Learner Name:

Learner Guide

Earthmoving Course

RIIMPO338E Conduct Rigid Haul Truck Operations

Learner Guide

National Courses PTY LTD

1.1 Introduction

This course is based on the unit of competency **RIIMPO338E Conduct Rigid Haul Truck Operations.**

In this course you will learn about:

- Planning and preparing for your work.
- Checking the equipment.
- Using the haul truck.
- Maintenance and housekeeping.

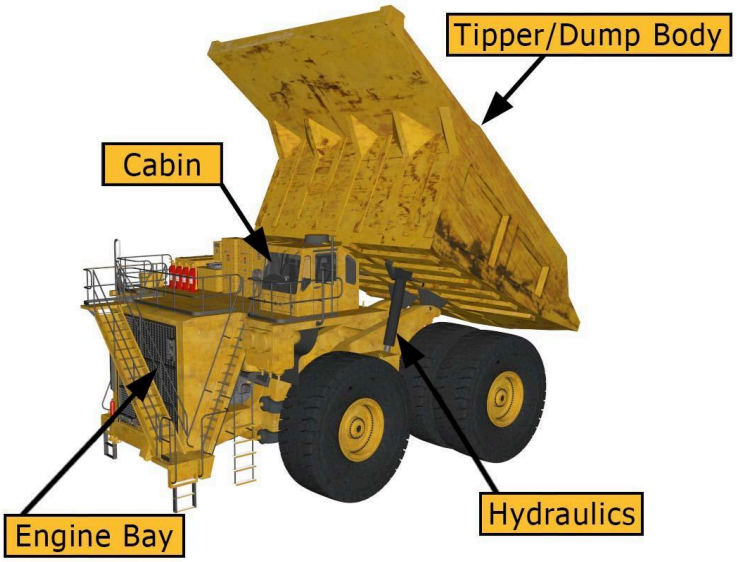
1.1.1 What is a Haul Truck?

A haul truck is an off-road or off-highway rigid dump truck. Haul trucks have been designed specifically for high production areas such as mining and civil construction.

The size of the haul truck can vary from 45 tonne capacity through to 360 tonnes. Ultra-class haul trucks are extremely large versions of the haul truck.

Rigid haul trucks are capable of carrying large payloads at speeds of up to 70km/h. This makes them suited to long hauls on flat roads.

1.1.2 Parts of a Haul Truck



Engine Bay	Where the engine is located.
Cabin	Part where operator sits and operates the truck.
Hydraulics	Used to tip the body to release its contents.
Tipper/Dump Body	Part where materials are dumped and carried during haulage.

Components may vary with the different makes and models of haul trucks, so for exact details on the components for the machine you are operating, check your operator's manual.

1.2 Work Safely

You must follow all safety rules and instructions when performing any work. If you are not sure about what you should do, ask your boss or supervisor. They will tell you what you need to do and how to do it in a safe way.

1.2.1 Health & Safety Rules

Every workplace has to follow laws and rules to keep everyone safe. There are 4 main types:

Acts	These are laws that you have to follow.
Regulations	These explain what the law means.
Codes of Practice	These are instructions on how to follow the law, based on industry standards.
Australian Standards	These tell you what the minimum requirement is for a job, product or hazard.

Some states use OHS laws, and other states use WHS laws. They both talk about the same thing, but use different words or names for people. If you have any questions about safety rules you should talk to your boss or supervisor.

1.2.2 Operations Documentation

Before starting your work you need to make sure you have access to all operations documentation for the job. This will help you to do your work in the safest way and make sure all work is compliant.

Operations documentation includes:

Site Details
The information and safety requirements of the workplace environment (where you will be working).

Hazard Details
Any hazards in the work area or related to the work. This could also include instructions on how to handle dangerous or hazardous materials.

Task Details
Instructions of what the work is or what you will be doing (this can include diagrams or plans). Also instructions on how to safely do the job.

Faulty Equipment Procedures
Isolation procedures to follow or forms to fill out.

Signage
Site signage tells you what equipment you need to have, or areas that are not safe to be in.

Emergency Procedures
Instructions on what to do in emergency situations, for example if there is a fire, accident or emergency where evacuation or first aid is needed.

Equipment and Work Instructions
Details of how to operate plant and equipment and the sequence of work to be done.

1.2.3 How to Keep Everyone Safe

WHS law says that all companies and workers need to keep themselves and other people safe while they work. This is called a duty of care.

To keep yourself and other workers safe you need to:

- Follow your instructions.
- Follow all workplace rules.
- Make sure all equipment is safe to use.
- Carry out your work safely.
- Report any problems.

If you think something is dangerous tell your boss or supervisor as soon as possible.

Your worksite will also have instructions for working safely including:

- Emergency procedures, including using fire fighting equipment, first aid and evacuation.
- Handling hazardous materials.
- Safe operating procedures.
- Personal protective clothing and equipment.
- Safe use of tools and equipment.

1.3 Work Instructions

You need to be clear about what work you will be doing. Make sure you have everything about the job written down before you start. This includes what you will be doing, how you will be doing it and what equipment you will be using.

Make sure you have all of the details about where you will be working. For example:

- **The Site** – Is there clear access for all equipment? Are there obstacles in the way? What are the ground conditions like? Is the site ready for your work to begin? Are there any 'out of bounds' areas you need to avoid?
- **The Weather** – Is there wind, rain or other bad weather? Is it too dark?
- **Traffic** – Are there people, vehicles or other equipment in the area that you need to think about? Do you need to get them moved out of the area? Do you need to set up barriers or signs?
- **Hazards** – Are there dangerous materials to work around or think about? Will you be working close to other people?

You also need to make sure you have all of the details about the kind of work you will be doing:

- **The Task** – What kind of material is being moved? How much is there to move? How long do you have to complete the work? Where will the load be discharged?
- **Plant** – What type of plant will be used? How big is it? How much room does it need? Is it available?
- **Communications** – How are you going to communicate with other workers?
- **Procedures & Rules** – Do you need any special permits or licences? Are there site rules that affect the way you will do the work e.g. contamination control requirements?

1.3.1 Reading and Checking Your Work Instructions

All work needs to follow worksite, environment and company safety procedures.

Procedures help to make sure that all work is done in a safe way, without damaging equipment or putting people in unsafe situations. They also help to make sure that work is done in the correct order and doesn't interrupt or get in the way of other work that is happening on the site.

Your work instructions will tell you the safest way to do the job, and the equipment that you will need to use. It is a good idea to check your work instructions with your boss or supervisor to make sure you know exactly what you need to do.

If you don't know where to get your instructions or you can't understand them, you can ask your boss or supervisor. They will tell you where to find your work instructions and explain what they mean.

1.3.2 Work Method Statements

Many worksites require a work method statement before any work can start. A work method statement is a list of steps that outlines how a job will be done. It also includes any hazards that occur at each step, and what you need to do about them.

These statements can also be known as a Safe Work Method Statement (SWMS), Job Safety Analysis (JSA) or Safe Operating Procedure (SOP).

1.3.3 Plans and Specifications

Some of your work instructions might be given to you in plans, maps, reports and specifications. You will need to get the information out of these documents and use it to do your job.

Project specifications will tell you the types, quantities, grades and classifications of materials you will be working with.

Make sure you are familiar with the site product or materials before you begin work. Some materials are more cohesive or sticky while others may be much less stable to work with, or create hazards like dust, contamination or damage to equipment if they are not handled just the right way.

Plans are usually 'scale drawings' that represent a large area on a small sheet of paper and show proportion at the same time.

Project plans and maps give you an overview of the site, for example:

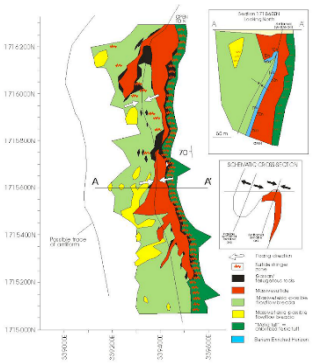
- The location of your work area in relation to the whole mine site.
- The position of stockpiles, work zones, roads and access areas.
- The location of environmentally sensitive or 'no go' areas.
- Contours, or the lay of the land, e.g. slopes, banks, depressions.

1.3.4 Geological and Survey Data

Geological and survey data is used to guide you through a job. It tells you what the area is like, what things you will need to think about and what work you need to complete.

1.3.4.1 Geological Data

Geological data gives you information about:



- Rock or material types and characteristics.
- Wet and dry areas.
- Water tables or other sources of water.
- Broken ground, faults or joints.
- Compaction levels.

All of this information will help you to decide where and how you should travel with equipment and areas to avoid.

1.3.4.2 Survey Data

Survey data covers information about job outcomes including:

- Bench heights and widths.
- Floor heights.
- Floor, ramp and bench grades.
- Underground working and voids.

Survey data can also be used to mark out:

- Work circuits.
- Pick up areas.
- Dump areas.
- Spill zones.
- Routes or traffic ways.

1.4 Inspect and Prepare the Work Area

Before you start any work you need to look around the site. The inspection and preparation of the worksite includes:

- Working out the path of movement for plant, vehicles and materials.
- Identifying hazards, and taking suitable actions to deal with them.
- Making sure all equipment, resources and workers are available for the task.

It is important to coordinate with other workers when you are inspecting and preparing the site to make sure everyone knows what is going on, what you are planning to do and what they need to do.

All workers on site must understand their own role and the roles of others before starting work. It helps to make sure work is done safely and efficiently.

Workers you may need to coordinate with includes:

- Other mobile plant operators.
- Processing plant operators.
- Maintenance workers.
- Water truck/cart operators.
- Service vehicle operators.
- Crane and float operators.
- Contractors.
- Inspectors, both internal and external, including WHS, environmental and quality assurance officers.
- Supervisors.
- Site visitors.

1.5 Hazard Identification and Control

Before you start work, you need to check for any hazards or dangers in the area. If you find a hazard or danger you need to do something to control it. This will help to make the workplace safer.

1.5.1 Identify Hazards

Part of your job is to look around to see if you can find any hazards before you start any work.

A **hazard** is the thing or situation that causes injury, harm or damage.

When you start checking for hazards, make sure you look everywhere. A good way to do this is to check:

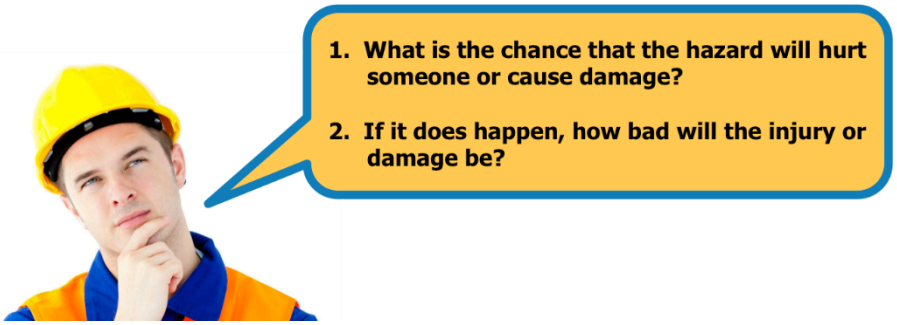
- Up high above your head.
- All around you at eye level.
- Down low on the ground (and also think about what is under the ground).

Some hazards you should check for in the work area are:

- Overhead clearance.
- Work area and ground conditions:
  - Uneven or unsafe ground.
  - Unstable faces.
  - Overhanging rocks.
  - Excavations.
  - Holes and potholes.
  - Soft edges and sinkage areas.
  - Dust and noise.
- Fires.
- People – site personnel or visitors.
- Handling characteristics of the equipment.
- The effects of the load as you haul or dump it.
- Hazardous materials – chemicals, fuel, contaminants, gases or dusts.
- Weather conditions – electrical storms, wind, heat, floods, fires, humidity.
- Equipment or machinery – other vehicles, conveyors, fixed plant, abandoned or unattended equipment, ancillary equipment, lifting equipment.
  - The times when the equipment is moving is the most hazardous.
  - As an operator, you need to be very aware of your surroundings when moving the vehicle, but you should also keep an eye on other vehicles moving around you.
  - Follow vehicle movement or traffic plans and your worksite procedures for equipment movements.

1.5.2 Control Hazards

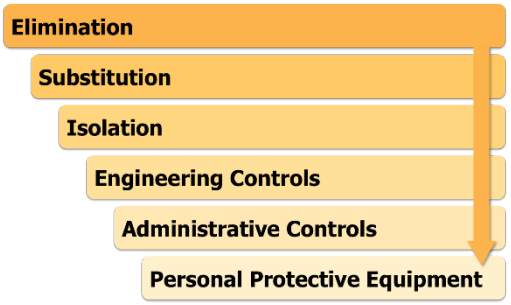
After you have found hazards or dangers you need to work out how bad they are:



Thinking about these things will help you to choose how to control the hazards. Hazards controls need to follow:

- Legislation (laws).
- Australian Standards.
- Codes of Practice.
- Manufacturers' specifications.
- Industry standards.

The best way to control hazards is to use the Hierarchy of Hazard Control. The hierarchy of hazard control is a range of options that can eliminate, or reduce the risk of hazards.



You start at the top of the list and see if you can take away (eliminate) the hazard or danger.

If you can't take it away you move down the list to see if you can swap it for something safer (substitution).

Keep working through the list until you find something that controls that hazard or danger.

This table shows you the 6 different types of controls in order from best to worst:

Hierarchy Level	Action
1. Elimination	Completely remove the hazard. This is the best kind of hazard control.
2. Substitution	Swap a dangerous work method or situation for one that is less dangerous.
3. Isolation	Isolate or restrict access to the hazard.
4. Engineering Controls	Use equipment to lower the risk level.
5. Administrative Controls	Site rules and policies attempt to control a hazard.
6. Personal Protective Equipment	The least effective control. Use PPE while you carry out your work.

It is important to think about all of the options available when deciding on the best hazard controls. You may need to use more than 1 control measure to bring the risk level down to an acceptable level.

Check the situation after you have applied a control measure to see if more controls, or different controls are needed to make the job safe. If more controls are needed, make sure they are applied before you start or continue the work.

Talk to your supervisor or safety officer if you are not sure if it is safe enough to carry out your work. If you think the hazard is still too dangerous you should not try to do the work.

1.5.2.1 Personal Protective Equipment

Personal Protective Equipment (PPE) is clothing and equipment designed to lower the chance of you being hurt on the job. It is required to enter most work sites.

It includes:

- **Head protection** – hard hats and helmets.
- **Foot protection** – non-slip work boots.
- **Hand protection** – gloves.
- **Eye protection** – goggles, visors or glasses.
- **Ear protection** – plugs or muffs.
- **Breathing protection** – masks or respirators.
- **Hi-visibility clothing** – clothing that makes you stand out and lets other people know where you are.
- **Weather protection** – clothing that protects you from the sun or from the cold.

Make sure any PPE you are wearing is in good condition, fits well and is right for the job.

If you find any PPE that is not in good condition, tag it and remove it from service. Then tell your supervisor about the problem and they will organise to repair or replace the PPE.

1.5.3 Take-5 Risk Assessments

A 'Take-5' is a quick and simple tool for use in the field to conduct a '**HAZOB'** (Hazard Observation).

It can be used to identify hazards and assess the risks associated with activities where documentation or a procedure already exists or when conditions (such as weather) change.

Once identified, the hazard is controlled, where possible, and recorded in accordance with site procedures.

Sites generally have a Take-5 book, checklist or process that is used as standard procedure in line with documentation and processes such as SWMS/JSA/JHA/JSEA and other safety procedures.

1.5.3.1 Completing a Take-5 Risk Assessment

The Take-5 system uses 5 simple steps to identify and deal with any hazards, on the spot. The steps are:

1. Stop

Think about the situation before you act. This includes thinking about who you may need to talk to, what equipment you should have, whether or not you have the required experience and training.

2. Look

Identify any hazards (physical or procedural). These may be hazards that exist because of a change in the situation (for example weather conditions) and are not listed in the procedural documentation.

3. Assess

What kind of damage could those hazards cause? Minor or severe? Will it risk damage to equipment or injury to workers?

4. Manage

Implement controls and explain what you are doing to the other people involved. It is important that you write down exactly what you did in the situation for future reference.

5. Proceed

Safely complete the task. Proceed with caution and monitor the situation carefully.

Different sites may have specific procedures or books for recording the details of the Take-5 process. It is important that you always record and report the details of any hazard in line with site policies and procedures.

1.5.3.2 Filling in a Take-5 Form

A Take-5 form should be used to record the details of the hazard where the hazard cannot be recorded as per standard procedures. This will generally include listing:

- Date.
- Time.
- Your name.
- Location of the hazard.
- Details of the hazard (what is the hazard?).
- Action taken.
- Details of any further action that is required.
- Details of recommendations for controls or treatments.
- Details of the risk level.

It is the responsibility of the person who has identified a hazard during a Take-5 risk assessment to record and report the hazard in accordance with site procedures in a timely fashion.

2.1 Check the Haul Truck

Before you use any piece of plant or equipment, you need to conduct routine checks to make sure it is safe to use.

Check the machine logbook before you start your inspection to see if there are any faults that still need to be fixed before you can use the haul truck.

Also make sure you are wearing the correct PPE before you start checking the machine.

Routine checks are made of:

Pre-Start Checks

Visual checks that are made before you start the equipment.

Operational Checks

Checks of all functions once the machine has been started.

Generally, routine checks are performed at the start of each day or shift.

You can use an inspection checklist to keep a record of the checks you have made.

2.1.1 Visual Pre-Start Checks

When inspecting the haul truck there are two levels that need to be checked:

- Ground level.
- Upper deck (and cabin).

2.1.1.1 Ground Level Checks

Ground level checks are done by walking around the haul truck and looking carefully for any signs of damage or defects. This includes:

Part	What to Check
Boarding Ladder	Damage or wear.
Front of Truck	Damage to headlights, guards or grille.
Battery Isolator	Check for tags.
Emergency Stop	Works – pushes in.
Fire Suppression Valve	Pin is secured.
Tyres & Rims	Check for cuts, gouges, proper inflation. It is important that tyres are properly maintained. Check for the following defects when carrying out your inspection: • Cuts, broken or deformed bead wire rubbing on the inside of dual wheels. • Carcass ply wear. • Carcass damage (more than 1/3 of the tyre width). • Radial cracks that reach the carcass. • Old, deformed or excessively damaged tyres.
Front Suspensions Strut	Correct height, cracks or loose bolts.
Brake Pack	Oil leaks, loose bolts
Engine	Oil leaks, fuel leaks or loose parts.
Fan Belts	Check brackets, hoses.
Radiator	Coolant leaks.
Main Frame	Cracks or damage.
Steering Arm	Loose or dry connections, cracks.
Torque Converter	Check for leaks or loose bolts.
Drive Shafts	Check for loose bolts, cracks.
Centre Bearing	Check for dry pivot, loose bolts or cracks.
Fuel Tank	Check for leaks, condition of hoses, loose bolts or cracks.
Hydraulic Lift Rams	Check for leaks, attachment pins, bolts, dry pivot.
Body Tray – Left, Right & Underside	Check for damage, check attachment pins, dry pivot.
Rock Ejectors	Check free swing, damage, attachment points.
Safety Sling for Body	Check for fraying, lock pin, on differential.
Rear Lights	Check lenses, bolts.
Rear Struts	Check ride height is correct. Check pins, dry pivot.
Differential	Check final drives.
Transmission	Check for oil leaks, retainers.
Hydraulic Oil Tank	Check for leaks, loose bolts, oil level through sight glass.
Transmission Oil Tank	Check for leaks, loose bolts, oil level through sight glass.
Fire Extinguisher	Check gauge, pin, mount and housing, current tag.
Air Cleaner	Check wing nuts, hoses.

2.1.1.2 Upper Deck and Cabin Checks

Upper deck checks are made once you climb up onto the haul truck.

Always use 3 points of contact whenever climbing up onto the haul truck. This means 2 hands and 1 foot or 2 feet and 1 hand at all times.

Once you are on the **upper deck** you will need to check:

Part	What to Check
Handrails	Check for damage, cracks or missing rails.
Mirrors	Check for cracks, scratches, mounting bolts and cleanliness.
Headboard	Check for cracks.
Main Air Tank	Purge tank of any water.
Grease Pot	Check hoses and pump attachment bolts.
Fire Suppression Cylinder	Check gauge, hoses, pin and tag.
Steering Oil Tank	Check for leaks, gauge and filler cap.
Battery Box	Check connections and bracket.
Engine Oil on Dipstick	Check correct oil level.
Air Cleaner Restriction Indicator	Check glass – if the red piston appears call maintenance.
Radiator Caps	Check water level, caps are secure.
Air Tanks	Pull engine cover, purge tanks.
Exhaust System	Check for leaks, loose bolts, cracks
Engine Covers	Check and secure straps.

Once in the **cabin** you need to check the following things:

Part	What to Check
Operator Seat	Adjust the seat, check and adjust the seat belt.
Steering Wheel	Adjust tilt and lock in place.
Fire Suppression Valve	Check pin and mount.
Fire Extinguisher	Check gauge, pin, mount & housing, current tag.
Air Gauge	Check sufficient air to start.
Windows and Mirrors	Clean.
Door Latches	Working properly.

2.1.2 Start the Haul Truck

1. Turn the key to the 'ON' position and check the monitoring system.
2. Sound the horn then start the engine.
3. Check the indicator lights for warnings.
4. Test the retarder (engine brake).

When starting a haul truck it is important to warn people nearby what you are doing. One way to do this is to sound the horn:

Number of Times to Sound the Horn	Action
Once.	Before starting the haul truck.
Twice.	Before moving forward.
Three times.	Before reversing.

Always wait for 5-10 seconds before moving off after sounding the horn to give people time to get out of the way.

2.1.3 Operational Checks

Once the engine has warmed up you can carry out operational checks. This includes checking all movements and systems.

- Check steering movement.
- Check rear view mirrors.
- Check flashing lamps.
- Check horn.
- Check accelerator, brakes, steering.
- Check all lights, systems and warning devices.
- Check all gauges during operation.
- Check the fire suppression system.
- Check the auxiliary fire system attachment (deluge system) if fitted.

Once you have finished your operational checks it is a good idea to check for external signs of oil or fluid leaks. It is common for the start-up process to cause a leak through hoses breaking. Look for signs of leaks.

2.1.3.1 Fire Suppression System

If the haul truck is fitted with a fire suppression system it is important that you check that it is working properly every day.

1. Check that the green power light is on.
2. Press the **ALARM TEST** button.
3. A red **ALARM TEST** indicator should light up.
4. After a verification delay the **FIRE** indication will flash and the audible alarm will sound.
5. After a delay the engine will shut down.
6. Press the **ISOLATE** and **RESET** button twice after the test to return the panel to normal.

2.1.4 Report All Faults

Once all routine checks are finished, you will need to report any problems, faults, defects and damage that you found during the inspection. This is so that they can be repaired and the machine and equipment are safe for you or the next operator to use.

Make sure the truck is tagged out (isolated from use) until the repairs have been made.

Record the details of the problem in a fault report or the truck logbook.

3.1 Drive the Haul Truck

There are some important things to keep in mind while you are operating the haul truck. They include:

- Stay in constant communication with other personnel throughout operations.
- Continuously monitor and check for hazards, and warn other workers if there is danger.
- Avoid driving over rocks – it can damage the tyres.
- Report your progress on a regular basis to your supervisor.
- Modify your work to meet any new project or quality requirements, or changing conditions.

You must stay within the limitations of the haul truck at all times while operating the vehicle. It will help to keep you safe and prevent damage to the haul truck. There are a range of instruments and gauges in the cabin of the truck that will warn you about any issues with the vehicle including:

- Engine oil pressure.
- Engine coolant temperature.
- Brake oil temperature.
- System air pressure.
- Fuel level.
- Parking brake (on or off).
- Transmission oil temperature.
- Maintenance required.
- Electrical system.
- Check engine.
- Coolant flow.
- Transmission oil filter.
- Steering system.
- Air filter restriction.
- Payload management system.

Keep an eye on these system indicators – they will help you to operate the vehicle within its limitations and avoid damaging the unit.

The safe speed at which the truck should be driven is determined by:

- The condition of the road.
- Weather conditions.
- The truck load weight.

Keep to the left of roads – stay approximately 0.5 to 1 metre from the edge of road, fill or embankment as they could collapse and the haul truck could tip over injuring the operator.

Maintain a safe distance of 5 truck lengths when driving behind other trucks and give plenty of room to other mobile equipment, such as graders, dozers and water trucks.

Use two-way radios to communicate when overtaking or entering a congested area, or with people involved in activities around you.

While driving the haul truck you will need to know the safe techniques for:

- Moving off.
- Shifting gear.
- Operating the retarder.
- Travelling downhill.
- Travelling in reverse.
- Turning.
- Stopping.
- U-turns.
- Working around other vehicles.

3.1.1 Moving Off

When moving off:

1. Check that there are no warnings or alarms.
2. Check that your seat belt is fastened.
3. Check that the dump level is in the **FLOAT** position.
4. Check that the air pressure gauge is in the green range.
5. Press the brake pedal fully.
6. Set the parking brake to **TRAVEL**.
7. Check that the retarder pilot lamp is off.
8. Set the shift lever to the desired position.
9. Sound the horn twice and wait for 5 seconds.
10. Remove your foot from the brake pedal and press the accelerator to move off.

If the shift lever is not positioned correctly, the shift position display on the panel may go out and the transmission warning monitor light may come on.

3.1.2 Shifting Gear

If the truck is fitted with an automatic transmission you shift up by pressing the accelerator down further while travelling.

To shift down release the accelerator pedal and the transmission will automatically shift down.

Always stop the truck before shifting from **REVERSE** to **FORFORWARD**. Run the engine at low idle when shifting gear.

3.1.3 Braking

Always read the operators manual to find out where each set of brakes is located, and how you apply them. Each truck may be different.

3.1.3.1 Brakes

The **service brake** is the air brake system. It requires time to build up air. Fanning the brakes can use this air faster than it can be replenished. This can cause the brakes to be less efficient. These apply brakes to both the front and the rear wheels, or depending on the settings, just the rear wheels. This brake is used in conjunction with the retarder.

The **secondary brakes** can be used if the service brake is not effective enough. It will apply front and rear brakes.

3.1.3.2 Retarder

The retarder is a brake system that slows engine movement, causing the truck to slow down. The retarder should be used to help control speed while driving downhill. Always operate the retarder slowly. If the brakes are applied suddenly you could skid.

3.1.3.3 Park Brake

The park brake should be used whenever stationary (parked or being loaded) or dumping materials. The park brake applies brakes to the rear wheels of the truck.

3.1.4 Travelling Downhill

Before starting to travel downhill:

1. Release the accelerator pedal.
2. Operate the retarder to slow the truck.
3. Move the shift lever to a position that matches the maximum allowable speed for the retarder brake performance (e.g. 5, 4, 3, L).

The overrun prevention device will activate the retarder if the truck exceeds the maximum speed for the gear selected while travelling downhill.

Do not change gear or coast (shift to neutral gear) while travelling downhill. Keep the transmission engaged, and use the retarder system.

Travelling continuously downhill at a speed greater than the permissible speed may damage the retarder. If any retarder monitors or alarms sound you should shift down to travel downhill. If this doesn't stop the alarm you should:

1. Stop the truck.
2. Shift to **NEUTRAL**.
3. Run the engine at 2000 rpm.
4. Wait for the monitor to go out.

If the retarder loses its effect when travelling downhill:

1. **Release the retarder completely.**
2. **Operate it again.**

If it still doesn't work:

1. **Release the retarder completely.**
2. **Press the brake pedal to stop the truck.**
3. **Contact maintenance.**

When travelling downhill do not use the foot brake unless it is an emergency. Using the foot brake while travelling downhill will overheat the front brakes reducing efficiency and life of the brakes.

3.1.5 Travelling in Reverse

1. Come to a complete stop.
2. Make sure the dump lever is in the **FLOAT** position.
3. Sound the horn 3 times.
4. Check that the way is clear.
5. Shift to **REVERSE** and gradually press the accelerator to move off.

3.1.6 Turning

Generally turns are completed at low speed with a small turn radius or at operational speed with a large turn radius (e.g. on a haul road). The speed of the machine, the weight of the truck and load and the way it is distributed will affect the way it turns.

Turning Effect	Description
Oversteer	This is where the rear wheels break away towards the outside of the turn. The way to correct this is to steer to the opposite lock and maintain engine rpms. Use the brake and accelerator to maintain control of the vehicle.
Balanced Steering	This is where all tyres maintain traction throughout the turn and the line of the turn is maintained.
Understeer	This is where the front tyres lose traction and the truck ends up going wider than the intended line of travel. Be careful when attempting to correct understeer. Apply the brakes and turn the wheel to get back on line. Do not apply the brake too hard or you can create an oversteer situation.

3.1.7 Stopping

To stop the haul truck release the accelerator and press the brake pedal.

Try to avoid:

- Sudden stops.
- Repeated stops.
- Long application of the brakes – this can cause overheating.

If you need to make an emergency stop (because the foot brake fails):

1. Apply the retarder. If it does not give enough braking force use the emergency stop as well.
2. Apply the park brake.

After making an emergency stop you need to allow the brake disc to cool before carrying out an inspection or any repairs.

3.1.8 U-Turns

Check your mirrors before making a U-turn to make sure there are no obstructions in the way. Use only enough power to turn the truck. Do not go too fast. Going too fast can cause the rear wheel to spin or may cause a blowout of the front tyres.

3.1.9 Working around Other Vehicles

Passing Working Equipment: Slow down and call the operator, wait for confirmation and stay well clear to avoid putting them in danger (e.g. with falling rocks) or disrupting their working operations.

Passing Light Vehicles: Slow down to a safe speed and steer wide to reduce the danger of falling rocks particularly when cornering.

Passing Personnel: Slow down and watch for people working in the area. Attempt to keep dust levels to a minimum.

Drive Around Survey Pegs: These pegs have been placed there for a purpose. Ask to have them highlighted with cones or flashing lights if they are hard to see.

Slow Moving Equipment: Caution is needed around slow moving equipment. Watch for light vehicles in tow.

General Rules for Giving Way to Other Plant:
A loaded haul truck has right of way over all empty vehicles and non- working plant including light vehicles as they are easier to stop.

A grader grading a haul road has right of way over all vehicles including loaded haul trucks and light vehicles.

A water truck watering a haul road has right of way over empty and loaded haul trucks including light vehicles and non-working plant.

An empty haul truck has right of way over non- working plant and non-working water trucks including light vehicles.

3.2 Adapt to Changing Conditions

While you are working the site will change. Equipment will move. The sun will rise and set again. Materials will move from one place to another. Other equipment and materials may be delivered or removed.

Where conditions become hazardous (i.e. rain, dust or wet ramps) slow down and drive to the conditions. If the conditions are deemed too dangerous park in a safe flat area and call the area supervisor and wait for further instruction.

You need to be aware of changes in conditions including:

Lighting Changes
While working underground, you may not be greatly affected by changes between night and day, but when working on the surface you could be. Twilight is the time when your eyes might become more tired and difficult to focus. It could be more difficult to see the terrain and to judge distances. Set up temporary lighting where possible and go slowly.

Weather Changes
Rain, sleet, snow, wind and humidity can all affect both your truck and the materials you are working with. Additional moisture from any source will change the composition of the materials, possibly making them heavier and slippery. This means you will not be able to haul as much and you will need to adjust the quantities you are dealing with in each load. You should notify your supervisor or another appropriate person that schedules and completion times may not be met.

Wet Conditions or Watered Routes
Wet roads increase the chance of incidents, especially if operators do not adjust their driving techniques to suit. Wet conditions can occur on site because of rain, but can also occur because of the use of water trucks. Whenever driving in the wet give yourself extra time and space to turn and stop. Use the controls smoothly and do not brake suddenly.

Inclines
When the haul road includes driving up or down inclines you need to make sure you implement the retarder before downhill travel and allow for the camber, crown and surface condition of the road. Coal can be slippery when it is dry and roads can be slippery when they are wet. Always drive defensively and safely while on site.

Rough Surfaces
The more a road is used during haulage the rougher the surface can become. You may need to reduce your speed, reduce the amount that is loaded and be aware of areas that are no longer level or stable, especially when dumping materials.

Soft Spots
A non-compactable area in a road surface caused by various factors such as a pocket of fine material, moist soft material. Continual hauling operations through these spots cause the road surface to slump. This adds to operator fatigue, damages truck suspension and reduces tyre life. Slow down, drive around the affected area where possible. Report to your Supervisor and request the area is repaired. Rutted, pot holed or uneven surfaces add to driver fatigue and put stress on the truck suspension and tyres. Call for a grader to rectify the problem.

Super Elevation
A super elevation is the forming of a road surface, where a corner is involved, to allow for cross fall to slope in the direction of travel i.e. when cornering to the right, the road is built up on the left hand side allowing a slope down to the right hand side.

The purpose of super elevation is to help maintain an even weight distribution over the truck suspension while cornering. The benefits of a super elevation:

- Improves machine stability.
- Reduces wear on suspension components.
- Reduces spillage.
- Improves production.
- Reduces overload on tyres.

3.3 Load, Haul and Dump Materials

The loading equipment used in conjunction with the haul truck can be static (fixed in one place) or dynamic (the equipment itself moves or the truck has to move with it).

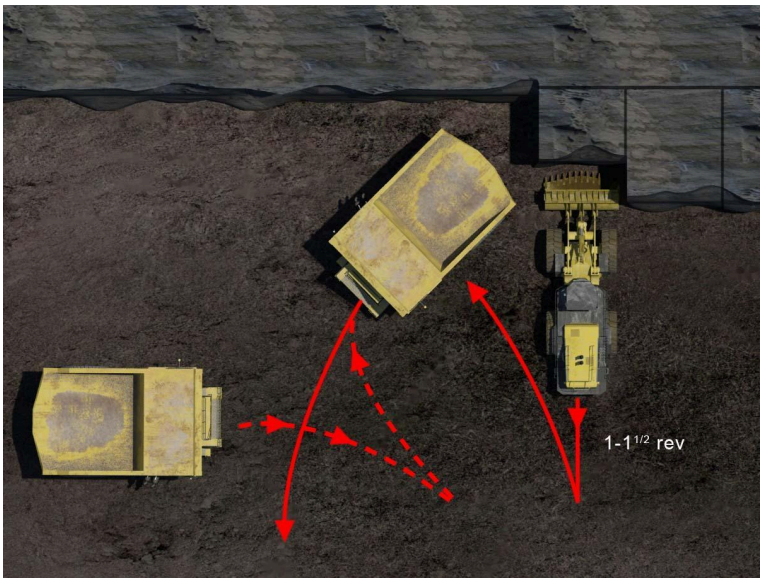
Be aware that positioning the haul truck correctly in alignment with the loading equipment is the most crucial aspect of haul truck loading operations. It allows the loading equipment to load more quickly and therefore increase productivity.

To ensure your truck is in the best possible position it may be necessary to:

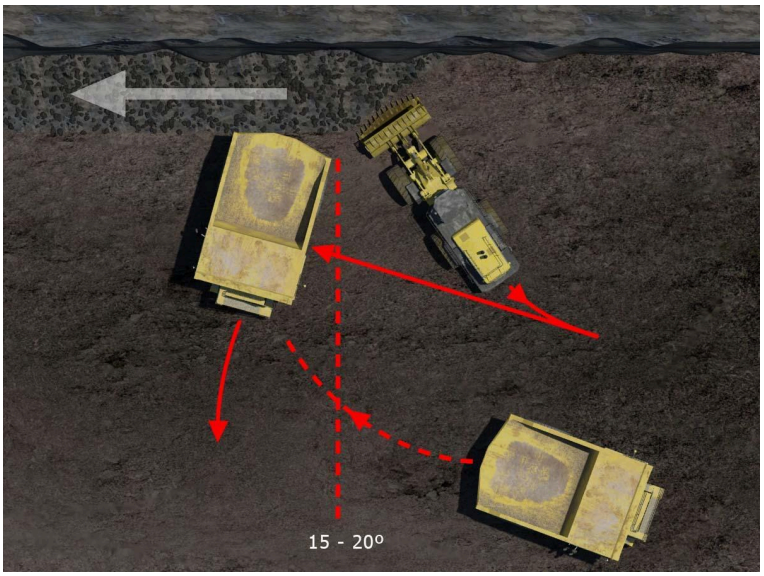
- Refer to the haul circuit plans and the vehicle and traffic management plans.
- Use a spotter if available, or ask the loading equipment operator for help. The spotter has better vision at the rear of the haul truck.
- Maintain a safe distance from edges.
- Remain in the cabin while being loaded for your own safety, and so that the loading equipment operator knows your location.

You should approach the loading area using the least amount of turning as possible. Back into position with the loader on the driver's side of the truck. Stop when the other operator signals. Apply the park brake and always stay in the truck while being loaded.

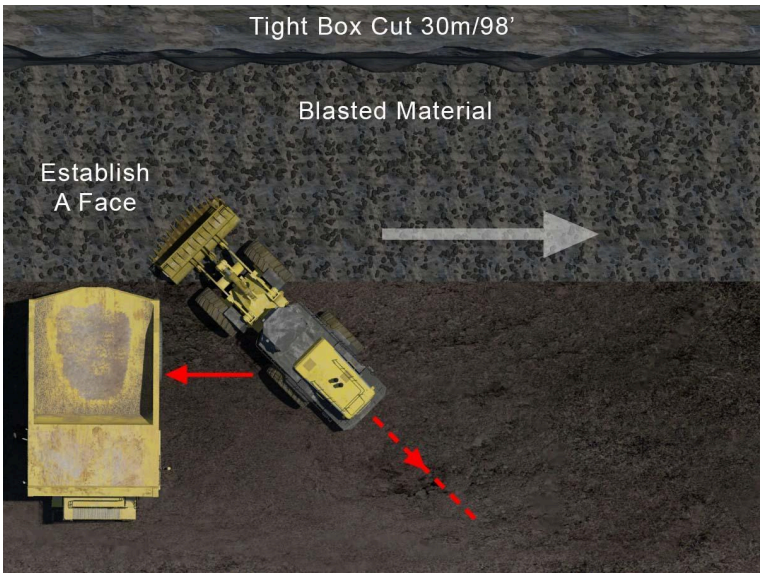
Truck Spotting



Parallel Dig



Tight Box Cut



When loading operations are being carried out it is very important that you maintain communication with the operator of the loading equipment (if mobile plant). You need to coordinate your movements with the operator to make sure you are in the correct position to be loaded. Follow any guidelines or instructions given to you by the operators. They will often wait with a loaded bucket for you to get into position before depositing the load into your truck.

Keep an eye on the payload management system (if fitted) to let you know when the truck is reaching capacity. The system can also track information about operations such as the total weight of materials hauled and the total number of loads hauled.

Some examples of loading equipment could include:

Loading Equipment	Description
Shovels	Large rotating buckets used in quickly transferring materials from long wall, strip mining or stockpile areas. Materials may be fed onto a conveyor system for loading on to haul trucks. The truck operator must keep pace with the equipment and be ready to move into position for loading to avoid time delays or spillage.
Bins	Materials may be stored in large bins similar to silos. Loading may be from gravity feed through chutes or may involve the use of transfer augers or conveyor systems.
Excavators	Can load from either behind (over the back) or from the side. The excavator operator will guide the truck driver into position. Watch out for blind spots on the excavator and make sure you allow enough room for the excavator to swing. Good communication is required.
Wheeled Loaders	Will generally load over the side of a haul truck (or from both sides) depending on the stockpile arrangement. The loader operator will guide the truck driver into position.
Conveyor Belts	Materials are loaded into the centre of the haul truck to keep it balanced and stable. The driver therefore needs to ensure the truck is always in the correct position for loading. Some conveyor systems may have load scales to give an accurate reading of the quantity of materials being transferred. Haul truck drivers need to keep up a constant loading rate so that the conveyors do not have to stop running in between loads.
Draglines	Be aware of the movement of the machine and follow workplace procedures. Allow sufficient room for loading so that the truck does not get in the way of the dragline equipment. Loading from draglines requires experience so talk to other operators, ask for mentoring if you feel you need it and follow directions.

Being familiar with the different types of equipment and knowing what is expected of you will help you achieve the best results. Other tips include:

- Take care – Look out for blind spots on machines or around the site, particularly in stockpile or loading areas.
- Use effective communication between operators.
- Ensure you know the required loading pattern and haul circuit.
- Observe vehicle movement plans on the worksite.

3.3.1 Loading

Loading may occur from one side of the truck, both sides of the truck or over the rear of the vehicle. Make sure you are aware of the site layout and haul routes to help you position yourself properly to maintain an efficient load, haul, dump sequence.

3.3.1.1 Single-Sided Loading

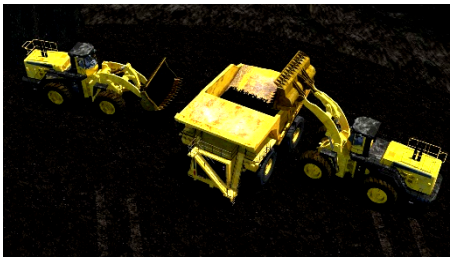
The loader or excavator loads onto the truck from one side only.

The haul truck needs to be positioned exactly, sometimes using spotters, and must wait until the other haul truck has left the loading area before reversing into the position. Your truck is loaded and then driven away before the next truck enters the loading area.

3.3.1.2 Double-Sided Loading

The truck is loaded from either side. The truck waiting to be loaded can be reversed into the empty loading position while your truck is being loaded and moved away. This means faster movement of materials but requires effective communication between all drivers.

Vehicle positioning is essential to ensure optimum output from the excavator and to keep the truck clear of the excavator boom swing. Knowing the haul circuit is critical.

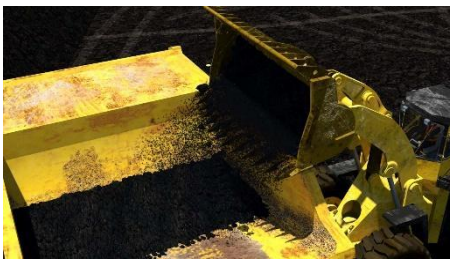


3.3.1.3 Drive-By Loading

The haul truck is loaded in a side-on position to allow for quicker entry and exit from the loading area. Once again, communication between haul truck operators is essential.

Sometimes a conveyor system is used, e.g. strip mining, long wall or mobile tracking equipment. This loads materials while the truck is moving at the same pace as the conveyor system. To be effective, a series of vehicles will be used so that the operations are not held up waiting for the next truck to arrive for loading.

3.3.1.4 Bucket Loading



The haul truck must be positioned correctly for bucket loading. Often the excavator or loader operator will guide the driver into position.

Ensure the load is fully discharged before moving the vehicle. Follow the haul route, particularly if you are working with other haul trucks.

3.3.2 Hauling Materials

Most haul roads have a crown to help drain away water. This affects the truck as it is always travelling on a slope and will want to drift to the edge of the road. Be careful as the steering on a haul truck is hydraulic and very light and sensitive.

Brake and accelerate carefully and try to avoid any sudden movements with the truck – especially when fully loaded. If the road is slippery, apply the retarder slowly and shift the transmission down to stop the rear wheels from locking up.

If the roads are wet there is a chance that water can get inside the front brakes. This can reduce the effectiveness of the brakes. If you notice that the brakes are not working as well as normal after travelling through water you should apply the brakes several times while stopped to create friction between the brake pad and disc to try and dry them out.

Maintain a safe speed and distance from other vehicles on the haul road at all times.

You may be required to haul the materials to a tip head, crusher pocket or waste dump. Make sure you approach and position the truck effectively for dumping.

3.3.3 Dumping Materials

Whenever dumping materials:

- Make sure there are no people in the area behind the truck (tipping zone).
- Reverse slowly into position applying the brakes slowly and evenly.
- Make sure the truck is level before tipping.
- Avoid dumpling uphill – more materials stay in the tray and it takes more energy to lift the load uphill.
- Make sure the surface dump area is stable and can hold the weight of the truck without it sinking.
- Always make sure there is a substantial windrow when dumping oven an edge (at least half the height of the tyres).
- Check for overhead hazards (power lines, conveyors etc) and maintain a safe distance at all times.
- Always lower the hoist and make sure the tray is properly positioned before leaving the dump area.

Vehicles may be required to discharge in the following locations:

Location	Description
Burden Dumps	This is where excess or surplus materials may be placed.
Reject Dumps	Where unsuitable materials or spoil may be dumped. Sometimes this material may be contaminated so will need to be handled correctly in line with organisation procedures. These may include procedures for waste disposal, hazardous materials, biological waste or other environmentally sensitive fluids or materials.
Rehabilitation Dumps	Where mounds may be created allowing for revegetation, noise control, or other purpose.
Stockpile Sites	These may be permanent or temporary depending on the materials. Materials could include minerals or other extracted materials, topsoil, gravels, over load, or other materials.
Tip Heads	Reverse the truck to the windrow and tip from right to left. Apply the park brake, put the truck in neutral and raise the tray. Once the tray is empty release the park brake, move forward slightly and lower the hoist. Once lowered select the correct gear, sound the horn and move off.
Paddock Dumping	This is usually done from right to left. Reverse to the pile dumped in the row previously, select neutral and apply the park brake. Hoist the tray and dump the materials. Once the tray is empty you can release the park brake, move forward slightly and lower the tray back down. Select the appropriate gear, sound the horn and move off.
Hoppers	Usually these are connected to a conveyor system or other processing equipment.
Bunkers	Often bunkers are specially designed silos or in ground material storage areas.
Feeders	These may be transfer points or may be a combination of stockpiles, hoppers or other equipment.
Crushers	This is where materials are dumped either directly in to a crushing plant or to stockpiles ready for loading to the crusher.

It is important to follow the worksite procedures and directions for any dumping activities. Materials must be placed in the appropriate locations and cross contamination should be avoided. Check with your supervisor if you have any queries about the tasks you are performing.

Operators must ensure the correct dumping procedures are followed and that spillage is minimised wherever possible. Where spillages occur, it may be necessary to have another plant item such as a loader clean up the spillages.

Take care when materials are wet as they may stick to the tray of the haul truck causing the load to be unbalanced when discharging. This is common when hauling clay based materials or spoil. Follow your organisation procedures for clearing the tray of the vehicle if this occurs.

3.4 Responding to Monitors and Alarms

Each machine has its own set of alarms, monitoring systems and gauges to help you safely and efficiently operate it, and warn you if something is wrong.

Each make and model of the same type of machine can be different so it is important that you are familiar with all of the systems for the equipment you are using. Check the operator's manual for a full list of devices, alarms and warnings.

Here are some examples of the gauges and warning systems:

Brake Monitors	**Air pressure, oil temperature, parking alarms.**
Temperature Gauges	**Oil, water.**
Filters	**Fuel, steering, transmission.**
Engine Gauges	**Fuel, engine oil pressure.**
Gauges and Meters	**Tachometer, torque converter, voltmeter, speedometer/ odometer, service meter, retarder, computer indicators.**

Generally alarms and warnings fit into 3 categories:

Warning Type	Category Description	Examples	What You Should Do
Category 1	These types of warnings let you know that the machine needs some attention, but it is still safe to operate.	• Low fuel. • Low system voltage.	Keep operating as long as it is safe to, and report the problem once you stop work.
Category 2	These warnings indicate that there is a problem caused by the way you are operating that may lead to problems with the equipment.	• Equipment is overheating. • Equipment is overloaded.	Change the way you are operating and if the problem is not fixed, stop operating and report the issue.
Category 3	This is the most serious warning level. Continuing to operate while this warning is sounding will cause damage to the machine.	• The park brake is on. • Low engine oil pressure.	Stop operating and shut down the equipment immediately. Report the problem straight away.

If you are unsure about the meaning of an alarm, gauge or monitoring system check your operator's manual, and talk to colleagues or your supervisor.

In all cases, any faults must be reported.

3.4.1 Respond to Haul Truck Emergencies

To keep yourself and others safe on site it is important that you know how to react in an emergency or dangerous situation.

Tyre Blowout

If one of the haul truck tyres blows out:

1. Stop the haul truck safely.
2. Call your supervisor and maintenance to organise repairs and site signage (isolation).
3. Check to see if there is a chance of tyre fire.
4. Stay with the truck unless there is a chance of tyre fire.

Tyre Fires and Explosions

Under extreme conditions tyres can overheat to the point of setting fire. This is rare but can be caused by a range of tyre defects such as:

- Friction from rubbing (dual tyres).
- Dragging wheel brakes.
- Failed wheel bearings.
- Tyre fatigue.
- Running underinflated tyres.
- Contact with high voltage electrical equipment.
- Lightning strikes.

If you experience a tyre fire:

1. Keep a safe distance – at least 300m from the tyre as it could explode.
2. Keep other unnecessary personnel away.
3. Isolate the vehicle.

Generally you should allow 24 hours after putting out the fire before you approach the equipment.

If a tyre explodes there is a chance that the others could follow. Do not attempt to release the pressure of tyres to try to prevent them from exploding. There is no guarantee that they will not explode.

Steering Loss

If your haul truck loses steering an emergency steering system will engage. This system activates when:

- The hydraulic pump for steering is defective.
- The engine has stalled.

If you experience steering loss, bring the truck to a stop as quickly and safely as possible and call maintenance personnel.

Down Ramp Runaway

If the truck is gaining too much speed while travelling downhill:

1. Apply the retarder.
2. Apply the foot brake.

If the truck is still gaining speed apply the emergency brake and follow emergency stop procedures.

Brake Failure

If the brakes fail during operation apply the emergency brakes and move the truck to a safe position. Call for assistance straight away.

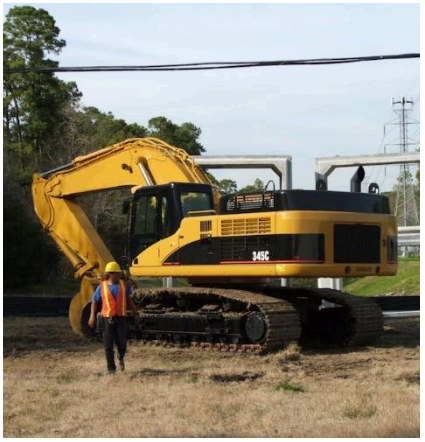
Any equipment that has been stopped using the emergency brakes cannot be operated again until it has been checked by maintenance personnel.

3.4.2 Monitor and Check for Hazards

While you work it is important to always be on the lookout for new hazards, and to check that hazard controls are still in place and working effectively.

This will help to ensure the safety of yourself, other personnel, plant and equipment.

Check the following things while you work:



Overhead Power Lines or Structures – Know how far you are from overhead power lines at all times. Use a spotter to guide you if visibility is reduced. Be aware that the distance to the overhead services may be reduced as fill goes up.

Other Vehicles or Equipment – At all times you need to know when other machines are working near the truck. Know and stick to your agreed travel paths or roads. Good communication between operators is essential to avoid incidents such as collisions.

Personnel – Good communication is the key to working with other workers. Be aware of people in work area. Make sure they are not in danger and are a safe distance from the truck. If you are authorised, tell them to leave if they shouldn't be there, or call on someone who is authorised. Make sure you are aware of the correct worksite procedures for working near or around other people in the area.

3.4.3 Check Completed Work

The key to completing assigned tasks efficiently is good time management and knowledge of the methods of operation and capabilities of the machinery being operated.

Always make sure you are aware of the work schedule and your work requirements are clear and confirmed.

Once you have completed your work you will need to check it against:

- Your work instructions or work plan.
- Site quality requirements and timelines.
- Product quality requirements.
- Project details and information.

Speak to your supervisor when the work is completed to see if there are any other tasks that need to be done to complete the task.

3.5 Park the Haul Truck

At the end of the shift you need to check the following things before shutting down the haul truck:

- Engine water temperature.
- Engine oil pressure.
- Fuel level.

If the engine has overheated do not stop the truck suddenly. Run it at mid range speed to cool it down gradually before you stop.

When you have finished the work you need to park the haul truck:

1. Park the truck on firm level ground.
2. Release the accelerator and press the brake to stop the truck.
3. Put the truck in neutral gear (N).
4. Move the park brake lever to **PARK**.

DO NOT use the retarder or emergency brake. Block the wheels if you have to leave the haul truck on an incline.

3.5.1 Shut Down the Haul Truck

Once you have parked the haul truck you need to:

1. Run the engine for at least 5 minutes at low idle speed to allow the engine to cool down gradually.
2. Once the temperature has come down you can turn the ignition key **OFF** and exit the haul truck.

After you climb down from the haul truck look around the bodywork and undercarriage to check for oil or water leaks.

4.1 Post-Operational Checks

Post-operational checks need to be done to make sure the haul truck is ready for the next operator.

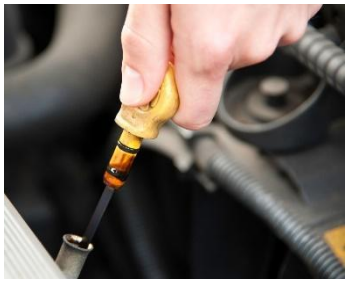
General maintenance activities are done to keep all plant and equipment working safely for longer.

As part of your job as a haul truck operator, you need to inspect your machine to find and report any faults or damage that may have occurred during your work activities.

Your inspection should include:

Visual Inspection	**Physically looking for anything odd, wrong, broken or damaged.**
Visual Inspection of the Environment	**Is any fluid leaking?**
Signals	**Alarms, lights, electronic indicators showing that something may be wrong.**
Gauges	**Showing temperatures and the levels of fuel, oil and other fluids.**

Post-operational checks should include all of the things you look for when conducting pre-start checks. For example:



- Fluid levels.
- Condition of tyres.
- Visibility (windows and mirrors).
- Hydraulics (rams, hoses and connections).
- Structure and tipper body for damage or wear.

4.1.1 Reporting Faults

Once a fault has been found, it needs to be reported and fixed.

Most sites have a fault report form that will need to be filled in with the details. The form will generally need the machinery or equipment make and model numbers, the site identification numbers, the type of fault and the person reporting the fault.

You also need to make sure the haul truck is tagged out (isolated from use) until the repairs have been made.

Some sites will have a verbal system of reporting where you speak with a supervisor who then documents the fault, while others may require the operator to organise repairs of the fault directly.

4.2 Carry Out Maintenance Tasks

Before carrying out any maintenance on the haul truck you may need to clean it. This will need to be done in a designated area to avoid any negative impact on the environment or contamination of the site.

Clean windows, mirrors and lights regularly. Clean hand holds and grip points to make them safe. Clean the grill and check oils and coolants in the radiator.

Maintenance activities could include:

- Air filters – should be checked regularly in dusty conditions. Clean or replace them as necessary.
- Greasing or lubricating pivots, joints or swing points.
- Tyres – check air pressures and condition.
- Battery checks – clean the battery, check electrolyte levels.
- Fuel and other fluids – check and maintain levels.
- Refuelling.
- Recording and reporting of faults through workplace procedures.

When conducting maintenance activities it is important to keep people in the area safe by using barricades or fences, if necessary, and locking out machines.

Tasks should be completed within designated areas and others should be informed of what you are doing.

You should conduct servicing, maintenance and housekeeping tasks to ensure the truck stays at its operating capacity for as long possible.

You will also need to coordinate with mechanics, maintenance supervisors or other site workers to ensure the vehicle is serviced at regular programmed intervals.

4.2.1 Refuel the Haul Truck

All refuelling of equipment needs to be done in line with safety procedures and workplace instructions.

Some sites may have refuelling areas for plant and machinery set up to make sure any spills or incidents can be contained without causing damage to the environment. Spill response procedures need to be clear and spill kits available to manage any incident.

Other sites use a service truck or fuel tanker that travels to each machine to refuel. On these sites it is very important that all procedures are followed to avoid any incidents (such as fires in a coal mine environment) or damage to the environment. For example, there may be site rules against refuelling plant and equipment near a waterway or sensitive area.

Refuelling can be a dangerous activity, so it is important that you know and understand the correct procedures and techniques. If you are not sure what to do, speak with your supervisor.

These are some general guidelines for refuelling haul trucks. Always check the procedures for your worksite before any refuelling is done:

- Park the vehicle in an appropriate location or within a bunded area. This contains any environmentally sensitive fluids or spills from entering and causing damage to the environment.
- Shut down the truck and apply all brakes and isolations.
- Leave the cabin, or if company procedures do not allow this make sure you do not restart the machine until you have permission from the refuelling operator.
- If you are responsible for refuelling the machine make sure you have the right PPE on before you start. This may include safety glasses, face shields, gloves or other approved gear.
- Activate the fuel pump correctly and make sure all safety procedures are followed.
- Shut down the fuel pump once the machine has been refuelled.
- Roll up or safely tidy all fuel lines or hoses.

4.2.2 Return the Vehicle to Service

Before your vehicle is returned to service you need to confirm that all designated maintenance activities and repairs have been completed.

Each site will have different processes for checking that the designated work has been correctly completed. Procedures could include:

- Third party checks – often done by a non-involved team member.
- Supervisor checks.
- Checklists or worksheets.
- Procedural documentation, e.g. maintenance contract.
- Other site-specific processes.

Once the maintenance work has been completed and checked, any locks and tags on the equipment will need to be removed.

4.2.2.1 Removing Locks and Tags

There are two primary people who are authorised to remove a lock or tag: the person who applied it and the designated, authorised repairer.

Locks and tags may have been applied to the haul truck as a whole or to isolation devices attached to the machine. Double-check each possible location for locks and tags. Never assume that removing one lock from an isolation device will remove all locks or tags.

Before any tags or locks are removed, the vehicle or equipment should have been checked to ensure all repairs and maintenance have been completed.

Once tags and locks have been removed, follow record keeping requirements to log the removal on the job card or other relevant documents.

The truck will then be listed as returned to service in accordance with worksite procedures.

4.3 Processing Maintenance Records

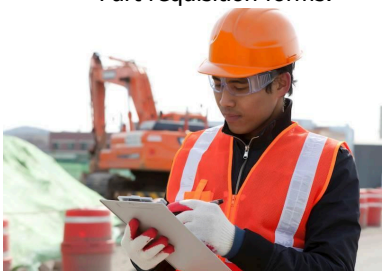
Most sites have workplace forms, logbooks or checklists for writing down details of all machine maintenance work.

They are used to record the history of the machinery and equipment so that all operations and any problems can be monitored.

They are also a way of making sure that all repairs and maintenance are done correctly and on time.

Written maintenance records for your haul truck may include:

- Inspection checklists.
- Fault reports.
- Fuel, oil, hydraulic and other fluid usage.
- Computer readings of various haul truck functions.
- Diary entries.
- Service manuals or logbooks.
- Repair request forms.
- Part requisition forms.



You will usually need to include details like the truck make and model number, site identification numbers, the type of maintenance carried out, the repairs or replacements that were done and the person who did the work.

Follow your site record keeping and reporting procedures. If in doubt about completing and processing written maintenance records, talk to your supervisor or an experienced worker.