1257
7043201 CHEV 73 454 all M/T & Truck 77 48 7036019 DA 2.8471 4.1257
7043202 CHEV 73 350 all Auto & Truck 73 44 7036019 DA 2.6649 3.6545
7043203 CHEV 73 350 all M/T & Truck 73 44 7036019 DA 2.6649 3.6545
7043207 CHEV 73 454 TRUCK FED C20, 30 & P-30 69 39 7036019 DA 2.5447 3.2084
7043208 CHEV 73 350 TRUCK ALL C, P, K 20 & 30 68 36 7037305 DA 2.6138 3.1008
7043210 CHEV 73 350 TRUCK A/T G SERIES 10 73 42 7036019 DA 2.7999 3.6545
7043211 CHEV 73 350 TRUCK M/T G SERIES 10 73 42 7036019 DA 2.7999 3.6545
7043212 CHEV 73 Vette Hi Perf. Auto 74 44 7036019 DA 2.7803 3.7699
7043213 CHEV 73 Vette Hi Perf. M/T 74 44 7036019 DA 2.7803 3.7699
7043215 CHEV 73 350 G&P SERIES 30 MOTORHOME 72 39 7037305 DA 2.8769 3.5406
7043216 CHEV 73 454 P-30 SUBURBAN FED & CAL 77 48 7036019 DA 2.8471 4.1257
7043250 OLDS 73-74 350 CUTLASS A/T 69 7047907 7040498 AS/CG ########## 3.2084
7043262 Pont 73 455 AT 71 41 7029529 CR 2.6389 3.4283
7043263 Pont 73 400 MT 71 43 7037851 CS 2.5070 3.4283
7043264 Pont 73 400 AT 72 43 7029529 DB 2.6193 3.5406
7043265 Pont 73 455 Firebird M/T 71 44 7029922 CR 2.4387 3.4283
7043266 Pont 73 400 LATE AT 72 45 7029529 DB 2.4811 3.5406
7043270 Pont 73 455 S.D. AT 76 51 7029529 BV 2.4936 4.0055
7043272 Pont 73 455 AT HI ALTITUDE 70 41 7029529 CR 2.5282 3.3175
7043273 Pont 73 455 SD MT 75 49 7029529 BV 2.5321 3.8869
7043274 Pont 73 400 AT HI ALTITUDE 72 45 7037851 DB 2.4811 3.5406
7043507 CHEV 73 454 TRUCK CAL C20, 30 & P-30 70 34 7036019 DA 2.9405 3.3175
7044201 CHEV 74 454 CHVL ALL M/T 75 39 7036019 DH 3.2233 3.8869
7044202 CHEV 74 CHEVELLE 350 AUTO & TRUCK 75 46 7029529 CH 2.7560 3.8869
7044203 CHEV 74 CHEVELLE 350 MAN & TRUCK 75 46 7029529 CH 2.7560 3.8869
7044206 CHEV 74 Vette & Nova Fed A/T 75 46 7029529 CH 2.7560 3.8869
7044207 CHEV 74 Vette & Nova Fed M/T 75 46 7029529 CH 2.7560 3.8869
7044208 CHEV 74 350 Camaro Hi Perf. A/T 75 43 7036019 DA 2.9657 3.8869
7044209 CHEV 74 350 Camaro Hi Perf. M/T 75 43 7036019 DA 2.9657 3.8869
7044210 CHEV 74 Vette 350 Hi Perf. A/T 75 43 7036019 DA 2.9657 3.8869
7044211 CHEV 74 Vette 350 Hi Perf. M/T 75 43 7036019 DA 2.9657 3.8869
7044212 CHEV 74 454 TRUCK C20, 30, P30 MTRHM 69 34 7037298 DH 2.8314 3.2084
7044213 CHEV 74 350 TRUCK CK20 & C30 68 36 7037305 CP 2.6138 3.1008
7044214 CHEV 74 350 TRUCK G30 VAN FED 72 39 7037305 CP 2.8769 3.5406
7044215 CHEV 74 350 TRUCK P30 MOTORHOME FED 72 39 7037305 CP 2.8769 3.5406
7044216 CHEV 74 350 TRUCK P20, 30 FED 68 36 7037305 CP 2.6138 3.1008
7044217 CHEV 74 454 TRUCK C30 EXC MTRHM A/T 69 34 7037298 DH 2.8314 3.2084
7044218 CHEV 74 350 VAN & VANDURA FED A/T 75 46 7029529 CH 2.7560 3.8869
7044219 CHEV 74 350 TRUCK ALL FED M/T 75 43 7036019 CH 2.9657 3.8869
7044221 CHEV 74 454 VETTE ALL M/T 75 39 7036019 DH 3.2233 3.8869
7044223 CHEV 74 454 MONTE, VETTE & TRUCK FED A/T 75 41 7036019 DH 3.0976 3.8869

7044224 CHEV 74 350 SPORTVAN, RALLY FED A/T 75 43 7029529 CH 2.9657 3.8869
7044225 CHEV 74 454 VETTE FED A/T 75 41 7036019 DH 3.0976 3.8869
7044226 CHEV 74 WAGON 400 AUTO 73 44 7029529 DL 2.6649 3.6545
7044227 CHEV 74 454 SUBURBAN A/T FED 74 37 7036019 DH 3.2256 3.7699
7044262 Pont 74 Firebird 455 Fed A/T 71 41 7029529 CR 2.6389 3.4283
7044266 Pont 74 ALL AT 72 45 7029529 DB 2.4811 3.5406
7044268 Pont 74 350 AT 72 43 7029529 DB 2.6193 3.5406
7044269 Pont 74 350 MT 68 35 7037851 DB 2.6696 3.1008
7044274 Pont 74 ALL HI ALTITUDE 72 45 7037851 DB 2.4811 3.5406
7044500 CHEV 74 454 MONTE, VETTE & TRUCK CA A/T 75 41 7036019 DH 3.0976 3.8869
7044502 CHEV 74 CHEVELLE 350 A/T CA & TRUCK 75 46 7037851 CH 2.7560 3.8869
7044503 CHEV 74 CHEVELLE 350 M/T CA & TRUCK 75 46 7037851 CH 2.7560 3.8869
7044505 CHEV 74 454 VETTE CA A/T 75 41 7036019 DH 3.0976 3.8869
7044506 CHEV 74 Vette & Nova Calif. A/T 75 46 7037851 CH 2.7560 3.8869
7044507 CHEV 74 Vette & Nova Calif. M/T 75 46 7037851 CH 2.7560 3.8869
7044513 CHEV 74 350 TRUCK CK20 & C30 CALIF 68 36 7037305 CP 2.6138 3.1008
7044512 CHEV 74 454 TRUCK 20, 30, MTRHM CA 69 34 7037298 DH 2.8314 3.2084
7044514 CHEV 74 350 TRUCK G30 VAN CALIF 72 39 7037305 CP 2.8769 3.5406
7044515 CHEV 74 350 TRUCK P30 MOTORHOME CA 72 39 7037305 CP 2.8769 3.5406
7044516 CHEV 74 350 TRUCK P20, 30 CALIF 68 36 7037305 CP 2.6138 3.1008
7044517 CHEV 74 454 TRUCK P30 EXC MTRHM CA 69 34 7037298 DH 2.8314 3.2084
7044527 CHEV 74 400 C20 SUBURBAN ALL TRANS 72 40 7037851 DL 2.8149 3.5406
7044518 CHEV 74 350 MOTORHOME CALIF A/T 75 42 7037851 CH 3.0324 3.8869
7044519 CHEV 74 350 TRUCK ALL CALIF M/T 75 42 7037851 CH 3.0324 3.8869
7044520 CHEV 74 454 SUBURBAN A/T CALIF 75 42 7037851 DH 3.0324 3.8869
7044526 CHEV 74 400 CHVL CA 73 42 7037851 DL 2.7999 3.6545
7044568 PONT 74 350 AT CALIFORNIA 72 43 7029529 DB 2.6193 3.5406
7045183 OLDS 75 350 CUTLASS A/T A/C FED 67 41 7040498 CV 2.2054 2.9947
7045200 Chev 75 454 AT Chevelle/Monte 76 43 7041477 CJ 3.0843 4.0055
7045202 CHEV 75 CAMARO & BLAZER 350 FED A/T 72 46 17052057 CH 2.4096 3.5406
7045203 CHEV 75 CAMARO & BLAZER 350 FED M/T 72 46 17052057 CH 2.4096 3.5406
7045206 CHEV 75 350 NOVA FED A/T 72 46 17052057 CH 2.4096 3.5406
7045207 CHEV 75 350 NOVA FED M/T 72 46 17052057 CH 2.4096 3.5406
7045210 Chev 75 FEDERAL AT HIGH PERF VETTE 72 44 17052057 CH 2.5510 3.5406
7045211 Chev 75 FEDERAL MT HIGH PERF VETTE 72 44 17052057 CH 2.5510 3.5406
7045212 CHEV 454 C10, 20, 30 P30 MTRHM FED 68 33 7037298 DH 2.7764 3.1008
7045213 CHEV & GMC Truck 75-76 Non-CA, HD 68 32 7029862 CP 2.8274 3.1008
7045214 CHEV 350 TRUCK G20, 30 FED 71 39 7037305 CP 2.7646 3.4283
7045215 CHEV 350 P30 MOTORHOME FED 71 39 7037305 CP 2.7646 3.4283
7045216 CHEV & GMC Truck, 75-76 Reg Chassis 68 32 7029862 CP 2.8274 3.1008
7045217 CHEV 454 P30 REG CHASSIS FED 68 33 7037298 DH 2.7764 3.1008
7045218 CHEV 75 350 G-10 VAN A/T 71 44 7041459 CH 2.4387 3.4283
7045219 CHEV 75 350 G-10 VAN M/T 71 44 7041459 CH 2.4387 3.4283
7045220 CHEV 454 TRUCK C-10 FED 70 38 7041477 CJ 2.7143 3.3175
7045221 CHEV 75 454 CHVL & MONTE CNDA A/T 70 38 7041477 CJ 2.7143 3.3175

7045222 Chev 75 AT ALL VETTE 72 46 17052057 CH 2.4096 3.5406
7045223 Chev 75 FEDERAL MT VETTE 72 46 17052057 CH 2.4096 3.5406
7045224 Chev 75 CHVL, MONTE 400 CA A/T 71 46 7037851 DL 2.2973 3.4283
7045225 CHEV 75-76 400 TRUCK G20, 30 FED 71 36 7037305 DL 2.9413 3.4283
7045228 Chev 75 400 FEDERAL AT Chevelle/Monte 71 47 17052057 DL 2.2242 3.4283
7045229 Chev 75 400 MT Truck K-10, 20 FED 69 36 7029862 DL 2.7214 3.2084
7045294 CHEV 75 350 CHVL & MONTE CNDA A/T 72 46 17052057 CH 2.4096 3.5406
7045502 CHEV 75 CAMARO 350 CA A/T 72 46 17052057 CH 2.4096 3.5406
7045503 CHEV 75 CAMARO 350 CA M/T 72 46 17052057 CH 2.4096 3.5406
7045504 Chev 75 350 AT CALIFORNIA 72 46 7037851 CH 2.4096 3.5406
7045506 CHEV 75 350 NOVA CA A/T 72 46 17052057 CH 2.4096 3.5406
7045507 CHEV 75 350 NOVA CA M/T 72 46 17052057 CH 2.4096 3.5406
7045512 CHEV 454 C10, 20, 30, P30 MTRHM CA 67 30 7036019 CJ 2.8188 2.9947
7045512 CHEV 454 P30 EXC MTRHM CA 67 30 7036019 CJ 2.8188 2.9947
7045583 CHEV & GMC Truck, 75-77 Calif. 73 42 7029862 CP 2.7999 3.6545
7045584 CHEV 350 TRUCK G20, 30 CALIF 72 40 7037305 CP 2.8149 3.5406
7045585 CHEV 350 P30 MOTORHOME CALIF 72 40 7037305 CP 2.8149 3.5406
7045586 CHEV & GMC Truck, 75-77 Reg Chassis CA 73 42 7029862 CP 2.7999 3.6545
7045588 CHEV 75-76 400 TRUCK G20, 30 CALIF 73 38 7037305 DL 3.0513 3.6545
7045589 CHEV 75-76 400 TRUCK K10, 20 CALIF 73 33 7037305 DL 3.3301 3.6545
17054919 CHEV SERV REPL 73 VETTE, NOVA, CAM 74 44 7036019 DA 2.7803 3.7699
17054920 CHEV SERV REPL 74 350 VETTE, CAM, CHVL 75 46 7029529 CH 2.7560 3.8869
17054923 GMC SERV REPL 71 350 ALL 74 39 7036019 BA 3.1062 3.7699
17054927 CHEV 72 350 Srv Repl Vette, Camaro, GMC 74 43 7036019 DA 2.8486 3.7699
17054928 CHEV 73 350 TRUCK ALL TRANS 73 42 7029862 DA 2.7999 3.6545
17054929 CHEV 74 350-400 CHVL, VETTE, MONTE 73 42 7037851 CH 2.7999 3.6545
17055038 CHEV 75 Serv Repl Truck, Vette, Nova 72 46 17052057 CH 2.4096 3.5406
17056200 CHEV 76 454 FULL SIZE A/T 79 46 7041477 DR 3.2398 4.3707
17056202 CHEV 76 350 CAMARO FED A/T 77 48 17052057 CH 2.8471 4.1257
17056203 CHEV 76 350 CAMARO FED M/T 77 48 17052057 CH 2.8471 4.1257
17056206 CHEV 76 Vette & Nova A/T 77 48 17052057 CH 2.8471 4.1257
17056207 CHEV 76 Vette & Nova M/T 77 48 17052057 CH 2.8471 4.1257
17056208 CHEV 76 350 TRUCK C10 A/T FED 77 48 17052057 CH 2.8471 4.1257
17056209 CHEV 76 350 TRUCK C10 M/T FED 77 48 17052057 CH 2.8471 4.1257
17056210 Chev 76 FEDERAL AT VETTE 77 51 17052057 CH 2.6138 4.1257
17056211 Chev 76 FEDERAL MT VETTE 77 51 17052057 CH 2.6138 4.1257
17056218 CHEV 76 350 G10 VAN A/T FED 76 47 17052057 CH 2.8015 4.0055
17056219 CHEV 76 350 G10 VAN M/T FED 76 47 17052057 CH 2.8015 4.0055
17056221 CHEV 76 FED HD TRUCK 454 AUTO 77 45 7041477 DR 3.0662 4.1257
17056226 Chev 76 FEDERAL AT A/C VETTE 77 51 17052057 CH 2.6138 4.1257
17056281 CHEV 76-77 CHVL, CAMARO CANADA 77 48 17052057 CH 2.8471 4.1257
17056282 CHEV 76 NOVA, VETTE CANADA 77 48 17052057 CH 2.8471 4.1257
17056283 CHEV 76 350 TRUCK C10 CANADA NO CAT 77 48 17052057 CH 2.8471 4.1257
17056284 CHEV 76 350 G10 VAN CANADA NO CAT 76 47 17052057 CH 2.8015 4.0055
17056286 CHEV 76 454 A/T CANADA 77 45 7041477 DR 3.0662 4.1257
17056502 CHEV 76 350 CAMARO CA A/T 77 48 17052057 CH 2.8471 4.1257

17056503 CHEV 76 350 CAMARO CA M/T 77 48 7037851 CH 2.8471 4.1257
17056506 CHEV 76 Vette & Nova A/T Calif 77 48 17052057 CH 2.8471 4.1257
17056507 CHEV 76 Vette & Nova M/T Calif 77 48 7037851 CH 2.8471 4.1257
17056508 CHEV 76 350 TRUCK C10 A/T CALIF 77 48 7037851 CH 2.8471 4.1257
17056509 CHEV 76 350 TRUCK C10 M/T CALIF 77 48 7037851 CH 2.8471 4.1257
17056512 CHEV 76 CALIF HD TRUCK 454 AT & MT 72 38 7036019 DR 2.9374 3.5406
17056517 CHEV 76 FED P-30 TRUCK 454 AUTO 72 38 7036019 DR 2.9374 3.5406
17056518 CHEV 76 350 G10 VAN A/T CALIF 76 47 7037851 CH 2.8015 4.0055
17056519 CHEV 76 350 G10 VAN M/T CALIF 76 47 7037851 CH 2.8015 4.0055
17057202 CHEV 77 CHVL, MONTE, VETTE 350 AUTO 77 52 7029529 CH 2.5329 4.1257
17057203 Chev 77 FEDERAL MT NON-A/C VETTE 77 52 7029529 CH 2.5329 4.1257
17057204 CHEV 77 CHVL, VETTE 350 AUTO A/C 77 52 7029529 CH 2.5329 4.1257
17057210 Chev 77 HIGH PERF NON-A/C VETTE 77 53 17052057 CH 2.4504 4.1257
17057211 Chev 77 HIGH PERF A/C & NON-A/C VETTE 77 53 17052057 CH 2.4504 4.1257
17057213 Chev 77 HD Truck 350 C-K-G-10-20-30 Fed 64 40 7036019 DP 1.9604 2.6861
17057215 Chev 77 HD P-30 Motor Home 350 Federal 64 40 7036019 DP 1.9604 2.6861
17057216 Chev 77 HD P-30 Conv Chassis 350 Fed 64 40 7036019 DP 1.9604 2.6861
17057222 Chev 77 G10 VAN FED A/C A/T 77 52 7029529 CH 2.5329 4.1257
17057514 Chev 77 HD G-20-30 Van 350 Calif 73 39 7036019 CP 2.9908 3.6545
17057228 Chev 77 FEDERAL A/C VETTE 77 53 17052057 CH 2.4504 4.1257
17057502 CHEV 77 350 NON A/C AUTO CALIF 72 41 7036019 CH 2.7512 3.5406
17057504 CHEV 77 350 A/C AUTO CALIF 72 41 7036019 CH 2.7512 3.5406
17057582 CHEV 77 350 HI ALT NON A/C 72 41 7036019 CH 2.7512 3.5406
17057584 CHEV 77 MONTE CARLO, HI ALT. A/C 72 41 7036019 CH 2.7512 3.5406
17058202 CHEV 78 VETTE 350 FED NO A/C A/T 77 52 7029529 CH 2.5329 4.1257
17058203 CHEV 78 FED VETTE A/C & NON-A/C 4-SPD 77 52 7029529 CH 2.5329 4.1257
17058204 CHEV 78 VETTE 350 FED A/C A/T 77 52 7029529 CH 2.5329 4.1257
17058210 CHEV 78 FED VETTE NON A/C AUTO 77 53 17052057 CH 2.4504 4.1257
17058211 CHEV 78 FED VETTE H.P. A/C & NON 4-SPD 77 53 17052057 CH 2.4504 4.1257
17058213 CHEV 78 GMC HD Truck & '79 Canada HD 63 40 7036019 CP 1.8606 2.5863
17058228 CHEV 78 FED VETTE H.P. A/C AUTO 77 53 17052057 CH 2.4504 4.1257
17058229 CHEV 78 400-454 HD TRUCK FED A/T 64 39 7036019 DG 2.0224 2.6861
17058250 BUICK, OLDS 403 NON A/C FED 73 55 7044432 CV 1.8096 3.6545
17058253 BUICK, OLDS 403 A/C FED 73 55 7044432 CV 1.8096 3.6545
17058258 BUICK, OLDS 403 A/C HI ALT 70 50 17051705 CV 1.8850 3.3175
17058282 CHEV 78 CANADA Z-94 CAMARO NO AC 77 52 7029529 CH 2.5329 4.1257
17058284 CHEV 78 CANADA Z-94 CAMARO AC 77 52 7029529 CH 2.5329 4.1257
17058502 CHEV 78 VETTE 350 CA NO A/C A/T 71 41 7036019 CH 2.6389 3.4283
17058504 CHEV 78 VETTE 350 CA A/C A/T 71 41 7036019 CH 2.6389 3.4283
17058553 BUICK, OLDS, PONT 403 CALIF 74 52 17051705 CV 2.1771 3.7699
17058582 CHEV 78 VETTE 350 HI ALT. NO A/C A/T 71 41 7036019 CH 2.6389 3.4283
17058584 CHEV 78 VETTE 350 HI ALT. A/C A/T 71 41 7036019 CH 2.6389 3.4283
17059203 CHEV 79 FED VETTE A/C & NON 4-SPD 72 40 7036019 CH 2.8149 3.5406
17059205 CHEV 79 350 TRUCK, NON-A/C, AUTO 72 52 7036019 DP 1.9478 3.5406
17059207 CHEV 79 305 EL CAMINO M/T 72 40 7036019 CH 2.8149 3.5406
17059210 CHEV 79 VETTE L-82 H.P. NON-A/C AUTO 77 53 17052057 CH 2.4504 4.1257

17059211 CHEV 79 VETTE L-82 H.P. A/C & NON 4-SPD 77 53 17052057 CH 2.4504 4.1257
17059216 CHEV 79 305-350 CAMARO A/C 72 40 7036019 CH 2.8149 3.5406
17059217 CHEV 79 305-350 CAMARO NO A/C 72 40 7036019 CH 2.8149 3.5406
17059218 CHEV 79 305 MALIBU 2.29 AXLE NO AC 71 40 7036019 CH 2.7026 3.4283
17059222 CHEV 79 305 MALIBU 2.29 AXLE AC 71 40 7036019 CH 2.7026 3.4283
17059228 CHEV 79 VETTE L-82 H.P. A/C AUTO 77 53 17052057 CH 2.4504 4.1257
17059282 CHEV 79 CANADA Z-94 CAMARO NO A/C 77 51 7029529 CH 2.6138 4.1257
17059284 CHEV 79 CANADA Z-94 CAMARO A/C 77 51 7029529 CH 2.6138 4.1257
17059298 VOLVO PENTA, MARINE, 305 69 40 CJ 2.4826 3.2084
17059504 79 SKYLARK, NOVA, CAMARO VETTE CA 72 40 7037305 CH 2.8149 3.5406
17059582 CHEV 79 305 MALIBU NO A/C 71 41 7036019 CH 2.6389 3.4283
17059582 CHEV 79 VETTE 350 HI ALT. NO A/C 71 41 7036019 CH 2.6389 3.4283
17059584 CHEV 79 305 MALIBU A/C 71 41 7036019 CH 2.6389 3.4283
17059584 CHEV 79 VETTE 350 HI ALT. A/C 71 41 7036019 CH 2.6389 3.4283
17080201 CHEV 80 71 48 7036019 DR 2.1496 3.4283
17080202 CHEV 80 71 42 7036019 CH 2.5737 3.4283
17080204 CHEV 80 73 41 7036019 CH 2.8651 3.6545
17080205 CHEV 80 72 51 7036019 DP 2.0287 3.5406
17080206 CHEV 80 72 51 7036019 DP 2.0287 3.5406
17080207 Chev 80 VETTE M/T 71 42 7036019 CH 2.5737 3.4283
17080212 CHEV 80 72 52 7036019 DH 1.9478 3.5406
17080213 CHEV 80 72 50 7036019 DP 2.1080 3.5406
17080215 CHEV 80 72 50 7036019 DP 2.1080 3.5406
17080224 CHEV 80 72 48 7036019 DR 2.2619 3.5406
17080228 CHEV 80 Vette L82 A/T 72 41 7036019 CH 2.7512 3.5406

Figure 2: Metering Areas of Jet & Rod Combinations

Jet Jet Area Rod Rod Area Total Area

0.060 0.00282743 0.026 0.00053093 0.0022965
0.060 0.00282743 0.030 0.00070686 0.00212058
0.060 0.00282743 0.031 0.00075477 0.00207267
0.060 0.00282743 0.032 0.00080425 0.00202319
0.060 0.00282743 0.033 0.0008553 0.00197213
0.060 0.00282743 0.034 0.00090792 0.00191951
0.060 0.00282743 0.035 0.00096211 0.00186532
0.060 0.00282743 0.036 0.00101788 0.00180956
0.060 0.00282743 0.037 0.00107521 0.00175222
0.060 0.00282743 0.038 0.00113411 0.00169332
0.060 0.00282743 0.039 0.00119459 0.00163284
0.060 0.00282743 0.040 0.00125664 0.0015708
0.060 0.00282743 0.041 0.00132025 0.00150718
0.060 0.00282743 0.042 0.00138544 0.00144199

0.060 0.00282743 0.043 0.0014522 0.00137523
0.060 0.00282743 0.044 0.00152053 0.0013069
0.060 0.00282743 0.045 0.00159043 0.001237
0.060 0.00282743 0.046 0.0016619 0.00116553
0.060 0.00282743 0.047 0.00173494 0.00109249
0.060 0.00282743 0.048 0.00180956 0.00101788
0.060 0.00282743 0.049 0.00188574 0.00094169
0.060 0.00282743 0.050 0.0019635 0.00086394

0.061 0.00292247 0.026 0.00053093 0.00239154
0.061 0.00292247 0.030 0.00070686 0.00221561
0.061 0.00292247 0.031 0.00075477 0.0021677
0.061 0.00292247 0.032 0.00080425 0.00211822
0.061 0.00292247 0.033 0.0008553 0.00206717
0.061 0.00292247 0.034 0.00090792 0.00201455
0.061 0.00292247 0.035 0.00096211 0.00196035
0.061 0.00292247 0.036 0.00101788 0.00190459
0.061 0.00292247 0.037 0.00107521 0.00184726
0.061 0.00292247 0.038 0.00113411 0.00178835
0.061 0.00292247 0.039 0.00119459 0.00172788
0.061 0.00292247 0.040 0.00125664 0.00166583
0.061 0.00292247 0.041 0.00132025 0.00160221
0.061 0.00292247 0.042 0.00138544 0.00153702
0.061 0.00292247 0.043 0.0014522 0.00147027
0.061 0.00292247 0.044 0.00152053 0.00140194
0.061 0.00292247 0.045 0.00159043 0.00133204
0.061 0.00292247 0.046 0.0016619 0.00126056
0.061 0.00292247 0.047 0.00173494 0.00118752
0.061 0.00292247 0.048 0.00180956 0.00111291
0.061 0.00292247 0.049 0.00188574 0.00103673
0.061 0.00292247 0.050 0.0019635 0.00095897
0
0.062 0.00301907 0.026 0.00053093 0.00248814
0.062 0.00301907 0.030 0.00070686 0.00231221
0.062 0.00301907 0.031 0.00075477 0.0022643
0.062 0.00301907 0.032 0.00080425 0.00221482
0.062 0.00301907 0.033 0.0008553 0.00216377
0.062 0.00301907 0.034 0.00090792 0.00211115
0.062 0.00301907 0.035 0.00096211 0.00205696
0.062 0.00301907 0.036 0.00101788 0.00200119
0.062 0.00301907 0.037 0.00107521 0.00194386
0.062 0.00301907 0.038 0.00113411 0.00188496
0.062 0.00301907 0.039 0.00119459 0.00182448
0.062 0.00301907 0.040 0.00125664 0.00176243
0.062 0.00301907 0.041 0.00132025 0.00169882
0.062 0.00301907 0.042 0.00138544 0.00163363

0.062 0.00301907 0.043 0.0014522 0.00156687
0.062 0.00301907 0.044 0.00152053 0.00149854
0.062 0.00301907 0.045 0.00159043 0.00142864
0.062 0.00301907 0.046 0.0016619 0.00135717
0.062 0.00301907 0.047 0.00173494 0.00128413
0.062 0.00301907 0.048 0.00180956 0.00120951
0.062 0.00301907 0.049 0.00188574 0.00113333
0.062 0.00301907 0.050 0.0019635 0.00105558

0.063 0.00311725 0.026 0.00053093 0.00258632
0.063 0.00311725 0.030 0.00070686 0.00241039
0.063 0.00311725 0.031 0.00075477 0.00236248
0.063 0.00311725 0.032 0.00080425 0.002313
0.063 0.00311725 0.033 0.0008553 0.00226195
0.063 0.00311725 0.034 0.00090792 0.00220933
0.063 0.00311725 0.035 0.00096211 0.00215513
0.063 0.00311725 0.036 0.00101788 0.00209937
0.063 0.00311725 0.037 0.00107521 0.00204204
0.063 0.00311725 0.038 0.00113411 0.00198313
0.063 0.00311725 0.039 0.00119459 0.00192265
0.063 0.00311725 0.040 0.00125664 0.00186061
0.063 0.00311725 0.041 0.00132025 0.00179699
0.063 0.00311725 0.042 0.00138544 0.0017318
0.063 0.00311725 0.043 0.0014522 0.00166504
0.063 0.00311725 0.044 0.00152053 0.00159671
0.063 0.00311725 0.045 0.00159043 0.00152681
0.063 0.00311725 0.046 0.0016619 0.00145534
0.063 0.00311725 0.047 0.00173494 0.0013823
0.063 0.00311725 0.048 0.00180956 0.00130769
0.063 0.00311725 0.049 0.00188574 0.0012315
0.063 0.00311725 0.050 0.0019635 0.00115375

0.064 0.00321699 0.026 0.00053093 0.00268606
0.064 0.00321699 0.030 0.00070686 0.00251013
0.064 0.00321699 0.031 0.00075477 0.00246222
0.064 0.00321699 0.032 0.00080425 0.00241274
0.064 0.00321699 0.033 0.0008553 0.00236169
0.064 0.00321699 0.034 0.00090792 0.00230907
0.064 0.00321699 0.035 0.00096211 0.00225488
0.064 0.00321699 0.036 0.00101788 0.00219911
0.064 0.00321699 0.037 0.00107521 0.00214178
0.064 0.00321699 0.038 0.00113411 0.00208288
0.064 0.00321699 0.039 0.00119459 0.0020224
0.064 0.00321699 0.040 0.00125664 0.00196035
0.064 0.00321699 0.041 0.00132025 0.00189674
0.064 0.00321699 0.042 0.00138544 0.00183155

0.064 0.00321699 0.043 0.0014522 0.00176479
0.064 0.00321699 0.044 0.00152053 0.00169646
0.064 0.00321699 0.045 0.00159043 0.00162656
0.064 0.00321699 0.046 0.0016619 0.00155509
0.064 0.00321699 0.047 0.00173494 0.00148205
0.064 0.00321699 0.048 0.00180956 0.00140743
0.064 0.00321699 0.049 0.00188574 0.00133125
0.064 0.00321699 0.050 0.0019635 0.0012535

0.065 0.00331831 0.026 0.00053093 0.00278738
0.065 0.00331831 0.030 0.00070686 0.00261145
0.065 0.00331831 0.031 0.00075477 0.00256354
0.065 0.00331831 0.032 0.00080425 0.00251406
0.065 0.00331831 0.033 0.0008553 0.00246301
0.065 0.00331831 0.034 0.00090792 0.00241039
0.065 0.00331831 0.035 0.00096211 0.00235619
0.065 0.00331831 0.036 0.00101788 0.00230043
0.065 0.00331831 0.037 0.00107521 0.0022431
0.065 0.00331831 0.038 0.00113411 0.00218419
0.065 0.00331831 0.039 0.00119459 0.00212372
0.065 0.00331831 0.040 0.00125664 0.00206167
0.065 0.00331831 0.041 0.00132025 0.00199805
0.065 0.00331831 0.042 0.00138544 0.00193286
0.065 0.00331831 0.043 0.0014522 0.00186611
0.065 0.00331831 0.044 0.00152053 0.00179778
0.065 0.00331831 0.045 0.00159043 0.00172788
0.065 0.00331831 0.046 0.0016619 0.0016564
0.065 0.00331831 0.047 0.00173494 0.00158336
0.065 0.00331831 0.048 0.00180956 0.00150875
0.065 0.00331831 0.049 0.00188574 0.00143257
0.065 0.00331831 0.050 0.0019635 0.00135481

0.066 0.00342119 0.026 0.00053093 0.00289027
0.066 0.00342119 0.030 0.00070686 0.00271434
0.066 0.00342119 0.031 0.00075477 0.00266643
0.066 0.00342119 0.032 0.00080425 0.00261695
0.066 0.00342119 0.033 0.0008553 0.0025659
0.066 0.00342119 0.034 0.00090792 0.00251327
0.066 0.00342119 0.035 0.00096211 0.00245908
0.066 0.00342119 0.036 0.00101788 0.00240332
0.066 0.00342119 0.037 0.00107521 0.00234598
0.066 0.00342119 0.038 0.00113411 0.00228708
0.066 0.00342119 0.039 0.00119459 0.0022266
0.066 0.00342119 0.040 0.00125664 0.00216456
0.066 0.00342119 0.041 0.00132025 0.00210094
0.066 0.00342119 0.042 0.00138544 0.00203575

0.066 0.00342119 0.043 0.0014522 0.00196899
0.066 0.00342119 0.044 0.00152053 0.00190066
0.066 0.00342119 0.045 0.00159043 0.00183076
0.066 0.00342119 0.046 0.0016619 0.00175929
0.066 0.00342119 0.047 0.00173494 0.00168625
0.066 0.00342119 0.048 0.00180956 0.00161164
0.066 0.00342119 0.049 0.00188574 0.00153545
0.066 0.00342119 0.050 0.0019635 0.0014577

0.067 0.00352565 0.026 0.00053093 0.00299472
0.067 0.00352565 0.030 0.00070686 0.00281879
0.067 0.00352565 0.031 0.00075477 0.00277088
0.067 0.00352565 0.032 0.00080425 0.0027214
0.067 0.00352565 0.033 0.0008553 0.00267035
0.067 0.00352565 0.034 0.00090792 0.00261773
0.067 0.00352565 0.035 0.00096211 0.00256354
0.067 0.00352565 0.036 0.00101788 0.00250778
0.067 0.00352565 0.037 0.00107521 0.00245044
0.067 0.00352565 0.038 0.00113411 0.00239154
0.067 0.00352565 0.039 0.00119459 0.00233106
0.067 0.00352565 0.040 0.00125664 0.00226902
0.067 0.00352565 0.041 0.00132025 0.0022054
0.067 0.00352565 0.042 0.00138544 0.00214021
0.067 0.00352565 0.043 0.0014522 0.00207345
0.067 0.00352565 0.044 0.00152053 0.00200512
0.067 0.00352565 0.045 0.00159043 0.00193522
0.067 0.00352565 0.046 0.0016619 0.00186375
0.067 0.00352565 0.047 0.00173494 0.00179071
0.067 0.00352565 0.048 0.00180956 0.00171609
0.067 0.00352565 0.049 0.00188574 0.00163991
0.067 0.00352565 0.050 0.0019635 0.00156216

0.068 0.00363168 0.026 0.00053093 0.00310075
0.068 0.00363168 0.030 0.00070686 0.00292482
0.068 0.00363168 0.031 0.00075477 0.00287691
0.068 0.00363168 0.032 0.00080425 0.00282743
0.068 0.00363168 0.033 0.0008553 0.00277638
0.068 0.00363168 0.034 0.00090792 0.00272376
0.068 0.00363168 0.035 0.00096211 0.00266957
0.068 0.00363168 0.036 0.00101788 0.00261381
0.068 0.00363168 0.037 0.00107521 0.00255647
0.068 0.00363168 0.038 0.00113411 0.00249757
0.068 0.00363168 0.039 0.00119459 0.00243709
0.068 0.00363168 0.040 0.00125664 0.00237504
0.068 0.00363168 0.041 0.00132025 0.00231143
0.068 0.00363168 0.042 0.00138544 0.00224624

0.068 0.00363168 0.043 0.0014522 0.00217948
0.068 0.00363168 0.044 0.00152053 0.00211115
0.068 0.00363168 0.045 0.00159043 0.00204125
0.068 0.00363168 0.046 0.0016619 0.00196978
0.068 0.00363168 0.047 0.00173494 0.00189674
0.068 0.00363168 0.048 0.00180956 0.00182212
0.068 0.00363168 0.049 0.00188574 0.00174594
0.068 0.00363168 0.050 0.0019635 0.00166819

0.069 0.00373928 0.026 0.00053093 0.00320835
0.069 0.00373928 0.030 0.00070686 0.00303242
0.069 0.00373928 0.031 0.00075477 0.00298451
0.069 0.00373928 0.032 0.00080425 0.00293503
0.069 0.00373928 0.033 0.0008553 0.00288398
0.069 0.00373928 0.034 0.00090792 0.00283136
0.069 0.00373928 0.035 0.00096211 0.00277717
0.069 0.00373928 0.036 0.00101788 0.0027214
0.069 0.00373928 0.037 0.00107521 0.00266407
0.069 0.00373928 0.038 0.00113411 0.00260517
0.069 0.00373928 0.039 0.00119459 0.00254469
0.069 0.00373928 0.040 0.00125664 0.00248264
0.069 0.00373928 0.041 0.00132025 0.00241903
0.069 0.00373928 0.042 0.00138544 0.00235384
0.069 0.00373928 0.043 0.0014522 0.00228708
0.069 0.00373928 0.044 0.00152053 0.00221875
0.069 0.00373928 0.045 0.00159043 0.00214885
0.069 0.00373928 0.046 0.0016619 0.00207738
0.069 0.00373928 0.047 0.00173494 0.00200434
0.069 0.00373928 0.048 0.00180956 0.00192972
0.069 0.00373928 0.049 0.00188574 0.00185354
0.069 0.00373928 0.050 0.0019635 0.00177579

0.070 0.00384845 0.026 0.00053093 0.00331752
0.070 0.00384845 0.030 0.00070686 0.00314159
0.070 0.00384845 0.031 0.00075477 0.00309368
0.070 0.00384845 0.032 0.00080425 0.0030442
0.070 0.00384845 0.033 0.0008553 0.00299315
0.070 0.00384845 0.034 0.00090792 0.00294053
0.070 0.00384845 0.035 0.00096211 0.00288634
0.070 0.00384845 0.036 0.00101788 0.00283057
0.070 0.00384845 0.037 0.00107521 0.00277324
0.070 0.00384845 0.038 0.00113411 0.00271434
0.070 0.00384845 0.039 0.00119459 0.00265386
0.070 0.00384845 0.040 0.00125664 0.00259181
0.070 0.00384845 0.041 0.00132025 0.0025282
0.070 0.00384845 0.042 0.00138544 0.00246301

0.070 0.00384845 0.043 0.0014522 0.00239625
0.070 0.00384845 0.044 0.00152053 0.00232792
0.070 0.00384845 0.045 0.00159043 0.00225802
0.070 0.00384845 0.046 0.0016619 0.00218655
0.070 0.00384845 0.047 0.00173494 0.00211351
0.070 0.00384845 0.048 0.00180956 0.00203889
0.070 0.00384845 0.049 0.00188574 0.00196271
0.070 0.00384845 0.050 0.0019635 0.00188496

0.071 0.00395919 0.026 0.00053093 0.00342826
0.071 0.00395919 0.030 0.00070686 0.00325233
0.071 0.00395919 0.031 0.00075477 0.00320442
0.071 0.00395919 0.032 0.00080425 0.00315494
0.071 0.00395919 0.033 0.0008553 0.00310389
0.071 0.00395919 0.034 0.00090792 0.00305127
0.071 0.00395919 0.035 0.00096211 0.00299708
0.071 0.00395919 0.036 0.00101788 0.00294132
0.071 0.00395919 0.037 0.00107521 0.00288398
0.071 0.00395919 0.038 0.00113411 0.00282508
0.071 0.00395919 0.039 0.00119459 0.0027646
0.071 0.00395919 0.040 0.00125664 0.00270256
0.071 0.00395919 0.041 0.00132025 0.00263894
0.071 0.00395919 0.042 0.00138544 0.00257375
0.071 0.00395919 0.043 0.0014522 0.00250699
0.071 0.00395919 0.044 0.00152053 0.00243866
0.071 0.00395919 0.045 0.00159043 0.00236876
0.071 0.00395919 0.046 0.0016619 0.00229729
0.071 0.00395919 0.047 0.00173494 0.00222425
0.071 0.00395919 0.048 0.00180956 0.00214963
0.071 0.00395919 0.049 0.00188574 0.00207345
0.071 0.00395919 0.050 0.0019635 0.0019957

0.072 0.0040715 0.026 0.00053093 0.00354057
0.072 0.0040715 0.030 0.00070686 0.00336465
0.072 0.0040715 0.031 0.00075477 0.00331674
0.072 0.0040715 0.032 0.00080425 0.00326726
0.072 0.0040715 0.033 0.0008553 0.00321621
0.072 0.0040715 0.034 0.00090792 0.00316358
0.072 0.0040715 0.035 0.00096211 0.00310939
0.072 0.0040715 0.036 0.00101788 0.00305363
0.072 0.0040715 0.037 0.00107521 0.00299629
0.072 0.0040715 0.038 0.00113411 0.00293739
0.072 0.0040715 0.039 0.00119459 0.00287691
0.072 0.0040715 0.040 0.00125664 0.00281487
0.072 0.0040715 0.041 0.00132025 0.00275125
0.072 0.0040715 0.042 0.00138544 0.00268606

0.072 0.0040715 0.043 0.0014522 0.0026193
0.072 0.0040715 0.044 0.00152053 0.00255097
0.072 0.0040715 0.045 0.00159043 0.00248107
0.072 0.0040715 0.046 0.0016619 0.0024096
0.072 0.0040715 0.047 0.00173494 0.00233656
0.072 0.0040715 0.048 0.00180956 0.00226195
0.072 0.0040715 0.049 0.00188574 0.00218576
0.072 0.0040715 0.050 0.0019635 0.00210801

0.073 0.00418539 0.026 0.00053093 0.00365446
0.073 0.00418539 0.030 0.00070686 0.00347853
0.073 0.00418539 0.031 0.00075477 0.00343062
0.073 0.00418539 0.032 0.00080425 0.00338114
0.073 0.00418539 0.033 0.0008553 0.00333009
0.073 0.00418539 0.034 0.00090792 0.00327747
0.073 0.00418539 0.035 0.00096211 0.00322327
0.073 0.00418539 0.036 0.00101788 0.00316751
0.073 0.00418539 0.037 0.00107521 0.00311018
0.073 0.00418539 0.038 0.00113411 0.00305127
0.073 0.00418539 0.039 0.00119459 0.0029908
0.073 0.00418539 0.040 0.00125664 0.00292875
0.073 0.00418539 0.041 0.00132025 0.00286513
0.073 0.00418539 0.042 0.00138544 0.00279994
0.073 0.00418539 0.043 0.0014522 0.00273319
0.073 0.00418539 0.044 0.00152053 0.00266486
0.073 0.00418539 0.045 0.00159043 0.00259496
0.073 0.00418539 0.046 0.0016619 0.00252348
0.073 0.00418539 0.047 0.00173494 0.00245044
0.073 0.00418539 0.048 0.00180956 0.00237583
0.073 0.00418539 0.049 0.00188574 0.00229965
0.073 0.00418539 0.050 0.0019635 0.00222189

0.074 0.00430084 0.026 0.00053093 0.00376991
0.074 0.00430084 0.030 0.00070686 0.00359398
0.074 0.00430084 0.031 0.00075477 0.00354607
0.074 0.00430084 0.032 0.00080425 0.00349659
0.074 0.00430084 0.033 0.0008553 0.00344554
0.074 0.00430084 0.034 0.00090792 0.00339292
0.074 0.00430084 0.035 0.00096211 0.00333873
0.074 0.00430084 0.036 0.00101788 0.00328296
0.074 0.00430084 0.037 0.00107521 0.00322563
0.074 0.00430084 0.038 0.00113411 0.00316673
0.074 0.00430084 0.039 0.00119459 0.00310625
0.074 0.00430084 0.040 0.00125664 0.0030442
0.074 0.00430084 0.041 0.00132025 0.00298059
0.074 0.00430084 0.042 0.00138544 0.0029154

0.074 0.00430084 0.043 0.0014522 0.00284864
0.074 0.00430084 0.044 0.00152053 0.00278031
0.074 0.00430084 0.045 0.00159043 0.00271041
0.074 0.00430084 0.046 0.0016619 0.00263894
0.074 0.00430084 0.047 0.00173494 0.0025659
0.074 0.00430084 0.048 0.00180956 0.00249128
0.074 0.00430084 0.049 0.00188574 0.0024151
0.074 0.00430084 0.050 0.0019635 0.00233734

0.075 0.00441786 0.026 0.00053093 0.00388694
0.075 0.00441786 0.030 0.00070686 0.00371101
0.075 0.00441786 0.031 0.00075477 0.0036631
0.075 0.00441786 0.032 0.00080425 0.00361362
0.075 0.00441786 0.033 0.0008553 0.00356257
0.075 0.00441786 0.034 0.00090792 0.00350994
0.075 0.00441786 0.035 0.00096211 0.00345575
0.075 0.00441786 0.036 0.00101788 0.00339999
0.075 0.00441786 0.037 0.00107521 0.00334265
0.075 0.00441786 0.038 0.00113411 0.00328375
0.075 0.00441786 0.039 0.00119459 0.00322327
0.075 0.00441786 0.040 0.00125664 0.00316123
0.075 0.00441786 0.041 0.00132025 0.00309761
0.075 0.00441786 0.042 0.00138544 0.00303242
0.075 0.00441786 0.043 0.0014522 0.00296566
0.075 0.00441786 0.044 0.00152053 0.00289733
0.075 0.00441786 0.045 0.00159043 0.00282743
0.075 0.00441786 0.046 0.0016619 0.00275596
0.075 0.00441786 0.047 0.00173494 0.00268292
0.075 0.00441786 0.048 0.00180956 0.00260831
0.075 0.00441786 0.049 0.00188574 0.00253212
0.075 0.00441786 0.050 0.0019635 0.00245437
0.075 0.00441786 0.051 0.00204282 0.00237504
0.075 0.00441786 0.052 0.00212372 0.00229415
0.075 0.00441786 0.053 0.00220618 0.00221168

0.076 0.00453646 0.026 0.00053093 0.00400553
0.076 0.00453646 0.030 0.00070686 0.0038296
0.076 0.00453646 0.031 0.00075477 0.00378169
0.076 0.00453646 0.032 0.00080425 0.00373221
0.076 0.00453646 0.033 0.0008553 0.00368116
0.076 0.00453646 0.034 0.00090792 0.00362854
0.076 0.00453646 0.035 0.00096211 0.00357435
0.076 0.00453646 0.036 0.00101788 0.00351858
0.076 0.00453646 0.037 0.00107521 0.00346125
0.076 0.00453646 0.038 0.00113411 0.00340234
0.076 0.00453646 0.039 0.00119459 0.00334187

0.076 0.00453646 0.040 0.00125664 0.00327982
0.076 0.00453646 0.041 0.00132025 0.00321621
0.076 0.00453646 0.042 0.00138544 0.00315102
0.076 0.00453646 0.043 0.0014522 0.00308426
0.076 0.00453646 0.044 0.00152053 0.00301593
0.076 0.00453646 0.045 0.00159043 0.00294603
0.076 0.00453646 0.046 0.0016619 0.00287456
0.076 0.00453646 0.047 0.00173494 0.00280152
0.076 0.00453646 0.048 0.00180956 0.0027269
0.076 0.00453646 0.049 0.00188574 0.00265072
0.076 0.00453646 0.050 0.0019635 0.00257296
0.076 0.00453646 0.051 0.00204282 0.00249364
0.076 0.00453646 0.052 0.00212372 0.00241274
0.076 0.00453646 0.053 0.00220618 0.00233028

0.077 0.00465663 0.026 0.00053093 0.0041257
0.077 0.00465663 0.030 0.00070686 0.00394977
0.077 0.00465663 0.031 0.00075477 0.00390186
0.077 0.00465663 0.032 0.00080425 0.00385238
0.077 0.00465663 0.033 0.0008553 0.00380133
0.077 0.00465663 0.034 0.00090792 0.00374871
0.077 0.00465663 0.035 0.00096211 0.00369451
0.077 0.00465663 0.036 0.00101788 0.00363875
0.077 0.00465663 0.037 0.00107521 0.00358142
0.077 0.00465663 0.038 0.00113411 0.00352251
0.077 0.00465663 0.039 0.00119459 0.00346204
0.077 0.00465663 0.040 0.00125664 0.00339999
0.077 0.00465663 0.041 0.00132025 0.00333637
0.077 0.00465663 0.042 0.00138544 0.00327118
0.077 0.00465663 0.043 0.0014522 0.00320442
0.077 0.00465663 0.044 0.00152053 0.00313609
0.077 0.00465663 0.045 0.00159043 0.00306619
0.077 0.00465663 0.046 0.0016619 0.00299472
0.077 0.00465663 0.047 0.00173494 0.00292168
0.077 0.00465663 0.048 0.00180956 0.00284707
0.077 0.00465663 0.049 0.00188574 0.00277088
0.077 0.00465663 0.050 0.0019635 0.00269313
0.077 0.00465663 0.051 0.00204282 0.00261381
0.077 0.00465663 0.052 0.00212372 0.00253291
0.077 0.00465663 0.053 0.00220618 0.00245044
0.077 0.00465663 0.054 0.00229022 0.0023664
0.077 0.00465663 0.055 0.00237583 0.0022808

0.078 0.00477836 0.026 0.00053093 0.00424743
0.078 0.00477836 0.030 0.00070686 0.0040715
0.078 0.00477836 0.031 0.00075477 0.00402359

0.078 0.00477836 0.032 0.00080425 0.00397411
0.078 0.00477836 0.033 0.0008553 0.00392306
0.078 0.00477836 0.034 0.00090792 0.00387044
0.078 0.00477836 0.035 0.00096211 0.00381625
0.078 0.00477836 0.036 0.00101788 0.00376049
0.078 0.00477836 0.037 0.00107521 0.00370315
0.078 0.00477836 0.038 0.00113411 0.00364425
0.078 0.00477836 0.039 0.00119459 0.00358377
0.078 0.00477836 0.040 0.00125664 0.00352173
0.078 0.00477836 0.041 0.00132025 0.00345811
0.078 0.00477836 0.042 0.00138544 0.00339292
0.078 0.00477836 0.043 0.0014522 0.00332616
0.078 0.00477836 0.044 0.00152053 0.00325783
0.078 0.00477836 0.045 0.00159043 0.00318793
0.078 0.00477836 0.046 0.0016619 0.00311646
0.078 0.00477836 0.047 0.00173494 0.00304342
0.078 0.00477836 0.048 0.00180956 0.00296881
0.078 0.00477836 0.049 0.00188574 0.00289262
0.078 0.00477836 0.050 0.0019635 0.00281487
0.078 0.00477836 0.051 0.00204282 0.00273554
0.078 0.00477836 0.052 0.00212372 0.00265465
0.078 0.00477836 0.053 0.00220618 0.00257218
0.078 0.00477836 0.054 0.00229022 0.00248814
0.078 0.00477836 0.055 0.00237583 0.00240253

0.079 0.00490167 0.026 0.00053093 0.00437074
0.079 0.00490167 0.030 0.00070686 0.00419481
0.079 0.00490167 0.031 0.00075477 0.0041469
0.079 0.00490167 0.032 0.00080425 0.00409742
0.079 0.00490167 0.033 0.0008553 0.00404637
0.079 0.00490167 0.034 0.00090792 0.00399375
0.079 0.00490167 0.035 0.00096211 0.00393956
0.079 0.00490167 0.036 0.00101788 0.00388379
0.079 0.00490167 0.037 0.00107521 0.00382646
0.079 0.00490167 0.038 0.00113411 0.00376755
0.079 0.00490167 0.039 0.00119459 0.00370708
0.079 0.00490167 0.040 0.00125664 0.00364503
0.079 0.00490167 0.041 0.00132025 0.00358142
0.079 0.00490167 0.042 0.00138544 0.00351623
0.079 0.00490167 0.043 0.0014522 0.00344947
0.079 0.00490167 0.044 0.00152053 0.00338114
0.079 0.00490167 0.045 0.00159043 0.00331124
0.079 0.00490167 0.046 0.0016619 0.00323977
0.079 0.00490167 0.047 0.00173494 0.00316673
0.079 0.00490167 0.048 0.00180956 0.00309211
0.079 0.00490167 0.049 0.00188574 0.00301593

0.079 0.00490167 0.050 0.0019635 0.00293817
0.079 0.00490167 0.051 0.00204282 0.00285885
0.079 0.00490167 0.052 0.00212372 0.00277795
0.079 0.00490167 0.053 0.00220618 0.00269549
0.079 0.00490167 0.054 0.00229022 0.00261145
0.079 0.00490167 0.055 0.00237583 0.00252584

0.080 0.00502655 0.026 0.00053093 0.00449562
0.080 0.00502655 0.030 0.00070686 0.00431969
0.080 0.00502655 0.031 0.00075477 0.00427178
0.080 0.00502655 0.032 0.00080425 0.0042223
0.080 0.00502655 0.033 0.0008553 0.00417125
0.080 0.00502655 0.034 0.00090792 0.00411863
0.080 0.00502655 0.035 0.00096211 0.00406444
0.080 0.00502655 0.036 0.00101788 0.00400867
0.080 0.00502655 0.037 0.00107521 0.00395134
0.080 0.00502655 0.038 0.00113411 0.00389243
0.080 0.00502655 0.039 0.00119459 0.00383196
0.080 0.00502655 0.040 0.00125664 0.00376991
0.080 0.00502655 0.041 0.00132025 0.00370629
0.080 0.00502655 0.042 0.00138544 0.00364111
0.080 0.00502655 0.043 0.0014522 0.00357435
0.080 0.00502655 0.044 0.00152053 0.00350602
0.080 0.00502655 0.045 0.00159043 0.00343612
0.080 0.00502655 0.046 0.0016619 0.00336465
0.080 0.00502655 0.047 0.00173494 0.0032916
0.080 0.00502655 0.048 0.00180956 0.00321699
0.080 0.00502655 0.049 0.00188574 0.00314081
0.080 0.00502655 0.050 0.0019635 0.00306305
0.080 0.00502655 0.051 0.00204282 0.00298373
0.080 0.00502655 0.052 0.00212372 0.00290283
0.080 0.00502655 0.053 0.00220618 0.00282036
0.080 0.00502655 0.054 0.00229022 0.00273633
0.080 0.00502655 0.055 0.00237583 0.00265072

Figure 3: Secondary Metering Rods Listed Rich to Lean

Code P/N Dia of Tip Tip Length
BV 7040724 0.0300 S
CB 7042335 0.0300 S
CC 7042356 0.0303 M
DC 7047816 0.0303 M
BY 7040856 0.0320 M
CF 7044775 0.0340 M
DG 7048890 0.0340 M

DF 7048512 0.0340 M
AX 7033549 0.0400 S
BB 7034335 0.0400 S
BF 7034400 0.0400 S
BG 7034822 0.0400 M
BH 7035916 0.0400 M
BJ 7036077 0.0400 S
BK 7037295 0.0400 S
BM 7037744 0.0400 M
BP 7038034 0.0400 S
BW 7040767 0.0400 M
CA 7042304 0.0400 M
CJ 7045780 0.0400 S
CM 7045840 0.0400 M
CS 7045924 0.0400 S
BE 7034377 0.0413 S
BL 7037733 0.0413 S
BN 7036671 0.0413 S
CE 7043771 0.0413 L
CY 7046004 0.0443 M
DA 7046010 0.0443 M
AD 7033772 0.0450 S
AH 7033812 0.0530 M
AU 7033655 0.0530 L
CK 7045781 0.0530 L
CV 7045984 0.0530 L
BU 7040725 0.0550 S
CR 7045923 0.0550 S
AJ 7033628 0.0570 M
AK 7033104 0.0570 S
AL 7033680 0.0570 S
AP 7033981 0.0570 M
AR 7033171 0.0570 S
AV 7033182 0.0570 M
AY 7033830 0.0570 L
AZ 7033889 0.0570 L
BA 7034337 0.0570 S
BZ 7042300 0.0570 L
CD 7042719 0.0570 L
CH 7045779 0.0570 S
CN 7045841 0.0570 S
CP 7045842 0.0570 S
CX 7045985 0.0570 L
DR 17053659 0.0570 S
BD 7034365 0.0580 M
DH 7048992 0.0580 M

BC 7034300 0.0584 S
BT 7040601 0.0600 M
AT 7033658 0.0670 L
CL 7045782 0.0670 L
DL 7048892 0.0690 S
DP 17053531 0.0690 S
AN 7034320 0.0700 S
BX 7040797 0.0700 S
DB 7047806 0.0700 S
AS 7045778 0.0777 M
CG 7045778 0.0777 M
CT 7045983 0.0777 M
DE 7048092 0.0877 M
BR 7038910 0.0900 L
AW 7033194 0.0908 M
BS 7038911 0.0950 L
CZ 7045986 0.0950 L
DD 7048091 0.1050 L
DK 7048919
DM 17050221
DN 17053703
DS 17056618
DU 17059952

Technical Procedure #1:
To pop the top off a Q-Jet, proceed as follows:

1. Remove the air cleaner stud.
2. Using a hammer and a small pin punch or a small finish nail, tap the roll pin holding the accelerator pump lever to the top of the carb in towards the choke horn wall. Don't tap the roll pin all the way up against the wall - leave just a slight gap so you can later get a screwdriver blade in behind it to pry it back again. Remove the accel pump lever.
3. Remove the single screw holding the secondary rod hanger to the top of the carb and remove the hanger with the secondary rods.
4. Remove the choke connecting rod. There are 2 types: One type has a clip holding it to the choke lever. Remove the clip, disengage the rod from the upper lever, then twist/rotate the rod to disengage it from the lower lever inside the carb. Later model carbs have a single screw holding the upper lever to the choke shaft. On this type, remove the screw, remove the lever, and remove the choke rod by twisting/rotating it to release it from the lower lever inside the carb.
5. Remove the (2) 1/2" head bolts at the front of the carb.
6. Remove the 9 top attach screws: Two long screws in the very back; a screw on either side of the secondary airvalves; two screws just forward of the secondary airvalves; two screws just

inside the choke air horn right at each primary discharge nozzle, and a single screw center front. If the carb has the stock screws in it, the two screws inside the air horn are designed to be too big to drop down into the intake manifold. But many aftermerket screws can, in fact, drop through the carb and go into the intake. Once you have loosned these two screws, use a pair of needle nosed pliers to carefully lift them out and make sure they don't drop.
7. Lift the top of the carb straight up until it clears the accelerator pump and until the air bleed tubes clear the gasket. If you have a pre-'75 Q-Jet with a choke-pulloff attached to the float bowl of the carb, cock the top over to the side to disengage the secondary airvalve rod.
8. Remove the gasket by carefully freeing it from the power piston/primary metering rod hanger.
9. Remove the accelerator pump.
10. Remove the power piston/primary metering rod hanger by pushing it down against its spring pressure and "flicking" it off your fingernail so it pops up. A couple of flicks will disengage the locking collar from the casting, and the assembly can be removed.
11. Remove the phenolic float bowl filler.
12. Remove the float and needle as an assembly.
13. Remove the main jets.

The rods and the jets are stamped with their sizes, but you may have to clean them and use a magnifying glass to see the stampings. Some commercially rebuild carbs use "generic" jets and rods with no size markings.

Only trick for re-assembly:

1. When installing the power piston, take care to fish around until the rods drop down into the jets and the power piston works smoothly. Gently push the piston nylon locking collar back into the carb casting. I've seen people not get the rods into the jets, and simply smash the top of the carb down onto the piston/rod assembly. Obviously, this will bend the rods.

Once you have the top back on, installing the choke linkage rod is considered the only "tricky" part. There is a short lever arm down inside the carb, and this arm has a hole in its end. This arm is very easy to see when you have the top off the carb, so I recommend that novices take a look at it and its orientation/function while they have the top off the carb. With the top off, take the choke rod and practice installing/engaging it in this lower lever until you get the knack of rotating the rod slightly to engage it in the hole in the lever.

Once you have the top back on (taking care not to overtighten screws and bolts), activate the choke linkage on the outside of the carb to move this lever arm to its furthest "up" position. You can just barely see it if you look down the carb. Now, insert the choke rod down into the carb, with the rod rotated slightly. Engage the hole in the lever arm at this angle, and once you've hooked the arm, rotate the rod to fully engage it.

Install the accelerator pump lever to the top of the carb. Insert a finish nail or a small pin punch through the roll pin hole to assure that it's aligned, and then use a small screwdriver to pry the roll pin back through the lever.

Install the secondary metering rods with the hanger.

NOTE: If you're going to be doing several jet changes, you do not need to attach the choke linkage rod to run the car. Leave the rod off until you're complete.

Technical Procedure #2
To adjust a Q-Jet with an adjustable Power Piston, proceed as follows:

The Q-Jet uses a power piston with metering rods to lean out the fuel mixture at cruise and at idle, and to richen up the mixture at wide open throttle (WOT). When engine vacuum is high, the power piston is pulled down into the carb against spring pressure, and this inserts the “fat” part of the primary metering rods into the jets for a lean, crisp, economical fuel mixture. When engine vacuum is lost, such as occurs under high power settings, the piston pops up from the spring pressure, and the “skinny” part of the primary rod is all that remains in the jet. This increases the metering area of the jet and richens up the fuel mixture for good power and performance.

Late ‘70s Q-Jets have an externally-accessible adjustment screw (through a small hole in the carb air horn) for adjustment of the power piston height. Many people refer to this as the “mixture screw” on a Q-Jet. Over the years, people have screwed these adjustment screws every way possible in an attempt to “tune” the carbs, and I now frequently see people asking about what the “spec” is for this adjustment. Fact is, there is none. But here’s how you can get your carb set up so it’ll run right again.

You will need to take the air horn (the “top” of the carb) off in order to get this set up properly. See “Technical Procedure #1” this paper for the step-by-step on doing this.

The adjustment screw for the power piston height is located down inside a small bore adjacent to the power piston. You can turn the flat adjustment screw with a pair of needle nosed pliers.

Note that the adjustment screw only adjusts and limits how far DOWN the power piston can go. There is no “up” limit on the piston that is adjustable. In other words, the screw sets the maximum depth that the rods engage into the jets at cruise and at idle. The intent of the adjustment is to assure that the “fat” part of the rod is fully inserted into the metering orifice of the jet under these conditions. If it’s set too shallow, with the skinny power tip portion of the rod in the jet, the mixture will be too rich. If it’s set too deep, the mixture will stay too lean as the engine gets into its power curve. We want to set the height so that the rod is fully inserted in the jet at cruise, but not set too deep.

To do this, you need a pair of calipers. Dial calipers are nice, but I use an old pair of vernier calipers. With the top off the carb, remove the power piston, remove one of the main metering rods, and remove one main metering jet. Lay the jet and the rod side by side on your workbench, and align the rod with the jet such that the top “step” in the rod (the step-up from the fat metering part of the rod to the main shaft of the rod) is aligned next to the bottom of the upper “lip” of the main jet (see Figure bellow) Note that I have given a “range” for this measurement: lining the rod up with the lower edge of the lip is the “max engagement” depth. Lining it up at the mid-point of the lip is the “min engagement” depth. If the rod is in this range, the resultant jetting will be correct. Now, measure the distance from the top surface of the jet to the very top of the rod.

Record this number.

Re-install the jet, the rod, and the power piston into the carb. Press down on the power piston until it seats. Using the calipers, measure the distance from the tip top of the main metering rod to the top surface of the jet and adjust the adjustment screw until you obtain the measurement you recorded earlier.

This measurement assures that the rod is fully inserted in the jet at cruise, and this will give you correct, excellent performance. If you find, after making this adjustment, that your idle speed is a little erratic, and idle speed increases noticeably when you "cup" your hand over the choke airhorn area, you can raise the adjustment screw 1 turn to correct this.

Alternate "Quickie" Procedure
If you don't have the tools to perform the measurements described above, and you just want to get the carb "into the ballpark" for some good performance, you can do the following quick verification and setup:

With the airhorn removed off the carb, push the power piston down to the fully seated position with your finger. Observe the relationship between the top "lip" of the plastic retaining ring and the top edge of the power piston cylinder. In its correct position, the power piston cylinder top edge should be about .030" above the top lip of the plastic ring. You can raise or lower the piston from this position ½ turn at a time to fine-tune your idle & cruise mixture (pop the silver plug out of the airhorn to gain access to the adjustment with the airhorn installed – you can turn the screw with a pair of long, thin needlenosed pliers.

How to adjust Q-Jet power piston

Technical Information Bulletin Rev. C 6-04-04
How to Adjust a Q-Jet Power Piston

by Lars Grimsrud
Lafayette, CO

This tech paper will discuss how to adjust the adjustable power pistons found on late-model Quadra-Jet Carbs for optimum street performance and drivability.

The procedure outlined here is not discussed in any other publication to the best of my knowledge. There is no known factory "spec" for this adjustment. The procedure outlined here is my own method for assuring a proper setup, and is based on my years of experience doing this work in the quickest, least painful, most economical way. It is recognized that other people will have different methods of doing things, and may disagree with specific methods and procedures that I use.

Overview

The Q-Jet uses a power piston with metering rods to lean out the fuel mixture at cruise and at idle, and to richen up the mixture at wide open throttle (WOT). When engine vacuum is high, the power piston is pulled down into the carb against spring pressure, and this inserts the "fat" part of the primary metering rods into the jets for a lean, crisp, economical fuel mixture. When engine vacuum is lost, such as occurs under high power settings, the piston pops up from the spring pressure, and the "skinny" part of the primary rod is all that remains in the jet. This increases the metering area of the jet and richens up the fuel mixture for good power and performance.

Late '70s Q-Jets have an externally-accessible adjustment screw (through a small hole in the carb air horn) for adjustment of the power piston height. Many people refer to this as the "mixture screw" on a Q-Jet. Over the years, people have screwed these adjustment screws every way possible in an attempt to "tune" the carbs, and I now frequently see people asking about what the "spec" is for this adjustment. Fact is, there is none. But here's how you can get your carb set up so it'll run right again.

Procedure

You will need to take the air horn (the "top" of the carb) off in order to get this set up properly. See the "Technical Procedure" at the end of this paper for the step-by-step on doing this.

The adjustment screw for the power piston height is located down inside a small bore adjacent to the power piston. You can turn the flat adjustment screw with a pair of needle nosed pliers.

Note that the adjustment screw only adjusts and limits how far DOWN the power piston can go. There is no "up" limit on the piston that is adjustable. In other words, the screw sets the maximum depth that the rods engage into the jets at cruise and at idle. The intent of the adjustment is to assure that the "fat" part of the rod is fully inserted into the metering orifice of the jet under these conditions. If it's set too shallow, with the skinny power tip portion of the rod in the jet, the mixture will be too rich. If it's set too deep, the mixture will stay too lean as the engine gets into its power curve. We want to set the height so that the rod is fully inserted in the jet at cruise, but not set too deep.

To do this, you need a pair of calipers. Dial calipers are nice, but I use an old pair of vernier calipers. With the top off the carb, remove the power piston, remove one of the main metering rods, and remove one main metering jet. Lay the jet and the rod side by side on your workbench, and align the rod with the jet such that the top "step" in the rod (the step-up from the fat metering part of the rod to the main shaft of the rod) is aligned next to the bottom of the upper "lip" of the main jet (see Figure bellow) Note that I have given a "range" for this measurement: lining the rod up with the lower edge of the lip is the "max engagement" depth. Lining it up at the mid-point of the lip is the "min engagement" depth. If the rod is in this range, the resultant jetting will be correct. Now, measure the distance from the top surface of the jet to the very top of the rod. Record this number.

Re-install the jet, the rod, and the power piston into the carb. Press down on the power piston

until it seats. Using the calipers, measure the distance from the tip top of the main metering rod to the top surface of the jet and adjust the adjustment screw until you obtain the measurement you recorded earlier.

This measurement assures that the rod is fully inserted in the jet at cruise, and this will give you correct, excellent performance.

Alternate “Quickie” Procedure

If you don’t have the tools to perform the measurements described above, and you just want to get the carb “into the ballpark” for some good performance, you can do the following quick verification and setup:

With the airhorn removed off the carb, push the power piston down to the fully seated position with your finger. Observe the relationship between the top “lip” of the plastic retaining ring and the top edge of the power piston cylinder. In its correct position, the power piston cylinder top edge should be about .020” above the top lip of the plastic ring. You can raise or lower the piston from this position ½ turn at a time to fine-tune your idle & cruise mixture (pop the silver plug out of the airhorn to gain access to the adjustment with the airhorn installed – you can turn the screw with a pair of long, thin needlenosed pliers.

Technical Procedure

To pop the top off a Q-Jet, proceed as follows:

1. Remove the air cleaner stud.
2. Using a hammer and a small pin punch or a small finish nail, tap the roll pin holding the accelerator pump lever to the top of the carb in towards the choke horn wall. Don't tap the roll pin all the way up against the wall - leave just a slight gap so you can later get a screwdriver blade in behind it to pry it back again. Remove the accel pump lever.
3. Remove the single screw holding the secondary rod hanger to the top of the carb and remove the hanger with the secondary rods.
4. If you have a later-model Q-Jet with a choke vacuum break diaphragm that is attached to the passenger side of the carb with two screws up high, remove the two screws and remove the vacuum break and its connecting rod. If your vacuum break is pressed into a bracket that is not attached with 2 screws up high, leave it alone.
5. Remove the choke connecting rod. There are 2 types: One type has a clip holding it to the choke lever. Remove the clip, disengage the rod from the upper lever, then twist/rotate the rod to disengage it from the lower lever inside the carb. Later model carbs have a single screw holding the upper lever to the choke shaft. On this type, remove the screw, remove the lever, and remove

the choke rod by twisting/rotating it to release it from the lower lever inside the carb.
6. Remove the (2) 1/2" hex bolts at the front of the carb.
7. Remove the 9 top attach screws: Two long screws in the very back; a screw on either side of the secondary airvalves; two screws just forward of the secondary airvalves; two screws just inside the choke air horn right at each primary discharge nozzle, and a single screw center front. If the carb has the stock screws in it, the two screws inside the air horn are designed to be too big to drop down into the intake manifold. But many aftermarket screws can, in fact, drop through the carb and go into the intake. Once you have loosened these two screws, use a pair of needle nosed pliers to carefully lift them out and make sure they don't drop.
8. Lift the top of the carb straight up until it clears the accelerator pump and until the air bleed tubes clear the gasket. If you have a non-removable vacuum break diaphragm, cock the top over to the side to disengage the secondary airvalve rod.
9. Remove the gasket by carefully freeing it from the power piston/primary metering rod hanger.
10. Remove the accelerator pump.
11. Remove the power piston/primary metering rod hanger by pushing it down against its spring pressure and "flicking" it off your fingernail so it pops up. A couple of flicks will disengage the locking collar from the casting, and the assembly can be removed.
12. Remove the phenolic float bowl filler.
13. Remove the float and needle as an assembly.
14. Remove the main jets.

The rods and the jets are stamped with their sizes.

Only trick for re-assembly:

1. When installing the power piston, take care to fish around until the rods drop down into the jets and the power piston works smoothly. Gently push the piston nylon locking collar back into the carb casting. I've seen people not get the rods into the jets, and simply smash the top of the carb down onto the piston/rod assembly. Obviously, this will bend the rods.

Once you have the top back on, installing the choke linkage rod is considered the only "tricky" part. There is a short lever arm down inside the carb, and this arm has a hole in its end. This arm is very easy to see when you have the top off the carb, so I recommend that novices take a look at it and its orientation/function while they have the top off the carb. With the top off, take the choke rod and practice installing/engaging it in this lower lever until you get the knack of rotating the rod slightly to engage it in the hole in the lever.

Once you have the top back on (taking care not to overtighten screws and bolts), activate the choke linkage on the outside of the carb to move this lever arm to its furthest "up" position. You can just barely see it if you look down the carb. Now, insert the choke rod down into the carb, with the rod rotated slightly. Engage the hole in the lever arm at this angle, and once you've hooked the arm, rotate the rod to fully engage it.

Install the accelerator pump lever to the top of the carb. Insert a finish nail or a small pin punch through the roll pin hole to assure that it's aligned, and then use a small screwdriver to pry the roll pin back through the lever.

Install the secondary metering rods with the hanger.

NOTE: If you're going to be doing several jet changes, you do not need to attach the choke linkage rod to run the car. Leave the rod off until you're complete.