



93202-00032

June 2017

SHOP MANUAL

WHEEL LOADER

30ZV-2

40ZV-2_A

42ZV-2

Technical Manual

- General Information

- Operational Principle

Powered by KUBOTA D1803-M-D1-E3B Engine (30ZV-2)
KUBOTA V2403-M-DI-E3B Engine (40ZV-2_A, 42ZV-2)

Serial No. 30ZV-2 30K1-5001 and up
40ZV-2_A 40K1-5001 and up
42ZV-2 01037-01793, 05001 and up



93202-00051

June 2017

SHOP MANUAL

WHEEL LOADER

30ZV-2

40ZV-2_A

42ZV-2

Technical Manual

-Disassembly & Reassembly

Powered by KUBOTA D1803-M-D1-E3B Engine (30ZV-2)
KUBOTA V2403-M-DI-E3B Engine (40ZV-2_A, 42ZV-2)

Serial No. 30ZV-2 30K1-5001 and up
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93202-00042

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SHOP MANUAL

WHEEL LOADER

30ZV-2

40ZV-2_A

42ZV-2

Technical Manual

- Troubleshooting

Powered by KUBOTA D1803-M-D1-E3B Engine (30ZV-2)
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Serial No. 30ZV-2 30K1-5001 and up
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TECHNICAL MANUAL (Operational Principle)

INTRODUCTION	IN-01~02	
SAFETY	S-1~34	
SECTION 1 GENERAL	T-1	
Group 1 Specifications	T1-1	
Group 2 Component Specifications	T1-2	
Group 3 Component Layout	T1-3	
SECTION 2 SYSTEM	T-2	
Group 1 Fuel System	T2-1	
Group 2 Hydraulic System	T2-2	
Group 3 Electrical System	T2-3	
SECTION 3 COMPONENT OPERATION	T-3	
Group 1 HST Pump	T3-1	
Group 2 HST Motor	T3-2	
Group 3 Axle	T3-3	
Group 4 Brake	T3-4	
Group 5 Orbitrol	T3-5	
Group 6 Control Valve	T3-6	
Group 7 Main Pump	T3-7	

TECHNICAL MANUAL (Troubleshooting) (P/N 93202-00042) is separately available.

It consists of the following sections:

SECTION 4 OPERATIONAL PERFORMANCE TEST

- Group 1 Introduction
- Group 2 Standard
- Group 3 Engine Test
- Group 4 Wheel Loader Test

SECTION 5 TROUBLESHOOTING

- Group 1 Diagnosing Procedure
- Group 2 Failure List
- Group 3 Engine
- Group 4 Vehicle Performance

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.

TECHNICAL MANUAL (Troubleshooting)

INTRODUCTION	IN-01~02	
SAFETY	S-1~34	
SECTION 4 OPERATIONAL PERFORMANCE TEST	T-4	
Group 1 Introduction	T4-1	
Group 2 Standard	T4-2	
Group 3 Engine Test.....	T4-3	
Group 4 Wheel Loader Test	T4-4	
SECTION 5 TROUBLESHOOTING	T-5	
Group 1 Diagnosing Procedure	T5-1	
Group 2 Failure List.....	T5-2	
Group 3 Engine	T5-3	
Group 4 Vehicle Performance	T5-4	

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SECTION 1 GENERAL

- Group 1 Specifications
- Group 2 Component Specifications
- Group 3 Component Layout

SECTION 2 SYSTEM

- Group 1 Fuel System
- Group 2 Hydraulic System
- Group 3 Electrical System

SECTION 3 COMPONENT OPERATION

- Group 1 HST Pump
- Group 2 HST Motor
- Group 3 Axle
- Group 4 Brake
- Group 5 Orbitrol
- Group 6 Control Valve
- Group 7 Main Pump

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TECHNICAL MANUAL (Workshop Manual)

INTRODUCTION	IN-01~02	
SAFETY	S-1~34	
SECTION 1 GENERAL	W-1-1	
Group 1 Precautions for Disassembling and Assembling.....	W1-1	
Group 2 Tightening.....	W1-2	
Group 3 Painting	W1-3	
SECTION 2 BODY	W-2-1	
Group 1 Canopy	W2-1	
Group 2 Cab.....	W2-2	
Group 3 Counterweight	W2-3	
Group 4 Center Hinge	W2-4	
Group 5 Engine Hood	W2-5	
Group 6 HST Pump and Main Pump	W2-6	
Group 7 HST Motor	W2-7	
Group 8 Control Valve	W2-8	
SECTION 3 TRAVEL SYSTEM	W-3-1	
Group 1 Tire	W3-1	
Group 2 Reduction Gear	W3-2	
Group 3 Axle	W3-3	
Group 4 Propeller Shaft	W3-4	
Group 5 Master Cylinder	W3-5	
Group 6 Parking Brake Solenoid	W3-6	
Group 7 Inching Valve	W3-7	
Group 8 Power Steering.....	W3-8	
Group 9 Steering Cylinder.....	W3-9	
SECTION 4 FRONT ATTACHMENT	W-4-1	
Group 1 Front Attachment.....	W4-1	
Group 2 Cylinder	W4-2	

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INTRODUCTION

TO THE READER

- This manual is written for an experienced technician to provide technical information needed to maintain and repair this machine.
- Be sure to thoroughly read this manual for correct product information and service procedures.

ADDITIONAL REFERENCES

- Please refer to the other materials (operator's manual, parts catalog, etc.) in addition to this manual.

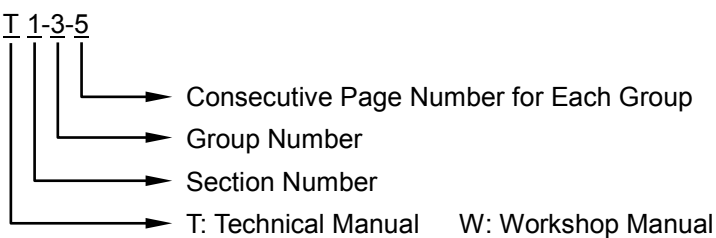
MANUAL COMPOSITION

- This manual consists the Technical Manual and the Workshop Manual.
 - Information included in the Technical Manual: technical information needed for redelivery and delivery, operation and activation of all devices and systems, operational performance tests, and troubleshooting procedures.
 - Information included in the Workshop Manual: technical information needed for maintenance and repair of the machine, tools and devices needed for maintenance and repair, maintenance standards, and removal/installation and assemble/disassemble procedures.

PAGE NUMBER

- Each page has a number, located on the center lower part of the page, and each number contains the following information:

Example : T 1-3-5



INTRODUCTION

SAFETY ALERT SYMBOL AND HEADLINE NOTATIONS

In this manual, the following safety alert symbol and signal words are used to alert the reader to the potential for personal injury or machine damage.

 This is the safety alert symbol. When you see this symbol, be alert to the potential for personal injury. Never fail to follow the safety instructions prescribed along with the safety alert symbol. The safety alert symbol is also used to draw attention to component/part weights. To avoid injury and damage, be sure to use appropriate lifting techniques and equipment when lifting heavy parts.

-  **CAUTION:**
Indicated potentially hazardous situation which could, if not avoided, result in personal injury or death.
- **IMPORTANT:**
Indicates a situation which, if not conformed to the instructions, could result in damage to the machine.
-  **NOTE:**
Indicates supplementary technical information or know-how.

UNITS USED

- SI Units (International System of Units) are used in this manual. MKSA system of units and English units are also indicated in parentheses just behind SI units.

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

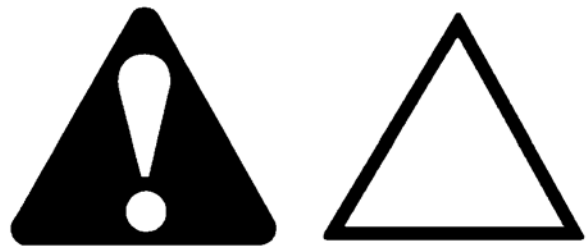
A table for conversion from SI units to other system units is shown below for reference purposes.

Quantity	To Convert From	Into	Multiply By	Quantity	To Convert From	Into	Multiply By
Length	mm	in	0.03937	Pressure	MPa	kgf/cm ²	10.197
	mm	ft	0.003281		MPa	psi	145.0
Volume	L	US gal	0.2642	Power	kW	PS	1.360
	L	US qt	1.057		kW	HP	1.341
	m ³	yd ³	1.308	Temperature	°C	°F	°C×1.8+32
Weight	kg	lb	2.205	Velocity	km/h	mph	0.6214
Force	N	kgf	0.10197		min ⁻¹	rpm	1.0
	N	lbf	0.2248	Flow rate	L/min	US gpm	0.2642
Torque	N·m	kgf·m	1.0197		mL/rev	cc/rev	1.0
	N·m	lbf·ft	0.7375				

SAFETY

RECOGNIZE SAFETY INFORMATION

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



001-E01A-0001

SA-2644

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 don't use any of the designated signal words above after the safety alert symbol has been 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.



IMPORTANT



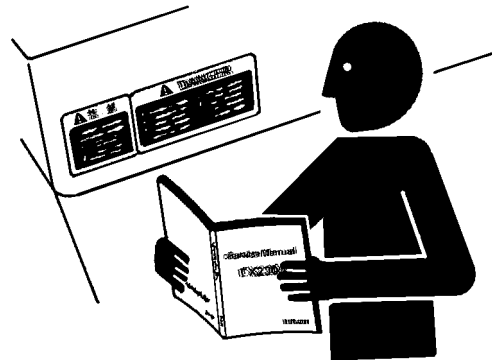
SA-1223

002-E01A-1223

SAFETY

FOLLOW SAFETY INSTRUCTIONS

- Carefully read and follow all safety signs on the machine and all safety messages in operator's manual.
- Safety signs should be installed, maintained and replaced when necessary.
 - If a safety sign or operator's 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).
- Learn how to operate the machine and its controls correctly and safely.
- Allow only trained, qualified, authorized personnel to operate the machine.
- Keep your machine in proper working condition.
 - Unauthorized modifications of the machine may impair its function 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 KCM Warranty Policy.
 - Do not use attachments and/or optional parts or equipment not authorized by KCM. 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 KCM 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 hazardous situation you may encounter. If you have any questions, you should first consult your supervisor and/or your authorized dealer before operating or performing maintenance work on the machine.



SA-003

003-E01B-0003

SAFETY

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 to 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 fires and accidents.
 - Keep emergency numbers for doctors, ambulance service, hospital, and fire department posted near your telephone.



SA-437

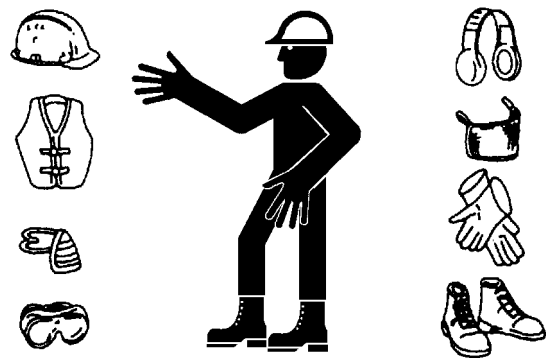
004-E01A-0437

WEAR PROTECTIVE CLOTHING

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

You may need:

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



SA-438

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.

005-E01A-0438

SAFETY

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.



006-E01A-0434

SA-434

INSPECT MACHINE

- Inspect your machine carefully each day or shift by walking around it before you start it to avoid personal injury.
 - In the walk-around inspection be sure to cover all points described in the “INSPECT MACHINE DAILY BEFORE STARTING” section in the operator’s manual.



007-E01A-0435

SA-435

SAFETY

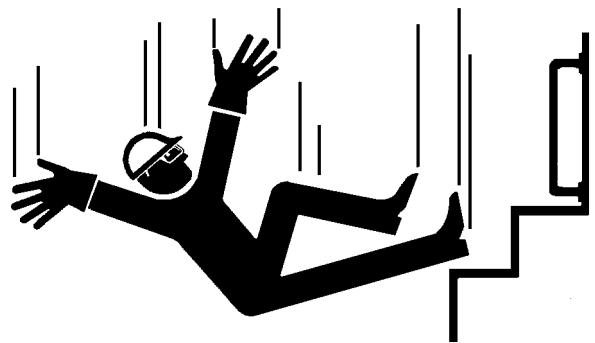
GENERAL PRECAUTIONS FOR CAB

- Before entering the cab, thoroughly remove all dirt and/or oil from the soles of your work boots. If any control such as a pedal is operated while with dirt and/or oil on the soles of the operator's work boots the operator's foot may slip off the pedal, possibly resulting in a personal accident.
- Do not leave parts and/or tools lying around the operator's seat. Store them in their specified locations.
- 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.
- Refrain from listening to the radio, or using music headphones or mobile telephones in the cab while 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.
- Do not leave cigarette lighters in the cab. When the temperature in the cab increases, the lighter may explode.

524-E01A-0000

USE HANDHOLDS AND STEPS

- Falling is one of the major causes of personal injury.
 - When you get on and off the machine, always face the machine and maintain a three-point contact with the steps and handrails.
 - Do not use any controls as hand-holds.
 - Never jump on or off the machine. Never mount or dismount a moving machine.
 - Be careful of slippery conditions on platforms, steps, and handrails when leaving the machine.



008-E01A-0439

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 miss-operations.
 - The seat should be adjusted whenever changing the operator for the machine.
 - The operator should be able to fully depress the pedals and to correctly operate the control levers with his back against the seat back.
 - If not, move 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-462

009-E01A-0462

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 loader control 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 loader control 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.

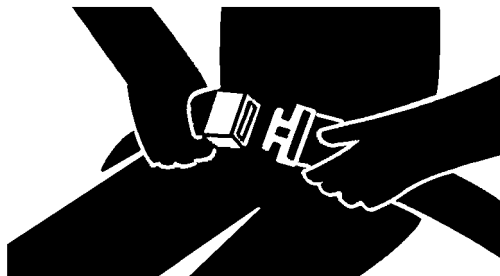
NEVER RIDE ATTACHMENT

- Never allow anyone to ride attachment or the load.
This is an extremely dangerous practice.

SAFETY

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.
 - 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.
 - Be sure to remain seated with the seat belt securely fastened at all times when the machine is in operation to minimize the chance of injury from an accident.
 - We recommend that the seat belt be replaced every three years regardless of its apparent condition.

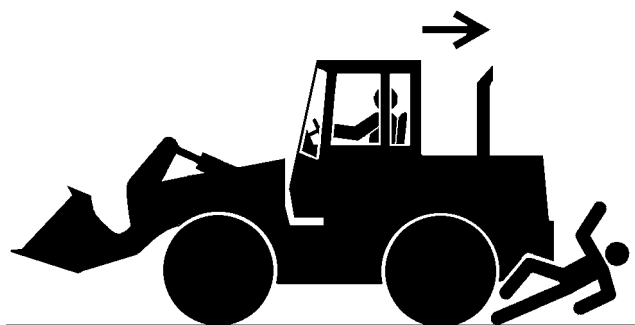


SA-237

010-E01A-0237

MOVE AND OPERATE MACHINE SAFELY

- Bystanders can be run over.
 - Take extra care not to run over bystanders. Confirm the location of bystanders before moving, or operating the machine.
 - Always keep the travel alarm and horn in working condition (if equipped). It warns people when the machine starts to move.
 - Use a signal person when moving, or operating the machine in congested areas. Coordinate hand signals before starting the machine.
 - Use appropriate illumination. Check that all lights are operable before operating the machine. If any faulty illumination is present, immediately repair it.



SA-398

011-E01A-0398

SAFETY

HANDLE STARTING AIDS SAFELY

Starting fluid:

- Starting fluid is highly flammable.
 - Keep all sparks and flame away when using it.
 - Keep starting fluid well away from batteries and cables.
 - Remove container from machine if engine does not need starting fluid.
 - To prevent accidental discharge when storing a pressurized container, keep the cap on the container, and store it in a cool, well-protected location.
 - Do not incinerate or puncture a starting fluid container.



SA-293

036-E01A-0293-3

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 tire or on ground.
 - Do not start engine by shorting across starter terminals.
 - 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.



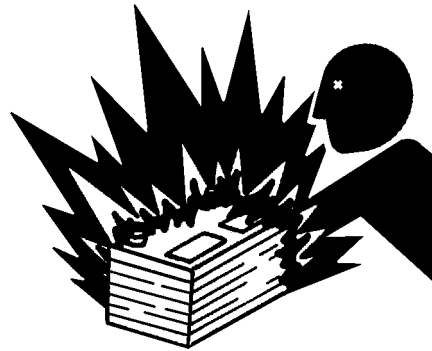
SA-431

012-E01B-0431

SAFETY

JUMP-STARTING

- Battery gas can explode, resulting in serious injury.
 - If the engine must be jump-started, be sure to follow the instructions shown in the “OPERATING THE ENGINE” chapter in the operator’s manual.
 - The operator must be 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

S013-E01A-0032

INVESTIGATE JOB SITE BEFOREHAND

- When working at the edge of an excavation or on a road shoulder, the machine could tip over, 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.
 - Confirm that your machine is equipped a FOPS cab before working in areas where the possibility of falling stones or debris exist.
 - When the footing is weak, reinforce the ground before starting work.
 - When working on frozen ground, be extremely alert. As ambient temperatures rise, footing becomes loose and slippery.
 - Beware of the possibility of fire when operating the machine near flammable objects such as dry grass.



SA-447

015-E01B0447

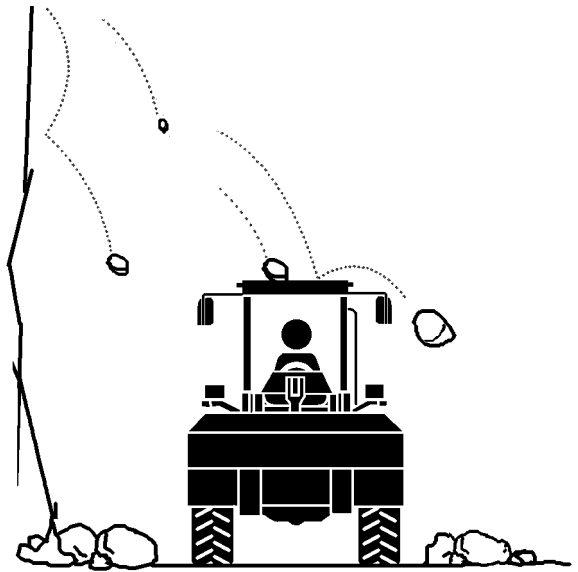
SAFETY

EQUIPMENT OF HEAD GUARD, ROPS, FOPS

In case the machine is operated in areas where the possibility of falling stones or debris exist, equip a head guard, ROPS, or FOPS according to the potential hazardous conditions. (The standard cab for this machine corresponds to ROPS and FOPS.)

ROPS: Roll-Over Protective Structure

FOPS: Falling Object Protective Structure



SA-521

PROVIDE SIGNALS FOR JOBS INVOLVING MULTIPLE NUMBERS OF MACHINES

- 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.



018-E01A-0481

SA-481

SAFETY

KEEP RIDERS OFF MACHINE

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

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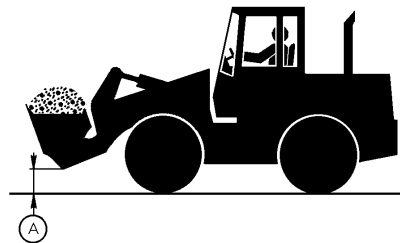


SA-427

DRIVE SAFELY

- Beware of the possibility of slipping and/or turning over the machine when driving on a slope.
 - When driving on level ground, hold the bucket at mark (A) 300 to 400 mm (12 to 16 in) above the ground as illustrated.
 - Avoid driving over any obstacles.
 - Drive the machine slowly when driving on rough terrain.
 - Avoid quick direction changes. Failure to do so may cause the machine to turn over.
 - If the engine stops while driving, the steering function becomes inoperative. Immediately stop the machine by applying the brake to prevent personal accident.
-
- Even though the machine is equipped with the emergency steering system, if the steering function becomes inoperative during drive operation, press the emergency steering check switch on the right console to activate the emergency steering system. Then, immediately park and stop the machine in a safe location.

019-E07A-0448



SA-448

SAFETY

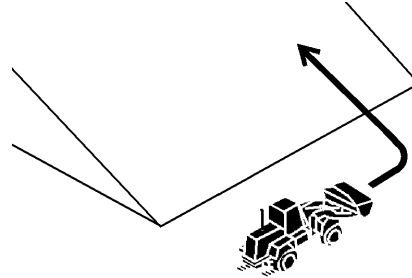
DRIVE MACHINE SAFELY (WORK SITE)

- Before driving the machine, always confirm that the steering wheel/ forward/reverse lever direction corresponds to the direction you wish to drive.
 - Be sure to detour around any obstructions.
- Driving on a slope may cause the machine to slip or overturn, possibly resulting in serious injury or death.
 - When driving up or down a slope, keep the bucket facing the direction of travel, approximately 300 to 400 mm (approximately 12 to 16 in) (A) above the ground.
 - If the 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 overturn. If the direction must be changed, move the machine to level ground, then, change the direction to ensure safe operation.

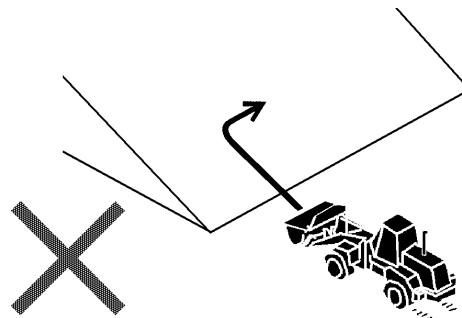
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SA-449



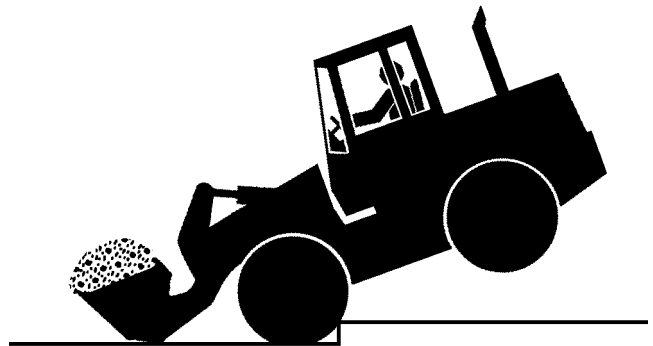
SA-450



SA-451

DRIVE SAFELY WITH BUCKET LOADED

- If the machine is operated incorrectly while driving with the bucket loaded, the machine may turn over. Be sure to follow all of the instructions indicated below.
 - When driving the machine on a job site with the bucket loaded, hold the bucket as low as possible to keep the machine balanced and to have good visibility.
 - Do not exceed the rated load capacity. Always operate the machine within the rated load capacity.
 - Avoid fast starts, stops, and quick turns. Failure to do so may result in personal injury and/or death.
 - Avoid rapid drive direction changes which could possibly cause personal injury and/or death.



SA-400

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