NEW YORK AIR BRAKE

HOW COLD WHEEL DETECTION SYSTEMS WORK

Wayside wheel temperature detection systems were originally introduced with the stated goal of detecting heat generated by failed or failing wheel bearings. Today, heat-sensing technology is widely deployed and the systems are also used as a measure of air brake effectiveness.

The theory and logic for using hot/cold wheel detectors for assessing brake performance, and by implication brake condition, are straightforward. Brakes in good condition will generate friction when applied to rail car wheels. This friction, in turn, raises the temperature of the wheels and the higher temperature is detected as a train passes through a detection system. Brakes that are unable to apply the appropriate level of braking force to the wheel – for whatever reason – are not able to raise wheel temperature to the expected level.

When freight cars passing through a wayside detection system have wheels that do not register the appropriate wheel temperature, they are flagged by the system as having “cold wheels” and by implication, substandard brakes. Should the same car be identified as having cold wheels multiple times, the car in question must be set out for air brake testing and, if need be, brake service.

The Issue of “False Positives”

While acknowledging that today’s wayside brake detection systems do an excellent job of identifying genuinely faulty or failed brakes, these systems can also generate a surprising number of “false positive” identifications – inaccurately flagging cars as having cold wheels (and sub-standard brakes) when, in actuality, the brakes are perfectly sound. These cars are taken out of service and set out for single-car testing that often proves that the brakes are entirely compliant with regulations and function properly. As a result, railroad operators and freight car leasing companies experience increased downtime, higher costs and lost productivity – while customers also see an indirect rise in shipping costs and delays.

Why would a freight car’s brakes fail a wayside detection, but subsequently pass a closer inspection when the car is pulled from the track for a single-car test? More often than not, it has to do with naturally occurring leaks in a freight train’s pneumatically controlled automatic air brake system.

Given the mechanical limitations of a pressurized air system and the harsh conditions under which air brakes work on a freight train, AAR regulations allow air brake cylinders to leak up to one psi per minute. If a car with fundamentally sound brakes is experiencing a small, but nevertheless allowable, cylinder leak – which is most likely to be evident if the brakes have been applied during a long, downward grade OR if the train is operating in extremely cold weather, when leakage is most severe – that car will likely earn a failing grade while passing through the next, nearby wayside detection system.

In a heated shop, however – this same car and these same brakes may very likely pass the single car test and be judged to be perfectly safe. Consequently, the car is returned to service without repair and may be flagged and set out again and again. This costly cycle can be avoided.

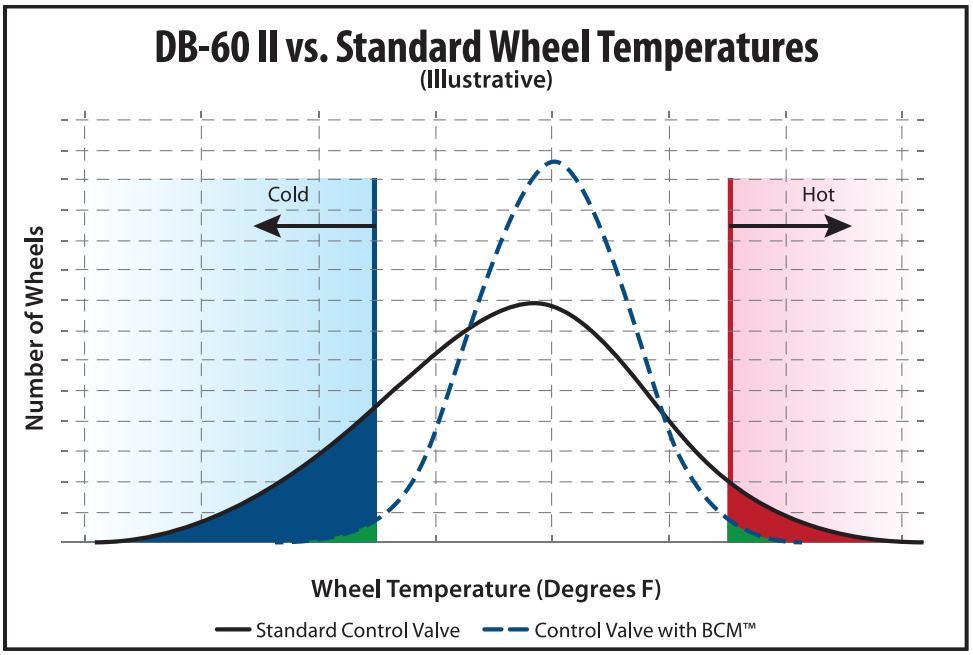
Brake Cylinder Maintaining™ (BCM) Helps Eliminate Costly "False Positives"

At present, pneumatically controlled air brake systems cannot recharge the brake cylinder while the brakes are applied. If the cylinder leaks, then braking force is lost during the brake application. The air system will recharge only after the brakes are released.

New York Air Brake's DB-60 II control valve includes an ingenious and industry-exclusive technology – Brake Cylinder Maintaining (BCM) – that automatically restores air pressure to the air brake system during a brake application. Of paramount importance, this innovation provides additional control to train operators under *all* conditions, especially during long downward grades and cold weather.

Of additional benefit, BCM can keep your wheels warm and your cars running longer – avoiding lost revenue and unnecessary maintenance costs due to false positive cold wheel set outs as described above.

Once air leakage is detected, the DB-60 II with BCM springs into action – restoring up to 85% of the original brake cylinder target pressure. Thoroughly tested by New York Air Brake, as well as by a Class 1 railroad in mountainous terrain, BCM can maintain 1 psi per minute of brake cylinder leakage within 8 psi of the target pressure and within 10 psi of the target at two psi/min brake cylinder leakage (twice the "legal" limit).



BCM reduces the number of cars with wheel temperatures outside the acceptable limits. On cars with brake cylinder leaks, wheels stay warm while cars without leaks don't have to work as hard and wheels don't get as hot. The result is a more efficient system with far less stress.

Other benefits you will appreciate in our new DB-60-II with BCM include:

1) Added safety is why this control valve is so right for railroads today – By maintaining higher brake reserves for greater stopping power, DB-60 II with BCM adds a powerful margin of safety to every consist.

2) No changes to existing control valve dimensions or clearances – As BCM is the result of internal refinements, no changes to installation, piping or mounting are required. The DB-60 II fits in the exact same space as standard control valves.

3) Existing DB-60s can be upgraded – Since the improvements have been confined to the quick service limiting valve, older DB-60s can be upgraded to incorporate brake cylinder maintaining. Interchangeability is sustained in all cases.

4) Less wear and tear on working cars – Because a vastly greater number of cars will have fully functional brakes there is less stress on the system, more even brake wear and lower forces on draft gear, wheels and track.

Learn more about how DB-60-II with BCM can help you operate more safely – and reduce the unnecessary costs and downtime resulting from false cold wheel readings.
Contact Vince Moore at New York Air Brake today, 315 786-5271.