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Technical Information Bulletin Rev. C 6-04-04

How to Adjust a Q-Jet Power Piston

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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.

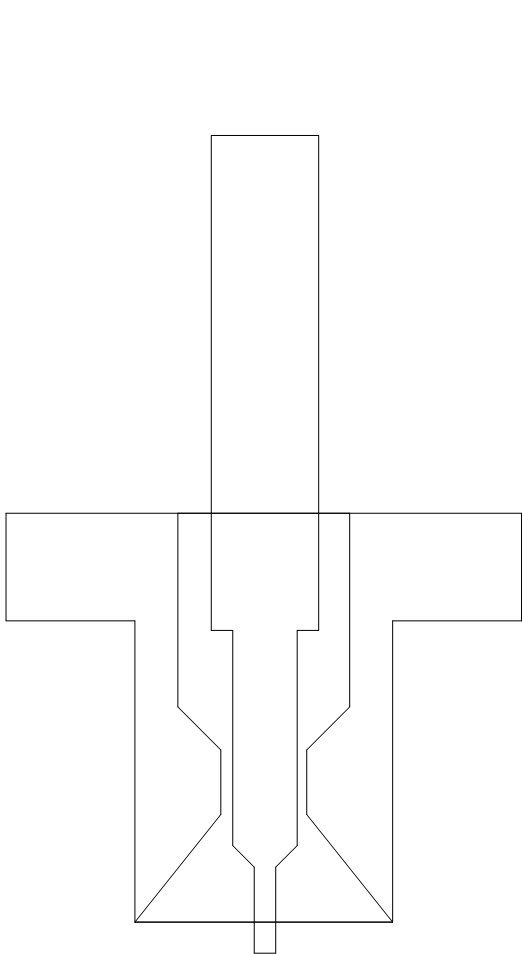
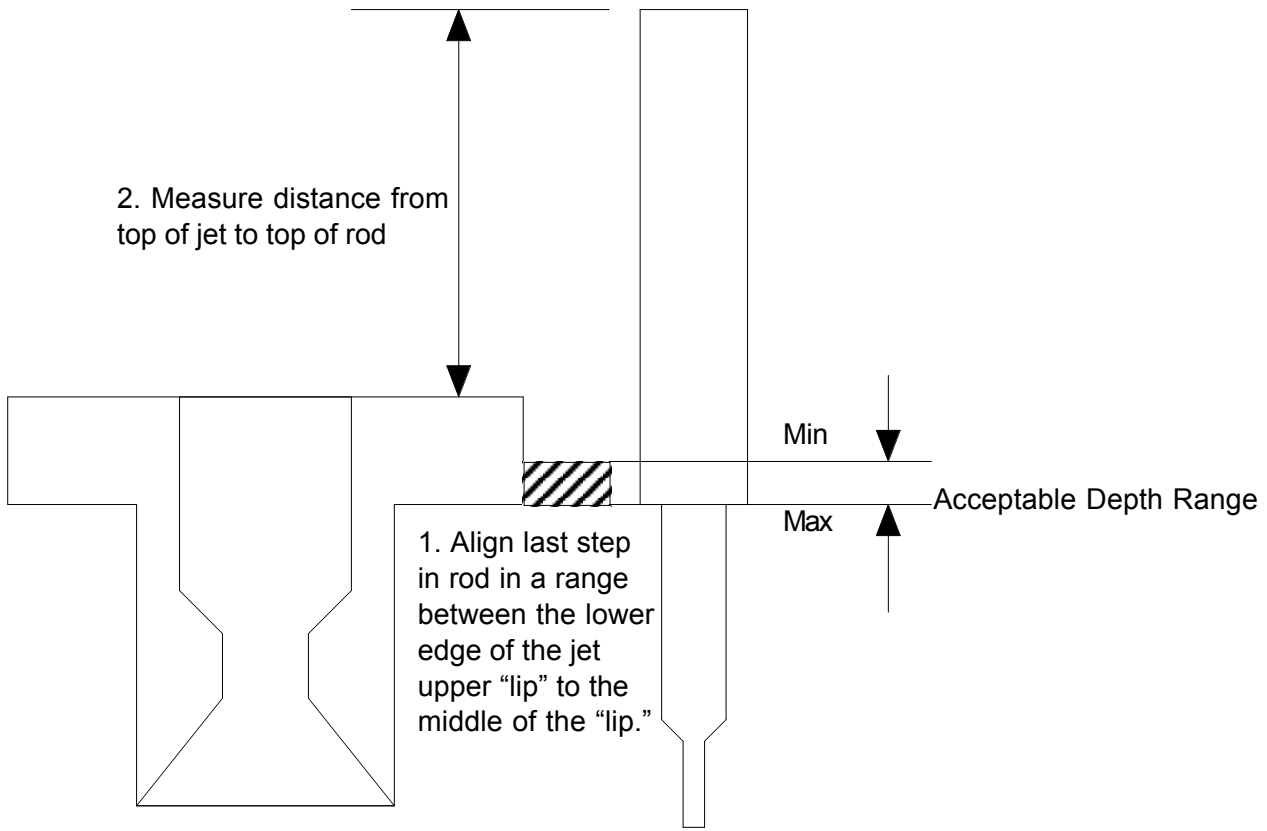
The adjustment screw for the power piston height is located down inside a small bore adjacent to the power piston. You can turn the flat adjustment screw with a pair of needle nosed pliers.

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.

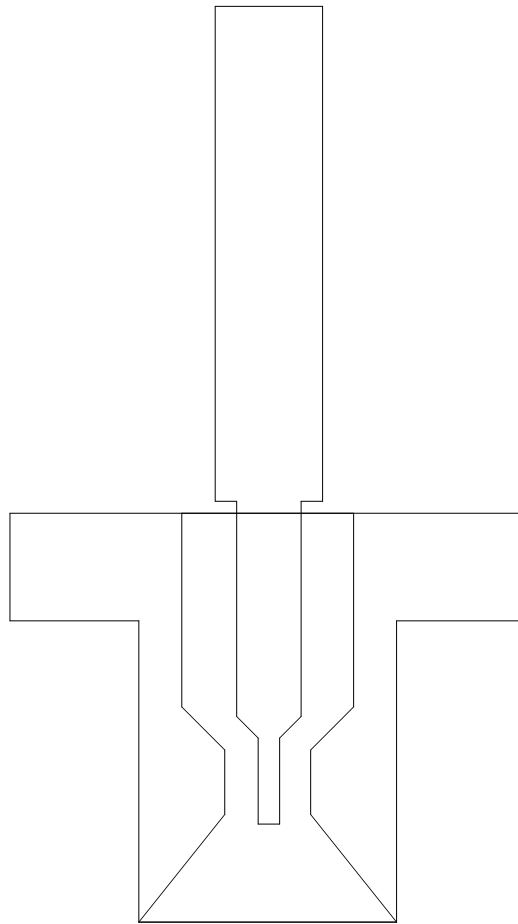
To do this, you need a pair of calipers. Dial calipers are nice, but I use an old pair of vernier calipers. With the top off the carb, remove the power piston, remove one of the main metering rods, and remove one main metering jet. Lay the jet and the rod side by side on your workbench, and align the 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.



Rod correctly in position in jet at cruise & idle



Rod fully retracted out of jet at WOT

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.