



Checking the train brakes in Cologne Gremberg

The many uses of KAESER air on Germany's Railways

## Rail Benefits from Compressed Air

Four railway compressed air applications in Cologne, Düsseldorf and Herne illustrate the versatility of this energy source which also has to meet increasingly stringent rail authority requirements.

Compressed air and railways have always gone hand in hand with one another even from the very earliest beginnings of this mode of transport in Germany 169 years ago. However, rather than looking at the braking system compressed air which is still produced by a compressor in the train locomotive itself, we are going to look at less obvious compressed air applications such as the KAESER Mobilair portable compressors used at an industrial railway in Herne.

### Brake Testing in Cologne-Gremberg

With tracks that stretch to the horizon and powerful diesel engines continuously sorting freight cars, the train assembly facility at Cologne-Gremberg is second in size only to the Cologne-Eifeltor marshalling yard. The wagons of incoming trains are separated and rearranged in different combinations to suit the intended new destinations. However, before these trains depart for their next journeys they have to undergo a thorough brake test and inspection. To save the resources of a locomotive, compressor systems installed on large train assembly facilities provide the



5 bar air pressure necessary for the brake system compressed air reservoirs and wagon brake lines. Up until recently, German requirements regarding compressed air quality for freight rail traffic were fairly relaxed, but with higher speeds the requirements became increasingly stringent. Deutsche Bahn (German Rail) stipulated that both freight and passenger train brakes should be tested with compressed air that has a pressure dew point of -40°C, which is the quality required for high-speed German ICE trains. Consequently, the compressed air supply on 'Field 2' of the Cologne-Gremberg train building facility was recently upgraded to meet the latest standards. New rail industry reforms enabled new procurement methods to be explored and a SIGMA AIR UTILITY compressed air installation now operates at the side of the track field. An underground pipe distribution network feeds the air from this system to the filling points fitted with brake testing equipment located at the end of the tracks. The testing procedure starts with the Rolling-Stock Controller attaching the railcar brake couplings to the brake hoses. The main airline and air supply reservoir for the train of carriages or wagons are then filled. This process takes only a few moments for a train that has very recently been assembled, yet may take up to 20 minutes for a 700 metre train which has been standing idle over the weekend and

whose brakes have lost pressure. The leak test is passed if the brake system air pressure does not drop by more than 0.5 bar over a 1 minute period. This may seem like a large pressure drop, but is in fact a safe and realistic value in view of the many flexible connections that make up the brake system. Constant air pressure is maintained by the locomotive's compressor which continuously tops up the system's air supply when the train is in operation. Furthermore, compressed air brakes on trains are designed in such way that the train is automatically brought to a standstill should a sudden drop in compressed air pressure occur, caused for example by a split hose. Once the brake test is complete, the Rolling-Stock Controller then calls up the number for each individual railcar via his portable GPRS-PC to verify that they are in correct order and to calibrate each of their brake data. He continues the safety inspection by checking to see that all the brakes are applied and checks the brake pads and other important components for signs of wear or other abnormalities. Once completed, the Controller then moves on to the next carriage or wagon.

### Brake Testing in Deutzerfeld

The maintenance workshop located at the centre of Cologne's Deutz district is not only home to large number of locomotives and railcars run by DB Regionalbahn Rheinland GmbH (Rhein Regional Railways Ltd, part of German Rail), but is also the carriage works for regional rail transport leaving Cologne. Located near the carriage workshop, the KAESER compressor system supplies air to pneumatic tools throughout the facility and also powers the carriage brake testing systems. Taking the place of the locomotive by filling the main brake lines and compressed air reservoir, these systems are able to

Sand "filling station" in Düsseldorf



perform all brake application/release operations providing information on brake status via manometer. The new compressed air quality requirements also apply here, so a powerful desiccant dryer completes the installation which, like the system at Gremberg, is controlled by a SIGMA AIR MANAGER 4/4. Providing control with monitoring, the Deutzfeld installation was also one of the first systems to be fully integrated into the KAESER Tele-service network. To ensure continuous compressed air availability, any deviations from the set parameters are automatically sent via SMS as status and service messages to four qualified German Rail (DB Regionalbahn GmbH) employees who are then able to take appropriate action.

### Stationary Sand System in Düsseldorf

Known as "Werkstatt Düsseldorf", the Düsseldorf 1 rail maintenance works is the local service point for all locomotives and railcars within the S-Bahn Rhein-Ruhr regional rapid transit rail network and also for trains operating further afield between the Rhein, Ruhr and Wupper districts. Fast, regional transport systems place particularly tough demands on brake systems and tracks, especially in the autumn when they have



Cleaning coal wagons with compressed air in Herne



**Brake test in Deutzerfeld – with air from KAESER compressors**



to deal with heavy falls of leaves. Therefore to maintain continuous optimised braking performance, a new sand loading installation powered by KAESER rotary screw compressors has been installed at the trackside. As this system also requires maximum air availability, all status and service messages are automatically sent via modem from the containerised compressor installation to the employee responsible, enabling rapid response. There is a striking similarity between the braking sand installation and a car filling station: The brake sand is delivered in tankers, unloaded under pressure and then stored in silos. Using compressed air, it is then fed to ten filling pumps and injected via a filling nozzle into the locomotives' or railcars' sand containers. As with a conventional fuel pump, the filling valves automatically detect when the tanks are full and stop the flow of sand. This system ensures that locomotives and railcars are both able to perform with maximum braking ability, which is probably no bad thing in a network that, from Hochdahl to Erkrath, has one of the steepest stretches of mainline railway in Europe.

### **Cleaning Power in Herne**

Situated at Wanne Westhafen station, the Wanne-Herner Eisenbahn und Hafen GmbH, WHE, (Wanne-Herne Railway and Harbour Ltd) is a well regarded transport company in the area whose main workshop has also relocated to this site. Slightly further east, a coal reloading point supplies the Herne STEAG power station with fuel where self-unloading trains are pushed through covered unloading bunkers. Their load falls into the bunkers after the pneumatically operated wagon sides open and continues its journey on conveyor belts. Sometimes, during the cold and damp months of the year, considerable quantities of this load would stick to the inside of the wagons. In order to detach this caked on coal with as little physical exertion as possible, WHE position a KAESER Mobilair 26 portable compressor at each unloading bunker. Suitable pressure hoses lay next to the middle and ends of the wagons on both sides so that long compressed air lances can be used where needed without having to pull on long, heavy air lines. This is a clever and flexible solution, especially considering that these dependable sources of compressed air can always be used for a wide range of other applications should they not be required for cleaning duty.

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*Author: Klaus Dieter Baetz  
Contact:  
klaus-dieter.baetz@kaeser.com*