

RECOVERY & TOWING

2020

OUR COMPANY

THE HISTORY OF A UNIQUE PRODUCT

The Black Snake product range began in 2002 with our unique Nylon 4WD "snatch-um" strop and has expanded rapidly into a wide variety of vehicle recovery, towing and specialty products. Our premier range features Kevlar® recovery strops capable of towing and recovering the largest mine-site vehicles, short Kevlar® underground mining specialty products and specially designed military strops. The Nylon range suits kinetic recovery and towing of small to medium sized vehicles. With over 150 different products available and in excess of 30,000 units supplied to various markets worldwide, the Black Snake Kevlar® and Nylon range have proven themselves hardworking, durable and efficient. Black Snake have successfully carved a unique niche in the mining, construction and military industries.

BLACK SNAKE - AUSTRALIAN AND FOCUSED ON GLOBAL MARKETS

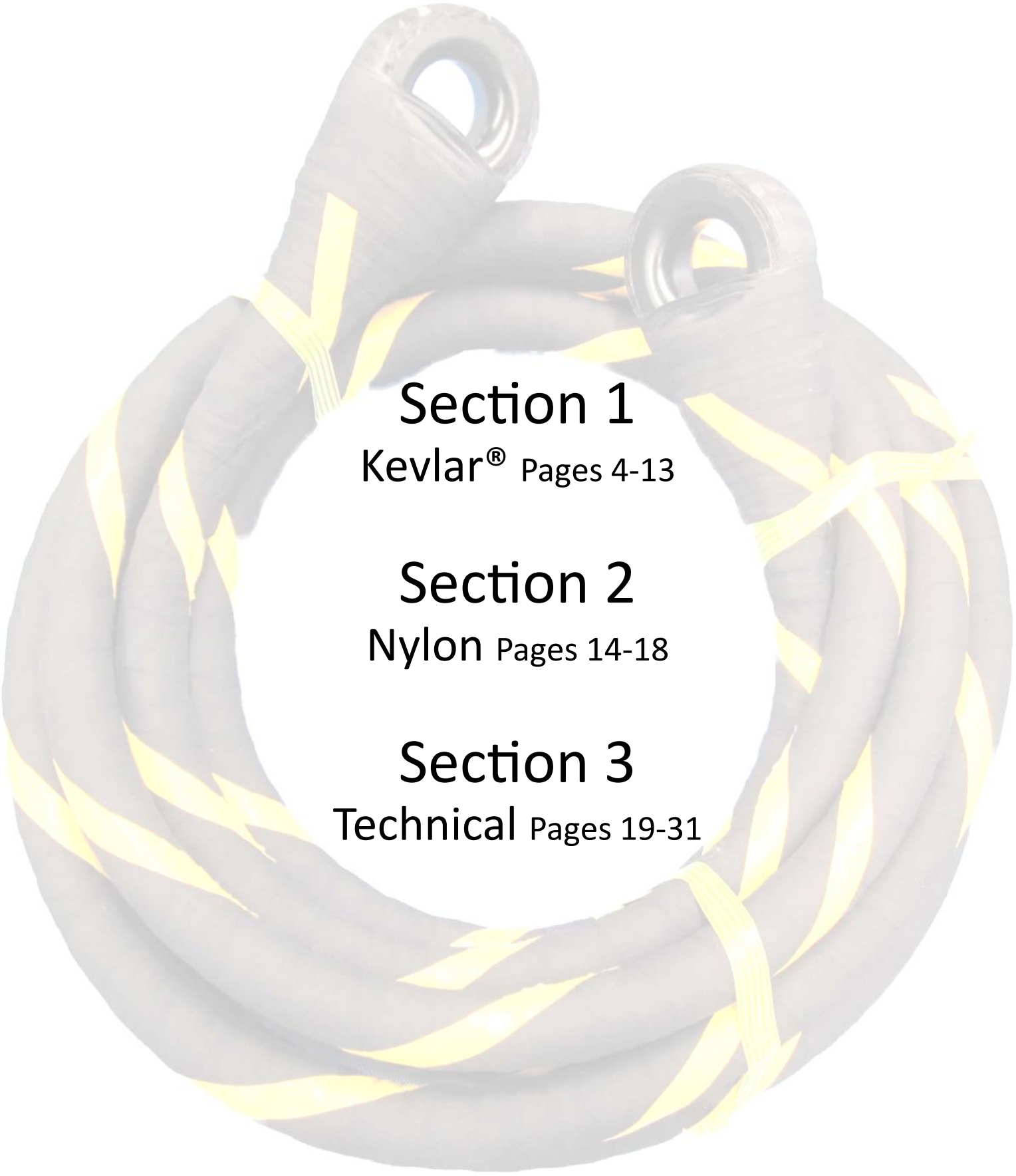
In 2018, the staff of Black Snake (AUST) - G.L.B. (Vic) Pty Ltd, combines an experienced marketing, design, prototyping and manufacturing team in a safe, flexible and efficient working environment. First and foremost, we focus on making our Black Snakes safe to use in all the hazardous conditions our products are subjected to. Black Snake (AUST) are all about strength, lightweight, ease of handling, durability and, of course, making products which are purposeful. Our customers expect high quality products, innovative designs and solutions. We value being able to provide honest, expert service and we offer many years of industry knowledge. We proudly bring our highly regarded Black Snake Kevlar® and Nylon recovery, towing, mooring and specialty strops to a huge global market.

INNOVATION LEADS TO A NEW PRODUCT RANGE

We have a new product range proudly featured in our Black Snake Recovery & Towing 2018 booklet. Following 3 years of development, we introduce the Black Snake **Y** Strop in a range of strengths and sizes for towing skid-mounted equipment. The robust, weather-resistant design of the Black Snake **Y** Strops allow permanent attachment to heavy equipment such as de-watering pumps, power generation sets and other commonly skid-mounted gear. Typically, the Black Snake **Y** strops and Bulldozer **Y** strops are expected to be used around mining and underground operations. Black Snake are excited to present the unique Black Snake Y strop.



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KEVLAR® RECOVERY STROPS

SECTION 1



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LIGHT DUTY KEVLAR® Y STROPS



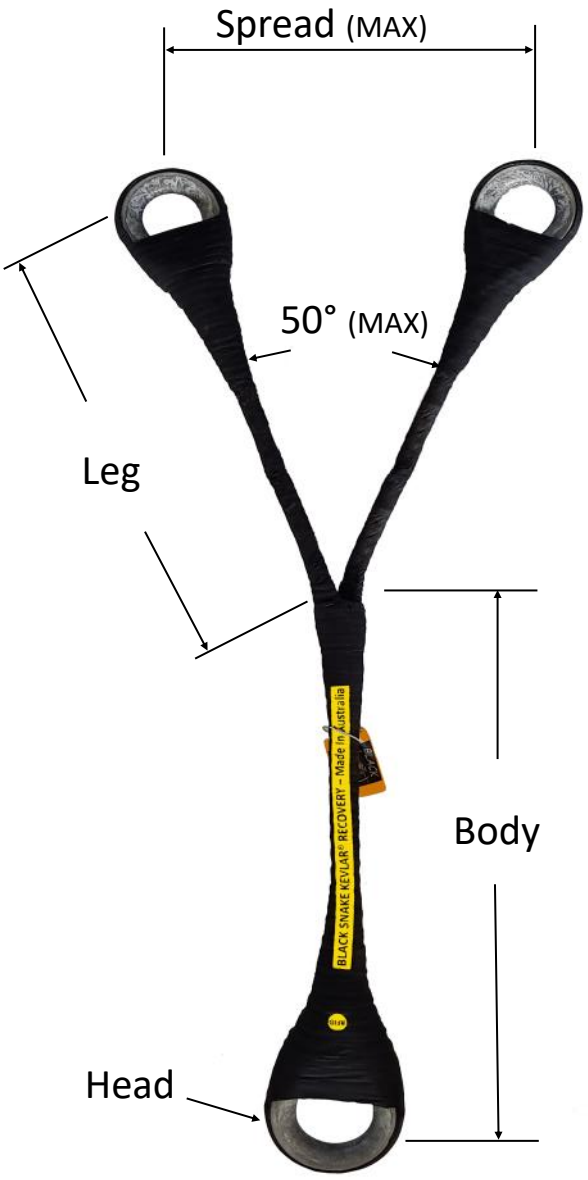
Y Innovation works

The Y Strop uses Kevlar® to achieve a unique and lightweight alternative to 2 leg chain or wire rope sling configurations. It is an excellent towing fixture due to its ease of use and safe handling. The light duty Y Strops are an ideal permanent addition for small to medium skid-mounted power generators, transformers, de-watering pumps, tool and equipment boxes.

The Y strop is also suitable for light vehicle towing and recovery with twin point connections, common to farm, military and small to medium mine vehicles.

The Kevlar® core and thick rubber cover make the Y strop perfect for snow, sand and muddy conditions. The Kevlar® Y Strop is UV stabilised, waterproof and can be used underwater as a tie-down or mooring strop.

Y STROP – Kevlar®		BREAK STRENGTH[1] 10 tonne	BREAK STRENGTH[1] 20 tonne
1 metre length	Leg=0.5m Body=0.5m Spread (max)=0.4m	Weight 6kg	Weight 7kg
2 metre length	Leg=1m Body=1m Spread (max)=0.8m	8kg	12kg
3 metre length	Leg=1.5m Body=1.5m Spread (max)=1.2m	9kg	14kg
4 metre length	Leg=2m Body=2m Spread (max)=1.6m	10kg	15kg
6 metre length	Leg=3m Body=3m Spread (max)=2.5m	11kg	23kg
10 metre length	Leg=4m Body=6m Spread (max)=3.4m	14kg	33kg
Maximum GVW[2] Severely bogged vehicle[3]		6 tonne	13 tonne
Leg Thimble Size AS1138		22mm	28mm
Head Thimble Size AS1138		28mm	36mm
Recommended coupling Leg		S grade shackle pin 4.7t-8.5t Super shackle pin 7t-12.5t Coupling link 13mm, 16mm	S grade shackle pin 6.5t-12t Super shackle pin 9.5t-18t Coupling link 18/20mm
Recommended coupling Head		S grade shackle pin 6.5t-12t Super shackle pin 9.5t-18t Coupling link 18/20mm	S grade shackle pin 12t-25t Super shackle pin 18t-40t Coupling link 22mm



1. Break strength is the applied load at which the Y Strop fails
2. Maximum GVW is the maximum recommended gross vehicle weight of a severely bogged vehicle for a specified Y Strop
3. Severely bogged vehicle is judged as resting on its axles or chassis. Resistance force is 75% of vehicle weight. Applicable for skid mounted equipment.

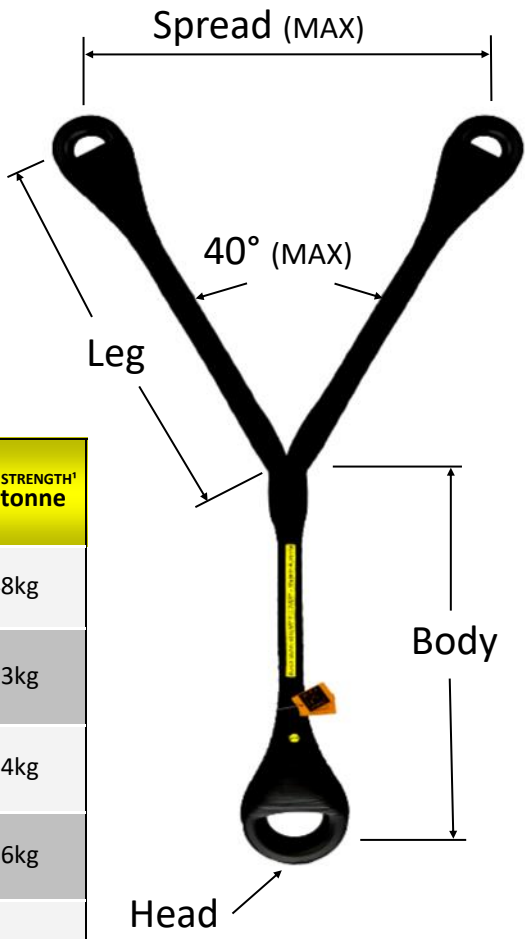
Strop weights are approximate and are subject to change without notice.

HEAVY DUTY KEVLAR® Y STROPS

Safely tow heavy skid mounted loads

The Black Snake Heavy Duty Y Strop has an extra thick rubber skin and high strength round eyes for maximum protection of the Kevlar® load bearing core. It is an excellent permanent towing fixture due to its ease of use and safe handling.
The heavy duty Y Strops are the ideal addition for heavy skid-mounted equipment.
The Y strop is also suitable for medium sized vehicle towing and recovery with twin point connections, common to farm, military and mine vehicles.





Y STROP – Kevlar®	Dimensions (m)	BREAK STRENGTH[1] 30 tonne	BREAK STRENGTH[1] 50 tonne	BREAK STRENGTH[1] 75 tonne	BREAK STRENGTH[1] 100tonne
3 metre length	Leg=1.5m Body=1.5m Spread (max)=1m	18kg	21kg	30kg	48kg
4 metre length	Leg=2m Body=2m Spread (max)=1.4m	20kg	23kg	32kg	53kg
6 metre length	Leg=3m Body=3m Spread (max)=2m	24kg	28kg	39kg	64kg
10 metre length	Leg=5m Body=5m Spread (max)=3.4m	35kg	42kg	59kg	86kg
15 metre length	Leg=6m Body=9m Spread (max)=4m	50kg	57kg	70kg	112kg
20 metre length	Leg=6m Body=14m Spread (max)=4m	59kg	75kg	92kg	144kg
Maximum GVW[2] Severely bogged vehicle[3]		20 tonne	33 tonne	46 tonne	67 tonne
Leg eye type		30t round eye	50t round eye	70t round eye	100t round eye
Head eye type		70t round eye	100t round eye	200t round eye	300t round eye
Recommended coupling leg		S grade shackle pin 6.5t-17t Super shackle pin 9.5t-30t Coupling link 18/20mm	S grade shackle pin 12t-25t Super shackle pin 18t-40t Coupling link 22mm	S grade shackle pin 17t-35t Super shackle pin 21t-40t Coupling link 26mm	S grade shackle pin 25t-55t Super shackle pin 40t-85t Coupling link 32mm
Recommended coupling Head		S grade shackle pin 17t-35t Super shackle pin21t-40t Coupling link 26mm	S grade shackle pin 25t-55t Super shackle pin 40t-85t Coupling link 32mm	S grade shackle pin 42t-55t Super shackle pin 55t-85t	S grade shackle pin 55t-85t Super shackle pin 85t-120t

1. Break strength is the applied load at which the Y Strop fails

2. Maximum GVW is the maximum recommended gross vehicle weight of a severely bogged vehicle for a specified Y Strop

3. Severely bogged vehicle is judged as a vehicle resting on its axles or chassis. The vehicle is being dragged with no rolling of the wheels. Resistance force is 75% of vehicle weight. Applicable for skid mounted equipment.

Weights of strops are approximate and the eye configurations are subject to change without notice.

SHORT KEVLAR® RECOVERY STROP

Recovery in underground longwall operations, mining vehicles and skid mounted equipment

The endless, parallel lay configuration of KEVLAR® fibres around the steel eyes is perfect for the construction of very short, high strength strops. Two leg systems using Black Snake KEVLAR® recovery strops have been used extensively in the underground coal (typically Longwall) operations throughout Australia. The lightweight and rugged construction suit the harsh, dirty conditions underground and the low elongation of the KEVLAR® and damping qualities of the rubber cover ensure low recoil in the event of over-loading the strop.

BREAK STRENGTH[1]	10 tonne	20 tonne	30 tonne	50 tonne	70 tonne	100 tonne	150 tonne	200 tonne	300 tonne
500mm length	2kg	4kg	4kg	4kg	7kg	N/A	N/A	N/A	N/A
1 metre length	3kg	3.5kg	3.5kg	4kg	7kg	15kg	request	N/A	N/A
1.5 metre length	3kg	5kg	5kg	6kg	8kg	17kg	17kg	request	request
2 metre length	4kg	6kg	6kg	7kg	10kg	19kg	19kg	23kg	32kg
3 metre length	4kg	8kg	8kg	9kg	12kg	23kg	23kg	27kg	37kg
Maximum GVW[2] Severely bogged vehicle[3]	6 tonne	13 tonne	20 tonne	33 tonne	46 tonne	67 tonne	100 tonne	130 tonne	200 tonne
EYE TYPE A.S. 1138 Thimble size Or Round Eye	Thimble 22mm	Thimble 28mm	30t Round eye Thimble 32mm request	50t Round eye Thimble 36mm request	70t Round eye	100t Round eye	150t Round eye	200t Round eye	300t Round eye
Recommended coupling	S grade shackle pin 4.7t-8.5t Super shackle pin 9.5t	S grade shackle pin 6.5t-12t Super shackle pin 12.5t-15t	S grade shackle pin 8.5t-17t Super shackle pin 12.5t-18t	S grade shackle pin 12t-25t Super shackle pin 18t-30t	S grade shackle pin 17t-35t Super shackle pin 21t-40t	S grade shackle pin 25t-55t Super shackle pin 40t-85t	S grade shackle pin 35t-55t Super shackle pin 40t-85t	S grade shackle pin 42t-55t Super shackle pin 55t-85t	S grade shackle pin 55t-85t Super shackle pin 85t-120t
	Coupling link 13mm 16mm	Coupling link 18/20mm	Coupling link 18/20mm	Coupling link 22mm	Coupling link 26mm	Coupling link 32mm	N/A	N/A	N/A









1. Break strength is the applied load at which the recovery strop fails

2. Maximum GVW is the maximum recommended gross vehicle weight of a severely bogged vehicle for a given tow strop

3. Severely bogged vehicle is judged as resting on its axles or chassis. The vehicle is being dragged with no rolling of the wheels. Resistance force is 75% of vehicle weight.
Weights of strops are approximate and are subject to change without notice.

*All attachments, shackles, hooks must have a greater minimum break strength than the recovery strop

Break Strength denotes the applied load at which the Recovery Strop fails. (i.e.: 50 tonne (f) =490.5kN applied force)

Nominal length refers to the measured length of the strop taken from inside each eyelet.

KEVLAR® RECOVERY STROP

Recovery/towing of mine vehicles, heavy commercial, military, and skid mounted equipment

The endless parallel lay configuration of the KEVLAR® fibres, coupled with high strength steel eyes encased in a thick, rubber cover, creates lightweight, rugged and very high break strength strops. From 4 metres up to 20 metres in length and ranging from 10-400 tonnes break strength, Black Snake KEVLAR® Recovery strops are suitable for most recovery situations in mine operations and heavy duty applications. With over 18,000 KEVLAR® Recovery Strops produced, Black Snake KEVLAR® Recovery strops provide a practical and proven alternative to wire rope, chain or fibre rope/round-sling/webbing straps.



BREAK STRENGTH[1]	10 tonne	20 tonne	30 tonne	50 tonne	70 tonne	100 tonne	150 tonne	200 tonne	300 tonne	400 tonne
4 metre length	4kg	8kg	9kg	10kg	14g	25kg	22kg	27kg	41kg	51kg
6 metre length	5kg	11kg	11kg	13kg	18kg	29kg	25kg	32kg	48kg	64kg
10 metre length	7kg	16kg	16kg	20kg	28kg	40kg	37kg	44kg	66kg	90kg
15 metre length	9kg	21kg	24kg	27kg	33kg	53kg	50kg	59kg	96kg	122kg
20 metre length	12kg	28kg	28kg	36kg	44kg	69kg	65kg	77kg	120kg	144kg
Maximum GVW[2] Severely bogged vehicle[3]	6 tonne	13 tonne	20 tonne	33 tonne	46 tonne	67 tonne	100 tonne	130 tonne	200 tonne	267 tonne
EYE TYPE A.S. 1138 Thimble size	Thimble 22mm	Thimble 28mm	30t Round eye Thimble 32mm request	50t Round eye Thimble 36mm request	70t Round eye	100t Round eye	150t Round eye	200t Round eye	300t Round eye	400t Round eye
Recommended coupling	S grade shackle pin 4.7t-8.5t Super shackle pin 7t-12.5t	S grade shackle pin 6.5t-12t Super shackle pin 9.5t-18t	S grade shackle pin 6.5t-17t Super shackle pin 9.5t-30t	S grade shackle pin 12t-25t Super shackle pin 18t-40t	S grade shackle pin 17t-35t Super shackle pin 21t-40t	S grade shackle pin 25t-55t Super shackle pin 40t-85t	S grade shackle pin 35t-55t Super shackle pin 40t-85t	S grade shackle pin 42t-55t Super shackle pin 55t-85t	S grade shackle pin 55t-85t Super shackle pin 85t-120t	S grade shackle pin 85t Super shackle pin 120t
	Coupling link 13mm 16mm	Coupling link 18/20mm	Coupling link 18/20mm	Coupling link 22mm	Coupling link 26mm	Coupling link 32mm	N/A	N/A	N/A	N/A

- Ultra high strength to weight ratio, flexibility for easy use and handling
- Low elongation of 4%, low recoil properties from the KEVLAR® fibres and the thick cover provide a safe energy damping feature in case of over-loading the strop during recovery
- Abrasion/cut resistant rubber protects the inner KEVLAR® fibres from the elements and keeps out oil, water, mud and dust allowing it to be virtually maintenance free
- Easy to install with various shaped eyelets available that are sized to fit standard connections. Special thimbles can also be fitted according to customer requirements
- Individual serial number and embedded RFID for full traceability

1. Break strength is the applied load at which the recovery strop fails

2. Maximum GVW is the maximum recommended gross vehicle weight of a severely bogged vehicle for a given tow strop

3. Severely bogged vehicle is judged as resting on its axles or chassis. The vehicle is being dragged with no rolling of the wheels. Resistance force is 75% of vehicle weight.
Weights of strops are approximate and are subject to change without notice.

*All attachments, shackles, hooks must have a greater minimum break strength than the recovery strop

Break Strength denotes the applied load at which the Recovery Strop fails. (i.e.: 50 tonne (f) =490.5kN applied force)

Nominal length refers to the measured length of the strop taken from inside each eyelet.

THIMBLE EYE DIMENSIONS

Light Duty Kevlar® Recovery Strops

Typical Eyes



The 10t & 20t MBS Black Snake KEVLAR® range use embedded AS1138 wire rope thimbles. The low elongation properties of the KEVLAR® fibres do not deform wire rope thimbles at these low applied loads. The 30t and 50t MBS Black Snake KEVLAR® range only use AS1138 wire rope thimbles when the knuckles of larger shackles or oversize pins are required.

BREAK STRENGTH[1]	10 tonne	20 tonne	Non Standard On request 30 tonne	Non standard On request 50 tonne
C	56mm	64mm	86mm	105mm
B	30mm	36mm	38mm	40mm
M** **Rubber flaps in thimbles can be trimmed to suit	45mm	50mm	60mm	70mm
D	22mm	30mm	36mm	46mm
W	32mm	38mm	44mm	48mm
Maximum GVW[2] Severely bogged vehicle[3]	6 tonne	13 tonne	20 tonne	33 tonne
Thimble size to AS1138	22mm	28mm	Request 32mm	Request 36mm
Recommended coupling	S grade shackle pin 4.7t-8.5t Super shackle pin 9.5t	S grade shackle pin 6.5t-12t Super shackle pin 12.5t-15t	S grade shackle pin 8.5t-17t Super shackle pin 12.5t-18t	S grade shackle pin 12t-25t Super shackle pin 18t-30t
	Coupling link 13mm 16mm	Coupling link 18/20mm	Coupling link 18/20 mm	Coupling link 26mm



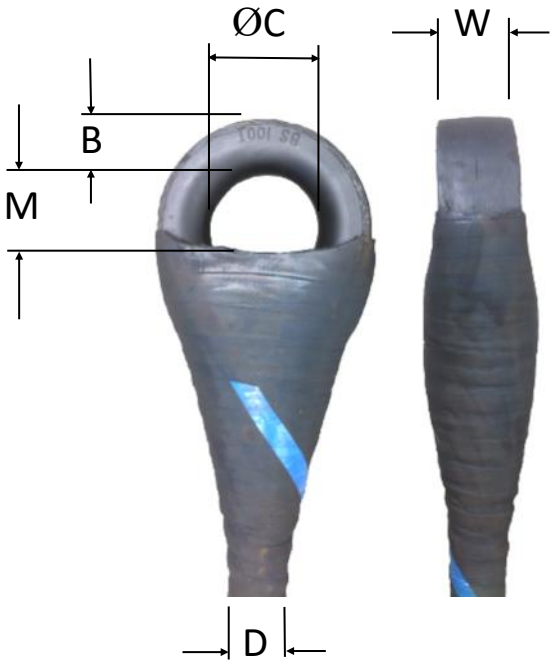
1. Break strength is the applied load at which the recovery strop fails.
2. Maximum GVW is the maximum recommended gross vehicle weight of a severely bogged vehicle for a given tow strop
3. Severely bogged vehicle is judged as a vehicle which is resting on its axles or chassis. The vehicle is being dragged with no rolling of the wheels. Resistance force is 75% of vehicle weight.

ROUND EYE DIMENSIONS

KEVLAR® Recovery Strops

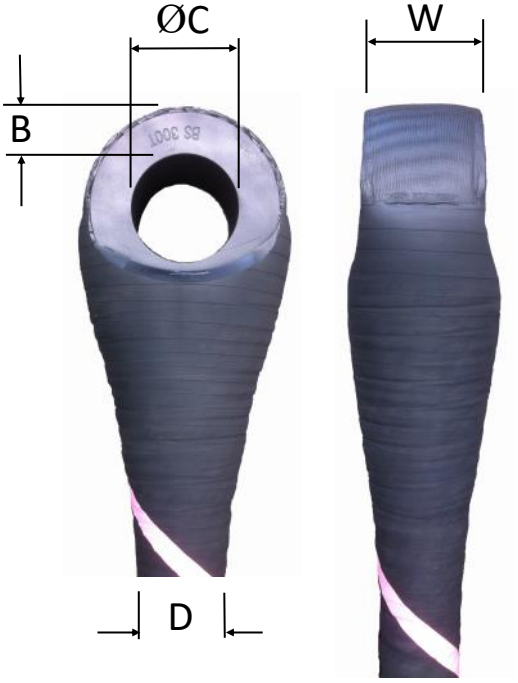
Custom designed and machined eyes are created from high strength, low alloy steel, hollow bar. A radius is machined onto the inside face of the bore to suit many types of coupling links and pins of appropriately sized shackles.

BREAK STRENGTH[1]	30 tonne	50 tonne	70 tonne	100 tonne
DIAMETER C	Ø56mm	Ø56mm	Ø63mm	Ø100mm
B	36mm	36mm	38mm	48mm
M** **Rubber flaps in thimbles can be trimmed to suit	45-48mm	45-48mm	52-56mm	70mm
D	42mm	46mm	50mm	56mm
W	34mm	44mm	56mm	70mm
Maximum GVW[2] Severely bogged vehicle[3]	20 tonne	33 tonne	46 tonne	67 tonne
Recommended coupling	S grade shackle pin 6.5t-17t Super shackle pin 12.5t-18t	S grade shackle pin 12t-25t Super shackle pin 18t-30t	S grade shackle pin 17t-35t Super shackle pin 21t-40t	S grade shackle pin 25t-55t Super shackle pin 40t-85t
	Coupling link 18/20mm	Coupling link 22mm	Coupling link 26 mm	Coupling link 32mm



Custom designed and machined eyes are created from high strength, low alloy steel hollow bar. The bore hole is designed to minimize elongation under very high loads and to suit appropriately large shackles. We are always designing for safety and therefore undersized shackles (Jaw width) will not fit on the machined eyes. For example, a 17t S Grade shackle will not fit a 150t strop.

BREAK STRENGTH[1]	150 tonne	200 tonne	300 tonne	400 tonne
DIAMETER C	Ø80mm	Ø80mm	Ø90mm	Ø90mm
B	50mm	50mm	54mm	54mm
D	64mm	70mm	80mm	90mm
W	70mm	80mm	100mm	120mm
Maximum GVW[2] Severely bogged vehicle[3]	100 tonne	140 tonne	200 tonne	280 tonne
Recommended coupling	S grade shackle pin 35t-55t Super shackle pin 40t-85t	S grade shackle pin 42t-55t Super shackle pin 55t-85t	S grade shackle pin 55t-85t Super shackle pin 85t-120t	S grade shackle pin 85t Super shackle pin 120t



1. Break strength is the applied load at which the recovery strop fails

2. Maximum GVW is the maximum recommended gross vehicle weight of a severely bogged vehicle for a given tow strop

3. Severely bogged vehicle is judged as a vehicle which is resting on its axles or chassis. The vehicle is being dragged with no rolling of the wheels. Resistance force is 75% of vehicle weight.

BULLDOZER ‘B’ FITTING

KEVLAR® Recovery Strops modified for bulldozer rippers

The bulldozer is the recovery vehicle of choice in many open-cut mining operations, quarry and construction sites. With ripper assemblies commonly attached to dozers, recovery gear has the challenge of maintaining integrity and strength in a hostile environment. Andromeda Industries Pty Ltd had an excellent fitting specifically designed for use with rippers, we adapted these fittings for use in the Black Snake KEVLAR® Recovery strops.

The bearing (contact) zone of the ‘B’ fitting is typically marked in yellow paint and is the thickest part of the cast fitting. The ‘B’ fittings are fully welded around each leg. If damaged in use, the ‘B’ fitting assembly can be repaired/replaced in our premises and the integrity of the KEVLAR® load bearing fibres can be assessed for damage. The Black Snake KEVLAR® Recovery strop with one or more ‘B’ fittings is a specialized, heavy duty product. The user should assess the suitability of this product and recovery procedures when choosing to recover equipment with bulldozer rippers.

BREAK STRENGTH[1]	100 tonne	150 tonne	200 tonne	300 tonne
A	320mm	370mm	370mm	370mm
B	105mm	105mm	110mm	115mm
C	195mm	195mm	195mm	195mm
H + L	300+1200mm	300+1200mm	300+1200mm	300+1200mm
W	95mm	95mm	95mm	95mm
Maximum GVW[2] Severely bogged vehicle[3]	67 tonne	100 tonne	130 tonne	200 tonne



Only use the Bulldozer ‘B’ Fitting Recovery Strop in a straight line pull. This ensures the ripper remains centred in the ’B’ fitting. Steering excessively to the left or right by more than 15° may cause the ripper trailing edges to contact the rubber arms in section “L” and damage/cut the rubber and loadbearing fibres. If used incorrectly, failure of the recovery strop may occur.





Modified cast fittings supplied by Andromeda Industries Pty Ltd can be installed to one or both ends of the recovery strop. The ‘B’ fitting is a product well suited for recovery use with bulldozer rippers.

1. Break strength is the applied load at which the recovery strop fails

2. Maximum GVW is the maximum recommended gross vehicle weight of a severely bogged vehicle for a given recovery tow strop

3. Severely bogged vehicle is judged as a vehicle which is resting on its axles or chassis. The vehicle is being dragged with no rolling of the wheels. Resistance force is 75% of vehicle weight.

BULLDOZER Y STROP

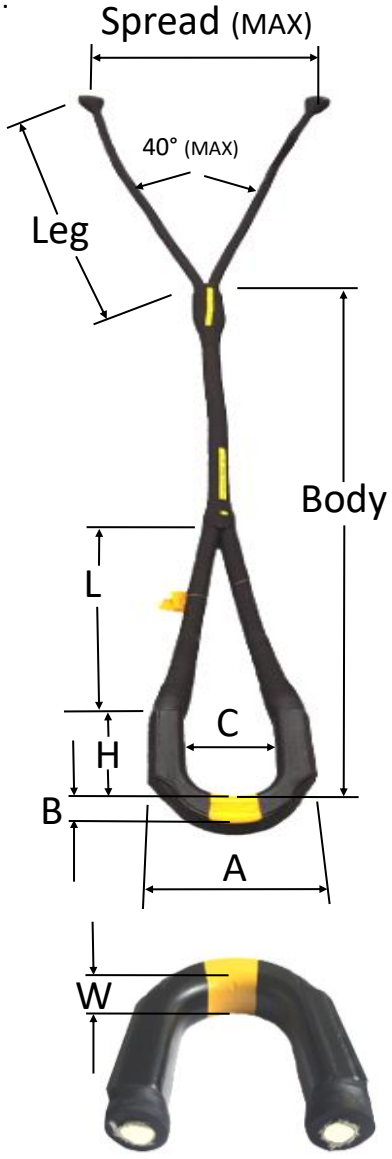
Towing re-imagined: The new Y strop for bulldozer rippers

The mine-site bulldozer is the towing vehicle of choice in many open-cut mining operations, quarry and construction sites. With ripper assemblies commonly attached to bulldozers, towing gear has many challenges maintaining integrity and strength in a hostile environment. Specifically designed for use with bulldozer rippers, we adapted Andromeda's 'B' fittings for use in the towing version of the Black Snake and introduce the: **BULLDOZER Y Strop**.

The bearing (contact) zone of the 'B' fitting is typically marked in yellow paint and is the thickest part of the cast fitting. The 'B' fitting is fully welded. The **BULLDOZER Y Strop** is a specialized, heavy duty product and can be permanently attached to skid-mounted equipment for regular moves. The user should assess the suitability of this product and towing procedures when choosing to tow skid-mounted or similar equipment with bulldozer rippers.

Only use the Bulldozer 'B' Fitting Recovery Strop in a straight line pull. This ensures the ripper remains centred in the 'B' fitting. Steering excessively to the left or right by more than 15° may cause the ripper trailing edges to contact the rubber arms in section "L" and damage/cut the rubber and loadbearing fibres. If used incorrectly, failure of the recovery strop may occur.

BULLDOZER	Y STROP	BREAK STRENGTH[1] 50 tonne	BREAK STRENGTH[1] 75 tonne	BREAK STRENGTH[1] 100tonne	BREAK STRENGTH[1] 150tonne
6 metre length	Leg=3m Body=3m Spread (max)=2m	50kg	59kg	72kg	75kg
10 metre	Leg=5m Body=5m Spread (max)=3.4m	64kg	80kg	95kg	99kg
15 metre	Leg=6m Body=9m Spread (max)=4m	78kg	90kg	120kg	125kg
20 metre	Leg=6m Body=14m Spread (max)=4m	96kg	112kg	150kg	155kg
	Leg eye type	Standard 50t Round eye	Standard 70t Round eye	Standard 100t Round eye	Standard 150t Round eye
	Recommended coupling leg	12-25 tonne S grade shackle pin Coupling link 22mm	17-35 tonne S grade shackle pin Coupling link 26mm	25-55 tonne S grade shackle pin Coupling link 32mm	35-55 tonne S grade shackle pin
	A	320mm	370mm	370mm	370mm
	B	105mm	105mm	110mm	115mm
	C	195mm	195mm	195mm	195mm
	H + L	300+900mm	300+900mm	300+900mm	300+900mm
	W	95mm	95mm	95mm	95mm
	Maximum GVW[2] Severely bogged vehicle[3]	35 tonne	50 tonne	70 tonne	100 tonne



1. Break strength is the applied load at which the Bulldozer Y Strop fails

2. Maximum GVW is the maximum recommended gross vehicle weight of a severely bogged vehicle for a specified Bulldozer Y Strop.

3. Severely bogged vehicle is judged as a vehicle resting on its axles or chassis. The vehicle is being dragged with no rolling of the wheels. Resistance force is 75% of vehicle weight. This is applicable for skid mounted equipment.

Strop weights are approximate and the eye configurations are subject to change without notice.

KEVLAR® BODY-UP SAFETY STROP

Extra Safety for Mining Trucks

First developed in 2008 in conjunction with a world class dump body manufacturer, Body-up Safety Strops provide a safe and lightweight alternative to wire rope truck body-up safety cables (normally closed spelter socket types).

Body-up Safety Strops are an innovative offshoot of the Black Snake KEVLAR® range of short, high strength strop and have been successfully implemented in Australian and overseas mine-sites.

A Working Load Limit (WLL) is required for Body-up Safety Strops (usually 30t, 40t or higher) and generally a 3:1 factor results in ultimate manufactured Break Strengths between 100t and 200t.

Body-up Safety Strops are custom made. It is essential that engineering parameters of this product are understood.

- Very flexible, lightweight and easy to handle
- Approximately 50% lighter than comparable standard truck body-up safety steel wire rope with closed spelter wire rope sockets
- Abrasion/cut resistant rubber protects the inner Kevlar® fibres from the elements and keeps out oil, water, mud and dust allowing it to be virtually maintenance free and durable
- Easy to install with machined steel eyes which can be supplied at 90° or in the same plane
- Low stretch (4%) and tight dimensional tolerances available
- Individual serial number for traceability
- RFID embedded into the rubber for full traceability if the ID tags are damaged
- Testing available on request
- Optional embedded Gunnebo® super shackles or S grade Dee shackles available upon request









NYLON RECOVERY STROPS

SECTION 2



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NYLON RECOVERY STROP

Snatch type recovery and towing of 4WD, light commercial, military and mine vehicles

The Black Snake Nylon Recovery Strop provides a heavy duty, industrial strength alternative to webbing snatch straps and kinetic nylon ropes. The Black Snake Nylon Recovery Strop incorporates nylon strands laid in an endless parallel lay construction into galvanised wire rope thimbles, the entire construction is then covered in a vulcanised, industrial grade rubber. This construction is very robust and has inbuilt protection for the load-bearing fibres along with excellent energy dampening qualities. With other nylon webbing straps, kinetic recovery nylon ropes and even nylon round-slings, the fabric construction make them susceptible to dirt, mud and abrasion damage. The soft eyes are particularly vulnerable to cutting and fraying from shackles, pins and hooks. The Black Snake Nylon Recovery Strop uses embedded heavy duty thimbles to eliminate cutting and fraying of the fibres.





- Abrasion/cut resistant rubber protects the inner nylon fibres from the elements and keeps out oil, water, mud and dust allowing it to be virtually maintenance free and making it far more durable than other fabric straps
- A tough, high performance, great alternative to webbing straps
- High strength Nylon 6.6 load core with high strength to weight ratio
- Very flexible and light weight for access into awkward spaces and for attachment devices
- Easy to install with galvanised thimbles embedded into the rubber casing. Perfectly matched with shackles and clevis pins
- Smooth stretch of up to 20% to assist snatch style recovery
- Individual serial number for traceability



BREAK STRENGTH[1]	8 tonne	12 tonne
3 metre length	3kg	4kg
6 metre length	4kg	6kg
10 metre length	6kg	8kg
15 metre length	8kg	11kg
20 metre length	11kg	14kg
Maximum GVW[2] Severely bogged vehicle[3]	5 tonne	8 tonne
A.S. 1138 Thimble size	16mm	22mm
Recommended coupling	3.25 - 6.5 tonne S grade shackle pin Coupling link 13mm	6.5 - 8.5 tonne S grade shackle pin Coupling link 13-16mm

1. Break strength is the applied load at which the recovery strop fails
2. Maximum GVW is the maximum recommended gross vehicle weight of a severely bogged vehicle for a given tow strop
3. Severely bogged vehicle is judged as a vehicle which is resting on its axles or chassis. The vehicle is being dragged with no rolling of the wheels. Resistance force is 75% of vehicle weight.

HIGH STRENGTH, HEAVY DUTY NYLON RECOVERY STROP

Snatch type recovery and towing of medium to heavy commercial, military, mine vehicles and skid mounted equipment

The Black Snake Heavy Duty Nylon Recovery/Tow Strop provides a high break strength, industrial grade alternative to old style recovery equipment. It is far lighter than wire rope or chain of the same break strength and provides a low shock load, kinetic type of recovery. It is particularly suited to operations in harsh environments. In the higher break strengths of 20 tonne through to 100 tonne, the Black Snake Nylon Recovery Strop is far more durable than nylon webbing straps, kinetic recovery nylon ropes and round-slings. The deeply embedded, galvanized, heavy duty steel thimbles eliminate cutting and fraying from shackles, pins and hooks, which present problems with fabric straps and ropes.

BREAK STRENGTH[1]	20 tonne	30 tonne	50 tonne	70 tonne	100 tonne
6 metre length	8kg	12kg	20kg	25kg	40kg
10 metre length	12kg	18kg	32kg	40kg	65kg
15 metre length	16kg	25kg	42kg	58kg	85kg
20 metre length	21kg	30kg	56kg	77kg	109kg
Maximum GVW[2] Severely bogged vehicle[3]	13 tonne	20 tonne	33 tonne	46 tonne	67 tonne
A.S. 1138 Thimble size	24mm	28mm	36mm	44mm	52mm
Recommended coupling	6.5 - 12 tonne S grade shackle pin	8.5-17 tonne S grade shackle pin	12-35 tonne S grade shackle pin	25-35 tonne S grade shackle pin	25-55 tonne S grade shackle pin
	Coupling link 16mm	Coupling link 18/20mm	Coupling link 26mm	Coupling link 32mm	Coupling link 32mm

*All attachments, shackles, hooks must have a greater minimum break strength than the recovery strop

Break Strength denotes the applied load at which the Recovery Strop fails. (i.e.: 50 tonne (f) = 490.5kN applied force)

Nominal length refers to measured length of the strop taken from inside each eyelet.

Weights of strops are approximate and are subject to change without notice.

- Abrasion/cut resistant rubber protects the inner nylon fibres from the elements and keeps out oil, water, mud and dust allowing it to be virtually maintenance free and making it far more durable than other fabric straps.
- High strength Nylon 6.6 load core with high strength to weight ratio.
- Very flexible and light weight for access into awkward spaces and for attachment devices.
- Easy to install with galvanized thimble eyelets embedded into the rubber casing. Perfectly matched with bow shackles and most clevis pins.
- Smooth stretch of up to 20% to assist snatch style recovery.
- Individual serial number and RFID for traceability.
- Safety in handling is a key benefit and cleaning is not required after use.



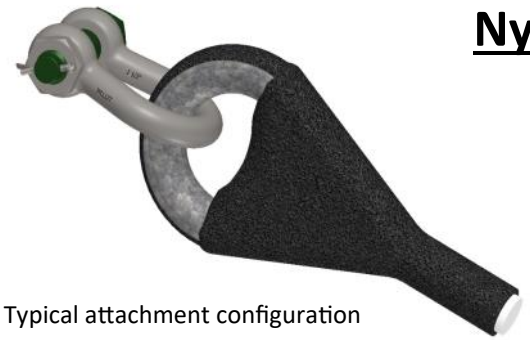
1. Break strength is the applied load at which the recovery strop fails

2. Maximum GVW is the maximum recommended gross vehicle weight of a severely bogged vehicle for a given tow strop

3. Severely bogged vehicle is judged as a vehicle which is resting on its axles or chassis. The vehicle is being dragged with no rolling of the wheels. Resistance force is 75% of vehicle weight.

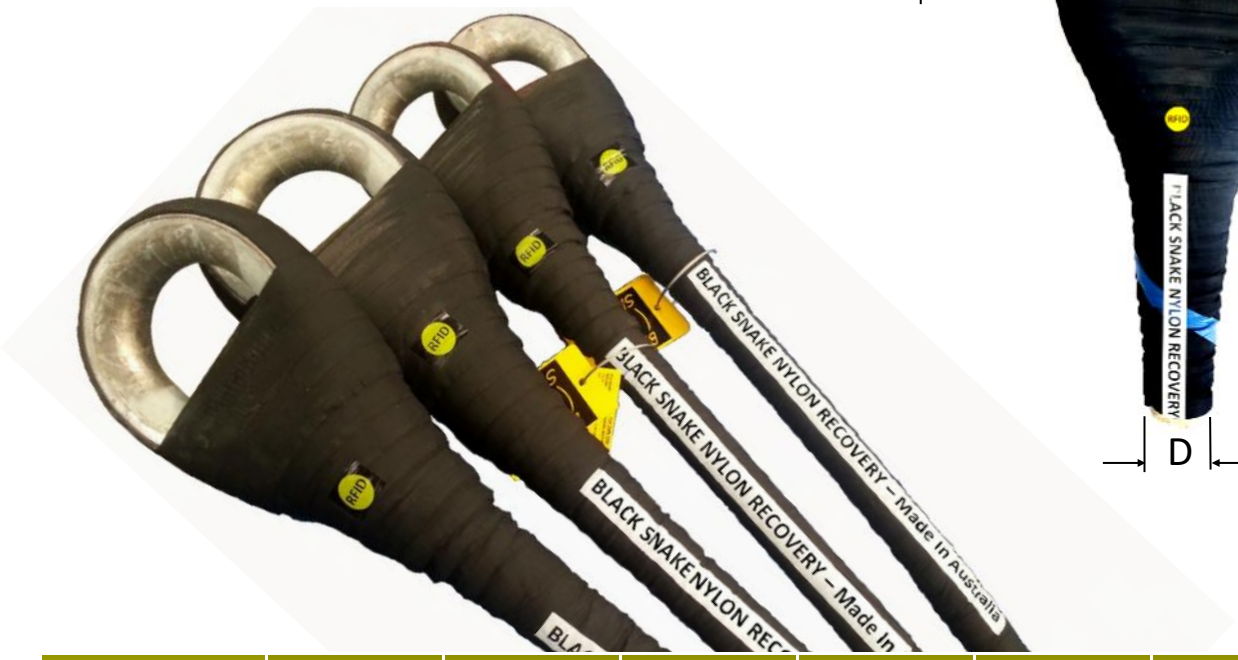
THIMBLE EYE DIMENSIONS

Nylon Recovery Strops



Typical attachment configuration of bow shackle to Nylon Strop





BREAK STRENGTH[1]	8 tonne	12 tonne	20 tonne	30 tonne	50 tonne	70 tonne	100 tonne
C	40mm	56mm	64mm	76mm	105mm	125mm	140mm
B	24mm	32mm	32mm	34mm	40mm	60mm	62mm
M** **Rubber flaps in thimbles can be trimmed to suit	40mm	45mm	50mm	60mm	70mm	80mm	100mm
D	22mm	26mm	32mm	42mm	56mm	70mm	80mm
W	26mm	32mm	34mm	38mm	48mm	62mm	72mm
Maximum GVW[2] Severely bogged vehicle[3]	5 tonne	8 tonne	13 tonne	20 tonne	33 tonne	46 tonne	67 tonne
Thimble size to AS1138	16mm	22mm	24mm	28mm	36mm	44mm	52mm
Recommended coupling	3.25 - 6.5 tonne S grade shackle pin	6.5 - 8.5 tonne S grade shackle pin	6.5 - 12 tonne S grade shackle pin	8.5 - 17 tonne S grade shackle pin	12 - 25 tonne S grade shackle pin	25 - 35 tonne S grade shackle pin	25 - 55 tonne S grade shackle pin
	Coupling link 13mm	Coupling link 13-16mm	Coupling link 16mm	Coupling link 18/20 mm	Coupling link 26mm	Coupling link 32mm	Coupling link 32mm

1. Break strength is the applied load at which the recovery strop fails.

2. Maximum GVW is the maximum recommended gross vehicle weight of a severely bogged vehicle for a given tow strop.

3. Severely bogged vehicle is judged as resting on its axles or chassis. The vehicle is being dragged with no rolling of the wheels. Resistance force is 75% of vehicle weight.

Thimble dimensions can vary within the AS1138 Standards and rubber trimming dimensions are approximate due to the manufacturing process.

STOWAGE BOXES and BAGS

Black Snake Shipping and Storage Solutions

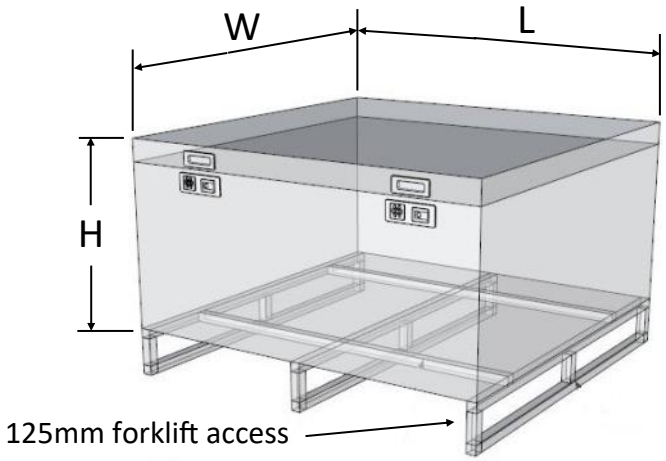
Providing durable and secure storage options

In keeping with our commitment to develop and optimise Black Snake products, we have introduced our brand new range of Black Snake Stowage bags and heavy duty Aluminium Stowage boxes.

Aluminium Stowage Boxes:

These heavy duty boxes provide the ideal solution for our customers to transport and store their Black Snake Strops in a safe and secure manner. The boxes are specifically designed to stand the rigours of an industrial life and protect the strops from damage when not in use. Stowage boxes are weather proof and theft repellent with their double key lock lids. The Stowage boxes also have forklift entry points for ease of use on site. We have a range of sizes:

	Length (cm)	Width (cm)	Height (cm)	Volume (m^3)
Light toolbox (no forklift access)	90	40	40	0.14
Mid toolbox (no forklift access)	110	50	42	0.23
Large toolbox (no forklift access)	100	60	60	0.36
Mid Case with forklift access	100	100	50	0.5
Large Case with forklift access	100	100	70	0.7
X-Large Case with forklift access	120	120	70	1
King Case with forklift access	120	120	90	1.3



Black Snake Stowage Bag:

The Black Snake Stowage bag is designed for the easy storage of smaller recovery strops. The bag is hard-wearing and durable with industrial heavy duty strapping and clasps both inside and outside the bags. Recovery gear remains coiled and manageable when not in use. The Black Stowage bag is a lightweight storage solution that easily fits in the boot of a commercial vehicle.

Our current range comes in one colour and two sizes:

	Length (cm)	Width (cm)	Height (cm)	Volume (m^3)
Large Stowage Bag BS-001	45	40	19	0.034
Small Stowage Bag BS-002	45	30	19	0.026





TECHNICAL

SECTION 3



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GENERAL CARE & SAFE USE

GOOD OPERATING PROCEDURES PREVENT INCORRECT USE and DANGEROUS OUTCOMES

Incorrect use will endanger vehicle occupants and observers. Vehicle recovery can result in very high loads and unexpected consequences such as vehicles rolling out of control on slopes, tipping and damage to towing attachments. Safe recovery procedures must be adopted for vehicles using recovery strops. Vehicle recovery points must be marked. This ensures that the recovery strop, all attachments and vehicles are maintained in good order.

The Photos below show the incorrect use of the Blacksnake Recovery Strop.







GENERAL CARE OF RECOVERY STROP:

Do not use the recovery strop if there is any sign of exposed inner core, broken core fibres, fire or chemical damage, or presence of foreign matter penetrating the rubber casing.

Do not expose recovery strop to high temperatures (>90°C).

Do not allow naked flames to damage the rubber casing.

Cleaning of the rubber casing can be managed with a high pressure cleaner to a water pressure under 2,000psi with the water nozzle at fan setting.

The rubber casing for heavy duty strops is a minimum 10mm thick and will provide adequate protection for the internal fibres from contaminants, water, chemicals and UV exposure. If the rubber casing is damaged, temporary repair can be achieved with PVC tape, duct tape, heavy fabric backed or rubber backed tape to protect inner core fibres from many contaminants and water.

SAFE USE:

Do not use the Recovery strop in any other configuration other than a straight line pull. If used incorrectly it may result in failure.

If in doubt of the forces involved with retrieval, do not attempt a vehicle recovery with this equipment.

This item is designed for towing and recovery work only.

It is never to be used for lifting or suspending.

Attachment hardware shall only be fitted to the steel bearing points of the eyes in the recovery strop.

Do not use a jerking (uneven acceleration) action when retrieving vehicle due to the high shock loads this can create.

Never stand on, over, under, beside a recovery strop during a recovery attempt. Always assume an item could fail including shackles and connectors. Keep people at a safe distance (e.g. 10 metres for 6 metre strop) when attempting a vehicle recovery.

Always inspect the recovery strop between each use.

TAGS / MARKINGS / IDENTIFICATION:

All Blacksnake Recovery strops are supplied with plastic tags attached to the main body of the strop. If the plastic tag is removed or damaged, the RFID can identify the serial no. product code and date of manufacture. This will provide traceability and a new tag can be created. If a tag is lost, the item should be removed from service until it can be inspected and re-tagged.

REPAIR / DISCARD CRITERIA

USE OR REPAIR

The cut has not penetrated to the Kevlar and the rubber is unlikely to open further.



The cut has not penetrated to the Kevlar but the rubber will possibly continue to split or catch on external objects.



Cold cure rubber compound or rubber tape can be used. Alternatively, PVC tape, duct tape or cloth tape may also be used as a temporary fix.





Repair to 'As New' can only be achieved at our manufacturing facility with a thorough and full inspection and vulcanised repair.



REPAIR OR DISCARD

Nylon and small Kevlar® recovery / body-up strops have thick rubber at the rear of the eyes protecting the loadbearing fibres. Depending on the severity of damage, the strop should be monitored, field repaired or removed from service.



For heavy duty Kevlar® strops, the rear of the eye is well protected with many layers of rubberized heavy duty tyre cord. Depending on the severity of damage, the strop should be monitored, field repaired or removed from service.





Repair to 'As New' can only be achieved at our manufacturing facility with an inspection report, vulcanised repair and de-rating if required.





DISCARD

Although fibres are mainly intact, foreign material has compromised Kevlar fibres and the Minimum Break Strength cannot be assured.



The dislodged eye can only be reinstated at manufacturer's facility. The exposed Kevlar fibres will be quickly damaged if used under load.



This damage is the result of doubling the strop around a shackle pin or similar. This strop cannot be repaired. Consider changing recovery procedure or strop length.



The rubber has been damaged and a large number of load-bearing fibres have been cut in this area. Do not use.



INSPECTION SHEET— RECOVERY STROP

☐ KEVLAR—YELLOW FIBRE

☐ NYLON—WHITE FIBRE

SERIAL NO# _____ PART NO. _____ BREAK STRENGTH _____

LENGTH _____ INSPECTOR _____ INSPECTION DATE _____

EYE (RFID)	Y	N
ELONGATION		
SEPARATION		
STEEL DAMAGE		

BODY	Y	N
RUBBER WEAR		
RUBBER CUT		
EXPOSED FIBRES		
CUT FIBRES		

EYE	Y	N
ELONGATION		
SEPARARTION		
STEEL DAMAGE		

TAGS	Y	N
ATTACHED		
LEGIBLE		

NOTES

_____

_____

_____

_____

_____

_____

_____

_____

PHOTOGRAPHIC EXAMPLES



EXPOSED CUT FIBRES



EYE SEPARATION



CUT RUBBER



DETERMINE THE RIGHT STROP and SHACKLE

Black Snake Guide to attaching strops to vehicles

Vehicle recovery is potentially very dangerous





Well engineered light vehicle recovery points match our range of light duty nylon (8t MBS-12t MBS) strops. The photo (left) show an accredited aftermarket tow hitch in place of the towball mount. NEVER USE A TOWBALL! Aftermarket front mounted bullbars must have chassis mounted recovery points. NEVER USE VEHICLE SHIPPING LUGS OR LASHING POINTS!

Many underground mine vehicles and light trucks have hooks or very tight pin/clevis recovery points. Black Snake Recovery Strops have thimbles and round eyes designed to suit couplers, shackles or hooks of greater minimum break strength (MBS) than the recovery strop. In an overload situation the loadbearing fibres and rubber cover will separate from the steel eye and steel connectors. The thick rubber cover dampens recoil of loadbearing fibres in a safe failure mode leaving all steelwork safely attached to vehicles.







Maintain your recovery points in good condition and ensure they are strong enough. Black Snake engineered round eyes spread the load on pins to avoid high pressure point loading. Weld stronger recovery points on large vehicles by increasing pin/clevis size, use higher grade steel or consult with your equipment supplier for well engineered solutions. Remember that all steel work must be stronger than the recovery strop.





The cast clevis and pin arrangements on mining trucks must provide adequate strength and security when used with Body Up Safety Strops. These are safety devices. It is critical to calculate the maximum possible loads or seek OEM advice instead of assuming that all the equipment is properly matched. In the case of Body Up Safety Strops, failure of any component can lead to injury or death if the mining truck's dump body falls or is accidentally powered down to the chassis.



DETERMINE THE RIGHT STROP and SHACKLE

Black Snake Guide to attaching strops to vehicles



Skid mounted plant and specialized equipment will generally have pin/clevis or inbuilt heavy lugs (pad eyes) with plate thickness and holes designed for shackles of a certain size. Ensure that shackles are correctly matched to the recovery strop. Safety bow shackles (with bolt and nut) are preferable to screw pin shackles. Ensure that personnel are correctly trained to attach these shackles to equipment and strops.



Lugs and pad eyes on the front of mining and road trucks must be linked to the vehicle chassis. Steel plate thickness and hole size should not allow undersize shackles to be mounted or installed. Bolster or cheek plates on lugs can be used to discourage the use of under-size shackles. Signage on recovery points can also be very useful.





Bulldozers are excellent recovery vehicles on soft, muddy or wet terrain. Bulldozers have high drawbar pull and good available traction. A D11T can have a drawbar pull up to 100t-130t at 1-2kph and weights of 105t-115t. Rolling resistance of tracked vehicles can be up to 10% of vehicle weight on soft, muddy roads, which should be considered if a bulldozer is recovering a bulldozer. A constant steady pull is required in the early stages of recovery using a bulldozer. The bulldozer ripper shank is strongest near the ripper beam assembly. The photo below shows a ripper modified with a mounting bracket for the Bulldozer 'B' fitting. If a winch assembly is mounted, pin/clevis tow assemblies are often available.





DETERMINE THE FORCES INVOLVED

Black Snake Guide to vehicle recovery

Vehicle recovery and towing involve forces which are often difficult to quantify and are dynamic. We provide a Vehicle Recovery Chart on the following pages to assist in choosing strop size and connectors together with estimated maximum vehicle weights for different bogged scenarios. Below is a series of examples.



FLIPPED, NOT BOGGED: This photo shows recovery of an upturned vehicle which requires very slow uptake of load on the strops and no sudden jerking or high acceleration by the recovery vehicles.

LIGHT/MEDIUM BOGGED: This photo shows the regular movement of a skid mounted transfer conveyor by 3 bulldozers. Soft, uphill slopes and skid-mounting make for slow, careful recovery. In this case, the lead bulldozer has the longest strop, second bulldozer keeps an eye on the leader and a third bulldozer pushes the equipment. Careful co-ordination and good procedures ensure longevity of recovery equipment and efficient moves.





LIGHT/MEDIUM to SEVERELY BOGGED: The combination of uphill slope, creating high opposing vehicle force due to gravity, rolling resistance and boggy conditions require conservative estimates of overall static and dynamic forces involved for this recovery. Bulldozers have much better traction in slippery conditions than wheeled vehicles. A slow, constant steady pull is paramount to the success of high load/force recoveries, not a jerking action (uneven acceleration or worse, kinetic snatch type action).



BEYOND MASSIVELY BOGGED: Conservative calculations are sometimes required when judging the chance of a successful recovery. Knowing the weight of a vehicle is sometimes not enough. A much higher estimate of forces is required. This excavator is stuck fast and recovery resembles more of a lift which requires much higher safety factors to be considered. Take into account the chance of very serious damage to the severely bogged vehicle chassis and tracks/wheels before attempting some recoveries.

VEHICLE RECOVERY CHART

Black Snake Guide for Kevlar® Strops

KEVLAR® RECOVERY STROP	10t Min Break Strength[1]	20t Min Break Strength[1]	30t Min Break Strength[1]	30t Non Standard thimbles on request
Using 2:1 Safety Factor Max force applied on recovery strop Recovery Load Limit Tonne (force)	5t (49kN)	10t (98kN)	15t (147kN)	15t (147kN)
Recover light/medium bogged vehicle Assume resistance 50% of Vehicle Weight	10t vehicle	20t	30t	30t
Recover a severely bogged vehicle Assume resistance 75% of Vehicle Weight	6t	13t vehicle	20t	20t
Recover a massively bogged vehicle Assume resistance 120% of Vehicle Weight	4t	8t	12t vehicle	12t
Grade 'S' shackle BODY fits through strop MBS (shackle) > MBS (recovery strop)	4.7 - 8.5 tonne MBS>20t	6.5 - 12 tonne MBS>30t	6.5 tonne MBS>30t	8.5-17 tonne MBS>40t
Grade 'S' shackle PIN fits through strop MBS (shackle) > MBS (recovery strop)	4.7 - 8.5 tonne MBS>20t	6.5 - 12 tonne MBS>30t	6.5 - 17 tonne MBS>30t	8.5 - 17 tonne MBS>40t
SUPER shackles BODY fits through strop MBS (shackle) > MBS (recovery strop)	7 - 12.5 tonne MBS>30t	9.5 - 18 tonne MBS>40t	9.5 tonne MBS>40t	12.5 - 30 tonne MBS>50t
SUPER shackle PIN fits though strop MBS (shackle) > MBS (recovery strop)	7 - 12.5 tonne MBS>30t	9.5 - 18 tonne MBS>40t	9.5 - 30 tonne MBS>50t	12.5 - 30 tonne MBS>50t
Use Coupling links MBS (coupling links) > MBS (recovery strop)	Coupling link 13mm - 16mm MBS>20t	Coupling link 18/20mm MBS>50t	Coupling link 18/20mm MBS>50t	Coupling link 18/20mm MBS>50t

KEVLAR® RECOVERY STROP	50t Min Break Strength[1]	50t Non Standard thimbles on request	70t Min Break Strength[1]	70t Non Standard Oversize Eyes on request	100t Min Break Strength[1]	100t Non Standard Oversize Eyes on request
Using 2:1 Safety Factor Max force applied on recovery strop Recovery Load Limit Tonne (force)	25t (245kN)	25t (245kN)	35t (343kN)	35t (343kN)	50t (490kN)	50t (490kN)
Recover light/medium bogged vehicle Assume resistance 50% of Vehicle Weight	50t vehicle	50t	70t	70t	100t	100t
Recover a severely bogged vehicle Assume resistance 75% of Vehicle Weight	33t	33t vehicle	46t	46t	67t	67t
Recover a massively bogged vehicle Assume resistance 120% of Vehicle Weight	21t	21t	29t vehicle	29t	42t	42t
Grade 'S' shackle BODY fits through strop MBS (shackle) > MBS (recovery strop)	N/A	12 - 25 tonne MBS>60t	N/A	13.5 - 17tonne MBS>80t	17 tonne MBS=100t Not recommended	25 tonne MBS>140t
Grade 'S' shackle PIN fits through strop MBS (shackle) > MBS (recovery strop)	12 - 25 tonne MBS>60t	12 - 25 tonne MBS>60t	17 - 35 tonne MBS>90t	17 - 35 tonne MBS>90t	25 - 55 tonne MBS>140t	25 - 55 tonne MBS>140t
SUPER shackles BODY fits through strop MBS (shackle) > MBS (recovery strop)	N/A	18 - 30 tonne MBS>80t	N/A	21 - 30 tonne MBS>90t	30 tonne MBS>120t	40 tonne MBS>160t
SUPER shackle PIN fits through strop MBS (shackle) > MBS (recovery strop)	18 - 40 tonne MBS>80t	18 - 30 tonne MBS>80t	21 - 40 tonne MBS>90t	21 - 40 tonne MBS>90t	40 - 85 tonne MBS>160t	40 - 85 tonne MBS>160t
Use Coupling links MBS (coupling links) > MBS (recovery strop)	Coupling link 22mm MBS>60t	Coupling link 22mm MBS>60t	Coupling link 26mm MBS>80t	Coupling link 26mm MBS>80t	Coupling link 32mm MBS>120t	Coupling link 32mm MBS>120t

VEHICLE RECOVERY CHART

Black Snake Guide for Kevlar® Strops

KEVLAR® RECOVERY STROP	150t Min Break Strength[1]	150t Non Standard Oversize Eyes on request	200t Min Break Strength[1]	300t Min Break Strength[1]	400t Min Break Strength[1]
Using 2:1 Safety Factor Max force applied on recovery strop Recovery Load Limit Tonne (force)	75t (735kN)	75t (735kN)	100t (980kN)	150t (1470kN)	200t (1962kN)
Recover light/medium bogged vehicle Assume resistance 50% of Vehicle Weight	150t vehicle	150t	200t	300t	400t
Recover a severely bogged vehicle Assume resistance 75% of Vehicle Weight	100t	100t vehicle	130t	200t	267t
Recover a massively bogged vehicle Assume resistance 120% of Vehicle Weight	62t	62t	84t vehicle	125t	166t
Grade 'S' shackle BODY fits through strop MBS (shackle)> MBS (recovery strop)	N/A	25 tonne Not Recommended MBS=150t	N/A	N/A	N/A
Grade 'S' shackle PIN fits through strop MBS (shackle)> MBS (recovery strop)	35 - 55 tonne MBS>180t	35 - 55 tonne MBS>180t	42- 55 tonne MBS>240t	55 – 85 tonne MBS>320t	85 tonne MBS>460t
SUPER shackles BODY fits through strop MBS (shackle)> MBS (recovery strop)	N/A	40 tonne MBS>190t	N/A	N/A	N/A
SUPER shackle PIN fits though strop MBS (shackle)> MBS (recovery strop)	40 - 85 tonne MBS>190t	40 - 85 tonne MBS>190t	55-85 tonne MBS>260t	85 -120 tonne MBS>380t	120 tonne MBS>500t

GRADE 'S' SAFETY BOW SHACKLES:

These types of shackles are rated and meet the requirement of AS2741 or equivalent International Standards. Grade 'S' shackles are the most common shackles used in lifting industries and should be readily available from major lifting equipment supply companies . Black Snake always recommend Bow configuration and Safety Pin type. Body (bow) and pin are high tensile steel, Grade 6, quench and tempered. The body (bow) has distinguishing markings showing Working Load Limit WLL (t) when used for lifting applications and a 6:1 design factor according to Standards. For Example: The 55t WLL shackle has a design factor up to 330t Minimum Break Strength MBS. Shackle is 39kg - 40kg.

SUPER SHACKLES - SAFETY BOW:

These types of shackles are rated and must meet the requirement of U.S. Fed. Spec. RR.C-271 Type IVA Class 3, Grade B. Super shackles are useful in vehicle recovery because a higher WLL is available for a given shackle dimension and weight. Black Snake always recommend Bow configuration and Safety Pin (bolt) type. Body (bow) and pin are high tensile steel, Grade 8, quench and tempered. The body (bow) has distinguishing markings showing Working Load Limit WLL (t) when used for lifting applications and a 5:1 design factor according to Standards. For Example: The 85t WLL shackle has a design factor up to 425t Minimum Break Strength MBS. Shackle is 39kg - 42kg.

COUPLING LINK 'G', CHAIN CONNECTOR, CONNECTING LINK, GRADE 80 CONNECTOR:

These chain couplers are rated and meet the requirement of AS3776 (Lifting Components for Grade T Chain Slings) and the equivalent international standards. Grade 'T' chain couplers are used in lifting industries and should be readily available. The couplers are high tensile steel, Grade 8(80). WLL (t) is only obtained from supplier specifications and a 4:1 design factor is used according to Standards. For Example: The G-32-8 32t WLL coupler has a design factor up to 128t Minimum Break Strength MBS. Great care must be used to knock the stud and pin assembly in.

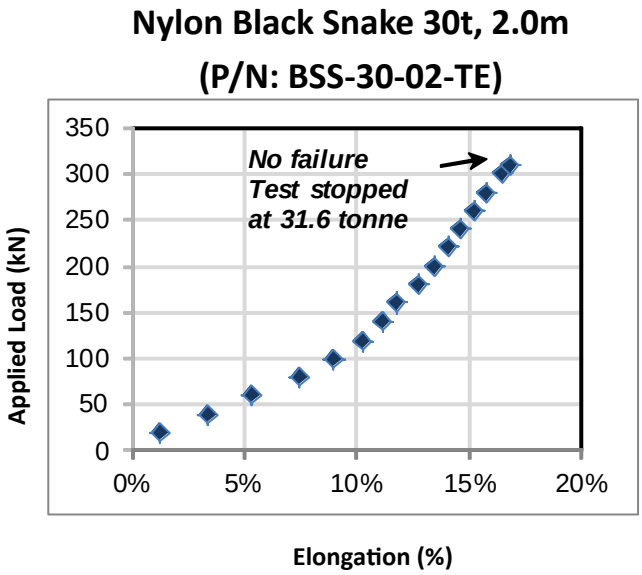
VEHICLE RECOVERY CHART
Black Snake Guide for Nylon Strops

RECOVERY STROP tonne	8t Min Break Strength[1]	12t Min Break Strength[1]	20t Min Break Strength[1]	30t Min Break Strength[1]
Using 2:1 Safety Factor Max force applied on recovery strop Recovery Load Limit Tonne (force)	4t (39kN)	6t (59kN)	10t (98kN)	15t (147kN)
Recover light/medium bogged vehicle Assume resistance 50% of Vehicle Weight	8t vehicle	12t	20t	30t
Recover a severely bogged vehicle Assume resistance 75% of Vehicle Weight	5t	8t vehicle	13t	20t
Recover a totally bogged vehicle Assume resistance 120% of Vehicle Weight	3t	5t	8t vehicle	12t
S Grade shackle BODY fits with MBS (shackle)> MBS (recovery strop)	3.25 - 6.5 tonne MBS>12t	4.7 - 8.5 tonne MBS>20t	6.5 - 12 tonne MBS>30t	8.5 - 17 tonne MBS>40t
S Grade shackle PIN fits with MBS (shackle)> MBS (recovery strop)	3.25 - 6.5 tonne MBS>12t	6.5 - 8.5 tonne MBS>20t	6.5 - 12 tonne MBS>30t	8.5 - 17 tonne MBS>40t
Use SUPER shackle BODY with MBS (shackle)> MBS (recovery strop)	5 - 9.5tonne MBS>20t	7 - 12.5 tonne MBS>30t	9.5 - 15 tonne MBS>40t	12.5 - 18 tonne MBS>50t
Use SUPER shackle PIN with MBS (shackle)> MBS (recovery strop)	5 - 9.5tonne MBS>20t	9.5 - 12.5 tonne MBS>30t	9.5 - 15 tonne MBS>40t	12.5 - 18 tonne MBS>50t
Use Couplers with MBS (couplers)> MBS (recovery strop)	Coupling link 13mm MBS>20t	Coupling link 13-16mm MBS>20t	Coupling link 16mm MBS>30t	Coupling link 18/20mm MBS>50t

RECOVERY STROP tonne	50t Min Break Strength[1]	70t Min Break Strength[1]	100t Min Break Strength[1]
Using 2:1 Safety Factor Max force applied on recovery strop Recovery Load Limit Tonne (force)	25t (245kN)	35t (343kN)	50t (490kN)
Recover light/medium bogged vehicle Assume resistance 50% of Vehicle Weight	50t vehicle	70t	100t
Recover a severely bogged vehicle Assume resistance 75% of Vehicle Weight	33t	46t vehicle	67t
Recover a totally bogged vehicle Assume resistance 120% of Vehicle Weight	21t	29t	42t vehicle
S Grade shackle BODY fits with MBS (shackle)> MBS (recovery strop)	12 - 25 tonne MBS>60t	25 - 35 tonne MBS>120t	25 - 55 tonne MBS>120t
S Grade shackle PIN fits with MBS (shackle)> MBS (recovery strop)	12 - 35 tonne MBS>60t	25 - 35 tonne MBS>120t	25 - 55 tonne MBS>120t
Use SUPER shackle BODY with MBS (shackle)> MBS (recovery strop)	18 - 40 tonne MBS>80t	40 - 55 tonne MBS>150t	40 - 55 tonne MBS>150t
Use SUPER shackle PIN with MBS (shackle)> MBS (recovery strop)	18 - 40 tonne MBS>80t	40 - 55 tonne MBS>150t	40 - 55 tonne MBS>150t
Use Couplers with MBS (couplers)> MBS (recovery strop)	Coupling link 26mm MBS>70t	Coupling link 32mm MBS>110t	Coupling link 32mm MBS>110t

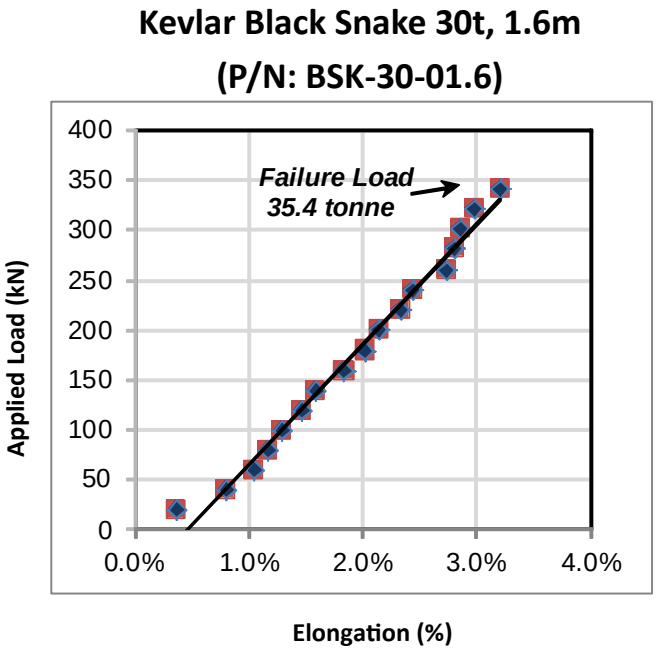
APPLIED LOAD vs ELONGATION

NYLON RECOVERY STROP Applied load vs Elongation (%)



- This graph shows actual results for a 30 tonne Black Snake Nylon Recovery Strop. A pre-load of 5kN was applied
- Smooth stretch up to 20% typical elongation is achieved by the Nylon 6.6 fibres and rubber casing combination
- It is typical for the Nylon recovery strop to stretch more at low applied loads before assuming a linear gradient as displayed on the graph
- Nylon 6.6 load bearing fibres are arranged as an endless parallel lay configuration around steel eyes/thimbles and wrapped in a protective rubber outer casing
- Nylon Black Snake recovery strops reduce shock loading when towing
- Vehicle recovery can be assisted using a 'snatch' or 'potential energy→kinetic energy' type of recovery
- Failure of the Nylon Recovery Strop from overloading can result in considerable re-coil. Nylon fibres separate at one eye and bury deep into the rubber casing which acts as a dampening mass (dead-weight)

KEVLAR® RECOVERY STROP Applied load vs Elongation (%)



- This graph shows actual test results for a 30t Black Snake Kevlar Recovery Strop. A pre-load of 5kN was applied
- Very low stretch up to 4% typical elongation is achieved by the Kevlar® fibres and rubber casing combination
- The linear gradient on the graph is typical for Kevlar® recovery strops longer than 0.5 metres
- Kevlar® Type29 load bearing fibres are arranged in an endless parallel lay configuration around steel eyes/thimbles which are wrapped in a protective rubber outer casing
- Shock loading of a Kevlar Black Snake recovery strop and associated couplings/attachments can occur due to the low elongation of the Kevlar fibres and should be avoided where possible
- No 'snatch' type of recovery should be attempted when using a Kevlar Recovery Strop
- Failure of the Recovery Strop from overloading result in minimal re-coil. The Kevlar fibres break at one eye and bury deep into the rubber casing which acts as a dampening mass (dead-weight)

Break strength is the applied load at which the recovery strop fails

Applied load vs Elongation (%) curves vary for different sized recovery strops and for different eye combinations

Note: Applied Load of 294kN is roughly 30,000kgf. A 30t Break strength Recovery strop fails above this applied load

The protective outer casing is an industrial NR/BR abrasion resistant rubber vulcanized around the eyes and load bearing fibres

GUIDE TO ORDERING

Simple and Clear Product Codes

Black Snake has a straightforward system of identifying your product.

1. The loadbearing fibre (Kevlar® or Nylon) is described first.
2. The minimum break strength (M.B.S.) is provided in metric tonnes.
3. The nominal length is given in metres ranging from 00.5m to 20m.
4. The eye type is provided if it is non-standard or if a special configuration is required.

Please refer to the chart below for examples and explanations of our product code structure. If you have questions or require non-standard configurations, contact us direct, or consult our knowledgeable distributors before ordering. It is paramount you receive the correct strop for your application.

PAGE	PRODUCT	PRODUCT CODE	FIBRE	M.B.S. (t)	LENGTH (m)	FITTING / COMMENTS
5,6	KEVLAR Y STROP	BSK-20-10-Y	KEVLAR	20	10	Y
7	SHORT KEVLAR RECOVERY STROP	BSK-50-00.5	KEVLAR	50	0.5	STD THIMBLE/ROUND EYE
8	KEVLAR RECOVERY STROP	BSK-400-06	KEVLAR	400	6	STD THIMBLE/ROUND EYE
9	NON STANDARD RECOVERY STROP	BSK-50-10-TE	KEVLAR	50	10	36MM GAL THIMBLE
11	BULLDOZER RECOVERY STROP	BSK-300-10-B	KEVLAR	300	10	B FITTING ONE END ONLY
11	BULLDOZER RECOVERY STROP	BSK-300-10-BB	KEVLAR	300	10	B FITTING EACH END
12	BULLDOZER RECOVERY STROP	BSK-75-06-YB	KEVLAR	75	6	Y STROP B FITTING ONE END
13	BODY UP STROP	BUS-100-01.9	KEVLAR	100	1.9	1.9MTRS STANDARD BEARING POINT TO BEARING POINT
13	BODY UP STROP	BUS-150-01.75CC	KEVLAR	150	1.75	1.75MTRS MEASURED CENTRE TO CENTRE OF EYES
13	BODY UP STROP	BUS-100-01.5CCOP	KEVLAR	100	1.5	1.5M CENTRE TO CENTRE, EYES ALIGNED IN OPPOSITE PLANE
15,16	NYLON RECOVERY STROP (SNATCH)	BSS-20-20-TE	NYLON	20	20	STD THIMBLE EYE
18	ALUMINIUM STOWAGE BOX	ASB001				MID CASE FORKLIFT ACCESS (100cm*100cm*50cm)
18	STOWAGE BAG (45cm*40cm*19cm)	BS-001				LARGE STOWAGE BAG

BSK-50-00.8 short strops





BSK-50-20 in a coil

BSK-300-20 on a pallet



RFID

Black Snake Radio Frequency Identification

Providing full traceability & identification of Black Snake strops

Advantages of the RFID (Radio Frequency Identification) Transponder:

As part of our commitment to the continual development and optimisation of the Black Snake product we have introduced the RFID into our manufacturing process. We embed the RFID transponder between layers of rubber during the construction process, prior to curing the strop. As a result, the transponder will remain in position and intact for the life of the strop. These RFID transponders are programmed with enough information to provide full identification of the individual strop should the Identification tags we provide ever become detached.

Procedure for Use:

Our customer will require an Android Smart phone to scan the transponder

When using a smart phone ensure you have downloaded the **NFC TagInfo** Android App on Google Play and that it is open.

Scan the yellow RFID label on the strop using a Smart phone.



Step 1: Scan RFID label using Android phone and NFC TagInfo App.



Step 2: After RFID is scanned select: Data (US-ASCII) as shown in the diagram to the left



Step 3: Analyse embedded data

Blocks 0 1 provide strop serial number

Blocks 2 3 4 5 provide product code

Blocks 6 7 provide manufacture date

DISCLAIMER:

The information provided in the Black Snake Recovery and Towing 2018 Booklet was prepared with due care and is based on test results believed to be correct and appropriate. However, no guarantee is given as to accuracy or suitability of the products for which the reader intends the information provided. Anyone intending to use recommendations contained within this publication and information concerning products, manufacturing techniques, dimensions, weights and other applications must ensure that it meets all appropriate health, safety and workplace standards. Black Snake (AUST) reserves the right to modify product properties and to change current recommendations without notice. Black Snake (AUST) makes no guarantee and assumes no obligation whatsoever in connection to these recommendations. The user of this information and recommendations shall assume all risk and liability in connection with this publication. Nothing in this publication should be taken as an inducement, or intended to suggest infringement of any existing or particular patent.

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