

Operation & Maintenance Manual Rosenqvist SL400/SL450

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PANDROL

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Thank you for choosing a quality product from Pandrol AB

Preface

This manual is intended for people who handle and operate this machine.

This manual is originally written in Swedish and then translated into the local language by Pandrol AB. Pandrol AB reserves the right to change specifications, equipment, instructions and maintenance guidelines without prior notice.

The manual contains instructions about the following topics:

- Installation
- Operation
- Safety features and warnings
- Maintenance and troubleshooting

IMPORTANT!

This manual contains ordered actions, e.g.

1. Do this
2. ...and then this...
3. ...and finally this

These actions must be done in the numerical order presented.

(1) refers to a component in a figure/illustration.

REVISION NOTES

Date	Revision	Note
2019-06-28	01	New layout, revised manual for SL400, SL450.

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1. Safety

Incorrect installation, operation and maintenance of this equipment may be dangerous and result in severe personal injuries.

Warnings and safety precautions described in this document shall only be considered as a minimum. National conditions, standards and regulations override conditions, standards and regulations described in this document.

Work with the machine is only to be carried out by qualified personnel, well-informed and educated in general railway workmanship and specifically in the conditions, standards and regulations on specific rail track.

The machine may only be used for its specified purpose. Any adjustments or service on the machine is only allowed to be done by qualified personnel that have read and understood this manual and have had training and information from Pandrol AB.

1.1 Safety actions

- Read and understand all safety regulations and warnings before installation, operating or performing maintenance on this machine.
- Locate emergency stop buttons and fire extinguisher on the carrier machine before installation, operating or performing maintenance on this machine.
- It is essential that all use, maintenance and service is implemented by qualified personnel, trained by Pandrol AB.
- The machine shall not be used as a transport vehicle for personnel or equipment. Only sleepers are allowed to be carried with the machine.
- Make sure that no unqualified/unauthorized persons are in the operating area during installation, use or maintenance.
- Safety regulations regarding personnel in operating area for the sleeper layer are valid for this attachment.
- Improper operation of this equipment can be dangerous and result in personnel injury or death. Personal eye protection and clothing must be worn when undertaking work.
- Improper maintenance of this equipment can be dangerous and result in personnel injury or death.
- Before maintenance work on the machine, disconnect hydraulics and electrics to the carrier machine.
- Use and follow standards and regulations, accident prevention regulations and regulations concerning special ambient conditions (e.g. areas potentially endangered by explosive materials, heavy pollution or corrosive influences).
- It is of great importance that all service, component replacements or other operations in the electronic or hydraulic systems are accomplished by qualified personnel only.
- The use of solvents as cleaning agents and the use of lubricants can involve health and/or safety hazards. The manufacturers of the solvents and lubricants should be contacted for safety data. The recommended precautions and procedures of the manufacturers should be followed.
- The use of an air jet, which must be less than 8 bar (116 psi), to blow parts clean or to blow them dry after being cleaned with a solvent will cause particles of dirt and/or droplets of the cleaning solvent to be airborne. These conditions may cause skin and/or eye irritation.
- When using an air jet do not direct it toward another person. Improper use of air jet could result in bodily injury.

1.2 Safety equipment

The machine is to be equipped with safety equipment according to national requirements.

1.3 Control system

The machine is to be equipped with safety equipment according to national requirements.

1.4 Moving parts

When operated, some parts of the machine are moving. Moving parts can cause personal injury or death.

To avoid accidents, follow the guidelines below:

- Keep hands etc. away from moving parts when operating the machine.
- Make sure no unauthorized personnel are in the working area when working the machine, particularly when sleepers are carried by the sleeper layer.



WARNING! Moving parts - risk of crushing, injury or death

1.5 Pressurized hydraulic oil

High pressure fluid is present in operational hydraulic systems. Fluids under high pressure are dangerous and can cause serious injury or death.

To avoid accidents, follow the guidelines below:

- Only qualified technicians or engineers are allowed to make modifications, repairs or adjustments to the hydraulic system.
- Always wear appropriate personal-protection equipment.
- Shut off the engine and drain the hydraulic system.



WARNING! Pressurized hydraulic oil – risk of personal injuries

1.6 Live current

Contact with electric parts can damage the equipment if live current is present. To avoid accidents, follow the guidelines below:

If electricity needs to be connected for testing purposes. Keep hands, tools etc. away from all electrical parts.

In any other case:

1. Shut off the vehicle's engine.
2. Disconnect the battery terminals.



WARNING! Live current

1.7 Machine in operation

Special precautions must be taken to ensure that operation of the machine will not result in severe injury or death and/or damage to the equipment.

To avoid accidents, make sure no one is in the vicinity of the machine before operation is started.



WARNING! Machine in operation

1.8 Operator leaves the machine unattended

When the operator leaves the machine unattended, the machine must always be parked horizontally on the ground. This is to ensure that the sleeper layer do not fall down on personnel or on infrastructure at any technical difficulties.



WARNING! Machine must always be parked safely on the ground

2. Risks

2.1 Introduction

An analysis shows that there are three distinct risk areas for this equipment:

- Operation, lift and handling
- Repair
- Maintenance

For each risk identified, there is a short explanation and the means of limiting this risk described. Most of the operating risks are also highlighted in other chapters in this manual.

Great emphasis is placed on the operators training to reduce the risk associated with the operation of this equipment. It should be stressed that, whilst the risk assessment laid out in this chapter include some consideration of the risk of working the machine under on-site conditions, this should not be taken as a thorough risk assessment of the site operations, as other equipment and processes, not considered herein, may affect the overall risk profile of the operation.

2.2 Operating risk

Drop of sleepers

Risk: During transport of sleepers there is a possibility that the operator unintentionally activate the function for opening of grapple arms and thereby drops the sleepers.

- Operators of the sleeper layer should always get training in how to operate the equipment.
- All personnel are to be kept at least 10 meters from machine when operating the equipment.

Loss of hydraulic pressure

Risk: If the machine loses the hydraulic pressure there is risk for drop of sleepers.

All hydraulic cylinders are equipped with hydraulic locks which prevents the cylinders to open in case a hose should break in the hydraulic system. All hoses fitted to the machine have a burst pressure in excess of four times the specified working pressure.

Hydraulic leakage (personal injury)

Risk: High pressure hydraulic systems are used on this equipment. Damage or failure of hoses and fittings may cause a high pressure jet of oil to be emitted from the system. This could be hazardous to eyes, skin etc. Pools of leaked oil could lead to an increased risk of slips, trips or falls. Connecting and disconnecting the supply and return hoses to the hydraulic systems of the carrier machine carries a risk that oil may be spilled. Hydraulic oil is frequently very hot and may cause burns and scalds.

- All hoses fitted to the sleeper layer have a burst pressure in excess of four times the specified working pressure. Regular monitoring of the dimensions of the ferrules fitted to the hoses, and careful training of the staff employed to make up hoses ensures that hose specifications are consistent.
- All components used in the hydraulic system are CE marked.
- Quick couplers are used, which minimizes oil being spilled during connection or disconnection to the carrier machine.
- Operators and service personnel should wear appropriate protective equipment, such as gloves, goggles and overalls. Skin exposed to hydraulic oils should be washed immediately.
- All personnel should be made aware of the contents of the product data sheets relating to the oil used.
- Pandrol AB recommends the use of biodegradable oils and greases, in order to minimize the environmental impact in case of an oil leakage.

2.3 Overturning

Risk: Operating the sleeper layer with a machine of insufficient capacity or if jibbed out too great a radius, there is a risk for overturning.

- Only trained personnel should operate the equipment.
- Safe load indicators must be used at all times.
- Ground conditions, rail cant etc should be considered before lifting.
- Keep all personnel clear of working area when operating the equipment.

2.4 Repair and maintenance

Damage to the equipment

Damage to the machine during repair or overhaul may cause the equipment to malfunction and may increase risk for personnel when in service.

Only competent staff should perform any repair or maintenance. For advice on maintenance or repair on the machine, please contact Pandrol AB.

Personnel injury

High pressure hydraulic system may have stored pressure even when disconnected from the rail/road machine. Some parts of the machine are heavy and may cause personal injury if dropped.

- Only competent staff should perform any repair or maintenance. For advice on maintenance or repair on the machine, please contact Pandrol AB.
- Appropriate protective equipment should be used at all times.
- Careful consideration should be given to the handling of all parts before commencing repair operations.

Operator drops the sleeper layer

- Machine must only be lifted in the machine bracket or rotator. Only properly trained personnel should attach and detach the equipment. Do not lift the machine with loose items lying on the machine. Keep all personnel clear of working area when lifting machine.

2.5 Qualified personnel

The sleeper layer is only to be used by qualified personnel, thoroughly familiar with and trained in general railway workmanship and operation according to the conditions and standard regulations applying to the track they are working on.

The equipment must be serviced, maintained, or in any way modified only by qualified personnel who are familiar with the Operation & Maintenance Manual and have received training and information from Pandrol AB.

The components in this unit and other components in the vicinity are powered by dangerous contact voltage.

Touching any parts, connected to such voltage, can cause serious injury or death.

In order to avoid personal injury or death and/or material damage, everyone involved with assembling, starting-up or overhaul must possess pertinent knowledge of the following:

- The automation technology sector
- Dealing with dangerous voltages
- Using standards and regulations, accident prevention regulations and regulations concerning special ambient conditions (e.g. areas potentially endangered by explosive materials, heavy pollution or corrosive influences)



WARNING!

All maintenance and service, or other operations on the electronic or hydraulic systems are to be carried out by qualified personnel.

2.6 Warning labels and information symbols

Below are warning labels and information symbols on the machine.

If any of these labels become damaged or lost, they are to be replaced with new original warning labels that are available from Pandrol AB.

		
<p>710016 - Read manual</p>	<p>710048 - Wear safety goggles</p>	<p>710051 - Wear safety helmet</p>
		
<p>710052 - Wear ear protection</p>	<p>710020 - Warning, Oil pressure</p>	<p>710019 - Warning, Risk of crushing</p>
		
<p>710021 - Do not ride or stand on machine</p>		

3. Description

The sleeper layer is designed and manufactured for efficient positioning of concrete sleepers. It utilise standard couplings on heavy excavators and loaders.

Rotator is provided as option. The rotator is hydraulically rotating, allowing perfect sleeper positioning regardless of the position or level of the carrier machine.

Up to four adjacent sleepers can be laid simultaneously from an accompanying supply. Lifted into position, their correct placement are ensured by a precision gauging hydraulic system that spreads the sleepers to the desired distance up to maximum 750 mm (29.5 in).

The sleeper layer has been rigorously developed, extensively tested and utilised with excellent results and high productivity. The sleeper layer can also be used to gather sleepers for storage.

SL400/SL450 is delivered CE-certified.

This is the machine identification plate with CE-marking and serial number.

PANDROL		Machine type	<input type="text"/>
Pandrol AB	Hyggesvägen 4	Serial no.	<input type="text"/>
	S-824 34 Hudiksvall	Weight (kg)	<input type="text"/>
SWEDEN	Phone +46 650 165 05	Max load (kg)	<input type="text"/>
	www.rosenqvistrail.com	Manufact. Year	<input type="text"/>
			CE

Fig 1. Identification plate

3.1 The basis for a sleeper layer

Without additional equipment (options) the sleeper layer consists of the following units:

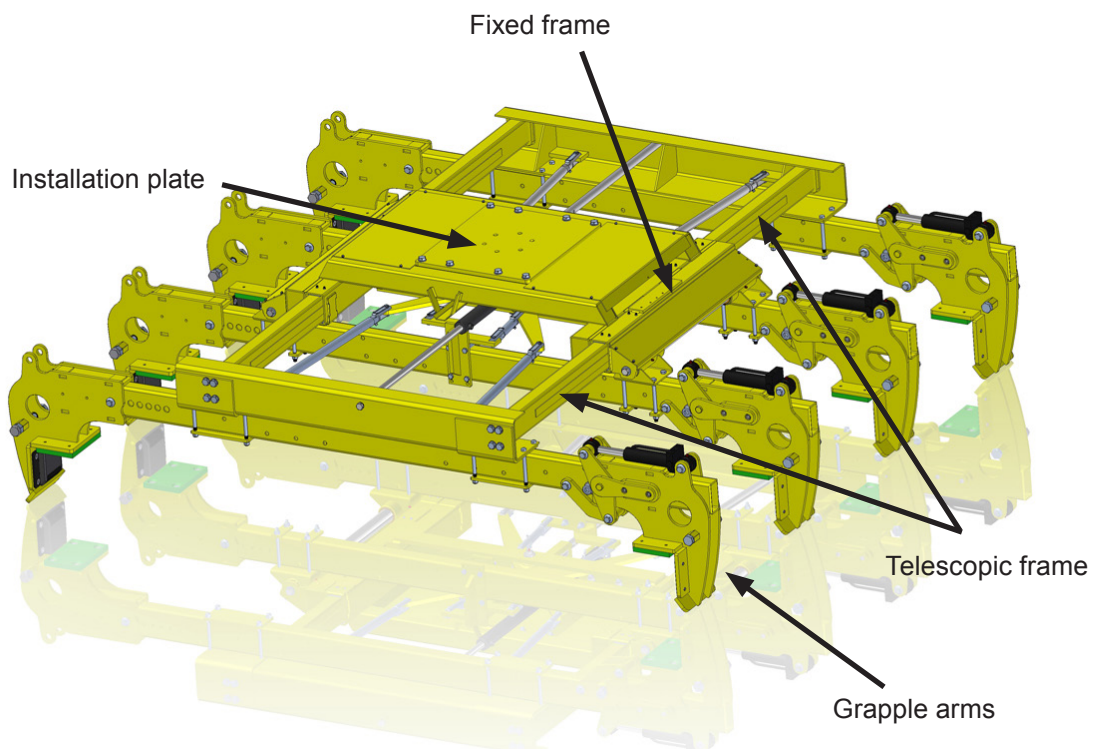


Fig 2. The figure shows SL450, the principle is the same for SL400.

3.2 Additional equipment

Machine bracket

With the machine bracket attached to the machine it is possible to lift and handle the sleeper lifter with a carrier. There are many different types of brackets available. Mounting of the machine bracket is normally done at the factory. Mounting of the machine bracket is to be done by qualified personnel only in accordance with the carrier manufacturer's recommendations.

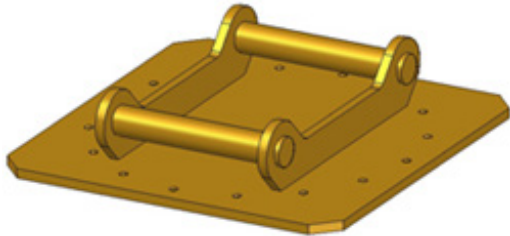


Fig 3. Machine bracket

4. Technical data

Type	SL400- 1430 0001	SL450 - 5008200
Length	1 000 – 2 500 mm (39.7 – 98.5 in)	1 120 – 2 500 mm (6'7" – 14'8" ft-in)
Height - Standard exclusive rotator and tilt rotator	655 mm (25.8 in)	762 mm (30 in)
Width	2 578 mm (101.5 in)	Min: 2 905 mm (114.1 in)
Weight (exclusive rotator/ tilt rotator)	814 kg (1795 lb)	1050 kg (2315 lb)
Lifting capacity	Maximum 1250 kg (2756 lb)	Maximum 1800 kg (3968 lb)
Number of sleepers	4 pcs	
Sleeper length	Per request	STANDARD 2490 mm - 2800 mm OPTION 2220 mm - 2530 mm
Sleeper distances	750 mm (29.5 in)	
Performance Any suitably excavator or truck with crane.	Up to 60m/h (197 ft/h)	Up to 60m/h (197 ft/h)
Hydraulics Two-way hydraulic function, 2 hoses.	<p>Recommended oil flow: 30-50 L/min (7.9-13.2 gal/min)</p> <p>Recommended oil pressure: 180-200 bar (2611-2900 psi) Maximum</p> <p>Attention! Exeeding the maximum oilpressure can cause damage to the equipment.</p>	

5. Installation

5.1 Attach the sleeper layer

1. Make sure that the Sleeper layer is equipped with a machine bracket suitable for the actual carrier. The bracket can be either welded or bolted onto the bracket installation plate.
2. Connect the Sleeper Layer to the excavator arm, or to the crane on the carrier. Make sure that it is correctly connected and secured.
3. Stop the engine and release the remaining hydraulic pressure.
4. Connect the two hydraulic hoses from the sleeper layer to the carrier machine auxiliary hydraulic functions.

Pre-drilled holes for rotator attachment.

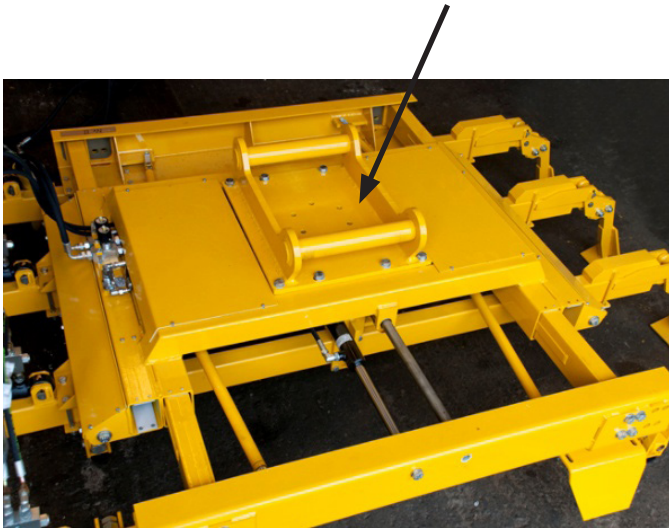


Fig 4. Machine bracket



WARNING! Bracket must be welded on the sleeper layer installation plate by qualified personnel and in accordance with the carrier manufacturer's recommendations.

5.2 Connect the hydraulics

Connect the hydraulics to the carrier machines auxiliary hydraulic function quick couplers.

5.3 Connect the hydraulics with rotator (SL400 only)

Connect the hydraulics to the carrier machines auxiliary hydraulic functions according to the picture below.

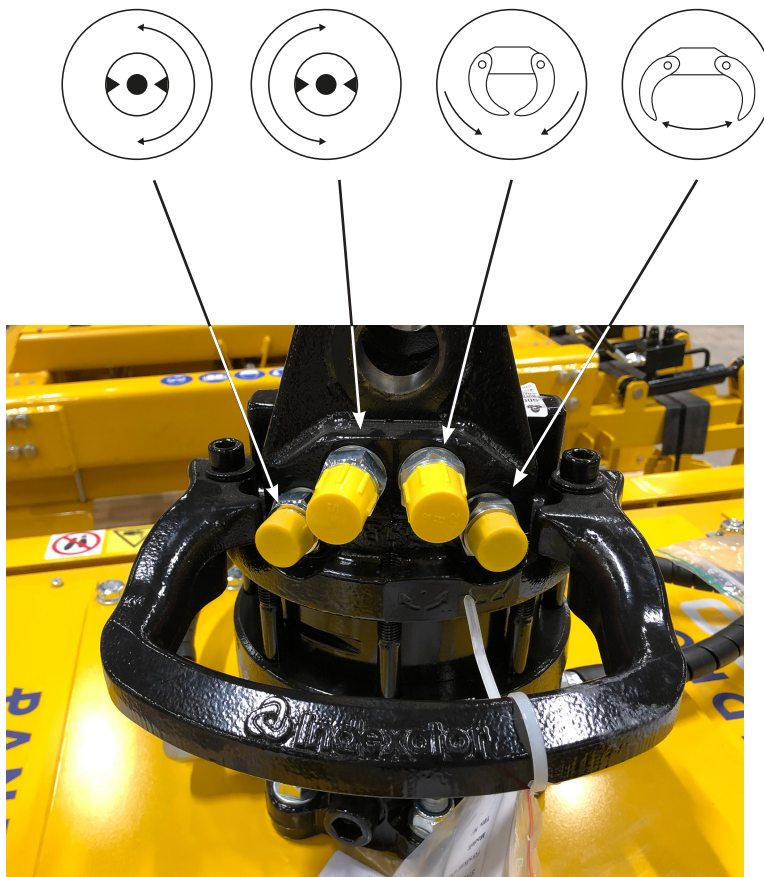


Fig 5. Connecting the hydraulics

IMPORTANT!

The hydraulic pressure from the carrier machine should never exceed 180-200 bar (2611-2900 psi)

NOTE!

Deviation in the hydraulic flow will result in inaccurate functionality of the sleeper layer. Recommended oil flow from the carrier machine: 30-50 L/min (7.9-13.2 gal/min)

Adjustment of the hydraulic oil pressure and flow settings on the sleeper layer are normally not necessary. The adjustment is done at the factory. If minor adjustments are necessary for correct functionality, please contact Pandrol AB for more information.

5.4 Function test

1. Set the sleeper layer to "work mode".
2. Operate the hydraulic function to close the grapples and spread the arms.
3. Operate the hydraulic function to open the grapples and retract the arms.
4. Set the sleeper layer to loading mode.
5. Operate the hydraulic function to close the grapples. The spreading function should not move the arms.
6. Operate the rotating function if applicable.
7. Check for leakage and tighten leaking couplings if necessary.



WARNING! The operator of the equipment must take necessary precautions to ensure safe operation of the equipment. The operator is responsible that nobody interferes with the machine and/or equipment when it is in use.

Safety regulations for the carrier regarding personnel in the operating area must also be considered during operation.

6. Setting up the sleeper layer

The sleeper layer must be tested and adjusted to fit:

- The actual type of concrete sleeper.
- The applicable sleeper distance.

All movements on lifting arms, rotator and spread functions must if fitted be checked and correctly adjusted before use to ensure no damage to the sleepers or injury of a person

6.1 Preparation before use

Before operation, the sleeper layer has to be adjusted for the current track condition. In this chapter will guide you through the necessary adjustments.

- Measure the dimensions on actual sleepers: length, height, width.
- Check the sleeper distance on the track and set the same sleeper distance for the sleeper layer.
- All movements on grapple arms and spread functions must be checked before use to prevent damage to the sleepers when handling.



WARNING! The sleeper layer is only to be used on a railway by qualified and experienced personnel.



WARNING! Set up of the sleeper layer is only to be done by qualified personnel with experienced workmanship.



WARNING! The carrier must adhere to the standards, terms and general conditions laid out by the track owner or railway administrators. The user of the equipment must observe and comply with the appropriate safety precautions.



WARNING! The sleeper layer must always be handled with the utmost care in all aspects during operation or maintenance. Failure to do so entails risk of mishaps that could result in serious or even fatal injuries.



WARNING! The user of the equipment must take the necessary precautions to ensure safe operation of the equipment. The operator is responsible for ensuring that nobody interferes with the machine and/or equipment whilst it is in use.

6.2 Adjustment for different sleepers

Measure the dimensions on actual sleepers: width, height and length. If necessary, adjust the sleeper layer.

Check the sleeper distance on the actual track and prepare the sleeper layer for it. The sleeper layer is equipped with sleeper grapple units for laying up to four sleepers at a time.

6.3 Actual sleeper length adjustment SL400

The SL400 is designed for limited variation in length of sleeper. If a different sleeper length is to be handled, please contact Pandrol AB for ordering of new parts.

There are two types of lifting yokes depending if there is a narrow- or broad gauge. The grapple arm mounted to be used with narrow gauge (Fig. 7) is of a floating type to adjust to the sleeper.

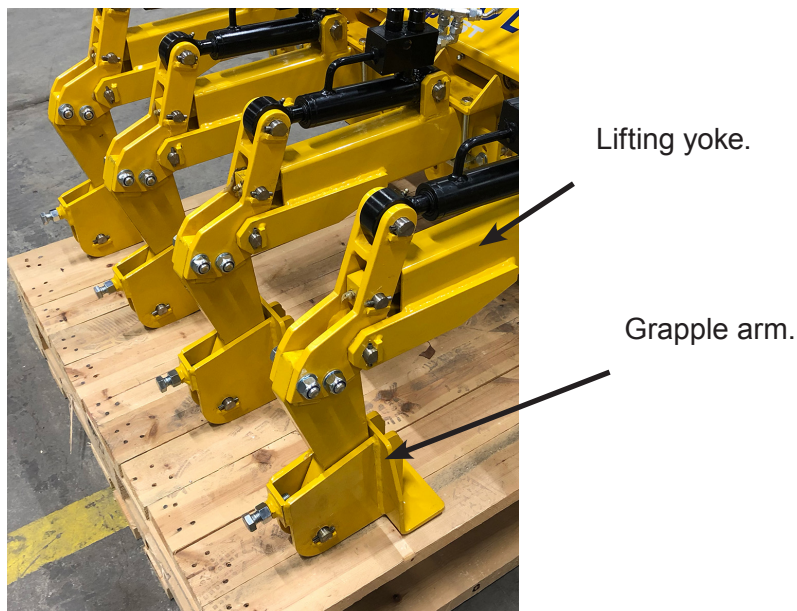


Fig 7. Actual sleeper length

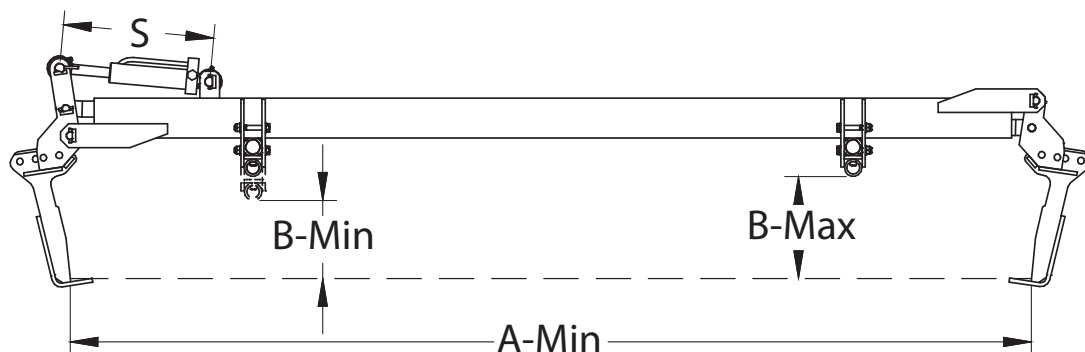


Fig 8. Measurement, sleeper length adjustment.

6.4 Actual sleeper length adjustment SL450

The sleeper layer SL450 is designed for a variation in length on sleepers. The minimum sleeper length is 2490 mm and the maximum length is 2800 mm as standard (option 2220 mm - 2530 mm).

The adjustment can be done on both sides of the sleeper layer. The figures below shows where the adjustment is done.

Description:

1. Measure the length of the current sleeper.
2. Loosen the bolts using two 21 mm spanners.
3. Measure the distance between the grapple arms with the hydraulic cylinder extracted.
4. Slide the fixed grapple arm to desired position (Fig. 8).
5. The grapple arm with the hydraulic cylinder needs space to grab the sleeper, therefore the distance between the grapple arms should be minimum 20 mm shorter than the length of the sleeper.
6. Tighten the bolts.

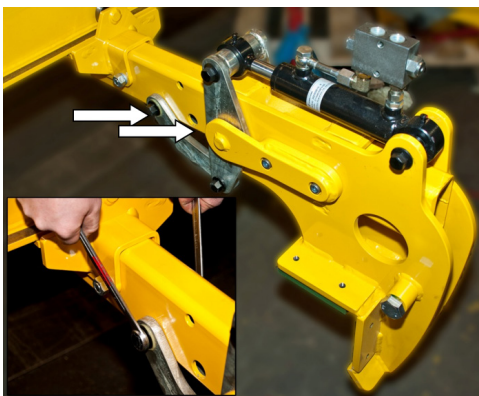


Fig 9. Two adjustments positions.

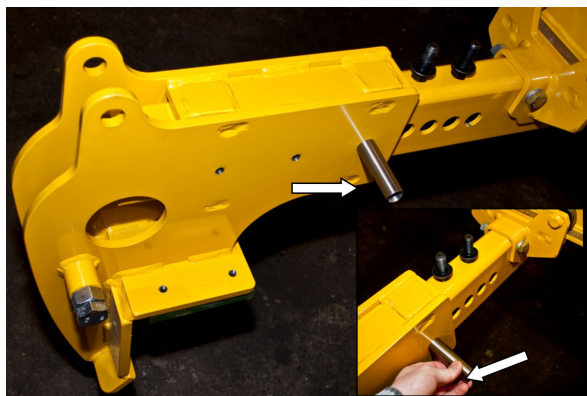


Fig 10. Eight adjustment positions, 37 mm/position.

6.5 Actual sleeper height SL400

The brackets on the sleeper layer can be adjusted to fit the height of the sleepers, see pictures below. Adjust the height so that the sleeper is hold by the rubber hose only. Wrong adjustment can cause damage to both sleeper and adjustment bracket.

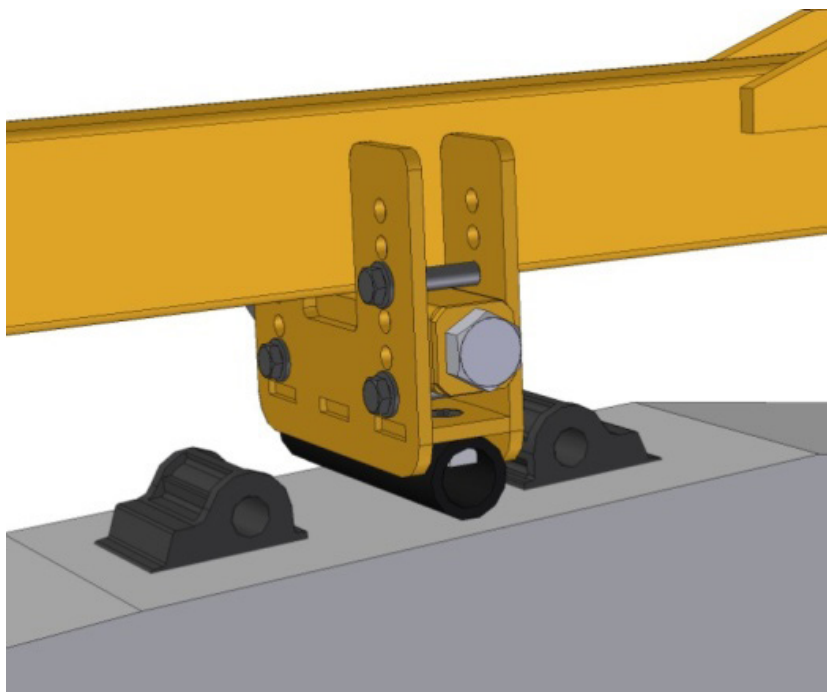


Fig 11. Actual sleeper height.



Fig 12. Actual sleeper height

6.6 Actual sleeper width

The Sleeper Layer SL400 is manufactured for a limited variation in sleeper width. The min and max distance must be specified when ordering the sleeper layer.

Adjustment for correct sleeper width SL400/SL450

To ensure proper function of the sleeper layer, it is important that it grabs the sleepers at its center point when they are gathered. Adjust the sleeper layer according to the following procedure:

1. Measure the actual distance A (Fig 13). If distance A differs from actual sleeper width, make adjustments according to points 2-4.
2. Loosen the locking nut (1).
3. Adjust the distance A to the sleeper width with the adjustable screw (2).
4. Tighten the locking nut (1).
5. Repeat step 2-4 for all sleeper spacers.
6. Start the engine and turn on the power for the carrier.
7. Operate the spreading cylinders to grapple position (retract).
8. Stop the engine and turn off the power for the carrier. Check distance measurements between the sleeper grapple units.

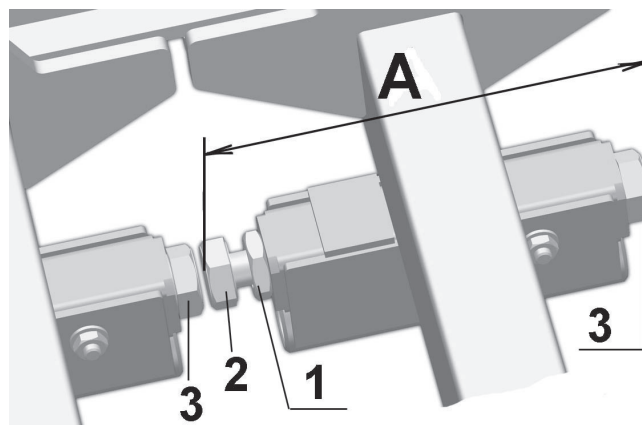


Fig 13. Actual sleeper width adjustment

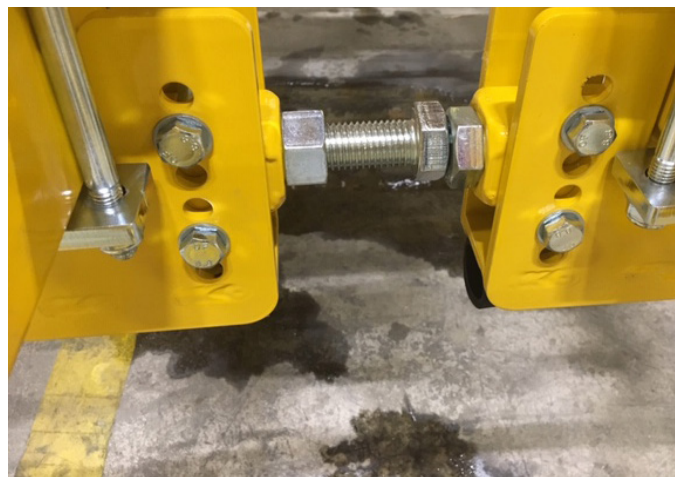


Fig 14. Actual sleeper width

6.7 Actual spreading width

The desired spreading width can be adjusted. The sleeper layer should hold no sleepers when adjusting the width.

To adjust the sleeper distance:

1. Release the screw and activate the hydraulic function. Spread the sleeper layer to desired position.
2. Move the end position sleeve to its end position according to Fig. 15. Fit and tighten the locking screw in most suitable hole.



Fig 15. Actual spreading width



WARNING! It is important to setup and adjust the sleeper layer in order to guarantee the right performance.

7 Operating the sleeper layer

7.1 Operating modes

The sleeper layer has two operating modes, **Loading Mode** and **Work Mode**, see figure 16, which enables loading and unloading sleepers from a truck body or a rail car.

Loading Mode

In loading mode only the sleeper grapple function is active. The spread function is cut off to ensure that no unwanted movements occur.

Work Mode

In work mode the grip and spread functions are operated with the same hydraulic function from the carrier machine. A hydraulic valve enables the grip and spread functions to operate in a two step sequence. The first sequence controls the grapple arms to grip and maintain the pressure holding the sleepers. When the sleepers are caught and hold, the increasing pressure activates the second sequence to spread the arms to the mechanically pre-set distance.

When the sleepers are placed into position the operator release the sleepers by changing the direction of the two way hydraulic function to open the grapples. When the grapples are fully opened, a sequence pressure valve enables the spreading function retract the arms back into the loading position.

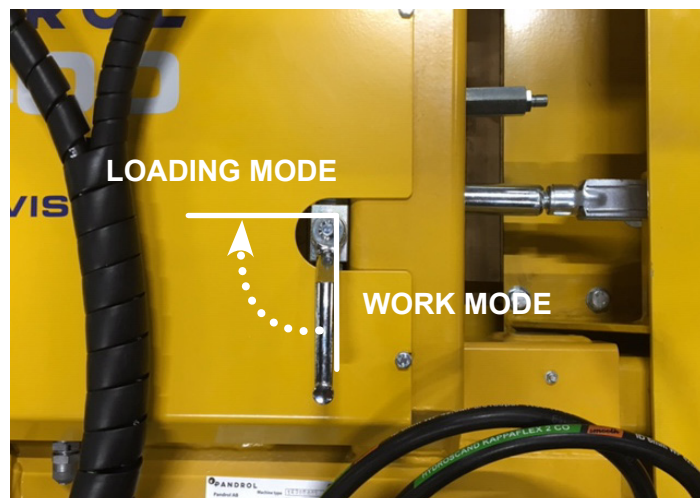


Fig 16. Operating modes

7.2 Loading

1. When loading sleepers onto a railway car or a truck body, set the sleeper layer to "Loading Mode"
2. Ensure that the sleepers are placed on a flat horizontal surface for a safe and correct grip.
3. Position the sleeper layer onto the sleepers to be lifted, and make sure it is correctly positioned before operating the grapples.
4. Before lifting the sleepers, make sure the sleeper layer has a firm grip of the sleepers and that there are no persons within the working area.
5. Lift and place the sleepers on a wooden dunnage on the railcar or the truck body.

7.3 Unloading

1. When unloading sleepers from a railcar or a truck body, set the Sleeper Layer to "Loading Mode"
2. Position the sleeper layer onto the sleepers to be lifted, and make sure it is correctly positioned before operating the grapples.
3. Before lifting the sleepers, make sure the sleeper layer has a firm grip of the sleepers and that there are no persons within the working area.
4. Lift and place the sleepers on a flat horizontal storage area.

7.4 Positioning of sleepers on track bed

1. Set the sleeper layer to "Work Mode".
2. Position the sleeper layer onto the sleepers to be lifted, and make sure it is correctly positioned before operating the grapples.
3. Once the sleepers are grabbed, make sure the sleeper layer has a firm grip of the sleepers and that there are no persons in the working area. Lift the sleepers and slew for positioning on the track bed.
4. Activate the hydraulic function to spread the sleepers to the preset position.
5. Position the sleepers on the track bed and activate the grapple opening function and make sure that the sleepers are placed in a correct position.
6. Lift the sleeper layer and activate the folding function to its limit, then prepare for next grip of sleepers.
7. Proceed the work by repeating the above instructions.



WARNING! Do not to activate the gripping function too long when it has reached its limit. The sleeper layer works in an automatic cycle, which means that the spreading function starts moving when the set hydraulic pressure is achieved (preset hydraulic valve).



WARNING! The user of the equipment must take the necessary precautions to ensure safe operation of the equipment. The operator is responsible for ensuring that nobody interferes with the machine and/or equipment whilst it is in use.

Safety regulations for the carrier, regarding personnel in the operating area, is also valid for this attachment

7.5 Preparation of railroad bed

Preparation and marking of the railroad bed should be done for perfect sleeper placement. Preparation has to be done ahead of the sleeper layer and preferable by other personnel. By the two following markings on the railroad bed, with spray colour, high efficiency can be achieved in laying.

- Aiming line along the railroad bed. This line has to be, preferable, done on left end side of the sleeper. From machine operators view.
- Line, on and perpendicular to aiming line. These lines show the position of the eight sleepers on each lay.

The distance between each line is 4 x sleeper pitch.

Example: $4 \times 600 = 2\,400$ mm (94.5 in)



WARNING! Do not allow anyone near the working area during work because of the risk of personal injury or death. Safety regulations for the carrier, regarding personnel in operating area, are also valid for this attachment.

9. Hydraulic system

Adjustment of the hydraulic oil pressure and flow settings on the sleeper layer are normally not necessary. The adjustment is done at the factory. If minor adjustments are necessary, for correct functionality, please contact Pandrol AB for more information. The picture below shows where the measuring outputs and adjustment points are located.

IMPORTANT!

The hydraulic pressure from the carrier machine should never exceed 180-200 bar (2611-2900 psi)

NOTE!

Deviation in the hydraulic flow will result in inaccurate functionality of the sleeper layer. Recommended oil flow from the carrier machine: 30-50 L/min (7.9-13.2 gal/min)

9.1 Overview

Pressure measurement

1. Spread retract (in)
2. Spread extract (out)
3. Gripping function
4. Grip release function

Pressure adjustment

5. Sliper grip pressure
6. (underneath) spread retraction pressure
7. Spread extraction pressure

Speed adjustment

8. Spreading

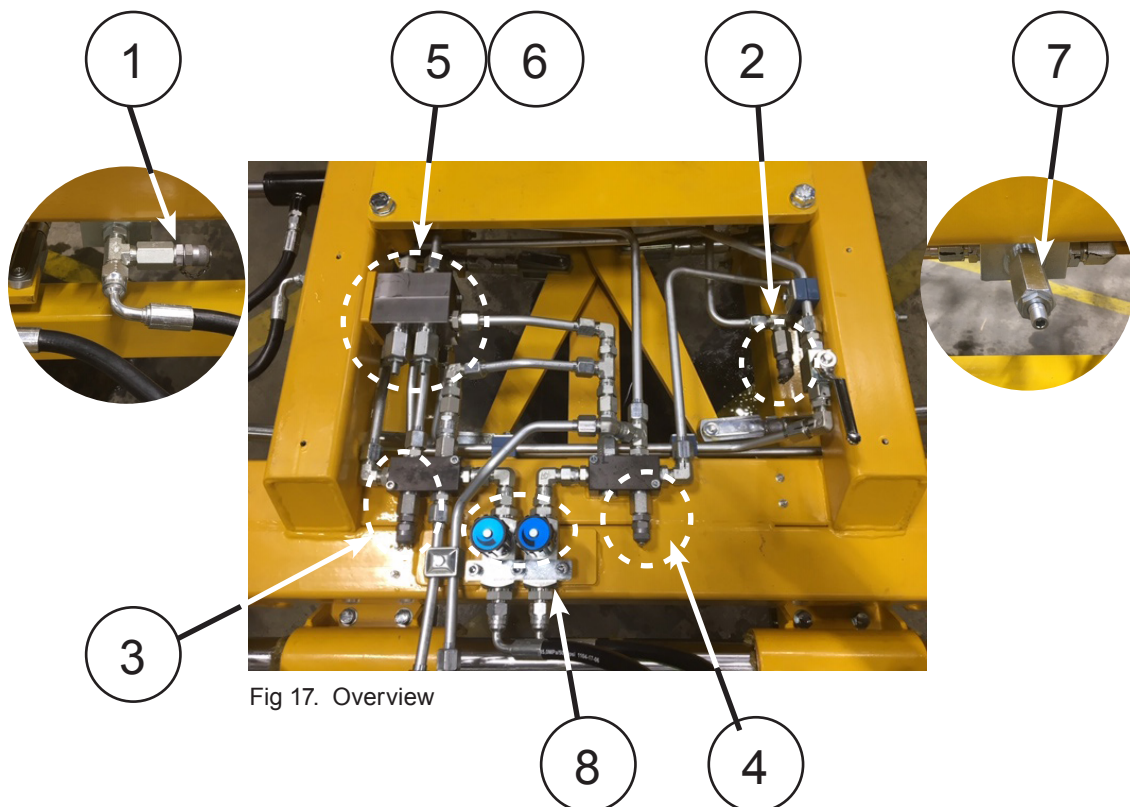


Fig 17. Overview

9.2 Speed adjustment

The hydraulic flow controls the speed of all functions. Adjust the hydraulics according to the picture below.

The adjustment knob (1) defines the spreading arm extraction speed.

The adjustment knob (2) defines spreading arm retraction speed.

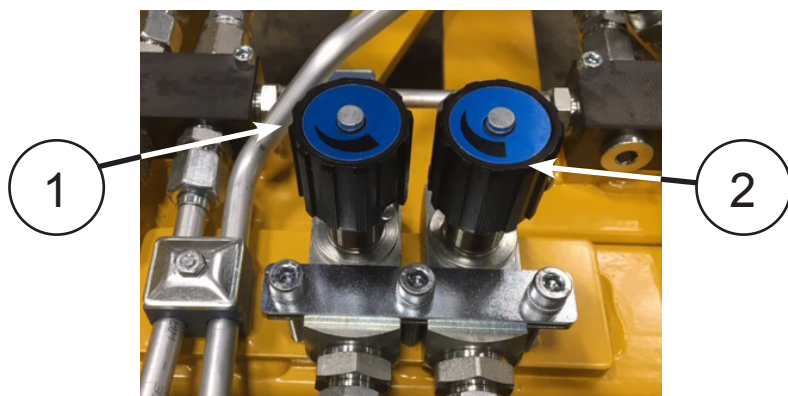


Fig 18. Speed adjustment

9.3 Pressure adjustment

Sleeper grip and release functions

If more pressure is needed to grab the sleepers, adjust the screw (1) clockwise increase the pressure and anti-clockwise to decrease the pressure.

If more pressure is needed to release the sleepers, adjust the screw (2) clockwise increase the pressure and anti-clockwise to decrease the pressure.

NOTE!

If the adjustments screws are adjusted to its end positions, the spreading function will not work correctly. If the the sleeper layer is unable to hold the sleepers in position despite the pressure adjustment screw is set to max, check the pressure at the carrier machine and adjust without exceeding 200 bar (2900 psi)

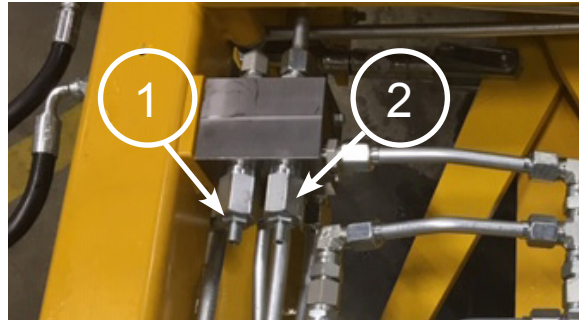


Fig 19. gripping pressure adjustment

Spread retraction pressure adjustment

If more pressure is needed to retract the spreading function, adjust the screw clockwise to increase the pressure and anti-clockwise to decrease the pressure.

NOTE!

Adjustment screw is positioned underneath the grip pressure adjustment block.



Fig 20. Spread retraction pressure adjustment

Spread extraction pressure adjustment

If more pressure is needed to extract the spreading function, adjust the screw clockwise to increase the pressure and anti-clockwise to decrease the pressure.

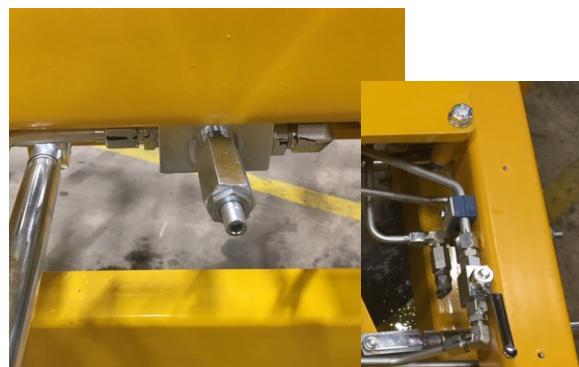


Fig 21. Spread extraction pressure adjustment

10. Maintenance

Maintenance and overhaul is to be carried out by qualified personnel only.

The sleeper layer is designed for the absolute minimum of maintenance. All its components have been chosen for a long working-life and are of high quality.

The sleeper layer requires:

- Visual inspection before every working shift
- A minor maintenance after every working shift
- A more thorough overhaul every six months

Warranty applies on consumable parts and spares delivered by Pandrol AB.



WARNING! Machine engine and hydraulics must be turned OFF before all service and overhaul work. Failure to do so could lead to fatal injury.

10.1 Daily inspection

Before and after every usage or working shift:

- Check the condition and if there is any leakage from the hydraulic components or hoses. If necessary, tighten the couplings and replace damaged parts.
- Check fastening clamps and its condition. Tighten or replace if damaged.
- Make sure that all screws and nuts are tightened, tighten if necessary. It might be necessary to tighten screws after some usage of the sleeper layer that has come loose caused by vibrations.
- Check for cracks or damage to mechanical parts.
- Keep the machine clean to ensure good visibility when checking for leakage or damage to the frame e.g. cracks.
- Lubricate according to lubrication chart every eight operating hour.

NOTE!

On delivery, some problems can arise due to friction and air in the hydraulic cylinders. The problems will, normally, disappear after a short time use. If the disturbance doesn't disappear then open and close cylinders until the air is out of the system.

Repair damaged paintwork by applying original paint (RAL 1004) to prevent rust.

10.2 Lubrication chart

Lubrication should be done every eight operating hours. Use multipurpose grease.

Treat all visible, not painted, surfaces with rust preventing agents. Grease all visible screw threads on adjustable parts.



Fig 22. Lubrication points

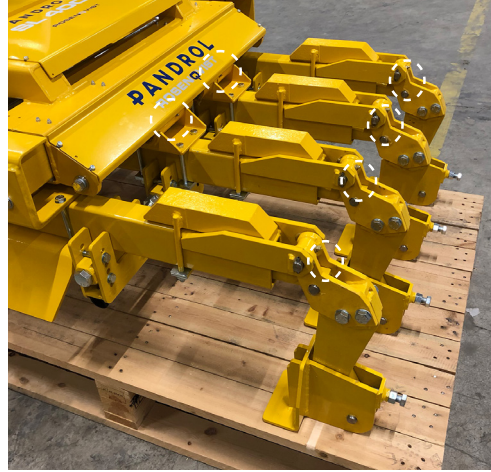


Fig 23. Lubrication points

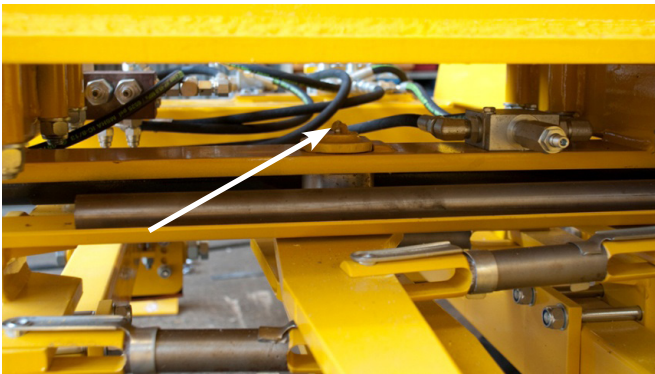


Fig 24. Lubrication points

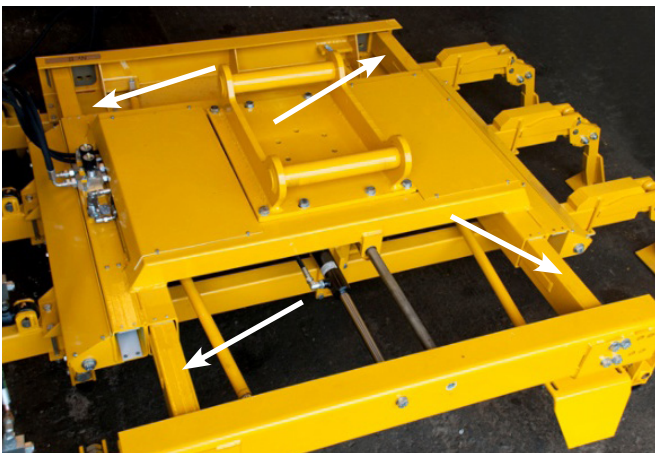


Fig 25. Grease the sliding areas

10.3 Overhaul

1. Every six months, check and retighten the screws for the installation plate.
 - Screws and nuts, at turning unit: M16. Torque: 190 Nm.
 - Screws, at main frame: M12. Torque: 80 Nm.

2. Once a year, check the following;
 - Cracks and damages on the frame construction.
 - Wearing and damages at shafts.
 - Plastic spacers on main frame.
 - Plastic spacers on movable sleeper grapple units.
 - Wear plates on sleeper positioner.
 - Wearing and damages to grapple arms.
 - Wearing and damages on seals and pistons in hydraulic cylinders.

3. Repair damages in the body colour by applying original paint to prevent steel from rusting. Original colour: RAL 1004.

4. We recommended that any overhaul is made by Pandrol qualified personnel.

10.4 Cleaning

- Wash with warm water and a mild detergent.
- Grease and lubricate the sleeper layer after cleaning.

11. Warranty and service

11.1 Guarantee

All products delivered from Pandrol AB comes with a 12 month guarantee.

The guarantee does not apply if the product defect or flaw in question exists because of or is a result of improper use, tampering, or unauthorized modification, or if the product has been exposed to fire, electrical storms or excessive voltage.

Warranty applies to consumable items and spare parts supplied by Pandrol AB.

11.2 Service

Service is offered after the expiration of the guarantee. Please contact Pandrol AB.

11.3 Disclaimer

Pandrol AB exempts itself from liability in the event of usage that deviates from that recommended in this manual.

12. Contact

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Phone:

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Web and e-mail

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13. Declaration of Conformity

Insert a copy of the Declaration of Conformity in this section.

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