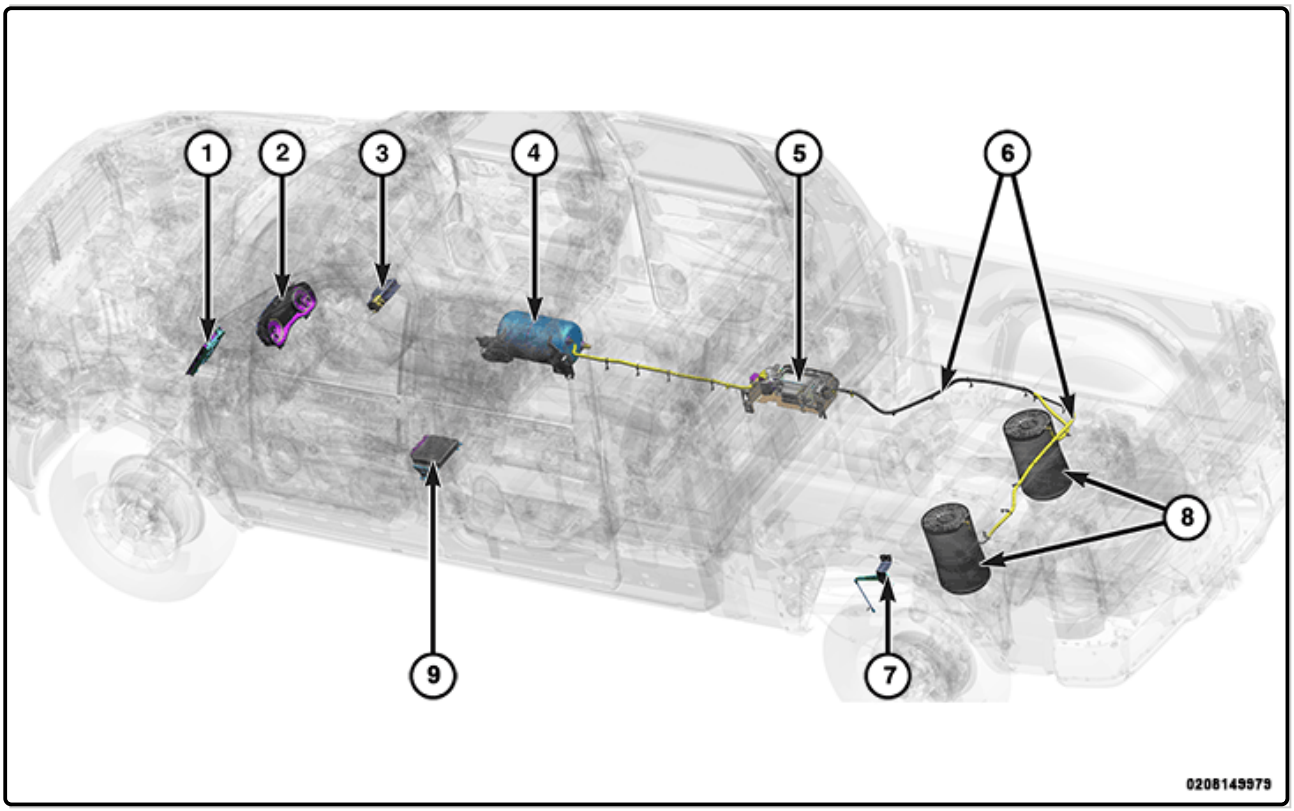
AIR SUSPENSION - DESCRIPTION AND OPERATION

DESCRIPTION AND OPERATION

DESCRIPTION



The air suspension system consists of the following major components:

Component Index

1.	**Body Control Module (BCM)**
2.	**Instrument Panel Cluster (IPC)**
3.	**Switch Bank Pod**
4.	**Air Reservoir**
5.	**Air Compressor**
6.	**Air Lines**

7.	**Height Sensor**
8.	**Air Spring**
9.	**Air Suspension Control Module (ASCM)**
—	**Air Hoses**

WARNING: All pressurized air suspension components contain high pressure air (up to 220 psig). Use extreme caution when inspecting for leaks. Wear safety goggles and adequate protective clothing when inspecting or servicing the air suspension system. A sudden release of air under this amount of pressure can cause possible serious or fatal injury.

WARNING: Before performing any service on the air suspension system, the system must be disabled to prevent the system from changing ride height. Before any given component is to be serviced it must be deflated. Servicing the air suspension system without the system disabled, or with pressure in any specific component, can cause possible serious or fatal injury.

OPERATION

The air suspension system is a rear leveling ride height system. The purpose of this system is to adjust the truck's rear ride height level. Leveling is maintained from no load to fully loaded. This system adjusts the rear vehicle ride height to maintain the selected ride height. There is a manual level request button located in the switch bank which allows the customer to select between two levels: Normal Ride Height and Trailer Ride Height. When the driver selects a level change, the vehicle will move to the requested ride height. The air suspension system will complete the leveling request even after the ignition is turned off.

NOTE:
When the ASCM or any height sensor is replaced the ASCM will need to be initialized using a scan tool. Refer to the appropriate installation procedure for specific instructions.

Air Suspension System Refilling

For information about the complete system fill procedure (Refer to 02 - Front Suspension/Air Suspension/Standard Procedure) .

When changing ride height using a scan tool, ride height can be changed regardless of the engine state (running or not), doors (open or closed). The only condition necessary is that battery voltage must be greater than 10.5 volts.

Ride Heights For Suspension Measurement Or Adjustment

When checking or performing the wheel alignment, the air suspension system must be at Normal Ride Height (NRH) When measuring curb height, the air suspension system must be at NRH.

Air Compressor

Component Index

The ASCM activates the air compressor. The air compressor is used to move the air between the air springs and the air reservoir and to refill the reservoir from atmosphere.

Air Hoses

Component Index

Air hoses facilitate the venting or intake of atmospheric air and are located near the seam of the cab and the pickup box.

Air Lines

Component Index

Air lines transport air throughout the air suspension system.

Air Reservoir

Component Index

The air reservoir is mounted to the right frame rail under the cab. The air reservoir houses the compressed air which is used to raise and lower pressure in the air springs in turn affecting the rear ride height.

Air Spring

Component Index

Air springs affect the rear ride height based on pressurized air which is transferred into or out of the air spring. The rear air springs feature three serviceable upper retaining clips.

Air Suspension Control Module (ASCM)

Component Index

This air suspension system is a closed system. The system consists of two air springs, air reservoir, air lines which connect these components together, a ride height sensor, an air compressor, ASCM, and the air suspension switch which is integral to the switch bank pod. The main purpose of the system is to adjust the vehicle ride height. During any height level change, stored pressurized air is moved between the air reservoir and the air springs. The system utilizes an air suspension switch which allows the customer to select different ride height levels. This system is equipped with two manual ride height levels:

- Trailer Ride Height
- Normal Ride Height

This system has automatic ride height which lowers the vehicle to aero level based on vehicle speed. The ASCM controls the air suspension system and performs the logic for the customer's input requests. The ASCM automatically changes the vehicle ride height if the current level is outside the required vehicle speed range. The ASCM automatically adjusts vehicle ride height to compensate for vehicle loads.

CAN-C Inputs

- Air suspension switch state
- Battery voltage measured at the terminals
- Trailer connection status
- Vehicle configuration
- Averaged ambient temperature
- Engine running state
- Starter motor running
- RFHM Basic request
- Driving program display code
- Commanded ignition switch status
- Ignition run active for remote start
- Current Gear
- Vehicle longitudinal acceleration
- Vehicle lateral acceleration
- Shipping status
- Ambient air pressure
- Steering wheel angle sensor status
- Steering wheel angle
- Door ajar
- Vehicle speed

Hardwire Input

- Height sensor values

Body Control Module (BCM)

Component Index

The BCM separates the branches of the bus networking systems, the BCM must act as a gateway module to allow communication between the different bus networks. The BCM will translate and share messages among all modules on the following bus networks. The BCM is the configuration master for the vehicle. As the configuration master, the BCM broadcasts configuration data over the bus whenever the ignition is in the RUN state.

LIN Inputs

- Air suspension switch state

LIN Outputs

- Ignition status
- Air suspension height mode status

CAN-C Inputs

- Remote start request
- Vehicle configuration
- ASCM status
- Height sensor level
- Wheel alignment level enabled
- Transport mode enabled
- ASCM warning messages

- Request for exit (Trailer_ HD) indicator
- Target level
- Aero mode disable/enable
- ASCM remote lowering status
- Request for AERO 1 indicator

CAN-C Outputs

- Remote start request
- Vehicle configuration

CAN-IHS Outputs

- Height sensor levels
- Air suspension status
- Wheel alignment level enabled
- Tire jack mode
- ASCM warning messages
- Transport mode enabled
- Aero mode disable/enable

Height Sensor

Component Index

The rear height sensor is wired directly to the Air Suspension Control Module (ASCM). The rear vehicle ride height information is used to determine and adjust the rear vehicle ride height. The rear height sensor has three wired circuits: height sensor power, signal, and return.

Hardwire Output

- Height sensor values

Instrument Panel Cluster (IPC)

Component Index

The Electronic Vehicle Information Center (EVIC) is integral to the IPC, and the EVIC displays air suspension status messages.

CAN-C Inputs

- Commanded ignition switch status
- Vehicle configuration
- Air suspension status
- Air suspension status for display
- ASCM HMI status
- Service air suspension
- Loss of function - system fault
- Loading level

Switch Bank Pod

Component Index

The air suspension system has a switch so that the driver can manually select between "Normal Ride Height" and "Alternate Trailer Ride Height". To request "Alternate Trailer Ride Height", the "Trailer Mode Button" switch must be pressed once. To go back to "Normal Ride Height", the "Trailer Mode Button" switch must be pressed again. This will cancel the "Alternate Trailer Ride Height" and raise the height back to "Normal Ride Height" level.

LIN Inputs

- Ignition status
- Air suspension height mode status

LIN outputs

- Air suspension switch state