

OPERATOR'S MANUAL FOR HYDRAULIC DRILL RIG

COMPONENTS

1. The hydraulic power unit, driven by a Petrol or diesel motor, direct drive twin hydraulic pump arrangement for dual function control without slowing auger rotation.
2. The drill mast consists of a hydraulic motor connected to a planetary gearbox feeding 1 inch pitch duplex roller drive chain giving approx. 3000kg extraction force, or hydraulic cylinder feed both with chrome guided linear rods, (length of stroke as per customer's specification).
3. Adjustable hydraulic pressure knob to control and limit the down force on the feed so the vehicle will not be raised up whilst drilling.
4. Pressure gauge on control panel for calculating either auger torque or feed pressure, gauge line can be swapped between circuits behind the control panel.
5. Directional control valves and tilt cylinder with over centre valve and flow limiters.
6. The hydraulic motor and planetary gearbox for auger drive with 2" round drive to fit sub adapters or universal joints.
7. 50-60 litre hydraulic oil tank with sight gauge, breather cap, twin internal suction screens and spin on 10 micron filter on the auxiliary return line.
8. Atlas copco LH22 hydraulic soil sampling hammer when optional.
9. The support cylinders (outriggers or stabilizers available with single or dual cylinders), which are adjustable to suit vehicle height. They must be raised for on-road transport.



GENERAL SAFETY:

1. Hearing protection must be worn when operating this machine.
2. Safety shoes (steel-capped) must be worn.
3. Hard hats, long sleeving, safety glasses, gloves or other PPE. must be worn on sites requiring these.
4. STAND CLEAR OF MOVING PARTS, SUPPORT LEGS AND AUGER.
5. Lock safety guards, cages etc in place while operating, safety cages are only installed if specified by the customer.
6. Do not wear loose clothing which could get caught in moving parts of the machine. So make sure shirts are tucked in, jackets are zipped up & long hair is tied back.
7. Check for underground services. Make sure you do not use the machine near underground power, gas, water or telephone services. Dial **1100** where applicable.
8. Stand well clear and make sure other people are clear of support legs when raising or lowering.
9. Fuel should be stored in approved fuel containers.
10. Do not smoke near the machine or where fuel is stored.
11. Repairs and maintenance should only be carried out by qualified trade people.



ENGINE:

Read engine operating instructions and be sure you are familiar with the controls of the engine.
Refer to the original engine manufacturers booklet supplied with the drill rig for detailed instructions, specifications and servicing.

This machine is fitted with an emergency stop button, this is a push lock type button that kills engine power.

1. Do not fill the engine with fuel when the engine is hot; allow plenty of time to cool.
2. Always use a funnel and do not overfill or spill fuel.
3. Check the engine oil level daily before starting.
4. Keep well away from the exhaust system as it is extremely hot.
5. Check the engine for fuel or oil leaks and have it repaired before using the machine.
6. Check coolant levels if the engine is water cooled.



HYDRAULIC SYSTEM DAILY CHECK:

1. Check over the machine for any hydraulic oil leaks or weeps and repair where necessary.
2. Make sure hoses are not kinked or damaged at wear points. Inspect regularly and repair.
3. Check fittings, quick-release couplings and swivels, if supplied.

Note: Hydraulic oil becomes extremely hot and operates at very high pressure. It can penetrate your skin and cause serious injury, if a hose is found to be damaged it must be replaced immediately before operating this machine.

DO NOT GO NEAR ANY OIL LEAKS WHEN THE MACHINE IS OPERATING, TURN MACHINE OFF IMMEDIATELY.

PRE-OPERATING CHECK

4. Check hydraulic oil level. This must be filled toward the top of the sight-glass at all times because the oil tank is very shallow and it may cavitate and cause damage to the hydraulic pumps if too low.
5. Check engine oil and fuel levels daily.
6. Check all quick-release couplings and make sure they are plugged in correctly, if your machine is supplied with quick release couplings and the engine is started before plugging them in it is impossible to join them together, engine must be stopped and pressure relieved from the system.
7. Support legs must be used at all times otherwise vehicle damage may occur.
8. Check control valves are not sticky or seized before starting the engine.
9. Adjust chain tension on chain feed rigs so the chain is tight.
10. All pivot point bearings are fully sealed and do not require greasing.

NOTE: The mast has enough power to pull up 3 + tonnes. Severe damage to vehicle and machine will result if extracting the auger without the vehicle correctly supported by the legs.



OPERATING THE AUGER:

1. Set the choke to "on" position, turn the key to start position and let engine run for a few seconds, and then set the choke to "off" position. (on Honda petrol engines only).
2. Always let the engine warm up for a few minutes before setting accelerator to half-throttle.
3. Move tilt lever down carefully until mast is upright, the tilt cylinder is fitted with flow restrictors and safety over centre valve and should not be removed or altered.
4. Move lever down for support leg or legs, so that the support legs just take the weight of the vehicle. Be sure to stand clear and keep feet away when doing this.
5. Fit augers and cutting tips with D pins or bolt together and attach them to the 1 1/8 hex sub adapter. Do not drive the vehicle with augers attached, this will raise the vehicles



- centre of gravity and make it unstable or they can fall off and cause severe injury to your vehicle and other people.
6. Move feed lever down until the auger is in contact with the ground, make sure the auger point is centred in the correct plane to the drill rig mast.
 7. Set the throttle to desired rpm and move lever down for auger rotation and at the same time feed down by inching a little at a time, the drill rig is fitted with a pressure control valve which limits the force of the push down, this knob can be adjusted to set your desired feed pressure and not lift the vehicle off the ground when drilling (clockwise for more feed pressure anticlockwise for less feed pressure). The feed pressure will depend on how hard the ground is, i.e. in soft ground: feed down and auger rotation can be held full on until desired depth is reached, hard ground, the feed pressure must be backed off so the vehicle is not raising off the ground.
 8. When desired depth is reached, stop rotation and feed up. When auger is clear of hole, you can reverse rotation to spin off excess dirt from auger, remove the auger whilst in transit.
 9. Fold the Raise support legs and set engine revs to idle or stopped before moving to your next position.

MAINTENANCE:

The engine should be maintained and serviced according to the instruction sheet supplied by the original engine manufacturer as all engines have different service intervals and oil specifications.

It is important to keep the hydraulic oil clean, free from dirt, water or foreign matter.

Replace return line oil filter every 12 months.

The oil tank should be cleaned out and refilled with new oil every 12 months. This is done by unscrewing the bolts holding the lid to the tank. Lift the complete lid away from the tank. Remove and wash suction strainer and re-fit.

Clean out tank and refit lid using a bead of silicon sealant as a gasket.

RECOMMENDED HYDRAULIC OIL: Use high quality "68" grade hydraulic oil, such as Shell Tellus 68 or Castrol AWS 68.

TROUBLE SHOOTING:

ENGINE WILL NOT START:

1. Make sure engine is not low on fuel or oil, some engines are fitted with low oil level switches.
2. Check fuel is turned "on" where applicable.
3. Check emergency stop switch is reset to "on" position (rotate the red knob until it releases).
4. There is normally a fuse behind the engine control panel on the Honda engine to check.
5. Stale fuel that has been sitting for a long period will cause the engine to not start, or on diesel engines the injectors may have to be bled.

HYDRAULIC FUNCTIONS NOT WORKING:

1. Check hydraulic oil on sight level gauge on hydraulic tank, pumps would be making noise if oil level is low.
2. Make sure all hoses are connected properly and not damaged.
3. Check couplings and make sure they are plugged in properly.
4. Check system operating pressure on the gauge and take machine for servicing if there is no system pressure, no pressure could be the pump drive coupling failed, pumps have excessive wear or pressure relief valves stuck open or broken springs.

THE HAZARDS

Drill rigs are large, heavy and generally slow moving units. They are complex machines and their operation requires high levels of knowledge and skill. The safe use of a rig is heavily dependent on competent operators and a high standard of maintenance.

Some hazards associated with drill rigs are:

1. noise
2. rig stability
3. moving and rotating machinery
4. manual handling of drill rods, bits and other heavy equipment
5. stored energy (high pressure air and fluids)
6. falling objects
7. exposure to dust, mud, aerosols and gases
8. working at height
9. intersecting a drill hole containing an unexploded charge, underground services including power cables, communications, gas or water mains.

WHAT CAN HAPPEN

Permanent hearing loss can result from inadequate noise management.

Moving a rig with a raised mast may cause crushing injuries or death if the rig topples on an uneven or unstable surface, the rig can contact an overhead obstruction, such as a bridge, tree branch or power line, and topple.

Contact with power lines can result in electrocution and the destruction of the rig by fire.

Loose clothing or uncovered long hair can become caught in rotating or moving machinery, resulting in serious injuries.

Manual handling of heavy equipment can cause musculoskeletal disorders or result in crushing injuries

Air and hydraulic hoses damaged by misuse or poor maintenance may fail, causing uncontrolled movements of heavy components.

Dust and aerosols generated by the drilling process can have long-term health effects if excessive levels are inhaled or the material is hazardous (e.g. fibrous minerals)

Drilling into a previous hole containing power cables, gas or water mains, fiber optic or an unexploded charge will result in serious damage and possibly death.

If a drill intersects a pocket of gas or other contaminants, it may become dangerous to keep operating.

Restricted visibility from the cab increases the possibility of collisions with other equipment.

A drill rig can become stranded if poor planning, control or supervision result in it being located behind charged holes or other obstacles, making recovery a hazardous operation.

Working platforms and walkways on drill rigs are usually elevated, and sometimes slippery, and falling or jumping from them can cause injury.

Mounting and dismounting a rig onto rough ground underfoot can result in serious leg and ankle injuries.

SAFE WORK PRACTICES

1. Only authorized and competent operators should operate and move drill rigs.
2. Before moving a rig, make sure that you will not endanger other people by doing so.
3. Be aware of overhead hazards, especially power lines.
4. Never move a rig with the mast raised, except when moving between drilling positions on level, competent ground.
5. Carry out thorough pre-start checks to identify potential component failures.
6. All rotating and moving components must be guarded to Australian Standards.
7. Ensure people working near rotating machinery do not wear loose clothing and do not have sweat cloths or cleaning rags loose on them.
8. Long hair should be tied back or netted when working near rotating machinery.
9. Always use the correct rod handling equipment.
10. Ensure safety hand rails and harness are adequate for the operation
11. Ensure the dangers of hole pressurization and blockage issues are advertised and controlled.
12. Provide detection equipment and safety procedures if it is possible that gas may be encountered.
13. Specify maximum noise levels allowable when purchasing any equipment.
14. Display noise warning signage and wear hearing protection in designated areas.
15. Always wear a respirator or mask in areas where exposure to dust or hazardous substances is high.
16. Never jump on or off any part of a drill rig. A safe means of access should be provided.
17. Establish a procedure for the safe removal and fitting of the drill string.
18. Use purpose-built tools, not Stilson-type wrenches, to break out the thread or D pin of drill rod and other components.

WARRANTY:

This machine is covered by a six months' warranty on faulty workmanship and all hydraulic and associated components are covered by the various manufacturer's warranties. Honda has a 3 year Engine Warranty.

IF YOU HAVE ANY PROBLEMS, PLEASE CONTACT CHRISTIE ENGINEERING.

