Learner Name:

Learner Guide

Earthmoving Course

RIIMPO325E Conduct Civil Construction Scraper Operations

Learner Guide

National Courses PTY LTD

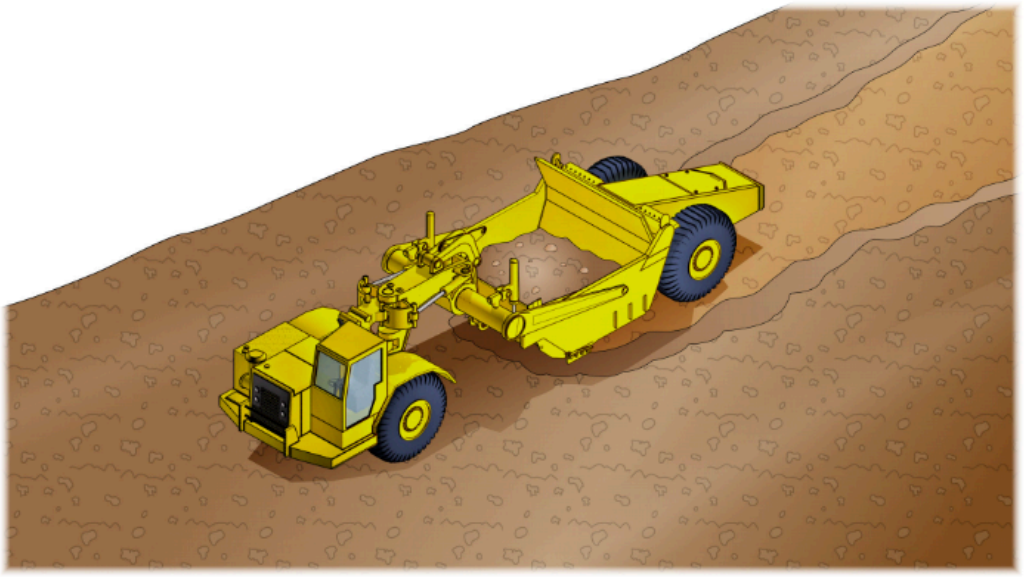
1.1 Introduction

1.1.1 Introduction to Scraper

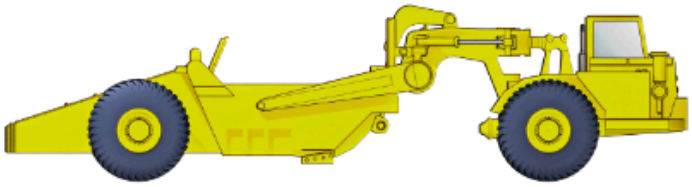
A scraper is a machine which scrapes and moves soil.

1.1.1.1 What Industries Do You Use A Scraper In?

- Civil construction

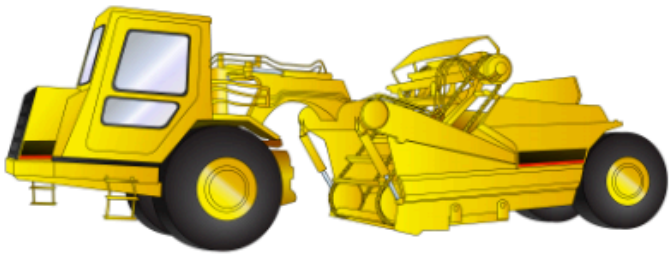


1.1.2 Types of Scraper



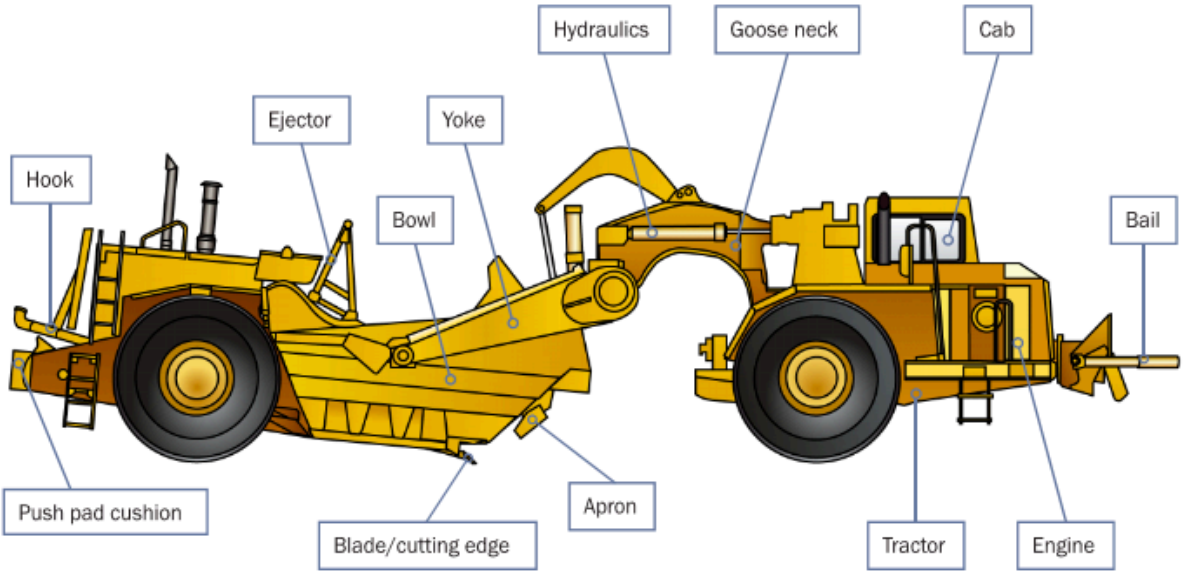
Single engine scraper

Dual engine scraper



Elevating scraper

1.1.3 An Example of Scraper



1.1.4 Who Has Duty of Care?

You have a duty of care. So does anyone who has something to do with the worksite. Duty of care applies to:

Employers/persons conducting a business or undertaking (PCBU). This includes managers, manufacturers/suppliers, importers, designers, inspectors, etc.	Workers. This includes employees, contractors and sub-contractors, employees of labour hire companies, outworkers, volunteers, etc.
	

1.1.4.1 Worker's Duty of Care

As a worker you must take care of your own health and safety – and the health and safety of others at the workplace. You must not put your own or other people's health and safety at risk.
Never work where you believe a hazard is a serious risk to your health and safety. You must also:

- do your best to follow reasonable health and safety instructions from your boss (PCBU)
- follow workplace health and safety policies and procedures
- do not work where you believe a hazard would be a serious risk to your health and safety.

1.1.4.2 PCBU/Employer's Duty of Care

The PCBU must:

- Provide a safe workplace
- Train workers and make sure they know what to do on the job
- Try to get rid of risks, or find ways to minimise risks
- Tell workers about any hazards or risks. Workers must know what to do in an emergency.
- Have a workplace safety plan. For example, workers should be trained in the use of fire fighting equipment and first aid equipment.

Penalties

If you are a PCBU/employer or a worker, the government can fine you or even imprison you for failing your duty of care.

1.2 The Basic Road of Construction

1.2.1 The Basic Road of Construction

A surveyor will stake out the site according to the site plan. The stakes mark where the road will go and any drains or pits, which will help to drain water away from the road area. 	An excavator or dozer removes the trees, shrubs and other plants and levels the area. Some trees may be protected with padding or fencing. 
Sometimes contractors may use a borrow pit (also called a sand box). A borrow pit is an area where soil, sand or gravel (material) is dug out to be used in another area. Sometimes the borrow pit will become the drains, or water catchment areas at the end of the work. 	The excavator or dozer may use material from the borrow pit to build up low areas in the road. They may also build up diversion blocks. Diversion blocks divert water away from the road and into drains. 
As the operator shapes the ground, they will usually create drainage at the sides of the road area. They will also make sure there is enough fall (scope) on the road so that water drains away from the road. 	Drains are installed to help take water away from the worksite. 
A front end loader or dozer shapes the road base. This helps smooth out the surface ready for grading. 	A water truck may wet down the ground. This helps the soil to bond. 

The grader grades the road to produce a much smoother surface.

A roller or compactor then compacts the road. This breaks up lumps and smooths the surface out.

A site supervisor or roller operator tests the compaction. Sometimes they will use a deflectometer or penetrometer. Some rollers/compactors can test the compaction as they drive.

Many layers of the ground material are built up. This is called the subgrade. Each layer is compacted and tested.

Trucks then deliver subbase. Haul trucks or tip trucks sometimes tip the subbase, and front end loaders spread it.

A water truck may spray water on the subbase to help the soil bond. This makes the particles stick together and make it compact better.

Several layers of subbase are laid. The subbase is compacted and tested.

Once the subbase is at the right thickness and is compacted properly, trucks deliver the course road base. The road base is built up in many layers. Water trucks may wet down the road base if it helps the roller/compactor compact the base.

When the road base is thick enough, and is compacted properly, the road is finished.

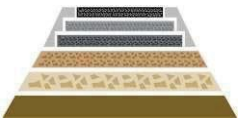
If asphalt is being laid, more layers will go on top of the road base. There will be an asphalt base course, then a binder course, and finally, a surface course.

Finally the planting, erosion control and drainage work is completed.

1.2.2 Principles of Soil Technology for Civil Works

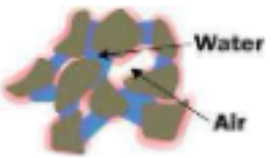
One of the most important jobs you will do, as a machine operator, is to help lay foundations. Foundations are the base for roads, railway lines, swimming pools and buildings. If you do not have a solid foundation, you cannot build something solid on top of it.

When soil is firmly compacted it has an increased density, this provides a stronger foundation to build on.

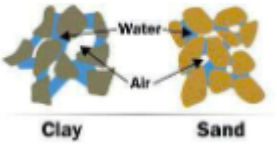


In civil construction, moisture content means how much water is in a soil, rock, aggregate or road base. Moisture is very important in earthmoving. Moisture affects the weight of soils. It makes soils swell, and it also affects the handling properties of the soil. Handling properties means how easy or hard it is to work with that soil.

The amount of water in soil affects its viscosity. Viscosity is how thick the soil is. For example dry loose soil has a low viscosityand is easy to work with. Wet muddy soil has a higher viscosity and can be more difficult to work with.

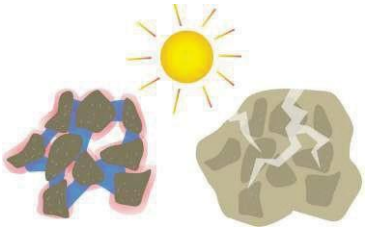


All soils usually contain moisture. How much moisture the soil has depends on many things. The weather, drainage, and the soil's ability to hold water all affect the moisture in a soil. Retention properties mean how much water a soil can hold. Different soils can hold different amounts of water. Sometimes you can treat a soil to change its moisture content. To do this you mix a chemical with the soil.



Different types of soils can cause problems with foundations. Wet, boggy soil can cause foundations to sink. That is why it is important to make sure water can run or drain from the site. It is also important that the foundation is built up to the right level. You can sometimes treat wet boggy soil with lime. Lime helps dry out the soil, and helps it 'clump' together.

Clay soils can also cause problems under foundations. This is because clay attracts water. When this happens, the clay expands and swells. Later, when it is hot and sunny, the water dries up and the clay cracks.



Over time, this swelling (expanding) and cracking (while shrinking) can warp your foundations. This can cause cracks and potholes in roads, cracked walls or ceilings in buildings, or swimming pools to crack and leak.

You can treat clay soils with chemicals that stop clay from attracting water. Once you treat the clay, you can compact it. This makes a much better foundation that won't swell and crack as much.

Before you use any chemicals, you must make sure they are safe. Check the safety data sheet (SDS) to find out how to safely use, store and handle the chemical. Check the site's environmental management plan. If you are not sure about using a chemical, talk to your site supervisor.

1.2.3 Earthmoving Site Hazards

1.2.3.1 Checking for Underground Services

You should always check where services are before you start work. You may phone 'Dial before you dig on 1100'. You may look at the site plan or talk to your supervisor. You may need to look at the location of pits and meters to get an idea of where the services run. You may need to check with the local council or service company. You may even need to get underground detection equipment.

If you hit a service line, contact the provider immediately. You may need to organise to get the service disconnected while a qualified person fixes the problem.

You can sometimes tell there are services below by the types of ground. Some services are surrounded by a different type of soil, rock or sand. You may notice that the soil is looser, or does not match the soil around where you are digging. There may be a line of tape alerting you to the services.

If you suspect there are services underground, stop working. Check the ground. You may need to excavate the area by hand, or dig in another area.

1.2.3 Operating Techniques

1.2.3.1 Building A Stockpile

A stockpile is a pile of material (soil, sand, rock, etc) that you use for earthmoving work. You must choose a good location for your stockpile. If you choose the wrong location, your stockpile could get washed away or become dirty (mixed with other materials).

If you can, choose an area of well drained, firm level ground. 	You should set up drainage so that rainwater does not cause the stockpile to wash away or slide. 

Make sure the stockpile is close to the area you are working. You don't want to drive too far to work with the stockpile. 	Make sure you have clear access to the stockpile. 
Clear the area of any rubbish or debris, so it doesn't get mixed in the stockpile. 	When you fill out a stockpile, start by filling the area closest to the back of the stockpile area. 
Don't work too close to the edge of the stockpile as it could give way. 	Keep filling out the stockpile one row at a time or by dozing material to the correct position on the stockpile. 

1.2.3.2 Taking from A Stockpile

When you take from a stockpile, try and work neatly. 	Take from the top, working down in layers. 	Do not undercut the stockpile. It might collapse on you. 
You may need to maintain the stockpile by neatening it up. 	To do this, you push material up that has been spread out. Keep the loading area clean and level. 	

2.1 Plan and Prepare for Scraper Operations

2.1.2 Work Health & Safety Legislative Requirements

'Laws to keep your workplace safe'
WHS/OHS requirements are outlined in Acts, Regulations, Codes of Practice and Australian Standards.

WHS/OHS Acts
'WHS/OHS Acts' are laws that explain how to improve health and safety in the workplace.
For example: Model National WHS Act, June 2011.
WHS has the same meaning as OHS in this document.

Regulations
'Regulations' explain specific parts of the Act.
For example: Part 4.3 – Confined spaces, Part 4.4 – Falls.

Codes of Practice/Compliance Codes
'Codes of Practice' are practical guidelines on how to comply with (meet the rules of) legislation.
For example: HAZARDOUS MANUAL TASKS Code of Practice, 23rd December 2011.

Australian Standards
'Australian Standards' are work guidelines that set the minimum accepted performance or quality for a specific hazard, process or product.
For example: AS 2550 – Cranes, hoists and winches – safe use set.

What are quality requirements?

The quality requirements tell you the standards you must meet when doing earthmoving work. They tell you what you need to do and how to do it to satisfy the customer. You may need to follow codes of practice, regulations, national standards etc.

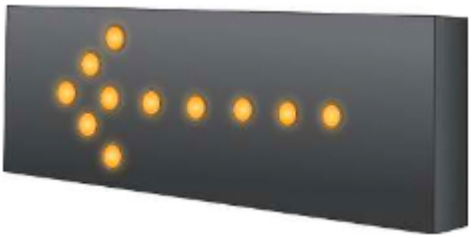

Slab Foundation Preparation.
Quality & Specification check list.

√	Job stage	Checked by
	Correct area pegged out	
	Vegetation removed	
	Top soil removed and stockpiled	
	Slab size pegged out in correct location	
	Slab size pegged out to correct size	
	Level markers in place	
	Site leveled to pegs	
	Crushed rock is correct size as per specification	
	Slab area boxed to correct height off floor	
	Crush rock is the correct height as specified	
	Boxing pegs at correct spacing and depth	
	Crushed rock is level to specification	
	Crushed rock covers the specified area	
	Crushed rock compaction meets specifications	
	Compacted crushed rock base is at the specified height	
	Slab preparation meets specification and ready for concrete contractor	
	Contractor notified ____/____/____ @ _____AM / PM	

What equipment may be used in a traffic control plan?

Stop/slow bats 	High visibility vests 	Radios 
Barricades 	Cones 	Bollards 

What signs may be used in a traffic control plan?

Speed limit signs 	Warning signs 
Arrow boards 	Portable traffic signals 

What kinds of information do you need before starting work?

- Plans – Drawings and sketches outlining what you need to do
- Specifications – rules and details about the job
- Operational details – how you will do the job
- Quality requirements of the job – the standards you are expected to meet.

When planning your job, why do you need to know what other people are doing on site?

- To make sure you will not get in the way of other jobs being done
- To make sure you know what others are doing near where you must work.

What are examples of documentation you should read before doing earthmoving work?

- WHS/OHS Act
- Regulations
- Codes of practice
- Australian Standards (AS 2958 Earthmoving machinery)
- Manufacturer's specifications
- Operator's manual for your machine
- Site requirements and procedures
- Company policies and procedures for Employment and workplace relations, Equal opportunity and disability.

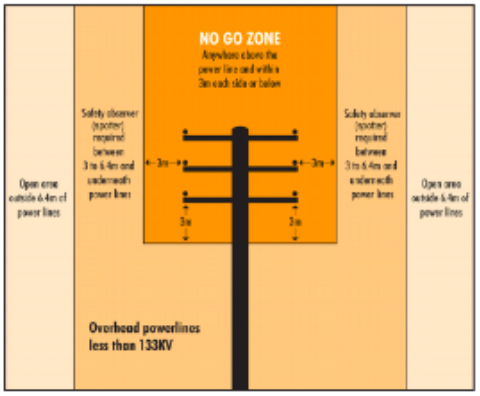
Why should you check the operator's manual before using earthmoving equipment?

The operator's manual tells you how to operate your machine. The manual also tells you about maintenance (how to keep your machine working well).

What do codes of practice explain?

Codes of practice are practical guidelines on how to comply or follow the rules in legislation/laws.
For example:
A traffic management code of practice will tell you all the rules a traffic controller must follow. For example, a traffic controller must have a zero percent blood/ alcohol concentration/ reading while performing traffic control duties.

What do Australian Standards explain?



Australian Standards are work guidelines that set the minimum accepted performance or quality for a specific hazard process or product.
For example:
A2250.1-2011 - Powerline distances
This standard tell you the distances you can safely work near powerlines on poles and towers.

2.1.2 Job Safety and Environment Analysis (JSEA) or Safe Work Method Statement (SWMS)

These forms help you plan for the work you will do. It is very important you fill these out before you start work. They help you work out the tools, equipment and PPE you need to do the job safely. All workplaces should have these types of forms.

Example:

Job safety and environment analysis (JSEA)/Safe work method statement (SWMS) 123456

1. ACTIVITY/TASK INFORMATION AND LOCATION	
Location/Project:	123 Belmaine Highway, Roseville
Activity or Task Description:	Load spoil from excavation right hand turn lane
Competency/Qualification needed to do work safely:	All operators have current tickets

2. HAZARD IDENTIFICATION

Location/Area Hazards		Rate	Work/Task Hazards		Rate	Work/Task Hazards		Rate
Area			**Visibility and hearing**			**Plant/machinery**		
Entry or exit is difficult			Poor lighting			Plant or Machinery	X	8
Engulfment/entrapment			Poor visibility			Tools/equipment		
Work at heights			Bright lights/UV			Traffic	X	8
Confined space			High noise levels	X	7	Pedestrians		
Remote location			Communication difficulties			Railway		
Rescue could be difficult			**Services**			Pneumatics		
Temperature extremes			Multiple electrical feeds			Process lines		
Hazardous/Toxic substances (attach MSDS)			Electrical hazards - LV			Suspended loads		
			Electrical hazards - HV			**Slips/trips/falls**		
Gasses/oxygen/chemicals			Overhead power	X	8	Slips/trip hazard		
Poisonous gas/es			UG services (gas, power, water)			Fall hazard		
Explosive/flamable gas			**Hazardous/toxic substances**			**Other**		
Oxygen levels (high or low)			Pressurised fluids			Sharp materials		
Inhalable dusts/fibres			Gas cylinders			Confined space		
Hazardous/toxic substances (attach MSDS)			Flammable materials			Work at heights		
			Toxic materials			Welding/Grinding		
Exposure			Acids/solvents			Manual handling		
Heat/Cold			Other chemicals			Using ladders		
Sunlight/ Radiation	X	4	Inhalable dusts/fibres			Using EWPs		

3. PPE		4. ACCESS/EQUIPMENT/ISOLATION		5. ENVIRONMENTAL		
Hands, feet and body		**Access equipment**		**Environmental Hazards**	✓×	**Rate**
Gloves: (type).....	X	Scaffold		Air pollution (dust, fumes)	X	5
Safety boots	X	Ladders		Noise (plant and equipment)	X	5
Long sleeves/pants	X	EWP		Spills to drains/waterways		
High visibility vest/clothing	X			Spills to ground	X	5
Head and face				Soil erosion		
Safety glasses/sun glasses	X	**Static plant/equipment:**		Hazard to flora/fauna		
Full face shield				Other:		
Hearing protection	X					
Hard hat	X	**Mobile plant/equipment:**				
Dust gas mask		*Excavators, Loaders, Trucks, Machine*	X			
Breathing apparatus			X			
Welding face shield		**Safety/emergency equipment:**				
Fall protection and access						
Safety harness						
Fall protection equipment						
Fall arrest equipment		**Isolation and warnings**				
Other:		Barricades	X			
		Group isolation				
		Personal locks or lock out tags				
		Warning signs	X			
		Area lighting				
		Other:				
		Traffic controllers	X			

Risk Rating Table: Use the following table to rate the risk.
- 1-2 = Low
- 3-4 = Medium
- 5-6 = High
- 7-8 = Extreme

Likelihood: (How likely is it to occur)	Consequences: Catastrophic	Major	Moderate	Minor
Almost Certain	8	7	6	5
Likely	7	6	5	4
Possible	6	5	4	3
Unlikely	5	4	3	2
Rare	4	3	2	1

6. PERMITS (Attach and record number)					
Hot work		Excavation	N/A	Hazardous work	
~~Access to work area~~		High voltage		Confined space	

Job safety and environment analysis (JSEA)/Safe work method statement (SWMS) 123456

7. JOB STEPS, HAZARDS AND CONTROLS

Step (No.)	Job Step (Describe each step)	Hazard/Environmental Issue	Risk Rating (Before control)	Control	Risk Rating (after control)
1	Set up traffic control	Traffic in busy intersection	8	Barriers and flag person supplied by ABC Traffic.	1
		Noise of traffic and plant	7	Hearing protection must be worn at all times.	1
		Sunlight	4	Long sleeve pants, tops, hard hats with visor and sunglasses.	1
2	Unload excavator from float	Excavator sliding on ramps	5	Pedestrian exclusion zones 1.5 x excav. height. Operator wear seat belt.	3
3	Excavate turn lane	Powerlines overhead	8	Power will be isolated. This must be confirmed before starting.	1
4	Load tip truck	Location of tip truck and drivers while loading.	8	Traffic controllers will direct drivers where to safely park. Drivers must remain in truck while being loaded.	1
5	Load excavator on float				
		Dust and noise	5	Noise restrictions limit work to between 6am-5pm. Water truck available to reduce dust if needed.	2
		Spills to ground	5	Pre-op checks on excavator before work. Spills kit on site if needed.	2

8. CONSULTATION AND WORKER OFF

By putting my signature below I confirm that I have attended a briefing and understand and will comply with all environmental and safety issues, as described in this JSEA/SWMS. I have reviewed and will comply with all necessary paperwork including permits, SDS, isolation plants etc.

Name	Signature	Date	Name	Signature	Date
Dick Osborne	Dick Osborne	2/4			
Paul Williams	Paul Williams	2/4			
Jason Tennant	Jason Tennant	2/4			
Amanda Jones	Amanda Jones	2/4			

9. FINAL APPROVAL/SIGN OFF

	Name	Signature	Date
Approved by:	Mark Alabaster	Mark Alabaster	2/4/
Approved by:	Duncan Morton	Duncan Morton	2/4/
Customer/Client	N/A		

What are the National Work Health (WHS) and Occupational Health and Safety (OHS) Acts about?

The Acts explain how to keep your workplace safe and healthy. They explain what you need to do to meet your duty of care.
For example:
You must make sure you do earthmoving work in a way that won't put yourself or others at risk. You must use earthmoving equipment according to instructions.

Note:
Check your state/territory requirements as Acts may vary.

Under WHS/OHS laws, what are your responsibilities while working?

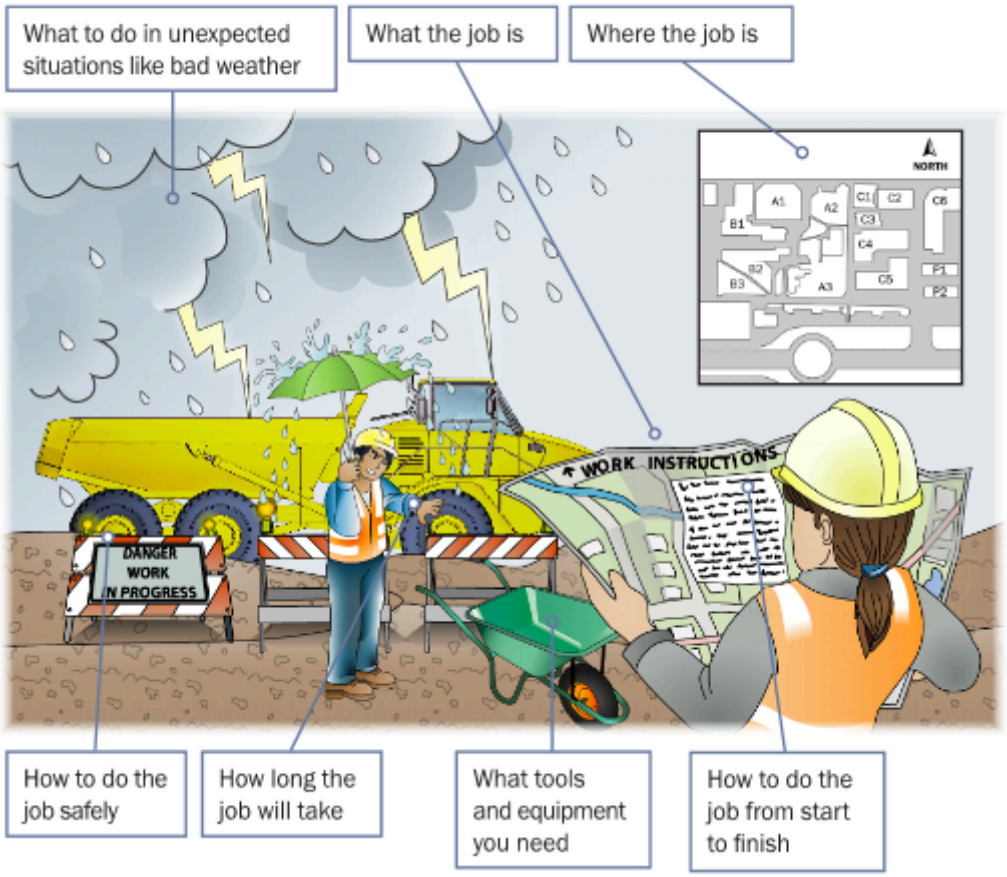
You must work in a way that is safe. You must not risk the health and safety of yourself or others.

2.1.3 Where to Find WHS Information

You can check these websites for more information about workplace health and safety. The National WHS Act started in some states/territories on January 1, 2012.

What do the job's work instructions explain?

Work instructions explain:

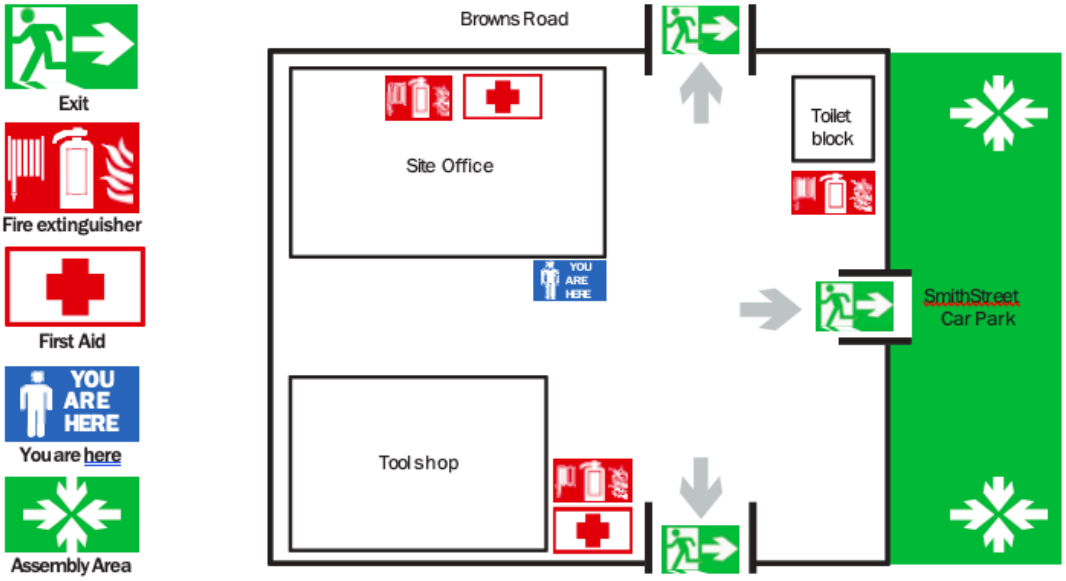


2.1.4 Safety Plan

The safety plan may tell you things like:

- How to use tools and equipment safely
- How hazards and risks need to be controlled
- Emergency procedures
- Emergency exits and assembly areas
- What PPE to wear
- Safe areas to park machinery.

2.1.21.1 Site Evacuation Plan (Example)



What does the safety plan tell you?

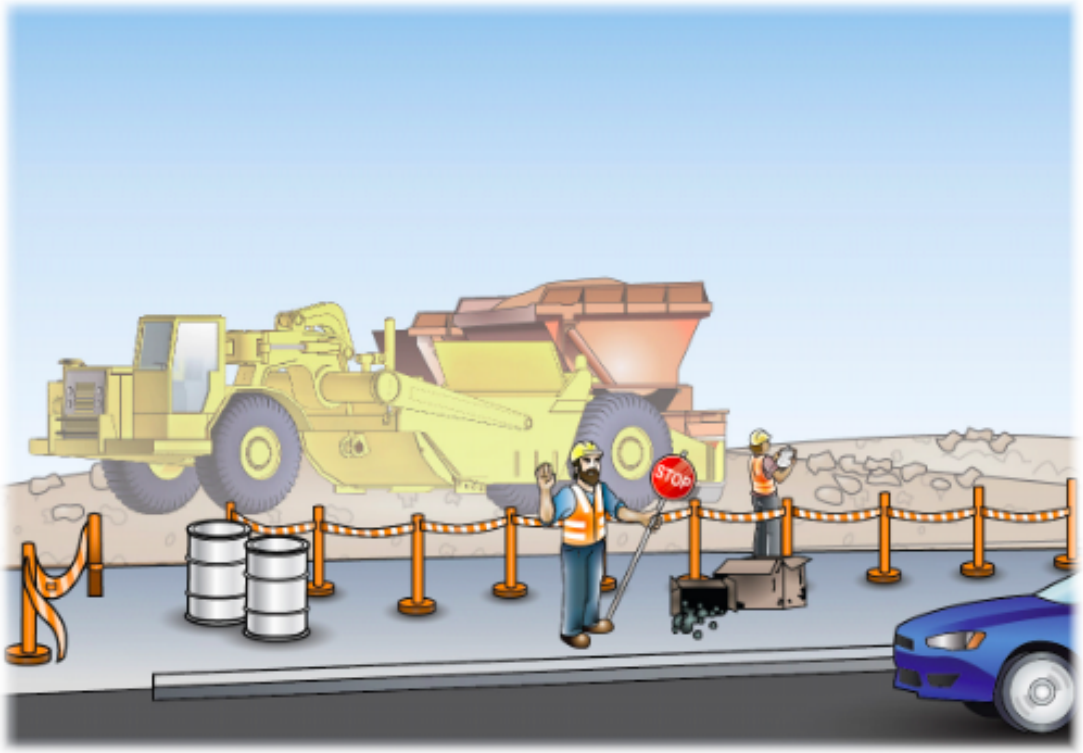
The safety plan tells you how the worksite intends to meet all the safety rules. It tells you:

What personal protective equipment (PPE) to wear

How to use tools, plant and equipment safely 	Emergency procedures and exits 
How to park safely and where to park 	How to control hazards and risks 

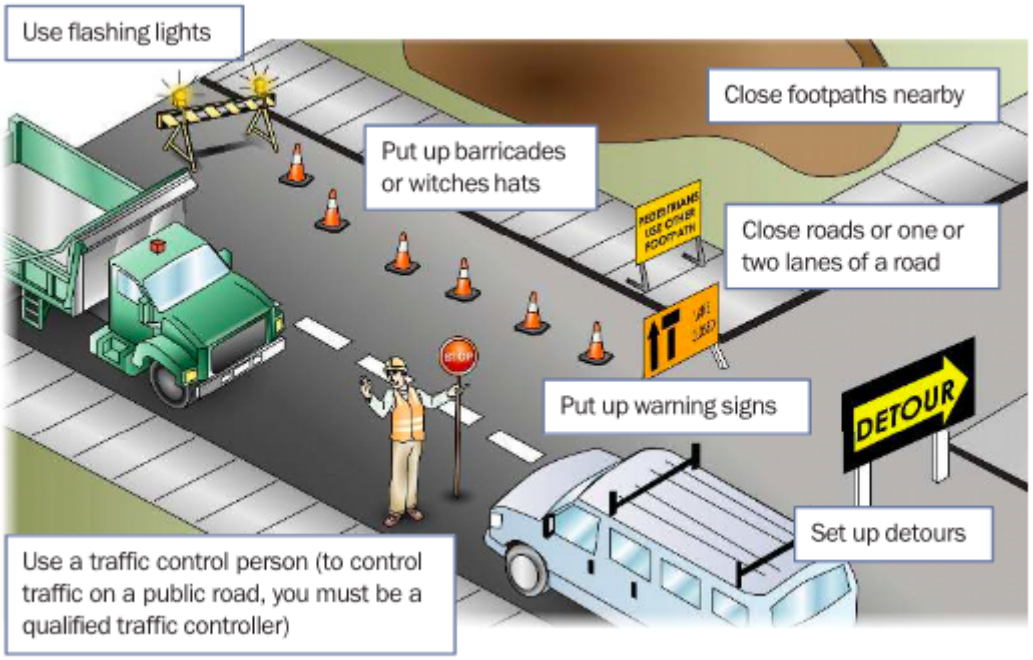
What does the traffic management plan (TMP) tell you?

It tells you how to control vehicles in and around the worksite. It helps keep the site safe for you and others. You may require a traffic control licence in your state or territory.



What can you do to control traffic in and around a worksite?

You can:



Where do you put up warning signs?

Near underground services 	Near dangerous places 
In places you need to control traffic 	On the site fencing 

2.1.5 Tools and Equipment

Here are some typical tools and equipment you might need. Remember, if your workplace has a policy about what PPE you need to use, you must use it.

Personal protective equipment (PPE)

- Steel cap boots
- High visibility safety vest
- Hearing protection
- Hard hat
- Goggles/glasses
- Gloves
- Dust mask

Hand tools

- Shovel and levels
- Socket sets
- Screwdrivers or wrenches
- Wire brush
- Spanners

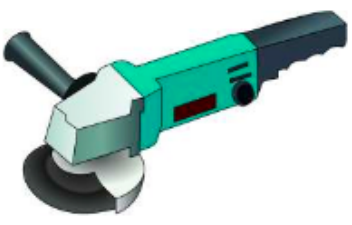
Maintenance equipment

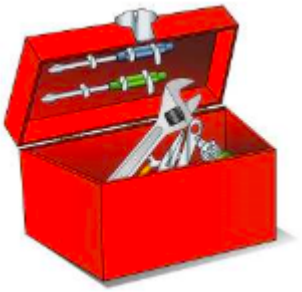
- Grease gun
- Tyre pressure gauge

Lifting equipment

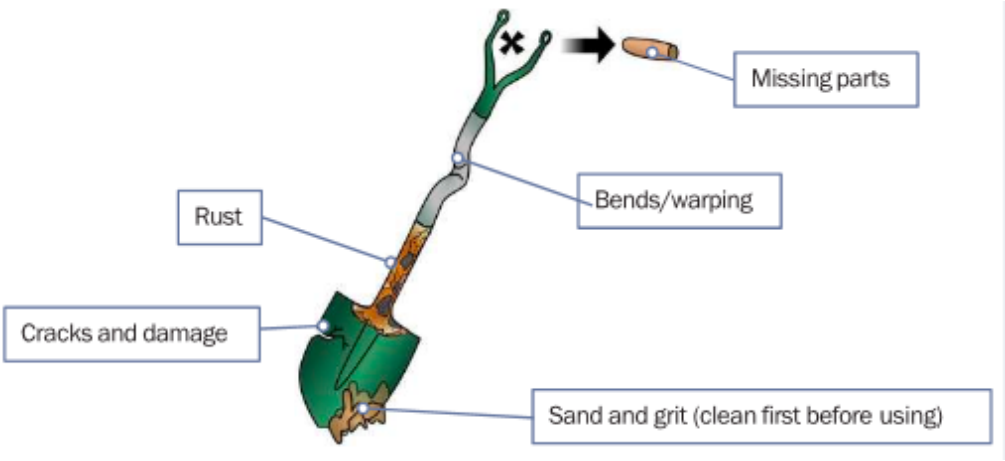
- Slings
- Chains
- Shackles

What kinds of tools and equipment might you use when doing earthmoving work?

Jack, chocks and stands. 	Crowbars 
Hand tools such as spanners, ratchets, wrenches, screwdrivers and hammers. 	Socket set 
Laser level 	Wire brush 
Welder 	Punch 
Grinder 	Oxy set 

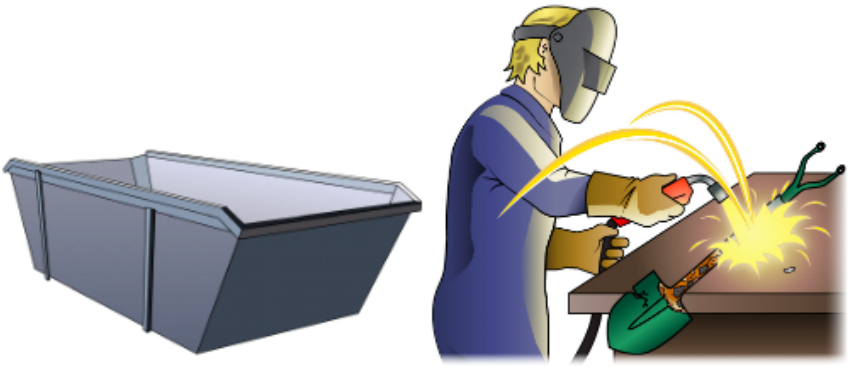
Portable lighting 	Grease gun 
	Other hand tools that come with the grader 

What kinds of faults do you check hand tools for?



What do you do with faulty hand tools?

If you can, arrange to have them repaired. If that is not possible, tag them as faulty, or put them in the rubbish.



2.1.6 First Aid and Emergencies

Employers should make sure there are trained first aiders and first aid kits available.
The employer should make sure:

- The first aid kits are checked, maintained and kept in a clean dry place.
- There are clear signs indicating the location of first aid kits.
- They have recorded and displayed the numbers and location for emergency services (or local doctors or hospitals).

2.1.6.1 Reporting Incidents

As a PCBU, employer or self-employed person you must report serious incidents to the SafeWork authority in your state. You must give a written report within 48 hours if any of the following happen on a site you are controlling:

A death 	An injury that requires medical treatment 	Exposure to a substance that requires treatment 	Other injuries or health issues caused from a workplace incident. 

The authorities may send an inspector to come and examine the site. You must leave the site as it is, unless you need to; protect people, help an injured worker, make the site safe, or stop other incidents happening. The inspector will tell you when you can continue working normally.

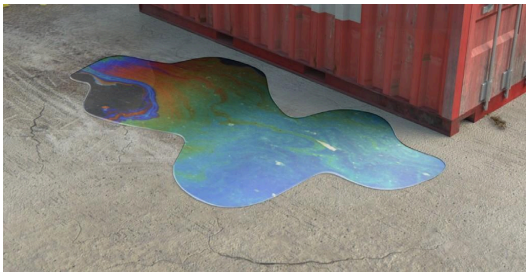
What equipment should be on site to deal with an emergency?

Telephone 	Fire extinguishers 
First aid kit 	Incident reporting forms 

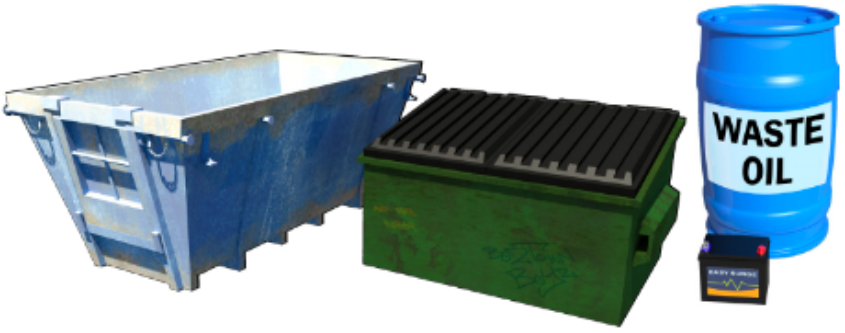
2.1.7 Environmental Management Plan (EMP)

The Environmental management plan (EMP) tells you important things about the environment at the worksite. It explains how the work you are doing could damage the environment. The possibility that you will cause this damage is called the environmental risk.

The EMP tells you what you must do so you do not damage the environment. It tells you how to work in a way that reduces damage to the environment.



The EMP also tells you how the worksite meets all environmental protection laws and what to do with waste.



2.1.7.1 Example of an Environmental Management Plan

Company Details:	EGA Earthworks – 19 Chandler Road, Boronia. Vic. 3155.		
Work description:	Soil removal		
Date	12/12/2015	**Contact**	Dick Osborne – 0455 555 555

Environmental concerns for the site	Risk Level	Risk likelihood	Protection measures
Excessive noise generation associated with the construction and operation of support infrastructure. Public nuisance /complaints.	Minor	Possible	Work on site to be carried out between 7:00am and 6:00pm.
Vegetation loss leading to increased runoff during wet periods.	Moderate	Almost certain	Use cut off drains to direct water away from area being worked on. Put silt cloth barrier on high side of trench. Put straw bales in trench to filter water.
Mud on surrounding roads near entry and exit points.	Moderate	Possible	Use rumble grids and wash wheels of vehicles leaving site.
Dust generation due to removal of top soil.	Moderate	Likely	Use water carts to keep soil moist.
Combustion products from exhaust pipes. Air emissions.	Moderate	Likely	Check that catalytic converters fitted to machinery.
Damage to remaining trees on site.	Moderate	Possible	Use temporary fencing and/or safety mesh to isolate trees from surrounding work.

Approved by:	TJ Crossbow	**Signed:**	TJ Crossbow

2.1.7.2 Working with an Environmental Management Plan

When preparing an Environmental management plan (EMP) there are three things you must decide:

1. How serious is the environmental risk?
2. How likely is it to happen?
3. How can you control the risk?

How can you control the environmental risk?
Here are some examples of environmental risks and the controls that could be used. They can be written into an environmental management plan.

Example 1

Risk : Soil and clay spread on residential streets.

Cause : Not cleaning wheels of vehicles leaving the worksite.

Control : Wash wheels or use rumble grids or put gravel at exit points.

Example 2

Risk : Noise.

Cause : Engine noise from heavy machinery.

Control : Work on site to be carried out between 7 am and 6 pm.

Example 3

Risk : Loss of topsoil.

Cause : Driving across a paddock or over vegetation.

Control : Go around the paddock even if it increases the time the job takes.

2.1.8 Disposing of Environmentally Sensitive Fluid

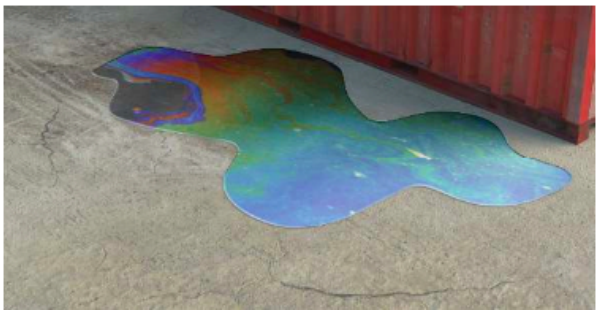
There are times when you will need to dispose of environmentally sensitive fluids. You may have to deal with oil spills or chemical spills.

There are disposal companies who remove used oil, oily water and emulsions, waste grease, filters, rags, brake fluids and coolants.

Oil is a good example of an environmentally sensitive substance that needs to be disposed of properly.

The damage oil and chemicals can do

If oil ends up in landfill, it will slowly leach into surrounding land and underground water.
Storm water and sewage, polluted by oil, can cause long term damage to coastal and marine habitats and ecosystems, seabirds, mammals, fisheries and people.



How serious is the environmental risk?

You can use the following table to rate how serious the environmental risks are.

Level	Rating	Examples of impact on the environment
1	Catastrophic	Death, injury or illness to humans or animals. Destruction of a heritage site. Toxic release into waterway and groundwater.
2	Major	Release leading to measurable change to storm water quality. Soil contamination over a wide area. Damage to a heritage site.
3	Moderate	Short term minor change to ecosystems. On site release that is contained with little contamination. Localised, short-term change in storm water quality.
4	Minor	On-site release immediately contained. Isolated complaints from the community.
5	Insignificant	Impact on the environment is too small to measure.

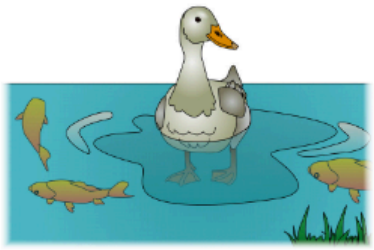
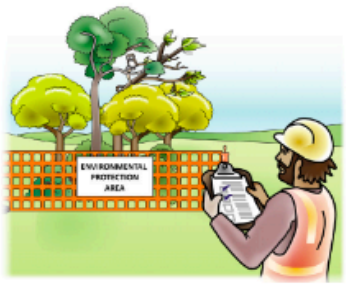
How likely Is the environmental risk?

You can use the following table to rate how likely it is that an environmental incident may happen.

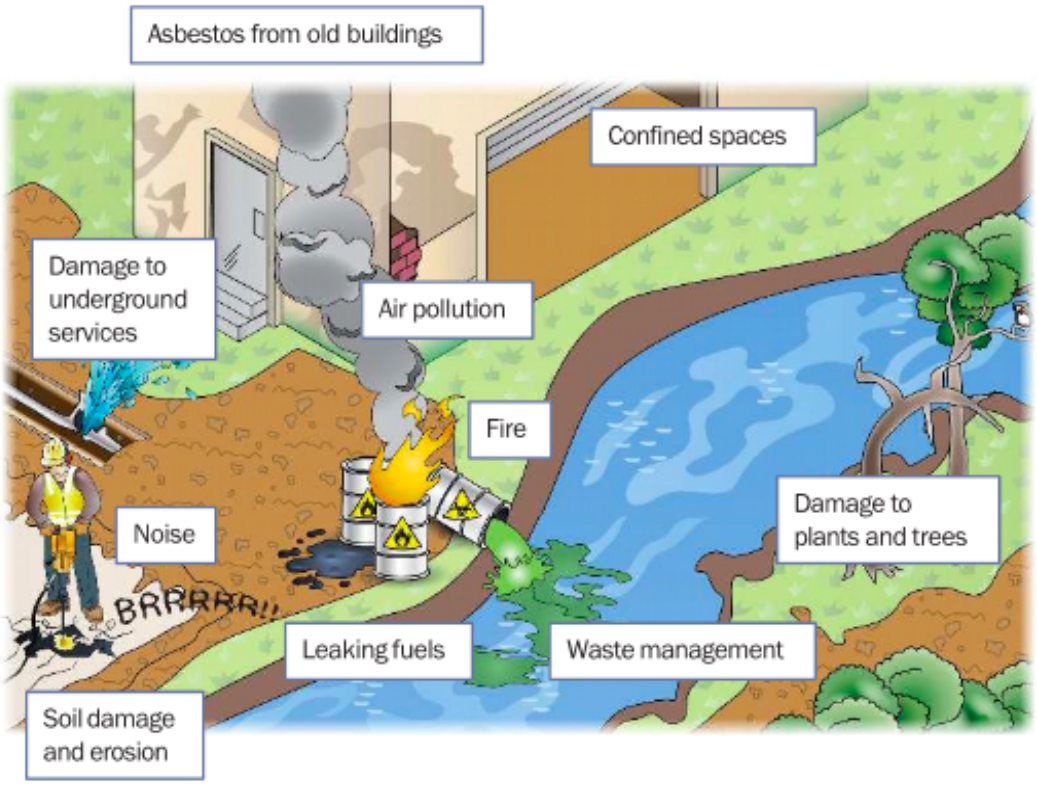
Level	Rating	Examples of impact on the environment
A	Almost certain	Environmental concerns that you expect will happen.
B	Likely	Environmental problem that has happened in the past and is likely to happen again.
C	Possible	Environmental concern that has sometimes been a concern and may happen.
D	Unlikely	Environmental concern that has sometimes been a concern but is not expected to happen.
E	Rare	Environmental issues that are very unlikely to happen.

What does the environmental management plan (EMP) tell you?

The EMP tells you:

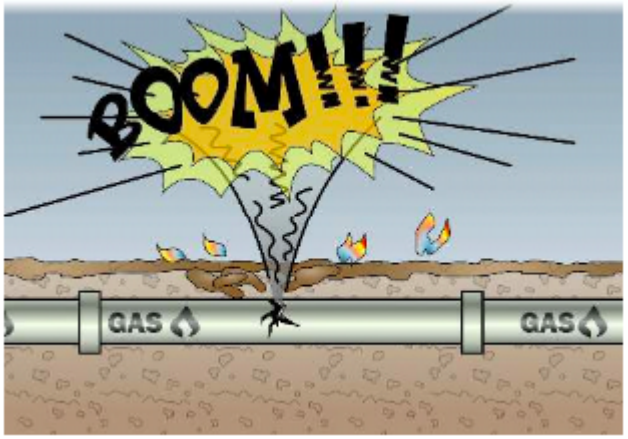
Possible risks to the environment on the worksite 	How to work in a way that reduces damage to the environment 
How the worksite meets all environmental protection laws 	Who is responsible for each part of the environmental management plan (EMP) 

What environmental challenges should you be careful of when working?



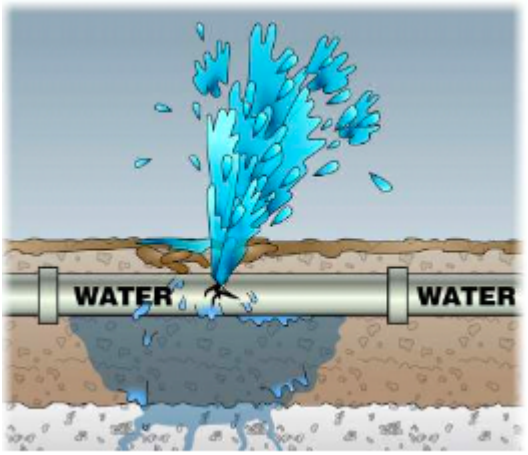
What could happen if you damage an underground gas line?

You could cause a gas leak, and maybe an explosion.



What could happen if you damage an underground water pipe?

You could cause a water leak, and the water could be polluted.
Surrounding soil can be eroded causing a cavity which could collapse either immediately or in the future.

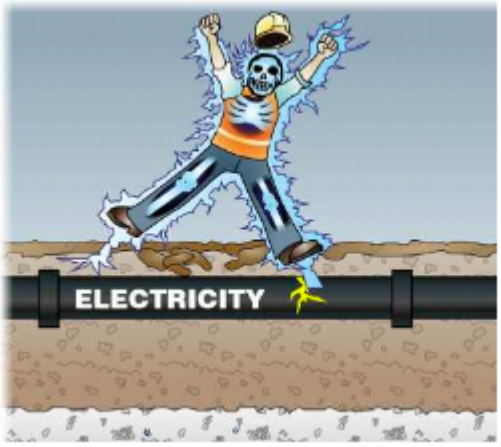


Why should you check the noise laws for your state/territory before starting work?

Because there are rules about how early or late you can work.

What is the danger if you damage an underground electrical cable?

There is a risk of an electric shock.



Who do you talk to if you damage an underground cable, gas line or other service?

You must tell your supervisor. Your supervisor will tell the relevant authority.

What is the aim of a traffic control plan?

The aim of a traffic control plan is to maintain a safe flow of traffic around the work area.

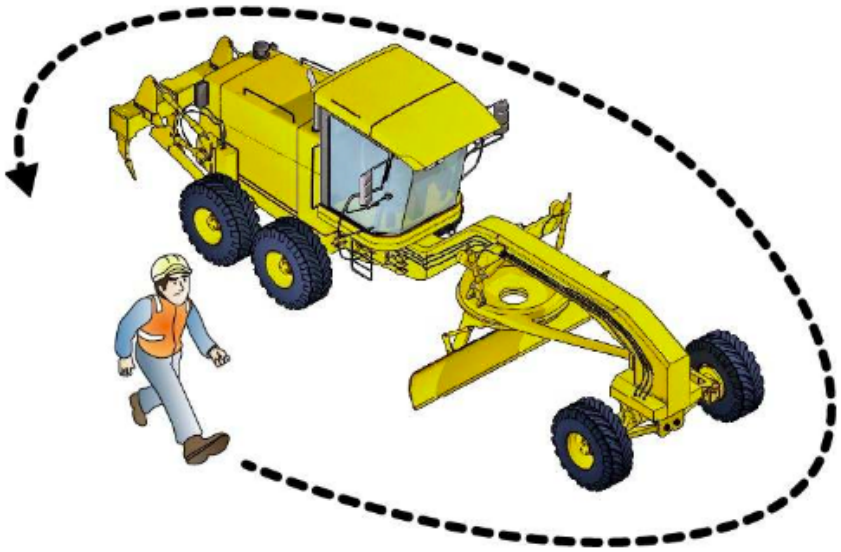
What kinds of PPE might you wear when using a scraper?

Hard hat 	Ear muffs 	Safety glasses/ goggles 	Sunscreen 
Gloves 	Safety vest 		Boots that cover the whole foot 

2.2 Operate Scraper

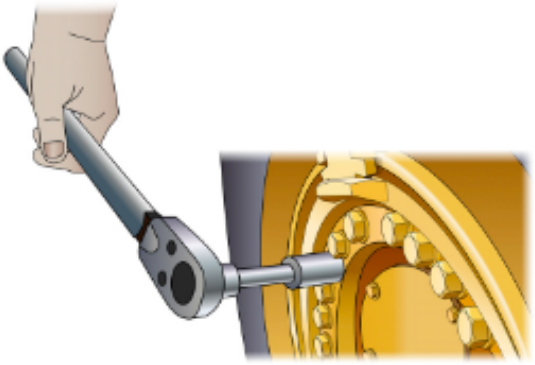
What is the first check you do on the machine?

Walk around it and check for obvious problems you can easily see.



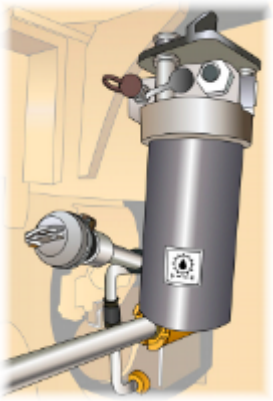
What are some pre-operational checks you do before using the grader?

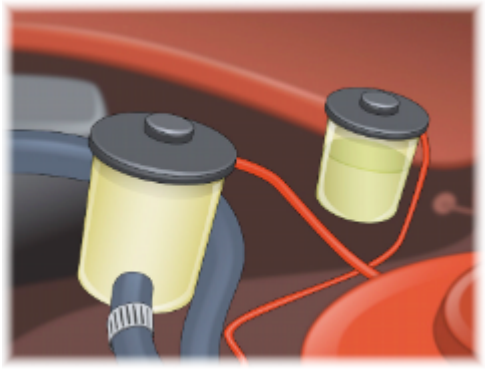
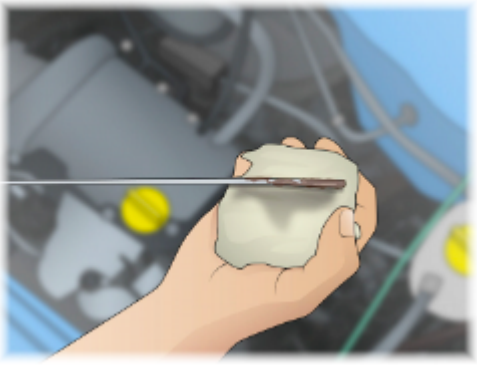
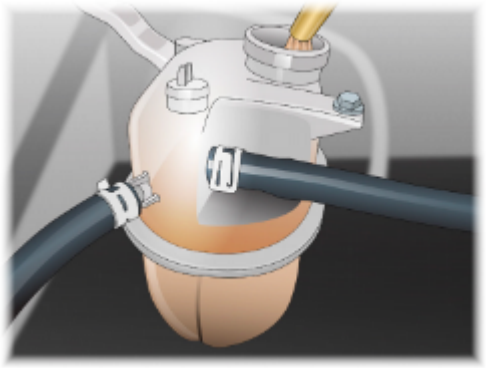
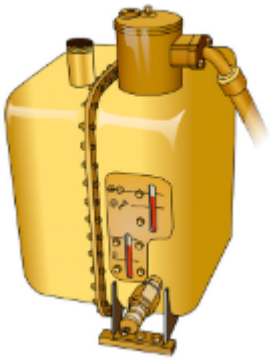
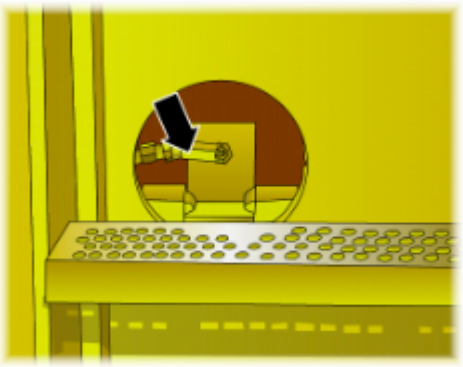
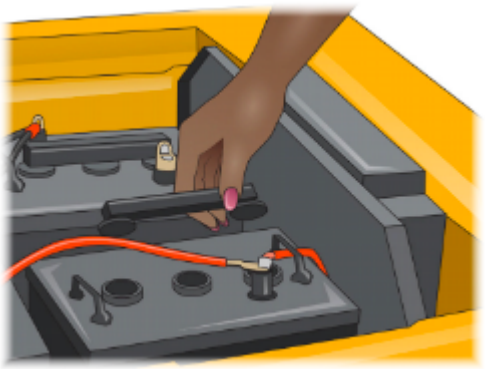
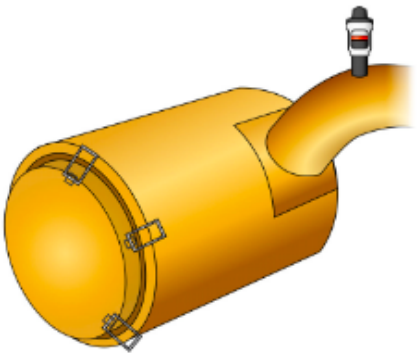
Tyre condition, tyre pressure and wheel nuts



Look for leaks under the machine

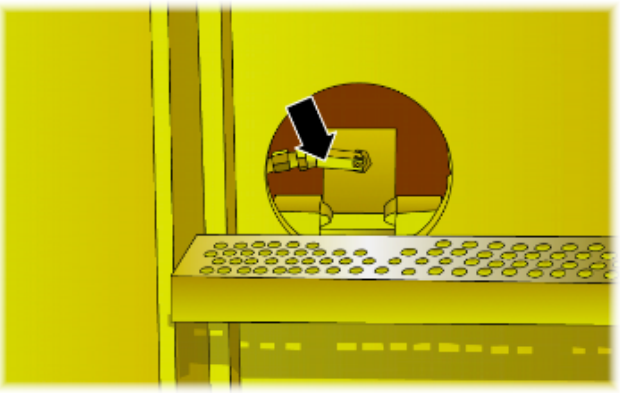
Check transmission oil



Check hydraulic fluid (brakes and clutch) 	Check engine oil 
Check engine coolant 	Check the fuel gauge to make sure the scraper has enough fuel 
Check power steering fluid 	Check the air tank (if fitted) and drain condensation 
Check battery water level 	Check air filter restriction 

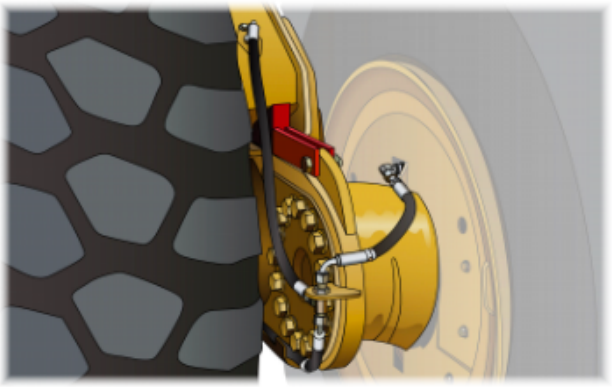
If your scraper has an air system, what do you do every day to get rid of condensation from the air tank?

Drain the water from the tank.

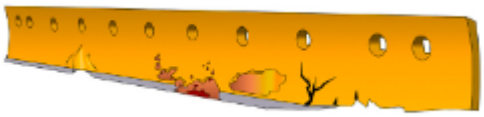
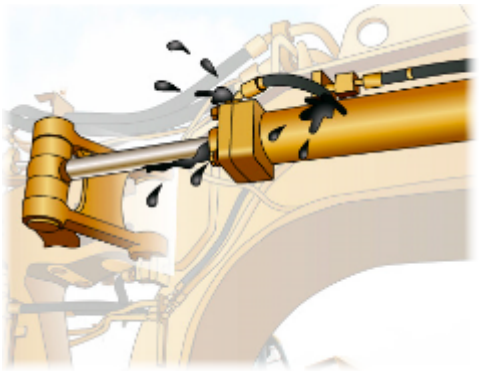
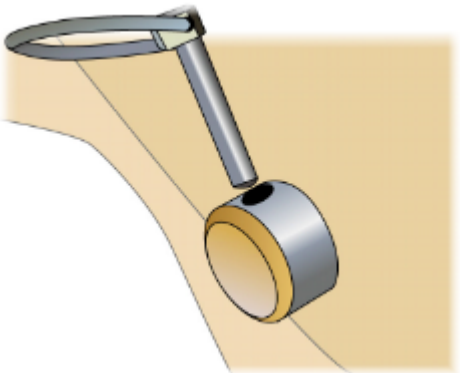


You are checking the tyres and the wear is uneven. What might the problem be?

The scraper might have a bent axle or loose wheel bearings.



What attachment checks do you do?

Check for wear 	Check for blocked grease nipples 
Check for oil leaks from hoses, fittings and hydraulic rams 	Check for missing pins and keepers 

You take out the oil dipstick and the oil looks milky. What does this mean?

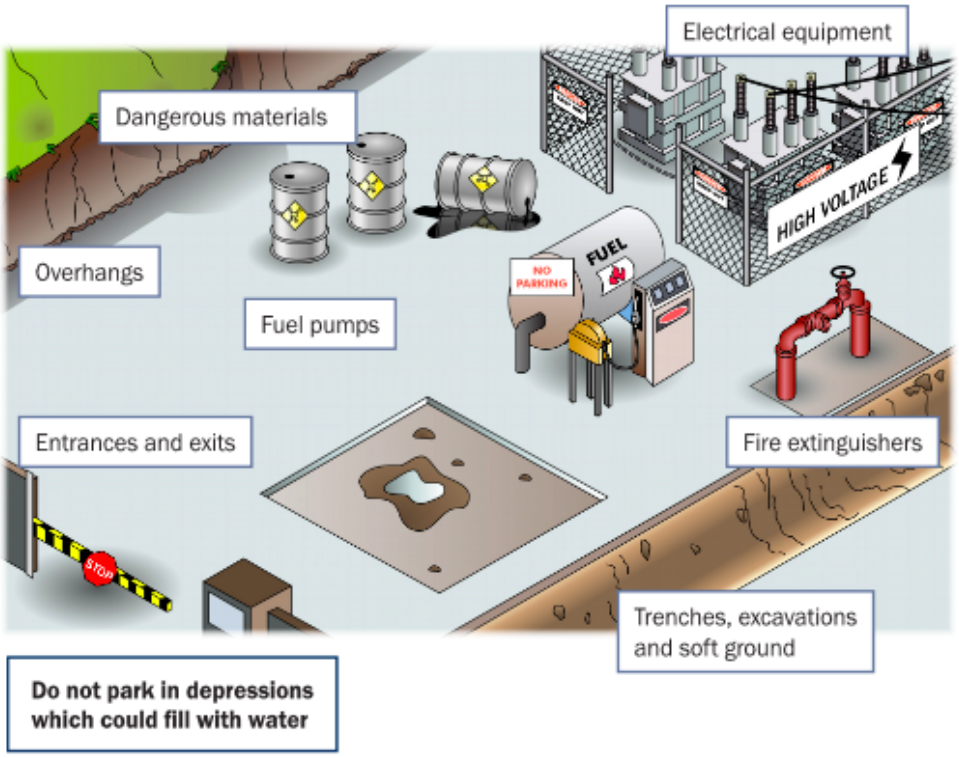
There may be water leaking into the sump and mixing with the engine oil.

If your machine has air brakes, what should you do if the brake pressure gauge isn't working?

1. Stop and shut down the machine. 	2. Tag out the machine. 
3. Record the fault in the logbook. 	4. Report to your supervisor. 

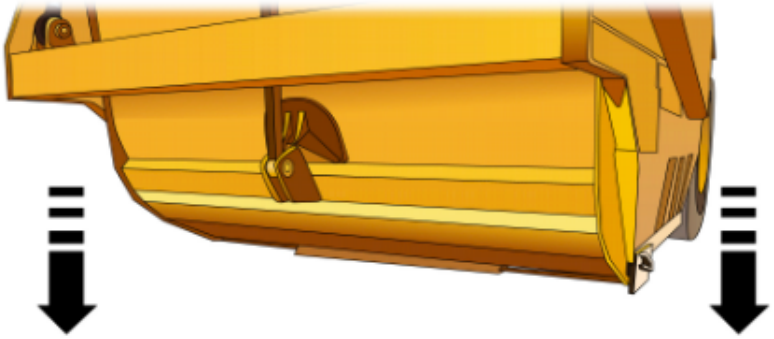
Where should you park the scraper?

Always park on firm, level ground and away from hazards. Do not park near:



What do you do with the bowl before shutting down the scraper?

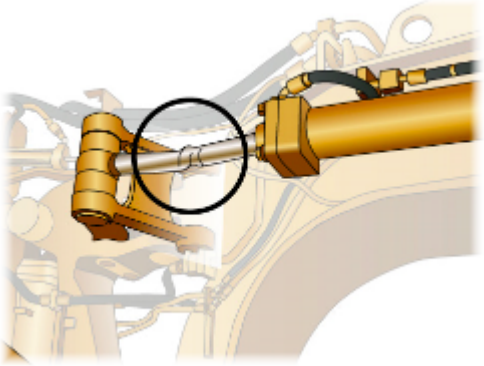
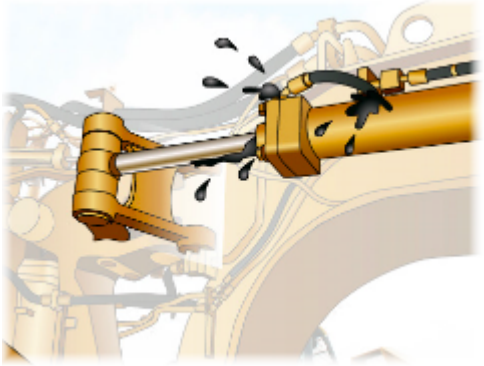
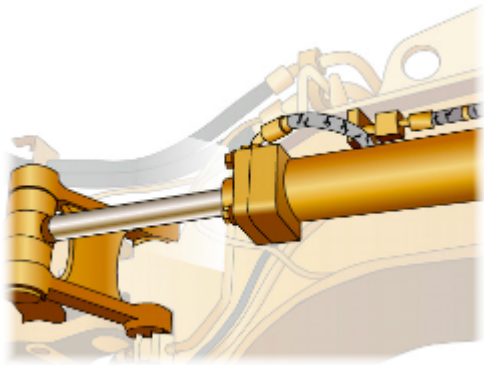
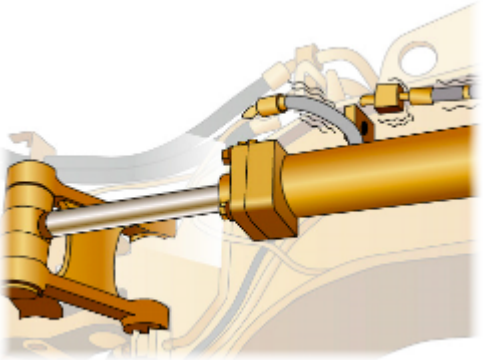
Lower the bowl and release the pressure in the hydraulic lines.



How do you shut down the scraper?

1. Make sure the park brake is on. 	2. Make sure the control levers are in neutral position. 	3. Turn off the ignition and remove the key. 

What problems do you check the hydraulic system for?

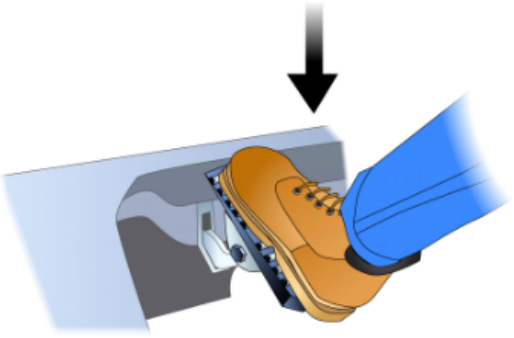
Damaged or bent hydraulic rams 	Leaks 
Cracked or split hydraulic hoses 	Loose connections 

What must you do if you find any fault with the scraper?

1. Tag out the equipment and DO NOT USE IT. 	2. Record the problem in the logbook.  3. Report the problem to a supervisor. 

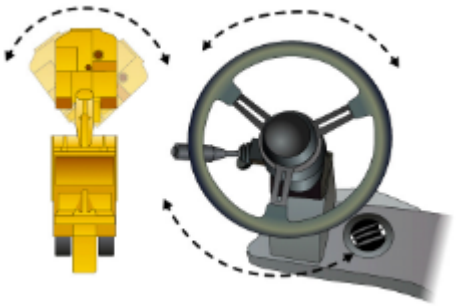
What kinds of tests should you do before using the scraper?

Test brakes



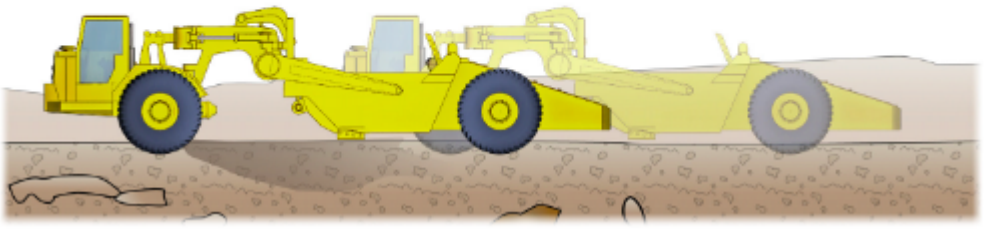
Test controls

Test steering



Test attachment movements

Drive the scraper a short distance to test its functions



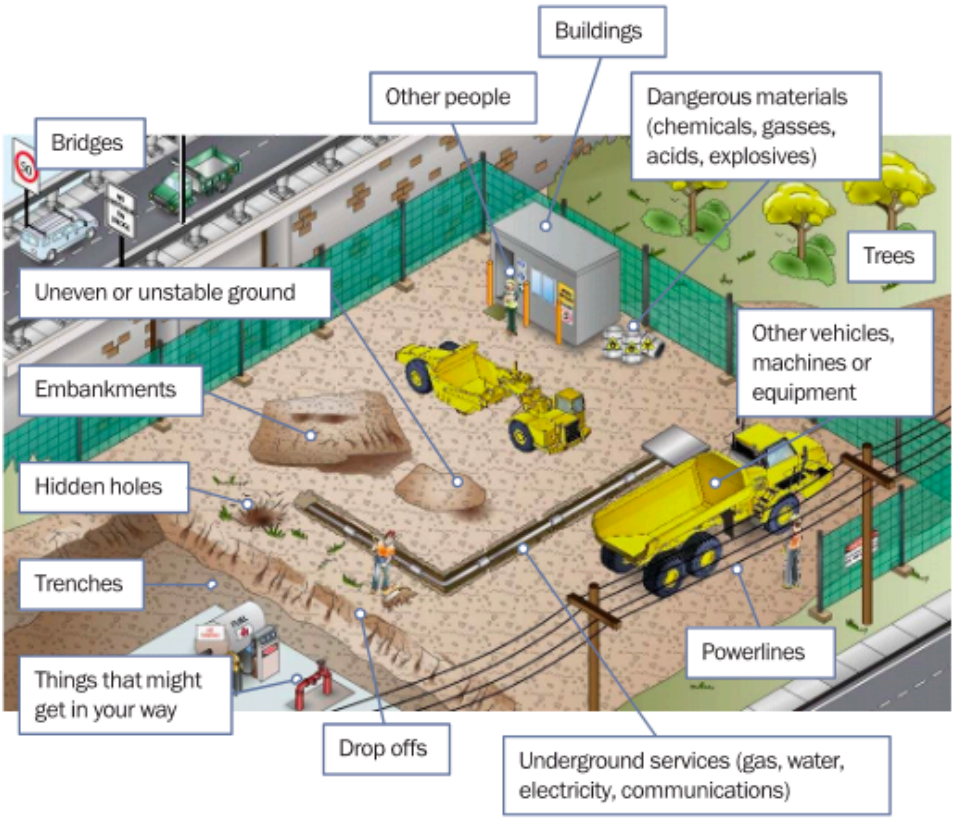
What must you do if you see a warning light or hear an alarm?

1. Stop and shut down the machine. 	2. Tag out the machine. 
3. Record the fault in the logbook. 	5. Report to your supervisor. 

A monitoring system on the machine shows a fault code or indicates a problem. What should you do?

Stop the machine 	Check gauges and displays for any changes in readings 	Idle the engine 
Write down any error code 	Check the operator's manual for error codes and faults 	Follow instructions in the manual 

What are some hazards you must look for before starting work?



The hierarchy of hazard control is a list of controls you can use to lower the danger from a hazard on the worksite. What are the six (6) levels in the hierarchy of hazard control from the first choice to the last choice?

1. **Elimination:** If possible, remove (take away) the hazard.
2. **Substitution:** Use a safer method if you can't remove the hazard.
3. **Isolation:** Stop access to the hazardous (dangerous) area.

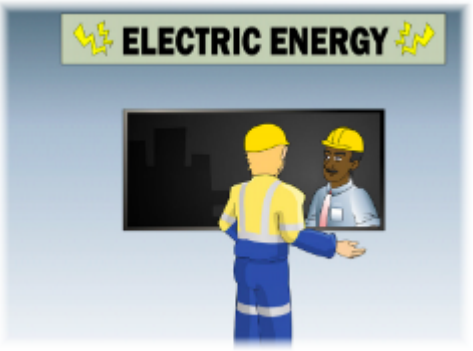
4. **Engineering Control Measures:** Change the tools, equipment or environment to make it safer.
5. **Administrative Practices:** Reduce the time the worker is exposed to the hazards by using training, job rotation, the timing of jobs, etc.
6. **Personal Protective Equipment (PPE):** Use PPE as your **last line** of defence.

Memory aid: Every **S**aturday **I E**at **A P**ie

2.2.1 How to Remember the Hierarchy of Hazard Control

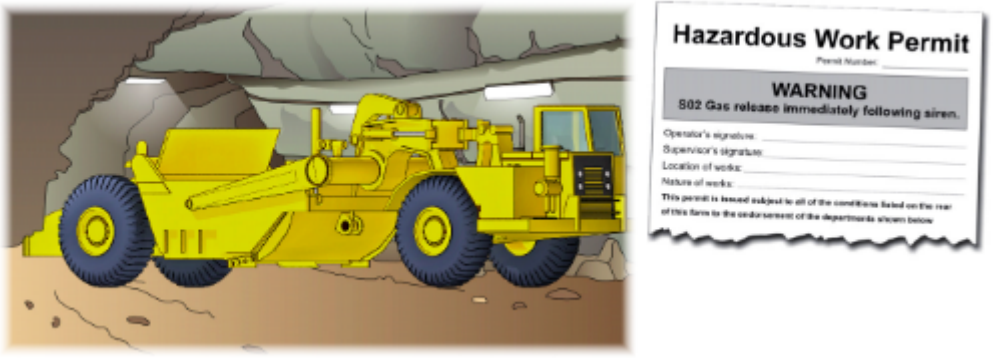
You can use the following acronym (an abbreviation formed from the initial components in a phrase) to help you remember the steps in the hierarchy of hazard control.

Who can you ask about underground services on the worksite?

Ask your site supervisor 	Call 'Dial Before You Dig' on 1100 as a guide to services location only. Ask a specialist consultant to check the site. 
Check the council maps for the site 	Ask the local supply authority (for example, the electricity, gas or water company). 

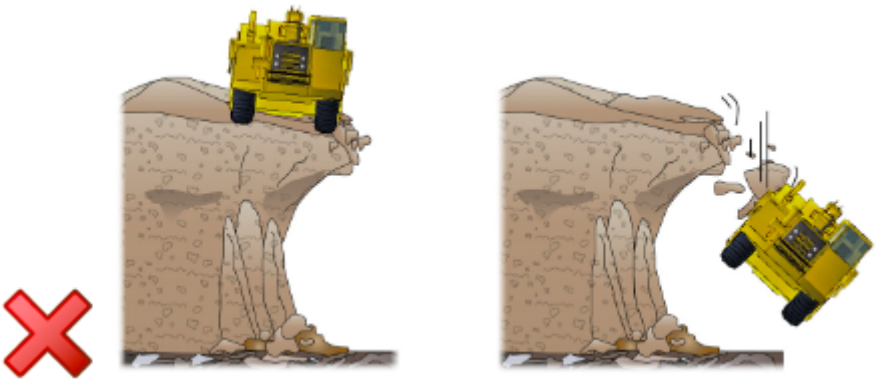
You will work in a hazardous area, for example, a confined space. What type of permit might you need to get?

You may need to get a hazardous work permit.



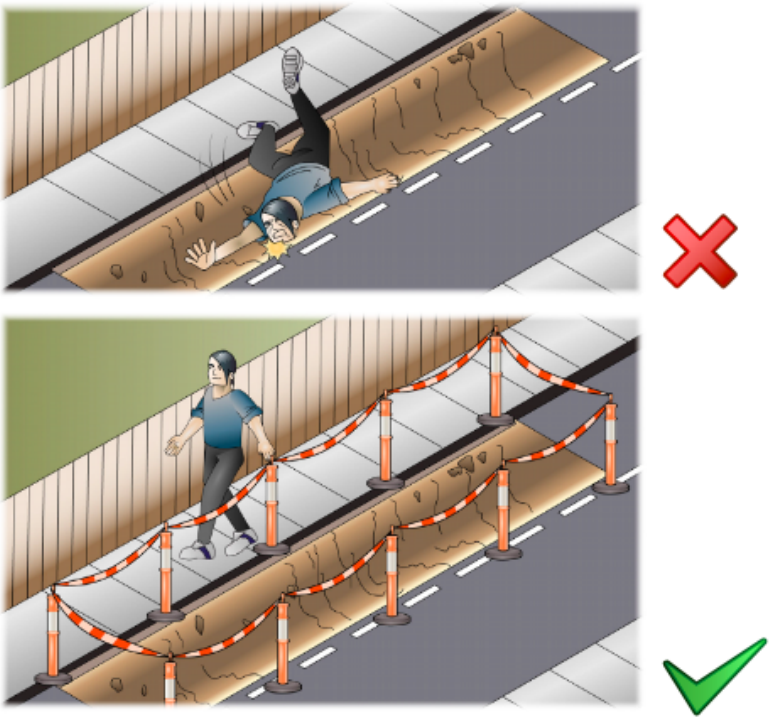
What is the danger of driving next to a trench?

The scraper might tip over and fall into the trench, or the edge of the trench might cave in.



There is a trench near a pedestrian footpath. How can you stop people falling into the trench?

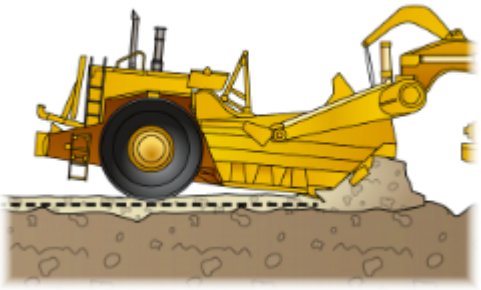
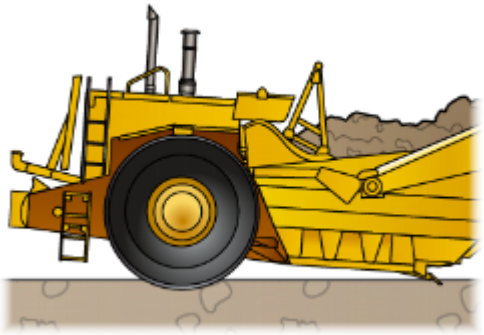
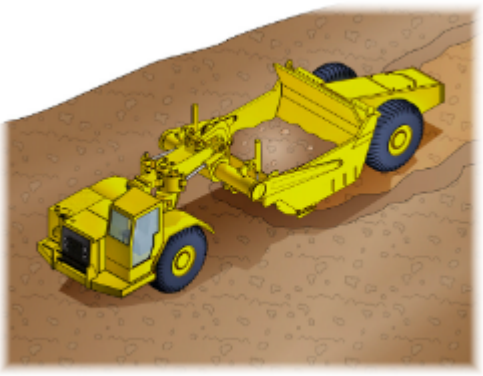
Put up barricades, guard rails or fencing. Use signs to warn people of the danger.



What is the danger of working when it is dark or difficult to see?

It's harder to see hazards. In the dark it is harder to tell distances.

What are some jobs you can do with a scraper?

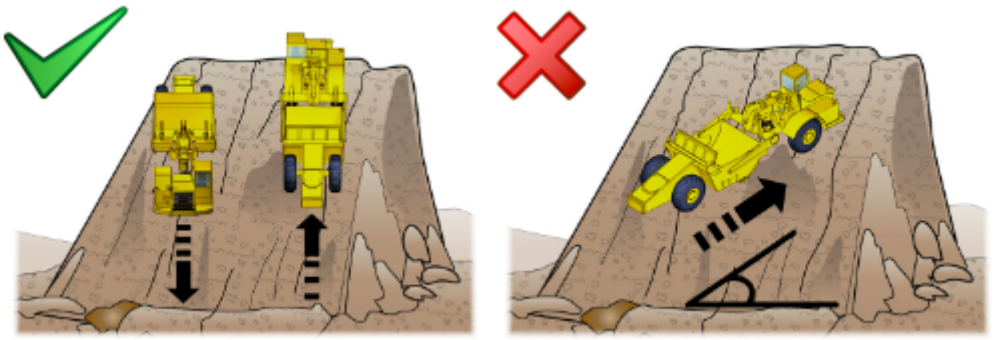
Load soil 	Level a surface 
Haul soil 	Spread soil 

How do you safely get in and out of the scraper's cabin?

Always use 3 points of contact facing the machine. For example, use two hands and one foot or two feet and one hand.

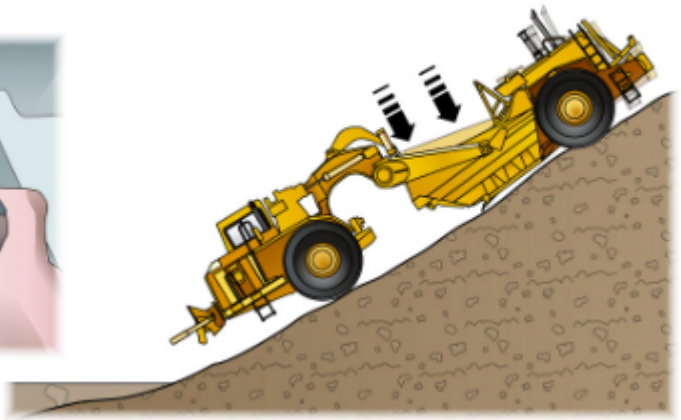
Which is the safest way to travel down on a slope?

Travel directly down the slope, not at an angle.



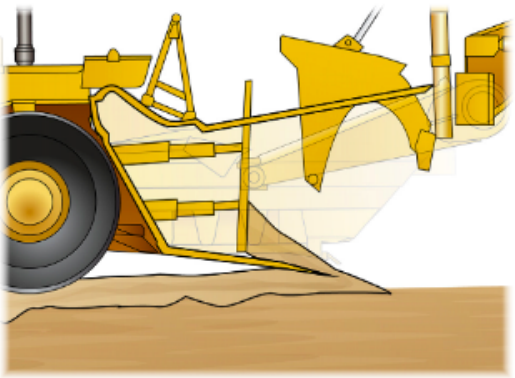
Which gear do you choose to go up or down a steep slope?

Use the lowest gear possible and keep the bowl low to the ground.



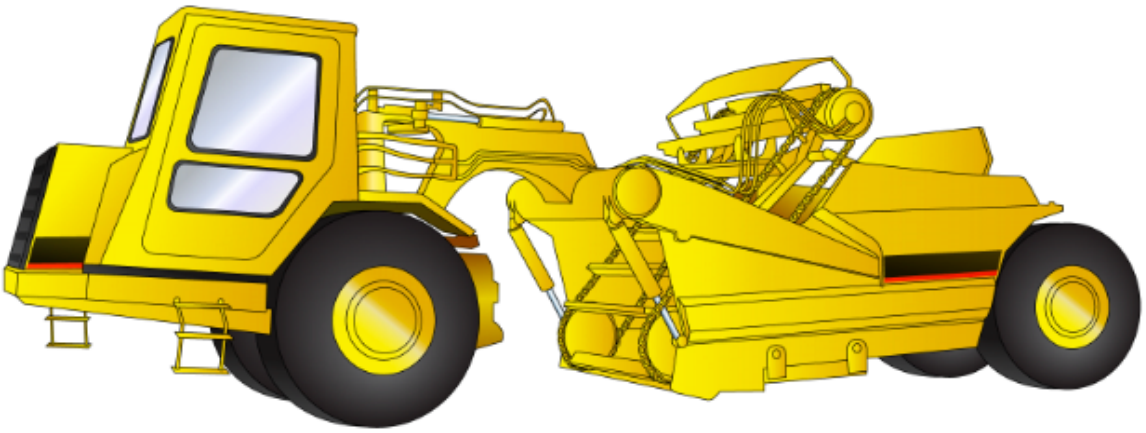
What does the ejector on the bowl do?

The ejector pushes the soil from the bowl through the open apron.



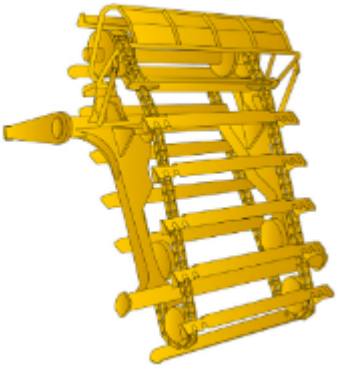
2.2.2 Elevating or Self Loading Scraper

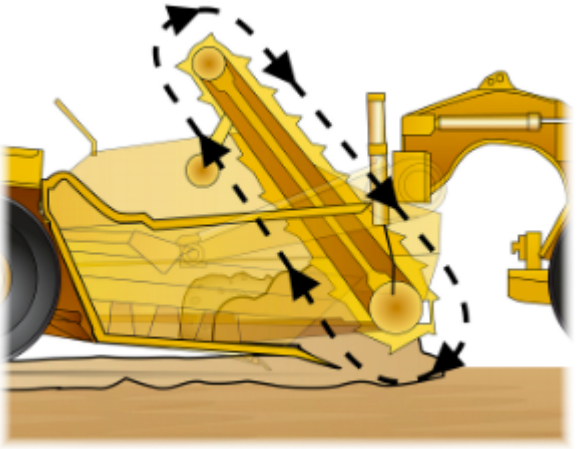
These machines are sometimes referred to as Hancock scrapers.
These machines have no apron, instead they include a hydraulically or electrically driven elevator made of two chains equipped with a series of crossbars.
The purpose of the elevator is to load material into the scraper's bowl. The elevator lifts the material away from the cutting edge and into the bowl. This greatly reduces the power needed to force the material into the bowl.
Dumping material is achieved by sliding the floor of the bowl backwards. The elevator can be reversed in order to assist in dumping the load evenly.



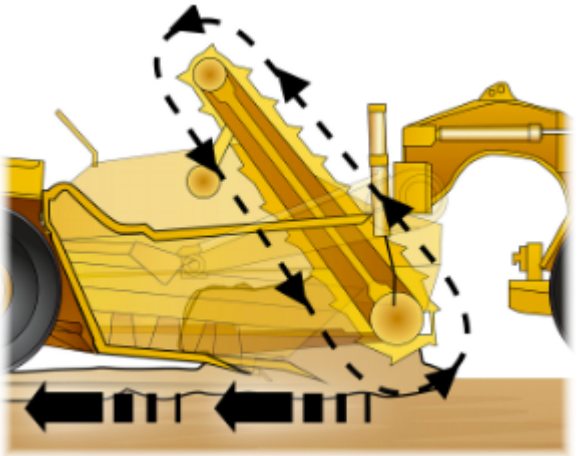
How does a scraper with an elevator move material?

The elevator brings the material that has been cut by the blade into the bowl.



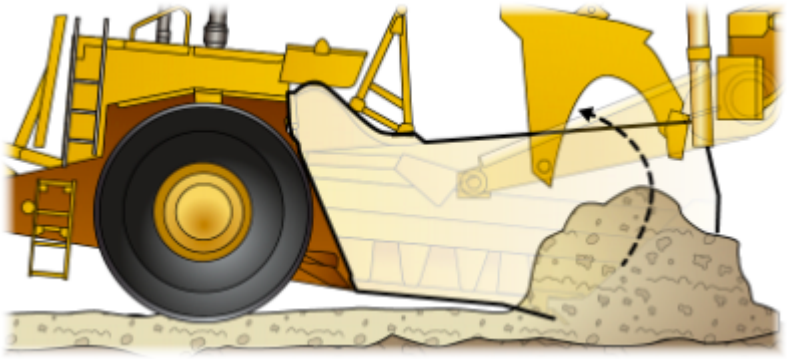


To unload soil, the floor slides backwards, the elevator is switched to reverse and the ejector pushes material forwards.



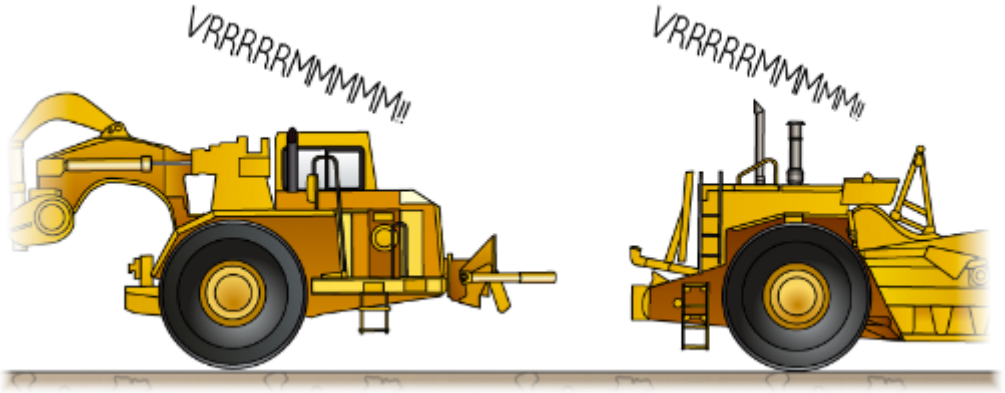
What does the scraper bowl's apron do?

The apron holds the soil in the bowl after the blade cuts it.



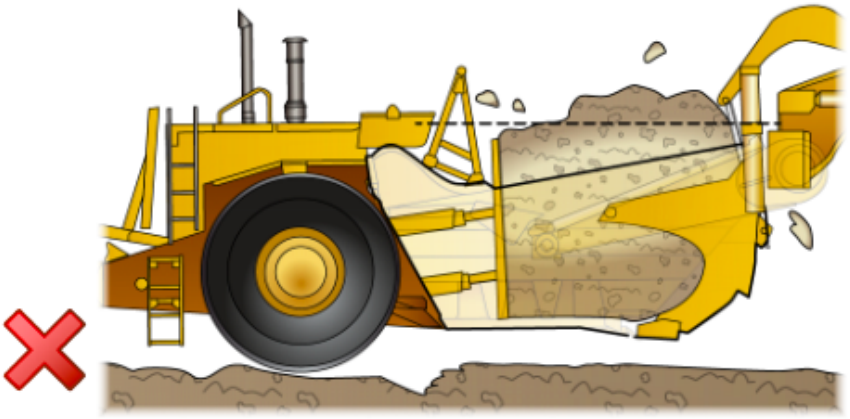
Which engine do you start first on a scraper with two engines?

Start the tractor engine first.



When shouldn't you use the ejector?

Don't use the ejector when the bowl is full or the apron is closed.

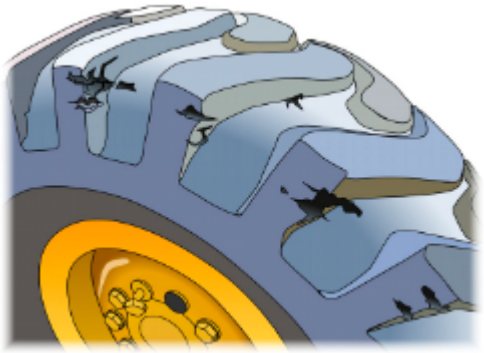


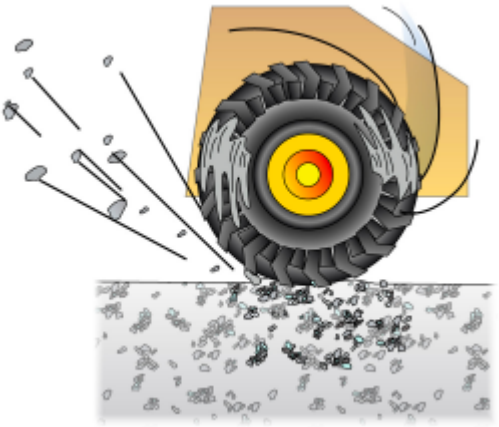
What extra brake does a scraper have?

The emergency or parking brake.

What is the risk when the tyres are slipping on shale or rock?

The tyres could be damaged, or the tyre tread could wear faster.





Where can you find out the specifications and limits of the scraper?

From your employer and the operator's manual.

You are using the scraper and a hydraulic hose starts to squirt fluid. What do you do?

1. Stop and remove the key.

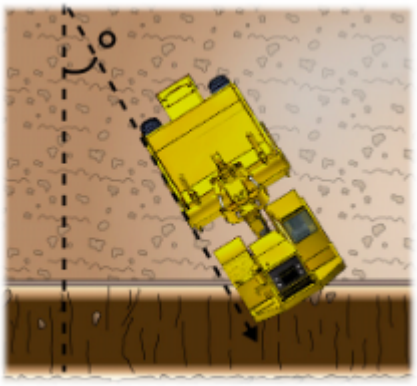
2. Tag out the machine.

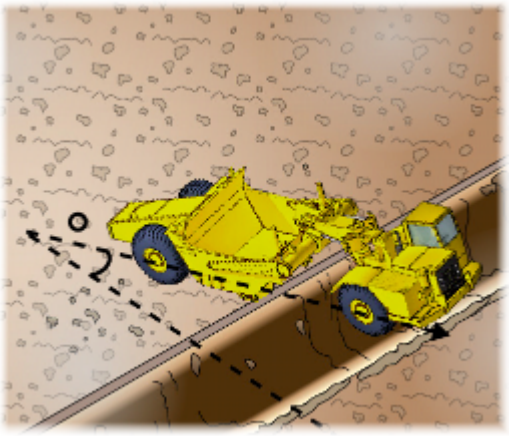
3. Record the fault in the logbook or daily inspection checklist.

4. Report to your supervisor. Have the hose replaced.

How do you safely cross a ditch?

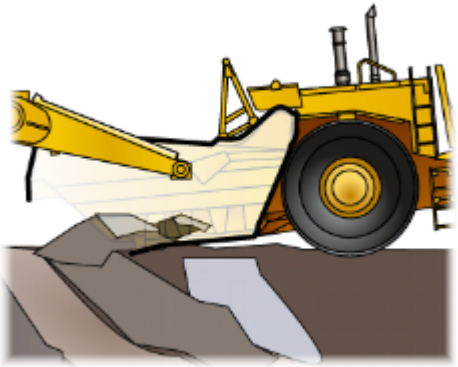
Cross the ditch at an angle and go slowly.

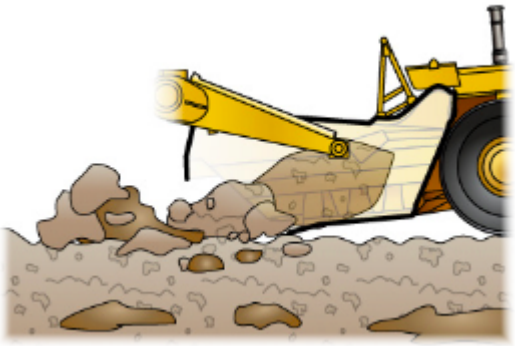




Which is harder to excavate and load, top soil or clay? Why is this?

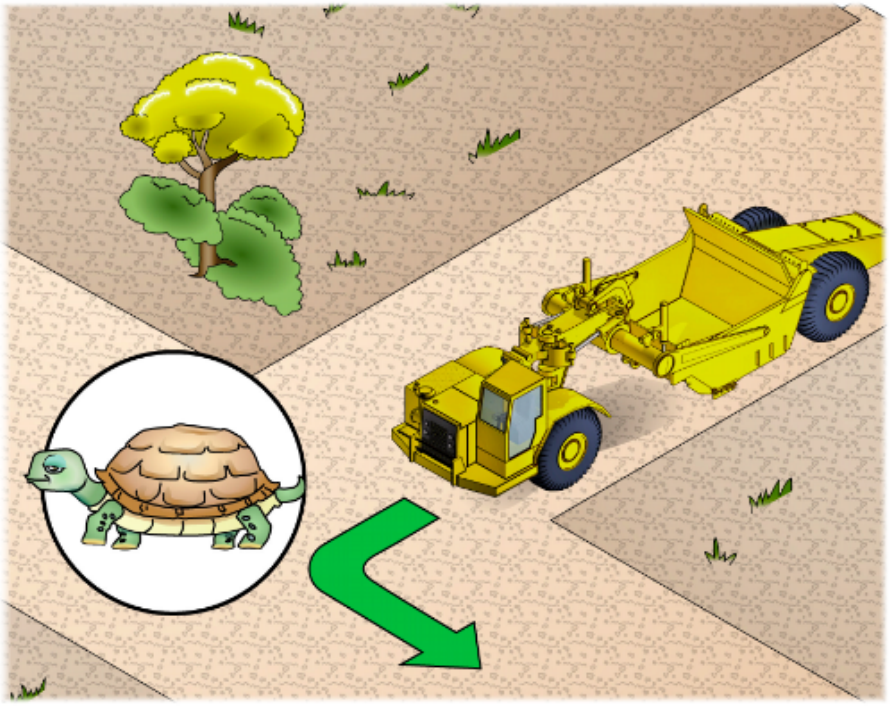
Clay. Clay is denser and does not break up as easily as top soil.





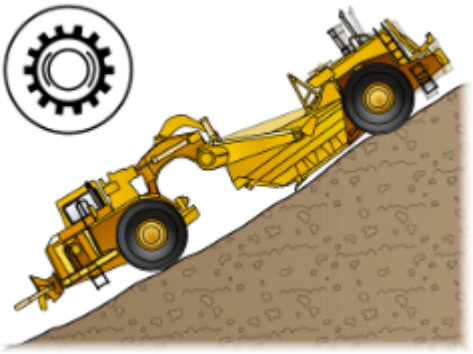
How do you safely turn a corner?

Slow right down to a safe speed.



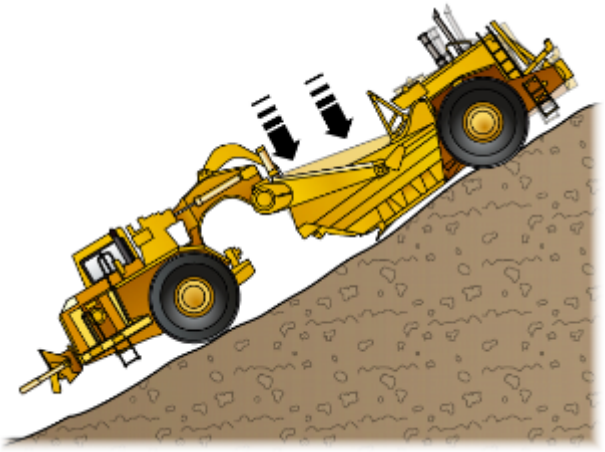
What do you use the retarder for?

The retarder helps control the speed of the scraper when you're on a slope. You should use it instead of the service brake.



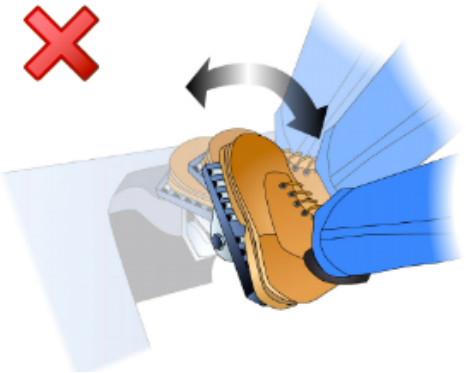
How do you travel down a steep slope safely?

Slow down using the service brake or retarder.
Choose the right gear for the slope. Travel slowly down the slope.



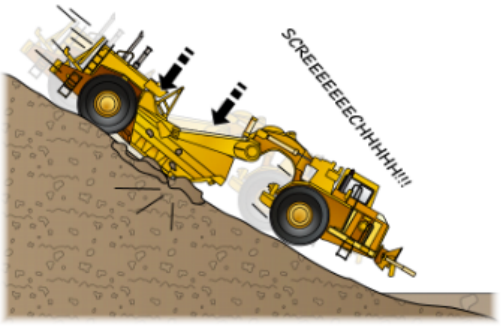
Why should you firmly press the brake pedal instead of fanning the pedal?

On a machine with air brakes, fanning the brake pedal might use up the brake air pressure too quickly.
Avoid fanning the brake pedal.



You're going down a slope and the brakes and retarder fail. How can you stop the scraper?

Lower the bowl and put the blade into the ground.



2.2.3 Table of Weight of Common Materials

1000 kilograms = 1 tonne

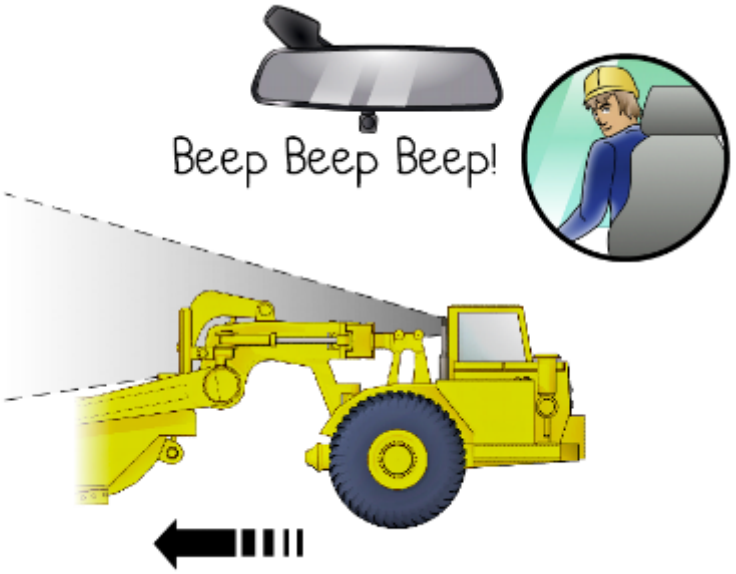
Examples of the approximate weight of different materials:
1 cubic metre of water = 1 metric tonne
1 cubic metre of earth = 1.9 metric tonnes
1 cubic metre of clay = 1.9 metric tonnes
1 cubic metre of dry beach sand = 2.0 metric tonnes
1 cubic metre of concrete = 2.4 metric tonnes
1 cubic metre of coal ash = .08 (8/10) of a metric tonne
25 bags of cement (40 kg each) = 1 metric tonne
1000 common bricks = 4 metric tonnes
1 cubic metre of steel = 7.3 metric tonnes
1 cubic metre of copper = 9 metric tonnes
1 cubic metre of lead = 11.4 metric tonnes

Which safety devices on a scraper protect you from being crushed if it rolls over?

The roll over protective structure (ROPS) and the seat belt. Always wear the seat belt when using a scraper!

How do you safely move a scraper that has been parked?

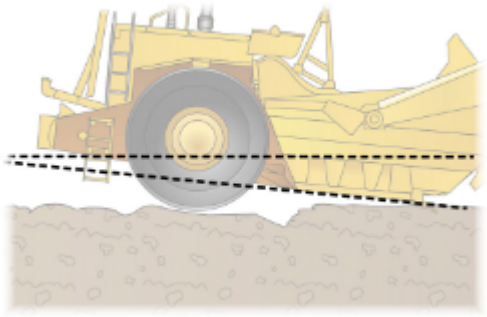
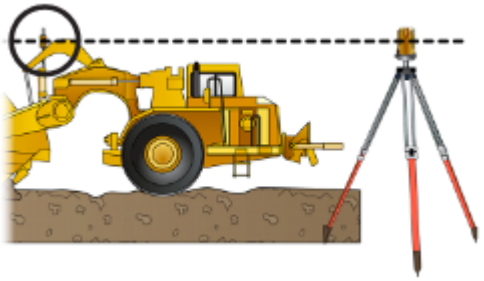
- Beep/sound horn once (×1) to start the engine (wait 5 seconds)
- Beep/sound horn two times (×2) to go forward (wait 5 seconds)
- Beep/sound horn three times (×3) to reverse (wait 5 seconds). Do this even if you have reversing alarms. Check mirrors. Look over both shoulders and check for a clear path.



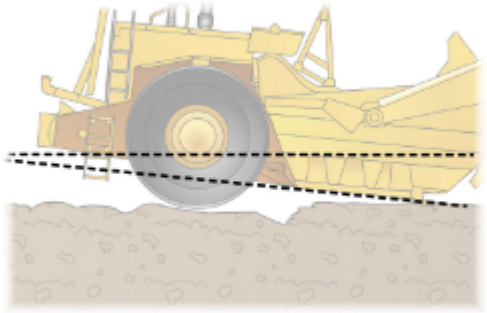
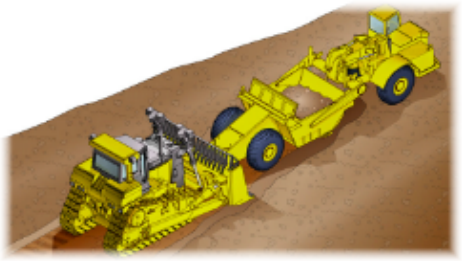
What does this hand signal shown here mean?

Stop	
Motion	Hand signal
	

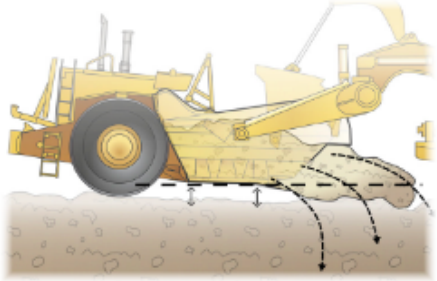
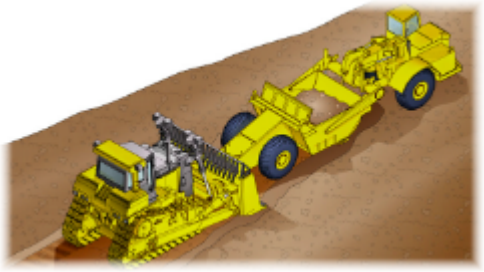
How do you level a surface using a scraper?

Set the blade at the right height. 	Level the surface by driving the scraper forwards. You might use a laser levelling attachment to help you get the surface perfectly level. 

How do you cut a surface using a scraper?

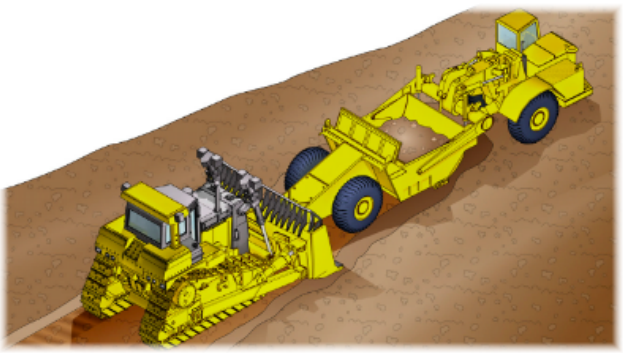
Set the blade to the right depth for cutting. 	Make the cut by driving the scraper forwards. If the scraper needs more power you can use a dozer to help push it. 

How do you spread material evenly?

Use the ejector, keep the bowl at the right height so it discharges evenly. 	Keep travel speed consistent so the material spreads evenly. You might use a dozer or other machine to help. 

If the scraper is having trouble cutting and loading soil, what can you do?

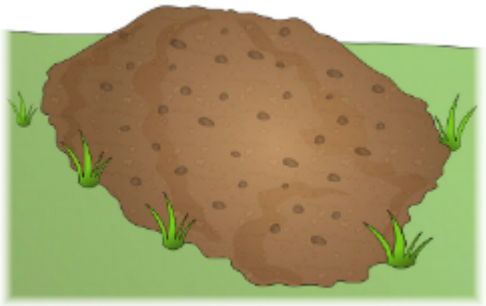
Use a dozer to help push the scraper.



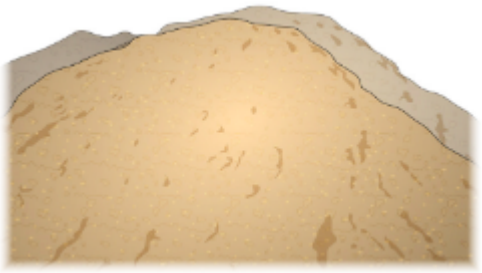
What do you need to know before loading materials?

You need to find out what kind of material you will be loading. For example:

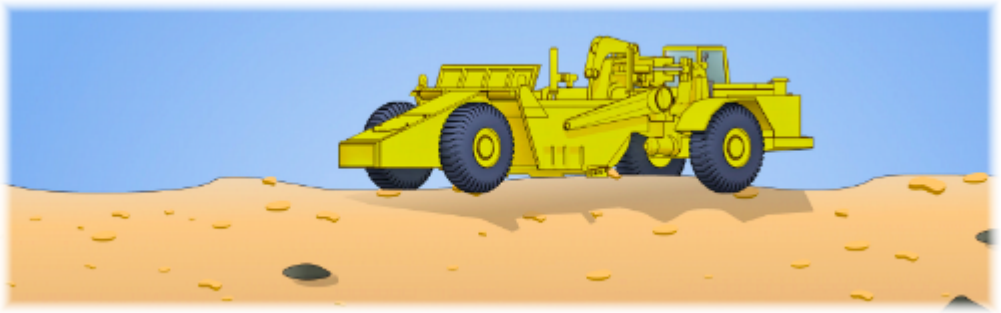
Top soil



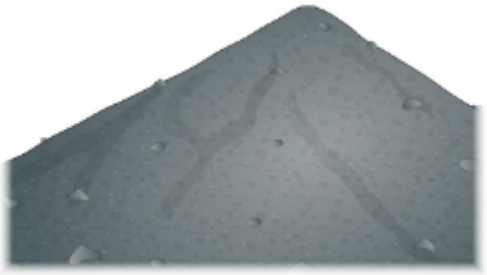
Sand



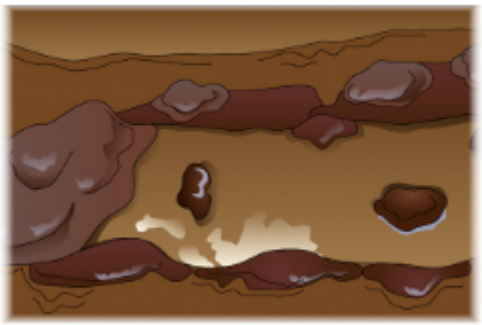
Overburden



Gravel or rocks



Mud/clay

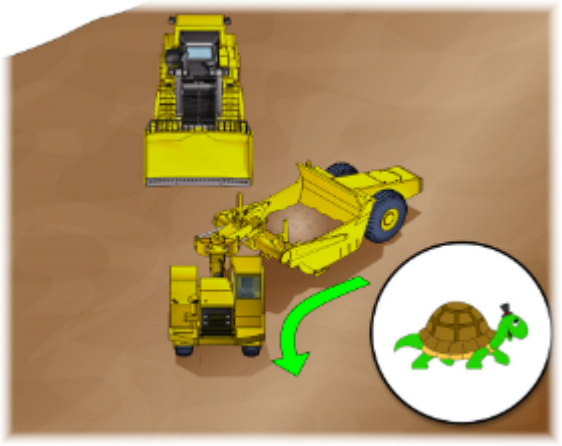


Waste products

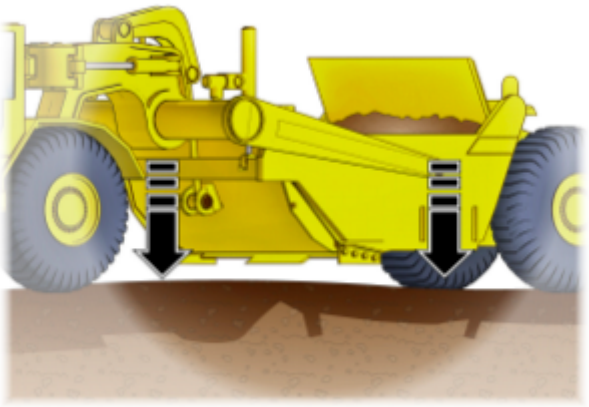
You need to know the kind of material so you can prepare properly. Some materials are heavier than others. Some materials are harder to break up than others.

After the material is loaded, you need to transport it. What do you need to do when transporting material?

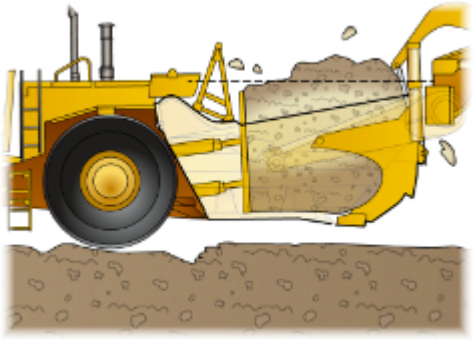
Go slowly and slow down when you turn



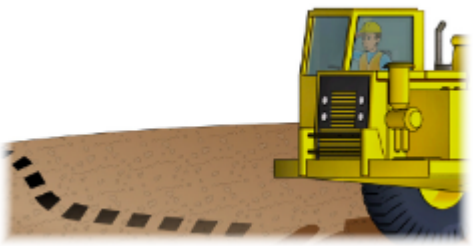
Keep the bowl low so the scraper stays stable



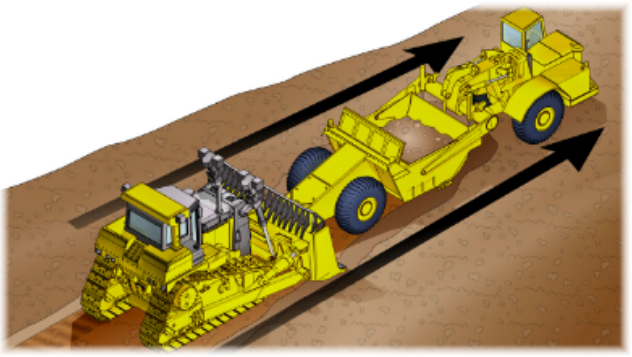
Don’t use the ejector if the apron is closed and the bowl is full



Make sure the path is clear

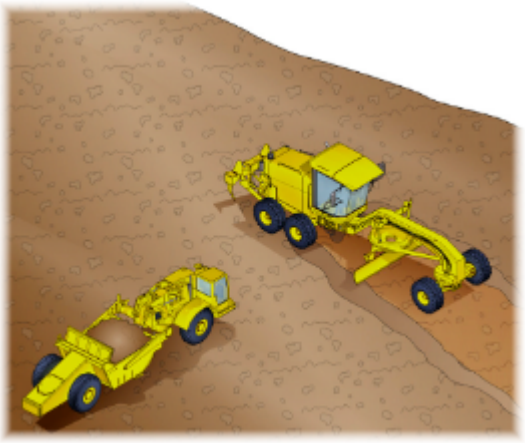


If your scraper is being pushed, keep in line with the machine that is pushing it.



Before you haul a load, what do you do if you have to travel over a rough surface?

On your first pass use the blade of the bowl to level your path. If there is a grader on site you might be able to get the path graded.

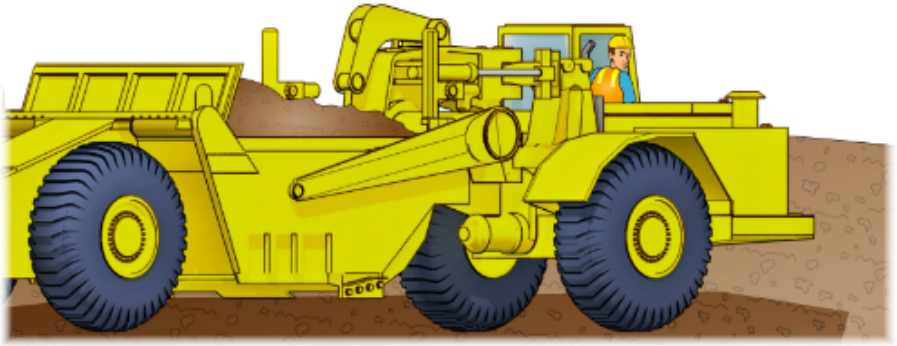


What do you need to check before unloading materials?

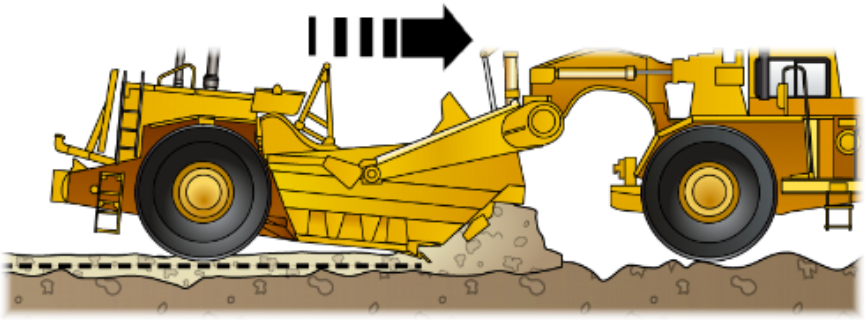
Check the site's plan. It will explain what kinds of materials can be unloaded and where.

How do you unload material safely?

Unload materials in a designated area where it won't cause a hazard

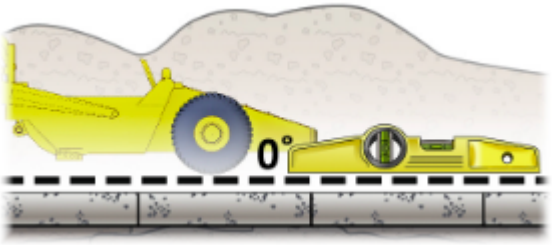


Keep the bowl level and then drive forward to dump smoothly

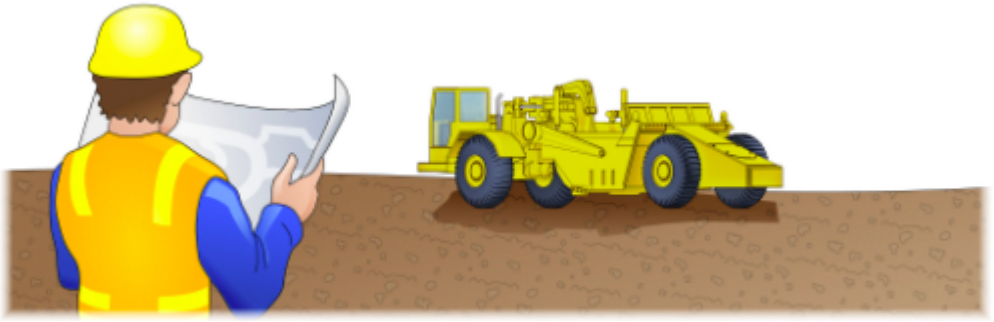


Communicate with other workers and follow signals and signs

Try to keep the fill area level and even



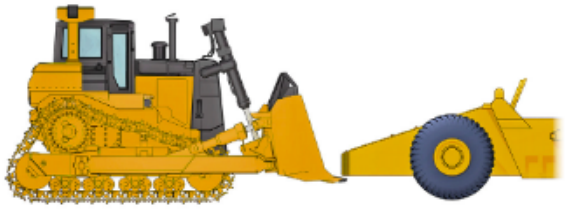
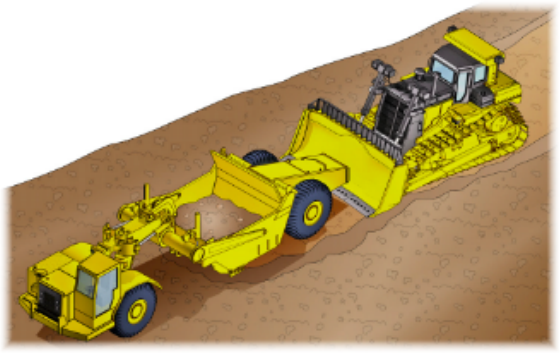
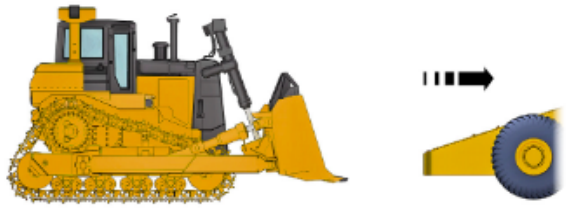
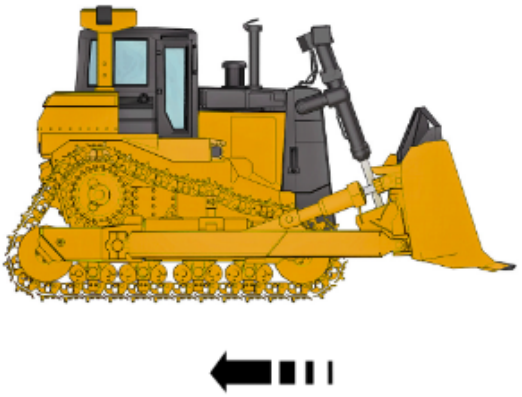
Follow your site's procedures



2.3 Couple Machines

2.3.1 Push Type Loading

Scrapers load by dragging or forcing a cutting blade through the soil to be lifted and moved. This requires a lot of power to be transferred through the drive wheels. With the bowl resting on the ground, weight on the drive wheels is reduced and so is the traction.
To assist a scraper to fully load, it needs more force on the cutting edge. This can be gained by having another machine like a dozer or scraper push from behind.
How does a scraper get pushed?

As the scraper approaches the cut area, a dozer or other scraper comes up behind and pushes against the scraper's rear cushion or pad. 	The cutting edge is lowered and both machines force the cutting edge through the fill until the bowl is full. 
When the bowl is full, the driver raises the bowl and continues to the dump site. 	The dozer reverses and repositions ready for the next scraper to be loaded. 

2.3.2 Coupling Self Propelled Scrapers for Push-pull Loading

Scrapers are usually only coupled during loading.
There is usually no verbal communication between operator's who are conducting push-pull operations.
Practice will make the coupling, uncoupling and pushing a smooth action. The pusher should travel at a speed which will allow the machine to catch up but not collide with the scraper.

2.3.3 Push-pull Loading

Push-pull loading using two scrapers is much more efficient. Both machines are productive as the pusher has no waiting time. How does push-pull loading work?

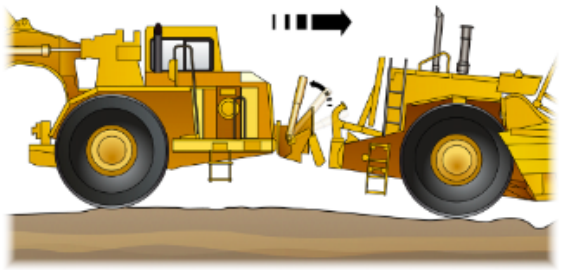
1. As the first scraper gets ready to load, a second scraper moves in behind.

2. When the second scraper makes contact, the bail is lowered onto the front scrapers hook.

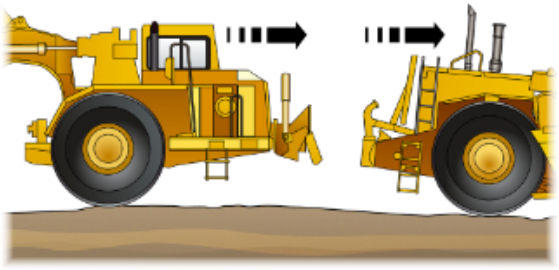
3. The first scraper lowers it's bowl and the power from both machines moves the cutting edge through the ground.

4. When the first scraper has started to raise the bowl, the scraper lowers its bowl and the first scraper then pulls the second scraper by the bail and helps it to load.

5. When both machines are loaded, the second operator raises the bail while still pushing against the cushion to uncouple the machines.

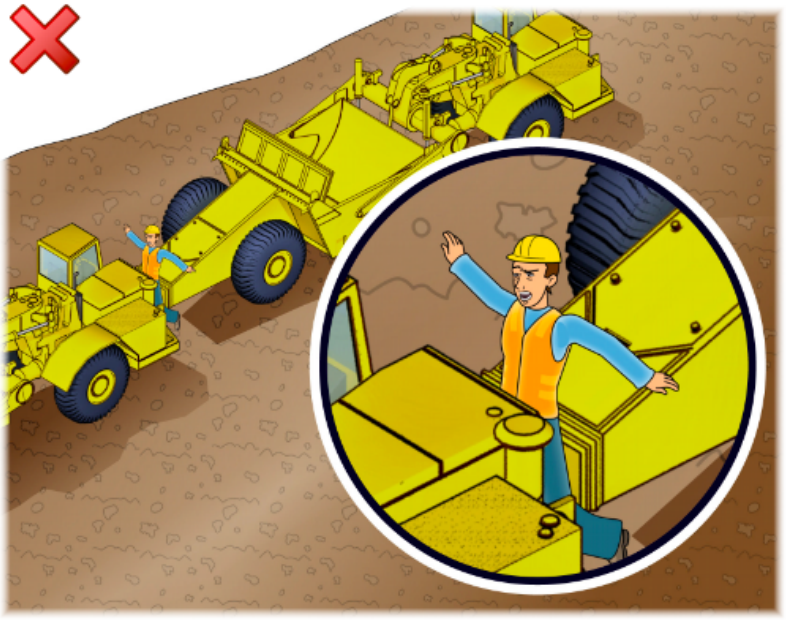


6. Both machines are free to travel to the dump point.



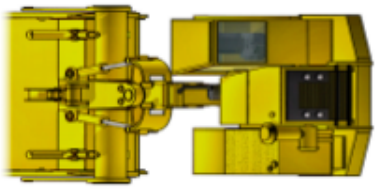
What should you do before coupling machines?

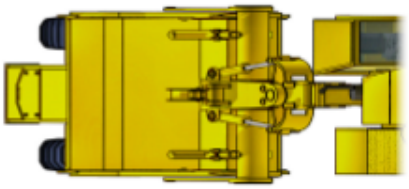
Keep people clear of the area, especially between the machines. There is a risk someone could be crushed.



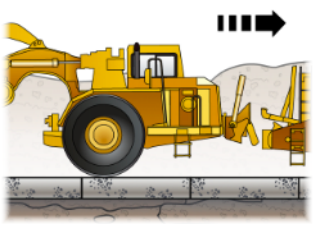
How do you couple a scraper with another machine?

1. Line up the scraper in front of or behind the machine you want to couple with.





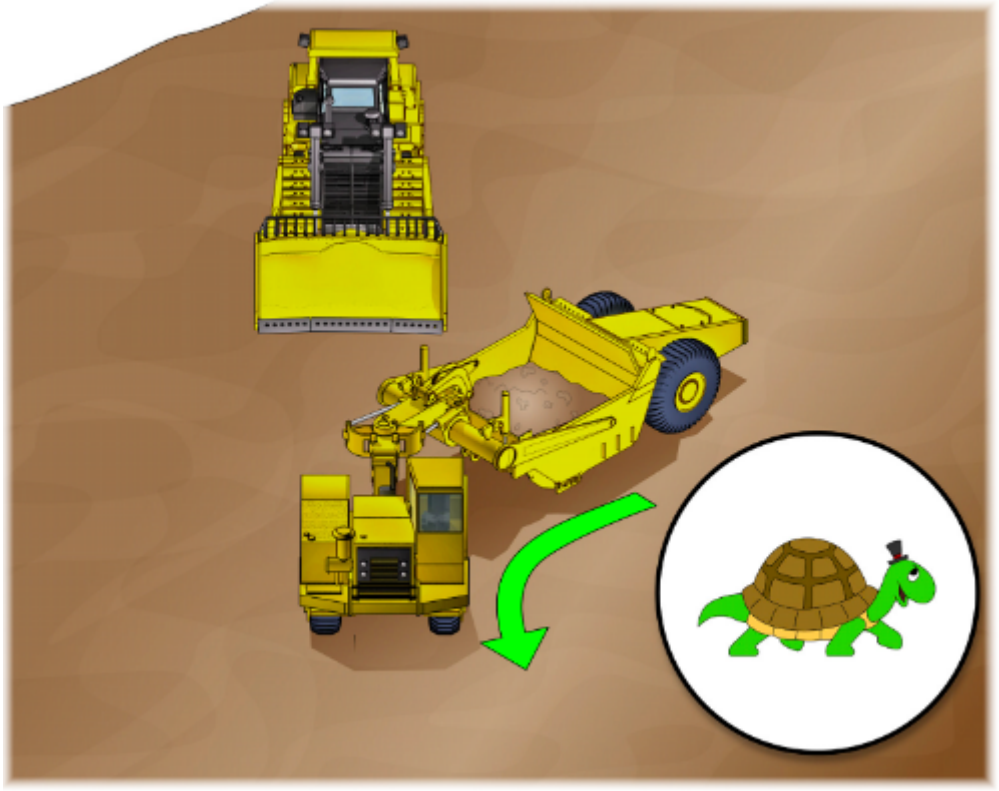
2. Drive towards the other machine until they touch.



3. Use the coupling lever or button to lower the bail. The machines will be coupled.

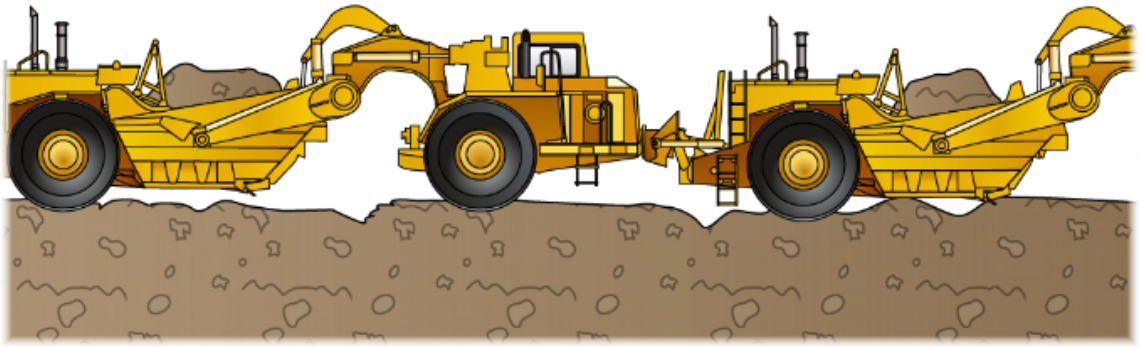
How does each scraper driver know when the pusher driver is ready to help them load?

The pusher driver will reverse into positon ready for the scraper. As the pusher starts to move forward and lowers the bowl, this signals the next scraper driver to move in and start loading.



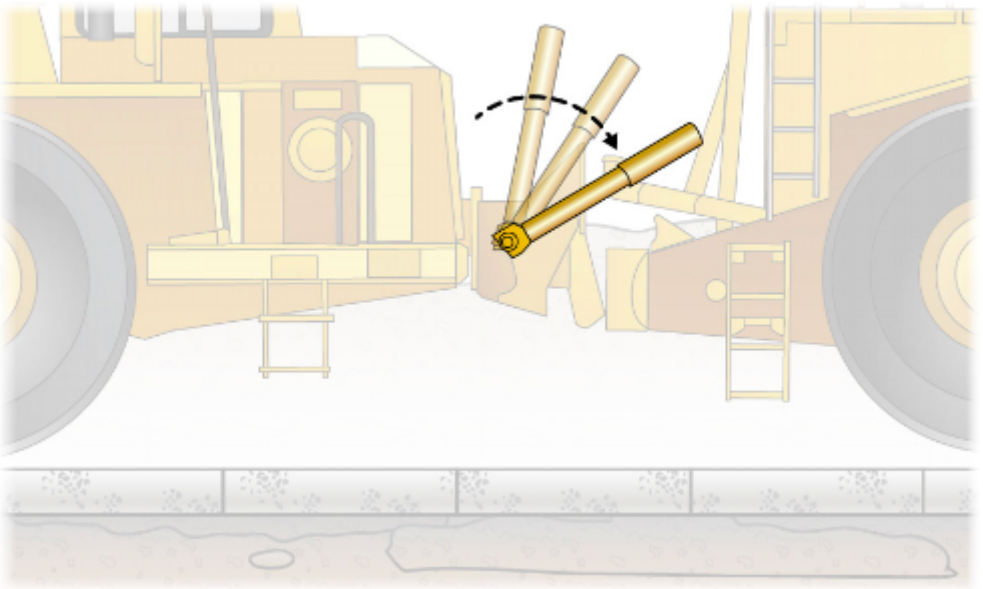
2.3.4 Using Coupled Scrapers to Make A Cut

1. The front scraper makes the first cut while the back scraper pushes the front scraper forwards.	2. The front scraper makes the first cut while the back scraper pushes the front scraper forwards.



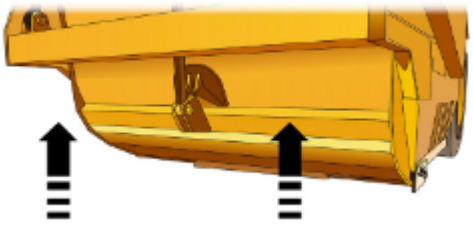
How does the pusher driver know when to operate the bail to connect scrapers in a push-pull loading operation?

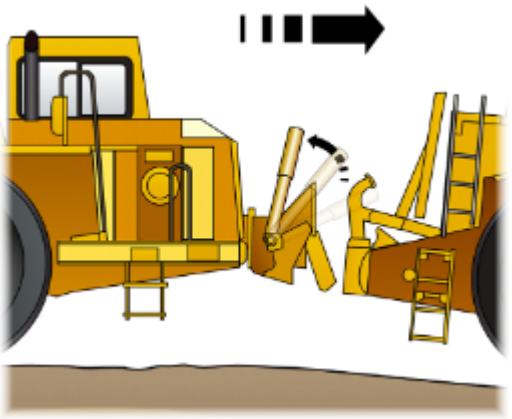
The operator would engage the bail as soon as the pusher makes contact with the scraper.



How does the rear scraper know when to disconnect the bail?

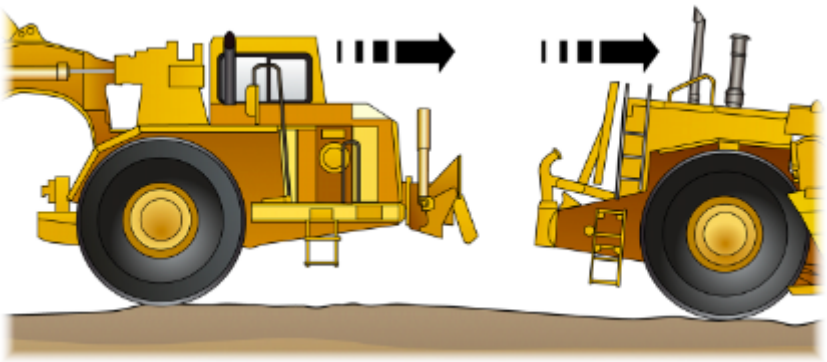
As soon as they lift the bowl out of contact with the ground and their scraper is no longer being pulled and it starts to push again. This is when the bail is raised.





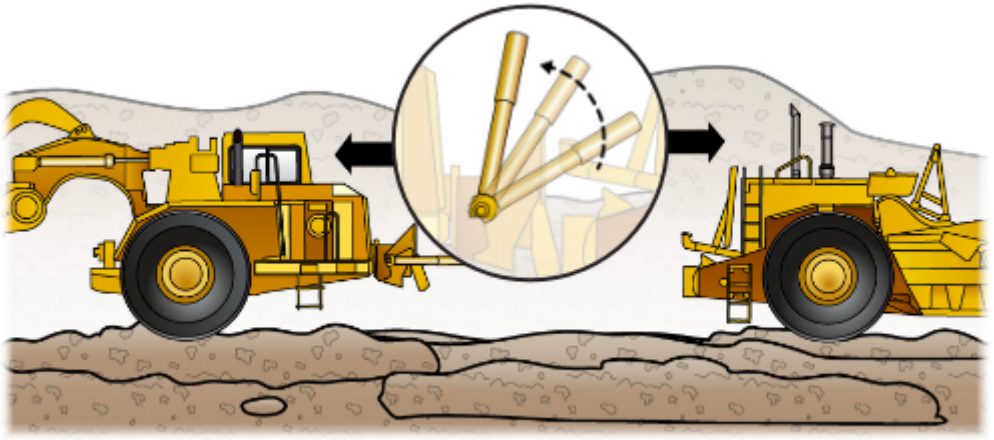
How is the pushing machine contact disconnected?

The scraper will move away from the pusher machine when no push is felt. This means the bail has been released.



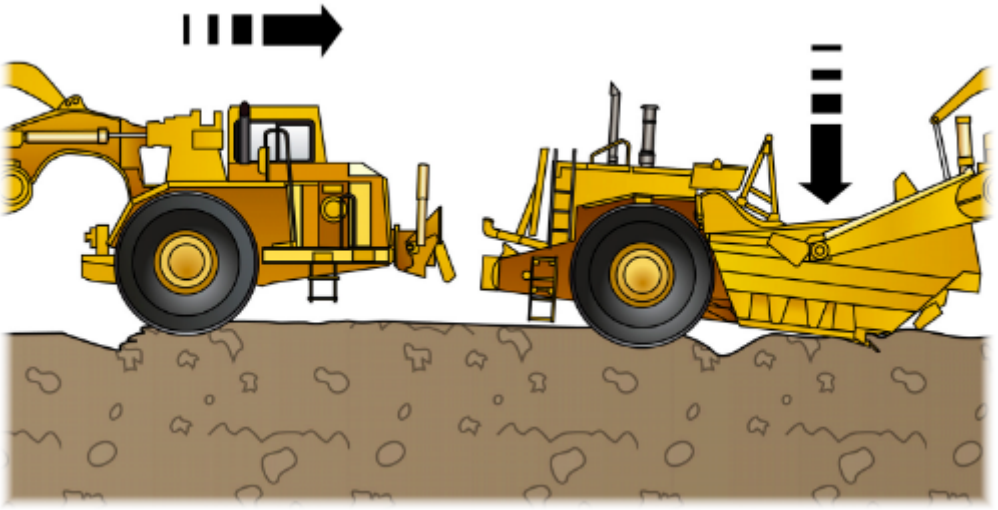
The bowls are full and you need to empty them. Why do you disengage and separate the scrapers first?

It's safer and easier to travel and dump the load when the scrapers are not coupled.



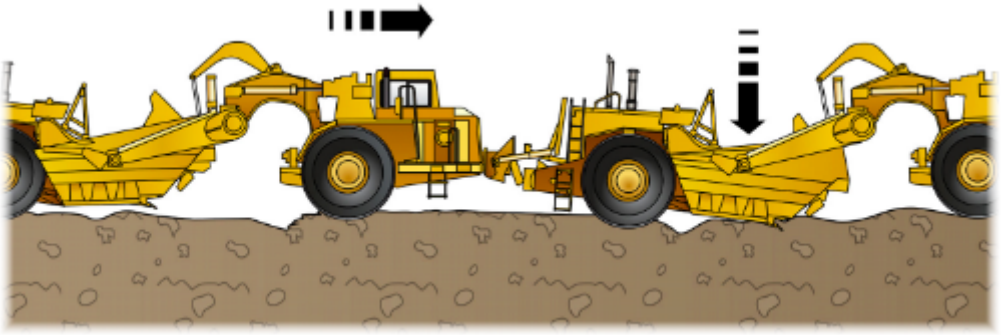
How does the pusher driver know when to push the scraper?

When the bowl of the scraper starts to lower, the pusher moves up and makes contact with the cushion.



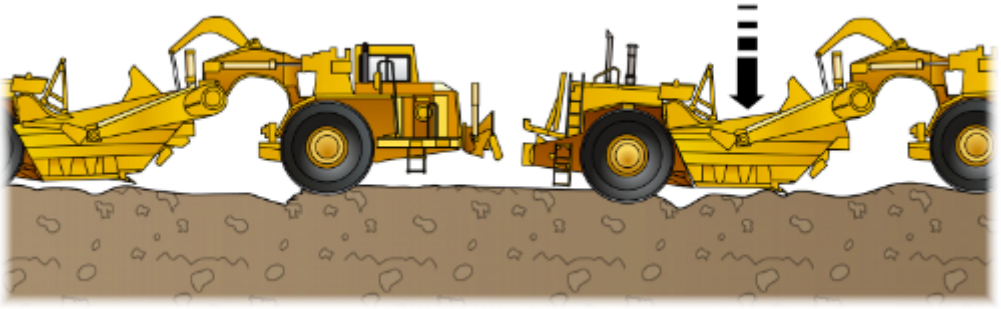
How does the scraper driver communicate with the pusher driver?

The scraper driver communicates by actions. When the bowl starts to lower, this signals the pusher driver to move in and start pushing.



How does the scraper driver signal the pusher driver to stop pushing?

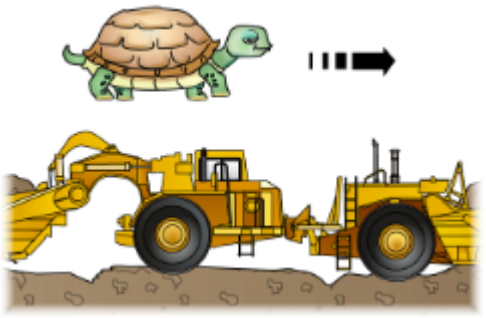
When the bowl starts to raise, this signals the pusher driver to slow down and stop pushing.



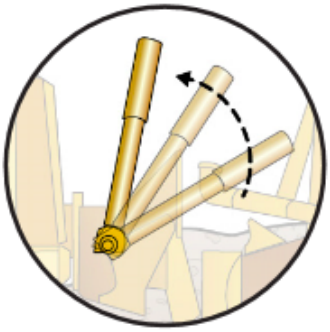
When the scraper bowls are full, you should disengage the scrapers. How do you do this?

1. Communicate with the other operator. Make sure the rear scraper is pushing against the front scrapers cushion.

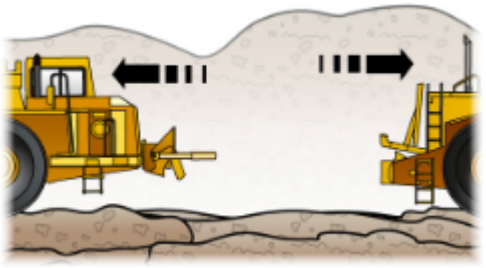
2. Slow the front scraper down slightly so the bail can release the hook.



3. Use the coupling lever or button to disengage.

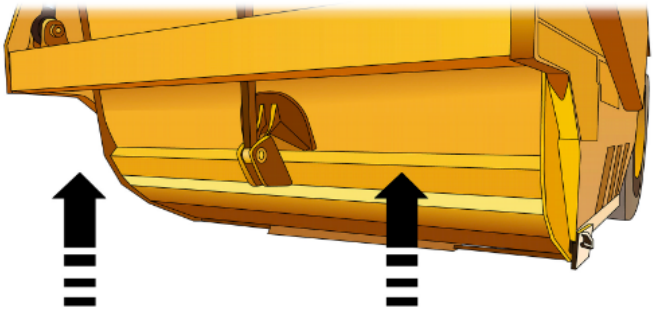


4. Move the scraper away from the other scraper.

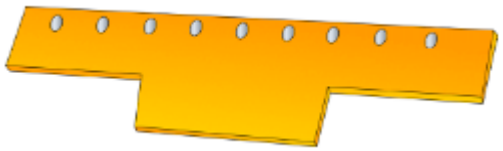
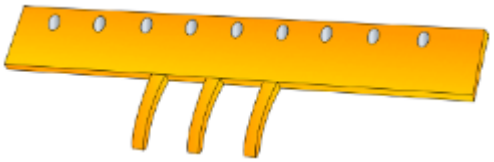


How does the pusher driver know when to stop pushing?

When the pusher driver sees the bowl start to lift.



What kinds of blade attachments might you use on a scraper bowl?

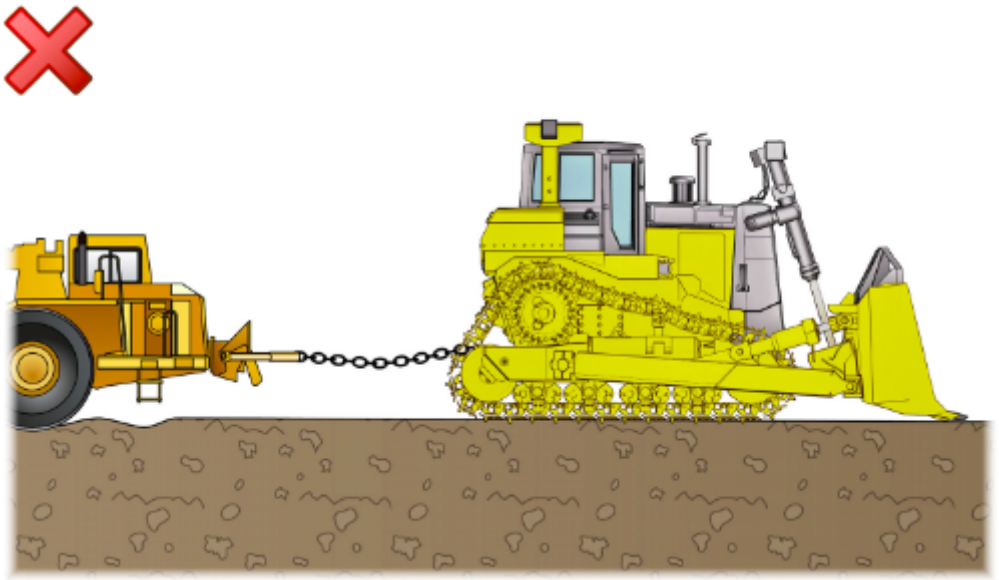
Stinger edge blade 	Stinger edge blade 
	Blade with teeth (on an elevating scraper) for hard and difficult surfaces. 

Where can you find out the limits of the attachment?

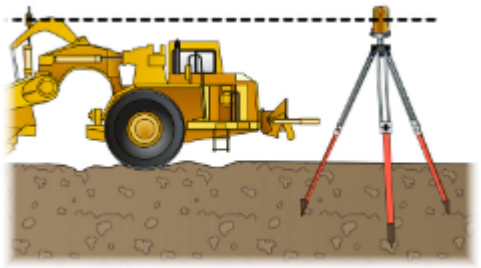
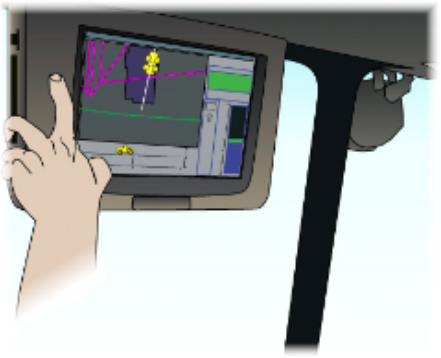
In the operator's manual which should come with the attachment.

Can a tow chain be attached to the bail to tow the scraper?

No, the bail is designed to connect two scrapers together.

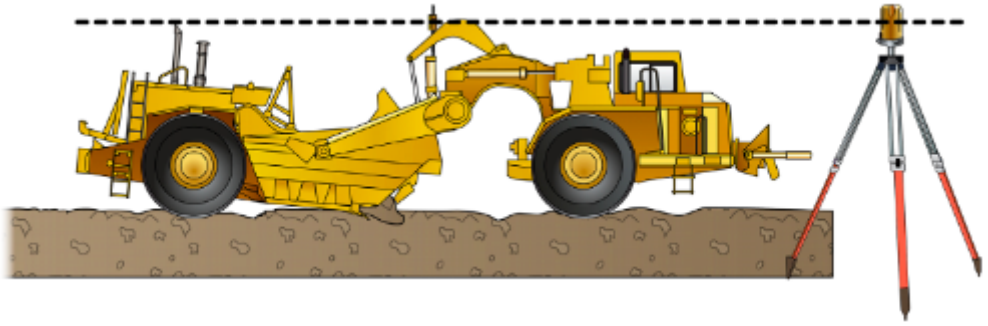


What attachments do scrapers use?

Laser levelling equipment	Machine guidance system
	

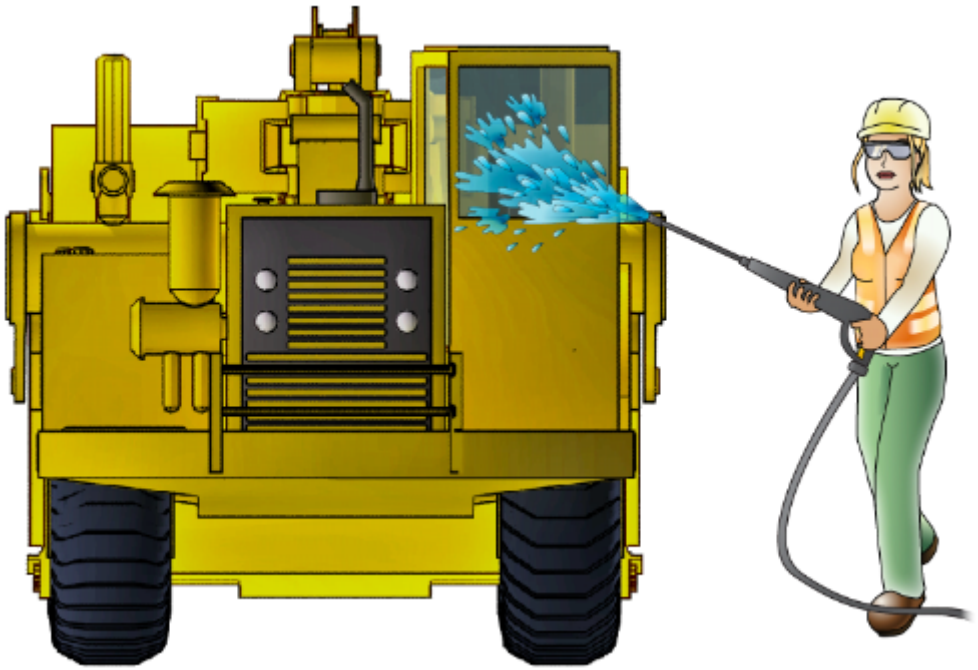
What is laser levelling equipment used for?

A laser beam is sent from the tripod to the receiver for the scraper blade. This maintains the cut height.



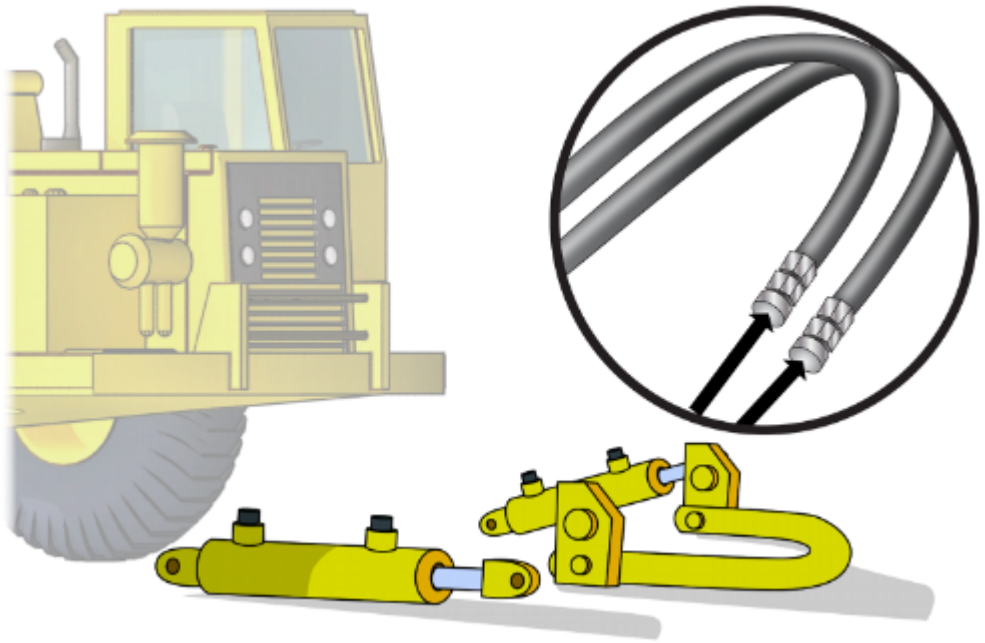
What must you do with attachments before storing them?

Clean them.



If you removed the bail attachment from the scraper, how would you prepare it for storage?

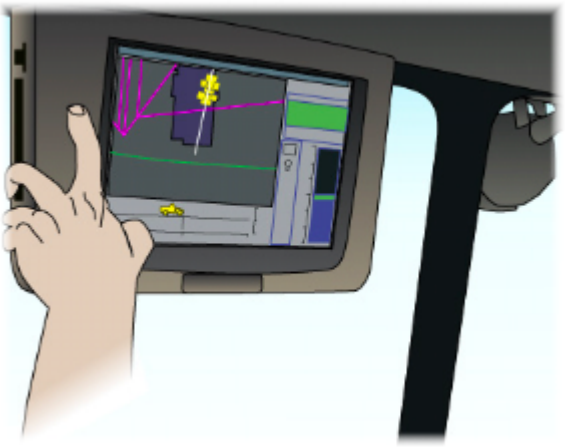
1. Clean all soil, dirt and oil from the bail.
2. Plug any open hydraulic fittings.
3. Cover the attachment to prevent weather damage if needed.
4. Secure any hoses that are left on the machine.



What does a scraper use a machine guidance system for?

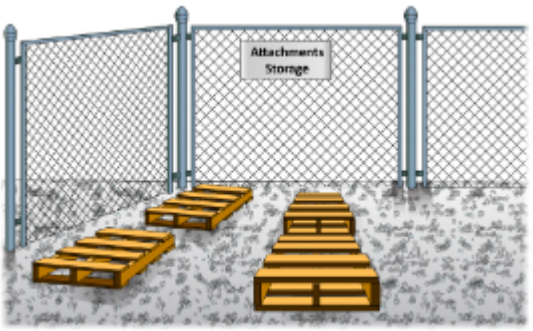
A GPS signal is sent to the machine to:

- Help the operator position the machine for the cut
- Keep the machine in position during the cut or dumping.



Where do you store attachments, such as blades, after you've finished using them?

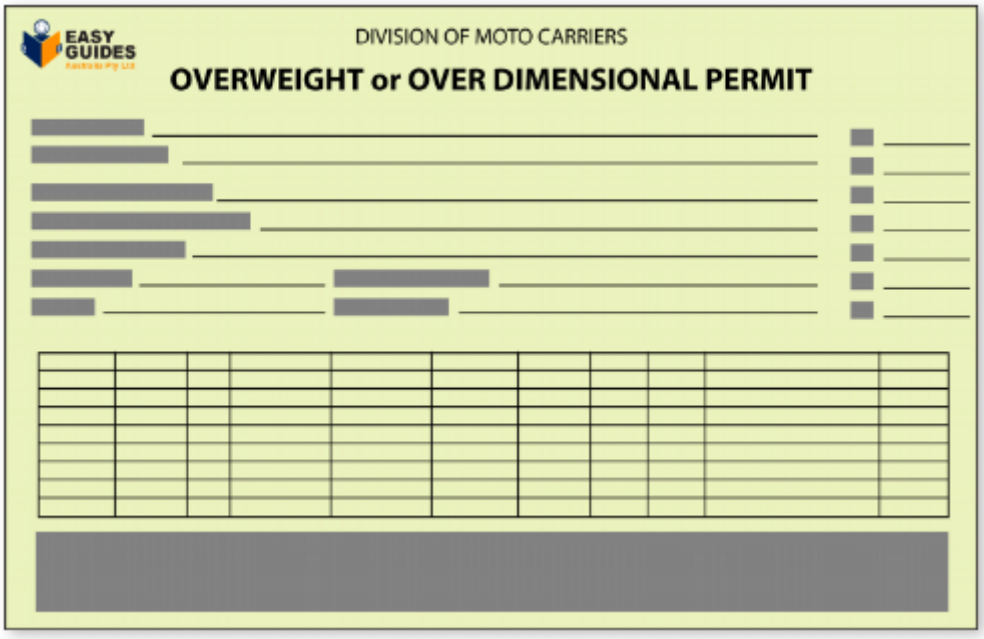
Your worksite should have a designated storage area for attachments. Ask your supervisor or a workmate.



2.4 Relocate the Scraper

Most scrapers exceed the legal vehicle width for road travel. What must you do to legally drive a scraper on a public road?

Get an over dimensional (wide load) permit.

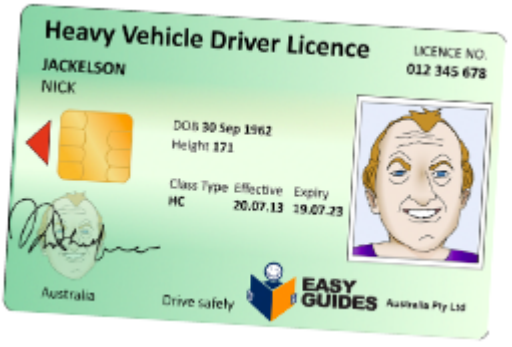


Scrapers are very heavy and may exceed the load ratings of bridges etc. What must you do before driving the scraper on a public road?

Check with your local transport authority (for example, VicRoads or the RTA).
Also, if the scraper is unregistered, you will need an unregistered vehicle permit.

What kind of licence do you need to drive a scraper weighing over 4.5 tonnes on a public road?

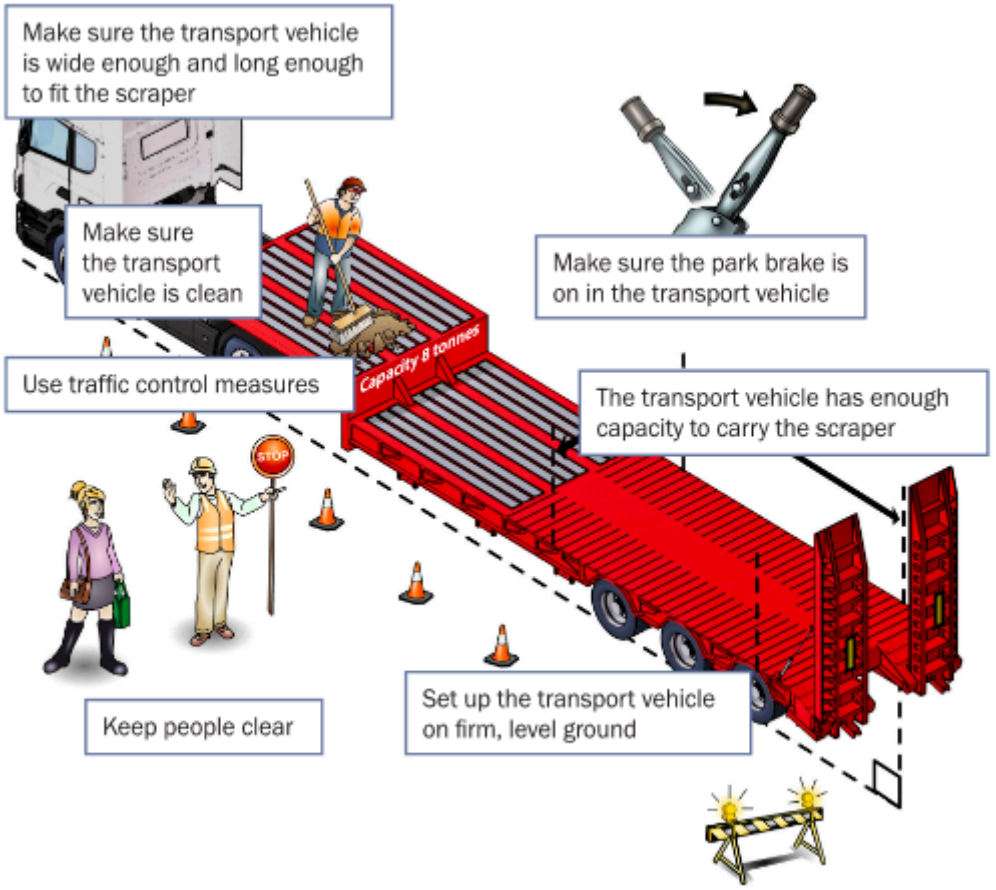
In most states/territories you will need a heavy vehicle licence.
For example, a light rigid (LR) licence for 4.5 – 8 tonnes (8.5 in some states).
Check the rules for your state/territory.



Before you drive on a public road, what checks do you make on the scraper?

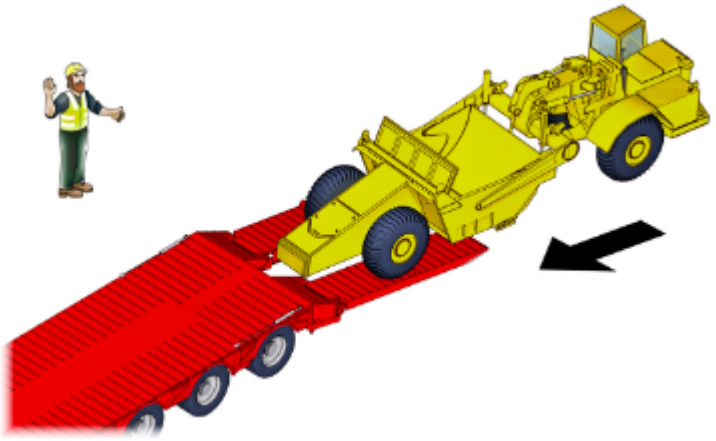
Make sure the scraper is roadworthy, and it is registered for road use. All brake lights, indicator lights, horn etc must be in working order.
Note: If the scraper is not registered you may be able to get an unregistered vehicle permit. Check with your relevant state/territory authority.

A scraper is to be transported. How is the preparation done by the person responsible?



Which way should the scraper face when loaded on to the vehicle?

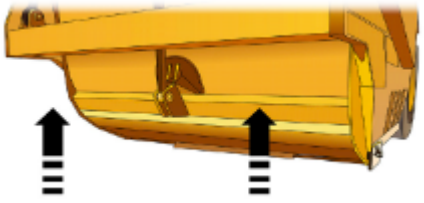
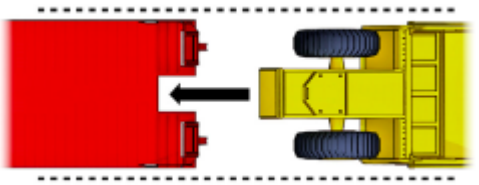
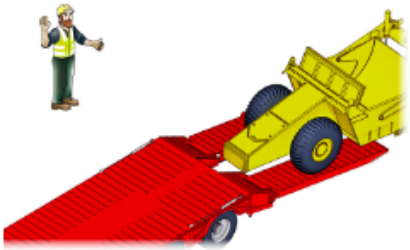
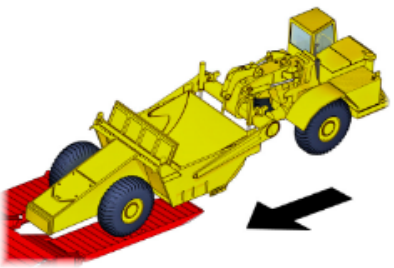
The axle loadings of the vehicle will control which way the scraper will face. Talk to the vehicle driver about the axle loadings of the vehicle.

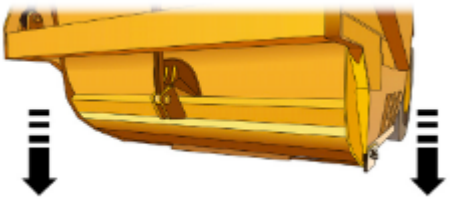
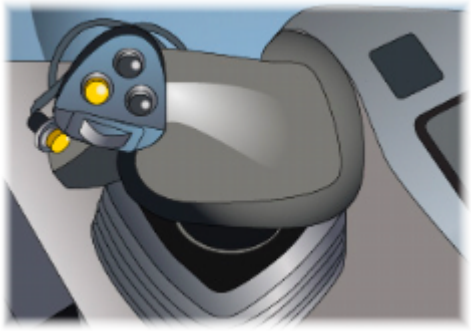
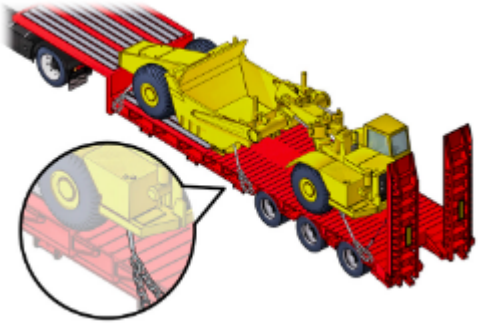


How would the scraper driver find the weight of the scraper?

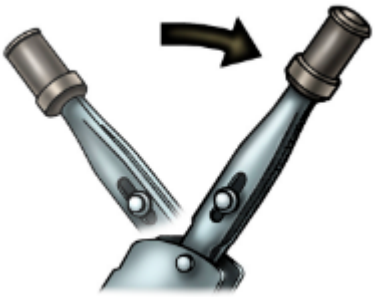
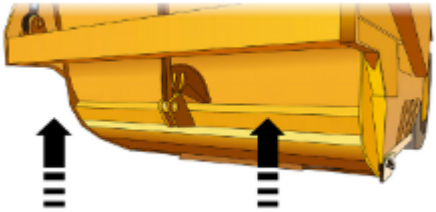
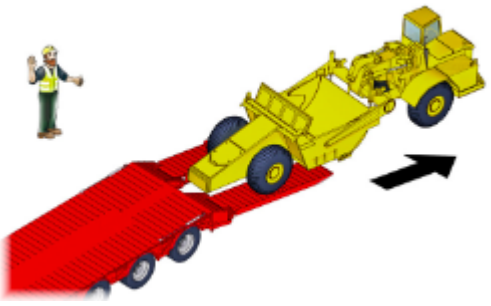
From the operator's manual or from the manufacturer's information.

How is a scraper loaded on to the transport vehicle?

1. Raise the bowl 	2. Line up the scraper with the ramps of the transport vehicle. 
3. Guide the scraper on to the transport vehicle. 	4. Get the scraper driven on to the transport vehicle. 

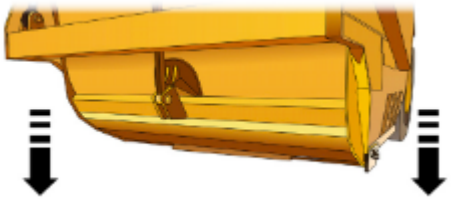
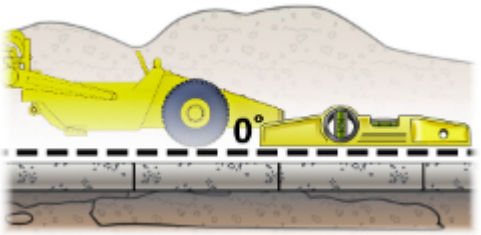
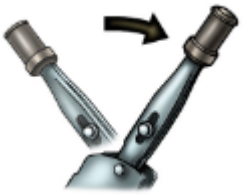
5. Put the parking/emergency brake on.  	6. Lower the bowl 
7. Release hydraulic pressure. 	8. Use chains to secure the scraper. 

How is a scraper unloaded from a transport vehicle?

Make sure the scraper's brakes are still applied 	Release all securing devices such as chains 
Start the scraper and raise the bowl to full height 	Drive the scraper slowly off the vehicle deck 

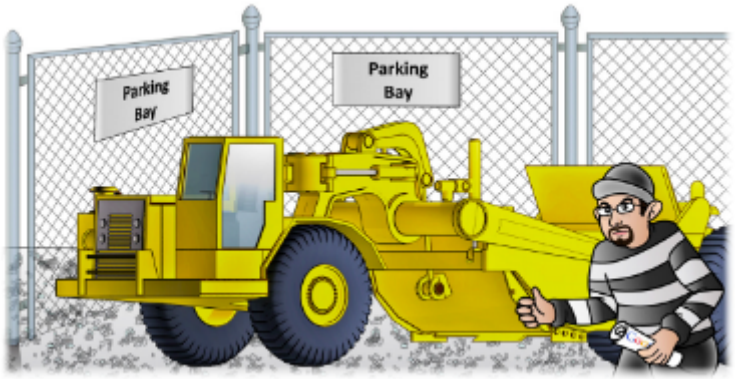
2.5 Carry Out Machine Operator Maintenance

What steps do you take when shutting down the scraper?

1. Lower the bowl 	2. Park the scraper on flat ground in a place where it won't cause a hazard. Make sure the scraper is not in a depression where it could be flooded. 
3. Idle the engine and then turn it off. 	4. Put on the brake. 
5. Remove the keys. 	6. Lock the cabin. 

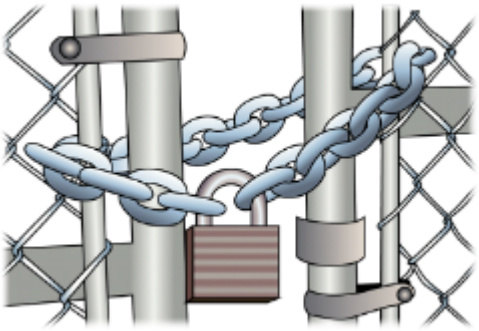
Why should you remove the keys from the scraper when leaving it parked?

To stop unauthorised people using the machine.



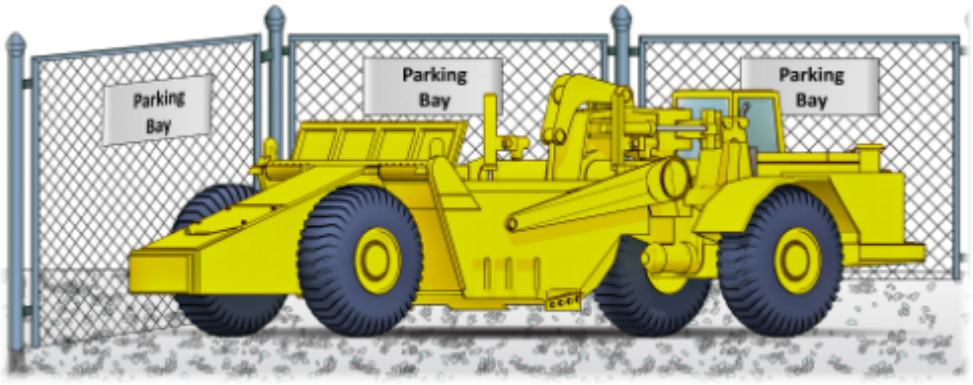
How do you secure the site to stop unauthorised people getting in?

Set up fences and barricades. If possible, lock the site.



How do you prepare for scraper maintenance?

Park in a suitable area

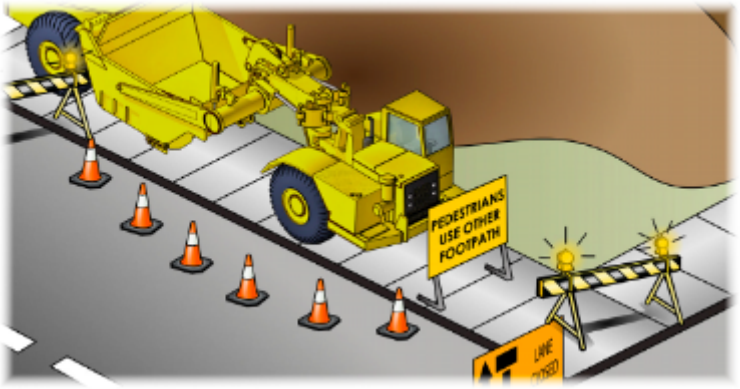


Clean excess dirt and dust from the scraper

Clean around all maintenance points such as dipsticks, filler caps and filter.

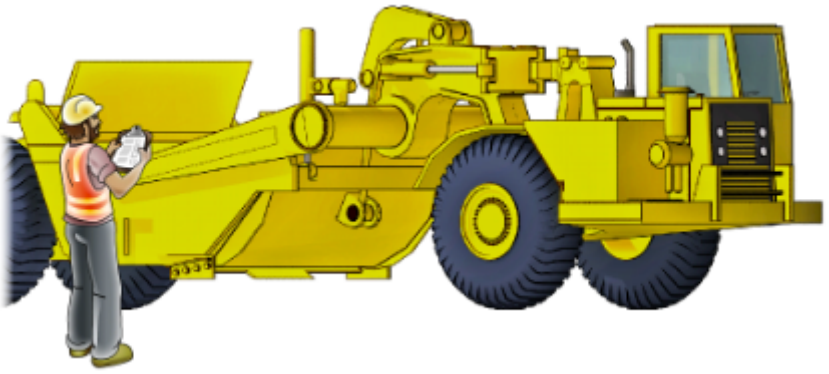
What do you do if you need to park the scraper next to a road?

Put up barricades, lights and warning signs to alert people and vehicles nearby.

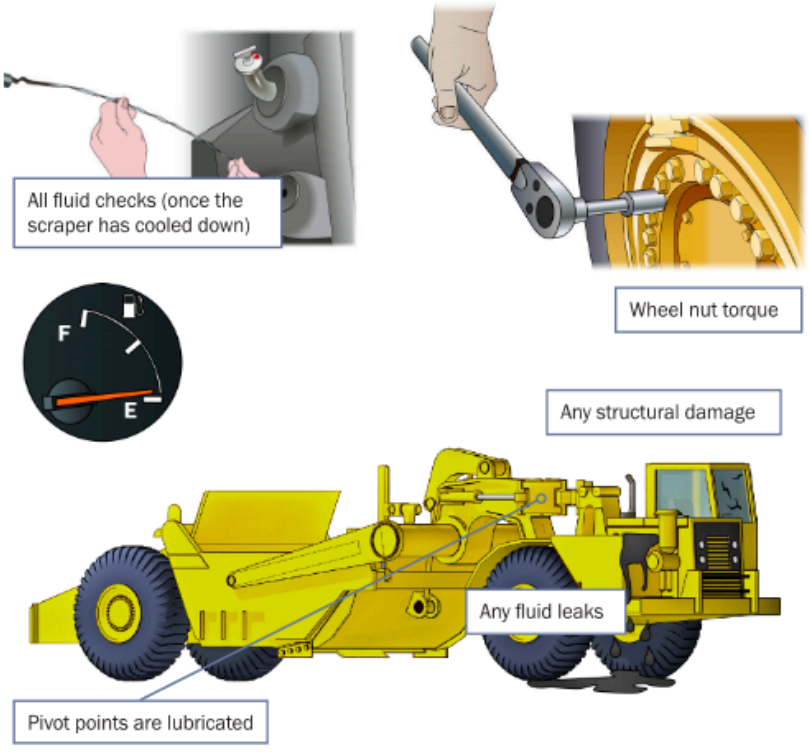


When do you test and inspect the scraper?

Every day. Always test and inspect before you use the scraper. You do this to make sure it's safe to use.



You need to make sure the machine is safe to use for the next person. What post-operational checks do you do after you've finished using the scraper?



What do you do if you find a fault with the scraper? For example, you might see a bulge in a hydraulic hose.

1. Stop and shut down the machine.

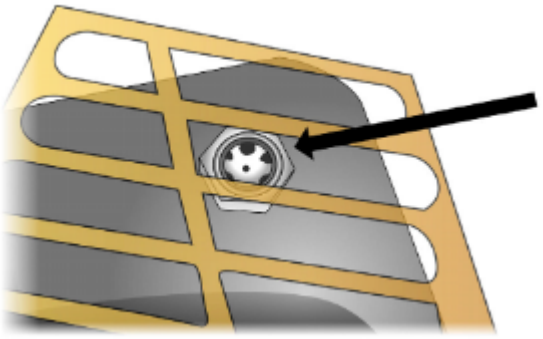
2. Tag out the machine.

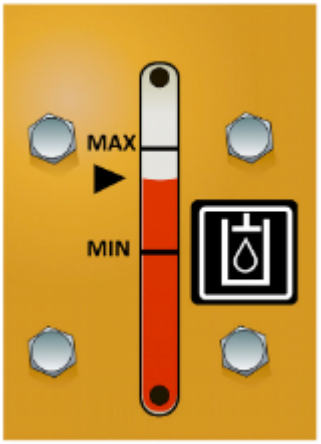
3. Record the fault in the logbook.

4. Report to your supervisor.

You're refilling the hydraulic storage tank. Why should you leave some space in the top?

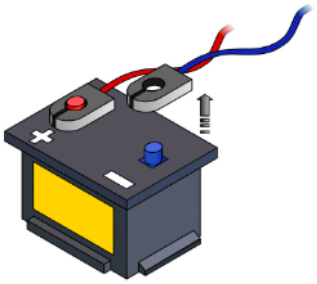
Leaving some space in the top gives the hydraulic fluid room to expand when it heats up.





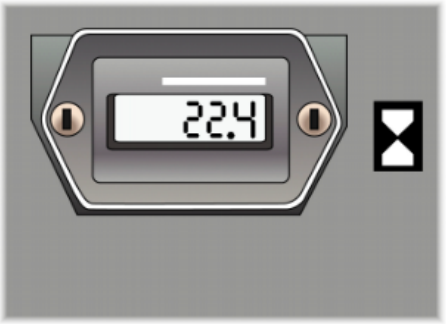
You want to change the battery. Which cable do you disconnect first, positive or negative?

Negative (earth).



How do you know when and what to service on the scraper?

Check the hour meter and service sticker on the machine. The hour meter tells you how many hours the machine has been operated.

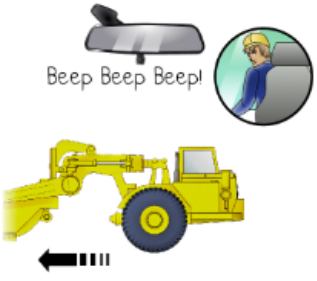


Check the logbook

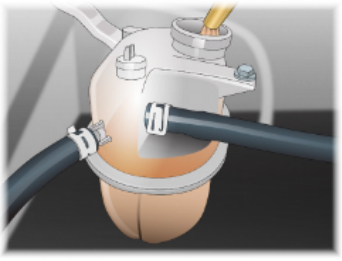
Check the operator's manual

What are some examples of maintenance you would do every 10 service hours?

Test the backup alarm

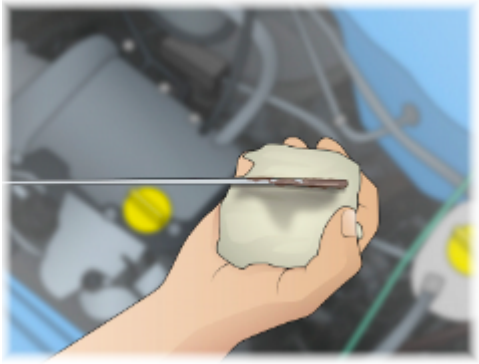


Check the coolant level

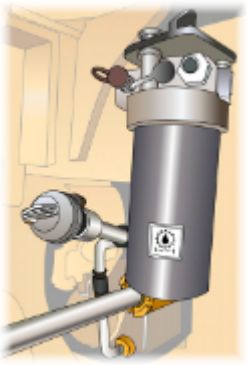


Check seat belt

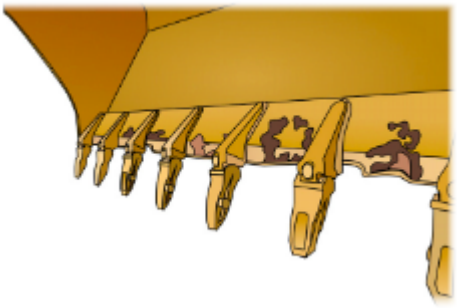
Check engine oil level



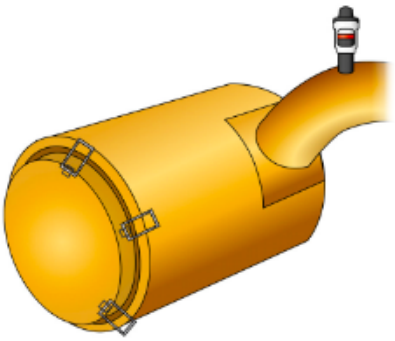
Check transmission fluid level



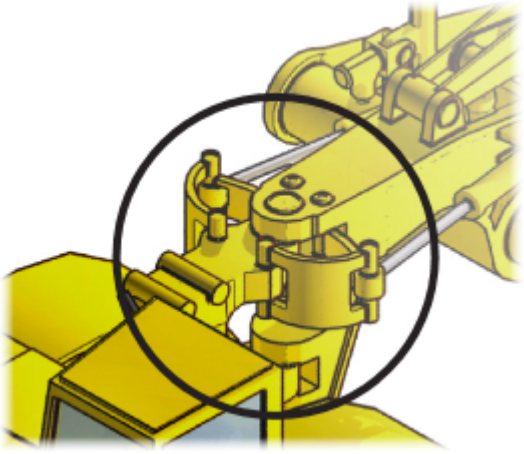
Check cutting edge for loose bolts or other damage



Check air filter indicator



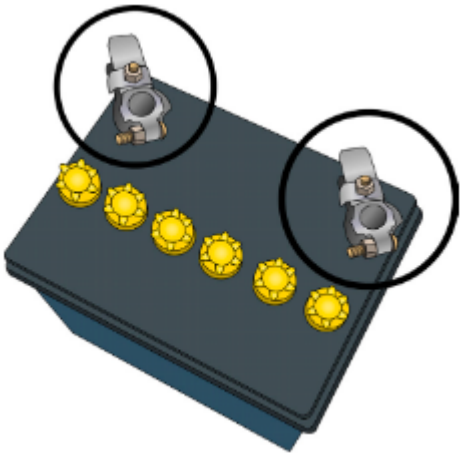
Check steering hydraulics



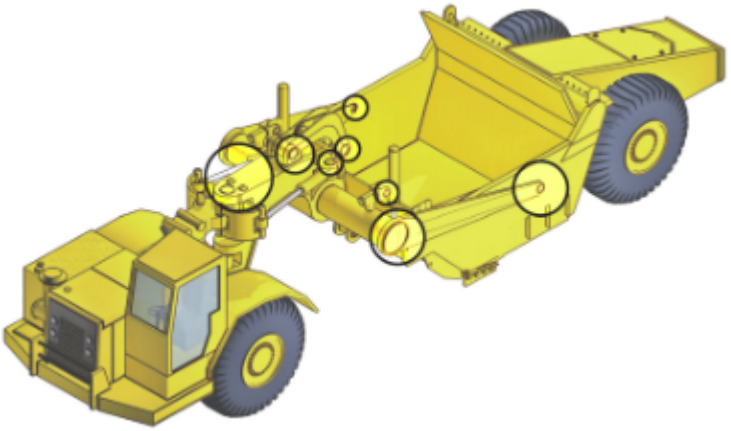
Clean windows

What are some examples of maintenance you might do every month?

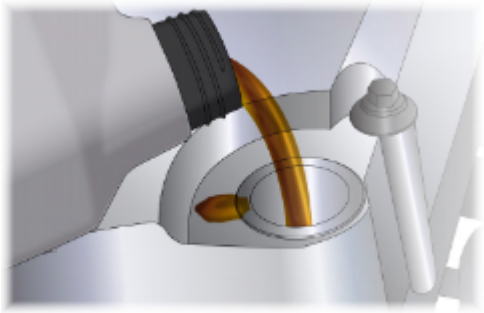
Clean battery terminals



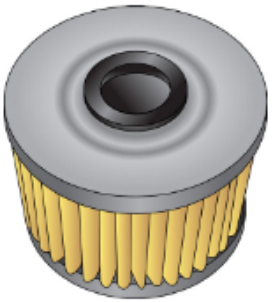
Check all pivot points for cracks



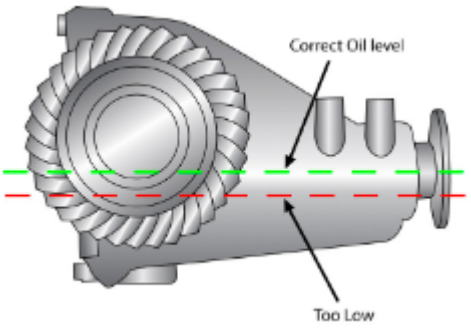
Change engine oil



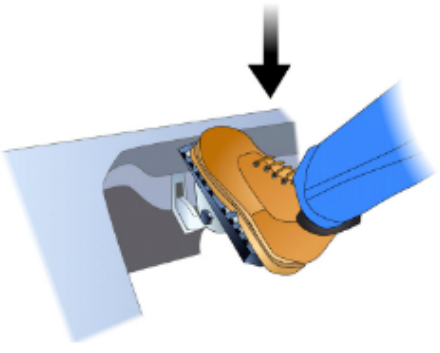
Change oil filter



Check differential oil level



Test the brakes



Where are maintenance records kept?

In the service logbook 
Site records system 

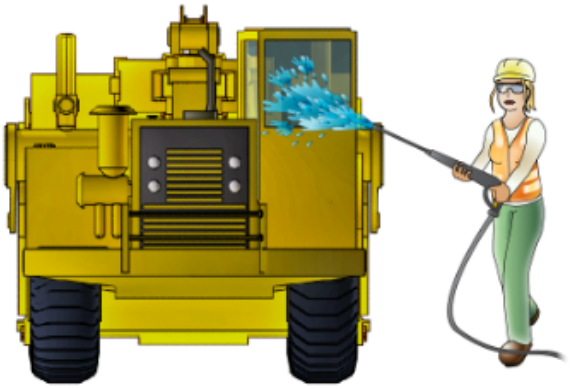
2.6 Conduct Housekeeping Activities

2.6.1 Clean Up

2.6.1.1 Recycling Items

Many environmentally sensitive items can be recycled. Items such as batteries, oil and gas cylinders can sometimes be recycled and reused.
Some oils can be taken to a recycling centre. With oil, bring your materials to the recycling centre in a clean, plastic container with a lid. The original container is a good container to return the oil in.

2.6.1.2 Pressure Clean



You may need to pressure clean the wheels, tyres, or attachments.

After you've finished the job, what should you do?

Tell people who live in the area that the work is finished

Clean the job site

Put any rubbish in the correct bin and recycle what you can

What instructions do you follow when cleaning up?

The environmental management plan and site procedures.

What is the danger of leaving earth and rocks around the work site?

Someone might trip on a rock and be injured. Rocks left on the road can damage cars.

What do you have to clean on the scraper?

Clean the windows and cabin	Clean the attachments
	

What do you do with other equipment and tools you've used?

Clean tools and equipment, and put them back in their place.

Where do you record the work done when repairing and maintaining service equipment during cleaning up the service area?

Enter all repairs and maintenance on equipment in the site specific record book or system.

Where do you record the materials, parts and lubricants used when servicing machines and equipment?

In the site specific record books or record keeping systems.