CRAWLER SYSTEMS

optitrak ovation

evolution ultiroller

Our Innovation. Your Advantage.
PROVIDING SUPERIOR UNDERCARRIAGE SOLUTIONS

OUR BUSINESS

Bradken is a global manufacturer of differentiated capital and consumable products to the mining, transport, general industrial and contract manufacturing markets with a sales and distribution network servicing customers around the world.

As a leading heavy engineering company we can manufacture fully machined cast iron and steel products from a mass of 0.5 kg (1.1lbs) to 25 tonne (55,000 lbs). Bradken produces consumable wear products for all types of earthmoving equipment to the global mining and quarrying industries. Our products include:

- Ground Engaging Tools (GET) and associated wear parts,
- Dragline rigging packages,
- A range of buckets to suit dragline, front-end loader, face shovel and hydraulic excavator equipment, and
- Undercarriage systems and componentry for hydraulic mining excavators and electric rope shovels.

With more than 30 years of experience in manufacturing crawler shoes and other undercarriage components, Bradken is a supplier of choice for mining customers worldwide.

EXPERIENCE

With over 90 years’ experience in the foundry business, the accumulated wealth of knowledge and depth of expertise in our workforce enables us to offer our customers a full service offering with design, manufacturing, maintenance and support services ultimately providing improved operational outcomes and safer work practices.

DESIGN

Our highly skilled product development teams ensure that our design and testing capabilities, using the latest technologies, set new benchmarks for excellence and offer significant advantages to our customers especially with regard to safety, service life and overall cost effectiveness.

CAPACITY

With a worldwide network of foundry and manufacturing facilities and an established sales and distribution network, our geographical diversity allows us to provide product, technical support and advice, and exemplary service to customers in the world’s major mining and industrial regions.

Bradken is a world leader in undercarriage design and manufacture for mining class Electric Rope Shovels and Hydraulic Excavators. Our reputation for high quality, dependable products has been proven over decades supplying to mining markets around the world.
OUR PRODUCTS

Bradken provides a full range of components for the undercarriage of mining equipment, including:

- Crawler Shoes / Track Pads
- Drive Sprockets / Drive Tumblers
- Front Idler Assemblies
- Load Rollers / Bottom Rollers
- Return Rollers / Top Rollers
- Sliders, Pins and other components

Bradken can provide DRP (Direct Replacement Parts) as well as manufacturing and supplying a number of proprietary products to suit a large range of machines.

**Opti-Trak** product range developed for the Hitachi, Komatsu and some Caterpillar hydraulic excavator platforms. Opti-Trak shoes are supported by Bradken’s patented pillar of strength, exhibiting greater structural integrity for superior wear life.

**Evolution** product range developed to overcome the shortfalls in traditional design for the Caterpillar hydraulic excavator platforms. The continuous roller path design enhancement reduces metal flow in the shoe, extending the life of the undercarriage.

**Ovation** product range designed for the Caterpillar and P&H electric rope shovel platforms. Ovation shoes are supported by Bradken’s patented pillar of strength, providing superior roller path reinforcement and increased service life.

**Ultiroller** load roller range designed to achieve maximum undercarriage life with lower operating temperatures for Caterpillar hydraulic excavator platforms. The self-contained assembly provides increased safety and ease of installation on the machine.

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<th>Hydraulic Excavator</th>
<th>Electric Rope Shovel</th>
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<tr>
<td>Hitachi* EX2500/EX2600</td>
<td>Komatsu® PC5000</td>
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<td>Hitachi* EX3600</td>
<td>PC6000</td>
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<td>Hitachi* EX5500/EX6600</td>
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The Opti-Trak® range of crawler shoes offers significant advantages over some traditional designs where shoes are case hardened, but the base metal is softer underneath meaning wear rates increase over time. Opti-Trak shoes come into their own in OEM undercarriage systems where there is sufficient room for wear because they are through hardened to provide excellent wear resistance and uniform wear rates all the way through the metal section.

The roller path is supported by Bradken’s patented ‘Pillar of Strength’ to prevent crushing of the worn shoe later in its service life. Other areas of high wear and those subjected to significant impact strikes have been strengthened to provide greater structural integrity.

Opti-Trak crawler shoes are interchangeable with the existing OEM components.

**THE BENEFITS**

**Increased Service Life**
Bradken’s Opti-Trak crawler shoes are made using through hardened material. In crawler systems with a greater wear envelope Opti-Trak shoes have been proven to last longer than OEM case hardened shoes.

**Reduced Downtime**
Connecting pins are manufactured from induction hardened 4340 grade steel, resulting in reduced pin failures and unexpected maintenance downtime.

**Increased Operational Performance**
Opti-Trak crawler shoes are supported by Bradken’s patented ‘Pillar of Strength’ which provides greater structural integrity to prevent crushing of the roller path as the crawler shoes wear, maximising shoe life.

**OEM Interchangeability**
Opti-Trak crawler shoes are interchangeable with OEM components meaning they can be easily integrated as replacement parts into existing OEM track systems.
The Ovation® range of crawler shoes and undercarriage components was developed to provide improved performance for Caterpillar and P&H electric rope shovel users. The roller path is reinforced by Bradken’s patented ‘Pillar of Strength’ that improves the crawler shoe’s ability to transfer machine loads to the ground. Safety and ease of pin removal on site has been enhanced with the addition of pockets specifically designed to facilitate the use of hydraulic cylinders to push the locking pins out of the bores on the largest oil sands shoes.

The Ovation range features alternative material and shoe length options to cater for various mining environments. Ovation 79” and 84” length crawler shoes can be manufactured from either BKC400 material providing excellent wear resistance and uniform wear rates when used in heavy duty, hard rock mining environments or BKCS30 material providing excellent impact resistance combined with the superior wear rate properties of the induction hardened surfaces. Ovation 125” and 140” length crawler shoes for high flotation applications are designed for use in mining operations where lower ground bearing pressure is required.

The Evolution® range of induction hardened crawler shoes was developed to overcome the shortfalls in traditional designs for the Caterpillar hydraulic excavator platforms. Evolution crawler shoes have thickened pin lugs and feature Bradken’s patented ‘Continuous Roller Path’, a design enhancement that improves contact pressure distribution between the roller and shoe resulting in increased roll life of mating components.

Connecting pins are manufactured from induction hardened NiCrMo steel and a simplified nut and bolt retention system negates the need to use retaining plates and circlips (as utilised in some other designs) allowing for easy installation, removal and maintenance. A redesigned and strengthened grouser wing tip provides greater durability and support in uneven pit conditions.

THE BENEFITS

**Increased Service Life**
Evolution crawler shoes feature Bradken’s ‘Continuous Roller Path’ that improves contact pressure distribution between the roller and shoe resulting in reduced metal flow on shoe roller path, increasing the service life of mating components.

**Increased Wear Resistance**
Evolution crawler shoes are manufactured from induction hardened NiCrMo cast steel and as such are able to handle high impact loads with increased wear resistance.

**Reduced Downtime**
Simplified nut/bolt pin retention system allows for safer and faster installation and removal resulting in a reduction in maintenance downtime.

**Reduced Downtime**
High toughness connecting pins are manufactured from induction hardened NiCr/Mo steel, resulting in reduced pin failures and unexpected downtime.

**Increased Wear Resistance**
Ovation crawler shoes feature induction hardened roller path surfaces and pin bores providing superior wear resistance and increased service life.

**Increased Operational Performance**
Ovation crawler shoes are supported by Bradken’s patented ‘Pillar of Strength’ which provides greater structural integrity to prevent crushing of the roller path as the crawler shoes wear, maximising shoe life.

**OEM Interchangeability**
Ovation crawler shoes are interchangeable with OEM components meaning they can be easily integrated as replacement parts into existing OEM track systems.
Bradken's Ultiroller was developed to overcome the problems inherent in the traditional Caterpillar load roller design. By introducing an independent axle to support the machine weight, the internal bearing surfaces are completely lubricated most of the time. Contact between the bush and axle occurs at the base and contact area is maximised due to reduced axle bending.

The combination of these features results in the lowering of operating temperatures and aids in decreasing the rate of wear. A single plated, two bolt retention system has been introduced to simplify installation and to eliminate reliance on the side frame to set the assembly float. This ultimately makes installation faster, safer and more efficient.

**Increased Service Life**

Maximised clearance between end block and crawler shoe provides greater allowance for wear resulting in extended service life of mating components.

**Ease of Installation**

‘Self-contained’ design allows parts to be fully assembled and pressure tested in a factory controlled environment prior to arriving on site, simplifying installation and reducing handling and safety issues.

**Reduced Wear Rate**

During operation, the axle-bush wear surfaces are at the bottom of the assembly and are fully lubricated, resulting in cooler running temperatures and reduced axle-bush wear rates.
Precision machined by the world’s largest manufacturer of mining class crawler shoes, the Bradken range of crawler shoe pins provide a tough and effective solution to the harsh operating environments experienced in the mining industry.

The quench and tempered alloy steel utilized is a tougher alloy. This results in reduced incidences of pin breakages. Each pin is individually induction hardened as part of the manufacturing process. The hardened outer case and tough ductile core reduces pin wear whilst maintaining optimum core strength.

The fully automated, quality assured production process ensures greater consistency and reliability of components.

Bradken offers an extensive range of complementary undercarriage components including:
- sprockets
- idlers
- sliders
- load and return rollers.

**Sprockets and Idlers**

Depending on the platform, Bradken sprockets and idlers are made from either high grade, high quality, induction hardened material or quench & tempered high grade alloy providing increased impact and wear characteristics. Hardness levels of the wear surfaces are matched to the mating components whilst retaining a ductile core that is able to absorb impact.

CNC machined surfaces and the use of superior quality components ensure that the replacement parts are a consistent fit and are of optimum quality.

**Load and Return Rollers**

The Bradken designed and manufactured range of load and return rollers has been developed for optimal wear in all mining environments. The range incorporates features designed to ensure maximised wear life and minimised downtime.

Bradken manufactured rollers have a forged one-piece CrMo steel roller shell. The inclusion of high quality, spun cast manganese bronze bushes and NCrMo grade axles offers superior wear and impact resistance. Component life expectancy is further enhanced by induction hardened wear surfaces.
PRODUCT DEVELOPMENT

Bradken’s reputation for producing high quality and innovative products results from understanding our customer’s operating conditions, a willingness to customise, and a long-standing track record of providing superior performance products.

Bradken’s product development team is dedicated to reducing our customers’ operating costs and increasing equipment efficiency. Our top priority is customer support and after sales service. The focus is to deliver greater user satisfaction through products that bring greater value and people who provide on-site technical collaboration and support.

Bradken embraces new technologies that help us produce world-class products. Our design, analysis and manufacturing capabilities feature:

- Computer-aided engineering, design and manufacture
- FEA – Finite Element Analysis
- Dynamic motion analysis and contact force analysis
- Virtual prototyping
- Solidification simulation
- Concurrent engineering
- Rapid prototyping
- Fatigue testing
- CMM dimensional verification
- On-site prototype testing

CRAWLER SYSTEM MONITORING

In order to continually improve our product offering and to help our customers achieve the maximum life expectancy from their undercarriage components, Bradken is able to offer a crawler system monitoring program. This service assists mine operators and contractors to obtain an accurate assessment of the amount of wear on their undercarriage components.

Just as mining conditions vary from site to site, so too do the wear characteristics of the undercarriage components. By monitoring the wear on the undercarriage components a program can be implemented to achieve maximum life from all components.

This preventative maintenance service can also help in scheduling to give maintenance planners a reliable indication of when replacement parts will be required.
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