Adaptive Cruise Control

The confident, sporty driving style that is an inherent part of the overall vehicle concept for the Audi Q5 is complemented by two highly complex comfort and convenience systems: Adaptive Cruise Control (ACC) automatically maintains the chosen distance from the vehicle in front, and Audi braking guard is an additional device aimed at preventing nose-to-tail collisions with the vehicle in front.
1 Introduction

The distance control system using radar sensing has already appeared successfully in series production on the Audi A8, A6, A5, A4 and Audi Q7, and will now be offered on the Audi Q5 as well. When the road is clear, ACC keeps the vehicle moving at a constant speed (the same function as a conventional cruise control). Above all, however, it assists the driver in dense traffic or if other drivers change lanes unexpectedly, by maintaining the required distance from the road user in front. To do this, the electronics brake or accelerate the vehicle within predetermined limits without any action on the driver’s part. The system is designed to operate smoothly and react to other moving vehicles with a moderate change of speed only.

1.1 Operating Principle and System Features

The radar sensor at the front of the Audi Q5 detects vehicles moving in front. The electronics determine their distance away, their angular position and their speed relative to the driver’s own vehicle. From these data its probable path (the dynamic envelope) and the desired distance to be maintained are computed. ACC activates the engine/transmission and brake system electronics in order to adjust this distance. However, the maximum braking action that the ACC can effect has been deliberately limited in order to make it clear to the driver that many situations in which another vehicle is approached, for instance at a high relative speed differential and on a winding road, cannot be mastered by the system alone. If road situations cannot be handled smoothly within the limits of the system, a flashing red light and an audible warning tells the driver in good time that he or she must take action. The driver can adjust the ACC to three settings – from sporty to relaxed – according to his or her individual preferences. This choice changes the distance from the vehicle ahead and determines the dynamics and characteristics of the regulating action. Adaptive Cruise Control takes effect in a speed range from 30 to 200 km/h. If the driver wishes to overtake more briskly, the system can be overridden briefly by depressing the accelerator pedal. However, it remains active and will revert later to the set road speed and the selected distance. The system shuts down when the brake pedal is operated, and must then be reactivated at the lever (‘Reset’). The previous setting is then effective again.

1.2 Controls and Displays

ACC is operated with a switch on the steering column below the turn signal lever, Figure 1. This position is standard on all Audi models with this equipment installed. The driver selects the chosen speed according to the marks on the speedometer: between 30 and 80 km/h in...