

RIIMPO321F - Conduct civil construction wheeled front end loader operations

Learner Guide



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1.1 Introduction

This course is based on the unit of competency, **RIIMPO321F Conduct Civil Construction Wheeled Front End Loader Operations.**

You will learn about civil construction wheeled front end loader operations including:



- ◆ Planning and preparing for work.
- ◆ Conducting routine checks.
- ◆ Operating wheeled front end loaders.
- ◆ Relocating the front end loader.
- ◆ Maintenance and other housekeeping tasks.

1.1.1 What is a Wheeled Front End Loader?

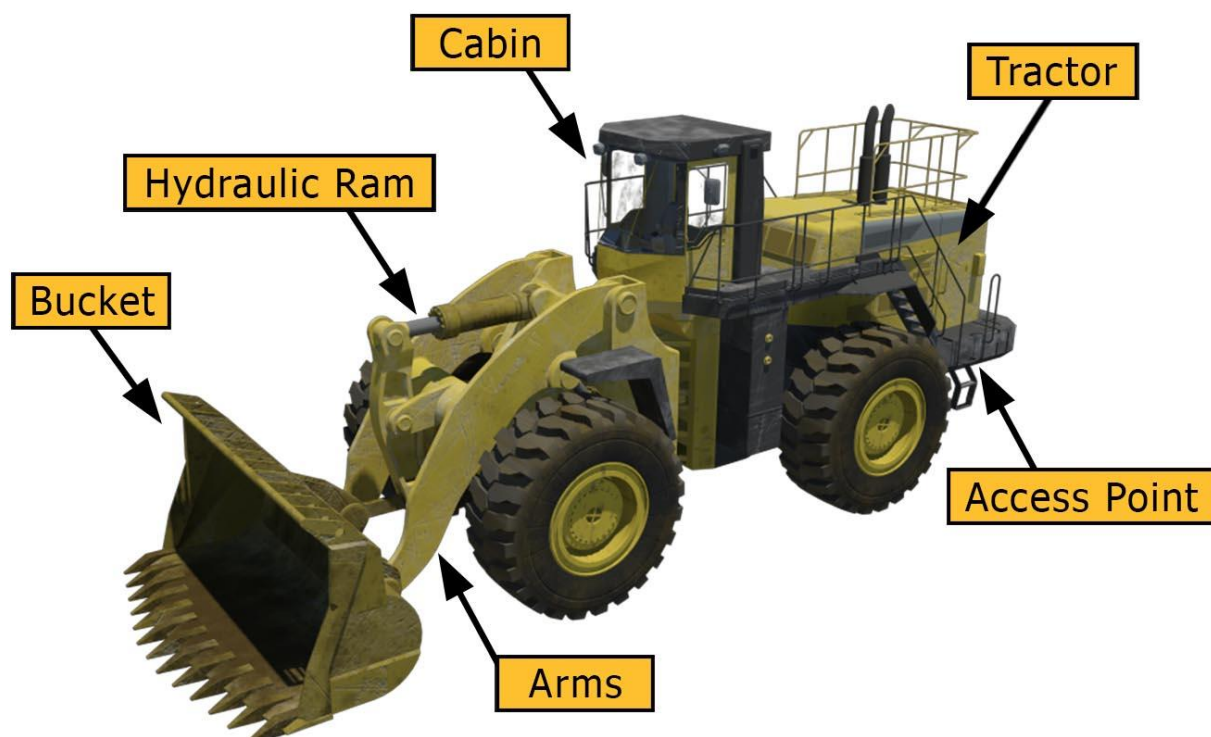
A wheeled front end loader is a self-propelled machine that has a front mounted bucket connected to the end of two booms (arms). The bucket has a very large capacity, and may be removable or permanently mounted.

The machine is self-propelled, meaning that it has a powerful engine and does not require pushing, pulling or towing.



1.1.1.1 Wheeled Front End Loader Components

The following diagram outlines the basic components of a wheeled front end loader:



Component	Description
Cabin	Where the operator sits. Contains the controls for the operation of the wheeled loader.
Tractor	Contains the engine of the machine.
Access Point	The point where the operator can safely access the loader cab.
Arms	Raises and lowers the bucket.
Bucket	Used to move materials. The most common attachment.
Hydraulic Ram	Moves the arms and bucket/attachment.

1.2 Working 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 and 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. 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 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 work practices.
- ◆ 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 structures, workers, traffic or areas that 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? Does the job need a special type of bucket or attachment?
- ◆ **Plant** – What type of plant will be used? How big is it? How much room does it need?
- ◆ **Attachments** – What equipment will you need to shift the load safely? Is the equipment available?
- ◆ **Communications** – How are you going to communicate with other workers?
- ◆ **Procedures & Rules** – Do you need any special permits or licences for the work? Are there site rules that affect the way you will do the work e.g. traffic control requirements?



1.3.1 Reading and Checking Your Work Instructions



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

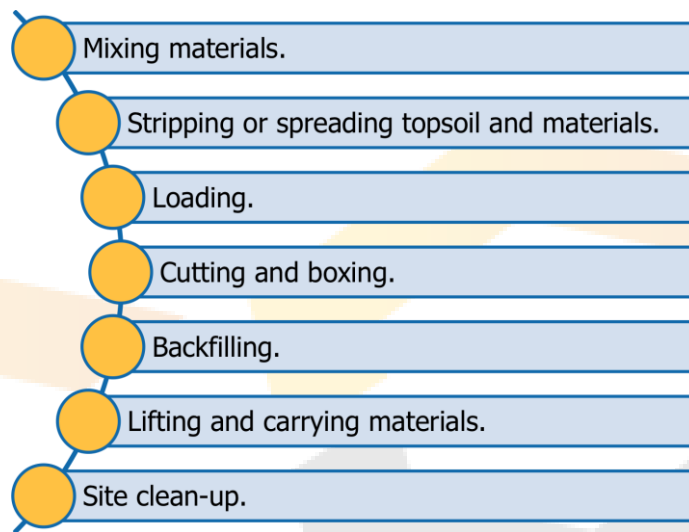
Procedures help to make sure that all work is done in a safe way, without damaging equipment or putting people in unsafe situations. They also help to make sure that work is done in the correct order and doesn't interrupt or get in the way of other work that is happening on the site. This is especially important in civil construction projects that need to be completed in a particular sequence.

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 the language or civil construction terminology being used in them, you can ask your boss or supervisor. They will tell you where to find your work instructions and explain what they mean.

1.3.1.1 Wheeled Front End Loader Operations

Most actions occur through the front end loader's forward movement. The loader is capable of:



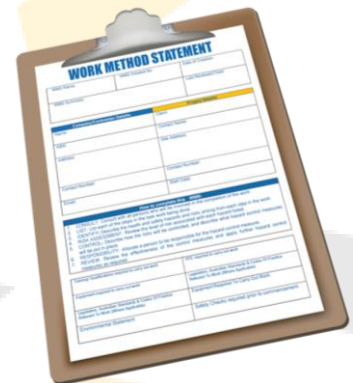
A front end loader may also be used for levelling out surfaces.

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 Safe Work Method Statement (SWMS), Job Safety Analysis (JSA) or Safe Operating Procedure (SOP).

Work method statements are a great tool for organising your work activities and making sure you have completed everything. They will also outline the details of all tools, equipment and coordination with other workers relating to your job. Make sure all of these are available and ready before you start.



1.3.3 Project Quality Requirements

Every civil construction project will have quality requirements. These outline when tasks need to be completed and the required standard of the work.



Your work instructions and plans or drawings will guide you, and help you to make sure you are achieving the quality standard for the project.

They can include:

- ◆ Project dimensions.
- ◆ Project tolerances.
- ◆ Standards of work.
- ◆ Material standards.

1.3.3.1 Site Material Characteristics

Make sure you are familiar with the site product or materials before you start to move them around. Have a look at the composition of the materials to see what kind of equipment you will need to move them, and what techniques to use.

Some materials are more cohesive or sticky while others may be much less stable to work with, or create hazards like dust or damage to equipment if they are not handled just the right way.

Part of the civil construction project may involve compacting materials as part of preparing a site or creating roads. You will need to confirm the level of compaction that is needed in your work instructions or project plans.



1.3.3.2 Plans, Drawings and Sketches

When looking for information or instructions for a civil construction project, you will come across plans, drawings and sketches. Examples of these are:



- ◆ Project plans.
- ◆ Site plans.
- ◆ Work plans.
- ◆ Project drawings.
- ◆ Sketches made to explain work that is happening on site.

Plans and drawings are useful because they can help you to get an overview of the site and the project as a whole. It can also be the best way to explain exactly what needs to be done.

You need to be familiar with the scale and symbols used in the plans and drawings so you can understand them properly. If you're not sure ask your supervisor or site personnel for help.

1.3.4 Civil Construction Sequences

Civil construction projects are made up of a range of smaller tasks or activities. It is important that these are done in the right order for the project to go smoothly.

Here is a basic civil construction sequence from clearing the area through to preparing for road construction:



1.3.5 Basic Earthworks Calculations

As a loader operator, the two main calculations you will need to be able to apply are for Area and Volume.

Area can be calculated using the following formula:

$$\text{Area} = \text{Length (L)} \times \text{Width (W)}$$

For example:

40 square metres (40m²) may be marked out as:

- ◆ 10 x 4 metres.
- ◆ 5 x 8 metres.
- ◆ 20 x 2 metres.

$$\begin{aligned}\text{Area} &= \text{L} \times \text{W} \\ &= 10\text{m} \times 4\text{m} \\ &= 40\text{m}^2\end{aligned}$$

$$\begin{aligned}\text{Area} &= \text{L} \times \text{W} \\ &= 5\text{m} \times 8\text{m} \\ &= 40\text{m}^2\end{aligned}$$

$$\begin{aligned}\text{Area} &= \text{L} \times \text{W} \\ &= 20\text{m} \times 2\text{m} \\ &= 40\text{m}^2\end{aligned}$$

Volume can be calculated using the following formula:

$$\text{Volume} = \text{L} \times \text{W} \times \text{H}$$

For example:

An area with a length of 10 metres, a width of 4 metres and that is 2 metres deep will be 80 cubic metres (80m³) of material.

$$\begin{aligned}\text{Volume} &= \text{L} \times \text{W} \times \text{H} \\ \text{Volume} &= 10\text{m} \times 4\text{m} \times 2\text{m} \\ \text{Volume} &= 80\text{m}^3\end{aligned}$$

1.3.6 Emergency Procedures



Emergency procedures will vary depending upon the worksite. These procedures could include:

- ◆ Emergency shutdown.
- ◆ Evacuation.
- ◆ First aid.
- ◆ Fire fighting.

1.3.6.1 Emergency Shutdown of Equipment

If there is a fire, emergency or accident you might need to use the emergency stop on the equipment you are using. This will turn the equipment off immediately. You can also use the emergency stop if the equipment stops working properly or you lose control of the equipment.



1.3.6.2 Evacuation

Things to remember are:

1. Keep calm.
2. Move away from the danger to a designated evacuation point, sometimes called an emergency assembly area.
3. Do not let other people into the area.
4. Call emergency services in accordance with workplace procedures and policies.



1.3.6.3 First Aid



First Aid is the quick care given to an injured or ill person. Every site will have a First Aid Officer. If somebody needs first aid you must tell your supervisor or First Aid Officer. Do not try to give first aid if you have not been trained.

1.3.6.4 Fire Fighting Equipment



Fire fighting equipment on site could be anything from small fire extinguishers through to large water cannons. Different fire fighting equipment should be used for different types of fire. Always check the equipment for information on what type of fire it can be used on.

Steps for using a fire extinguisher:

1. Evacuate the area.
2. Isolate the area.
3. Call emergency services or follow other designated on site procedure.
4. If it is safe to do so, use an extinguisher to attempt to control the fire using the **PASS** system.

The **PASS** system:

P	Pull the pin.
A	Aim at the base of the fire.
S	Squeeze the trigger.
S	Sweep the base of the fire.

Contact your site emergency management team as soon as possible and call the fire brigade on **000**.

1.4 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.

The best way to control hazards is to use a simple problem-solving approach:

1. Identify the problem. (What is the hazard?)
2. Identify the cause of the problem. (What is causing the hazard?)
3. Work out the different options that you have to solve the problem. (What can be done to eliminate or minimise the hazard as much as possible?)
4. Choose the best option to solve the problem and apply it. (What is the best option to eliminate or minimise the hazard?)
5. Check to see if the problem has been solved. (Has the hazard been eliminated or reduced to a safe level?) If not, you will need to use additional, or better options for fixing the problem. (Controlling the hazard.)



1.4.1 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 a 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:



- ◆ Overhead and underground services.
- ◆ Uneven, soft, slippery or unstable terrain.
- ◆ Trees.
- ◆ Fires.
- ◆ Bridges.
- ◆ Excavations.
- ◆ Buildings.
- ◆ Traffic.
- ◆ Embankments.
- ◆ Cuttings.
- ◆ Hazardous materials.
- ◆ Structures such as site offices and scaffolds.
- ◆ The weather and environment.
- ◆ Other workers or site visitors.
- ◆ Pedestrians and other public traffic.
- ◆ On site vehicles, plant, equipment and machinery.
- ◆ Poorly maintained or faulty equipment.
- ◆ Hazards from components of the front end loader (e.g. hoses under pressure, hydraulic tanks, cooling systems or braking systems).
- ◆ Road surface and edge solidity.
- ◆ Handling characteristics of the loader.
- ◆ Effects of the load as you move or scoop it.
- ◆ Chemical hazards such as fuel, chemicals, contaminants, gases or dusts.

1.4.2 Working Near Power Lines

Working near power lines can be very dangerous if you are not careful.

It is very important that you know the safe operating distances for different types of power lines and the steps you must take if your job needs you to work closer than the safe distances.

Generally, if you need to work closer than the safe work distance you must:

- ◆ Contact the local electrical authority for permission to work closer (this is called an exemption).
- ◆ Have the power lines shut off. If this is not possible then have the power lines insulated.
- ◆ Use a spotter (depending on local laws and rules).



Distances are different depending on the voltage of the power lines and the state/territory you are working in. You should check with the local electrical authority for information and advice to find out the voltage of power lines in your work area.

VIC

In Victoria the Framework for Undertaking Work Near Overhead and Underground Assets states that equipment must not be closer than the following distances to electric/power lines:

Electric/Power Line Type	Distance
Distribution lines up to and including 66kV (power poles)	6.4m (or 3.0m with a qualified spotter)
Transmission lines greater than 66kV (towers)	10m (or 8m with a qualified spotter)

Note: Distances are different depending on the voltage of the power lines and the state/territory you are working in. You should check with the local electrical authority for information and advice to find out the voltage of power lines in your work area.

Ie WA

In Western Australia this falls under Regulation 3.64 from the OSH Regulations and states the following as the minimum distances:

Electric/Power Line Type	Distance
Up to 1kV (insulated)	0.5m
Up to 1kV (uninsulated)	1.0m
Above 1kV and up to 33kV	3.0m
Above 33kV	6.0m

1.4.2.1 Tiger Tails

Tiger tails are used as a visual aid to identify the location of overhead power lines.

It is important to note that tiger tails **DO NOT** insulate the power lines so exclusion zones and safe operating distances must still be maintained, even when tiger tails are present.



1.4.2.2 Contact with Power Lines



If the loader makes contact with live power lines you should:

1. Stay calm, remain in your seat, and warn others to keep away.
2. Try to break contact by lowering the bucket and get someone to switch off the power if possible.
3. If it is unsafe to stay in the machine, jump well clear and don't make contact with the ground and the machine at the same time.
4. Remain a safe distance from the machine and warn others to keep clear.
5. Have someone notify the supervisor, who should contact the appropriate electrical authority.

1.4.3 Control Hazards

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

1. What is the chance that the hazard will hurt someone or cause damage?
2. If it does happen, how bad will the injury or damage be?



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:

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. This includes using signage and barricades.
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 one 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.



1.4.3.1 Personal Protective Equipment (PPE)

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.



cold.

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. An ear protection must be worn when the noise level could contribute to the hearing loss (e.g. above 85dba)
- ◆ **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

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. Tell your supervisor about the problem and they will organise to repair or replace the PPE.



1.4.3.2 Traffic Control Barricades and Signage

In some cases you may need to isolate the work area. Set up barricades and signage to warn others that you are working in the area and that it is dangerous for them to come too close.

On worksites it is often necessary to control the movement of traffic around and through the site. To do this there are two different types of traffic management plans:

Traffic Management Plan

Deals with traffic moving through the site, i.e. traffic on public roads and members of the public.

Vehicle Management Plan

Deals with on-site vehicle movements, haul circuits and dump runs, and material routes.

In the traffic or vehicle management plan, signs and the distances between them will be listed. Reading the plans will show you where particular signs need to be placed.

Signs and barriers may include:

- ◆ Danger or warning signs like speed limits, 'workmen ahead' or 'reduce speed'.
- ◆ Flashing lights.
- ◆ Barricades and fences.



1.4.4 Environmental Protection Requirements

Environmental protection requirements are part of every worksite. Make sure you check with your supervisor about what environmental issues need to be managed during your work.

All environmental details should be listed in an 'Environmental Management Plan' for the site. It can include details for:

- ◆ Waste management.
- ◆ Water quality protection.
- ◆ Noise control.
- ◆ Flora and Fauna (Plants and Animals)
- ◆ Vibration control.
- ◆ Dust management.



The plan will outline the steps and processes needed to prevent or minimise damage to the environment through the use of machinery and equipment.

2.1 Choose and Check Plant and Equipment

Once you have confirmed your job requirements you need to choose the right plant, equipment and attachments to get the job done.

When choosing plant and equipment you need to think about:

- ◆ The task requirements, specifications and goals.
- ◆ The appropriateness of the equipment for the completion of the task.
- ◆ The characteristics, correct use, operating capacity and limitations of each item.
- ◆ The potential risks to yourself and others in the intended use of the equipment.

Information about technical capabilities and limits can be found in the operator manuals for each item.

It is not safe to operate plant, equipment or attachments beyond the manufacturer's specifications. This may cause the machinery to break and could also cause an accident.



2.1.1 Front End Loader Characteristics and Limitations

Check the operator's manual and manufacturer's specifications for information about:

- ◆ Load limits and operating capacities.
- ◆ Balance requirements with and without a loaded bucket.
- ◆ The limits on slopes that can be negotiated both loaded and unloaded.
- ◆ Manoeuvring capability, such as turning radius and stopping distances.
- ◆ Attachment use.
- ◆ Use of slings.
- ◆ Materials and handling requirements.



2.1.2 Choosing Front End Loader Attachments

The most commonly used front end loader attachment is a multi-purpose 4:1 bucket, which can be used to scoop, carry, pick up and level materials.

Other approved attachments may include:

Attachment Type	Examples and Uses
Rippers or Scarifiers	For ripping the surface and loosening materials where needed.
Augers	Used for drilling holes and moving materials.
Lifting Devices	Slings, lifting gear, platforms.
GPS	For machine guidance and levelling.
Tillers	For mixing materials.



When choosing an attachment you have to work out if it is suitable for the tasks you need to complete by confirming:

- ◆ What the attachment is designed for.
- ◆ If it is an approved attachment that can be used with the loader you are operating.
- ◆ The manufacturer's requirements for the attachment.
- ◆ That you know how to use the attachment properly.

You will find this information in the operator's manual for the loader and the operator's manual for the attachment. Otherwise you may need to check the workplace equipment procedures for your site.

2.1.3 Fit and Remove Attachments

Once you have decided that the attachment is right, you need to attach it securely using approved attachment points and methods. Each attachment will have its own requirements for how and where it is fitted on the loader. You can find this information in the operator's manual or manufacturer's instructions.

Make sure you take appropriate safety precautions (such as releasing hydraulic pressures where needed) before fitting or removing attachments.



Generally, to **fit** an attachment:



1. Collect any required tools or equipment.
2. Make sure the front end loader is safely parked and correctly located for attaching the equipment.
3. Follow manual handling procedures – attachments can be heavy and awkward to manipulate.
4. Connect the attachment using the manufacturer's guides and ensuring all connectors are correctly joined.

Generally, to **remove** an attachment:

1. Collect any required tools or equipment.
2. Ensure the front end loader is safely parked and removal of the attachment will not cause a hazard.
3. Ensure any pressure couplings have the pressure released before detaching.
4. Disconnect connectors in correct order and using recommended safety procedures.



2.1.4 Conduct Routine Checks



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 loader.

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

Routine checks are made up 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.

2.1.4.1 Pre-Start Check

Pre-start checks are done before the engine is started. Walk around the loader and look for anything that is out of the ordinary.

Part or Component	What to Check
Structure	Check the general condition of the front end loader, including any loose nuts or bolts. Check for oil or other fluid leaks. Check for any signs of visual weaknesses, damage, stressed welds or paint separation. Make sure a Roll Over Protective Structure (ROPS) and a Falling Object Protective Structure (FOPS) are fitted to the loader.
Tyres	Check the condition and air pressure of the tyres to make sure they are within the manufacturer's specifications. If the loader has water-filled tyres check the pressure with the valve at the top of the wheel.
Bucket	Check the bucket for worn or broken components e.g. teeth, blade, bolts. Inspect the hydraulics and connections for wear and tear. Check the condition of the pivot pins.
Safety Pins	Check safety pins are in place where needed and loose bolts are tightened. Also check keeper plates and pins are in place.
Power Arms	Make sure you check the power arms for damage or defects, but be careful not to put yourself in a position where you could be crushed if there is a malfunction. If you find excessive wear in the power arms and connections that make the loader dangerous to operate tell your supervisor or an authorised person. Then isolate the loader and don't use it until it is repaired.
Fluids and Lubrication	Check that the oils (engine, transmission, hydraulic) and fuel are at the right levels. Check that the water or other approved coolant is at the right level. Transmission fluid needs to be checked in accordance with the manufacturer's specifications. Check that parts are lubricated to ensure smooth operation.
Engine	Check condition and security of battery. Check electrolyte levels. Check for any obvious signs of damage or wear.
Hydraulic Rams, Hoses and Piston Rods	Hydraulic rams and pressure hoses are checked for splits, leaks, fractures, bulges and bent piston rods.
Decals and Signage	Check that all decals and signage are present on the machine.
Windows	Check that the windows are clean and you have good visibility from the operator's chair.
Cabin	Check that the seat and safety belt are in good condition. Check that the cabin is clean. Check that the floor plates are free from grease and oil.
Service History and Logbook	Check the machine hour meter, manufacturer's recommendation and logbook to find out if the loader needs to be serviced. You can also check the instruments or computer for this information on later models.

For exact details on the components for the machine you are operating, check the operator's manual as different brands may have different requirements.

2.1.5 Operational Checks

Operational checks are made once the engine is started.



Make sure all holding brakes are on and the loader is in neutral gear (where appropriate) before the loader is started.

Start up the loader following the manufacturer's instructions. Where the machine has two pedals for independent rear brakes (designed for manoeuvrability), the pedals must be connected together.

You will need to let the engine idle for the required amount of time. Depending on the individual machine this idle time could range from 3 to 10 minutes.

Controls and functions that need to be checked on the loader:

Part or Function	What to Check
All Controls	Test all arm and bucket movements.
Switches and Gear Buttons	Check the master switch, isolation switches and start switch or key. Test gear change buttons or quick shift arrangements.
Gauges and Instruments	Check that all instruments are displaying properly and are not signalling any alarms or warnings.
Safety Devices	Test all lights and other warning devices.
Attachments	Check that it works properly.
Travel, Turning and Brakes	Test all movements and brakes, including the emergency stopping device.
Ancillary Equipment	Test all communications devices and any other systems or functions fitted, e.g. air-conditioning, radio, two-way radios, lights.

Once you have finished your operational checks it is a good idea to check for external signs of oil or fluid leaks.

2.1.6 Recording and Reporting Faults

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

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

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



Note: If equipment is faulty

1: Don't Use

2: Tag out

3: Report (Get repaired)

2.2 Operate the Front End Loader



During civil construction front end loader operations you will need to:

- ◆ Assess the materials you are working with.
- ◆ Use the equipment safely within the technical specifications and limits.
- ◆ Continuously monitor and check for hazards.

It is important to coordinate your activities with other workers when you are planning and carrying out the work to make sure everyone knows:

- ◆ The work being completed.
- ◆ How, when and where you will be operating.
- ◆ 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 include:

- ◆ Supervisors and management.
- ◆ Other plant and vehicle operators.
- ◆ Traffic controllers or other workers on the site.
- ◆ Team leaders.
- ◆ Site safety personnel.

2.2.1 Assess Materials to be Shifted

You will need to assess the materials you are working with to figure out the best way to handle it. For example, clay is more cohesive and harder to excavate than topsoil.

There may be different types of materials being handled at the worksite. They may include:

Material	Characteristics
Clays and Mud	Clay and mud can tend to be dense and sticky and may not discharge cleanly if wet or damp. Sometimes, particularly with damp materials, the dump process may be longer than normal. Mud can purge from the loader, rather than discharge smoothly.
Topsoil and Organic Materials	Generally these types of materials are loose and will dump cleanly. As topsoil can be reused in re-vegetation activities, it will normally be dumped in a quarantine area to keep it free from contaminants. It may be necessary to clean down the machine before starting work in other areas or prior to hauling topsoil or organic matter to prevent contamination.
Stones, Rocks and Gravel	The operating techniques used will depend on the type of rock, and the size of gravel and stones. For example: ◆ Metamorphic rocks are heavy and hard. ◆ Igneous rock is volcanic and can be hard but may also be very light. Igneous rock can be very abrasive and may cause damage to the loader or wear down ripping points quickly. ◆ Sedimentary rocks and shale could peel out when cut and removed.
Silts and Sands	Depending on the amount of moisture, silts and sands can move cleanly and easily or can be difficult because of the fine and sometimes crumbly nature of the materials.
Construction Site Materials	Construction site materials can be blended materials, bituminous mixes and waste materials. How these materials handle will depend on the properties of the materials and the environmental conditions such as the moisture levels. Knowing the material and how it reacts during operational activities is essential in order to complete required tasks efficiently and achieve optimum output.

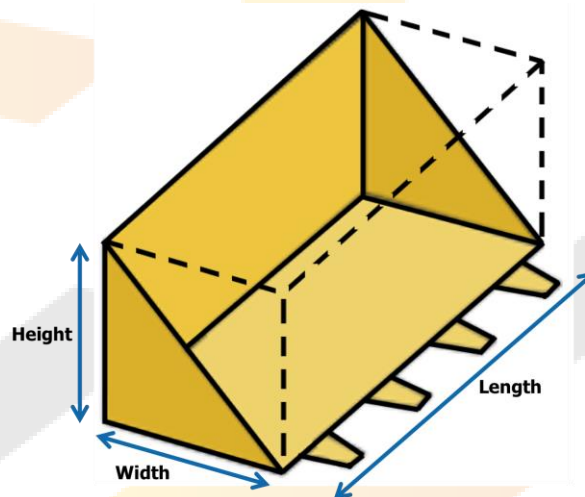
You will also need to assess the weight of the materials you are working with.

Material	Weight / Cubic Metre	Material	Weight / Cubic Metre
Bronze	8.5 t	Lead	11.4 t
Clay	1.9 t	Lime (stone)	2.6 t
Coal	864 kg	Sand (beach, dry)	2.0 t
Concrete	2.4 t	Sand (beach, wet)	2.3 t
Earth	1.9 t	Sand (river, wet)	1.5 t
Granite	2.6 t	Shale	2.6 t
Gypsum	2.3 t	Terracotta	1.8 t
Iron Ore	5.4 t	Zinc	7.0 t

Think about the size of the bucket you are using and work out the weight of the load.

To work out the volume that the bucket can hold multiply the height (H), width (W) and length (L), then divide it by 2:

$$\frac{L \times W \times H}{2}$$



Check the weight of the materials against the manufacturer's specifications to make sure you don't overload the loader. Keep in mind that uneven, rough, boggy or sloping ground can all reduce the amount of material that the loader can safely carry.

2.2.1.1 Soil Technology

Characteristics of the materials being moved or loaded will affect your work.

You need to understand the basics of soils, clays and other materials so you are able to:

- ◆ Know how to best respond to them and handle them.
- ◆ Achieve the best outcomes in your work.
- ◆ Calculate load amounts.
- ◆ Understand conditions for moving the materials.



Note: You cannot compact materials properly with the wheels or buckets you need to use compaction wheels or plates. You can get better compaction using the weight of the wheeled front end loader.

When handling low viscous materials such as mud or wet sand:

- ◆ Consider if there is room for run off at the stockpiling area
- ◆ Consider safety hazards and risks such as slips and fall, spilling out on to a road or into a water supply

2.2.2 Safe Operating Techniques

To make sure your work is done in a safe way it is important to follow some basic safe operating techniques.

- ◆ Make sure the loader is suitable for the ground conditions and that the bucket is suitable to the task.
- ◆ Always keep to safe driving speeds for the conditions and terrain so that the loader doesn't tip over.
- ◆ Keep clear of holes or soft ground areas. Be careful when driving along the high side of a trench as it could cave in.
- ◆ Always travel with the bucket as low as the ground conditions will allow.
- ◆ Keep in constant communication with other personnel throughout your loader operations. Continuously monitor and check for hazards, and warn other workers if there is danger.
- ◆ Report your progress on a regular basis to your supervisor and modify your work to meet any new project or quality requirements, or changing conditions.



The operator's manual will outline the limitations of the front end loader you are using. This will include information about:

- ◆ Safe operating speeds and techniques.
- ◆ Safe travel speeds.
- ◆ Monitoring systems and alarms.

Front end loader operators will usually use the following techniques to complete civil construction tasks:



- ◆ Mixing materials.
- ◆ Stripping or spreading topsoil and materials.
- ◆ Levelling.
- ◆ Cutting or boxing.
- ◆ Backfilling.
- ◆ Site clean-up.

2.2.2.1 Driving to the Work Area

Check that the route and direction of travel is clear – check over both shoulders before reversing. If a reverse warning device is not fitted, sound the horn twice before moving off.

Raise attachments smoothly and keep the bucket at a safe travelling height (as low as possible) while moving to the work area.

Travel directly up or down a sloping surface, not across or diagonally down. This will ensure the loader is as stable as possible. Avoid side hill travel where possible.



On approach to downhill or uphill travel, reduce speed and choose an appropriate gear for the grade. During downhill travel always use a low gear to help control the descent. Often this is the same gear that would be used to climb the hill.

Take care when changing gears during uphill travel, especially when in a heavy loader. If you miss a gear you could lose control of the loader. If the loader does not have enough power to climb, reverse back down and choose the correct gear to climb the hill.

Do not ever coast (put into a neutral gear and roll) the loader down a hill.

2.2.2.2 Safe Operating Speeds

While operating the loader make sure movements are smooth, not jerky, and that you operate the machine at a safe speed.

Operating the loader too fast can cause instability.



2.2.2.3 Safe Travel Speeds

Going too fast will reduce the stability and control of the loader, as well as putting yourself and other workers in the area in danger.

Your speed may be affected by a range of factors including:

The age of the machine.

The work environment.

Ground conditions.

Attachments fitted.

The type of tyres fitted.

Visibility.

Site rules, policies and procedures.

Amount of traffic, other vehicles or obstructions in the area.

2.2.2.4 Using Attachments

You need to know and understand the operational limits of the equipment you are using to make sure you don't damage it, or put yourself in danger. Each attachment has been designed to do a specific type of work, for a specific type or range of materials. Do not ever use an attachment for any job other than the one it is designed for. Check the manufacturer's specifications or instructions for information.

To use attachments safely and effectively you should:

- ◆ Make sure you have enough room to operate the attachment safely without putting other workers in danger.
- ◆ Keep all operations within the limits and capabilities of the equipment. You could damage the attachment if you push it too hard.
- ◆ After you have finished using the attachment, check your work to make sure it matches the plan.



2.2.3 Excavating, Loading and Transporting Materials

Excavating and loading with a front end loader is done by driving the bucket into the materials and scooping them up. This can include cutting into the ground or loading materials from a stockpile.

Make sure you work safely and follow the work plan including:



- ◆ Checking for underground services (power, telephone, gas, water, sewer, drainage and fibre optic cable lines) before starting to excavate. Talk to the site supervisor who will contact the supply authorities for council maps of the site.
- ◆ Checking state or territory standards for safe operating distances from power lines.
- ◆ Using barricades, guard rails or fencing and warning signs to prevent workers falling into a trench or vehicles and machines getting too close. No workers should be standing within operating radius of your loader while you work.

When excavating you should check for signs that you are getting close to a previous excavation or an underground service. If you notice any of the following signs, stop operating immediately and hand dig to investigate:

- ◆ Crushed blue metal or plastic tape.
- ◆ Clean sand or sand bags.
- ◆ Broken tiles.
- ◆ Moisture.
- ◆ Any other unusual material.



Don't undercut a bank or stockpile as it could collapse and the loader could overturn.

Don't overload the bucket – make sure you work out the capacity of the bucket and assess the material to be loaded.

Some points to remember when travelling with a load:

- ◆ Constantly monitor the load as you drive.
- ◆ Always travel with the bucket as low as possible and tilted back for greater stability and vision and less spillage.



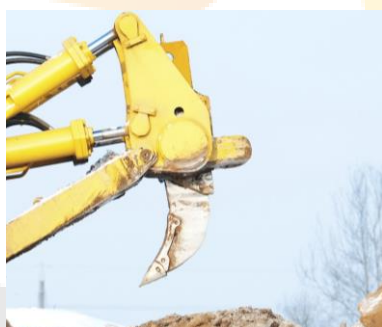
2.2.3.1 Dumping Material into Trucks

When dumping material into a truck:



- ◆ Approach the truck slowly or wait until it is correctly positioned.
- ◆ Make sure you know where the driver is at all times.
- ◆ Place a layer of soil in the truck to take the impact of large rocks.
- ◆ Never load over the cabin of the truck as the bucket could hit the cabin or load could drop onto the cabin.
- ◆ Be careful of large boulders tipping out of the bucket onto the truck.
- ◆ Make sure anyone in the area is at a safe distance from loading operations and that they stay within your view.

2.2.4 Mixing Materials



You may need to mix materials using the loader. A tiller is a useful attachment for this kind of work.

You can use one to break up the ground and mix topsoil or clay with other materials to prepare the ground for future work.

Rippers and scarifiers can also be used to break up the ground before mixing materials.

2.2.5 Stripping and Spreading Topsoil

Front end loaders can be used to strip back the top layer of earth to excavate or level an area. The blade of the bucket is used to cut and lift a small amount of the topsoil.

This topsoil can be transported to another area and spread out. Spreading topsoil can be done a number of ways. You can discharge the soil from the bucket bit by bit as you move along, or scrape a small pile of topsoil over an area using the blade of the bucket or a 4-in-1 bucket.



2.2.6 Levelling

Often the loader will be used to level out uneven ground. This can be done using the blade of the bucket.



When levelling, you need to work to the designated grade, slope and fall (for water to run off).

In many cases GPS and laser control systems are now used to provide a more accurate finish to the work. This eliminates the need to have a person standing close by ready to take levels, although this may still need to occur with some works.

Levelling equipment needs to be calibrated regularly and checked against site reference points such as pegs, benchmark points or other defined levels.

2.2.7 Cutting and Boxing

Cutting involves cutting or removal of material above a required level i.e. cutting down to create a floor or design level.

Boxing is the technique of removing materials below a level and may involve trenching, or removing sections of pavement in a "box" type shape to a desired level.



2.2.8 Backfilling

The front end loader can be used to backfill trenches or excavations after work has been completed.

When backfilling make sure that you do two things:

- ◆ Check that the right materials are deposited into the excavation.
- ◆ Check that the right level of compaction is achieved.

Always approach a trench square-on (form a 'T' with the trench) and take care when working near the high side of the trench or on soft or sloping ground.

Loose materials in a trench or excavation can settle over time and sink down. Make sure there is enough material packed into the trench to keep the ground even after the work is completed.



2.2.9 Site Clean-Up



Front end loaders are useful for cleaning up worksites after major works have been completed, or preparing sites for other work.

Site clean-up includes removing unwanted materials from the area. You may need to stockpile them for later use, or deposit them in an area where they can be removed from the site.

2.2.10 Monitoring Systems 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 that may be found on a front end loader:



- ◆ Engine oil pressure
- ◆ Engine temperature.
- ◆ Hydraulic oil pressure.
- ◆ Hydraulic oil temperature.
- ◆ Electrics.
- ◆ Fuel.

Generally alarms and warnings fit into 3 categories:

Warning Type	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.

2.3 Adjust Techniques to Meet Changing Conditions

While you are working and moving materials, the site will change.

Lighting Changes – 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 Conditions – Rain, sleet, snow, wind and humidity can all affect both your loader 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 lift or haul as much and you will need to adjust the quantities you are dealing with in each load.



Changing Work Conditions – As more materials are moved around or removed from a site the work conditions may change. Materials that you are working with can change throughout a project. As you excavate deeper or move onto other stages of the civil construction project such as landscaping or preparing road base you will be working with different materials, attachments and personnel.



2.4 Lift, Carry and Place Loads using Slings and Lifting Gear



In civil construction projects you may need to use the front end loader to lift and carry loads using slings and lifting gear for example, lowering pipes into trenches or moving equipment or construction materials around the site.

It is important that this work is conducted in coordination with authorised personnel such as a licensed dogger or rigger.

2.4.1 Determine the Weight of the Load in Coordination with Other Personnel

You need to coordinate with authorised personnel to work out the weight of the load to make sure your loader can safely lift it without damaging the equipment, attachment or making it unstable.

The weight of the load can be found in a number of ways:

- ◆ Check for weight markings on the load.
- ◆ Check delivery dockets or information sheets.
- ◆ Check the weighbridge certificate.
- ◆ Calculate the weight of the load or material.



If you cannot be sure of the weight and cannot calculate it, do not lift the load.

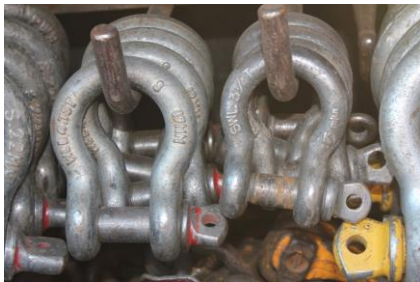


Once you know the weight of the load you need to make sure the loader you are using has the capacity to lift it safely. You can check the capacity of the loader in the operator's manual or manufacturer's specifications.

If you are using an attachment to lift the load you need to check that it is also rated to be able to lift the load. Keep in mind that using an attachment may also reduce the overall capacity of the loader.

Pass on any information about machine and equipment capacity to the person slinging the load.

2.4.2 Choosing Lifting Gear



When using the loader for lifting, make sure it is fitted with the correct lifting attachment or that the machine has the appropriate lifting lugs. Always use an approved lifting lug or lift connection that is clearly marked with the Safe Working Load (SWL).

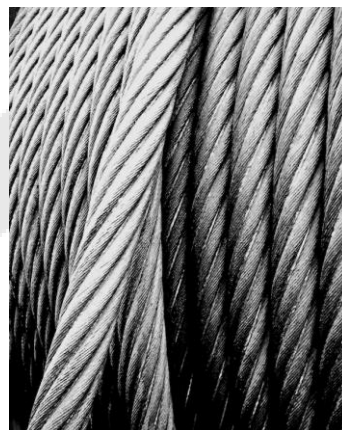
Lifting gear needs to be selected based on the type, size, weight and shape of the load to be lifted. Only a licensed dogger or rigger is authorised to select and inspect lifting gear, determine the weight of loads and select and apply slinging techniques.

2.4.2.1 Types of Lifting Gear

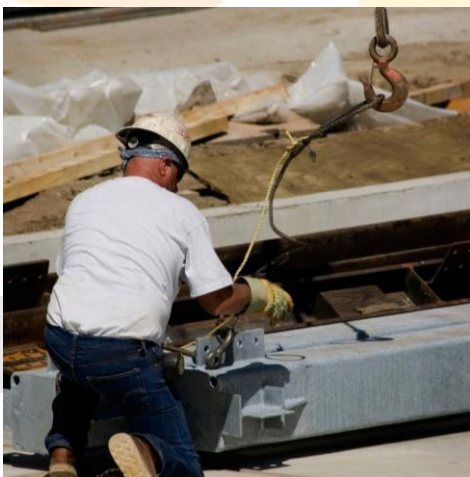
Lifting gear that may be used with the loader includes:

- ◆ Wire rope slings – also known as Flexible Steel Wire Rope (FSWR).
- ◆ Chain slings.
- ◆ Synthetic slings.
- ◆ Eye bolts, shackles and hooks – used to attach lifting gear to the load and loader.

Each piece of lifting gear is rated to a specific capacity known as a Working Load Limit (WLL). This WLL can change depending on how the lifting gear is connected and arranged. This is why a licensed dogger or rigger needs to decide what lifting gear is being used and how it will be used.



2.4.3 Inspecting and Connecting Lifting Gear



Slings and other lifting gear must be inspected before and after use for any signs of damage or wear. All faults must be reported in accordance with site procedures and the equipment must be isolated (removed from service).

Defects that would condemn a lifting chain and hook from safe use include:

- ◆ Cracks in links
- ◆ Over 10% wear
- ◆ Over 10% elongation
- ◆ Over 5% wear or stretch in throat of hook
- ◆ Over 10% wear in bite hook
- ◆ Twisted or damaged links
- ◆ No SWL tag
- ◆ Rusted
- ◆ Chain or hook affected by heat
- ◆ Spot welded links

Once the correct attachment and lifting gear has been chosen and inspected by a licensed dogger or rigger, you need to make sure it is connected to the loader properly. Slings should only be attached to manufacturer approved lifting lugs using a shackle that is rated to lift the load.

You are not allowed to attach slings to the teeth of the bucket because it may break off the teeth and /or the sling could slip off the teeth and cause the load to fall, which may injure or kill someone or damage the load. It is against regulations to sling loads using a skid steer loader without the approximately approved lifting connection fitted.

Remember: Only a licensed dogger or rigger can select, inspect and apply slinging techniques and determine the weight of loads. You may only participate in these activities under the direct guidance of a qualified dogger or rigger.

2.4.4 Positioning the Front End Loader

Before lifting a load with slings you need to get the loader into the right position. Make sure:

Before lifting a load:

- ◆ The loader is on firm level ground.
- ◆ The load, loader and lifting gear can all be safely accessed.
- ◆ Any other personnel, plant and equipment not directly involved are a safe distance away.
- ◆ You have enough overhead clearance to lift the load.
- ◆ You have enough room to move once you have lifted the load, especially if you need to travel with it.
- ◆ The loader is in line with the load so it will not swing when it is lifted.

If the load you are going to lift is likely to swing, you can attach taglines to the load. The minimum diameter size of the tagline that can be used to control loads must not be less than 16mm in diameter.

2.4.5 Lifting Techniques

Follow these guidelines whenever using the front end loader to shift a load using slings and lifting gear:

Operating Techniques for Lifting Loads	
Follow directions from the dogger to position the lifting point over the centre of gravity of the load to keep the load from swinging.	☐
When you are given the signal perform a test lift then lower the load again so that any changes to the slings and load can be made.	☐
Keep all movements smooth and slow.	☐
If the weight of the load causes the machine to tilt or if the hydraulics begin to strain stop the lift immediately and lower the load back down.	☐
Loads should be moved shortest distance possible to maintain effective and efficient control of the machine and the load.	☐
Constantly monitor the load during the move.	☐
Monitor your speed of travel and stay within safe speed limits.	☐
Maintain a safe distance from exposed edges.	☐
Follow all hand signals or other designated signals.	☐
If the slings shift on the load being lifted stop the loader, warn workers in the area, carefully lower the load and have the slings re-positioned and secured.	☐
Make sure that if lowering objects such as pipes into trenches that the trench is shored and workers are standing a safe distance away.	☐
Land the load at the designated location. Ensure that it is secure and stable.	☐
Make sure lifting equipment is properly detached before moving off.	☐
Check the hydraulic hoses and rams before and after lifting to make sure no damage has been done to the equipment.	☐

2.4.6 Communicating When Moving and Lifting Loads



Communicating when transporting and lifting loads may involve communication equipment such as two-way radios. Whistles, bells or other devices may also be used as audible signals to assist with movement of loads.

There are also specific hand signals that apply to the lifting and movement of loads. Hand and audible signals are designed to make the lifting and placement of objects safer and more effective.

Make sure you confirm all signals with the dogger who is directing you before you start to shift the load. Make sure you follow all directions given to you by the person who is directing the lift.

Shown here are the hand and audible signals used in Australia:

HAND SIGNALS	
Hoisting Raise Whistle, Bell & Buzzer Signals 2 Short ..	Hoisting Lower Whistle, Bell & Buzzer Signals 1 Long _
Luffing Boom Up Whistle, Bell & Buzzer Signals 3 Short ...	Luffing Boom Down Whistle, Bell & Buzzer Signals 4 Short
Slewing Right Whistle, Bell & Buzzer Signals 1 Long, 2 Short _..	Slewing Left Whistle, Bell & Buzzer Signals 1 Long, 1 Short _..
Jib/Trolley Out; Telescoping Boom Extend Whistle, Bell & Buzzer Signals 1 Long, 3 Short _...	Jib/Trolley In; Telescoping Boom Retract Whistle, Bell & Buzzer Signals 1 Long, 4 Short _....
Stop Whistle, Bell & Buzzer Signals 1 Short .	
Creep Speed: Appropriate hand signal for motion with hand opening and closing	

2.5 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, Structures and Clearances – Know how far you are from overhead power lines at all times. Use a spotter to guide you if you cannot clearly see. Be aware that the distance to the overhead services may be reduced as ground conditions change or stockpiles are created. You also need to be aware of overhead clearances when dumping materials into trucks or other haulage units.

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

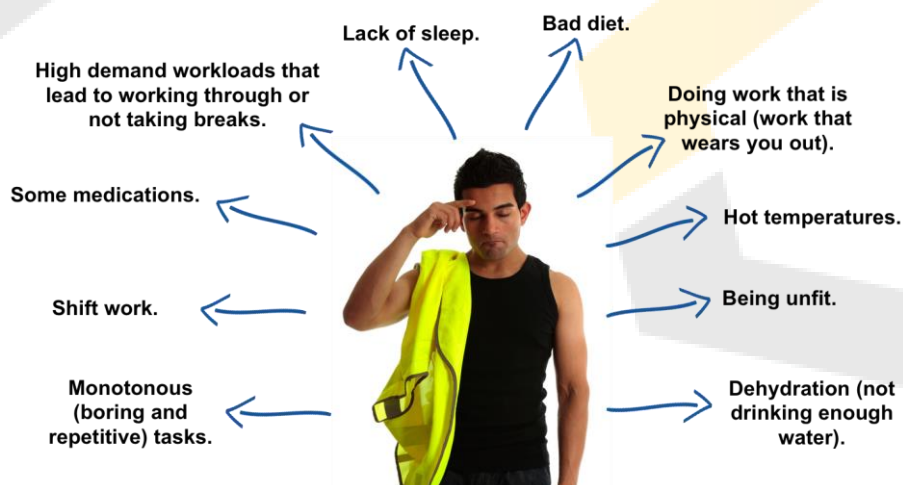
Live Stockpiles – Movement of materials in a live stockpile is likely. There is always the potential for the walls of a stockpile to collapse if it is incorrectly excavated.

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



Operator Fatigue – Fatigue is one of the leading causes of accidents for operators of all types of vehicles and equipment.

Fatigue can be caused by:



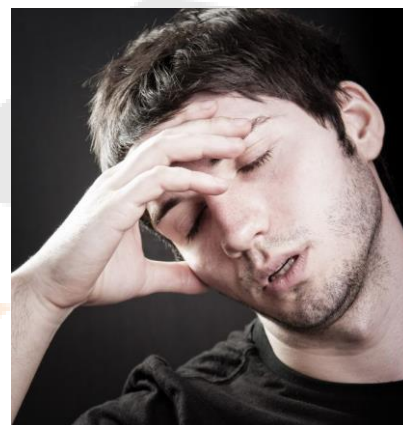
Warning signs that you are suffering fatigue include:

Physical	◆ Slow reaction time. ◆ Tiredness, yawning or sore eyes. ◆ Headaches, stomach or other problems. ◆ Micro sleeps (nodding off for a short period of time).
Mental	◆ Trouble concentrating and thinking clearly. ◆ Shorter than normal attention span. ◆ Boredom, irritability or lack of motivation.
Work	◆ Poor or careless performance. ◆ Overlooking minor but potentially important details. ◆ Lower levels of communication and cooperation with others.

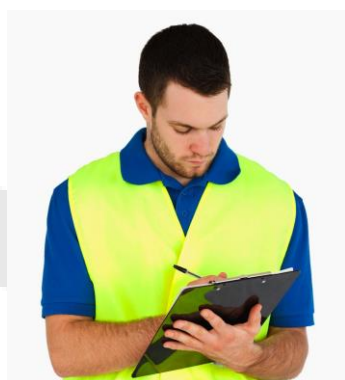
It is very important that fatigue is managed properly. Here are some ways you can manage fatigue:

- ◆ Get enough sleep.
- ◆ Drink plenty of water.
- ◆ Take regular breaks.
- ◆ Keep a healthy diet.
- ◆ Keep a reasonable level of fitness.

Talk to your boss or supervisor about breaking up boring or monotonous tasks or rotating the work you are doing with other workers if possible.



2.5.1 Reporting Hazards



Any hazard or environmental issue that you identify during your work will need to be reported. If you have taken any action you will also need to report those details. This could include written or verbal reports.

Your worksite may have standard paperwork that needs to be filled out, for example:

- ◆ Hazard report forms.
- ◆ Work method statements.
- ◆ Other reports or documents.

2.6 Checking Completed Work



The key to completing tasks efficiently is good time management and knowing how to use your equipment properly.

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

- ◆ Your work instructions and project plans and drawings.
- ◆ Project quality requirements and timelines.

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 job.

3.1 Park and Shut Down the Front End Loader

Once all tasks are complete and the work for the day is done, it is important that you park and shut down the loader.

Every piece of machinery has slightly different park and shutdown procedures. For the exact procedure for the machine you are operating, check the operator's manual.



3.1.1 Parking the Front End Loader

The loader needs to be parked in a safe way that will allow easy access to the vehicle.

Safe parking practices:



- ◆ Stop the loader on a flat level surface in the designated area and keep the access points clear.
- ◆ Park the loader away from overhangs, excavations, access ways and tidal or flood areas.
- ◆ If the loader must be parked on a sloping surface it should be facing across the slope.
- ◆ Keep the loader away from refuelling sites and areas when parking or you can block the rest of the machines on the site from accessing fuel.
- ◆ Apply all locks and brakes.
- ◆ Move all attachments into the shutdown position and release any pressure from the lines.
- ◆ If the loader has to be parked on a public access way, lights, signs and barricades should be erected to warn people.

3.1.2 Shutting Down the Front End Loader

Shutdown procedures include:

- ◆ Cooling of the engine before shutting it down. This depends on the loader but is usually the same amount of time as the engine warm up time.
- ◆ Monitoring the controlled lowering of temperatures and pressures.
- ◆ Walking around the machine looking for any signs of damage or faults that may have occurred during the task.
- ◆ Securing the loader, using any applicable lock out or isolation devices and removing the keys. This will prevent any unauthorised movement of the loader.
- ◆ Making sure equipment is correctly stowed in accordance with site and manufacturer's requirements.

Any problems found during the shutdown procedures need to be documented in the way required by the worksite.



3.2 Post-Operational Checks



Post-operational checks need to be done to make sure the front end loader 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 loader 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.
- ◆ Hydraulics (rams, hoses and connections).
- ◆ Structure and attachments for damage or wear.



3.2.1 Reporting Faults



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

Most sites have a fault report form that you will need to fill out 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 loader is tagged out (isolated from use) until the repairs have been made. This will stop anybody from using it before it has been repaired.

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.

Note: If equipment is faulty

1: Don't Use

2: Tag out

3: Report (Get repaired)

3.3 Prepare the Front End Loader for Relocation

The loader will need to be prepared before it can be moved from site to site.

Some issues in moving the loader to another worksite may include:

- ◆ Cross-contamination between sites.
- ◆ Hazards from loose or detached parts.
- ◆ Movement of the loader in transit.

Before relocating the loader you may need to do some or all of the following things:

- ◆ Clean the loader thoroughly.
- ◆ Clean any attachments going with the loader.
- ◆ Empty the fuel tank (if practical).
- ◆ Secure all moving parts.
- ◆ Remove and store any attachments going to the new site.
- ◆ Make sure all connectors are secure and locked.
- ◆ If possible, lower the bucket to rest position and lock it into place or remove the bucket if needed.



3.3.1 Relocate the Loader



Front end loaders can be moved on special trailers or on the back of a truck. Any transport must comply with:

- ◆ Codes of practice.
- ◆ Traffic management requirements.
- ◆ Site regulations.
- ◆ Traffic codes and road rules.

Be careful when loading the loader onto the transport and use a spotter to help guide the loader up the ramps.

Once on board the loader must be securely locked down to prevent any movement.

3.4 Clean the Loader and Carry Out Routine Maintenance

It may not be practical to clean the loader after every use but you should clean it thoroughly as often as possible. Mud and other contaminants left for long periods will eventually damage the machine.

Cleaning is also a good way to do an even closer inspection of the loader, and may highlight issues you didn't see during the walk-around inspections.

Cleaning will need to be done in a designated area to avoid any negative impact on the environment or contamination of the site.



3.4.1 Carry Out Maintenance Tasks



Before carrying out any routine maintenance and minor repairs make sure you have all of the tools and equipment you will need to finish the job.

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 loader stays at its operating capacity for as long possible.

Maintenance activities could include:

- ◆ Air filters – should be checked daily in dusty conditions. Clean or replace them as necessary.
- ◆ Greasing or lubricating attachments.
- ◆ Checking bucket teeth and replacing them as needed.
- ◆ 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.

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



3.4.2 Vehicle Refuelling Procedures

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 plant and equipment. Always check the procedure for your work site before any refuelling is done.

- ◆ Park the machine 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 machine 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 refueled.
- ◆ Roll up or safely tidy all fuel lines or hoses.



3.4.3 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 front end loader may include:

- ◆ Inspection checklists.
- ◆ Fault reports.
- ◆ Fuel, oil, hydraulic and other fluid usage.
- ◆ Service manuals or logbooks.
- ◆ Repair request forms.
- ◆ Part requisition forms.

You will usually need to include details like the loader 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.



3.5 Clean Up After Operations

Once all tasks are finished, you will need to clean up the site. This includes removing any tools and equipment that have been used.



3.5.1 Clearing the Work Area

In clearing your work area you will be carrying out housekeeping activities. Housekeeping procedures on your site may include:



- ◆ Eliminating or controlling any potential hazards. Your duty of care means you shouldn't leave a possible source of danger or accident for others.
- ◆ Using the correct PPE – Make sure you use appropriate PPE when dealing with waste or possible hazardous materials as you clear up. For example, chemicals used for cleaning can be dangerous unless used correctly.
- ◆ Removing any hazard controls that are no longer needed, e.g. temporary fences, barricades and signage.
- ◆ Recycling or disposing of materials to carry out site clean-up tasks, e.g. construction materials, stockpiled materials, stones, rocks, gravel and bituminous mixes, paper and site rubbish – Put any waste materials in the bins provided, and recycle where possible, in line with the site plans for environmental management or waste disposal.
- ◆ Packing up, maintaining and storing plant, equipment and tools.

Good housekeeping will help you to see any problems or hazards on the worksite. This will help you to make sure the working environment is safe.

It is your responsibility to clean up after your work activities and not leave it to someone else to do.

3.5.2 Cleaning and Storing Attachments



Once the attachment has been removed it should be cleaned, checked or inspected for wear or damage and maintained and stored according to the manufacturer's instructions and site requirements. This will help make sure that they are kept in good working order.

While you are cleaning attachments, check each item for damage, wear and tear or defects. If anything is wrong report it, repair it, or have it fixed by a qualified person.

Most equipment will have specified storage areas and requirements so make sure you know where and what these are before you detach heavy attachments. This will allow you to offload the attachment where it is meant to be and minimise heavy lifting or handling.

Be careful when you are cleaning and maintaining attachments. They may be sharp or hot so make sure you are wearing PPE whenever handling them.

3.6 Process Written Records

Site record keeping procedures keep the site running smoothly. Part of your role will include completing and processing records for your loader and the tasks that you have completed.

As well as the maintenance records you have filled in, some other records, reports and paperwork that may be needed include:

- ◆ Logs – supply logs, work activity logs, training logs, usage or driver logs.
- ◆ Shift documents – end of shift, end of process.
- ◆ Fault reports.
- ◆ Hazard reports.
- ◆ Incident reports – accident forms, incident reports or environmental incident reports.



It is important that you keep detailed records of all your activities, especially any problems you had during your shift. You may need to explain what you saw, or what you did at a later time.

Make sure you keep notes about what happened and what you did to fix it. This includes faulty or broken equipment, operational issues (mistakes or not following procedures correctly for some reason) and any other unusual things.