



White Paper

Prepared for the Revised Stopping Distance Requirements...

Procuring the right brake and friction can assure consistent performance

By Tim Bauer, senior director, Undercarriage Products-Aftermarket, Meritor

When it comes to meeting new federal stopping distance requirements, fleets have some legitimate concerns: Do we have the right brakes matched with the right friction? Does our inventory of brake parts and replacement friction, brake shoes and disc pads fit a vehicle's exact operating vocation? Do we have the correct technical specs and part numbers? Will our aftermarket supplier have a call center to answer my operator's question?

All of these questions are valid and real-life issues in the minds of fleet equipment managers and maintenance directors who must specify the right brake and friction material to comply with Phase 2 of the new Federal Motor Vehicle Safety Standards reduced stopping distance (RSD) requirements, known as FMVSS 121. The new requirements were established by the National Highway Traffic Safety Administration (NHTSA). When it's time for a fleet to change the RSD shoes on their new vehicles, replacement with the proper and cost-effective solutions is vital to ensure that all vehicles continue to meet FMVSS121 stopping distance requirements.

Phase 2 of the RSD regulation addresses about 20 percent of the market and includes vehicles such as 4x2 tractors, three-axle tractors and tractors with four or more axles. Vocations include pickup and delivery, less-than-truckload and special heavy haulers. Changes have been designed into the brake system hardware and complementary friction materials to meet RSD requirements, according to Meritor brake engineers.

"Complete brake specifications and friction combinations are completed, prepared and ready for the North American truck operators," said Joe Kay, director of engineering, Brake Systems, Meritor. He acknowledged that changing wheelbases, tires and tire sizes were variables taken into account when the respective vehicle OEM approves new brake equipment (both cam and air disc systems).

While the new requirements address only new vehicles (see chart), servicing after the first brake cycle is important to maintain the braking performance designed into the new vehicle. "The best way to do that is to select friction materials and brake hardware from an OEM supplier to ensure the consistent vehicle operation," said Tim Bauer, senior director, Undercarriage Products-Aftermarket, Meritor.

As one of the industry's leading foundation brake and friction suppliers, Meritor has re-engineered its friction materials to meet the new RSD requirements. The industry commonly discusses the materials as being "RSD friction from an aftermarket brand supplier" that is not intended for use during OEM production of RSD brake systems.

"We always recommend that fleets replace brake shoes with the same friction material they removed from the vehicle at the time of servicing," said Peter Freeman, senior product manager, Wheel End-Aftermarket, Meritor. "We highly recommend that fleets use an RSD material for replacement friction to help keep all of their vehicles performing and stopping in the same stopping distances."

Reduced stopping distance is not achieved simply by using new friction materials, according to Meritor engineers. Changes have been made to the drum brake assemblies, including the use of air disc brakes on some heavier-capacity front axle brake applications and variations to the vehicle's entire braking system.

Below are the most frequent questions-and-answers from an aftermarket perspective about the new regulations and the decision to standardize friction:

Q. Can a fleet retrofit all of their brakes to the new Meritor RSD friction materials?

A. Rear brakes can be retrofitted seamlessly from existing materials to the new Meritor RSD friction. Meritor RSD friction materials may increase torque in older front brake designs and affect the integrity of older front spiders with 5/8" bolts.

Q. Will the use of Meritor RSD friction materials on vehicles with older brakes improve the stopping distance of those vehicles or increase the wear life?

A. Retrofitting tractors and trailers with older brake designs to the new Meritor RSD friction materials will have no impact on vehicle stopping distances. Stopping distance and wear will be comparable to existing friction materials.

Q. Will the new Meritor RSD materials be available for all-makes brakes?

A. Meritor Aftermarket offers a complete selection of Meritor RSD friction materials for the most popular brake applications.

Q. By what distribution channel will Meritor Aftermarket supply new RSD friction materials?

A. New Meritor RSD friction materials will be available only on new or reman lined brake shoes and brake shoe kits from the authorized parts outlets, such as OE dealers or warehouse distributors.

Q. Will Meritor RSD friction materials be available with PlatinumShield™II brake shoes?

A. All Meritor aftermarket RSD friction materials will be available on new and reman brake shoes protected with Meritor's rust-jacking preventive coating, PlatinumShield™II.

Q. Will Meritor RSD friction materials be available in bulk block sets for reliners?

A. Meritor RSD friction material will be available only on new or reman lined brake shoes. Meritor Aftermarket will not offer RSD friction materials in bulk block sets.

Q. Will the new stopping distance regulations require air disc brakes?

A. Both types of air brakes systems may be used by the truck operators to meet the requirements -- drum brakes and air disc. Meritor's EX225 air disc brakes are available and specified for front axles used on some OEM vehicle applications to meet the requirements.

Q. How will fleet operations and vehicle specifications change?

A. A fleet continuing to use drum brakes will see minimal changes to operations and service practices. In most cases, drum brakes will remain standard equipment. In instances where larger brakes are required, Meritor has lightweight component options, including stamped steel spiders and SteelLite X30™ brake drums to help mitigate weight increases.

Meritor Q Plus™ brake service practices will not change. Service technicians and mechanics will not have to be retrained on maintenance of the Q Plus brake. While the regulations do not affect service parts, Meritor Q Plus brake shoes with enhanced friction material will be available for purchase in the aftermarket.

Q. Are reduced stopping distance drum brakes available for vehicles *not* impacted by the revised regulations in August 2011?

Meritor is committed to providing commercial vehicles with safe and long-lasting drum brakes. Because there are common brake sizes between vehicles affected by the regulations, and those not affected by the regulations, there are RSD materials that would be available. However, vehicle braking performance will not be improved by using the new materials on older vehicles.

Here are key Q&As from an original equipment (new vehicle) perspective:

Q. What is the new FMVSS 121 stopping distance requirement and when does it take effect?

A. Phase 1 of the new RSD requirement took effect August 2011. It required new three-axle tractors, (with gross vehicle weight ratings up to 59,600 lbs.; from 60 mph), to stop within 250 feet loaded and 235 feet unloaded.

Timing (For New Vehicles)	Number of Tractor Axles For New Vehicles	Tractor GVWR (lbs.)	Loaded 60 MPH Stopping Distance (ft.)	
			Current	New
Aug 1, 2011	Three	0 to 59,600	355	250
Aug 1, 2013	Three	59,600 to 70,000		250
	Three	> 70,000		310
	Two	All		250
	≥ Four	0 to 85,000		250
	≥ Four	> 85,000		310

Q. What is the requirement for other types of vehicles such as straight trucks and buses?

A. New requirements for other types of vehicles are part of Phase 2, effective August 2013.

Q. How has Meritor updated its products to help OEMs comply with the new federal requirements?

The Meritor Q Plus drum brake has been improved to help vehicle manufacturers meet the revised stopping distance regulations. Tractor brakes must deliver not only

maximum stopping power, but also excellent service life, low noise, compatibility with existing trailers and smooth response. Therefore, Meritor re-engineered both front and rear brake specifications. The result is an improved Q Plus that delivers stopping distances similar to an air disc brake with cost of ownership advantages comparable to traditional drum brakes.

Key updates to the Q Plus brake include new Meritor Approved (MA) friction materials, more robust front brake spiders and larger front brake mounting bolts. In many cases, brake sizes will increase over today's common 15" x 4" front brakes and 16.5" x 7" rear brakes. However, the minimum required brake size depends on a number of factors and will therefore vary by vehicle manufacturer.

Q. What is the impact on my existing vehicles? Do I need to change my existing vehicles to the new Meritor RSD friction materials?

A. The law only affects new production tractors. There is no legal requirement to retrofit older vehicles, yet many fleets (of all sizes) opt to use the RSD lining on their existing fleet population.

Q. How is compatibility affected between tractors equipped with the new Meritor RSD friction materials and trailers with older brakes and friction materials?

A. Tractor-trailer brake compatibility was a design requirement for the new Meritor RSD friction materials. Meritor's solutions have been developed to maintain tractor-trailer compatibility with existing trailer fleets. The tractor will incur approximately 5 percent more of the braking workload, while the trailer will experience a proportionate reduction in workload.

Q. Regarding the new Meritor RSD Q Plus brakes, what has changed other than the friction material?

A. Because front brakes now absorb more brake torque, the front brake spiders have been made heavier and the mounting bolts are a larger diameter. Front brakes now use Type 24 brake chambers, increasing the AL factor to 132.

Q. Are larger brake sizes required to meet the new RSD requirements?

A. Not in all cases. Meritor has worked with all of the major vehicle OEMs to design the brake package to meet the new stopping distance requirements. Brakes may be slightly different from one OEM to another. See the Meritor application charts for specific sizes per OEM.

Q. Are there advantages to using larger brake sizes for the Meritor RSD requirements?

A. Larger brakes will provide some advantages, including increased lining volume to drive longer service intervals, lower operating temperatures, reduced fade and improved performance.

Q. Will my service practices have to change?

A. Drum brake service practices do not change. Service technicians and mechanics will not have to be re-trained and parts inventory practices will transition to the new drum brakes. However, new parts and friction, including new brake shoe FMSIs and hardware kits corresponding to the new brake sizes, should be stocked at fleets or authorized parts outlets.

For more information, contact Meritor at www.meritor.com or Meritor Aftermarket Customer Care at 888-725-9355. Literature on Demand, which is available to all customers, includes:

- ***SP1221 Meritor Reduced Stopping Distance Friction Materials***
- ***SP11137 Reduced Stopping Distance Friction Materials Q&A***
- ***SP1385 Meritor Aftermarket Friction***

- ***PB8857OE Meritor Lined Brake Shoes and Brake Shoe Kits (OE Dealer Version)***
- ***PB8857WD Meritor Lined Brake Shoes and Brake Shoe Kits (WD Version)***

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