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2016 JEEP Cherokee OEM Service and Repair Workshop Manual

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The ASCM uses the compressor temperature sensor data to prevent the overheating of the compressor. The ASCM uses the ambient air temperature signal on the CAN-FD from the BCM in addition to the compressor temperature sensor reading to accomplish this.

The ASCM uses electro-valves to control air movement into and out of the four air springs. Each valve is capable of controlling the flow of air into or out of the air spring that it fills or drains. The valves are also used to control air movement between the air springs, the reservoir and the surrounding atmosphere.

The ASCM uses two Fast Down Leveling commands (one command per axle) to activate the Fast Down Leveling Valve to control air movement between the air springs on one axle, and the fast down leveling reservoir. The fast down leveling reservoir allows the air suspension system to drain the air springs quickly, yet have the compressed air available for refilling.

The ASCM activates the Air Compressor command to control the operation of the air compressor. The air compressor will then move the air between the air springs and the reservoir and to refill the reservoir from the atmosphere. The ASCM uses the following parameters to determine if the compressor can be activated:

- Ignition status is RUN
- Engine running
- CAN-FD battery voltage of at least 11.8 volts
- Hardwired battery voltage of at least 12.3 volts
- Post-RUN requirements and the ignition status is in LOCK – battery requirements apply and the engine not cranking or commanded to crank

Ride Height Management

The ASCM adjusts the vehicle ride height automatically with different loads. Leveling (readjustment based on tolerance bands) is maintained from no load to Gross Axle Weight Rating (GAWR).

The ASCM uses the load detection feature to determine the vehicle weight based on the measurement of the air spring pressures when engine is running and gear status is equal to PARK or Neutral. The ASCM uses the engine type and fuel type parameters to determine the load measurement status. The ASCM broadcasts one of the following load statuses on the CAN-FD:

- Light
- Full
- Load not determined – load unknown or vehicle is in Limp Home Mode (LHM)
- Protection – load measurement exceeded system limit (ASCM will not honor raise or lower commands)
- Overload 2 – ASCM will only allow raising the vehicle to the Normal position

NOTE

The ASCM will deactivate the load detection feature when the vehicle is in Shipping Mode.

- Vehicle speed
- Latitude and longitude acceleration data from brake system
- Steering wheel angle
- RFH module basic request
- Trailer connection status
- Transmission drive mode status
- ASCM request for ride height mode indicator
- ASCM ride height mode request
- ASCM status
- ASCM HMI status
- ASCM loading level
- SysFail HMI
- Remote start request status
- ASCM warning messages
- Transmission shift in progress status
- Wheel speed sensor data – all four wheels
- ADS service system message
- Engine running status
- Engine speed
- Brake pedal status
- Brake state
- Steering wheel angle and speed
- ORC lateral and longitudinal acceleration data
- ORC yaw rate
- Electronic Stability Control (ESC) state and data
- Brake booster pressure
- ABS activity data
- Accelerator pedal position data
- Transmission torque data

CAN-FD Outputs

- Vehicle configuration
- Remote start request status
- Height sensor levels
- Air suspension status

- ASCM HMI status
- Service air suspension
- Loss of function - system fault
- Loading level

Primary Air Reservoir

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The air reservoir is an aluminum cylinder that is mounted below the loadfloor in the cargo compartment. The air reservoir contains the compressed air which is used to raise, lower, and maintain pressure in the air suspension system, which allows the system to maintain vehicle ride height. There is a primary air tank and a secondary air tank to handle vehicle demands. The smaller tank, fast down leveling reservoir, is used for fast down leveling of the vehicle during Entry/Exit.

Ride Height Sensor

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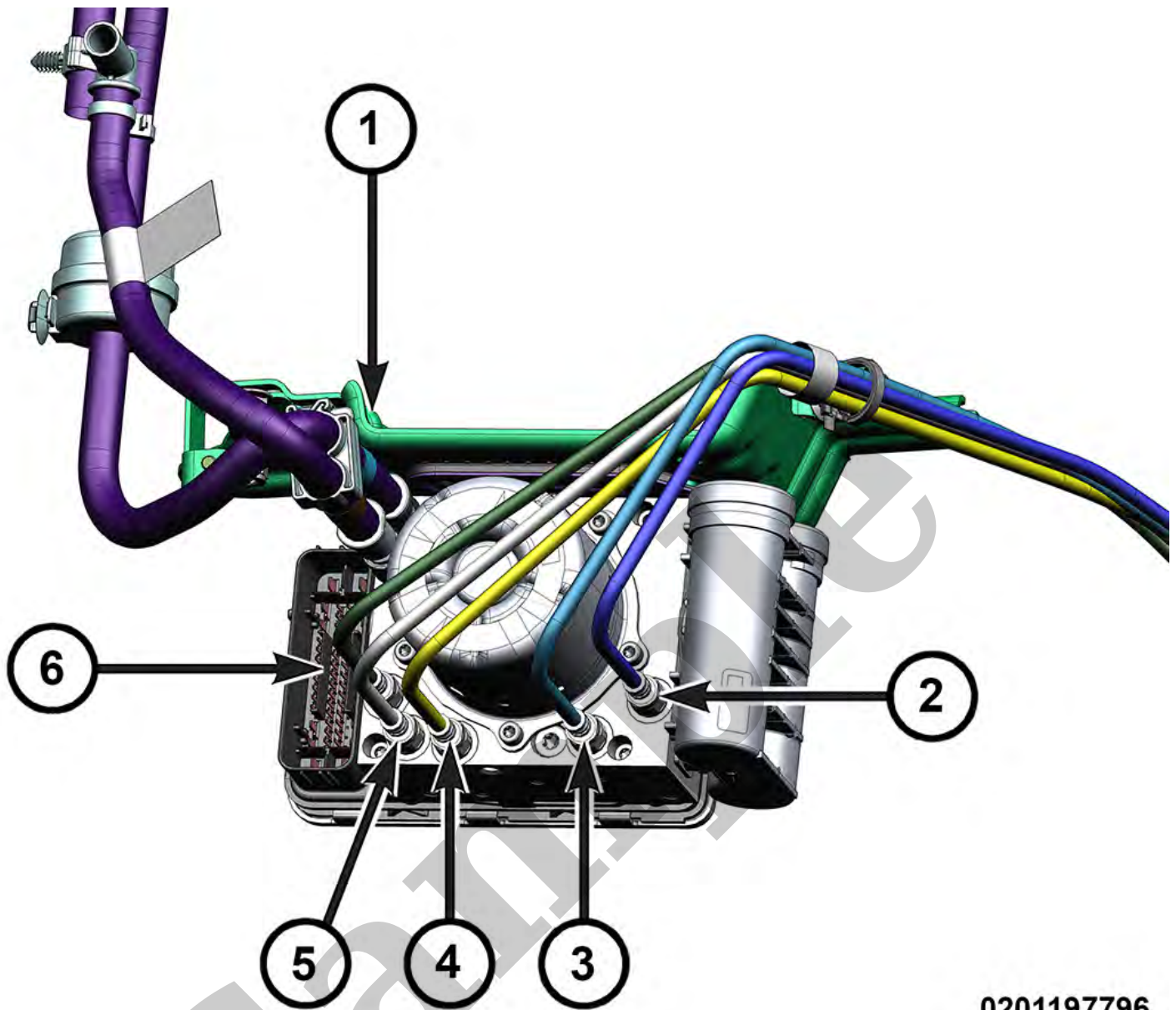
The ASCM reads the four ride height sensors (one near each of the wheels) which report the relative distance between the frame and the suspension. The ASCM uses these readings when determining the current vehicle height which has a diagnostic range between -100 mm (-4 in.) from jounce to 153 mm (6 in.) rebound. In addition, the hardwired ride height sensor signals are broadcast by the ASCM on the CAN-FD data bus to other modules on the CAN-FD bus. The front height sensors are attached to the upper control arms and the lower outboard portion of the strut towers. The rear height sensors are attached to the rear compression link and the frame.

Ride Height Switch Module (RHSM) and Selec-Terrain Switch

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RHSM

The air suspension system has an air suspension switch/RHSM in order for the operator to manually set the vehicle to any of the **Ride Height Modes**. The RHSM sends its signals on the LIN data bus to the BCM, which broadcasts the signal data on the CAN-FD data bus to the ASCM. To request one level higher to the current ride height, the switch is pressed forward once. To request two levels higher, the switch is pressed forward twice, and so on. If the system is at the highest ride height level, any additional switch requests to raise the ride height are ignored by the ASCM. To request one level lower than the current ride height, the switch is pressed rearward once. To request two levels lower, the switch is pressed rearward twice, and so on. If the system is at the lowest ride height level, any additional switch requests to lower the ride height are ignored by



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1 - Inlet and Outlet Vent Hose Assembly	4 - Air Line to Front Air Spring (through Fast Down Valve)
2 - Air Line to Front Air Spring (through Fast Down Valve)	5 - Air Line to Rear Air Spring
3 - Air Line to Primary Reservoir	6 - Air Line to Rear Air Spring

COMPRESSOR ASSEMBLY: The compressor assembly consists of five hose connection points, seven if you include the inlet and outlet vent hoses. A leak here would cause of the following conditions:

- Low Reservoir Pressure – Due to leak on Primary Reservoir line.
- Low Rear Axle Height- Due to leak on either Rear Air Spring line.

1 - Air Line from Compressor Assembly
2 - 2-way Check Valve

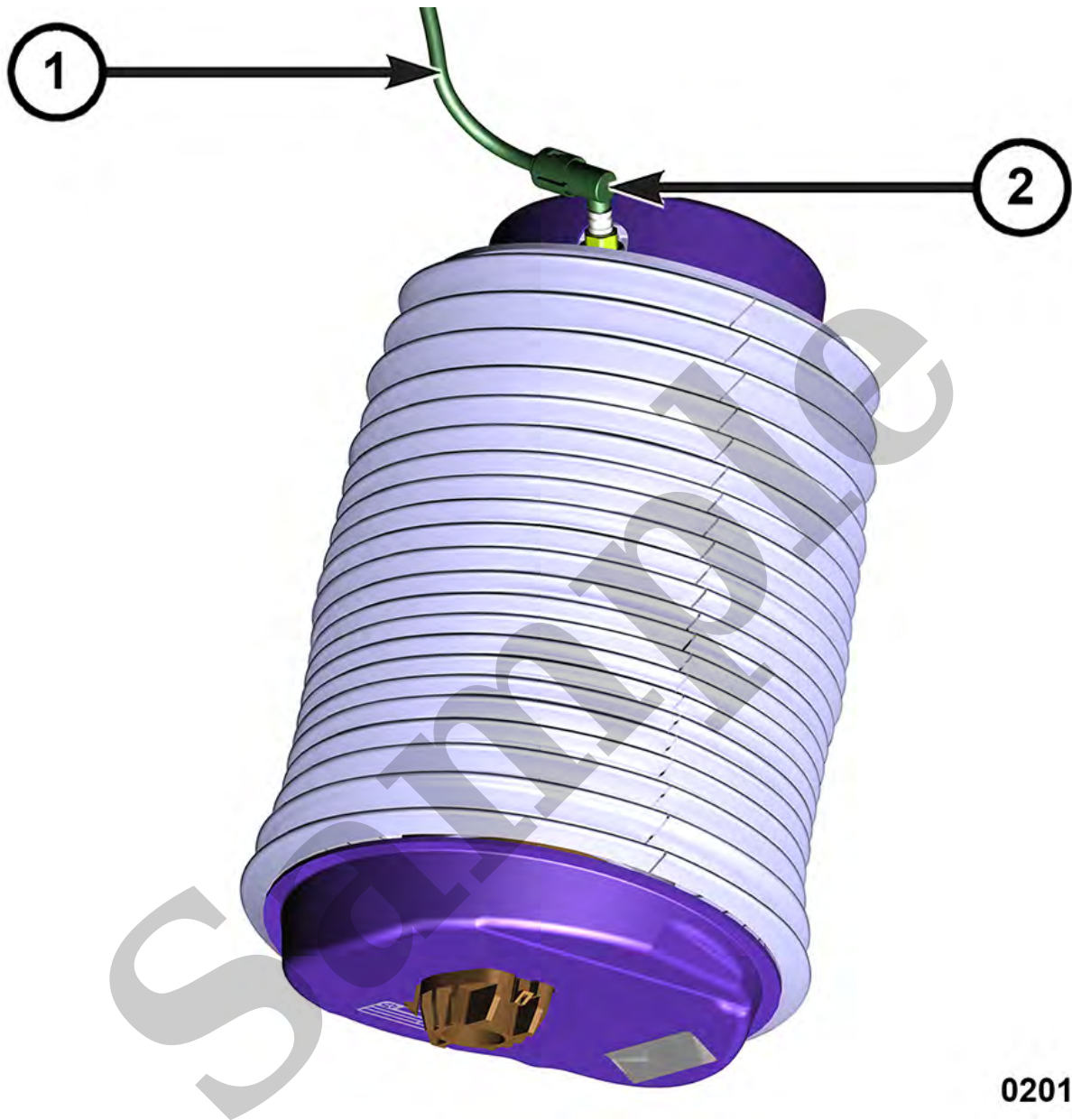
REAR AIR SPRING: The Rear Air Springs raise and lower the rear axle and have 1 connection point. The air line feeds into a 2-way check valve that can also leak or get stuck. Leaks can develop here at the fitting or at any other point on the Air Spring. A leak here could cause the following conditions:

- Rear Right and Rear Left Corner of the vehicle is lower compared to the others – Due to pressure loss.

NOTE

Make sure Air Spring is inflated to Off-Road or Off-Road 2 while checking for leaks as leaks may develop only during normal or higher ride heights.

2. If no leaks were found at the strut, spray soapy water at the fittings at the quick release valve.
3. If no leaks are found at the front strut or quick release valve, check the air tube in the system between the two components.



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1 – Air Line from Compressor Assembly
2 – 2-way Check Valve

CHECKING THE REAR AIR BAG SPRING CIRCUITS FOR LEAKS: The rear air bag springs raise and lower the rear axle and have one connection point. The air line feeds into a 2-way check valve that can leak. Leaks can develop at the fitting or at any other point on the air bag spring.

1 – Inlet and Outlet Vent Hose Assembly	4 – Air Line to Front Air Spring (through Fast Down Valve)
2 – Air Line to Front Air Spring (through Fast Down Valve)	5 – Air Line to Rear Air Spring
3 – Air Line to Primary Reservoir	6 – Air Line to Rear Air Spring

CHECKING THE AIR COMPRESSOR/MODULE:

1. Spray soapy water on the air tube fittings at the air compressor/module and look for air bubbles.
2. If no leaks were found at the air compressor/module, spray soapy water on the fittings at the air tanks and quick release valve and look for leaks.

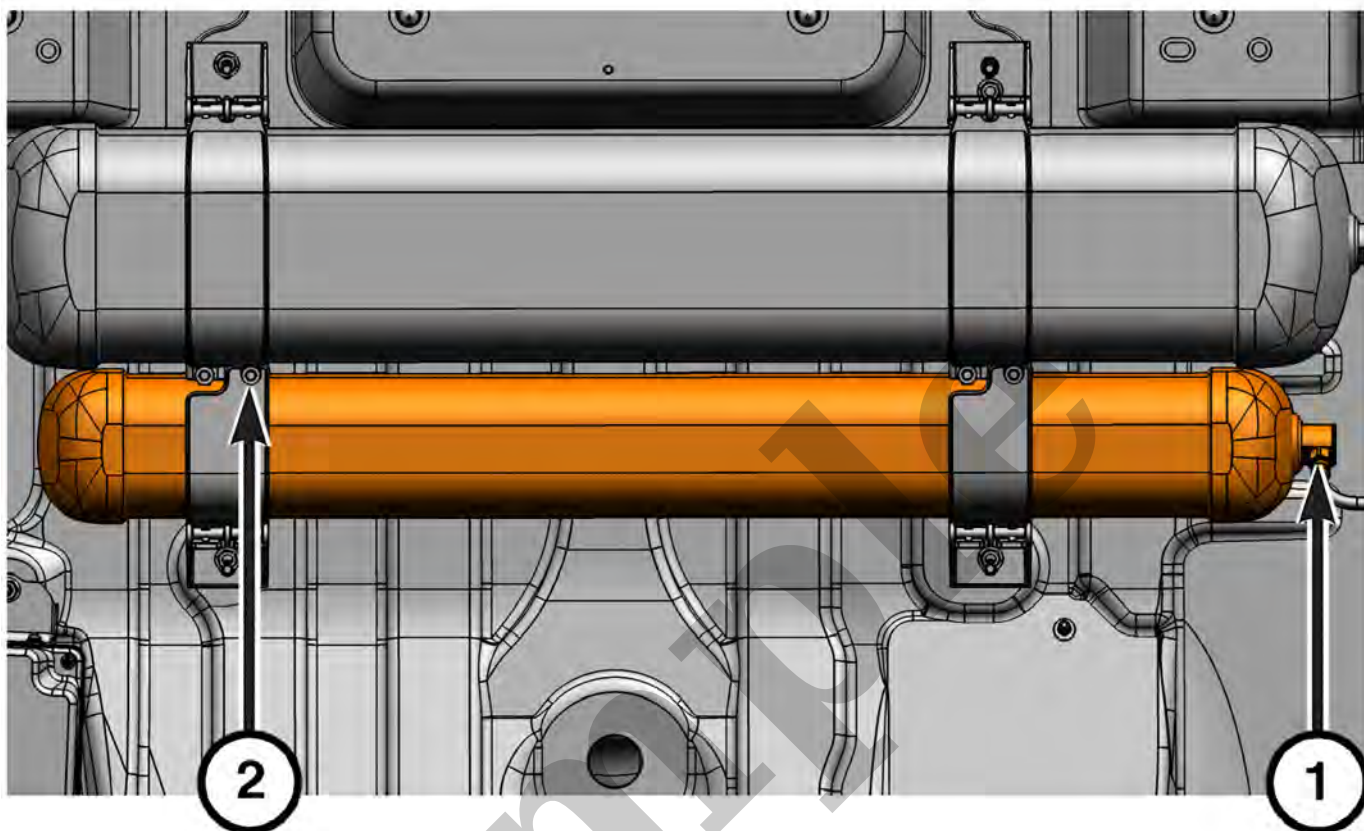
NO EXTERNAL LEAKS FOUND: If no external leaks are found in the system it is possible that the system is leaking internally through one of the check valves in the quick release valve or pump. This could be identified by a height sensor change up or down and the pressure equalizing with the tank side of the system. Review the report of the scan tool readings closely if no external leaks were apparent.

SCAN TOOL LEAK TEST

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VERIFYING THE SYSTEM IS LEAKING: The air suspension system should be leak tested using the scan tool to verify a leak, or verify the integrity of the system after repairs have been performed. To initiate the leak test with the scan tool;

1. Using the Scan Tool, go to Air Suspension Control Module (ASCM) > "System Tests" > "ASCM Leak Down Test") and follow the routine. Choose to start a **"New Test"** .
2. The routine will adjust the Air Suspension to "Off-Road", record the pressure and height values, then leave the ASCM in "In-Plant Mode". "In Plant Mode" disables any adjustments
3. The vehicle must remain stationary a minimum of 4 hours before the results can be viewed with the scan tool. The following conditions must be met while the vehicle is sitting:



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1 - Air Reservoir Line Nut

2 - Air Reservoir Strap Bolts

5. Disconnect the fast down leveling air reservoir line nut from the fast down leveling air reservoir.
6. Remove the fast down leveling air reservoir strap bolts.
7. Remove the fast down leveling air reservoir straps.
8. Remove the fast down leveling air reservoir.

INSTALLATION

Follow the removal procedure in reverse for general reassembly of the components on the vehicle. The steps listed below are calling out specific procedures that should be followed during installation.

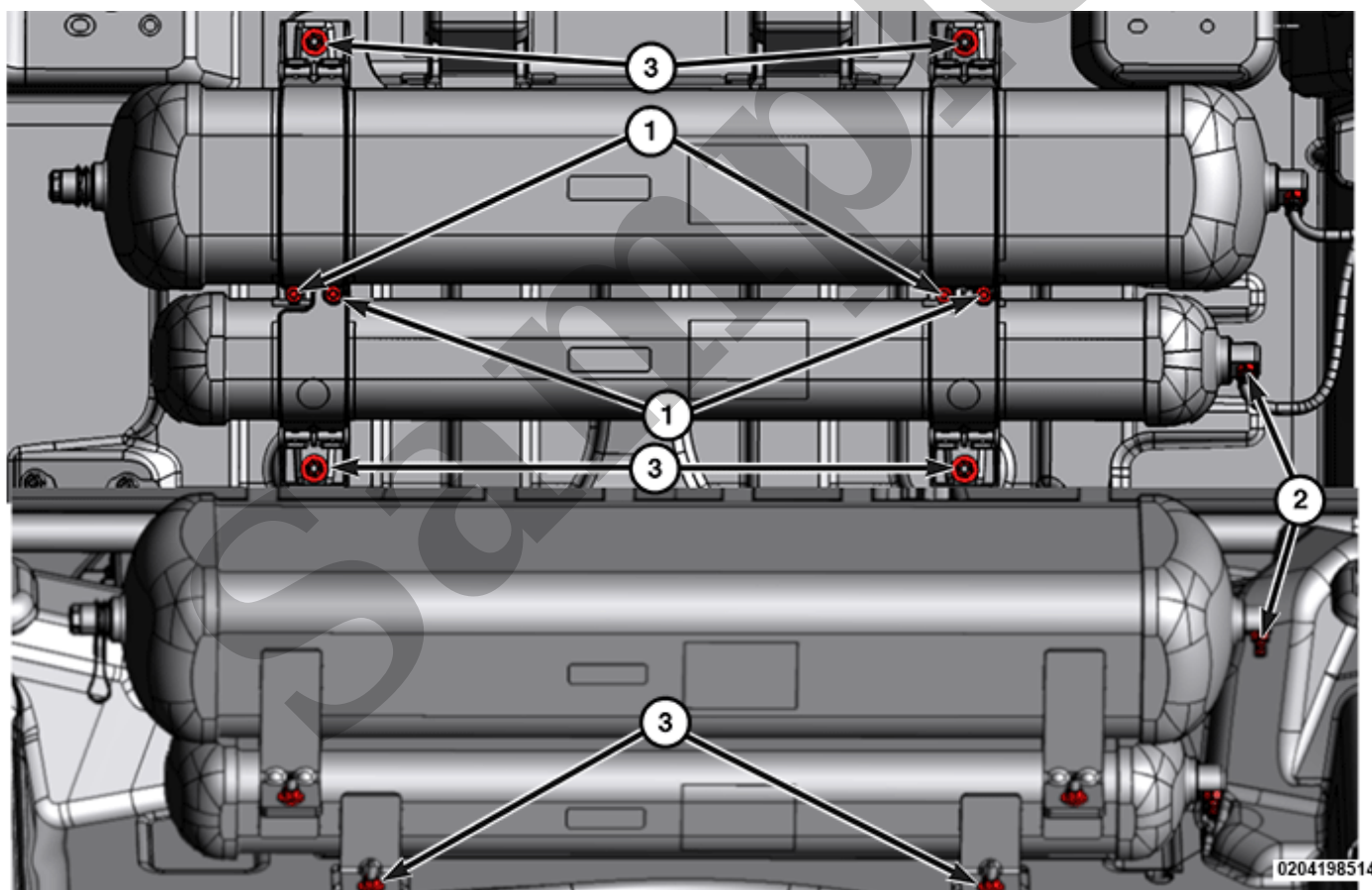
4. Disconnect the fast down leveling air reservoir line nut from the fast down leveling air reservoir.
5. Remove the fast down leveling air reservoir bracket nuts.
6. Remove the fast down leveling air reservoir.

INSTALLATION

Follow the removal procedure in reverse for general reassembly of the components on the vehicle. The steps listed below are calling out specific procedures that should be followed during installation.

- Perform the Complete System Fill standard procedure ([Refer to Front Suspension/Air Suspension - Standard Procedure](#)).
- Perform the Air Suspension Control Module (ASCM) Verification Test ([Refer to DTC-Based Diagnostics/MODULE, Air Suspension Control \(ASCM\) - Standard Procedure](#)).

TORQUE SPECIFICATIONS - AIR RESERVOIR



CALLOUT	DESCRIPTION	SPECIFICATION	COMMENT
1	Air Reservoir Strap Bolts	2 N·m (18 In. Lbs.)	—
2	Air Reservoir Line Nut	6 N·m (53 In. Lbs.)	—