

TROUBLESHOOTING

HAMMER MALFUNCTION

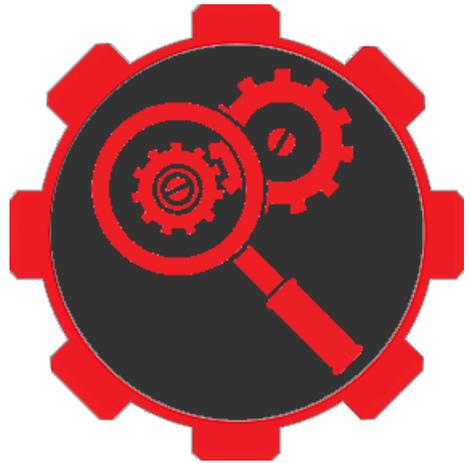
ROTATION

VIBRATION

FLUSHING

PENETRATION RATES

**DRILL TUBE AND
DRILL BIT OPERATION**



HAMMER MALFUNCTION

FAULT	CAUSE	SOLUTION / ACTION
Hammer does not start operating after tube change.	<ul style="list-style-type: none"> Excess oil drained down into hammer. Foreign particles in hammer. Hammer filled with water and mud, especially if drilling under water level. 	<ul style="list-style-type: none"> Lift off and flush. Add small amount of diesel to flush through if necessary. Pull out and inspect hammer. Pull out and clean hammer. Ensure that hole is clean' before uncoupling tubes for tube change. Ensure non-return valve is fitted to hammer or fit intertube non return valve, if drilling in deep water.
Hammer operates on the surface but fails to work when lowered into the hole.	<ul style="list-style-type: none"> Drill bit flushing holes blocked with clay, or debris whilst lowering into the hole. Lowering into soft clay or similar, thereby not allowing bit to be pushed up into the hammer. 	<ul style="list-style-type: none"> Inspect and strip if necessary. Increase rotation speed and perhaps thrust to force through soft ground, keeping full air on at all times and lifting constantly to flush. Water injection can be used to break up soft clay.
Hammer operates intermittently on surface test or down-the-hole.	<ul style="list-style-type: none"> Hammer parts worn, broken or seized. Hammer incorrectly assembled. Dirt or foreign particles in hammer. Excessive lubricating oil or other oil coming through the system. Excessive water in the compressed air. 	<ul style="list-style-type: none"> Strip, Inspect and service. Strip and re-assemble correctly. Strip, clean and re-assemble Check quantity of lubricating oil and for signs of compressor oil in the air line. Check moisture trap and water injection pump, if in use. Use antifreeze type oil - check for signs of Excessive water in system.
Hammer does not operate on surface test or down-the-hole.	<ul style="list-style-type: none"> Insufficient or no air reaching hammer. Hammer incorrectly assembled. Dirt or foreign particles in hammer. Retained oil or anti-sieze grease in hammer. Hammer parts worn, broken or siezed up. Blockage in shock absorber. Flushing holes in drill bit blocked. 	<ul style="list-style-type: none"> Check compressor operation Strip and re-assemble correctly. Strip, clean and re-assemble. Flush through hammer by lifting off the bottom of the hole. Add a small amount of diesel to the hammer to clear the oil. Strip, inspect and service. Unscrew hammer and check. Strip shock absorber if necessary. Clean out holes.

HAMMER MALFUNCTION

FAULT	CAUSE	SOLUTION / ACTION
Hammer deviates at the start of hole	<ul style="list-style-type: none"> Breakout table bushes not being used or ones in use badly worn. Mast not secured. Machine not stable. Jacklegs creeping due to slow loss of hydraulic oil. Obstruction at the top of the hole causing the hammer to deviate. Too high feed force (thrust). 	<ul style="list-style-type: none"> Fit or replace bushes. Secure mast. Ensure machine is rigid. Place wood blocks under jack leg if ground is soft. Ensure there is sufficient weight on jack legs. Repair jackleg. Remove any obstructions before drilling continues. Reduce feed force to correct level.

ROTATION

FAULT	CAUSE	SOLUTION / ACTION
Rotation stiff or stalls easily.	<ul style="list-style-type: none"> Excessive feed force. Collar or stone in hole, which is binding on the drill tubes. Drill Bit is worn. Hole has moved 'out of line'. Faulty rotation head. 	<ul style="list-style-type: none"> Reduce feed force to recommended level. Lift to flush clear. Pull out if necessary. Pull out and re-grind or renew drill bit. Re-align machine over hole carefully. Pull out if necessary. Repair of adjust rotation head.

VIBRATION

FAULT	CAUSE	SOLUTION / ACTION
Vibration / Squealing noises from the bore hole.	<ul style="list-style-type: none"> Too low a feed force. Too high a rotation speed. Difficult ground conditions. Drill Bit is worn out. Drill bit is broken in the hole. Obstruction in the hole. Loss of gauge on drill bit head. Metal particles in the bore hole. 	<ul style="list-style-type: none"> Adjust feed force to recommended level. Reduce rotation speed to recommended level. Drill carefully, flushing often and keeping feed force and rotation speed low. Pull up and re-grind or renew drill bit. Pull up and check. Pull back to allow obstruction to fall below hammer. Re-face gauge with die grinder. Pull out drill string and use magnet to retrieve particles from hole.

FLUSHING

FAULT	CAUSE	SOLUTION / ACTION
Flushing air insufficient for good hole cleaning.	<ul style="list-style-type: none"> Operating pressure at hammer too low. Too low a up-hole velocity. Collar or blockage in hole. Flushing air being lost in fissures. 	<ul style="list-style-type: none"> Check air pressure as near to hammer as possible. Check compressor operation. Dependant on possibilities: Increase air volume or air pressure. Increase drill tube diameter. Reduce drill bit diameter. Flush more regularly. Check for air leaks. Pull drill string up past blockage to clear collar. Drill slowly until beyond fissures. Flushing then returns.
Flushing of debris from hole reduces or stops completely	<ul style="list-style-type: none"> Collar or blockage in hole. No air to hammer. Build-up of debris. Ground water reached causing mud collar. 	<ul style="list-style-type: none"> Pull drill string up past blockage to clear collar. Check compressor operation. Lift and flush, pull up as far as required to resume flushing. Lift and flush, pull up to clear. If necessary Use foam, if available.
Flushing action of hammer not working when hammer lifted into flushing position.	<ul style="list-style-type: none"> Insufficient or no air reaching hammer. Hammer incorrectly assembled. Dirt or foreign particles in hammer. Drill bit not dropping into flushing position. Blockage in shock absorber. Flushing holes in drill bit blocked. 	<ul style="list-style-type: none"> Check compressor operation. Strip and reassemble correctly. Strip, clean and reassemble. Remove drill bit and chuck to ascertain cause. Unscrew hammer and check. Strip shock absorber if necessary. Clean out holes.

PENTRATION RATES

FAULT	CAUSE	SOLUTION / ACTION
Penetration rates low or zero.	<ul style="list-style-type: none"> Low operating pressure. Hole not clear. Blocked with drilling debris. Hard band of rock. Hammer blocked, parts worn, seizing up or broken. Drill bit excessively worn or broken. Too low a rotation speed. Excessive lubricating oil or water Injection being used. Faulty feed mechanism on drill rig. Large head of water in hole. 	<ul style="list-style-type: none"> Check air pressure at hammer and compressor operation. Check for air leaks in air line. Lift and flush, pull up to clear. Time the penetration rate over next two drill tubes and compare with expected penetration rate. Pull up and inspect. Pull up, check drill bit. Re-grind if necessary. Keep rotation speed to recommended level. Check quantities of both being injected. Check drill rig feed operation. Flush to see how much water in hole. Increase operating pressure to compensate if possible use foam to assist with cutting evacuation.

DRILL TUBE AND DRILL BIT OPERATION

FAULT	CAUSE	SOLUTION / ACTION
Drill bits difficult to strip due to tightness of chuck joint.	<ul style="list-style-type: none"> Too high a feed force. Bad ground requiring high torque. Insufficient anti-seize grease on thread 	<ul style="list-style-type: none"> Adjust feed force to recommended level. Drill through bad ground carefully keeping a clean hole. Use correct anti-seize grease on chuck thread when screwing in the drill bit and chuck.
Drill bit and chuck becomes unscrewed or lost in the hole	<ul style="list-style-type: none"> Hammering with no rotation, Reverse rotation or back-hammering Chuck or cylinder thread worn out. 	<ul style="list-style-type: none"> Always keep rotation to the right or clockwise when hammering. Renew chuck or cylinder or both.
Drill tube joints excessively tight especially the last few near to the hammer.	<ul style="list-style-type: none"> Excessive feed force. Collaring in the hole. Worn or broken drill bit. Insufficient anti-seize grease on thread joints. Excessive tightening when making-up joints with rotation head. 	<ul style="list-style-type: none"> Adjust feed force to correct recommended level. Flush regularly in order to keep hole clear. Pull out, re-sharpen or renew. Clean and re-grease all joints. Tighten sufficiently. Do not apply full forward rotation torque to joint.



United Kingdom

Halco Rock Tools Ltd
Armytage Road
Brighouse
West Yorkshire
HD6 1QF

Tel: +44 (0)1422 399900

Email: salesuk@halcorocktools.com

USA

Halco America LLC
2720 Fallon Drive
Sherman
TX 75090

Tel: +1 903 893 2300

Email: salesusa@halcorocktools.com



Halco Rock Tools
Quality Management System
is Certified to ISO9001:2008
Certification No. LRQ 0850659

V3. 2015