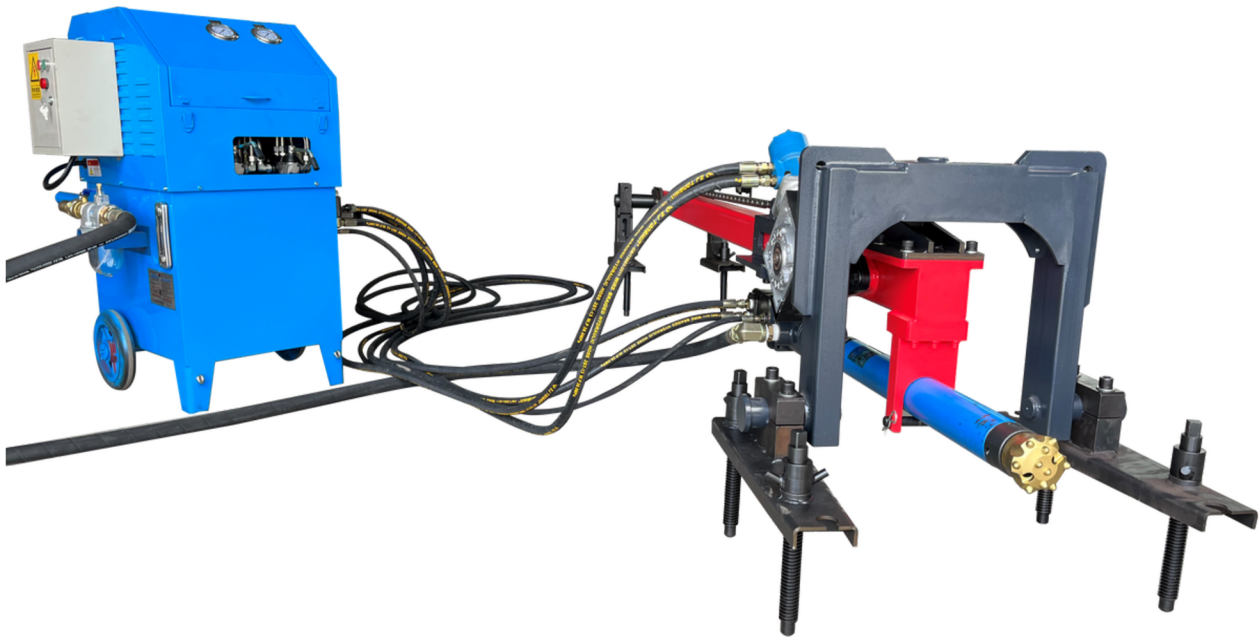




MULTIFUNCTIONAL HYDRAULIC DRILL

INSTRUCTION MANUAL



► INTRODUCING THE MULTIFUNCTIONAL HYDRAULIC DRILL

The Multifunctional Hydraulic Drill is designed for use in quarrying and rock blasting, particularly for creating large-diameter holes (90mm – 3.5 inches). It is primarily used for drilling holes to accommodate diamond wire.

Its key features are practicality, ease of use, and a lightweight, simple design. The drill is equipped with a pneumatic rotating head, which, when paired with the hole hammer, ensures precise drilling alignment and allows for deep drilling with high penetration speeds.

The support column includes a unique fixation system with a spherical joint and an anchoring jack, enabling drilling in any direction. Additionally, the drill's design ensures a minimal height from the ground, particularly when performing horizontal drilling.

► INSTRUCTION AND MAINTENANCE MANUAL

THE FOLLOWING PAGES PROVIDE ESSENTIAL GUIDANCE FOR THE RECOMMENDED USE OF YOUR MACHINE.

⚠ WARNING:

- This manual contains critical safety information.
- Before operating or handling this equipment, please carefully review this manual.
- Store this manual in a safe, dry location for future reference, ensuring it remains intact and readily accessible.
- While this manual offers comprehensive instructions for proper machine use, it cannot substitute for user experience.
- For additional copies or updates, please contact Harlen Supplies directly. Our team is available to address any questions or concerns.



Disclaimer:

Harlen Supplies (Pty) Ltd assumes no responsibility for direct or indirect damages to persons or property resulting from the use of this manual or machine under conditions not specified, or that do not ensure operator safety. All data provided in this manual is indicative and not binding, as we reserve the right to modify or update our machines without prior notice.

GENERAL NOTES ON DELIVERY

Upon receiving the machine, please:

- Open the package and ensure the equipment is undamaged.
- Report any damage to Harlen Supplies immediately.
- Inform Harlen Supplies (Pty) Ltd if any parts are missing.

GUARANTEE

This machine is guaranteed against manufacturing and material defects for six months from the date on the transport document. The guarantee applies only if any defects are promptly reported to Harlen Supplies. Defective parts will be replaced at Harlen Supplies discretion, provided the defect is not due to failure to follow use and maintenance instructions, improper use, or normal wear. Replacement or repair parts will be available at our company.

The user is responsible for shipping, transport, labor, and any travel expenses required if one of our technicians must perform repairs onsite. Parts subject to normal wear are not covered by this guarantee.

MODIFICATIONS

Harlen Supplies reserves the right to modify machines as needed without prior notice.

IDENTIFICATION OF SPARE PARTS

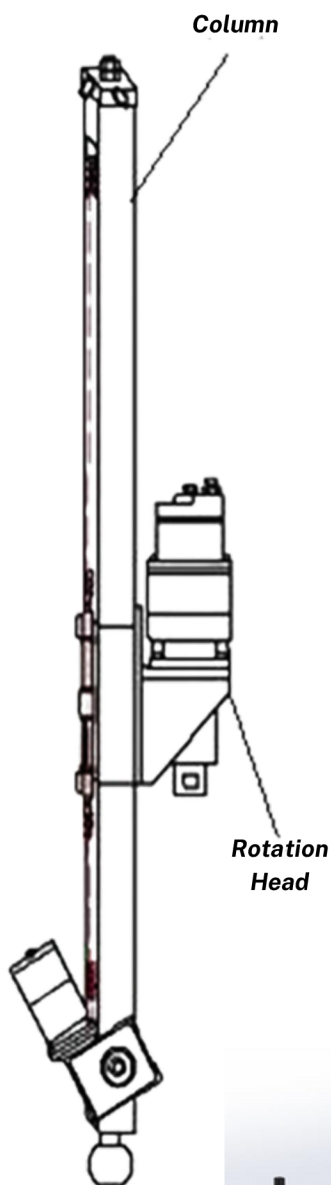
When requesting spare parts, please include the machine's serial number (found on the test card) and the part number from the enclosed spare parts list.

TECHNICAL DESCRIPTION

MODEL:

SERIAL NO:

► OPERATING AND MAINTENANCE GUIDE



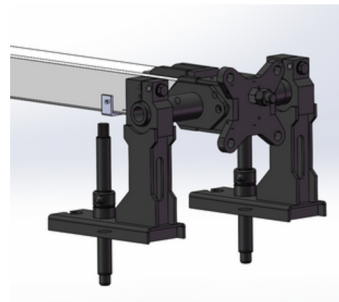
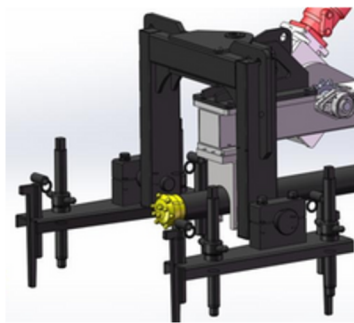
The electric drill consists of a column that supports the rotating head, which is equipped with an attachment for the down-the-hole hammer. The rotating head can be fitted with a threaded connection for rods with a cylindrical male fitting (RD70).

The advancement of the rotating head is driven by a chain mechanism powered by a pneumatic gear motor.

► STANDARD EQUIPMENT INCLUDES:

- Support column
- Anchoring down jack with a spherical joint for column engagement and 4 leveling screws
- Control panel with integrated line lubricator
- Socket wrench for locking the column spherical joint bolts
- Wrench for disengaging the hammer (4 pieces)
- 5 drilling rods, each 1000 mm (39 in.) in length
- Down-the-hole hammer with one bit
- Column anchoring chains (available only with the 3000 mm model)

***Air Consumption During Drilling:
9000 l/min at 6 bar***



SAFETY

General Safety Information:

Specific safety measures were implemented during the design and construction phases to protect operators. Detailed documentation of these safety measures is available in the technical dossier at Harlen Supplies' offices.

Some risks, however, could not be fully addressed at the design level. In such cases, this manual outlines safety guidelines to ensure the safest possible operation.

WARNING:

Our company strongly recommends that all users strictly follow the instructions, procedures, and guidelines provided in this manual, take all necessary precautions, and comply with current safety regulations.

Safety Guidelines:

- Only qualified personnel should perform the installation, maintenance, and operation of this machine.
- Before performing any cleaning or maintenance, ensure that the power supply is disconnected.
- Do not remove any fixed safety guards that protect moving parts of the machine.
- Avoid placing hands in areas where there is a risk of crushing or trapping.
- The operator should stand by the control panel, maintaining the maximum safe distance and protection.
- During operation, the operator should always remain behind the control panel.
- Machine handling or component adjustments must be done with the machine turned off, power disconnected, and only by specialized personnel using appropriate tools.
- Use only original spare parts when replacing machine components.

NOISE EMISSION

THE HYDRAULIC DRILL EMITS THE FOLLOWING AMOUNT OF NOISE:
90 ÷ 93 DB

WARNING:

Operators must wear adequate ear protection at all times.

RISKS IDENTIFIED THROUGH THE ANALYSIS OF HAZARDS AND HAZARDOUS CIRCUMSTANCES DURING WORK

Exposure to overhead electrical lines, electrical shocks, collisions, impacts, compressive forces, vibrations, slips, falls at the same level, excessive noise, shear forces, grinding activities, the risk of falling materials from above, and contact with mineral oils and their derivatives.

➤ SAFETY (CONTINUE)

Safety Precautions and Operating Guidelines for Machine Operators:

Before Operation:

- Ensure all bolts on the machine are securely fastened.
- Confirm there are no overhead power lines that may interfere with the machine's range of movement.
- Inspect the tracks and work areas, setting up any necessary bracing structures.
- Stabilize the machine effectively to prevent any unintended movement.
- Check the blocking systems and ground clamping mechanisms to verify they are working properly.
- Be aware that the operating area is subject to high noise levels.
- Restrict access to the area around the machine to prevent entry by unauthorized personnel.

During Operation:

- Immediately report any malfunction or hazardous conditions.
- Position yourself in a way that avoids contact with any moving parts.
- Never attempt to adjust or intervene with moving parts while the machine is running.
- Stay focused and avoid distractions to ensure safety.

After Operation:

- Disconnect the machine's air supply.
- Properly position the machine, ensuring that no tools are left suspended.
- Bring the translation carriage to a stop.
- Perform any required inspection and maintenance tasks with the power supply disconnected.
- Follow all maintenance instructions outlined in this manual to prepare the machine for safe reuse.

Safety Precautions and Operating Guidelines for Machine Operators:

- Safety boots
- Hard hat
- Safety glasses
- Protective gloves
- Earplugs or earmuffs

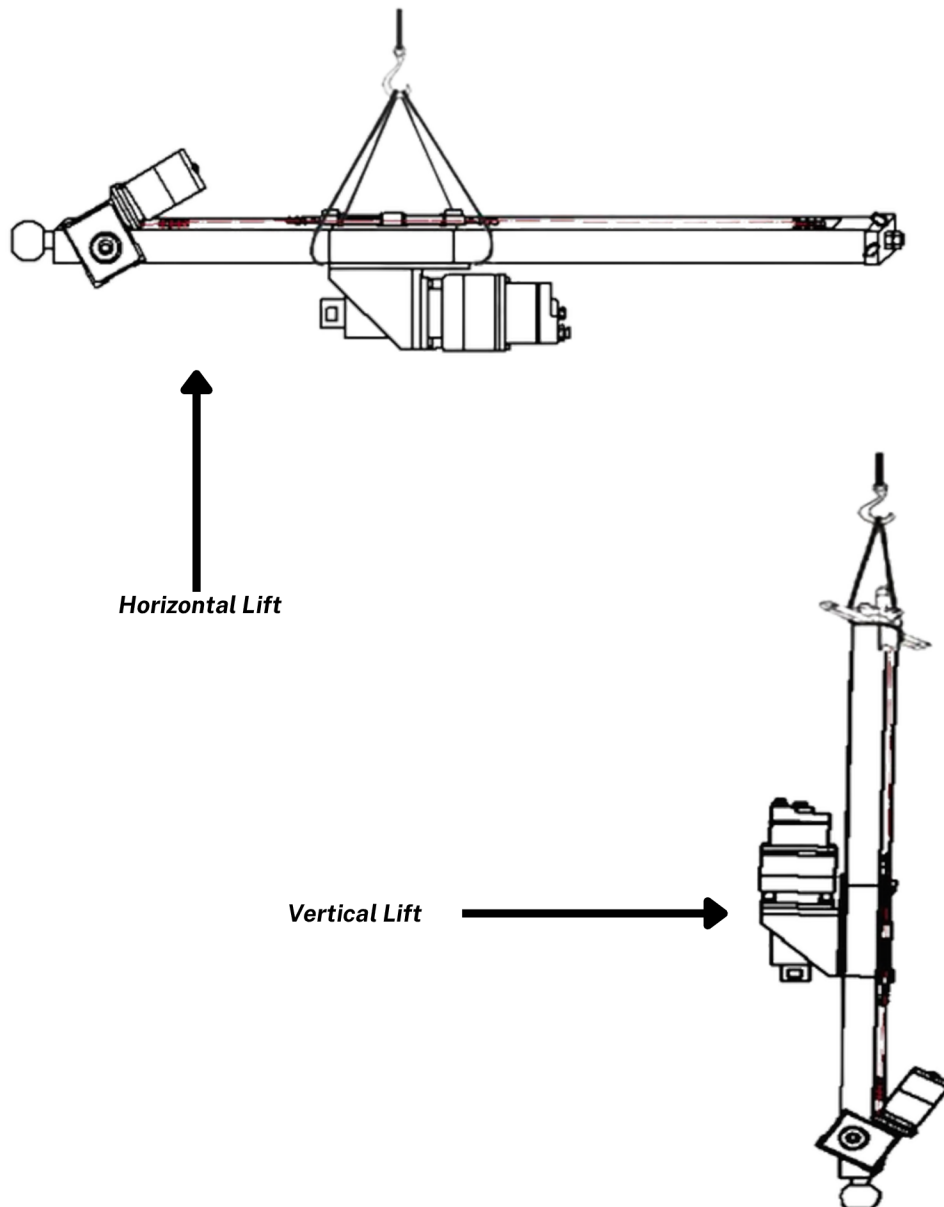


➤ SAFETY (CONTINUE)

HANDLING AND TRANSPORTATION:

⚠ WARNING:

Only specialized or properly trained personnel should handle and transport this machine, using suitable lifting equipment.



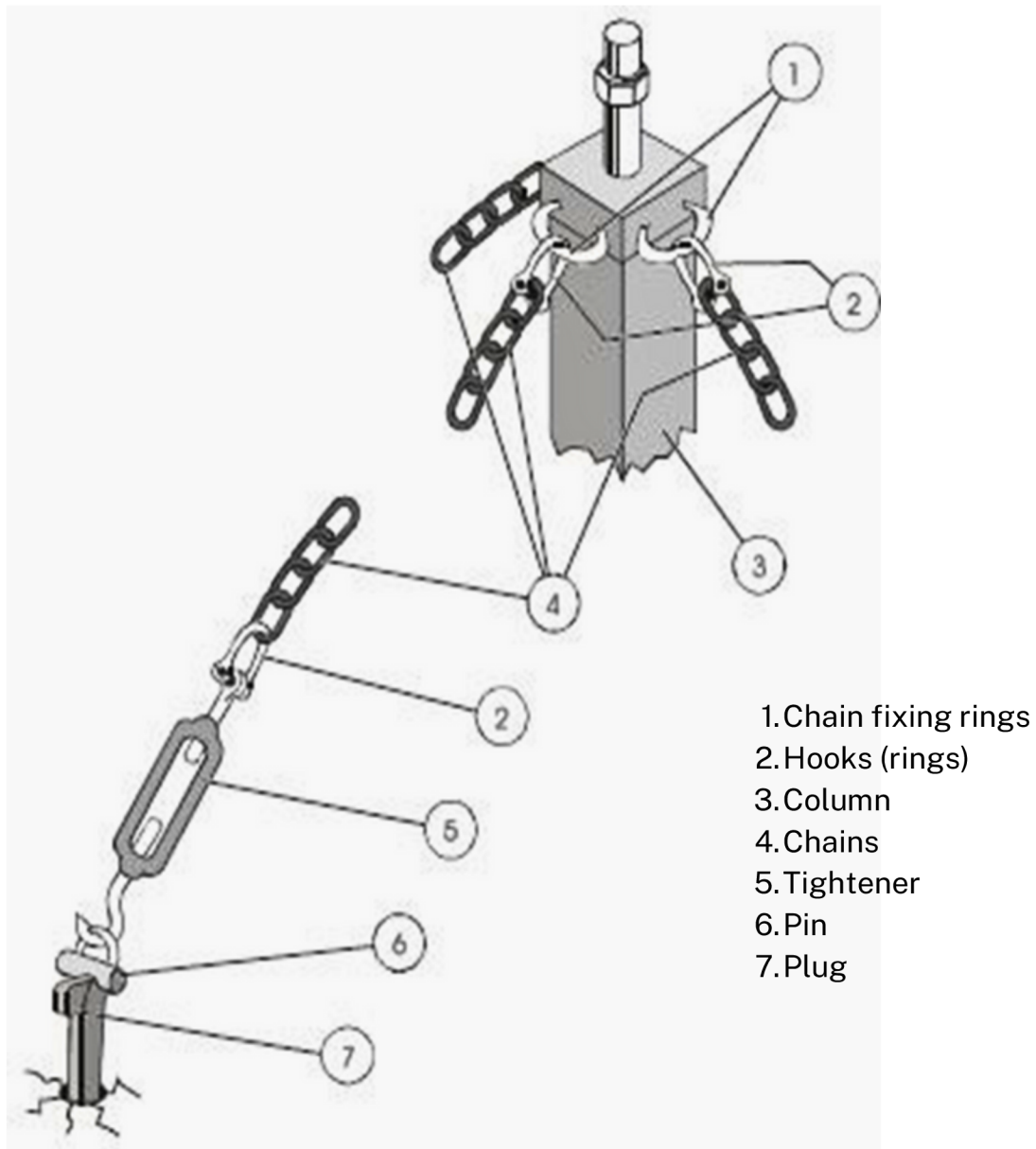
Horizontal And Vertical Lifting:

- Follow specific procedures and use designated lifting points to ensure stability and prevent damage to the machine during horizontal transport.

► COLUMN ANCHORING WITH CHAINS - SUPPLIED ONLY FOR THE MODEL

1. Drill three holes, each 34 mm in diameter and 20 cm (8 inches) deep.
2. Attach the chains (4) to the column rings (1) by connecting them with the hooks (2).
3. Loosen the tighteners (5) to prepare for tensioning.
4. Secure the chains (4) to the ground with the designated anchoring pins (6-7), following the "Down Jack Anchoring" procedure.
5. Evenly tighten the chains using the tighteners (5) to ensure equal tension.

- **Note: Each chain should measure 3000 mm in length.**



► CONNECTIONS

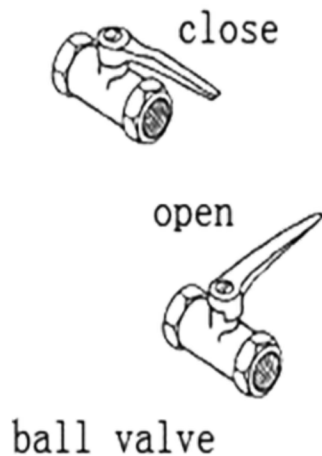


FIGURE 6

1. Position the control panel at a safe and accessible distance.
2. Oil Tube Installation: Connect the oil pipes from the oil tank to the hydraulic motors according to the numbered markings on the pipes. *Note: Tighten connections if any oil leakage occurs.*
3. Electrical Supply Connection: Connect the three-phase electrical supply (2.5mm² copper wire) to the motor of the oil tank, following the circuit diagram in the addendum. *Note: Ensure the motor fan rotates in the direction indicated by the arrow.*
4. When the change-direction valve is in the middle position, the system is stopped, as shown in the image below.



5. Position the control panel in the most convenient and safe location for operation.
6. Close the compressor entry valve (24, Plate one) and the supply valve for the down-the-hole hammer, as shown in Figure 6.
7. Connect the feeding hose (9, Plate one) of the down-the-hole hammer to the corresponding fitting on the rotating head output group (7, Plate one).
8. Connect the up and down hoses (1, Plate one) to the appropriate fittings (2, Plate one) on the feeding motor.
9. Set the distribution levers for rotation (25, Plate one) and advance (13, Plate one) to the closed or rest (central) position (N).
10. Connect the main feeding hose from the compressor supply to the corresponding fitting (24, Plate one) on the control panel.

- **Note: Ensure the air supply hose is no smaller than 1 1/4".**

LEVER POSITIONS:

Rotation:

- **A: Anticlockwise (rod unscrewing)**
- **N: Rest**
- **B: Clockwise (drilling)**

Advance:

- **A: Up (backwards)**
- **N: Rest**
- **B: Down**

► VERIFICATIONS AND ADJUSTMENT

⚠ WARNING:

For a new machine or after extended periods of inactivity, add oil directly into the drill supply pipes to ensure quick initial lubrication.



Gauge on the control panel

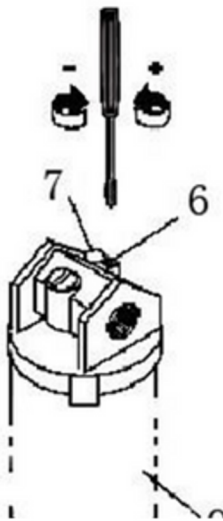
FIGURE 8

Lubrication Check:

- Ensure there is an adequate amount of lubricating oil in tank 9 (see Plate Two and Figure 9). If the oil is low, refer to the "Maintenance: Adding Oil" section.

Pressure Check:

- Confirm that the compressor provides sufficient pressure to position gauge needle 3 (Plate Two) within the 5.5–7 bar range on the dial (Figure 8).
 - Note: The ideal operating pressure is 6 bar. During drilling, maintain this pressure in the gauge's green zone.
 - If the pressure falls outside this range, consult TROUBLE SHOOTING CHART



Lubricator

FIGURE 9

Oil Flow Adjustment:

- Adjust the oil flow rate using adjustment screw 6 (Plate Two and Figure 9) until you observe one drop of oil every two seconds in visualizer 7. This indicates the correct flow rate for lubrication.

Lubrication Test:

- To confirm adequate lubrication, disconnect the drill's supply pipe and simulate air flow as if in operation. When holding your palm near the air jet, you should feel a slight oiliness.

⚠ WARNING:

When testing the air flow, gradually open the air valve, keeping the hose securely anchored to prevent any movement.

USAGE AND NOTICE OF HYDRAULIC OIL SYSTEM

1. Ensure all components remain clean at all times.
2. The oil tank is designed to use HM32 hydraulic oil; do not substitute it with alcohol, gas, or diesel oil.
3. The working medium should be changed periodically. When replacing it, filter using a 120# mesh filter and maintain cleanliness.
4. The operating temperature of the working medium should be between 10–60°C. Do not allow it to exceed 70°C.

USAGE AND NOTICE OF MOTOR AND OIL PUMP

1. The recommended oil for this pump is HM-32 hydraulic oil or HL-32 hydraulic oil. If the ambient temperature is below 10°C, HM-15 or HL-15 hydraulic oil can be used. For temperatures above 40°C, HM-46 or HL-46 hydraulic oil is suitable. Other types of oil should not be used.
2. The oil level in the tank should be maintained at three-quarters of the tank's capacity. When adding oil, use a 120-160# filter mesh. If the machine is used frequently, clean the filter every two months, and clean the oil tank and change the oil every six months.
3. The normal operating temperature for the pump is between 10-50°C. If the temperature exceeds this range, take appropriate measures to cool the pump or stop operation. Conversely, if the temperature is too low, warm the pump before use rather than operating it directly.
4. Regularly inspect the high-pressure rubber hoses to prevent accidents. Perform a pressure test every six months, ensuring the test pressure exceeds 88.7 MPa. If the hose shows any signs of leaking, bulging, or breaking below this pressure, it should no longer be used. After replacing with a new hose, perform a 94.5 MPa over-pressure test. Avoid folding or sharply bending the high-pressure hose. Operators should keep a safe distance from the hose to prevent accidents. If the pump is stationary, consider replacing the rubber hose with a steel pipe.
5. The pump should undergo annual maintenance. Clean all components with light diesel oil or kerosene, taking care to protect the connection surfaces.

➤ USING THE MACHINE

⚠ WARNING:

Before using the machine, ensure it is securely anchored to the ground, and that all bolts and air hoses are firmly tightened.

Fitting the Down-the-Hole (DTH) Hammer:

- The machine typically comes with the down-the-hole hammer already attached to the rotating head. The hammer is equipped with a drilling bit at its bottom, which can either be selected by the customer or chosen based on the material being drilled.
- If a down-the-hole hammer is not supplied with the machine, follow the instructions provided by the manufacturer of the hammer.
- To install the down-the-hole hammer, screw it onto the rotating head's output group in a clockwise direction. Before installation, verify that the threaded fitting on the hammer matches the one on the rotating head (either cylindrical RD50 or RD60).
- The down-the-hole hammer must be tightened using the special wrenches provided (refer to 'Extension Rod Joint').

Operational Steps:

1. Power up the control panel by opening valve 3 (Plate one).
2. Verify that the gauge needle 11 (Plate one) fluctuates within the range of 5.5 to 6 bar on the dial (see Fig. 10).
3. Position the hammer bit near the surface to be drilled by lowering distribution lever 10 (Plate one) to position B, as shown in Fig. 11. This action will advance the rotating head and down-the-hole hammer assembly.
4. Open valve 15 to start rotation and percussion of the hammer. Lower distribution lever 10 (Plate one) to position B (see Fig. 11) to activate the hammer bit, which will rotate clockwise.
5. Adjust the advance speed by using the pressure regulator. Lift knob a to either tighten or loosen it. Turning the knob clockwise increases the pressure, while counter-clockwise decreases it, as reflected by the change on gauge b (see Fig. 12).
6. Drilling is now in progress.

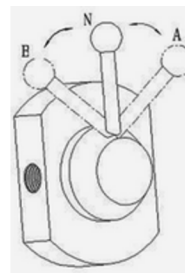
⚠ WARNING:

The advance function is only intended to keep the bit positioned close to the rock being drilled, not to apply pressure against the rock.



Gauge

FIGURE 10



Rotation distributor
and advance
distributor

FIGURE 11

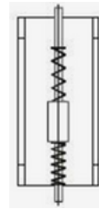


Pressure
regulator

FIGURE 12

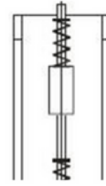


FIGURE 13



Carriage

FIGURE 14



Spring play recovery

FIGURE 15

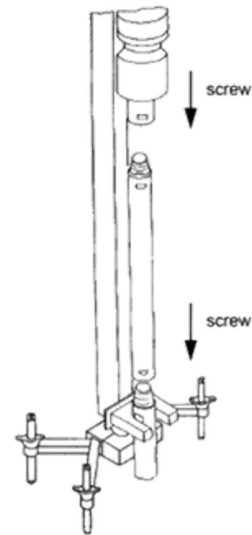


FIGURE 16

► EXTENSION ROD JOINTING - END OF DRILLING LIMIT PROCEDURE:

1. **Stop Operations:** Block advance, rotation, and percussion by placing distributors 4 and 7 in the "rest" (N) position (see Figures 7 and 11) and close valve 10 (Plate Two).
2. **Release Carriage Spring Tension:** Slightly lift the rotating head to release the tension in the carriage springs (see Figures 13 and 14).
3. **Prevent Reducer Damage:** Insert the supplied wrench into seat (a) of the output group and secure it against the column to prevent the reducer from advancing and to protect the rotating head from counter-blows while changing rods (see Figure 15).
4. **Loosen Hammer or Rod:** Place the wrench in seat (b) of the hammer or rod, keeping it secured against the wrench in (a). Apply a few hammer blows to the wrench in seat (b) to release the hammer or rod (see Figure 15).
5. **Remove Wrenches and Unscrew the Hammer or Rod:** Take out the wrenches, set the rotating head to rotate counter clockwise (position A on distributor 1 - Figure 7), and unscrew the hammer or rod. Raise the rotating head to a high position on the column.
6. **Attach Extension Rod:** Manually screw the extension rod onto the hammer or onto the rod already in the hole, as necessary (see Figure 16).
7. **Reattach and Secure:** Lower the rotation head, set it to rotate clockwise (position B on distributor 1 - Figure 7), and screw it securely to the rod or hammer.
8. **Resume Drilling:** Verify that the rod is firmly connected to both the head and hammer (or the existing rod in the hole), then resume drilling. For additional joints, repeat these steps as needed.

⚠ WARNING:

Never unscrew rods or the hammer using only the rotation head's force. Always position the control panel as far away from the column as possible during these operations.

▶ ROD AND HAMMER RECOVERING

1. **Stop Advance, Rotation, and Percussion:** Block the advance, rotation, and percussion functions by closing distributors and valve 4, 7, and 10 (Plate Two).
2. **Position the Rotating Head:** Raise the rotating head high on the column, as close to the top as possible.
3. **Secure the Rod in the Hole:** Insert the supplied wrench into seat (d) on the rod in the hole, resting it on the rod guide. For vertical drilling, this wrench prevents the rods from falling into the drill when unscrewed from the rotating head.
4. **Prevent Movement of the Rotating Head:** Insert the wrench into seat (a) on the rotating head and secure it against the column.
5. **Prepare to Release the Rod:** Insert the wrench into seat (b).
6. **Loosen the Rod:** Use a hammer to strike the wrench in seat (b), rotating the rod clockwise to release it.
7. **Remove Wrenches and Unscrew the Rod:** Take out the wrenches from seats (a) and (b), rotate the head, and unscrew it from the rod.
8. **Reposition the Rotating Head:** Lift the rotating head up the column to nearly its highest point.
9. **Remove the First Rod:** Insert the wrench into seat (c) and secure the wrench in seat (d) against the column. Strike the wrench in seat (c) with a hammer to release and unscrew the rod, fully removing the first rod.
10. **Attach to the Next Rod:** Lower the rotating head to engage with the second rod still in the drill and screw it onto the head, allowing it to lift the rod.
11. **Repeat for Remaining Rods:** Repeat this procedure to continue retrieving each rod and the hammer in sequence.

⚠ WARNING:

Do not use the rotation head's force alone to unscrew the rods or hammer. Keep the control panel at a safe distance from the column to avoid accidental maneuvers.

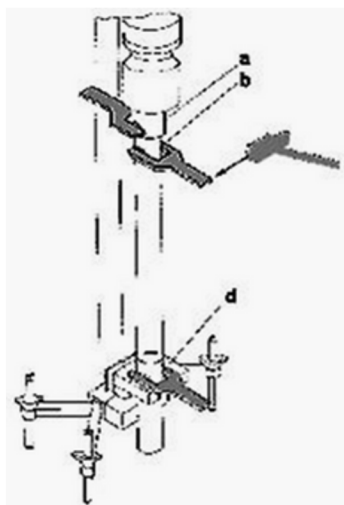


FIGURE 17

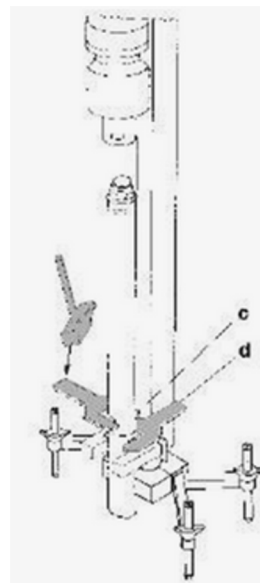


FIGURE 18

► MAINTENANCE

⚠ WARNING:

Before adding oil, stop the machine, close the compressor air supply, and release any remaining air in the control panel by opening valve 10 (Plate Two). Removing the plug or lubricator tank while the control panel is pressurized is dangerous and should be avoided.

Adding Oil to the Line Lubricator

Preparation:

- Ensure the machine is off and unpowered. The compressor air supply should be closed, and any residual air should be discharged by opening valve 10 (Plate Two) to prevent pressurized release of components.

Add Oil:

- Option 1: Unscrew the screw plug 1 (Fig. 20) and add oil directly.
- Option 2: Press button 5 and rotate the lock ring to release the tank, then add oil.

Extended Idle Periods:

- If the machine has been idle or if long idle periods are expected, apply oil directly into the supply inlets of the rotating head and advance motor. Slowly rotate these parts to ensure thorough lubrication of mechanical components.
- **Recommended Oils:** Use MOBIL ALMO 525 or SHELL TORCULA 100, or a similarly fluid equivalent.
- **Recommended Grease:** Use ROL-OIL ALCOPLEX 2 or equivalent.

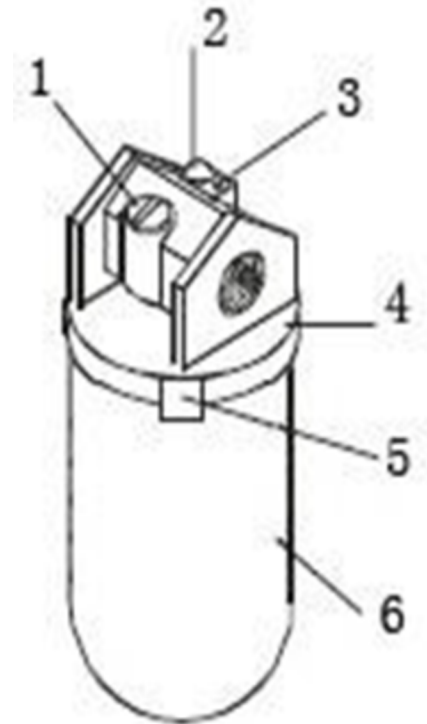


FIGURE 20

Routine Maintenance and Checks

Daily:

- Verify the oil level in the line lubricator.
- Check all bolts and air hoses for secure tightening.
- Inspect chain tension and adjust with tightener 17 (Plate One) if needed.
- Examine the drill bit for wear and integrity.

Weekly:

- Grease the advance group chain using the provided greasers and recommended grease.
- Inspect the neck of the sphere for any cracks. If cracks are detected, stop using the machine immediately.

TROUBLE SHOOTING CHART - TROUBLE, CAUSE & REMEDY

Trouble -

Insufficient Air Pressure (Below 5.5-7 Bar) -

Cause -

- Insufficient air generated by the compressor.
- Feeding hose diameter is too small or the hose length is excessive.

Remedy -

- Replace the compressor with one that has a higher air delivery rate.
- Use a feeding hose with a larger diameter appropriate for the length. A minimum diameter of 1 1/4 is recommended.

Trouble -

Low Yield -

Cause -

- Lack of lubrication.
- Insufficient operating pressure.
- Worn, dirty, or malfunctioning down-the-hole hammer.
- Worn drill bit.

Remedy -

- Check and ensure proper lubrication of the down-the-hole hammer.
- Clean the hammer and perform any necessary maintenance.
- Recondition or replace the hammer, and sharpen the drill bit as needed.

Trouble -

Advance Cannot Be Regulated by the Pressure Regulator -

Cause -

- Malfunctioning pressure regulator.
- Advance feeding hoses are connected incorrectly (see position 13 on Plate Two).

Remedy -

- Replace the pressure regulator (see Plate Two).
- Correct the orientation of the advance feeding hoses at position 13.

Trouble -

Advance Motor Does Not Turn -

Cause -

- Insufficient lubrication.
- Foreign material obstructing the rotation group.

Remedy -

- Check and ensure proper lubrication.
- Remove the motor cap, clean it, and confirm free movement of the rotor and blades.

► TROUBLE SHOOTING CHART - TROUBLE, CAUSE & REMEDY

Trouble -

Rotating Head Does Not Turn -

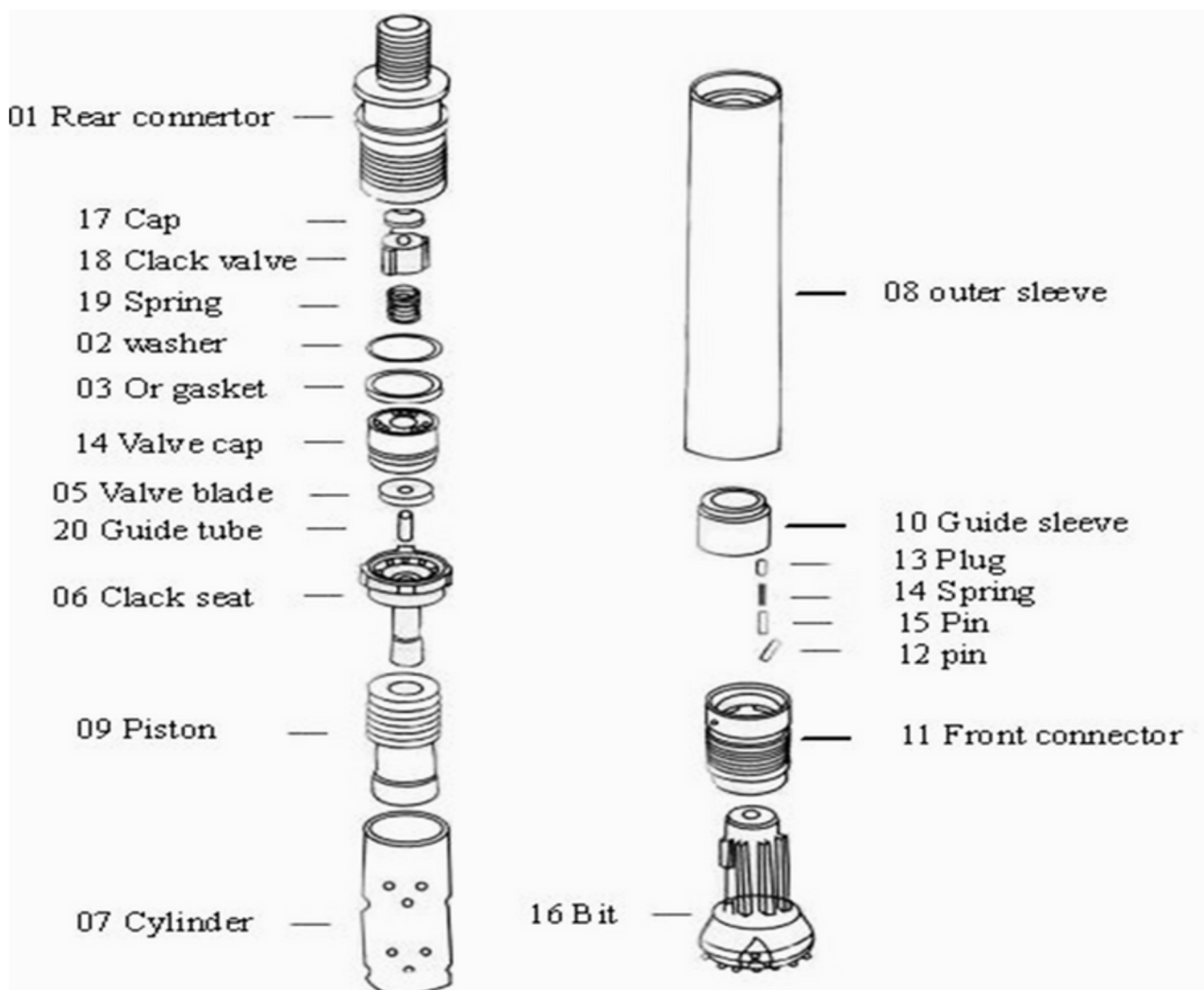
Cause -

- Reduction gear breakage due to incorrect rod jointing or unscrewing actions without the correct use of the wrenches supplied.
- No lubrication in the reduction gear.
- Electric motor is damaged.

Remedy -

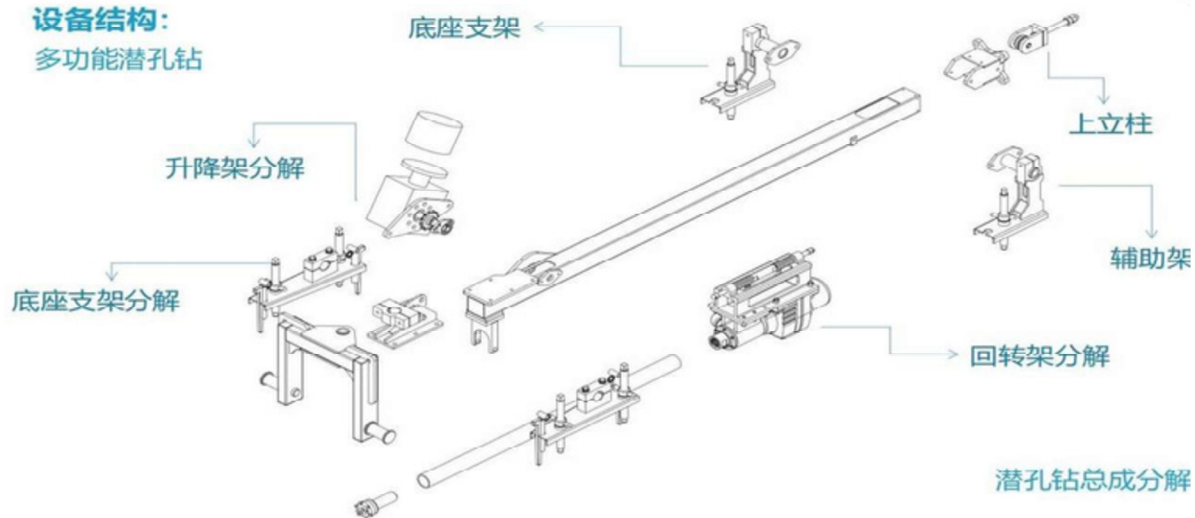
- Replace the reduction gear.
- Check and ensure proper lubrication.
- Change the electric motor.

► SPARE PARTS OF THE DOWN THE HOLE HAMMER

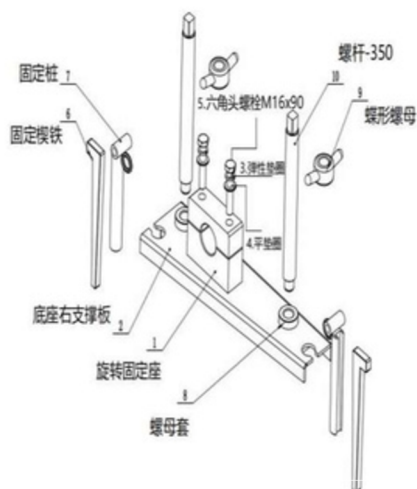
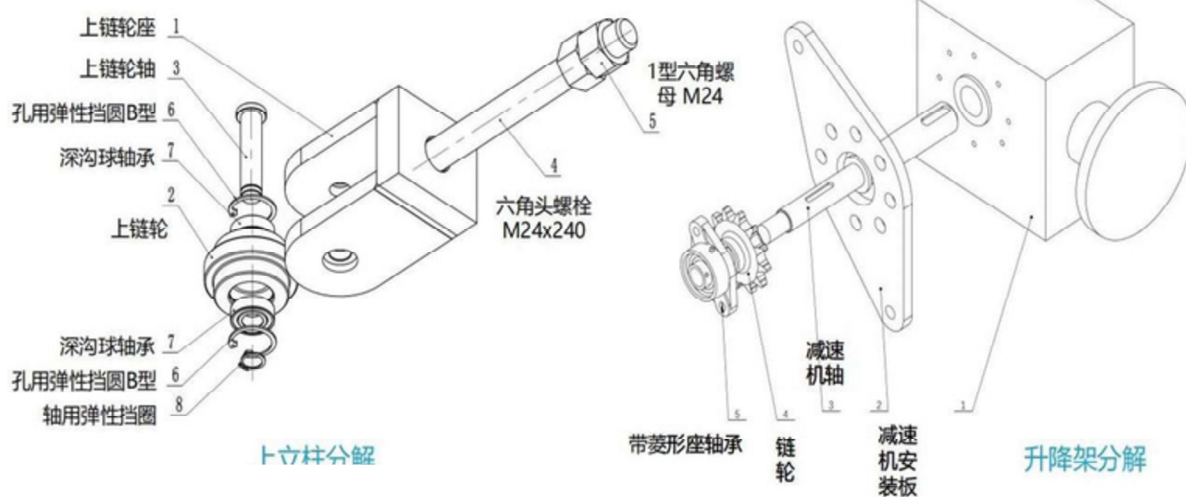


产品介绍

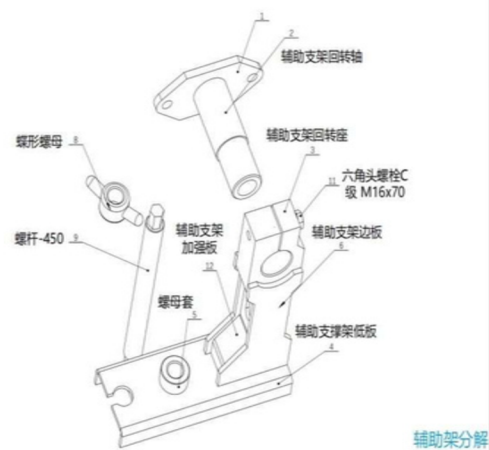
设备结构：
多功能潜孔钻



多功能潜孔钻



底座支架分解

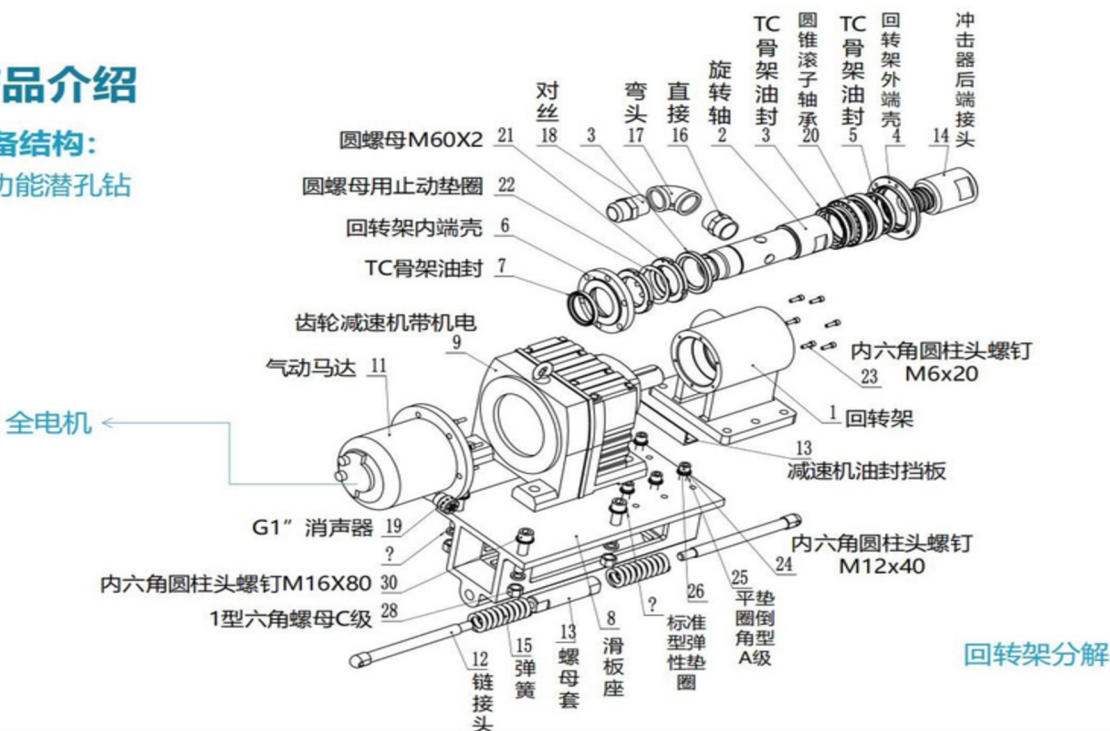


辅助架分解

产品介绍

设备结构:

多功能潜孔钻



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Harlen Supplies (Pty) Ltd offers an extensive selection of products and solutions for your rock breaking and drilling needs. Our range includes handheld rock drills, drill steel, drill bits, Top Hammer rods, bits and couplings, as well as DTH rods, bits and hammers.