



Request For Information

Repair of the Drilling Machine (Rig) in Maban

Relief international is looking for service providers who deal in repair of the borehole drilling rig to repair of the drilling rig in Maban. The repair service will facilitate the smooth operation of the drilling rig such that it supports the timely running of WASH programs activities in the refugee camps in Maban.

Description of the Drilling (Machine) Rig

The rig is mounted on a Hino truck and is supported by a separate trailer-mounted 30-bar Elgi compressor. It operates entirely on a hydraulic system powered by a six-cylinder engine installed on the rig. This engine drives three hydraulic pumps that control all drilling operations.

- **Pump 1** is a three-in-one unit responsible for rotation, feed (vertical movement), mast hoisting/lowering, and mud pump operations.
- **Pump 2** is a dual pump system that operates the leveling jacks and the hoisting winch.
- **Pump 3** is a single pump dedicated to the foam pump and breakout tongs.

Description of the Service and intended outcomes include

See the attached Mechanical Assessment Report

Any providers, with previous experience of delivering these services and with an operational ability to deliver in Maban, please submit your company details, contact details and company registration forms to the following email address ssd.procurements@ri.org by Friday September 26th 2025.

Procurement Team
South Sudan





Drilling Machine (Rig) Assessment Report

Introduction

This report aims to identify the failures and damages previously encountered by the drilling rig, and outline the necessary repairs to restore it to full operational condition.

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Findings

After running the machine engine for some time, it was observed that several operations were either lost or not functioning properly. The issues identified are outlined below:

1. Power Loss

- **Symptoms:**

Hydraulic (torque) pressure is at a minimum, resulting in slow or non-functional operations. Rotation is weak and slow, the mud pump is non-operational, the mast hoist is not functioning, and the leveling jacks lack sufficient power to lift the machine body.

- **Cause:**

Faulty hydraulic pumps due to contamination from drilling fluid mixing with hydraulic oil. This mixture has caused internal wear and pressure loss in the system.

Recommended Repair Procedure:

- (a) Remove all hydraulic pumps and send them to a workshop for testing.
- (b) Repair internal leakages and bypasses by replacing worn-out gears, seals, or O-rings.
- (c) Replace pumps if they are beyond repair.

2. Mixing of Hydraulic Oil and Drilling Fluid (Water + Polymer)

Issue:

- Hydraulic oil contamination with water and silt has damaged the pumps. Silt enters the system as water carries drilled cuttings from the hole.

Cause:

- (a) Worn-out spindle shaft connecting to the power swivel motor.
- (b) Damaged motor oil seals allowing water into the oil circulation system.
- (c) Worn-out shaft water seal permitting water ingress into the motor.

Repair Procedure:

- (i) Remove the power take-off shaft (spindle), weld using low-carbon stainless steel rods, machine to the required diameter, and harden appropriately.
- (ii) Inspect and test the motor; replace pistons, seals, and O-rings as needed.
- (iii) Replace worn-out shaft seals and keep spare sets.

3. Leakage of Drilling Fluid from the Head

Cause:

- Loose water seals and a worn-out spindle shaft.

Solution:

Addressed by actions in **2(i)** and **2(iii)**.

4. Failed Mud Pump

Issue:

- The mud pump is non-operational due to failed motors. The pump cylinders are intact and do not require repair.

Cause:

- (a) Pump failure.
- (b) Motor malfunction.

Proposed Repairs:

- (i) Remove and test the motors.
- (ii) Repair or replace the motors as necessary.
- (iii) Refer to **1(a, b, c)** for hydraulic pump repairs.

5. Leakage in the Directional Valve

Cause:

- Worn-out seals, O-rings, or spools due to hydraulic oil contamination. Rust has jammed the levers attached to the spools.

Repair Procedure:

- Remove the directional valve assembly, clean with petrol, replace all worn seals, O-rings, and spools, and reinstall.

6. Leakage of the Winch Motor

Cause:

- Worn-out seals.

Repair Procedure:

- Remove and test the motor, replace worn parts, and reinstall.

7. Cleaning and Flushing of Hydraulic Oil Circulation System

Issue:

Hydraulic oil adulterated with water, reducing system efficiency.

Cleaning Procedure:

- (a) Drain all contaminated oil from the hydraulic tank.
- (b) Flush and clean the tank with diesel or petrol.
- (c) Replace oil filters.
- (d) Drain all hydraulic rams.
- (e) Flush hydraulic pipes with clean hydraulic oil.

8. Breakout Tongs Ram Not Working

Cause:

- Faulty return valve.

Solution:

- Replace the return valve.

9. Replacement of High-Pressure Flexible Drill Fluid Hose

Replace the 8-meter long, 2" diameter high-pressure hydraulic hose (100R2AT/DIN).

10. Compressor Body Frame Loosened

Issue:

- The frame requires fastening and reinforcement.

Repair Procedure:

- Fasten with bolts and nuts and weld sporadic areas to ensure stability.

Additional Observations:

- Transmission oil is below the required level and needs topping up.
- Exhaust manifold bend is missing and requires replacement.
- Routine engine servicing is needed.

11. Battery Replacement

Batteries for both the rig and compressor are depleted and need replacement.

Requirement: 4 batteries, 150Ah each.

12. Complementary Items Required

To support operations, the following items should be procured:

- Drag bit 9" – 4 pieces
- Drag bit 10" – 2 pieces

BOQ of Drilling rig Repair and parts replacement

#	Description	Model/Part number	Unit	Quantity
1	Repair of hydraulic pumps	Pump 1, RSA 5 GMP Pump 2, MPLD 45-221C09R	Numbers	3
2	Repair of worn-out spindle (rubber seal, spindle)	Rubber seal 4" in diameter, spindle rod 4")	Numbers	1
3	Repair of hydraulic motors	Motor type: XL B 40 110B	Lumpsum	4
4	Repair/cleaning of directional valve	As per sample	Lumpsum	1
5	Replacing high pressure drill fluid hose pipe	SAE 100R2AT/DIN	Meters	8
6	Labor for cleaning and flushing of hydraulic circulation system	-	Lumpsum	1
7	Rig and compressor batteries 150AmH	Chloride Exide 150AmH	Numbers	4
8	Drag bits (10" & 9")	Stainless steel 10" & 9"	Numbers	4