

Setup Tips

Suspension

The primary function of the dampers, is to control the energy as it enters and exits the springs, which when compressed (“bump”) and then released (“rebound”) have a natural tendency to overshoot their original length as they release the energy. (Ever driven a car with a broken damper? you will know that it is not a nice experience)

Dampers won’t limit the total amount of load transfer through the car, but will affect the amount of time it takes the loads to transfer. Therefore, the car’s behaviour during moments of transition; such as initial brake application, brake release, initial turn-in and application of throttle can be affected by a damper setting change.

If we take the front suspension as an example, the compression (bump) happens when additional load is put on the spring, as when hitting a bump and/or hitting the brake pedal. As the spring compresses in response to this additional load, the compression setting on the dampers provides additional resistance. The rebound motion is simply the spring trying to “rebound” to normal after being compressed, as when the car comes off a bump or the driver releases the brake pedal. Resistance to how fast this happens comes from the damper’s rebound setting.

Rebound (front)

- Stiffer rebound: As the brakes are released at corner-entry, the initial turn-in should be more positive, with less UNDERsteer. Taken too far, this can produce turn entry OVERsteer.
- Softer rebound: As the brakes are released at corner-entry, the tires will have better compliance, while the handling balance will shift toward UNDERsteer. The compromise is the potential for increased UNDERsteer at corner exit.

Rebound (rear)

- Stiffer rebound: Will produce increased UNDERsteer at corner entry. The potential downside is less compliance when the throttle is opened.
- Softer rebound: This change will be best felt at corner entry with less UNDERsteer and improved throttle-open compliance. The potential downside is that the driver may have less control at corner entry.

Compression (front)

- Stiffer compression: Slows down the car’s frontward weight transfer upon initial brake application. The compromise is a slight loss of compliance.
- Softer compression: Adds grip to the front tires through better compliance, but at the cost of stability of the vehicle.

Compression (rear)

- Stiffer Compression: this change is most effective at reducing UNDERsteer at turn-in and mid-corner and resisting UNDERsteer at initial throttle application, at the cost of possible OVERsteer both at turn-in and throttle-on at the exit of the corner.

- Softer Compression: This change should improve rear grip through better compliance. The corner-entry handling balance will move toward UNDERsteer along with improved power-down. The compromise is increased UNDERsteer at turn-in and under throttle-on conditions, such as at the corner exit.