Park/Shunt Valve with release function and charging valve

Legislators require that trailer vehicles must be automatically braked upon breaking away from the tractor. For road vehicles there is a special requirement that compressed air is not lost in the event of braking. Knorr-Bremse therefore focuses on the automatic activation of the spring brakes with the TEBS G2.1. An important contribution to safety gained from this is that an uncoupled trailer is automatically mechanically braked. This ensures that the vehicle is always parked securely. This is also the case of the trailer’s rear axles stoppage.

NOTE: Furthermore, there is the regulation that the parking brake must be activated before the vehicle is parked.

Knorr-Bremse therefore focuses on the automatic activation of the spring brakes with the TEBS G2.1. An important contribution to safety gained from this is that an uncoupled trailer is automatically mechanically braked. This ensures that the vehicle is always parked securely. This is also the case of the trailer’s rear axles stoppage.

Trailer Information Module TIM G2 (Optional)

The Trailer Information Module TIM G2 from Knorr-Bremse is a display and control unit for the trailer vehicle, which directly displays the diagnostic and trailer specific data. TIM G2 monitors the manufacturer, driver or workshop personnel to demand access to the saved data of the TIM G2 without the PC diagnostics program.

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Due to the growing demand for safety-related products in agriculture with continually expanding performance classes of the agricultural tractors, Knorr-Bremse has adapted a proven product for a new area of application.

**TEBS G2.1 Module**

The Knorr-Bremse TEBS G2.1 module is the heart of the electronic brake system. Both the electronic control unit and the sensors and pneumatic components are contained in a compact module, which is optimised for simple installation and service.

**Basic Functions**

The brake functions, the ABS, load measuring and the stability program are controlled in the module as integrated functions. This enables a more precise and uniform control of the brake pressure compared to conventional brake systems.

Trailer-equipped with TEBS G2.1 may be pulled by tractors with ABS, EBS or by tractors with conventional brake systems.

**The Stability Program RSP**

If a driver overestimates the speed during a steering or evasive manoeuvre the vehicle speed is lowered and thus the lateral acceleration. Even if the driver recognizes the critical situation, it is normally too late to avoid an accident. If a driver underestimates the speed during a steering or evasive manoeuvre to avoid a collision, there exists a danger that the trailer can become unstable and tip over, especially if a load has a high centre of gravity. The system can detect whether a critical situation is present by monitoring the

- lateral acceleration,
- load, and
- speed.

With automatic braking of the individual wheels, the system halts the trailer or follower does not jackknife.

**Stop Light Supply**

If the power supply through the ISO 7638 connection is interrupted, the alternate voltage supply from the stop lamp circuit takes over, in order to maintain the functions of the electronic load measuring and anti-lock brake system.

When all voltage supplies fail, the trailer can be also be braked using only the pneumatic brake, however no ABS and ALB (automatic load braking) function.

**Operational Data Recorder (ODR)**

The Operational Data Recorder (ODR) records data about the operational condition of the vehicle, including the distance travelled with the load, braking activity and the number of ABS and RSP interventions. In addition, the ability to reset the ODR enables recording data over a defined time span.

**Optional Auxiliary Functions**

Auxiliary programmable input and output functions

- TEBS G2.1 supplies one pneumatic and three electronic inputs, as well as up to seven electrical inputs to meet the specific requirements of the customer.

- Steaming axle lock

- Tipping angle lock

- Lifting axle control

Using the Auxiliary Design Language (ADL) for auxiliary functions, the specific requirements of the customer can be implemented in addition to the comprehensive built-in auxiliary functions in TEBS G2.1.
Due to the growing demand for safety-related products in agriculture with continually expanding performance classes of the agricultural tractors, Knorr-Bremse has adapted a proven product for a new area of application.

**TEBS G2.1 Module**

The Knorr-Bremse TEBS G2.1 is the heart of the electronic brake system. Both the electronic control unit and the sensors and pressure components are contained in a compact module, which is optimized for simple installation and service.

**Basic Functions**

The brake functions, the ABS, load measuring and the stability program are controlled by the module as integrated functions. This enables a more precise and uniform control of the brake pressure compared to conventional brake systems.

**Anti-lock Brake System (ABS)**

The Anti-lock Brake System (ABS) makes the braking process significantly safer. It prevents the wheels from locking during over-braking on a slippery road. If the road is only slippery on one side, the driver can keep the vehicle on its lane without significantly loss of stability and the trailer or follower does not jackknife. This also reduces the wear on the tyres.

**Stop Light Supply**

If the power supply through the ISO 7638 connection is interrupted, the alternate voltage supply from the stop light circuit takes over, in order to maintain the functions of the electronic load measuring and anti-lock brake system.

When all voltage supplies fail, the trailer can also be braked using only the pneumatic brake, however no ABS and ALB (automatic load braking) function.

**Operational Data Recorder (ODR)**

The Operational Data Recorder (ODR) records data about the operational condition of the vehicle, including the number of ABS and RSP interventions. In addition, the Operational Data Recorder (ODR) also records data about other functions and performance features can be implemented in addition to the comprehensive built-in auxiliary functions.

**Application Area**

The Knorr-Bremse TEBS G2.1 is primarily designed for agricultural trailers. It is designed for an application voltage range of 8-32 Volts, i.e., thus allowing the advantages of the TEBS G2.1 to all trailer types over 3.5 tons to be used worldwide.

**Optional Auxiliary Functions**

Auxiliary programmable input and output functions

TEBS G2.1 supports a pneumatic or electrical signal when a preprogrammed vehicle speed is reached. This is also possible with ABS control or reverse travel.

**Lifting axle control**

TEBS G2.1 supports a pneumatic or electrical signal when a preprogrammed vehicle speed is reached.

**Auxiliary Design Language (ADL) for auxiliary functions**

Using the Auxiliary Design Language (ADL), new functions and performance features can be implemented in addition to the comprehensive built-in auxiliary functions.
Electronic Brake System TEBS G2.1 with ABS (Anti-lock Brake System) and RSP (Roll Stability Program) for Agricultural Trailers

Due to the growing demand for safety-related products in agriculture with continually expanding performance classes of the agricultural tractors, Knorr-Bremse has adapted a proven product for a new area of application.

**Basic Functions**
- The brake functions, the ABS, load monitoring and the stability program are controlled by the embedded microcontroller. This enables a more precise and uniform control of the brake pressure compared to conventional brake systems.
- Trailers equipped with TEBS G2.1 may be pulled by tractors with ABS, EBS or by tractors with conventional brake systems.

**The Roll Stability Program RSP**
- If a driver underestimates the speed during a steering or evasive manoeuvre, the system can detect whether a critical situation is present by monitoring the:
  - lateral acceleration,
  - load, and
  - speed.
- With automatic braking of the individual wheels, the stability program is able to prevent the trailer or follower from jackknifing.
- When a pre-programmed vehicle speed is reached, TEBS G2.1 supplies a pneumatic or electrical signal, using a pneumatic or electrical output.
- When all voltage supplies fail, the trailer can be braked using only the pneumatic brake, however without ABS and ALB (automatic load braking) function.
- The Anti-lock Brake System ABS makes the braking process considerably safer, i.e. it prevents the wheels from locking during evasive braking or on a slippery road. If the road is only slippery on one side, the driver can keep the vehicle in the lane with significantly less steering movements and the trailer or follower does not jackknife.
- The Anti-lock Brake System ABS continuously checks whether a critical situation is present by monitoring the:
  - speed.
- With a pre-programmed vehicle speed, the ABS signals, using a pneumatic or electrical output, as well as up to seven electrical inputs to meet the specific requirements of the customer.

**Operational Data Recorder (ODR)**
- The Operational Data Recorder (ODR) records data about the operational condition of the vehicle, including the distance travelled with the load, braking activity and the operational condition of the vehicle, including the distance travelled with the load, braking activity and the operational condition of the vehicle.
- In addition, the system can detect whether a critical situation is present by monitoring the:
  - lateral acceleration,
  - load, and
  - speed.
- This signal can be used to activate the operational data recorder.

**Optional Auxiliary Functions**
- Auxiliary programmable input and output functions
- Optional programmable input and output functions for auxiliary functions
- Using the Auxiliary Design Language (ADL) for auxiliary functions

**Stop Light Supply**
- When all voltage supplies fail, the trailer can be braked using only the pneumatic brake, however without ABS and ALB (automatic load braking) function.
- The stop light supply is also powered by the TEBS G2.1.

**Integrated Speed Switch or Speed Monitor**
- A pre-programmed vehicle speed is reached.

**Tipping Angle Lock**
- Optionally, when the trailer is stationary or slow moving, the TEBS G2.1 signals, using a pneumatic or electrical signal, when a pre-programmed vehicle speed is reached.

**Auxiliary Design Language (ADL) for auxiliary functions**
- Using the Auxiliary Design Language (ADL), new functions and performance features can be implemented in addition to the comprehensive built-in auxiliary functions in TEBS G2.1.
Park/Shunt Valve with release function and charging valve.

The valve isolates them and protects the pressure in the system. In the event of pressure loss in the auxiliary circuit, the valve is partially charged before the auxiliary circuits are charged.

The AE437x is additionally equipped with an integrated brake system for Agriculture. In the uncoupled state, the service brake system and the parking brake system must be activated before the vehicle is parked. NOTE: Furthermore, there is the regulation that the passenger in a trailer vehicle is automatically mechanically braked upon breaking away from the tractor. For road vehicles there is a special requirement that combined state is needed in the auxiliary circuit.

This ensures that the vehicle is always parked securely. As an important contribution to safety gained from this is that an automatic actuation of the spring brakes with the TEBS G2.1. An important contribution to safety gained from this is that an automatic actuation of the spring brakes with the TEBS G2.1. An important contribution to safety gained from this is that an automatic actuation.

PARK/HUNT VALVE WITH RELEASE FUNCTION AND CHARGING VALVE

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PARK/SHUNT VALVE WITH RELEASE FUNCTION AND CHARGING VALVE

Legislators require that trailer vehicles must be automatically braked upon breaking away from the tractor. For road vehicles there is a special requirement that compressed air loss in the vehicle does not lead to a loss of braking.

Knorr-Bremse therefore focuses on the automatic activation of the spring brakes with the TEBS G2.1. An important contribution to safety gained from this is that an unoccupied trailer is automatically mechanically braked. This ensures that the vehicle is always perfectly secured. This also the case of the trailer is not actually stopped by the driver.

NOTE: Furthermore, there is the regulation that the parking brakes must activate automatically for the brake vehicle is parked.

The parking/hydraulic brake with charging brakes, the AHKS, is used in trailer vehicles that are equipped with TEBS G2.1 and combined cylinders. It is installed in the supply line of the trailer and makes it possible to manually release and apply the brakes of the trailer in the uncoupled state.

TRAILER INFORMATION MODULE TIM G2 (OPTIONAL)

The Trailer Information Module TIM G2 from Knorr-Bremse is a display on the trailer vehicle, which directly displays the diagnostic and trailer specific data. TIM G2 monitors the manufacturer, service and workshop passwords of the trailer and accesses the saved data of the TIM G2 without the PC diagnostics program.

The Trailer Information Module TIM G2 may be ordered optionally when purchasing the TEBS G2.1 brake system.

NOTE: The diagnostic function is only available as an option on trailer vehicles that are equipped with TEBS G2.1.

PC DIAGNOSTICS (OPTIONAL)

User-friendly, PC-based diagnostic software enables the following functions:

- Parameterisation of the brake and auxiliary functions
- Test of line fault
- Diagnostic information recording (saving parameters and data logs)
- Monitoring of the driving performance
- Audit and load test
- System test
- Operation dependent data recorders display and report

Application

- Agricultural Trailers
- Construction Vehicles
- Commercial Vehicles
- Coaches
- Industrial Vehicles
- Trailers
- Road Vehicles
- Special Vehicles