Original instructions

ENG 9/22

OPERATOR'S MANUAL

OM2300ENG.922

PLATE COMPACTOR

Ho-Pac 2300

RAMMER HITS HARDER

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.

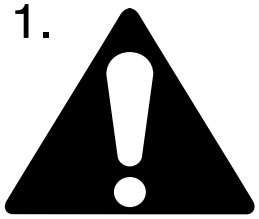
In this manual, the units of measurement are metric. For example, weights are given in kilograms (kg). In some cases, another unit follows in parenthesis (). For example 28 litres (7.4 US gal).

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

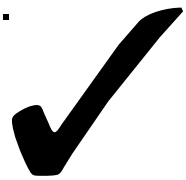
This symbol identifies prohibited action or hazardous location. Failure to understand and obey this safety warning could result in injury to you or others, and could also cause damage to product. See illustration 2.

2.

R010128

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

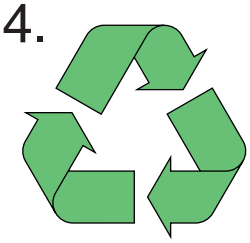
3.



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 70.

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

1.5 ORDERING REPLACEMENT PUBLICATIONS

This manual is an integral part of this product. Keep it in a convenient location so that it is easily accessible for future reference.

Replacement manuals can be ordered by contacting your local dealer.

1.6 RELATED PUBLICATIONS

Related publications for the products include:

COMPACTION GUIDE 103392

The Compaction Guide contains:

- Background information about soil, soil compaction, and basic overview of different types of soil compaction equipment.
- General information on operating techniques for vibratory plate compactors and drivers.
- Performance data for the compactor models derived from field tests.

1.7 DEFINITIONS

Compactor - the product described in this manual.

Carrier - the base machine, onto which the compactor is mounted that supplies the operating power and controls with which the compactor is operated.

This manual - this compilation, which contains vital information for transportation, handling, storage, installation, operation and maintenance of the compactor.

Safety label - a label applied to the compactor advising on protective measures for the most severe risks.

Harm - physical injury or damage to health. This is always in relationship with people, not to equipment or property.

Hazard - potential source of harm.

Risk - the combination of the probability of occurrence of harm and the severity of that harm.

Hazard zone - any space around the compactor or the carrier, in which a person can be exposed to a hazard.

Bystander - any person in the hazard zone who is not handling the compactor.

Range - the lowest-to-highest limits of a device that will allow it to adequately respond represented by two values, 'V1 - V2'. The term "minimum flow" describes the least amount required that permits continuous operation that is both satisfactory and efficient.

Hydraulic flow - a measure of the volume of oil necessary for the safe and efficient operation of the compactor. The motor is coupled directly to the eccentric mass. The rotation speed of the motor must be kept inside a narrow flow range. Too little flow will underspeed the motor resulting in unsatisfactory performance. Excessive flow (above the accepted flow rate) does not improve compactor performance. Too much flow results in overheating the oil and causes the motor to overspeed, which will add significantly higher loads that contribute to early bearing failure. Important: Never use a relief valve as a means to reduce the hydraulic oil flow. Oil by-passed over the relief valve will cause significant heat generation.

Operating pressure - a measure of the hydraulic oil pressure taken in the attachment's supply line during operation. Oil pressure will fluctuate with change in soil density and the amount of force exerted by the carrier. When the product is raised off the ground, the flow of oil is under no load and oil pressure is minimal. Each component of the hydraulic system has a maximum working pressure. For safety and reliability, pressure must be controlled so that no component is subjected to pressures beyond their design. Important: The operating pressure is not to be used as a relief valve pressure setting. Poor performance and significant heat generation will occur.

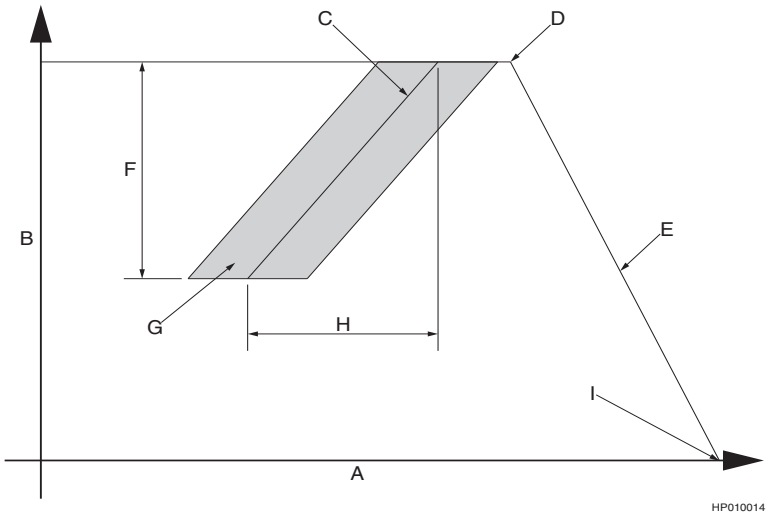
Relief valve - an adjustable, spring-loaded valve that opens when a preset pressure value is reached. A relief valve is used to protect the circuit against hydraulic overload. Relief valves vary in design. Pilot-controlled pressure relief valves are designed so that the relief pressure increases very little as the flow through the valve increases. For compactor applications, pilot-controlled relief valves are recommended over direct-acting relief valves. Important: The relief valve is a required component, used to protect the circuit against hydraulic overload.

Dynamic relief pressure - The pressure measured at the moment the oil pressure exceeds the preset value of the relief valve and the spool "cracks" open. Also referred to as "cracking pressure".

Static relief pressure - The pressure measured at the moment the relief valve has opened fully and all oil is by-passed. Also referred to as "full relief pressure".

Opening curve - the rise of pressure between the dynamic and static pressures. For example, a relief valve adjusted to a dynamic pressure of 200 bar (3000 psi) will crack open when the preset point is reached, but will fully open at a higher (static) pressure. Important: The hydraulic system of the carrier must be capable of providing the accepted oil flow at a pressure equal to at least the dynamic relief pressure.

Flow pressure diagram



A. Pressure

B. Flow

C. Operating pressure

D. Dynamic relief pressure (Relief valve cracks open)

E. Opening curve

F. Hydraulic flow range

G. Attachment operational range

H. Operating pressure range

I. Static relief pressure (No flow to attachment)

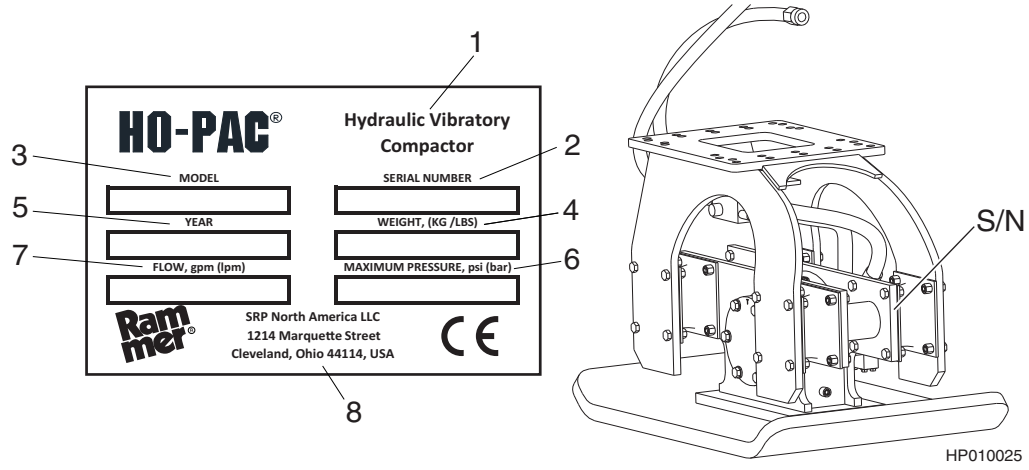
2. MACHINE NUMBERS

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	Plate compactor
2	Serial number
3	Model
4	Weight
5	Manufactured
6	Max operating pressure
7	Recommended operating flow
8	Manufactured by

3. PRODUCT INTRODUCTION

3.1 OVERVIEW

The product is a hydraulically operated vibratory plate compactor and driver. It is designed for mounting on mobile equipment with hydraulic booms, such as rubber tired or track-type construction vehicles. The boom mounted product reaches out to work anywhere the machine can reach and allows the operator to keep a safe distance from the work tool.

3.2 COMPACTOR AND CARRIER COMPATIBILITY

The compactor is designed to provide satisfactory operation with reliable service life when teamed with a compatible carrier. Balance the size of the compactor with the size of the carrier. If the compactor is too small for the carrier, the carrier will damage it. Conversely, if the compactor is too large for the carrier, the compactor could damage the undersized carrier.

Other considerations:

- Reach: Select a carrier size with sufficient reach to compact the deepest area of the trench or excavation. This will also help to minimize the frequency of repositioning the carrier.
- Lift capacity: Know how your machine is equipped and if any modifications have been made. Factors such as boom type, stick length, undercarriage, tracks, and counterweights affect the lifting capacity of the carrier. Also take into account any add-ons, such as a quick attach coupler. Consult the carrier manufacturer's manual for specifications.
- Hydraulic circuit: Select a carrier equipped with a one-way hydraulic circuit and unrestricted free flowing return. It must maintain adequate flow and pressure without loss of hydraulic power to the compactor when carrier applies down-pressure. If the carrier cannot maintain the prower required, motor speed slows and soil density targets will not be reached.

Undersized compactors (as well as under-performing compactors) are less economical to use because compaction is limited to smaller lifts and will require additional passes. This generates other inefficiencies as longer running cycles result in loss of time, increased energy consumption and component wear.

Optimum efficiency is achieved only when proper operating technique is employed. The number of passes needed, along with the duration, will vary with material type and lift. Additional fill material and repositioning of the carrier may be required to achieve a finished surface.

CARRIER WITH AUXILIARY HYDRAULIC CIRCUIT

Warning! Hydraulic circuits differ between machines. Improper oil flow or pressure can damage the compactor or carrier. Only qualified personnel, having knowledge of the machine's systems, proper test equipment and tools should perform conversion set-up and adjustments.

The compactor is a hydraulic-driven work tool that is not self-powered. Satisfactory performance centers on the hydraulic circuit of the host machine to deliver proper flow and pressure requirements.

Generally, most machines will require some degree of conversion to make use of their hydraulic power. Conversions to machines equipped with a factory or dealer installed auxiliary circuit, however, may require little more than minor adjustments to flow and pressure settings.

Carefully follow all instructions, including those provided by the machine manufacturer, when making adjustments.

3.3 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.

3.4 LIFTING INSTRUCTIONS

Use a hoist when lifting components which weigh 23 kg (51 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.

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 the typical 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. 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.

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.

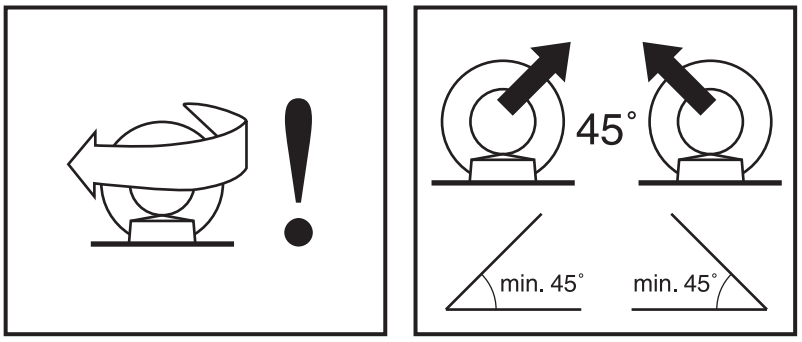
When two lifting points are used, the lifting capacity depends on the angle of the lifting chains. The angle should not be less than 45°, as shown in the illustration. When the lifting eye screws are tightened, both rings should be aligned.

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.

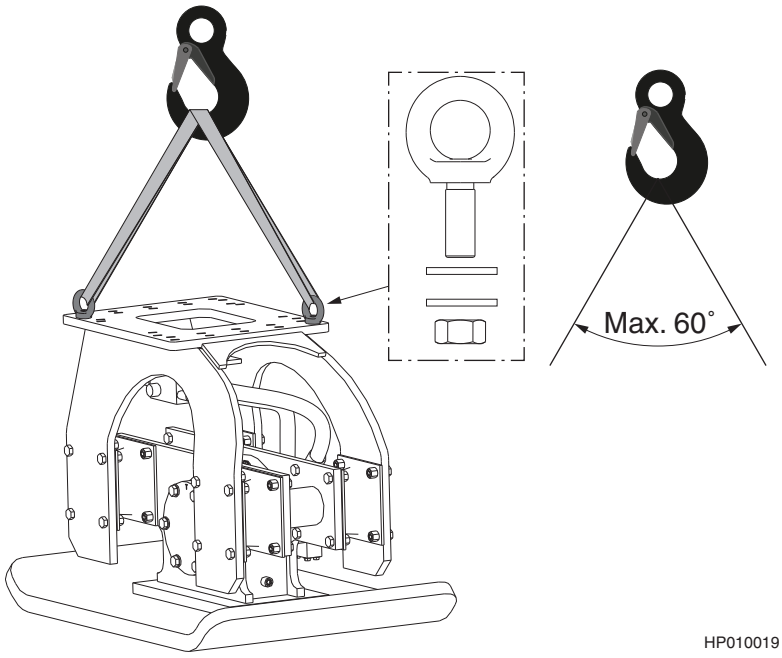
Note: The lifting eye must always be removed from the product and replaced with a screw before operation.



G010014

Lifting devices must safely carry the working weight of the product. See “Product specifications” on page 70.

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.

3.5 TRANSPORT INSTRUCTIONS

Warning! Injury may result if the product shifts or falls. Do not lift the product by the mounting pins or hoses. Lift the product only by the designated lifting points. Lifting devices must safely carry the loads to which they will be subjected. Lift away from people. Do not enter the danger zone while the product is being lifted. See "Lifting instructions" on page 13.

Warning! Injury from a falling object or debris. Hoisted items can be hazardous to bystanders or the machine itself. Before lifting the product, remove all unsecured items including loose parts, service tools and debris.

Warning! Crushing injury. Keep hands and feet clear of crush points. Always use sufficient blocking to avoid accidental or sudden movement of the attachment.

TRANSPORTING THE PRODUCT INDEPENDENTLY OF THE CARRIER

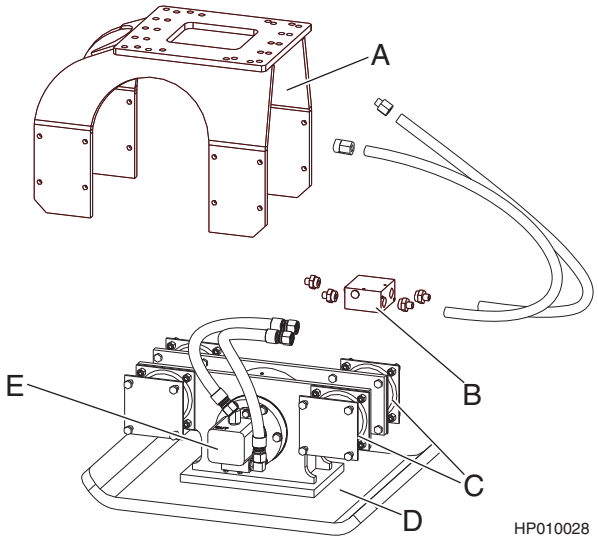
1. Remove all loose debris from the product.
2. Follow removal instructions.
3. Secure the hoses to the unit to avoid accidental damage.
4. Lift attachment at recommended lifting points. See "Provided lifting points" on page 13.
5. Stabilize and secure the product adequately for transport.

TRANSPORTING THE PRODUCT WHILE INSTALLED ON THE CARRIER

1. Remove all loose debris from the product.
2. Secure the hoses to the unit to avoid accidental damage.
3. Inspect the mounting pins and hardware for damage and integrity.
4. Transport carrier in accordance with carrier manufacturer's recommendations.

3.6 MAIN PARTS

The main parts of the compactor are shown below.



A. Top frame

B. Control valve

C. Suspension system

D. Dynamic assembly

E. Hydraulic motor

TOP FRAME

The top frame serves as the connection point used to attach the compactor to the stick or linkage of the carrier.

CONTROL VALVE

All compactor models come standard with the multi-function control valve. Benefits include optimized operation with improved reliability of critical components, such as the motor and bearings.

Note: The valve is factory preset and requires no further adjustments.

The valve performs the following functions:

- The flow regulator protects the bearings from excessive loads by limiting oil flow that can overspeed the hydraulic motor.
- The pressure control protects the hydraulic components from overpressure. This is factory preset at the maximum operating pressure plus 14 bar (205 psi).
- The anti-cavitation circuit controls deceleration of the hydraulic motor and eccentric mass. It also protects the motor from damage on circuits not set up with an open return.
- The return line check valve prevents reverse flow to the hydraulic motor. It also provides a nominal back-pressure to ensure the proper operation of auxiliary valves.

SUSPENSION SYSTEM

The rubber springs mounted between the top frame and dynamic assembly isolate the vibratory energy from the carrier.

DYNAMIC ASSEMBLY

The dynamic assembly consists of the lower assembly, eccentric mass, bearings, and rubber springs. The dynamic assembly generates and transfers the vibratory energy to the soil. The strength of vibration is affected by the motor's speed of rotation, weight of the eccentric mass, and the distance between eccentric mass and shaft. The vibratory action and impulse force is transferred through the attached compaction plate.

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

QUALIFIED PERSON

For the purposes of this manual, a qualified person is an individual that has successfully demonstrated or completed the following:

- Has read, fully understands and adheres to all safety statements in this manual.
- Is competent to recognize predictable hazardous conditions and possess the authorization, skills, and knowledge necessary to take prompt corrective measures to safeguard against personal injury and/or property damage.
- Has completed adequate training in safe and proper installation, maintenance, and operation of this equipment.
- Is authorized to operate, service and transport the equipment.

OWNER'S RESPONSIBILITIES

- Ensure that only qualified personnel operate and service the equipment.
- Ensure appropriate personnel protection equipment is available to personnel when working in hazardous conditions and enforce its use.
- Ensure equipment is kept in safe operating condition.
- Ensure safety-related materials such as instructions and including this manual are kept in a convenient location so that they are easily accessible to operators and maintenance personnel.

OPERATIONAL SAFETY PROGRAM

The safe and efficient use of the equipment depends upon proper installation, operation, maintenance, and repair. Operational safety programs must encompass all of these elements.

Accident prevention through operational safety programs is most effective when the equipment owner further develops the program by taking into account his own experience with using and maintaining equipment.

Developing such programs help minimize equipment downtime, while maximizing service life and performance. Most importantly, it will minimize the risk of personal injuries.

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.

Those responsible for administering personal protective equipment shall train personnel with the proper selection and use of personal protective equipment to protect against misuse.

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.

Federal, state, local and OSHA construction guidelines and regulations

Use Ho-Pac products in accordance with all federal, state, and local regulations regarding construction practices and public safety. Identification of, and compliance to, governing regulations are the responsibility of the owner and operator.

In the United States, comply with the recommendations of the Occupational Safety and Health Administration standards of the U.S. Department of Labor. For OSHA construction guidelines contact your local federal government office or write:

U.S. Government Printing Office Superintendent of Documents P.O. Box 371954 Pittsburgh, Pa. 15250-7954

Website: www.osha.gov

Ask for Construction Industry OSHA Standards Stock #869-034-00107-6.

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.

ACCIDENTAL START-UP

Prevent accidental activation of machinery by locating control switches in guarded areas.

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 10 m (33 ft) and could cause death or serious injury.

Stop operation when a person enters hazard zone.

Wear approved personal protective product."

HP010035

Protect yourself and your surroundings from flying debris:

- As an operator, ensure you have adequate protection, such as bullet-proof glass, mesh guard, or equivalent protection.
- Keep the cabin windows and doors closed during operation. Window bars are recommended to protect the windows from flying debris.
- Do not operate the product or carrier with people around it.

HIGH NOISE LEVEL

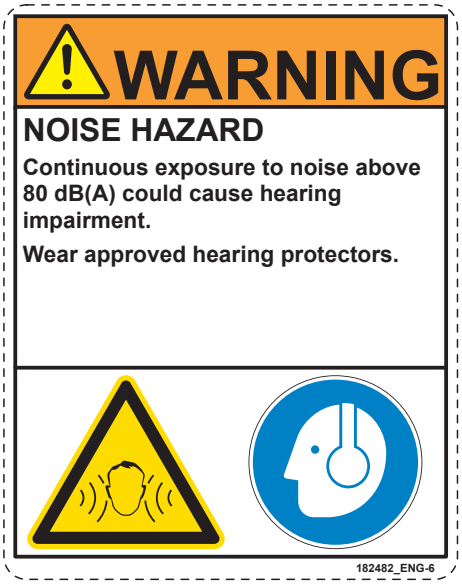
A product in operation creates a high noise level. Always wear ear protection to prevent personal injury.

The safety label on the product is shown below:

"NOISE HAZARD

Continuous exposure to noise above 80 dB(A) could cause hearing impairment.

Wear approved hearing protectors."



HP010037

HOT SURFACE

Some components of the product become hot during operation. Allow surfaces and fluids to cool before handling. Always wear personal protective equipment to prevent personal injury.

The safety label on the product is shown below:

"BURN HAZARD

Contact with hot surface could cause severe injury.

Do not touch!

Wear approved personal protective equipment."

HP010038

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

PRODUCT LIMITS

Operating the product beyond its design limits can cause damage. It can also be dangerous. See “Product specifications” on page 70.

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

COMPATIBILITY AND USE WITH OTHER EQUIPMENT

The product is designed to deliver satisfactory performance when used with a broad range of equipment. In all instances it first must be confirmed through adequate research and testing, that the equipment is suitable to operate the product. The technical data as well as information concerning connecting requirements can be found in this manual and shall be strictly observed.

Since carrier hydraulic circuits differ and options vary, careful review of the equipment's specifications along with thorough knowledge of the system's operation, including hydraulic and electric is required. If in doubt, and further assistance is required, it is the responsibility of the equipment owner to contact their authorized Ho-Pac dealer.

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 13. Contact your carrier dealer to find out how to lift with your carrier.

SPARE PARTS

Use only genuine spare parts. The use of other spare part 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.

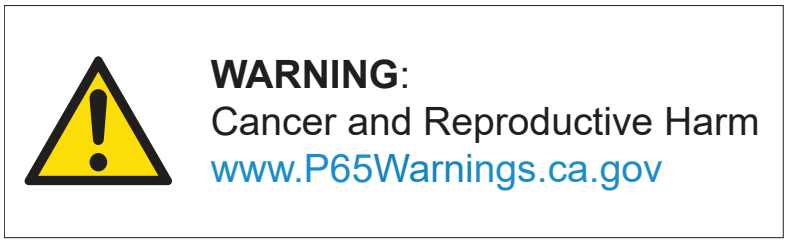
CALIFORNIA PROPOSITION 65

This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

The safety label on the product is shown below:

"WARNING:

Cancer and Reproductive Harm - www.P65Warnings.ca.gov"



HP010036

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.

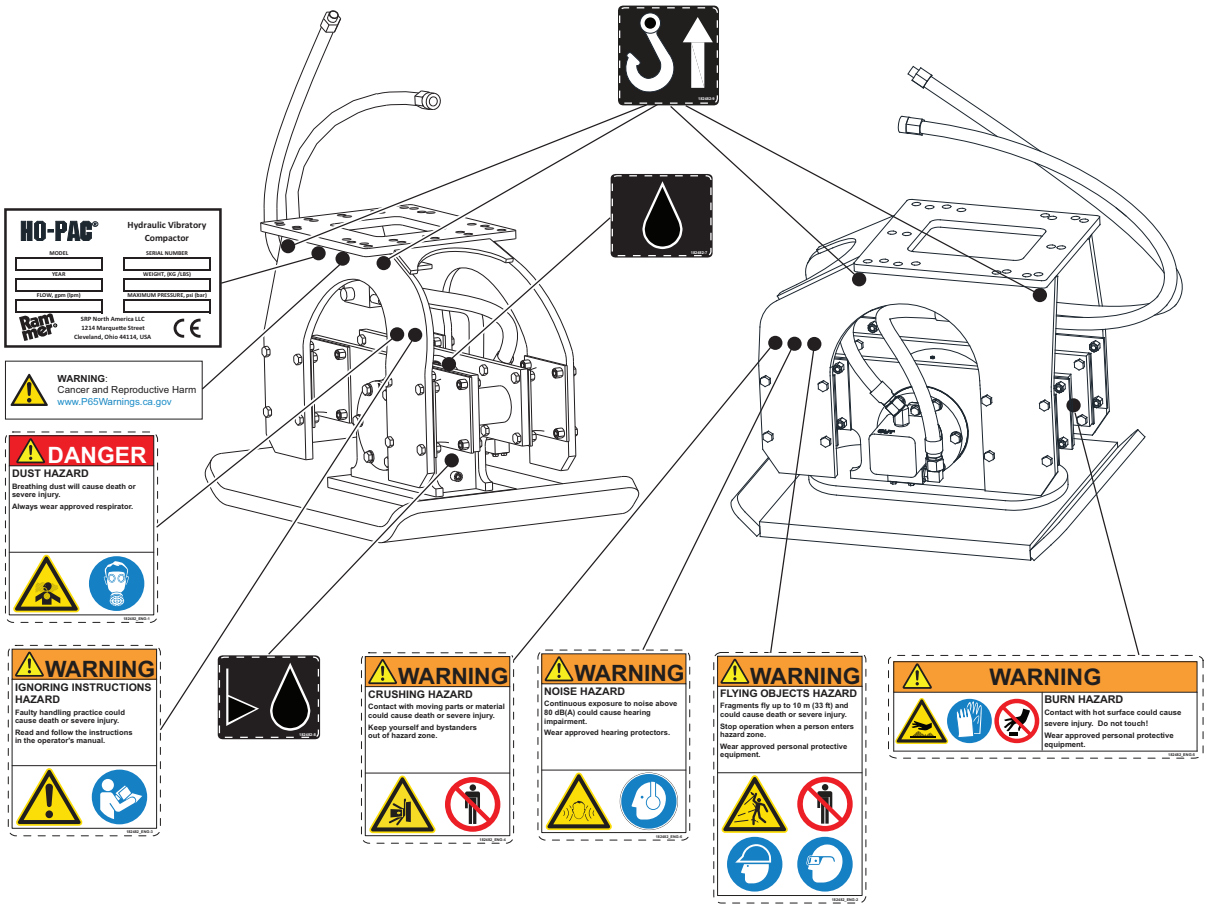
If a safety label is attached to a part that is replaced, install a new safety label on the replacement part. If this manual is available in your language, then the safety labels should be available in the same language.

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.

Ho-Pac 2300



HP010043

4.3 ENVIRONMENTAL PROTECTION AND RECYCLING POLICY

Ho-Pac 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 Ho-Pac 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 Ho-Pac product please follow these guidelines:

- Dispose of packaging materials properly and in accordance with regulations. Recycle wood, plastic and steel at qualified recycling facilities.
- 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).

5. OPERATION

5.1 OPERATING INSTRUCTIONS

RECOMMENDED USE

The compactor is designed for use in soil compaction. Applications include backfill compaction, base course preparation, finish surface treatment, and embankment buildup.

The compactor can also be an effective sheet or pile driver. Vibration energy is transferred through the sheet or pile to the soil. Soils with 50% or more granular content are "liquefied" by the vibration, which breaks the skin friction, allowing the sheet or pile to penetrate more easily. For more information, see the Compaction Guide. To request a copy, 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 70. The product is installed on the carrier in much the same way as installing a bucket or other attachments. This 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, a secondary relief valve in the carrier auxiliary circuit is 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 a third party suppliers.

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 52.

Operating temperature

The operating temperature is 0 °C (32 °F) to 80 °C (176 °F). If you must work in a temperature lower than 0 °C (32 °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 “Oil specifications” on page 53.

PRINCIPLES OF OPERATION

The compactor combines three actions that are highly effective in the compaction of granular type soils:

1. Vibration: The vibratory action is generated by the hydraulic motor that drives the out-of-balance eccentric mass turning at a high rpm. Granular soils are extremely responsive to consolidation by vibration. Soil particles are set in motion and settle under their own weight. The air surrounding these particles is forced out, which allows them to pack closely together.
2. Impulse force: Generated by the centrifugal force of the rotating eccentric mass. When properly controlled, this also gives an impact force.
3. Down force: A pressing force exerted by the carrier against the compactor springs.

Vibration, impulse force, and down force are transferred through the attached compaction plate to the soil.

For more information, see the Compaction Guide. To request a copy, contact your local dealer.

5.2 DAILY OPERATION

PRE-OPERATION INSPECTION

Warning! Repair or replace any damaged components prior to operation. Do not operate the compactor until all faults are corrected.

Important: Operating the product beyond its performance limits will cause equipment damage. The product is designed to provide optimum performance with reliable service life at the flow and oil pressure specified. Prior to the compactor's first use on a machine, it is important to test the hydraulic circuit. See “Testing the hydraulic circuit” on page 83.

For safe and proper operation, perform a thorough daily inspection of the equipment before use:

1. Ensure the compactor is securely attached to the carrier. Check mounting pins and hardware for wear or damage.
2. Remove any excess dirt and debris that accumulated on the compactor as this may decrease performance.
3. Inspect the following for damage:

- Inspect rubber of spring mounts for cracks or separation from end plate.
- Inspect hoses, seals, motor, and valve for oil leaks.
- Check for loose or missing fasteners.

See “Inspection and maintenance” on page 60.

OPERATING TECHNIQUES

Always practice proper operating techniques.

- Do not allow the top frame to contact the base plate. Spring mount and frame damage may result. Stretch the spring mounts no more than approximately one-half (1/2) their width.
- Do not use the compactor to lift or push materials. Damage to spring mounts and other components may result.
- Do not operate the compactor underwater. Bearing damage may result.
- Do not operate the compactor without the compaction plate attached. A dynamic imbalance may result in equipment damage.
- At temperatures below 0°C (32 °F), operate the compactor for a few minutes without down force to allow the spring mounts to warm.
- Do not operate the compactor with hydraulic oil temperature above 80°C (176 °F).

OPERATING THE COMPACTOR

Warning! Flying debris hazard. Injury from flying debris. Do not operate the compactor with workers in close proximity of work zone. Clear all personnel from work area before the compactor is operated. Personal protection equipment, including safety eyewear, must be worn when operating or servicing this equipment.

Warning! Noise hazard. Risk of hearing impairment or loss. Hearing protection must be worn by all personnel exposed to prolonged high noise levels.

Warning! Falling hazard. Injury from falls into open excavations. Ground vibrations may collapse trench walls. Excavations must be shored to meet federal, state and local guidelines. Erect barriers around open excavations to control entry into established work zone.

Warning! Never activate the compactor unless the operator is seated in the operator's seat and in full control of the machine. Follow instructions in the operator's manual provided with the carrier.

Note: Before starting compaction work, it is recommended to perform compaction measurement tests with the material to be compacted to determine specific output rates and degrees of compaction. For more information on measuring compaction, see the Compaction Guide.

1. Clear all personnel from the work area.
2. Position the carrier in line with the direction of work.

3. Position the compactor parallel to the work surface and within view of the operator. The compaction plate must be in full contact with the work surface for maximum effectiveness.
4. Activate the compactor with the switch located in the operator's cab.
5. Use the carrier to push down against the springs of the compactor. In addition to transferring the vibratory energy more effectively to the soil, this adds static pressure to assist in compaction.

   Important: Overstretching the rubber springs will contribute to early spring failure. Stretch the spring mounts no more than approximately one-half (1/2) their width.
6. Maintain down pressure as the material compacts. For larger areas, decrease the boom down-force and slide the compactor over the material with a repetitive, back and forth motion. The initial pass is continued until compaction is no longer apparent, typically 5 to 15 seconds.

   Important: Run the compactor until maximum density is achieved. Avoid unnecessary run time that can lead to loosening of soil previously compacted.
7. Repeat compacted lifts as necessary until a finished surface is achieved. Optimum compaction is usually obtained with two passes. The duration of the initial pass is dependent on depth and material. The second pass may require additional fill material and compactor repositioning to achieve finished grade.
8. After compaction is complete, re-position the compactor and/or carrier to continue working.

   Note: Exposure to abrasions, over-stretching and heat build-up from prolonged operating cycles all contribute to shorter spring life. Stop the compactor during repositioning to help minimize heat-aging of rubber.

Factors affecting the compaction results

The rate of compaction to 95% (Modified Proctor test) will vary due to many factors, including variations in operator technique. Other factors that will produce different results include:

- Soil densities are reduced at the bottom of excessively high lifts. It may be necessary to try different lifts to determine the maximum and most effective lift that can be used and still achieve the required density.
- Compaction is affected by material type. Soils with 50% or more granular content are the most responsive to compaction through vibratory action.
- Moisture content is also critical to achieving maximum compacted densities of fill material. Fill materials may need conditioning prior to compaction.

For information on measuring compaction, see the Compaction Guide.

5.3 MOUNTING AND DISMOUNTING THE PRODUCT

REMOVAL FROM CARRIER

Warning! Burn injury from contact with hot fluids and surfaces. Some components of the machinery become hot during operation. Allow surfaces and fluids to cool before handling.

Warning! Fluid penetration hazard. Release pressure trapped in hoses before disconnecting. Wear appropriate protective equipment including safety eyewear and gloves.

Warning! Both operator and assistant must be qualified in handling procedures. The operator must have unobstructed view of the assistant and load at all times. The operator shall maintain full control of the machine at all times.

Collect fluids in a suitable container. Clean up spilled fluids and obey all local regulations for the disposal of these fluids.

1. Position the product on stable ground.
2. Disconnect the hydraulic connections.
3. Ensure that all loads are adequately secured and remove the mounting pins and hardware.
4. Keep the mounting hardware with the product to avoid loss or damage.

INSTALLATION ON CARRIER

The compactor can be attached to the carrier once the any other attachment has been removed and the mounting bracket is bolted to the top frame. Installation can vary, but the mounting procedures are similar to mounting a bucket. Use standard mechanic's techniques and tools. Note that the mounting bracket, hardware, pins and adapters may be furnished with the compactor or supplied in the mounting kit.

No special tools are required, but the following tools should be available:

- PPE including safety eyewear and gloves
- Sledge hammer
- Drift pin / alignment bar
- 3/4 drive socket wrench
- 3/4 drive metric sockets
- Grease guns
- Standard and metric open end wrenches
- Rags
- Suitable container to collect fluids

Installation procedure

Warning! Personal protection equipment required when handling. PPE should include appropriate clothing, gloves, safety wear, and shoes.

Warning! Both operator and assistant must be qualified in handling procedures. The operator must have an unobstructed view of the assistant and load at all times. The operator shall maintain full control of the machine at all times. All directions and signals must be agreed upon in advance. Take signals from only ONE person.

Warning! Crushing hazard. Keep clear of crushing points and moving parts. Use sufficient blocking and restraints to avoid accidental or sudden movement of loads.

The following describes the basic procedure to attach the product to a carrier equipped with a typical pin-on type mounting arrangement. Procedures may vary and you should always follow the instructions in the manual that is provided by the carrier manufacturer. For carriers equipped with a quick coupler, refer to the owner's manual furnished by the coupler manufacturer for instructions.

The carrier operator and an assistant shall perform the following procedure:

1. Operator: Move the carrier and the product to a firm level surface. Position the product with the hose side facing toward the carrier.
2. Assistant: Check that the product is stable and all loads are supported.
3. Operator: Maneuver the stick in between the lugs of the mounting bracket. Align the stick pin holes to the holes in the mounting bracket.
4. Assistant: Clean pins of rust and debris before they are installed. Insert the stick pin and secure with keepers.
5. Repeat the steps 1 - 4 to install the link pin.
6. Lubricate the pins.

Connecting pressure and return lines

Warning! Hydraulic circuits differ between machines. Improper set up can damage the compactor or carrier. Only qualified personnel, having knowledge of the machine's systems should install it. Identify whether the carrier's pressure line is located on the right-hand or left-hand side. Do not guess. The compactor will not operate if these hoses are crossed.

Warning! Fluid penetration hazard. Release the pressure trapped in the hoses before disconnecting. Wear appropriate protective equipment including safety eyewear and gloves.

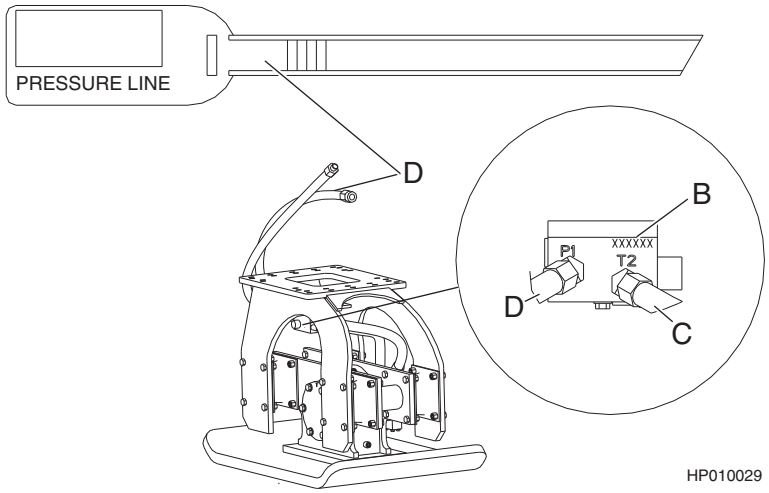
Collect fluids in a suitable container. Clean up spilled fluids and obey all local regulations for the disposal of these fluids.

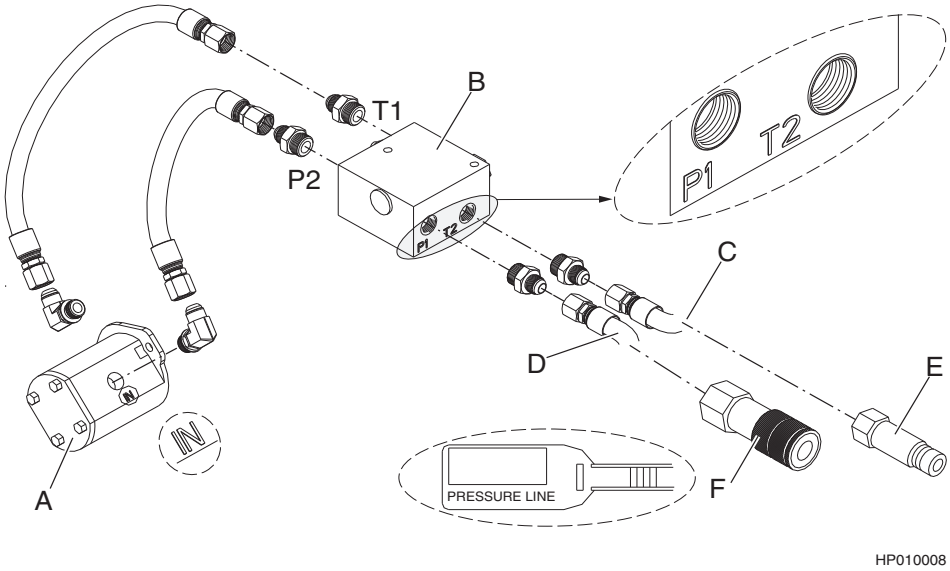
Important: Read, understand and follow the instructions included with the installation kit. The installation is not complete until the hydraulic circuit is tested for flow and pressure. Tools required for testing include a flow meter and pressure gauges. See “Testing the hydraulic circuit” on page 83. Questions regarding testing procedures should be directed to Technical Support.

Important: Contamination can diminish service life. Prevent contaminating the oil. Always clean the area around connections prior to opening the hydraulic system.

Important: The compactor will not operate if the supply and return hoses are crossed. For ease of identification, the supply hose is tagged with a red colored cable tie and marked "PRESSURE LINE".

1. Connect the supply (IN) and return (OUT) hoses to their designated ports. See the accompanying figures for hydraulic connections.





A. Hydraulic motor

B. Control valve

C. Return hose

D. Supply hose

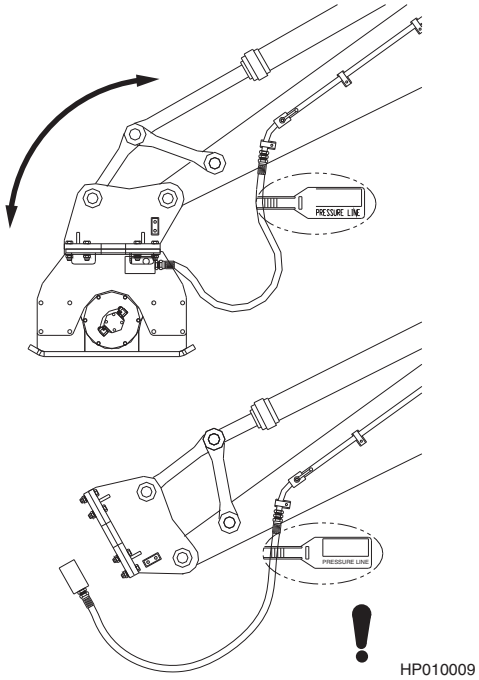
E. QD plug

F. QD socket

- Supply hose tagged with [Pressure line]
- Supply hose connection to valve port [P1]
- Return hose connection to valve port [T2]

Important: The control valve is attached to the mounting frame. The part number of the valve can be found stamped into the body above connection port T2.

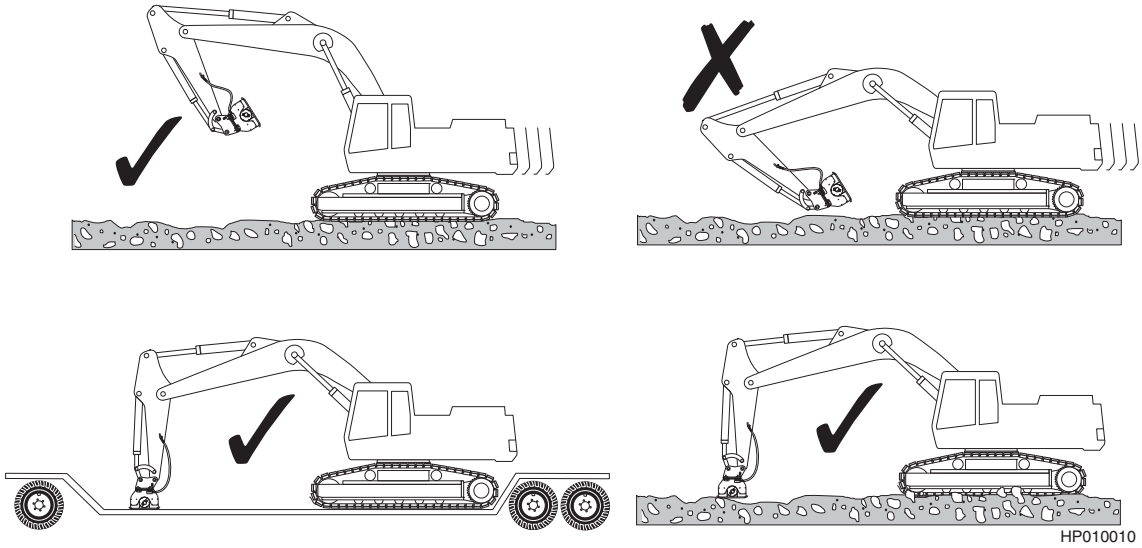
2. Raise the compactor off the ground and operate the bucket cylinder to ensure hoses will not be pinched or restricted. See the accompanying figure for hose length and routing for unrestricted movement.



3. Briefly test the compactor for proper operation. Stop and check for hydraulic leaks. Tighten hoses and connections as needed.

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 ground.



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 compaction work. Special conditions of use are:

- 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 compactor must not be used under water.

5.6 STORAGE

LONG TERM STORAGE

During periods of non-use, protect against damage. Observe the following storage preparations.

- Do not drain oil unless fluid degradation warrants change. Keep the motor full of oil to protect internal components.
- Seal hydraulic connections to protect against contamination.
- Store in upright position.
- Support the mounting frame with blocks to minimize permanent sag in spring mounts.
- Protect rubber components such as spring mounts and hoses from exposure to direct sunlight to reduce aging effects.
- Avoid wet or damp conditions to minimize rust.

LUBRICATION

1. GREASING

The bearings are continuously lubricated during operation from the oil splash system located within the housing weldment.

Important: Check the bearing oil level regularly. Make sure it is up to the `FULL' line, and check for leaks if the level is low. Conversely, if visible oil leaks are detected during daily inspection, check the oil level and fix the cause of the leak. For oil changes, keep to the schedule. Avoid mixing different oil types that may not be compatible. The best approach is to thoroughly flush out old fluids before adding a different type.

VENT PLUG

The lubrication system is sealed to protect the oil from outside contamination. A vent plug is located on the housing weldment near the fill plug. It is a one-way passage used to vent any pressure build-up inside the eccentric housing. A small amount of oil residue surrounding its location is normal.

1.1 BEARING LUBRICATION OIL

OIL TYPE

The compactor is factory filled with premium quality hydraulic oil ISO VG32 combining non-foam and anti-wear additives. The use of other oils shall be permitted only if they have a minimum viscosity of at least 12 cSt at an operating temperature of 66°C (151 °F).

OIL CAPACITY

The approximate oil capacity is 2.2 l (2.2 qt). Do not overfill. The excess oil from overfilling will spray from the vent plug.

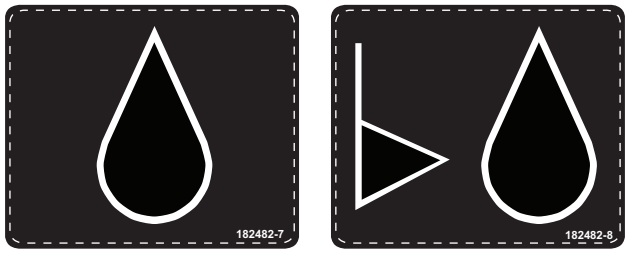
OIL CHANGE INTERVAL

Replace the bearing oil every 1000 operating hours, or once per year. Note that the maintenance intervals are subject to adjustment if operating under extreme operating conditions.

1.2 OIL LEVEL AND FILL POINTS

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

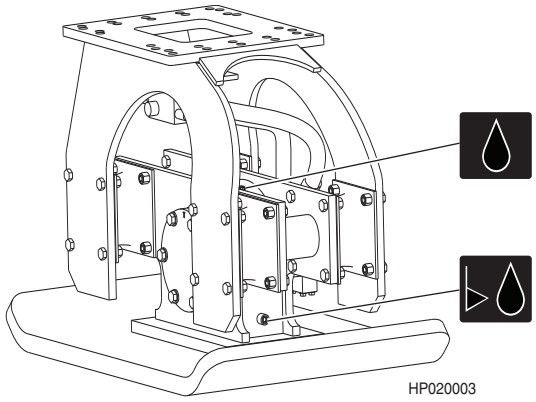
The oil fill and level points of the product are marked with the following stickers.



A. Oil fill

B. Oil level

The oil level and fill points of the product are shown below.



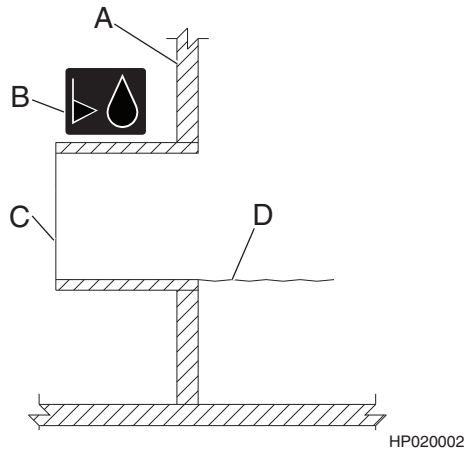
CHECKING OIL LEVEL

Warning! Hot surface - burn injury if contacted. Some components of the machinery become hot during operation. Allow parts and fluids to cool before handling.

Important: Contamination can shorten bearing life. Prevent dirt and debris from contaminating the oil. Always clean the area around the plugs prior to removal.

1. Position the compactor upright on a level surface with easy access to both the oil fill and oil level plugs.
2. Clean the area around the oil level plug.
3. Remove the plug.

   The oil level should be visible at the lip of the opening.



A. Eccentric housing
B. Oil level label
C. Oil level plug
D. Max. oil level

ADDING OIL

1. Position the compactor upright on a level surface with easy access to the oil fill and level plugs.
2. Clean the area around the oil fill plug.
3. Remove the plug.
4. Add oil until excess drips from the opening.
5. Re-install and tighten the oil fill and level plugs.
6. Wipe up any oil spills.

DRAINING OIL

1. Position the compactor upright on a level surface with easy access to the oil fill and level plugs.
2. Clean the area around the oil fill and level plugs.
3. Loosen, but do not remove, the oil level plug.
4. Point the oil level plug downward so that the oil will drain.
5. Place a suitable container to catch the oil.
6. Remove the oil level plug and drain all oil.

   Important: If the oil is contaminated with water or dirt, flush the eccentric housing with clean oil prior to oil replacement. Properly dispose of the used oil. Obey all local regulations for the disposal of these fluids.
7. Fill the new oil to the proper level. Do not overfill. Use the correct type of oil.

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.

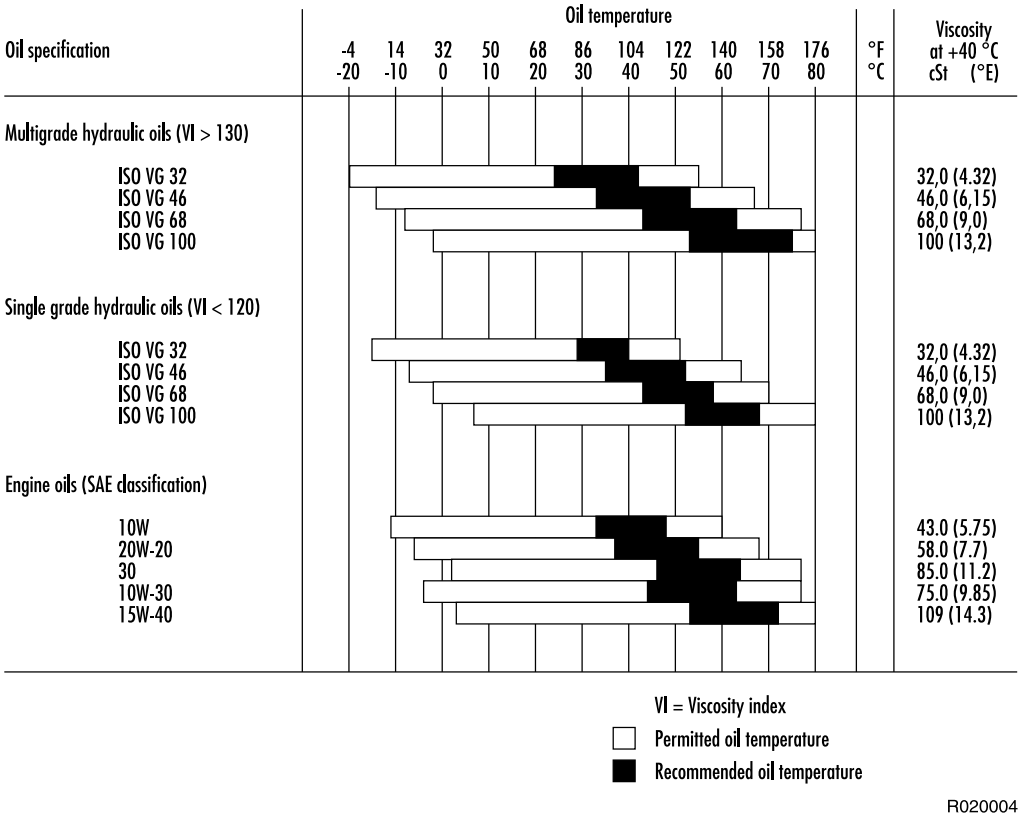
If the temperature of the hydraulic oil exceeds 80 °C (176 °F), an auxiliary oil cooler is needed. The oil viscosity must be between 1000-20 cSt while the product is being used.

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 10 bar (145 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” on page 48.

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 product and loss of oil through the hydraulic lines.

Warning! Unless otherwise instructed, all maintenance is performed with the compactor supported on stable ground and the machine shut off. Remove the ignition key, engage interlock, and apply parking brake.

Warning! Crushing injury. Never rely on the rotation system or cylinders as a means of support when servicing the equipment. Hydraulic cylinders are strictly lifting devices and not a structural support member. Prevent sudden or unexpected movement by using proper blocking to support loads.

Warning! Pressurized system. When releasing pressure in the hydraulic system ensure load cannot fall or make unexpected movements.

Warning! Perform service in safe work areas. Never service the compactor in the trench.

Warning! Crushing injury. Any guard removed from the equipment for purpose of inspection or maintenance must be reinstalled before returning back to work.

Warning! Injury from pressurized fluid. Fluid under pressure can penetrate skin. Never use hands to locate leaks. Use cardboard. Regularly inspect hoses for damage. Replacement hoses must be the same type and pressure rating.

Warning! Personal protective equipment, including safety eyewear, must be worn when operating or servicing this equipment.

Warning! Hot surface - burn injury if contacted. Some components of the machinery become hot during operation. Allow parts and fluids to cool before handling.

Important: Do not make alterations to the product without written authorization from Sandvik. Contact your local dealer.

1.2 INSPECTION AND MAINTENANCE

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

MAINTENANCE SCHEDULE

When properly installed, operated, and maintained by qualified personnel, the compactor requires a minimum of maintenance.

The maintenance schedule table below specifies how often and what items need to be inspected in order to maintain the safety, reliability, and performance of the compactor. Intervals are based on standard (normal) operating conditions and must be adjusted accordingly if operating under harsh applications or extreme conditions. For example, if using water content hydraulic fluid or when operating under conditions of extreme temperatures, dust, high elevations, or extended continuous use, components will require more frequent monitoring. Use regular component inspection to determine if interval adjustment is warranted.

Note: While the frequency of inspections and maintenance depend primarily on use, other factors such as extreme environmental conditions require additional measures. See “Other maintenance procedures” on page 62.

	Hours				
Item	10	50	250	1000	Note
Visual inspection - walk around	X				A, B
Re-check fasteners' torque		X			C, B
Check bearing lubrication level		X			C, D, B
Replace bearing lubricant				X	B
Measure oil pressure			X		E

N/A - Non-applicable

Note:

A. Refer to the list of parts to include during the inspection.

B. As recommended unless a change in performance is observed.

C. After first 50 hours of use.

D. Bearings are continuously lubricated by oil splash. Add oil if below mark. Do not overfill.

E. Recommended as a check. See “Checking oil pressure” on page 85.

Note: In the above table, the method described for daily inspections is identified as a "walk around". All external components must be looked at for any visible signs of wear, damage, loose, missing or unsecured fasteners, fluid leaks, and cracks in welds.

10 HOUR DAILY MAINTENANCE

- Remove all excessive dirt/debris on the compactor that can decrease performance.
- Check for loose or missing fasteners.
- Check components for excessive wear.
- Check spring mounts for cracks.
- Check fasteners for tightness. Check and replace any threaded fasteners that are missing or damaged. Follow proper torque procedures.
- Check hoses and connections for oil leaks.

Replace damaged or deteriorated hoses. Replace if any of the following conditions are present:

- Leak at end fitting that cannot be eliminated through proper tightening techniques.
- Outer coverings are chafed or cut.
- Wires are exposed.
- Outer coverings are ballooning.
- Flexible part of the hoses are kinked.
- Outer covers have embedded armoring.
- End fittings are displaced.

1.3 MAINTENANCE INTERVALS IN SPECIAL APPLICATIONS

The service interval is considerably shorter with special applications. See “Special conditions of use” on page 45. In special applications, consult your local dealer for the correct service intervals.

1.4 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.

Clean the surfaces of the compactor:

- In conditions of extreme humidity
- Muddy and wet soils
- If reduced performance is observed

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

2. REPLACING SPRING MOUNTS

The spring mounts are subject to aging and require periodic replacement. While spring life depends primarily on use, other factors, such as extreme environmental conditions can also shorten spring life.

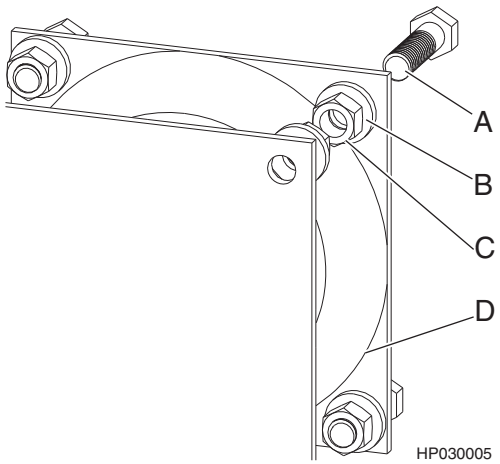
Warning! Some components of the compactor are heavy. Use approved lifting equipment to properly support and stabilize mass.

Warning! Crushing injury. Do not place hands or fingers between the mounting frame and compaction plate during removal of spring mounts. Ensure all loads are adequately supported before performing any service work.

Note: If multiple mounts are to be replaced, it is recommended that you replace one mount at a time.

1. Position the compactor on flat, stable surface.
2. Support the top mounting frame to remove weight from the spring mounts.
3. Loosen all nuts. Remove the nuts and washers.
4. Remove all bolts and the spring mount.
5. Position the new mount. Use an alignment bar to align the bolt holes.
6. Install new bolts (A), flat washer (B), and nuts (C). See the figure.

   Important: The flat washer (B) must be installed on the rubber side of the spring mount (D).



7. Tighten bolts to the proper torque. See “Standard tightening torques” on page 65.

3. TIGHTENING THREADED FASTENERS

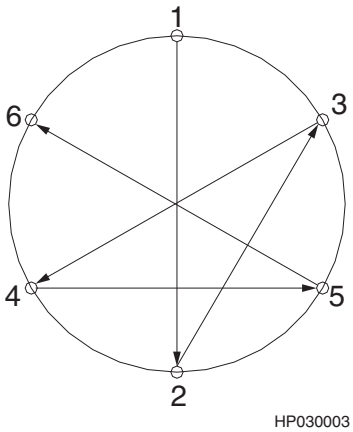
Due to vibration and shock loads experienced by the compactor, all threaded fasteners must be checked frequently for loose, broken or missing bolts. Keep threaded fasteners tight, and replace missing or damaged fasteners with new. Replacement fasteners must be of the same type and grade. Follow proper tightening procedures and bolt torques. Failure to follow these instructions when tightening can have serious consequences.

TIGHTENING METHOD

- All threads must be free of damage and foreign debris. Surfaces to be bolted must be flat.
- Lubricate bolt threads.
- Do not apply thread lock compound to the bolt threads unless instructed to do so.
- A hardened washer must be used under the head of a bolt in a blind hole.
- When a nut and bolt are used, a hardened washer must be used under the element to be turned. The element not turned must be prevented from rotating during tightening.
- Bolts should be systematically tightened starting from the most rigid part of the joint.
- Use progressive tightening of bolts. Turn each bolt a little at a time until final torque is reached.

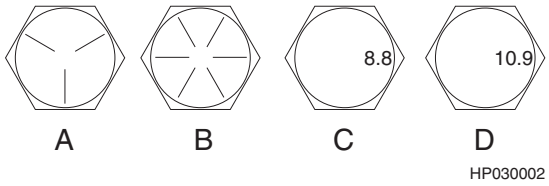
Note: After bolt installation, operate the compactor for a few hours, and then re-check the bolt torques.

This figure shows the tightening sequence.



STANDARD TIGHTENING TORQUES

SAE bolts are identified by the radial lines on the head. Metric bolts are identified by the class number on the head.



A. SAE bolt grade 5

B. SAE bolt grade 8

C. Metric bolt property class 8.8

D. Metric bolt property class 10.9

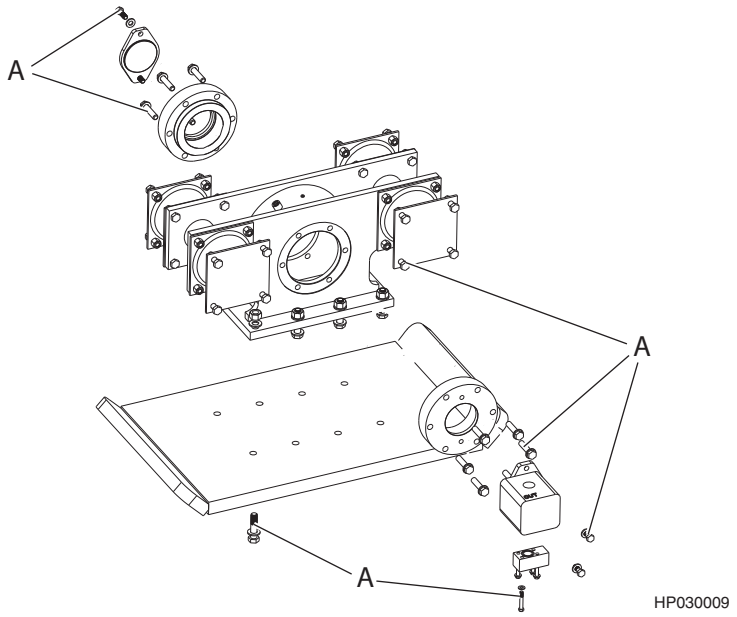
	SAE GR 8		CL 8.8		Notes
Size	ft-lb	N•m	ft-lb	N•m	
3/8	35	47			
1/2	85	115			(1/2 - 13)
5/8	170	230			(Only bearing carrier bolts)
3/4	280	380			
7/8	400	542			
1	650	880			

TIGHTENING COMPACTOR BOLTS

1. Clean the threaded fasteners and surfaces to be bolted.
2. Lightly lubricate the threads.

   Note: Do not apply thread lock compound to the bolt threads unless instructed to do so.
3. Install all bolts finger-tight to their positions.

   See the accompanying figure for the positions of threaded fasteners (A).



4. Follow a criss-cross pattern and tighten all bolts until 1/3 of the specified torque is reached. See “Tightening method” on page 64. See “Standard tightening torques” on page 65.
5. Tighten all bolts again until 2/3 of the specified torque is reached.
6. Continue the criss-cross pattern and tighten all bolts to the full torque. See “Standard tightening torques” on page 65.

4. TROUBLESHOOTING

4.1 PRODUCT DOES NOT OPERATE

INSUFFICIENT OIL PRESSURE OR FLOW

Check hydraulic supply system. Correct as required.

FAILED BEARINGS

Inspect and replace bearings. See “Replacing bearings” on page 76.

BROKEN MOTOR SHAFT OR WORN SPLINES

Inspect and replace worn parts.

4.2 PRODUCT OPERATES ERRATICALLY

ERRATIC OIL PRESSURE OR FLOW

Check hydraulic supply system. Correct as required.

FAILED SPRING MOUNT

Inspect and replace failed mount. See “Replacing spring mounts” on page 63.

4.3 EXCESSIVE NOISE OR VIBRATION DURING OPERATION

FAILED BEARINGS

Inspect and replace bearings. See “Replacing bearings” on page 76.

LOOSE BOLTS OR MOUNTING HARDWARE

Inspect and tighten bolts.

IMPERFECT BEARING LUBRICATION

Check oil level, quality and type. See “Greasing” on page 48.

4.4 OPERATION STALLS UNDER LOAD

PRESSURE RELIEF TOO LOW

Check hydraulic supply system. Correct as required.

FAILED BEARINGS

Inspect and replace bearings. See “Replacing bearings” on page 76.

MOTOR WORN OR MOTOR SEALS FAILED

Inspect and replace motor.

4.5 PRODUCT IS OPERATING SMOOTHLY, BUT AT REDUCED SPEED

FLOW TOO LOW

Check carrier output. If motor or flow regulator valve was replaced, check that the motor and valve are properly matched.

4.6 OIL DISCHARGE FROM PRESSURE RELIEF VENT

OIL LEVEL TOOL HIGH

Check oil level. See “Greasing” on page 48.

4.7 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

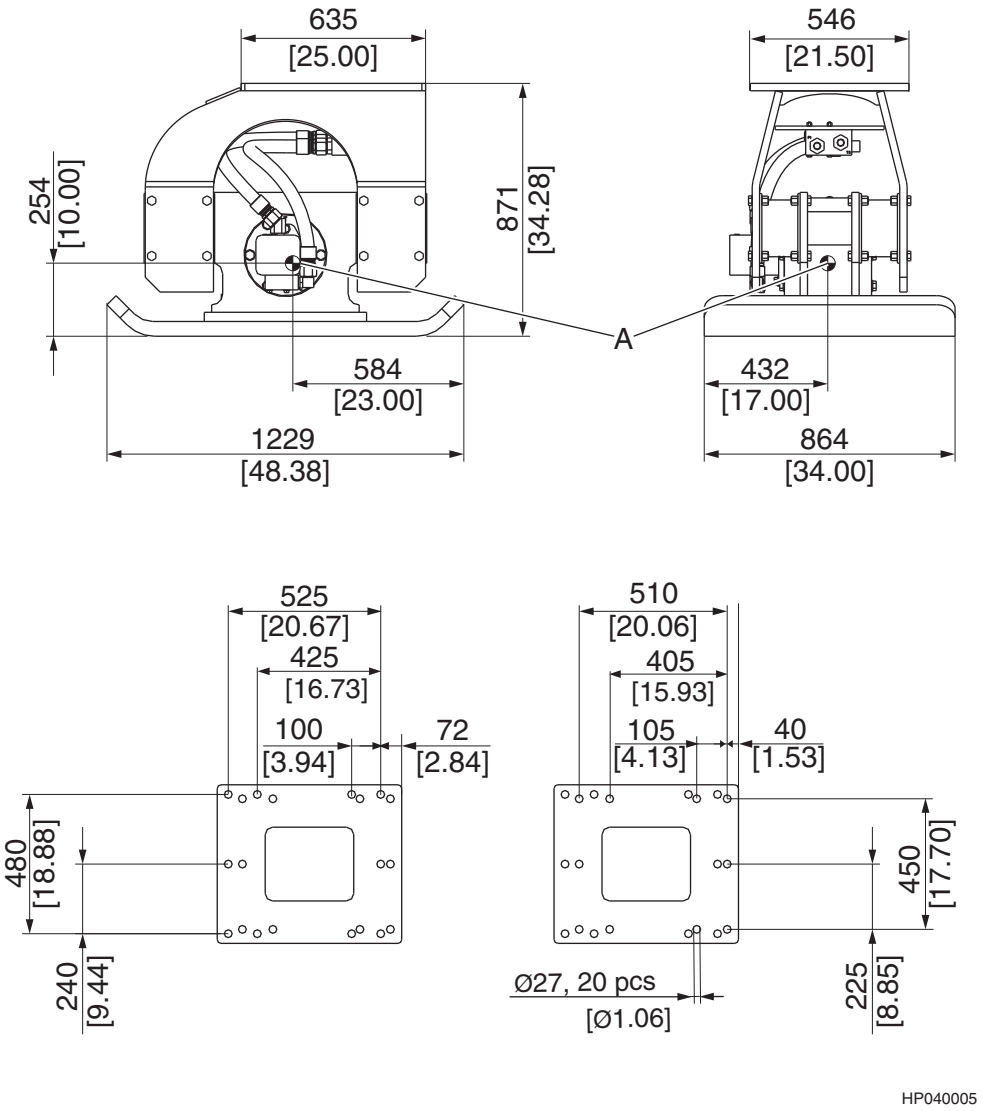
1. PRODUCT SPECIFICATIONS

1.1 TECHNICAL SPECIFICATIONS

Item	Specification
Impulse force N (lbf)	106.760 N (24001 lbf)
Cycles RPM	2100
Oil flow [1] l/min (gal/min)	178 l/min (47.0 gal/min)
Operating pressure max bar (psi)	152 bar (2205 psi)
Oil pressure at no load bar (psi)	20...35 bar (290...510 psi)
Auxiliary circuit relief pressure bar (psi), Dynamic[2]	Max operating + 28 bar (405 psi)
Auxiliary circuit relief pressure bar (psi), Static [3]	Max operating + 45 bar (655 psi)
Compaction plate dimensions mm (inch), Std.	860 x 910 mm (33.86 x 35.83 in)
Compaction plate dimensions mm (inch), Opt.	Contact your local dealer.
Compaction area m^2 (ft^2), Std.	0.79 m^2 (8.5 ft^2)
Compaction area m^2 (ft^2), Opt.	For available size options.
Hose diameter mm (inch), Pressure	25 mm (0.98 in)
Hose diameter mm (inch), Return[4]	25 mm (0.98 in)
Back pressure[4]	Requires free flowing return.
Working weight [5]kg (lb), Flat top MR/LR8	1315 kg (2899 lb)
Carrier range[6] t (lb), Excavator	16...54 t (35 000...120 000 lb)

1. Proper pairing of motor (and valve) with the carrier's oil flow is critical to reach target soil density and machine efficiency. Optimal motor speed (RPM) is attained only when the carrier's hydraulic circuit provides sufficient oil flow at a pressure equal to at least the dynamic relief pressure.
2. Verify that the carrier's main relief is set to the value established by the manufacturer. Its value must be greater than the dynamic relief setting.
3. At no time is oil pressure permitted to exceed 207 bar (3000 psi) at the compactor.
4. Unrestricted, free flowing return of 6.9 bar (100 psi) or less. At elevated pressures, motor efficiency and shaft seal life are reduced.
5. Weight of compactor with typical mounting bracket.
6. Values listed are guidelines. Mount only to carriers having adequate load-carrying capabilities. Always consult the specifications of the equipment manufacturer for the load / lift chart.

1.2 MAIN DIMENSIONS



A = center of gravity

Note: The figure shows a 2300 with a flat top frame (MR/LR8 bolt hole pattern). The compactor is offered in multiple configurations (that is, Motor options). Pay strict attention to values, figures, captions and notations.

2. EC DECLARATION OF CONFORMITY

EU DECLARATION OF CONFORMITY

Original

(Directive 2006/42/EC, Annex II. 1. A)

Manufacturer: SRP North America LLC

Address: 1214 Marquette Street, Cleveland, Ohio 44114, USA

Herewith declares that the Ho-Pac vibratory compactor:

Model: 2300

Serial number:

- **Is in conformity with the relevant provisions of the Machinery Directive 2006/42/EC.**
- **And the following (parts/clauses of) standards have been applied:**

  EN ISO 12100 - Safety of machinery, General principles for design, Risk Assessment and risk reduction

  EN 474-1:2006 + A6:2019: en Earth-moving machinery, Safety, Part 1: General requirements

Technical file and manufacturing conformity

The undersigned is authorized to compile the technical file and confirms that the product design conforms with essential health and safety requirements and the manufacture of the product complies with the technical file.

Note! If the above-identified unit is to be incorporated into an assembly with other machinery to make one machine, its operation is prohibited until the machine assembly, which incorporates the above-mentioned, complies with the applicable requirements of the EU Machinery Directive 2006/42/EC.

The undersigned is empowered to draw up this declaration of conformity.

Signed for and on behalf of SRP North America LLC:

Signature:

Name/Title:

Date (yyyy-mm-dd):

WORKSHOP

1. DISASSEMBLY AND ASSEMBLY

1.1 SAFETY

Warning! Do not perform any service/workshop instructions until you have read and understood the general product, safety, and operating information. See “Safety in general” on page 19.

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!

1.2 RELEASING HYDRAULIC PRESSURE FROM HOSES

RELEASING PRESSURE FROM HOSES

Warning! The hydraulic pressure inside the hoses must always be released before making any adjustments or repairs when the product is connected to the carrier. There may also be pressurized oil trapped inside the hoses even if the product is disconnected from the carrier. Release the hydraulic pressure according to the following instructions before opening any hoses.

1. Stop the carrier engine.
2. Operate all control levers to their fully extended stroke to release any pressure trapped inside hoses. This will prevent unexpected movement of the compactor and loss of oil through the hydraulic lines.
3. Close product shut-off valves. If quick couplers are used, disconnection automatically closes attachment lines. If the line includes ball valves, make sure that they are closed.

1.3 REPLACING BEARINGS

Due to the rotational speeds and high loads, bearing failure is usually sudden. A rattling or scraping sound is a tell-tale sign of imminent failure. Visual inspection of bearing requires removal of the bearing housing.

Important: Use only genuine spare parts to protect total warranty coverage. Non-approved parts may impair performance and reliability.

Important: Bearings are interference press fit into housing. Replacement requires a workshop equipped with a manual arbor or hydraulic press.

Use standard mechanic's techniques and tools to disassemble and assemble the compactor. For questions regarding maintenance, repair, and operation, contact your local dealer.

REMOVAL OF BEARING

Warning! Crushing injury. Eccentric mass is heavy. Handle carefully to avoid injury to hands or fingers.

Obey all local regulations for the proper disposal of all used fluids.

1. Secure the product properly on flat, stable surface.
2. Remove the hydraulic motor.
3. Remove the motor side bearing housing from the eccentric housing.
4. Remove the eccentric mass.
5. Remove the other bearing housing.
6. Press the bearing out of the housing. Ensure that the housing is properly supported and press only against the bearing's inner race.

Important: Do not pry out the outer bearing race if it remains in the housing. Place a small weld bead, at 3 mm (1/8 inch) along the inside diameter. When cool, remove the outer race.

INSTALLATION OF BEARING

Important: Handle new bearings with care to prevent damage. Do not remove from packaging until ready to install.

Important: Bearings are interference press fit. Apply contact pressure to the outer race only. Do not hammer on the bearing rings.

1. Clean the bearing housing.
2. Lightly lubricate the bearing's outer race.
3. Slowly press the bearing into the housing.
4. Clean and lubricate the eccentric shaft.
5. Slip the bearing/housing onto the shaft.

   Note: Close tolerance slip fit.
6. Repeat steps 1-4 with other bearing and housing.
7. Install the bearings and eccentric in to the eccentric housing. Install the bolts.
8. Install the hydraulic motor and bolts.
9. Install the hydraulic hoses.

Important: Keep fasteners tight. Replace missing or damaged fasteners with new. Replacement fasteners must be the same type and grade. Follow proper torque procedures. See “Standard tightening torques” on page 65.

1.4 HYDRAULIC MOTOR

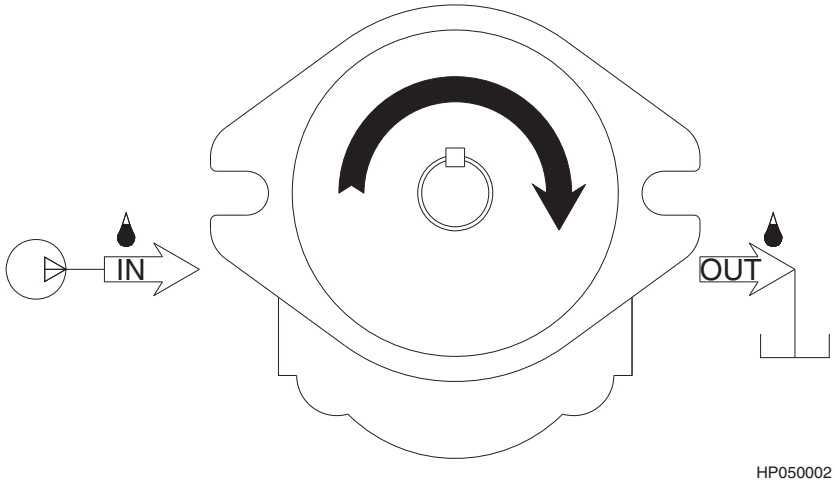
Some compactor models offer motor options of different sizes. See “Product specifications” on page 70.

Important: The volume of the oil flow affects the speed of the motor. Overspeeding can lead to early bearing failure. Poor performance will result from underspeeding. For optimal efficiency, select the motor carefully and always confirm that the motor and carrier are compatible.

ASSEMBLING HYDRAULIC MOTOR

Important: Pressurizing the outlet port will damage the motor's internal components. Verify the correct installation before pressurizing the hydraulic circuit.

The motor is assembled for CLOCKWISE ROTATION. Motor ports are marked [IN] and [OUT]. When viewed from the shaft end and with the larger portion of the body downward, the [IN] port is located on the left-hand side. See the figure for the motor view from the shaft end.



1.5 CONTROL VALVE

For each motor option, there is a corresponding control valve. The controller is a multi-function control valve that helps optimize operation with improved reliability of critical components, such as the motor and bearings.

Important: Incorrect combination of motor and control valve will result in poor performance and damage. In case the compactor is mounted on a different carrier, or the motor or the valve needs replacing, identify which motor and valve package option is installed on the compactor.

FUNCTIONS OF CONTROL VALVE

The control valve functions as a:

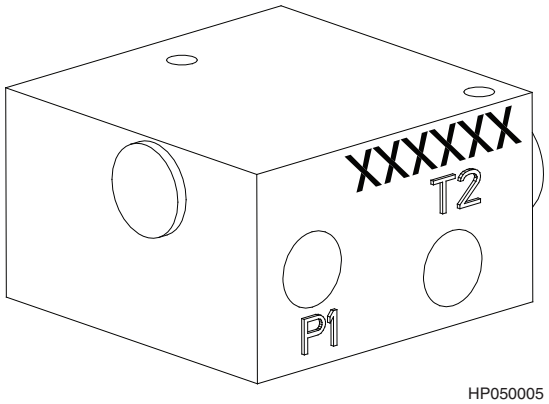
- Flow regulator, to protect the bearings from damage by limiting the oil flow and preventing the hydraulic motor from overspeeding.
- Pressure control, to protect the hydraulic components from overpressure. This is factory preset at the maximum operating pressure plus 14 bar (205 psi).
- Anti-cavitation circuit, to control deceleration of the hydraulic motor and eccentric mass. It also protects motor from damage on circuits not set up with an open return.
- Return line check valve, to prevent reverse flow to the hydraulic motor. It also provides a nominal back pressure to ensure the proper operation of priority flow control valves.

Important: The valve is factory preset and requires no further adjustments.

IDENTIFICATION AND PORT CONNECTIONS OF CONTROL VALVE

The part number of the control valve is stamped on the manifold just above the T2 port. See figure.

Important: For ease of identification, the valve body is stamped with the part number and the ports are stamped P1, P2, T1, and T2.



HP050005

XXXXXX: Area stamped with part number

P1: Incoming supply oil flow from carrier.

P2: Regulated oil flow to motor's [IN] port.

T1: Return oil flow from motor's [OUT] port.

T2: Return oil flow to the carrier (tank).

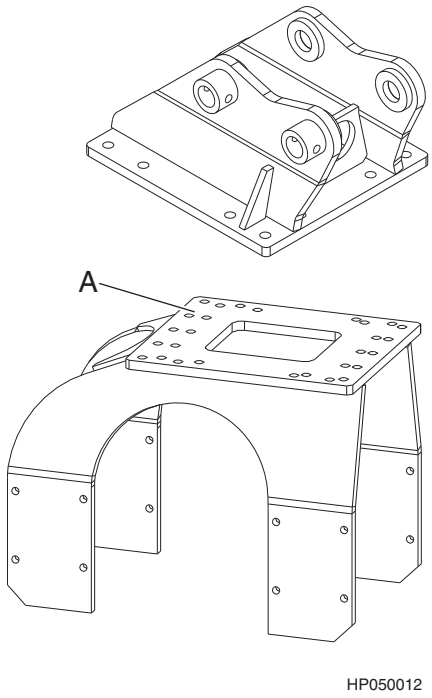
1.6 MOUNTING BRACKET

MOUNTING BRACKET FOR FLAT TOP FRAME

Important: The compactor does not include a mounting bracket. You must order the mounting bracket separately. Ordering requires complete information about the carrier, including make, model, series and serial number. If the carrier is equipped with a quick coupler, additional information including make, model, series and serial number of the quick coupler is required.

See the flat top frame and mounting bracket in the figure.

The bracket design is carrier-specific. The carrier's bucket pins must be used whenever possible.



Note: The mounting pin is shown for reference. Sandvik mounting brackets are typically designed to utilize the carrier's bucket pins.

Use the bolts provided to fasten the mounting bracket to the proper set of holes located in the connection plate (A) of the flat top frame. The dimensions of the bolt pattern are in this manual. See “Main dimensions” on page 71.

See the table for information on the bolts used to fasten the mounting bracket. The bolt hole patterns for the compactor model are shown in the "Family" column of the table.

Flat top mounting bracket		
Family	**Mounting bracket**	**Bolt set**
MR / LR8	Order separately.*	Included with the compactor.
* The mounting bracket design varies according to the carrier model and the quick coupler, if applicable.		

Note: Follow proper tightening procedures and torques. See “Tightening threaded fasteners” on page 64.

Once the mounting bracket is bolted to the top frame, the compactor is ready to be attached to the carrier. See “Mounting and dismounting the product” on page 39.

2. TESTING

2.1 TESTING THE HYDRAULIC CIRCUIT

Warning! Only qualified personnel, having knowledge of the machine's systems, proper testing equipment and tools should attempt testing and adjustments.

The compactor is not self-powered. It is hydraulically powered. The compactor's performance is impaired by a hydraulic system that is not operating correctly or set outside the accepted specifications.

Prior to use, test and calibrate the carrier's hydraulic circuit. `Test and calibrate' refers to the act of evaluating and adjusting to meet the accepted specifications of the compactor.

The tools required to complete the hydraulic system tests include a flow meter and pressure gauges. The tests are performed under varied conditions, including temperature, work mode, engine speed, and load. Use the worksheet to record test results.

Work mode	Engine RPM	Flow l/min [gal/min]	Load bar [psi]	Oil temp ºC [ºF]	Relief [Crack]	Relief [Static]	Return bar [psi]
			0				
			69 [1000]				
			103 [1500]				
			124 [1800]				
			138 [2000]				
			152 [2200]				
			165 [2400]				
			179 [2600]				
			193 [2800]				
			207 [3000]				
			221 [3200]				
			234 [3400]				

- Work mode: If the machine is equipped with a work mode switch, set it to the correct position.
- Engine RPM: Set to normal operating speed.
- Flow: Record measured flow at each load pressure.
- Load Pressure: Steadily increase load with the restrictor valve on the flow meter.
- Oil Temperature: Oil temperature must be at normal operating temperature while testing. Stop the test if the temperature exceeds 80° C (176° F).
- Relief Pressure [Crack]: Slowly close the restrictor valve until the pressure gauge indicates that the relief valve has cracked open.
- Relief Pressure [Static]: After cracking pressure is reached, further adjust the restrictor valve until the flow gauge indicates that the relief valve is fully open.
- Return Pressure: Record the pressure measured in the return line. The measuring point for the gauge must be located near the motor's outlet port.

When troubleshooting, include all parts associated with the attachment circuit to exclude any possibility of a collapsed hose or other fault or malfunction.

Testing procedures can vary depending on the specifics of your equipment. Follow the instructions provided by the carrier and flow meter manufacturers when testing the hydraulic circuit.

Important: Verify that the circuit to be tested is equipped with a relief valve. Before starting, ensure that the restrictor valve on the flow meter is open. Include the hoses attached to the work tool to eliminate possible faults; for example, a collapsed hose.

2.2 CHECKING OIL PRESSURE

Important: This product is designed to provide optimum performance with reliable service at the oil flow and pressure specified. Inattention to correct machine set up may result in equipment damage, diminished service life, and poor efficiency.

Measure oil pressure:

- When the compactor is first installed on a carrier.
- When the machine operates other hydraulic work tools.
- When repairs or modifications are made to the machine's hydraulic circuit.
- When the compactor is removed from one machine and attached to a different machine.
- Every 250 operating hours as a check (recommended).

MEASURING OIL PRESSURE

Warning! Only qualified personnel, having knowledge of the machine's systems, proper testing equipment and tools, should attempt testing and adjustments.

Warning! Prevent accidental start. Engage interlock, shut off engine, and apply parking brake. Follow all safety and operating instructions provided by the carrier manufacturer.

Certain tests, such as measuring the oil pressure, can be done only while the compactor is operating:

1. Lower the compactor to the ground and stop the carrier engine.
2. Relieve hydraulic pressure in the attachment circuit.
3. Connect a pressure gauge (0-344 bar, 0-5000 psi) to the supply hose at the [IN] side of the compactor.
4. Use the worksheet to record your results. See “Testing the hydraulic circuit” on page 83.
5. Start the carrier and position the compactor against the ground.
6. Adjust the engine's rpm to the normal operating speed and set the operating mode to "work tool".
7. After the normal operating temperature is reached, start the test.

8. Start the compactor and record the pressure reading. Note: It is normal for the pressure reading to increase and decrease as the carrier applies varying amounts of down pressure against the springs.
9. Compare your results with the values listed in the specifications.
10. When you are done measuring the oil pressure, lower the compactor safely to the ground and stop the engine. Relieve hydraulic pressure in the attachment circuit. Remove the test gauge.

Sandvik Rock Processing Solutions, North America
1214 Marquette Street
Cleveland, Ohio 44114
USA

78-20-14147-36-124-63
78-20-14147-39-12-91