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with VB-FullAir 2-Corner rear axle air suspension FOR KIT 105 09 09 20X

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1. Safety regulations

Personal safety regulations

- Always wear appropriate safety clothes and safety shoes.
- Do not wear any rings, watches, or free hanging clothes.
- Never keep any loose goods in pockets of clothes.
- Bind long hair together.
- Never use defect tools. Use tools only for the purpose where it is meant for.
- Wear safety goggles.

General safety regulations

- Always use a car lift to perform the operations.
- Be sure the vehicle is always supported properly when necessary.
- Be sure the vehicle can not roll away.
- Incapable fitting operations may result in dangerous situations.

Used Symbols

Attention



When the warning symbol is displayed, information of great importance to the safety and / or health of the involved persons is provided. This symbol is also used in operations that are crucial for the correct mounting of the air suspension set.

Tip



When the tip symbol is displayed, advice is given to make the mounting of the air suspension set more easy.

Torque



Every bolted joint in this manual comes with a torque.

2. General fitting regulations

This manual has been carefully crafted to provide the best way to fit the air suspension mentioned on the cover of this manual. However, the manual is a random indication of the technical specifications at any given time.

VB-Airsuspension reserves the right to make technical changes in the air suspension kit without any notification.

Fitting of the air suspension kit can only be done in a from VB-Airsuspension authorised workshop. The fitting can only be done by authorised mechanics. The mechanics must have proper experience in electric/electronics, pneumatics and regular vehicle technics.

- When necessary, use the work-shop manuals of the vehicle.
- Always follow the directions of the vehicle manufacturer, unless otherwise expressly stated in this manual.
- Work clean.
- Always tighten the bolts and nuts according the recommended torque.
- Whenever changes are made to the original corrosion protection, restore it immediately. For this purpose use for example protective coating or spray wax.
- Always re-fit the removed wires and tubes on the original way.
- Always secure the wires and air tubes with plenty of tie-wraps. Secure all connectors properly and make sure that there is no stress on them.
- All electrical cables must be kept at least 100 mm away from the ABS/ESP block, its sensors and other controllers.
- Make sure the air-tubes do not make sharp corners and can not bend or wear against other parts.
- Connecting electrical cables or air-tubes to brake lines is strictly prohibited!
- Make sure no tools, cleaning rags or other materials remain under the car.
- Check the air suspension after finishing the fitting according the checklist.
- Check after the fitting, the system for air leakage.
- When finishing the fitting, always make a test drive.
- Make sure that the right calibration support are available, for this kit the right calibration support are:

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

• The air-suspension is split up in two corners, which correspond to one corner of the vehicle. When a part is specific for one corner, this will be marked with a coloured sticker.

Colour	Description
Green	Left rear
Black	Right rear



3. Mounting the air spring system **3.1 Preparations**

- Support the vehicle properly. 1.
- 2. Remove the spare wheel.
- When the vehicle has a towbar, please 3. continue with point 5.
- Remove the rear bumper and the under 4. bumper.
- Remove the shock absorbers, the bolts and 5. nuts will be re-used.
- 6. Remove the U-bolts.
- Remove the rear leaf spring bracket bolts. 7.
- 8. Remove the front leaf spring bracket bolts.
- Remove the leaf springs. 9.
- Remove the rear leaf spring brackets. 10.
- 11. Remove the bump stops.
- Remove the two bolts (see picture) of the 12. towbar(if present) on the left side of the vehicle.
- Remove the rear part of the heat shield, the 13. original fasteners will be re-used.





3.2 Mounting the air spring system 3.2.1 Cross beam, main springs and panhardrod

Place the bolts without nuts in the holes of 1. the front leaf spring bracket.



2 x Bolt M10x30 10.9* 2 x Lock nut M10 4 x Washer M10

- 2. Mount cable ties in the holes of the cross beam.
- 3. Mount the cross beam between the front leaf spring brackets but only mount it with the bolts and nuts who have been placed in step 1.

Don't secure the bolts yet.



 Mount the outer and inner brackets together with the main spring in the leaf spring bracket.
 Don't secure the bolts yet.

Left:

S	
100 Nm	

1 x Bolt M12x120 10.9* 1 x Lock nut M12 2 x Washer M12

Right:



1 x Bolt M12x140 10.9* 1 x Lock nut M12 2 x Washer M12

5. Mount the inner brackets to the cross beam. **Don't secure the bolts yet.**



1 x Bolt M8x20 8.8* 1 x Lock nut M8 2 x Washer M8





6 x Bolt M8x25 8.8* 6 x Lock nut M8 12 x Washer M8

 Mount the panhardrod bracket to the cross beam and to the upper mounting point of the right shock absorber.
 Don't secure the bolts yet.











making everyday smoother

8. Mount the panhardrod bracket to the cross beam with the three bolts as shown in the picture. **Don't secure the bolts yet.**



2 x Bolt M10x30 10.9* 2 x Lock nut M10 4 x Washer M10

9. Mount the left shock absorber but only with the upper bolt. *Don't secure the bolts yet.*



- 10. Place the upper clamping plate on top of the axle, be sure that the ball joint pointing to the inner and front side of the vehicle.
- 11. Be sure that the lower clamping plates gets mounted with the two threaded holes facing the front side of the vehicle.







12. Mount the panhardrod ball joint to the panhardrod ball joint bracket.



1 x Lock nut M10 1 x Washer M10



13. Place the bolt already through the hole of the lower clamping plate.



14. Mount the lower clamping plates together with the shock absorbers to the vehicle. **Don't secure the bolt yet.**



2 x Bolt M12x80 10.9* 2 x Lock nut M12 4 x Washer M12

15. Mount the original clamping plates. *Don't secure the bolts yet.*









8 x Bolt M12x160 10.9* 8 x Lock nut M12 16 x Washer M12





Use the back hole of the clamping plate.



16. Mount the panhardrod ball joint bracket to the left lower clamping plate.



3 x Bolt M10x25 10.9 3 x Washer M10

17. Mount the panhardrod to the panhardrod ball joint. *Don't secure the nut yet.*



18. Mount the panhardrod to the panhardrod bracket. *Don't secure the bolt yet.*



1 x Bolt M12x90 10.9* 1 x Lock nut M12 2 x Washer M12



3.2.2 Air springs

1. Mount the air couplers to the air springs.



2. Mount the heightsensors to the upper spring brackets. Pay attention to the position of the heightsensor (see right image)



4 x Bolt M5x10 8.8 4 x Washer M5



See the top view for the position of the heightsensor.

3. Mount the upper spring bracket to the air springs.



2 x Bolt M6x12 8.8 2 x Washer M6





4. Mount the heat shield to the right air spring.



2 x Bolt M6x12 8.8 2 x Washer M6



- 5. Slide the upper spring bracket in the hole in the chassis.
- 6. Mount the bump stop with the distance washer.



2 x Flare bolt M10x55 10.9



The air couplers have to point to the innerside of the vehicle.

- 7. Mount the heat shield under the original fasteners of the original heat shield.
- Bend the exhaust so the exhaust and heat 8. shield can't make contact.
- Mount the air spring with the piston to the 9. main spring. Mount the filling plate between the piston and main spring. Use the front holes of the main springs. ** Don't secure the countersunk screws yet.



2 x Countersunk Allen screw M10 x 90**

Pump with a extern air supply air in the air 10. spring. Pump as many that the X dimension is right. X= between the main spring and the upper air spring bracket.



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

- 11. Secure the bolts of the cross beam and leaf spring bracket with the specific torque.
- 12. Secure the lower bolts of the shock absorber.
- Measure the distance (A) between the 13. chassis and the rim edge on the left-hand side. Measure the distance (B) between the chassis and the rim edge on the right-hand side. If the distance between left and right is more than 2 mm, loosen the lock nut and remove the panhard rod bolt.
- Turn the panhard rod: 14. - Left: when A < B - Right: when A > BSize difference > 2mm, Adjust!
 - Size difference < 2mm, Go further!
- 15. Secure the lock nut.















By rotating the panhard rod 1 turn, the adjustment of the displacement is 1.5 mm

- 16. Check the length of the heightsensor rods.- 170 mm measured from heart to heart.
- 17. Mount the height sensor rods to the height sensors.
- 18. Mount the height sensor rods to the ball-joints brackets.



The height sensor arm must be pointing to the back of the vehicle!

3.2.3 Compressorbox



When the vehicle has a towbar, please mount the towbar and continue with step 2.

- 1. Slide the clamping plates in to the chassis from the rear side until the holes match with the holes of the vehicle.
- 2. Mount the compressorbox bracket to the holes as shown.



When the vehicle has a towbar, please use the bolts of the towbar and not the supplied fasteners.



2 x Bolt M12x25 8.8 2 x Washer M12

3. Mount the compressorbox to the bracket with only the two marked nuts.



2 x Flare lock nut M6

- 4. Mount the under bumper.
- 5. Protect the black air tube with a black corrugated hose.









- 6. Push the **green** air tube in the valve block. Lead the **green** air tube to the left air spring, cut the air tube at the right length and mount it to the air coupler on the air spring.
- 7. Push the **black** air tube in the valve block. Lead the **black** air tube to the right air spring by leading it through the cross member of the chassis, cut the air tube at the right length and mount it to the air coupler on the right air spring.
- 8. Lay the complete wiring harness to the left heightsensor.
- 9. Mount the compressor protection cover.



2 x Flare lock nut M6

- 10. Push the compressor air intake tube in the hole of the filling pipe of the fueltank.
- 11. Mount the rear bumper back.





3.3 Wiring harness 3.3.1 Wiring harness

- 1. Place the wiring harness along the vehicle as in the picture.
- 2. Lay the wiring harness from the compressor along the left side of the fuel tank to the front of the car. Use sufficient cable ties to mount the wiring harness to the vehicle.





Make sure that the air tubes aren't near hot or moving parts.

 Connect the connector to the left heightsensor. The cable for the right heightsensor have to be mount on the cross beam to the right side of the vehicle and fastened with the earlier mounted cable ties.



- 4. Disassemble the underside of the heat shield and carefully make holes of Ø6,5mm in it as shown in the picture.
- 5. Mount with cable ties with feet Ø6,5mm the wiring harness to the heat shield.
- Place the wiring harness further to the battery on the left frontside of the vehicle. Use sufficient cable ties to mount the wiring harness to the vehicle.

Recommend to remove the cover of the air intake box and the battery.





For models with a control unit for batterymonitoring it is not allowed to de-mount the battery. The control unit can be reconigzed on the extra box on the ground cable (blue marked in the picture).



- 7. Lay the wiring harness along the red line in the picture to the battery, use the original cable clamps.
- 8. Mount the mass cable to the vehicle masspoint in the motorcompartiment.
- 9. The supply cable with the fuses must be lead to the fusebox on the leftside of the vehicle under the bonnet.



10. The rest of the cables can be directed through the rubber thule in the vehicle.



Tape the connectors together with a longer pin. Now, the connectors are easily guided to the inside of the vehicle.

Be careful that the rubber thule don't damaged. if damaged, there's a chance that water comes in the vehicle.

3.3.2 Fuseholder

- 1. Connect the yellow wires to the small fuse block.
- 2. Connect the red wires to the large fuse block.
- Mount the fuseholder to the bonnet gasdamper attachment point. Don't mount the fuses yet.
- Lay the yellow/red cable from the fuseholder to the original fusebox (along the red line) and connect it to the 30A fuse (see small picture).
- 5. Mount the wiring harness to the original wiring harness so the wiring harness don't



hang free anywhere.

6. The wiring harness inside the vehicle has two white connectors, 1 for the remote control and 1 for the contact+ and speedsignal.



When the speedsignal option is ordered, please continue with paragraph 4.3.4

3.3.3 Handbrake signal

- 1. Remove the cover of the handbrake lever.
- 2. Search for the brown/yellow cable of the handbrake.
- 3. Connect the yellow VB-cable (19) with the braun/yellow cable.
- 4. Place the VB-cable underneath the middle console trough to the white connector under the steering wheel.
- 5. Mount the covers in reversed order.









3.3.4 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.

3.3.5 Contact plus (15+)

- 1. Remove the lower cover under the steering wheel.
- 2. Disassemble the original fusebox.









3. On the backside of the fusebox there is a pin (see arrow).



- 4. Stick the pink cable on the pin.
- 5. Mount the fuse holder and covers in reverse order.
- 6. Mount the white connector with the pink and yellow cable to the VB wiring harness in the car.
- 7. Mount the wiring harness with cable ties to the original wiring harness.







VB-Airsuspension recommended the place on the picture. Make sure, that the remote control never comes in the way of the airbag.

- 1. Remove the stowage box out of the middle console arm rest.
- 2. Drill a small hole in the bottom so that the cable form the remote control fits trough it.
- 3. Lay the cable under the middle console to the front of the vehicle.
- 4. Lay the cable to the fusebox of the vehicle.
- 5. Mount the connector next to the EOBD connector of the car.
- 6. Connect the connector from the remote with the VB wiring harness.
- 7. Mount the VB wiring harness to the original wiring harness with cable ties.



8. Mount the remote holder in the stowage box and mount the remote in it.



3.4 Warranty sticker

- 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 \Box / \Box -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 *f*-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{I} -button once. \mathcal{I} -mode is closed.
- 14. Press button **2** or \bigcirc 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.
- 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. Wiring diagram



Name	Description
ASCU	VB-ASCU (control unit)
AS3	Air spring left
AS4	Air spring right
Со	Compressor
Ct1a	Connector, 1-pole, to dashboad
Ct1b	Connector, 1-pole, to handbrake
Ct2a	Connector, 2-pole, compressor
Ct2b	Connector, 2-pole, valve on compressor
Ct5a	Connector, 5-pole, relay Re
Ct6a	Connector, 6-pole, height sensor S3
Ct6b	Connector, 6-pole, height sensor S4
Ct6e	Connector, 6-pole, VB-supply cable (white)
Ct6f	Connector, 6-pole, remote control Rc (white)
Ct6g	Connector, 6-pole, option connector
Ct10a	Connector, 10-pole, valve block connection
Ct35a	Connector, 35-pole, VB-ASCU control unit
Ds	Blind plug
F1	Fuse compressor, 40A
F2	Fuse compressor, 7,5A
F3	Fuse BF1 on the battery 30A
Speed	Speed signal (Optional)
Hb	Hand brake signal (Optional)
Rc	Remote control
Re	Compressor relay
S3	Height sensor left
S4	Height sensor right
S5	Pressure sensor on valve block
Vb	Valve block
Vv1	Valve for air-spring, right front on valve block
Vv2	Valve for air-spring, left rear on valve block
Vv3	Valve for air-spring, right rear on valve block
Vv4	Dump valve, to release air on valve block
Vv5	Valve for air-spring, left front on valve block
Vv6	Release valve on compressor
Colourcode:	(not mentioned, is yellow with wire number)
bl	Blue
br	Brown
ge	Yellow
gn	Green
ro	Red
ro/ws	Red/White
rs	Pink
sw	Black
vi	Violet
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.









Dealer:



www.vbairsuspension.com