

327B & 330B Articulated Trucks

Service Manual

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From serial no. ZCNAD30TP8P457003





SERVICE MANUAL

ARTICULATED TRUCKS

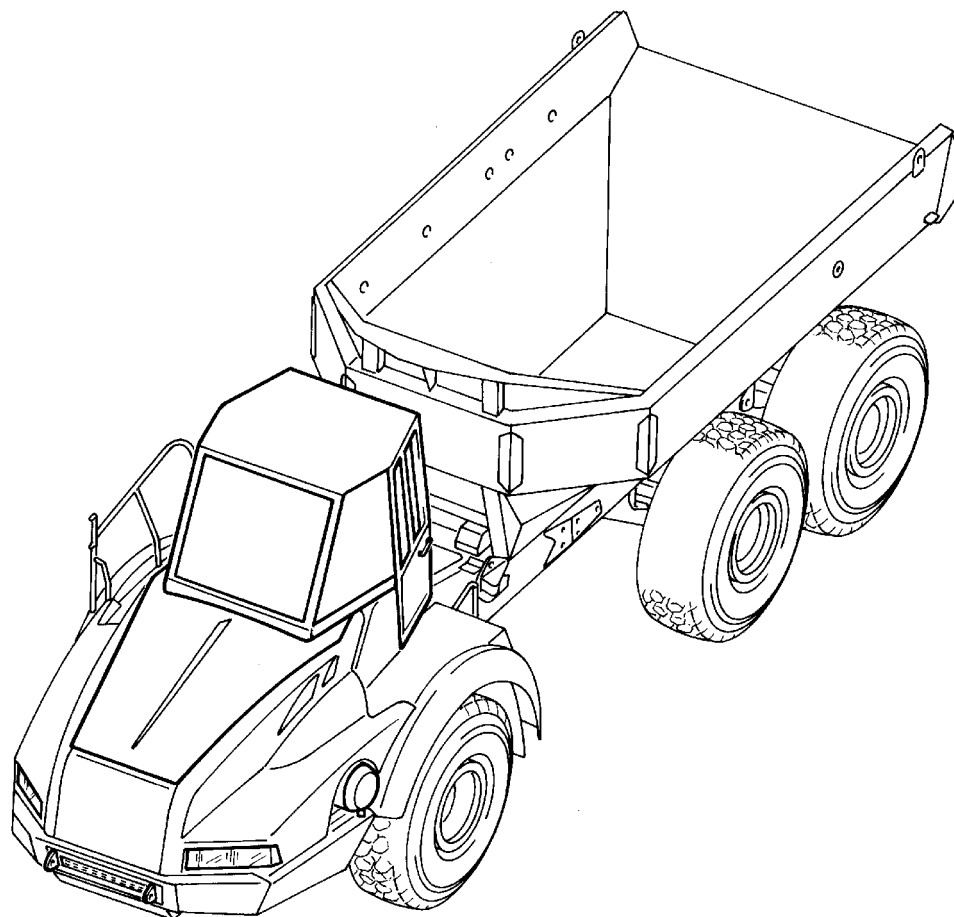
327B-330B

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All data given in this publication is subject to production variations. Dimensions and weights are only approximate. Illustrations do not necessarily show products in standard condition. For exact information about any particular product, please consult your Dealer.

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Figure 1



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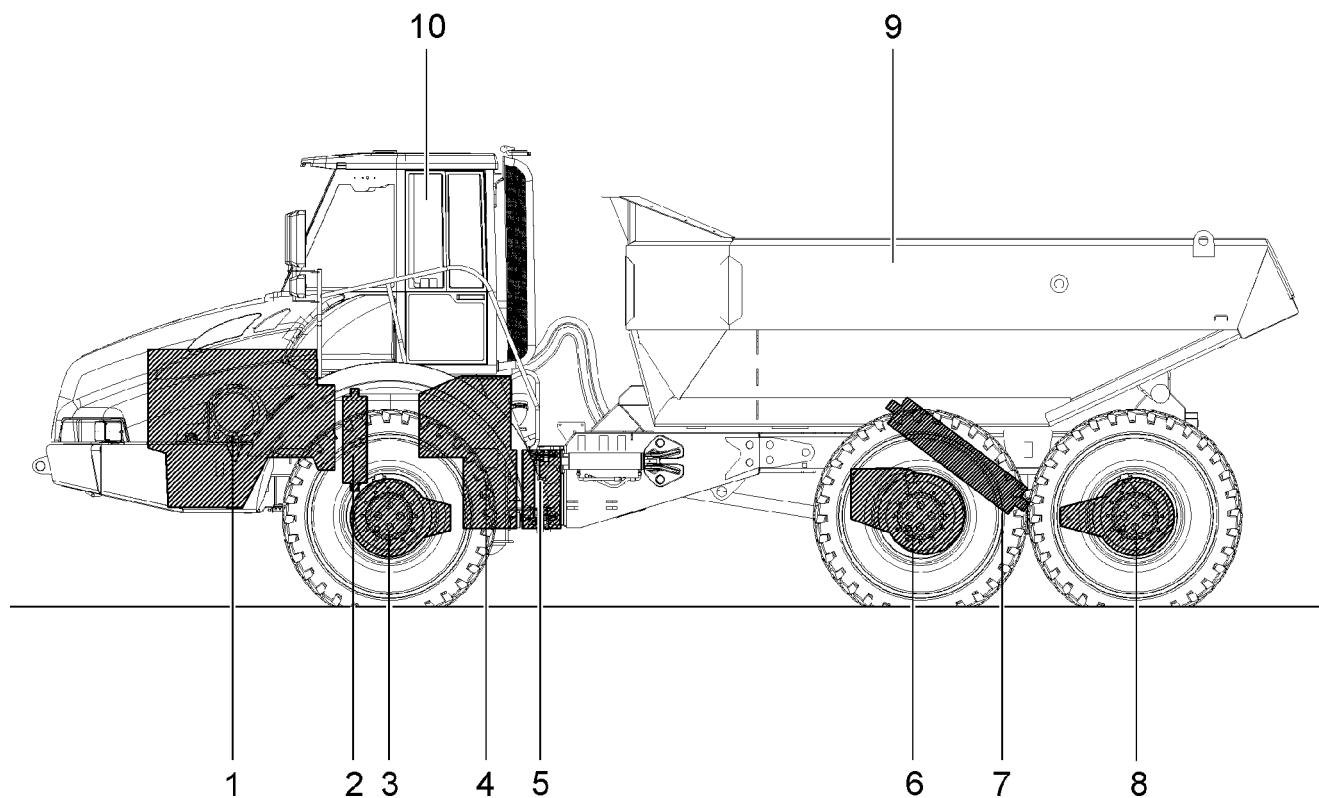
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PARTS

Figure 2



276CRM001

1. Engine
2. Suspension cylinder
3. Front axle
4. Transmission
5. Articulation joint
6. Intermediate axle
7. Dumper cylinder
8. Rear axle
9. Body
10. Cab

Main vehicle assemblies production numbers

You are advised to make a note of the model and serial number (PN) and/or production code (PIN) of the main vehicle assemblies written on the respective plates applied to the assembly.

The plate location is shown in Section 2– TECHNICAL DATA. This will ensure faster identification of the parts required for partial or total replacement.

Engine

Automatic transmission

Front hubs

Intermediate axle

Rear axle

Chassis

Cab

Suspension cylinder

Tipper cylinder

Steering cylinders

Hydraulic system pump

**Brake cooling system pumps
(wet brakes version)**

Radiator fan system pump

Radiator fan system motor

Tipper valve

Steering valve

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SERVICE MANUAL - SECTION 1

**ARTICULATED DUMP TRUCKS
327B-330B**

GENERAL

327B-330B**SECTION 1****GENERAL**

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CONDITIONS OF USE

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INTRODUCTION

This technical handbook contains a series of repair procedures relating to the articulated dump trucks ADT 327B-330B.

This handbook is an integral part of the vehicle. It is provided with the vehicle and must be kept with the vehicle for future reference until scrapping.

Read this handbook carefully before using the vehicle. Safe running and long life of your vehicle will depend on the observance of the rules suggested in this issue.

Copyright

The copyrights of this handbook belong to the vehicle manufacturer.

The text, drawings and illustrations contained in this handbook cannot be circulated or given to third parties, totally or partially, without the written consent of the vehicle manufacturer.

INFORMATION ON THIS HANDBOOK

Definitions

Handbook *is this* SERVICE MANUAL.

Vehicle is the machinery described in this manual.

Manufacturer is the company manufacturing the vehicle.

Dealership is the company or organisation officially representing the Manufacturer.

Supplier is any company supplying components and/or consumable material used by the vehicle.

User is the person directly or indirectly involved in repairing the vehicle.

Contents



This manual contains the repair instructions for all the vehicle parts.



Some devices described in this handbook may not be fitted in your vehicle, according to the outfit and the market for which the vehicle was made.

This handbook is organised in several sections, which are organised in chapters and, where required, paragraphs to ensure rapid and easy retrieval of information.

Refer to the general list of contents at the beginning of this Handbook for further information on how the various topics are set out.

Symbols

You will find the following symbols highlighting parts of the handbook. Their meaning is:



Procedures, technical information and precautions which, if not respected and/or incorrectly carried out, could cause injury to users (safety symbol, also see section SAFETY INSTRUCTIONS).



Procedures, technical information and precautions which, if not respected and/or incorrectly carried out, could damage the vehicle.



Procedures, technical information and precautions which, if not respected and/or incorrectly carried out, could pollute the environment.



Very important procedures, technical information and precautions.

Purpose of this handbook

Purpose of this handbook is to allow users to get to know the vehicle and repair it as specified, in a safe and long-lasting fashion, taking the required actions and arranging human and material resources as needed.

To whom this manual is addressed

This manual is addressed to those persons who need to and/or have been delegated to carry out repairs on the vehicle and/or whose job it is to give instructions on how to carry out such repairs.

These persons are:

- operative units/site/department managers;
- users directly concerned in vehicle maintenance.

Safekeeping of this handbook

This handbook must be kept inside the vehicle, in a dry place, and must be readily available for consultation.

You are advised to file a copy.

Keep the handbook for the entire life of the vehicle, until it is scrapped. Users are required to purchase a new copy if the handbook is either lost or damaged. Copies must be exclusively ordered from the manufacturer.

Updates to this handbook

The information, descriptions and illustrations in this handbook reflect the state of the art at the time of marketing of the vehicle.

The manufacturer reserves the right to implement changes to vehicles, for technical or marketing reasons, at any time. The manufacturer will not be obliged either to implement such changes in the vehicles marketed before or to consider this handbook obsolete.

Any additional information which the manufacturer may deem suitable to provide at a later time will be kept with the handbook as an integral part of the publication.

Units of measure

International System (SI) units of measure as used in this handbook.

Imperial System values are expressed in brackets.

SCHEDULED USE

The vehicle described in this handbook was designed and made for the following use:

- to haul excavation material in general;
- to haul material resulting from interventions on industrial or civilian artefacts in general;
- to haul material required to make infrastructures and/or industrial or civilian artefacts in general.

The vehicle must be used for such purposes.

The vehicle must be in proven and checked conditions of efficiency for said use, fully respecting the envisaged criteria and restrictions of use.

Specific care must be paid to the following aspects:

- do not exceed the payloads specified by the manufacturer;
- do not exceed the gradients specified by the manufacturer;
- do not drive the vehicle on loose terrain which can compromise stability;
- do not use the vehicle to remove objects or products;
- use the vehicle paying special attention to the safety instructions and specifications;
- carry out the ordinary maintenance requirements specified by the manufacturer;
- carry out the extraordinary maintenance requirements which are required, specifically those related to safety of use.

 ***The manufacturer declines liability for injury to persons and for damage to the vehicle and/or to the transported goods in the event of other use or use in other conditions than those specified.***

VEHICLE OPERATORS

The vehicle can be driven exclusively by qualified personnel with the necessary skills and suitable technical knowledge.

Vehicle drivers must:

- have the skills required to drive the vehicle in all environmental and weather conditions;
- be psychologically and physically fit;
- be very responsible and respect the safety instructions.

Vehicle maintenance personnel must:

- have the operative skills required for construction site vehicle maintenance;
- be sensitised to respect and adopt safety instructions and precautions.

Vehicle operators must be in condition to work in total safety, also by means of suitable training periods or courses, to acquire full knowledge of instructions for vehicle use.

The direct reporting manager must ensure respect of general safety instructions, specifically those contained in this handbook.

The manager will also ascertain suitability of operating personnel, in terms of technical skills and psychological – physical conditions.

WASTE DISPOSAL

Collect and properly dispose of replaced material (brake pads, filters, etc.) and waste material, resulting from maintenance operations and repairs (material soaked in fuel, oil, powder, etc.) according to the laws in force, separately from normal waste.

Collect and dispose of used lubricants and fluids, according to the laws in force.

Collect and dispose of used batteries according to the laws in force.

Drain and recharge the air conditioning system using the specific devices, according to the laws in force.

Furthermore, you are advised to separate ferrous materials, light alloys and waste plastic materials for separate recycling.

SCRAPPING THE VEHICLE

The vehicle must be scrapped according to the laws in force, at the end of the vehicle's working life.

Recycle and demolish the vehicle according to the laws in force.

The vehicle must be demolished by expert personnel using suitable working tools to ensure the required safety conditions.

Demolish the vehicle by separating and collecting the various materials by type to allow recycling and disposal.

Please note that it is forbidden to abandon an obsolete vehicle at a quarry, building site, dump or in the environment.

Specific attention must be devoted to certain components and substances which can pollute the environment and/or cause injuries, i.e.:

- presence of fuels, coolant fluids, hydraulic oil and lubricating oils on board;
- presence of batteries and respective electrolyte;
- presence of pressurized gas (tires, suspension components, air conditioner);
- presence of solid polluting materials (tires, brake pads, plastic parts, filters) or hazardous materials (glass, windows).

Dispose of these materials according to the laws in force.

WARRANTY AND LIABILITY OF THE MANUFACTURER

Warranty conditions

The user must carefully observe the precautions illustrated in this handbook to ensure validity of the contractual warranty. Specifically, the user will:

- respect restrictions of use specified by the manufacturer;
- not implement changes or variants to the vehicle without the manufacturer's written approval;
- always carry out the maintenance interventions;
- always use genuine spare parts;
- ascertain that the personnel called to use the vehicle have the necessary requirements in terms of skills and training.

The contractual warranty will not be applicable if the aforesaid conditions are not respected, even in part.

Liability

The manufacturer declines all direct or indirect liabilities deriving from:

- disrespect of the instructions contained in this handbook;
- use of the vehicle by untrained or unauthorized personnel;
- use non complying with the regulations in force in the country where the vehicle was marketed;
- unauthorized changes and/or repairs;
- use of other than genuine spare parts.



The engine and fuel system on your machine is designed and built to government emissions standards. Tampering by dealers, customers, operators and users is strictly prohibited by law. Failure to comply could result in government fines, rework charges, invalid warranty, legal action and possible confiscation of the machine until rework to original condition is completed. Engine service and/or repairs must be done by a certified technician only!

SERVICE

After sales service

Dealerships are available for all types of interventions. Equipment and expert personnel are available for overhauling and repairing operations.

Dealerships can provide information and advice to ensure the best use of the vehicle.

Spare parts

Use genuine spare parts for replacements which can be ordered from dealers.

Please remember that the following information will be required to order spare parts:

- vehicle type;
- chassis number;
- reference and catalogue numbers shown in the Spare Parts Catalogue.

If the part belongs to a main assembly (engine, transmission, axles, motors, etc.), you will also need to specify the assembly model and serial number.

SAFETY INSTRUCTIONS

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INTRODUCTION

The instructions and warnings given in this handbook illustrate the fundamental safety principles for operating articulated dump trucks.

Figure 1



156NS01

These instructions are not comprehensive. They do not illustrate all the potential hazards which may arise.

Operators must be aware of all the procedures described in this handbook. The procedures advise against adopting work methods which could cause injuries and/or affect integrity of the vehicle.

The procedures are not comprehensive. The Manufacturer cannot account for all the possible methods of use and operation, nor evaluate all the possible consequences.

Consequently, operators must be responsible and careful at all times, to prevent hazardous situations for themselves and others.

Use of the vehicle is subjected to respecting the specifications contained in this manual and safety regulations set forth by the law in the country where the vehicle is used. Knowledge of local legislation is mandatory for all vehicle users.

Read this manual carefully. Contact an expert or call the Manufacturer if in doubt.

Safety information and symbols

Figure 1 shows a *safety symbol* which is used to attract the operator's attention to safety relevant matters. Pay the utmost care when you see this symbol on the vehicle or in this handbook.

Always follow the recommended safety instructions.

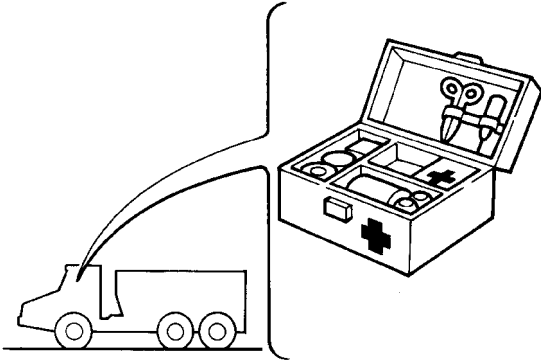
Always read the safety related adhesive labels. Replace the labels if they are damaged.

Safety plates and labels on the vehicle are illustrated in Section 2 – TECHNICAL DATA.

General instructions

Arrange a first aid kit in the vehicle. Check and replenish regularly (Figure 2).

Figure 2



156NS02

Arrange a plate providing emergency telephone numbers. Keep it up-to-date.

Vehicle personnel should be aware of basic first aid procedures to be applied in the event of an accident or casualty.

Keep children away from the vehicle, the equipment and the materials used.

Keep unauthorised persons away from the vehicle, the equipment and the materials used.

The vehicle can only be driven by qualified personnel, who is authorised to do so by the legislation in force. Drivers must be in suitable psychological and physical (tiredness, effect of alcohol, drugs, etc.).

Furthermore, drivers must be familiar with the position and operation of all controls, instruments, gauges and warning lights in the vehicle. The driver must also be able to evaluate, in principle, failures which may occur and adopt the required precautions.

Do not allow unqualified or unsuitable personnel to use the vehicle.

Maintenance and repair operations must be carried out by qualified personnel, who are familiar with the arrangement and operation of assemblies and workshop tools.

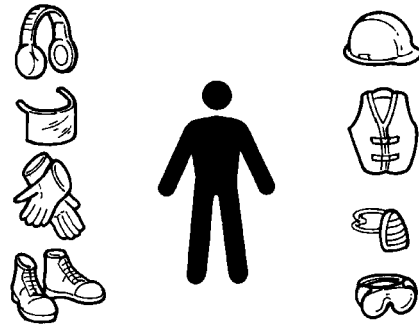
Do not allow unqualified personnel to carry out maintenance or repair operations on the vehicle.

Do not wear rings, wristwatches or loose and hanging clothes when carrying out maintenance and repair operations on the vehicle.

Do not use radio or personal stereo headphones during operations to avoid distractions.

Personnel will use the vehicle safety features (seat belts) and personal protection devices during vehicle use and maintenance (Figure 3).

Figure 3



156NS03

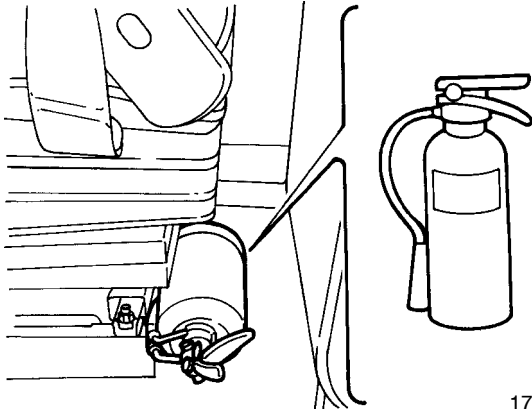
Standard safety equipment includes:

- helmet
- goggles or face mask
- protective earphones
- thick gloves
- suitable clothes
- safety boots.

PREVENTING FIRES

Keep a suitably sized fire extinguisher in the vehicle. Check it regularly (Figure 4).

Figure 4



174NS09

The portable fire extinguisher can only be used by skilled personnel.

Vehicle personnel must be familiar with the basic techniques for dealing with fire.

Fuel and most lubricants and fluids are flammable (Figure 5).

Figure 5



156NS05

Do not smoke while refuelling or topping up fluids. Do not refuel or top up near naked flames. Do not handle fuel (Figure 6).

Figure 6



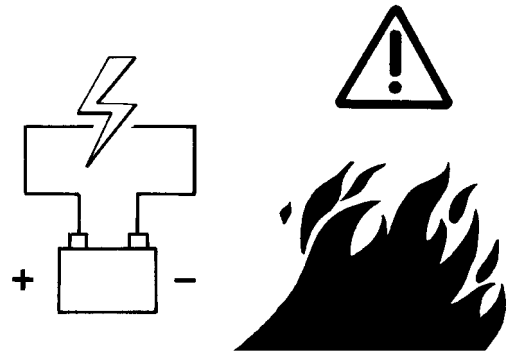
156NS06

Stop the engine before refuelling. Do not refuel in closed places.

Check for leakage or residues of fuel, lubricants and fluids which could cause minor fires before starting the engine.

Short circuits can cause fires (Figure 7).

Figure 7



156NS07

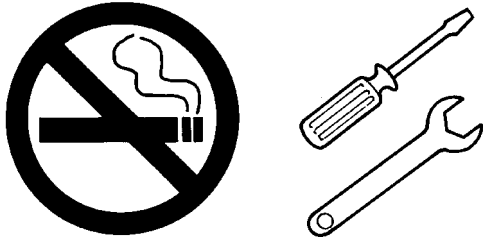
Regularly check conditions of battery terminals, wires and electrical devices.

Do not store flammable substances in places which are not suitable for the purpose. Do not pierce or burn pressurised container or cylinders. Do not pile up materials soaked in flammable substances.

Be careful where you leave rags and/or replaced materials which may contain flammable residues.

Put out all smouldering materials and naked flames before starting any maintenance operation.
Do not smoke during maintenance operations (Figure 8).

Figure 8



156NS08

Do not use petrol, solvents or other flammable or toxic fluids to clean mechanical parts. Use non-flammable, non-toxic, type-approved products on the market.
Do not weld near tanks, pipes, reservoirs, electric wires or flammable materials in general.

Protect flammable parts with suitable guards when welding.

Stay away from the vehicle and call a fire-fighting expert team in the event of a large-scale fire (Figure 9).

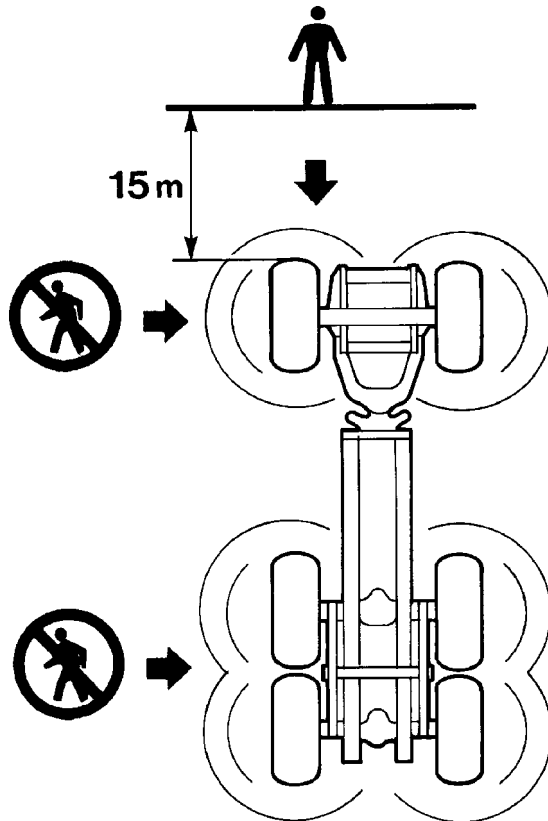
Figure 9



156NS09

Stay away from the vehicle if a small fire occurs in the brake or tyre areas. The tyres could explode.
Never stand in front of the sidewall. Keep a safety distance of at least 15 metres (16,5 yd) from the thread (Figure 10).

Figure 10



156NS10

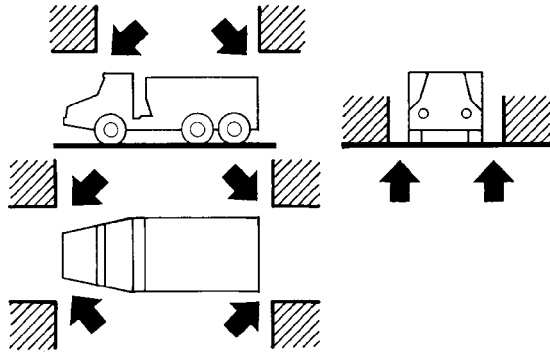
Stay away from the vehicle for a few hours after putting out the fire to allow the tyres to cool down. Approach the vehicle protected by a crawler loader bucket, for example.

ROLLOVER ACCIDENTS

Prevention

Always check height and width during the various loading/unloading operations. Make sure they fall within the specified limits (Figure 11).

Figure 11



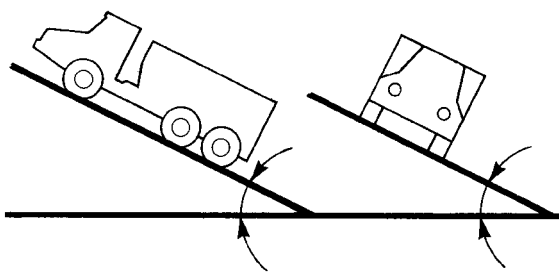
156NS19

Keep the wheels perpendicular to the slope when driving up or down a gradient.
Do not make a U-turn on a gradient to prevent rolling over.

Respect the transverse gradient permitted for the loaded and empty vehicle.

Respect the maximum possible gradient for the loaded and empty vehicle (Figure 12).

Figure 12



156NS20

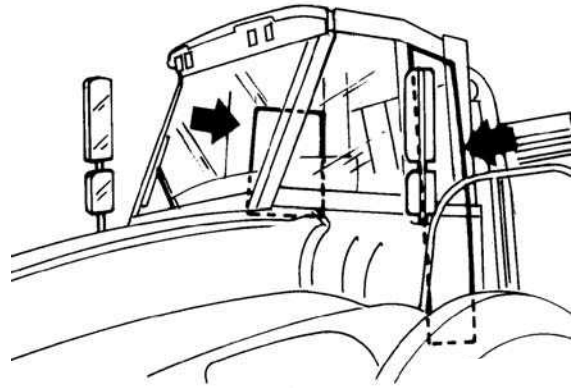
Make sure you always have a hammer in the cab to smash the windows if an accident occurs.

What to do if the vehicle rolls over

Make that users are aware of how to get out in an emergency and know where the hammer for smashing the windows is located.

The vehicle can be exited as follows (Figure 13):

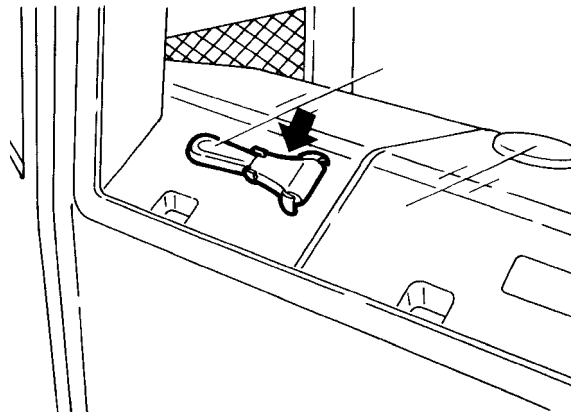
Figure 13



269NS073

- through the door (after opening it)
 - through the front right window (after smashing it).
- Use the specific tool (Figure 14) positioned under the right window to smash it in an emergency.

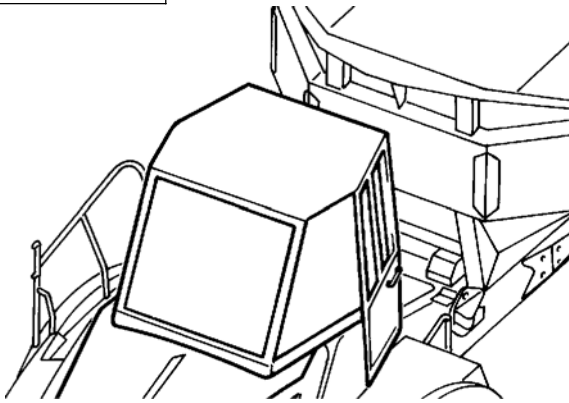
Figure 14



174NS08

Structure of the cab

Figure 15



276NS002T

The vehicle is equipped with a driver's cab (Figure 15) that satisfies the ROPS (RollOver Protective Structure) and FOPS (Falling Object Protective Structure) specifications.

These features have been designed to minimize the consequences of vehicle overturning or the fall of heavy objects onto the cab.

The cab–chassis attachment points and the accessories inside also satisfy the ROPS–FOPS characteristics.

The cab is thus a specific safety component of the vehicle, as demonstrated by the certifications obtained by the Manufacturer.

Any alteration of the characteristics of the cab caused by damage, fire, corrosion or modification can reduce the degree of protection it ensures.

In this case, the structural part of the cab and any accessories must be replaced in order to restore the original safety conditions.

After any accident, fire, overturning or crushing it is **ABSOLUTELY NECESSARY** that the following operations are performed by a qualified technician:

- replace the structural parts of the cab;
- inspect the couplings, seat, seat belt and all the components that concern driver's safety;
- replace all the components possibly damaged or no longer satisfying the original characteristics.



For more information on the operations to be performed in case of damage to the cab, contact an authorized dealer.



Do not make modifications of any type (welding, drilling, straightening or emergency repairs) to the structure of the cab and accessory parts.

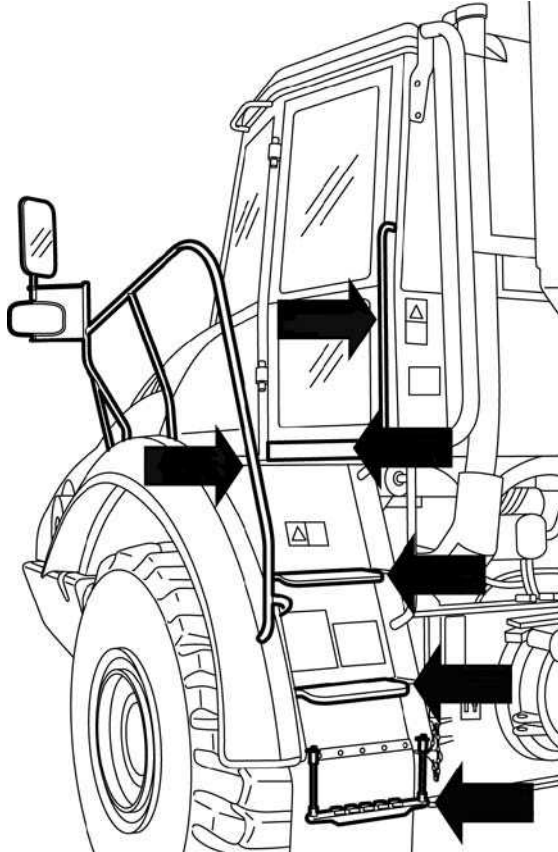
Any intervention may change the structural characteristics of the cab and cause death or serious injury to the driver in case of accident, fire, overturning or crushing of the vehicle.

INSTRUCTIONS FOR USE

Cab

Use the steps and handles to get on and off (Figure 16).

Figure 16

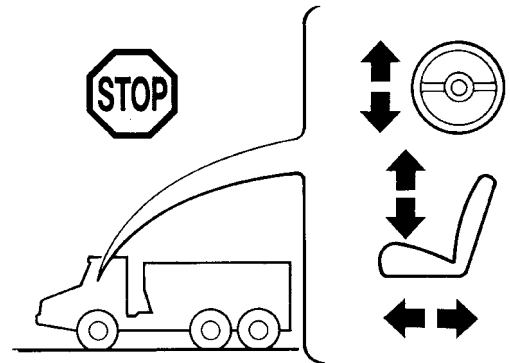


276NS006T

Keep the steps and handles clean to avoid slipping.
Do not use flexible parts or controls as handles. They could break or get damaged.
Face the vehicle while you are getting on and off. Have three points of contact (steps and handles) at any time.
Do not jump on or off the vehicle.
Do not get on or off while the vehicle is moving.
Keep the floor clear from fragments, tools or other objects which could interfere with the pedals.
Keep the pedals clean (mud or grease).
Eliminate anything which can reduce visibility or distract the driver.
Keep windows and rearview mirrors clean.

With the vehicle stationary and the parking brake applied, before setting off, check position of the seat, the steering wheel and the rearview mirrors to ensure maximum driving comfort and control accessibility (Figure 17).

Figure 17



156NS12

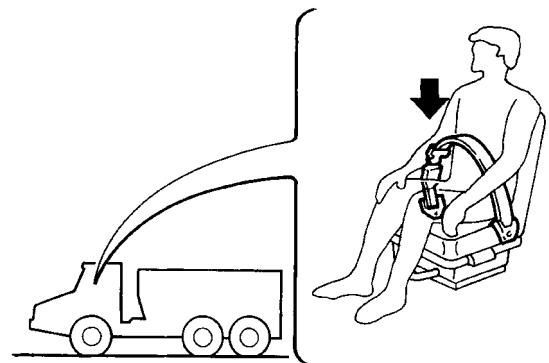
Make these adjustments each time the driver is changed.

Drivers should be able to fully press the pedals and operate the controls correctly without lifting their backs from the backrest.

Do not adjust the seat, the steering wheel or the rearview mirrors while driving or in any other way than specified.

Always wear seat belts (Figure 18).

Figure 18



156NS13

The webbing must not be twisted. The belt should wrap around your hips, not your abdomen, to prevent the risk of slipping forwards.

Replace the seat belt being worn in an accident of a certain severity even if it does not appear damaged.

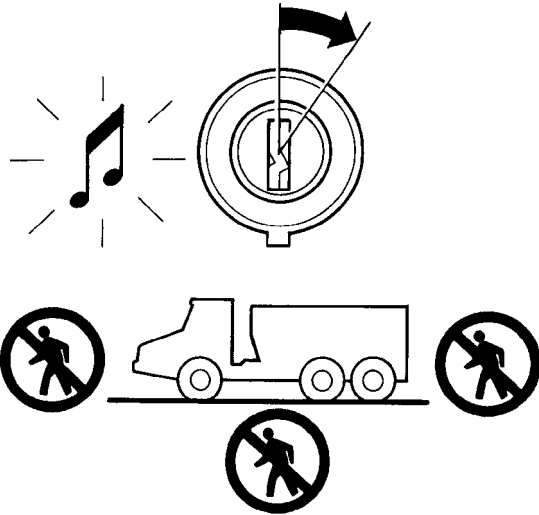
Do not make changes which can decrease functionality of the seat belt.

Starting and stopping

Before starting off, check the vehicle exterior for problems, such as flat tyres, fluid leakage, broken parts. Make sure no one is near the vehicle when starting the engine.

Sound the horn before starting the engine (Figure 19).

Figure 19



156NS14

Start the engine while you are sitting in the driver's seat. Do not start the engine by short-circuiting the starter motor wires.

Two people are required to start the engine with a battery charger or auxiliary battery: one person will sit in the driver's seat and the other person will stand near the battery charger or auxiliary battery.

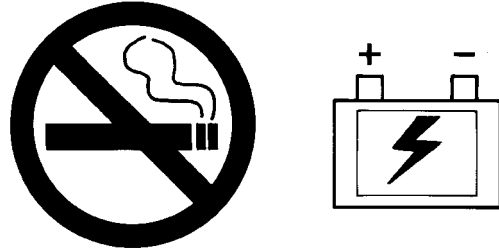
Do not carry out this operation if the flat battery is frozen. It could explode.

Respect cable connection procedure and polarity to prevent the risk of the batteries exploding or projecting electrolyte.

Always wear gloves and protective glasses when approaching the batteries.

Do not smoke or use naked flames near the batteries (Figure 20).

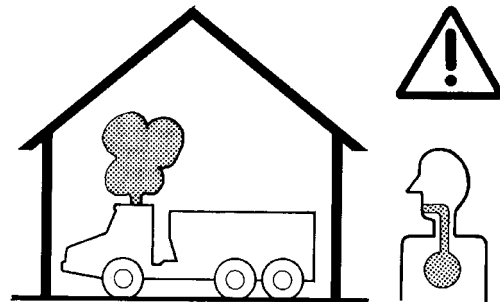
Figure 20



156NS15

In the event of contact with electrolyte, wash the affected part for at least 15 minutes and call a doctor. Do not run the engine in closed places without a suitable ventilation system for disposing of harmful exhaust in the air (Figure 21).

Figure 21



156NS16

Never leave the vehicle with the engine running.

Do not park with the parking brake applied and the gear engaged, also if you are sitting in the driver's seat. Before leaving the vehicle parked in a suitable area where it is not a hindrance, make sure that the parking brake is applied and that the keys have been removed from the control panel.

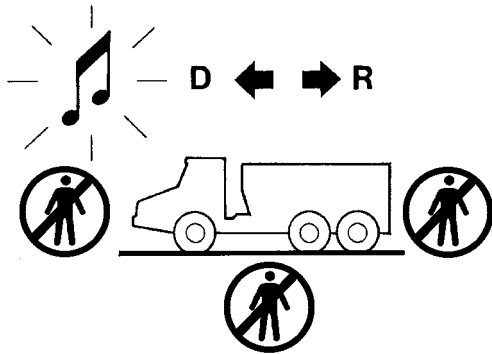
Always apply the parking brake in the following cases:

- when the vehicle is parked for a long or short time;
- when loading/unloading the vehicle.

Driving the vehicle

Make all the necessary adjustments (seat, steering wheel, rearview mirrors) before setting off. Check that the engine warning lights are OK. Sound the horn before starting off (Figure 22).

Figure 22

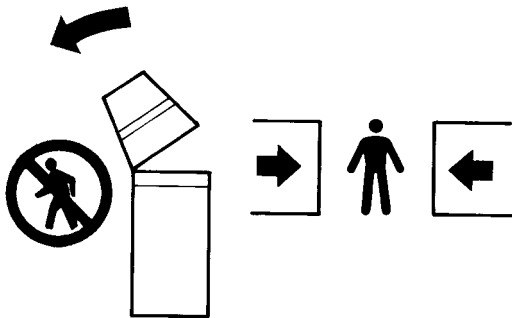


156NS17A

Check that no-one is standing near the vehicle before starting off.

Be very careful when steering: the front part of the vehicle can move also when the vehicle is stationary. This can be very dangerous for persons standing near the vehicle (Figure 23).

Figure 23



156NS18

Check the ground surrounding the vehicle before reversing to make sure there are no people or obstacles. Do not transport people in the cab or in other parts of the vehicle, with exception of the emergency seat. Respect signs, especially speed limits. Never exceed the speed limit.

Never drive at speeds which are forbidden and dangerous for yourself or others.

Switch the lights on at night and when visibility is poor (dust, fog, rain). Slow down.

Never travel with the transmission in neutral.

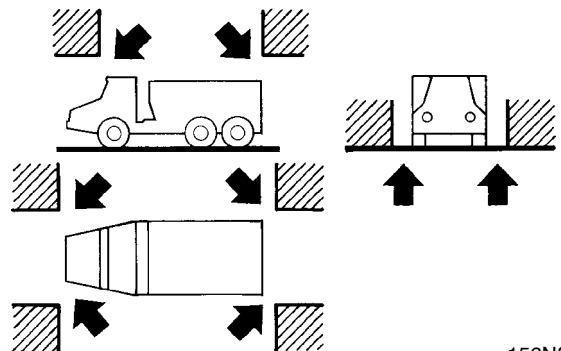
Do not use the parking brake for slowing down or stopping the vehicle.

Working the vehicle

Do not use the vehicle for purposes other than those described by the Manufacturer.

Always check height and width during the various loading/unloading operations. Make sure they fall within the specified limits (Figure 24).

Figure 24



156NS19

Beware of overhead obstacles, such as bridges, cables and wires. Make sure that the load does not knock into them.

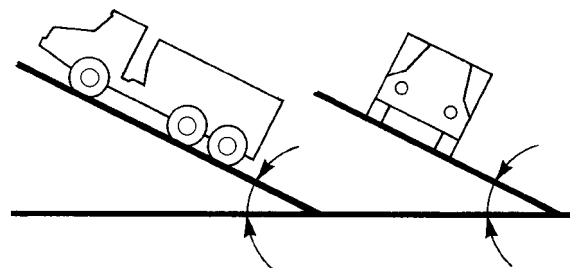
Keep the wheels perpendicular to the slope when driving up or down a gradient.

Do not make a U-turn on a gradient to prevent rolling over.

Respect the transverse gradient permitted for the loaded and unladen vehicle.

Respect the maximum possible gradient for the loaded and unladen vehicle (Figure 25).

Figure 25



156NS20

Look out for people when reversing and changing direction.

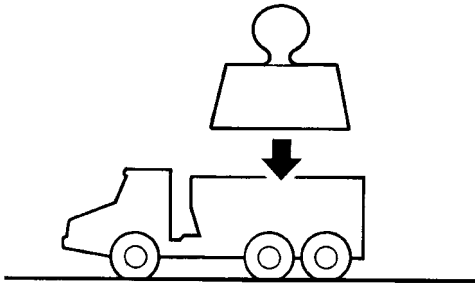
Ideally, a person should be asked to signal when reversing. This person will be able to observe the approach from a more favourable position with respect to the driver.

Do not move the vehicle to loading position while the bucket of loader or excavator is moving overhead.

Stay inside the cab while loading the vehicle.

Make sure that the maximum capacity of the vehicle is not exceeded during loading operations (Figure 26).

Figure 26



156NS21

Make sure that the load is well arranged and will not fall out of the body during transportation.

Check the area before unloading. Look out for hazardous points: loose terrain, ditches, humps and fencing. Beware of icy ground: it may become weak and slippery when the temperature rises.

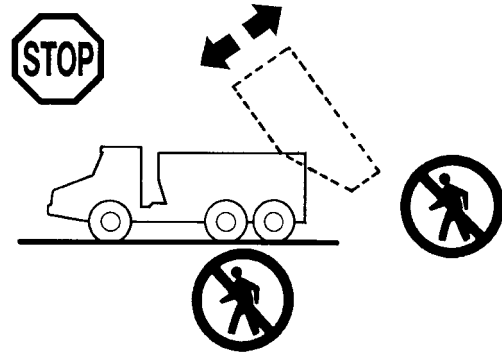
Avoid loading and unloading on steep slopes: the vehicle could roll over.

Be very careful of unbalancing the vehicle by the movement of material out of the body during unloading operations.

Check that the body is in the correct position before starting off after unloading.

No—one should ever stand in the loading and unloading area of the vehicle (Figure 27).

Figure 27



156NS22

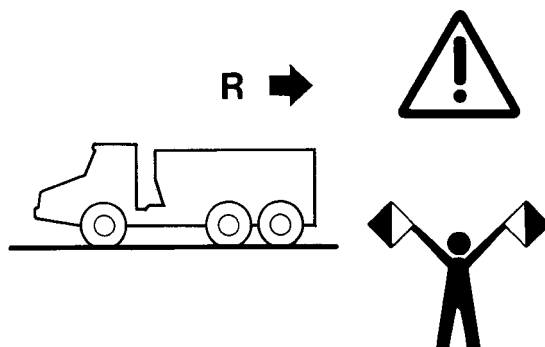
When unloading by means of the external control, the operator must never leave the control, which is located in a safe position, and must wear all the required personal protection devices.

Never start off during loading or unloading operations. Do not get on or off the vehicle during loading and unloading operations.

When crossing another vehicle, the unladen vehicle should give way to the loaded vehicle and the vehicle driving downhill should give way to the vehicle running uphill.

If other vehicles and/or other machines are used in the working area, appoint a person in charge of signalling and use signals which can be understood by all drivers (Figure 28).

Figure 28



156NS23

In this case, all personnel will follow the instructions provided.

Towing the vehicle

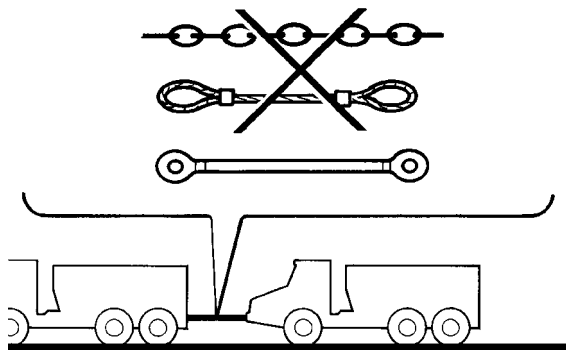
Use the specific hitches provided for this purpose to tow the vehicle.

Do not use cables, belts or chains to have the vehicle towed or to tow another vehicle: they could break.

Do not use cables, belts or chains to have the vehicle towed or to tow another vehicle if the braking system of the vehicle being towed does not work.

Always use a stiff, suitably dimensioned bar (Figure 29).

Figure 29



156NS24

A user must always be aboard the vehicle being towed. Do not stand near vehicles being towed.

The parking brake will not work if the output propeller shaft is removed from the rear gearbox and/or the transfer cases and/or the drive axles.

In this case, arrange suitable wedges under the wheels in both directions of travel to prevent uncontrolled vehicle movements.

Replacing a wheel

The wheel replacement operation requires the utmost care. The operation must be carried out by at least two people, using a hoist or a crane to handle the wheel.

Stop the empty vehicle on a flat area, apply the parking brake and remove the ignition key from the panel.

Make sure that the ground is adequately firm for the load to be supported. If in doubt, use plates and plat-forms to prevent sinking.



ALWAYS lock the safety joint before lifting the vehicle.

Only use the lifting points on the machine.

Make sure that the lifting device is suitable to carry out the operations and respect safety requirements.

Keep away from tires and/or brakes that show signs of overheating. Wait for the temperature of the components to cool.

Deflate the tire completely, if it is not already flat.

Do not use wheels or fasteners other than those originally provided.

Excessive tightening may damage the wheel studs/nuts.

Do not use tubes or extensions other than those provided to tighten the wheel nuts.

Check that the wheel nuts are tight after two or three hours of vehicle operation.

Check wheel nut tightness regularly.

MAINTENANCE

General

Personnel in charge of repairs must be aware of all the procedures described in this handbook. The procedures advise against adopting work methods which could cause injuries and/or affect integrity of the vehicle.

The procedures are not comprehensive. The Manufacturer cannot account for and evaluate all the possible methods of operation or the possible consequences. Keep the place of work clean and dry. Do not smoke during the operations. Wear all the required personal protection devices before starting maintenance operations.

Carry out the scheduled maintenance operations. Carry out all the operations which are required for correct and safe use of the vehicle.

Before starting maintenance operations take the following precautions:

- stop the vehicle on a flat surface;
- engage the parking brake;
- shut off the engine;
- remove the ignition switch key;
- place a DO NOT OPERATE tag on the steering wheels.

Do not allow unqualified personnel to carry out maintenance or repair operations on the vehicle.

Carry out maintenance and repair operations with the utmost care.

Only use the specific tools or wrenches expressly specified for replacement, checking and maintenance operations.

Never tamper with valves, regulators or other devices, unless specified in the handbook, to prevent damage to vehicle components and consequent hazards for persons.

Power supply disconnection

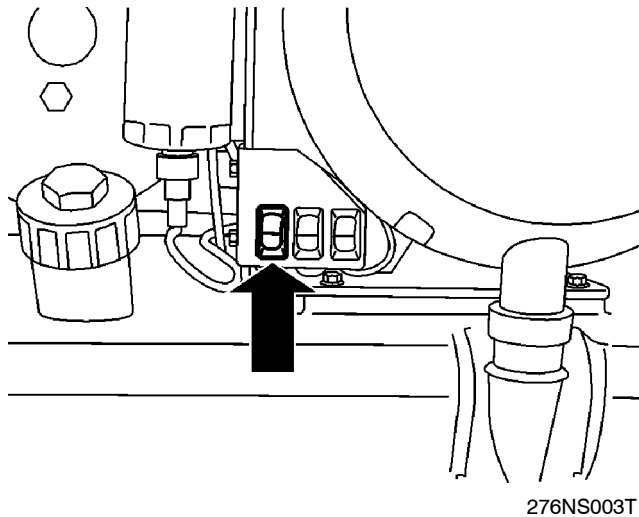
Battery disconnect switch

Every time the user must operate directly or indirectly on parts of the electrical system, it is necessary to be absolutely certain to cut off the power supply using the battery disconnection switch.

Proceed as follows:

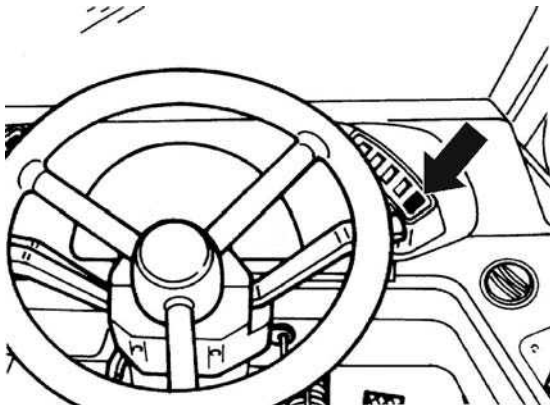
- go to the left side of the engine hood (Figure 30, see arrow)

Figure 30



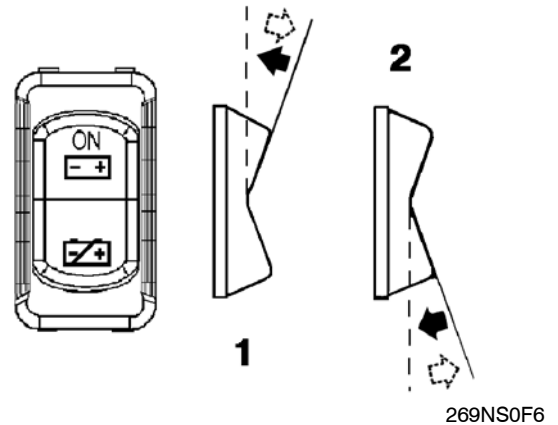
- climb into the cab (Figure 31, see arrow);

Figure 31



- to connect the power supply to the equipment press the button (Figure 32, ref. 1): the upper part of the switch lights up (green ideogram);
- to disconnect the power supply to the equipment press the button (Figure 32, ref. 2): the lower part of the switch lights up (red ideogram).

Figure 32



To disconnect the power supply the user must:

- switch off the engine;
- wait about 10 seconds.

After the engine is shut off the system control units must carry out a series of procedures that require the electric power supply to be kept on for a few seconds. Consequently, it is not possible to disconnect the power supply using the switch for about 10 seconds after the engine has been turned off.

The system automatically disconnects the electric power supply under the following conditions:

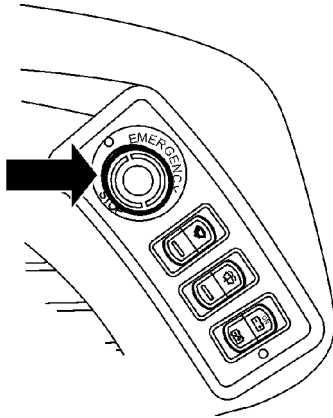
- engine off;
- no actuation on the controls of the cab for at least fifteen minutes.

Disconnection of the emergency electric power supply

The vehicle is equipped with a push button, located on the instrument dashboard, for the disconnection of the emergency electric power supply.

To disconnect the electric power supply for the equipment, press the button (Figure 33, see arrow).

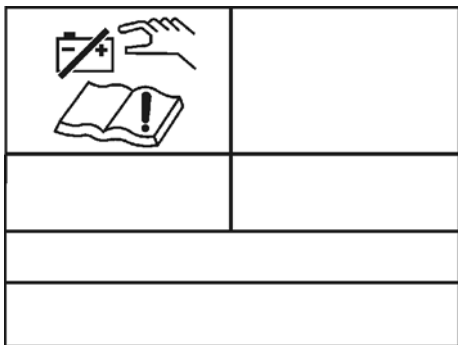
Figure 33



276ENS001

A warning screen will appear on the display.

Figure 34



292ANS001L



If the vehicle is running at the time the button is pressed, the operation shuts off the engine and engages the emergency steering pump.

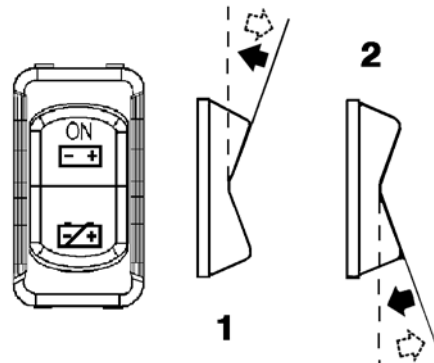
This maneuver DOES NOT ENTAIL any functional inconvenience for the engine control system.

To restore the electric power supply, proceed as follows:

- if the engine was running when the power supply was shut off, move the ignition switch to position 0 (STOP);

- press the button (Figure 35, ref. 2): the bottom part of the switch illuminates (red ideogram);

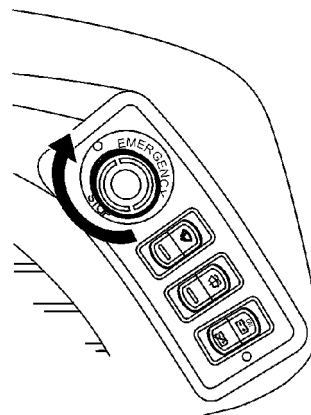
Figure 35



IF6

- turn the button clockwise (see arrow);

Figure 36



276ENS002

- press the button (Figure 36, ref. 1): the top part of the switch illuminates (see ideogram).

Emergency switch

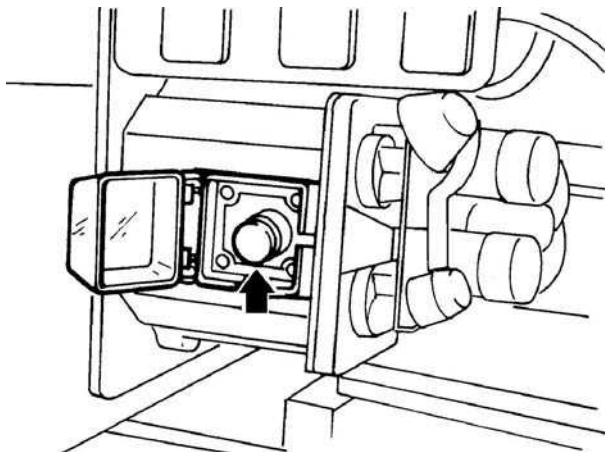
The emergency switch disconnects electrical power to all utilities, none excluded. This can cause considerable functional problems to the engine control system. For this reason, the switch must only be tripped when absolutely necessary.



After 5 (five) consecutive switch-offs of the engine using the emergency switch, the engine restarts but remains in idle and does not respond to the accelerator. IT IS NOT POSSIBLE TO RESTORE FUNCTIONALITY OF THE ENGINE DEVICE CONTROL USING THE DIAGNOSIS EQUIPMENT. IN THIS CASE IT MUST BE REPLACED.

Proceed as follows:

Figure 37



269NS102

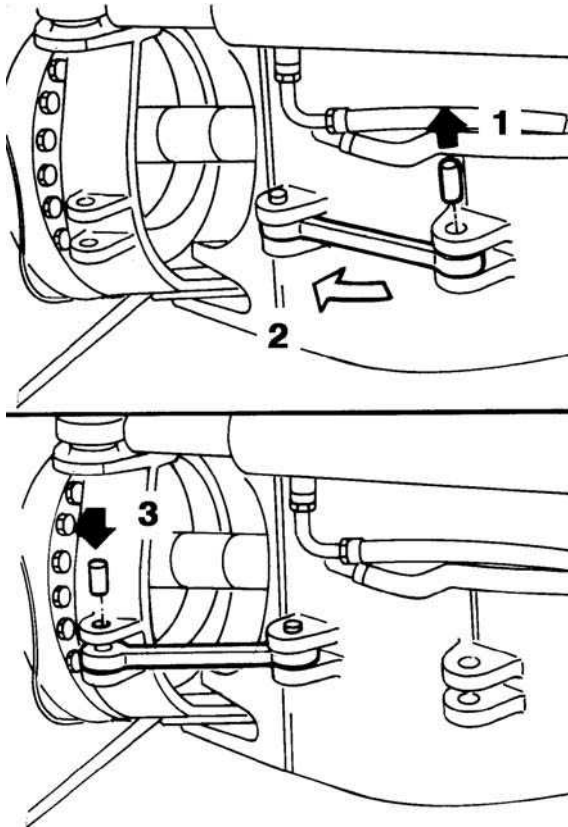
- lift the protective cover and operate the switch below (Figure 37, see arrow).

Safety locks

Always lock the joint in secured position unless otherwise specified.

Proceed as follows:

Figure 38



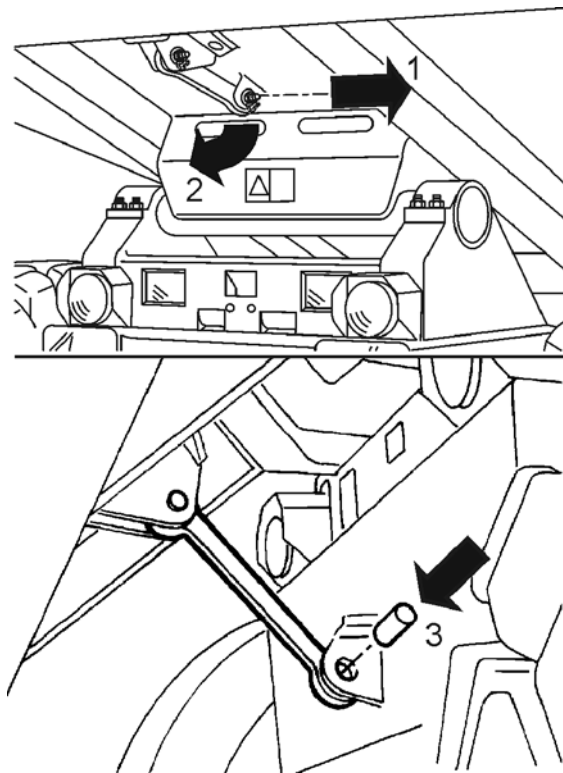
269NS111

- align the vehicle (front and rear chassis);
- remove the pin (Figure 38, ref. 1);
- swing the tie-rod forward to make the holes in the tie-rod and chassis coincide (Figure 38, ref. 2);
- insert the pin through the holes and fasten it with the retaining pin (Figure 38, ref. 3).

Always lock the tipped body when operating in the rear chassis area.

Proceed as follows:

Figure 39

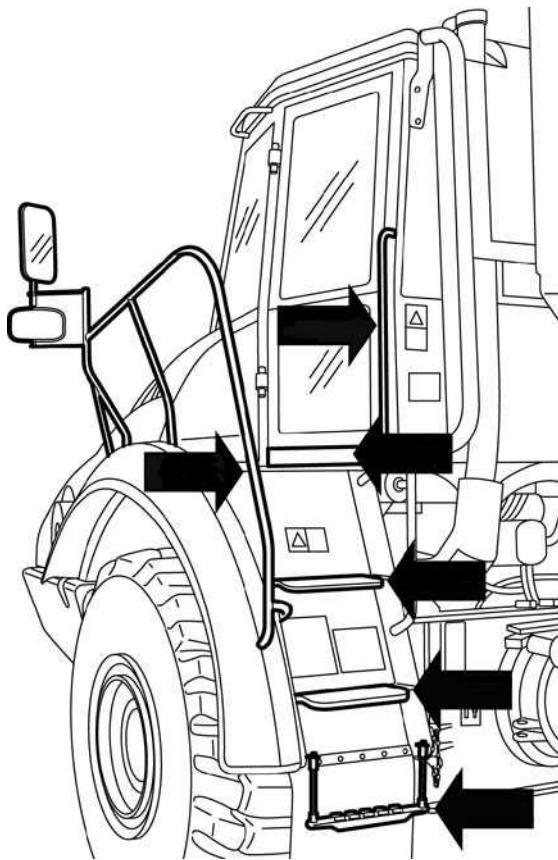


276NS004T

- remove the pin (Figure 39, ref. 1);
- tip the body completely;
- twist the tie-rod to make the holes in the tie-rod and chassis coincide (Figure 39, ref. 2);
- insert the pin through the holes and fasten it with the split pin (Figure 39, ref. 3).

Preventing injuries

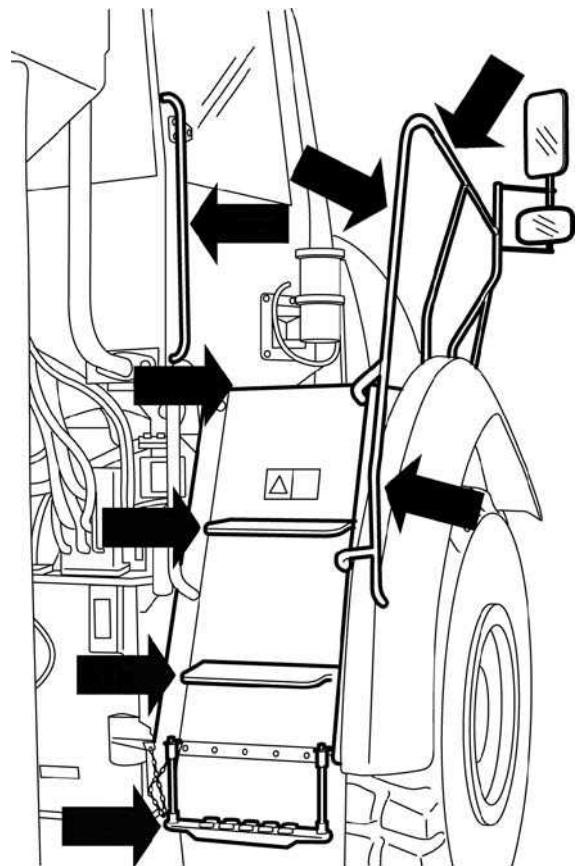
Figure 40



276NS006T

Use the steps and grips for getting on and off the left-hand side of operators platform (Figure 40, see arrow).

Figure 41

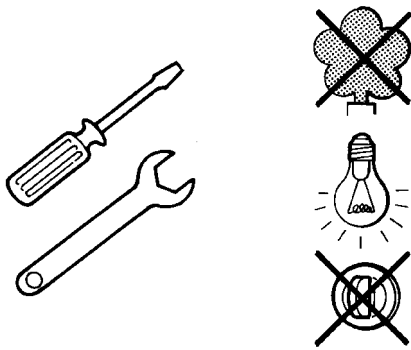


276NS005T

Use the steps and hand grips for getting on and off the right-hand side platform (Figure 41, see arrow). Keep the steps and grips clean to avoid slipping. Do not use flexible parts or controls as grips. They could break or get damaged. Face the vehicle while you are getting on and off. Keep three points of contact (steps and grips) at all times. Do not jump on or off the vehicle. Do not get on or off while the vehicle is moving.

All checking, bleeding, topping –up, maintenance and replacement operations must be carried out with the vehicle stationary, on level ground, in a well lit and ventilated area. Apply the parking brake, arrange wedges under the wheels and remove the keys from the ignition switch, unless otherwise specified in the handbook (Figure 42).

Figure 42



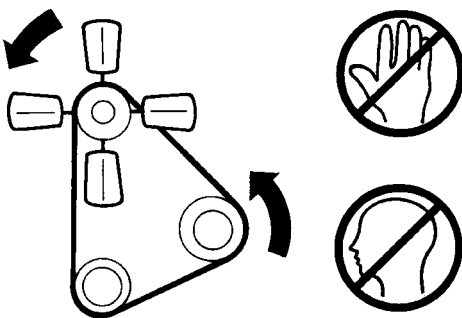
156NS29

Make sure that no-one is sitting in the driver's seat. Use portable lamps when the lighting is not adequate and to illuminate working areas which cannot easily be accessed otherwise.

Use a ladder or platform with steps compliant with safety regulations to carry out repairs and maintenance operations in areas which cannot be reached from the ground.

Keep hands and clothes away from moving parts when carrying out operations with the engine running. Never put your head or other parts of your body (feet, hands) near turning belts or fans, when the engine is running (Figure 43).

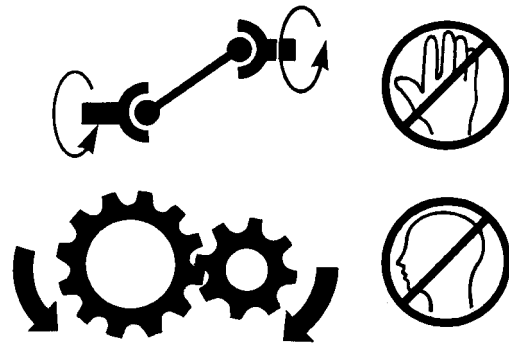
Figure 43



156NS30

Do not put your head or other parts of your body (feet, hands) near shafts or turning parts when the engine is running (Figure 44).

Figure 44



156NS31

Warn people who are near the vehicle before starting the engine (e.g. for a test).

Wait for at least four hours after stopping the vehicle before conducting maintenance operations to avoid contacts with hot parts. Be very careful of the cooling fan which could start up suddenly.

Do not work over or under the vehicle propped up on jacks or other lifting devices which are not suitable to ensure safety (Figure 45).

Figure 45



156NS32

Unload the vehicle before jacking it up. Only use the lifting points shown.

Make sure that the lifting device is suitable to carry out the operations and respect safety requirements.

After jacking up the vehicle, prop it up before carrying out operations underneath.

Fully deflate the tyre before carrying out any type of operation on tyres or rims.

Never stand in front of the sidewall while you are inflating a tyre.

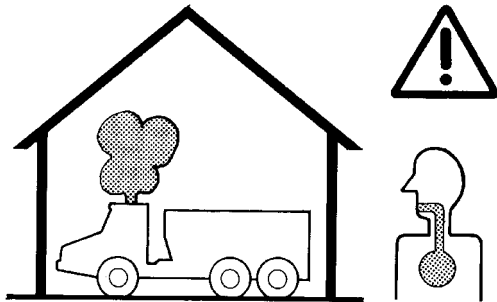
Never weld rims with tyres fitted to prevent explosions and fire.

Only use the expressly specified tools for inflating the tyres with nitrogen.

Preventing intoxication and contamination

Do not run the engine in closed places without a suitable ventilation system for disposing of harmful exhaust in the air (Figure 46).

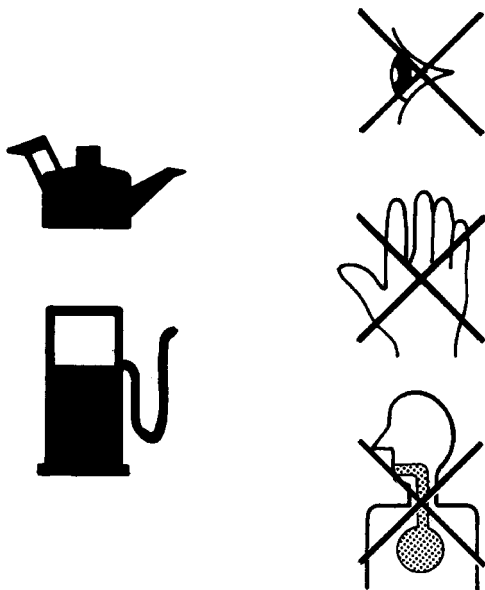
Figure 46



156NS33

Avoid prolonged, repeated contacts of fuel, lubricant and fluids with skin to prevent skin problems and other syndromes (Figure 47).

Figure 47

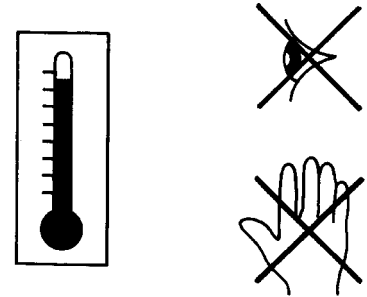


156NS34

Do not swallow fuel, lubricant or fluids. In the event of accidental contact with eyes, wash the concerned part thoroughly with water.

Be very careful: drained oil and fluids, as well as filters and surrounding parts, could be very hot (Figure 48).

Figure 48



156NS35

Ensure adequate ventilation to prevent the accumulation of toxic vapours while cleaning and replacing filters.

Do not weld in closed areas or areas which are not suitably ventilated.

Do not weld on or near painted surfaces to prevent developing toxic vapours.

Remove the paint with suitable products, wash the surfaces and leave to dry.

Do not breathe dust and toxic residues while grinding and sand-blasting. Protect your eyes with masks and goggles.

Use a suitable vacuum cleaner to remove dusty residues from the vehicle or place of work.

Do not play with compressed air. Keep compressed air guns away from people.

Wear protective goggles with side guards and a mask when using compressed air to clean filters, to prevent injury caused by particles of dust. You are advised to carry out the cleaning operations in a ventilated area. Be very careful before removing caps or covers from reservoirs, radiators or cylinders: turn the part slowly to discharge any residual pressure.

Stand at a side during bleeding operations and always wear protective goggles. Loosen the bleeder slowly by a few turns to let out condense and fluid.

Discharge pressure from the circuits before carrying out operations.

Never use your hands to feel for leakage of pressurised fluid.

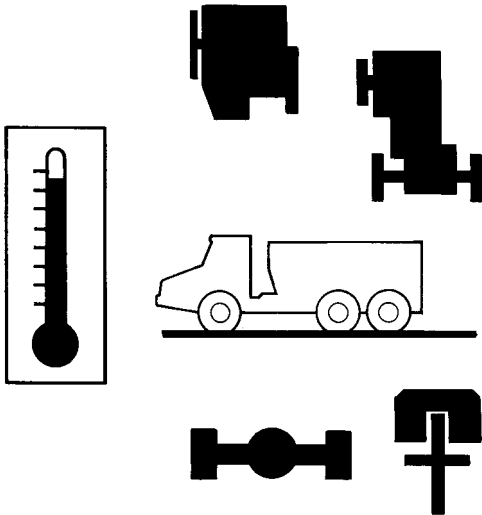
Pressurised fluid leakage can penetrate under the skin and in the eyes, causes very severe injuries.

Never use naked flames to feel for leakage of air conditioning system. It could generate phosgene, a very dangerous gas.

Preventing burns and electrocution

Be very careful of all parts of the vehicle which could present high operating temperatures: engine, radiators, heat exchangers, exhaust pipe, gearbox, axles, brake discs, hubs (Figure 49).

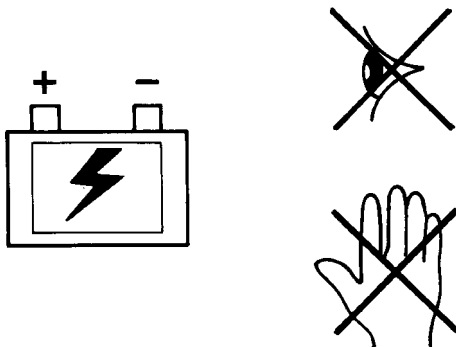
Figure 49



156NS36

Do not loosen the radiator cap when the engine is hot. Let the coolant cool down before removing the cap. In any case, remove the cap very carefully. Loosen the cap slowly to release the pressure and remove it. Do not place sources of heat near pressurised fluid tubes to prevent sudden failures. Protect tubes and electrical wires with suitable guards for welding. Batteries contain sulphuric acid: always wear gloves and protective glasses when approaching the batteries (Figure 50).

Figure 50

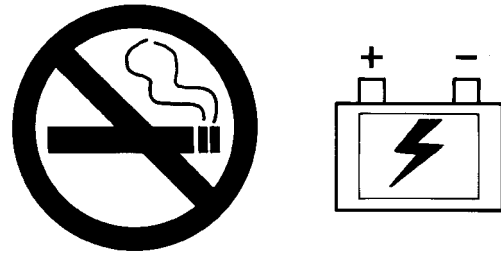


156NS37

In the event of contact with electrolyte, wash the affected part for at least 15 minutes and call a doctor. Do not charge a frozen battery. It could explode. Respect cable connection procedure and polarity to prevent the risk of the batteries exploding or projecting electrolyte.

Do not smoke or use naked flames near the batteries (Figure 51).

Figure 51



156NS15

Ensure adequate ventilation to prevent the accumulation of explosive gas while recharging the battery. Do not charge batteries near the workshop air compressor intake. Arrange the air compressor away from the area where paint, fuel and batteries are stored to prevent taking in vapours. Do not open the camera box or the monitor. Live parts inside. All operations must be carried out by skilled, suitably equipped personnel.



SERVICE MANUAL - SECTION 2A

**ARTICULATED DUMP TRUCKS
327B**

TECHNICAL DATA

327B-330B**SECTION 2A****TECHNICAL DATA**

CNH America L.L.C. reserves the right to make improvements in design or changes in specifications at any time without incurring any obligation to install them on units previously sold.

All data given in this publication is subject to production variations. Dimensions and weights are only approximate. Illustrations do not necessarily show products in standard condition. For exact information about any particular product, please consult your Dealer.

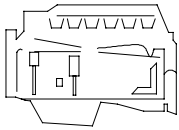
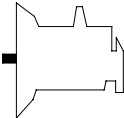
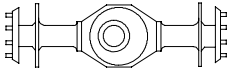
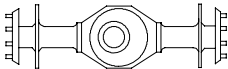
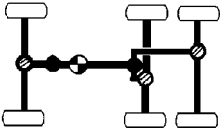
Revision History				
Issue	Issue Date	Applicable Machines	Print Number	Remarks
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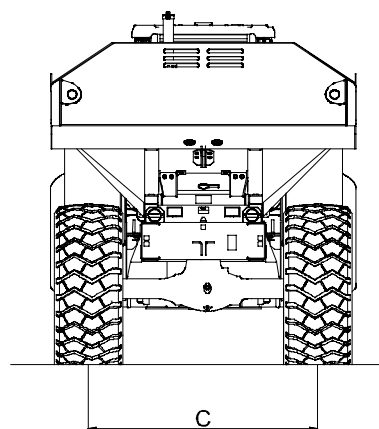
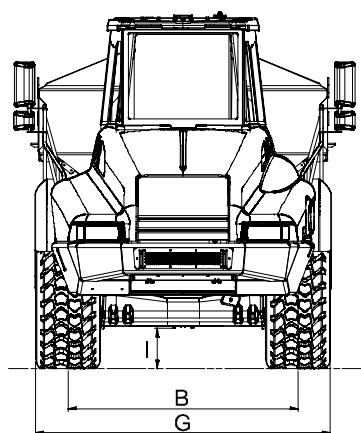
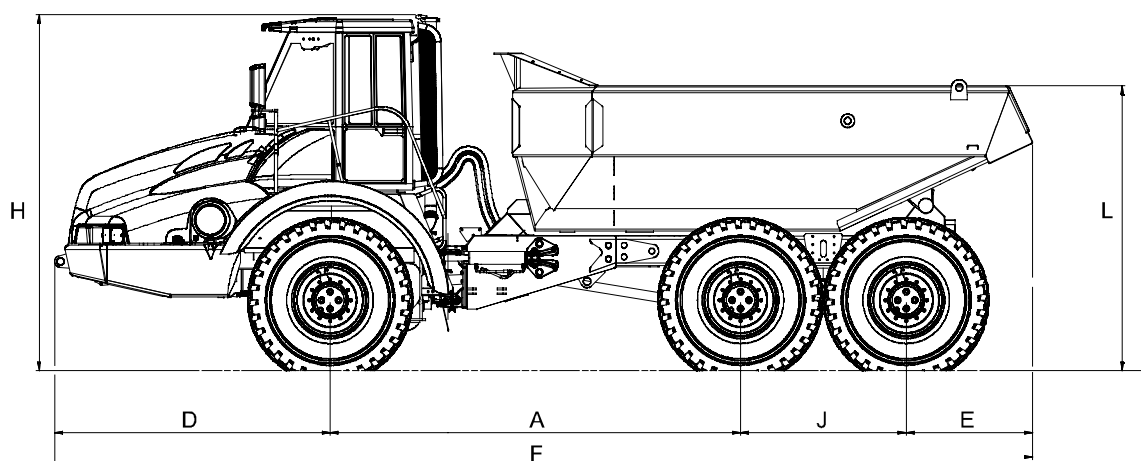
VEHICLE COMPOSITION

GROUPS	DESCRIPTION
ENGINE 	IVECO F3A (Cursor 10)
GEARSHIFT 	ZF 6 WG 260
FRONT AXLE 	KESSLER D81
INTERMEDIATE AXLE 	KESSLER D81
REAR AXLE 	KESSLER D81
TRANSMISSION LAYOUT	

DIMENSIONS (empty vehicle) [mm (ft)]

		mm	ft
A	Wheelbase	4362	14.31
B	Front track	2360	7.74
C	Rear track	2360	7.74
D	Front overhang	2824	9.29
E	Rear overhang	1295	4.26
F	Overall length	10181	33.40
G	Maximum width (excluding mirrors)	2961	9.74
H	Maximum height (*)	3700	12.14
I	Ground clearance (*)	473	1.55
J	Distance between tandem axles	1700	5.59
L	Body height (*)	2518	8.26
Internal steering circle		4300	14.11
External steering circle		8400	27.56

Dimensional tolerance: 3% (*) empty vehicle

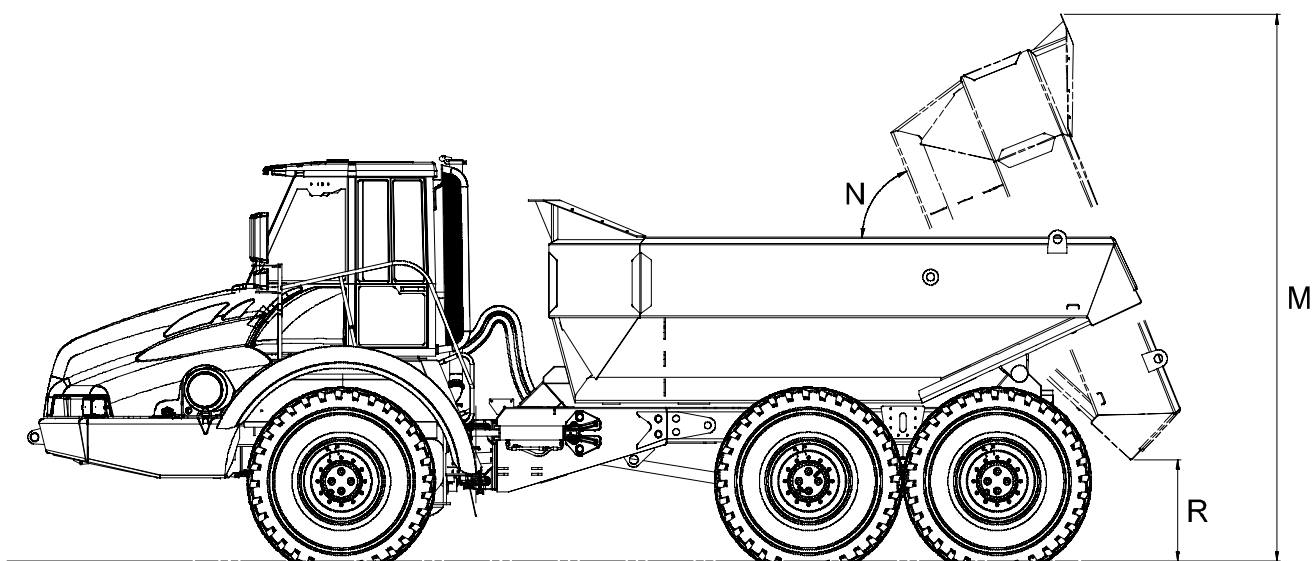


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DIMENSIONS WITH BODY RAISED

M	Maximum height of body (*)	mm	6425
		ft	21.08
N	Maximum dumping angle – Degrees	°	68
R	Ground clearance (*)	mm	965
		ft	3.17
–	Loading capacity to the brim (SAE 1:1)	m ³	10.6
		yd ³	13.86
–	Full loading capacity (SAE 2:1)	m ³	14.5
		yd ³	18.96

Dimensional tolerance: 3% (*) empty vehicle



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