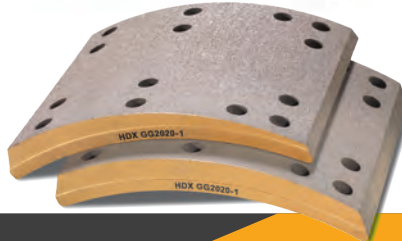
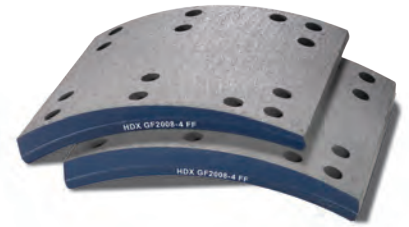
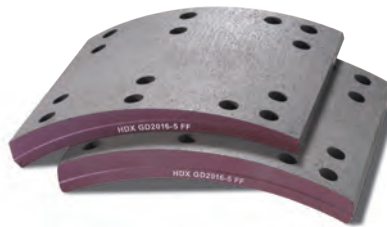
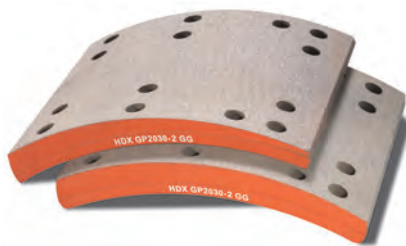


Brake Shoe Friction Product Line Selection Guide

The Versatility Leader for Brake Lining Offerings in the Heavy-Duty Industry.



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[illegible]

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Haldex Comprehensive Brake Linings You Can Count On

For decades Haldex has offered fleets the right products for all types of applications. Haldex formulations include components that can take the heat extremes necessary to achieve safe and reliable stopping performance. When used properly, Haldex friction materials lower life cycle cost on all brake contact parts.

You depend on Haldex for high quality products, exceptional service and innovation that resets the benchmark for total program satisfaction.

These fundamentals are the foundation of the Haldex friction program. Whether you're focused on distribution or are responsible for a fleet, Haldex has the most progressive solution available when it comes to brakes and brake shoe remanufacturing.



All Haldex brake linings are FMVSS-121 Certified.
Haldex lining formulations exceed OEM performance parameters.

Grey-Rock™ LEGACY Materials

FORMULA	AXLE RATING	LINING TYPE	APPLICATION
GP 2030 GG	26,000 lbs	Organic	
GM 2040 FF	25,000 lbs	Semi-Met	
GZ 2035 FF	23,000 lbs	Semi-Met	
GC 2035/2020 FF	23,000 lbs	Combination	
GG 2020 FF	23,000 lbs	Organic	
GD 2016 FF	23,000 lbs	Organic	
GR 2015 FF	20,000 lbs	Organic	

Grey-Rock™ FLEET GRADE Materials

FORMULA	AXLE RATING	LINING TYPE	APPLICATION
GF 2008 FF	20,000 lbs	Organic	
GN 2017 FF	20,000 lbs	Organic	

Enhanced Economy FLEET Materials

FORMULA	AXLE RATING	LINING TYPE	APPLICATION
HV88 FF	23,000 lbs	Organic	
HV77 FF	20,000 lbs	Organic	

Haldex Cost Effective Reduced Stopping Distance Friction Materials

Haldex RSD Friction compounds are made with low abrasive materials and premium phenolic resins. These high quality bonding agents allow our friction materials to manage extreme conditions better than our competitors. Superior compounds like GR2015 and GG2020 allow the customer **serious cost saving advantages**.

LONGER LIFE CYCLES ON BRAKE PADS AND CONTACT PARTS

Haldex Advantage: Advanced technology results in fewer worn out parts.

IMPROVED COST PER MILE

Haldex Advantage: Starts with reasonably priced friction material.

SUPERIOR BRAKE BALANCE BETWEEN TRACTOR AND TRAILER

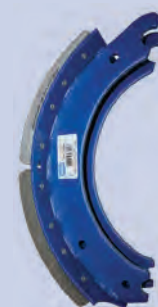
Haldex Advantage: Grey-Rock™ RSD products make it more cost-effective to use one material on both

SIMPLIFIED INVENTORIES

Haldex Advantage: Grey-Rock™ RSD products eliminate the need for two different types of friction material.

REDUCED BRAKE MISAPPLICATIONS

Haldex Advantage: Using Grey-Rock™ RSD friction material for both tractor and trailer, eliminates chances of non-RSD product on your vehicles.



GR2015 RSD SYSTEMS COMPIANT

- 20,000 lb axle rated
- Low Abrasion Organic Compound
- FF Coefficient of Friction
- AL Factor: 165



GG2020 RSD SYSTEMS COMPIANT

- 23,000 lb axle rated
- Low Abrasion Organic Compound
- FF Coefficient of Friction
- AL Factor: 165

23,000 lbs

Brake Lining Selection Guide (Rev. 6/14)

Green Zone

Yellow Zone

Red Zone

General Application

Braking Frequency

Maintenance Habits

Driver Habits

"Lighter Loads, Flatter Roads"	"Coast to Coast"	"Steep Grades, Heavy / Moving / Liquid Loads, City Roads"
Very Low, Mostly Interstate	Moderate, Mix of Interstate / Urban	Moderate - High, Any Environment
Very Good - Regular Maintenance and Complete Brake Jobs	Good - Maintenance as Needed, But Always Complete Brake Jobs	Poor - Outsourced Service, One Wheel Brake Jobs Common
Gentle - Non aggressive	Gentle - Average	Average - Aggressive

Brake linings should be chosen based on a variety of application parameters. Fleets must consider other factors besides axle rating to determine the proper lining. Load, road type, braking frequency, maintenance practices, AL factor and driver habits all affect braking performance.

HV88

23,000 lbs @ 165 AL
650° Temp Range
Good Brake Power

GD-2016

23,000 lbs @ 165 AL
750° Temp Range
Very Good Brake Power

GC-2020

23,000 lbs @ 165 AL
975° Temp Range
Exceptional Brake Power

GC-20/35

23,000 lbs Combination
1000° Temp Range
Exceptional Brake Power

GZ-2035

23,000 lbs Semi-Met
1000° Temp Range
Exceptional Brake Power

Competitive Brake Lining Listing

Abex
Bendix®
Cobreq
Meritor
Fras-Le
Marathon
Neo Brake
TruckPro/Armada
Fleetpride/OTR
H.D. America
Vipar
Freightliner/Alliance
Int'l/Diamond
Paccar/Roadleveler
Gorilla

VL23 ORANGE
NABK110
M23-MG2-MG2L
AF523
NB210-NBMB-NB250-NBSM-NB225
AR2
M23-M23H
VHD2300-23STD
S23
D3S
23STD-23PRE
SB/GB23-SB/GB23P

6149 BRONZE
MA312
AF555
FLOE
AR3
RED
23PRE
P23
D3P

685 ES6000
NABK171
MA310
AF557
HS
AR4
ORANGE
NB2001
AR5

6040
6098
SM/6098

Haldex

20,000 lbs

Brake Lining Selection Guide (Rev. 6/14)



	Green Zone	Yellow Zone	Red Zone
General Application	"Lighter Loads, Flatter Roads"	"Coast to Coast"	"Steep Grades, Heavy/ Moving/ Liquid Loads, City Roads"
Braking Frequency	Very Low, Mostly Interstate	Moderate, Mix of Interstate/Urban	Moderate - High, Any Environment
Maintenance Habits	Very Good - Regular Maintenance and Complete Brake Jobs	Good - Maintenance as Needed, But Always Complete Brake Jobs	Poor - Outsourced Service, One Wheel Brake Jobs Common
Driver Habits	Average - Non aggressive	Average	Average - Aggressive
	<i>Brake linings should be chosen based on a variety of application parameters. Fleets must consider other factors besides axle rating to determine the proper lining. Load, road type, braking frequency, maintenance practices, AL factor and driver habits all affect braking performance.</i>		
Haldex Brake Lining	HV-77 20,000 lbs @ 165 AL 550° Temp Range Good Braking Power	GN-2017 20,000 lbs @ 165 AL 625° Temp Range Very Good Brake Power	GF-2008 20,000 lbs @ 165 AL 750° Temp Range Excellent Drum Compatibility
	GR-2015 20,000 lbs @ 165 AL 775° Temp Range Highest Temperature 20K Lining		
	Competitive Brake Lining Listing		
Abex Bendix® Cobreq Meritor Fras-Le Marathon Neo Brake TruckPro/Armada Fleetpride/OTR H.D. America Vipar Freightliner/Alliance Intl/Diamond Paccar/Roadleveler Gorilla	VL20 BLACK -BLUE-GREEN NABK090 M20-EG-MG1 AF520 MH ECO-NB180-NBRM AR1 BLACK-BLUE M20-M20H VHD2000-20STD S20 D2S 20STD-20PRE SB/GB20-SB/GB20P	6014 SILVER NABK102 AF550 DB NB200-NBFM 20PRE	6011 ES4200 MA212 6008-1



Fleets should always choose brake linings based on their unique application. Competitive lining listing for reference only • no assumption of lining performance made.

BrakeZone

Haldex Brake Lining Application Survey

This application guide is designed to be a simple but comprehensive tool to assist you in determining the proper range of Haldex brake linings best suited for your equipment, based on your fleet’s specific operating conditions. To use this guide, first complete the quick, three-question survey below.

Choose only one answer per question to describe your fleet’s operating conditions, and record that score in the appropriate box. Once you have completed the survey, total the values of your answers. This total is your “application score”. Refer to the charts on the next page to determine the right Haldex brake linings for your fleet, based on your unique application score.



1

Which best describes how this vehicle is normally loaded in an average day of operation?

> Normally runs below axle rating 2

> Normally runs about axle rating 3

> Normally runs above axle rating 4

> The vehicle is used in refuse/mixer/dump type operations 5

Application score

Record scores below

2

Which best describes the terrain this vehicle covers in an average day of operation?

> Flat or mostly (90%) flat with some rolling hills 1

> Rolling hills encountered frequently with some steep grades 2

> Steep grades abundant or significant mountainous terrain 4

+

3

Which best describes this vehicle’s travel patterns during an average day of operation?

> Nearly all (85%) interstate travel5 (1/2)

> Mix of interstate, city, two-lane blacktop 2

> All urban 3

> This vehicle is a school bus 3

> This vehicle is used in mixer/dump type operations 3

> This vehicle is used in refuse type operations 6

+

4

Total the three scores above for your own application score:

Refer to the application charts on the next page for your own best Haldex brake lining options.

=

1. Calculate your application score with the BrakeZone application survey on the previous page.
2. Locate your application score on the appropriate lining options charts below.
3. Listed to the right of your score will be the Haldex brake lining options that will put you in your BrakeZone – exceptional performance and lower life cycle costs.
4. Contact your Haldex distributor to order premium-quality brake shoes with the Haldex brake lining indicated by your score.

Haldex 20k Axle Brake Linings				
Score	HV77	GN	GF	GR (RSD)
3				
3.5				
4.5				
5				
5.5				
6				
6.5				
7				
7.5				
8				
8.5				
9				
9.5				
10				
11				
12				
13				
14				
15				

Haldex 23k Axle Brake Linings					
Score	HV88	GD	GG (RSD)	GC	GZ
3					
3.5					
4.5					
5					
5.5					
6					
6.5					
7					
7.5					
8					
8.5					
9					
9.5					
10					
11					
12					
13					
14					
15					

Haldex	25k	26k
Score	GM	GP
3.5		
4.5		
5		
5.5		
6		
6.5		
7		
7.5		
8		
8.5		
9		
9.5		
10		
11		
12		
13		
14		
15		

Economy Performance	Compliant with FMVSS 121 requirements.
Good Performance	Very good stopping power. Good brake life, handles normal temperatures and load variability for this type of application.
Better Performance	Excellent stopping power, superior brake life. Handles high operating temperatures and load variability with ease for this type of application.
Best Performance	Includes all the benefits of Better Performance products plus significant gains in lowering life cycle costs by extending lining life to its maximum. Highly compatible with brake drums for these applications – lowest total life cycle costs.

Reduced Stopping Distance Regulations

In July of 2009, the National Highway Traffic Safety Administration (NHTSA) issued an amendment to FMVSS No.121 relative to stopping distances to be implemented in two phases:

Reduced Stopping Distances Phase I & II

Date of Implementation	Vehicle Type	Tractor GVWR (lbs.)	New Distance Unloaded	New Distance Loaded	Old Distance Unloaded	Old Distance Loaded
August 1, 2011	3 Axle Tractor	Up to 59,600	235 ft.	250 ft.	335 ft.	355 ft.
	3 Axle Tractor	59,600 – 70,000	235 ft.	250 ft.	335 ft.	355 ft.
	3 Axle Tractor	Above 70,000	235 ft.	310 ft.	335 ft.	355 ft.
August 1, 2013	2 Axle Tractor	Inclusive	235 ft.	250 ft.	335 ft.	355 ft.
	4+ Axle Tractor	Up to 85,000	235 ft.	250 ft.	335 ft.	355 ft.
	4+ Axle Tractor	Above 85,000	235 ft.	310 ft.	335 ft.	355 ft.

Safety first at Haldex

Safety has always been a core focus for Haldex. NHTSA's continuing mission of increasing safety on today's roadways is an effort Haldex is proud to support at many levels throughout the heavy-duty industry.

Haldex friction products and FMVSS 121

RSD Performance Requirements

- GG 2020 and GR 2015 brake linings have been certified to comply with FMVSS 121 RSD performance requirements and testing protocols.
- RSD performance validation through on-vehicle testing was conducted on behalf of Haldex by LINK Commercial Vehicle Testing at TRC (Transportation Research Center, Inc.).

FMVSS 121 dynamometer performance requirements

All Haldex friction materials satisfy the retardation, brake power and recovery specifications of NHSTA FMVSS 121 to assure compliance within this requirement regardless of the vehicle manufacturer and/or vehicle configuration.

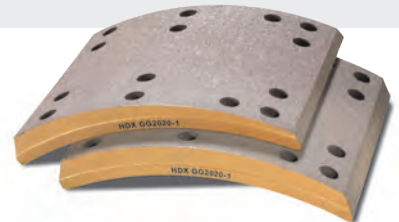
RSD **CERTIFIED** 
GG 2020 • GR 2015

Engineered stability

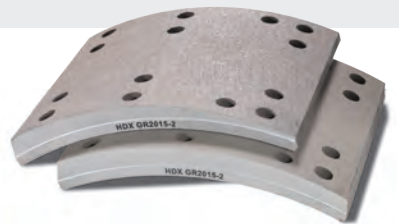
The high-performance legacy of Grey-Rock brake linings is built on decades of providing best-in-class stability.

Advanced friction compounds deliver highly stable brake linings that help you manage the rigors of variable load and road environments and the ever-growing demands for both safety and economy.

GG 2020
Premium
RSD Certified
23,000 lb. axle



GR 2015
Premium
RSD Certified
20,000 lb. axle



The right choice

Brake linings should always be chosen based on the unique application environment **YOU** operate in.

Don't sacrifice brake performance – or your ROI – to a choice someone else made for you. Exercise your right to choose and upgrade to a high-performance aftermarket option.



Reduced Stopping Distance FAQ



Fleets should take the time to ensure they understand the factors that affect safe braking performance, especially on vehicles that have been in service for a period beyond a year. Stopping performance on these “utilized” vehicles is typically reduced over time. The natural course of wear on wheel end and brake system components – as well as maintenance practices and driver braking habits – commonly result in decreased stopping performance.



Fleets often ask these questions:

Does the original brake lining supplied by the OEM have to be used for aftermarket replacement?

NO.

Are there aftermarket brake linings that are certified to meet FMVSS 121 reduced stopping distances?

YES. For example Haldex **GG 2020** and **GR 2015** have been certified according to FMVSS 121 criteria.

What are the requirements for linings used to service vehicles manufactured under this new rule?

There are currently no federal motor carrier safety regulations governing aftermarket friction material or performance requirements, thus end users (fleets) are not required to verify that vehicles meet the new FMVSS 121 stopping distance requirements.

Once in the field, trucks and tractors are subject to a 20 mph stopping distance requirement under Federal Motor Carrier Safety Regulation (CFR 49 393), or an alternative brake retardation force requirement measured by a device known as a “Performance Based Brake Tester.” These requirements are not new and will not change with the new stopping distance rule.

Will the new ruling require a radical redesign of braking systems on Class 8 tractors?

NO. There are no specific design requirements. New vehicles must meet Reduced Stopping Distance requirements, while still complying with all other existing performance requirements (FMVSS 121, etc.). OEMs may choose a variety of methods to increase braking force. Foundation brake enhancements could include:

- Increased brake drum diameter on the front axle
- Wider brake shoes (front and rear)
- Increased brake chamber size
- Longer brake adjuster arm
- More robust S-cam bushings
- Brake linings with increased coefficient of friction
- Re-enforcement of other components to reduce deflection



OEMs may also choose to direct more air pressure to the front axle brakes, taking advantage of their increased capacity. In most cases, a combination of these methods will be utilized to meet the requirements. OEMs may also offer air disc brakes as an option to increase performance.

Will Haldex friction products qualify as acceptable replacement linings on vehicles manufactured under this new rule?

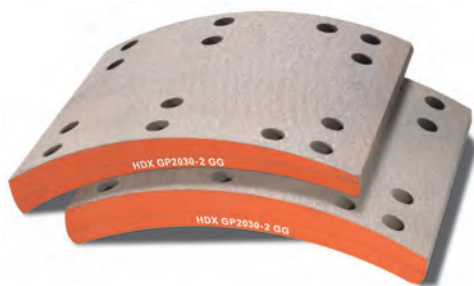
YES. Tractor manufacturers will likely choose to incorporate a combination of enhancements to produce more “brake power” during stopping to achieve the required distances. Some may choose to utilize brake lining material with higher coefficient of friction as part of the solution. In many cases, using Haldex friction in place of the OEM friction material yields a variety of performance enhancements including reduced lining wear, less brake fade and increased brake power.

For all your friction needs, specify Haldex.

Haldex Severe-Duty High Temperature Brake Linings



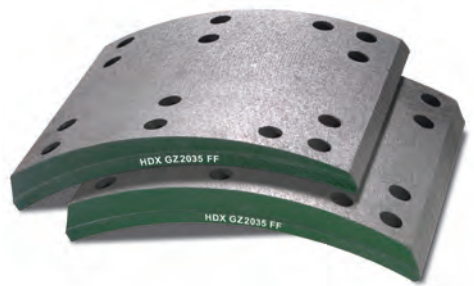
Haldex’s rugged Grey-Rock™ brake linings are in a class of their own.



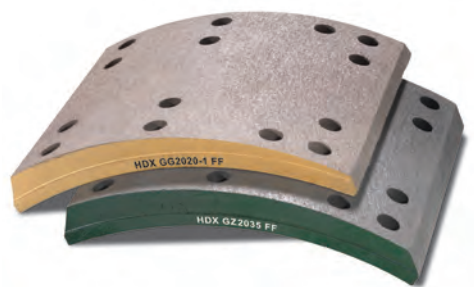
Haldex GP 2030
Severe-Duty Organic Brake Lining
Equivalent to FMVSS 121 performance levels
26,000 lb. axle load • 1000°F temp range • Coefficient - GG
An organic material engineered for extreme severe applications. A great choice for emergency equipment where brake linings must be able to withstand several levels of thermal shock.



Haldex GM 2040
Semi-Metallic Brake Lining
Equivalent to FMVSS 121 performance levels
25,000 lb. axle load • 1000°F temp range • Coefficient - FF
For the most severe applications, Haldex GM 2040 is engineered to withstand extremely high temperatures while maintaining exceptional braking power.



Haldex GZ 2035
Semi-Metallic Brake Lining
Equivalent to FMVSS 121 performance levels
23,000 lb. axle load • 1000°F temp range • Coefficient - FF
This semi-metallic brake lining does it all – withstands high temperatures, maintains brake power and is very gentle on drums, compared to other linings for severe-duty applications.

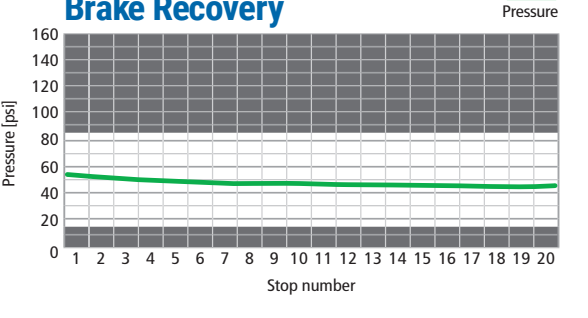
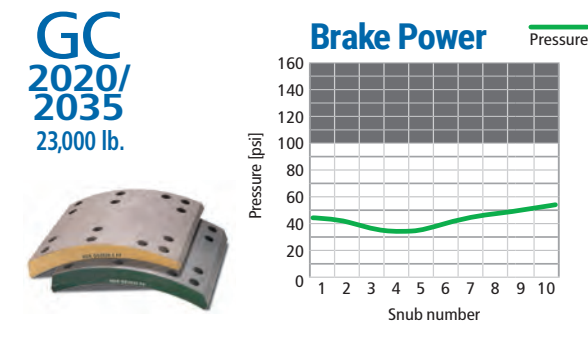
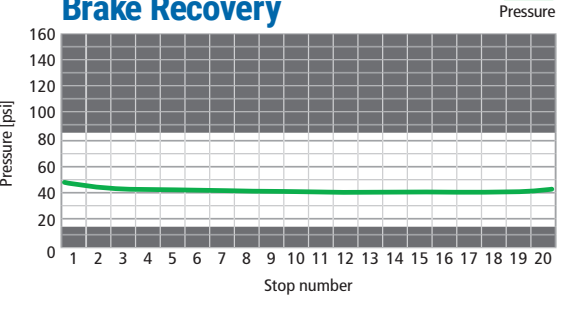
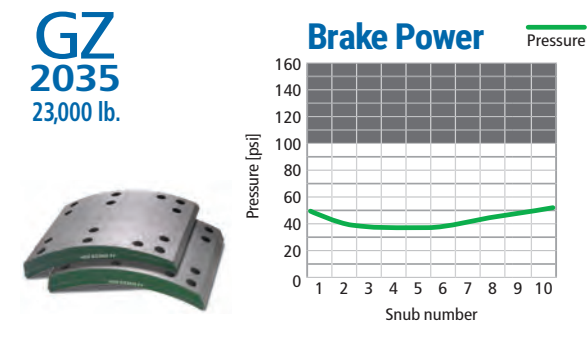
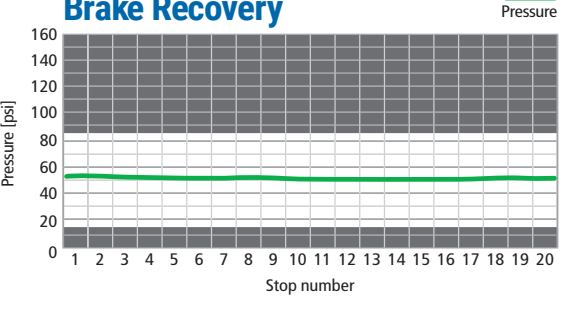
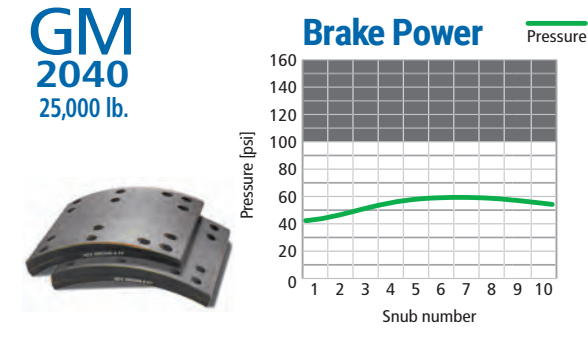
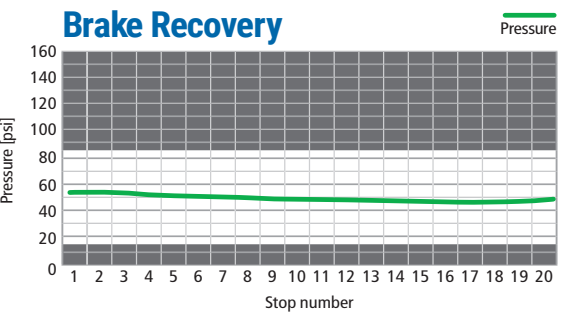
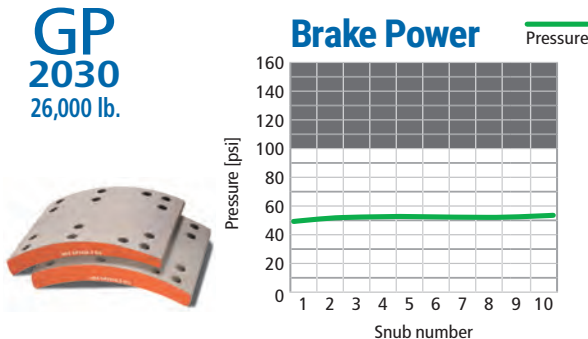


Haldex GC 2020/2035
Combination Brake Lining
Equivalent to FMVSS 121 performance levels
23,000 lb. axle load • 1000°F temp range • Coefficient - FF/FF
A true semi-metallic/organic combination lining, Haldex GC is a superior choice for heat resistance, durability and stability. GC combines Haldex GZ 2035 at the cam end, and GG 2020 at the anchor end.

Haldex Severe-Duty High Temperature Brake Linings

Haldex severe duty brake lining options			
Axle load	Organic	Combo	Semi-met
23,000 lb.	GG	GC	GZ
25,000 lb.			GM
26,000 lb.	GP		

Haldex severe duty brake linings have been certified to meet or exceed the equivalent FMVSS 121 performance levels.



Haldex GG 2020

Premium 23,000 lb. RSD Brake Lining

RSD certified, equivalent to FMVSS 121 performance levels for 23,000 lb. axle load.

The Grey-Rock™ icon that is the gold standard of stability and versatility for brake linings in the heavy-duty industry.

When fleets demand the critical combination of safety, stopping performance and lower life-cycle costs, GG 2020 is the answer.

GG 2020 Performance Ratings				
@ 23,000 lb. axle load	Economy	Good	Better	Best
Temperature range – 975° F				●
Lining wear				●
Drum compatibility				●
Braking effectiveness				●
Fade resistance				●
Recovery characteristics				●
Retardation effectiveness				●
Hot stop effectiveness				●
Cold stop effectiveness				●

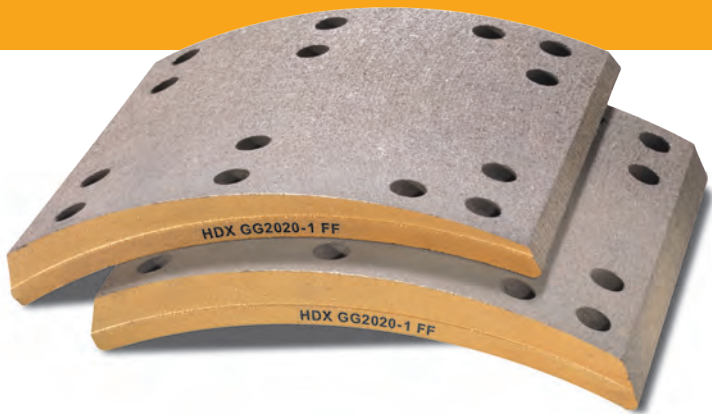
BrakeZone Application Range

Optimized lining performance for **BrakeZone** application scores:

3 to 13

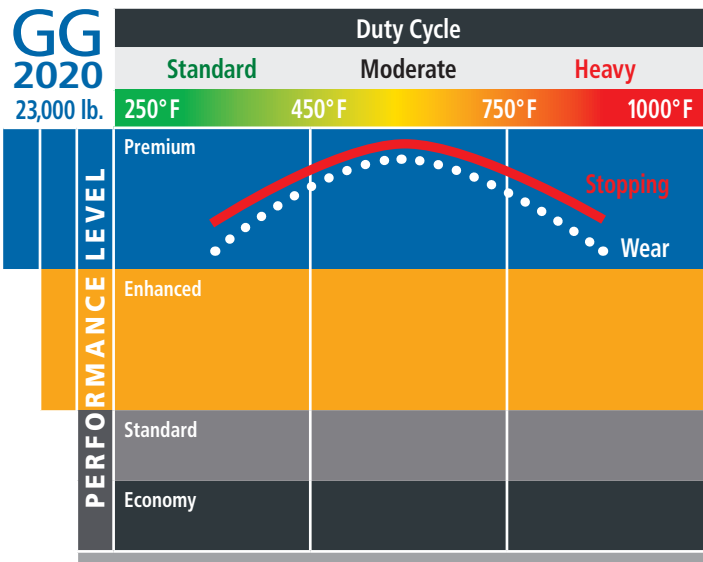
@ 23,000 lbs./axle

- > Road type
- > Load conditions
- > Braking frequency



Haldex GG 2020

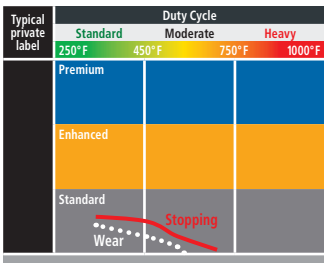
Premium 23,000 lb. RSD Brake Lining



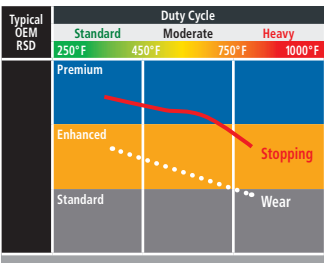
As a lining formulation that's always been a leader, GG 2020 has been providing RSD-compliant stopping performance for more than 25 years.

The Grey-Rock legacy of stability that was born from advanced compounding principles is proving yet again to be of timeless value as expectations for brake linings evolve with today's vehicles.

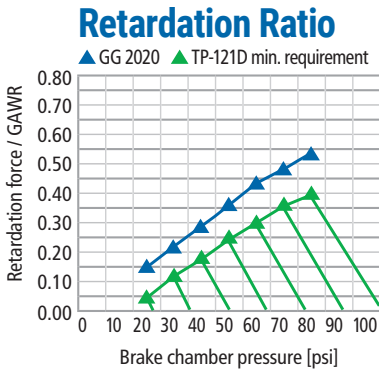
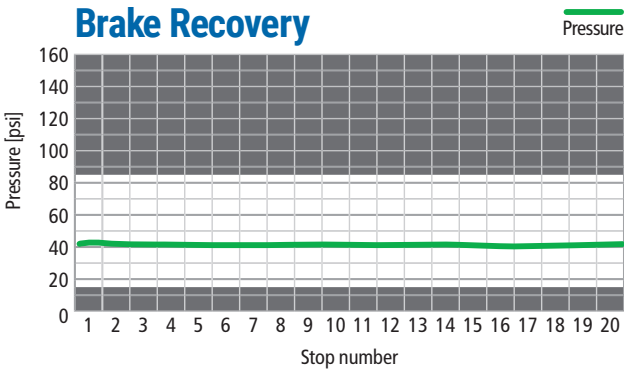
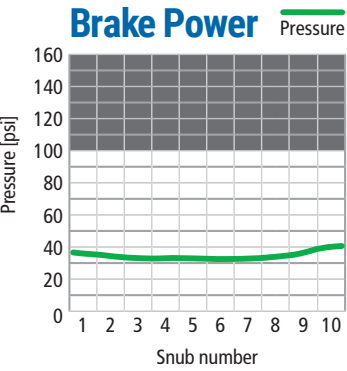
This unique level of stability delivers not only high-confidence stopping performance, but also best-in-class wear performance whether at low, moderate or high application temperatures.



Typical private-label linings are engineered for lowest cost optimization. Stability is sacrificed which leads to quickly diminishing stopping performance at even moderate temperatures. Wear rates also accelerate due to the lining's instability.



Typical OEM RSD linings have a high coefficient of friction, which yields stopping power, but with a trade-off of lining wear and incompatibility with brake drums. The results are dramatically increased life cycle costs.



GG 2020 Technical Stats		
Brake size: 16.5 x 7 S-Cam	AL factor: 165	Friction average: Normal .431 – .454
Axle load: 23,000 lb.	Suggested AL factor: 144 – 180	Hot .411 – .442
Rolling radius: 20.8		Coefficient - FF

Haldex Brake Lining Options				
Axle load	Economy	Good	Better	Best
20,000 lb.	HV77	GN	GF	GR
23,000 lb.		HV88	GD	GG

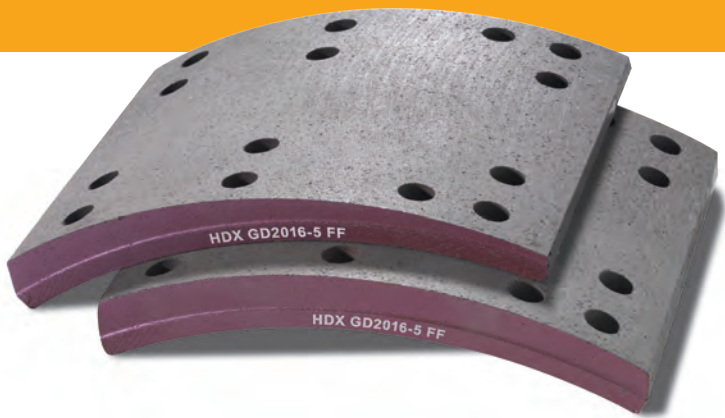
Haldex GD 2016

Premium 23,000 lb. Brake Lining

Equivalent to FMVSS 121 performance levels for 23,000 lb. axle load.

Residing in the premium performance class, GD 2016 exhibits excellent stability in higher temperature stopping environments.

Engineered to excel when compared against the historically popular OEM-grade, pre-RSD 23K brake linings.



GD 2016 Performance Ratings				
@ 23,000 lb. axle load	Economy	Good	Better	Best
Temperature range – 750° F				●
Lining wear			●	
Drum compatibility			●	
Braking effectiveness			●	
Fade resistance			●	
Recovery characteristics				●
Retardation effectiveness			●	
Hot stop effectiveness			●	
Cold stop effectiveness			●	

Optimized lining performance for **BrakeZone** application scores:

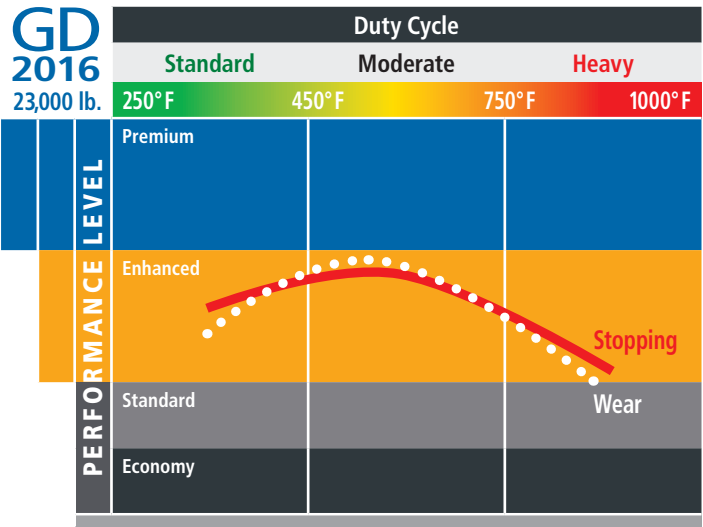
3 to 8.5
@ 23,000 lbs./axle

> Road type
> Load conditions
> Braking frequency



Haldex GD 2016

Premium 23,000 lb. Brake Lining



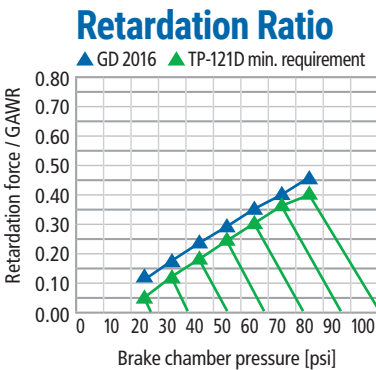
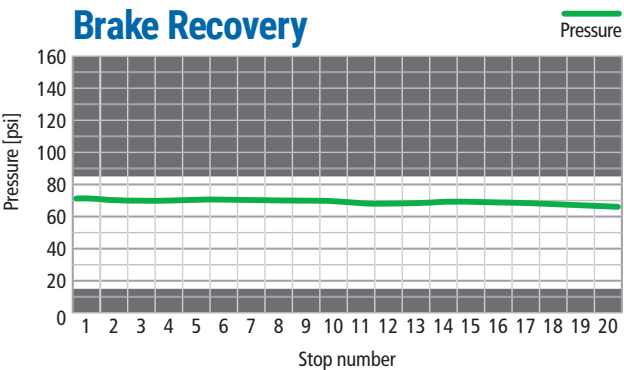
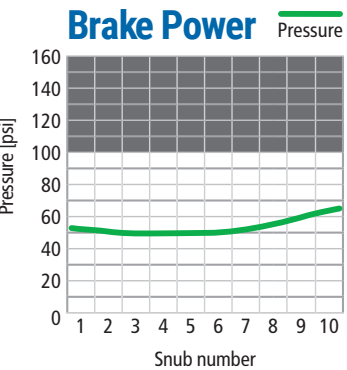
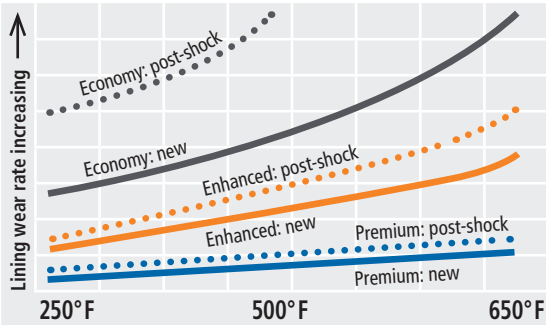
A high-performance lining for coast-to-coast heavy haul operations that need the additional stability to perform on axles loaded to 23,000 lb.

Consistent stopping effectiveness through a wide temperature zone – highly stable at moderate braking temperatures.

Optimization that matches up well with heavy hauling applications for lower brake wear at higher temperatures.

Exceptional recovery characteristics that yield long-lasting performance in applications with highly variable application temperature events.

- All brake linings get “shocked” when subjected to a prolonged, elevated temperature event, such as braking while coming down a long, steep grade with a heavy load.
- The overall stability of the lining formulation is what makes the real difference when comparing pre-shock and post-shock braking performance.
- Premium and enhanced performance linings typically recover from these shock events very well, nearly maintaining “as-new” wear characteristics.
- Unstable linings can wear up to 60% more post-shock, no matter the braking temperature, on every post shock brake application, accelerating lining replacement exponentially.
- Post-shock stopping effectiveness can be reduced as much as 30%, on every post-shock brake application, in linings with a weak stability rating.



GD 2016 Technical Stats		
Brake size: 16.5 x 7 S-Cam	AL factor: 165	Friction average: Normal .340 – .410
Axle load: 23,000 lb.	Suggested AL factor: 165 – 180	Hot .340 – .410
Rolling radius: 20.8		Coefficient - FF

Haldex Brake Lining Options				
Axle load	Economy	Good	Better	Best
20,000 lb.	HV77	GN	GF	GR
23,000 lb.		HV88	GD	GG

Haldex GR 2015

Premium 20,000 lb. RSD Brake Lining

RSD certified, equivalent to FMVSS 121 performance levels for 20,000 lb. axle load.

A legacy Grey-Rock™ lining formulation engineered for reduced stopping distances and exceptional wear characteristics.

A high-performance, stability-enhanced lining that is the fleet's first stop for upgrading OEM-RSD brakes.



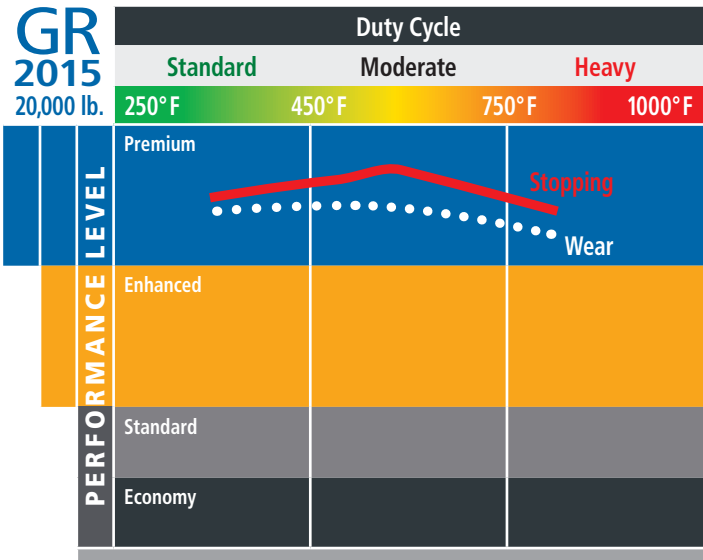
GR 2015 Performance Ratings				
@ 20,000 lb. axle load	Economy	Good	Better	Best
Temperature range – 775° F				●
Lining wear				●
Drum compatibility				●
Braking effectiveness				●
Fade resistance				●
Recovery characteristics				●
Retardation effectiveness				●
Hot stop effectiveness				●
Cold stop effectiveness				●

BrakeZone Application Range		
Optimized lining performance for BrakeZone application scores:	3 to 9 @ 20,000 lbs./axle	> Road type > Load conditions > Braking frequency



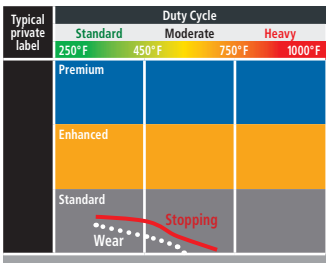
Haldex GR 2015

Premium 20,000 lb. RSD Brake Lining

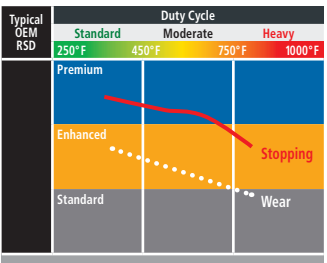


GR 2015 is a true leader in the premium lining class because it is engineered for stability. Yielding high performance throughout the duty cycle spectrum, GR 2015 doesn't force you to make a choice between stopping effectiveness and life-cycle costs while dealing with the reality of variable application environments.

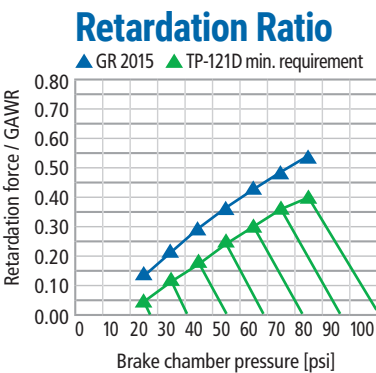
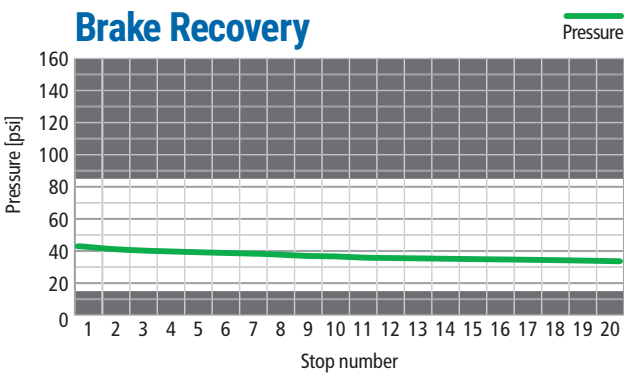
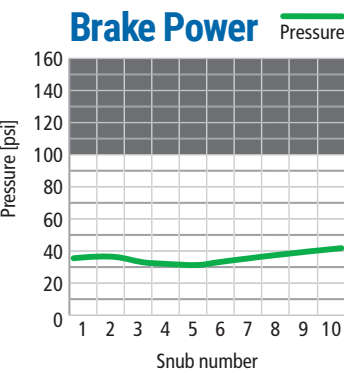
Highly stable friction properties ensure that the lining is resistant to heat, and that it returns to its original state as it cools down. This stability is the key to delivering the premium performance that GR 2015 has become known for at fleets across North America.



Typical private-label linings are engineered for lowest cost optimization. Stability is sacrificed which leads to quickly diminishing stopping performance at even moderate temperatures. Wear rates also accelerate due to the lining's instability.



Typical OEM RSD linings have a high coefficient of friction, which yields stopping power, but with a trade-off of lining wear and incompatibility with brake drums. The results are dramatically increased life cycle costs.



GR 2015 Technical Stats		
Brake size: 16.5 x 7 S-Cam	AL factor: 165	Friction average: Normal .323 – .349
Axle load: 20,000 lb.	Suggested AL factor: 144 – 180	Hot .353 – .422
Rolling radius: 20.8		Coefficient - FF

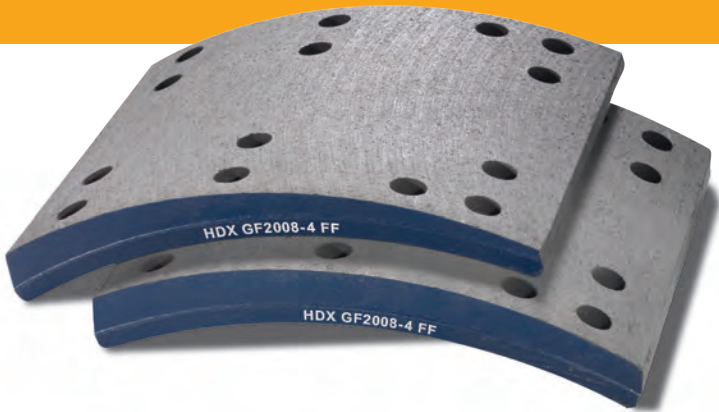
Haldex Brake Lining Options				
Axle load	Economy	Good	Better	Best
20,000 lb.	HV77	GN	GF	GR
23,000 lb.		HV88	GD	GG

Haldex GF 2008 Premium 20,000 lb. Brake Lining

Equivalent to FMVSS 121 performance levels for 20,000 lb. axle load.

A premium brake lining for tractor/trailer combinations that operate in a demanding coast-to-coast environment.

GF 2008 continues to be the fleet’s first choice to consistently out-perform other pre-RSD 20K OEM linings.

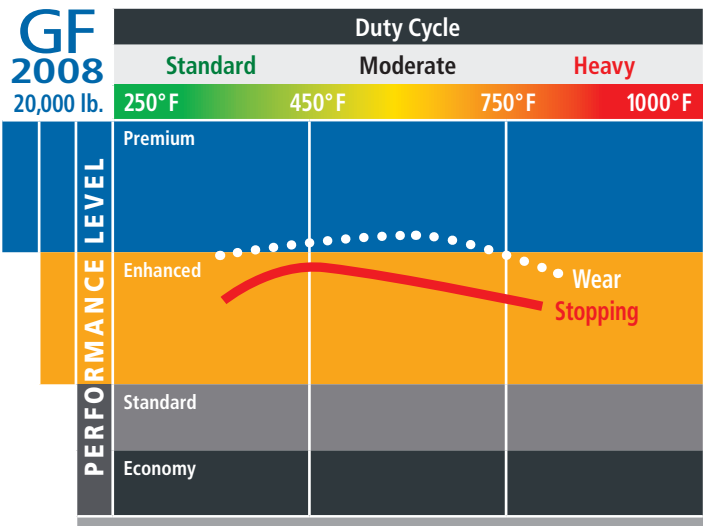


GF 2008 Performance Ratings				
@ 20,000 lb. axle load	Economy	Good	Better	Best
Temperature range – 750° F				●
Lining wear			●	
Drum compatibility				●
Braking effectiveness			●	
Fade resistance			●	
Recovery characteristics				●
Retardation effectiveness			●	
Hot stop effectiveness			●	
Cold stop effectiveness				●

BrakeZone Application Range		
Optimized lining performance for BrakeZone application scores:	3 to 8 @ 20,000 lbs./axle	> Road type > Load conditions > Braking frequency



Haldex GF 2008 Premium 20,000 lb. Brake Lining

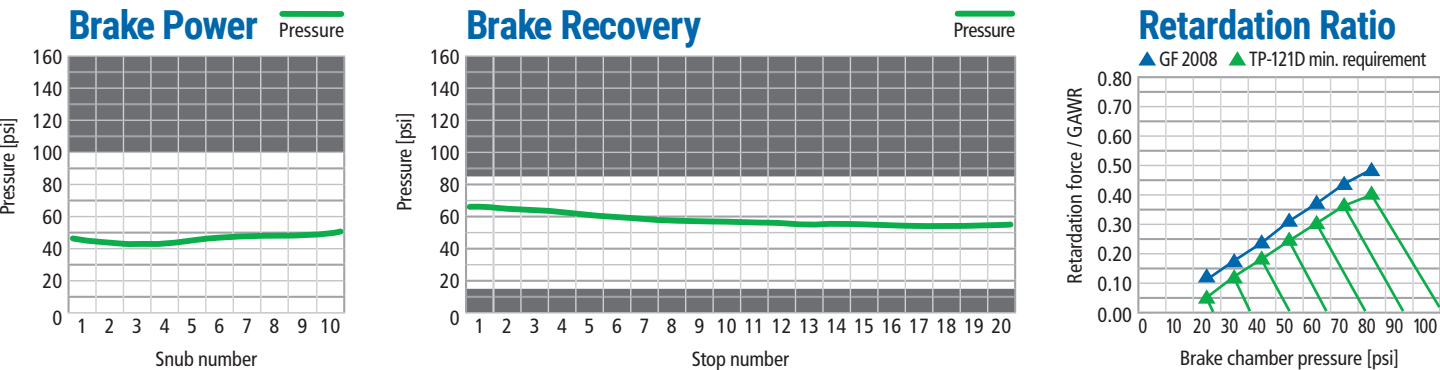
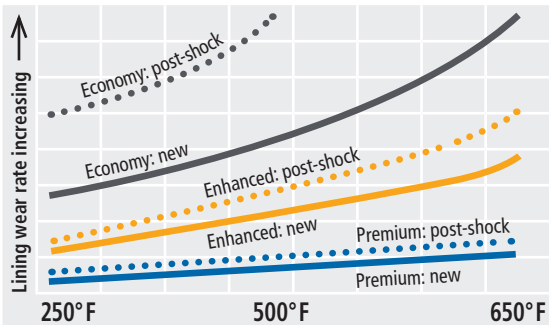


Premium performance wear rates and drum compatibility help the fleet keep life cycle costs extremely low by ensuring more miles between brake replacement servicing.

Excellent resistance to brake fade and consistent recovery characteristics help ensure high-performance braking stop after stop.

Engineered to excel in a coast-to-coast, load-to-load environment, GF 2008 has become a leading replacement for OEM linings among fleets in North America.

- All brake linings get “shocked” when subjected to a prolonged, elevated temperature event, such as braking while coming down a long, steep grade with a heavy load.
- The overall stability of the lining formulation is what makes the real difference when comparing pre-shock and post-shock braking performance.
- Premium and enhanced performance linings typically recover from these shock events very well, nearly maintaining “as-new” wear characteristics.
- Unstable linings can wear up to 60% more post-shock, no matter the braking temperature, **on every post shock brake application**, accelerating lining replacement exponentially.
- Post-shock stopping effectiveness can be reduced as much as 30%, **on every post-shock brake application**, in linings with a weak stability rating.



GF 2008 Technical Stats		
Brake size: 16.5 x 7 S-Cam	AL factor: 165	Friction average: Normal .347 – .392
Axle load: 20,000 lb.	Suggested AL factor: 165 – 180	Hot .360 – .410
Rolling radius: 20.8		Coefficient - FF

Haldex Brake Lining Options				
Axle load	Economy	Good	Better	Best
20,000 lb.	HV77	GN	GF	GR
23,000 lb.		HV88	GD	GG

Haldex GN 2017

Standard 20,000 lb. Brake Lining

Equivalent to FMVSS 121 performance levels for 20,000 lb. axle load.

Upgraded stopping performance and extended lining wear results vs. entry level linings.



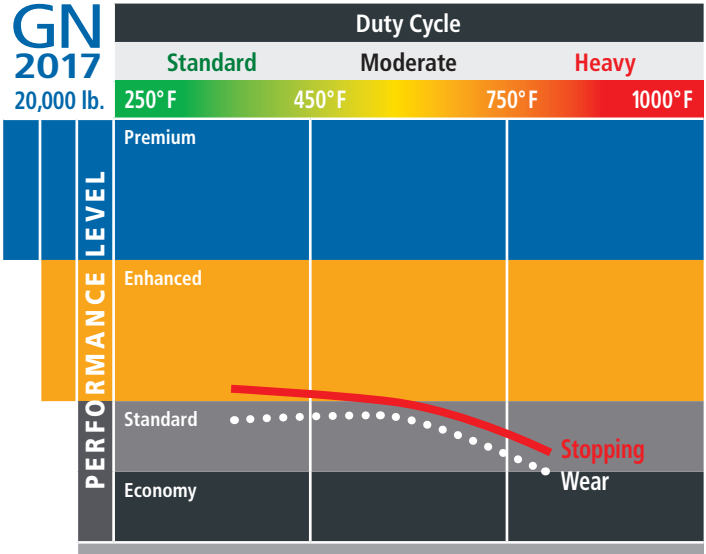
GN 2017 Performance Ratings				
@ 20,000 lb. axle load	Economy	Good	Better	Best
Temperature range – 625° F		•		
Lining wear		•		
Drum compatibility			•	
Braking effectiveness		•		
Fade resistance		•		
Recovery characteristics		•		
Retardation effectiveness		•		
Hot stop effectiveness		•		
Cold stop effectiveness		•		

BrakeZone Application Range		
Optimized lining performance for BrakeZone application scores:	3 to 4.5 @ 20,000 lbs./axle	> Road type > Load conditions > Braking frequency



Haldex GN 2017

Standard 20,000 lb. Brake Lining

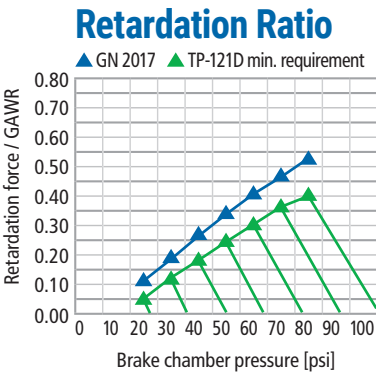
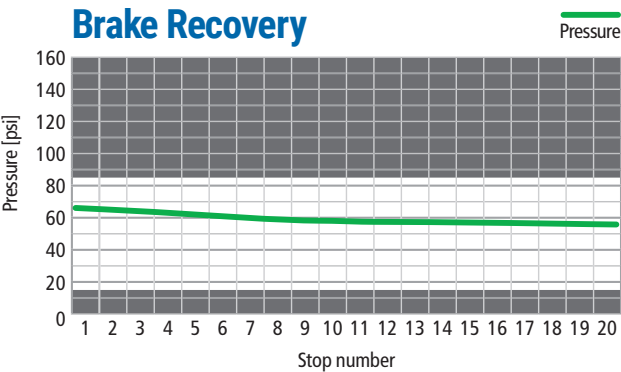
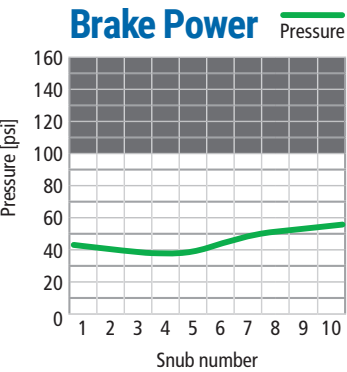


Excellent value for fleets that predominantly operate in general freight, interstate-speed environments.

Highly stable when subjected to temperature spikes that arise from high-speed, sudden stopping events.

Excellent compatibility with brake drums.

A notable upgrade in braking performance and lower lining wear rates when compared to economy class brake linings.



GN 2017 Technical Stats		
Brake size: 16.5 x 7 S-Cam	AL factor: 165	Friction average: Normal .345 – .395
Axle load: 20,000 lb.	Suggested AL factor: 165 – 180	Hot .360 – .415
Rolling radius: 20.8		Coefficient - FF

Haldex Brake Lining Options				
Axle load	Economy	Good	Better	Best
20,000 lb.	HV77	GN	GF	GR
23,000 lb.		HV88	GD	GG

Haldex HV88

Standard 23,000 lb. Brake Lining

Equivalent to FMVSS 121 performance levels for 23,000 lb. axle load.

A versatile brake lining that manages heavier loads with confidence.

An upgrade to competitive entry level 23,000 lbs. brake linings for fleets that want better overall performance.



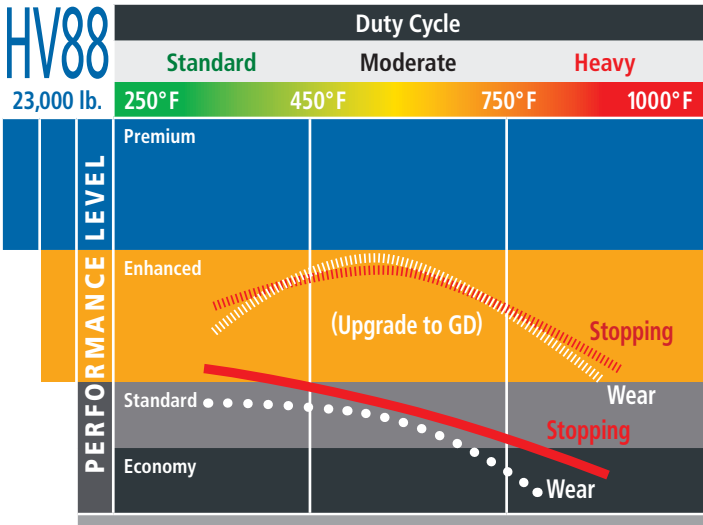
HV88 Performance Ratings				
@ 23,000 lb. axle load	Economy	Good	Better	Best
Temperature range – 650° F		•		
Lining wear		•		
Drum compatibility			•	
Braking effectiveness		•		
Fade resistance		•		
Recovery characteristics		•		
Retardation effectiveness		•		
Hot stop effectiveness		•		
Cold stop effectiveness		•		

BrakeZone Application Range	
Optimized lining performance for BrakeZone application scores:	3 to 4.5 @ 23,000 lbs./axle > Road type > Load conditions > Braking frequency

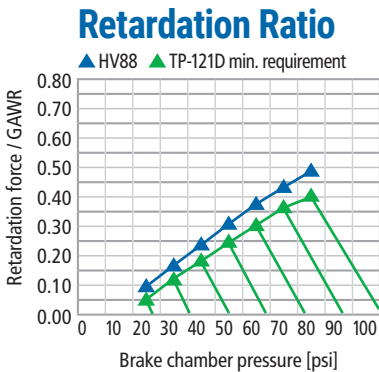
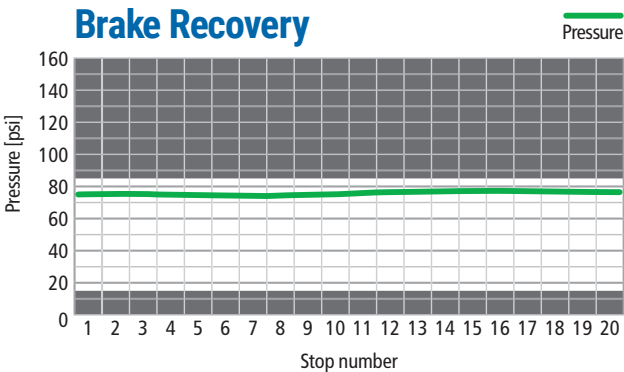
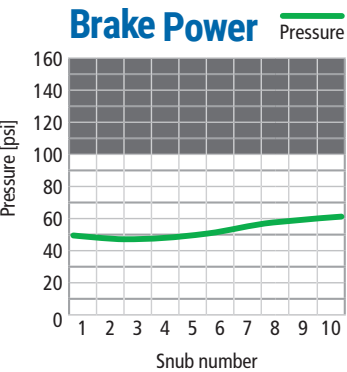
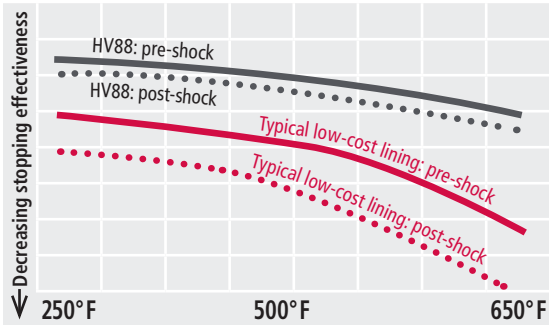


Haldex HV88

23,000 lb. Brake Lining



- All brake linings get “shocked” when subjected to a prolonged, elevated temperature event, such as braking while coming down a long, steep grade with a heavy load.
- The overall stability of the lining formulation is what makes the real difference when comparing pre-shock and post-shock braking performance.
- Post-shock stopping effectiveness can be reduced as much as 30%, **on every post-shock brake application**, in linings with a weak stability rating.
- HV88 is engineered to be a more stable lining than typical low-cost alternatives as offered by many competitors.
- HV88 formulation specifications are focused on a tight pre-shock and post-shock performance band which delivers better stopping effectiveness and lower wear.



HV88 Technical Stats		
Brake size: 16.5 x 7 S-Cam	AL factor: 165	Coefficient - FF
Axle load: 23,000 lb.	Suggested AL factor: 165 – 180	
Rolling radius: 20.8		

Haldex Brake Lining Options				
Axle load	Economy	Good	Better	Best
20,000 lb.	HV77	GN	GF	GR
23,000 lb.		HV88	GD	GG

Haldex HV77

Economy 20,000 lb. Brake Lining



Equivalent to FMVSS 121 performance levels for 20,000 lb. axle load.

An entry-level lining that provides confident stopping power and is easy on the drums.

Relative to competitive entry level linings and a better choice than “give-away” private labeled linings in this class.

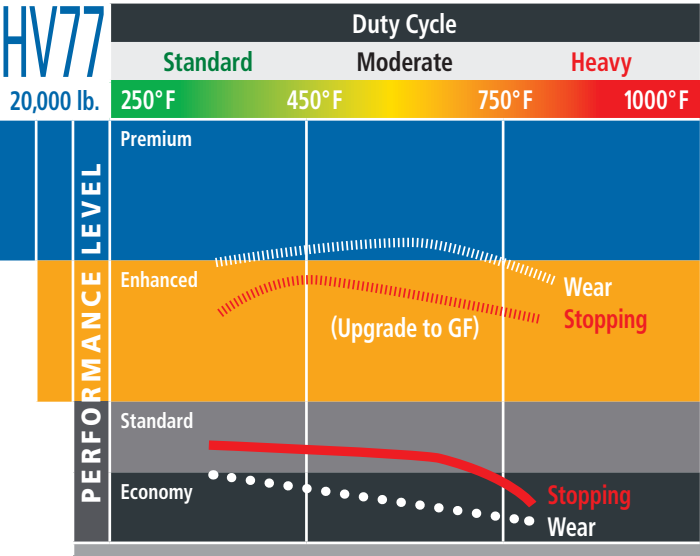
HV77 Performance Ratings				
@ 20,000 lb. axle load	Economy	Good	Better	Best
Temperature range – 550° F		•		
Lining wear	•			
Drum compatibility			•	
Braking effectiveness	•			
Fade resistance	•			
Recovery characteristics	•			
Retardation effectiveness	•			
Hot stop effectiveness	•			
Cold stop effectiveness	•			

BrakeZone Application Range		
Optimized lining performance for BrakeZone application scores:	3 to 3.5 @ 20,000 lbs./axle	> Road type
		> Load conditions
		> Braking frequency



Haldex HV77

Economy 20,000 lb. Brake Lining



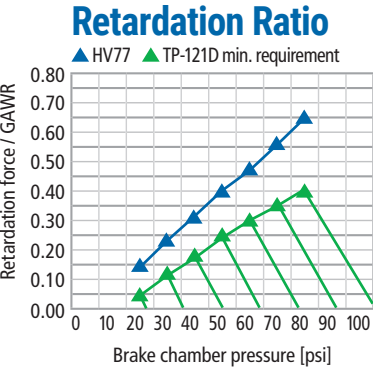
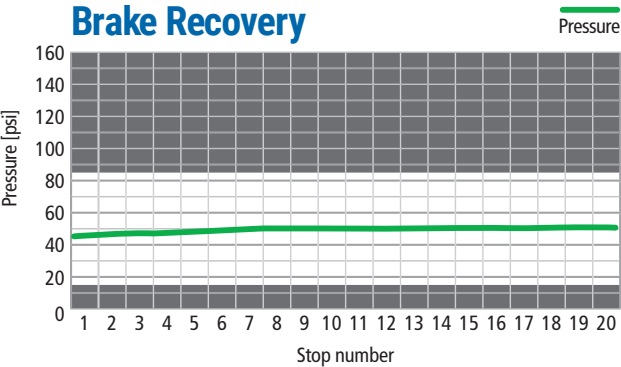
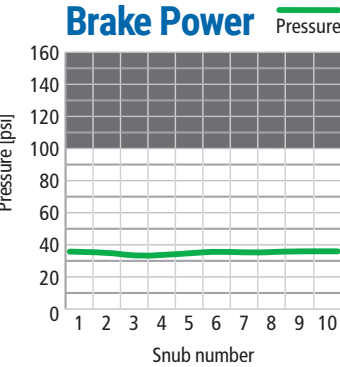
Offered for consumers that consider “price” the primary factor relative to brake lining selection criteria.

Equivalent to FMVSS 121 performance levels.

Boosted stop effectiveness compared to competitive entry-level linings.

Easy on brake drums due to its mild friction performance.

Competitive wear rates in low-to-moderate temperature applications when tested against linings in this class.



HV77 Technical Stats		
Brake size: 16.5 x 7 S-Cam	AL factor: 165	Coefficient - FF
Axle load: 20,000 lb.	Suggested AL factor: 165 – 180	
Rolling radius: 20.8		

Haldex Brake Lining Options				
Axle load	Economy	Good	Better	Best
20,000 lb.	HV77	GN	GF	GR
23,000 lb.		HV88	GD	GG

Friction Application Reference Chart (Application Only)



HALDEX NO.	Good	Better			Best									
	MID23	HV88 FF	HV77 FF	HV76 FF	TM2900 FF	GP2030 GG	GM2040 FF	GZ2035 FF	GC2020 FF/ 2035 FF	GG2020 FF	GD2016 FF	GR2015 FF	GF2008 FF	GN2017 FF
APPEARANCE														
APPLICATION	23K Axle Rating Std / Economy	23K Axle Rating Std / Economy	20K Axle Rating Economy	20K Axle Rating Steer Economy	26K Axle Rating Transit / Coach	26K Axle Rating Severe Service	25K Axle Rating Severe Service	23K Axle Rating Severe Service	23K Axle Rating Severe Service	23K Axle Rating RSD Heavy Haul	23K Axle Rating Premium FLT Grade	20K Axle Rating RSD FLT Grade	20K Axle Rating Premium FLT Grade	20K Axle Rating Standard
COMPETITORS														
ABEX		AX6149 / VL23	VL20		MQ6133	ED6028 / EH6040	EM6069		ES1160 SDA6098 RSC6260/6061	RX6297	EX685	RN6260	EN6008 / EL6011	AN6166
ARMADA TRUCKPRO		AR2 /AR3	AR1						AR23HD / ARWBT		AR23P		AR20P	
BENDIX			BLACK				ES1180	BRONZE / ES1100	ORANGE / ES1160	BA232R	RED / ES600 YELLOW GOLD / ES710	ES420 / BA202R	BLUE	SILVER
CARLISLE		EC23	EC20						MB23		CF2000		MB21	MB20
DUROLINE		DNA11			DNA68	DNA88	DNA25				DNA38		DNA18	DNA10
FRAS'LE		AF555	AF520 / AF540 / AF550				AF560				AF557			
FERODO		OPTIPRO 830							OPTIPRO 839		OPTIPRO 835 / 837		OPTIPRO 825 / 827	OPTIPRO 820
HDA		H23S / H23V	H20V	H20V			H25				H23P		H20P	H20S
MARATHON		MV23	MV20		HST / MBST / KVT	MBS / ST			MBC		FS23 / HS23 / FLOE		FS20 / HS20	
MERITOR		R301 / MG2 / EG2	EG			R403	R501		CG	MA2303 / MA2302 / MA2301	MA312 / MA310	MA2001	MA212 / MA210	MG1
OTR FLEETPRIDE		OTR GREEN	OTR BLACK					OTR GOLD	OTR SILVER	RSD23	OTR ORANGE / RED	RSD20		OTR BLUE
ROAD CHOICE VOLVO MACK		HV23	HV20								HD23		HD20	
TMD		D2300									DON2300		DON2000	D2000
TRP		STD / LH23	LH20								PR23	RSD20	PR20	STD20
VIPAR COMAN		TUFFLINE 630	TUFFLINE 620								TUFFLINE 633 VIPRO 23K PREM		TUFFLINE 623 VIPRO 20K PREM	VIPRO 20K STD

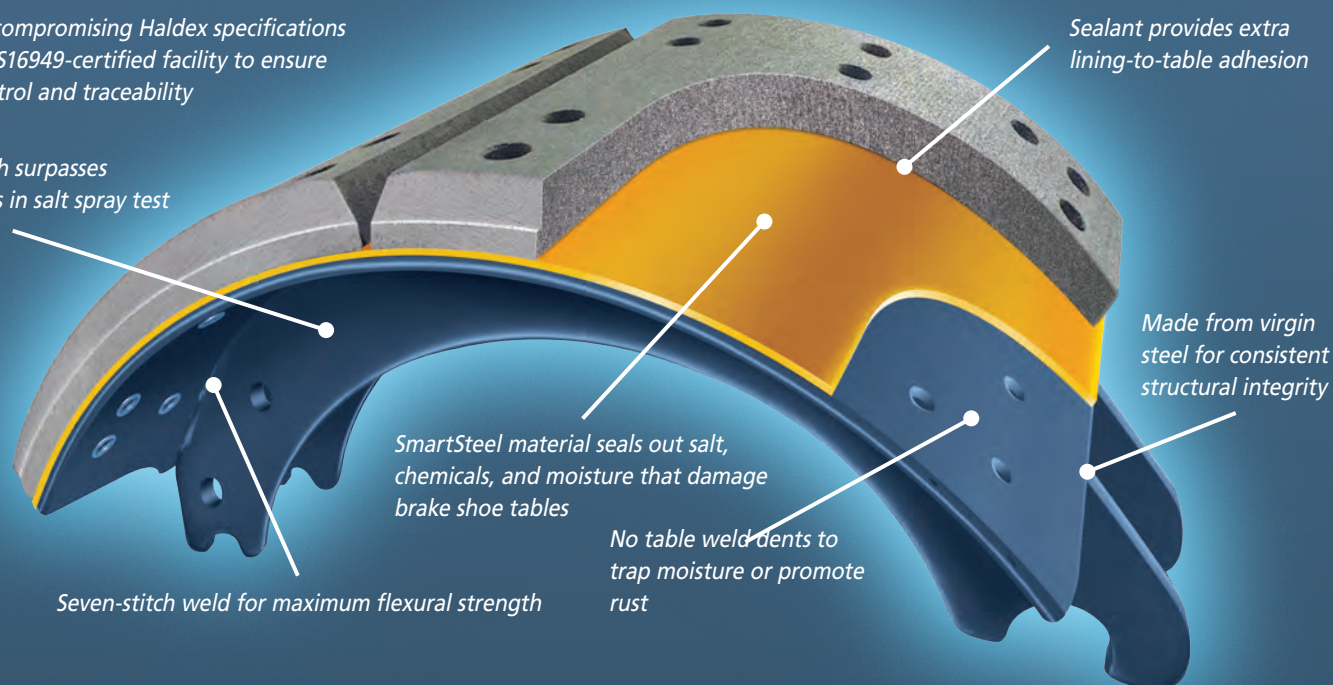
* When considering RSD linings, the end user should make sure the lining selected has been qualified on a test track. Many lining companies use a simulated test conducted on a dynamometer. These results are not generated from an actual road test and are easily manipulated to produce a desired result. Haldex does not recognize RSD testing solely performed on a dynamometer. Haldex RSD product have all been qualified at Transportation Research Center and executed by LINK Commercial Vehicle Testing

Put a stop to rust jacking.

Go for integrity and long service life with **SMARTSteel™** brake shoes from Haldex.

Built to uncompromising Haldex specifications in an ISO/TS16949-certified facility to ensure quality control and traceability

E-coat finish surpasses 2,500 hours in salt spray test



Sealant provides extra lining-to-table adhesion

Made from virgin steel for consistent structural integrity

SmartSteel material seals out salt, chemicals, and moisture that damage brake shoe tables

No table welds to trap moisture or promote rust

Seven-stitch weld for maximum flexural strength

The problem:

Rust jacking occurs when corrosion builds up between a brake shoe table and the brake lining. Rust jacking pushes the lining away from the rivets that hold it in place and can cause the lining to buckle, crack and fail – resulting in downtime, fines, and accidents.

Vehicles and trailers exposed to road deicers or serving in agricultural, industrial, intermodal or coastal route applications are at especially high risk for rust jacking.

The solution:

SMARTSteel brake shoes from Haldex significantly reduce the chance of corrosion between the shoe table and lining with an adhesion material that locks out chemicals, water, and salt spray. This bond is cured by the heat of the brake application.

Lock out rust jacking and lining failure. Lock in service life and integrity – with Haldex **SMARTSteel**.



For more information, contact your Haldex sales professional.



Haldex, Midland and Like-Nu are SAF-HOLLAND Group brands

PROSteel™

**Haldex**

The New Haldex Steel Shoe Product Offering is like nothing you've seen before.....

- Made from virgin steel (not recycled) for consistent structural integrity.
- Manufactured in a Haldex approved ISO/TS16949 certified facility to insure quality control and traceability.
- Heat treated cam and anchor ends to provide longer life and minimize wear.
- Seven stitch weld for maximum flexural strength.
- No table weld indentations to trap moisture and promote rust.
- Powder coat finish for superior wear.
- Surface coating surpasses 1000 hours in salt spray test.
- Made to Haldex demanding specifications.
- Certified by the Haldex name stamp.

Haldex Says No To Recoining

Many reliners today practice a process called recoining. They use a large press to try and salvage a damaged core. The theory is, it will reduce the amount of scrap for the reliner. Haldex does not believe in this method. Rust damages the shoe table and tolerances become distorted from the stress of application. This results in cracked lining and premature failure of the product. Haldex does not pass scrap back to the customer, we replace it with new PROSteel™ shoes, AT NO ADDITIONAL CHARGE!

Damaged Shoe Replacement

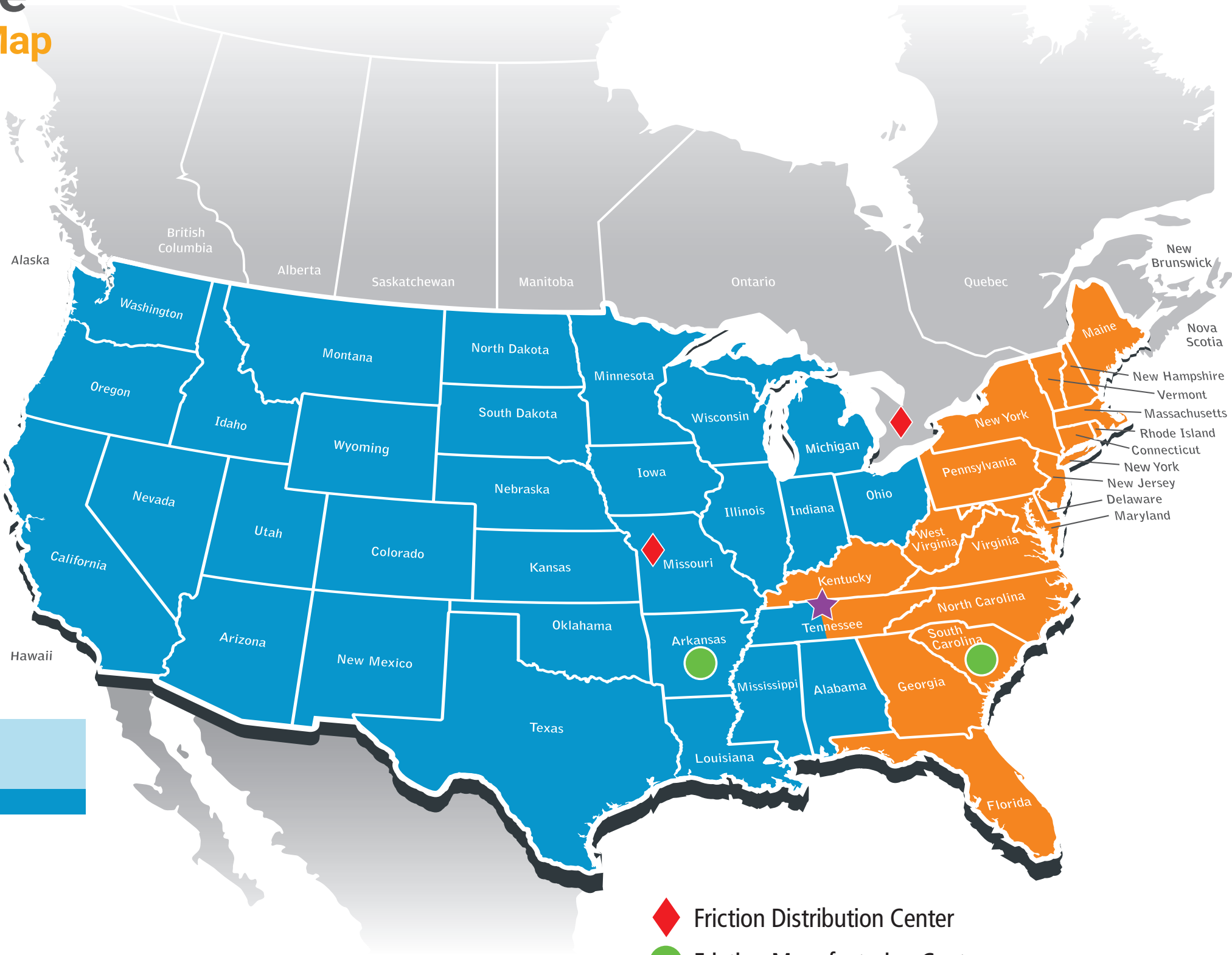
Haldex remanufactured shoes are black, but you may see new blue PROSteel™ shoes included in your shipments. This is evidence that Haldex scrapped an "out of tolerance" core and replaced it with NEW PROSteel™. Dealing with scrap cores is a fact of life in the reline business. There is no "low cost fix". Damaged shoes cause problems and should be replaced with new steel. Every time a Haldex customer receives new blue steel with their remanufactured shoe order, it is a solid reminder of the value of doing business with a quality manufacturer.

**Haldex RSD Compliant Materials
Available Now. See Complete
Details on Reverse Side.**



Brake Shoe Core Return Map

To schedule a brake shoe core return, contact the appropriate Haldex Friction Center. Request Haldex Core Return Guidelines document, XL-TA20040AL-en-US for details.



**Blue States –
Return to Little Rock, AR**

Little Rock, AR 72209
6800 Geyer Springs Rd
PH: 501-221-4384
FAX: 501-221-4388

Schedule a Core Return:
cores.littlerock@safholland.com

**Canada –
Return to Cambridge, On**

Cambridge ON N1T 0A5
500 Pinebush Road Unit 1
PH: 1-800-267-9247
Fax: 519-621-3924

No Need to Schedule Core Return:

**Orange States –
Return to Columbia, SC**

Columbia, SC 29209
1241 First Street South Ext.
PH: 803-647-1308
Fax: 803-695-5446

Schedule a Core Return:
cores.columbia@safholland.com

- ◆ Friction Distribution Center
- Friction Manufacturing Center
- ★ Nashville and West are Served by Little Rock

Engineering Your Road to Success

The SAF-HOLLAND® Group is one of the leading international manufacturers of suspension-related assemblies and components for trailers, trucks and buses. Our innovative products increase the efficiency, safety and environmental friendliness of commercial vehicles, contribute to the success of our customers. With around 5,500 employees worldwide, we are at the forefront of shaping the future of the transportation industry.



Trailer Axles and
Suspension Systems



Coupling and Lifting
Technologies



Brake Solutions and
Air Valve Technologies



Suspensions and Components
for Commercial Vehicles



Suspensions for
Trucks and Buses



Trailer
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safholland.com

SAF-HOLLAND, Inc.
Tel 800.876.3929

SAF-HOLLAND Canada Limited
Tel 519.537.3494
Western Canada 604.574.7491

SAF-HOLLAND Mexico
Tel 52.55.5456.8641