



**BENDIX RECOMMENDS HIGH PERFORMANCE REPLACEMENT BRAKE LININGS
TO ENSURE SAFETY AND REDUCED STOPPING DISTANCE COMPLIANCE**

Selecting the Correct Replacement Brake Lining Is Important to the Overall Safety of the Vehicle

An emergency stop is no time for a driver to discover that his or her stopping power has been compromised by the vehicle's replacement brake linings. Unfortunately, drivers of vehicles using aftermarket replacement friction won't know if their new linings have diminished stopping power until a real-world situation puts them to the test. By then, it could be too late.

This serious safety consideration should not be left to chance. Fleet owners and operators can avoid reduced stopping power by replacing brake linings with those specified by the original equipment manufacturer (OEM). Committing to a like-for-like replacement is the only way fleets can maintain the same high level of safety NHTSA intended by mandating improvements in stopping performance. And it's a certain way to maintain compliance with new federal standards designed to improve highway safety.

Meeting New RSD Regulations

The first phase of stringent new federal Reduced Stopping Distance (RSD) regulations for Class 8 tractors went into effect August 1, 2011, with the second phase taking effect August 1, 2013. The requirements mandate a 30 percent reduction in stopping distance for over-the-road heavy trucks.

To meet the RSD standards, brake manufacturers have responded with high-performance foundation drum brake systems. The new brakes not only meet stopping distance requirements, they also perform better and with significantly less fade than their predecessors. These benefits extend to the OEM replacement linings designed for RSD-compliant braking systems. The high performance linings feature significantly higher stopping power, less fade, and perform significantly better than traditional brake linings. This means that they also maintain their performance levels much more effectively when subjected to the temperature increases that occur during demanding brake usage like carrying heavy loads, frequent stops, and operating in mountainous regions.

However, even as fleets and drivers have added new high-performance drum brakes to their vehicles, many remain unaware that the routine maintenance decision for specifying replacement friction can negate the technological advancements of the brakes – and potentially compromise safety. Relining today's high-performance drum brakes with typical aftermarket friction, and not the linings specified by the OEM, can significantly reduce a vehicle's braking capability and lead to longer stopping distances.

Demystifying FMVSS 121 Testing

In its recommended practices, the Technology and Maintenance Council (TMC) of the American Trucking Associations states, "It is essential that the replacement brake linings function as well as the material originally supplied on the vehicle."

When it comes to the average aftermarket replacement friction, these linings will likely not perform nearly as well as the original equipment. This reduced performance places these linings outside of the TMC's recommendations. Furthermore, the average replacement friction likely does not pass the higher vehicle performance requirements of RSD-level tests, even if it is Federal Motor Vehicle Safety Standard (FMVSS) 121 certified to the old standards.

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In two key instances, FMVSS 121 testing does not line up with new RSD standards. The new RSD rules require brakes to achieve a deceleration force of .634 Gs – a significant increase from the previous force of .37 Gs. This higher requirement is not reflected in the FMVSS 121 dynamometer test.

In addition, the laboratory environment of the FMVSS 121 test is unable to account for the weight transfer experienced in a braking vehicle, particularly the addition of weight to the steer axle. This is a worrisome oversight, as the TMC's aftermarket brake lining classification report states: "Brakes relined with certain aftermarket materials can have reduced braking output, cause a shift of work to brakes on other axles, and reduce the overall stopping capability of the vehicle."

The same TMC report bluntly states that the SAE J661 testing of small lining samples "is not considered accurate in determining performance on a full-size brake," making it abundantly clear that this particular procedure is no longer a reliable barometer of how a brake should perform in today's RSD environment.

Comparing Linings – A 96-Foot Difference

To demonstrate how roadway safety may be jeopardized by the choice of replacement friction, Bendix compared the stopping distance performance of various linings on high-performance drum brakes. The company measured the 60 mph stopping distance of an RSD-compliant vehicle with high performance brakes and linings. Bendix then replaced the friction with multiple non-high performance Original Equipment and aftermarket materials that had passed the FMVSS 121 dyno test, but were not suitable for RSD compliance.

With nothing else changed, the stopping distance increased from 215 feet using the OEM friction to 311 feet with the worst performing aftermarket replacement friction – a stunning 45 percent decrease in performance. That 96-foot difference in stopping distance – a total of five passenger car lengths – is a stark illustration of the roadway safety at stake.

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With nothing else changed, the vehicle's stopping distance increased from 215 feet using the OEM friction to 311 feet with the aftermarket replacement friction – a stunning 45 percent decrease in performance. That 96-foot difference in stopping distance – approximately five passenger car lengths – is a stark illustration of the roadway safety at stake.

Also of note, the stopping distance for the high performance friction is 35 feet shorter than the RSD requirement of 250 feet, demonstrating the ability of high performance friction to far exceed RSD standards.

Improving Road Safety

Engineering teams from Bendix Spicer Foundation Brake and other OEMs invest heavily in designing and specifying brake packages that factor in a wide array of variables, such as axle load rating, wheelbase, and tire size. To produce a comprehensive brake package that places safety top of mind, engineers also specify the most effective friction materials for use in those brakes. Low-cost aftermarket friction is not engineered to the same standard and thus not suitable for consideration as Original Equipment on heavy trucks and tractors built after August 2011.

The safety concerns associated with substandard aftermarket friction are real. When the time comes to replace brake linings, fleet owners and operators are best served by relining with the same friction originally spec'd on the vehicle. By doing so, they can ensure RSD-level braking performance and enhance highway safety.

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