
Vehicle part : Electronically Controlled Brake System for Trailers (EBS)
Type : Trailer EBS
Client : WABCO Fahrzeugbremsen, D-30453 Hanover, Germany

Test according to the “Ordinance of intrastate and border crossing transport of hazardous goods on public roads and by railroad (*Gefahrgutverordnung Straße und Eisenbahn - GGVSE*)“, status of 2003-09-10, and according to the “Directive on the European Agreement on international transport of hazardous goods on public roads (ADR)“, status of 2002-12-14, Section 9.2.2.

The tests were performed according to VdTÜV-leaflet transport of hazardous goods 5205 ADR 2003 „Electrical equipment of hazardous goods vehicles, explanations of Section 9.2.2 ADR 2003“, status of 10.2003.

1. General

- 1.1 Name and address of the manufacturer / client : WABCO Fahrzeugbremsen
Am Lindener Hafen 21
D-30453 Hannover, Germany
- 1.2 Type : Trailer EBS
(EBS => **electronic brake system**)
- 1.3 Components : Electronically controlled brake system for trailers with load-sensing brake pressure control and automatic anti-wheel-lock braking system
- 2S/2M : Two rpm sensors and one trailer modulator for 1- to 3-axle semitrailers and centre-axle trailers with air suspension
- 4S/2M : Four rpm sensors and one trailer modulator for 2- and 3-axle semitrailers and centre-axle trailers with air suspension
- 4S/2M+1M : Four rpm sensors, one trailer modulator and one ABS relay valve for 2- to 4-axle semitrailers and 2- to 3-axle centre-axle trailers with air suspension

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- 4S/3M : Four rpm sensors, one trailer modulator and one EBS relay valve for 2- to 5-axle drawbar trailers and 2- to 4-axle semitrailers, resp. 2- to 3-axle centre-axle trailers with air suspension
- 1.4 Range of Application : Single or multi-axle trailers of the classes O₃ and O₄, in accordance with EC directive 70/156/EEC, Annex II - with air suspension, disc or drum brakes
- 1.5 Special marking : GGVS/ADR => TPN 1203/04
- 1.6 Kind and place of the special marking : Printed on the EBS.
The EBS label must be attached on the right front portion of the vehicle.
- 2. Technical Data**
- 2.1 EBS Trailer Brake Valve and PREV : WABCO No. 971 002 ... 0
Trailer brake valve with emergency braking function without lead and PREV (Park Release Emergency Valve)
(Degree of protection IP 69K)
- 2.2 Trailer Modulator : WABCO No. 480 102 ... 0
The trailer modulator (AHM) controls and monitors the electro-pneumatic brake system. It is installed in the electro-pneumatic brake system between reservoir resp. trailer brake valve and brake cylinder. It controls the brake cylinder pressure on both sides of one, two or three axles.
(Degree of protection IP 69K)

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- 2.2.1 Installation : The trailer modulator should be installed close to the axles on the vehicle frame.
- 2.2.2 Marking : The WABCO type plate is located at the left below the sensor inputs of the trailer modulator.
- 2.3 EBS Relay Valve : WABCO No. 480 207 ... 0
Electrically controllable relay valve with pressure sensor and redundance valve (Degree of protection IP 69K)
- 2.4 ABS Relay Valve : WABCO No. 472 195 0 ... 0
Electrically controllable relay valve (Degree of protection IP 69K)
- 2.5 Lift Axle Valve : WABCO No. 463 084 010 0 / 463 084 030 0
Electrically controllable lift axle valve, for automatic lifting and lowering of lift axles. (Degree of protection IP 69K)
- 2.6 Sensors
- 2.6.1 ABS-Sensors : WABCO No. 441 032 ... 0
Inductive rpm sensors fastened with adapter bushings WABCO No. 899 760 510 4 and No. 899 759 815 4. (Degree of protection IP 69K)
- 2.6.2 Axle Load Sensors and external Brake Pressure Sensors : WABCO No. 441 040 ... 0
Pressure sensors (Degree of protection IP 69K)
- 2.7 Cables
- 2.7.1 Supply Cable for Semitrailers and Centre-Axle Trailers : WABCO No. 449 172 ... 0
For voltage supply from the tractor to the trailer modulator

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- 2.7.2 Supply Cable for Drawbar Trailers : WABCO No. 449 272 ... 0
For voltage supply from the tractor to the trailer modulator
- 2.7.3 Supply Cable for Semitrailers and Centre-Axle Trailers : WABCO No. 449 373 ... 0
For voltage supply from the tractor to the trailer modulator
- 2.7.4 Supply Cable for Semitrailers with Section Point : WABCO No. 449 133 ... 0
For voltage supply from the tractor to the trailer modulator
- 2.7.5 Supply Cable for Drawbar Trailers with Section Point : WABCO No. 449 233 ... 0
For voltage supply from the tractor to the trailer modulator
- 2.7.6 Supply Cable with Bayonet Counterpart : WABCO No. 449 333 ... 0
For voltage supply from the tractor to the trailer modulator
- 2.7.7 Trailer Brake Valve Cable : WABCO No. 449 47. ... 0
To connect the EBS trailer brake valve to the trailer modulator
- 2.7.8 EBS Relay Valve Cable : WABCO No. 449 372 ... 0
To connect the EBS relay valve to the trailer modulator
- 2.7.9 ABS Relay Valve Cable : WABCO No. 449 426 ... 0
To connect the ABS relay valve to the trailer modulator
- 2.7.10 Axle Load Sensor Cable : WABCO No. 449 752 ... 0
To connect the axle load sensor to the trailer modulator

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- 2.7.11 Diagnostic Cable : WABCO No. 449 672 ... 0
To connect the diagnostic socket to the trailer modulator
- 2.7.12 Diagnostic Cable : WABCO No. 449 614 ... 0
To connect the diagnostic socket to the trailer modulator and to control lift and/or steering axles.
The connection must be installed in a cable box, degree of protection IP 54
- 2.7.13 Solenoid Cable : WABCO No. 894 601 ... 0
To connect the lift axle valve or a solenoid valve to cable no. 449 614 ... 0
- 2.7.14 ECAS Supply Cable : WABCO No. 449 382 ... 0
To connect the electronically controlled air suspension system to the trailer modulator
- 2.7.15 ABS Sensor Extension : WABCO No. 449 71 ... 0
To connect the ABS sensors to the trailer modulator
- 2.7.16 Diagnostic Cable and 24 N : WABCO No. 449 684 ... 0
To connect the diagnostic socket to the trailer modulator and to control the emergency supply via the stoplight.
The connection must be installed in a cable box, degree of protection IP 54
- 2.7.17 Wear Indicator : WABCO No. 449 834 ... 0
To connect a wear indicator to the trailer modulator
- 2.7.18 Starting Aid : WABCO No. 449 762 ... 0
To connect the starting aid to the trailer modulator

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- 2.7.19 Starting Aid and Solenoid Valve : WABCO No. 449 764 ... 0
To connect a starting aid with residual pressure retention (controlled via solenoid valve)
- 2.7.20 Telematic Cable : WABCO No. 449 476 ... 0
To connect a telematic system to the modulator
- 2.7.21 Supply Cable, two-piece : WABCO No. 449 335 ... 0
For voltage supply from the tractor to the trailer module
- 2.7.22 Supply Cable, two-piece : WABCO No. 449 135 ... 0
For voltage supply from the tractor to the trailer module
- 2.7.23 Diagnosis and Lift Axle Valve : WABCO No. 449 624 ... 0
To connect a lift axle valve to the trailer modulator
- 2.7.24 Diagnosis and RTR (Reset to ride) : WABCO No. 449 664 ... 0
To connect an RTR-valve to the trailer modulator
- 2.7.25 Diagnosis, RTR and Lift Axle : WABCO No. 449 663 ... 0
To connect an RTR valve and a lift axle valve to the trailer modulator
- 2.8 Special Equipment : No ground connection between the electrical parts of EBS and vehicle chassis

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3. Test Results

The tests were performed with reference to the VdTÜV-leaflet Transport of Hazardous Goods 5205 ADR 2001 „Electrical equipment of hazardous goods vehicles, explanations of Section 9.2.2 ADR 2003“, status date of 10.2003.

The EBS of trailers meets the requirements

- of the “Ordinance of intrastate and border crossing transport of hazardous goods on public roads and by railroad (*Gefahrgutverordnung Straße und Eisenbahn - GGVSE*)“, status date of 2003-09-10,
- of the “Directive on the European Agreement on international transport of hazardous goods on public roads (ADR)“, (*Accord européen relatif au transport international des marchandises dangereuses par route – ADR*)“, status date of 2002-12-14 and
- of Protection Standard IP 54

Protective grade against penetration of solid bodies (including dust) und contact of dangerous parts.

Protection against penetration of dust as well as
protection against wire contact
⇒ degree of protection IP5XK

Protective grade against water penetration

Protection against water penetration
⇒ degree of protection IPX4

pursuant to DIN 40050, Part 9, Status date of May 1993.

Location and Date of Tests : Hanover, Germany, 2004-02-05

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4. Remarks

4.1 Installation Requirements

- The electronically controlled brake system for trailers must be installed in a sufficiently protected location of the vehicle in accordance with the specifications of the brake device manufacturer.
- The cables of the EBS are Polyurethan-coated according to DIN VDE 0250 Part 818 or alternatively according to DIN VDE 0282 Part 10.
- The bayonet fastening ring of the bayonet plug must be tightened up to the clearly perceptible stops after being plugged into the solenoid valve.
- The connecting cables must be equipped with snap-on contacts according to DIN 46247 page 3 (without insulation) or DIN 46245 page 3 (with insulation) or with other snap-on contacts which provide the same degree of protection against untightening as those mentioned above.
- The insulated ground return line must be connected to the battery of the tractor.
- After the EBS has been installed in the vehicle, all cable connections must be checked for tightness and - if necessary – will be retightened.

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4.2 Advice

- The electronically controlled braking system for trailers produced in series must meet the data and requirements of the test report, of drawings and models submitted.

This test report

- will be void in case of modifications to the system tested or to the respective legal regulations and
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Hanover, Germany, 2004-02-05
SF/Bb/Ow



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