

Butterfly Setup

Setting the butterflies up correctly is important for idle quality and keeping an even temperature throughout the motor. Even though the injector casting may be one piece, the castings move around an incredible amount when the bolts are torqued! A procedure must be followed to optimize things after final torqueing of the casting. This procedure must be repeated once the motor has been brought up to temperature. A gasoline application should be final-adjusted as below with the motor HOT.

1. Back off any idle stop screws completely so they are not effecting throttle placement.
2. Loosen the locknuts on the crosslink that ties the two banks together.
3. Remove the ram tubes and loosen the screws holding each butterfly to the throttle shaft until they can float freely in the shaft.
4. Gently force one throttle shaft into the closed position by hand while lightly tapping individually on the butterfly blades with something soft (like a plastic screwdriver handle). It may take opening and closing it a few times to get each butterfly positioned optimally and seated in its bore. The shaft should want to "stick" closed when all are seated correctly. As you tap, you'll notice the sound will change when the butterfly seats in its bore.
5. Gently tap one end of the throttle shaft all the way one direction until it stops. Then tap it the other way paying attention to the approximate distance it moves. Finally, tap it back the other way and split the difference - try to achieve a place in between the two extremes. Close is good enough.
6. Tighten the butterfly screws for the bank just adjusted.
7. Run the crosslink hex shaft until the other bank of butterflies will close independently of the bank previously adjusted above.
8. Repeat steps 3, 4, 5 & 6 on the other bank.
9. Determine which shaft is "driven" directly by the throttle pull and which "follows".
10. Perform this procedure on the "driven" bank first: One at a time, close the butterflies on a .002" feeler gauge and draw it out noting the resistance. Adjust the idle-stop until a uniform, light drag is achieved. It should be very similar on all butterflies on the bank. Tighten the thumbscrew locknut for that stop. If one seems very different than the others when pulling the feeler gauge, go back to step 3.
11. Adjust the idle stop on the "follower" bank until the .002" feeler gauge pulls snug and lock down the locknut for it. NOTE: The crosslink hex may need to be altered to allow this to be set.
12. Now adjust the crosslink in or out until both banks of butterflies hit their stops at the same time and pull the same with the feeler gauge when against their stops.

It's important that the butterfly gap is not set too large or the IAC (Idle Air Control) will not be able to help maintain your idle (it'll be closed all the time). Keep the gap small and give the IAC something to do!

With the motor running, check the header tubes with a hand-held temperature gun about 2" out from the head flange. Get an average exhaust temperature per bank and compare the banks. You may wish to adjust the idle stops and crosslink hex to get better temperature balance from one side to the other. A colder bank needs MORE air, a warmer bank needs LESS air.