

Press Release

Munich, September 21, 2018

Perpetuum and Knorr-Bremse RailServices look ahead to future cooperation

- **Signed declaration between Perpetuum and Knorr-Bremse for maximized safety and reliability and reduced costs**
- **Future cooperation of digital applications in the rail sector**
- **Condition based maintenance of wheels, gearboxes, motors and wheel bearings for a better insight**

München, September 21, 2018 – Knorr-Bremse RailServices, the aftermarket specialists in the Rail Vehicle Systems division of Knorr-Bremse, and Perpetuum have signed a declaration of intent as the basis for further future cooperation between the two companies. Perpetuum is the global leader in the provision of information to maximise safety and reliability and reduce costs.

The declaration allows both companies to continue servicing their customers independently from each other while working to accelerate the adoption of digital applications in the rail sector.

Perpetuum has developed an algorithm for recording and monitoring vibrations of wheels, gearboxes, motors and wheel bearings on rolling stock with the aim of obtaining better insight into the condition of the vehicle fleet. It is also able to simultaneously monitor the track. This allows maintenance cycles, quality, and efficiency to be optimized and conclusions drawn regarding the systems' behaviour in the future.

Knorr-Bremse RailServices is looking to combine the Perpetuum system and its information with iCOM Monitor, both systems are already being used by various operators to support condition-based maintenance. iCOM Monitor collects, consolidates, and processes the data generated by other systems on the vehicles and then sends them to a back office for further analysis.

Both companies see great potential in future collaboration, with significant added value for customers as a result of being able to gain deep insight into a wide variety of systems in their fleets and thus achieve cost reductions through optimized maintenance cycles. Possible applications have already been identified for both products in future joint customer projects and these will soon be pursued further.

Knorr-Bremse is the global market leader for braking systems and a leading supplier of other safety-critical rail and commercial vehicle systems. Knorr-Bremse's products make a decisive contribution to greater safety and energy efficiency on rail tracks and roads around the world. For more than 110 years the company has been the industry innovator, driving innovation in mobility and transportation technologies with an edge in connected system solutions. Knorr-Bremse is one of Germany's most successful industrial companies and profits from the key global megatrends: urbanization, eco-efficiency, digitization and automated driving.

About 29,000 employees (as of June 30, 2018) at over 100 sites in more than 30 countries use their competence and motivation to satisfy customers worldwide with products and services. Localization is a central focus of Knorr-Bremse's strategy. Knorr-Bremse delivers braking, entrance, control and auxiliary power supply systems, HVAC and driver assistance systems for rail vehicles, as well as braking,

steering, powertrain and transmission control solutions, and driver assistance systems for commercial vehicles.

In 2017, Knorr-Bremse's two divisions together generated revenues of EUR 6.2 billion (IFRS). A comprehensive aftermarket & services business with high entry barriers gives these revenues increasingly cyclically independent stability. The company benefits from strong, entrepreneurial and experienced management. Technical excellence, reliability, passion and responsibility are deeply embedded in its corporate culture.

Perpetuum:

Perpetuum is a global leader in the provision of information to maximise safety and reliability and reduce costs.

Its award winning, self-powered, wireless sensing technology, combined with its vibration engineering expertise and rich analytics, provides real time information that enables the rail industry to optimise railway operations.

Perpetuum's revolutionary technology is deployed and operational in the UK, Australian, USA and Swedish national passenger rail networks. www.perpetuum.com

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