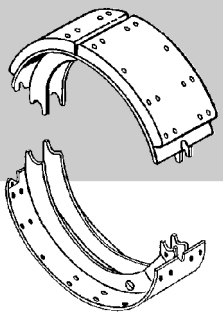
Dayton Parts™

www.daytonparts.com

New Lined Shoes



PRODUCT **E**MPHASIS **P**ROGRAM

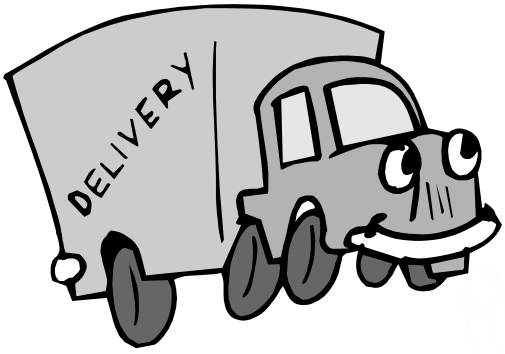
Heavy Duty Air Brake Shoes

For your truck to do its' job it must be able to...

Carry Its' Load

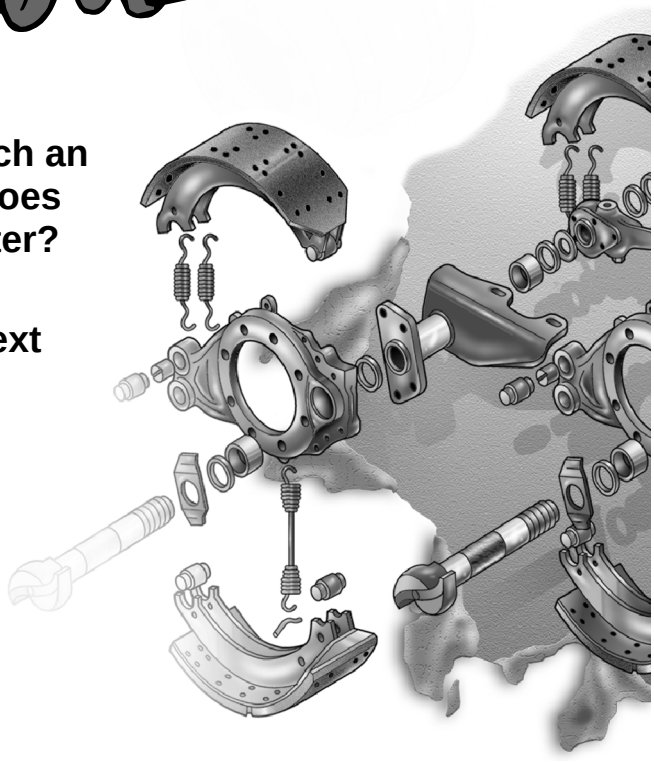
Go

Stop



Since the air brake system performs such an important function, are relined brake shoes the real value or is there something better?

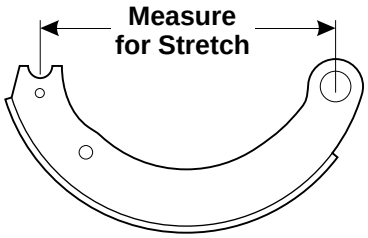
A few things to consider before the next brake job on your vehicle...



BATCO®

Brake and Wheel Products

Relined or New Lined Shoes?

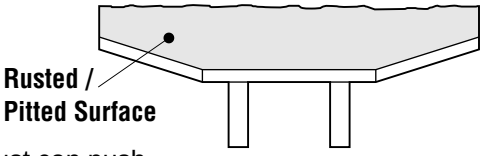


Stretch

An s-cam brake uses a rotating "S" head to make a brake application. The design has been around since the 1950's and has worked very well for the heavy truck and trailer industry. However, because of the design, force is exerted on each brake shoe in opposite directions. Every time a brake application is made one shoe is being elevated and the roller end is being pushed toward the anchor end of the shoe while the other shoe is being elevated and the roller end is being pushed away from the anchor end of the shoe or "stretched". This means half of the shoe cores returned to any remanufacturer will be "stretched" to some degree. When a brake shoe is stretched the arc of the shoe table is changed. Now you have a shoe core that cannot be relined because the arc of the shoe table no longer matches the arc of the brake block.

Remanufacturers use "re-coining" machines to correct this problem by bending the shoe core table back to the original arc. This does make the shoe core useable as far as the arc of the shoe table now fits the brake block correctly and can be riveted accordingly. The real question is what happens when this shoe is put back into service? A shoe core web bent to the correct arc does not have the same integrity it had when it was originally punched out of a sheet of steel. Add a little heat (what do brakes generate) and it won't be long before a "remanufactured" brake shoe has stretched again, changing how it contacts the brake drum.

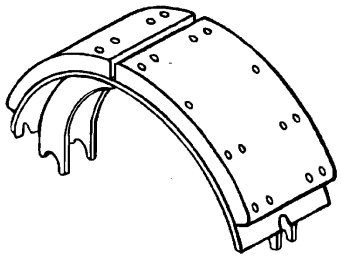
Rust



Magnesium chloride might work great on icy road surfaces but it is highly corrosive when it comes into contact with steel. When moisture and road chemicals like mag chloride get under brake block they cause the shoe table to rust. If the shoe table rusts enough while in service the rust can push up on the brake block (called rust jacking) and crack it. The loss of metal also weakens the shoe table making it easier for the brake shoe to stretch.

Some remanufactured shoes have E-coat paint applied to them but that doesn't replace the metal already lost due to rust just like "re-coining" the shoe core doesn't restore the strength of the shoe table. A new lined shoe has a solid table to properly tension the brake block while evenly dispersing the force of each brake application so you get all of the benefits out of the friction material. If you're currently buying remanufactured brake shoes, I suggest you take a shoe out of your inventory and remove the brake block to see what's underneath for yourself.

Rivet Holes

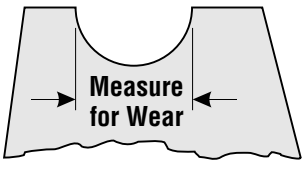


Brake shoes are usually de-lined by one of two methods; one, by rotating the shoe against a blade that shears the rivets and skives the old lining off or two, by punching the rivet out of each hole. The shearing method tends to elongate the rivet holes and the punch method to oversize them. If the holes are elongated or oversized, the rivets can no longer securely hold the lining on the brake shoe table.

Each time a brake application is made the brake block will move slightly pulling on the rivets until they become loose.

Once the rivets are loose, the lining could actually shear them during a brake application and the lining will separate from the brake shoe. You can't see the rivet holes on a relined shoe because the roll of a punched rivet can cover an oversized or elongated hole.

Roller Opening



Usually the original brake shoes on an axle will have a hardened roller opening. However, most of the shoe cores in remanufacturer's core banks do not have hardened roller openings. When the roller opening becomes worn the roller will no longer fit properly causing instability during a brake application. As the cam head rotates to elevate the shoes it will have to take up the wear in the roller opening before it starts to move the shoe. If one shoe has a worn roller opening and the other shoe doesn't, the shoe without the wear will contact the drum before the other shoe causing a loss in braking efficiency. It doesn't take much wear in the roller opening to cause this scenario. Most s-cam air brakes run a shoe to drum clearance of 0.017". In other words if one shoe has 0.017" (1/64") wear in the roller opening it will contact the drum and the other shoe hasn't moved yet.

The Right Lining for Your Application

There are many different brands and grades of brake lining to choose from. Picking the right lining for your application is important. A lining misapplication can cause poor braking performance and unnecessary maintenance costs. The type of work you do with your truck(s) will determine what lining you'll need to use. An on-highway dry freight truck won't use the same lining as a logger in the mountains. The brake systems in these two examples are responding to totally different demands and therefore require two completely different linings to do a good job. The lining for the on-highway application probably wouldn't stop the logger's truck at the bottom of the hill and the lining for the logging application would probably put the on-highway driver through the windshield once it got a little warm (you get the picture).

Lining Grades

Dayton Parts stocks more shoe numbers in more grades of lining than anyone else in the heavy duty industry. From 12-1/4" x 4" to 16-1/2" x 8-5/8" in loose shoes or shoeboxes, from 20k economy grade to 26k transit material, we have it all on the shelf.

Dayton Parts is proud to offer quality friction products from Marathon Brake Systems. Here are the Marathon friction materials we offer on our new lined shoes and the Dayton Parts lining designation:

Dayton Parts 20E — Marathon MV20, 20k economy — Designed for use on trucks, tractors and trailers operating in general freight and on-highway applications that do not require a severe service lining.

Dayton Parts 20M — Marathon UB, 20k Medium — A step up from the economy block, ideal for over the road dry freight, general hauling and other standard vocations where severe braking is not required.

Dayton Parts 21P — Marathon HS20, 21k Premium — A premium long life material. Versatile, outstanding performance makes this block ideal for a variety of over the road applications with excellent brake effectiveness, fade and recovery characteristics.

Dayton Parts 23E — Marathon MV23, 23k Economy — Designed for price sensitive fleets that require a 23k material. Suited for low powered brake systems that need a more aggressive block.

Dayton Parts 23M — Marathon FLOE, 23k Medium — Engineered for tough applications like liquid tanker, grain, cement, standard duty refuse and over the road hauling with excellent stopping power and fade resistance.

Dayton Parts 23P — Marathon HS, 23k Premium — Works on a broad range of applications from severe duty to normal over the road hauling. High density formulation for excellent heat dissipation, long service life, dependable stopping power, outstanding fade and recovery characteristics and extremely drum friendly.

Dayton Parts 23S — Marathon MBC, 23k Semi-Met Combo — MBS full metallic cam blocks with Heat Star anchor blocks give this combination material the stopping power for severe duty applications like coal hauling and the dissipation for the high heat of refuse collection.

Dayton Parts 25P — Marathon TS, 25k Premium — A premium block ideal for the high heat and extra heavy loads found in refuse, concrete, logging, sand and gravel, oil tankers and other tough applications.

Dayton Parts 26T — Marathon KVT, 26k Transit — Developed to handle the high heat and severe duty demands of refuse, concrete, logging, sand and gravel, oil tanker, beverage transport and other tough applications with excellent stopping power, long service life and extremely drum friendly.

The Different Methods of Testing and Rating Brake Lining

FMVSS-121 - (Federal Motor Vehicle Safety Standard) All lining has to pass this test to be considered for OE (Original Equipment) approval. This test is conducted with a wheel load of 11.5k (23/axle) or 10.0k (20/axle) (depending on which rating the lining manufacturer is applying for) using a complete brake assembly from the slack adjuster to the drum. This test is quite extensive and expensive so most "brand name" suppliers of aftermarket friction do **not** have this test done. They're **not** required by law to have this test conducted on their brand of friction material to **be able to sell it.** Within reason they can claim whatever they want to. Since aftermarket linings aren't subject to the same scrutiny as OE approved linings another test procedure has emerged in recent years.

TMC RP628 - This **"brake torque"** test was formulated by PRI (Performance Research Institute) and is used by TMC (Technology and Maintenance Council). PRI tests and TMC lists the brake torque of aftermarket and some OE approved linings that are submitted for evaluation. In the fine print, TMC recommends that OE lining be replaced with lining of comparable brake torque at the time of a brake job. This is good advice as long as the vocation of the vehicle hasn't changed. A vehicle originally bought as a cross-country rig then later sold and changed into a dump truck is going to have different brake requirements. Is the OE lining still right for the application? Maybe, but probably not.

FMSI Edge Code – FMSI (Friction Materials Standards Institute) still uses the original SAE (Society of Automotive Engineers) test and identification system. This test uses a 1" square of friction material (not real world) and a two letter edge code that represents the range for two coefficients of friction. The first letter indicates the normal (cold stop) coefficient of friction which is the average of four readings from 200 to 400 degrees. The second letter indicates the hot stop coefficient of friction which is an average of 10 readings from 400 to 650 degrees taken over the first fade/recovery and the second fade/recovery. The range of each letter code is as follows:

C — Not over 0.15
D — Over 0.15 but not over 0.25
E — Over 0.25 but not over 0.35
F — Over 0.35 but not over 0.45
G — Over 0.45 but not over 0.55
H — Over 0.55

SAE Test J661 with identification system outlined in J866 used by FMSI

This identification system was approved in 1964 for a test that was outlined in 1958. Each letter represents a range that's too wide and without more specific data you can't be sure where you're at. Old-timers believe that if an EE friction worked okay then FF has to be better and so on. This is a myth. Axle load capacity ratings don't necessarily coincide with brake torque (aggressiveness) and the FMSI system is far too vague. You could end up with one axle or wheel doing more work than another which leads to brake imbalance. Remember, be sure you have **the right lining for the application.**

FMCSR RULE 393.47 (Federal Motor Carriers Safety Regulations) states quote "The brake lining in every motor vehicle shall be so constructed and installed as not to be subject to excessive fading and grabbing and shall be adequate in thickness, means of attachment and physical characteristics to provide for safe and reliable stopping".

So what does all that impressive long winded legalese mean?

Be sure you have **the right lining for the application.**