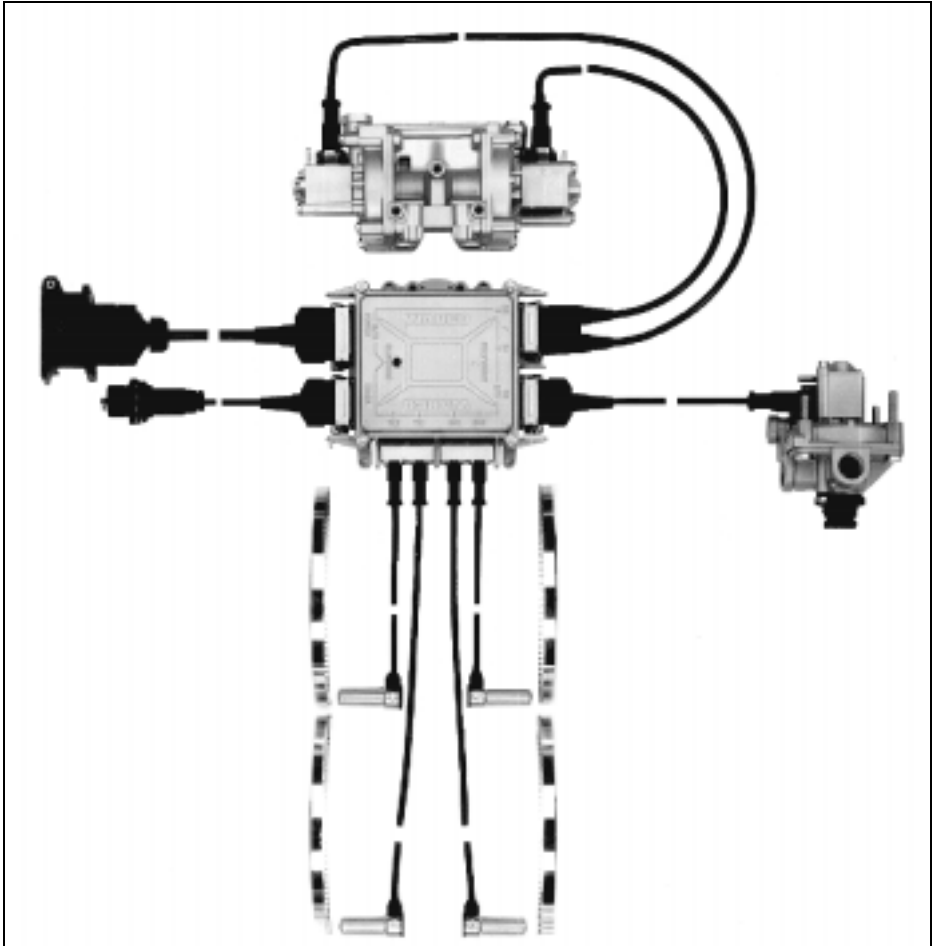


WABCO



Installation Instructions Vario Compact ABS (VCS)

Installation Instructions

Vario Compact ABS (VCS)

Installation of the Vario Compact ABS developed by WABCO is very easy and requires very little effort. The ECU no longer needs to be opened.

Overview Vario Compact ABS

WABCO Part Number		Possible Systems				Features						Comments
FIG. 1												
Compact Design	Separate ECU	4S/3M	4S/2M	2S/2M	ISO	24N	RV	MRV	ISS	RET	C3	
400 500 030 0	446 108 030 0	X	X	X	X	-	X	-	X	-	X	3 MOD
-	446 108 031 0	X	X	X	X	-	X	X	X	-	X	VCS-Plus
400 500 037 0	-	X	X	X	X	X	X	-	X	-	X	3 MOD
400 500 038 0	-	X	X	X	X	X	X	-	X	-	X	3 MOD
FIG. 2												
400 500 032 0	446 108 032 0	X+RET	X	X	X	-	X	X	-	X	X	2 MOD, 4S/3M+RET
400 500 034 0	-	X	X	X	X	X	X	-	X	-	X	w. stud bolts, 2 MOD
400 500 035 0	446 108 035 0	X	X	X	X	X	X	-	X	-	X	2 MOD
400 500 036 0	-	X	X	X	X	-	X	-	X	-	X	2 MOD
400 500 050 0	446 108 050 0	X	X	X	X	-	X	X	X	-	X	12 Volts-ECU
FIG. 3												
400 500 040 0	446 108 040 0	-	X	X	X	-	X	-	-	-	X	
-	446 108 041 0	-	X	X	X	-	X	X	-	-	X	VCS-Plus
400 500 042 0	-	-	X	X	X	-	X	-	-	-	X	
400 500 045 0	446 108 045 0	-	X	X	X	X	X	-	-	-	X	
400 500 046 0	-	-	X	X	X	X	X	-	-	-	X	

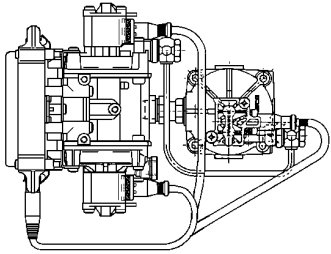


FIGURE 1

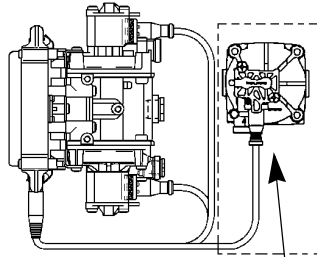


FIGURE 2

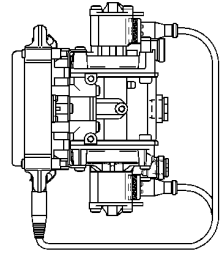


FIGURE 3

not supplied

Explanations:

- 4S/3M, 4S/2M, 2S/2M: system suitable for the respective ECU; grey background means as supplied, 2S/1M always being possible.
- ISO: Supply according to ISO 7638; with supply exclusively according to ISO, voltage output for Diagnostic Controller on the diagnostic plug.
- 24N: additional supply with 24N (mixed supply).
- RV: actuation for ABS relay valve only.
- MRV: actuation for solenoid control valve (ABS relay valve possible).
- ISS **I**ntegrated **S**peed **S**witch.
- Ret: actuation of a retarder possible.
- C3 Output for speed signal at the diagnostic plug.
- 2MOD 3rd modulator and solenoid cable are **not** supplied with the compact unit.
- 3MOD 3rd modulator and solenoid cable are supplied with the compact unit.
- w.Stud bolts with 3 stud bolts M8 for mounting on the ABS relay valve.

1. Installing the System

1.1. As A Compact Unit

If a compact unit is fitted (consisting of the ECU and the horizontally opposed valve) it should be placed close to the rear axle of a trailer, or in the immediate vicinity of the central axle of semi-trailers / central axle trailers. For mounting, use 3 bolts M8.

1.2. As Separate Units

If separate components are to be installed, the ECU can be placed anywhere on the vehicle frame. Use either the 4 front through holes (facing the front of the ECU), or the 3 threaded holes at the rear (facing the back of the ECU).

Please take into account the depth of the blind hole in the centre, selecting a bolt of the appropriate length (see enclosed drilling templates).

2. Installation of Air Lines And Wiring

Connect the air lines to the various components as you would for Vario-C.

2.1. Securing Electrical Plug-In Connections

For this purpose, WABCO has developed a new locking system, the plugs is located on the outside of the ECU.

This locking system makes the wiring very much easier to connect and also ensures that the ECU remains sealed since it is no longer opened. Each plug is coded to avoid confusion. The cables can also have coding sleeves fitted to prevent mismatching.

Please make sure that the plug-in connections are always secured using the locking strap.

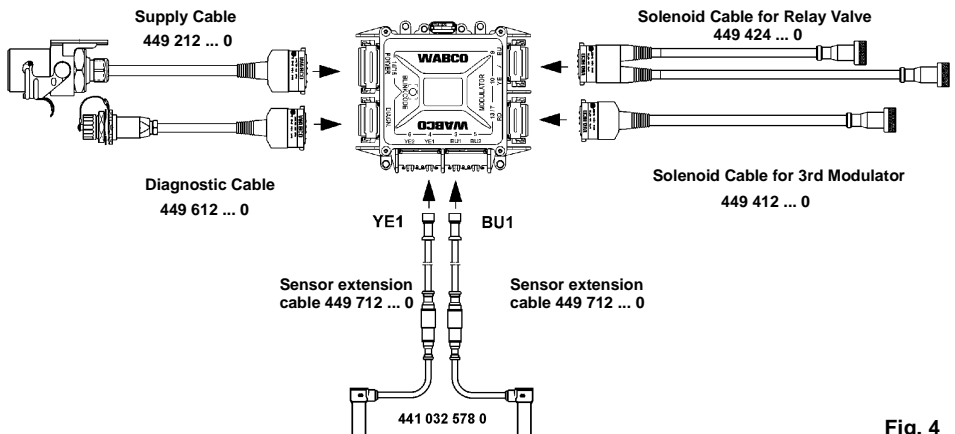


Fig. 4

2.1.a 2S/2M System:

- Connect solenoid cable (Y cable) 449 424 ... 0 to connector YE/BU on the modulator terminal (necessary only if separate ECU is used).
- Connect one sensor cable 449 712 ... 0 to connector BU 1 (see Section 3 - Coding Sleeves).
- Connect the second sensor cable to connector YE 1
- Connect supply cable 449 .12 ... 0 to the "Power" connector.

General Information

- When connecting the sensor and modulator cables, the same applies as for Vario-C

Sensors YE and Modulator YE always on the right-hand side looking in driving direction (see also Page 9).

- To make sure that the right cables are connected, it is important to select the same colour for each side of the vehicle (see system examples - wiring diagram 841 801 188 0).
- When connecting the cables, please make sure that the WABCO logo on each plug faces upwards (so that looking at the ECU you will see the flash code lamp and the logo on the plug).

The plugs are then secured using the special locking straps provided.

- **When the cables have been connected, the system's voltage supply can be switched on**

2.1. b 4S/2M System:

- All connections similar to the 2S/2M system plus
- Plug sensor cable into connector BU 2.
- Plug sensor cable into connector YE 2.

When properly connected, secure all cables with the locking straps provided.

2.1. c 4S/3M System

- All connections similar to the 4S/2M system plus:
- Modulator cable 449 412 ... 0 for the 3rd modulator at modulator connector RD

When properly connected, secure all cables with the locking straps provided

3. Coding Sleeves for Sensor Extension Cables

The sensor connectors have also been designed in such a way that mismatching is impossible. When first installing the system, make sure you have the allocations right. When fitting these coding sleeves, the following applies:

(4 coding sleeves per accessory kit, WABCO Part Number 472 195 374 2)

- All ECUs are supplied with filler plugs but without coding sleeves
- If coding sleeves are to be used, remove the filler cap. Take the coding sleeve for that connector from the accessory kit.
- Now push the sensor extension cable into the sleeve and connect to the terminal provided on the ECU (see wiring diagram 841 801 188 0).

- Follow the same procedure for the other sensor cables.

Basic Information

There are 4 different coding sleeves. To prevent errors when reconnecting sensors after repairs, there is one coding sleeve for each terminal.

The purpose coding sleeves is merely to prevent mismatching. VCS is, of course, fully operational even if no coding sleeves are used.

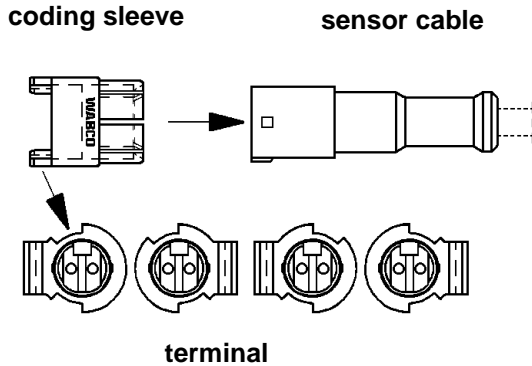


Fig. 5

4. Watch Flash Code LED

When the ECU receives its voltage supply, the integrated flash code lamp will come on.

- If there is no fault within the system, it will go off again after approx. 3 seconds
- If there is a fault, a flashing cycle will commence. The number of flash pulses corresponds to the various terminals.

Example:

The lamp flashes 6 times

The faulty component is YE 2 (see marking on the cover: YE 2 = 6). Check the sensor and the cable of terminal YE 2.

If you require any further information on the type of error, please use one of the following diagnostic tools from WABCO:

- Flash Code Plug 446 300 334 0 (for a description, see brochure 815 000 209 3)
- Compact Tester 446 300 400 0 (for a description, see brochure 815 000 207 3)

A description for both types of diagnostic equipment is available describing the commissioning test, system inauguration etc. in more detail.

Basically the following points are important

- sufficient voltage supply
- correct allocation sensors / modulators
- air gap between sensor and pole wheel no greater than 0.7 mm.

When completing the commissioning process, the error memory **must** be deleted. When doing a test run, make sure the indicator lamp in the towing vehicle goes off when the vehicle has reached a speed of approx. 7 k. p. h.

Additional Information on Defects

The dual markings on the ECU cover mean:

Display LED flashing:

- 7 times** - modulator A is defective
- 13 times** - retarder is defective
- 14 times** - defective supply cable or system variance
- 15 times** - defective ECU.

5. Remediating One Or Several Defects

Before remediating any defect, the ignition has to be switched OFF. After it has been remedied, it must be switched ON again.

6. General Information

Disconnecting Plug-In Connections

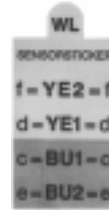
Whenever it is necessary to pull out a plug, it is important to know:

- The locking straps can be released by hand. To do this, push the locking strap upwards by applying even pressure with the thumb and forefinger of one hand, or use the thumbs of both hands.

Painting Cover for ECU (WABCO Part Number 830 902 402 4)

There is a cardboard cover available for protecting the ECU of the VCS. This cover is available on request. To make sure that the cables' locking straps are protected from any excess paint, we strongly recommend the use of this painting cover, or protection of the locking straps using sticky tape (warranty in the event of any claims).

Sensor Sticker 899 200 822 4



The stickers with the above WABCO part number are available for marking the sensor cables (main axle or steering/additional axle). They are supplied in rolls of 1,000 stickers each (roll diameter approx. 16 cm) but are also available singly.

Fitting Position For Separate ECU

In order to avoid the sensor terminals getting excessively dirty, the ECU should not be fitted in such a way that its terminals point upwards (looking at the ECU as shown in Fig. 6).

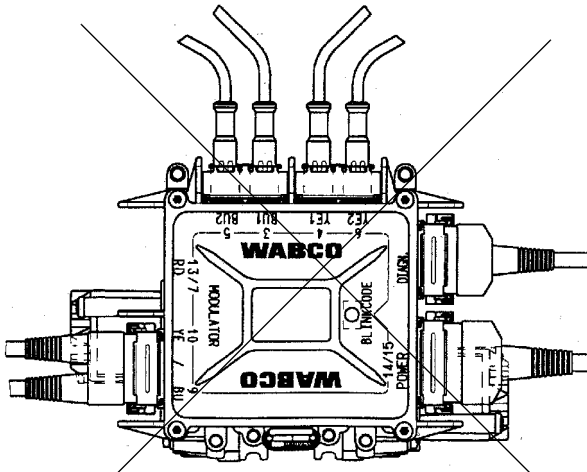


Fig. 6

Important Information For Allocating Sensors + Modulators

The rule known from Vario-C:

YELLOW ON THE RIGHT WHEN LOOKING IN DRIVING DIRECTION

also applies to Vario Compact, regardless of whether the ECU is installed separately or as a part of a compact unit.

Compact Design (ECU on horizontally opposed valve):

Release the solenoid cables on the housing and push the cable with the yellow marking onto the modulator which is on the vehicle's right-hand side as you look in the driving direction (the unit to be fitted either in driving direction or against the driving direction).

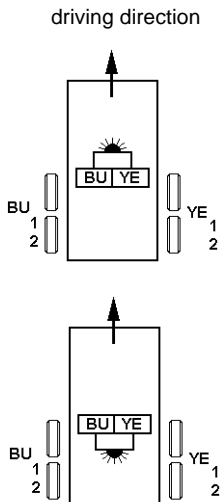
Separate Installation of ECU (Separate Relay Valve or Horizontally Opposed Valve):

Push solenoid cable with the yellow marking onto the modulator which is on the right as you look along the vehicle in its driving direction.

Connecting The Sensor Cables:

YE Sensors (YE 1 or YE 2) are also connected on the right as you look along the vehicle in the driving direction. For the allocation of axles, please refer to the system examples in the brochure entitled "Expertises for Trailers VARIO COMPACT ABS", Part Number: 815 000 203 3.

Compact Design



ECU fitted separately

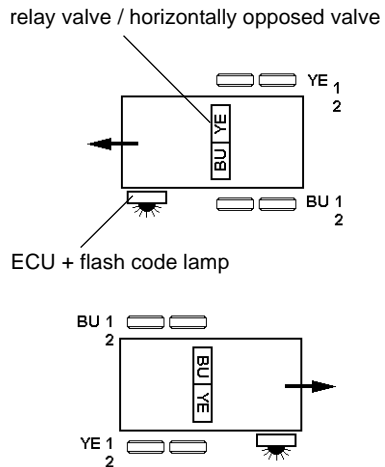


Fig. 7

Diagnostic Cable 449 612 ... 0

WABCO has made it possible to perform external diagnosis on the vehicle. For this purpose, Diagnostic Cable 449 612 ... 0 can be affixed to the vehicle on its front or rear.



WABCO Part No.	Length (mm)
449 612 010 0	1000mm
449 612 030 0	3000mm
449 612 050 0	5000mm
449 612 060 0	6000mm

This cable has the sprayed-on VCS plug on its electronics end and a round 7-pole connector (similar to ECAS).

WABCO Recommendation

This diagnostic socket is always placed on the left as you look along the vehicle's driving direction, e. g. immediately next to the rotary slide valve. For mounting, a hole with a diameter of 32 mm is required. After removing the retaining nut, this socket can be mounted on a suitable retaining plate.

To appropriately mark this diagnostic socket, each cable has a sticker supplied (length 60 mm, width 17 mm). Since this socket is also used for ECAS diagnosis, each accessory pack contains a **WABCO ABS ECAS Diagnosis** sticker.

After installation, that sticker should be affixed in the immediate vicinity of the diagnostic socket.

Other Diagnostic Means

If the diagnostic means listed above appear to make diagnosis excessively time-consuming, WABCO also offers more comfortable and easy-to-use diagnostic equipment:

Compact Tester:

This tester now permits the Vario-C and VCS electronic systems in a trailer to be tested without any documentation and to achieve real commissioning. Any errors are logically assigned to symbols and are clearly defined.

Compact Tester: 446 300 400 0
Diagnostic Cable: 446 300 401 0

Diagnostic Controller:

This allows what is probably the most comprehensive type of diagnosis. The Controller has an integrated multimeter. The findings from testing the ABS can also be printed out in a log.

PC Diagnosis

Using the PC for diagnosis represents the latest and most convenient diagnostic procedure for VCS. All of the functions which the Diagnostic Controller offers are provided. In addition, the notebook function can be used.

The software (2 diskettes) and the interface are available from WABCO.

The programme requires WINDOWS (Windows 3.1 or Windows 95) and will run on any common PC or laptop computer.

Diagnostic Equipment for VCS

Diagnostics Cards VCS:

		(F)	446 300 655 0
(D)	446 300 624 0	(I)	446 300 656 0
(GB)	446 300 651 0	(S)	446 300 660 0

PC-Diagnosis

