BEFORE you drill for the first time ...

Please READ and UNDERSTAND this IMPORTANT INFORMATION regarding WINK Drill Rod and it's thread design. If not, you run the risk of destroying hundreds of dollars worth of gear in mere seconds.

The Wink thread system is designed with deeper threads and more threads per inch than conventional drill rod. It is also designed to thread loosely until the shoulders of the parts meet. The Wink threads gain their strength when they are positively locked by clinching or applying torque to the joints after the shoulders have butted together. This solid, positive lock on the fitting is necessary to transfer the vibration and power of the drill down the drill string.

... be sure you understand how to lock the threads together.

1. The fitting should thread together easily. The threads should freely engage fully until the shoulders of the fittings meet. If the threads do not freely engage all the way — clean them and check for wear. A file may be needed to remove burrs or small deformation. If the shoulders do not meet, the fitting will not lock properly — remove the damaged fitting from service.

2. With the threads of the two fittings fully engaged, and the shoulders butting, use the pipe wrenches with the snipes (cheater bars) to clinch the joint. This needs to be done to each joint in the drill string.

Q. So ... what can go wrong? A. The joint can come loose while drilling.

Reaction: If a joint becomes loose, a distinct sound will be heard and the full power of the drill will act against these loose threads. "Spalling", very rapid heating (glows bright red), 'vaporizing' of the steel (the steel particles are so finely shattered that they float out of the joint in a fine cloud) or the steel could completely break — all in just seconds.

Result: It will probably take hours to disengage these two pieces from the drill string as they somewhat 'weld' together (they may have to be cut out). If you don't have replacement parts, you are done for the day or more, depending on access to replacement parts.

Cost: Actual cost of the fittings that were lost, the time to remove the damaged parts, and you might be shut down if you don't have the replacement parts. This could easily amount to thousands of dollars lost.
Prevention:

1. Understand how and why these joints couple this way. Check all threads before coupling, dirt, ice, metal burrs on the threads can all interfere with the tightening of the threads. This can make the fittings hard to tighten — keeping the shoulders of the fittings from butting together properly to make the positive joint. It may appear that you have tightened them as per the instructions, but if the shoulders of the fittings are not properly butted together and torqued or clinched—the joint will come loose.

2. Use the tools in your tool kit to prevent this. Wire brush will clean the threads. The file will remove any burrs. Rags may be needed to clean mud from the threads. Store the fittings with care so the threads do not get dirty. Some jobs are done in dirty environments; the driller must take responsibility for the conditions and make arrangements (extra supplies, etc) to ensure the equipment can be operated, cleaned and stored properly.

3. 'Watch and listen carefully' When you start drilling watch the threads above ground to be sure they are not loose and listen for abnormal sounds. By the time you have drilled the first length into the ground, the joints that are out of sight usually have proven their lock and don’t often come loose below ground.

4. Always have a man on the throttle at the engine, if the driller identifies a problem — stopping the engine quickly may save the joint.

5. Don’t start the power plant if you are not sure the joints are locked. If not sure—unthread the joint, clean it, and thread it again. The piece may be worn and no longer serviceable. Don’t 'try' it if it didn’t couple properly — take it out of service.

6. When turning the drill head, always turn in a **clockwise direction**. This is the direction that tightens the joint threads. Turning the drill string counter clockwise could loosen a threaded joint in the drill string.

This equipment is constructed from high quality appropriate materials designed to operate under the normal conditions of Vibracore Drilling. Considerable life can be expected from this equipment. Ensuring that the drill crew is operating the equipment properly will prevent unnecessary damage to drill rods and accessories.

This equipment is extremely powerful and **often underestimated** in its abilities—due to its size. The fact is that it has the power to destroy the carbon steel components in seconds (when not properly installed) cannot be overstated. It is extremely unforgiving. On the other hand, this same power will deliver amazing results. **The WINK Vibracore Drill will very quickly expose operator error and will also reward a conscientious crew with incredible capabilities and solid results!**
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10. Parts list and numbers
Section-1 Drill Head
Drill Head 1.

DAILY MAINTENANCE

- Watch for loose connections, drill head caps, etc. Clean dirt, moisture, grease etc. after daily use. Listen for sound changes while drilling, this will alert you to loose fittings or drill rod connections.

The following procedure should be performed approx. every 100 hrs

DRILL HEAD – INSPECTION- (bearing replacement if neccessary )

1) Clamp Drill Head upright in a sturdy vice and place a container to capture oil. (fig.1) Remove End Cap (B), Using Cap Wrench (J) (fig.2). Remove threaded Drive Cap (A) from Drill Head to gain access to the Eccentric assembly and related parts. (fig.2)

2) Check Oil captured in container. There should be approximately 44ml (1.5oz). Check oil for any particles such as brass or steel filings: - if filings are present check- Bearings (C), Eccentric (E) (fig.12), and Oil Seal (K) (fig. 7a,7b,7c).

3) Pull out the Eccentric Assembly with the Drive Bearing (C) by grasping the Driver Shaft (D) and pulling outward. (fig.3) The lower or End Cap bearing (C) will remain in Shell. Remove lower bearing from the End Cap side (fig.5)

4) Inspect bearings (C) for wear or damage. Replace Bearings and Inner Bearing Races (F) if required. Remove Retaining Bolt (G), Driver Shaft (D) and washers (H) to replace bearing races. (fig.8) Use milled flat surfaces on Driver Shaft for wrench application (fig.9)

5) Inspect Oil Seal (K) (fig.7) the oil seal should be intact and should retain its integrity. If the oil seal needs replacement refer to Drill Head 8. Oil Seal Replacement.

6) Inspect the Driver Shaft (D) for wear. For example, the square receptacle for the Flex Cable should not be rounded. Inspect eccentric for abnormalities.

7) Re-install lower bearing and End Cap (B). Tighten using Cap Wrench (J) and hammer. Tilt drill head in vice so that it will receive the oil. Pour oil in shell. (fig.10). When the drill body is held upright, 1.5 ounces of oil will almost cover the roller bearings of the lower or End Cap bearing (for reference ).

8) Re-install the Eccentric assembly with Drive Bearing (C) (fig.) sliding it in the way it came out (fig.3) and ensure it is well seated into the bottom bearing.

9) Replace the threaded Drive Cap (A) over the Driver Shaft and tighten onto the Head Shell using the Cap Wrench (J) and a hammer. (fig.11)

10) Drill Head is ready for use.
Drill Head 2.

Fig. 1

End Cap - B) Removed Capture Oil
Drill Head 3.

Fig. 2

Notes: Use hammer on Cap Wrench to loosen and tighten Drive & End Caps

Cap Wrench - J)

Drive Cap - A)
Drill Head 4.

Fig. 3

Notes:
Pull Eccentric assembly straight out

Eccentric Assembly
Drill Head 5.

Fig. 4

Notes: Eccentric with drive bearing and driver shaft removed. Lower Bearing is removed from opposite end.

Drive Bearing - C)

Driver Shaft - D)
Drill Head 6.

Fig 5.
- End or lower bearing is removed/installed from End Cap side of head
- Be sure bearing is seated correctly when installing
Drill Head 7.

END CAP/DRIVE CAP "O"-RING REPLACEMENT
1) Using a Pick tool, remove "O"-Ring from Drive and End Caps
2) Inspect and replace if required.
3) Be sure the seat groove is clean and lightly oil the ring before placing.

Fig. 6

![Drive Cap "O" Ring]
OIL SEAL REPLACEMENT

If, during inspection of the Head, as per Daily Maintenance Procedure, there is evidence of Oil Seal deterioration, replace as follows:

1) Remove Oil Seal (K) from Threaded Drive Cap (A) by tapping the Seal (K) towards large opening in threaded Drive Cap (A).

2) Insert new Oil Seal (K) into the Threaded Drive Cap (A) with the numbers facing toward you. (Fig. 7b, 7c)

3) Carefully tap Oil Seal into place. Use a large Flat Washer and a dead blow hammer. Do not damage while doing so.

Fig. 7a
Drill Head 9.

Oil seal Replacement - continued

Fig. 7b

Fig. 7c
Drill Head 10.

Fig. 8

1) If Removing Retaining Bolt and Driver Shaft
2) Clean Lock-Tight residue from threads
3) Use Lock-Tight when reassembling, on Retaining Bolt and Driver Shaft threads
Drill Head 11.

Fig. 9

- Use a socket and a crescent wrench to tighten/loosen Retaining Bolt and Driver Shaft
- Driver Shaft has **Milled Slots** for wrench application
Drill Head 12.

Fig. 10, Adding oil

1) With lower bearing and End Cap in place
2) Tilt Drill Head to the side to accept oil
3) Pour 1.5 ounces oil into shell (44ml)
4) Re-install eccentric assembly and driver cap
Drill Head 13.

Fig. 11

Notes: Always ensure Drive and End Caps are tight.
Drill Head 14. Parts

Fig. 12
Section-2  Power Plant
Power Plant 1.

POWER PLANT INSPECTION

1) Check oil level in Engine.
2) Check fuel level in Engine.
3) Check Clutch assembly by removing Clutch Cover (fig.13) ensure Clutch is firmly bolted in place.
4) Check ‘V’ belt for wear and tension. Belt should be tight with approx. \( \frac{1}{4} - \frac{1}{2} \) inch play. Check by lifting up on belt with finger, (fig.14)
5) Check Jack Shaft assembly (fig.15) All bolts, Locking Pin are tight.
6) Check Square Cable End Receptacle ensure is still square (fig.15)

For full detail on engine inspection, consult the **Honda Owner’s Manual**

LUBRICANTS

We recommend the following:
1) For Vibracorer Head – ESSO Nuto A 10, or equivalent high temperature oil.
2) For Flex Shaft Grease - ‘A’ complex with paratac (Red Ram) or equivalent high temperature grease.
3) For Honda engine - see Honda Owner’s Manual
Power Plant 2.

Fig. 13

1) Remove Clutch Cover (4 bolts) to inspect Clutch
2) Inspect “V” Belt for wear and tension
Power Plant 3.

Fig. 14

1) Check tension, movement should be $\frac{1}{4}$ - $\frac{1}{2}$ inch.
2) Ensure Clutch Bolt is tight
Power Plant 4.

Fig. 15 Jackshaft

1) Ensure Locking Pin is tight
2) Ensure Square Receptacle is not rounded
3) Adjust belt tension if required
Power Plant 5.

POWER PLANT SERVICE & Notes

ENGINE

1) Crankshaft oil should be changed after first 20 hours of use. Thereafter, change oil every 300 hours.
2) Clean spark plugs every 100 hours.
3) Always wipe down engine after use.
4) Shut fuel flow valve off when not in use.
5) Drain the fuel from tank if putting engine out of service for a long period.
6) Operate engine on level ground.
7) Do not “bottom out” pull cord when starting.
8) For full detailed information on engine, consult the Honda Owner’s Manual
Section-3 Flex Cable

Available - 16' (4.87m) or 21' (6.4m) lengths
Flex Cable 1.

FLEX-CABLE INSPECTION
1) Daily visual inspection, (Fig. 16) check the Outer Casing (C) for wear or damage. Check inner Core end (E) (should be square and not rounded)
2) Quick Coupler (A) and Casing Adapter (B) may be unscrewed from the ferrules (if deemed necessary) so that the inner Core (E) may be removed for inspection for damage and/or lack of grease.
3) Examine Flex Nut (F) and ensure threads are clean.
4) Ensure that Quick Coupler (A) and Casing Adapter (B) are firmly tightened into their respective Ferrules (D).

FLEX-CABLE ASSEMBLY - OVERHAUL
1) It is recommended that the Flex-Cable Core (E) (Fig. 16) be removed from the Casing after 100 hours of use, and lubricated.
2) The Inner core is removed by way of the Quick coupler end (A) by disconnecting (A) from the Ferrule (D). The Inner Core is then pulled out.
3) Wipe off the grease. Apply a thin coat of Red Ram special compound, or equivalent high temperature grease, to lubricate the Flex-Cable Core (E). Note: Do not over-lubricate as this will tend to cause excessive heating in use.
4) Care and installation: Never kink a Flexible Cable, in shipment, installation or operation. When installing core, be sure that the proper relationship between core and Casing length is maintained. Do not cramp the Core into the Casing. Be sure that the core fittings (A&B) are properly tightened at each end.

Note: When the Flex Cable needs lubrication, it makes a ‘rattling sound’ at speed.
Flex Cable 2.

Fig. 16

Note: To replace/change Flex Nut Remove Casing Adapter-B)
Flex Cable 3.

To Replace inner core- (cable)

1. Work from Quick Coupler end A) fig. 16 (previous page)
2. This end has 2 parts, first remove the outer end fig.16a
3. Then remove the snap ring (use snap ring pliers) fig.16a
4. Now you can remove the bearing housing section fig.16b
5. Use vice grips to hold the crimped end of cable and remove the square drive end fig.16c
6. Slide the inner core (cable) out of the casing and replace with new core.
7. Assemble in reverse order and grease the new cable. (see flex cable overhaul #3, pg- 27 for grease procedure)
Flex Cable 4.

Replace inner core cont’d

Fig 16b

bearing housing

snap ring

Fig 16c

square drive end
Section-4 Gin Pole

Fig. 17
Gin Pole 1.

SET-UP PROCEDURE

1. The Gin Pole Needs to be stabilized before use. A guide wire(s) can be strung from the top of the pole to an anchor point.

2. If practical, a spare length of drill rod can be used as a stabilizing anchor. At the drill site, drive one 5' (1.5m) stabilizing drill rod (f) with shoe, into the ground approx. 1' (.30m) away from drill string leaving no more than 18" (.45m) sticking out. Drive at a slight angle away from Drill String. This rod will be used to hold base in place, and help anchor the Gin-pole in an upright position. (fig. 18)

3. Place Base (a) over stabilizing drill rod. (fig. 18)

4. Place Bottom Section (b) (fig.19) on base and release approx 10' (3.04m) of cable from winch.

5. Before placing top section (c) thread hook and cable (d) from Winch through pulley in top section of Gin-pole.

6. Place top section (c) on bottom section (b) Gin-pole is ready for use. (fig. 17)

7. The winch has 2 speed settings - high and low torque, and also a hand brake.

8. Keep cable clean and inspect for wear or fraying. Be aware and use caution when operating the winch.

9. **Make sure you have the ratchet engaged when cranking tension. Also make sure you have a good grip on the handle and are holding the tension when releasing the ratchet.**

10. Additional ground support 'may be' needed for the Gin Pole base depending on the terrain you are working on. If the ground around the drill hole collar is soft and prone to sinking you'll need to improvise a stable hoisting platform. (fig. 20)

11. Additional pulling power 'may be' needed to hoist your drill rods depending on the type of ground, the size of rods and the depth of holes. The Standard Gin Pole works very well for holes up to 50' or so, as an operating guideline. Adding a running block to your cable will double your pulling power (fig. 21).

12. You may want to add a Powered Winch to your WINK Drilling equipment. Many types are available if this suits your budget and drilling requirements.
Gin Pole 2.

Fig. 18

Drill String

Stabilizing Rod- f)

Base- a)
Gin Pole 3.

Fig. 19

Bottom Section - b)

Cable & Hook - d)

Base - a)

Top Section - c)
Gin Pole 4.

Fig. 20

- An “example” of a simple hoisting platform made from old drill rods and 2x6 lumber.
- It may be necessary to shore up your Gin Pole base to prevent sinking into soft ground.
Gin Pole 5.

Fig. 21
- Adding a running block to your cable will double your pulling power
- When adding hoisting/pulling power you’ll need to add a Guide Wire to the top of the Gin Pole to provide stability (photo insert)
Alternate Gin Pole Base

- This base incorporates a plate and tube system that helps steady the Gin Pole.
- The plate bolts onto the base and has a short tube through which the drill rods is guided. It is also reversible.
- When working on solid ground this attachment will eliminate the need for the stabilizing rod.
Section-5 WINK Drill Rod

- WINK drill rod incorporates specially designed threads and knurling for wrench application. Thread pattern ensures a locking fit. Dimensions:

  **BW-** 2.25” OD 1.75” ID, x 5’ feet. Weight- 27 lbs (12 kg)
  **NW-** 2.75” OD 2.25” ID, x 5’ feet. Weight- 34 lbs (16 kg)
  **HW-** 3.50” OD 3.00” ID, x 5’ feet. Weight- 44 lbs (20 kg)
Drill Rod 1a)

- A standard wire brush is essential for maintaining clean threads. Always inspect and clean drill rod threads (as necessary) before connection.

- The key to successful drilling is **Tight Connections**. Always use snipes (cheater bars) to tighten all drill rods and accessories.

**Make a Joint:** The threaded ends of the fittings or drill rods should thread together easily until the shoulders of the fittings meet. If this is not the case, it may indicate dirty threads or wear. The two pieces need to be fitted with pipe wrenches with snipes (cheater bars), and torqued tight. This locking of the fittings is critical for transmitting the sonic vibration from the drill head to the core shoe.

**Break a Joint:** The pieces are fit with pipe wrenches with snipes (cheater bars) and torqued apart. This will require a strong, sharp thrust with the wrenches and a distinct snapping sound should be heard. After this release, the threads should unscrew easily.

**Tip:** When making a joint, use the snipes fully choked (extended onto the wrench handle as far as possible). When breaking the joint, the snipe can be extended approximately one foot longer over the wrench handle to add leverage for breaking the joint. In this way, more torque is always available to break the joint than is used to make the joint.

**Tip:** When ever possible, use a **pushing motion** with pipe wrenches especially when working on a platform or over water. If using a pulling motion there can be a tendency to lose your balance and fall over backwards when the joint breaks, or if the wrench slips.
**Drill Rod 1**

**IMPORTANT:** If a connection becomes loose the threads will be destroyed in seconds and you will probably lose the two drill rods with the loose threads and possibly lose the entire drill string and the hole.

- Where possible, use thread protector caps during transit of drill rod to prevent damage to the threads.
- When removing drill rods from the string, use care in placement of the rods. You should have a tidy work area and place to store the rods between holes.
- Clean up and proper storage of drill rods and accessories is also essential.
- Use the a brush to clean the threads. Use a rag to wipe down the rods and remove any dirt or moisture. A thin coating of light oil will inhibit rust. We recommend using an aerosol lubricant for ease of application and use. Clean and lubricate shoes, sleeve adapters and side ejectors in the same manner. (Fig. 22)
- **CORE BARREL RODS.** Special attention is required to maintain these drill rods. Core barrels have a honed inner surface that is designed to accept the plastic sample tubes. You must clean the inside of these rods and dry them by pushing a cloth through them. It is recommended to also run a cloth through that is wet with a light oil. Keeping the inner surface of your core barrels free of rust and any build up of dirt is very important.
Drill Rod 2.

- Unlike conventional drill rod that uses rotation and machine forced drilling pressures, WINK Drill Rod uses sonic vibration and weight (gravity).
- Joints must remain tight without the help of rotation.
- The WINK Thread design and pattern ensures a strong locking fit manually, using pipe wrenches with snipes.
- Thread design also makes breaking the rods easier.
- Once they are broken the rods unscrew with ease.
Drill Rod 3.

Fig. 22

- Clean and oil drill rod threads and drill accessories, shoes, adapters, side ejectors etc. after use.
- We recommend using an aerosol lubricant.
Section-6 Drill Accessories

Core Barrel Systems
Drill Accessories 1a
Core Barrel System

Fig-1. Upper end - with sleeve adapter (SA), and side ejector

Fig-2. Lower end - with sleeve adapter (SA), and drill shoe/bit
Drill Accessories 1b
Core Barrel System

Prepare Core Barrel 1.

1. Install the top Sleeve Adapter into ‘Box End’ of the Core Barrel
Prepare Core Barrel 2,3.

2) Slide the Plastic Sample Tube into the Core Barrel from the bottom end, until it seats firmly against the ridge inside the Top Sleeve Adapter. Measure and cut it off 1” (one inch) from the end of the male threads of the Core Barrel. 3) Install Bottom Sleeve Adapter.
Prepare Core Barrel 4.

4) Install ‘Core Shoe’ (with Soil Retainer if using one) and tighten all connections with Pipe Wrenches and cheater bars, working from one end to the other. If using a side ejector, install it now on the Top end.

Note: It is possible to eliminate the lower sleeve adapter if you are sampling with a Single Core Barrel, in this case you would cut the plastic tubing ‘FLUSH’ with the end of the male threads of the core barrel and install the Core Shoe directly to the Core Barrel.
Drill Accessories 2a

Soil Retainer (installation)

The ‘Soil Retainer’ fits inside the Core Shoe in this manner. The fins point upward toward the core barrel.
Drill Accessories 2b

Soil Retainer (installation)

Note: Be sure the Soil Retainer is seated properly. It’s recommended to screw the lower Sleeve Adapter into the Core Shoe in an upright manner first, and then screw the 2 parts (as a unit) onto the end of the Core Barrel.

Soil Retainer is seated properly on inner flange
Drill Accessories 3.
Side Ejector

- Allows selective sampling to depth
- Can be placed anywhere in the drill string
- Unwanted material is ejected until the desired depth is reached
Drill Accessories 4.

Drill Shoes/bits

Inside Cutter Shoe

Tip Beveled inward
Drill Accessories 5.
Drill Shoes (cont’d)

Chisel Cutter Shoe
Drill Accessories 6.

Sleeve Adapter

- Sleeve Adapters secure the sample tubes on either end of the core barrel.
- There is a 1/8 inch shoulder on the inside which the sample tubes rest against.

reverse view
Drill Accessories 7.
Rod Adapters

- Connects Drill Head to Drill Rods
- Sizes for BW, NW, HW rods
Drill Accessories 8.

Hoisting Caps (primary lifting device)

- Connects to drill rods for hoisting procedure
- Sizes for BW, NW, HW rods
Drill Accessories 9.

Plastic Sample Tubes (sleeves)

- Sample Tubes are available for our drill rod Core Barrels-
- Sample Sizes **BW** 1.75” diameter **NW** 2.25” diameter **HW** 3.00” diameter
- End caps to seal sample for shipment
Drill Accessories 10a

Ball Controller 1)

- The Ball Controller is a **Safety Device** used for **Lowering** drill rods and **Holding** drill rods when raising them. Situations where this is **essential** include drilling over water, via vessel or through ice. You may have to add and lower several drill rods before you reach bottom.

- **Note:** Always make sure your winch cable is attached to your drill string (except when adding/removing rods). The Ball Controller holds the rods (in suspension) while you add/remove the next rod and re-set your winch cable.

To release and lower rods, use a pry tool and lift up the Center Sleeve of the Ball Controller (as above).
Important Notes:

Lowering Rods-
- Always attach the winch cable to the Hoisting Cap of the drill rod to be added, before adding and tightening the rod to the string.
- Once the rod has been tightened, take up the slack and the full weight of the drill string before releasing the Ball Controller.
- Using the winch, lower the drill string to the desired depth and then engage the Ball Controller. Make sure the controller is locked and holding the weight of the drill string effectively before removing the cable hook from the Hoisting Cap. *This is particularly important in wet and freezing conditions*
- Add the next rods in the same manner until your reach bottom and begin drilling.

Raising Rods-
- The same principles apply, leave the cable attached to the Hoisting Cap of the rod to be removed until you have determined that the Ball Controller is effectively holding the drill string.
- Break the rods, before removing the winch cable.
- Keep the cable attached to the drill string as long as possible while the drill rods are hanging. This ensures that the drill string will not be lost in the water if it is accidentally released from the ball controller.
Drill Accessories 10c
Ball Controller 3)

Ball Controllers can also be used for Hoisting

- The unit slides over, and down the length of the drill rod freely. When the unit is lifted upward, it locks onto the rod and lifts the drill string. Below is an example of an NW Ball Controller being used for hoisting rods. In this case you’ll need 2 Ball Controllers, one for Holding and one for Hoisting.
Drill Accessories 11
Sample Tube Push Tool

- **Push Tool** helps get the sample tube out of the core barrel
- Sometimes the sample tube may need some help to get it moving.
- Use the Push Tool by sliding it into one end of the core barrel and force it against the plastic tubing.
- Available for BW, NW, and HW Core Barrels
Section-7 Tools

Fig. 23 basic tools required
Tools 1.

**Basic Tools- Required** (fig. 23)
- 2 - 24” (min) good quality Pipe Wrenches
- 2 – Snipes (cheater bars)
- Crescent wrench
- Hammer
- Wire Brush
- Cap Wrench (included) (see fig. 2)
- Running Block (included) (see fig. 21)
- Spade Shovel

**Additional tools- Recommended:**
- Socket set- (good quality complete)
- Hack saw
- Spare pipe wrench and crescent wrench
- Tape measure, pencil, felt marker
- Log Book- ‘Drillers Log’
- Rags, paper towels
- Metal File
- Channel Locks (adjustable pliers)
- Pry Bar
- Spray Lubricant
Section-8 Safety

PPE (personal protective equipment)
- Hardhat
- Eye protection
- Hearing protection
- Gloves: use good quality leather gloves. The drill head operates at high temperatures and gloves are essential.
- Reflective safety vest or “High Visibility” clothing is recommended.
- Long sleeves are also recommended
- Life Vest (on water)

Working with Pipe Wrenches
- When ever possible, use a pushing motion with pipe wrenches especially when working on a platform or over water. If using a pulling motion there can be a tendency to lose your balance and fall over backwards when the rods break, or if the wrench slips.
- Snipes (cheater bars) lightweight aluminum is recommended.
Section-9  Drilling Procedures.

1. **Always** make sure your connections are tight.
2. With your shovel you may need to dig down to get your hole started. If the surface material is very dry and hard, dig as necessary to the softer material below.
3. Listen to your drill, sudden changes in sound will alert you to any problems. A loose connection will be readily apparent in the sound. The sound or ‘TONE’ of the drill will also change with the different types of strata being penetrated.
4. Turning the drill head can help with the drilling process especially when using a Chisel bit/shoe and going through harder strata. Only turn the drill “Clockwise” to prevent any chance of loosening a connection.
5. Keep your work area organized and make sure your drill rod threads are clean with a wire brush.
6. Use caution when operating the winch. Make sure the ratchet is engaged when cranking the cable.
7. If you are doing some hard serious hoisting, periodically stand back and have a good look at your Gin Pole and guide wire making sure things are all still in line.
8. Always think ahead to your next moves.
9. Good quality gloves are essential when operating the WINK drill head. The heat and vibration can be very tiring on the hands.
STARTING THE HOLE:

The first operation for starting a new drill hole is to use a shovel to open a hole through any grassy areas and areas with roots. The Core Shoe cutting surfaces are not very suitable for cutting through roots, so an initial hole can help get to a quick start and ensure that a root system does not clog the bore of the sample tube.

On occasion, a lack of ground water moisture or compaction at the surface can result in difficult initial penetration of the drill. Operators have found that in instances like this, it works well to use a shovel or hand auger to dig through this initial material, then, often only a few feet below surface, the drill is able to penetrate easily.

When using a side ejector, it is very useful to have a thin piece of flexible tubing or wire or stick to probe through the side ejector port to ensure that the material is filling and moving through the sample tube. Ideally if the drill rod has penetrated the first 5 feet, a probe through the side ejector should reveal that the material inside the drill rod has filled the 5 feet as well. If not, it is an indication that the material is not flowing smoothly into the sample tube. Possibly the material or size of aggregate is not suited to the size of drill rod and a larger size of drill rod may be needed for this material.
SAVE YOUR HANDS:

There are times when it is necessary to have your hands on the drill when it is operating - but most of the time, you don't need to hold it. The drill generates tremendous vibration energy and the operator should only hold the handles of the machine when necessary - to save fatigue on the hands.

The following are times when the drill needs to be held:

1. The drill needs to be held when the first length of drill rod is started. At this time, the drill needs to be supported and aligned to vertical. Observe the rod from different angles to assure the drill is entering the ground at or near vertical.

2. When the drill encounters difficult strata, the cutter shoes are designed to cut through with a slow rotation. The handles are used to rotate the drill slowly - approx 1 revolution per minute is good.

3. The drill turns quite easily when vibrating - use as light hand pressure as necessary to reduce fatigue.

4. The engine operator can help with the rotation as the Flex Cable needs to be lifted over the head of the driller with each revolution. Always rotate the drill clockwise - the cutters are designed for this direction and this will also act as a tightening force on the drill string threads.

5. When you reach your sampling depth, a slow rotation of the drill will help the material pass through the side ejector more easily. The drill should also descend slowly at the sample depth to assure the target material has lots of time to properly fill the core tube. Descent of the drill can be slowed by upward pulling on the handles or use of the Gin Pole and winch if necessary.

6. When working over water, from a barge or on ice, it may not be possible to fully rotate the drill in a clockwise manner. In this case a twisting motion, back and forth is acceptable.
Section-10 Parts List & Numbers