



Version VIII STi Front Suspension



Version VIII STi Rear Suspension

10.1.2 Rear Suspension

Four lateral control arms and two trailing arms make up the rear suspension. The front bushings on these trailing arms behave similar to a tramp rod, allowing some vertical movement and rocking of the rear drivetrain to improve NVH, dampening actual dynamic throttle behaviour. Control arms are attached in pairs along with one trailing arm to each wheel hub at one end, and the chassis at the other. All control arms and trailing arms are rubber bushed at both ends. Camber is preset from the factory and has no standard means of adjustment. Toe angles are set by adjusting the rearmost control arm to chassis mounting point by means of an eccentric bolt. A stabiliser is also used at the rear to control body roll, linking left and right lateral control arms and is attached via rubber bushings bolted to a very tall chassis mounted bracket. Sway bar links even on Version VII and later WRX's retain the same plastic and rubber bushed items as used on previous models. Only the STi pick up the trick ball type links. Rear springs are progressive rate, and shock absorbers are twin-tube double acting units.

Driven to Distraction

A bit of a mouthful, but an important concept nevertheless, is that AWD does not increase a vehicle's capacity for mechanical grip, as this is influenced by factors such as weight distribution, tyres, geometry etc. Instead, AWD as used by the WRX dramatically increases the size of the available median performance envelope, while at the same time flattering less skilled drivers. In plain English, a driver of an AWD can operate the throttle pedal without much consideration to subtlety, using a pair of the proverbial size nine work boots, and get away with it. Compared this with the driver of a high powered 2WD car, who needs ballet shoes and a softly, softly approach when squeezing on the loud pedal

10.1.3 On-Road Behaviour

Like most cars, Subaru has tuned the suspension settings of a standard WRX to cater for a wide range of drivers. This means handling characteristics have been set for the lowest common denominator, or drivers with dubious skill levels, and those that demand ride comfort over performance. Understeer is almost universally considered the safest handling trait for average drivers, so understeer you get, and plenty of it. Unfortunately, understeer is not a lot of fun for the enthusiast driver, and is ultimately far slower than a neutrally handling car.

So what has Subaru done to "dial" an understeering attitude into the car's chassis? Once this is understood it becomes easier to appreciate the manner in which we go about improving the situation, to achieve more neutral behaviour. The biggest single factor influencing this trait actually has nothing to do with the suspension, and is a trait of the AWD system used by Subaru. Covered in more detail in *The Drivetrain* chapter, all Subaru's that do not use the new six-speed transmission can be described as having front torque biased AWD, and will *always* understeer because of the competing grip functions between steering and drive.

Drivetrain characteristics aside, two main areas of suspension design can be identified as the cause of this generous understeer. Firstly there is the conservative front and rear roll-stiffness ratios Subaru's suspension engineers have chosen for the car, while compromised front suspension geometry is the second technique used. Both points can be mitigated, and will be covered in detail later on in this chapter.

However, it should be noted, that a couple of important changes were made to the Version VII, specifically widening of the front and rear track by 20mm and an increase in the rear roll centre height of 33mm, contributing to a seemingly more neutral corner