



**CONSTRUCTION**  
Training Group

# **LEARNER GUIDE**

## **Drilling Rig (DR)**

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# **Drilling Rig**

## **Part One**

# **Performance Assessment**

## Conduct Routine Checks:

### 1. Conducts routine checks on Drill Rig (at least 14 Checked)

- Walk around check for damage
- Explain safety decal and warning devices
- Track condition and adjustment
- Engine Oil
- Hydraulic Oil
- Transmission Oil
- Battery security, water level and cleanliness
- Coolant
- Explain bleeding of fuel system
- Seat adjusted and secure
- Seat Belt (condition and security)
- Mirrors adjusted and clean
- Overhead guard (if fitted)
- Check drilling fluid tanks
- Correct fluid type and levels
- Condition of boring rods
- Correct storage of boring rods
- Inspect Boring attachments

### 1.2 Identifying Hazards (at least 12 checked)

- Power lines
- Traffic road/construction
- Bridges
- Ground condition
- Underground services
- Overhead services
- Surrounding buildings
- Obstructions
- Other equipment in area
- Personnel in area

- Hazardous materials
- Railway lines
- Trees
- Dangerous rotating parts
- Weather conditions
- Other hazards unique to the workplace
- Applicant immediately removes hazards, or ensures hazards are eliminated by instigating appropriate action

### 1.3 Personal Protection Equipment (at least 5 elements checked)

- Hard Hat
- Safety glasses
- Hearing protection
- High visibility vest
- Electrically insulated gloves
- Electrically insulated boots

### 1.4 Start up procedures (at least 5 elements checked)

- Shut off drilling fluid pump
- Sets throttle at idle
- Ensures controls are in neutral
- Starts engine
- Allows engine to warm up
- Checks steering
- Checks emergency stop button
- Checks warning devices in operation
- Checks power vice for operation and wear



## **2. Operating Drill Rig:**

### **2.1 Applicant operates drilling rig (at least 32 elements performed correctly)**

- Access the site before drilling
- Follows and maintains agreed travel plan/path
- Ensures travel direction is clear
- Gives way to other traffic before moving off
- Maintains a safe distance from other vehicles
- Travels at a safe speed
- No mishaps when operating
- Where drill rig goes undetected by others, operator takes appropriate action by stopping or slowing drill rig, sounding horn or flashing lights
- Looks in direction of travel; if reversing, looks over both shoulders before drill rig moves
- Does not travel until attachments are adjusted to a safe height
- Travels in reverse if site is obscured, and must constantly look in the direction of travel
- No object in the path of drill rig is hit or knocked over
- Operator keeps all parts of body within the machine when travelling. However, when maneuvering, the operator may lean out for a clear view
- Correct controls are selected
- Operation of controls is smooth
- Whilst manoeuvring in a confined area, the applicant shunts or repositions drill rig to access the area
- Drill rig is correctly positioned relative to drilling task
- Safe operating speed
- Operator is aware of other plant/personnel
- Need to be aware of debris which could cause damage to drill rig
- While travelling, the drill rig is high enough to clear any bumps or rises on the ground
- Explain or demonstrate the use of battery jumper leads
- During travel, the operator keeps looking in the direction of travel
- Travels at a safe speed and maintains safe control of drill rig
- Lubricates male and female threads of rods
- Erect signs and barricades
- Stake rig down
- Attach drill head assembly
- Keeps people clear off rotating parts
- Starts drilling operations in safe manner
- Measures depth
- Drills in competent manner in line with the operators manual
- Removes drilling rods after required depth
- Shuts drill rig off, then removes drill head
- Disposal of waste liquids are carried out in accordance with environmental standards
- Drill string is disassembled as each joint is drawn back into the drill rig
- Operator does not alight from drill rig until it is safely parked and turned off
- Applicant explains correct use of the parking procedures when on an incline, as per the manufacturers recommendations

### **3. Shuts Down Equipment:**

#### **3.1. Shuts down equipment and secures site (demonstrates at least 7 elements)**

- Parks drill rig in a suitable location away from danger areas
- Lowers attachment to ground
- Appropriate gear, relevant to the drill rig, transmission type, is selected when parking vehicle
- Applies parking brake
- Shut off the drilling fluid pump
- Reduce engine speed to idle
- Wait two minutes before engine is turned off after operating at full power
- Engine/power is turned off, keys removed
- Dismounts correctly

#### **3.2 Post operational checks (demonstrates at least 4 elements)**

- Check structure for defects
- Batteries are checked
- Fuel
- Oil
- Hydraulic oil
- Tracks

#### **3.3 Transport the drill rig (at least 4 elements)**

- Align drill rig with trailer/truck
- Slowly drive drill rig squarely onto the trailer
- Stop drill rig when the tie-down position is reached
- Lower rear stabilizer and drill rack frame
- Follow 'shut down procedures'
- Tie-down drill rig using approved tie-down points

#### **Secure Site:**

#### **3.4 Secures Site (complete at least 7 elements)**

Parks drill rig clear of:

- Power Lines
- Inclined surfaces
- Next to open excavations
- Access ways
- Walkways
- Fire/emergency exits
- First aid facilities
- Refueling sites
- Blind corners
- No less than two meters from nearest railway track
- Flood areas

# **Drilling Rig**

## **Part Two**

### **Oral/Written Assessment**

## Conduct Routine Checks

### **Performance Criteria 1.1.1 (select 11, including 4 shaded)**

#### **1. Before starting the drill rig each day, what should you do? ■**

*Perform a pre-start check*

#### **2. Before starting the engine, what should you know? □**

*The correct shutdown procedures*

#### **3. You are required to inspect your drill rig before use. Name at least 4 liquid levels □**

- Hydraulic Oil
- Engine Oil
- Cooling Water
- Fuel
- Battery electrolyte level in each cell

#### **4. You are required to inspect your drill rig before use. Name at least 4 parts which would form part of your inspection ■**

- Braking
- Steering
- Controls
- Lights
- Warning Devices
- Tracks
- Security of attachments

#### **5. What precautions should be taken by the operator when a leak in the fuel system is detected? ■**

*Shut down machine and remove keys, fit 'Do Not Operate' tag, then report to an authorised person and have repairs carried out (Isolate Fuel if possible)*

#### **6. What should be fitted to the drill rig to warn others of its movement? □**

*A flashing warning light and reverse beeper*

#### **7. Why should steps and grab trails be free from oil, grease and mud? □**

*To stop injury from slips and falls*

#### **8. Name 5 hazards you would expect to find on your worksite? ■**

*Powerlines, other equipment, personnel, unstable ground, vehicle traffic, weather, inclined surfaces, underground services, obstructions*

#### **9. What percentage of wear in a shackle would cause it to be discarded? □**

*10%*

#### **10. What action would you take with tracks that are loose? □**

*Have the track tension adjusted to manufactures specifications*

#### **11. How would you check the tension of the tracks of a drill rig? □**

*By placing a straight edge on the track from the roller to the drive wheel and measuring the distance from the straight edge to the track*

**12. How would you find the correct track sag or tension for the drill rig? □**

*From the manufacturers manual*

**13. What defects would you look for on the hydraulic rams and hydraulic pressure hoses? □**

*Leaks from seals, split or fractured hoses, bent or damaged rams*

### Plan Work

**Performance Criteria 1.2.1  
(select 7 including 4 shaded)**

**14. What underground services would you check for before starting to drill? ■**

*Check for power, telephone, gas, water, sewer, stormwater, fibre optic cables.*

**15. What are the dangers of starting and running an internal combustion engine in an enclosed space? □**

*Exhaust fumes from the internal combustion engine can kill.*

**16. What action must you take before starting up and whilst operating an internal combustion engine in an enclosed space? ■**

*The enclosed space must have adequate ventilation.*

**17. What must be provided and maintained on the exhaust of an internal combustion engine when operating in an enclosed space? □**

*An approved exhaust control unit, catalytic converter (scrubber)*

**18. When should hearing protection be worn? ■**

*When at risk of hearing damage – eg: above 85dba*

**19. What is the minimum type of footwear a drill rig operator should wear? ■**

*Electrically insulated boots*

**20. What documentation would you be required to obtain before digging up a footpath? □**

*A permit from the relevant local government authority*

**21. Why do we use drilling fluids? □**

- For cooling the drill head
- Stabilises the soil
- Increases lubricity in sticky soil
- Produces a slurry to flow spoil out of bore hole during back reaming.

**22. What are the different types of fluids used for? □**

*Water: Topsoil or Loam  
Water & Bentonite: Sand  
Water and Polymer : Clay  
Water, Bentonite & Polymer:  
Increases viscosity and luvricity of fluid*

**23. What is the drill head used for rock? □**

*It is a pneumatic rock drill*



**Performance Criteria 1.3.1**  
(Select 3 including 2 shaded)

**24. What action would you take if you noticed a bulge form in a hydraulic hose? ■**

*Stop operating, and have the hose replaced before the machines used*

**25. When should the operator carry out tests, check and inspections on the drill rig to be operated? □**

*Daily before use*

**26. Before operating the drill rig, what should you do if you have not used the machine before? □**

*Read the operators manual to familiarise yourself with the machine*

**27. What action would you take with damage and defects found on the drill rig? ■**

*Shut down drill rig and remove keys, tag 'Do Not Operate' and report the damage to an authorised person who will arrange repairs*

**Operate Drill**

**Performance Criteria 2.1.2**  
(select 4 including 3 shaded)

**28. What personal protection equipment should be worn when working with the drill rig? ■**

- Hard Hat
- Safety Glasses
- Electrically Insulated Boots
- Electrically insulated Gloves

**29. While drilling you suspect there could be an underground service in the area, what action would you take? ■**

*Stop operating immediately and hand dig to investigate further, also check relevant authority maps and plans*

**30. What is the hand signal for stop? (demonstrate to the assessor □**

*Stop*

**31. What must you do before attempting to remove an obstruction from a plugged drill rod? □**

*Relieve drilling fluid pressure before cleaning out nozzles with a tip cleaner*

**32. How would you dismantle a drill rig that had contacted live power cabled that could be released? ■**

*Jump clear of the drill rig making sure you do not contact the ground and the machine at the same time, then with your feet together, hop away at least 10m*

**Shut Down Equipment**

**Performance Criteria 3.1.3**  
(Select 2 including 3 shaded)

**33. Name 3 areas where you would not park your drill rig? ■**

- Access Ways
- Near Overhang
- Refuelling Sites
- Flood Areas
- Next to Open Trenches

**34. What type of surface is ideal to park your drill rig on? ■**

*A firm level surface*

**Secure Site**

**Performance Criteria 3.2.3  
(Select 2 including 1 shaded)**

**35. What shall be provided when a drill rig has to be parked on or protrudes on to an access way? ■**

*Barricades, signs and lights*

**36. For what reason should the key be removed from the ignition of the drill rig? □**

*To stop unauthorised use*

## Assessment Summary Drilling Rig

### Oral/Written Assessment

Operational Area Unit	Number of Critical criteria required	Number of critical criteria achieved	Number of non-critical criteria required	Number on non-critical criteria achieved	Competent (tick)	
					Yes	No
1	4		8			
2	7		13			
3	2		3			

Oral/Written Assessment completed within time allowed – approx 1.5 hours?

### Performance Assessment

Operational Area Unit	Number of criteria required	Number of critical criteria achieved	Competent (tick)	
			Yes	No
1	4			
2	1			
3	4			

Oral/Written Assessment completed within time allowed – approx 1.5 hours?

\*Performance Standard = Number of items required to meet standard (including all critical boxes)  
 Knowledge Standard = Number of questions required to meet standard (including all critical boxes)

### Summary

Candidate is:  Competent Date: \_\_\_\_\_  
 (circle the result obtained)  Not Yet Competent

Name of Assessor: \_\_\_\_\_ Name of Candidate: \_\_\_\_\_

Signature: \_\_\_\_\_ Signature: \_\_\_\_\_

### Comments/feedback

(Assessors to make any additional comments which clarify the assessment)

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