

Rammer[®]

ENG 3/95

OPERATION AND MAINTENANCE

RAMMER S 26 N
RAMMER S 26 CITY

RAMMER HITS HARDER

IMPORTANT SAFETY INFORMATION

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.

Read and understand all safety precautions and warnings before operating or performing lubrication and maintenance on this machine.

Basic safety precautions are outlined in the "Safety" section of this guide and in the description of operations where hazards exist. WARNING labels have also been put on the machine to provide instructions and to identify specific hazards which if not observed could cause body injury or death to you or other persons. These warnings in the guide and on the machine labels are identified by the WARNING symbol.

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

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

Do not operate this machine until you read and understand the instructions in the Operation and Maintenance Guide.

Do not perform any lubrication and maintenance on this machine until you read and understand the instructions in the Operation and Maintenance Guide.

Specifications and design presented in this manual are subject to change without notice.

This manual was created on Apple Macintosh Publishing System. Pages were created in Aldus PageMaker. Line art have been made in Adobe Illustrator and Intergraph Microstation. Proofs were created on an HP LaserJet 4M and final manual was created on a Xerox DocuTech Printing System. Text type is Sabon Roman and Futura Condensed Bold. Ornaments are ITC Zapf Dingbats.

2 OPERATION AND MAINTENANCE

CONTENTS

1. READ ME FIRST	4
2. SAFETY	6
3. LIFTING INSTRUCTIONS	10
4. INTRODUCTION	11
5. PRINCIPLES OF BREAKING	12
6. CHOOSING TOOLS	13
7. OPERATION	14
8. MAINTENANCE	18
8.1 MAINTENANCE INTERVALS	19
8.2 HYDRAULIC OIL	20
8.3 LUBRICATING	25
9. REMOVAL OF TOOL	26
10. REMOVAL OF LOWER TOOL BUSHING	27
11. REMOVAL FROM CARRIER	28
12. TECHNICAL SPECIFICATIONS	29
13. TOOLS	30
14. TROUBLE SHOOTING	31

1. READ ME FIRST

GENERAL INFORMATION

This manual instructs you on your hammer and its safe operation and maintenance. Study this manual before installing, operating or maintaining this equipment. The hammer is a powerful tool. Used without proper care, it can cause damage.

To use the hammer correctly, you must also be a competent operator of the carrier machine. Do not use or install the hammer if you can not use the carrier machine.

Do not rush the job of learning. Take your time and most important, take it safely.

If there is anything you do not understand, ask your Rammer dealer. He will be pleased to advise you.

HAMMER MODEL AND SERIAL NUMBER

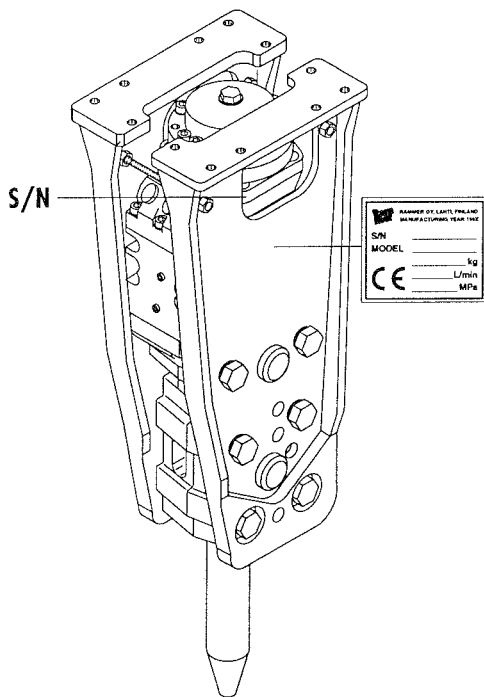
This manual deals with the Rammer S 26 N and S 26 CITY hydraulic hammers. The equipment serial number is stamped on the valve body, near the supply line connection. The serial number is also located on the CE-marking.

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

USING THE MANUAL

This manual is arranged to give you a good understanding of the equipment and its safe operation. It also contains maintenance information and technical specifications. Read this manual from front to back before using or maintaining the hammer for the first time. If you do not understand something or you are unsure, ask your Rammer dealer. Do not guess. Read all safety statements carefully. Be safe and be careful.

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



WARRANTY

The customer is provided with a separate warranty sheet, where the export warranty terms are explained. Check always that this warranty sheet is provided with the hammer. If not, contact your Rammer dealer immediately.

WARRANTY REGISTRATION CARD

A warranty registration card is filled after the installation inspection by the Rammer 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.

SPARE PART ORDERS

When you need spare parts or some information concerning maintenance or your hammer, please contact your Rammer dealer.

Quick deliveries are secured 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 hammer
- Name, number and required amount of spare parts

2. SAFETY

SAFETY IS NOT JUST A MATTER OF RESPONDING TO THE WARNINGS. ALL THE TIME YOU ARE WORKING WITH YOUR HAMMER YOU MUST BE THINKING WHAT HAZARDS THERE MIGHT BE AND HOW TO AVOID THEM.

DO NOT WORK WITH THE HAMMER UNTIL YOU ARE SURE THAT YOU CONTROL IT.

DO NOT START ANY JOB UNTIL YOU ARE SURE THAT YOU AND THOSE AROUND YOU WILL BE SAFE.

All mechanical equipment can be hazardous if operated without care or correct maintenance.

In this manual you will find warning messages. Read them and understand them. They tell you of hazards and how to avoid them.

WARNING!

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

MANUALS

Study this manual before installing, operating or maintaining the hammer. If there is anything you don't understand, ask your employer or your Rammer dealer to explain it. Keep this manual clean and in good condition.

Study also the operating and maintenance manual of your carrier before operating the hammer.

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.

CARE AND ALERTNESS

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

LIFTING EQUIPMENT

You can be injured if you use faulty lifting equipment.

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

Do not use hammers or hammer tools for lifting. Contact your carrier dealer to find out how to lift with your carrier.

TOOLS

Use only genuine spare parts and tools. Use only genuine Rammer tools. The use of other tool brands may damage the hammer.

REGULATIONS AND LAWS

Obey all laws, worksite and local regulations which affect you and your equipment.

PRACTICE

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

Keep other people away.

Do not perform new operations until you are sure you can do them safely.

EQUIPMENT CONDITION

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

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

EQUIPMENT LIMITS

Operating the equipment beyond its design limits can cause damage. It can also be dangerous.

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

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.

Work sites can be noisy. Do not rely on spoken commands.

WORK SITE

Work sites 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 underground cables and pipes if you will be breaking the ground.

METAL SPLINTERS

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

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 equipment in public places can be dangerous. Place barriers around the machine, to keep people away.

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 Rammer dealer for advise before modifying the hammer. Before welding on the hammer while it is installed on the carrier, disconnect the carrier alternator and battery. Note that welding of the hammer tools will render them useless and make the warranty void.

FLYING CHIPS OF ROCK

Protect yourself and your neighborhood against flying chips of rock. Do not operate the hammer or carrier if someone is too close to the hammer. Keep carrier cab doors and windows closed during hammer operation. Window bars are recommended to protect window from flying chips of rock.

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 get medical help quickly.

PRESSURE ACCUMULATORS

The hammer incorporates two pressure accumulators. The accumulators are pressurized even when there is no hydraulic pressure to the hammer. Attempting to dismantle the accumulators without first releasing the pressure can cause injury or death. Do not try to dismantle pressure accumulators, contact your Rammer dealer first.

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 hammer operation, keep people away from the hydraulic hoses.

There might be pressurized oil trapped inside the hammer even if the hammer is disconnected from the carrier. Be aware of possible blank firing while greasing or removing and installing tools.

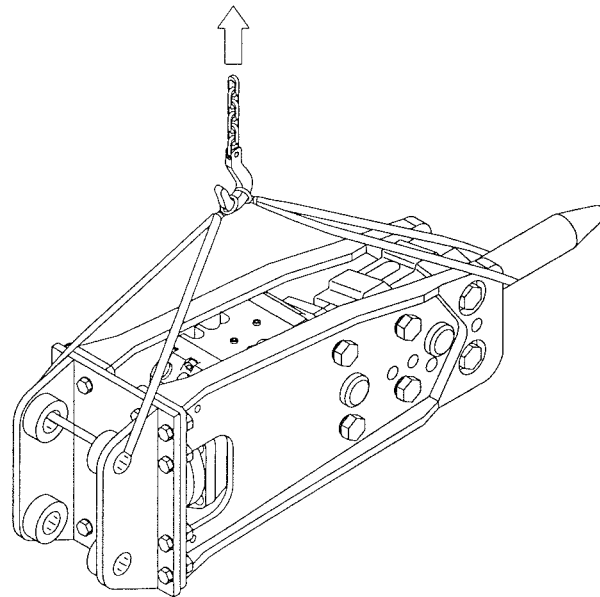
3. LIFTING INSTRUCTIONS

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

Lifting device must safely carry 700 kg (1540 lb) to lift hammer mechanism and sideplates.

Place slings as shown by the illustration to lift the hammer.

Do not use hammer or hammer tools for lifting.



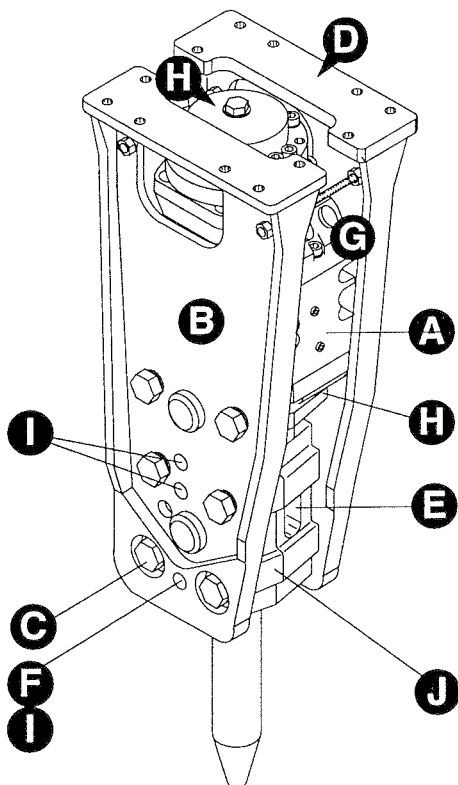
4. INTRODUCTION

The hammer is a hydraulically operated breaker. It can be used on any carrier which meets the necessary hydraulic and mechanical installation requirements. Basically, the unit functions by repeatedly raising a steel piston and driving it down onto the head of a removable breaking tool.

No extra pressure accumulators are necessary since the internal pressure accumulator absorbs hydraulic pressure peaks.

The impact energy of the hammer is constant and independent of the carrier's hydraulic system.

The main parts of the hammer are shown below.



Key	Description
A	Hammer mechanism
B	Sideplates
C	Sideplate mounting screws
D	Mounting flange with bolts
E	Tool retaining mechanism
F	Tool bushing retaining mechanism
G	Hammer inlet and outlet ports
H	Pressure accumulators
I	Grease nipples
J	Front head

The hammer is designed to be used in breaking concrete, road surface or asphalt, hard or frozen ground. It is also suitable in light trenching and benching applications or in ground compacting. It can be used also in breaking small and soft boulders.

Your Rammer dealer will gladly give you more information.

5. PRINCIPLES OF BREAKING

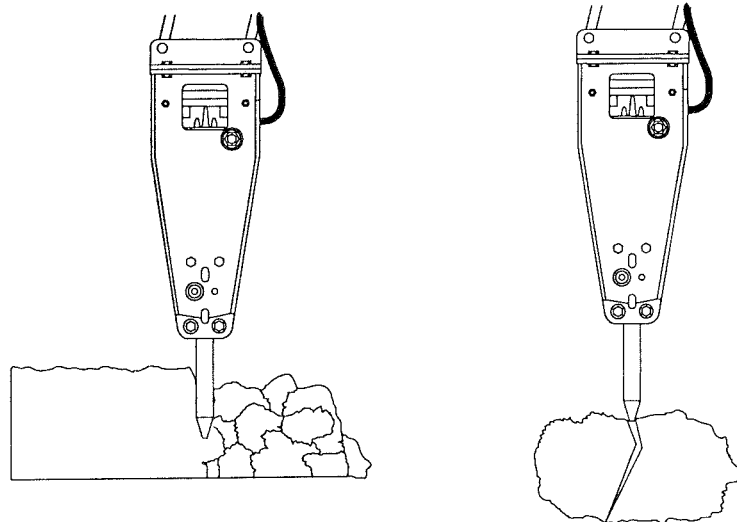
To increase the hammer's working life, pay particular attention to correct working methods and how to choose the correct tool for the job. There are basically two ways of breaking with a hydraulic hammer:

PENETRATIVE BREAKING (OR CUTTING)

In this form of breaking moil point or chisel tool is forced inside the material. This method is most effective in soft, layered or plastic, low abrasive material. The high impact rate of the small hammers makes them ideal for penetrative breaking.

IMPACT BREAKING

In impact breaking, the material is broken by transferring very strong mechanical stress waves from the tool into the material to be broken. Best possible energy transfer between tool and object is achieved with a blunt tool. Impact breaking is most effective in hard, brittle and very abrasive materials. Use of chisel tool in hard material will cause the sharp edge to wear very quickly. The high impact energy of the big hammers makes them ideal for impact breaking.



6. CHOOSING TOOLS

Rammer can offer a selection of standard and special tools to suit each application. The correct type of tool must be selected to get the best possible working results and longest life time for the tool.

CHISEL TOOL

- For sedimentary (e.g. sandstone) and weak metamorphic rock into which the tool penetrates
- Concrete
- Trenching and benching

MOIL POINT

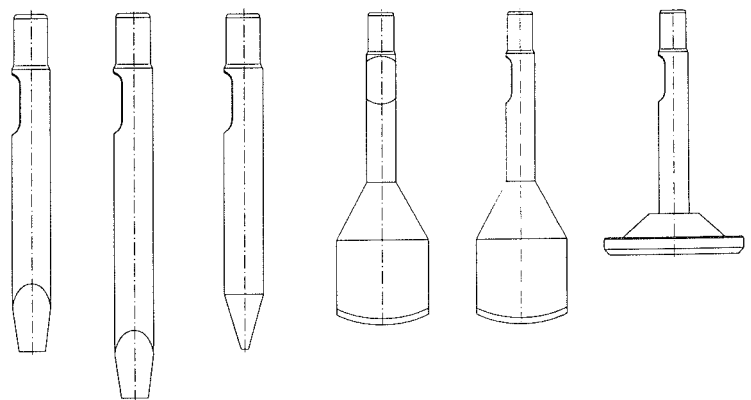
- For sedimentary (e.g. sandstone) and weak metamorphic rock into which the tool penetrates
- Concrete
- Trenching and benching

SPADE TOOL

- Frozen or compact ground
- Asphalt cutting

COMPACTING PLATE

- Ground compacting



7. OPERATION

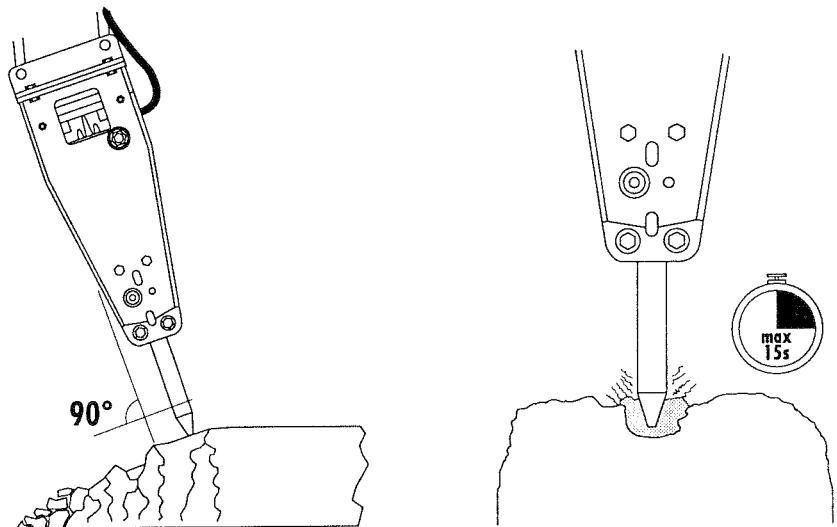
1. Prepare the carrier for normal excavation work.

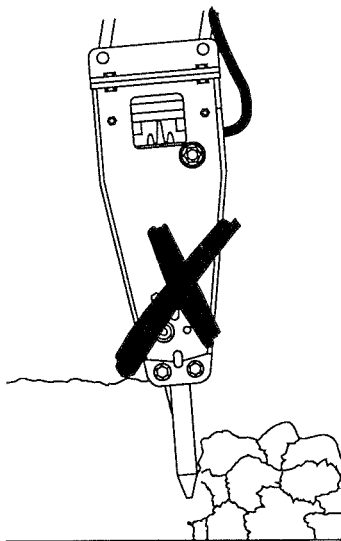
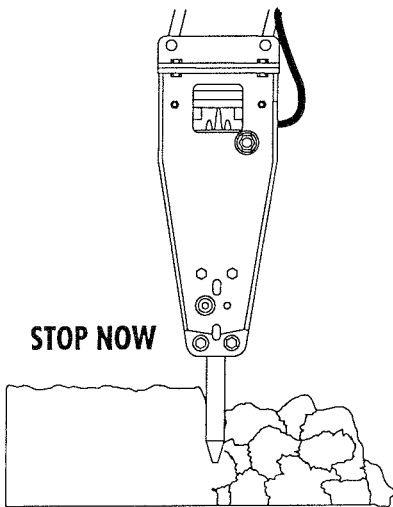
Move the carrier to required position.
Set the drive to neutral.

2. Set the engine speed to the recommended engine RPM.
3. Place the tool against the object at a 90 degree angle. Avoid small irregularities on the object which will break easily and cause either idle strokes or incorrect working angle.
4. Use the excavator boom to press the hammer firmly against the object. Do not pry the hammer with the boom. Do not press too much or too little with the boom. Correct force is applied when the tracks start to lift off the ground.

WARNING!

Protect yourself and your neighborhood against flying chips of rock. Do not operate the hammer or carrier if someone is too close to the hammer.





5. Start the hammer
6. Do not let the tool move outwards from the hammer when it penetrates. Keep boom down pressure on the hammer
7. Keep the tool at a 90 degree angle at all times. If the object moves or its surface breaks, correct the angle immediately. Keep feed force and tool aligned.
8. Stop the hammer quickly. Do not allow the hammer to fall down and make idle strokes when object breaks.

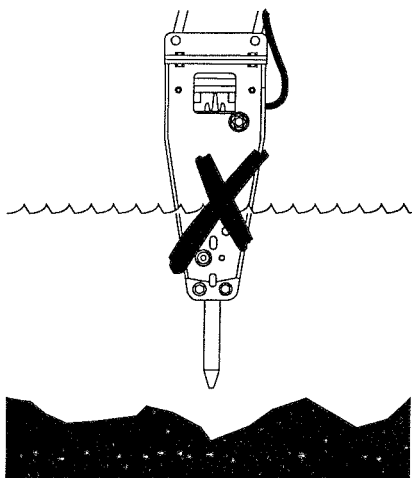
Frequent idle strokes have a deteriorating effect on the hammer.

If hammer falls through, the sideplates wear out quicker.

9. Do not strike in one spot for more than 15 seconds at a time. If the object does not break or, if the tool does not penetrate, stop the hammer and change position of the tool. Working too long in one spot will make stone dust under the tool. Dust dampens impact effect and produces heat.
10. When breaking concrete, hard or frozen ground, never strike and pry with the tool at the same time. The tool may snap off. Bending may be caused by stones inside hard or frozen ground. Be careful and stop striking if you find sudden resistance under the tool.

NOTE: Listen to the hammer's sound while you are using it. If the sound becomes thinner and the impact less efficient, the tool is misaligned with the material and/or there is not enough down force on the tool. Realign the tool and press the tool firmly against the material.

NOTE: Do not operate the hammer with the carrier's boom stick or bucket cylinders at the end of their stroke (either fully extended or fully retracted). Damage to the carrier will result.



CAUTION!

The hammer must not be used under water. If water fills the space where the piston strikes the tool, a strong pressure wave is generated and the hammer may be damaged.

For underwater operations consult your Rammer dealer for underwater models.

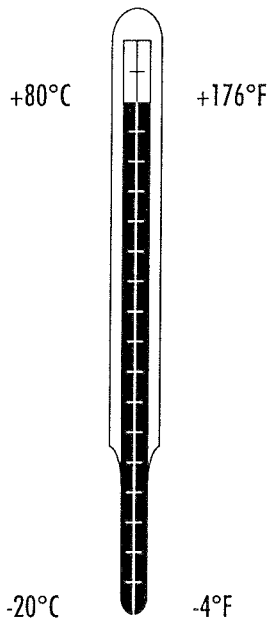
OPERATING TEMPERATURE

The operating temperature is -20°C to +80°C (-4°F to +176°F).

If the temperature is lower than -20°C (-4°F), hammer and tool has to be preheated before starting operation in order to avoid breakage of the accumulators membranes and the tool. During operation they will remain warm.

If the temperature of the hydraulic oil exceeds +80°C (+176°F), an auxiliary oil cooler is needed.

The oil viscosity must be between 1000-15 cSt while the hammer is being used.



NOISE DAMPENING

Operating the hammer near residential areas or other noise sensitive areas can cause noise pollution. In order to avoid unnecessary noise, please follow these basic rules:

When operating with the hammer, keep the tool at 90° to the material and the feed force in-line with the tool.

Replace or fix all parts that are worn out, damaged or loosened. This not only saves your hammer but it decreases the noise level.

Silenced CITY models are ideally suited for breaking in urban areas.

LONG TERM STORAGE

Observe following points when the hammer is stored:

- The storage area must be dry
- The tool must be removed
- The lower end of the piston, tool and tool bushings must be well protected with grease.
- Connections must be sealed with clean plugs to prevent oil leakage and dirt from getting into couplings.
- The hammer must be stored in vertical position.
- Make sure the hammer can not fall.

In this way the vital parts of the hammer are protected from rust and the machine is ready to be used whenever necessary.

WASHING THE HAMMER

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

CAUTION!

Plug the pressure and return line before washing the hammer. Otherwise dirt can enter the hammer and this may cause damage to the hammer.

8. MAINTENANCE

The hydraulic hammer is a precision made hydraulic machine. Absolute cleanliness and great care are basic and essential matters in the handling of any hydraulic components. Dirt is the worst enemy in hydraulic systems.

Handle hammer parts carefully and remember to cover cleaned and dried parts with clean lintfree cloth.

Do not use any 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.

INSTALLATION INSPECTION

Installation inspection must be carried out after the hammer has been installed on the carrier. In the installation inspection certain specifications (operating pressure, oil flow etc.) are checked that they are within given limits.

WARRANTY REGISTRATION CARD

A warranty registration card is filled after the installation inspection by the Rammer dealer and a copy of it is sent to the manufacturer.

Make sure that you get a copy of it after the installation inspection and that it is correctly filled, because no warranty claims are handled without it.

INITIAL 50-HOUR INSPECTION

It is recommended to have the first inspection done by your Rammer dealer after 50 to 100 operating hours.

Contact your Rammer dealer for more information about the initial 50-hour inspection.

- Check all hydraulic connections.
- Check that the hydraulic hoses do not rub against anything in any boom/stick position.
- Replace and inspect the hydraulic oil filters of the carrier.

8.1 MAINTENANCE INTERVALS

NOTE: Times given refer to carrier service meter hours (SMH) in hammer use.

EVERY TWO HOURS

- Grease the tool shank and the tool bushings.
- See also page 25.
- Observe hydraulic oil temperature, all lines and connections as well as impact efficiency and evenness of operation.
- Tighten loose connections.

EVERY 10 HOURS OR AT LEAST ONCE A WEEK

- Remove the retaining pin and the tool and check their condition. Grind burrs away if necessary.
- Check that the tool has received sufficient greasing. Grease more frequently, if necessary.

EVERY 50 HOURS OR AT LEAST ONCE A MONTH

- Check the tool shank and tool bushings for wear.
- Check the hydraulic hoses. Replace if necessary. Do not let dirt get into the hammer or hoses.

EVERY 600 HOURS OR ONCE A YEAR.

This service is recommended to be done by your Rammer dealer after 600 operating hours. Neglecting the yearly service can cause severe damage to the hammer.

Your Rammer dealer will reseal the hammer, replace the accumulator membranes and replace safety decals as needed.

Contact your Rammer dealer for more information about yearly service.

- Check all hydraulic connections.
- Check that the hydraulic hoses do not rub against anything in any boom/stick position.
- Replace and inspect the hydraulic oil filters of the carrier.

SERVICE INTERVAL IS CONSIDERABLY SHORTER IN SPECIAL APPLICATIONS SUCH AS: HAMMER TUNNELING, SCALING, FOUNDRY CLEANING, UNDERWATER USE, ETC. IN SPECIAL CASES CONSULT YOUR RAMMER DEALER FOR CORRECT SERVICE INTERVALS.

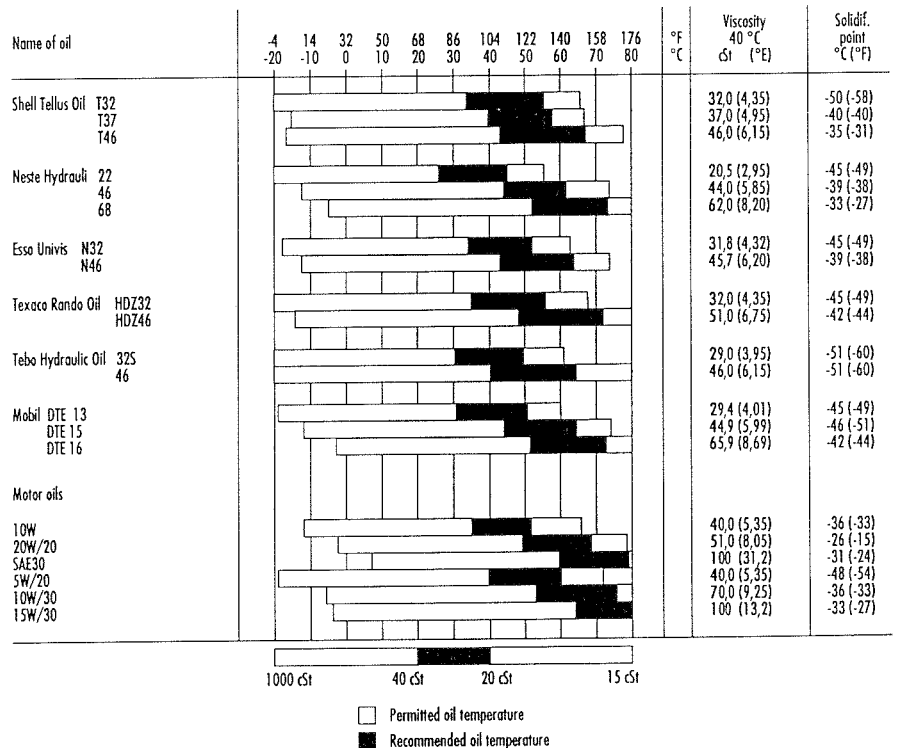
8.2 HYDRAULIC OIL

GENERALLY SPEAKING THE HYDRAULIC OIL ORIGINALLY INTENDED FOR THE CARRIER CAN BE USED IN THIS HAMMER. HOWEVER, SINCE WORKING WITH THE HYDRAULIC HAMMER HEATS THE OIL MORE THAN THE USUAL EXCAVATION WORK, THE TEMPERATURE OF THE OIL MUST BE MONITORED.

When the hammer is used continuously, the temperature of the hydraulic oil normalizes at a certain level depending on conditions and on the carrier. The temperature must not exceed 80°C (176°F) in the tank (viscosity 20 to 40 cSt or 2.90 to 5.35°E).

The hammer 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 hammering can start (viscosity 1000 cSt or 131°E).

Table below shows hydraulic oils recommended for hammer 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 hammer:

Oil too thick:

- Difficult start up
- Stiff operation
- Hammer strikes slowly
- Danger of cavitation in the pumps and in the hydraulic hammer
- 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
- Hammer strikes irregularly and slowly
- Danger of cavitation in the pumps and in the hydraulic hammer

NOTE: Rammer strongly recommends different hydraulic oils for use in summer and winter if there is an average temperature difference of more than 35°C (95°F). The correct hydraulic oil viscosity is then ensured.

SPECIAL OILS

In some cases special oils (e.g. biological oils and non-flammable oils) can be used with hydraulic hammers. Observe following aspects when considering the use of special oils:

- The viscosity range of the special oil must be within 15 to 1000 cSt (2.35 to 131°E)
- Lubrication properties must be good.
- Corrosion resistance properties must be good.

NOTE: although special oil could be used the in carrier, always check suitability for the hammer due to the high piston speed in hammer.

Contact oil manufacturer or Rammer for more information about special oils.

HYDRAULIC OIL CLEANLINESS

The return flow from the hammer must always go through a filter.

The purpose of the oil filter is to remove impurities from the hydraulic oil since they cause accelerated component wear, blockages and even seizure. 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 hammer is being installed on the carrier
- Because of component wear
- Prolonged hammering with the hammer pointing upwards

OIL FILTER

In hydraulic hammer work, 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 fibre cloth or very fine gauge metallic mesh to withstand pressure fluctuations.
- The oil filter must have a volume flow capacity of at least twice the hammer's maximum flow.

In general, oil companies guarantee new oils to have a particle size of 40 microns maximum. When adding oil to existing tank the oil must be filtered.

Damages caused by hydraulic oil impurity in carrier and hammer circuits:

1. The working life of the pumps is significantly shortened
 - Rapid wear of parts
 - Cavitation
2. Valves do not function properly
 - Spools bind
 - Rapid wear of parts
 - Blocking of small holes
3. Wear of cylinder and gaskets
4. Reduced hammer efficiency
 - Rapid wear of moving parts and seals
 - Danger of piston seizure
 - Oil leakage
5. Shortened working life and reduced efficiency of hydraulic oil
 - Oil overheats
 - Oil quality deteriorates
 - Electro-chemical changes in the hydraulic oil

NOTE: Component damage is only “a symptom”. The problem 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. The hammer must be dismantled, cleaned and reassembled and the hydraulic oil must be changed.

HYDRAULIC OIL COOLING

The maximum permitted hydraulic oil temperature in continuous hammer use is 80°C (175°F). Therefore, a reliable hydraulic oil thermometer is necessary. If there is no thermometer on the carrier one must be installed. The temperature of the hydraulic oil depends on ambient conditions, the cooling system efficiency of the carrier and on the used capacity of the hammer.

When the hydraulic hammer is used continuously it may be necessary to have cooling system with extra cooling capacity compared with normal excavation work.

The oil cooler of the carrier must have a volume flow capacity of at least twice the hammer's maximum volume flow.

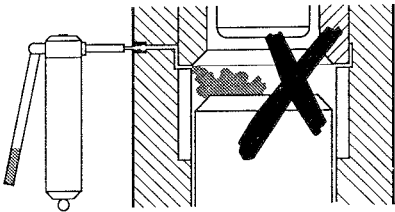
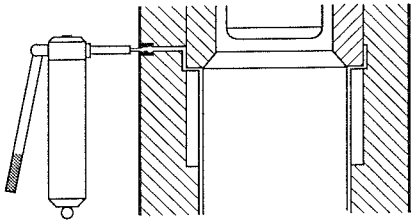
The cooler must stand the dynamic pressure of 20 bar (290 psi).

If the carrier's oil cooler is too small either the original cooler must be replaced with a larger one or an auxiliary cooler must be installed.

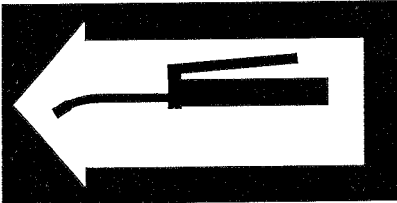
The auxiliary hydraulic cooler can be installed:

- In front of the radiator, in which case a fan is not needed. Max. rise of the cooling air is 5°C (9°F).
- Any other suitable place, using a fan either hydraulically or electrically driven.

8.3 LUBRICATING



GREASING POINTS ON THE HAMMER HAVE BEEN MARKED WITH FOLLOWING STICKER.



GREASING INTERVAL

- Tool shank must be well lubricated before installing the tool
- 3-5 strokes from grease gun to tool bushings and tool at regular intervals.
- Adapt interval and amount of grease to wear rate of the tool and working conditions. That can be anything between two hours and daily, depending on material (rock/concrete) to be broken.

GREASING

While greasing, the hammer must be standing upright resting on the tool to ensure that the grease will penetrate downwards between the tool and the bushing.

Do not fill the space between the piston and the tool with grease. Lower piston seal failure can result and the hammer will leak oil thereafter.

Insufficient greasing or improper grease may cause:

- Abnormal wear of tool bushing and tool
- Tool breakage

GREASE TYPE

- Dropping point very high, over 250°C (480°F)
- Max. working temperature over 150°C (300°F)
- Min. working temperature below lowest ambient temperature
- Additives: molybdenum disulfide (MoS₂), graphite or equivalent
- Grade (thickness) NLGI 0-2
- Water resistant

RECOMMENDED GREASES

- ESSO EOL 232, part no. 90 203
- WYNN'S GS80
- SHELL Kuggfett
- SHELL Extrema MDS
- KLÜBER Crafloscon C-SG 0 Ultra
- LE 3751/3752

9. REMOVAL OF TOOL

REMOVAL

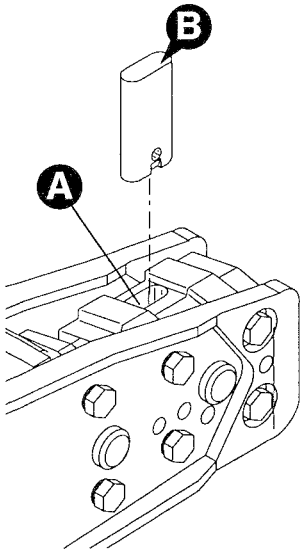
1. Set the hammer on level ground.
2. Make sure that the carrier's transmission is in neutral and the parking brake is engaged.
3. Stop the engine.
4. Push locking pin (A) as far it will go.
5. Remove retaining pin (B).
7. Remove tool, approx. 36 kg (79 lb).

NOTE: If hammer is still on carrier, it may be easier to stick the tool in the ground and lift the hammer off the tool.

Make sure that the tool can not fall.

INSTALLATION

1. Check the tool and the lower tool bushing for wear.
2. Clean and coat tool and retaining pin (B) with grease.
3. Install tool and align the groove of the tool with the pin bore.
4. Push locking pin (A) as far it will go.
5. Install retaining pin (B). Check that retaining pin is not installed upside down (note detail on illustration).
6. Check that retaining pin (B) is secured by locking pin (A).



10. REMOVAL OF LOWER TOOL BUSHING

INNER DIAMETER ON NEW LOWER TOOL BUSHINGS IS 90 MM (3.54 IN). REPLACE BUSHING IF BUSHING DIAMETER IS MORE THAN 92 MM (3.62 IN).

REMOVAL

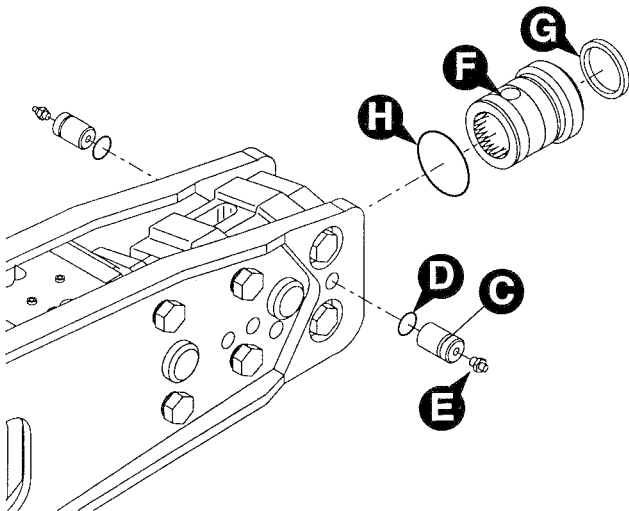
1. Remove tool as instructed on previous page.
2. Remove retaining pins (C) with O-rings (D) and grease nipples (E).
3. Remove lower tool bushing (F).
4. Remove seal (G) and O-ring (H) from lower tool bushing (F).

INSTALLATION

1. Clean all parts and check lower tool bushing for wear.
Apply MoS2 spray to the contact surfaces of lower tool bushing and front head.
2. Install seal (G) and O-ring (H) on lower tool bushing (F).
3. Install lower tool bushing (F).

Align the groove in the lower tool bushing with the hole in the front head.

4. Install retaining pins (C) with O-rings (D) and grease nipples (E).
5. Install the tool.



11. REMOVAL FROM CARRIER

REMOVAL

1. Position the hammer horizontally on the floor and remove the tool.

WARNING!

The hammer must be secured from rolling over when disconnected from the carrier. Only use skilled operator to position carrier for hammer removal!

2. Disconnect hoses (A). Plug the hoses and the hammer inlet and outlet ports.

Release oil pressure before opening hose connections. Wait ten minutes for oil pressure to drop before opening hose connections.

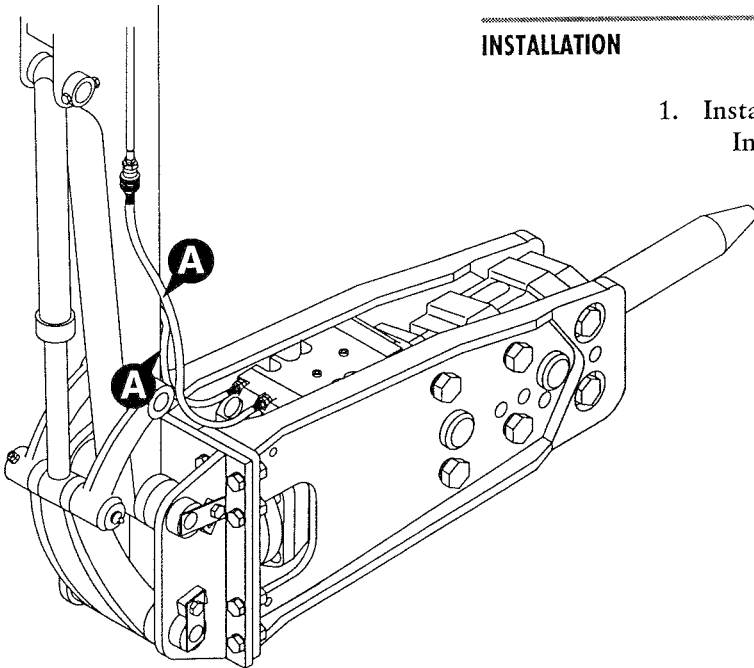
3. Remove bucket pins and other parts.
4. The carrier can be moved aside.

INSTALLATION

1. Install hammer in the same manner as mounting a bucket. Install bucket pins.

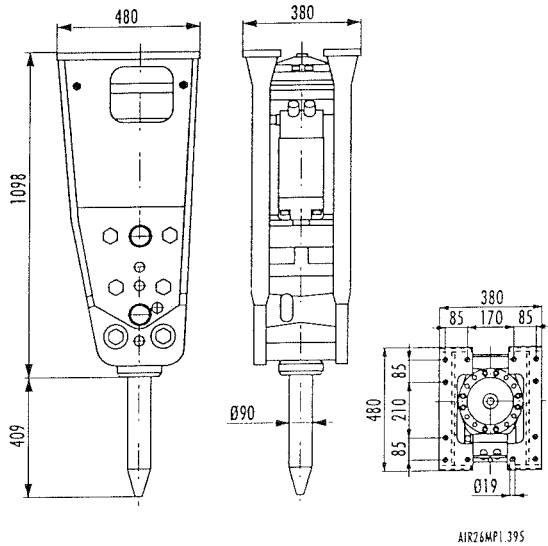
2. Connect hoses (A).

Hammer inlet port is marked on the valve body with "IN" and outlet port with "OUT".



12. TECHNICAL SPECIFICATIONS

RAMMER S 26 N



Working weight ⁽¹⁾: 540 kg (1200 lb), CITY: 560 kg (1235 lb)

Impact energy, actual: 1000 J (738 ft lb)

Impact rate ⁽²⁾: 450-1000 bpm

Operating pressure ⁽³⁾: 90-125 bar (1305-1810 psi)

Pressure relief min ⁽⁴⁾: 155-175 bar (2248-2538 psi)

Pressure relief max: 210 bar (3050 psi)

Pressure in LP circuit: 32-34 bar (465-495 psi)

Oil flow range: 60-135 l/min (16-36 gal/min)

Back pressure max: 20 bar (290 psi)

Input power: 28 kW (38 HP)

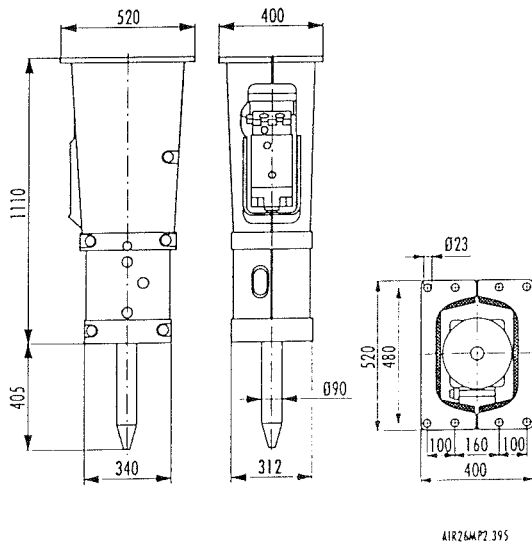
Tool diameter: 90 mm (3.54 in)

Connections for hoses:

pressure line (IN): BSP-internal R1"

return line (OUT): BSP-internal R1"

RAMMER S 26 CITY



Line size minimum inner diameter

pressure line: 19 mm (0.75 in)

return line: 19 mm (0.75 in)

Oil temperature: -20 - +80°C (-4 - +176°F)

Oil viscosity: 1000-15 cSt

Carrier weight ⁽⁵⁾: 6-12 ton (13250-26500 lb)

Noise level: 85 dB(A)/30-50 m, CITY 85 dB(A)/18-24 m

(1) Includes sideplates and standard tool.

(2) Actual impact frequency depends on oil flow, oil viscosity, temperature, and material to be broken.

(3) Actual pressure depends on oil flow, oil viscosity, temperature, material to be broken and back pressure.

(4) Minimum setting = Actual Operating Pressure + 50 bar (730 psi).

(5) Check carrier's lifting capacity from carrier manufacturer

13. TOOLS

Chisel Tool (A)

Part no.: 261

Length: 850 mm (33.5 in)

Weight: 34 kg (75 lb)

Diameter: 90 mm (3.54 in)

Long Chisel (B)

Part no.: 262

Length: 1000 mm (39.4 in)

Weight: 48 kg (106 lb)

Diameter: 90 mm (3.54 in)

Moil Point (C)

Part no.: 263

Length: 850 mm (33.5 in)

Weight: 36 kg (79 lb)

Diameter: 90 mm (3.54 in)

Spade, Parallel to boom (D)

Part no.: 265

Length: 850 mm (33.5 in)

Weight: 55 kg (122 lb)

Diameter: 90 mm (3.54 in)

Width: 280 mm (11 in)

Spade, Transverse to boom (E)

Part no.: 266

Length: 850 mm (33.5 in)

Weight: 55 kg (122 lb)

Diameter: 90 mm (3.54 in)

Width: 280 mm (11 in)

Compacting Plate (F)

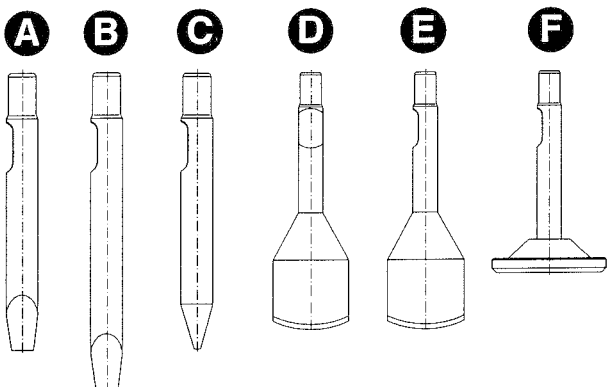
Part no.: 267

Length: 860 mm (33.9 in)

Weight: 82 kg (181 lb)

Diameter: 90 mm (3.54 in)

Plate dia.: 330 mm (13 in)



14. TROUBLE SHOOTING

HAMMER DOES NOT START

- **The piston is in its lower hydraulic brake.**
Keep the hammer control valve open and force tool against an object. The tool head will push piston out of its brake area.
- **The hammer control valve does not open.**
When operating hammer control valve, check that the pressure line will pulsate (this indicates the hammer control valve opens). If the valve does not operate, check operating means: mechanical connections, pilot pressure or electrical control.
- **The relief valve in hydraulic circuit opens at a low pressure. The hammer operating pressure is not reached.**
Check the installation. Check relief valve operation. Measure the high pressure on hammer inlet line.
- **Leakage from pressure to return in excavator hydraulic circuit.**
Check the installation. Check pump and other hydraulic components.
- **Excessive back pressure in return line.**
Check the installation.
- **Failure in hammer valve operation.**
Contact your Rammer dealer.
- **Piston failure.**
Contact your Rammer dealer.
- **Grease between piston and tool contact area.**
Remove tool and wipe excessive grease off.
- **Pressure and return hoses installed backwards.**

IMPACT RATE SLOWS DOWN

- Oil has overheated (over + 80°C/+176°F).
Check for fault in oil cooling system or internal leak in hammer. Check hydraulic circuit of the carrier. Check relief valve operation in the carrier. Check the line size. Assemble extra oil cooler.
- Excessive back pressure in return line.
Check the installation. Check the size of breaker return line.
- The relief valve in hydraulic circuit opens at too low pressure. The hammer operating pressure is not reached.
Check the installation. Check the relief valve operation. Measure pressure on the hammer inlet line.
- Leakage from pressure to return in excavator hydraulic circuit.
Check pump and other hydraulic components.
- Failure in hammer valve operation.
Contact your Rammer dealer.
- Pressure loss in the pressure accumulators.
Contact your Rammer dealer.
- Hydraulic oil viscosity too low.

HAMMER OPERATES IRREGULARLY BUT THE BLOW HAS FULL POWER

- The relief valve in hydraulic circuit opens at too low pressure. The hammer operating pressure is not reached.
Check the installation. Check the relief valve operation. Measure the high pressure on the hammer inlet line.
- Failure in hammer valve operation.
Contact your Rammer dealer.
- Not enough feed force from excavator.
Refer to correct working methods.

HAMMER OPERATES POORLY AND THE BLOW HAS NO POWER

- The relief valve in hydraulic circuit opens at too low pressure. The hammer operating pressure is not reached.

Check the installation. Check the relief valve operation. Measure pressure on the high pressure line to the hammer. Contact your Rammer dealer.

- **The pressure accumulators has lost its nitrogen charge.**
Contact your Rammer dealer.
- **Pressure adjusting valve setting is incorrect.**
Contact your Rammer dealer.
- **The working method is not correct.**
Refer to correct working methods.
- **Failure in hammer valve operation.**
Contact your Rammer dealer.

OIL OVERHEATS

- **The relief valve in hydraulic circuit opens at too low pressure. The hammer operating pressure is not reached.**
Check the installation. Check the relief valve operation. Measure pressure on the hammer inlet line.
- **Leakage from pressure to return in excavator hydraulic circuit.**
Check the installation. Check the pump and other hydraulic components.
- **Internal oil leak in the hammer.**
Contact your Rammer dealer.
- **Hydraulic oil viscosity too low.**
Check hydraulic oil viscosity.
- **Cooling capacity of the factory oil cooler is too small.**
Add an extra oil cooler.
- **Application not correct for hammer.**

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mer®**