

CAMBER

This discussion is primarily directed toward front engine cars with MacPherson front suspension running on radial tires. ie. Cars like all the BMW models.

Negative camber is when the top of the tire tips inward. Negative camber is necessary for good cornering performance. The main question is how much. When turning a corner the body rolls and the outside tire is forced to tip outward in relation to the road. This causes the tire to ride on it's outside edge and lose grip rather than being flat on the road. I refer to this as body roll positive camber. To maintain the best grip we would like the tire tread to remain flat on the road. To compensate for body roll camber change auto manufacturers design in some negative camber. Again the question is how much is the right amount. To improve cornering performance and reduce body roll camber change most tuners (us included) increase roll stiffness via stiffer springs, sway bars and lowering the body (lower center of gravity). Increasing negative camber is one of the most effective and inexpensive ways to improve handling but is often overlooked on street cars. Negative camber in the 2 degree range will have little effect on tire wear but can have a dramatic affect on reducing understeer. Insufficient negative camber is the reason many driver school students destroy the outside edges of their front tires. For perspective, the front suspension of race cars are usually set up with 3 to 4 degrees (or more) of negative camber. However, this much negative camber would quickly wear out the tires of a street driven car that spends most of it's time going straight.

Ireland Engineering offers several types of camber plates. Fixed plates are usually the best choice for performance street cars. These add a fixed amount of negative camber and use the factory upper strut bearing. These are an economical path to upgraded performance without affecting ride quality. Customers who want more aggressive performance and/or use their cars for driver schools, track days, or autocross may want to consider adjustable camber plates. The adjustable plates allow you to have "street" and "track" settings and to fine tune the handling. These are available in several styles. Race cars use camber plates with spherical bearings. These offer no compliance but locate the suspension most accurately. We don't recommend these for street cars but some customers use them anyway, as we do on our dual purpose cars. With the racing plates you can expect increased vibration and noise. We offer the KMac type adjustable camber plates which are similar to the factory upper strut bearing except they have a stiff urethane bushing instead of rubber. The KMac plates are made up of 3 plates which allow the center piece containing the strut bearing to be adjusted then clamped in place when the bolts are tightened. We now offer a new type of camber plate that is exclusive to Ireland Engineering that allows the use of the factory upper strut bearing and allows up to 1.25 degrees of additional negative camber. This plate also offers up to .5 degree of positive camber for cars that are radically lowered or to correct damaged suspensions.

Easy method to measure camber--- You will need a carpenter's square and a tape measure. With the car on relatively flat surface, place the carpenters square on the ground and against the tire. The square will be touching the side wall near the ground. Measure the distance from the same point on the side wall near the top of the tire to the square.

Also measure the distance between the two data points. The tangent of one degree is .017. Therefore 1 degree of camber is .017" per inch. An example is: If the two points are 20" apart , then one degree is $20 \times .017 = .034$ ". There is a slight error due to the lower side wall bulging for the weight of the car, but you can easily estimate this