



# Sleeper Handling

## Product Application Guide - Issue 1

# INTRODUCTION

Thomson Engineering Design Ltd has been designing and building rail infrastructure component handling equipment since 1999. We now offer an unrivalled range of products and are frequently called upon to construct custom solutions for individual clients around the world.

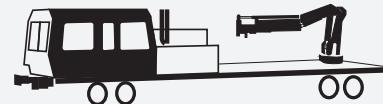
Today, our range of sleeper (tie) handling products includes devices for most applications. This short guide offers advice on selecting the best product for your specific requirements and we hope you will find it informative. If, however, you require further information or if you would like to discuss a unique challenge, please contact our technical department by email to [technical@thomsondesignuk.com](mailto:technical@thomsondesignuk.com) .

## QUALITY & SAFETY BUILT-IN

Thomson Engineering Design Ltd has an unrivalled reputation for the quality and reliability of its products and is accredited to ISO9001:2015 for design, manufacture, testing and documentation of machinery and equipment. The company also holds a number of other rail industry supplier qualifications.



**SUITABLE FOR USE WITH KNUCKLE BOOM CRANES ON BOTH ROAD AND RAIL VEHICLES. WHERE AN ATTACHMENT IS SUITABLE FOR RAIL MOUNTED MACHINES BUT NOT ROAD VEHICLES THE ICON ON THE RIGHT IS USED.**



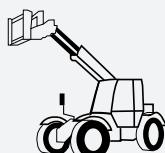
**SUITABLE FOR USE ON ROAD RAIL EXCAVATORS**



**SUITABLE FOR USE WITH TRACKED EXCAVATORS / WHEELED EXCAVATORS / HEAVY CONSTRUCTION MACHINES**



**SUITABLE FOR SPECIAL PURPOSE MATERIALS HANDLERS SUCH AS SPEEDSWINGS, TELE-HANDLERS AND LOADING SHOVELS**



**SUITABLE FOR USE WITH GENERAL PURPOSE CRANES**



**SUITABLE FOR USE WITH GANTRY / YARD CRANES**

# HOST MACHINE APPLICATION MATRIX

PRODUCT	PAGE No.						
SM12 SLEEPER MANIPULATOR	8		<input type="checkbox"/>	<input type="checkbox"/>			
SC19-01 SLEEPER CHANGER	10		<input type="checkbox"/>	<input type="checkbox"/>			
SC23-03 SLEEPER CHANGER	12		<input type="checkbox"/>	<input type="checkbox"/>			
TCSG16 SLEEPER GRAB	14	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
TCSG20 SLEEPER GRAB	16	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
CSH09 SLEEPER HANDLER	18	<input type="checkbox"/>					
PG14-400 PLATE GRAB	20	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
PG14-600 PLATE GRAB	22	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
PG14-800 PLATE GRAB	24	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
LBB20 LONG BEARER BEAM	26	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SLEEPER SPREADER ATTACHMENTS	28		<input type="checkbox"/>	<input type="checkbox"/>			
CUSTOM SLEEPER SPREADERS	30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HYDRAULIC SLEEPER PACK GRABS	32	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
MECHANICAL PACK GRABS	34	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TSH13 TRACK SLAB HANDLER	36	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		



All our attachments can be supplied with custom built adapter systems to suit any host machine. Download our Adapter Head Selection Guide for full details of fixed, rotating, quick change, and all other types.

The guide includes details of what measurements we will need from your machine in order to ensure a perfect 'plug-and-play' fit.

Email [railplant@unipartrail.com](mailto:railplant@unipartrail.com) for more details.

# KEY FEATURES & OPERATION

Our range of products includes models for use with a wide variety of host machines. All our products are designed to withstand much more than normal use can throw at them but some items also include extra safety features as described below and listed in the table on page 5.

All excavator and crane attachments are operated using the hydraulic systems of the host machine but some of our rail handling products can also be specified to be manually operated or to be powered by pneumatic systems or even with a built in electro-hydraulic power pack.

## FEATURES



FITTED WITH 'PARACHUTE VALVE PROTECTION'. LOAD CANNOT BE RELEASED WHEN LIFTED.



FITTED WITH A PRESSURE CONTROL VALVE TO LIMIT THE HYDRAULIC PRESSURE WITHIN THE DEVICE SYSTEM REGARDLESS OF THE PRESSURE FROM THE HOST MACHINE. ATTACHMENTS FITTED WITH THIS SYSTEM CAN COPE WITH 90 TO 275 BAR INLET PRESSURE.



MAXIMUM RATED LOAD TO BE LIFTED BY THE DEVICE

## OPERATION



HYDRAULICALLY OPERATED FROM AUXILIARY SERVICE(S) ON THE HOST MACHINE



AUTOMATIC MECHANICAL ACTUATION



REMOTE CONTROLLED NORMALLY BY EITHER RADIO OR PENDANT CONTROLLER

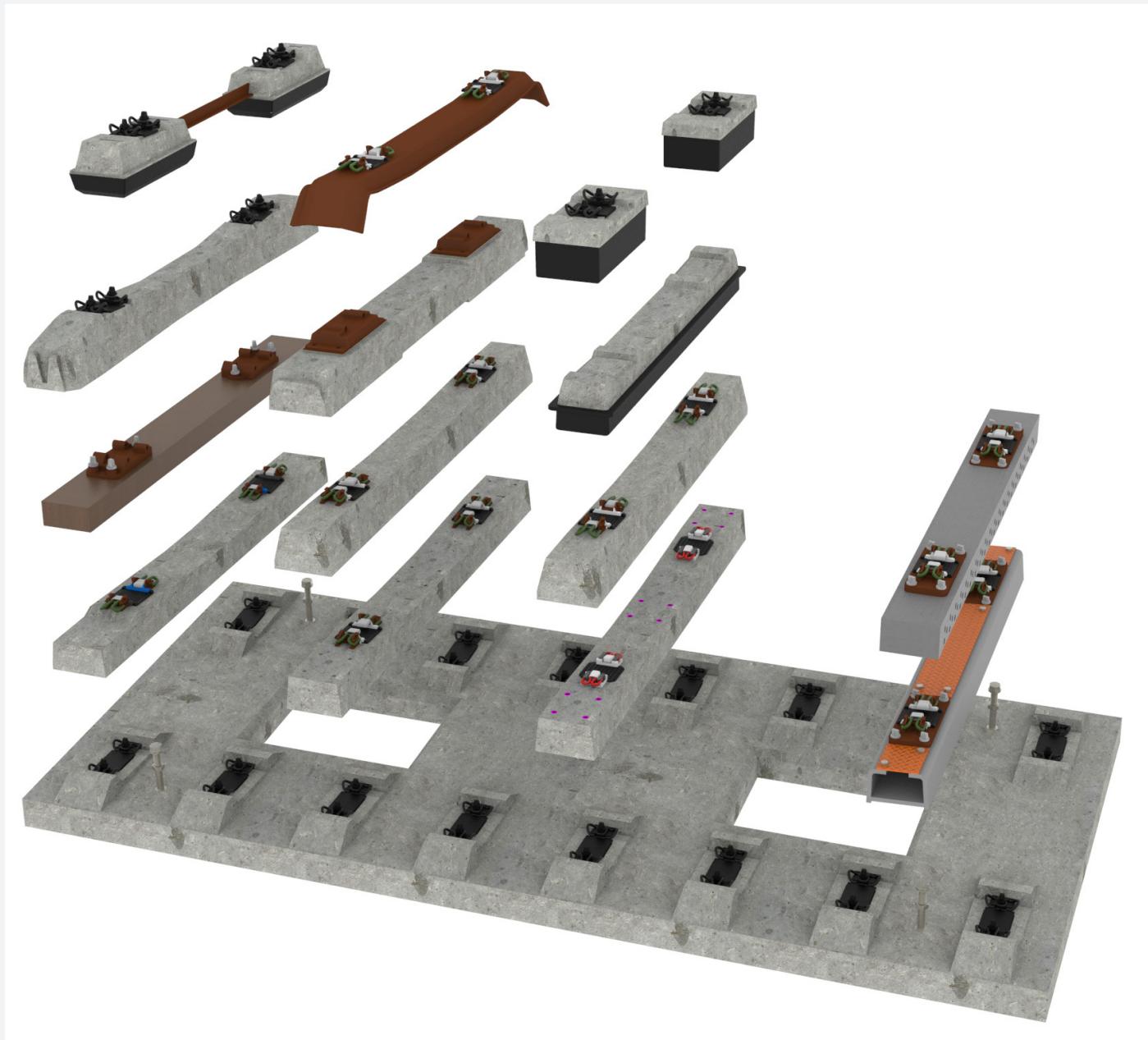


SELF POWERED. ATTACHMENTS WITH THIS SYSTEM ARE POWERED BY A BUILT-IN PETROL (GASOLINE), DIESEL OR ELECTRO-HYDRAULIC POWER PACK. ELECTRIC SYSTEMS MAY BE SPECIFIED IN 24V DC, 110V AC, 240V AC OR 415V 3 PHASE AC. 24V SYSTEMS MAY ALSO BE BATTERY POWERED.

# FEATURES & OPERATION MATRIX

PRODUCT	PAGE No.			WLL				
SM12 SLEEPER MANIPULATOR	8		<input type="checkbox"/>	400kg (880lbs)	<input type="checkbox"/>			
SC19-01 SLEEPER CHANGER	10		<input type="checkbox"/>	500kg (1,100lbs)	<input type="checkbox"/>			
SC23-03 SLEEPER CHANGER	12		<input type="checkbox"/>	500kg (1,100lbs)	<input type="checkbox"/>			
TCSG16 SLEEPER GRAB	14	<input type="checkbox"/>	<input type="checkbox"/>	1,250kg (2,750lbs)	<input type="checkbox"/>			
TCSG20 SLEEPER GRAB	16	<input type="checkbox"/>	<input type="checkbox"/>	2,050kg (4,500lbs)	<input type="checkbox"/>			
CSH09 SLEEPER HANDLER	18	<input type="checkbox"/>	<input type="checkbox"/>	1,500kg (3,300lbs)	<input type="checkbox"/>			
PG14-400 PLATE GRAB	20		<input type="checkbox"/>	1,250kg (2,750lbs)	<input type="checkbox"/>			
PG14-600 PLATE GRAB	22		<input type="checkbox"/>	2,500kg (5,500lbs)	<input type="checkbox"/>			
PG14-800 PLATE GRAB	24		<input type="checkbox"/>	2,500kg (5,500lbs)	<input type="checkbox"/>			
LBB20 LONG BEARER BEAM	26	<input type="checkbox"/>	<input type="checkbox"/>	750kg (1,650lbs)	<input type="checkbox"/>			
SLEEPER SPREADER ATTACHMENTS	28	<input type="checkbox"/>	<input type="checkbox"/>	375kg (825lb) Per Sleeper	<input type="checkbox"/>			
CUSTOM SLEEPER SPREADERS	30			To Customer Requirement	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
HYDRAULIC SLEEPER PACK GRABS	32		<input type="checkbox"/>	To Customer Requirement	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
MECHANICAL PACK GRABS	34	<input type="checkbox"/>	<input type="checkbox"/>	To Customer Requirement		<input type="checkbox"/>	<input type="checkbox"/>	
TSH13 TRACK SLAB HANDLER	36	<input type="checkbox"/>	<input type="checkbox"/>	6,500kg (14,300lbs)	<input type="checkbox"/>			

# SLEEPER TYPES



Concrete, timber, composite, steel, mono-block, duo-block, slab-track, solid, hollow, plain and rubber booted: the variety of different sleeper types used in today's railway networks is astonishing. Add to that different rail gauges, different axle load ratings and a whole range of different rail fastening systems and it is no surprise that no two customers have the same requirement.

The Thomson range of sleeper handling solutions provides a solution to every circumstance and in this introductory brochure we highlight the main product lines. Full details for each of our products is available upon request and our Technical Team is always on hand to help guide you to the right product.

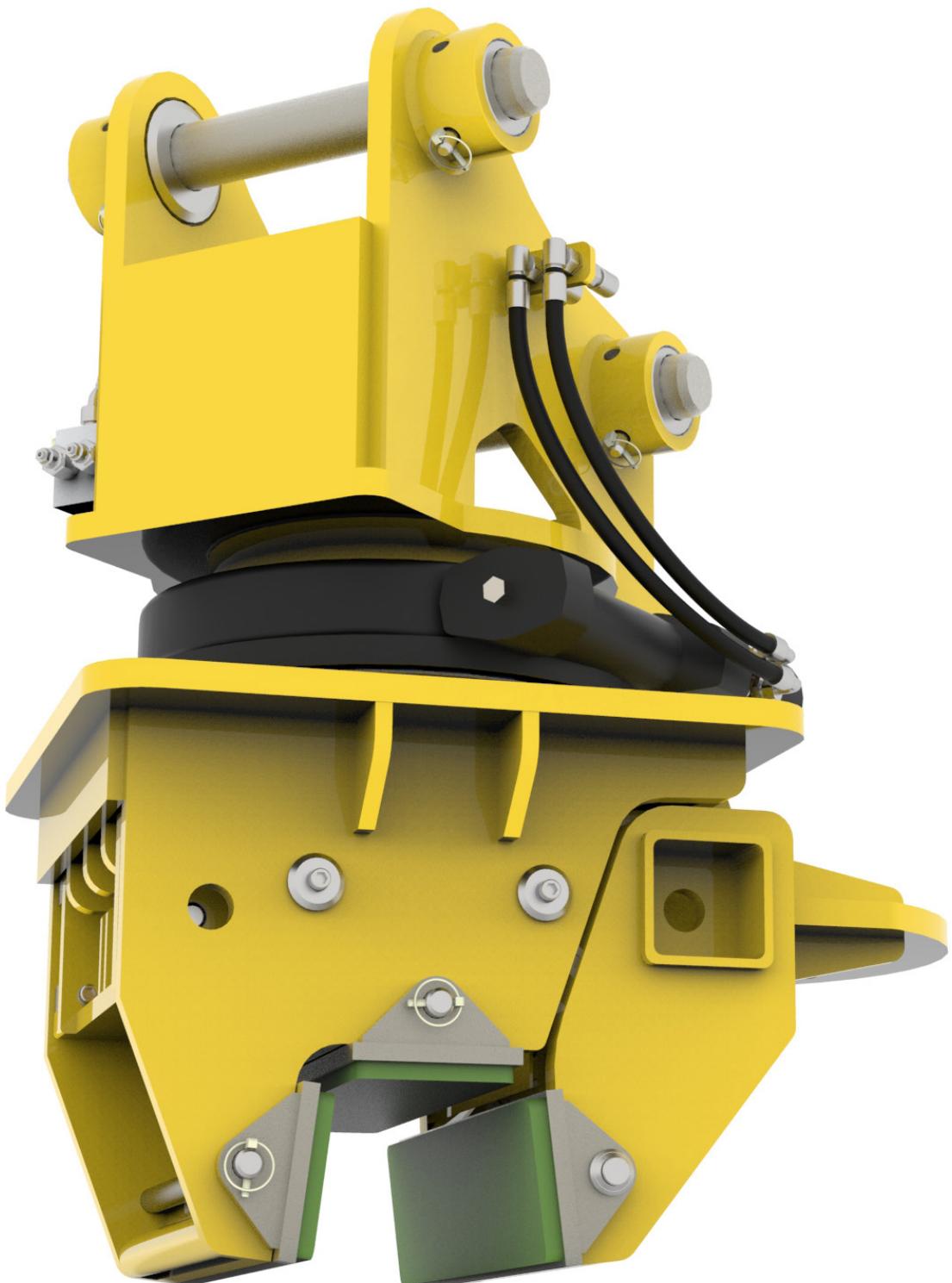
For any advice please contact [technical@thomsondesignuk.com](mailto:technical@thomsondesignuk.com).

# APPLICATION MATRIX

- Ideal for smaller jobs
- Recommended for heavy duty use

PRODUCT	PAGE No.	SLEEPER CHANGING	SLEEPER DELIVERY	SLEEPER LAYING	BULK HANDLING	BEARER LAYING / HANDLING	BEARER CHANGING	DUO-BLOCK HANDLING	SPECIAL TYPES (COMPOSITE, HOLLOW, ETC.)
SM12 SLEEPER MANIPULATOR	8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
SC19-01 SLEEPER CHANGER	10	<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
SC23-03 SLEEPER CHANGER	12	<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
TCSG16 SLEEPER GRAB	14			<input checked="" type="checkbox"/>		<input type="checkbox"/>			<input type="checkbox"/>
TCSG20 SLEEPER GRAB	16			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>			
CSH09 SLEEPER HANDLER	18			<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>
PG14-400 PLATE GRAB	20	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
PG14-600 PLATE GRAB	22	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
PG14-800 PLATE GRAB	24	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
LBB20 LONG BEARER BEAM	26					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
SLEEPER SPREADER ATTACHMENTS	28			<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>
CUSTOM SLEEPER SPREADERS	30	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
HYDRAULIC SLEEPER PACK GRABS	32	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>				
MECHANICAL PACK GRABS	34	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>				
TSH13 TRACK SLAB HANDLER	36	<input checked="" type="checkbox"/>							

# SM12 SLEEPER MANIPULATOR





## KEY FACTS

The SM12 Sleeper Manipulator incorporates a worm drive rotator and a rigidly attached adapter head allowing total control of sleeper positioning and orientation. This makes it an ideal choice for sleeper replacement and for bearer replacement in switch and crossing panels.

Interchangeable grab pads makes this versatile attachment suitable for handling all types of mono-block sleepers (ties) and crossing bearers. It can even be adapted for handing duo-block sleepers by fitting special jaws designed to grab the tie bar.

The soft grip urethane pads prevent damage to concrete surfaces and the rolling jaw mounting arrangement allows the pads to conform to all sleeper shapes.

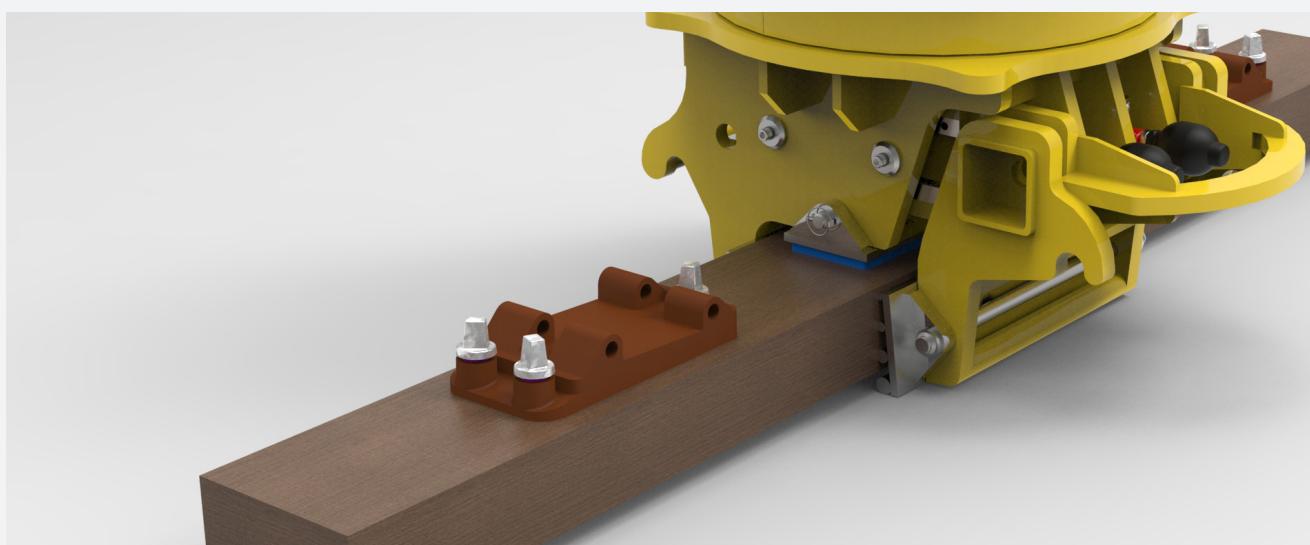
The powerful worm-drive rotator helps to set the sleepers precisely square to the rails when used in sleeper changing operations.

A built in hydraulic accumulator helps to maintain a steady, even grip load on the sleeper faces throughout the work cycle.

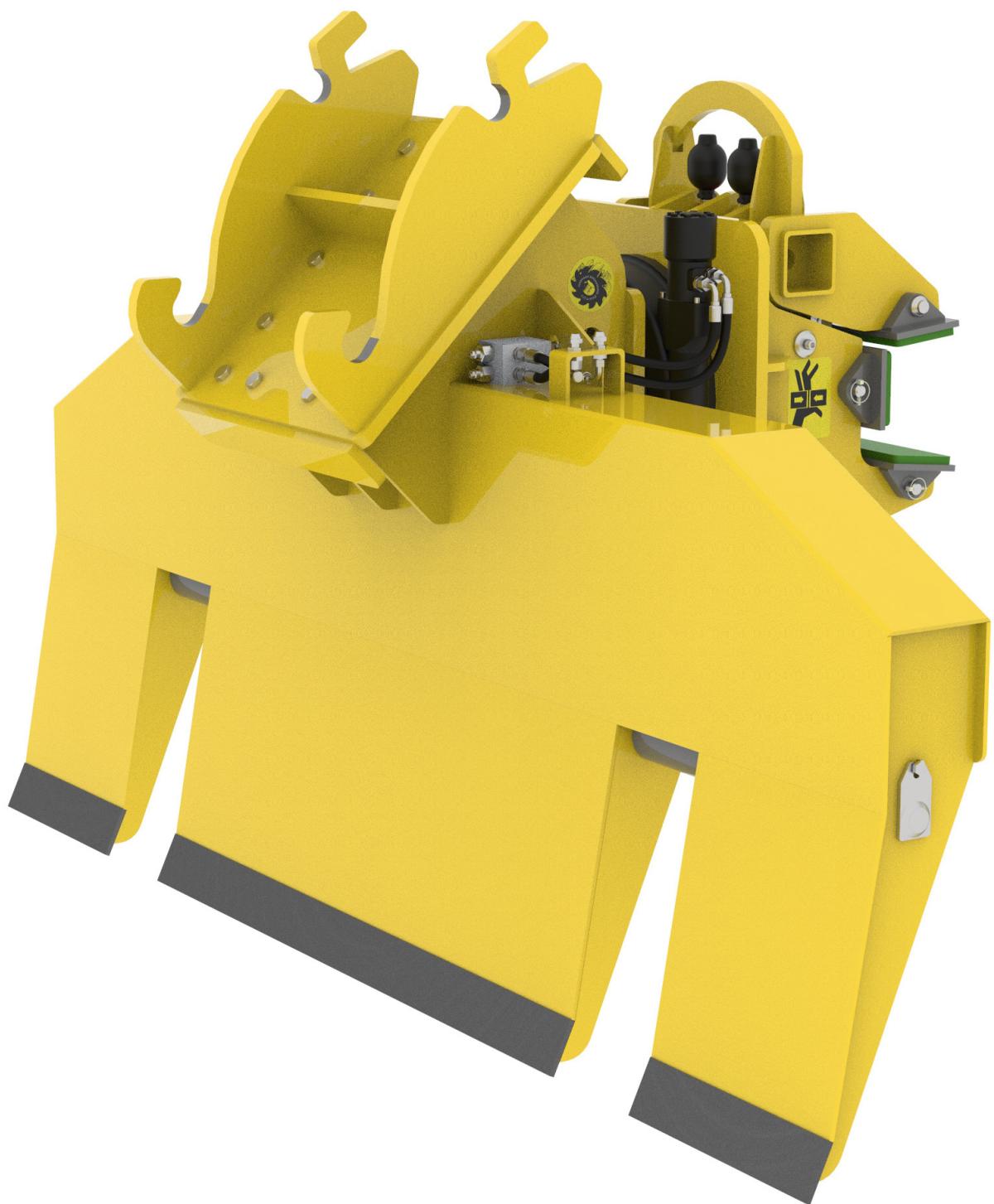
## ALTERNATIVE PRODUCTS

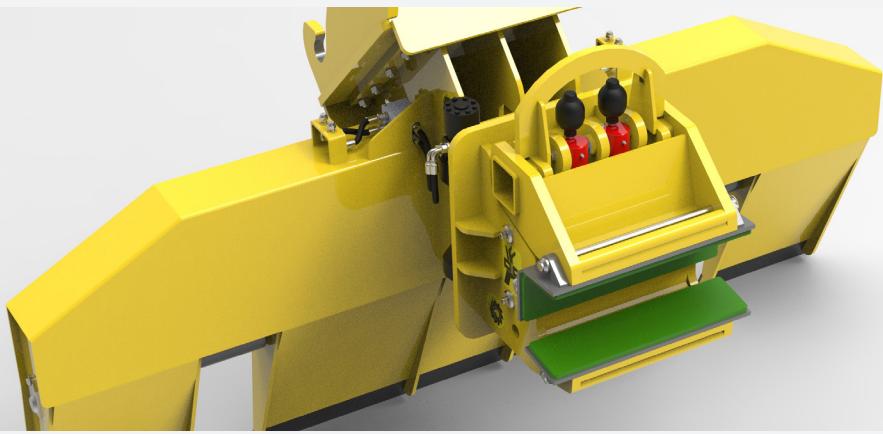
For a complete sleeper changing system see our SC19 and SC23 Sleeper Changer attachments.

Our Long Bearer Beam may offer a better solution for handling switch and crossing bearers.



# SC19-01 SLEEPER CHANGER





## KEY FACTS

The SC19-01 Sleeper Changer incorporates a digging blade with a powerful sleeper manipulator to swiftly remove and replace sleepers (ties) in a single operation.

The blade is internally braced for high strength and pressure reducing valves are fitted to allow 'plug-and-play' fitment to almost any excavator.

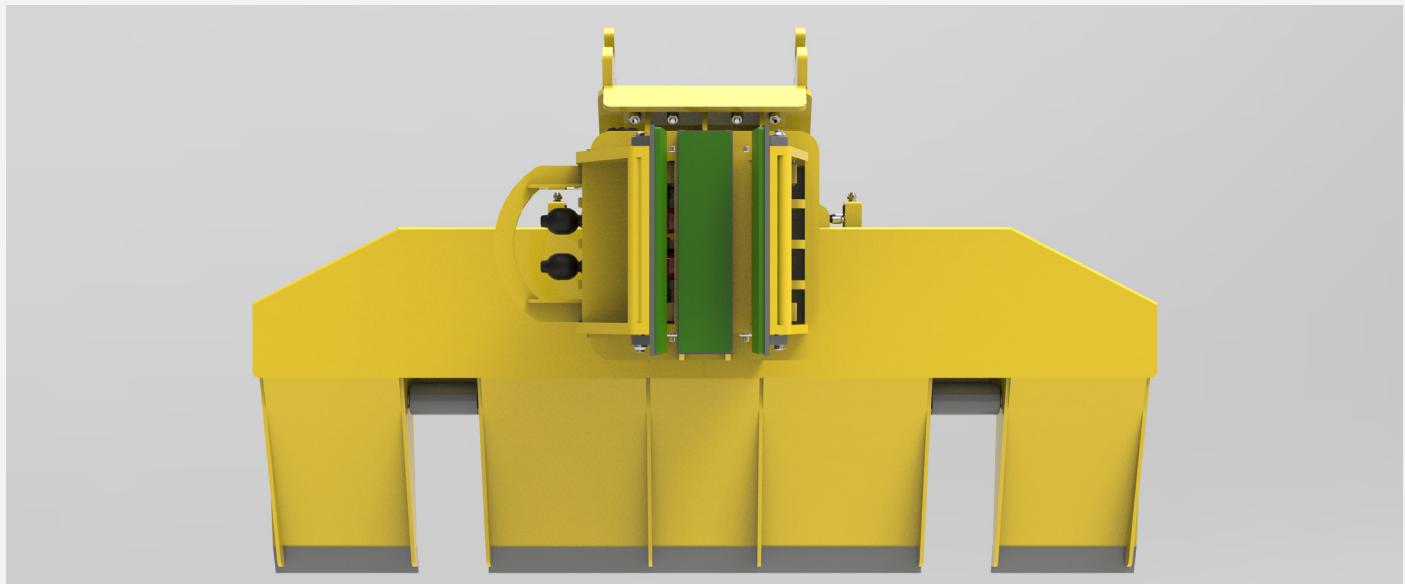
Soft steel rollers prevent damage to the rail head and models are available to suit all track gauges.

Accessories include a tilt head option and adapters for all types of excavator.

## ALTERNATIVE PRODUCTS

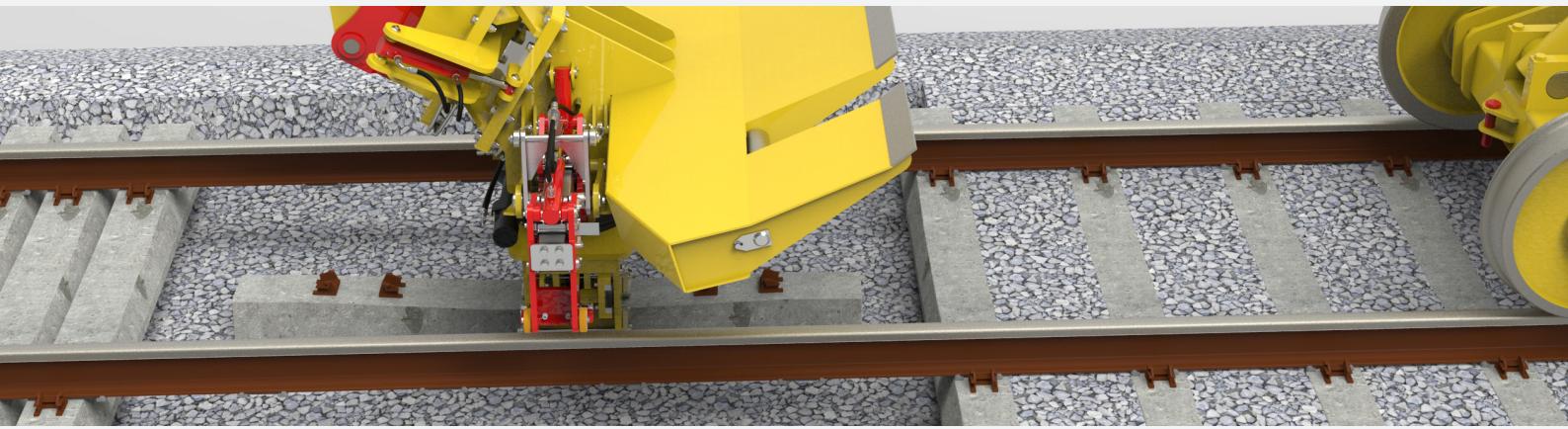
The SC23-03 Sleeper Changer incorporates actuators for Fastclip® fixings and a Vossloh® clip version is in development at the time of publication.

Our SM12 Sleeper Manipulator is ideal for changing sleepers where an alternative system is used for digging away the ballast cribs.



# SC23-03 SLEEPER CHANGER





## KEY FACTS

The SC23-03 Sleeper Changer offers the same functionality as the SC19-01 but it can also set Pandrol Fastclip® series rail fastening systems to lock the sleepers to the rails without the need for manual intervention.

A version of this device which can set Vossloh and similar fasteners is also currently in development.

Available with a tilt head and in versions to suit each different track gauge the SC23-03 is a self-contained solution to spot sleeper replacement.

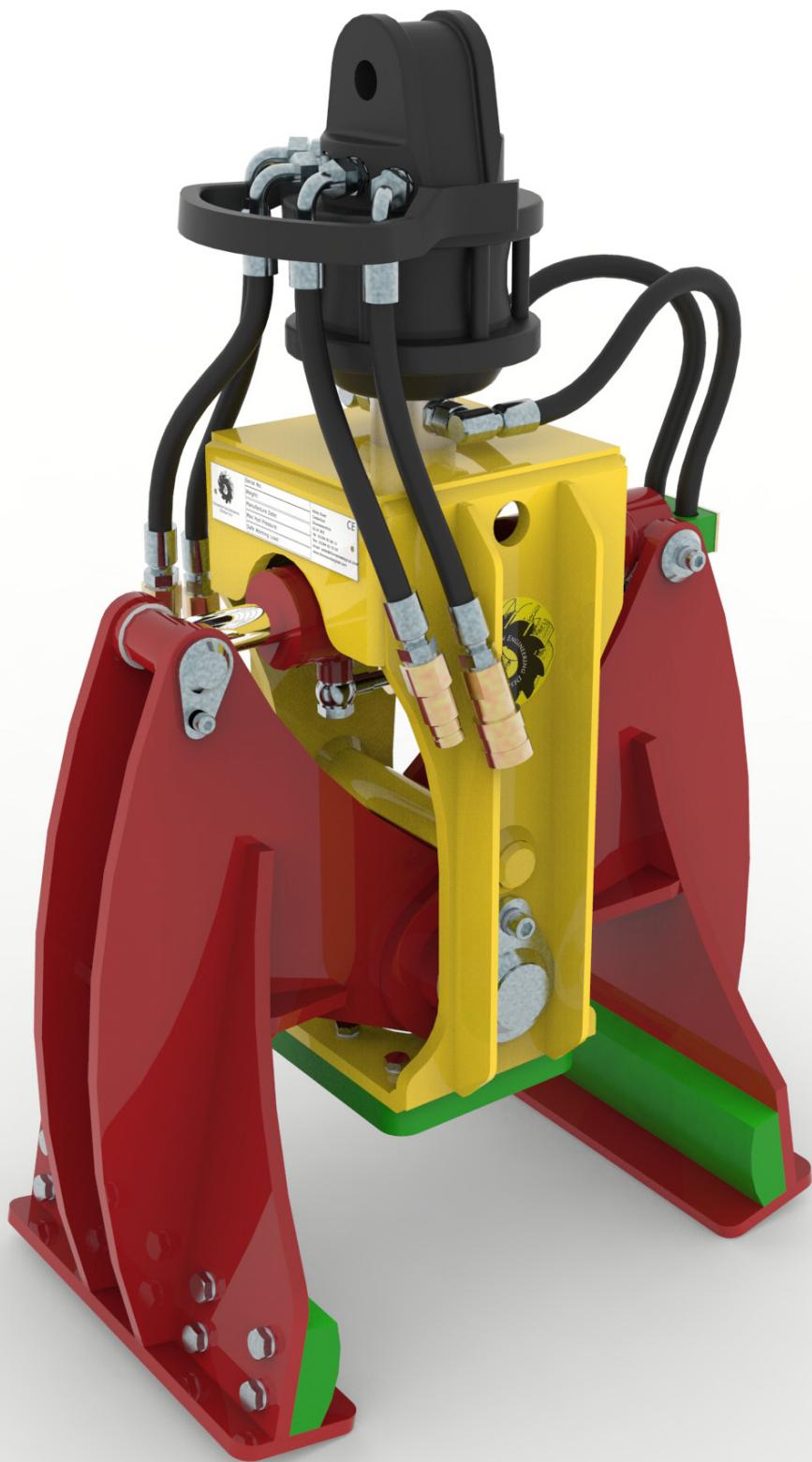
Interchangeable grab pads also allow this device to install steel, composite and timber sleepers if required and the device can be ordered in standard (1435mm) and broad-gauge versions.

## ALTERNATIVE PRODUCTS

Our SC19-01 Sleeper Changer is ideal for sleepers with other clipping systems.



# TCSG16 SLEEPER GRAB





## KEY FACTS

A robust yet lightweight grab for handling single sleepers (ties). This product was originally designed for sleeper delivery trucks and maintenance team vehicles for use in small maintenance operations but it is equally useful for general purpose sleeper handling as an attachment for excavators and handlers.

Weighing just 130kg (290lb) this little grab nevertheless has a massive 57.5kN (13,000lb) grip force and with its soft load-spreading pads, securely grabs the heaviest concrete sleepers for safe, rapid handling.

The grab cylinder is fitted with a check valve to lock the jaws in the event of damage to the hydraulic pipework and the shape of the jaws is designed to protect the cylinder from bump damage.

## ALTERNATIVE PRODUCTS

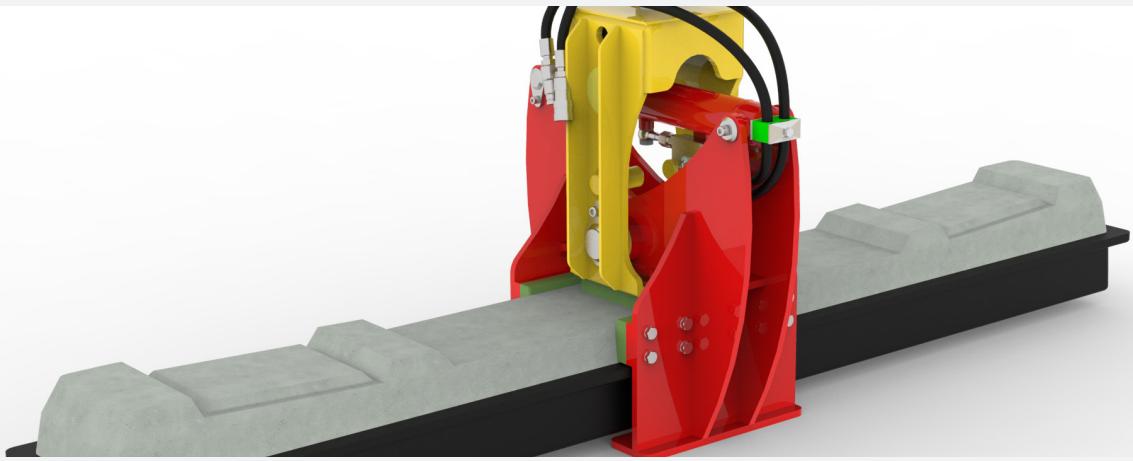
For handling rubber booted sleepers we provide a special version of this grab known as the TCSG20-03.

For in-track sleeper handling we recommend our Plate Grabs and SM12 Sleeper Manipulator.



# TCSG20 SLEEPER GRAB FOR COATED SLEEPERS





## KEY FACTS

Developed from our TCSG16 Sleeper Grab, this unique product provides a safe means of loading and delivering low vibration mono-block sleepers without risk of damage to the rubber anti-vibration boot.

Adapter heads are available to suit all types of host machine and a pressure control system can also be specified.

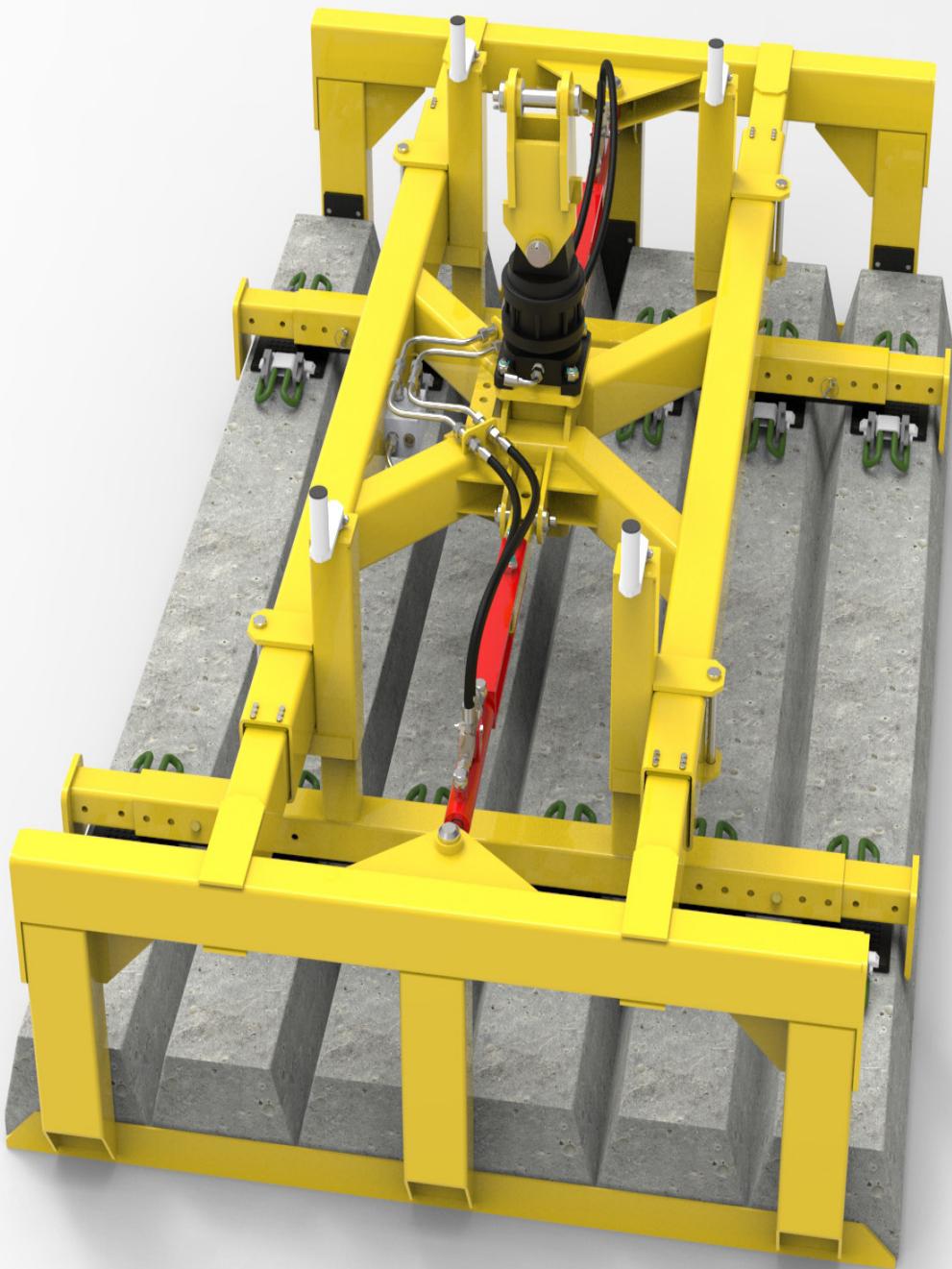
Ideal for use with truck mounted hydraulic loading cranes, this grab can also be successfully deployed on excavators and handlers.

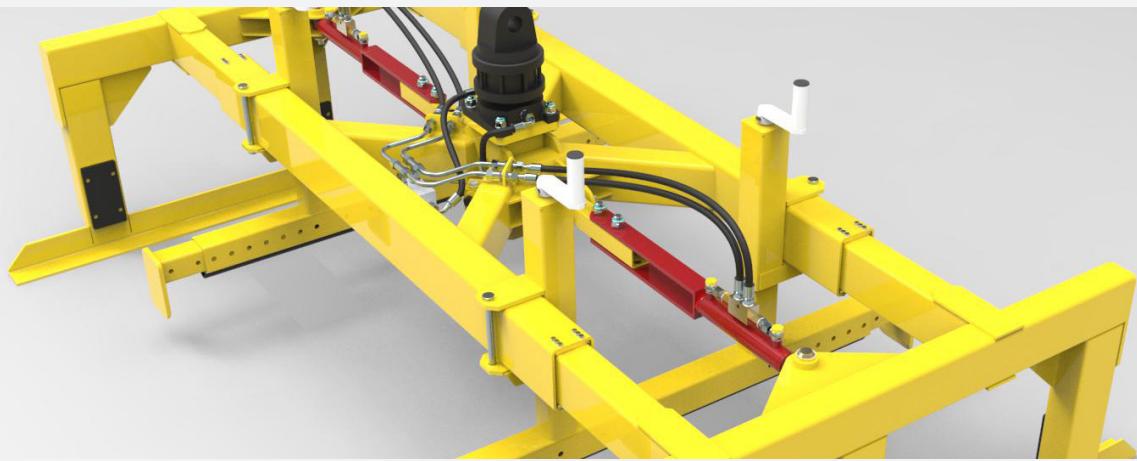
## ALTERNATIVE PRODUCTS

The TCSG16 Sleeper Grab is a direct alternative for handling plain sleepers.



# CSH09 SLEEPER HANDLER





## KEY FACTS

The CSH09 Sleeper Handler is specifically designed as an attachment for truck-mounted cranes and is used in sleeper delivery operations.

Adjustable for different sleeper lengths, widths and depths and capable of handling sleepers with timber dunnage on top, this extremely versatile attachment is a single solution for all road transport sleeper delivery operations.

Sleeper delivery trucks are quickly loaded and unloaded improving efficiency and output.

## OPTIONS

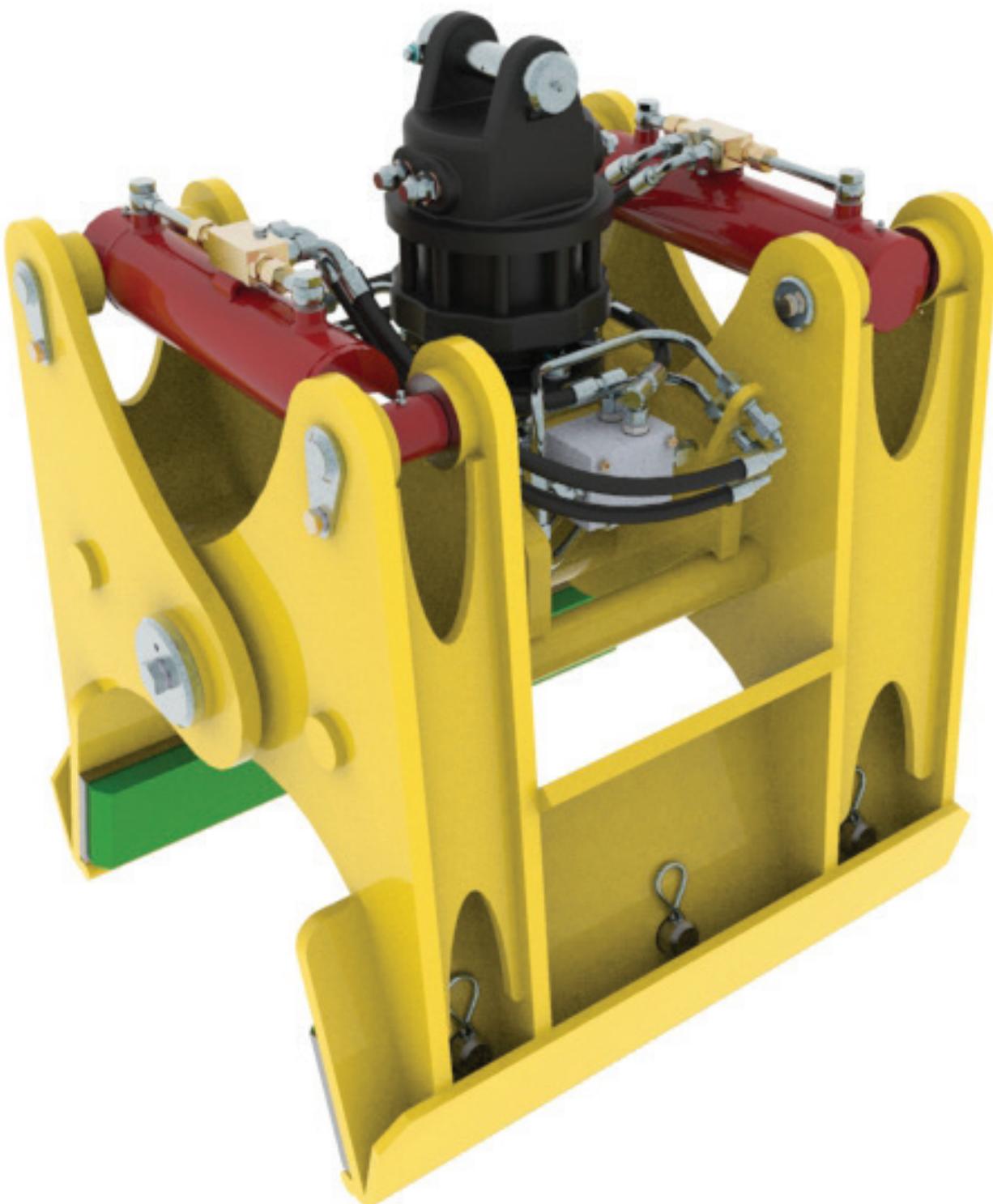
The CSH09 Sleeper Handler is available with a full range of adapter heads to suit all types of truck cranes.

A 4-tonne capacity rotator is fitted as standard but swivel hook and other adapter types are also available.

Different models are available for handling from 4 to 8 sleepers per lift.



## PG14-400 PLATE GRAB





## KEY FACTS

Thomson PG14 Plate Grabs are available in 400mm (15.75"), 600mm (23.5") and 800mm (31.5") jaw depth. All versions have steel bars along the bottom edges of the jaws for handling rails and steel sleepers and can be fitted with polyurethane grip pads for handling concrete and timber sleepers.

All models incorporate check valves on both cylinders and a pressure control system which eliminates the need to set the delivery pressures on the host machine.

The PG14-400 grab is a popular fitment on both truck-mounted cranes and excavators and finds many uses in sleeper delivery, general purpose handling and even sleeper changing operations.

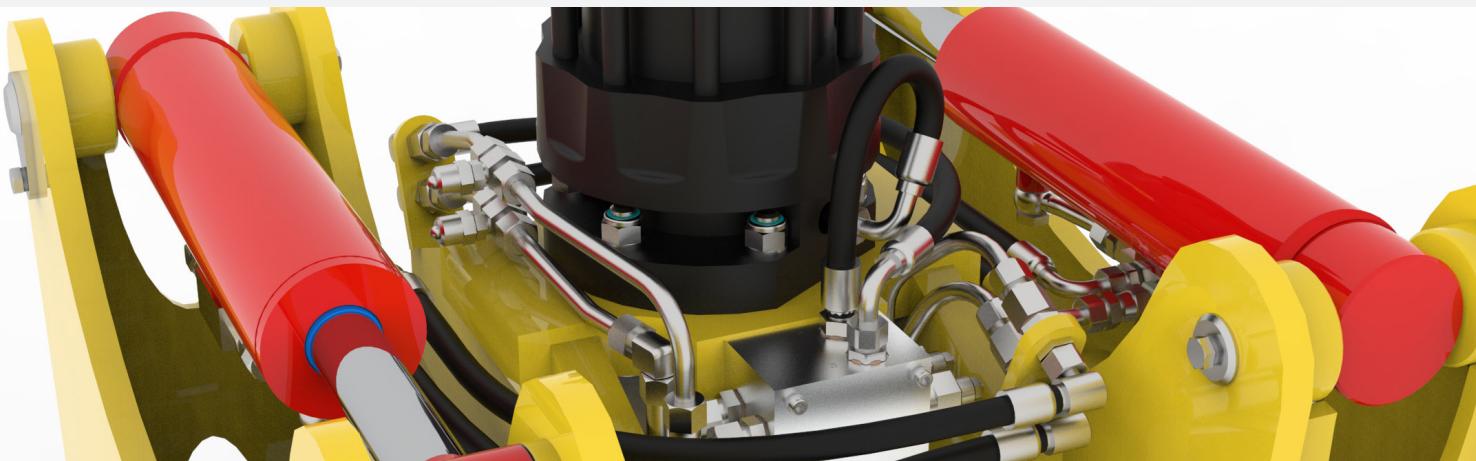
## ALTERNATIVE PRODUCTS

The PG14-600 and PG14-800 offer the same functionality with greater capacity.



# PG14-600 PLATE GRAB





## KEY FACTS

With a 600mm (23.5") jaw depth the PG14-600 Plate Grab can handle rails, single concrete or timber sleepers or packs of up to 6 steel sleepers.

Like the 400mm and 800mm versions this grab opens wide making it stable to carry between jobs and closes tightly at the jaw tips to handle the widest range of loads.

All Thomson Plate Grabs feature an industry standard 6-bolt mounting flange so that whilst it is most commonly supplied with a rotator and adapter head, these grabs can also be fitted with many other types of adapter.

## ALTERNATIVE PRODUCTS

The PG14-800 is ideal for handling larger packs of steel sleepers.



# PG14-800 PLATE GRAB





## KEY FACTS

The largest plate grab in our range, the PG14-800 has an 800mm (31.5") jaw depth allowing it to handle the tallest bundles of steel sleepers.

Grip load is controlled by a factory-set pressure reducing valve which eliminates the risk of crushing the sleepers and polyurethane pads can be fitted for safely handling concrete sleepers.

As standard a 6,000kg (13,000lb) capacity rotator is fitted but this can be uprated to a 10,000kg (22,000lb) capacity unit for very heavy-duty applications.

## ALTERNATIVE PRODUCTS

The PG14-400 and PG14-600 models offer the same functionality and the same options in a more compact form.

The SM12 Sleeper Manipulator has a more powerful worm-drive rotator and a rigid coupling to the host vehicle for use in sleeper changing operations.



# LBB20 LONG BEARER BEAM





## KEY FACTS

Where sleepers and bearers are stacked tightly together it is often difficult to grab them using a plate grab or similar device and forcing jaws down between the sleepers can damage their surfaces.

This unique grab overcomes this issue by gripping the sleeper on its ends. Long cylinders and adjustable cylinder attachment points make this device suitable for handling sleepers and bearers from 2.05m (6ft 8.5") to 4.3m (14ft 1") in length.

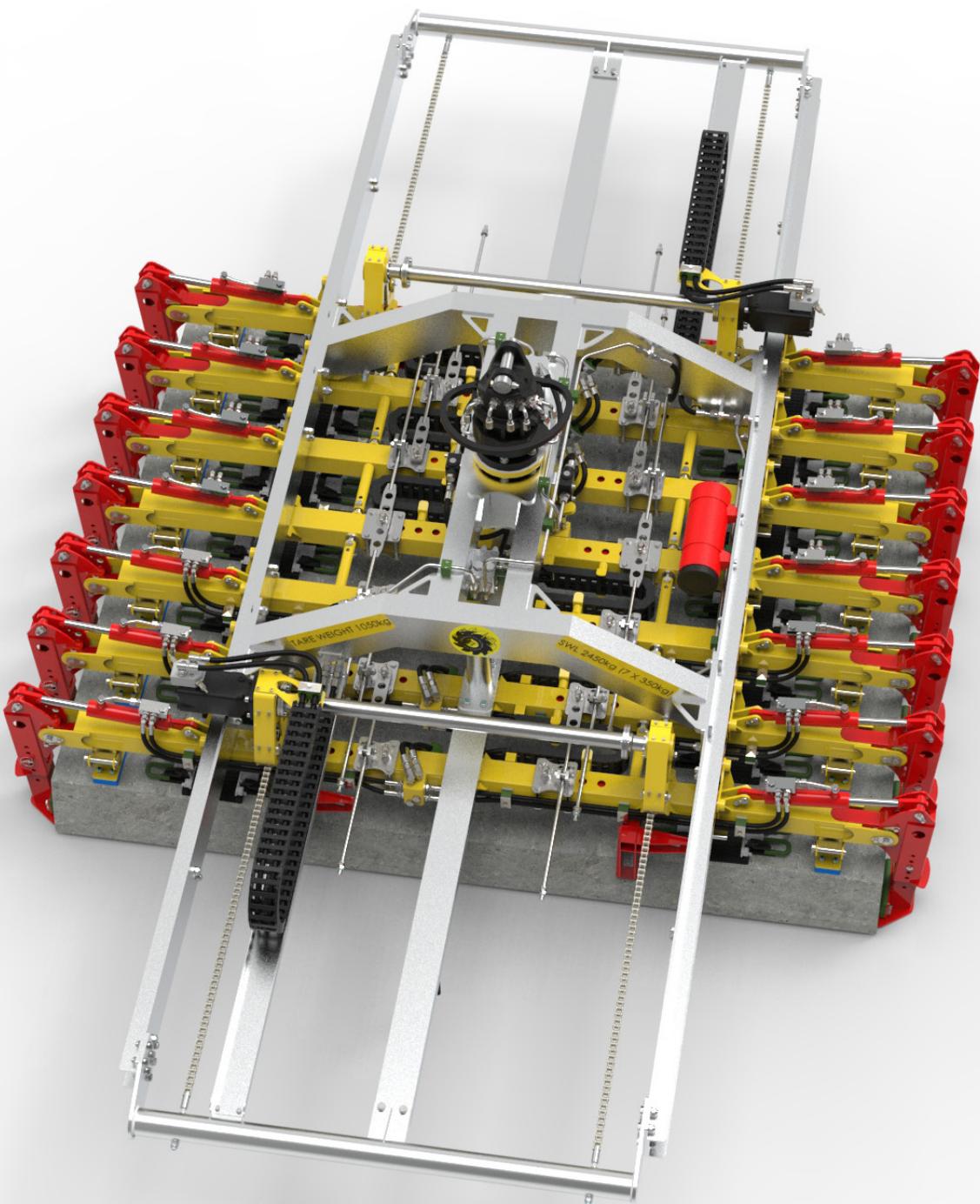
When carrying a load, the parachute valve system prevents the grip being released inadvertently and allows the operator to 'side-shift' the load to balance it.

## OPTIONS

A full range of adapter systems is available to suit all types of host machine.



# SLEEPER SPREADER ATTACHMENTS





## KEY FACTS

Thomson Sleeper Spreader Attachments are the quickest and most reliable of their kind for laying sleepers onto a prepared trackbed.

Fitted to an excavator, these attachments gather, grab, lift, space and lay sleepers accurately and efficiently. The unique chain drive spreading mechanism maintains the balance of the device throughout the work cycle allowing the operator to work at significantly higher speeds than traditional cylinder driven types.

The use of an aerospace aluminium alloy for the main chassis allows more steel to be used where it's needed - in the grab legs and this in turn allows these devices to produce best-in-class sleeper grab forces.

Combine this with soft pads at all contact points, simple adjustment for different sleeper spacings and the ability to lift timber dunnage with the sleepers and it is no wonder that this is such a popular attachment.

All models come with pressure control and parachute valve protection as standard.

## OPTIONS

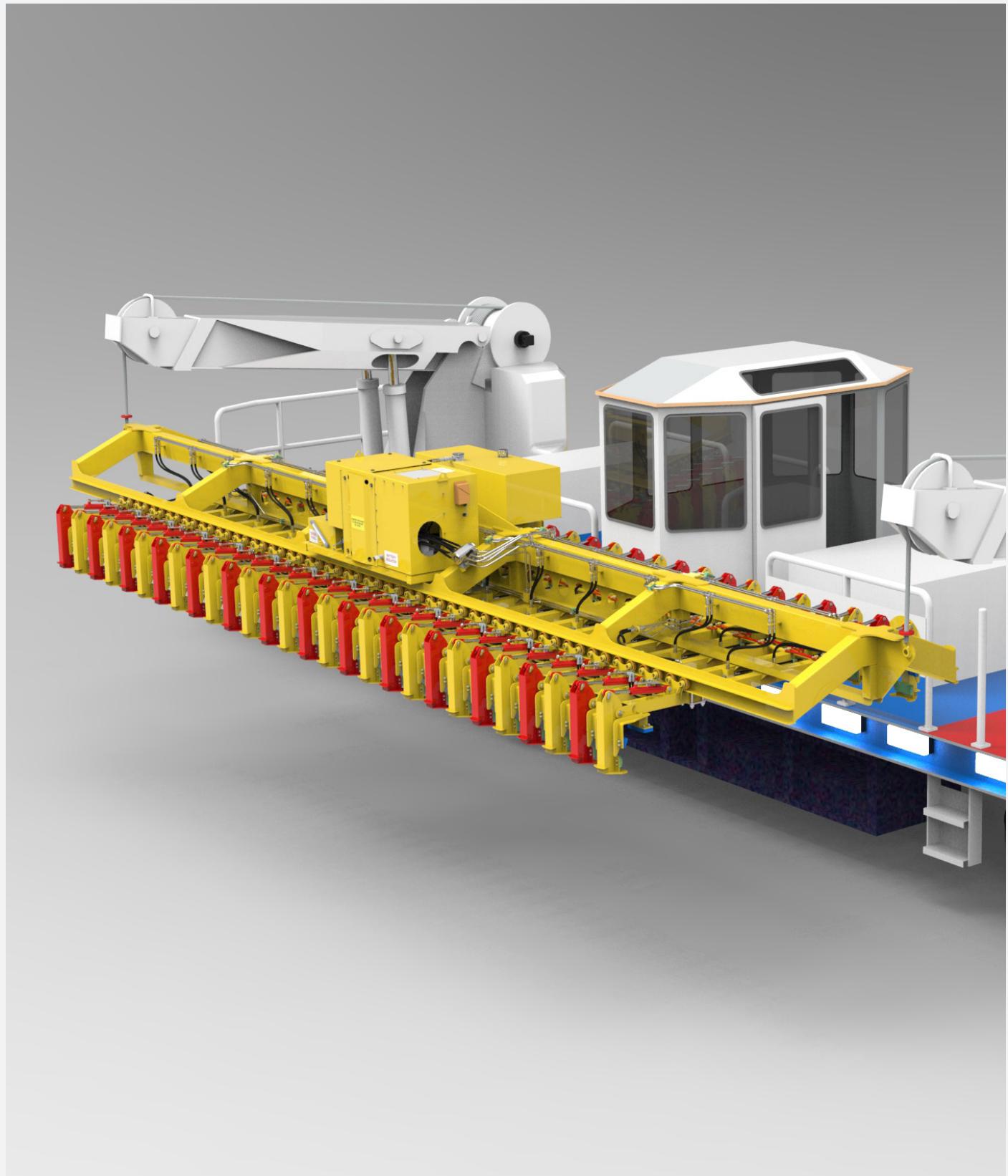
Adapter heads for all machine types are available.

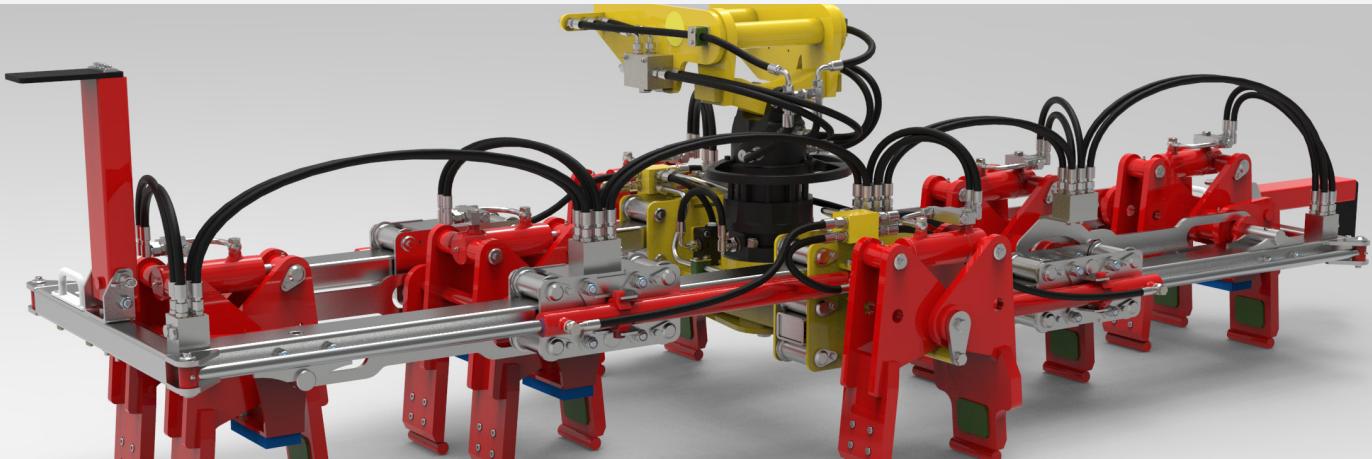
Models are available for any number of sleepers per lift from 4 to 28 - limited only by the capacity of the host machine.

Two or three service hydraulic system.



# CUSTOM SLEEPER SPREADERS





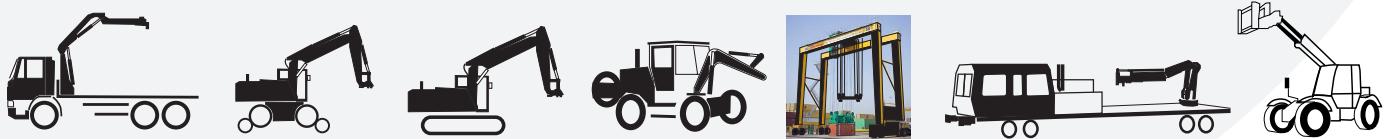
## KEY FACTS

Since 1999, Thomson Engineering Design have offered a bespoke design and build service to the rail industry which has provided many special sleeper handling devices to clients around the world.

When it comes to the number of sleepers unloaded and laid the limit is only the capacity of the host machine but, when small is beautiful we are equally at home designing special super-compact spreaders such as the five-sleeper spreader shown above, which was built for use in London Underground's deep tube network.

When it comes to specification, there are no limits. Built-in power packs, radio and pendant control systems and a range of safety features can be specified.

Our ISO9001:2015 accredited manufacturing facilities have been specifically arranged to allow us to create one-off products alongside multiple production runs whilst a commitment to LEAN manufacturing processes ensures that we can offer bespoke products at highly competitive prices.



# HYDRAULIC SLEEPER PACK GRABS





## KEY FACTS

Thomson Hydraulic Sleeper Pack Grabs can be specified for handling up to 60 sleepers per lift in any pack configuration.

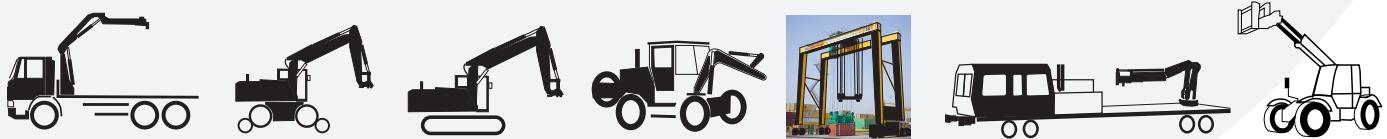
Each one is individually engineered to meet your precise specification whilst quality and reliability are assured by full factory testing and inspection against that specification.

Our pack grabs are relied upon in heavy-duty applications all over the world.

## OPTIONS

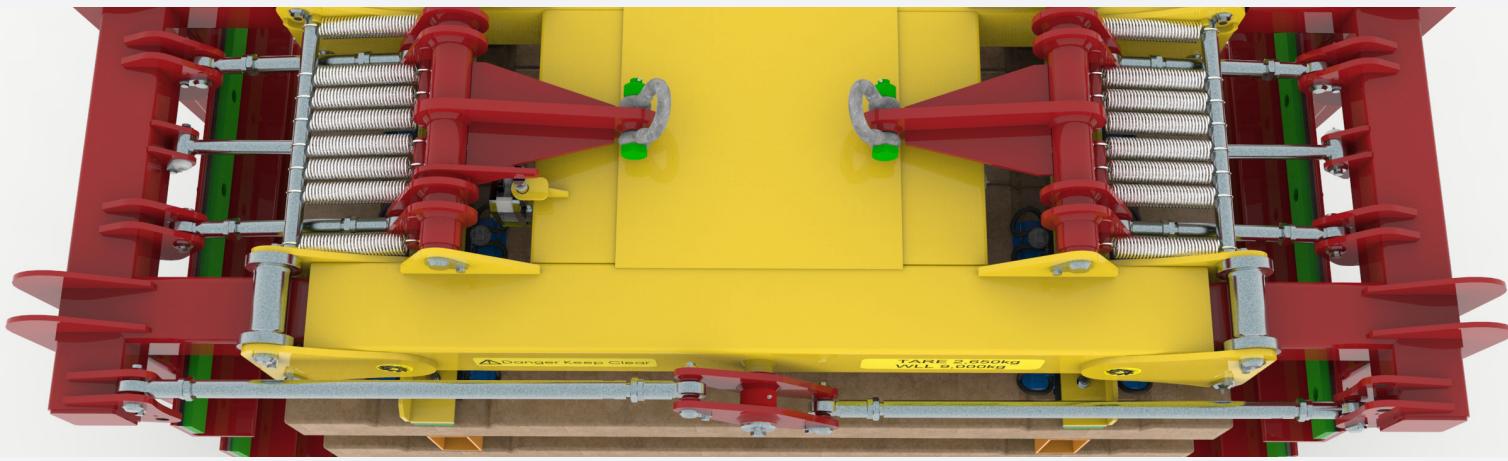
As well as the types shown here which are all powered by the host machine, integrated power modules can be provided, powered by electric motors, petrol or diesel engines and controlled by pendant or radio control modules.

Thomson Engineering Design recognise that almost no two applications are the same and so each product is individually designed and manufactured in our state-of-the-art factory.



# MECHANICAL PACK GRABS





## KEY FACTS

Many sleeper manufacturing, storage and stock-holding yards are only equipped with mobile cranes or gantry cranes and often these machines have no auxiliary power system for actuating a sleeper grab.

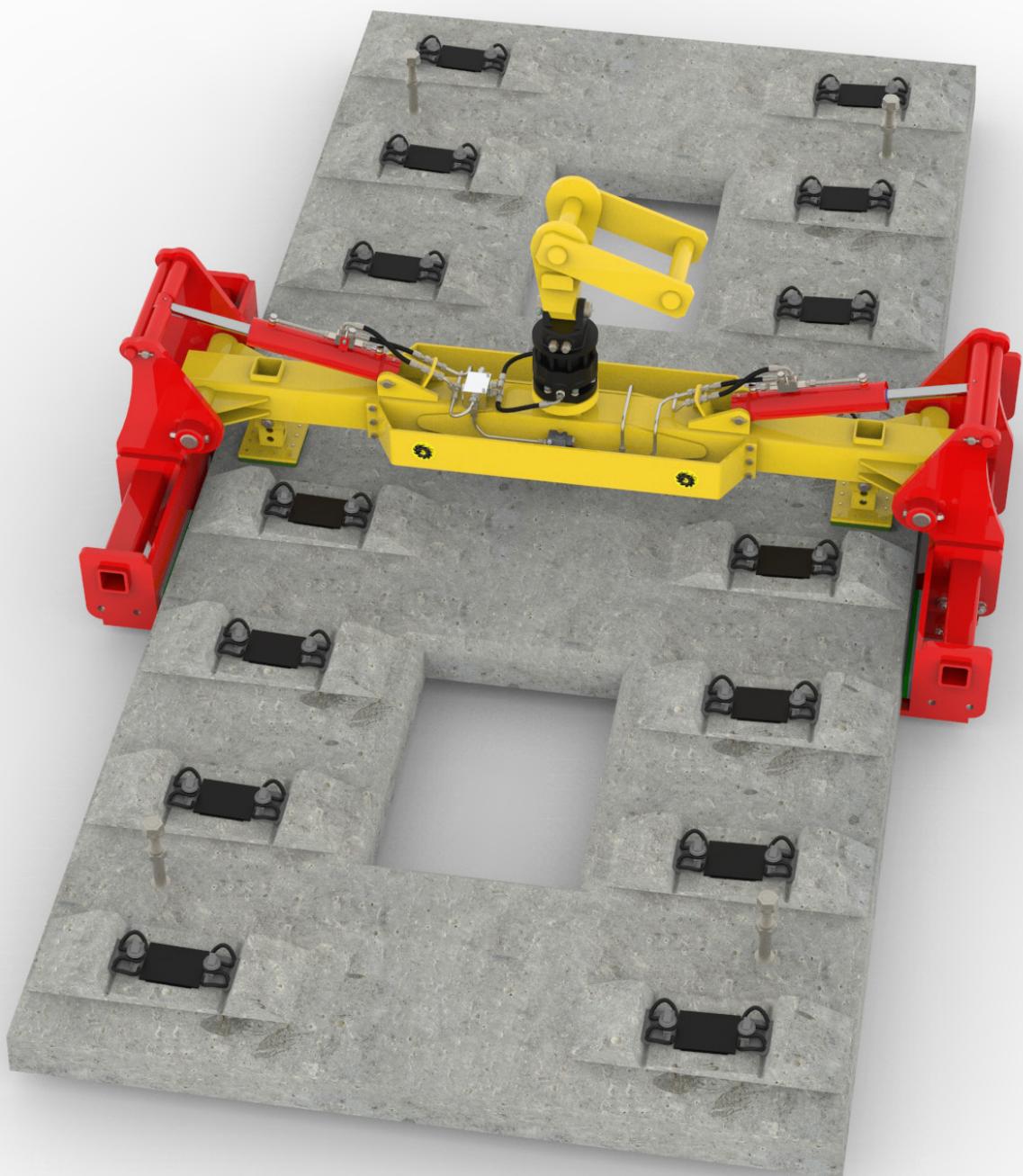
To meet the needs of this sector of the market, Thomson Engineering Design produce a range of sleeper handling grabs which incorporate a mechanical 'escapement' mechanism which automatically grabs and releases the sleepers as the device is raised and lowered.

As the grab is lowered onto a pack of sleepers the mechanism automatically trips and when the grab is raised again the jaws close on the sleeper ends before the grab lifts. When the grab delivers the pack the same mechanism trips again, automatically releasing the sleepers and locking the jaws open ready for the next pack.

Mechanical Pack Grabs can be supplied for any sleeper size, weight and pack configuration.



# TSH13 TRACK SLAB HANDLER





## KEY FACTS

The TSH13 Track Slab Handler has removable jaw extensions making it suitable for handling both IVES and PORR track panels.

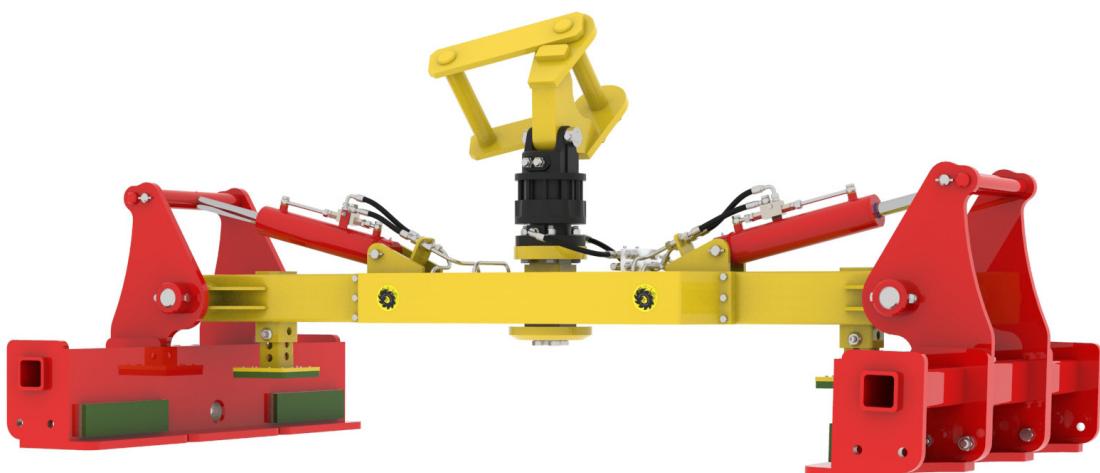
Soft urethane pads at all contact points protect the concrete surfaces from damage whilst the high grip force ensures safety.

Check valves on the cylinders lock the jaws in place in the event of a hydraulic failure and parachute valve protection means that the load cannot be accidentally released during the lifting operation.

Built in pressure control valves mean that the device can be fitted to almost any host machine.

## ALTERNATIVE PRODUCTS

Custom made handlers are available for all other track slab types.



## Notes:



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