



English

Operations & User Manual

Crossover bucket:
SB and SC modules

Original instructions

Version 1216

REMU

Screening Technology & Amphibious Excavators

- Original -

EC Declaration of conformity for machinery

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

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Herewith we declare that

REMU Blade Screen/Screener-Crusher module

Model:

Serial number:

Manufacturing year:

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

And furthermore, we declare that

**The following (parts/clauses of) European
harmonised standards have been used: SFS-EN ISO
12100, SFS-EN 349**

Ähtäri ___/___ 20___

Juha Salmi
Managing Director



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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 bucket will not be damaged or made unsafe by the methods you choose.

2. SPECIAL APPLICATIONS

REMU occasionally modifies some 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 Crossover 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 Crossover 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 bucket will meet the desired application.

FOREWORD

“ We wish to thank you for choosing the REMU Crossover bucket.

Take time to read this manual carefully as it must be read in conjunction with the operator's manual of the work unit. This manual will help you to utilise the REMU Crossover 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 Crossover bucket, which are not included in this manual.

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

3. GENERAL

Blade Screen or Screener-Crusher module attached to Crossover frame forms a material processing tool that is referred as bucket in this manual. The working principle of the REMU Crossover bucket is based on rotating 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.

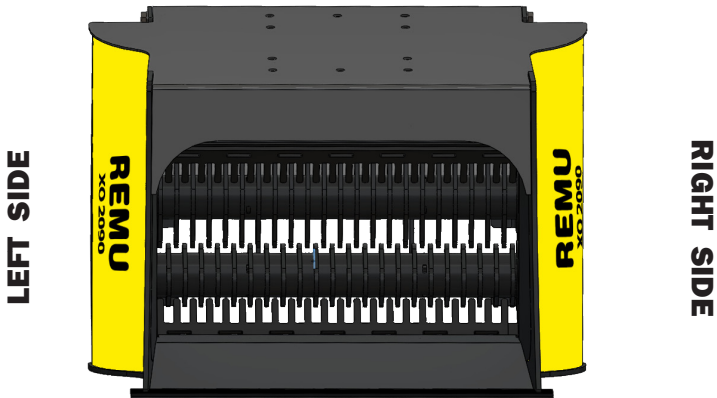
REMU Crossover bucket can be used to process various materials.

The following pictures show the different sides of the bucket.

Top, bottom, front and back sides of the bucket

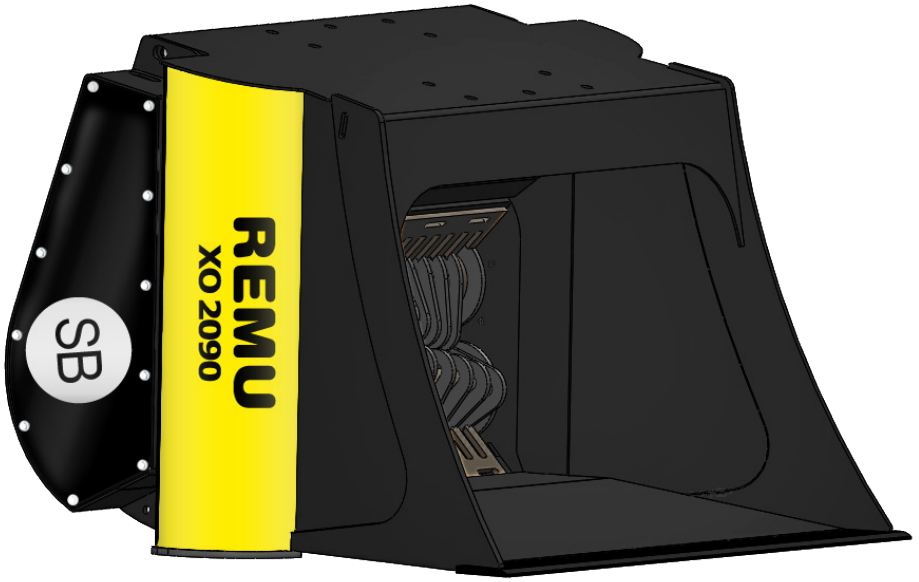


Left and right sides of the bucket



3.1 Bucket Parts

XO2090 as an example



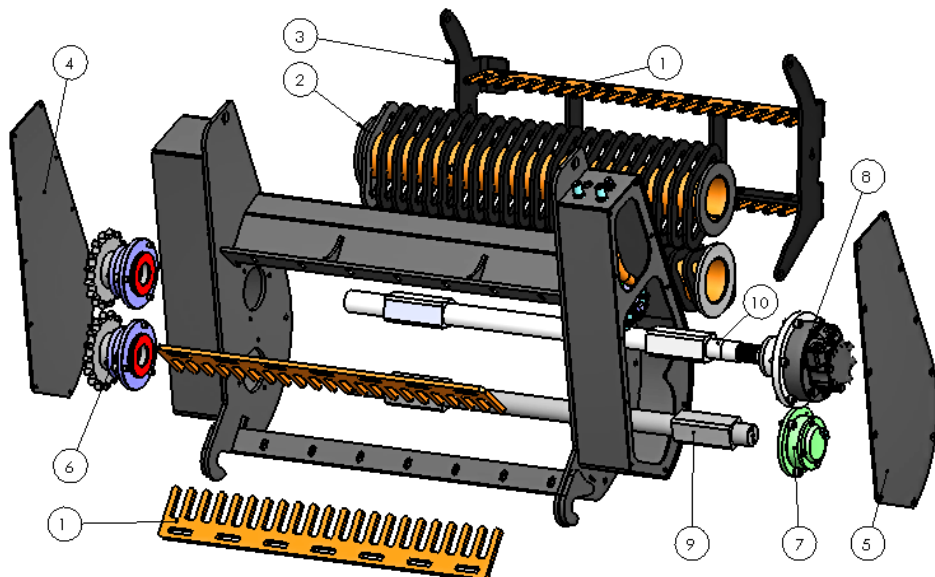
Crossover frame with Blade Screen module



Blade Screen module

Screener-Crusher module





Item	Description
1	Comb blank
2	Rotor
3	Cleaning scraper frame
4	Right side door
5	Left side door
6	Bearing assembly
7	Bearing assembly
8	Hydraulic motor
9	Lower inner shaft
10	Upper inner shaft

* See the spare part catalogue for spare part numbers for your bucket.

3.2 CE Plate Location

CE plate indicating the serial number of the module is located on the top side of it.

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













REMU		CE
NAME:	REMU	SERIAL No:
TYPE:		YEAR:
WEIGHT:	kg	
Do not deface or remove the plate.		REMU Oy Inhentie 7 63700 Ahtari Finland

4. 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 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.

4.1 Safety Labels on the Bucket

Label	 	Label	
Explanation	Caution! Read the manual before operating the bucket.	Explanation	The maximum allowed hydraulic oil flow.
Label	 	Label	
Explanation	Beware of tipping bucket. The centre of mass of the module and frame combination is located at the back side of the combination which may cause it to tip over. Keep safety distance.	Explanation	The maximum allowed hydraulic pressure.
Label	 	Label	
Explanation	Beware of material leaving the bucket. Keep safety distance.	Explanation	Lubricate every 30 hours.
Label	 	Label	
Explanation	Do not put your hands near or between moving parts. Keep safety distance.	Explanation	Lubricate every 8 hours.

4.2 Safety Procedures Before Operation

- The limitations and performance of the REMU Crossover and the work unit must be fully understood before any attempt is made to operate the 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 bucket and the work unit.
- Inspect the bucket, 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 given in this manual.
- Ensure safety labels are clean and readable. Replace safety labels if you cannot read them.

4.3 Safety Procedures During Operation

- Do not lift the work unit with the 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 raw materials, primary product and secondary product stock piles.
- Test operation of the bucket 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 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 walk under the bucket when it is mounted to the 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).
- Do not leave the bucket in water or other liquids during breaks.
- Do not use the bucket in acidic liquids.
- 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.

4.4 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 7.
- Clean and inspect the bucket for any damage. Repair any damage before operating the bucket again.
- Do not leave the bucket in water or other liquids after operation.

4.5 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. Be

careful when lifting the bucket or its parts.

- Switch off the work unit and ensure it cannot be switched on during maintenance and installation.
- Do not touch moving parts of the 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 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.

5. INSTALLATION OF THE BUCKET

The installation of Crossover bucket includes mounting Crossover frame to the work unit, attaching the module to the Crossover frame and connecting this bucket combination to the auxiliary hydraulics of the work unit. Follow the safety precautions given in the chapter 4 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.

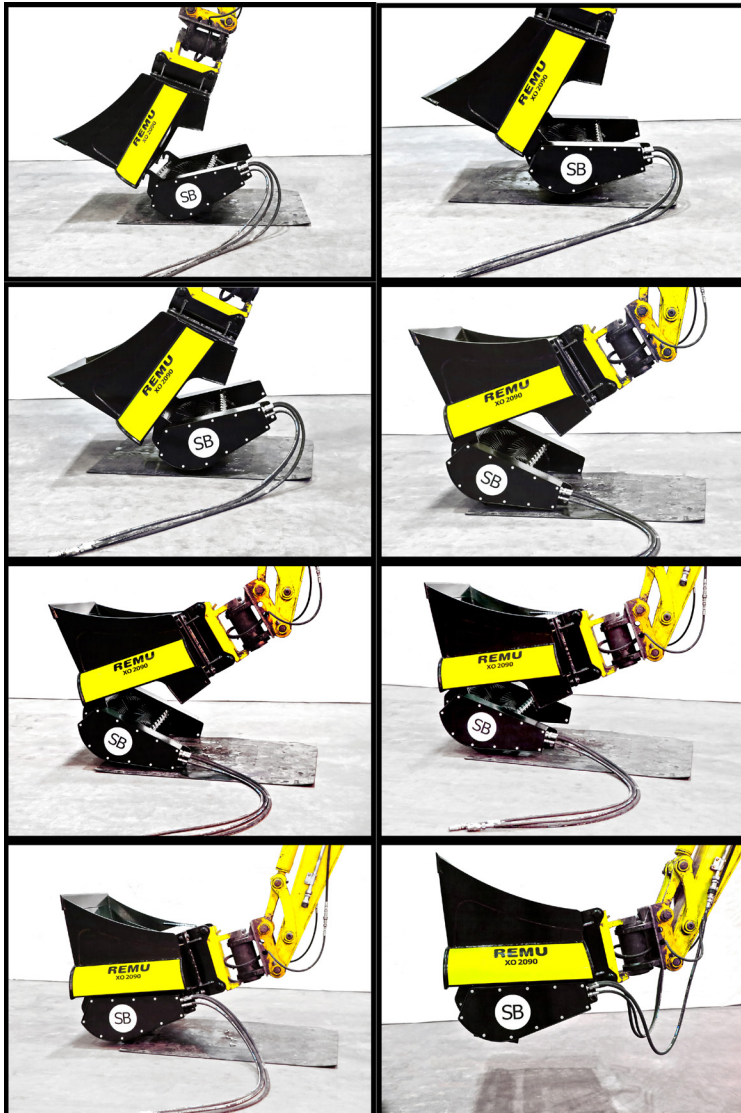
5.1 Mounting the Crossover Frame to the Work Unit

- Ensure the mounting is properly connected to Crossover frame.
- Ensure the mounting fits the work unit.
- Attach Crossover frame to the work unit in the desired application. REMU recommends that the bucket is used 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 bucket in the application in use. Note the weight of the frame and the module in use and ensure the loaded weight of the 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. Use copper paste or similar with bolts.

5.1.1 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.



5.2 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 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 maximum efficiency of the bucket may not be achieved. See the chapter 5.2.4 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 quick turning by on-off switch. Quick turning 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, install a pressure accumulator 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 bucket and take them into consideration during installation.

- **Load sensing and pressure controlled variable hydraulic pumps:** Ensure the auxiliary hydraulics of the work unit meet the hydraulic requirements of the bucket. Set the control parameters in a way that 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 bucket.

5.2.1 Maximum Allowed Hydraulic Oil Flow and Pressure

Modern work units are capable of producing more flow and pressure than required for the bucket. Limit the hydraulic oil flow and pressure from the work unit in a way

they do not exceed values set to your bucket.

If the maximum allowed hydraulic oil flow and pressure are exceeded the 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.

Module type	Hydraulic motor(s)	Maximum allowed hydraulic oil flow (l/min)	Maximum allowed pressure (bar)
SB2090, SB2150	1	85	300
SC2090, SC2150	1	85	300

See the maximum values for your module from the table above.



5.2.2 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 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. REMU recommends that the drain line is connected to the tank of the work unit through the return filter.
- Ensure the auxiliary hydraulic lines are open and allow the hydraulic oil flow to the bucket circuit.
- Operate the bucket at low engine R.P.M. in one direction for approximately twenty seconds to expel air from the hydraulic lines.

5.2.3 Hydraulic Oil Flow and Pressure Settings

- Set the hydraulic oil flow and pressure in a way they do not exceed the maximum allowed values given in the chapter 5.2.1.
- 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.
- Measure the pressure in the drain line. The pressure should not exceed 5 bar.

5.2.4 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.



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.

5.3 Installation Check List

Bucket installer must go through the following checklist and record the steps.

Phase	Completed
Crossover frame is mounted to the work unit	
The module is attached to 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 given limits	
The pressure in the drain line is measured (maximum 5 bar)	
The pressure is measured when the bucket is running	
Pressure (bar):	

The hydraulic oil flow is measured when the 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 bucket	
Installation date	
Signature of the installer	
Name of the installer in block letters	

6. OPERATIONS

Blade Screen module attached to Crossover frame can be applied in a number of applications including screening, mixing, padding and stabilization. When Screener-Crusher module is attached to Crossover frame, the bucket can be used for example for grinding, mixing, aerating, and crushing soft materials.

When using REMU Crossover bucket it should be fully understood that some materials are not as free flowing and take a considerably longer time to process. For example the moisture content and geological characteristics affect the material processing. REMU makes no assessment of production capabilities since in addition to material characteristics the work unit in use affects the results. For further details contact the REMU dealer or the manufacturer.

6.1 Before Processing

Prepare the material before processing 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 bucket should not be used for digging.

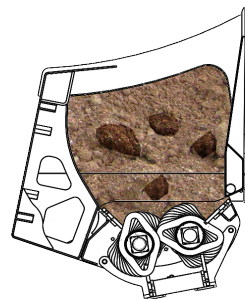
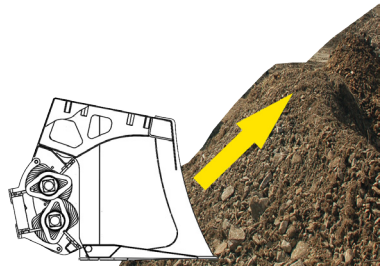
Ensure the bucket is installed according to instructions given in the chapter 5.

6.2 Materials processing

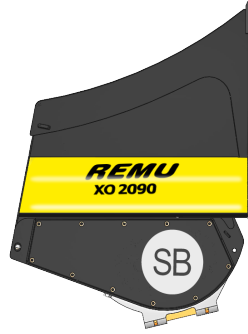
Filling the bucket, processing it and emptying the oversized material from the bucket form the materials processing process.

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 primary product.

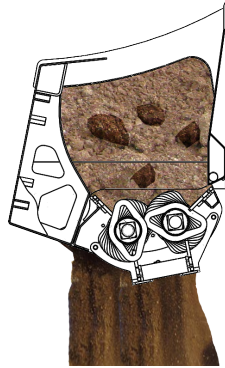
Position the bucket over the primary product storage area, hopper or truck. You may start processing before the bucket is tilted in the processing position in order to improve the results.



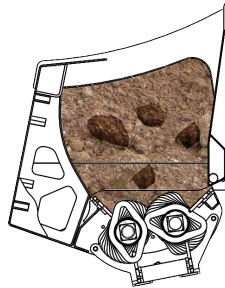
Tilt the bucket to the processing position. In Blade Screen and Screener-Crusher modules the processing position is when the yellow plate of the Crossover frame is horizontally.



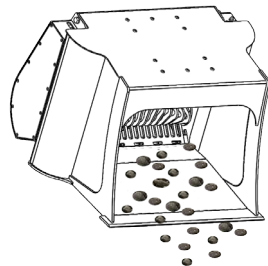
Turn the rotors in one direction as long as the material flows easily through the bucket. Change then the rotating direction of the rotors.



Continue processing until the material does not easily flow through the bucket anymore. If the bucket clogs during the 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.



6.3 Operation Efficiency

Some materials can be processed easier than others due to their moisture content or geological characteristics. Some common challenges include: the bucket clogs during the processing or the material cannot be processed easily.

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

- The rotating speed of the rotors may be too high. Adjust the hydraulic oil flow to the bucket to find the rotor speed that suits your material the best. The maximum allowed hydraulic oil flow for the bucket may not be the flow that gives the best result.
- The material may need more preparing before processing. If the material is too compressed it may not be processed easily.
- The material may be compressed on top of rotors. Tilt the bucket during the process in a way the material moves in the bucket and then tilt it back to the processing position. Repeat if necessary.
- Light material does not flow through the rotors. You may fill heavier material on top of the material you are processing 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 flow 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 processing impossible.

6.4 Cleaning the Bucket

Clean the 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:

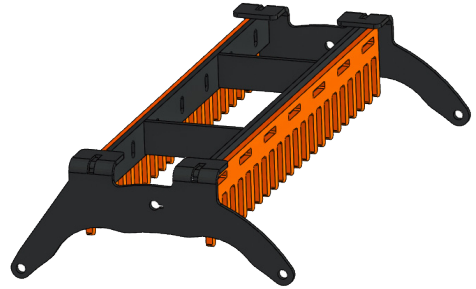
- Right after processing, before the material dries in place in the blades.
- Whenever the efficiency of the processing is impaired.
- Before the build-up of material between the blades of one rotor touches the adjacent rotor blade.
- On a regular basis according to the characteristics of the processed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

Clean the 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.

6.4.1 Cleaning Scraper

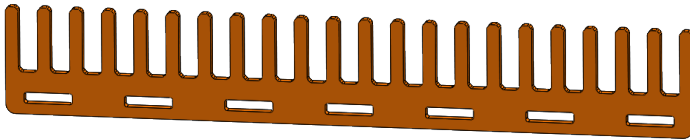
If the material being processed is moist and builds up very quickly on the rotors, REMU recommends that the cleaning scrapers should be fitted to the bucket to improve operation efficiency. When processing material with cleaning scrapers the cleaning scraper combs clean the material from the rotors constantly during processing.



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

6.5 Comb Counter Blades

Blade Screen and Screener-Crusher modules are equipped with comb counter blades.



6.6 Adjusting the Grain Size

It is possible to modify the grain size of the primary product by changing Blade Screen or Screener-Crusher module. A small adjustment can be achieved by moving the counter blade combs or shortening the spikes of the counter blade combs.

If the processed material or the requirements for the primary product change significantly, contact the REMU dealer or the manufacturer to find the most suitable solution for your application.

7. MAINTENANCE

Regularly performed proper lubrication and maintenance of the 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 bucket. Familiarize yourself with the following maintenance procedures. Contact the REMU dealer or the manufacturer if you need any additional information for maintaining your bucket.

Follow the safety precautions given in the chapter 4 during maintenance. Always dispose the contaminated products as industrial waste in accordance with the local regulations.

7.1 REMU Spare Parts

REMU 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 processed. The size of 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.

7.2 Maintenance Intervals

The maintenance intervals are determined by the bucket operating hours. See the additional maintenance procedures for especially abrasive or otherwise special conditions in the chapter 8.

The following table indicates maintenance intervals based on operating hours.

Point	Item	Procedure
8 Hours or 1 day		
1.	Rotor Drive and Idler End Lubrication Points	Grease. Recommendation: Multi-purpose NLGI No.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.	Hoses	Inspect for damage and leaks. Repair if necessary.
Always when changing the module		
6.	Attachment Mechanisms of Frame and Module	Inspect condition for wear or damage.
30 Hours or 3 Days		
7.	Chain Case	Lubricate the chain with the chain lubrication spray.
50 Hours or 1 Week		
8.	Mounting	Check tightness of retaining bolts.
100 Hours		
9.	Motor	Inspect visually.
10.	Side cases	Open both side cases of the module. Inspect the condition of components. Replace if needed.

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

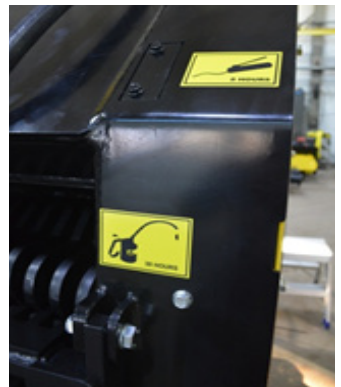
ITEM 1 (SEE FIGURE BESIDE):

In Blade Screen and Screener-Crusher modules the lubrication nipples are located on the right and left top corners of the module.

Lubricate with hand grease gun for approximately 10 pumping.

ITEMS 2, 3 & 4:

Visually inspect each 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 rotor and the inner shaft is about 2 to 4 mm (0.08" to 0.16"). The rotor can turn around its shaft for about 8 degrees.

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

ITEM 5:

Visually inspect the hydraulic hoses for leaks and damages.

ITEM 6:

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

ITEM 7:

Lubricate the chain in Blade Screen and Screener-Crusher modules through the lubrication hole at the back side of the module.

ITEM 8:

Check tightness of retaining bolts.

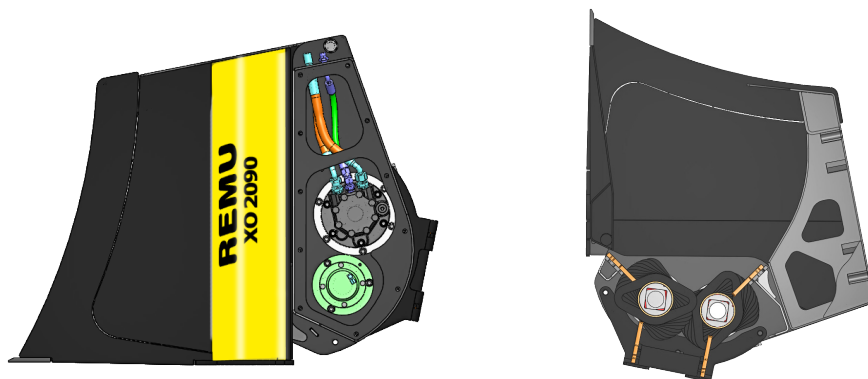
ITEMS 9 & 10 (SEE FOLLOWING FIGURE PAGE 27):

Blade Screen and Screener-Crusher modules are equipped with a direct drive motor that is attached to the upper shaft of the module. The motor is connected to the hydraulic circuit of the work unit. The hydraulic oil inside the motor housing lubricates the motor bearings.

The sprockets and the chain in Blade Screen and Screener-Crusher modules are located in the opposite end of the shaft than the motor. The tightness of the chain 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 side cases to visually inspect the condition of the bearing unit assemblies and their lubrication components. Replace any broken components.



7.3 Rotors Maintenance

In order to retard the wear of the rotors it is recommended that the tips of the 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.

8. 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 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, moist conditions	Before operation	Inspect the condition of the bucket.
	During operation	Lubricate every 2 hours.
	After operation	Drain the side cases and lubricate the chain. Grease the bearings after use and use the bucket empty for a while.
Salt water, highly corrosive material	Before operation	Inspect the condition of the bucket condition.
	During operation	Lubricate every 2 hours.
	After operation	Drain the side cases and lubricate the chain.
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	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.

9. TROUBLESHOOTING

Troubleshooting is a series of steps to help solving the problems of your REMU Crossover 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.

9.1 Fault Diagnosis

If the REMU Crossover 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.

Bucket makes noise during processing	
Mechanical	Blade Screen and Screener-Crusher modules have inner shafts inside rotors. There is a small play between the rotor and the shaft which may cause some noise when the bucket is running. See the chapter 7.2 for more information.
Rotors turn slowly or do not turn at all	
Hydraulic	Check that 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 bucket. If necessary, set the values according to the values given in the chapter 5.2.1. If the work unit cannot fulfil the hydraulic requirements of the 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, motor or pressure relief valves. Note that the components might be damaged even if there are no leaks.

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 chain, sprockets and shafts. Replace broken and worn out components.
	If the chain is in the serviceable condition, remove it and try to turn the rotors with your hands. If the rotors turn easily, the problem might be in the motor. If the lower rotor does not move, remove the sprocket and check the condition of the bearings from both sides of the shaft. Replace if needed. If the upper rotor does not move, remove the sprocket and check the condition of the bearing. Replace if needed. If the bearing is not damaged, the problem might be in motor.
There is hydraulic oil leaking from the bucket	
Hydraulic	Inspect the hoses, couplings, motor and other hydraulic components. Retighten leaking hoses and replace any broken components.
Chains break down repeatedly	
Hydraulic	Premature chain failures may result from rotor over speed. Measure the hydraulic oil flow from the work unit to the bucket and set it according to the values given in the chapter 5.2.1. Premature chain failures may also result from quick changes in the rotating direction of the rotors with work units not equipped with proportional auxiliary hydraulics. See chapter 5.2 for more information.
Mechanical	Worn out sprockets wear down the chains. Replace any worn out sprockets.
Bucket malfunctions in the cold weather	
Hydraulic	Let the hydraulic oil warm up before starting to operate the bucket.
Grain size increases	
Mechanical	Inspect the condition of rotors and counter blades. Perform hard facing to the rotor blades and replace counter blades if necessary.
	It is possible to adjust the grain size by moving the counter blades closer to the rotors. See chapter 6.6 for more information.

10. 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 bucket is stored outside, ensure that the bucket is placed on a dry, level and firm base.

10.1 Storage Preparation

- Place the bucket on the firm and level base the bottom side of the bucket facing the ground.
- If you are storing the module attached to the Crossover frame, support the bucket combination in the upright position to avoid tipping over.
- 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.
- Make sure all screw threads for attaching couplings in Crossover frame are capped in case there aren't any couplings attached to these.

10.2 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.
- Follow the installation instructions given in the chapter 5 when installing the bucket to the work unit.
- If the drain line has not been capped during storage and the oil has drained away from it, the motor housing may not have hydraulic oil inside it. Add hydraulic oil to the motor housing through the plug on the side of the motor.

11. TRANSPORT AND LIFTING

Modules have their weights stamped on the CE plate. Note that the weight may slightly differ between different module assemblies. Note also the weight of the Crossover frame (XO20190: 225 kg, XO2150: 335 kg).

The centre of the gravity of a module and Crossover frame combination is located in the back side of the combination. This may cause the bucket to tip over without support.

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.

11.1 Transport when Mounted on the Work Unit

Transportation of the bucket mounted on the work unit should be done as if the Crossover bucket was a standard bucket. Note that Crossover frame and modules cannot be used as tie down points for the work unit.

11.2 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.
- Support the combination of Crossover frame and the module to avoid tipping over.
- Position the bucket so that other items will not damage it.
- Use the appropriate tie down points.
- Do not transport loose items in the bucket.

12. DECOMMISSIONING AND SCRAPPING

When the 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 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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