

Throttle Stop Tip Sheet

(Written by Peter Biondo March 2015)

I put together this *throttle stop tip sheet* to help you get the most out of your throttle stop. If you are in the market for a new throttle stop, please consider Biondo Racing Products at www.BiondoRacing.com or 800-332-1320. Our goal is to help our Biondo Racing and Spring Fling customers turn on win lights!

One question I commonly get asked is: **“Is it beneficial to shift on time (have a timer shift the car during the T/S duration) while on the stop?”** The answer largely depends on how much under your index your car runs. Example: If your car runs well under the index (over 1 second under the index), you can gain consistency by shifting on time. Cars running less than 1 second under the index will most likely NOT benefit from shifting by time.

There are 3 major benefits for shifting on time:

- The car will come off the stop in high gear; this creates a smoother transition from part to full throttle and also lessens the chances of spinning the tires when coming off the stop.
- The rpm's 'on the stop' will be much more stable when in high gear. In other words, your stop rpm's will not climb or climb at a much slower rate when in high gear compared to low gear. This will result in more consistency and a more predictable throttle stop ratio.
- Shifting early in the run (shifting on time) with cars running deep under the index will knock off some ET on its own...making it where you can run a more manageable duration in your Stage 2 setting.

1) FINDING THE RIGHT THROTTLE STOP 'CLOSED POSITION' OR 'BLADE ANGLE'

Finding how much to mechanically shut your throttle down is crucial. This is commonly referred to as 'blade angle' or 'throttle stop rpm'. I have found 3 blade angles that work well (find the settings below). The most accurate way to adjust your "blade angle" is by RPM- (the rpm your engine drops to while the throttle stop is engaged). Once you have the right throttle stop RPM for your application, you are done with the mechanical part of it and all ET adjustments should be done with a timer (your Stage 2 setting).

As mentioned above, I have found 3 blade angles that work well for different applications. I broke this down into 2 sections; the first section of recommended settings is for racers shifting on RPM while the second section is for racers shifting on time.

Recommended Throttle Stop RPM settings when shifting on time:

- A "throttle stop rpm" of 4100-4200 if your car runs 1.5 seconds + under the index.
- A "throttle stop rpm" of 4400-4500 if your car runs 1 - 1.5 seconds under the index.
- A "throttle stop rpm" of 4600-4700 if your car runs .3 to .9 under the index.

Recommended Throttle Stop RPM settings when shifting on RPM:

- A "throttle stop rpm" of 3900-4000 if your car runs 1 second + under the index.
- A "throttle stop rpm" of 4300-4400 if your car runs .3 to .9 under the index.
- A "throttle stop rpm" of 4700-4800 if your car runs less than .3 under the index.

2) RECOMMENDED SETTINGS FOR WHEN YOUR T/S COMES ON (Stage 1 of TS timer)

Before figuring out your ever so important throttle stop ratio, you first must enter a number in Stage 1 of your throttle stop timer. This number indicates when the throttle stop will come on after launch. Most people prefer to have this number set early for high mph. I recommend having the throttle stop come on (Timer 1) to be between .1 and .3. Once you set this, you will never adjust it again. To adjust your ET you will be adjusting the TS duration (Stage 2 of your timer).

3) RECOMMENDED SETTINGS WHEN SHIFTING ON TIME

When shifting on time, I recommend having it shift a few tenths (.2 to .8) after the stop comes on. In general, the faster the car, the earlier you should shift. As with Stage 1, once you set this you will never adjust it again. A typical setup would be to have Stage 1 of the timer at .15 and have it shift at .6.

4) FIGURING OUT YOUR THROTTLE STOP RATIO

Whether you are using a weather station to predict a throttle stop or not, I highly recommend you learning your throttle stop ratio. The Throttle Stop Ratio is the effect the throttle stop time has on your ET. It is VERY important you learn this as this will be how you make your dial in adjustments when the weather changes between rounds. Example: If you add 2 tenths (.2) to your throttle stop timer and it changes your ET by 1 tenth (.1), then you have a 2 to 1 ratio.

To learn your T/S ratio do the following:

Make one run with a small amount of time (duration) in Stage 2 of your throttle stop timer (1 second). Make a second run with a large amount of time (3 seconds). Let's say run # 1 was an 8.40 and run # 2 was a 9.40. You can now figure out your throttle stop ratio by dividing the change in the throttle stop time by the change in ET. The change in throttle stop time divided by the Change in E.T = T/S Ratio. OR in this case (2.00 divided by 1.00 = 2). This is called a 2 to 1 ratio. Learning your ratio will allow you to correct for changing air conditions. If you are using an ET prediction program, you will need to enter this ratio into your prediction program.

Your throttle stop ratio is highly dependent on your "throttle stop rpm". The following is a good baseline of what your throttle stop ratio would be at different T/S Rpm's. (Keep in mind, you should check your throttle stop ratio to be sure as every combination could vary slightly).

- 3900-4100 T/S rpm results in a 2 to 1 ratio
- 4200-4400 T/S rpm results in a 2.5 to 1 ratio
- 4500-4700 T/S rpm results in a 3 to 1 ratio

These ratios are based on cars equipped with converters that stall in the 5600-6700 range. Extremely tight or loose converters will result in different ratios.

5) YOUR THROTTLE LINKAGE (when running an In-Line Throttle Stop)

An "In-linkage" throttle control is sensitive to the throttle linkage system. It is very important to have an absolutely solid and rigid pedal stop. Without this, you can stretch your linkage causing inconsistency. If you are running a dragster with a throttle cable, your cable attaching bracket must also have a rigid and stable mount. Any flexing or moving will result in inconsistency.

6) SPEED CONTROLS- Necessary or not?

Speed controls are a way to slow down how fast a (CO2 powered) throttle stop either comes on or comes off. This can be especially beneficial in higher powered cars and on greasy, hot tracks. If you have a high horsepower car, and the car comes off the stop in first gear (shifting on rpm), it is a good idea to slow down the throttle stop opening speed to 50% to 60% speed. The Co2 powered stops that we sell have the capability to slow down and regulate this speed. This will keep your vehicle hooked up when the stop comes off and it will also be a smoother transition from part to full throttle. On the other hand, if you are coming off the throttle stop in high gear (shifting on time), it is not necessary to slow the throttle opening speed down as the transition from part to full throttle is smoother in high gear. There are also arguments about whether or not the throttle stop closing speed is more consistent if left at full speed or a slowed down. I have found that having the throttle slowed down slightly (80% of full speed) or at full speed seems to work well for most vehicles.

7) In Linkage throttle Stops VS. Baseplate Throttle Stop

This has been an ongoing argument since the birth of the throttle stop in the 1980's. Which one is better? Which is more consistent? While one style may benefit a certain combination or driving style, the other may benefit another style or combination. Bottom line here is if you purchase a good T/S in either category, and follow these guidelines, you can have great success with both. I have been fortunate to win division and national championships using both styles.

Whether you are in the market for an in-line throttle stop or a baseplate throttle stop, at Biondo Racing Products we promise to offer the best products and advice the industry has to offer. Visit www.BiondoRacing.com or call 800-332-1320 to talk one on one with the racers at Biondo for the advice for your specific vehicle/ application.