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RIIHAN311F

Conduct operations with Integrated Tool Carrier

Learner Guide

This course is based upon the unit of competency **RIIMPO321F: Conduct Integrated Tool Carrier Operations.**

This course is appropriate for mobile plant operators in the mining and civil industries and covers:

- Planning and preparing for operations.
- Operating the loader.
- Carrying out post-operational procedures.

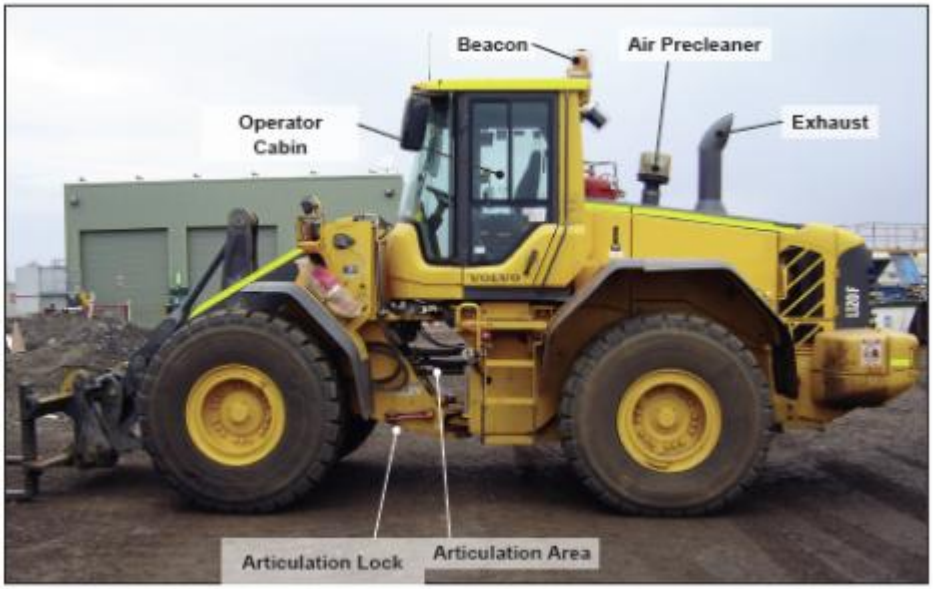
What is an Integrated Tool Carrier?

An Integrated Tool Carrier is a self-propelled wheeled machine with an integral front-mounted bucket-supporting structure and linkage. The Integrated Tool Carrier is able to load or excavate through the forward motion of the machine, and it lifts, transports and discharges material.

Common operation of a Integrated Tool Carrier would be moving stockpiled material from ground level and placing it into an awaiting dump truck or into an open trench.

Integrated Tool Carrier Components

The following diagram outlines the basic components of an Integrated Tool Carrier:



Compliance Documentation

Documentation is essential to all aspects of every worksite. Whether it is environmental plans through to construction plans, documentation outlines what to do, when to do it and the manner in which the task is to be done.

Compliance documentation is the name given to the documents that outline the requirements for the tasks and site. Every mining worksite will have site-specific requirements that will be outlined during your initial inductions.

Staff should be notified of changes to compliance documentation during toolbox meetings, through staff newsletters or other established forms of communication used on the site.

Some forms of compliance documentation relevant to Integrated Tool Carrier can include:

- Legislative requirements e.g. WHS requirements, and equal employment opportunity.
- Organisational policies and procedures e.g. Workplace relations and sick leave requirements.
- Site-specific policies and procedures e.g. Emergency policies and evacuation procedures.
- Australian guidelines and specifications e.g. Codes of practice. For example, SafeWork NSW document 1213 – Moving plant on construction sites.
- Australian Standards. E.g. AS/NZS 4240.2:2009 Remote Control Systems for Mining Equipment - Operation and Maintenance for Underground Metalliferous Mining.
- Manufacturer's guidelines and specifications e.g. Pre-start checklists, service requirements and vehicle operations manuals.
- Vehicle specifications e.g. Operating limits.
- Training records e.g. Your own training record or licensing requirements.

Being able to access, interpret and apply the requirements of the documents is part of the job for any plant operator.

During your site induction you will be told how to access the documentation relevant to your site and duties.

Interpretation of compliance documentation includes getting the key information out of the document that will allow you to make correct decisions for each situation. It includes understanding what is required of you and how you are expected to perform the tasks.

When interpreting documents it is vital that you understand the difference between words such as 'should', 'consider' and 'must.'

- 'Should' indicates the preferred course of action. For example: "In the event of a certain situation the following procedures should be conducted."

- 'Consider' means that you have a choice of actions and will need to select the action that will give the best and safest result.

- 'Must', shall, requires, and mandatory all indicate that the action is a legal requirement and MUST be complied with.

Applying the information in these documents involves following the directions in the documents. If you are in any doubt as to what you should do after reading the documentation, it is essential you speak with your supervisor or other designated personnel for further instructions or clarification.

Legislative Requirements

WHS Legislation is defined as laws and guidelines to help keep your workplace safe. These can be broken down into four main types:

Acts	Laws to protect the health, safety and welfare of people at work.
Regulations	Gives more details or information on particular parts of the Act.
Codes of Practice / Compliance Codes	Are practical instructions on how to meet the terms of the Law.
Australian Standards	Give you the minimum levels of performance or quality for a hazard, work process or product.

It is important that you are familiar with the WHS laws that exist in your state or territory. Each state in Australia has its own WHS legislation and regulations that must be followed.

The following WHS Legislative Requirements will affect the way that you work in the construction industry:

- Australian Standards.
- Industry specific WHS Standards, Codes of Practice and Guidelines.
- Duty of Care.
- Health and Safety Representatives, Committees and Supervisors.
- Job Safety Analysis (JSA) and Safe Work Method Statements (SWMS).
- HRW Licences or Certificates of Competency.

Talk to your WHS officer or representative if you have any questions about legislative requirements.

Duty of Care

All personnel have a legal responsibility under duty of care to do everything reasonably practicable to protect others from harm by complying with safe work practices, including activities that require licences, tickets or certificates of competency or any other relevant state and territory WHS requirements.

This includes:

- Employers and self-employed persons.
- Persons in control of the work site.
- Supervisors.
- Designers.
- Manufacturers.
- Suppliers.
- Workers/employees/personnel.
- Sub-contractors.
- Inspectors.

Safe Work Practices

Safe work practices are methods that must be implemented to make sure a job is carried out as safely as possible.

Safe work practices include:

- Day to day observation of WHS policies and procedures.
- Emergency procedures.
- Risk assessment.
- Use of basic fire-fighting equipment.

Safe work practices are governed by legislative requirements and workplace procedures.

Safe work practices relate to:

- Access to site amenities, such as drinking water and toilets.
- Drugs and alcohol at work.
- General requirements for safe use of plant and equipment.
- General requirements for use of personal protective equipment and clothing.
- Housekeeping to ensure a clean, tidy and safer work area.
- Preventing bullying and harassment.
- Smoking in designated areas.
- Storage and removal of debris.

Safe work practices should be referred to, and documented, when completing Safe Work Method Statements as a guideline for how to carry out a task safely.

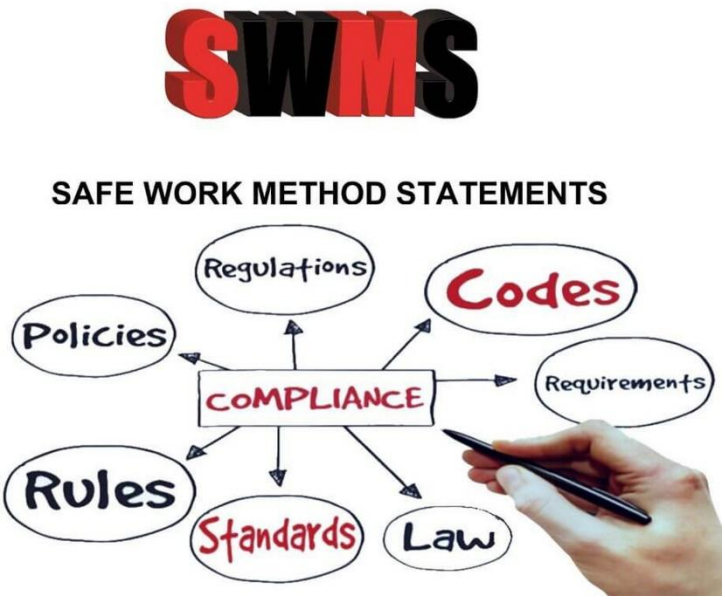
Safe Work Method Statements

A Safe Work Method Statement (SWMS) details how specific hazards and risks, related to the task they are completing, will be managed and is developed by the employer for their workers.

They fulfill a number of objectives:

- They outline a safe method of work for a specific job.
- They provide an induction document that workers must read and understand before starting the job.
- They assist in meeting legal responsibilities for the risk management process, hazard identification, risk assessment and risk control.
- They assist in effectively coordinating the work, the materials required, the time required and the people involved to, achieve a safe and efficient outcome.
- They are a quality assurance tool.

Completing a SWMS:



1. Break the job down into logical steps taking into consideration what is required to be achieved by the task.

2. Against each step, identify the workplace hazards in this activity i.e. the ways that a person (or plant) could be injured or harmed (or damaged) during each step.

3. Decide on measures required to mitigate hazards. i.e. what could be done to make the job safer and prevent the injuries or harm that may occur.

4. Identify roles and responsibilities for actions and outcomes to make ensure risk controls are carried out and supervision of the process occurs.

5. Ensure the SWMS is fully understood by all workers prior to commencing the task.

"A SWMS must be prepared in consultation with those people who will be doing the job."

The Safe Work Method Statement must be available for inspection at any given time. It must also be reviewed each year and amended if necessary.

Safe Work Method Statements may also be referred to as Safe Work Procedures (SWP) or Job Safety Analysis (JSA).

Work requirements

Work requirements or work instructions, and procedures are the details of how a task or job is completed. How each site communicates their work requirements and procedures is different and will be detailed during your induction. Requirements can be detailed in writing or verbally through:

- Briefings.
- Toolbox meetings.
- Work handovers/transitions.
- Work orders.

How the requirements are communicated will depend upon the process and the complexity of the task.

Information contained in the work requirements and procedures could include:

- Product, process or procedural identification – Products or equipment to be used, task requirements and materials to be shifted e.g. gravel, clay, rock or topsoil.

- Nature and scope of tasks – The type of job being undertaken in a broad sense, as well as breaking the job down into the tasks to be completed.

- Achievement targets – Required or estimated productivity targets.

- Operational conditions – Relevant site conditions and terrain that may affect the operation of the machine e.g. slopes, soft ground, bulky materials, haul road access, steepness of roads, and weather conditions which can determine travel time and driving hazards.

- Obtaining permits required – Such as excavation permits from management or local authorities, vehicle permits, utility lines and placements. An unregistered vehicle permit is required prior to driving unregistered rubber tyred loadshifting equipment on public roads. A class licence for plant up to 4.5 tonnes and C class licence for plant over
  4.5 tonnes (i.e. Australian heavy vehicle licence) may also be needed.

- Site layout – Defined worksite areas that are set out for the required task.

- Out of bounds areas – Areas that are designated as outside of the given site layout. Out of bounds areas may be shown by fencing, taped and barricaded areas, para- webbing, and signs.

- Worksite inspection requirements – Requirements for inspection of the worksite in regards to WHS at the site, as outlined in your site specific and task specific inductions.

- Lighting conditions – Weather conditions that may affect the worksite or shaft lighting in an underground environment.

- Plant or equipment defects – Workplace procedures for plant inspection, reporting defects, and maintenance requirements.

- Hazards and potential hazards – Site specific hazard and risk assessment procedures that identify hazards and risk in the workplace.

- Coordination requirements or issues – Reporting and work coordination. This may include traffic management or vehicle movement plans or working with more than one loader.

In order to understand the requirements of your job as a whole or its specific tasks, you may need to interpret these plans, reports, maps, and specifications. For any requirements that you are unsure of, you should check with your supervisor or other authorised personnel outlined in your induction.

Organising work tasks

Your daily and weekly work tasks should be scheduled in order to complete all assigned tasks in the most efficient manner and in the given timeframe for the work site. Some work site will have task schedules set out, while others will require you to structure your own scheduling. Methods of scheduling will also vary depending upon the work site, but could include handwritten checklists, computer programs, and verbal instruction. If you are unsure of the scheduling requirements of your work site speak with your supervisor or other authorised personnel.

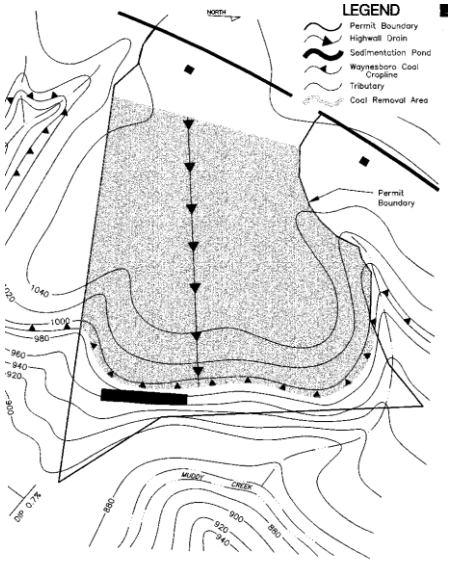
Geological and survey data

In order to complete the allocated job, you may need to access, interpret and apply geological and survey data. You may need to use diagnostic skills and techniques in order to interpret and apply the information. If you are unsure how to interpret documents, consult other qualified personnel.

Geological data may provide information relating to:

- Material types – Material density and characteristics need to be identified to ensure the correct equipment and attachments are used, and in the correct manner.

- Wet and dry areas – the moisture levels of the material can affect the capabilities of the machinery, or cause machinery to become difficult to manoeuvre. The load shifting potential of wet materials is higher than with dry materials. This can cause the load to move unexpectedly and pull the machinery off balance.
- Water tables – knowledge of the water table for the area being worked upon is important because of potential seepage or salinity that can affect the machinery. If blasting has occurred prior to Integrated Tool Carrier operations starting, the area may be wetter than originally expected.
- Broken ground, faults and joints – the geological data for these makes the operator aware of material seams, ground faults, and other features of the work zone to ensure the operator is able to make correct work decisions about production levels or hazardous areas.



DETAIL MAP OF MINE SITE 2

- Other job specific requirements – such as environmental plans and waste material plans.
- Compaction levels of the ground – the degree of compaction is important because it can determine the production quantities, the number of loaders needed to finish the task and the type of Integrated Tool Carrier needed.

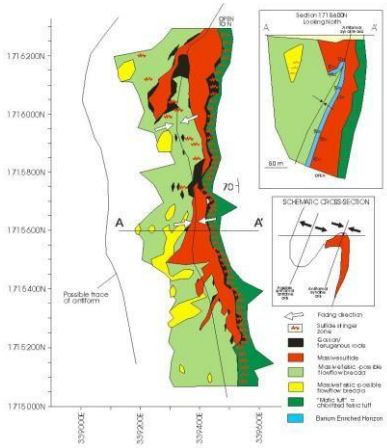
Survey data may provide information relating to:

- Floor heights – the height of the floor needs to be defined to ensure the structural stability of the mine area.
- Bench heights and widths – are where cuttings are present. These may form roads or entry and exit points within the work area or quarry. They are important also in the stability of cut faces, and must be maintained to a high level.
- Floor and bench grades – are important for the operator to know in advance, as being too steep can cause too much strain on the machinery or cause undue movement with the materials. The bench grades need to be suitable so that the risk to people and plant are minimised. For example a steep grade could increase that chance of a vehicle (either loaded or empty) getting out of control or the brakes failing on the downward slope.

- Voids – and other underground situations or circumstances such as old mine shaft areas, public utilities (phones, power lines gas pipes), sinkage areas or areas where ground stability may be an issue.

Survey data, marks and information can also be used to define work circuits, pick up areas, dump areas, spill zones, routes or traffic ways. Knowing where these areas are is essential for the safety of all personnel working or moving in the work zone and for the smooth operation of machinery and completion of tasks.

Vehicle movement plans and circuit plans need to be defined clearly before the works begin. Movement and circuit plans may change regularly depending upon the worksite layout and changing work requirements. These plans are usually discussed at site inductions, site toolbox meetings, pre-start meetings or team briefings.



Accessing, interpreting and applying technical geological or survey data that will define your tasks, the requirements of the task or other relevant information is essential. Access arrangement will be defined during your site-specific induction.

Determining the appropriate path of movement for loads and vehicles

Loaders and other construction vehicles are very large. This makes moving loads, equipment or the vehicle itself problematic if you have not planned the move carefully. The planning process for moving loaders (loaded or unloaded) includes:

- Walking the route (if possible) looking for sloping, soft or rough terrain, and obstructions such as trees, rocks and underground services. Underground services can be located from supply authority or council maps.
- Ensure you will have enough space to safely and sensibly make any turns and that there is adequate space for braking and slowing.
- Following policies and requirements such as:
    - Movement plans for the site.
    - Codes of practice for vehicle movements.
    - Legislation and regulations for vehicle movements.
    - Licensing requirements.

Some of the work areas that you may need to plan a move through could include:

- Quarries and mine sites.
- Manufacturing plants.
- Construction, building or demolition sites.
- Road or rail construction sites.
- Warehouses, factories or wharfs.

Risks and Hazards

A RISK is the chance of a hazard hurting you or somebody else or causing some damage.

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

If you can remove or at least control a HAZARD you can reduce the RISK involved.

Risk Management

Risk management is the process of reducing or managing the risks when working with or with a hazard or in a hazardous situation.

Risk management is made up of the following stages:

1. Hazard Identification.
2. Risk Assessment.
3. Consultation and Reporting.
4. Hazard Control.
5. Review.

Step 1 – Hazard Identification

Checking for hazards is the first step in Risk Management.

If you don't identify the hazards you can't control them!

Being familiar with your worksite will allow you to identify a hazard quickly. When you start working on a new site, take the time to look around the site and identify where structures, parking areas, and work zones are. Participating fully in your site induction will also help you to familiarise yourself with what potential hazards are onsite.

You can also check records of injuries and incidents, safety tags or talk to other workers.

Make a note of any hazard you identify in the area. Remember, a hazard can also be a situation so keep an eye on how the people around you are working too!

Each worksite has its own specific hazards. A site induction needs to inform you if any of these hazards exist on site. Some of these hazards can be removed through staff training, better equipment and safe work methods. Talk to the WHS officer for more information.

Potential Hazards and Risks

Potential hazards and risks that may be identified during the inspection of the work area may include:

- **Installed services** – underground or above ground power lines, telephone lines, gas pipes, cables. To find out the location of underground services you may need to contact the site supervisor, local authorities, dial before you dig or the council

- **Damaged or defective equipment** – could include pressurised hoses and fastenings, non-pressurised hoses, ancillary machinery equipment, vandalised equipment.

- **Equipment/product** – other vehicles, conveyors, fixed plant, overhead structures and services, abandoned equipment, unattended equipment, lifting equipment, moving vehicles and equipment.

- **People** – site personnel, non-inducted personnel, site visitors, others authorised or unauthorized.

- **Environmental hazards** – uneven ground, excavations, holes and pot holes, recently filled trenches, sinkage areas, dust and noise, unstable terrain, trees.

- **Structural hazards** – buildings, structures, facilities, bridges, suspended pathways, walkways, service drains, fences, structural obstructions, adjoining pit walls or structures, ramps.

- **Weather conditions** – storms, heat, floods, fires, gas leaks, humidity.

- **Chemical hazards** – fuel, chemicals, contaminants, gases, dusts. Specific training may be required to deal with chemical hazards. Speak with your supervisor if you are unsure if you need specialised training for the chemical hazards on your worksite.

- **Energy** – any system or equipment that stores any form of energy could become a hazard or risk. Some energy hazards that can be found on worksites include:

  - Engine components.
  - Radiators and cooling systems.
  - Hydraulic tanks and reservoirs.
  - Air tanks and reservoirs.
  - Hydraulic hoses.
  - Air hoses and tyres.
  - Air conditioning components.
  - Electrical, braking or centrifugal forces and systems.

Risk Assessment

Risk assessments should be performed by competent individuals who are familiar with assessing hazard injury severity, likelihood, and control measures.

A risk assessment is not required for excavation and trenching under the WHS Regulations; however, it is required for certain situations, such as working with asbestos.

In many cases, a risk assessment will help to determine which control measures should be implemented. It will aid in:

- determine which workers are at risk, and
- identify the sources and processes causing the risk.
- determine whether and what type of control measures should be implemented, and
- Check the effectiveness of existing control measures.

When assessing the risks associated with the vehicle operations, you should consider things such as:

- local site conditions, such as access, ground slope, nearby buildings and structures, watercourses (including underground), and trees
- excavation depth
- soil properties such as variable soil types, stability, shear strength, cohesion, the presence of groundwater, and the effect of exposure to the elements
- fractures or faults in rocks, including bedding planes, joints, dip and strike directions and angles, clay seams
- any specialised plant or work methods required (e.g., ground support)
- the method(s) of transport, haul routes and disposal
- what exposures might occur, such as to noise, ultraviolet rays or hazardous chemicals
- the number of people involved;
- the possibility of unauthorised access to the work area; and
- the time frame for which the excavation will be open

Using a risk matrix to assess risk

During a risk assessment, a risk matrix is frequently used to measure the level of risk by taking into account the consequence/severity and likelihood of injury to a worker after being exposed to a hazard. The two measures can then be used to help determine the hazard's overall risk rating. When using a risk matrix, two key questions to ask are:

1. **Consequences:** How severe would the most serious injury be if you were exposed to the hazard?
2. **Likelihood:** How likely is it that the person will be injured if exposed to the hazard?

Risk assessment matrix

Likelihood \ Consequence	Insignificant (1)	Minor (2)	Moderate (3)	Major (4)	Catastrophic (5)
Rare (1)	2	3	4	5	6
Unlikely (2)	3	4	5	6	7
Possible (3)	4	5	6	7	8
Likely (4)	5	6	7	8	9
Almost certain (5)	6	7	8	9	10

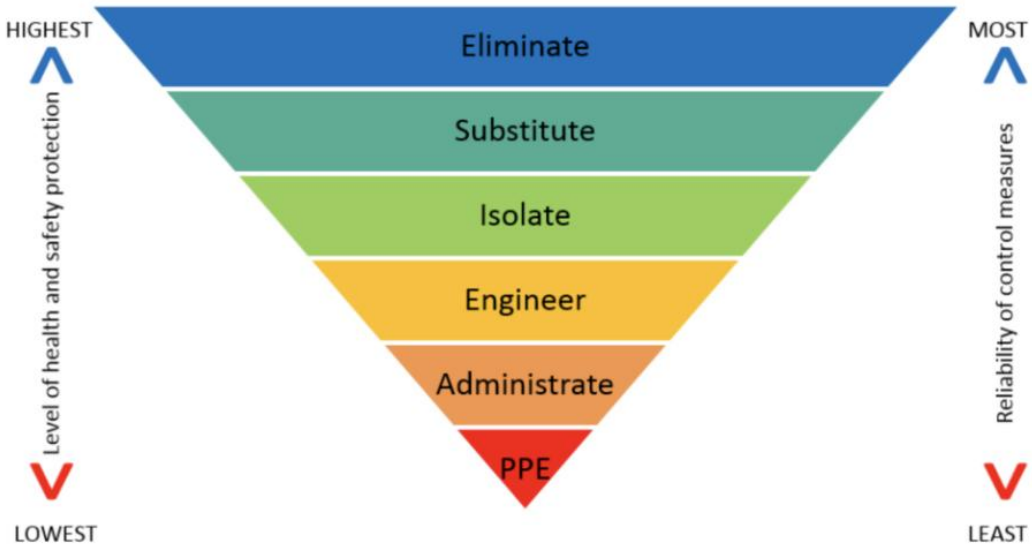
Control measures

Some methods of control are more effective than others. Control measures can be ranked from most secure and reliable to least secure and reliable.

This is referred to as the hierarchy of control.

The most effective control is to always aim to eliminate a hazard. If this is not feasible, you must mitigate the risk by doing one or more of the following:

- Substitution – Using an excavator equipped with a rock breaker, for example, rather than the manual method
- Isolation – For example, to reduce the risk of a collision, concrete barriers can separate pedestrians and powered mobile plants.
- Engineering Controls – Benching, battering, or shoring the sides of the excavation, for example, to reduce the risk of ground collapse.



If the risk remains, administrative steps such as placing warning signs near the excavation must be taken to limit it as much as feasible.

Any remaining threat must be addressed by providing workers with proper Personal Protective Equipment (PPE), such as hard helmets, hearing protectors, and high visibility vests.

Administrative control measures and personal protective equipment (PPE) rely on human behaviour and supervision, and when used alone, they are the least effective at reducing risks**Step 4 – Hazard Control**

The Hierarchy of Hazard Control is the name given to a range of control methods used to eliminate or control hazards in the workplace.

Exclusion zones

Contact with overhead or subsurface electric lines can be fatal.

Exclusion zones are the shortest safe distance from live power lines that can be maintained to reduce the risk of electric shock.

Working near electricity wires might be dangerous. Touching them or going into their exclusion zone can result in a severe electric shock.

If you must work near powerlines, take the following precautions:

- Before you begin, create a safe work system.
- Create a safe system that maintains a safe distance from powerlines (stay outside the exclusion zone)
- Identify overhead and subsurface powerlines using maps and/or conversations with the property owner and the electrical company.

Conduct a site-specific risk assessment – consider the following:

- The type of machinery and equipment/tools utilised,
- The site and weather circumstances,
- The sort of work being done and the set-up and pack-up processes
- Install risk controls – the most effective technique to control risk is to de-energise the line for the length of work where there is a risk of contact.

<u>Keep your employees and contractors up to date on electrical safety.</u>

- Install and train your employees and contractors on safe work practices, emergency protocols, and exclusion zones.
- Plan the jobs conducted near powerlines carefully and work away from them wherever possible, rather than below them.
- Mark the safe distance from a powerline on the ground to show your workers.
- Make people aware that powerlines sag or wobble in hot or windy conditions.
- Harvesters may enter exclusion zones, elevating work platforms, irrigation pipes, grain drills, elevators, mobile grain silos, cranes, tippers, and excavators. Ascertain that operators are aware of the height and reach of any machinery or hand-held items employed.

<u>Avoid entering exclusion zones.</u>

- Draw attention to powerlines and poles. Request authorisation from your utility company to paint power poles and/or have them install markings or flags on powerlines.
- Plan your job so that no tree branches fall across powerlines.
- Use insulated or non-conductive tools and equipment whenever possible.
- Use a safety observer to ensure that you stay well clear of exclusion zones.
- Follow the safety instructions provided by your electrical entity.

Although the following are the minimum safe distances, staying as far away from powerlines as possible is the best way to stay electrically safe.

Hazard Control – Safeguarding Site and Non-Site Personnel

Protecting site personnel (employees, contractors, management, students, other inducted personnel) and non-site personnel (delivery drivers, training assessors, members of the public, site visitors) on the site is one of the primary responsibilities of all members of a work site. How people are protected will depend on the worksite policies and procedures and government legislation for the state or territory you are located in. As a minimum, barricades, signs and safe systems and procedures should be used.

Common safety systems and procedures can be broken down into the following groups:

- **Loader/Equipment tasks** – operation of equipment safely and within capacity, use of a rollover protective structure and safety belts if the Integrated Tool Carrier may overturn, correct maintenance of the Integrated Tool Carrier in accordance with manufacturer's specifications, securing loads within the bowl area, only loading according to specifications for the machine (not overloading), proper task planning to identify and avoid obstacles, risks or hazards, observing loads at all times, using only approved attachments, using any site specific vehicle movement or Integrated Tool Carrier circuit plans.

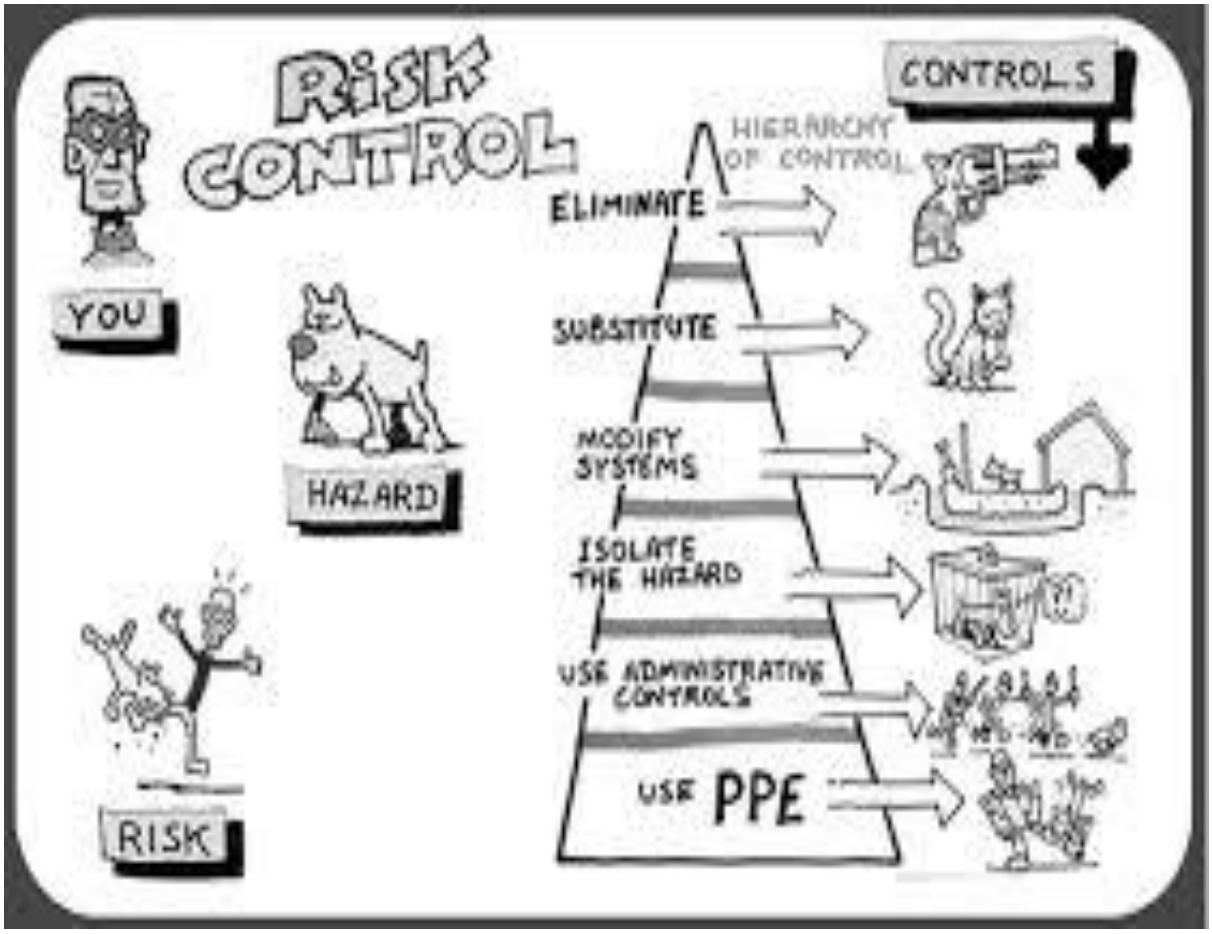
- **Personal tasks** – maintaining personal protective equipment properly, using PPE including sun, noise, dust protection, hearing protection, wearing high visibility clothing or reflective vests, having manual handling awareness, using lifting and carrying equipment in accordance with manufacturers specifications and guidelines, monitoring temperature extremes and responding appropriately, following site procedures as outlined in the site inductions.

- **Operational tasks** – hazard and risk identification and control through barricades or fences, having procedures for hazardous or high risk tasks, having access to appropriate training for handling, application or storage of chemicals and hazardous substances, appropriate training for confined spaces, awareness of site areas such as excavations, overhead utilities or structures, operation of the machine within the recommended manufacturers guidelines.

- **Document guidelines** – Australian standards such as 2550.1 2002 Cranes, hoists and winches – safe use general requirements, SafeWork NSW guides such as 1213 – Moving Plant on Construction Sites, organisational procedures, Manufacturers guidelines and specifications, material data safety sheets, safe work method statements, training programs. All site processes, procedures and policies for should be accessible on the worksite or through the site supervisor.

- **Physical protection** – having barricades, concrete barriers, safety zones, exclusion areas, signage warning of hazards or risks, equipment for protection from hazards or risks and the appropriate use of PPE related to the work tasks and site requirements.

The use of barricades, guardrails or fences within the work site is one of the most commonly used techniques for personnel protection. Some organisations will have contractors erect the barricades while others will have operators erect the barricades. Another important safeguard method is the use of appropriate signage within and around the work site.


RISK CONTROL
CONTROLS
HIERARCHY OF CONTROL
ELIMINATE
SUBSTITUTE
MODIFY SYSTEMS
ISOLATE THE HAZARD
USE ADMINISTRATIVE CONTROLS
USE PPE
YOU
HAZARD
RISK

Examples of Site Safety Warning Signs and Symbols

Danger Signs

AS 1319 specifies that these signs are to be used where conditions are likely to be life threatening. The sign is to incorporate the word Danger in white letters on a red oval shape inside a black rectangle.

Warning Signs

AS 1319 specifies that these signs warn of conditions that are NOT likely to be life threatening if the message is ignored. The symbol used is a yellow equilateral triangle with
a black enclosure.

Prohibition Signs

AS 1319 specifies these signs are to have a red annulus and slash symbol on a white background. They indicate actions or activities that are not permitted.

Mandatory Signs

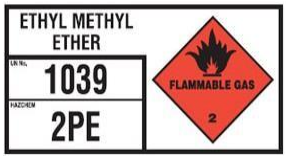
AS 1319 specifies these signs shall be a blue disc with the symbol in white. The word MUST is usually contained in the message.

Emergency Signs

AS 1319 specifies these signs shall comprise of a white symbol or text on a green rectangle with white enclosure. These signs indicate the location or direction to emergency related facilities and first aid or safety equipment.

Fire Signs

AS 1319 refers to fire signs which are covered in AS2444. These signs indicatethe location of fire alarms and fire fighting equipment. Signs shall comprise a red rectangle sign with a white legend and enclosure.



AS 1216 specifies the relevant "designs, layout and size". These signs are prescribed in the "Australian Dangerous Goods Code" and various State Government "Dangerous Goods, Storage and Handling Regulations".

Safety Tags & Lockout Systems

Safety and Directional Signs

Speed Zone Signs

Warning Signs

Directional Signs

Hazard Control – Personal Protective Equipment

Before starting external checks on the vehicle it is necessary for the operator to be wearing appropriate personal protective equipment.

Personal protective equipment (PPE) is the equipment you can wear or use to protect yourself. Every worksite will have PPE requirements. For construction and mining worksites these pieces of equipment will need to be worn from the time you enter the site. For example, high visibility clothing and steel capped boots. Other pieces of PPE would need to be worn only when specific activities are undertaken, such as hearing protection need only be worn when undertaking high noise activities. Signs are usually placed in the workplace to indicate which specific item of PPE is needed.

Common PPE includes:

- Clothing – high visibility, protective, full body clothing, safety vests, sunscreen or sun protection.
- Head – hard hats, sun hats.
- Hearing protection – ear muffs, ear plugs.
- Face – face shield, respiratory protection, dust mask.
- Hand protection, eye protection.
- Footwear – non-slip footwear that encloses the foot.
- Safety harnesses, seat belts, and any other task specific protective equipment.

Personal protective equipment needs to be maintained in good condition, and replaced if it becomes damaged or defective. PPE is the last line of defence for protecting the individual from workplace hazards and risks but will only be effective if it is worn correctly and is adjusted to fit the individual.

Hazard Control – Selecting Environmental Control Measures

Working within the construction industry, you need to be aware of the environmental requirements of the work area, and any constraints that you are under. Environmental requirements are the procedures to be followed to protect or enhance the environment, or to comply with the environmental management plan. Within the environmental requirements are the environmental constraints. Constraints are those activities that must not be done or those activities that must be done in a particular way in order to protect or preserve the environment.

Environmental requirements and constraints can include:

- Methods for applying chemicals to a stockpile.

- Methods for creating a topsoil stockpile that keeps the seeds in the soil viable.
- Dust – dust can be a safety issue as well as an environmental problem. As a Integrated Tool Carrier driver you will create dust. It is your task is to minimise the amount of dust you create.
- Safe work practices and procedures – designed to minimise the risks and hazards associated with particular tasks.
- Contamination control requirements – these requirements will outline what you need to do in the event of a contamination situation. Contamination could come from fluids leaking from the machine and spillage of fluids from service activities, but could also include contamination in the form of the wrong materials being placed in an area. Contamination control requirements are necessary and vital on every construction site. It is essential that you understand them.

- Start times for vehicles – of particular importance on projects impacting high density residential areas.

- *Assess site conditions including:*
    - Work platforms – the actual work zone or surfaces.
    - Grades, slopes and terrain.
    - Haul circuits.
    - Dump sites.

- Chemical and fuel safety – handling hazardous goods and materials such as chemicals and fuels requires specific training. If you are required to regularly handle goods that may be dangerous or hazardous, speak with your supervisor, training officer or assessor about appropriate training. Hazardous goods spills can cause massive damage to the relationship between the worksite and the surrounding community. All spills must be treated quickly, efficiently and with the aim of stopping any further damage.

If you discover a hazardous goods spill it is essential for you to:

1. ***Report it –*** to the appropriate person, generally your supervisor first, then your emergency response team.

2. ***Isolate it –*** keep others away from the area until the emergency response team or hazardous material team arrives.

3. ***Apply first aid –*** if you or someone else has come in contact with the substance apply appropriate first aid treatment, if you know how. If you are not trained call for medical or first aid assistance.

4. ***Follow site procedures –*** each type of hazardous material on site should have an emergency response procedure as well as a general site spill procedure. Make sure that you know these procedures.

Environmental management policies and procedures vary greatly within worksites depending upon the tasks being undertaken. It is important for each member of the work team to be aware of the requirements that apply to the tasks they are undertaking. For any requirements that you are unsure of, you should check with your supervisor or other authorised people outlined in your induction.

Step 5 – Review

Once a Hazard Control Strategy is in place you should review the situation to see if the risk has been reduced to a safer level, and if there is more you can do to reduce the risk. Often a number of strategies need to be used together to reduce risk.

Make sure you record any action you've taken and talk to your supervisor and WHS officer about the control strategies in place.

Coordination with other Personnel

All personnel on site must understand their role and the role of others before commencing work, and during the work process. Coordinating requirements with the appropriate personnel is important to ensure the work site operates efficiently, effectively and safely. It also ensures compliance with WHS and work site requirements and instructions.

Relevant site personnel may include:

- Other mobile plant operators.
- Maintenance personnel.
- Service vehicle operators.
- Mechanics.
- External contractors.
- Supervisors, environmental officers, WHS officers, inspectors/auditors.
- Site visitors.
- Trainers and assessors.

Communication is essential to coordination of activities. Communication can be both written and verbal. Communication needs to be a two way process with both sides being prepared to speak and listen to share ideas on how to effectively achieve the outcomes needed.

Attach, Secure, lift, carry & place materials

Pre-start checks should be conducted before the vehicle is started, on a daily basis. You may need to use hand tools to complete the pre-start and start up procedures. These tools could include spanners, shifters, hammers, screwdrivers, pneumatic equipment, and other hand tools as appropriate for the Integrated Tool Carrier you are operating. If you do need to use these hand tools, ensure you are using them correctly and to meet the task requirements.

Always use a daily inspection checklist or logbook when doing pre and post operational checks on a wheeled loader.

There are a number of areas that may need to be completed, including:

- Company/machine/operator details.
- Return to service signoff.
- Fault report.
- Operational checklist.
- Return to service signoff.
- Maintenance, service repairs.

Visual Inspection

Walk around the Integrated Tool Carrier and check the following areas:

- **External check of the machine** – look for signs of damage, faults, and defects such as oil leaks or other leaky fluids. Inspect hoses, fittings, hydraulic rams, grease holes and grease pins. Check windows. Check tyre condition and inflation. Check the bucket for damage, missing or worn teeth. Also check the bucket for worn cutting edges, and damage to the pivot pins and keeper plates. Check for any loose nuts, bolts, couplings and missing pins. Check under the Integrated Tool Carrier for oil leaks. Look for visual weaknesses, damage, stressed welds, paint separation.

Make sure there is a Roll Over Protective Structure (ROPS) and a Falling Objects Protective Structure (FOPS) attached to the Integrated Tool Carrier to protect you in the instance of the machine being overturned or from falling objects.

- **Internal check of the machine** – Cabin check only – do not move underneath the loader!
  Check for worn levers or gears, general wear and tear on any part of the cabin, log book, running sheet, vehicle history, service sheets, safety devices and alarms are working correctly.
  Check the seat and safety belt for damage, defects or wear. Check the floor plates are free from oil, grease and tools to prevent falls or trips and stop them from becoming slippery or damaging the plates.

Inspect Attachments

Once you have checked the external areas of the loader, it is necessary to check all attachments and coupling points to ensure the attachments are connected correctly and securely to avoid any accidents or incidents.

The type of attachment that could be connected to the Integrated Tool Carrier will vary depending upon make, model and manufacturer's specifications but could include:

- Buckets – can be general purpose, or 4 in 1(used for scraping, loading, clam-shelling and dozing).
- Trench excavators.
- Rock/concrete breakers (hydraulic hammers).
- Lifting attachments.
- Fork arms.
- Other lifting equipment and gear.

Check for modifications, attachments or adaptations that are outside the manufacturer's specifications. Check that all attachments are fitted, used and modified in accordance with manufacturer's specifications. Make sure operational motions and the range of motion are within the manufacturer's guidelines. Ensure that you check all pins, clips and keeper plates for wear and damage.

How each attachment needs to be checked is outlined in the operator's manual for the machine. **The procedure outlined in this manual must be followed.**

Some points to remember could include:

- *Visual inspection. Walk around the vehicle:*
  - Is there any visible damage?
  - Is the attachment sitting in the correct alignment?
  - Do the linkage points sit correctly?

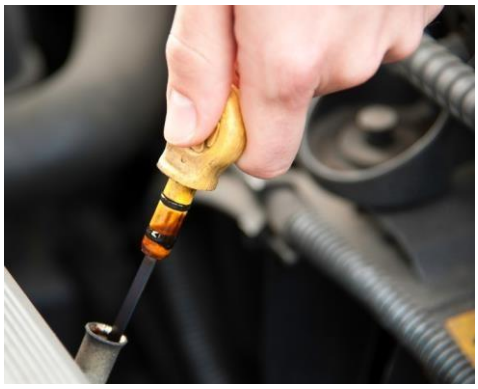
- *Physical inspection:*
  - Touch, feel the point of attachment, if it is safe to do so.
  - Are the link points tight or is something loose?
  - Is there unnecessary or unusual movement in any of the attachments?
- *Are the attachments authorised*?

The operator's manual for the item of equipment you are using and inspecting must be followed exactly. If you do not have access to the manual, speak with your supervisor or team leader.

Fluid Levels

Always check fluid levels are correct for the machine. Fluids could include:

- Windscreen washer.
- Hydraulic, transmission and engine oils.
- Coolants.
- Brake fluid.
- Fuel.
- Battery.
- Water.



Transmission fluids should be checked when the transmission is cold and after the transmission is hot, or in accordance with manufacturer's specifications.

If you need to check the coolant level while operating make sure you allow the machine to cool down, loosen the radiator cap to release the pressure using a cloth, then remove the cap slowly.
Water leaking into the sump can cause bubbly or milky engine oil. Any lubrication of parts should be conducted now unless the operator's manual requires a warm lubrication procedure.

Hydraulics

Check that the hydraulic oil storage tank is not filled above the marked fill line – space is needed in the system for the displacement of the oil.

The hydraulic tank should be vented to release any built up pressure.

If you notice a bulge, crack or leak in any part of the hydraulic systems (rams, hoses) it must be fixed immediately. Do not let the hydraulic oil make contact with your skin. Oil under pressure can pierce your skin.

Battery

Check the battery condition, security, and cleanliness.

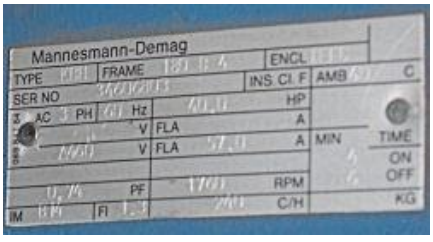
Air Tank

Ensure that the air tank is drained, check the air pre-cleaner bowl and replace if necessary, and ensure that the air filter indicator is at required levels.

Tyres

- Check that the tyres/wheels are adequately inflated and in good working order.
- Make sure the tyres on both sides are equal in pressure or the Integrated Tool Carrier could overturn.
- If the wheels have demountable split rims inflate the tyre in a cage (if available). If the rim flies off it could seriously injure or kill you. Ensure that all split rim bolts are secure.
- When checking the tyre pressure or inflating/deflating a tyre that has a split safety locking rim, use a gauge with a chuck and inflate the tyre in a cage (if available) or by standing to the side. Do not stand in front of the wheel.
- If you are checking the air pressure of water filled tyres then do so with the valve at the top of the wheel, or when using a glycerine gauge the wheel can be in any position.

- If the tyres on a Integrated Tool Carrier are water ballast this will be indicated by a warning riveted or screwed to the Integrated Tool Carrier near the driving station. Also when the valve is at its lowest point water would appear when checking the tyre pressure.
- Fill water ballast tyres with the wheel jacked up and the valve at the top of the wheel. Fill with water to the manufacturer's specifications, add antifreeze if required and then add air pressure.
- Adding ballast to the tyres of a Integrated Tool Carrier increases the weight and the stability of the front end Integrated Tool Carrier and provides better traction as the tread is embedded.
- The front tyres of a Integrated Tool Carrier should be of equal pressure. If the tyre pressure is not equal the weight of the load would transfer to the side of less pressure, which may cause the front end Integrated Tool Carrier to overturn.



Safe working load

Check the load or data plate to determine the safe working load of the Integrated Tool Carrier to make sure you do not overload it during use. If you are not able to determine the safe working load of the machine it should not be used.

Post Start-Up or Operational Checks

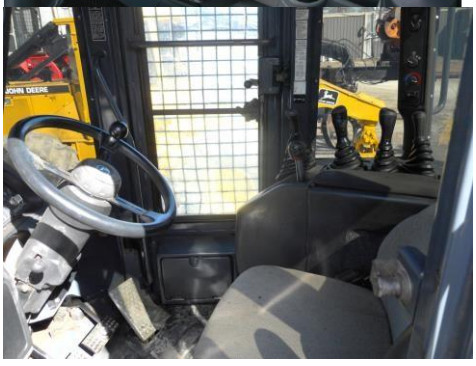
Post start-up checks are done while the vehicle is running but before work is started.

*During the **post start-up** procedures operators will need to check:*

- Seat and safety belt adjustment, park brake on and gearing in neutral.
- Engine idles for the required amount of time. Depending upon the individual machine this idle time could range from 3 to 10 minutes.
- External signs of oil or fluid leaks. It is common for the start up process to cause a leak through hoses breaking. Also check for bulges in hydraulic hoses.

- Gauges, alarms and monitoring systems are located, identified and operating as they are supposed to. Any display instrumentation used needs to be checked. This could include laser levels, computerised systems, location systems (GPS) as well as gauges, alarms and monitors. If any gauges are not working properly at any time you must shut down the Integrated Tool Carrier and report the fault to an authorised person for repairs to be carried out.
- Check hydraulic controls are operational and attachments move correctly.

- Monitor temperatures of oil, engines and accessories.
- Check accessories are in working order – steering, foot and holding brake, wipers, two-way radios, horns, air conditioner and lights.
- All lights need to be checked, including gauge/alarm lights, stop engine lights, or visual warning lights.



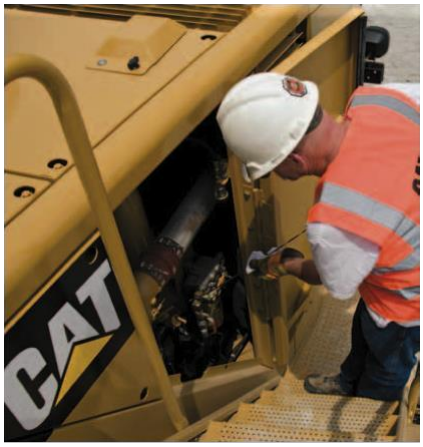
- Check machine warnings – both audio and visual warning systems (horns blown and reversing alarms checked).
- Apply brakes, clear for travel prior to movement of vehicle.
- If the Integrated Tool Carrier will not start after being refueled there may be air in the fuel system that needs bleeding.

It is important when conducting operational checks that you perform all tasks safely and without unnecessary risks to yourself or other personnel.

This may include:

- Taking adequate precautions when working under a raised bucket or attachment.
- Switching off the machine and reporting faults or replacing parts if you are able.

Once all pre-start and start-up checks are completed, you will need to report any problems, faults, defects, or damages found during the checks and refrain from operating if a danger exists (isolate the loader). For example, you would follow this process if you found excessive wear in the power arms and connections. Some work sites have comprehensive checklists that will need to be completed during the starting checks.



All checks must be completed in the way the operator's manual outlines for each machine. Each machine may have slightly different check requirements because of the history of the machine. If you need help completing the checks for the machine you are operating, speak with your supervisor or team leader.

Report all faults

As part of your tasks, you need to inspect your equipment and machinery to find faults, defects or damages, and when they have been found, you need to report them. Do not operate the Integrated Tool Carrier until it has been returned to service.

Damage and defects can result from daily use, work activities or incorrect use. It is essential for the operator to know the limits of the machinery and stay within the capabilities of the machine.

If faults are found on the Integrated Tool Carrier you may need to follow isolation procedures as well as reporting the problem. Isolation procedures are those procedures that isolate a defective or potentially dangerous item of equipment away from areas where it may cause further damage. To isolate an item you should move it to a secure location, lock the machine and remove the keys and then 'tag out'. This means placing a tag on the machine so that others are aware that the machine should not be used. This tag will need to stay in place until a mechanic or other authorised repairer has fixed the fault and certified the machine as being fit for service again. Never operate a machine that has been tagged out and never remove the tags from the machine.

Operational records are used to track faults, malfunctions and hazards so that prevention or maintenance measures can be factored into the work tasks to ensure everyone stays safe and the tasks are completed within specifications and timelines.

SHIFTING MATERIALS

Material shifting is a prime duty of loaders. Standard operation for a Integrated Tool Carrier would be the excavation of materials, picking up the materials with the bucket, transporting them to the desired location, and dumping the materials. The Integrated Tool Carrier can also be used as a crane to lift and transport objects.

Equipment that is associated with Integrated Tool Carrier operation can include:

- Wire slings – also known as Flexible Steel Wire Ropes (FSWR).
- Chain slings.
- Synthetic slings – made from synthetic materials.

- Shackles – used to attach slings to the loader.
- Personal Protective Equipment (PPE): boots, hard hats, gloves, hearing protection, respiratory protection (respirators, face masks), high visibility clothing, sun protection or task specific personal protective equipment.

DRIVE TO THE WORK AREA

Prior to the shifting of any materials the Integrated Tool Carrier must be driven to the work area. When mounting or dismounting the Integrated Tool Carrier you should use the grab rail or hand rail and steps, maintaining 3 points of contact. Where the Integrated Tool Carrier has two pedals for independent rear brakes (designed for maneuverability), the pedals must be connected together.

Make sure the controls are in neutral and that the park brake is on before starting the engine. Adjust the seat until comfortable and adjust mirrors (if applicable). Start the Integrated Tool Carrier as per the manufacturer's manual.

You should ensure that the route and direction of travel is clear, and that you travel at a safe speed. Always check over both shoulders to ensure the direction of travel is clear before reversing. Sound the horn twice before moving unless a reversing alarm is fitted. Attachments should be raised smoothly with the bucket at a safe travelling height. After moving off, test the foot brakes and steering. If you have not used the machine before you should read the operator's manual, and seek training and supervision if required.

Wherever possible, side hill travel should be avoided, as there is a greater chance of turning the machine over. If you must drive the Integrated Tool Carrier down a sloping surface you should drive directly down the slope, not across or diagonally down. This will ensure the Integrated Tool Carrier is as stable as possible.

On approach to downhill travel you should reduce the speed of the Integrated Tool Carrier and select an appropriate gear for the grade. During downhill travel always select a low gear to help control the descent. Often this is the same gear that would be used to climb the hill.

Be cautious when changing gears during uphill travel, especially when in a heavy loader. Missing a gear could result in you losing control of the loader. If the Integrated Tool Carrier does not have enough power to climb the incline, reverse back down the hill and select the correct gear to climb the hill.

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

INTEGRATED TOOL CARRIER OPERATIONS – Excavating, Loading, Pushing, Levelling, & Operating as a Crane

Using the Integrated Tool Carrier attachment the Integrated Tool Carrier is able to excavate and pick up loads, transport materials and dump loads into trucks or back-filled trenches, as well as level surfaces.

When conducting these operations there are a number of important points to remember:

- Work at a safe and acceptable speed, avoiding excessive wheel spin.
- Ensure that the Integrated Tool Carrier is suitable for the ground conditions, and that the bucket is suitable to the task. Soft or uneven ground can reduce the load capacity by fifty per cent, and may cause the machine to overturn.
- Use an appropriate path of travel and ensure direction of travel is clear.
- Interpret and observe all signals from personnel.
- Position the bucket at the correct level and angle for excavating, loading, transporting and dumping.
- Always travel with the bucket as low as possible and tilted back for greater stability and vision and less spillage.

- When using a Integrated Tool Carrier with air brakes:
  - Make sure air pressure is up and can be maintained.
  - Never pump or fan the air brakes, this could cause them to overheat and possibly fail
  - Brake firmly in one application.
  - Never use a brake that neutralises the transmission when travelling.

- If the Integrated Tool Carrier will not start after being refueled there may be air in the fuel system that needs bleeding.

- When running an internal combustion engine in an enclosed space, ensure that the space is adequately ventilated as exhaust fumes can kill. Use an approved exhaust control unit, scrubber) such as a catalytic converter

- If you notice a bulge form in a hydraulic hose while operating the Integrated Tool Carrier you should stop operating, tag the machine and make sure the hose is replaced before the machine is used again.

- Always travel directly up or down a slope rather than across it, and use a low gear.

- Passengers should ride only in the cabin with a special seat and seat belt.

- Use sufficient revs and speed for the task, ensuring constant monitoring of the load.

- Approach the trench or truck slowly and correctly.

- Place loads to ensure stability and avoid causing hazards.

- Dump material no closer than 1 metre from an excavation, with material coming to rest no closer than 0.5 metres.

- Always approach a trench square on, and do not drive too close as the Integrated Tool Carrier may overturn.

- Maintain stockpile and working surface. Remove any large rocks from the trench where required.

- Do not undercut a bank or stockpile, as it could collapse and cause the Integrated Tool Carrier to overturn and trap the operator underneath.

- Consolidate and level the surface.

- Use barricades, guard rails or fencing to prevent personnel falling into a trench.

- Use shoring, battering or benching methods to prevent a cave in for trenches and excavations over 1.5 metres deep.

- Monitor indication signs that you are getting quite close to an underground service when excavating:
  - Crushed blue metal or plastic tape.
  - Clean sand or sand bags.
  - Broken tiles.
  - Moisture.
  - Any other unusual material.

- If you see any of these signs, stop operating immediately and hand dig to investigate. Check with your supervisor or access maps/plans.

- Use barricades, guardrails or fences around an excavation to stop personnel accidentally falling in or machines coming too close.

When using the Integrated Tool Carrier as a crane you must:

- Establish the weight of the load, and ensure it is not more than the safe working load for the operation.
- Be aware that sloping ground would reduce the load that could safely be carried.
- Never hoist people with the bucket or attach slings to the teeth of the bucket. This is against all safe operating procedures and may cause injury to others.
- If the load is likely to swing or be unstable, attach a tag line. The minimum size tag line that should be used is 16mm diameter. Always wear gloves.
- Position the attachments to connect the load.
- Attach the sling to a manufacturer approved lifting lug using a shackle. A chain sling should never be joined with a bolt.
- Check the sling attachment point.
- Perform a test lift of the load. Lower the load and make any changes necessary.
- Always ensure the lifting gear is tagged or rated correctly

- Move the load. Monitor the load constantly, and follow hand signals or other designated signals.
- Balance the load. The bucket should be positioned above the centre of gravity of the load to keep the load from swinging. Sometimes the only way of finding the centre of gravity of the load is by performing test lifts.
- Ensure that if lowering objects such as pipes into trenches that the trench is shored and personnel are standing well clear of either end of the pipes.

- If the slings shift on a load being hoisted, stop the crane, warn personnel in the area, carefully lower the load, and re-position and secure slings.
- Land the load at the designated location. Ensure that it is secure and stable.
- Safely detach lifting equipment.

ASSESS MATERIALS TO BE SHIFTED

The operator should inspect and identify the material types, the haul area or circuit and the grade and terrain of the site before starting work. The density of the material needs to be assessed as this affects the cutting speed and carrying capacity of the machine. For example clay is more cohesive and harder to excavate than topsoil. In doubtful soil, trenches over 1.5 metres deep need to be shored before entering. Each operator will need to gain experience with different materials to develop the ability to accurately assess the weight of the load and how this load will affect the performance of the loader.

The speed of the vehicle needs to be adjusted for the density of the materials and to maintain an even cut or load face. Denser materials such as clay require the Integrated Tool Carrier to move slower to achieve acceptable results.

LOAD ASSESSMENT

You can check the weight of the load 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.

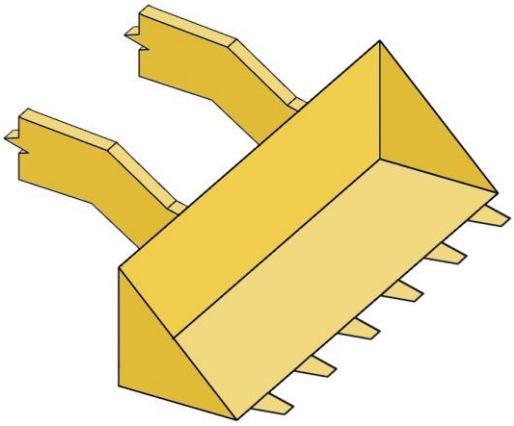
Bronze	8.5t / cubic metre	Lead	11.4t / cubic metre
Clay	1.9t / cubic metre	Lime (stone)	2.6t / cubic metre
Coal	864kg / cubic metre	Sand, beach, dry	2.0t / cubic metre
Copper	9.0t / cubic metre	Sand, beach, wet	2.3t / cubic metre
Earth	1.9t / cubic metre	Sand, river, wet	1.5t / cubic metre
Granite	2.6t / cubic metre	Shale	2.6t / cubic metre
Gypsum	2.3t / cubic metre	Terracotta	1.8t / cubic metre
Iron, ore	5.4t / cubic metre	Zinc	7.0t / cubic metre
Gravel, loose, dry	1.5t / cubic metre	Stone, crushed	1.6t / cubic metre
Gravel, with sand, natural	1.9t / cubic metre	Stone (common, generic)	2.5t / cubic metre
Mud, packed	1.9t / cubic metre	Trap rock, solid	2.8t / cubic metre
Mud, fluid	1.7t / cubic metre	Trap rock, broken	1.7t / cubic metre
Concrete	2.4t / cubic metre		

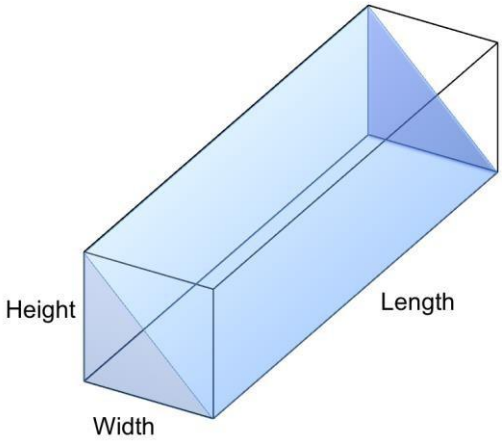
Always check the load plate to make sure that any load that is lifted is within the safe working load/working load limit of the loader.

INTEGRATED TOOL CARRIER BUCKET CAPACITY

To determine the capacity of a bucket you need to multiply the Height, Width, and Length and divide it by two.

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

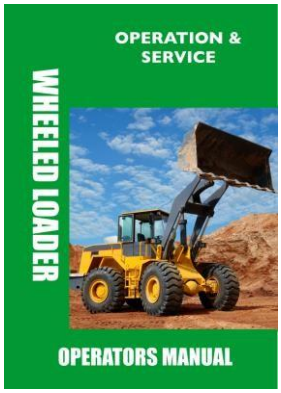




OPERATE INTEGRATED TOOL CARRIER CONTROLS

Controls and levers are used in loaders to control all aspects of machinery operations. The primary functions of a Integrated Tool Carrier are to excavate and shift materials in a controlled environment.

It is the operator's responsibility to be familiar with all of the controls, instrumentation and levers of their machine. This should be done prior to starting work or when a different make or model is used.



Read the operator's manual to familiarise yourself with the machine. It is important to take the time to know about all of the controls and levers for the machine that you are operating. Even an older or newer model of the same unit can have variations in the placement and application of the controls.

The operator should know where to find all control switches such as lights, wipers, cabin temperature controls, radio or other machine accessories. When site conditions change due to light, weather, dust or other situations, the operator has to adjust efficiently to the site conditions.

Similarly, all control levers and switches, including emergency response buttons and Integrated Tool Carrier controls, must be identified prior to starting work. This also ensures efficient and effective use of the controls during machine operation.

Before starting a task it is important that the operator has all appropriate and required licenses and competencies. You will need to check with each state or territory licensing and regulatory bodies to determine which regulations must be complied with.

Once the task has been completed you should turn the Integrated Tool Carrier off. Do not leave the engine running if the Integrated Tool Carrier is going to be left unattended.

GENERAL OPERATING TECHNIQUES

When using a loader, the operator will use many different techniques to control the loader, ensuring safe operation and that required tasks are completed efficiently.

Some general operating techniques include:

SAFE OPERATING SPEEDS

The travel speed for each vehicle is determined by many factors, such as:

- Speed limit zones or signs.
- Age of vehicle – older vehicles can move slower.
- Environmental conditions – terrain, weather, site procedures, task requirements, movement needs.
- Ground conditions – clay soils need slower speeds, wet areas need slower speeds.
- Operator personal decisions.
- Legislative requirements – traffic regulations, state legislation.
- Site procedures – vehicle movement plans, haul circuit conditions.
- Manufacturer's guidelines – vehicle capacity.

Loaders that have front and back balloon tyres are susceptible to bouncing when driven with speed. Lower the front tyre pressure, and avoid excessive speeds in these loaders as they can tip and overturn.

The appropriate speed for the task is determined by all of the above factors. Moving too fast will increase the likelihood of loss of control of the vehicle, endangering the driver and others on the worksite.

RELOCATING THE LOADER

Sometimes a Integrated Tool Carrier may need to be transported on the back of a float. To load the Integrated Tool Carrier onto the float, ensure the Integrated Tool Carrier is clean and ready for transport.

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

- Clean the excavator thoroughly.
- Clean any attachments going with the excavator.
- 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.

Slowly drive the Integrated Tool Carrier onto the back of the float. Generally you will need to reverse the Integrated Tool Carrier onto the float using spotters. Make sure you follow all directions and signals given by the spotters. The Integrated Tool Carrier will then need to be secured.

MANOEUVRING

When operating large loaders, there is often limited room and space for movement and turning. You need to become familiar with the turning capabilities of the machine you are using and the correct gearing for movement.

You will also need to watch out for other plant, structures, stockpiles and obstructions. Manoeuvring skills often come with experience using the loader, but you can also talk to other experienced Integrated Tool Carrier operators.

BRAKING

Learning the braking capacity and distance of the Integrated Tool Carrier you are driving will often come with experience. Other braking techniques include:

- Don't brake too suddenly unless in the case of an accident.
- Allow enough distance to stop particularly with a loaded bucket.
- Apply the brakes in a manner that doesn't put the machine off balance.
- Monitor braking while turning, especially if locking brakes are fitted.

Read the operator's manual and speak to experienced operators.

BUCKET LOADING, CARRYING AND DISCHARGE TECHNIQUES

A variety of techniques can be used for loading, carrying and discharging. It is essential that you always use the correct technique for the specific task.

Some points to remember include:

- Always use the correct method of loading for type of bucket.

- Don't overload the bucket – ensure you calculate the capacity of the bucket and assess the material to be loaded.

- Keep the bucket low to the ground when travelling with a loaded bucket. Always travel at safe speed and avoid spillages where possible.

- When discharging a load:
  - Level the ground or surface to avoid rollover.
  - Place a layer of soil in the receiving truck to take the impact of large rocks.
  - Raise the bucket to the correct height for discharge before starting to roll the bucket. Never pass a load over the cabin of the truck.
  - Do not load a truck on a sloping surface as it could overturn.
  - Ensure correct braking (or use of hand/load brake) to stop movement if applicable.

- Talk to more experienced operators and ask for mentoring or read your operator's manual for assistance.

Efficiency and effectiveness in loading comes with practice and experience.

Bucket loading, carrying and discharge techniques include:

- Single sided loading – usually loading from on only, to either haul vehicles, hopper, or conveyo

- Double sided loading – can apply to loading into a hopper or mixer with two or more

  stockpiles where specific mixing ratios may be required. Double sided loading can also apply to two loaders working together and loading a haul vehicle from different sides. This action requires very clear communications between

  Integrated Tool Carrier drivers and the truck driver.

- Building and maintaining stockpiles – ensure that you know the size and shape requirements of the stockpile. Stay within the surveyed/marked area if appropriate and

  create ramps as necessary. Using the Integrated Tool Carrier push up and shape as required, and watch out for un-compacted or loose materials to avoid roll over.

- Drive-by loading – constant movement of the haulage vehicle (or rail Carrier s). This often makes it difficult to maintain consistent load

  discharge, and requires experience and good operating technique.

- Haulage vehicle positioning – ensure that the haulage vehicle is in the correct position and that you know where the driver is. Do not load a truck on a sloping surface. Avoid contact with the haulage vehicle - leave enough room to raise the bucket and discharge materials.

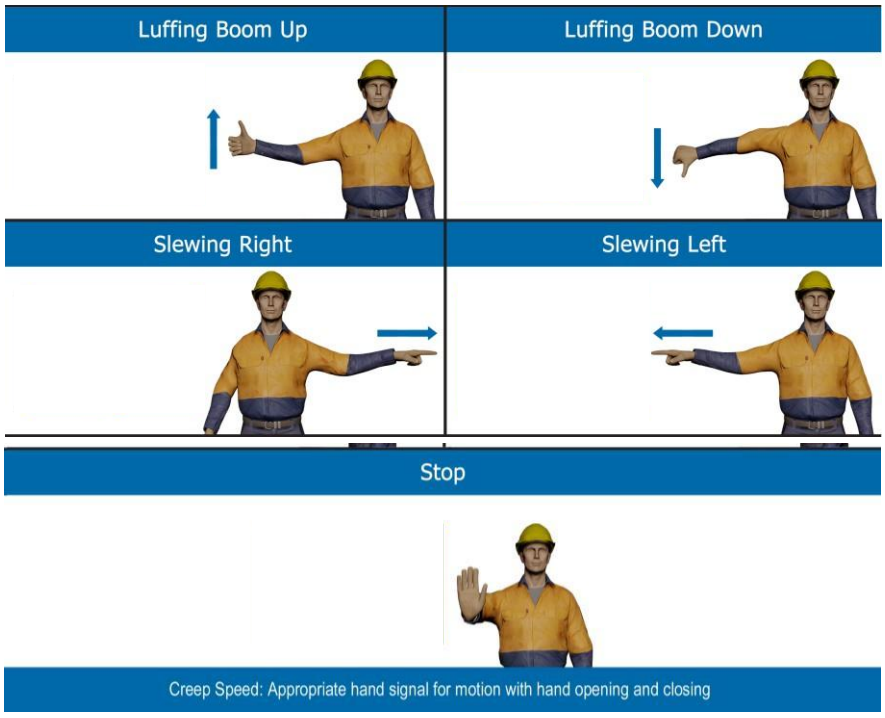
VEHICLE AND PERSONNEL SAFETY TECHNIQUES

- Overhead power lines – when working near overhead power lines always be alert, and know vehicle clearances. Ensure that you are aware of reduced distances as the fill goes up, and know emergency procedures in case of contact. You may also need to:
  - Put safety tags on electrical switches/isolators to stop others from turning the power back on while you are working on or near power lines.
  - Insulate power lines.
  - Use a safety observer (also known as a spotter) inside the exclusion zone to make sure you don't get too close to power lines
  - Disconnect power when working near power lines or overhead services.

- Live stockpiles – movement of materials is likely. Be aware and able to respond appropriately. There is a potential for the walls of the stockpile to collapse if incorrectly excavated. Ensure correct operating techniques are used and communication is maintained on the work site.

- Other machines and personnel – know your travel paths or circuits and be aware of where other machines and personnel are working in the vicinity. Good communication between operators is essential. Verbally, using hand signals or whistle are all forms of communication on the work site.

Some common hand signals used in Australia include:



Manual lifting – when you need to lift a piece of equipment it is important that you use correct manual handling technique. These techniques include:

- Keeping the load close to the body.
- Bend your knees, not your back.
- Do not lift more than you are able to.
- Use team lifts for heavy items.
- Use manual handling equipment as much as possible.

SITE CONDITIONS

While you are working and moving materials on the site, the site conditions will change. Changes in site conditions, terrain and grades will affect the operation of the machine. This in turn requires the operator to be able to change operational styles and techniques based on prevailing conditions.

Common changes in site conditions and hence operator techniques can include:

Weather conditions – rain, sleet, snow, sun, wind, and humidity can affect both the Integrated Tool Carrier and materials you are working with. Additional moisture will change the composition of the materials possibly making them heavier and more slippery.

Changes in operating techniques include:

- Adjusting the weight of the load being pushed, pulled or lifted.
- Not carrying as much material in the bucket in a run.
- Using additional PPE as required for the conditions.
- Speaking with you supervisor in regards to stopping work, or extra safety requirements that may need to be implemented.

Lighting conditions – could be due to weather or day turning to night.

Changes in operating techniques include:

- Being more aware of your surroundings.
- Working under overhead lights at night or in darker conditions.
- Wearing sunglasses in bright conditions.
- Becoming aware of adjustments needed to sight when moving from underground to above ground conditions.

Ground conditions – having large vehicles moving over an area constantly can either increase or decrease the compaction levels of the surface.

Changes in operating techniques include:

- Driving at a speed applicable to the conditions.
- Being alert to the possibility of slips, loss of traction, sinking or bogging.

Stockpile heights and gradient changes – materials dumped into stockpiles or materials being excavated from the ground will both change the gradient of the surface.

Changes in operating techniques include:

- Appropriate monitoring of the stockpile height and width according to site plans and procedures.
- Monitoring of materials and ground surfaces that have been excavated, causing an altered gradient.
- Driving at appropriate speeds to the incline or decline.

Grade changes – grade changes of the materials could include changing from acceptable grade materials to spoil materials, or from loose grade material (such as sand) to a denser grade material (such as rock).

Changes in operating techniques include:

- Constantly monitoring your load to ensure stability of materials and that you are still working within safe working limits of your machine.
- Decreasing or increasing the angle of excavation.
- Following site environmental procedures when dealing with spoil materials.

Environmental conditions –if you are moving materials from the base of a hole, you will be moving towards the water table and increasing the chances of encountering wet materials.

Changes in operating techniques include:

- Monitoring the moisture content of the materials.
- Decreasing the size of the load when moisture content increases.
- Monitoring and being aware of sinkage areas or slippery zones.

Fluids and material disposal - when disposing of fluids and materials that may impact on the environment it is necessary to ensure you are getting rid of the materials in accordance with your site environmental management policies and procedures.

Changes in operating techniques include:

- Disposing of fluids and materials in the designated area.
- Following specific procedures in a controlled environment.

When operating a Integrated Tool Carrier it is important for you to feel confident and comfortable in your machine and to know the capabilities of the machine. This will ensure that you are able to competently use the Integrated Tool Carrier in changing conditions.

ACT ON OR REPORT MONITORING SYSTEMS AND ALARM

Each piece of machinery will have its own set of alarms, monitoring systems and gauges to assist the driver in the effective and efficient operation of the vehicle.

Some of the alarms, gauges and monitoring systems you may find on a piece of machinery could include:

- **Brake monitors** – air pressure, oil temperature, parking alarms.
- **Temperature gauges** – oil, water.
- **Filters –** fuel, steering, transmission.
- **Engine gauges** – fuel, engine oil pressure.
- **Gauges and meters** – tachometer, torque converter, voltmeter, speedometer, odometer, service meter, retarder.

For a list of the specific gauges, alarms and monitors on the Integrated Tool Carrier you are operating, refer to the operator's manual.

If an alarm, gauge or monitoring system shows that something is wrong or not working within the specified range, you must stop your machine and respond to the alarm in an appropriate manner. It is essential that you stop the machine in a safe and controlled manner, and that this is communicated to any other relevant personnel working within your area. Some work sites will need you to remove your Integrated Tool Carrier to a designated maintenance area before stopping.

The response required from the operator will be dependant upon the type of alarm, gauge or monitoring system that is indicated. Basic warnings to fill your fuel or oil, check your speed or arrange servicing of the vehicle can be attended to as soon as practical or possible without danger. Other alarms require an immediate response to minimise the risk of danger. For example, a sudden drop in oil pressure could indicate a broken or leaking hose. In these cases the machinery will need to be removed from the work area, reported immediately to your supervisor, and fixed by either the operator or a mechanic. If you are unsure about the meaning of an alarm, gauge or monitoring system check your operator's manual, and talk to colleagues or your supervisor.

In all cases, any faults found on your Integrated Tool Carrier must be reported in writing or verbally. The work site induction will outline the particular requirements for each individual site you work on.

INCIDENT AND EMERGENCY PROCEDURES

Emergency procedures are those actions taken by personnel on-site when an unexpected incident or accident occurs.

It is the operator's responsibility to fully understand the emergency shut down procedures for the Integrated Tool Carrier they are operating prior to starting an activity. These are detailed in the operator's manual, stickers and charts within the cab of the loader, and in site procedures and policies such as emergency management plans, or site safety plans.

Common Integrated Tool Carrier emergency situations and emergency procedures that can be found onsite could include:

- **Contact with electrical services or lightning strike** – stay calm and within the cab unless the vehicle has caught fire, and wait for electricity to be turned off. The electrical supply authority should be contacted immediately. Warn others to keep away. Try to break contact if possible. If it is not possible to break contact, lower all attachments if it is safe to do so, turn off the engine and avoid all contact with the cabin frame. If the vehicle has caught fire, carefully open the door without touching metal objects and jump clear of the cabin. Keep both feet together and jump as far away from the machine as possible. Make sure a supervisor is notified. Due to the possibility of fire explosion, it is recommended that a clear zone of 200 – 300 meters is put in place around the vehicle. Keep all personnel clear of the area until an all-clear is given.

- **Collision** – attempt to avoid a collision in any manner practical for the situation and site conditions. If it puts you at more risk by avoiding a collision, allow the collision to take place but brace yourself if possible. Once a collision has occurred, render any first aid that is necessary if you know how to, and wait for supervisors and team leaders to arrive onsite. Do not move the vehicles until given permission to do so and an investigation has taken place.

- **Face overhangs** – can be unstable or could possibly collapse. Check the survey and geological information for the area if you are concerned.

- **Out of control vehicle** – application of emergency brake system. Fanning the brake rather than a firm application may exhaust the air pressure faster than the compressor can replace it. Control the machine until full stop is achieved where possible.

- **Roll over of Integrated Tool Carrier** – ensure your seat belt is in place, stay within the cabin until assistance arrives. Do not try to jump clear. This can put you in more danger as roll over protection systems are in place in all loaders within Australia.

In the case of an emergency:

1. Remain calm.
2. Raise the alarm with your supervisor and/or first aid officer.
3. Get help from emergency services (Dial 000).
4. Evacuate if necessary (refer to site emergency plans).

Emergencies happen very quickly, therefore knowing your emergency response plans is essential, and reacting with the intention of trying to improve the situation is vital. All incidents need to be reported. Use an incident report form or other appropriate workplace proforma.

FOLLOWING SITE PLANS AND TIMELINES

Completing assigned tasks and activities within a given timeframe and following the site plan is essential to the smooth operation of the worksite. The site plans will detail the timeline for specific tasks as well as for the completion of the entire operation, as well as the quality requirements that must be met. The operator must be familiar with and understand the site plans and designated timeframes for these processes at their site.

Organisation and time management are essential in order to achieve desired outcomes. To-do lists or checklists may be used, or your site may have specific documentation to be filled out. If you are unsure, ask your supervisor.

All tasks must also be completed within the operating capacity of the allocated equipment. Having a sound knowledge of your Integrated Tool Carrier and equipment, and their capabilities is essential. If you are unsure of the operating capacity of your loader, consult your operator's manual or speak to your supervisor.

PARK THE LOADER

Parking the Integrated Tool Carrier in a way that is safe is necessary to the smooth operation of the worksite. Following the worksite parking procedures will ensure the avoidance of hazards, and continued smooth operation of the worksite.

Some site hazards that will need to be avoided could include:

- Access points.
- Excavations or trenches (the weight of the Integrated Tool Carrier could cause the excavation to cave in, particularly if the ground is affected by rain).
- Overhangs.
- Drainage areas.
- Refueling areas.
- First aid stations.
- Structures such as buildings, fences, and bridges.
- Pedestrian areas.
- Personal areas and personnel such as work experience students, visitors to the site, staff and other personnel.

Machinery needs to be parked in a safe and efficient manner that will allow easy access to the vehicle and other vehicles on the site.

One manner of doing this is to ensure you park your Integrated Tool Carrier clear of other equipment hazards.

An equipment hazard could include:

- Other loaders.
- Water tanks and tankers.
- Graders, rollers and scrapers.
- Buildings and structures.
- Fire fighting/electrical equipment.

Your Integrated Tool Carrier must be parked following your worksite parking procedures (sometimes called park-up procedures). Park-up procedures are done while the engine is operating. *They include:*

- Stopping the Integrated Tool Carrier on a firm, level surface in the designated area and keeping the access points clear.
- If the Integrated Tool Carrier must be parked on an incline it should be facing up the slope.
- Integrated Tool Carrier should be parked away from dangerous areas such as access ways, near overhangs, refueling sites, tidal or flood areas, or adjacent to an excavation.

- Locks and holding brakes are applied.
- Attachments are moved into the shut-down position. This could include lowering the bowl, removing the pressure from hydraulic lines or making the attachments safe in the way needed for the work site.
- All vehicles are left or secured in the way outlined in the site procedures. This could include moving the vehicle to a security area.

If the Integrated Tool Carrier must be parked on, or protrudes onto an access way, you must ensure that any appropriate barricades, lights or signs are used.

SHUT DOWN THE LOADER

Every item of machinery has slightly different shut down procedures. For the exact procedure for the machine you are operating, consult the operator's manual.

Shut down procedures are those tasks and checks done after operations are complete.

These commonly include:

- Cooling the engine before shutting it down. Dependent upon the vehicle, but commonly the same amount of time as the engine warm up time.
- Monitoring controlled lowering of temperatures and pressures.

- Conducting post-operational checks.
- Securing the vehicle and using any applicable lock-out or isolation devices, and removing the keys to prevent unauthorised movement.
- Ensuring equipment is correctly stowed and site secured in accordance requirements. This could include securing the work site with barricades or fences to stop unauthorised entry.

Any problems found during the shut down procedures need to be documented using the method required by the work site. You may need to ensure that any faulty equipment is isolated in an appropriate space on the worksite and that the appropriate tags have been applied.

If you are unsure of how the worksite requires you to report problems, or shut down an item of machinery speak with your supervisor, check your induction information or speak with a co-worker.

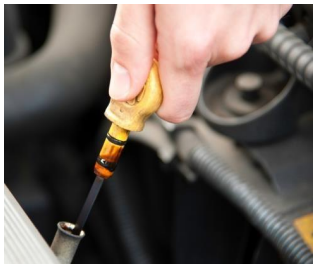
CONDUCT POST-OPERATIONAL CHECKS

Post-operational checks are conducted once activities with a particular piece of machinery have been completed. They include conducting the shut down tasks and completing any records, reports or other actions, depending upon any issue found during shut down procedures. Post-operational checks should be conducted to make sure the Integrated Tool Carrier is ready for the next operator.

Walk around the machine and look for any signs of damage or faults that may have occurred during the operation of the loader.

You should be looking for the same things as during the pre-start check: leaking fluids, damage to accessories, anything that has changed since conducting start- up checks. Any defective equipment needs to be identified and isolated (tagged and moved to another area if possible) before reporting the defect to your supervisor.

You can use a daily inspection checklist or similar workplace document to make sure all necessary checks are made at the end of the day or shift.



MAINTENANCE & HOUSEKEEPING TASKS

Basic service, maintenance and housekeeping procedures vary for each machine. It is necessary for the operator to consult the operator's manuals and service guide for exact details for each machine.

Depending upon the nature of the activities, service and maintenance may be daily, weekly, monthly and specified operational hours.

Some common servicing and maintenance activities that you can complete include:

- Conducting authorised servicing such as filling up oils and hydraulic fluids, lubricating moving parts, clearing blockages, and checking tyre condition and inflation.
- Cleaning the machine.
- Recording and reporting faults to appropriate personnel.
- Storing serviceable equipment as required.
- Replacing batteries, filters and any other authorised replacements. When changing a battery the grounded clamp needs to be removed first. Check the operator's manual to find out which terminal is the grounded one for the Integrated Tool Carrier you are using.

Integrated Tool Carrier operators may also be required to assist maintenance personnel during maintenance or repair to the vehicle. During this task, it is essential that there is clear communication between the operator and maintenance personnel in order to conduct the maintenance or repair effectively and safely.

Vehicle Refueling Procedures

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

Some sites may have refueling 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 refueling plant and equipment near a waterway or sensitive area.

Refueling 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 refueling plant and equipment. Always check the procedure for you work site before any refueling 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 refueling operator.

If you are responsible for refueling 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 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.

MAINTAIN AND PROCESS RECORDS AND REPORTS

Some records and reports that an operator may need to complete include:

- Fuel usage.
- Logs – supply logs, work activity logs, training logs, usage or driver logs.
- Shift documents – end of shift, end of process, dispatch details, activity reports.
- Incident reports – accident forms, incident investigation reports, environmental incidents, QA reports.
- Planning documents – specifications, activity plans, diary plans, quality assurance plans, environmental plans, occupational health and safety plans.
- Maintenance records – the maintenance that has been completed.
- Repair records – any repairs that have been completed, or issues for repairs to be undertaken.
- Fault records – any operational fault that has occurred during the shift, including potential faults. Each site may have different record keeping requirements and procedures. If you are unsure of the requirements for your site you must speak to your supervisor or other relevant personnel.