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der Vorgänger

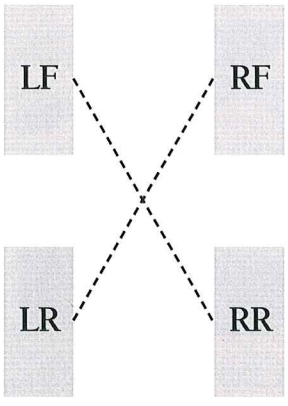
Making it turn equally left and right

Photos and story by richard Curtis
for *der Vorgänger*

To corner balance or not? That is a question that faces not a few Porsche owners. Most of the research I've done on this question says that unless you're tracking the car, or if your car is severely off in its corner weights because of, say, an accident, then you're not likely to notice an improvement in handling. However, if you do track the car, or if you do notice uneven handling in, say, left turns versus right turns, or if you've just replaced major suspension components such as springs and shocks, then you might want to invest in a corner balance.

Does my car need corner balancing?

Not necessarily. Street cars are rarely corner balanced because their suspensions are relatively soft to begin with, especially when compared to dedicated track cars, and most street cars have no means of easily adjusting spring height. Dedicated track cars generally have very high spring rates, often double or even quadruple those of



Corner balancing equations:

LF + RF = Total front weight
LR + RR = Total rear weight
A + B = Total weight

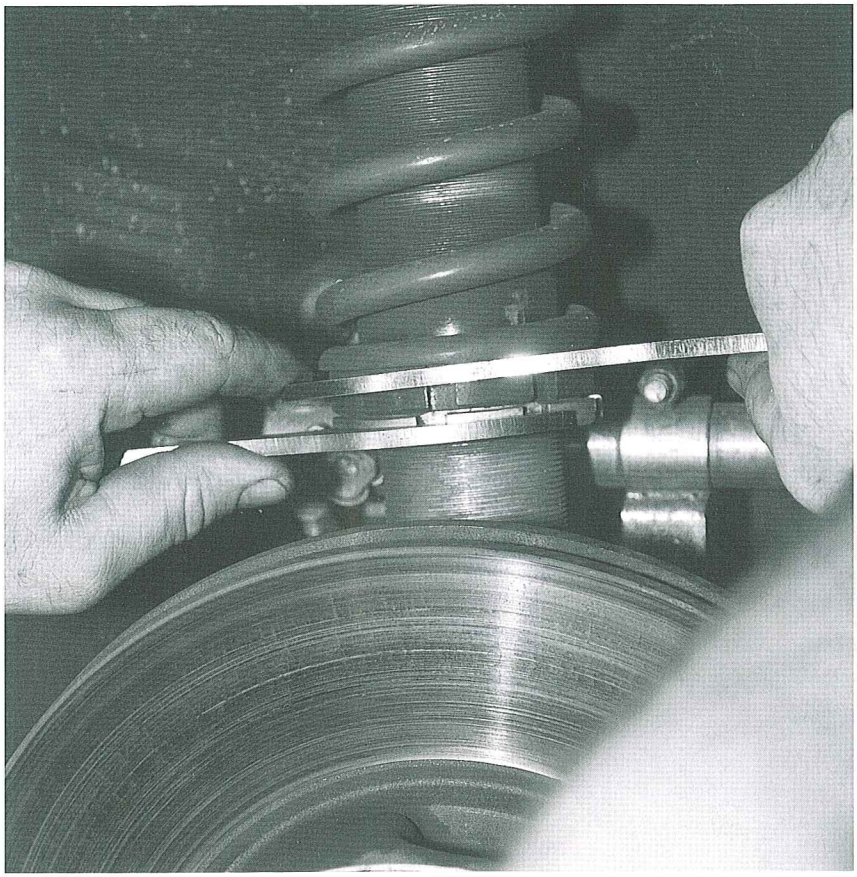
Ideally, LF + RR = LR + RF with the driver in the driver's seat.

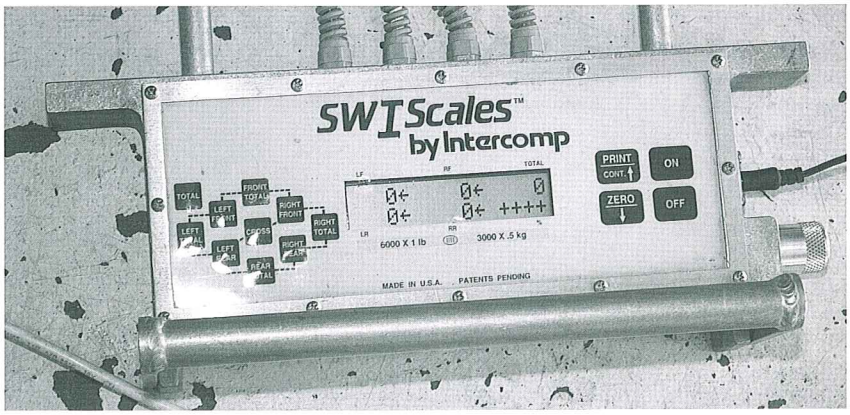
Above: Chapman rolls the car onto the scales from the wooden blocks. Then he jostles the car up and down to settle the car onto its suspension. Empty, Siciliano's 911 weighed 2,100 lbs.

Left: The Hunter lift has built in jacks that enable Chapman to raise the car in order to set it on the wood blocks. The car is then rolled onto the scales. Chapman says that 911s need a forward rake of 1 degree. He sets up the corner weights according to what the driver wants. Drivers can make small adjustments later, he says, through sway bar adjustments and tire pressures.

Opposite page, top: Taylor Chapman right, discusses the corner balance procedure with car owner Mark Siciliano.

Opposite page, left: Chapman loads Siciliano's 1972 911 onto the lift in preparation for corner balancing. Note that Chapman sets the car on blocks of wood (same height as the scales) before rolling the car onto the scales (see photos at right).





street cars, and therefore even small adjustments to spring height has a dramatic effect on corner heights/weights.

Most experts, such as Taylor Chapman a Porsche specialist with German Auto Group in Springfield, Va., agree that if your Porsche is driven just on the street, you're not likely to recognize the benefits of corner balancing. Even Porsche says that corner weights within 44 pounds (22 kilograms) of each other are acceptable. If you drive your car in Driver Education events or in races, then yes, the benefits of corner balancing should be more apparent, says Chapman. However, there is no harm in having your street-driven Porsche corner balanced.

Why corner balance?

A car properly corner balanced will handle evenly through both left and right turns. If not properly balanced, a car may become unpredictable, oversteering in, say, a left turn while understeering in a right turn. A properly balanced car will also enjoy improved tire wear.

What is corner balancing?

Your car weighs what it weighs. Corner balancing will not change the total weight; it just moves the weight around. You can move weight from one corner to its diagonal opposite, but the total of the two diagonals will remain the same (see diagram on Page 20).

At its most basic, corner balancing is adjusting ride height. This moves weight from one corner to another to equal as closely as possible the total of the weights of the opposing corners, i.e., Left Rear (LR) + Right Front (RF) equals Right Rear (RR) + Left Front (LF). Ideally, this will optimize the car's handling. This is why it's also important to have the driver's weight in the driver's seat while doing a corner balance.

How to get started?

Remember that corner balancing involves moving weight around the car by fiddling with corner ride heights to yield the driver's desired handling characteristics.

Start by having the driver (or a similar amount of weight) in the driver's seat plus a half-tank of fuel. If, for example, you're a DE instructor and most often have a passenger with you, you might want to account for that extra weight in the passenger's seat, too, for the most optimal corner balance.

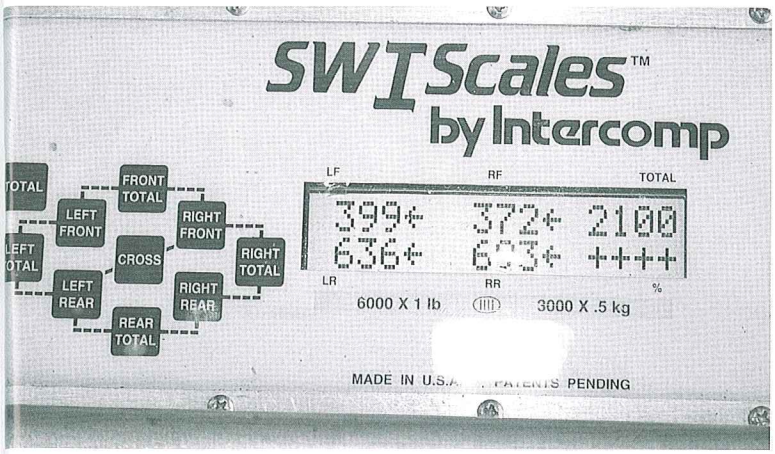
Any friction or binding in the suspension should be resolved. Tire pressures should be set to their desired "hot" readings.

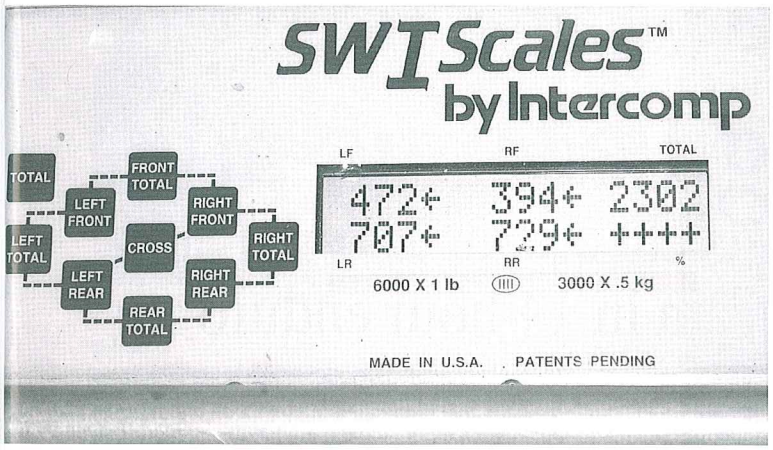
You must have a set of scales and the car should be on a totally flat surface. The car should be rolled onto the

Top left: As a demonstration, Chapman adjusts the right front spring three full turns to shift weight to the left rear. This moved 48 lbs to the left rear.

Top: One of the steps in prepping the car for corner balancing is to set the tire pressures. Chapman says the pressures should be "hot" pressures with which the car will see track duty.

Above: The scales used.





scales and the car then rocked back and forth to settle it on its suspension. Chapman places the car on wooden blocks, then rolls the car onto the scales.

How is a car corner balanced?

At the extreme, if a car is out of balance across the diagonals, then the car could have a teeter-totter effect although not necessarily extreme or even noticeable.

In its most simple terms, you corner balance a car by adjusting the height of a corner. Raise the height and you move weight from that tire to the diagonally opposite tire. You can do this simply by changing air pressures (remember hearing how NASCAR will add as little as a quarter-pound of weight to change the handling?) or by adjusting the springs or torsion bars to cause more weight either to be pressed against the pavement on that tire or to shift some of its weight to the opposite corner.

If you increase tire pressure on one tire, for example the LR, it will make that tire slightly taller, thereby raising that corner and placing additional weight on the diagonally opposite tire, the RF. You can do the same by adjusting the springs on coilovers, torsion bars or on the rear of early 911s by adjusting the eccentrics on the spring blades.

Know that adjusting one wheel's weight will change the other three; the total weight is a constant.

The final corner weights depend on how the driver wants his car to handle; the driver can make small adjustments at the track through sway bars and pressures.

Alignment first or corner balancing first?

Porsche technician Chapman recommends doing the corner balancing first followed by an alignment. Any ride height change will affect the alignment, he says, but not vice versa. He notes also that a caster change affects toe setting but not vice versa.

How long does it take to corner balance a car?

Chapman says this depends. If the car has been corner balanced before, it probably only needs a slight tweaking. If shocks and springs have been changed, it might take longer. If the car has been in an accident, the balance might be off a great deal. An average time, he says, would be 2-4 hours.

How much does a corner balance cost?

Multiply the number of hours it takes by the technician's hourly rate.

Above: After the corner balancing, Chapman sets the alignment. He says that its best to do the alignment after the balancing because any ride-height change will affect the alignment.

Above left: Two examples of balancing achieved by changing the ride heights at various corners. The bottom photo is with a driver in the car.