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How to Set Up a Q-Jet Choke

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This tech paper will discuss basic set-up of the Q-Jet automatic choke systems.

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 uses an automatic choke system that is actually very good, if properly set up and adjusted. But before starting on the choke setup, it's important to remember a few other tuning parameters.

The Q-Jet choke setup assumes that other engine parameters are correctly set up and tuned. Most importantly is proper ignition timing. Before doing any carb tuning, it is imperative that the initial timing, total timing, timing curve, and vacuum advance systems be correctly set up and functioning. You cannot correct tuning issues related to timing by tweaking the carb. See my papers on setting up timing and vacuum advance before you start playing with carb adjustments.

Also, the choke setup assumes that your carb is correctly jetted and set up. If your carb is running either rich or lean, the choke will not function properly, even when adjusted to specification. Make sure your carb has the correct jets, rods and float level adjustment before trying to set up the choke. These carbs are old, and most of them have seen some "creative" jetting over the years. See my paper on Q-Jet setup for a listing of carb numbers and correct jetting.

Procedure

There are two styles of Q-Jets, and the setup procedure differs between the two.

The early style carbs utilize a "divorced choke" system. These carbs, used from 1967–1974, rely on a choke coil bolted down to the intake manifold inside a little metal box. There is a rod that connects the carb choke linkage to the coil on the manifold. As the manifold crossover gets hot, the coil expands, and pushes the rod up to open the choke.

The second style uses an "integral choke," and was used from 1975–1981 (except truck – Heavy Duty truck carbs used after 1975 still used divorced choke systems). 1975–1979 uses a "hot air" choke whereby clean air is pulled from a nipple at the back of the carb airhorn, through a steel tube, through a heat exchanger in the manifold crossover, and back up a steel tube into the front of the choke

housing on the carb. There is a vacuum bleed hole between the carb choke housing and manifold vacuum, causing the air to be pulled through the tube from the airhorn. As the engine gets hot, the air in the tube gets hot, and the coil expands to open the choke. This choke will not function at all if the entire hot air tube system is not hooked up and functional. From 1980-1981 an integral electric choke was used in place of the hot air system. There is a single wire that connects to the choke housing cover. The cover contains an electrical heating element that heats up the coil and opens the choke.

As a note, the 1980 electric choke cover can be used to convert a 1975-1979 hot air choke to an electric choke. The only thing to remember is to remove the hot air choke gasket: If you do not remove the cover gasket when using the electric choke cover, the electric choke will not have a ground, and it will not function. I also recommend that you install a rubber cap on the hot air inlet port on the choke housing to avoid sucking dirty air into the housing. There is no need to plug the vacuum bleed hole in the housing since this vacuum bleed is insignificant to engine operation.

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

1. Divorced Choke Systems (1967-1974)

- ❖ Disconnect the divorced choke rod from the lever on the passenger side of the carb. Leave it attached to the choke coil box on the manifold.
- ❖ Open the throttle slightly and fully close the choke by pushing on the lever arm that the disconnected rod normally attaches to.
- ❖ Push the choke rod all the way down into the choke coil until it hits the stop. If the engine is dead cold, it may already be bottomed out.
- ❖ At this position, the top of the choke rod should be level with the bottom edge of the choke rod hole in the lever on the carb.
- ❖ Bend the rod to obtain this relationship.
- ❖ Once complete, hook the rod back up to the lever.
- ❖ With the rod hooked up, push the choke rod back down to the seated position once again. This should fully close the choke blade. If the choke blade is not fully closed in this position, bend the choke intermediate rod that comes up through the body of the carb and attaches to the choke blade lever. Bend the rod so that the choke blade is fully closed.
- ❖ Remove the short piece of vacuum hose attaching the choke pulloff to the vacuum nipple on the carb. Attach a long (about 2') vacuum hose to the pulloff.
- ❖ Crack the throttle slightly and push down on the divorced choke rod to close the choke fully. Release the throttle. Keep light finger pressure on the choke rod to maintain light closing pressure on the choke.
- ❖ Suck on the vacuum hose to retract the choke pulloff. If the pulloff does not retract, it must be replaced.
- ❖ With the pulloff fully retracted and light finger pressure on the choke rod, use your other hand to lightly push down on the forward lower edge of the choke blade to simulate to force of the air across the blade. This will open the choke slightly. At this point, measure the distance between the forward lower edge of the choke blade and the forward wall of the airhorn. This distance should be 1/4". You can use a 1/4" drill bit as a simple gauge to check it. To adjust, bend the tang on the choke linkage where it contacts the choke pulloff rod.
- ❖ Re-attach the vacuum hose to the pulloff and the carb.

This completes choke adjustment for a divorced choke carb.

2. Integral Choke Systems (1975-1981)

- ❖ Remove the three screws holding the black choke cover to the choke housing and remove the cover. If rivets are used, drill out the rivets.
- ❖ Crack the throttle slightly open and push up on the choke coil lever inside the choke housing until the choke is closed.
- ❖ Notice that there is a small 1/8" hole recess inside the choke housing which will appear right below the lower edge of the choke coil lever when you push the lever up. Insert a 1/8" drill bit in this recess and allow the lever to rest on the drill bit.
- ❖ In this position, your choke blade should be fully closed. If not, bend the choke intermediate rod that comes up through the body of the carb and attaches to the choke blade lever. Bend the rod so that the choke blade is fully closed.
- ❖ Now, remove the drill bit, crack the throttle slightly and rotate the fast idle cam (the steel counterweight that rotates on the choke housing shaft between the choke housing and the carb body) so that the fast idle cam follower is positioned on the second step of the cam, right up against the edge of the highest step.
- ❖ In this position, apply light finger pressure on the choke coil lever inside the choke housing to close the choke (lift up on the lever).
- ❖ The choke should be cracked open 5/16" as measured between the rear upper edge of the choke blade and the rear airhorn wall. Use a drill bit to check this.

- ❖ To adjust, notice that there is a small sheet metal tang attached to the lower side of the fast idle cam. This tang determines the travel range of the choke. Bend the tang to adjust.
- ❖ Now, install the choke housing cover to the choke housing. If you're using an electric choke, DO NOT use a gasket between the cover and the housing. Be sure that the choke coil tang in the cover correctly mates with and engages to the choke coil lever inside the housing.
- ❖ With the cover attach screws loose, rotate the cover so that the indicator scribe line points straight up. This should fully close the choke. If there is no scribe line (electric chokes do not have lines), rotate the cover counter clockwise until the choke blade is fully closed. Lightly snug the cover attach screws to keep the cover in this position. You may need to crack the throttle open to get the choke to snap closed.
- ❖ Remove the short piece of vacuum hose attaching the choke pulloff to the vacuum nipple on the carb. Attach a long (about 2') vacuum hose to the pulloff.
- ❖ Suck on the vacuum hose to retract the choke pulloff. If the pulloff does not retract, it must be replaced.
- ❖ With the pulloff fully retracted, use your other hand to lightly push down on the forward lower edge of the choke blade to simulate to force of the air across the blade. This will open the choke slightly. At this point, measure the distance between the forward lower edge of the choke blade and the forward wall of the airhorn. This distance should be ¼". You can use a ¼" drill bit as a simple gauge to check it. To adjust, turn the screw on the end of the choke pulloff lever. After each adjustment, you must release the vacuum on the hose and suck on it again to re-seat the pulloff, each time apply the light finger pressure to the forward lower edge of the choke blade.
- ❖ Once completed, loosen the choke coil cover attach screws and rotate the cover clockwise. On hot air choke systems, the cover scribe mark should be aligned with the second dot clockwise of the center dot on the choke housing marks. On electric chokes, the indentation in the outer edge of the cover should be aligned with the screw & clip location towards the forward side of the choke housing. Snug the screws down or re-install new rivets. (NOTE: On riveted applications, the rivet holes can be tapped for #10 screws.)
- ❖ Re-attach the vacuum hose to the pulloff and the carb.

This completes choke adjustment for an integral choke carb.

Tuning note on Intergral Choke Carbs:

When doing custom tuning adjustments on the integral choke carbs, keep the adjustments limited to 2 parameters: Setting the position of the choke cover (rotating the cover) and adjusting the choke pulloff screw. When doing these adjustments, keep the following relationship in mind:

- ❖ The cover adjustment (rotating the cover) determines how LONG (duration) the choke is applied before fully opening. Turning the cover clockwise shortens the duration. Turning the cover counter clockwise increases choke duration. It only takes a very small rotational adjustment to change this (1 or 2 mark lines on the cover). Contrary to popular misunderstanding, turning the cover does **NOT** change how rich or lean the carb runs with the choke applied.
- ❖ The choke pulloff screw determines how RICH or LEAN the carb will initially run when started cold. If your carb runs rich when initially started, turn the screw to open the choke a little more. Likewise, if your car starts lean and wants to die, turn the screw to open the choke blade a little less.

In summary:

Rotate the cover to change the amount of **TIME** the choke is applied.

Adjust the screw to change how *rich/lean* the choke is upon initial startup.

3. Fast Idle Bench Setup

The fast idle screw is located on the passenger side of the carb, on the primary throttle shaft just below the choke linkage. An initial fast idle setting can be done as follows:

- ❖ Back out the idle speed screw on the driver's side of the carb 3 full turns.
- ❖ Crack the throttle open and rotate the fast idle cam so that the cam follower is on the top (fastest) part of the cam (simply lift the cam all the way up).
- ❖ Hold the throttle blades firmly closed and back the fast idle screw out until the cam follower just barely loses contact with the fast idle cam. Find the adjustment point where the follower just barely touches the cam with the throttles fully closed. From this point, turn the fast idle screw in 2-1/2 turns.
- ❖ Re-establish your driver's side idle speed screw by turning it back in 3 turns to the original setting.
- ❖ Start the engine cold and fine-adjust your fast idle screw to the fast idle speed of your preference.

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:

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