

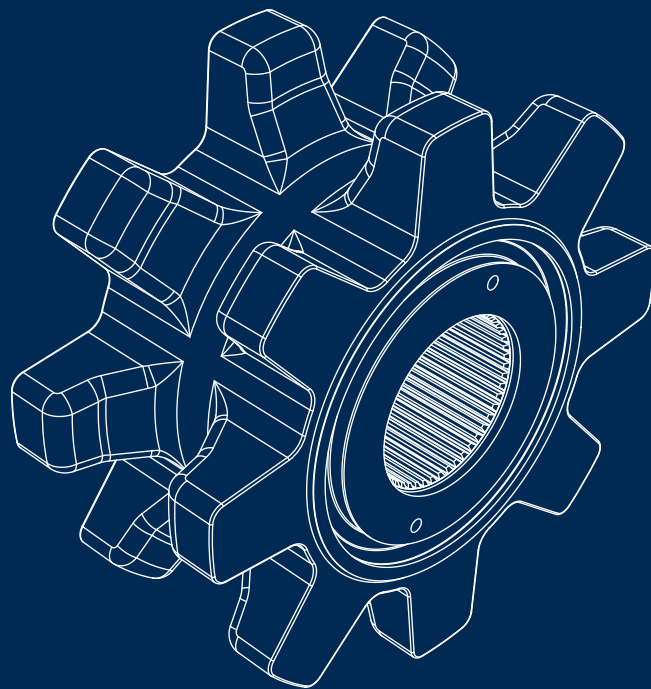
# P&H® Electric Rope Shovels Reliable high quality parts



**FLS**

# Improve performance with our spare parts for P&H® Electric Rope Shovels

Discover the difference our re-engineered spare wear parts can make in your existing equipment to increase performance and decrease maintenance.



## Benefits

- Increase durability
- Increase longevity
- Consistent high quality
- Reduce maintenance and downtime

# Extraordinary components do not happen by accident

EXCEL™ bronze bushings and components perform better because our standards are higher.

## Higher tensile strength

Tin is the most expensive ingredient in the metallurgy of bronze alloys, but it creates tougher bushings that last longer. We use the maximum percentage of tin to increase your profits. We certify our crusher bronze to the top end of the CDA specification for tin.

## Uniform lead distribution

During casting, we use an innovative technique that distributes lead and other alloy grains uniformly. We then use a unique chilling process that ensures the uniform distribution is locked in. Our dedication to lead distribution means that when you use EXCEL™ cast alloys, there is less friction and more defense against heat build-up. In short, our bushings and other cast parts last longer and have fewer problems.



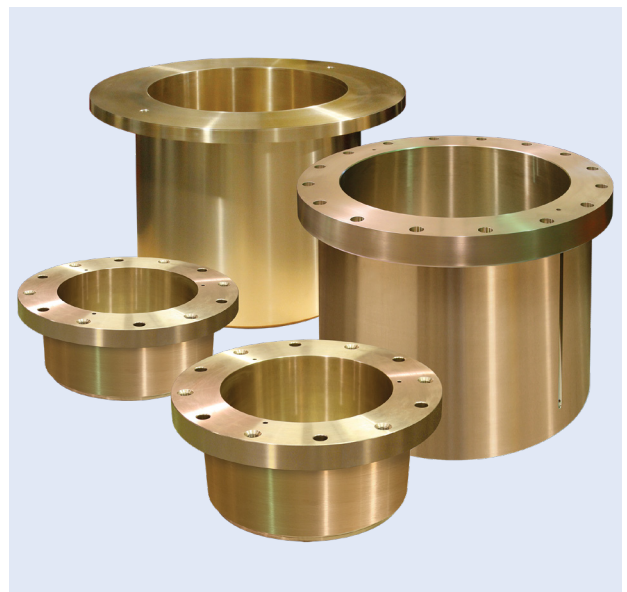
Standard bronze pour from furnace to ladle in our FLSmidth foundry for EXCEL parts

## Optimum concentricity

Our competitors are content with bushings that are close enough to concentric. We create perfectly concentric bushings using a unique pinch turning method during machining and cut the inside and outside diameters simultaneously. This process guarantees that your bushings are concentric with no weak spots or deformities and lowers the risk of hot spots.

## Porosity-free/uniform grain structure

We begin preparing for casting by selecting the highest grade pure raw materials. The unique centrifugal casting technique that we use produces a tighter, denser grain structure in the alloy and eliminates nearly all gas pockets. What does this mean to you? The cast alloys you buy from us last longer and have significantly fewer defects.

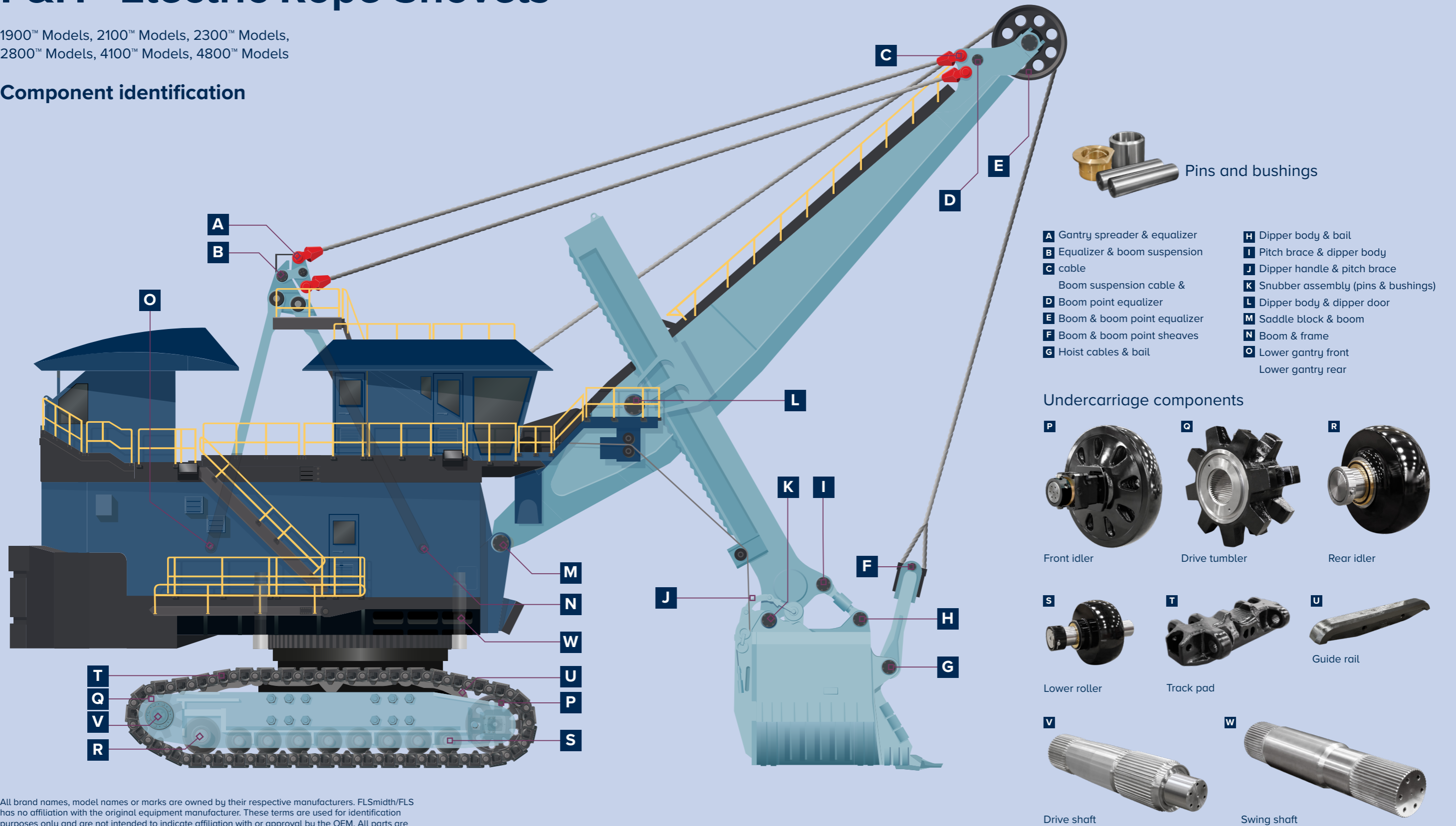


XL40 bronze components

# P&H® Electric Rope Shovels

1900™ Models, 2100™ Models, 2300™ Models,  
2800™ Models, 4100™ Models, 4800™ Models

## Component identification



All brand names, model names or marks are owned by their respective manufacturers. FLSmidth/FLS has no affiliation with the original equipment manufacturer. These terms are used for identification purposes only and are not intended to indicate affiliation with or approval by the OEM. All parts are manufactured by, for and warranted by FLSmidth/FLS and are not manufactured by, purchased from or warranted by the original equipment manufacturer.

# Premium components



## Front idler

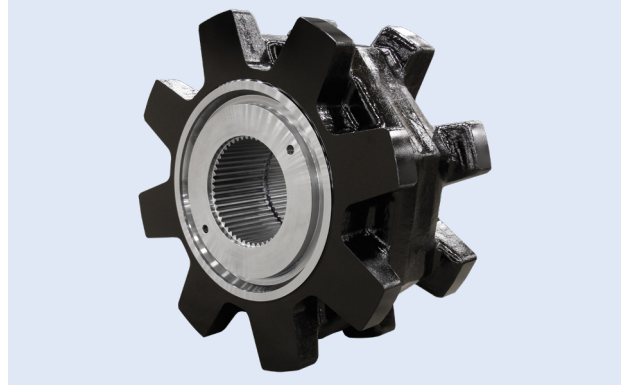
You need an idler that will hold up longer. That's why we do induction hardening on our idlers to give them additional strength. Each of our idlers is made using our premium bronze bushings and mechanical face seals to give you the quality you deserve.

## Straddle mount for front idler

With the conventional OEM idler arrangement, the bearing blocks seize to the idler shaft, causing stress and decreasing the life of the idler and bushing. Our straddle mount splined front idler has an enlarged thrust washer that absorbs greater thrust loads during operation to increase the life of the idler. It also has 92% more bearing surface area and gives you a longer bushing life because we have improved the design of the grooves and the contact with the bearing.

This design decreases the time involved in maintenance. The idler and bushing hold up better against wear, allow for even lubrication and decrease the stress on the idler system. At the same time as you are getting longer life from your idler and bushing, you can count on the indexable collars to maintain your end play, and these lateral adjustments are easier because the shaft is collared. With this straddle mount design, you can rotate and replace your bushings without breaking the chain.

We can perform retrofitting on your existing front idlers to create a splined configuration for them.



## Drive tumbler

The track lug on our drive tumbler has been precision-engineered to reduce backlash. In addition to it working better, the tumbler lasts longer because of our unique manufacturing process. We optimise the metallurgical composition of the drive tumbler so that it holds up better against wear.



## Lower rollers and rear idler

Unlike conventional rollers, we forge the body of our rollers from a single piece of steel. We complete the rollers with our premium bronze bushings. The finished product is one that is engineered for maximum strength.



### Guide rails

Undercarriage guide rails last longer when they are made with quality metallurgy. We use the highest grade of manganese steel in our guide rails to give them more durability. They are available for purchase as an assembly or as individual replacement components.



### Track pads

Track pads bear an extreme weight load, so we make ours stronger than conventional pads. We use only the highest quality materials because they last longer. When your track pads can better support your equipment, you can go further between maintenance shutdowns.

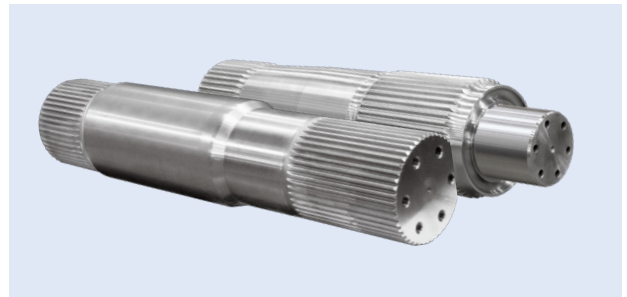
Our standard track pads are made with high quality manganese steel. We also have heavy duty and custom alloy metallurgical options available to meet the specific demands of your mine.



### Premium bronze bushings

We manufacture a wide variety of bronze bushings and washers.

- Idler bushings
- Roller bushings
- Thrust washers
- Shipper shaft bushings



### Swing shaft and final drive shaft

Get more from your shafts. Our swing shaft and drive shaft are better because we spend more time and attention machining them to perfectly meet the specifications. These high-quality shafts are completely interchangeable with your original OEM components.

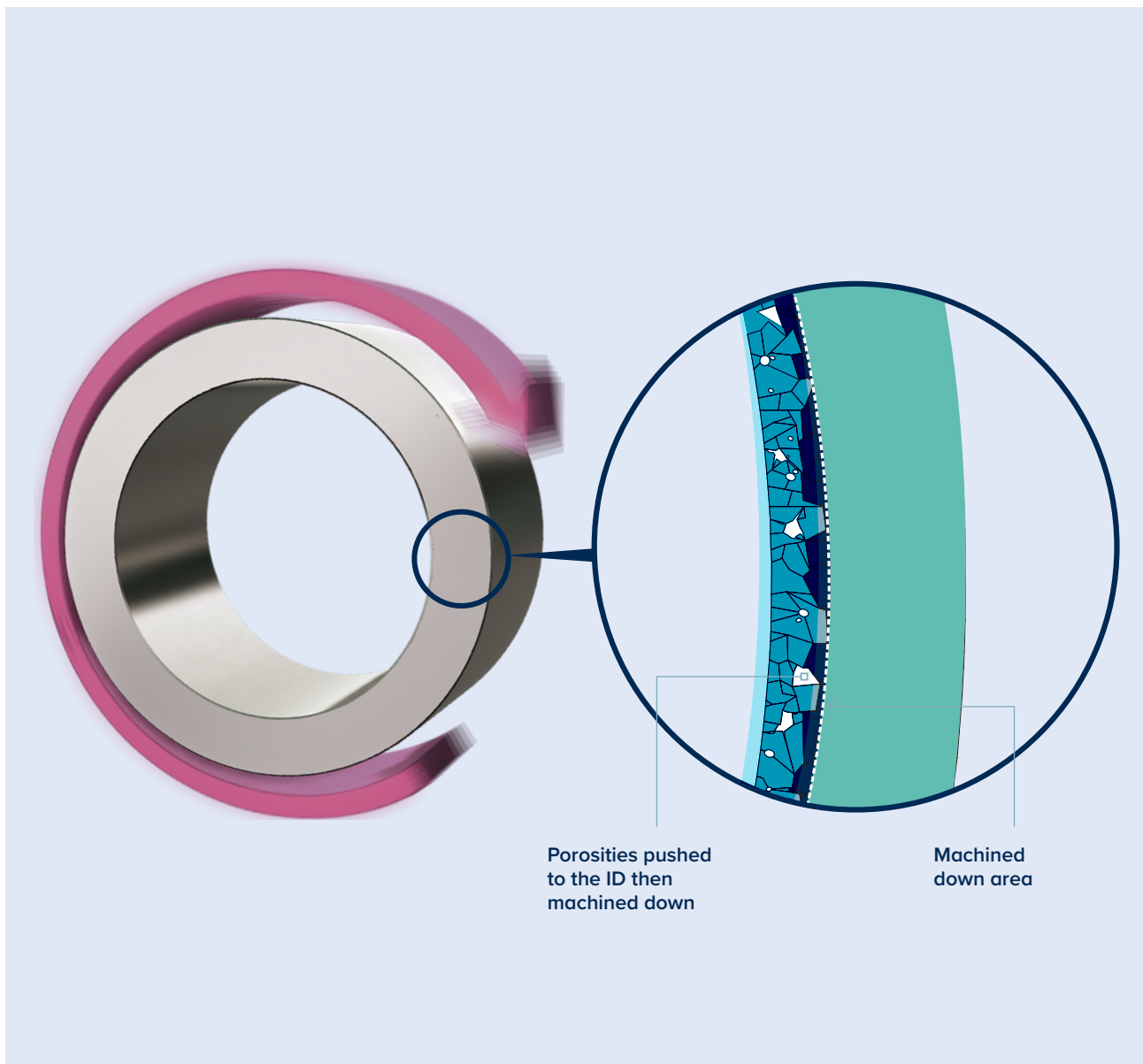
Our swing shaft and drive shaft are available for most P&H shovel models. We sell them as assemblies and as individual replacement components.

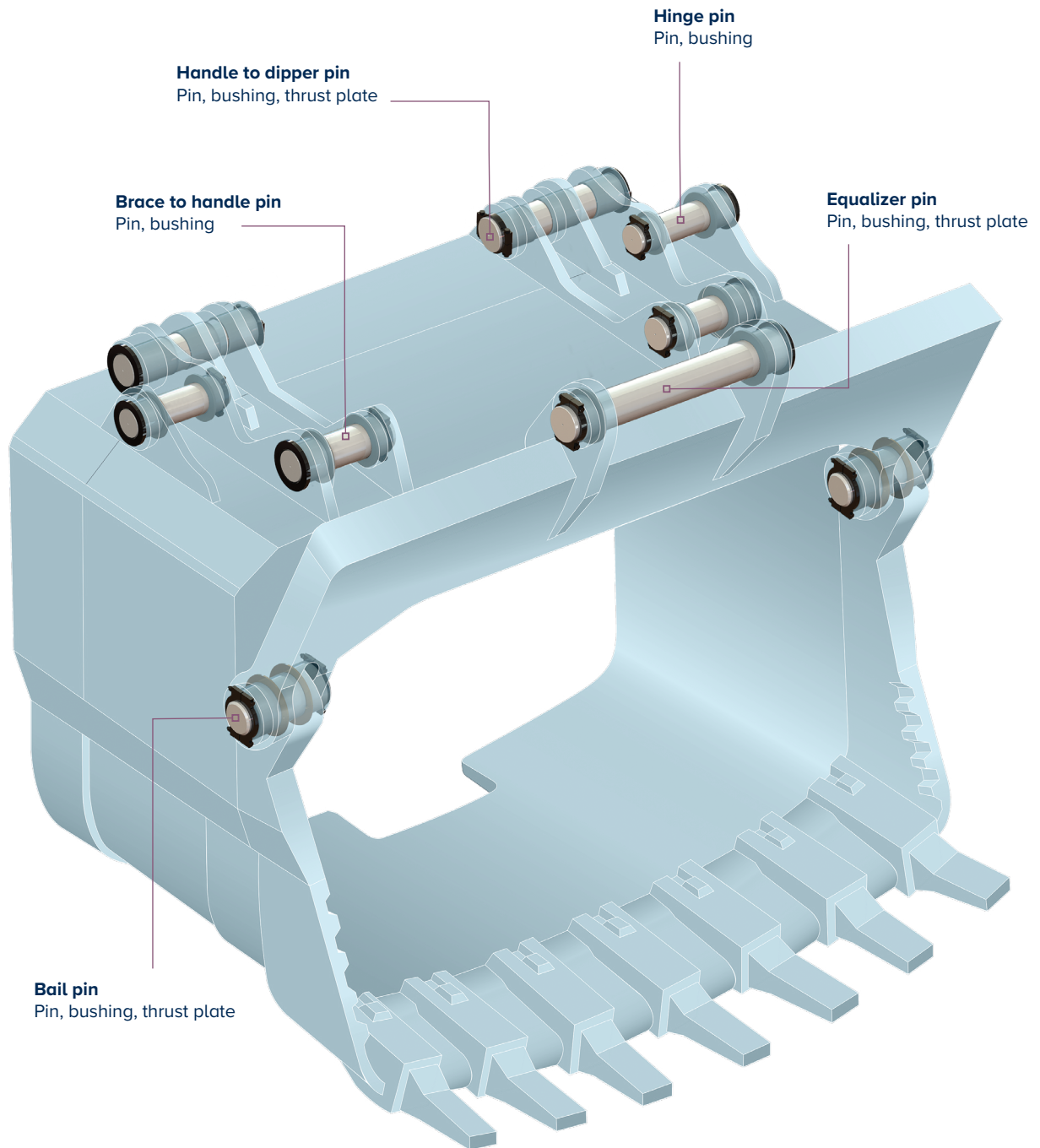
## Superior manganese steel casting

We use a unique centrifugal casting process for our manganese steel. We start our process with the highest grade of metallurgical components to maximise the durability of the final product.

When we are ready for casting, we use strict control of our melting and pouring temperatures and a centrifugal casting technique. Because of the way we cast the steel, the metal grain structure is consistent, the grain boundaries are tight and the diameter of the part is perfectly round.

After casting a part, we use an exclusive cooling process that prevents metal grains from drifting and minimises pearlite. The final result is a flawless part with the highest possible level of integrity.





## Pin and bushing sets

Take full advantage of our expertise in applied mining and engineering, and use our mated pins and bushings together. We are confident that our pin and bushing sets will stand up to the mining industry's heaviest demands. These sets can be designed and produced specifically for custom, extreme applications using a variety of materials that maximise performance.

We offer complete bucket pin and bushing kits that are customised for your shovel. Be sure to have everything that you need on hand next time you need to do maintenance on your bucket. Talk to FLSmith about the efficiency and effectiveness of our pin and bushing kit options.



# We offer consistent, top-quality spare parts... as always

This is what we do and have been doing more than 80 years. Your machines need to run reliably to keep your business successful. We're here to help keep that equipment operating efficiently.

## Premium pins

We are the leading supplier of high quality dipper, handle, bail and equaliser replacement pins in the mining industry. With over eight decades of experience, state-of-the-art equipment and our selection of the highest quality raw materials, we manufacture unmatched replacement pins.

## Induction hardened pins

Our induction hardened pins have an extended service life because our unique hardening process penetrates the pin deeper than our competitors' pins. Conventional pins have an approximately 12.7 mm (1/2 in) thick hardened layer. Our induction hardening process creates a hardened layer that is deeper and more wear resistant,

## Proprietary overlay pins

Our overlay pins are manufactured using an automated process to precisely control the depth that the overlay material penetrates the base metal. The technique we use involves making multiple passes over the pin, adding a small amount of overlay each time. This process keeps the pin strong while adding the versatility that overlay provides. Our pins have the optimal amount of overlay without diluting the base metal. In contrast, other overlay pins on the market are often weaker because the overlay penetrates too far into pin and dilutes the base.

You can trust EXCEL™ overlay pins to stand up to extreme applications. In fact, they last up to five times the life of heat treated pins. The overlay material we use has a hardness of over 60 HRC.

## Surface finish

No matter what type of pin you need, the surface finish of our pins exceeds industry standards. We accomplish this by focusing more time on each pin and applying more passes than our competitors. Then every pin goes through an inspection process to make sure that the finish meets our strict standards. The fine finish that we achieve is free of pores and extends the life of the pin. For our overlay pins, this attention to the finish also makes sure that the overlay application is the full depth of the mating contact surfaces.

## Customised designs

All our pins and bushings can be customised to your specifications and requirements. As a standard, we adhere to tight tolerances, and any dimensional tolerances that you require can be accommodated. Whether you have specific maintenance objectives that you are concerned about or want to discuss extreme loads and environments, our pin and bushing experts will work with you to engineer exactly what you are looking for. All customisation is available for single pins and sets of mated pins and bushings.



Welded Head



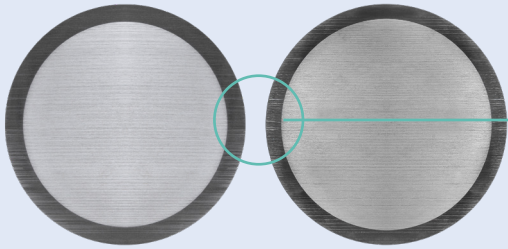
Dual Collar



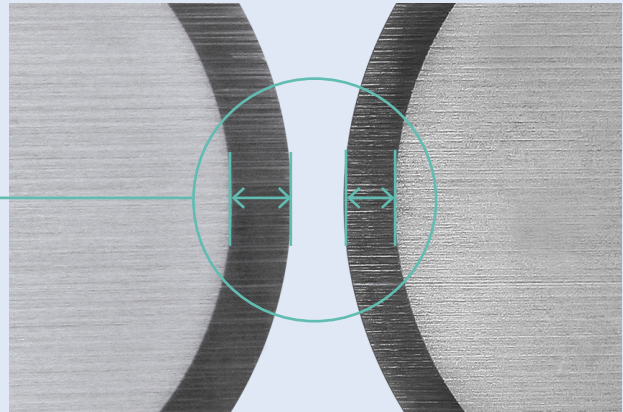
Machined Head

### Induction hardened pins

- Provides outstanding service life
- Greater penetration than the competition



Deeper hardening. 1/2" to 5/8" (12.7-15.88mm)

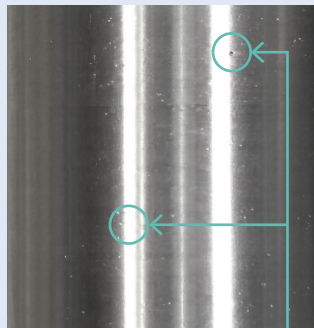


EXCEL hardening

Conventional depth



EXCEL finish



Unacceptable finish

### Our surface finish exceeds industry standards

- More passes applied than the competition
- Fine surface finish provides extended life
- Ensures full-depth overlay application with mating contact surfaces
- 100% Inspected

Porosity

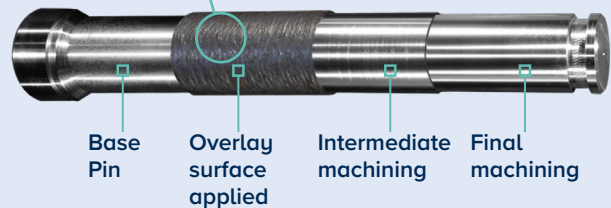
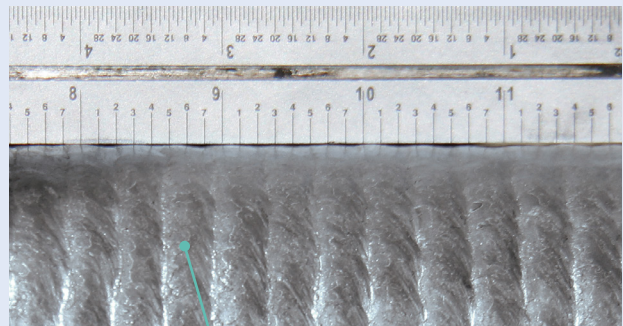
### EXCEL proprietary overlay pins

#### Setting new standards throughout the mining industry

Our pins are manufactured using an automated process to precisely control the depth of penetration of proprietary overlay material to the base metal. This technique allows for the application of the optimal amount of overlay material without further dilution of the base metal which is commonly found in other overlay pins on the market.

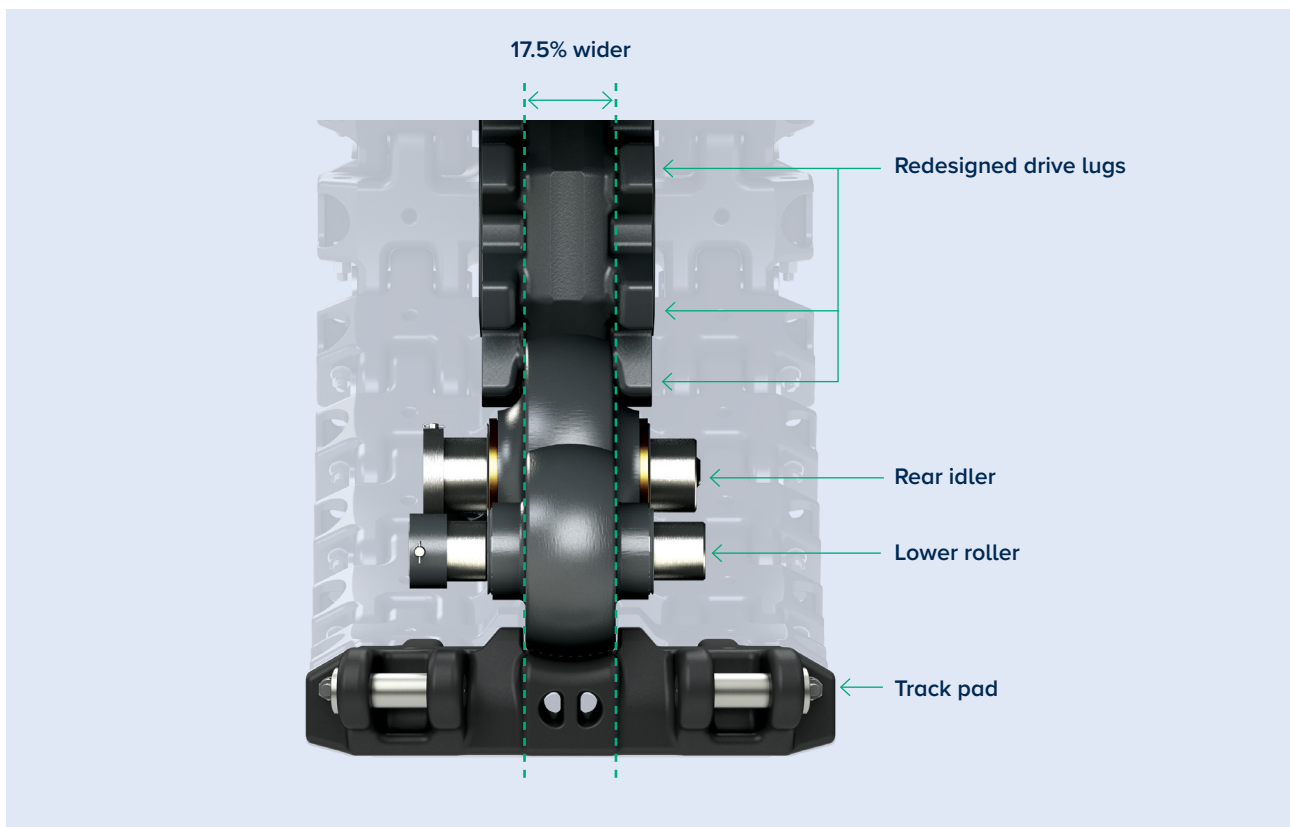
#### Multi-pass overlay penetration is the key

- Soft core retains toughness, adds versatility
- Our pins stand up to extreme applications
- Proprietary overlay material with hardness ranged at 60+ hrc
- Surface finish exceeds industry standards



# Working with you to optimise performance

Our engineering and technical experts work directly with customers to solve problems in innovative ways. We partner with operations around the world to develop customised solutions for lasting performance in critical equipment. We get our hands dirty and spend the time needed to fully understand the issues you are facing. Once we have first-hand knowledge of the situation, our design engineering team goes to work to bring new thinking to the table and offer application-specific solutions designed for your operation.



## Wide Path™ undercarriage

Our team of engineers re-engineered the OEM undercarriage to create the Wide Path™ undercarriage. Our track pads have thicker internal cross sections and 17.5% more surface area in contact with the roll path. These stronger, larger pads do not bend or crush the way conventional pads do so they last longer.

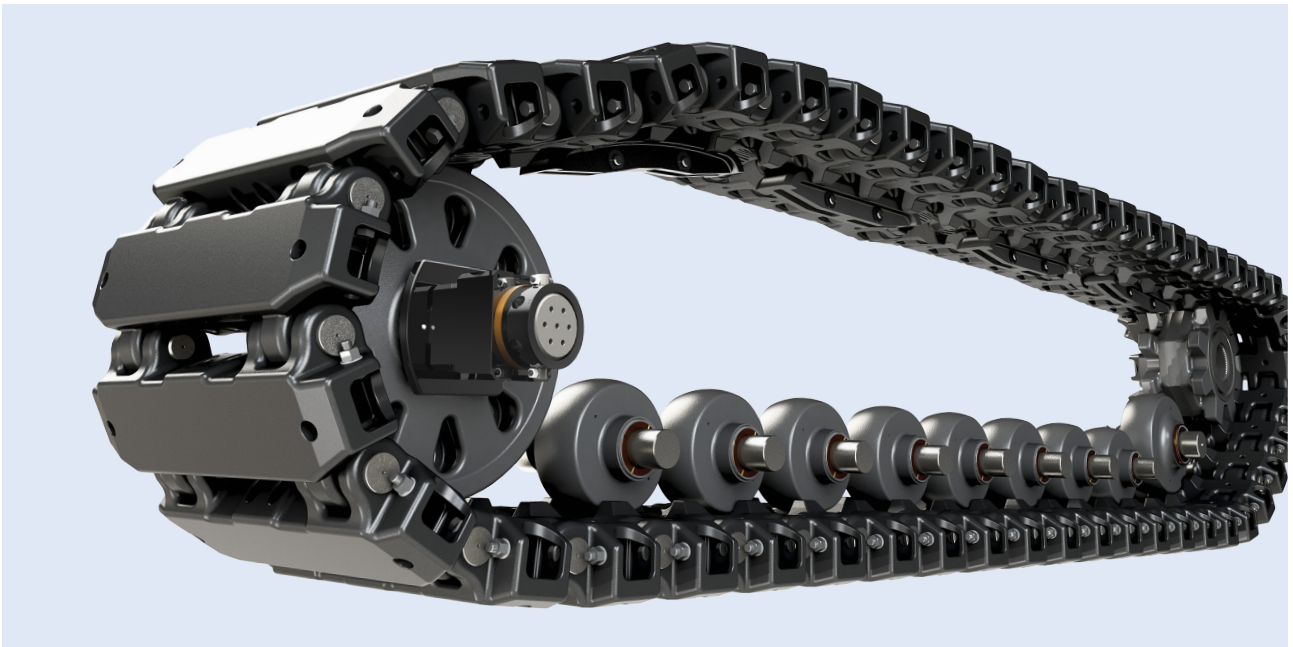
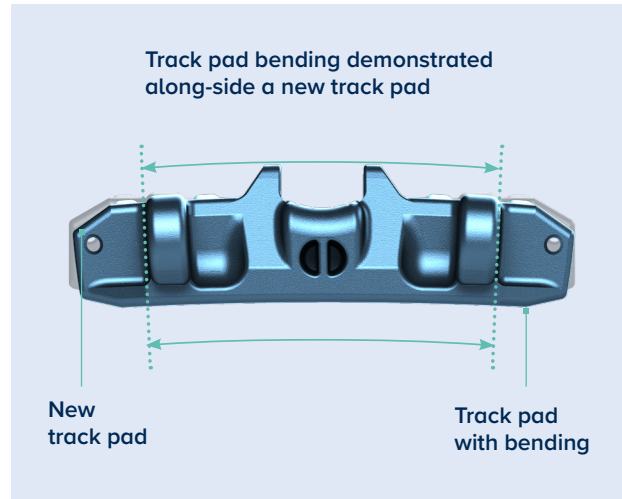
The increased contact area also improves the overall weight distribution of your shovel, which reduces the wear on the track pads, lower rollers, rear idler, drive tumbler, side frame guide rails and propel components.

## Improved performance

In addition to lasting longer than conventional designs, the Wide Path™ undercarriage system has a thicker internal structure so the track pads do not bend. When track pads bend or toenail, they interfere with smooth track articulation and decrease the quality of performance for the entire system.

As conventional track pads wear, they begin to bend away from the ground across the width of the pad. Bending in this way causes stress on the pins and interference between the pad and the car body. Our design minimises bending to increase the life of track pads and the pins.

Decreasing the required maintenance and increasing the performance of the undercarriage system allows operators to have more confidence in the entire shovel. They will be able to focus on the job at hand instead of frustration over equipment issues.



## Complete undercarriage system

The existing OEM undercarriage of your excavator can benefit from using our individual replacement parts as the original parts wear. However, for maximum performance and the longest wear life possible, we also provide complete undercarriage system replacements. Our undercarriage system is ready to install without any modifications to the frame.

With our proprietary Wide Path™ undercarriage, forged one-piece rollers and custom retention hardware that fully retains the pin head, every component of your new undercarriage system is built to last. For hard rock applications, manganese track pads are available to give you extra durability.

"The low maintenance and minimal reactive downtime customers have experienced with this undercarriage (opposed to the OEM) has made their life easy. Not only are they impressed with the product, but also with FLSmidth's routine first-class support. The fact that multiple undercarriage sets have been purchased since this first article was launched proves that actions speak louder than words."

**DAVE EAGAN**  
Global Service Line Manager,  
Extraction Products





"Our customers need replacement parts that operate in harsh environments. For this reason, we demand metallurgically sound castings produced through the careful control of chemistry and processing parameters for our replacement parts. Our promise is to provide our customers with the highest quality components."

**MIKE BERGERHOUSE**  
Senior Metallurgical Engineer  
FLSmidth Inc. - Pekin Operations

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**Contact us**

**FLSmidth A/S**

2500 Valby  
Denmark  
Tel. +45 3618 1000  
[info@flsmidth.com](mailto:info@flsmidth.com)

**FLSmidth Inc.**

Pekin Operations  
Pekin, IL 61555  
Tel +1 309 347 3031  
[excelparts@flsmidth.com](mailto:excelparts@flsmidth.com)



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