

BJK's DIY alignment tools:



Four home made Tees. They stand off the wheel about an inch and represent a plane parallel to the wheel. The vertical part of the Tee is used to attach a magnetic based digital level. Note the small bars welded on the underside of the horizontal bar. When measuring toe, two aluminum bars rest here and give the total toe reading (more on this later).



Since the front doesn't have an axle, these bars were made to hold the Tees to the front wheels.



Here is a shot of camber being measured. Caster is adjusted at the same time as camber.



A small block of steel threaded $\frac{1}{4}$ -20 was welded to a spare axle nut. This screws onto the axle threads and provides the retaining force to hold the Tee to the wheel.

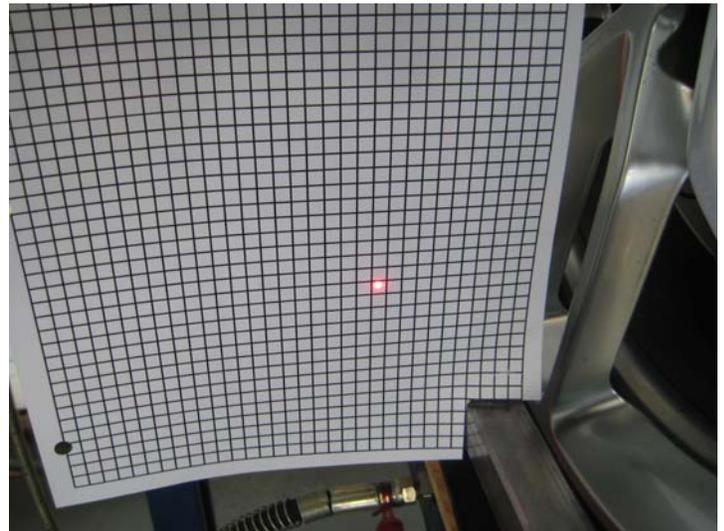


Here is toe being measured. More shots to show more detail.



Rear Toe and thrust are adjusted the same time. For thrust, use the laser capability of the laser level to shoot a beam forward.

Here's the opposite side Tee I welded a small washer to stop the aluminum bar. There are washers on both ends of the horizontal member. In my case, this is the right side of the car,



I shoot at a target made of graph paper. Move from side to side of the car, adjusting toe and thrust until you get the laser dot the same distance from the Tee on both sides, **AND** toe where you want it. If you have 2 laser levels, it can go much faster. You will have to drop the toe bar for laser shooting, and move the other to wrench on the toe links.

A close up of the measurement being made. You can't see it very well but there is a 12inch steel rule taped to each aluminum bar. I hope you figured out the rulers need to be the same distance from the other end for each bar.



Next I set up my toe measuring bars on the front Tees, and move the paper target to the rear Tees. The laser pointer is now used pointing rearward, using the same idea that the final laser indication on both sides is the same distance from the respective TEE AND toe is set to the desired number.

If the steering wheel is still tied down nice and tight and parallel, the alignment will be done.

A few things to consider. Many people worry about repeatability. Well, if you take the car for a test drive and return for minor adjustment (usually steering wheel position needs a tweak), you may find the measurements jst a bit different. Several possibilities.

- A little less gas in the tank, ride height is now a bit different.
- Ride height slightly different due to settling.
- Wheels have a slight amount of runout and they are not in the same position as before.
- Toe changes DO affect camber just a teeny bit, after all there is caster in the suspension. Vice versa.
- When digital instruments get close to zero, it sometimes takes a while for them to settle into a final reading.
- The instrument is not placed exactly where it was before.

Here's my home made rear caster tool. Caster is adjusted at the same time camber is set and before toe/thrust (rear) or toe/steering wheel position (front)

Front camber measured again with the digital level. Unless you have turn plates or something to ensure the tires aren't bound to the surface (poly sheets, poly grocery bags, etc) you will have a hard time getting front caster. You can search the 'net for measuring front caster, but for sure, both camber and front caster have to be set before moving on to the last step, front toe and steering wheel at zero.



When I start adjusting front toe, I tie down the steering wheel in the position I want it. I use turn plates, so I only tie down after the car is on turn plates. Just a loop of rope around the wheel and some cheap ratchet tie downs.