BMW Group - AIR: 2022-06-19 / 14:22
Dealer: 32711/06
Model: i4 M50
Development code: G26
Model code: 31AW
Lead type: 31AW

Functional description

Single-axle air suspension

FUB-FUB-FB-370001-F17 - V.5

Single-axle air suspension

Using the air suspension on the rear axle, the single-axle ride level control ensures a consistent vehicle height and ground clearance.

Depending on the vehicle load, the single-axle ride level control keeps the vehicle height at the rear axle at a predefined level. As a result, driving safety and driving dynamics are increased on any surface.

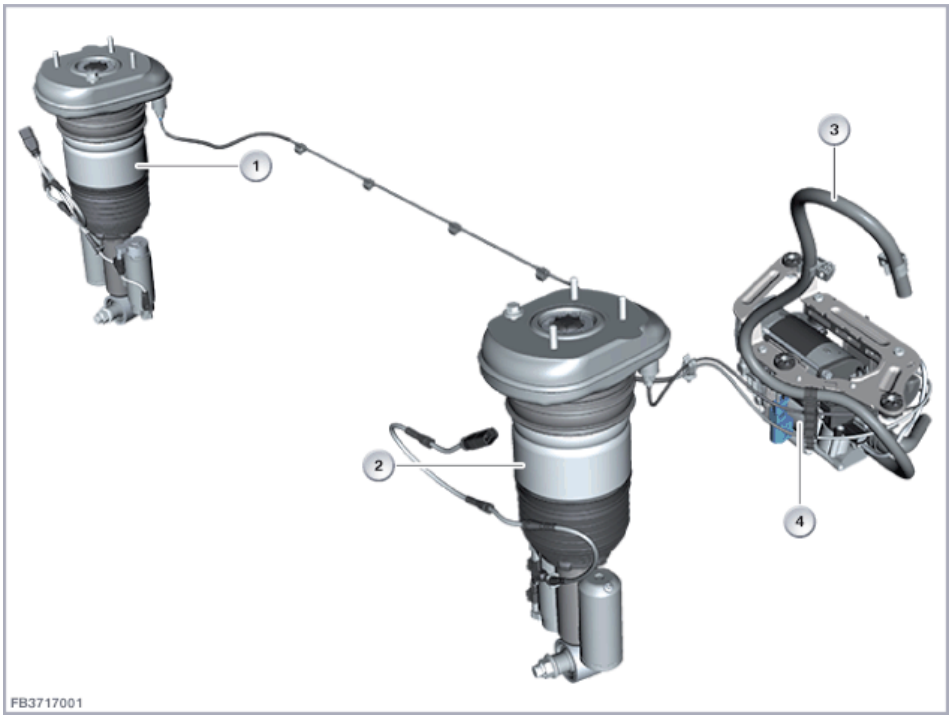
The single-axle ride level control additionally ensures consistent driving comfort, since the full spring travel is kept constant in all driving situations.

The Vertical Dynamics Platform (VDP) is the central control unit for the driving dynamics systems. The single-axle ride level control is activated by the VDP control unit.

A button for setting the level is not provided.

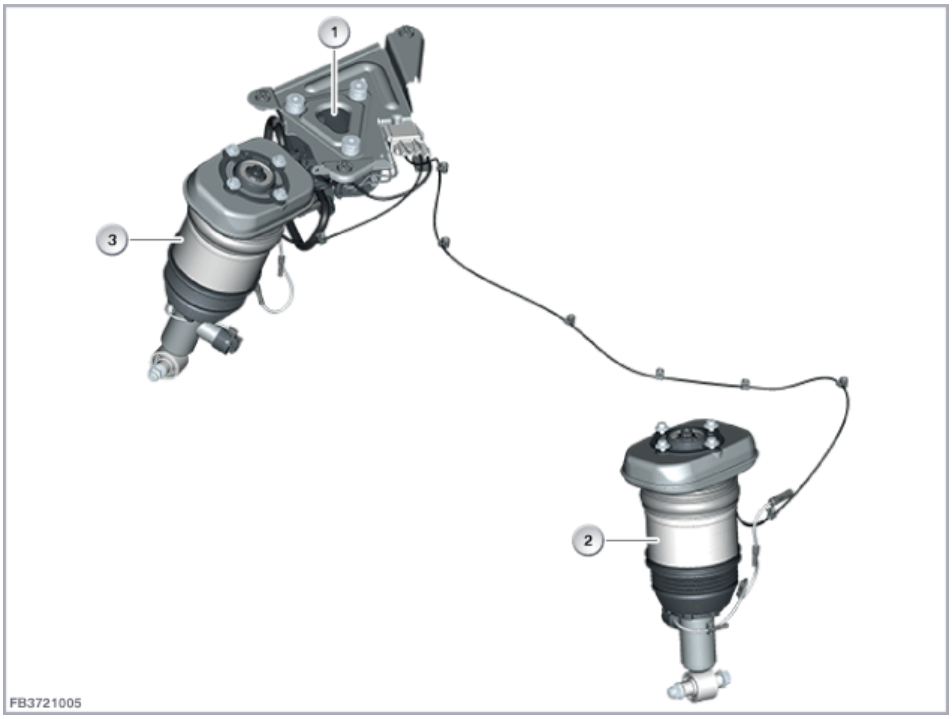
Notice!

During long immobilization periods, the vehicle ride level may drop. This is not a malfunction.



G3x example

Index	Explanation	Index	Explanation
1	Air spring, rear right	2	Air spring, rear left
3	Air intake hose	4	Air supply system



G26 Battery Electric Vehicle example

Index	Explanation	Index	Explanation
1	Air supply system	2	Air spring, rear left
3	Air spring, rear right		

Brief component description

The following components for the Vertical Dynamics Platform (VDP) are described:

Control unit, Vertical Dynamics Platform (VDP)

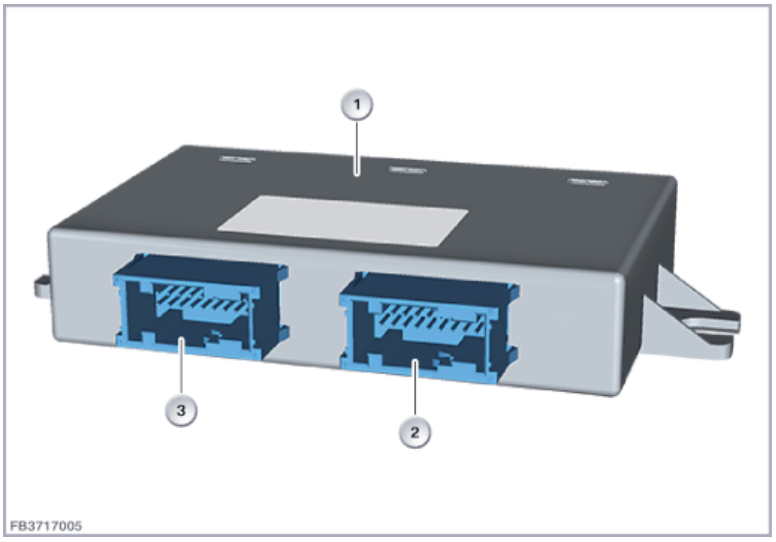
The VDP control unit is located in the rear right of the trunk.

The VDP control unit adjusts the single-axle ride level control. In this case, the VDP control unit is installed in the basic version.

The VDP control unit activates the compressor through the compressor relay.

The VDP control unit is connected to the FlexRay. Two 18-pin plug connections serve as the interface to the wiring harness.

The rear right power distribution box supplies the VDP control unit with terminal 30. The Body Domain Controller (BDC) supplies power from Terminal 30F.



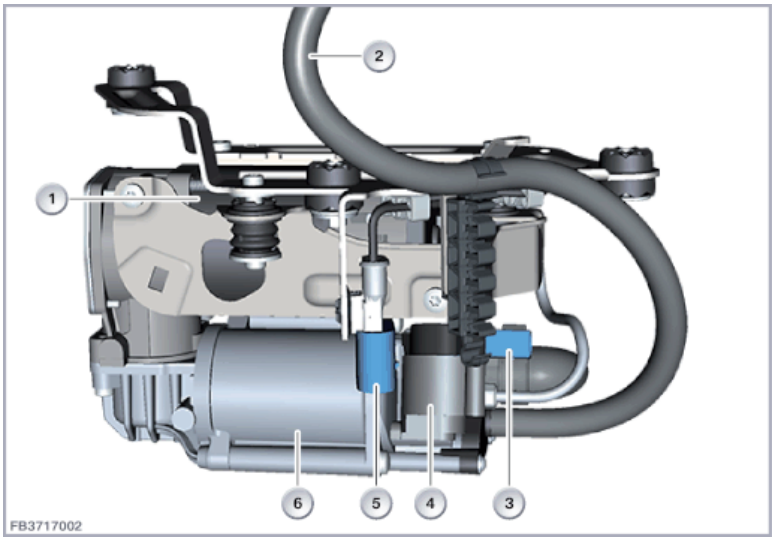
Index	Explanation	Index	Explanation
1	Control unit for vertical dynamic platform (VDP), basic version	2	18-pin plug connection
3	18-pin plug connection		

Air supply system

The air suspension is a further development.

The air volume was increased to improve comfort. No pressure accumulator is available for the single-axle ride level control. Air is pumped into the air springs or bled from the air springs.

The U-type bellows are used to improve comfort from axial positions. Compared to lateral layers, axial layers may deform more easily. This results in more harmonious compression and rebound.



G3x example

Index	Explanation	Index	Explanation
1	Compressor	2	Air intake hose
3	2-pin plug connection	4	Discharge valve

5	2-pin plug connection	6	Air drier

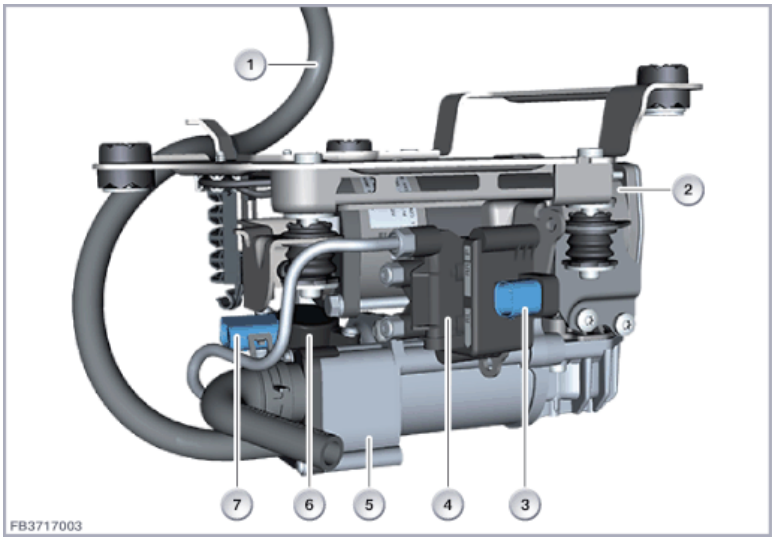
The air supply system consists of:

- Compressor (without temperature sensor)
- Air drier
- Valve block
- Discharge valve

The compressor is designed for 17 bar of pressure. The air drier installed in the compressor prevents icing.

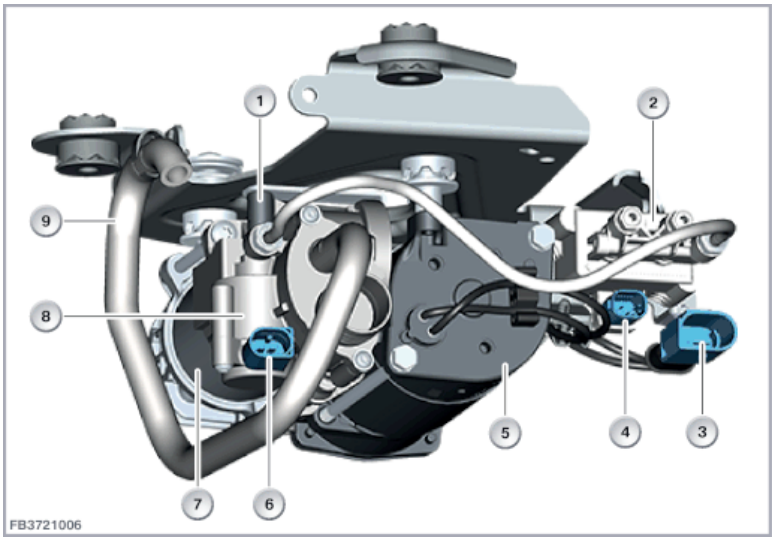
Two solenoid valves for the rear air springs are integrated into the valve block.

The discharge valve controls the lowering of the vehicle.



G3x example

Index	Explanation	Index	Explanation
1	Air intake hose	2	Compressor
3	3-pin plug connection	4	Valve block
5	Air drier	6	Discharge valve
7	2-pin plug connection		



G26 Battery Electric Vehicle example

Index	Explanation	Index	Explanation
1	Air supply system	2	Valve block
3	3-pin plug connection	4	2-pin plug connection
5	Compressor	6	2-pin plug connection
7	Air drier	8	Discharge valve
9	Air intake hose		

Ride height sensor

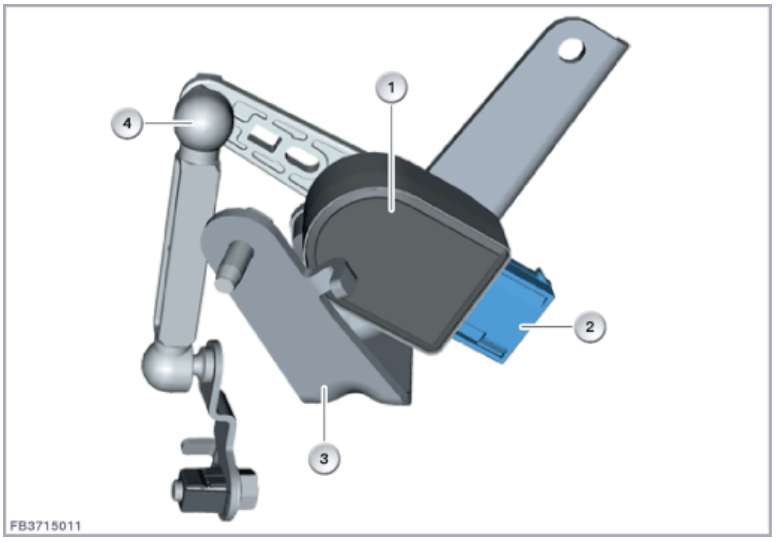
The ride height sensor is a proximity sensor. The ride height sensor proportionally converts distances covered into an analog voltage signal using an angle of rotation. The sensor can be rotated by 360°.

Ride height sensors with a sawtooth-shaped characteristic curve are used. These are characterized by a wide application range and an almost independent installation position.

For vehicles with the VDP control unit: The 4 ride height sensors are connected to the VDP control unit.

For Battery Electric Vehicles (BEVs) and VDP control unit: Three ride height sensors (left front, rear left and right rear) are connected to the VDP control unit.

For vehicles without the VDP control unit: The 2 ride height sensors are connected to the BDC control unit.

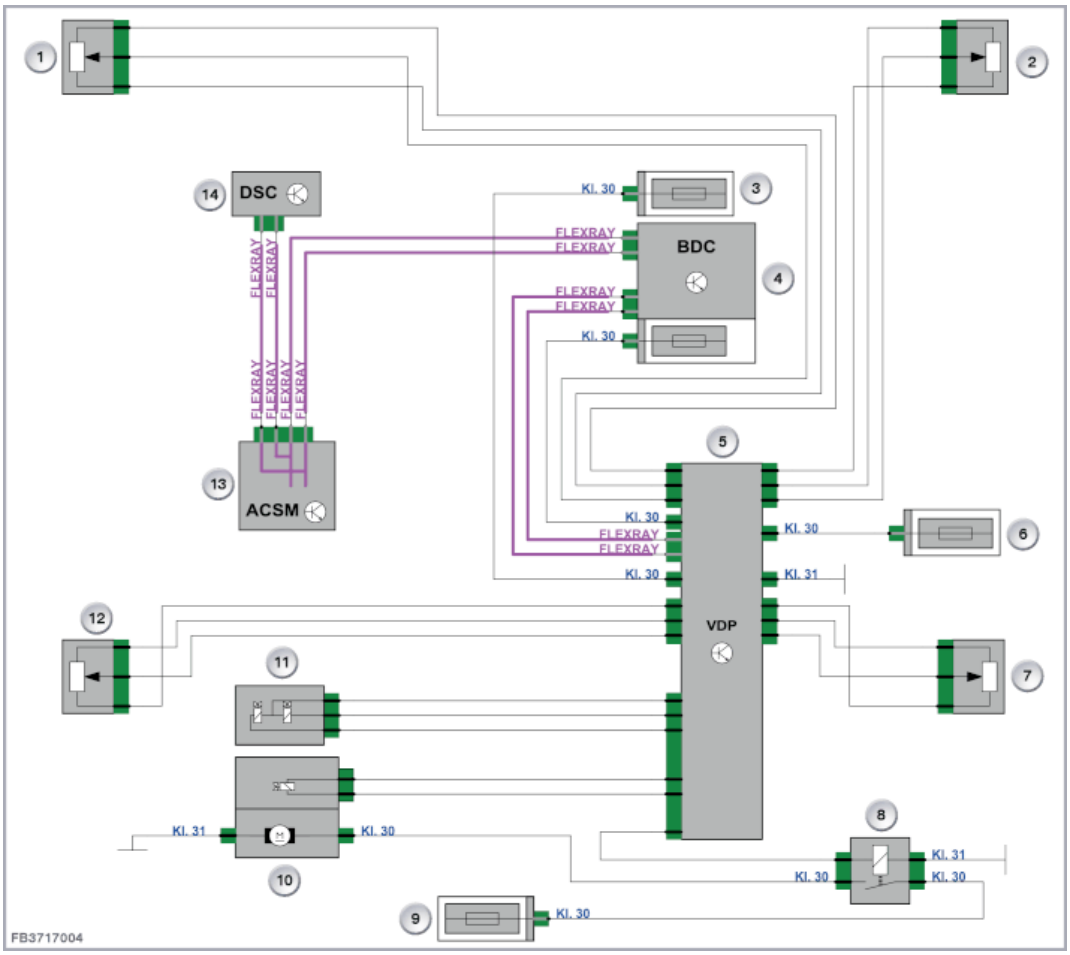


Example, ride height sensor

Index	Explanation	Index	Explanation
1	Ride height sensor	2	6-pin plug connection
3	Bracket	4	Linkage rod

Functional networking

For implementation of the Vertical Dynamics Platform (VDP), a complex system network with distributed functions in further control units is necessary.



Index	Explanation	Index	Explanation
1	Front left ride height sensor	2	Right front ride height sensor
3	Front right power distribution box	4	Body Domain Controller (BDC)
5	Vertical Dynamics Platform (VDP)	6	Power distribution, right rear
7	Right rear ride height sensor	8	Compressor relay
9	Power distribution box, battery	10	Compressor
11	Air supply system	12	Rear left ride height sensor
13	Crash Safety Module (ACSM)	14	Dynamic Stability Control (DSC)

Notes for service

General notes

Notice!

The VDP control unit detects when the vehicle is taken onto the vehicle lift. Once this is done, the single-axis ride level control cannot carry out control again until the vehicle is moved for longer than 5 seconds at a driving speed greater than 5 km/h.

Diagnosis instructions

Notice!

In the diagnosis, there are several service functions available for the vertical dynamic platform (VDP).

The following service functions are available:

- Data memory

  The data memory in the VDP regarding the air suspension is deleted.

- Ride height adjustment

  Start-up of the ride height sensors.

- Ride height sensors

  Functional check of the ride height sensors.

- Compressor cycle

  Functional check of the compressor.

- Air spring

  Filling and draining of the individual pneumatic strut assemblies.

- Status values

  Output of all system-related status values such as pressures and ride height.

- Delete transport mode

  Reset the transport mode.

- Vertical-acceleration sensors

  Functional check of the vertical acceleration sensors.

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