

Electronic Brake System TEBS G2.1 for Agriculture



Application

- Agricultural Trailers

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.

Proven electro-pneumatic components of the TEBS G2.1 electronic brake system from the related commercial vehicle sector were used to meet the increasingly strict adaptability requirements of agricultural and truck trailers.

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 optimized 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

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

For the function of the system, a connector conforming to ISO 7638 (ABS socket) is necessary and mandatory on the tractor for permanent power supply and function of the TEBS G2.1 warning system.

The module can be operated in a voltage range of 8-32 Volts i.e., thus allowing the advantages of the TEBS G2.1 for all trailer types over 3.5 tons to be used worldwide.



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 or on a slippery road. If the road is only slippery on one side, the driver can keep the vehicle in its lane with significantly less steering movements and the trailer or follower does not jackknife. This also reduces the wear on the tyres.

THE ROLL STABILITY PROGRAM RSP

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 with a load having a high centre of gravity. Even if the driver recognizes the critical situation, it is normally too late to avoid an accident.

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 vehicle speed is lowered and thus the lateral acceleration is also reduced, which improves the stability of the vehicle.

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 without 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 supports one pneumatic and three electrical outputs, as well as up to seven electrical inputs to meet the specific requirements of the customer.

Steering axle lock

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

Tipping angle lock

Optionally, when the trailer is stationary or slow moving, the TEBS G2.1 signals, using a pneumatic or electrical signal, if trailer has a higher lateral (tilt) angle than was pre-programmed. This signal can be used to warn the driver of a tipping trailer that there is a danger from an increase in tipping angle of the trailer.

Lifting axle control

TEBS G2.1 supports either a pneumatic or electrical signal for the Knorr-Bremse lifting axle valve and thus prevents too high axle load of the fixed axles. Up to two lifting axles can be controlled, either independently of each other or simultaneously. The lifting axle control can be combined with an input signal for support of the traction assist, forced lowering or manoeuvring system.

Integrated speed switch or speed pulse

TEBS G2.1 supplies 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 in TEBS G2.1.



Park/Shunt Valve with release function and charging valve

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 actuation 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 if the trailer is not actually stopped by the driver.

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

The parking/manoeuvring valve with charging valve AE437x 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.

The AE437x is additionally equipped with an integrated charging valve. During charging the valve ensures that the service brake system and the parking brake system are partially charged before the auxiliary circuits are charged. In the event of pressure loss in the auxiliary circuit the valve isolates them and protects the pressure in the brake system.



Trailer Information Module TIM G2

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 enables the manufacturer, driver or workshop personnel to directly access the saved data of the TEBS G2.1 without the PC diagnostics program.

PC DIAGNOSTICS (OPTIONAL)

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

- Parameterization of the brake and auxiliary functions
- End of Line Test
- Diagnostic information recording (saving protocols and data sets)
- Monitoring of the driving performance
- Axle load output
- System test
- Operation dependent data recorder display and reset

Commercial Vehicle Systems

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