



Tech

ACKERMANN EFFECT

Ackermann is the difference in turn radius between the front tires. On oval track cars it can be desirable to create a situation where the left front tire turns faster than the right front tire. The Ackermann effect can help the car turn better through the center of the turn. You can measure the amount of Ackermann you currently have by using a set of turn plates. Typically, Ackermann is measured by turning the right front 10 degrees to the left. If you have Ackermann, the left front will travel further than the right front. A typical amount would be three degrees in 10 degrees of steering. To simplify, moving the right front from zero through 10 degrees of steering will cause the left front to move say 13 degrees in this scenario.

Ackermann is created by your front end geometry. Tie rods that angle forward from the inner pivot point out to the spindle will have more Ackermann.

You can usually adjust the Ackermann by moving the left front tie rod end in a slotted spindle arm. Moving the tie rod end closer to the ball joint will create more Ackermann. Some cars use an offset slug design to make the adjustment. Offset wheelbases have an effect as well. In the shop you should check the Ackermann on your car at the minimum and maximum setting. Having this knowledge in your note book will help you make the quick adjustment at the track.

On 3/8 mile and under tracks more Ackermann is usually more desirable. On 1/2 mile tracks and above less is generally needed. Just like with rear stagger, too much Ackermann will make the car loose on turn exit or will cause premature tire wear. Too much Ackermann can over heat the left front so that it will not perform on the long run. The amount your run depends on your set up and the track. Some tracks like more and others less.

Sometimes you can see the effects of excessive Ackermann by inspecting the wear pattern on the left front. If you see a graining pattern in the tire surface or if you have very high pyrometer readings in the left front you may want to consider reducing the amount of Ackermann.

Just as with rear stagger the right amount of Ackermann will help you through the middle of the turn. Too much and you will not be good on the long run. Through trial and error you can fine tune the car with Ackermann. If your car is just a bit tight in the center then more Ackermann may be the cure. Try adding small amounts as anything beyond what you need will just tear up the left front. Too much can also slow the car down as your horsepower has to overcome the dragging of the left front through the turn. The dragging condition will also be very hard on the performance of the left front tire.



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On small tracks Ackermann can be added in aggressive amounts to see if there is a gain to be had. On large tracks a finer adjustment should be utilized. Remember that Ackermann will have the most effect on the car at the apex of the turn. At the apex, the steering is turned to the maximum amount for that turn. While Ackermann has an effect whenever the wheels are turned the effect is going to be most dramatic at the apex.

There are times when the car will cut to the center better on turn entry due to the effects of Ackermann. In this condition, chassis set ups or track layouts load the left front tire more helping the car get to the center. While the turn in benefit helps, it may cause a loose condition on exit due to the steering being overturned at that point in the corner. A balance must be found. You may find that you notice the Ackermann effect on higher banked tracks due to the loading of the left front where as on flat tracks the left front has less weight on it causing more of a undesirable dragging condition.