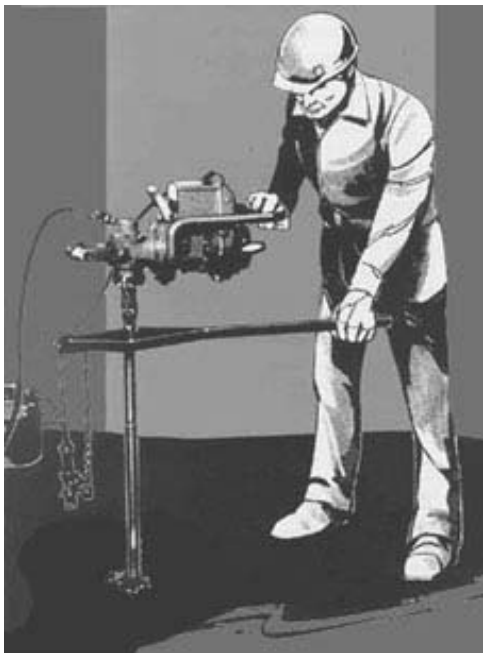
Operating Manual for Model 4-M Packsack Diamond Core Drill



The operation is a very simple, and to secure the best results the driller should familiarize himself with unit by drilling a shallow hole at his shop location before going into the field. The machine is durable and will give trouble-free operation, **if the instructions are followed fully.**

Fuel Mixture:
Thoroughly mix ¾ of a pint of 2 Cycle oil with each gallon of regular grade gasoline. Strain the fuel mix through a filtered funnel into the five-gallon gasoline tank. Connect one end of the fuel line to the tank and pump the ball on the gas line. Before connecting the other end of the gas line to the engine, bleed out all the air from the line. This is done by pressing in the ball on the connector until the gasoline flows freely from the connector. Then make your connection to the engine and pump the bulb again to get fuel into the carburetor.

Starting the Drill Motor:
Place the choke lever to choke position (straight down). Turn on the ignition switch, and pull the starter cord until the engine fires. After the first firing of the engine, turn the choke to off position (horizontal with the carburetor). The motor should start on the first or second try as the carburetor is adjusted at our factory. It may be necessary to adjust the settings of the carburetor from time to time because of vibrations, elevations and atmospheric conditions.
Be very careful when making carburetor adjustments, as too lean a mixture can cause internal damage or a burnt-out engine.
Avoid flooding the engine and do not use naphtha or high-test gasolines. Use a good grade of 2 cycle oil designed for two-cycle air cooled engines.

Staring the Pump Motor:
Check the oil in the crankcase and make sure that it is at proper level. Fill the gasoline tank with **regular grade gasoline,** (no oil mix). Pull out the choke, and pull the starter cord until the engine fires. After the first firing, push in the choke, and if necessary pull the starter again and the engine will run. Choking required only when the engine is cold.

Water:
The drill must be operated with water passing through the bit. Water cools the bit and removes the cuttings from the hole. Clear water should be used, as sand in the water will soon ruin the working mechanism of the pump. If using a pump and re-circulating water a settling tank is required.

Connecting the Water Hose Lines:
Connect the intake house and screen to the male hose filling on the front of the pump just below the gasoline tank. Connect the by-pass hose to the valve on the side of the pump. The supply hose to the drill is connected to the male house fitting beside the valve, and to the female hose fitting on the valve of the transmission assembly.

If the water supply is limited and has to be conserved, turn the by-pass valve on at the pump and allow the water to return to its water barrel or sump.
In average formations, as little as one gallon of water per foot will be sufficient to cool the bit and clear cuttings from the hole. In soft formations more water will be required. Full capacity of the pump is rarely needed, except when drilling with casing where volume rather then pressure is the more important.

Starting the Hole:
Thread the diamond bit to the reaming shell, the reaming shell to a two foot core barrel with head, and connect to the transmission adapter. Tighten the joints thoroughly.
Start up the pump and adjust the water valve on the transmission, allowing a small flow of water through the bit.
Hold the drill in the left or right hand and start the engine. By placing the assembly between the feet (or using a board with a hole the size of the template bit drilled in it as a guide) drill a hole approximately 6" deep and remove the core, place the eye bolt in this hole and tighten securely. Start the drill hole approximately seven inches away from the eye bolt, using the previously described method. Drill into the rock sufficiently to prevent the bit from wandering, shut off the drill and lift the assembly out of the hole and place the jo-bar in position.
The two hooks on the transmission are placed in the eye rings of the jo-bar; the chain of the eye-bolt is passed over the ratchet on the front of the bar. Start the engine again, and re-align the drill to the desired angle.
Pressure is applied on the jo-bar to advance the bit. Release the throttle of the engine and make sure the rods have stopped turning before releasing the jo-bar. During the first two feet the drill should be carefully held in line with the hole. Apply a thin layer of drill rod grease to the rods and core barrel to prevent excessive wear and vibration.
Only moderate pressure should be applied to the jo-bar. Warranty becomes void if excessive pressure is applied to the jo-bar resulting in bearing and clutch failure.
When larger than XRT sized rod, and XRP core barrel is used, extreme caution should be taken not to overload the machine.

Clutch:
The drill has a centrifugal clutch which, when rotating, applies pressure to the drum of the transmission, and in turn revolves the rods.
Care should be taken against slipping of the clutch. Some clutch slippage cannot be avoided, but excessive slipping will cause overheating, and burn the linings. The transmission should be removed from the engine periodically and checked.

Blocking and Fishing:
When the motor begins to labor with poor advance, core has become blocked in the barrel. Often a jumping action can be noticed by the operator. If the core barrel is full, drilling should continue until a kick or quick slowdown of the motor is noticed. The rods and core barrel must now be taken from the hole and core removed.

If a kick or quick slow-down occurs before the barrel is full, immediately stop the engine, pull the rods and take out the core.
If a block isn't achieved, and the core is left in the hole, the core fisher is attached to the barrel in place of the bit, and the rods are lowered back into the hole to recover the core. Occasionally the fisher will have to be taken up to remove some of the lost core and then replaced in the hole to pick up the balance.
Drilling can be continued once more after all core is extracted from the hole. **It is most important not to run over loose core in the hole because it will damage the bit.**
In some formations where the rock is fractured, the core will block quite often, sometimes with only a few inches in the barrel. This must be removed, or grinding of core or bit damage will occur.

Rods and Core Barrel:
A 2-foot starter core barrel purchased with the drill should be used for starting the hole. A 2-foot run is made with one of these barrels and the core is removed. Add a 2-foot rod to the same barrel and drill another 2 feet. Remove this core from the hole, and then use the 5-foot rods in the hole.
For Example: When the hole is 15 feet deep, there will be the 5-foot core barrel, two 5-foot rods in the hole, and five 2-foot rods on surface, ready for advancement. For deeper holes in solid formations a 5 ft. extension may be added to make up a 10 ft. core barrel.

"Secrets to Successful Operation"

1. Mix the gasoline and oil thoroughly before straining it through a filtered funnel into the tank. Also make sure that it is clean and free of water. **NEVER us a chamois to filter your gasoline and oil mix.**
2. When a new machine is put into operation, it should be used only for a few hours and then completely checked over for parts that may have vibrated loose, and minor adjustments should be made for top operations.
3. **To prevent air lock in the tank,** tighten the gasoline cap to the first notch only.
4. Apply only a thin layer of grease to the rods and core barrels.
5. Always keep the machine in line with the jo-bar, and do not operate the unit if it is vibrating excessively.
6. Do not use damaged or bent drill rods and couplings.
7. Replace the diamond bit when it ceases to cut and replace the shell when it becomes undersize.
8. Use water pump grease only in the grease cups of the pump assembly. Before each day's operation, check the grease content of the transmission, and use only a good grade of transmission grease, when needed.