OPERATING MANUAL

AND

PARTS LIST

WINKIE DRILL

MINEX

WINKIE DRILL MANUAL

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WINKIE DRILL

GW-15

WHEN ORDERING PARTS PLEASE GIVE:

1. Model of Drill
2. Serial Number of Drill
3. Part Name
4. Catalogue Reference Number
5. Quantity Required
6. When ordering parts for engines, pumps, winch, etc., always include the PART NAME and the NAMEPLATE READING of the unit
7. Shipping Instructions

NOTE: All prices F.O.B.

WINKIE DRILL ASSEMBLY PARTS MANUAL

WINKIE: THE MOST OUTSTANDING BUY IN ITS FIELD:

Meet a pint-size powerhouse, driller's drill, ready to rewrite your footage costs with its nine (9) outstanding features.

Lower Maintenance – Maintenance costs are reduced over the conventional core drill, resulting from minimizing the moving parts, and having only three precision machined analoy castings in the drill itself.

Lower Moving Costs – Setup and moving costs are very low. Savings may be made with carrying the Winkie Drill to the site, in lieu of building roads.

Lower Labor Costs – Labor cost may be cut by 50% through using only one man to operate the Winkie. Save by not building roads for the portable carry-in-hand Winkie.

Lower Fuel Costs – Fuel consumption under full load is approximately 3 to 4 gallons per drilling shift.

Lower Diamond Bit Costs – Dynamic balance in this drill means less rod vibration; thus, less drill rod and corebarrel wear, and most important, LESS DIAMOND BIT COST.

High R.P.M. – High Speed bit rotation plays a very important role in reducing bit cost, in addition to yielding a greater daily footage. It is recognized that diamond wear is reduced as speed of rotation approaches 700 RPM, above 700 RPM, and up to Winkie speed of 2000 RPM.

Less Handling of Tools – The overhead principle drive on the Winkie allows as great as 3 foot runs without rechecking on the drill rod. Compare chucking time of 36 inch strokes for the Winkie, against conventional drills with 24 inch strokes.

Less Water Required – Drilling with the minimum water requirements is the best policy with the Winkie.

Experience – No experienced Diamond Drill Operator is required. A minimum of instruction is required.

Plus these added features –

- Full 10 H.P. 2 cycle gasoline engine. 6000 RPM.
- Torque resolving safety clutch.
- Built-in water swivel with adjustable packed type water seal.
- Vacuum carburetion system to allow continued operation of the engine at any conceivable angle.
- Circular holding ring (for protection of the unit and complete selection of gripping areas.)
- Hardened spur gears for quieter, smoother and longer operation.
- Water-cooled gear box.
- Recess mounted bearings designed with a safety factor of "3".
- Unipress mechanical pull down pressure feed.

DESCRIPTION OF WINKIE DRILL

The Winkie drill is a lightweight portable core drill. The drill was designed to recover 1" cores to a depth of 450'. In some formations, cores up to 2 1/8" diameter can be recovered to lesser depths. A lightweight water pump is used to circulate water to remove the cuttings and to cool the bit. Diamond core bits specially designed or selected are used to cut the rock. In some softer overburdens, drag bits can be used to put the hole down to solid material.

APPLICATIONS

The principal applications of the Winkie are:

1. **Exploration –** core samples desired for mines and quarries.
2. **Probing –** to find depth to rock for foundation or other testing.
3. **Highway Sampling –** concrete cores recovered for testing pavement.
4. **Masonry Drilling –** cutting holes through reinforced concrete, brick; for conduits, pipes, etc. used by public utilities, industrial plants, refineries, maintenance work, etc.
5. **Grout Holes –** drilling holes for the purpose of grout injection. After the grouting has been completed, a series of holes can be drilled to produce cores showing the effectiveness of the grout.
6. **Marine Blast Hole Drilling –** in certain applications, due to its portability and principal overhead direct drive the drill can be operated from an inexpensive boat or raft.
7. **Underwater Drilling –**

Remember, the Winkie Drill is the smallest and lightest weight patented gear shift drill of its type on the world market.

Limitations

The Winkie drill cannot be used to produce cores in gravel, sand or silty clay formations. It is not designed to compete against jack hammers for production drilling. Its principal application is where cores are primary and hole is secondary. However, in some cases, such as drilling holes for parking meters, the hole can be drilled to required diameters. With jack hammers, a rough hole by comparison is drilled. As you see the Winkie work, more ideas for its application will be uncovered.

COMPONENTS OF THE WINKIE DRILL

The drill itself consists of 3 assemblies: (1) Engine (2) Transmission (3) Unipress

1. Engine – 10 HP, 2 cycle, air cooled gasoline engine. Easy starting with a nylon cord recoil type starter. A vacuum carburetor system allows drilling "up" holes or at any angle. The engine is mounted with its drive shaft vertical so that it drives directly into the transmission.

2. Transmission Assembly – The transmission contains the clutch, gear box and water swivel. The engine shaft, through a splined connection, drives the centrifugal clutch. As the engine speed is increased past 900 RPM, the clutch shoes are thrown out and engage the clutch drum which rotates the input shaft to the gear box. If the engine speed should be reduced to lower than 900 RPM, the springs on the clutch shoe will pull the shoes away from the inner drum surface and, of course, power to the drill rods is removed.

3. Unipress – The Winkie Unipress enables the operator to exert a steady pressure with a minimum of exertion. Fatigue of the operator is reduced by 50% or more, contributing to more economical operation.

4. Water System – Circulating water through the drill rods down to the bit is required to wash out cuttings, cool the bit, and to keep the core from sticking. For this purpose, an engine-pump unit complete with hoses and water by-pass system is offered.

The pump is a JKS – BRONCO "8" – 7/8 stroke 1 ½" bore – two piston progressing cavity positive displacement 8.2 U.S. GPM at 400 PSI. Since the pump runs constantly with the engine, a pressure valve relieves pressure on the pump, if for any reason, the bit or rods become clogged.

A ¾" x 20' 4-ply pressure hose with fittings and shut-off valve, and a 1" x 15' 3-ply suction hose with fittings, foot valve and strainer are part of the water system unit.

Of course, a water supply is necessary. For Masonry drilling, city water is convenient. For field work, it may be necessary to use a water tank or drum for the water. If the formation is solid enough, it may be convenient to recirculate the water from the hole to the tank. In this case a "T" joint on top of the casing is required to direct the water to the tank.

BRIEF HISTORY OF DIAMOND DRILLING

Modern Diamond Drilling dates back to the year 1862 when a Swiss named Jean Rudolphe gave birth to the idea of mounting diamonds in the periphery of a tube to cut cylindrical core of rock. Even before this time, recorded history shows that as far back as 2000 B.C., the ancient Egyptians were using tubular drills to assist in building their pyramids.

The first steam-powered drill was built in 1862-63. By 1870, steam drills with RPM as high as 360 and 5 to 7 horsepower were being used. Through the years, marked improvements have been made in Diamond Drills and their accessories, paralleling the ever-increasing need for rock sampling in hard formations.

The introduction of the Winkie Drill was a major step in Diamond Drill development . It offers, for the first time, portability with Winkie drilling capacities, presently associated with drills ten times the Winkie's weight. But the Winkie costs only a fraction of other drills.

To get better core recovery in soft formation, it is a known fact in the Diamond Drilling Industry that larger diameter holes have to be drilled. However, the Winkie Type Drill, with its high RPM and faster penetration

using less circulating water, has proven to be the first in various fields to get a larger percentage of core recovery, drilling smaller diameter holes than the conventional drill.

For instance, on one drilling project using conventional Diamond Drills, the core recovery in the coal seam was practically nil using double tube core barrels. The Winkie Drill was used on the same project with a single tube core barrel. It recovered 29 ¾" of coal cores from a 32" seam.

The standard Diamond Bit sizes used are the following:

**IEW - 5 (1.5" hole – 1" core)
**AW - 34 (1.89" hole – 1.32" core

The mining series Thin Wall Diamond Bit allows faster penetration and uses less water to carry up the cuttings. The automatic safety clutch on the Winkie Drill permits the use of thin wall bits to be run with a minimum supply of water without the worry of burning an expensive Diamond Bit.

TECHNICAL INFORMATION

DRILLING PROCEDURE

First of all, drill must be securely anchored.

Starting the Drill Hole

Starting on Rock Surfaces:

A. Use a short core barrel ranging between 1-1/2" to 2' often termed the starting barrel. This barrel is a single or double tube barrel. Drill the starting barrel at least 4" to 6" into the rock.

B. If using a whole stone straight wall bit (a bit without a core spring), dry block. Dry blocking with impregnated bit will significantly reduce bit life.

1. Shut off the water supply and
2. Run the drill at half throttle, at the same time applying pressure to bit.

The machine will automatically stop when the bit has dry blocked (wedged the core in the face of the bit with rock dust). With a core spring, the bit may be drawn off the bottom and the core will remain in the barrel in the event the core may be left in the hole, a core fisher with springs is attached to the core barrel to fish the lost core. Do not rotate the core fisher.

Starting with Soil Overburden:

I. The soil must be stabilized either by casing or drilling mud preceding the initiation of core drilling. Casing may be either drilled into the soil or driven until it is well seated into the rock.

II. Assuming casing has been advanced to rock surface; the casing must be well cleaned out to free it of all foreign matter (mud, gravel, etc.) except water. This is accomplished by a chopping and washing or fishtailing procedure.

A tungsten carbide drag bit, adapted directly to the drill rods, can be used to put down a pilot hole with the WINKIE, and give the operator an estimate on the depth of overburden and amount of casing required to case the whole to solid formation. After a solid formation with the drag bit, adapt the diamond or tungsten carbide casing shoe to the casing and repeat the same operation, as when drilling with drag bit, but use the casing and rotate it down the pilot hole made with the drag bit. When this performance is completed, adapt the core barrel with diamond and reaming shell to drill rods and start coring.

It is also possible to adapt the diamond or tungsten carbide casing shoe to the casing and rotate the casing into solid formation without a pilot hole. When solid formation is encountered, just leave the casing in the hole as the core barrel will pass through the casing shoe.

If core recovery is required in soft shale formation, a tungsten carbide core bit can be used as well as a large stone diamond bit. It is not possible to take a core in clay, sand or gravel, and never attempt to use a diamond bit in the above formations as it will wear and destroy any expensive diamond bit.

III. Now, lower the tools to the bottom of the hole in this order:
(Bottom to top)
   A. Diamond bit and reaming shell
   B. Core Barrel
   C. Drill rod or rods

IV. Connect the Winkie to top of the drill rods and follow the drilling procedure as outlined in steps A, B and C in the discussion proceeding on starting on rock surfaces.

TROUBLE INDICATORS

Blocked Bit

The drill engine automatically slows down, indicating that the core barrel should be withdrawn and the core emptied.

Blocked Core Barrel

A. A blocked bit usually shows itself by first a refusal to penetrate and secondly a bumping of the tools as they rotate, commonly called a “kick”.

NOTE: One of the best methods to gauge the rate of penetration is to mark the drill rods with driller's chalk. When the drill rod rotates, these rings will disappear below the collar of the hole as the bit penetrates.
Always keep very close record of measurements.

This is important to your logging procedure.

NOTE: If drilling is continued when the core barrel is blocked, it ordinarily results in grinding of core, in turn, causing a decrease in core recovery and excessive wear on the diamond bit.

Continued Blocking of the Bit

A. Check to see that a free flow of water is reaching the bit. Often times the drill rods are obstructed with clay, gravel, etc. Also check your diamond bit for inside gauge. It is possible the used bit may cut a larger diameter core than the core barrel will admit.

B. Possibly an insufficient water pressure is being used. Refer to the pumping chart to establish volumes for various size drill holes. In order to attain these volumes, a positive pressure must be maintained.

C. Dented or bent inner tube may cause blocking.

Causes of Vibration (Not necessarily in order of importance)

1. Lack of rod grease.
2. Excessive feed rate or pressure.
3. Drilling over or grinding core.
4. Incorrect water pressure and volumes.
5. Bent rod drills.
6. Incorrect size of rods, and core barrels in relation to the size of the hole.
7. Drill bits too dull.

ROTATIONAL SPEED VERSUS LINEAL TRAVEL

Do Not confuse RPM with the actual lineal travel of a diamond. A diamond on the outside cutting edge of an EW (1-1/2" dia.) bit at 1000 RPM travels 393 feet per minute. An AW (1-1/8" dia.) bit has a peripheral speed of 491 feet per minute. A BW (2-3/8" dia.) bit has a peripheral speed of 622 feet per minute. A 6-1/2" dia. bit has a peripheral speed of 1636 feet per minute. When the diamond bit is not in use, protect it and do not use it as you would a pipe wrench; it is valuable and will serve you better if used properly. Never drop your rods on the bottom of the drill hole; this will damage your bit.

When changing from old to new bits, use caution in lowering the rods in the hole, and it is a good practice to ream the last to or three inches, just in case the old bit lost some gauge which would cause a new bit to get wedged and also damage outside stones. Never wrench your drill rods down a tight hole. This is bound to damage your outside diamonds.