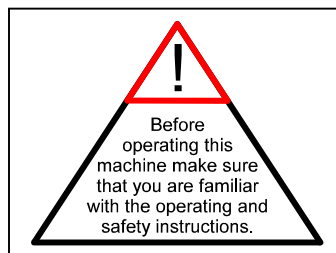


MODEL 2 2414 0010 – PNEUMATIC ROTARY HAMMER DRILLS



OPERATING MANUAL



Essential Machine Features

Mechanical axle coupling
 Empty blow damper
 Tool fitting for rapid change
 Tool system SDS max
 Operation mode Drilling and Chiselling
 Chisel position adjustable
 Oil lubrication for gearbox and striking mechanism
 Side handle pivoting
 Depth gauge attachable (optional)

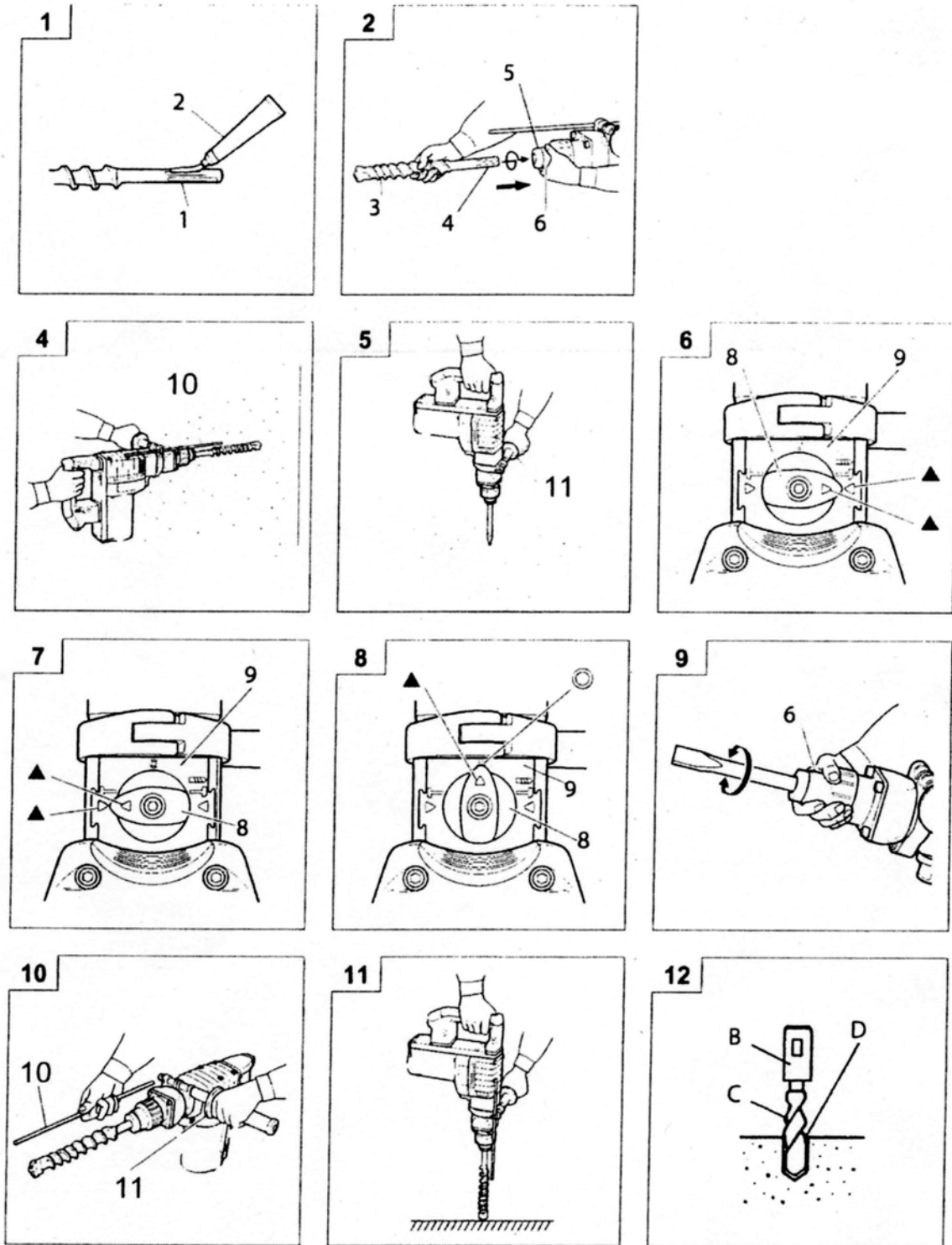
Technical Specification

Operating Pressure:	6 bar
Power:	1200 W
Speed:	250 rpm
Air Consumption:	1.5 m ³ /min
Tool Fitting:	SDS max
Weight (net):	11.85 kgs
Dimensions (L x W x H):	495 x 250 x 115 mm

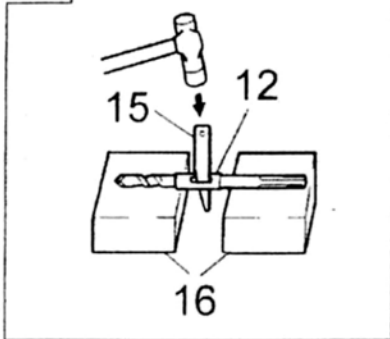
Minimal Drilling Distance to the Wall:	38mm
Drilling capacity in medium-hard concrete B 35:	dia. 20mm: 370 mm/min dia. 25mm: 300 mm/min dia. 32mm: 190 mm/min
Sound level	90.4 dB (A)
Arithmetic mean for acceleration:	9.2 m/s ²

The machine is designed for the following:

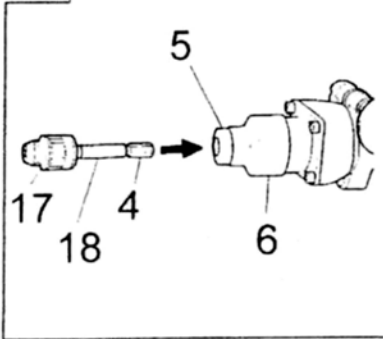
Operation Mode	Required Tools	Working Area
Drilling into concrete, masonry and natural stone	Drill with SDS-max shank end - Hammer drill - Fretwork drill - Hammer drill bits	Drilling area in concrete dia. 12-50mm dia. 40-80mm dia. 45-150mm
Chiselling of concrete, masonry and natural stone	Moil pointed, flat and form chisel with SDS-max plug-in end	Surface treatment and fretwork operations
Drilling in wood and metal	Drill chuck holder Quick-release chuck Wood drill and metal drill with cylindric shank or hexagonal bolt	Wood drill dia. 10-32mm Metal drill dia. 10-20mm
Mixing of non-flammable materials (e. g. mortar)	Drill chuck holder Quick-release chuck Mixing tools with cylindric shank or hexagonal bolt	Mixing tools dia. 80-150mm



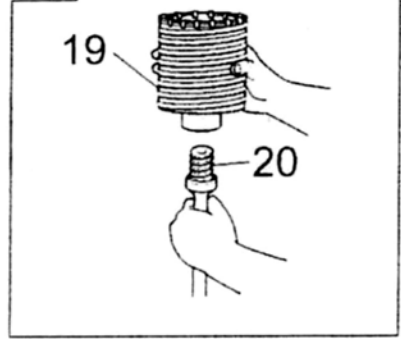
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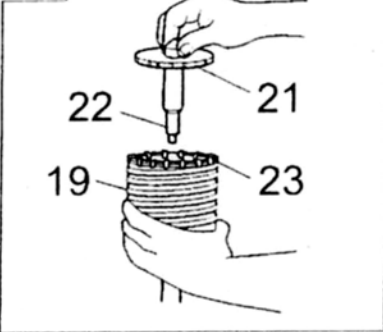
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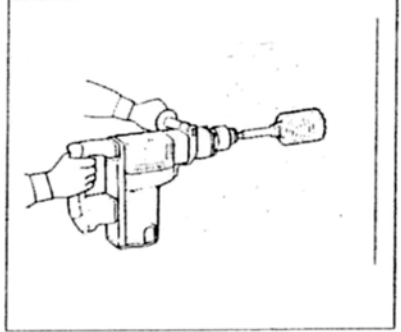
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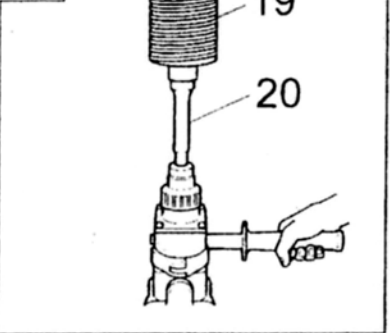
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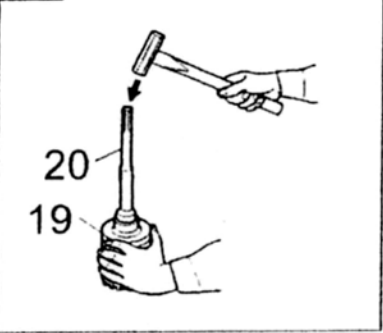
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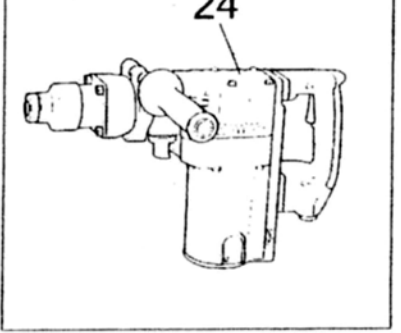
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	English	Deutsch
01	Tool shank	Werkzeugschaft
02	Grease	Schmierfett
03	Tool	Werkzeug
04	Part of SDS max shank	Teil des SDS-max Schaftes
05	Front cap	Vordere Abdeckung
06	Grip	Spannbacke
08	Selector lever	Wahlhebel
09	Under cover	Untere Abdeckung
10	Depth gauge	Anschlagstange
11	Side handle	Seitengriff
12	Taper shank adapter	Konusschaftadapter
13	Drill bit (taper shank)	Bohrer (mit konischem Schaft)
14	Indicating groove shows standard-depth matching the outside diameter of the anchor for drilling	Anzeigerille zeigt Normalloch-Tiefe gemäß Außendurchmesser des Ankers für Bohren.
15	Cotter	Keil
16	Rest	Auflage
17	Drill chuck	Bohrfutter
18	Chuck adapter	Bohrfutteradapter
19	Core bit	Bohrkrone
20	Core bit shank	Bohrkronenschenkel
21	Guide plate	Führungsplatte
22	Center pin	Mittelstift
23	Core bit tip	Bohrkronenspitze
24	Crank case cover	Kurbelgehäuseabdeckung

GENERAL PRECAUTIONS

WARNING! Using pneumatic machines, you must always follow the basic precautions to avoid the risk of personal injury. Read these instructions completely before using the machine, and keep these instructions.

For safe operation:

1. Keep the working place clean. Untidy working places and work-benches increase the danger of accidents.
2. Observe the conditions of operation.
3. Keep children away and avoid other persons to come into contact with the machine.
4. Machines not used should be kept safely. They should be stored in a dry place, so that children will not get them into their hands.
5. Do not employ machines by excessive force. Their performance is better and safer if they work at the prescribed speed.
6. Only use the right machines. Never use a smaller machine or tool for operations which require high-performance machines. Only employ tools which correspond to the intended use.
7. Dress properly. Do not wear loose clothing or jewellery, they can be caught in moving parts. Working outdoors, wear gloves and non-slip shoes.
8. Wear safety glasses. At operations with formation of dust, wear a face or dust mask.
9. Never carry the machine by the hose.
10. Secure the working place well. Use clamps or a vice to fix the workpiece. This is safer than using hands and clears both hands for operating the machine.
11. Never bend over wide. Always keep a firm stand and a safe balance.
12. The tools should be treated carefully and kept clean. For sound and safe operation, they should always be sharp. It is necessary to follow the instructions for lubrication and exchange of the accessories. Regularly check the air hose and replace in the case of damage. The handles should always be dry and clean and not show any oil or grease spots.
13. Separate the machine from the air supply line if it is not used or before operations of maintenance and on exchange of tools such as e. g. drill bits and chisels.

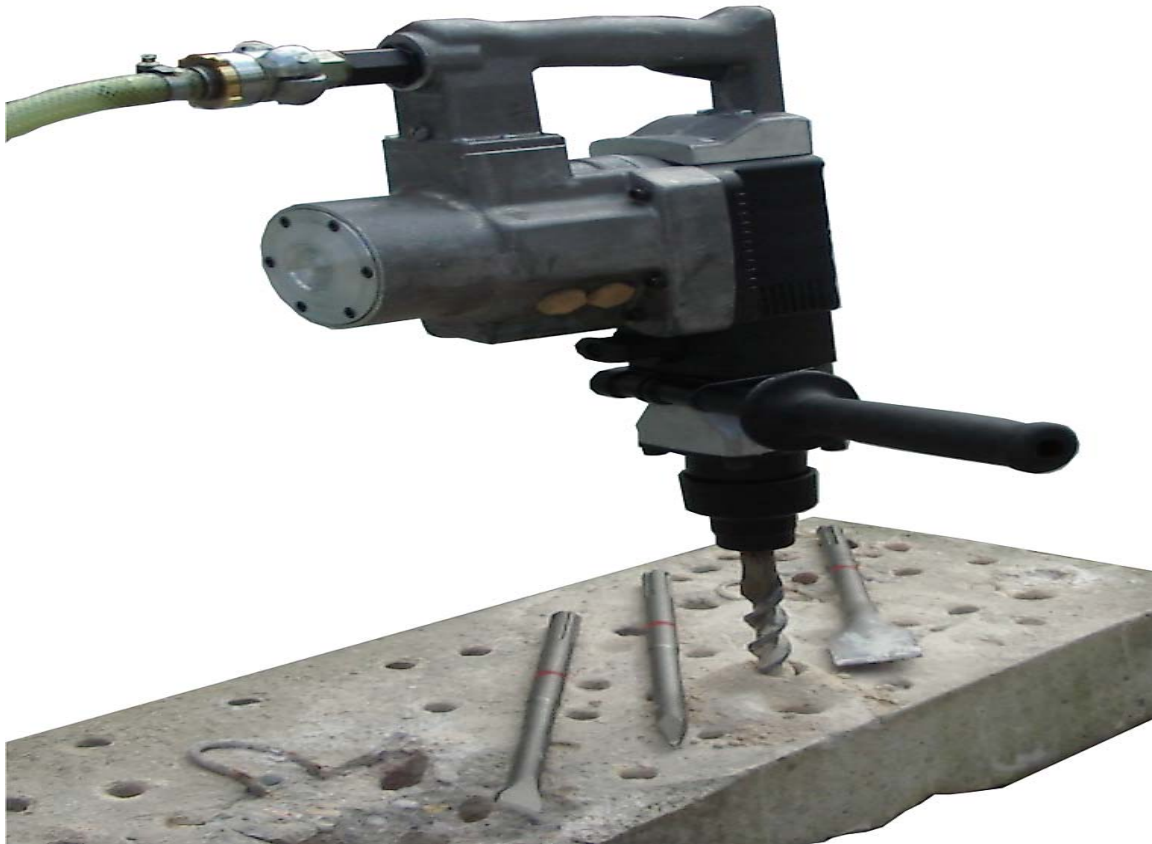
14. Remove wrench. Before starting the motor, take care that all standing wedges and wrenches have been removed.
15. Avoid unintentional starting. Never carry a connected machine with your finger at the button. Before transportation check if the machine is turned off.
16. Always keep the process of operation under control.
17. Check damaged parts. Before using the machine, damaged parts or protective devices should be carefully checked to make sure they work soundly and fulfil the designated function. Check alignment, connections and attachment of moving parts. Also check if parts are broken. Parts or protective devices that are damaged should, if nothing else is mentioned in these operating instructions, only be exchanged or repaired by qualified personnel. The same applies to defective switches and valve triggers. If the machine cannot be switched on or off with the valve trigger, it should not be used.
18. **Warning:** The use of other accessories or other additional items than recommended in these operating instructions may include the risk of bodily injury.
19. Let your machine be repaired only by qualified personnel. The machine corresponds to existing safety requirements. Repairs should only be performed by qualified personnel using original spare parts, as otherwise considerable danger may occur for the user.

PRECAUTIONS DURING THE USE OF THE ROTARY HAMMER DRILL

- To protect your ears during operation, wear hearing protection.
- Do not touch the drill bit during or immediately after operation. The drill bit will get very hot during operation, and serious burns may occur.
- Before starting to demolish, chisel or drill into a wall, floor or ceiling, you must carefully check that electric cables or conduits are not buried inside.
- Always hold the body handle and side handle of the machine, as otherwise the emerging counterforce may lead to inaccurate and even dangerous operation.

AREAS OF OPERATION

- Drilling holes into concrete
- Drilling anchor holes
- Demolishing concrete, chiselling, digging and squaring (applying optional accessories)

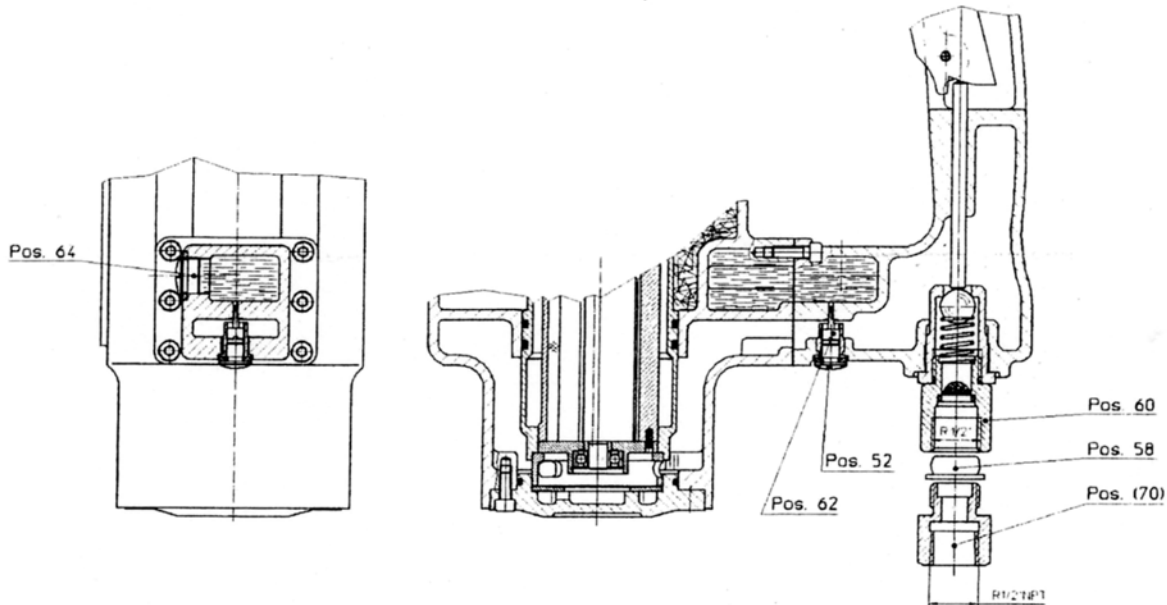


Typical Illustration

STARTING OF OPERATION AND HANDLING

Observe before operation:

Open locking screw (oil fill screw) item 64 and fill in oil ampul enclosed in the case.



Do not use excessive contact pressure – the striking performance will not be increased by that. Merely apply and conduct the machine.

Side handle: 360° pivoting and possible to arrest in all positions

1. Attaching the tools

NOTE

Always use original SPITZNAS tools with SDS-max shank.

- Clean the tool shank and then lubricate it with the provided grease (in the green tube). **(Image 1)**
- To attach the tool (SDS-max shank), insert it into the opening as far as it will go, as shown in **Image 2**. If you turn the tool under light pressure, you will hit upon a spot with a resistance. At this point, pull the grip into the direction of the arrow mark and insert the tool completely up to the innermost stop. If the grip is released, it will return and secure the tool.
- To remove the tool, pull the grip in the direction of the arrow and pull out the tool.

APPLICATION OF THE ROTARY HAMMER DRILL

1. Drilling holes: (Image 4)

The switch is pulled through after the drill bit has been set to the desired drilling spot.

It is not necessary to exercise great pressure to Rotary Hammer Drill. Small pressure will suffice, namely so strong that the drilling chips will be dissipated.

ATTENTION

Although the machine is equipped with a safety clutch, if the drill bit becomes jammed in concrete or other material, the standstill of the drill could cause the machine body to turn in reaction. Ensure that the main handle and the side handle are held tight well during operation.

2. Instruction for Chiselling or Demolishing (Image 5)

By applying the tool tip to the chiselling or demolishing position, operate the rotary hammer tool by utilizing its own weight. Forcible pressing or thrusting is unnecessary.

3. Drilling with "Rotation + Hammering": CAUTION!

If the selector lever is switched during rotation of the motor, the tool can suddenly start, which may lead to unexpected accidents. Therefore switch the selector lever only at full standstill of the motor.

Switching to "Rotation + Hammering":

- Pull the selector lever, release the lock and turn clockwise.
- Adjust the mark ▲ of the selector lever to the mark ▲ at the ■ T side of the undercover, as shown in Image 6.
- Push and lock the selector lever.

NOTE:

Turn the selector lever (do not pull it up) to secure that it is completely locked and make sure it is not rotating.

4. Chiselling and Chipping with "Hammering": CAUTION!

- If the selector lever is switched during rotation of the motor, the tool can suddenly start, which may lead to unexpected accidents. Therefore switch the selector lever only at full standstill of the motor.
- If the chisels and chippers are used in the position "Rotation + Hammering", the tool may rotate, which can lead to unexpected accidents. Use the tools only in the position Hammering".

(1) Switching to "Hammering"

- Pull the selector lever, release the lock and turn clockwise.

- Adjust the mark ▲ of the selector lever to the mark ▲ at the T side of the undercover, as shown in **Image 7**.
- Press and lock the selector lever.

NOTE:

Turn the selector lever (do not pull it up) to check if it is completely locked and make sure it is not rotating.

(1) Fixing of the Working Positions of Tools (e. g. cold chisel etc.)

- Pull the selector lever, release the lock and turn. Adjust the mark ▲ of the selector lever to the mark ◎ at the undercover, as shown in **Image 8**.
- Press and lock the selector lever.
- Turn the handle, as shown in **Image 9** and fix the tool in the desired direction of operation.
- Switch the selector lever to "Hammering" according to the procedure described above in point (1) and secure the position of the tool.

5. Attaching the Depth Gauge (Image 10)

- Loosen the side handle and slide the straight part of the depth gauge into the bolt hole of the side handle.
- Bring the depth gauge into the indicated position and turn the side handle right to fix the depth gauge.

6. Warm-Up Operation (Image 11)

Since the machine uses grease lubrication, warming up may be required in cold areas. Press the drill tip against concrete, turn on the switch of the machine and use the machine after hitting noise can be heard.

ATTENTION:

At the warm-up hold the side handle and the machine body well with both hands, so that you will not luxate because of a jammed drill.

DRILLING AND DRIVING-IN OPERATIONS FOR ANCHORS

1. Using a Taper Shank Adapter (Image 12)

- Attach a drill bit with taper shank to the taper shank adapter.
- Switch on the machine and drill a hole until the indicative groove at the drill shows the depth of the drill hole.
- After blowing off the drill dust with a bellows, attach the plug to the anchor tip and drive in the anchor with a manual hammer.
- To remove the drill bit (taper shank), insert the cotter into the slot of the taper shank adapter and strike the head of the cotter with a manual hammer supporting on rests. (**Image 13**).

USING THE DRILL CHUCK AND CHUCK ADAPTER

Observe that the machine can also be employed in the operation mode "Rotation only", if separately available parts, such as e. g. drill chuck and chuck adapter, are attached. In this case use the machine in the selector lever position "Rotation + Hammering".

CAUTION:

Hold the machine at main and side handle with both hands during operation to avoid lateral vibration of the body.

(1) Switching to "Rotation + Hammering". To switch to "Rotation + Hammering", follow the procedure described under [Drilling with "Rotation + Hammering"].

(2) Attaching the Chuck Adapter to the Drill Chuck (Image 14)

- Attach the chuck adapter to the drill chuck.
- The SDS-max shank of the chuck adapter corresponds to the drill tip. Therefore follow the procedure described under [Attaching of Tools] to attach and remove the drill tip.

(3) Drilling

- Do not exercise stronger pressure than necessary to the machine body, as the drilling procedure cannot be accelerated as desired by that. On the contrary: unnecessarily strong application of power or pressure to the machine body leads to damage to the drill tip, decrease of work efficiency and shortening of the life of the machine.
- It may sometimes occur that a drill bit breaks shortly before ending the drilling procedure. Therefore it is important to diminish the contact pressure, if the drilling procedure approaches its end.

USE OF A CORE BIT

Using a core bit, holes with big diameter as well as blind holes can be drilled. In this case, use the optional accessories for core bits (such as locating pin and core bit shank) to achieve a better drilling performance.

1. Mounting

ATTENTION:

Before mounting a core bit, always disconnect the air hose.

- Mount the core bit to the drill shank. **(Image 15)**
- Attach the drilling set drill holder with thread collet to the Rotary Hammer Drill body in the same way as the drill or the moil pointed chisel. **(Image 16)**
- Insert the locating pin into the guide plate up to the end.
- Attach the guide plate by adjusting the concave part to the core bit tip. If the position of the concave part is shifted by turning the guide plate left or right, the guide plate will never slip off, even if the drill is positioned downward. **(Image 17)**

2. Drilling of Holes

- Disconnect air hose.
- The locating pin is equipped with a spring. By light pressure exercised in a straight line to the wall or bottom area, the entire tip of the core bit will come into contact with the material to be drilled. **(Image 18)**
- When the drill hole depth reaches about 5 mm, the drill hole position can be determined. Remove the locating pin and the guide plate from the core bit and continue the drilling operation.

CAUTION

When removing the locating pin and the guide plate, disconnect the air hose.

3. Removing the Core Bit

- Hold the Rotary Hammer Drill (with the core bit inserted) tight facing upward and turn it until about two or three hit cycles are repeated, by which the screw is loosened and the drill can be removed. **(Image 19)**
- Remove the core bit shank from the machine and, in doing so, hold the core bit with one hand, while you knock on the head of the SDS-max shank part of the core bit shank forcefully with a hammer two or three times, by which the cheese-head screw head will loosen and the drill can be removed. **(Image 20)**

EXCHANGING GREASE

The gearbox head is assembled closely to avoid entrance of dust etc. Therefore it can be used for a long time without lubrication. To exchange grease, proceed as given below.

(1) Time to Exchange

Exchange the hammer grease about every 6 months.

2. Grease Refilling

CAUTION

Before refilling the grease, turn the machine off and disconnect the air hose.

- Remove the crank case cover and wipe the grease from the inside. **(Image 21)**
- Supply the crank case with 20 grams of hammer grease A (normal accessories in the tube). Since the tube contains 30 grams of grease, use 2/3 of the contents.
- After refilling, safely reinstall the crank case cover.

NOTE

The hammer grease A is of low viscosity degree.

MAINTENANCE AND INSPECTION

1. Inspection of the Tool

Since use of a dull tool reduces the performance, the tool is to be ground or replaced if wear is noticed.

2. Inspection of the Clamping Bolts:

All clamping bolts must regularly be checked to be firmly tightened.

MAINTENANCE OF THE PNEUMATIC MOTOR

Only due maintenance according to the following list means continuous performance, reduction of wear and increase of life.

Lubrication of the Motor:

Sound lubrication is indispensable. Therefore the Rotary Hammer Drill has a built-in oiler. It is adjusted and fixed ex works and does not have to be adjusted anymore. Should an adjustment be necessary nevertheless, it should be done in such a way that the locking screw (item 52) is turned to stop and then turned back by ¼ rotation. At regular intervals (5 hrs. running time) the oil level of the oil fill screw (item 64) must be checked. On shortage, refill oil. Oil grades with a viscosity class of SAE 5W-SAE 10W are to be used. At temperatures below +3°C (+38°F), anti-ice grease such as "BP Energol AX10", "Kilfrost" or "Kompranol N74" should be used.

It is not avoidable that small amounts of oil will pour out through the air outlet (sintered metal silencer).

Oil refill ampul 3.5 cm³ (Order No. 9 9902 0020).

Air Connection:

The compressed air should be clean and dry (professional pneumatic system). Before connecting, blow the air hose through. Line, fitting and hose must have the required section so that the necessary air mass is available (1500 l/min). The Rotary Hammer Drill has an upstream screen (item 60) at the connection, which must regularly be checked and cleaned.

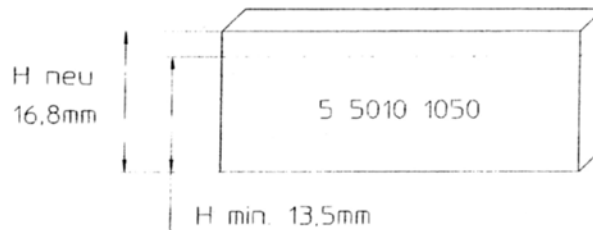
The working pressure may not amount to more than 6 bar, as otherwise the machine will be damaged.

Motor Cleaning:

After about 10 operating hours rinse the motor thoroughly with cleansing oil (Order No. 9 9902 0010). Fill cleansing ampul into air connection (items 60/70), connect compressed air and run the device (about 20 sec free running).

Vane Wear in the Motor:

The vanes are the main wearing parts and should be exchanged in time. The wear is perceivable when the performance decidedly decreases (>100 h running time at regular oil lubrication). The vanes are worn if the height H is smaller than 13.5 mm.



Disassembly

Disassembly should only be executed according to the sectional drawing.

Exchanging the Vanes

Loosen screws (item 25), remove motor housing cover (item 23), Belleville spring (item 22) and thrust collar (item 21). Completely pull out end plates (items 17 and 7) with rotor (item 15), cylinder bushing (item 12) and vanes (item 16), pull end plate (item 17) from the rotor journal. Mostly the end plate (item 17) may as well just be pulled from the rotor journal. Further disassembly is then no more necessary normally. Withdraw vanes from the rotor slots and replace with new vanes. Slide end plate onto rotor journal. Pay attention to the spacer (item 20). Insert thrust collar and Belleville spring and fix the motor housing cover.

Motor / Handle

Loosen screws (items 29 and 67). Remove the motor with handle from the gearbox. Separate the handle (item 50) from motor housing after removing the screws (item 66). **Attention!** The oil pocket is thus opened. Screw out nipple (items 60/70). Remove compression spring (item 58), ball (item 57) and valve pin (item 56). Strike out the double-notched pin (item 55) and pull the valve trigger (item 54) out of the guide. Loosen screws (item 25), remove motor housing cover (item 23), withdraw Belleville spring (item 22) and thrust collar (item 21). Pull out complete interior motor parts and continue to disassemble. Light hitting with a rubber hammer on the geared output may help with this. Canting of the interior parts should be avoided. Remove the end plate (item 17) with spacer (item 20) from the rotor journal. Remove the cylinder bushing (item 12) and pull the vanes (item 16) out of the rotor slots. Remove the gasket (item 9) and screw the pinion (item 6) out of the rotor (item 15). Remove the end plate (item 7) and spacer (item 11) from the rotor journal. The sealing body (item 2) normally remains in the motor housing (item 1), but can be pulled out. Screw the silencer (item 26) out of the motor housing (item 1).

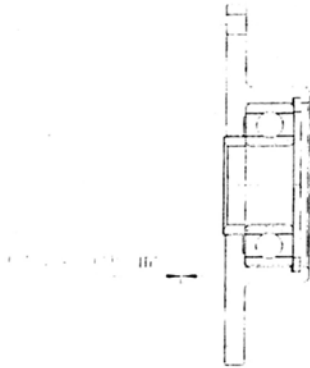
Assembly

Before assembly, the rotor slots should be cleaned from remainders of resin and oil. The new vanes (item 16) must fall lightly into the slots. Assembly is then done in the reverse order.

Attention!

If the bearing (item 8 + 18) has been exchanged, the clearance must be checked in any case and be brought to the designated measure with a new spacer (items 11 + 20) if necessary. (Image b). The spacer should stand 0.04 to 0.05 mm in front of the end plate (item 7 + 17). Here the interior ring of the ball bearing must previously be pressed in the direction of the snap ring (item 10 + 19) free from backlash. The interior chamfers of the spacers face the plane surfaces of the rotor.

Image b



After assembly of motor and handle, the following points are to be checked:

- I. Impermeability of the oil pocket (sealing of the motor housing to the handle)
- II. Function of the valve (trigger, pin, ball, lock spring)
- III. Motor run (motor must be easily turned by hand – free run)
- IV. Measure speed (at 6 bar, free speed of at least 14,000 rpm should be reached).

Should the rotor turn with difficulty or not at all, a "setting hit" will mostly help. By light hitting with a rubber hammer in lateral and / or axial direction to the motor housing, the rotor is set into its position. If the rotor continues to clamp, after removing

- a) the clearance fit
- b) the rotor length to the length of the cylinder bushing
- c) the dimensions of the vanes

must be checked.

Concerning a) Check once more as described under "the clearance".

Concerning b) The rotor must be 0.1 to 0.13 mm shorter than the length of the cylinder bushing.

Concerning c) The vanes may not be exposed in the diameter and length of the rotor.

ATTENTION

Repair, modification and inspection of SPITZNAS pneumatic machines should be executed by authorized professionals.

Information about Operating Noise and Vibration

The typical A-weighted noise performance level is 90.4 dB (A).

Always wear hearing protection during work.

The typical weighted square mean for acceleration is 9.2 m/s².