



Ross Bentley's High Performance Driving Tips - #10

HANDLING CHARACTERISTICS AND BALANCE

The terms "understeer" and "oversteer" are probably the two most misunderstood words used by the "enthusiast" driver. And yet, understanding them, and even more important, knowing what it feels like and how to control it is a real key to high performance driving.

Understeer is a term used to describe the handling characteristics when the front tires lose traction in relationship to the rear, and regardless of your steering corrections the car continues "plowing" or "pushing" to the outside of the turn. Understeer effectively increases the radius of a turn and in excessive amounts is rarely desirable.

Accelerating too hard or not smooth enough through a corner transfers excessive weight to the rear, decreasing traction at the front and causing understeer (unless you have applied so much power that the rear wheels have broken loose - this reduces traction at the rear and results in a characteristic called "power oversteer"). Most peoples' first reaction is to turn the steering wheel in more and more. Don't! This increases the problem because the tires were meant to face the road with their full profile, not with the sidewall. So, the tire's traction limit has now been decreased.

The cure to understeer is to decrease the steering input slightly and ease off the throttle gently to transfer weight back to the front. This increases the traction limit of the front tires and allows you to begin smoothly and progressively accelerating again. Of course, this easing off and getting back on the throttle will reduce your ensuing straightaway speed - and upset the balance of the car - so, make sure you get the acceleration right the first time.

Oversteer is a handling characteristic where the rear tires have less traction than the fronts, the back end wants to come around and the nose of the car is pointed at the inside of the turn. This is also called "being loose", "fishtailing" or "hanging the tail out". Its effect is to decrease the radius of a turn and if controlled properly, can sometimes increase your speed through some corners.

Turning into a corner with the brakes applied (trail braking) causes the weight to transfer forward, making the rear-end lighter, thus reducing rear tire traction. The result - oversteer. To control excessive oversteer, just look and steer where you want to go - simple as that. What this does is forces you to turn into the slide, or to opposite lock, thereby increasing the radius of the turn and reducing slippage at the rear. At the same time, gently and smoothly ease on slightly more throttle to transfer weight to the rear, and thus, increasing traction. Whatever you do, avoid any rapid deceleration. This will surely result in a spin as you decrease the rear tire traction even more.

This balancing of oversteer and understeer to a neutral state by controlling the amount of weight transfer with the throttle, brakes and steering is the very essence of High Performance Driving! And, perhaps, the best feeling in the world.

We've seen how important balancing the weight transfer in the car is, and how to do this with our controls. But we also have to accomplish this with extreme smoothness. If you jerk the steering into a turn, it immediately transfers excessive weight to the outside of the car, lifting the inside, and upsetting the suspension geometry and springs. Now, you will have to wait until the car's weight settles down and is balanced again before being able to accelerate smoothly out of the corner. This wastes time and causes more wear and tear on the suspension and tires.

So, the car should be driven absolutely as smooth as possible all the time. Practise this in your everyday driving. Don't pounce on the gas pedal - squeeze it on and ease off gently. Don't slam on the brakes - squeeze them smoothly and progressively to the threshold braking limit. Don't yank or jerk the steering wheel - smoothly and gently feed in the required steering input that your eyes looking well down the road tell you. Don't bang the shifter into gear - simply place it in gear with finesse. A good driver is smooth, gentle and unspectacular.

The better you get to know your vehicle, the better the feel you will have for this very delicate balance. It takes a great deal of practice to find the limits of both you and your car. To find these limits on the street can be impractical and dangerous. Work on it where it is safe!

When you drive smoothly, concentrating on all these basic driving techniques, you will find that you naturally become much more sensitive to everything the car is doing. You develop a real feel for the balance of the car and without even trying will find you are much quicker – but not speeding - and are much more aware and alert. The key is thinking about, and being critical about, your everyday driving.

Practise all the time. No one ever gets too much. Practise driving smoothly; picking out the exact spot where you want the wheels when you turn a corner; looking far ahead down the road; checking what's behind and beside you; stopping smoothly with the nose of the car exactly one meter from the crosswalk without actually feeling the precise moment when the car stops; feeling and controlling the balance of the car. Enjoy the feeling of being in control!

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