



FITTING INSTRUCTIONS

making everyday smoother



- Increased comfort • Better driveability • More safety



MERCEDES BENZ VITO

with VB-FullAir 2-Corner rearaxle air suspension

for kit 105 02 19 22x

What's changed

New version number:	V1.2		
Release date:	12/19/2012		
Changed compared to	V1.1		
Page: (New version)	Changes		
11	Description for mounting ball joints in suspension arm changed		
12	Heightsensor rods for 4X4 model added		
17	Description for getting speed signal changed		
28/29	What to do when xenon lights are fitted		



VB
airsuspension

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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



xx Nm

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.

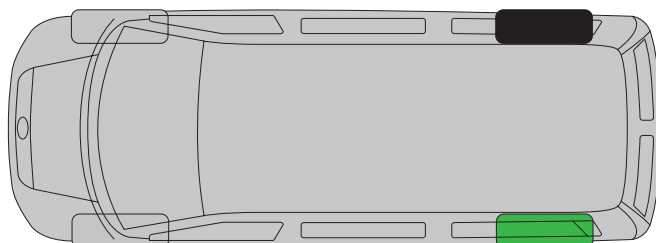
- When necessary, use the work-shop manuals of the vehicle.
Always follow the directions of the vehicle manufacturer, unless otherwise expressly stated in this manual.
- Work clean.
- Always tighten the bolts and nuts according the recommended torque.
- Whenever changes are made to the original corrosion 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 = 430mm*	009 000 00 54

* The X-value is the distance between the middle of the wheel and the wheel arch.

- 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
Black	Right rear
Green	Left rear



3. Overview of the air-suspension kit



The air-suspension kit consists of numerous different parts. To keep things clear, only the main parts have been included on the above picture. The more common parts, like for example the fitting materials, have been left out.

Number	Description
1	Air springs
2	Upper spring plates
3	Remote
4	Heightsensor + bracket right
5	Heightsensor + bracket left
6	Clamping plate
7	Heightsensor rod L= 50mm HtoH
8	Compressorbox + wiring harness

For an overview of the place where the different parts are located, please see the chapter “Exploded View” in chapter 7. You can also find the partnumbers there.

4. Mounting the air-suspension kit

4.1 Preparations

1. Support the vehicle properly.
2. Remove the lower bolt of the shockabsorbers.



The bolt can be used again.

3. Raise the vehicle untill the springs can be removed.
4. Remove the springs with the upper mounting rubbers.

5. Remove the lower mountingrubbers.



4.2 Mounting the air suspension parts

1. Mount the upper spring plates to the chassis.




20 Nm

4x Countersunk allan screw M8x16




2. Mount the air springs to the upper spring plates.


	4x Flare lock nut M6
8 Nm	

	The air spring should be mounted with the air-coupling to the front of the vehicle, so that the VB-Airsuspension logo to the back points.
---	--



3. Mount the air spring to the suspension arm.

	2x Bolt M8x30* 2x Washer M8
6 Nm	

	Note the placing of the clamping plates, they can be mounted just in one way.
---	--

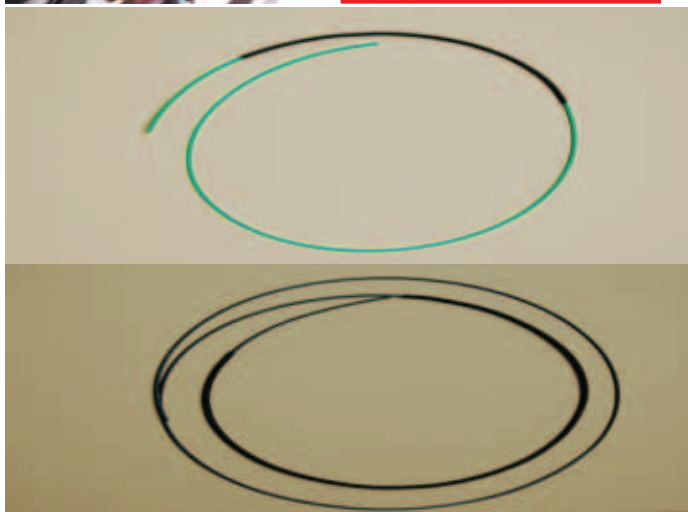
	Don't secure the bolts.
---	--------------------------------



4. Protect the air-tubes with a black corrugated hose.

	The black corrugated hose with a length of 0,3m should be mounted on the green air-tube
---	--

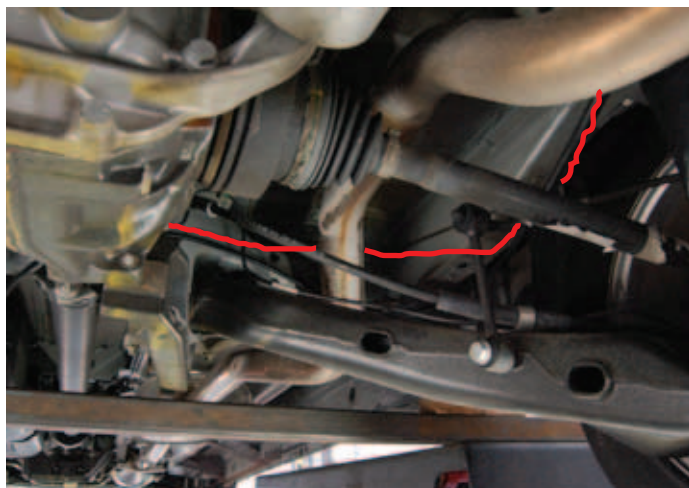
	The black corrugated hose with a length of 1m should be mounted on the black air-tube
---	--



5. Connect the **black** air tube to the right air spring and slide the black corrugated hose over the air-tube to the air-spring.
6. Place the black air-tube to the left of the vehicle, over the differential along the chassis beam. (marked with the red line)
7. Connect the **green** air tube to the left air spring and slide the black corrugated hose over the air-tube to the air-spring.



Make sure that the air tubes are clean and undamaged. Cut the air tube right with an air pipe cutter, of the special tools.



8. Mount the lower side of the shock absorber but don't secure them jet. Use sealant to secure the bolts.



2x Original bolt*

180 Nm



Don't secure the bolts.

* The bolt have to be tighten at ride height

9. Pump with an external air-supply some air in the air-springs, so the rubber can set itself and the car is on ride height.




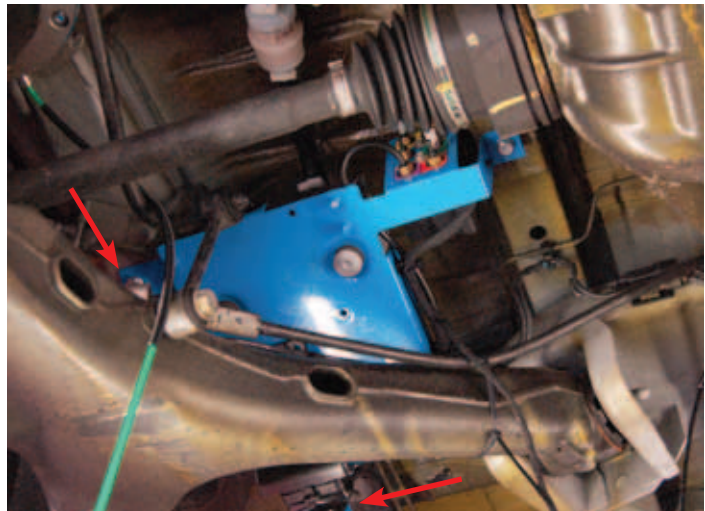
4.3 Compressorbox

1. Slide the compressorbox on the left side of the vehicle between the drive shaft and the suspensionarm.

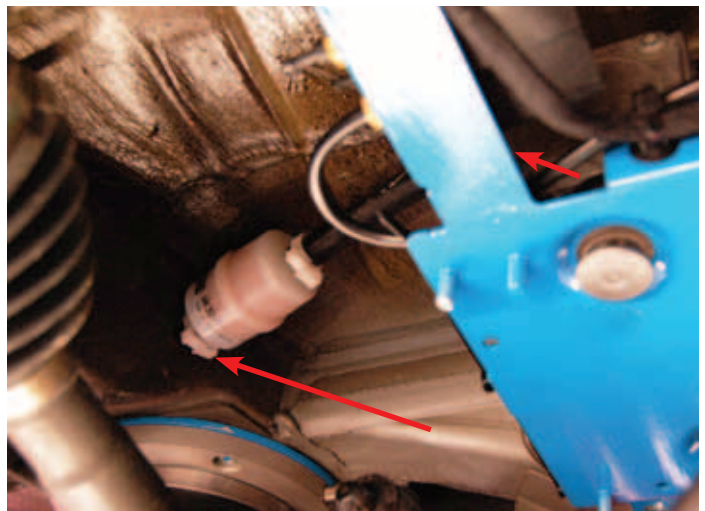


2. Mount the compressorbox to the chassis.

	3x Bolt M8x20 3x Washer M8
20 Nm	



3. Slide the suction-tube into the chassis.



4.4 Heightsensors



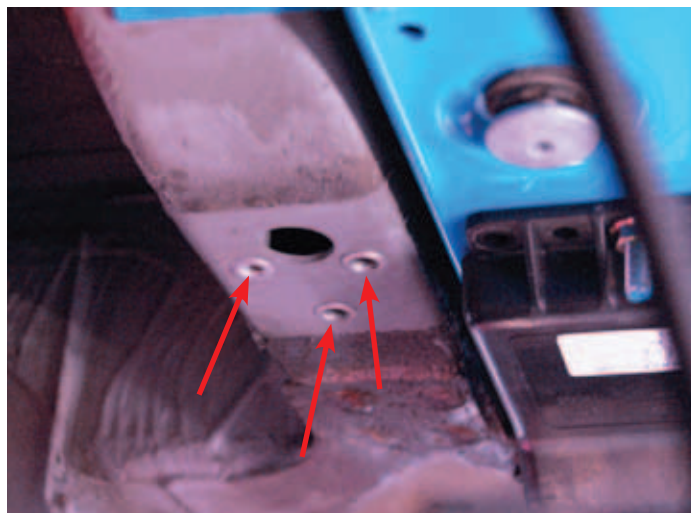
If the vehicle has Xenon lights, please first continue with chapter 8.

1. Mount three blind rivet nuts M6 into the three holes in the chassis. Do this for both sides of the vehicle.



6x Blind rivet nuts M6

-



2. Mount the left heightsensor to the chassis.



**3x Bolt M6x16
3x Washer M6**

8 Nm



3. Mount the right heightsensor to the chassis.

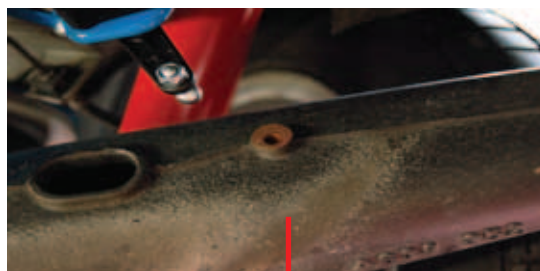


**3x Bolt M6x16
3x Washer M6**

8 Nm



4. Drill a hole of Ø5mm in the suspension arm.
5. Cut a M6x1 thread into this hole.



6. Mount the balljoint to the suspension arms.



**2x Ball joint M6
2x Washer M6**

8 Nm



7. Check the length of the heightsensor rods.
- **50 mm** measured from heart to heart.

When the vehicle is a 4X4 model, the height-sensor rods should be **-105 mm** , measured from heart to heart

8. Mount the heightsensor rod to the right heightsensor and the ball joint.



The arm of the right heightsensor should be pointing to the rear of the vehicle.



9. Mount the heightsensor rod to the left heightsensor and the ball joint.



The arm of the left heightsensor should be pointing to the front of the vehicle.



4.5 Wiring harness

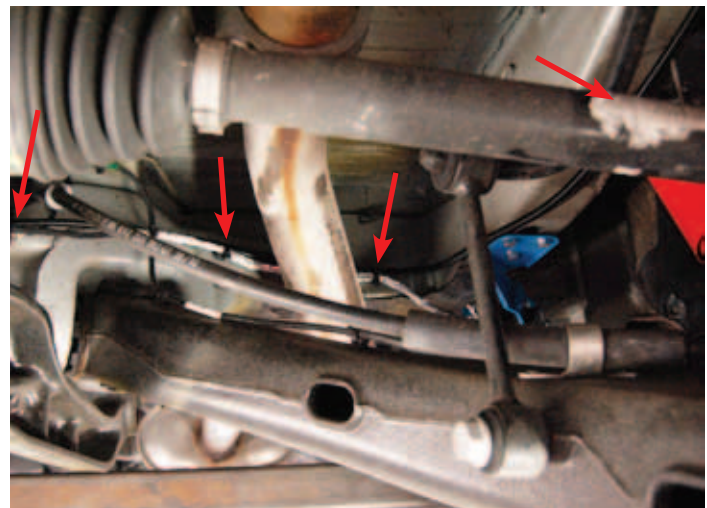
1. Lay the **black** heightsensorcable along the black air-tube to the right rear heightsensor.
2. Mount the air-tube and the cable with 3 or 4 cable ties with feet Ø6,5 to the chassis. (see arrows)



NEVER connect cables or tubes on the brake lines.



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



3. Lay the **green** heightsensorcable to the left heightsensor.
4. Mount the heightsensorcable with cable ties with feet Ø6,5 to the chassis (see arrows).
5. Connect the heightsensorcables to the heightsensors.



Push the connector untill you hear a "click".



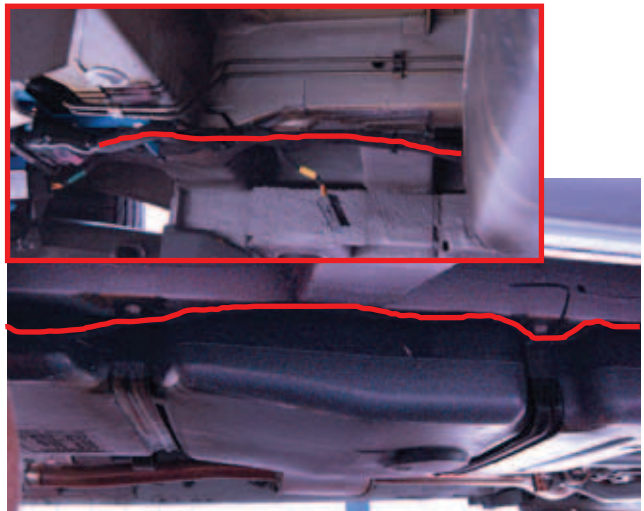
There never may be tension on the wiring and the plug connections.



6. Lay the air-tube of the right air-spring to the compressorbox.
7. Lay the air-tube of the left air-spring to the compressorbox.
8. Mount the **green** air-tube to the connection with the **green** mark on the compressorbox.
9. Mount the **black** air-tube to **black** connection on the compressorbox.



10. Lay the wiring harness along the leftside of the vehicle chassis along the fueltank to the front of the vehicle.(see red lines)
11. Mount the wiring harness with cable ties to the chassis.



Make sure that you have used enough cable ties to fasten the cable.

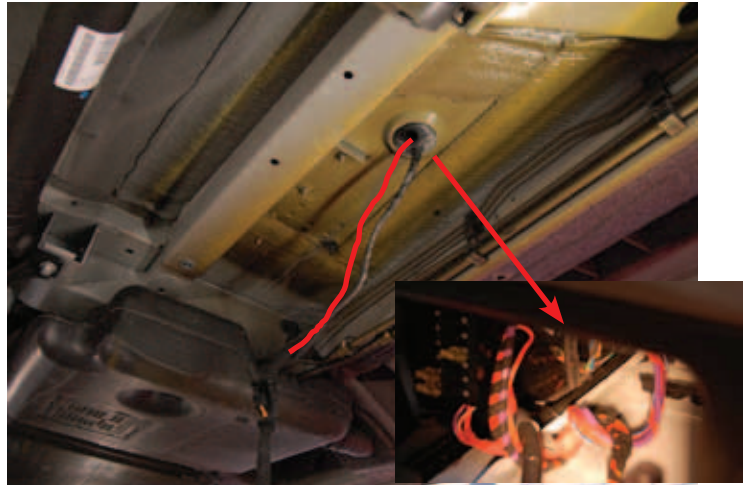
12. Remove the seat cover.



13. Remove the nut of the Earth point.
(see arrow)
14. Remove the support where the battery is mounted with.
15. Remove the battery.



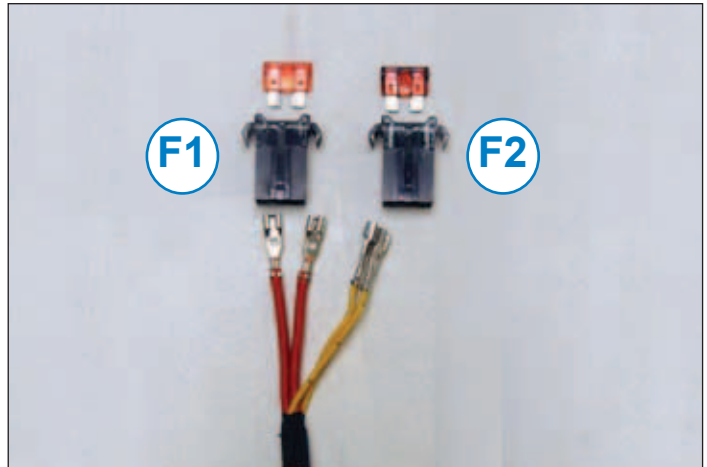
16. Place the wiring harness, through the rubber bushing into the floor of the seatframe.
17. Mount the wiring harness with cable ties to the chassis.



18. Mount the red cable on the positive(+) terminal of the battery.
19. Mount the red cable with cable ties to the battery cable.(see picture)



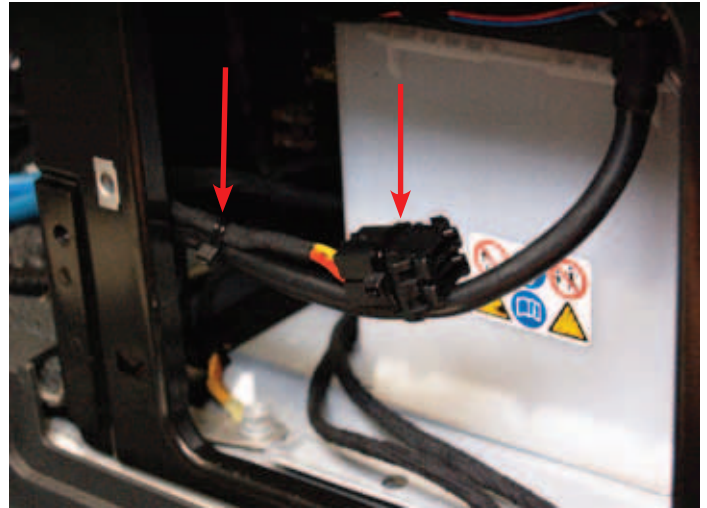
20. Connect the red wires in a fuse block (F1).
21. Connect the yellow wires in the other fuse block(F2).
22. Mount the battery back under the seat.



23. Mount the earth cable with an eyelet of 8mm of the VB wiring harness to the earth point of the car.



24. Mount the fuse blocks with cable ties to the earth cable of the battery.

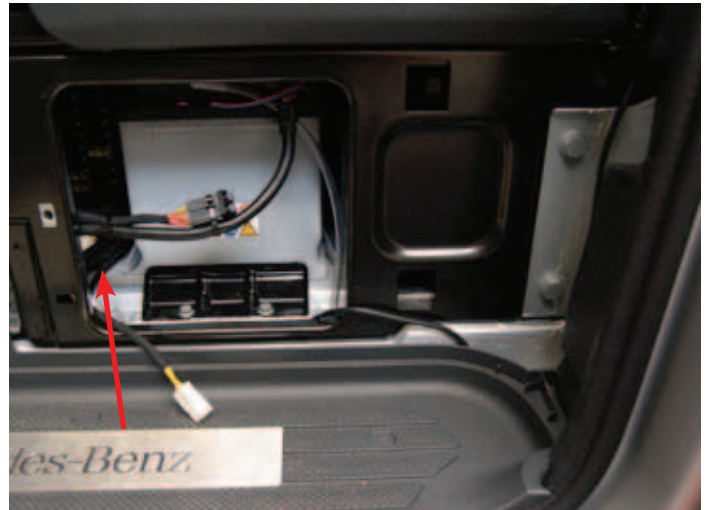


4.6 Remote

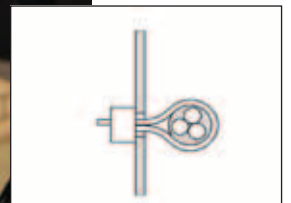


Make sure the remote control never gets in the way of the airbags.

1. Lay the cable of the remote in the corner between the covers to the opening of the battery. (Red line)
2. Mount the cable with cable ties with feet Ø6,5 to the seat frame. (see arrows)
3. Connect the cable of the remote to the wiring harness from VB.
4. Secure the cable out of sight in the seat frame.
5. Search for a good position to hang the remote control.
6. Mount the holder.
7. Hang the remote control in the holder.



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

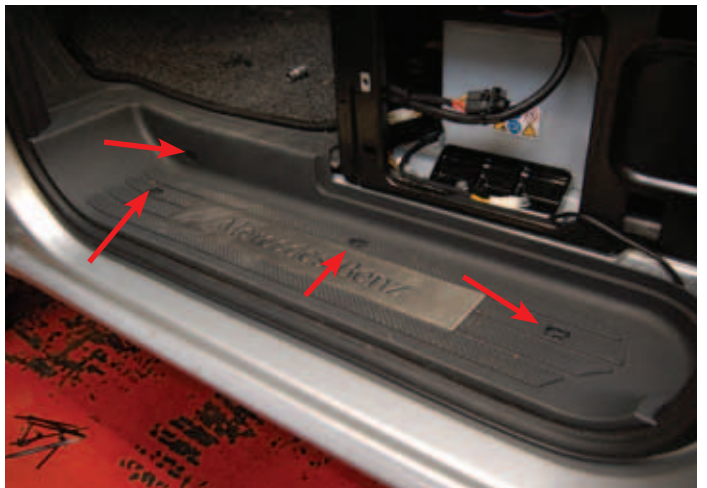


4.7 Remaining connections

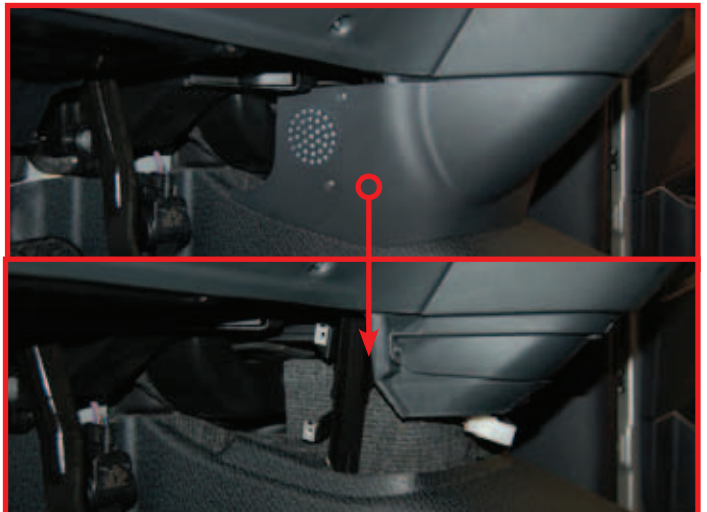
1. Remove the cover of the A-style on the drivers side.



2. Remove the entry trim of the cabin.



3. Remove the cover above the pedals.
4. Remove the cover of the middle console at the bottom.



5. Place the supply cable via the A style to the space above the pedals.

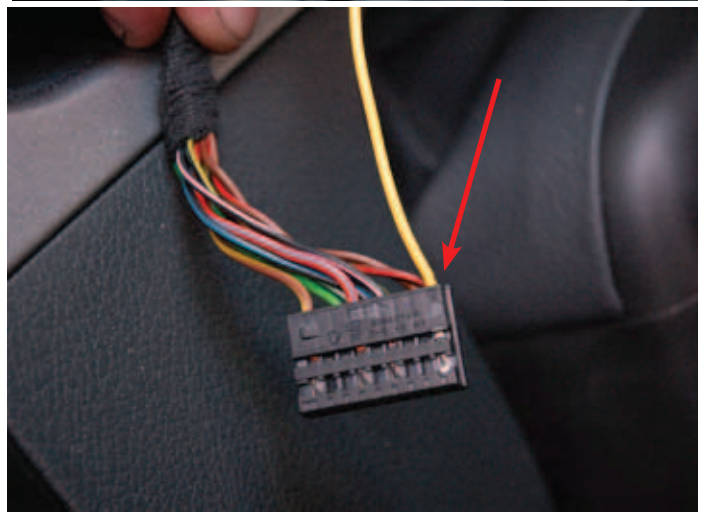


4.7.1 Speedsignal

1. Stick both hooks in the holes of the instrument cluster (see small picture) and gently turn them 90°. Next, pull the entire instrument cluster out of the dashboard.
2. Release the connector on the backside of the instrument cluster.
3. Press the lock and remove the inner black housing (1).
4. Place the yellow cable (nr 18) with the loose connector through the backside to the instrument cluster.
5. Place this cable in position 9 of the connector.
6. Re-Mount the connector and the instrument cluster in reverse order.



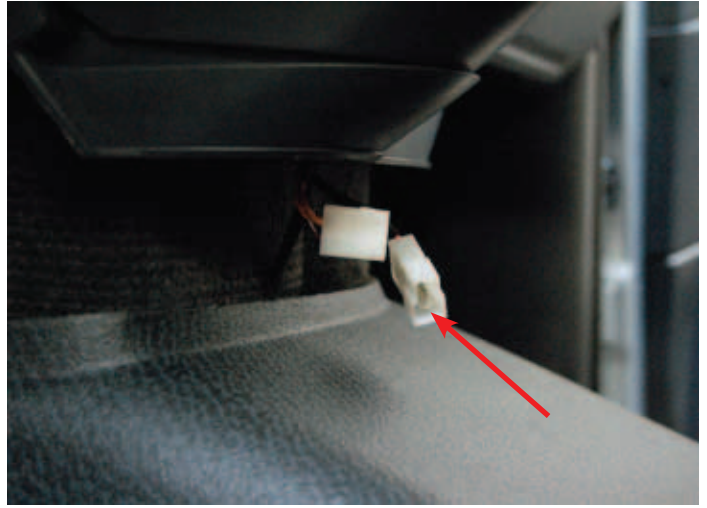
If the position 9 is already filled, please connect the yellow cable to that cable.



4.7.2 Contact plus

1. Search under the middle console to the connector which has been shown in the picture. (from the cigarette lighter)

2. Release the connection.



3. Lay the connectors from the VB wiring harness to the released connectors.



4. Connect the "VB" connectors to the original connectors.
5. Secure the wiring harness out of sight when re-mounting the covers.
6. Mount the covers back in reverse order.
7. Connect the connector of the speed and supply cable to the wiring harness under the seat.



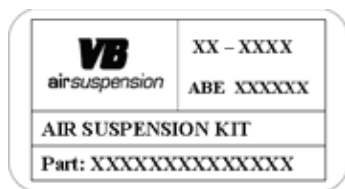
4.8 Warranty

1. Place the warranty stickers A+B in the B-style of the passengerside of the vehicle.

A



B

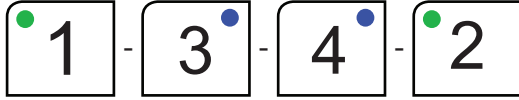


2. Place the sticker with the fuses instruction on the seat cover.

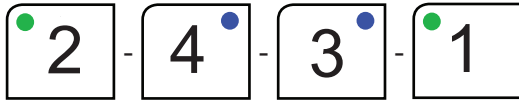


4.9 Calibration

1. Mount the fuses (**F1**=40A + **F2** = 7,5A)
2. Switch on the ignition.
3. Make sure the vehicle is standing on it's wheels, on a level surface.
4. Briefly press the **SERVICE**-key (LED lights), and enter the following code within 10 seconds:



- The system will give a long beep and reboot.
5. During the first beep, hold the **SERVICE**-key, until a second long beep is heard. Now enter the following code within 10 seconds:

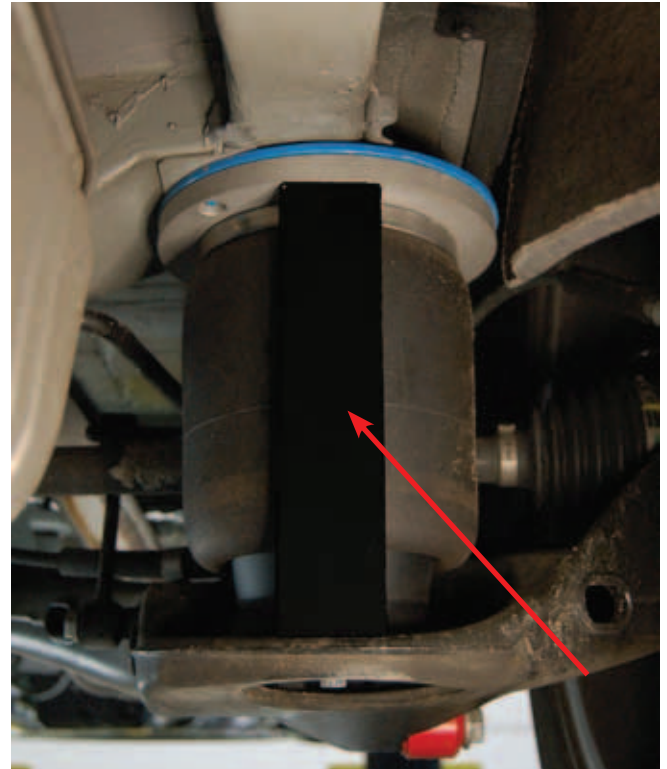
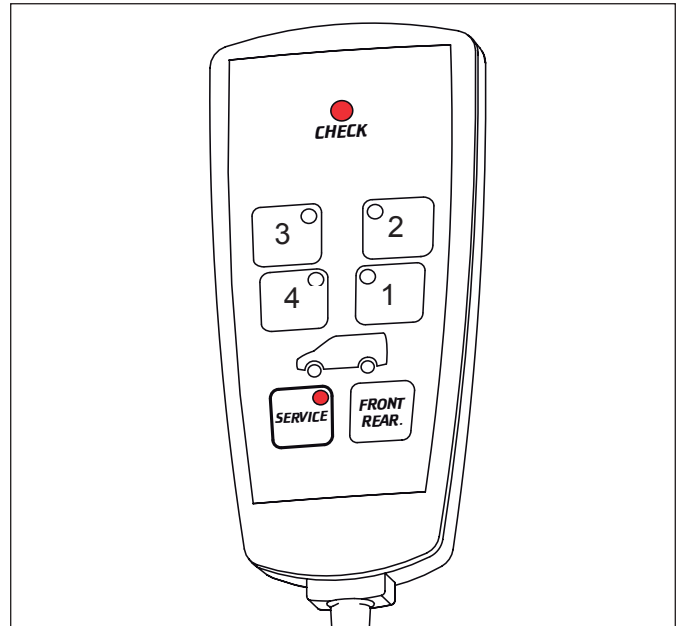


- The calibration mode is activated. The rear axle LED and **CHECK** LED will blink.
6. Use the arrow-keys to raise the vehicle to place the calibration supports.



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

7. Check if the calibration support are placed properly.
8. Use the arrow-keys to release all air from the air springs, until the hissing sound stops.
9. When the correct height is set, hold the **SERVICE**-key until a long beep is heard. The ride height is now stored.
10. Briefly press the **SERVICE**-key. The calibration mode is now closed. The system will reboot again
11. Briefly press the **SERVICE**-key to leave the Service mode.
12. Use the arrow key to lift the vehicle, so the calibration supports can be removed.
13. Remove the calibration supports.
14. Set the vehicle at ride height.
15. Switch off the ignition.
16. Secure all bolts and nuts, which were marked in this manual with **
17. Let an official dealer check the head-light adjustment.
18. Check the vehicle according to the checklist in this manual.



5. Checklist

5.1 System finishing

OK

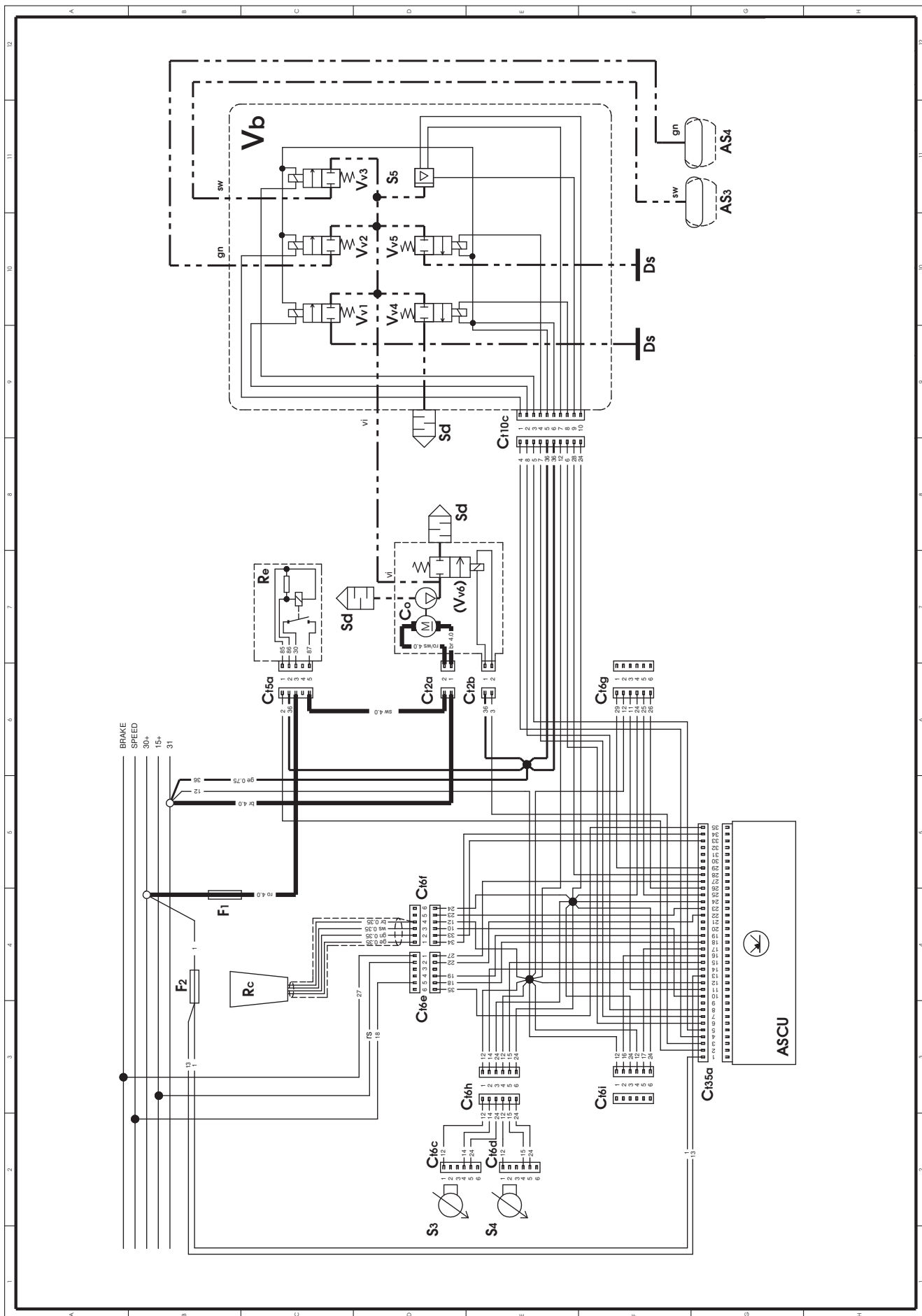
- | | | |
|------|---|--------------------------|
| 1.1 | Chassis height, near the rear axle, checked. | <input type="checkbox"/> |
| 1.2 | Shock absorbers set-up and relieved of air | <input type="checkbox"/> |
| 1.3 | Height sensor correctly mounted | <input type="checkbox"/> |
| 1.4 | Rear axle correctly aligned. | <input type="checkbox"/> |
| 1.5 | Tubes, cables and connectors correctly mounted. | <input type="checkbox"/> |
| 1.6 | Bolts and nuts tightened on the right torque and checked off in the manual. | <input type="checkbox"/> |
| 1.7 | System checked for air-leaks | <input type="checkbox"/> |
| 1.8 | Space around the air-springs checked | <input type="checkbox"/> |
| 1.9 | Present documentation checked. | <input type="checkbox"/> |
| 1.10 | Warranty form filled out and identification sticker stucked. | <input type="checkbox"/> |
| 1.11 | Transformation of air suspension written down in maintenance booklet. | <input type="checkbox"/> |

5.2 Functions of system

OK

- | | | |
|-----|---------------------------------|--------------------------|
| 2.1 | Manual raising | <input type="checkbox"/> |
| 2.2 | Automatic lowering above 5 km/h | <input type="checkbox"/> |
| 2.3 | Manual lowering | <input type="checkbox"/> |
| 2.4 | Automatic raising above 5 km/h | <input type="checkbox"/> |
| 2.5 | Test drive approved | <input type="checkbox"/> |

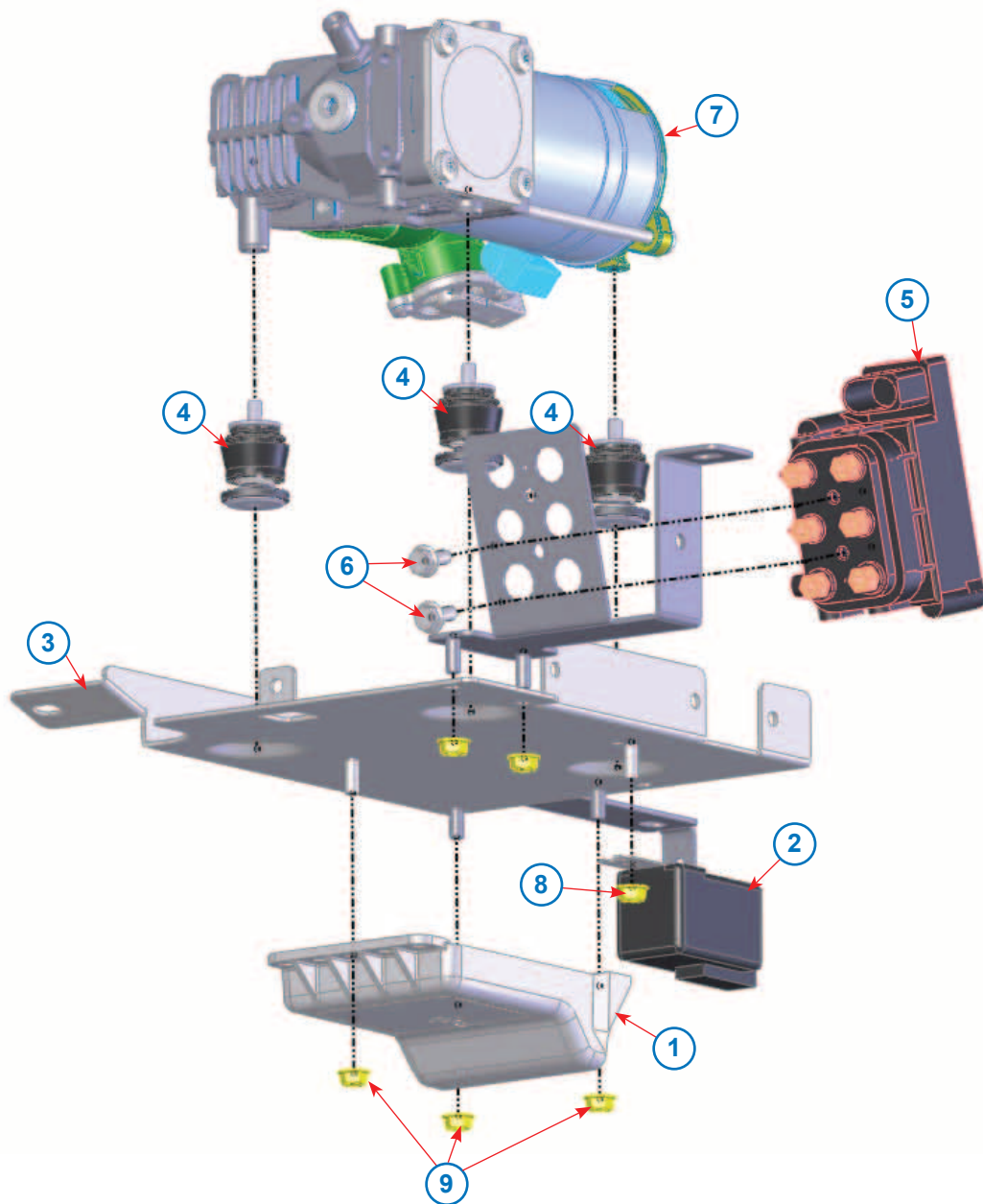
6. Wiring diagram



Name	Description
ASCU	VB-ASCU (control unit)
AS3	Air spring left
AS4	Air spring right
Co	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
Da	Dashboard
Di	Diode
Ds	Blind plug
F1	Fuse compressor, 40A
F2	Fuse compressor, 7,5A
F3	Fuse BF1 on the battery 30A
Speed	Speed signal
Brake	Brake signal
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

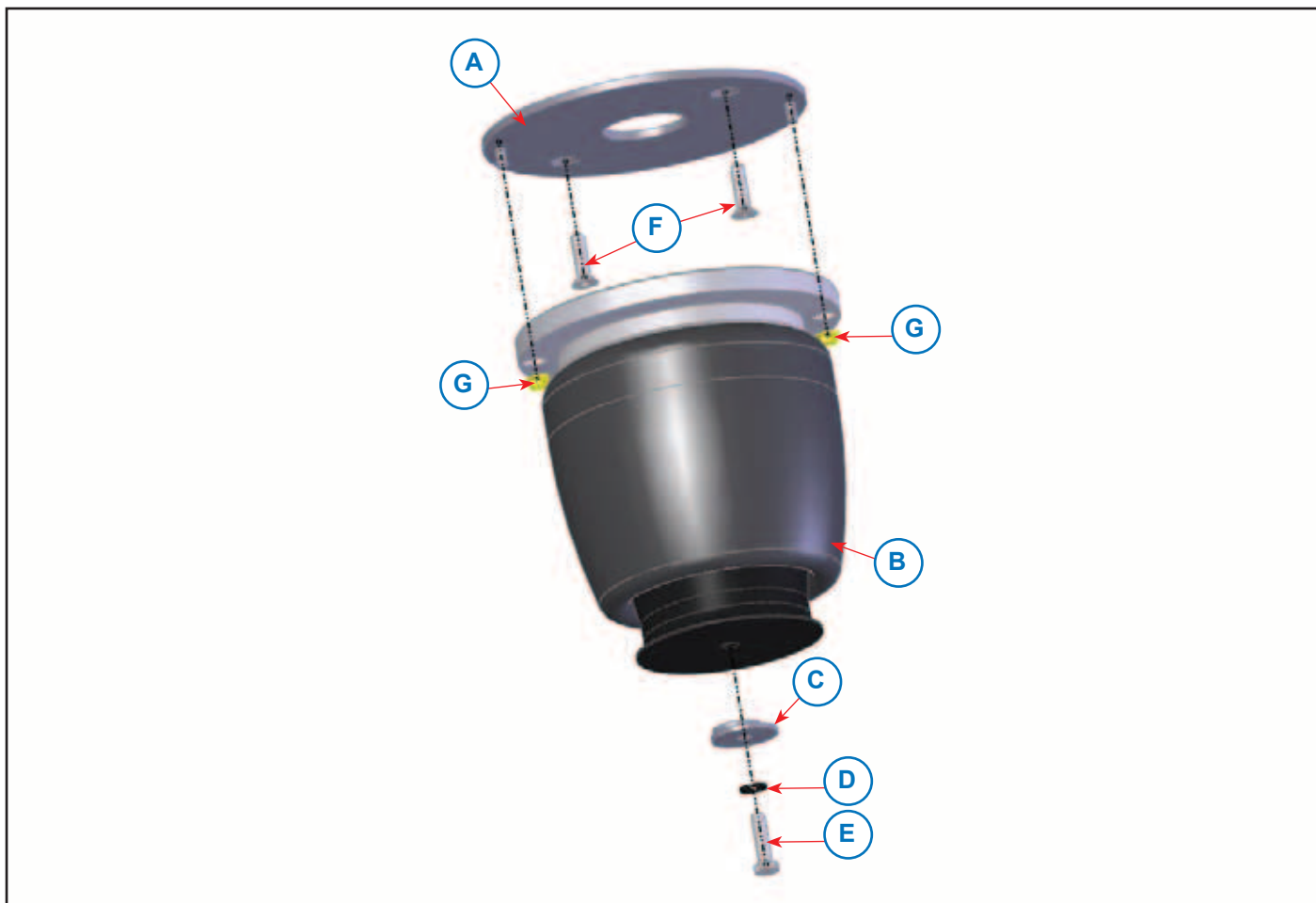
7. Exploded view

7.1 Compressorbox

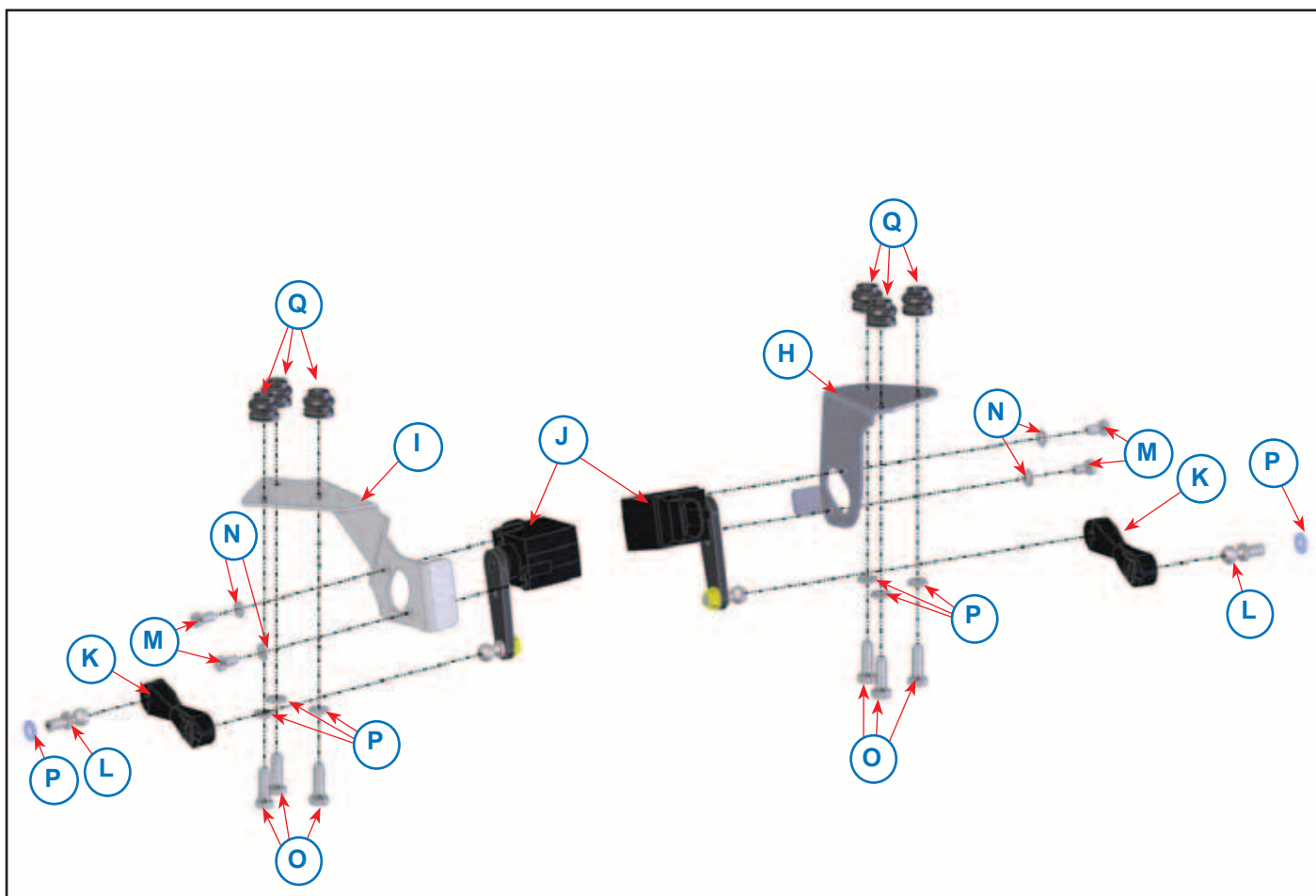


Item	Qt.	Description	Art. nr.
1	1	ASCU	105 212 20 10
2	1	Relais 40 Amp	003 050 00 07
3	1	Compressorbox bracket	105 213 11 31
4	3	Compressorhangingset	805 235 00 85
5	1	Valve block	105 225 06 71
6	2	Screw for plastic	001 520 60 12AA
7	1	Compressor	105 211 11 00
8	3	Flange lock nut	001 110 60 01 AB
9	3	Tensilock nut M6	001 110 60 00 AB

7.2 Air-spring



7.3 Heightsensor



Item	Qt	Description	Art. nr.
A	2	Upper spring plate	105 203 01 83
B	2	Air-spring	105 203 25 32
C	2	Clamping plate	105 205 00 83
D	2	Washer M8	001 120 80 00 A
E	2	Bolt M8x30 Kl. 8.8	001 010 80 300 AA
F	4	Countersunk Allan screw M8x16 Kl. 10.9	001 050 80 16 CA
G	4	Flange lock nut M6 Kl. 8.8	001 110 60 00 AB

Item	Qt.	Description	Art. nr.
H	1	Heightsensor bracket right	006 209 01 44
I	1	Heightsensor bracket left	006 209 01 45
J	2	Heightsensor	006 209 10 30
K	2	Heightsensor rod L=50mm HtoH	105 209 51 54
	2	Heightsensor rod L=105mm HtoH (only for 4X4 models)	105 209 50 72
L	2	Ball joint M6	105 209 51 78
M	4	Bolt M5x10 Kl. 8.8	001 010 50 10 AA
N	4	Washer M5	001 120 50 00 AA
O	6	Bolt M6x20 Kl. 8.8	001 010 60 20 AA
P	8	Washer M6	001 120 60 00 A
Q	6	Blind rivet nut M6	001 290 80 01

8. Xenon modification

1. Disconnect the original heightsensormount
2. Set the vehicle at ride height.
3. Disassemble the original heightsensor.
4. Remove the original heightsensorbracket.
5. Grind the bracket flat as shown on the picture.



Protect the surface with an anti corrosion substance. For example: protective coating or spray-wax.



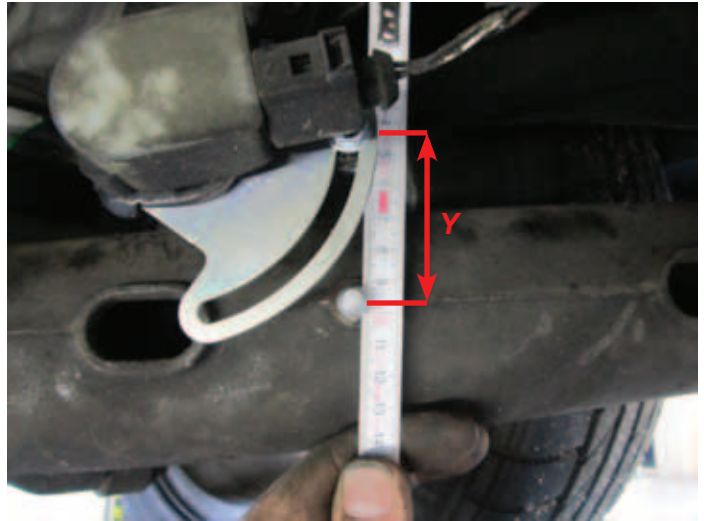
6. Mount the original heightsensorbracket.
7. Remove the ball joint out of the original heightsensor.
8. Mount the original heightsensor back at its bracket together with the mounting bracket for the heightsensormount.



8 Nm


**1 x Bolt M6x20
2 x Washer M6
1 x Lock nut M6**

9. Mount the original heightsensormount to the mounting bracket, the dimension Y must be the same length as the original heightsensormount.
10. Demount the original heightsensor with bracket.




11. Mount a blind rivet nut M8 into the hole in the cross beam. The hole is in the cross beam in front of the differential on the left side of the driving shaft.

	1x Blind rivet nut M8
-	

	<i>The picture was taken from the front side of the vehicle.</i>
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12. Mount the original heightsensor bracket with the heightsensor at the shown place to make place for the VB heightsensor.

	1 x Bolt M8x20
15 Nm	1 x Washer M8



13. Connect the original connector back to the original heightsensor.
14. Continue on page 11 with step 1.

9. Notes

[illegible]



VB-Airsuspension is producing, as one of the few European manufacturers, a very broad range of different (air-) suspension systems. From reinforced coil springs, semi-air suspension systems, up to complete full air-suspension systems, we provide solutions for customers with different vehicle types, like ambulances, minibuses, car transporters, motorhomes, etc. Now you can see why more and more commercial vehicle body manufacturers specify VB-Airsuspension on their vehicles.



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