2. Select >>Levelling system/PASM<< >>Maintenance/repairs<< >>Bleeding axle by axle<< in the control unit overview. Select the relevant axle and follow the instructions on the Porsche System Tester.

WM 4301IN BLEEDING AND FILLING THE LEVELLING SYSTEM (CAYENNE, CAYENNE GTS, CAYENNE TURBO S, CAYENNE S, CAYENNE S E-HYBRID, CAYENNE TURBO, CAYENNE S DIESEL, CAYENNE (3.0)) > BLEEDING AND FILLING ONE AXLE > FILLING

1. After completing the work, select >>Levelling system/PASM<< >>Maintenance/repairs<< >>Filling air suspension system/individual components<< in the control unit overview and follow the instructions on the Porsche System Tester.

2. Set the vehicle down on its wheels and calibrate the air suspension system. → 430115 CALIBRATION

WM 4301IN BLEEDING AND FILLING THE LEVELLING SYSTEM (CAYENNE, CAYENNE GTS, CAYENNE TURBO S, CAYENNE S, CAYENNE S E-HYBRID, CAYENNE TURBO, CAYENNE S DIESEL, CAYENNE (3.0)) > BLEEDING AND FILLING ONE AXLE > BLEEDING AND FILLING THE ENTIRE AIR SUSPENSION SYSTEM AND PRESSURE ACCUMULATOR

Information

Only nitrogen 5.0 may be used for filling the air suspension system. Available by requesting part number: 999.917.303.01.

- Use a compressed gas bottle with a corresponding pressure reducer unit and pressure gauge .
- Fill the air suspension system to at least → **Pressure: +10 bar+1 bar** .
- Fill the air suspension system to max . → **Pressure: +17 bar**
- Wheels must be suspended freely .
- Switch on ignition .
- Pressure reducer WE 1409 or **Nitrogen filler set VAS 6629 WE 1374 must be used** .
- Adapter T10157 and **connecting line 9825/1 must be used** .
- The air suspension system is filled using the pressure accumulator .
- Observe specified tightening torques . → 4X00IN TIGHTENING TORQUES FOR LEVELLING SYSTEM/PORSCHE DYNAMIC CHASSIS CONTROL (PDCC)

WM 4301IN BLEEDING AND FILLING THE LEVELLING SYSTEM (CAYENNE, CAYENNE GTS, CAYENNE TURBO S, CAYENNE S, CAYENNE S E-HYBRID, CAYENNE TURBO, CAYENNE S DIESEL, CAYENNE (3.0)) > BLEEDING AND FILLING ONE AXLE > BLEEDING THE ENTIRE AIR SUSPENSION SYSTEM AND PRESSURE ACCUMULATOR WITH PARTIAL LOSS OF SYSTEM AIR

This function is used for bleeding when working on the system and/or the pressure accumulator. Some of the system air is lost in the process.

Bleeding

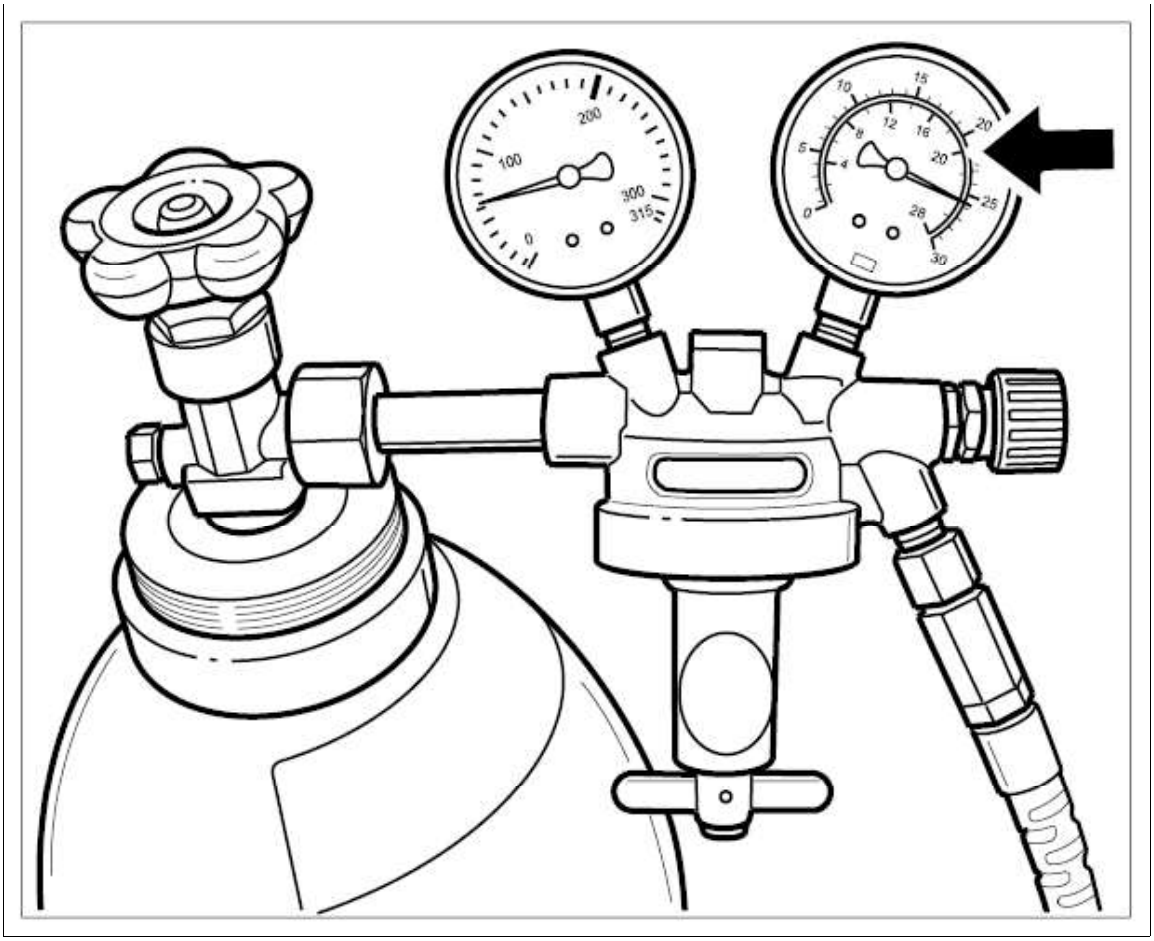
1. Select >>Levelling system/PASM<< >>Maintenance/repairs<< >>Vent total air suspension system<< in the control unit overview and follow the instructions on the Porsche System Tester.

Filling

2. When the work is complete, have the compressed gas bottle with the relevant pressure reducer unit, pressure gauge and adapter ready.

3. Connect the compressed gas bottle to the pressure accumulator and set the pressure → **Pressure: 17 bar** to the max. setting (shown as an example!)

Fig 1: Connecting Compressed Gas Bottle To Pressure Accumulator



Courtesy of PORSCHE CARS NORTH AMERICA, INC.

4. Select >>Levelling system/PASM<< >>Maintenance/repairs<< >>Filling air suspension system/individual components<< in the control unit overview and follow the instructions on the Porsche System Tester.

5. Once you have filled the system successfully, remove the compressed air bottle and adapter.

6. Set the vehicle down on its wheels and calibrate the air suspension system. → 430115

CALIBRATION

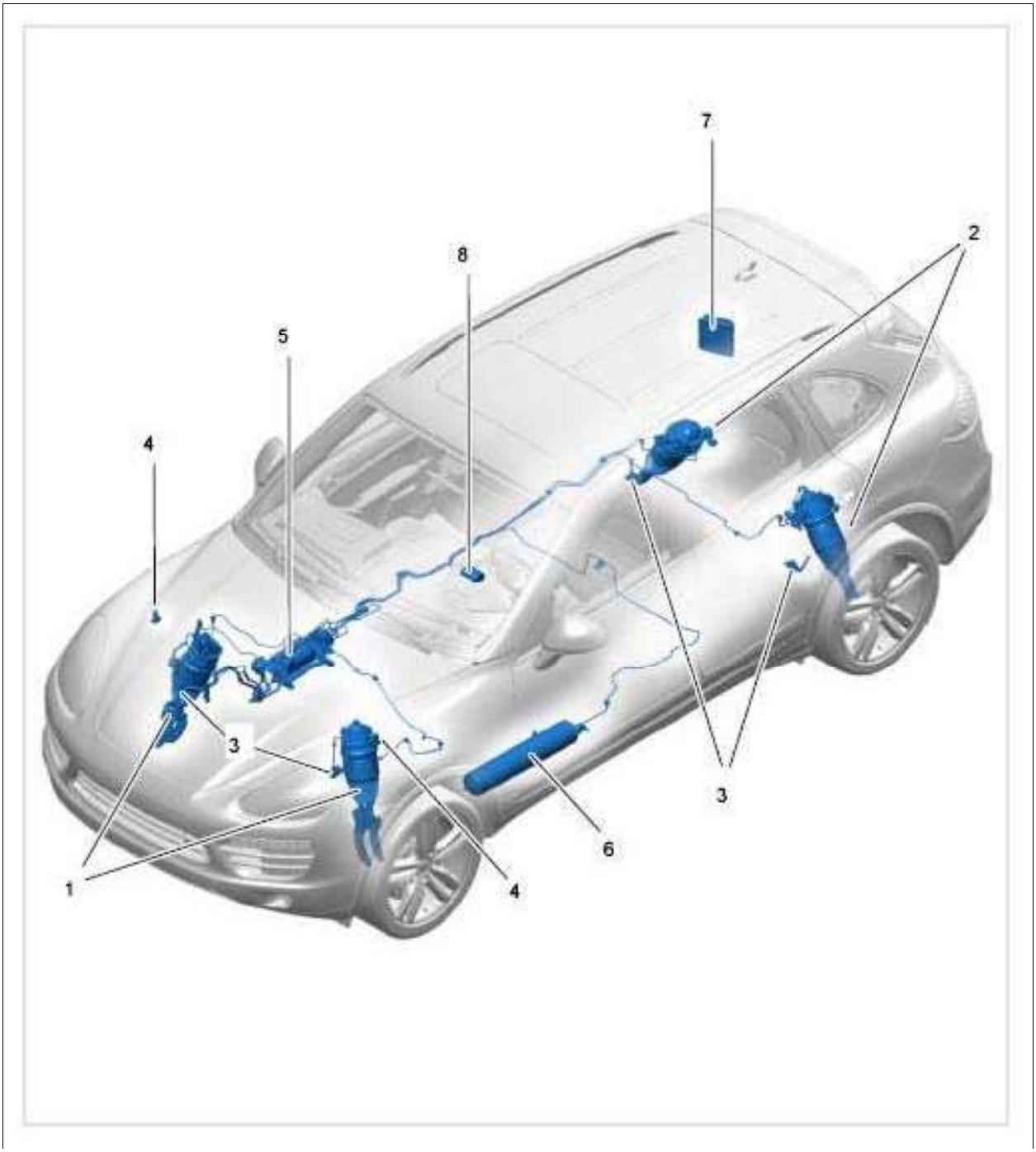
WM 4301IN COMPONENT ARRANGEMENT - LEVELLING SYSTEM (CAYENNE, CAYENNE GTS, CAYENNE TURBO S, CAYENNE S, CAYENNE S E-HYBRID, CAYENNE TURBO, CAYENNE S DIESEL, CAYENNE (3.0))

The Cayenne models are available with an optional levelling system with fully supporting air suspension on both axles and an electronically controlled damping system Porsche Active Suspension Management (PASM).

The air suspension with level adjustment makes it possible to actively adapt the ground clearance of the Cayenne to the situation in which the vehicle is being used or to its load.

Depending on the load, various vehicle ride heights with various suspension characteristics can be achieved by increasing or decreasing the air volume. The amount of air needed for each air-spring strut is determined by means of a control unit and provided via an air supply consisting of a compressor, a solenoid valve unit and pressure accumulator.

Fig 1: Air Suspension System Component Arrangement

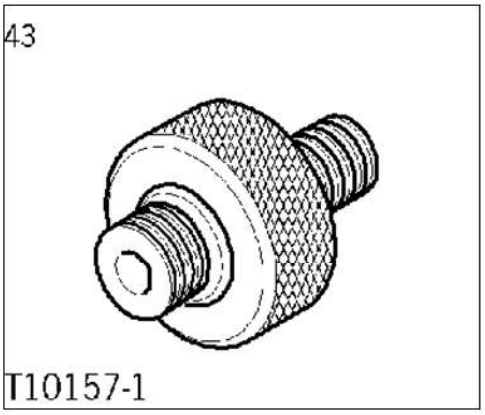


Courtesy of PORSCHE CARS NORTH AMERICA, INC.

No.	Component designation	Qty.	Position
-1-	Air-spring strut, front axle	2	Wheel housing/lower control arm
-2-	Air-spring strut, rear axle	2	Air spring mounting/wheel bearing housing, lower

-3-	Level sensors	4	Upper control arm/front axleUpper control arm, front/rear axle
-4-	Body acceleration sensors (2x front and 1x rear)	3	Front wheel housing (right/left), right luggage compartment (integrated in levelling system/PASM control unit!)
-5-	Compressor and valve unit	1	Centre underbody, right
-6-	Pressure accumulator	1	Centre underbody, left
-7-	Levelling system/PASM control unit	1	Luggage compartment, right
-8-	PASM switch unit	1	Centre console

WM 4301IN FILLING SPECIFICATION FOR AIR-SPRING STRUT (CAYENNE, CAYENNE GTS, CAYENNE TURBO S, CAYENNE S, CAYENNE S E-HYBRID, CAYENNE TURBO, CAYENNE S DIESEL, CAYENNE (3.0)) > TOOLS

Designation	Type	Number	Description	
Compressed gas bottle with pressure gauge unit	Commercially available tool	00000		
adapter	VW tool	T10157/1		

WM 4301IN FILLING SPECIFICATION FOR AIR-SPRING STRUT (CAYENNE, CAYENNE GTS, CAYENNE TURBO S, CAYENNE S, CAYENNE S E-HYBRID, CAYENNE TURBO, CAYENNE S DIESEL, CAYENNE (3.0)) > TECHNICAL VALUES

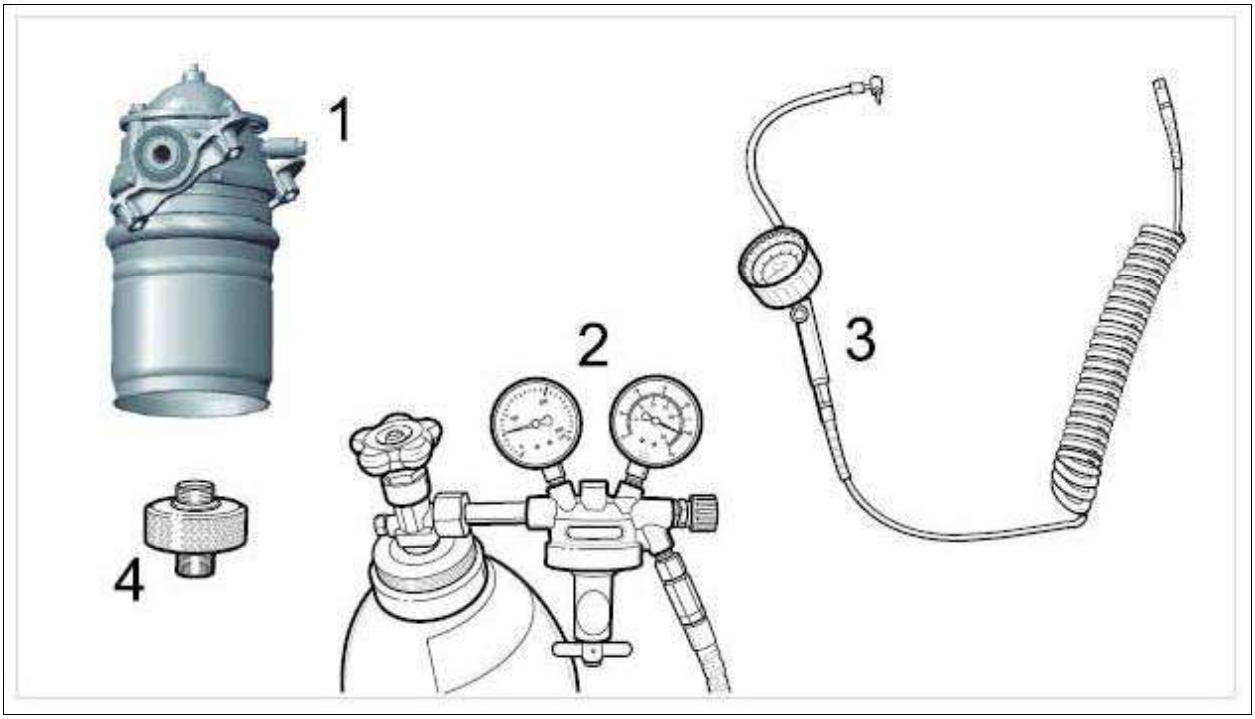
Location	Description	Type	Basic value	Tolerance 1	Tolerance 2
Air-spring strut filling pressure		Pressure	+2.5 bar		

WM 4301IN FILLING SPECIFICATION FOR AIR-SPRING STRUT (CAYENNE, CAYENNE GTS, CAYENNE TURBO S, CAYENNE S, CAYENNE S E-HYBRID, CAYENNE TURBO, CAYENNE S DIESEL, CAYENNE (3.0)) > INFORMATION > OVERVIEW

Information

The graphics in this document may differ from the original, but this does not affect their validity and relevance.

Fig 1: Identifying Filling Unit



Courtesy of PORSCHE CARS NORTH AMERICA, INC.

-1- - Upper part of air-spring strut with pressure control valve. The **adapter T10157/1** is fitted to the pressure control valve before filling the air-spring strut.

-2- - Compressed gas bottle with pressure gauge unit 00000 (pressure gauge unit with at least 17 bar adjustable pressure. The required pressure is set on the compressed gas bottle using the pressure gauge unit. The compressed gas bottle is filled with nitrogen.)

-3- - Air-spring filling unit VAS 6231 00000 (The air-spring strut can be filled with three to four short, individual pressure shots using the air-spring filling unit.)

-4- - Adapter T10157/1 (The **adapter T10157/1** is fitted to the pressure control valve before filling the air-spring strut.)

WM 4301IN FILLING SPECIFICATION FOR AIR-SPRING STRUT (CAYENNE, CAYENNE

GTS, CAYENNE TURBO S, CAYENNE S, CAYENNE S E-HYBRID, CAYENNE TURBO, CAYENNE S DIESEL, CAYENNE (3.0)) > INFORMATION > GENERAL INFORMATION

The air-spring struts are pre-filled to approx. 2.5 bar overpressure ex-works. If a new air-spring strut is installed, air can diffuse (escape) from the bellows of the air-spring strut as a result of storage times of varying duration. If the air-spring strut is removed from the transport packaging and installed without being filled, the bellows can fall into folds, thereby damaging the air-spring strut. For this reason, all air-spring struts must be re-filled prior to use. The procedure is described in detail in the course of the repair instructions.

WM 4301IN FILLING SPECIFICATION FOR AIR-SPRING STRUT (CAYENNE, CAYENNE GTS, CAYENNE TURBO S, CAYENNE S, CAYENNE S E-HYBRID, CAYENNE TURBO, CAYENNE S DIESEL, CAYENNE (3.0)) > INFORMATION > FILLING THE AIR-SPRING STRUT

WARNING: Working with compressed air

- *Risk of eye injuries*
- *Risk of damaging and dirtying components*

→ Wear protective goggles with side eye protection.

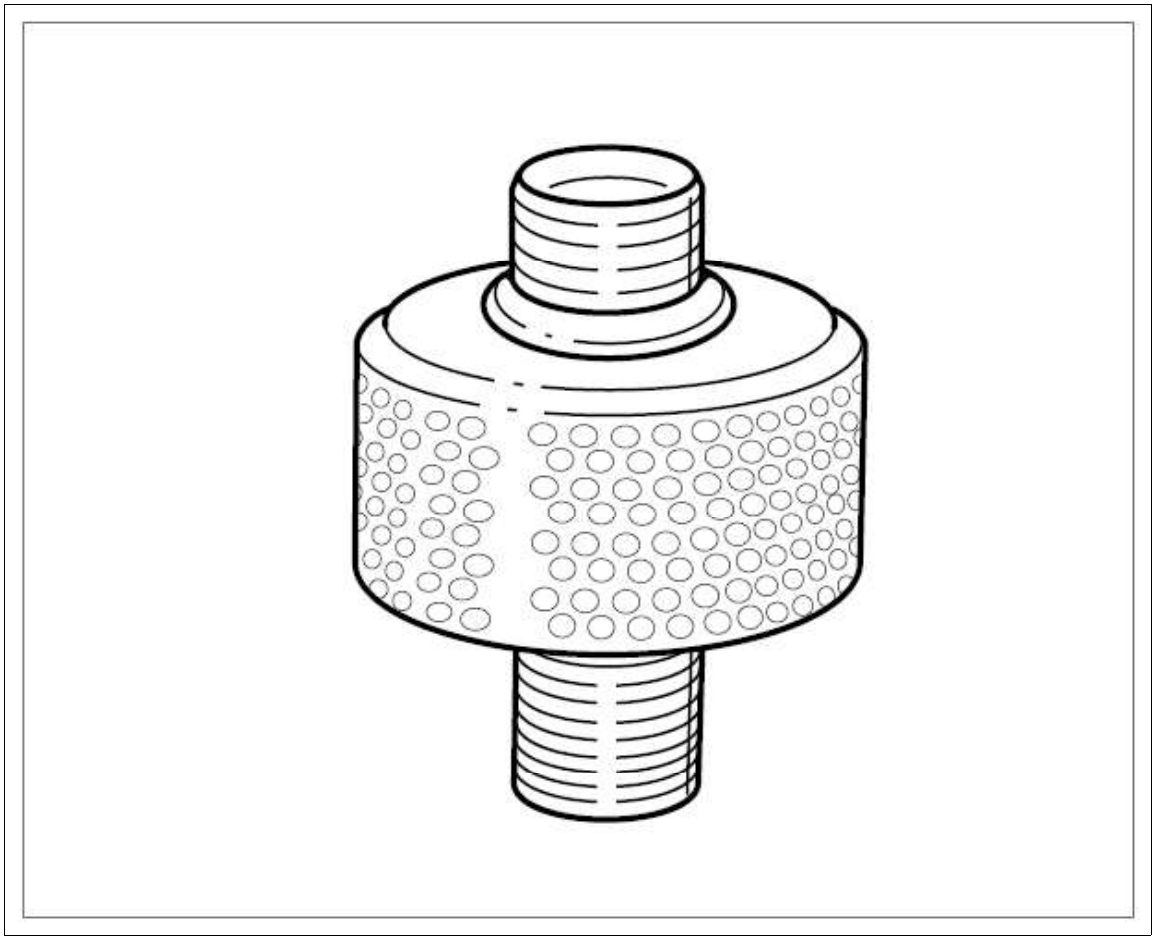
→ Protect the point at which the compressed air emerges with suitable material.

→ Place the point at which the compressed air emerges on suitable surfaces.

1. Remove protection cap from the pressure control valve. Carefully remove any remaining packaging. Make sure not to damage the protective bellows during the filling process.

2. **Adapter T10157/1** from the filling unit must be screwed onto the pressure control valve at the correct position.

Fig 1: Identifying Adapter T10157/1



Courtesy of PORSCHE CARS NORTH AMERICA, INC.

Information

The air-spring strut must only be filled with the approved gasses, nitrogen or oil-free compressed air .

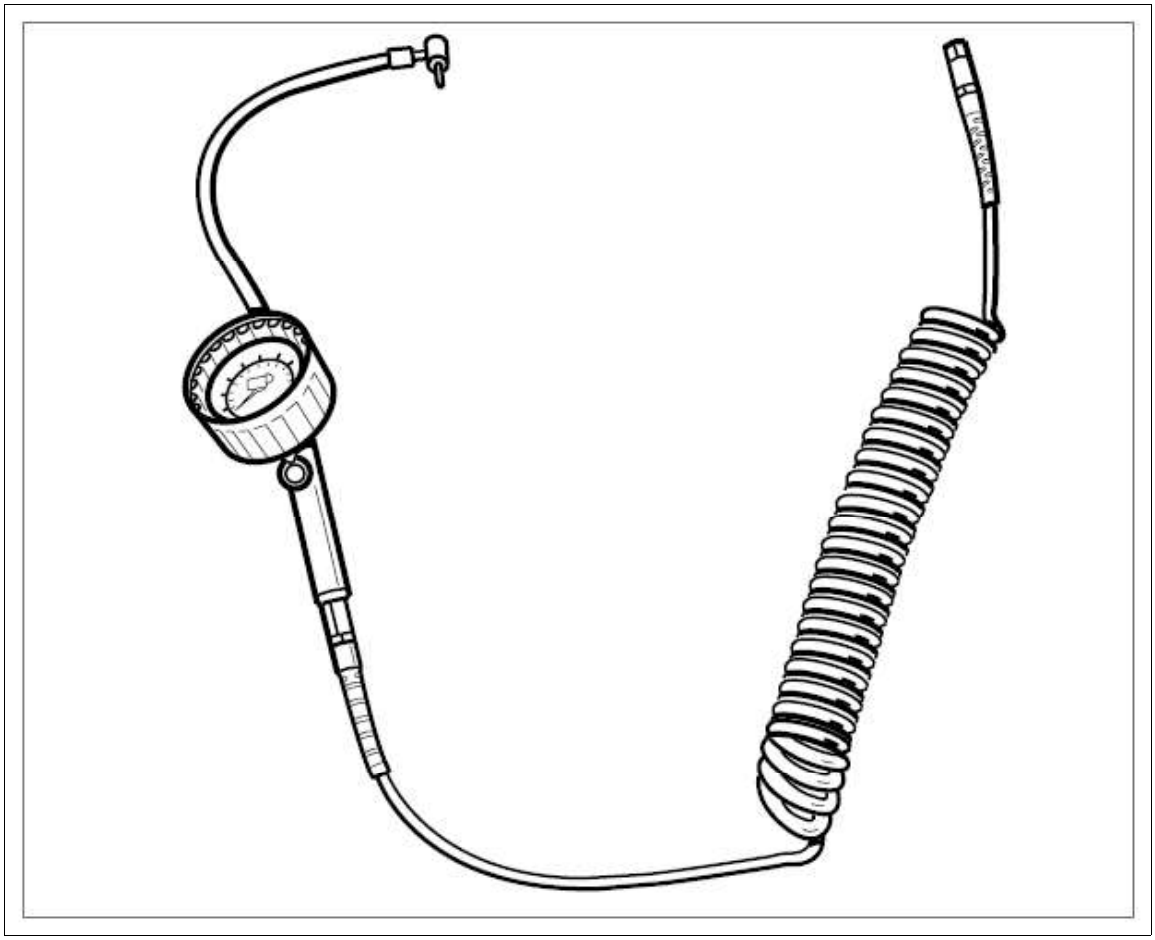
In some cases, up to 11 bar overpressure (upper tolerance, spring strut depressurized) is required to open the pressure control valve .

Fill the air-spring strut using several individual pressure shots. Filling the air with individual pressure shots will prevent the air-spring strut from being filled with too much overpressure .

Do not fill the air-spring strut with overpressure of more than 2.5 bar .

4. → see Fig 2 Filling unit must now be fitted to the pressure gauge unit of the compressed air bottle.

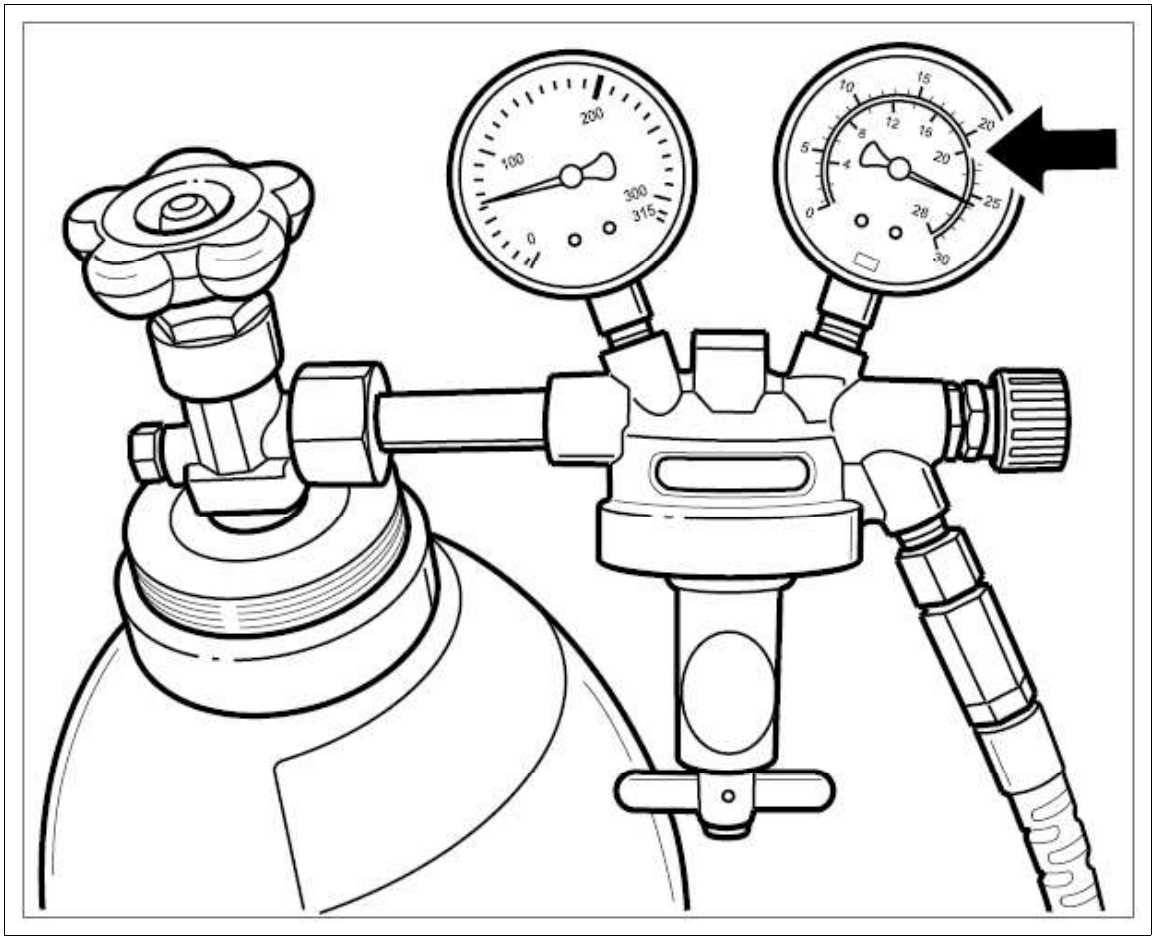
Fig 2: Pressure Gauge



Courtesy of PORSCHE CARS NORTH AMERICA, INC.

5. → see Fig 3 pressure gauge unit (flow limiter) must be set to approx. 20 l/min **-arrow-** .

Fig 3: Locating Pressure Gauge Reading

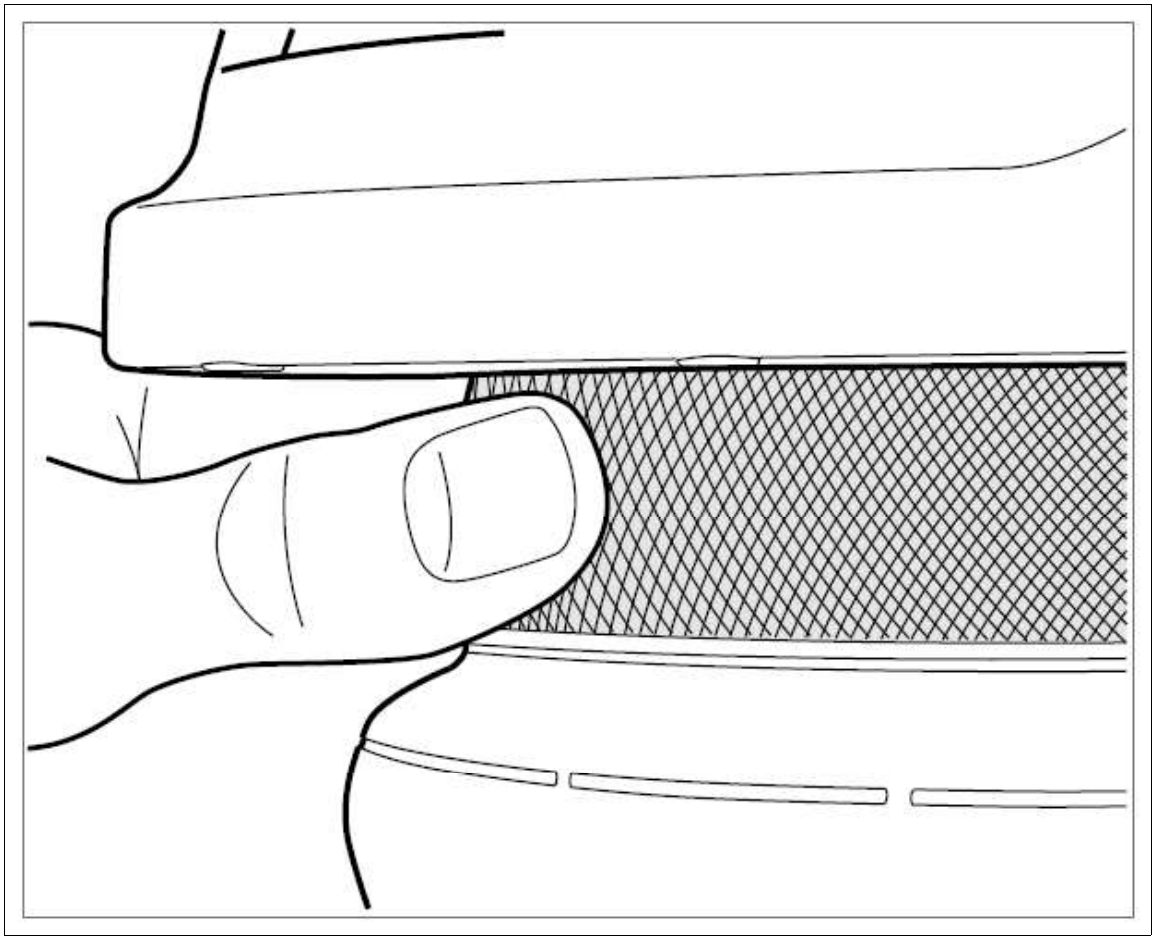


Courtesy of PORSCHE CARS NORTH AMERICA, INC.

Information

The air-spring strut is empty if the rubber bellows can be pressed in slightly.

Fig 4: Checking Air Bellows



Courtesy of PORSCHE CARS NORTH AMERICA, INC.

6. Carefully overcome the counter-pressure of the pressure control valve with three to four short individual pressure shots and fill the air-spring strut. Do not exceed the maximum → **Pressure: +2.5 bar** !

6.1. Check the rubber bellows several times during the filling process to see if it can be pressed in. Sufficient air is filled in when the bellows can no longer be pressed in slightly.

6.2. If the length of the air-spring strut changes during the filling process, enough air has been filled in.

6.3. When sufficient air has been filled, **quickly** pull off the connection from the pressure control valve. Pulling off the **air-spring strut filling unit VAS 6231 00000** quickly prevents gas from escaping from the air-spring strut. Repeat the filling process if necessary.

7. Once the air-spring strut has been filled correctly, it can be removed from the transport packaging and fitted.

WM 430307 BLEEDING PORSCHE DYNAMIC CHASSIS CONTROL (PDCC) (CAYENNE, CAYENNE GTS, CAYENNE TURBO S, CAYENNE S, CAYENNE S E-HYBRID, CAYENNE

TURBO, CAYENNE S DIESEL, CAYENNE (3.0)) > PRELIMINARY WORK

1. Remove front cover (engine compartment). → 700219 REMOVING AND INSTALLING FRONT COVER (ENGINE COMPARTMENT)

WM 430307 BLEEDING PORSCHE DYNAMIC CHASSIS CONTROL (PDCC) (CAYENNE, CAYENNE GTS, CAYENNE TURBO S, CAYENNE S, CAYENNE S E-HYBRID, CAYENNE TURBO, CAYENNE S DIESEL, CAYENNE (3.0)) > BLEEDING PDCC

WARNING: Caustic fluids

- *Danger of chemical burns*

→ Avoid contact with caustic fluid.

→ Wear personal protective gear.

→ Ensure that there is good ventilation.

→ If you do come into contact, wash off immediately with plenty of warm water and contact a doctor if necessary.

NOTE: Aggressive fluids

- *Risk of damage to components and surfaces*

→ Do not spill fluids.

→ In the event of contact, wash the component or surface with water.

→ Replace components that are already damaged.

Information

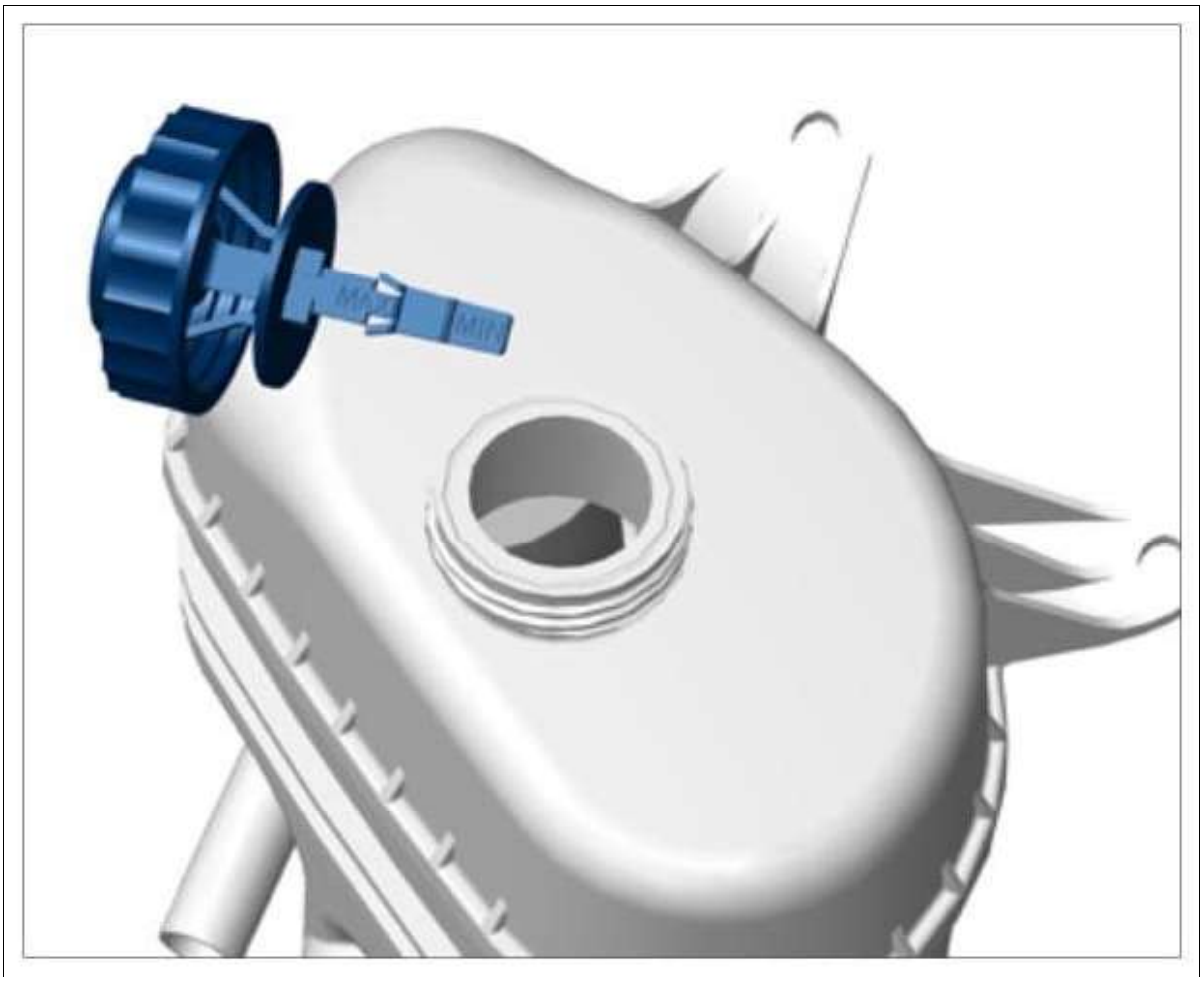
Overfilling the system can cause Pentosin CHF 202 to overflow onto coolant hoses and other components. The engine must be run for approx. 20 seconds prior to the fluid level check. Check the fluid level.

Information

- The reservoir must always be replaced if individual or multiple components, such as the tandem pump, valve blocks (FA/RA), anti-roll bars (FA/RA) are replaced!
- If system faults still occur after replacing a component (another component is defective), the reservoir does not have to be replaced again!
- Only Pentosin CHF 202 may be used in the reservoir. .
- The reservoir must not be sucked dry! This is likely to damage the tandem pump and contaminate the system .

- The reservoir cap has a dipstick with a -MIN/MAX marking- . The markings are for a fluid level when the engine is cold (approx. 20 ° C)!

Fig 1: Identifying Markings On Dipstick



Courtesy of PORSCHE CARS NORTH AMERICA, INC.

Fig 2: Identifying Installation Position Of PDCC Reservoir

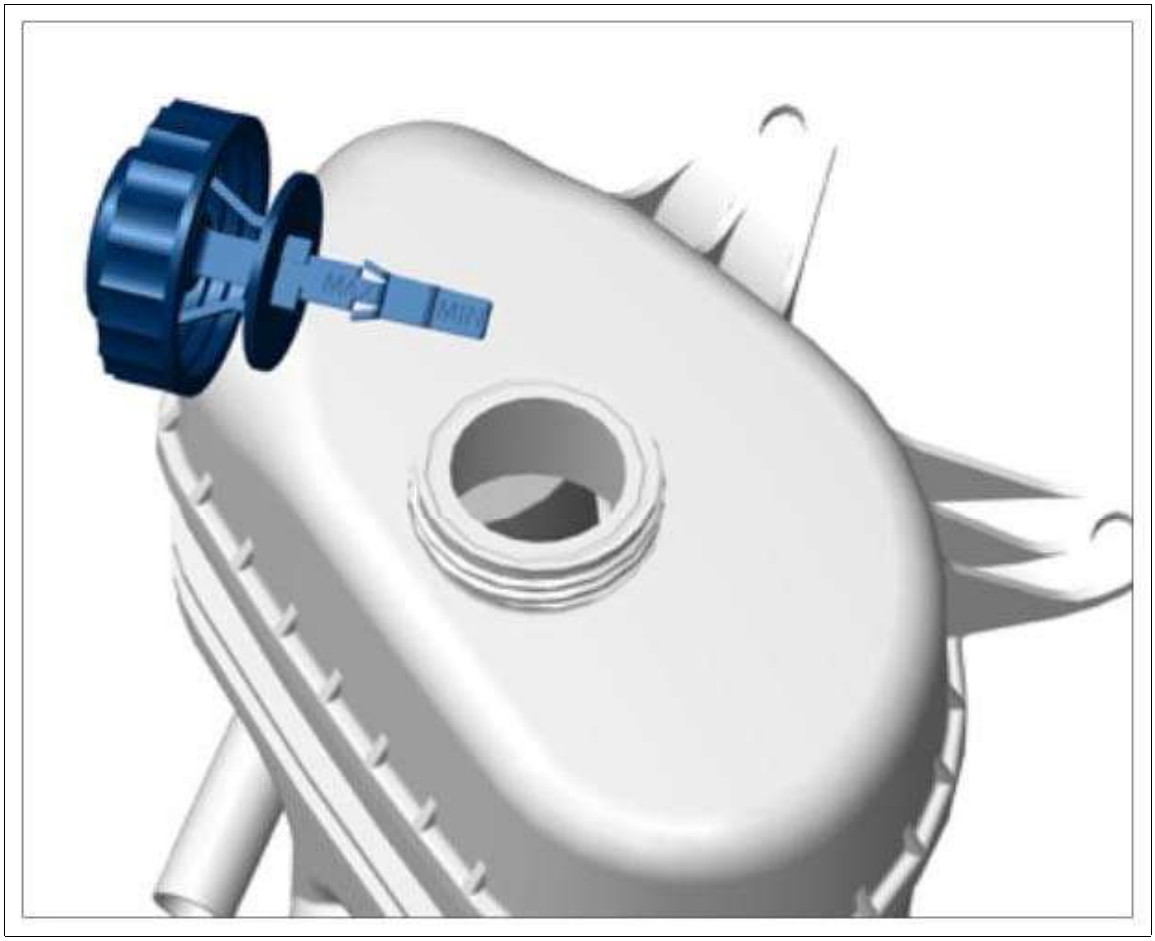


Courtesy of PORSCHE CARS NORTH AMERICA, INC.

1. PDCC reservoir
2. Power-steering reservoir

1. Open the PDCC reservoir **-1-** . → 4303AW SAFETY REQUIREMENTS FOR PORSCHE DYNAMIC CHASSIS CONTROL (PDCC)
2. Fill the reservoir with Pentosin until the fluid level remains fixed.
3. Briefly start the engine, let it run for approx. 1 second and add Pentosin again. During this process, the fluid level in the reservoir may drop quickly. This depends on the quantity of oil required. Therefore, always top up with Pentosin. Repeat this process several times. If the fluid level in the reservoir does not fall any further when the engine is briefly turned over, start the engine again and let it run at idle speed.
4. Check the fluid level several times at idle speed. If the fluid level is still dropping, keep topping up until the fluid level remains constant in the reservoir. If the oil level drops to the bottom of the tank, or if several air bubbles rise to the surface and/or a significant amount of foam forms in the reservoir, air is still present in the hydraulic system. It is quite normal for a few air bubbles to appear in the reservoir immediately after topping up.
5. Switch off the engine and set the correct fluid level. The fluid level must be between the **-MIN/MAX marking-** .

Fig 3: Identifying Markings On Dipstick



Courtesy of PORSCHE CARS NORTH AMERICA, INC.

7. After completing assembly, move the vehicle into an open area to bleed it. → 4303AW SAFETY REQUIREMENTS FOR PORSCHE DYNAMIC CHASSIS CONTROL (PDCC)

8. Close the doors and lids. Connect the PIWIS Tester to the vehicle.

9. One worker should sit in the vehicle and select >>PDCC<< >>Maintenance/repairs<< >>Control unit start-up<< in the control unit search on the Porsche System Tester. This includes bleeding and the worker is guided through the menu. The vehicle body will roll to a significant degree. The 2nd worker must ensure complete safety around the vehicle!

10. Repeat the bleeding process twice. Then open the engine compartment lid and reservoir. Check the fluid level and hydraulic fluid when the engine is running and top up with the required amount of oil. The fluid level must not drop anymore and only a few air bubbles should circulate. There must be a significant reduction in the amount of air bubbles and/or foam formation compared to Step → 4.

11. Switch off the engine and set the correct fluid level. The fluid level must be between the **-MIN/MAX marking-** .

12. If this is not the case, the bleeding process must be repeated. If the fluid level continues to drop, the system must be visually inspected for any signs of leaks! Repeat the bleeding process following repairs.

WM 430307 BLEEDING PORSCHE DYNAMIC CHASSIS CONTROL (PDCC) (CAYENNE, CAYENNE GTS, CAYENNE TURBO S, CAYENNE S, CAYENNE S E-HYBRID, CAYENNE TURBO, CAYENNE S DIESEL, CAYENNE (3.0)) > SUBSEQUENT WORK

1. Install front cover (engine compartment). → 700219 REMOVING AND INSTALLING FRONT COVER (ENGINE COMPARTMENT)

WM 4303AW SAFETY REQUIREMENTS FOR PORSCHE DYNAMIC CHASSIS CONTROL (PDCC) (CAYENNE, CAYENNE GTS, CAYENNE TURBO S, CAYENNE S, CAYENNE TURBO) > GENERAL WARNING NOTES

⚠ *CAUTION: Increased risk of accidents and material damage if too much Pentosin CHF 202 is filled in or if Pentosin CHF 202 comes into contact with the coolant hoses when filling or topping up.*

- *It is possible to overfill the system, causing Pentosin CHF 202 to overflow onto coolant hoses and other components.*

→ Start the engine prior to the fluid level check. Check the fluid level.

→ If coolant hoses come into contact with Pentosin, clean them thoroughly with water IMMEDIATELY.

→ Replace visibly swollen coolant hoses.

NOTE: Contamination caused by fluids

- *PDCC system failure*

→ Only draw out fluid using a syringe that is used exclusively for Pentosin.

→ The (PDCC) system must never become contaminated by other fluids and dirt.

NOTE: Incorrect line routing

- *Risk of damage to lines and hoses*
- *Malfunction and fault memory entry on control*

→ Avoid small bending radii when routing lines.

→ File down edges and burrs in the routing area or mask them with adhesive tape.

→ Maintain a sufficient distance from components exposed to high temperatures while driving.

WARNING: Moving components

- *Danger of limbs being trapped or severed*

→ Do not reach into the danger area.

→ Secure the system to prevent it from being activated accidentally.

→ Keep third parties away from the danger area.

Information

The vehicle must be standing freely on a level surface. The lifting platform arms must not be located under the vehicle. The doors, rear lid and engine compartment lid must be closed. There must be no loose or unsecured parts in the vehicle. People and objects (e.g. lifting platforms, walls, etc.) must be a safe distance of 50 cm away. The mechanic must remain at the vehicle for the entire duration of the drive link tests. This person must ensure that no one enters or approaches the safety area.

- The vehicle only moves if the engine is running.
- The fluid level in the reservoir must be topped up prior to the system test or before bleeding the system. This is carried out with the engine running, while constantly monitoring the fill level in the reservoir. Only then is the actual process (system test/bleeding) started using the PIWIS Tester and with the engine compartment lid closed.
- The vehicle sways significantly during the system test or while bleeding the system.
- The workshop's extraction system must be switched on and the extractor positioned behind the exhaust system.
- Total extraction of the exhaust gas is not possible because of the movements of the vehicle. The mechanic must ensure that there is adequate ventilation and air extraction.

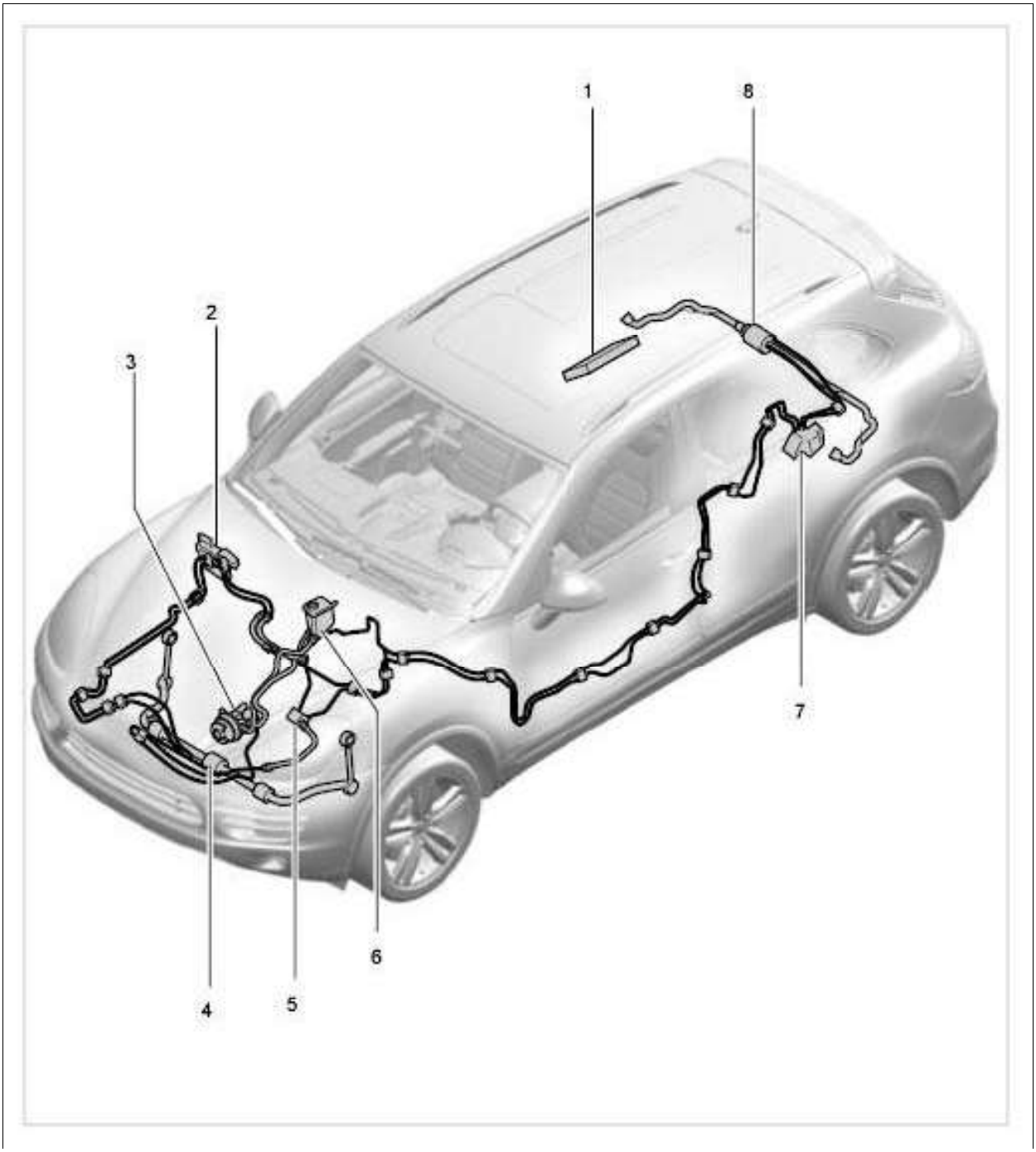
WM 4303IN PORSCHE DYNAMIC CHASSIS CONTROL (PDCC) COMPONENT ARRANGEMENT (EXCEPT CAYENNE, CAYENNE GTS, CAYENNE TURBO S, CAYENNE S, CAYENNE S E-HYBRID, CAYENNE TURBO, CAYENNE S DIESEL, CAYENNE (3.0)) > INFORMATION > PDCC COMPONENT ARRANGEMENT

The Porsche Cayenne range can be fitted with an active chassis (Porsche Dynamic Chassis Control) as an optional extra. The entire system consists of chassis components designed to actively stabiles the vehicle.

When a vehicle is cornering, the centrifugal forces acting at the center of gravity increase rolling moment across the vehicle's roll axis. This force will tilt the vehicle towards the outer cornering wheel, causing the vehicle to quickly approach its driving dynamic limits. The tilt angle of the body and the resulting wheel-load difference must be countered by using servo motors at the front and rear axle.

When cornering, the outer cornering wheel compresses and the inner cornering wheel extends. This causes a turning action at the servo motors, which counters the tilting of the body. This in turn distributes the load more evenly across two wheels on the same axle and noticeably improves driving dynamics even further.

Fig 1: Identifying PDCC Component Arrangement



Courtesy of PORSCHE CARS NORTH AMERICA, INC.

No.	Description of component	Qty.	Position
1	Control unit	1	Under right rear seat
2	Front valve block	1	Front right wheel housing (A-pillar)

3	Hydraulic pump (tandem pump)	1	Front left engine block
4	Front-axle anti-roll bar (PDCC)	1	Front chassis subframe
5	Distributor, power distributor (fluid flow)	1	Front-axle final drive, center
6	Reservoir (fluid tank)	1	Left plenum panel wall, under left cover
7	Rear valve block	1	Rear left chassis subframe
8	Rear-axle anti-roll bar (PDCC)	1	Rear chassis subframe

WM 430419 REMOVING AND INSTALLING VALVE BLOCK (CAYENNE, CAYENNE GTS, CAYENNE TURBO S, CAYENNE S, CAYENNE S E-HYBRID, CAYENNE TURBO, CAYENNE S DIESEL, CAYENNE (3.0)) > TECHNICAL VALUES

Location	Description	Type	Basic value	Tolerance 1	Tolerance 2
No. 1: Line to valve block		Tightening torque	28 Nm (21 ftlb.)		
No. 5: Valve block to wheel housing	M6 thread	Tightening torque	10 Nm (7.5 ftlb.)		
No. 4: Rear-axle valve block to chassis subframe	M8 x 25 thread	Tightening torque	23 Nm (17 ftlb.)		
Cover to rear-axle valve block	M6 thread	Tightening torque	10 Nm (7.5 ftlb.)		
No. 5: Cap screws on valve block	M14/M16 thread	Tightening torque	28 Nm (21 ftlb.)		

WM 430419 REMOVING AND INSTALLING VALVE BLOCK (CAYENNE, CAYENNE GTS, CAYENNE TURBO S, CAYENNE S, CAYENNE S E-HYBRID, CAYENNE TURBO, CAYENNE S DIESEL, CAYENNE (3.0)) > PRELIMINARY WORK > PRELIMINARY WORK (FOR FRONT-AXLE VALVE BLOCK)

Information

- Please check the arrangement of components in the PDCC system . → 4303IN PORSCHE DYNAMIC CHASSIS CONTROL (PDCC) COMPONENT ARRANGEMENT
- Please observe safety requirements for the PDCC system . → 4303AW SAFETY

REQUIREMENTS FOR PORSCHE DYNAMIC CHASSIS CONTROL (PDCC)

1. Remove the front right wheel. → 440519 REMOVING AND INSTALLING WHEEL
2. Remove front wheel housing liner at the right. → 505619 REMOVING AND INSTALLING FRONT WHEEL HOUSING LINER

WM 430419 REMOVING AND INSTALLING VALVE BLOCK (CAYENNE, CAYENNE GTS, CAYENNE TURBO S, CAYENNE S, CAYENNE S E-HYBRID, CAYENNE TURBO, CAYENNE S DIESEL, CAYENNE (3.0)) > PRELIMINARY WORK > PRELIMINARY WORK (FOR REAR-AXLE VALVE BLOCK)

Information

- Please check the arrangement of components in the PDCC system . → 4303IN PORSCHE DYNAMIC CHASSIS CONTROL (PDCC) COMPONENT ARRANGEMENT
- Please observe safety requirements for the PDCC system . → 4303AW SAFETY REQUIREMENTS FOR PORSCHE DYNAMIC CHASSIS CONTROL (PDCC)

1. Raise the vehicle. → 4X00IN LIFTING THE VEHICLE

WM 430419 REMOVING AND INSTALLING VALVE BLOCK (CAYENNE, CAYENNE GTS, CAYENNE TURBO S, CAYENNE S, CAYENNE S E-HYBRID, CAYENNE TURBO, CAYENNE S DIESEL, CAYENNE (3.0)) > REMOVING FRONT-AXLE VALVE BLOCK

NOTE: Incorrect line routing

- *Risk of damage to lines and hoses*
- *Malfunction and fault memory entry on control unit*

→ Avoid small bending radii when routing lines.

→ File down edges and burrs in the routing area or mask them with adhesive tape.

→ Maintain a sufficient distance from components exposed to high temperatures while driving.

NOTE: Voltage peaks

- *Risk of damage to electrical load or to the control unit*

Information

Before starting to work on the PDCC system, always clean the underbody or at least clean the system components you will be working on. Ensure absolute cleanliness at all times. In other words:

- Clean the system components to be removed using a power washer, for example. Ensure that the high-pressure spray is at least 50 cm away from the component (risk of damage to electric lines,

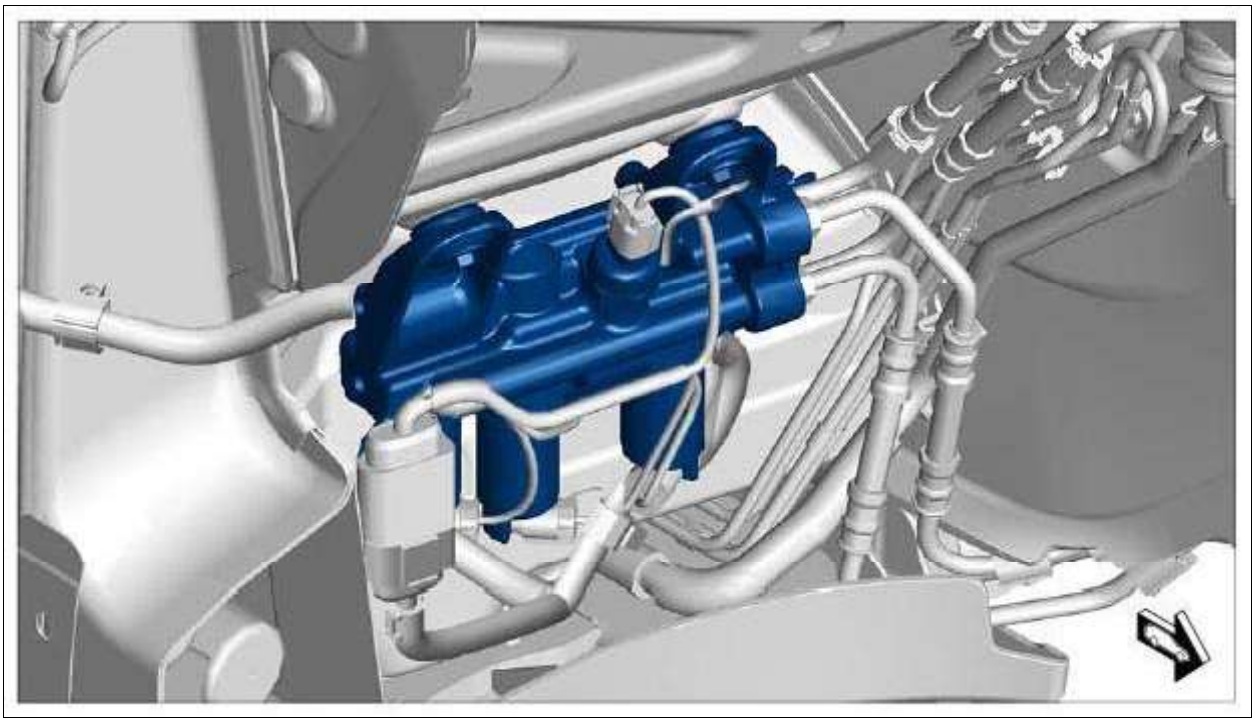
connectors and contacts) .

- Before loosening the hydraulic connections, the areas around the connections must also be cleaned carefully (e.g. using a brush and/or a lint-free cloth) .
- If you intend to use the component again, the openings must be closed off immediately using suitable stoppers .
- If you are using new components, the stoppers must only be removed immediately before fitting .

Information

If a component is replaced, the reservoir must always be replaced as well. → 430955 REPLACING RESERVOIR (PDCC)

Fig 1: Identifying Front-Axle Valve Block



Courtesy of PORSCHE CARS NORTH AMERICA, INC.

1. Unclip combination connector **-arrow-** .