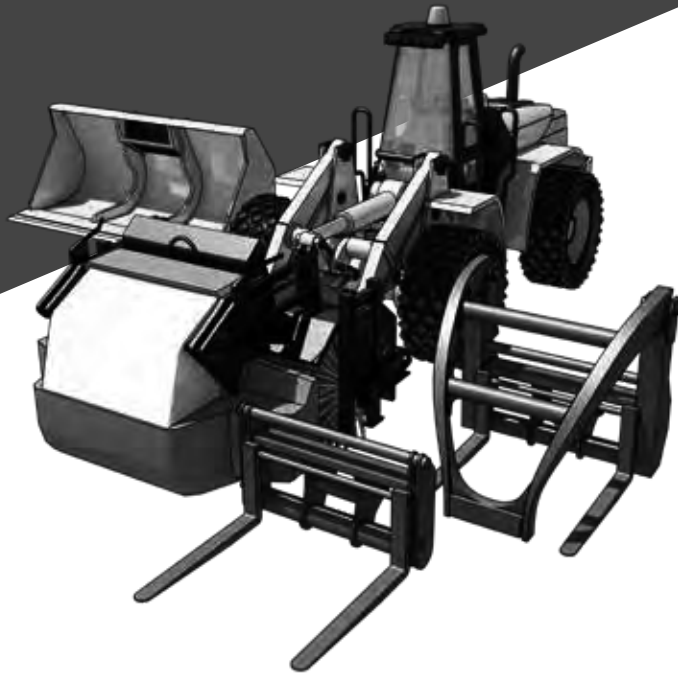


# LEARNER GUIDE



# Integrated Tool Carrier

RII COMPETENCY

Training support material for:

RIIHAN311F

Conduct operations with integrated tool carrier

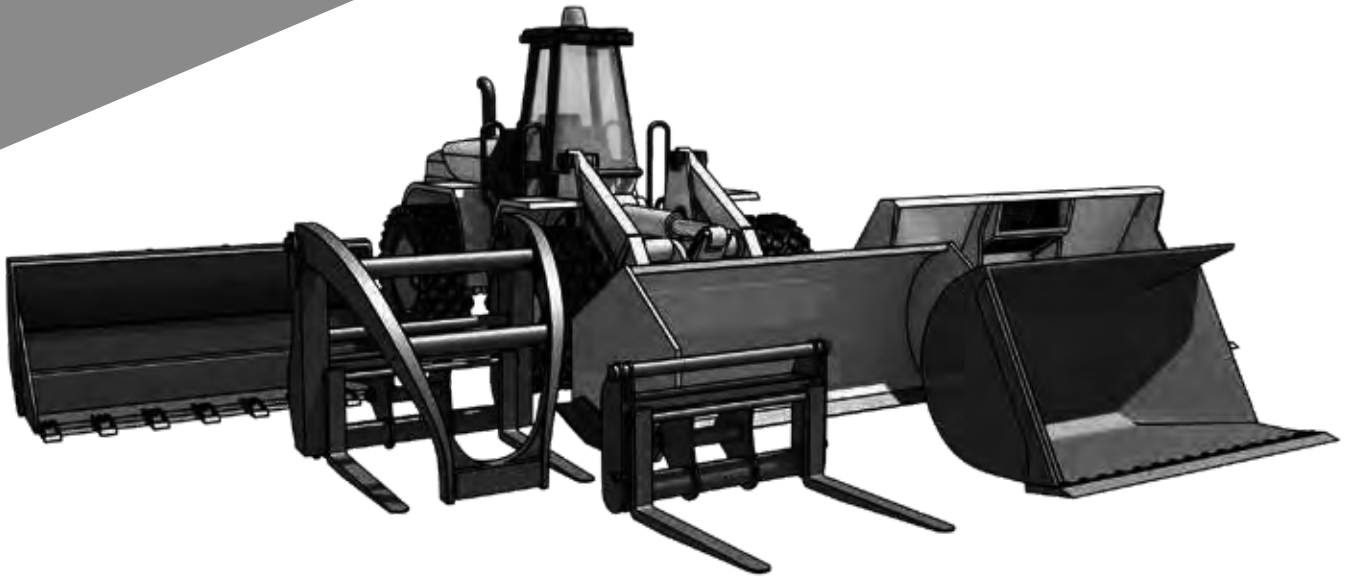
Produced by:



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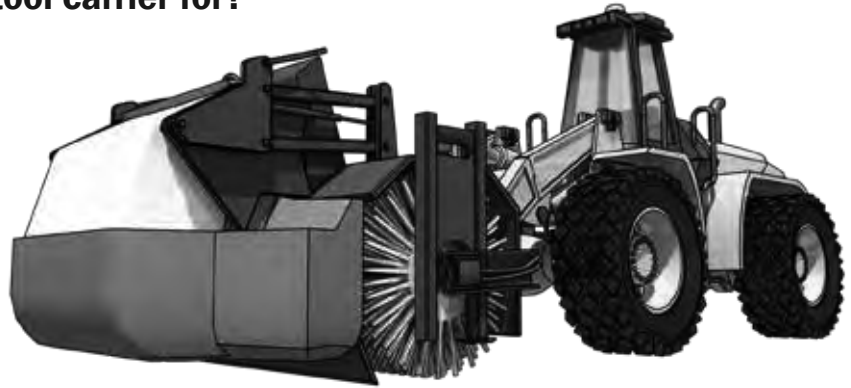
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# Introduction to Integrated tool carrier



## What do you use an integrated tool carrier for?

- Mining
- Construction
- Clean up
- Moving dirt/rocks etc
- Agriculture – farming
- Forestry
- Can use for lifting purposes



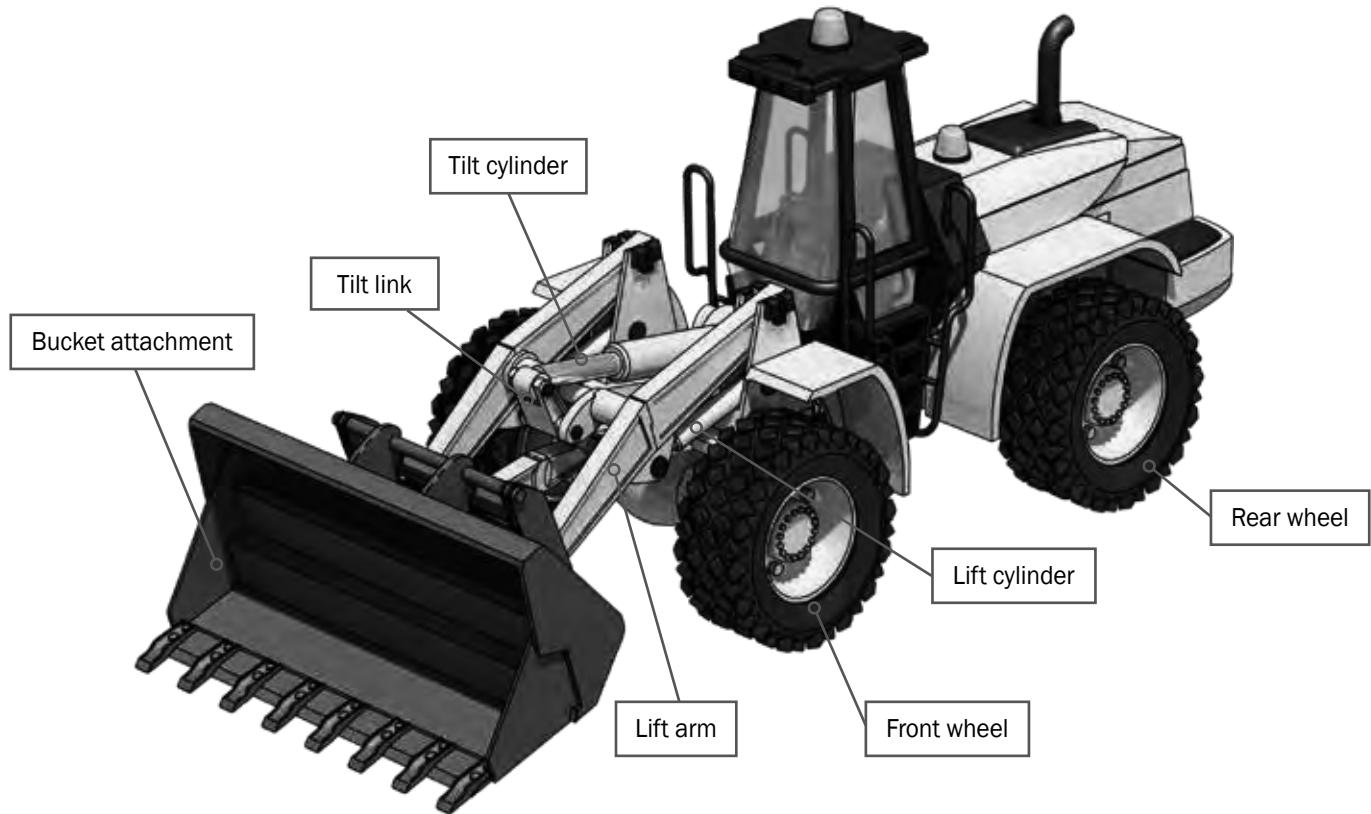
## What industries do you use an integrated tool carrier in?

- Civil construction
- Mining



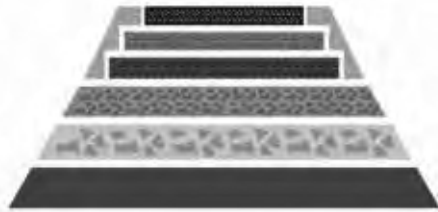
## Example of an integrated tool carrier (ITC)

An integrated tool carrier (ITC) is a machine similar to a front end loader which has a quick release mechanism on the lift arms which allows the fast changing of various attachments without the need for hand tools or special equipment.

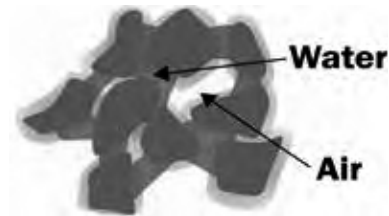


## Principles of soil technology for civil works

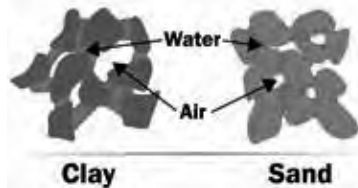
One of the most important jobs you will do, as a machine operator, is to help lay foundations. Foundations are the base for roads, railway lines, swimming pools and buildings. If you do not have a solid foundation, you cannot build something solid on top of it.



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.



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.

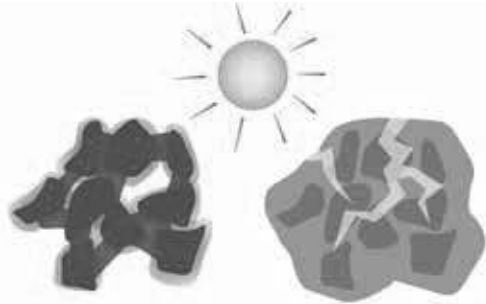


Different types of soils can cause problems with foundations. Wet, boggy soil can cause foundations to sink. That is why it is important to make sure water can run or drain from the site. It is also important that the foundation is built up to the right level. You can sometimes treat wet boggy soil with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



*Principles of soil technology for civil works (continued)*

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.



## Earthmoving site hazards

### 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.





## Operating techniques

### 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.



*Building a stockpile (continued)*

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.



## Operating techniques

### 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.



## Earthmoving hazards and risks

The most common hazards and risks with earthmoving work are:

Falls from plant or machinery



Traffic and other mobile plant



Overhead or underground power



Underground gas lines



Water and sewage piping



Rollovers



*Earthmoving hazards and risks (continued)*

Noise



Dust



Manual handling



Contaminated soil



Falling into trenches or excavations



UV rays (radiation) from working in the sun



## 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).



## 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:

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

## Tools and equipment

Here are some typical tools and equipment you might need.

### Personal protective equipment (PPE)

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



### Hand tools

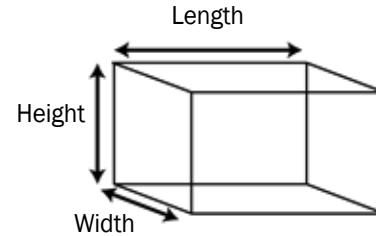
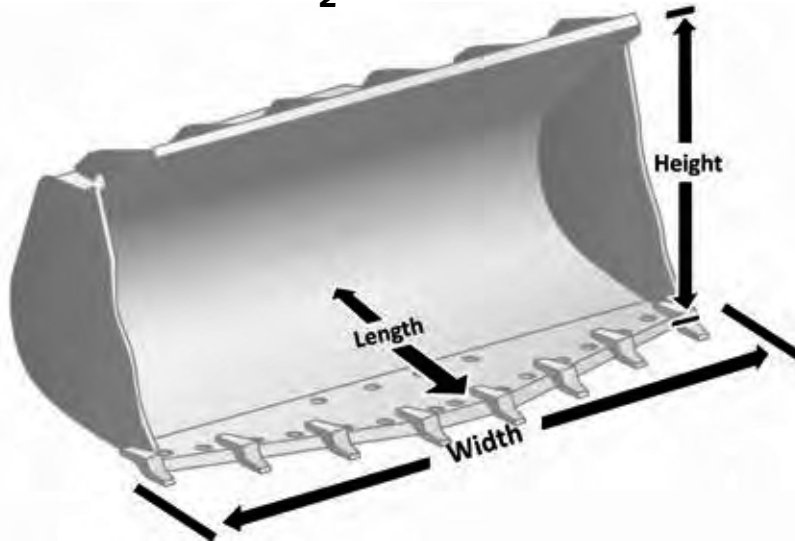
- Shovel and levels
- Socket sets
- Screwdrivers or wrenches
- Wire brush
- Spanners



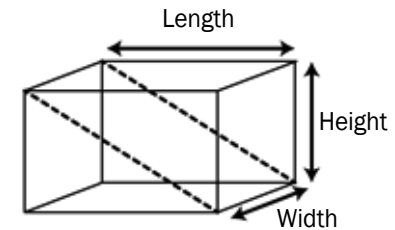
Calculations (continued)

## How to find the cubic capacity of a bucket

$$\text{Capacity} = \frac{L \times W \times H}{2}$$



**Cubic capacity of cube**  
 $= L \times W \times H$



**Cubic capacity of bucket**  
 $= (L \times W \times H) \div 2$

Cubic capacity is  $\div 2$  because of the shape of the bucket (a triangular prism)



# Plan and prepare for integrated tool carrier operations

## Element 1



**QUESTION 9**

What do the job's work instructions explain?

Work instructions explain:

What to do in unexpected situations like bad weather

What the job is

Where the job is



How to do the job safely

How long the job will take

What tools and equipment you need

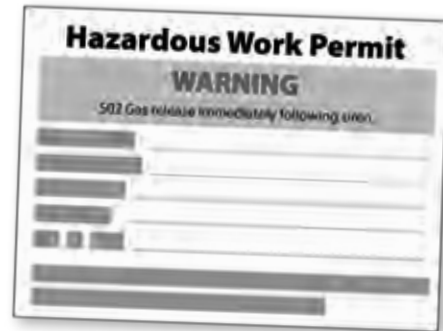
How to do the job from start to finish

**QUESTION 10**

You will be working in a hazardous area.

What type of permit might you need to get?

You may need to get a hazardous work permit.



**QUESTION 11**

What does the safety plan tell you?  
What personal protective equipment (PPE) 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



...CONTINUES ON NEXT PAGE

**QUESTION 11****...CONTINUED FROM PREVIOUS PAGE**

What does the safety plan tell you?

How to use tools, plant and equipment safely



Emergency procedures and exits



How to park safely and where to park



Control hazards and risks



**QUESTION 12**

What kinds of personal protective equipment (PPE) should you use when:

1. The work area is noisy?
2. Something might fall on you?
3. You are operating equipment?

1. Ear muffs or other hearing protection.



2. Safety helmet.



3. Non-slip footwear that cover your feet. Some sites require steel capped lace up boots. Do not wear thongs!

**QUESTION 13**

There is a trench near a pedestrian footpath.

How can you stop people falling into the trench?

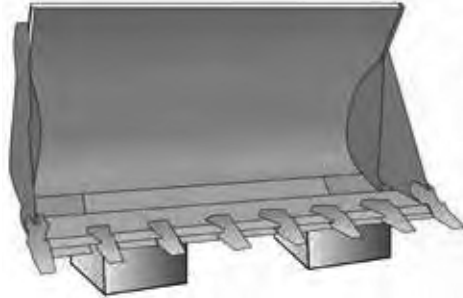
Put up barricades, guard rails or fencing. Use signs to warn people of the danger.



**QUESTION 14**

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

Chocks, blocks or safety bars to stop the bucket dropping



Crow bars



Hand tools such as spanners, ratchets, wrenches, screwdrivers, hammers



Socket set



**...CONTINUES ON NEXT PAGE**

**QUESTION 14****...CONTINUED FROM PREVIOUS PAGE**

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

Laser level



Wire brush



Welder



Jack

**...CONTINUES ON NEXT PAGE**



**QUESTION 14****...CONTINUED FROM PREVIOUS PAGE**

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

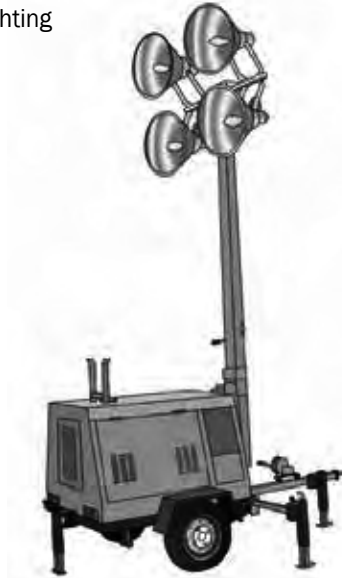
Grinder



Oxy set



Portable lighting



Grease gun

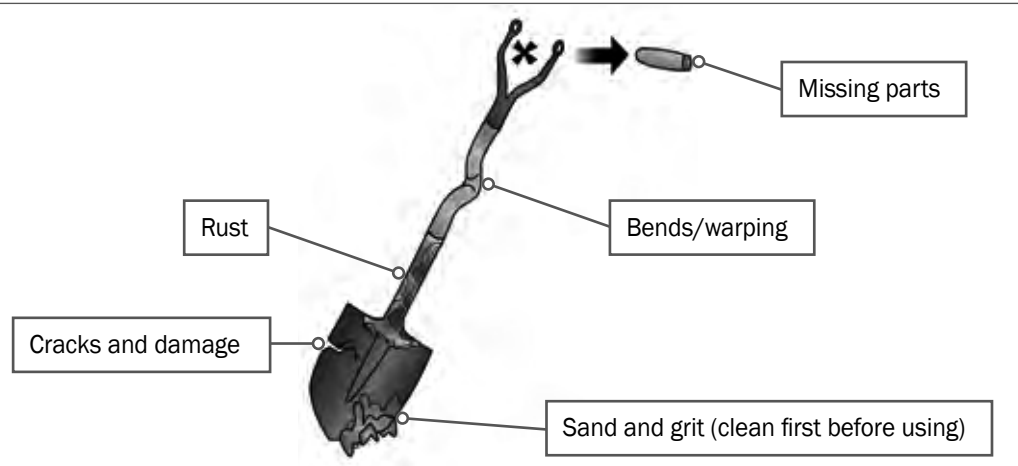


Other hand tools  
that come with  
the integrated tool  
carrier



**QUESTION 15**

What kinds of faults do you check hand tools for?

**QUESTION 16**

What do you do with faulty hand tools?

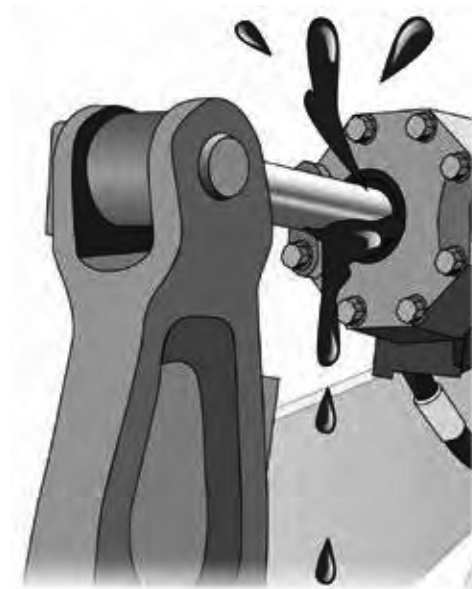
If you can, arrange to have them repaired.  
If that is not possible, put them in the rubbish.



**QUESTION 17**

What attachment checks do you do?

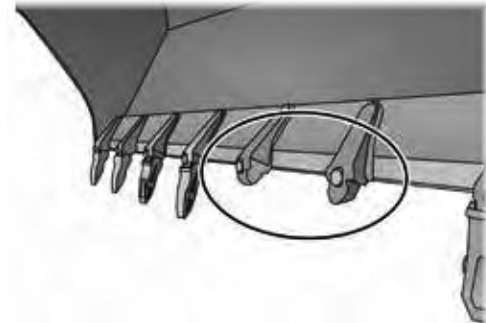
Check oil leaks from hoses, fittings and hydraulic rams



Check worn cutting edge or skid plates



Check worn, loose or missing teeth

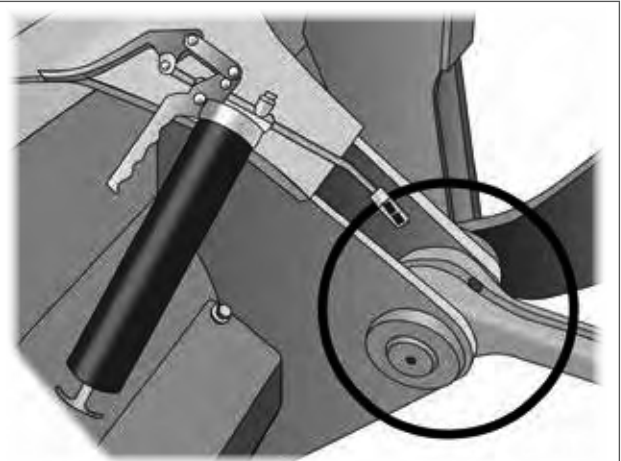


**...CONTINUES ON NEXT PAGE**

**QUESTION 17****...CONTINUED FROM PREVIOUS PAGE**

What attachment checks do you do?

Check grease nipples



Check missing pins and keepers

