BIONDO RACING PRODUCTS, INC.

PRECISION THROTTLE CONTROL

Part # PCTS-SH

MOUNTING/ INSTALLATION

Remove your throttle cable from your carburetor and remove the rod end that's hooked to your carb. The base of the air cylinder has been tapped to fit either a solid rod (1/4 -28) or cable (10-32) linkage. In most cases it is necessary to reroute your cable, move your cable mount back, or shorten your throttle rod length (a throttle stop cable bracket is available from BRP). Mount the air cylinder on your cable or rod linkage. Install the other end of the cylinder to your carburetor with the rod end supplied. During these steps the cylinder should be in it's retracted (shortest) position- use the adjustment collars to insure this. It is important to verify that there is no catching or binding anywhere in the system that will interfere with cylinder expansion. After installation, have a friend step on the gas pedal and check for full throttle (this should be done without the engine running). Also check to make sure your pedal is stopped by an absolutely solid and rigid pedal stop. At this point you will never have to readjust your throttle cable or rod again, all stroke adjustments are done separately.

Mount the "square" solenoid valve in a spot suitable to allow easy plumbing and access. Use 6-32 screws through the 2 mounting holes, with washers between the mounting surface and the solenoid valve– do not overtighten the solenoid when mounting, this can cause the solenoid to leak. If you purchased the throttle cable bracket from BRP, it has a place to mount the solenoid valve.

WIRING

AS A DOWNTRACK THROTTLE STOP:
The solenoid has 2 wires, connect one wire to a GOOD chassis ground and connect the other wire to your throttle stop timer. Refer to your timer for proper wiring (it usually goes to the terminal labeled "off/on", "throttle stop" or "N.O.")

AS A STARTING LINE CONTROL:
The solenoid has 2 wires, connect one wire to a GOOD chassis ground and connect the other wire to the "hot" transbrake solenoid wire. (Do not wire this system to your timers and transbrake at the same time unless you run it through a relay or are using the starting line enhancer feature in our Digital Delay Boxes, or another brand od delay box)

PLUMBING

Two 4' pieces of air line are provided. Connect one piece of air line from **PORT "2"** on the solenoid valve to the front port of the T/S cylinder. Connect the other piece of air line from **PORT "4"** on the solenoid valve to the rear port on the cylinder. Connect the air line from your CO2 bottle to the **PORT "1"** port on the solenoid valve. Set the regulator on your CO2 bottle to 80-115 psi (dual carb setup may require you to increase pressure up to 115 psi). Note that the solenoid has a little red "test" button on the top of it for off-track testing.

DO NOT OVERTIGHTEN FITTINGS AS THAT WILL CAUSE TEFLON TO GET INTO SOLENOID AND CAUSE LEAKAGE

OPERATION

Setting your throttle stop stroke (your closed throttle position):

This is a very important setting. It determines your throttle stop "closed" position- (what RPM's your engine will go to when the throttle stop is activated). The adjustment is done with the aluminum clamping collars. Only one collar is needed, the second is put there as a backup.
Use an allen wrench to loosen or tighten the adjustment collars. NOTE: DO NOT OVERTIGHTEN THE COLLARS. Refer to our "TIPS" page to find a good setting for your application. If you decide to change this setting and want a reference point to get back to it, you can do this by one of two ways:
1) checking your "closed throttle" RPM
2) Use a caliper to measure your stroke and note it in your logbook.

*If additional stroke is desired, you may remove one of the adjustment collars- this will give you additional throttle closing.

Setting the Closed Throttle Opening and Closing Speeds:

By slowing down the speed at which the throttle cylinder closes and opens your throttle, you will eliminate unwanted tire spin, chassis unloading and get smoother and more consistent results.
Adjuster screws #1 and #2 on the square solenoid valve are used to separately adjust the throttle closing and opening speeds. Screw #1 controls the throttle closing speed only (speed of rod as it extends) while screw #2 controls the throttle opening speed only (speed of rod as it retracts). Turning these screws clockwise slows down the corresponding throttle closing/ opening speeds. The screws need to be turned almost all the way in to slow the speeds down. EXAMPLE: If you would like to only slow down the rate at which your car goes back to full throttle when your timer kicks off, turn screw #2 clockwise until seated, then simply crack screw counterclockwise @ 1/8 of a turn or until desired cylinder speed is reached.

Maintenance

It is a good idea to lubricate this system once a year. To do this, turn off the CO2 bottle valve and disconnect the air line that goes from the bottle into the fitting on the solenoid. Place 2 or 3 drops of a light oil into the solenoid fitting. Air tool oil is good, do not use a solvent based oil.

6-24-20

Tips on Using a Throttle Stop

Written by Peter Biondo

Through years of on track experience with throttle stop racing I have learned a few things about throttle stops that can serve as a guideline to help in your throttle stop racing.

1/ FINDING THE RIGHT THROTTLE STOP "CLOSED POSITION" OR "BLADE ANGLE" -
Finding how much to mechanically shut your throttle down is crucial. You want to find a setting that will work well and be consistent. 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, you are done with the mechanical part of it, and all ET adjustments should be done with a timer.

As mentioned above, I have found 3 blade angles that work well:
- A "throttle stop rpm" of 3900- this will work well if your car runs **1 second under the index**.
- A "throttle stop rpm" of 4300- this will work well if your car runs **.3 to .9 under the index**.
- A "throttle stop rpm" of 4800- this will work well if your car runs less than **.3 under the index.**

*** If shifting on time, please refer to that section below as the suggested t/s rpm is different.

2/ FIGURING OUT YOUR THROTTLE STOP RATIO -
Before figuring out your ratio you first must enter a number in timer 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 between .1 and .3. Once you set this, you will never adjust it again. To adjust your ET you will change timer 2.

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. Here's an 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 ratio do the following:

Make one run with a small amount of time (duration) in the throttle stop timer (.5). Make a second run with a large amount of time (2.5). Let's say run # 1 was an 8.40 and run # 2 was an 9.40. You can 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 (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 track and air conditions. Your ratio depends on your "throttle stop rpm". For most applications a 3900 T/S rpm results in a 2 to 1 ratio, a 4300 T/S rpm results in a 3 to 1 ratio, and a 4800 T/S rpm results in a 5 to 1 ratio. These ratios are based on cars equipped with converters that stall in the 5600-6400 area. Extremely loose or tight converters will result in different ratios.

3/ YOUR THROTTLE LINKAGE -
An "In-linkage" throttle control is sensitive to the entire 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. Your cable attaching bracket must also be rigid. Any flexing or binding will ruin the consistency.

4/ TIME SHIFTING WHILE ON THE STOP
Is it beneficial to shift on time (have a timer shift the car during the stop duration) while on the stop? The answer really depends on how fast 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 a time. There are 2 major benefits for shifting on time.

- The car will come off the stop in high gear, lessening the chances of spinning the tires at that point.
- The rpm's on the stop will be much more stable when in high gear. In other words, your stop rpm's will 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.

*** Cars running less than 1 second under the index will most likely not benefit from shifting by time.
*** When shifting on time, it is good have it shift a few tenths (.3 to .9) after the stop comes on.
*** When shifting on time you should raise your throttle stop rpm 300 higher than the suggested rpm mentioned in the above #1 example. (Example: cars running one second or more under the index should have a throttle stop rpm of 4200 as opposed to the 3900 suggested rpm described above.)

5/ 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, it 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.

6/ **In Linkage throttle Stops vs. Baseplate Throttle Stop**
This has been an ongoing argument since the birth of the throttle stop. Which one is better? Which is more consistent? While one style may benefit a certain combination ordriving style, the other may benefit another style or combination. If you have specific questions on which one is right for you, call and ask for Peter Biondo for specific advice.