



Express Parts **Heavy Haul Industry**

Our Innovation. Your Advantage.



What We Do

Bradken designs and manufactures a variety of rail spare parts and drawgear solutions capable of withstanding the harshest climates and most demanding operating conditions in the world.



Registered Trademarks.

All company names, logos, product names, and identifying marks used throughout this publication are the property of their respective trademark owners. They are used for descriptive purposes only and are protected by the relevant laws of the countries in which the trademarks are registered.

We'll work with you to understand your operational challenges and provide the smartest solutions with:



Experience and Expertise

With over 100 years' experience in the foundry business and with world-class manufacturing facilities located globally, Bradken has the knowledge, expertise and capability to produce fully machined cast iron and steel products from a mass of 0.5kg (1.1lbs) up to and over 25,000kg (65,000 lbs).



Safety

Bradken products provide comprehensive safety features to reduce risk during equipment maintenance.



Reducing Costs and Increasing Productivity

Bradken products have been designed and engineered to optimise operational performance and aim to provide our customers with lowered Total Cost of Ownership (TCO).



Innovation and Design

Leveraging our expertise and experience in wear materials with our innovative technical teams, Bradken can supply unique and tailored packages to deliver high performing solutions.



Support Services

Global mining and resources companies partner with Bradken because they know we will leverage our extensive design, engineering and in field support services to solve their specific operational challenges.



Local Sales and Support Networks

Bradken's global sales and distribution networks supply the world's major mining and industrial regions.



Sustainability and Environment

Bradken is committed to reducing its impact on the environment through a comprehensive and targeted sustainability plan.



Equal Opportunities

We value diversity and inclusion in the workplace. We seek to recruit, develop and retain the most talented people from diverse cultures, perspectives, skills and experiences within our workforce.

Ultra Capacity Couplers



Bradken's range of Ultra Capacity Couplers has a proud and proven 40 year service history within the demanding Pilbara iron ore environment. With axle loads up to 45 tonne and train lengths up to 330 wagons, our established range of products caters for all configurations including F and E/F type couplers in both rotary and fixed (non-rotary) applications.

Our Ultra Capacity Couplers are supplied in two basic types: standard interlocking shelf (Type E/F) or vertically interlocked (Type F) - offering a proven strength in excess of 1,000,000 lbs (454 tonne).

Standard Interlocking Shelf (Type E/F)

With standard interlocking shelf, horizontal and vertical aligning capabilities of the couplers are not affected. Couplers are free to move vertically within the limits of the shelves, which are sufficient to accommodate car height differences and dynamic movement.



Vertically Interlocked (Type F)

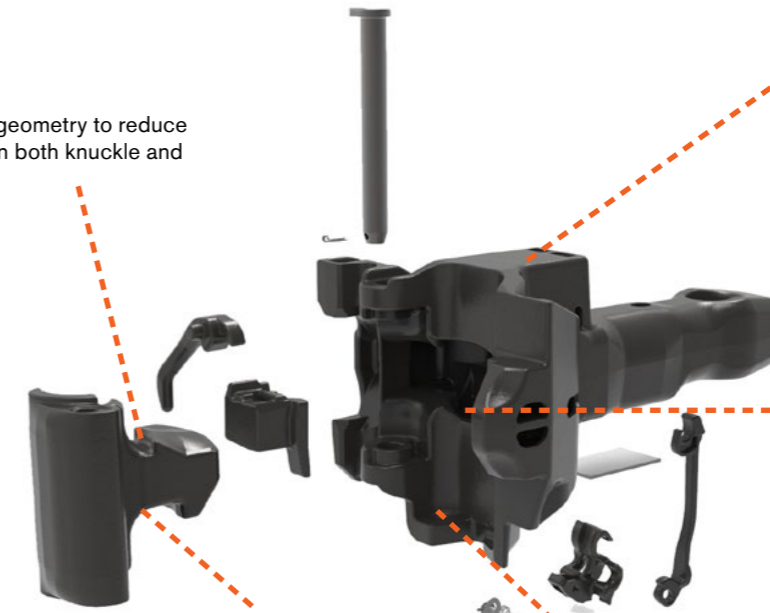
The vertically interlocked type of coupler does not allow for free vertical movement and can be used in instances where it is necessary to couple with other couplers with interlocking wings. The coupler requires a sprung carrier positioned under the shank to support the weight of the coupler and maintain coupler alignment.



Ultra Capacity Coupler features

FEA optimised geometry to reduce crack initiation in both knuckle and coupler head

Made of E-Tuff material, the Ultra Capacity Coupler exceeds standard AAR coupler strength by 30%



Surface treatment in critical areas significantly increases fatigue life and consistency of knuckles.

Reduced slack contour to reduce dynamic loads and increase component wear life.

Available in two Interlocking options:
-Standard Interlocking Shelf (Type E/F)
-Vertically Interlocked (Type F)

Benefits of using Bradken Ultra Capacity Couplers



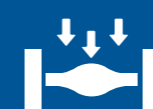
Made from Superior Alloy

Bradken E-Tuff alloy exceeds industry default AAR M-201 E Grade



We fit the majority of applications

Numerous variants available to suit all applications



Designed for 40T & up axle loads

AAR products are only designed for 32.5T axle loads



30% Stronger

Superior material and design

Heavy Duty Couplers



Bradken's Heavy Duty Coupler is a scaled down version of the Ultra Capacity Coupler providing a highly reliable coupler for applications up to 30 tonne axle loads.

Bradken can supply and customise a range of Heavy Duty Couplers to suit your particular wagon using a range of shank types, lengths and vertical offsets. Bradken also supplies all necessary coupler accessories including knuckles, knuckle pins, lifters, rotor levers, locks and wear plates. Couplers can be supplied painted to customer specifications.



The benefits of Bradken Heavy Duty Couplers over AAR E and E/F type couplers:

Compact design allowing closer wagon spacing and potentially more wagons in train consist.



Excellent strength to weight ratio using FEA optimised design and materials.



Broad range of existing designs to suit almost any wagon configuration.

Ultra Capacity and Heavy Duty Rotary Couplers

Using Bradken Rotary Couplers, individual cars or groups of cars can be rotary dumped without uncoupling. Bradken can provide both Ultra Capacity and Heavy Duty sized Rotary Couplers.

Rotary unloading is achieved by fitting each car or group of cars with a Fixed Coupler at one end and a Rotary Coupler at the other. A Rotary Coupler is always matched with a Fixed Coupler so that both couplers will return to the upright position after dumping.

As rotary dumping of cars involves inverting the couplers, it is necessary to ensure couplers will remain securely locked during the dumping (tipping) operation.

Experience shows that under certain operating conditions a standard Rotary Coupler can uncouple. With this in mind, our Rotary Ultra Capacity Coupler has been fitted with an optional added safety feature, a spring loaded rotor/lifter lock, which mechanically locks the two components preventing any accidental uncoupling.



Advantages of the Bradken Rotary Coupler system

Reduced wear and tear on couplers, drawgear and car structure caused by uncoupling and recoupling.

Made of Bradken's E-tuff alloy providing 30% more strength over the AAR E and E/F type couplers.

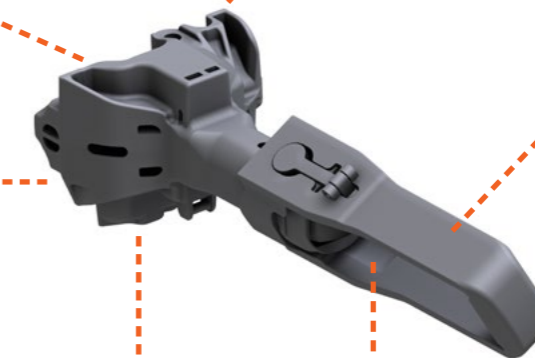
Spring loaded rotor/lifter lock which mechanically locks the two components to prevent any accidental uncoupling.

Forged Yokes, made of Bradken alloy are stronger than the standard AAR M201 E Grade, provide reduced maintenance and downtime.

Unbroken brake line connections for faster unloading

Optional surface hardening allows for extended yoke wear life.

Safe unloading: Fewer persons needed for terminal operations.



Ultra Capacity Knuckle



The knuckles are designed to fit Bradken Ultra Capacity Couplers. They are the strongest and most fatigue resistant knuckles on the market.

Machined Ultra Capacity Knuckles:

- are cast in Bradken proprietary E-Tuff alloy
- feature proprietary surface treatment in critical areas
- are 30% stronger than AAR F51AE knuckle

All knuckles are dimensionally gauged, hardness tested and magnetic particle inspected.

Comparison of Bradken knuckles against the standard AAR product

Strength	Knuckle	Yield Strength	Ultimate Strength	Comment
—	AAR knuckle (AAR F)	2.45MN	3.0MN	AAR M201 E grade material
—	Bradken AAR knuckle (AE1332)	2.77MN	3.45MN	Optimised core design and E-Tuff material provide strength benefits above the standard AAR knuckle.
—	Bradken Ultra Capacity Knuckle (AE320M)	3.32MN	4.1MN	Fundamentally stronger design. Cast in E-Tuff and surface treated in critical areas to provide further strength and fatigue improvements.

■ CAST KNUCKLES ■ SURFACE TREATED KNUCKLES



Advantages

In heavy haul rail the service life of knuckles is usually limited by fatigue. To improve knuckle reliability and reduce your total cost of ownership, Bradken has introduced an Ultra Capacity Knuckle featuring surface treated critical surfaces.

Destructive fatigue testing of surface treated and standard knuckles has shown that surface treatment:

- increases mean knuckle fatigue life by 30%
- reduces variability in critical area surface finish, which improves consistency and reliability of knuckle fatigue life.

Bradken's Direct Replacement Part (DRP) Knuckle

Do you have a AAR F-type coupler? Upgrade to the Bradken Ultra Capacity Knuckle to gain the following benefits:

- Longer service life
- Greater consistency of performance
- Fewer separation events

E-Tuff Material

Bradken Ultra Capacity Couplers and Knuckles are manufactured from cast E-Tuff steel.

Bradken developed E-Tuff specifically for use in drawgear applications. E-Tuff is an adaptation of the industry default AAR M-201 E Grade and offers superior tensile, hardness, and fatigue performance, which are each key to different aspects of improved drawgear performance.

15%

15% stronger than the Standard AAR M-201 E grade.

Key benefits of Bradken E-Tuff drawgear:

✓ Increased strength

Higher yield and ultimate strength of drawgear components, reducing the likelihood of mainline breakaways. E-Tuff is 15% stronger than AAR M-201E grade.

✓ Increased wearlife

Higher hardness slows the onset of slack within the coupler (between knuckle, locking block, and coupler body). Excessive slack increases impact loading significantly reducing drawgear fatigue life. Up to 15% harder than AAR M-201 E grade.

✓ Improved fatigue resistance

Bradken has undertaken extensive fatigue testing of E-Tuff (both S-n and -n performance) benchmarking it against AAR M-201 E-Grade. Bradken E-Tuff demonstrates superior life under damaging high-stress / low-cycle loading.

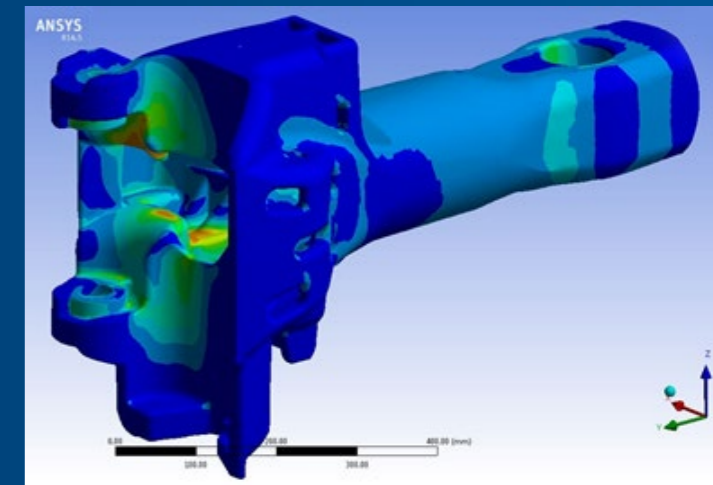
30%

The Bradken Ultra Capacity Coupler is 30% stronger than AAR E and E/F type couplers.

Product Development

Design features

The Ultra Capacity Coupler is designed with a modified F contour, which offers reduced slack when compared to a 10A contour. It features a 12" head and provides significant additional capacity over the standard Heavy Duty Coupler with only a marginal increase in weight.

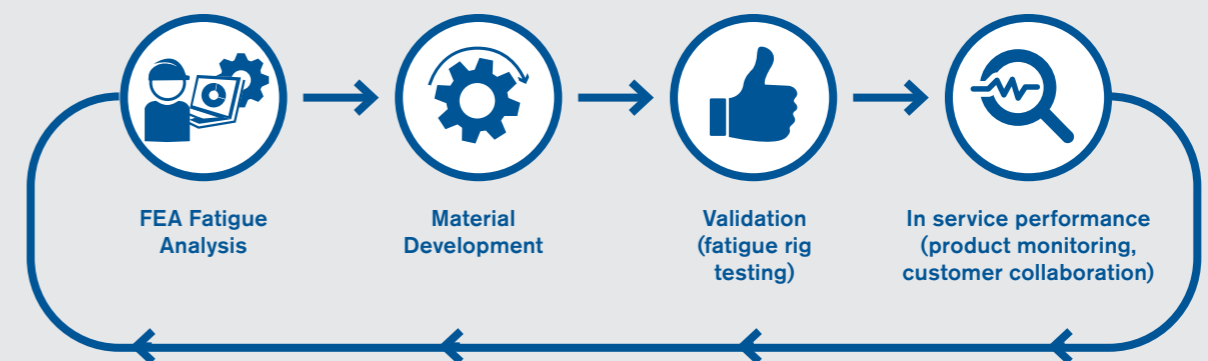


Fatigue testing

As with all Bradken couplers, the Ultra Capacity Coupler employs the 'safety valve' principle of making the knuckle the 'first to fail' element in the system. Fatigue testing to further verify the Bradken's Ultra Capacity Couplers superior strength and reliability was completed both in Germany and at Central Queensland University in Australia, which has one of the only fatigue rigs in the world capable of replicating train loads experienced in the country's harsh iron ore environment.



Cutting edge development



Forged Yokes



Bradken Yokes have a proven track record of reliability having been in use in a wide range of iron ore, coal, grain and intermodal wagons throughout Australia, New Zealand and South-east Asia rail networks.

Our Forged Yokes are offered in all three basic forms: Standard Fixed Yoke (AAR type F), Standard Rotary Yoke and Short Fixed Yoke.

All three of these forged products can be altered by the addition of wear plates, pin retaining lugs and pin bore bushes to suit almost all draft pocket configurations.

These yokes are machined in all critical areas for optimum surface finish and integrity. This combined with the ability to control grain alignment in the direction of high stress significantly improves the strength and fatigue life of the yokes.

The overall geometry has remained the same allowing the Forged Yokes to be installed as direct replacements for Cast Yokes. The difference between the two parts lies in the material and the changes in production method.

In addition, Bradken's ability to integrate yokes and other drawgear products with the supply of other spare parts along with a fully supported technical network means our customers can confidently concentrate on their core business.

Styles



Short Fixed Yoke



Standard Fixed Yoke (AAR type F)



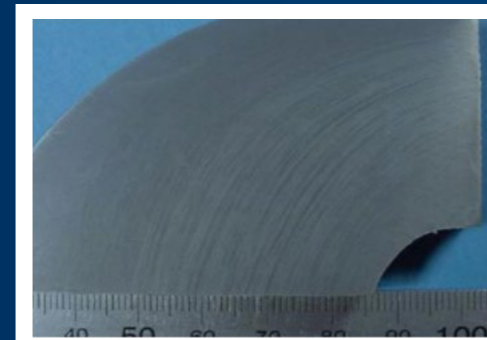
Standard Rotary Yoke

Forged Yoke Material

Key advantages of Bradken Forged Yoke material

The below points combine to provide significant improvement in strength and fatigue life of the yoke:

- 1 Offers greater component integrity, steel cleanliness, consistency and improved material strength due to highly refined input material (source billets produced in advanced steel making process including vacuum degassing).
- 2 Our Forged Yokes are machined in critical areas and developed to produce grain alignment with the direction of high principal stress. This grain alignment provides a strength and fatigue advantage in this direction which is particularly advantageous at the rear relief radius where fatigue failures typically occur in Cast Yokes.



The sectioning result of the Bradken Forged Yoke shows the highly stressed rear relief radius which can be prone to fatigue failure in Cast Yokes. This highlights the grain alignment that is produced through forging which results in higher strength and a longer lasting yoke.



23% higher Yield Stress(MPa) point before material deformation in comparison to standard E Grade material



15% higher Ultimate Tensile Stress(MPa) before cracks occur



85% increase in impact toughness

Drawbars

Bradken offers two Drawbar options below:



Fixed

- Benefit – drawgear mass reduced
- 65% reduction from a coupler to coupler connection
- Cast in E-Tuff alloy with close quality control to ensure high integrity in all critical areas.



Rotary

- Patented Forged Rotary Drawbar designs
- Provides a Rotary Wagon connection at the Drawbar end, replacing two couplers (a Fixed and Rotary Coupler)
- Benefit – Drawgear TCO reduced. Not only is the single Forged Rotary Drawbar lower in initial cost than two couplers, it is also simpler with fewer moving components with significantly reduced maintenance requirements
- One Rotary Drawbar provides a 65% weight reduction in comparison to a coupler to coupler connection.

Drawgear & Bogie Spare Parts

Bradken supplies a range of critical spare parts for a smooth and efficient Drawgear system.

Wagon Draftpacks

Bradken is proud to partner with Miner Enterprises Inc. as the premier supplier of their Draftgear equipment.



Miner Crown SE Draftpack

Miner TF880 Draftpack

Miner SL-76 Draftpack

Bradken Draftpack

Contact Contact Sidebearers for Bogies

Bradken recommends Miner Sidebearer as the best in the market. We can also supply other types to suit your particular application.



Stucki ISB-10

Stucki SSB

Miner TCC-IV



Bogie Springs

Bradken supplies a range of AAR-equivalent springs to assist in sideframe and bolster damping. Springs range from D3 to D7 Inner and Outer Springs.



Bolster Friction Shoes

In combination with our high quality springs, Friction Shoes assist in stabilising bogies resulting in longer component life in harsh operating conditions.



Drawgear Followers

Followers are available to suit drawbars and couplers. These are critical components of the draftpack assembly, guiding drawgear for smooth operation.



Bogie Brake Beams

Bradken supplies the Miner Series 2008 Brake Beams due to their optimum material composition and resultant extended wear life. Brake Beams are available in a range of sizes to suit narrow and standard gauge bogies.

Wear Liners, Plates and Rubber Pads for Sideframes and Bolsters



Centre Bowl and Plate Liners for smooth curve negotiation



Wear Plates to suit Sideframes and Bolsters



Brake Beam Pocket Wear Liners

Couplers



A358TS	Coupler A358 - Top Operated	A258RR	Coupler A258 Hd Bottom Rotary
A156TK	A156 Coupler - Top Operated	A259RK	Coupler A259 Bottom Rotary
A193TG2	A193 Coupler Top Operated	A262TK	Coupler A262 Top Operated
A229TK	A229 Coupler Top Operated	A267RK	Coupler A267 Bottom Rotary Bottom Shelf
A267TK	A267 Coupler Top Operated	A302RK	Coupler A302 Rotary Operated
A350RC	A350 UC Coupler Rotary	A307RK	Coupler A307 Bottom Rotary
A351RC	A351 UC Coupler	A319RR	Coupler A319 Bottom Rotary
A121TG	Coupler A121 Top Operated	A331TR	Coupler A331 Top Operated
BK18452B	Coupler A150 Assembly	A335TK	Coupler A335 Top Operated
A156BK	Coupler A156 Bottom Operated	A358TC	Coupler A358 Top Operated Clear
A170RR	Coupler A170 Bottom Operated	A358TK	Coupler A358-2 Top Operated
BK8919	Coupler A170 Bottom Rotary Bottom Shelf	A372RK	Coupler A372
A171RR	Coupler A171 Bottom Rotary Bottom Shelf	A273TK	Coupler Top Operated
A193RG	Coupler A193 Bottom Rotary Operated	A150TR	Coupler Top Operated
A204TK	Coupler A204 Top Operated	AC5277	Coupler With D/Gear Complete
A206RK	Coupler A206 Bottom Rotary	A323RC	Rotary Coupler Fixed Shank
A244BK2	Coupler A244 Bottom Operated Black	A322RC	Rotary Coupler Rotary Shank
A254TR	Coupler A254 Top Operated	A201BK	Slack Controlled Auto Coupler

Draft Gears & Spares



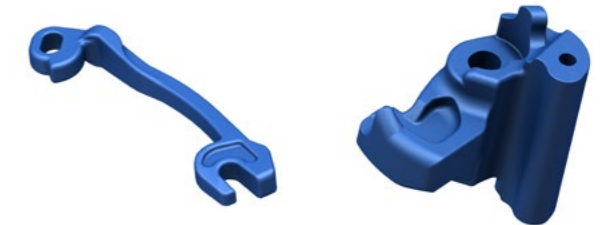
SL76	Draft Gear Chassis Equipment	D-11518	Pre Shortening Insert
CROWN SE	Draft Gear M901E	W11480	Shoe
TF880	Draftgear M901E	BK729	Side Wedge Friction Draft Gear
AE762	Draftgear Quikdraw Ultra-Lite	W11481	Wedge
W11479	Follower Top	W10368	Outer Stationary Plate CE 6
W11059	Insert Pre-Shortening	W10364	Shoe Wedge (R500)
W11477	Pads Tecspak	W10366	Tapered Stationary Plate (R500)
AC2156-2	Pad-Single Oh Drawgear Assy	W11477	Pads Tecspak

Yokes



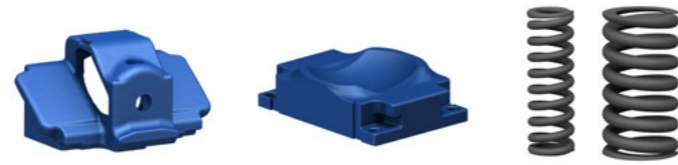
AE120-3K2	Yoke AE120 Quad Shear	AE426-3K	Yoke AE426
AE144-2K	Yoke AE144	AE433-3K	Yoke AE433
AE231-3G2	Yoke AE231	AE433-3G	Yoke AE433
AE240-4R	Yoke AE240	AE702-4R	Yoke AE702
AE240-3R	Yoke AE240	BK21283	Yoke AE767 Short to suit Quikdraw
AE255-3B	Yoke AE255	AE200-3K	Yoke Assy AE200
AE270-1C	Yoke AE270 No Wear Plate Clear (Rotary)	AE200-3B	Yoke Assy AE200
AE270-2C	Yoke AE270 Uc Rotary End Clear	AE183-4B	Yoke Body
AE271-1C	Yoke AE271 No Wearplate Clear (Fixed)	AE231-3	Yoke AE231
AE271-2C	Yoke AE271 UC Fixed End Clear	AE270-5K	Rotary Yoke AE270

Knuckles/Lifters



AE316P	Knuckle & Knuckle Pin	AE79	Lifter Bottom Standard
AE320	Knuckle 10A Contour Reduced Slack for Ultra Capacity Coupler	AE242	Lifter Top Standard
AC4031	Knuckle 11	AE80	Pin Knuckle Pivot Dee Head 42mm DIA X 340mm Long (Nom)
AE316	Knuckle 11 Face 10A Contour with Reduced Slack Feature	AE97	Pin Knuckle Pivot Round Head 42mm X 366mm Long (Nom)
BK6154	Knuckle Assembly	AE322	Pin Pivot 1.654 DIA X 14.8 Long
AE649	Knuckle Reduced Slack Ultra Capacity Alliance Coupler	COM0646	Brake Block Key Alt.no 1201034 (Drg.h83-11329)
AE547	Knuckle With Reduced Slack Feature	BG3574	Key Brake Block SSRC Bogie
AE303	Knuckle 11 10A Contour Upward	408-003/1	Keybrake Block Bogie General
AE77	Lock Standard	BG2580	Key Brake Shoe Rotary Dump
AE279	Lever Rotor		

Springs/Friction Shoes/Followers



RC59	Spring Coil Inner Ride Control Bogies	AE223	Follower Front (U0757)
AE681	Spring Compression Ultra Coupler Rotary	AE319M	Follower Rf361 Draft Gear
RC128M	Spring Inner Coil D3	RC226	Friction Shoe Winged
RC330	Spring Inner Inner Bolster	RC246	Shoe Winged Friction
RC321	Spring Inner Ssrc Bogie	AC1877	Shoe Friction
AE84	Spring Knuckle Torsion Round Material	RC54	Shoe Friction
RC127M	Spring Outer Coil D3	RC125	Shoe Winged Friction
RC247	Spring Ride Control Ssrc Bogie	10455	Class K Adaptor Plus (Includes Adaptor Casting+Elast. Pad)
RC58M	Spring Coil Outer	U0333	Follower Front
AE664	Follower Front Ultra Heavy Duty Coup Rot End		

Wear Liners/Rubber Pads



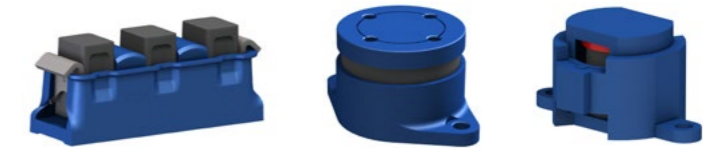
AC2721	Pad - Double Drawgear Assembly	B138	Wear Plate Pocket
AC2156-1	Pad - Single Ad Drawgear Assembly AC3730	B875	Wear Plate Pocket Bogie
AC1109	Pad Rubber Double	B1838	Wear Plate Slope Surface A/D SSRC Bogie
AC1108	Pad Rubber Single	B1839	Wear Plate Slope Surface O/H SSRC Bogie
AC2721	Pad - Double Drawgear Assembly	B1547	Wear Platepedestal Roof Bogie Transdyne AISIC-1095
AC2156-1	Pad - Single Drawgear Assembly	AE635	Wear Plates
AC1109	Pad Rubber Double	B1032	Liner Cupped
AC1108	Pad Rubber Single	B633	Liner Cupped 305mm DIA
AC2156-2	Pad Single Oh Dgear Assy	B1033	Liner Cupped 356mm DIA
WE-4110-04B	Plate Wear Hollube	B1099	Liner Cupped Bolster
WE-4110-04A	Plate Wear Non Metallic Hollube	B500	Wearplate Cupped
B1463	Wear Liner Pocket Hollube Ride Control Bogie		

Brake Beams



BB618RH	Beam Brake Right Hand No.18. 70 Tonne (Bb818RH)	BG3050	Beam Brake A/D Right Hand
BB618LH	Beam Brake Left Hand No.18. 70 Tonne (Bb818LH)	BG3791	Brake Beam (Opp. Hand) L.H. Treadwell Hot Metal Car
BG3226	Brake Beam A/D	BG3507	Brake Strut For Brake Beams As Drawn
BG3538	Brakebeam Ad	BG3508	Brake Strut For Brake Beams Opp. Hand
BG3539	Brakebeam Oh	BG2185	Head Brake A/D
		BG2186	Head Brake O/H

Constant Contact Sidebearers



TCC-IV-45STQR	Miner Constant Contact Side Bearers	B2038	Side Bearer Bracket
W11149	Housing TCC-IV-60LT	29129	Side Bearer Housing
4500	Model 4500 Preload Plus CCSB	W10157	Spring Insert Sidebearer TCC111-60-ST #40236
W11423	Pad Assy (for TCC-IV-45)	W11398	Top Cap (for TCC-IV)

Level Crossing & Signal Equipment & De-Rails

38-2504-54 18	High Intensity Gate Arm CW 1591 Led Lights & Wiring	2149-A-112-E	Split Base Assy
38-2504-64 28	High Intensity Gate Arm CW Led Lights	3570-113	Arm Counterweight LH Aluminium Model 10 Crossing
38-2504-38	Boom Gate Arm AL/FG 11.2m	3565-102	Arm Counterweight LH Cast Iron Model 10 Signals
38-2504-20-8	Gate Arm AL/FG	3570-112	Arm Counterweight RH Aluminium Model 10 Crossing
38-2504-24	Gate Arm AL/FG 19-24 High Intensity Sheeting	3565-103	Arm Counterweight RH Cast Iron Model 10 Signals
38-2504-32	Gate Arm AL/FG 25-32 High Intensity Sheeting	38-0027-13	Bolt Shear Pivot Type Breakaway Adaptor
38-2504-28	Gate Arm Aluminium Fibreglass	0333-CFR	C/Bell W/Universal Socket DC Suit 4 X 5
1591-51	Gate Light Set (3) Special Gate Arm	38-0027-600	Pivot Type Breakaway Adaptor Fibreglass/Alum. gate Arms
1590-50	Gate Light Set 3-5/8 DIA Xing Contains 3 X Type 1590 Lights	38-0027-62-A	Post Assy Complete Pivot Type Breakaway Adaptor
1591-50	Gate Light Set 4-1/8 DIA Xing Contains 3 X Type 1591 Lights	HB DE-RAIL	Sliding Derail Left & Right Lpts
1597-50	Gate Light Set Led Boom Arm	EB DE-RAIL	Hinged Derail Left Or Right
3593-131-MI	Gate Mechanism C/W Mech Support & Conduit Assy	HRS-100	Hi-Rise Operating Stand
3590-131-BE	Gate Mechanism C/W Mech.support & Conduit Assy	HBXS	Bi-Directional Derail
2149A-111G	Basemast 5.5DIA. Level Crossing		

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a solution for
your business.**



Our Innovation. Your Advantage.



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