Original instructions

ENG 8/25

OPERATOR'S MANUAL

OMRPV14R,RPV22R,RPV29R,RPV39R,RPV53R,RPV75RENG.825

PULVERIZER

RAMMER RPV14R, RPV22R, RPV29R, RPV39R, RPV53R, RPV75R

OPERATION

1. INTRODUCTION

1.1 THIS MANUAL

This manual is arranged to give you a good understanding of the product and its safe operation. It also contains maintenance information and technical specifications. Read this manual from front to back before installing, operating or maintaining the product for the first time.

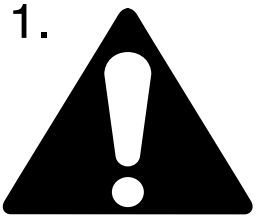
In this manual, the units of measurement are metric. For example, weights are given in kilograms (kg). In some cases, another unit follows in parenthesis (). For example 28 litres (7.4 US gal).

The specifications and designs presented in this manual are subject to change without prior notice.

SYMBOLS USED IN THIS MANUAL

This symbol identifies important safety messages within this manual. Carefully read the message that follows. Failure to understand and obey this safety warning could result in injury to you or others, and could also cause damage to product. See illustration 1.

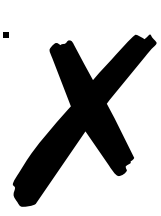
1.



R010127

This symbol identifies prohibited action or hazardous location. Failure to understand and obey this safety warning could result in injury to you or others, and could also cause damage to product. See illustration 2.

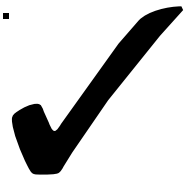
2.



R010128

This symbol identifies correct and recommended action. See illustration 3.

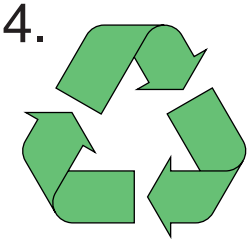
3.



R010126

This symbol identifies environmental and recycling matter. See illustration 4.

4.



R010265

1.2 IMPORTANT SAFETY INFORMATION

Basic safety precautions are outlined in the "Safety" section of this manual and in the instructions where hazards exist. These warnings are identified by a warning symbol.

To use the product correctly, you must also be a competent operator of the carrier. Do not use or install it if you cannot use the carrier. The product is a powerful tool. Used without proper care, it can cause damage.

Do not rush when you are learning to use the product. Take your time and most importantly, take it safely. Do not guess. If there is anything you do not understand, ask your local dealer.

Improper operation, lubrication or maintenance of this product can be dangerous and could result in injury.

Do not operate this product until you read and understand the instructions in this manual.

Do not perform any lubrication and maintenance on this product until you read and understand the instructions in this manual.

1.3 WARRANTY

The customer is provided with a separate warranty, where the export warranty terms are explained. Always check that this warranty is provided with the product. If not, contact your local dealer immediately.

WARRANTY REGISTRATION CARD

A warranty registration card is filled out after the installation inspection by the dealer and a copy of it is sent to the manufacturer. This card is very important because no warranty claims are handled without it. Make sure that you get a copy of it after the installation inspection and that it is correctly filled out.

INSTALLATION INSPECTION

An installation inspection must be carried out after the product has been installed on the carrier. During the installation inspection, certain specifications (operating pressure, oil flow, etc.) are checked so that they are within given limits. See “Product specifications” on page 68.

1.4 SPARE PART ORDERS

When you need spare parts or some information concerning maintenance to your product, please contact your local dealer. Quick deliveries are ensured by exact orders.

Required information:

- Name of customer, contact person
- Order number (when available)
- Delivery address
- Mode of delivery (air mail, etc.)
- Required delivery date
- Invoicing address
- Model and serial number of product
- Name, number and required amount of spare parts

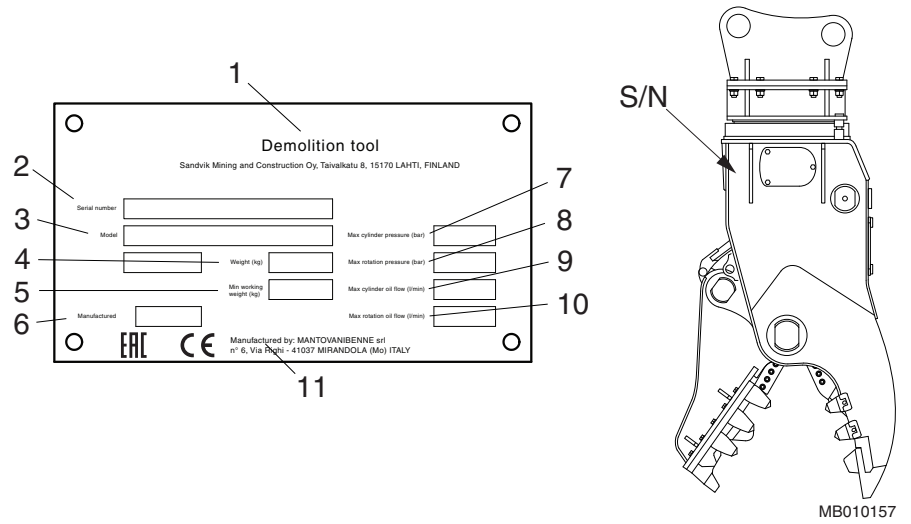
2. MACHINE NUMBERS

2.1 PRODUCT IDENTIFICATION

The product serial number is stamped on the product body. The model and serial number are also located on the product identification plate.

It is important to make correct reference to the serial number of the product when making repairs or ordering spare parts. Identification of the serial number is the only proper means of maintaining and identifying parts for a specific product.

See the following figure for the location of the serial number on your product model.



CONTENT OF THE PRODUCT IDENTIFICATION PLATE

1	Demolition tool
2	Serial number
3	Model
4	Weight (kg)
5	Min working weight (kg)
6	Manufactured
7	Max cylinder pressure (bar)
8	Max rotation pressure (bar)
9	Max cylinder oil flow (l/min)
10	Max rotation oil flow (l/min)
11	Manufactured by

3. PRODUCT INTRODUCTION

3.1 OVERVIEW

The product is a hydraulically operated pulverizer. It can be used on any carrier which meets the necessary hydraulic and mechanical installation requirements.

3.2 REMOVAL FROM PACKAGE

Remove all the steel belts from the package. Open the package and remove all plastics covering the product. Recycle all package materials (steel, plastic, wood) properly.

Check that the product is in good condition and that there is no visible damage. Check that all ordered parts and accessories have been enclosed with the product. Some options may be provided by your local dealer, such as installation kits, including hoses and mounting bracket.

3.3 LIFTING INSTRUCTIONS

Use a hoist when lifting components which weigh 23 kg (50 lb) or more, to avoid back injury. Make sure all chains, hooks, slings, etc., are in good condition and are in the correct capacity. Make sure hooks are positioned correctly. Do not side load the lifting eye during a lifting operation.

PROVIDED LIFTING POINTS

The lifting points located on the product frame are to be used solely to lift or handle the product itself. The lifting capacity calculation is based on the product's working weight, including an average sized mounting bracket.

Warning! To avoid falling objects, do not use the product to lift other products. The lifting points located on the product frame are to be used solely to lift or handle the product itself.

The maximum allowed total weight is shown on the product's identification plate and specification page. See “Product specifications” on page 68. If the weight exceeds the maximum allowed total weight shown on the identification plate and specification page, you will have to use other lifting points/methods than originally provided on the product.

The other threaded holes on the product are intended for handling single parts only. You must not lift the entire assembly by using these threaded holes. For handling the parts, see product workshop documentation for suitable lifting methods and lifting adapters.

LIFTING EYE SCREWS

If lifting eye screws are used, lifting eye screws must be completely tightened. The lifting eye can be loaded only if the screw is properly tightened to the frame.

Failure to properly tighten the screw before allowing load pressure on the lifting eye may cause lifting eye to break and free fall of the product.

If you use mechanical tools for tightening, make sure not to overstrain the shank. Before lifting, make sure that the rope and/or hook is stretched.

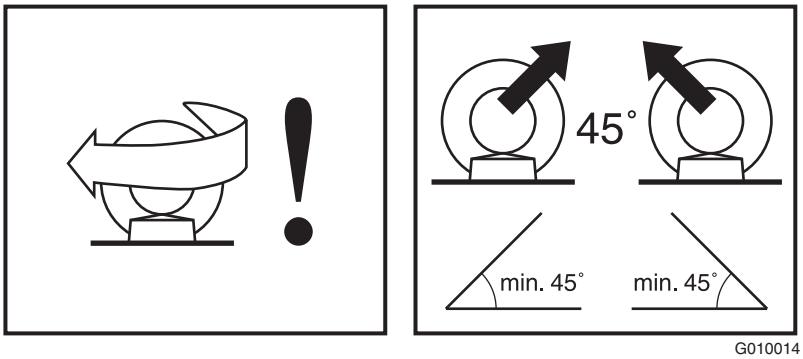
When two lifting points are used, the lifting capacity depends on the angle of the lifting chains. The angle should not be less than 45°, as shown in the illustration. When the lifting eye screws are tightened, both rings should be aligned.

The loading capacity calculation applies to temperatures between -10 °C (14 °F) and 40 °C (104 °F).

Before reuse of lifting eye screws, make sure there are no surface flaws (for example pits, voids, folds and seams, deformation of the ring, missing or broken threads, rust, etc.).

The local, national safety standards for machines and lifting-tackles must always be strictly observed.

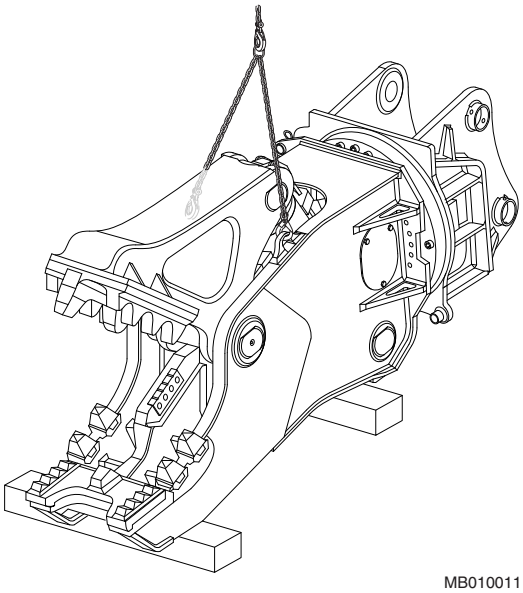
Note: The lifting eye must always be removed from the product and replaced with a screw before operation.



G010014

Lifting devices must safely carry the working weight of the product. See “Product specifications” on page 68.

Place a chain or sling as shown in the illustration to lift the product.



Note: The lifting eye screws must always be removed from the product and replaced with a screw before operation.

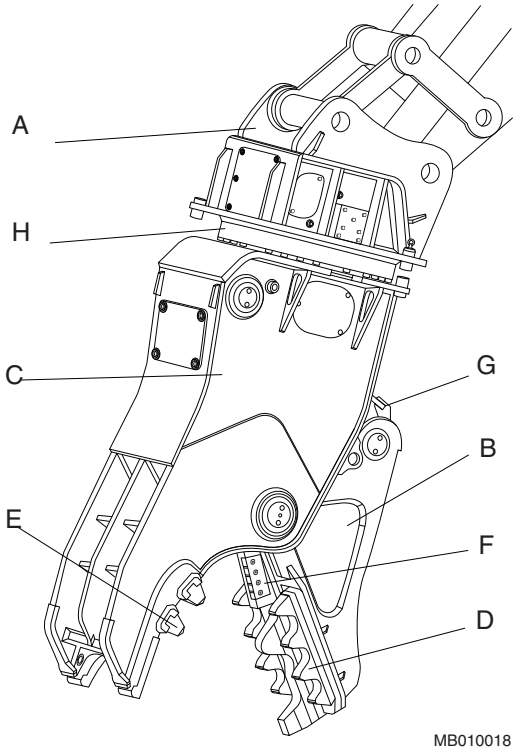
SAFETY INSTRUCTIONS FOR LIFTING

Below are some common safety instructions concerning lifting operations. In addition to this, the local, national standards for machines and lifting-tackles must always be strictly observed. Please note that the list below is not all inclusive, you must always ensure the procedure you choose is safe for you and others.

- Do not lift the load over people. No one must be under the hoisted load.
- Do not lift people and never ride the hoisted load.
- Keep people clear from the lift area.
- Avoid side pull of the load. Make sure you take up the slack slowly. Start and stop carefully.
- Lift the load a few centimeters and verify it before proceeding. Make sure the load is well balanced. Check for any loose items.
- Never leave the suspended load unattended. Maintain load control at all times.
- Never lift the load over the rated capacity (see the product's operating weight from the specification page).
- Inspect all lifting product before use. Do not use twisted or damaged lifting product. Protect lifting product from sharp corners.
- Obey all local safety instructions.

3.4 MAIN PARTS

The main parts of the rotating pulverizer are shown below.



A. Mounting bracket

B. Jaw

C. Frame

D. Crushing plate

E. Crushing tooth

F. Cutting blades

G. Cylinder

H. Thrust bearing

4. SAFETY AND ENVIRONMENTAL INSTRUCTIONS

4.1 SAFETY IN GENERAL

All mechanical products can be hazardous if operated without due care or correct maintenance. Most accidents involving machine operation and maintenance are caused by failure to observe basic safety rules or precautions. An accident can often be avoided by recognizing potentially hazardous situations before an accident occurs.

Because it is impossible to anticipate every possible circumstance that might involve a potential hazard, the warnings in this guide and on the product are not all inclusive. If a procedure, tool, working method or operating technique not specifically recommended by manufacturer is used, you must satisfy yourself that it is safe for you and others. You should also ensure that the product will not be damaged or made unsafe by the method of operation or maintenance procedures you choose.

Safety is not just a matter of responding to the warnings. All the time you are working with your product you must pay attention to what hazards there might be and how to avoid them. Do not work with the product until you are sure that you can control it. Do not start any job until you are sure that you and those around you will be safe.

Warning! Read the following warning messages carefully. They tell you of different hazards and how to avoid them. If proper precautions are not taken, you or others could be seriously injured.

4.2 SAFETY INSTRUCTIONS

MANUALS

Study this manual before installing, operating or maintaining the product. If there is anything you do not understand, ask your employer or your local dealer to explain it. Keep this manual clean and in good condition.

The related safety label on the product and the text on the label are shown below.

"IGNORING INSTRUCTIONS HAZARD

Faulty handling practice could cause death or serious injury.

Read and follow the instructions in the operator's manual."

R010348

CARE AND ALERTNESS

All the time you are working with the product, take care and stay alert. Always be alert for hazards. The possibility of a serious or even fatal accident is increased when you are intoxicated.

CLOTHING

You can be injured if you do not wear proper clothing. Loose clothing can get caught in the machinery. Wear protective clothing to suit the job.

Examples are: a safety helmet, safety shoes, safety glasses, well-fitting overalls, ear-protectors and industrial gloves. Keep cuffs fastened. Do not wear a necktie or scarf. Keep long hair restrained.

PRACTICE

You and others can be killed or injured if you perform unfamiliar operations without practicing them first. Practice away from the job site, in a clear area.

Keep other people away. Do not perform new operations until you are sure you can do them safely.

REGULATIONS AND LAWS

Obey all laws, work site and local regulations which affect you and your product.

COMMUNICATIONS

Bad communications can cause accidents. Keep people around you informed of what you will be doing. If you will be working with other people, make sure they understand any hand signals you will be using.

Worksites can be noisy. Do not rely on spoken commands.

WORKSITE

Worksites can be hazardous. Inspect the site before working on it.

Check for potholes, weak ground, hidden rocks, etc. Check for utilities (electric cables, gas and water pipes, etc.). Mark the positions of cables and pipes.

Poor visibility can cause accidents and damage. Make sure that visibility and lighting in the working area are adequate.

Worksites can be noisy. Wear ear protection to prevent personal injury.

BANKS AND TRENCHES

Banked material and trenches can collapse. Do not work too close to banks and trenches where there is a danger of collapse.

SAFETY BARRIERS

Unguarded product in public places can be dangerous. Place barriers around machinery to keep people away.

AIRBORNE POLLUTANTS

The related safety label on the product and the text on the label are shown below.

"DUST HAZARD

Breathing dust will cause death or severe injury.

Always wear approved respirator."

R010349

Airborne pollutants are microscopic particles, which will damage your health when inhaled. Aiborne pollutants on construction sites can be for example silica dust, oil fumes or diesel exhaust particles, visible or invisible. Especially in demolition sites, there may be other dangerous substances, such as asbestos, lead paints or other chemical substances.

The effect of airborne pollutants may be immediate if the substance is poisonous. The main danger with airborne pollutants comes from long term exposure, where particles are inhaled but not removed from the lungs. The disease is called silicosis, asbestosis or other, and will result in death or serious injury.

To protect yourself from airborne pollutants, always keep excavator doors and windows closed during operation. Excavators with pressurized cabins should be utilized in product operation. Proper maintenance of fresh air filters of the excavator is essential. Where pressurized cabins are not available, proper respirators must be utilized.

Stop working when bystanders are in the area of airborne pollutants and make sure they have proper respirators. Respirators are as important for bystanders as hard hats.

Respirators for both operator and bystanders must be approved by the respirator manufacturer for the application in question. It is essential that the respirators protect from the tiny dust particles which cause silicosis and which may cause other serious lung diseases. Do not use the product until you are sure the respirators are working properly. This means each respirator must be checked to make sure that it is clean, that its filter has been changed, and to otherwise make sure the respirator will protect in the way it is meant to.

Always make sure dust has been cleaned off your boots and clothes when you leave your shift. The smallest particles of dust are the most harmful. They may be so fine that you cannot see them. Remember, you MUST protect yourself and bystanders from the danger of breathing or inhaling dust.

Always follow local laws and regulations for airborne pollutants in the working environment.

FLYING DEMOLITION DEBRIS

The safety label on the product is shown below:

"FLYING OBJECTS HAZARD

Fragments fly up to 40 m (130 ft) and could cause death or serious injury.

Stop operation when a person enters hazard zone.

Wear approved personal protective equipment."

R010350

Protect yourself and your surroundings from flying debris. Do not operate the product or carrier with people around it.

The European standard EN 474-1 on safety of earth-moving machinery requires that adequate operator's protection, such as bullet proof glass, mesh guard or an equivalent protection is used.

Keep the cabin windows and doors closed during operation. Window bars are recommended to protect the windows from flying debris.

CRUSHING HAZARD

The safety label on the product is shown below:

"CRUSHING HAZARD

Contact with moving parts or material could cause death or severe injury.

Keep yourself and bystanders out of hazard zone."

G010031

COLLAPSING CONCRETE FRAMES

Protect yourself and your surroundings from collapsing concrete frames. Do not operate the product or carrier with people around it.

PRODUCT LIMITS

Operating the product beyond its design limits can cause damage. It can also be dangerous. See “Product specifications” on page 68.

Do not try to upgrade the product's performance by unapproved modifications.

HYDRAULIC FLUID

Fine jets of hydraulic fluid at high pressure can penetrate the skin. Do not use your fingers to check for hydraulic fluid leaks. Do not put your face close to suspected leaks. Hold a piece of cardboard close to suspected leaks and then inspect the cardboard for signs of hydraulic fluid. If hydraulic fluid penetrates your skin, seek medical help immediately.

Hot hydraulic fluid can cause severe injuries.

HYDRAULIC HOSES AND FITTINGS

Ensure all hydraulic components will withstand maximum pressure and mechanical stresses caused by operation of the product. Consult your local dealer for instructions.

FIRE HAZARD

Most hydraulic fluids are flammable and might ignite when contacting hot surface. Avoid spilling hydraulic fluid to hot surfaces.

Working with the product on certain materials can cause sparks and hot splinters to get loose. These can ignite flammable materials around working area.

Ensure that adequate extinguisher is available.

HYDRAULIC PRESSURE

Hydraulic fluid at system pressure can injure you. Before disconnecting or connecting hydraulic hoses, stop the carrier engine and operate the controls to release pressure trapped in the hoses. During operation, keep people away from the hydraulic hoses.

There might be pressurized oil trapped inside the product even if it is disconnected from the carrier. Be aware of possible unexpected movements of the product while maintaining product.

LIFTING EQUIPMENT

You can be injured if you use faulty lifting equipment. Make sure that lifting equipment is in good condition. Make sure that the lifting tackle complies with all local regulations and is suitable for the job. Make sure that the lifting equipment is strong enough for the job and you know how to use it.

Do not use this product or any of its parts for lifting. See “Lifting instructions” on page 8. Contact your carrier dealer to find out how to lift with your carrier.

SPARE PARTS

Use only genuine spare parts. Use only genuine cutting blades with pulverizers. The use of other spare part or cutting blade brands may damage the product.

PRODUCT CONDITION

Defective product can injure you or others. Do not operate product which is defective or has missing parts.

Make sure the maintenance procedures in this manual are completed before using the product.

REPAIRS AND MAINTENANCE

Do not try to do repairs or any other maintenance work you do not understand.

MODIFICATIONS AND WELDING

Non-approved modifications can cause injury and damage. Contact your local dealer for advice before modifying the product. Before welding on the product while it is installed on the carrier, consult your carrier dealer for precautions in welding.

METAL SPLINTERS

You can be injured by flying splinters when driving metal pins in and out. Use soft-faced hammer or drifts to remove and fit metal pins, such as pivot pins. Always wear safety glasses.

LABELS ON THE PRODUCT

Safety labels communicate the following four things:

- The severity level of the risk (that is signal word "DANGER" or "WARNING").
- The nature of the hazard (such as high pressure, dust, etc.).
- The consequence of interaction with the hazard.
- How to avoid the hazard.

You must ALWAYS follow the instructions in the safety messages, the messages in the product safety labels and the instructions set forth in the manuals to avoid death or severe injury!

Keep the safety labels clean and visible at all times. Check the condition of safety labels daily. Safety labels and instructions which have disappeared, been damaged, painted over, come loose, or do not meet the legibility requirements for safe viewing distance must be replaced before operating the product.

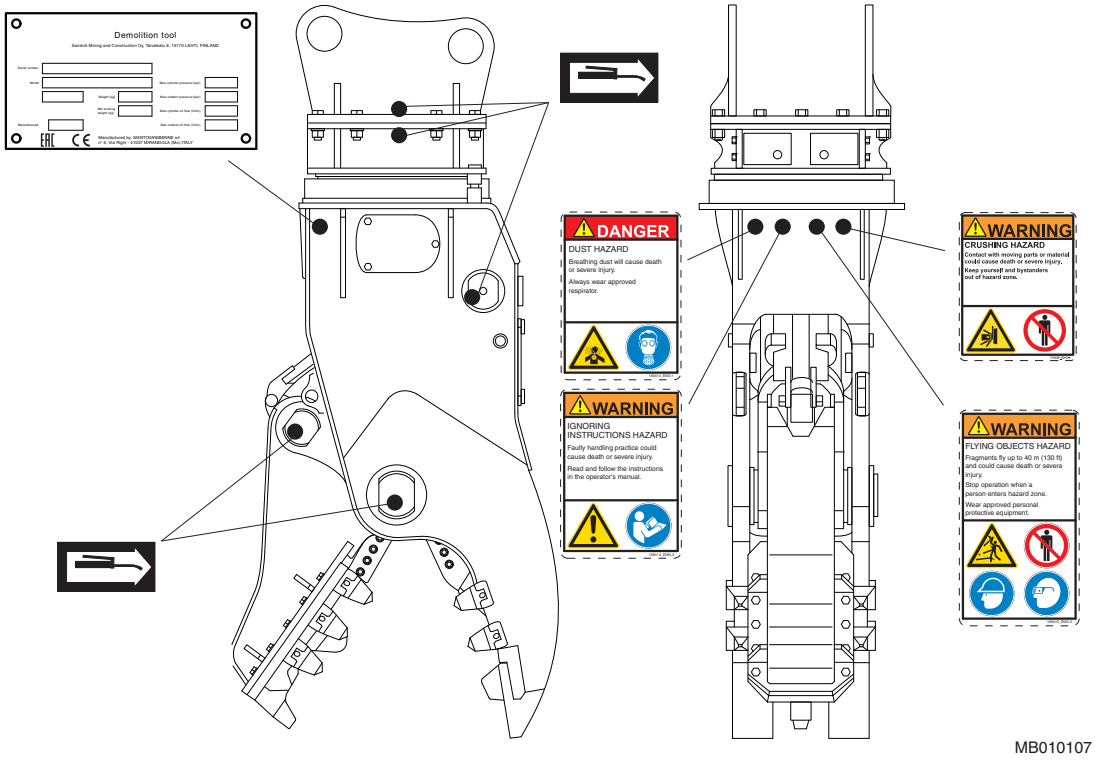
If a safety label is attached to a part that is replaced, install a new safety label on the replacement part. If this manual is available in your language, then the safety labels should be available in the same language.

There are several specific safety labels on this product. Please become familiarized with all safety labels. The location of the safety labels is shown in the illustration below.

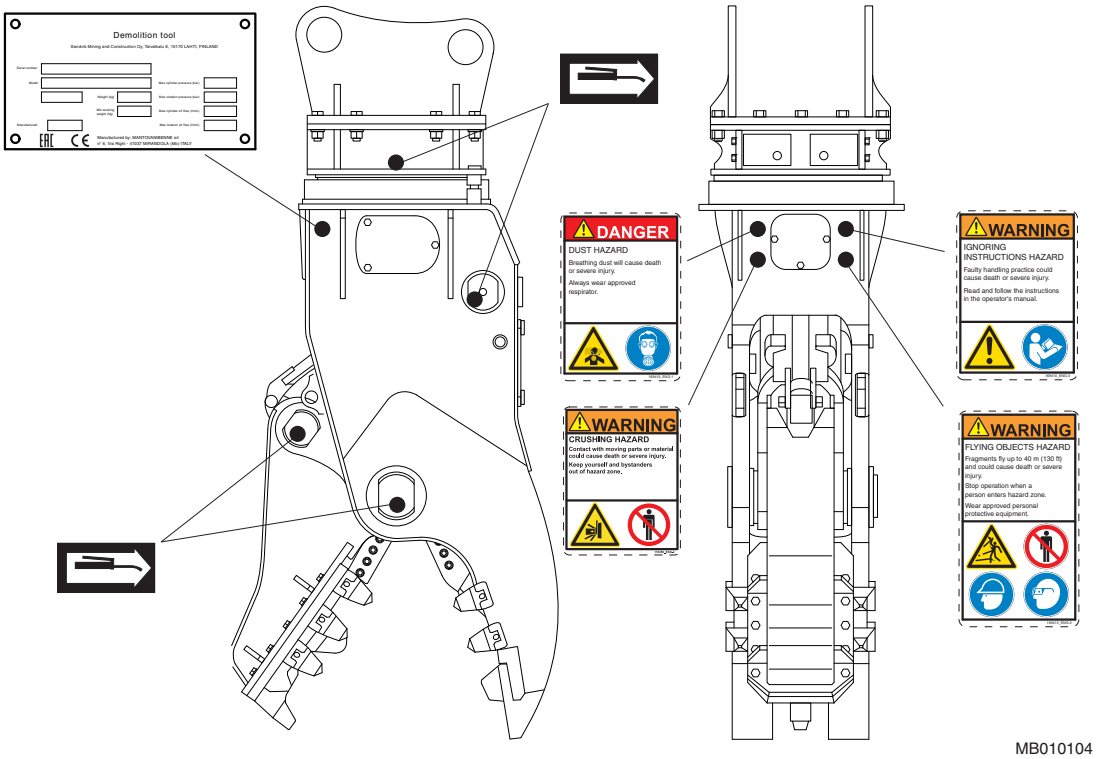
When you clean the safety labels, use a cloth, water and soap. Do not use solvent, gasoline or other harsh chemicals to clean the safety labels.

Solvents, gasoline or harsh chemicals could loosen the adhesive that secures the safety labels. Loose adhesive will allow the safety label to fall.

RPV14R



RPV22R



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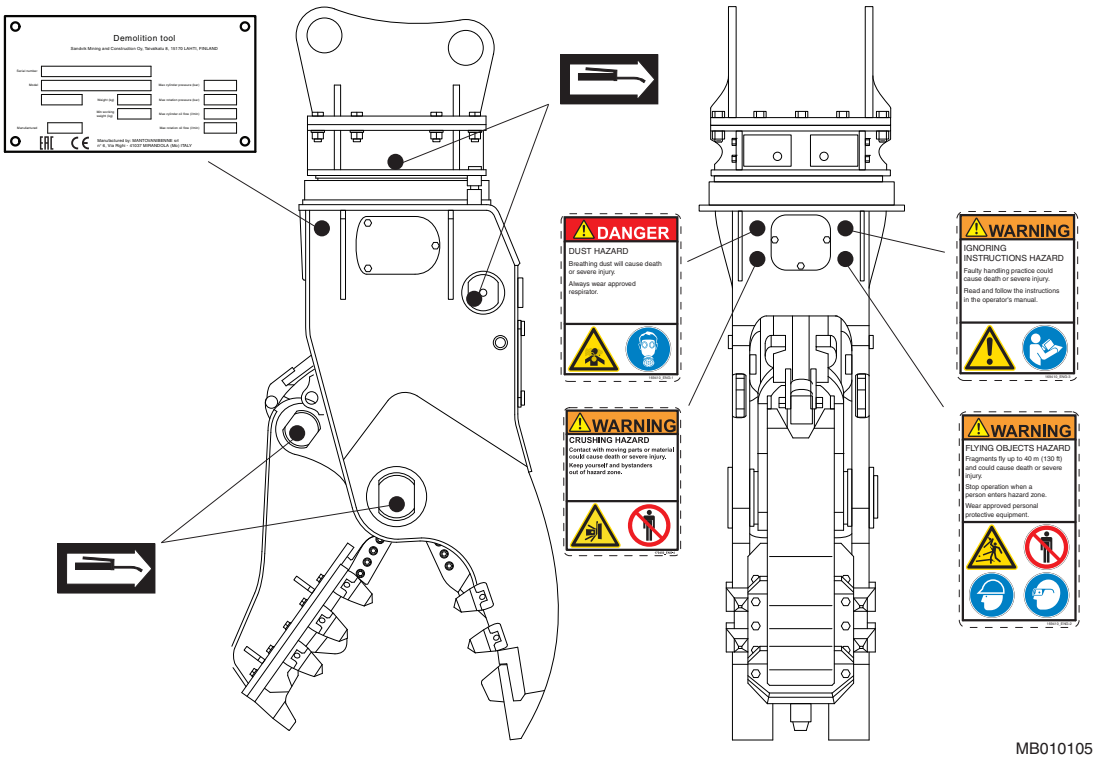
RPV29R



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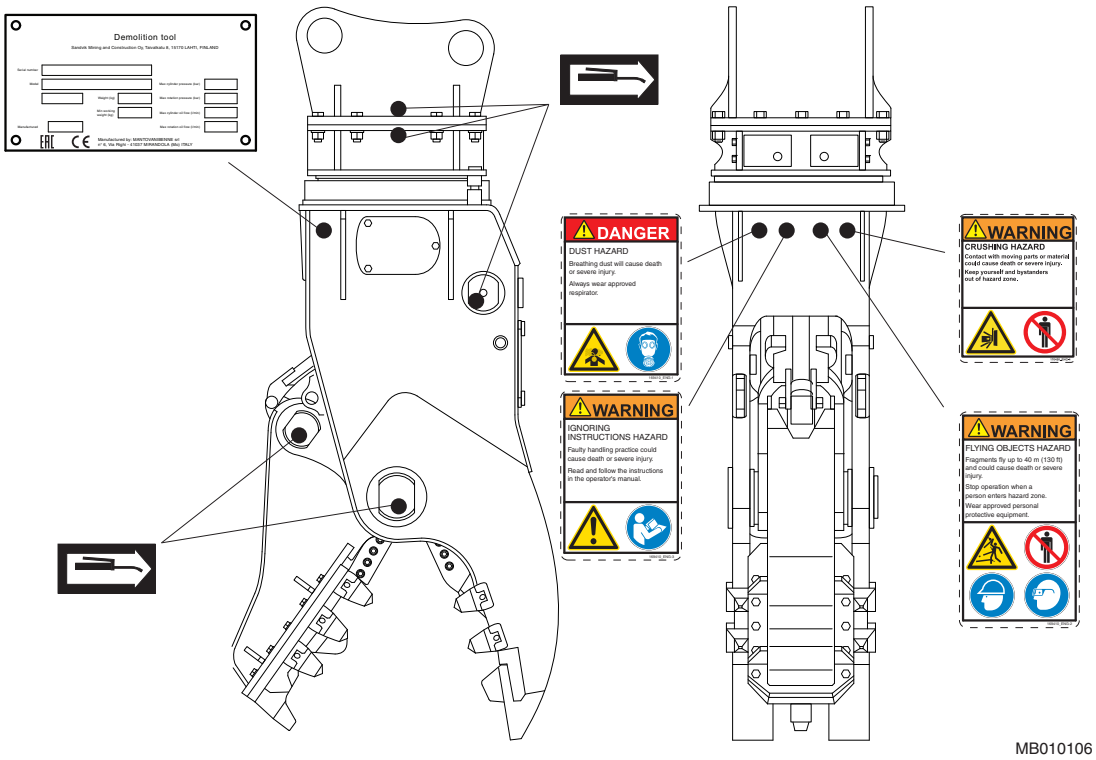
RPV39R, RPV53R, RPV75R



4.3 ENVIRONMENTAL PROTECTION AND RECYCLING POLICY

Rammer products support the recycling of materials to help customers achieve their environmental objectives. During manufacturing all necessary precautions are taken to make sure that no harm is done to the environment.

Every effort is made to foresee and minimize the risks that might be associated with the operation and maintenance of Rammer products, and which could pose danger to humans or the environment. We support customers in their efforts to consider the environmental protection in their everyday work.

When working with a Rammer product please follow these guidelines:

- Dispose of packaging materials properly. Wood and plastic can be burned or recycled. Deliver the steel belts to metal recycling center.
- Protect the environment from oil spills.

  In case of hydraulic oil leaks, the product should be serviced immediately.

  Follow the product's greasing instructions and avoid excessive greasing.

  Be careful when handling, storing and transporting oils.

  Dispose of empty oil or grease containers appropriately.

  Consult local authorities for detailed instructions.
- All metal parts of the product can be recycled by delivering them to an authorized scrap metal collection facility.
- Comply with local waste classification rules when disposing of used rubber or plastic parts (wear plates, seals).

Consult with your local dealer for more information.

5. OPERATION

5.1 OPERATING INSTRUCTIONS

RECOMMENDED USE

The pulverizer is designed for use in demolishing work to pulverize demolition material. It can be used in recycling plants for separating the concrete from the reinforcement bars or for removing and regrinding road surfaces. For more information, contact your local dealer.

OPERATING CONDITIONS

Principles of installation

Almost all carriers meeting the mechanical and hydraulic requirements of the product can be used. See “Product specifications” on page 68. The product is installed on the carrier in much the same way as installing a bucket or other attachment. A flange-mounted product also requires a separate mounting bracket.

The product is connected to a carrier's hydraulic circuit with an installation kit. If the carrier is already fitted with an installation kit, the installation requires only suitable hoses and fittings. For product installation, secondary relief valves in the bucket cylinder circuit and the carrier auxiliary circuit are needed. If the carrier does not have a suitable kit to run attachments, one must be built. This may require a more complex installation, including new piping and additional valves such as a flow control valve or pressure relief valve.

Suitable kits can be ordered from the manufacturer or their local dealers, carrier manufacturers and their dealers, or third party suppliers.

Note: In models equipped with a system to prevent rotation of the product, remember to unlock the system before starting operation. See “Mounting and dismounting the product” on page 33.

Hydraulic oil

In general, the hydraulic oil originally intended for the carrier can be used with this product. See “Requirements for hydraulic oil” on page 42.

Operating temperature

The operating temperature is -20 °C (-4 °F) to 80 °C (176 °F). If you must work in a temperature lower than -20 °C (-4 °F), the product must be preheated before any operation can begin. Start the operation with low hydraulic flow.

Note: The temperature of the hydraulic oil must be monitored. Ensure that oil grade and monitored oil temperature together guarantee correct oil viscosity. See “Requirements for hydraulic oil” on page 42.

PRINCIPLES OF OPERATION

The operation of the product is based on a static force produced by the hydraulic cylinder of the product. To increase the product's working life, pay particular attention to correct working methods.

Crushing is performed at the front of the jaws. **NOTICE! Avoid using cutting blades for crushing**. **Doing so may damage the blades**.

Cutting is performed with cutting blades at the rear of the jaws. The cutting blades can be reversed.

JAWS, TEETH AND CUTTING BLADES

Jaws

The jaws are operated by the hydraulic cylinder. One jaw is fixed and the other, equipped with breaking teeth, is moving. Crushing is performed using the crushing teeth of the jaws.

Crushing teeth

Crushing is performed using the crushing teeth of the jaws. The long-lasting, convex teeth are made of special steel. They are fastened with screws and can be replaced.

Crushing plate

The teeth of the crushing plate are made of special steel. The teeth are welded directly onto the plate. The crushing plate is removable, so that the teeth can be serviced separately.

Cutting blades

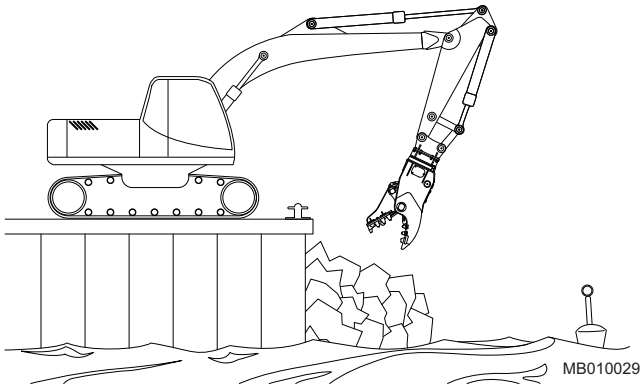
The cutting blades are fastened with screws. You can turn them to use unused cutting edges or replace them with new cutting blades. See “Turning and changing cutting blades” on page 52.

5.2 DAILY OPERATION

Warning! Protect yourself and your surroundings from flying debris and collapsing concrete frames. Do not operate the product or carrier with people around it.

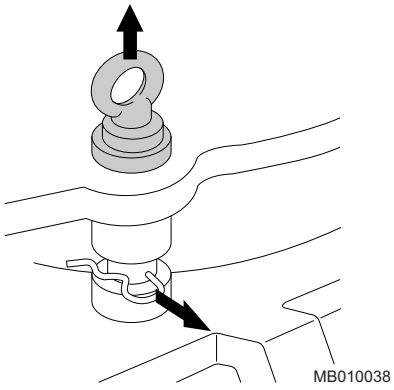
The product, as a standard assembly, must not be used under water. It must be adapted for underwater applications. Contact your local dealer for more information on underwater use.

After operating the product under water or in environments close to the sea, carefully wash the product. Subsequently disassemble the hinges and carefully clean the pins and bushings to remove all traces of oxidation. Lastly, grease the disassembled parts.

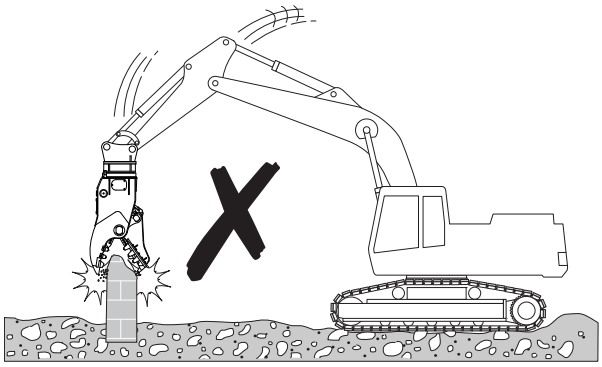


In models equipped with a rotation prevention system, remember to unlock the system before starting operation.

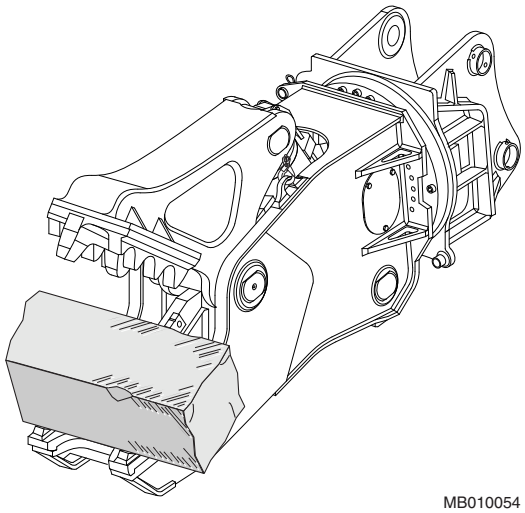
Remove the cotter pin and take out the locking pin.



- Prepare the carrier for normal excavation work. Move the carrier to the required position. Set the drive to neutral.
- Set the engine speed to the recommended engine RPM.
- NOTICE! Carefully operate the carrier controls to place the product and boom into the working position. Quick and careless boom movements can result in damage to the product.


MB010053

- Open the jaws, position the object on the fixed jaw side by operating excavator cylinders and close the jaws to crush. The best crushing result is obtained by using the whole tooth area of the jaws. **NOTICE! Avoid using cutting blades for crushing**. **Doing so may damage the blades**.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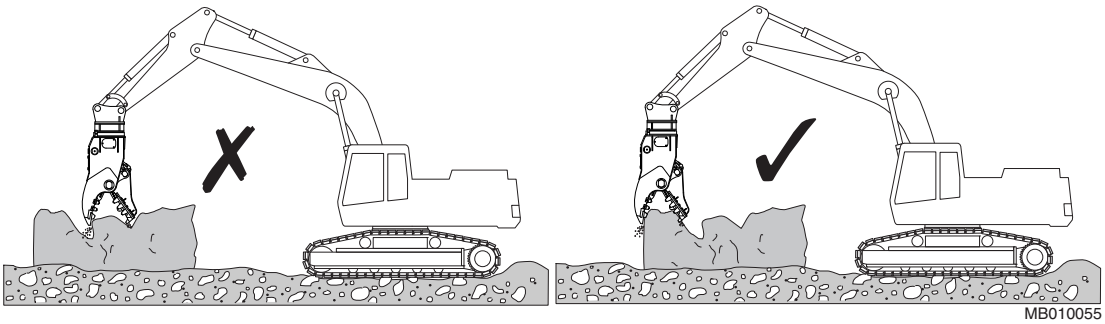
- When crushing very large concrete blocks, start crushing from the outer edges of the concrete.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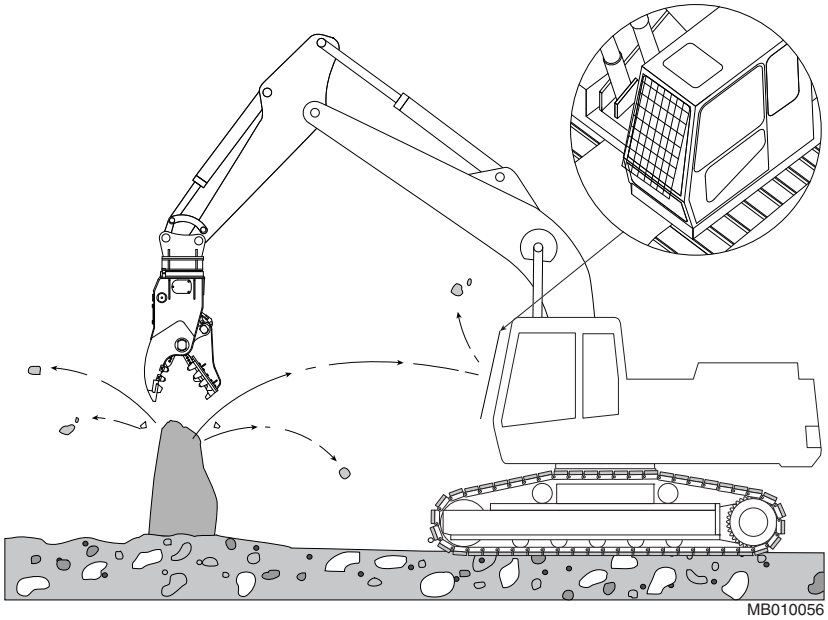
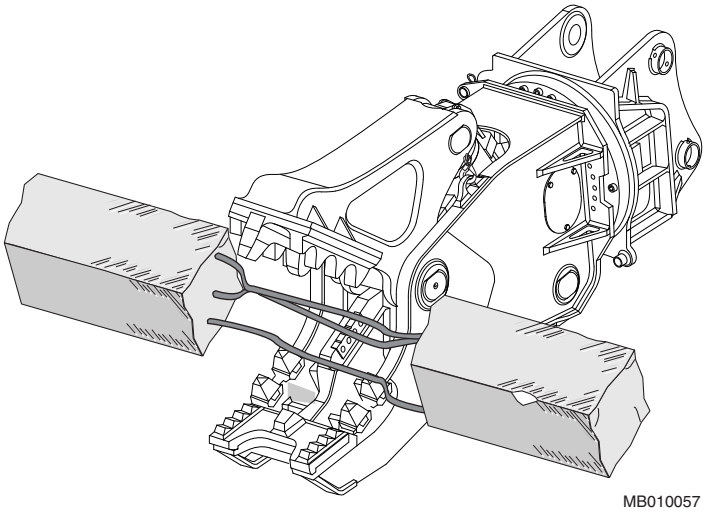
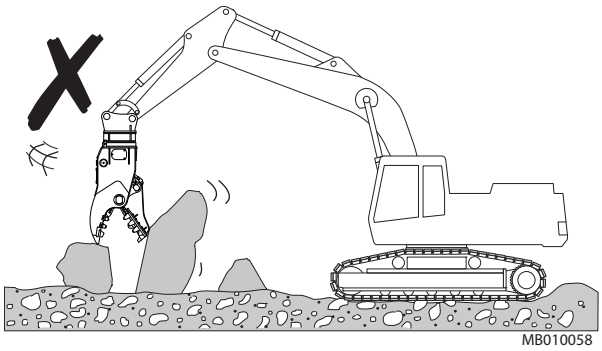
- Use a safety screen to protect the operator from flying debris. Keep the cabin windows and doors closed during operation.



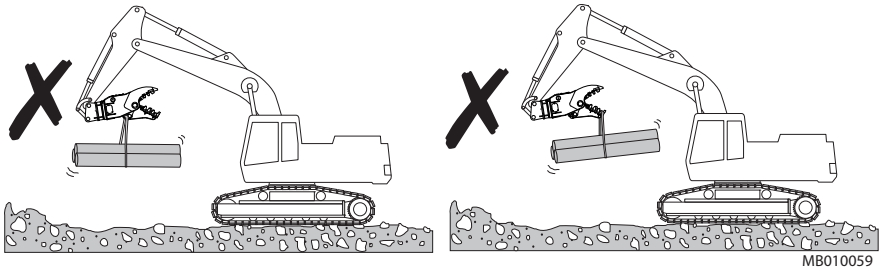
- To cut rebars or similar objects with the product, open the jaws. Operate the excavator cylinder to position the object on the cutting blade of the fixed jaw side and close the jaws to cut. For the best possible cutting performance and to avoid damaging the product, only use cutting blades for cutting.



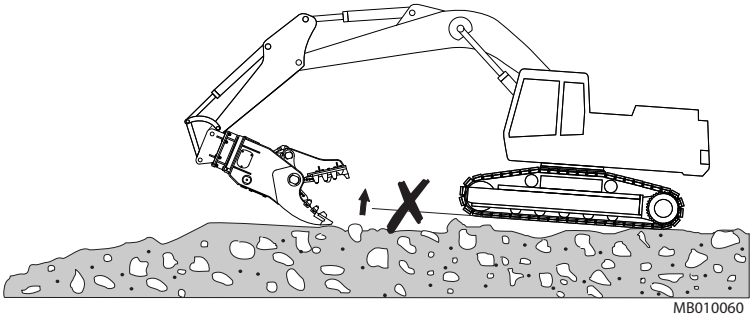
- The product is intended for pulverizing. Do not use the product as a lever or to strike, hit or ram objects. Do not use the side of the product to move concrete or objects.



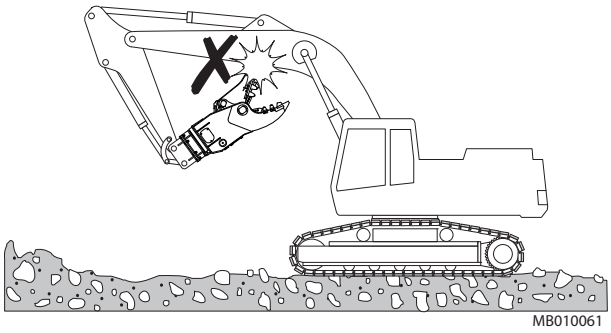
- Do not use the product for lifting. Lifting eyes on product are for storage and maintenance purposes only.



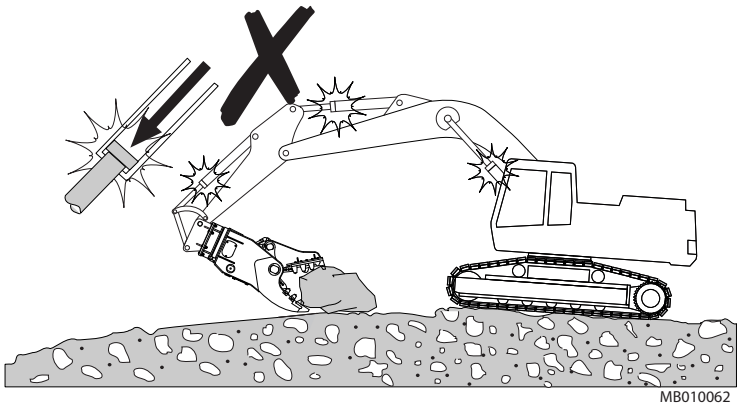
- Do not use the product to move the excavator.



- When operating the product, make sure that it does not make contact with the carrier boom or hydraulic lines.



- Do not operate the jaws with the carrier's boom stick or bucket cylinders at the end of their stroke (either fully extended or retracted). This may damages the carrier.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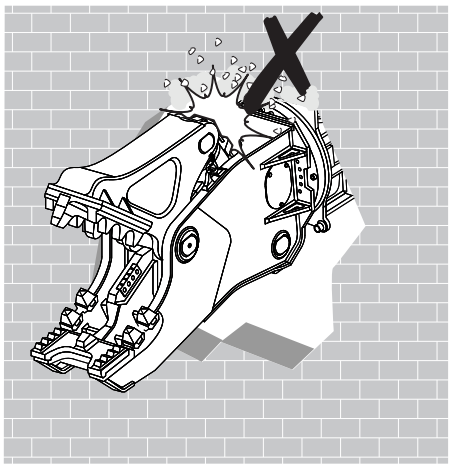
- When the jaws are closed, the cylinder rod is exposed. NOTICE! Avoid hitting the rod or shield plate with concrete or iron bars. Damage to the cylinder rod or shield plate may cause rod seal breakage and oil leaks.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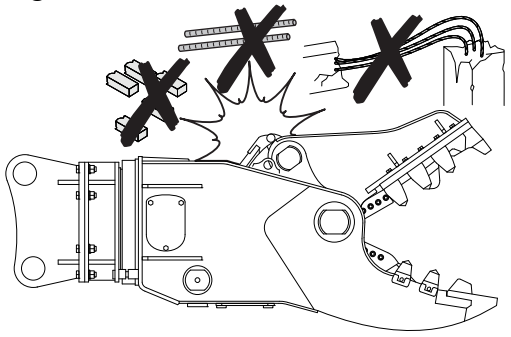
- Always remove demolition debris from the product. Getting steel frame or rebar between the jaws and cylinder rod clevis can damage the cylinder rod or jaws. Getting steel bars in the clearance between the cylinder and the base of the fixed jaw can damage the main shaft.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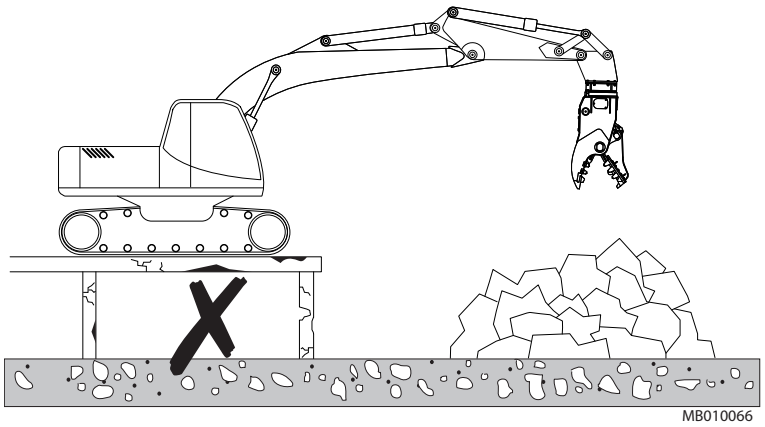
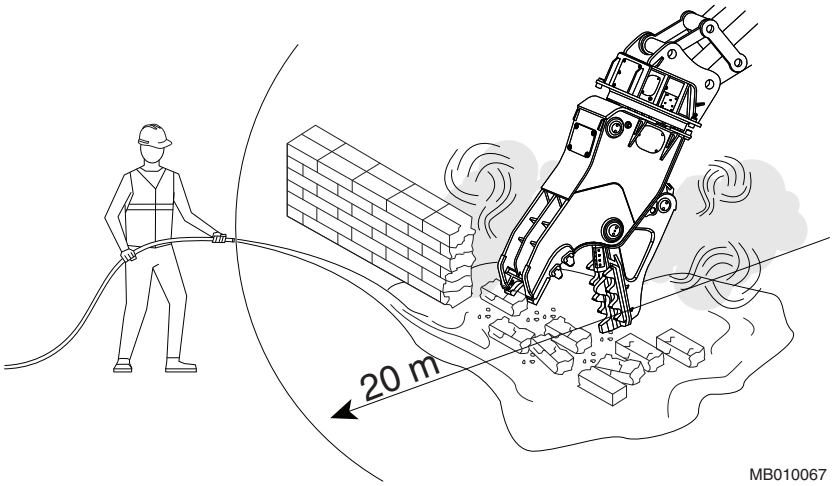
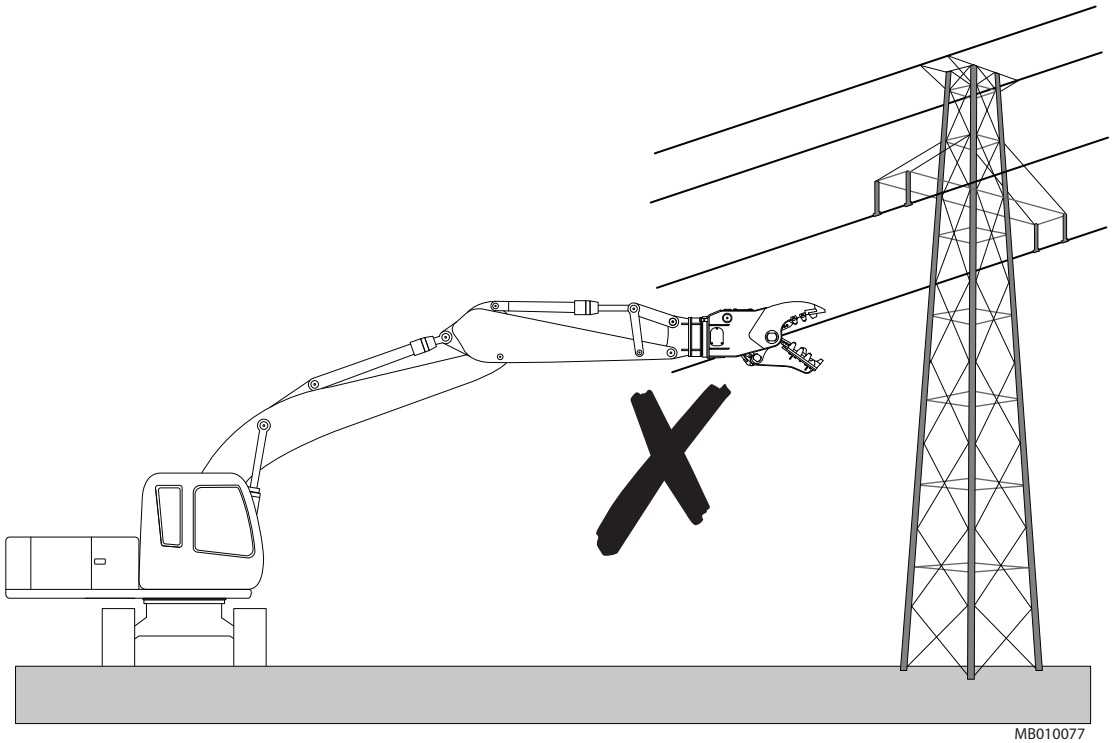
- To avoid a dangerous fall, ensure that the structure your carrier is on is strong enough to support it



- To prevent the spread of dust during operation, constantly keep the working area damp with water jets.



- Stay more than 10 meters (33 feet) away from live, overhead electric cables with any part of the machine.



- The bearings must be well greased during operation. Make regular inspections during operation. If no grease is visible, the bearings require more frequent greasing. If bearings are covered with excessive grease, they require less frequent greasing. See “Greasing points” on page 41.

5.3 MOUNTING AND DISMOUNTING THE PRODUCT

REMOVAL FROM CARRIER

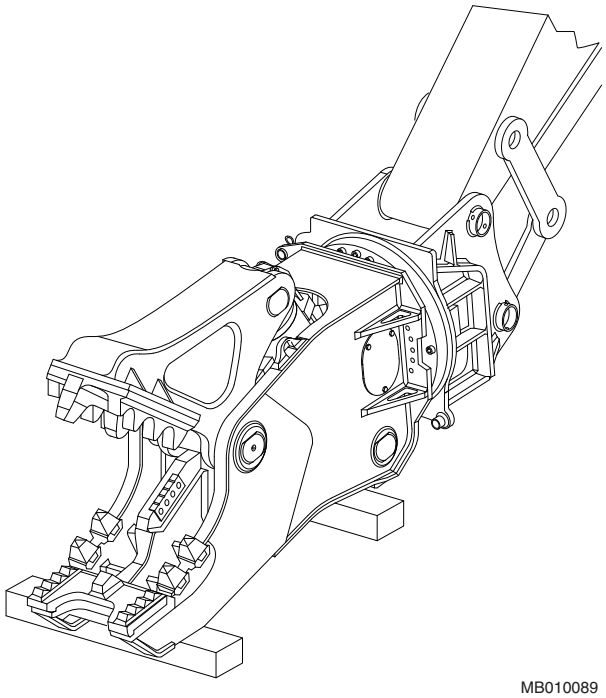
Warning! The product must be secured from falling over when disconnecting it from the carrier. Only use a skilled operator to position the carrier for the removal!

Warning! Hydraulic pressure inside the product must always be released before opening hose connections!

Warning! Hot hydraulic fluid can cause severe injuries!

Warning! The thrust bearing must be locked to prevent the product from rotating during maintenance or transportation.

1. Position the product horizontally on the floor.



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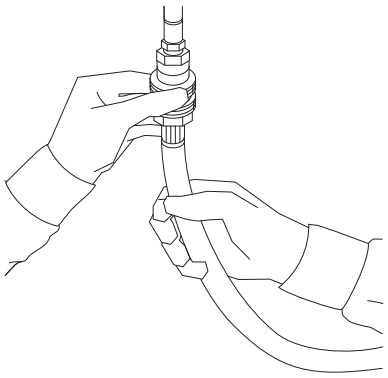
2. Stop the carrier engine. Operate the boom and product controls to release pressure trapped inside hoses.

3. Close the product shut-off valve. If quick couplers are used, disconnection automatically closes product lines. If the line includes ball valves, make sure that they are closed.

4. Disconnect the hoses. Protect the environment from oil spills. Plug the hoses.



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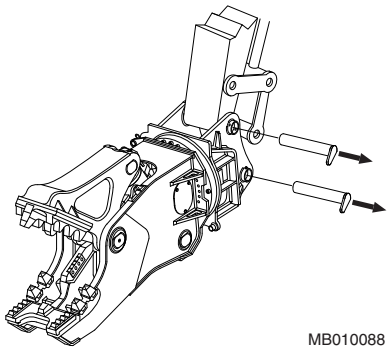
5. Remove the mounting bracket pins and other parts.



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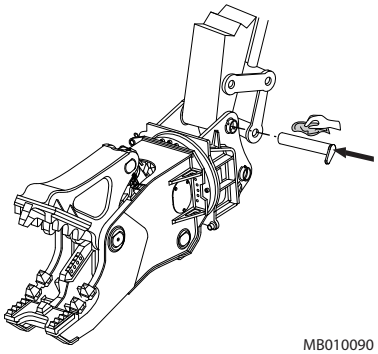
6. Install the locking pins and cotter pins.
7. Move the carrier aside, if needed.

INSTALLATION ON THE CARRIER

Warning! The residual air in the hoses must always be removed before operation!

1. Remove the cotter pins and take out the locking pins.
2. Install the product in the same manner as mounting a bucket. Install bucket pins.



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3. Connect the hoses. An installation inspection must be carried out after the product has been mounted on the carrier. During installation inspection, certain specifications (operating pressure, oil flow, etc.) are checked so that they are within given limits. See “Product specifications” on page 68.

4. Open the ball valves.

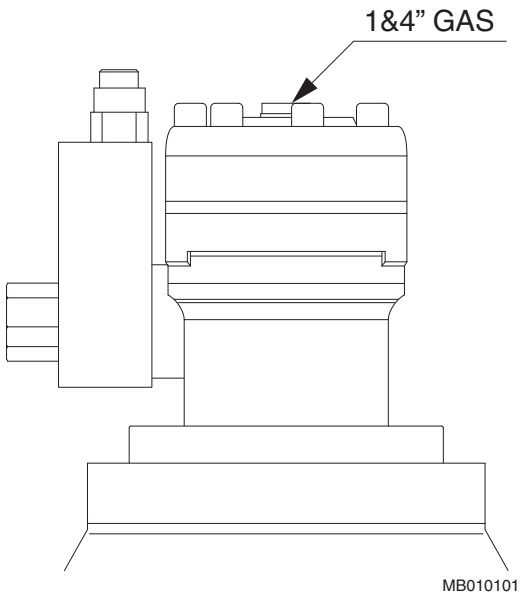
5. Remove the air from the hoses by carefully operating the crusher cylinder. Open and close the empty jaws several times.

Note:

- If the lines going to the opening and closing connection have two different pressure values, connect the line with the highest pressure (which should not exceed the max. value) to the connection fitting jaw closing and the lower pressure line to the connection fitting jaw opening, in order to have the maximum clamping force.
- Remove the cap from the fitting of the hydraulic hoses connecting the excavator and the crusher.
- Make sure that the hose fittings are perfectly clean and dust-free, and attach them to the machine by tightening the screws or the fittings.

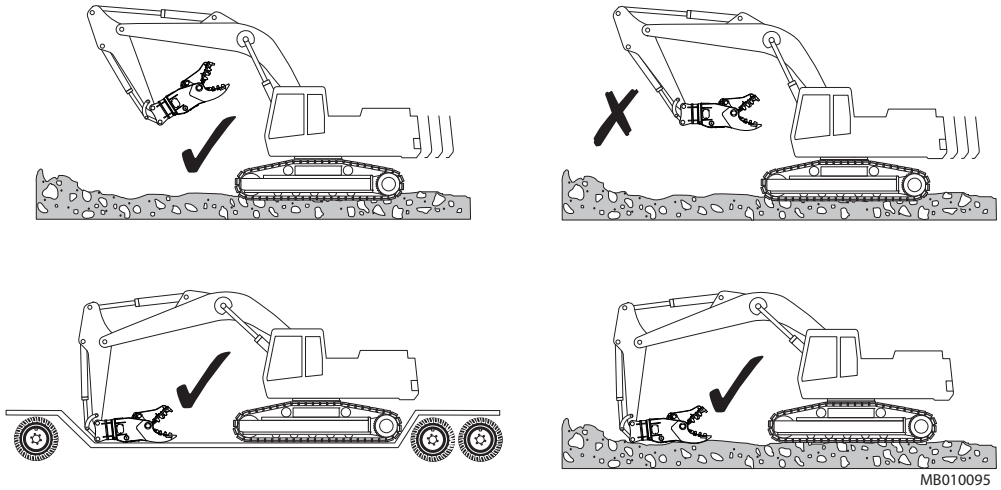
Note:

- The hydraulic rotation motor can operate with the drainage outlet plugged if, during activation, the back-pressure on the drainage branch during operation is not greater than 15 bar (218 psi).
- At first installation, check the backpressure value on the return branch of the rotation system, activating the hydraulic rotation in both directions.
- If the measured back pressure is greater than 15 bar (218 psi), connect a drainage line that connects the drainage attachment of the motor to the tank.
- The drainage attachment of the motor, normally plugged, is located on the bottom of the motor (see illustration).



5.4 MOVEMENT

The transportation and parking positions are shown below. When moving the carrier, ensure that the product is not too close to the carrier.



5.5 SPECIAL CONDITIONS OF USE

The product may require modifications, special operating techniques, increased maintenance or special wear items if it is used in conditions that differ from normal breaking or demolition work. Special conditions of use are:

- Underwater operations
- Operations in extremely low or high temperatures
- Use of special hydraulic fluids
- Operations with special carrier
- Other special conditions

In case of special conditions of use, contact your local dealer for instructions.

The product as a standard assembly, must not be used under water. Contact your local dealer for more information on underwater use.

5.6 STORAGE

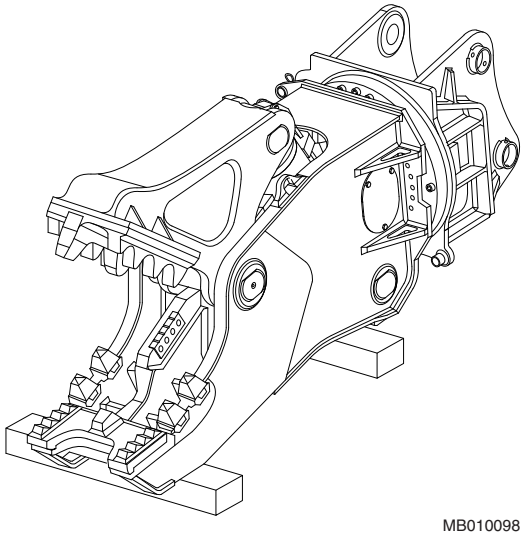
LONG TERM STORAGE

Observe the following points when the product is stored. This way, the vital parts of the product are protected from rust and the product is ready to be used whenever necessary.

1. Make sure your storage area is dry.

2. To avoid damaging the cylinder rod, operate the cylinder to the shortest position by leaving the jaws open.

3. Insert blocks under the product to keep it off the ground. If the product is stored outside, cover it to prevent rusting.



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4. Apply grease to all product parts. Protect the mounting bracket, pin holes, cutting blades and pivot ends with an anticorrosive agent.

5. Seal connections with clean plugs to prevent oil leakage and dirt from getting into the couplings.

6. Make sure the product cannot fall over.

LUBRICATION

1. GREASING

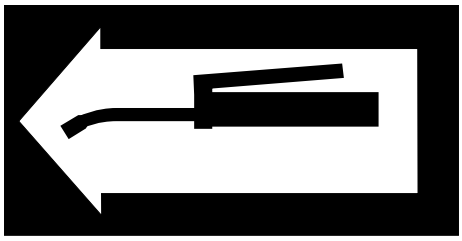
1.1 RECOMMENDED GREASES

Item	Recommended greases	Greasing interval
Pins and bushings		every 8 hours
Thrust bearing		every 40...80 hours
	Additives: molybdenum disulfide	
	Minimum working temperature below lowest ambient temperature	
	Penetration 0 ... 2 (NLGI)	
	No reaction with hydraulic oils	
	Water resistant	
	Good adhesion with steel	

1.2 GREASING POINTS

Follow the product's greasing instructions and avoid excessive greasing. Dispose of empty grease containers appropriately.

The greasing points of the product are marked with the following sticker.



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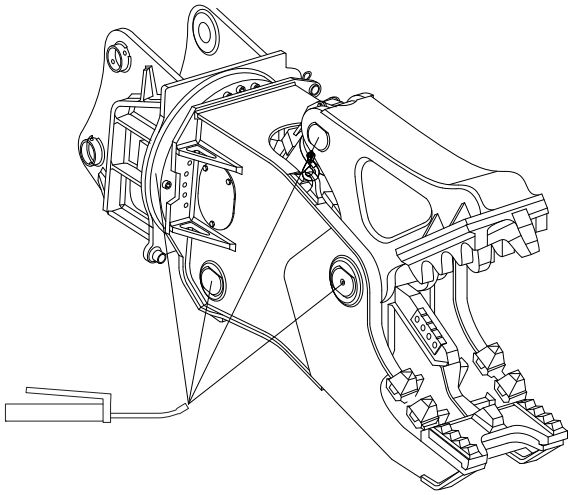
The greasing points of the product are shown below.



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2. CARRIER HYDRAULIC OIL

2.1 REQUIREMENTS FOR HYDRAULIC OIL

GENERAL REQUIREMENTS

In general, the hydraulic oil originally intended for the carrier can be used with this product. However, since working with the product heats the oil more than with the usual excavation work, the temperature of the oil must be monitored.

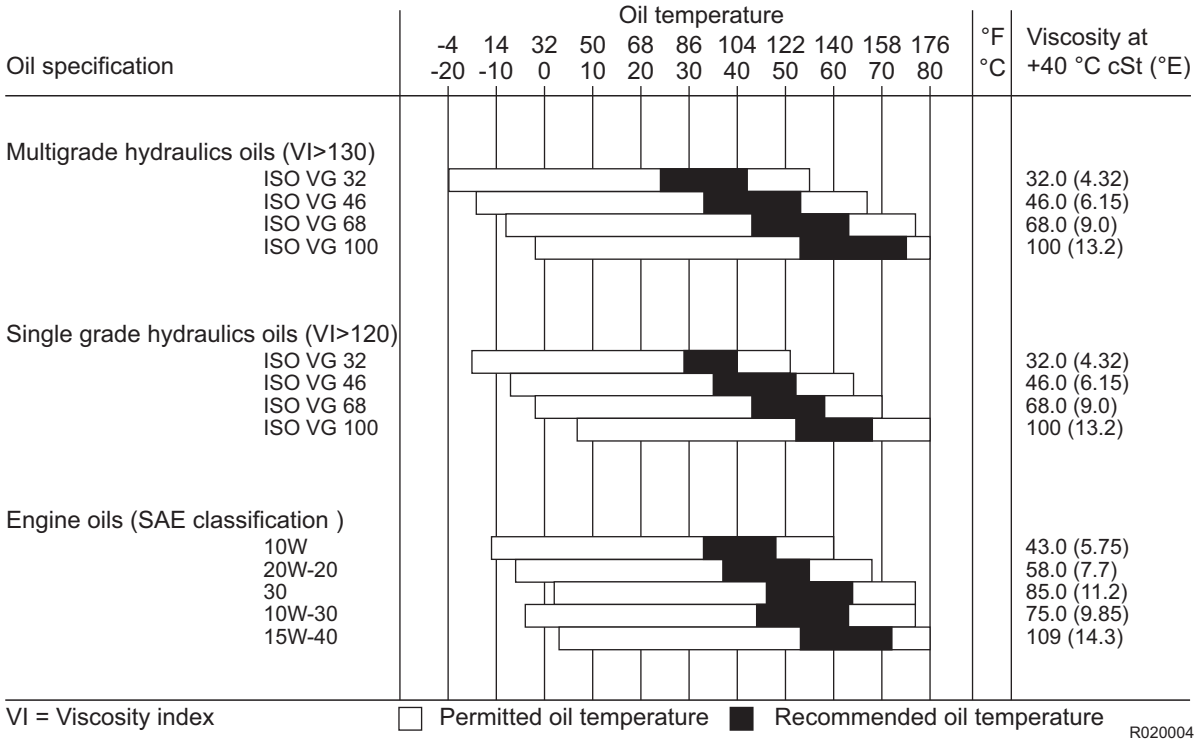
If the temperature of the hydraulic oil exceeds 80 °C (176 °F), an auxiliary oil cooler is needed. The oil viscosity must be between 1000-20 cSt while the product is being used.

When the product is used continuously, the temperature of the hydraulic oil normalizes at a certain level depending on conditions and on the carrier. The temperature in the tank must not exceed the maximum allowed.

The product must not be started if the ambient temperature is below freezing and the oil is very thick. The machine must be moved to bring the oil temperature above 0 °C (32 °F) before working can start (viscosity 1000 cSt or 131 °E).

OIL SPECIFICATIONS

The table below shows hydraulic oils recommended for product use. The most suitable oil is selected in such a way that the temperature of the hydraulic oil in continuous use is in the ideal area on the chart and the hydraulic system is used to best advantage.



Problems due to incorrect hydraulic oil viscosity in the product:

Oil too thick

- Difficult start up
- Stiff operation
- Danger of cavitation
- Sticky valves
- Filter bypass opens, impurities in the oil are not removed

Oil too thin

- Efficiency losses (internal leaks)
- Damage to gaskets and seals, leaks
- Accelerated wearing of parts, because of decreased lubrication efficiency
- Danger of cavitation

Note: We strongly recommend the use of different hydraulic oils in the summer and in the winter if there is an average temperature difference of more than 35 °C (95 °F). The correct hydraulic oil viscosity is thus ensured.

SPECIAL OILS

In some cases, special oils (for example biological oils and nonflammable oils) can be used with the product. Observe the following aspects when considering the use of special oils:

- The viscosity range in the special oil must be in the given range (1000-20 cSt).
- The lubrication properties must be sufficient.
- The corrosion resistance properties must be good enough.

Note: Although a special oil could be used in the carrier, always check its suitability with the product. Contact the oil manufacturer or your local dealer for more information about special oils.

2.2 OIL COOLER

The carrier hydraulic system must be able to maintain a temperature within an acceptable level during the product operation. This is because:

1. Seals, wipers, membranes and other parts manufactured from the corresponding materials can normally stand temperatures up to 80 °C (176 °F).

2. The higher the temperature is, the less viscous the oil gets, thus losing its capability to lubricate.

A standard carrier, with a proper product circuit, meets the requirements of the necessary cooling capacity. If the oil temperature tends to be too high during product operation, the following must be checked:

- The product circuit pressure relief valve should not be opened unnecessarily.
- The product circuit pressure drops must be reasonable; that is, less than 20 bar (290 psi) in the hydraulic line.
- There should be no internal leakages in product or carrier hydraulic pumps, valves, cylinders, motors, etc.

If all of the above-mentioned items are in order, and the temperature of the hydraulic oil still tends to be too high, extra cooling capacity is needed. Contact the carrier manufacturer or your local dealer for details.

2.3 OIL FILTER

The purpose of the oil filter is to remove impurities from the hydraulic oil. Air and water are also impurities in oil. Not all impurities can be seen with the naked eye.

Impurities enter the hydraulic system:

- During hydraulic oil changes and refilling.
- When components are repaired or serviced.
- When the product is being installed on the carrier.
- Because of component wear.

Normally the existing, main oil filters of the carrier are used as attachment circuit return line filters. Contact the carrier manufacturer or your local dealer concerning instructions for the filter change intervals.

To work well with the product, the carrier oil filter must fulfill the following specifications:

- The oil filter must allow maximum particle size of 25 microns (0.025 mm).
- The oil filter material must be man-made fibre cloth or very fine gauge metallic mesh to withstand pressure fluctuations.
- The oil filter must have a nominal flow capacity of at least twice the product's maximum flow.

In general, oil companies guarantee new oils to have a maximum particle size of 40 microns. Therefore, filter the oil when filling the tank.

The damage caused by hydraulic oil impurities in the carrier and attachment circuits include:

Shortened working life of pumps and other components

- Rapid wear of parts.
- Cavitation.
- Wear of cylinder and gaskets.

Reduced attachment efficiency

- Accelerated wear of moving parts and seals.
- Oil leakages.

Shortened working life and reduced lubricating capability of oil

- Overheated oil.
- Deteriorated oil quality.
- Electrochemical changes in hydraulic oil.

Malfunction of valves

- Binding spools.
- Rapid wear of parts.
- Blocking of small holes.

Note: Component damage is only a symptom. The trouble itself will not be cured by removing the symptom. After any component damage due to impurities in the oil, the entire hydraulic system must be cleaned. Dismantle, clean and reassemble the product and change the hydraulic oil.

MAINTENANCE

1. ROUTINE MAINTENANCE

1.1 OVERVIEW

This product is a precision-made hydraulic machine. Therefore, great care and cleanliness should be taken when handling any of the hydraulic components. Dirt is the worst enemy in hydraulic systems.

Handle the parts carefully and remember to cover any cleaned and dried parts with a clean, lint-free cloth. Do not use anything other than purpose-designed materials for cleaning hydraulic parts. Never use water, paint thinners or carbon tetrachloride.

Components, gaskets and seals in the hydraulic system should be oiled with clean hydraulic oil before assembly.

Remember to grease the product parts regularly, according to the instructions in this manual. See “Greasing points” on page 41.

Prior to maintenance or inspection, operate all the control levers to their fully extended stroke. This will release pressure within the hydraulic piping and prevent unexpected movement of the jaw and loss of oil through the hydraulic lines.

Close the jaws during maintenance or inspection. If you must leave the jaws open, remember to block the jaws to prevent them from closing.

1.2 INSPECTION AND MAINTENANCE BY THE OPERATOR

Note: The times given refer to the carrier hours with the product installed.

EVERY EIGHT HOURS

Grease shafts and pins. See “Greasing points” on page 41.

DAILY MAINTENANCE

1. Check the hydraulic hoses and hose connections. Tighten if necessary.

2. Check the cutting blades and their clearance. Tighten bolts or replace the cutting blades, if necessary. See “Turning and changing cutting blades” on page 52.

3. Check the jaws and teeth for wear. Replace if necessary. Any type of hardfacing welding on the teeth of the jaws is not recommended as they are made of die-cast, wear-resistant material. Hardfacing welding on the teeth would alter their special shape, reducing the ability to penetrate concrete as well as productivity. See “Replacing teeth” on page 55.

4. Check the grease nipples.

WEEKLY MAINTENANCE

1. Check the main body for wear.

2. Check the pins and bushings for wear.

3. Check the cylinder rod, seals and connection points for wear. Tighten if necessary.

4. Observe hydraulic oil temperature for all lines and connections.

5. Check that the product works smoothly by operating the jaws.

6. Tighten connections, if necessary.

EVERY 40...80 HOURS

Grease the thrust bearing. Adapt the greasing interval and amount of grease to working conditions. See “Greasing points” on page 41.

1.3 INSPECTION AND MAINTENANCE BY THE DEALER

Note: The times given refer to carrier hours with the product installed.

INITIAL 50 HOUR INSPECTION

It is recommended that your local dealer perform the first inspection after 50 to 100 operating hours. Contact your local dealer for more information about the initial 50-hour inspection.

EVERY 600 HOURS OR ONCE A YEAR

The 600-hour/yearly service is performed by your local dealer. It is recommended every 600 operating hours or once a year, whichever comes first. Neglecting the 600-hour/yearly service can cause severe damage to the product.

Your local dealer will reseal the product and replace safety decals as needed. Contact your local dealer for more information about 600-hour/yearly servicing.

During this service, you should also perform the following tasks:

- Check all hydraulic connections.
- Check that the hydraulic hoses do not rub against anything in any boom/stick position.

1.4 MAINTENANCE INTERVALS IN SPECIAL APPLICATIONS

The service interval is considerably shorter with special applications such as underwater use. See “Special conditions of use” on page 36. In special applications, consult your local dealer for the correct service intervals.

The product, as a standard assembly, must not be used under water. It must be adapted for underwater applications. Contact your local dealer for more information on underwater use.

1.5 OTHER MAINTENANCE PROCEDURES

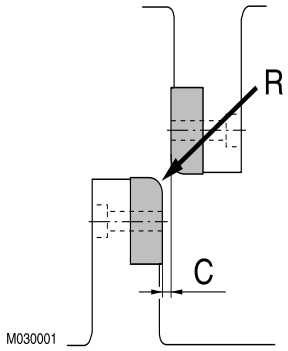
WASHING THE PRODUCT

When working with product and removing it from the carrier, dirt (mud, rock powder, etc.) can become attached to it. Wash the outside of the product with a steam washer before sending it to the workshop. Otherwise dirt can cause difficulties in disassembly and assembly.

CAUTION! Plug the pressure and return line before washing the product. Otherwise, dirt could get in it and cause damage to the components.

2. TURNING AND CHANGING CUTTING BLADES

WEAR LIMITS, ADJUSTMENTS AND TORQUES FOR CUTTING BLADES



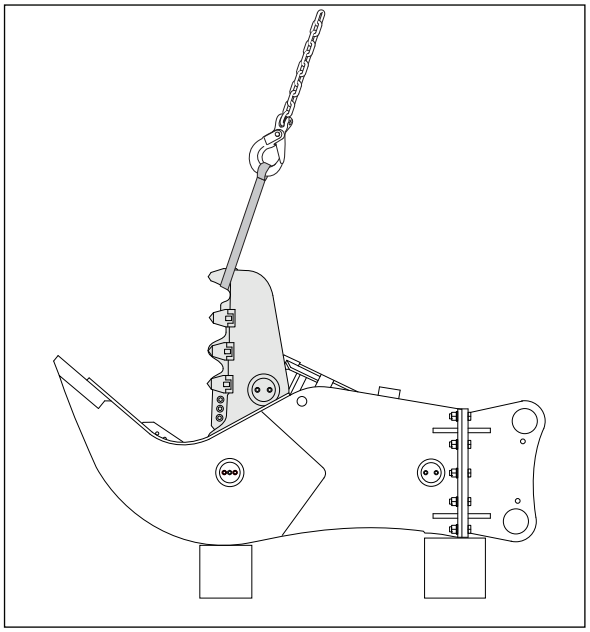
Item	Adjustment
Cutting blade clearance (C)	0.2...1.2 mm (0.01...0.05 in)

Screw	Tightening torque, grade 8.8	Tightening torque, grade 10.9	Tightening torque, grade 12.9
M8	25 Nm (18 lbf ft)	35 Nm (26 lbf ft)	42 Nm (31 lbf ft)
M10	50 Nm (37 lbf ft)	70 Nm (52 lbf ft)	85 Nm (63 lbf ft)
M12	85 Nm (63 lbf ft)	120 Nm (89 lbf ft)	145 Nm (107 lbf ft)
M14	135 Nm (100 lbf ft)	190 Nm (140 lbf ft)	230 Nm (170 lbf ft)
M16	210 Nm (155 lbf ft)	295 Nm (218 lbf ft)	355 Nm (262 lbf ft)
M18	290 Nm (214 lbf ft)	410 Nm (302 lbf ft)	490 Nm (361 lbf ft)
M20	410 Nm (302 lbf ft)	575 Nm (424 lbf ft)	690 Nm (509 lbf ft)
M22	550 Nm (406 lbf ft)	780 Nm (575 lbf ft)	930 Nm (686 lbf ft)
M24	710 Nm (524 lbf ft)	995 Nm (734 lbf ft)	1240 Nm (915 lbf ft)
M27	1050 Nm (774 lbf ft)	1450 Nm (1069 lbf ft)	1750 Nm (1291 lbf ft)
M30	1420 Nm (1047 lbf ft)	2000 Nm (1475 lbf ft)	2350 Nm (1733 lbf ft)

TURNING AND CHANGING CUTTING BLADES

Warning! Prior to maintenance or inspection, operate all the control levers to their fully extended stroke. This will release pressure within the hydraulic piping and prevent unexpected movement of the jaw and loss of oil through the hydraulic lines.

Warning! Support the jaw to prevent it from closing unexpectedly during maintenance.



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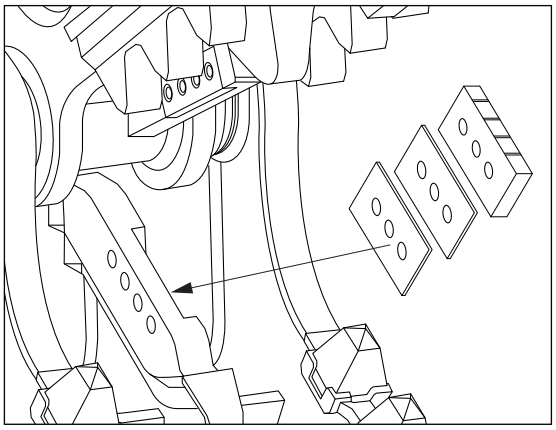
Used cutting blades can be recycled. Contact your dealer for more information about local regulations of recycling.

1. Position the product on level ground.
2. Support the jaw.
3. Make sure the carrier's transmission is in neutral and the parking brake is engaged.
4. Stop the carrier engine.
5. Clean the cutting blades and the base.

6. Remove the screws, cutting blades and shim plates. Turn the blades to use one of the 4 sharp sides (the blades may be rotated up to 4 times). Replace the blades if necessary.


MB030007

7. Grind the surfaces to flush all burrs from the cutting blade and cutter base. If burrs remain on the surface, the cutting blade will not have proper contact with the cutting blade base. This will cause the cutting blade to break.

8. With a feeler gauge check, that the clearance between the two cutting blades is the required 0.2...1.2 mm (0.008...0.05 in). If necessary, restore the correct clearance by inserting the appropriate shims below the cutting blade.

9. Install the screws and tighten them to the specified torque.

3. REPLACING TEETH

WELDING TOOLS AND TORQUES FOR CUTTING BLADE SCREWS

Item	Welding tool
Repair of parent, installation of tooth	MIG-wire, DIN 8559: SG 2
	Welding rod, DIN 1913: E 51 53 B 10
Hardfacing	MIG-wire, DIN 8555: SG 6 - 60
	Welding rod, DIN 8555: E 6 - 55

Screw	Tightening torque, grade 8.8	Tightening torque, grade 10.9	Tightening torque, grade 12.9
M8	25 Nm (18 lbf ft)	35 Nm (26 lbf ft)	42 Nm (31 lbf ft)
M10	50 Nm (37 lbf ft)	70 Nm (52 lbf ft)	85 Nm (63 lbf ft)
M12	85 Nm (63 lbf ft)	120 Nm (89 lbf ft)	145 Nm (107 lbf ft)
M14	135 Nm (100 lbf ft)	190 Nm (140 lbf ft)	230 Nm (170 lbf ft)
M16	210 Nm (155 lbf ft)	295 Nm (218 lbf ft)	355 Nm (262 lbf ft)
M18	290 Nm (214 lbf ft)	410 Nm (302 lbf ft)	490 Nm (361 lbf ft)
M20	410 Nm (302 lbf ft)	575 Nm (424 lbf ft)	690 Nm (509 lbf ft)
M22	550 Nm (406 lbf ft)	780 Nm (575 lbf ft)	930 Nm (686 lbf ft)
M24	710 Nm (524 lbf ft)	995 Nm (734 lbf ft)	1240 Nm (915 lbf ft)
M27	1050 Nm (774 lbf ft)	1450 Nm (1069 lbf ft)	1750 Nm (1291 lbf ft)
M30	1420 Nm (1047 lbf ft)	2000 Nm (1475 lbf ft)	2350 Nm (1733 lbf ft)

CHANGING A TOOTH

Welding must occur in a workshop with proper welding tools. If you must weld the product when it is on the carrier, consult your carrier dealer for precautions during welding.

Warning! Support the jaw to prevent it from closing unexpectedly during maintenance.

A used tooth can be recycled. Contact your dealer for more information about local regulations of recycling.

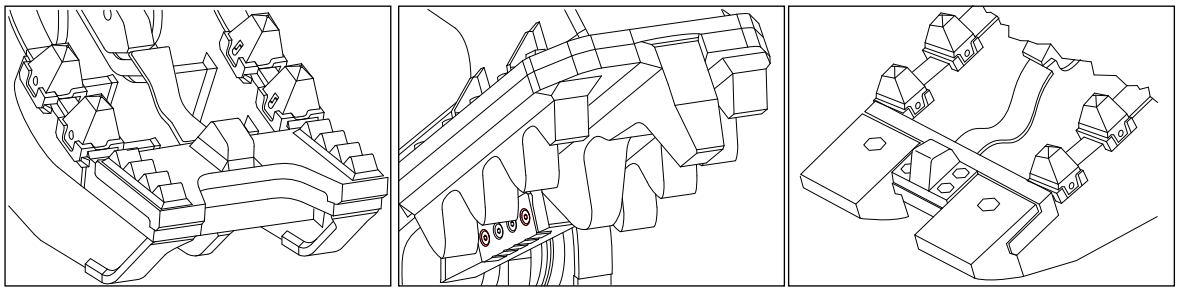
Periodically check the wear and tear of the teeth and the interchangeable plates.

For the product to perform and operate well and to reduce maintenance costs, it is necessary to replace the interchangeable parts before wear and tear can undermine their housings.

If, due to lack of maintenance, teeth are lost during product operation, stop operation immediately or you will damage the housings on the product body.

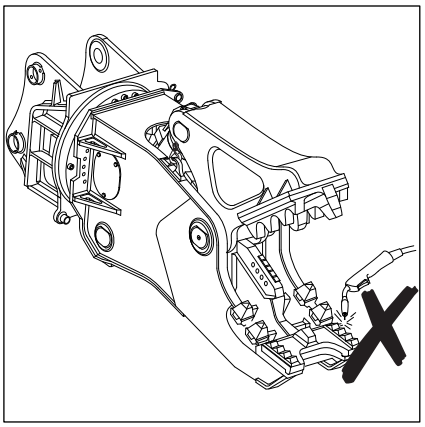
During complete shutdown, make sure that the jaw rest on the central tooth of the product framework. If you do not, it will be necessary to replace the interchangeable part where the central tooth is located.

WARNING! When replacing the interchangeable plate, close the mobile jaw on the fixed part to prevent the plate from falling when the screws are removed and creating a danger to the operator.



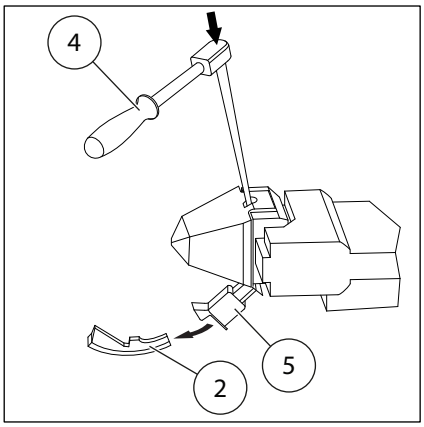
MB030011

NOTICE! Any type of hardfacing welding on the interchangeable parts is not recommended, since they are made of wear proof material and hard to weld. Furthermore, the hardfacing welding would alter the flatness of the manufactured parts, making the coupling in their housings difficult.



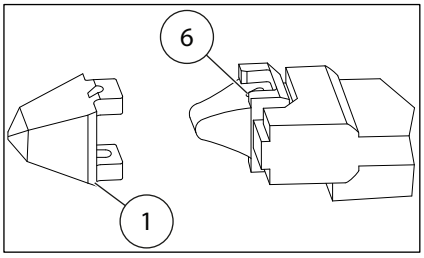
MB030012

1. Place the product on the ground at a 30° incline so that the side with the tooth to be replaced faces upward. Remove the fastening pin (2), together with the hardened resin (5) with of the supplied pin extractor, striking the end with a hammer (see illustration).



MB030013

2. Extract the tooth (1) from its housing. Carefully clean the space (6), which contained the resin, and eliminate any residue.



MB030014

3. Place the product on the ground at a 30° incline so that, due to gravity, the tooth will naturally come into contact with the adapter.

4. Once the tooth (1), is positioned on the adapter, insert the fastening pin (2) from the back.

5. By gently hammering, make sure that the key is in full contact with the tooth. Make sure that contact between the tooth and the adapter is maintained.

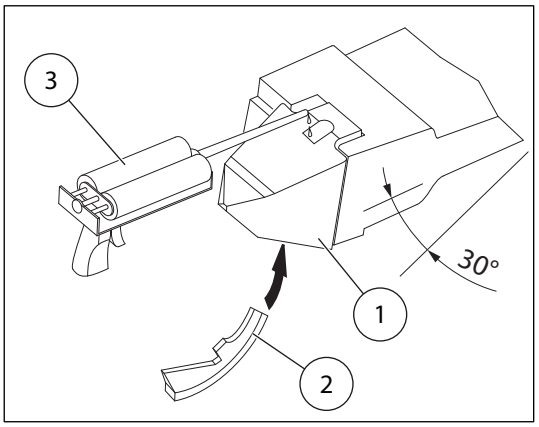
6. Prepare the STIMIX kit. The kit includes a pistol (3), one cartridge containing resin, and two mixing tubes.

7. Remove the plug by unscrewing the screw and insert the mixing tube by fastening it with the nut. Place everything on the pistol. NOTICE! To prevent the product leaking hold the pistol vertically.

8. Press the pistol handgrip and, keeping the pistol vertical, push the resin into the mixing tube.

9. Press three times to release all of the resin. Insert the STIMIX resin into the relevant hole between the pin and the tooth.

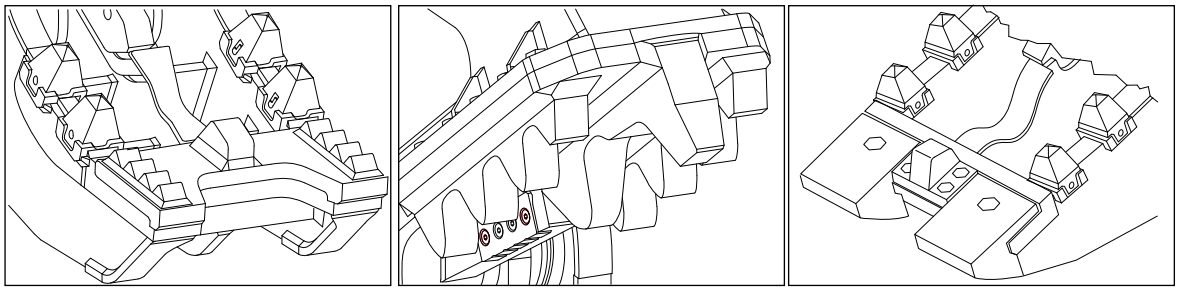
10. Operate slowly, but constantly, and without interruption (on all teeth).



MB030015

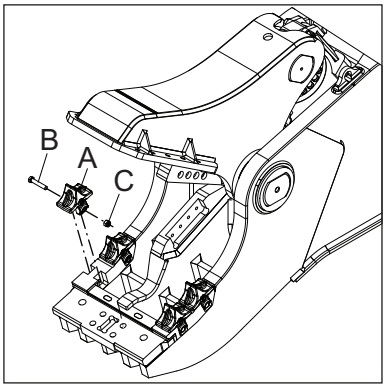
CHANGING A TOOTH (SCREW AND NUT FASTENING)

WARNING! When replacing the interchangeable plate, close the mobile jaw on the fixed part to prevent the plate from falling when the screws are removed and creating a danger to the operator.



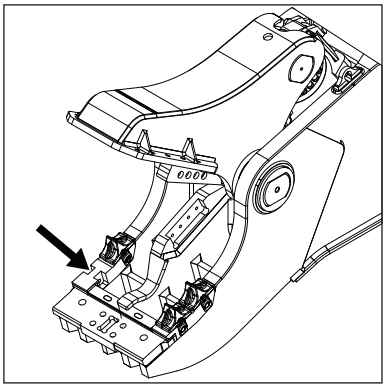
MB030011

1. Place the product on the ground so that the side with the tooth to be replaced faces upward. Remove the fastening screw (B), and the nut (C).



MB030056

2. Extract the tooth (A) from its housing. Carefully clean the housing.



MB030057

3. Attach the new tooth (A) to the product with the new screw (B) and nut (C).

   Check that the tooth is seated properly

4. Tighten the screw and nut to the specified torque.

4. REPLACING CRUSHING PLATE

TIGHTENING TORQUE FOR CRUSHING PLATE

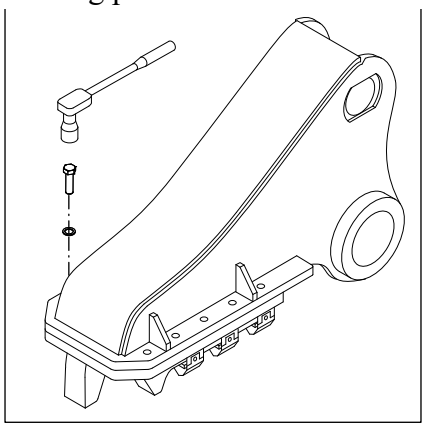
Screw	Tightening torque, grade 8.8	Tightening torque, grade 10.9	Tightening torque, grade 12.9
M8	25 Nm (18 lbf ft)	35 Nm (26 lbf ft)	42 Nm (31 lbf ft)
M10	50 Nm (37 lbf ft)	70 Nm (52 lbf ft)	85 Nm (63 lbf ft)
M12	85 Nm (63 lbf ft)	120 Nm (89 lbf ft)	145 Nm (107 lbf ft)
M14	135 Nm (100 lbf ft)	190 Nm (140 lbf ft)	230 Nm (170 lbf ft)
M16	210 Nm (155 lbf ft)	295 Nm (218 lbf ft)	355 Nm (262 lbf ft)
M18	290 Nm (214 lbf ft)	410 Nm (302 lbf ft)	490 Nm (361 lbf ft)
M20	410 Nm (302 lbf ft)	575 Nm (424 lbf ft)	690 Nm (509 lbf ft)
M22	550 Nm (406 lbf ft)	780 Nm (575 lbf ft)	930 Nm (686 lbf ft)
M24	710 Nm (524 lbf ft)	995 Nm (734 lbf ft)	1240 Nm (915 lbf ft)
M27	1050 Nm (774 lbf ft)	1450 Nm (1069 lbf ft)	1750 Nm (1291 lbf ft)
M30	1420 Nm (1047 lbf ft)	2000 Nm (1475 lbf ft)	2350 Nm (1733 lbf ft)

REMOVAL OF CRUSHING PLATE

Warning! Support the jaw to prevent it from closing unexpectedly during maintenance.

A used crushing plate can be recycled. Contact your dealer for more information about local regulations of recycling.

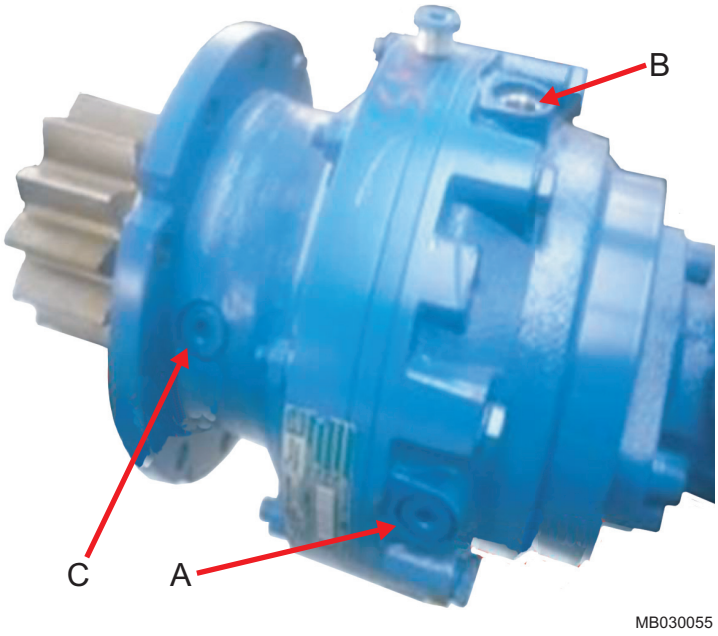
1. Position the product on level ground.
2. Support the jaw.
3. Remove the screws and washers.
4. Remove the old crushing plate.



5. Fix the new crushing plate properly into place.
6. Install the screws and washers. Tighten parts to the specified torques.

5. CHANGING OIL IN THE ROTATION UNIT (MODELS WITH GEARBOX)

DIAGRAM



Item
Drain plug (A)
Filler cap (B)
Level plug (C)

Oil viscosity
90W-140

CHANGING OIL IN THE ROTATION UNIT

Warning! Support the jaw to prevent it from closing unexpectedly during maintenance.

The oil must be changed after the first 150 working hours. Afterwards, it must be changed every 2000 operating hours or at least once a year.

Change the oil while the rotation unit is hot. Wash the internal parts with the proper liquids before introducing the new oil.

Avoid mixing oils of different viscosity or of different brands. Do not mix mineral oils with synthetic oils.

After start-up, check the lubricant level periodically and top it up whenever necessary.

During continuous operation, the temperature of the lubricant must not exceed 80 °C (176 °F). Whenever this value is in danger of being exceeded, forcibly cool the oil.

NOTICE! Change the oil while the rotation unit is hot.

NOTICE! Some models have maintenance free motor. Check the motor type you have and check the motor manual or contact the manufacturer for more information.

1. Position the product on level ground. The rotation unit and product must be in an upright position.

2. Support the jaws.

3. Unscrew the filler cap (B) and the drain plug (A).

4. Completely empty oil in the rotation unit.

5. Replace the drain plug (A).

6. Remove the level plug (C).

7. Fill the rotation unit with new oil using the filler cap until the oil begins to overflow from the level plug (C).

8. Replace the filler cap (B) and the level plug (C).

6. TROUBLESHOOTING

6.1 PRODUCT DOES NOT CRUSH

WORN TEETH

Change the teeth or crushing plate. See “Replacing teeth” on page 55. See “Replacing crushing plate” on page 60.

DROP IN HYDRAULIC PRESSURE ON BASE MACHINE

Adjust pressure. See “Product specifications” on page 68.

OIL LEAKAGE WITHIN CYLINDER

The product must be serviced in an authorized Rammer service shop.

6.2 PRODUCT DOES NOT CUT

WORN CUTTING BLADES

Turn over the cutting blades and adjust. If necessary, change the cutting blades. See “Turning and changing cutting blades” on page 52.

CUTTING BLADE DOES NOT FIT PROPERLY ONTO THE CUTTER BASE

Refit and tighten with bolts. See “Turning and changing cutting blades” on page 52.

INCORRECT CLEARANCE BETWEEN THE BLADES AND BASE

Check the clearance and adjust. See “Turning and changing cutting blades” on page 52.

DROP IN HYDRAULIC PRESSURE ON BASE MACHINE

Adjust pressure. See “Product specifications” on page 68.

OIL LEAKAGE WITHIN CYLINDER

The product must be serviced in an authorized Rammer service shop.

6.3 JAW DOES NOT MOVE

MALFUNCTION IN CARRIER HYDRAULIC SYSTEM
Check the operation of the auxiliary circuit.

BALL VALVES MAY BE CLOSED
Open the ball valves.

JAW MAY BE BLOCKED
Remove obstacles.

OIL LEAKAGE WITHIN CYLINDER
The product must be serviced in an authorized Rammer service shop.

CYLINDER ROD IS BENT
The product must be serviced in an authorized Rammer service shop.

6.4 EXCESSIVE MOVING

WORN PINS AND BUSHINGS
The product must be serviced in an authorized Rammer service shop.

6.5 OIL LEAKAGE

OIL LEAKAGE AT HOSE END
Check the hose end and tighten.

OIL LEAKAGE AT SWIVEL JOINT
The product must be serviced in an authorized Rammer service shop.

CYLINDER SEALS ARE DAMAGED
The product must be serviced in an authorized Rammer service shop.

6.6 PRODUCT DOES NOT ROTATE

ROTATION IS LOCKED
Open the rotation lock. See “Mounting and dismounting the product” on page 33.

6.7 FURTHER ASSISTANCE

CONTACT YOUR DEALER

If you need further assistance, have the following information ready when calling your dealer:

- Model and serial number
- Working hours and service history
- Carrier model
- Installation: Oil flow, operating pressure and return line pressure if known
- Application
- Has the product operated normally before

SPECIFICATIONS

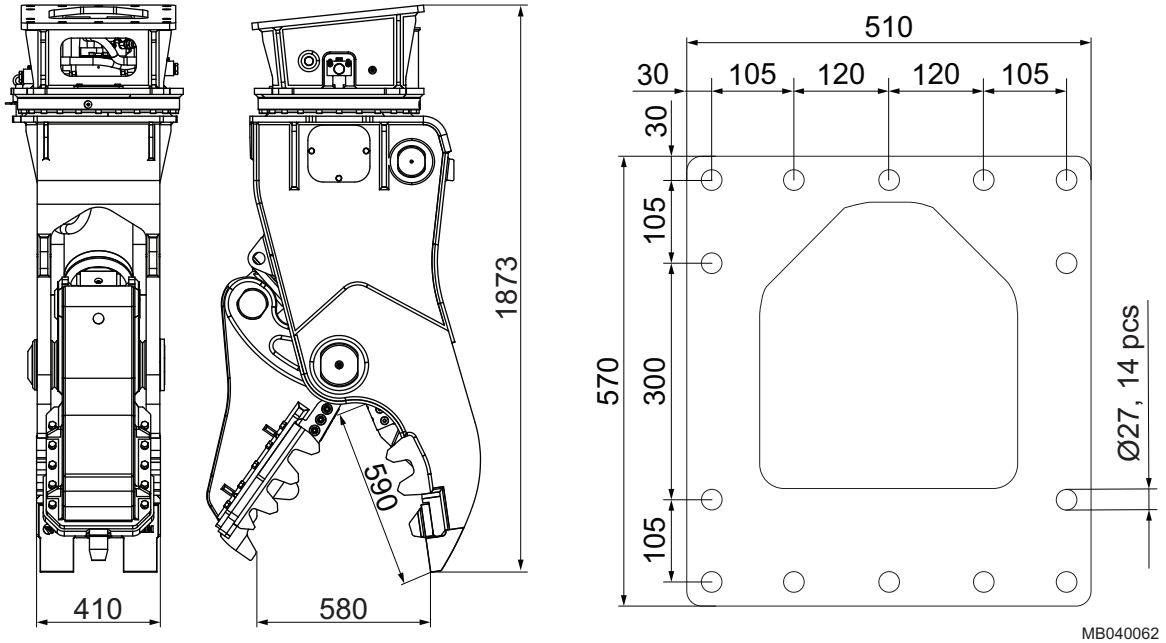
1. PRODUCT SPECIFICATIONS

1.1 TECHNICAL SPECIFICATIONS RPV14R

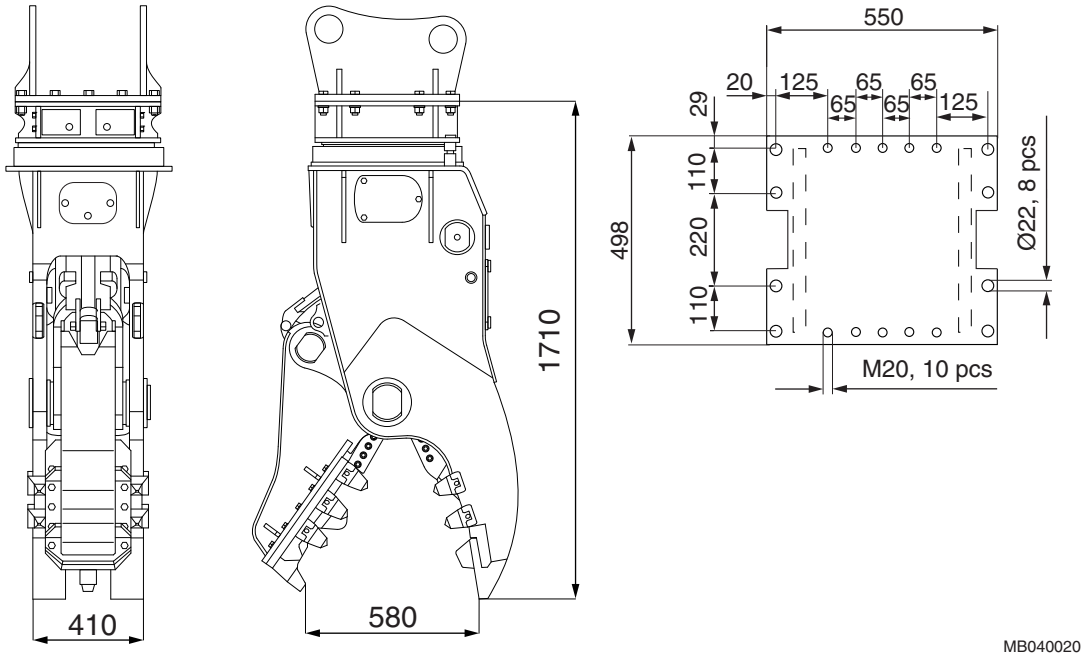
Item	Specification
Minimum working weight[1]	1180 kg (2600 lb)
Pulverizer weight	1040 kg (2290 lb)
Max. jaw opening	580 mm (22.83 in)
Max. cutting force	1590 kN (357446 lbf)
Max. crushing force	720 kN (161862 lbf)
Operating pressure	300...350 bar (4350...5075 psi)
Oil flow	100...180 l/min (26.4...47.6 gal/min)
Hose connections	SAE 6000 psi 3/4"
Operating pressure, rotation	130...150 bar (1885...2175 psi)
Oil flow, rotation	15...20 l/min (4.0...5.3 gal/min)
Connections, rotation	1/2" GAS
Max diameter to be cut	35 mm (1.38 in)
Jaw closing time at max oil flow	2.2 s
Jaw opening time at max oil flow	1.1 s
No. of cycles per minute at max oil flow	18.3 cycles/min
Optimum oil temperature	40...60 °C (104...140 °F)
Allowed oil temperature range	-20...80 °C (-4...176 °F)
Optimum oil viscosity at operating temperature	30...60 cSt
Allowed oil viscosity range	20...1000 cSt
Carrier weight[2]	10...15 t (22000...33100 lb)

1. Weight of unit with applicable jaws and standard bracket
2. Check carrier's lifting capacity from carrier manufacturer

1.2 MAIN DIMENSIONS RPV14R RAMMER BOLT PATTERN



1.3 MAIN DIMENSIONS RPV14R ORIGINAL

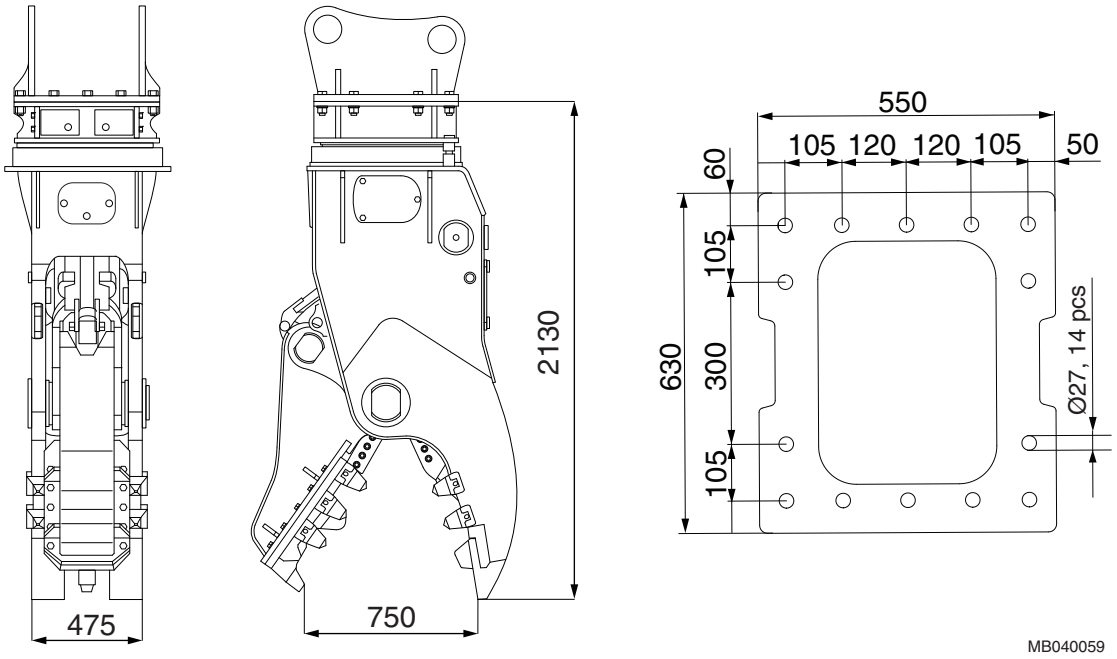


1.4 TECHNICAL SPECIFICATIONS RPV22R

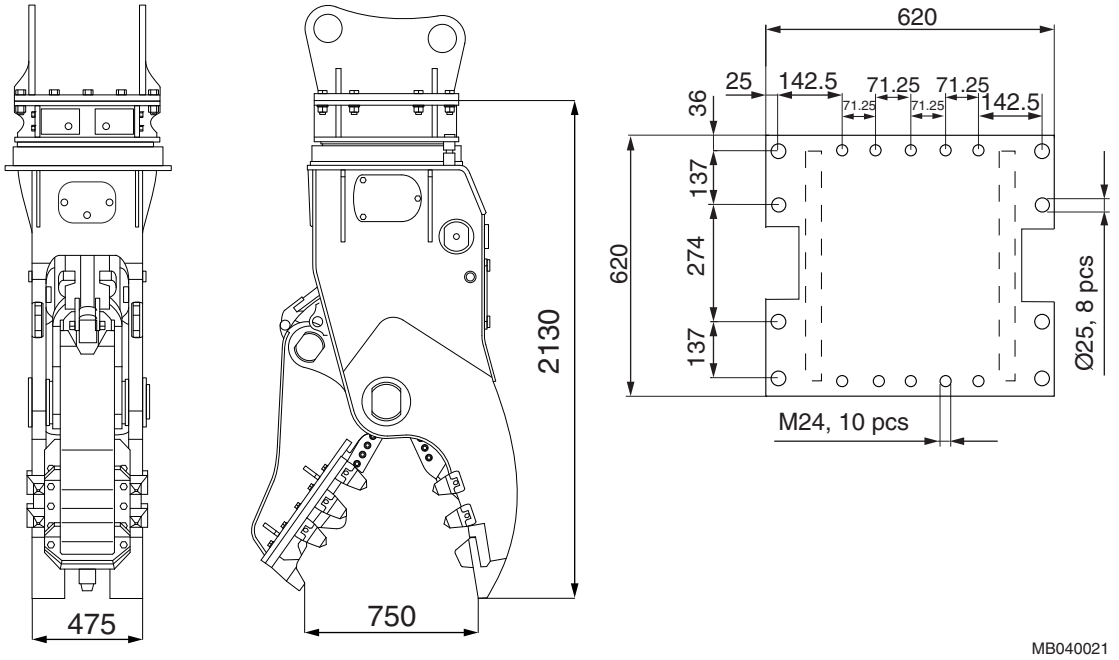
Item	Specification
Minimum working weight[1]	2150 kg (4740 lb)
Pulverizer weight	1950 kg (4300 lb)
Max. jaw opening	750 mm (29.53 in)
Max. cutting force	2675 kN (601364 lbf)
Max. crushing force	1100 kN (247290 lbf)
Operating pressure	300...350 bar (4350...5075 psi)
Oil flow	180...200 l/min (47.6...52.8 gal/min)
Hose connections	SAE 6000 psi 1"
Operating pressure, rotation	130...150 bar (1885...2175 psi)
Oil flow, rotation	30...40 l/min (7.9...10.6 gal/min)
Connections, rotation	1/2" GAS
Max diameter to be cut	55 mm (2.17 in)
Jaw closing time at max oil flow	1.4 s
Jaw opening time at max oil flow	2.3 s
No. of cycles per minute at max oil flow	16.3 cycles/min
Optimum oil temperature	40...60 °C (104...140 °F)
Allowed oil temperature range	-20...80 °C (-4...176 °F)
Optimum oil viscosity at operating temperature	30...60 cSt
Allowed oil viscosity range	20...1000 cSt
Carrier weight[2]	21...26 t (46300...57300 lb)

1. Weight of unit with applicable jaws and standard bracket
2. Check carrier's lifting capacity from carrier manufacturer

1.5 MAIN DIMENSIONS RPV22R RAMMER BOLT PATTERN



1.6 MAIN DIMENSIONS RPV22R ORIGINAL

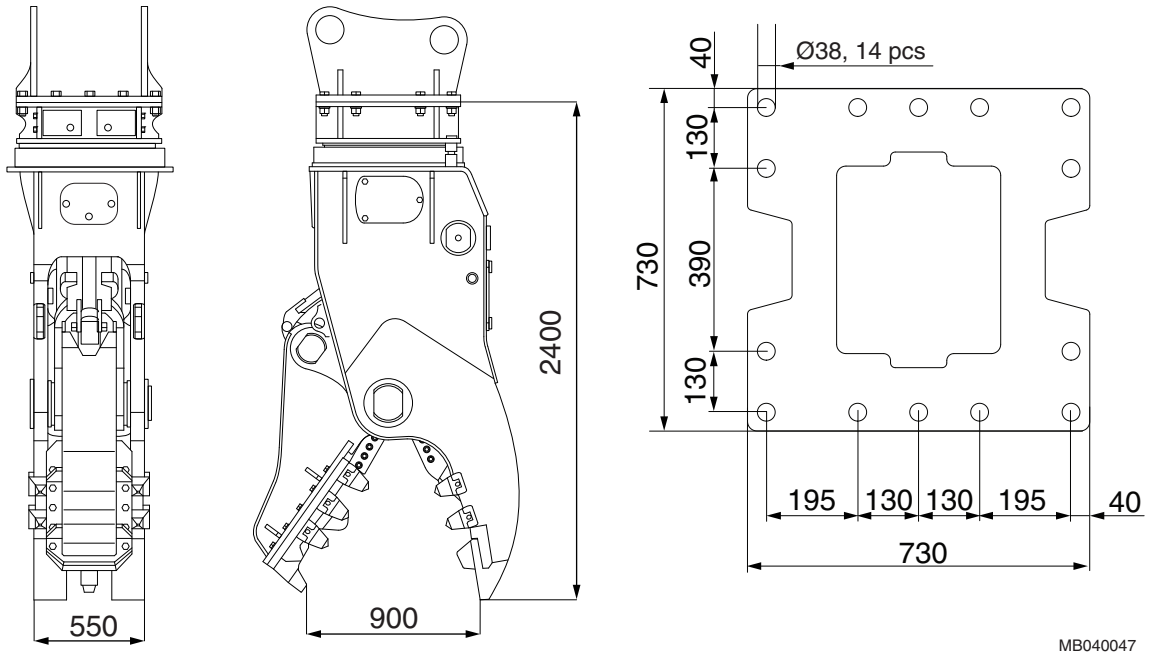


1.7 TECHNICAL SPECIFICATIONS RPV29R

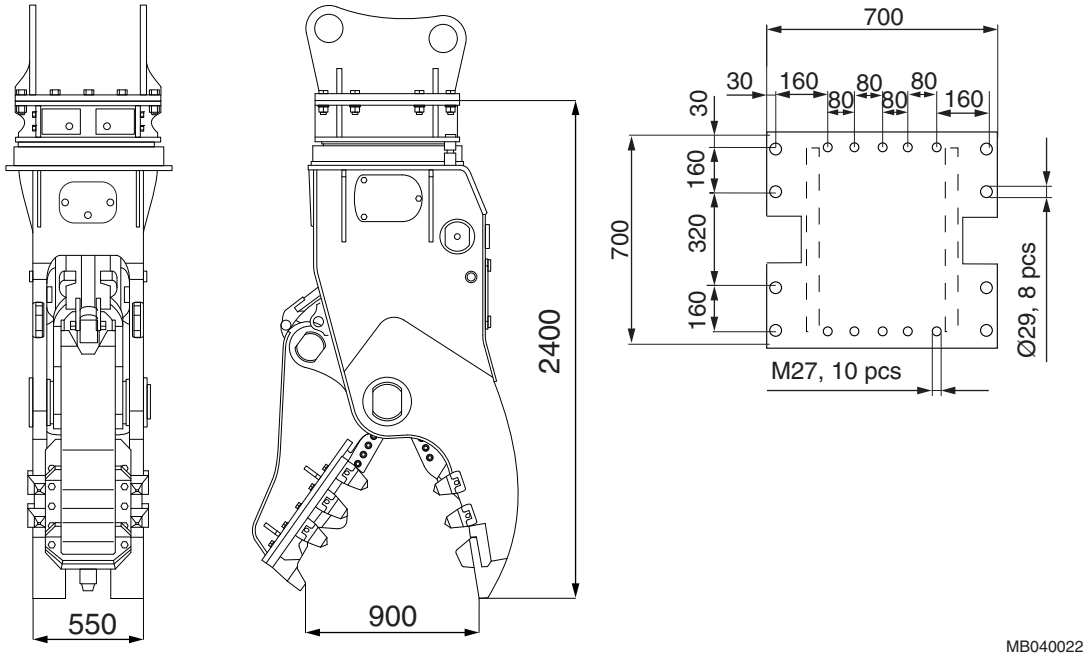
Item	Specification
Minimum working weight[1]	3010 kg (6640 lb)
Pulverizer weight	2760 kg (6080 lb)
Max. jaw opening	900 mm (35.43 in)
Max. cutting force	2615 kN (587875 lbf)
Max. crushing force	1300 kN (292252 lbf)
Operating pressure	300...350 bar (4350...5075 psi)
Oil flow	200...220 l/min (52.8...58.1 gal/min)
Hose connections	SAE 6000 psi 1"
Operating pressure, rotation	100...115 bar (1450...1670 psi)
Oil flow, rotation	30...40 l/min (7.9...10.6 gal/min)
Connections, rotation	1/2" GAS
Max diameter to be cut	61 mm (2.40 in)
Jaw closing time at max oil flow	2.3 s
Jaw opening time at max oil flow	2.3 s
No. of cycles per minute at max oil flow	13.2 cycles/min
Optimum oil temperature	40...60 °C (104...140 °F)
Allowed oil temperature range	-20...80 °C (-4...176 °F)
Optimum oil viscosity at operating temperature	30...60 cSt
Allowed oil viscosity range	20...1000 cSt
Carrier weight[2]	27...35 t (59500...77200 lb)

1. Weight of unit with applicable jaws and standard bracket
2. Check carrier's lifting capacity from carrier manufacturer

1.8 MAIN DIMENSIONS RPV29R RAMMER BOLT PATTERN



1.9 MAIN DIMENSIONS RPV29R ORIGINAL

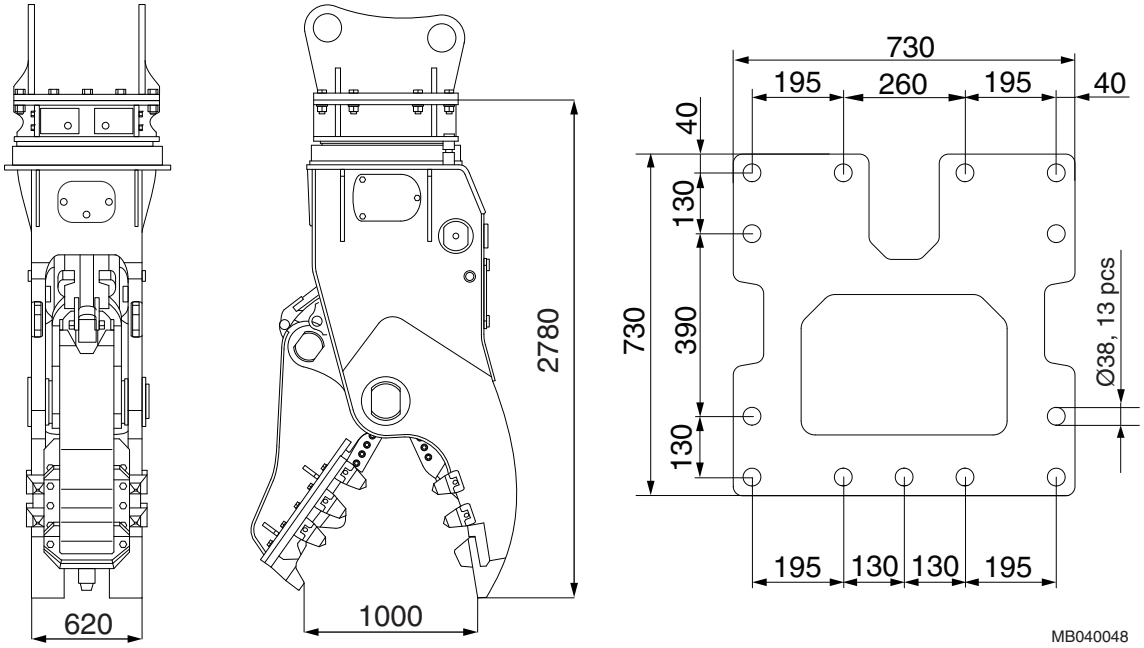


1.10 TECHNICAL SPECIFICATIONS RPV39R

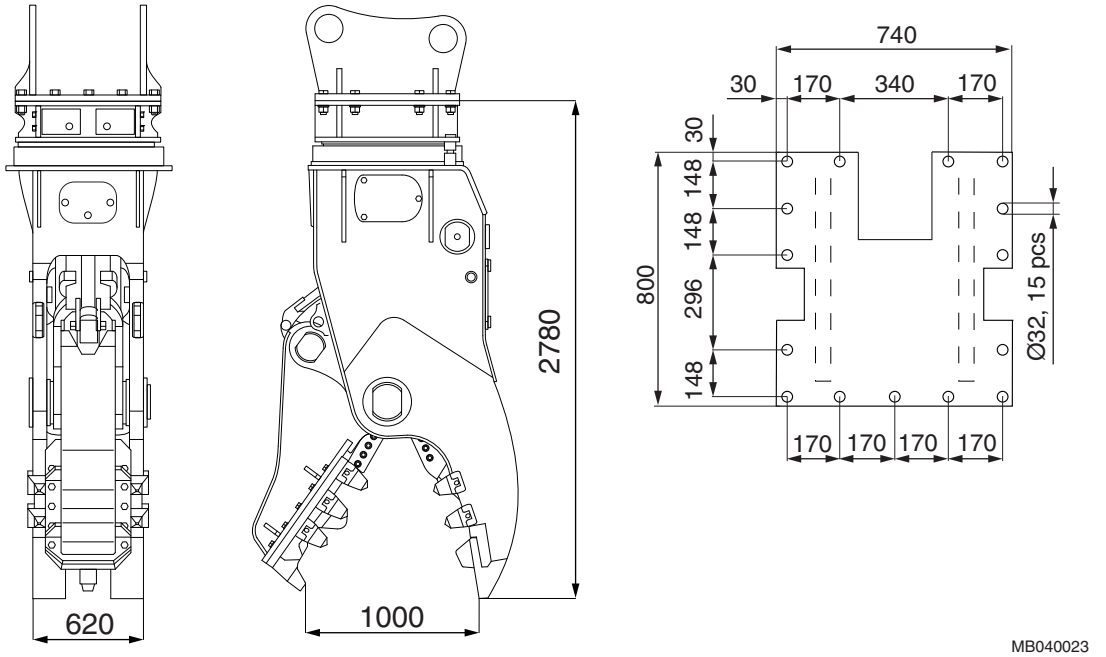
Item	Specification
Minimum working weight[1]	4400 kg (9700 lb)
Pulverizer weight	4050 kg (8930 lb)
Max. jaw opening	1000 mm (39.37 in)
Max. cutting force	3710 kN (834041 lbf)
Max. crushing force	1885 kN (423765 lbf)
Operating pressure	300...350 bar (4350...5075 psi)
Oil flow	300...340 l/min (79.3...89.8 gal/min)
Hose connections	SAE 6000 psi 1 1/4"
Operating pressure, rotation	100...115 bar (1450...1670 psi)
Oil flow, rotation	30...40 l/min (7.9...10.6 gal/min)
Connections, rotation	1/2" GAS
Max diameter to be cut	66 mm (2.60 in)
Jaw closing time at max oil flow	2.4 s
Jaw opening time at max oil flow	2.3 s
No. of cycles per minute at max oil flow	12.7 cycles/min
Optimum oil temperature	40...60 °C (104...140 °F)
Allowed oil temperature range	-20...80 °C (-4...176 °F)
Optimum oil viscosity at operating temperature	30...60 cSt
Allowed oil viscosity range	20...1000 cSt
Carrier weight[2]	35...50 t (77200...110200 lb)

1. Weight of unit with applicable jaws and standard bracket
2. Check carrier's lifting capacity from carrier manufacturer

1.11 MAIN DIMENSIONS RPV39R RAMMER BOLT PATTERN



1.12 MAIN DIMENSIONS RPV39R ORIGINAL

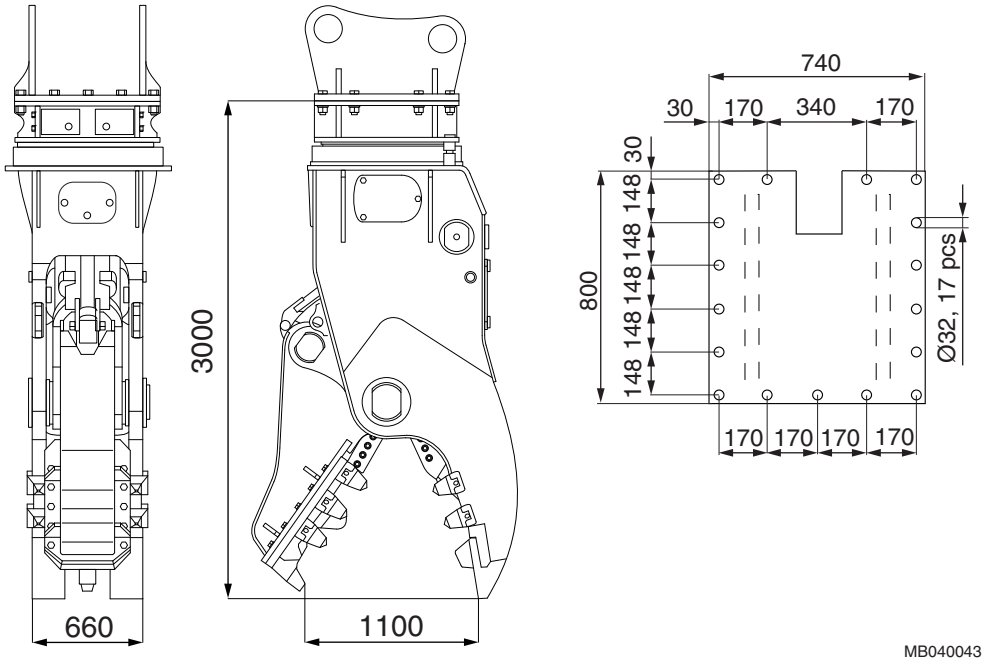


1.13 TECHNICAL SPECIFICATIONS RPV53R

Item	Specification
Minimum working weight[1]	5500 kg (12130 lb)
Pulverizer weight	5150 kg (11350 lb)
Max. jaw opening	1100 mm (43.31 in)
Max. cutting force	5415 kN (1217340 lbf)
Max. crushing force	2375 kN (533921 lbf)
Operating pressure	300...350 bar (4350...5075 psi)
Oil flow	335...375 l/min (88.5...99.1 gal/min)
Hose connections	SAE 6000 psi 1 1/4"
Operating pressure, rotation	100...115 bar (1450...1670 psi)
Oil flow, rotation	30...40 l/min (7.9...10.6 gal/min)
Connections, rotation	1/2" GAS
Max diameter to be cut	68 mm (2.68 in)
Jaw closing time at max oil flow	3.0 s
Jaw opening time at max oil flow	2.8 s
No. of cycles per minute at max oil flow	10.2 cycles/min
Optimum oil temperature	40...60 °C (104...140 °F)
Allowed oil temperature range	-20...80 °C (-4...176 °F)
Optimum oil viscosity at operating temperature	30...60 cSt
Allowed oil viscosity range	20...1000 cSt
Carrier weight[2]	50...65 t (110200...143300 lb)

1. Weight of unit with applicable jaws and standard bracket
2. Check carrier's lifting capacity from carrier manufacturer

1.14 MAIN DIMENSIONS RPV53R

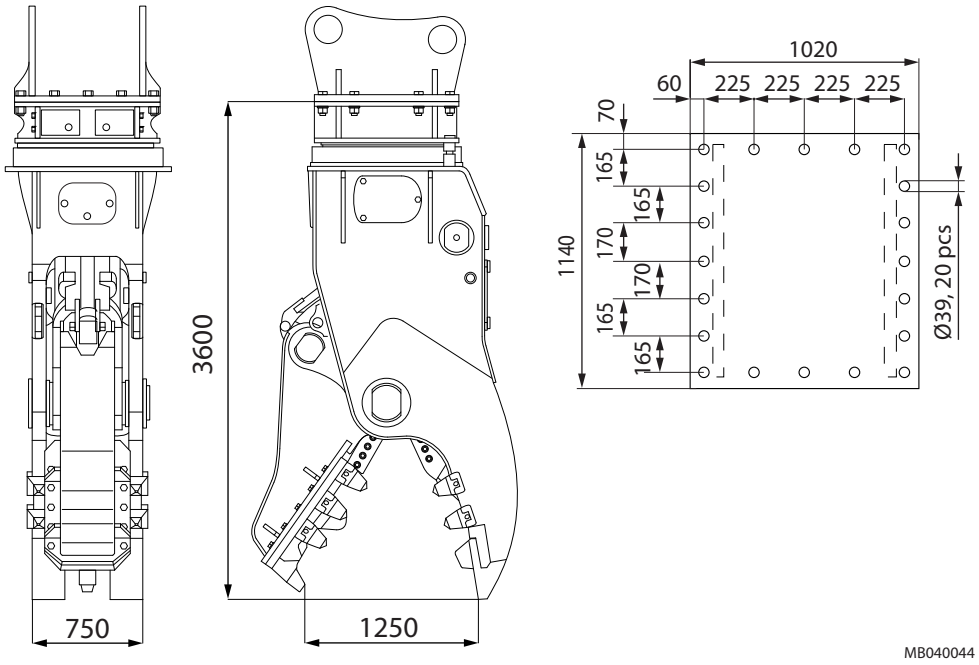


1.15 TECHNICAL SPECIFICATIONS RPV75R

Item	Specification
Minimum working weight[1]	8900 kg (19620 lb)
Pulverizer weight	8100 kg (17860 lb)
Max. jaw opening	1250 mm (49.21 in)
Max. cutting force	7845 kN (1763626 lbf)
Max. crushing force	3600 kN (809312 lbf)
Operating pressure	320...350 bar (4640...5075 psi)
Oil flow	600...700 l/min (158.5...184.9 gal/min)
Hose connections	SAE 6000 psi 1 1/2"
Operating pressure, rotation	140...150 bar (2030...2175 psi)
Oil flow, rotation	50...60 l/min (13.2...15.9 gal/min)
Connections, rotation	1/2" GAS
Max diameter to be cut	70 mm (2.76 in)
Jaw closing time at max oil flow	2 s
Jaw opening time at max oil flow	3.5 s
No. of cycles per minute at max oil flow	9.7 cycles/min
Optimum oil temperature	40...60 °C (104...140 °F)
Allowed oil temperature range	-20...80 °C (-4...176 °F)
Optimum oil viscosity at operating temperature	30...60 cSt
Allowed oil viscosity range	20...1000 cSt
Carrier weight[2]	70...95 t (154300...209400 lb)

1. Weight of unit with applicable jaws and standard bracket
2. Check carrier's lifting capacity from carrier manufacturer

1.16 MAIN DIMENSIONS RPV75R



2. COMPLIANCE

2.1 EU DECLARATION OF CONFORMITY

EU DECLARATION OF CONFORMITY

Manufacturer: MANTOVANIBENNE S.R.L.

Address: VIA RIGHI, 6 41037 MIRANDOLA (MO), ITALY

Declares under our sole responsibility that the interchangeable product:

Rammer rotating pulverizer

Model: RPV14R

Model: RPV22R

Model: RPV29R

Model: RPV39R

Model: RPV53R

Model: RPV75R

Model	Serial number	Reference number
RPV14R	PV14RA	
RPV22R	PV22RA	
RPV29R	PV29RA	
RPV39R	PV39RA	
RPV53R	PV53RA	
RPV75R	PV75RA	

Place of issue: Mirandola, Italy

Date of issue: dd.mm.yyyy

to which this declaration relates, conforms to the Basic Safety and Health Requirements of Directive 2006/42/EC.

Harmonized standards applied: EN474-1; EN474-5; EN12100-1; EN12100-2

Other standards applied: ISO 10567/92; ISO 7451/83; SAE J1097; DIN 15019; DIN 24086

Name and position of issuer: N.N

Signature of issuer: N.N

Issuer of technical dossier: M.M Via A. Righi, 6 41037 Mirandola (MO) Italy

Original

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