

OPERATE AN ALTERNATING CURRENT WINDER

NQF Level: 3

Credits: 15

SAQA Unit Standard number: 256597

Introduction

The importance to operate an alternating current winder is to provide transport for persons, material up and down the shaft and conveying minerals to surface. Persons and material are normally conveyed in cages and minerals are hoisted with skips. There are operating differences between alternating current winders and the mines specific requirements will be applicable for every winder.

Every person in the working environment has a responsibility towards personal safety and the safety of others. A person competently operating an alternating current winder contributes effectively towards his/her own safety and the safety of others in terms of providing winding operations and thereby transportation for persons to and from the underground workings and conveying minerals to surface.

You must also be alert to potential consequences of incorrect working standards and must strictly adhere to legislation and all laid down site specific requirements that will ensure your own safety and the safety of others, as well as the operation of equipment to comply with required safety standards.

Incorrect operating methods are hazardous and may lead to accidents and cause injuries to persons or damage equipment.

The driver must:-

Obtain the key from the engine room.

Switch on the lights.

Check the guards and fences.

Check for cleaning material, tools or persons in the drums or near the motors.

Return to the footplate; secure the winder "brake on, control lever in neutral".

Check the depth indicators and drum marks for which the winder has been clutched.

Check the logbook for entries and the last signals received by previous driver.

Check the lubrication and cooling system levels.

Switch in the auxiliary circuit breaker.

Start the lubrication, cooling water and solution circulation pumps. (Compressor, if air brakes are fitted).

Switch on the dynamic MG set or the magnetising rectifier (The Dynamic volt meter will be 50 volts constant).

Switch in the main circuit breaker (MCB)

Reset all the flags or pilot lights on the indication panels.

Check the lubrication and cooling systems. (Bearing and gearbox lubrication).

Check the gearbox oil level, if splash feed. (Level glass or dipstick)

Reset the safety circuit and test the control lever operation. (Forward, Reverse and Dynamic braking available).

NOTE: - Check the solution strength, by moving the control lever out of neutral.

The required amperage in first contact is the only indication of the solution strength. (ask the electrician or engineer)

The soda must be premixed with water when added.

The first contact amperage will vary from winder to winder.

(Only some winders have safety circuit reset buttons).

The driver must: -

Notify the banksman to re-open the shaft.

Request a clear signal from the banksman.

Test both brakes separately.

Clutch correctly if necessary and run a trail trip.

Return the conveyance to the banksman and await further signals.

Alternating current winder

Apply sufficient current in the required direction to control the winder.

Ease off the main brake lever and manipulate the control lever to control the speed.
Check the ammeter, depth indicator and the rope speed indicator.
Manipulate the control lever to reduce the speed when approaching the signal destination.
Reduce the winder speed to stop at the signaled destination.
Apply the main brake lever and verify the required indicators.
Move the control lever into neutral and check that the winder remains stationary.

Reaction to emergencies -

Stop and secure all winding operations in the shaft.
Secure the winder brakes and the control lever in neutral.
Apply the side brake levers to the brake on clutch in position.
Transmit one long ring on the intercommunicating bell system when required to stop all other winders in the shaft.
Mark the depth indicator.
Make the necessary entry in the diver's logbook and state the time and sign the entry. Notify the persons in authority.
Await a written instruction from a person in authority before moving the winder or acting on signals
Control lever stuck in the open position.
Stop the winder by tripping the emergency trip switch to obtain the benefit of slow braking.
Secure the winder.
Make an entry in the logbook, state the time and sign the entry.
Report to a person in authority.
Request the assistance of a fitter and or electrician to rectify the fault.
After repairs run one complete trip through the shaft testing the control lever operation.
Counter-sign the logbook entry when it has been cleared by the engineer and artisans.

Brakes fail to come on: -

Do not trip the safety circuit when the brakes fail to come on.
Manipulate the control lever and move the conveyances to the point of balance or mid-wind position in the shaft.
Release the main brake lever to prevent a trip-out on no-start or brake rubbing.
Apply the main and side brake levers at the point of balance or mid-wind positions "*when the brakes do not come on*".
Release all brakes and move the winder slowly up and down in the mid shaft position.
Request persons in authority to for assistance.
Test both brakes separately after the brakes have been cleaned, adjusted or repaired.
Return the conveyances to the original signal destination,
When required permit persons to leave the conveyance, using the respective signalling system.
Request the clear signals when required.
Test both brakes separately for brake holding power.
Run one complete trip through the shaft.
Test both brakes separately and if satisfactory.
On completion countersign the logbook entry made by the engineer and fitter.

Brake slipping -

Secure the winder main brake on and control lever in the neutral position.
Move the respective side brake lever to the brake off position.
Apply power to move the conveyances to the point of balance, or for a single drum winder to surface.
Apply the main brake lever and the side brake levers to the "brake on position".
Make an entry in the driver logbook, state the time and sign the entry.
Notify a person in authority for assistance.
The fitter will clean and/or adjust the brake.
Test the brake and if the holding power is satisfactory.
Run one complete trial trip.
Test the brake again as described above and if satisfactory,
Countersign the entry made by the engineer and fitter in the driver log book.

Long reach rod breaks: -

Transmit the signal 2 pause 2 pause 2 (*persons must leave the conveyance*), or when required request the clear signal on the respective signalling systems.
Receive a clear signal.

Move the conveyance to the point of balance in the shaft.

Apply the side brake lever which is still operative (*Opposite side*).

Move the control lever to the neutral position.

Keep the main brake lever in the off position to prevent further damage to faulty brake equipment.

Report to a person in authority and request an artisan's assistance.

The artisan must make an entry in the driver log book, enter the time, sign and the driver must countersign.

When the broken long reach rod has been replaced;

Assist the fitter with the re-adjusting of the brake. (*Verifies the brake indicator*).

Test both brakes separately after the defective reach-rod has been replaced and the required adjustment on respective brake is completed.

Run a complete trial trip.

Test both brakes separately and if the holding power is satisfactory.

Countersign the driver logbook entry made by the person in authority and artisan.

Bad coiling

Stop and secure the winder, brakes on, control lever in neutral and apply the side brake levers.

Make an entry in the driver logbook and state position of the conveyance in the shaft.

Notify a person in authority and request artisan's assistance.

The artisan must make an entry in the driver logbook, enter the time, sign and the driver must countersign.

Follow the required site specific requirements to rectify the bad coiling.

Return the conveyance to the signalled destination (if required).

Obtain a clear signal 2 pause 2 from the banksman and onsetter respectively.

Run a complete trial trip to test the rope coiling.

Counter-sign the entry in the driver logbook made by the person in authority and artisan.

Trial run of winding plant

When winding in any compartment or compartments of a shaft, winze or headgear has been stopped for repairs or blasting operations or when it has been stopped for any other purpose for a period exceeding one hour in duration or when a conveyance has been changed, the winding engine serving such compartment or compartments shall not be used for the raising or lowering of persons until the cage, skip or other means of conveyance has been run at least one complete trip up and down such compartment or compartments.

Solution strength: -

The rotor resistance makes up the external rotor circuit and it provides the means of controlling the speed of the winder. Reducing the resistance increase the speed and amperage meters are provided for indication.

The liquid used is water with caustic soda, soda ash, washing soda or salt as an additive and this mixture is called electrolyte or solution. Electric current passing through a resistance generates heat.

Resistance over heating: -

Electrolyte in controllers must be cooled to prevent boiling which would result in flashing and erratic control.

Rotor resistance of the grid type must be adequately ventilated to prevent overheating with damaging results.