

FITTING INSTRUCTIONS making everyday smoother





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VOLKSWAGEN CADDY

with VB-FullAir 2-Corner rear axle air suspension FOR KIT 105 09 09 22X

Revision table

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19	Updated: Paragraph 3.5 Warranty sticker.			
20	Updated: Chapter 4 Calibration: new remote.			
21	Updated: Chapter 5 Checklist.			
24	Added: Barcode.			
All	New notation for version number (V1.0, V1.1, V2.0, etc).			

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1. Safety instructions

Personal safety instructions

- Always wear suitable protective clothing and safety boots.
- Do not wear rings, watches or loose clothing.
- Never carry loose items in pockets.
- Tie back long hair.
- Never use broken tools. Only use tools for their intended purpose.
- Wear safety goggles.

General safety instructions

- If possible, always use a hydraulic ramp when carrying out the activities.
- If applicable, ensure that the vehicle is properly supported.
- Ensure that the vehicle cannot roll away.
- Improperly carried out installation can result in hazardous situations.

Symbols used

Caution



When the warning symbol is shown, information is provided that is extremely important for the safety and/or health of those involved. This symbol is also used for procedures that are critical for the correct installation of the air suspension kit.

Tip



When the tip symbol is shown, information is provided that will help make installation of the air suspension kit simpler.

Torque



In this manual there is a check box next to each bolted joint showing the torque to be used when tightening the bolted joint.

2. Fitting instructions

This manual has been put together with great care and describes the steps for installing the air suspension indicated on the front page. However, the content of this manual is a snapshot view of the situation as at the time it was written.

VB-Airsuspension reserves the right to introduce technical changes at any time without warning. The warranty is only valid if installation is carried out by a specialist workshop. Installation may only be carried out by suitably authorised personnel.

Staff must be experienced in working on light commercial vehicles, particularly in relation to electrics/ electronics, pneumatics and general vehicle mechanics.

- Use vehicle workshop manuals where necessary.
- Always follow the vehicle manufacturer's conversion instructions, unless expressly stated otherwise in this manual.
- Keep workplace clean and tidy.
- Always tighten nuts and bolts to the specified torque.
- If modifications have been made to the original anti-corrosion system, this must be rectified immediately. Use spray wax or a protective coating for this purpose.
- Always refit removed tubes and wires in the same way they were originally fitted.
- Secure pipes and wires with a sufficient number of tie-wraps. Ensure that the wires cannot be placed under tension.
- The supply cable must be at least 100 mm away from the ABS/ESP block, the sensors and other control equipment.
- Ensure that there are no tight bends in air tubes and that they cannot be kinked or chafe against other parts.
- Never attach air tubes, wires or other parts to the vehicle's brake lines.
- Do not leave any tools, cleaning cloths or other materials behind after completing work.
- Use the checklist to check the air suspension system after fitting.
- Check the system for air tightness after fitting.
- Take the vehicle for a test drive after fitting.
- Ensure the correct calibration supports are available. The correct calibration supports to be used with this kit are:

Axle:	Calibration height:	Order number:
Rear axle	X = 285 mm	009 000 00 57

• The air suspension kit is supplied for two corners. If a part is specifically for one corner, it is identified with a coloured sticker.

Colour	Description
Green	Rear left
Black	Rear right



3. Fitting the air suspension kit 3.1 Preparations

- 1. Support the vehicle and the axle properly.
- 2. Remove the spare wheel.
- 3. Remove the bumper.
- 4. Remove the tow hitch if fitted.
- 5. Remove the bumper insert if no tow hitch is fitted.
- 6. Remove the shock absorbers.
- 7. Remove the U-bolts.
- 8. Remove the upper bolts from the spring shackles.
- 9. Remove the bolts from the front leaf-spring brackets.
- 10. Remove the leaf springs.
- 11. Remove the bump stops.
- 12. Remove the rear section of the heat shield. The nuts and bolts will be re-used.



3.2 Fitting the air suspension kit for the rear axle

1. Place the bolts (M12 x 80) in the lower clamping plates.



Be sure that the lower clamping plates gets mounted with the two threaded holes facing the front side of the vehicle.

- 2. Fit the top of the shock absorbers to the chassis.
 - ** Do not tighten the bolts yet.





Original fasteners**

100 Nm



Use screw thread locking liquid with PTFE Fit the lower clamping plates with the shock absorbers to the rear axle.
 ** Do not tighten the bolts yet.

M12 × 80	
M12	
M12	
100 Nm	

R

4. Fit the main spring in the front leaf-spring bracket.
** Do not tighten the bolts yet.

2 x bolt **
4 x washer
2 x lock nut

 2 x bolt** 2 x washer 2 x lock nut 	M12 × 110 M12 M12
Nm	100 Nm

5. Place the upper clamping blocks on the spring seats.







The ball joint must point towards the front and the inside of the vehicle.









Cut off the end of the wire.

8. Fit the mounting supports.

2 x Allen screw2 x washer	M8 x 25 M8
Nm	20 Nm



Use the bolt of the bump stop to centre the mounting support accurately.

9. Fit the air couplings to the air springs.





2	X	air coupling	

5 Nm

10. Fit the height sensors to the height sensor brackets as shown in the figure.

4 x bolt 4 x washer		M5 M5	x 10
Nm		5 Nm	
	Ensure the hel correctly. See general picture	ight sensor is the overhead e of the asser	positioned view for a nbly.

11. Fit the air springs to the lower spring plates.

2 x bo 2 x wa	olt M6 x 12 asher M6
Nm	6 Nm
	Note the colour markings. The colour markings indicate which part is for the left and which for the right.





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12. Fit the heat shield to the right air spring.
** Do not tighten the bolt yet. Fit the panhard rod first.



2 x bolt**	M6 x 12
2 x washer	M6
Nm	6 Nm

13. Slide the lower spring plates into the mounting supports.





The air coupling must face towards the inside of the vehicle.

14. Fit the panhard rod bracket to the right mounting support.





15. Fit the torque rod to the panhard rod bracket.

Nm	60 Nm
2 x lock nut	M10
4 x washer	M10
2 x bolt	M10 × 30



16. Cut the heat shield as shown in the illustration and fold it inwards.



17. Fit the torque rod to the left mounting support.



1 x bolt	M10 × 30
1 x washer	M10
Nn	60 Nm

- 18. Mount the bump stop on the left-hand side without the shim.
- 19. Mount the bump stop on the right-hand side with the shim.





- 20. Push the cups around the underside of the air springs.
- 21. Fit the air springs to the main springs. Fit the shim between the cup and the main spring.
 ** Do not tighten the bolts yet. Only tighten this bolt when the air springs are pressurised.
- 2 x countersunk Allen M10 x 90 screw**

20 Nm



Use the rear hole of the main spring.





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22. Fit the panhard rod ball-joint bracket to the lower speed nut on the left-hand side.



3 x bolt	M10 × 30	8.8
	60 Nm	

23. Lower the vehicle onto the calibration supports.

Go to section 2 for details of the correct calibration supports for this kit.

The following step can only be carried out when the vehicle is at the ride-height.

24. Secure the bolts from section 3.2, step 4.

- 25. Secure the bolts from section **3.2**, step **6**.
- 26. Fit the panhard rod ball-joint to the panhard rod ball-joint bracket.

Supplied nut and washer on ball joint

60 Nm

27. Screw the panhard rod onto the ball-joint.
Apply grease to the thread.
** Do not tighten the nut yet.





28. Fit the panhard rod together with the heat shield to the panhard rod bracket.
** Do not tighten the bolt yet.

1 x bolt**	M12 × 90
2 x washer	M12
1 x lock nut	M12
Nm	60 Nm

29. Secure the bolt from section **3.2**, step **12**.



- 30. Measure the distance (*A*) between the chassis and rim edge on the left-hand side.
- 31. Measure the distance (*B*) between the chassis and rim edge on the right-hand side.
- 32. If there is a difference greater than 2 mm between the left and right measurements, remove the panhard rod bolt.
- 33. Turn the panhard rod:Anti-clockwise: when *A* > *B*Clockwise: when *A* < *B*
- 34. Fit the bolt.If the difference is > 2 mm, adjust!If the difference is < 2 mm, continue!
- 35. Ensure that the ball-joint is straight relative to the bracket when you tighten the lock nut.
- 36. Tighten the lock nut.

٨	lut supplied
Nm	60 Nm

- 37. Check the length of the height sensor rods (*165 mm*) measured centre to centre.
- 38. Fit the height sensor rods to the height sensors.
- 39. Fit the height sensor rods to the ball-joints.
- 40. Secure the height sensor rods by pushing in the clips.





When making adjustments: 1 turn is equivalent to 1.5 mm of movement.







The height sensor arms must point backwards.

3.3 Compressor box



If the vehicle has a tow hitch, slide it into the side member and skip step 1.

1. Slide the mounting plate for the compressor box mounting bracket into the side member from the rear until the thread meets the slotted hole.



2. Fit the compressor box mounting bracket to the chassis.



If the vehicle has a tow hitch, use the original bolts of the tow hitch instead of the bolts provided.

2 x bolt 2 x washer	M12 × 25 M12	8.8
Nm	70 Nm	

- 3. Fit the bumper insert if the vehicle does not have a tow hitch.
- 4. Slide the supplied section of black corrugated hose over the black air tube.
- 5. Connect the *black* air tube to the right air spring.
- 6. Route the air tube through the rear cross-member to the compressor box.
- 7. Connect the green air tube to the left air spring.
- 8. Route the air tubes to the compressor box.





9. Fit the compressor box to the bracket. For this purpose you should only use the 2 flange nuts shown.

2 x flange nut	<i>M</i> 6
Nm	5 Nm

- 10. Fit the *green* air tube to the air coupling on the valve block.
- 11. Fit the *black* air tube to the air coupling on the valve block.
- 12. Ensure that the colour markings match.

13. Route the wiring harness along the chassis towards the front until it reaches the left height sensor.

14. Fit the cover to the compressor box.

4 x flange nut	M6
Nn	5 Nm

- 15. Route the inlet line upwards until it reaches the filling neck.
- 16. Fit the inlet line to the filling neck.
- 17. Fit the bumper.





3.4 Wiring harness

- 1. Route the left height sensor cable to the rear left height sensor.
- 2. Route the right height sensor cable to the rear right height sensor.



The wire for the right height sensor must be routed to the right, over the tank and the heat shield until it reaches the front leaf-spring bracket, and fixed with tie-wraps.

 $\underline{\wedge}$

Ensure that the wiring harness does not come into contact with moving or hot parts of the vehicle.

3. Route the remaining wires from the wiring harness along the red line to the front of the vehicle.









Use suffic wires.

Use sufficient tie-wraps to secure the wires.

Ensure that the wiring harness does not come into contact with moving or hot parts of the vehicle.

- 4. Remove the underside of the middle heat shield.
- 5. Carefully drill a number of 6.5 mm diameter holes as shown in the illustration.
- 6. Fit the wiring harness to the heat shield using tie-wraps with fir tree foot (Ø6.5 mm).
- 7. Route the wiring harness further forwards until it reaches the battery. To make it easier to install the wiring harness, it is advisable to remove the cover of the air filter housing and the battery.



On models with a control unit for battery monitoring, the battery must on no account be removed! This control unit can be recognised by the extra box on the earth cable (marked blue in the illustration).

- 8. Route the wiring harness along the red line. Use the vehicle's original cable clamps for this purpose.
- 9. Connect the yellow and brown wire to the earth point.
- 10. The main power supply cable (12V+) must be routed to the fuse box at the front left.

11. Route the VB wiring harness through the indicated wire socket to the inside.



Tape together the connectors and a long pin. This makes it easier to route the connectors inwards through the rubber.

Ensure that the cable grommet does not become damaged. Otherwise there is a chance of water getting in.

- 12. Connect the yellow wires to the small fuse block.
- 13. Connect the red wires to the large fuse block.
- 14. Fit the fuse blocks to the fuse block support.
- 15. Do not fit the fuses yet.





- 16. Fit the fuse block as shown.
- 17. Connect the yellow/red wire to the 30A fuse (indicated by arrow).













If you have ordered the speed signal option, go to section 3.4.2.

3.4.1 Handbrake signal

- 1. Remove the handbrake cover.
- 2. Look for the brown/yellow wire of the handbrake.
- 3. Route the white wire of the supply cable to the handbrake.
- 4. Using the red connector, connect white wire no. 19 to the brown/yellow wire of the handbrake signal.
- 5. Connect the supply cable to one of the white connectors.
- 6. Refit the interior components removed earlier.

3.4.2 Speed signal

- 1. Remove the instrument panel from the dashboard.
- 2. Remove the connector from the instrument panel.
- 3. Slide off the plastic part of the connector to expose the wires.
- 4. Route the yellow wire to the rear of the instrument panel.
- 5. Place the terminal of yellow wire no. 18 in the location indicated in the table.
- 6. If this location is occupied, remove the terminal.
- 7. Using the red connector, connect yellow wire no. 18 to the wire with the colour coding shown in the table.

Model year	Pin number	Wire colour coding (if pin already occupied)
2010<	28	
>2010	9	purple/white

8. Refit the interior components removed earlier.







3.4.3 Contact 15+ signal

- 1. Remove the cover under the steering wheel.
- 2. Remove the fuse box.



There is an unused connector on the rear of the fuse box.



Connect the pink wire to the unused connector. Refit the interior components removed earlier.

3.4.4 Remote control



4.

5.

VB-Airsuspension recommends the position shown in the photograph. Ensure the remote control is not installed in front of the airbags.

- 1. Identify a suitable location to install the remote control.
- 2. VB-Airsuspension recommends the position shown in the photograph.
- 3. Place the remote control in the holder.
- 4. Ensure that the connector is not under tension. Secure the end of the wire with a tie-wrap.
- 5. Route the remote control wire to the VB wiring harness under the sill covering.
- 6. Connect the remote control wire to the VB wiring harness.
- 7. Fit the connector next to the EOBD connector so that this is easily accessible.
- 8. Refit the interior components removed earlier.



3.5 Warranty stickers

- 1. Mount the spare wheel.
- 2. Place sticker **B** on the left upper air spring bracket.
- 3. Affix protective film over the sticker.



- 4. Affix the supplied warranty stickers A + B to the B-pillar on the passenger side.
- 5. Affix protective film over the stickers.





B





- 6. Affix the supplied kit sticker **A** onto the compressor box.
- 7. Affix protective film over the sticker.





8. Note the installation of the air-suspension kit in the maintenance booklet.

4. Calibration

1. Place the fuses in the fuse blocks. (F1 = 40 A + F2 = 7.5A).



Program the VB-ASCU via the SMT.

- 2. Turn the ignition on.
- 3. Ensure that the vehicle is resting on the wheels on a flat surface.
- Briefly press the *f*-button once (LED lights up).
 Enter the following code within 10 seconds:



The LEDs on the remote control will go out.

- 5. Press and hold the *f*-button untill a long tone is heard.
- 6. Enter the following code within 20 seconds:



Calibration mode has been activated.

- 7. The \square/\square -LED and the \triangle -LED will start to flash.
- 8. Press button **2** or \bigcirc to raise the vehicle.
- 9. Place the calibration supports under the vehicle.
- 10. Hold down button **1** or \bigcirc to allow all the air to vent from the air-springs.

The air-springs are empty once the hissing sound can no longer be heard.

The calibration height has been reached.

11. Hold down the *sc*-button until the long tone is heard.

The ride height has been stored.

- Briefly press the *f*-button once. calibration mode is closed. The system restarts.
- 13. Briefly press the $\mathcal{F}^{\mathcal{L}}$ -button once. $\mathcal{F}^{\mathcal{L}}$ -mode is closed.
- 14. Press button **2** or $\widehat{\Box}$ to raise the vehicle.
- 15. Remove the calibration supports from under the vehicle.
- 16. Set the vehicle to the ride-height.
- 17. Turn the ignition off.
- 18. Tighten all nuts and bolts indicated in the manual with **.
- 19. Have the headlamp adjustment checked by a dealer.
- 20. Check the vehicle using the checklist in the manual.









For an overview of the right calibration supports for this kit, please see chapter 2.

5. Checklist

Final checks

- 1.1 Ride height correctly calibrated.
- 1.2 Front axle/rear axle aligned.
- 1.3 Height sensors correctly fitted.
- 1.4 Shock absorbers vented.
- 1.5 Bolts tightened to correct torque and ticked off.
- 1.6 Air tubes, wires and connectors properly secured.
- 1.7 System checked for air tightness.
- 1.8 Clearance around air springs checked.
- 1.9 Identification stickers including protective film stuck to the vehicle.
- 1.10 Headlamp adjustment checked.
- 1.11 If prescribed, have ADAS (Advanced Driver Assistance Systems) recalibrated.
- 1.12 VB-ID card inside cover of user manual.
- 1.13 Documentation present in vehicle: user manual

- TUV / ABE documentation

System functions

- 2.1 Raise manually.
- 2.2 Lower automatically.
- 2.3 Lower manually.
- 2.4 Raise automatically.
- 2.5 Test drive carried out.

ΟΚ

SYSTEM OK

6. Electrical diagram



Name	Description
ASCU	VB-ASCU (electronic control unit)
AS3	Air spring, rear left
AS4	Air spring, rear right
Ct2a	Connector, 2-pin, compressor power supply
Ct2b	Connector, 2-pin, dump valve on compressor
Ct5a	Connector, 5-pin, compressor relay
Ct6a	Connector, 6-pin, height sensor left
Ct6b	Connector, 6-pin, height sensor right
Ct6e	Connector, 6-pin, VB supply cable
Ct6f	Connector, 6-pin, remote control
Ct6g	Connector, 6-pin, connector option (yellow)
Ct10c	Connector, 10-pin, valve block
Ct35a	Connector, 35-pin, VB-ASCU
Co1	Compressor
Ds	End plug
F1	Fuse, compressor, 40 A (amps)
F2	Fuse, VB-ASCU, 7.5 A (amps)
Hb	Handbrake signal (option)
Re	Compressor relay
Rc	Remote control
S3	Height sensor, rear left
S4	Height sensor, rear right
S5	Pressure sensor on valve block
Sd	Air silencer
Speed	Speed signal (option)
Vb	Valve block
Vv1	Valve for front right air spring on valve block
Vv2	Valve for rear left air spring on valve block
Vv3	Valve for rear right air spring on valve block
Vv4	Dump valve to vent air on valve block
Vv5	Valve for front left air spring on valve block
Vv6	Dump valve on compressor
Colour codes (yello	bw is not indicated with wire number)
bl	blue
br	brown
ge	yellow
gn	green
ro	red
ro/ws	red/white
rs	pink
SW	black
vi	purple
WS	white
	0.50 mm ²
	0.75 mm ²
	4.00 mm ²
	Air tube



VB-Airsuspension is one of the few European manufacturers producing a wide range of (air) suspension systems. From semi air suspension and simple reinforced coil springs to full air suspension systems: we offer customers the ideal solution for a range of applications such as ambulances, car transporters and motorhomes. Now you know why more and more body shops and commercial vehicle manufacturers are making VB-Airsuspension systems their benchmark.













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