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What are the newest safety benefits to be found on the S4?

- The torsen differential is a fully mechanical device of worm gears that can split torque 50:50 in a no-slip condition. However, when one axle slips, the torsen differential will send more torque to the axle with more grip, in other words, it works in an exactly opposite way to a conventional differential. Since it is a completely mechanical device, the locking action is instantaneous and progressive.
- The torsen does not lock or inhibit speed differences under braking, thus allowing all 4 wheels to rotate independently at their own speeds when no power is applied. The torsen differential only locks in a power application situation while some other system lock both during acceleration and braking. The torsen has a torque sensing characteristic while other have a rotational sensing characteristic.
- The accusations that four wheel drive wastes a lot of gas is only applicable to part time manually engaging systems. A full time system with a center differential has none of the tire scrubbing waste of the former. Furthermore, research by Audi showed that as tractive loads built up, the tire losses of two wheel drive exceeded the losses caused by the extra weight and inertia of a full time four wheel drive system. Tire losses were found to rise disproportionately with load. Consider the extreme case of the "burnout" or wheel spin scenario, where 100% of the tractive energy is converted to burning rubber rather than propelling the vehicle.