

GETTIN' THINGS STRAIGHT...

Editor's Note:

This month's subject, laser alignment, may not sound "Grass Roots", but with the advancements in technology and progression of our sport, it appears that nearly everyone has or has access to the latest gadgets that help us "take it to the next level". Jimmy Rivers of Jimmy Rivers Performance Works in Martinez GA. (just outside of Augusta) joins the CRI Tech crew this month to explain how to properly use the laser alignment tools to get you headed towards the front of the pack.

This month we'll explain how to align your kart using a laser alignment gauge. This type of unit is an extremely valuable setup tool, and is beyond a doubt the absolute best method of maintaining your kart's toe setting and alignment. As a Distributor, the unit that we'll be using will be the Accutoe Pro. There are other gauges available, but this is by far the best, in our opinion.

Setting the toe and the alignment is the first step to setting up your kart, and a procedure that should be checked on a weekly basis. Sometimes, on track activity, close racing, and bang ups produce slight tweaks to front-end components, and this in turn affects the toe. You don't have to be involved in a major crash to change your settings.

Before starting, it is imperative your kart has a steering lock, sometimes called a toe lock, to insure the fixed position of the steering shaft during our setup procedure. Any loose movement or play will alter our readings and the result will not be accurate.



Opening the fitted case, you will see the components that make up the Accutoe pro kit. You will have the laser assembly, the rear axle laser bracket, and the thumbscrew to attach the laser to the bracket, and the mirror bracket for the front. I find it is necessary to have the expansion kit as well, as this gives you options as to the use of this instrument, whether you choose to use it

on the stand without tires, or on the scales with the driver seated. The original version requires the removal of the snap ring, and attaches to the outer end of the rear axle, whereas with the shorter axles and the lack of surface beyond the hub, the new rear axle extension slides into the inner diameter of the axle. Personally, I believe it is best to do your initial alignment on the stand and then finish the job on the scales with the driver in the kart. This will be the most accurate, as it reflects the changes that occur when the chassis is fully loaded, just as on the track.



Align the steering shaft with the pitman arm in a true vertical position. Install the lock pin and securely tighten the steering lock to the steering shaft. It is a good idea to have the lock bolt on this piece on the driver's right, it makes future adjustments to the right side square much easier.

First, we will cover aligning the kart on the stand with the tires removed. Install the rear axle laser bracket on the right rear hub using three wheel nuts. Snug with a wrench, no need to be extremely tight, however make sure the bracket is mounted flush against the hub. Attach the laser with the thumbscrew, and, with the front hubs and spacers removed, place the mirror bracket on the right front spindle. When installing the mirror bracket, it is necessary to shift the v-block to the inside of the kart. It is important to have full contact between the v-block and the spindle and with the clamp part on the main shaft of the spindle, not the threads. Tighten the three screws evenly and finger tight, leaving it just loose enough to be able to rotate the mirror bracket by hand. With the mirror positioned below the spindle, return to the rear of the kart and with the tab on the rear axle bracket below the axle as well, turn on the laser, and adjust until you see the red laser dot appear on the mirror bracket. At this point, go back to the front and rotate the mirror until it reflects the dot back to the scale. Sometimes, when you have a lot of misalignment, it

is helpful to have something such as a wall, or a helper behind the kart to help pick up the location of the laser beam. Adjust the right tie rod until you have reached a “zero” position. This is when the laser is reflected into the same spot on the scale that it originates from. The right side of your kart is now square.

Remove all the components of the Accutoe and place on the left side of the kart in the same fashion as the right. On the mirror bracket, remember, you must move the v-block to the inside again. On occasion, depending on the relationship between the left rear hub and the left front spindle, it may be necessary to move the hub out to allow the mirror and the laser to intersect each other. Weights placed on the left side of the frame as well



can create obstacles in the path of the laser. Remove if needed.

With the axle bracket, laser, and mirror bracket installed, adjust the laser until contact is made to the mirror bracket again. Then, just as on the right side, rotate the mirror until the reflection appears on the scale. This is the amount of toe-out you have. Adjust the left tie rod until you reach the desired setting for your kart. Usually, a setting between 1/16 to 1/8 covers most karts.

Now, we want to cover using the Accutoe pro with the kart loaded and ready to race. Place the kart on the scale stand or other flat level surface with the driver seated and the pin in the steering lock. Take the time to make sure everything reflects an “as raced” condition.

First, let’s cover the old style rear axle extension. Remove the lock ring from the end of the axle on the right rear. Before installing, loosen the thumbscrews and remove the additional extension from within. Slide the extension over the end of the axle, aligning the key in the axle with the keyway in the extension, and evenly tighten all four thumbscrews. To align the laser and the mirror, use of the additional extension may be required. If you have the new style extension, insert the proper end into the inner diameter of the rear axle. It may be necessary to



“touch up” the inside of the axle to insure a nice smooth fit for the extension. Be careful not to remove any material, as a good snug fit is required for accuracy. The use of either rear extension is the same after installing on the kart. Next, remove the safety clip and the castle nut retaining the right front hub, and install the front extension until it is tight. Install the laser on the rear, and rotate the axle to point the laser beam toward the front extension. Move to the right front and install the mirror bracket. Rotate the rear axle until the laser beam contacts the mirror and just like explained above; rotate the mirror to reflect the beam back to the scale. Sometimes, the right side square is off because the steering lock has moved.

If you can reach zero and the pitman arm remain vertical, loosen the steering lock and correct. This is when having the lock bolt on the driver’s right makes life much easier. I find it a good idea to leave the lock pin removed all the time unless setting up the kart, much less risk of it getting moved. A quick note, keep an eye on the lock bolt. If it starts to round out, replace it immediately, it will save many headaches later. If required, adjust the right tie rod to reach zero, and tighten the jam nuts. Now, remove the Accutoe components and place on the left side of the kart, and adjust as necessary to reach your desired toe setting. Now, your toe is properly set, and your kart aligned.

