



Type : **Trailer EBS D**
Manufacturer : **Wabco GmbH**

Page: 1

Test report
No.: TUEH - TB 2010 - 185.00

In accordance with the Directive of the European Council
Relating to the
Technical unit

Trailer EBS D
98/91/EG dated **14.12.1998**
ECE-R 105
including amendment 04
and
Annex B, part 9 ADR 2009

Approval status		
	Approval number / Test Report	Date
EEC	e1*72/245*2006/28*1206*03 (EMC-Approval)	21.09.2006
	Trailer Anti Lock Braking System Approval Report No.: EB 123.7E of TÜV Nord Mobilität (attestation by Kraftfahrt-Bundesamt ¹)	16.11.2006 (17.01.2007)
	Electronic Function & Safety Assessment Test Report No.: EB 124.3 E of TÜV Nord Mobilität (attestation by Kraftfahrt-Bundesamt ¹)	24.11.2006 (17.01.2007)

Name and address of the test laboratory : TÜV Technische Überwachung Hessen GmbH
-Automotive-
Rüdesheimer Str. 119
D-64285 Darmstadt
Telefon: 06151 600 240/237
Telefax: 06151 600 670
Email: juergen.meid@tuevhessen.de

Name and address of applicant : WABCO GmbH
Am Lindener Hafen 21
DE-30453 Hannover
<http://www.wabco-auto.com>

¹ German Federal Motor Vehicle Approval Agency



Type : **Trailer EBS D**
Manufacturer : **Wabco GmbH**

Page: 2

0. General

- 0.1. Make
(trade name of the manufacturer) : **WABCO**
- 0.2. Type : **Trailer EBS D**
Commercial description : **Trailer EBS D**
- 0.3. Marking of type, if present on the
separate technical unit (b); : **480 102 010 0 – 480 102 019 0**
- 0.4. Location of that marking : **On the identification plate**
- 0.5. Name and address of the manufac-
turer : **WABCO GmbH
Am Lindener Hafen 21
D-30453 Hannover
Germany**
- 0.6. Description of the system : **815 020 020 03
System Spezifikation
480 102 000 0 / doc. 535
480 102 019 0 / doc. 535**
- 0.7. Location of EEC type approval mark,
method of applying the mark : **engraved in the cover of the electronic unit**
- 0.8. Modifications : **n.a.**



Type : **Trailer EBS D**
Manufacturer : **Wabco GmbH**

Page: 3

1. Vehicle part

1.1. Description

1.1.1. **Modulator: variants** : 480 102 010 0 – 480 102 019 0

1.1.2 **Connections, pneumatic:** : 1 Supply reservoir
2.X Brake actuator
3 Discharge
4 Control pressure

1.1.3 **Connector locations, electrical:** : Modulator
Power
Diagn.
C (speed sensor)
D (speed sensor)
E (speed sensor)
F (speed sensor)
IN/OUT1
IN/OUT2
Wear Indicator

1.1.4 **Connecting cable:** Coat insulation of power cable (bulk stock) made out of PUR or optionally of PVC
Further description see appendix 1

1.1.6 **Installation instructions:** : 815 020 020 3 / description of the system, section 6
449 000 000 0 / doc. 611



Type : **Trailer EBS D**
Manufacturer : **Wabco GmbH**

Page: 4

2. Testing protocol

2.1. Test results

- 2.1.1. General : Taking into account the directives stated above, the **EBS Modulator** was checked for its suitability for trailers permitted for the transportation of dangerous goods. The scope of testing also includes the connecting cables stated above, installed in the relevant connections. IP54 is the minimum degree of protection demanded for electrical plug connections in ADR vehicles (GGVS (Act Governing the Road Haulage of Hazardous Materials (Germany))).
- 2.1.2. Tests on vehicle : The applicant presented the above-mentioned **EBS Modulator** in a braking-system model. Tests at vehicles have been performed by TÜV Nord (Test Reports see above). The anti lock system does comply with category A for trailers.

2.2. Scope

- 2.2.1. Trailer specification : All **O₃ and O₄** trailers requiring a Registration Certificate for the transport of certain dangerous goods (see clause 2.2.3.).
- 2.2.2. Designation of vehicle body according to 9.1.1.2 directive ADR 2009 : Vehicle **EX/II or EX/III**
Vehicle **FL**
Vehicle **OX**
Vehicle **AT**
Vehicle **MEMU**
- 2.2.3. Definition of O₃ and O₄ trailers (for point 2.2.1.) : In accordance with Framework Directive 2007/46/EG, annex II, clause A, subclause 3 :
- Vehicle category O₃ Trailers (including semi-trailers).
- 2.2.3.1. Vehicle category O₃ : Trailers with a maximum permitted mass exceeding 3,5 tonnes but not exceeding 10 tonnes.
- 2.2.3.2. Vehicle category O₄ : Trailers with a maximum permitted mass exceeding 10 tonnes.



Type : **Trailer EBS D**
Manufacturer : **Wabco GmbH**

Page: 5

2.2.4. In accordance with ADR 2009, part 9, chapter 9.1, subclause 9.1.1.2

2.2.4.1. vehicle EX/II or EX/III : A vehicle intended for the carriage of explosives or objects including explosive material (class 1)

2.2.4.2. vehicle FL : a) A vehicle intended for the carriage of liquids with a flashpoint of not more than 60 °C (with the exception of Diesel fuels according to the standard EN 590:2004, gas oil or heating oil (light) – UN number 1202 – with a flashpoint according to standard EN 590:2004) in fixed tanks or mountable tanks having a volumetric capacity of more than 1 m³ or in tank containers or portable tanks having a volumetric capacity of more than 3 m³ per single reservoir
or
b) A vehicle intended for the carriage of flammable gases in fixed tanks or mountable tanks having a volumetric capacity of more than 1 m³ or in tank containers or portable tanks or MEGC having a volumetric capacity of more than 3 m³ per single reservoir
or
c) A battery-vehicle with a total capacity of more than 1 m³ for the carriage of flammable gases.

2.2.4.3. vehicle OX : A vehicle intended for the carriage of hydrogen peroxide, stabilized, or of hydrogen peroxide, aqueous solution, stabilized with more than 60 % hydrogen peroxide (class 5.1 UN number 2015) in fixed tanks or mountable tanks having a volumetric capacity of more than 1 m³ or in portable tanks having a volumetric capacity of more than 3 m³ per single reservoir.

2.2.4.4. vehicle AT : a) A vehicle other than those of type EX/III, FL or OX intended for the carriage of dangerous goods in fixed tanks or mountable tanks having a volumetric capacity of more than 1 m³ or in tank containers, portable tanks or MEGC having a volumetric capacity of more than 3 m³ per single reservoir
or
b) A battery vehicle having a volumetric capacity of more than 1 m³ which is not a vehicle FL.

2.2.4.5. vehicle MEMU : A vehicle which complies with the definition "Mobile unit for the production of explosive substances or objects containing explosive materials" given in section 1.2.1.



Type : **Trailer EBS D**
Manufacturer : **Wabco GmbH**

Page: 6

2.2.5. Definition of the zones supplements to the vehicles FL according to 2.2.4.2. : In its subclause 9.7.8.2, the ADR gives an explanation of the classification of zones 0 and 1. Together with the application of the relevant explosion protection regulations and their instructions for implementation, these explanations are the basis for the general indications stated here.

2.2.5.1. Zone 0 : Zone 0 comprises areas in which an explosive atmosphere is present continuously or for long periods. In case of tank trucks, vehicles having tanks and battery vehicles, this is, for instance,
- the internal of the tanks, armatures and lines used for filling or delivering and for gas return

2.2.5.2. Zone 1 : Zone 1 comprises areas in which an explosive atmosphere is likely to occur in normal operation. In case of tank trucks, vehicles having tanks and battery vehicles, this is, for instance,
- the internal of closed armature boxes
- within a radius of 0.5 m around the armatures
- within a radius of 0.5 m around the venting equipment which cannot be shut off and is open under normal operating conditions (such as tipping valve)
- within a radius of 0.5 m around the safety valves

2.2.5.3. Zone 2 : Zone 2 comprises areas in which an explosive atmosphere is not likely to occur in normal operation and, if it does occur, is likely to do so only infrequently and will exist for a short period only.

2.3. Conditions

2.3.1. Ground return line : When fitting and installing an EBS modulator into a trailer having the ADR certificate, the ground return line must not be routed via vehicle frame. The maximum intensity of current must not exceed the device-specific permitted current of the line and connection.



Type : **Trailer EBS D**
Manufacturer : **Wabco GmbH**

Page: 7

- 2.3.2. Installation position of the EBS : The suitable location on the trailer has to be decided first. The installation has to be done in accordance with system documentation (Installation Instruction). The installation in FL vehicles has to be made outside the areas of zone 0 and 1 (according to chapter 2.2.5.!) Additional batteries in trailers have to be operable by means of a disconnection switch (Emergency OFF) in ADR-vehicles.
- 2.3.3. Fixation of cables : In order to prevent any vibration transfer to connectors or connector sealings, the free cable length between connector and cable clip shall not exceed 30 cm (except the cable ensuring the connection to the towing vehicle). Fastening of cables shall be such as to prevent any chafing.
- 2.3.4. Load room of EX/III vehicles : If the load room of EX/III vehicles is provided or permitted for goods of the compatible group J (= *objects that contain both explosive materials and flammable liquids, or flammable gel*), there are only electrical equipment parts in the load room allowed, corresponding at least the protection degree IP65.
- 2.4. **Summary of assessment** : **From the technical point of view, there are no objections to the installation of the EBS modulator in trailers which according to ADR 2009 are subject to the special rules defined for the transport of dangerous goods if the installation complies with the conditions stated above.**
- 2.5. **General indications**
- Date of testing : 23rd August, 2010



Type : **Trailer EBS D**
Manufacturer : **Wabco GmbH**

Page: 8

3. Appendices

1. : Connecting cables at the slots of the Trailer EBS D modulator and connecting valves
2. : Illustration of the system connections
3. : Arrangement of the EBS D trailer modulator in combination with a semi-trailer
4. : Arrangement of the EBS D trailer modulator in combination with a draw-bar trailer
5. : Trailer EBS D system plate [example]

4. Statement of conformity

The system description given in section No. 0.6. and the vehicle part stated in this description -
- comply - with the directives stated above

This report includes pages 1 to 8 and the appendices.

Duplication and publishing in extracts of the Test Report is allowed only by written permission of the Test Laboratory.

TEST LABORATORY
- Automotive -
TÜV Technische Überwachung Hessen GmbH

ECE-R 105
designated by designation authority of Kraftfahrt-Bundesamt,
Federal Republic of Germany
under the registration number:
KBA-P 00005-95

64285 Darmstadt, 22.12.2010
42155978



Dipl.-Ing. Meid

**Appendix 1
to Test Report**
No.: **TUEH - TB 2010 - 185.00**
on the basis of the Test Instructions
98/91/EG, ECE-R 105
and **Annex B, part 9 ADR 2009**



Type : **Trailer EBS D**
Manufacturer : **Wabco GmbH**

Part 1: Connecting cables at the slots of the Trailer EBS D Modulator

Slot Modulator EBS D	Device plugs/ device sockets Interface plugs	Degree of protection	Possible con- necting cables (Product- Identification-No.):	Depiction of the cable structure	connection de- vice plug/ device socket Disconnecting plug	Degree of protection	Cable end/ Require- ments [Installation in- structions for cables see 449 000 000 0/doc 611]
Power	Connector housing 894 110 137 4	IP 6K9K	449 172 XXX 0 Power cable for semi trailer ¹⁾		ISO 7638 socket 7-poles	IP 54	7-core supply line
			449 272 XXX 0 Power cable for drawbar trailer ¹⁾		ISO 7638 socket 7-poles	IP 54	7-core supply line
			449 335 XXX 0 Power cable with disconnection plug ¹⁾ (further cable 449 135 xxx 0 or 449 231 xxx 0)		Bayonet 7-poles [7 assigned]	IP 6K9K	7-core supply line Degree of pro- tection only in combination with the corresponding WABCO- connecting plug
			449 333 XXX 0 Power cable with disconnection plug (further calbe 449 133 xxx 0 or 449 233 xxx 0) ¹⁾		Bayonet 7-poles [7 assigned]	IP 6K9K	7-core supply line Degree of pro- tection only in combination with the corresponding WABCO- connecting plug
			449 373 XXX 0 Power cable with additional parts for semi trailer ¹⁾		7 cores With open end	IP 54	ISO 7638 socket is delivered with the package
Diagnosis	Connector housing 894 110 136 4	IP 6K9K	449 334 XXX 0 Diagnose / Power / ELM For the connection of the diagnosis of the lifting axle valve and the electronic air suspension mo- dule [ELM] to the trailer modulator		diagnosis plug 7-poles [3 assigned]	IP 6K9K	wires: 3x 0,5mm ²
					Magnetic plug 2-poles [2 assigned]	IP 6K9K	wires: 2x 0,75mm ²
					Bayonet 7-poles [3 assigned]	IP 6K9K	wires: 2x 0,75mm ²

**Appendix 1
to Test Report**
No.: TUEH - TB 2010 - 185.00
on the basis of the Test Instructions
98/91/EG, ECE-R 105
and Annex B, part 9 ADR 2009



Type : **Trailer EBS D**
Manufacturer : **Wabco GmbH**

Slot Modulator EBS D	Device plugs/ device sockets Interface plugs	Degree of protection	Possible con- necting cables (Product- Identification-No.):	Depiction of the cable structure	connection de- vice plug/ device socket Disconnecting plug	Degree of protection	Cable end/ Require- ments [Installation in- structions for cables see 449 000 000 0/doc 611]
Diagnosis	Connector housing 894 110 136 4	IP 6K9K	449 341 XXX 0		DIN-Bayonet 4-poles [2 assigned]	IP 6K7	wires: 2x 0,75mm ²
				For the connection of a RTR-valve and 24N supply to the trailer modulator		DIN-Bayonet 4-poles [2 assigned]	IP 6K9K
			449 343 XXX 0		DIN-Bayonet 4-poles [2-assigned]	IP 6K9K	wires: 2x 2,5mm ² Degree of protec- tion only in combination with the corresponding WABCO- connecting plug!
			For the connection of a RTR- and lift axle valve and the 24N supply to the trailer modulator		DIN-Bayonet 4-poles [2-assigned]	IP 6K9K	wires: 2x 0,75mm ²
			449 344 XXX 0		diagnosis plug 7-poles [3 assigned]	IP 6K9K	wires: 3x 0,5mm ²
			Diagnosis / ELM For the connection of the dignosis and an electronic air suspension module [ELM] to the trailer module		Bayonet 7-poles [3 assigned]	IP 6K9K	wires: 3x 1,5mm ²
			449 346 XXX 0		Open end 2-poles		2x contact points wires: 2 x 2.5mm ² Suitable ADR installation required, min. IP54!
			For the connection of a RTR and lift axle valve and a 24N supply to the trailer modulator		DIN-Bayonet 4-poles [2 assigned]	IP 6K9K	wires: 2x 0,75mm ²
					DIN-Bayonet 4-poles [2 assigned]	IP 6K9K	wires: 2x 0,75mm ²

Appendix 1
to Test Report
 No.: **TUEH - TB 2010 - 185.00**
 on the basis of the Test Instructions
98/91/EG, ECE-R 105
 and **Annex B, part 9 ADR 2009**



Type : **Trailer EBS D**
 Manufacturer : **Wabco GmbH**

Slot	Device plugs/ device sockets	Degree of protection	Possible con- necting cables (Product- Identification-No.):	Depiction of the cable structure	connection de- vice plug/ device socket	Degree of protection	Cable end/ Require- ments [Installation in- structions for cables see 449 000 000 0/doc 611]
Modulator EBS D	Interface plugs				Disconnecting plug		
Diagnosis	Connector housing 894 110 136 4	IP 6K9K	449 382 XXX 0 ECAS supply cable with open end (partially with con- tact points)		7-poles With open end	---	PG 11 screwing wires: 3 x 1.5 mm ² 4 x 0.5 mm ² Suitable ADR installation required, min. IP54!
			449 383 XXX 0 24N / ILS signal For the connection of 24N supply to the trailer modulator and additional ILS speed signal indication		open end 4-poles	---	wires: 2 x 2.5 mm ² 2 x 0.5 mm ² Suitable ADR installation required, min. IP54!
			449 387 XXX 0 24N / ILS Signal For the connection of 24N supply to the trailer modulator and additional ILS speed signal indication		open end 4-poles	---	2x contact points wires: 2 x 2.5 mm ² 2 x 0.5 mm ² Suitable ADR installation required, min. IP54!
			449 435 XXX 0 ILS 1/ISS For the connection of a ILS 1 or ISS sensor to the trailer modulator		DIN-Bayonet 4-poles [3 assigned]	IP 69K	wires: 3 x 1.5 mm ²
			449 554 XXX 0 Diagnosis / lift axle / ELM For the connection of a lift axle valve an a electronic ais suspension module [ELM] to the trailer modulator		diagnosis plug 7-poles [3 assigned/belegt]	IP 6K9K	wires: 3 x 0.5 mm ²
DIN-Bayonet 4-poles [2 assigned]	IP 69K	wires: 2 x 0.75 mm ²					
Bayonet 7-poles [3 assigned]	IP 6K9K	wires: 3 x 0.75 mm ²					

**Appendix 1
to Test Report**
No.: **TUEH - TB 2010 - 185.00**
on the basis of the Test Instructions
98/91/EG, ECE-R 105
and **Annex B, part 9 ADR 2009**



Type : **Trailer EBS D**
Manufacturer : **Wabco GmbH**

Slot	Device plugs/ device sockets	Degree of protection	Possible con- necting cables (Product- Identification-No.:)	Depiction of the cable structure	connection de- vice plug/ device socket	Degree of protection	Cable end/ Require- ments [Installation in- structions for cables see 449 000 000 0/doc 611]				
Modulator EBS D	Interface plugs	IP 6K9K	449 614 XXX 0 Diagnosis		diagnosis plug 7-poles [3 assigned]	IP 6K9K	wires: 3 x 0.5 mm ²				
					Open end 3-poles		wires: 3 x 0.75 mm ² Suitable ADR installation required, min. IP54!				
			Diagnosis	Connector housing 894 110 136 4	IP 6K9K	449 624 XXX 0 Diagnostics and Lift axle control valve		diagnosis plug 7-poles [3 assigned]	IP 6K9K	wires: 3 x 0.5 mm ²	
								magnetic plug 2-poles [2 assigned]		IP 69K	wires: 2 x 1.5 mm ²
						449 663 XXX 0 Diagnostic, Lift axle control valve and TASC-valve		diagnosis plug 7-poles [3 assigned]	IP 6K9K	wires: 3 x 0.5 mm ²	
								DIN-Bayonet 4-poles [2 assigned]		IP 6K9K	wires: 2 x 0.75 mm ²
								DIN-Bayonet 4-poles [2 assigned]		IP 6K9K	wires: 2 x 0.75 mm ²
						449 664 XXX 0 Diagnostic and 1-circuit lift axle control valve		diagnosis plug 7-poles [3 assigned]	IP 6K9K	wires: 3 x 0.5 mm ²	
			DIN-Bayonet 4-poles [3 assigned]	IP 69K	wires: 3 x 1.5 mm ²						

Appendix 1
to Test Report
 No.: **TUEH - TB 2010 - 185.00**
 on the basis of the Test Instructions
98/91/EG, ECE-R 105
 and **Annex B, part 9 ADR 2009**



Type : **Trailer EBS D**
 Manufacturer : **Wabco GmbH**

Slot	Device plugs/ device sockets	Degree of protection	Possible con- necting cables (Product- Identification-No.):	Depiction of the cable structure	connection de- vice plug/ device socket	Degree of protection	Cable end/ Require- ments [Installation in- structions for cables see 449 000 000 0/doc 611]
Modulator EBS D	Interface plugs				Disconnecting plug		
Diagnosis	Connector housing 894 110 136 4	IP 6K9K	449 665 XXX 0 Diagnosis, lift axle, ELM For the connecton of 24N supply , dia- gnosis and a lift axle valve/Colas to the trailer modulator		diagnosis plug 7-poles [3 assigned]	IP 6K9K	wires: 3 x 0.5 mm ²
					DIN-Bayonet 4-poles [3 assigned]	IP 6K9K	wires: 3 x 1.0 mm ²
					opend end 2 poles		wires: 2 x 2.5 mm ² contacts Suitable ADR installation required, min. IP54!
			449 672 XXX 0 Diagnostic		diagnosis plug 7-poles [3 assigned]	IP 6K9K	wires: 3 x 0,5 mm ²
			449 684 XXX 0 Diagnose / 24N		diagnosis plug 7-poles [3 assigned]	IP 6K9K	wires: 3 x 0,5 mm ²
					opend end 4-poles		wires: 2 x 2.5 mm ² + 2 x 0.5 mm ² Suitable ADR installation required, min. IP54!

**Appendix 1
to Test Report**
No.: **TUEH - TB 2010 - 185.00**
on the basis of the Test Instructions
98/91/EG, ECE-R 105
and **Annex B, part 9 ADR 2009**



Type : **Trailer EBS D**
Manufacturer : **Wabco GmbH**

Slot Modulator EBS D	Device plugs/ device sockets Interface plugs	Degree of protection	Possible con- necting cables (Product- Identification-No.):	Depiction of the cable structure	connection de- vice plug/ device socket Disconnecting plug	Degree of protection	Cable end/ Require- ments [Installation in- structions for cables see 449 000 000 0/doc 611]
IN/OUT2	Connector housing 894 110 135 4	IP 6K9K	449 377 XXX 0 IVTM / SmartBoard		Bayonet 7-poles [4 assigned]	IP 6K9K	wires: 4 x 0,5 mm ²
		IP 6K9K	449 378 XXX 0 For the connection of a IVTM ECU in combination with a distribution unit to the trailer modulator		Open end 5-poles		wires: 5 x 0.5 mm ² Suitable ADR installation required, min. IP54!
		IP 6K9K	449 472 XXX 0 magnetic valve For the connection of a magnetic valve to the trailer modu- lator		DIN-Bayonet 4-poles [4 assigned]	IP 6K9K	wires: 4 x 0.5 mm ²
		IP 6K9K	449 473 XXX 0 Pressure sensor For the connection of a pressure sen- sor to the trailer modulator		DIN-Bayonet 4-poles [4 assigned]	IP 6K9K	wires: 4 x 0.5 mm ²
		IP 6K9K	449 476 XXX 0 Telematik		DIN-Bayonet 4-poles [4 assigned]	IP 6K9K	wires: 2 x 0.5 mm ² 2 x 2.5 mm ²
		IP 6K9K	449 477 XXX 0 Telematik		open end 4-poles		wires: 2 x 0.5 mm ² 2 x 1.0 mm ² Suitable ADR installation required, min. IP54!

Appendix 1
to Test Report
 No.: **TUEH - TB 2010 - 185.00**
 on the basis of the Test Instructions
98/91/EG, ECE-R 105
 and **Annex B, part 9 ADR 2009**



Type : **Trailer EBS D**
 Manufacturer : **Wabco GmbH**

Slot	Device plugs/ device sockets	Degree of protection	Possible con- necting cables (Product- Identification-No.:	Depiction of the cable structure	connection de- vice plug/ device socket	Degree of protection	Cable end/ Require- ments
Modulator EBS D	Interface plugs				Disconnecting plug		[Installation in- structions for cables see 449 000 000 0/doc 611]
Modulator	Connector housing 894 110 134 4	IP 6K9K	449 372 XXX 0 Magnetic connecti- on cable		DIN-Bayonet 4-poles [3 assigned]	IP 6K9K	wires: 3 x 1.0 mm ²
			DIN-Bayonet 4-poles [2 assigned]		IP 6K9K	wires: 2 x 1.5 mm ² [2 x 1.0 mm ²]	
			DIN-Bayonet 4-poles [3 assigned]		IP 6K9K	wires: 3 x 0,5 mm ²	
		449 426 XXX 0 cable for ALD relay valve Connection of a re- lay valve to the trai- ler modulator		Magnitic plug 3-poles [3 assigned]	IP 6K9K	wires: 3 x 1,5 mm ²	
449 427 XXX 0 cable for ALD relay valve Connection of a re- lay valve to the trai- ler modulator		DIN-Bayonet [3 assigned]	IP 6K9K	wires: 3 x 1,5 mm ²			

**Appendix 1
to Test Report**
No.: **TUEH - TB 2010 - 185.00**
on the basis of the Test Instructions
98/91/EG, ECE-R 105
and **Annex B, part 9 ADR 2009**



Type : **Trailer EBS D**
Manufacturer : **Wabco GmbH**

Slot Modulator EBS D	Device plugs/ device sockets Interface plugs	Degree of protection	Possible con- necting cables (Product- Identification-No.):	Depiction of the cable structure	connection de- vice plug/ device socket Disconnecting plug	Degree of protection	Cable end/ Require- ments [Installation in- structions for cables see 449 000 000 0/doc 611]
Power Connecting cable	ISO 7638 Socket	IP 54	449 133 XXX 0 Power cable for semi trailer with connection plug ¹⁾ (further calbe 449 333 xxx 0)		Bayonet 7-poles [7 assigned]	IP 6K9K	7-core supply line
	ISO 7638 Socket	IP 54	449 135 XXX 0 Power cable for semi trailer with connection plug ¹⁾ (further cable 449 335 xxx 0)		Bayonet 7-poles [7 assigned]	IP 6K9K	7-core supply line
	ISO 7638 Socket	IP 54	449 231 xxx 0 Power cable for drawbar trailer wit connecton plug ¹⁾ (further calbe 449 335 xxx 0)		Bayonet 7-poles [7 assigned]	IP 6K9K	7-core supply line
	ISO 7638 Steckdose	IP 6K9K	449 233 XXX 0 Power cable for drawbar trailer wit connecton plug ¹⁾ (further calbe 449 333 xxx 0)		Bayonet 7-poles [7 assigned]	IP 54	7-core supply line

**Appendix 1
to Test Report**
No.: **TUEH - TB 2010 - 185.00**
on the basis of the Test Instructions
98/91/EG, ECE-R 105
and **Annex B, part 9 ADR 2009**



Type : **Trailer EBS D**
Manufacturer : **Wabco GmbH**

Slot Modulator EBS D	Device plugs/ device sockets Interface plugs	Degree of protection	Possible con- necting cables (Product- Identification-No.):	Depiction of the cable structure	connection de- vice plug/ device socket Disconnecting plug	Degree of protection	Cable end/ Require- ments [Installation in- structions for cables see 449 000 000 0/doc 611]
IN/OUT1	Plug 3-poles [3-assigned]	IP 68	449 752 XXX 0 Cable for pressure sensor		DIN-Bayonet 3-poles [3-assigned]	IP 6K9K	wires: 3 x 1,5 mm ²
			449 762 XXX 0 Tractionhelp button		open end 2-poles	---	wires: 2 x 0,75 mm ² Suitable ADR installation required, min. IP54!
			449 764 XXX 0 Tractionhelp button and solenoid valve		DIN-Bayonet 4-poles [2-assigned]	IP 6K9K	wires: 2 x 0,75 mm ²
					open end 2-poles	---	wires: 2 x 0,75 mm ² Suitable ADR installation required, min. IP54!

**Appendix 1
to Test Report**
No.: **TUEH - TB 2010 - 185.00**
on the basis of the Test Instructions
98/91/EG, ECE-R 105
and **Annex B, part 9 ADR 2009**



Type : **Trailer EBS D**
Manufacturer : **Wabco GmbH**

Slot	Device plugs/ device sockets	Degree of protection	Possible con- necting cables (Product- Identification-No.):	Depiction of the cable structure	connection de- vice plug/ device socket	Degree of protection	Cable end/ Require- ments [Installation in- structions for cables see 449 000 000 0/doc 611]
Modulator EBS D	Interface plugs				Disconnecting plug		
other	DIN-Bayonet 4-poles [4 assigned]	IP 6K9K	449 362 XXX 0 Power supply and data supply		open end 4-poles	---	wires: 2 x 2,5 mm ² 2 x 0,56 mm ² Suitable ADR installation required, min. IP54!
	Bayonet 7-poles [5 assigned]	IP 6K9K	449 363 XXX 0 Data supply		open end 4-poles	---	wires: 2 x 1,0 mm ² 3 x 0,5 mm ² Suitable ADR installation required, min. IP54!
	DIN-Bayonet 4-poles [4-assigned]	IP 6K9K	894 601 138 2 Adapter pressure sensor 441 040 xxx 0 and pressure switch 894 042 771 0		DIN-Bayonet 4-poles [3-assigned] DIN-Bayonet 4-poles [2-assigned]	IP 6K9K IP 6K9K	wires: 3 x 0,5 mm ² wires: 2 x 0,75 mm ²
Y-cable							
	4 pole DIN bayonet ISO 15170-B1- 2.1-Sn/K1	IP 6K9K	449 447 XXX 0 Y-cable in con- junction with con- nection cable 449 663 XXX 0, 449 664 XXX 0; connection 2x TASC valve 463 090 XXX 0		4 pole DIN bayonet ISO 15170-B1-2.1- Sn/K1	IP 6K9K	2x 1,5mm ² Degree of pro- tection in com- bination with mating WABCO connector

Remarks/Notes:

1) **Material of the cable coat insulaton optionally PUR or PVC**



Type : **Trailer EBS D**
Manufacturer : **Wabco GmbH**

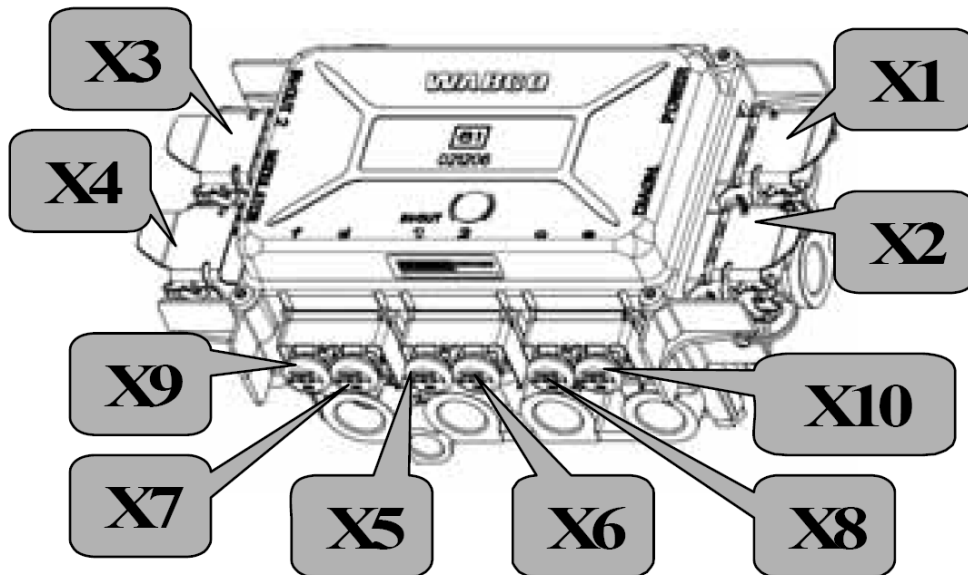
Page: 11

Part 2: Connecting valves

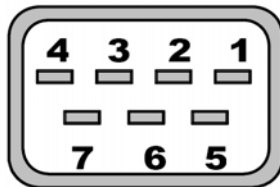
Connecting valve	Part number	Description
EBS-relay valve	480 207 xxx 0	Electric controlled relay valve with pressure sensor and back up valve (degree of protection: IP 69K)
ABS-relay valve	472 195 0xx 0	Electric controlled relay valve (degree of protection: IP 69K)
Lift axle valve	463 084 010 0	Electric controlled lift axle valve for automatic lifting and dropping of lift axles (degree of protection: IP 69K)
Lift axle valve	463 084 030 0	Electric controlled lift axle valve for automatic lifting and dropping of lift axles (degree of protection: IP 69K)

Type : **Trailer EBS D**
 Manufacturer : **Wabco GmbH**

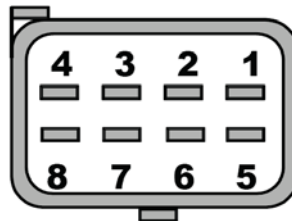
Illustration of the system connections



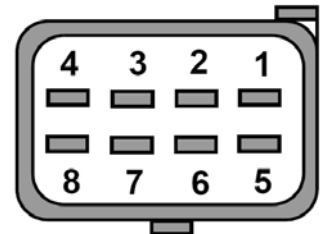
Stecker X1 "POWER"



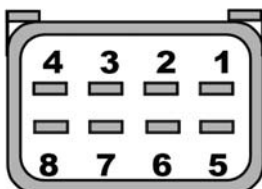
Stecker X2 "DIAGNOSE"



Stecker X3 "IN/OUT2"



Stecker X4 "MODULATOR"



**Stecker X5 "IN/OUT1"
(Multifunktionseingang)**



Stecker X6 "Verschleiß"



Stecker X7 - X10 "ABS-Sensor"



**Appendix 2
to Test Report**
No.: **TUEH - TB 2010 - 185.00**
on the basis of the Test Instructions
98/91/EG, ECE-R 105
and **Annex B, part 9 ADR 2009**



Type : **Trailer EBS D**
Manufacturer : **Wabco GmbH**

IN/OUT2
externer Bremsdrucksensor/Telematik

rot (1)
braun (6)
gelb (7)
blau (8)

- Schaltleitung 3 (Anschlusskabelschleife) (S14, S4)
- Mass ECU
- Eingang externer Bremsdrucksensor
- rot, R 30 (nicht abgeblendet)
- Mass ECU
- CAN 2 - High
- CAN 2 - Low

RSS Installationsvorschrift

Einbaubestimmungen zur Sicherstellung der RSS-Funktion
- für Modulator 480 102 041 0

Fahrtrichtung

Zusätzliche Winkelabweichungen beim Einbau

POWER - ISO 7638 / TCE

schwarz (4)
braun (5)
grün (3)
rot (2)
weiß/blau (7)

- CANLow (Standard 24V, TCE 5V)
- CANHigh (Standard 24V, TCE 5V)
- Warnlampe (nicht in allen TCE-Versionen)
- Mass ECU (nicht in allen TCE-Versionen)
- Mass Verteiler (R 31) (Mass in allen TCE-Versionen)
- 24V ECU (R 19) (nicht in allen TCE-Versionen)
- 24V K130 Plus in allen TCE-Versionen

ECU

ISO 7638

MODULATOR - 3. Modulator

- Schaltleitung 1 (K115, S4)
- Mass ECU
- Anschlussverteiler -24V
- Reduzierventil -24V
- Eingang Drucktemo of EBS (Relaisventil)
- Magnetsventil -Mass
- Einlassventil -24V
- Reduzierventil -Mass

WABCO Vehicle Control Systems
An Ambrak-Schmid Company
www.wabco-auto.com

IN/OUT1 - Anfahrhilfe

- Schaltleitung 5 (24V)
- Mass ECU
- Eingang opt. Achsenbremser /Anfahrhilfe

480 116 ... 6 Nennwert
480 118 ... 6 Nennwert

Drehzahlsensoren f.d

- Schwarz
- Braun

Drehzahlsensoren c.e

- 5 V
- Mass ECU
- Eingang Verschleißsensor

480 054 ... 0 Anschlusskabel

DIAGN.
Diagnose/Bremslicht/ISS/
ILS/ECAS/ELM/Batterie

- rot (2)
- braun (7)
- grün (3)
- schwarz (4)

480 984 ... 0 Anschlusskabel

POWER - ISO 7638 / TCE

- CANLow (Standard 24V, TCE 5V)
- CANHigh (Standard 24V, TCE 5V)
- Warnlampe (nicht in allen TCE-Versionen)
- Mass ECU (nicht in allen TCE-Versionen)
- Mass Verteiler (R 31) (Mass in allen TCE-Versionen)
- 24V ECU (R 19) (nicht in allen TCE-Versionen)
- 24V K130 Plus in allen TCE-Versionen

ECU

ISO 7638

DIAGN.
Diagnose/Bremslicht/ISS/
ILS/ECAS/ELM/Batterie

- ISO9141 K-Line
- Schaltleitung 4 (Diagnose-Vorwarnung)
- Mass ECU
- Schaltleitung 2 (ECAS/ELM/S2)
- Bremslicht
- Ausgang Bremslicht (ECAS)
- Mass ECU (Bremslicht)
- Schaltleitung 1 (S2/S15, 1)

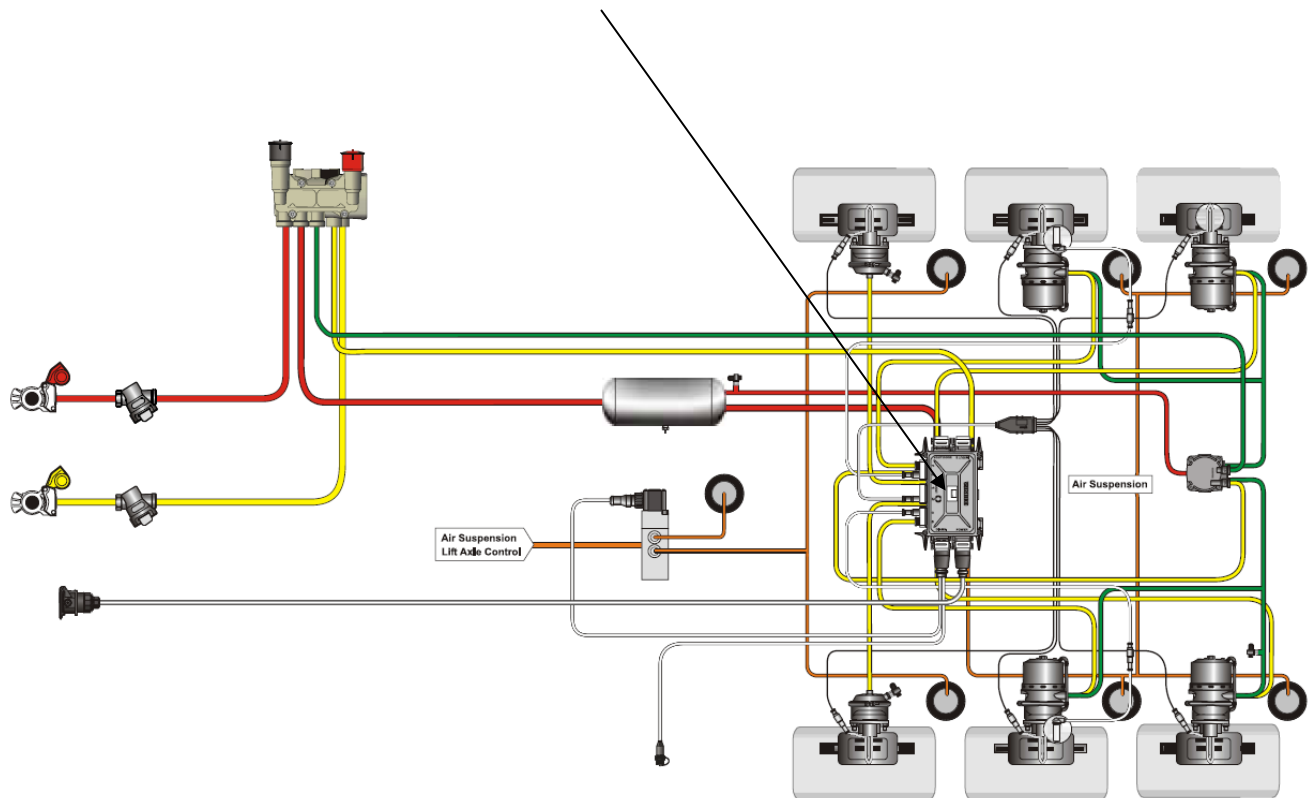
Trailer EBS-D Generation

The original document can be found on the homepage: www.wabco-auto.com (catalogue: INFORM)

Type : **Trailer EBS D**
Manufacturer : **Wabco GmbH**

Page: 1

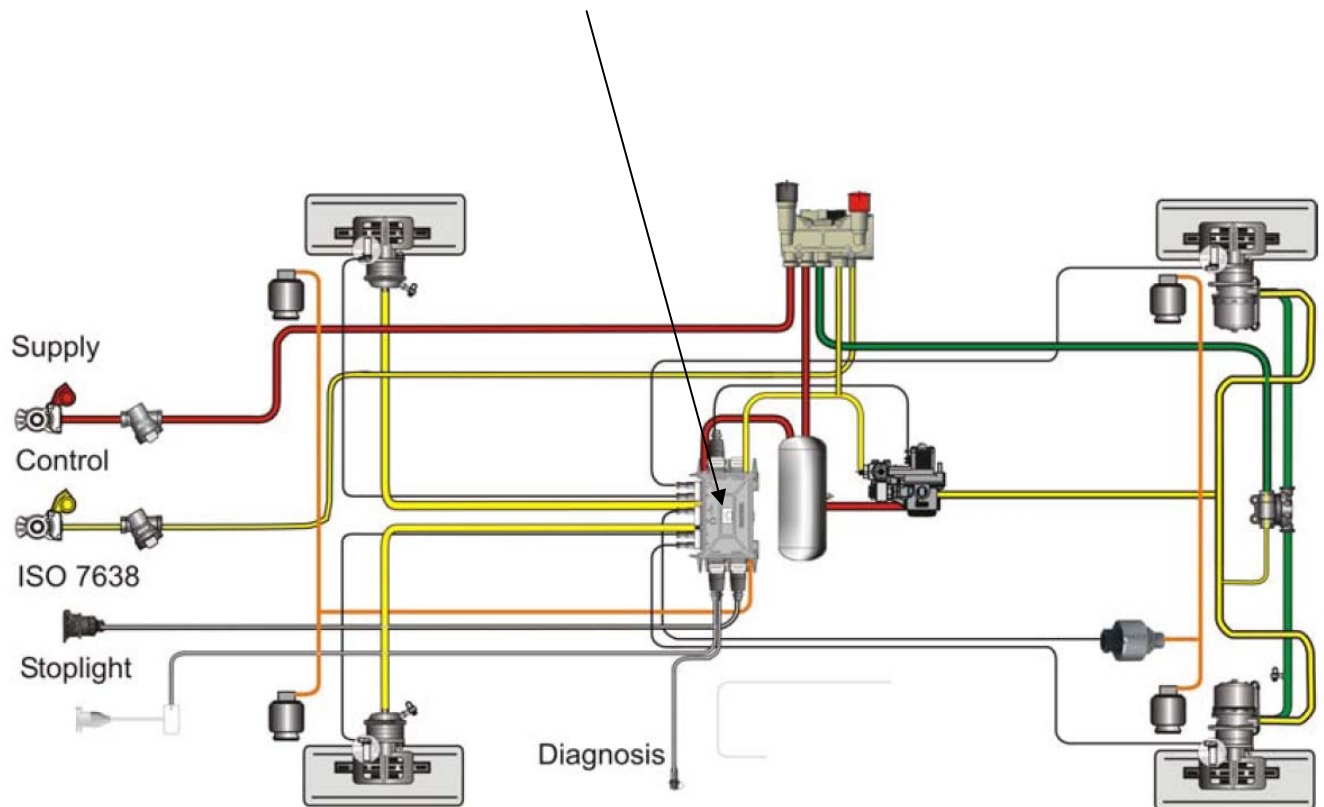
**Arrangement of the Trailer EBS D modulators in combination
with a semi trailer**



Type : **Trailer EBS D**
Manufacturer : **Wabco GmbH**

Page: 1

**Arrangement of a Trailer EBS D modulators in combination
with a drawbar trailer**

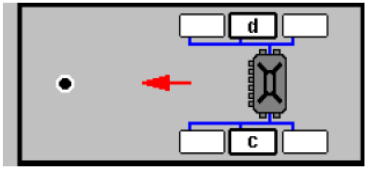


**Appendix 5
to Test Report**
No.: **TUEH - TB 2010 - 185.00**
on the basis of the Test Instructions
98/91/EG, ECE-R 105
and **Annex B, part 9 ADR 2009**



Type : **Trailer EBS D**
Manufacturer : **Wabco GmbH**

Trailer EBS D system plate (example)

WABCO				TRAILER EBS						
HERSTELLER MANUFACTURER CONSTRUCTEUR				ELEKTR: SCHALTER 1 ELECTR: SWITCH 1 COMMUTATEUR ELECTR.1		---		BREMSENPRÜFNUMMER BRAKE TEST NUMBER NUMERO D'ESSAI DE FREIN		
TYP TYPE TYPE				ISS GESCHW. ISS SPEED COMMUTATEUR VITESSE		2		GGVS/ADR		
FAHRZEUG IDENTNR. CHASSIS NUMBER NUMERO DE CHASSIS				ISS-PIN INVERTIERT ISS. PIN INVERT COMMUTATEUR INVERSE		---		TPN 1203/04		
BREMSBERECHNUNGS-NR. BRAKE CALCULATION NO. CALCUL DE FREINAGE NO.				10 s PULS 10 s PULSE IMPULSION 10s		---		ANFAHRHILFE GESCHW. TRACTION HELP V VITESSE AIDE DEMARRAGE		
ABS-System ABS-System ABS-System		2S/2M		ELEKTR: SCHALTER 2 ELECTR: SWITCH 2 COMMUTATEUR ELECTR.2		---		ANFAHRHILFE DRUCK TRACTION HELP PRESS. PRES. AIDE DEMARRAGE		
POLRADZÄHNEZAHL c,d POLE WHEEL TEETH c,d DENTS ROUE DENTEE c,d		100		POS. LIFTACHSEN POS. LIFTAXLE PRÉP. ESS. RELEV.				30		
POLRADZÄHNEZAHL e,f POLE WHEEL TEETH e,f DENTS ROUE DENTEE e,f		100		I/O 1 I/O 1 I/O 1		---		0		
EXT. BREMSDRUCKSENS. EXT. BRAKE PRESS. SENS. EXT. CAPT. PRES. DE FREIN		---		RSS RSS RSS		---		100		
STEUERDRUCK PM (BAR) CONTROL PRESSURE (BAR) PRESSION DE SERVICE PM (BAR)		6.5		STEUERDRUCK PM (BAR) CONTROL PRESSURE (BAR) PRESSION DE SERVICE PM (BAR)		0.8		2.0		6.5
ACHSE AXLE ESSIEU	ACHSLAST LEER AXLE LOAD UNLADEN CHARGE ESSIEU A VIDE (KG)	BALGDRUCK LEER SUSP. PRESS. UNLADEN PRESS. SUSP. A VIDE (BAR)	BREMSDRUCK LEER BRAKE PRESS. UNLADEN PRESS. DE FREIN. A VIDE (BAR)	ACHSLAST BELADEN AXLE LOAD LADEN CHARGE ESSIEU EN CHARGE (KG)	BALGDRUCK BELADEN SUSP. PRESS. LADEN PRESS. SUSP. EN CHARGE (BAR)	BREMSDRUCK BELADEN BRAKE PRESS. LADEN PRESS. DE FREIN. A CHARGE (BAR)				
1	9000	0.5	6.5	9000	5.0	0.5	1.8	6.5		
2	9000	0.5	6.5	9000	5.0	0.5	1.8	6.5		
3	9000	0.5	6.5	9000	5.0	0.5	1.8	6.5		
4	---	---	---	---	---	---	---	---		
5	---	---	---	---	---	---	---	---		