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Information Document
ID_EB158

Additional Auxilliary Brake Functions

ECE Regulation 13/11

Electronically controlled Brake System (EBS) for trailers

Trailer EBS E
Trailer EBS E with TCE

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Information Document for Trailer EBS-

- Brake Release Function

- Tension Reduction Function

1 General

1.1 Name of manufacturer

WABCO Fahrzeugsysteme GmbH
Am Lindener Hafen 21
D-30453 Hannover

1.2 System name/model: Trailer EBS

1.3 System variant: E

Versions:

Trailer EBS E

Trailer EBS E with TCE*

* TCE: Trailer Central Electronic

1.4 System configurations

2S/2M, 2 sensors and one trailer modulator for 1- to 3-axle semi- and centre-axle trailer with air suspension or mechanical suspension.

2S/2M+SLV, 2 sensors, one trailer modulator and one select low valve for 2- to 3-axle semi- and centre-axle trailer with air suspension or mechanical suspension and one self-steering axle.

4S/2M, 4 sensors and one trailer modulator for 2- and 3-axle semi- and centre-axle trailer with air suspension or mechanical suspension.

4S/2M + 1M, 4 sensors, one trailer modulator and one ABS-relay valve for 3- to 4-axle semi-trailers and 3-axle centre-axle trailers with air suspension or mechanical suspension.

4S/3M, 4 sensors, one trailer modulator and one EBS-relay valve for 2- to 3-axle full trailers and 2- to 3-axle semi-trailer and 2- and 3-axle centre-axle trailer with air suspension or mechanical suspension.

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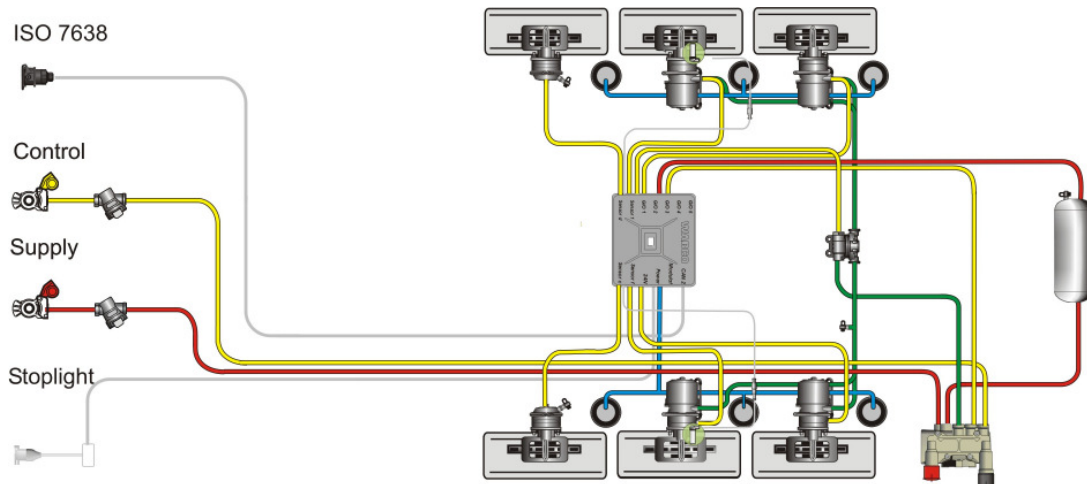
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1.5 Explanation of the basic functions and philosophy of the system

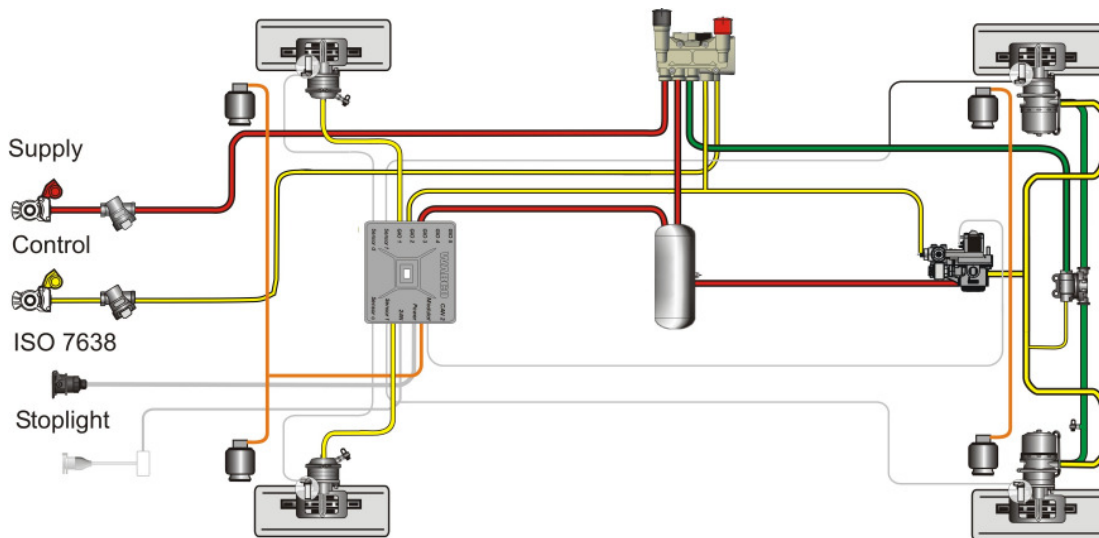
Note: Regarding the description of the above mentioned system see Information Document ID124.4E of TÜV Nord Report EB_124.4E.

1.5.1 System structure

The standard EBS system for a three-axle semi-trailer is shown in the following figure. It controls the brake pressures electronically on each side. The system is made up of a dual-circuit trailer modulator with digital data interface according to ISO 11992 to the EBS towing vehicle, an EBS relay emergency valve or Park Release Emergency Valve (PREV), and the ABS sensors.



When used in full trailers or semi-trailers, with a steering axle, a system with an additional EBS relay valve on the steering axles is used.



Trailers with this brake system are compatible with conventional and EBS-braked towing vehicles. They can be braked with pneumatic redundancy in the case of an EBS failure on the trailer.

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2 Description of the functions

In addition to the functions prescribed in ID_EB124.4E the following functions acc. to paragraphs 2.1 and 2.2 may be optionally integrated into the Trailer EBS. The described functions are integrated in the TEBS E and can be activated optionally by setting the parameters with the WABCO diagnostic program.

2.1 Brake release function

This function can be used, if the trailer brakes have to be released e.g. to change the length of a telescopic drawbar. For this the brakes of the trailer can be released by the brake release function.

2.1.1 The brake release function can only be activated if all of the following conditions are met:

- Vehicle is at standstill (no wheel speed detected by the system)
- Demand pressure at the yellow coupling head of the trailer (parking brake in the tractor applied) must be greater than 6.5 bar.
- The brake release button has to be pressed. Instead of a separate button it is also possible to activate the brake release function by the Smartboard; see below paragraph 4.

When these conditions are fulfilled, the brakes are released by venting the brake chambers by the EBS-modulators as long as the button is pressed.

2.1.2 The function will be disabled when:

- The power supply from the tractor is interrupted (ie. ignition off or ISO 7638 connector disconnected)
- When the pressure at the yellow coupling head falls below 6.5 bar
- When at least one wheel speed signal is detected.

To activate the function again the button has to be released and pushed again.

2.1.3 Installation diagram

Appendix 1 shows an example in which the brake release button is connected to GIO3.

The brake release button can be connected to any GIO port. The allocation has to be made by parameter setting.

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2.2 Tension reduction function

When a truck-trailer combination is parked (e.g. at a ramp) and the parking brake in the tractor is applied the following effect can occur: During loading or unloading the trailer or changing the suspension level manually the trailing arms rotate round the pivot to adjust the effective wheel base between tractor and trailer with respect to the loading condition (suspension height). Because the brakes are applied this is not possible. If under these conditions the parking brake would be released, the trailer would make a jerk to release the high tension forces within the suspension. This may cause damage at the trailer or may hurt a person.

2.2.1 The tension reduction function can only be activated if all of the following conditions are met:

- Supply pressure must be greater than 4.5 bar
- Demand pressure (control line pressure p_m) of the trailer must be greater than 3.5 bar
- Detected wheel speed of unbraked wheels must be less than 2.5 km/h
- The tension reduction button has to be pressed to initiate this function. Instead of a separate button it is also possible to activate the tension reduction function by the Smartboard; See below paragraph 4.

2.2.2 The tension reduction function will run in the following sequences:

- Semitrailer 2S/2M or 4S/2M: The brakes will be released independently side by side. If the wheels of one side are released the wheels of the other side are braked. This sequence will run three times. At the end of these sequences all brakes will be applied and the function is terminated.
- Semitrailer 4S/2M + 1M or 4S/3M: The brakes controlled by the third modulator (ABS relay valve or EBS relay valve; axle controlled) are released when this function is activated. The brakes controlled by the trailer modulator will be released independently side by side. If the wheels of one side are released the wheels of the other side are braked. This sequence will run three times. At the end of these sequences all brakes will be applied and the function is terminated.
- Full Trailer 4S/3M: The brakes will be released independently axle by axle. If one axle is released the other axle is braked. This sequence will run three times. At the end of these sequences all brakes will be applied and the function is terminated.

2.2.3 The function will be disabled when:

- The power supply from the tractor is interrupted (ie. ignition off or ISO 7638 connector disconnected)
- When the pressure at the yellow coupling head falls below 3.5 bar
- When at least one wheel speed signal is above 2.5 km/h.
- When the supply pressure is below 4:5 bar

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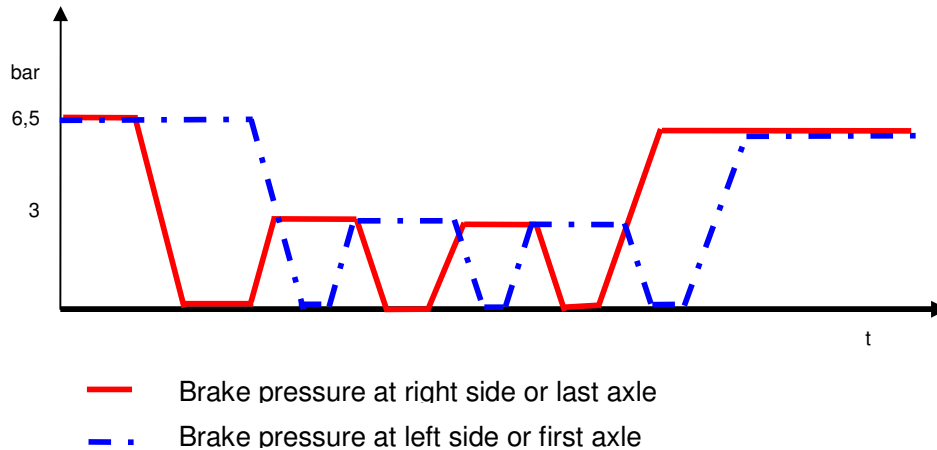
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To activate the function again the button has to be pushed again.

2.2.4 Pressure profil:

Diagram of brake chamber pressurization during tension release function



3 Parameter Setting

Variable parameters: For the functions mentioned under paragraphs 2.1 and 2.2, no specific parameters have to be set by the trailer manufacturer.

4 Smartboard

The SmartBoard monitors trailer relevant data on a display like mileage, failure memory, axle load, tyre pressure etc. It can also be used to control ECAS-functions like lifting/lowering and to activate (by selection) the brake release function or the tension release function.



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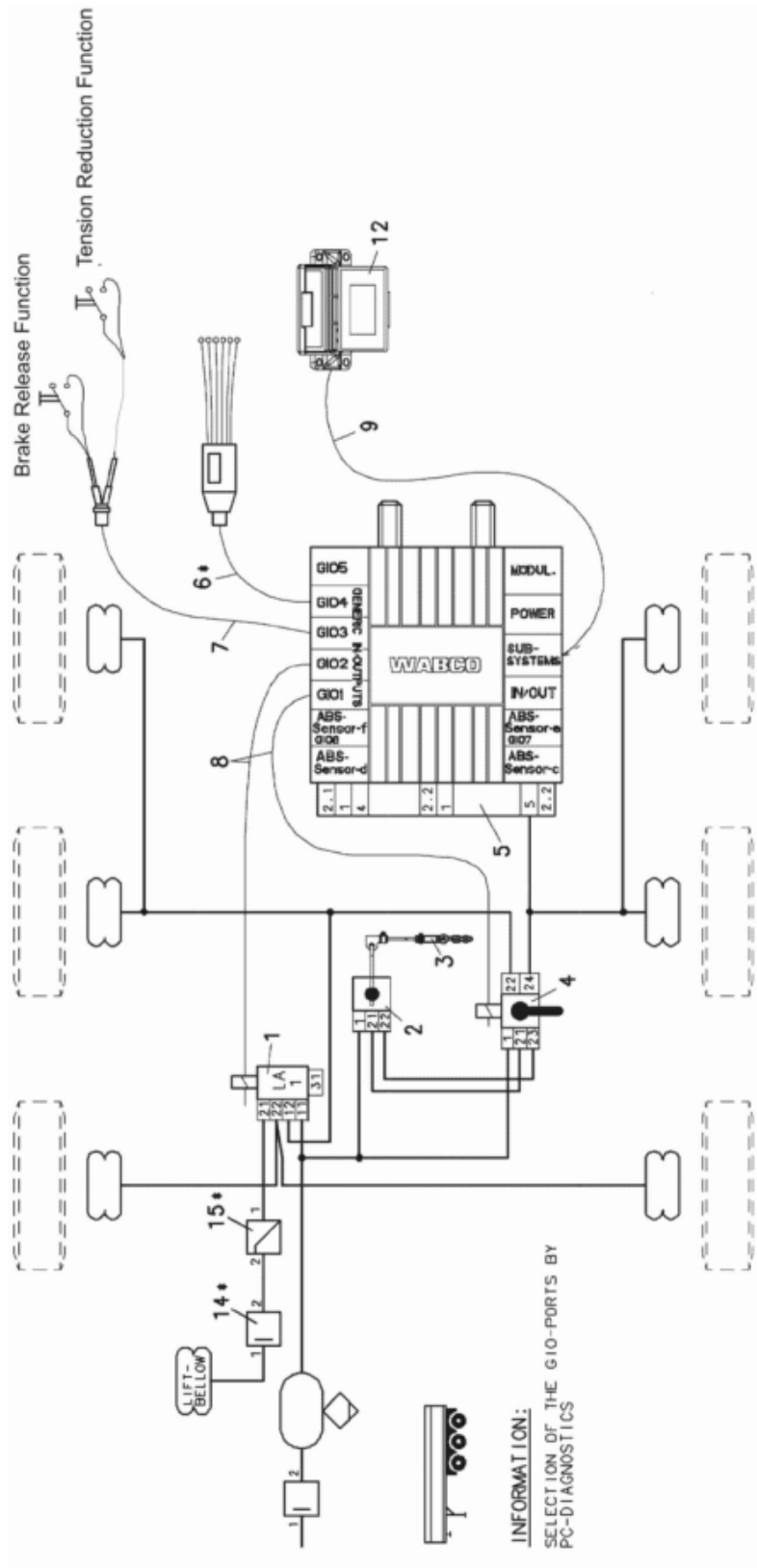
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Example of cabling schematic



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