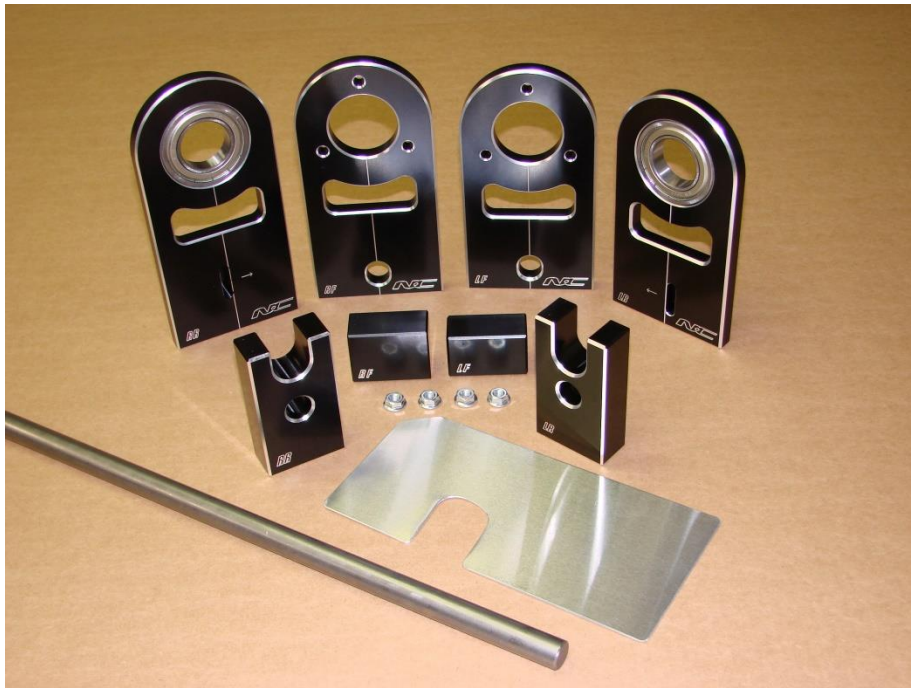


NC Chassis Co.

# Alignment Block Kit



JN  
10/1/2015

### Pick a Flat Surface

- It is important to pick a flat level surface for this procedure. To assure accuracy in the measurements we're going to take; the plates and blocks you are about to use should be very level with each other.
- Additional tools needed for this procedure are: a firm tape measure, a stagger or small tape measure, the NC Alignment Block kit, and a ½" open-end wrench.
- The accuracy of this process is important; to establish a good base set-up to assure future adjustments are as effective as they should be. Over-sight with axle locations can be a big difference between winning and handling problems that are frustrating and do not make sense.

### Parts to Remove

- Remove the snap ring and/or spacers on the outside of the rear axle hubs from the rear axle.
- You should also remove the springs from the shocks; so the shocks can be compressed for the chassis and axles to rest on the blocks.
- It may be faster to leave the springs on the shocks and just remove the top of the shock from the car. However, leaving the shocks attached to the car allows the shock angle to be used as a reference point when determining our measurements.

### Positioning the Block Kit

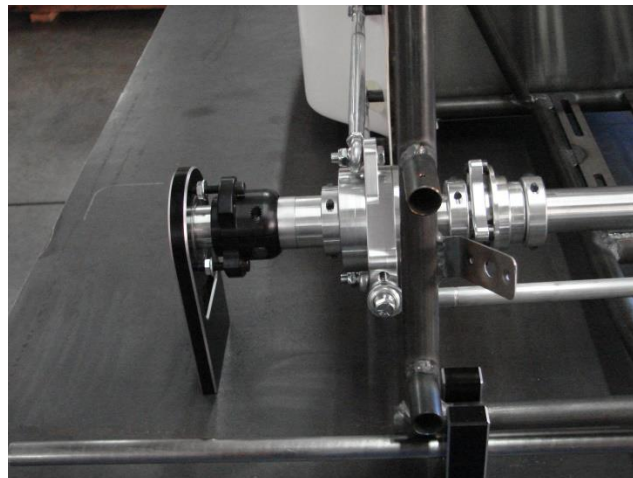
- Before we put our blocks and plates in place it is important to understand the purpose of this kit. This kit will put our radius rod angles in a more neutral setting. The angles of these rods change the location of the axles; both front and rear. These angles are constantly changing via different ride heights for different tracks and chassis roll when on the race track. So we have determined the angle that this kit gives us is about the best position for our measurements; so the change that does take place under race conditions is beneficial to the performance of the car.
- First, let's begin by placing the chassis blocks and axle plates under the front of the car. You will notice there are 4 different aluminum blocks and 4 different axle plates; each is engraved to verify its position. For ex- RF stands for right front. Bolt the axle plates directly to the front hubs. Then place the chassis blocks under the front of the frame just forward of the belly-pan. Allow the car to rest on the blocks and plates.
- Now proceed to the rear of the chassis. Place the rear axle plates on the rear axle by sliding them up against the rear hub on each side of the axle. Then place the chassis

blocks under the rear hollow cross tube of the frame; positioning them on the inside of the left and right corners of the frame. Once those are in place take the provided 5/8 solid bar and slide it thru the rear aluminum chassis blocks.

- **IMPORTANT:** The RR and LR chassis blocks have a notch to rest the rear frame tube. There is three different sizes available; 3/4", 7/8", and 1". Make sure you have the correct set for your chassis; you want the chassis block to have an almost snug fit when it cups the frame tube.
- At this time take a quick glance at all the blocks; try to make sure the chassis and axles are relaxed on the blocks and the plates are rested well on the table. There should be no bind in any of the axles. Keep in mind that if the car does not set down completely on one of the blocks; it's not a major problem. Try to reposition the block a little to make as much contact as possible between the table and chassis.

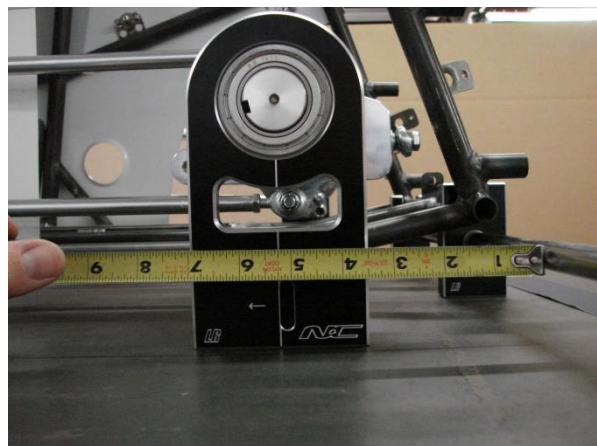
### Rear Panhard Bar Setting

- Let's start with the rear panhard bar location. Based on your race set-up; first put the panhard in your preferred starting hole locations. For a Grizz we normally start in the bottom hole of the left birdcage and 3<sup>rd</sup> hole from the bottom on the right rear bracket.
- Now that the panhard is in the preferred starting position we can adjust the rear axle off-set in the car. Off-set is the left to right position of the axle within the chassis; which is adjusted by rotating the rear panhard bar. For the rear of the car we normally start by shifting the axle so the head of the left rear panhard bolt is just outside the frame. Another reference point is the left rear radius rods. When the rear off-set is at the standard position the left rear rods will appear fairly parallel with the outside of the car. The further left you position the rear axle the tighter the car will be. The further right the rear axle is positioned the looser the car will be.



### Square the Rear Axle / Time the Birdcages

- With the rear axle off-set positioned we can focus on squaring the rear axle. Standing at the right or left side of the car; get as eye level with the rear axle and the solid bar as possible. This way the tape measure can be read accurately. Put the end of the tape measure against the front side of the solid bar and measure to the center line of the rear axle plate. Refer to the factory measurement sheet for all NC model car measurements.
- **IMPORTANT:** When adjusting the birdcages to square the rear axle, be aware of the rotation of the birdcage also referred as the timing of the birdcage. It is common in racing to have the birdcage straight-up or 90 degrees with the bottom of frame. Another way to look at this is having the top and bottom right rear radius rod heims positioned in the center of the axle. With the Grizzly birdcages the bottom of the brake plate can be used as a reference point and on the left rear the bottom of the birdcage that extends forward to the left rear shock can be used as a reference point. Recheck the rear axle square measurement after setting the birdcage timing.
- It is also common practice for many racers to rotate the top of the birdcage slightly forward from 90 degrees. A rule of thumb is a  $\frac{1}{4}$  to  $\frac{1}{2}$  a turn in the top radius rod or out of the lower radius rod. RR and LR are pictured.



### Front Spindle Alignment

- Timing the steering shaft is very critical. When we time the steering shaft with the front axle and spindles; the solid 5/8 bar (same bar used to square the rear axle) can be pulled through the front plates without any bind. This adjustment is made so that at corner entry the Left Front turns in sync with the Right Front. This helps the car roll to the apex of the corner with minimal steering input. If this alignment is incorrect and the Left Front turns to much faster than the Right Front, the Right Front will tend to drive

straight; causing a great deal of bind and resistance in the front end. This is very important to the performance of the car and must be checked regularly; especially after any altercation on the racetrack.

- If the front axle was bent, it is typically bent on the right side. With the front axle bent it is possible to re-align the spindles with each other and allow the bar to move through the plates without resistance. This should not be interpreted as fixing the bent front axle. It is important that you stand on the right side of the car and look down directly over the top of the right front spindle for a visual check. If the axle is bent; the spindle will be pointing towards you and the end of the axle will be angled back towards the nerf bar. **Replacement of the front axle would be the only solution at this time.** Otherwise if you were to use the bent front axle, your alignment would never be correct. The Right Front spindle could never turn far enough to the left, because it is already turned to the left when the wheels are pointed straight.
- A quick visual check can be made of both left and right spindles. Look under the arm of the spindle; if the gusset is not straight then the arm is bent and needs to be replaced.
- **Procedure for Alignment:** Standing at the front of the car you will notice two ears welded on the steering shaft. Bolted to those ears are the left and right steering rods. Lower holes are for pavement top holes are for dirt. Rotate the steering rods until the ears appear to be at 11.5 and 1 O'clock (Refer to picture below). This setting will keep the RF tire more in sync with the LF tire. Now that the steering shaft is timed properly make sure the radius rods are not in a bind, they should swivel on the ball of the heim with little effort; and the bar should move freely within the front plates.

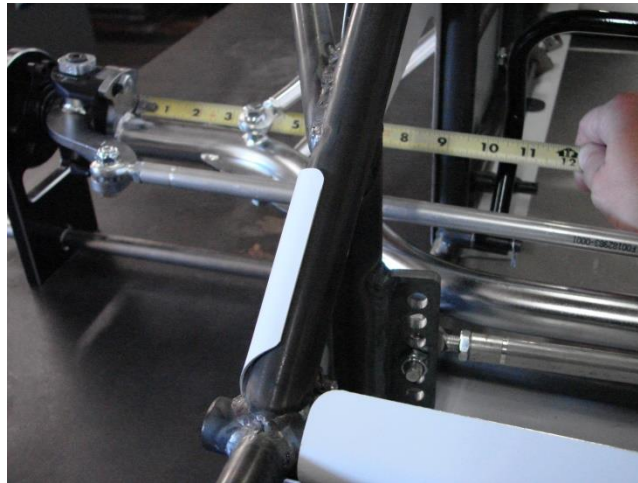


#### Front Axle Off-set

- Same as the rear panhard bar; locate the front panhard bar in your preferred hole location (For a Grizz; normally 3<sup>rd</sup> hole up from bottom). Once that is done we can direct our attention to the left and right position of the front axle; also known as front off-set.

For a Grizz we remove the outer hood and stand at the front of the car. Then using a stagger tape; measure from the inside of the RF steel flange, just above the weld across to the inside edge of the side panel. The starting measurement for the Grizz is 8-5/8". Less would be like spacing the RF tire in to improve grip; more would make the front of the car have less grip.

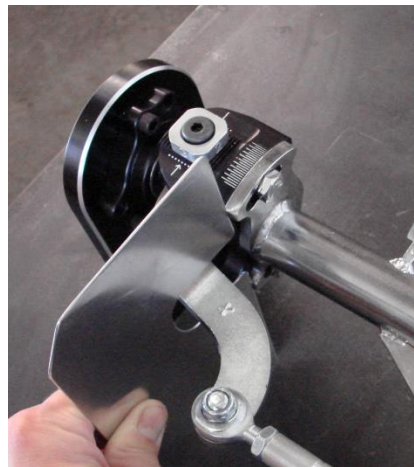
- This measurement should be double checked when setting the wheelbase.



#### Wheelbase / Lead / Front Axle Rotation

- The wheelbase and lead are set simultaneously. Wheelbase is the distance from the center of the rear axle to the center of the front axle. Lead is the difference between the right and left side wheelbase; the left side being the shorter distance. Lead is an adjustment some racing mechanics use a lot or very seldom. It is a personal preference. Track size or shape is the primary reason for changing lead. More lead the easier the car turns. Most common lead used is between  $\frac{1}{4}$ " -  $\frac{1}{2}$ ".
- At this time set the rotation of the front axle; using the caster plate tool as shown below. Place this tool on the table, same as the axle plates; and slide it against the front ears of the right steel flange. Using the right front radius rods, adjust the axle so that both top and bottom ears are touching the plate. Once this adjustment is made the front axle rotation is in a stock position. Rotating the axle back will make the steering more stiff; forward will make it easier to turn.
- The rear plates and front plates will be used for the wheelbase measurement. This measurement is taken after the front spindles are aligned because the spindles need to be square with one another and the 5/8 bar needs to be left in the front plates. This assures an accurate center to center measurement will be taken with the axle plates.
- Begin by hooking the tape measure to the center cut out of the right rear plate and pull the tape measure forward to the center of the right front plate. Using the right front

radius rods; set the desired wheelbase length. Refer to the factory measurement sheet for wheelbase suggestions. Once the right side wheelbase is set, move to the left side and take the same measurement; minus the amount of desired lead. Example: 50" right side and 49-7/8" left side is a 1/8" of lead.



### Completion

- Once the wheelbase is set and you have double checked the rotation of the front axle; the front and rear axle alignment should be complete and all heim jam nuts should be tight.
- At NC Chassis we hope this procedure is a benefit to gaining consistency in the performance of your chassis. On the following page is a chart that breaks down the measurements discussed in this manual for our different model cars and sizes. Please use this chart as a guide and feel free to explore different settings to achieve a change in car handling base on your driver and racetrack.

**Chassis Model**

<b>Rear Axle Square Measurement</b>									
<i>Size of chassis (Rollcage height)</i>									
	31"	33"	35"	76 x 36"	37"	78 x 38"	39"	80 x 40"	41"
17 Grizz	5-1/4"	5-1/4"	5-1/4"		5-1/4"				
09 Grizz		5-1/4"	5-1/4"		5-1/4"				
07 Grizz		5-1/4"	5-1/4"		5-1/4"				
Kong		5-1/4"	5-1/4"		5-1/4"				
Extreme 02		5-1/4"	5-1/4"		5-1/4"		5-1/4"		
Ultimate 01		5"	5"		5"				5"
Pro 2000		5"			5"				5"
Classic 1900				5"		5"		5"	

**Grizz Square w/LR Radius Bracket: 5-1/16"**

<b>Wheelbase Measurement</b>									
	31"	33"	35"	76 x 36"	37"	78 x 38"	39"	80 x 40"	41"
17 Grizz	45-1/4"	47-1/8"	48-1/8"		49-1/8"				
09 Grizz		47"	48"		49"				
07 Grizz		47"	48"		49"				
Kong		47-1/4"	48-1/4"		49-1/4"				
Extreme 02		48-3/8"	48-3/8"		49-3/8"		49-3/8"		
Ultimate 01		48-7/8"	48-7/8"		49-7/8"				49-7/8"
Pro 2000		49-5/8"			50-5/8"				50-5/8"
Classic 1900				46-3/8"		48-3/8"		50-3/8"	