AUTOMATIC PARKING BRAKE

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Much more than just a handbrake, the automatic parking brake is an element in driving comfort and pleasure. Its assistance is particularly appreciable when starting on a hill or leaving a parking space, for example. Its action ensures gradual and smooth departure of the car.

DOMINIQUE DUMAS

BASIC FACTS

The automatic parking brake is not just a motorised handbrake. Managed by a computer, it acts progressively and adapts to each situation. An electric motor, controlled by a computer, applies the brakes at the rear of the car – just the right amount – and releases them gently when the driver engages the clutch and accelerates enough to start the car moving. This mode of operation is of great assistance on hill starts. In this case, the computer assesses the road's gradient and deduces the minimum torque required to advance the vehicle. Hence, there is no risk of the car rolling back during starting, a situation which is often delicate especially when the road is very steep. In addition, as the system releases the brake gradually, the car always moves off gently and smoothly. The automatic parking brake is engaged as soon as the engine stops, applying as much brake pressure as required by the situation. For hill starts, the automatic parking brake is engaged by acting on a command. The computer automatically determines the brake pressure suited to the gradient of the road. The system releases the rear brakes when the engine and clutch provide enough torque to move the vehicle forward. Dynamically, the automatic parking brake also ensures an anti-blocking function.

IN SHORT

MANAGED BY A SPECIAL COMPUTER, THE AUTOMATIC PARKING BRAKE AUTOMATICALLY APPLIES BRAKING PRESSURE ON THE REAR WHEELS ADJUSTED TO THE GRADIENT OF THE ROAD. ACTING PROGRESSIVELY WHEN RELEASING THE BRAKE, THE SYSTEM PROVIDES THE DRIVER WITH REAL ASSISTANCE FOR HILL STARTS.

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HOW DOES IT WORK?

The active element of the automatic parking brake is an assembly based on an electric motor pulling the rear brake cables by means of a reduction gear: a set of gears to increase the torque of the electric motor and apply considerable force to the cables. It also includes a force sensor which constantly measures the traction applied on the cables.

This whole assembly is managed by a computer. To accurately manage the required braking pressure, it is equipped with an inclinometer which indicates the gradient of the road. At the same time, two position sensors, one on the clutch pedal, the other on the gearbox, inform the computer that the driver intends to start driving. In addition, to manage hill starts, the computer analyses the torque applied to the wheels by the engine and the clutch. Depending on this data, the computer applies a force suited to each situation to the rear brake control cables by operating the system's electric motor. It checks the force by means of the sensor. Finally, it informs the driver of these actions by displaying a message on the instrument panel.

1 | Casing (electric motor and electronics)
2 | Brake cables
3 | Backup control
4 | Battery
5 | Warning light
6 | Brake application/release control
7 | CAN (Controller Area Network) bus
8 | Body computer
9 | Clutch pedal sensor
10 | ABS computer
11 | Injection computer

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