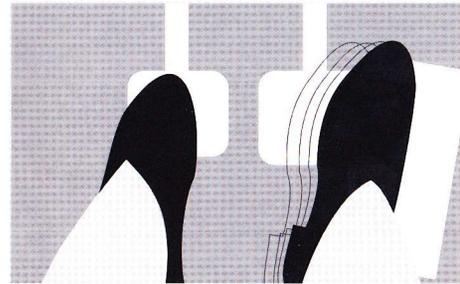


### A couple more terms.

**Downshifting** is the process of going from higher gears to lower gears as you approach a turn. Downshifting is not used to slow the car, as is commonly believed. That's what brakes are for. Rather, it is used to get the car into the proper gear for exiting the turn under maximum acceleration.

**Heeling and toeing** are used during downshifting to match engine speed with transmission speed while simultaneously applying the brakes. If you came flying down a straight at a 6000 rpm redline in fifth gear and dropped directly into 3rd, the rpm would skyrocket and the countryside would likely be littered with critical engine bits and pieces. Heeling and toeing let you get everything in harmony before engaging a lower gear, to keep things inside where they belong.

The term came from the old days when the pedals in a race car were arranged so that the right toe worked the brake pedal and the heel was on the gas. However, to heel and toe these days, the left edge of the foot works the brake, the right edge the accelerator.



As you approach the turn, start braking with the edge of your foot. Flexing your foot at the ankle, roll the right edge onto the accelerator pedal as you disengage the clutch with your left foot.

While continuing to add brake pressure, increase engine speed sufficiently so that when you engage the next lower gear, there is a smooth transition with no jerking and no over-revving. It sounds difficult, and it is. A bit like patting your

head and rubbing your belly simultaneously, but with practice it becomes second nature. Don't worry about double clutching (shifting into neutral, letting out the clutch, raising engine speed, declutching and shifting). That's only necessary for racing transmissions that lack the synchronizers used in a modern street car gearbox.

For years conventional wisdom held that braking had to be done in a straight line and was therefore completed by the turn-in-point. But several years ago, as tire technology and suspension design improved, drivers began experimenting with a technique called **trail braking**.

With this technique, hard braking is completed by the time the car reaches the turn-in point, but rather than getting off the brakes completely, decreasing pressure is applied well into the corner almost up to the acceleration point. In other words, pressure "trails" off rather than coming off all at once.

When the brakes are first applied, weight is transferred forward, the nose goes down, the car settles on the suspension, achieving a solid balance.

If the brakes come off suddenly, that balance is disturbed. But by trail braking, that balanced nose-down position can be carried well into the turn, and the transition from hard braking to brakes off is smooth and gentle.