INSTRUCTIONS
2024

SCREENING BUCKET
USER MANUAL

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NOTES

EC Declaration of Conformity for Machinery,

(Machinery Directive 2006/42/EC, Annex II., sub. A)

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63700 Ähtäri, Finland

Name and address of the person authorized to compile the technical file:

Name: Juha Salmi

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63700 Ähtäri, Finland

Herewith we declare that

Remu Screening bucket

Model: _____

Serial number: _____

is in conformity with the relevant provisions of the Machinery Directive (2006/42/EC)

And furthermore, we declare that

the following European harmonised standards (or their parts/clauses) have been used: SFS-EN ISO 12100, SFS-EN 349

Place and date: Ähtäri _____/_____20_____

Juha Salmi

Managing Director

Contents

1 SAFETY NOTICE

The warnings in this user manual are not all-inclusive. Though every effort has been taken to ensure detailed coverage, Remu cannot anticipate every possible circumstance that might involve a potential hazard. If operation or maintenance is not performed as specifically instructed in this manual, ensure it is safe for you and others. Ensure also that the Remu Screening bucket will not be damaged or made unsafe by the methods you choose.

2 SPECIAL APPLICATIONS

Remu occasionally modifies some Remu Screening buckets at the request of the customer to meet the special application needs. It should be noted that these modifications change the performance and operation characteristics of the standard Remu Screening bucket. These characteristics and their effect on the bucket must be fully understood by the user.

Owners and operators are hereby advised that the use of modified Remu Screening buckets in applications for which they were not intended is strictly prohibited. If the bucket is operated in conditions for which it was not designed, severe damage and hazardous situations may occur. Damage caused by inappropriate applications will not be covered by Remu's warranty.

Owners and operators are hereby obliged to check with the Remu dealer or the manufacturer to ensure the particular Screening bucket will meet the desired application.

3 FOREWORD

We wish to thank you for choosing the Remu Screening bucket.

Take time to read this manual carefully before operating or installing the bucket as it must be read in conjunction with the operator's manual of the work unit. Make sure that the manuals do not have any discrepancy. This manual will help you to utilise the Remu Screening bucket efficiently and economically. Your safety and the safety of others depend upon care and judgement in the operation of this attachment. A careful operator is good insurance against accidents.

Remu's policy is to continually improve the product design. That may provide changes to this Remu Screening bucket, which are not included in this manual.

This publication is based on current information at the time of the printing.

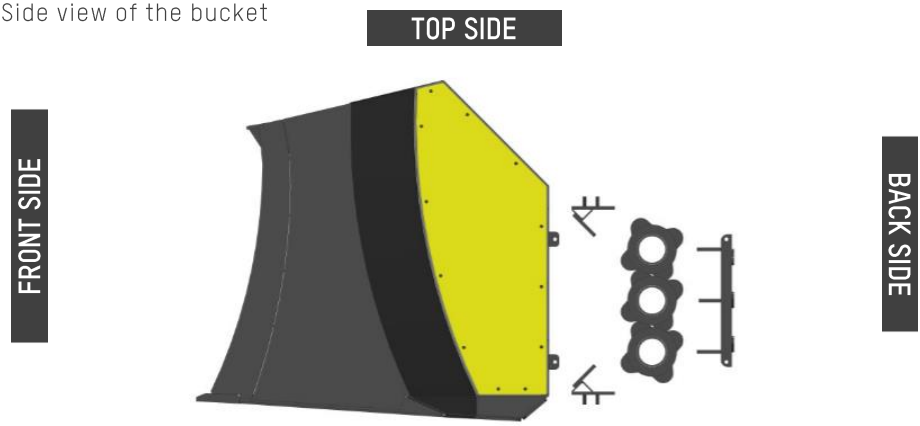
4 GENERAL

The working principle of the Remu Screening bucket is based on rotating screening rotors that separate fine material from oversized material. The fine material that is loaded to the bucket will screen through the rotors and the oversized material will stay inside the bucket. The Remu Screening bucket can be used to process various materials.

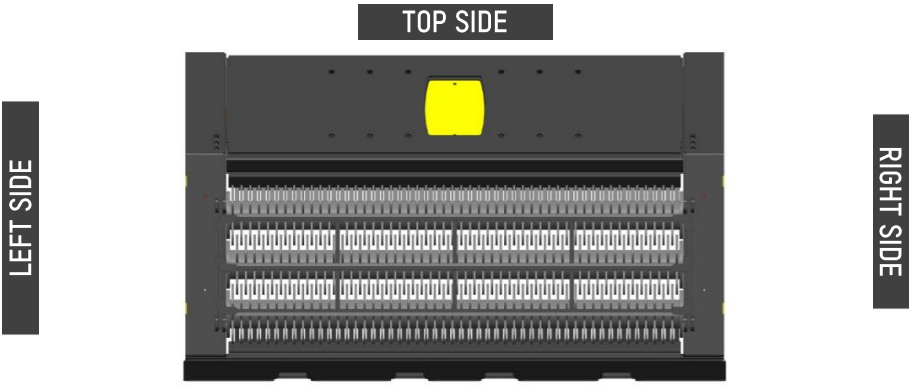
When the Remu Crossover bucket frame is attached to SB or SC modules it can be referred as Screening bucket and this User manual also applies to it. The SV and CM modules have separate User manuals.

The following pictures show the different sides of the Screening bucket

Side view of the bucket



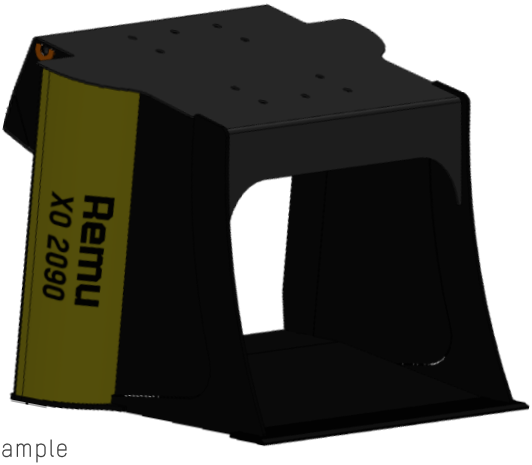
Back view of the bucket



EE 3220 as an example

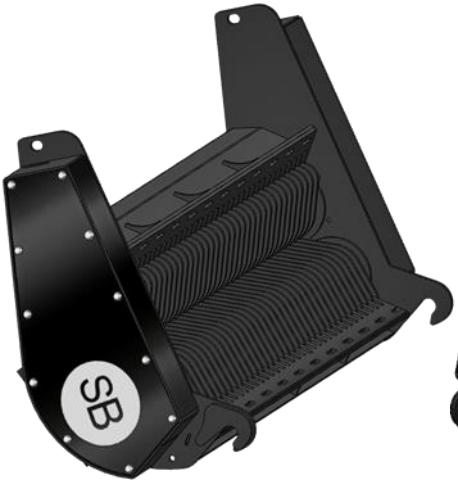
4.1 Screening Bucket Parts

Crossover frame



XO 2090 as an example

Blade Screen module

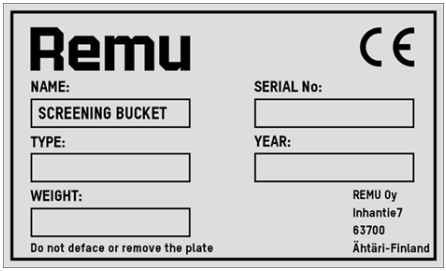


Screener Crusher module

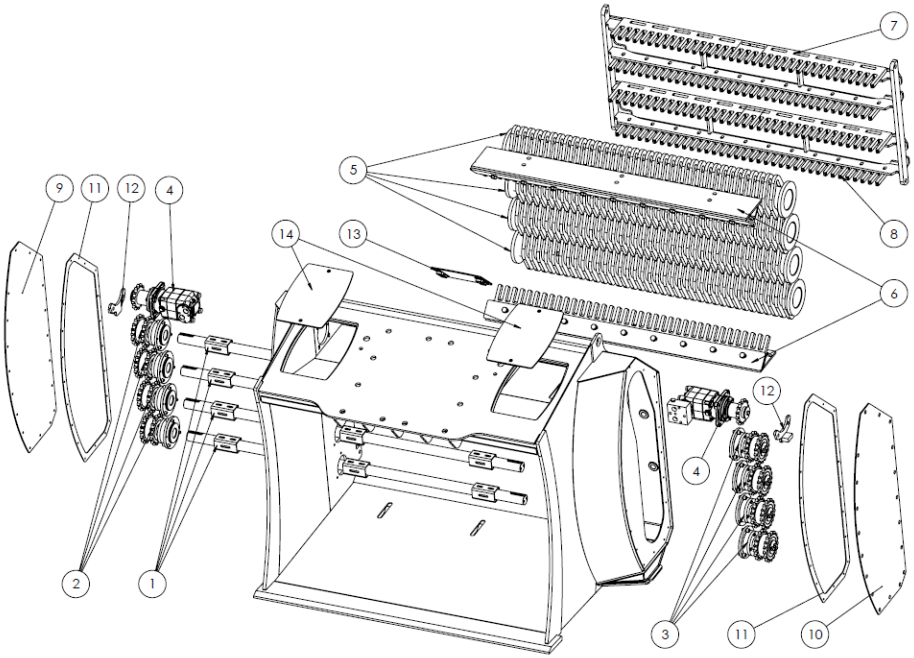
4.2 CE Plate Location

CE plate indicating the serial number is located on the top of the bucket

Crossover frame does not have CE plate. The serial number of the frame is stamped on the right upper corner of the back side of the frame.



EP 4150 as an example



ITEM	DESCRIPTION
1	Inner shaft
2	Bearing assembly
3	Bearing assembly
4	Hydraulic motor
5	Screening rotor
6	Comb counter blade frame
7	Cleaning scraper frame
8	Cleaning scraper comb

9	Side door
10	Side door
11	Side door gasket
12	Motor chain tensioner
13	Back side hatch
14	Front side top hatch

5 SAFETY PRECAUTIONS FOR OPERATION

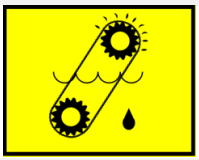
Many failures and accidents that occur during operation or maintenance are a result of neglecting fundamental precautions.

Do not operate this Screening bucket unless you have read and understood the instructions in this manual. Do not allow anyone to operate the bucket without reading this manual. Unauthorised modifications to the bucket may impair the function and safety and reduce service life.

5.1 Safety Labels on the Screening Bucket

LABEL	
EXPLANATION	Read the manual before operating the bucket.
LABEL	
EXPLANATION	**Keep the work area clear:** Machine operator: Stop the machine immediately if you observe people within the machine's danger zone (25 m or 80 feet). Do not resume work before the work area is free.

	Bystanders: Keep away from the machine's danger zone (25 m or 80 feet). The machine may cause serious damage or fatal injuries.
LABEL	
EXPLANATION	Danger of tipping
LABEL	
EXPLANATION	Material can sling from the bucket.
LABEL	
EXPLANATION	Do not put your hands near or between moving parts.
LABEL	
EXPLANATION	Recommended hydraulic oil flow. See the chapter 6.2.1 for more information. (Check the correct label from your bucket)
LABEL	
EXPLANATION	Maximum allowed hydraulic oil pressure. See the chapter 6.2.1 for more information. (Check the correct label from your bucket)

LABEL	
EXPLANATION	Lubricate every 30 hours
LABEL	
EXPLANATION	Lubricate every 8 hours.
LABEL	
EXPLANATION	Continuously lubricated chains. See the chapter 8.2 for more information.

5.2 Safety Procedures Before Operation

- The limitations and performance of the Remu Screening bucket and the work unit must be fully understood before any attempt is made to operate the screening bucket.
- Learn and apply the procedures and rules relative to the work site.
- Establish a means of communication in the event of accident or fire.
- Clear obstacles from work site and be aware of hazards including overhead wires.
- Complete standard daily checks of the screening unit and the work unit
- Inspect unit, rotors and hoses for damage and make the appropriate repairs before operating.
- If the bucket is fitted to the work unit via a quick hitch, ensure before operating the bucket that the quick hitch is connected properly and is capable of withstanding thrust in the direction it is applied.

- Ensure that the work site is clear of personnel at least for a radius of 25 metres (80 feet). Mark the work site to avoid people entering it.
- Ensure that the attachment mechanisms of the Module are undamaged and the Module can be attached to the Crossover frame according to the instructions in the chapter 6.1.1.
- Ensure safety labels are clean and readable. Replace safety labels if you cannot read them.

5.3 Safety Procedures During Operation

- Do not lift the work unit with the Screening bucket, as severe structural damage may occur to the bucket.
- Ensure that the work site is clear of personnel at least for a radius of 25 metres (80 feet). Stop working immediately if anyone enters the work site.
- Organise the work site in a way that it is easy and safe to move between unscreened, primary product and secondary product stock piles.
- Test operation of the screening rotors with empty bucket.
- Operate the bucket only while seated in the work unit operator's seat.
- Periodically check the bucket and tighten bolts that may have worked loose.
- Operate the bucket only according to given limitations for hydraulic pressure and flow.
- Do not use the bucket for digging.
- Do not use the bucket for demolition.
- Keep the bucket as low as possible when working.
- Keep work site flat by continually grading it.
- Do not overload the work unit.
- Ensure that the bearing capacity of the work site can withstand the weight of the work unit and the screening bucket.
- Be careful not to hit anything or anyone with the bucket.
- Do not swing the bucket over personnel or the cabs of the trucks.
- Do not go under a bucket that is attached to a work unit.
- Do not work when dust, fog or smoke reduces visibility.
- Ensure that the job site is sufficiently alight when working in the dark.

- Stop the machine frequently when working in the dark. Walk around and inspect the bucket, the work unit and the safety distance of 25 metres (80 feet).
- The noise level caused by materials processing varies with the processed material and the work unit in use. It is recommended to use hearing protection.

5.4 Safety Procedures After Operation

- Lower the bucket on a flat solid ground.
- Lubricate the bucket in accordance with the maintenance schedule given in the chapter 8.
- Clean and inspect the screening bucket for any damage. Repair any damage before operating the bucket again.
- Do not leave the bucket in water or other liquids after operation.

5.5 Safety Procedures During Maintenance and Installation

- Use appropriate personal protective equipment.
- Use appropriate tools.
- Note that the parts are heavy. Ensure you have suitable lifting equipment and use them in appropriate manner.
- Switch off the work unit and ensure it cannot be switched on during maintenance and installation.
- Do not touch moving parts of the Screening bucket before the work unit is switched off and made sure it cannot be switched on during maintenance or installation.
- Never use diesel, petrol or any other solvents for cleaning the bucket.
- Do not work under or near unsupported parts.
- Ensure when attaching the Module to the Crossover frame that the pins of the frame are properly attached to the hooks of the module.
- Support the Module before removing it from Crossover frame.

6 INSTALLATION OF THE SCREENING BUCKET

The installation of the Screening bucket includes mounting the bucket or the Crossover frame to the work unit (and attaching the module to the Crossover frame) and connecting the Screening bucket to the auxiliary hydraulics of the work unit. Follow the safety precautions given in the chapter 5 during the installation.

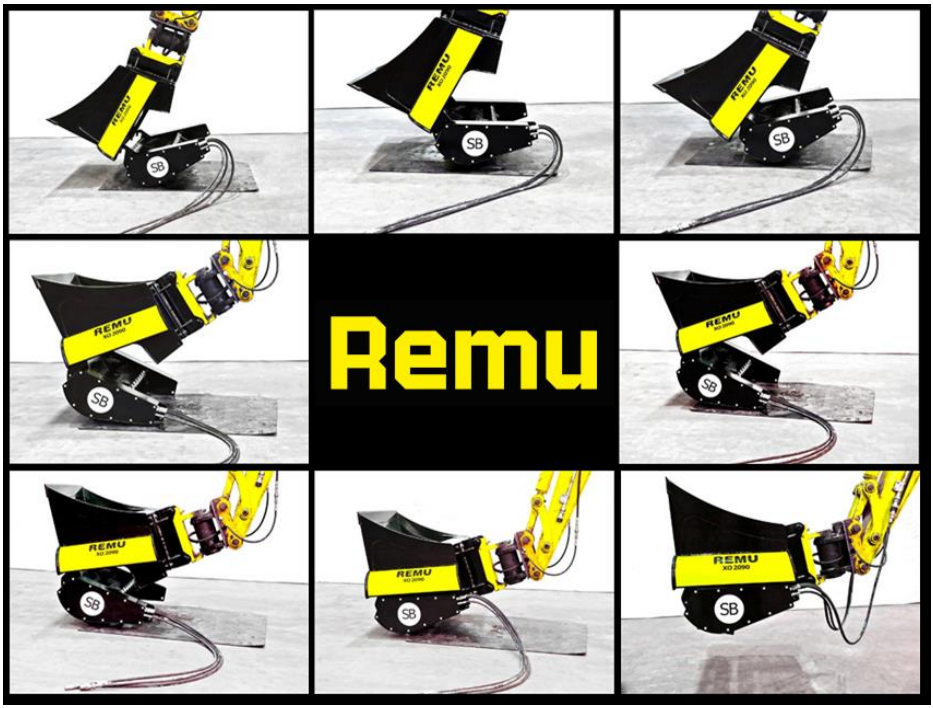
If at any time the installer is unsure of the requirements of the installation, the installer has the responsibility to contact the Remu dealer or the manufacturer to obtain the correct up to date information.

6.1 Mounting the Screening Bucket to the Work Unit

- Ensure the mounting is properly connected to the bucket or the Crossover frame.
- Ensure the mounting fits the work unit.
- Attach the Screening bucket or the Crossover frame to the work unit in the desired application. Remu recommends that the Screening bucket is installed in a face shovel application instead of digging application. The installation in a face shovel application will increase efficiency by extending the reach and allowing the operator to pile the material in higher piles.
- Ensure that the lifting capacity of the work unit is capable of handling the loaded weight of the Screening bucket in the application in use. Note the weight of the bucket and ensure the loaded weight of the Screening bucket does not impair the safe use of the work unit. Do not exceed the full turn tipping load when using a wheel loader.
- Ensure the bucket is safe to use when using a mounting that is not manufactured by Remu. More information about mountings and their suitability to different applications can be obtained from the manufacturer of the mounting.
- Ensure the mounting is properly locked.

6.1.1 Attaching the Module to Crossover frame

- After successfully mounting Crossover frame to the work unit, start attaching the module to Crossover frame.
- Place the module on level ground.
- Move the frame on top of the module in a way that the pins of the frame attach to the hooks of the module. Remu recommends that another person assists the driver next to the bucket. If the driver does not have anyone assisting, he must go and check that the hooks and pins are attached properly.
- When the pins are attached to the hooks, lift the bottom side of the module gently upwards with the frame and simultaneously turn the upper part of the frame next to the module. If the module does not turn easily, do not turn it with force. Recheck that the hooks are in place.
- When the module and the frame are next to each other, lock the module in place with two locking screws (hex screw M20x45 8.8 ISO 4018 with washer M20 DIN 125, tightening torque 375 Nm). Use copper paste or similar with screws.



6.2 Connecting the Bucket to the Auxiliary Hydraulics of the Work Unit

Requirements for the auxiliary hydraulics of the work unit:

- **Bidirectional auxiliary hydraulics:** An operator controlled directional control valve and plumbing to the boom tip capable of handling the required flow and pressure. If the work unit does not have bidirectional auxiliary hydraulics installed in it, the bidirectional auxiliary hydraulics needs to be installed prior installing the screening bucket.
- **Determining the hydraulic oil flow, pressure and hydraulic power of the work unit:** The work unit flow, pressure and power requirements can be obtained from the manufacturer or the distributor of the work unit or by performing tests to the work unit. If the work unit cannot provide the required flow, pressure and hydraulic power, the screening bucket's maximum efficiency may not be achieved. See the chapter 6.2.4 for more information.
- **Proportional auxiliary hydraulics or pressure accumulator:** Remu recommends that the bucket must be installed to a control system where the rotating direction of the rotors can be proportionally changed instead of using an on-off switch, which can cause too sudden changes in direction. Delay should be 2/3 seconds in both directions and can be adjusted in the computer work tool selection menu. Contact manufacturer for specifics.
    - Too sudden changes in direction may damage the chains of the bucket and cause excess wear to other components of the bucket.
    - If you do not have proportionally hydraulics in your work unit, a pressure accumulator can be installed to avoid high pressure peaks.
- **Adding hydraulic oil:** Check the amount of hydraulic oil in the work unit and add if necessary.

Modern work units can include various control systems for hydraulics. Ensure you understand their function before installing the screening bucket and take them into consideration during installation.

- **Load sensing variable hydraulic pumps:** Ensure the auxiliary hydraulics of the work unit meet the hydraulic requirements of the screening bucket. Set the control parameters in a way they do not exceed the maximum hydraulic oil flow and pressure allowed for your bucket.
- **Flow cut-off system** that activates when the circuit relief valve is activated: The work unit's hydraulic design parameters must be understood prior the installation of the screening bucket.

6.2.1 Recommended Hydraulic Oil Flow and Maximum inlet Pressure

Modern work units are capable of producing more flow and pressure than required for the screening bucket. Limit the hydraulic oil flow and pressure from the work unit in a way that they do not exceed values set to your bucket.

Our tests show that the best screening result is usually archieved when the rotors are spinning at the speed of 100 rpm to 150 rpm. In the following table is listed the recommended hydraulic oil flows and the maximum pressures for the buckets. If the maximum allowed hydraulic oil flow and pressure are exceeded the screening bucket will suffer from over speed that may result in an early failure of the power transmission components of the bucket. If a failure occurs due to over speed, the warranty will not apply.

BUCKET MODEL	HYDRAULIC MOTORS	RECOMMENDED HYDRAULIC OIL FLOW MIN - MAX		MAXIMUM PRESSURE	
		l/min	gal/min	bar	psi
EL 2085	1 x FRO160	20–30	5–8	110	1600
	1 x FRO200	25–35	6–9	110	1600
EP 3150 EP 4150*	2 x MRO200	45–75	12–20	210	3000
	2 x MRO315	75–130	20–35	210	3000
	2 x MRO400*	95–150	25–40	210	3000
EX 140** EE 3160** EE 4160** EE 3220	2 x MRO315**	115–150	30–40	210	3000
	2 x MRO400	130–190	35–50	210	3000
	2 x HRO400	130–190	35–50	250	3600
	2 x MRO500	170–225	45–60	210	3000
	2 x HRO500	170–225	45–60	250	3600
EE 4220 EE 4290	2 x HRO400	130–190	35–50	250	3600
	2 x HRO500	170–225	45–60	250	3600
XO 2090 XO 2150	1 x DD400	40–75	10–20	210	3000
	SV	20–40	5–10	200	2900
	CM: 1 x MRO500	40–95	10–25	210	3000

PD 2160	2 x DD400	75–115	20–30	210	3000
PD 3160	3 x DD400***	130–190	35–50	210	3000
	2 x TMYFT800****	200–250	50–65	210	3000

* The motor option is only available for this bucket.

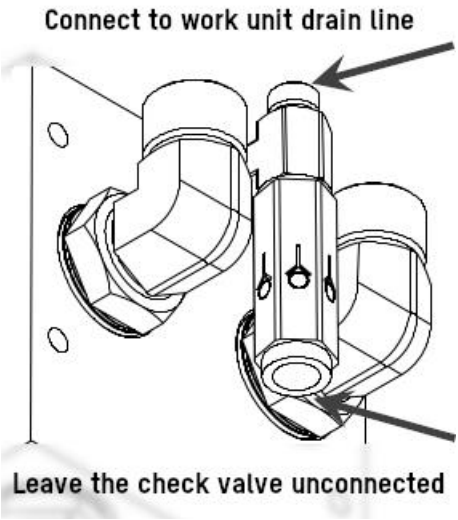
** The motor option is only available for these buckets.

*** Direct drive motor.

**** Chain drive motor.

6.2.2 Connecting the Hydraulic Hoses

- Connect the hydraulic hoses after ensuring the hydraulic hose couplings from the work unit match the hydraulic hose couplings of the Screening bucket.
- Ensure the hoses and couplings are clean and in serviceable condition.
- Connect the bidirectional auxiliary hydraulic flow to the bucket hydraulics.
- Connect also the drain line. Minimum size of the drain line is 3/8" and for PD-series 1/2" minimum size drain line is recommended.
- It is recommended to connect drain line to swivel motor case drain line on machine located behind boom, or directly to the the Hydraulic tank with less than 15 psi tank pressure.
- The PD buckets have a check valve installed to the t-adapter of the drain line:
  - Connect the drain line to the free end of the t-adapter and leave the check valve unconnected.
  - Make sure you have the plastic cap in place in the end of the valve.
  - If there is a pressure spike over 8 bar (116 psi) the check valve activates. Inspect the reason for the



pressure spike and replace the valve cap.

- Ensure hydraulic lines are open and allow the hydraulic oil flow into the bucket circuit.
- Operate the screening bucket at low engine rpm in one direction for approximately twenty seconds to expel air from the hydraulic lines.

6.2.3 Hydraulic Oil Flow and Pressure Settings

- Set the pressure in a way that it does not exceed the maximum value given in the chapter 6.2.1.
- The MRO motors have a pressure relief valve that prevents them to be used if the pressure is over 210 bar (3000 psi).
- Set the hydraulic flow in a way that the best screening result for the screened material is archieved. The recommended minimum and maximum values are given in the chapter 6.2.1.
- Measure the pressure in the drain line. The pressure should not exceed 5 bar.

Note! Some modern work units have flow and pressure sensors that provide readings on a display located in the cab. This feature only provides a theoretical indication and should not be relied upon. The flow and pressure must be tested to ensure accuracy.

6.2.4 Testing of Hydraulic Requirements

If the hydraulic oil flow, pressure and hydraulic power of the work unit are unknown, they must be tested before mounting the bucket to the work unit. The owner of the bucket is responsible for organising reliable testing by a competent person before the installation. The flow and pressure tests must be recorded for possible warranty claim purposes.

Attach the flow and pressure meters to the delivery line of the work unit to ensure accurate test results.

6.3 Installation Check List

The person installing the Screening bucket must go through the following check list and record the steps.

PHASE	COMPLETED
The bucket or the crossover frame is mounted to the work unit	
(The module is attached to the crossover frame)	
All the hydraulic hoses of the bucket are connected to the work unit	
The drain line is connected	
The pressure from the work unit to the bucket is set according to given limits	
The hydraulic oil flow from the work unit to the bucket is set according to the recommended values	
The pressure in the drain line is measured (maximum 5 bar)	
The pressure is measured when the screening bucket is running	
Pressure (bar):	
The hydraulic oil flow is measured when the screening bucket is running	
Oil flow (l/min):	
Maintenance procedures are performed according to this manual	
Test run the bucket unloaded	
Test the maximum positions of the bucket unloaded (emptying the bucket etc.)	

Information for the warranty purposes:

OWNER OF THE SCREENING BUCKET	
INSTALLATION DATE	
SIGNATURE OF THE INSTALLER	
NAME OF THE INSTALLER IN BLOCK LETTERS	

7 OPERATION

Remu screening buckets have been successfully applied in a number of applications. It should be fully understood that even though applied widely, the Remu screening bucket is not an answer for all screening problems. Some materials are not as free flowing due to the moisture content or geological characteristics and take a considerably longer time to process. Remu makes no assessment of production capabilities since the material characteristics and the work unit in use affect the results. For further details contact the Remu dealer or the manufacturer.

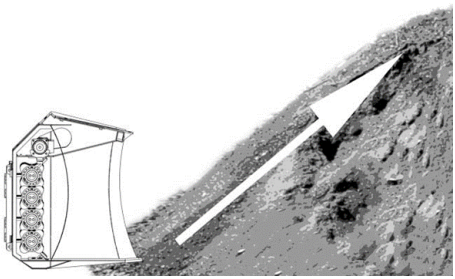
7.1 Before Screening

Prepare the material before screening and pile it near the work site. In case you need to mix different materials to the primary product, pile them all in one pile. If the material is not free flowing due to moisture or geological characteristics, pay special attention in preparing it. Note that the screening bucket should not be used for digging.

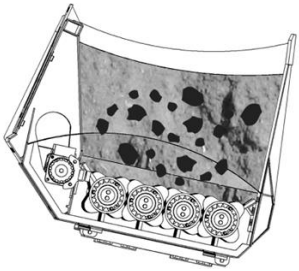
Ensure the screening bucket is installed according to instructions given in the chapter 6.

7.2 Screening process

Filling the screening bucket, screening and emptying the oversized material from the bucket form the screening process.

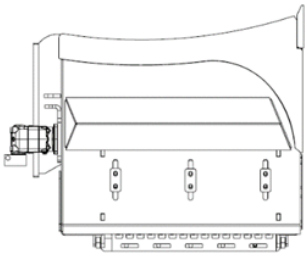


Fill the bucket by scooping material from the pile of prepared material. Do not overfill the bucket above waterline as the spillage during operation will contaminate the screened primary product.

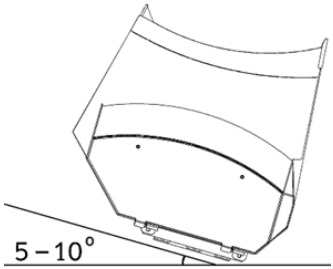


Position the screening bucket over the primary product storage area, hopper or truck.

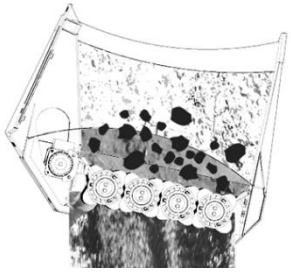
You may start the screening process before the bucket is tilted in the screening position in order to improve the screening result.



Tilt the bucket to the screening position. The screening position differs between the bucket models: with EX-series buckets the screening rotors parallel to the ground and with other buckets in 5 to 10 degrees angle with the ground. In SB and SC modules the screening position is when the yellow plate of the Crossover frame is horizontally.

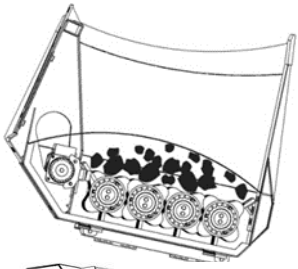


Screen in one direction as long as the material flows easily through the bucket. Change then the rotating direction of the rotors.

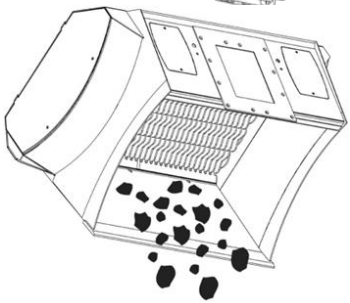


ATTENTION! It is essential to rotate rotors evenly on both directions. This ensures the best durability of the rotors and screening result.

Continue screening until the material does not easily flow through the bucket anymore. If the bucket clogs during the screening operation, simply reverse rotation and the rotors will self-clean.



Empty the oversized material from the bucket to the secondary product storage area, hopper or truck. Do not continue to operate the bucket excessively to process the final amount of material as the breaking down of the final amount of material may cause accelerated wear to the rotor blades. While emptying the bucket give the rotors a quick spun to clean them.



7.3 Operation Efficiency

Some materials screen easier than others due to their moisture content or geological characteristics. Some common challenges include: the bucket clogs during the screening, the material does not screen easily or the material does not screen at all.

In the following there are listed some means of improving the operation efficiency and the screening results:

- The rotating speed of the rotors may be too high or low. Adjust the hydraulic oil flow to the bucket to find the rotor speed that suits your material the best. It is not recommended to use values that differ from the minimum and maximun flow values.
- The material may need more preparing before screening. If the material is too compressed it will not screen easily.
- The material may be compressed on top of screening rotors. Tilt the bucket during the screening process in a way the material moves in the bucket and then tilt it back to the screening position. Repeat if necessary.
- Light material does not screen through the rotors. You may fill heavier material on top of the material you are screening to push the lighter material through rotors. Note that particles of this added material may end up in the primary product.
- Moist material does not screen through the rotors. Pay attention to filling the bucket to avoid material compressing in the bucket. The high moisture content of the material has its effect on the operation efficiency and the processing time but does not make the screening impossible.

7.4 Cleaning the Screening Bucket

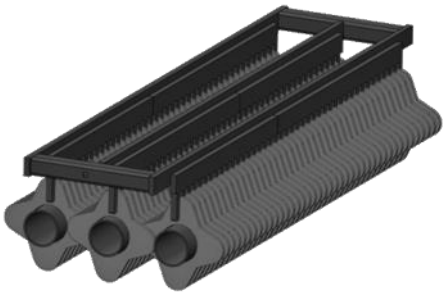
Clean the screening rotors and counter blades regularly to keep the bucket in serviceable condition and to avoid accelerated wear to the blades. The cleaning should be carried out:

- Right after screening, before the material dries in place in the blades.
- Whenever the efficiency of the screening is impaired.
- Before the build-up of material between the blades of one rotor touches the adjacent rotor blade.
- On a regular basis according to the characteristics of the screened material.

Clean the screening bucket by filling it with dry, hard, oversized material (for example soft rock, bricks, secondary product or moraine). Process this material in the conventional manner until the build-up of material is reduced to a point where the rotor tubes are visible.

7.4.1 Cleaning Scraper

If the material being processed is moist and builds up very quickly on the rotors, Remu recommends that the cleaning scrapers should be fitted to the screening bucket to improve operation efficiency.



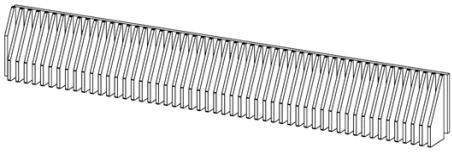
When screening with cleaning scrapers the cleaning scraper combs clean the material from the screening rotors constantly during screening.

For further details of the cleaning scrapers contact the Remu dealer or the manufacturer.

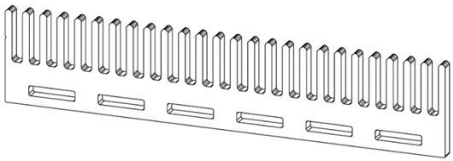
7.5 Counter Blades

Remu screening bucket has either aggressive or comb counter blades according to the application in use.

Aggressive counter blades



Comb counter blades



Aggressive counter blades are mainly used in the crushing applications when crushing some soft or fragile materials like gypsum, bark, mulch, foundry sand, sand stone, mud stone, lime stone, coal or similar. Harder materials like stone, concrete or similar cannot be crushed with the screening bucket. Comb counter blades are mainly used in the screening applications.

SB and SC modules are equipped with comb counter blades.

Note that it is also possible to mix different counter blade types together.

7.6 Adjusting the Screening Result

It is possible to modify the grain size of the primary product by moving the comb counter blades closer or farther from the screening rotors. In the crushing applications by moving the aggressive counter blades closer or farther from the rotors the crushing effect can be adjusted to suit the crushed material the best.

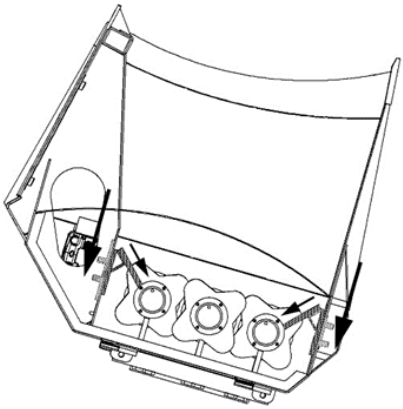
For SB and SC modules a small adjustment can be achieved by moving the counter blade combs or shortening the spikes of the counter blade combs.

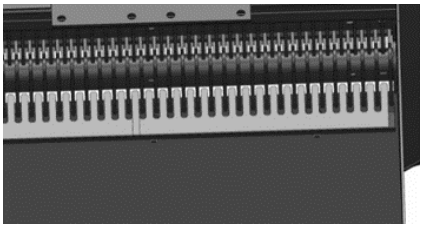
Note that some blade types can be used both in screening and in crushing applications.

If the screened material or the requirements for the primary product change significantly, contact the Remu dealer or the manufacturer to find the most suitable screening rotors, counter blades and cleaning scrapers for your application.

7.6.1 Reducing the Grain Size or Increasing the Crushing Effect

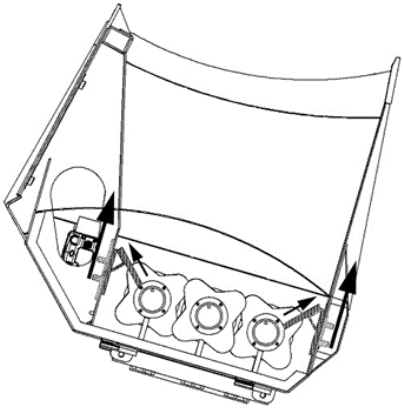
- Loosen all counter blade retaining nuts.
- Move the counter blades as close to the screening rotors as possible.
- Retighten the counter blade retaining nuts in this position.
- Run tests with material to be screened.
- If the operation of the bucket is impaired with this configuration, move the counter blades slightly farther away from the rotors.
- Run tests with the new configuration. Adjust again if necessary.

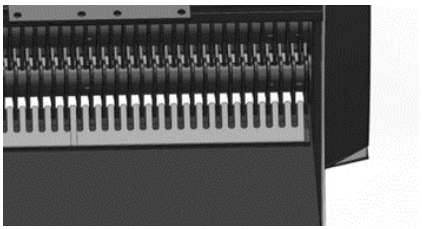




7.6.2 Increasing the Grain Size or Reducing the Crushing Effect

- Loosen all counter blade retaining nuts.
- Move the counter blades as far away from the screening rotors as possible.
- Retighten the counter blade retaining nuts in this position.
- Run tests with material to be screened.
- If the operation of the bucket is impaired with this configuration, move the counter blades slightly closer to the rotors.
- Run tests with the new configuration. Adjust again if necessary.





8 MAINTENANCE

Regularly performed proper lubrication and maintenance of the screening bucket are essential for extended service life and safe operation without the loss of efficiency. This chapter provides procedures for safe lubrication and maintenance of the screening bucket. Familiarize yourself with the following maintenance procedures. Contact the Remu dealer or the manufacturer if you need any additional information for maintaining your screening bucket.

Follow the safety precautions given in the chapter 5 during maintenance. Always dispose the contaminated products as industrial waste in accordance with the local regulations.

8.1 Remu Spare Parts

Remu screening bucket rotors, counter blades and cleaning scrapers are consumable wear items that must be regularly built up or replaced. The frequency of building up or replacing the rotors or counter blades will depend on the abrasive quality of the material being screened. The size of screened primary product will gradually increase in proportion to the amount of wear of the consumable components. The wear-rate of the wear parts can be slowed down by periodically applying hardfacing.

Always use genuine Remu products for repair and maintenance. Spare parts are available from the Remu dealer or the manufacturer.

8.2 Maintenance Intervals

The maintenance intervals are determined by the screening bucket operating hours. See the additional maintenance procedures for especially abrasive or otherwise special conditions in the chapter 9.

The following table indicates maintenance intervals based on operating hours.

POINT	ITEM	PROCEDURE
8 hours or 1 day		
1	Bearing lubrication points	Lubricate. Recommendation: Multi-purpose NLGI 2 Lithium EP grease.
2	Rotors	Inspect condition for wear or damage.
3	Counter Blades	Inspect condition for wear or damage.
4	Cutting Edge	Inspect condition for wear or damage.
5	Motors and Hoses	Inspect for damage and leaks. Repair if necessary.
6	Chain Case (Spray lubrication)	Inspect chain case drain holes are clear and free of obstructions. **Note! All bucket models do not have holes.**
Always when changing the Module		
7	Attachment Mechanisms of Crossover frame and Module	Inspect condition for wear or damage.
30 hours or 3 days		
8	Chain Case (Spray lubrication)	Lubricate the chains. Recommendation: HHS Lube NLGI 2
9	Mounting	Check tightness of retaining bolts.

50 hours or 1 week		
8	Chain Case (Continuous)	Add one cartridge grease to all chain cases. Recommendation: Multi-purpose NLGI 00 Lithium EP grease
100 hours or 2 weeks		
10	Motor	Inspect and adjust.
11	Chains (Spray lubrication)	Open both chain cases. Inspect the condition of components. Replace if needed.
12	Side case (Direct drive motors)	Open both side cases of the module. Inspect the condition of components. Replace if needed.
400 hours or 2 months		
8	Chain Case (Continuous)	Open both chain cases. Inspect the condition of components. Replace if needed.
1600 hours or 1 year		
8	Chain Case (Continuous)	Open chain cases. Remove grese. Reseal hatches. See the table in the ITEM 8 part for information about the grease amounts.

Note! Lubricate item 1 every two hours for the first ten hours of operation.

ITEM 1:

Some bucket models have a cover on the lubrication points. Remove the cover before you can access the lubrication points. Clean the grease nipples. Pump grease to all lubrication points until the grease comes out between the end of the rotor and the bucket frame. Fasten the covers back in place.

EX-series buckets: Notice that there are lubrication points in the both ends of the screening rotors. For most ergonomical working position place the bucket on the ground face downwards.

ITEMS 2, 3 & 4:

Visually inspect each screening rotor, both counter blades and cutting edges to ensure that they are in a serviceable condition and have not been bent or excessively worn.

Note! The design of the rotors allows them a normal radial movement of about 5 mm (0.20"). The play between the screening rotor and the inner shaft is about 2 to 4 mm (0.08" to 0.16").The screening rotor can turn around its shaft for about 8 degrees.

The separate screening rotor and shaft design allows the screening rotor to move in the lateral during the screening. This lateral movement reduces the stress to the bearings.

ITEM 5:

Visually inspect the hydraulic motor(s) and hoses for leaks and damages.

ITEM 6:

Inspect the chain case drain holes and ensure they are clear and free of obstructions.

ITEM 7

Inspect condition of pins and hooks in the bottom side of the Crossover frame and Module. Inspect also condition of the locking screws and screw holes in the top side of the Crossover frame and Module.

ITEM 8:

Spray lubrication: Remove the chain case covers and lubricate chains with chain lubricant spray. For SB and SC modules there is a lubrication hole at the back side of the module. Lubricate the chains through the lubrication hole.

Continuous lubrication: The best maintenance position for opening the chain case in EP and PD series is face downwards on the ground. For the EX 140 bucket best maintenance position for opening the chain case is bottom of the bucket downwards on the ground. In these positions the grease won't escape the chain case so easily.

Amount of grease used in buckets with continuously lubricated chains:

BUCKET	AMOUNT OF GREASE USED IN BUCKET	
	kg	lbs
EP series	18	40
EX 140	10	22
PD series	10	22

ITEM 9:

Check tightness of retaining bolts.

ITEMS 10, 11 & 12:

Every 100 hours of operation the motor drive chains requires inspection and possible adjustment to ensure correct tension. As a new the motor drive chain sag is a maximum of 3-5 mm (0.12"-0.20") on the unloaded side of the chain, and 8-14 mm (0.31"-0.55") when the chain is at the end of its service life. The sag is measured in the halfway between the two shafts. Note that there is no chain adjustment between the screening rotor shafts.

Depending on a model Remu screening bucket has either one or two hydraulic motors. Both of the motors are connected to the hydraulic circuit of the work unit. It is important that twin motor units have exactly equal adjustment on both motor drive chains to load the chains equally. To adjust the motor drive chain loosen the motor mounting plate bolts and move the motor to the correct position (0-3 mm (0-0.12") movement when the chain is new). Retighten the bolts to the correct torque to ensure the adjustment stays in place.

The PD buckets, Blade Screen and Screener-Crusher modules are equipped with (a) direct drive motor(s). The motor is attached to the shaft of the Screening bucket or Module. The motor is connected to the hydraulic circuit of the work unit. The hydraulic oil inside the motor housing lubricates the motor bearings. Note that the motor bearing housing has its own lubrication point and the maintenance is according to the ITEM 1.

The sprockets and the chain(s) in PD buckets, Blade Screen and Screener-Crusher modules are located in the opposite end of the shaft than the motor. The tightness of the chain(s) does not need to be adjusted.

Replace the chain and sprockets when they are at the end of their service life. Worn out chain wears down sprockets and worn out sprockets on the other hand wear down the chain.

Open the chain and side cases to visually inspect the condition of the bearing unit assemblies and their lubrication components. Replace any broken components.

8.3 Rotors Maintenance

In order to retard the wear of the rotors it is recommended that the tips of the screening rotor blades are built up with hardfacing on a periodical basis. The abrasive characteristics of the material being processed will determine how frequently this hardfacing action is required.

9 MAINTENANCE UNDER SPECIAL CONDITIONS

Maintenance under extreme or special conditions needs to be carried out on a more frequent basis than during standard conditions. Make sure the screening bucket is maintained according to the special conditions. In the following table there are listed some special conditions and additional maintenance procedures related to them.

CONDITIONS	WHEN TO PERFORM	PROCEDURE
Muddy water, rain, snow	Before operation	Inspect the condition of the bucket.
	During operation	Lubricate every 2 hours.
	After operation	Drain the chain cases of water and lubricate chains.
Salt water, highly corrosive material	Before operation	Inspect the condition of the bucket.
	During operation	Lubricate every 2 hours.
	After operation	Drain the chain cases of water and lubricate chains.
		Clean the bucket with high-pressure fresh water to remove material residue.

Excessive dust	During operation	Lubricate every 2 hours
Rocky material	After each two operating hours	Inspect the condition of the bucket. Check for structural damage, cracks and loose or missing bolts.
Cold weather	Before operation	Warm up the hydraulic oil.
	After operation	Use high quality high viscosity lubricating products. Clean the bucket carefully to prevent dirt from freezing to the bucket.

For further details contact the Remu dealer or the manufacturer.

10 TROUBLESHOOTING

Troubleshooting is a series of steps to help solving the problems of your Remu screening bucket. All faults that are noticed during operating the bucket should be immediately investigated to avoid further damage. At the same time the severity of the problem must be determined and investigated whether it is safe to continue the operation.

This chapter advises you how to diagnose the reason for fault quickly and systematically. As soon as you have diagnosed the reason for fault, perform the needed actions according to the instructions given in this manual. For further instructions contact the Remu dealer or the manufacturer.

10.1 Fault Diagnosis

If the Remu screening bucket fails to operate in the desired manner, reasons for faults may be related to the mechanical or the hydraulic system of the bucket. In the following table there are listed some possible situations and corrective actions related to them.

SCREENING BUCKET MAKES NOISE DURING THE SCREENING	
Mechanical	Every bucket model except the EL-series buckets has an inner shaft inside the screening rotor. There is a small play between the rotor and the shaft which may cause some noise when the screening bucket is running. See the chapter 8.2 for more information.
SCREENING ROTORS TURN SLOWLY OR DO NOT TURN AT ALL	
Mechanical	Check if there is material caught in the rotors. Remove material if necessary. If the problem repeats often, consider the use of cleaning scrapers.
	Open the chain case. Check the condition of the chains, sprockets and shafts. Replace broken and worn out components.
	If the chains are in the serviceable condition, remove the motor to shaft chain(s) and try to turn the screening rotors with your hands. If the rotors turn easily, the problem might be in the motor(s). If the rotors do not turn, remove the chains between the shafts and find out which rotors do not move. When finding a rotor that does not move, remove the sprocket and check the condition of the bearings. Replace any broken bearings..
Hydraulic	Check if the auxiliary hydraulic lines are open and allow the hydraulic oil flow to the bucket circuit. Open the lines if necessary. Measure the hydraulic oil flow and pressure from the work unit to the screening bucket. If necessary, set the values according to the values given in the chapter 6.2.1. If the work unit cannot fulfil the hydraulic requirements of the screening bucket, the efficient use of it may require the use of another work unit. Inspect the bucket for leaks. Retighten or replace any leaking components, like hoses, motors or pressure relief valves. Note that the components might be damaged even if there are no leaks.

THERE IS HYDRAULIC OIL LEAKING FROM THE SCREENING BUCKET	
Hydraulic	Inspect the hoses, couplings, motors and other hydraulic components. Retighten leaking hoses and replace any broken components.
CHAINS BREAKDOWN REPEAREDLY	
Hydraulic	Premature chain failures may result from screening rotor over speed. Measure the hydraulic oil flow from the work unit to the screening bucket and set it according to the values given in the chapter 6.2.1. Premature chain failures may also result from quick changes in the rotating direction of the screening rotors with work units not equipped with proportional auxiliary hydraulics. See chapter 6.2 for more information.
Mechanical	Worn out sprockets wear down the chains. Replace any worn out sprockets.
BLADES AND/OR ROTORS WEAR OUT UNEVENLY	
Mechanical	If the rotors are only rotated in one direction, the material to be screened is compressed between the outermost rotor and the counter blade. This wears the blades on one side and causes the outermost rotor to wear prematurely. Rotate the rotors evenly in both directions.
SCREENING BUCKET MALFUNCTIONS IN THE COLD WEATHER	
Hydraulic	Let the hydraulic oil warm up before starting to operate the screening bucket.
GRAIN SIZE INCREASES	
Mechanical	Inspect the condition of screening rotors and counter blades. Perform hard facing to the screening rotor blades and replace counter blades if necessary
	It is possible to adjust the grain size by moving the counter blades closer to the screening rotors. See chapter 7.6.1 for more information.

11 STORAGE

If the bucket is not used for a long period of time it must be carefully stored to prevent damage and to ensure a good operating condition. Indoor storage is the best way. If the screening bucket is stored outside, ensure that the bucket is placed on a dry, level and firm base.

11.1 Storage Preparation

- Place the bucket on the firm and level base the bottom side of the bucket facing the ground.
- If the module is stored attached to the Crossover frame, support the bucket to vertical position to avoid overturning.
- Clean the bucket thoroughly.
- Inspect the bucket for loose or missing parts. Tighten or replace parts if necessary.
- Lubricate all lubrication points of the bucket.
- Ensure all hydraulic lines are full of oil and capped tightly.
- Apply rust preventative sealer to all exposed surfaces.
- Ensure that all coupling holes on Crossover frame are capped, if the coupling is not attached.

11.2 Procedures after Storage

- Clean the bucket thoroughly.
- Remove rust preventative sealer from all surfaces.
- Inspect the bucket for loose or missing parts. Tighten or replace parts if necessary.
- Lubricate all lubrication points of the bucket.
- If the drain line hose was not capped and oil has drained out, the motor case may be empty. Fill the motor case through the plug in the side of the motor.
- Follow the installation instructions given in the chapter 6 when installing the bucket to the work unit.

12 TRANSPORT AND LIFTING

The bucket has its weight stamped on the CE plate. Note that the weight may slightly differ between different bucket assemblies.

The centre of the gravity of the screening bucket is located about one third from the back side of the bucket depending on the bucket model. Make sure to use lifting equipment suitable for lifting the bucket. If lifting with forklift or similar, lift the bucket from the back side of the bucket to avoid tipping over. If lifting with slings, adjust slings to compensate the uneven distribution of the weight.

12.1 Transport when Mounted on the Work Unit

Transportation of the screening bucket mounted on the work unit should be done as if the screening bucket was a standard bucket. Note that the screening bucket cannot be used as tie down point for the work unit.

12.2 Shipped as Stand-Alone Bucket

- Ensure hydraulic lines are properly capped to avoid oil leakage and contamination of the lines.
- Position the bucket the bottom side facing the ground.
- Ensure there are wooden blocks or similar between the bucket and the transportation base.
- Position the bucket so that other items will not damage rotors or hydraulic motor(s).
- Use the appropriate tie down points.
- Do not use the motor(s) as tie down points.
- Do not transport loose items in the screening bucket.

13 SPECIFICATIONS

	MODEL	CARRIER SIZE (MIN) EXCAVATOR | LOADER	RECOMMENDED HYDRAULIC OIL FLOW MIN - MAX*	MAX HYDRAULIC PRESSURE*	BUCKET VOLUME ISO/SAE	SCREENING AREA	WIDTH	DEPTH	HEIGHT	STANDARD WEIGHT
METRIC UNITS		tons	l/min	bar	m^3	m^2	cm	cm	cm	kg
	EL 2085	3 | 1	25–35	110	0.15 - 0.18	0,2	109	63	64	240
	EP 3150	14 | 7	75–130	210	1.0 - 1.1	1,1	190	123	119	1280
	EP 4150	18 | 9	75–130	210	1.3 - 1.4	1,4	190	123	139	1500
	EE 3160	25 | 12	130–190	210	2.1 - 2.4	1,5	200	169	158	2470
	EE 4160	30 | 14	170–225	210	2.7 - 3.0	1,8	200	169	180	2780
	EE 3220	35 | 14	170–225	210	3.0 - 3.3	1,9	260	169	158	3090
	EE 4220	40 | 18	170–225	250	3.7 - 4.2	2,5	260	169	180	3560
	EE 4290	N/A | 21	170–225	250	4.8 - 5.5	3,3	330	175	180	4620
	EX 140	16 | N/A	170–225	210	0.9 - 1.1	0,8	126	128	137	1400
	PD 2160	25 | 10	75–115	21	1.4 - 1.7	1,1	214	166	137	2440
	PD 3160	30 | 12	130–190** 200–250***	210	2.0 - 2.3	1,5	214	166	160	2610
	XO 2090									
	+SB/SC	5 | 1	40–75	210	0.32 - 0.37	0,5	125	97	88	615
	+SV	5 | 1	20–40	200	0.32 - 0.37	0,5	125	113	88	410
	XO 2150									
	+SB/SC	8 | 2	40–75	210	0.52 - 0.60	0,8	185	115	88	840
	+SV	8 | 2	20–40	200	0.52 - 0.60	0,7	185	109	88	540
	+CM	8 | 2	40–95	210	0.52 - 0.60	N/A	185	125	88	635
IMPERIAL UNITS		1000 lbs	gal/min	psi	yd^3	ft^2	inch	inch	inch	lbs
	EL 2085	7 | 2	6–9	1600	0.20 - 0.24	2,2	43	25	25	530
	EP 3150	31 | 15	20–35	3000	1.3 - 1.5	12	75	48	47	2820
	EP 4150	40 | 20	20–35	3000	1.6 - 1.9	15	75	48	55	3310
	EE 3160	55 | 26	35–50	3000	2.7 - 3.1	16	79	67	62	5450
	EE 4160	66 | 31	45–60	3000	3.5 - 3.9	19	79	67	71	6130
	EE 3220	77 | 31	45–60	3000	3.9 - 4.3	20	102	67	62	6810
	EE 4220	88 | 40	45–60	3600	4.8 - 5.5	27	102	67	71	7850
	EE 4290	N/A | 46	45–60	3600	6.3 - 7.2	36	130	69	71	10190
	EX 140	35 | N/A	45–60	3000	1.2 - 1.4	9	50	50	54	3090
	PD 2160	55 | 22	20–30	3000	1.8 - 2.2	12	84	65	54	5380
	PD 3160	66 | 26	35–50** 50–65***	3000	2.6 - 3.0	16	84	65	63	5760
	XO 2090									
	+SB/SC	11 | 2	10–20	3000	0.40 - 0.50	5,4	49	38	35	1355
	+SV	11 | 2	5–10	2900	0.40 - 0.50	5,4	49	45	35	900
	XO 2150									
	+SB/SC	18 | 4	10–20	3000	0.60 - 0.75	8,6	73	45	35	1850
	+SV	18 | 4	5–10	2900	0.60 - 0.75	7,5	73	43	35	1190
	+CM	18 | 4	10–25	3000	0.60 - 0.75	N/A	73	49	35	1400

* With defaul motors.

** With direct drive motors.

*** With chain drive motors.

Weight is calculated with configuration X001 10/30, comb counter blades, no cleaning scrapers.

13.1 Grain Size

Grain size of screened or crushed material is matter of many circumstances like weather conditions, moisture, skills of operator, blade design, setting of counter blades and geological characteristics of material. Approximate grain size of the screened material is about 7 mm smaller than the blade spacing in use.

In the following table there are listed screening rotor blade spacings and possible grain sizes.

BLADE SPACING		PARTICLE SIZE	
mm	inch	mm	Inch
15	19/32"	0–8	0–5/16"
20	25/32"	0–13	0–33/64"
24	15/16"	0–17	0–43/64"
30	1 3/16"	0–23	0–29/32"
34	1 11/32"	0–27	0–1 1/16"
40	1 37/64"	0–33	0–1 19/64"
50	1 31/32"	0–43	0–1 11/16"
64	2 33/64"	0–57	0–2 1/4"
74	2 29/32"	0–67	0–2 41/64"
95	3 47/64"	0–88	0–3 15/32"

14 DECOMMISSIONING AND SCRAPPING

When the screening bucket has reached the end of its service life, it must be disposed at a specialist machine breaker. The following issues must be taken into consideration when dismantling the bucket:

- The parts are heavy.
- All safety instructions must be followed also during scrapping.

Dismantle the bucket and recycle the parts according to local regulations. Functioning components, such as hydraulic motors, can either be used in other machines or dismantled and scrapped. Hydraulic hoses, oils and greases must be delivered to hazardous-waste disposal.

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Download the very latest information on this product range at: www.Remu.fi

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