

PART NO. EM1N1-NA1-1

HITACHI

Operator's Manual

ZAXIS

60USB-3

Hydraulic Excavator

ZAXIS60USB-3 HYDRAULIC EXCAVATOR OPERATOR'S MANUAL

EM1N1-NA1-1

 **Hitachi Construction Machinery Co., Ltd.**

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Serial No. 0010001 and up

INTRODUCTION

Read this manual carefully to learn how to operate and service your machine correctly. Failure to do so could result in personal injury or equipment damage.

This standard specification machine can be operated under the following conditions without being modified.

Atmospheric Temperature: -20°C to 40°C (-4°F to 104°F)

Altitude: 0 m to 1500 m (0 ft to 4900 ft)

In case the machine is used under conditions other than described above, consult your nearest Hitachi dealer.

This manual should be considered a permanent part of your machine and should remain with the machine when you sell it.

This machine is of metric design. Measurements in this manual are metric. Use only metric hardware and tools as specified.

- SI Units (International System of Units) are used in this manual.

For reference MKS system units and English units are also indicated in parentheses after the SI units.

Example : 24.5 MPa (250 kgf/cm², 3560 psi)

Right-hand and left-hand sides are determined by facing in the direction of forward travel.

Write product identification numbers in the Machine Numbers section. Accurately record all the numbers to help in tracing the machine should it be stolen. Your dealer also needs these numbers when you order parts. If this manual is kept on the machine, also file the identification numbers in a secure place off the machine.

Use only diesel fuel with quality specified in JIS K-2204, EN-590, ASTM D-975, GOST R52368 or GB252.

Failure to use diesel fuel with quality as specified above may allow the engine to emit exhaust gas which cleanness can not conform to the requests in various relevant regulations. In addition, serious damage to the engine may result. Consult with your authorized dealer for detailed information.

Warranty is provided as a part of Hitachi's support program for customers who operate and maintain their equipment as described in this manual. The warranty is explained on the warranty certificate which you should have received from your dealer.

This warranty provides you the assurance that Hitachi will back its products where defects appear within the warranty period. In some circumstances, Hitachi also provides field improvements, often without charge to the customer, even if the product is out of warranty.

Should the equipment be abused, or modified to change its performance beyond the original factory specifications, the warranty will become void and field improvements may be denied.

Setting fuel delivery above specifications or otherwise overpowering machines will result in such action.

Only qualified, experienced operators officially licensed (according to local law) should be allowed to operate the machine. Moreover, only officially licensed personnel should be allowed to inspect and service the machine.

PRIOR TO OPERATING THIS MACHINE IN A COUNTRY OTHER THAN A COUNTRY OF ITS INTENDED USE, IT MAY BE NECESSARY TO MAKE MODIFICATIONS TO IT SO THAT IT COMPLIES WITH THE LOCAL REGULATORY STANDARDS (INCLUDING SAFETY STANDARDS) AND LEGAL REQUIREMENTS OF THAT PARTICULAR COUNTRY. PLEASE DO NOT EXPORT OR OPERATE THIS MACHINE OUTSIDE OF THE COUNTRY OF ITS INTENDED USE UNTIL SUCH COMPLIANCE HAS BEEN CONFIRMED. PLEASE CONTACT HITACHI CONSTRUCTION MACHINERY CO., LTD. OR ANY OF OUR AUTHORIZED DISTRIBUTOR OR DEALER IF YOU HAVE ANY QUESTIONS CONCERNING COMPLIANCE.

All information, illustrations and specifications in this manual are based on the latest product information available at the time of publication. The right is reserved to make changes at any time without notice.

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MACHINE NUMBERS

The manufacturing Nos. explained in this group is the individual number (serial No.) given to each machine and hydraulic components. These numbers are requested when inquiring any information on the machine and/or components. Fill these serial Nos. in the blank spaces in this group to immediately make them available upon request.


MACHINE

MODEL/TYPE: _____

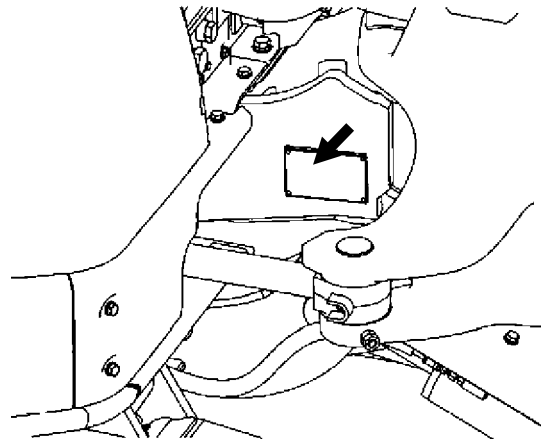
PRODUCT IDENTIFICATION NUMBER: _____

PRODUCT IDENTIFICATION NUMBER

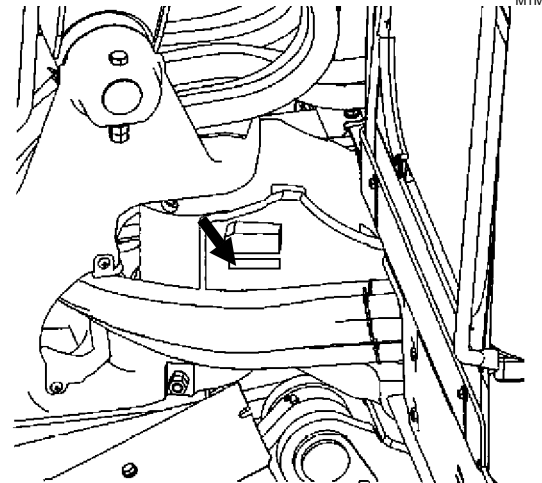
PRODUCT IDENTIFICATION NUMBER: _____

 NOTE:

HCM1N100X00010001 Marks to indicate the start and end of the PIN
PRODUCT IDENTIFICATION NUMBER (PIN)



M1M0-00-001

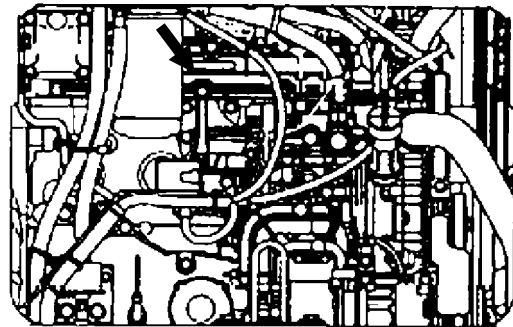


M1M0-00-002

ENGINE

TYPE: _____

MFG. NO.: _____

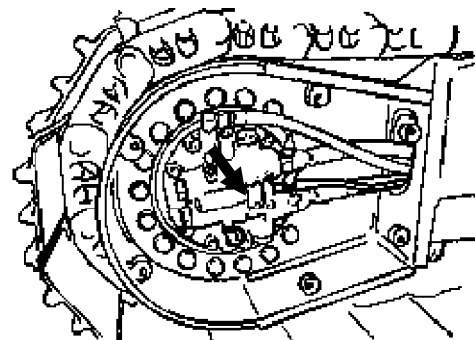


M1M0-00-003

TRAVEL MOTOR

TYPE: _____

MFG. NO.: _____



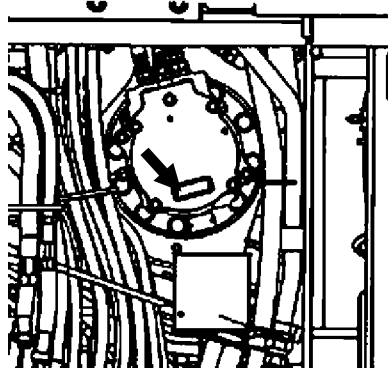
M1M0-00-004

MACHINE NUMBERS

SWING MOTOR

TYPE: _____

MFG. NO.: _____

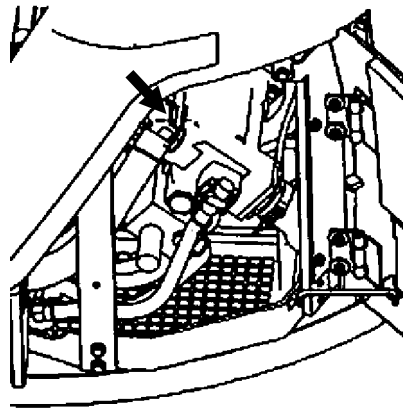


M1M0-00-005

HYDRAULIC PUMP

TYPE: _____

MFG. NO.: _____



M1M0-00-006

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SAFETY


RECOGNIZE SAFETY INFORMATION

- These are the **SAFETY ALERT SYMBOLS**.
 - When you see these symbols on your machine or in this manual, be alert to the potential for personal injury.
 - Follow recommended precautions and safe operating practices.



SA-688

UNDERSTAND SIGNAL WORDS

- On machine safety signs, signal words designating the degree or level of hazard - **DANGER**, **WARNING**, or **CAUTION** - are used with the safety alert symbol.
 - **DANGER** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
 - **WARNING** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
 - **CAUTION** indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
 - **DANGER** or **WARNING** safety signs are located near specific hazards. General precautions are listed on **CAUTION** safety signs.
 - Some safety signs do not use any of the designated signal words above after the safety alert symbol are occasionally used on this machine.
- To avoid confusing machine protection with personal safety messages, a signal word **IMPORTANT** indicates a situation which, if not avoided, could result in damage to the machine.
-  **NOTE** indicates an additional explanation for an element of information.

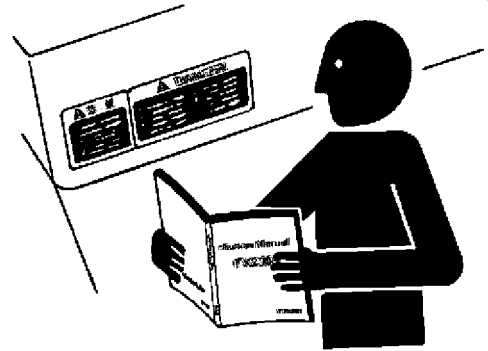


SA-1223

SAFETY

FOLLOW SAFETY INSTRUCTIONS

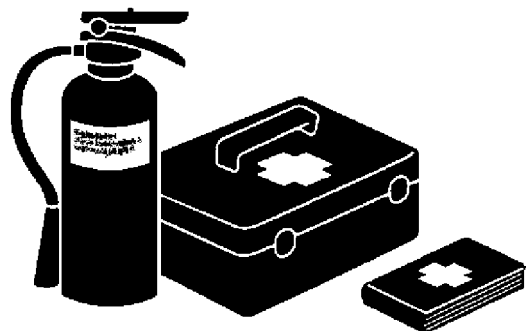
- Carefully read and follow all safety signs on the machine as well as all safety messages in this manual.
- Safety signs must be installed, maintained and replaced if damaged.
 - If a safety sign or this manual is damaged or missing, order a replacement from your authorized dealer in the same way you order other replacement parts (be sure to state machine model and serial number when ordering).
- Allow only properly trained, qualified, authorized personnel to operate the machine.
- Learn how to correctly operate and service the machine.
- Keep your machine in proper working condition.
- Always operate the machine within the specification.
 - Unauthorized modifications of the machine may impair the functions and/or safety and affect machine life.
 - Do not modify any machine parts without authorization. Failure to do so may deteriorate the part safety, function, and/or service life. In addition, personal accident, machine trouble, and/or damage to material caused by unauthorized modifications will void Hitachi Warranty Policy.
 - Do not use attachments and/or optional parts or equipment not authorized by Hitachi. Failure to do so may deteriorate the safety, function, and/or service life of the machine. In addition, personal accident, machine trouble, and/or damage to material caused by using unauthorized attachments and/or optional parts or equipment will void Hitachi Warranty Policy.
- The safety messages in this SAFETY chapter are intended to illustrate basic safety procedures of machines. However it is impossible for these safety messages to cover every possible hazardous situation you may encounter. If you have any questions concerning safety, you should first consult your supervisor and/or your authorized dealer before operating or performing maintenance work on the machine.



SA-003

PREPARE FOR EMERGENCIES

- Be prepared if a fire starts or if an accident occurs.
 - Keep a first aid kit and fire extinguisher on hand.
 - Thoroughly read and understand the label attached on the fire extinguisher and use it properly.
 - To ensure that a fire-extinguisher can be always used when necessary, check and service the fire-extinguisher at the recommended intervals as specified in the fire-extinguisher manual.
 - Establish emergency procedure guidelines to cope with any fire or accidents which may occur.
 - Keep emergency numbers for doctors, ambulance service, hospitals, and fire department posted near your telephone.



SA-437

SAFETY

WEAR PROTECTIVE CLOTHING

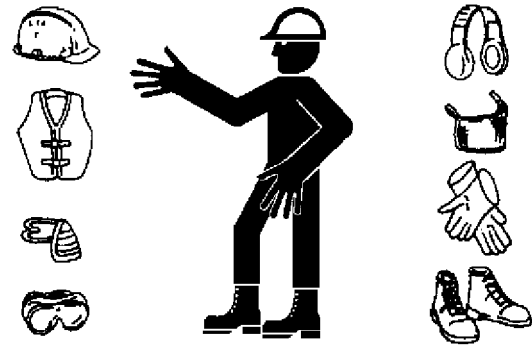
- Wear close fitting clothing and safety equipment appropriate to the job.

You may need:

- A hard hat
- Safety belt
- Safety shoes
- Safety glasses, goggles, or face shield
- Heavy gloves
- Hearing protection
- Reflective clothing
- Wet weather gear
- Respirator or filter mask.

Be sure to wear the correct equipment and clothing for the job. Do not take any chances.

- Avoid wearing loose clothing, jewelry, or other items that can catch on control levers or other parts of the machine.
- Operating equipment safely requires the full attention of the operator.
- Do not wear radio or music headphones while operating the machine.



SA-438

PROTECT AGAINST NOISE

- Prolonged exposure to loud noise can cause impairment or loss of hearing.
- Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortably loud noises.



SA-434

INSPECT MACHINE

- If any abnormality is found, be sure to repair it immediately before operating the machine.
- In the walk-around inspection, be sure to cover all points described in the “PRE-START INSPECTION” chapter in the operator’s manual.



SA-435

SAFETY

TIDY UP INSIDE OPERATOR'S SPACE

- Always keep inside the operator's space clean by observing instructions below, to prevent any personal accidents from occurring.
- Remove mud and/or oily material from the shoe soles before entering the operator's space. If pedals are operated without removing mud or oily matter, the foot may slip off the pedal, possibly creating a hazardous situation.
- Do not leave parts and/or tools around the operator's seat.
- Avoid storing transparent bottles in the cab. Do not attach any transparent type window decorations on the windowpanes as they may focus sunlight, possibly starting a fire.
- Do not wear radio or music headphones and do not use a cell phone while traveling or operating the machine.
- Keep all flammable objects and/or explosives away from the machine.
- After using the ashtray, always cover it to extinguish the match and/or tobacco.
- Never allow hazardous materials such as combustible and/or explosive material in the operator's space.
- Do not leave cigarette lighters in the cab. If the temperature in the cab increases, the lighter may explode.

USE HANDHOLDS AND STEPS

- Falling is one of the major causes of personal injury.
 - When you get on and off the machine, always use the crawler instead of the step for safety. Also get on and off from the position of the crawler that can secure your feet space enough.
 - When you get on and off the machine, always face the machine.
 - Maintain a three-point contact with the steps and handrails.
 - Do not use any controls as handholds.
 - Never jump on or off the machine. Never mount or dismount a moving machine.
 - In case adhered slippery material such as oil, grease, or mud is present on steps, handrails, or platforms, thoroughly remove such material.



SA-439

SAFETY

ADJUST THE OPERATOR'S SEAT

- A poorly adjusted seat for either the operator or for the work at hand may quickly fatigue the operator leading to mis-operation of the machine.
- The seat should be adjusted whenever the operator for the machine changes.
- The operator should be able to fully depress the pedals and to correctly operate the control levers with his back firmly against the seat back.
- If not, readjust the seat forward or backward, and check again.
- Adjust the rear view mirror position so that the best rear visibility is obtained from the operator's seat. If the mirror is broken, immediately replace it with a new one.



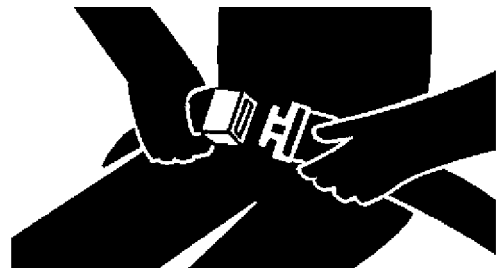
SA-378

ENSURE SAFETY BEFORE RISING FROM OR LEAVING OPERATOR'S SEAT

- Before rising from the operator's seat to open/close either side window or to adjust the seat position, be sure to first lower the front attachment to the ground and then move the pilot control shut-off lever to the LOCK position. Failure to do so may allow the machine to unexpectedly move when a body part unintentionally comes in contact with a control lever, possibly resulting in serious personal injury or death.
- Before leaving the machine, be sure to first lower the front attachment to the ground and then move the pilot control shut-off lever to the LOCK position. Turn the key switch OFF to stop the engine.
- Before leaving the machine, close all windows, doors, and access covers and lock them up.

FASTEN YOUR SEAT BELT

- If the machine should overturn, the operator may become injured and/or thrown from the cab. Additionally the operator may be crushed by the overturning machine, resulting in serious injury or death.
- Be sure to remain seated with the seat belt securely fastened whenever operating the machine.
- Prior to operating the machine, thoroughly examine webbing, buckle and attaching hardware. If any item is damaged or worn, replace the seat belt or component before operating the machine. Replace the seat belt at least once every 3 years regardless of appearance

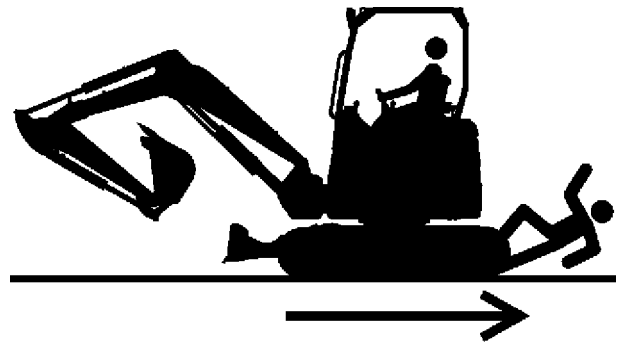


SA-237

SAFETY

MOVE AND OPERATE MACHINE SAFELY

- Always be aware that there is a potential danger around the machine while operating the machine.
- Take extra care not to run over bystanders. Confirm the location of bystanders before moving, swinging, or operating the machine.
- Always keep the travel alarm and horn in working condition (if equipped).
- Before starting to move or operate the machine, sound the travel alarm and horn to alert bystanders.
- Use a signal person when moving, swinging, or operating the machine in congested areas. Locate the signal person so that the operator can always witness the signal person.
- Coordinate the meanings of all safety signs, hand signals and marks before starting the machine. Appoint a person who is responsible to make a signal and/or guidance.
- Never allow any persons or obstacles to enter the machine operation areas.
- Use appropriate illuminations. Check that all lights are operable before operating the machine. If any faulty illumination is present, immediately repair it.

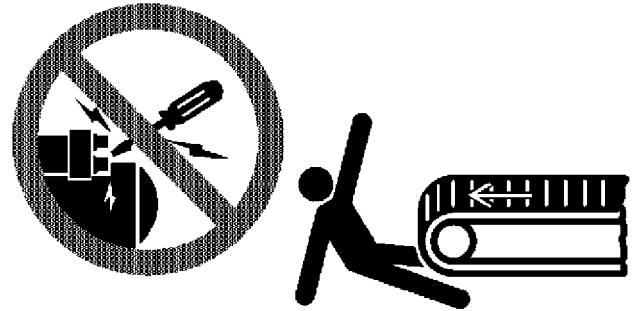


SA-1291

SAFETY

OPERATE ONLY FROM OPERATOR'S SEAT

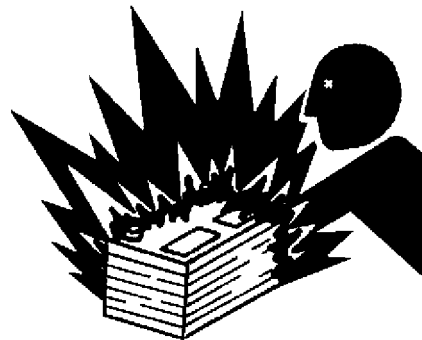
- Inappropriate engine starting procedures may cause the machine to runaway, possibly resulting in serious injury or death.
- Start the engine only when seated in the operator's seat.
- NEVER start the engine while standing on the tracks or on ground.
- Do not start engine by shorting across starter terminals. A hazardous situation may be created and/or possible damage to the machine may result.
- Before starting the engine, confirm that all control levers are in neutral.
- Before starting the engine, confirm the safety around the machine and sound the horn to alert bystanders.



SA-444

JUMP STARTING

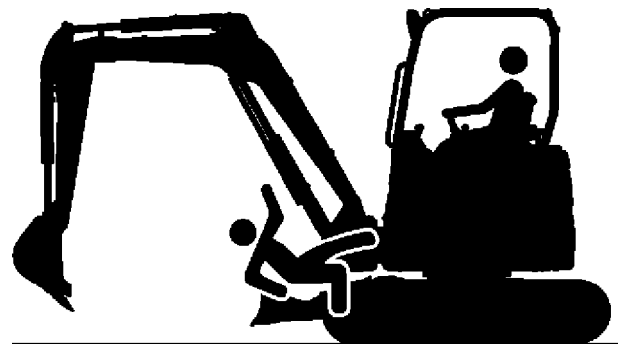
- Failure to follow correct jump starting procedures could result in a battery explosion or a runaway machine.
- If the engine must be jump started, be sure to follow the instructions shown in the "OPERATING THE ENGINE" chapter.
- The operator must be seated in the operator's seat so that the machine will be under control when the engine starts. Jump starting is a two-person operation.
- Never use a frozen battery.
- Failure to follow correct jump starting procedures could result in a battery explosion or a runaway machine.



SA-032

KEEP RIDERS OFF MACHINE

- Riders on machine are subject to injury such as being struck by foreign objects and being thrown off the machine.
- Riders also obstruct the operator's view, resulting in the machine being operated in an unsafe manner.
- Only allow the operator is allowed on the machine. Keep riders off.

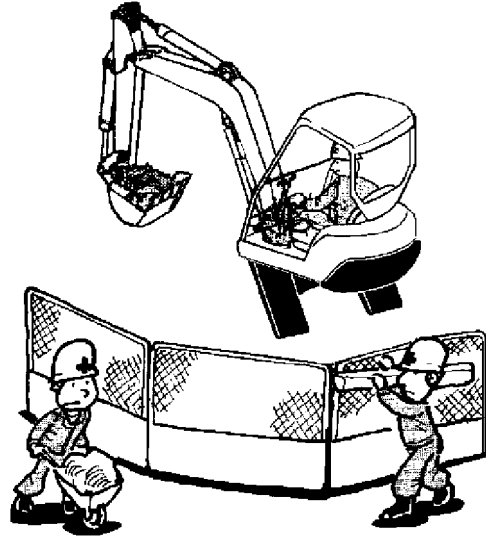


SA-1292

SAFETY

PRECAUTIONS FOR OPERATIONS

- Thoroughly make certain safety at the work site before starting operations. Especially always observe the following points.
 - Be sure to install the overhead cab guard before operating the machine in areas where the possibility of falling stones or debris exists.
 - If operation on soft ground is required, sufficiently reinforce the ground beforehand.
- Be sure to wear close fitting clothing and required safety items, such as a hard hat, when operating the machine.
- Keep all bystanders and unnecessary objects out of and away from the machine working areas. Always beware of the surroundings while operating the machine. Take care not to allow the rear part of the upperstructure to come in contact with objects when swinging the machine in a small area.
- When loading a dump truck, bring the bucket from the rear side of the dump truck to avoid moving the bucket over the dump truck cab or over any co-workers.

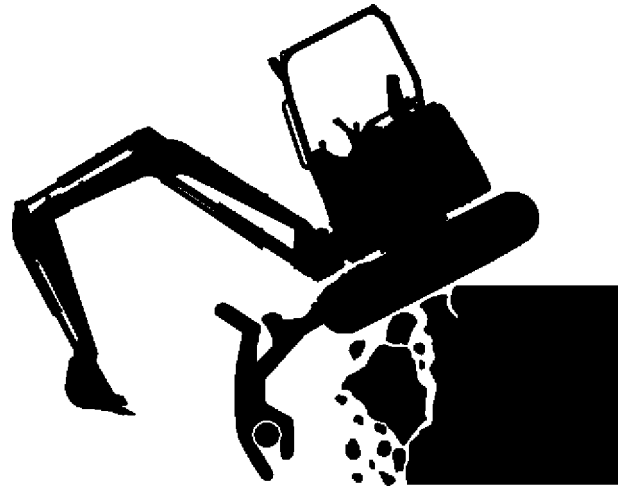


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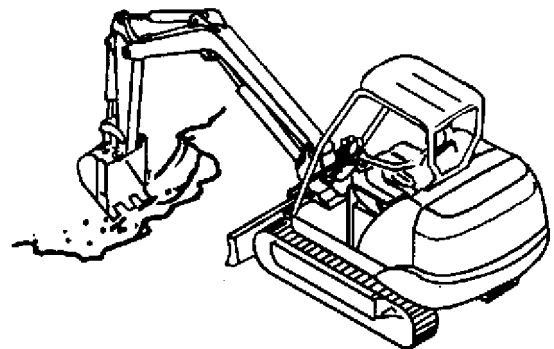
SAFETY

INVESTIGATE JOB SITE BEFOREHAND

- When working at the edge of an excavation or on a road shoulder, the machine could tip over due to collapse of the ground, possibly resulting in serious injury or death.
- Investigate the configuration and ground conditions of the job site beforehand to prevent the machine from falling and to prevent the ground, stockpiles, or banks from collapsing.
- Make a work plan. Use machines appropriate to the work and job site.
- Reinforce ground, edges, and road shoulders as necessary. Keep the machine well back from the edges of excavations and road shoulders.
- When working on an incline or on a road shoulder, employ a signal person as required.
- Never allow bystanders to enter the working area such as swing radius or traveling range.
- When the footing is weak, reinforce the ground before starting work.
- Confirm that your machine is equipped a FOPS cab before working in areas where the possibility of falling stones or debris exist.
- When working on frozen ground, be extremely alert. As ambient temperatures rise, footing may become loose and slippery.
- When operating the machine near open flame, sparks, and/or dead grass, a fire may easily break out. Use special care not to cause a fire.
- Make sure the work site ground has sufficient strength to firmly support the machine. When working close to an excavation or on road shoulders, operate the machine with the tracks positioned perpendicular to the cliff face with travel motors at the rear and with the blade at the front, so that the machine can more easily evacuate if the cliff face collapses.
- If working at the bottom of a cliff or on a high bank is required, be sure to investigate the area first and confirm that no danger of the cliff or bank collapsing exists. If any possibility of cliff or bank collapsing exists, do not work in that area.
- Soft ground may collapse when operating the machine on it, possibly causing the machine to tip over. When working on a soft ground is required, be sure to reinforce the ground first using large pieces of steel plates strong enough and firm to easily support the machine.
- Note that there is always a possibility of machine tipping over when working on rough terrain or on slopes. Prevent machine tipping over from occurring. When operating on rough terrain or on slopes:
 - Reduce the engine speed.
 - Select slow travel speed mode.
 - Operate the machine slowly and be cautious with machine movements.



SA-1293



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SAFETY

PROTECT AGAINST FALLING STONES AND DEBRIS

- Confirm that your machine is FOPS cab equipped before working in areas where the possibility of falling stones or debris exist.

PROVIDE SIGNALS FOR JOBS INVOLVING MULTIPLE NUMBERS OF MACHINES

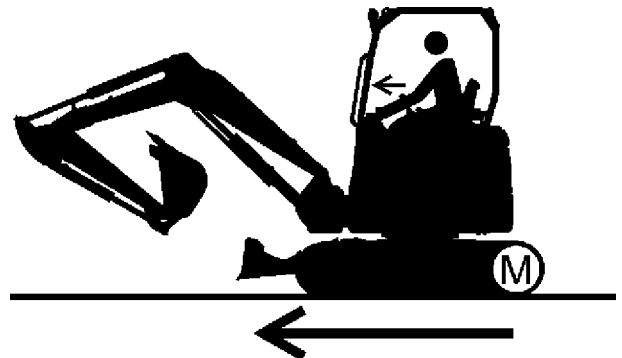
- In case more than one machine is operated in the same job site, accidental collision between machines may cause serious injury or death.
- For jobs involving multiple numbers of machines, provide signals commonly known by all personnel involved. Also, appoint a signal person to coordinate the job site. Make sure that all personnel obey the signal person's directions.



SA-481

CONFIRM DIRECTION OF MACHINE TO BE DRIVEN

- Incorrect travel pedal/lever operation may result in serious injury death.
 - Before driving the machine, confirm the position of the undercarriage in relation to the operator's position.
 - If the travel motors are located towards the front of the cab, the machine will move in the reverse direction when travel levers are operated to the front



SA-1294



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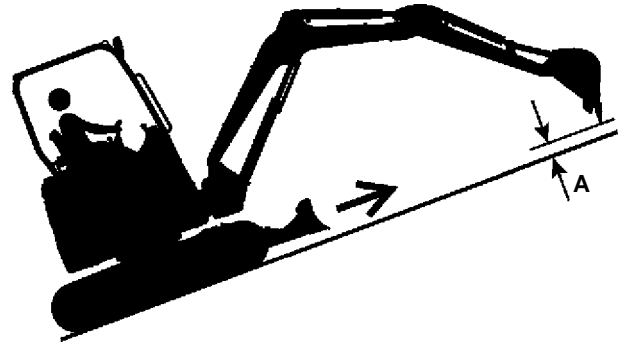
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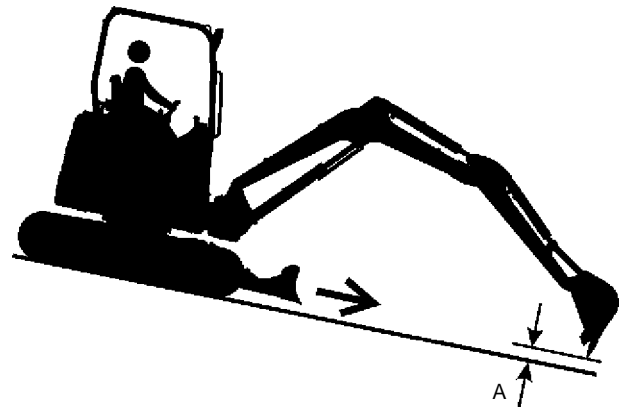
SAFETY

DRIVE MACHINE SAFELY

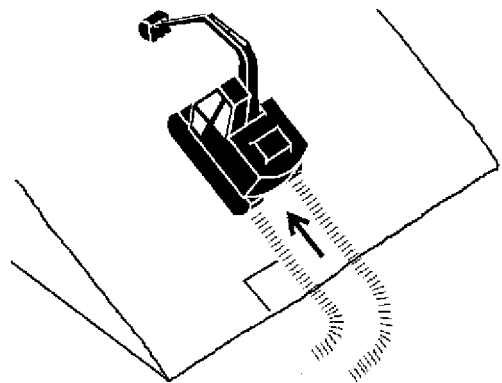
- Driving the machine in the incorrect direction may result in serious injury or death and/or severe damage to property.
- Before driving the machine, always confirm that the travel levers/pedals direction corresponds to the direction you wish to drive.
 - Be sure to detour around any obstructions.
 - Avoid traveling over obstructions. Soil, fragments of rocks, and/or metal pieces may scatter around the machine. Do not allow personnel to stay around the machine while traveling.
- Driving on a slope may cause the machine to slip or overturn, possibly resulting in serious injury or death.
 - Never attempt to ascend or descend 30 degrees or steeper slopes.
 - Be sure to fasten the seat belt.
 - When driving up or down a slope, keep the bucket facing the direction of travel, approximately 200 to 300 mm (8 to 12 in) (A) above the ground.
 - If machine starts to skid or becomes unstable, immediately lower the bucket to the ground and stop.
- Driving across the face of a slope or steering on a slope may cause the machine to skid or turnover. If the direction must be changed, move the machine to level ground, then, change the direction to ensure safe operation.
- Avoid swinging the upperstructure downhill. The machine may tip over. If swinging uphill is unavoidable, carefully operate the upperstructure and boom at slow speed.
- If the engine stalls on a slope, return the control levers to neutral. Then, restart the engine.
- Be sure to thoroughly warm up the machine before ascending steep slopes. If hydraulic oil has not warmed up sufficiently, sufficient driving power to ascend may not be obtained.



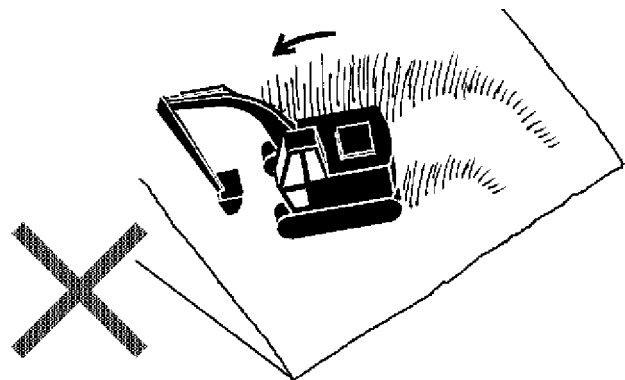
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SA-441



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