

# Operation & Maintenance Manual

## D31E-20

## D31P-20

## D31PL-20

## D31PLL-20

## D31P-20A

## D37E-5

## D37P-5A

### BULLDOZER

<b>SERIAL NUMBERS</b>	<b>D31E-20</b>	<b>42723 and up</b>
	<b>D31P, PL-20</b>	<b>47617 and up</b>
	<b>D31PLL-20</b>	<b>47653 and up</b>
	<b>D31P-20A</b>	<b>47617 and up</b>
	<b>D37E-5</b>	<b>3731 and up</b>
	<b>D37P-5A</b>	<b>3661 and up</b>

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# 1. FOREWORD

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This manual provides rules and guidelines which will help you use this machine safely and effectively. Keep this manual handy and have all personnel read it periodically. If this manual has been lost or has become dirty and can not be read, request a replacement manual from Komatsu or your Komatsu distributor.

If you sell the machine, be sure to give this manual to the new owners.

Continuing improvements in the design of this machine can lead to changes in detail which may not be reflected in this manual. Consult Komatsu or your Komatsu distributor for the latest available information of your machine or for questions regarding information in this manual.

This manual may contain attachments and optional equipment that are not available in your area. Consult Komatsu or your Komatsu distributor for those items you may require.

## WARNING

- **Improper operation and maintenance of this machine can be hazardous and could result in serious injury or death.**
- **Operators and maintenance personnel should read this manual thoroughly before beginning operation or maintenance.**  
**Keep this manual in a readily available place near the machine (on machines with cab, there is a door pocket to hold the manual), and have all personnel involved in working on the machine read the manual periodically.**  
**Where to keep this manual. → See "11.7 MANUAL POCKET".**
- **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 you and others. In no event should you or others engage in prohibited uses or actions as described in this manual.**
- **Komatsu delivers machines that comply with all applicable regulations and standards of the country to which it has been shipped. 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 Komatsu or your Komatsu distributor before operating the machine.**
- **The description of safety is given in SAFETY INFORMATION on page 0-2 and in SAFETY from page 1-1.**

### **CALIFORNIA**

#### **Proposition 65 Warning**


**Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.**


## 2. SAFETY INFORMATION


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Most accidents are caused by the failure to follow fundamental safety rules for the operation and maintenance of machines. To avoid accidents, read, understand and follow all precautions and warnings in this manual and on the machine before performing operation and maintenance.

To identify safety messages in this manual and on machine labels, the following signal words are used.

 **DANGER** – This word is used on safety messages and safety labels where there is a high probability of serious injury or death if the hazard is not avoided. These safety messages or labels usually describe precautions that must be taken to avoid the hazard. Failure to avoid this hazard may also result in serious damage to the machine.

 **WARNING** – This word is used on safety messages and safety labels where there is a potentially dangerous situation which could result in serious injury or death if the hazard is not avoided. These safety messages or labels usually describe precautions that must be taken to avoid the hazard. Failure to avoid this hazard may also result in serious damage to the machine.

 **CAUTION** – This word is used on safety messages and safety labels for hazards which could result in minor or moderate injury if the hazard is not avoided. This word might also be word for hazards where the only result could be damage to the machine.

**NOTICE** – This word is used for precautions that must be taken to avoid actions which could shorten the life of the machine.

Safety precautions are described in SAFETY from page 1-1.

Komatsu 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 some procedures, contact your Komatsu distributor.

## **3. INTRODUCTION**

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### **3.1 INTENDED USE**

This Komatsu BULLDOZER is designed to be used mainly for the following work:

- Dozing
- Smoothing
- Cutting into hard or frozen ground or ditching.

See the section "12.10 WORK POSSIBLE USING BULLDOZER" for further details.

### **3.2 FEATURES**

- The first complete mono lever system in its class for easier operation
- Maintenance as easy as a mini hydraulic excavator
- Newly installed warning lamps for fuel level, coolant level in the sub radiator tank, and air cleaner.

### **3.3 BREAKING IN THE MACHINE**

Your Komatsu machine has been thoroughly adjusted and tested before shipment.

However, operating the machine under severe conditions at the beginning can adversely affect the performance and shorten the machine life.

Be sure to break in the machine for the initial 100 hours (as indicated by the service meter.)

During breaking in:

- Idle the engine for 5 minutes after starting it up.
- Avoid operation with heavy loads or at high speeds.
- Avoid sudden starts, sudden acceleration, sudden steering and sudden stops except in cases of emergency.

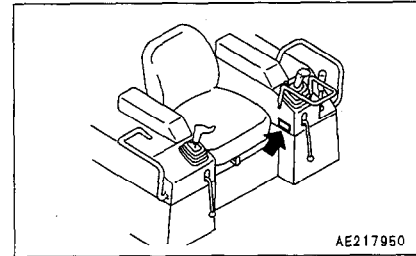
The precautions given in this manual for operating, maintenance, and safety procedures are only those that apply when this product is used for the specified purpose. If the machine is used for a purpose that is not listed in this manual, Komatsu cannot bear any responsibility for safety. All consideration of safety in such operations is the responsibility of the user.

Operations that are prohibited in this manual must never be carried out under any circumstances.

## 4. LOCATION OF PLATES, TABLE TO ENTER SERIAL NO. AND DISTRIBUTOR

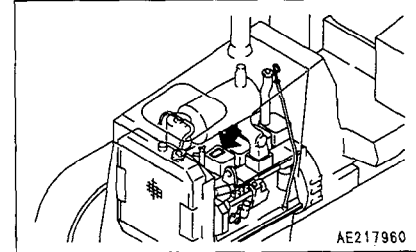
### 4.1 MACHINE SERIAL NO. PLATE POSITION

On the inside of the L.H. armrest



### 4.2 ENGINE SERIAL NO. PLATE POSITION

On the upper side of the engine cylinder head cover



### 4.3 TABLE TO ENTER SERIAL NO. AND DISTRIBUTOR

Machine serial No.:	
Engine serial No.:	
Distributor name:	
Address:	Phone:
Service personnel for your machine:	

### REMARKS

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**MEMO**

# SAFETY

 **WARNING**

**Read and follow all safety precautions. Failure to do so may result in serious injury or death.**

This safety section also contains precautions for optional equipment and attachments.

## 6. GENERAL PRECAUTIONS

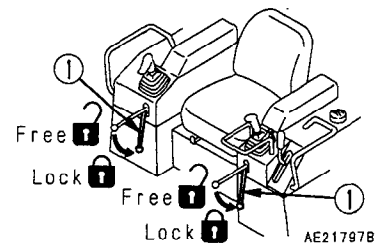
**⚠ WARNING:** For reasons of safety, always follow these safety precautions.

### 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, or if you are taking medicine which will make you sleepy, or if you have been drinking. Operating in such a condition will adversely affect your judgement and may lead to an accident.
- When working with another operator or with a person on worksite traffic duty, be sure that all personnel understand all hand signals that are to be used.
- Always follow all rules related to safety.

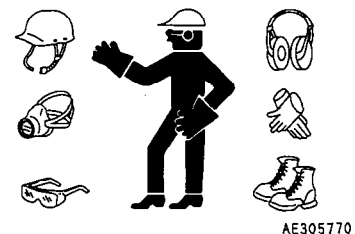
### SAFETY FEATURES

- Be sure that all guards and covers are in their proper position. Have guards and covers repaired if damaged.
- Use safety features such as safety lock levers ① and the seat belt properly.
- Never remove any safety features. Always keep them in good operating condition.  
**Safety lock lever** → See "12.11 PARKING MACHINE".  
**Seat belt** → See "27. USING SEAT BELT".
- Improper use of safety features could result in serious bodily injury or death.



### CLOTHING AND PERSONAL PROTECTIVE ITEMS

- Avoid loose clothing, jewelry, and loose long hair. They can catch on controls or in moving parts and cause serious injury or death.
- Also, do not wear oily clothes, because they are flammable.
- Wear a hard hat, safety glasses, safety shoes, mask or gloves when operating or maintaining the machine. Always wear safety goggles, hard hat and heavy gloves if your job involves scattering metal chips or minute materials particularly when driving pins with a hammer and when cleaning the air cleaner element with compressed air. Check also that there is no one near the machine.
- Check that all protective equipment functions properly before using.



### UNAUTHORIZED MODIFICATION

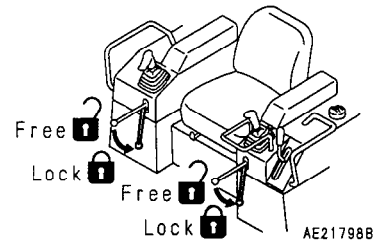
Any modification made without authorization from Komatsu can create hazards. Before making a modification, consult your Komatsu distributor. Komatsu will not be responsible for any injury or damage caused by any unauthorized modification.

**ALWAYS APPLY LOCK WHEN LEAVING OPERATOR'S SEAT**

- When standing up from the operator's seat, always place the safety lock levers and parking brake lever securely in the LOCK position. If you accidentally touch the levers when they are not locked, the work equipment may suddenly move and cause serious injury or damage.
- When leaving the machine, lower the blade and ripper completely to the ground, set the safety lock levers and parking brake lever to the LOCK position, then stop the engine. Use the key to lock all the equipment. Always remove the key and take it with you.

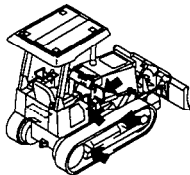
**Work equipment posture → See "12.11 PARKING MACHINE".**

**Locking → See "12.15 LOCKING"**

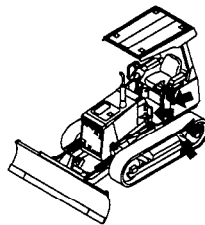


**MOUNTING AND DISMOUNTING**

- Never jump on or off the machine. Never get on or off a moving machine.
- When getting on or off the machine, always face the machine and use the handrails and steps.
- Never hold any control levers or lock levers when getting on or off the machine.
- Maintain three-point contact to be sure that you do not fall from the machine.
- Repair any damaged handhold, and tighten any loose bolts. Handholds, track frame and track shoes must be free of oil, grease and excessive dirt.



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### FIRE PREVENTION FOR FUEL AND OIL

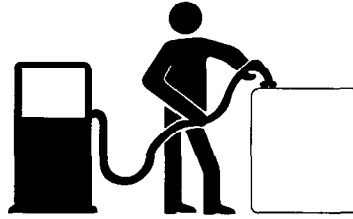
Fuel, oil, and antifreeze can be ignited by a flame. Fuel is particularly flammable and can be hazardous.

Always observe the following:

- Keep any flame or lighted cigarette away from flammable fluids.
- Stop the engine and do not smoke when refueling.
- Tighten all fuel and oil caps securely.
- Use well-ventilated areas for adding or storing oil and fuel.
- Keep oil and fuel in the determined place and do not allow unauthorized persons to enter.



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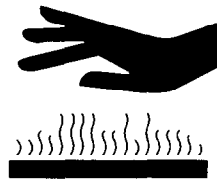
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### PRECAUTIONS WHEN HANDLING AT HIGH TEMPERATURE

- Immediately after operations are stopped, the engine oil and hydraulic oil are at high temperature and are still under pressure. Attempting to remove the cap, drain the oil or water, or replace the filters may lead to serious burns. Always wait for the temperature to go down, and follow the specified procedures when carrying out these operations.
- To prevent hot water from spurting out, stop the engine, wait for the water to cool, then loosen the cap slowly to relieve the pressure before removing the cap.  
(When checking if the water temperature has gone down, put your hand near the front face of the radiator and check the air temperature. Be careful not to touch the radiator.)
- To prevent hot oil from spurting out, stop the engine, wait for the oil to cool, then loosen the cap slowly to relieve the pressure before removing the cap.  
(When checking if the oil temperature has gone down, put your hand near the front face of the hydraulic tank and check the air temperature. Be careful not to touch the hydraulic tank.)



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### ASBESTOS DUST HAZARD PREVENTION

Asbestos dust can be hazardous to your health if it is inhaled.

Komatsu does not use asbestos in its products, but if you handle materials containing asbestos fibers, follow the guidelines given below:

- Never use compressed air for cleaning.
- Use water to keep down the dust when cleaning.
- If there is danger that there may be asbestos dust in the air, operate the machine from an upwind position whenever possible.
- Use an approved respirator if necessary.



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### CRUSHING OR CUTTING PREVENTION

Do not enter, or put your hand or arm or any other part of your body between movable parts such as the work equipment and cylinders, or between the machine and work equipment.

If the work equipment is operated, the clearance will change and this may lead to serious damage or personal injury.

If it is necessary to go between movable parts, always lock the levers and be sure that the work equipment cannot move. For details, see "8. PRECAUTIONS FOR MAINTENANCE".

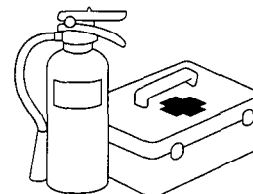


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### FIRE EXTINGUISHER AND FIRST AID KIT

Always follow the precautions below to prepare for action if any injury or fire should occur.

- Be sure that fire extinguishers have been provided and read the labels to ensure that you know how to use them.
- Provide a first aid kit at the storage point. Carry out periodic checks and add to the contents if necessary.
- Know what to do in the event of a fire or injury.
- Decide the phone numbers of persons (doctor, ambulance, fire station, etc.) to contact in case of an emergency. Post these contact numbers in specified places and make sure that all personnel know the numbers and correct contact procedures.



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**ROPS**

If ROPS is installed, do not operate the machine with the ROPS removed. ROPS is installed to protect the operator if the machine should roll over. It supports the load when the machine rolls over and also absorbs impact energy. The Komatsu ROPS fulfills all worldwide regulations and standards, but it is damaged by falling objects or by rolling over, its strength will be reduced and it will not be able to provide its original capacity. In such a case, please contact your Komatsu distributor for advice on the method of repair. Even if ROPS is installed, it can only protect you properly if you wear the seat belt. Always fasten the seat belt when operating the machine.

**Seat belt → See "27. USING SEAT BELT".**

**PRECAUTIONS FOR ATTACHMENTS**

- When installing and using an optional attachment, read the instruction manual for the attachment and the information related to attachments in this manual.
- Do not use optional parts or attachments that are not authorized by Komatsu or your Komatsu distributor. Use of unauthorized attachments could create a safety problem and adversely affect the proper operation and useful life of the machine.
- Any injury, accidents, product failures resulting from the use of unauthorized attachments will not be the responsibility of Komatsu.

**PRECAUTIONS WITH SEAT BELT**

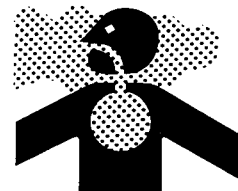
- To ensure safety during operations, always wear the seat belt.
- Before fastening the seat belt, check that there is no abnormality in the belt or belt mount bracket. If these are worn or damaged, replace the seat belt.
- Be sure that the seat belt is not twisted when fastening it.

**Seat belt → See "27. USING SEAT BELT".**

**VENTILATION FOR ENCLOSED AREAS**

Exhaust fumes from the engine can kill.

- If it is necessary to start the engine within an enclosed area, or you handle fuel, flushing oil, or paint, open the doors and windows to ensure that you provide adequate ventilation to prevent gas poisoning.
- If opening the doors and windows still does not provide adequate ventilation, set up fans.



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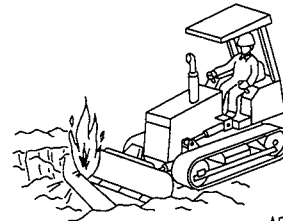
## 7. PRECAUTIONS DURING OPERATION

**⚠ WARNING:** Failure to follow these safety precautions may lead to a serious accident.

### 7.1 BEFORE STARTING ENGINE

#### SAFETY AT WORKSITE

- Before starting operations, thoroughly check the area for any unusual conditions that could be dangerous.
- Check the terrain and condition of the ground at the worksite, and determine the best and safest method of operation.
- Make the ground surface as hard and horizontal as possible before carrying out operations. If the jobsite is dusty, spray water before starting operations.
- If you need to operate on a road, protect pedestrians and cars by designating a person for worksite traffic duty or by installing fences and putting up No Entry signs around the worksite.
- If water lines, gas lines, or high-voltage electrical lines may be buried under the worksite, contact each utility and identify their locations. Be careful not to sever or damage any of these lines.
- Check the ground condition and the depth and flow of water before operating in water or crossing a river. NEVER be in water which is in excess of the permissible water depth.  
**Permissible water depth → See "12.9 PRECAUTIONS FOR OPERATION".**



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#### CHECKS BEFORE STARTING ENGINE

Carry out the following checks before starting the engine at the beginning of the days work. Failure to carry out these checks may lead to serious injury or damage.

- Completely remove all flammable materials accumulated around the engine and battery, return all fuel containers to their proper place, remove all parts and tools from the operator's compartment, and remove any dirt from the mirrors, handrails, and steps.

**Walk-around checks → See "12.1.1 WALK-AROUND CHECK".**

- Check the coolant level, fuel level, and oil level in the hydraulic tank, check for clogging of the air cleaner, and check the electric wiring.

**Checks before starting → See "12.1.2 CHECK BEFORE STARTING".**

- Adjust the operator's seat to a position where it is easy to carry out operations, and check for wear or damage to the seat belt and seat belt mounting equipment.

**Adjusting operator's seat → See "12.1.3 ADJUST OPERATOR'S SEAT".**

- Check that the gauges work properly, and check that the control levers are all at the NEUTRAL position.

**Method of checking operation of gauges →**

**See "12.1.4 OPERATIONS AND CHECKS BEFORE STARTING ENGINE".**

If the above inspections show any abnormality, carry out repairs immediately.



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**WHEN STARTING ENGINE**

- Walk around your machine again just before mounting it, and check for people and objects that might be in the way.
- Never start the engine if a warning tag has been attached to the blade control lever.
- When starting the engine, sound the horn as an alert.
- Start and operate the machine only while seated.
- An additional worker may ride in the machine only when sitting in the passenger seat. Do not allow anyone to ride on the machine body.
- Do not short circuit the starting motor circuit to start the engine. It is not only dangerous, but will also cause damage to the equipment.



## 7.2 AFTER STARTING ENGINE

### CHECKS AFTER STARTING ENGINE

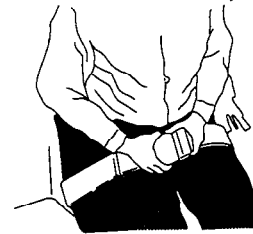
Failure to carry out the checks properly after starting the engine will lead to delays in discovery of abnormalities, and this may lead to serious injury or damage to the machine.

When carrying out the checks, use a wide area where there are no obstructions. Do not allow anyone near the machine.

- Check the operation of the gauges and equipment, and check the operation of the blade, ripper, brakes, travel system, and steering system.
- Checks for any abnormality in the sound of the machine, vibration, heat, smell, or gauges; check also that there is no leakage of air, oil, or fuel.
- If any abnormality is found, carry out repairs immediately.  
If the machine is used when it is not in proper condition, it may lead to serious injury or damage to the machine.

### PRECAUTIONS WHEN STARTING OFF

- Before starting off, check again that there is no one in the surrounding area and that there are no obstacles.
- When starting off, sound the horn as an alert.  
Always operate the machine only when seated.
- An additional worker may ride in the machine only when sitting in the passenger seat. Do not allow anyone to ride on the machine body.
- Fasten your seat belt securely equipped with seat belt.
- Check that the backup alarm works properly.
- Always close the door of the operator's compartment and check that the door is securely locked.

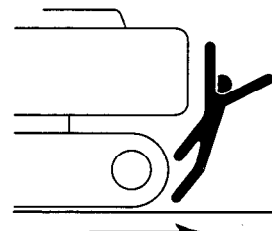


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### CHECK WHEN CHANGING DIRECTION

To prevent serious injury or death, always do the following before moving the machine or doing the leveling work.

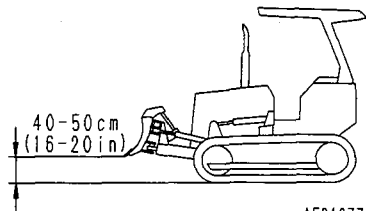
- Before changing between forward and reverse, reduce speed and stop the machine.
- Before operating the machine, sound the horn to warn people in the area.
- Check that there is no one near the machine. Be particularly careful to check behind the machine.
- When operating in areas that may be hazardous or have poor visibility, designate a person to direct worksite traffic.
- Ensure that no unauthorized person can come within the direction of turning or direction of travel.  
Always be sure to carry out the above precautions even when the machine is equipped with a backup alarm and mirrors.



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**PRECAUTIONS WHEN TRAVELING**

- Never turn the key in the starting switch to the OFF position when traveling. It is dangerous if the engine stops when the machine is traveling, because it becomes impossible to operate the steering. (for machines stopped by starting switch)
- It is dangerous to look around you when operating. Always concentrate on your work.
- It is dangerous to drive too fast, or to start suddenly, stop suddenly, turn sharply, or zigzag.
- If you find any abnormality in the machine during operation (noise, vibration, smell, incorrect gauges, air leakage, oil leakage, etc.), move the machine immediately to a safe place and look for the cause.
- Set the work equipment to a height of 40 – 50 cm (16 – 20 in) from the ground level and travel on level ground.
- When traveling, do not operate the work equipment control levers. If the work equipment control levers have to be operated, never operate them suddenly.
- Do not operate the steering suddenly. The work equipment may hit the ground surface and cause the machine to lose its balance, or may damage the machine or structures in the area.
- When traveling on rough ground, travel at low speed, and avoid sudden changes in direction.
- Avoid traveling over obstacles as far as possible. If the machine has to travel over an obstacle, keep the work equipment as close to the ground as possible and travel at low speed. Never travel over obstacles which make the machine tilt strongly (10° or more).
- When traveling or carrying out operations, always keep your distance from other machines or structures to avoid coming into contact with them.
- NEVER be in water which is in excess of the permissible water depth.  
**Permissible water depth → See "12.9 PRECAUTIONS FOR OPERATION".**
- When passing over bridges or structures on private land, check first that the structure is strong enough to support the mass of the machine. When traveling on public roads, check first with the relevant authorities and follow their instructions.



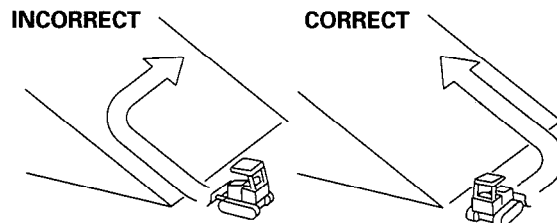
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### TRAVELING ON SLOPES

- Traveling on slopes could result in the machine tipping over or slipping to the side.
- When traveling on slopes, keep the blade approximately 20 to 30 cm (8 to 12 in) above the ground. In case of emergency, quickly lower the blade to the ground to help the machine to stop.
- Do not turn on slopes or travel across slopes. Always go down to a flat place to perform these operations.
- Do not travel on grass, fallen leaves, or wet steel plates. Even slight slopes may cause the machine to slip to the side, so travel at low speed and make sure that the machine is always traveling directly up or down the slope.
- When traveling downhill, use the braking force of the engine and travel slowly.
- Be careful when allowing the machine to travel downhill under its own weight. It may steer in the opposite direction.

**Reverse steering when traveling downhill →**

**See "12.7.2 TURNING WHILE DESCENDING A SLOPE".**



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### PROHIBITED OPERATIONS

To prevent the machine from turning over or the work equipment from being damaged because of overload, always keep within the safe angle and maximum load specified for the machine. Never use the machine in excess of its capacity.

### PRECAUTIONS WHEN OPERATING

- Be careful not to approach too close to the edge of cliffs. When making embankments or landfills, or when dropping soil over a cliff, dump one pile, then use the next pile of soil to push the first pile.
- The load suddenly becomes lighter when the soil is pushed over a cliff or when the machine reaches the top of a slope. When this happens, there is danger that the travel speed will suddenly increase, so be sure to reduce the speed.
- If the load is applied to only one side of the blade, the rear of the machine may swing.
- Carry out only work that is specified as the purpose of the machine. Carrying out other operations will cause breakdowns.  
**Specified operations → See "12.10 WORK POSSIBLE USING BULLDOZER".**
- Do the following to ensure good visibility.
  - When operating in dark places, turn on the working lamps and front lamps, and install lighting at the jobsite if necessary.
  - Do not carry out operations in fog, mist, snow, or heavy rain, or other conditions where the visibility is poor. Wait for the weather to clear so that visibility is sufficient to carry out work.
- Always do the following to prevent the work equipment from hitting other objects.
  - When operating in tunnels, under bridges, under electric wires, or other places where the height is limited, be extremely careful not to let the blade hit anything.
  - To prevent accidents caused by hitting other objects, always operate the machine at a speed which is safe for operation, particularly in confined spaces, indoors, and in places where there are other machines.

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