BRADKEN KNOWS THE MINING MARKET

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.

Our experienced engineering team is able to adapt our range of Bradken designed products to address the specific requirements and challenges presented by the diversity of the global mining market.

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 range of Ground Engaging Tools (GET), Buckets and Rigging have been designed and manufactured by our skilled and experienced team to provide quality and innovation that in turn provides our customers with reductions attributed to their Total Cost of Ownership (TCO), whilst providing improved safety features to reduce the risk of injury at site.

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 recognises that when it comes to dragline rigging, you’re only as strong as your weakest link. We manufacture an extensive range of dragline rigging components for a variety of applications and machines to provide customers with reliable and innovative solutions to suit their individual mine site needs.
Bradken’s Harmonise Rigging/Jewellery solution is a collection of innovative designs with a revolutionary approach to the upper hoist rigging assembly. The new design features the Integrated Socket Equaliser (ISE), an innovation that seamlessly replaces five components in the upper hoist assembly creating an elegant solution that also reduces rigging height and weight.

This innovative (ISE) design has proven itself to be a “Fit and Forget” component that can last up to 12 months without any maintenance or repair, which in turn reduces machine down time and lowers maintenance costs.

### HIGHER SPOIL

The innovative Integrated Socket Equaliser (ISE) is unique to the Bradken Harmonise range. The ISE reduces rigging height by more than a metre, the resulting gain in spoil height (dragline dependant) is also a large advantage at spoil bound mine sites to reduce rehandle and walking time. A saving of 1 metre in spoil height can gain your site an extra 4% pile volume.

### SWIVEL MOTION

Harmonise Upper Hoist system has been designed with freedom of movement where it is needed most. The Integrated Socket Equaliser ISE has horizontal swivel movement for better operator control. The Tri-Link has a vertical swivel motion to reduce the load on the lower rigging, bucket and chains during the dig cycle. Overall the coordinated design is stronger, lighter, reduces inherent stresses and offers the operator more control.

### CENTRELINE WEDGE

Wedge removal can often require heavy hammering - a potential safety risk. Bradken has included the centreline wedge concept in our sockets. They are safe, easy and quick to change in the field and are designed to utilise the hydraulic wedge removal tool already in use at a number of sites.

### REDUCED RISK EXPOSURE

Bradken is committed to providing reduced risk wherever possible:

- Reduced number of change-outs due to longer lasting parts
- Reduced inventory due to less components in the upper rigging assemblies and only three pin types used
- All Bradken Lifting lugs permit latched hooks to be used for a safer installation
- Bradken have maintained the Strength Safety Factor while reducing the mass on a number of rigging components by using intelligent design and superior materials
- No welding of cover plates required to contain Bradken APT pins, saving time by eliminating unnecessary labour thereby reducing the risk of injury.
APT (Advanced Processing Technology) Dragline Rigging Pins are manufactured with high hardness and high toughness which has proven to last at least three times longer than conventional rigging pins. This in turn reduces your maintenance costs and machine downtime.

Bradken has a range of DRP pins that can fit to your current rigging package without the need for modification. Talk to your local Bradken representative about our current offering of DRP pins or the opportunity to customise a pin to suit your rigging requirements.

Take advantage of Bradken’s innovative APT pins and make the change today.

SAFE INSTALLATION AND REMOVAL

Bradken’s APT pins feature an industry accepted RUD lifting lug, which enables lifting hooks to fully close for safer removal. Since employing this feature, Bradken has further developed the lifting lug concept following our continuous improvement process. The latest variation of the pin now has a fully recessed lift point, reducing the risk of the RUD lifting lug being removed in unforeseen circumstances, where the lug was not used in the manner that it was designed.

Bradken’s lifting lug is inset in the pin head, shielding it from damage of being knocked off.

Bradken’s lifting lug allows enough room for lifting hooks to close securely.
**REDUCED INVENTORY**

Bradken’s Harmonise Dragline Rigging products were designed simultaneously, which enabled Bradken to consolidate pins and reduce inventory.

**PIN PLACEMENT**

Bradken’s Harmonise pins have been designed to fit flush in rigging parts, reducing the risk of pin damage and unscheduled down time.

**HAMMER FREE LOCKING SYSTEM**

All Bradken rigging incorporates safe hammer free locking systems. Designed for installation using conventional tools, Bradken retainer systems are fast and easy to operate.

The unique P-Lock system allows removal of the keeper from two directions, ensuring less handling of heavy parts.

The T-Lock and B-Lock systems provide your mine site with hammer free locking pin options that are easy to install and remove. B-Lock provides the added benefit of a fully covered locking head to minimise the risk of damage.

**LONG LIFE**

Bradken has actively trialled APT pins against competitor offerings and has continually been able to exceed the OEM part by more than three (3) times, in some instances, the part has lasted more than eight (8) times.

**REDUCTION IN YOUR TOTAL COST OF OWNERSHIP**

With operating costs playing a key role in any mine site operations, Bradken has formulated a tool to showcase the cost savings that our APT pins can provide. Your local Bradken representative will be able to sit down with you and highlight these savings using our APT Cost Analysis Benefits tool.
RIGGING DUMP LOCK

The dump block forms part of Bradken’s Harmonise rigging system. This system has utilised the very latest technology in engineering and has already demonstrated massive productivity gains over the current market offerings.

INTERCHANGEABLE CAST CLEVIS

Bradken’s Dump Block features the option of a vertical or a horizontal cast clevis, which can be made to suit any size dump rope between 50mm and 95mm. Bradken’s Harmonise Dump Block can be used with Bradken’s Harmonise Rigging Package or your existing rigging.
COMPATIBLE WITH BECKETED ROPES

One of the unique features of Bradken’s Harmonise Dump Block is the ability to use it on a number of machines at your mine site operations. The 48" Dump Block encompasses the most common dragline machines (see packages page for machine classes) and is designed to be used with becketed ropes, ensuring there is no additional downtime attributed to changing dump ropes during planned/unplanned maintenance breaks. The Dump Block is also designed to suit rope sizes of 51mm (2"), 76mm (3") and 83mm (3 1/4").

ENGINEERED TO LAST THE DISTANCE

The Dump Block features 20% larger bearings compared to OEM offerings, enabling the bearing life to double that of the competition. Finite Element Analysis (FEA) has been used to effectively reduce the weight by making sure that there is no wasted mass in the dump block while at the same time optimising the material for maximum strength.

CHAIN

Bradken’s Harmonise Chain combines innovative design with world class manufacturing and inspection techniques to provide reliability, safety and reduced operating costs. Available in a range of chain lengths and sizes to suit Hoist, Drag and Dump Chain configurations.

OPTIMISED MATERIAL DISTRIBUTION

Bradken’s product development team optimised the crotch/bight contact between all Harmonise links by increasing the surface area to improve sliding contact. This allows for a more uniform wear, which in turn decreases the contact pressure and maximises chain life.
INCREASED WEAR MATERIAL WHERE IT MATTERS

Bradken chain was designed using dynamic simulation analysis and Finite Element Analysis (FEA) in order to provide increased wear material where needed whilst keeping the rigging weight to a minimum. The chain features a greater section thickness in high-wear crotch/bight areas, particularly in the step-up and stud-end links. The chain is cast in Bradken Intellectual Property (IP) alloys, with options suitable for abrasive and high impact sites.

BRADKEN 3” DUMP CHAIN VS 2.5” DUMP CHAIN

Bradken’s dump chain provides unparalleled benefits to other like products currently being offered in the market.

Bradken’s larger heavy duty 3” dump chain has been designed with additional wear material in high wear areas while maintaining a similar weight to a standard 2.5” assembly.

The 3” chain assembly requires fewer links to achieve comparable lengths to the 2.5” assembly, which means it can be installed without requiring modifications to the dump rope as there is no adverse effect on the bucket carry angle.

The Bradken 3” dump chain offers improved wear life resulting in less downtime and reduced maintenance costs.

MECHANICAL REPAIR LINKS - HAMMER FREE

The Harmonise range features a hammer free Mechanical Repair link to suit a wide range of chain sizes and OEM equivalents. The mechanical repair link reduces unscheduled downtime caused by chain failures.

- Made from superior cast alloy
- Standard dump or becketed socket options
- Centreline socket system allows for easy wedge removal with a hydraulic ram
- Hammer free locking system(s)
- Optimised fit with other Bradken linkages
- Significant mass reduction compared to competitors
- Optimised fit with mating anchor links, dump links and dump equaliser

DUMP SOCKET

- Added wear material in high wear areas
- Made from superior cast alloy
- Hard Facing Options available
- APT pins allow for reduced inventory and operating costs
- Selection hammer free of locking systems
- Fits existing bucket hitches
- Increased wear material where needed

<table>
<thead>
<tr>
<th>CLASS</th>
<th>Pin Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, 2, 3</td>
<td>4.25&quot;</td>
</tr>
<tr>
<td>80mm to 83mm</td>
<td>5&quot;</td>
</tr>
<tr>
<td>3/32&quot; to 3/16&quot;</td>
<td></td>
</tr>
</tbody>
</table>

DUMP SHACKLE/HITCH LINK

<table>
<thead>
<tr>
<th>CLASS</th>
<th>Pin Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, 2, 3</td>
<td>4.25&quot;</td>
</tr>
<tr>
<td>HARD FACING OPTIONS AVAILABLE</td>
<td></td>
</tr>
</tbody>
</table>
**DRAG SOCKET**

- Made from superior cast alloy
- Centreline socket system allows for easy wedge removal with a hydraulic ram
- Optimal force flow design, distributing pressure evenly on rope
- Optimised fit with other Bradken linkages
- Increased wear material where needed

<table>
<thead>
<tr>
<th>CLASS</th>
<th>Pins</th>
<th>Logo</th>
<th>Rope Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>6&quot;</td>
<td>4.25&quot;</td>
<td>80 to 89mm 3/8&quot; to 3/4&quot;</td>
</tr>
<tr>
<td>3</td>
<td>7&quot;</td>
<td>4.25&quot;</td>
<td>92 to 102mm 5/8&quot; to 4&quot;</td>
</tr>
<tr>
<td>4</td>
<td>9&quot;</td>
<td>5&quot;</td>
<td>119 to 127mm 3/8&quot; to 5&quot;</td>
</tr>
</tbody>
</table>

**HOIST SOCKET**

- Made from superior cast alloy
- Male and female hoist sockets
- Centreline socket system allows for easy wedge removal with a hydraulic ram
- Hammer free locking system(s)
- Optimised fit with other Bradken linkages

<table>
<thead>
<tr>
<th>CLASS</th>
<th>Pins</th>
<th>Logo</th>
<th>Rope Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6&quot;</td>
<td>80-98mm 3/8&quot; to 3/4&quot;</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>8&quot;</td>
<td>92 to 102mm 5/8&quot; to 4&quot;</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>8&quot;</td>
<td>110 to 127mm 4 3/8&quot; to 5&quot;</td>
<td></td>
</tr>
</tbody>
</table>

**Y-LINK**

- Added wear material in high wear areas
- Made from superior cast alloy
- Optimised to fit 3", 3.5", 4" and 4.5" hoist chain
- APT pins allow for reduced inventory and operating costs
- Selection of hammer free locking systems
- Increased wear material where needed

<table>
<thead>
<tr>
<th>CLASS</th>
<th>Pins</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>6&quot;</td>
</tr>
<tr>
<td>3</td>
<td>8&quot;</td>
</tr>
<tr>
<td>4</td>
<td>8&quot;</td>
</tr>
</tbody>
</table>

**DRAG SHACKLE /HITCH LINK**

- Added wear material in high wear areas
- Made from superior cast alloy
- Surface crotch fit with Pear Links
- APT pins allow for reduced inventory and costs
- Selection of locking systems
- Fits existing bucket hitches
- Increased wear material where needed

<table>
<thead>
<tr>
<th>CLASS</th>
<th>Pins</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>6&quot;</td>
</tr>
<tr>
<td>3</td>
<td>7&quot;</td>
</tr>
<tr>
<td>4</td>
<td>9&quot;</td>
</tr>
</tbody>
</table>

**SPREADER BAR**

- Made from superior cast alloy
- Cast ends
- Incorporates safe hammer free locking system(s) and APT Pins
- Reversible – Connecting pins can be inserted from either side
- Available in a range of different lengths
- Increased wear material where needed

<table>
<thead>
<tr>
<th>CLASS</th>
<th>Pins</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>3&quot;</td>
</tr>
<tr>
<td>2 &amp; 3</td>
<td>8&quot;</td>
</tr>
<tr>
<td>4</td>
<td>10&quot;</td>
</tr>
</tbody>
</table>