

Document title AIRmatic with ADS control unit, component description

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MODEL 221
with CODE (489) Airmatic (semi-active air suspension)
up to Model Year 8

N51 AIRmatic with ADS control unit



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N51 AIRmatic with ADS control unit

The AIRmatic with ADS control unit (adaptive damping system) is mounted under the front passenger foot plate.



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Function

The air suspension with adaptive damping system, is a combination of air suspension (pure level control) with an automatic damper adjustment (two solenoid valves on the damping valve unit). The system operates in accordance with a control algorithm which establishes the suitable damping stage depending on the driving situation.

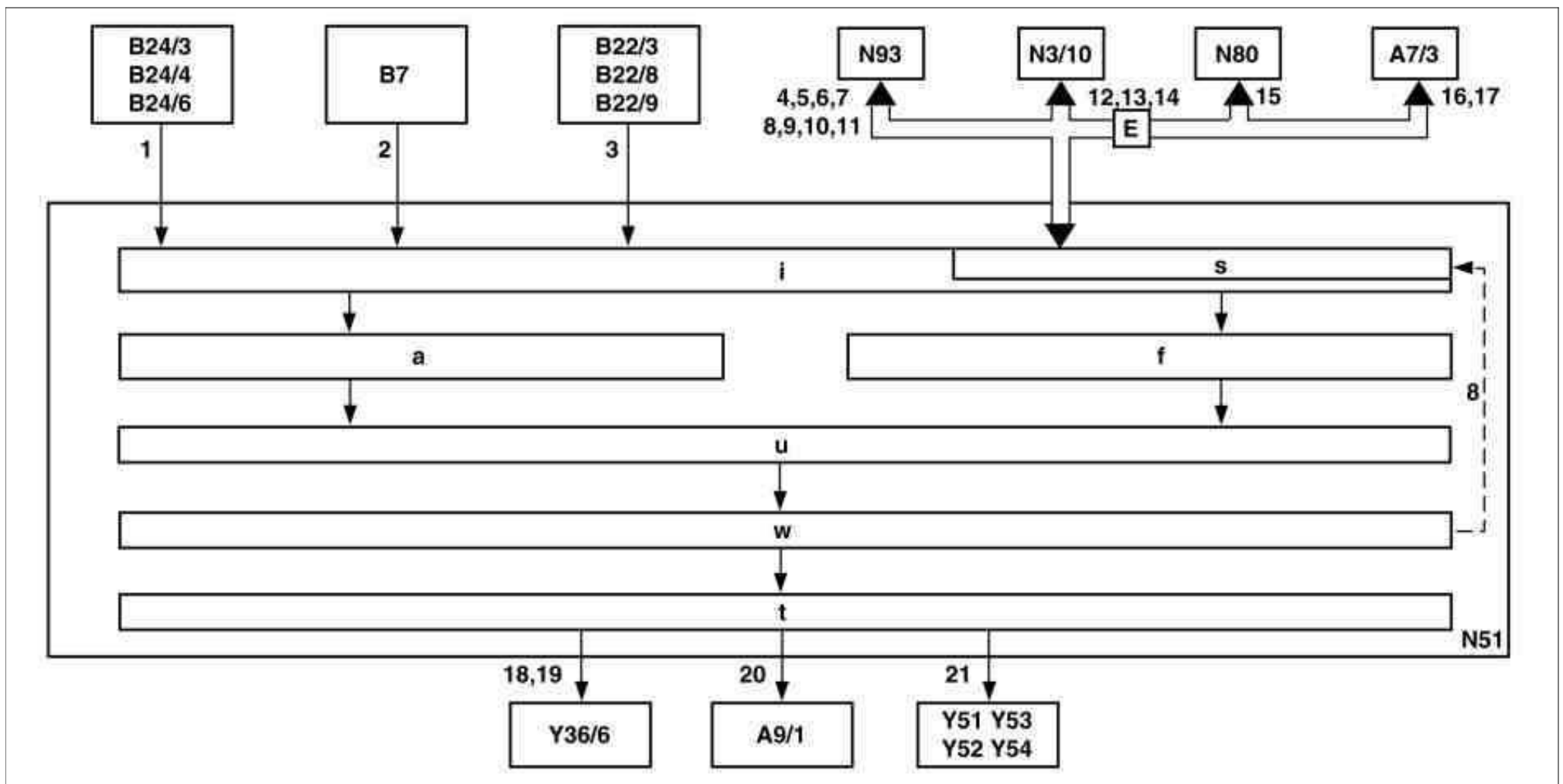
Activation of the AIRmatic with ADS control unit

The AIRmatic with ADS control unit is activated when the chassis CAN is activated, via which the control unit receives the wake-up pulse. The control unit checks the current vehicle level. The vehicle level is corrected if necessary.

Diagnosis

If the AIRmatic with ADS control unit detects a fault, the corresponding fault message is transmitted to the central gateway control unit (N93) via the chassis CAN and on to the instrument cluster (A1) via the central CAN. Thereupon the instrument cluster displays a message in the multifunction display (A1p13).

The AIRmatic with ADS control unit is connected to the data link connector via the diagnostic CAN, the central gateway control unit and via the chassis CAN (X11/4).



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Block diagram of AIRmatic with ADS control unit

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|----|--|----|---|-------|--|
| 1 | Vertical acceleration signal | 12 | Atmospheric pressure signal | A7/3 | Traction system hydraulic unit |
| 2 | Air spring pressure signal | 13 | Vehicle data signal | A9/1 | AIRmatic compressor unit |
| 3 | Level sensor signals | 14 | Intake air temperature for compressor control | B7 | AIRmatic pressure sensor |
| 4 | Status LED signal | 15 | Steering angle sensor signal: | B22/3 | Rear axle level sensor |
| 5 | Wake-up signal for door contact/luggage compartment contact "ON" | 16 | Wheel speed signals | B22/8 | Left front level sensor |
| 6 | Displayed speed signal | 17 | Service brake operated signal | B22/9 | Right front level sensor |
| 7 | Outside temperature signal | 18 | Level valves actuation | B24/3 | Left front body lateral acceleration sensor |
| 8 | Signals for diagnosis, from and to data link connector (X11/4) | 19 | AIRmatic central reservoir charge valve actuation | B24/4 | Right front body lateral acceleration sensor |
| 9 | System messages/fault messages | 20 | Drain valve actuation | B24/6 | Right rear body lateral acceleration sensor |
| 10 | Change vehicle level signal | 21 | Damper valve units actuation | N3/10 | ME control unit |
| 11 | Change chassis setting signal | | | | |
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|-------|-------------------------------------|---|--|---|--|
| N51 | AIRmatic with ADS control unit | a | Adaptive damping system (ADS) | i | Receiver driver stage for sensor signals |
| N80 | Steering column module | D | Detection of vehicle handling (vertical body acceleration, longitudinal and lateral acceleration, brake application, comfort and sport switchover) | s | CAN interface |
| N93 | Central gateway control unit | D | Calculation of damping forces | t | Output stage |
| Y36/6 | Level control valve unit | f | Suspension, level control and level adjustment | u | Conversion of damping forces, spring rate and specified level into valve/compressor actuation times |
| Y51 | Left front axle damping valve unit | D | Detection of vehicle handling | w | Monitoring of control unit, operating condition and actuation signals, fault detection, cutout, fault type and diagnosis entry |
| Y52 | Right front axle damping valve unit | D | Detection of vehicle level and driver's requirement (switch position) | | |
| Y53 | Left rear axle damping valve unit | D | Calculation of specified level and spring rate | | |
| Y54 | Right rear axle damping valve unit | | | | |
| E | Chassis CAN | | | | |