Traffic and Mobile Equipment Procedures

Vehicle accidents cause a significant number of injuries within the mining industry each year. Many vehicle accidents have caused serious injuries and even fatalities. As well, you should be aware that vehicles and mobile equipment represent a significant portion of the investment in any mining project. Accident damage to vehicles and equipment may result in a large amount of financial loss, not only to repair or replace the equipment, but also in lost production.

The site's Safety and Health Management System must provide procedures that govern the use of vehicles and mobile equipment. These should be obeyed by all drivers and operators at all times. Where the mine procedures make no specific provision, drivers and operators must observe the normal traffic rules for that State or Territory.

This topic provides details of the general procedures that you will be required to follow on most mine sites. These procedures fall into four categories:

- 1. Authority to operate
- 2. Operator's responsibilities for checking and operating equipment
- 3. General traffic procedures
- 4. Response to emergency situations

Warning:

Mine sites will have developed their own traffic procedures to suit site-specific requirements. You should ensure that you familiarise yourself with these procedures.

DEFINITIONS

The following definitions for vehicles and mobile equipment are observed throughout this topic.

- Light Vehicles Vehicles such as 4WD cars, utilities, and tray backs.
- Medium Vehicles Vehicles / equipment such as bobcats, backhoes, cranes, loaders, rigid trucks etc.
- Mobile Equipment Equipment such as haul trucks, graders, dozers etc.

Your site traffic procedures will define the vehicle types used on your mine.

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Scraper

1. AUTHORITY TO OPERATE ON THE MINE SITE

You must not operate any vehicle or mobile equipment unless you:

- have obtained the appropriate competency for the particular vehicle or mobile equipment, and
- have been authorised in writing by senior management or their representative.

The exception to this is when you are undergoing approved operator training under the supervision of an appointed trainer.

The authorisation you are granted may permit you to drive or operate in certain areas only. For example, you may be authorised to drive to the stores area or on certain access roads but not on the rest of the mine site (i.e. haul roads, stockpiles etc).

Warning:

Do not operate any vehicle or item of mobile equipment in any area unless you have been deemed competent and been authorised in writing by senior management or their representative.

2. OPERATOR'S RESPONSIBILITIES FOR CHECKING AND OPERATING EQUIPMENT

THE ROLE OF THE DRIVER/OPERATOR

At first glance, it would seem that the driver/operator's role is simply to drive or operate the machine. However, this approach ignores some other important aspects of the operator's job. Some of the other functions an operator may need to fulfill include:

- selecting the correct equipment for the job
- performing walkaround checks
- conducting pre-start inspections
- reporting defects
- servicing (fluid/lubricant/fuel refills)
- operating the equipment safely and productively
- operating the equipment with due care so as not to reduce its service life or cause unnecessary damage to it or other equipment
- parking equipment safely in designated areas
- observing the correct shutdown procedures
- ensuring that the equipment is available for use whenever it is next required
- ensuring that preventative maintenance is carried out when it is due
- ensuring that high standards of housekeeping are maintained.



Traffic and Mobile Equipment Procedures

If each operator performs all of these roles diligently, then a high standard of vehicle and mobile equipment operations will be maintained throughout the mine site. Correct and careful operation of the equipment can extend its serviceable life and reduce the cost of repairs and maintenance.

SELECTING EQUIPMENT FOR THE JOB

It is important that vehicles and mobile equipment are used to achieve the most economic benefit. It is therefore important for the correct type of vehicle or mobile equipment to be used for any given task.

Essentially, mobile equipment used in the mining industry can be categorised under three classifications:

- Earthmoving moving/manipulating materials
- Excavating digging/excavating/loading material
- Transporting haulaging/high speed relocation of material.

All equipment, whether on wheels, tracks or walking pads will fit into one of these categories in which it will operate most efficiently and economically. Mismatching machines against applications is ineffective and adds needlessly to costs.

For example, operating a dozer to move a blade full of material over 1000 metres from 'cut' point to 'fill' point would be a ridiculously expensive mismatch of machine to job.



Shovel loading a dump truck

As well as selecting the correct machine for the job, it is also important to select the correct number of machines so that the job is done efficiently. Obviously, if machines are spending a large percentage of their time waiting, then the job is not being conducted efficiently. Selecting the correct number of machines reduces waiting time and minimises avoidable delays.

While you will normally be assigned to machines and tasks, you should be aware of these principles and raise potential efficiency gains with your supervisor.

CHECKING EQUIPMENT

Walkaround Checks and Pre-Start Inspection

The site Standard Operating Procedure (SOP) will require you to carry out walkaround checks and pre-start inspections on all vehicles and mobile equipment on the mine site. Don't ever think that pressure of work means there is not enough time to properly conduct the inspections and checks. The cost of a few minutes inspection time is easily justified when compared with the hours or days of unscheduled downtime that can occur because not enough attention has been paid to properly checking equipment.

Walkaround checks are completed each time you take charge of a vehicle or piece of equipment and at breaks. As the name suggests, walkaround checks involve walking around the vehicle or mobile plant at ground level, visually inspecting for signs of defects or faults. You will be looking for such things as cuts in tyres, low tyre pressure, loose or missing wheel nuts, blown lights, loose or damaged panels, and so on. Walkaround checks should be completed even in the event of a 'hot seat' changeover. Do not assume vehicles and mobile equipment are in perfect order simply because they have been performing well over the course of the previous shift.



Pre-start inspections are normally conducted at the beginning of the shift or the first time the vehicle or item of equipment is used on a shift. The following are pre-start checks which are typically included in a site standard operating procedure (SOP):

- Check for Danger/Out of Service/Information tags on the main isolator switch or other obvious location.
- Check all oil levels (engine, power steering etc).
- Check the condition of the tyres including pressure, depth of tread, rips, cuts, abrasion, damage to valves, missing valve caps, and for foreign material embedded in the tyre.
- · Check the condition of the rims and wheel nuts.
- Clean the windscreen if necessary.
- Fill the windscreen washer reservoir if necessary.
- Check that the radiator is full and the cap is secure.
- Check the operation of indicators, stop lights, head lights, tail lights.
- Check the operation of all vehicle instrumentation and the horn.
- Check the operation of the foot and hand brake.
- Ensure a fire extinguisher is in place and is in a serviceable condition.
- Inspect that the door latches operate inside and out.
- Check the fuel level.
- Check the spare tyre, jack and lever.
- Check that seatbelts are clean and in working order.
- Check the flashing lights or flags on light vehicles.

Traffic and Mobile Equipment Procedures

Vehicle and Mobile Equipment Defects

During the course of inspections and pre-start checks you will encounter defects and faults from time-to-time. In all cases, you should ensure that the defect or fault is either repaired or reported through the appropriate channels. If the problem is such that the equipment is unsafe to operate, you should attach an Out of Service tag to the appropriate position to ensure that the vehicle or item of mobile equipment is not operated. Never operate any vehicle that is in an unsafe condition.

Note:

You are responsible for your own safety and that of your workmates and the equipment.

SERVICING EQUIPMENT

Servicing is an important part of vehicle and mobile equipment operations. On many mine sites, all servicing will be carried out by workshop personnel or the manufacturer's maintenance contractor. However, the driver/operator may be responsible for some aspects of minor servicing including such tasks as topping up fluids and cleaning filters. Note that in all cases, the servicing of mining equipment can only be performed by trained and authorised personnel.

A range of fluid level indicating devices are used on plant and equipment. They range from sight glasses and dipsticks through to level plugs and devices which will signal an unobserved low level condition via audible or visual warnings or by system shutdown.

Whichever type of device is fitted to equipment that you are checking, ensure that you maintain the correct type and level of the fluid in the appropriate compartment. Failure to do so can cause severe equipment damage which is costly to repair.

Warning:

Fluid tanks and compartments may contain hot fluids under pressure. Ensure you know the correct procedures for checking and refilling before commencing such tasks.

Refuelling

The following procedures may apply when refuelling vehicles. Ensure that:

- you turn off the engine
- you vacate the cab during refuelling
- there is no smoking or naked flame near fuelling operations
- fuel is not spilt and fuel nozzles are replaced in holders



OPERATING EQUIPMENT

General Principles

Your training for operating a vehicle or piece of equipment will provide information on specific procedures for operation. However, the following five general principles should be observed at all times:

- 1. Operate the equipment in a safe manner at all times.
- 2. Carry out all operational checks correctly (e.g. temperature, pressure checks, etc).
- 3. Operate the equipment productively and efficiently.
- 4. Don't use the equipment in a manner which will reduce its service life.
- 5. Operate the equipment in accordance with the site's Safety and Health Management System procedures and relevant legislation.

If all drivers and operators understand and adopt these principles there is a high probability that the operation of mobile equipment will be successful and profitable.

Operational Checks

All drivers and operators of vehicles should perform all specified operational checks while the machine is being operated. This includes monitoring such items as:

- gauges temperature, fluid level (eg fuel), pressure
- all controls and switches
- alarms and indicator lights
- · vehicle levelling devices.

You should ensure that you check these items on a frequent and regular basis and respond appropriately to any indicator that falls outside of the normal operating range or any alarm that sounds during operation.



Dump truck controls and gauges

Warning:

If any reading is abnormal, stop the equipment and have the problem rectified.

Traffic and Mobile Equipment Procedures

VEHICLE/MOBILE EQUIPMENT HOUSEKEEPING

The basic rule is to leave the vehicle/mobile equipment in the condition in which you would like to find it.

Clutter and litter is not only unsightly, it can also be dangerous. Follow these simple procedures to maintain a tidy vehicle/mobile equipment.

- Clean up as you go. Remove spills of oil or grease immediately and do not allow rubbish to
- Dispose of any used oil containers and oily rags in accordance with the site waste disposal policy.
- Make sure the seating is clean enough to sit on.
- Treat the vehicle/mobile equipment with respect and remember that other people will use it after you.



3. GENERAL TRAFFIC PROCEDURES

This section provides information on the general traffic procedures you will encounter on most mine sites. Ensure you familiarise yourself with any site-specific procedures that apply to the mine site where you are working, since they may differ slightly from those provided here.

TRAFFIC RULES

Seatbelts

Drivers and passengers must be seated in approved seating and have their seatbelts fitted and correctly adjusted before the vehicle moves off.

Speed Limits

Speed limits around the site are indicated by appropriate signage. Do not exceed the posted speed limits. Remember that these are maximum speeds - slower speeds are often necessary to suit traffic and specific weather and road conditions.

Keep Left

As for the public road system, general traffic is usually required to keep to the left.

Give Way Procedures

The following "give way" procedures apply on the mine site.

 All vehicles must give way to emergency vehicles while they are displaying emergency signals. Vehicles are to keep to the left to allow the emergency vehicle to pass.

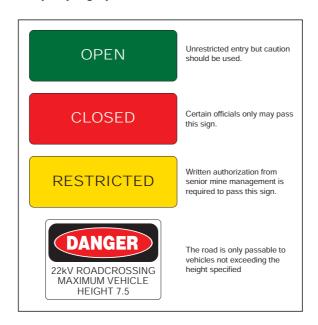


 Except where 'Give Way' or 'Stop' signs exist, a site specific 'give way' procedure will apply. On some sites items of mobile equipment such as trucks, loaders, cranes, forklifts, graders, etc have the right of way over light vehicles.

Drivers with the "right of way" should exercise caution and show consideration to other vehicles. Do not insist on claiming your right of way if it is likely to cause a collision.

Warning Signs

Many traffic signs used on a mine site are the same as those used on public roads. The illustration below shows some of the additional traffic control signs that may be used on a mine site. You should obey any sign you encounter.



Horn Signals

With the exception of light vehicles, operators of ALL mobile equipment must sound the correct horn signal before starting the engine and before moving in any direction.

One blast before starting the engine

Two blasts before moving forward

Three blasts — before reversing.

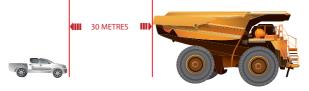
To enable people nearby to move to a safe position, a driver shall not start or move mobile equipment for ten seconds after signalling an intention to move.

Traffic and Mobile Equipment Procedures

Separation

Following too close to the rear of another vehicle is a dangerous practice. This is particularly important when following items of mobile equipment where the operator's vision may be restricted. The following procedures should apply.

- Maintain a distance of at least 30 metres from the vehicle in front and position your vehicle in the field of view of the mobile equipment operator's rear view mirror.
- The minimum distance of 30 metres should be increased when visibility is decreased eq in dust, rain, fog, at night.



Overtaking

Overtaking on a mine site may only occur after positive radio contact has been made with the driver/operator of the vehicle being overtaken.

Overtaking heavy mobile equipment is hazardous and is prohibited in the following circumstances.

- Where a watercart is operating with its sprays on.
- · Where the overtaking vehicle has to exceed the speed limit in order to complete the manoeuvre.
- Where sufficient clear visibility is not available to allow safe overtaking.
- On a single lane road or where the width of the road is insufficient to allow two vehicles to pass safely.

Note:

The operator of the overtaking vehicle is responsible for the safe completion of the manoeuvre.

Restricted Areas

Mine sites will have restricted areas where vehicle operations require written authorisation or special permits. Ensure you know where the restricted areas are and ensure you do not enter them unless you are appropriately authorised.

Restricted areas may include:

- explosives magazine compound
- designated blast areas
- underground workings
- air strips and aeroplane parking and refuelling areas
- areas designated as environmentally sensitive

- rehabilitation areas
- cultural heritage areas
- roads closed for repair or rebuilding.

If you work on a mine that has both surface and underground operations, you should be aware that workers, vehicles and items of mobile equipment must be authorised to go underground. Only vehicles which are certified for use in an underground coal mine and which have been authorised by the site's senior management may be driven into the portal.

Parking

When parking a vehicle or item of mobile equipment, ensure:

- the area where you are parking is designated as a parking zone
- the park brake and transmission selector are set to the appropriate position
- you follow the appropriate shutdown procedures
- at the end of the shift, items of wheeled mobile equipment are parked in the 'spoon drain' parking facilities
- light vehicles are parked in designated areas.

Haul Roads

By law, haul roads regularly used for two-way traffic should be at least 3.5 times the width of the largest vehicle using the road. If you are required to operate mobile equipment on a mine site, ensure that you are familiar with any width restrictions on the mine's roads.



Haul road

Lighting Code

The lighting code shown below is generally followed across most mine sites. You should familiarise yourself with the code and respond appropriately when you encounter the site-specific lights on vehicles/mobile equipment.

Note that flashing lights must be turned off when driving the vehicle on public roads



Traffic and Mobile Equipment Procedures

SAFE PRACTICES FOR VEHICLES/MOBILE EQUIPMENT

Obscured Vision

Remember, the operators of items of mobile equipment do not have all-round vision. The diagram below shows the blind spots that occur on a typical item of heavy equipment. As you can see, the blind spots are large enough to prevent the operator from seeing pedestrians and vehicles. Numerous accidents have occurred where mobile equipment has been driven or reversed over vehicles which were parked in a blind spot. For your own safety, assume the operator cannot see you.



Drivers of vehicles entering areas where large equipment such as excavators, shovels, dozers, scrapers and haul trucks are working must:

- only do so if necessary for the performance of their work
- make radio contact with operating units
- shut off the engine and set the park brake when parking the vehicle.

If you are entering the working area of a dragline, you must gain permission from the dragline operator. Your mine will have a site procedure for this.



Mine traffic - Note light vehicle circled

Exercise extreme care when driving in congested areas or manoeuvring in confined locations. When reversing, make certain all is clear behind you. If necessary, have someone direct you and/or assist you to control other traffic.

Night Driving

During the hours of darkness, vehicles are to be driven with headlights on. Always drive to the range of your lights and dip them to oncoming traffic.

The reduced visibility at night presents hazards which require the operator to exercise a greater level of caution than during daylight hours. The diligent use of turn signals is also more important at night.

Note:

Use your headlights and indicators courteously and diligently when driving at night.

Wet Weather

After a shower of rain or the operation of water trucks, wet, slippery road surfaces will reduce tyre traction. The following guidelines should be followed when driving in these conditions.

- Avoid severe applications of the brakes, throttle and retarder, or sudden movements
 of the steering wheel. Smooth driving is a key factor to staying out of trouble.
- When travelling down hills use the same gear to descend as you would to drive up.
- Use 4WD where necessary.
- Increase the travelling distance behind other vehicles, especially heavy equipment.
- It is good practice to use headlights if visibility is poor and if it is severely reduced, you should stop.
- Above all, drive to the conditions of the road that prevail at that time.

Roadworks

Drive slowly on roads that are under repair or maintenance work. Follow all warning and instruction signs that indicate the presence of unsafe conditions. Above all, obey any signs which indicate a road is closed.

Pedestrians

When operating any vehicle or mobile equipment, keep a look out for pedestrians. Be courteous when operating any vehicle around pedestrians. For example, do not cover them with dust or water from puddles etc.

On the surface, pedestrians must give way to vehicles unless on a signed pedestrian crossing. If you are on foot around mobile equipment, ensure that you can be seen by the operator. If you are not sure the operator is aware of your presence, you should assume that he/she does not know you are there.



Loader

Breakdowns

Repair or arrange for the repair of any faults or breakdowns of the vehicle. Do not leave it to the next person or until it causes an accident or further damage. If you need to leave a broken down vehicle unattended, ensure that it does not cause a hazard to other road users. Leave an Out of Service tag attached to the steering wheel or other appropriate location so that any person checking the vehicle is aware of the problem.

Changing Wheels

You should only change wheels on vehicles or mobile equipment if you have been trained, assessed as competent, and authorized to do so.

Traffic and Mobile Equipment Procedures

Towing

Trailers are to be fitted with safety chains crossed under the draw bar to cradle it in the event that the towing hitch becomes disconnected.

Do not exceed the load rating of the trailer. Extreme caution should be used when towing another vehicle because the towed vehicle may not have power brakes or power steering functions.

Loading Haul Trucks

During the loading of haul trucks, the driver should remain in the cab. If it is necessary for the driver to exit the cab in the loading area, two-way radio communication should be made to ensure that the loading operation is temporarily stopped.

High/Wide Loads

Exercise extreme care when transporting high/wide loads. Plan the route paying particular attention to overhead obstacles. Obstacles may include items such as conveyors and power lines. On some sites, you will need to raise a permit to transport high/wide loads.

4. RESPONSE TO EMERGENCY SITUATIONS

ROLLOVERS

Rollovers can occur to any vehicle. Articulated loaders, forklifts and haulage trucks are particularly prone to this hazard.

Rollovers mostly occur as a result of one or more of the following conditions. Noted next to each cause is the method of avoiding a rollover



Potential cause	Preventive action
The vehicle is articulated	Never turn a loader with the bucket raised — approach a truck or stockpile as straight as possible
The bucket or fork is raised too high	Always travel with the bucket or forks as low as is practically possible
Flat tyre	Check tyres for cuts and gouges during your pre-start checks
Rocks or rough surface in the tramming area	Keep the working area clean and levelled off.
Excessive speed	Drive at a safe speed

To reduce the risk of injury, always wear a seatbelt. Never try to jump clear if a rollover is imminent — hang on and stay in the seat.

RUNAWAY VEHICLES

Component failure, inattention, and not complying with safety procedures can all contribute to a runaway situation. If a runaway situation should occur, there are three important points that you should remember and act upon:

- Do not leave the vehicle until it is stopped and parked. In most circumstances, the risk of injury to you is far greater if you jump out. Fatalities have occurred when operators have tried to jump clear but have been run over by the vehicle. The exception would be when there is clearly going to be catastrophic damage to the vehicle and certain severe injury or death (eg heading over a high vertical face).
- 2. The vehicle should be brought to a stop as quickly as possible. Any delay in operating the emergency brakes will allow the vehicle to accelerate to dangerous speeds.



3. Never attempt to jump onto a runaway vehicle in the hope of bringing it under control.

Stopping a runaway vehicle probably requires more conscious thought and effort from you than any other operating situation.

You should be aware that once the engine has failed, or part of the drive train between the engine and the wheels has failed, the vehicle can only be stopped by:

- applying the brakes and/or emergency brakes
- lowering hydraulic equipment such as the bucket of a loader
- turning toward a rill or windrow. This should only be used as a last resort.

Caution:

The worst possible thing to do if you experience brake problems is to engage the transmission in the opposite direction to your travel. In this situation:

- the transmission attempts to drive the engine backwards until the torque converter stalls
- the usual result is that the engine stalls, leaving you with no engine braking, no service brakes, (although one or two applications may be possible) and limited steering.

TYRE FIRES

The main risk in a tyre fire is that the tyre will explode. This may propel the split rim at great speed over 200 to 300 metres. Tyres may also explode if brake drums or wheel bearings overheat or if the vehicle comes into contact with overhead power lines.

Traffic and Mobile Equipment Procedures

In the event of becoming aware of a tyre fire:

- 1. Use the emergency radio procedure to call for help
- 2. move the vehicle to a clear area 300m to 500 m away if possible and safe to do so
- 3. shut down the engine
- 4. dismount from the machine on the side away from the burning tyre or follow site procedures (this may include transferring to another vehicle).
- 5. evacuate the area around the vehicle.
- 6. do not attempt to extinguish the tyre fire.
- 7. do not approach the vehicle for 24 hours after the fire is extinguished.



ON-BOARD FIRES

Naturally, prevention is better than a cure. All precautions should be taken to ensure fire does not occur on vehicles or mobile equipment.

Warning:

Fire extinguishers should be fully charged and correctly located on all vehicles and items of mobile equipment. Do not operate a vehicle or item of mobile equipment which is not fitted with an appropriately located and fully charged fire extinguisher.

Do not attempt to fight an on-board fire with a hand-held extinguisher where there is a danger of an explosion from overheated tyres, fuel ignition, batteries etc.

In the event of an on-board fire, the following procedures should be used.

- On a vehicle NOT FITTED with a fire suppression system, the following procedures should be adopted:
 - 1. Bring the vehicle to a stop.
 - 2. Apply the park brake, put the transmission in neutral.
 - 3. Shut the engine down as soon as possible.
 - 4. Use the emergency radio procedure to call for help.
 - 5. Isolate the batteries if possible.
 - 6. Leave the vehicle and remove the hand-held fire extinguisher.
 - 7. Use the extinguisher to fight the fire in those instances where it is safe to do so. When the extinguisher is exhausted, stand well clear of the vehicle.

Warning:

Do not under any circumstances attempt to fight a fire aboard an explosives vehicle. Clear the area and contact the emergency response team.

Many of the items of mobile equipment on mine sites are fitted with automatic fire suppression systems. These systems may trigger automatically, or may be operated manually by removing the safety pull ring and pressing the actuator button.

- On a vehicle/mobile equipment FITTED with a fire suppression system the following procedures should be adopted:
 - 1. Bring the vehicle to a stop.
 - Apply the park brake, put the transmission in neutral.
 - 3. Shut the engine down as soon as possible.
 - 4. Activate the fire suppression system from the cab.
 - 5. Use the emergency radio procedure to call for help.
 - 6. Isolate the batteries if possible.
 - 7. Leave the vehicle and remove the hand-held extinguisher.
 - 8. Use the extinguisher to assist the fire suppression system in those instances where it is safe to do so. When the extinguisher is exhausted, stand well clear of the vehicle.

The fire suppression system can usually be activated from the ground as well as from within the cab.

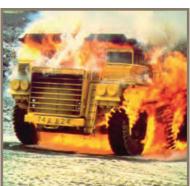
Warning:

Once the suppression system has operated, it should be recharged. Do not operate the vehicle if the fire suppression system is not fully charged.

TRAFFIC ACCIDENTS

Any accident or near miss involving vehicles or mobile equipment should be reported to the person coordinating your work and ultimately to the senior manager of the site. In the case of a serious accident, do not disturb the vehicle/s or the accident site, except to save someone's life or to prevent further injury





Traffic and Mobile Equipment Procedures

Note:

Precise procedures in the event of an accident will be provided at the site-specific induction.

If a hazard exists to other road users as a result of the accident, place safety cones or lights either side of the accident as a warning. If someone has been seriously injured, seek medical assistance using the emergency two-way radio procedure, giving accurate information and directions. Where possible arrange for another vehicle to meet and direct emergency vehicles to the scene.

The person who co-ordinates the response to the emergency may summon the mine's Emergency Response Team in the case of accidents involving:

- trapped persons
- · vehicles which have come to a stop in an inaccessible area as a result of the accident
- · any danger from leaking fuels, gases or hazardous materials
- · spillage of chemicals.

SUMMARY

This topic has provided information on the responsibilities and procedures that are relevant to the operation of vehicles and mobile equipment. Naturally, it is beyond the scope of this training program to cover every procedure and every traffic situation. The information provided here should be regarded as a basis on which to build your knowledge of site-specific traffic procedures. Ensure that you obtain a copy of the procedures for any site on which you work and ensure you become familiar with them. If the traffic procedures are obeyed at all times, the chances of traffic accidents on site will be greatly reduced. Do your part by ensuring that you follow the procedures.



Dozer and scraper stripping top soil