

DL220

Shop Manual

950106-00118E

Serial Number 5001 and Up

DOOSAN reserves the right to improve our products in a continuing process to provide the best possible product to the market place. These improvements can be implemented at any time with no obligation to change materials on previously sold products. It is recommended that consumers periodically contact their distributors for recent documentation on purchased equipment.

This documentation may include attachments and optional equipment that is not available in your machine's package. Please call your distributor for additional items that you may require.

Illustrations used throughout this manual are used only as a representation of the actual piece of equipment, and may vary from the actual item.

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Wheel Loader Safety

Edition 1

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Wheel Loader Safety

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SAFETY PRECAUTIONS



Follow all safety recommendations and safe shop practices outlined in the front of this manual or those contained within this section.

Always use tools and equipment that are in good working order.

Use lifting and hoisting equipment capable of safely handling load.

Remember, that ultimately safety is your own personal responsibility.

APPLICABLE MODELS

The contents of this section apply to the following models and serial number ranges.

MODEL	SERIAL NUMBER RANGE
DL200	5001 and Up
DL220	5001 and Up
DL250	5001 and Up
DL300	5001 and Up
DL350	5001 and Up
DL400	5001 and Up
DL450	5001 and Up
DL500	5001 and Up

TO THE OPERATOR OF A WHEEL LOADER



DANGER

Unsafe use of the wheel loader could lead to serious injury or death. Operating procedures, maintenance and equipment practices or traveling or shipping methods that do not follow the safety guidelines on the following pages could cause serious, potentially fatal injuries or extensive damage to the machine or nearby property.

Please respect the importance of taking responsibility for your own safety, and that other people who may be affected by your actions.

Safety information on the following pages is organized into the following topics.

1. "General Safety Essentials" on page 1-9.
2. "Location of Safety Labels" on page 1-9.
3. "Unauthorized Modifications" on page 1-12.
4. "General Hazard Information" on page 1-12.
5. "Before Starting Engine" on page 1-20.
6. "Machine Operation" on page 1-24.
7. "Maintenance" on page 1-32.
8. "Battery" on page 1-41.
9. "Towing" on page 1-43.
10. "Shipping and Transportation" on page 1-44.

 **WARNING**

Improper operation and maintenance of this machine can be hazardous and could result in serious injury or death.

Operator and maintenance personnel should read this manual thoroughly before beginning operation or maintenance.

Keep this manual in the storage compartment to the rear of the operator's seat, and have all personnel involved in working on the machine periodically read the manual.

Some actions involved in operation and maintenance of the machine can cause a serious accident, if they are not done in a manner described in this manual.

The procedures and precautions given in this manual apply only to intended uses of the machine.

If you use your machine for any unintended uses that are not specifically prohibited, you must be sure that it is safe for any others. In no event should you or others engage in prohibited uses or actions as described in this manual.

DOOSAN delivers machines that comply with all applicable regulations and standards of the country to which it has been sent. If this machine has been purchased in another country or purchased from someone in another country, it may lack certain safety devices and specifications that are necessary for use in your country. If there is any question about whether your product complies with the applicable standards and regulations of your country, consult *DOOSAN* or your *DOOSAN* distributor before operating the machine.

 **SAFETY ALERT SYMBOL** 

Be Prepared - Get to Know All Operating and Safety Instructions.

This is the Safety Alert Symbol. Wherever it appears in this manual or on safety signs on the machine you should be alert to the potential for personal injury or accidents. Always observe safety precautions and follow recommended procedures.

Learn the Signal Words Used with the Safety Alert Symbol

The words "**CAUTION**", "**WARNING**", and "**DANGER**" used throughout this manual and on decals on the machine indicate degree of risk of hazards or unsafe practices. All three degrees of risk indicate that safety is involved. Observe precautions indicated whenever you see the Safety Alert "Triangle", no matter which signal word appears next to the "Exclamation Point" symbol.

CAUTION

This word is used on safety messages and safety labels and indicates potential of a hazardous situation that, if not avoided, could result in minor or moderate injury. It may also be used to alert against a generally unsafe practice.

WARNING

This word is used on safety messages and safety labels and indicates potential threat of a hazardous situation that, if not avoided, could result in serious injury or death. It may also be used to alert against highly unsafe practice.

DANGER

This word is used on safety messages and safety labels and indicates an imminent hazard of a situation that, if not avoided, is very likely to cause death or extremely serious injury. It may also be used to alert against equipment that may detonate or explode if handled or treated carelessly.

Safety precautions are described in SAFETY from page -9 on.

DOOSAN cannot predict every circumstance that might involve a potential hazard in operation and maintenance. Therefore the safety messages in this manual and on the machine may not include all possible safety precautions. If any procedures or actions not specifically recommended or allowed in this manual are used, you must be sure that you and others can do such procedures and actions safely and without damaging the machine. If you are unsure about the safety of any procedures, contact a *DOOSAN* distributor.

GENERAL SAFETY ESSENTIALS

Accessory Applications

This wheel loader has been designed primarily for moving earth with a bucket. For use as a grapple or for other object handling, contact *DOOSAN*. Lifting-work applications are permitted in approved lift configuration, to rated capacity only, with no side-loading (unless prohibited by local regulation). Do not use machine for activities for which it was not intended. Do not use bucket for lifting work, unless lift slings are used in approved configuration.

LOCATION OF SAFETY LABELS

Location of safety labels (decals) can vary from unit to unit. Refer to appropriate Operation and Maintenance Manual, and Parts Manual for your unit.

There are several specific warning signs on this machine. The exact location of hazards and the description of the hazards are reviewed in the appropriate Operation and Maintenance Manual.

Please become familiarized with all warning signs.

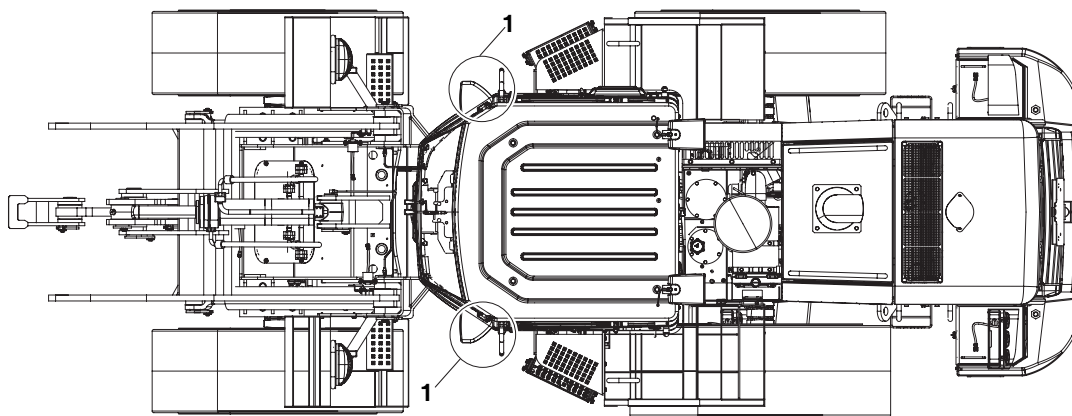
Make sure that all the warning signs are legible. Clean the warning signs or replace the warning signs if you cannot read the words. Replace the illustrations if the illustrations are not visible. When you clean the warning signs, use a cloth, water and soap. Do not use solvent, gasoline, or other harsh chemicals to clean the safety signs. Solvents, gasoline, or other harsh chemicals could loosen the adhesive that secures the warning sign. Loose adhesive will allow the warning sign to fall off.

Replace any safety sign that is damaged, or missing. If a safety sign is attached to a part that is replaced, install a safety sign on the replacement part.

VISIBILITY INFORMATION

A rear view camera and mirrors ensure that visibility around the machine, from the operator's seat, meets the latest ISO standards for the region or marketplace that machine is sold into.

NOTE: *These devices may vary from one region to another, depending upon local and regional regulations. If a machine is moved or sold into another region or marketplace, it is the owner's responsibility to make sure it complies with all regulations.*



1. Mirror

FG015658

Figure 1



WARNING

Failure to check for and clear people from the surrounding area of a machine could result in serious injury or death. The operator should make sure that visual aids (mirrors and camera (s)) are in proper working condition. Look for any possible blind spots.

Your machine may be equipped with visual aids; mirrors or cameras, but even with these aids, there still may be blind spots which cannot be seen from the operator's seat, so always be careful when operating.

Adjust the visual aids for the best visibility criteria for all areas around the machine.

When swinging or backing up, press button to change display mode on monitor so you can check rear and side of machine. Before moving the machine, look around the work site through mirrors and monitor to confirm that no one is around the machine.

While operating or traveling in places with poor visibility, and if it is impossible to confirm the condition of the work site, or if an obstacle is in the area around the machine, there can be a danger that machine may suffer damage or operator or others may suffer serious personal injury.

Inspect equipment and immediately report if there are problems with the visual aids. If machine cannot be fixed immediately, **DO NOT** use the machine. Contact your local *DOOSAN* distributor as soon as possible and ask for repairs.

Guidelines

- If the visibility cannot be sufficiently assured, use a flagman. The operator should pay careful attention to the signals and follow the instructions of the flagman.
- Signals should only be given by one flagman.
- When working in dark places, turn "ON" work lights and front lights on the machine. Set up additional lighting in the area.
- Stop operations if there is poor visibility, such as fog, snow, rain, or sandstorms.
- Check mirrors and rear view camera (optional) lens on machine before starting operations. Clean off any dirt and adjust view to ensure good visibility.

When operating or traveling during poor visibility conditions, and especially in a large machine, strictly adhere to the above guidelines.

NOTE: *Refer to ISO 5006 for additional guidelines and information.*

It may not be possible to adjust all visual aids to see all the way around the machine. Therefore, additional precautions must be taken to ensure the safe operation of the machine.

NOTE: *Larger machines are more likely to have blind spots.*

NOTE: *Refer to ISO 5006 for weight class information.*

UNAUTHORIZED MODIFICATIONS

Any modification made without authorization or written approval from *DOOSAN* can create a safety hazard, for which the machine owner will be held responsible.

For safety's sake, replace all OEM parts with the correct authorized or genuine *DOOSAN* part. For example, not taking the time to replace fasteners, bolts or nuts with the correct replacement parts could lead to a condition where the safety of critical assemblies are dangerously compromised.

GENERAL HAZARD INFORMATION

Safety Rules

Only trained and authorized personnel can operate and maintain the machine.

Follow all safety rules, precautions and instructions when operating or performing maintenance on the machine.

Do not operate the machine if you are not feeling well, if you are taking medication that makes you feel sleepy, if you have been drinking, or if you are suffering from emotional problems. These problems will interfere with your sense of judgment in emergencies and may cause accidents.

When working with another operator or with a person on work site traffic duty, be sure that all personnel know the nature of the work and understand all hand signals that are to be used.

Always observe strictly any other rules related to safety.

Safety Features

Be sure that all guards and covers are installed in their proper position. Have guards and covers repaired immediately if damaged.

Be sure that you understand the method of use of safety features such as transmission lever neutral lock and the seat belt, and use them properly.

Never remove any safety features. Always keep them in good operating condition.

Failure to use safety features according to the instructions in the Operation and Maintenance Manual could result in serious bodily injury.

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