CIVILSAFETY
SAFETY AND TRAINING

# AHCMOM304 Operate machinery and equipment


## Learner Guide

This page is intentionally left blank.

| Version No# | Review Date | Date Updated | Validation Date | Validation Team | Details of Updates |
|---|---|---|---|---|---|
| V1.0 | 09/05/2019 | 09/05/2018 | / / | | Document created. |
| | / / | / / | / / | | |
| | / / | / / | / / | | |
| | / / | / / | / / | | |

*Note: please change Version number and date on each document to reflect the Version Plate.*

| Doc No. | Version No. | Name | Start Date | Review | Location |
|---|---|---|---|---|---|
| VC2018**172** | 1.0 | AHCMOM304 Learner Guide | 09/05/2018 | 09/05/2019 | Training Data / 01 UNITS / AHCMOM304 |

# Contents

This page has been intentionally left blank.

# Overview

This unit covers the process of maintaining and operating machinery and equipment and defines the standard required to:

- Carry out pre-operational checks and maintenance and report defects if necessary;
- Secure attachments according to manufacturer's directions;
- Operate machinery in a safe and controlled manner;
- Follow procedures to minimize environmental impacts;
- Implement shut-down procedures and store machinery and equipment; and
- Record maintenance and operation details.

# Introduction to Machinery

## Introduction

Machinery is an important part of many jobs in horticulture, production horticulture and agriculture, ranging from simple small hand-held equipment to specialised machinery to large machinery with complex attachments.

**Day-to-day maintenance and safety issues are the responsibility of the operator.**

You need practical skills to handle machinery, but you also need a rang of other skills in order to use and maintain machinery safely.

Skills needed when using machinery and equipment at work:

- Use operator manuals;
- Assess potential risks and hazards;
- Follow Safety Data Sheets (SDS) and label directions for all materials used;
- Follow instructions for safety procedures and personal protective equipment;
- Carry out pre-start / pre-operational checks;
- Secure attachments according to manufacturer's directions;
- Operate machinery in a safe and controlled manner;
- Implement shut-down procedures;
- Clean, secure and store machinery;
- Follow procedures to minimise environmental impacts;
- Follow instructions for fault finding;
- Follow manufacturer's specifications for servicing of machinery and equipment;
- Follow instructions for minor repairs;
- Keep routine records of maintenance and operation details;
- Report defects if necessary;
- Understand diagrams in manuals; and
- Use part lists and code.

A series of checks must be carried out before using machinery and equipment. This is important in situations in which a number of people use the same machine.

Most organisations usually have a system of checks and a maintenance department or contractor that will deal with reported defects.

Individuals working alone or in small teams will be responsible for checking and maintaining their own machines. This may mean using either a pre-set format specified by the work organisation or the list from an operator manual.

It is important that machinery is always cared for and well maintained, either by a maintenance team or by the individuals who use the machinery on a day-to-day basis.

**Larger machinery with complex attachments.**

**Specialised machinery such as turf cutters.**

Sometimes machines can go wrong and parts wear our or break.

Operator manuals have a section on finding faults or trouble-shooting that gives a list of common problems and suggestions about what might be the cause of the problems, as well as advice about how to correct them.

Operator manuals also have a section with diagrams and part lists that can help you to find the right spare parts.

Larger organisations usually have a maintenance department or workshop that deals with the routine maintenance and repair of equipment. Written reports are best to ensure that machines are safe to use and that faults are dealt with efficiently.

Operators of machinery have a responsibility to report faults to ensure the health and safety of other users and the efficiency of operations.

## Work Health and Safety (WHS)

All employees should know about their workplace's WHS procedures.

As an employee you have a responsibility to:

- Follow your organisation's work health and safety procedures;
- Follow manufacturers' guidelines (where available) for machinery and equipment;
- Respond to a situation here someone is put at risk of injury provided that in doing so you do not endanger yourself; and
- Report any incidents or situations which cause you or other people injury or put you or others at risk of injury.

Therefore, before undertaking any workplace activities you should become familiar with any WHS procedures in your workplace that relate to the tasks you will be undertaking. It is your responsibility to follow these procedures.

### Codes of Practice

Safework Australia has developed a series of Codes of Practice. These practical guides aim to achieve the standards of health and safety required under the Work Health and Safety (WHS) Act. The idea is to provide employers guidance in effectively managing work and health and safety risks in the workplace. Employees should be aware that these codes can be readily accessed online should they have any queries relating to WHS in their workplace.

### State Legislation

Employees should be aware of other WHS legislation for your state, Australian Standards, and codes of practice for:

- Manual handling;
- The control of workplace hazards;
- The safe use of chemical and biological agents;
- First aid; and
- The safe operation of vehicles, machinery and equipment including the provision of guards, operating tractors, chainsaws and brush cutters, in-service safety inspection and testing of electrical equipment.

### Manufacturers' Responsibilities

Manufacturers are responsible for the safe design of machinery. Anyone servicing or repairing machinery must follow the manufacturers' guidelines as laid out in their operations and service manuals.

Machinery accidents can be caused by many things such as:

- Lack of operator training;
- Inexperience;
- Failing to follow a safe system of work directions;
- Haste;
- Fatigue;
- Risk-taking;
- Inattention;
- Operator's fault;
- Using a machine that is unsuitable for the task;
- Unsafe methods for clearing blockages or making adjustments;
- Failing to follow safety operating or 'Safe Stop' procedures;
- Guards and other safety devices missing or defective; and
- Poor maintenance.

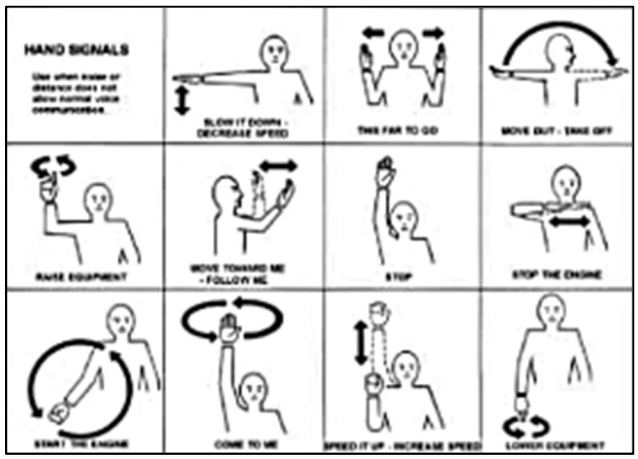
Many injuries are caused by mechanical hazards associated with the machine or equipment, such as:

- **Pinch Points:** are formed when two machine parts move together and at least one of the parts moves in a circle (e.g. gear, belt or chain drives). **Keep guards and shields in place and well maintained. You must never operate machinery without guards.**
- **Wrap Points:** when any part of the machine rotates and loose clothing or hair can be caught in the rotating mechanical parts. Rotating power take off shafts are one of the most common wrap points. Maintain guards to protect yourself and make sure your shoe laces are tied, and never wear loose fitting clothing.
- **Shear Points:** when the edges of two machine parts move across or close to each other to create a scissors-like area (such as hedge trimmers) that can cut through skin, clothing and body parts.
- **Crush Points:** are formed when two objects are moving toward each other or when one object is moving toward a stationary object and the gap between them is getting smaller such as when a machine is running into something else.
- **Burn Points:** where machine parts get hot such as mufflers, engine blocks and pipes.
- **Freewheeling Parts**: continue to move after power to the machine has been turned off because of the large amount of force required to move mechanical parts. Stop machine engine, disengage any implements and wait for the machine to stop completely.
- **Stored Energy:** energy that has been confined and is released unexpectedly (e.g. springs and hydraulic systems). Know which parts of the machine are spring loaded and release pressure when machines are shut down.
- **Thrown Objects:** materials that are discharged from the machine (e.g. rotating blades used to cut, grind or chop materials, such as a rotary motor). Allow machines to come to a complete stop before going ear discharge areas. Keep the discharge chute pointed away from bystanders. Wear eye protection to protect yourself from thrown objects.

Outcomes of machinery accidents can range in severity, such as with a negligible injury that requires first aid, minor injury needing several days away from work, to major injury with irreversible damage to health requiring a long time off work. **Machinery accidents can be fatal.**

## Working with Other People

When operating machinery, everybody needs to be safe. This includes the operator, workers who are either assisting the operator or working nearby, as well as members of the public who are in the proximity. Always keep a look out for children.




**Hand signals can be used when working with other people.**

As an operator:

- Check for bystanders before starting machines or equipment;
- Check where assistants are working and make sure they can be seen;
- Establish a way to work safely and make sure everyone follows it;
- Communicate clearly and make sure instructions can be heard and understood;
- If using hand signals, agree to their meaning beforehand;
- Only carry someone else if a proper passenger seat is fitted; and
- Use the horn to warn other people.

Helping an operator:

- Agree on the way to work and follow it;
- Listen to and follow instructions;
- If using hand signals, agree on their meaning beforehand;
- Make sure the operator can see you;
- Never stand in the line of travel of a machine; and
- Find out the safe places to work or to stand when near machines do not operate any external controls unless instructed to do so.

## Environmental Impacts

There are varying degrees of impacts on the environment from horticultural and agricultural practices. **Machinery can spread weeds** and can have other impacts on the environment in different ways, such as:

**Weed seeds caught in tyre tread can spread weeds from place to place.**

- Damage to the soil from soil compaction destroying soil structure, increasing density of the soil, reducing air volume and a reducing ability to drain surplus water;
- **Waste or litter generation from plant residues** (e.g. lawn clippings and crop residues);
- Waste generation from spent engine oils, filters and other machinery wastes;
- Waste generation from packaging from new machines and materials used;
- Dust generation from movement over dry soil;
- **Exhaust emissions pollution;**
- **Potential greenhouse gases;**
- Oil products and their vapour;
- Engine noise levels;
- Equipment operation noise levels; and
- The spread of weeds, pests and diseases.

## Fault Reporting

Any machinery and equipment found to be faulty needs to be handled according to the organisation's requirements.

**Machinery and equipment fault handling involves identifying faults and hazards, assessing risks of injury or harm arising from each identified hazard and controlling the risks through measures to eliminate or reduce them.**


**To eliminate hazards and associated risks the faulty or damaged machinery and equipment** need to be:

- Identified;
- **Not used;**
- **Isolated and / or locked so that they cannot be used;**
- **Safely tagged with 'out of service' tags to indicate they are faulty, unserviceable and must not be used; and**
- **Reported to the supervisor according to the organisation's requirements.**

# Preparing Machinery and Equipment for Use

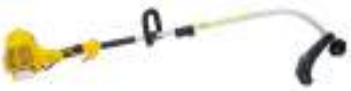
## Types of Machinery

Machinery and equipment used in horticulture and agriculture varies depending on the different purposes they are being used for and may include:

- Hydraulic equipment;
- Stationary engines;
- Spraying equipment;
- Mulching and chipping equipment; and
- Powered trailers and three-point equipment.

This unit of competency does not cover:

- Chainsaws;
- Tractor vehicles; and
- Earth moving equipment.



There are many different types of machinery used in the various areas in horticulture and agriculture. The machinery and equipment selected must be appropriate and the best machine for the job requirements.

The machine selected depends on:

- The work to be carried out;
- The condition of the ground (e.g. how steep or how wet);
- Proximity to people and buildings (where noise, dust or odours can be a problem);
- Availability of the machine; and
- How the machine can be transported to the site.

**Pictures above: walk behind lawnmower, ride on lawn mower, line trimmer, hedge trimmer and powered knapsack sprayer.**

## Personal Protective Equipment

**Personal protective equipment (PPE) is anything used or worn to minimise risk to health or safety.**

PPE is one of the least effective ways of controlling risks to health and safety and should not be relied upon to replace other practical control measures that are available. It is used as a short term measure until a more effective way of controlling the risk can be used.

When selecting PPE to minimize risk to health and safety it must be:

- Suitable for the nature of the work and associated hazard;
- Suitable size and fit and reasonably comfortable for the person to wear;
- Used or worn correctly by the worker; and
- Maintained or replaced so it continues to minimize the risk to the worker.

PPE for machinery use includes:

- Eye protection and face protection (e.g. goggles, glasses and face shields);
- Hearing protection (e.g. ear plugs and ear muffs);
- Respiratory protection (e.g. filter, respirators and dust masks);
- Hand and arm protection (e.g. gloves);
- Foot protection (e.g. safety shoes, boots and gum boots);
- Head protection (e.g. hard hats, helmets and broad brimmed hats);
- Body protection (e.g. aprons and overalls);
- High visibility clothing;
- **Any substance used to protect health (e.g. sunscreen); and**
- Any other recommended PPE.


**Personal protective equipment signage.**

First aid kits appropriate to possible injuries the machinery could cause and staff trained in first aid and emergency procedures must be available where the machinery is being operated.

## Routine Checks

Before starting any work with a machine, including operation, maintenance or repair there are various checks that need to be followed, such as:

- The machine is suitable for the job;
- All safety devices, such as guards, are in place and working correctly;
- The operator is properly trained to do this job and use this machine safely;
- The instruction manual for the machine has been provided, read and understood;
- Suitable clothing is available and worn (e.g. close fitting so as not to snag on vehicle and machinery controls or be caught in moving machine components);
- The right personal protective equipment (PPE) is available and worn;
- Any jewelry (including watches and rings) that might snag have been removed;
- **Long hair has been secured (tied back or enclosed in a hair net) in such a way that it cannot snag on vehicle and machinery controls or be caught up in moving machine parts;**
- A risk assessment has been carried out;
- The work has been properly planned and communicated to those who may be at risk; and
- Everyone understands what needs to be done and has a system of communication agreed on.


**The John Deere 12-point inspection.**

| Doc No. | Version No. | Name | Start Date | Review | Location |
|---|---|---|---|---|---|
| VC2018**172** | 1.0 | AHCMOM304 Learner Guide | 09/05/2018 | 09/05/2019 | Training Data / 01 UNITS / AHCMOM304 |

### Checking the Machine Before Use

Basic checks should be carried out before working with any machinery and equipment, to make sure that it is in good working order and safe to use. The requirements vary according to the machine and are available in the operator manual for the machine or equipment. Mechanical defects checks include brakes, wheels and tyres. Guards and other protective devices correctly fitted and maintained in good condition. They need to be in place, securely attached, working and not damaged, (i.e. any damaged or defective guards should be repaired or replaced before the machine is used).

Other checks include:

- Stopping devices are functioning clearly (e.g. emergency stopes);
- All controls should be clearly marked to show what they do;
- If work is to be carried out on the machine make sure it can be done safely (e.g. check for safe access and that working platforms have guard rails etc.);
- Hitching and attachment points are safely attached to the towing vehicle and attention to the condition of drawbar / pick-up hitch, and hitch rings, pins, clips, etc.;
- For self-propelled machines, make sure mirrors are clean and properly adjusted;
- Check any other reversing aids are working;
- Carry out any pre-use / pre0start checks as specified in the operator's manual; and
- Checking that ancillary equipment is attached correctly and is operational.

**A machine suitable for doing the job it is doing. Source: qtimberworlf-uk.com**

## Pre-start Checks

**Before starting and operating a machine, it is the responsibility of the operator / driver to ensure pre-start checks are carried out and recommended PPE is used.**

An example of pre-start checks for a lawn mower include:

### Blades

- Before each use, check the cutter blades for damage or excessive wear. Never operate the mower with a worn, damaged, split or dented blade (a piece of blade which breaks off and is thrown outwards can cause serious injuries);
- **To avoid severe personal injury, disconnect the spark plug cap to prevent accidental starting; and**
- Wear heavy gloves to protect your hands from the cutter blades.

### Engine Oil Level

(Not necessary with two-stroke motors).

- Check the engine oil level with the engine stopped and the mower on a level surface;
- Clean the area around the oil filler cap;
- Remove the oil filler cap, and wipe the dipstick clean;
- Insert and remove the dipstick without screwing it into the filler neck (check the oil level shown on the dipstick);
- If the oil level is low, add the recommended oil to reach the upper limit mark on the dipstick – do not overfill; and
- After checking the engine oil level, screw in the oil filler cap / dipstick securely.

### Fuel

- **Do not smoke while refueling the mower;**
- Refuel in a well-ventilated area before starting the engine – if the engine has been running, allow it to cool;
- Remove the fuel filler cap and check the fuel level;
- If the fuel level is low, refuel the tank with the correct type of fuel for the motor (refuel carefully to avoid spilling fuel and do not overfill);
- After refueling, tighten the fuel filler cap securely as petrol is highly flammable and explosive;
- Never refuel the mower inside a building where petrol fumes may reach flames or sparks;
- Keep petrol away from appliances with pilot lights, barbeques, electric appliances, etc.; and
- Fuel can damage paint and plastic, be careful not to spill fuel when filling your fuel tank.

### Air Cleaner

- Make sure the air filters are clean and in good condition; and
- A dirty air filter will restrict air flow to the carburetor, reducing engine performance.

### Grass Catcher

- Inspect the grass catcher before use; and
- Check for holes and excessive wear.

**This man is conducting a pre-start check of a mower before starting it.**

### Cutting Height

- Check the cutter housing height settings; and
- If you are not sure what cutting height to select, start with a high setting and check the appearance of the lawn after mowing a small area, then re-adjust cutting height if necessary.

# Operating Machinery and Equipment

## Safe Operating Procedures

**All organisations should have 'safe operating procedures' (SOPs) for all machinery and equipment operated by them.**

SOPs for machinery help make sure that machines are operated safely and should cover:

- Warnings;
- PPE signage;
- Pre-operational safety checks;
- Stopping procedures;
- Housekeeping; and
- Potential hazards.


**PPE signage directions must be followed at all times and remember, machinery can be dangerous so safe operating procedures must be followed.**

While operating machinery, you should be monitoring its performance and efficiency so that adjustments can be made as required.

***Please see Appendix A for the safe operating procedures for walk behind mowers and rotary cultivator.***

## Operating Principles

When maintaining machinery, you will often be required to operate the machinery including test driving. Before operating machinery, review the operational procedures specified in the operator's manual.

Some machines have a high centre of gravity and are susceptible to rolling over sideways on steep slopes or banks**. Operators should use caution when driving on uneven ground especially if there are washouts or holes present.** In this situation the operator should dismount and inspect the area where they are intending to drive.

On a steep hill, an over-reliance on the brakes may cause wheels to skid. Operators must use extreme caution in hilly country, especially when it is wet and slippery.

**Mini-loaders can be difficult to operate on wet, slippery slopes and uneven ground. Source: kangaloader.com**

Driving straight up or down (for example when mowing grass) is usually safer than driving around the side of a steep hill as there is always the risk of tipping over particularly if there are hidden depressions. When using machinery on very steep slopes, it is usually recommended that the operator reversed up the slope.

### Lifting Loads

Machine operators should only lift using components that are specifically designed and have a rated capacity. Operators should not use unrated components or components rated for other purposes, such as towing. Only use rated lifting components and only attach to specifically designed, rated and identified lift points on the machine.

To ensure stable operation and to avoid damage to components, operators should never exceed the rated load limits and should consider the ground being travelled over and speed of travel.

### Weight Distribution

The overall weight of the machine and the way that the weight is distributed has a huge impact on its performance. Before operating machinery that carries ballast or is used for moving heavy loads, check with your supervisor that the weight distribution is suited to the work that you will be doing.

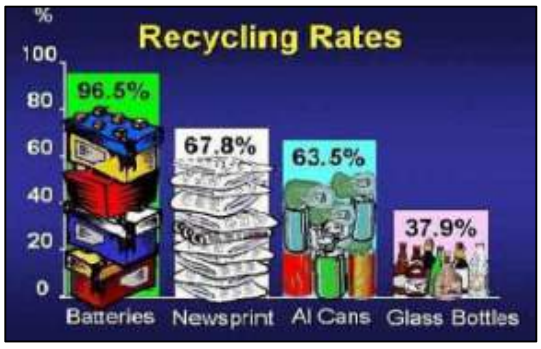
If the operator has any doubts about a situation they should not operate the machine and discuss options with their supervisor.

## Minimising Environmental Impacts

With good environmental management there are ways to minimise environmental impacts and make significant business savings.

***Damage to the soil from soil compaction can be reduced by:***

- **Reduce the amount of machinery traffic over the area (e.g. mowing an area less often);**
- **Reduce the weight of machines (e.g. using smaller machines when soil is vulnerable, such as when soil is wet); and**
- **Limit the area affected by machine weight (e.g. driving machine wheels in same tracks each time).**




**Batteries and other materials can be recycled.**

***Waste generation from plant residues:***

- Recycle plant residues and waste (e.g. composting);
- Do not remove residues and waste (e.g. do not collect lawn clippings); and
- Be careful where residues go.

***Spent engine oils, filters and other machinery wastes:***

- Make sure machinery is not leaking oils, etc.; and
- Recycle or return to suppliers.

***Packaging from new machines and materials used:***

- Purchase less;
- Purchase items with the least amount of packaging or packaging that is recyclable;
- Avoid disposable products and purchase products which are durable, reusable and recyclable;
- Recycle, reuse or return to suppliers; and
- Purchase products in bulk or concentrated form to reduce packaging.

***Dust generation from cultivation and movement over dry soil:***

- Reduce cultivation and movement when soil is dry and dust hazards are high; and
- Reduce machinery speed when soil is dry and dust hazards are high.

***Exhaust emissions pollution:***

- Use machines that are designed and maintained to reduce emissions; and
- **Use machines with lower emissions (e.g. four-stroke machinery rather than two-stroke**).

***Noise levels:***

- Use machines that are designed and maintained to reduce noise;
- Carry out noisy activities at times that minimise disturbance to others (e.g. normal work hours); and
- Reduce machinery speed.

***Spread of weeds, pests and diseases:***

- Clean machinery regularly to reduce the risk of spreading of weeds, pests and diseases – dirty machinery carries soil, seeds and organic matter which may dislodge when the machine is next used and spread contamination to new sites;
- Clean equipment with high-pressure water before moving;
- Between vulnerable sites – avoiding components that can be damaged by water (e.g. electrical components); and
- Develop and use checklists as a reminder to clean critical areas on each machine.

***drumMUSTER* is a national program for the collection and recycling of empty chemical containers. ChemClear is a program for collection and disposal of unwanted agricultural and veterinary chemicals.**

## Licencing, Roads and Traffic Requirements

Work health and safety legislation and regulations requires employers to provide such training to employees as is necessary to enable the employees to perform their work in a manner that is safe and without risks to health. This includes the use of any machinery or equipment.

Employers are also required to provide training to employees on:

- The nature of hazards;
- The processes used for hazard identification, risk assessment and risk control;
- The need for, and proper use, of measures to control risk;
- Safety procedures; and
- The use, fit and storage of personal protective equipment.

***Various State / Territory legislation, regulations and Codes of Practice with regard to licencing, road and traffic requirements apply to the use of some machinery.***

**Various State / Territory legislation, regulations and Codes of Practice with regard to licencing, road and traffic requirements apply to the use of some machinery and equipment.**

The particular State or Territory government departments covering vehicle registration and licencing needs to be referred to for the specific regulations and Codes of Practice that need to be followed. **There are penalties for not following the relevant regulations and Codes of Practice.**

When the machinery is considered a vehicle, it may only be used on a road for the purpose covered by the restrictions and conditions for it. Restricted vehicles usually have a special number plate.

General restrictions apply (e.g. the vehicle may only be used on a road by a person who holds the appropriate licence to carry out the activity for which it is conditionally registered, or for the purpose of travelling to and from sites for the purpose of carrying out the activity for which the vehicle is conditionally registered).

Access restrictions also apply (e.g. the vehicle must not travel on a road, whether sealed or unsealed) except:

- Where it is impracticable not to do so;
- To cross a railway line, bridge, ford or causeway;
- To cross a road by the shortest convenient route; and
- To perform the special function for which it was designed.

Other restrictions include:

- Speed towing;
- Usage;
- Special restrictions (e.g. VicRoads may impose unique conditions specific to a particular vehicle use); and
- Other conditions (e.g. including the vehicle must have a flashing or rotating yellow light operating at all times the vehicle us used on a Road or Road Related Area).

***Some machinery must have a flashing or rotating yellow light operating at all times when it is used on a road or road related area.***

## Checking and Completing Machinery and Equipment Operation

### Shut Down Procedures

Shutdown procedures for machines and equipment are specified in the operator manual for the machine. **The specified shutdown procedures must be followed for the particular machine or equipment.**

Example of shutdown procedures for a ride-on mower includes:

- Park the machine on a smooth level area;
- Set the parking brake;
- Lower all implements;
- Run engine at low idle for five minutes to allow engine to cool;
- Turn start key switch to 'OFF' and remove key;
- Dismount machine using three-point contact;
- Block wheels and remove and disconnect switch key if parking for extended period; and
- Conduct post-operation walk-around inspection.

***Follow shutdown procedure for machine.***

### Dealing with Maintenance or Other Problems


*A range of kits are available for minor repairs and maintenance work. Source: John Deere*

Minor problems and minor maintenance can sometimes be dealt with by the operator only when they are trained and authorized to do so.

General procedures for minor problems, such as clearing blockages include:

- Follow the manufacturer's instructions / procedures as set out in the operator's manual and always follow the Safe Stop procedure before attempting to deal with problems;
- Only carry out work that you have been trained for and are authorized to do;
- Secure anything that could fall (e.g. by using props or blocks);
- Secure anything that could move or rotate (e.g. by using chocks);
- Deal with energy stored in springs or hydraulics (e.g. consider how to stop this energy being released or release it safely);
- Use the right tools for the job;
- Machine components may suddenly move when a lockage is cleared;
- Adjustment of machine settings can help avoid blockages; and
- Always replace the guards before running the machine.

## Cleaning Machinery and Equipment

Dirty machinery can carry soil, seeds, and organic matter which may dislodge when the machine is next used and spread contamination to new sites.

Soil-borne pests and diseases can be transferred in wet soil attached to wheels, tracks or parts of the machine that work in the ground. Some pests and diseases can also be transferred in dust that can accumulate on many parts of the machine such as the engine bay, cabins and air intakes.

Regular clearing of machinery helps stop the spread of soil-borne weeds, pests and diseases. All equipment should be washed clean with high-pressure water before moving between risk and / or vulnerable areas. On completion of cultivation, physically dislodge lumps of soil and debris attached to the machine before washing down.

Checklists make the inspection and cleaning process faster and easier and form a record of proof that the machine has been cleaned. In some cases, machinery is inspected by inspecting officers who will use their own checklists and carry out an inspection.

***Steps for wash down:***

1. **Avoid wetting areas and equipment that can be damaged by water such as electrical equipment.**
2. **Wash down using high pressure water to remove any rubbish, plant debris and mud. Pay careful attention to any crevices where mud or plant debris may get trapped including cutter areas, chassis rails, tyre treads and under wheel arches.**
3. **Decontaminate by applying a decontaminant solution when recommended, to all surfaces that have come in contact with mud and dirt, including tools, footwear, floor mats, foot pedals and other places that have come into contact with footwear. Always read chemical labels and Safety Data Sheets carefully and follow directions.**
4. **Rinse using high pressure water to rinse off the decontaminant. Move the machine to a dry surface. Clean down the wash area ready for the next machine.**

***Selecting a cleaning site:***

Machinery is usually cleaned and inspected at or near the job site to reduce the risk of contaminating other machinery or land. Some enterprises have special wash down areas.

***Make sure your cleaning site is:***

- Close to the work area to minimise spread of soil during transit;
- Agreed to by the land owner;
- Accessible in all weather;
- Contained for safe disposal of waste;
- Away from water courses, streams or drains;
- Flat for safety while working and to reduce run-off;
- Stable surface to prevent re-contaminating machinery such as concrete, gravel or well grassed area;
- Accessible to suitable cleaning equipment, electricity and high-pressure water;
- Accessible to a petrol-powered pressure washer if power is not available;
- **Near a sump or waste water collection area for water, dirt and any plant material to drain into; and**
- **Identified with signs or symbols and maps.**

***Various types of high pressure water cleaners are available to clean machinery.***

## Securing and Storing Machinery and Equipment

**Machinery needs to be stored away according to manufacturer and enterprise directions.**

**Make sure machinery is in good repair before it is stored, secured and protected from the weather.**

***A secure, weather proof storage shed makes a good home for machinery.***

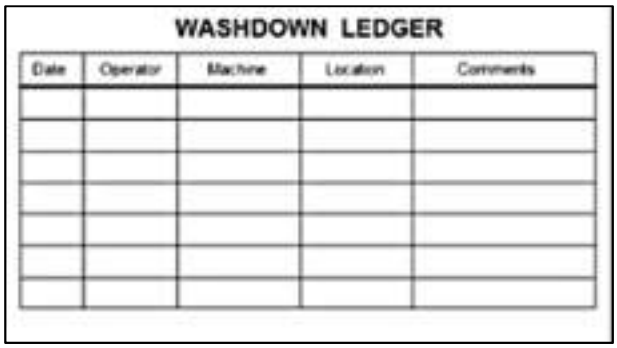
Machinery must be put away clean, dry and lubricated, aimed at keeping rust producing moisture away from bearings and other vital parts. **Moisture causes rust and corrodes shafts and bearings and other moving parts, including engine components, it also hardens seals on bearings.**

# Operational Records

**Records are a management tool of facts and figures allowing measurement of how efficiently resources are being used.**

Records need to be written or documented and kept for a reasonable length of time.

They are useful in helping recognizing problems, working out solutions to the problems and helping make important decisions.


WASHDOWN LEDGER

| Date | Operator | Machine | Location | Comments |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Machinery records can include:

- Date and operating times;
- Name of operator;
- Cleaning;
- Machinery and equipment inventory (recording what machinery is available for use);
- Maintenance and repairs (recording what has been done, when services are required, parts used etc.); and
- Tool inventory (recording tools available for carrying out maintenance and repairs).

Operating records for machines depends on manufacturer recommendations and the requirements of the enterprise and could include:

- Identification of machine;
- Date;
- Location used;
- Operator;
- Operator's licence number (if necessary for the machine);
- Operator's signature;
- Running hours for that day;
- Running hours in total;
- Cleaning carried out; and
- Comments or other information.

***Appendix A: Safe Operating Procedure for Walk Behind Mower and Rotary Cultivator***

# SAFETY OPERATING PROCEDURES

# Walk-Behind Mower

**DO NOT** use this machine unless a teacher has instructed you in its safe use and operation and has given permission.


## PRE-OPERATIONAL SAFETY CHECKS

1. Wear proper clothing and Personal Protective Equipment (PPE).
2. Ensure mower is clean. Dirt, oil and debris contribute to fires.
3. Ensure all guards are fitted, secure and functional.
4. Ensure cutting blades are sharp, secure and in good condition. Damaged blades can cause a dangerous imbalance.
5. Repair or replace any loose, broken, missing or damaged parts.
6. Faulty equipment must not be used. Report suspect machinery immediately.

## OPERATIONAL SAFETY CHECKS

1. Clear the area to be mowed of debris that may be thrown.
2. Be aware of the potential for ejected material and ensure that no person or animal is endangered when operating the mower.
3. Avoid mowing in wet conditions due to lack of traction.
4. Maintain a proper balance and secure footing when starting the mower.
5. Keep clear of moving machine parts.
6. Operate at a speed slow enough to keep control over unexpected hazards.
7. Mow in a forward direction.
8. When mowing on a slope, mow across the slope – this keeps a better distance between the operator and the mower in case of a slip.
9. Never leave the machine running unattended.
10. Always shut off the mower, remove spark plug lead and allow it to come to a complete standstill before adjusting or clearing grass clogs.
11. Allow the mower to cool before refuelling. Use only approved safety containers to store fuel.
12. Turn off fuel supply when mowing has concluded.

## HOUSEKEEPING

1. Clean away any oil and debris from in and around engine and catcher parts.
2. Keep the work area or implement shed in a clean and tidy condition.

## POTENTIAL HAZARDS

- Noise
- Rapidly rotating cutting blades
- Ejected material and flying debris

**This SOP should be used in conjunction with Education Policy and Procedures Register (EPPR) -**
***HLS-PR-012: Curriculum Activity Risk Management Modules***

*Acknowledgement: Much of the information for this document has been sourced from content kindly provided by Department of Education & Children's Services SA website : Machine Guarding - Safe Operating Procedures*

Date of last review _____ Signature _____

# SAFETY OPERATING PROCEDURES

# Walk Behind Rotary Cultivator

**DO NOT** use this machine unless a teacher has instructed you in its safe use and operation and has given permission.


## PRE-OPERATIONAL SAFETY CHECKS

1. Read the owners manual and safety instructions before operating.
2. Know the location and function of all controls.
3. Ensure all guards are fitted, secure and functional.
4. Check unit for loose/missing nuts, bolts and screws. Tighten and/or replace as needed.
5. Look for signs of damage to tillage tines. Replace if required.
6. Inspect fuel lines, tank, and area around carburetor for fuel leaks. Do not operate unit if leaks are found.
7. Faulty equipment must not be used. Immediately report suspect machinery.

## OPERATIONAL SAFETY CHECKS

1. Watch especially for ejected material and ensure that no person or animal is endangered when operating.
2. Adjust the handles to a position for comfort and good balance.
3. Set the tine depth according to soil conditions. See operator's manual.
4. Ensure the cultivator is securely held and is on firm and even ground before starting.
5. Keep clear of rotating machine parts whilst the engine is operating.
6. Maintain a straight wrist position Avoid using your wrist in a bent, extended or twisted position for extended periods.
7. Be alert for rocks and other obstruction when operating the rotary hoe.
8. Use extreme caution when reversing or pulling the machine towards the operator.
9. Shut down immediately if the unit starts to shake or vibrate. Do not operate the cultivator until the problem is corrected.
10. Always stop the engine and disconnect spark plug wire before cleaning the tines or undertaking maintenance.
11. Exercise extreme care when refuelling to avoid spilling fuel onto hot motor or exhaust.

## HOUSEKEEPING

1. Clean away any foreign material, debris from in and around the motor, tines and guards.
2. Keep the work area and implement shed in a clean and tidy condition.

## POTENTIAL HAZARDS

■ Trip hazards ■ Noise ■ Foot injuries ■ Entanglement ■ Flying debris

**This SOP should be used in conjunction with Education Policy and Procedures Register (EPPR) - *HLS-PR-012: Curriculum Activity Risk Management Modules***

*Acknowledgement: Much of the information for this document has been sourced from content kindly provided by Department of Education & Children's Services SA website : Machine Guarding – Safe Operating Procedures.*

Date of last review _____ Signature _____