The **Airmatic Dual Control** is a fully-supporting air suspension system. “DC” (Dual Control) means that both the suspension and the damping can be adjusted. Depending on the road surface condition and driving style an additional air volume is switched to or away from the suspension struts. This causes a change in spring rate.

The system provides both static and dynamic support by means of four air bellows located at the wheels.

The **Airmatic system** also features the following additional functions:

- The **level control** allows both manual and speed-responsive, automatic raising/lowering of the vehicle level.

- The **electronic level control system** controls the vehicle level at the front and rear axles and ensures the vehicle level remains constant according to the driving and vehicle loading conditions.

- The “**Adaptive Damping System** (ADS) adapts the damping forces to the road surface condition and the driving style. The road conditions are determined by vertical acceleration pickups at the body of the vehicle. The driving style (horizontal acceleration) is calculated using the vehicle speed and turn angle. The damping is adjusted to the sporty damping stage at a speed of ~160 km/h.
Advantages

- Higher level of driving safety and ride comfort due to:
  - Adaptation of suspension to road surface condition and driving style.
  - Adapting damping to road conditions and driving style.
  - Low location of center of gravity.
  - Low aerodynamic drag and therefore low fuel consumption.
  - Less lift at front axle.
- Individual adaptation due to:
  - Raising vehicle level for poor road surfaces or driveways.
  - 3 possible damping levels for comfortable, sporty or extremely sporty driving style.
- Driver information:
  - Higher vehicle level and sporty damping level displayed by means of indicator lamps in switches.
  - Warning appears on multifunction display in instrument cluster if vehicle level is too low.

Ground terminal 31
Voltage at circuit 30
Voltage terminal 87

Left front body acceleration sensor (B24/3)
Right front body acceleration sensor (B24/4)
Right rear body acceleration sensor (B24/6)

Left front level sensor (B22/8)
Right front level sensor (B22/9)
Rear axle level sensor (B22/3)

AIRmatic pressure sensor (B7)

Left front axle damping valve unit (Y51) with solenoid valves (y1, y2)
Right front axle damping valve unit (Y52) with solenoid valves (y1, y2)
Left rear axle damping valve unit (Y53) with solenoid valves (y1, y2)
Right rear axle damping valve unit (Y54) with solenoid valves (y1, y2)

AIRmatic with ADS control module (N51)

Level adjustment switch (N72s18) Lower control panel control module (N72)
Comfort and sport switch (N72s25)

Control module (N47-5)
Control module Electronic ignition switch (N73)
Control module (N15/3)

Engine control module
Steering column module (N80)
Multifunction display (A1p13)

Central reservoir charge valve (Y)

AIRmatic pressure sensor, AIRmatic control module (X11/4)
Engine control module (A9/1m1)
Engine control module (A9/1)
AIRmatic pressure reduction valve (A9/1y1)

AIRmatic compressor unit, front left/right suspension strut (Y51/1, Y52/1), rear left/right suspension strut (Y53/1, Y54/1)

AIRmatic driver information

GF32.22-P-0003-01E

AIRmatic, location of pneumatic/hydraulic components

GF32.22-P-0003-02E

AIRmatic, location of electrical/electronic components

GF32.22-P-0003-03E

Function overview

The functions of the pneumatic closed loops are controlled using the components of the electric/electronic system.

The AIRmatic control module receives input signals from the following components:

- ESP control module (via CAN)
- Engine control module (via CAN)
- Transmission control module (via CAN)
- Central gateway control module (via CAN)
- Instrument cluster (via CAN)
- Steering angle sensor (via CAN)
- Comfort and SPORT switch (via CAN)
- Level adjustment switch (via CAN)
- 3 body acceleration sensors
- 2 front axle level sensors
- 1 rear axle level sensor
- 1 AIRmatic pressure sensor
- Voltage supply and ground

In the AIRmatic control module, the input signals are converted into output signals for the following components:

- 4 level valves (assigned to wheel)
- 4 additional volume valves (assigned to wheel)
- 1 AIRmatic central reservoir charge valve
- 1 AIRmatic pressure reduction valve
- 4 ADS damping valves (each with 2 solenoid valves, assigned by wheel)
- Multifunction display in instrument cluster
- Indicator lamps in the switches: comfort and sport, level adjustment
- Air compressor

The AIRmatic control module uses the input signals to decide which of the 4 functions must be controlled:

- Self-leveling suspension
- Level adjustment
- Additional volume added and removed
- ADS

Several control functions can be processed at the same time.
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