



Setting the Standards

**Trailer Component
Suppliers Perspective**

Mario Colosimo
BPW

Historical Perspective

For many years trailers had to be cheap to buy, with little consideration to whole of life costs.

New developments were few and far between, as manufacturers strived to reduce manufacturing costs.

In the last 20 or so years, the market has changed, with ever increasing consideration to safety and whole of life costs.

Historical Perspective

- Springbrakes were introduced, offering true emergency braking.
- Quick change brake shoes (on drum brakes) made servicing easier.
- Automatic Slack Adjusters became more prevalent.
- Trailer ABS brake systems and load sensing brake systems became available.
- Airbag suspensions

Current Technologies

- Disc Brakes for Trailers are taking a greater market share.
- Trailer Anti-lock brake systems and Automatic Slack Adjusters are standard in Europe and the US.
- In Europe the majority of trailers also have load sensing brakes.
- Airbag suspensions are fitted to the vast majority of trailers in the developed economies.
- Trailer EBS brake systems (which include load sensing) are becoming dominant in Europe.

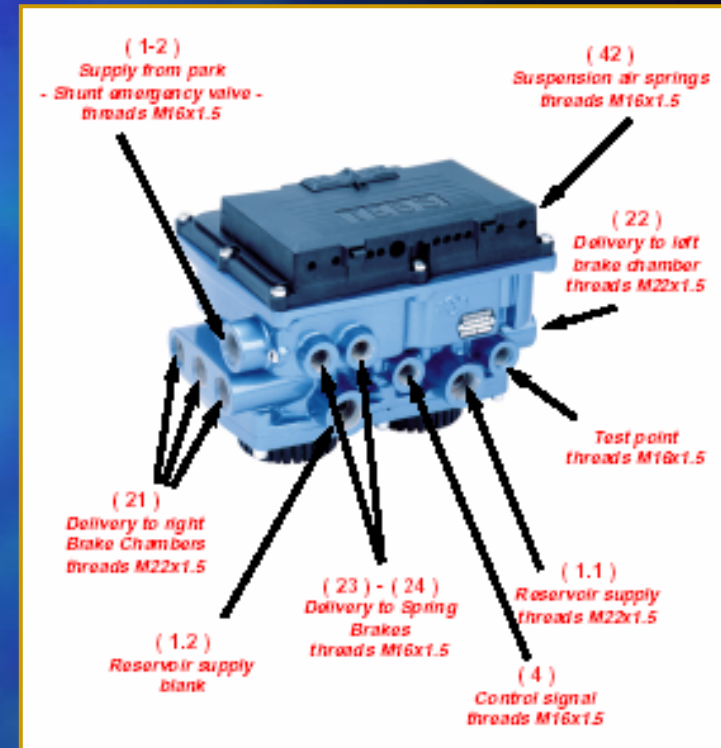
Trailer EBS

- EBS = Electronic Brake System
- Conventional pneumatic control system uses AIR to “control” relay valves. EBS uses ELECTRONIC signal to “control” relay valves, enabling faster responding brakes
- Actual brake force is still provided by compressed air delivered to brake chambers
- Trailer EBS is available with Wabco and Knorr-Bremse – 24 Volt systems, which can be powered by 12 Volt prime movers through a trailer mounted voltage inverter
- Trailer EBS is recommended if Prime Mover has ABS or EBS output.



Major Benefits of Trailer EBS

- Electronic actuation of the trailer brakes
- Anti-Lock Function (ABS)
- Integrated electronic load sensing
 - Actual load is detected by sensors
 - Brake pressure depends upon the load; between laden and unladen vehicle
- Roll Stability Program (RSP)
- Trailer Information Module (TIM)



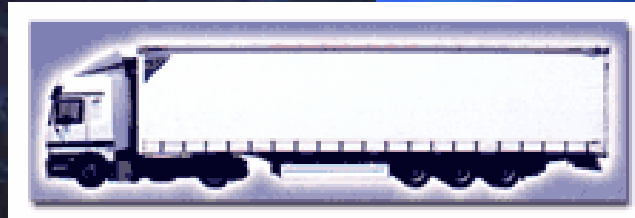
Roll Stability

The Roll Stability Program gathers information from various sensors, including an accelerometer and pressure transducers in the EBS valve, and the wheel speed sensors.

The computer in the EBS valve processes this information and automatically applies the trailer brakes when it determines that the trailer is approaching point of rollover.



KNORR-BREMSE TRAILER EBS FUNCTIONALITY CHART WITH DIFFERENT PRIME MOVERS



Trailer EBS Functionality

Prime Mover
Brake System
Configuration

Electronic
Brake
Actuation

ABS

Load
Sensing

RSP

TIM
(Optional)

EBS



ABS



Conventional
(without
EBS or ABS)



LEGEND

- ABS:** Anti-Lock Brake System
EBS: Electronic Brake System
RSP: Roll Stability Program
TIM: Trailer Information Module

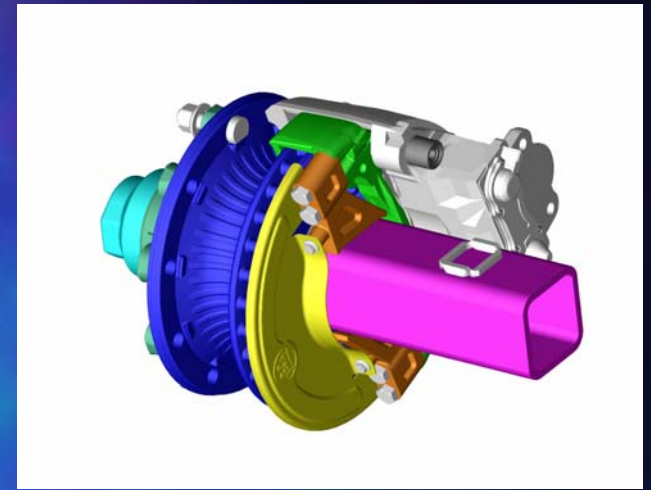
NOTE

BPW Transport Efficiency supplied Knorr-Bremse EBS Trailer Brake Kits can be ordered to suit either 12 Volt or 24 Volt supply, and for either disc brake or drum brake trailer axles.

Disc Brake Benefits

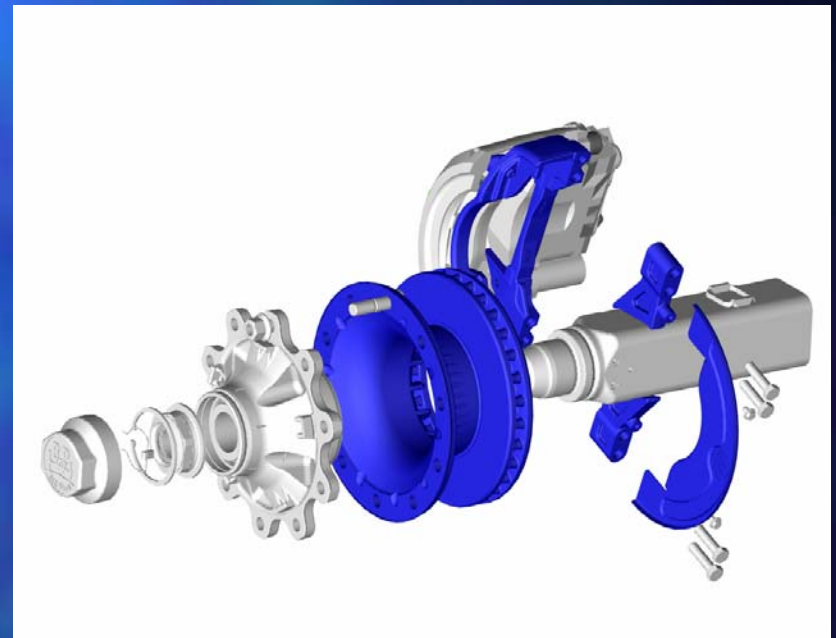
SAFETY : Disc Brakes have far **superior fade performance**, which means that the brakes are not prone to fade, as are drum brakes. The Disc Brake is also more sensitive and reacts quicker due to smaller service boosters and inbuilt automatic adjustment, resulting in a **shorter braking distance**.

LESS DOWNTIME : As there are fewer component parts to service on the disc brake. There is no greasing required on the disc brake, unlike conventional drum brakes which require regular lubrication of the camshaft bushes and slack adjuster. Disc Brakes have automatic adjustment.



Disc Brake Compatibility

- **Truck/Trailer combinations must be set up so that the brakes apply at the same time.**
- **If the truck has drum brakes, it should have automatic slack adjusters.**
- **If the truck has load sensing brakes, the trailer should also have load sensing brakes.**
- **If the truck has drum brakes, then it should be set up to be slightly more aggressive when the brakes are cold.**

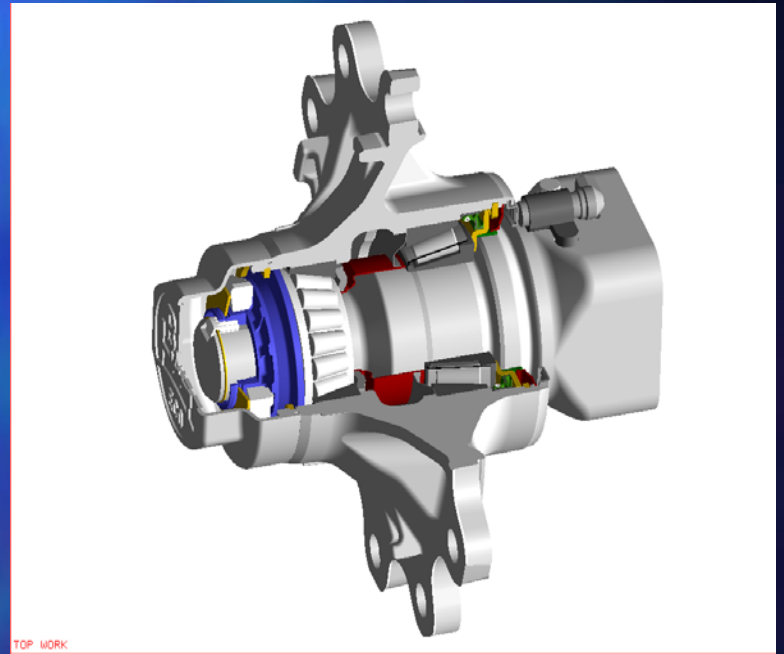


Hub Developments

Axle manufacturers have been developing product to respond to operator demands for lower maintenance equipment.

This has led to competing concepts in the wheel hub area.

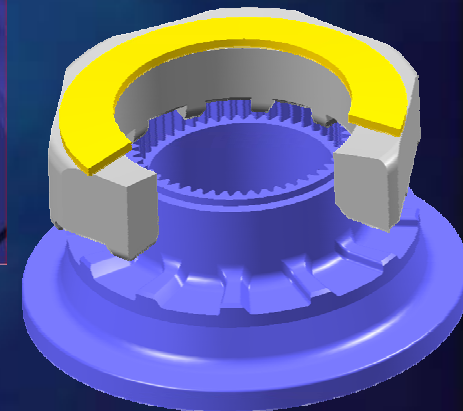
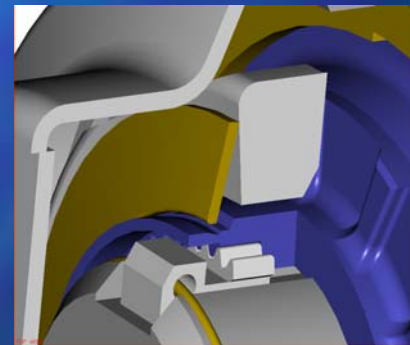
- The bearing spacer
- The combination bearing
- The Torque Prevailing Axle Nut



Hub Developments

The Combination bearing concept relies on correct bearing adjustment being achieved via machining tolerances controlled by the bearing manufacturer, with lubrication and sealing also the responsibility of the bearing manufacturer.

The Torque Prevailing Axle Nut concept is preferred by BPW, with it's ECO Plus Hub, as a more accurate adjustment is possible, using standard serviceable ISO bearings, while maintaining control of lubricant and hub seals.



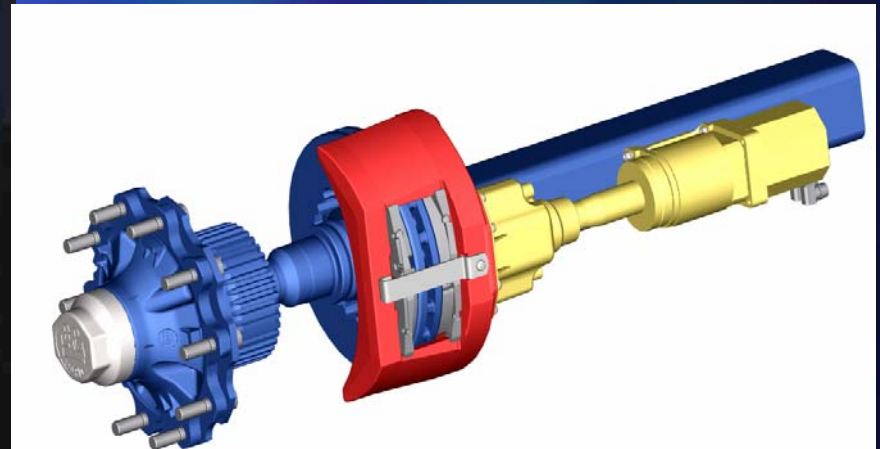
Future Developments



ECO - Disc Tronic

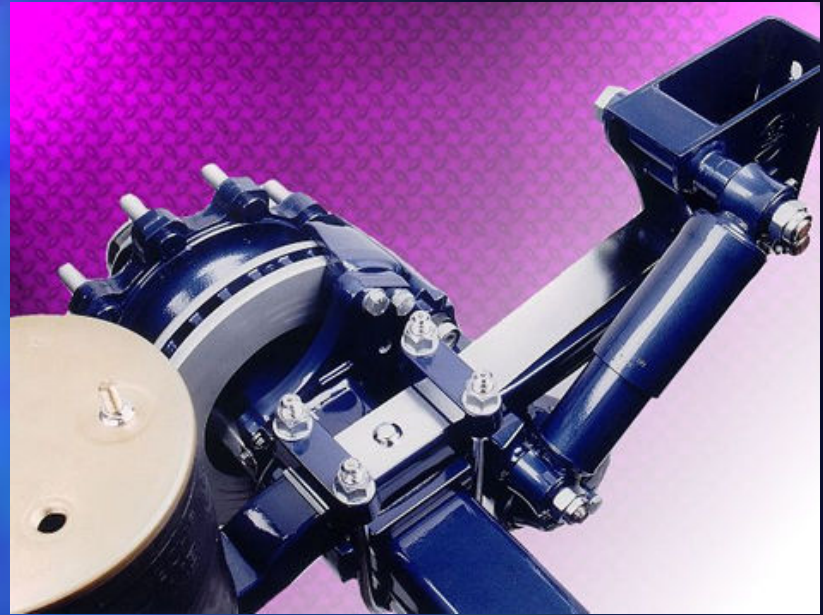
Third Generation Disc Brake

- floating rotor
- can be electrically actuated



The Future

- **Disc Brakes** will become more dominant as they undergo further development.
- **Braking Systems** will become smarter, offering improved safety.
- **Running Gear Suppliers** who remain focused on offering products that give the lowest possible “whole of life” cost will prevail.
- **Maintenance of trailers** will require trained personnel who are fully aware of the intricacies of the new technologies, the responsibility for this training will fall more and more in the lap of the running gear suppliers.





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