

OPERATION MANUAL

SK210LC-11E
SK210NLC-11E
SK210SNLC-11E
SK240SN-11E

APPLICABLE No.

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READ, UNDERSTAND AND FOLLOW ALL SAFETY PRECAUTIONS AND INSTRUCTIONS FOUND IN THIS MANUAL BEFORE OPERATING THE MACHINE.

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Symbol mark comparison list

© In some machines in use, the symbol marks may have been changed according to the revision of the ISO standard.


















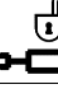
















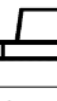








Check your machine's symbol marks referring to the symbol mark comparison list below because some symbol marks in your machine and the symbol marks in the instruction manual may not be corresponding to each other.

		Symbol in instruction manual	Symbol on machine
SWITCH DISPLAY	WIPER		
	WINDOW WASHER		
	CAMERA		
	BUZZER STOP		
	CLOCK		
	FUEL CONSUMPTION	L/H	
	ECO		
	MAINTENANCE TIME		
	BRIGHTNESS		
	HOME SCREEN CHANGE		
	RETURN		
	STARTING PASSWORD		
	LANGUAGE SWITCH		
	SETTING		
CABIN WORK LIGHT			
AUTOMATIC ENGINE SPEED REDUCTION			
MAINTENANCE	FUEL FILTER		
	ENGINE OIL FILTER		
	HYDRAULIC OIL FILTER		
	AIR BREATHER FILTER		
	AIR CLEANER FILTER		
	COOLING WATER		
	TRANSMISSION OIL		
	GREASE		
	DECREASED ENGINE PERFORMANCE		
AIR CONDITIONER	AUTO	AUTO	
	A/C AIR CONDITIONER	A/C	
	OUTSIDE AIR INTRODUCTION		
	INTERIOR AIR RECIRCULATION		
	DEFROSTER		
	FAN	FAN	
	TEMP	TEMP	

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		Symbol in instruction manual	Symbol on machine	
CAB	UNLOCK			
	START KEY OFF	OFF		
	START KEY ACCESSORY	ACC		
	START KEY ON	ON		
	START KEY START	START		
	ACCELERATOR LOW	LO		
	ACCELERATOR HIGH	HI		
	SLEWING LEFT			
	SLEWING RIGHT			
	EXIT			
	GRIP	BOOST		
CANCEL ANTI-INTERFERENCE				
CABIN ANTI-INTERFERENCE				
WORKING MODE	DIGGING			
	HAMMER			
	CRUSHER			
	THUMB BUCKET			
	PROCESSOR			
	TILT BUCKET			
	GRAPPLE			
	MAGNET			
	OTHER	HEAVY LIFT		
		OVERLOAD ALARM		
HEIGHT/DEPTH DISPLAY				
	COUNTERWEIGHT REMOVAL			

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IMPORTANT INFORMATION

PREFACE

- Read, understand and follow the safety messages and instructions in this manual and the safety messages on the machine. If these safety messages are not followed, serious injury or death could occur.
- Always be aware of your surroundings when operating this machine and understand the capabilities of this machine and the attachment/equipment.
- Always use caution to safely operate this machine.



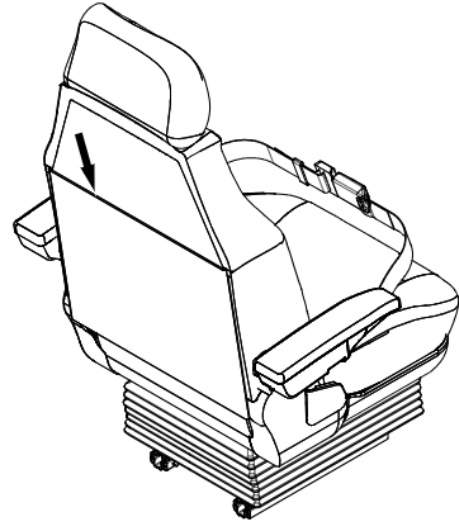
Use of this machine and this manual

- Improper operation, inspection, maintenance or repair of this machine may cause serious injury, death or damage to the machine.
- If a license or other special qualification is required to operate a hydraulic excavator in the country where this machine will be operated, all operators of this machine must meet those requirements and have a valid (not expired) license or qualification.
- Do not operate this machine for the first time or perform any inspection, maintenance or repair on this machine, until you have carefully read and understand the operation, inspection, maintenance, and repair information in this manual.
 - Operation related activities include setting up, rectifying malfunctions and the disposal of materials.
 - Maintenance related activities include lubrication, maintenance, inspection and repair work.
 - Transportation related activities include loading and unloading the machine.
- For machines equipped with KOBELCO approved attachments, read the section related to the specialized attachments in this manual and any additional manuals for the specialized attachment. Use of the unapproved attachment/equipment voids KOBELCO's liability for the machine.
- Do not remove this manual from this machine.
- If this manual is lost, damaged or unreadable, order a replacement from your KOBELCO authorized dealer.
- This manual is a part of this machine and should be transferred with the machine to new users or owners.
- Always use genuine KOBELCO parts. Do not use aftermarket or non-KOBELCO parts on your machine.
- Manufacturers cannot anticipate every possible scenario and potential hazard that may arise during operation, inspection and maintenance activities. Therefore, the warnings in this manual and on the product may not communicate all of the possible safety precautions for your situation. When performing any operation, inspection, maintenance and repair activities that are not contained in this manual, proceed at your own risk and do not perform any unsafe acts. You should also ensure the machine will not be damaged or create an unsafe condition by your actions. Always follow the safety procedures in this manual and for your worksite. Never perform any task or operation prohibited by this manual.
- If a tool, procedure, work method or operating technique not specifically recommended by KOBELCO is used, you must evaluate that it is safe for yourself and others to proceed. You should also ensure the machine will not be damaged or create an unsafe condition by the operation, maintenance and/or repair procedures you choose. Never perform any task or operation prohibited by this manual.
- The information, specification, and illustrations in this manual are based on information available at the time it was written. KOBELCO is committed to continuous improvement of the safety systems and features of its products, and may change the specifications, torques, pressures, measurements, adjustments, illustrations, and other content at anytime without any obligation to notify the users/owners of these changes. Your KOBELCO authorized dealer will have the most current information available.
- Should there be questions, errors, omissions or other issues that need to be communicated to the manufacturer, contact your KOBELCO authorized dealer.
- KOBELCO provides machines produced in accordance with regulations and standards of a country in which the machine is sold to the first owner. If you have a machine purchased in a foreign country or from a person or company in another country, your machine may lack safety devices or machine components or not meet a safety standard required in your country. Please contact your KOBELCO authorized dealer to ask whether your machine's specifications meet the regulations and the standards in your country.

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STORE OPERATION & MAINTENANCE MANUALS ON THE MACHINE

Always store all manuals for this machine and any attachments, including this manual and the related manuals, in the pocket located at the rear side of the operator's seat. Check the manuals are in this location as a part of your pre-start inspection. If the manuals are not present during your pre-start inspection, inform your supervisor and order replacement manuals from your KOBELCO authorized dealer.



SAFETY INFORMATION IN MESSAGES OR LABELS IN THIS MANUAL AND ON THE MACHINE

“Many accidents are the result of not following basic safety precautions and could have been avoided by recognizing potentially hazardous situations.”

Proper risk assessment can prevent many accidents from occurring. During operation, always pay attention to the potential hazards near the machine and at your worksite.

- Improper operation, inspection, maintenance and repair could cause serious injury, death or property damage. Before operating, inspecting and maintaining this machine, carefully read and understand this manual, the related manuals, and any attachment manuals that may be provided to you.
- Only allow trained and experienced personnel to operate, to inspect and to maintain this machine. These individuals must also comply with all applicable employment, industry, and governmental rules, standards, and regulations.



This safety alert symbol identifies important safety messages in this manual. When you see this symbol, be alert, your safety is involved, carefully read the message that follows, and inform other operators.

Many safety messages in this manual or on the labels on this machine contain signal words. Signal words are used to identify safety messages and property damage messages and designate a level of hazard seriousness. Many of these safety messages may also contain avoidance information to hazardous events.

The three signal words are DANGER, WARNING and CAUTION. Each alerts the viewer to the existence and relative seriousness of a hazard. They are reserved for personal injury hazards.

Safety signs identified by DANGER shall be used sparingly and only for those situations presenting the most serious hazards. Hazards identified by WARNING present a lesser degree of risk of injury or death than those identified by DANGER.



DANGER indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.



WARNING indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

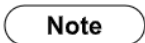


CAUTION indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

Other than the above-mentioned signal words, the following words identify important information which must be kept for the protection of the machine and may be helpful for the operator.



Notice indicates information considered important, but not hazard related .
(e.g., messages related to property damage)



Note indicates information that may be helpful for the operator.

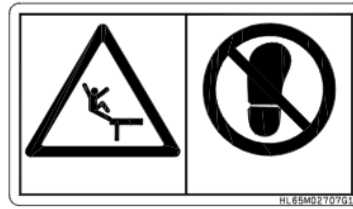
SAFETY LABELS

Safety labels are affixed to machine to alert the operator and surrounding personnel of hazardous situations during operation, inspection or maintenance.

Example of a pictorial only safety label

The pictorial only safety label is used to alert the operator and surrounding personnel of potentially hazardous situations.

For pictorial only safety label, the hazard pictorial is in the upper or left box, and the avoidance information is in the lower or right box.



SUMMARY OF THE MACHINE

APPLICABLE WORKS

Use this machine in the following applications:

- Digging
- Trenching
- Loading
- Leveling
- Demolishing
- Breaker work

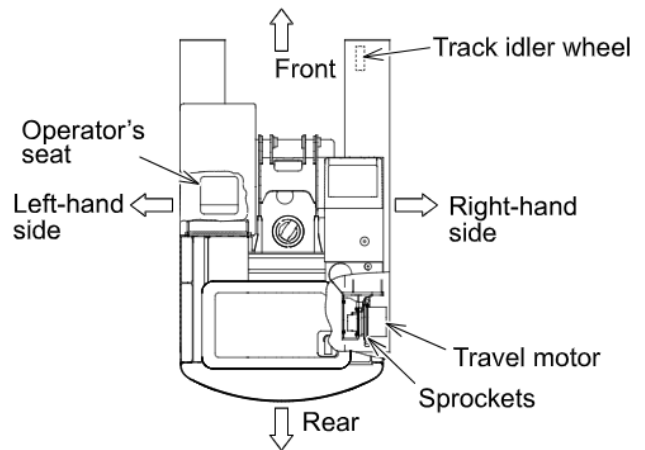
Never use the machine for any purpose other than the above applications.

If you use the attachment which KOBELCO did not supply, read, understand and follow the safety messages and instructions in the applicable manual described by the attachment manufacturer.

For details of work procedures, please refer to "MACHINE OPERATION" in Chapter 3 and "OPTIONAL EQUIPMENT" in Chapter 8.

FRONT, REAR, RIGHT & LEFT OF THE MACHINE

This manual refers to the front, rear, right & left of this machine as seen when sitting in the operator's seat with the machine in the normal travel position. The normal travel position is when the idler wheels are positioned at the front under the cab and the drive sprockets are positioned at the rear.



OPERATING CONDITION

This machine is intended to be operated in the ambient temperature of -20 degrees C to 40 degrees C (-4 degrees F to 104 degrees F) with the well-maintained condition.

Outside this temperature range, sufficient machine performance may not be obtained.

BREAK-IN OPERATION

Prior to shipment, this machine was inspected and adjusted by KOBELCO. Future performance and service life of this machine depends on how the machine is operated during the break-in period.

Hour Meter	Load Status
Less than 10 hours	About 60%
Less than 100 hours	About 80%
100 hours and more	Full load

During the break-in period

- Always sufficiently warm-up the engine and the hydraulic oil.
- Do not operate with loads that exceed the recommended load status for each phase shown in the table or operate at high speeds.
- Do not perform a sudden start, sudden acceleration, or other sudden changes in engine speed.
- Avoid unnecessary sudden stops or sudden changes in driving direction.
- Do not operate the engine at high speed for extended periods of time.

QUALIFICATION FOR OPERATING THE MACHINE

If a license or other special qualification is required to operate a hydraulic excavator in the country where this machine will be operated, all operators of this machine must meet those requirements and have a valid (not expired) license or qualification.

Instruct that only skilled trained operators may operate the machine. The operator shall:

- Receive training in the proper operation of this machine;
- Understand the capabilities and limitations of this machine;
- Become familiar with the construction of this machine and the hazards involved based on training and experience;
- Confirm that the machine is properly maintained and is in good condition;

Read and properly understand the warnings, instructions, and operating procedures in this manual.

WARRANTY

This machine is warranted as per the standard warranty. In case of any failures are proved to be KOBELCO's responsibility, KOBELCO will repair or replace any parts or components for free of charge to the extent specified in the standard warranty. KOBELCO shall not be liable for any improper operation, maintenance, modification, and alteration etc., other than described in this manual.

FLUORINATED GREENHOUSE GASES

**REGULATION (EU) No 517/2014 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of 16 April 2014
on fluorinated greenhouse gases and repealing Regulation (EC) No 842/2006**

Contains fluorinated greenhouse gases in the air-conditioning system.

TYPE OF F GAS	HFC-134a
TOTAL F GAS MASS (kg)	0.8
TOTAL EQ(CO ₂) (t)	1.2
GWP (Global warming potential)	1,430

"EU" DECLARATION OF CONFORMITY

On the following pages, a sample setting out the contents of the "EU" Declaration of Conformity (EU DoC) is provided.

The EU DoC is the manufacturer's declaration about equipment compliance to relevant EU provisions.

The contents described in the following page may be changed, so please refer to the Declaration of Conformity supplied with each machine for the exact contents.

Please keep the original document in a safe place. Local authorities may require you to show this document in order to assure compliance of your equipment.

IMPORTANT: an original of this "EU" declaration is supplied with each machine and must be kept carefully by the owner.

IMPORTANT: the official documents supplied with the machine must be kept by the owner so as to be able to present them to any inspecting authority which may request them.

- Under point 2 all information required by EU "Outdoor Noise" Directive 2000/14/EC is given.
Please refer to your own original EU DoC for specific machine information. Other information about equipment guaranteed sound power level (LWA) can be found on the paragraph of "NOISE LEVEL". On the same page, information about operator's station noise level (LpA) is given, which is not matter of above-mentioned EU Directive and therefore not indicated on it.
- Generic serial number for this machine type.
The sequence of letters and numbers may vary depending on machine configuration.
- EU DoC serial number.
Please make reference to this number when requiring information or support from KOBELCO about EU DoC.
- Signature of a person authorized to sign the document on behalf of the company.



SAMPLE

"EU" DECLARATION OF CONFORMITY

The undersigned declare that the machine described below has been designed and manufactured in compliance with the following European Directives, as amended, and the regulations transposing them into national laws.

This declaration of conformity only applies to the machine described below and which has not been modified:

1. 2006/42/EC "Safety of machine"

1.1 European Harmonised standards under which conformity is declared:

EN 474-1
EN 474-5

1.2 Name and address of the representative authorised to compile the technical file:

Kobelco Construction Machinery Europe B.V.
Veluwezoom 15, 1327 AE Almere The Netherlands

2. 2000/14/EC & 2005/88/EC "Noise emission"

2.1	Conformity assessment procedure followed:	2000/14/EC, Annex VI
2.2	Name and address of the Notified Body involved:	TÜV SÜD Industrie Service GmbH Westendstrasse 199, D-80686 München, Germany
2.3	Measured sound power level LWA (ref. 1 pW):	XX dB(A)
2.4	Guaranteed sound power level LWA (ref. 1 pW):	XX dB(A)
2.5	Engine power (as defined by ISO 14396):	XX kW
2.6	Holder of the technical documentation:	Kobelco Construction Machinery Co., Ltd.

3. 2014/30/EU "Electromagnetic Compatibility (EMC)"

3.1 European Harmonised standards under which conformity is declared:

EN ISO 13766-1:2018

4. Other applicable Directive/s:

###

5. Manufacturer:

Kobelco Construction Machinery Co., Ltd.

6. Category:

Hydraulic excavator

7. Type:

SK*****-*

8. Serial number:

XXXXXXXXXX

Engine emission stage : STAGE V

9. Authorized Representative:

Kobelco Construction Machinery Europe B.V.
Veluwezoom 15, 1327 AE Almere, The Netherlands

Authorized Signature of Declarant:
Kobelco Construction Machinery Co., Ltd.
2-1, Itsukaichiko 2-chome, Saeki-ku,
Hiroshima 731-5161 Japan



Hiroshima, Japan

DD/MM/YYYY

XXXXXXXXXX

Signature
Name (Department)

"UK" DECLARATION OF CONFORMITY

Note

Description concerning UK Declaration of Conformity based on UK legislations is provided on the following pages. Therefore, it is intentionally written in English.

"UK" DECLARATION OF CONFORMITY

On the following pages, a sample setting out the contents of the "UK" Declaration of Conformity (UK DoC) is provided.

The UK DoC is the manufacturer's declaration about equipment compliance to relevant United Kingdom of Great Britain and Northern Ireland provisions.

The contents described in the following page may be changed, so please refer to the Declaration of Conformity supplied with each machine for the exact contents.

Please keep the original document in a safe place. Local authorities may require you to show this document in order to assure compliance of your equipment.

IMPORTANT: an original of this "UK" declaration is supplied with each machine and must be kept carefully by the owner.

IMPORTANT: the official documents supplied with the machine must be kept by the owner so as to be able to present them to any inspecting authority which may request them.

- Under point 2 all information required by UK Noise Emission in the Environment by Equipment for use Outdoors Regulations 2001 is given.
Please refer to your own original UK DoC for specific machine information. Other information about equipment guaranteed sound power level (LWA) can be found on the paragraph of "NOISE LEVEL". On the same page, information about operator's station noise level (LpA) is given, which is not matter of above-mentioned UK legislation and therefore not indicated on it.
- Generic serial number for this machine type.
The sequence of letters and numbers may vary depending on machine configuration.
- UK DoC serial number.
Please make reference to this number when requiring information or support from KOBELCO about UK DoC.
- Signature of a person authorized to sign the document on behalf of the company.



SAMPLE

"UK" DECLARATION OF CONFORMITY

The undersigned declare that the machine described below has been designed and manufactured in compliance with the following UK legislations, as amended.

This declaration of conformity only applies to the machine described below and which has not been modified:

1. The Supply of Machinery (Safety) Regulations 2008

1.1 UK Designated Standards under which conformity is declared: EN 474-1
EN 474-5

1.2 Name and address of the representative authorised to compile the technical file:
Kobelco Construction Machinery Europe B.V. UK Branch
Unit 9, The Felbridge Centre, East Grinstead, West Sussex RH19 1XP, U.K.

2. Noise Emission in the Environment by Equipment for use Outdoors Regulations 2001

2.1	Conformity assessment procedure followed:	Noise Emission in the Environment by Equipment for use Outdoors Regulations 2001, SCHEDULE 9
2.2	Name and address of the Approved Body involved:	TUV SUD BABT Octagon House, Concorde Way, Segensworth North, Fareham, Hampshire, PO15 5RL
2.3	Measured sound power level LWA (ref. 1 pW):	XX dB(A)
2.4	Guaranteed sound power level LWA (ref. 1 pW):	XX dB(A)
2.5	Engine power (as defined by ISO 14396):	XX kW
2.6	Holder of the technical documentation:	Kobelco Construction Machinery Co., Ltd.

3. Electromagnetic Compatibility Regulations 2016

3.1 UK Designated Standards under which conformity is declared: EN ISO 13766-1:2018

4. Other applicable legislation/s: ###

5. Manufacturer:
Kobelco Construction Machinery Co., Ltd.

6. Category:
Hydraulic excavator

7. Type:
SK*****-*

8. Serial number:
XXXXXXXXXX

Engine emission stage : STAGE V

9. Authorized Representative:
Kobelco Construction Machinery Europe B.V. UK Branch
Unit 9, The Felbridge Centre, East Grinstead, West Sussex RH19 1XP, U.K.

Authorized Signature of Declarant:
Kobelco Construction Machinery Co., Ltd.
2-1, Itsukaichiko 2-chome, Saeki-ku,
Hiroshima 731-5161 Japan



Hiroshima, Japan DD/MM/YYYY

XXXXXXXXXX

Signature
Name (Department)

VIBRATION TO THE OPERATOR

The level of vibrations transmitted to the operator depends mainly upon the conditions of the ground on which operations take place, the mode of operation of the machine and its equipment.

Thus, the exposure to vibrations can be considerably reduced when the following recommendations are complied with:

- Use equipment compatible with the machine and the type of work to be done;
- Adjust and lock the seat in the correct position; also inspect regularly the suspensions of the seat, performing the adjustments and repairs as required;
- Perform regularly the current maintenance operations of the machine at the prescribed intervals;
- Operate the equipment in a uniform manner, preventing, as far as possible, sharp movements or excessive loads;
- When travelling, avoid, as far as possible, particularly rough terrain or the impact against possible obstacles.

This machine is equipped with an operator's seat complying with the requisites of standard ISO 7096:2008. This ensures that the exposure of the operator's body to vibrations comply with the protection requisites for the protection against vibrations when the machine operates as required by the operational scopes, in accordance with the prescriptions of this manual.

The operator's seat has been tested in accordance with EM6 input spectral class and has a seat transmissibility factor < 0.7.

- The weighted average quadratic acceleration value to which the operator's arms are subjected does not exceed 2.5 m/s².
- The weighted average quadratic acceleration value to which the operator's body is subjected does not exceed 0.5 m/s².

These results were obtained using an acceleration gauge while digging ditches.

Note

The Whole-Body exposure value is determined under particular operating and terrain conditions and therefore may not be representative for all the possible operating conditions within the intended use of the machine. Consequently this single Whole-Body vibration emission value is not intended to determine the Whole-Body vibration exposure as required by European Directive 2002/44/EC. For this purpose it is recommended to conduct working conditions measurement. If this is not feasible use of information provided in the table below from ISO/TR 25398:2006 (*).

Working conditions	Basic emissions value			Standard deviation		
	1.4*a _{w,eqx} [m/s ²]	1.4*a _{w,eqy} [m/s ²]	a _{w,eqz} [m/s ²]	1.4*s _x [m/s ²]	1.4*s _y [m/s ²]	s _z [m/s ²]
Excavation	0.44	0.27	0.30	0.24	0.16	0.17
Hydraulic hammer	0.53	0.31	0.55	0.30	0.18	0.28
Mine	0.65	0.42	0.61	0.21	0.15	0.32
Travel	0.48	0.32	0.79	0.19	0.20	0.23

(*) ISO/TR 25398:2006 Mechanical vibrations - Guidelines for assessment of exposure to whole-body vibration of ride-on machine - Use of harmonized data measured by international institutes, organizations and manufacturers.

NOISE LEVEL

Sound power level

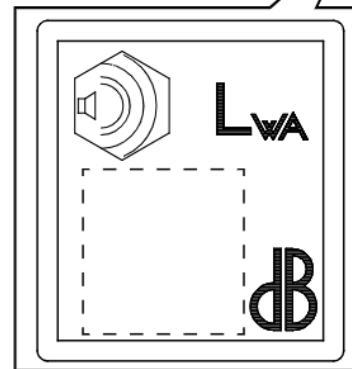
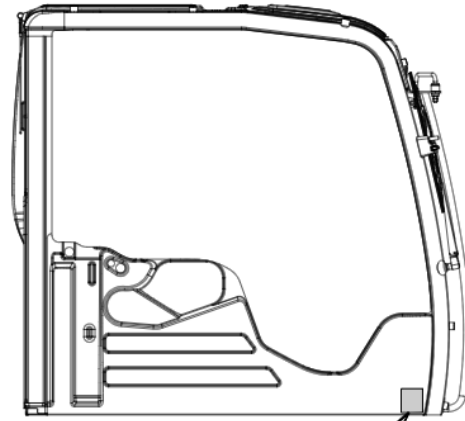
Guaranteed sound power level, determined in accordance with EU Directive 2000/14/EC and UK Noise Emission in the Environment by Equipment for use Outdoors Regulations 2001.

Level of sound pressure at operator's compartment

LpA = 71 dB (A) (SK210LC-11E,SK210NLC-11E)

LpA = 72 dB (A) (SK210SNLC-11E,SK240SN-11E)

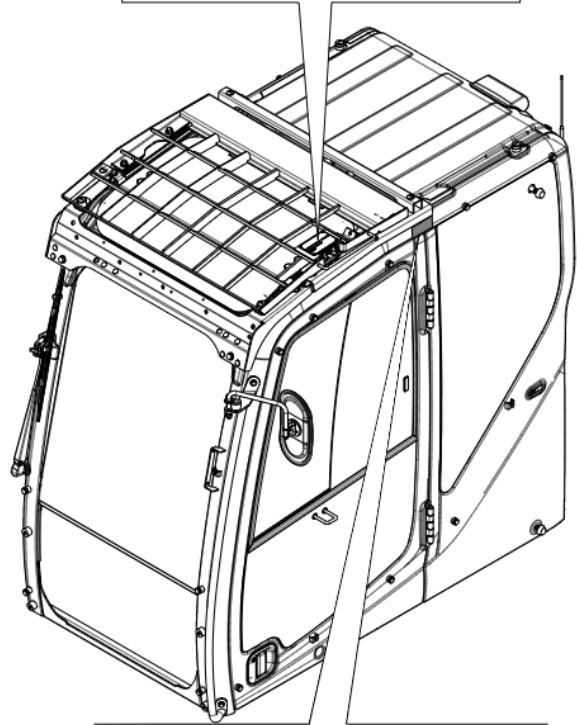
Cab with door and windows closed and the heating / conditioning fan in operation at mid-range speed, measured on identical machine, in accordance with Standard ISO 6396:2008.



CAB WITH ROPS (ROLL-OVER PROTECTIVE STRUCTURE)/ FALLING OBJECTS PROTECTIVE STRUCTURE

- The machine cab is equipped with ROPS (roll-over protective structure) and OPG (operator protective guards) top guard level II. The ROPS and top guard, fitting supports, and fastening elements on the machine are integral parts of the structure.
- When the machine is used at the work site where falling objects may hit the cab, always have the top guard installed and inspect them on a periodic basis to ensure the top guard have not been damaged. The impact from objects striking the top of the cab could result in a potential crush hazard and result in serious injury or death.
- Any damage to the protective structures or the cab caused by collision, corrosion or fire are required to be inspected carefully by appropriate personnel. All damaged parts must be replaced with genuine KOBELCO parts to ensure the protective structures will be restored to their original specifications. Before making any changes to the cab, replacing the whole structure, or replacing the ROPS or top guard, contact your KOBELCO authorized dealer.
- To prevent serious injury or death, do not attempt to weld, to drill, to straighten or to repair the protective structures. Never attach any devices to lift the cab on the protective structure. Any type of modification may affect the structural integrity of the protective system and result in a complete loss of protective capability. Consult your KOBELCO authorized dealer to determine this structure's limitations without voiding its certification. Failures to contact your KOBELCO authorized dealer may void your warranty.
- Pay attention to the operating mass. If the operating mass exceeds MAX. MASS (maximum operating mass) described on ROPS CERTIFICATION with the special attachment or others installed, it will cause insufficient function, resulting in serious injury or death, should the machine tips/rolls over.

OPERATOR PROTECTIVE GUARDS CERTIFICATION	
This structure is tested and meets the requirements of TOP GUARD-LEVEL(II), ISO 10262:1998.	
PRODUCT IDENTIFICATION NUMBER	MACHINE MODEL
SERIAL No.	
WARNING -The modification and rework causing the deterioration of the strength are not allowed. -Don't use the parts other than the specified parts.	
PRODUCED BY KOBELCO CONSTRUCTION MACHINERY CO., LTD.	
YY2018388P3	



ROPS CERTIFICATION	
This structure is tested and meets the ROPS requirements of ISO 23117-2:2008.	
OPERATOR PROTECTIVE GUARDS CERTIFICATION	
This structure is tested and meets the requirements of TOP GUARD-LEVEL(I), ISO 10262:1998.	
PRODUCT IDENTIFICATION NUMBER	MACHINE MODEL
SERIAL No.	MAX. MASS(kg)
WARNING -The modification and rework causing the deterioration of the strength are not allowed. -Don't use the parts other than the specified parts. -When the skidplate is open, the cab doesn't comply with TOP GUARD Level (II).	
PRODUCED BY KOBELCO CONSTRUCTION MACHINERY CO., LTD.	
YY2018388P4	

DO NOT MODIFY THE ENGINE



Never modify the engine. If a certified engine is modified, its certification becomes invalid.
Never modify the EGR, the sensors, and the turbocharger.

DO NOT MODIFY ENGINE AIR INTAKE AND EXHAUST SYSTEMS

Notice

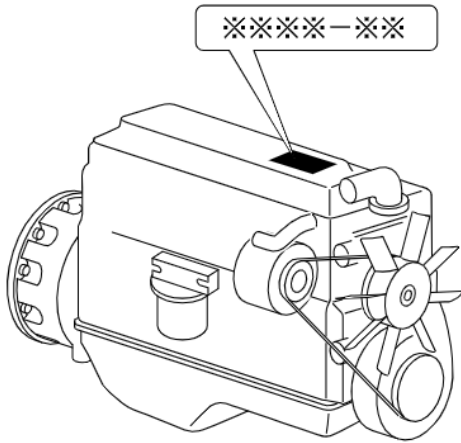
- Other than modification to the air intake system of the engine such as adding or modifying the filter, modification to the exhaust system, the fuel system, the electric system, and the cooling system may affect the exhaust gas cleaning performance and result in deterioration of the performance.
 - Do not perform modification beyond our specified setting to avoid a case falling under violation of each country's emission regulations.
-

ORDERING PARTS AND SERVICE

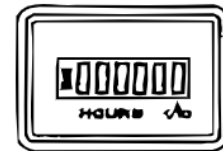
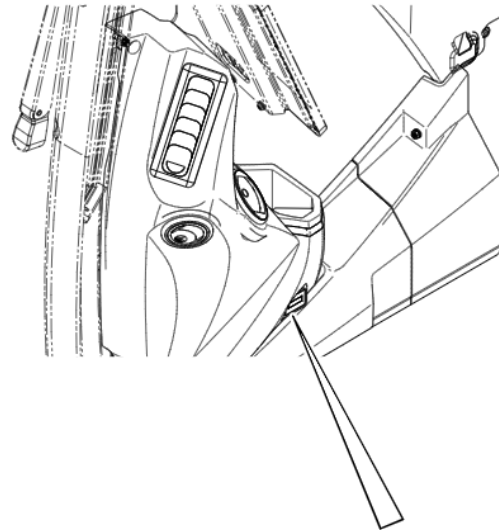
When ordering parts and service, have the machine serial number, the engine serial number and the current hours of operation available for your KOBELCO authorized dealer.

The machine serial number and the engine serial number are stamped in the locations shown below. For future reference, confirm and record these numbers in the spaces below.

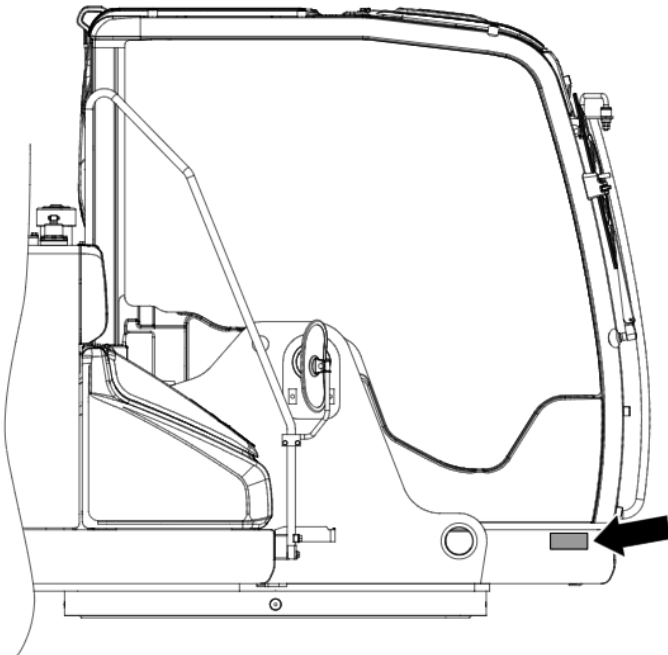
MACHINE TYPE	MACHINE SERIAL No.	ENGINE SERIAL No.	HOUR METER



ENGINE SERIAL No.
("※" means engine serial number)



HOUR METER



POSITION OF MACHINE SERIAL No. AND MACHINE TYPE

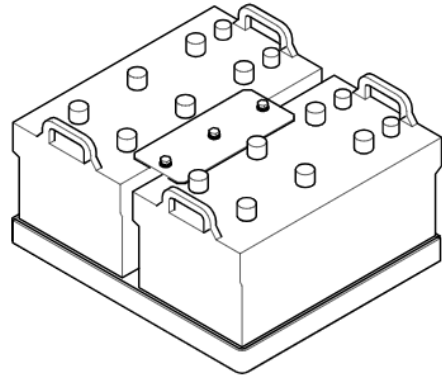
IMPORTANT NOTIFICATION

To show additional detail of parts and components or show motion of this machine, some illustrations may show the machine with safety related parts and components, including guards, doors, covers and shields, either removed or not in place. To prevent serious injury, death, or property damage, all of the safety related parts and components must be properly installed and secured, before starting this machine.

In addition, some illustrations may show features or functions that differ from your machine. If you have any questions, contact your KOBELCO authorized dealer.

Example

This illustration shows the battery with the cover removed.



1. SAFETY INSTRUCTIONS

1.1 SAFETY LABELS & DECALS



READ THE OPERATOR'S MANUAL

Read, understand and follow the safety messages and instructions in this manual. If these safety messages are not followed, serious injury or death could occur.

SAFETY MESSAGES

Several labels for specific safety messages are attached to this machine. The exact location and description of the hazards are reviewed in this section.

Please read and understand all safety messages in this manual and on the machine.

1.1.1 ALWAYS MAKE SURE ALL OF THE SAFETY LABELS ARE LEGIBLE AND NOT DAMAGED

- Clean the safety labels or replace the safety labels if you can not read the words or see the illustrations. To clean the safety labels, only use a cloth, water and soap. Do not use any solvent, gasoline or other harsh chemicals to clean the safety labels. Solvents, gasoline or harsh chemicals could loosen the adhesive that secures the safety labels and allow the label to fall off the machine.
- Always replace any safety label that is damaged or missing. If a safety label is attached to a part that is replaced, you will need to install a safety label on the replacement part. Your KOBELCO authorized dealer can provide new safety labels.
- Never remove any safety labels attached to this machine. For all other labels on the machine, clean and replace as needed in accordance with the instructions above.

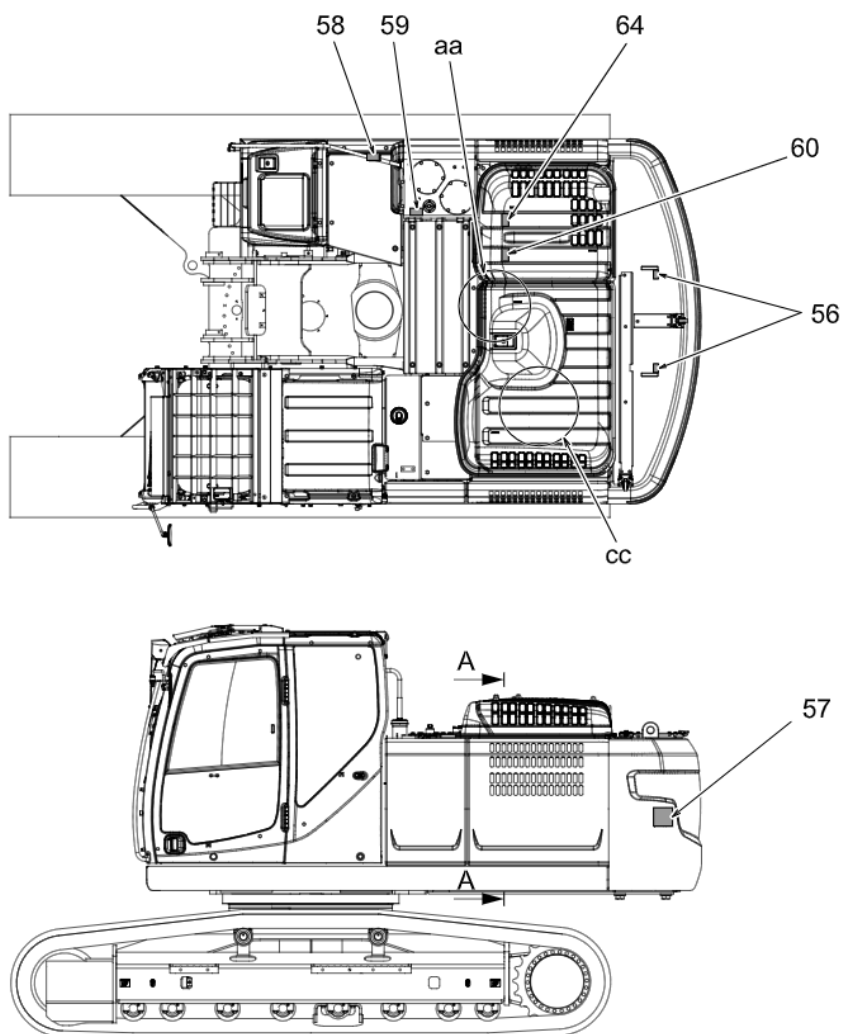
1.1.2 "DO NOT OPERATE" TAG

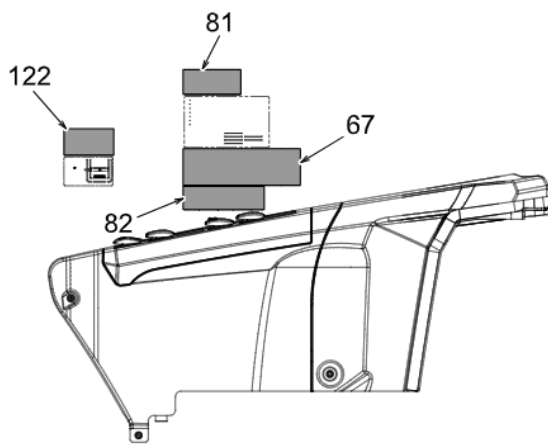
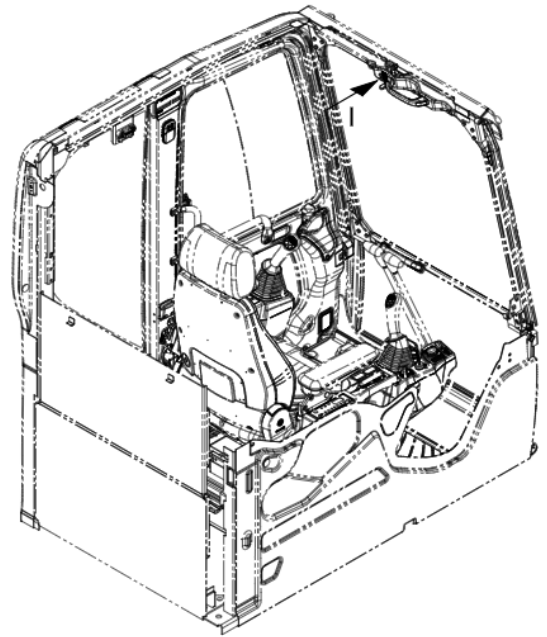
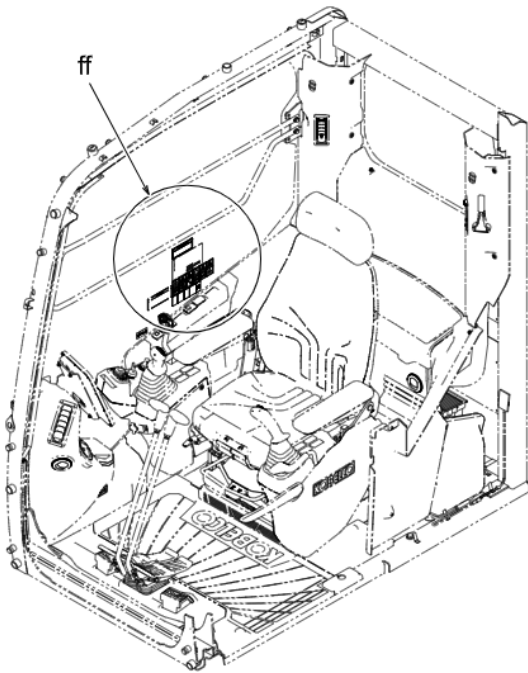
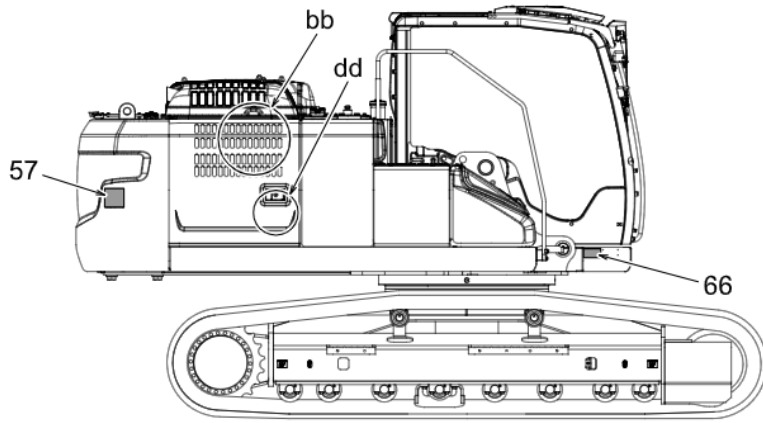
Part Number:YN20T03045P1

Use a temporary hang tag to communicate that the machine is out of service. You may need to use more than one temporary hang tag depending on the inspection and maintenance activities to be performed.

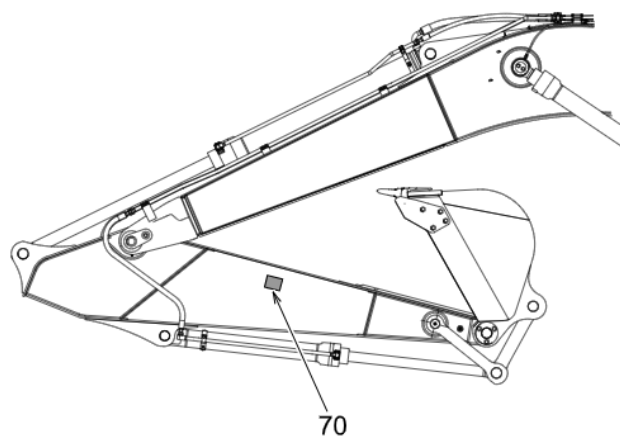


1.1.3 LOCATION OF SAFETY LABELS & DECALS

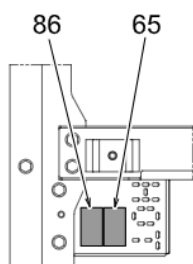




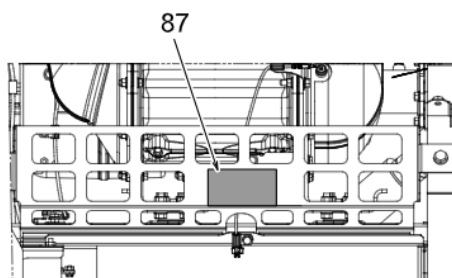
DETAIL ff



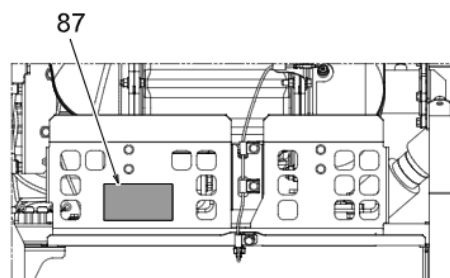
[1. SAFETY INSTRUCTIONS]



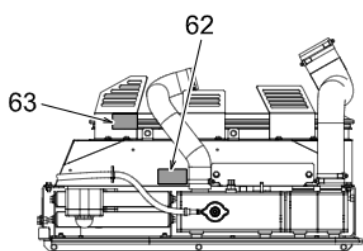
DETAIL aa
SHOW INSIDE PANEL



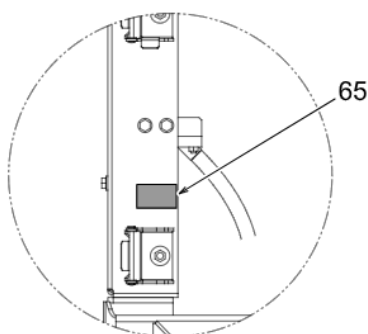
DETAIL bb
SHOW INSIDE PANEL



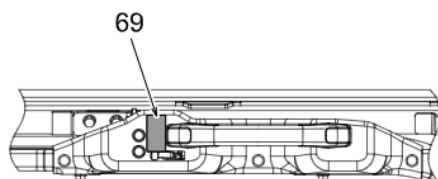
DETAIL bb
SHOW INSIDE PANEL
FOR SK210NLC-11E



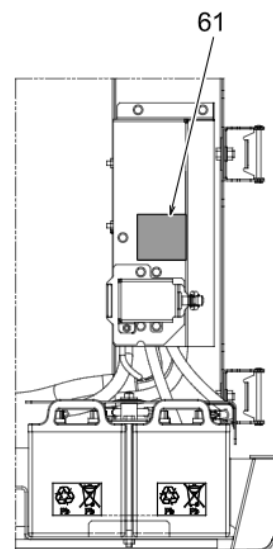
DETAIL cc



DETAIL dd



VIEW I



SECTION AA

1.1.4 SAFETY LABELS

DO NOT USE COUNTERWEIGHT LIFTING EYES

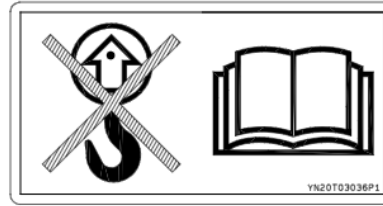
Location:56

Part Number:YN20T03036P1

FALL HAZARD

NEVER use counterweight lifting eyes to lift the machine. Counterweight lifting eyes could fail and the machine could fall.

Refer to operation manuals for proper machine lifting method.



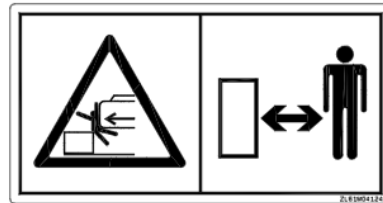
SWING

Location:57

Part Number:ZL61M04124

Do not enter in the swing area.

Stay away from the machine during operation to prevent you from contacting with or being crushed between machine components.



WORKING ABOVE GROUND

Location:58

Part Number:ZL61N02604

There is a danger of falling when working on areas above ground.

- Do not approach edges.
- Use the appropriate equipment, such as ladders or platform when working above ground. In addition, strap yourself to the proper equipment accordingly.
- Avoid spillage of any oil or grease.
- Clean all slippery substances such as grease, oil, hydraulic oil, mud, ice, and others attached to the steps, handrails, crawlers, ladders, and platforms.
- Do not leave any tools around the working area.
- Use extreme caution to avoid slipping while walking.
- Do not jump on or from the machine. Use the steps and handrails and securely maintain a three point contact while mounting or dismounting at all times.



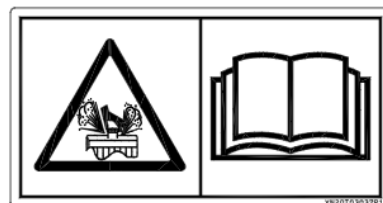
PRESSURIZED HOT OIL

Location:59

Part Number:YN20T03037P1

BURN HAZARD

- Lower attachment/equipment.
- Stop engine and press breather top button to release pressure from hydraulic tank before removing filler port plug.



[1. SAFETY INSTRUCTIONS]

WORKING ABOVE GROUND

Location:60

Part Number:ZL61M02708

There is a danger of falling when working on areas above ground.

- Do not approach edges.
- Use the appropriate equipment, such as ladders or platform when working above ground. In addition, strap yourself to the proper equipment accordingly.
- Avoid spillage of any oil or grease.
- Clean all slippery substances such as grease, oil, hydraulic oil, mud, ice, and others attached to the steps, handrails, crawlers, ladders, and platforms.
- Do not leave any tools around the working area.
- Use extreme caution to avoid slipping while walking.
- Do not jump on or from the machine. Use the steps and handrails and securely maintain a three point contact while mounting or dismounting at all times.

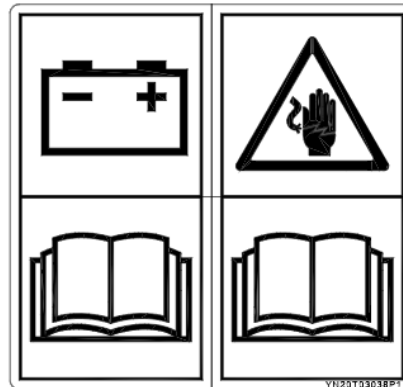


HANDLING BATTERY

Location:61

Part Number:YN20T03038P1

Read this manual to handle the battery properly.



HOT COOLANT

Location:62

Part Number:ZL61N00404

Never loosen or open the radiator cap when coolant is hot. Stream of hot coolant will spout and could cause burns.

Before opening the radiator cap:

- Cool down the engine completely.
- Cover the radiator with cloth rag.
- Loosen the cap slowly to relieve pressure.



ENGINE ROTATING PARTS WARNING

Location:63

Part Number:ZL61N05104

Keep away from the fan and belt when the engine is running.

Rotating parts can cause personal injury. Stop the engine before servicing.



HOT PARTS

Location:64

Part Number:ZL61M00508

Do not touch the engine until it cools down.

Because it could be high temperature and cause burns.



HOT PARTS

Location:65

Part Number:HL65M00507G1

Do not touch the engine until it cools down.

Because it could be high temperature and cause burns.

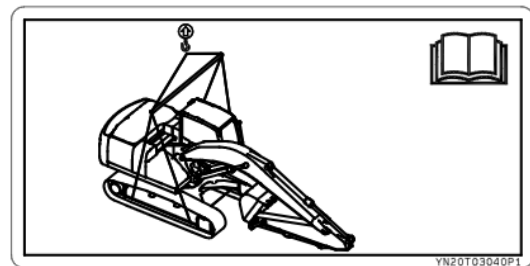


MACHINE LIFTING

Location:66

Part Number:YN20T03040P1

- Lift up the machine in the position as shown in right figure.
- The lifting up position shown in the figure is for the standard machine. For details, refer to the lifting procedure.

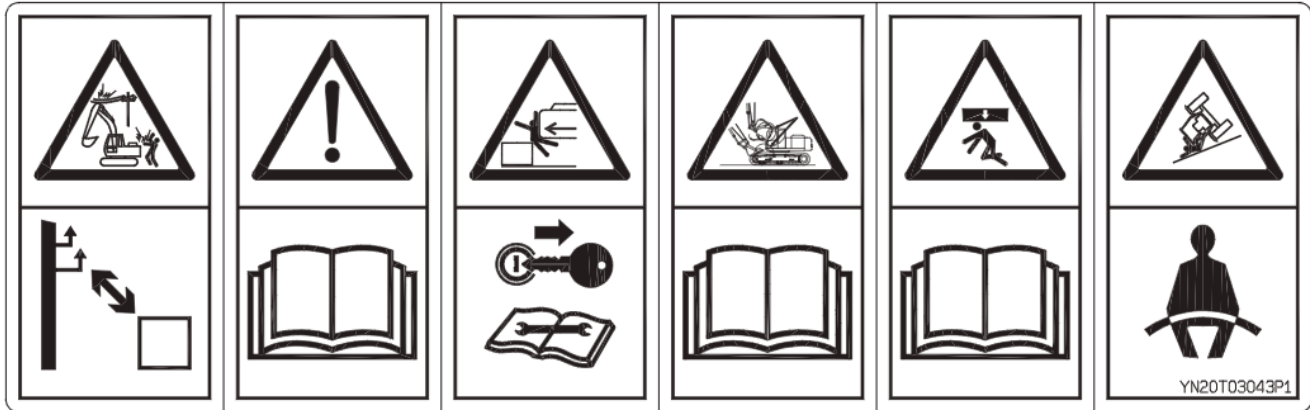


[1. SAFETY INSTRUCTIONS]

SAFETY PRECAUTIONS

Location:67

Part Number:YN20T03043P1



- **READ THIS MANUAL**

Read and understand this manual before operating, maintaining, disassembling, assembling or transporting this machine.

If the instructions and procedures in this manual are ignored or not followed, it may result in severe personal injury or death.

- **HANDLING OF CONTROL LOCK LEVER**

Before leaving the cab, park the machine on the level and firm ground and lower the attachment/equipment to the ground, make sure to pull up the control lock lever to the "LOCKED" position and then stop the engine.

- **ELECTRICAL POWER LINES**

Keep the machine and attachment/equipment at a safe distance from electrical power lines. Contact with electrical power lines can cause electric shock.

- **ATTACHMENT/EQUIPMENT INTERFERENCE WITH CAB**

Check clearance between the attachment and the cab before starting operation because a certain kinds of attachment/equipment and a certain combination of the option and the machine may cause interference between the attachment/equipment and the cab or some other parts of the machine.

Be sure to check the clearance between the attachment/equipment and the cab whenever the attachment/equipment or the combination is changed

- **PAY ATTENTION TO FALLING OF LOAD**

Do not use the power boost switch to lift a load because if you release the power boost switch during the operation, a lifted load can fall.

- **PRECAUTIONS WHEN TIPPING OVER**

When the machine tips over, the operator can be thrown out of the cab and crushed under the machine. Be sure to fasten the seat belt during operation.

LOCK THE FRONT WINDOW AT THE OPENING POSITION

Location:69

Part Number:HL61N06002G1

Lock the front window at the opening position securely, or it may slip down and may personal injury.



KEEP CLEAR WORKING AREA

Location:70

Part Number:ZL61N07508

Make sure the area is clear of obstacles and persons before beginning the operation of the machine.

Always look around before you start the swing operation.

Make sure everyone is cleared in your worksite. Sound horn before beginning swing operation.



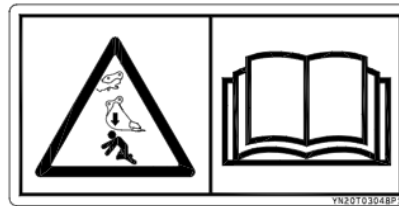
HANDLING THE QUICK HITCH

Location:81

Part Number:YN20T03048P1

Regarding a quick hitch to be installed, use the quick hitch with an automatic, mechanically and securely fixing structure, such as a lock pin.

Because when hydraulic holding force disappears due to damage of hydraulic piping or electrical wiring, the front attachment may fall off.



PRECAUTIONS OF HANDLING QUICK HITCH

Location:82

Part Number:YN20T03049P1

Be sure to read this manual before removing / installing the attachment.



WORKING ABOVE GROUND

Location:86

Part Number:HL65M02707G1

There is a danger of falling when working on areas above ground.

- Do not approach edges.
- Use the appropriate equipment, such as ladders or platform when working above ground. In addition, strap yourself to the proper equipment accordingly.
- Avoid spillage of any oil or grease.
- Clean all slippery substances such as grease, oil, hydraulic oil, mud, ice, and others attached to the steps, handrails, crawlers, ladders, and platforms.
- Do not leave any tools around the working area.
- Use extreme caution to avoid slipping while walking.
- Do not jump on or from the machine. Use the steps and handrails and securely maintain a three point contact while mounting or dismounting at all times.



[1. SAFETY INSTRUCTIONS]

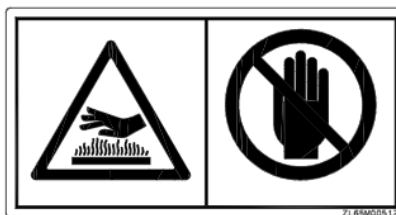
HOT PARTS

Location:87

Part Number:ZL65M00512

Do not touch SCR until it cools down.

SCR can be hot. It could cause burns.



PRECAUTIONS OF LIFTING WORK

Location:122

Part Number:YT20T01734P1

Perform lifting works by following this manual.

(See "OBJECT HANDLING" in Chapter 8)



1.2 PRE-START SAFETY



READ THE OPERATOR'S MANUAL

Read, understand and follow the safety messages and instructions in this manual. If these safety messages are not followed, serious injury or death could occur.

1.2.1 OPERATION RULES

ALWAYS OBSERVE BASIC SAFETY RULES AND PRECAUTIONS

All operators are required to receive training before operating this machine.

If a license or other special qualification is required to operate a hydraulic excavator in the country where this machine will be operated, all operators of this machine must meet those requirements and have a valid (not expired) license or qualification.

- Follow all safety precautions and procedures described in this manual while operating, inspecting and maintaining this machine.
- Never operate this machine if you are under the influence of drugs or medicines (including those which may make you drowsy) or alcohol. If you are not alert, do not operate the machine.
- To prevent accidents, confirm all working procedures before starting work. If a signal person is needed, always agree on the hand signals and designate a signal person before starting work.

All personnel must know and understand all the signals. The operator shall respond to signals only from the appointed signal person, but shall obey a stop signal from anyone at any time. The signal person must stand in a clearly visible location when giving the signals.

ENSURE WORKSITE SAFETY

Understand your task and the potential hazards:

- Before operation, conduct a risk assessment with the site manager and confirm that all necessary safety precautions have been taken for the task. Always ask the site manager if there are any additional safety precautions or regulations for the task.

Know your working area:

- Visually survey the area around the working site before operating the machine. Look for mud or other soft ground that could cause the machine to become stuck or unstable when operating the machine. The ground near cliffs, trenches and road shoulders may be too soft to operate the machine. Be aware that rain, blasting activities, earthquakes, or other events may cause the ground be soft. Use signs to identify soft shoulders and soft ground. If needed, use a signal person.
- Choose operating locations where landslide will not occur or where falling rocks or building debris will not land on the machine.
- Set up barricades to prevent unauthorized personnel and/or machines from entering the working site.
- If working near a road, use a signal person and signs to alert vehicles and pedestrians of potential hazards and falling objects.

KEEP AWAY OTHER PEOPLE FROM THE MACHINE AND ATTACHMENT / EQUIPMENT DURING OPERATION

To prevent serious injury or death:

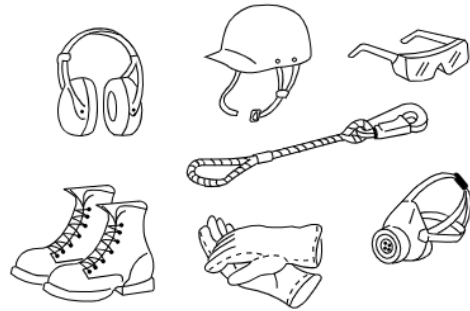
- Never allow anyone to stand on the machine, including the attachment /equipment and the upper structure, when operating.
- Never allow anyone to stand or to ride on a suspended load or the attachment/equipment.

1.2.2 PROTECTION TOOLS

PERSONAL PROTECTIVE EQUIPMENT

Wear fitted clothing and protective gears.

- Wear clothing not exposing your skin.
- Always change any clothing that has become contaminated with oil, fuel or other flammable substances.
- Do not wear loose fitting clothing, jewelry or any accessory and restrain long hair that can get caught in moving parts or that can catch on controls and result in unintended movement of the machine or the attachment /equipment.
- Always wear the proper personal protective equipment for the task you will be performing. This may include a hard hat, safety shoes, safety glasses, face shield, respirator, and/or a reflective vest. Consult with your supervisor to confirm you have the proper personal protective equipment for the task.
- Use ear protection when operating in noisy areas. Prolonged exposure to loud noises can cause hearing damage and even total hearing loss.
- Inspect all personal protective equipment for damage prior to use. If any personal protective equipment is damaged, or past its expiration date, do not use the equipment and contact your supervisor to obtain a replacement before operating machine.
- Other personnel working in the vicinity of the machine, including the signal person, should also wear the proper personal protective equipment appropriate for the worksite and for the task. This may include a hard hat, safety shoes, safety glasses, face shield, respirator, gloves, ear protection, and/or a reflective vest. Consult with your supervisor to confirm that personnel working in the vicinity of the machine have the proper personal protective equipment for the worksite and the task.



PREPARE FOR EMERGENCY

In case of emergency, know where the fire extinguishers (type: ABC, ABE) and the first aid kit are located.

- Know how to use a fire extinguisher.
- Inspect and maintain the fire extinguishers in compliance with your local/national regulations.
- Determine what emergency communication devices are necessary for your location and have a list of important telephone numbers available.
- Periodically inspect the first aid kit. Replenish items and replace expired items as necessary.



1.2.3 ABNORMAL AND EMERGENCY CONDITION

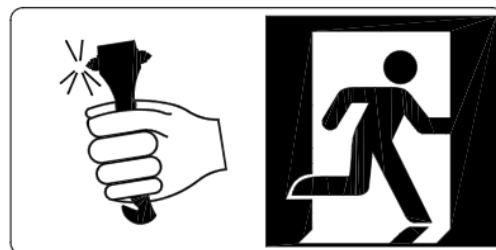
WHEN A FAILURE IS FOUND

When operating, inspecting or maintaining the machine, if there is an unusual noise, vibration, smell, instrument malfunction, smoke, oil leak, a warning light illuminates or a warning is on the multi-display, do not continue to operate the machine.

- Always park on a firm, level location, lower the attachment to the ground, pull the control lock lever to the locked (up) position, stop the engine, and remove the key.
- Contact your Supervisor.
- Contact your KOBELCO authorized dealer for repair.

EMERGENCY ESCAPE FROM THE CAB

If the normal operator's exit is blocked in an emergency, stop the engine, use the escape hammer to break a window, and exit the cab. See "EMERGENCY ESCAPE FROM OPERATOR'S STATION" in Chapter 2 in the standard operation & maintenance manual.



IN THE EVENT OF A FIRE OR OTHER EMERGENCY

- Stop the engine.
- Use hand rails and steps to dismount machine. Do not jump from machine.

IN THE EVENT OF A THUNDERSTORM

- Lower the attachment to the ground and if possible anchor the digging tool into the soil.
- Leave the cab and move away from the machine before a thunderstorm breaks out. Otherwise, you must stop the engine and keep waiting inside the closed cab until the end of a thunderstorm.

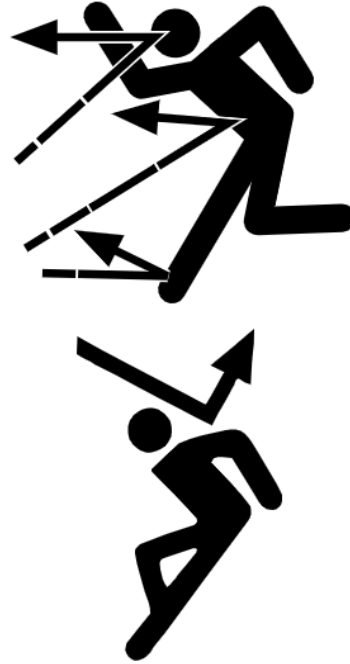
1.2.4 POTENTIAL HAZARDS WHEN OPERATING

PAY ATTENTION TO FALLING MATERIALS AND FLYING DEBRIS

Be sure to install the top guard and the front guard (option) when performing demolition, working in quarry or mining applications or any site in which falling materials and/or flying debris can be generated .

- If working with the hydraulic breaker or other attachments, be sure to install front guard.
- When performing work that may result in falling material and flying debris, keep people a safe distance away from the work area.
- Always close the front window and doors before operating.

As for installing the front guard (option), contact your KOBELCO authorized dealer.



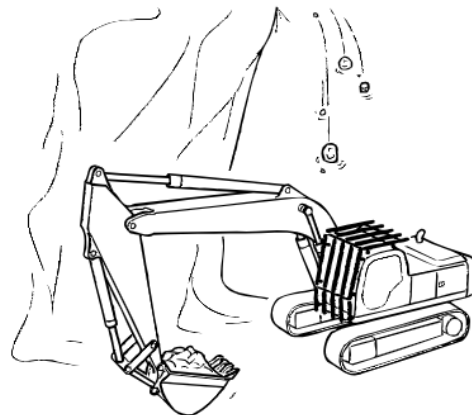
CHECK PROTECTIVE RELATED GUARDS AND EQUIPMENT

- Check that all protective related guards, covers, windows and mirrors are not damaged and are secure prior to operation. If any damage or other issue is found, do not use the machine until the protective related parts and equipment has been replaced. Never attempt to repair protective related parts and equipment.
- Understand how the protective systems and the protective related equipment protects you as the operator and others around the machine.
- Never remove protective related parts and equipment from the machine.

LIMITED PROTECTION FROM OBJECTS FALLING ON THE CAB

When operating near areas where landslides may occur or where rocks or other debris may fall, be aware that the cab and the guards installed provide limited protection for the operator and may not prevent serious injury or death.

- The top guard is designed according to ISO10262 and should not allow loads up to 227 kg (500 lbs.) dropped from a height of 5.22 m (17 ft.) to penetrate the cab. During building demolition or other activities, the load, the distance of the drop, or both could produce forces that exceed the limits of the top guard and cause serious injury or death.
- Never weld, drill or modify the top guard or other protective structures. Any modification could weaken the structural integrity of these protective structures, resulting in serious injury or death in case of collision, falling objects or landslides.
- Do not install any cab lifting device to the top guard or other protective structures.
- If an accident occurs, do not try to straighten or repair the top guard or other protective structures. Contact your KOBELCO authorized dealer for functional verification or replacement of any of the protective structures.

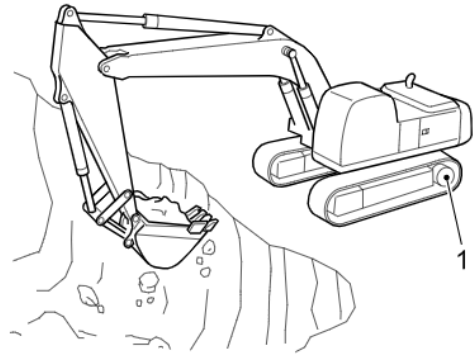


GROUND CONDITIONS

Always place tracks perpendicular (at a 90 degree angle) to the edge of a cliff or the road shoulder with the travel motors(1) positioned away from the edge to prevent the machine from falling over the edge.

Visually inspect for soft ground near the edge, especially either any raised ground or any wet ground following a rain.

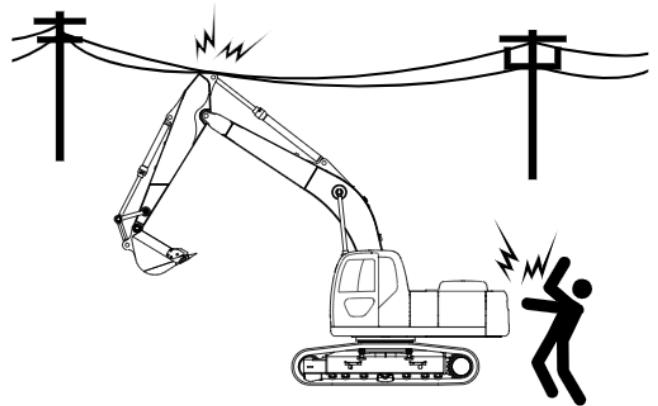
Do not dig close to the machine or undercut the bank in front of the machine to prevent the machine from falling over the edge.



ELECTRICAL POWER LINES

Keep a safe distance from electrical power lines. Never approach power lines with any part of the machine and its load unless all local and national required safety precautions have been taken. Electrocutation and death can result from arcing, touching or even being close to a machine that is in contact with or near an electrical source.

- Maintain the maximum possible distance from power lines and never violate the minimum clearance.
- Always contact the nearest electric utility and determine jointly what specific precautions must be taken to ensure safety.
- Consider all lines to be power lines and treat all power lines as energized even though it is known or believed that the power is shut off and the line is visibly grounded.
- Use a signal person to observe the approach of any part of the machine or load to the power line.
- Caution all ground personnel to stand clear of the machine and the load at all times.
- If the machine should come in contact with a live electrical source, do not leave the operator's seat. Do not allow anyone to approach or touch the machine.
- Observe the applicable rules or regulations for clearance distances for power lines and other electrical equipment for the country where the machine is operating. Always maintain the following clearances when operating near high voltage power lines.



The reference of the safe distances from high voltage cables are as follows.

LINE VOLTAGE(V)	MINIMUM DISTANCE m(feet)
0 to 50,000	3.0(10) or more
50,000 to 200,000	4.5(15) or more
200,000 to 350,000	6.0(20) or more
350,000 to 500,000	7.5(25) or more
500,000 to 750,000	10.5(35) or more
750,000 to 1,000,000	13.5(45) or more

USE WORK LIGHTS

- When operating in dark locations, turn on the work light. If necessary, use additional lighting devices to make the work areas bright enough to operate.
- Stop work if you have poor or limited visibility because of darkness, fog, rain, especially lightning, snow, or other causes.

OPERATING ON SOFT GROUND

When working on soft or wet ground, place logs or lumber horizontally beneath the crawler tracks to prevent the machine from becoming stuck.

Be aware frozen ground may become soft or wet as the ambient temperature rises during the day and could cause the machine to become unstable or stuck.

VISUALLY INSPECT GROUND CONDITIONS BEFORE OPERATING

The ground near cliffs, trenches and road shoulders may be too soft to operate the machine. Visually inspect for soft ground before travelling or working in these areas. Be aware that rain, blasting activities, earthquakes, or other events may cause the ground to be soft.

To prevent serious injury, death, and property damage, only travel or work on firm ground when the machine is close to sudden elevation changes, including cliffs, trenches and road shoulders. The weight of the machine or vibration from the machine may cause the ground to collapse and cause the machine to tip or roll over.

1.2.5 FIRE PREVENTION

FIRE CAUSED BY FLAMMABLE SUBSTANCES

Fuel, oil, electrolyte, windshield washer fluid and other chemicals are flammable.

To prevent serious injury or death from possible fire:

- Remove flammables such as leaves, wooden debris, paper waste, etc. from the areas of exhaust manifold, muffler, battery, and undercover, etc.
- Do not smoke or bring other ignition sources near areas where flammables are stored and/or handled.
- Refuel only after stopping the engine.
- Do not leave the machine when refueling or when refilling with oil.
- Try not to spill fuel on heated surfaces or on electrical parts. Clean any spills immediately.
- After refueling or refilling with oil, securely tighten the fuel and the oil caps and clean up any spills immediately.
- Store fuel and oil in designated areas and restrict access to only authorized personnel.
- Remove all flammable materials in the area before performing grinding or welding work.
- Do not weld or perform gas cutting on pipes and tubes which contain combustible liquids.
- Only use nonflammable oils to wash parts. Do not use flammable oils, such as diesel fuel or gasoline, to wash parts.



FIRE CAUSED BY THE ELECTRIC SYSTEM

Short-circuits in the electrical system may cause fire.

- Check all wiring harness connections are clean and secure.
- Inspect wiring harnesses, connectors, and clamps periodically. Repair, replace, or tighten connectors and clamps if any damage or loose connections are found.

FIRE CAUSED BY LEAK

Check all clamps, guards, protective cushions for the hoses and the tubes are secure.

During operation, machine vibration may cause loose hoses or loose tubes to be damaged from contact with other parts and leak high pressure oil or other fluids and result in a fire and serious injury or death.

If any issue is found, immediately tighten, repair or replace it.

Do not operate machine with damaged or bent hoses or tubes.

USE ANTI-EXPLOSION WORK LIGHTS

Use only work lights with anti-explosion specification to prevent serious injury or death.

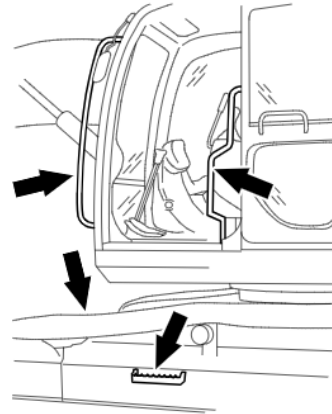
Lighting must meet the requirements for areas where explosive concentrations of vapors and dusts could exist to prevent a fire or explosion when performing inspection and maintenance activities.

1.2.6 GETTING ON AND OFF THE MACHINE

PRECAUTIONS OF GETTING ON AND OFF THE MACHINE

To prevent serious injury or death:

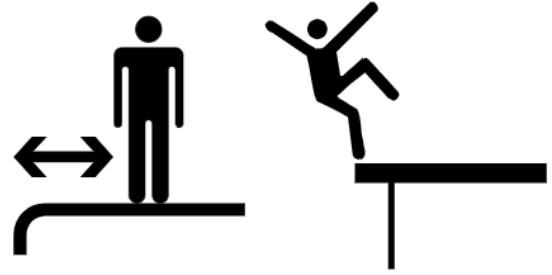
- Clean all slippery substances such as grease, oil, mud, ice, and others attached to the steps and handrails.
- Inspect the steps and handrails for damage or loose parts. Replace any damaged parts and tighten any loose bolts or nuts.
- Always use the steps and handrails to get on and off the machine.
- Always face the machine and maintain three points of contact with the steps and handrails.
- Do not use the control lock lever and control levers as hand holds.
- Do not have anything in your hands, including tools, when getting on and off the machine.
- Never jump on and off the machine or attempt to get on or off a moving machine.



1.2.7 PREVENT FALLS

PREVENT FALLS

- Always use appropriate equipment and fall protection.
- When there is a risk of falling, use suitable equipment to address the potential risks, including the use of lifting platforms, scaffolding, ladders, or auxiliary cranes if necessary.
- If work cannot be carried out using additional equipment or from the ground, the operator and assembly personnel must wear approved fall protection at all times.
- All fall protection systems must meet local, regional and national regulations for your country where the machine is located.
- Do not use defective or damaged personal protective equipment. Always obtain replacement personal protective equipment before starting the task.
- Clean all slippery substances such as grease, oil, hydraulic oil, mud, ice, and others attached to the steps, handrails, crawlers, ladders, and platforms.
- Inspect appearances and mounting portions of the steps, handrails, ladders, and platforms. Replace any damaged parts and tighten any loose bolts or nuts.
- Use the proper personal protective equipment, such as a full-body harness, if needed.
- Use extreme caution when walking on elevated surfaces to avoid slipping.
- Always use the steps, handrails, ladders and platforms to access locations above the ground level.
- Always face the machine and maintain three points of contact with the steps and handrails.
- Do not use control lock lever or control levers as hand hold.
- Do not have anything in your hands, including tools, when getting on and off the machine.
- Never jump on and off the machine, or attempt to get on and off a moving machine.
- Clean all spills, and store or secure tools in a strong place properly after working.



[1. SAFETY INSTRUCTIONS]

1.2.8 PRE-START UP INSPECTION ON THE MACHINE

Always perform a pre-startup inspection before operating this machine to check for any potential issues. For more information, refer to "EVERYDAY CHECK-UP" in Chapter 3 in the standard operation & maintenance manual.

ATTACH A "DO NOT OPERATE" TAG

To prevent serious injury or death, never allow unauthorized personnel to start the engine or touch the control levers during inspection and maintenance activities. Always lower the attachment, pull the control lock lever to the locked(up) position, stop the engine, and remove the key before performing inspection and maintenance.

Use a temporary hang tag to communicate that the machine is out of service. You may need to use more than one temporary hang tag depending on the inspection and maintenance activities to be performed.



CHECK THE MACHINE LOG BOOK

Check machine log book to check that periodic maintenance and inspections have been performed and all necessary repairs made.

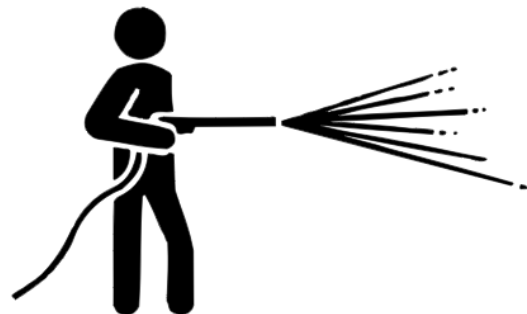
ALWAYS KEEP THE MACHINE CLEAN

Always keep the machine clean and free of scattered debris, and spilled lubricant and oil.

If electrical components or systems get wet, then equipment malfunction, short circuit, or fire may result in serious injury or death.

Never use pressurized water or steam to clean inside the operator cab or any electrical components, such as sensors and connectors.

Also never wash the vent hole of covers or guards with high-pressure cleaning machine.



KEEP INSIDE OF OPERATOR CAB CLEAN

- To prevent slippery pedals, always remove mud, grease, oil, and other substances from the soles of your shoes before entering the cab.
- Secure parts and tools inside the cab before operating.

To prevent fire:

- Do not bring explosive or flammable materials into the cab.
- Do not leave your cigarette lighter inside the cab.
If the cab temperature becomes too hot, the lighter may explode.
- After smoking, always put out your cigarette.
- Do not leave plastic bottles inside the cab or attach suction cups to the windows.
These items may act as lenses and could start a fire.

SEAT BELT INSPECTION

Check if seatbelt is cut or frayed and check if mounting hardware is damaged or loose before fastening the seatbelt. If an issue is found with the seatbelt or the mounting hardware, do not use machine until the issue has been repaired.

Replace seatbelts every 3 (three) years or more frequently if damaged or frayed.

1.3 SECURE VISIBILITY



READ THE OPERATOR'S MANUAL

Read, understand and follow the safety messages and instructions in this manual. If these safety messages are not followed, serious injury or death could occur.

1.3.1 BE AWARE OF YOUR SURROUNDINGS

When operating or traveling in the machine, the operator may not observe people and obstacles near the machine. To prevent serious injury, death or damage to the machine.

- Keep windows clean.
- Replace cracked or broken glass.
- Adjust the mirrors for maximum visibility around the machine before operating. If needed, clean the mirrors.
- If the machine is equipped with the rearview camera and the side cameras, clean the lenses to display clear images from the rearview and side cameras to the monitor.
- Move the attachment /equipment as needed to improve visibility of the right side during machine travel.
- There are blind areas in the mirror and camera views. Confirm for safety around the machine before operating the machine.
- If needed, use a signal person. The operator should always be alert and follow the signals from the signal person. The operator shall respond to signals only from the appointed signal person, but shall obey a stop signal from anyone at any time.
- When operating in dark locations, turn on the work light. Additional lighting may be needed to illuminate the work area.
- Stop work if you have poor or limited visibility because of darkness, fog, rain, especially lightning, snow, or other causes.
- Never attach mirrors or other articles to the handrails. Over time, excessive vibration may weaken the handrail and cause it to fail.
- Do not operate the machine without the monitor pictures of the rearview camera and the side camera being displayed.
- Do not remove or disassemble the rearview camera and the side camera systems.
The camera systems are installed on the base machine according to ISO 16001:2017. When removal or disassembly of them is required, contact your KOBELCO authorized dealer otherwise it may void the machine warranty provided with the machine.

MIRROR AND CAMERA LOCATION

Only use genuine KOBELCO mirrors, rearview camera system, and side camera system.

Regarding adjustment of the mirrors, the rearview and side cameras, see "ADJUSTMENT OF MIRRORS" in Chapter 3.

1.4 PRECAUTIONS FOR OPERATION



READ THE OPERATOR'S MANUAL

Read, understand and follow the safety messages and instructions in this manual. If these safety messages are not followed, serious injury or death could occur.

1.4.1 STARTING

CHECK A "DO NOT OPERATE" TAGS

Before starting the engine, check display of warning tags.

If warning tags are displayed, do not start the engine. The warning tags are used to notify that the machine is in an inoperable condition.

Report this situation to a supervisor of the machine and do not start the engine until the warning tags are removed.



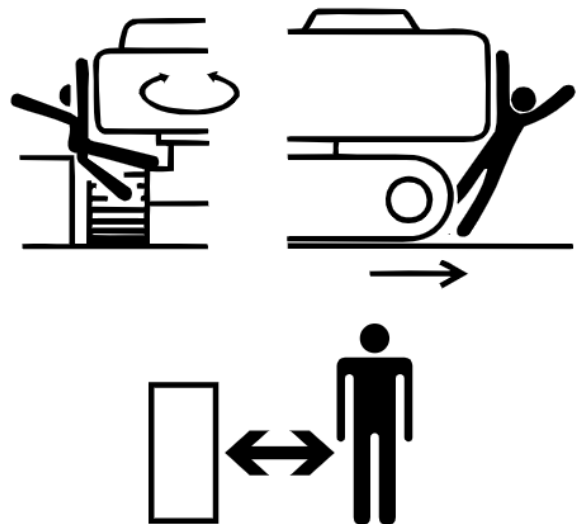
ONLY THE OPERATOR IS ALLOWED IN THE CAB

The operator is the only person that should be on or near the machine and in the cab. Do not allow any other personnel to be present in the cab or on the machine.

CHECK WORKING SITE AND SET UP BARRICADES

To prevent serious injury, death and property damage, before you start the engine and before you operate the machine:

- Check that no one is on, under, and around the machine. Make sure that all personnel are clear of the machine and surrounding area.
- Check there are no other machines or obstacles in the area surrounding the machine.
- Set up barricades to prevent unauthorized personnel and / or machines from entering the working site.



PRE-OPERATION SAFETY CHECK

To prevent serious injury or death, before operating:

- Close and lock the doors and windows.
The window guard may not prevent flying debris from striking the operator inside the cab.
- Close and lock the access panels and doors.
- Adjust mirrors for maximum visibility around the machine. See "ADJUSTMENT OF MIRRORS" in Chapter 3 for additional information.

[1. SAFETY INSTRUCTIONS]

FASTEN YOUR SEATBELT

To prevent serious injury or death, always fasten your seatbelt before starting the machine and keep your seatbelt fastened during operation.

Sit in operator's seat and adjust seat so you can properly operate all of the machine controls.

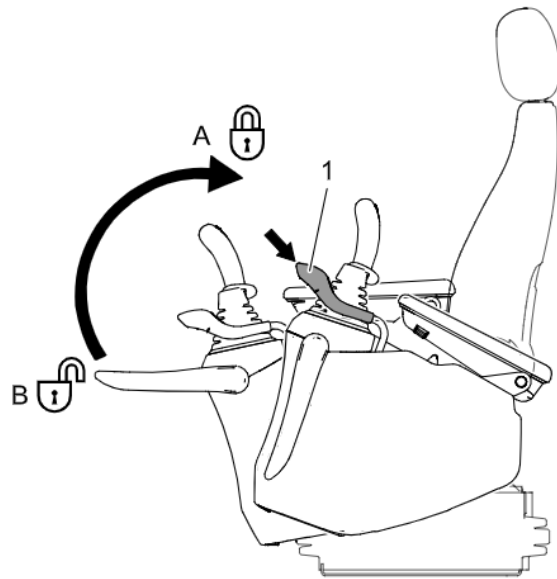


BEFORE STARTING ENGINE

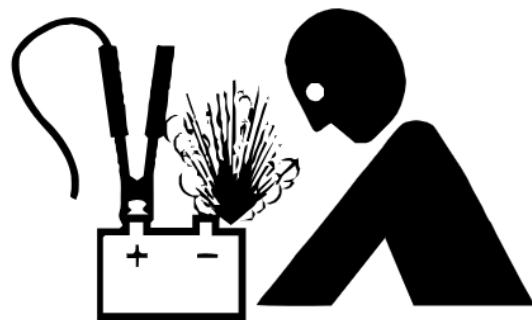
- Check the pilot control lock lever (1) is in the locked (up) position. If not locked, incidental contact with the control levers, pedals and other control devices may result in unexpected and unintended machine movement.
- Confirm that all control levers and pedals have returned to neutral.
- Sound horn to alert personnel near the machine.

A: Locked Position

B: Unlocked Position



Only start the engine from the operator's seat. Never attempt to start the engine by connecting the starter terminals to the batteries. Unexpected machine movement could result in serious injury, death, or damage to the machine and electrical system.



WARM UP

To prevent serious injury or death, always allow the machine to warm up prior to operation, especially in cold weather. Do not start operation as soon as the engine is started. If not warmed up, there could be a delay between when the control levers are moved and when the machine or the attachment /equipment responds, resulting in unintended or unexpected movement of the machine or attachment /equipment.

After starting the engine, check all gauges indicate properly.

ATTACHMENT MODE SELECT SWITCH

Check the attachment installed matches the selected attachment mode and is appropriate for the task to be performed. If the attachment mode selected does not match the attachment, the machine will not work properly and it will result in serious injury, death, or property damage.

See "SWITCHING ATTACHMENT MODE" in Chapter 3 for additional information.

CHECK CONTROL PATTERN BEFORE OPERATING

Before operation, always check the operation of each control lever and each pedal.

If the movement of the machine does not match selected control pattern which is shown on the card, stop the work and shut down the machine. The machine movement must match with the operating pattern.

If the machine movement does not match the card displayed in the cab, change the card so as to match the machine control pattern indicated on the card.

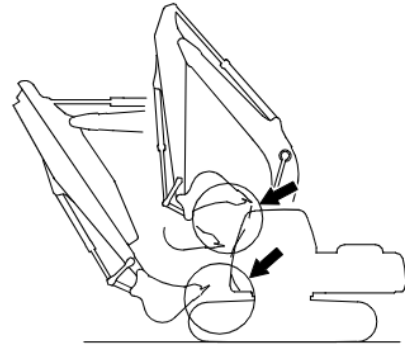
If any issue is found, do not operate machine until the issue had been corrected. If needed, contact your KOBELCO authorized dealer.

CHECK WARNING DEVICES

Make sure that the horn, the travel alarm, the swing flashers and all other warning devices are warning properly.

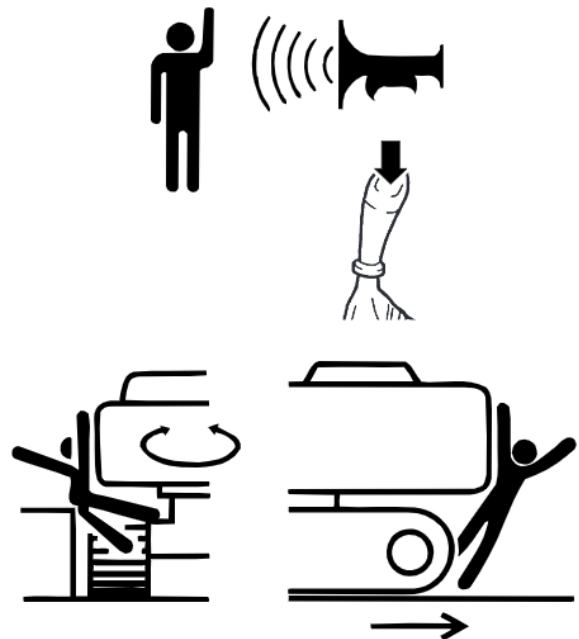
AVOID INTERFERENCE BETWEEN THE ATTACHMENT AND THE MACHINE

Check clearance between the attachment and the cab before starting operation because a certain kinds of attachment and a certain combination of the option and the machine may cause the contact of the attachment and the cab or some other parts of the machine.



PRECAUTIONS OF SWINGING / TRAVELING

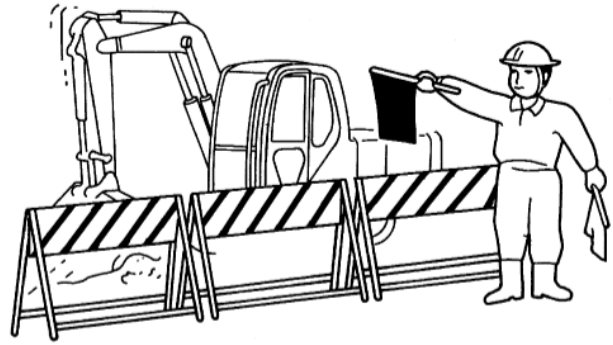
- Always sound the horn before starting the engine, traveling the machine, or swinging the upper structure to alert people in the vicinity of the machine.
- Always operate at a safe distance from other machines or obstacles in the vicinity of the machine.
- Place a signal person at poor visibility area.
- Check the swing flasher and the travel alarm for proper operation.



[1. SAFETY INSTRUCTIONS]

WORKSITES IN URBAN AREAS

Set up barricades to prevent unauthorized personnel and/or vehicles from entering the worksite. If working near a road, use a signal person and signs to alert vehicles and pedestrians of potential hazards and falling objects. If needed, use a signal person to direct traffic. The operator should always be alert and follow the signals from the signal person. The operator shall respond to signals only from the appointed signal person, but shall obey a stop signal from anyone at any time.

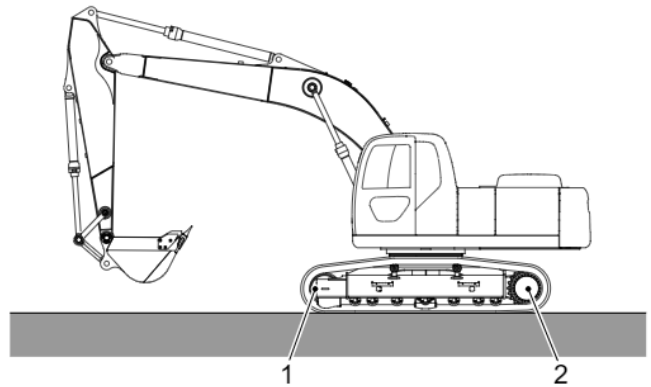


1.4.2 TRAVELING

ALWAYS CONFIRM DIRECTION OF TRAVEL

Before moving the machine, check the position of the undercarriage (tracks). The normal travel position is for the idler wheels(1) to the front under the cab and the drive sprockets(2) to the rear.

When the undercarriage (tracks) is reversed, the travel controls operate in the opposite directions compared to when the idler wheels(1) are in the front. Move the travel levers slowly and travel at a low speed.



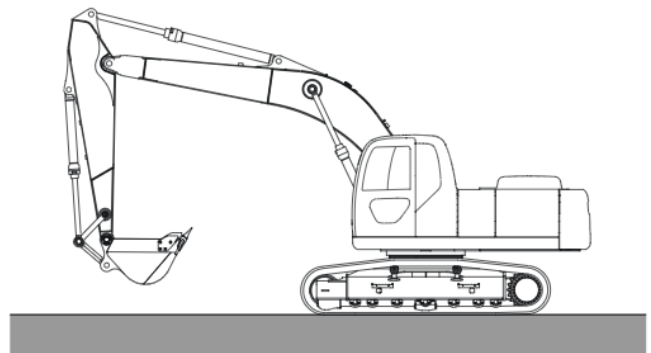
MOVE TRAVEL LEVERS IN A SLOW AND DELIBERATE MANNER

- Gradually increase speed. Moving the travel levers quickly will cause the machine to accelerate quickly and result in a sudden start or sudden acceleration.
- Do not move the travel levers from forward to reverse or vice versa rapidly.
- Do not perform an abrupt pivot turn or spin turn.
- Do not stop quickly by releasing the levers during travel.

PRECAUTIONS IN TRAVELING

Travel on a level and firm ground as much as possible.

- Ensure operator has good visibility when traveling and is aware of any and all obstructions on the job site.
- Travel slowly on a rough terrain.
- Do not go over obstacles. When going over obstacles inevitably, go slowly with the attachment positioned close to the ground to avoid machine becoming unstable or tipping.

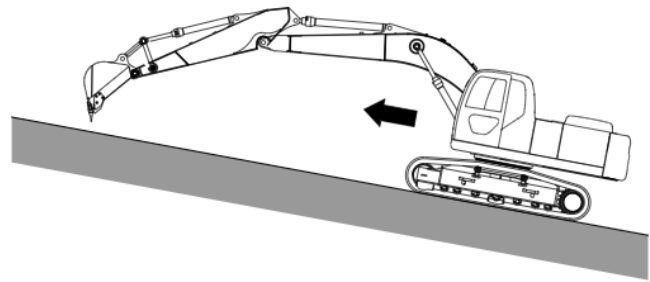


[1. SAFETY INSTRUCTIONS]

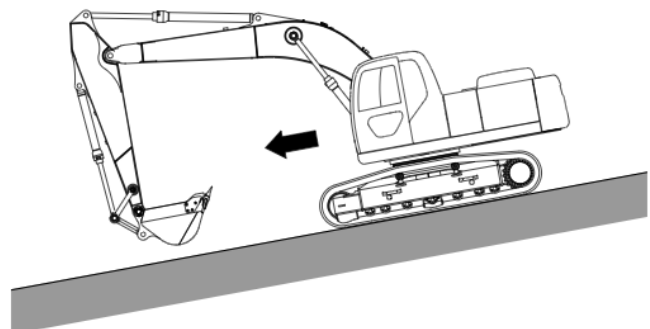
TRAVELING ON SLOPES

Traveling up and down slopes of 30 degrees or more is not allowed to avoid a risk of tipping/rolling over.

- Travel at a low speed when traveling up and down the slopes.
- When traveling up the slopes, extend the front attachment forward to avoid tipping/rolling over to the rearward.
- When traveling down the slopes, set the bucket in the position where it can reach the ground immediately to stop the machine from tipping or sliding.
- Travel carefully on wet ground, grass, grasses, fallen leaves, ice, and steel plates because the machine can slip easily.



Traveling up slope



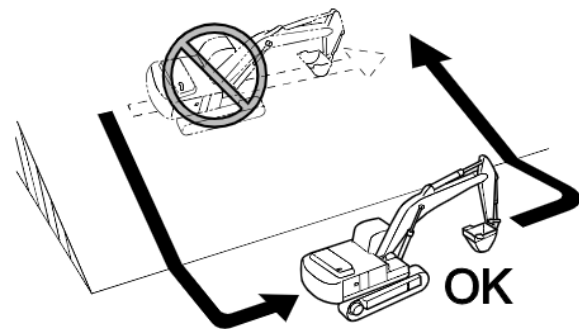
Traveling down slope

PRECAUTION OF TRAVELING ON SLOPES

The machine could tip or roll over, slide, or skid when travelling across slopes.

Be sure to travel off the slope, travel along flat area, then travel onto the slope at the desired location.

Never travel across the slopes.



TRAVELING ON FROZEN OR SNOW COVERED GROUND

Use extreme care when operating on frozen or snow covered ground.

- The ground may be extremely slippery and the machine can slide or skid.
- Do not perform abrupt start, stop, or movements or the machine could become unstable and tip or roll over.
- Snow can make elevation changes (e.g., road shoulders or steep banks) hard to perceive.
- Snow can cover obstacles or obstructions and make them difficult to recognize.
- During the day as ambient temperatures rise, frozen ground may thaw and become soft and cause the machine to become unstable or stuck.

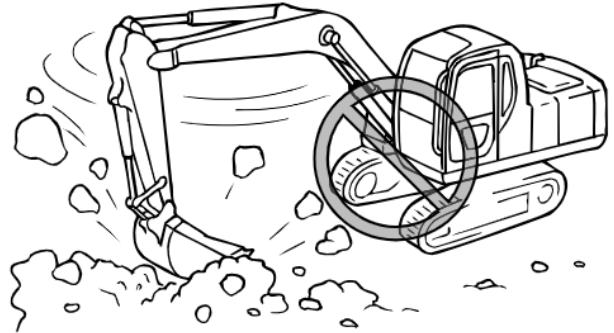
1.4.3 PROHIBITED OPERATIONS

Always follow the procedures in this manual when operating this machine. Abuse and misuse may result in serious injury, death, property damage and reduce the life of the machine. Never attempt the following under any circumstances.

NEVER USE THE SWING POWER TO PERFORM WORK

Never apply swinging force (slewing force) to rock sliding work and side wall breaking work.

If the swing power is used to perform work, excessive force may be exerted on the machine and the attachment /equipment resulting in damage and may reduce the life of the swing system.

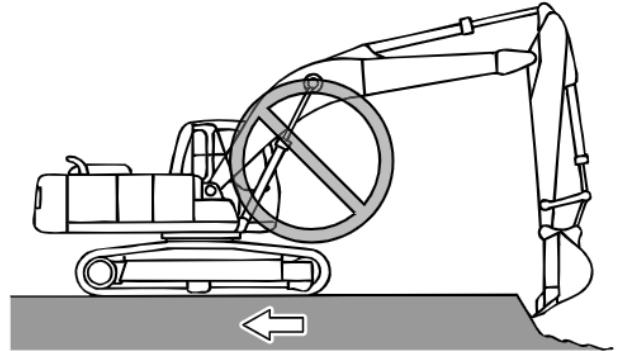


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NEVER USE THE TRAVEL POWER TO PERFORM WORK

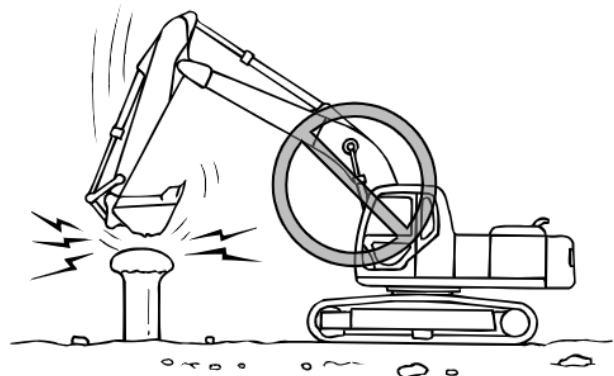
Do not use the travel power to perform digging or leveling work with the attachment in contact with the ground.

If the travel power is used to perform work, excessive force may be exerted on the machine and the attachment /equipment resulting in damage.



DO NOT PERFORM "HAMMERING" OPERATIONS WITH THE BUCKET

Never use the bucket for hammering and piling. It will cause severe damage to the machine and its components.

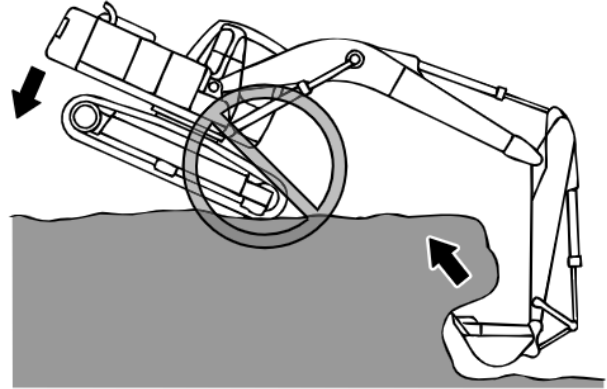


[1. SAFETY INSTRUCTIONS]

DO NOT USE MACHINE WEIGHT FOR DIGGING OPERATION

Do not use the machine weight to obtain power to dig. This could cause severe damage to the machine and its components.

Before digging concrete or hard rock, use a breaker/hammer to break it up before digging. This will prevent damage to the machine and allow for easier loading.



OPERATING ON A SLOPE

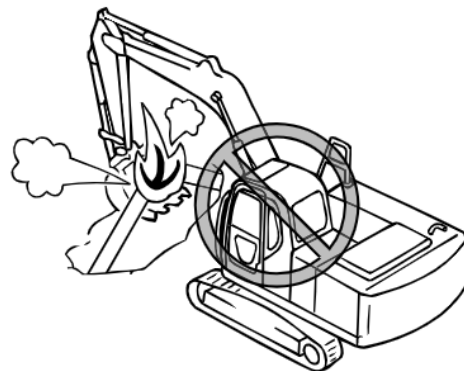
Use extreme caution when operating machine on a slope. The machine may become unstable and could tip or roll over.

- Place the crawlers parallel to the slope.
- Always swing the upper structure slowly when rotating it toward the downhill side with a load. The extra weight from the load may make the machine unstable.
- Be aware the weight of the upper structure could cause it to rotate when the machine stops on a slope.
- When the machine stops on the slope, lower the attachment to the ground on the downhill side of the machine and wedge the bucket into the ground if equipped.

CALL BEFORE YOU DIG

Confirm the local government or the public service company for locations of underground utilities of gas, water, phone, electrical power, and so forth before working in the area seemingly with these lines.

Always inspect the worksite for evidence of unmarked utilities and piping and contact others if necessary.

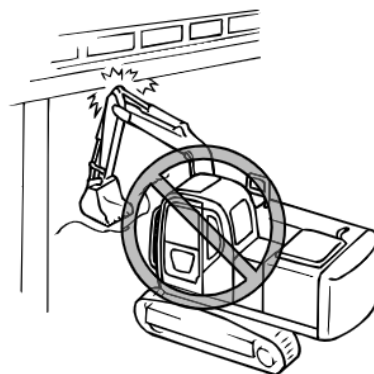


LIMITED MOVEMENT IN WORK AREA

Use extreme caution when working in areas that constrain or limit the movements of the machine, including tunnels, bridges, around electrical power lines, or inside structures, to prevent the machine or the attachment /equipment from contacting these obstacles during operation.

To prevent serious injury, death or property damage, always use a signal person to assist the operator with maneuvering in these areas and keep the machine and the attachment /equipment a safe distance from these obstacles.

The operator should always be alert and follow the signals from the signal person. The operator shall respond to signals only from the appointed signal person, but shall obey a stop signal from anyone at any time.

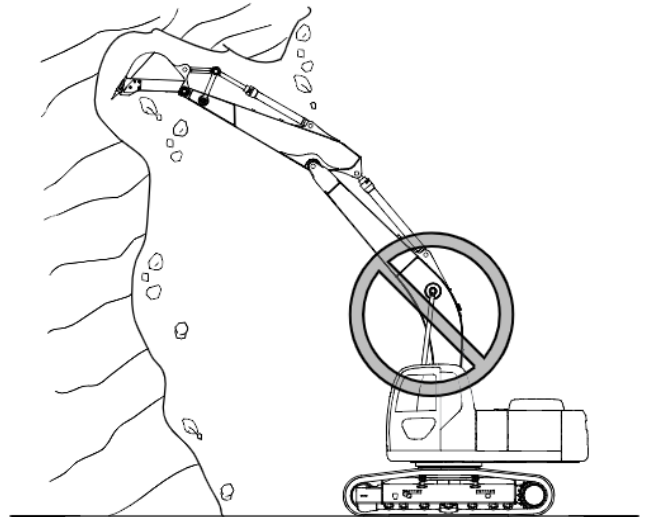


OPERATING UNDER CLIFF OR OVERHANG

Never undercut or dig beneath a cliff or overhang. It can cause rocks and debris to fall.

Be aware that the cab guard installed provide limited protection for the operator and may not prevent serious injury or death.

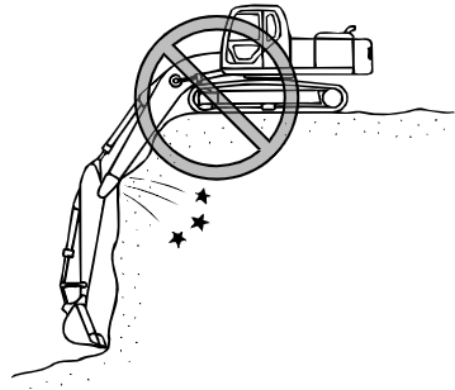
The cab top guard was designed conforming to ISO10262 and should not allow every possible loads to penetrate the cab.



DEEP EXCAVATION OPERATION

To prevent damage to the machine, during deep excavation or diagonal digging.

- Do not allow the arm or the hydraulic piping to contact the side of the trench or hole.
- Do not allow the arm to contact the crawler shoe when operating with the arm below horizontal.



DO NOT LIFT OR MOVE PERSONNEL

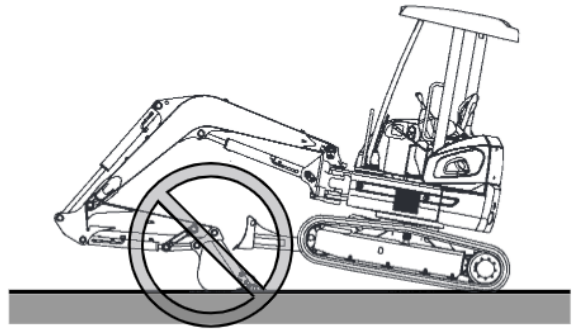
Never lift or move personnel by using the attachment. The lifted personnel may fall off, causing severe accidents.



[1. SAFETY INSTRUCTIONS]

DO NOT LIFT UP THE MACHINE WITH ARM CYLINDER STROKE END

Never lift up the machine with arm cylinder fully extended. It may cause damage to the equipment/attachment and cylinder.



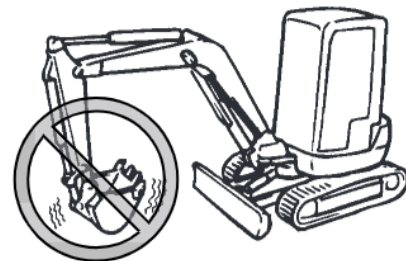
NO PERSONNEL ALLOWED UNDER THE BUCKET OR ATTACHMENT / EQUIPMENT

Never move a suspended load or the bucket over a person or above the driver's cab of a truck. The load could fall and cause serious injury or death.



REMOVING DIRT OF BUCKET

With the bucket in the retracted position, do not give impact on the bucket to remove soil. It may cause damage to the equipment/attachment and cylinders.



LIFTING WORK

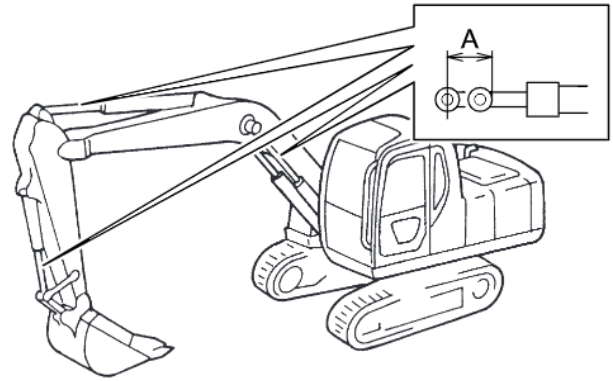
This machine is designed for the application of digging, loading, and leveling using the bucket, or for use with a crusher, breaker/hammer, shear or other attachment. When lifting a load by using this machine, observe the laws and others of the country or area in which this machine is to be used.

Even though lifting with this machine is allowed according to the laws of the country or area in which this machine is to be used, do not lift the load by using the teeth of the bucket, the breaker, the crusher, or others. It can cause the lifting tools to come off and result in falling off of the load, leading to serious accidents or death. Always use a certified lifting device.



DO NOT OPERATE THE CYLINDERS TO THE STROKE END

Operate the bucket, boom and arm cylinders to leave some clearances (A) to the both stroke ends. If the cylinder is operated to the stroke end, it will generate an excessive load and cause damage to not only the cylinder but also the pin, boom and arm.



DO NOT OPERATE IN ENCLOSED SPACES

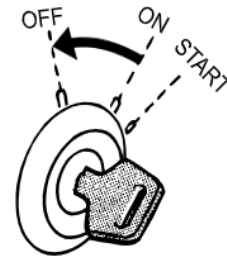
Do not operate the machine in enclosed spaces or, in any case, without appropriate ventilation.

PRECAUTIONS FOR POTENTIALLY EXPLOSIVE ENVIRONMENT

Do not operate the machine in a potentially explosive environment.

PRECAUTIONS FOR LEAVING THE OPERATOR'S SEAT

Do not leave the machine with the engine running.

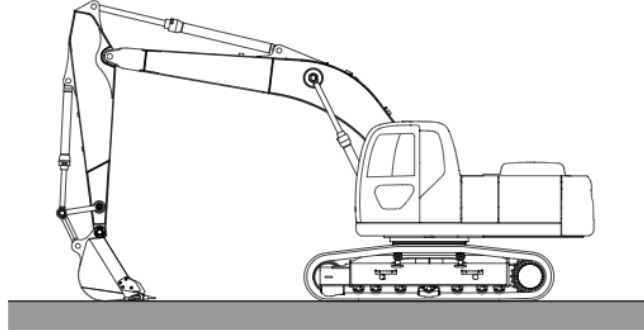


1.4.4 SAFETY CHECK ON THE PARKING MACHINE

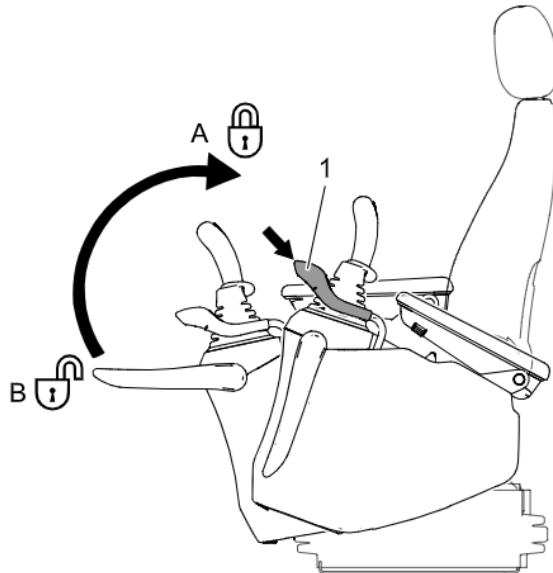
There are risks of creeping, unexpected movement at the time of coming start if the machine is not parked properly. Park the machine following the safety parking procedures shown below.

ALWAYS PARK MACHINE PROPERLY

1. Travel machine to a safe location on firm, level ground.
2. Lower the attachment to the ground.
If equipped with a dozer blade, lower it to the ground.
3. Set the auto acceleration switch to the "OFF" position.



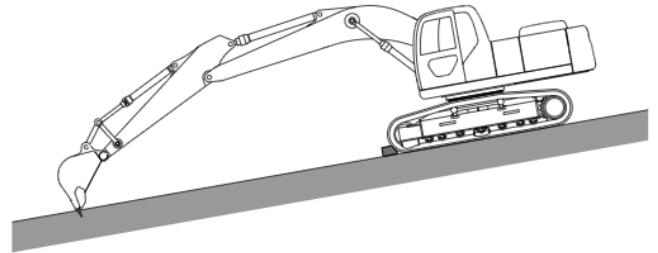
4. Pull the control lock lever(1) to the locked(up) position(A).
If not locked, accidental or unintended contact with the control levers, pedals and other control devices may result in unexpected and unintended machine movement.
5. Turn engine throttle to the low idle position.
6. Turn the starter switch to the "OFF" position and remove the key.
Close and lock the windows and the cab door.
Check the windows, doors and all other machine access covers are locked and secured.



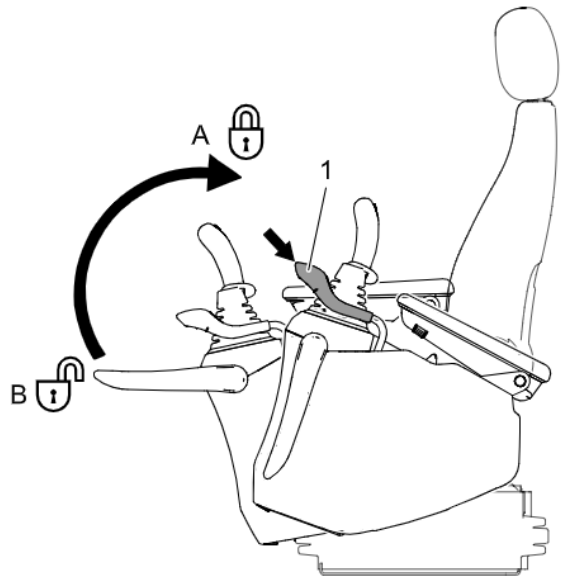
PARKING MACHINE ON SLOPE

If the machine must be parked on a slope, follow the procedure below.

1. The undercarriage and the upper structure and the attachment /equipment must face downhill.
2. Lower the attachment into the ground. If equipped with a bucket, wedge the bucket into the ground. If equipped with a dozer blade, lower it to the ground.
3. Set the auto acceleration switch to the "OFF" position.
4. Pull the control lock lever(1) to the locked(up) position(A).
If not locked, accidental or unintended contact with the control levers, pedals and other control devices may result in unexpected and unintended machine movement.
5. Turn engine throttle to the low idle position.
6. Turn the starter switch to the "OFF" position and remove the key.
Close and lock the windows and the cab door.
Check the windows, doors and all other machine access covers are locked and secure.
7. Block the tracks in the front and the rear.



1



1.5 AT THE END OF EACH SHIFT

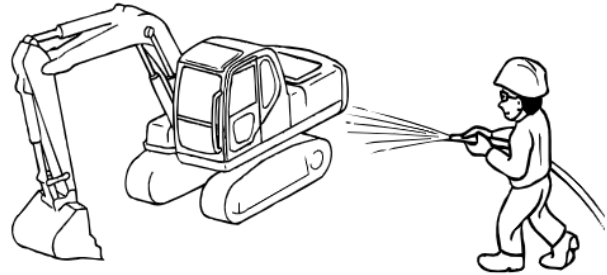


READ THE OPERATOR'S MANUAL

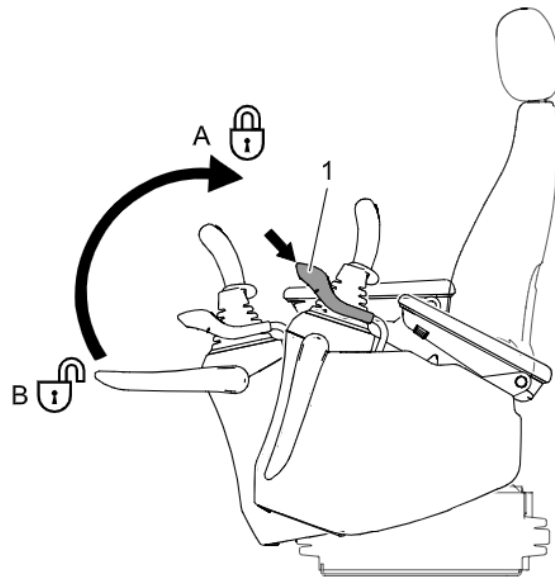
Read, understand and follow the safety messages and instructions in this manual. If these safety messages are not followed, serious injury or death could occur.

Always make sure the machine is secure and ready to be used for the next shift or moved to another job site.

1. Park the machine on a firm, level ground.
2. Lower attachment to the ground.



3. Pull the control lock lever(1) to the locked(up) position(A) and check all control levers and pedals have returned to neutral.
4. Close and secure all windows in place to prevent water or moisture from damaging any electrical components.
5. Remove the key from the key switch and lock all doors and access panels.
6. Refill the fuel tank to the full mark to reduce air volume and condensation (moisture). This will decrease the possibility of freezing in the fuel tank, rusting due to moisture and other potential issues.
7. Thoroughly clean and inspect the machine. If any issues are found, always lubricate, repair, or replace any machine parts and systems prior to restarting the machine. As needed, contact your KOBELCO authorized dealer.
8. If the machine is stored in cold climates, it may be necessary to remove the batteries from the machine and store them in a warm, well ventilated area. Re-install the batteries before the next start up. This helps prevent premature battery deterioration.



1.6 PRECAUTIONS OF INSPECTION & MAINTENANCE

**WARNING**

READ THE OPERATOR'S MANUAL

Read, understand and follow the safety messages and instructions in this manual. If these safety messages are not followed, serious injury or death could occur.

1.6.1 PERIODIC INSPECTIONS

- Every year, the machine should be inspected by a qualified inspector or a registered inspection agency. If needed, contact your KOBELCO authorized dealer for that inspection.
- Every month inspect the machine for the following.

See chapter 4. "INSPECTION AND MAINTENANCE" for additional information about the monthly inspection & maintenance requirements for your machine.

Always keep all maintenance and all inspection records, including both the monthly and the yearly inspections, according to local codes and regulations of your country.

[1. SAFETY INSTRUCTIONS]

1.6.2 BEFORE INSPECTION & MAINTENANCE

READ OPERATION/MAINTENANCE PROCEDURES CAREFULLY

Improper maintenance could cause serious injury (crush or burn) and damage the machine. Read and understand the maintenance procedures (preparation for safe work, proper tools, qualifications, important parts, supervisor designation and wear the appropriate personal protective equipment, etc.) described in the manuals before safely and carefully inspecting and performing maintenance on the machine.

CONFIRM JOB PROCEDURES

To prevent accidents, confirm all work procedures before starting.

USE A SIGNAL PERSON AND A FLAGMAN

Know and use the hand signals required for particular jobs and confirm who has the responsibility for signaling: All personnel must know and understand all the signals.

The operator shall respond to signals only from the appointed signal person, but shall obey a stop signal from anyone at any time.

The signal person must stand in a clearly visible location when giving the signals.

ORGANIZE AND CLEAN UP WORK SITE

Inspecting and maintaining the machine at a messy working site may cause personal injury.

Clear obstacles, grease, oil, paint, debris, etc., from the work site.

ATTACH A "DO NOT OPERATE" TAG

To prevent serious injury or death:

- Never allow unauthorized personnel to start the engine or touch the control levers during inspection and maintenance activities.
- Always lower the attachment, pull the control lock lever to the locked(up) position, stop the engine, and remove the key before performing maintenance.
- Use a temporary "DO NOT OPERATE" hang tag to communicate that the machine is out of service. You may need to use more than one temporary hang tag depending on the work to be performed.
- Always have an operator at the controls to shut down the machine if the machine needs to be running for maintenance activities or an inspections. The operator and the maintenance personnel must have a means of communication when performing these tasks.



If any issues are found, always contact your KOBELCO authorized dealer before repairing or replacing any machine parts and systems prior to restarting the machine.

USE PROPER TOOLS

To prevent serious injury or death, do not use of damaged tools or tools not intended for the task.

1.6.3 DURING INSPECTION & MAINTENANCE

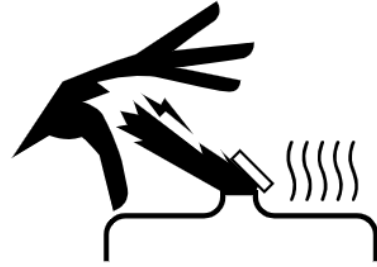
STOP ENGINE BEFORE PERFORMING INSPECTION AND MAINTENANCE

Always stop the engine and allow the engine and other components to cool before performing inspection or maintenance activities. Do not touch engine components when the engine is running or immediately after it has stopped to prevent serious injury or death. There are many hazards that can cause harm, including rotating parts, high voltage, high pressure fluids, and high temperature.

HOT FLUIDS

To prevent burn injuries.

- Do not remove the radiator cap immediately after stopping operation. Hot radiator fluid may cause burns. Wait until the radiator cap is cool to the touch, then slowly loosen to release the internal pressure. Then remove the cap.
- Do not remove the oil cap or plug immediately after stopping operation. Hot oil may cause burns. Wait until the oil cap or plug is cool to the touch, then slowly loosen it to release the internal pressure. Then remove the oil cap or plug.

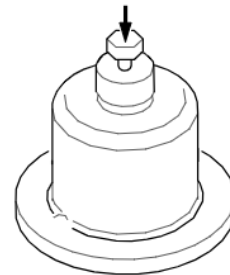


HIGH PRESSURE OIL

Do not attempt to repair or tighten hydraulic hoses or fittings when the engine is running or when the hydraulic circuit is pressurized.

Pressure can be maintained in the hydraulic circuit long after the engine has been shut down.

- Even though the hydraulic circuit has been left for a long time after engine stop, sometimes the pressure still remains inside the hydraulic circuit. Before refilling or draining the hydraulic oil, or inspecting or maintaining the machine, always release the pressure in the hydraulic lines by using the "Pressure Release" function as described in Chapter 2, or by pressing the air breather of the hydraulic oil tank and loosening the connecting parts of the related hoses and connectors.



OK



High pressure oil can penetrate the skin or eyes and cause injury, blindness or death. Fluid escaping from a small hole can be almost invisible.

- Always wear a face shield, protective glasses and gloves when inspecting for leaks.
- Always use a piece of cardboard or wood to inspect for suspected leaks.

If oil is injected into the skin, it must be removed within a few hours by a doctor familiar with this type of injury. High pressure oil from even a pin hole leak can penetrate the skin or eyes and cause severe injury or blindness.

[1. SAFETY INSTRUCTIONS]

HIGH PRESSURE FUEL IN THE FUEL LINES

During engine running, high pressure is generated inside the fuel lines of the engine.
After engine stop, wait 1 minute before starting inspection and maintenance.

HIGH PRESSURE OIL HOSE/PIPING

Leakage of oil or fuel from the hose or piping may cause a fire or malfunction of the machine. Stop working immediately whenever looseness of or leakage from the installation parts of the hoses or piping are found and tighten or repair them using proper repair procedures and tightening torque.

Consult with your KOBELCO authorized dealer if damage or deformation of the hoses or piping is found.
The hoses in below-mentioned conditions are required to be replaced.

- A damaged hose or hose with a deformed fitting.
- The sheathing material of the hose has scratches or cuttings, or exposes the wire reinforcement layer.
- A part of the sheathing material is swelled.
- A part of the hose shows a sign of twist or crush.

ELECTRIC SHOCK

Work on the machine's electrical equipment may only be carried out by skilled electrical personnel or trained personnel under the supervision of an electrician in accordance with electrical regulations for the country in which this machine is to be used.

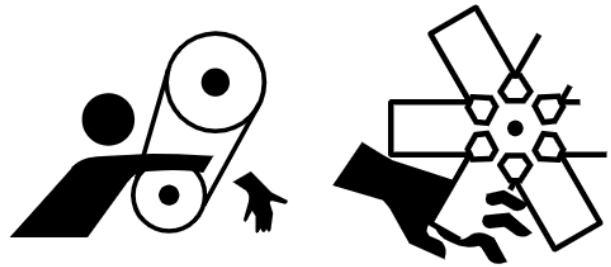
When working on energized equipment, always have another person positioned near the emergency-off or main switch and overvoltage release.

Contact your authorized KOBELCO dealer for assistance.

ROTATING PARTS

Stay clear of all rotating and moving parts.

- Wrapping or entanglement may result in serious injury or death. Keep hands, clothing and tools away from the rotating fan and running fan belts. Never operate machine without guarding in place.
- Do not drop or insert tools into the fan or fan belt area while machine is running. They may be ejected at high speed and cause serious personal injury or death.
- Always have an operator at the controls to shut down the machine if the machine needs to be running for maintenance activity or an inspection. The operator and the maintenance personnel must have a means of communication when performing these tasks.



VENTILATION PRECAUTIONS

Never operate the engine in an enclosed area without adequate ventilation. Engine exhaust contains carbon monoxide. Inspecting and maintaining the machine indoors or in a place with poor ventilation could cause serious injury or death.

Adequate ventilation is needed when inspecting, maintaining or running the machine indoors. Fully ventilate the work area, especially when handling fuel, cleaning solvent or paint.

If the natural ventilation is poor, install ventilators, fans, exhaust extension pipes or other artificial venting devices.



CONNECTING, DISCONNECTING AND STORING ATTACHMENT / EQUIPMENT

To prevent serious injury or death:

- Always follow the instructions from your supervisor and the instructions in this manual when connecting or disconnecting the attachment /equipment.
- Secure the attachment /equipment to prevent them from falling over when stored.



1

SECURELY BLOCK THE MACHINE OR ANY COMPONENT THAT MAY FALL

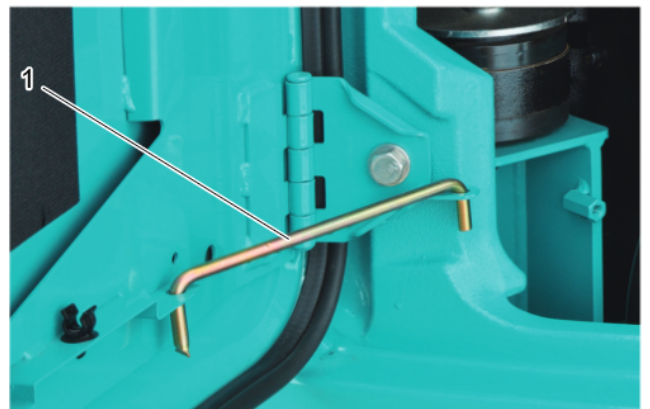
To prevent serious injury or death, always support all the attachment /equipment when performing maintenance or inspecting underneath the machine or any raised attachment /equipment.

- Before performing maintenance or repairs under the machine, park the machine on firm level ground, lower the attachment to the ground, pull the control lock lever to the locked(up) position, stop engine, and remove the key.
- Securely block the tracks.
- If you must work beneath the raised machine or equipment, always use wood blocks, jack-stands or other rigid and stable supports to support them. Never get under the machine, the attachment /equipment, if they are not sufficiently supported. This procedure is especially important when working on hydraulic cylinders.



LOCK THE ACCESS PANEL

To prevent serious injury, always secure the opened door panel with the lock lever(1) when maintaining the machine. If the door panel is not secure, it could move and you may be injured.



DO NOT DROP TOOLS OR PARTS

Falling tools or parts may cause damage to the machine or cause unintended movement of the machine and result in serious injury or death.

- Retrieve any tools that fall immediately.
- Always secure tools or parts that are near the machine and store tools properly after maintenance is complete.

[1. SAFETY INSTRUCTIONS]

USE CAUTION WHEN ADJUSTING THE CRAWLER TENSION

The crawler adjuster contains high pressure grease. If the tension is adjusted without following the prescribed procedure below, the grease fitting may fly off and discharge grease, resulting in serious injury. Always wear suitable protective gears.

- Always wear suitable protective gear.
- Do not put your face, arms, legs or body in front of the grease fitting. If grease contacts your skin, wash completely with soap and water to avoid skin irritation.
- Loosen the grease fitting one turn to gradually relieve pressure. If grease does not come out after one turn of the grease fitting, there is a problem. Call your KOBELCO authorized dealer for assistance.
- Loosen the grease fitting slowly.
After relieving the grease pressure, see "ADJUSTING CRAWLER TENSION" in Chapter 4 for additional information about how to adjust the crawler tension.



DO NOT DISASSEMBLE THE RECOIL SPRING

Never attempt to disassemble the recoil spring. The recoil spring assembly acts as a shock absorber for the front idler and contains a powerful spring under tension. If it is disassembled, the spring will eject from the assembly and may result in severe personal injury or death.

If there is an issue with the recoil spring assembly, contact your KOBELCO authorized dealer for repair.

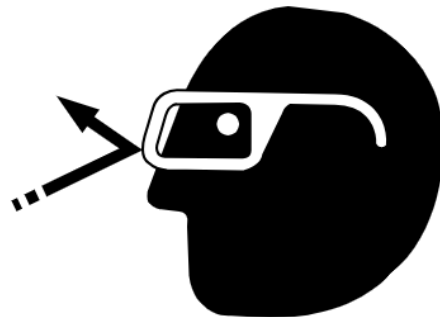
BEFORE HAMMERING METAL PINS, TEETH OR BEARINGS

Always wear required personal protective equipment such as safety glasses when using hammers, as metal fragments or other objects can fly and cause serious personal injury.

Broken metal pieces may cause severe personal injury when hammering metal pins, teeth or bearings.

To avoid injury:

- Wear protective gears such as safety glasses, gloves, hardhat, protective shoes, etc.
- Confirm the work area is clear of personnel before using hammer.
- Use a piece of wood or similar material to absorb the direct impact of the hammer when removing metal pins, teeth or bearings.



BE AWARE OF THE HAZARDS WITH THE REFRIGERANT AND THE AIR CONDITIONING SYSTEM

- Do not loosen the refrigerant circuit parts. If refrigerant gets in your eyes, it may cause loss of sight including potential blindness. Do not touch the refrigerant circuit parts. If refrigerant gets on your skin, it may cause frostbite.
- Do not inhale refrigerant gas.
- Keep refrigerant gas away from heat sources.

Dispose of refrigerant according to local codes and regulations of each country.

If you need additional assistance, contact your KOBELCO authorized dealer about proper disposal of refrigerant.

The temperature of the refrigerant gas compressed by the compressor becomes a high temperature. Until the temperature of the refrigerant gas goes down, do not touch the compressor, the hose, and the condenser by bare hand.

1.6.4 PRECAUTIONS WHEN HANDLING OIL, GREASE AND OTHER MATERIALS

HANDLING OIL AND GREASE

- Draining hot oil or other fluids may cause burns. Allow time for machine to cool down before draining oil or other materials.
- Always wear safety glasses or face shield, long sleeves and gloves to prevent exposure to oil and other materials. Exposure may result in serious injury including, burns and inflammation.
- Do not drink oil or other materials. You may experience diarrhea, vomiting, serious injury or death.
- Always label containers used to collect oil and other materials and dispose of in accordance with national regulations.
- Keep oil and other materials out of the reach of children.
- If any oil, grease or other material comes in contact with your eyes, wash thoroughly with water and seek immediate medical attention.

PRECAUTIONS WHEN PAINTING

- Paint vapors are flammable and may explode. Keep all ignition sources away from paint and other flammable materials.
- Always ventilate the work area when painting. During painting and drying, the exhaust system should reduce potential exposures. If the ventilation is not adequate, install ventilators, fans, exhaust extension pipes or other ventilation devices as needed.
- When using paints, take care not to let paint touch your skin. Always wear appropriate personal protective equipment including a respirator fitted with appropriate cartridges or a supplied air respirator, safety glasses, protective gloves, hood, long sleeves, pants, closed toed shoes.
- If paint get into your eyes, wash your eyes with much water and see a doctor as soon as possible.
- If you feel bad by inhaling vapor or gas, exit to a clean-air place and see the doctor as required.
- In case of fire, use CO₂ gas or foam fire extinguisher.
- If paint is on your skin, wash with soap and water to remove. If you experience pain or irritation, seek medical attention.
- If paint spills, spread sawdust or absorbents around the perimeter to keep spill from spreading. Then use rags to blot paint. Rags and other waste soaked with paint may spontaneously catch fire if improperly discarded. Immediately place rags and other waste soaked with paint in a sealed, water-filled, metal container.
- After painting, wash your face, hands, and rinse your mouth before eating.
- Keep paint containers sealed and in a secure location out of the reach of children.
- Dispose of paint and solvents as industrial wastes in accordance with applicable regulations.

1.6.5 CAUTION WHEN WELDING

NEVER USE HEAT NEAR HYDRAULIC EQUIPMENT, PIPING OR HOSES

When welding, soldering or using a torch, do not expose piping and hoses containing pressurized oil to heat. Heat may create the potential for exposure to flammable gas and result in a fire.

Always cover hydraulic equipment, piping, hoses and other flammable items with fire-proof blankets.

Keep a suitable fire extinguisher readily available.

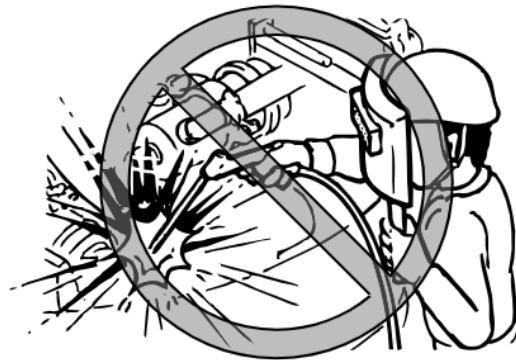


DO NOT HEAT PIPING WITH FLAMMABLE OIL

- Do not weld or perform gas cutting on pipes and tubes filled with flammable oil.
- Remove flammable oil from pipes and tubes using nonflammable solvent before welding and gas cutting.

DO NOT MODIFY MACHINE WITHOUT APPROVAL FROM KOBELCO

- Any and all modifications to this machine must be approved by KOBELCO.
- Unauthorized modification of the machine is not covered by the warranty provided with this machine.



GENERAL GUIDELINES FOR WELDING

Contact manufacturer, or authorized KOBELCO dealer before welding on machine. Welding could damage wires, electronic processors, hoses, and tubes. Any welding on structural parts (as undercarriage, upper frame, equipment parts,...) should only be done by the manufacturer, or authorized KOBELCO dealer. Welding performed by others will void the warranty for your machine.

Do not weld tanks or lines that contain flammable fluids or flammable material. Empty and purge the lines and tanks. Then clean the lines and tanks with a nonflammable solvent prior to welding or flame cutting.

To prevent serious injury or possible fire, welding work must be performed by a certified welder at a facility with welding devices suitable for the task.

BASIC PRECAUTIONS FOR WELDING AND GRINDING

- Always wear protective gears appropriate for welding.
- Perform work in a well-ventilated area.
- Before welding, select a location away from flammable items and have a fire extinguisher nearby. Ensure adequate ventilation.
- Turn the engine off and remove the key.
- Disconnect the negative (-) cable from its battery terminal. When the battery power-off switch is provided, set it to "OFF".
- Remove or adequately shield all components, hoses, tubes, and wires in the area.
- Ensure that the components are properly grounded in order to avoid unwanted arcs. Attach the welder ground cable directly to the area within 1 m (3 ft.) from the part to be welded and on the same parent material. If the welder ground cable is attached to the area near electric parts/connectors, these electric parts/connectors may be damaged.
- Make sure neither the bearing nor the bearing seal is between the welder ground cable and the part to be welded.
- Do not attach the welder ground cable near the pin or cylinder. It will damage the plating on the pin or cylinder.
- Remove paint from any surface to be welded to avoid generating poisonous gas.
- After grinding or welding, confirm there is no smoke or fire near the work area.

1.6.6 AFTER COMPLETION OF MAINTENANCE

AFTER MAINTENANCE

Before returning machine to service, always confirm there are no leaks and the controls are functioning properly.

- Run the engine at low idle speed and check for oil or water leaks.
- Slowly operate each control lever and check that it is functioning properly.
- Then gradually increase the engine speed and check for oil or water leaks again.
- Manipulate each control lever again and check that it is functioning properly.
- Close the doors, guards, engine hood, etc.

PROPER WASTE DISPOSAL

- Drain used fluids from the machine into leak proof containers. Clearly mark the type of fluid on the containers.
- Never pour used oil or other fluids onto the ground, down a drain or into any body of water. Improper disposal can harm the environment. Contact your local government or public service company to ask about proper disposal methods.
- Properly dispose of oil, fuel, engine coolant, urea water, refrigerant, solvents, filters, batteries and other harmful substances according to local, state and federal environmental regulations for the country in which the machine is located.



1.7 PRECAUTIONS FOR BATTERY



READ THE OPERATOR'S MANUAL

Read, understand and follow the safety messages and instructions in this manual. If these safety messages are not followed, serious injury or death could occur.

1.7.1 HANDLING THE BATTERY

PREVENTION OF ELECTROLYTE BURNS

Wear safety glasses or face shield, and chemical resistant gloves and clothing when handling or servicing batteries.

Battery electrolyte contains dilute sulfuric acid. Electrolyte will damage eyes or skin on contact. If battery electrolyte contacts skin or eyes, flush affected areas immediately with a large amount of fresh water, then seek medical attention.

Wash hands after touching batteries and connectors.



BATTERY EXPLOSION PREVENTION

- Always keep cigarettes, flames and other ignition sources away from batteries.
Batteries give off hydrogen gases that can explode and cause serious injury or death.
- Always keep all battery caps tightly secured.



CHARGING THE BATTERY

See "USING JUMPER CABLES" in Chapter 3.

REPLACING THE BATTERY

See "CHECKING BATTERY VOLTAGE" in Chapter 4.

BATTERY DISPOSAL

Dispose of batteries according to local codes and regulations of each country.

If you need additional assistance, contact your KOBELCO authorized dealer about proper disposal of used batteries.

1.8 HANDLING OF THE ACCUMULATOR OR GAS SPRING

**WARNING**

READ THE OPERATOR'S MANUAL

Read, understand and follow the safety messages and instructions in this manual. If these safety messages are not followed, serious injury or death could occur.

High pressured nitrogen gas is sealed inside the accumulator or gas spring.

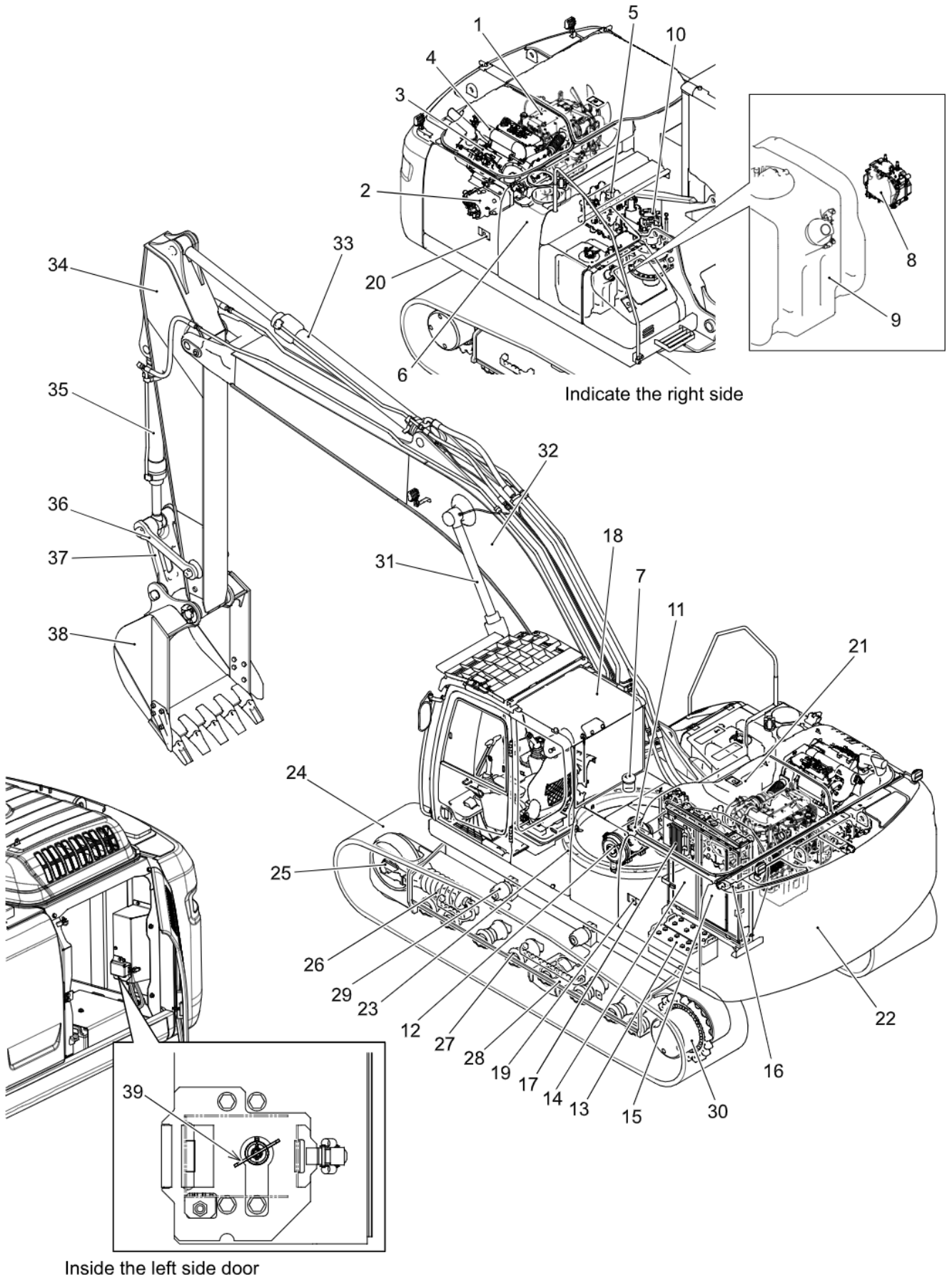
To prevent serious injury or death:

- Never attempt to disassemble accumulator or gas spring.
- Never drill or weld, or perform gas cutting on accumulator or gas spring.
- Keep fire and other ignition sources away from the accumulator or gas spring.
- Never throw accumulator or gas spring into fire.
- Ask your KOBELCO authorized dealer to vent the gas from the accumulator or to remove the gas spring before disposal.



2. MACHINE FAMILIARIZATION

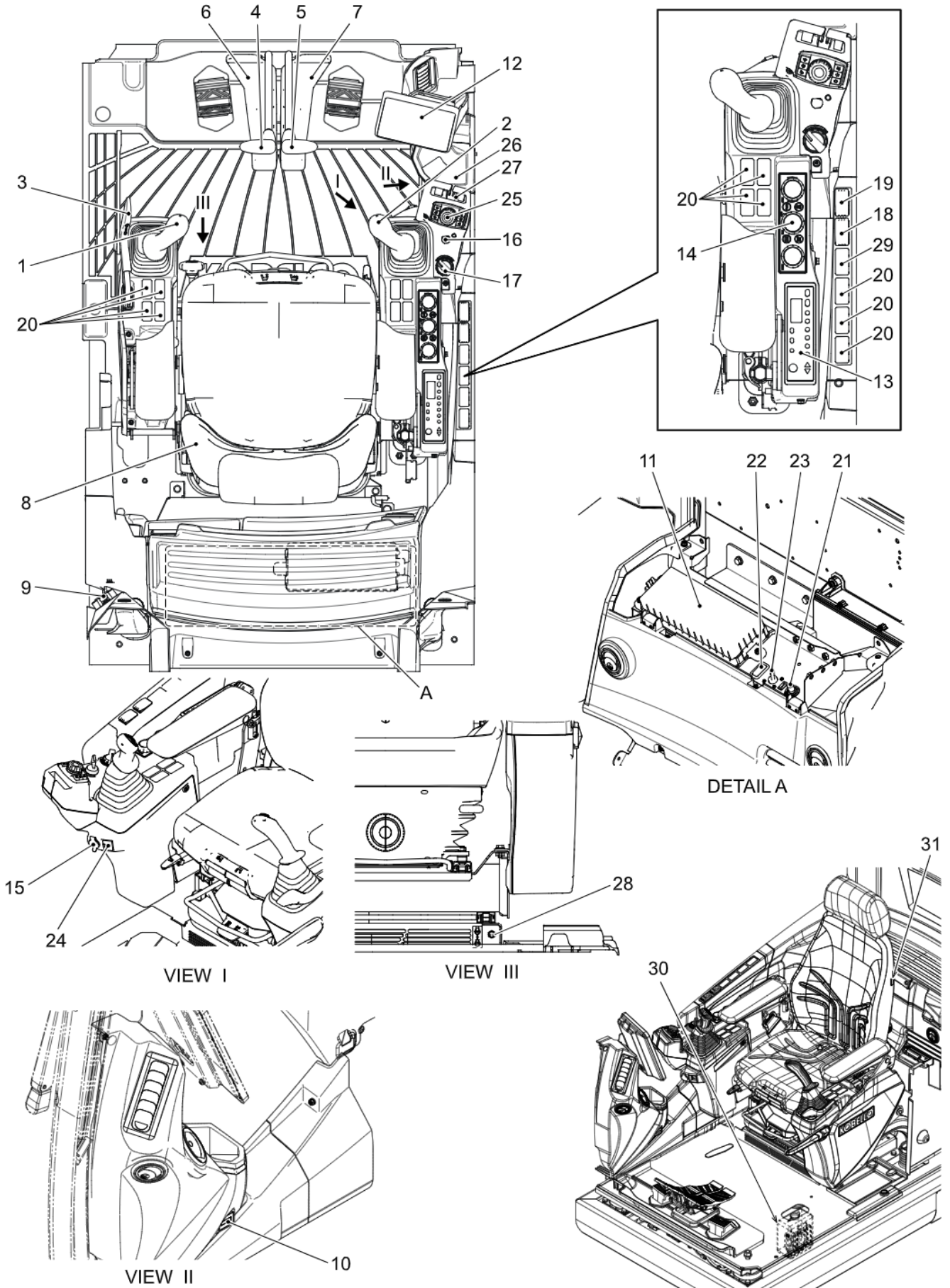
2.1 BASIC COMPONENTS OF THE MACHINE



[2. MACHINE FAMILIARIZATION]

Item	Name	Item	Name	Item	Name
1	Engine	14	Oil cooler	27	Lower Roller
2	Hydraulic pump	15	Radiator	28	Track guide
3	Diesel particulate filter (DPF)	16	Intercooler	29	Upper roller
4	SCR	17	Fuel cooler	30	Travel motor
5	Control valve	18	Cab	31	Boom cylinder
6	Hydraulic oil tank	19	Left side door	32	Boom
7	Fuel tank	20	Right side door	33	Arm cylinder
8	DEF/AdBlue pump	21	Engine hood	34	Arm
9	DEF/AdBlue tank	22	Counterweight	35	Bucket cylinder
10	Swing motor	23	Swing bearing	36	Idler link
11	Swivel joint	24	Crawler	37	Bucket link
12	Air cleaner	25	Front idler	38	Bucket
13	Battery	26	Crawler adjuster	39	Battery power-off switch

2.2 OPERATOR'S STATION NOMENCLATURE



2

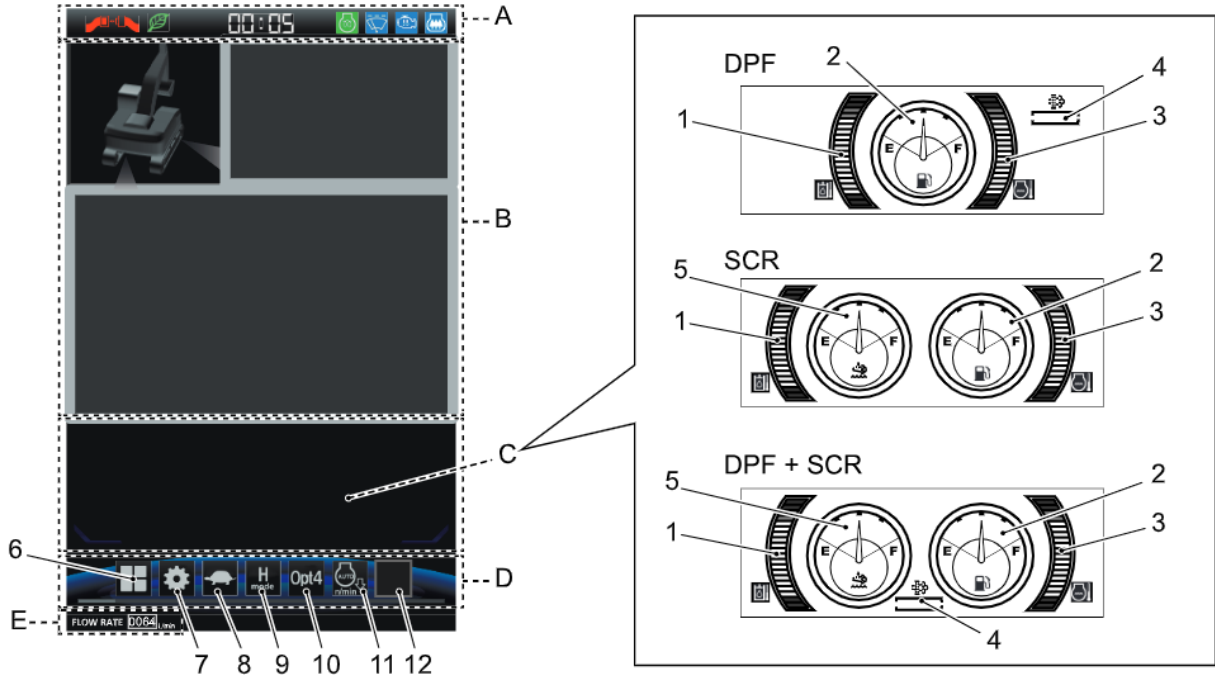
[2. MACHINE FAMILIARIZATION]

Item	Name	Item	Name
1	Left control lever (with horn switch)	17	Engine throttle
2	Right control lever	18	Working light (boom and deck)
3	Control lock lever	19	Manual regeneration switch
4	Left travel lever	20	Cap (Optionally installed switch)
5	Right travel lever	21	Emergency accel
6	Left travel pedal	22	Swing parking brake release switch
7	Right travel pedal	23	KPSS release switch
8	Operator's seat	24	USB port/external input terminal (AUX)
9	Life hammer	25	Switch box
10	Hour meter	26	Cup holder
11	Fuse and relay box	27	Holder for Smart phone
12	Monitor	28	Engine stop switch
13	Radio	29	Working light switch (cab)
14	Air conditioner operation panel	30	Washer fluid tank
15	12V power supply	31	Heated seat switch
16	Starter switch		

2.3 MONITOR

2.3.1 NORMAL SCREEN

According to the types of the exhaust gas cleaning devices, the display of portion C is changed. This manual explains operations based on the screens of the DPF and the SCR.



2

Symbol	Display		
A	Notification icons/clock		
B	The images captured by the rearview camera and the side cameras are displayed.		
C	Meter	1	Hydraulic oil temperature meter
		2	Fuel level meter
		3	Engine coolant temperature meter
		4	Soot deposition meter
		5	DEF/AdBlue level gauge
D	Switch	6	Setting menu
		7	Switch setting
		8	Travel speed selection
		9	Work mode selection
		10	Attachment mode selection
		11	Auto acceleration ON/OFF selection
		12	Range of option display
E	Set flow rate of front attachment The flow rate at a light load work becomes a set value and is displayed.		

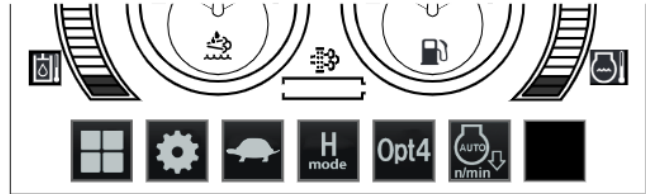
2.3.2 SWITCH DISPLAY

The number of switch indications changes according to the position of the control lock lever.

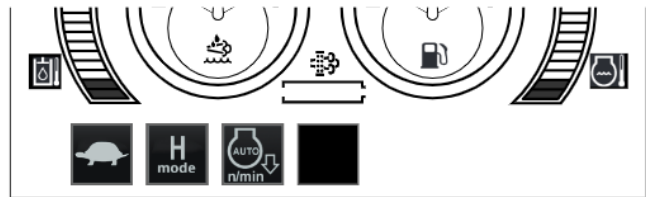
Notice

When the control lock lever is raised upward to the locked(up) position, setting for changing the screen becomes possible.

When the lever is raised upward to the locked(up) position



When the lever is push down to the "UNLOCKED" position
Some functions and settings are not accessible.



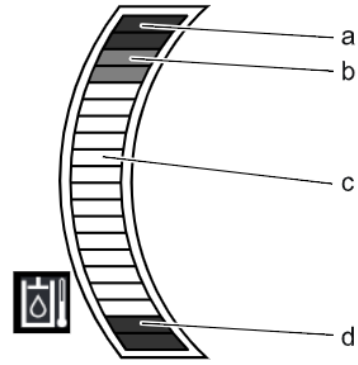
2.3.3 NOTIFICATION ICON

Display	Summary
	Seat belt display Displayed 5 seconds after the starter switch is turned "ON".
	Displayed at the operation of low fuel consumption.
	Displayed when the auto idle stop function is turned on.
	Displayed when the glow plug is being actuated.
	Displayed when the Auto Warm Up function is turned on.
	Displayed when the wiper is being actuated.

2.3.4 HYDRAULIC OIL TEMPERATURE METER

The meter shows the hydraulic oil temperature. After the starter switch is turned to the "ON" position, bars are displayed on the monitor.

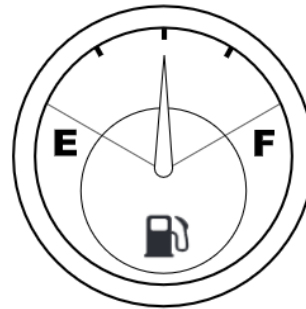
As the hydraulic oil temperature rises, the bars increase. If the bars indicating a high temperature appear during operation, set the engine throttle to the low idle position, pull up the control lock lever to the locked(up) position, and do not perform any lever operations until the bars indicating a high temperature disappear and the bars are decreased to the normal temperature range(c).



Symbol	Color of bars	Temperature
a	Red	High temperature Warning sounds.
b	Orange	High temperature
c	White	Normal
d	Blue	Low temperature

2.3.5 FUEL LEVEL METER

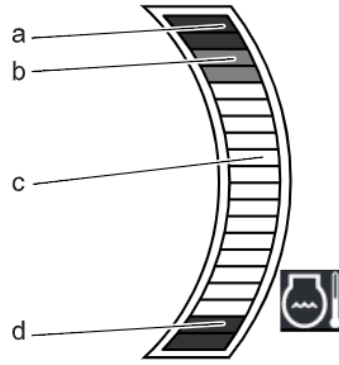
The meter shows the amount of fuel in the fuel tank. After the starter switch is turned to the "ON" position, the fuel level meter is displayed on the monitor. The remaining amount of fuel is indicated with the pointer, and when the fuel level is low, the pointer indicates point E. When the fuel level is low, see "CHECKING FUEL LEVEL AND REFUELING" in Chapter 3 in the operation manual, and supply fuel.



2.3.6 ENGINE COOLANT TEMPERATURE METER

The meter indicates the temperature of the engine coolant. After the starter switch is turned to the "ON" position, bars are displayed on the monitor. As the engine coolant temperature rises, the bars increase.

If the bars indicating a high temperature appear during operation, set the engine throttle to the low idle position, pull up the control lock lever to the locked(up) position, and do not perform any lever operations until the bars indicating a high temperature disappear and the bars are decreased to the normal temperature range(c).

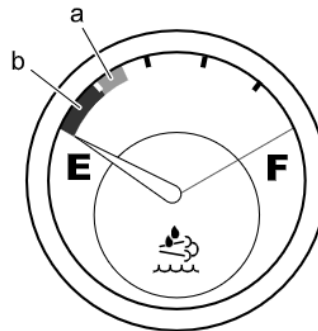


Symbol	Color of bars	Temperature
a	Red	Overheat Warning sounds. The engine speed becomes limited.
b	Orange	High temperature
c	White	Normal
d	Blue	Low temperature

2.3.7 DEF/ADBLUE LEVEL GAUGE

The level gauge indicates the DEF/AdBlue level in the DEF/AdBlue tank. After turning the starter switch "ON", the level gauge of DEF/AdBlue is displayed on the monitor.

The amount of DEF/AdBlue is indicated with a pointer, and when the DEF/AdBlue level is low, the pointer points E. The amount of DEF/AdBlue is proper if the pointer points the place higher than yellow (a). When the pointer points the range of yellow (a) or red (b), the warning is displayed on the monitor and the warning sounds. At that time, see "CHECKING DEF/ADBLUE LEVEL AND REFILLING" in Chapter 3 of the operation & maintenance manual and refill DEF/AdBlue.

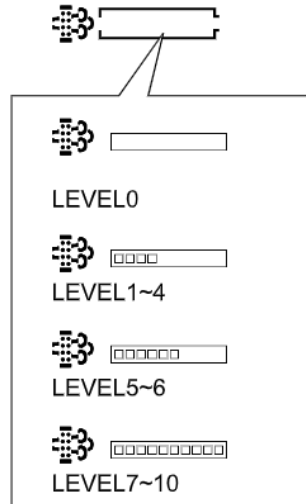


2.3.8 SOOT DEPOSITION METER

The meter shows the soot amount accumulated in the DPF filter. After turning the starter switch "ON", the soot deposition meter is displayed on the monitor.

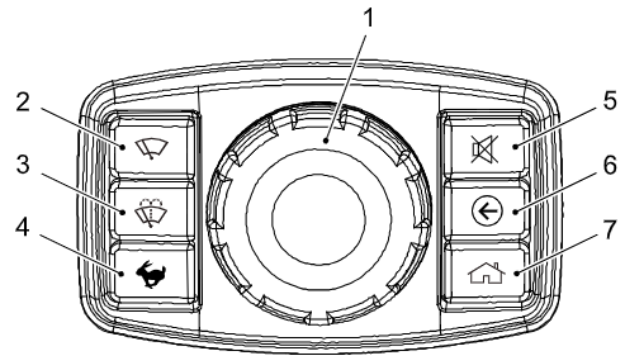
It shows the level in 10 levels. As the amount of soot increases, the level goes up.

The soot amount shown in this deposition meter is an approximate amount. When soot accumulates, the warning is displayed on the monitor and the warning sounds. Then, see "ABOUT MANUAL REGENERATION" in Chapter 4 in the operation manual, and perform manual regeneration.



Level	Color	Warning	Remedy
0	No display	None	The machine automatically enters the soot combustion mode. (automatic regeneration)
1 to 4	Green	None	
5 to 6	Yellow	Warning sound/display	Perform the manual regeneration.
7	Red	Warning sound/display	
8 to 9		Warning sound/display The engine speed becomes limited.	Perform the manual regeneration. If manual regeneration does not finish, contact your KOBELCO authorized dealer.
10		Warning sound/display The engine speed and the engine output become limited. Manual generation becomes impossible in this state even if the switch is pressed.	Stop the operation and contact your KOBELCO authorized dealer.

2.3.9 SWITCH BOX



Item	Name	Function
1	Jog dial	Controls the cursor on the monitor and switches the screen.
2	Wiper switch	Activates the wiper.
3	Washer switch	Sprays the washer fluid to the front window.
4	Travel speed select switch	Switches the travel speed.
5	Buzzer stop switch	Stops buzzer sounding.
6	Return switch	Returns the monitor screen to the previous screen.
7	Home switch	Returns the monitor screen to the normal screen.

Example of operating monitor

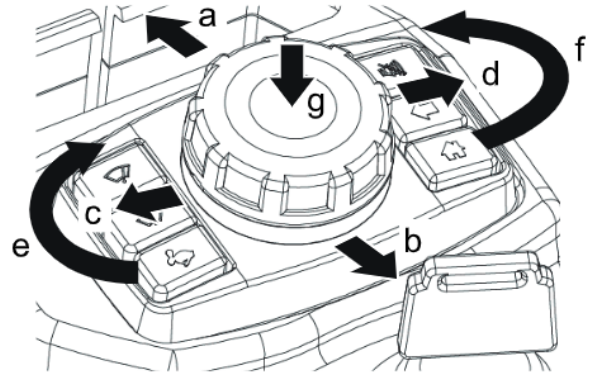
Jog dial operation

Tilting (a,b,c,d) and rotating (e,f) the jog dial

To move the cursor on the monitor and adjust the values and others.

Pushing down (g) the jog dial

- To switch the screen to the selected setting screen.
- To determine the adjusted value and others.



How to move the cursor

<p>(c) Tilt the jog dial left (d) Tilt the jog dial right (e) Turn the jog dial clockwise (f) Turn the jog dial counterclockwise</p>	<p>(a) Tilt the jog dial forward (b) Tilt the jog dial rearward</p> <p>(e) Turn the jog dial clockwise (f) Turn the jog dial counterclockwise</p>
---	---

2

How to set the adjustable value in each item

<p>Increasing the value</p> <p>(a) Tilt the jog dial forward (e) Turn the jog dial clockwise</p>	<p>Decreasing the value</p> <p>(b) Tilt the jog dial rearward (f) Turn the jog dial counterclockwise</p>
--	--

2.3.10 SETTING MENU SCREEN

Notice

When the control lock lever is raised upward to the locked(up) position, setting for changing the screen becomes possible.

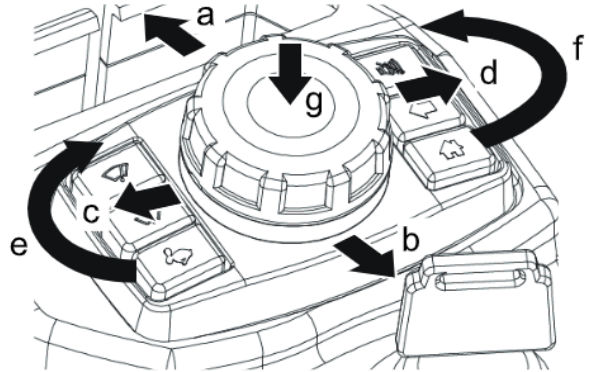
Jog dial operation

Tilting (a,b,c,d) and rotating (e,f) the jog dial

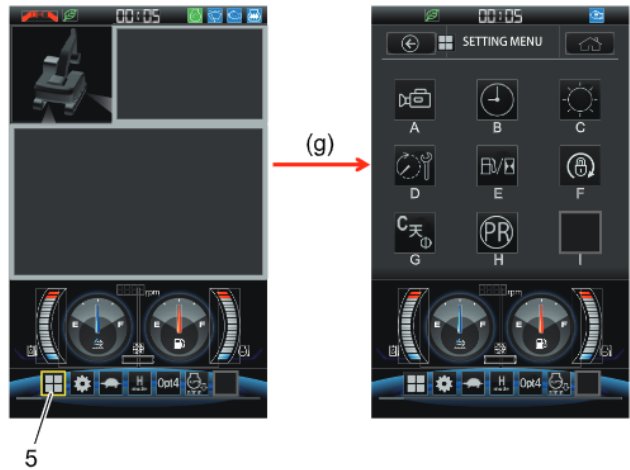
To move the cursor on the monitor and adjust the values and others.









Pushing down (g) the jog dial

- To switch the screen to the selected setting screen.
- To determine the adjusted value and others.



1. Tilt and turn the jog dial to move the cursor to setting menu (5) on the monitor.
2. Push down (g) the jog dial to switch the monitor to the [SETTING MENU] screen



A	B	C
		
PICTURE OF CAMERA	CLOCK SETTING	SCREEN BRIGHTNESS
D	E	F
		
MAINTENANCE	CONSUMPTION	START PASSWORD
G	H	I
		An icon for option will be located.
LANGUAGE SELECTION	PRESSURE RELEASE	

PICTURE OF CAMERA



This menu allows you to select the picture layout of the camera displayed on the normal screen.

Layout of camera images

Layout 1	Layout 2	Layout 3
<p>(A) Image captured by rearview camera (B) Image captured by right side camera</p>	<p>(A) Image captured by rearview camera (B) Image captured by right side camera</p>	<p>Synthetic image made from images captured by right side camera and rearview camera</p>
Layout 4		
<p>Synthetic image made from images captured by left and right side cameras and rearview camera</p>		

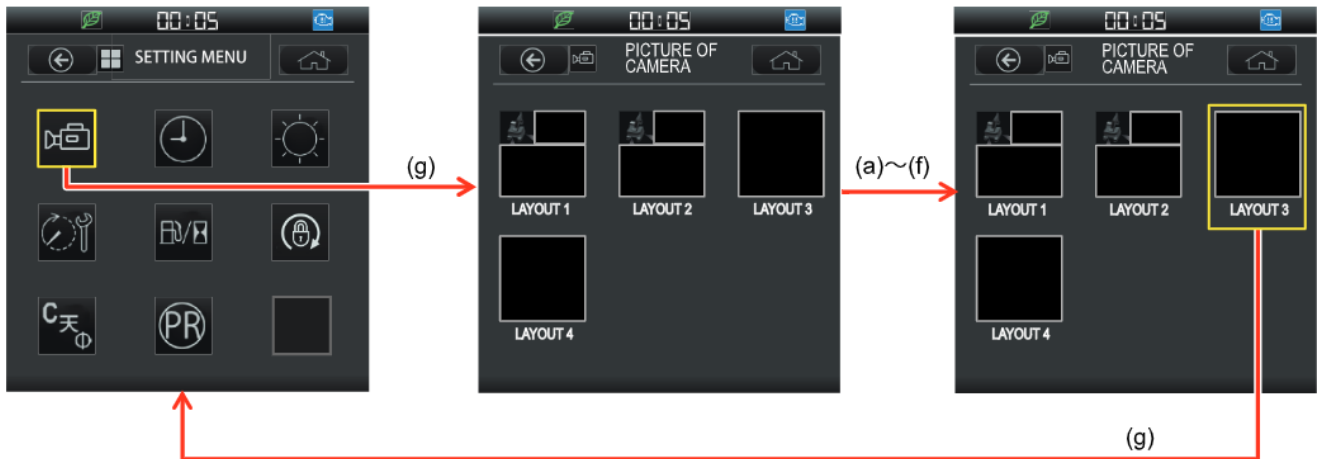
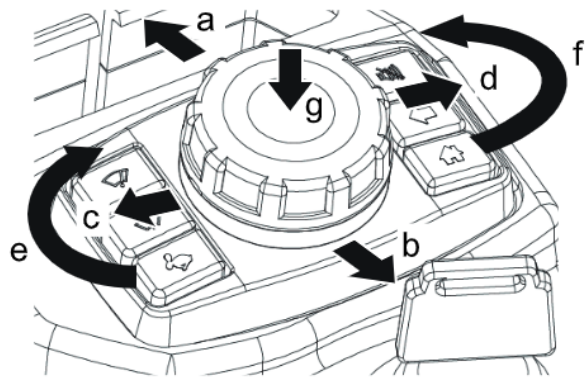
Jog dial operation

Tilting (a,b,c,d) and rotating (e,f) the jog dial

To move the cursor on the monitor and adjust the values and others.

Pushing down (g) the jog dial

- To switch the screen to the selected setting screen.
- To determine the adjusted value and others.



1. Switch the monitor to the [SETTING MENU] screen.
2. Tilt and turn the jog dial to move the cursor to [PICTURE OF CAMERA] on the [SETTING MENU] screen.
3. Push down (g) the jog dial to switch the monitor to the [PICTURE OF CAMERA] screen.
4. Tilt and turn the jog dial to move the cursor to a desired layout.
5. Push down (g) the jog dial to set the selected layout and return the monitor to the [SETTING MENU] screen.

CLOCK SETTING



This menu allows you to set the clock.

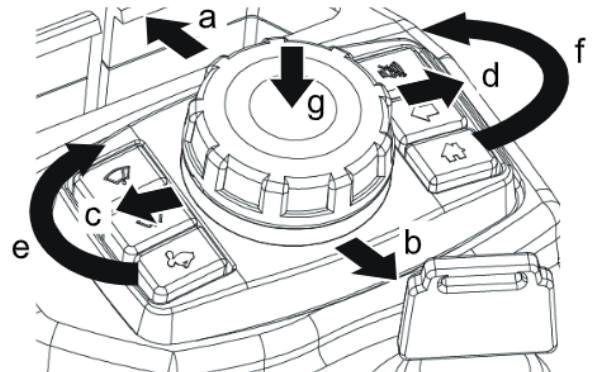
Jog dial operation

Tilting (a,b,c,d) and rotating (e,f) the jog dial

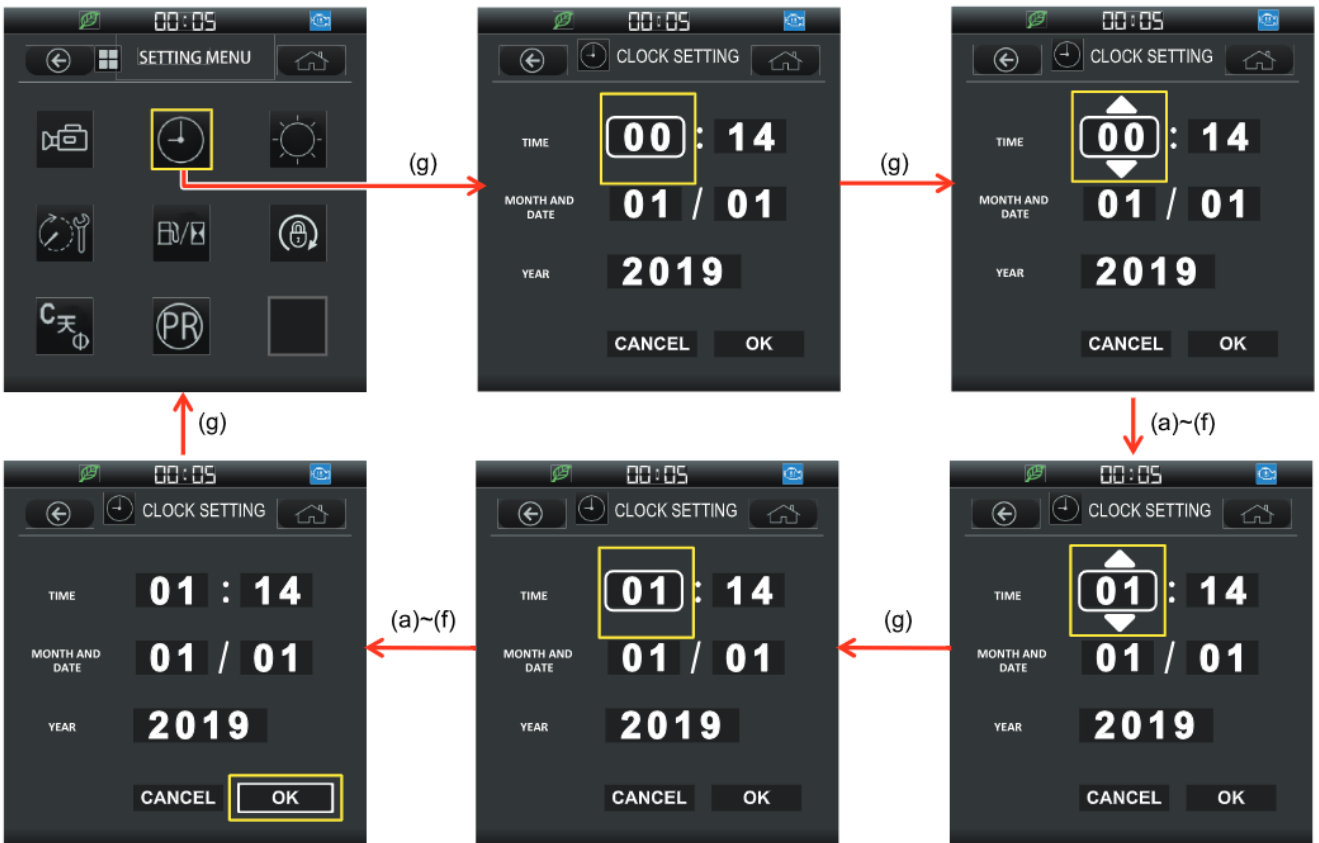
To move the cursor on the monitor and adjust the values and others.

Pushing down (g) the jog dial

- To switch the screen to the selected setting screen.
- To determine the adjusted value and others.



2



1. Switch the monitor to the [SETTING MENU] screen.
2. Tilt and turn the jog dial to move the cursor to [CLOCK SETTING] on the [SETTING MENU] screen.
3. Push down (g) the jog dial to switch the monitor to the [CLOCK SETTING] screen.
4. Tilt and turn the jog dial to move the cursor to a desired item to set.
5. Push down (g) the jog dial to enable the selected item to be adjustable.
6. Tilt and turn the jog dial to a desired value.
7. Push down (g) the jog dial to set the desired value.
8. Tilt and turn the jog dial to move the cursor to [OK].
9. Push down (g) the jog dial to return the monitor to the [SETTING MENU] screen.

SCREEN BRIGHTNESS



This menu allows you to adjust the screen brightness.

Setting of day brightness

Adjust the screen brightness when the working light is "OFF".

Setting of night brightness

Adjust the screen brightness when the working light is "ON".

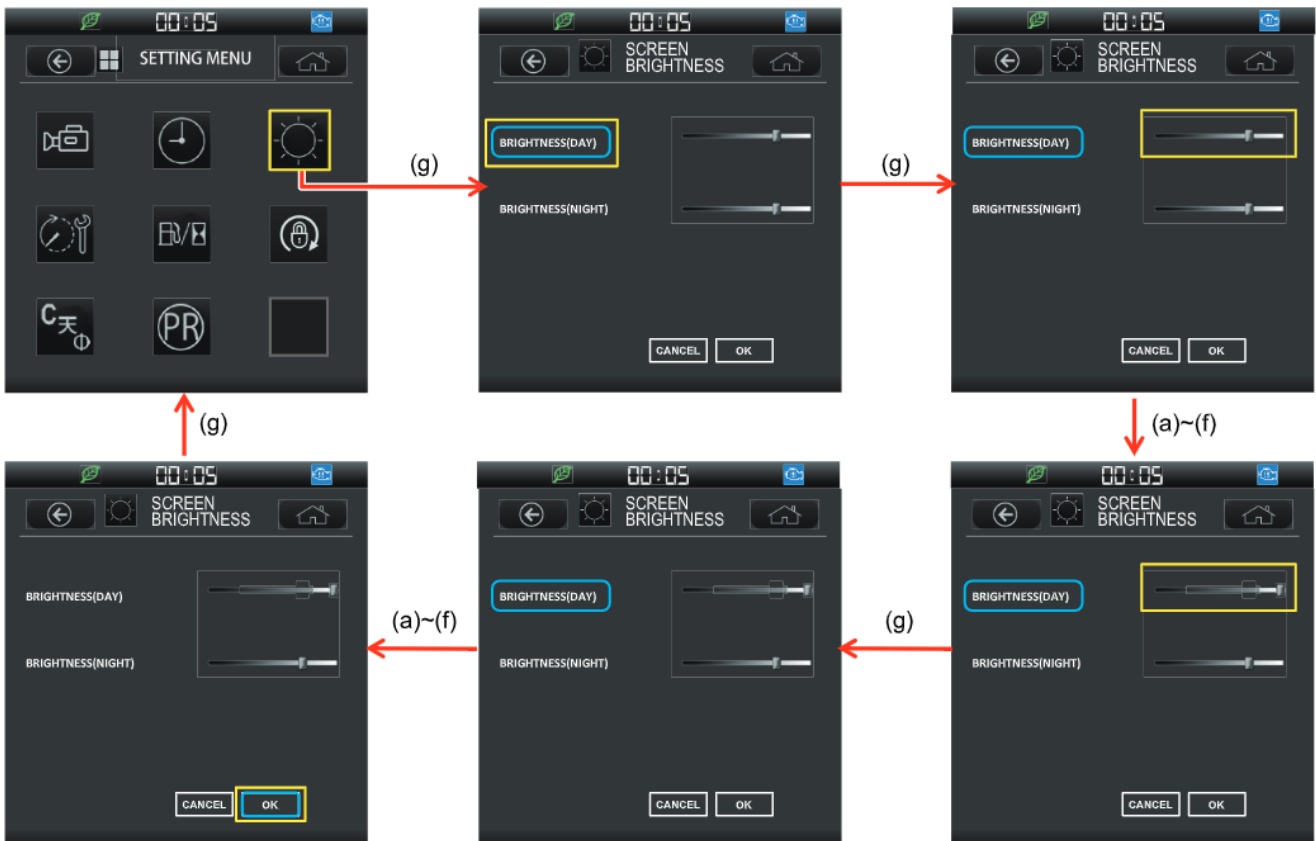
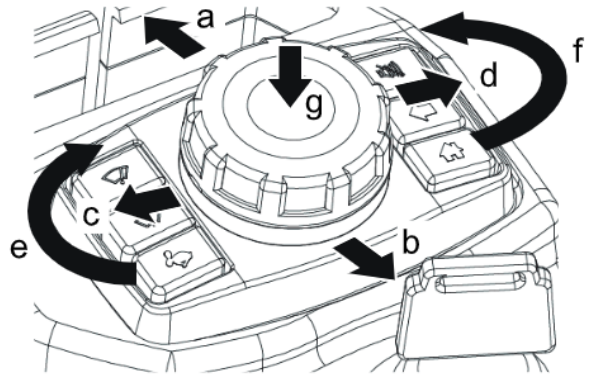
Jog dial operation

Tilting (a,b,c,d) and rotating (e,f) the jog dial

To move the cursor on the monitor and adjust the values and others.

Pushing down (g) the jog dial

- To switch the screen to the selected setting screen.
- To determine the adjusted value and others.



1. Switch the monitor to the [SETTING MENU] screen.
2. Tilt and turn the jog dial to move the cursor to [SCREEN BRIGHTNESS] on the [SETTING MENU] screen.
3. Push down (g) the jog dial to switch the monitor to the [SCREEN BRIGHTNESS] screen.
4. Tilt and turn the jog dial and move the cursor to a desired item to set.

5. Push down (g) the jog dial to enable the selected item to be adjustable.
6. Tilt and turn the jog dial to move the slider left or right to desired screen brightness.
7. Push down (g) the jog dial to set the desired screen brightness.
8. Tilt and turn the jog dial to move the cursor to [OK].
9. Push down (g) the jog dial to return the monitor to the [SETTING MENU] screen.

MAINTENANCE



This menu allows you to display the remaining time to the end of the set replacement interval of the filter/oil. Also, you can set the next replacement interval.

After the replacement interval is reached, inspect and maintain the part following to "INSPECTION AND MAINTENANCE" in Chapter 4 in the operation manual.

In case of after replacement interval

- The warning is displayed on the monitor.
- The color of the remaining time display in the [MAINTENANCE] changes to red.

Notice

After the replacement interval is reached, the buzzer sounds, if the machine setting has been changed. If needed, contact your KOBELCO authorized dealer.

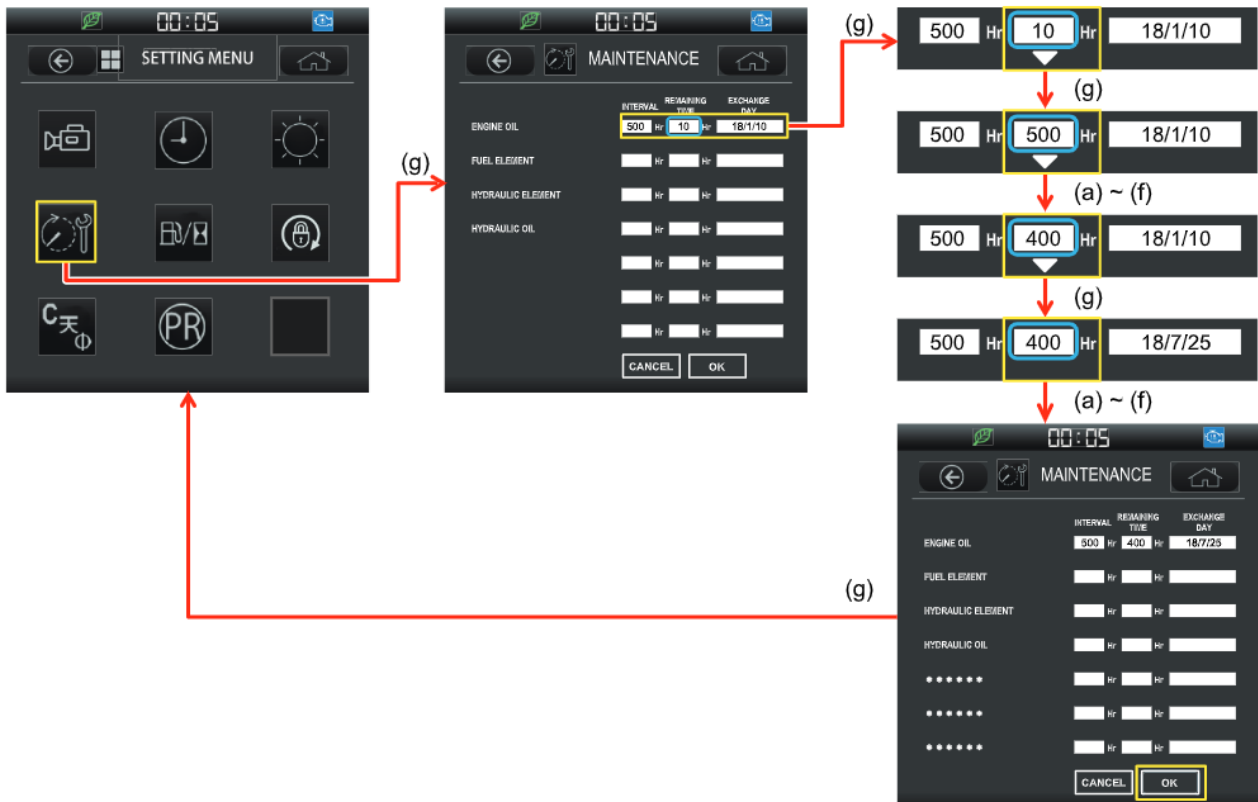
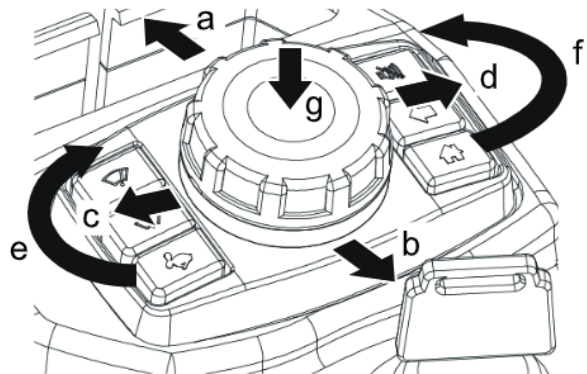
Jog dial operation

Tilting (a,b,c,d) and rotating (e,f) the jog dial

To move the cursor on the monitor and adjust the values and others.

Pushing down (g) the jog dial

- To switch the screen to the selected setting screen.
- To determine the adjusted value and others.



1. Switch the monitor to the [SETTING MENU] screen.

2. Tilt and turn the jog dial to move the cursor to [MAINTENANCE] on the [SETTING MENU] screen.
3. Push down (g) the jog dial to switch the monitor to the [MAINTENANCE] screen.
4. Tilt and turn the jog dial to move the cursor to [REMAINING TIME] of a desired item to set.
5. Push down (g) the jog dial to reset [REMAINING TIME] to the equal value of [INTERVAL] and enable the selected item to be adjustable.
6. Tilt and turn the jog dial to a desired value.
The value cannot exceed [INTERVAL].
7. Push down (g) the jog dial to set the desired value.
At this time, [EXCHANGE DAY] is renewed.
8. Tilt and turn the jog dial to move the cursor to [OK].
9. Push down (g) the jog dial to return the monitor to the [SETTING MENU] screen.

CONSUMPTION



The monitor display of the fuel efficiency can be set.

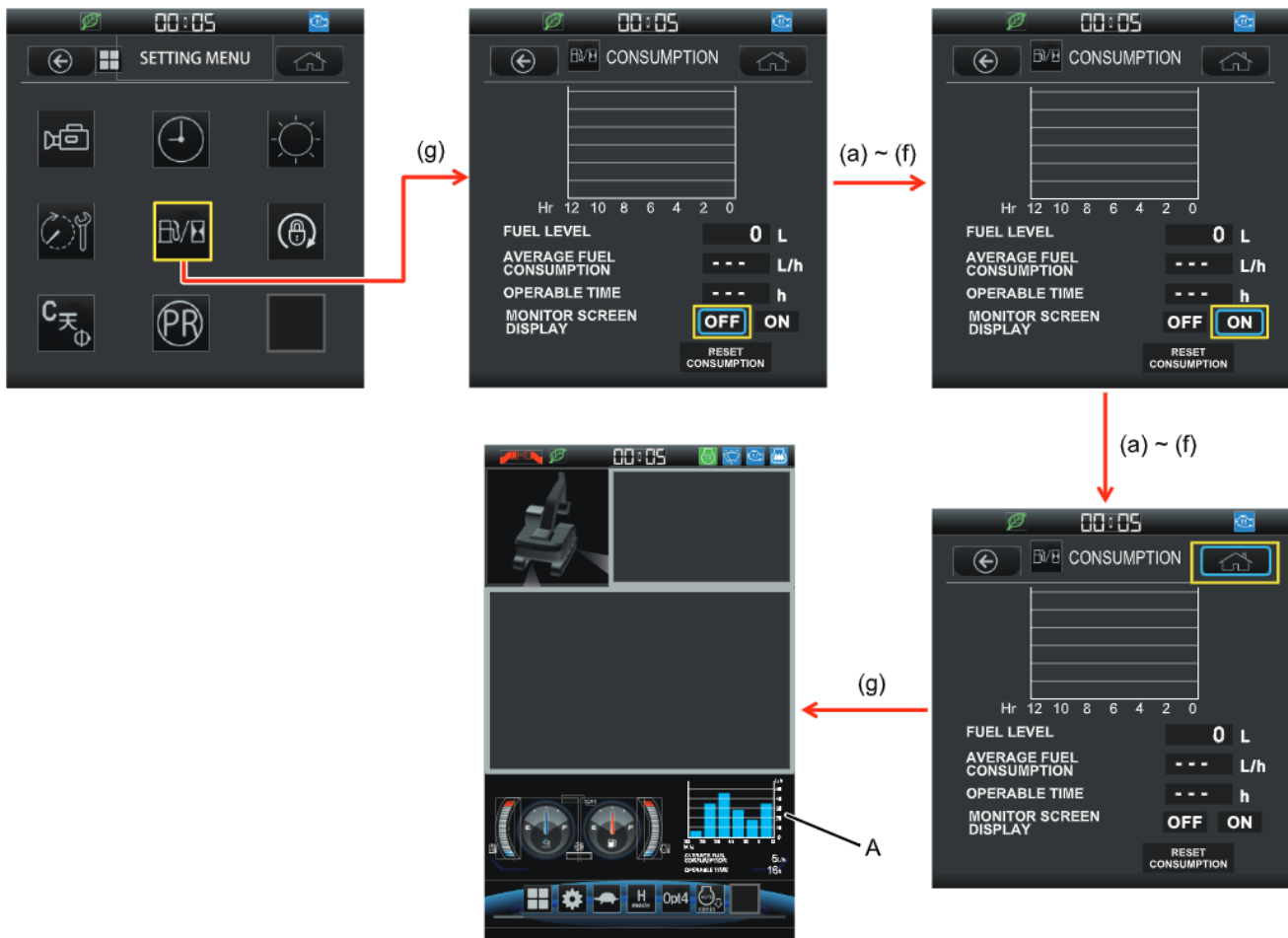
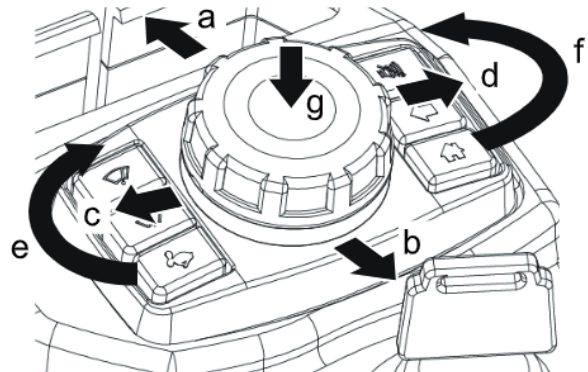
Jog dial operation

Tilting (a,b,c,d) and rotating (e,f) the jog dial

To move the cursor on the monitor and adjust the values and others.

Pushing down (g) the jog dial

- To switch the screen to the selected setting screen.
- To determine the adjusted value and others.



1. Switch the monitor to the [SETTING MENU] screen.
2. Tilt and turn the jog dial to move the cursor to [CONSUMPTION] on the [SETTING MENU] screen.
3. Push down (g) the jog dial to switch the monitor to the [CONSUMPTION] screen.
4. Tilt and turn the jog dial to move the cursor to [ON] of [MONITOR SCREEN DISPLAY]
5. Push down (g) the jog dial to switch the setting to [ON].
6. Move the cursor to [HOME].
7. Push down (g) the jog dial to switch the monitor to the normal screen.
The normal screen displays the consumption graph (A).

START PASSWORD



This menu allows you to set a start password.

Notice

To use this function, the machine setting needs to be changed.
If usage of this function is needed, contact your KOBELCO authorized dealer.

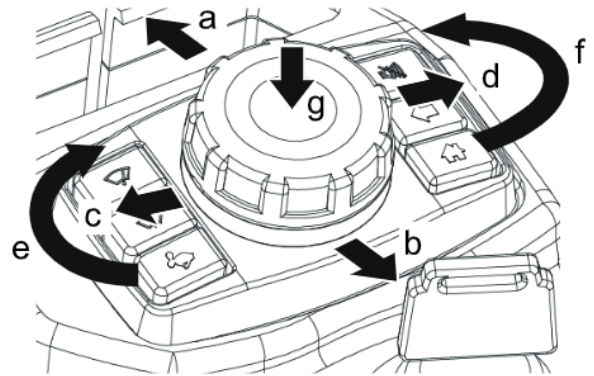
Jog dial operation

Tilting (a,b,c,d) and rotating (e,f) the jog dial

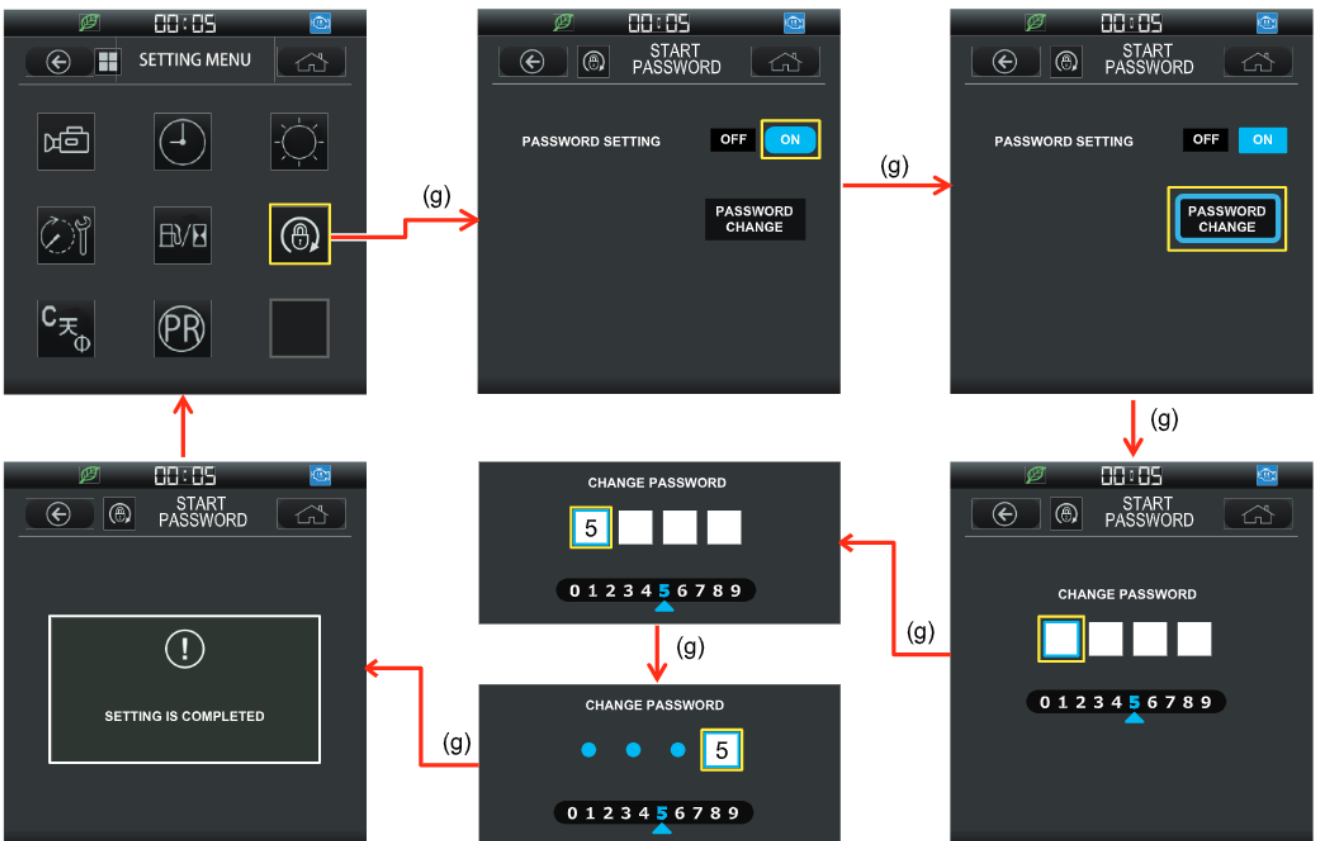
To move the cursor on the monitor and adjust the values and others.

Pushing down (g) the jog dial

- To switch the screen to the selected setting screen.
- To determine the adjusted value and others.



Setting of password



1. Switch the monitor to the [SETTING MENU] screen.
2. Tilt and turn the jog dial to move the cursor to [START PASSWORD] on the [SETTING MENU] screen.
3. Push down (g) the jog dial to switch the monitor to the [START PASSWORD] screen.
4. Tilt and turn the jog dial to move the cursor to [ON].

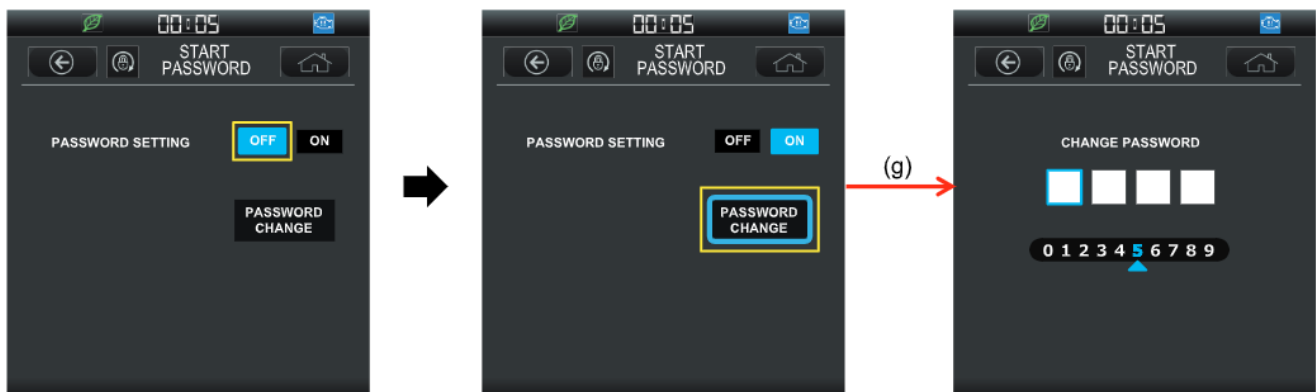
[2. MACHINE FAMILIARIZATION]

5. Push down (g) the jog dial to switch the setting to [ON].
6. Tilt and turn the jog dial to move the cursor to [PASSWORD CHANGE].
7. Push down (g) the jog dial to switch the monitor to the password setting screen.
8. Tilt and turn the jog dial to a desired number.
9. Push down (g) the jog dial to determine the number.
10. Determine the 4th number to set the password and then the monitor is returned to the [SETTING MENU] screen.

Cancellation/change of password

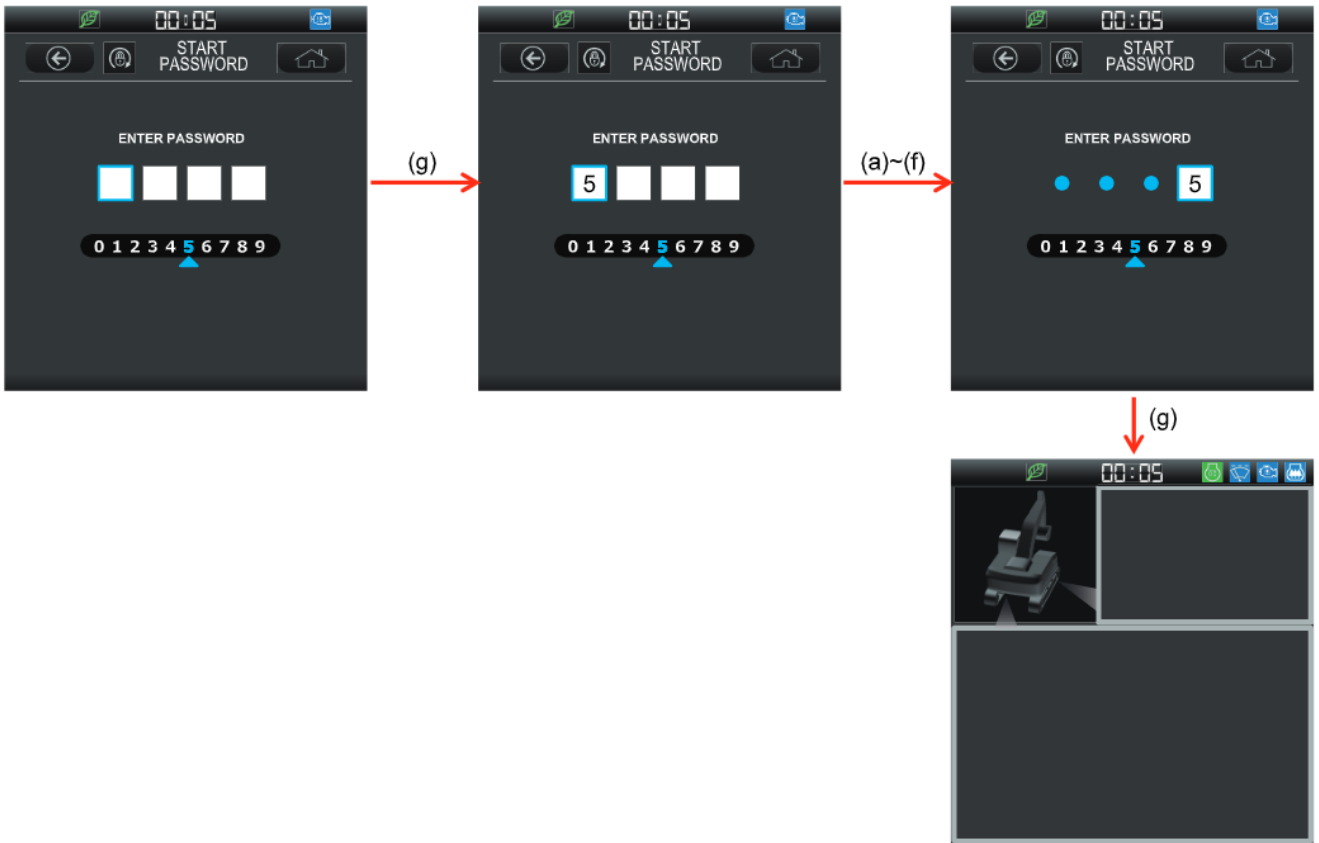
Notice

If the password is locked, [PASSWORD IS LOCKED] appears on the screen.
In that case, the password cannot be cancelled/changed.



1. Turn [OFF] [PASSWORD SETTING] to cancel the password.
2. Turn [PASSWORD SETTING] to [ON].
3. Tilt and turn the jog dial to move the cursor to [CHANGE PASSWORD].
4. Push down (g) the jog dial to switch the monitor to the password setting screen.
5. Change the password.

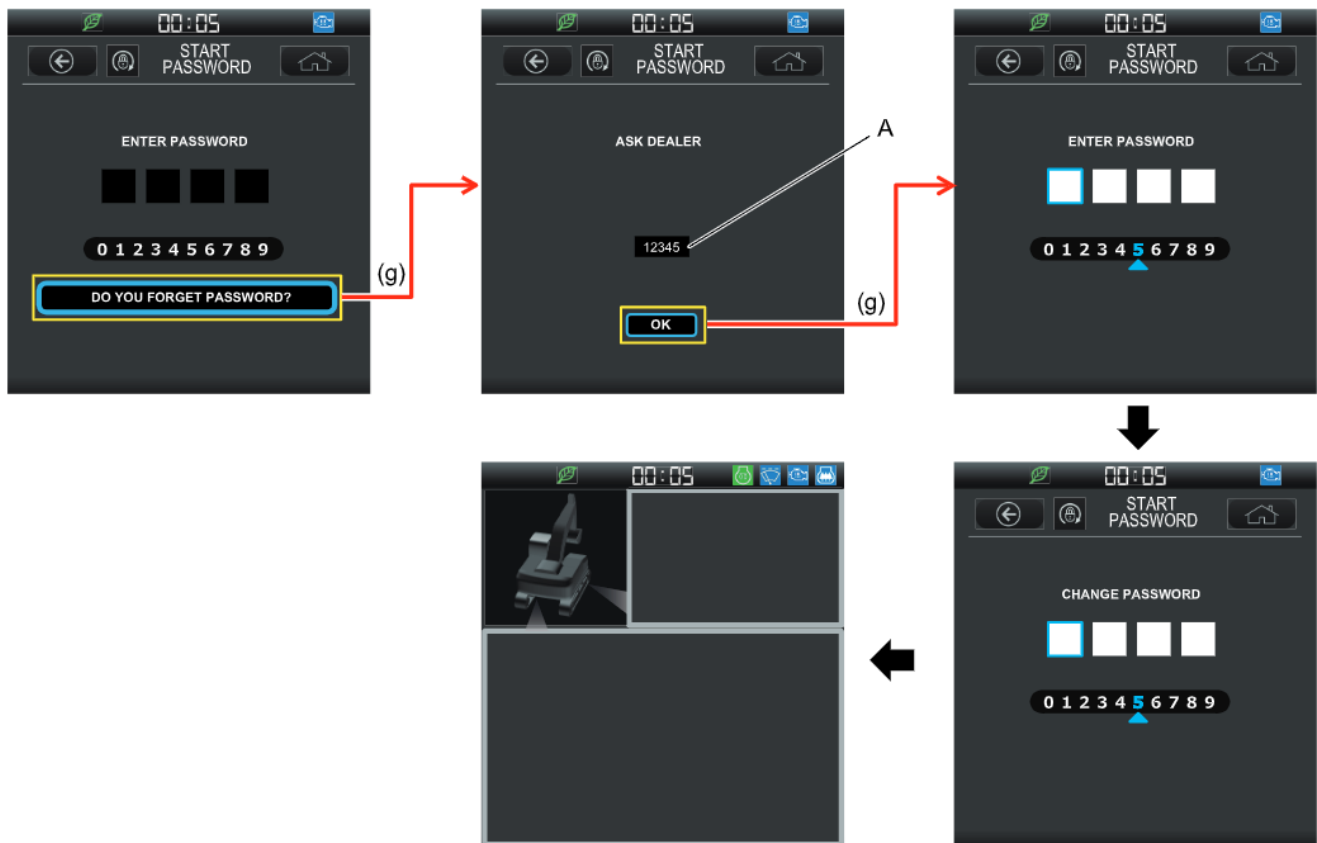
After password setting



2

1. After the starter switch is turned [ON], the [START PASSWORD] screen is displayed.
2. Tilt and turn the jog dial to the set numbers.
3. Push down (g) the jog dial to determine the number.
4. Determine the 4th number, and then the normal screen is displayed.
5. Engine start becomes possible.

In case of forgetting password



1. If a wrong password is input for 3 times, [DO YOU FORGET PASSWORD?] appears on the screen.
2. Tilt and turn the jog dial to move the cursor to [DO YOU FORGET PASSWORD?].
3. Push down (g) the jog dial to switch the screen and then five-digit number (A) is displayed.
4. Record that 5-digit number and contact your KOBELCO authorized dealer. Your KOBELCO authorized dealer will notify you of a one-time password.
5. Tilt and turn the jog dial to move the cursor to [OK].
6. Push down (g) the jog dial to switch the screen to the password inputting screen.
7. Input the one-time password to enter the password setting screen.
8. After the password is changed, the screen is changed to the normal screen.

LANGUAGE SELECTION



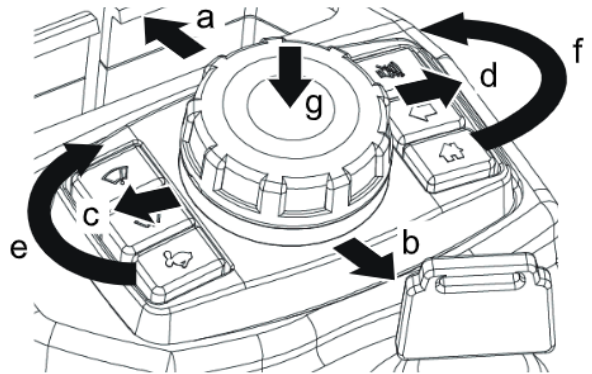
This menu allows you to set the language displayed on the monitor.

Jog dial operation**Tilting (a,b,c,d) and rotating (e,f) the jog dial**

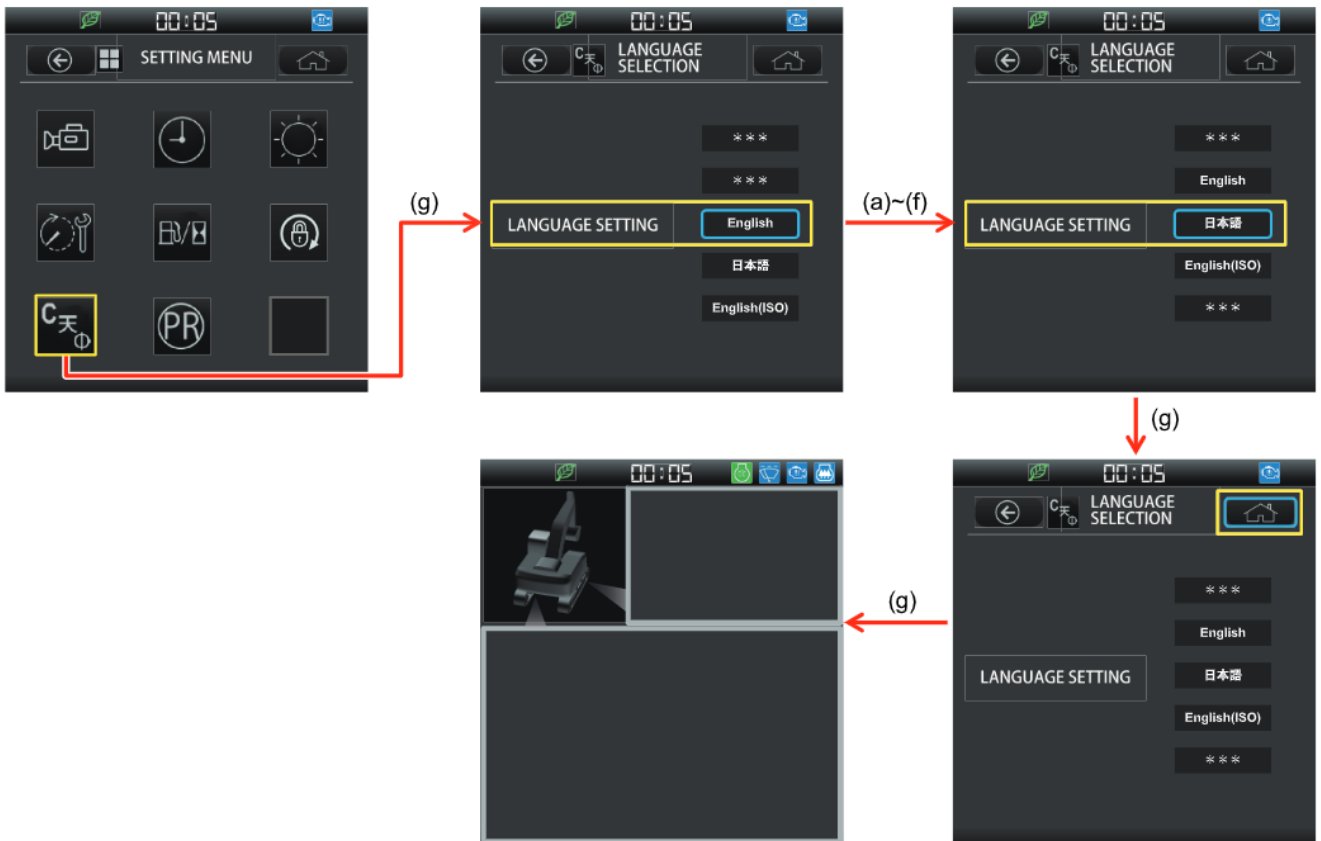
To move the cursor on the monitor and adjust the values and others.

Pushing down (g) the jog dial

- To switch the screen to the selected setting screen.
- To determine the adjusted value and others.



2



1. Switch the monitor to the [SETTING MENU] screen.
2. Tilt and turn the jog dial to move the cursor to [LANGUAGE SELECTION] on the [SETTING MENU] screen.
3. Push down (g) the jog dial to switch the monitor to the [LANGUAGE SELECTION] screen.
4. Tilt and turn the jog dial to move the cursor to [LANGUAGE SETTING].
5. Push down (g) the jog dial to enable the language to be selectable.
6. Tilt and turn the jog dial to select a desired language.
7. Push down (g) the jog dial to set the selected language.
8. Move the cursor to [HOME]
9. Push down (g) the jog dial to return the monitor to the [SETTING MENU] screen.

PRESSURE RELEASE



This menu allows you to release the internal pressure of the hydraulic circuit.

See "RELEASING INTERNAL PRESSURE IN HYDRAULIC SYSTEM" in Chapter 4 in the operation & maintenance manual for details.

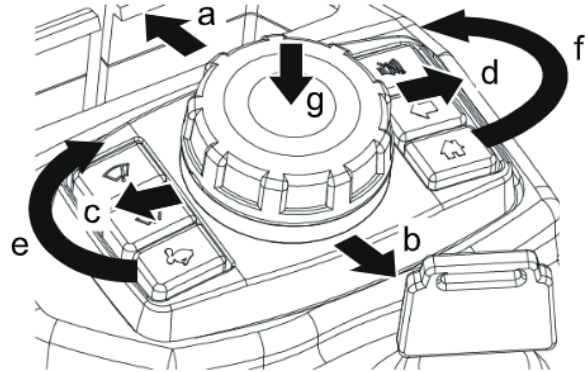
Jog dial operation

Tilting (a,b,c,d) and rotating (e,f) the jog dial

To move the cursor on the monitor and adjust the values and others.

Pushing down (g) the jog dial

- To switch the screen to the selected setting screen.
- To determine the adjusted value and others.



1. Switch the monitor to the [SETTING MENU] screen.
2. Tilt and turn the jog dial to move the cursor to [PRESSURE RELEASE] on the [SETTING MENU] screen.
3. Push down (g) the jog dial to set the machine to the pressure release mode.

Notice

After turning the key OFF and finishing the internal pressure releasing, wait 5 minutes or more before turning the key ON again.

If the key is turned ON again soon after the key OFF, it may cause the internal pressure releasing to finish improperly, resulting in continued releasing operation.

2.3.11 SWITCH SETTING SCREEN

Notice

Some settings cannot be selected without raising the control lock lever to the “LOCKED” position.

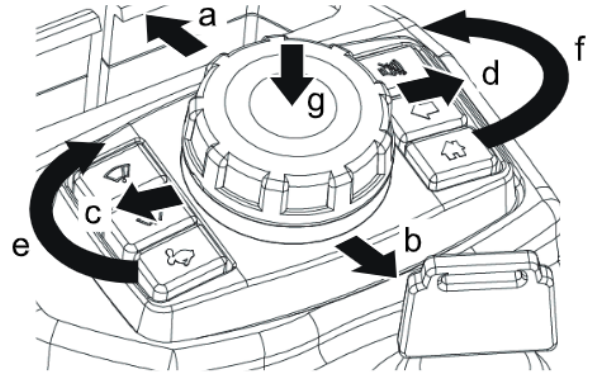
Jog dial operation

Tilting (a, b, c, d) and rotating (e, f) the jog dial

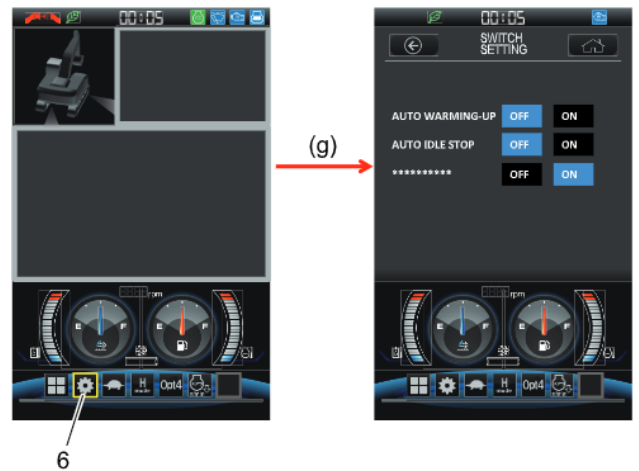
To move the cursor on the monitor and adjust the values and others.

Pushing down (g) the jog dial

- To switch the screen to the selected setting screen.
- To determine the adjusted value and others.



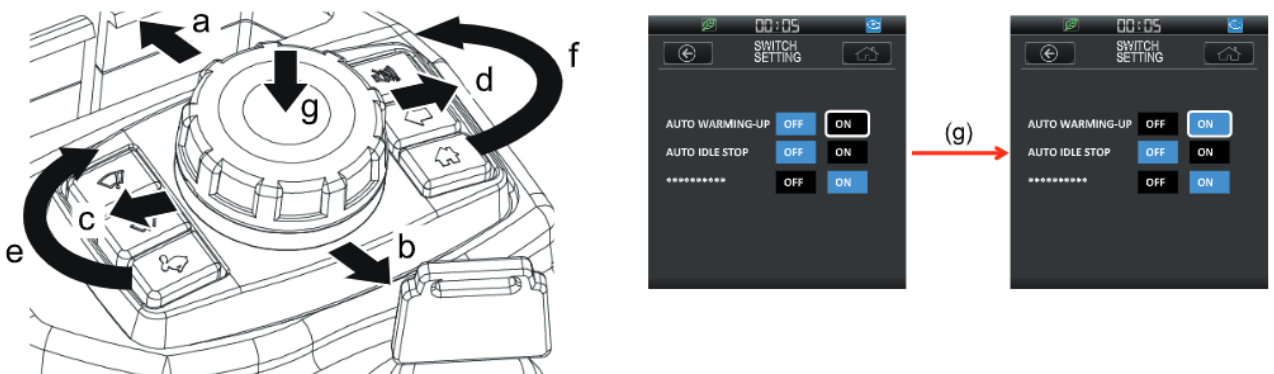
1. Tilt and turn the jog dial to move the cursor to switch setting (6) on the monitor.
2. Push down (g) the jog dial to switch the monitor to the [SWITCH SETTING] screen.



Auto warming up setting

CAUTION

- Do not leave the operator's seat during automatic warming-up.
- The attachment/equipment may slowly move to the internal direction but this is not failure. Check that the surroundings are clear of people and objects for avoiding being caught between the attachment/equipment and the machine, or interfered with the attachment/equipment.



[2. MACHINE FAMILIARIZATION]

1. Tilt and turn the jog dial to move the cursor to [ON] of [AUTO WARMING-UP].
2. Push down (g) the jog dial to switch the setting to [ON].
3. Turn "OFF" the starter key switch once to store the setting.

Notice

Once "AUTO WARMING-UP/ON" is set, there is no need to set it again.

4. Pull up the control lock lever to the "LOCKED" position.

5. When the engine is started in cold condition, auto warming-up starts. During warming-up of the hydraulic oil, the icon is indicated on the monitor.

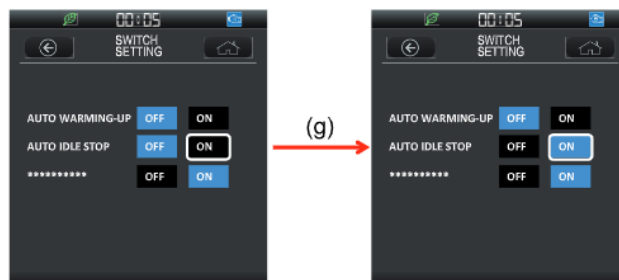
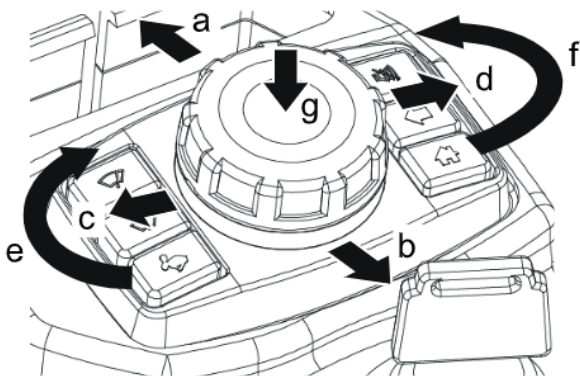


Notice

- If "AUTO WARMING-UP" is changed to [OFF] during hydraulic oil warming-up, the warming-up operation is forced to stop.
- In the hydraulic oil warming-up, if the control lever is operated, the warming-up operation is interrupted tentatively. Then the warming-up operation starts again, if the neutral lever condition continues for about 10 seconds.
- When the engine coolant temperature goes down, the automatic warming-up may start.

6. After the warming-up operation, "WARM-UP FINISHED" is displayed and the buzzer sounds for 5 seconds to tell the completion of the warming-up operation.

Setting of auto idle stop



1. Tilt and turn the jog dial to move the cursor to [ON] of [AUTO IDLE STOP].
2. Push down (g) the jog dial to switch the setting to [ON].
3. Turn "OFF" the starter key switch once to store the status.

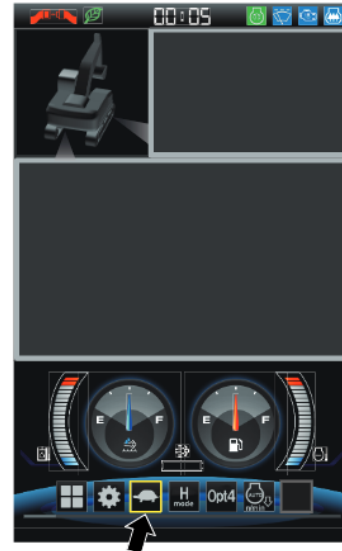
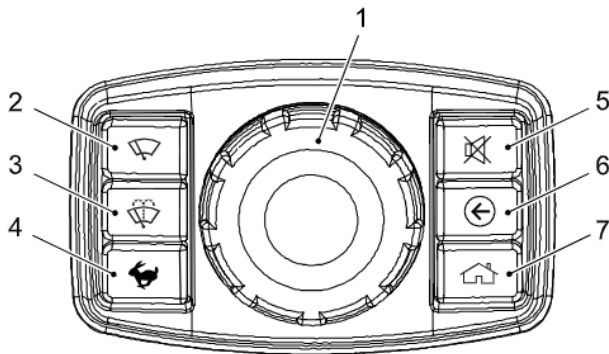
4. After the starter switch is turned "ON", the icon is displayed on the monitor.
Auto Idle Stop time can be adjusted from 30 to 999 seconds by your KOBELCO dealer.



2.3.12 TRAVEL SPEED SELECTION

WARNING ABOUT TRAVEL SPEED

The travel speed should be set to the LOW (1st) speed when the machine is traveling on a downhill, or being loaded to/unloaded from a trailer. A sudden change of the machine stability could cause personal injury.



2

Each time the engine is started, the travel speed is automatically set to the LOW 1st (turtle) speed. Press switch (4) on the control panel and then the travel speed changes to the HIGH (2nd) speed and the icon displayed on the monitor changes to the HIGH (2nd) speed (rabbit).

LOW 1st speed: turtle



Set to LOW 1st speed when moving the machine on the rough or soft ground, slope, or in the narrow place, or when powerful tractive force is required.

HIGH 2nd speed: rabbit



Set to HIGH 2nd speed when moving the machine on a level and firm ground.

Notice

The HIGH (2nd) speed is automatically switched to the LOW (1st) speed when the load of traveling becomes high and automatically returned to the HIGH (2nd) speed when the load is lowered.

2.3.13 WORK MODE SELECTION

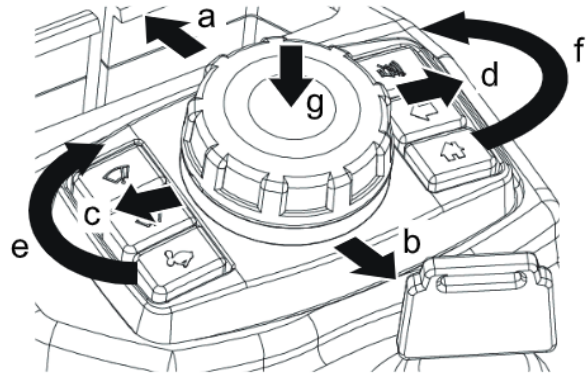
Jog dial operation

Tilting (a, b, c, d) and rotating (e, f) the jog dial

To move the cursor on the monitor and adjust the values and others.

Pushing down (g) the jog dial

- To switch the screen to the selected setting screen.
- To determine the adjusted value and others.



Select a proper work mode from three modes shown below according to the work condition and purpose. Move the cursor to [work mode selection] (8) and push down (g) the jog dial to switch the mode.

S mode:

"S mode" is suitable for a standard digging work and loading operations. It provides good fuel consumption and is well-balanced with a workload.

ECO mode:

"ECO mode" focuses on reduced fuel consumption operation.

H mode:

"H mode" is suitable for a heavy digging work, which provides high speed and gives priority to a workload.











CAUTION

Before beginning the work, make sure the selected work mode is correct.

2.3.14 SWITCHING ATTACHMENT MODE

Select an appropriate mode to use according to the attachment installed.

Display	Attachment mode	Summary
	Bucket	This mode needs to be selected for digging work.
	Breaker	This mode needs to be selected when an attachment using a single flow circuit such as a breaker is installed.
	Nibbler (crusher)	This mode needs to be selected when an attachment using two flow circuits such as a nibbler (crusher) is installed.
	*Rotary grapple	This mode is designed considering the operation such as a grapple.
	*Processor	This mode is designed considering the operation such as a processor.
	*Thumb bucket	This mode is designed considering the operation such as a thumb bucket.
	*Rotary tilt	This mode is designed considering the operation such as a rotary tilt.
	*Individual setting	This mode can be customized for an attachment other than those mentioned above.

CAUTION

- When the attachment mode is inappropriate, select a proper attachment mode.
- Always select the breaker mode when operating a breaker. Working in a mode other than the breaker mode causes damages to the hydraulic components and/or the breaker.
- Be sure to lower the attachment to the ground and ensure safety before switching the attachment mode.

Notice

- If tuning of operability is needed, contact your KOBELCO authorized dealer.
- When the control lock lever is raised upward to the locked(up) position, setting for changing the screen becomes possible.
- The default settings of the modes with " * " are the same as the nibbler mode.

ATTACHMENT MODE SELECTION

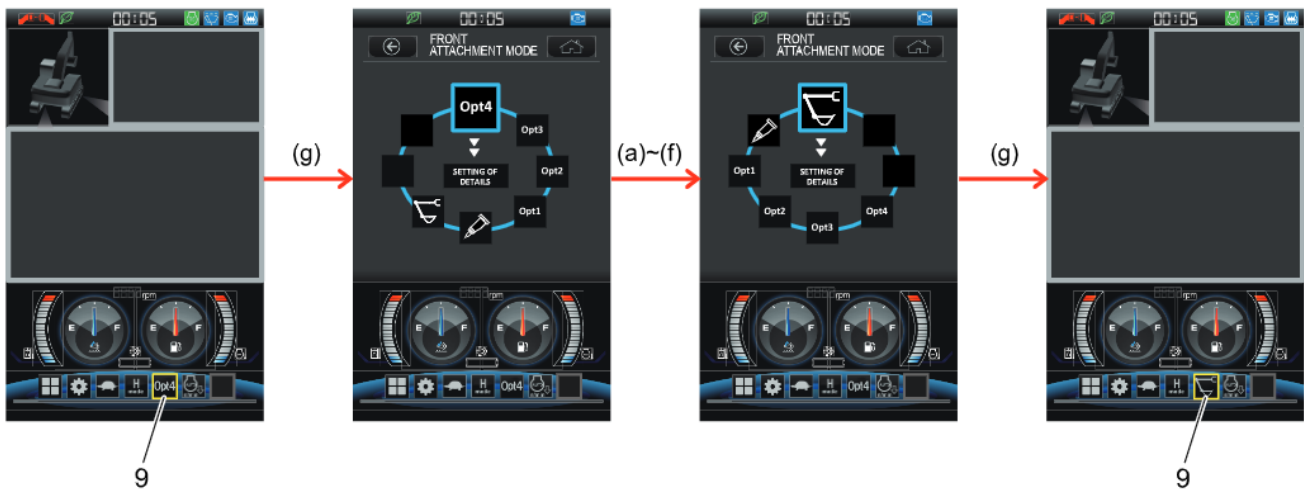
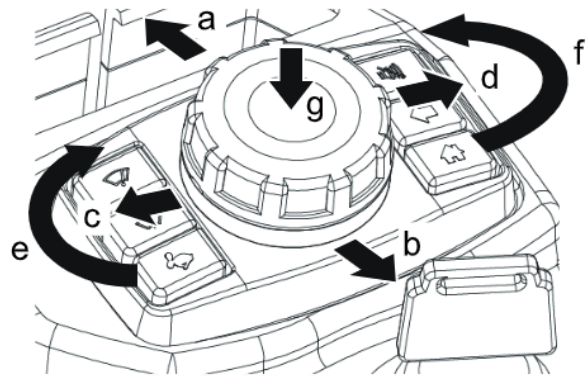
Jog dial operation

Tilting (a,b,c,d) and rotating (e,f) the jog dial

To move the cursor on the monitor and adjust the values and others.

Pushing down (g) the jog dial

- To switch the screen to the selected setting screen.
- To determine the adjusted value and others.



1. Tilt and turn the jog dial to move the cursor to attachment mode selection (9) on the monitor.
2. Push down (g) the jog dial to switch the monitor to the [FRONT ATTACHMENT MODE] screen.
3. Tilt and turn the jog dial to move the cursor to the icon of the front attachment being installed.
4. Push down (g) the jog dial to switch the icon of attachment mode selection (9) to the icon of the selected attachment.

SETTING OF ATTACHMENT MODE DETAILS

Notice

Adjust them to a proper set value matching with an attachment to be used.

Flow rate adjustment

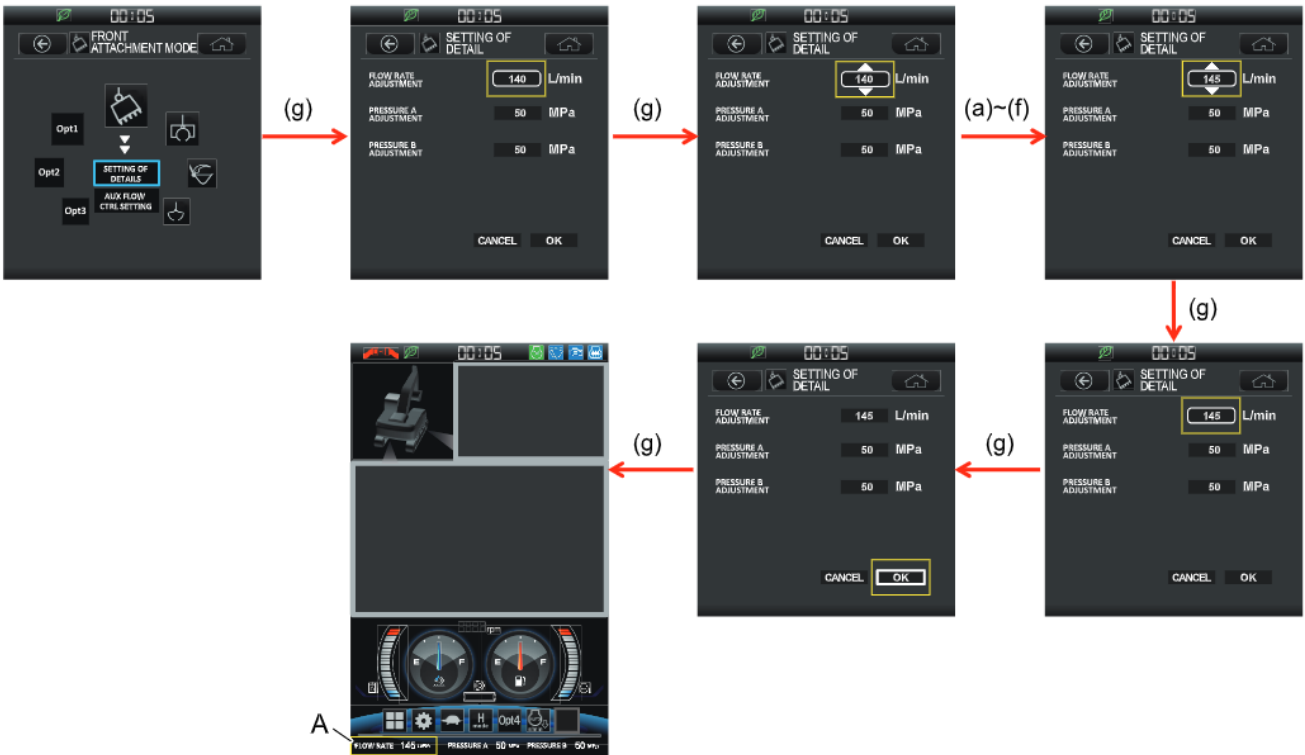
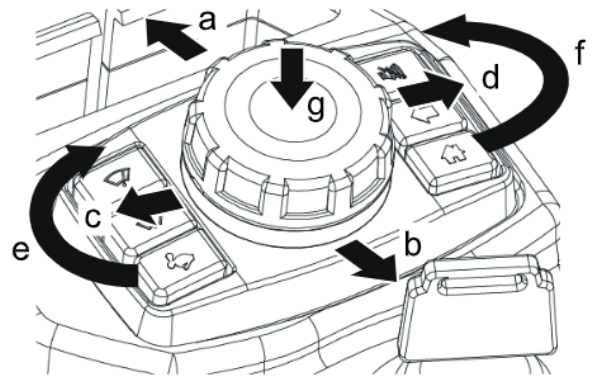
Jog dial operation

Tilting (a,b,c,d) and rotating (e,f) the jog dial

To move the cursor on the monitor and adjust the values and others.

Pushing down (g) the jog dial

- To switch the screen to the selected setting screen.
- To determine the adjusted value and others.



1. Move the cursor to [SETTING OF DETAIL] of the selected icon.
2. Push down (g) the jog dial to switch the monitor to the [SETTING OF DETAIL] screen.
3. Tilt and turn the jog dial to move the cursor to [FLOW RATE ADJUSTMENT].
4. Push down (g) the jog dial to enable the flow rate to be adjustable.
5. Tilt and turn the jog dial to a desired value.
6. Push down (g) the jog dial to set the desired flow rate.
7. Tilt and turn the jog dial to move the cursor to [OK].
8. Push down (g) the jog dial to return the monitor to the normal screen.
Set value (A) is displayed on the lower side of the screen.

PRESSURE ADJUSTMENT

The pressure adjustment of the attachment can be done by setting the value at [PRESSURE A ADJUSTMENT] or [PRESSURE B ADJUSTMENT]. When seeing from the inside of the cab, the high pressure oil flowing at the right side of the attachment can be adjusted from [PRESSURE A ADJUSTMENT], and the high pressure oil flowing at the left side of the attachment can be adjusted from [PRESSURE B ADJUSTMENT].

Notice

For some machines and specifications, [PRESSURE B ADJUSTMENT] is only available.

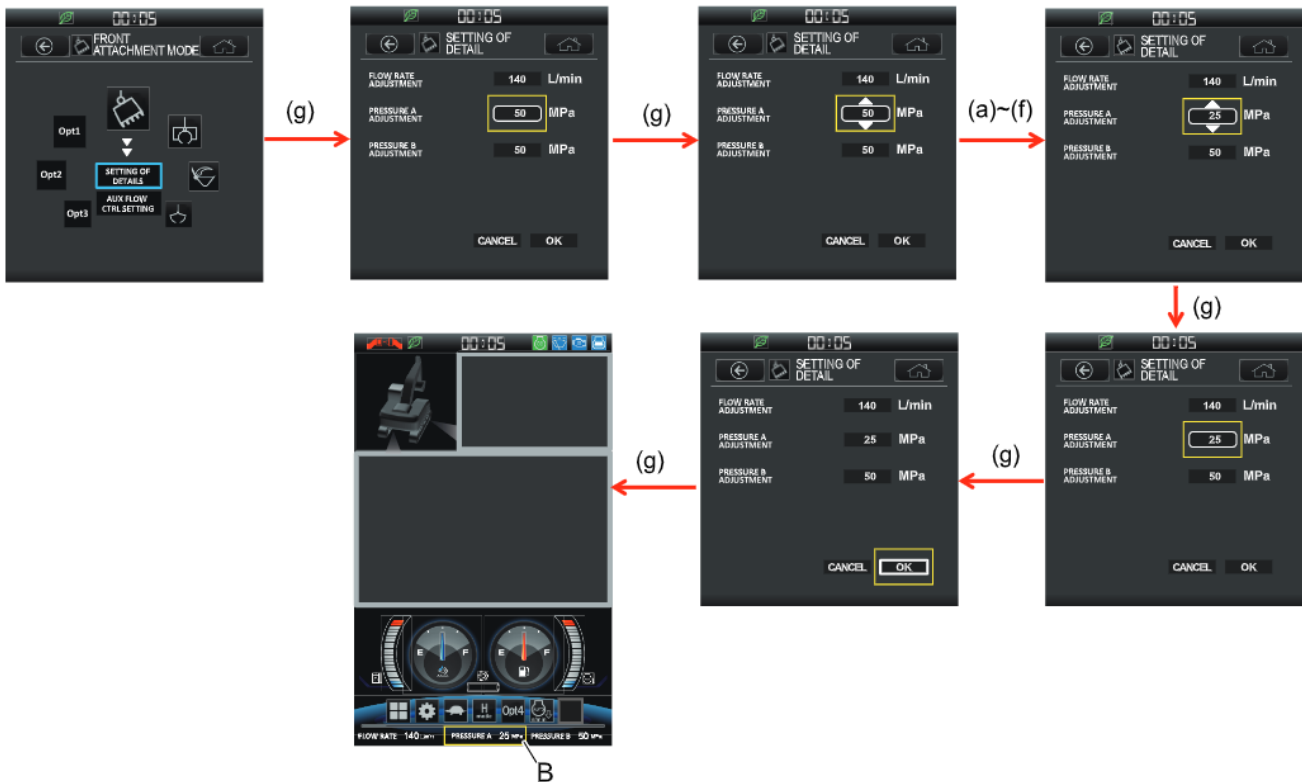
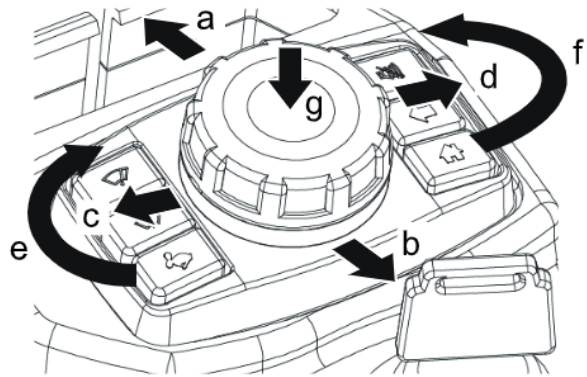
Jog dial operation

Tilting (a,b,c,d) and rotating (e,f) the jog dial

To move the cursor on the monitor and adjust the values and others.

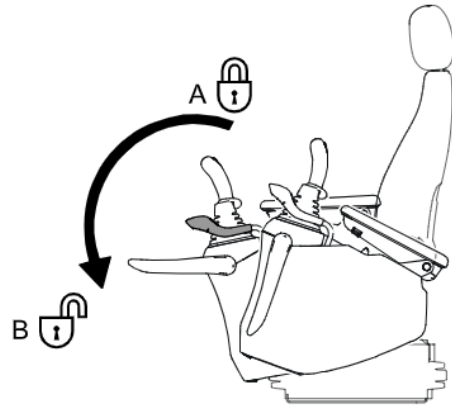
Pushing down (g) the jog dial

- To switch the screen to the selected setting screen.
- To determine the adjusted value and others.



1. Move the cursor to [SETTING OF DETAIL] of the selected icon.
2. Push down (g) the jog dial to switch the monitor to the [SETTING OF DETAIL] screen.
3. Tilt and turn the jog dial to move the cursor to [PRESSURE A ADJUSTMENT] or [PRESSURE B ADJUSTMENT].
4. Push down (g) the jog dial to enable the flow rate to be adjustable.

5. Push down the control lock lever to "UNLOCKED" position (B).
6. Operate the subject front attachment for adjustment to perform relief operation.
If it is not operated, "0" is displayed.
7. Tilt and turn the jog dial to a desired value.
8. Push down (g) the jog dial to set the desired pressure.
9. Tilt and turn the jog dial to move the cursor to [OK].
10. Push down (g) the jog dial to return the monitor to the normal screen.
Set value (B) is displayed on the lower side of the screen.



CAUTION

- Warm-up the hydraulic oil before adjustment.
- Ensure stop valves at the arm are closed.

2.3.15 AUTO ACCELERATION ON/OFF SELECTION

When machine operation is stopped for a certain time, the auto acceleration function reduces the engine speed to a low speed and when the machine operation starts again, the engine speed automatically returns to the former speed.



WARNING Loading/unloading the machine

When loading or unloading the machine on a trailer, turn the auto acceleration switch off. If it is operated while the acceleration switch is on, the engine speed changes suddenly.

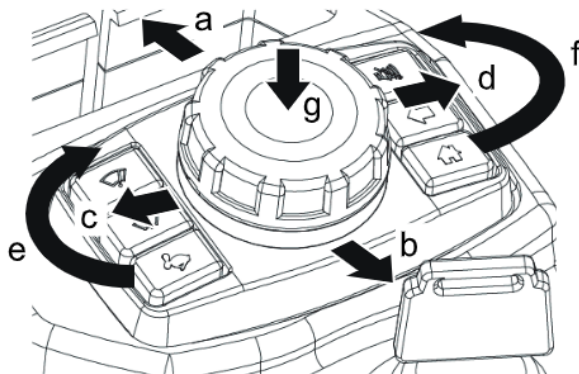
Jog dial operation

Tilting (a,b,c,d) and rotating (e,f) the jog dial

To move the cursor on the monitor and adjust the values and others.

Pushing down (g) the jog dial

- To switch the screen to the selected setting screen.
- To determine the adjusted value and others.



Move the cursor to auto acceleration (9) and push down (g) the jog dial to turn [ON] and actuate the auto acceleration.

When the jog dial is pushed down (g) again, it becomes [OFF] and then the auto acceleration is canceled.

It sets the engine speed to low under the following conditions.

- When the acceleration dial position is set at a higher value than the range of the idle speed.
- When the control levers and/or pedals are not operated for 4 seconds or more.

When the control levers and/or pedals are operated, the engine speed rises back to the set level of the acceleration dial gradually according to the amount of operation of the lever and/or pedals.

If the switch (9) is pressed to turn off during the auto acceleration operation, the engine speed rises back to the set level of the acceleration dial gradually.



9

Notice

After key OFF, even if the machine is restarted, the setting is stored.

2.3.16 HEAVY LIFT

This switch is used when lifting a heavy load and power is required for it.

Heavy Lift provides 10% more hydraulic pressure and provide greater lifting power at close radius. This allows for a smooth and steady operation while moving heavy objects.

⚠ DANGER

Never turn off the heavy lift during any heavy lifting operation.

Sudden or unexpected movement of the lifted load could result in serious injury or death.

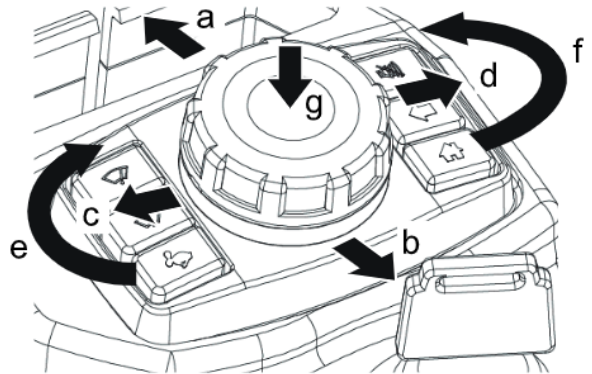
Jog dial operation

Tilting (a,b,c,d) and rotating (e,f) the jog dial

To move the cursor on the monitor and adjust the values and others.

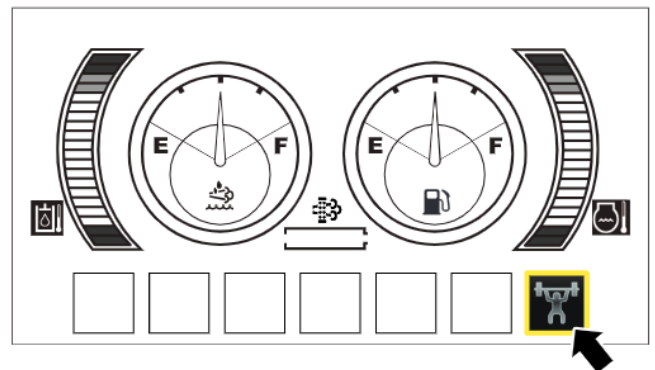
Pushing down (g) the jog dial

- To switch the screen to the selected setting screen.
- To determine the adjusted value and others.



2

1. Tilt and turn the jog dial to move the cursor to the heavy lift.
2. Push down (g) the jog dial to switch the setting to [ON].
3. When the jog dial is pushed down (g) again, it becomes [OFF] and then the heavy lift is canceled.



2.3.17 SETTING OF OVER LOAD ALARM

When lifting operation is performed, change the setting of over load alarm to [ON].

After it is turned [ON], the warning will sound when the load being lifted is close to the maximum load of each working range.

As for the lifting procedures, see "LIFTING WORK" in Chapter 8.

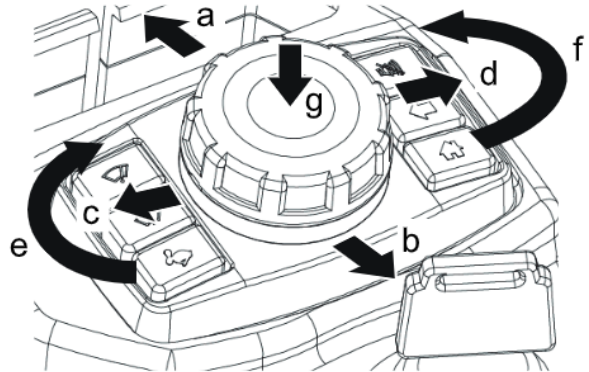
Jog dial operation

Tilting (a,b,c,d) and rotating (e,f) the jog dial

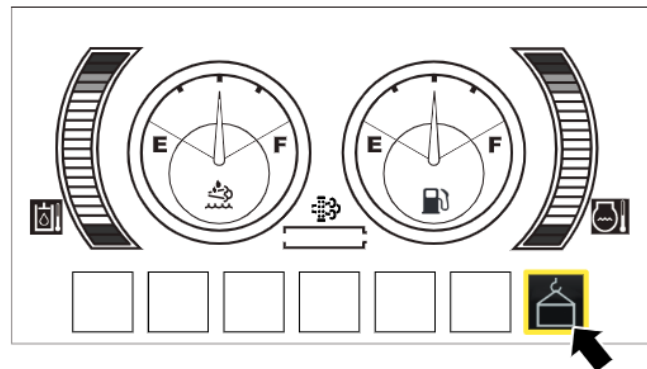
To move the cursor on the monitor and adjust the values and others.

Pushing down (g) the jog dial

- To switch the screen to the selected setting screen.
- To determine the adjusted value and others.



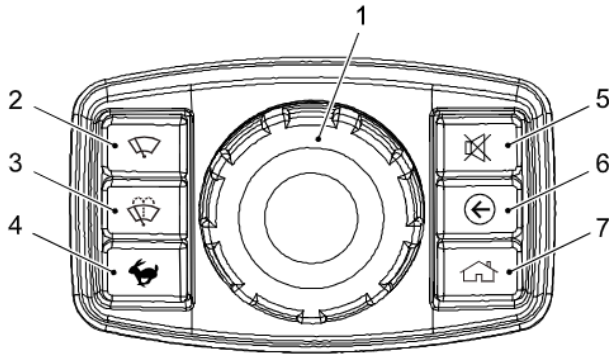
1. Tilt and turn the jog dial to move the cursor to the over load alarm.
2. Push down (g) the jog dial to switch the setting to [ON].
3. When the jog dial is pushed down (g) again, it becomes [OFF] and then the over load alarm is canceled.



2.3.18 WIPER SWITCH

Push switch (2) to actuate the wiper of the front window.

Within 10 seconds after pushing switch (2), operate jog dial (1) and select a desired function.



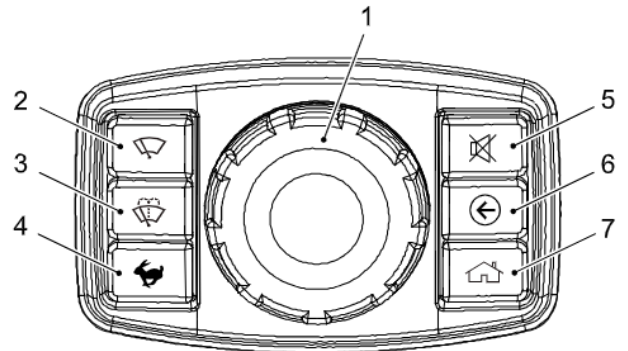
Symbol	Function
A	The wiper works one time.
B	The wiper works intermittently.
C	The wiper works continuously.

If switch (2) is pushed one more again, the wiper stops.

2.3.19 WASHER SWITCH

While switch (3) is being pressed, the washer fluid is sprayed through the nozzle of front window.

The washer fluid reservoir is located under the floor plate inside the cab.

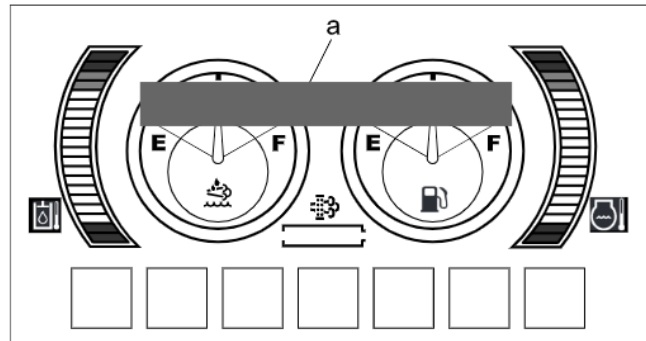
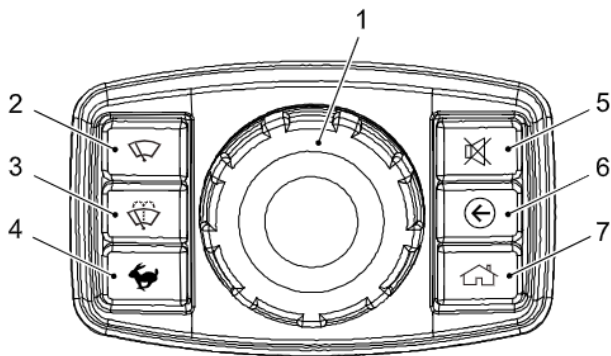


Notice

Make sure that the washer reservoir is filled with the washer fluid before operating the washer.

2.3.20 BUZZER STOP SWITCH

When warning (a) is displayed on the monitor and the buzzer sounds, press buzzer stop switch (5) to stop the buzzer of the items shown in the table.



Warning Level and Its Description

Level	Description
1	This is largely-concerned with the safety and machine movement. Stop the machine immediately and perform inspection and maintenance.
2	This notifies of the mode change of the machine.
3	This may lead to the failure of the machine. Immediately perform inspection and maintenance.
4	Difficulty may occur in working. Immediately perform inspection and maintenance.
5	This notifies of the machine status and maintenance.

Buzzer sound type

Buzzer sound type	Sounds
Type 1	Continuous
Type 2	Sound 0.2 seconds, stop 0.3 seconds
Type 3	Sound 0.5 seconds, stop 0.5 seconds

Priority Group A

















Level	Display	Warning Details	Buzzer				
			Auto Stop	Manual Stop	Type	Starter Key ON	Engine Running
1		Mechatro Controller does not send data.	Unavailable	Available	3	○	○
1		The swing parking brake release switch is switched to the "RELEASE LOCK" position.	Available (5 sec.)	Available	2	○	○
1		An emergency stop is performed due to low engine oil pressure.	Available (5 sec.)	Unavailable	1	○	—

Priority Group B









Level	Display	Warning Details	Buzzer				
			Auto Stop	Manual Stop	Type	Starter Key ON	Engine Running
1		Displayed when the selector valve malfunctions.	Unavailable	Available	2	—	○
1		Displayed when the DEF/AdBlue sensor detects the quality failure of DEF/AdBlue, and the machine becomes inoperable.	Unavailable	Unavailable	1	○	○
1		Displayed when the DEF/AdBlue level gauge shows Level 0 (no display), and the machine becomes inoperable.	Unavailable	Unavailable	1	○	○
1		Displayed when each device and sensor of NOx discharge control system fails or becomes abnormal, and the machine becomes inoperable. (The failure code is an example)	Unavailable	Unavailable	1	○	○
	P204F						
1		Displayed when the DEF/AdBlue dosing module fails or becomes abnormal, and the machine becomes inoperable. (The failure code is an example)	Unavailable	Unavailable	1	○	○
	P204F						
1		Displayed when the EGR valve fails or becomes abnormal, and the machine becomes inoperable. (The failure code is an example)	Unavailable	Unavailable	1	○	○
	P1459						
2	WARM	Displayed when automatic warming-up is done.	Available (5 seconds)	Unavailable	2	—	○
2		Displayed when soot is accumulated in DPF, and manual regeneration is necessary.	Unavailable	Available	3	—	○
2		Displayed when soot accumulated in DPF becomes Level 7 (Red) or more of the soot deposition meter, and manual regeneration is necessary.	Unavailable	Unavailable	2	—	○
2		Displayed when the machine is in the emergency evacuation mode.	Unavailable	Unavailable	1	○	○

2

[2. MACHINE FAMILIARIZATION]

Level	Display	Warning Details	Buzzer				
			Auto Stop	Manual Stop	Type	Starter Key ON	Engine Running
2		Displayed when the DEF/AdBlue sensor detects the quality failure of DEF/AdBlue, and the engine output is limited.	Unavailable	Unavailable	2	○	○
2		Displayed when the DEF/AdBlue level gauge becomes Level 1 (Red), and the engine output is limited.	Unavailable	Unavailable	2	○	○
2	 P204F	Displayed when each device and sensor of the NOx discharge control system fails or becomes abnormal, and the engine output is limited. (The failure code is an example)	Unavailable	Unavailable	2	○	○
2	 P204F	Displayed when the DEF/AdBlue dosing module fails or becomes abnormal, and the engine output is limited. (The failure code is an example)	Unavailable	Unavailable	2	○	○
2	 P1459	Displayed when the EGR valve fails or becomes abnormal, and the engine output is limited. (The failure code is an example)	Unavailable	Unavailable	2	○	○
2	 P204F	Displayed when each device of NOx discharge control system or sensor fails or becomes abnormal, and the engine output is limited. (The failure code is an example)	Unavailable	Available	3	○	○
2	 P204F	Displayed when the DEF/AdBlue dosing module fails or becomes abnormal, and the engine output is limited. (The failure code is an example)	Unavailable	Available	3	○	○
2	 P1459	Displayed when the EGR valve fails or becomes abnormal, and the engine output is limited. (The failure code is an exam)	Unavailable	Available	3	○	○
3		Displayed when the DEF/AdBlue sensor detects the quality failure of DEF/AdBlue.	Unavailable	Available	3	○	○
3		Displayed when the DEF/AdBlue level gauge becomes Level 2 (Yellow).	Unavailable	Available	3→2※1	○	○
3		Displayed when the soot deposition meter level reaches 10 (Red), and no regeneration can be done.	Unavailable	Unavailable	2	—	○
3		Displayed when the engine oil pressure reduces, and disconnection is detected.	Unavailable	Available	2	○	○
3		Displayed when the engine coolant temperature rises.	Unavailable	Available	3	○	○
3		Displayed when the radiator upper tank water level becomes low.	Unavailable	Available	3	○	○
3		Displayed when the water level of the water separator (fuel filter) increases.	Unavailable	Available	3	○	○
3		Displayed when the air cleaner element is clogged.	Unavailable	Available	3	○	○
3	I113	Self-diagnosis (failure on the pressure sensor, or the proportional valve, etc.)	Unavailable	Available	3	○	○

*1: If the buzzer keeps sounding due to DEF/AdBlue not being refilled, the type of buzzer sound changes.
For details on SCR system related warnings, see "SCR SYSTEM and DEF/AdBlue" in Chapter 4.

Level	Display	Warning Details	Buzzer				
			Auto Stop	Manual Stop	Type	Starter Key ON	Engine Running
3	 	Displayed when the fan rotates during engine stop.	Unavailable	Available	3	○	—
3	 	Displayed when the fan speed of the oil cooler fan is the specified value or less.	Unavailable	Available	3	—	○
3	 	Displayed when the fan speed of the radiator fan is the specified value or less.	Unavailable	Available	3	—	○
3	 	Displayed when failures occur in the fan drive proportional valve.	Unavailable	Available	3	○	○

2.3.21 WARNING DISPLAY SCREEN






WHEN WARNINGS ARE DISPLAYED

A warning displayed on the multi-display may lead to severe trouble. Stop the operation immediately, investigate the causes and take proper measures.

- The warning display has the order of priority and when many troubles such as level 1 and 2 in priority (A) occurred at the same time, level 1 is displayed in priority to level 2.
- The start-up inspection should be performed according to not only the monitor but also the instructions in "MAINTENANCE".

WARNING CLASSIFICATION CHART (PRIORITY A)

Display	Level	Warning Details	Required Actions
	1	Mechatro Controller does not send data.	Contact your KOBELCO authorized dealer for inspection/maintenance.
	1	The swing parking brake release switch is switched to the "RELEASE LOCK" position.	
	1	An emergency stop is performed due to low engine oil pressure.	













WARNING CLASSIFICATION CHART (PRIORITY B)












Display	Level	Warning Details	Required Actions
	1	Displayed when the selector valve malfunctions.	The attachment installed to the crusher or breaker specification machine does not match the selected attachment mode. Select an appropriate attachment mode by switching the attachment mode select switch. Breaker mode: When using a breaker Nibbler mode: When using a nibbler (crusher) Even when an adequate operation mode is selected and the indication of selector failure does not disappear, contact and ask your KOBELCO authorized dealer for inspection/maintenance.
	1	Displayed when DEF/AdBlue sensor detects the quality failure of DEF/AdBlue, and the machine becomes inoperable.	Refer to Chapter 3 "CHECKING DEF/AdBlue LEVEL AND REFILLING" and Chapter 4 "DRAINING DEF/AdBlue" to drain the contents of DEF/AdBlue tank, and refill DEF/AdBlue.
	1	Displayed when DEF/AdBlue level gauge becomes Level 0 (No display), and the machine becomes inoperable.	Refer to Chapter 3 "CHECKING DEF/AdBlue LEVEL AND REFILLING", and supply DEF/AdBlue until DEF/AdBlue level gauge becomes Level 3 (Green) or more.
 P204F	1	Displayed when each device and sensor of the NOx discharge control system fails or becomes abnormal, and the machine becomes inoperable. (The failure code is an example)	Contact your KOBELCO authorized dealer for inspection/maintenance.
 P204F	1	Displayed when DEF/AdBlue injection device fails or becomes abnormal, and the machine becomes inoperable. (The failure code is an example)	
 P1459	1	Displayed when the EGR valve fails or becomes abnormal, and the machine becomes inoperable. (The failure code is an example)	
	2	Displayed when the power boost switch (Yellow) on the upper grip of the right control lever is "ON". - Separate boom specification When operating nibbler (crusher) up (bucket out)	Displayed when the power boost switch (Yellow) on the upper grip of the right control lever is used.
WARM	2	Displayed when the automatic warming-up is done.	The warming-up operation of the engine and hydraulic oil are completed. Refer to "STARTING ENGINE" in "3. MACHINE OPERATION", and start the engine with proper procedures.
	2	Displayed when soot is accumulated in DPF, and manual regeneration is necessary.	Refer to Chapter 4 "ABOUT MANUAL REGENERATION", and perform manual regeneration.
 ※1	2	Displayed when regenerating DPF.	Refer to Chapter 4 "ABOUT AUTOMATIC REGENERATION" and "ABOUT MANUAL REGENERATION". If manual regeneration is in progress, wait until the display turns off.
	2	Displayed when soot accumulated in DPF becomes Level 7 (Red) or more of the soot deposition meter, and manual regeneration is necessary.	Refer to Chapter 4 "ABOUT MANUAL REGENERATION", and perform manual regeneration.

*1: This mark is also displayed during machine operation, when occasional automatic soot combustion is performed.

See "ABOUT MANUAL REGENERATION" in Chapter 4.

[2. MACHINE FAMILIARIZATION]

Display	Level	Warning Details	Required Actions	
	2	Displayed when DEF/AdBlue sensor detects the quality failure of DEF/AdBlue, and the engine output is limited.	Refer to Chapter 3 "CHECKING DEF/AdBlue LEVEL AND REFILLING" and Chapter 4 "DRAINING DEF/AdBlue" to drain the contents of DEF/AdBlue tank, and refill DEF/AdBlue.	
	2	Displayed when DEF/AdBlue level gauge becomes Level 1 (Red), and the engine output is limited.		
 P204F	2	Displayed when each device and sensor of the NOx discharge control system fails or becomes abnormal, and the engine output is limited. (The failure code is an example)		
 P204F	2	Displayed when the DEF/AdBlue dosing module fails or becomes abnormal, and the engine output is limited. (The failure code is an example)		
 P1459	2	Displayed when the EGR valve fails or becomes abnormal, and the engine output is limited. (The failure code is an example)		
 P204F	2	Displayed when each device or sensor of NOx discharge control system fails or becomes abnormal, and the engine output is limited. (The failure code is an example).		Contact your KOBELCO authorized dealer for inspection/maintenance.
 P204F	2	Displayed when the DEF/AdBlue dosing module fails or becomes abnormal, and the engine output is limited. (The failure code is an example)		
 P1459	2	Displayed when the EGR valve fails or becomes abnormal, and the engine output is limited. (The failure code is an exam)		
	2	Displayed when the machine is in the emergency evacuation mode.		
	3	Displayed when DEF/AdBlue sensor detects the quality failure of DEF/AdBlue, and the engine output is limited.		Refer to Chapter 3 "CHECKING DEF/AdBlue LEVEL AND REFILLING", and Chapter 4 "DRAINING DEF/AdBlue" to drain the contents of DEF/AdBlue tank, and refill DEF/AdBlue.
	3	Displayed when DEF/AdBlue level gauge becomes Level 2 (Yellow).	Refer to Chapter 3 "CHECKING DEF/AdBlue LEVEL AND REFILLING", and supply DEF/AdBlue until DEF/AdBlue level gauge becomes Level 3 (Green) or more.	
	3	Displayed when the soot deposition meter level reaches 10 (Red), and no regeneration can be done.	Contact your KOBELCO authorized dealer for inspection/maintenance.	

Display	Level	Warning Details	Required Actions
	3	<ul style="list-style-type: none"> - Displayed when the engine oil pressure is lower than a specified value, and the output reduction control is performed. - Displayed when a disconnection is detected. 	<ul style="list-style-type: none"> - Stop the engine promptly, check the oil level, and disconnection place, and refill or replace the specified engine oil referring to "LUBRICANT, FUEL & COOLANT SPECIFICATIONS", if required. - If this is displayed while engine stop, the wire may be disconnected, etc. Contact your KOBELCO authorized dealer for repair.
	3	Displayed when the coolant temperature exceeds a specified value.	Stop operation, and lower the engine speed to the low idle speed to cool the engine. When the warning display does not disappear after a few minutes, stop the engine, and check the coolant level, fan belt tension, and radiator clogging.
	3	Displayed when the water level of the radiator upper tank is low.	Stop the engine, and open the radiator cap after the coolant temperature becomes low to refill coolant. Also, check the radiator sub tank, and refill coolant if the coolant level is low.
	3	Displayed when the water level in the water separator (fuel filter) increases.	Drain water from the water separator.
	3	Displayed when the engine output reduces due to a clogged intake air filter.	Check and clean the filter. If necessary, replace the filter.
I113	3	Error code is displayed when failure occurred in the pressure sensor, proportional valve, etc.	Contact your KOBELCO authorized dealer for inspection/maintenance.
	3	Displayed when the fan rotates during engine stop.	Contact your KOBELCO authorized dealer for inspection/maintenance.
	3	Displayed when the fan speed of the oil cooler fan is the specified value or less.	Contact your KOBELCO authorized dealer for inspection/maintenance.
	3	Displayed when the fan speed of the radiator fan is the specified value or less.	Contact your KOBELCO authorized dealer for inspection/maintenance.
	3	Displayed when failures occur in the fan drive proportional valve.	Contact your KOBELCO authorized dealer for inspection/maintenance.
	4	<p>Battery failure. (High voltage/low voltage/insufficient charge)</p> <p>The battery is not charged adequately if the warning does not disappear after a while from the engine is started or if the warning is displayed while the engine is running.</p>	Check the usage condition of the electrical components and the charge circuit.
	4	The fuel is below a specified quantity.	Refill the specified fuel.

[2. MACHINE FAMILIARIZATION]

Display	Level	Warning Details	Required Actions
	5	Displayed when the temperature of hydraulic oil rises abnormally.	Stop operation, and ask your KOBELCO authorized dealer for inspection/maintenance.
	5	Displayed during the automatic warming-up operation.	Automatic warming-up operation is being performed. Wait until "WARM FINISH WARM-UP" appears.
	5	The remaining time to the engine oil change becomes zero.	Refill the specified new engine oil with the specified quantity.
	5	Displayed when the key switch is turned to "START" position while the pilot control shut-off lever is down.	Set the key switch back to "ON" position, and secure safety by raising the pilot control shut-off lever. Turn the switch to "START" again to start the engine.
	5	Displayed when the remaining time to the fuel filter change becomes zero.	Replace with a specified new fuel filter.
	5	Displayed when the remaining time to the hydraulic oil filter change becomes zero.	Replace with a specified new hydraulic oil filter.
	5	Displayed when the remaining time to the hydraulic oil change becomes zero.	Replace with a specified new hydraulic oil.
	5	Displayed when the remaining time of the maintenance (cleaning or replacement) interval becomes zero.	Contact your KOBELCO authorized dealer for inspection/maintenance.
	5	Displayed when the remaining time to the next change of the swing gear oil becomes zero.	Change the gear oil to the new specified gear oil.
	5	Displayed when the remaining time to the next change of the travel gear oil becomes zero.	Change the gear oil to the new specified gear oil.
	5	Displayed when the remaining time to the next replacement of the fuel pre-filter becomes zero.	Replace the filter to the new specified filter.
	5	Displayed when the remaining time to the next replacement of the filter of the DEF/AdBlue supply module becomes zero.	Replace the filter to the new specified filter.
	5	Displayed when the remaining time to the next replacement of the air breather element becomes zero.	Replace the element to the new specified element.
	5	Displayed when the remaining time to the next replacement of the air cleaner element becomes zero.	Replace the element to the new specified element.
	5	Displayed when the remaining time to the next change of the coolant becomes zero.	Replace the coolant to the new specified coolant.
	5	Displayed when the remaining time to the next greasing of the swing reduction unit becomes zero.	Grease the swing reduction unit.
	5	Displayed when the remaining time to the next replacement of the drain filter cartridge becomes zero.	Replace the filter to the new specified filter.
	5	Displayed when the remaining time to the next replacement of the pilot line filter becomes zero.	Replace the filter to the new specified filter.

2.3.22 CLOGGING DETECTOR OF HYDRAULIC OIL FILTER

Change the hydraulic oil filter when "CHANGE HYD.OIL FLTR" appears on the monitor. (See "REPLACING RETURN FILTER" in Chapter 4 for replacement procedures.)

Note

When the clogging detector of the hydraulic oil filter is working, the pump operation noise becomes louder for approximately 3 seconds with the control lever in the neutral position, but it is not abnormal.

1. To release the warning, set the maintenance interval of the return filter again from the monitor. (Default value: 1000 hrs.)
(See "MAINTENANCE" in Chapter 2 for setting procedures.)



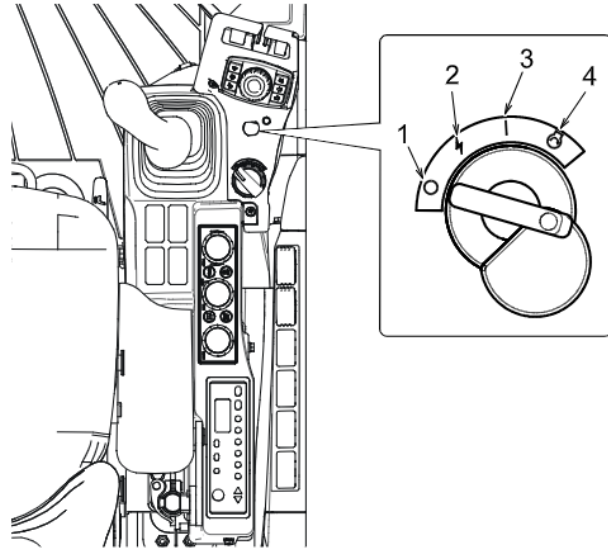
2. After the setting of 1. is completed, operate the machine for a while, then the warning is released automatically.

2.4 HANDLING OF SWITCHES AND METERS

2.4.1 STARTER SWITCH

This switch is used to start or stop the engine.

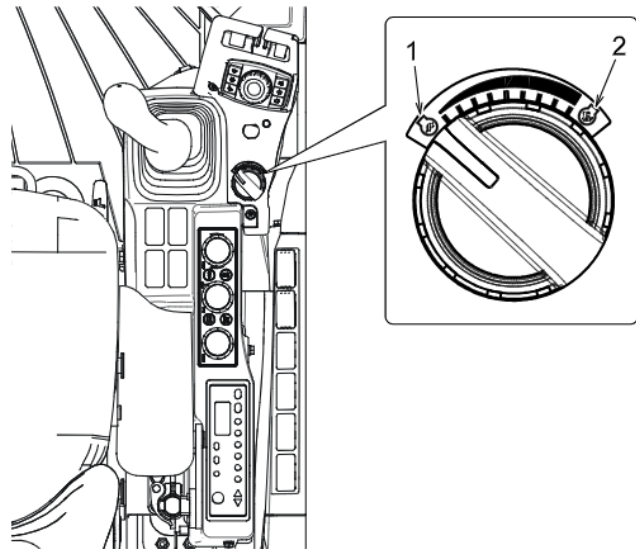
1. OFF (STOP):
At this position, you can insert or remove the starter key. Before restarting or stopping the engine, turn the starter key to the "OFF" position.
2. ACC (Accessory):
While the engine is stopped, power and the radio (FM/AM) can be used in the "ACC" position.
3. ON:
Electricity flows in all circuits. During operation, the starter key should be in this position.
4. START:
When starting the engine, turn the key to the "START" position. When the engine starts, release your hand from the starter switch. The starter key will return to the "ON" position by itself.



2.4.2 ENGINE THROTTLE

This dial adjusts the number of engine speed (output). This is a dial type rotary switch and a continuous adjustment type. If you release the dial at a rotated position, it stops at that position, and maintains assigned engine speed.

1. LO (Low idle)
The number of engine speed is minimum at the end of left rotation.
2. H (High idle)
The number of engine speed is maximum at the end of right rotation.



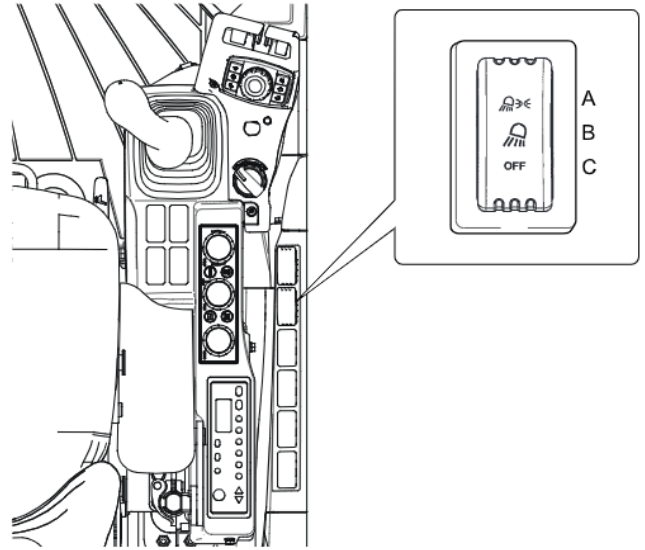
2.4.3 WORKING LIGHT SWITCH (BOOM, DECK, AND COUNTERWEIGHT)

Push the switch to turn on/off the working lights.

A: The working lights of the boom, the deck, and the counterweight turn on.

B: The working lights of the boom and the deck turn on.

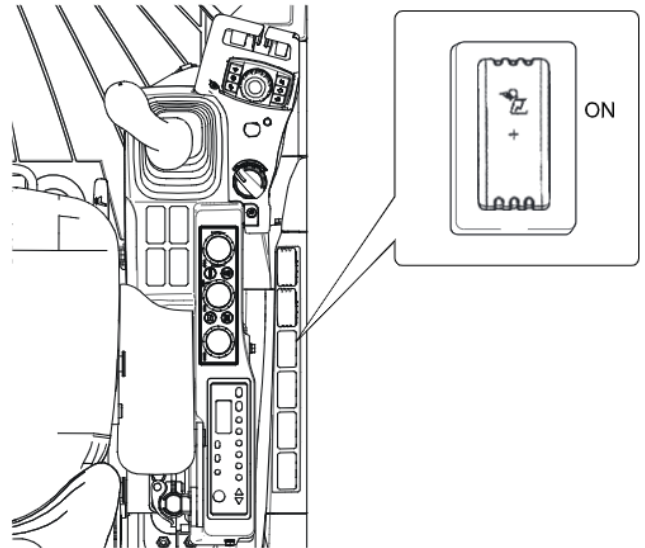
C: The working lights of the boom, the deck, and the counterweight turn off.



2.4.4 WORKING LIGHT SWITCH (CAB)

Push the switch to turn on the working light of the cab.

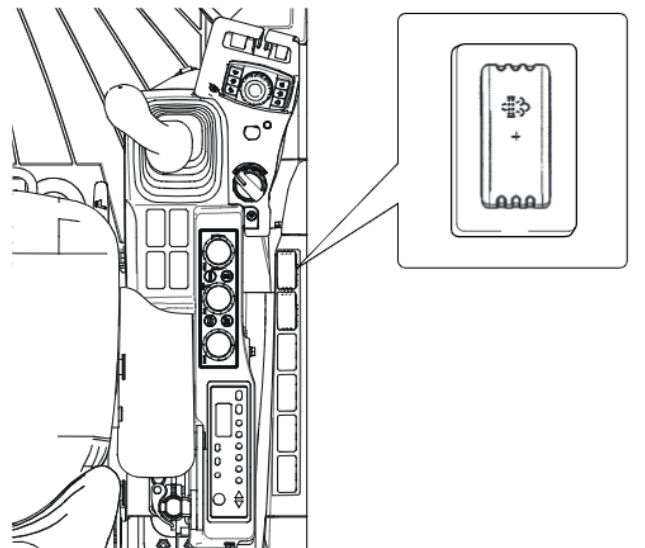
Push the no symbol mark side to turn off the working light on the cab.



2.4.5 DPF MANUAL REGENERATION SWITCH

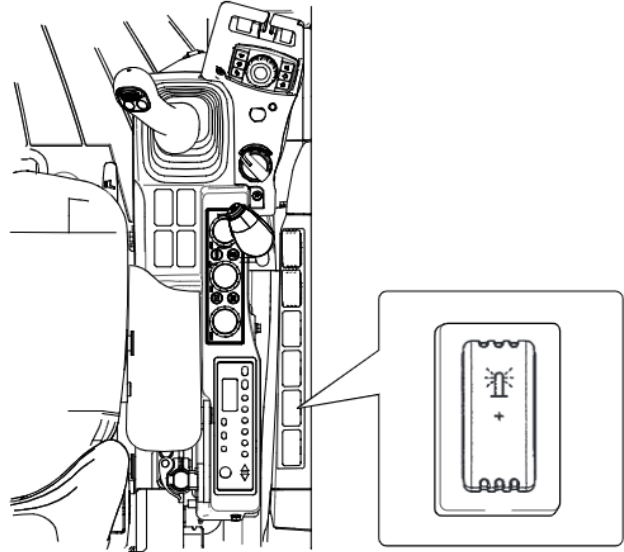
When you press the DPF manual regeneration switch, DPF is regenerated.

For details, see "DIESEL PARTICULATE FILTER (DPF)" in Chapter 4.



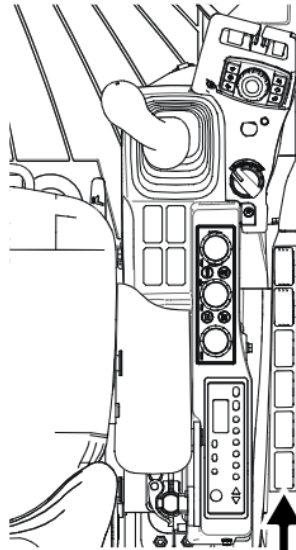
2.4.6 ROTATING LIGHT SWITCH (OPT)

If the switch is pressed, the rotating light turns on.
If the side without the symbol mark is pressed, the rotating light turns off.



2.4.7 CAP (OPTION SWITCH)

This is a place to install an optional switch.

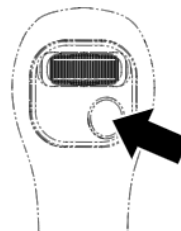


2.4.8 HORN SWITCH

CAUTION

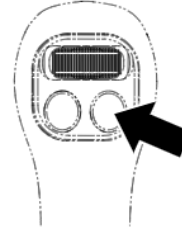
Be sure to sound the horn before starting this machine to warn surrounding personnel.

The horn sounds while the switch located on the top of the left control lever grip is being pressed.



2.4.9 POWER BOOST SWITCH

When power is required for a "particular situation" such as raising boulders and excavating rocks, a significant excavating power is generated while pressing the switch attached on the right control lever grip.



Notice

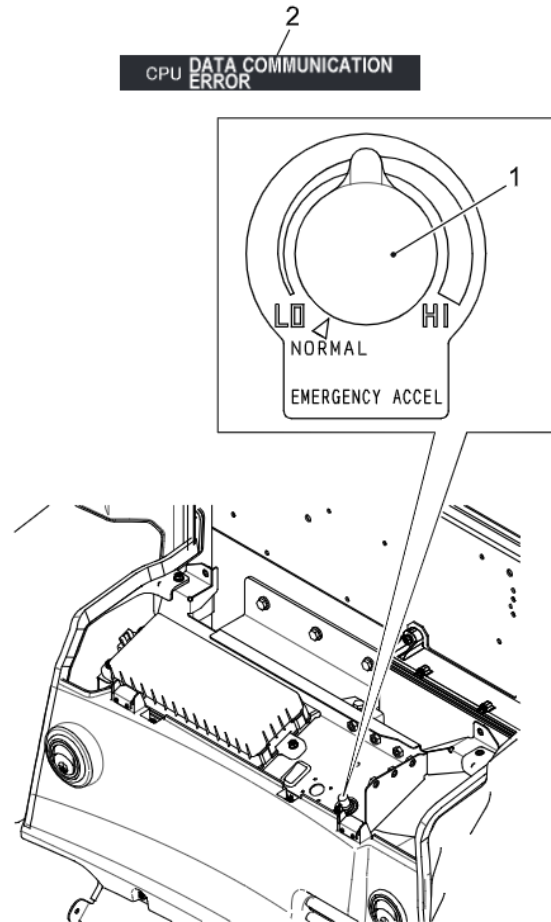
When a longer arm than standard is equipped, use of the power boost switch is prohibited.

2.4.10 EMERGENCY ACCEL

This dial is used when the controller that controls this machine has trouble. When the engine speed cannot be adjusted with the engine throttle due to controller trouble, operate this emergency accel (1) to adjust the engine speed.

Under normal conditions, do not operate emergency accel (1).

When controller warning (2) is displayed on the monitor, contact your KOBELCO authorized dealer.



OPERATION PROCEDURES

When operating the emergency accel, follow the procedures below.



HOW TO HANDLE EMERGENCY ACCEL

Be sure to follow the procedures for the emergency accel. Because the engine speed may rise suddenly when the engine starts, and it is extremely dangerous.

1. Stop the engine, and set emergency accel (1) to "NORMAL".
2. Start the engine.
3. Turn emergency accel (1) to the HI side to adjust the engine speed.
4. When stopping the engine, set emergency accel (1) to "NORMAL".

2.4.11 SWING PARKING BRAKE RELEASE SWITCH

**WARNING**

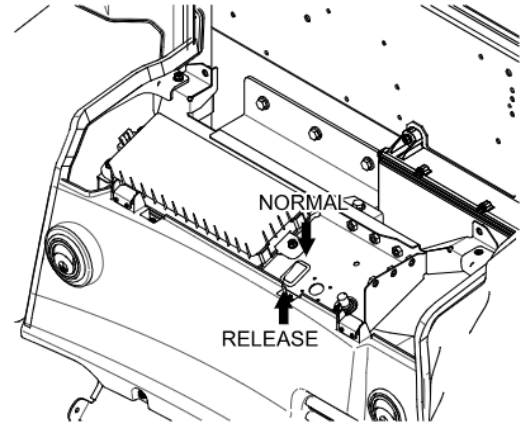
SWING PARKING BRAKE RELEASE SWITCH

Do not operate the swing parking brake release switch on slopes and soft grounds. The upper structure may turn unexpectedly and it is significantly dangerous.

This switch is used only when the swing parking brake cannot be released due to trouble. Set this switch to "RELEASE" to release the brake.

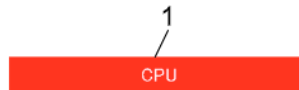
Generally, the switch should be on "NORMAL".

When trouble is found in the swing parking brake systems, contact your KOBELCO authorized dealer promptly.



2.4.12 SWING PARKING BRAKE RELEASE SWITCH

If a failure occurs in the controller controlling the machine, warning (1) is displayed on the monitor.



CAUTION

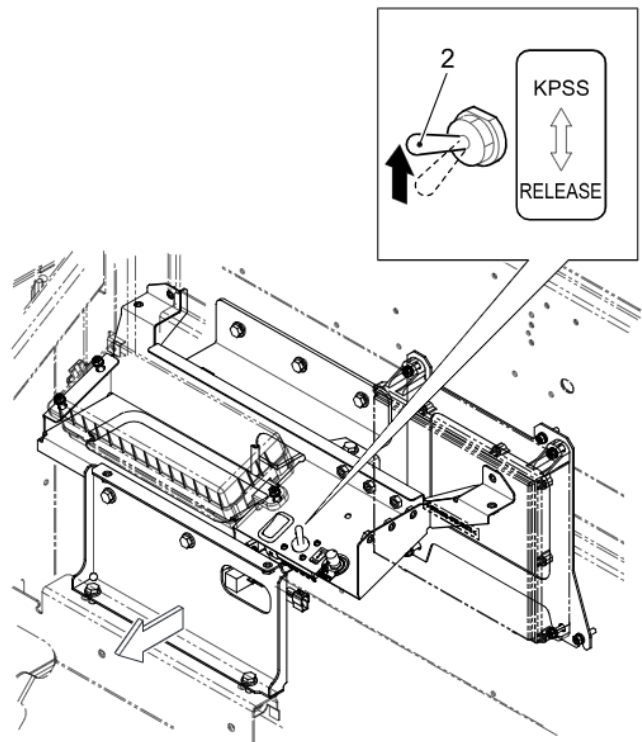
If warning (1) is displayed on the monitor, immediately contact your KOBELCO authorized dealer.

If the machine cannot be operated due to a failure of the controller and needs to be moved, or the machine position needs to be changed, release the KPSS to temporarily operate the machine.

CAUTION

- Release the KPSS only when temporal operation of the machine is required due to a controller failure.
- In cases other than described above, do not release the KPSS.
- In some cases, the machine may not be operated even though the KPSS is released, according to the cause of failure.

Move KPSS release switch (2) to the "RELEASE" side to release the KPSS. After the change, move the machine or change the machine position.



Notice

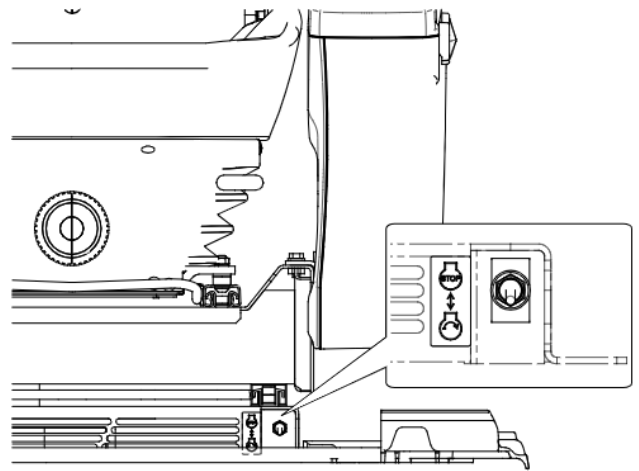
After the KPSS is released, the speed of the machine at operation is limited.

2.4.13 ENGINE STOP SWITCH

Notice

Do not use this switch to stop the engine under normal conditions.

When the engine does not stop due to trouble and damage of the machine even when turning the starter switch "OFF", lift up the switch near the lower left side of the seat to stop the engine. When not using this switch, always keep the switch down.



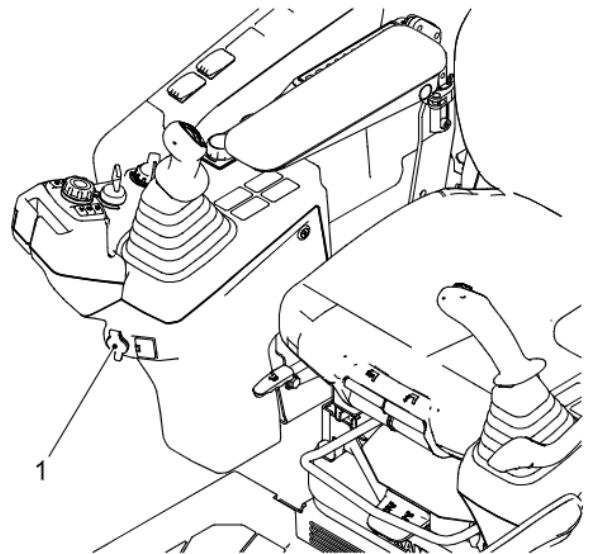
2

2.4.14 12 V POWER SUPPLY

Twelve volt power supply (1) is located at the lower side of the right control stand.

When using accessories such as a fan for general automobiles and other accessories that require the 12 V DC power supply, the 12 V power supply is required. Remove the cover from the 12 V power supply, and insert a 12 V male socket. After using the accessory, put the cover back on.

Maximum continuous output = 36 W



2.4.15 USB PORT/EXTERNAL INPUT TERMINAL (AUX)

Notice

- This part does not guarantee connection with all types of AUX terminals. Also, when each terminal does not match the inlet of this machine, connection is not available.
- For use of external sound devices, follow the manuals for them respectively.

Using the external input terminal (AUX), you can listen to music from a cell phone and external sound device. The USB port and the external input terminal are located at the lower side of the right control stand inside the cab. When using them, open cap (1), and connect each cable (sold separately). When they are not used, close cap (1).

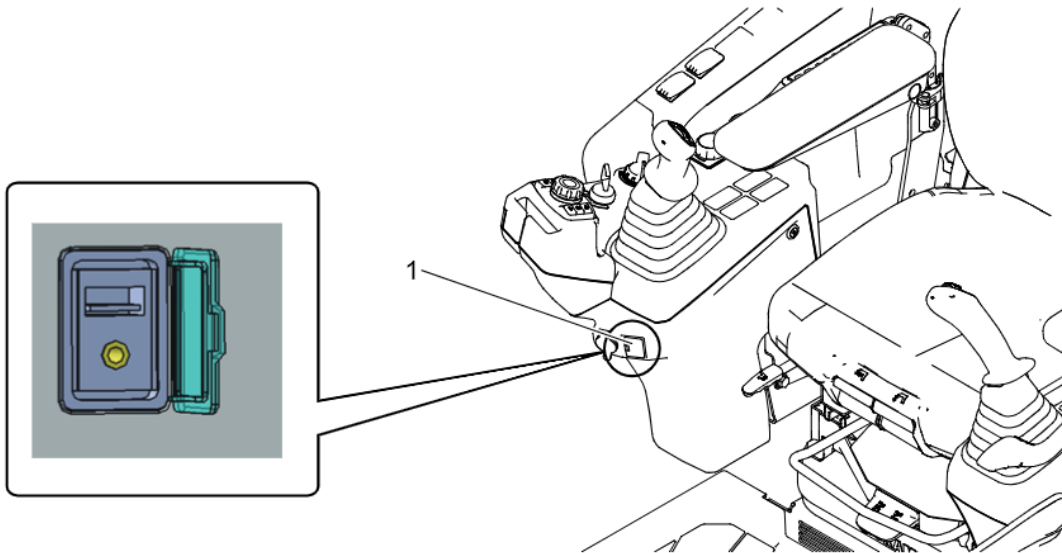
USB PORT

Charging is possible by connecting your cable to the USB connector (type A).

* Charging of all devices is not guaranteed.

EXTERNAL INPUT TERMINAL (AUX)

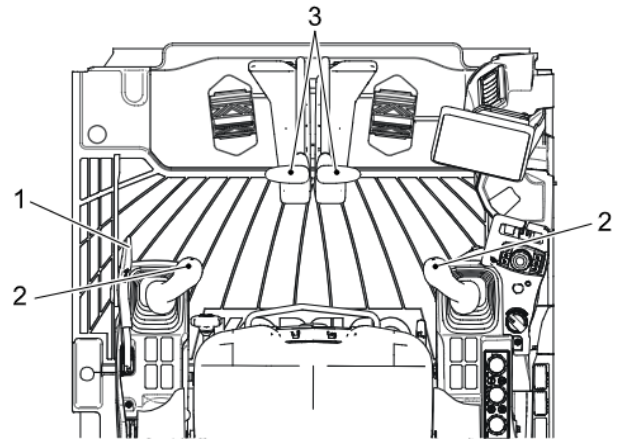
Connect a digital audio player, etc. to listen to music from the machine's speakers. For connection cables, see "HANDLING OF RADIO" in Chapter 2.



2.5 HANDLING OF LEVERS AND PEDALS

2.5.1 LOCATION OF LEVERS AND PEDALS

- (1) Control Lock Lever
- (2) Operator Control Levers
- (3) Travel Levers



2.5.2 CONTROL LOCK LEVER

The control lock lever is provided to prevent any unexpected operation due to unexpected contact with the left/right control levers or travel levers.

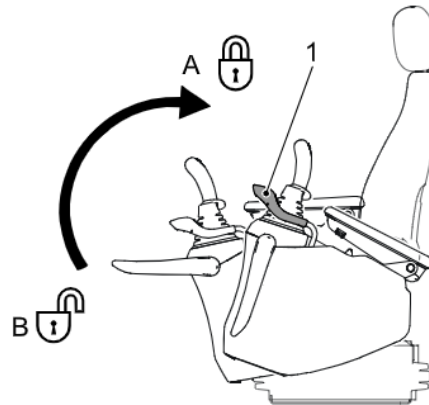


HANDLING OF CONTROL LOCK LEVER

- Do not stand up and move during operation, or unexpected contact with the control levers may cause a sudden movement of the machine. Raise the control lock lever securely to the "LOCKED" position before standing up or moving.
- Set the control lock lever to the "LOCKED" position securely, or it may not be locked. Make sure that the control lock lever is at the "LOCKED" position shown in the figure.
- When unlocking, do not touch other levers unintentionally. Touching other levers may cause danger due to unexpected machine movement.
- After completion of work or during transportation, be sure to set the control lock lever to the "LOCKED" position.
- Do not get on and off the machine holding the control lock lever.

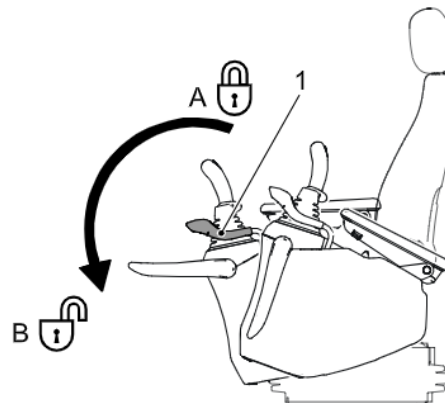
LOCKING HYDRAULIC SYSTEM

When the control lock lever is raised to "LOCKED" position (A), the operation control function is locked.



UNLOCKING HYDRAULIC SYSTEM

When the lever is lowered to the "UNLOCKED" position (B), the hydraulic system is unlocked.



2.5.3 OPERATOR CONTROL LEVERS



CONTROL OF LEVERS

- Before operation, be sure to pay attention to the safety of the surroundings and operate each lever slowly to fully make sure that the machine movement is in accordance with the control pattern indicated on the control pattern label in the cab.
- If you operate the machine while the control pattern label in the cab does not match the actual machine movement, it may cause severe personal injury.
- When the ISO/BHL card on the right side window does not match the actual machine movement, flip the card to the match the correct setting.
- When stopping swing operation, stop it earlier than your intended position by taking the swing distance after returning the swing lever to the neutral position into account.

Release the lever to return it to the neutral position and stop the attachment/equipment from moving. It is possible to perform various operations at the same time.

ISO pattern

Left control lever

- (1) Swing right
- (2) Swing left
- (3) Arm out
- (4) Arm in

N (Neutral): Upper structure and arm are held in the position at that time

Right control lever

- (5) Boom down
- (6) Boom up
- (7) Bucket in
- (8) Bucket out

N (Neutral): Boom and bucket are held in the position at that time

BHL pattern

Left control lever

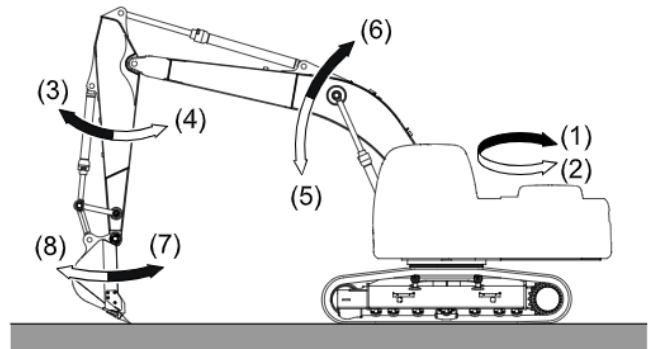
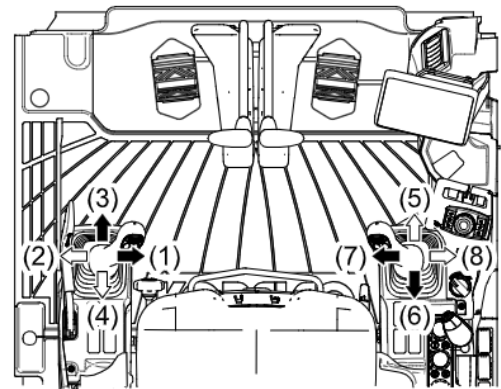
- (1) Swing right
- (2) Swing left
- (3) Boom down
- (4) Boom up

N (Neutral): Upper structure and arm are held in the position at that time

Right control lever

- (5) Arm out
- (6) Arm in
- (7) Bucket in
- (8) Bucket out

N (Neutral): Boom and bucket are held in the position at that time



Switching control pattern

As for switching procedure of the control pattern, refer to "MULTI-CONTROL VALVE (ISO & BHL PATTERN)" in Chapter 2.

2.5.4 TRAVEL LEVER & PEDAL



HANDLING OF THE TRAVEL LEVER & PEDAL

- During travel operation, pay attention to the control levers. There is a possibility of accident because the attachment is suddenly swung and moved by the unexpectedly touching and shifting the control lever.
- When operating the travel levers, check the crawler frame direction. When the travel motor is positioned on the front side, the traveling lever operation is reversed.
- If you put your foot on a pedal during work, there is a possibility of severe injury because the machine will start abruptly if the pedal is depressed unintentionally. Do not put your foot on a pedal, except for driving or turning with pedals.
- Pay attention when driving and operating with pedals.

FRONT/REAR AND LEFT/RIGHT OF MACHINE

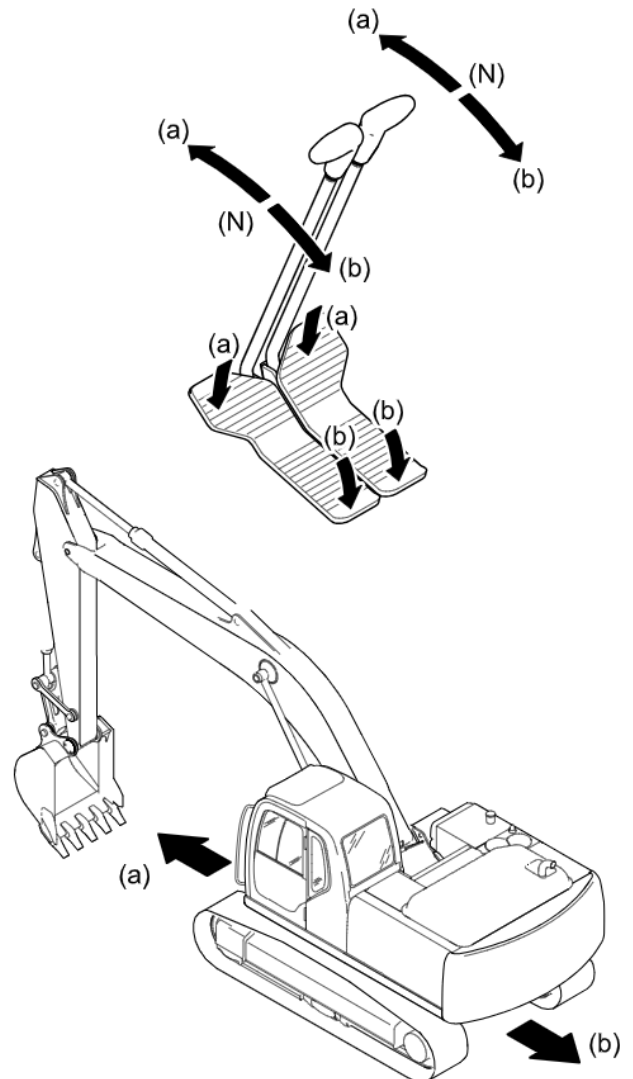
In this manual, front/rear and left/right are determined by looking the forward direction from the operator's seat with the travel motors at the rear side.

The manual levers and travel pedals are used for the travel operation of this machine.

(a) Travel forward: Push the travel levers to the front
(Depress the front of travel pedals)

(b) Travel backward: Pull the travel levers toward yourself
(Depress the back of travel pedals)

(N) Neutral: The machine stops traveling.



2.6 HANDLING OF FUSE & RELAY BOX

2.6.1 ABOUT FUSE & RELAY BOX

The fuses protect the wiring and electrical components from damage of burning out due to excess current. If the electrical system does not work properly, check to replace any blown fuses with new ones. If there is a corroded fuse generating white powder on it, or if some looseness exists between a fuse and its fuse holder, replace it as well.

2.6.2 REPLACING FUSES

CAUTION

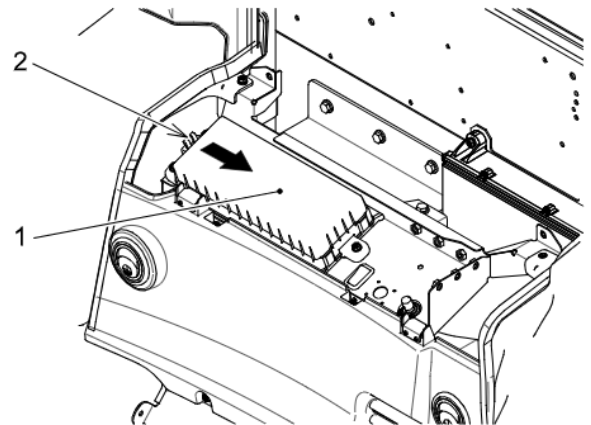
Make sure the starter switch is in the "OFF" position when replacing fuses.

Notice

- The spare fuses are stored in the fuse & relay box.
- A fuse must be replaced with a one of the same type and capacity of that of the blown fuses. The electrical system may be damaged if a different one is used. If fuse replacement is frequently required, it may be due to a failure in the electrical system. Please contact KOBELCO authorized dealer/distributor.

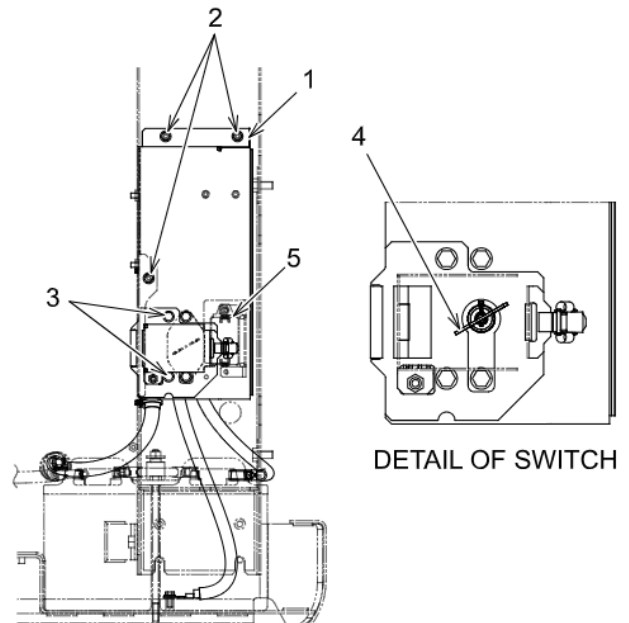
Replacement of fuse in operator's station

1. To remove the fuse box cover at the right side of the operator's seat, push lock part (2) of cover (1) inward and release the lock and then lift the cover.
2. When replacing the fuse, use a fuse extractor to remove it from the fuse box.
3. After replacing the fuse, install the cover securely.



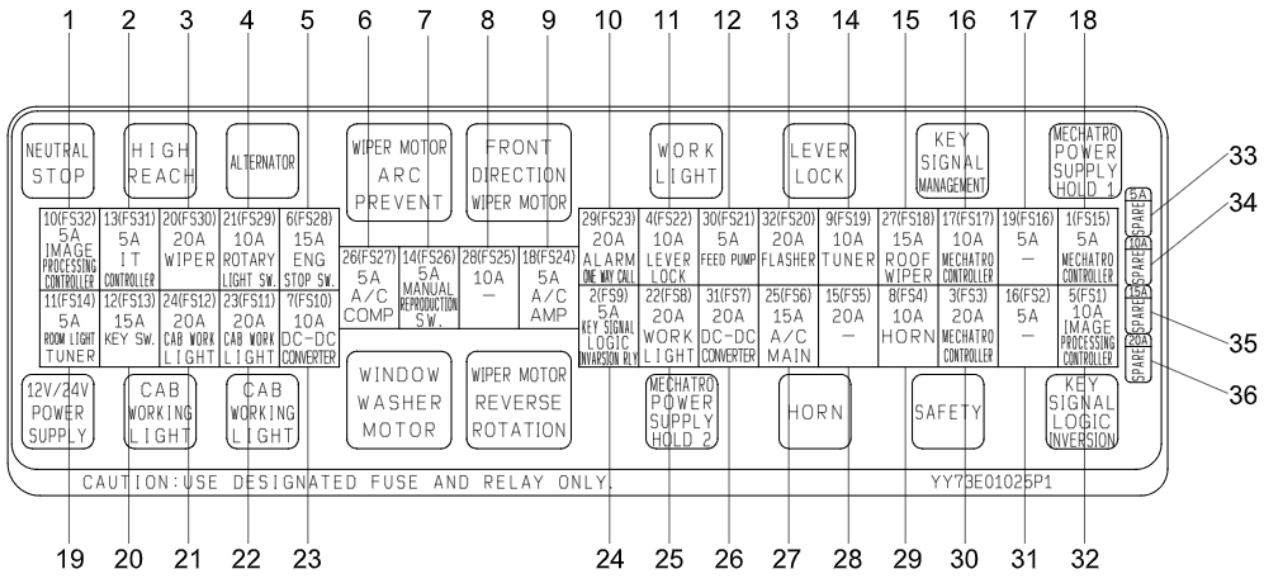
Replacement of fuse in starter relay

1. Use the starter key to open the side door on the left side of the machine and hold it with the stay.
2. Turn the battery power-off switch OFF.
ON: Turn the key to the right to connect the electrical circuit.
OFF: Turn the key to the left to shut down the electrical circuit.
3. Remove three mounting bolts (2) of starter relay cover (1) and four mounting bolts (3) of battery power-off switch (4) and its cover. And then remove the covers.
4. Open the cover of fuse box (5) and replace the fuse.
5. Install the removed covers.
Tightening torque: 23 N·m(16.9lbf·ft)
6. Remove the support stay and close the side door.



2.6.3 FUSE CAPACITY AND CIRCUIT NAME

The following shows each fuse capacity and circuit name.



Item	Capacity	Circuit Name	Item	Capacity	Circuit Name
1	5A	Image processing controller	19	5A	Room lamp, tuner
2	5A	IT controller	20	15A	Key switch
3	20A	Wiper	21	20A	Cab working light
4	10A	Rotary light switch	22	20A	Cab working light
5	15A	Engine stop switch	23	10A	DC-DC converter
6	5A	Air conditioner	24	5A	Key signal logic inversion relay
7	5A	Manual regeneration switch	25	20A	Working light
8	10A	-	26	20A	DC-DC converter
9	5A	Air con. Amp.	27	15A	Air conditioner
10	20A	Travel alarm	28	20A	-
11	10A	Lever lock	29	10A	Horn
12	5A	Feed pump	30	20A	Mechatro controller
13	20A	Flasher	31	5A	-
14	10A	Tuner radio	32	10A	Image processing controller
15	15A	Skylight wiper	33	5A	Spare fuse
16	10A	Mechatro controller	34	10A	Spare fuse
17	5A	-	35	15A	Spare fuse
18	5A	Mechatro controller	36	20A	Spare fuse

2.6.4 BATTERY POWER-OFF SWITCH

Set the battery power-off switch to "OFF" for the following purposes:

- To stop operation of the machine for a long period (one month or longer)
Shut down the power circuit to prevent battery discharge, short circuit, or electric leakage.
- To perform maintenance of the electrical system or electric welding
Shut down the power circuit to prevent damage of electrical components, fire and so on.

CAUTION

Before turning the battery power-off switch to the "O (OFF)" position, wait until the alarm stops sounding. If the battery power-off switch is turned off while the alarm is sounding, it can damage the exhaust gas cleaning device.

Sometimes the alarm keeps on sounding for about maximum 10 minutes.

Notice

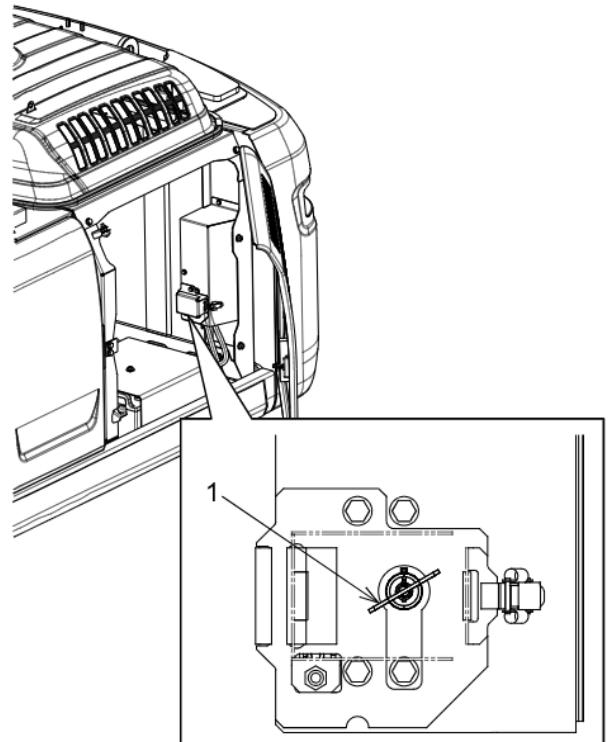
When setting the switch to the OFF position, all electrical circuits are shut down, and the preset memory and clock memory of the radio are cleared.

The battery power-off switch shuts down the battery circuit.

The switch is located on the right of the opened left side door. It is usually set to the "I (ON)" position.

ON(I): Turn key (1) right to connect the electrical circuit.

OFF(O): Turn key (1) left to shut down the electrical circuit.



2.7 HANDLING OF FUSIBLE LINK (FOR STARTER)

Notice

The fusible link is a large capacity circuit.

As with normal fuses, it protects electrical components and wiring from burn out due to excess current.

In case the starter does not work when the starter switch is turned "ON", disconnection of the fusible link is suspected. Check and replace it as needed.

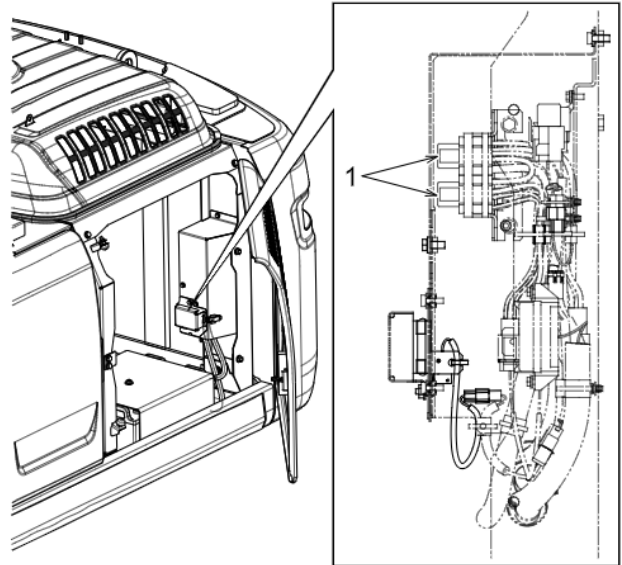
2.7.1 FUSIBLE LINK INSPECTION/REPLACEMENT

CAUTION

Remove the negative (-) terminal of the battery to shut down the flow of electricity to avoid electric shock and short circuit leading to damages of the component.

When the battery power-off switch is provided, set it to "OFF".

1. Use the starter key to open the side door at the left side of the machine and hold it with the stay.
2. Remove fusible link (1), and perform inspection or replace it with a new one.
3. Remove the supporting stay, and close the side door.

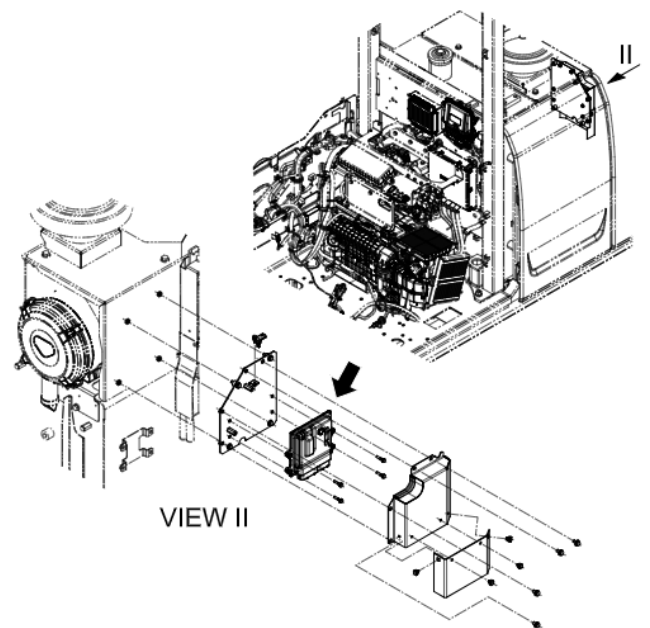
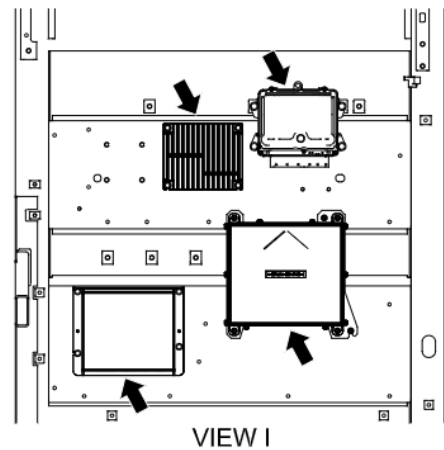
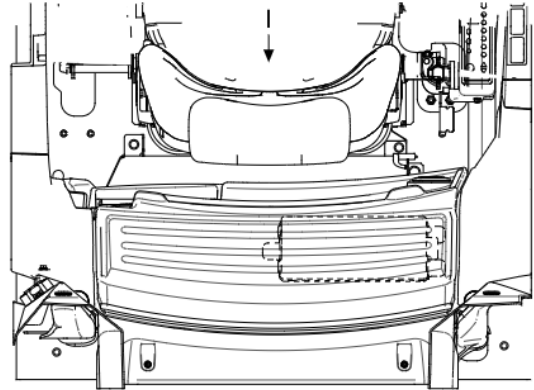


2.8 CONTROLLER

CAUTION

- Be careful not to splash water, mud and drinks on the controller. It may cause failure.
- When the controller warning is displayed on the monitor, contact your KOBELCO authorized dealer. See "WARNING DISPLAY SCREEN" in Chapter 2 for warnings.

The controller controls both the machine and the engine.



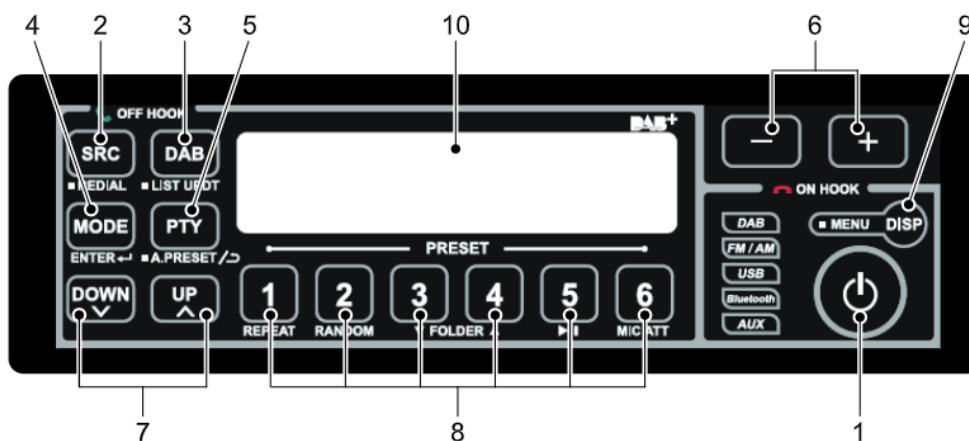
2.9 HANDLING OF RADIO (DAB)

CAUTION

Do not operate the radio during operation.

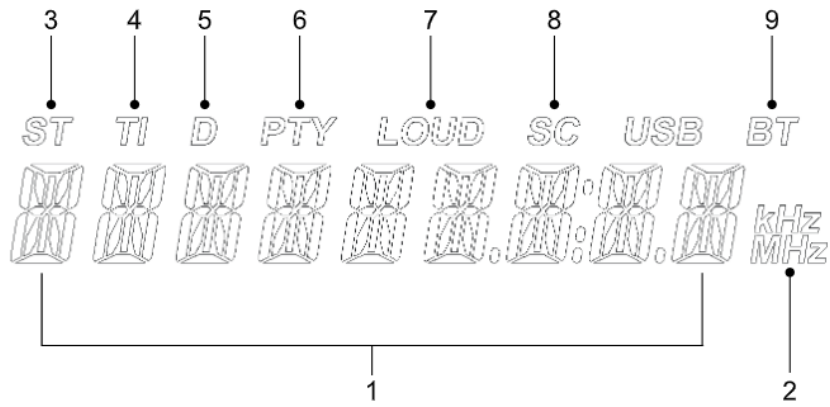
Lower the attachment to the ground, pull up the control lock lever to the "LOCKED" position, and then operate the radio.

2.9.1 NAME OF EACH PART



No.	Name	Function
1	[PWR] key	Turns the power of the unit ON/OFF.
2	[SRC] key	Switches the source (DAB→RADIO→EXT).
3	[DAB] key	Renews the received DAB list.
4	[MODE] key	Switches the sub source of each source.
5	[PTY] key	Performs PTY (DAB genre selection) and auto presetting (FM/AM).
6	[VOL+][VOL-] key	Adjusts the volume.
7	[UP][DOWN] key	Switches the frequency and the menu items.
8	[PRESET] key (1 to 6)	Recalls and registers preset frequencies.
9	[DISP] key	Switches the display (frequency/service name/title/clock).
10	LCD display	Displays the frequency and the clock.

LCD display

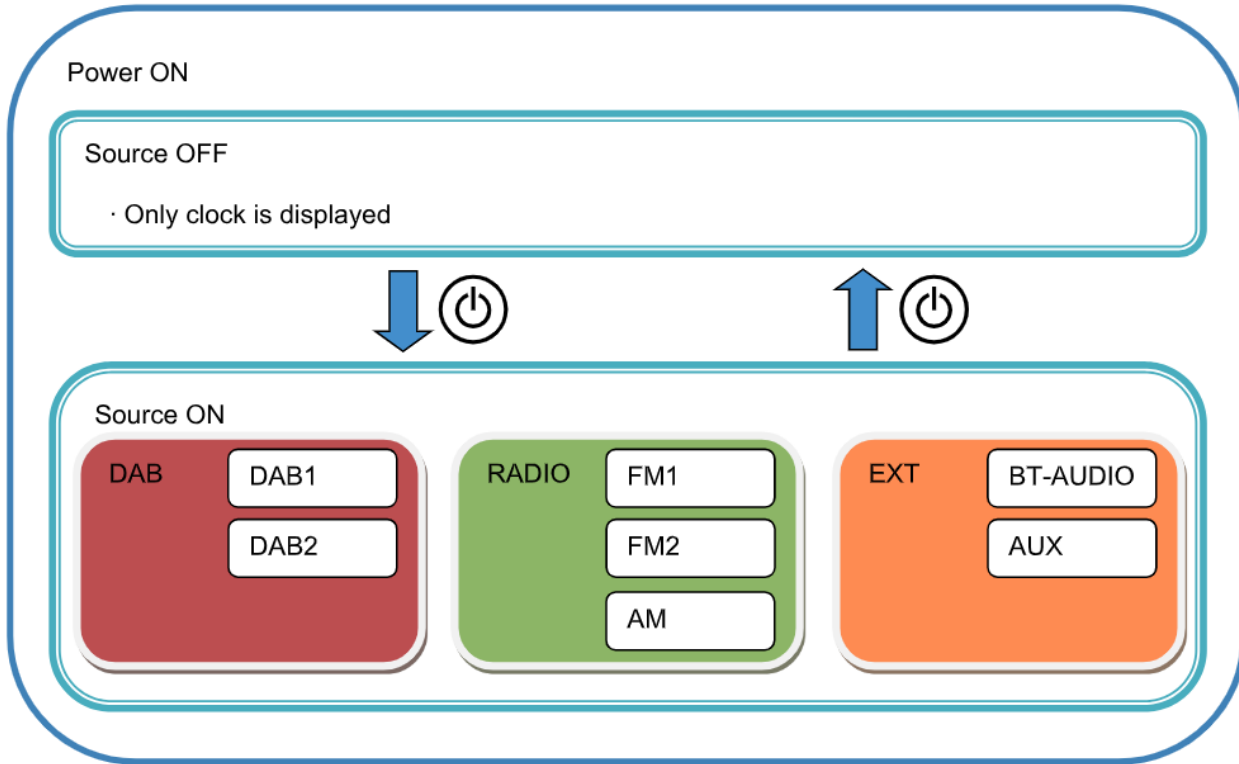


No.	Name	Function
1	Segment	Displays the information of letter/number such as source/frequency/service name.
2	kHz/MHz pict	Used as the unit of the frequency display.
3	ST pict	Turns on when DAB/FM1/FM2 is selected and stereo sound is received.
4	TI pict	Turns on when traffic information is received.
5	D pict	Turns on when DAB data is received.
6	PTY pict	Turns on when Program TYPe is used.
7	LOUD pict	Turns on when LOUDNESS is ON.
8	SC pict	Blinks when the DAB secondary service is provided and turns on when it is received.
9	BT pict	Turns on when connected with a mobile phone through Bluetooth.

2.9.2 SOURCE ON

When the source is OFF, [POWER] key enables the source to turn ON.

The source activated at the source ON is that selected when the source was turned OFF.

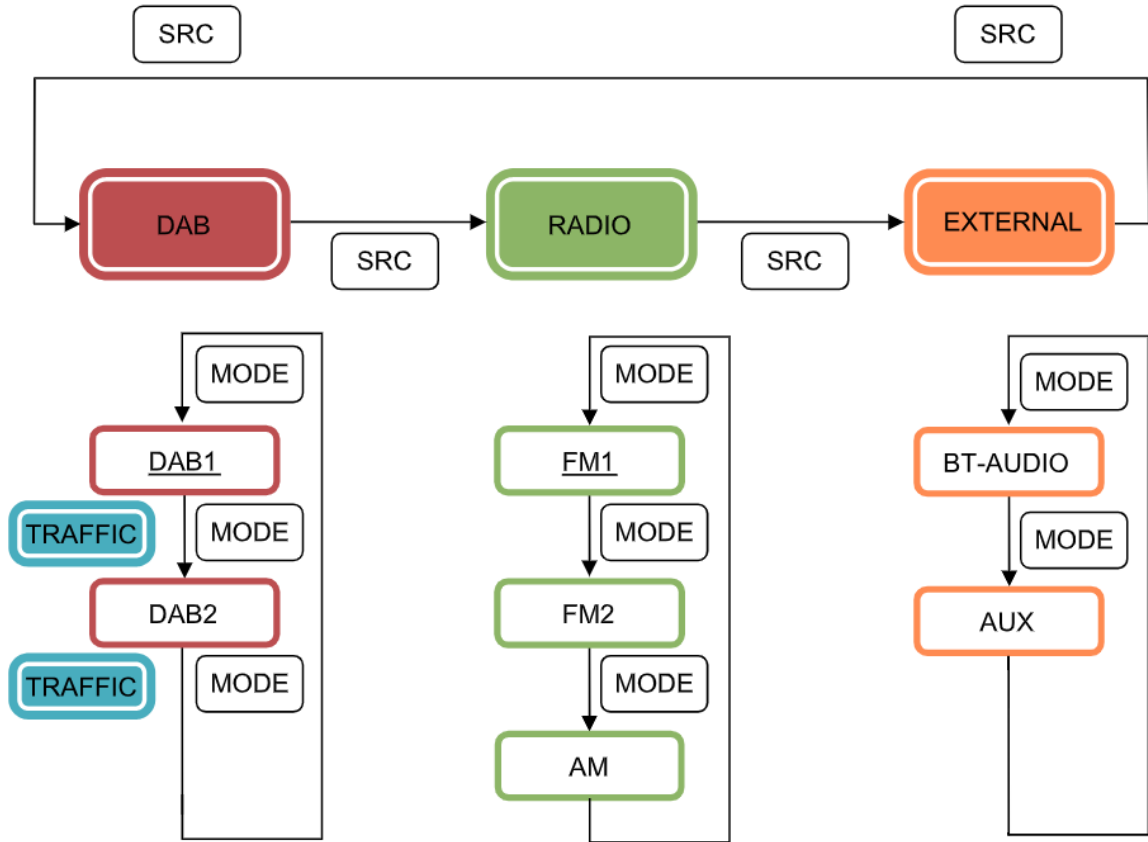


2.9.3 SWITCHING SOURCE

[SRC] key and [MODE] key can switch the input source.

If the source is not available, the source next to that becomes the default.

TRAFFIC is aired in the ensemble now selected in real-time. So, change due to source switching is not performed but the sound is automatically changed to TRAFFIC only when the TI interruption is activated at the menu.



- With underline: Default
- Change from DABx to TRAFFIC is performed automatically when the TI interruption is set for "AUTO" in the menu.

DAB

This is the source to receive the DAB broadcast.

DAB1/DAB2 can be selected according to the different places of preset registration.

RADIO

This is the source to receive the analog radio.

FM1/FM2 or AM can be selected according to the different places of preset registration.

EXTERNAL

This is the source to play the external device such as a Bluetooth Audio/AUX.

TRAFFIC (TRAFFIC INFORMATION)

This is the source to receive TI (TRAFFIC INFORMATION).

The play mode can be selected at the menu.

2.9.4 DAB

This receives DAB/DAB+radio.

The preset numbers are divided into 2 groups of DAB1 and DAB2.

(The group of the preset numbers are different, but the function is the same)

(1) DAB1

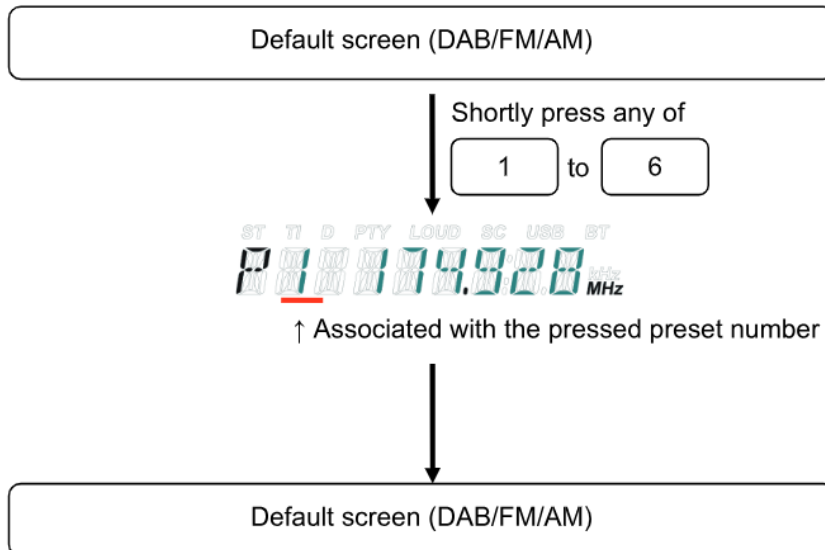


(2) DAB2



RECALLING PRESET FREQUENCY (DAB, FM, AM)

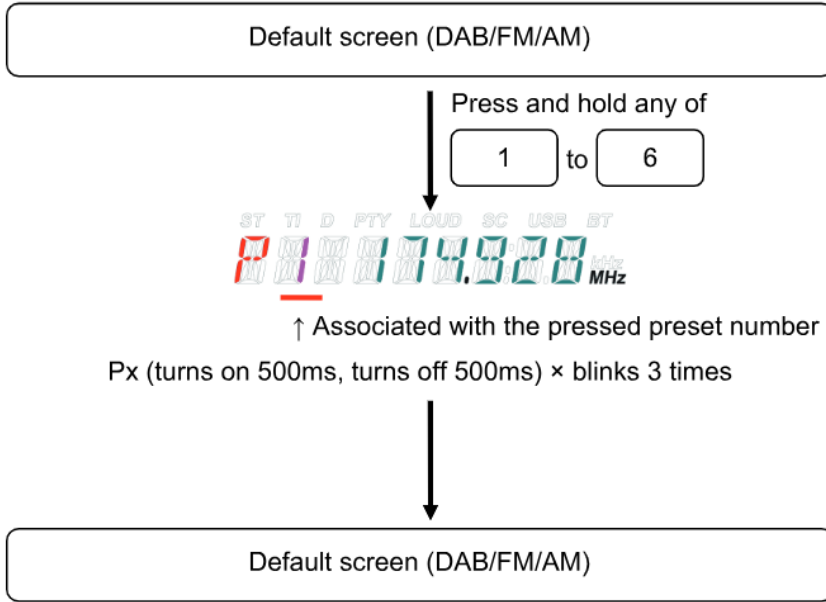
The frequency registered to the preset number can be recalled to receive the DAB/FM/AM.



REGISTERING PRESET FREQUENCY (DAB, FM, AM)

The frequency being received can be memorized into a desired preset number.

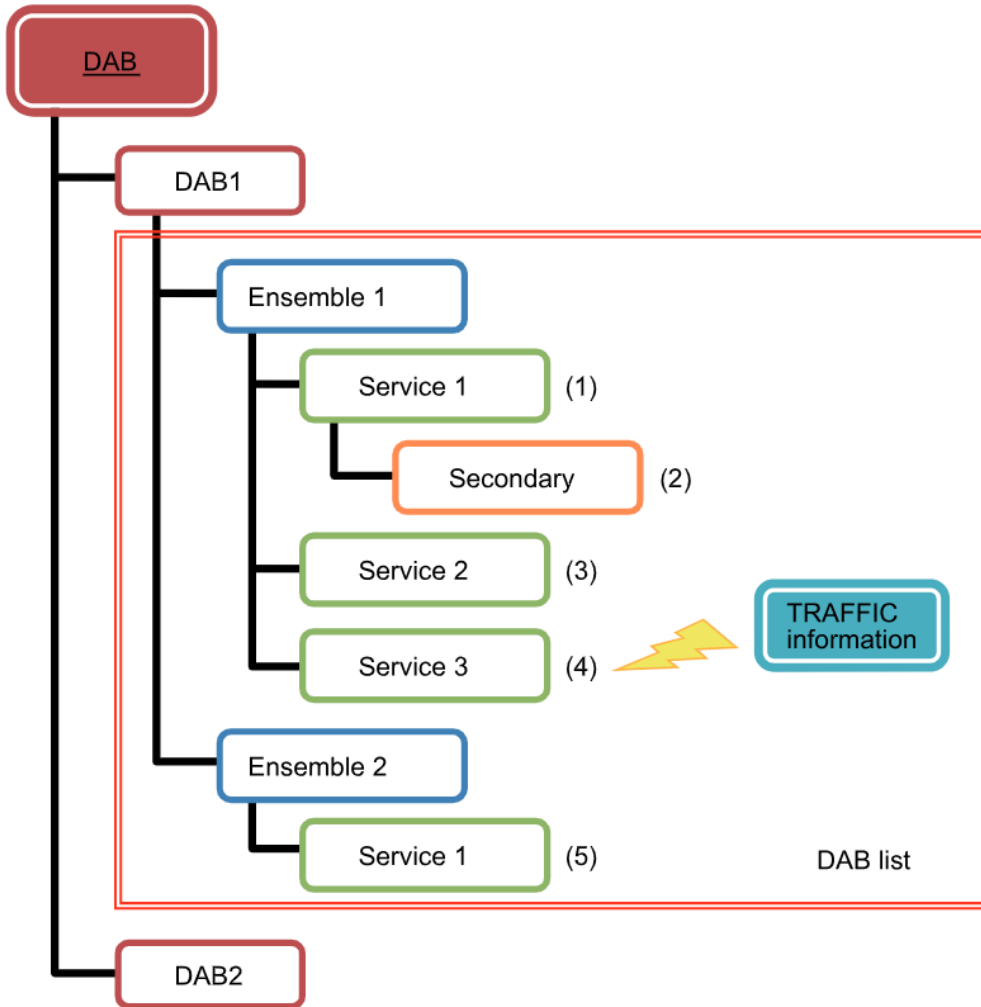
Source	Preset number
DAB	12 6×2 (DAB1, DAB2)
FM	12 6×2 (FM1, FM2)
AM	6



LIST SELECTION (DAB)

By shortly pressing [Δ] or [▽], the item changes to the list items below.

[Δ]: (1)→(2)→...→(5)→(1)... / [▽]: (1)→(5)→...→(2)→(1)→...



ENSEMBLE JUMP (DAB)

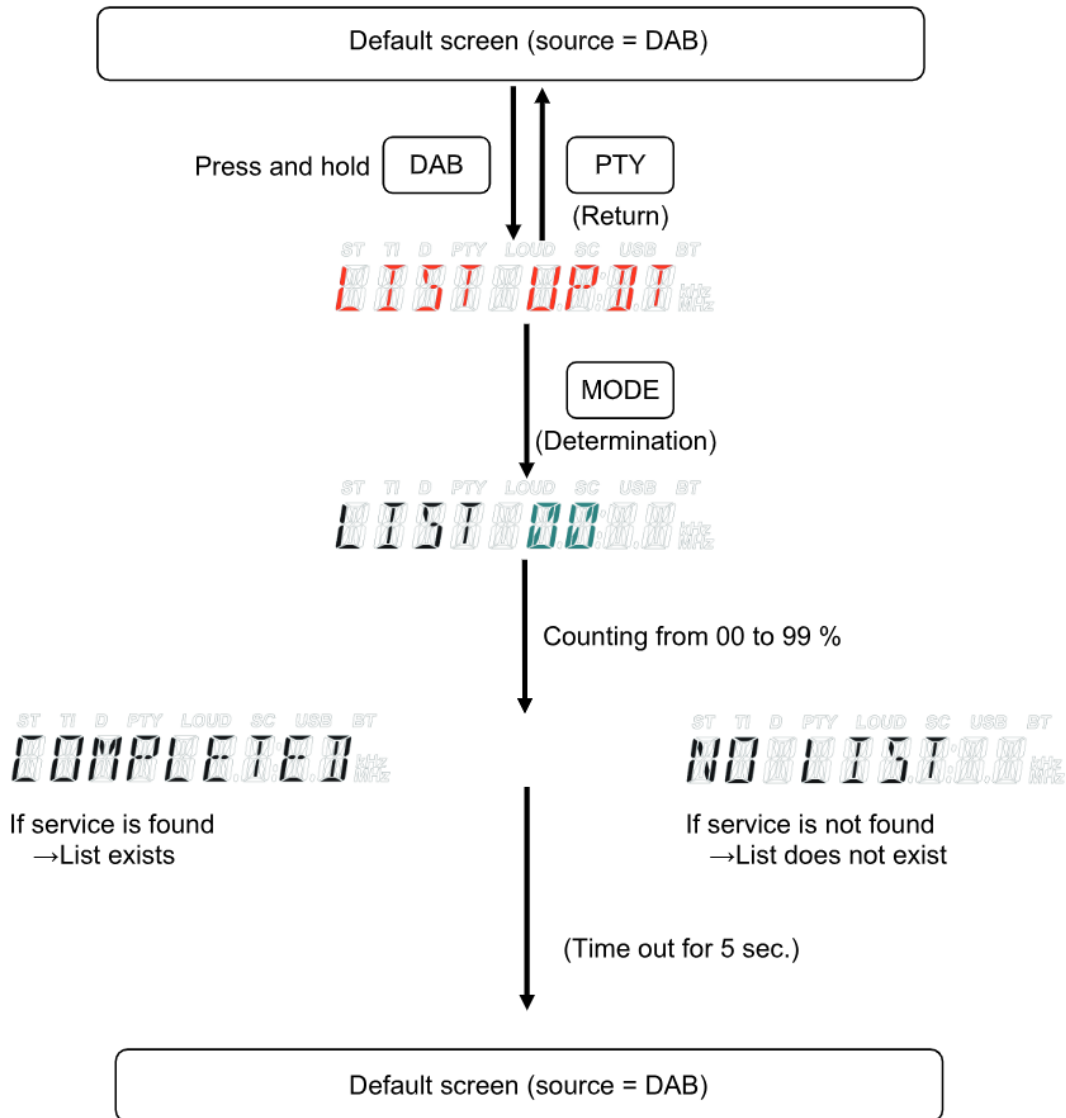
By pressing and holding [Δ] or [∇], the ensemble changes to the next ensemble.
 To perform ensemble jump, the DAB list shall be renewed beforehand.
 The list shown below is the channels of frequencies.

DAB channel

Channel No.	Frequency (MHz)
5A	174.928
5B	176.640
5C	178.352
5D	180.064
6A	181.936
6B	183.648
6C	185.360
6D	187.072
7A	188.928
7B	190.640
7C	192.352
7D	194.064
8A	195.936
8B	197.648
8C	199.360
8D	201.072
9A	202.928
9B	204.640
9C	206.352
9D	208.064
10A	209.936
10B	211.648
10C	213.360
10D	215.072
11A	216.928
11B	218.640
11C	220.352
11D	222.064
12A	223.936
12B	225.648
12C	227.360
12D	229.072
13A	230.784
13B	232.496
13C	234.208
13D	235.776
13E	237.488
13F	239.200

DAB LIST RENEWAL (DAB)

Receivable DAB list can be generated.
The order is the frequency order.



PTY SEARCH (DAB)

When the source is DAB, press the [PTY] button to activate the PTY search.

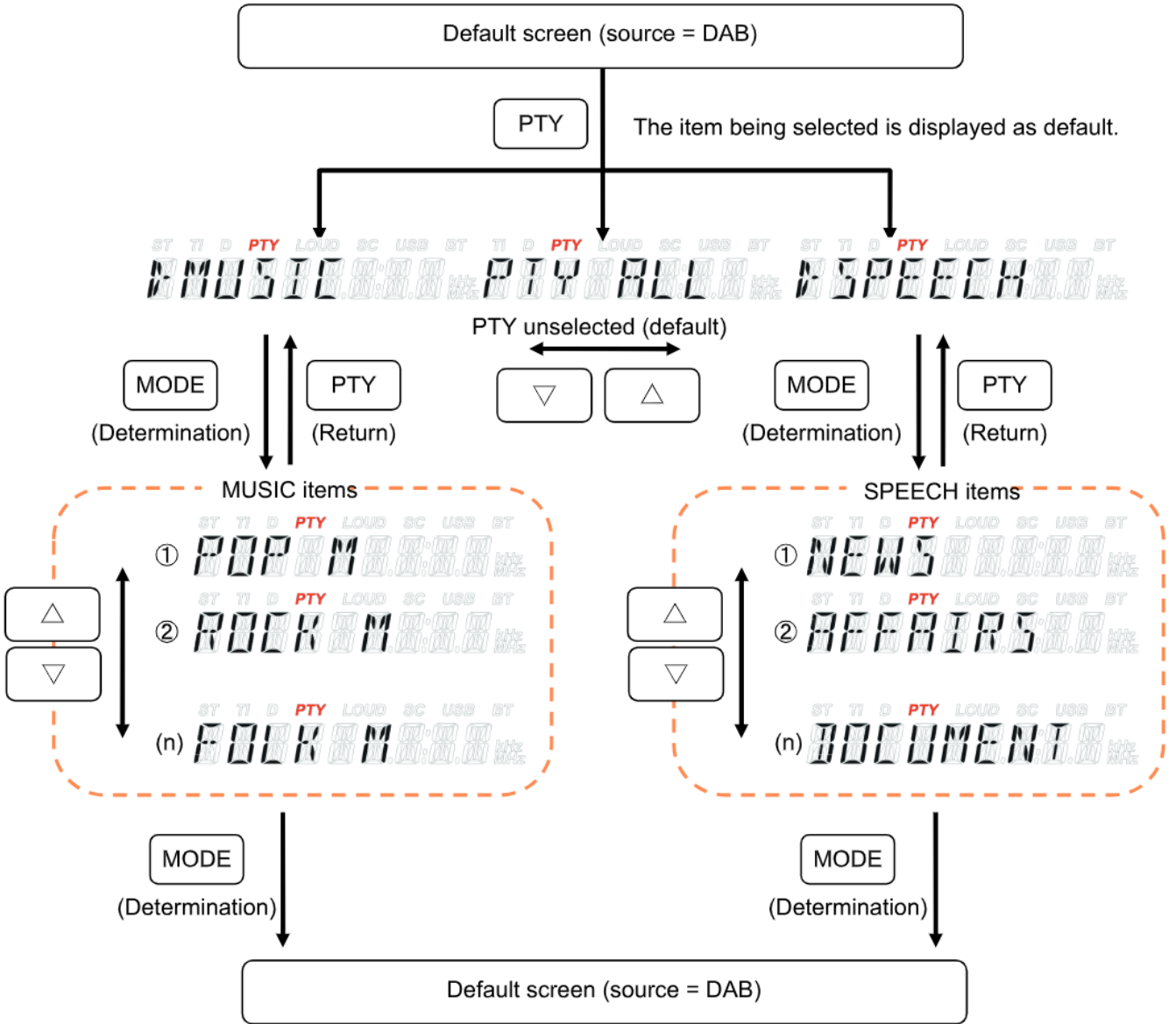
Select MUSIC or SPEECH.

Use [▽] or [△] key to select the item, [MODE] key to enter the next menu layer, and [PTY] key to back to the previous menu layer.

Each MUSIC or SPEECH has the item selected before, and it is the default when selecting the item.

As a result of PTY search, if the selected PTY is not in the DAB list, it will be deemed as that PTY ALL is selected.

→The PTY pict turns off.



[△] ① → ② → (n) → ① → ...

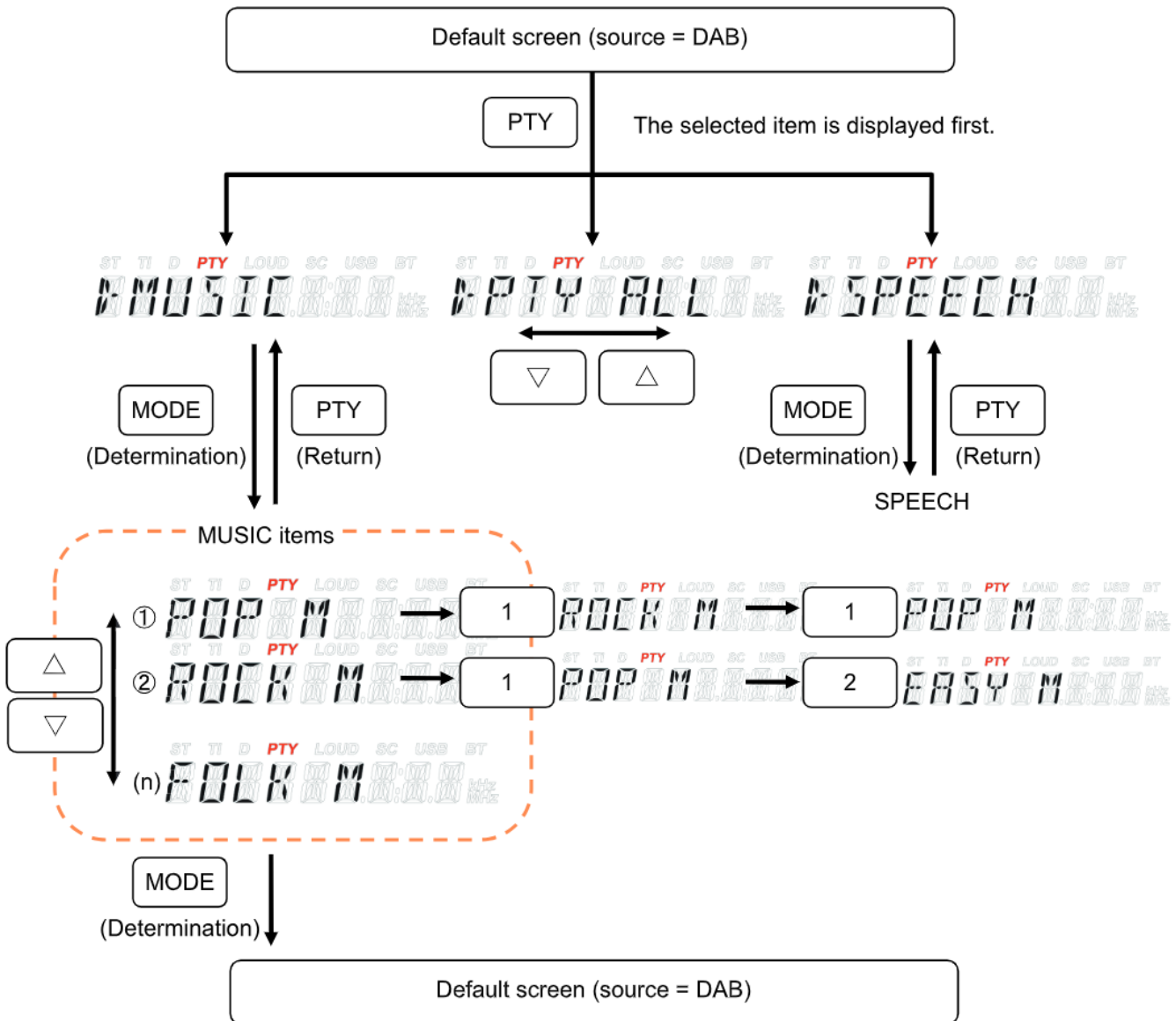
[▽] ① → (n) → ... → ① → (n) ...

[2. MACHINE FAMILIARIZATION]

- Short cut function

When selecting the MUSIC items or the SPEECH items, the number of pressing [Δ] or [▽] key can be reduced significantly by pressing the preset buttons.

	MUSIC group	SPEECH group
[1] key	POP M, ROCK M	NEWS, AFFAIRS, INFO
[2] key	EASY M, LIGHT M	SPORT, EDUCATE, DRAMA
[3] key	CLASSICS, OTHER M	CULTURE, SCIENCE, VARIED
[4] key	JAZZ, COUNTRY	WEATHER, FINANCE, CHILDREN
[5] key	NATION M, OLDIES	SOCIAL, RELIGION, PHONE IN
[6] key	FOLK M	TRAVEL, LEISURE, DOCUMENT

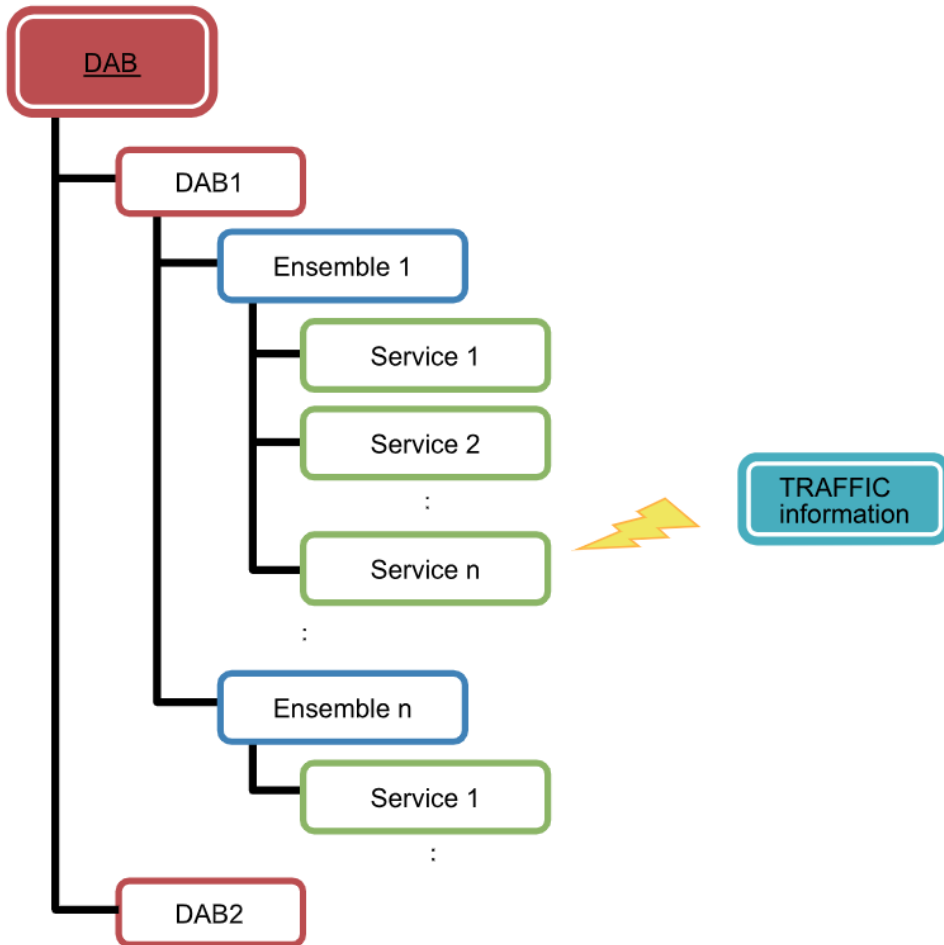


[Δ] ① → ② → (n) → ① → ...

[▽] ① → (n) → ... → ① → (n) ...

	ST TI D PTY LOUD SC USB BT	ST TI D PTY LOUD SC USB BT
	NEWS	NEWS
1	NEWS	NEWS
2	NEWS	NEWS
3	NEWS	NEWS
4	NEWS	NEWS
5	NEWS	NEWS
6	NEWS	NEWS
7	NEWS	NEWS
8	NEWS	NEWS
9	NEWS	NEWS
10	NEWS	NEWS
11	NEWS	NEWS
12		NEWS
13		NEWS
14		NEWS
15		NEWS
16		NEWS
17		NEWS
18		NEWS

TRAFFIC (TRAFFIC INFORMATION)



TRAFFIC information occurs in the ensemble being played now.

→Other ensembles (Ensemble n, as shown in the figure above) cannot detect the TRAFFIC information even though it occurs.

When the TRAFFIC information occurs in the ensemble being played now, if the TI interruption setting menu is set to AUTO, the item is automatically switched from the service being played now to the service in which the TRAFFIC information is being played.

→After the TRAFFIC information is finished, the service returns to the previous service.

2.9.5 FM/AM

FM

This receives FM broadcast.

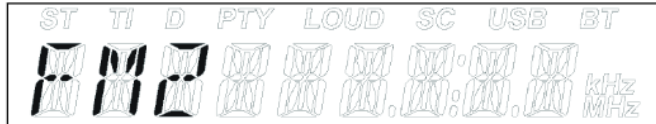
The preset numbers are divided into 2 groups of FM1 and FM2.

(The group of the preset numbers are different, but the function is the same)

(1) FM1

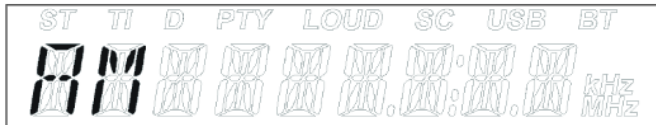


(2) FM2



AM

This receives AM broadcast.

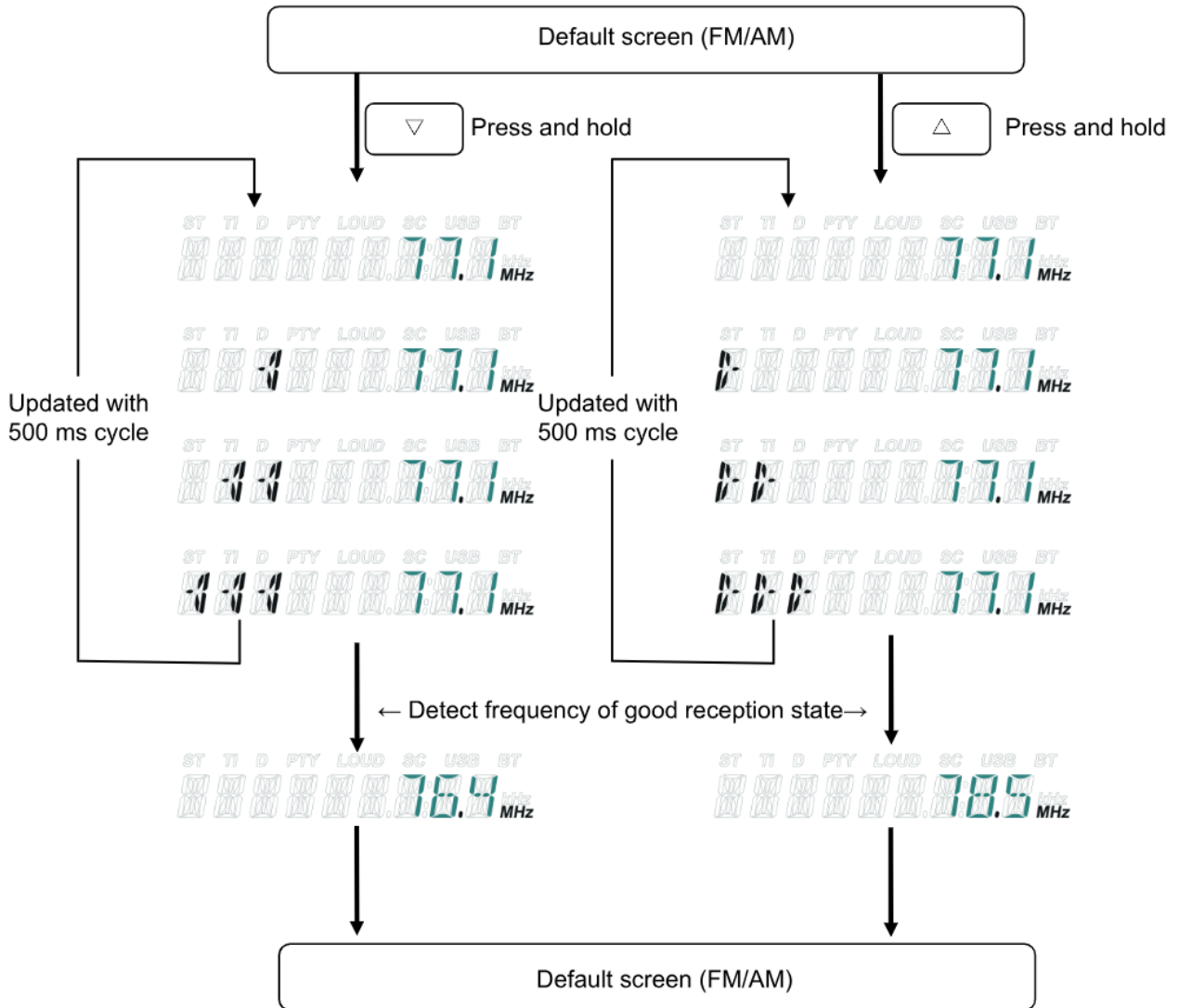


[2. MACHINE FAMILIARIZATION]

AUTO SEEK UP/DOWN (FM, AM)

The frequency in good condition to be received is detected and received.

Even though the frequency in good condition to be received cannot be found after one cycle of seeking, auto seek operation will be continued.



MANUAL SEEK UP/DOWN (FM, AM)

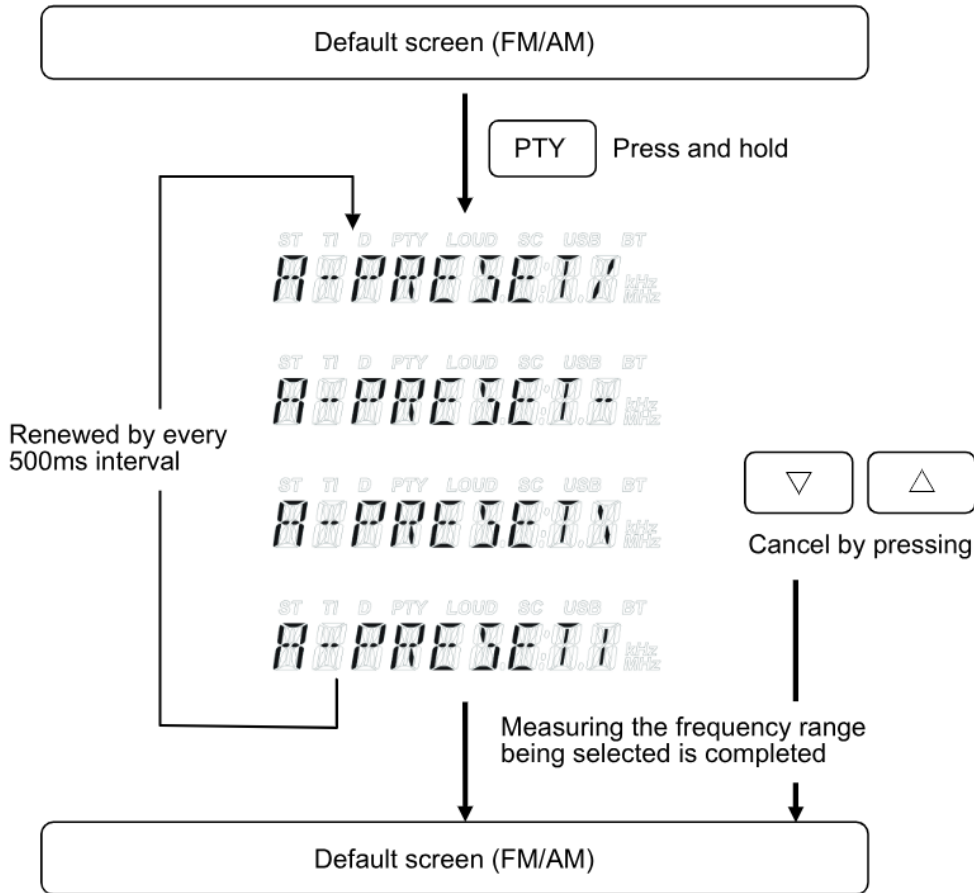
By shortly pressing [△] or [▽], the channel is moved to the next channel.

The increment/decrement of frequency up/down is one step.

AUTOMATIC PRESETTING (FM, AM)

<FM/AM>

The frequencies with the intensity to be received well are registered in preset memories 1 to 6 in order.



2

2.9.6 BLUETOOTH AUDIO

The Bluetooth unit dedicated for external devices is used.

Audio files can be played by connecting a mobile phone or Bluetooth audio device through Bluetooth.

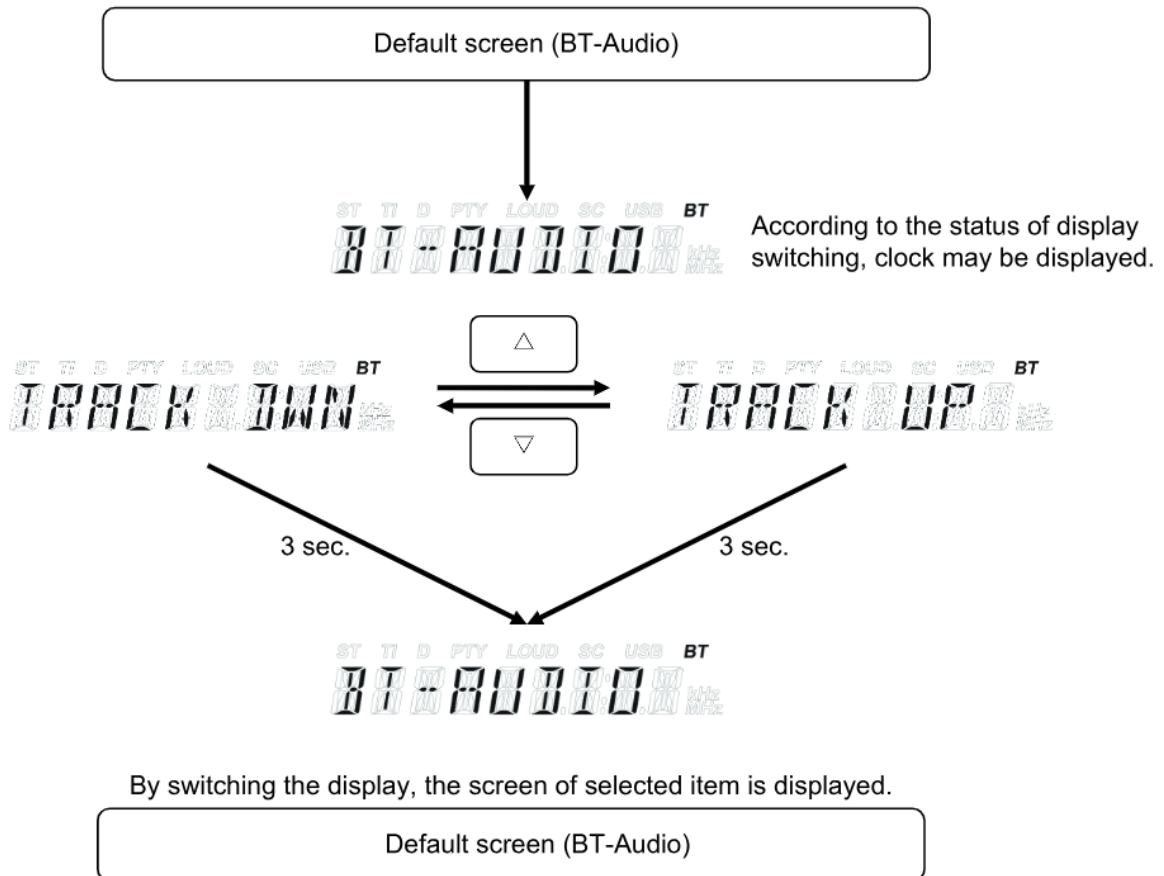
Operations such as play/pause and change to the next or previous track are possible.



CHANGING TRACKS

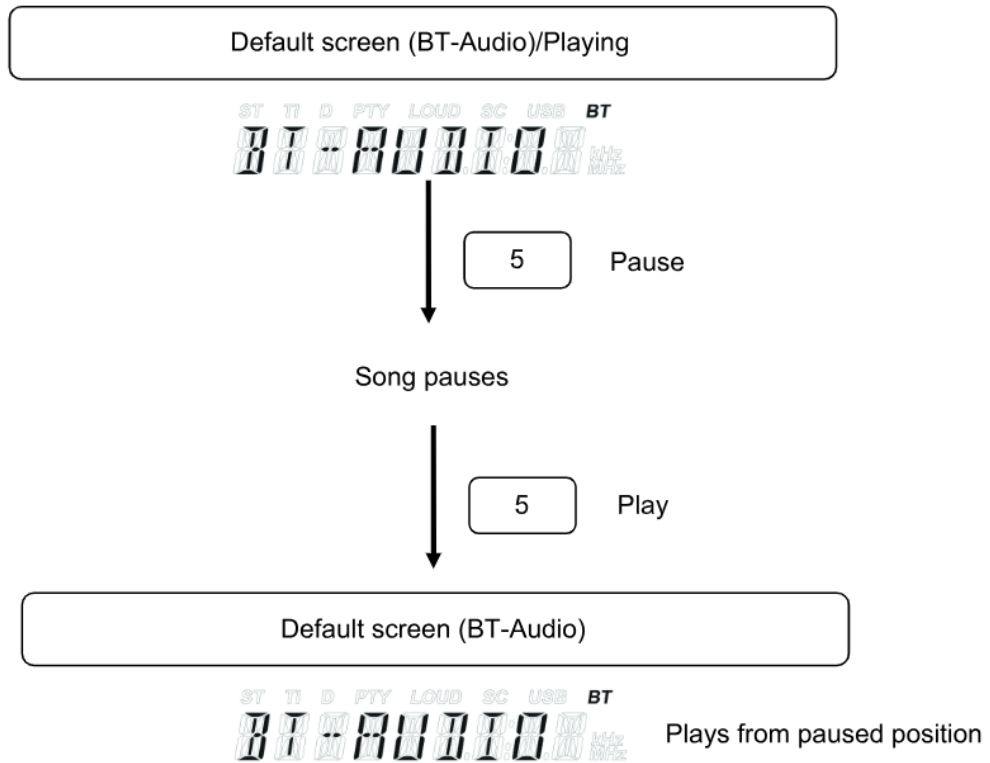
By shortly pressing [Δ] or [▽] key, the track can be changed.

BT-Audio cannot display the track name and the play time. (Bluetooth device restriction)



PAUSE

The track being played can be paused. Playing starts if the play key is pressed again.



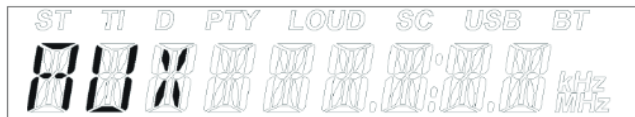
2

Basic specification of Bluetooth

Item	Contents
Bluetooth version	5.0
Field intensity	Class 1
Maximum number of devices for pairing registration	8 units
Supported profile	A2DP / AVRCP / HFP / SPP
Frequency range	2402 — 2480 MHz
Modulation system	GFSK, $\pi/4$ -DQPSK, 8-PSK
Output power	Max. 10.0dBm e.i.r.p

2.9.7 AUX

Audio input from a connected external device is output from the radio AV unit.

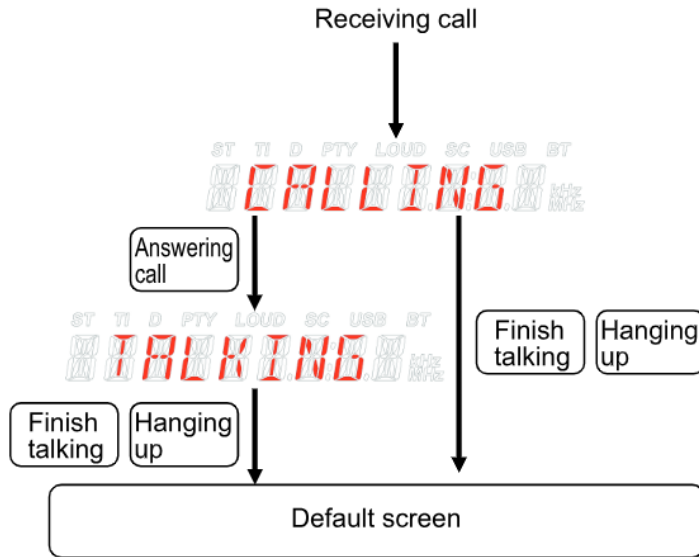


2.9.8 BLUETOOTH HANDSFREE

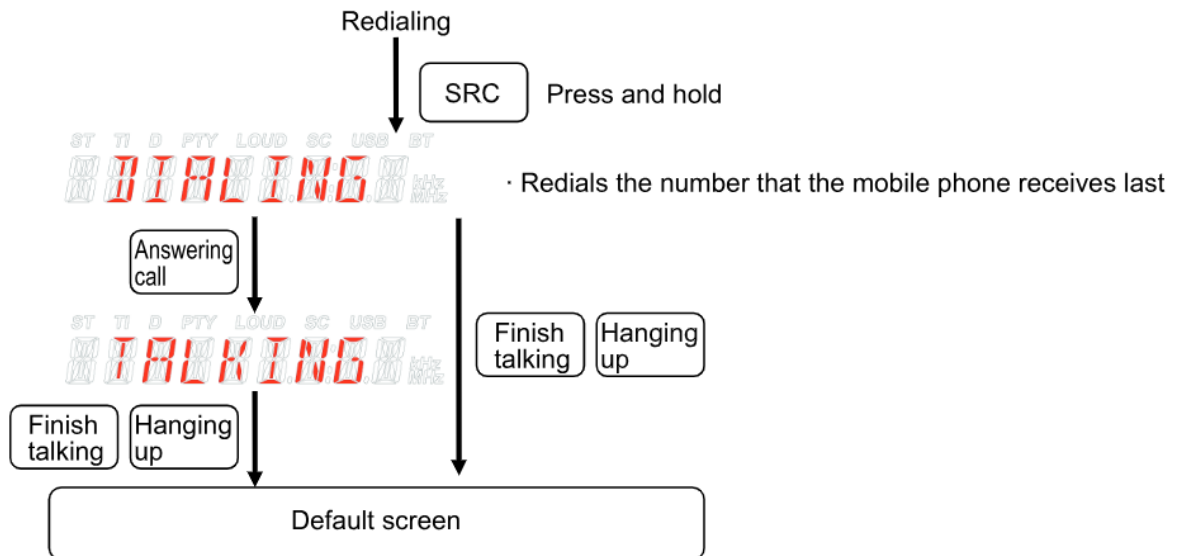
Handsfree talking by the mobile phone with Bluetooth (HFP protocol) is possible.

Item	Applicable	Contents
Incoming call to finishing talking	Yes	Incoming call → talking: Press any of SRC, DAB, MODE, PTY, UP/DOWN, or PRESET to start talking. Talking → Finishing talking: Press DISP or POWER button to finish talking and enter the status of before receiving the incoming call.
Incoming call rejection	Yes	Used when answering the call is impossible. Press DISP or POWER button and then the call is rejected and the radio AV unit changes to the band selected before receiving the incoming call.
Redialing	Yes	The redialing function dials the number of the incoming call received last after ACC ON. However, depending on a mobile phone, if the time of receiving call is short, it may not be able to dial. Press and hold SRC button.

RECEIVING CALL

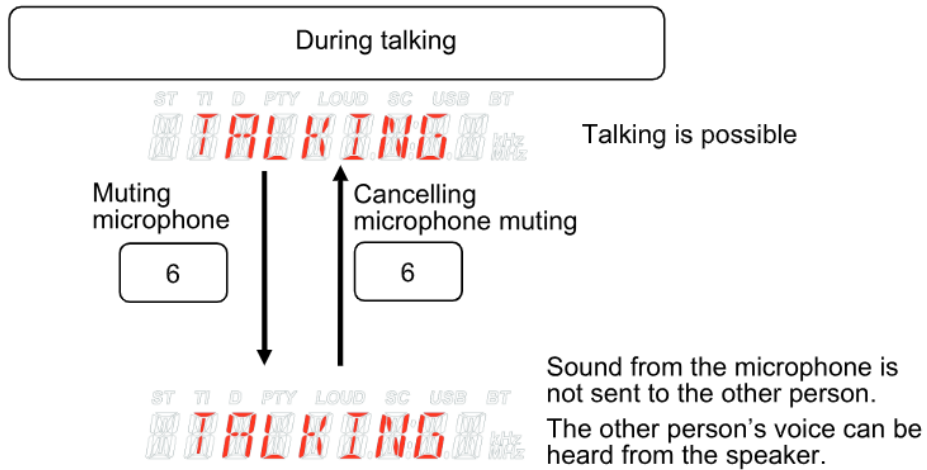


REDIALING



MUTING MICROPHONE

Used when you would not like to input sound to the mobile phone temporarily during talking.



2.9.9 CLOCK DISPLAY

Switching 24 hrs./12 hrs. display is possible from the menu.

When the 12 hrs. display is selected, AM/PM is also displayed.

12 hrs. display	24 hrs. display
AM 12:00 to 12:59, 1:00 to 11:59	0:00 to 23:59
PM 12:00 to 12:59, 1:00 to 11:59	0:00 to 23:59

Sample of display



12-hour display (AM)



12-hour display (PM)



24-hour display

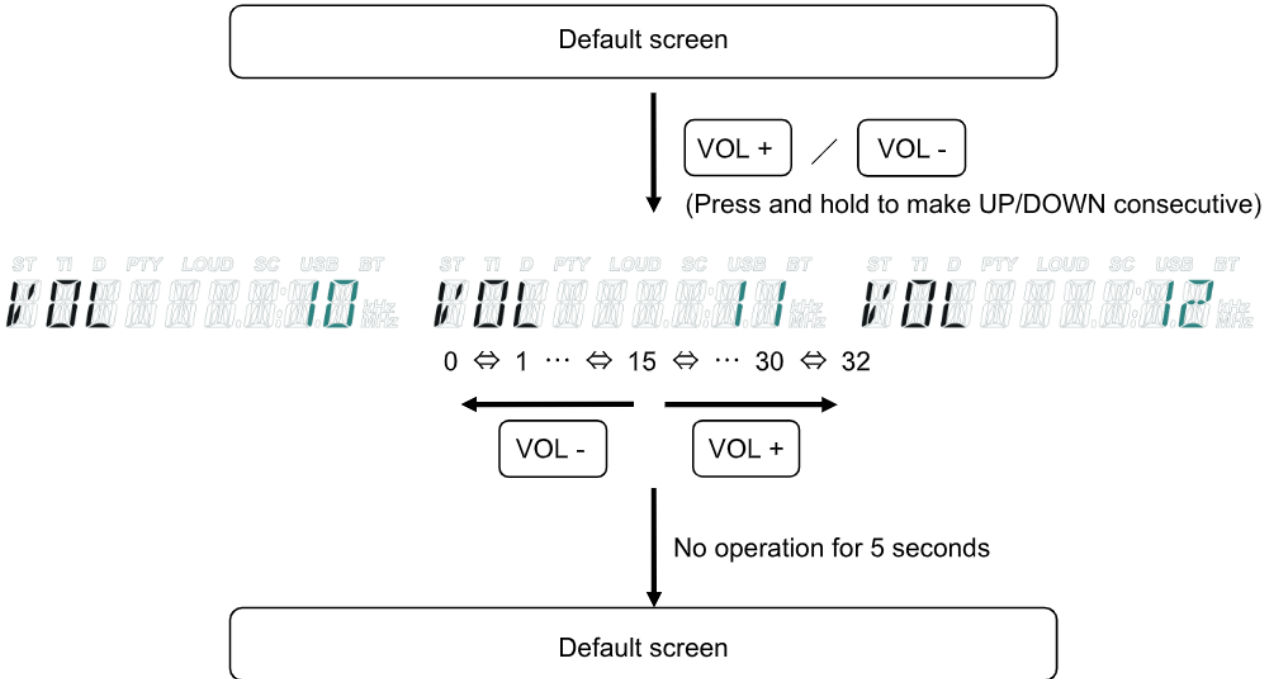
2.9.10 VOLUME CONTROL

The volume level output from this unit can be changed.

The volume level can be increased/decreased up/down by 1step or consecutively.

If no operation status continues for 5 seconds, the display changes to the previous display before the operation.

Item	Value
Range	0 (muting) to 32 (all 33 steps)
Default value	11



2.9.11 SWITCHING DISPLAY

The display mode selected last is memorized.

If applicable item is not found, (ex. the FM source at display 2) the item of the next display mode will be displayed. However, the display mode number is kept.

Display mode	DAB	FM/AM	Bluetooth Audio	AUX
1	Source name	→	→	→
2	Ensemble name	-	-	-
3	Secondary name	-		
4	Service name	-	-	-
5	Frequency display	Frequency display	-	-
6	Channel No.	-	-	-
7	Clock	→	→	→

→: Same to the left, —: Not applicable

SOURCE NAME (ALL)

Each source name (DAB/FM/AM/Bluetooth Audio/AUX) is displayed according to the display specification. Refer to the source switching screen

ENSEMBLE NAME (DAB)

The received ensemble name is displayed.



SERVICE NAME (DAB)

The received DAB service name is displayed.



SERVICE NAME (DAB)

The received DAB service name is displayed.



FREQUENCY DISPLAY (DAB, FM, AM)

The frequency being received is displayed.



Example of actual display



[2. MACHINE FAMILIARIZATION]

CHANNEL NO. (DAB)

The channel number being received is displayed.



Example of actual display



CLOCK DISPLAY (ALL)

Clock is displayed.



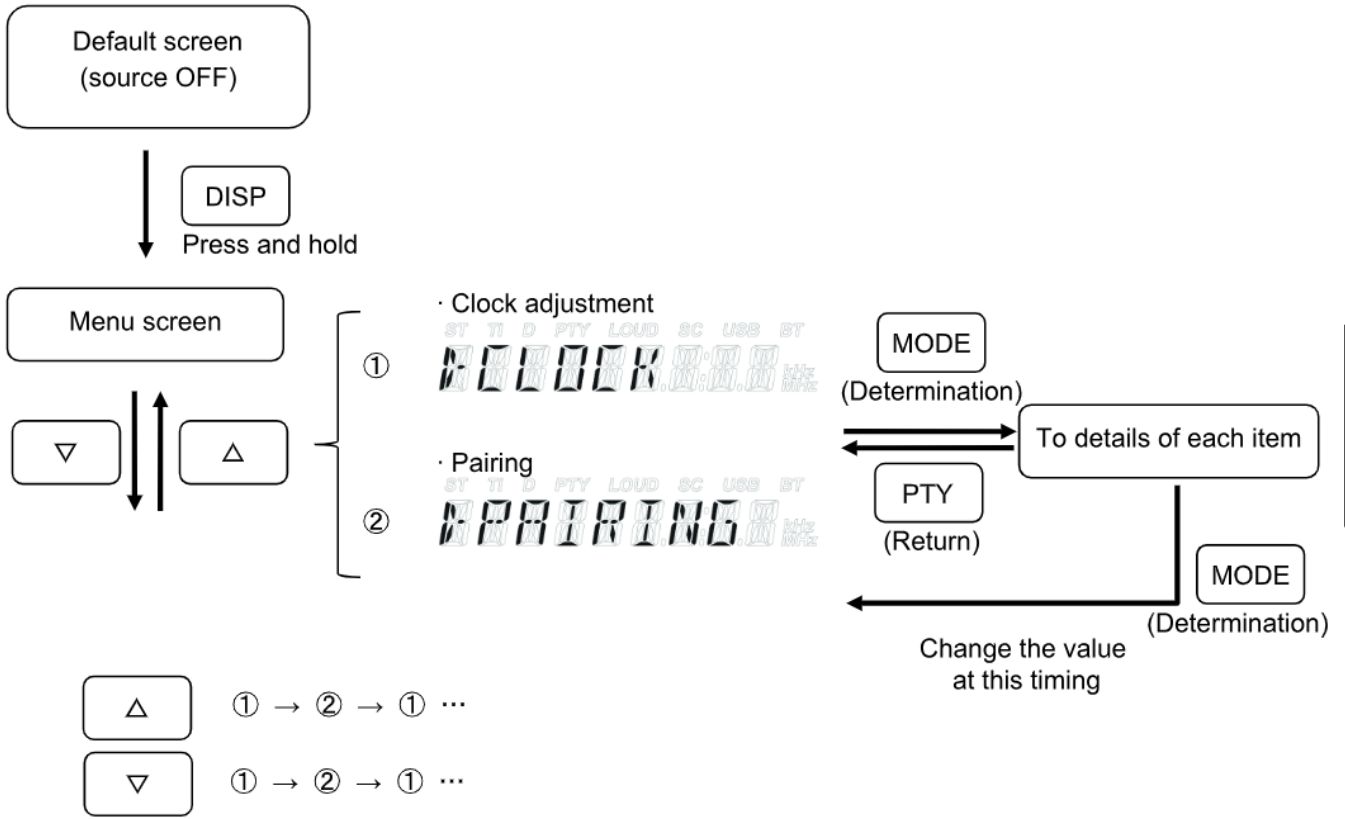
2.9.12 DRC (DYNAMIC RANGE CONTROL)

The function that clarifies the low tone drowned by noise at small volume.

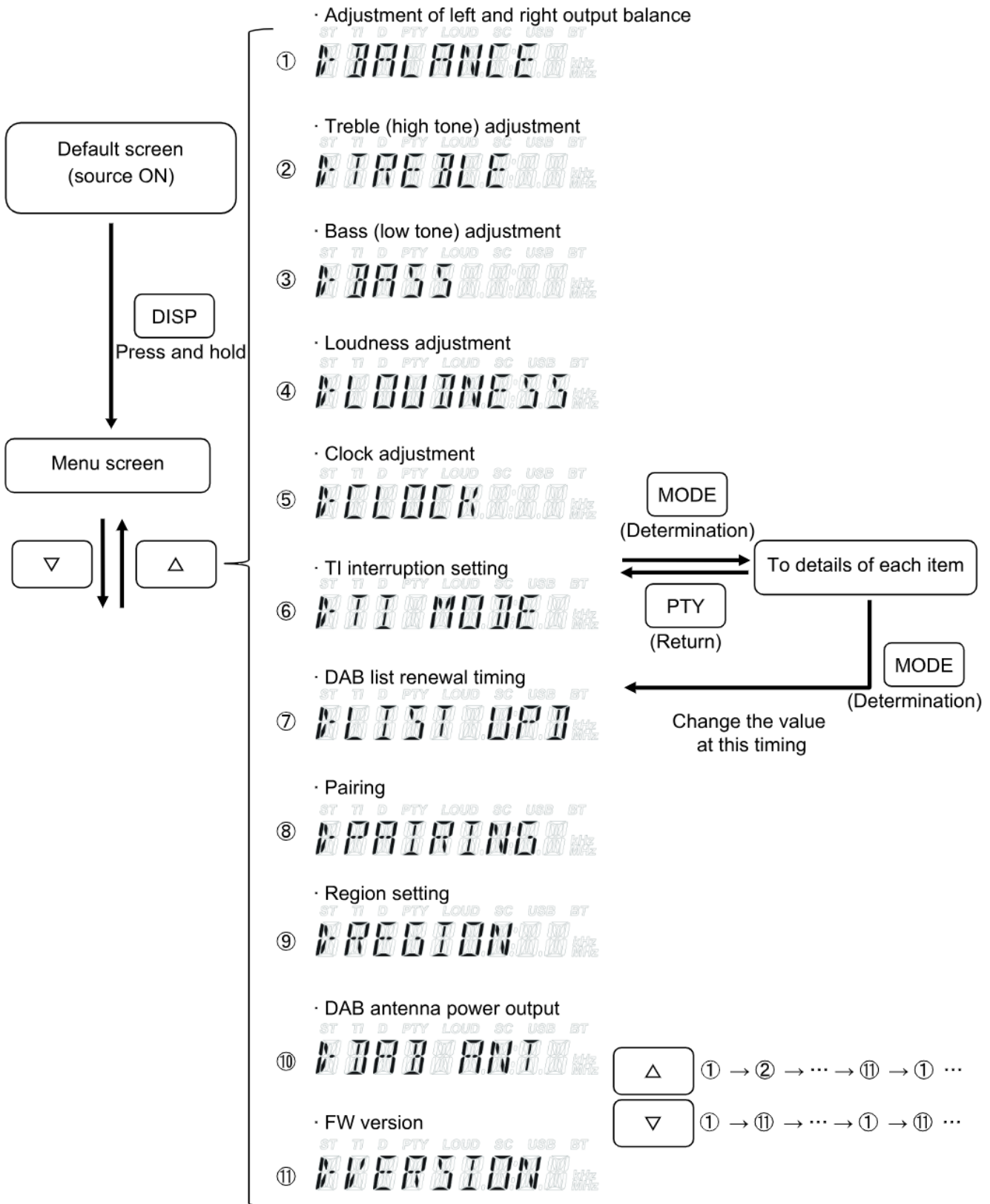
2.9.13 MENU

Each set value can be changed.

<Source OFF menu> * Perform this under power OFF condition brought by PWR key.



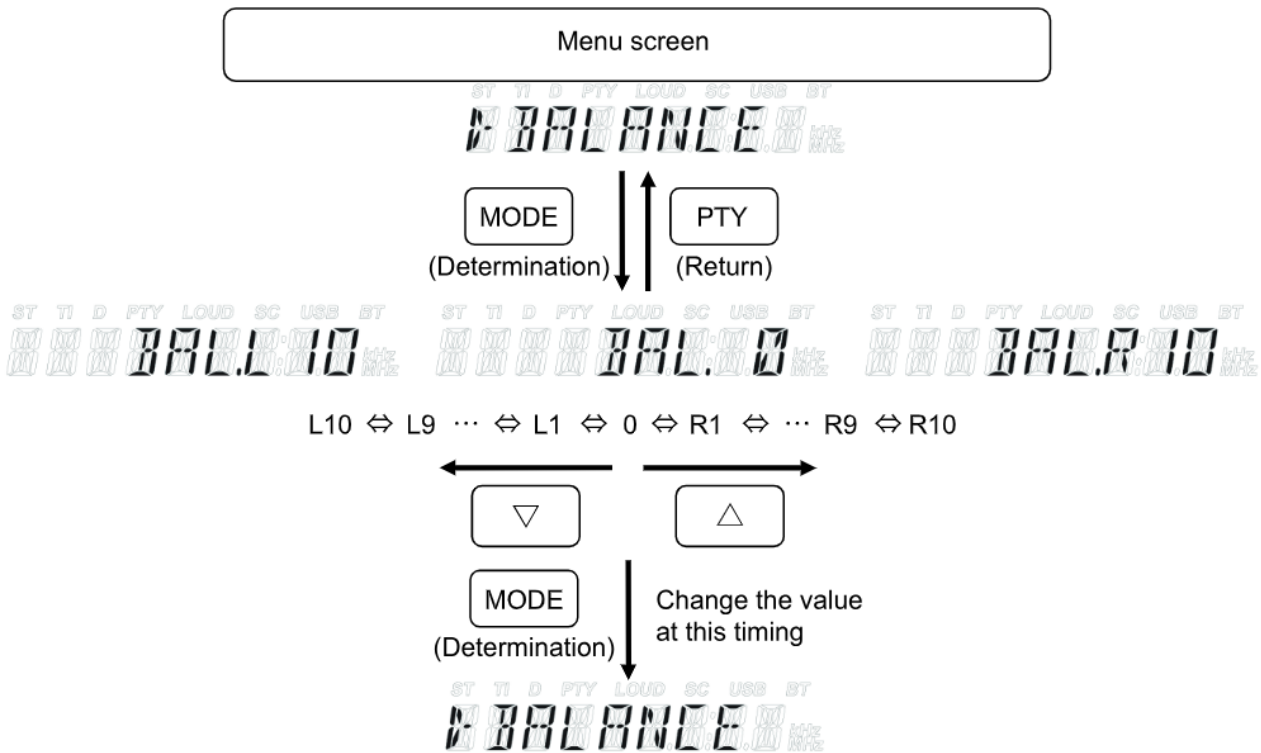
<Source ON Menu> * Perform this under power ON condition brought by PWR key.



ADJUSTMENT OF LEFT AND RIGHT OUTPUT BALANCE

The proportion of the speaker output can be changed.

The adjustment steps are L10 (only left) to L1 to 0 (center) to R1 to R10 (only right) (21 steps)

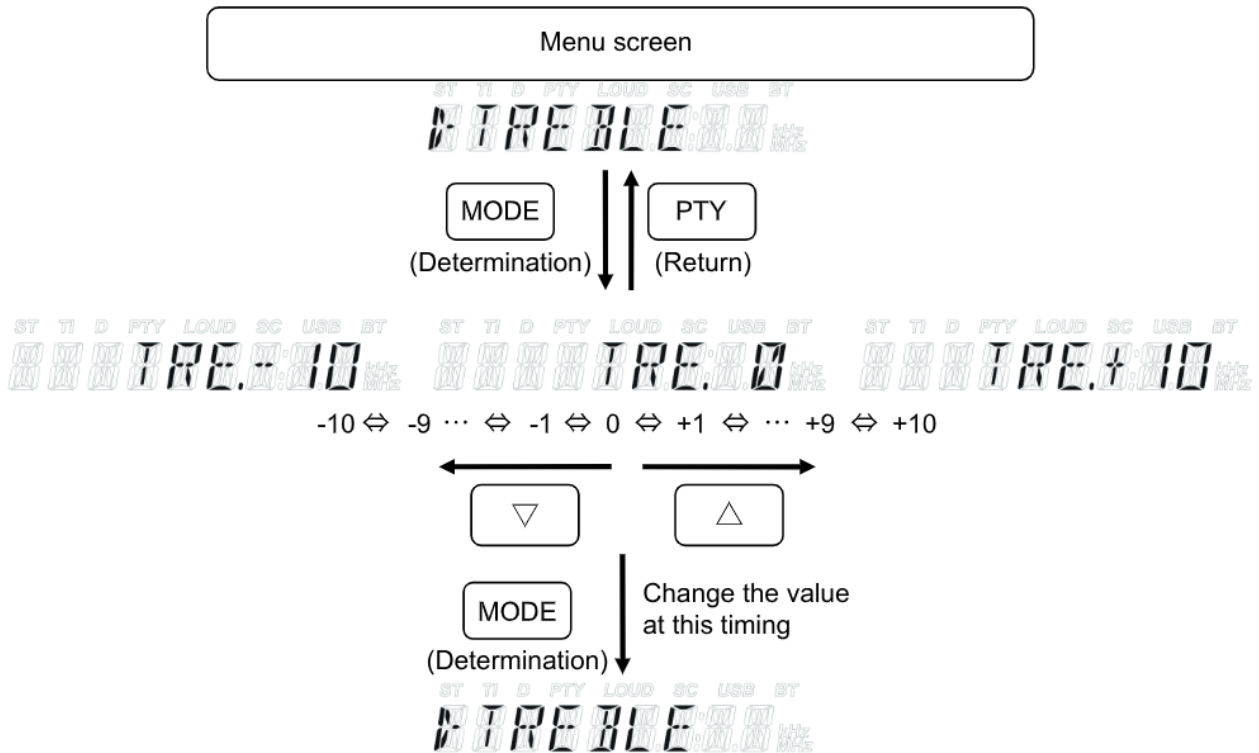


2

TRABLE (HIGH TONE) ADJUSTMENT

The high tone quality output from the speaker can be adjusted.

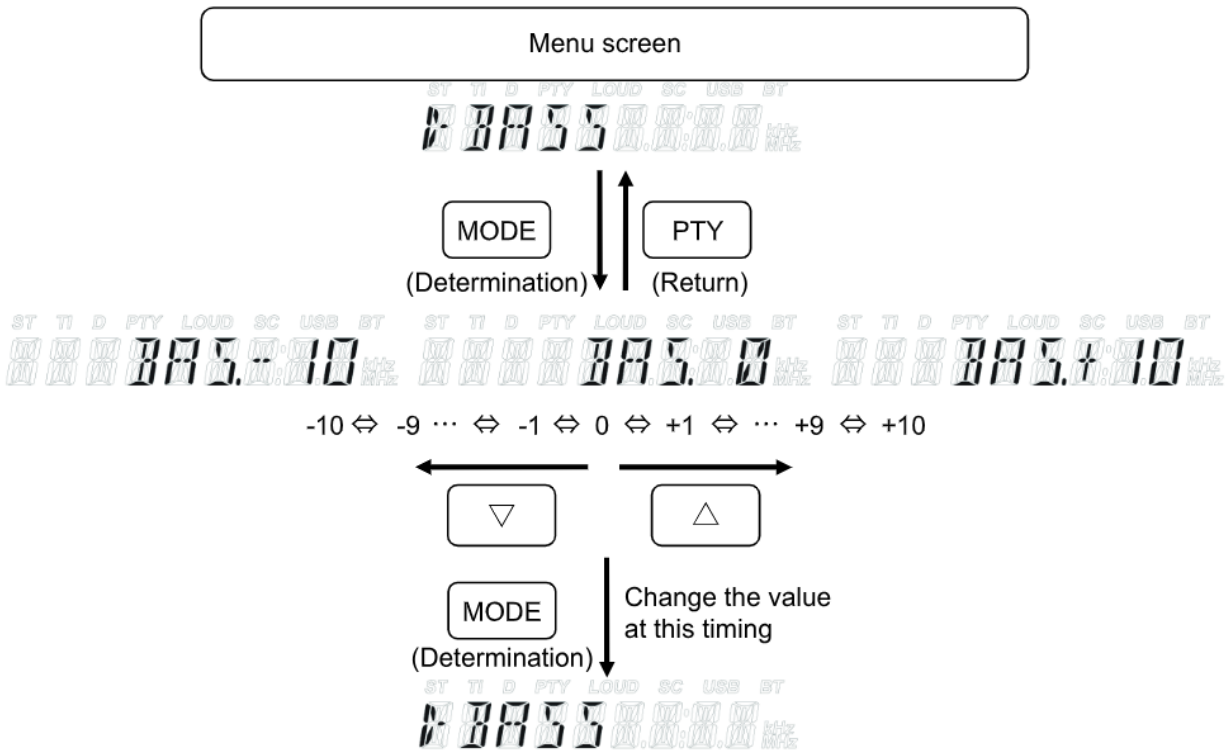
The adjustment steps are +10 to 0 to -10 (21 steps)



[2. MACHINE FAMILIARIZATION]

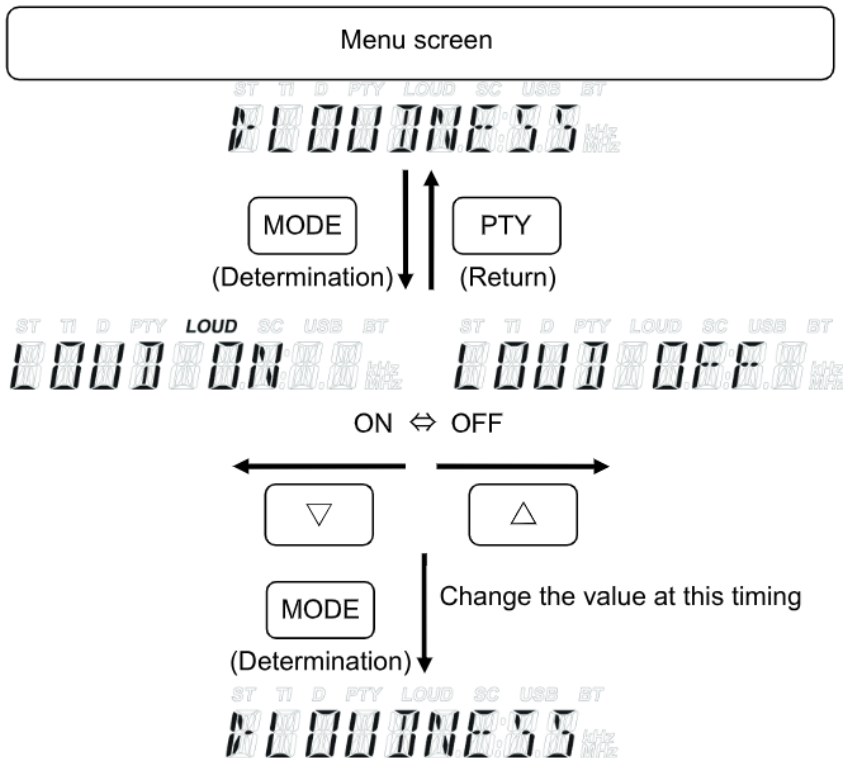
BASS (LOW TONE) ADJUSTMENT

The low tone quality output from the speaker can be adjusted.
The adjustment steps are +10 to 0 to -10 (21 steps)



LOUDNESS SETTING

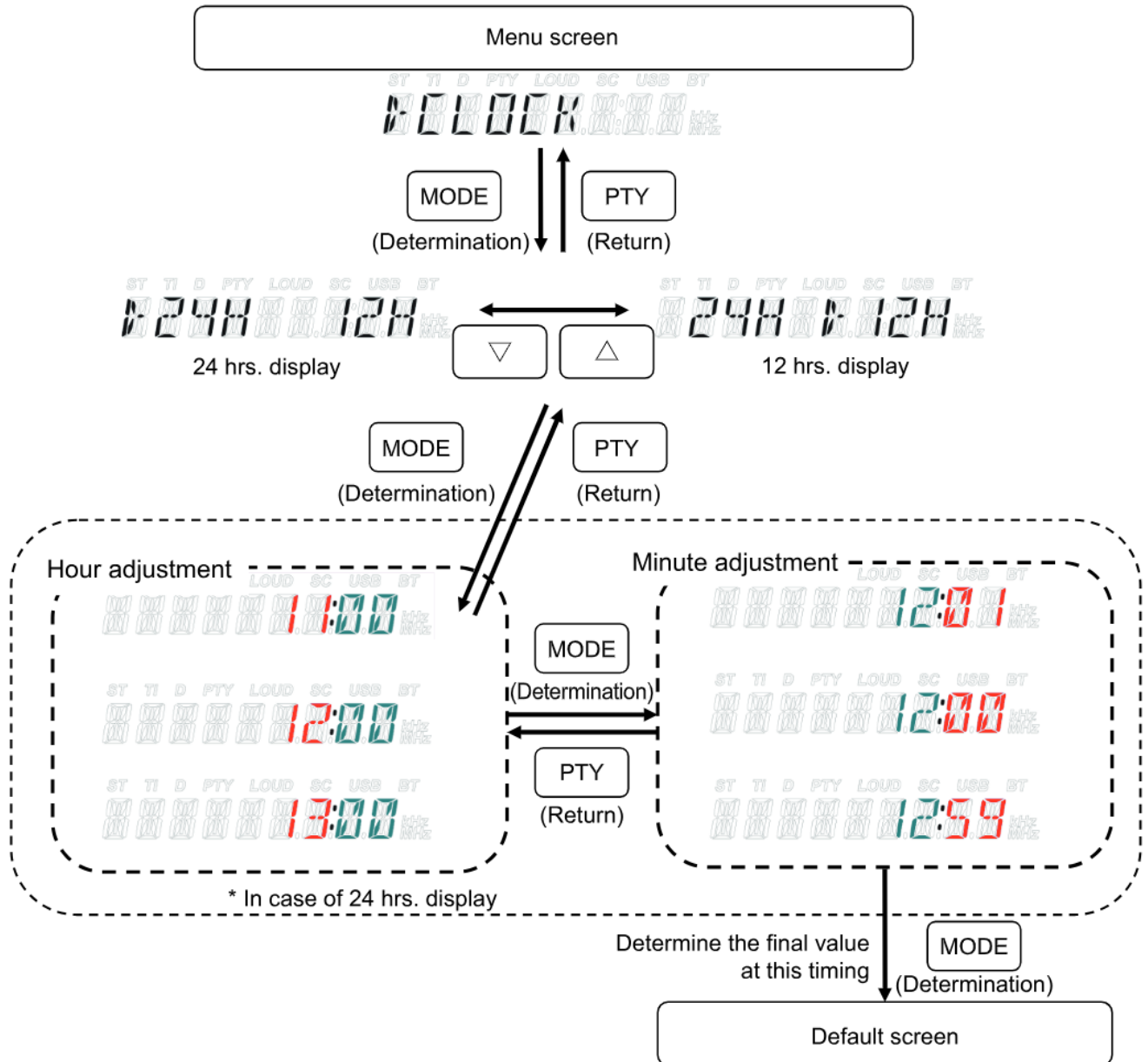
This is the correction circuit that boosts the low tone and high tone ranges sensed as insufficient at low volume.
ON / OFF (2 steps) are the setting value.



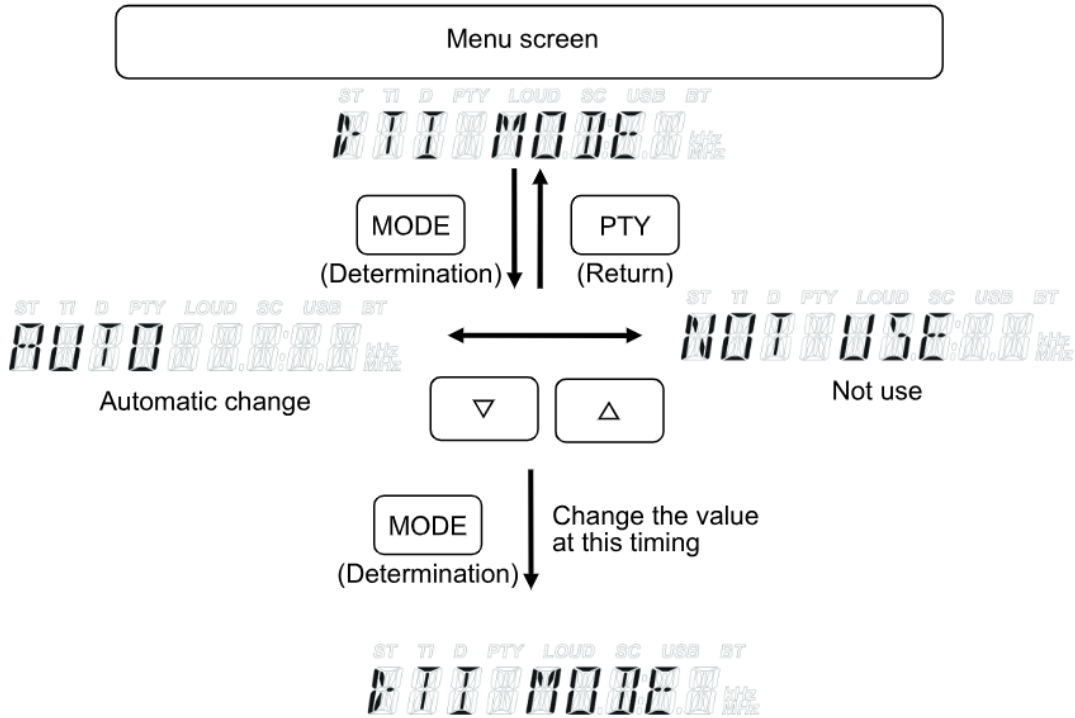
CLOCK ADJUSTMENT

When changing 12 hrs. display to 24 hrs. display, the setting starts from the time displayed now.

Ex.) 24 hrs. display 23:00 → 12 hrs. display PM 11:00 → 24 hrs. display 23:00



TI INTERRUPTION SETTING (DAB)



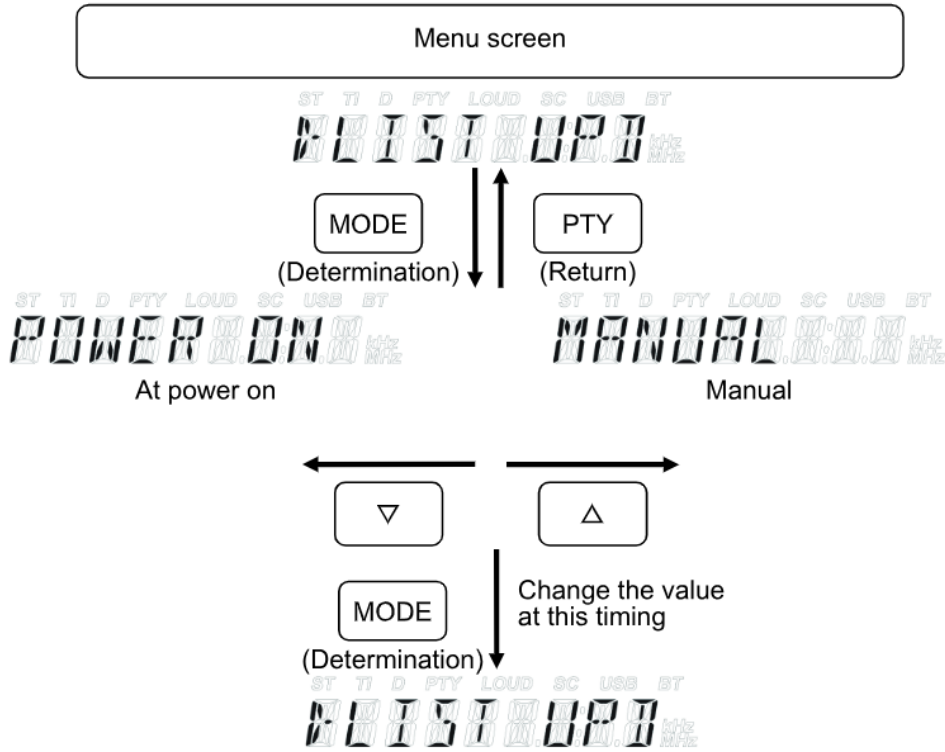
1. AUTO — Automatic change —
When the source is DAB, if TI is received within the ensemble aired now, the service will be automatically changed to the service broadcasting TI.
2. NOT USE — TI function is not used —
TI function is not used.

DAB LIST RENEWAL TIMING (DAB)

Renewal timing of the DAB list can be set.

- POWER ON...Renews the list when [PTY] button is pressed and held with the source set in DAB at power ON.
- MANUAL...Renews the list when [PTY] button is pressed and held with the source set in DAB.

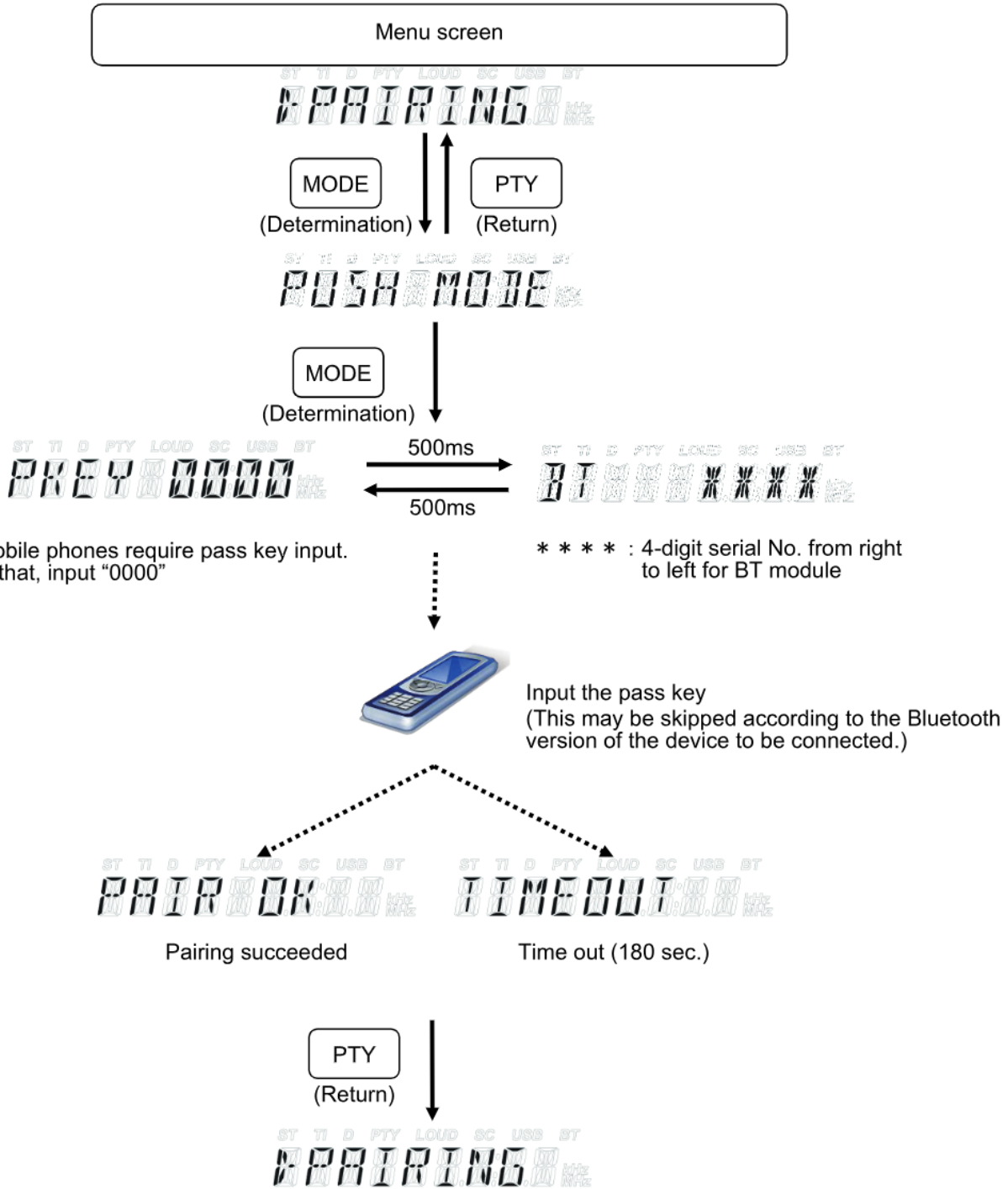
Sometimes DAB renewal takes approximately maximum 3 minutes.



[2. MACHINE FAMILIARIZATION]

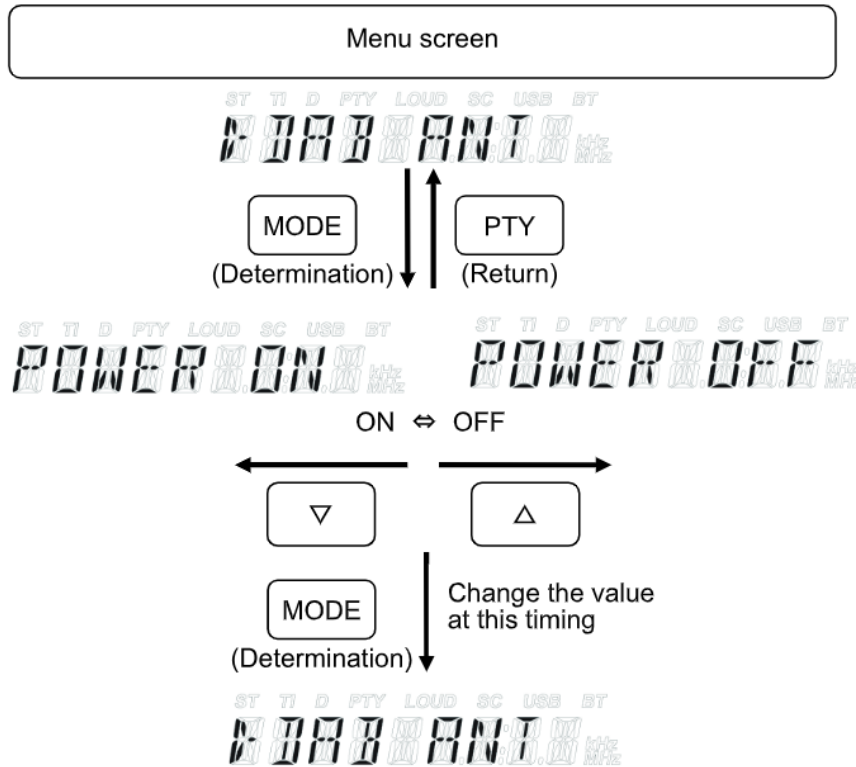
PAIRING (BLUETOOTH)

A Bluetooth device to be used at this unit is identified.



DAB ANTENNA POWER OUTPUT

Whether the power is output to DAB antenna terminal or not can be set.



2.9.14 DESCRIPTION OF BUILT-IN WIRELESS EQUIPMENT

Apply Standard radio



Hereby, Tokai Rika Create Corporation, declares that the radio equipment type TK-NR3 is in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address:

<http://torica.co.jp/eng/product-certification/>

С настоящото, Tokai Rika Create Corporation, декларира, че този тип радиосъоръжение TK-NR3 е в съответствие с Директива 2014/53/ЕС.

Цялостният текст на ЕС декларацията за съответствие може да се намери на следния интернет адрес:

<http://torica.co.jp/eng/product-certification/>

Tímto Tokai Rika Create Corporation, prohlašuje, že typ rádiového zařízení TK-NR3 je v souladu se směrnicí 2014/53/EU.

Úplné znění EU prohlášení o shodě je k dispozici na této internetové adrese:

<http://torica.co.jp/eng/product-certification/>

Hermed erklærer Tokai Rika Create Corporation, at radioudstyrstypen TK-NR3 er i overensstemmelse med direktiv 2014/53/EU.

EU-overensstemmelseserklæringens fulde tekst kan findes på følgende internetadresse:

<http://torica.co.jp/eng/product-certification/>

Hiermit erkläre Tokai Rika Create Corporation, dass der Funkanlagentyp TK-NR3 der Richtlinie 2014/53/EU entspricht.

Der vollständige Text der EU-Konformitätserklärung ist unter der folgenden Internetadresse verfügbar:

<http://torica.co.jp/eng/product-certification/>

Käesolevaga deklareerib Tokai Rika Create Corporation, et käesolev raadioseadme tüüp TK-NR3 vastab direktiivi 2014/53/EL nõuetele.

ELi vastavusdeklaratsiooni täielik tekst on kättesaadav järgmisel internetiaadressil:

<http://torica.co.jp/eng/product-certification/>

Με την παρούσα ο/η Tokai Rika Create Corporation, δηλώνει ότι ο ραδιοεξοπλισμός TK-NR3 πληροί την οδηγία 2014/53/ΕΕ.

Το πλήρες κείμενο της δήλωσης συμμόρφωσης ΕΕ διατίθεται στην ακόλουθη ιστοσελίδα στο διαδίκτυο:

<http://torica.co.jp/eng/product-certification/>

Por la presente, Tokai Rika Create Corporation, declara que el tipo de equipo radioeléctrico TK-NR3 es conforme con la Directiva 2014/53/UE.

El texto completo de la declaración UE de conformidad está disponible en la dirección Internet siguiente:

<http://torica.co.jp/eng/product-certification/>

Le soussigné, Tokai Rika Create Corporation, déclare que l'équipement radioélectrique du type TK-NR3 est conforme à la directive 2014/53/UE.

Le texte complet de la déclaration UE de conformité est disponible à l'adresse internet suivante:

<http://torica.co.jp/eng/product-certification/>

Il fabbricante, Tokai Rika Create Corporation, dichiara che il tipo di apparecchiatura radio TK-NR3 è conforme alla direttiva 2014/53/UE.

Il testo completo della dichiarazione di conformità UE è disponibile al seguente indirizzo Internet:

<http://torica.co.jp/eng/product-certification/>

Ar šo Tokai Rika Create Corporation deklarē, ka radioiekārta TK-NR3 atbilst Direktīvai 2014/53/ES.

Pilns ES atbilstības deklarācijas teksts ir pieejams šādā internetā vietnē:

<http://torica.co.jp/eng/product-certification/>

Aš, Tokai Rika Create Corporation, patvirtinu, kad radijo įrenginių tipas TK-NR3 atitinka Direktyvą 2014/53/ES.

Visas ES atitikties deklaracijos tekstas prieinamas šiuo interneto adresu:

<http://torica.co.jp/eng/product-certification/>

Tokai Rika Create Corporation ovime izjavljuje da je radijska oprema tipa TK-NR3 u skladu s Direktivom 2014/53/EU.

Cjeloviti tekst EU izjave o sukladnosti dostupan je na sljedećoj internetskoj adresi:

<http://torica.co.jp/eng/product-certification/>

[2. MACHINE FAMILIARIZATION]

Tokai Rika Create Corporation igazolja, hogy a TK-NR3 típusú rádióberendezés megfelel a 2014/53/EU irányelvnek.

Az EU-megfeleléségi nyilatkozat teljes szövege elérhető a következő internetes címen:

<http://torica.co.jp/eng/product-certification/>

B'dan, Tokai Rika Create Corporation, niddikjara li dan it-tip ta' tagħmir tar-radju TK-NR3 huwa konformi mad-Direttiva 2014/53/UE.

It-test kollu tad-dikjarazzjoni ta' konformità tal-UE huwa disponibbli f'dan l-indirizz tal-Internet li ġej:

<http://torica.co.jp/eng/product-certification/>

Hierbij verklaar ik, Tokai Rika Create Corporation, dat het type radioapparatuur TK-NR3 conform is met Richtlijn 2014/53/EU.

De volledige tekst van de EU-conformiteitsverklaring kan worden geraadpleegd op het volgende internetadres:

<http://torica.co.jp/eng/product-certification/>

Tokai Rika Create Corporation niniejszym oświadcza, że typ urządzenia radiowego TK-NR3 jest zgodny z dyrektywą 2014/53/UE.

Pełny tekst deklaracji zgodności UE jest dostępny pod następującym adresem internetowym:

<http://torica.co.jp/eng/product-certification/>

O(a) abaixo assinado(a) Tokai Rika Create Corporation declara que o presente tipo de equipamento de rádio TK-NR3 está em conformidade com a Diretiva 2014/53/UE.

O texto integral da declaração de conformidade está disponível no seguinte endereço de Internet:

<http://torica.co.jp/eng/product-certification/>

Prin prezenta, Tokai Rika Create Corporation declară că tipul de echipamente radio TK-NR3 este în conformitate cu Directiva 2014/53/UE.

Textul integral al declarației UE de conformitate este disponibil la următoarea adresă internet:

<http://torica.co.jp/eng/product-certification/>

Tokai Rika Create Corporation týmto vyhlasuje, že rádiové zariadenie typu TK-NR3 je v súlade so smernicou 2014/53/EÚ.

Úplné EÚ vyhlásenie o zhode je k dispozícii na tejto internetovej adrese:

<http://torica.co.jp/eng/product-certification/>

Tokai Rika Create Corporation potrjuje, da je tip radijske opreme TK-NR3 skladen z Direktivo 2014/53/EU.

Celotno besedilo izjave EU o skladnosti je na voljo na naslednjem spletnem naslovu:

<http://torica.co.jp/eng/product-certification/>

Tokai Rika Create Corporation vakuuttaa, että radiolaitetyyppi TK-NR3 on direktiivin 2014/53/EU mukainen.

EU-vaatimustenmukaisuusvakuutuksen täysimittainen teksti on saatavilla seuraavassa internetosoitteessa:

<http://torica.co.jp/eng/product-certification/>

Härmed försäkrar Tokai Rika Create Corporation att denna typ av radioutrustning TK-NR3 överensstämmer med direktiv 2014/53/EU.

Den fullständiga texten till EU-försäkran om överensstämmelse finns på följande webbadress:

<http://torica.co.jp/eng/product-certification/>

TORICA

Tokai Rika Create Corporation

2-3-10, Aoi,Higashi-ku,Nagoya 461-0004,JAPAN

Bluetooth

Frequency of Operation : 2402MHz ~ 2480MHz

Transmit Power (MAX) : 10.0dBm

Apply Standard radio



Hereby, Tokai Rika Create Corporation, declares that the radio equipment type TK-NR3 is in compliance with the relevant statutory requirements.

The full text of the declaration of conformity is available at the following internet address:

<http://torica.co.jp/eng/product-certification/>

TORICA

Tokai Rika Create Corporation
2-3-10, Aoi,Higashi-ku,Nagoya 461-0004,JAPAN

Bluetooth

Frequency of Operation : 2402MHz - 2480MHz

Transmit Power (MAX) : 10.0dBm

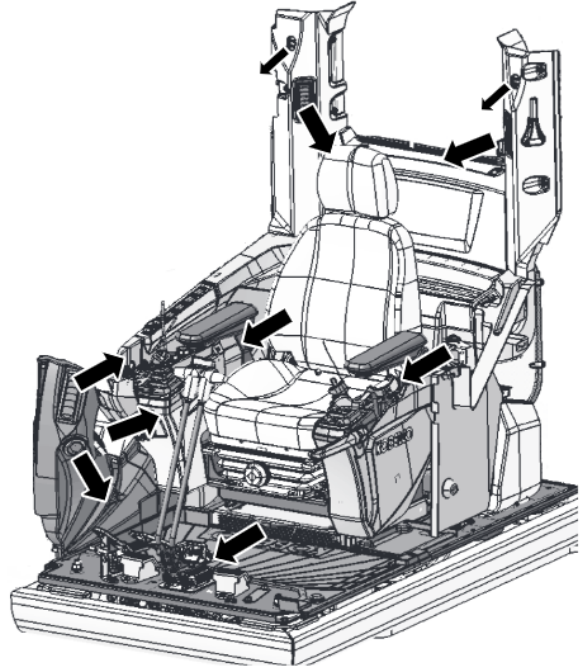
2.10 AIR CONDITIONER

The air conditioner can adjust the temperature inside the cab and dehumidify the cab.

The air conditioner is located under the cover at the back of the operator's seat and sends out warm and cool air in the cab.

2.10.1 GRILLE (AIR OUTLET)

Select air stream in preferable direction by hand.



2

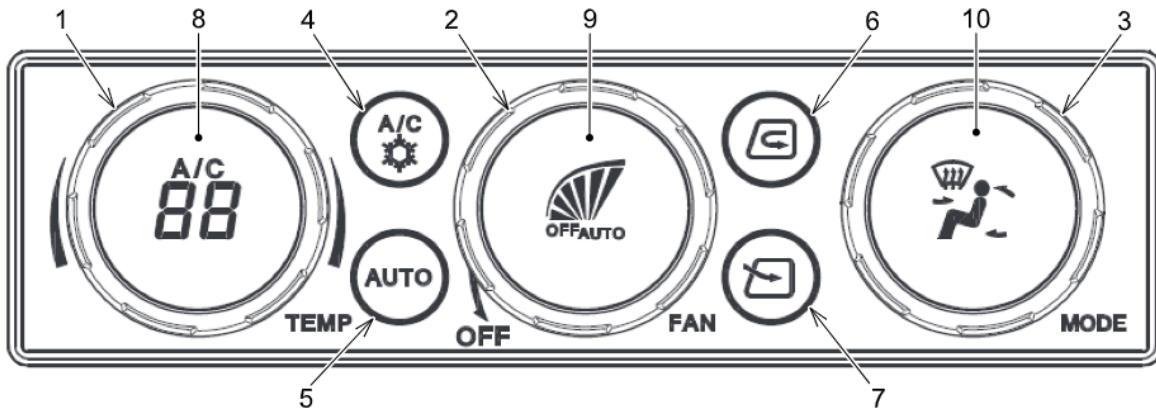
CAUTION

After replacing the parts, or charging or replacing refrigerant gas, break in the air conditioner.

When breaking in the air conditioner, be sure to set the engine speed to low speed.

Never start the air conditioner with the high engine speed. This might cause failure of the air conditioner.

2.10.2 AIR CONDITIONER CONTROL PANEL



Item	Name	Item	Name	Item	Name
1	Temperature setting dial	5	AUTO control switch	9	(Fan speed/AUTO/OFF) LCD display
2	Fan speed selector dial	6	Recirculation air selector switch	10	(Air outlet mode) LCD display
3	Air outlet mode selector dial	7	Fresh air selector switch		
4	Compressor switch	8	(Temperature/A/C) LCD display		

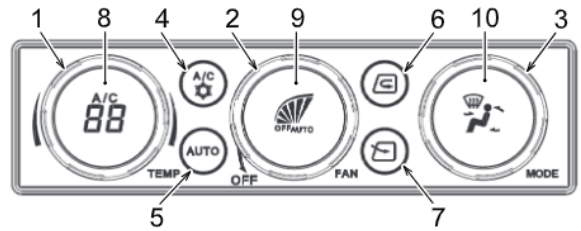
Notice

- (Temperature/A/C) LCD display (8) displays temperature and ON/OFF of the compressor; (fan speed/AUTO/OFF) LCD display (9) displays blower fan speed, AUTO, and OFF; and (air outlet mode) LCD display (10) displays air outlet mode.
- Each of switches (4 to 7) turns on the indicator (amber) when the item is being selected.
- Each of switches (4 to 7) and displays (TEMP/FAN/MODE/COOL displayed in blue/HOT displayed in red) are equipped with illumination at night. (COOL displayed in blue, HOT displayed in red, and others displayed in white)

2.10.3 AIR CONDITIONER OPERATION PANEL

MAIN POWER SWITCH AND DISPLAY

- When the panel is OFF, "OFF" is displayed on (fan speed/AUTO/OFF) LCD display (9).
- When the panel is OFF, if fan speed selector dial (2) is operated clockwise, or AUTO control switch (5) is pressed down, the panel becomes ON and air conditioner control starts.



Operating fan speed selector dial (2) is operated clockwise: Operation starts with the fan speed Lo (manual) (other than the fan speed, the setting is the same as the previous operation)

Pressing down AUTO control switch (5): FULL AUTO operation starts

- If the fan speed selector dial (2) is operated counterclockwise with the fan speed set to Lo, the panel becomes OFF.
- The air conditioner operation also turns OFF when the starter switch is turned OFF. However, if turned OFF with this switch, the status of the control panel just before turning OFF is sometimes not recalled when the starter switch is turned ON again.

FAN SPEED SELECTION AND DISPLAY

In the manual selection, (fan speed/AUTO/OFF) LCD display (9) is like the following.

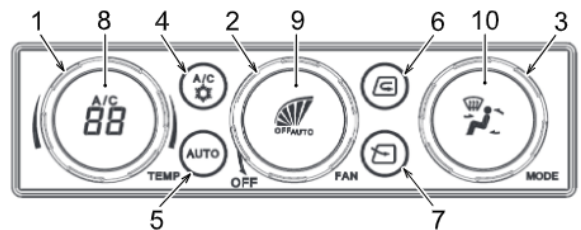
Fan speed	Lo (Min. flow)	M1	M2	M3	M4	Hi (Max. flow)
LCD display						

By operating fan speed selector dial (2) in UP (turning clockwise) or DOWN (turning counterclockwise) direction manually, the AUTO control of fan speed is canceled, and "AUTO" on (fan speed/AUTO/OFF) LCD display (9) is turned OFF.

COMPRESSOR ON/OFF SWITCHING AND DISPLAY

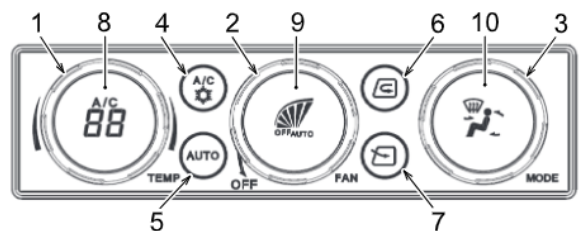
When compressor switch (4) is pressed with "A/C" on (temperature/A/C) LCD display (8) turned OFF and the indicator of compressor switch (4) turned OFF, the compressor turns ON and then "A/C" on (temperature/A/C) LCD display (8) turns ON and the indicator of compressor switch (4) turns ON.

If the compressor switch is pressed again, the compressor turns OFF and "A/C" on (temperature/A/C) LCD display (8) and the indicator of compressor switch (4) turn OFF.



AUTO CONTROL SWITCHING AND DISPLAY

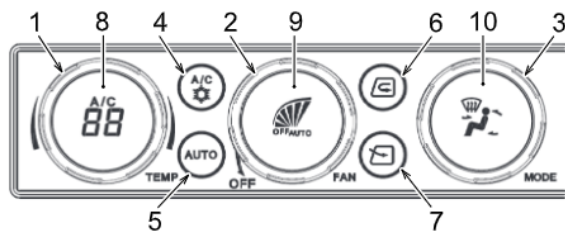
- "AUTO" on (fan speed/AUTO/OFF) LCD display (9) turns ON only when both the fan speed and the air outlet are under AUTO control.
- When AUTO control switch (5) is pressed, the fan speed and the air outlet become under the AUTO control, and "AUTO" on (fan speed/AUTO/OFF) LCD display (9) turns ON.
- When the panel is OFF, if AUTO control switch (5) is turned ON, the air conditioner function becomes ON. However, both the fan speed and the air outlet become AUTO control.



[2. MACHINE FAMILIARIZATION]

TEMPERATURE SETTING SELECTION AND DISPLAY

- The set temperature in digital display appears on (temperature/A/C) LCD display (8). The range of temperature setting is from 18 to 32 degrees C (64 to 90 degrees F).
- When changing the set temperature, operate temperature setting dial (1) clockwise (UP) or counterclockwise (DOWN)
The increment and decrement of both UP and DOWN are 1 degree C.
- The set temperature of 18 degrees C (64 degrees F) is the maximum cooling and that of 32 degrees C (90 degrees F) is the maximal heating control.
- The set temperature display can be switched from/to degrees F to/from degrees C.
With the panel turned ON, if recirculation air selector switch (6) and fresh air selector switch (7) are pressed simultaneously for 5 seconds or more, the "degrees F/C" display is switched (No unit is displayed).



LCD DISPLAY

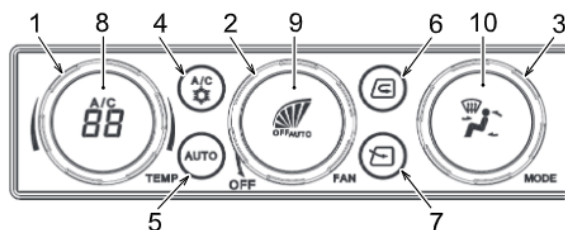
Celsius (degrees C): LO, 19 to 31, HI

Fahrenheit (degrees F): LO, 65 to 89, HI

LO: 18 degrees C (64 degrees F), HI: 32 degrees C (90 degrees F)

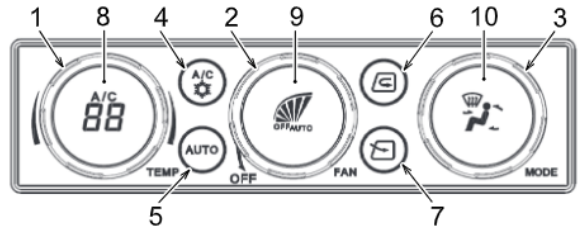
RECIRCULATION AIR SELECTION AND DISPLAY

- With the fresh air intake condition {with the indicator of fresh air selector switch (7) turned ON}, if recirculation air selector switch (6) is pressed, it will switch the setting to recirculation air and the indicator of recirculation air selector switch (5) turns ON.
- With the recirculation air condition {with the indicator of recirculation air selector switch (6) turned ON}, if fresh air selector switch (7) is pressed, it will switch the setting to fresh air intake and the indicator of fresh air selector switch (7) turns ON.



AIR OUTLET MODE SELECTION AND DISPLAY

- The current air outlet mode position is displayed with arrow(s) on (air outlet mode) LCD display (10).
- With "AUTO" turned ON, if air outlet mode selector dial (3) is operated, the mode displayed at that time is fixed. Then "AUTO" on (fan speed/AUTO/OFF) LCD display (9) turns OFF, and the AUTO control of the air outlet is released.



* The AUTO control of the air outlet is also released even when only the air outlet is under the AUTO control (with "AUTO" turned OFF).

<Air outlet mode and display>

Mode	1	2	3	4	5
Air outlet mode	FACE	VENT	B/L	F/D	DEF
	Upper body (front side)	Upper body	Upper body and foot	Foot and front glass	Defroster
LCD display					

2

- When air outlet mode selector dial (3) is operated clockwise in the manual control, the mode is switched through Mode 1 → Mode 2 → Mode 3 → Mode 4 → Mode 5.
- When air outlet mode selector dial (3) is operated counterclockwise in the manual control, the mode is switched through Mode 5 → Mode 4 → Mode 3 → Mode 2 → Mode 1.

2.10.4 HOW TO USE AIR CONDITIONER

Before turning the air conditioner on, close the doors and windows of the cab to achieve the best performance as an automatic air conditioner.

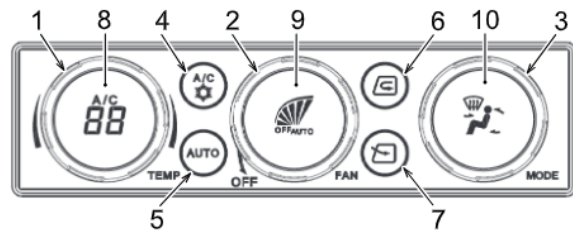
COOLING METHOD

Note

To avoid freezing of the evaporator, do not operate the air conditioner for a long time in the COOL-MAX set temperature with the LO airflow.

If it is frozen and cool air does not flow any longer, turn compressor switch (4) off, set the temperature high, operate the air conditioner with the maximum airflow "HI", and then turn compressor switch (4) "ON".

1. Operate fan speed selector dial (2) clockwise or press AUTO control switch (5).
2. Operate fan speed selector dial (2) clockwise and set the fan speed HI.
3. Operate temperature setting dial (1) and set a desired temperature.
4. Press compressor switch (4).
5. Press recirculation air selector switch (6) to select recirculation air.
6. Operate air outlet mode selector dial (3) and select the VENT outlet (mode 2).
7. When the temperature inside the cab becomes low, adjust the temperature and the fan speed to desired levels. When AUTO control switch (5) is pressed, the temperature, fan speed, and mode selection become automatic control.

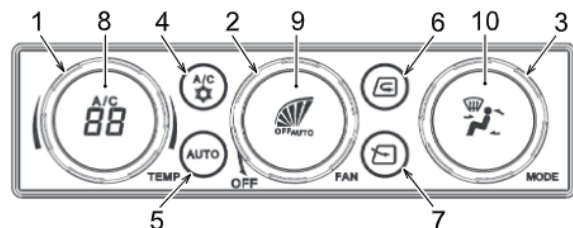


HEATING METHOD

CAUTION

The engine coolant is used for heating, and it is only possible to heat the air when the temperature of the coolant is high.

1. Operate fan speed selector dial (2) clockwise or press AUTO control switch (5).
2. Operate fan speed selector dial (2) clockwise and set the fan speed HI.
3. Operate temperature setting dial (1) and set a desired temperature.
4. Press fresh air selector switch (7) to select fresh air intake.
5. Operate air outlet mode selector dial (3) and select the foot and front glass outlet (mode 4).
6. When the temperature inside the cab becomes high, adjust to the temperature and the fan speed to desired levels. When AUTO control switch (5) is pressed, the temperature, fan speed, and mode selection become automatic control.

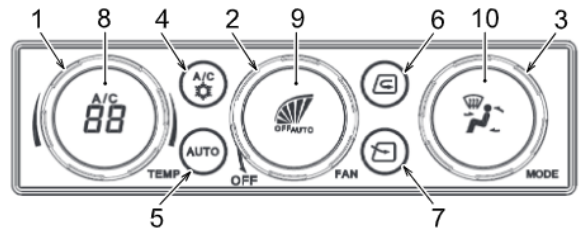


METHOD OF HEATING WITH DEHUMIDIFICATION AND DEMISTING

Note

When the outdoor temperature is 0 degrees C (32 degrees F) or lower, the air conditioner (compressor) may not work.




1. Operate fan speed selector dial (2) clockwise or press AUTO control switch (5).
2. Operate fan speed selector dial (2) and set a desired fan speed.
3. Operate temperature setting dial (1) and set a desired temperature.
4. Press fresh air selector switch (7) to select fresh air intake.
5. Press compressor switch (4) to operate the air conditioner (compressor).



2.10.5 SELF-DIAGNOSIS FUNCTION IN DISPLAY MONITOR



If there are problems on the input circuit of the driving line in the motor actuator, they can be checked on the panel display.

<Display for detection of motor actuator disconnection/short circuit and motor lock>

Error	Error	
Air mix	· Displays "Er" on temperature display segment	
Air outlet mode	· Blinks human indication	
Switching recirculation air and fresh air	· Blinks indicators of recirculation air selector switch and fresh air selector switch	

When a failure occurs in the input circuit of the evaporator sensor or the recirculation air sensor, it can be checked by the panel display.

<Display for detection of disconnection/short circuit of recirculation air sensor and evaporator sensor>

Error	Error	
Recirculation air sensor	· Displays "E*" on temperature display (last digit displays 0 to 9) · Turns off AUTO display	
Evaporator sensor	· Blinks A/C mark on (temperature/A/C) LCD display and indicator of compressor switch	

Error detection of each sensor from monitor mode function

- With the panel turned ON, if the compressor switch and the AUTO control switch are pressed simultaneously for 1 second or more, the display is switched to the monitor mode. To return to the previous display, perform the same operation.
- The normal status, disconnection, and short circuit of the recirculation air sensor and the evaporator sensor are shown in segment display.

<Contents of LCD display in monitor mode>

Display No.		Display data (displayed in 7 segments and 2 digits)	
No.	Fan speed in bar display	Display in decimal system (0 to 99) *A/C segment is OFF	Display in hexadecimal system (0 to FF) *A/C segment is ON
		88	88
0		Recirculation air sensor Temperature (degrees C)	Recirculation air sensor AD value
1		Evaporator sensor Temperature (degrees C)	Evaporator sensor AD value

UP by recirculation air selector switch

DOWN by fresh air selector switch

Switched by compressor switch

		1st digit in segment display															
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
2nd digit in segment display	0	Recirculation air sensor disconnection "0C" display															
		Evaporator sensor disconnection "0C" display															
	1	Each sensor is normal															
	2																
	3																
	4																
	5																
	6																
	7																
	8																
	9																
	A																
	B																
	C																
	D																
	E																
F	Recirculation air sensor short "F6" Display																
	Evaporator sensor short "F6" Display																

<Contents of error display>

Sensor Name	Short Display	Disconnection Display
Recirculation air sensor	F6	0C
Evaporator sensor	F6	0C

2.10.6 HANDLING AT IN-SEASON/OFF-SEASON

IN-SEASON

To use the air conditioner for a long time comfortably, contact your KOBELCO authorized dealer for inspection and maintenance of the air conditioner at the beginning of in-season of cooling.

OFF-SEASON

During off-season, operate the air conditioner at least once a week for several minutes.

The oil shortage at each part of the compressor will be prevented by operating the air conditioner and it will always be kept in the best condition.



2.11 HANDLING OF SEAT BELT



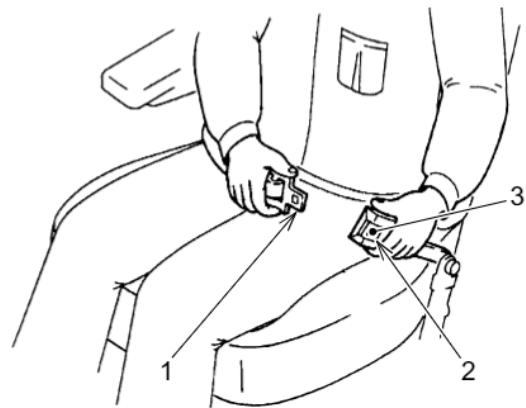
INSTALLATION OF SEAT BELT

- Be sure to fasten your seat belt during operation. If not followed, it can result in serious accidents or death caused by being heavily hit inside the cab or thrown out of the cab when the machine tips/rolls over.
 - Check the mounting bolts installed to the seat for looseness and retighten the bolts if required.
 - Change the seat belt every three years, even if there is no abnormality in the appearance. The manufacturing date is woven into the back side of the belt.
-

Since this seat belt is equipped with take-up motion, the adjustment of length is unnecessary.

2.11.1 HOW TO FASTEN SEAT BELT

1. Check that the seat belt is not twisted, and pull it out to a sufficient length.
2. Insert the seat belt into buckle (2) until it clicks. Release the seat belt, and the length is automatically adjusted and the buckle is locked.



2.11.2 HOW TO UNFASTEN SEAT BELT

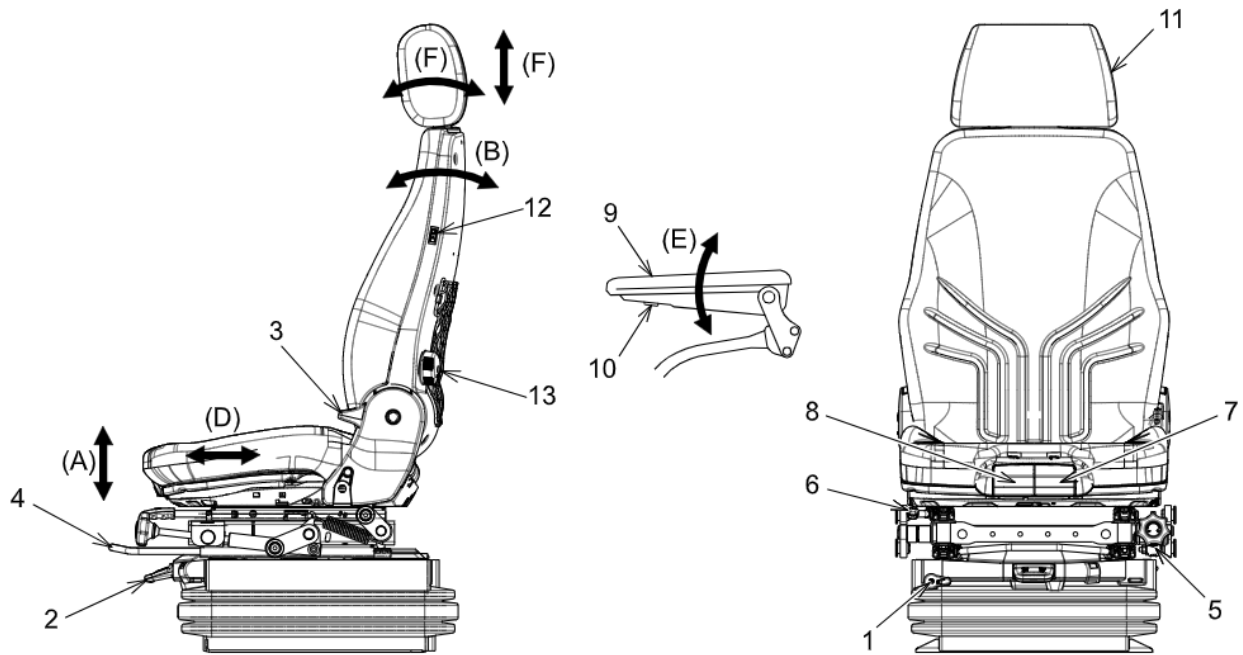
- Press the red button (3) of the buckle (2), and the belt (1) is unfastened.

2.12 HANDLING OF OPERATOR'S SEAT (AIR SUSPENSION SEAT)

Adjust the operator's seat to the position at which you can operate the control levers and pedals easily.

CAUTION

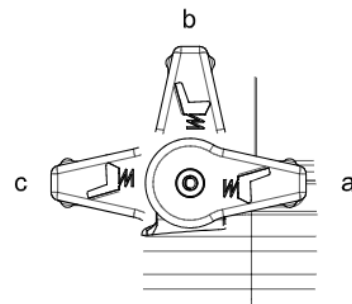
When adjusting the operator's seat, pay attention to hands in order not to be caught between the handle and seat stand.



2.12.1 DAMPER ADJUSTMENT

The damper can be adjusted.

- Move handle (1) to a desired position. (3 steps)
 - a. Soft
 - b. Middle
 - c. Hard



2.12.2 WEIGHT ADJUSTMENT

(A) The height of the operator's seat can be adjusted according to the operator's weight.

1. Pull up lever (2) shortly and then the seat height is automatically adjusted according to the operator's weight.
 2. Release the lever to fix the height of the seat.
-

Notice

- Adjust the damper to the soft position before adjusting the seat.
 - Turn the starter switch to the "ON" position before adjusting the seat.
-

2.12.3 HEIGHT ADJUSTMENT

(A) The height of the operator's seat can be adjusted.

1. Fully pull up lever (2).
 2. Adjust the seat height to a desired height.
 3. Release the lever to fix the height of the seat.
-

Notice

- Adjust the damper to the soft position before adjusting the seat.
 - Turn the starter switch to the "ON" position before adjusting the seat.
-

2.12.4 RECLINING ADJUSTMENT

(B) The reclining angle can be adjusted.

1. Pull up lever (3).
2. Tilt the seat backrest to a desired angle.
3. Release the lever to fix the angle of the seat.

2.12.5 FRONT/REAR ADJUSTMENT OF CONTROL STAND

(C) The position of the whole control stand and operator's seat can be adjusted back and forth.

1. Pull up lever (4).
2. Move the seat back and forth to adjust it to a desired position.
3. Release the lever to fix the position of the control stand.

2.12.6 TILT ADJUSTMENT OF CONTROL BOX

The angle of the control box can be adjusted.

- Turn handle (5) to tilt the front side of the control box up or down.

2.12.7 FRONT/REAR ADJUSTMENT OF SEAT

(D) The position of the operator's seat can be adjusted back and forth.

1. Pull up handle (6).
2. Move the seat back and forth to adjust it to a desired position.
3. Release the handle to fix the position of the seat.

2.12.8 TILT ADJUSTMENT OF SEAT SEATING SURFACE

(A) The angle of the seating surface of the operator's seat can be adjusted.

1. Pull up handle (7).
2. Tilt the seat seating surface to a desired angle to adjust it.
3. Release the handle to fix the position of the seat seating surface.

2.12.9 FRONT/REAR ADJUSTMENT OF SEAT SEATING SURFACE

(D) The position of the seating surface of the operator's seat can be adjusted back and forth.

1. Pull up handle (8).
2. Move the seat seating surface back and forth to adjust it to a desired position.
3. Release the handle to fix the position of the seat seating surface.

2.12.10 ARM REST ADJUSTMENT

(E) The arm rest can be lifted up, and its angle can be adjusted.

- Arm rest (9) can be lifted up backward.
- Turn control dial (10) at the bottom of arm rest (9) by hand to adjust the angle of the arm rest in the regular position.

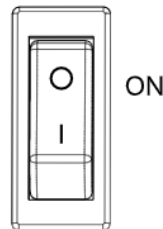
2.12.11 HEAD REST ADJUSTMENT

(F) The head rest can be adjusted by moving it up, down, back, or forth.

- To adjust head rest (11) up or down, hold it with both hands, and move it up or down slightly.
- To adjust head rest (11) back and forth, hold it with both hands, and move it back and forth to a desired position.

2.12.12 SEAT HEATER

Turn seat heater switch (12) "ON" to warm the seat.



Notice

This function can be used with the starter switch "ON".

2.12.13 LUMBAR SUPPORT

Adjust the lumbar supporting level of the backrest by using adjusting dial (13) of the lumbar support.

2.13 HANDLING PARTS INSIDE CAB



LEAVING OPERATOR'S SEAT

Do not leave the cab with the engine running.

When necessary to leave the operator's seat, be sure to lock the control lock lever and then stop the engine.

If the control lever is unexpectedly touched without the control lock lever locked, it may cause severe accident resulting in severe injury.

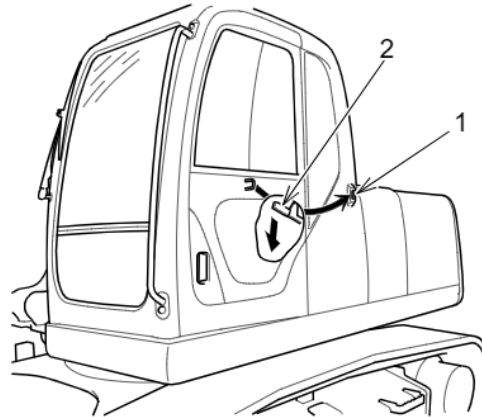
2.13.1 CAB DOOR LOCK



In operation, lock the door securely either open or close. If not locked, the door may open or close unexpectedly and this may cause danger and failure of the machine.

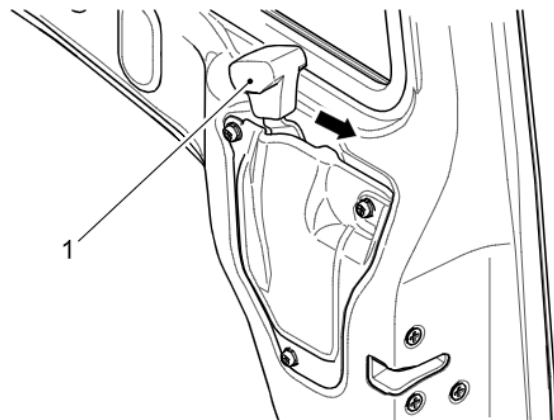
This procedure is used to securely lock the door in open position.

- Push the door against catch (1) and check that it is locked securely.
- To close the door, move lever (2) on the left side of the operator's seat to the direction of the arrow and then the catch is released.



2.13.2 OPENING DOOR FROM INSIDE OF CAB

- To open the door from the inside of the cab, move lever (1) to the direction of the arrow.



2.13.3 OPENING/CLOSING FRONT WINDOW (UPPER)



WARNING

OPENING/CLOSING FRONT WINDOW (UPPER)

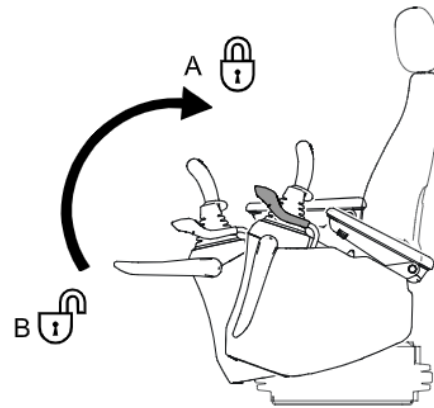
- Opening/closing the front window with the machine in a level position and lock the front window securely. If the lock is released in the forward tilting position of machine there is a possibility of falling of the front window.
- When closing the front window, the closing speed increases due to the weight of front window. Hold and close it by both hands securely.
- When opening/closing the front window in, pull up the control lock lever to the "LOCKED" position and stop the engine.



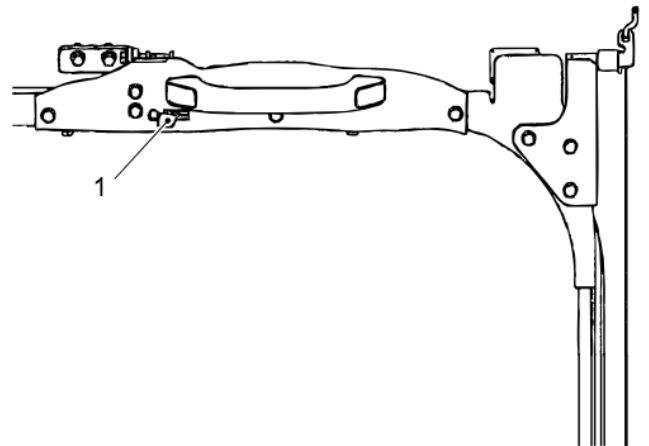
CAUTION

To prevent your hand from being caught between the windows, open and close the front window slowly. It is dangerous to work with the front window not or incompletely locked. Confirm that the front window is surely locked.

1. Move the machine to a level and firm place.
2. Put the bucket on the ground.
3. Stop the engine and move the control lock lever to the "LOCKED" position.



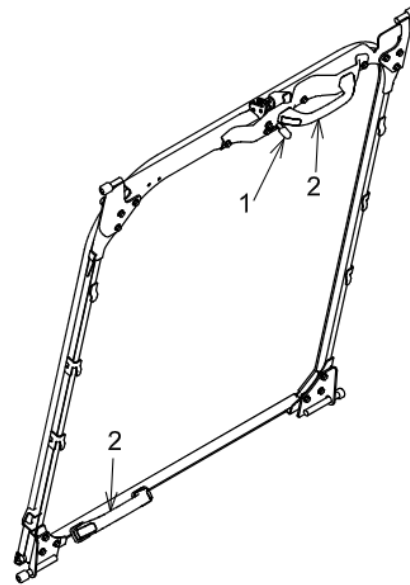
4. Push lock lever (1) on the center of the front window (upper) right to release the lock.



5. Hold and lift up the handles (2) on the upper and lower part of the front window (upper), and move the front window (upper) fully toward the back of the ceiling to automatically set it to the locked condition; however, check it is locked securely.

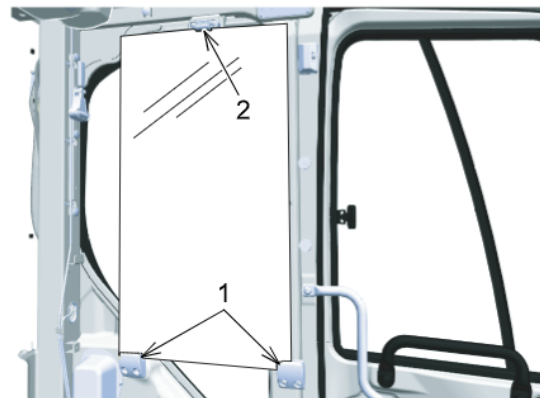
When closing front window

1. Hold handles (2) at the upper and lower parts of the front window (upper) and push lock lever (1) right to release the lock.
2. When the front window (upper) is returned to the original position, it is locked automatically. However, check that the window is securely locked.



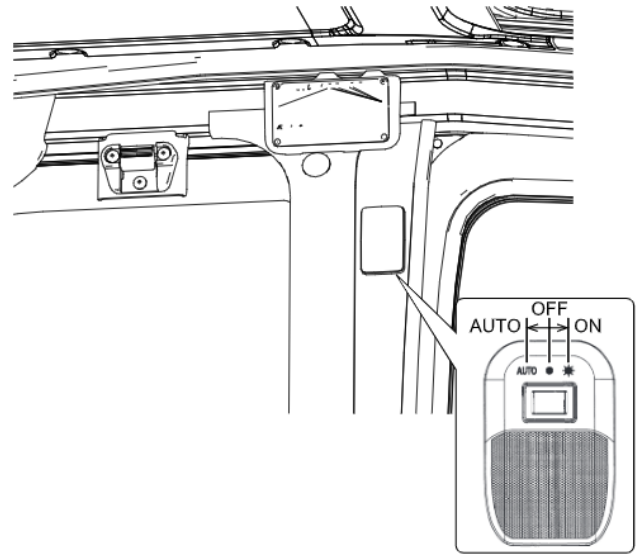
2.13.4 REMOVING FRONT WINDOW (LOWER)

1. After open the front window (upper) in the ceiling, hold the front window (lower) by hands and remove it from the window frame. The removed front window (lower) should be stored in holder (1) on the left back side of the cab for secure storage.
2. Insert the glass into right and left holders (1), and fix the glass with lock (2) on the upper window frame.



2.13.5 INTERIOR LIGHT

Move the switch to a desired setting position among the following position: AUTO, OFF, and ON.



2

Switch	Contents
AUTO	The interior light turns on for a certain time after the door is opened or the engine key is turned off.
OFF	The interior light does not turn on.
ON	The interior light turns on.

2.14 EMERGENCY ESCAPE FROM OPERATOR'S STATION

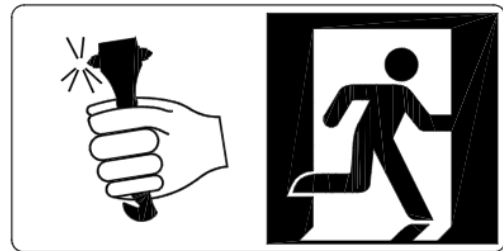
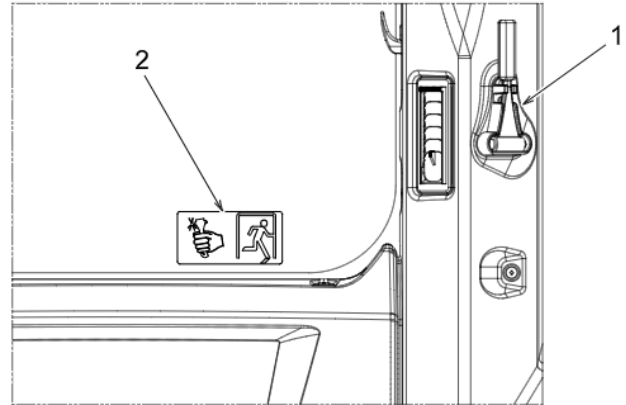
If it is impossible to open the cab door in an emergency, escape from the cab by the following way.

1. Open the front window and escape through the front window.

Notice

For how to open the front window, see "OPENING/CLOSING FRONT WINDOW" in Chapter 2.

2. If the front window cannot be opened, break the front or rear window glass by using hammer for emergency exit (1) placed on the right rear of the cab.



CAUTION

Pay attention to the broken pieces so as not to be injured when breaking the window glass.

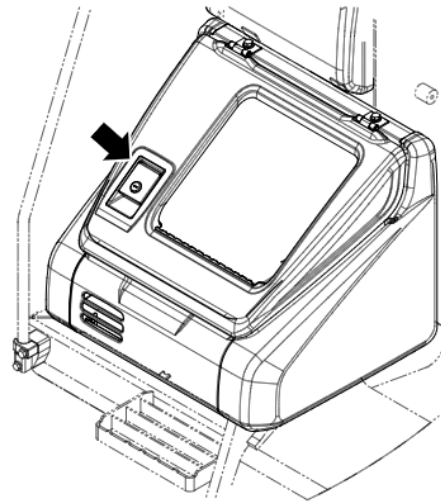
Notice

Label (2) indicating the emergency exit are affixed on the rear window.

2.15 OTHER ACCESSORIES

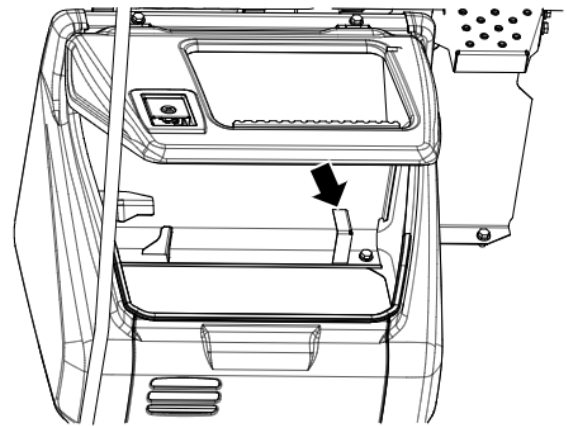
2.15.1 TOOL BOX

Use the tool box for storing tools and fixtures. The storage place is on the right front of the machine. Use the starter key to unlock the cover, open the cover, and hold it with the lock lever. After using tools, remove the lock lever, close the cover, and lock it with the starter key.



2.15.2 GREASE GUN HOLDER

This is on the right front of the machine. When the gun is not used, put it on this holder.



2.15.3 GUARD/SIDE DOOR (WITH LOCK)

CAUTION

Be sure to stop the engine before opening the engine hood, battery cover, and side cover, etc.

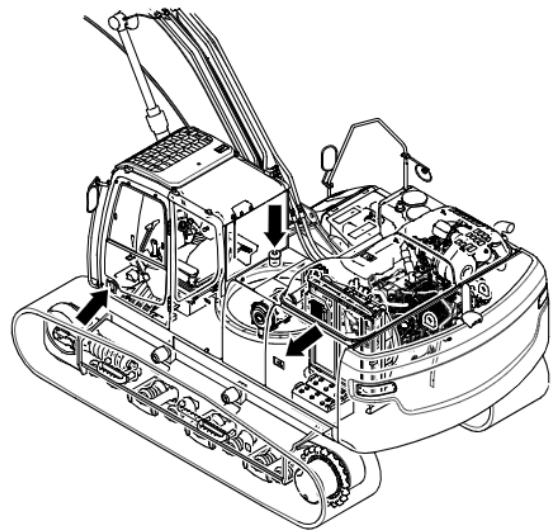
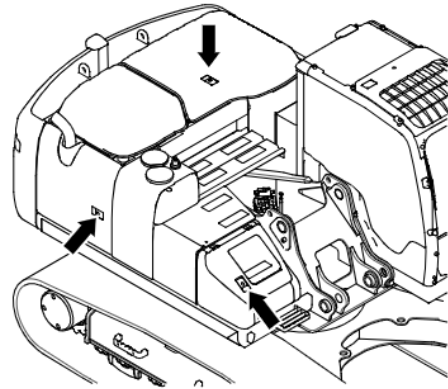
The engine hood, fuel inlet, right and left side doors, and cab door covers are provided with the lock mechanism. To open/close them, use the starter key. When using the starter key, fully insert it and then turn it. If it is not fully inserted, it may be broken.

HOW TO UNLOCK AND OPEN GUARD AND SIDE DOOR

1. Insert the starter key into the keyway.



2. Turn the starter key counterclockwise and pull the door handle to open the door.
3. If the door is provided with a stay, support the door securely using the stay.



HOW TO LOCK GUARD AND SIDE DOOR

1. If a stay is provided, return the stay to the original position.
2. Close the door.
3. Turn the starter key clockwise and remove it.

2.16 FUEL SUPPLY PUMP



HANDLING OF FUEL SUPPLY PUMP

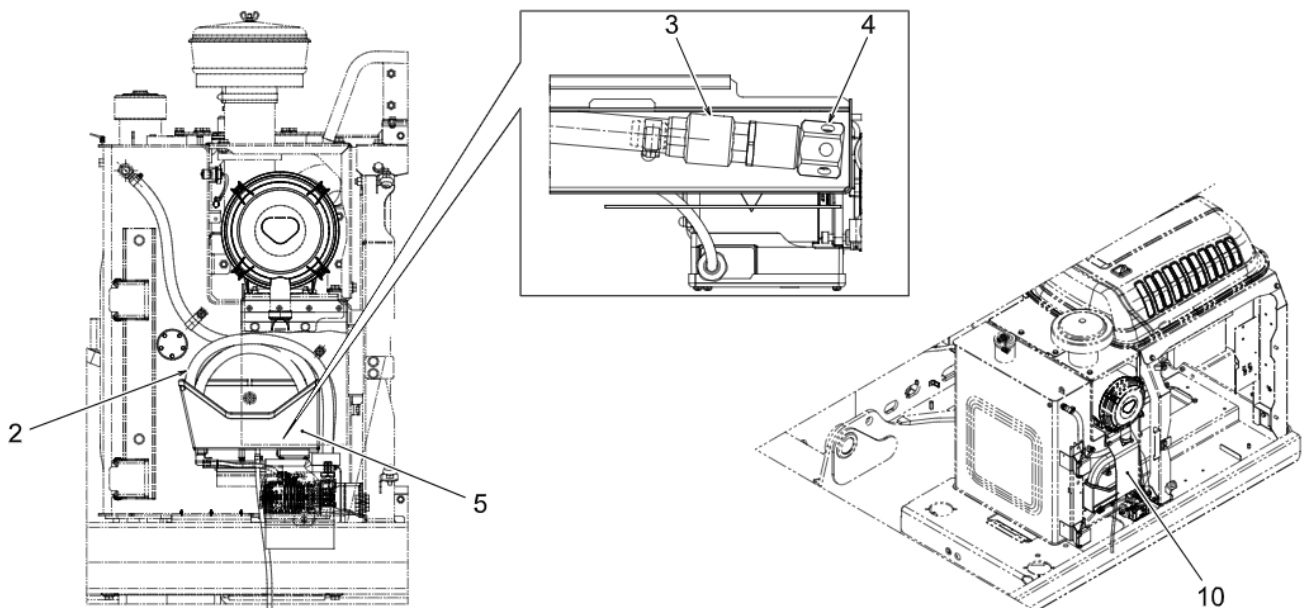
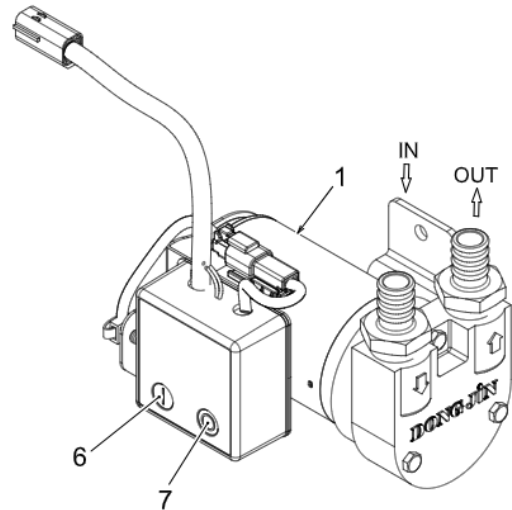
- Wipe off spilled fuel to prevent a fire.
- After the work, check that fuel does not leak.

Fuel can be supplied by using the fuel supply pump according to the following procedures.
Supply light oil as fuel.

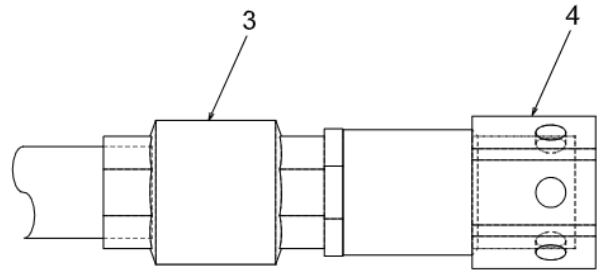
Notice

- Before starting fuel supply, check the hoses, the supply pump, and the harnesses for damage and each connecting part for looseness.
- If strainer (3) is dirty, clean it with light oil.
- Do not leave the machine during fuel supply.

- (1) Fuel supply pump
- (2) Suction hose
- (3) Strainer
- (4) Nut
- (5) Hose storing box
- (6) ON switch
- (7) OFF switch



1. When perform fuel supply, stop the engine.
2. Open the side door at the left side of the machine with the starter key and hold the door with the stay.
3. Take out suction hose (2) from hose storing box (5).
4. Loosen nut (4) of strainer (3) at the end of the suction hose to the position where the turn stops.
5. Put the suction hose into the fuel tank (fuel supply side).
6. Press ON/OFF switch (6) of the fuel supply pump to start fuel supply. During fuel supply, red lamp (9) turns on.
7. When the fuel tank becomes close to full, the fuel supply stops automatically.
When you need to stop the fuel supply, press ON/OFF switch (6).
8. After finishing the fuel supply, take out suction hose (2) from the tank, tighten nut (4) of strainer (3) to the position where the turn stops, and then put the hose back into the storing box.
9. Close the side door and lock it with the starter key.



3. MACHINE OPERATION

3.1 DAILY MAINTENANCE CHECKS

Before starting the engine, walk around the machine to check for any loose nuts and bolts, any oil, fuel or coolant leakage, and the condition of the attachment/equipment, body structure, and hydraulic system. Check for any looseness in the electrical wiring and for any accumulated material (leaves, dirt, etc.).



MACHINE FIRE PREVENTION

The deposit of flammable materials, fuel leakage and oil leakage in heated area around the engine, or muffler and battery may cause fire of machine. Check the area sufficiently, and if the abnormality is found, repair it or contact your KOBELCO authorized dealer.

- Clean all slippery substances such as grease, oil, hydraulic oil, mud, ice, and others attached to the steps, handrails, crawlers, ladders, and platforms.
- Check the engine for any oil, fuel or coolant leakage. Repair as required.
- Check the area around the engine and radiator for any accumulated material and remove as required.
- Check the hydraulic devices, hydraulic oil tank, hoses and joints for oil leakage, and repair as required.
- Check the travel system, such as the crawler, front idlers and sprockets, for any damage or wear, and the bolts for looseness, and the rollers for oil leakage, and repair as required.
- Check the attachment/equipment, body structure, and cylinders for any cracking, damage or looseness, and repair as required.
- Check the doors, covers, steps and handrails for damage, and the bolts for looseness. Repair any damages and tighten loose bolts.
- Check the monitor for damage and replace it as required.
- Check the rearview mirrors for abnormality and replace it with a new one when it is broken. Clean the surface of the mirror and adjust the angle so that the operator can see the rear from the operator's seat.
- If the machine is equipped with the rearview camera and the side cameras, clean the lenses to display clear images from the rearview and side cameras to the monitor.
- Check the seat belts and the mounting hardware for the abnormality and if any damage is found, replace it with a new one.

3

3.1.1 LOCK ROD

The side doors and the engine hood etc. have the lock rod.

When opening the side door or the engine hood etc. be sure to fix them with the lock rod to avoid unintentional closing.



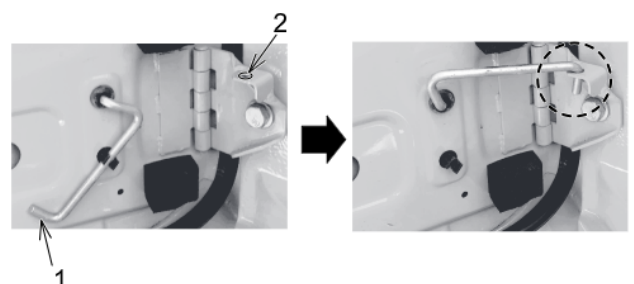
Before performing inspection or maintenance, be sure to confirm that the side doors and the engine hood, etc., are securely fixed with the lock rod.

If the side doors and the engine hood, etc., are not fixed, it may result in personal injury.

Swing type lock rod

Open the side door or the engine hood, etc., and then insert lock rod (1) into lock hole (2) to fix it with the lock rod.

When closing the side door or the engine hood, etc., remove the lock rod from the lock hole and return it to its original position. And then, close the side door or the engine hood.

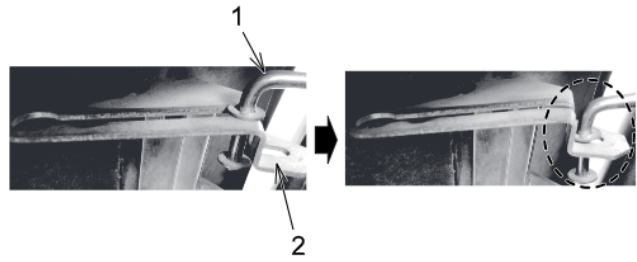
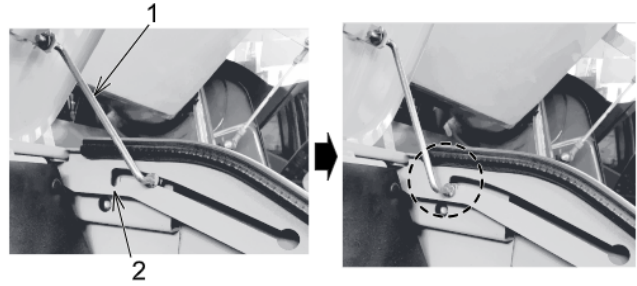


[3. MACHINE OPERATION]

Slide type lock rod

Open the side door or the engine hood, etc., and slide and put lock rod (1) into notch (2) at the rail. Then, fix the side door or the engine hood with the lock rod.

When closing the side door or the engine hood, etc., remove the lock rod from notch (2) and then close the side door or the engine hood.



3.2 CHECK BEFORE STARTING ENGINE

The following checkup should be performed once before the first engine startup in a day.

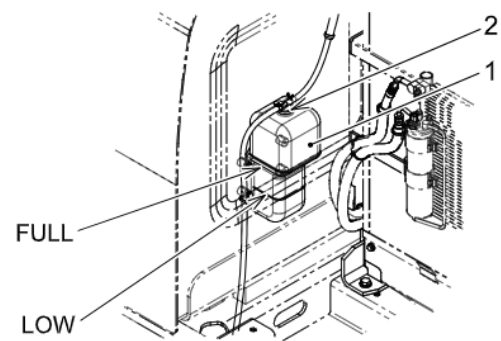
3.2.1 CHECKING COOLANT LEVEL AND REFILLING



HANDLING OF RADIATOR

- Do not open the radiator cap if not required. Check the coolant of reserve tank (1) when the engine is cooled down.
- After the engine stops, the coolant is hot and the high pressure is accumulated in the radiator. Removing the radiator cap under this condition may cause burns. After the coolant cools down, turn the cap slowly to release the pressure.
- If the water level in the reserve tank drops frequently, immediately contact your KOBELCO authorized dealer.

1. Use the starter key to open the side door on the left side of the machine and hold it with the stay.
2. Check that the coolant level falls within the range of FULL (upper limit)-LOW (lower limit) of reserve tank (1). If the water level is low, remove the cap of filler port (2) of the reserve tank and pour coolant water to the FULL level.
If the reserve tank is empty, check it for water leaks and check the water level in the radiator. If the water level is low, fill the radiator with coolant and then fill the reserve tank with coolant. Then immediately contact your KOBELCO authorized dealer.
3. After supply, tighten the cap securely.
4. Release the support stay and close the side door.



3.2.2 CHECKING ENGINE OIL LEVEL OF ENGINE OIL PAN AND REFILLING



TEMPERATURE AFTER STOPPING ENGINE

Immediately after the engine is stopped, there is a possibility of getting burn with heated parts and oil. Start working after the temperature goes down.

Notice

- Make sure the machine is in a level and firm condition when checking the engine oil level.
- Be sure to check the engine oil level before starting the engine.
- When checking the engine oil level after operation, wait approximately 30 minutes from engine stop before checking it.

1. Open the engine hood with the starter key and hold it with the stay.

2. Pull out oil level gauge (1) and wipe off the oil with a waste cloth.

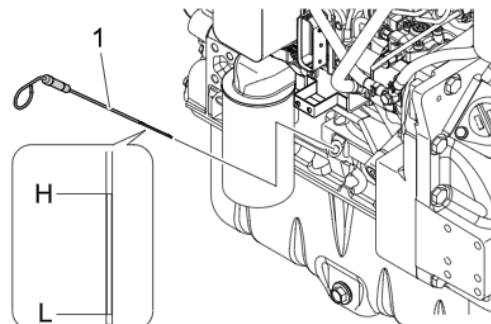
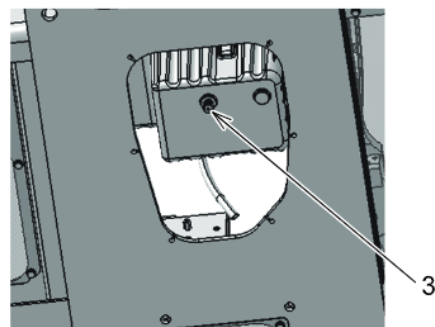
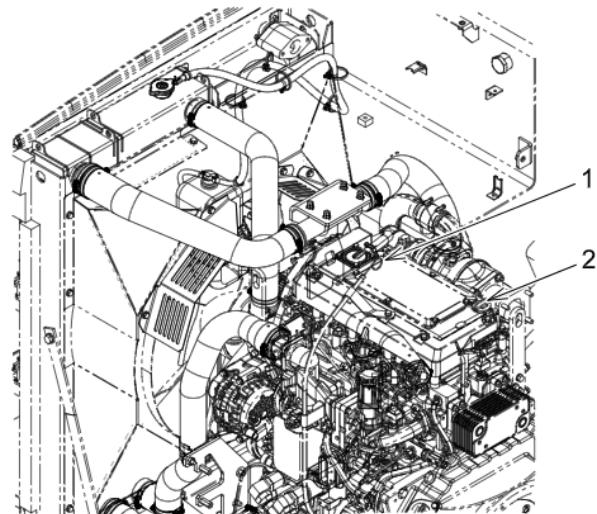
3. Insert oil level gauge (1) completely once again and pull it out.

4. When oil level gauge (1) indicates the oil level between "H" (upper limit) and "L" (lower limit), it is proper. When the oil level does not reach "L" level, refill the engine oil from oil filler cap (2). If the oil is significantly contaminated or deteriorated, change it ahead of the periodic replacement interval. For engine oils to use, see "LUBRICANT, FUEL & COOLANT SPECIFICATIONS" in Chapter 4.

5. When the oil level is above the "H" level, loosen drain valve (3) to drain the excess engine oil and check the oil level once again.

6. Check that the oil level is proper and insert level gauge (1) securely.

7. Remove the support stay and close the engine hood.



3.2.3 CHECKING FUEL LEVEL AND REFUELING



WARNING

REFUELING

- Never use the oil other than diesel fuel as fuel. Check the fuel type again before refueling.
- Be sure to stop the engine before refueling.
- Do not overflow fuel while refueling. Wipe off spilled fuel completely.



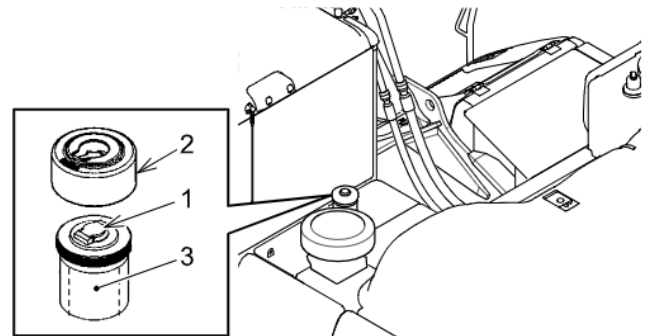
CAUTION

When getting on and off the machine, use the steps and handrails to prevent yourself from falling down or off from the machine.

Notice

- Be careful not to refuel the tank to a level more than necessary (to the top end of tank). There is a possibility of overflowing because the fuel expands as the outside air temperature rises.
- Be sure to use diesel fuel as fuel, which meets the standard of each country. To achieve a good fuel efficiency and exhaust gas property, the engine of this machine uses the electronically controlled fuel injector. Because this device requires high parts precision and high lubricating ability, when low viscosity fuel with low lubricating ability is used, the durability may decrease significantly.

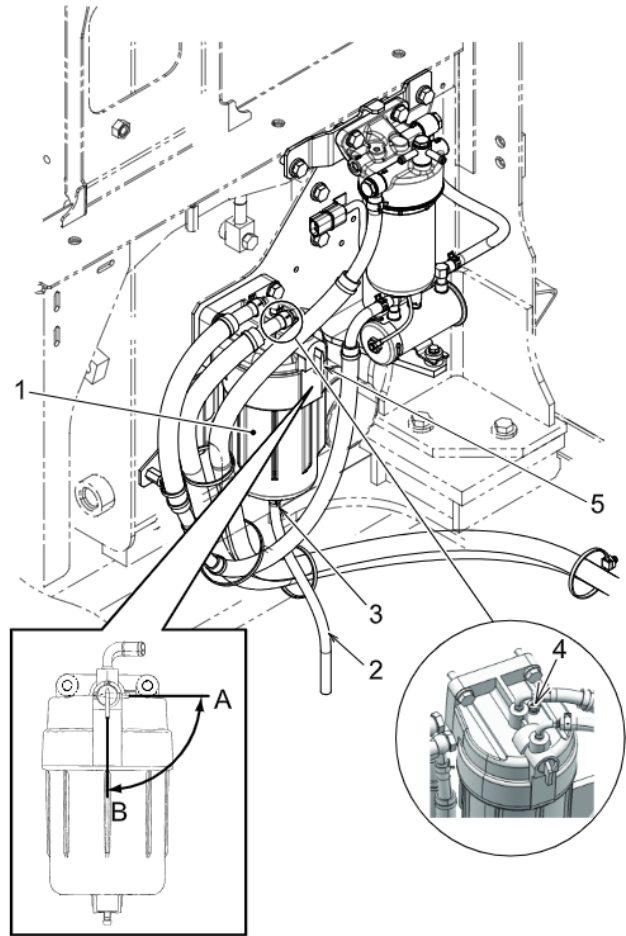
1. Use the monitor to check the fuel level.
After turning the starter switch ON, the fuel level meter is displayed. When the fuel level is low, the pointer points E.
2. Refuel only after stopping the engine.
3. When refueling, climb up from the right front side of the machine and stand on the step above the control valve.
4. Remove rubber cover (2), if equipped, from the filler port and turn filler cap (1) to open it.
5. Refuel the machine with strainer (3) attached to the filler port.
When dirt is adhered on strainer (3), take out strainer (3), wash it with light oil or clean it by air blowing, and then attach it to the filler port again.
Fuel tank capacity: 320L(84.5Gal)
6. After refueling, tighten filler cap (1) securely. Attach rubber cover (2) according to the orientation of the cap.



3.2.4 DRAINING FUEL PRE-FILTER

The fuel pre-filter is a device which separates water mixed in fuel. When water is accumulated in the fuel pre-filter, drain the water.

1. Use the starter key to open the side door on the right side of the machine and hold it with the stay.
2. Place a drain oil container under drain hose (2).
3. Rotate valve counter clockwise(5) to "Close" position (A).
4. Loosen drain valve (3) and air bleeder plug (4) to drain water accumulated in fuel filter (1) into the container.
5. After draining the water, tighten drain valve (3) and air bleeder plug (4) securely. Check the water drained to the container. If that is contaminated significantly, clean the element and the inside of the case.
6. Rotate valve clockwise(5) to "Open" position (B).
7. Remove the support stay and close the side door.



3.2.5 CHECKING OIL LEVEL OF HYDRAULIC OIL TANK



WARNING PRESSURE WITHIN HYDRAULIC OIL TANK

The inside of the hydraulic tank is dangerous because it is high temperature and pressurized.

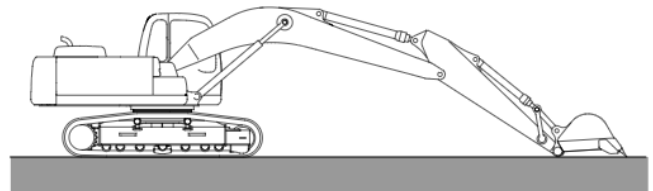
Before removing the filler port plug, stop the engine and then press the top of breather (1) to release the pressure in the hydraulic oil tank.

Notice

For refilling procedures of the hydraulic oil, see "5000 HOUR INSPECTION & MAINTENANCE PROCEDURES" in Chapter 4.

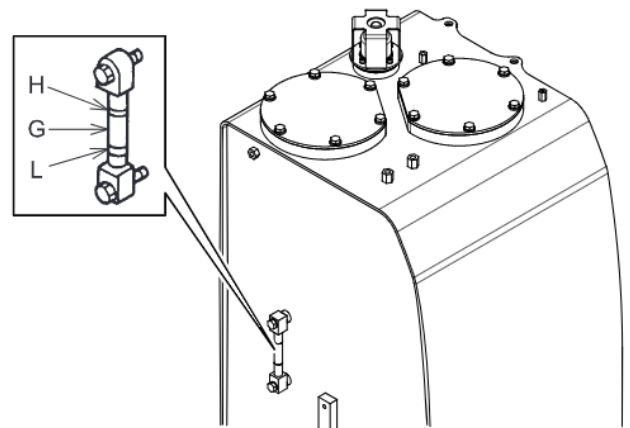
The hydraulic oil tank is on the right side.

1. Move the machine to a level and firm place.
2. Retract the arm cylinder and bucket cylinder, and place the bucket and dozer (when installed) on the ground.
3. Stop the engine and move the control lock lever to the "LOCKED" position.



3

4. Check the oil level through sight level gauge (G) provided on the side of the hydraulic oil tank. If the reading falls within the range of "H" to "L", the oil level is normal. The oil level varies depending on the oil temperature. Use the following rough standard at inspection.
 - Before operation: Near the "L" level (oil temp. 10 to 30 degrees C (50 to 86 degrees F))
 - During normal operation: Near the "H" level (oil temp. 50 to 80 degrees C (122 to 176 degrees F))



Notice

Do not supply oil to the "H" level or more.

If the hydraulic oil tank becomes full, it can cause damages to the tank and the components and spray of the hydraulic oil.

3.2.6 CHECKING FAN BELT AND AIR CONDITIONING COMPRESSOR BELT



WARNING INSPECTING AND MAINTAINING THE BELT

Be sure to stop the engine before inspection and maintenance of the engine.

Inspecting and maintaining the running engine may cause severe injury by being caught in the rotating parts, such as the fan and the belt.



Replace the belt with a new one if flaking or breakage is found on the belt by the inspection, slip occurs excessively, or the belt cannot be adjusted to within the adjustment range. Keep the belt away from oils. The service life may be shortened if it slips by oil.

Notice

- When the belt is replaced by a new one, the belt needs to be broken in. Run the engine at idle for 3 to 5 minutes and then adjust the belt tension again.
- After running the engine for about 2 hours, a new belt obtains a complete break-in.
- When replacing a set of two belts, be sure to replace both two with new ones.

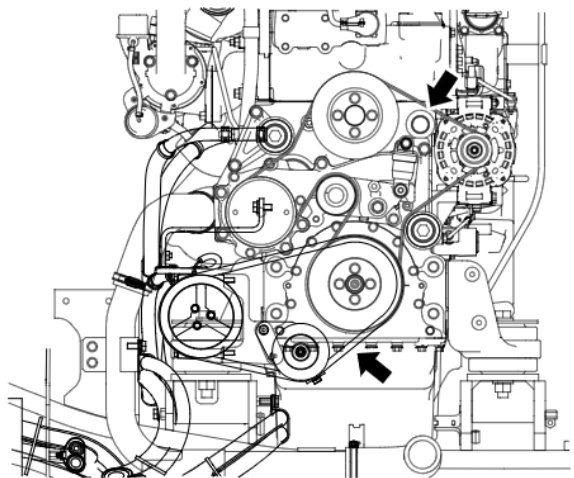
The engine of this machine is equipped with the alternator, the fan, and air conditioning compressor belts. Check the belts for wear and damage, and also for tension, and adjust them properly in order to maintain the maximum engine performance and the service life. If failures are found, replace the belt.

Notice

For adjustment procedures for each belt, see "ADJUSTING FAN BELT AND AIR CONDITIONING COMPRESSOR BELT" in Chapter 4.

In case of air conditioning compressor belt

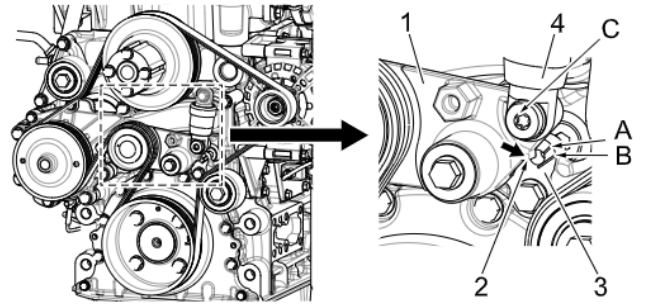
- To check the belt tension, press on the center of the belt with your thumb. If the deflection falls within the range shown in the following table, it is normal.



Belt	New Belt Tension mm (inch)	At Inspection mm (inch)	Pushing Force N (lbf)
Air conditioning compressor belt	2.9(0.11)	2.9(0.11)	New: 28 to 35(6.3 to 7.9) Inspection: 14 to 17(3.1 to 3.8)

In case of alternator and fan belt

- The alternator and fan belt is automatically adjusted by the hydraulic auto tensioner. If the auto tensioner in a static condition is placed at the position of replacement time, replace it with a new one.
- In an initial condition, when the belt is in the static condition, tensioner protrusion (2) of tensioner arm (1) is placed at groove position (A) of tensioner bracket (3). However, as the belt gets extended, the piston of hydraulic unit (4) is extended (C), and the protrusion is moved to groove position (B). Groove position (B) is the position of belt replacement time.



3.2.7 CHECKING DEF/ADBLUE LEVEL AND REFILLING

CAUTION

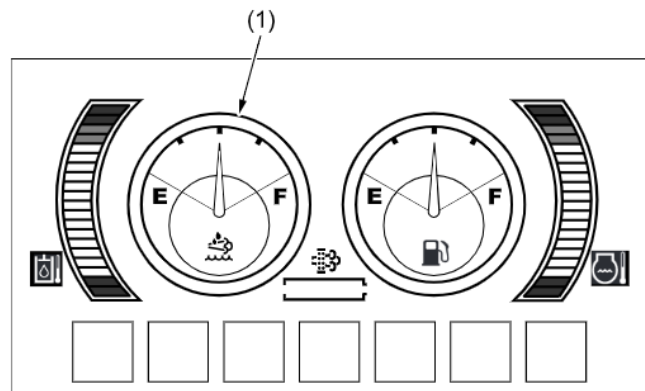
- Use DEF/AdBlue which meets ISO 22241-1 or JIS K2247-1.
- Do not fill the DEF/AdBlue tank with diesel fuel or water.
- Comply with the precautions specified by the manufacturer when handling DEF/AdBlue.
- For handling of a long term storage of the machine, see Section "PRECAUTIONS FOR LONG-TERM STORAGE".

Notice

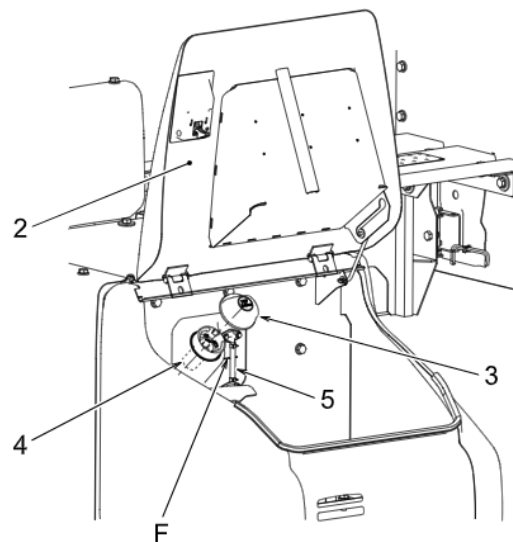
When the level gauge of monitor indicates Level 2 (Yellow), Level 1 (Red), or Level 0 (No display), refill DEF/AdBlue immediately to Level 3 (Green) or over.

DEF/AdBlue shortage restricts the engine output and, in the end, the machine becomes inoperable.

1. Use the gauge cluster to check the level of DEF/ (1) AdBlue.
After turning the starter switch ON, level gauge (1) is displayed on the multi-display.
The levels are displayed in ten levels. As the amount of remaining DEF/AdBlue decreases, the number of levels decreases.



2. Use the starter key to open tool box cover (2) on the right front of the machine.
3. Turn inlet port cap (3) to open it.
When dirt is adhered on strainer (4) of the inlet port take out strainer (4), wash it with water, dry it completely, and then attach it to the inlet port again.
4. Refill DEF/AdBlue from the inlet port. Refill it until the level reaches the line F, while checking level gauge (5) on the right side of the tank.
 - SK210LC-11E/SK210NLC-11E
Full capacity of tank: 83L(22Gal)
 - SK210SNLC-11E/SK240SN-11E
Full capacity of tank: 33.9L(9.0Gal)
5. After refilling, tighten inlet port cap (3) securely and close tool box cover (2).



3.2.8 ADJUSTMENT OF OPERATOR'S SEAT

**WARNING****ABOUT ADJUSTMENT OF OPERATOR'S SEAT**

- Adjust the operator's seat before the operation or when the operator changes.
- When adjusting the operator's seat, pay attention to hands in order not to be caught between the handle and the seat stand.

Notice

For adjusting procedures of operator's seat, see "HANDLING OF OPERATOR'S SEAT" in Chapter 2.

Adjust the operator's seat in a way so that the operator can operate the control levers, pedals and switches freely, with his/her back contacting with the backrest of the operator's seat.



3.2.9 ADJUSTMENT OF MIRRORS



ABOUT ADJUSTMENT OF MIRRORS

Be sure to adjust the mirrors before operation.

When the mirrors are poorly adjusted, visibility cannot be ensured and it could cause severe injury.

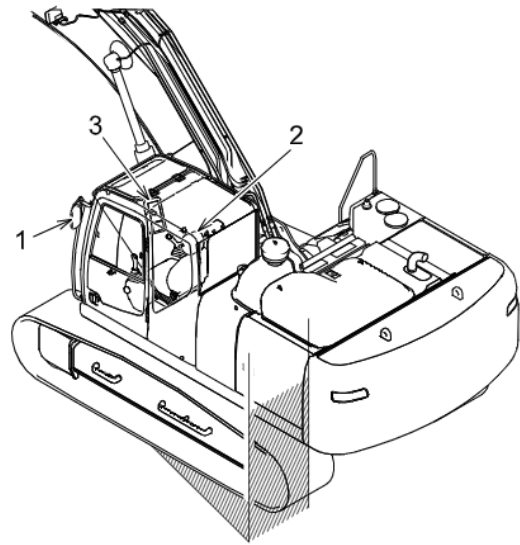


Use genuine mirrors only.

When the mirrors are attached to a non-specified place, such as the handrail of the cab entrance, the strength of handrail may be decreased and it may cause damage or falling off of the mirror.

Adjust cab left mirror in a way so that the blind spot can be minimized when seeing it from the operator's seat.

- (1) Cab left mirror
- (2) Seat
- (3) Monitor



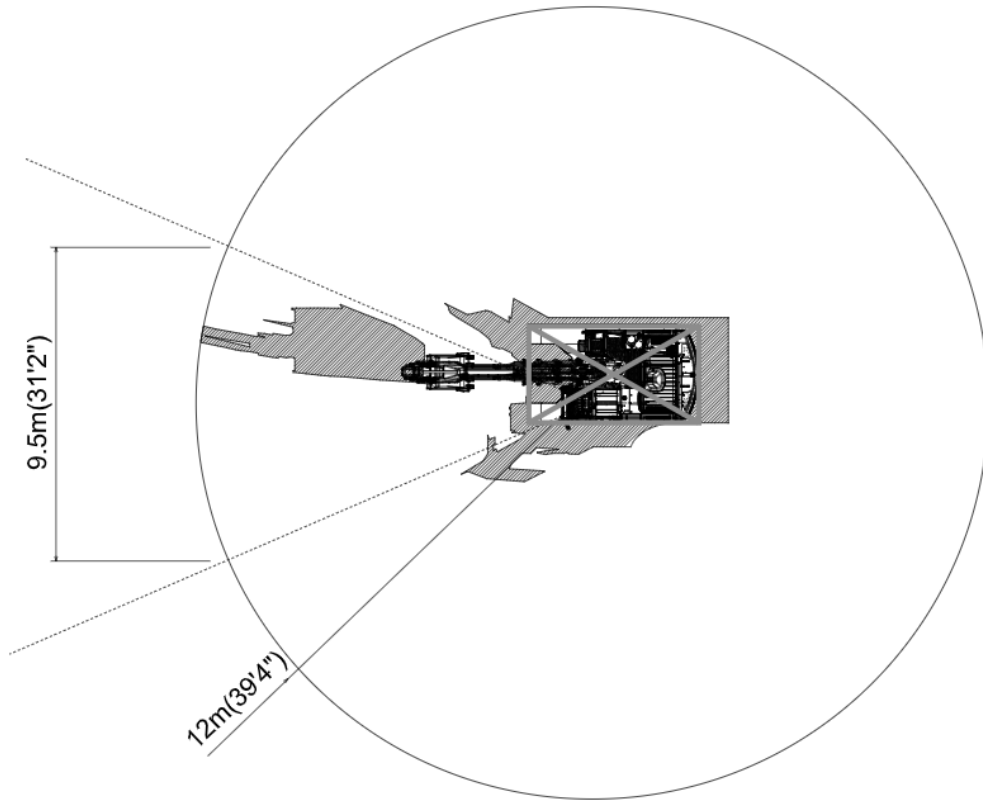
VISIBILITY MAP

- The following visibility map is a rough standard of areas where the operator cannot see both directly and indirectly (through the mirrors and the camera). The operator can use this map as a reference to improve field rules or enhance visibility by adding an auxiliary device.
 - This map was made according to the standard specification. Be cautious that the map may change according to the machine specification.
 - This map is provided for the machine with the side camera.
-

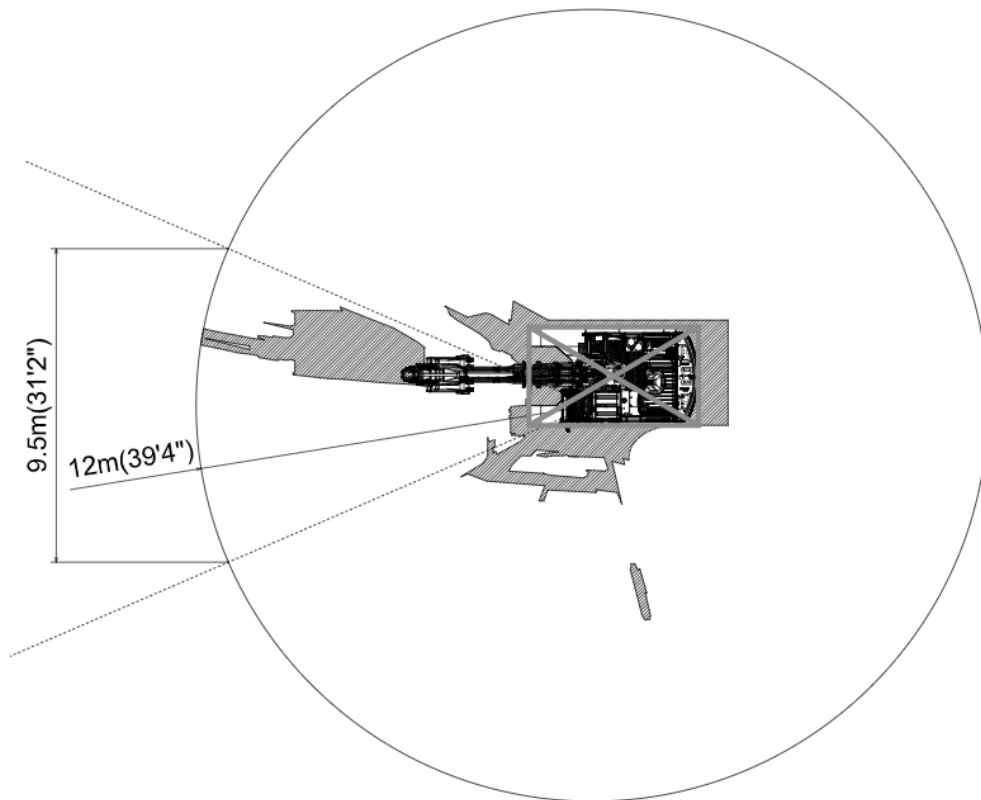
Note

This map is a rough standard at the ground surface within the radius of 12 m, centering the operator reference point (680 mm above and 20 mm forward from Seat Index Point) from near areas of the machine.

Direct and indirect visibilities (when using three cameras of Eagle-Eye-View)



Direct and indirect visibilities (only using right camera+rear camera)

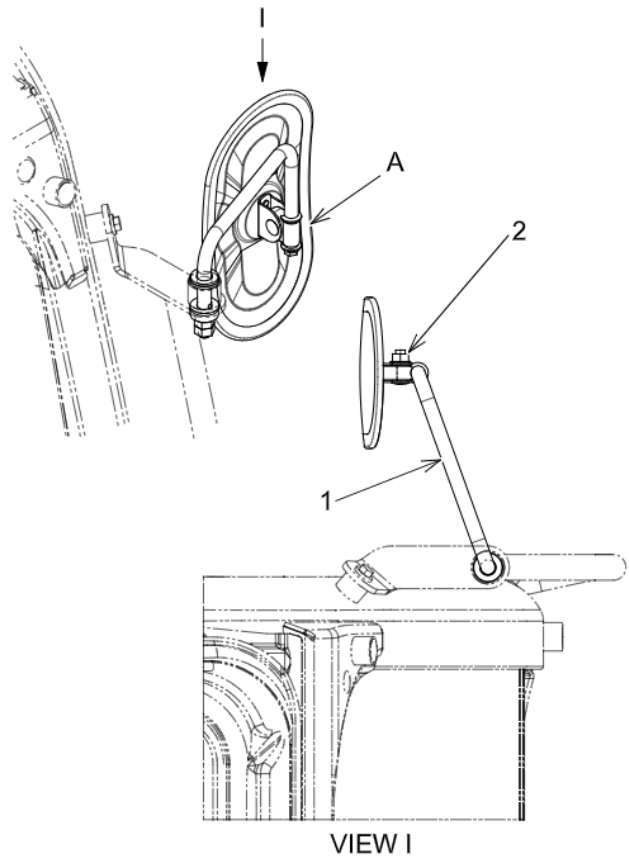


[3. MACHINE OPERATION]

MIRROR A (CAB LEFT SIDE)

Adjust the mirror in the way that a person (or the object of 1.5 m high and 30 cm in diameter) who stands on the left rear end of the machine can be identified by the operator in the operator's seat.

- Install the mirror to the position shown in the figure.
- Install the mirror in the way not to come in contact with stay (1) of the mirror.
- If the movement of the mirror is not smooth, loosen nut (2) of the mirror to adjust it.
Tightening torque of nut (2)
M10: 18.6 to 25.5N·m(13.7 to 18.8 lbf·ft)
- Adjust the mirror to reflect the machine side.

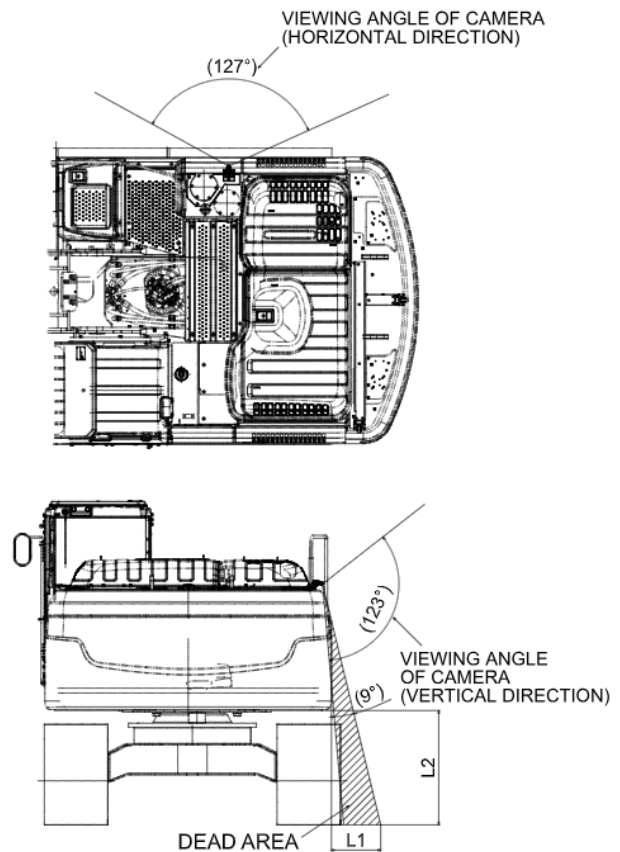


SIDE CAMERA (RIGHT SIDE)

Blind spot range

L1: 475mm(18.7")

L2: 1,060mm(3'6")

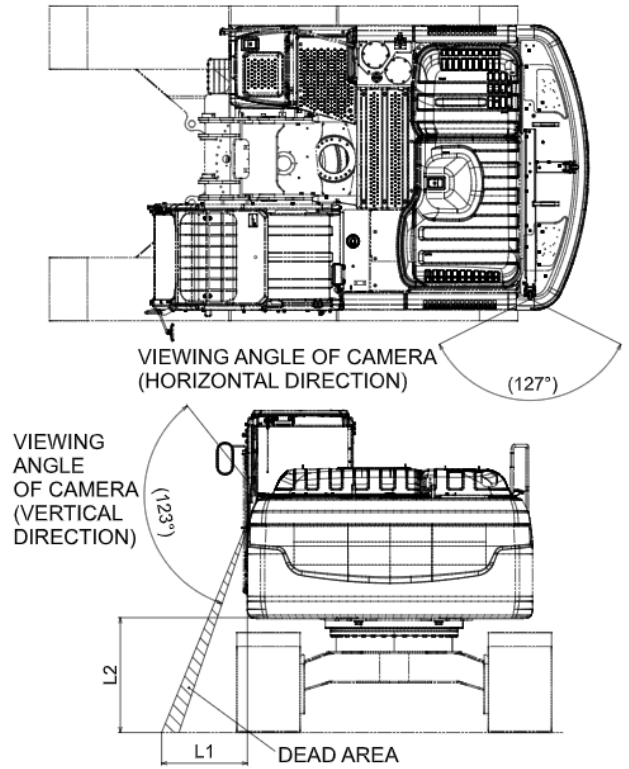


SIDE CAMERA (LEFT SIDE)

Blind spot range

L1: 815mm(32.1")

L2: 1,091mm(3'7")

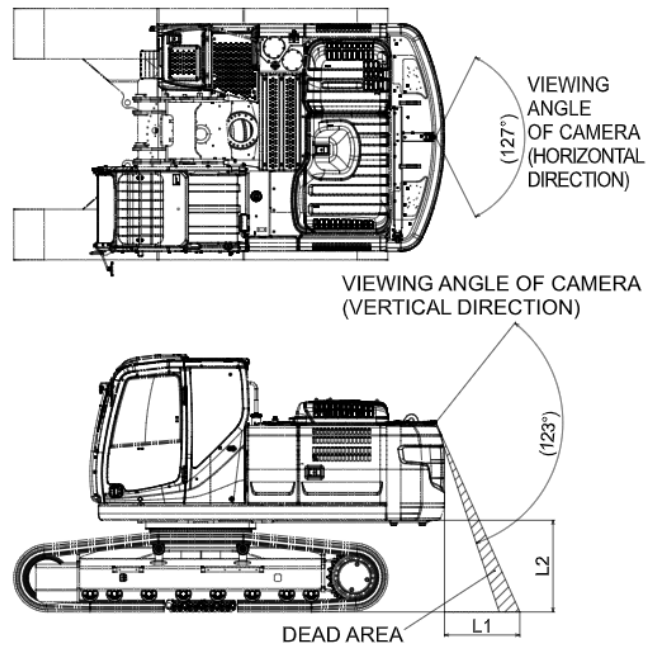


CAMERA (MACHINE REAR SIDE)

Blind spot range

L1: 896mm(35.2")

L2: 1,091mm(3'7")



3.2.10 CHECKING DISPLAY OF MONITOR

Before starting the engine, check the display status of the monitor according to the following procedure.

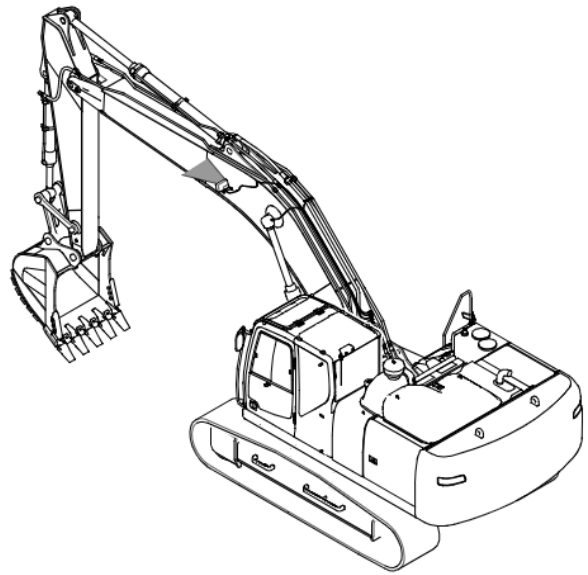
CAUTION

When the warning is displayed on the monitor, ask your KOBELCO authorized dealer for inspection.

1. Make sure the pilot control lock lever is in the "LOCKED" position.
2. Make sure all control levers are in the "NEUTRAL" position.
3. Turn the key of the starter switch to the "ON" position.
4. Check that no warning is displayed on the monitor.

3.2.11 CHECKING WORKING LIGHT

While the starter switch is in the "ON" position, press the working light switch to turn on the working lights. If they do not light, presumably light bulbs are burned out or the electrical wire is broken. Ask your KOBELCO authorized dealer for repair.



3.2.12 CHECKING OF AIR CLEANER INLET

- Check that no mud, leaves, and snow, etc. are accumulated around the air cleaner inlet.
- When it is covered with snow, remove it.
- When washing the machine with high-pressure water for cleaning, be careful not to let the water enter the air cleaner inlet.

3.3 STARTING ENGINE



WHEN STARTING ENGINE

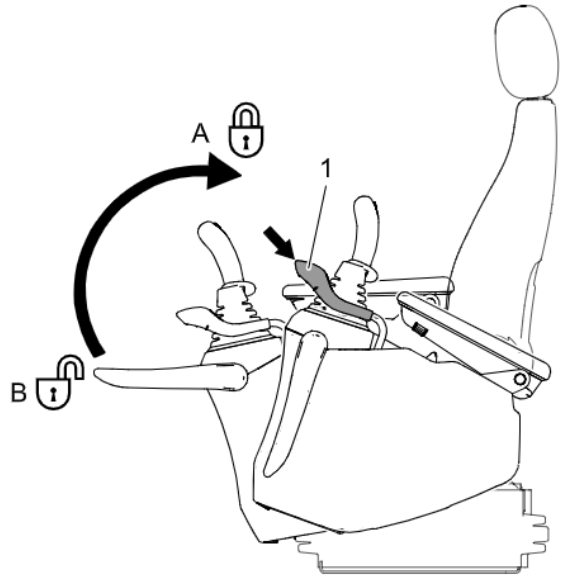
After making sure that no one is near the machine and no obstruction is left around the machine, sound horn and start the engine.

Notice

- Do not hold the starter key switch in the START position for more than 15 seconds. If the engine does not start, return the starter key switch to the OFF position, wait 30 seconds, and then try it again.
- When starting engine, if warning is displayed on the monitor, stop engine immediately and identify the cause, and then repair it if necessary.
- After the auto idling stops, when necessary to restart the engine, start the engine after returning the starter key switch to ACC or OFF once and the throttle potentiometer to the low idling position. But it is impossible to start the engine again until the buzzer stops sounding after the engine stops.

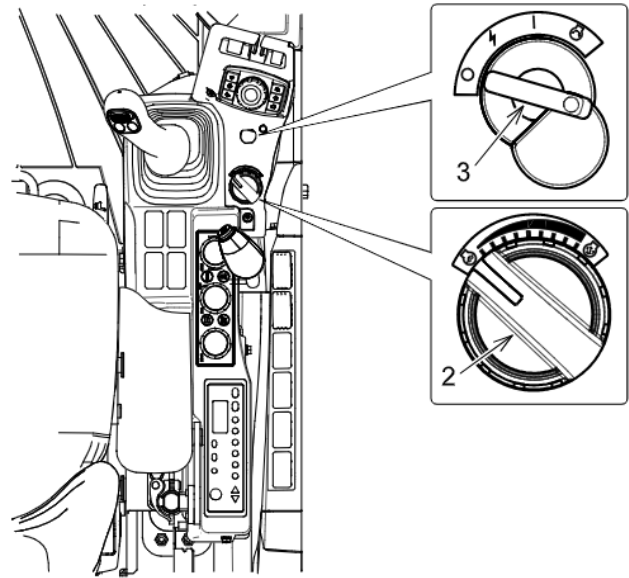
3.3.1 START-UP UNDER NORMAL TEMPERATURE CONDITIONS

1. Make sure control lock lever (1) is in the "LOCKED" position.
 - A: "LOCKED" position
 - B: "UNLOCKED" position
2. Make sure all control levers are set to the "NEUTRAL" positions.



[3. MACHINE OPERATION]

3. Turn engine throttle (2) to the low idle position.
4. Turn the key of starter switch (3) to the "ON" position and check the operation status of the multi-display.
5. Turn the key of starter switch (3) to the "START" position to start the engine.
6. Release your hand from key (3) immediately after the engine starts. The starter key will return to the "ON" position by itself.



3.3.2 START UP IN COLD CONDITIONS

In cold weather, due to increase in oil viscosity and decrease in battery performance, starting the engine may be difficult.

Notice

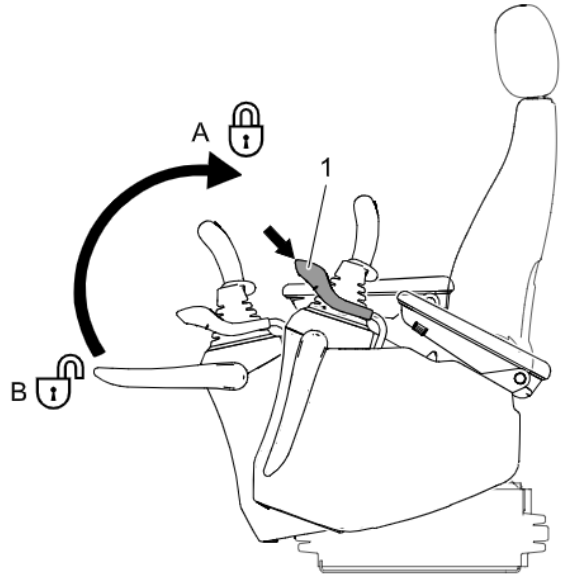
For the engine start up procedures with the automatic warming-up system, see "USER MENU SETTING" in Chapter 2.

1. Make sure the control lock lever (1) is in the "LOCKED" position.

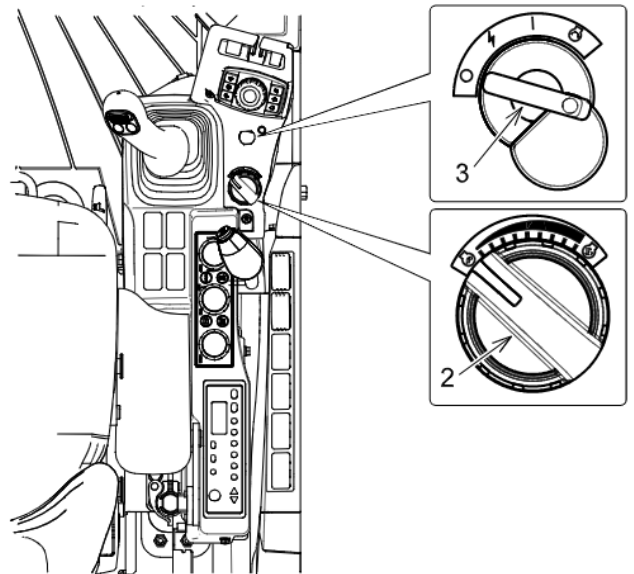
A: "LOCKED" position

B: "UNLOCKED" position

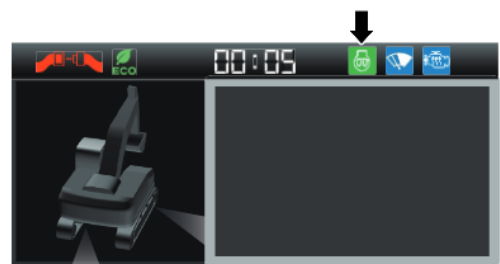
2. Make sure all control levers are set to the "NEUTRAL" positions.



3. Turn engine throttle (2) to the low idle position.
4. Turn the key of starter switch (3) to the "ON" position and hold the position.
When the coolant temperature decreases below 10 degrees C (50 degrees F), the glow plug is preheated automatically by the engine coolant temperature sensing.



5. Also check the operation of the monitor.
6. After having completed the preheating (within five seconds), turn the key of starter switch (3) to the "START" position to start the engine.
7. Release key (3) immediately after the engine starts. The starter key will return to the "ON" position by itself.



3.3.3 USING JUMPER CABLES



STARTING ENGINE BY JUMPER CABLES

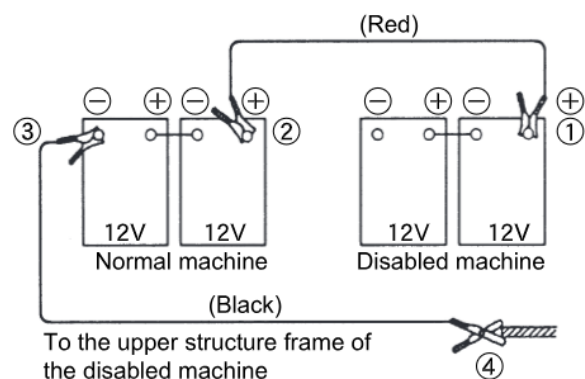
- Combustible gas (hydrogen gas) is generated in the battery. Do not allow sparks or flames to come in contact with the battery to avoid catching a fire and triggering an explosion.
- Do not allow the normal machine to come in contact with the disabled one to skip negative side cable connection.
- Wear protective glasses and rubber gloves when using jumper cables to start the engine.
- Never allow the positive and negative side clips of the jumper cables to come in contact with each other when connecting the jumper cables.
- Do not mistake positive (+) for negative (-) or vice versa in the jumper cable connection. When the negative jumper cable is finally connected to the upper structure of the disabled machine, it may generate sparks. Connect the jumper cable to a ground surface as far as possible from the battery.
- If the battery electrolyte is frozen, do not attempt to start the engine with another power supply.
- Wrong connection of the jumper cables may cause explosion of the battery.
- The starting system of this machine is 24 volts. Therefore the boost battery voltage in use should be 24 volts. The application of high voltage employed for a welding machine, etc. in engine start may cause damage to the electrical system.



- Use the battery of which the capacity is equivalent to that of the disabled machine for the normal machine.
- Select the jumper cables and clips with a proper size for the battery.
- Check the jumper cables and clips for damage and corrosion.
- Connect the clip securely.
- Check that the control lock lever is in the "LOCKED" position.
- Check that each control lever is returned to the neutral position.
- The starter switches on both the normal and disabled machines must be held in the "OFF" position until the cable connections are completed. Because when the power is connected, it may cause unexpected move of the machines and it is dangerous.

1. For the normal machine, put the attachment on the ground, return all control levers to the neutral position and then set the control lock lever to the "LOCKED" position.
2. Set the starter switch to the "OFF" position for both the normal machine and the disabled machine.
3. Remove the terminal cover of the battery, and connect the jumper cable (red) clip to the positive (+) terminal on the battery of the disabled machine.
4. Connect the jumper cable (red) clip to the positive (+) terminal on the battery of the normal machine.
5. Connect the jumper cable (black) clip to the negative (-) terminal on the battery of the normal machine.
6. Finally, connect the clip of the other end of the negative (-) jumper cable (black) to the upper structure frame of the disabled machine.

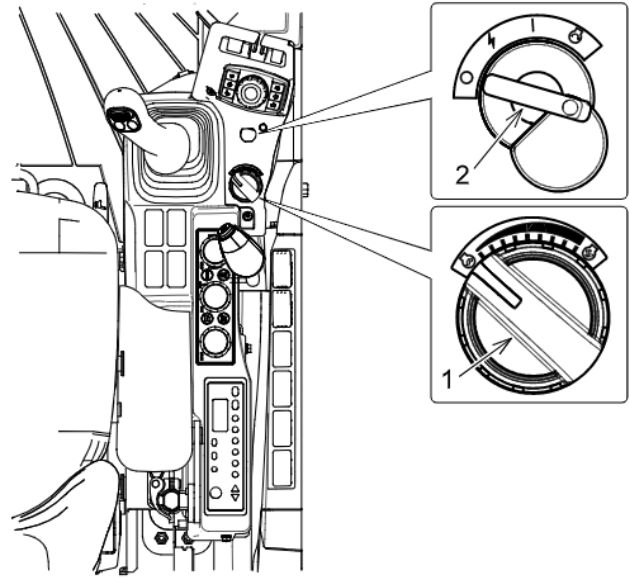
Order of connecting the cable ① → ② → ③ → ④
 Order of removing the cable ④ → ③ → ② → ①



7. Start the engine of the normal machine, and run it for about 10 minutes at high idle.
The battery of the disabled machine is partially charged.
8. Start the engine of the disabled machine.
9. Soon after the starting of the engine of the disabled machine, immediately remove the jumper cables in the reverse order of the connection.
10. Finally, check and repair the cause of the problem of the start/charging system on the disabled machine.

3.4 STOPPING MACHINE ENGINE

1. Place the attachment on the ground before stopping the engine.
2. Pull up the pilot control lock lever to the "LOCKED" position.
3. Turn engine throttle (1) to the low idle position.
4. Turn starter key (2) to the "OFF" position to stop the engine.
5. Remove starter key (2) and store it.



3.5 CHECK AFTER STARTING ENGINE

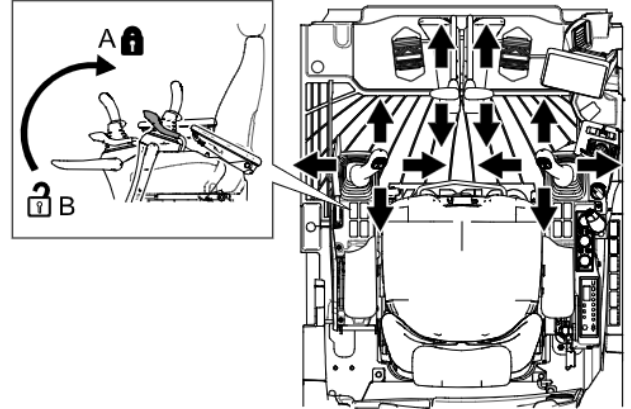
Before operation, be sure to inspect and check the machine after starting the engine. If any failures are found, contact your KOBELCO authorized dealer.

3.5.1 CHECK OF PILOT CONTROL LOCK LEVER

Check that the locking function of the pilot control lock lever is proper.

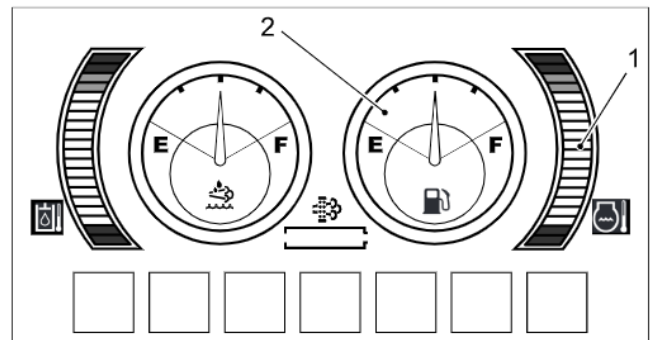
See "PILOT CONTROL LOCK LEVER" in Chapter 2.

1. Move the pilot control lock lever to the "LOCKED" position.
2. Make sure that movement of the attachment, swing and travel, are disabled when the pilot control lock lever is in the "LOCKED" position.



3.5.2 CHECK OF ENGINE AND MONITOR

1. Check the engine for oil or water leakage the engine and the area around the engine.
2. Check that no warning is displayed on the monitor and the pointer is at a proper position on engine coolant temperature meter (1) and fuel level meter (2).
3. Check that the exhaust sound, the color of exhaust gas and vibrations of the engine are normal.



CAUTION

- Inspection with the engine running shall be done by a person other than the operator and the operator shall stay seated during inspection.
- When the warning is displayed on the monitor, ask your KOBELCO authorized dealer for inspection.

Notice

Color classification for identifying the exhaust gas state (After warming-up at no load)

Colorless or light blue: Normal (Perfect combustion)

Black: Abnormal (failure of exhaust gas cleaning device)

White: Abnormal (failure of exhaust gas cleaning device)

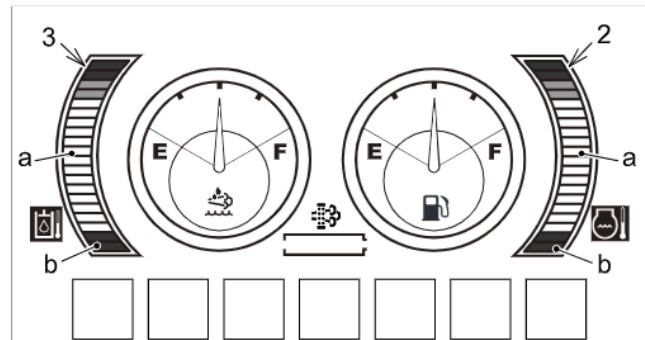
The smoke may look white in winter due to cold weather.

3.6 WARMING-UP



ABOUT WARMING-UP

- When the reading of hydraulic oil temperature meter (3) is in low temperature range (b), rapid operations may cause severe damages to the hydraulic components. Before starting operations, warm-up the hydraulic oil until the reading of hydraulic oil temperature meter (3) rises to normal range (a).
- If the attachment/equipment is operated without enough warming-up operation, the response of the attachment to the control lever is delayed and sometimes it moves in an unexpected manner for the operator. Therefore, be sure to perform the warm-up operation. Especially in cold weather, a sufficient warming-up operation is necessary.



Notice

In warming-up the engine, turn auto idling stop function switch OFF.

Notice

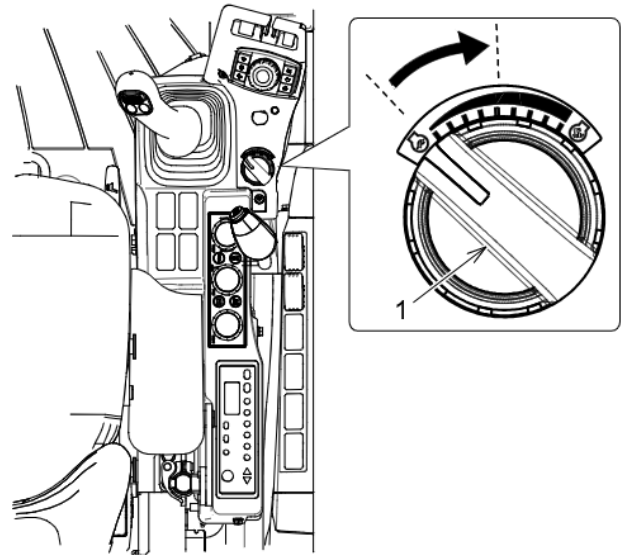
For the engine start up procedures with the automatic warming-up system, see "USER MENU SETTING" in Chapter 2.

3.6.1 ENGINE WARMING-UP

Notice

Avoid idling because it may cause poor engine performance and trouble.

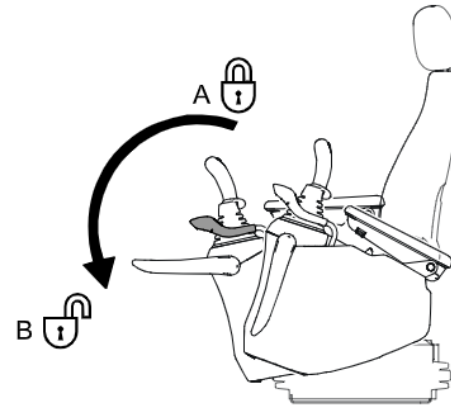
1. Run the engine for about 5 minutes with no load at middle speed by setting engine throttle (1) to the middle between the low idle and the full speed positions.
2. When the reading of engine coolant temperature meter (2) rises to normal range (a), engine warming-up is completed.



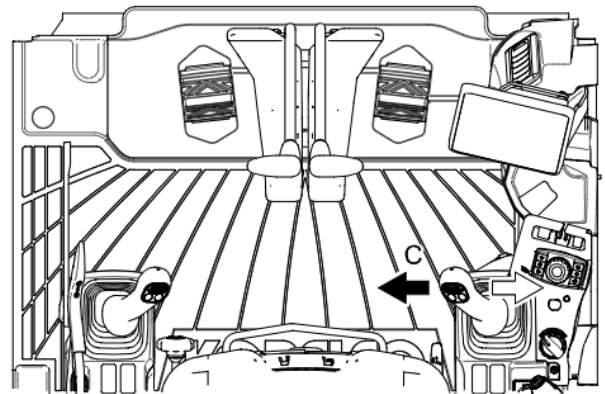
3.6.2 WARMING-UP HYDRAULIC OIL

Perform warming-up of the hydraulic oil after engine warming-up is completed.

1. Push pilot control lock lever (1) down and forward and set it at the "UNLOCKED" position.
2. Raise the boom to the height where the bucket can be operated.



3. Move the right control lever slowly toward bucket digging side (C) to the stroke end position and perform relief operation until the reading of hydraulic oil temperature meter (3) rises to normal range (a).
4. After that, slowly extend and retract each cylinder several times.
5. Also perform swing and travel operations slowly to circulate the warm hydraulic oil in all operation circuits.
When the reading of hydraulic oil temperature meter (3) is in low temperature range (b), repeat the above-mentioned procedure until it rises to normal range (a).



3.7 AUTO IDLING STOP FUNCTION

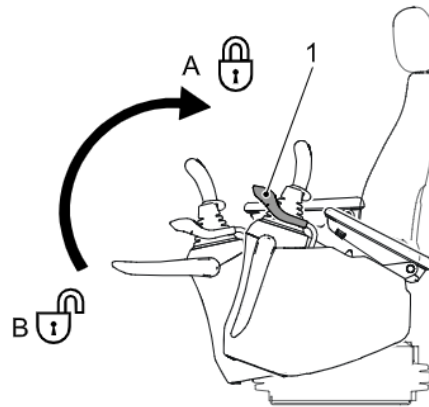
CAUTION

This machine is equipped with auto idling stop function to reduce the fuel consumption and exhaust gas, due to unnecessary engine idle time.

- When auto idling switch is on, if the engine is running the engine stops after an elapse of the specified time from when the safety lock lever is pulled up.
- After the auto idling stops, when necessary to restart the engine, start the engine after returning the starter key switch to ACC or OFF once and the throttle potentiometer to the low idling position. But it is impossible to start the engine again until the buzzer stops sounding after the engine stops.
- If you would like to perform warming-up of the engine, operate the air conditioner, or use the working light continuously with the pilot control lock lever in the "LOCKED" position, turn the auto idle stop function "OFF". With the auto idle stop function turned "ON", the engine stops, so that the function stops.
- When necessary to leave the operator seat, always turn the starter switch off.
- When the failure warning of "engine coolant temperature" or "coolant level" appears, or auto warming-up is working, the auto idle stop function does not work regardless whether the auto idle stop function turns "ON" or "OFF".
- Do not use auto idling stop mode when lifting.

This switch is usually set to "OFF". When the auto idling stop function is selected, the engine stops automatically after an elapse of the specified time with the control lock lever (1) set to "LOCKED" position (A) during engine operation. This function is effective in saving of fuel and in restraint of exhaust gas by setting auto idling stop function.

- As for the setting of the auto idle stop function, see "Setting of auto idle stop" in Chapter 2.
- The default setting of the interval until engine stop is 300 seconds.
To change the set interval, contact your KOBELCO authorized dealer.



Notice

- After setting control lock lever to locked(up) position (A), the engine changes to "DECEL" speed about 4 seconds later.
- Buzzer sounds for 5 seconds before engine stops.
- Excessive Engine Idling: idling beyond 15 minutes is excessive and should be avoided. Excessive idling can create engine wear and carbon soot buildup which may cause premature component failure.

3.7.1 RESTART AFTER AUTO IDLE STOP

CAUTION

When leaving the operator's seat, be sure to set the starter switch to the "OFF" position.

1. Check that the buzzer stops.

2. Turn the engine throttle to the low idle position.

3.8 WORK MODE SELECTION

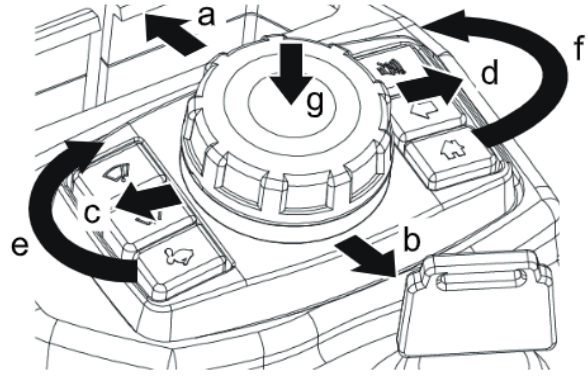
Jog dial operation

Tilting (a, b, c, d) and rotating (e, f) the jog dial

To move the cursor on the monitor and adjust the values and others.

Pushing down (g) the jog dial

- To switch the screen to the selected setting screen.
- To determine the adjusted value and others.



Select a proper work mode from three modes shown below according to the work condition and purpose. Move the cursor to [work mode selection] (8) and push down (g) the jog dial to switch the mode.

S mode:

"S mode" is suitable for a standard digging work and loading operations. It provides good fuel consumption and is well-balanced with a workload.

ECO mode:

"ECO mode" focuses on reduced fuel consumption operation.

H mode:

"H mode" is suitable for a heavy digging work, which provides high speed and gives priority to a workload.








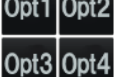


CAUTION

Before beginning the work, make sure the selected work mode is correct.

3.9 SWITCHING ATTACHMENT MODE

Select an appropriate mode to use according to the attachment installed.

Display	Attachment mode	Summary
	Bucket	This mode needs to be selected for digging work.
	Breaker	This mode needs to be selected when an attachment using a single flow circuit such as a breaker is installed.
	Nibbler (crusher)	This mode needs to be selected when an attachment using two flow circuits such as a nibbler (crusher) is installed.
	*Rotary grapple	This mode is designed considering the operation such as a grapple.
	*Processor	This mode is designed considering the operation such as a processor.
	*Thumb bucket	This mode is designed considering the operation such as a thumb bucket.
	*Rotary tilt	This mode is designed considering the operation such as a rotary tilt.
	*Individual setting	This mode can be customized for an attachment other than those mentioned above.

CAUTION

- When the attachment mode is inappropriate, select a proper attachment mode.
- Always select the breaker mode when operating a breaker. Working in a mode other than the breaker mode causes damages to the hydraulic components and/or the breaker.
- Be sure to lower the attachment to the ground and ensure safety before switching the attachment mode.

Notice

- If tuning of operability is needed, contact your KOBELCO authorized dealer.
- When the control lock lever is raised upward to the locked(up) position, setting for changing the screen becomes possible.
- The default settings of the modes with " * " are the same as the nibbler mode.

3.10 MACHINE OPERATION

The machine operation procedures described below provide operators with basics which should be learned and understood, thoroughly. You can further improve your operational skill by thoroughly learning the performance and structure of this machine.

3.10.1 PRECAUTIONS OF MACHINE OPERATION



WHEN OPERATING MACHINE

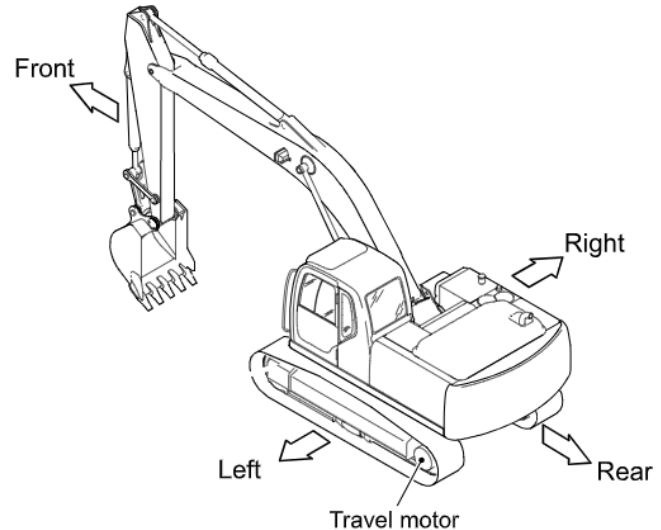
- When starting the machine, check the safety around the machine and sound the horn before starting the machine.
 - Keep the area around the machine clear of people.
 - When the control lever is operated during the auto acceleration operation, the engine speed increases abruptly. Operate the control lever carefully.
-



- The indications on the monitor do not assure the condition of the devices. Daily maintenance should be performed not only by seeing the monitor but also by following the procedures described in this manual.
 - When abnormality was detected during operation, stop the machine immediately and take proper measures.
 - The machine should not be operated until the failure is repaired. Operating the machine with the failure that has not been repaired may result in a serious accidents.
-

FRONT/REAR AND LEFT/RIGHT OF MACHINE

In this manual, front/rear and left/right are determined by looking the forward direction from the operator's seat with the travel motors at the rear side.



3.10.2 TRAVEL PROCEDURES



ABOUT TRAVELING

- Confirm the travel motor position before traveling. When the travel motor is positioned at the front side, the machine moves reversely to travel lever operations.
The normal travel control can be performed when the travel motor is at the rear side of the machine and the front idler is at the front side of the machine.
- Sound the horn to warn the workers in the working site.



ABOUT TRAVEL SPEED

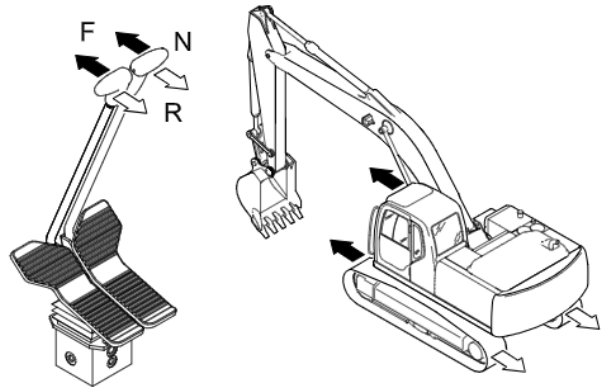
During traveling, do not change the travel speed. Also, the travel speed should be set to the LOW (1st) speed when the machine is traveling on a downhill, or being loaded to/unloaded from a trailer. A sudden change of the machine stability could cause personal injury.

Before starting traveling operation move the control lock lever to "UNLOCKED position" and set the bucket at the height of 30 to 40 cm (12 to 16 inch) above the ground.

F: Forward traveling

N: Neutral (Stop)

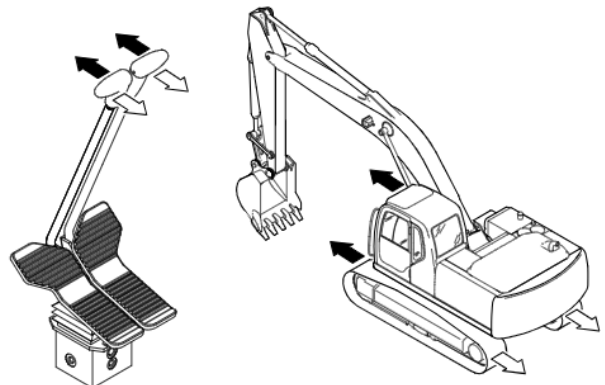
R: Backward traveling



3

Forward/Reverse traveling

- Push (forward) or pull (backward) both the left and right travel levers simultaneously.
Both the forward and reverse travel speed can be changed by lever displacement.

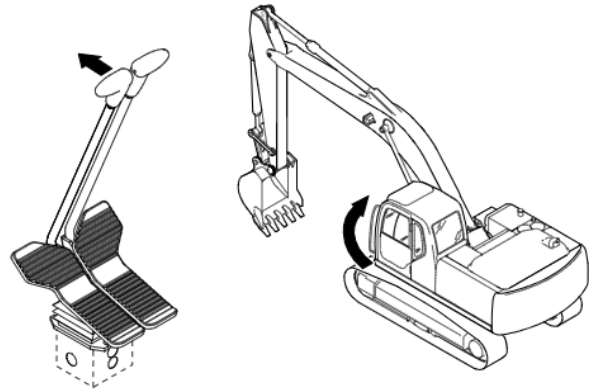


[3. MACHINE OPERATION]

Pivot turn

This operation drives only one crawler to turn the machine.

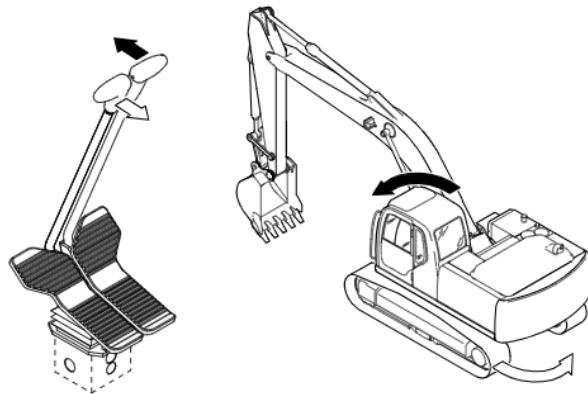
- Operate one of the two travel levers to make a pivot turn.



Spin turn

This drives the right and left crawlers in opposite direction each other to turn the machine on the spot.

- Push one of the two travel levers forward and pull the other lever backward simultaneously.



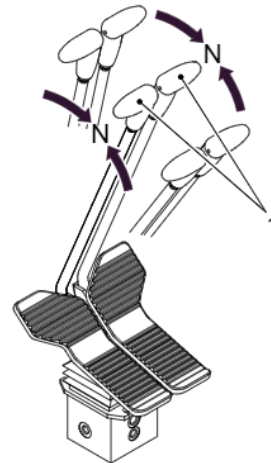
STOP TRAVELING



ABOUT STOP TRAVELING

Do not stop the machine suddenly, but stop it after slow down the speed as much as possible.

- Put both travel levers (1) in the "NEUTRAL (N)" position.
The machine stops traveling.

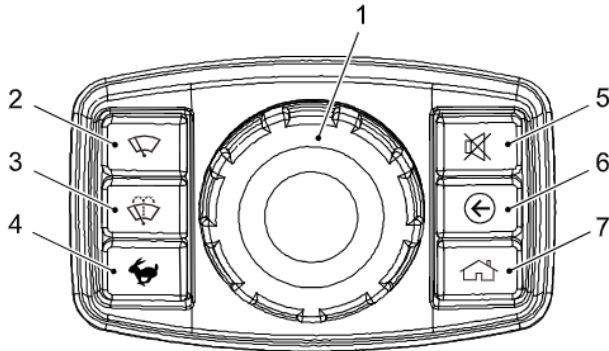


3.10.3 TRAVEL SPEED SELECTION



ABOUT TRAVEL SPEED

The travel speed should be set to the LOW (1st) speed when the machine is traveling on a downhill, or being loaded to/unloaded from a trailer. A sudden change of the machine stability could cause personal injury.



3

Each time the engine is started, the travel speed is automatically set to the LOW 1st (turtle) speed. Press switch (4) on the control panel and then the travel speed changes to the HIGH (2nd) speed and the icon displayed on the monitor changes to the HIGH (2nd) speed (rabbit).

LOW 1st speed: turtle



Set to LOW 1st speed when moving the machine on the rough or soft ground, slope, or in the narrow place, or when powerful tractive force is required.

HIGH 2nd speed: rabbit



Set to HIGH 2nd speed when moving the machine on a level and firm ground.

Notice

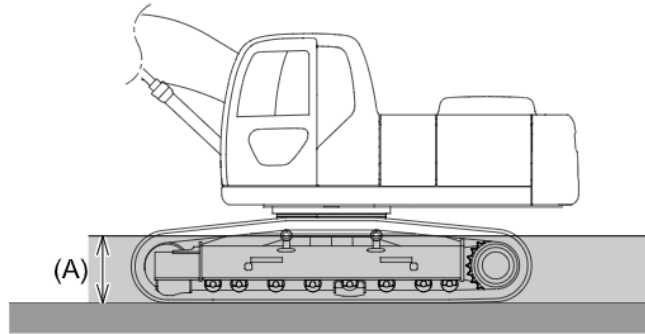
The HIGH (2nd) speed is automatically switched to the LOW (1st) speed when the load of traveling becomes high and automatically returned to the HIGH (2nd) speed when the load is lowered.

3.10.4 MACHINE OPERATION IN WATER OR ON SOFT GROUND

IMPORTANT

Take enough care not to immerse the swing bearing, swing pinion and swivel joint into water or soil. When the machine is sunk to the level of or above the swing bearing in the water or soil, the swing bearing and others may be worn abnormally if it is used without any treatment. Apply grease to the greasing points.

- If the bottom of a river is flat and it flows slowly, the machine can travel in the water up to the depth of the center of upper roller (A).
- When crossing a river, carefully cross the river while checking the condition of the river bottom by the bucket, etc. Never enter the water over the depth of (A).
- On a soft ground, the machine may sink gradually. Pay attention to the travel system and the water depth all the time.
- After traveling in seawater, wash the machine carefully to remove salt.
- On parts soaked in the water for a long time, use a grease gun to apply grease securely, until the old grease comes out from the inside.



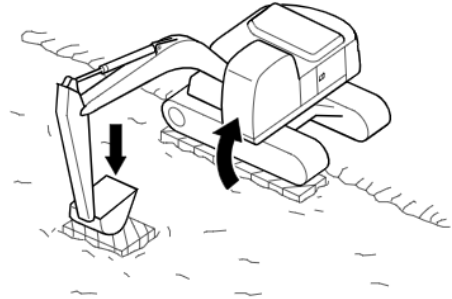
3.10.5 GETTING OUT OF SOFT GROUND

Avoid traveling on a soft ground if possible.

Be careful not to get stuck in mud. In case of being stuck in the mud, get out of it using the procedure below.

WHEN ONE SIDE OF MACHINE GETS STUCK IN SOFT GROUND

- When one side of the machine gets stuck in the soft ground, push the bottom of the bucket against a plank or others laid on the ground to lift up the stuck shoe, and put logs or lumbers beneath the crawler belt to escape from the soft ground.



Notice

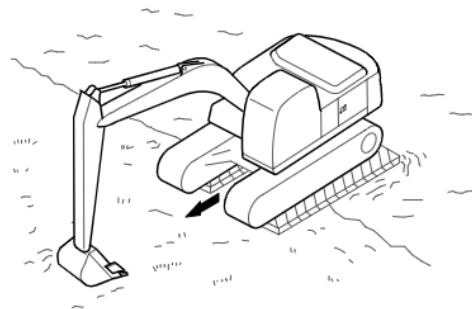
When using the boom and arm to lift up the machine, push the bottom of the bucket, not the teeth, against the ground.

WHEN BOTH SIDES OF MACHINE GET STUCK IN SOFT GROUND

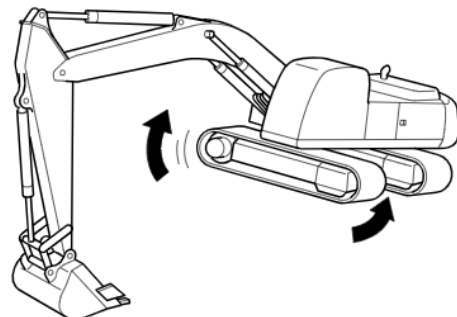
CAUTION

Operate the machine at the operator's seat. Keep the area around the machine clear of people.

- When both sides of the crawlers get stuck in the mud and the machine does not move due to slip, put logs or lumber as described above, lower the attachment to the front ground, pull the arm just like digging, push the travel levers forward, and pull out the machine.



- If the machine cannot travel due to highly tensed crawlers caused by clogged mud and gravel in the crawlers after traveling on the soft ground, lift each crawler off the ground by pushing the boom and arm against the ground and shake the mud or gravel off the crawler, and then get out of the soft ground. Gravel, or mud clogged in the crawler can be shaken off by lifting the crawler up and moving it forward and backward.



3.10.6 SWING AND ATTACHMENT/EQUIPMENT OPERATIONS

The following is the explanation of operation of the standard attachment/equipment. As to the machine equipped with a special attachment, read the operation manual of the special attachment, too.

The operation is explained according to the ISO pattern. As for the other operation patterns, see "MULTI-CONTROL VALVE" in "MACHINE FAMILIARIZATION" or "OPTIONAL EQUIPMENT".



ABOUT THE USE OF THIS MACHINE

To operate this machine, fully read the safety precautions of this manual and understand them thoroughly.



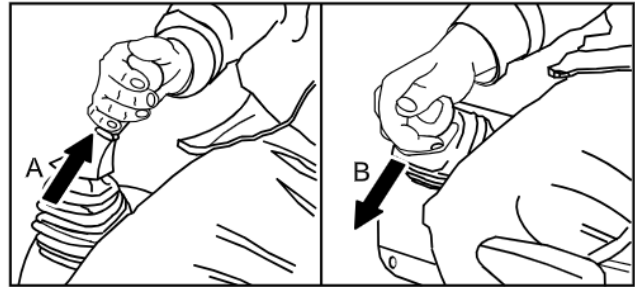
INTERFERENCE BY FRONT ATTACHMENT

Check clearance between the front attachment and the operator's station and other parts of the machine before starting operation because a certain kinds of front attachment and combination of the options installed on the base machine may cause the front attachment to interfere with the operator's station or other parts of the machine.

BOOM OPERATION

To operate the boom, move the right control lever forward and backward. Speed of the boom is controlled by the displacement of the control lever.

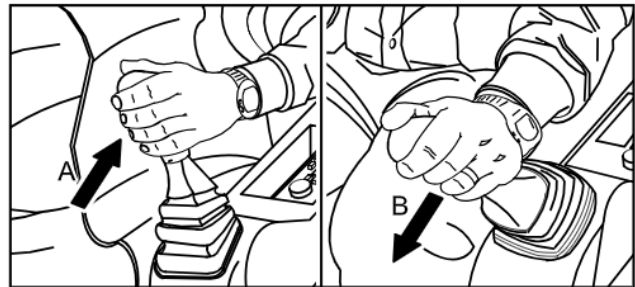
- A: Pull the right control lever backward to move the boom up.
- B: Push the right control lever forward to move the boom down.
- Return the right control lever to the neutral (center) position to stop the boom.



ARM OPERATION

To operate the arm, move the left control lever forward and backward. Speed of the arm is controlled by the displacement of the control lever.

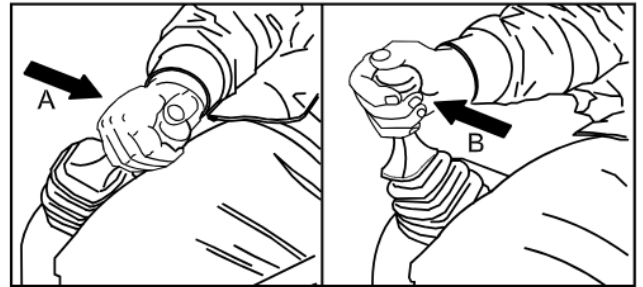
- A: Pull the left control lever backward to move the arm closer to the cab (Arm in).
- B: Push the left control lever forward to move the arm forward and away from the cab (Arm out).
- Return the left control lever to the neutral (center) position to stop the arm.



BUCKET OPERATION

To operate the bucket, move the right control lever left and right. Speed of the bucket is controlled by the displacement of the control lever.

- A: Move the right control lever left to move the bucket to the digging side.
- B: Move the right control lever right to move the bucket to the dumping side.
- Return the right control lever to the neutral (center) position to stop the bucket.



SWING OPERATION



PRECAUTIONS TO PREVENT DANGER IN SWINGING

Make sure that the swing area and the surroundings are clear of obstacles and people before beginning operation. Sound the horn or send signals to warn people before starting to operate the machine.

To perform the swing operation, move the left control lever left and right. Speed of the swinging is controlled by the displacement of the control lever.

- A: Move the left control lever left to swing the machine left.
- B: Move the left control lever right to swing the machine right.
- Return the left control lever to the neutral (center) position to stop the swinging.

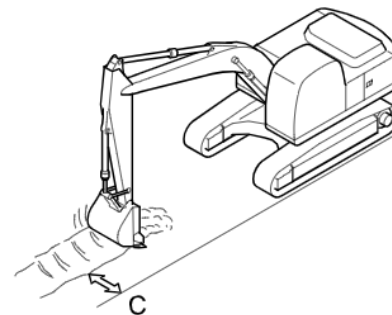
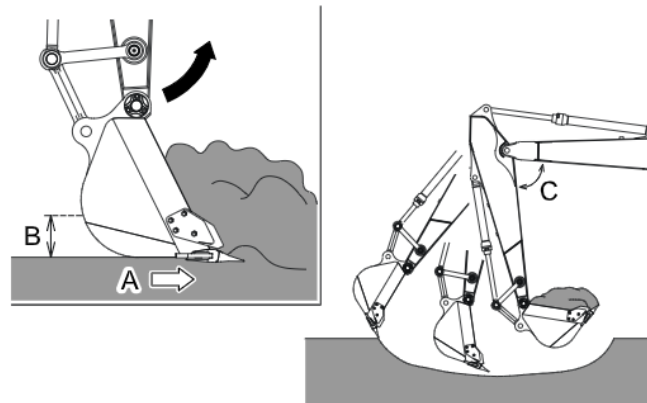


3.11 WORK PROCEDURES OF MACHINE

3.11.1 DIGGING WORK

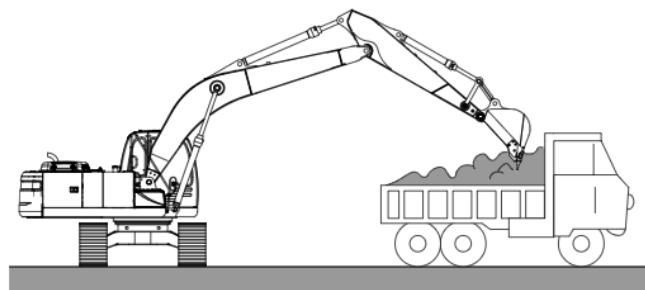
For digging work, mainly the arm crowding force is used, and the bucket scooping force may be used if necessary.

- When a strong digging force is required, dig slowly while keeping angle (C) between the boom and the arm at approximately 90 to 110 degrees. When lowering the boom, avoid rapid operations. Especially, urgent stop during boom "DOWN" has a great impact on the machine, resulting in adverse effects on parts.
- Point the bucket tooth tips to digging direction (A) as much as possible, and dig with the bucket positioned at shallow depth (B) by operating the arm and the bucket. This will reduce the digging resistance and damage to the tooth tips.
- If soil does not fall out easily, set the bucket in the bucket out position and move the bucket a few times by the control lever. Never extend and retract the bucket cylinder repeatedly with the boom cylinder and the arm cylinder fully extended or retracted to fall out the soil.
- When digging a wide trench, dig both sides of it first and dig the center last. To improve the efficiency, attach a bucket suitable for trenching and place the crawlers parallel (C) to the trench to dig.



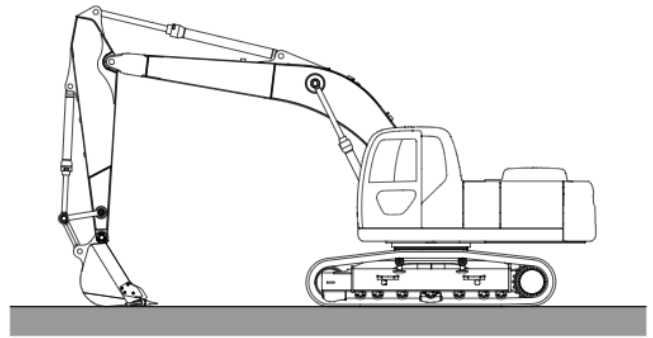
3.11.2 LOADING WORK

- Before performing loading and unloading, set a dump truck on a place where the dump truck can be easily seen from the operator with the smaller swing angle.

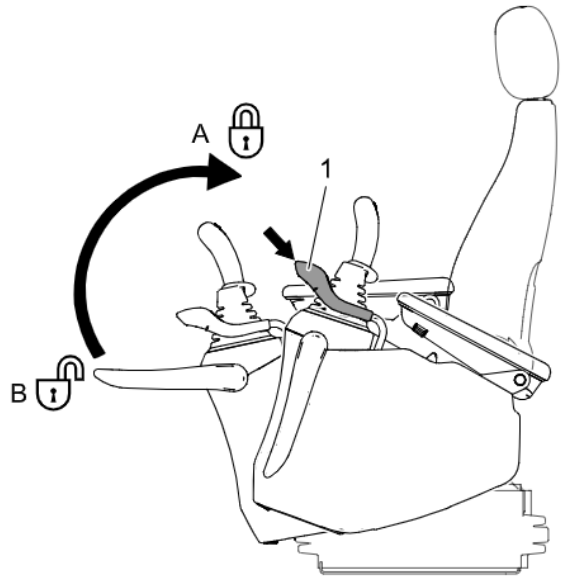


3.12 ALWAYS PARK MACHINE PROPERLY

1. Travel machine to a safe location on firm, level ground.
2. Lower the attachment to the ground.
If equipped with a dozer blade, lower it to the ground.
3. Set the auto acceleration switch to the "OFF" position.



4. Pull the control lock lever(1) to the locked(up) position(A).
If not locked, accidental or unintended contact with the control levers, pedals and other control devices may result in unexpected and unintended machine movement.
5. Turn engine throttle to the low idle position.
6. Turn the starter switch to the "OFF" position and remove the key.
Close and lock the windows and the cab door.
Check the windows, doors and all other machine access covers are locked and secured.

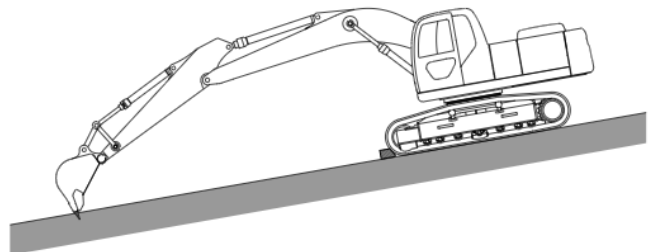


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3.12.1 PARKING MACHINE ON SLOPE

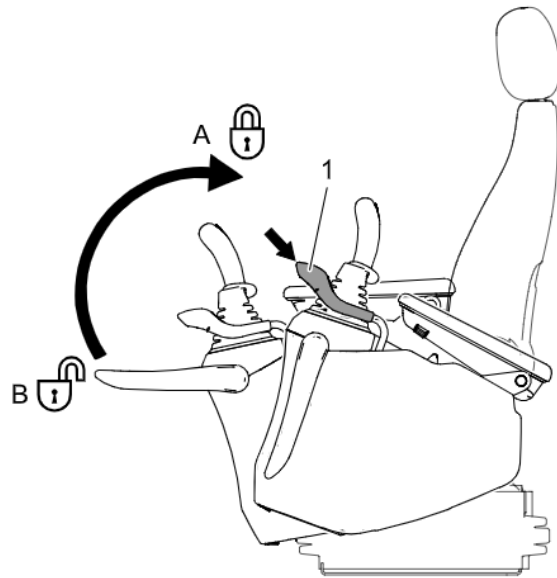
If the machine must be parked on a slope, follow the procedure below.

1. The undercarriage and the upper structure and the attachment /equipment must face downhill.
2. Lower the attachment into the ground. If equipped with a bucket, wedge the bucket into the ground.
If equipped with a dozer blade, lower it to the ground.
3. Set the auto acceleration switch to the "OFF" position.



[3. MACHINE OPERATION]

4. Pull the control lock lever(1) to the locked(up) position(A).
If not locked, accidental or unintended contact with the control levers, pedals and other control devices may result in unexpected and unintended machine movement.
5. Turn engine throttle to the low idle position.
6. Turn the starter switch to the "OFF" position and remove the key.
Close and lock the windows and the cab door.
Check the windows, doors and all other machine access covers are locked and secure.
7. Block the tracks in the front and the rear.



3.13 INSPECTION AND CHECK AFTER OPERATION

Check the engine coolant temperature, engine oil pressure and fuel level on the monitor.

- If there is the engine coolant temperature or the engine oil pressure warning display, move the machine to a safe place and stop the engine immediately. Then repair the machine according to "INSPECTION AND MAINTENANCE CHART" in Chapter 4.
- Check oil and water leakage, the attachment/equipment, the exterior parts, and the travel system components. If leakage or damage is found, repair it immediately according to "INSPECTION AND MAINTENANCE CHART" in Chapter 4.
- Refuel the tank to the maximum. Refuel the tank to the maximum after finishing work for a day. Be careful not to refuel the tank to a level more than necessary (to the top end the tank). There is a possibility of overflowing because the fuel expands as the outside air temperature rises.
- Clean all slippery substances such as grease, oil, hydraulic oil, mud, and others attached to the steps, handrails, crawlers, ladders, and platforms.

3.14 MACHINE OPERATION IN ADVERSE CONDITIONS

3.14.1 OPERATION IN COLD CONDITION

CAUTION

- When the ambient temperature is low, starting the engine may be difficult due to decrease of oil liquidity, and the radiator may be damaged due to coolant freezing.
- If the machine with the engine running at low idle is left for a long time, it may cause clogging of the DPF.

FUEL/OIL

Use good low-viscosity fuel/oil for each device. For the optimum viscosity, see "LUBRICANT, FUEL & COOLANT SPECIFICATIONS" in Chapter 4.

COOLANT

When operating or storing the machine in cold climates, the additive rate of the cooling system should match the expected minimum outdoor temperature.

If the coolant is frozen, it may cause damage to the radiator, cylinder block and cylinder head. When being shipped from the factory, "Long Life Coolant" is used to prevent rust and freezing of the cooling system.

When operating or storing the machine in extreme cold, check the coolant frequently to keep an appropriate concentration. For the concentration of coolant, see "LUBRICANT, FUEL & COOLANT SPECIFICATIONS" in Chapter 4.

BATTERY

When the ambient temperature is low, the battery capacity may decrease and the battery electrolyte may freeze. Charge the battery full earlier than the specified interval and pay full attention to thermal insulation by covering the battery.

When leaving the machine outdoors overnight, it is recommended to remove the battery and store it in a warm room.

Measure the specific gravity of battery electrolyte after its temperature becomes almost the same as the outdoor temperature, instead of immediately after operation. The charging rate can be calculated roughly by measuring the specific gravity and using the table below.

Specific Gravity of Battery Electrolyte

Charging rate	Battery electrolyte temperature		
	-20 degrees C	0 degrees C	20 degrees C
100%	1.31	1.29	1.28
90%	1.29	1.28	1.26
80%	1.28	1.26	1.25
75%	1.27	1.25	1.24

AFTER OPERATION

To prevent malfunctions of the travel system components due to freezing of mud and water stuck to them, follow the precautions below.

- Remove mud and water stuck to the machine sufficiently. Especially, be sure to drain off the water from the travel system, and then park the machine on a dry and firm ground to prevent the travel system from freezing.
- Wipe the cylinder rod completely. If frozen mud or water is stuck to the cylinder rod surfaces, the seal may be damaged when retracting the cylinder. Retract each cylinder to the minimum size to minimize the exposed area of the rod.

For the storing position, see "PRECAUTIONS FOR LONG-TERM STORAGE" in Chapter 3.

3.14.2 OPERATION AT SEASHORE

After operation, wash the machine carefully to remove salt, and apply anti-rust treatments with oil and grease, if necessary.

3.14.3 OPERATION IN SANDY AND DUSTY AREAS

- Clean and change the air cleaner element earlier than the specified interval.
- Clean the radiator earlier than the specified interval to prevent the radiator core from being clogged with dust.
- Be careful to prevent dust entering when refueling, and refilling oils. Inspect the filter element earlier than the specified interval.
- Especially, clean the starter and alternator earlier than the specified interval to prevent deposit of dust on them.

3.15 PRECAUTIONS FOR LONG-TERM STORAGE

When storing the machine for a long period (one month or longer), maintain the machine with attention to the following points, to prevent decrease in function at the next operation.

3.15.1 WASHING MACHINE

Wash the machine thoroughly, inspect and maintain the travel system components and apply touch-up to the peeling paint and scratches. Apply grease to the greasing points.

CAUTION

DO not wash the inside of the cab.

When washing the machine, cover the CPU and the electric components to prevent water or steam from splashing on or contacting with them.

3.15.2 REFILLING OIL/GREASING

Check the level and contamination of the fuel and hydraulic oil. Refill the oil if the level is low, and replace the oil if the oil is contaminated.

- To prevent condensation in the fuel tank, supply new clean fuel fully to the upper limit.
- Apply a sufficient quantity of anti-rust oil to any parts which rust easily, especially to the exposed area of each cylinder piston rod.

3.15.3 BATTERY

- To compensate the self-discharge during storage, perform auxiliary charge at least once a month.
- If the battery power-off switch is equipped, set the battery power-off switch to the "OFF" position to cut off the current.
- Remove the negative (-) terminal from the battery then remove the positive (+) terminal, and remove the battery from the machine for storage.

With the battery (+) terminal connected, be careful not to connect the negative (-) terminal of the battery to the machine body (ground terminal) with a tool or others because it will cause electricity to flow even when the battery power-off switch is turned OFF.

CAUTION

Before turning the battery power-off switch to the "O (OFF)" position, wait until the alarm stops sounding.

If the battery power-off switch is turned off while the alarm is sounding, it can damage the exhaust gas cleaning device.

Sometimes the alarm keeps on sounding for about maximum 10 minutes.

3.15.4 COOLANT

Check engine coolant level and if necessary add additional antifreeze.

To prevent damage to the machine, never mix coolant types and only use genuine KOBELCO Extended Long-Life Coolant. See "LUBRICANT, FUEL & COOLANT SPECIFICATIONS" in Chapter 4.

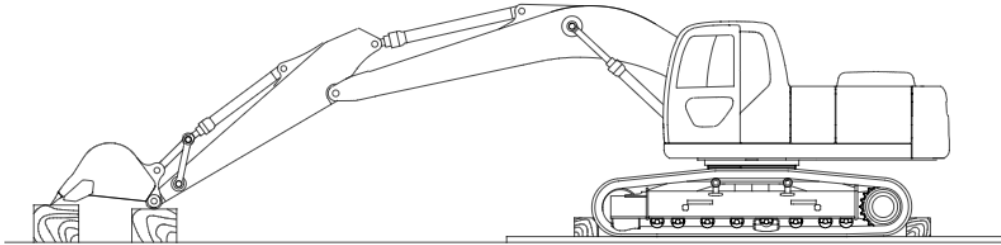


DO NOT MIX COOLANT TYPES! SPECIAL COOLANT REQUIRED.

Machine damage may occur if dissimilar coolants are mixed.

Coolant of different colors, makes, brands, and the use of straight water should not be mixed with the KOBELCO coolant system. Only the KOBELCO genuine factory filled coolant Extended Long-Life Coolant has been approved and tested for use. Other products that are advertised as Extended or Super Long-Life coolant are non-approved and may degrade the coolant systems integrity when mixed. Mixing may have a detrimental effect to the corrosion protection and reducing the extended life properties. A complete system drain and flush is required to convert to an alternate brand Nitrate Free Extended Long Life Coolant.

3.15.5 PREVENTION OF DUST AND MOISTURE



Store the machine in a dry indoor location. If you place the machine outside unavoidably, lay ladders on a flat ground and cover the machine with a sheet. Especially, cover the muffler, hydraulic oil tank breather, fuel tank cap, and swing motor level gauge.

To protect the exposed part of the rod, fully retract the arm and bucket cylinders, be sure to place the bucket on the ground and chock the crawlers.

3.15.6 PERIODICAL LUBRICATING OPERATION (DURING STORAGE)

Once a month, start the engine to operate the machine and also move the working devices to supply the hydraulic oil to each part. If the oil film shortage occurs on parts and rust is formed on parts, it may cause abnormal wear at the next operation.

- Check the engine oil level and coolant level before starting the engine. Refill engine oil or coolant if its level is low.
- Wipe off the anti-rust oil from the cylinder rods. After the lubricating operation, apply the anti-rust oil again.
- After starting the engine, fully warm-up the machine and repeat the traveling, swing and digging operations several times to prevent lubricant oil film shortage.
- If the machine is stored indoors, adequate ventilation is required during warming-up.

Lubricating operation

1. Slowly extend and retract each cylinder several times and circulate the hydraulic oil in all operation circuits.
2. Also perform swing and traveling slowly to circulate the hydraulic oil.

3.15.7 TREATMENT AFTER LONG-TERM STORAGE

When starting to use the machine after a long-term suspension, perform the following treatments.

- Loosen the plugs of the travel reduction unit and swing reduction unit and remove the dust and water which deposited during the long-term storage.
- Lubricant gets deteriorated while the machine is not in use. Use extreme caution when starting to use the machine at the next time.
- Check the deterioration of the hydraulic hoses carefully after the long-term storage. Replace the deteriorated hoses.
- Wipe off the anti-rust oil from the cylinder rods.
- Refill oil and grease to all necessary parts.
- Check the engine oil level and coolant level before starting the engine. Refill engine oil or coolant if its level is low.
- After starting the engine, fully warm-up the machine and repeat the traveling, swing and digging operations several times to prevent hydraulic oil film shortage.
- If the machine is stored indoors, adequate ventilation is required during warming-up.
- When DEF/AdBlue in the DEF/AdBlue tank is past the expiration intervals shown in the table below, ask your KOBELCO authorized dealer for changing DEF/AdBlue. DEF/AdBlue that becomes old sometimes emits the ammonia acrid odor, so do not smell that.

Storage ambient temperature	Expiration interval
10 degrees C (50 degrees F) or less	36 months
25 degrees C (77 degrees F) or less	18 months
30 degrees C (86 degrees F) or less	12 months
35 degrees C (95 degrees F) or less	6 months
Exceeds 35 degrees C (95 degrees F)	1 month

4. INSPECTION AND MAINTENANCE

4.1 GENERAL



INSPECTION AND MAINTENANCE ON THE MACHINE

Thoroughly read and understand the safety precautions contained in this manual before performing any inspection or service procedures on systems or components of this machine.

- Regular inspection and maintenance enable this machine to achieve the full function and extend the service life of each part.
- The information contained in this chapter gives the proper procedures for performing inspection and maintenance of this machine. Use these procedures when performing inspection and maintenance as they will guide the technician step by step for each procedure. Also, see "INSPECTION AND MAINTENANCE CHART" for general service interval recommendations.
- As a general rule, the period of the lubrication and maintenance is determined by the hour meter. If the hour meter reading matches roughly with the calendar day, and if you would like to schedule them based on the calendar day, take whichever comes first. For items which do not have a certain service time, see "WHEN REQUIRED".



Notice

As a general rule, the period of the lubrication and maintenance is determined by the hour meter. If the hour meter reading matches roughly with the calendar day, and if you would like to schedule them based on the calendar day, take whichever comes first. For items which do not have a certain service time, see "WHEN REQUIRED".

- Use only specified oils, fluids, lubricants, filters and replacement parts to keep machine in optimum operating condition. Use the oils and greases with the specified viscosity depending on the ambient temperature. Store containers of oils, fluids and grease indoors in an appropriate location. To prevent dust and water intrusion, keep the containers of oil, fluid, and lubricant in a proper indoor place.

4.2 INSPECTING AND MAINTAINING MACHINE

4.2.1 PERIODIC INSPECTION AND MAINTENANCE

Regular inspection and maintenance enable this machine to achieve the full function and extend the service life of each part. Inspection and maintenance schedules are given in both the calendar time and the operation time. Take either schedule whichever comes first. For items which do not have a certain service time, see "WHEN REQUIRED". Also, operation in sites under severe work conditions or with a lot of dust and moisture may need more frequent lubrication and maintenance than the service times specified there.

4.2.2 PRECAUTIONS OF INSPECTION AND MAINTENANCE

Use inspection and maintenance procedures described in this manual. Park the machine on a level and firm ground before inspection and maintenance.

Notice

For the adjustment, disassembling and repair of the engine, reduction unit, hydraulic component and electronic devices (controller, etc.), contact your KOBECO authorized dealer.

STOP THE ENGINE BEFORE INSPECTION AND MAINTENANCE

Be sure to stop the engine before inspection and maintenance of the engine. Inspecting and maintaining the running engine may cause injury by being caught in the cooling fan or fan belts. When running the engine is unavoidable during the inspection or maintenance, it should be done by at least two persons with the condition that one person can stop the engine at any time and they are communicating with each other.

PUT THE WARNING TAGS

Put the tags "DO NOT START ENGINE!", "DO NOT OPERATE" and "UNDER INSPECTION/MAINTENANCE" on noticeable places such as around the operator's seat as well as the starter switch or control levers before inspection and maintenance.

USE OUR GENUINE PARTS

- For replacement of parts, grease and oil, be sure to use KOBELCO genuine parts. Use grease and oil with the specified viscosity depending on the ambient temperature.
- Store containers of greases and oils in a clean room to keep them away from dust and water.

KEEP OUT DUST

Attach a plug or cap to the lubrication hole of a removed hydraulic hose or hydraulic component to keep out foreign materials.

INSPECT DRAIN OIL AND FILTERS

When replacing oil or filter, check the drain oil or old filter for metallic powder or other foreign materials mixed. Contact the person in charge and take appropriate measures if any foreign materials are found.

HANDLING OF WASTE OIL AND ANTIFREEZE

Be sure to drain waste oil and antifreeze in containers and ask a public service company for disposal of them as the industrial waste.

CLEAN THE SEALING SURFACE

After removing the O-ring or gasket seal, clean the sealing surface to replace it with a new one. Apply thin oil to the O-ring or seal and attach it into the groove correctly.

DO NOT MIX OILS

Never mix different kinds of oil. When using another kind of oil, replace the total amount of old oil.

4.2.3 LOCK ROD

The side doors and the engine hood etc. have the lock rod.

When opening the side door or the engine hood etc. be sure to fix them with the lock rod to avoid unintentional closing.

CAUTION

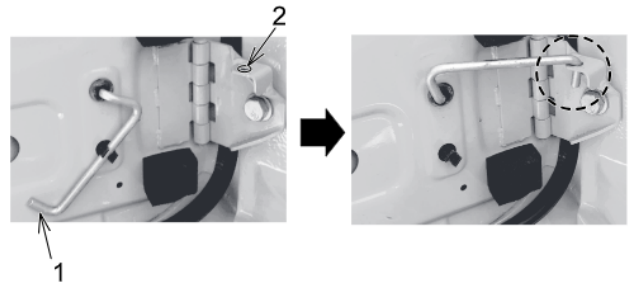
Before performing inspection or maintenance, be sure to confirm that the side doors and the engine hood, etc., are securely fixed with the lock rod.

If the side doors and the engine hood, etc., are not fixed, it may result in personal injury.

Swing type lock rod

Open the side door or the engine hood, etc., and then insert lock rod (1) into lock hole (2) to fix it with the lock rod.

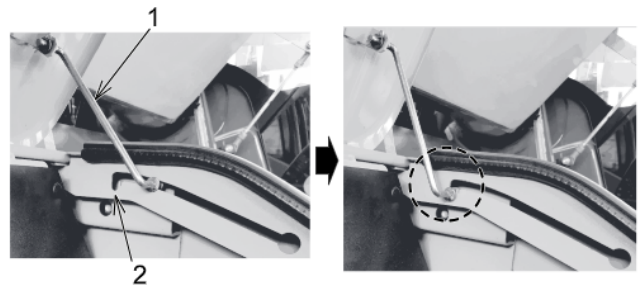
When closing the side door or the engine hood, etc., remove the lock rod from the lock hole and return it to its original position. And then, close the side door or the engine hood.



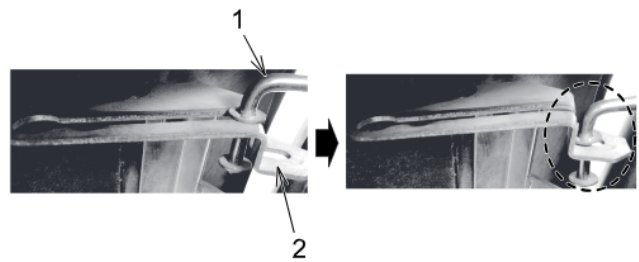
Slide type lock rod

Open the side door or the engine hood, etc., and slide and put lock rod (1) into notch (2) at the rail. Then, fix the side door or the engine hood with the lock rod.

When closing the side door or the engine hood, etc., remove the lock rod from notch (2) and then close the side door or the engine hood.



4



4.2.4 GREASING TABLE LABEL

The greasing table label displayed on the machine indicates the following inspections and maintenances.

(a) Indicates the inspection and maintenance interval for the first 50 hrs. of operation of a new machine.

(b) Indicates the inspection and maintenance interval when using a breaker or crusher.

(c) Indicates the first one-time maintenance interval.

(1) Inspection and maintenance interval

(2) Greasing the boom and arm pins

(3) Greasing the pins around the bucket (front attachment)

(4) Adjusting the tension of the crawlers (greasing the idler adjusters)

(5) Greasing the swing bearing

(6) Changing the oil in the travel reduction unit

(7) Cleaning the suction strainer

(8) Changing the hydraulic oil

(9) Changing the oil of the swing reduction unit

(10) Cleaning the air conditioner filter

(11) Replacing the return filter of the hydraulic oil

(12) Replacing the air cleaner element

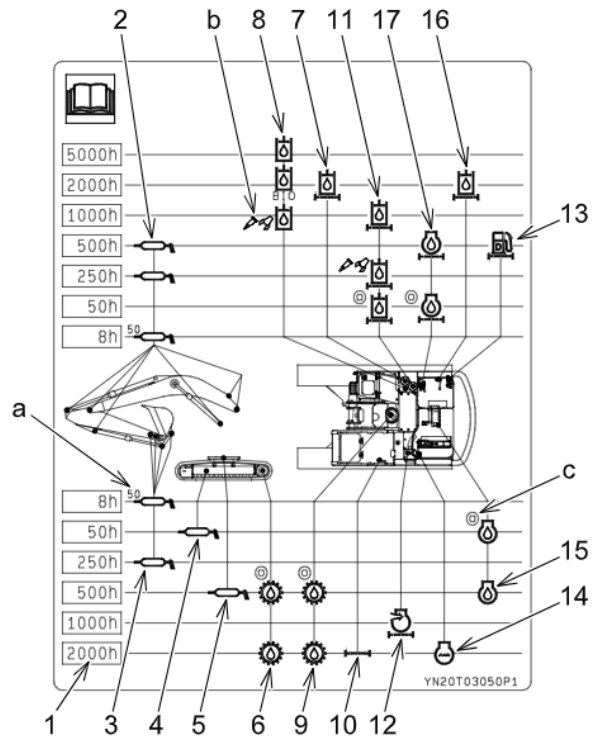
(13) Replacing the fuel filter

(14) Changing the coolant

(15) Changing the engine oil

(16) Cleaning the pilot line filter

(17) Replacing the engine oil filter



4.3 DIESEL PARTICULATE FILTER (DPF)

4.3.1 ABOUT DPF

DPF traps soot emitted from the engine using the filter to clean up exhaust gas.

When a certain amount of soot trapped on the filter is deposited, DPF enters the mode in which it burns the trapped soot. Burning soot in this mode to recover the filter function is called "regeneration".

Be sure to comply with the followings to prevent failure of DPF. (Time of deposition varies depending on the working conditions.) It is normal even though the exhaust sound changes during soot combustion.

CAUTION

If the machine with the engine running at low idle is left for a long time, it may cause clogging of the DPF.

Notice

When a certain amount of soot in the exhaust gas is deposited on the filter, DPF automatically burns the trapped soot according to the operating condition. For details, see "ABOUT AUTOMATIC REGENERATION". In some operating conditions, the automatic combustion may not be completed. At that time, the indication appears on the monitor to request the actuation of DPF manual regeneration. Pull up the control lock lever and press the DPF manual regeneration switch. This prevents abnormal deposit of soot and keeps the purification capacity of DPF in good condition at all times.

4.3.2 ABOUT AUTOMATIC REGENERATION

When a certain amount of soot is deposited on the DPF filter, the DPF enters the mode to burn the soot automatically.



At this time, the indication of regenerating is displayed on the monitor, but normal operations are possible.

CAUTION

Immediately after the machine operation and during the regeneration, the temperature around the exhaust pipe and muffler and of the exhaust gas are very high. Putting any combustible materials close to these hot parts, could cause a fire. Touching hot exhaust gas may cause burns.

Notice

In some operating conditions, the automatic regeneration may not be completed. When the automatic regeneration is not performed and soot is deposited, the warning requesting the user to perform the manual regeneration is displayed on the monitor. In this case, perform the manual regeneration, referring "ABOUT MANUAL REGENERATION".

In the following operations, the automatic regeneration may be difficult to complete.

- At engine start, when the control lever is pulled up to the "LOCKED" position and most of the times the levers are not operated.
 - When many operations at a low speed of the engine are performed.
 - When the engine is started and stopped frequently
 - When the operation is performed in an extremely cold place
 - When there are many low-load operations
 - When the engine is operated and stopped while it is still not warm
-

Notice

- The above indication may be displayed also when the deposited amount of soot is low.
 - To maintain the condition inside the muffler proper, the automatic regeneration may be performed even when the soot deposition meter on the monitor indicate lower.
 - It takes about 30 to 40 minutes to complete the automatic regeneration.
-

4.3.3 ABOUT MANUAL REGENERATION



When this warning is displayed on the monitor, perform the manual regeneration of DPF immediately.

Notice

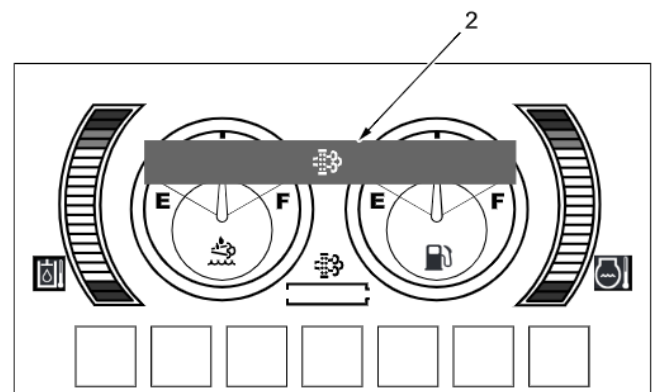
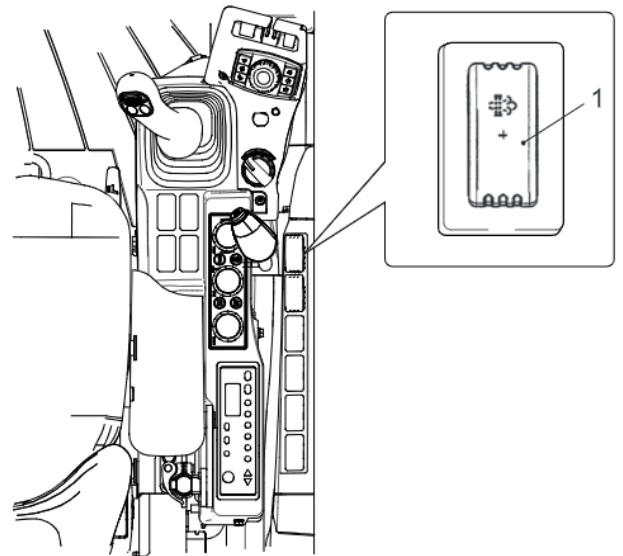
- DPF starts the automatic regeneration when a certain amount of soot is deposited, but it may not be completed in some operating conditions.
When the automatic regeneration is not performed and soot is deposited, the above warning is displayed and the warning sounds. In that case, perform the manual regeneration in the following procedure.
- When too much soot is deposited, DPF failure occurs and the engine speed is restricted. To restore DPF, the machine needs to be maintained by your KOBELCO authorized dealer.

OPERATION METHOD

CAUTION

- Immediately after the machine operation and during the regeneration, the temperature around the exhaust pipe and muffler and of the exhaust gas are very high. Putting any combustible materials close to these hot parts causes a fire. Touching hot exhaust gas may cause burns.

1. Move the machine to a safe place.
2. Place the machine in the parking position and move the control lock lever to the "LOCKED" position.
3. Press DPF manual regeneration switch (1).
Indication of regenerating (2) is displayed on the monitor. The engine speed is fixed and the machine enters the mode in which soot is burnt.
4. When indication (2) goes off, the manual regeneration is completed.
When the engine is stopped during the manual regeneration or when the control lock lever is set to the "UNLOCKED" position, the regeneration is paused.
In that case, perform the manual regeneration again.



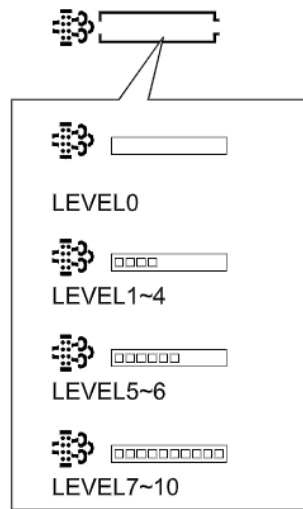
Notice

- It takes about 10 to 20 minutes to complete the manual regeneration.
- Regeneration is performed by increasing the temperature inside the muffler to a certain level. Therefore, the process completes faster if it is performed immediately after operation, when the temperature inside the muffler is high.
- It may take more than 20 minutes for combustion when the engine is cool because warming-up is needed before combustion.

4.3.4 SOOT DEPOSITION METER AND WARNING DISPLAY

Soot deposition amount can be checked with the monitor. Set the starter key switch to "ON" position to display soot deposition meter. Use this meter as a rough guideline.

If the manual/automatic regeneration is not performed, the soot deposition amount becomes high, the warning appears and the warning sounds, the engine speed is restricted, and regeneration becomes impossible. To restore DPF, contact our service factory for maintenance.



Warning Display	Soot Deposition Meter	
	Level	Color
None	0	No Display
None	1 to 4	Green
	5 to 6	Yellow
	7	Red
	8 to 9	
	10	

- If the soot deposition meter shows Level 5 (yellow) or more, the warning appears with sound. Perform the manual regeneration.
- If the soot deposition meter shows Level 7 (red) or more, the additional warning, "EXHAUST GAS AFTER TREATMENT EQUIPMENT WILL BE DAMAGED", is displayed. Perform the manual regeneration.
- If the soot deposition meter shows Level 8 (red) or more, the engine speed is restricted. Perform the manual regeneration. If manual regeneration does not finish, contact your KOBELCO authorized dealer.
- If the soot deposition meter shows Level 10 (red), and the "EXHAUST GAS AFTER TREATMENT EQUIPMENT FAILURE" warning is displayed, the engine speed and the engine output are restricted. Manual generation becomes impossible in this state even if the switch is pressed. Stop the operation and contact your KOBELCO authorized dealer.

4.3.5 INSPECTION AND MAINTENANCE

- Inspection interval: Every 3,000 hours
Inspect the external appearance of the DPF including the emission sensor and the differential pressure sensor.
For inspection and replacement, contact your KOBELCO authorized dealer.
- Replace DPF every 6,000 hours. For replacement, contact your KOBELCO authorized dealer.

4.3.6 PRECAUTIONS OF USING DPF

USE SPECIFIED FUEL ONLY

Notice

Use the specified fuel described in "LUBRICANT, FUEL & COOLANT SPECIFICATIONS" in Chapter 4 in the operation manual.

If you use fuel other than the specified fuel, it has an adverse effect on the engine and DPF, causing white smoke and malfunction.

USE SPECIFIED ENGINE OIL ONLY

Notice

Use the specified engine oil described in "LUBRICANT, FUEL & COOLANT SPECIFICATIONS" in Chapter 4 in the operation manual.

Use the specified engine oil to keep the DPF function normal for a long time.

PROHIBITION OF ENGINE PIPE DISASSEMBLY

Notice

Do not remove the exhaust pipe or disassemble the muffler and parts around it. This may affect the performance of DPF adversely or break it.

4.4 SCR SYSTEM AND DEF/ADBLUE

This machine is equipped with SCR (Selective Catalytic Reduction) system for NOx (nitrogen oxidate) discharge reduction.

4.4.1 SCR

SCR equipped with this machine reduces NOx in exhaust gas by injecting DEF/AdBlue into the muffler to resolve NOx in the exhaust gas into water and nitrogen.

4.4.2 DEF/AdBlue

DEF/AdBlue is used for the SCR system on this machine. Use only specified DEF/AdBlue.

CAUTION

- DEF/AdBlue should meet ISO 22241-1 or JIS K2247-1.
 - Do not put diesel fuel or water in the DEF/AdBlue tank.
 - Follow the precautions for handling DEF/AdBlue specified by the manufacturer.
-

4.4.3 DEF/AdBlue CIRCUIT AND BATTERY

CAUTION

Before turning the battery power-off switch to the "O (OFF)" position, wait until the alarm stops sounding. If the battery power-off switch is turned off while the alarm is sounding, it can damage the exhaust gas cleaning device.

Sometimes the alarm may keep sounding for up to 10 minutes.

Notice

Even after turning the engine OFF, you may hear running sound of the DEF/AdBlue supply module. To prevent DEF/AdBlue remaining in the DEF/AdBlue pipe from freezing and drying, DEF/AdBlue is returned to the tank with the DEF/AdBlue supply module.

4.4.4 STORING DEF/ADBLUE

Notice

DEF/AdBlue freezes at - 11 degrees C. The container may be damaged from volume expansion due to freezing.

- DEF/AdBlue should be stored in a place without direct sunlight and with well ventilation, with its container sealed.
- Do not mix DEF/AdBlue with other chemicals, heat it, or dilute it with water.

4.4.5 PURCHASING DEF/ADBLUE

DEF/AdBlue can be purchased in the following places or confirm where to purchase.

- Gas stations and stores that sell automobile goods.
- DEF/AdBlue manufacturers
- KOBELCO authorized dealer/distributor



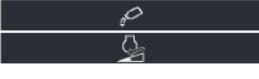
4.4.6 LOW DEF/ADBLUE LEVEL

Notice

If the pointer of the monitor points the yellow or red range, immediately supply DEF/AdBlue until the pointer points the place higher than the yellow range.

When DEF/AdBlue becomes low, restriction is applied to the engine output.

When the following warnings are displayed in the multi-display, see "CHECKING DEF/ADBLUE LEVEL AND REFILLING" to supply DEF/AdBlue.

Level	Warning Display	Contents
1st Level		Displayed with the warning sound when the pointer of the DEF/AdBlue level gauge points the yellow range.
2nd Level		Displayed with the warning sound when the pointer of the DEF/AdBlue level gauge points the yellow range. Gradually, a restriction is applied to the engine output.
3rd Level		Displayed with the continuous warning sound when the pointer of the DEF/AdBlue level gauge points the E point. The engine output is further restricted than Level 2.

4.4.7 QUALITY PROBLEMS OF DEF/ADBLUE




CAUTION

- Use DEF/AdBlue which meets ISO 22241-1 or JIS K2247-1.
- Do not add diesel fuel or water in the DEF/AdBlue tank.
- Follow the precautions for handling DEF/AdBlue specified by the manufacturer.

When the following warnings are displayed on the multi-display, something other than DEF/AdBlue is in the DEF/AdBlue tank. See "DRAINING DEF/ADBLUE" and "CHECKING DEF/ADBLUE LEVEL AND REFILLING" to drain and refill DEF/AdBlue.

If the machine is operated with the DEF/AdBlue in abnormal quality, the engine output is restricted.

Also, when something else than DEF/AdBlue is put in the tank and the engine is started, the DEF/AdBlue pipes and the DEF/AdBlue supply module may need to be replaced.

LEVEL	Warning Display	Description
Level 1		Displayed with the warning sound when the DEF/AdBlue sensor determines the quality problem of DEF/AdBlue.
Level 2		Displayed with the warning sound when a certain period of time has passed from Level 1. The engine output is gradually restricted.
Level 3		Displayed with the continuous warning sound when a certain period of time has passed from Level 2. The engine output is further restricted than Level 2.

Notice

When failure of the DEF/AdBlue quality or the exhaust gas cleaning device occurs repeatedly, the warning level goes up. If another failure of the DEF/AdBlue quality or the exhaust gas cleaning device occurs in a short period of time after the failure of that is corrected, the warning level starts from Level 3.

4.4.8 DRAINING DEF/ADBLUE

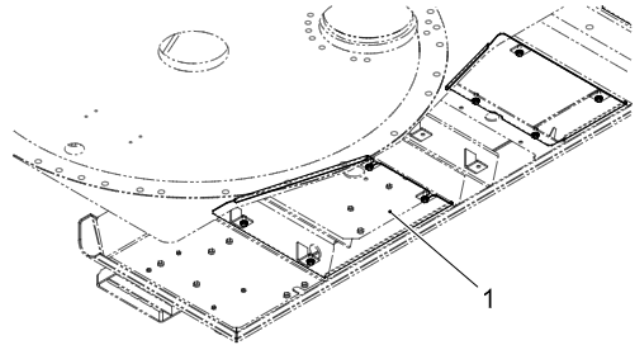
In case of draining the content of the DEF/AdBlue tank is required like when the warning for abnormal DEF/AdBlue quality appears, follow the next procedures.

Notice

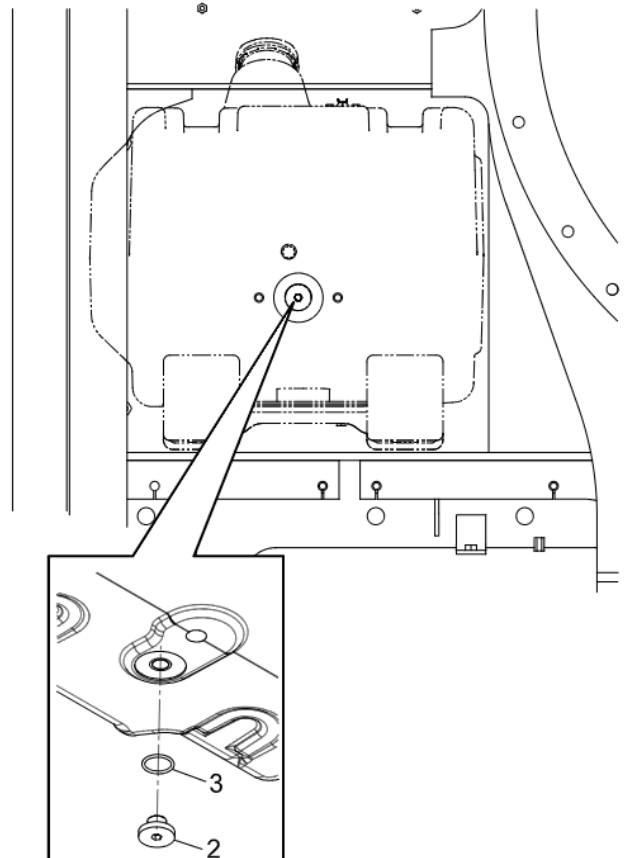
When supplying DEF/AdBlue after draining, the quality of DEF/AdBlue is promptly judged if the starter key switch is "ON"; however, if it is done while the switch is "OFF", it takes a while to judge its quality after turning the switch "ON" at the next time.

When the work is done in "OFF", wait for approximately 10 minutes after turning the switch "ON", and check the warning is not displayed on the monitor.

1. Prepare a container to receive drain DEF/AdBlue and cloths to wipe it off.
2. Remove cover (1) on the bottom of the DEF/AdBlue tank.



3. Remove drain plug (2) and O-ring (3) of the DEF/AdBlue tank, and start draining DEF/AdBlue.
4. After draining DEF/AdBlue, attach O-ring (3) and drain plug (2).
Tightening torque of plug: $50 \pm 5\text{N}\cdot\text{m}$ (36.9 ± 3.7 lbf·ft)
5. Attach cover (1).
6. See "CHECKING DEF/ADBLUE LEVEL AND REFILLING" in Chapter 3 to supply DEF/AdBlue.
7. After the supply, check no warning is displayed on the monitor.



4.4.9 FAILURE OF EXHAUST GAS CLEANING DEVICE

When the following warnings are displayed on the monitor, the exhaust gas cleaning device has a failure or an error.

When keep operating with the exhaust gas cleaning device having a failure or an error, the engine output is restricted and, in the end, the machine becomes inoperable. When these warnings are displayed, contact our service factory.

LEVEL	Warning Display	Description
Level 1	Failure of NOx exhaust control system (Error code is example)	Displayed with the warning sound when a device or sensor has a failure or an error.
	Failure of DEF/AdBlue dosing module (Error code is example)	
	Failure of EGR valve (Error code is example)	
Level 2	Failure of NOx exhaust control system (Error code is example)	Displayed with the warning sound when a certain period of time has passed from Level 1. The engine output is restricted.
	Failure of DEF/AdBlue dosing module (Error code is example)	
	Failure of EGR valve (Error code is example)	
Level 3	Failure of NOx exhaust control system (Error code is example)	Displayed with the continuous warning sound when a certain period of time has passed from Level 2. The engine output is further restricted than Level 2.
	Failure of DEF/AdBlue dosing module (Error code is example)	
	Failure of EGR valve (Error code is example)	

Notice

When failure of the DEF/AdBlue quality or the exhaust gas cleaning device occurs repeatedly, the warning level goes up. If another failure of the DEF/AdBlue quality or the exhaust gas cleaning device occurs in a short period of time after the failure of that is corrected, the warning level starts from Level 3.

4.4.10 EMERGENCY EVACUATION MODE

If the machine should be moved to somewhere emergency even though the machine is in a state of the third level of warning and under engine restriction due to DEF/AdBlue shortage, abnormal quality, or a failure of the exhaust gas cleaning device, keep pressing buzzer stop switch (5) and return switch (6) on the switch box for 5 seconds to enter the emergency evacuation mode.

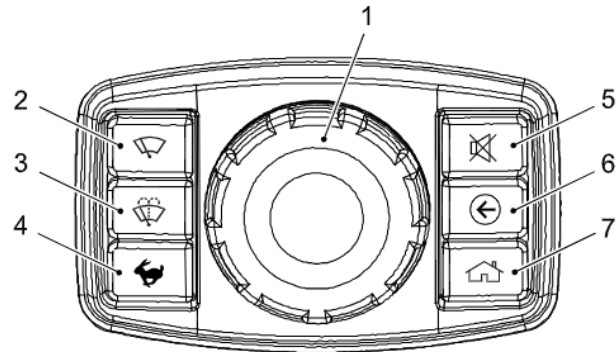
However, operations other than traveling are restricted, so normal operations become impossible.

CAUTION

- The emergency evacuation mode can be used for only total 30 minutes. Use this mode only in a case of emergency and if the warnings are displayed, take proper measures immediately.
- When entering the emergency evacuation mode, surely keep pressing buzzer stop switch (5) and return switch (6) on the switch box for 5 seconds.
If not keep pressing them for 5 seconds securely, the machine will not enter the emergency evacuation mode.

Switch box

- (1) Jog dial
- (2) Wiper switch
- (3) Washer switch
- (4) Travel speed select switch
- (5) Buzzer stop switch
- (6) Return switch
- (7) Home switch



4.4.11 SCR INSPECTION AND MAINTENANCE

There are parts in SCR that require a periodical inspection and maintenance. (See "INSPECTION AND MAINTENANCE CHART" in Chapter 4)

Contact KOBELCO or your KOBELCO authorized dealer for inspection and maintenance of SCR.

4.5 LUBRICANT, FUEL & COOLANT SPECIFICATIONS

Regardless of the outdoor temperature, the following reduction units use the following oil:

- Swing reduction unit: Gear oil #90, API classification GL-4 class
- Travel reduction unit: Gear oil #90, API classification GL-4 class

[4. INSPECTION AND MAINTENANCE]

Components	Type	Capacities (When changed)	Temperature Range								Specified Lubricant
			-22 -30	-4 -20	14 -10	32 0	50 10	68 20	86 30	104 °F 40 °C	
Hydraulic oil tank	Hydraulic oil	140 Liters (37 Gal)	ISO VG32								* Long life hydraulic oil KW5032S (20 L) P/No. KAPYN01T01066D1
		244 Liters (64.5 Gal) [Hydraulic system]	ISO VG46								* Long life hydraulic oil KW5046 (20 L) P/No. KAPYN01T01066D3
			ISO VG68								* KW5068 (20 L) P/No. KAPYN01T01066D5
Engine oil pan	Engine oil	[Total volume] 20 Liters (5.3 Gal) [H level] 13.7 Liters (3.6 Gal) [L level] 6.5 Liters (1.7 Gal)	SAE 10W-40								* A.P.I CJ-4, CJ-6 ACEA E9, E6 JASO DH-2
Swing motor reduction unit	Gear oil	2.7 Liter (0.7 Gal)	EXTREME GEAR OIL SAE #90								* A.P.I classification for "service GL-4"
Travel motor reduction unit		5.3 Liter X 2 (1.4 Gal X 2)									
Swing motor reduction unit (Housing)	EP grease	0.7 kg (1.5 lbs)	EP GREASE								* Extreme pressure multipurpose grease Cartridge (400g x 20 units) Pail can
Attachment pins		16 places	EP GREASE								
Slewing ring gear		1 place	EP GREASE								
Track tension Adjustment		2 places	EP GREASE								
Operating lever (Pilot valve)		As required	EP GREASE								
Swing gear		9.5 kg (21 lbs)	EP GREASE								
Fuel tank	Diesel fuel	321 Liters (84.8 Gal)	No.2								ASTM D-975
			No.2								** EN 590
			No.1								
Diesel exhaust fluid tank	DEF / AdBlue	(SK210LC-11E/SK210NLC-11E) 83 L (22 Gal) (SK210S/NLC-11E/SK240SN-11E) 33.9 L (9.0 Gal)	ISO 22241-1								ISO 22241-1
Radiator (Reserve tank)	Engine coolant (Antifreeze)	9.6 L [Total volume 23 L]	ELL Coolant								* [Do not mix and use different types of coolants.] Use only KOBELCO GENUINE EXTENDED LONG-LIFE COOLANT KOBELCO GENUINE EXTENDED LONG-LIFE COOLANT P/N: KAPYN01T01110D2 - COOLANT, 1 US GAL. P/N: KAPYN01T01110D3 - COOLANT, 55 US GAL.

* EU regulation requires a fuel with sulphur content not greater than 10 mg/kg, cetane number not less than 45 and an FAME content not greater than 8 % v/v.

Notice

Each * mark in the item's column shows the KOBELCO genuine part.
As for the genuine oil, grease, and coolant, ask your KOBELCO authorized dealer.

Notice

- When oil leakage or damage of the lower roller, upper roller and front idler is recognized, contact your KOBELCO authorized dealer for repair.
- Be sure to use diesel oil as fuel, which meets the standard of each country. To achieve a good fuel efficiency and exhaust gas property, the engine of this machine uses the electronically controlled fuel injector. Because this device requires high parts precision and high lubricating ability, when low viscosity fuel with low lubricating ability is used, the durability may decrease significantly.

Notice

When replacing and refilling the long life hydraulic oil, use the oil specified by KOBELCO.
When non-specified hydraulic oil is used or mixed, the performance decreases and the replacement interval of hydraulic oil needs to be shortened.

Notice

This machine is intended to be operated in the ambient temperature of -20 degrees C to 40 degrees C (-4 degrees F to 104 degrees F) with the well-maintained condition.
Outside this temperature range, sufficient machine performance may not be obtained.

Notice

EPA regulation requires you to use ultra-low sulfur diesel (ULSD).

Fuel requirements

- When operating the engine in cold districts or high altitudes, the fuel cetane number should be equal to 45 or higher.
- The sulfur content must not exceed 15 ppm by mass.
A higher sulfur content fuel may cause sulfuric acid corrosion in the cylinders of the engines. Especially in USA and Canada, Ultra Low Sulfur fuel must be used.
- Use the fuel that can be used where the temperature is 12°C (53.6 °F) lower than the expected lowest temperature to prevent the fuel from freezing.
- Water or sediment in the fuel must not exceed 0.05 % by volume.
- The ash content must not exceed 0.01 % by mass.
- The carbon residue content must not exceed 0.35 % by mass. Less than 0.1 % is preferred.
- The total aromatic content must not exceed 35 % by volume. Less than 30 % is preferred.
- PAH (Polycyclic Aromatic Hydrocarbons) must not exceed 10 % by volume.
- The metal content (magnesium, silicon, and aluminum) must not exceed 1 ppm by mass.
(Test analysis method JPI-5S-44-95)
- The diesel fuel must be free from zinc and sodium.
- Lubricity: Wear mark of WS1.4 should be maximum of 460 µm at HFRR test.)

4.6 USING BIODIESEL FUEL

4.6.1 CONFORMING BIODIESEL FUEL

Use the biodiesel fuel with the mixture concentration of B20 (biodiesel=20%, light oil=80%) conforming to the standard below.

European Standard: EN14214/American Standard: ASTM D-6751/ Indonesia: 723K/10/DJE/2013/ Japan: JIS K 2390 U

In particular, in North America, you must purchase the fuel from a BQ-9000-certified* manufacturer or BQ-9000-certified* distributor.

Notice

*BQ-9000 is trademark of National Biodiesel Board registered in the U.S.

4.6.2 PRECAUTIONS FOR USING BIODIESEL FUEL

- When compared with using the ordinary light oil (B0). In the case of B20, it reduces approximately by 2 % for the output, and 3 % for the fuel consumption.
- When using the biodiesel oil, observe the specified part replacement, operation, and conditions.
- The biodiesel fuel accelerates oxidation corrosion of metal and deterioration of the hoses and seals. Be sure to observe the replacement interval.
- When compared with using the ordinary light oil (B0), sometimes the biodiesel fuel accelerates generation of clogging of the fuel filter and deterioration of the engine oil. Be sure to observe the replacement interval.
- If the machine needs to be stored for a long time (rough standard is approximately 1 month) unavoidably, drain all of the biodiesel fuel remaining in the fuel tank, refill clean fuel, and operate the machine every month at least for 30 minutes.
- To obtain the optimum performance of the engine, inspect, clean, and adjust the fuel injectors every 1000 hours of operation.
Contact and ask your KOBELCO authorized dealer for these.
- Only use the biodiesel fuel suitable for the engine operating conditions. Since the biodiesel fuel solidifies at low temperature, check the working temperature of the diesel fuel to be used.
- The following daily checks are very important.
 - Check the lubricating oil level. If the lubricating oil level exceeds the lubricating oil level of the previous day, replace the engine lubricating oil.
 - Perform a daily check of the water separator's water level. Drain the water separator to prevent the water level from exceeding the "Maximum" on the indicator.

4.6.3 PART REPLACEMENT INTERVAL WHEN USING BIODIESEL FUEL

- Fuel hose
 - Replace the part every 2 years or 2,000 hours, whichever comes first.
 - Use the hose for biodiesel fuel specified by KOBELCO.
- Fuel filter
 - Replace the part every 3 months or 250 hours, whichever comes first.
 - Replace the O-ring simultaneously when replacing the fuel filter.
 - When using the biodiesel oil at the ambient temperature of 20 degrees C or less, it can accelerate generation of clogging of the fuel filter due to precipitates generated during combustion.
- Pre-filter
 - Replace the part every 3 months or 250 hours, whichever comes first.
 - Replace the O-ring simultaneously when replacing the water separator inside the pre-filter.
 - When starting operations, check the water level of the water separator (inside the pre-filter) and drain the water. Drain the water at the bottom of the fuel tank every day.
- Engine oil, and engine oil filter
 - Use the genuine oil.
 - Replace the oil every 3 months or 250 hours, whichever comes first.

4.6.4 HOW TO STORE BIODIESEL FUEL AND EXPIRATION OF SERVICE LIFE

- Store the biodiesel fuel in a sealed tank that will not allow intrusion of contamination and water.
- Store the biodiesel fuel in the environment whose temperature will not increase to high temperatures (80 degrees C or more) or decrease to low temperatures (20 degrees C or less).
- Biodiesel fuel of any concentration can be used only within the limited period of three months from the date of manufacture. Therefore, use biodiesel fuel within two months from supplying it to the tank, or within three months from its manufactured date, whichever comes first.

4.6.5 WHEN FAILURES OCCUR DUE TO USE OF BIODIESEL FUEL

If failures of the engine occur due to the use of the conforming biodiesel fuel, submit the information below.

- Submit the certificate showing that the biodiesel fuel in use conforms to the standard.
- Collect the failure parts and the fuel in use and submit these.
- Submit the certificate of the maintenance record.

4.7 ABOUT USE OF BIO-OIL (BIODEGRADABLE HYDRAULIC OIL)

4.7.1 GREASE AND OIL FOR USE

Regarding greases and oils for use, ask your KOBELCO authorized dealer.

4.7.2 PRECAUTIONS FOR BIO-OIL

- When changing mineral based hydraulic oil to bio-oil, perform flushing three times. Without flushing, the mineral oil in the circuit is not completely cleaned and the effect of biodegradability cannot be expected.
- Because the friction coefficient of bio-oil is smaller than that of mineral oil, the performance of parking brakes for swing and travel decrease.

4.7.3 REPLACEMENT INTERVAL OF BIO-OIL

Bio-oil should be replaced every 2,000 hours.

For replacing procedures, see "CHANGING HYDRAULIC OIL" in Chapter 4.

4.7.4 FLUSHING PROCEDURES OF BIO-OIL

1. Drain all mineral oil from the hydraulic oil tank.
2. Drain all mineral oil from the cylinders.
3. Fill with new bio-oil in the hydraulic oil tank fully.
4. After starting the engine, operate each cylinder for 10 strokes respectively.

CAUTION

Rapid operation may burn the seal because of the air remained in the cylinder. During the first 4 strokes, operate the cylinder slowly with the engine speed at low idle to charge the hydraulic oil in the cylinder.

5. Idle the right and left travel motors for about 3 minutes respectively.
6. Perform the swing operation for 10 turns.
7. Drain all bio-oil from the hydraulic oil tank.
8. Drain all bio-oil from each cylinder.
9. Fill with new bio-oil in the hydraulic oil tank and repeat the procedures 4 to 9 twice.
10. In the final state, analyze the hydraulic oil and check the remaining amount of mineral oil.

4.8 MAINTENANCE PARTS

Replace parts, such as filters and elements, during the periodical maintenance or before the end of the service life. The machine can be used economically if the maintenance parts are changed properly and timely. When you place an order of parts, confirm the parts number on the parts manual.

MAINTENANCE PARTS LIST

Item	Part Number	Part Name	Q'ty	Replacement Interval	
Hydraulic oil tank	YN52V01025R100	Return filter element kit (STD, Breaker)	1	Replace at 50 hours for the first time, then every 1000 hours (every 250 hours with breaker specification)	
	(ZD11G19000)	(O-ring)	1		
Hydraulic oil tank	LQ50V00004F1	Suction strainer	1	Clean every 2000 hours	
	(ZD11G19000)	(O-ring)	1		
Air breather	YN57V00012S002	Element	1	Replace every 1000 hours. Replacement every 1000 hours is just a rough guideline. If the machine is operated in very dusty conditions, replace the element earlier.	
Air cleaner	YN11P00029S003	Element (Outer)	1	Replace every 6 times cleaning or every 1 year	
	YN11P00073S002	Element (Inner)	1	Replace at the same time with the outer element (do not clean)	
Engine oil filter	VY12769535150	Cartridge	1	Replace at 50 hours for the first time, then every 500 hours	
Fuel filter	Main	VY129G0155800	Cartridge	1	Replace every 500 hours
	Pre	YN21P01068R100	Cartridge	1	
Air conditioner	YT50V01036P1	Element kit	1	Replace after 10 times cleaning. When clogging is severe, clean or replace the filter.	
	LQ50V01007P1	Fresh air filter	1		
Pilot line filter	YN50V00020F1	Pilot line filter	1	Clean every 2000 hours	
Radiator	YN05P00088S032	Radiator cap	1	Replace every 1000 hours	
Built-in battery for communication controller	YN22E00643S001	Battery	1	Replace every year	

IMPORTANT

- Parts enclosed in parenthesis () should be changed at the same time.
- The built-in battery for communication controller needs to be replaced every year. For replacement, contact your KOBELCO authorized dealer.

4.9 TIGHTENING TORQUES FOR BOLTS & NUTS (SPECIFIC POSITIONS)

Follow the next table when tightening or retightening bolts or nuts in every part.

Check for any loose or missing bolts or nuts before daily operation and at periodical inspection. Retighten a loose bolts and nuts and supply new parts for missing ones as required.

Inspection and retightening are needed at first 50 hours for a new machine and after that every 250 hours. Except for the retightening positions indicated in the following table, retighten the bolts and nuts according to the tightening torque table in "TIGHTENING TORQUE FOR BOLTS & NUTS" in Chapter 4.

Size (M)	Width across Flats mm	Position of bolts/nuts	Tightening torque N·m (Without Lubrication)	Recommended thread locking agent
M5	—	Installing fuel tank level sensor	1.96±0.2	
M8	13	Installing condenser	11±1.0	
	13	Installing water sub-tank	10.7±1.1	
	13	Condenser mounting bracket	23±2.3	
M10	17	Installing swivel joint dust cover	14.7±1.5	Applying Loctite #572
	17	Installing swing bearing access panel cover	29.4±2.9	Applying Loctite #572
	17	Installing floor plate rubber mount	46.5±4.6	
	17	Installing air cleaner	39.2±3.9	Applying Loctite #262
	17	Installing engine oil filter	46.1±4.9	Applying Loctite #262
	17	Installing bracket for power take-off	64.7±6.4	Applying Loctite #262
	17	Installing hydraulic oil tank cover	46.5±4.6	
	17	Installing fuel tank bottom cover	46.5±4.6	
	17	Installing lower frame grease bath cover	10.8±0.98	
	17	Installing engine	64.7±6.5	Applying Loctite #262
M12	19	Installing engine	115±12	Applying Loctite #262
	19	Installing swivel joint	107.8±10.8	Applying Loctite #262
	19	Installing cab	80±8	
	19	Installing travel motor cover	83.4±8.4	Applying Loctite #262
M14	22	Installing engine	172±17	Applying Loctite #262
M16	24	Installing travel motor	279±29	Applying Loctite #262
	24	Floor plate rubber mount mounting nut	191±19	
	24	Front idler idler adjuster connection	279±29	Applying Loctite #262
	24	Installing sprocket	279±29	Applying Loctite #262
M18	27	Installing lower roller	455±45	Applying Loctite #262
	22	Installing engine	172±17	Applying Loctite #262
	14	Installing power take-off coupling	220±10	
M20	30	Installing fuel tank	370±37	Applying Loctite #262
	30	Installing hydraulic oil tank	370±37	Applying Loctite #262
	30	Installing upper roller	539±54	Applying Loctite #262
	17	Installing main pump	431±43.1	Applying Loctite #262

Size (M)	Width across Flats mm	Position of bolts/nuts	Tightening torque N·m (Without Lubrication)	Recommended thread locking agent
M20	33	Installing shoe bolts	853±49	
	30	Installing swing bearing (outer race)	392±39	Applying Loctite #262
	30	Installing swing bearing (inner race)	564±56	Applying Loctite #262
	17	Installing swing reduction unit	539±54	Applying Loctite #262
M33	50	Installing counterweight (STD 3,820kg (8,420lbs), Semi-heavy 4,300kg (9,480lbs))	2.25±0.22 kNm	Applying Loctite #262
M39	60	Installing counterweight (Semi-heavy 4,900kg (10.810lbs))	3.75±0.38 kNm	Applying Loctite #262
5/8-18UNF	19	Installing idler adjuster grease nipple	58.8±9.8	

CAUTION

The counterweight mounting bolts may become loose when the counterweight is hit against some solid obstacles during swing operation etc.

Check the counterweight mounting bolts in the following procedure.

Use a hand hammer to hit the bolt heads or nuts lightly. When a dull sound is heard, the mounting bolt may be loose. Retighten the bolt.

4.10 TIGHTENING TORQUES FOR BOLTS & NUTS

For tightening and retightening of bolts which are not specified in the table "TIGHTENING TORQUES FOR BOLTS & NUTS (SPECIFIC POSITIONS)", see the following table.

METRIC COARSE THREAD (NOT PLATED)

Torque value Unit : N•m {lbf•ft}

Classification		4.8T		7T		10.9T	
		No lubrication	Oil lubrication	No lubrication	Oil lubrication	No lubrication	Oil lubrication
M6	P=1	4.4±0.5 {3.2±0.4}	3.7±0.4 {2.7±0.3}	9.6±1.0 {7.1±0.7}	8.1±0.8 {6.0±0.6}	17.4±1.8 {12.8±1.3}	14.7±1.5 {10.8±1.1}
M8	P=1.25	10.7±1.1 {7.9±0.8}	9.0±0.9 {6.6±0.7}	23.5±2.0 {17.3±1.5}	19.6±2.0 {14.5±1.5}	42.2±3.9 {31.1±2.9}	35.3±3.9 {26.0±2.9}
M10	P=1.5	21.6±2.0 {15.9±1.4}	17.9±1.8 {13.2±1.3}	46.1±4.9 {34.0±3.6}	39.2±3.9 {28.9±2.9}	83.4±8.8 {61.5±6.5}	70.6±6.9 {52.1±5.1}
M12	P=1.75	36.3±3.9 {26.8±2.9}	31.4±2.9 {23.2±2.1}	79.4±7.8 {58.6±5.8}	66.7±6.9 {49.2±5.1}	143±15 {105±11}	121±12 {89.2±8.9}
M14	P=2	57.9±5.9 {42.7±4.4}	49.0±4.9 {36.1±3.6}	126±13 {92.9±9.6}	106±10 {78.2±7.4}	226±20 {167±15}	191±19 {141±14}
M16	P=2	88.3±8.8 {65.1±6.5}	74.5±6.9 {55.0±5.1}	191±20 {141±15}	161±16 {119±12}	343±39 {253±29}	284±29 {209±21}
M18	P=2.5	122±12 {90.0±8.9}	103±10 {75.8±7.2}	265±29 {195±21}	226±20 {167±15}	481±49 {355±36}	402±39 {297±29}
M20	P=2.5	172±17 {127±13}	144±14 {106±10}	373±39 {275±29}	314±29 {232±21}	667±69 {492±51}	559±59 {412±44}
M22	P=2.5	226±20 {167±15}	192±20 {142±15}	500±49 {369±36}	422±39 {311±29}	902±88 {665±65}	755±78 {557±58}
M24	P=3	294±29 {217±21}	235±29 {173±21}	637±69 {470±51}	520±49 {383±36}	1160±118 {856±87}	941±98 {694±72}
M27	P=3	431±39 {318±29}	353±39 {260±29}	941±98 {694±72}	765±78 {564±58}	1700±167 {1250±123}	1370±137 {1010±101}
M30	P=3.5	588±59 {434±44}	490±49 {361±36}	1285±127 {948±94}	1079±108 {796±80}	2300±235 {1700±173}	1940±196 {1430±145}
M33	P=3.5	794±78 {586±58}	667±69 {492±51}	1726±177 {1270±131}	1451±147 {1070±108}	3110±314 {2290±232}	2610±265 {1930±195}
M36	P=4	1030±98 {760±72}	863±88 {637±65}	2226±226 {1640±167}	1863±186 {1370±137}	4010±402 {2960±297}	3360±333 {2480±246}

METRIC FINE THREAD (NOT PLATED)

Classification		Torque value Unit : N•m {lb•ft}					
		4.8T		7T		10.9T	
Nominal size		No lubrication	Oil lubrication	No lubrication	Oil lubrication	No lubrication	Oil lubrication
M8	P=1.0	11.3±1.1 {8.3±0.8}	9.5±1.0 {7.0±0.7}	24.5±2.0 {18.1±1.5}	20.6±2.0 {15.2±1.5}	44.1±3.9 {32.5±2.9}	37.3±3.9 {27.5±2.9}
M10	P=1.25	22.6±2.0 {16.7±1.5}	18.7±1.9 {13.8±1.4}	48.1±4.9 {35.5±3.6}	41.2±3.9 {30.3±2.9}	87.3±8.8 {64.4±6.5}	73.5±6.9 {54.2±5.1}
M12	P=1.25	39.2±3.9 {28.9±2.9}	33.3±2.9 {24.6±2.1}	85.3±8.8 {62.9±6.5}	71.6±6.9 {52.8±5.1}	154±16 {114±12}	129±13 {95.2±9.6}
M16	P=1.5	92.2±8.8 {68.0±6.5}	77.5±7.8 {57.2±5.8}	196±20 {145±15}	169±17 {125±13}	363±39 {268±29}	304±29 {224±21}
M20	P=1.5	186±19 {137±14}	155±16 {114±12}	402±39 {297±29}	333±29 {246±21}	726±69 {535±51}	608±59 {448±44}
M24	P=2	314±29 {232±21}	265±29 {195±21}	686±69 {506±51}	569±59 {420±44}	1240±118 {915±87}	1030±98 {760±72}
M30	P=2	637±59 {470±44}	530±49 {391±36}	1390±137 {1030±101}	1157±118 {853±87}	2500±255 {1840±188}	2080±206 {1530±152}
M33	P=2	853±88 {629±65}	706±70 {521±52}	1860±186 {1370±137}	1550±155 {1140±114}	3350±334 {2470±246}	2790±275 {2060±203}
M36	P=3	1070±108 {789±80}	892±88 {658±65}	2330±226 {1720±167}	1940±196 {1430±145}	4200±422 {3100±311}	3500±353 {2580±260}

4.11 TIGHTENING TORQUES FOR JOINTS & HYDRAULIC HOSES

IMPORTANT

These tightening torques are available in the case of tightening without lubricant.

ORS FITTING (O-RING SEAL TYPE)

Hose Mouth and Fitting Size	Wrench (mm)	Tightening torque N·m {lbt·ft}
1-14UNS	30	137 ± 14 {101 ± 10}
	32	
1-3/16-12UN	36	177 ± 18 {130 ± 13}
	41	
1-7/16-12UN	41	206 ± 21 {152 ± 15}
	46	

BYTE TYPE TUBE FITTING

Tube size O.D. x Thickness (mm)	Wrench (mm)	Tightening torque N·m {lbt·ft}
10 * 1.5	19	49 ± 5 {36 ± 3.6}
15 * 2.0	27	118 ± 12 {87 ± 8.7}
18 * 2.5	32	147 ± 15 {108 ± 11}
22 * 3.0	36	216 ± 22 {159 ± 16}
28 * 4.0	41	275 ± 28 {202 ± 20}
35 * 5.0	55	441 ± 44 {325 ± 33}

O-RING FITTING

Screw diameter (PF)	Wrench (mm)	Tightening torque N·m {lbt·ft}
1/8	14	17 ± 2 {13 ± 1.5}
1/4	19	36 ± 4 {27 ± 2.7}
3/8	22	74 ± 7 {55 ± 5.5}
1/2	27	108 ± 11 {80 ± 8}
3/4	36	162 ± 16 {119 ± 12}
1	41	255 ± 26 {119 ± 12}
1-1/4	50	392 ± 39 {289 ± 29}

HYDRAULIC HOSE

Screw diameter (PF)	Wrench (mm)	Tightening torque N·m {lbt·ft}
1/8	17	20 ± 2 {15 ± 1.5}
1/4	19	29 ± 3 {21 ± 2.1}
3/8	22	49 ± 5 {36 ± 3.6}
1/2	27	78 ± 8 {58 ± 5.8}
3/4	36	118 ± 12 {87 ± 8.7}
1	41	137 ± 14 {101 ± 10}
1-1/4	50	167 ± 17 {123 ± 12}

SPLIT FLANGE

Nominal Size	Tightening torque N·m {lbt·ft}			
	Working pressure 20.6 Mpa {210 kg/cm ² }	Bolt size (M)	Working pressure 41.2 Mpa {420 kg/cm ² }	Bolt size (M)
3/4	33.9 ± 3	10	39.5 ± 4	10
	{25 ± 2.5}		{29 ± 2.9}	
1	42.4 ± 4	10	62.2 ± 6	12
	{31 ± 3.1}		{46 ± 4.6}	
1-1/4	55.1 ± 6	10	93.3 ± 9	14
	{41 ± 4.1}		{69 ± 6.9}	
1-1/2	70.6 ± 7	12	169 ± 17	16
	{52 ± 5.2}		{125 ± 12}	
2	81.9 ± 8	12	282 ± 28	20
	{60 ± 6}		{208 ± 21}	

IMPORTANT

The tightening torques of the split flange are available in the case of tightening without lubricant.

4.12 INSPECTION AND MAINTENANCE CHART

The following charts show the recommended interval or the hour meter reading for each device for greasing, element replacement, and inspection and maintenance items.

Perform inspection and maintenance according to the calendar time or operation time shown by the hour meter, whichever comes first.

Symbols in the Table

 Indicates a required periodic inspection or maintenance with the hour meter interval.

⊙ Indicates a first one time maintenance interval.

○ Indicates an inspection or maintenance interval.

ENGINE

Item/Interval		Irregular	Start-Up Inspection	Every 1 Month or 100H	Every 3 Months or 250H	Every 6 Months or 500H	Every 12 Months or 1,000H	2,000H	5,000H	Grease (Replacement Part)	Procedure Description Section
Engine oil	Checking oil level		○							Engine oil	3.2.2
	Replacement			⊙ (First time)		○					4.18.1
Replacing oil filter				⊙ (First time)		○				Cartridge	4.18.1
Fuel pre-filter	Draining		○							Cartridge	3.2.4
	Replacement					○					4.18.2
Fuel filter	Replacement					○				Cartridge	4.18.3
DPF (body)	*Inspection						○				4.3.5
	*Cleaning, replacement								○ (6,000H)		4.3.5
Checking air cleaner inlet			○								3.2.12
Air cleaner element	Inspection, cleaning					○				Outer element (Inner element is not cleaned)	4.17.4
	Replacement								○	After 6 times of cleaning of outer element or after 1 year	
Cleaning radiator coolant and cooling system	Checking water level		○								3.2.1
	Replacement, cleaning								○ (Or every 2 years)	LCC	4.20.1
Checking radiator hoses for cracking and damage						○					4.17.2
Cleaning radiator, oil cooler core, intercooler and filters		○									4.13.1
Fan belt and air conditioner belt	Inspection		○								3.2.6
	Adjustment			⊙ (First time)		○					4.17.1
Cleaning or replacing radiator cap / reserve tank cap	Inspection	○									4.19.5
	Replacement						○				
Checking engine mounting bracket for tightening condition							○				4.19.3
Checking intake system rubber hose					○ (120H)						4.16.3

Item/Interval	Irregular	Start-Up Inspection	50H	Every 1 Month or 100H	Every 3 Months or 250H	Every 6 Months or 500H	Every 12 Months or 1,000H	2,000H	5,000H	Grease (Replacement Part)	Procedure Description Section
		8H		100H	250H	500H	1,000H				
*Checking and adjusting valve clearance						○					—
*Checking and adjusting compression pressure							○				—
*Checking intake and exhaust manifolds for tightening condition			◎ (First time)				○				—
*Checking oil pan and other auxiliary devices for tightening condition			◎ (First time)				○				—
*Checking each tightening part of turbo charger			◎ (First time)	○ (120H)							—
*Checking turbo charger rotor and impeller for rotation condition					○						—
*Checking play of turbo charger rotor						○					—
*Checking lubricating system of turbo charger for leakage		○					○				—
*Checking and cleaning starter brush and commutator							○				—
*Checking oil pan for mixing of water and fuel				○							—
*Checking fan mounting bolt for tightening condition			○								—
*Checking thermostat function							○				—
*Checking starter function						○					—
*Checking startability, exhaust color, and abnormal sound		○									—
*Checking heater plug and intake air heater (starting auxiliary device)						○					—
*Checking alternator function							○				—
*Checking pipe joints for tightening condition				◎ (First time)			○				—
*Checking exhaust pipe and muffler for looseness of mounting part and damages							○				—
*Checking and cleaning alternator brush (when brush is equipped)							○				—
*Cleaning EGR cooler								○ (4,500H)			—
*Replacing Blow-by gas filter								○ (4,500H)			—
*Check ECU and related sensors and actuators								○ (4,500H)			—
*Check crankcase breather								○ (4,500H)			—
*Check and replace SM (Supply Module) main filter								○ (4,500H)			—
*Check and clean injector								○ (4,500H)			—
Checking each part for oil and fuel leakage		○									3.1
Checking each part for water leakage		○									3.1
Checking electrical system		○									—

Notice

Contact your KOBELCO authorized dealer for inspection and adjustment of the items marked with *.

[4. INSPECTION AND MAINTENANCE]

FUEL SYSTEM

Item/Interval		Irregular	Start-Up Inspection 8H	50H	Every 1 Month or 100H	Every 3 Months or 250H	Every 6 Months or 500H	Every 12 Months or 1,000H	2,000H	5,000H	Grease (Replacement Part)	Procedure Description Section
Fuel tank	Checking oil level		○									3.2.3
	Draining water and sediment			○								4.15.1
	Cleaning cap and strainer						○					4.18.6
Bleeding air from fuel piping		○										4.13.4

SCR SYSTEM

Item/Interval		Irregular	Start-Up Inspection 8H	50H	Every 1 Month or 100H	Every 3 Months or 250H	Every 6 Months or 500H	Every 12 Months or 1,000H	2,000H	5,000H	Grease (Replacement Part)	Procedure Description Section
DEF/AdBlue tank	Checking fluid level		○									3.2.7
	Inspection					○						4.17.5
	*Cleaning strainer						○					—
	*Cleaning							○				—
*DEF/AdBlue breather tube	Cleaning						○					—
DEF/AdBlue piping	Inspection					○						4.17.5
DEF/AdBlue supply module	Inspection					○						4.17.5
*DEF/AdBlue supply module filter	Replacement									(3 years or 4500 H)		4.21.2
*DEF/AdBlue dosing module	Inspection					○						4.17.5
*SCR (insulation material)	Replacement									○ (4,500)	Gasket	4.21.2
*SCR system cooling water piping	Inspection					○						4.17.5
*Harness around SCR	Inspection					○						4.17.5

HYDRAULIC SYSTEM

Item/Interval		Irregular	Start-Up Inspection 8H	50H	Every 1 Month or 100H	Every 3 Months or 250H	Every 6 Months or 500H	Every 12 Months or 1,000H	2,000H	5,000H	Grease (Replacement Part)	Procedure Description Section
Hydraulic oil	Checking oil level		○									3.2.5
	Replacement							○ (Breaker)		○	Hydraulic oil	4.21.1
Suction strainer	Cleaning									○	Strainer	4.21.1
Hydraulic oil tank	Replacing return filter			◎ (First time)		○ (Breaker)		○			Element	4.19.1
	Replacing air breather element							○			Element	4.19.2
Checking hydraulic components, pipes and hoses for oil leakage and damage			○									3.1
Cleaning pilot line filter									○			4.20.6

UPPER FRAME

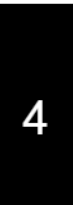
Item/Interval		Irregular	Start-Up Inspection	50H	Every 1 Month or	Every 3 Months or	Every 6 Months or	Every 12 Months or	2,000H	5,000H	Grease (Replacement Part)	Procedure Description Section
			8H		100H	250H	500H	1,000H				
Swing reduction unit oil	Checking oil level				○ (120H)						Gear oil SAE #90 GL-4	4.16.1
	Replacement					◎ (First time)		○				4.20.2
Greasing to swing bearing							○				EPG lithium added extreme-pressure grease	4.18.4
Checking grease of swing grease bath								○			EPG lithium added extreme-pressure grease	4.20.5
Swing brake function			○									—
Greasing to control lever push rod and universal joint part							○				EPG lithium added extreme-pressure grease	4.18.7
Installing swing bearing Checking bolt for looseness							○					4.18.5
Installing counterweight Checking bolt for looseness				◎ (First time)		○						4.9
Greasing swing reduction unit								○				4.20.4
Checking body structure			○									3.1

LOWER FRAME

Item/Interval		Irregular	Start-Up Inspection	50H	Every 1 Month or	Every 3 Months or	Every 6 Months or	Every 12 Months or	2,000H	5,000H	Grease (Replacement Part)	Procedure Description Section
			8H		100H	250H	500H	1,000H				
Travel reduction unit oil	Checking oil level				○ (120H)						Gear oil SAE #90 GL-4	4.16.2
	Replacement					◎ (First time)		○				4.20.3
Adjusting tension of crawler				○								4.15.2
Checking upper roller and lower roller for oil leakage			○									3.1
Checking idler and travel reduction unit for oil leakage			○									3.1
Checking sprocket, idler, and roller for wear			○									3.1

ATTACHMENT

Item/Interval		Irregular	Start-Up Inspection	50H	Every 1 Month or	Every 3 Months or	Every 6 Months or	Every 12 Months or	2,000H	5,000H	Grease (Replacement Part)	Procedure Description Section
			8H		100H	250H	500H	1,000H				
Greasing attachment (around bucket)			○ (Until 50 H)			○					EPG lithium added extreme-pressure grease	4.14.1
Greasing attachment			○ (Until 50 H)		○ (250 H is only for new machine)	○						4.14.1
Checking attachment structure			○									3.1



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ELECTRICITY

Item/Interval		Irregular	Start-Up Inspection	50H	Every 1 Month or 100H	Every 3 Months or 250H	Every 6 Months or 500H	Every 12 Months or 1,000H	2,000H	5,000H	Grease (Replacement Part)	Procedure Description Section
			8H									
Battery	Checking liquid level					○						4.17.6
	Measuring specific gravity					○						4.17.6
	Cleaning and grease application					○						4.17.6
	Measuring voltage							○				4.19.4
Electrical wiring			○									3.1
Check instruments, switches, and light warning devices for performance condition			○									3.2.10 3.2.11

OTHER DEVICES

Item/Interval		Irregular	Start-Up Inspection	50H	Every 1 Month or 100H	Every 3 Months or 250H	Every 6 Months or 500H	Every 12 Months or 1,000H	2,000H	5,000H	Grease (Replacement Part)	Procedure Description Section	
			8H										
Air conditioner	Checking refrigerant volume						○					4.18.8	
	Checking and cleaning condenser	○										4.13.1	
	Filter	Cleaning				○							4.17.3
		Replacement		After about 10 times of cleaning									
Checking wiper blades			○									4.13.2	
Checking washer fluid			○									4.13.3	
Checking external appearance of machine for deformation and damages			○									3.1	
Checking bolts and nuts for looseness and coming off			○									3.1	
Seatbelt	Inspection		○									2.11	
	Replacement								○ (3 years)				

4.13 MAINTENANCE WHEN REQUIRED

Thoroughly read and understand "SAFETY PRECAUTIONS" of this manual before operating, inspecting or maintaining the machine.

4.13.1 CLEANING RADIATOR, OIL COOLER CORE AND SCREEN



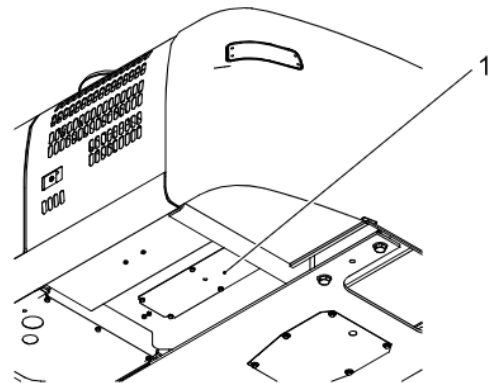
PRECAUTIONS FOR HANDLING

Direct strike of compressed air, steam or high pressure water to your body can cause personal injury. Wear protective glasses, goggles, mask, and protective shoes, etc.

Notice

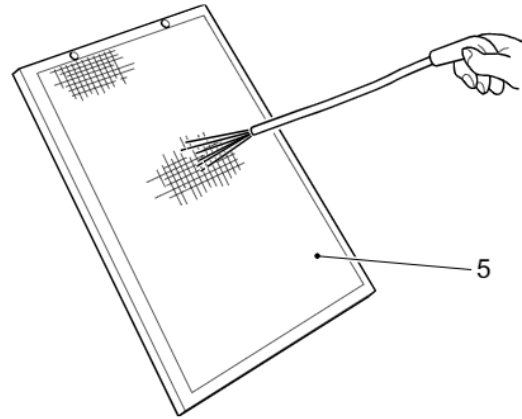
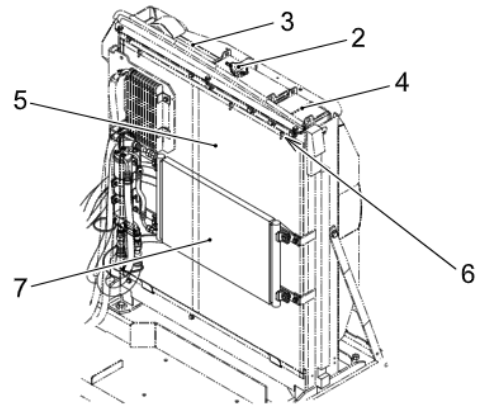
When using compressed air or high pressure water, keep a safe distance from the fin to prevent it from being damaged. If the fin is damaged, it may cause water leakage or overheating.

1. Use the starter key to open the engine hood and the side door at the left side of the machine and hold them with the lock lever.
2. Remove cover (1) under the radiator.



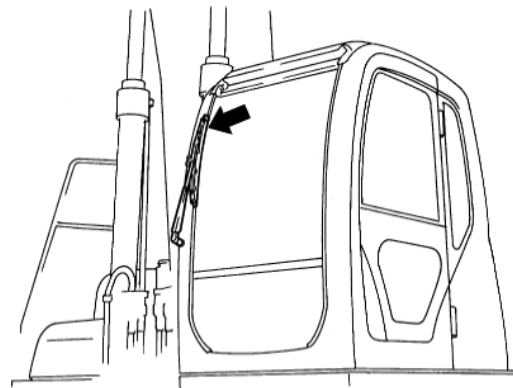
[4. INSPECTION AND MAINTENANCE]

3. Loosen wing bolt (6) on the radiator at the front of the oil cooler and the radiator and pull screen (5) out.
4. Clean screen (5) with compressed air (0.2 MPa or less) or soft clean water.
5. Check radiator (2), oil cooler (3), intercooler (4), and condenser (7) for mud, dust, or leaves and if any of them are adhered, clean them.
6. Insert screen (5) into the original position, and install it with wing bolt (6).
7. Attach cover (1) under the radiator.
8. Remove the support lock lever and close the side door and engine hood.



4.13.2 CHECKING AND REPLACING WIPER BLADES

- Check the wiper blades and replace them if there is wear or damage.

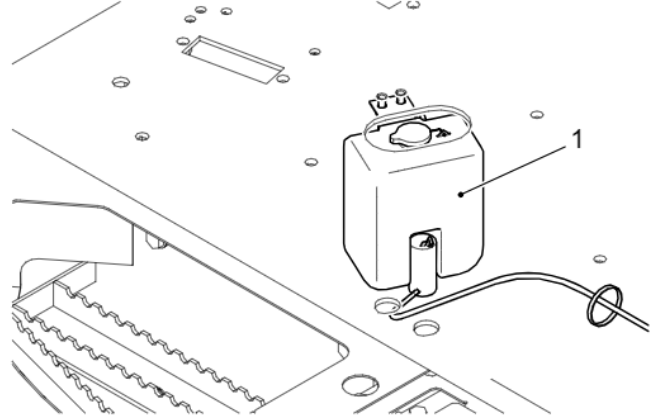


4.13.3 WASHER FLUID INSPECTION

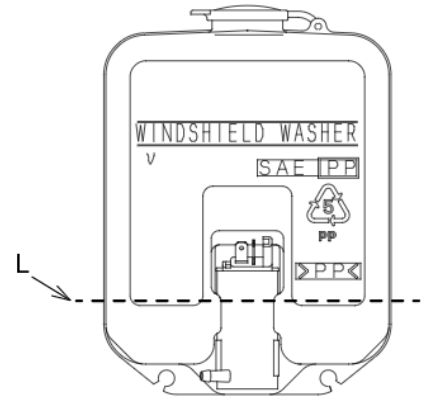
Notice

If the washer is used when the washer tank is empty, the motor attached to the washer tank may be damaged.

1. Remove the floor mat.
2. Inspect the fluid level of washer tank (1).



3. If the washer fluid level is low, remove the cap, and add washer fluid for automobiles.
4. Put the floor mat back to its original position.



4.13.4 BLEEDING AIR FROM FUEL PIPING

After replacing the element of fuel filter or running out of fuel, air enters the fuel piping and the engine cannot be started.

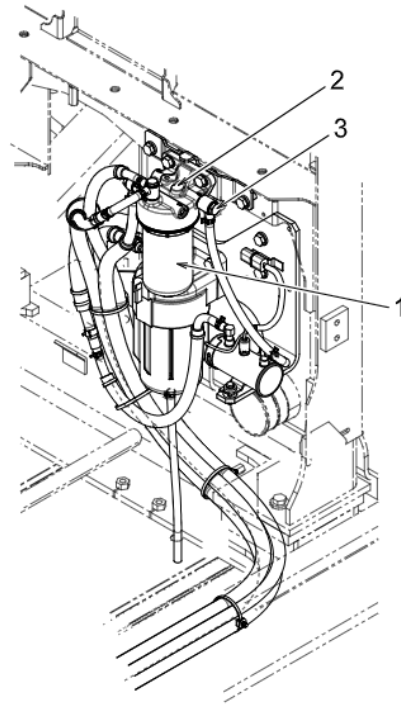
Use the following procedures to bleed air.



WARNING ABOUT BLEEDING AIR FROM FUEL PIPING

- Wipe off spilled fuel completely to prevent a fire.
 - After the operation, make sure that fuel does not leak.
-

1. Move the control lock lever to the "LOCKED" position and stop the engine.
2. Refill the fuel tank to the maximum.
3. Turn the starter key to the "ON" position and wait for 10 to 15 seconds or more to send the fuel to the fuel system by the fuel supply pump (1).



4.13.5 RELEASING INTERNAL PRESSURE IN HYDRAULIC SYSTEM

Before replacing the front attachment or the hydraulic piping, release the internal pressure of the hydraulic system. Release the internal pressure of the hydraulic system following the next steps.

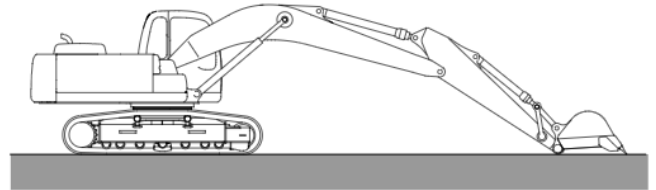


WARNING

RELEASING INTERNAL PRESSURE IN HYDRAULIC SYSTEM

Immediately after operation, there is a hazard of getting burn by heated parts. Wait until the temperatures decrease before starting works.

1. Move the machine to a level and firm place.
2. Retract the arm cylinder and bucket cylinder, and place the bucket on the ground.
3. Start the engine.



4. Release the internal pressure referring to "PRESSURE RELEASE" in Paragraph "SETTING MENU SCREEN" in Chapter 2.

When internal pressure releasing is started,

"DRAINING HYD. PRESS." is displayed on the monitor and the engine speed is reduced to a low speed.

5. The buzzer sounds intermittently.
(To stop the buzzer, push the buzzer stop switch).
6. In this condition, move the control levers of the attachment/equipment to release the pressure.
Be cautious that the attachment/equipment may move due to its own weight.
7. Set the starter key to "OFF" to stop the engine and to finish releasing the internal pressure.

4



CAUTION

After turning the key OFF and finishing the internal pressure releasing, wait 5 minutes or more before turning the key ON again.

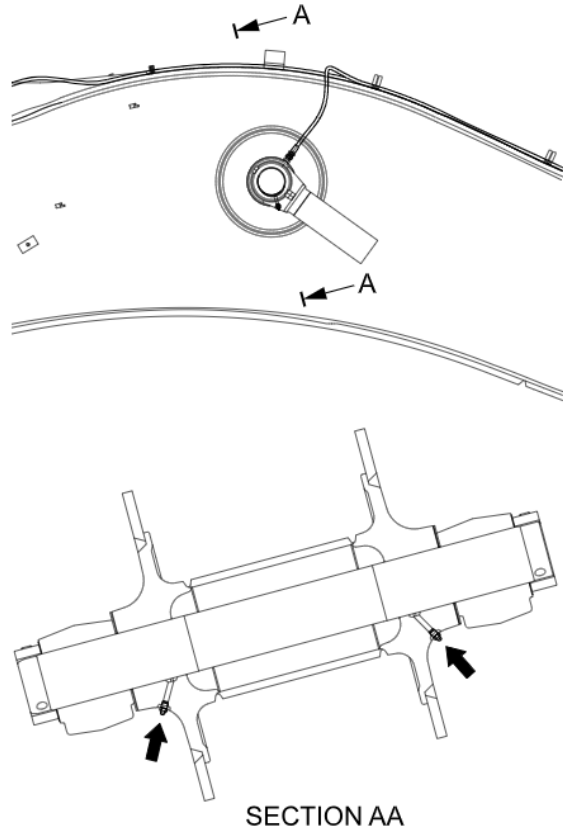
If the key is turned ON again soon after the key OFF, it may cause the internal pressure releasing to finish improperly, resulting in continued releasing operation.

- When releasing the internal pressure is failed, "FAIL DRAIN HYD. PRESS" is displayed on the monitor, and the buzzer sounds continuously. In that case, turn the starter key "OFF", wait 5 minutes or more, and then perform procedures 4. to 7. again.



4.13.6 GREASING ATTACHMENT/EQUIPMENT

When greasing the boom side bosses located at the boom cylinder rod installation part, grease two grease nipples shown in the figure.



Notice

Some machine specifications do not have the grease nipples for greasing.

4.13.7 CLEANING CAB SKYLIGHT

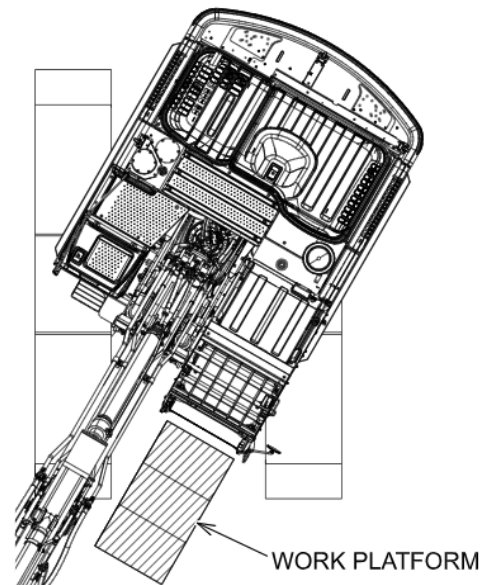
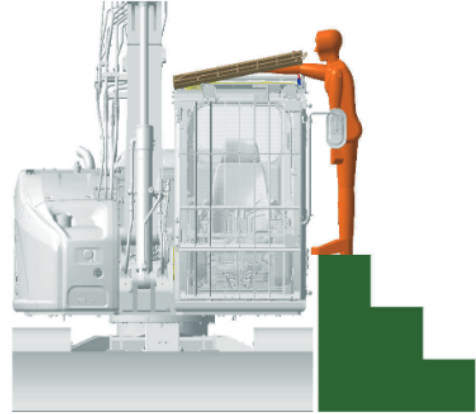
CAUTION

When cleaning the cab skylight, pull up the control lock lever to the "LOCKED position" and stop the engine.

Before starting cleaning, place the work platform at the left side of the machine.

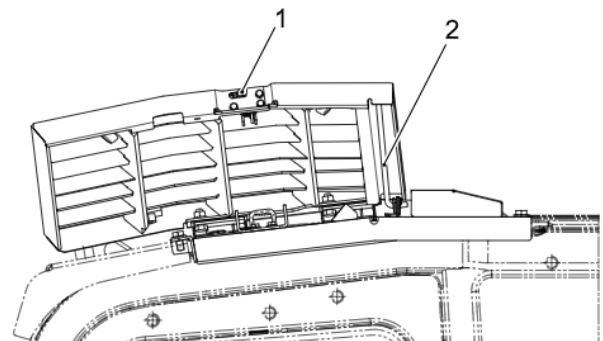
If you cannot reach the upper face of the cab due to the protrusion of the crawler, set the work platform at the front side of the cab and then perform cleaning.

1. Release lock (1) of the cab guard.



SWING POSITION

2. Lift up the cab guard and fix it with support lock lever (2).

**CAUTION**

Securely fix the cab guard with the support lock lever in order to avoid your hand from being caught, resulting in injuries.

[4. INSPECTION AND MAINTENANCE]

3. Clean the cab skylight.
4. After cleaning the cab skylight, release the support lock lever, close the cab guard, and then lock it.

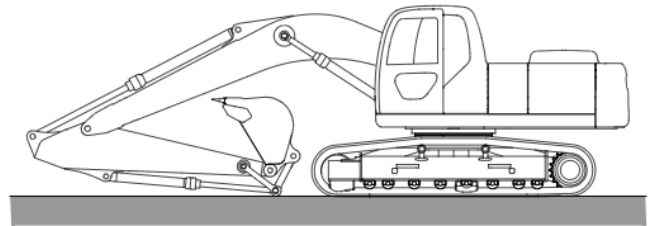
4.14 8 HOUR (DAILY) INSPECTION & MAINTENANCE PROCEDURES

Thoroughly read and understand "SAFETY PRECAUTIONS" of this manual before performing the inspection and maintenance.

See "EVERYDAY CHECK-UP", "CHECK BEFORE STARTING ENGINE" and "CHECK AFTER STARTING ENGINE" to perform a daily pre-operation inspection and maintenance (before operation and immediately after starting operation).

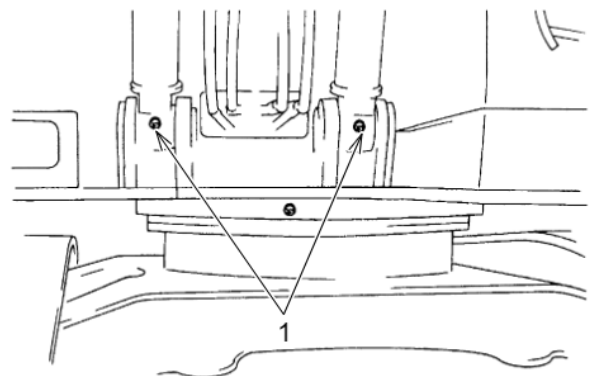
4.14.1 GREASING ATTACHMENT

Before applying grease, set the machine in the grease application position as shown in the figure, clean all grease nipples, and then apply grease until the grease comes out through the gap between the pin and the hole. The grease gun is located inside the cover on the right front of the machine.



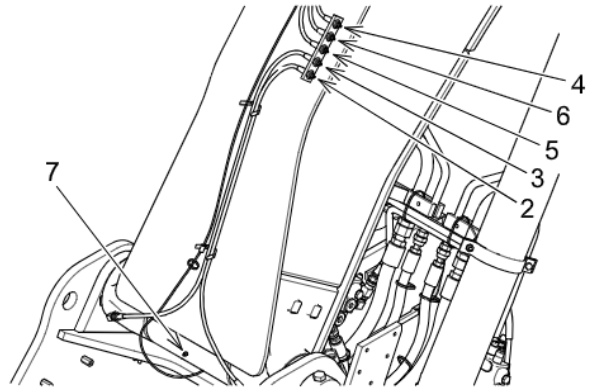
Notice

- Grease greasing points (1) to (14) every 8 hours during the first 50 hours of operation by a new machine. Also, grease them when 250 hours and 500 hours of operation by the new machine has been reached respectively. After that, grease them every 500 hours or every 6 months, whichever comes first. Also, regarding the pins around the bucket, grease them every 250 hours.
 - For digging work in the water, grease the submerged parts before and after the work every day.
 - After heavy duty work with a special attachment such as a nibbler (crusher) or a breaker, grease the machine every day.
 - Grease the machine before the work if it has not been used for one month or longer.
-
- Grease grease nipples (1) on the right and left boom cylinder heads.

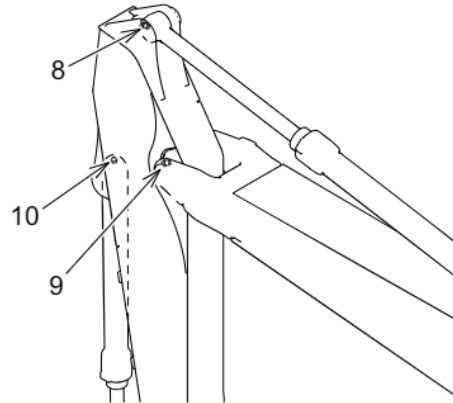


[4. INSPECTION AND MAINTENANCE]

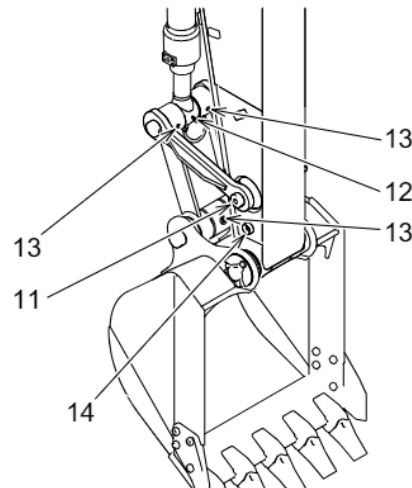
- Among the grease nipples in 5 locations near the boom foot, grease the boom foot pin from (2) and (3), the boom cylinder rod from (4) and (5), and the arm cylinder head from (6). Also, grease grease nipple (7) in the center of boom foot.



- Grease grease nipple (8) on the arm cylinder rod, grease nipple (9) in the connecting part between the boom and the arm, and grease nipple (10) on the bucket cylinder head.



- Grease grease nipple (11) on the link pin, grease nipple (12) on the bucket cylinder rod, three grease nipples (13) on the bucket link, and grease nipple (14) on the left side of the arm end.



4.15 50 HOUR INSPECTION & MAINTENANCE PROCEDURES

Thoroughly read and understand "SAFETY PRECAUTIONS" of this manual before performing the inspection and maintenance.

Perform this section together with "8 HOUR (DAILY) INSPECTION & MAINTENANCE PROCEDURES" in Chapter 4.

4.15.1 DRAINING WATER AND SEDIMENT IN FUEL TANK

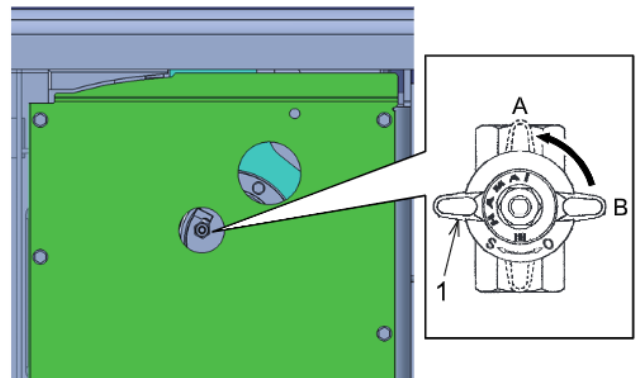


WARNING

HANDLING OF FUEL OIL

- Wipe off spilled fuel to prevent a fire.
- Make sure that there is no fuel leakage after performing work.

1. Move the machine to a level and firm place.
2. Swing the upper structure to a range in which drain valve (1) under the fuel tank can be released, and put the bucket on the ground.
3. Stop the engine, and set the control lock lever to the "LOCKED" position.
4. Place a container for drain water and sediment under drain valve (1).
5. Insert your hand through the hole in the under cover and set drain valve (1) to "OPEN" position (A) to drain water and sediment deposited on the bottom. At this time, be careful not to be splashed by the drain fuel.
6. Set drain valve (1) to "CLOSED" position (B) when clean fuel comes out.



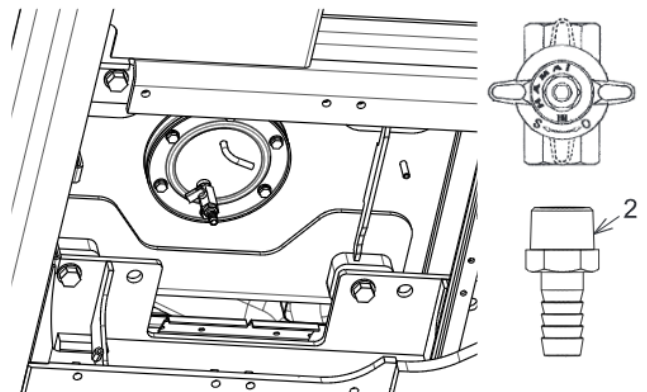
4

WHEN INSTALLING NOZZLE

Notice

A nozzle to suppress splashing of drain water and sediment can be attached to the drain valve. Use this as necessary.

1. Take out nozzle (2) from the tool box.
2. Loosen the bolts of the cover under the fuel tank and remove the cover.
3. Attach the nozzle to the drain valve. Tightening torque of nozzle: 10.0 N·m
4. Open the drain valve and when clean fuel comes out, close the drain valve.



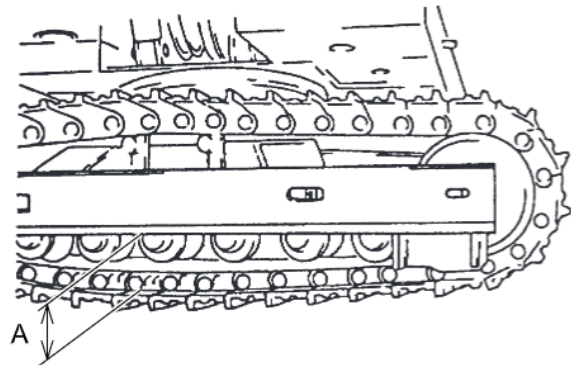
4.15.2 ADJUSTING CRAWLER TENSION

Notice

- Before inspecting and greasing the crawler, remove soil adhered to the crawler tracks completely by washing them.
- Crawler adjustment is necessary depending on the work condition at the working site. At a working site covered with many gravel and cobbles, loosen the crawler tension slightly, and on a firm ground, increase the tension slightly.

CHECKING CRAWLER TENSION

- Measure the upper part of the shoe and the lower part of the track frame, while raising one of the crawlers up, for which tension is to be measured. In this case, hold the raised machine with a stand securely.
A proper tension: 320 to 350 mm (12.6 to 13.8 inch)



CRAWLER TENSION ADJUSTMENT PROCEDURES

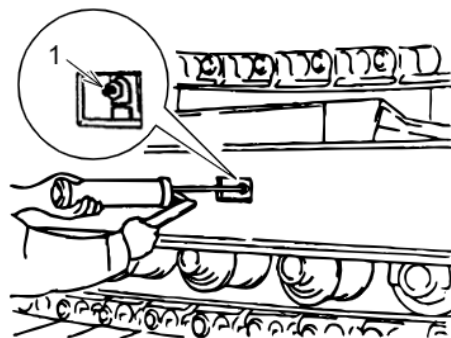


ABOUT CRAWLER FAILURE

When a crawler cannot be adjusted, the crawler has a failure.

A strong force is applied to the spring of track spring. Grease in the cylinder is under high pressure. If the travel system is adjusted or disassembled in a wrong way, it is very dangerous and could cause severe personal injury. Contact your KOBELCO authorized dealer for repair immediately.

1. Crawler tension is adjusted by applying grease to grease nipple (1) of the idler adjuster of lower frame with a grease gun.
2. In order to make the both tension of the left and right crawlers equal each other, travel the machine forward and backward to even out the pressure.
3. Check the amount of slack of the crawlers once again and readjust them as necessary.
4. Perform the same adjustment on another side crawler.



CRAWLER LOOSENING PROCEDURES



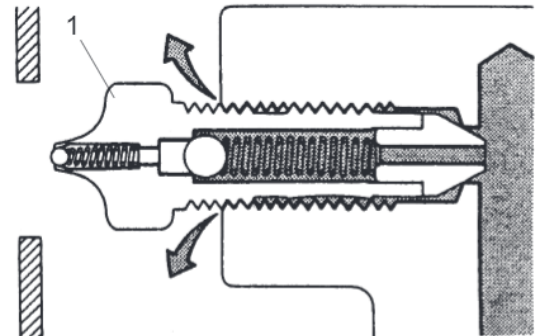
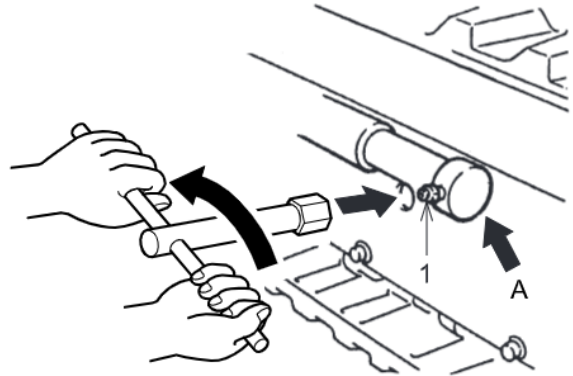
ABOUT HANDLING OF GREASE CYLINDER

Wear protective glasses.

Grease cylinder is under high pressure. If you loosen the grease nipple rapidly, high pressure grease will spout and may cause severe personal injury. Never position your body or face in front of the plug. Loosen the grease nipple gradually.

Do not loosen the grease nipple more than one turn because it can pop out due to the internal high pressure grease.

1. Loosen grease nipple (1) of the grease cylinder maximum one turn slowly to drain the grease. When the grease is not drained well, raise the crawler to be loosened and rotate the crawler slightly.
2. When the tension of crawler is adjusted properly, tighten grease nipple (1). For the tightening torque, see "TIGHTENING TORQUES FOR BOLTS & NUTS (SPECIFIC POSITIONS)" in Chapter 4.



Details of A Section (Grease Discharge)

4.16 100 HOUR INSPECTION & MAINTENANCE PROCEDURES

Thoroughly read and understand "SAFETY PRECAUTIONS" of this manual before performing the inspection and maintenance.

Perform this section together with "EVERYDAY CHECK-UP and 50 HOUR INSPECTION & MAINTENANCE PROCEDURES".

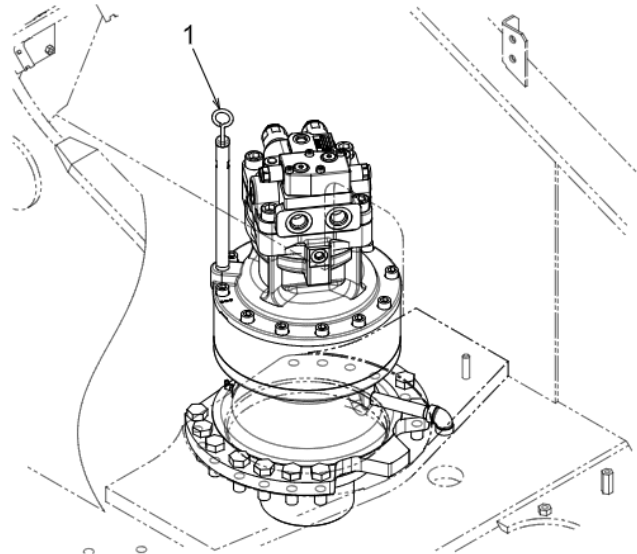
4.16.1 CHECKING OIL LEVEL OF SWING REDUCTION UNIT



WARNING ABOUT OIL TEMPERATURE IMMEDIATELY AFTER OPERATION

Immediately after operation, the oil is hot and it may cause burns. Start working after the temperature goes down.

1. Move the machine to a level and firm place.
2. Put the bucket on the ground.
3. Stop the engine and move the control lock lever to the "LOCKED" position.
4. Use level gauge (1) to check the level of gear oil. When the level is within the specified range of the scale of level gauge (1), it is proper.
5. If the gear oil level is low, remove level gauge (1) and refill the specified gear oil from the filler port. For the specified gear oil, see "LUBRICANT, FUEL & COOLANT SPECIFICATIONS" in Chapter 4.
6. Attach level gauge (1).



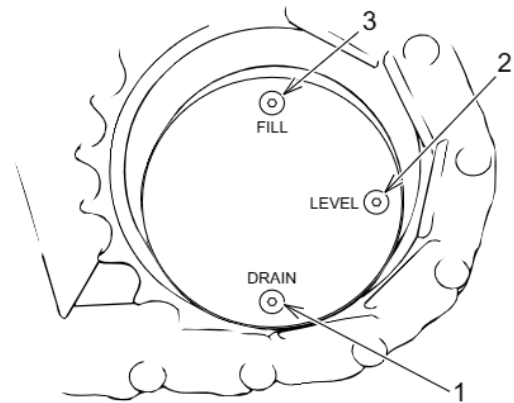
4.16.2 CHECKING OIL LEVEL OF TRAVEL REDUCTION UNIT



ABOUT CHECKING OIL LEVEL

- Wear protective glasses.
- Pressure may be generated inside the traveling devices. Slowly loosen the plug to release the internal pressure and then remove the plug. When the plug is loosened abruptly, the plug and oil may pop out and it is dangerous. Never position your body or face in front of the plug.
- Immediately after operation, the oil is hot and it may cause burns. Start working after the temperature goes down.

1. Move the machine to a level and firm place.
2. Stop the machine at a position in which drain plug (1) is positioned at the lower side and lower the bucket to the ground.
3. Stop the engine and move the pilot control shut-off lever to the "LOCKED" position.
4. Remove level plug (2) and check the level and contamination of the gear oil.
If the oil level is up to the neck of the level plug, it is proper.
5. If the gear oil level is low, remove level plug (2) and fill plug (3) and refill the specified gear oil.
For specified gear oil, see "LUBRICANT, FUEL & COOLANT SPECIFICATIONS" in Chapter 4.
6. Clean level plug (2) and fill plug (3) with light oil and install them.
7. Check the other travel reduction unit in the same procedure.



4.16.3 CHECKING INTAKE SYSTEM RUBBER HOSE

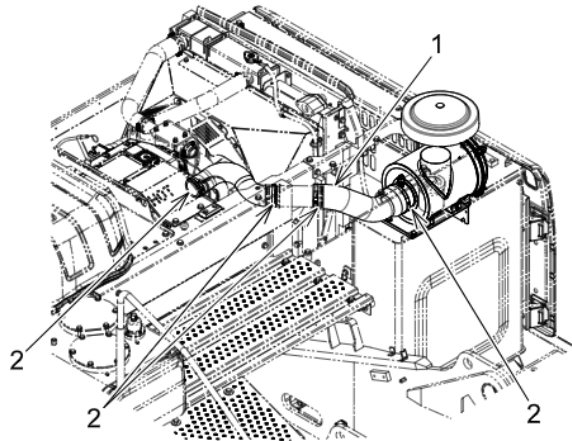


ABOUT HANDLING OF RUBBER HOSE

- Do not touch the hot parts. Contact with hot parts during operation or immediately after stopping operation may cause burns.
- When replacing the rubber hoses, cover the inlet with a clean cloth to prevent dust from entering it.

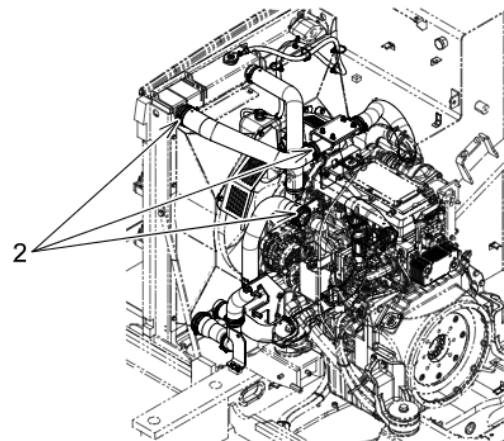
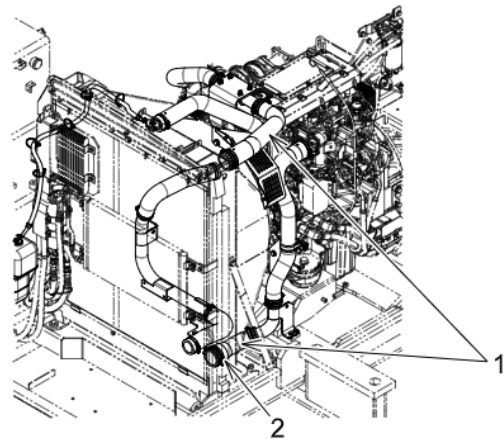
CHECKING RUBBER SUCTION HOSE FOR AIR CLEANER

1. Check that rubber hose (1) is not damaged or deteriorated and band (2) is not loose.
2. Rubber hose (1) which is damaged or deteriorated should be replaced with a new one together with band (2).



CHECKING RUBBER HOSE OF INTERCOOLER

1. Check that rubber hose (1) is not damaged or deteriorated and band (2) is not loose.
2. Rubber hose (1) which is damaged or deteriorated should be replaced with a new one together with band (2).



4.17 250 HOUR (3-MONTH) INSPECTION & MAINTENANCE PROCEDURES

Thoroughly read and understand "SAFETY PRECAUTIONS" of this manual before performing the inspection and maintenance.

Perform this section together with "EVERYDAY CHECK-UP, and 50, and 120 HOUR INSPECTION & MAINTENANCE PROCEDURES".

4.17.1 ADJUSTING FAN BELT AND AIR CONDITIONING COMPRESSOR BELT

CHECKING FAN BELT AND AIR CONDITIONING COMPRESSOR BELT



WARNING

INSPECTING AND MAINTAINING BELT

Be sure to stop the engine before inspection and maintenance of the engine.

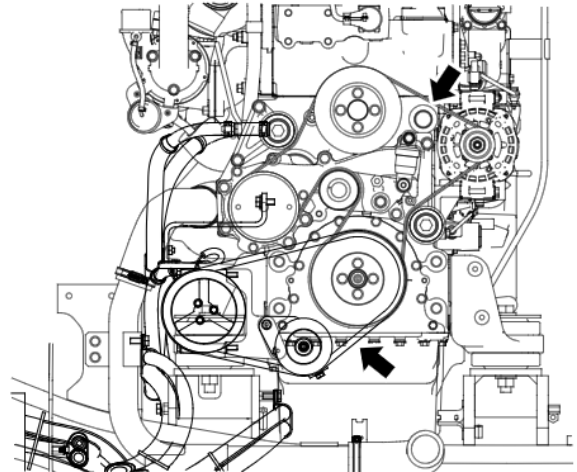
Inspecting and maintaining the running engine may cause severe injury by being caught in the rotating parts, such as the fan and the belt.



CAUTION

Replace the belt with a new one if flaking or breakage is found on the belt by the inspection, slip occurs excessively, or the belt cannot be adjusted to within the adjustment range. Keep the belt away from oils. The service life may be shortened if it slips by oil.

The engine of this machine is equipped with the alternator, fan, and an air conditioning compressor belts. Check the belts for wear and damage, and also for tension, and adjust them properly in order to maintain the maximum engine performance and the service life. If failures are found, replace the belt.



Notice

The alternator and air conditioning compressor belts is automatically adjusted.

Belt	New Belt Tension mm (inch)	At Inspection mm (inch)	Pushing Force N (lbf)
Air conditioning compressor belt	2.9(0.11)	2.9(0.11)	New: 28 to 35(6.3 to 7.9) Inspection: 14 to 17(3.1 to 3.8)

ADJUSTING ALTERNATOR AND FAN BELT



INSPECTING AND MAINTAINING THE BELT

Be sure to stop the engine before inspection and maintenance of the engine.

Inspecting and maintaining the running engine may cause severe injury by being caught in the rotating parts, such as the fan and the belt.

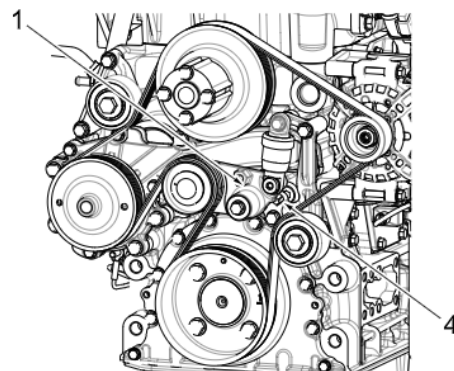
Notice

An improperly installed belt may not only decrease the performance of compressor but also damage the belt and the compressor.

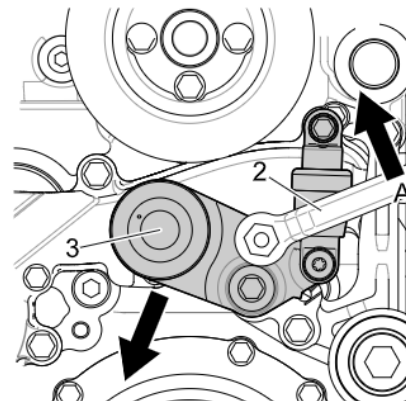
Retract the hydraulic unit to reduce the tension of the belt and then remove/install the belt.

1. Turn hexagon nut (1) placed at the tensioner arm to counterclockwise direction (A) by using tool (2) such as a ratchet wrench.
2. Lower tensioner arm (3) until hole (5) for inserting a fixing tool placed on tensioner bracket (4) at the arm back side can be seen.
3. Insert a cross slot screwdriver into the hole for fixing tool to fix tensioner arm (3) and then remove/install the belt.

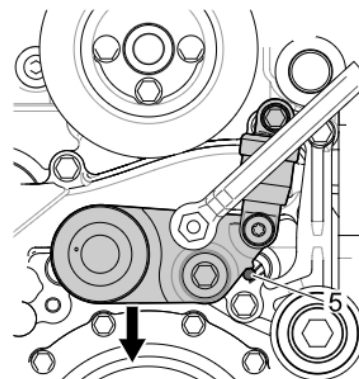
At this time, the hydraulic unit may break due to a sudden increase of the hydraulic pressure, so while the hydraulic unit is changing from the extended condition to the retracted condition, the movement shall be slow by taking three seconds or more.



Extended hydraulic unit



Retracted hydraulic unit



ADJUSTING TENSION OF AIR CONDITIONING COMPRESSOR BELT

**WARNING** INSPECTING AND MAINTAINING THE BELT

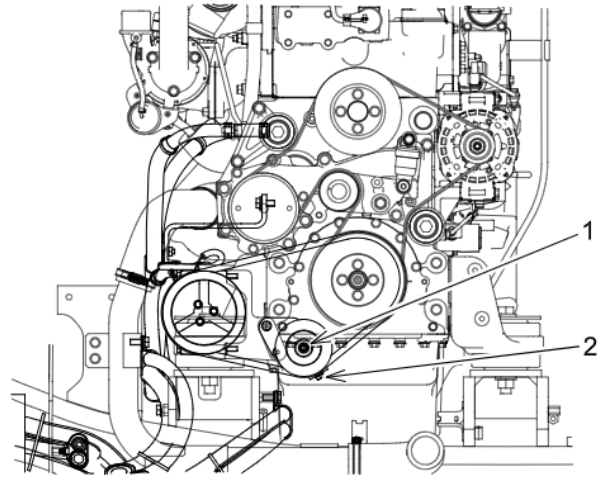
Be sure to stop the engine before inspection and maintenance of the engine.

Inspecting and maintaining the running engine may cause severe injury by being caught in the rotating parts, such as the fan and the belt.

Notice

An improperly installed belt may not only decrease the performance of compressor but also damage the belt and the compressor.

1. Open the engine hood with the starter key and hold it with the stay.
2. Loosen nut (1) of the idle pulley slightly, turn adjusting bolt (2) to adjust the belt and tighten nut (1).
Tightening torque
Nut (1): $46.5 \pm 4.6 \text{ N}\cdot\text{m}$ ($34.3 \pm 3.4 \text{ lbf}\cdot\text{ft}$)
3. After adjustment, run the engine at low idle for about 5 minutes and then check the belt tension again.
4. Remove the support stay and close the engine hood.

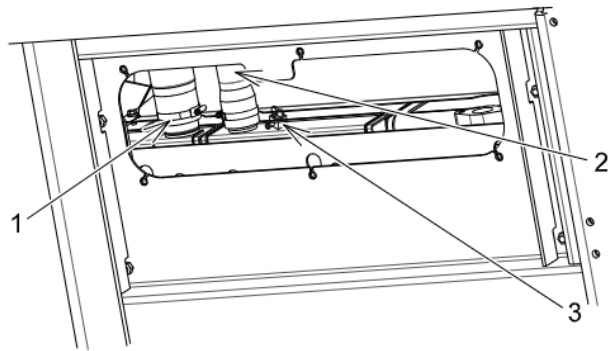
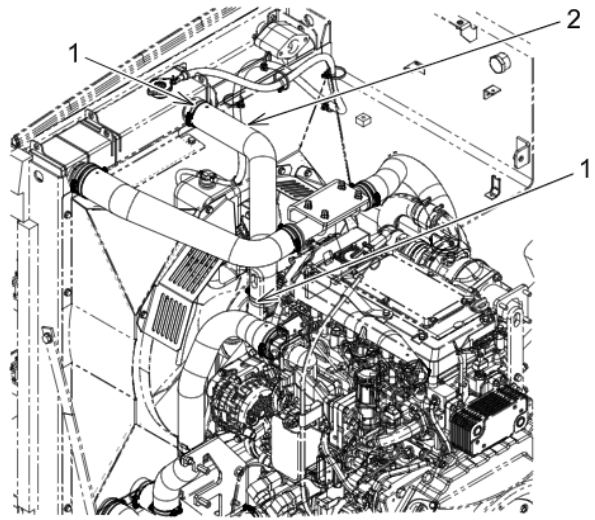


4.17.2 CHECKING RADIATOR HOSES

If you find cracks, permanent set, and water leakage on the hoses, replace the hoses immediately. Serious damages such as engine overheating can be prevented.

INSPECTING RADIATOR HOSES

1. Use the starter key to open the engine hood, and hold it with the stay.
2. Check each hose for water leakage due to looseness of clamp (1) or cracking or permanent set of hose (2).
3. Tighten loosened clamp (1).
Replace hose (2) having cracks or permanent set.



REPLACING RADIATOR HOSES

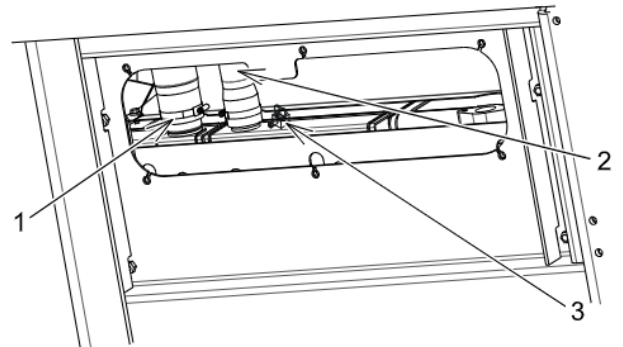
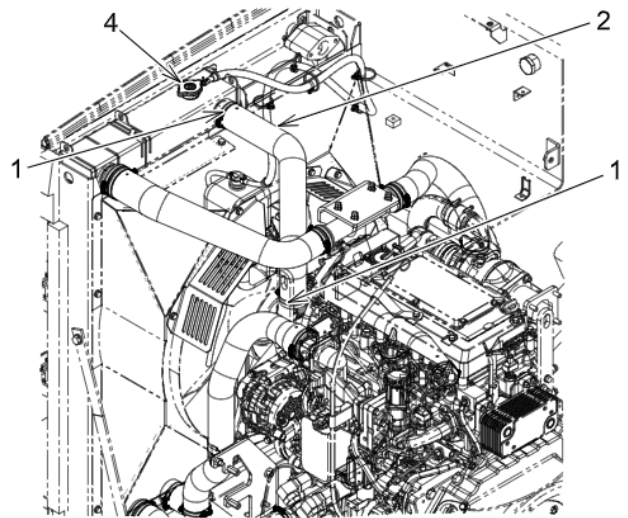


REPLACING RADIATOR HOSES

Inside the radiator, the high pressure steam occurs and it may cause personal injury. Do not loosen or remove the radiator cap when the coolant is under high pressure and high temperature.

- Stop the engine before removing the radiator cap.
- Allow enough time for the coolant to cool down before removing the radiator cap.

1. Loosen six bolts under the radiator, and remove the cover.
2. Loosen radiator cap (4) slowly. After checking that the pressure is completely released, push the cap down, loosen it further, and then remove it.
3. Loosen drain valve (3) and drain the coolant into a container until the water level of the radiator becomes lower than hose (2) to replace.
4. Loosen clamp (1), remove damaged hose (2), and replace it with a new hose.
5. Tighten drain valve (3).
6. Refill the radiator with coolant and then fill the reserve tank with coolant.
7. After refilling, tighten the radiator cap (4) securely.
8. Remove the support stay, and close the engine hood.
9. Install the cover on the specified position under the radiator.



4.17.3 CLEANING OR REPLACING AIR CONDITIONER FILTERS

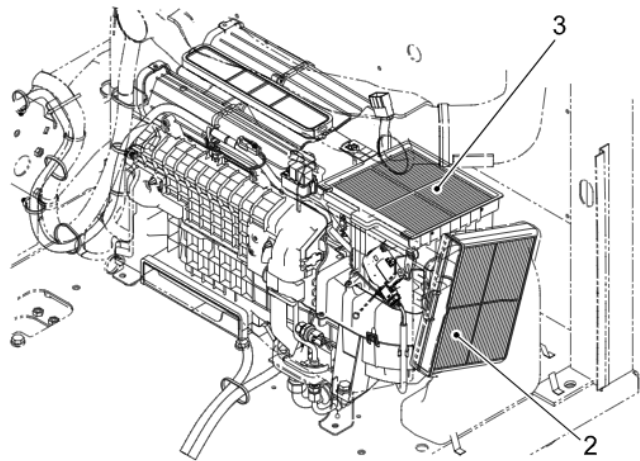
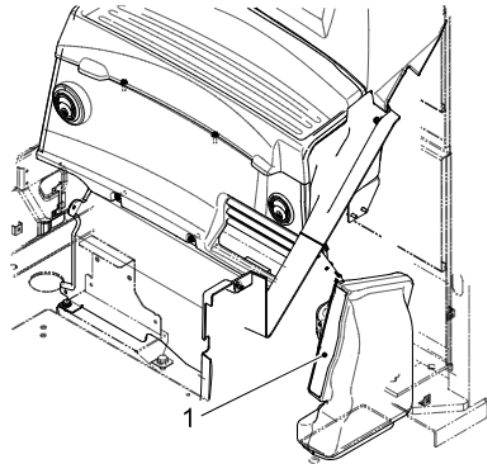
IMPORTANT

The maintenance interval is a reference value. Clean the filters earlier than the specified interval in case the machine is being used in dusty area.

	Cleaning	Replacement
Recirculation air filter	Every 500 hours	After cleaning approximately 10 times
Fresh air filter	Every 250 hours	After cleaning approximately 10 times

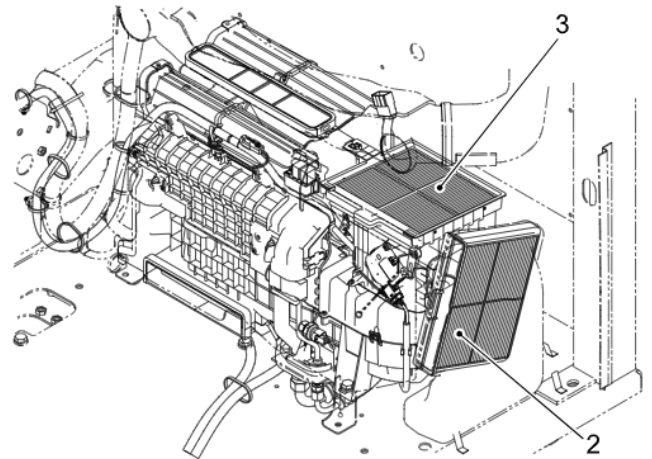
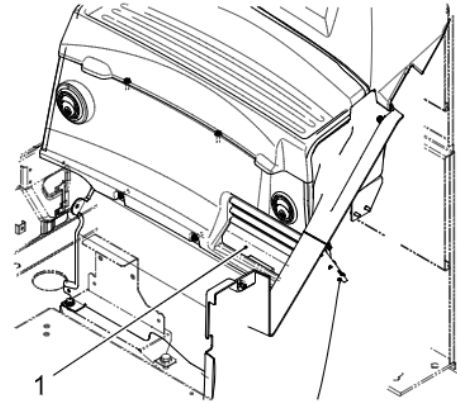
CLEANING OR REPLACING AIR CONDITIONER FRESH AIR FILTER

1. Fresh air duct (1) is placed on the left rear side of the operator's seat.
2. Hold the handle of the fresh air filter (2) inserted into fresh air duct (1) and pull it out toward you.
3. Clean the recirculation/fresh air filters by blowing compressed air (0.2 MPa (29psi) or less) to them.
4. Install the cleaned or replacement filters in the reverse order of removal.



CLEANING OR REPLACING OF AIR CONDITIONER RECIRCULATION AIR FILTER

1. Hold the lower side of cover (1) at the left rear side of the operator's seat and pull it toward you.
2. Hold the handle of recirculation air filter (3) through the opening of the removed cover (1) and pull it out forward.
3. Clean the recirculation / fresh air filters by blowing compressed air (0.2 MPa (29psi) or less) to them.
4. Install the cleaned or replacement filters in the reverse order of removal.



Notice

Install the recirculation air filter with the arrow facing rearward.

4.17.4 INSPECTING, CLEANING, OR REPLACING AIR CLEANER ELEMENT

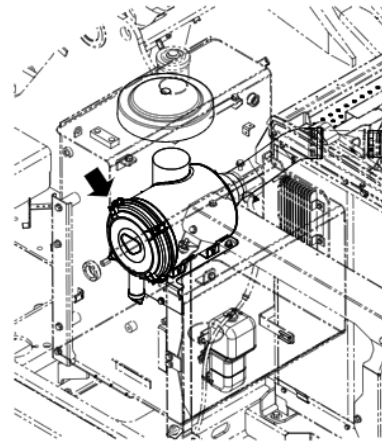
CAUTION

- Wear protective glasses, respirator, and gloves when using compressed air.
- Before cleaning or replacing the air cleaner element, stop the engine.
- Be careful not to allow foreign materials and dust to enter the inlet.
- Do not remove the inner element except for replacing with a new one.

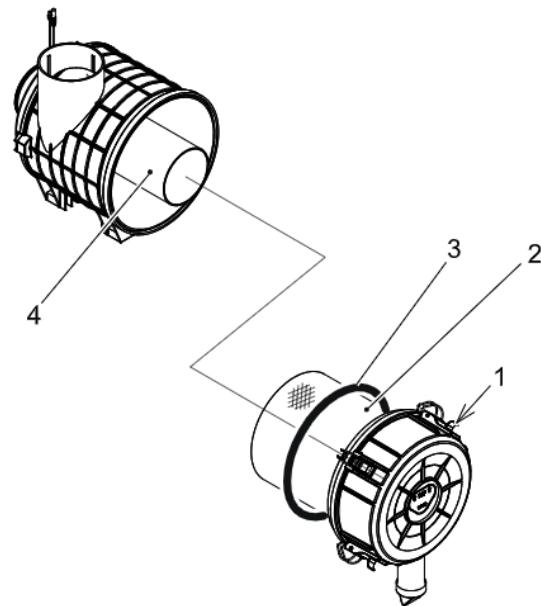
	Cleaning	Replacement
Outer element	When the warning is displayed on the multi-display or every 250 hours	After cleaning 6 times or after one year
Inner element	—	When replacing the outer element

CLEANING OR REPLACING OF OUTER ELEMENT

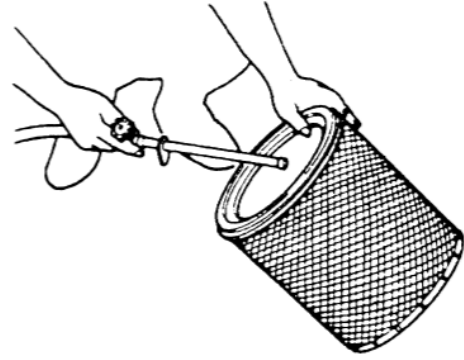
1. Use the starter key to open the side door at the left of the machine, and hold it with the stay.



2. Remove the clamp from air cleaner cover (1) to open it.
3. Remove outer element (2), and clean inside the air cleaner.



4. From inside outer element (2), blow compressed air (0.2 MPa or less) along the folds. Then blow the compressed air from the outside along the folds, and then from the inside again.
Do not hit the outer element to solid objects or clean the outer element by hitting it.
5. After cleaning, check outer element (2), and if holes and ruptures are found, replace it with a new one.
6. Install outer element (2), and place O-ring (3) to cover (1).



CAUTION

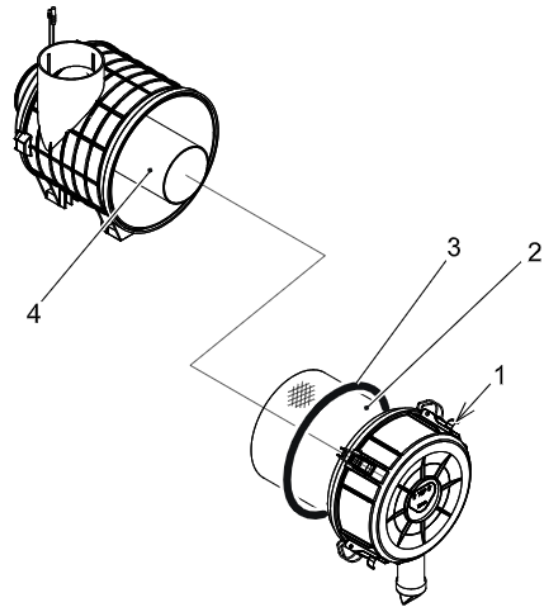
Install the cover with the O-ring attached to the air cleaner.
Without the O-ring, water gets into the air cleaner, causing failure of the engine.

7. Install cover (1) to the air cleaner with the arrow facing up, and fix it with the clamp.
8. Close the side door, and lock it with the starter key.

REPLACING INNER ELEMENT

Replace the inner element when replacing the outer element.

1. Remove outer element (2).
2. Clean inside the air cleaner.
3. Remove inner element (4).
4. Remove the cover at the inlet, and install new inner element (4).
5. Install new outer element (2) and then install O-ring (3) to cover (1).
6. Install cover (1) to the air cleaner with the arrow facing up, and fix it with the clamp.
7. Close the side door, and lock it with the starter key.



4.17.5 INSPECTING SCR SYSTEM

- Check the DEF/AdBlue tank, the DEF/AdBlue supply module, and around the DEF/AdBlue pipe for water leakage.
- Check the tubes and the hoses in the DEF/AdBlue piping for deterioration and damage.
- For the following inspections, contact your KOBELCO or KOBELCO authorized dealer.
Inspection around the DEF/AdBlue dosing module for water leakage
Inspection of the cooling water piping of the SCR system for water leakage, deterioration, and damage
Inspection of the harnesses of SCR for damage, and the connecting parts for looseness.

4.17.6 INSPECTING AND MAINTAINING BATTERY



INSPECTING AND MAINTAINING BATTERY

- Wear protective glasses, long-sleeve shirt and gloves when handling the batteries.
 - Do not bring a fire near the battery because the combustible hydrogen gas generated by the battery can cause explosion.
 - If the dilute sulfuric acid in the battery splashes onto your skin or into your eyes, it will cause burns or blindness. At such case, immediately wash the skin or eyes with sufficient clean water, and ask a special doctor to treat it as soon as possible.
 - Before performing inspection and maintenance on the batteries, be sure to stop the engine.
 - Confirm that the battery power-off switch is set to the OFF position to cut off the current.
 - When removing the battery terminal, be sure to remove the ground side (negative terminal) first and conversely, when attaching the battery terminal, attach the ground side last.
 - Do not put tools and hardware on the protective cover on the battery upper section. It may cause a short circuit resulting in a fire or explosion.
-



Before turning the battery power-off switch to the "O (OFF)" position, wait until the alarm stops sounding. If the battery power-off switch is turned off while the alarm is sounding, it can damage the exhaust gas cleaning device.

Sometimes the alarm keeps on sounding for about maximum 10 minutes.

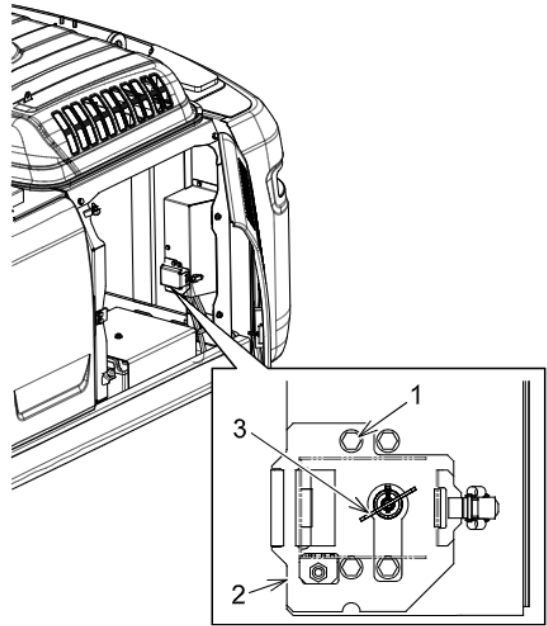
CHECKING BATTERY ELECTROLYTE LEVEL

Notice

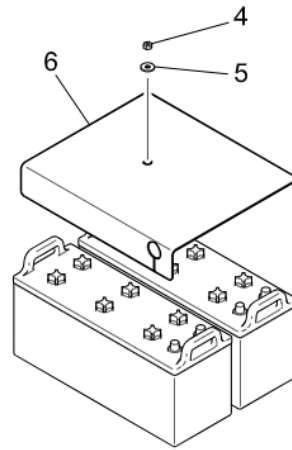
- Clean the battery terminals, and apply grease or commercial anti-rust lubricant spray.
 - Do not dispose of the batteries by yourself but always ask a professional service company to dispose of it.
 - If the batteries became old, do not attempt to use the old battery and a new battery together. The service life of the new battery may be shortened. When replacing the batteries, replace both at the same time.
-

1. Use the starter key to open the side door at the left side of the machine, and hold it with the stay.

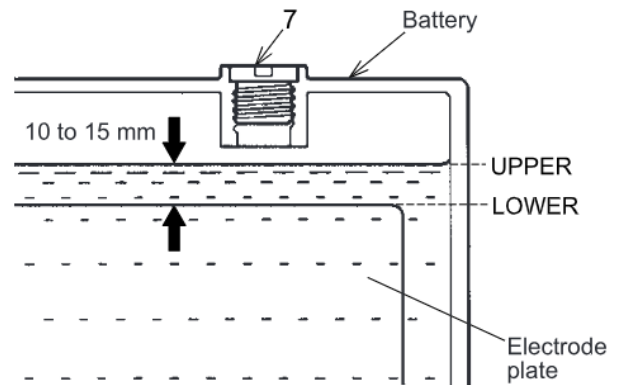
2. Remove bolt (1) and remove cover (2) of the battery power-off switch.
3. Turn the battery power-off switch OFF using key (3).



4. Remove nut (4) and washer (5) on the battery protection cover, and remove protection cover (6).



5. Remove cap (7), and if the level is below the specified level (10 to 15 mm above the electrode plate), supply distilled water to the specified level.
6. Clean the vent hole of the battery cap, and tighten cap (7) firmly.
7. Put battery cover (6) back to the original position.
8. Install battery cover (6) with nut (4) and washer (5).
9. Remove the support stay, and close the side door.



SPECIFIC GRAVITY OF BATTERY ELECTROLYTE



PRECAUTIONS IN COLD CLIMATES

- Be careful of retaining the temperature of the batteries. If the temperature is too low, they may freeze, and their electric capacity decrease significantly.
- Charge the batteries as soon as possible.



Measure the specific gravity of battery electrolyte after its temperature becomes almost the same as the outdoor temperature, instead of immediately after finishing operation.

- The specific gravity of the battery electrolyte varies according to the fluid temperature; therefore, retain the temperature within the range of use as shown in the following table. If the specific gravity is at the lower limit or below (small value), charging is necessary.

Specific Gravity of Battery Electrolyte

Charging rate	Battery electrolyte temperature		
	-20 degrees C (-4 degrees F)	0 degrees C (32 degrees F)	20 degrees C (68 degrees F)
100 %	1.31	1.29	1.28
90 %	1.29	1.28	1.26
80 %	1.28	1.26	1.25
75 %	1.27	1.25	1.24

4.18 500 HOUR (6-MONTH) INSPECTION & MAINTENANCE PROCEDURES

Thoroughly read and understand "SAFETY PRECAUTIONS" of this manual before performing the inspection and maintenance.

Perform this section together with "EVERYDAY CHECK-UP and 50, 100, 120, and 250 HOUR INSPECTION & MAINTENANCE PROCEDURES".

4.18.1 REPLACING ENGINE OIL AND ENGINE OIL FILTER



WARNING

ABOUT HOT PARTS

- Contact with hot parts during operation or immediately after stopping operation may cause burns. Do not touch the hot parts.
- Immediately after operation, the oil and oil filter are hot. Start the replacement after the temperature goes down.



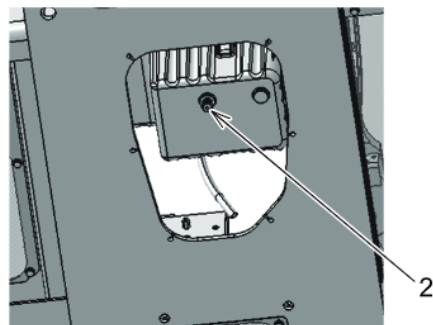
CAUTION

- Do not reuse the filter element, O-ring and gasket.
- When replacing the O-ring or gasket, check the fitting condition at the mounting surface to prevent it from being twisted and broken.

Notice

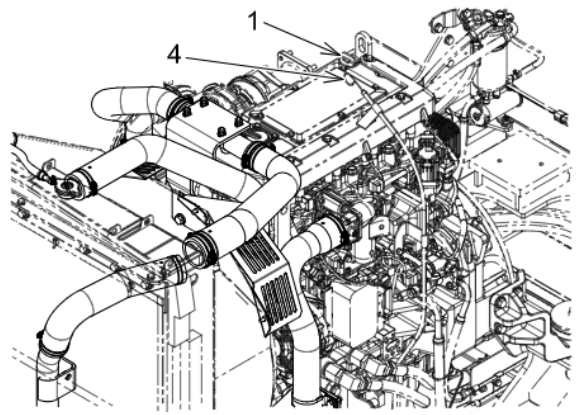
- Check drain engine oil, and if metal chips or powder is found in the oil, contact your KOBELCO authorized dealer/distributor.
- Change the engine oil after 50 hours of operation has been reached for the first time.
- When the engine oil is replaced, replace the engine oil filter as well.
- When the engine oil filter is replaced, run the engine at low idle for several minutes until the oil is filled in the filter.

1. Loosen the six bolts at the under cover just under the engine and remove the cover.
2. Place a container for drain oil under drain valve (2).
Container: 20.5 L (5.4 Gal) or more

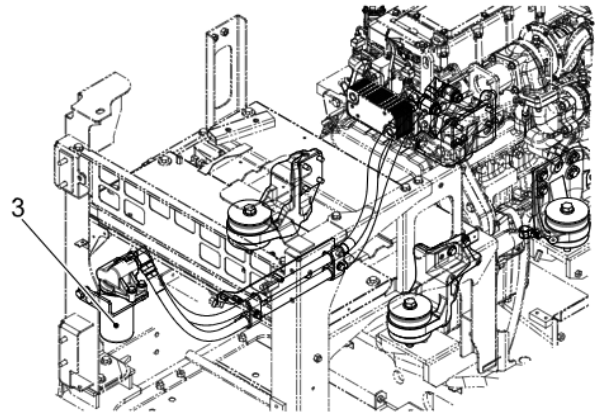


[4. INSPECTION AND MAINTENANCE]

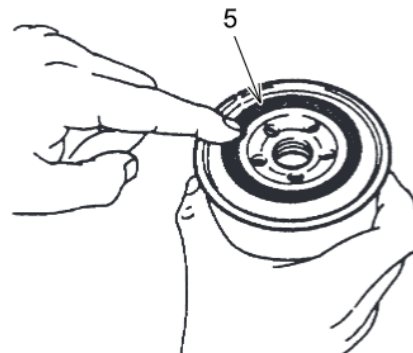
3. Clean the area around oil filler cap (1), remove the cap and loosen drain valve (2) of the engine oil pan to drain the oil.
4. After draining the oil, tighten drain valve (2) and oil filler cap (1) securely.



5. Turn filter element (3) with a filter wrench and remove it.
6. Remove dirt and foreign materials from the mounting surface of the oil filter body.



7. Apply engine oil to the gasket of new filter element and install the filter element by turning it by hand until it does not turn any more.

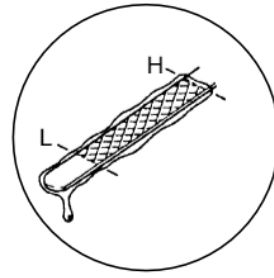


CAUTION

- Do not reuse the filter element, O-ring and gasket.
- When replacing the O-ring or gasket, check the fitting condition at the mounting surface to prevent it from being twisted and broken.

8. Use the filter wrench to tighten the filter element about a three-quarter turn.
Tightening Torque: 21 to 25 N·m (15.4 to 18.4 lbf·ft)
9. Remove the oil filler cap and refill the specified engine oil from the oil filler port, referring to "LUBRICANT, FUEL & COOLANT SPECIFICATIONS" in Chapter 4.
10. Use level gauge (4) to check the engine oil level. Refill the engine oil to the proper level, which is between upper limit (H) and lower limit (L).
11. Attach oil filler cap (1).

12. Start the engine, run the engine at low idle for several minutes and stop the engine. About 10 minutes later, check the engine oil level. If the level is low, refill the engine oil repeatedly to the proper level.
13. Make sure that there is no leakage from the mounting surface of the oil filter.
14. Attach the cover under the engine to the original position.



4.18.2 REPLACING FUEL PRE-FILTER



WARNING

HANDLING OF FUEL

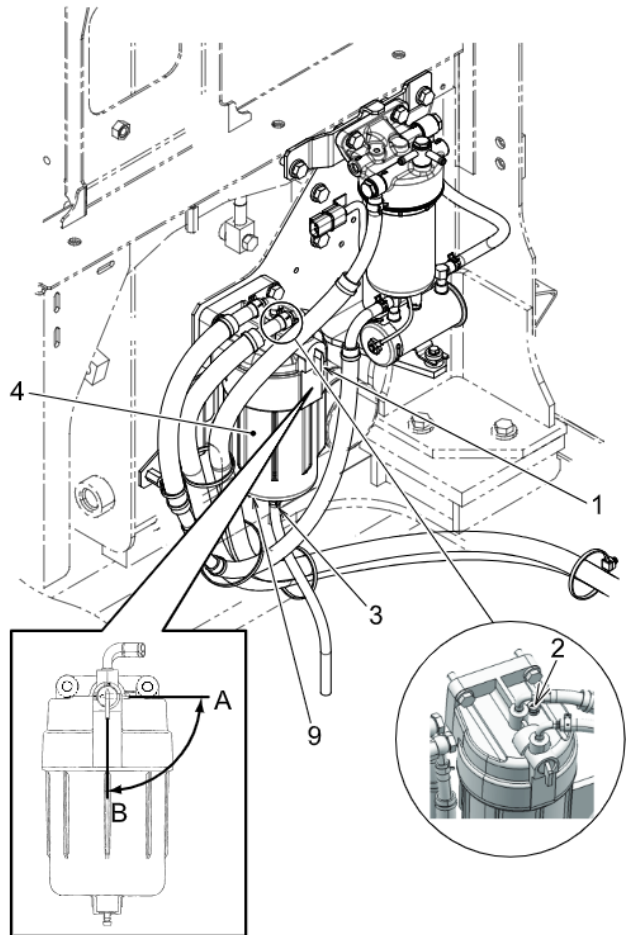
- Wipe off spilled fuel to prevent a fire.
- Make sure that there is no fuel leakage after performing work.



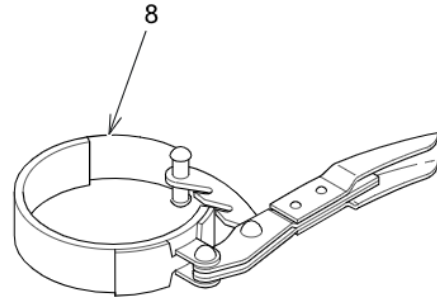
CAUTION

- Do not reuse the filter element, O-ring, and gasket.
- When replacing the O-ring or gasket, check the fitting condition at the mounting surface to prevent it from being twisted and broken.

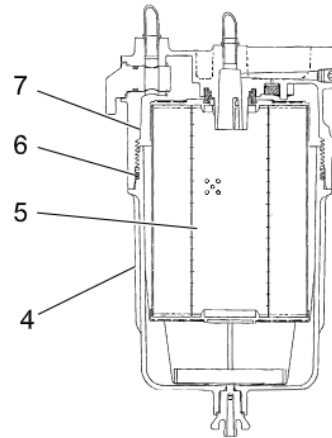
1. Place a container for drain fuel under fuel pre-filter (9).
2. Set stop valve (1) to "CLOSED" position (A).
3. Clean the area around air bleeder plug (2).



4. Loosen air bleeder plug (2) and drain plug (3) to drain the fuel inside the filter.
5. Turn case (4) with filter wrench (8) to remove it.



6. Install new filter element (5) to case (4).
7. Apply light oil slightly to new gasket (6) and attach it to case (4).
8. Remove dirt and foreign materials on the mounting surface of cover (7).
9. Turn case (4) with filter wrench (8) to install it to cover (7) securely.
10. Tighten air bleeder plug (2) and drain plug (3).
11. Set stop valve (1) to "OPEN" position (B).
12. See "BLEEDING AIR FROM FUEL PIPING" in Chapter 4 to perform air bleeding.



4.18.3 REPLACING FUEL FILTER



WARNING HANDLING OF FUEL

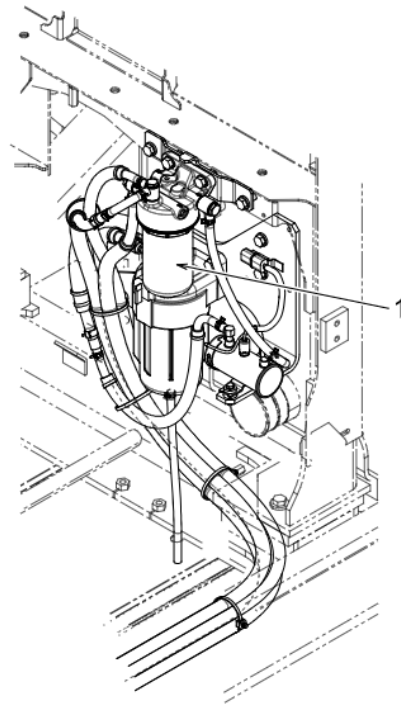
- Wipe off spilled fuel to prevent a fire.
- Make sure that there is no fuel leakage after performing work.



- Do not reuse the filter element, O-ring and gasket.
- When replacing the O-ring or gasket, check the fitting condition at the mounting surface to prevent it from being twisted and broken.

1. Place a container for drain fuel under fuel filter (1).
2. See "REPLACING FUEL PRE-FILTER" in Chapter 4 to close the stop valve of fuel pre-filter.

3. By using your hand or filter wrench(6) of a plier type, turn fuel filter (1) left (4) to remove it. When using the filter wrench, apply it to the plastic portion of the filter and then remove the filter. When holding the fuel filter at the removal, pay attention not to spill the fuel in the filter. If it spills, wipe off the spilled fuel completely.



4. Completely clean the filter installation surface and apply a thin coat of fuel to the gasket surface of the new fuel filter.

5. Remove dirt and foreign materials from the installation surface of the filter (3) body.

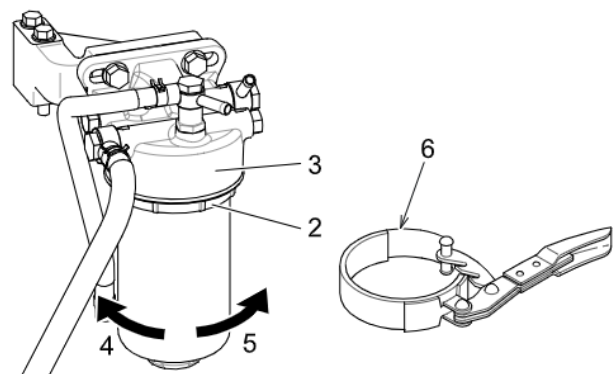
6. Apply filter wrench (6) of a band type to plastic portion (2) of filter body (3) and turn it right (5) to install the filter securely.

Tightening torque: $30 \pm 5 \text{ N} \cdot \text{m}$ ($22 \pm 3.6 \text{ lbf} \cdot \text{ft}$)

7. Open the stop valve of the fuel pre-filter.

8. Bleed air according to "BLEEDING AIR FROM FUEL SYSTEM" in Chapter 4.

9. Start the engine, run it at idle for several minutes, and then check the filter mounting area for fuel leakage.



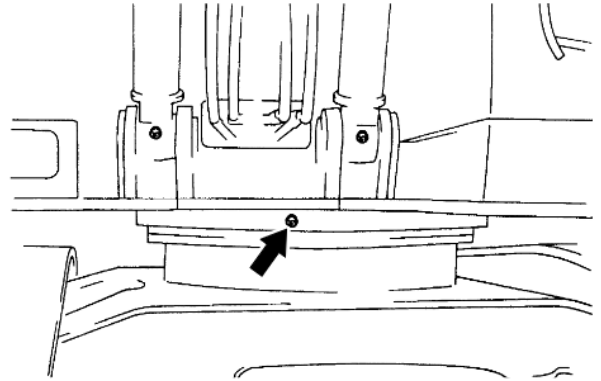
4.18.4 GREASING SWING BEARING

WARNING ABOUT GREASING SWING BEARING

Do not swing the machine while greasing the swing bearing because it is dangerous.

The grease nipple is at one location.

- Clean the grease nipple and swing the upper structure by every 90 degrees for greasing. Every time after swinging the upper structure, apply grease until the grease comes out through the seal of bearing. (About maximum 30 cc per each direction)

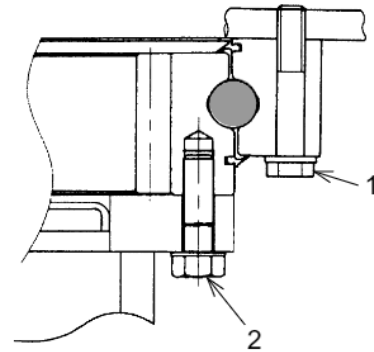


4.18.5 CHECKING SWING BEARING MOUNTING BOLT FOR LOOSENESS

Notice

Special tool is required to tighten the swing bearing. Contact your KOBELCO authorized dealer.

1. Check that bolts (1) and (2), which tighten the swing bearing are not loose.
2. When they are loose, remove bolts (1), and (2), apply the recommended thread locking agent (Loctite #262 or equivalent) and tighten them. Tighten diagonally positioned bolts alternately.

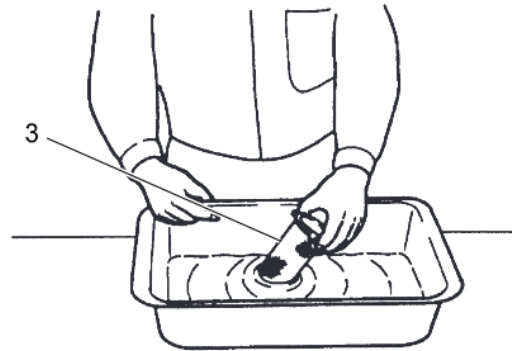
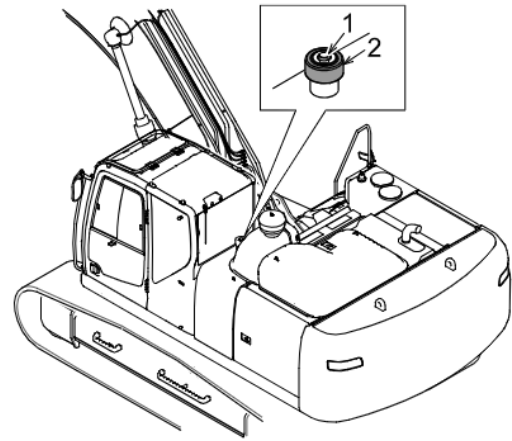


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Mounting part	Tightening torque N · m (lbf · ft)
Inner race	564 ± 56 (415 ± 41)
Outer race	392 ± 39 (289 ± 29)

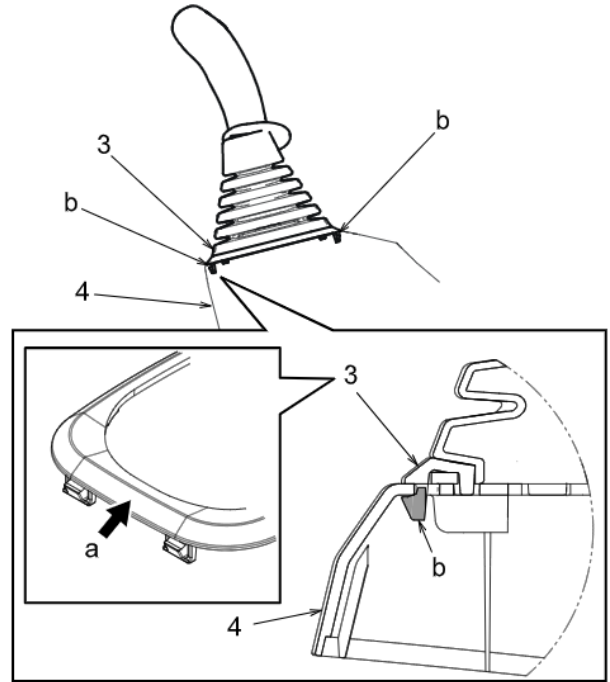
4.18.6 CLEANING FUEL TANK CAP AND STRAINER

1. Stop the engine.
2. Climb up the step on the control valve from the right front of the machine.
3. If rubber cover (2) is attached on the fuel port, remove it, and turn filler cap (1) to open it using the starter key.
4. Check the seal on filler cap (1), and replace it if damaged.
5. Wash strainer (3) with clean light oil, and install it. Replace it if damaged.
6. Attach filler cap (1), and after locking it with the starter key, attach rubber cover (2) by aligning the orientation of fuel cap (1).

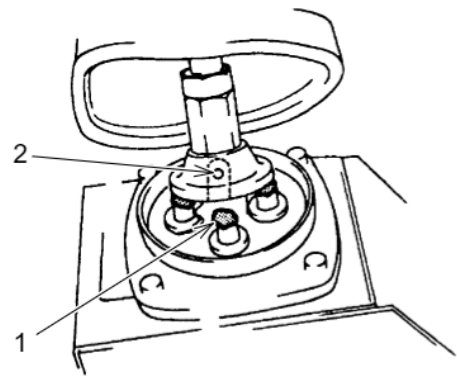


4.18.7 LUBRICATING PUSH ROD OF CONTROL LEVER

1. Push part "a" of boot (3), remove two front clicks (b) out of four clicks from plastic cover (4), and then remove boot (3).



2. Remove the rubber boot of the pilot valve and apply a small amount of grease to push rod (1) and top end (2) of the rotation sliding section.
3. After applying the grease, install the boot of the pilot valve and boot (3).



4.18.8 CHECKING AIR CONDITIONER REFRIGERANT



REFRIGERANT

- Do not loosen the parts in the refrigerant circuit because there is a hazard of losing sight by getting refrigerant in your eyes and getting frostbite on your hands by touching it.
- Inhalation of the refrigerant may result in fatal injury. Also, do not bring a fire near the area where refrigerant gas is produced.

Notice

- When filling or changing refrigerant, confirm the type of refrigerant and use the specified refrigerant. (Refrigerant type: R-134a Quantity: 840g±50g (1.85 lbs ± 0.11 lbs))
The use of unspecified refrigerant may cause damage of the components.
- Operate the air conditioner at least once every week for several minutes to rotate the compressor regardless of the season. This will prevent the refrigerant gas from leaking from the compressor sealing.
- If an oil stain is found around a pipe joint, it is a sign of gas leakage. Contact your KOBELCO authorized dealer for inspection.

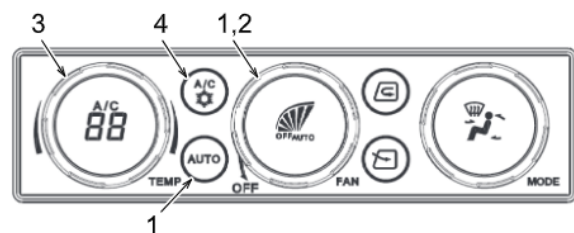
Notice

Be sure to follow the following regulations to protect the global environment.

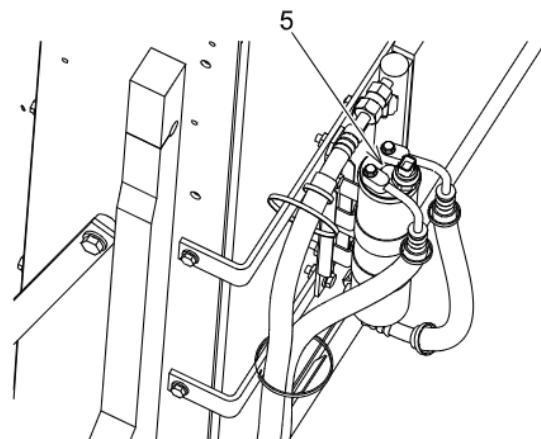
- Do not release the refrigerant sealed in this product to the atmosphere without care.
- Extract the sealed refrigerant from the unit when disposing this product.

1. Start the engine, and set the engine speed to the middle speed position of the engine throttle.
2. Fully open the windows of the cab and the doors.
3. Set the air conditioner as shown in the following.


- (1) Air conditioner control: ON
- (2) Fan speed selector switch: HI display
- (3) Temperature setting switch: MAX COLD
- (4) Air conditioner switch: ON



4. Check the amount of the refrigerant by seeing sight glass (inspection window) (5).
See the figure of "Condition of Sight Glass" for judging whether the refilled refrigerant volume is sufficient or not.



Condition of Sight Glass

When insufficiently charged	After turning ON the main power switch, bubbles are seen continuously.	
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4.19 1000 HOUR (12-MONTH) INSPECTION & MAINTENANCE PROCEDURES

Thoroughly read and understand "SAFETY PRECAUTIONS" of this manual before performing the inspection and maintenance.

Perform this section together with "EVERYDAY CHECK-UP and 50, 100, 120, 250, and 500 HOUR INSPECTION & MAINTENANCE PROCEDURES".

4.19.1 REPLACING RETURN FILTER



WARNING PAY ATTENTION TO HOT PARTS

- The oil in the hydraulic oil tank is under high pressure and high temperature. Before removing the cover, stop the engine first, remove the breather cap, press the valve, and release the pressure from the tank.
- Immediately after engine operation, the oil is hot and it may cause burns. Wait until the oil temperature cools down before attempting to change the hydraulic oil.

Notice

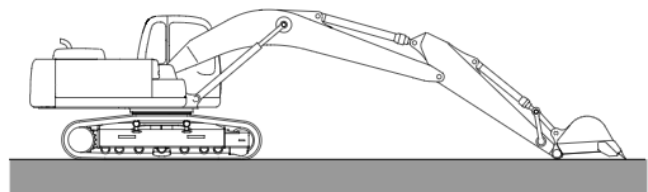
Hydraulic oil before filtration inside the filter contains dirt. When taking out the return filter, do not return the hydraulic oil remaining in the filter back to the tank.

Notice

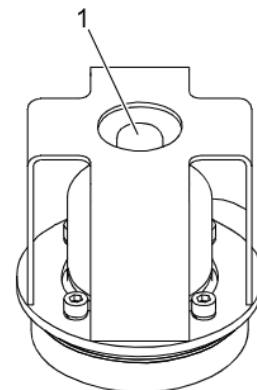
As for the return filter element kit to be replaced, ask your KOBELCO authorized dealer for the part number and then place an order.

Replace the return filter after 50 hours of operation has been reached for the first time, and then every 1,000 hours. For breaker specification, replace it every 250 hours.

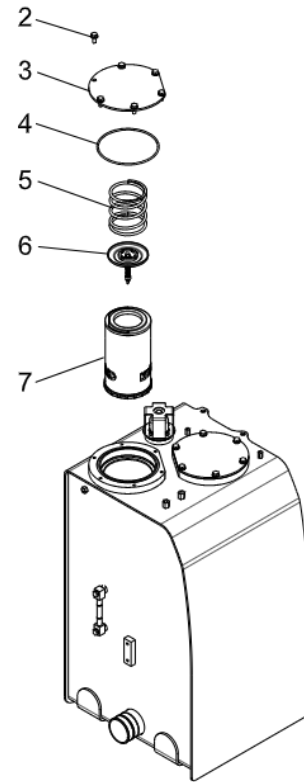
1. Move the machine to a level and firm place.
2. Park the machine in the hydraulic oil level inspection position.
3. Stop the engine and move the pilot control shut-off lever to the "LOCKED" position.



4. Keep pressing air breather (1) on the top of the hydraulic oil tank until the pressure inside the hydraulic oil tank is released.



5. Remove bolt (2) and cover (3) on the tank upper surface.
6. Take out spring (5), check valve (6) and element assembly (7) from the tank.
At this time, do not return the hydraulic oil remaining in the filter back to the tank.
7. Replace O-ring (4) on the mounting surface of cover (3).
8. Insert element assembly (7).
9. Attach the element by the reverse order of the steps 3 and 4.
10. Attach cover (3) with bolts (2).
Tightening Torque: $46.5 \pm 4.6 \text{ N} \cdot \text{m}$ ($34.3 \pm 3.4 \text{ lbf} \cdot \text{ft}$)
11. Start the engine, set the machine in the hydraulic oil level inspection position, and check the hydraulic oil level.



4.19.2 REPLACING AIR BREATHER ELEMENT

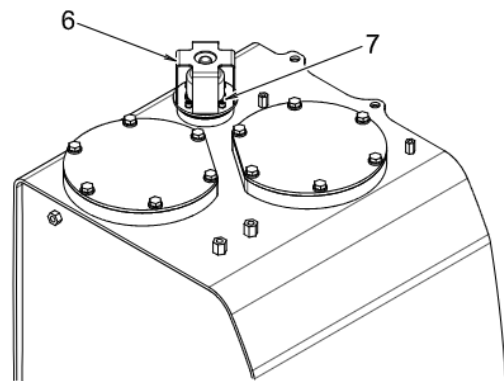
CAUTION

Immediately after engine operation, the oil is hot and it may cause in burns. Wait until the oil temperature cools down before attempting to change the element.

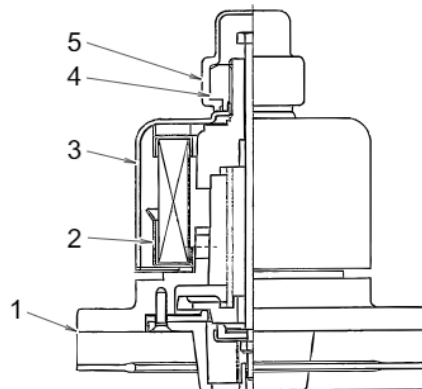
Notice

- To keep the hydraulic oil clean and to extend the service life of the hydraulic components, replace the filter element at regular intervals.
- Every 1000 hours replacement is a rough guideline. If the machine is operated in very sandy and dusty conditions, replace the oil filter earlier than the specified interval.

1. Move the machine to a level and firm place.
2. Put the bucket on the ground.
3. Stop the engine and move the pilot control shut-off lever to the "LOCKED" position.
4. Keep pressing air breather (1) on the top of the hydraulic oil tank until the pressure inside the hydraulic oil tank is released.
5. Remove bolt (7) and cover (6) at the upper surface of the tank.



6. After removing breather cap (5), remove nut (4) in order.
7. Turn cover (3) in the counterclockwise direction, remove the cover, and then remove element (2).
8. Install new element (2) and install cover (3) aligning the groove.
9. Be sure to prevent water and dirt from entering the air intake and exhaust ports between cover (3) and body (1).
10. Tighten nut (4).



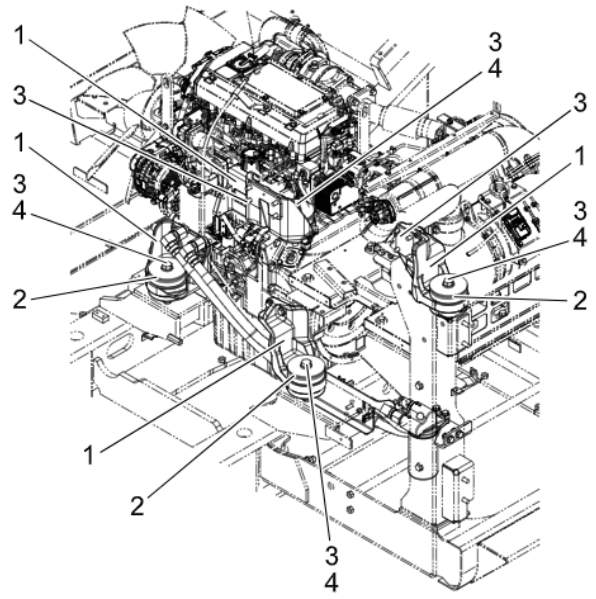
CAUTION

To avoid breakage of bolts, do not over-tighten nut (4).
Tightening Torque: 8 to 10 N·m (5.9 to 7.4 lbf·ft)

11. Securely tighten breather cap (5) clockwise by hand.
12. Install cover (6) with bolt (7).
Tightening Torque: $4.41 \pm 0.49 \text{ N} \cdot \text{m}$ ($3.25 \pm 0.36 \text{ lbf} \cdot \text{ft}$)

4.19.3 CHECKING ENGINE MOUNTING BRACKET FOR TIGHTENING CONDITION

1. Check damage and deterioration of engine mounting bracket (1) and rubber mount (2) and looseness of mounting bolts (3) and nuts (4).
When engine mounting bracket (1) and rubber mount (2) are damaged or deteriorated, contact your KOBELCO authorized dealer for replacement.
2. When looseness is found, tighten mounting bolts (3) and nuts (4).
For the tightening torques, see "TIGHTENING TORQUES FOR BOLTS & NUTS (SPECIFIC POSITIONS)" in Chapter 4.



4.19.4 CHECKING BATTERY VOLTAGE



WARNING HANDLING OF BATTERY

- Wear protective glasses, long-sleeve shirt and gloves when handling the batteries.
 - Do not bring a fire near the battery because the combustible hydrogen gas generated by the battery can cause explosion.
 - If the dilute sulfuric acid in the battery splashes onto your skin or into your eyes, it will cause burns or blindness. At such case, immediately wash the skin or eyes with sufficient clean water, and ask a special doctor to treat it as soon as possible.
 - Before performing inspection and maintenance on the batteries, be sure to stop the engine and set the battery power-off switch to the "OFF" position.
 - When removing the battery terminal be sure to remove the ground side (negative terminal) first and conversely, when attaching the battery terminal, attach the ground side last.
 - Do not put tools and hardware on the protective cover on the battery upper section. It may cause a short circuit resulting in a fire or explosion.
-

Notice

- When the cover of the battery power-off switch is opened after the engine is stopped, the alarm sounds.
 - Before turning the battery power-off switch to the "O (OFF)" position, wait until the alarm stops sounding. If the battery power-off switch is turned off while the alarm is sounding, it can damage the exhaust gas cleaning device.
Alarm may sound for up to 10 minutes.
-

Notice

- Clean the battery terminals and apply grease or commercial anti-rust lubricant spray.
 - Do not dispose of the battery by yourself but always ask a professional service company to dispose of it.
 - If the batteries became old, do not attempt to use the old battery and a new battery together. The service life of the new battery may be shortened. When replacing the batteries, replace the both at the same time.
-

1. Measure the voltage of batteries and when it does not reach the specified voltage, charge or replace the batteries.
2. After replacement, the battery should be properly secured to the machine.

4.19.5 CLEANING OR REPLACING RADIATOR CAP



WARNING

HANDLING OF COOLANT AND CAP

Do not loosen or remove the reserve tank cap and the radiator cap when the coolant is under high pressure and high temperature.

High temperature steam and coolant will spray and could cause burns.

- When opening the cap, wait until the coolant cools down, and then slowly turn and open the radiator cap.
- The antifreeze is poisonous, so prevent it from contacting with skin. If the antifreeze gets into your eyes or on your skin, flush the eyes or skin with plenty of water, and seek medical attention.

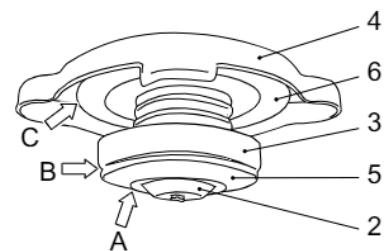
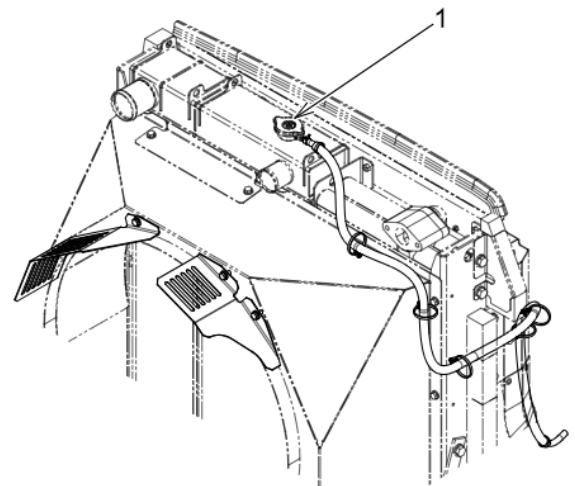


CAUTION

Securely close the cap after opening it.

Inspection	Replacement
When required	Every 1000 hours

1. Open the engine hood and hold it with the stay.
2. Loosen radiator cap (1) slowly. After checking that the pressure is completely released, push the cap down, loosen it further, and then remove it.
3. Check the following points of the cap. If foreign materials are adhered, remove them and if any damages are found, replace the parts.
 - A: Contact surface between negative pressure valve (2) and gasket (5)
 - B: Both surfaces of pressure valve (3) and gasket (5)
 - C: Both surfaces of external lid (4) and gasket (6)
4. Close cap (1) and close the engine hood.



4.20 2000 HOUR INSPECTION & MAINTENANCE PROCEDURES

Thoroughly read and understand "SAFETY PRECAUTIONS" of this manual before performing the inspection and maintenance.

Perform this section together with "EVERYDAY CHECK-UP and 50, 100, 120, 250, 500, and 1000 HOUR INSPECTION & MAINTENANCE PROCEDURES".

4.20.1 REPLACING COOLANT



WARNING HANDLING OF COOLANT

Do not loosen or remove the radiator cap when the coolant is under high pressure and temperature. High temperature steam and the coolant will spout and could cause burns.

- When opening the radiator cap, wait until the coolant cools down, and then slowly turn and open the radiator cap.
 - The antifreeze is flammable, so do not bring flames and sparks close to it.
 - The antifreeze is poisonous, so prevent it from contacting with skin. If the antifreeze gets into your eyes or on your skin, flush the eyes or skin with plenty of water, and seek medical attention.
-



If air remains inside the coolant circuit, it will lead to damage of the machine. Perform the work according to the procedure and do not allow the air to remain inside the coolant circuit.



DO NOT MIX COOLANT TYPES! SPECIAL COOLANT REQUIRED.

Machine damage may occur if dissimilar coolants are mixed.

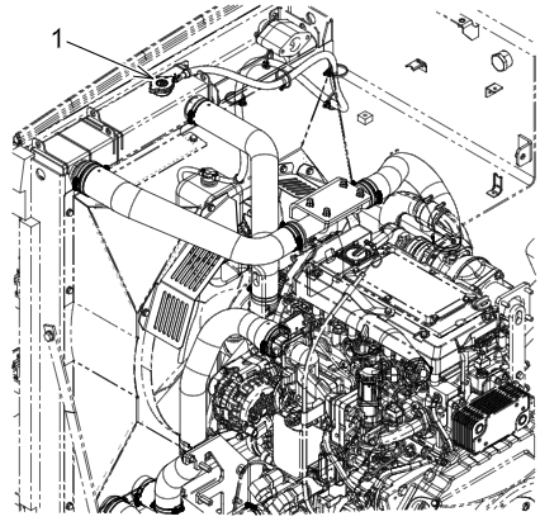
Coolant of different colors, makes, brands, and the use of straight water should not be mixed with the KOBELCO coolant system. Only the KOBELCO genuine factory filled coolant Extended Long-Life Coolant has been approved and tested for use. Other products that are advertised as Extended or Super Long-Life coolant are non-approved and may degrade the coolant systems integrity when mixed. Mixing may have a detrimental effect to the corrosion protection and reducing the extended life properties. A complete system drain and flush is required to convert to an alternate brand Nitrate Free Extended Long Life Coolant.

Notice

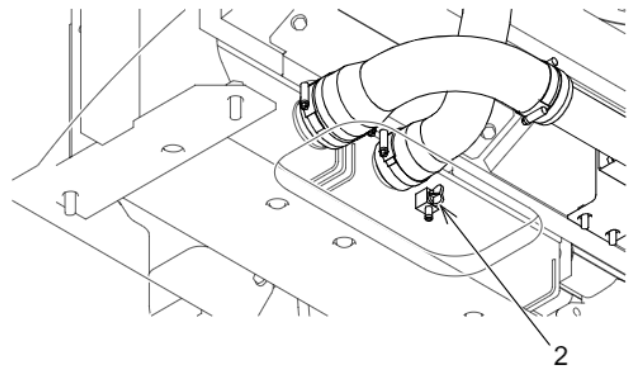
- Use the KOBELCO genuine antifreeze at 50 % concentration.
 - Use the specified antifreeze. If improper antifreeze is used, it will cause damage to the machine such as occurrence of rust inside the coolant circuit.
 - The KOBELCO genuine antifreeze is non-amine type. Only use genuine KOBELCO brand Extended Long-Life Coolant.
 - Replace the coolant earlier than the specified interval when it is dirty and/or bubbling.
-

1. Move the machine to a level and firm place and lower the bucket to the ground.
2. Stop the engine and move the pilot control shut-off lever to the "LOCKED" position.

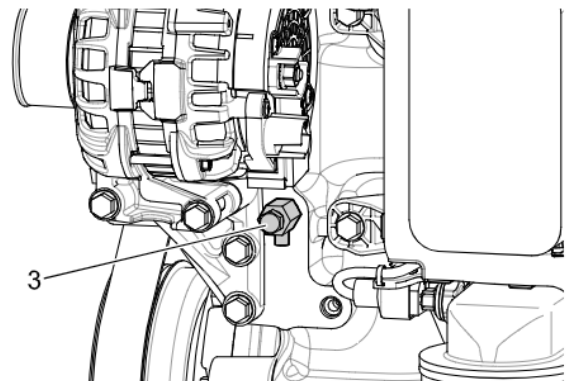
3. Loosen radiator cap (1) slowly. After checking that the pressure is completely released, push the cap down, loosen it further, and then remove it.
Here is the radiator filler opening.
4. Remove the under cover under the radiator, place a container for drain coolant, and open drain valve (2) and drain plug (3) on the side face of the engine to drain the coolant.
5. After draining the coolant, close drain valve (2) and drain plug (3), and prepare a hose for pouring water, and pour tap water from the radiator filler opening.



6. Open drain valve (2) and drain plug (3), and then start and run the engine with low idle for 10 minutes while washing the inside of the radiator with flowing water.
During the washing with flowing water, regulate the volumes of water being poured to keep the water level in the radiator full.
And also, always check the hose used for pouring water for coming off from the radiator filler opening.



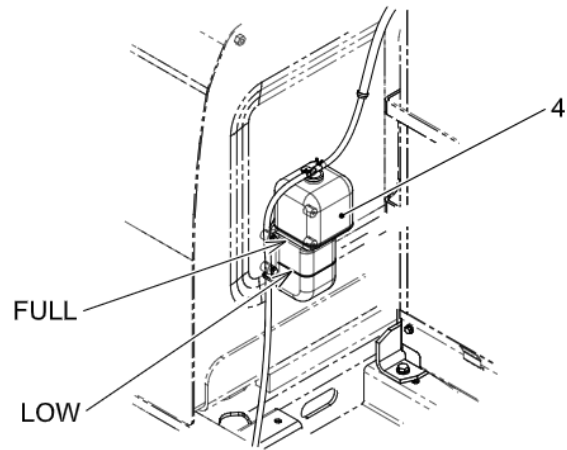
7. Stop the engine and stop pouring water, and then discharge the water. After that, close drain valve (2) and drain plug (3).
8. Wash the radiator with cleaning solution. Regarding how to use the cleaning solution, follow the handling manual of the cleaning solution to be used.
9. After washing the radiator with the cleaning solution, perform washing with flowing water again according to procedures 5 to 7. At this time, continue the washing with flowing water until clean water comes out.



10. Drain the coolant inside the reserve tank (4) and wash the inside of it.
11. Pour the coolant from the radiator filler opening up to the neck of the radiator filler opening.
At this time, to avoid intrusion of air as much as possible, slowly pour the coolant. (Speed of refilling is 4 L/min)
12. To bleed the air inside the cooling circuits, start and run the engine for 5 minute with low idle and then another 5 minutes with high idle, as stand-by operation. Perform this operation with radiator cap (1) removed.
13. Stop the engine, wait approximately 3 minutes, and then pour the coolant up to the neck of the radiator filler opening, and tighten radiator cap (1).
14. Refill reserve tank (4) with the coolant up to LOW (lower limit).

[4. INSPECTION AND MAINTENANCE]

15. Install the under cover under the radiator.
16. After the coolant cools down enough, check the coolant levels at the radiator filler opening and the reserve tank (4).
 - If the coolant level at the radiator filler opening becomes low, refill the coolant.
 - Refill the reserve tank with the coolant up to FULL (upper limit).



4.20.2 REPLACING OIL IN SWING REDUCTION UNIT



HANDLING OF OIL IMMEDIATELY AFTER OPERATION

Immediately after operation, the oil is hot and it may cause burns. Start working after the temperature goes down.

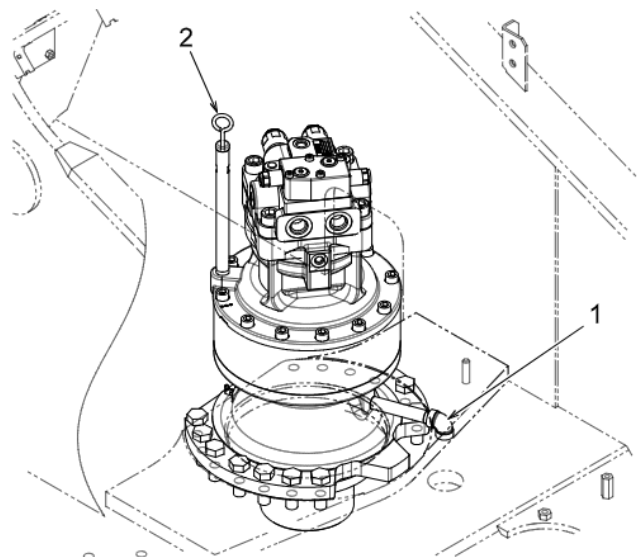
Notice

Replace the oil after 500 hours of operation has been reached for the first time.

Notice

- Check drain oil, and if metal chips or powder is found in the oil, contact your KOBELCO authorized dealer.
- Dispose of the drain waste oil properly as industrial waste.

1. Move the machine to a level and firm place.
2. Put the bucket on the ground.
3. Stop the engine and move the pilot control shut-off lever to the "LOCKED" position.
4. Place a container for drain oil under drain plug (1) at the rear lower part of swing reduction unit.
Container: 2.7 L (0.7 Gal) or more
5. Remove drain plug (1) and drain oil in the container.
6. After draining the oil completely, clean drain plug with light oil and attach it in place.
7. Remove level gauge (2) and refill the specified gear oil to the specified quantity.
When the oil level is within the specified range of the scale of level gauge (2), it is proper.
For the specified gear oil, see "LUBRICANT, FUEL & COOLANT SPECIFICATIONS" in Chapter 4.
8. Attach level gauge (2).



4.20.3 REPLACING OIL IN TRAVEL REDUCTION UNITS

**WARNING** HANDLING OF OIL IMMEDIATELY AFTER OPERATION

- Immediately after operation, the oil is hot and it may cause burns. Start working after the temperature goes down.
- Pressure may be generated inside the traveling devices. Slowly loosen the plug to release the internal pressure.

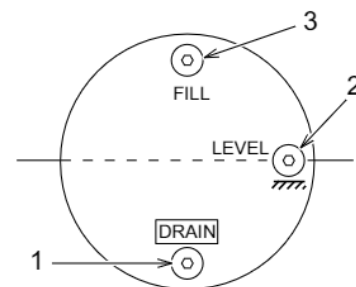
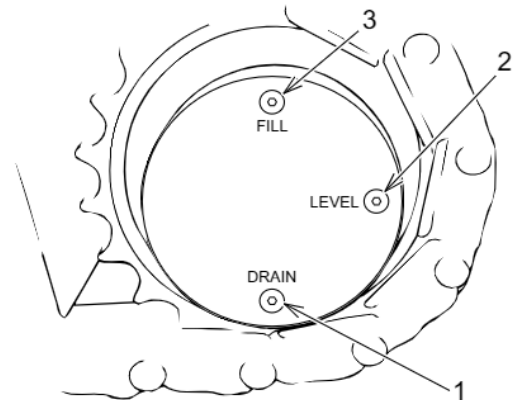
Notice

Replace the oil after 500 hours of operation has been reached for the first time.

Notice

- Check the drain oil, and if metal chips or powder is found in the oil, contact your KOBELCO authorized dealer.
- Dispose of the drain waste oil properly as industrial waste.

1. Move the machine to a level and firm place.
2. Stop the machine at a position in which drain plug (1) is positioned at the lower side and lower the bucket to the ground.
3. Stop the engine and move the pilot control shut-off lever to the "LOCKED" position.
4. Place a container for drain oil under drain plug (1).
Container: 5.3 L (1.4 Gal) × 2 or more
5. Remove drain plug (1), level plug (2) and fill plug (3) and drain oil in the container.
6. After draining the oil completely, clean drain plug (1) with light oil and attach it in place.
7. Refill the specified gear oil from the hole of fill plug (3) until the oil comes out from level plug (2).
For the specified gear oil, see "LUBRICANT, FUEL & COOLANT SPECIFICATIONS" in Chapter 4.
8. Clean level plug (2) and fill plug (3) with light oil and install them.
9. Similarly, replace the oil of the travel reduction unit on the other side.



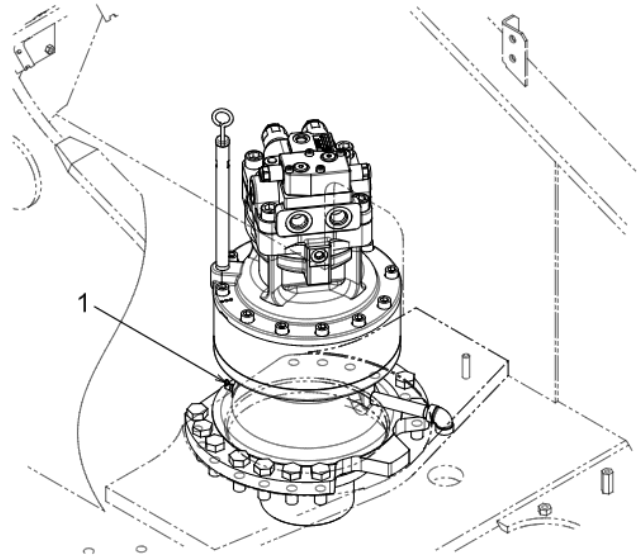
4.20.4 GREASING SWING REDUCTION UNIT



HANDLING IMMEDIATELY AFTER OPERATION

Immediately after operation, each part is hot and it may cause burns. Start working after the temperature goes down.

1. Move the machine to a level and firm place.
2. Put the bucket on the ground.
3. Stop the engine and move the pilot control shut-off lever to the "LOCKED" position.
4. Apply grease to grease nipple (1).
When the hose for greasing is connected, apply grease from the grease nipple at the end of the hose.



4.20.5 CHECKING GREASE IN SWING GREASE BATH

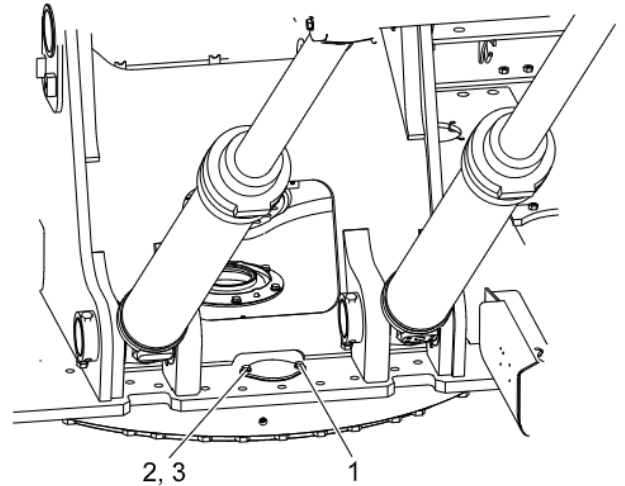
Notice

When grease quality deteriorates, it can cause damage on the pinion shaft of the swing reduction unit and the swing bearing.

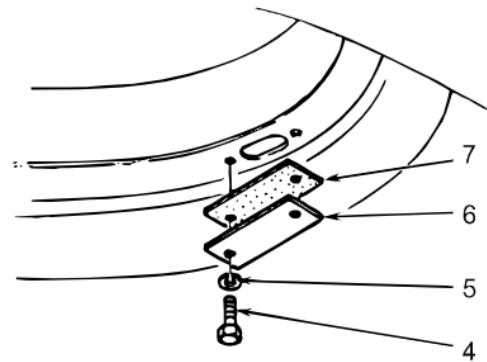
When the swing bearings gears are damaged or the grease is deteriorated and needs to be replaced, contact your KOBELCO authorized dealer.

Because the upper structure needs to be disassembled to replace grease for the swing grease bath, contact your KOBELCO authorized dealer.

1. Loosen bolt (1) at the forward side of the upper structure, and remove cover (2) and packing (3) for inspection.
2. After inspection, replace with new packing (3), and after cleaning cover (2), apply Loctite #572 and then install it.



3. If water is deposited, loosen bolt (4) and spring washer (5) in the lower side of the lower frame, and remove cover (6) and packing (7) to drain the water. The grease may become clouded when mixed with a small amount of water; however, it should not cause trouble while the viscosity is high.



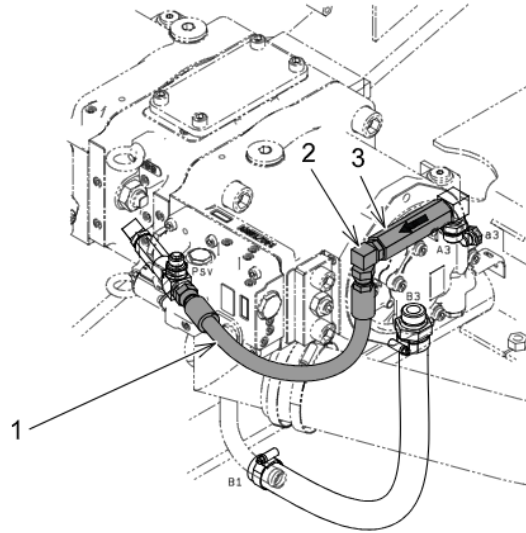
4.20.6 CLEANING PILOT LINE FILTER

CAUTION

Immediately after operation, hot hydraulic oil may spout and cause burns.
Wait until the oil temperature cools down before attempting to clean the pilot line filter.

Before performing the work, wait until the internal pressures of the hydraulic oil tank and the hydraulic system are released.

1. Open the side cover next to the pump and take out hose (1), connector (2) and line filter (3).
2. Clean line filter (3) with light oil and install it.



4.21 5000 HOUR INSPECTION & MAINTENANCE PROCEDURES

Thoroughly read and understand "SAFETY PRECAUTIONS" of this manual before performing the inspection and maintenance.

Perform this section together with "EVERYDAY CHECK-UP and 50, 100, 120, 250, 500, 1000, and 2000 HOUR INSPECTION & MAINTENANCE PROCEDURES".

4.21.1 REPLACING HYDRAULIC OIL AND CLEANING SUCTION STRAINER



WARNING

HANDLING OF HYDRAULIC OIL TANK AND OIL

- The oil in the hydraulic oil tank is under high temperature and high pressure and it is dangerous. Before removing the cover, stop the engine first, remove the breather cap, press the valve, and release the pressure from the tank.
- Immediately after engine operation, the oil is hot and it may cause burns. Wait until the oil temperature cools down before attempting to replace the hydraulic oil.

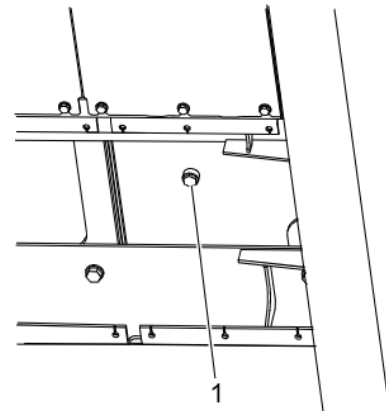
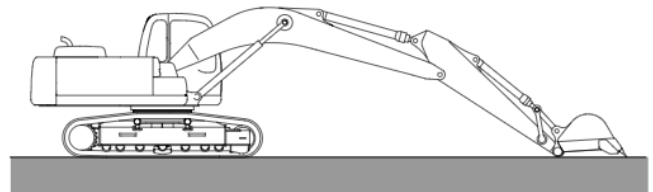
Notice

When the hydraulic breaker is installed, the deterioration of the hydraulic oil is faster than that of the normal bucket digging work. See "PERIODIC INSPECTION AND MAINTENANCE OF NIBBLER (CRUSHER) AND BREAKER" in chapter 8 to maintain the hydraulic oil.

Notice

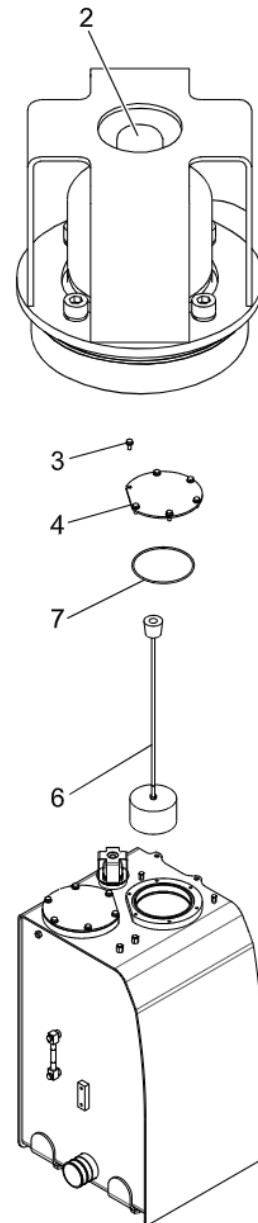
Dispose of the drain waste oil properly as industrial waste.

1. Move the machine to a level and firm place.
2. Swing the upper structure so that drain plug (1) on the bottom of hydraulic oil tank is positioned to the midpoint of right and left track crawler frames.
3. Retract the arm cylinder and bucket cylinder and place the bucket and dozer (if equipped) on the ground.
4. Stop the engine and move the pilot control shut-off lever to the "LOCKED" position.
5. Clean the surface around the cover to keep foreign materials away from the hydraulic oil tank.



[4. INSPECTION AND MAINTENANCE]

6. Keep pressing air breather (2) on the top of the hydraulic oil tank until the pressure inside the hydraulic oil tank is released.
7. Remove bolt (3) and cover (4) on the tank upper surface.

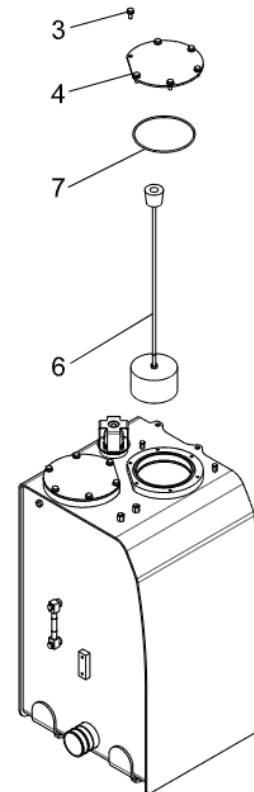
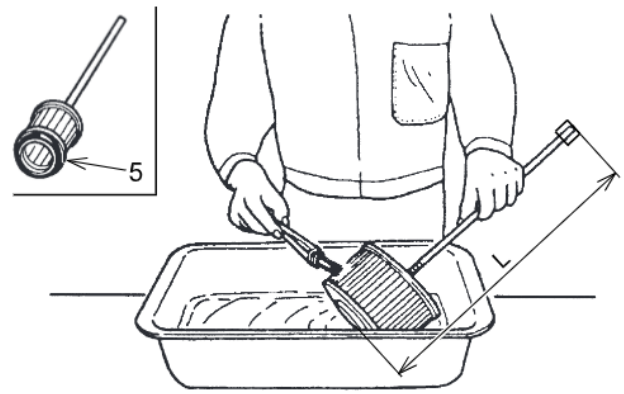


Notice

Do not drop bolts or others into the tank.

8. Place a container for drain oil under drain plug (1) on the bottom of the hydraulic oil tank.
9. Loosen drain plug (1) slowly and drain hydraulic oil completely.
10. Clean drain plug (1) and install it in place.
Tightening Torque: $108 \pm 10 \text{ N}\cdot\text{m}$ ($79.7 \pm 7.4 \text{ lbf}\cdot\text{ft}$)
11. Take out suction strainer (6).

12. Clean suction strainer (4) with light oil or cleaning solvent, dry it well and check it for damage. If damaged significantly, replace the strainer with a new one.
L: 796±1mm(31±0.04 inch)
13. Check O-rings (5) and (7) on the bottom of the strainer, and if wear or damage is found, replace it with a new one.
14. Insert suction strainer (6) into the hydraulic oil tank.
15. Refill hydraulic oil through filler port on the top of the hydraulic oil tank.
Pour the oil while checking the oil level with level gauge (G).
16. Attach filler port cover (4) with six bolts (3).
Tightening Torque: 46.5±4.6N·m(34.3±3.4lbf·ft)
17. Start the engine, run it at low idle for several (5 to 7) minutes. After that, extend and retract each cylinder and swing the machine.
18. Set the machine in the hydraulic oil level inspection again, stop the engine and check the oil level. If the oil level is low, refill the hydraulic oil.



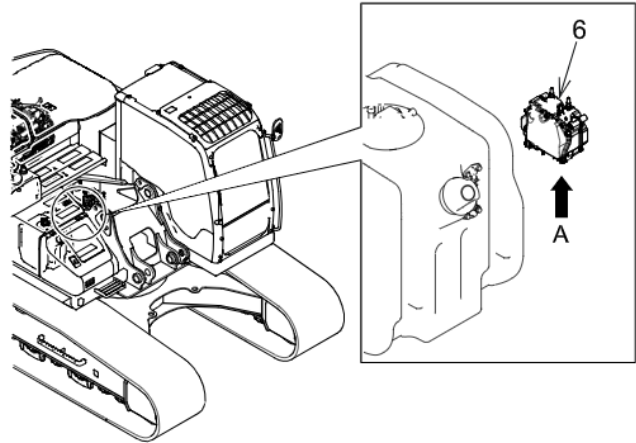
4.21.2 REPLACING DEF/AdBlue SUPPLY MODULE FILTER

CAUTION

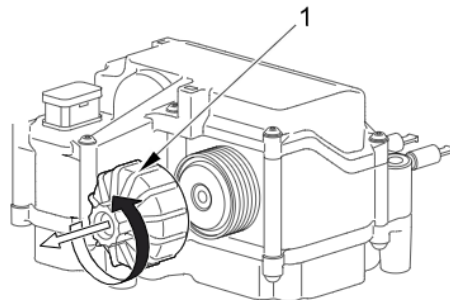
- Do not reuse the filter element, O-ring and gasket.
- When replacing the O-ring or gasket, check the fitting condition at the mounting surface to prevent it from being twisted and broken.

Contact your KOBELCO authorized dealer for the replacement of DEF/AdBlue supply module filter.
Before replacing the filter, stop the engine and wait about 30 minutes.

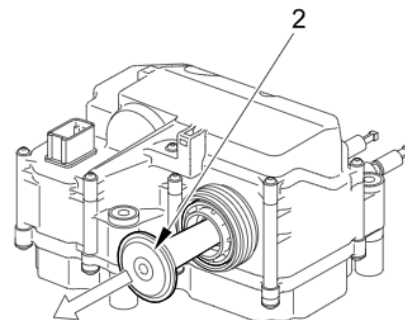
1. DEF/AdBlue supply pump (6) is mounted to the upper frame on the right side of the machine.
A: Filter side
2. When there is a cover around the pump, remove it.
3. When replacing the filter, DEF/AdBlue may spill. Prepare a container to catch DEF/AdBlue under pump (6) and cloth to wipe off DEF/AdBlue.



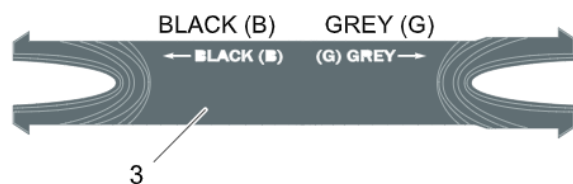
4. Turn filter cover (1) of the pump to remove it.
Wrench size: 27 mm (1.063 inch)



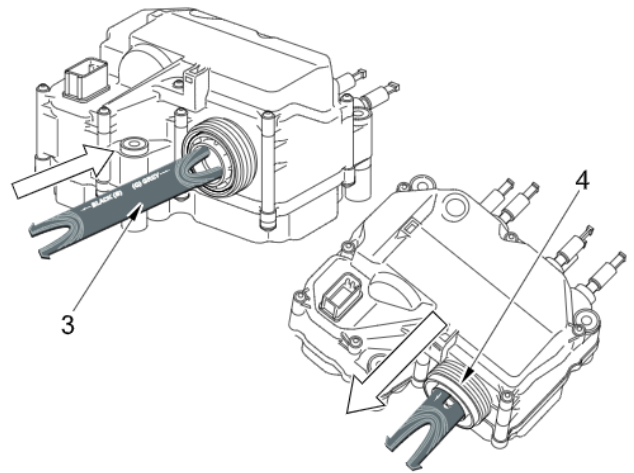
5. Remove equalizing filter (2).



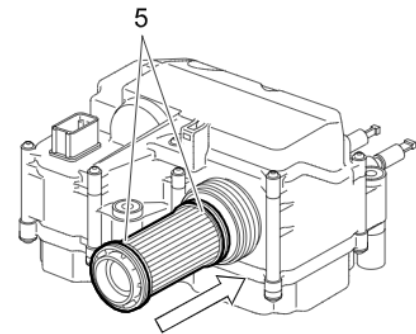
6. Use removing tool (3) to replace the filter.



7. Insert the black side of removing tool (3), hook it to filter (4) and take out filter (4).

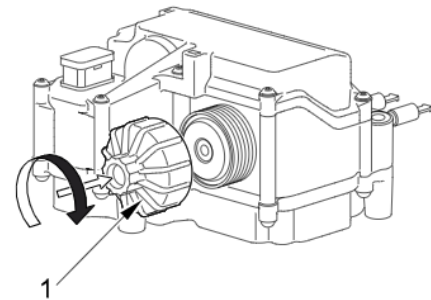


8. Apply DEF/AdBlue slightly to new O-ring (5) and attach it on new filter (4).
Follow with the precautions of DEF/AdBlue handling.



9. Attach filter (4) and equalizing filter (2) to pump (6).
10. Remove the dirt and foreign materials from the mounting surfaces of filter cover (3) and the supply module.

11. Attach filter cover (1) with a wrench.
Tightening Torque: 20 to 25 N·m (15 to 18 lbf·ft)
12. When the cover was removed, attach it in place.



CAUTION

After the operation, make sure that DEF/AdBlue is not leaking from the area around the DEF/AdBlue supply module, DEF/AdBlue tank, DEF/AdBlue piping and muffler.

4.22 MAINTENANCE OF MACHINES OPERATED UNDER SEVERE CONDITIONS

The machines operated under severe conditions generally mean the machines operated under the conditions described below.

- The machines operated in the environment in which dust and powder dust always exist.
- The machines operated under heavy loads consecutively for a long time.
- The machines whose engine is operated in low idle consecutively for a long time.
- The machines whose engine is in idle status most of the time.
- The machines whose engine starts and stops repeatedly and frequently.
- The machines that have failed before even though the standard maintenance have been performed steadily.

In case of maintaining the machines operated under severe conditions, measures such as shortening the maintenance interval need to be taken.

4.22.1 RECOMMENDED MAINTENANCE FOR MACHINES OPERATED UNDER SEVERE CONDITIONS

Notice

For the standard maintenance interval, see "INSPECTION AND MAINTENANCE CHART" in Chapter 4.

Item	Recommended maintenance
Inspecting engine oil level	Inspect it before starting operations
Engine oil	Chemical synthetic oil of API classification CF-4 or more (high-performance oil)
Changing engine oil	Every 250 hrs.
Replacing engine oil filter	Replace it at the same time of changing engine oil
Replacing fuel filter	Every 500 hrs.
Replacing fuel pre-filter/water separator	Every 250 hrs.
Replacing CCV filter (replacement type)	Every 500 hrs.
Replacing DPF	The service life of DPF may be shortened before reaching the standard replacement time. If the manual regeneration warning is displayed frequently, contact your KOBELCO authorized dealer.
Washing injector	Wash it with the dedicated fuel additive every 1000 hrs. or 12 months.
Washing engine combustion chamber	Wash it with the dedicated fuel additive every 1000 hrs. or 12 months.
Air cleaner element (outer)	Clean it before starting operations Every 250 hrs.
Air cleaner element (inner)	Replace it at the same time of replacing the outer element (Do not clean)
iNDr filter	Depending on the operation environment, clean it every 3 hrs. Keeping the spare part is recommended.

4.22.2 STARTING AND STOPPING ENGINE

Before starting operations, warm-up the machine.

When finishing operations, do not operate the lever for 5 minutes and change the engine speed to low idle, and then stop the engine.

4.22.3 HOW TO USE MACHINES

When often performing light-load operations with the engine running in low idle, change the engine speed to high idle periodically to perform heavy-load operations.

5. TRANSPORTATION

5.1 TRANSPORTATION

When transporting the machine, observe the transportation related regulations.

5.1.1 STRICTLY OBSERVE TRANSPORTATION RELATED REGULATIONS

When you have any questions about transportation, contact the nearest KOBELCO branch or sales office.

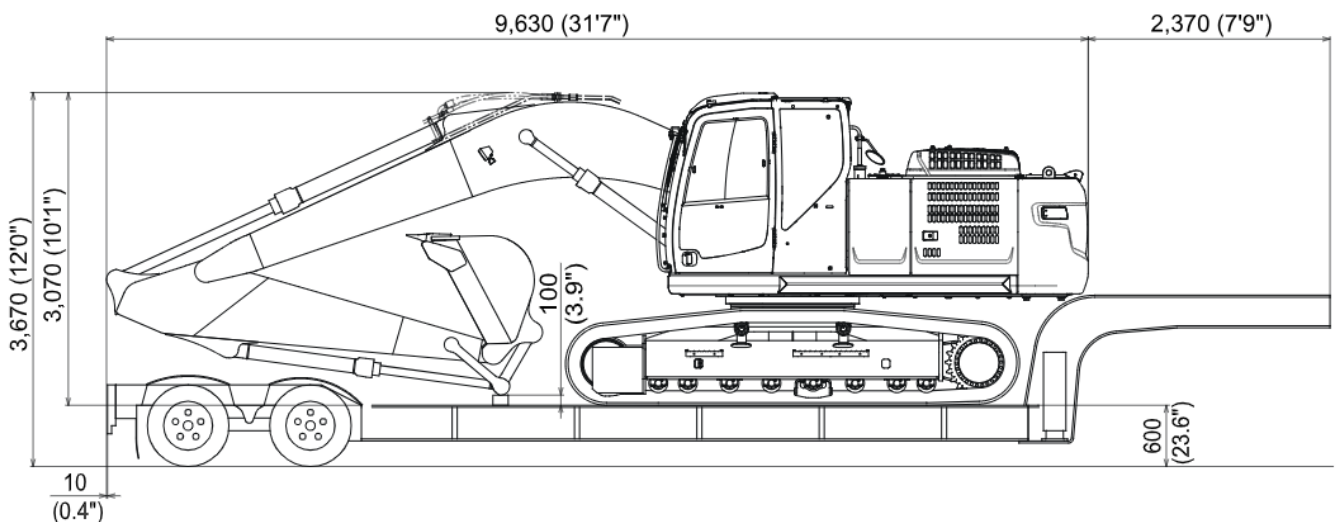
- When transporting this machine with a trailer, etc., consider the width, height, length and mass of the machine. The transportation mass and dimension vary depending on the type of shoe and the specifications of the attachment.
- Refer to masses and dimensions described in "SPECIFICATIONS" and "OPTIONAL EQUIPMENT" in this manual to select the proper transportation method.
- Perform a previous inspection on the route such as limitations on width, height and mass (weight) of vehicles and traffic regulations, etc.



CONTROL PATTERNS OF THE CONTROL LEVERS

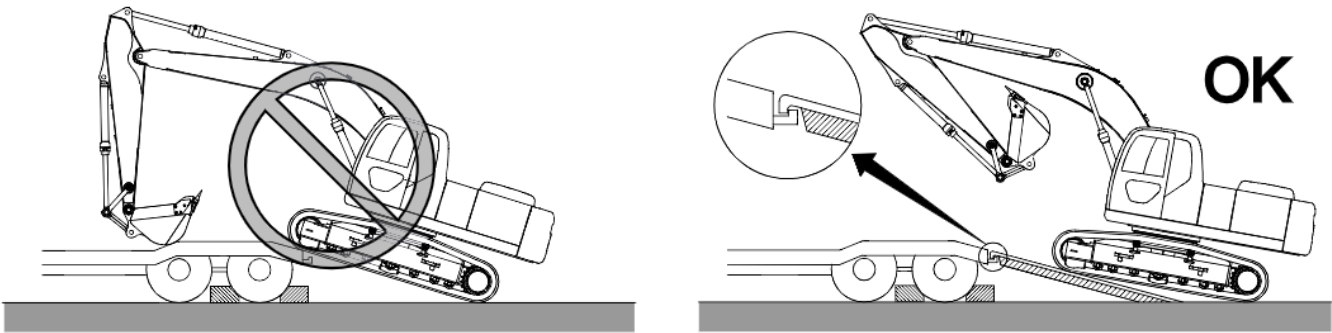
Before operation, be sure to pay attention to the surroundings and operate each control lever slowly and confirm that each motion is in accordance with the control pattern indicated on the label. When it is not matched, replace the label with the proper label matching with the actual motion or mend the hydraulic piping.

In addition, see "PRECAUTIONS FOR OPERATIONS" in Chapter 1 for precautions regarding operations.



The dimensions are 2.94m (9'8") for the arm, 0.8m³ (1.05 cu·yd) bucket, and 5.65m (18'6") boom specification. Regarding the machine weight, refer to Chapter 6 "SPECIFICATION".

5.2 LOADING/UNLOADING THE MACHINE



WARNING

Loading/unloading the machine

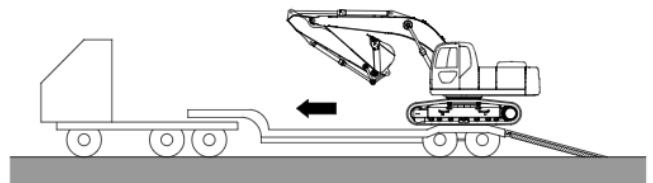
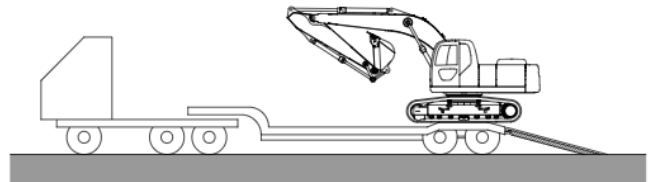
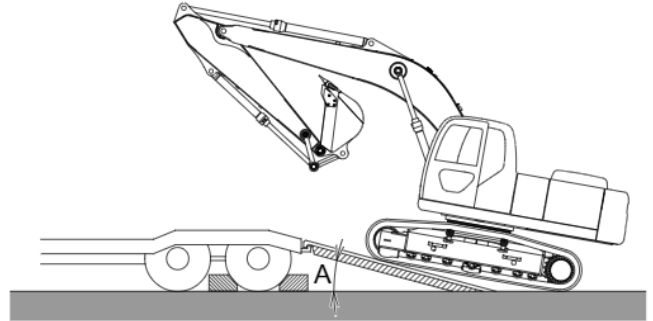
- Load/unload the machine on a level and hard ground.
- Use ramps, platforms, and embankment with sufficient width, length, slope, rigidity, and strength.
- Remove mud and dirt of the undercarriage to prevent the machine from skidding on the ramp. In addition, remove any deposit on the ramp including water, snow, ice, grease, and oil.
- When loading or unloading the machine, set engine speed to LOW and travel speed select switch to LOW (1st) speed.
- Do not use the attachment for loading and unloading the machine to avoid danger.
- Use only the travel levers when the machine is on ramps.
- When going over the ramp top to/from a trailer, the machine may lose balance due to an abrupt change in the center of gravity. Be sure to travel slowly.
- Be sure to turn the auto acceleration switch to the "OFF" position. When the machine is operated with the auto acceleration turned to the "ON" position, the engine speed may change abruptly.
- Do not make a turn on the ramp to avoid tipping. Make a turn after returning to the ground or the trailer bed.
- When the machine is going down a slope or being loaded on or unloaded from the trailer, set the LOW (1st)/HIGH (2nd) travel speed select switch to LOW.
Since the LOW (1st)/HIGH (2nd) automatic travel speed select switching system automatically changes the traveling speed, it may adversely affect machine control when the machine is going down a slope or being loaded on or unloaded from the trailer. This abrupt change of machine control may cause severe accidents.

5.2.1 LOADING

Use the following procedure.

WHEN USING A RAMP

1. Chock the trailer tires to prevent the trailer from moving.
2. Use a ramp with sufficient length, width, strength and gradient. Install the ramp so its angle (A) to the ground is 15 degrees or less.
3. Start the engine, and move down the control lock lever to the "UNLOCKED" position.
4. On the switch panel on the gauge cluster, press the travel speed select switch to set it to the LOW (1st) speed.
5. Make sure the machine position is aligned to the ramp before going up on the ramp, raise the dozer (if installed), and travel slowly.

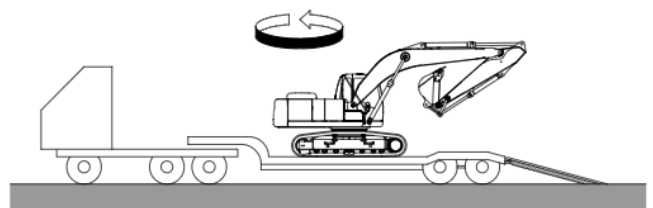


CAUTION

When this machine is traveling up or down the ramp, fold the arm and attachment and raise the boom to avoid interference with the ramp or trailer bed, as shown in the figure.

When the clearance between the ramp or the trailer bed is insufficient, the machine may abruptly lean to one side when it goes over the ramp top, and strike its arm or bucket cylinder against the trailer bed, ramp, or ground, resulting in damage to the cylinder.

6. When the machine comes to the required position, slowly swing the upper structure 180 degrees.
7. Lower the attachment/equipment slowly.
8. Move the control lock lever to the "LOCKED" position.
9. Perform cool-down operation with the engine in the low idle position, and then stop the engine and remove the starter key.

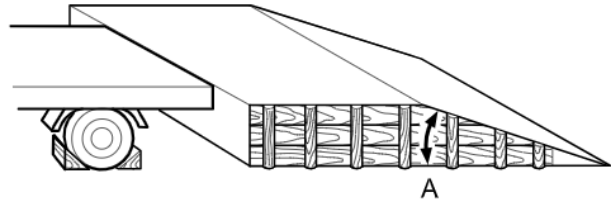


[5. TRANSPORTATION]

10. Lock the lock devices such as guards and doors.

WHEN USING PLATFORM OR EMBANKMENT

1. Make the embankment wide enough to the machine width. The angle (A) of the platform or embankment to the ground should be 15 degrees or less.
2. Check that the embankment is sufficiently sturdy to hold the machine weight.
3. The surface of the platform or embankment must be level to that of the trailer bed.
4. Park the trailer properly at the required position.



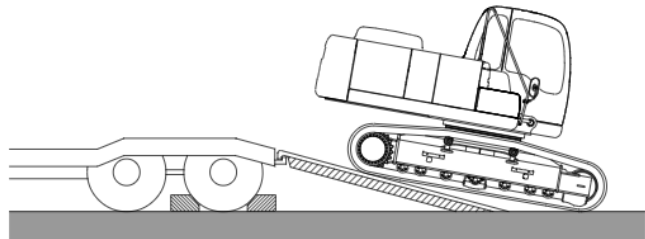
LOADING A MACHINE WITHOUT ATTACHMENT/EQUIPMENT



DO NOT SWING

Do not swing the machine during loading and unloading the machine. It may cause the machine to tip/roll over to the counterweight side.

- When loading a machine without an attachment/equipment, adjust the travel direction so the counterweight comes to the top of the slope.



5.2.2 FIXING THE MACHINE

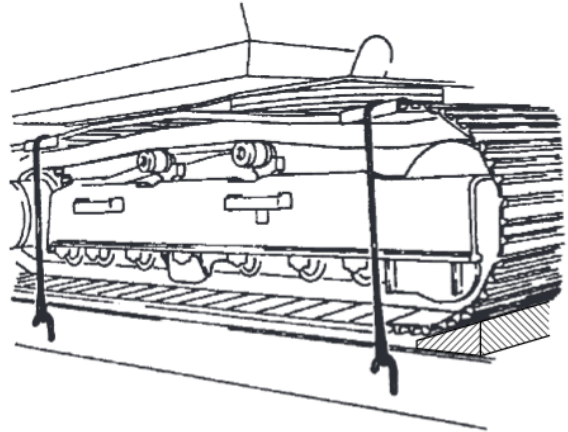
Notice

- Retract the radio antenna in before transportation. In addition, remove the mirrors if required. Store the removed parts securely in the cab.
- Place a wood block under the bucket (attachment) link to avoid contacting the ground and protect the bucket cylinder from being damaged during transportation.

After loading the machine on the required position, fix the machine by the following procedures.

CRAWLER

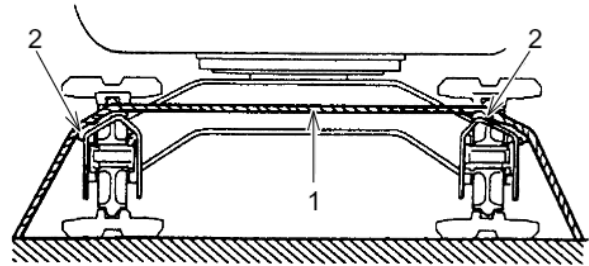
1. Check that all guards and doors are locked.
2. Chock the front and rear of the crawlers and fix the machine securely with wire ropes of appropriate strength to prevent the body from moving back and forth or rolling by vibration of the trailer. In addition, secure individual parts and removed parts securely on the trailer.



RUBBER CRAWLER AND PAD SHOE

1. Check that all guards and doors are locked.
2. Chock the front and rear of the crawlers and fix the machine securely with wire ropes of appropriate strength to prevent the body from moving back and forth or rolling by the vibration of the trailer. In addition, secure individual parts and removed parts securely on the trailer.

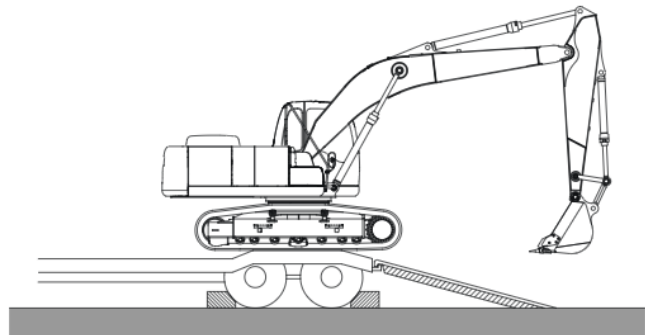
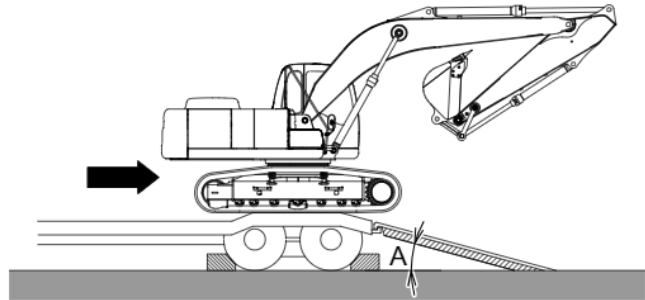
Do not directly apply the wire rope (1) on the rubber crawler or the pad shoe. Place pads (2) (such as soft cloth) at the left and right of the crawler frame to fix the rope securely on the loading platform of the truck.



5.2.3 UNLOADING

Use the following procedure.

1. Chock the trailer tires to prevent the trailer from moving.
2. Use ramps with sufficient length, width, strength and gradient. Attach the ramps so its angle (A) to the ground is 15 degrees or less.
3. Remove chains or wire ropes that have been fixing the machine.
4. Start the engine, and move down the pilot control shut-off lever to the "UNLOCKED" position.
5. On the switch box, press the travel speed select switch to set it to the LOW (1st) speed.
6. Raise the boom slowly.
7. Raise the attachment. With the arm retracted to under the boom, raise the dozer (if equipped) and travel slowly.
8. Level the machine at the rear end of the trailer and stop temporarily.
9. Make sure the machine position is aligned parallel to the ramps, and adjust the angle between the arm and boom to 80 to 100 degrees.

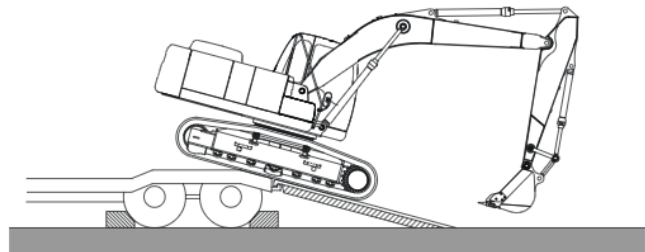


CAUTION

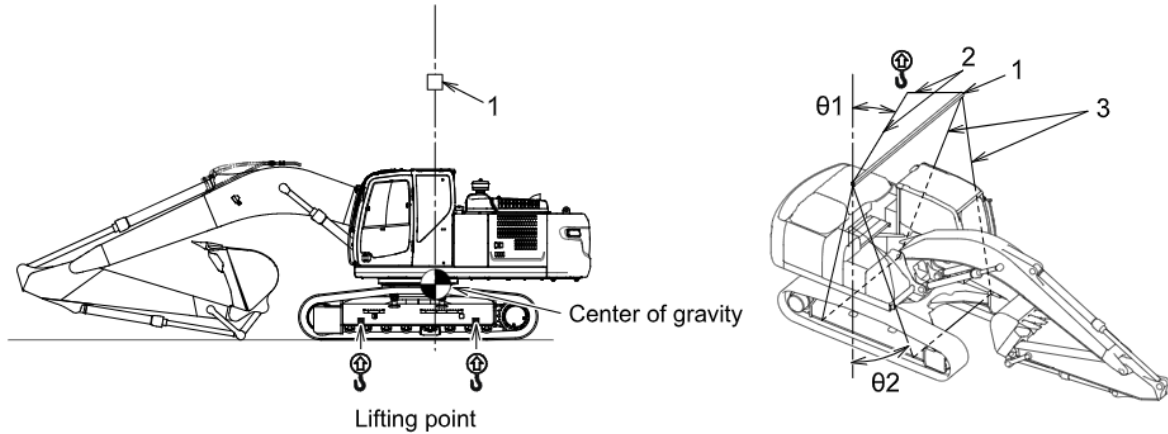
When this machine is traveling up or down the ramp, fold the arm and attachment and raise the boom to avoid interference with the ramp or trailer bed, as shown in the figure.

When the clearance between the ramp or the trailer bed is insufficient, the machine may abruptly lean to one side when it goes over the ramp top, and strike its arm or bucket cylinder against the trailer bed, ramp, or ground, resulting in damage to the cylinder.

10. Until the machine completely passes through the ramps, travel down the ramps slowly with moving the boom and the arm slowly to keep the bucket close to the ground so that it can be lowered to the ground in an emergency.
11. After passing through the ramps, slowly swing the upper structure 180 degrees to take the front traveling position (so the travel reduction unit comes to the rear).



5.3 LIFTING MACHINE



Lifting tool

No.	Name	Q'ty	Remarks
1	Spreader beam	1	4,500 mm (14'9") or more is recommended
2	Lifting tool	2	Chain of grade 6 or more is recommended
3	Lifting tool	2	Chain of grade 6 or more is recommended
$\theta 1$	60 degrees or less		
$\theta 2$	60 degrees or less		

5.3.1 PREPARATION

- Before installing the lifting tools, set the machine position as shown in the illustration.
- Stop the engine and move the pilot control shut-off lever to the "LOCKED" position.
- Be sure to check the lifting points for failures such as deformation or cracks before performing a lifting work. If any failures are found, contact your KOBELCO authorized dealer for inspection.

5.3.2 SELECTION OF LIFTING TOOLS

- Check the lifting tools for failures every time after using them and if damages are found, do not use them.
- Regarding the machine weight and dimensions, refer to Chapter 6 "SPECIFICATIONS".
- Select a sufficient length for spreader beam (1) to avoid interference between the lifting tools and the machine.
- Select the lifting tools with a proper strength according to the machine weight and the lifting angles ($\theta 1, \theta 2$).

5.3.3 INSTALLING LIFTING TOOLS

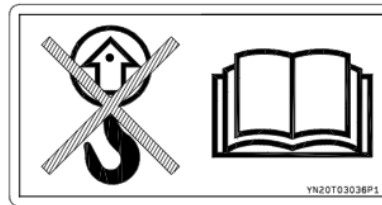
Note

The machine weight and the center of gravity may differ according to the installed attachment/equipment or options.

If they are unknown, ask your KOBELCO authorized dealer.

- Set spreader beam (1) above the center of gravity of the machine.
The illustration shows the center of gravity of the machine with the standard bucket installed and without the options.
- Install lifting tools (2,3) to the lifting points (between the lower rollers) of the left and right crawlers as shown in the illustration and then install spreader beam (1).
- Install lifting tool (3) avoiding interference with the machine.
- Set the installation angles (θ_1, θ_2) of lifting tools (2,3) so as not to exceed 60 degrees.
- If interference between lifting tools (2,3) and the machine is unavoidable, insert pads between the lifting tools and the machine.

Do not use the lifting holes near which the right label is attached for lifting the machine.



5.3.4 LIFTING MACHINE

- Before lifting the machine, check the center of gravity carefully.
- During the machine lifting operation, keep away from the area around and under the machine.
- Do not lift the machine with a person on the operator's seat or other places.
- Do not perform abrupt operations during lifting of the machine.

5.4 INSTALLING AND REMOVING MIRROR

When the machine is shipped from a factory, the mirrors are not installed.

When removing and installing the mirrors, see "ADJUSTMENT OF MIRRORS" in Chapter 3.

5.5 TOWING THE MACHINE

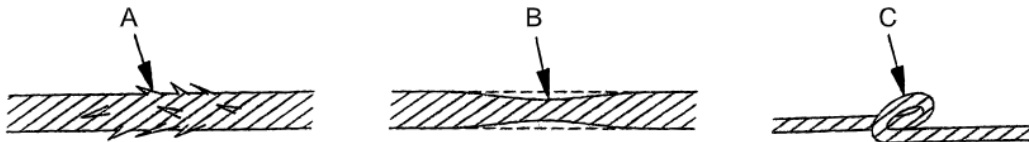


READ THE OPERATOR'S MANUAL

Read, understand and follow the safety messages and instructions in this manual. If these safety messages are not followed, serious injury or death could occur.

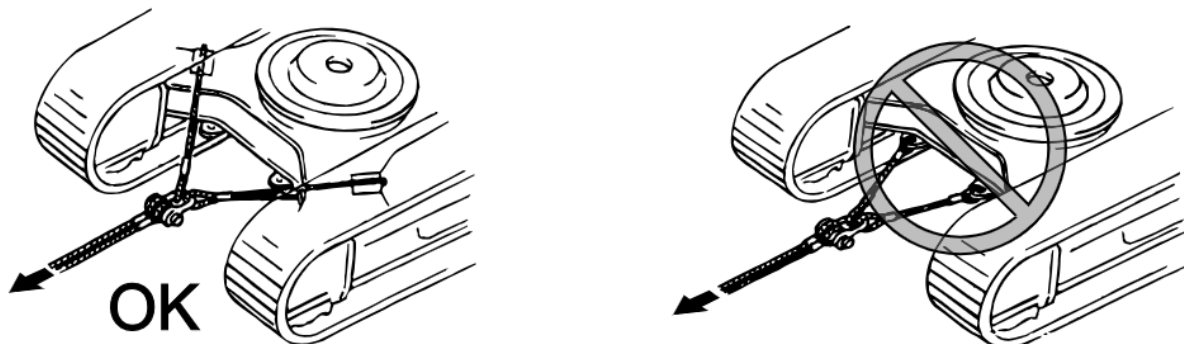
To prevent serious injury or death from improper towing methods.

- Always wear leather gloves when handling wire rope or chains.
- The allowable force of the crawler frame is the 100 % load of the machine total weight.
- Check the wire rope or chains to be used for towing is strong enough to tow the weight of your machine.
- Never use a wire rope which has cut strands (A), reduced diameter (B), kinks (C) or other visible damage or the wire rope may break while towing.
- Never tow the machine across a slope.
- Never stand between the towing machine and the machine or object that is being towed.
- To prevent damage to the wire rope or chains, place pads between the wire rope or chains and edges of the lower frame.
- Do not shock load the wire rope or chains. Tow slowly and avoid sudden load changes to the wire rope or chains.
- Shackles must be used for towing.



5.5.1 TOWING METHOD OF THE MACHINE

- Only tow the machine if absolutely necessary, e.g. moving the machine to a safe location for repair.
- If the machine cannot travel under its own power, attach wire rope or chains that are strong enough to tow your machine to the positions on the lower frame as shown. Never use the lower frame holes for towing. Then tow the machine using another machine.
- Keep the wire rope or chains level and keep both machines in a straight line when towing as shown in the figure.
- In case of towing needing to disengage the travel motor brakes, chock both track crawlers securely to prevent the machine from moving uncontrollably before disengaging the travel motor brakes.



6. SPECIFICATION

6.1 GENERAL SPECIFICATIONS

6.1.1 SK210LC-11E, SK210NLC-11E

Item		Unit	SK210LC-11E	SK210NLC-11E
Operating mass		kg (lb)	22,100 (48700)	22,000 (48,510)
Machine mass		kg (lb)	22,000 (48,500)	21,900 (48,300)
Bucket capacity		m ³ (cu·yd)	0.8 (1.05)	0.8 (1.05)
Bucket mass		kg (lb)	660 (1,450)	660 (1,450)
Engine name		—	YANMAR 4TN107FTT diesel engine	
Engine rated power	ISO 9249 : With fan	kW/min ⁻¹	122/2,000	122/2,000
	ISO 14396 : Without fan		127/2,000	127/2,000
CO ₂ value	Hot NRTC※	g/kwh	674	
A	Overall length	mm (ft.in.)	9,600 (31'6")	9,600 (31'6")
B	Overall height	mm (ft.in.)	3,060 (10'0")	3,060 (10'0")
C	Overall width	mm (ft.in.)	2,990 (9'10")	2,800 (9'2")
D	Track shoe width (Grouser shoe)	mm (inch)	600 (23.6")	600 (23.6")
E	Cab height	mm (ft.in.)	3,060 (10'0")	3,060 (10'0")
F	Minimum ground clearance (excluding lug height)	mm (inch)	425 (16.7")	425 (16.7")
G	Tail swing radius	mm (ft.in.)	2,910 (9'7")	2,910 (9'7")
H	Crawler overall length	mm (ft.in.)	4,450 (14'7")	4,450 (14'7")
I	Tumbler center distance	mm (ft.in.)	3,660 (12'0")	3,660 (12'0")
J	Clearance height under upper structure (excluding lug height)	mm (inch)	1,060 (3'6")	1,060 (3'6")
K	Overall width of upper structure	mm (ft.in.)	2,710 (8'11")	2,710 (8'11")
L	Crawler overall width	mm (ft.in.)	2,990 (9'10")	2,800 (9'2")
Ground contact pressure		kPa(psi)	46 (6.7)	46 (6.7)
Swing speed		min ⁻¹ (rpm)	12.7 (12.7)	12.7 (12.7)
Travel speed (low/high)		km/h(mph)	3.6 / 6.0 (2.2 / 3.7)	3.6 / 6.0 (2.2 / 3.7)
Gradeability		% (deg)	70 (35)	70 (35)

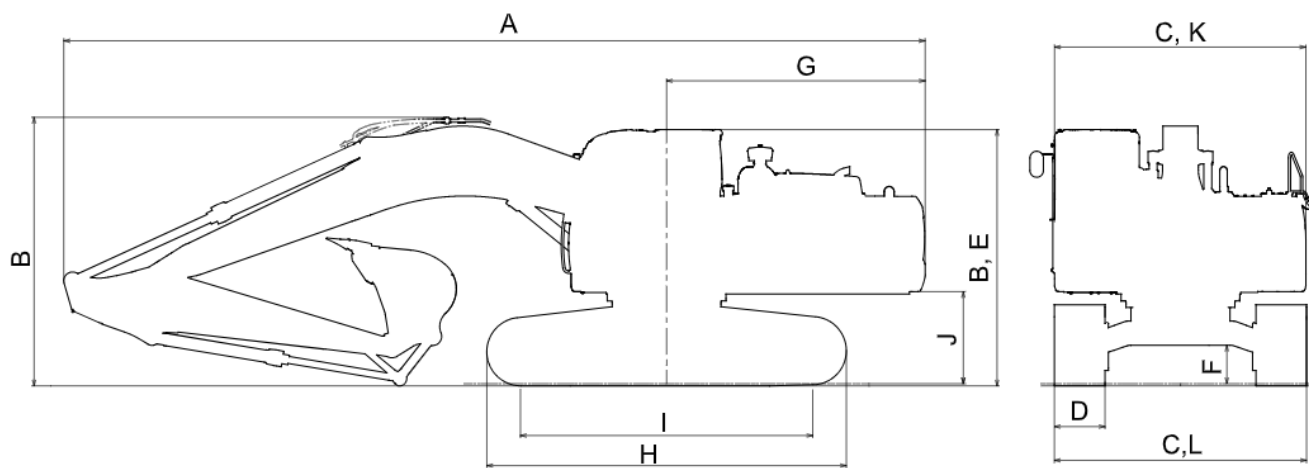
* This measurement results from testing over a fixed test cycle under laboratory conditions a(n) (parent) engine representative of the engine type (engine family) and shall not imply or express any guarantee of the performance of a particular engine.

IMPORTANT

General specifications indicate the specifications of standard machine with the 5.65 m (18'6") boom and the 2.94 m (9'8") arm.

Bucket capacity is indicated by ISO.

[6. SPECIFICATION]



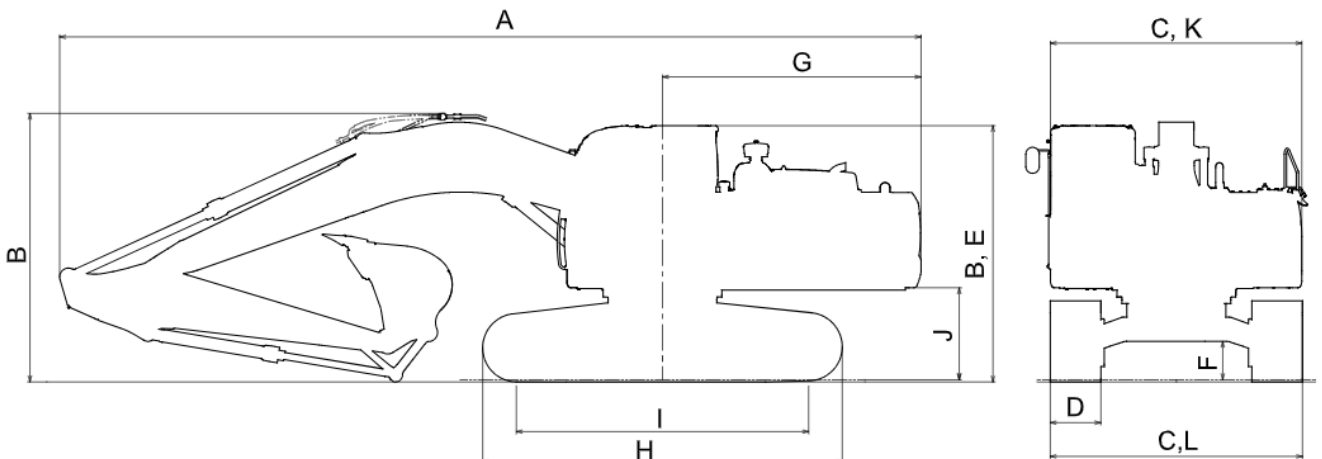
6.1.2 SK210SNLC-11E, SK240SN-11E

Item		Unit	SK210SNLC-11E	SK240SN-11E
Operating mass		kg (lb)	22,500 (49,600)	23,600 (52,000)
Bucket capacity		m ³ (cu-yd)	0.8 (1.05)	0.8 (1.05)
Engine name		—	YANMAR 4TN107FTT diesel engine	
Engine rated power	ISO 9249 : With fan	kW/min ⁻¹	122/2,000	122/2,000
	ISO 14396 : Without fan		127/2,000	127/2,000
CO ₂ value	Hot NRTC※	g/kwh	674	
A	Overall length	mm (ft.in.)	9,500 (31'2")	9,500 (31'2")
B	Overall height	mm (ft.in.)	3,060 (10'0")	3,070 (10'1")
C	Overall width	mm (ft.in.)	2,540 (8'4")	2,540 (8'4")
D	Track shoe width (Grouser shoe)	mm (inch)	500 (19.7")	550 (21.7")
E	Cab height	mm (ft.in.)	3,060 (10'0")	3,070 (10'1")
F	Minimum ground clearance (excluding lug height)	mm (inch)	425 (16.7")	440 (17.3")
G	Tail swing radius	mm (ft.in.)	2,800 (9'2")	2,800 (9'2")
H	Crawler overall length	mm (ft.in.)	4,450 (14'7")	4,270 (14'0")
I	Tumbler center distance	mm (ft.in.)	3,660 (12'0")	3,470 (11'5")
J	Clearance height under upper structure (excluding lug height)	mm (inch)	1,050 (3'5")	1,050 (3'5")
K	Overall width of upper structure	mm (ft.in.)	2,540 (8'4")	2,540 (8'4")
L	Crawler overall width	mm (ft.in.)	2,540 (8'4")	2,540 (8'4")
Ground contact pressure		kPa(psi)	56 (8.1)	56 (8.1)
Swing speed		min ⁻¹ (rpm)	12.7 (12.7)	12.7 (12.7)
Travel speed (low/high)		km/h(mph)	3.6 / 6.0 (2.2 / 3.7)	3.6 / 6.0 (2.2 / 3.7)
Gradeability		% (deg)	70 (35)	70 (35)

IMPORTANT

General specifications indicate the specifications of standard machine with the 5.65 m (18'6") boom and the 2.94 m (9'8") arm.

Bucket capacity is indicated by ISO.



6.2 SHOE TYPES AND USES

Notice

- Never use the shoes other than the grouser shoe of 600 mm (23.6") (SK210LC-11E, SK210NLC-11E), 500 mm (19.7") (SK210SNLC-11E), 550 mm (21.7") (SK240SN-11E) in barren (a field with a lots of rocks and gravel). Traveling and digging work in barren could cause bent shoes and loose shoe bolts and may also damage other travel system components (link, roller, etc.).
- The attachment is with a 2.94 m(9'8") arm and a 0.8 m³(1.05 cu·yd)(heaped) bucket.
- The dimensions marked with * do not include height of shoe lug.

6.2.1 SK210LC-11E

Type		Grouser shoe			
		600 (23.6")	700 (27.6")	790 (31.1")	900 (35.4")
Use		For ordinary soil	For soft soil	For soft soil	For soft soil
		(Standard)	(Option)	(Option)	(Option)
Body specification	Operating mass kg (lb)	22,100 (48,700)	22,500 (49,600)	22,700 (50,100)	23,100 (50,900)
	Crawler overall length mm (ft-in)	4,450 (14'7")	←	←	←
	Crawler overall width mm (ft-in)	2,990 (9'10")	3,090 (10'1")	3,180 (10'5")	3,290 (10'10")
	Ground contact pressure kPa (psi)	46 (6.7)	40 (5.8)	36 (5.2)	32 (4.6)

6.2.2 SK210NLC-11E

Type		Grouser shoe		
		600 (23.6")	700 (27.6")	790 (31.1")
Use		For ordinary soil	For soft soil	For soft soil
		(Standard)	(Option)	(Option)
Body specification	Operating mass kg (lb)	22,000 (48,500)	22,500 (49,600)	22,700 (50,100)
	Crawler overall length mm (ft-in)	4,450 (14'7")	←	←
	Crawler overall width mm (ft-in)	2,800 (9'2")	2,900 (9'6")	2,990 (9'10")
	Ground contact pressure kPa (psi)	46 (6.7)	40 (5.8)	36 (5.2)

6.2.3 SK210SNLC-11E

Type		Grouser shoe	
		500 (19.7")	600 (23.6")
Use		For ordinary soil	For soft soil
		(Standard)	(Option)
Body specification	Operating mass kg (lb)	22,500 (49,600)	22,700 (50,100)
	Crawler overall length mm (ft-in)	4,450 (14'7")	←
	Crawler overall width mm (ft-in)	2,540 (8'4")	2,640 (8'8")
	Ground contact pressure kPa (psi)	56 (8.1)	47 (6.8)

6.2.4 SK240SN-11E

Type		Grouser shoe
		550 (21.7")
Use		For ordinary soil
		(Standard)
Body specification	Operating mass kg (lb)	23,600 (52,000)
	Crawler overall length mm (ft-in)	4,270 (14'0")
	Crawler overall width mm (ft-in)	2,540 (8'4")
	Ground contact pressure kPa (psi)	56 (8.1)

6.3 MASS AND EXTERNAL DIMENSIONS WHEN OPTION IS SELECTED

Notice

When the option is selected, increase or decrease the values in the general specification according to the values in the following lists.

6.3.1 SK210LC-11E, SK210NLC-11E

Arm mass

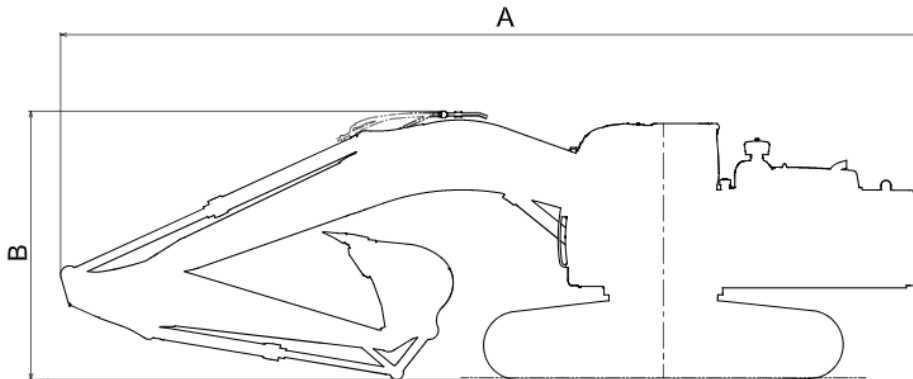
Unit: kg (lb)

3.5m (11'6") arm	+120 (264)
2.4m (7'10") arm	-60 (132)

Arm external dimensions

Unit: mm (ft-in)

	A	B
3.5m (11'6") arm	+70 (2.8")	+140 (5.5")
2.4m (7'10") arm	+80 (3.1")	+150 (5.9")



Notice

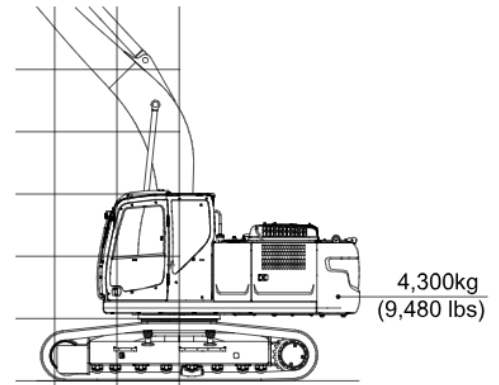
- The operating mass and the machine mass in the general specifications increase or decrease according to a bucket actually installed on the machine.
- The external dimensions other than the above-mentioned are common with those in the general specification.

6.3.2 SK210LC-11E, SK210NLC-11E

Counterweight mass

Unit: kg (lb)

4,800kg (10,580lb) Counterweight	+500 (1,100)
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Notice

- Determine the counterweight mass according to the LIFT CAPACITY label inside the cab.
4,300kg (9,480 lbs): standard specification
4,800kg (10,580 lbs): optional specification
- The external dimensions other than the above-mentioned are common with those in the general specification.

6.3.3 SK210SNLC-11E, SK240SN-11E

Arm mass

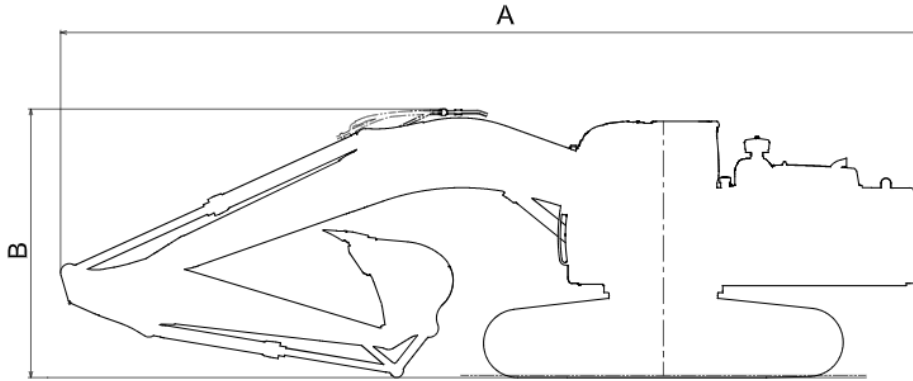
Unit: kg (lb)

2.4m (7'10") arm	—60 (132)
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Arm external dimensions

Unit: mm (ft-in)

	A	B
2.4m (7'10") arm	+80 (3.1")	+150 (5.9")

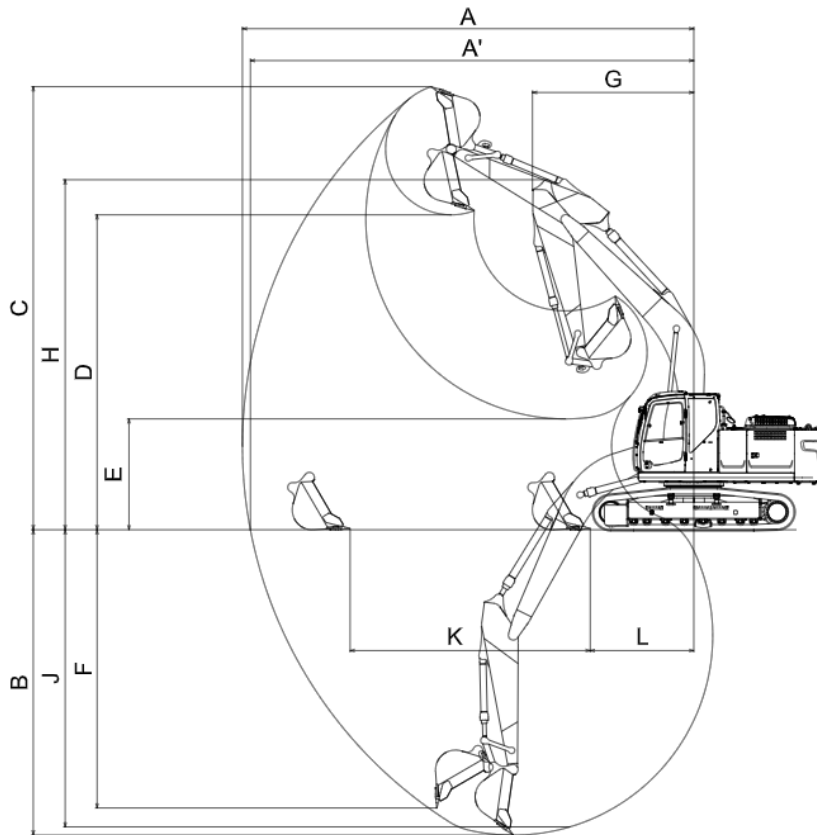


Notice

- The operating mass and the machine mass in the general specifications increase or decrease according to a bucket actually installed on the machine.
- The external dimensions other than the above-mentioned are common with those in the general specification.

6.4 WORKING RANGES

6.4.1 SK210LC-11E, SK210NLC-11E, SK210SNLC-11E

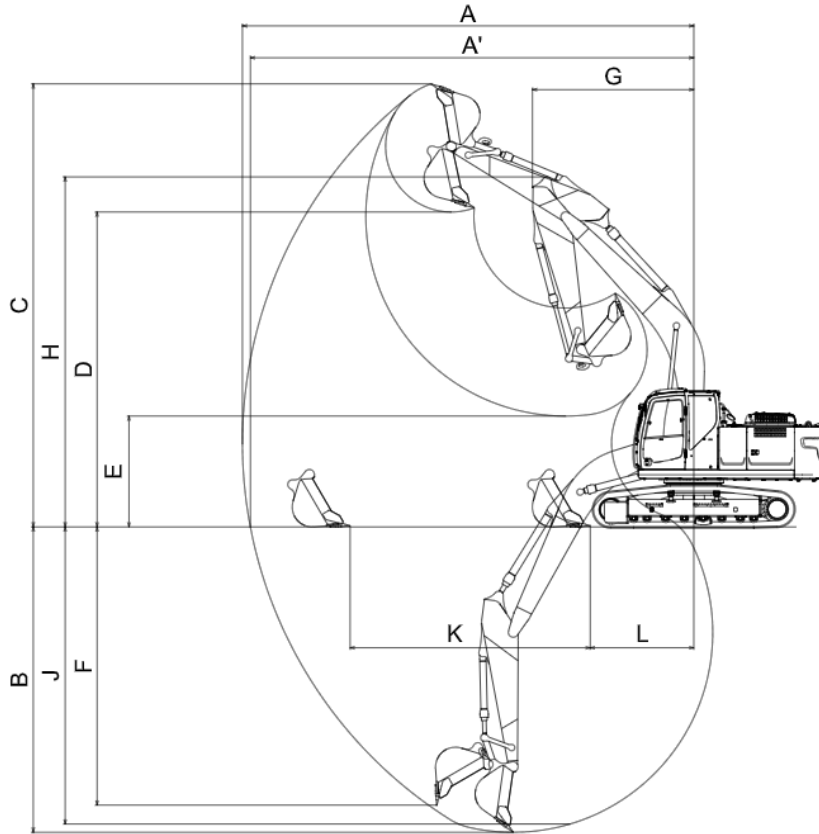


Types of Attachment		2.4 m (7'10") Arm 0.93m ³ (1.22 cu-yd) Bucket	2.94 m (9'8") Arm 0.8m ³ (1.05 cu-yd) Bucket	3.5 m (11'6") Arm 0.7m ³ (0.92 cu-yd) Bucket
A	Maximum digging reach	9,420 (30'11")	9,900 (32'6")	10,340 (33'11")
A'	Maximum reach at ground reference plane	9,240 (30'4")	9,730 (31'11")	10,170 (33'4")
*B	Maximum digging depth	6,160 (20'3")	6,700 (21'12")	7,260 (23'10")
*C	Maximum height of cutting edge	9,510 (31'2")	9,720 (31'11")	9,750 (32'0")
*D	Maximum dumping height	6,680 (21'11")	6,910 (22'8")	6,970 (22'10")
*E	Minimum dumping height	2,980 (9'9")	2,430 (7'12")	1,870 (6'2")
*F	Vertical digging depth	5,570 (18'3")	6,100 (20'0")	6,470 (21'3")
G	Minimum swing radius	3,560 (11'8")	3,550 (11'8")	3,480 (11'5")
*H	Height at minimum swing radius	7,750 (25'5")	7,680 (25'2")	7,720 (25'4")
*J	Eight feet level digging depth	5,950 (19'6")	6,520 (21'5")	7,080 (23'3")
K	Horizontal digging stroke at ground level	Stroke	4,080 (13'5")	5,270 (17'3")
L		At minimum	2,980 (9'9")	2,270 (7'5")
				1,900 (6'3")

Notice

The dimensions marked with * do not include height of shoe lug.

6.4.2 SK240SN-11E



Types of Attachment		2.4 m (7'10") Arm	2.94 m (9'8") Arm
Item		0.93m ³ (1.22 cu-yd) Bucket	0.80m ³ (1.05 cu-yd) Bucket
A	Maximum digging reach	9,420 (30'11")	9,900 (32'6")
A'	Maximum reach at ground reference plane	9,240 (30'4")	9,730 (31'11")
*B	Maximum digging depth	6,150 (20'2")	6,690 (21'11")
*C	Maximum height of cutting edge	9,510 (31'2")	9,730 (31'11")
*D	Maximum dumping height	6,690 (21'11")	6,920 (22'8")
*E	Minimum dumping height	2,980 (9'9")	2,440 (8'0")
*F	Vertical digging depth	5,570 (18'3")	6,100 (20'0")
G	Minimum swing radius	3,570 (11'9")	3,550 (11'8")
*H	Height at minimum swing radius	7,750 (25'5")	7,690 (25'3")
*J	Eight feet level digging depth	5,950 (19'6")	6,510 (21'4")
K	Horizontal digging stroke at ground level	Stroke	4,080 (13'5")
L		At minimum	2,980 (9'9")

Notice

The dimensions marked with * do not include height of shoe lug.

6.5 ATTACHMENT TYPE AND COMBINATION

6.5.1 FRONT VARIATION

- When a bucket with large capacity is used, it should be used in combination with a short arm so that the machine is stabilized and excessive load to the front part and the cylinders can be avoided.
 - When a long boom or arm is used, it should be used in combination with a bucket with small capacity.
-



INTERFERENCE BY FRONT ATTACHMENT

Check clearance between the front attachment and the operator's station and other parts of the machine before starting operation because a certain kinds of front attachment and combination of the options installed on the base machine may cause the front attachment to interfere with the operator's station or other parts of the machine.

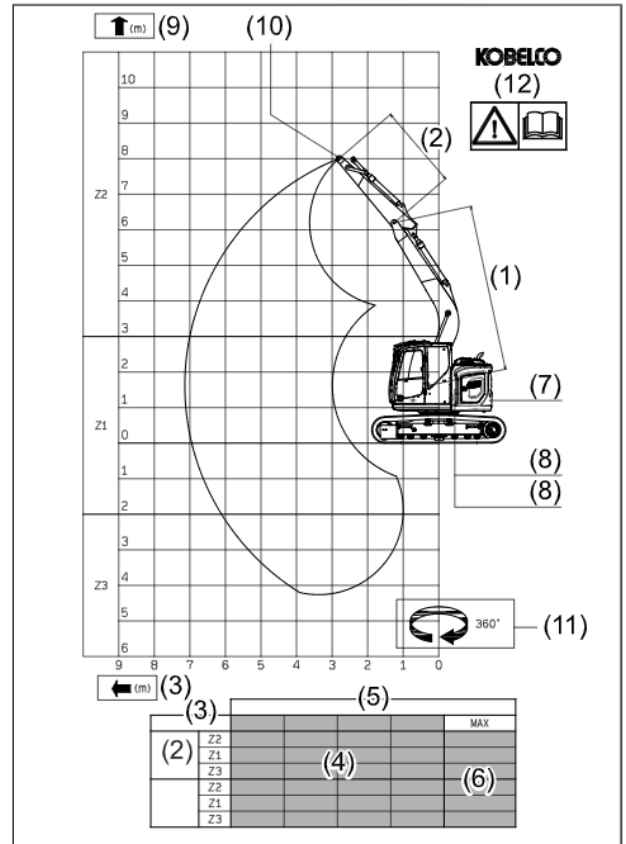
Notice

- Some installed attachments may cause failures of this machine or the attachment/equipment, voiding the manufacturer's warranty.
Contact your KOBELCO authorized dealer for the attachment to be installed.
 - Before using an inversely installed bucket, check that it does not interfere with the arm because interference can occur during operation and cause damage.
-

6.6 LIFT CAPACITY

6.6.1 EXPLANATION OF FIGURE

- (1) Boom length
- (2) Arm length
- (3) Distance of load from swing center line
- (4) Maximum load (ton) according to tipping limit based on ISO10567 (stability 75 % and hydraulic system 87 %)
- (5) Maximum load at each working range from axis of swing
- (6) Maximum load at maximum working range from axis of swing
- (7) Counterweight
- (8) Set pressure of main relief valve/ holding valve in hydraulic system
- (9) Height of working range
- (10) Lift point (axis)
- (11) Axis of rotation
- (12) Model name



Notice

Work conditions

- With no front attachment installed (bucket, clamshell, or others).
When lifting a load with the front attachment installed, the weight of the front attachment shall be deducted from the values of this table.
- With a fully retracted bucket cylinder
- On a firm and level ground
- In full swing position

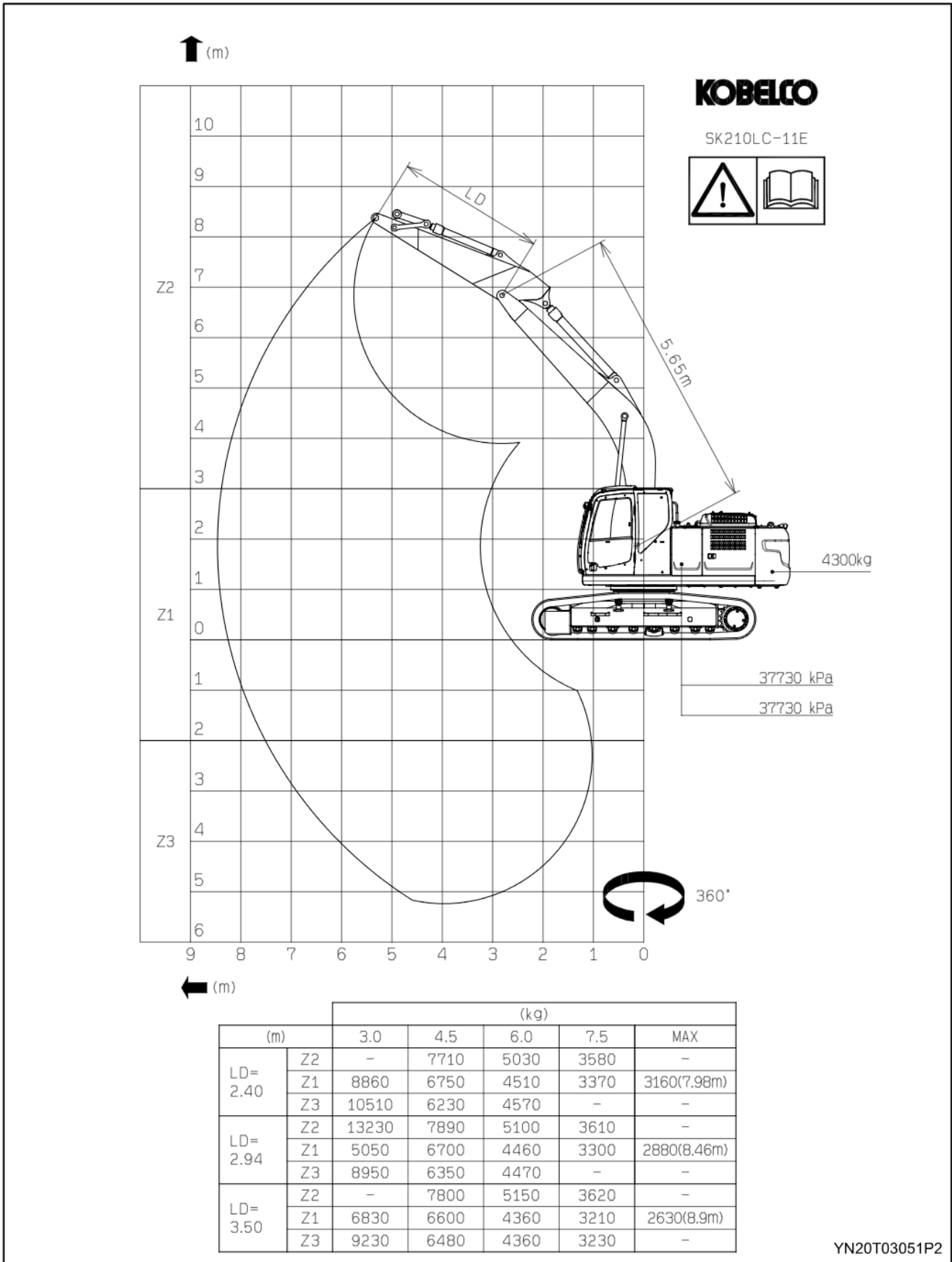
Loads on table

The loads on the table are valid for the work height of range (Z) considered in accordance with an intended distance from the axis of rotation.

6.6.2 LIFT CAPACITY

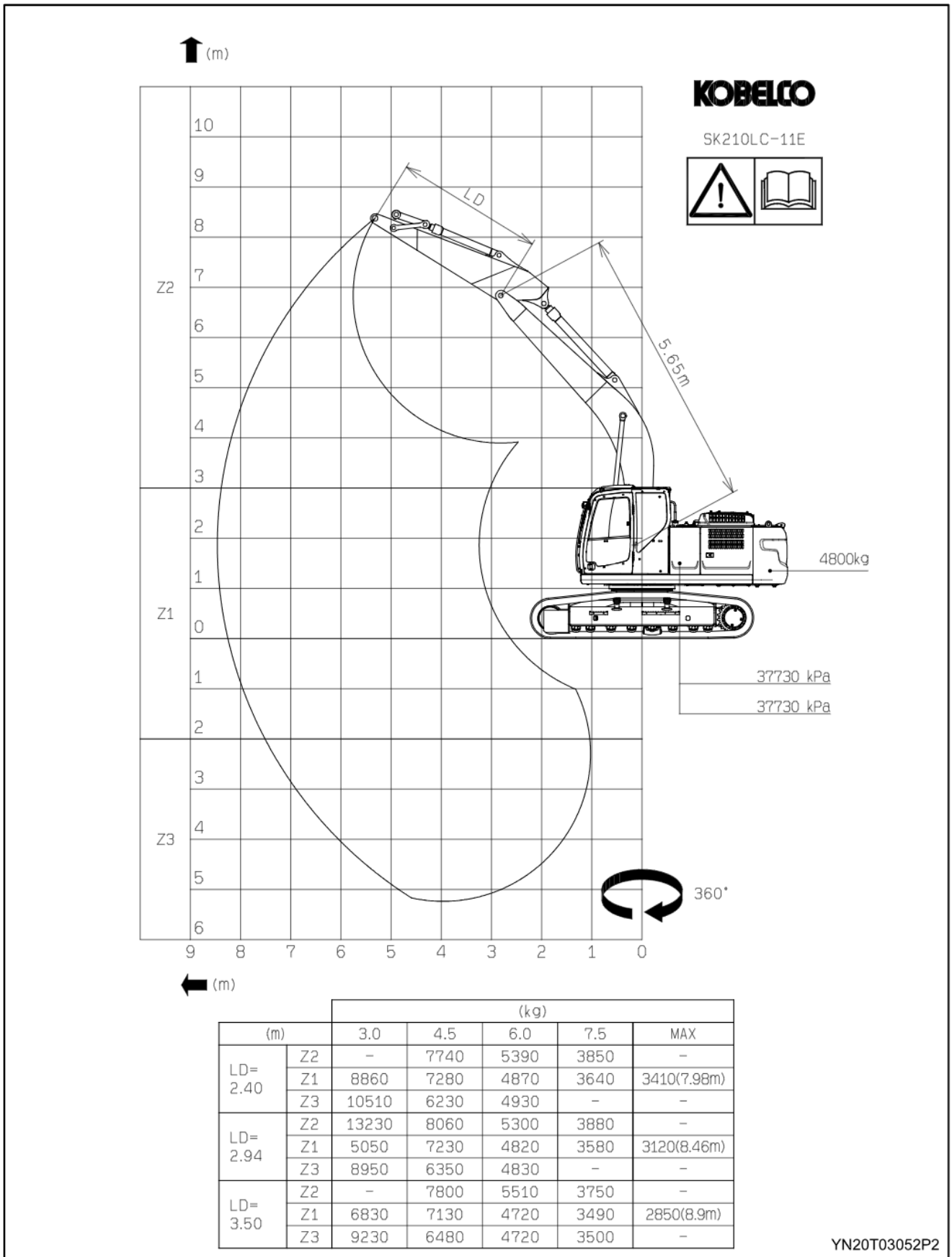
SK210LC-11E Counterweight: 4,300kg (9,480 lbs)

The lift capacity table is based on the standard machine equipped with the 2.94 m (9'8") arm and the 600 mm (23.6") shoe.



SK210LC-11E Counterweight: 4,800kg (10,580 lbs)

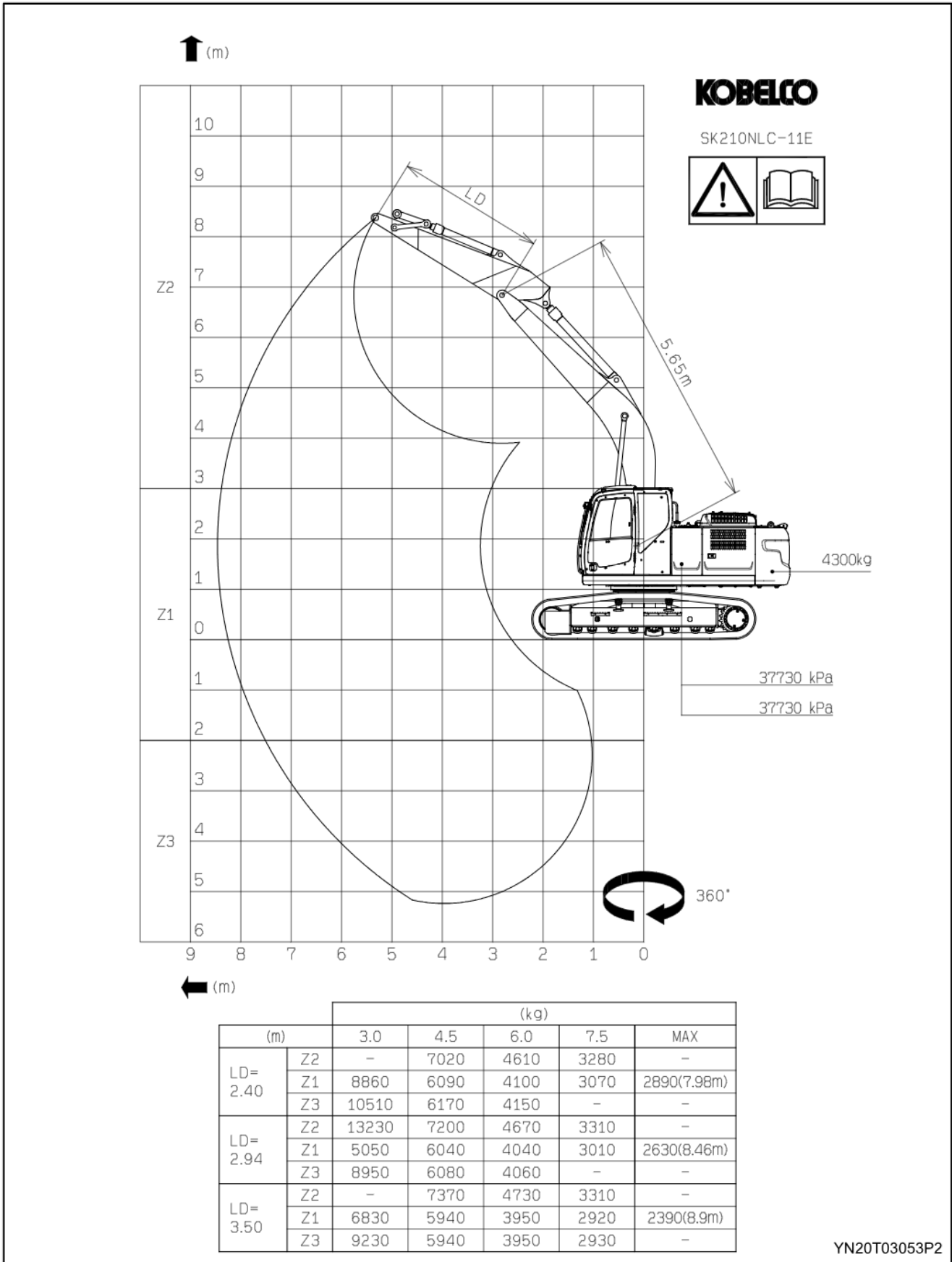
The lift capacity table is based on the standard machine equipped with the 2.94 m (9'8") arm and the 600 mm (23.6") shoe.



[6. SPECIFICATION]

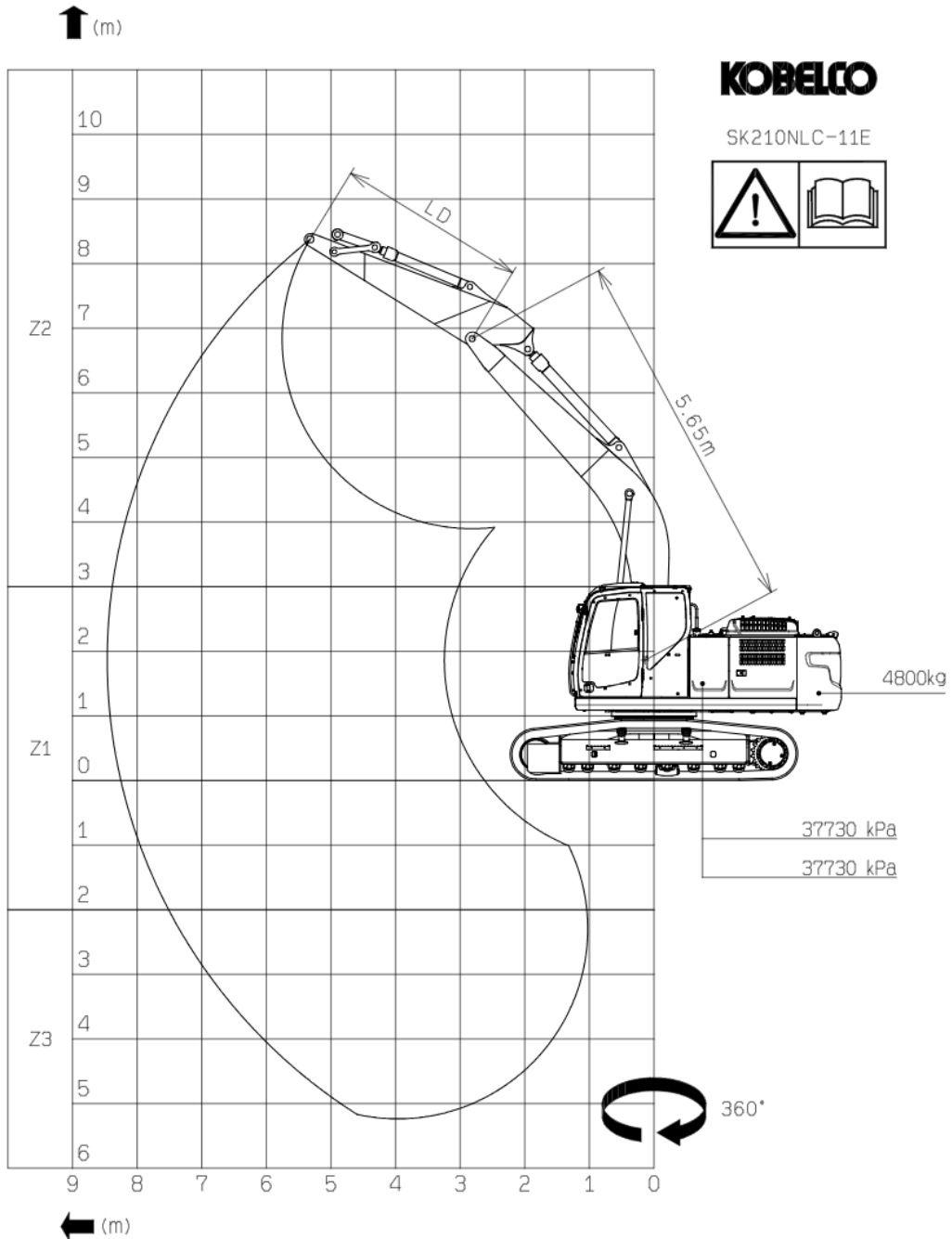
SK210NLC-11E Counterweight: 4,300kg (9,480 lbs)

The lift capacity table is based on the standard machine equipped with the 2.94 m (9'8") arm and the 600 mm (23.6") shoe.



SK210NLC-11E Counterweight: 4,800kg (10,580 lbs)

The lift capacity table is based on the standard machine equipped with the 2.94 m (9'8") arm and the 600 mm (23.6") shoe.



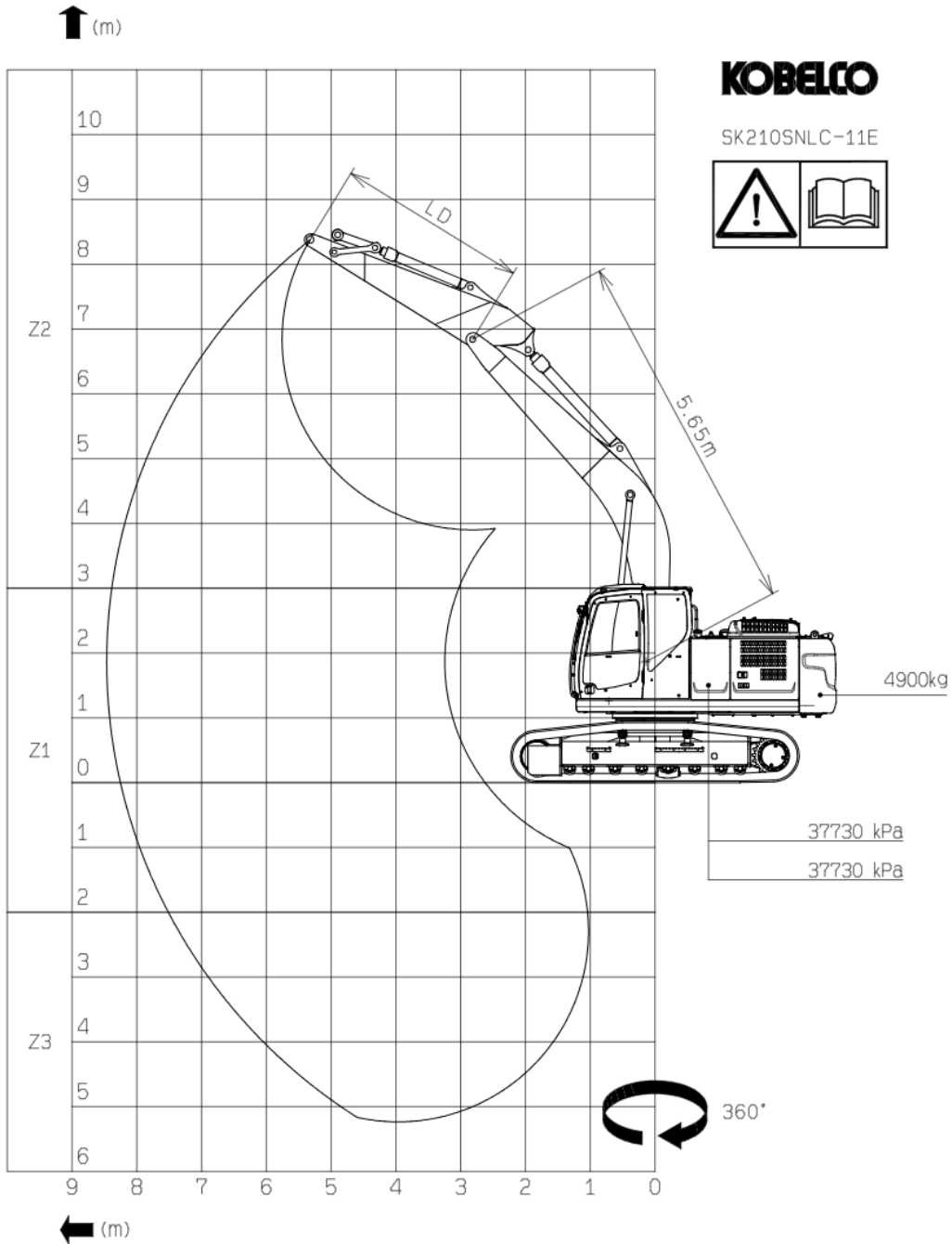
		(kg)				
(m)		3.0	4.5	6.0	7.5	MAX
LD= 2.40	Z2	-	7520	4960	3540	-
	Z1	8860	6590	4440	3330	3130(7.98m)
	Z3	10510	6230	4500	-	-
LD= 2.94	Z2	13230	7700	5020	3570	-
	Z1	5050	6540	4390	3270	2860(8.46m)
	Z3	8950	6350	4410	-	-
LD= 3.50	Z2	-	7800	5070	3580	-
	Z1	6830	6440	4300	3180	2610(8.9m)
	Z3	9230	6440	4300	3190	-

YN20T03054P2

[6. SPECIFICATION]

SK210SNLC-11E Counterweight: 4,900kg (10,810 lbs)

The lift capacity table is based on the standard machine equipped with the 2.94 m (9'8") arm and the 500 mm (19.7") shoe.

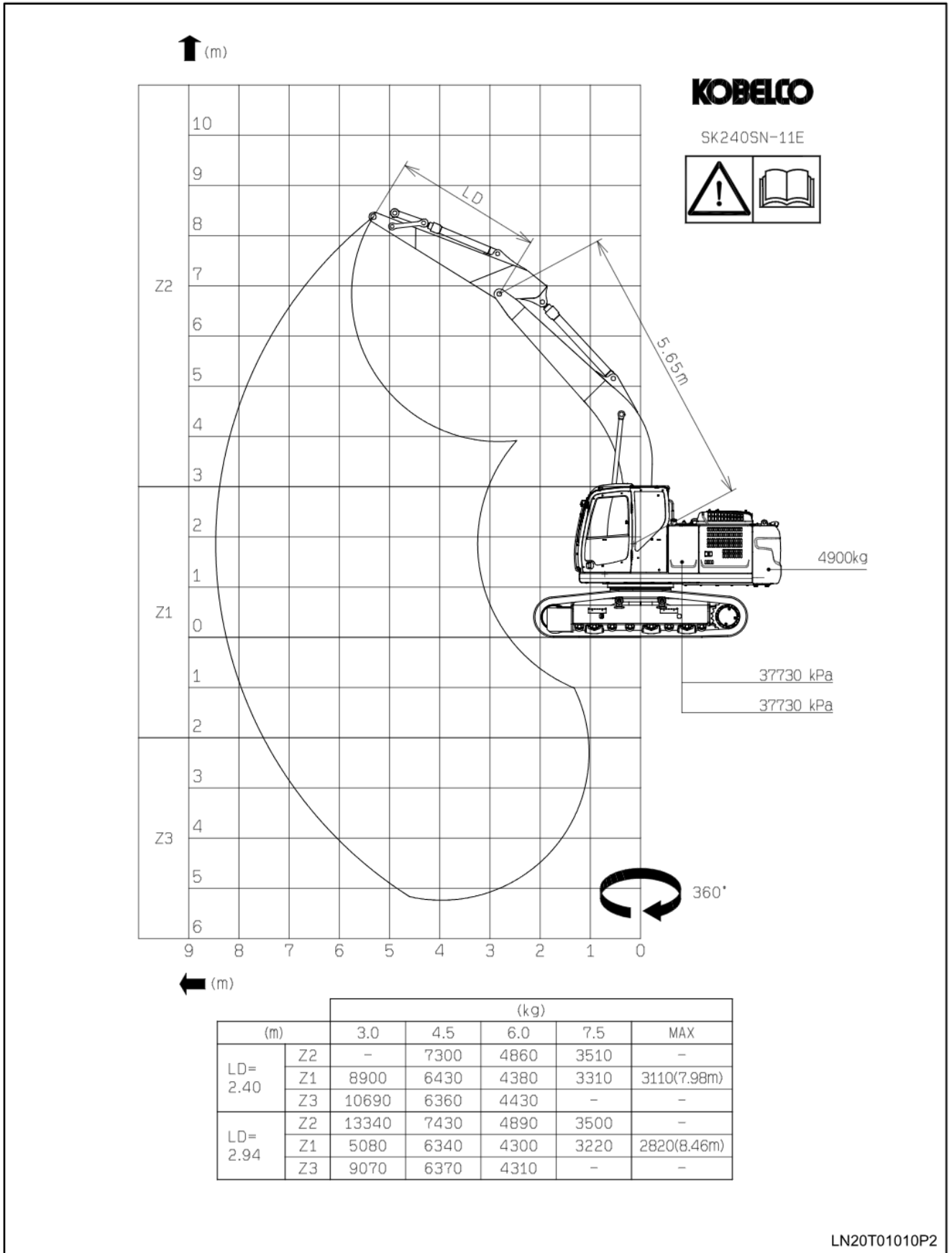


		(kg)				
(m)		3.0	4.5	6.0	7.5	MAX
LD=2.40	Z2	-	7020	4670	3360	-
	Z1	8900	6150	4190	3160	2970(7.98m)
	Z3	10690	6230	4240	-	-
LD=2.94	Z2	13160	7160	4700	3360	-
	Z1	5080	6060	4100	3070	2690(8.46m)
	Z3	9070	6100	4120	-	-

LN20T01009P2

SK240SN-11E Counterweight: 4,900kg (10,810 lbs)

The lift capacity table is based on the standard machine equipped with the 2.94 m (9'8") arm and the 550 mm (21.7") shoe.



7. MACHINE OPERATION MANAGEMENT SYSTEM

7.1 MACHINE OPERATION MANAGEMENT SYSTEM

- Machine Operation Management System is the system that manages information, such as the operating information and failure of the hydraulic excavator.
- To use this system, communication contract is required. Consult your KOBELCO authorized dealer for the contract.



ABOUT DISASSEMBLY AND REPAIR

Never disassemble or repair the communication controller or transceiving antenna of this system. Do not pinch the cable or pull it by force and damage it. This may cause a failure or fire of the machine.



- Electromagnetic waves generated from the components of this system may adversely affect the medical electric devices, such as cardiac pacemaker device.
When using medical electric devices while operating the machine, use extreme caution and consult the manufacturers of the medical electric devices in advance.
 - Do not spill water over the cable and the components of this system. This may cause a failure of the machine.
-

Notice

- Installation and removal of the components and the cable of this system is performed by your KOBELCO authorized dealer.
 - The communication controller of this system does not require inspection and operation.
-

Notice

- Because this system uses wireless signals, it cannot be used in a place where no radio wave reaches (in the mountains, inside a building, in a tunnel, etc.), in a place of weak radio wave, or outside the communication area. When making the contract, check the communication area with your KOBELCO authorized dealer.
 - This system consumes very little electricity even when the starter switch is OFF (turned off).
For a long term storage of the machine, see "PRECAUTIONS FOR LONG-TERM STORAGE" in Chapter 3.
 - The built-in battery for communication controller needs to be replaced every year. For replacement, contact your KOBELCO authorized dealer.
-

7.2 REMOTE DOWNLOAD SYSTEM

This system sometimes automatically renews (downloads) the software of the controller in this machine. At that time, the instruction will appear on the monitor, so that operate the jog dial.

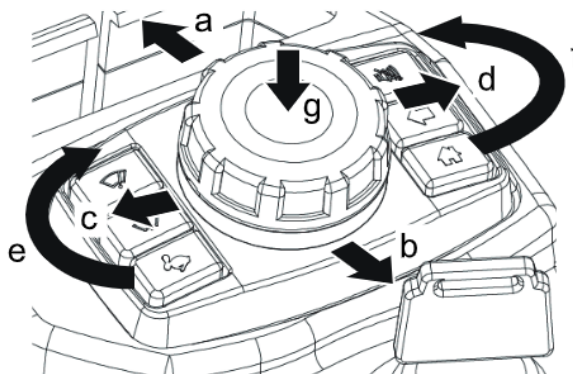
Jog dial operation

Tilting (a,b,c,d) and rotating (e,f) the jog dial

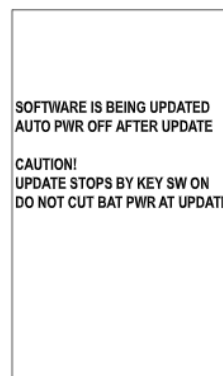
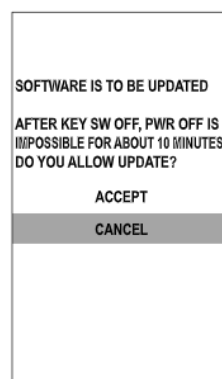
To move the cursor on the monitor and adjust the values and others.

Pushing down (g) the jog dial

- To switch the screen to the selected setting screen.
- To determine the adjusted value and others.



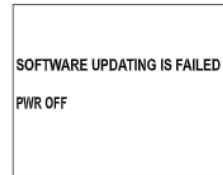
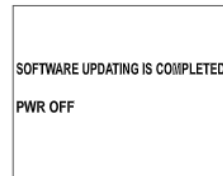
1. If update of the software is possible, when the starter switch is turned to the "ON" or "START" position and the engine is started, the following selection screen appears on the monitor.
2. Using the jog dial, move the cursor to [ACCEPT].
3. Push down (g) the jog dial to set preparation of update. (At this time, the updating of the software does not start)
4. Then the screen returns to the normal screen, so that continue the machine operation.
5. Then, turn the starter key to the "OFF" position to display the following screen on the monitor, and then the update of the software starts. The update takes almost 10 minutes.



CAUTION

During the renewal of the software, do not turn OFF the battery power-off switch or remove the battery terminals. If the battery power is shut off during the renewal, it can damage the controller.

6. When the renewal is completed, the following screen appears on the monitor and the power turns OFF.
The renewal of the software sometimes fails. At that time, the following screen appears on the gauge cluster and the power turns OFF.
In that case, the next time the starter key turns "ON", the selection screen appears again.
When the renewal of the software keeps failing, contact your KOBELCO authorized dealer.



Notice

- The renewal of the software is performed when required.
- The renewal of the software will not start when [CANCEL] is set, 30 seconds elapses with the selection screen displayed, or the control lock lever is moved to the "UNLOCKED" position, even if the starter key is turned "OFF".
In that case, the next time the starter key turns "ON", the selection screen appears again.
- During the renewal of the software, if the starter key turns "ON", the renewal stops and the power turns OFF.
In that case, the next time the starter key turns "ON", the selection screen appears again.
- If a certain period has passed after the selection screen appeared because [CANCEL] has been set repeatedly, the selection screen stops to appear and the renewal of the software is not performed.

7.3 DESCRIPTION OF BUILT-IN WIRELESS EQUIPMENT

Description of built-in wireless equipment

Apply Standard radio



Hereby, JRC Mobility Inc. declares that the radio equipment type JRN-430KS is in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address:

<https://www.jrc-m.co.jp/english/products/support.html>

С настоящото, JRC Mobility Inc. декларира, че този тип радиосъоръжение JRN-430KS е в съответствие с Директива 2014/53/ЕС.

Цялостният текст на ЕС декларацията за съответствие може да се намери на следния интернет адрес:

<https://www.jrc-m.co.jp/english/products/support.html>

Tímto JRC Mobility Inc. prohlašuje, že typ rádiového zařízení JRN-430KS je v souladu se směrnicí 2014/53/EU.

Úplné znění EU prohlášení o shodě je k dispozici na této internetové adrese:

<https://www.jrc-m.co.jp/english/products/support.html>

Hermed erklærer JRC Mobility Inc. at radioudstyrstypen JRN-430KS er i overensstemmelse med direktiv 2014/53/EU.

EU-overensstemmelseserklæringens fulde tekst kan findes på følgende internetadresse:

<https://www.jrc-m.co.jp/english/products/support.html>

Hiermit erklärt JRC Mobility Inc. dass der Funkanlagentyp JRN-430KS der Richtlinie 2014/53/EU entspricht.

Der vollständige Text der EU-Konformitätserklärung ist unter der folgenden Internetadresse verfügbar:

<https://www.jrc-m.co.jp/english/products/support.html>

Käesolevaga deklareerib JRC Mobility Inc. et käesolev raadioseadme tüüp JRN-430KS vastab direktiivi 2014/53/EL nõuetele.

ELi vastavusdeklaratsiooni täielik tekst on kättesaadav järgmisel internetiaadressil:

<https://www.jrc-m.co.jp/english/products/support.html>

Με την παρούσα ο/η JRC Mobility Inc. δηλώνει ότι ο ραδιοεξοπλισμός JRN-430KS πληροί την οδηγία 2014/53/ΕΕ.

Το πλήρες κείμενο της δήλωσης συμμόρφωσης ΕΕ διατίθεται στην ακόλουθη ιστοσελίδα στο διαδίκτυο:

<https://www.jrc-m.co.jp/english/products/support.html>

Por la presente, JRC Mobility Inc. declara que el tipo de equipo radioeléctrico JRN-430KS es conforme con la Directiva 2014/53/UE.

El texto completo de la declaración UE de conformidad está disponible en la dirección Internet siguiente:

<https://www.jrc-m.co.jp/english/products/support.html>

Le soussigné, JRC Mobility Inc. déclare que l'équipement radioélectrique du type JRN-430KS est conforme à la directive 2014/53/UE.

Le texte complet de la déclaration UE de conformité est disponible à l'adresse internet suivante:

<https://www.jrc-m.co.jp/english/products/support.html>

Il fabbricante, JRC Mobility Inc. dichiara che il tipo di apparecchiatura radio JRN-430KS è conforme alla direttiva 2014/53/UE.

Il testo completo della dichiarazione di conformità UE è disponibile al seguente indirizzo Internet:

<https://www.jrc-m.co.jp/english/products/support.html>

Ar šo JRC Mobility Inc. deklarē, ka radioiekārta JRN-430KS atbilst Direktīvai 2014/53/ES. Pilns ES atbilstības deklarācijas teksts ir pieejams šādā interneta vietnē:

<https://www.jrc-m.co.jp/english/products/support.html>

Aš, JRC Mobility Inc. patvirtinu, kad radijo įrenginių tipas JRN-430KS atitinka Direktyvą 2014/53/ES.

Visas ES atitikties deklaracijos tekstas prieinamas šiuo interneto adresu:

<https://www.jrc-m.co.jp/english/products/support.html>

JRC Mobility Inc. ovime izjavljuje da je radijska oprema tipa JRN-430KS u skladu s Direktivom 2014/53/EU.

Cjeloviti tekst EU izjave o sukladnosti dostupan je na sljedećoj internetskoj adresi:

<https://www.jrc-m.co.jp/english/products/support.html>

JRC Mobility Inc. igazolja, hogy a JRN-430KS típusú rádióberendezés megfelel a 2014/53/EU irányelvnek.

Az EU-megfelelőségi nyilatkozat teljes szövege elérhető a következő internetes címen:

<https://www.jrc-m.co.jp/english/products/support.html>

B'dan, JRC Mobility Inc. niddikjara li dan it-tip ta' tagħmir tar-radju JRN-430KS huwa konformi mad-Direttiva 2014/53/UE.

It-test kollu tad-dikjarazzjoni ta' konformità tal-UE huwa disponibbli f'dan l-indirizz tal-Internet li ġej:

<https://www.jrc-m.co.jp/english/products/support.html>

Hierbij verklaar ik, JRC Mobility Inc. dat het type radioapparatuur JRN-430KS conform is met Richtlijn 2014/53/EU.

De volledige tekst van de EU-conformiteitsverklaring kan worden geraadpleegd op het volgende internetadres:

<https://www.jrc-m.co.jp/english/products/support.html>

JRC Mobility Inc. niniejszym oświadcza, że typ urządzenia radiowego JRN-430KS jest zgodny z dyrektywą 2014/53/UE.

Pełny tekst deklaracji zgodności UE jest dostępny pod następującym adresem internetowym:

<https://www.jrc-m.co.jp/english/products/support.html>

O(a) abaixo assinado(a) JRC Mobility Inc. declara que o presente tipo de equipamento de rádio JRN-430KS está em conformidade com a Diretiva 2014/53/UE.

O texto integral da declaração de conformidade está disponível no seguinte endereço de Internet:

<https://www.jrc-m.co.jp/english/products/support.html>

Prin prezenta, JRC Mobility Inc. declară că tipul de echipamente radio JRN-430KS este în conformitate cu Directiva 2014/53/UE.

Textul integral al declarației UE de conformitate este disponibil la următoarea adresă internet:

<https://www.jrc-m.co.jp/english/products/support.html>

JRC Mobility Inc. týmto vyhlasuje, že rádiové zariadenie typu JRN-430KS je v súlade so smernicou 2014/53/EÚ.

Úplné EÚ vyhlásenie o zhode je k dispozícii na tejto internetovej adrese:

<https://www.jrc-m.co.jp/english/products/support.html>

JRC Mobility Inc. potrjuje, da je tip radijske opreme JRN-430KS skladen z Direktivo 2014/53/EU.

Celotno besedilo izjave EU o skladnosti je na voljo na naslednjem spletnem naslovu:

<https://www.jrc-m.co.jp/english/products/support.html>

JRC Mobility Inc. vakuuttaa, että radiolaitetyyppi JRN-430KS on direktiivin 2014/53/EU mukainen.

EU-vaatimustenmukaisuusvakuutuksen täysimittainen teksti on saatavilla seuraavassa internetosoitteessa:

<https://www.jrc-m.co.jp/english/products/support.html>

Härmed försäkrar JRC Mobility Inc. att denna typ av radioutrustning JRN-430KS överensstämmer med direktiv 2014/53/EU.

Den fullständiga texten till EU-försäkran om överensstämmelse finns på följande webbadress:

<https://www.jrc-m.co.jp/english/products/support.html>

İşbu belge ile JRC Mobility Inc., JRN-430KS tipi radyo ekipmanının 2014/53/EU Yönergesi ile uyumlu olduğunu beyan eder.

AB uygunluk beyanının tam metnine aşağıdaki internet adresinden ulaşılabilir:

<https://www.jrc-m.co.jp/english/products/support.html>

Hér með lýsir JRC Mobility Inc. því yfir að fjarskiptabúnaður af gerðinni JRN-430KS sé í samræmi við tilskipun 2014/53/ESB.

Fullur texti ESB-samræmisýfirlýsingarinnar er fáanlegur á eftirfarandi netfangi:

<https://www.jrc-m.co.jp/english/products/support.html>

Herved erklærer JRC Mobility Inc. at radioustyret type JRN-430KS er i samsvar med direktiv 2014/53/EU.

Den fullstendige teksten til EU-samsvarserklæringen er tilgjengelig på følgende internettadresse:

<https://www.jrc-m.co.jp/english/products/support.html>

JRC Mobility

JRC Mobility Inc.

NAKANO CENTRAL PARK EAST, 10-1,

Nakano 4-chome, Nakano-ku, Tokyo 164-8570, Japan

Note

Importer's name and address will be officially listed on separate construction machine maker instruction manual.

Description of built-in wireless equipment

Apply Standard radio



Hereby, JRC Mobility Inc. declares that the radio equipment type JRN-430KS is in compliance with S.I. 2017/1206.

The full text of the UK declaration of conformity is available at the following internet address:

<https://www.jrc-m.co.jp/english/products/support.html>

С настоящото, JRC Mobility Inc. декларира, че този тип радиосъоръжение JRN-430KS е в съответствие Законов инструмент 2017/1206.

Цялостният текст на Великобритания декларацията за съответствие може да се намери на следния интернет адрес:

<https://www.jrc-m.co.jp/english/products/support.html>

Tímto JRC Mobility Inc. prohlašuje, že typ rádiového zařízení JRN-430KS je v souladu se Statutární nástroj 2017/1206.

Úplné znění UK prohlášení o shodě je k dispozici na této internetové adrese:

<https://www.jrc-m.co.jp/english/products/support.html>

Hermed erklærer JRC Mobility Inc. at radioudstyr typen JRN-430KS er i overensstemmelse med Lovbestemt instrument 2017/1206.

UK-overensstemmelseserklæringens fulde tekst kan findes på følgende internetadresse:

<https://www.jrc-m.co.jp/english/products/support.html>

Hiermit erklärt JRC Mobility Inc. dass der Funkanlagentyp JRN-430KS der Statutarisches Instrument 2017/1206 entspricht.

Der vollständige Text der UK-Konformitätserklärung ist unter der folgenden Internetadresse verfügbar:

<https://www.jrc-m.co.jp/english/products/support.html>

Käesolevaga deklareerib JRC Mobility Inc. et käesolev raadioseadme tüüp JRN-430KS vastab Seaduslik instrument 2017/1206 nõuetele.

UK vastavusdeklaratsiooni täielik tekst on kättesaadav järgmisel internetiaadressil:

<https://www.jrc-m.co.jp/english/products/support.html>

Με την παρούσα ο/η JRC Mobility Inc. δηλώνει ότι ο ραδιοεξοπλισμός JRN-430KS πληροί Καταστατικό μέσο 2017/1206.

Το πλήρες κείμενο της δήλωσης συμμόρφωσης ΗΒ διατίθεται στην ακόλουθη ιστοσελίδα στο διαδίκτυο:

<https://www.jrc-m.co.jp/english/products/support.html>

Por la presente, JRC Mobility Inc. declara que el tipo de equipo radioeléctrico JRN-430KS es conforme con el Instrumento estatutario 2017/1206.

El texto completo de la declaración RU de conformidad está disponible en la dirección Internet siguiente:

<https://www.jrc-m.co.jp/english/products/support.html>

Le soussigné, JRC Mobility Inc. déclare que l'équipement radioélectrique du type JRN-430KS est conforme à la Instrument statutaire 2017/1206.

Le texte complet de la déclaration Royaume-Uni de conformité est disponible à l'adresse internet suivante:

<https://www.jrc-m.co.jp/english/products/support.html>

Il fabbricante, JRC Mobility Inc. dichiara che il tipo di apparecchiatura radio JRN-430KS è conforme alla Atto statutario 2017/1206.

Il testo completo della dichiarazione di conformità UK è disponibile al seguente indirizzo Internet:

<https://www.jrc-m.co.jp/english/products/support.html>

Ar šo JRC Mobility Inc. deklarē, ka radioiekārta JRN-430KS atbilst Tiesību akts 2017/1206.

Pilns UK atbilstības deklarācijas teksts ir pieejams šādā interneta vietnē:

<https://www.jrc-m.co.jp/english/products/support.html>

Aš, JRC Mobility Inc. patvirtinu, kad radijo įrenginių tipas JRN-430KS atitinka Įstatyminė priemonė 2017/1206.

Visas JK atitikties deklaracijos tekstas prieinamas šiuo interneto adresu:

<https://www.jrc-m.co.jp/english/products/support.html>

JRC Mobility Inc. ovime izjavljuje da je radijska oprema tipa JRN-430KS u skladu s Statutarni instrument 2017/1206.

Cjeloviti tekst UK izjave o sukladnosti dostupan je na sljedećoj internetskoj adresi:

<https://www.jrc-m.co.jp/english/products/support.html>

JRC Mobility Inc. igazolja, hogy a JRN-430KS típusú rádióberendezés megfelel a Törvényi eszköz 2017/1206.

Az UK-megfelelőségi nyilatkozat teljes szövege elérhető a következő internetes címen:

<https://www.jrc-m.co.jp/english/products/support.html>

B'dan, JRC Mobility Inc. niddikjara li dan it-tip ta' tagħmir tar-radju JRN-430KS huwa konformi mad-Strument Statutorju 2017/1206.

It-test kollu tad-dikjarazzjoni ta' konformità tal-UK huwa disponibbli f'dan l-indirizz tal-Internet li ġej:

<https://www.jrc-m.co.jp/english/products/support.html>

Hierbij verklaar ik, JRC Mobility Inc. dat het type radioapparatuur JRN-430KS conform is met Wettelijke akte 2017/1206.

De volledige tekst van de VK-conformiteitsverklaring kan worden geraadpleegd op het volgende internetadres:

<https://www.jrc-m.co.jp/english/products/support.html>

JRC Mobility Inc. niniejszym oświadcza, że typ urządzenia radiowego JRN-430KS jest zgodny z Instrument ustawowy 2017/1206.

Pełny tekst deklaracji zgodności UK jest dostępny pod następującym adresem internetowym:

<https://www.jrc-m.co.jp/english/products/support.html>

O(a) abaixo assinado(a) JRC Mobility Inc. declara que o presente tipo de equipamento de rádio JRN-430KS está em conformidade com a Instrumento estatutário 2017/1206.

O texto integral da declaração de conformidade do UK está disponível no seguinte endereço de Internet:

<https://www.jrc-m.co.jp/english/products/support.html>

Prin prezenta, JRC Mobility Inc. declară că tipul de echipamente radio JRN-430KS este în conformitate cu Instrumentul Statutar 2017/1206.

Textul integral al declarației UK de conformitate este disponibil la următoarea adresă internet:

<https://www.jrc-m.co.jp/english/products/support.html>

JRC Mobility Inc. týmto vyhlasuje, že rádiové zariadenie typu JRN-430KS je v súlade so Zákonný nástroj 2017/1206.

Úplné UK vyhlásenie o zhode je k dispozícii na tejto internetovej adrese:

<https://www.jrc-m.co.jp/english/products/support.html>

JRC Mobility Inc. potruje, da je tip radijske opreme JRN-430KS skladen z Zakonski akt 2017/1206.

Celotno besedilo izjave UK o skladnosti je na voljo na naslednjem spletnem naslovu:

<https://www.jrc-m.co.jp/english/products/support.html>

JRC Mobility Inc. vakuuttaa, että radiolaitetyyppi JRN-430KS on Lakisääteinen säädös 2017/1206 mukainen.

Iso-Britannia-vaatimustenmukaisuusvakuutuksen täysimittainen teksti on saatavilla seuraavassa internetosoitteessa:

<https://www.jrc-m.co.jp/english/products/support.html>

Härmed försäkrar JRC Mobility Inc. att denna typ av radioutrustning JRN-430KS överensstämmer med Lagstiftning 2017/1206.

Den fullständiga texten till UK-försäkran om överensstämmelse finns på följande webbadress:

<https://www.jrc-m.co.jp/english/products/support.html>

İşbu belge ile JRC Mobility Inc., JRN-430KS tipi radyo ekipmanının S.I. 2017/1206 ile uyumlu olduğunu beyan eder.

Birleşik Krallık uygunluk beyanının tam metnine aşağıdaki internet adresinden ulaşılabilir:

<https://www.jrc-m.co.jp/english/products/support.html>

Hér með lýsir JRC Mobility Inc. yfir að fjarskiptabúnaður af gerðinni JRN-430KS er í samræmi við S.I. 2017/1206.

Fullur texti bresku samræmisýfirlýsingarinnar er fáanlegur á eftirfarandi netfangi:

<https://www.jrc-m.co.jp/english/products/support.html>

Herved erklærer JRC Mobility Inc. at radioutstyret type JRN-430KS er i samsvar med S.I. 2017/1206.

Den fullstendige teksten til den britiske samsvarserklæringen er tilgjengelig på følgende internetadresse:

<https://www.jrc-m.co.jp/english/products/support.html>

JRC Mobility

JRC Mobility Inc.

NAKANO CENTRAL PARK EAST, 10-1,

Nakano 4-chome, Nakano-ku, Tokyo 164-8570, Japan

Note

Importer's name and address will be officially listed on separate construction machine maker instruction manual.

7.4 DESCRIPTION OF BUILT-IN WIRELESS EQUIPMENT

Description of built-in wireless equipment

Apply Standard radio



Hereby, TP-Link Corporation Limited. declares that the radio equipment type TL-WN725N is in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address:

<https://www.jrc-m.co.jp/english/products/support.html>

С настоящото, TP-Link Corporation Limited. декларира, че този тип радиосъоръжение TL-WN725N е в съответствие с Директива 2014/53/ЕС.

Цялостният текст на ЕС декларацията за съответствие може да се намери на следния интернет адрес:

<https://www.jrc-m.co.jp/english/products/support.html>

Tímto TP-Link Corporation Limited. prohlašuje, že typ rádiového zařízení TL-WN725N je v souladu se směrnicí 2014/53/EU.

Úplné znění EU prohlášení o shodě je k dispozici na této internetové adrese:

<https://www.jrc-m.co.jp/english/products/support.html>

Hermed erklærer TP-Link Corporation Limited. at radioudstyrstypen TL-WN725N er i overensstemmelse med direktiv 2014/53/EU.

EU-overensstemmelseserklæringens fulde tekst kan findes på følgende internetadresse:

<https://www.jrc-m.co.jp/english/products/support.html>

Hiermit erklárt TP-Link Corporation Limited. dass der Funkanlagentyp TL-WN725N der Richtlinie 2014/53/EU entspricht.

Der vollständige Text der EU-Konformitätserklärung ist unter der folgenden Internetadresse verfügbar:

<https://www.jrc-m.co.jp/english/products/support.html>

Käesolevaga deklareerib TP-Link Corporation Limited. et käesolev raadioseadme tüüp TL-WN725N vastab direktiivi 2014/53/EL nõuetele.

ELi vastavusdeklaratsiooni täielik tekst on kättesaadav järgmisel internetiaadressil:

<https://www.jrc-m.co.jp/english/products/support.html>

Με την παρούσα ο/η TP-Link Corporation Limited, δηλώνει ότι ο ραδιοεξοπλισμός TL-WN725N πληροί την οδηγία 2014/53/ΕΕ.

Το πλήρες κείμενο της δήλωσης συμμόρφωσης ΕΕ διατίθεται στην ακόλουθη ιστοσελίδα στο διαδίκτυο:

<https://www.jrc-m.co.jp/english/products/support.html>

Por la presente, TP-Link Corporation Limited, declara que el tipo de equipo radioeléctrico TL-WN725N es conforme con la Directiva 2014/53/UE.

El texto completo de la declaración UE de conformidad está disponible en la dirección Internet siguiente:

<https://www.jrc-m.co.jp/english/products/support.html>

Le soussigné, TP-Link Corporation Limited, déclare que l'équipement radioélectrique du type TL-WN725N est conforme à la directive 2014/53/UE.

Le texte complet de la déclaration UE de conformité est disponible à l'adresse internet suivante:

<https://www.jrc-m.co.jp/english/products/support.html>

Il fabbricante, TP-Link Corporation Limited, dichiara che il tipo di apparecchiatura radio TL-WN725N è conforme alla direttiva 2014/53/UE.

Il testo completo della dichiarazione di conformità UE è disponibile al seguente indirizzo Internet:

<https://www.jrc-m.co.jp/english/products/support.html>

Ar šo TP-Link Corporation Limited, deklarē, ka radioiekārta TL-WN725N atbilst Direktīvai 2014/53/ES.

Pilns ES atbilstības deklarācijas teksts ir pieejams šādā interneta vietnē:

<https://www.jrc-m.co.jp/english/products/support.html>

Aš, TP-Link Corporation Limited, patvirtinu, kad radijo įrenginių tipas TL-WN725N atitinka Direktyvą 2014/53/ES.

Visas ES atitikties deklaracijos tekstas prieinamas šiuo interneto adresu:

<https://www.jrc-m.co.jp/english/products/support.html>

TP-Link Corporation Limited, ovime izjavljuje da je radijska oprema tipa TL-WN725N u skladu s Direktivom 2014/53/EU.

Cjeloviti tekst EU izjave o sukladnosti dostupan je na sljedećoj internetskoj adresi:

<https://www.jrc-m.co.jp/english/products/support.html>

TP-Link Corporation Limited. igazolja, hogy a TL-WN725N típusú rádióberendezés megfelel a 2014/53/EU irányelvnek.

Az EU-megfelelőségi nyilatkozat teljes szövege elérhető a következő internetes címen:

<https://www.jrc-m.co.jp/english/products/support.html>

B'dan, TP-Link Corporation Limited. niddikjara li dan it-tip ta' tagħmir tar-radju TL-WN725N huwa konformi mad-Direttiva 2014/53/UE.

It-test kollu tad-dikjarazzjoni ta' konformità tal-UE huwa disponibbli f'dan l-indirizz tal-Internet li ġej:

<https://www.jrc-m.co.jp/english/products/support.html>

Hierbij verklaar ik, TP-Link Corporation Limited. dat het type radioapparatuur TL-WN725N conform is met Richtlijn 2014/53/EU.

De volledige tekst van de EU-conformiteitsverklaring kan worden geraadpleegd op het volgende internetadres:

<https://www.jrc-m.co.jp/english/products/support.html>

TP-Link Corporation Limited. niniejszym oświadczam, że typ urządzenia radiowego TL-WN725N jest zgodny z dyrektywą 2014/53/UE.

Pełny tekst deklaracji zgodności UE jest dostępny pod następującym adresem internetowym:

<https://www.jrc-m.co.jp/english/products/support.html>

O(a) abaixo assinado(a) TP-Link Corporation Limited. declara que o presente tipo de equipamento de rádio TL-WN725N está em conformidade com a Diretiva 2014/53/UE.

O texto integral da declaração de conformidade está disponível no seguinte endereço de Internet:

<https://www.jrc-m.co.jp/english/products/support.html>

Prin prezenta, TP-Link Corporation Limited. declară că tipul de echipamente radio TL-WN725N este în conformitate cu Directiva 2014/53/UE.

Textul integral al declarației UE de conformitate este disponibil la următoarea adresă internet:

<https://www.jrc-m.co.jp/english/products/support.html>

TP-Link Corporation Limited. týmto vyhlasuje, že rádiové zariadenie typu TL-WN725N je v súlade so smernicou 2014/53/EÚ.

Úplné EÚ vyhlásenie o zhode je k dispozícii na tejto internetovej adrese:

<https://www.jrc-m.co.jp/english/products/support.html>

TP-Link Corporation Limited. potrjuje, da je tip radijske opreme TL-WN725N skladen z Direktivo 2014/53/EU.

Celotno besedilo izjave EU o skladnosti je na voljo na naslednjem spletnem naslovu:

<https://www.jrc-m.co.jp/english/products/support.html>

TP-Link Corporation Limited. vakuuttaa, että radiolaitetyyppi TL-WN725N on direktiivin 2014/53/EU mukainen.

EU-vaatimustenmukaisuusvakuutuksen täysimittainen teksti on saatavilla seuraavassa internetosoitteessa:

<https://www.jrc-m.co.jp/english/products/support.html>

Härmed försäkrar TP-Link Corporation Limited. att denna typ av radioutrustning TL-WN725N överensstämmer med direktiv 2014/53/EU.

Den fullständiga texten till EU-försäkran om överensstämmelse finns på följande webbadress:

<https://www.jrc-m.co.jp/english/products/support.html>

İşbu belge ile TP-Link Corporation Limited., TL-WN725N tipi radyo ekipmanının 2014/53/EU Yönergesi ile uyumlu olduğunu beyan eder.

AB uygunluk beyanının tam metnine aşağıdaki internet adresinden ulaşılabilir:

<https://www.jrc-m.co.jp/english/products/support.html>

Hér með lýsir TP-Link Corporation Limited. því yfir að fjarskiptabúnaður af gerðinni TL-WN725N sé í samræmi við tilskipun 2014/53/ESB.

Fullur texti ESB-samræmisýfirlýsingarinnar er fáanlegur á eftirfarandi netfangi:

<https://www.jrc-m.co.jp/english/products/support.html>

Herved erklærer TP-Link Corporation Limited. at radioutstyret type TL-WN725N er i samsvar med direktiv 2014/53/EU.

Den fullstendige teksten til EU-samsvarserklæringen er tilgjengelig på følgende internettadresse:

<https://www.jrc-m.co.jp/english/products/support.html>

JRC Mobility

JRC Mobility Inc.

NAKANO CENTRAL PARK EAST, 10-1,

Nakano 4-chome, Nakano-ku, Tokyo 164-8570, Japan

Note

Importer's name and address will be officially listed on separate construction machine maker instruction manual.

Description of built-in wireless equipment

Apply Standard radio



Hereby, TP-Link Corporation Limited. declares that the radio equipment type TL-WN725N is in compliance with S.I. 2017/1206.

The full text of the UK declaration of conformity is available at the following internet address:

<https://www.jrc-m.co.jp/english/products/support.html>

С настоящото, TP-Link Corporation Limited. декларира, че този тип радиосъоръжение TL-WN725N е в съответствие Законов инструмент 2017/1206.

Цялостният текст на Великобритания декларацията за съответствие може да се намери на следния интернет адрес:

<https://www.jrc-m.co.jp/english/products/support.html>

Tímto TP-Link Corporation Limited. prohlašuje, že typ rádiového zařízení TL-WN725N je v souladu se Statutární nástroj 2017/1206.

Úplné znění UK prohlášení o shodě je k dispozici na této internetové adrese:

<https://www.jrc-m.co.jp/english/products/support.html>

Hermed erklærer TP-Link Corporation Limited. at radioudstyr typen TL-WN725N er i overensstemmelse med Lovbestemt instrument 2017/1206.

UK-overensstemmelseserklæringens fulde tekst kan findes på følgende internetadresse:

<https://www.jrc-m.co.jp/english/products/support.html>

Hiermit erklärt TP-Link Corporation Limited. dass der Funkanlagentyp TL-WN725N der Statutarisches Instrument 2017/1206 entspricht.

Der vollständige Text der UK-Konformitätserklärung ist unter der folgenden Internetadresse verfügbar:

<https://www.jrc-m.co.jp/english/products/support.html>

Käesolevaga deklareerib TP-Link Corporation Limited. et käesolev raadioseadme tüüp TL-WN725N vastab Seaduslik instrument 2017/1206 nõuetele.

UK vastavusdeklaratsiooni täielik tekst on kättesaadav järgmisel internetiaadressil:

<https://www.jrc-m.co.jp/english/products/support.html>

Με την παρούσα ο/η TP-Link Corporation Limited. δηλώνει ότι ο ραδιοεξοπλισμός TL-WN725N πληροί Καταστατικό μέσο 2017/1206.

Το πλήρες κείμενο της δήλωσης συμμόρφωσης HB διατίθεται στην ακόλουθη ιστοσελίδα στο διαδίκτυο:

<https://www.jrc-m.co.jp/english/products/support.html>

Por la presente, TP-Link Corporation Limited. declara que el tipo de equipo radioeléctrico TL-WN725N es conforme con el Instrumento estatutario 2017/1206.

El texto completo de la declaración RU de conformidad está disponible en la dirección Internet siguiente:

<https://www.jrc-m.co.jp/english/products/support.html>

Le soussigné, TP-Link Corporation Limited. déclare que l'équipement radioélectrique du type TL-WN725N est conforme à la Instrument statutaire 2017/1206.

Le texte complet de la déclaration Royaume-Uni de conformité est disponible à l'adresse internet suivante:

<https://www.jrc-m.co.jp/english/products/support.html>

Il fabbricante, TP-Link Corporation Limited. dichiara che il tipo di apparecchiatura radio TL-WN725N è conforme alla Atto statutario 2017/1206.

Il testo completo della dichiarazione di conformità UK è disponibile al seguente indirizzo Internet:

<https://www.jrc-m.co.jp/english/products/support.html>

Ar šo TP-Link Corporation Limited. deklarē, ka radioiekārta TL-WN725N atbilst Tiesību akts 2017/1206.

Pilns UK atbilstības deklarācijas teksts ir pieejams šādā interneta vietnē:

<https://www.jrc-m.co.jp/english/products/support.html>

Aš, TP-Link Corporation Limited. patvirtinu, kad radijo įrenginių tipas TL-WN725N atitinka Įstatyminė priemonė 2017/1206.

Visas JK atitikties deklaracijos tekstas prieinamas šiuo interneto adresu:

<https://www.jrc-m.co.jp/english/products/support.html>

TP-Link Corporation Limited. ovime izjavljuje da je radijska oprema tipa TL-WN725N u skladu s Statutarni instrument 2017/1206.

Cjeloviti tekst UK izjave o sukladnosti dostupan je na sljedećoj internetskoj adresi:

<https://www.jrc-m.co.jp/english/products/support.html>

TP-Link Corporation Limited. igazolja, hogy a TL-WN725N típusú rádióberendezés megfelel a Törvényi eszköz 2017/1206.

Az UK-megfelelőségi nyilatkozat teljes szövege elérhető a következő internetes címen:

<https://www.jrc-m.co.jp/english/products/support.html>

B'dan, TP-Link Corporation Limited. niddikjara li dan it-tip ta' tagħmir tar-radju TL-WN725N huwa konformi mad-Strument Statutorju 2017/1206.

It-test kollu tad-dikjarazzjoni ta' konformità tal-UK huwa disponibbli f'dan l-indirizz tal-Internet li ġej:

<https://www.jrc-m.co.jp/english/products/support.html>

Hierbij verklaar ik, TP-Link Corporation Limited. dat het type radioapparatuur TL-WN725N conform is met Wettelijke akte 2017/1206.

De volledige tekst van de VK-conformiteitsverklaring kan worden geraadpleegd op het volgende internetadres:

<https://www.jrc-m.co.jp/english/products/support.html>

TP-Link Corporation Limited. niniejszym oświadcza, że typ urządzenia radiowego TL-WN725N jest zgodny z Instrument ustawy 2017/1206.

Pełny tekst deklaracji zgodności UK jest dostępny pod następującym adresem internetowym:

<https://www.jrc-m.co.jp/english/products/support.html>

O(a) abaixo assinado(a) TP-Link Corporation Limited. declara que o presente tipo de equipamento de rádio TL-WN725N está em conformidade com a Instrumento estatutário 2017/1206.

O texto integral da declaração de conformidade do UK está disponível no seguinte endereço de Internet:

<https://www.jrc-m.co.jp/english/products/support.html>

Prin prezenta, TP-Link Corporation Limited. declară că tipul de echipamente radio TL-WN725N este în conformitate cu Instrumentul Statutar 2017/1206.

Textul integral al declarației UK de conformitate este disponibil la următoarea adresă internet:

<https://www.jrc-m.co.jp/english/products/support.html>

TP-Link Corporation Limited. týmto vyhlasuje, že rádiové zariadenie typu TL-WN725N je v súlade so Zákonný nástroj 2017/1206.

Úplné UK vyhlásenie o zhode je k dispozícii na tejto internetovej adrese:

<https://www.jrc-m.co.jp/english/products/support.html>

TP-Link Corporation Limited. potrjuje, da je tip radijske opreme TL-WN725N skladen z Zakonski akt 2017/1206.

Celotno besedilo izjave UK o skladnosti je na voljo na naslednjem spletnem naslovu:

<https://www.jrc-m.co.jp/english/products/support.html>

TP-Link Corporation Limited. vakuuttaa, että radiolaitetyyppi TL-WN725N on Lakisäätöinen säädös 2017/1206 mukainen.

Iso-Britannia-vaatimustenmukaisuusvakuutuksen täysimittainen teksti on saatavilla seuraavassa internetosoitteessa:

<https://www.jrc-m.co.jp/english/products/support.html>

Härmed försäkrar TP-Link Corporation Limited. att denna typ av radioutrustning TL-WN725N överensstämmer med Lagstiftning 2017/1206.

Den fullständiga texten till UK-försäkran om överensstämmelse finns på följande webbadress:

<https://www.jrc-m.co.jp/english/products/support.html>

İşbu belge ile TP-Link Corporation Limited., TL-WN725N tipi radyo ekipmanının S.I. 2017/1206 ile uyumlu olduğunu beyan eder.

Birleşik Krallık uygunluk beyanının tam metnine aşağıdaki internet adresinden ulaşılabilir:

<https://www.jrc-m.co.jp/english/products/support.html>

Hér með lýsir TP-Link Corporation Limited. yfir að fjarskiptabúnaður af gerðinni TL-WN725N er í samræmi við S.I. 2017/1206.

Fullur texti bresku samræmisýfirlýsingarinnar er fáanlegur á eftirfarandi netfangi:

<https://www.jrc-m.co.jp/english/products/support.html>

Herved erklærer TP-Link Corporation Limited. at radioutstyret type TL-WN725N er i samsvar med S.I. 2017/1206.

Den fullstendige teksten til den britiske samsvarserklæringen er tilgjengelig på følgende internetadresse:

<https://www.jrc-m.co.jp/english/products/support.html>

JRC Mobility

JRC Mobility Inc.

NAKANO CENTRAL PARK EAST, 10-1,

Nakano 4-chome, Nakano-ku, Tokyo 164-8570, Japan

Note

Importer's name and address will be officially listed on separate construction machine maker instruction manual.

8. OPTIONAL EQUIPMENT

8.1 OPERATION OF HYDRAULIC NIBBLER (CRUSHER) AND BREAKER

8.1.1 SELECTION OF NIBBLER (CRUSHER) AND BREAKER

- When installing a nibbler (crusher) or a breaker, select a proper one for the machine stability and the working pressure.
Also, handle it by following precautions of handling specified by the manufacturer of the nibbler (crusher) or the breaker.
- Use of the unapproved attachment/equipment voids KOBELCO's liability for the machine.

8.1.2 INSTALLATION OF NIBBLER (CRUSHER) OR BREAKER

After installing the nibbler (crusher) or the breaker, check that there are no looseness of the installation portions, oil leakage from the piping, and abnormal sound before starting operation.

After removing the nibbler (crusher) and the breaker, plug the machine side piping at the arm end and the nibbler (crusher) or breaker piping to prevent foreign materials and water from entering the piping.

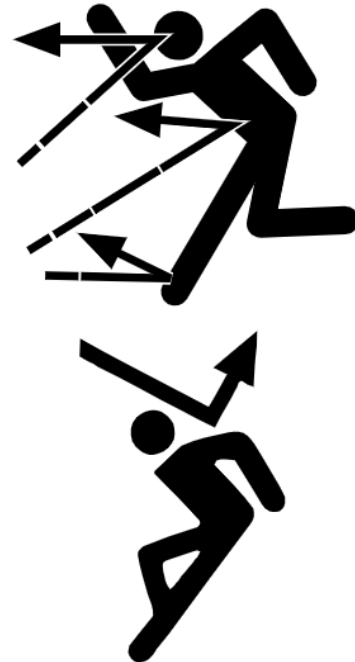
8.1.3 POTENTIAL HAZARDS WHEN OPERATING

PAY ATTENTION TO FALLING MATERIALS AND FLYING DEBRIS

Be sure to install the top guard and the front guard (option) when performing demolition, working in quarry or mining applications or any site in which falling materials and/or flying debris can be generated .

- If working with the hydraulic breaker or other attachments, be sure to install front guard.
- When performing work that may result in falling material and flying debris, keep people a safe distance away from the work area.
- Always close the front window and doors before operating.

As for installing the front guard (option), contact your KOBELCO authorized dealer.



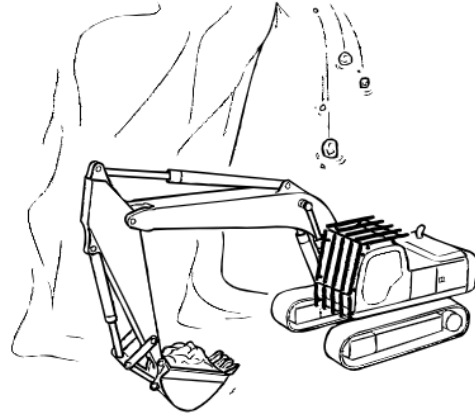
CHECK PROTECTIVE RELATED GUARDS AND EQUIPMENT

- Check that all protective related guards, covers, windows and mirrors are not damaged and are secure prior to operation. If any damage or other issue is found, do not use the machine until the protective related parts and equipment has been replaced. Never attempt to repair protective related parts and equipment.
- Understand how the protective systems and the protective related equipment protects you as the operator and others around the machine.
- Never remove protective related parts and equipment from the machine.

LIMITED PROTECTION FROM OBJECTS FALLING ON THE CAB

When operating near areas where landslides may occur or where rocks or other debris may fall, be aware that the cab and the guards installed provide limited protection for the operator and may not prevent serious injury or death.

- The top guard is designed according to ISO10262 and should not allow loads up to 227 kg (500 lbs.) dropped from a height of 5.22 m (17 ft.) to penetrate the cab. During building demolition or other activities, the load, the distance of the drop, or both could produce forces that exceed the limits of the top guard and cause serious injury or death.
- Never weld, drill or modify the top guard or other protective structures. Any modification could weaken the structural integrity of these protective structures, resulting in serious injury or death in case of collision, falling objects or landslides.
- Do not install any cab lifting device to the top guard or other protective structures.
- If an accident occurs, do not try to straighten or repair the top guard or other protective structures. Contact your KOBELCO authorized dealer for functional verification or replacement of any of the protective structures.



8.1.4 PRECAUTIONS IN USE OF BREAKER

DO NOT PRY AND BREAK FORCIBLY

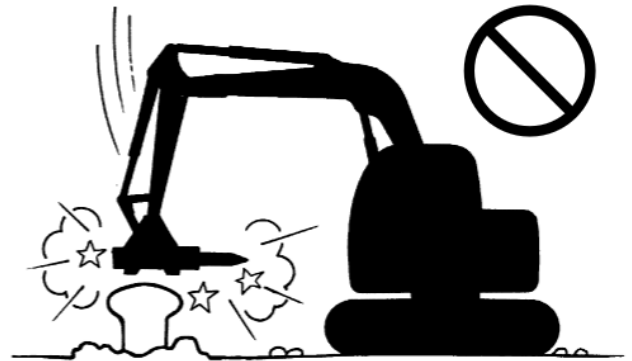
Do not break a rock or concrete by prying it with the breaker. Prying may cause damages to the boom, the arm, and the breaker.



DO NOT USE BREAKER FOR OTHER THAN INTENDED PURPOSE

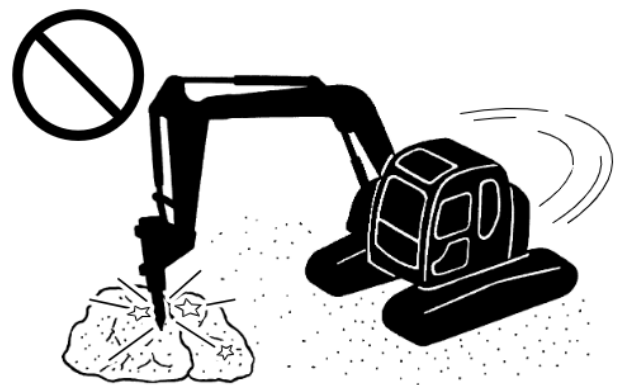
Do not break a rock or concrete by falling or hitting the breaker.

Hitting may cause damages to the boom, the arm, the breaker, and the base machine.



DO NOT MOVE DEBRIS

Do not use the breaker for moving debris and others. Especially, when pulling down rocks and others with the flank of the breaker by using the swinging force, it may cause damages to the boom, the arm, the breaker, and the base machine.

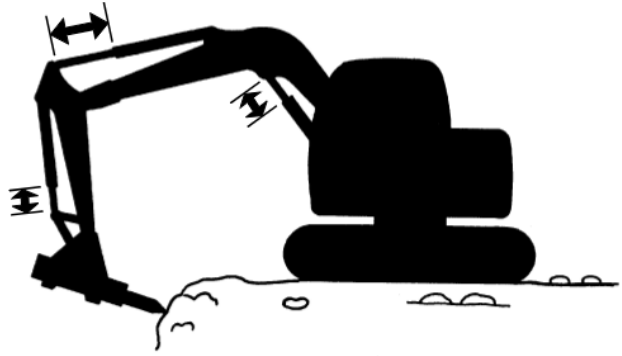


[8. OPTIONAL EQUIPMENT]

CYLINDER ROD AT STROKE END

Operate the cylinder rod with leaving some space to the stroke end.

Operating the hydraulic cylinder at the stroke end during demolition work may cause excessive loads on the boom, the arm, and the base machine, resulting in damages.



CONTINUOUS USE FOR 1 MINUTE OR LONGER

If an object cannot be broken by hitting the same point for 1 minute or more, change the target point.

Using the breaker continuously causes increase of the hydraulic oil temperature or abnormal wear of the breaker chisel.



NEVER PERFORM LIFTING WORK

Never use the breaker for lifting work.

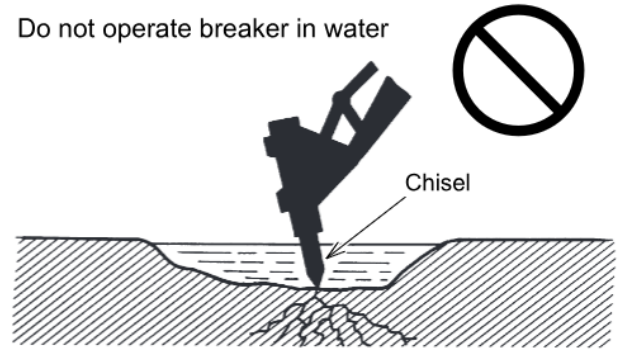


DO NOT OPERATE BREAKER IN WATER

Do not operate the breaker in water.

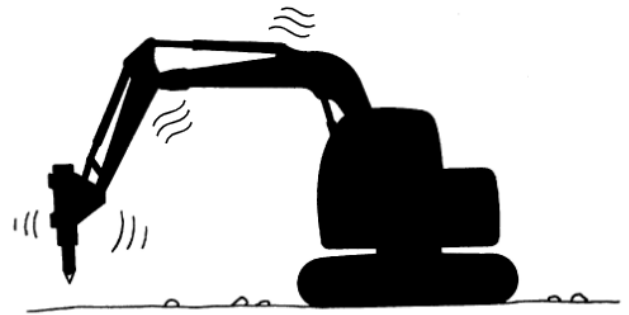
Working in the water can cause rust on the breaker and damage the sealed portions. Consequently, rust, dirt, and water may enter the hydraulic oil and damage the hydraulic components of the base machine.

Do not operate breaker in water

**STOP WORKING WHEN HOSE SWINGS**

When the hydraulic hose swings abnormally during breaker work, stop the work and immediately contact your KOBELCO authorized dealer.

If you continue working, it may cause damages to the hydraulic components and piping.

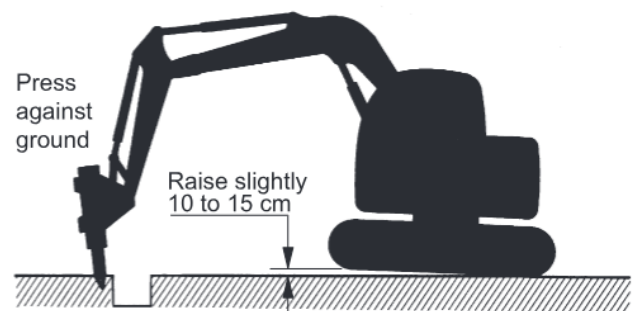
**DO NOT OPERATE BREAKER WITHOUT WORK MATERIAL**

Do not operate the breaker without contact. Operation without material under the tool causes increase of the hydraulic oil temperature and damages to the breaker.

**PAY ATTENTION TO LIFTING UP OF MACHINE**

The lifting amount of the machine during breaker work shall be 10 to 15cm.

If the lifting amount is large, it can cause damages to the boom and the arm.

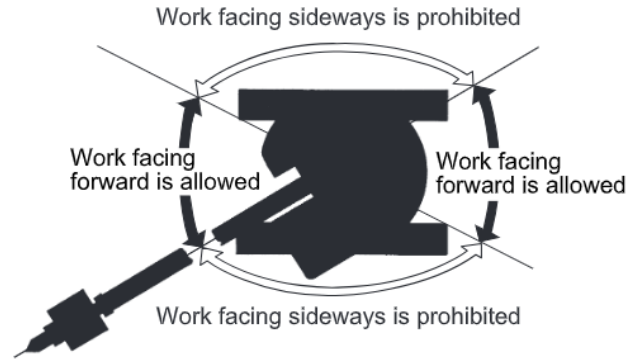


[8. OPTIONAL EQUIPMENT]

DO NOT WORK FACING SIDWAYS

Do not operate the breaker when the machine is facing sideways.

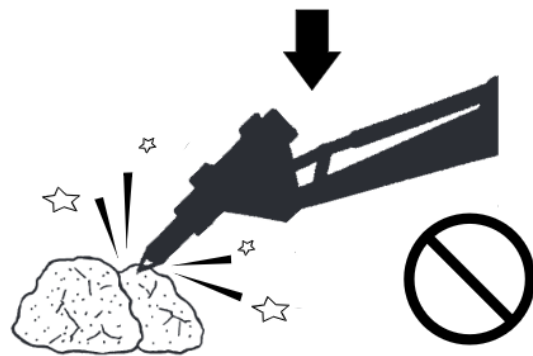
It will cause excessive loads on the travel system, resulting in bending of the shoe plates and oil leakage from the roller.



PAY ATTENTION TO DIRECTION OF BREAKER

The pushing direction of the breaker shall be in the same direction of the chisel axle. Apply the chisel perpendicularly to a surface to be broken during operation.

If you work in an unnatural posture, the sealed portions of the breaker may be damaged, causing foreign materials or water to enter the machine and resulting in damages to the hydraulic components.



DO NOT OPERATE BREAKER IN HORIZONTAL OR UPWARD DIRECTION

Do not operate the breaker in the horizontal or upward direction.

It will cause excessive loads on the boom, the arm and the base machine, resulting in damages.



PAY ATTENTION TO INTERFERENCE BETWEEN CHISEL AND BOOM

When the machine is in a position of holding the breaker inward, it may cause interference between the chisel and the boom. Be careful about operation.



8.1.5 PRECAUTIONS IN USE OF NIBBLER (CRUSHER)

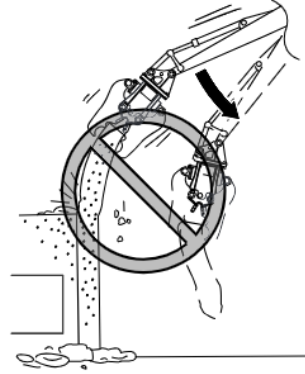
CAUTION

To protect the operator from flying debris and demolished structures, install the front guard and top guard on the cab before demolition.

DO NOT PRY OBJECT

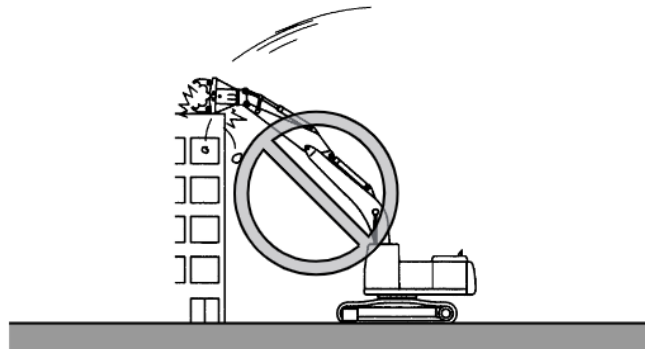
Do not pry or pull down an object while holding it by the nibbler (crusher).

Prying may cause damages to the boom, the arm, and the nibbler (crusher).



DO NOT USE NIBBLER (CRUSHER) FOR OTHER THAN INTENDED PURPOSE

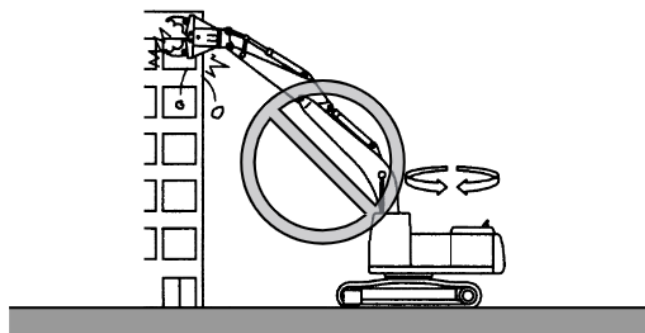
Do not drop or hit the nibbler (crusher) to an object. Hitting may damage the boom, the arm, the nibbler (crusher), and the base machine.



DO NOT SWING DURING NIBBLER (CRUSHER) WORK

Do not demolish or pull down an object by using the swinging force of the machine while holding the object by the nibbler (crusher).

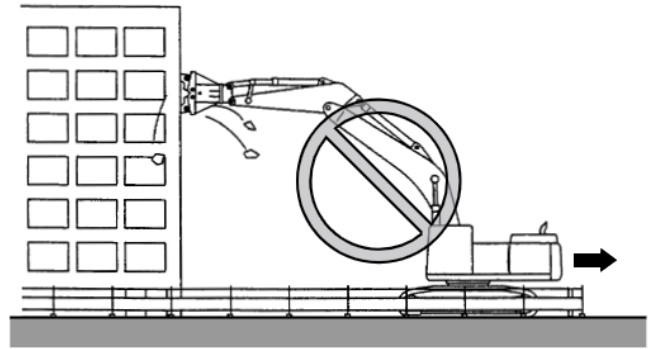
It may cause damages to the boom, the arm, the nibbler (crusher), and the base machine.



DO NOT TRAVEL DURING NIBBLER (CRUSHER) WORK

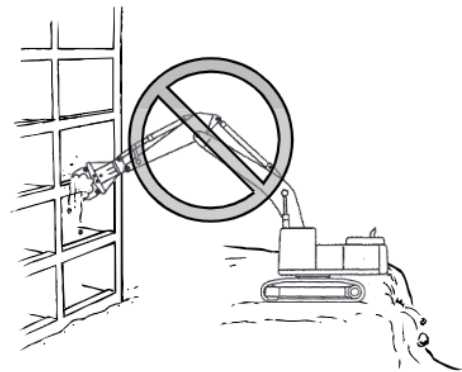
Do not demolish or pull down an object by traveling the machine while holding the object by the nibbler (crusher).

It may cause damages to the boom, the arm, the nibbler (crusher), and the base machine.

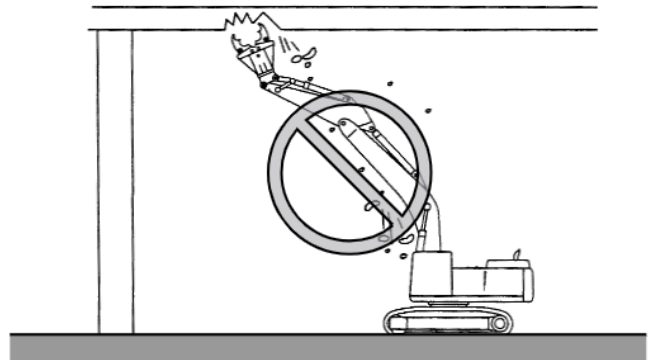
**DO NOT WORK ON UNSTABLE PLACE**

Do not perform work when the machine is on a weak ground or debris.

Working under unstable condition may cause the machine to tip over.

**WATCH OUT FOR FALLING OBJECTS OVERHEAD**

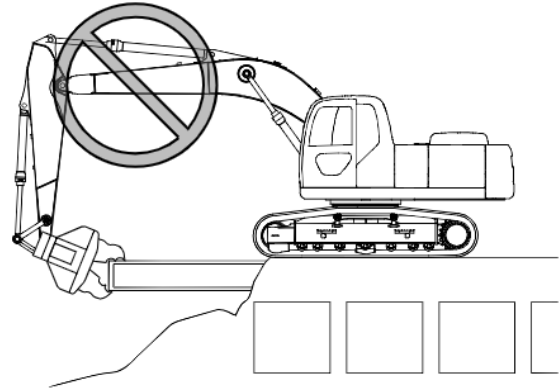
Operating the nibbler (crusher) over the machine can cause demolished structures to fall onto the machine.



[8. OPTIONAL EQUIPMENT]

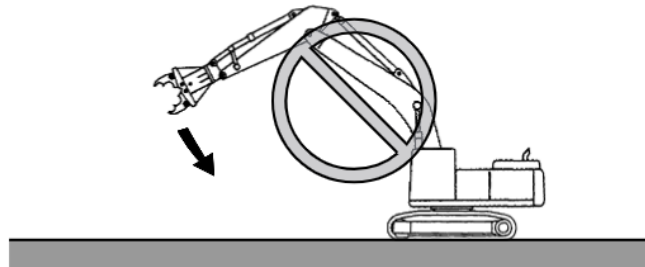
PAY ATTENTION TO GROUND

If an object under the machine is demolished, it causes the ground of the machine to be unstable, resulting in falling of the machine.



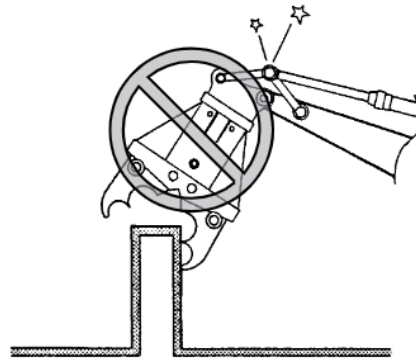
DO NOT OPERATE MACHINE ABRUPTLY

Do not operate or stop the boom, the arm, and the nibbler (crusher) abruptly. It can cause damages to each cylinder and the machine to tip over.



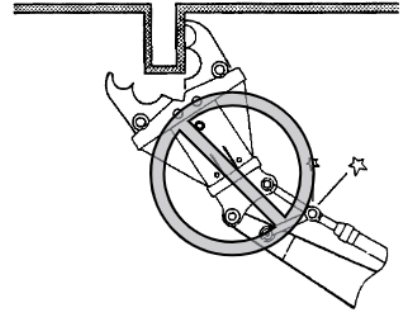
CYLINDER ROD AT STROKE END

Operate the cylinder rod with leaving some space to the stroke end. Operating the hydraulic cylinder at the stroke end during demolition work may cause excessive loads on the boom, the arm, the link portions, and the base machine, resulting in damages.

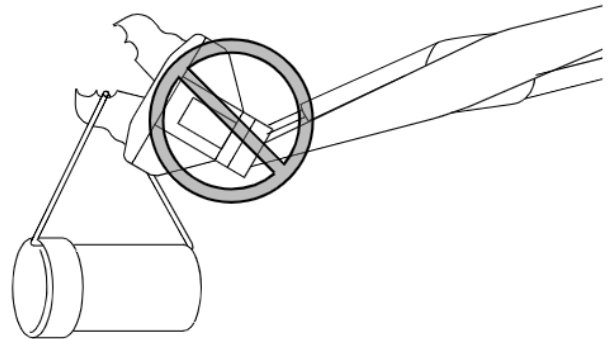


DO NOT HOLD OBJECT OBLIQUELY BY NIBBLER (CRUSHER)

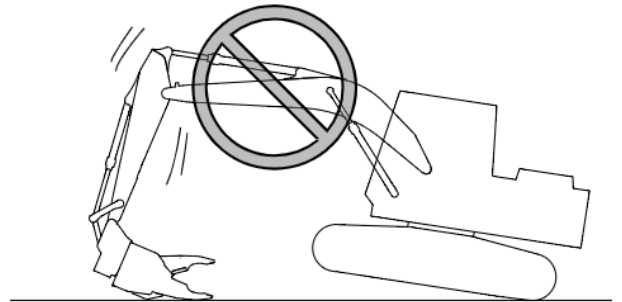
Do not set the machine in a position or posture in which the nibbler (crusher) has to hold an object obliquely. It will cause excessive loads on the arm and the link portions, resulting in damages.

**NEVER PERFORM LIFTING WORK**

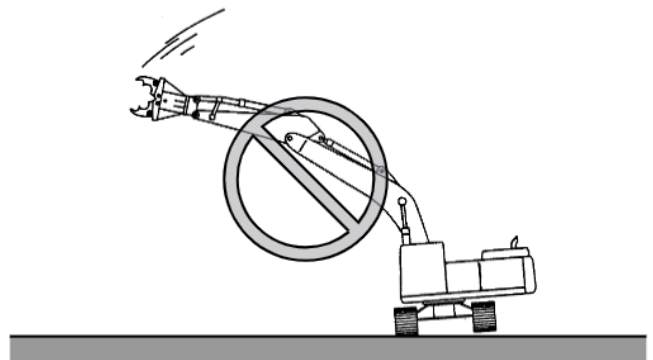
Never use the nibbler (crusher) for lifting work.

**DO NOT LIFT BASE MACHINE**

Do not lift up the base machine by pushing the nibbler (crusher) against the ground. It will cause damages to the boom, the arm, and the nibbler (crusher).

**PAY ATTENTION TO WORKING SIDEWAYS**

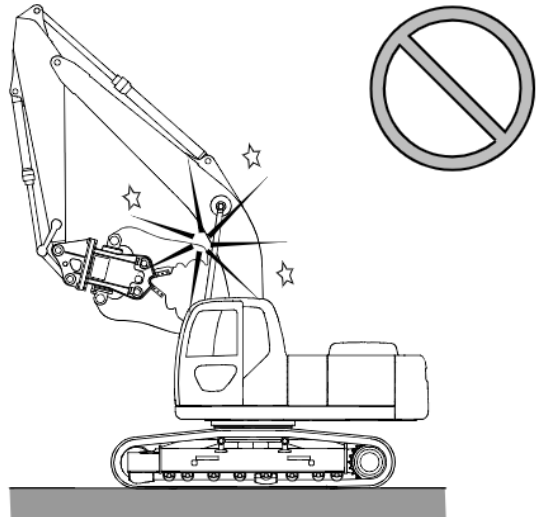
Operating the nibbler (crusher) while the machine is facing sideways may cause the crawlers to be raised off the ground and the machine to become unstable. Always ensure machine is stable before operating.



[8. OPTIONAL EQUIPMENT]

PAY ATTENTION TO INTERFERENCE BETWEEN NIBBLER (CRUSHER) AND BOOM









When the machine is in a position of holding the nibbler (crusher) inward, it may cause interference between the nibbler (crusher) and the boom. Be careful about operation.



8.2 SELECTION OF ATTACHMENT MODE AND SELECTOR VALVE

8.2.1 SWITCHING ATTACHMENT MODE

Select an appropriate mode to use according to the attachment installed.

Display	Attachment mode	Summary
	Bucket	This mode needs to be selected for digging work.
	Breaker	This mode needs to be selected when an attachment using a single flow circuit such as a breaker is installed.
	Nibbler (crusher)	This mode needs to be selected when an attachment using two flow circuits such as a nibbler (crusher) is installed.
	*Rotary grapple	This mode is designed considering the operation such as a grapple.
	*Processor	This mode is designed considering the operation such as a processor.
	*Thumb bucket	This mode is designed considering the operation such as a thumb bucket.
	*Rotary tilt	This mode is designed considering the operation such as a rotary tilt.
	*Individual setting	This mode can be customized for an attachment other than those mentioned above.

CAUTION

- When the attachment mode is inappropriate, select a proper attachment mode.
- Always select the breaker mode when operating a breaker. Working in a mode other than the breaker mode causes damages to the hydraulic components and/or the breaker.
- Be sure to lower the attachment to the ground and ensure safety before switching the attachment mode.

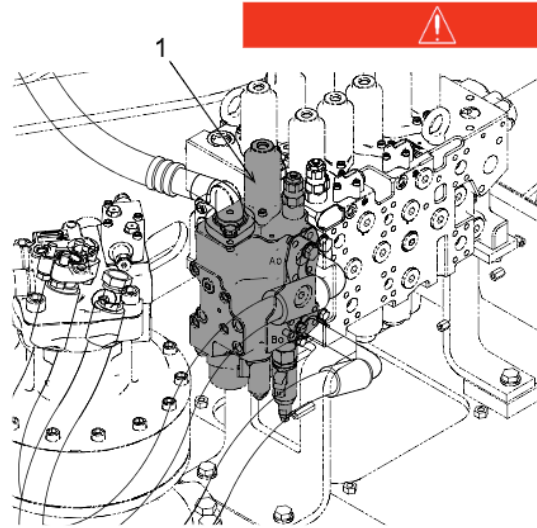
Notice

- If tuning of operability is needed, contact your KOBELCO authorized dealer.
- When the control lock lever is raised upward to the locked(up) position, setting for changing the screen becomes possible.
- The default settings of the modes with " * " are the same as the nibbler mode.

8.2.2 SWITCHING SELECTOR VALVE

Selector valve (1) switches the flow of hydraulic oil. The selector valve is switched automatically according to the selected attachment mode. Therefore, it is necessary to switch to an appropriate attachment mode according to the attachment being installed.

For switching the attachment mode, see "SELECTION OF ATTACHMENT MODE" in Chapter 8.



Attachment Mode	Hydraulic Circuit
Other than breaker	Flow and return circuit
Breaker	Single flow circuit

CAUTION

When "SELECTOR VALVE FAILURE" is displayed on the monitor, the output and input signals of the mechatro controller may be different.

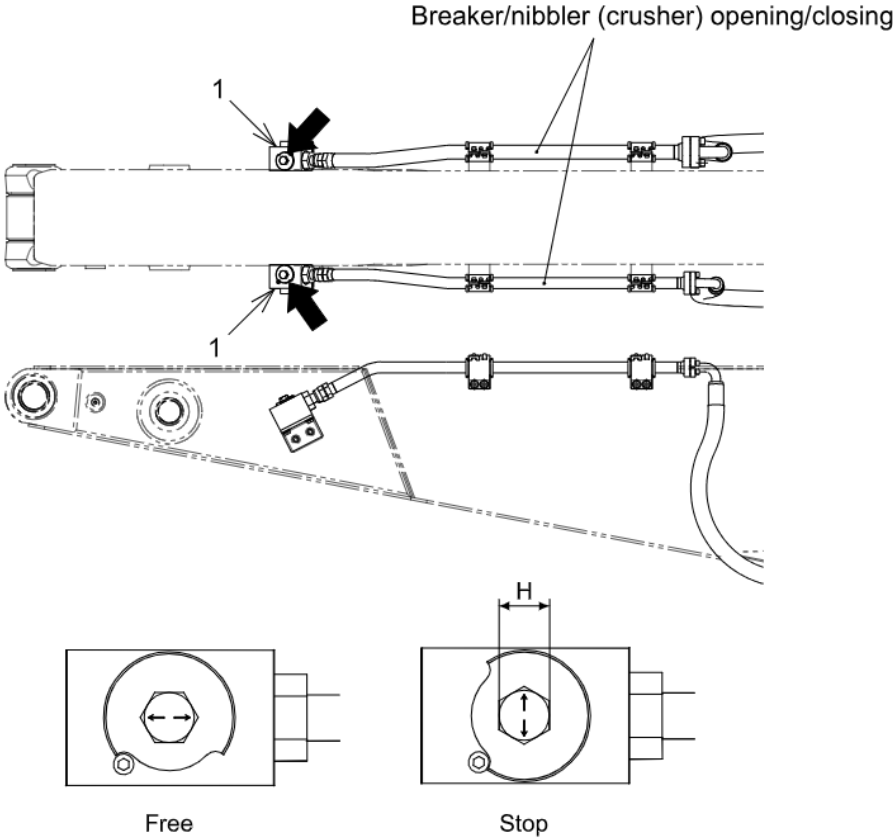
Select a proper attachment mode again. When "SELECTOR VALVE FAILURE" does not go off even when the appropriate attachment mode is selected, it may be due to an electric failure. Contact your KOBELCO authorized dealer.

8.3 SWITCHING STOP VALVE

Stop valves (1), and (2) at the arm top end are used to stop the flow of hydraulic oil. When installing and removing the attachment, the stop valves must be switched to the stop position.

VALVE POSITION

- Free: Hydraulic oil flows
- Stop: Hydraulic oil stops



TOOLS

Hydraulic Circuit	Stop Valve	Wrench Size (H)
Breaker/nibbler opening/closing	1	24mm

8.4 FLOW RATE ADJUSTMENT

Depending on the attachment being installed, the flow rate of service circuit needs to be changed.
For the setting procedure of flow rate, see "SETTING OF ATTACHMENT MODE DETAILS" in Chapter 2.

 **CAUTION**

The flow rate specification varies according to each breaker.
Using the breaker at a flow rate over that described in the specification may cause seizure or overheat of the breaker. Make sure to check the specification of each breaker and adjust the flow rate accordingly.

8.5 CONTROL OF PROPORTIONAL HAND CONTROL

WARNING ATTACHMENT TO BE INSTALLED

The operation methods are explained based on the example of a nibbler (crusher) or breaker installed as a front attachment.

The explanation is based on a case that the opening/closing operation system or breaker operation system is connected to the nibbler (crusher) pipings.

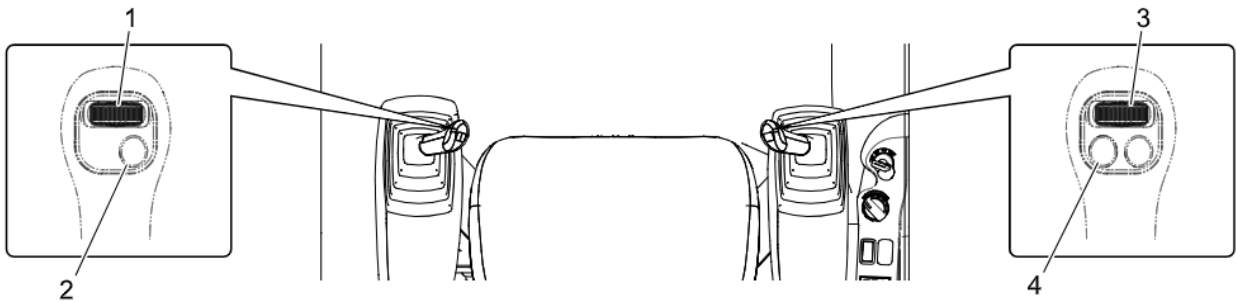
Operation may differ depending on a manufacturer and specification of an attachment installed. Check the operation manual for the manufacturer specification of the attachment before operation.

WARNING ABOUT USE OF PROPORTIONAL HAND CONTROL

Read, fully understand and follow all safety precautions and procedures in the operation & maintenance manual before attempting any operation of the machine.

Notice

When using the nibbler (crusher) or the breaker, see "SELECTION OF ATTACHMENT MODE AND SELECTOR VALVE" in Chapter 8 in the operation & maintenance manual.

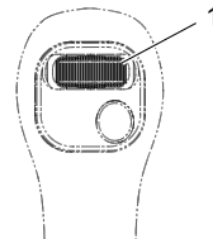


Left Control Lever Switch		Right Control Lever Switch	
1	Extra/Rotary Control Switch	3	Nibbler control switch
2	Horn switch	4	Breaker control switch

8.5.1 EXTRA / ROTARY HAND CONTROL

Slide switch (1) on the left control lever to actuate the extra.

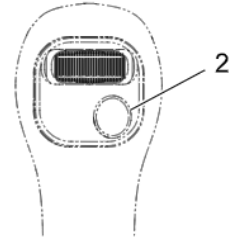
The table below shows that when switch (1) is slid, the left and right, which side of the front attachment the high pressure oil flows when seeing it from the inside of the cab.



Operation procedures	Oil flow
Sliding to the left	Right piping
Sliding to the right	Left piping

8.5.2 HORN SWITCH

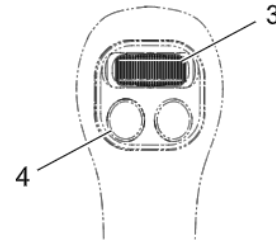
For horn switch (2), see "HORN SWITCH" in Chapter 2 in the operation & maintenance manual.



8.5.3 NIBBLER (CRUSHER) OPERATION

Slide switch (3) that is located on the right control lever to open or close the "nibbler (crusher)".

The table below shows that when switch (3) is slid, the left and right, which side of the front attachment the high pressure oil flows when seeing it from the inside of the cab.



Operation procedures	Oil flow
Sliding to the left	Left piping
Sliding to the right	Right piping



WARNING NIBBLER (CRUSHER) OPERATION

Do not touch breaker switch (button) (4) when operating the nibbler (crusher). The nibbler (crusher) can move abruptly.



WARNING PRECAUTIONS FOR LEAVING THE OPERATOR'S SEAT

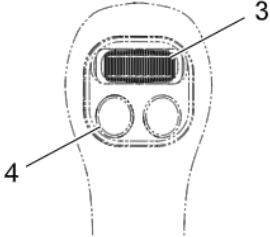
Do not leave the machine with the engine running.

Notice

According to the slide distance of the nibbler (crusher) control switch, the hydraulic oil flow rate increases or decreases.

8.5.4 BREAKER OPERATION

To operate the breaker, press switch (4).
 The table below shows that when switch (4) is pressed, the left piping on the attachment/equipment receives high pressure oil flow when looking from the operator's seat.
 Operate the breaker for maximum of 60 seconds, then release the switch.



Operation procedures	Oil flow
Press switch (4)	Left piping
Release switch (4)	Stops (does not flow)

Notice

The breaker can be operated by sliding nibbler control switch (3) to the left. However, use breaker control switch (button) (4) as much as possible.

WARNING

PRECAUTIONS FOR LEAVING THE OPERATOR'S SEAT

Do not leave the machine with the engine running.

8.6 PERIODIC INSPECTION AND MAINTENANCE OF NIBBLER (CRUSHER) AND BREAKER

8.6.1 PERIODIC INSPECTION AND MAINTENANCE CHART OF NIBBLER (CRUSHER) AND BREAKER

When this machine is used with the hydraulic breaker, the deterioration and contamination of hydraulic oil becomes faster than that of the normal bucket digging work because the machine is used under more severe conditions. Neglecting the maintenance could result in a failure of the base machine, hydraulic breaker, and hydraulic components. To extend the service life of hydraulic components, replace the hydraulic oil and the filter elements, at the following intervals.

As for the return filter element kit to be replaced, ask your KOBELCO authorized dealer for the part number and then place an order.

Item	Inspection and Maintenance Point	Replacement Interval (Hours)		
		First Time	Second Time	Periodic
Hydraulic oil	Hydraulic oil tank	—	—	1000
Return filter element kit	Hydraulic oil tank	50	250	250

8.7 PRECAUTIONS FROM BREAKER MANUFACTURERS

When installing the breaker, first fully read the precautions for using the breaker and precautions for each breaker. Installing an accumulator is sometimes required. Consult your KOBELCO authorized dealer for details before starting installation.

8.8 OBJECT HANDLING

8.8.1 SAFETY PRECAUTIONS

When performing lifting work by this machine, follow the following precautions and be careful about safety.

- Perform the lifting work according to regulations of each country and field.
- Before starting the work, check the parts of the hook, for possible failure.
- Move the machine to a level and firm ground to avoid performing work at a slope or with the condition that the machine is tilted.
- Keep away other workers from the swing area to prevent them from entering the area under a lifted load.
- Use lifting tools (hook, and chain, etc.) with a proper length and without wear and damage.
- Do not lift a load with the bucket teeth, etc.
- Before performing works, turn the over load alarm [ON].
- Perform slowly the lifting work and slowly travel the machine while lifting a load.
- Do not lift a load exceeding the maximum lifting capacity.
- Do not perform towing operation and pulling out operation with the devices for lifting work.
- Do not leave the operator's seat while lifting a load. When stopping the lifting work, lower the load to the ground.
- When strong winds blow, do not perform lifting work.
- Never lift or move personnel by using the lifting tools.

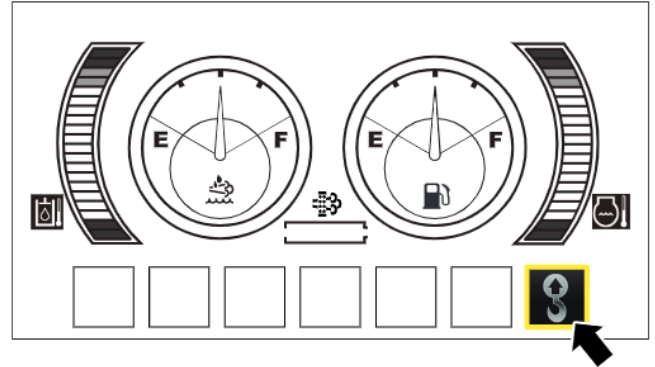


8.8.2 LIFTING WORK

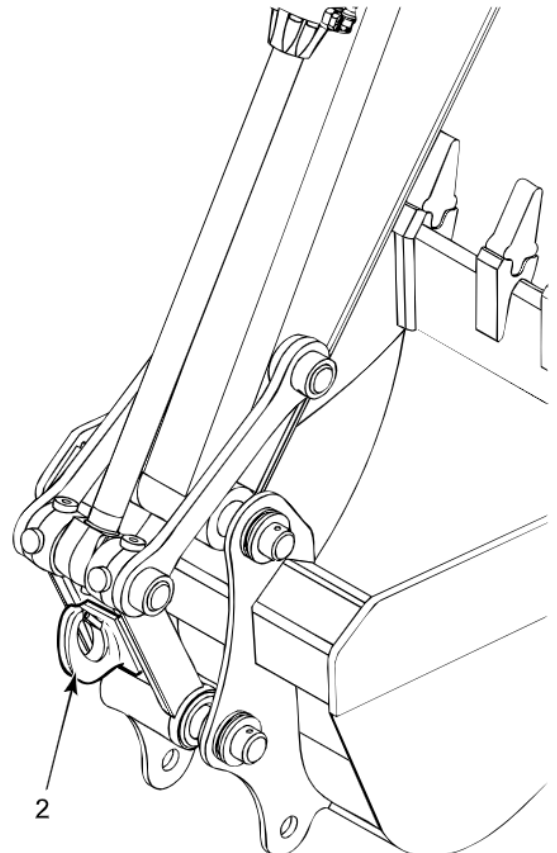
**WARNING****CHECKING LIFTING TOOLS**

The holding valve, the hook, the warning device, and the rated lift capacity chart are the parts necessary to perform lifting work. If some of them are missed, or a failure is found on them, do not perform lifting work.

1. Check the rated lift capacity chart inside the cab and make sure that a total load including the weight of a load to be handled does not exceed the maximum load.
2. Before starting lifting work, turn over load alarm [ON].
(See "Setting of over load alarm" in Chapter 2.)
3. Using a wire or chain with a proper length, lift the load by hook of the bucket link.

**WARNING****CHECKING LIFTING TOOLS**

- Check the lifting tools (hook, and chain, etc.) for wear and damage.
 - Do not use these devices for towing operation and pulling out operation.
4. Perform lifting work slowly and avoid rapid movement that may cause the lifted load to swing. If the value of the lifted load becomes close to the maximum load at each working range, the warning appears on the multi-display and the warning buzzer sounds. At that time, change the working range, or reduce the load.
 5. Lower the load to a level and firm surface and after placing the load on there, remove the wire, etc.





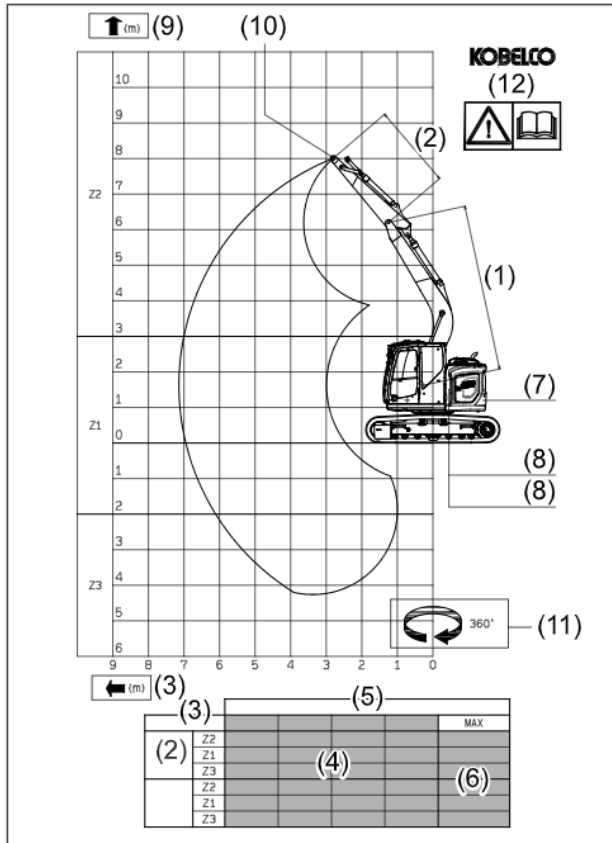
PRECAUTIONS FOR LIFTING WORK

- If a lifted load swings or rotates, it may contact with the workers around the machine and the cab. Check that the workers around the machine are not in the swing area and perform lifting work slowly.
- If the warning buzzer sounds during lifting work, lower the load to the ground.

8.8.3 RATED LIFT CAPACITY CHART

EXPLANATION OF FIGURE

- (1) Boom length
- (2) Arm length
- (3) Distance of load from swing center line
- (4) Maximum load (ton) according to tipping limit based on ISO010567 (stability 75 % and hydraulic system 87 %)
- (5) Maximum load at each working range from axis of swing
- (6) Maximum load at maximum working range from axis of swing
- (7) Counterweight
- (8) Set pressure of main relief valve/ holding valve in hydraulic system
- (9) Height of working range
- (10) Lift point (axis)
- (11) Axis of rotation
- (12) Model name



Notice

Work conditions

- With no front attachment installed (bucket, clamshell, or others).
When lifting a load with the front attachment installed, the weight of the front attachment shall be deducted from the values of this table.
- With a fully retracted bucket cylinder
- On a firm and level ground
- In full swing position

Loads on table

The loads on the table are valid for the work height of range (Z) considered in accordance with an intended distance from the axis of rotation.

8.9 QUICK HITCH



HANDLING QUICK HITCH

Regarding a quick hitch to be installed, use the quick hitch having an automatic mechanical locking mechanism such as a lock pin that will ensure the lock.

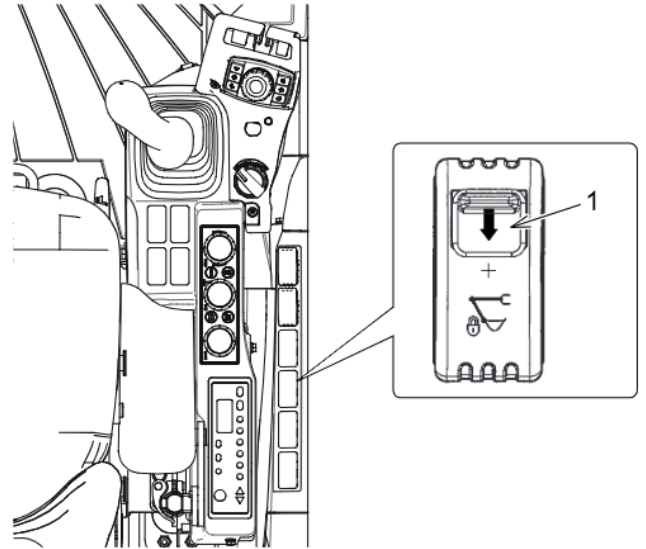
Because when the hydraulic pipes or electric wires are damaged, the hydraulic holding power will be lost, resulting in falling off of the front attachment.

8.9.1 QUICK HITCH OPERATION SWITCH

Use this switch to install and remove the front attachment from the quick hitch.

Move sliding portion (1) of the switch to the direction of the arrow shown in the figure and then push the "LOCK" or "UNLOCK" side to switch the function.

If you release the switch, the switch automatically returns to the neutral position.



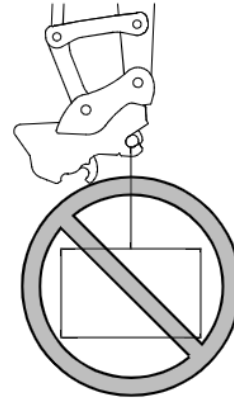
Notice

- The alarm sound keeps going off while the "UNLOCK" or "LOCK" side of the quick hitch operation switch is being pushed.
- For detailed operations, see "REMOVING FRONT ATTACHMENT" and "INSTALLING FRONT ATTACHMENT" sections in Chapter 8.

8.9.2 PROHIBITED WORKS

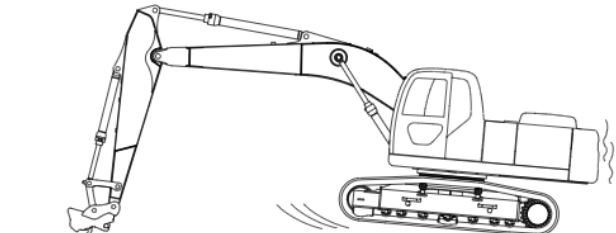
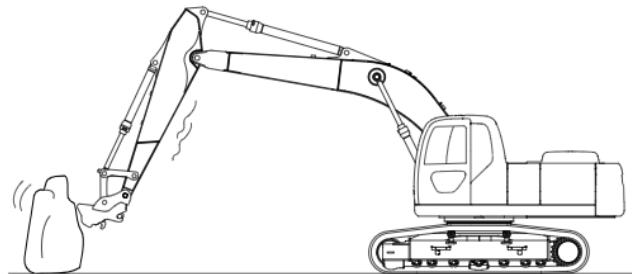
DO NOT PERFORM LIFTING WORK

Never perform any lifting work using the quick hitch. A lifted load may fall and cause serious accidents.



DO NOT WORK WITHOUT FRONT ATTACHMENT

Do not lift a load or the machine, when the front attachment is not installed. It may cause damage to the quick hitch.



DO NOT LIFT OR MOVE PERSONNEL

Never lift or move personnel by using the quick hitch. The lifted personnel may fall off, causing severe accidents.



8.9.3 PRECAUTIONS FOR USE

CHECK OPERATION & MAINTENANCE MANUAL OF QUICK HITCH

Before installing the quick hitch, carefully read the operation & maintenance manual of the quick hitch.

CHECK EFFECTS TO OPERATING RANGE AND LIFTING CAPACITIES

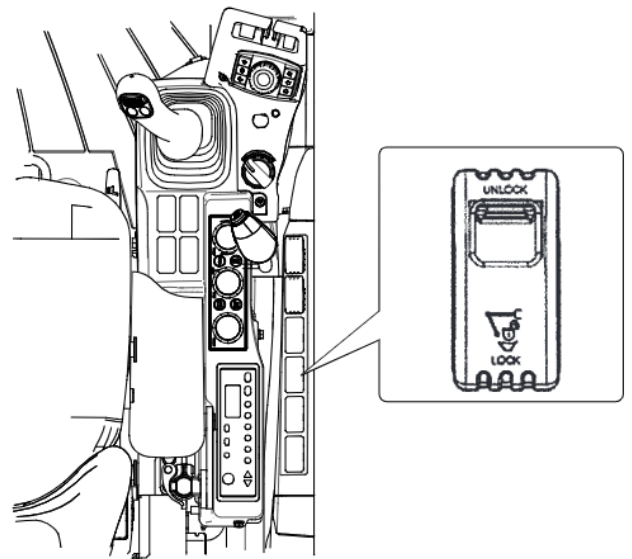
When the quick hitch is installed, the operating range and the lifting capacities will be changed. Also, according to the installed quick hitch or front attachment, it may interfere with the attachment/equipment or the base machine. Before starting work, check the operating range, and make sure that the total loads including the weight of the quick hitch, the front attachment, and a load to be handled do not exceed the maximum load described in the rated lift capacity chart inside the cab.

CHECK QUICK HITCH OPERATION SWITCH

When the front attachment is installed, check that the operation switch is in the neutral position before starting the engine.

(See "QUICK HITCH OPERATION SWITCH" in Chapter 2.)

The table below shows that when the switch is slid left or right, which side of the front attachment the high pressure oil flows when seeing it from the inside of the cab.



Operation procedures	Oil flow
LOCK side	Right piping
UNLOCK side	Left piping

INSPECTION BEFORE OPERATION

Before operating the machine, check the installation part for engagement and looseness, and the pipes for oil leakage.

8.9.4 INSTALLING FRONT ATTACHMENT



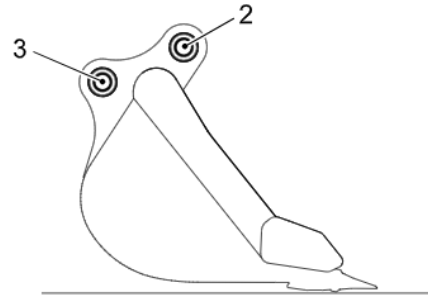
INSTALLING FRONT ATTACHMENT

- Work on a stable and level ground to prevent the front attachment from falling down.
- After installing the front attachment, make sure that the quick hitch holds the front attachment securely.

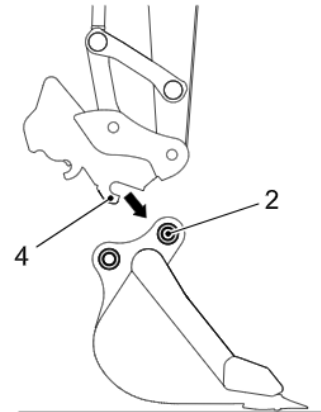
The quick hitch shown in the explanation figures is an example.

Before performing this work, carefully read the operation & maintenance manual of the installed quick hitch.

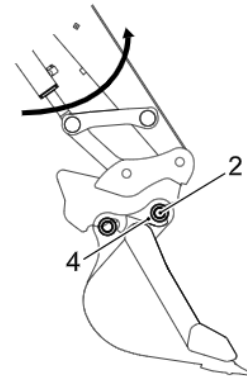
1. Place the front attachment on a level ground.
Attach pins (2) and (3) to the front attachment.



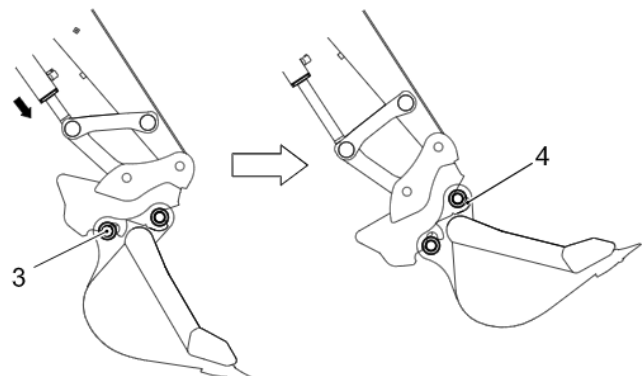
2. Operate the machine to lower the quick hitch and engage fixed hook (4) with pin (2).



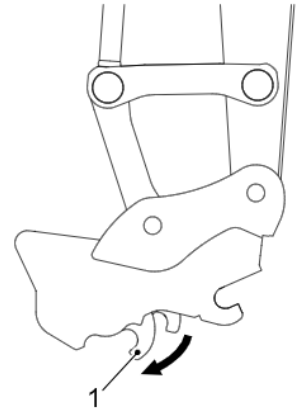
3. Raise the arm to float the bucket.
Securely mesh fixed hook (4) with pin (2).



4. Extend the bucket cylinder so that the quick hitch comes in contact with pin (3).
At that time, make sure that fixed hook (4) engages with pin (2).



5. Push the "LOCK" side of the quick hitch operation switch to engage movable hook (1) with pin (3). (See "QUICK HITCH OPERATION SWITCH" in Chapter 2.)
6. Check that the front attachment is securely installed, according to the operation & maintenance manual of the installed front attachment.

**Notice**

If the engagement of the quick hitch cannot be fully checked from the operator's seat, get off the machine and check the engagement at a place close to the quick hitch.

8.9.5 REMOVING FRONT ATTACHMENT



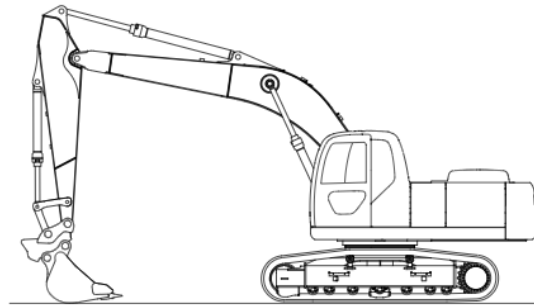
REMOVING FRONT ATTACHMENT

- Work on a stable and level ground to prevent the front attachment from falling down.
- Be sure to lower the front attachment to the ground before operating the quick hitch.

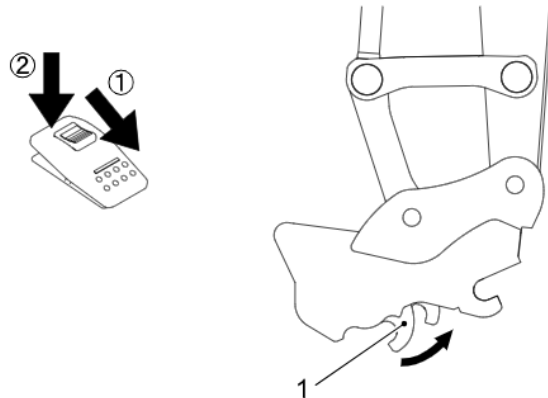
The quick hitch shown in the explanation figures is an example.

Before performing this work, carefully read the operation & maintenance manual of the installed quick hitch.

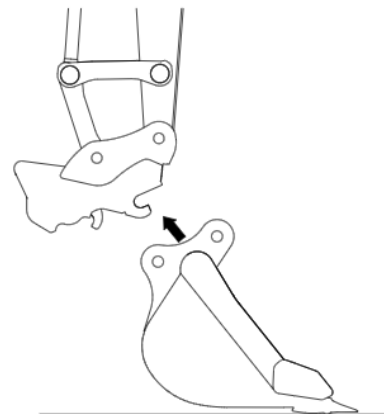
1. Move the machine to a level ground and lower the front attachment to the ground.



2. Push the "UNLOCK" side of the quick hitch operation switch to move movable hook (1) to release the front attachment.
(See "QUICK HITCH OPERATION SWITCH" in Chapter 2.)



3. Move the attachment/equipment of the machine side to remove the front attachment.



Notice

Some kinds of quick hitch may be difficult to remove from the front attachment. In that case, operate the pressure reducing valve to make the removal work easier.

(See "MANUAL SWITCHING OF PRESSURE REDUCING VALVE FOR QUICK HITCH" in Chapter 8.)

8.9.6 MANUAL SWITCHING OF PRESSURE REDUCING VALVE FOR QUICK HITCH

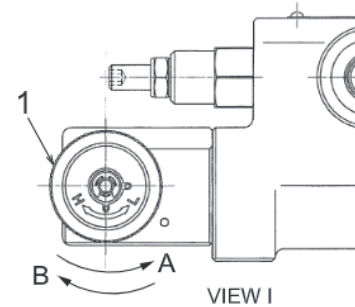
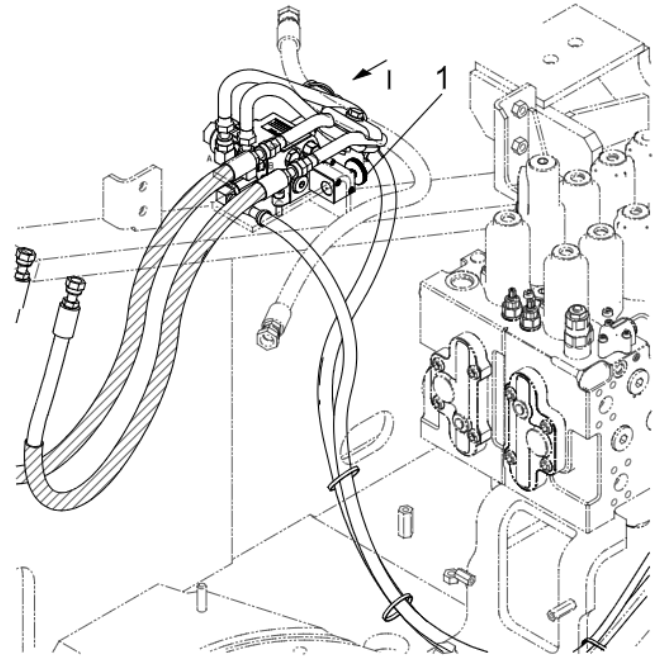
Some kinds of quick hitch may be difficult to remove from the front attachment.

In that case, switch the pressure reducing valve manually to apply a high pressure on the "UNLOCK" side of the quick hitch to make it easier to remove.

- Turn valve switch knob (1) to direction A to increase the pressure at the unlock side (rod side) of the quick hitch.

With this condition, remove the front attachment. (See "REMOVING FRONT ATTACHMENT" in Chapter 8.)

- Except when removing the front attachment, turn switch knob (1) to direction B until it reaches the stop position. The pressure of the quick hitch at the unlock side (rod side) will be decreased. When operating the switch knob, do not stop it halfway but be sure to turn it until it reaches the stop position.



8.10 SETTING TRAVEL ALARM

CAUTION

If the travel alarm does not sound when it is turned "ON" and the travel levers (or pedals) are operated, stop the engine immediately and contact your KOBELCO authorized dealer for repair.
Do not keep on operating the machine with the travel alarm in the failure condition.

The travel alarm sounds the alarm to the surrounding personnel when the machine is traveling.

ON: The alarm sounds.

OFF: The alarm stops.

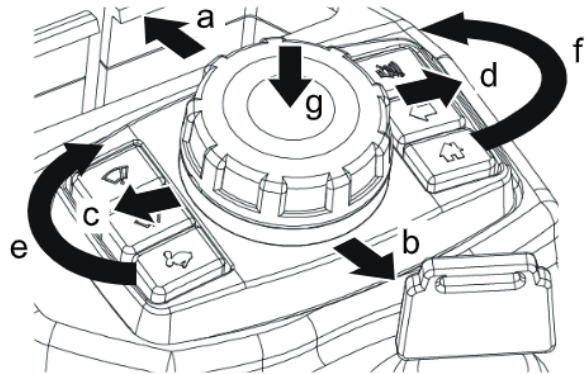
Jog dial operation

Tilting (a,b,c,d) and rotating (e,f) the jog dial

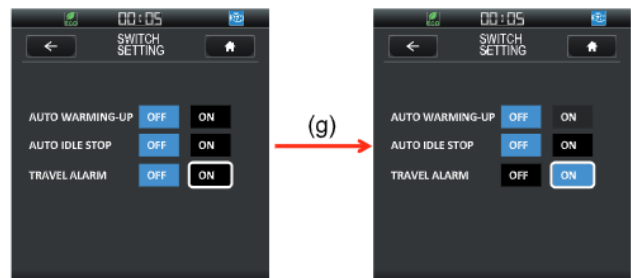
To move the cursor on the monitor and adjust the values and others.

Pushing down (g) the jog dial

- To switch the screen to the selected setting screen.
- To determine the adjusted value and others.



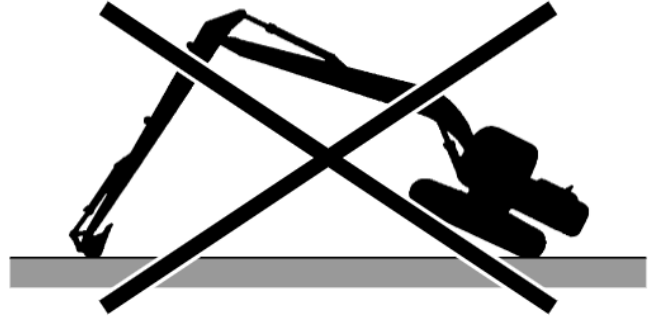
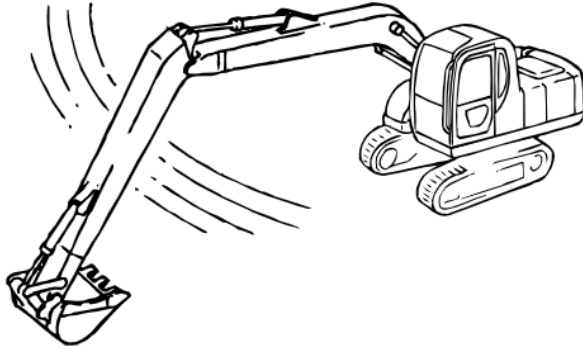
1. Tilt and turn the jog dial to move the cursor on the monitor to [ON] of [TRAVEL ALARM].
2. Push down (g) the jog dial to switch the setting to [ON].



8.11 HANDLING THE LONG RANGE ATTACHMENT

A machine with a long-range attachment can reach long distances and effectively dredge and clean mud and sludge accumulated at the bottom of rivers. However, the machine must be handled carefully. Failure to correctly use the attachment may damage it and cause a personnel accident.

8.11.1 CAUTION ON OPERATION



- The long range attachment is made only for light operations. Do not use the long-range attachment for civil engineering work such as excavation.
- Operate the machine smoothly to perform stable and safe swing motion as the boom and the arm are very long.
- If the machine is suddenly operated to stop slewing, it swings the attachment greatly and exerts unreasonable force upon the attachment, which may damage to the machine. Operate the machine smoothly exercising full care.
- Do not use the power boost switch.
When the long-range attachment is attached, the use of attachment boost is strictly prohibited.
- Cylinder rod at stroke end
Operate the cylinder rod with leaving some space to the stroke end.
Operating the hydraulic cylinder at the stroke end during demolition work may cause excessive loads on the boom, the arm, and the base machine, resulting in damages.
- The large length of the boom and the arm increases the maximum digging height and the reach, Therefore, exercise full care of interference with the upper front of the machine and interference with other things when slewing the machine.
- Do not lift or drive the machine with the bucket on the ground. it is dangerous because force is added to the pin near the bucket.
- Use the KOBELCO recommended bucket.
If a bucket other than the recommended bucket is used, it may cause breakage of the attachment/equipment or the cylinders.

Notice

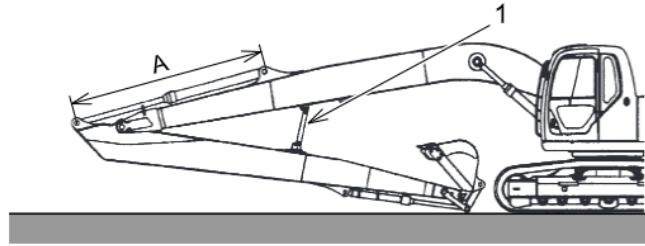
The work mode is fixed and unselectable in this machine specification.

8.11.2 CAUTION ON TRANSPORTING

Avoid transporting the machine on the road with the attachment/equipment largely sticking out of the end of a trailer.

Be sure to remove the long range attachment/equipment from the base machine.

When transporting the machine within the working site, if it is unavoidable to transport the machine by a trailer with the long range attachment/equipment installed, fold the arm before the transportation. However, an excessive load will be applied on the arm cylinder because of its own weight. Be sure to install accessory transportation support bar (1) between the boom and the arm.

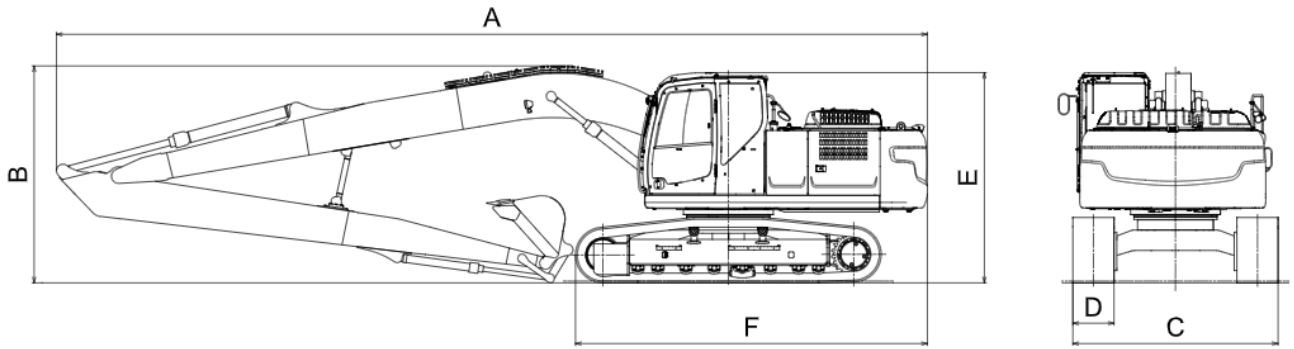


Notice

Attach the transportation support bar after retracting the arm cylinder to approximately 5 mm from the arm cylinder stroke end (A).

8.11.3 GENERAL SPECIFICATIONS

MACHINE DIMENSIONS



	Item	Unit	SK210LC-11E
A	Overall length	mm (ft-in)	12,690 (41'8")
B	Overall height	mm (ft-in)	3,160 (10'4")
C	Overall width	mm (ft-in)	2,990 (9'10")
D	Track shoe width (Grouser shoe)	mm (inch)	600 (23.6")
E	Cab height	mm (ft-in)	3,060 (10'0")
F	Base machine length	mm (inch)	5,130 (16'10")

WEIGHT

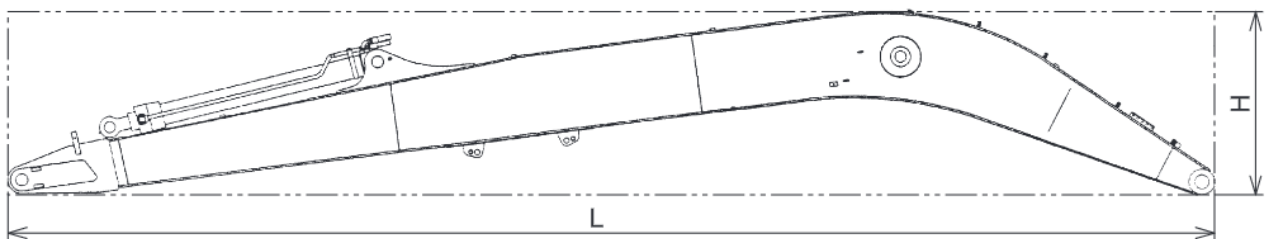
Item	Unit	SK210LC-11E
Attachment Types	ft	50
Shoes	mm (inch)	600 (23.6")
Working Weight	kg (lb)	23,600 (52,000)

GROUND PRESSURE

Item	Unit	SK210LC-11E
Attachment Types	ft	50
Ground pressure (600mm Shoe)	kPa (psi)	49 (7.1)

OVERALL SPECIFICATIONS OF BOOM

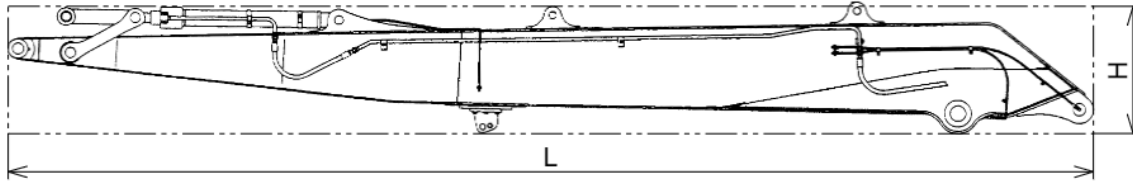
Item	Unit	8.75m (28'8") Boom
L x H x W	m (ft-in)	8.96 x 1.44 x 0.67 (29'5" x 4'9" x 26.4")
Weight	kg (lb)	2,290 (5,050)



[8. OPTIONAL EQUIPMENT]

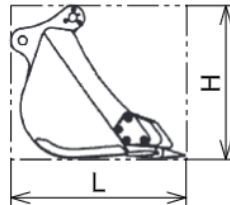
OVERALL SPECIFICATION OF ARM

Item	Unit	6.35m (20'10") Arm
L x H x W	m (ft-in)	7.31 x 0.89 x 0.41 (23'12" x 35.0" x 16.1")
Weight	kg (lb)	1,240 (2,730)

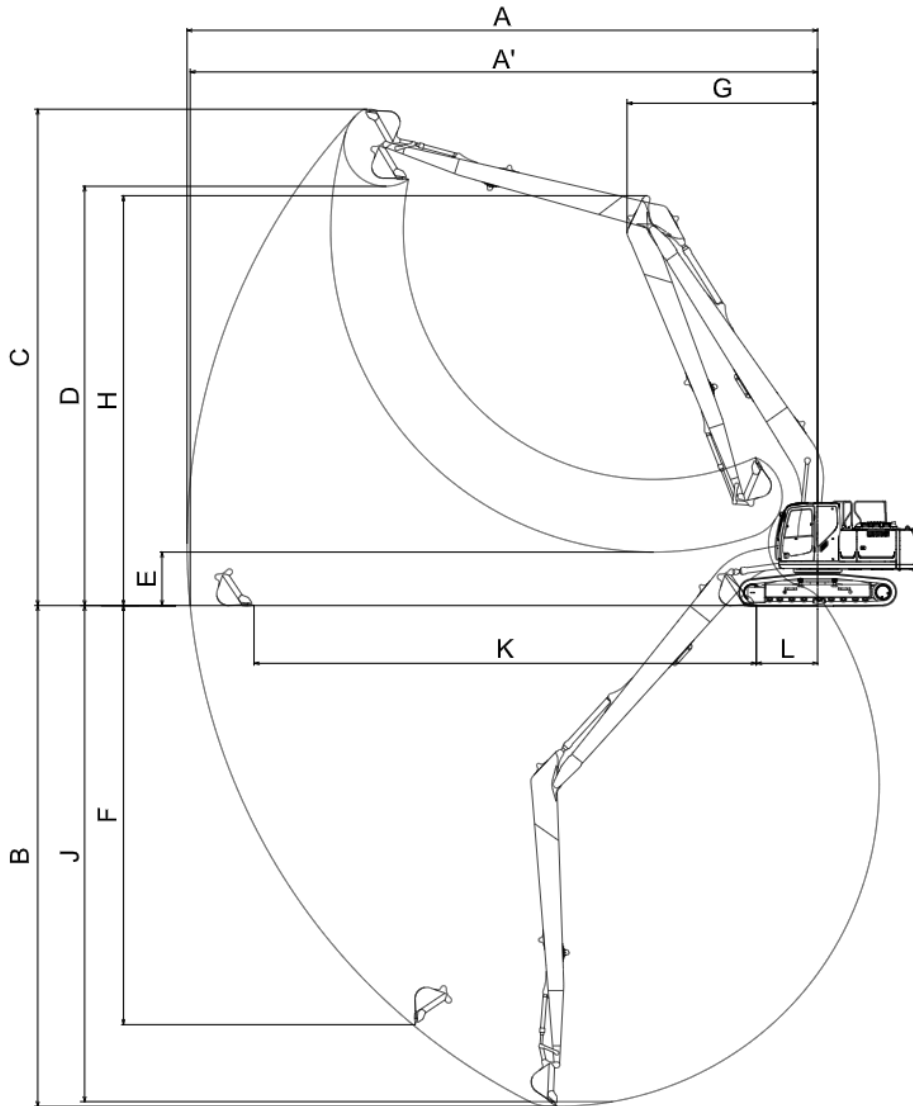


OVERALL SPECIFICATIONS OF BUCKET

Item	Unit	0.45 (0.40)m ³ (0.59 cu-yd) Bucket
L x H x W	m (ft-in)	1.17 x 1.08 x 0.91 (3'10" x 3'7" x 35.8")
Weight	kg (lb)	370 (816)



8.11.4 WORKING RANGE



Types of Attachment		8.75m (28'8") Boom+6.35m (20'10") Arm with 0.45m ³ (0.59 cu-yd) Bucket (mm)	
Item			
A	Maximum digging reach		15,820 (51'11")
A'	Maximum digging reach at ground level		15,710 (51'7")
※B	Maximum digging depth		12,010 (39'5")
※C	Maximum digging height		13,900 (45'7")
※D	Maximum dumping clearance		11,530 (37'10")
※E	Minimum dumping clearance		2,080 (6'10")
※F	Max. vertical wall digging depth		11,190 (36'9")
G	Minimum swing radius		4,730 (15'6")
※H	Height at min. swing radius		10,520 (34'6")
※J	8 feet level digging Depth		11,910 (39'1")
K	Horizontal digging stroke	Stroke	11,610 (38'1")
L	digging stroke at ground level	Minimum	2,200 (7'3")

9. SPECIAL PROCEDURES

9.1 SPECIAL PROCEDURES AT ENGINE FAILURE

- This chapter describes how to release the brakes of the travel motor and the swing motor and how to lower the attachment to the ground.
- These operations should be performed only by an experienced and trained operator who fully reads and understands this manual.

9.2 LOWERING ATTACHMENT TO GROUND

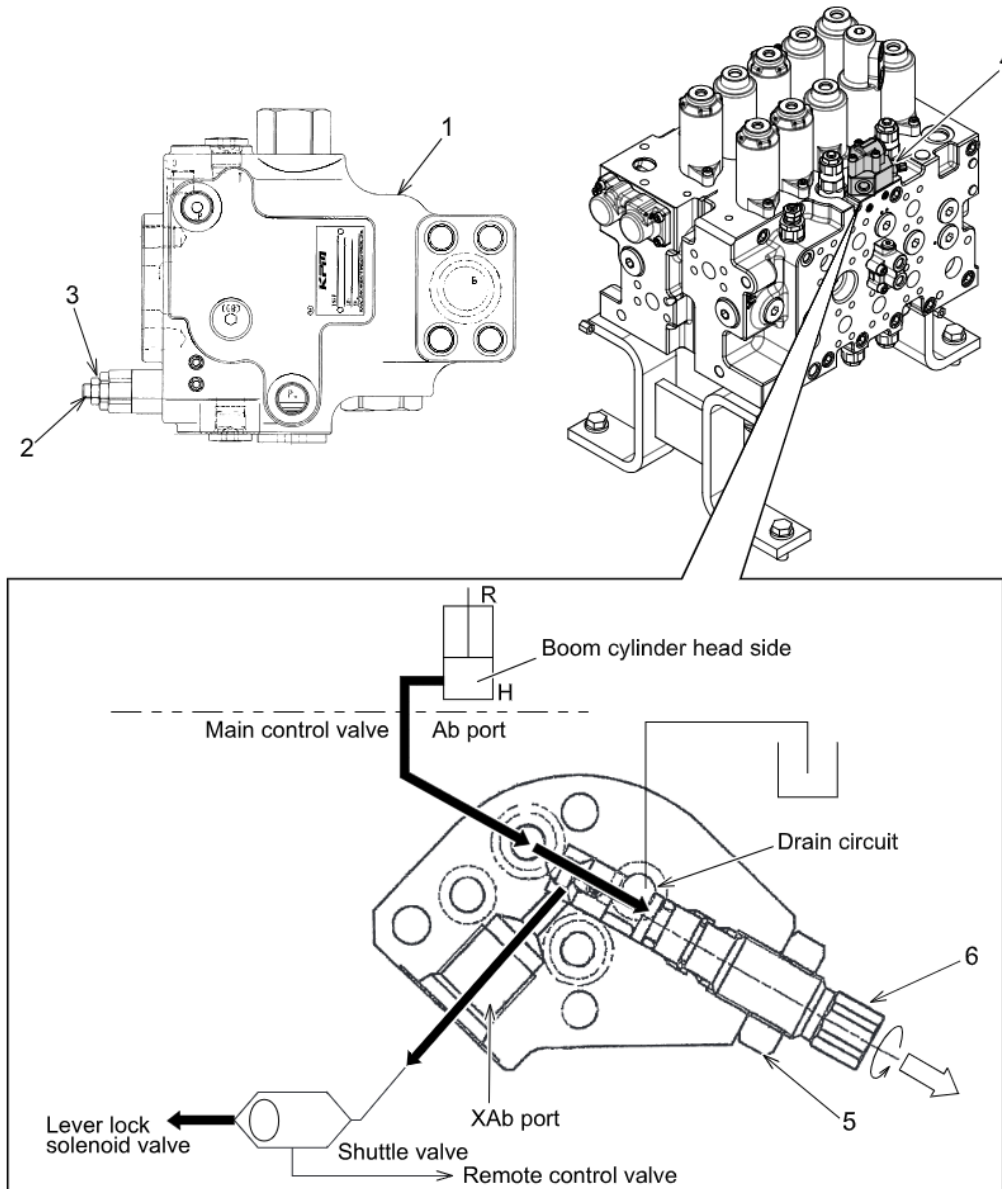
When an engine failure occurs, the attachment can be lowered to the ground in the following procedure.



ABOUT LOWERING THE ATTACHMENT TO THE GROUND

When lowering the attachment to the ground, make sure that there is no one under the attachment before starting the work. A person could be hit and injured by the attachment being lowered.

1. At first, if the holding valve is attached to the boom cylinder, loosen lock nut (3) of the port relief valve of holding valve (1) and loosen adjusting bolt (2).
2. Loosen lock nut (5) of emergency manual valve (4) at the head side of the boom cylinder and loosen needle valve (6).
3. The hydraulic oil at the boom cylinder head side flows to the drain circuit through the orifice and then the boom lowers slowly.
It will take 4 to 8 minutes until the boom lowers to the ground though it may differ according to the machine position and the holding pressure.
4. After placing the attachment on the ground, tighten each part of the holding valve (1) and the emergency manual valve as before.



9.3 RELEASING TRAVEL MOTOR BRAKES

TOOLS

- Chock block: 4 pcs.
- Allen wrench: 1 pc. (12 mm)
- Allen wrench: 1 pc. (8 mm)
- Torque wrench: 150 to 170N·m(111 to 125ft·lbf)
- Plastic mallet or soft mallet
- Container for drain oil: 2 pcs. (6 L)
- Eye bolt: 1 pc. (M10:1.5 x 30 mm)
- Lifting device (100 kg or more)
- Screw seal (for drain plug, level plug, and fill plug)



WARNING

CHOCKING THE CRAWLER

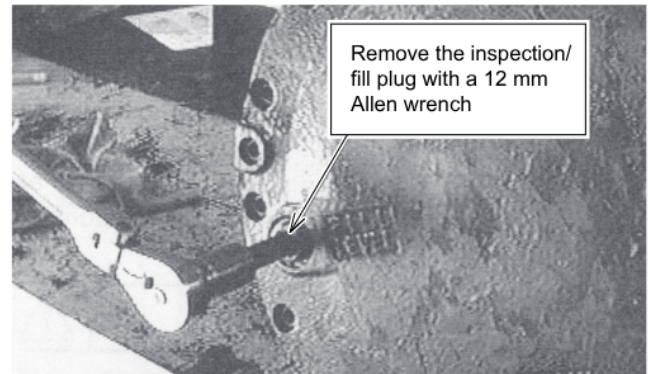
When releasing the brakes of the travel motor and the swing motor, chock the front and rear of the crawlers. See "LOWERING ATTACHMENT TO GROUND" in Chapter 9 to lower the attachment to the ground. On a slope or soft ground, the upper structure and the machine may move unintentionally and it is very dangerous.



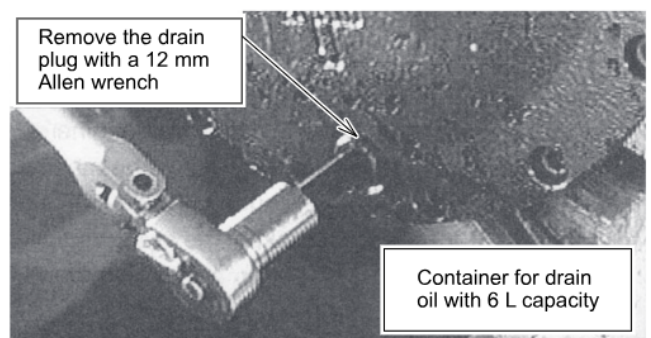
CAUTION

- Do not damage the cover of the travel motor. Not following this may cause oil leakage.
- Prevent contamination of the removed parts. Intrusion of dust may cause a failure of the machine.
- When installing or removing the planetary gear assembly, be careful not to get the hands caught.

1. Chock the front and rear of each crawler to prevent the machine from moving before releasing brakes.
2. See "LOWERING ATTACHMENT TO GROUND" in Chapter 9 to lower the attachment to the ground.
3. Turn the starter switch to the "OFF" position and remove the key.
4. Remove the inspection plug and fill plug from the travel motor with an Allen wrench.

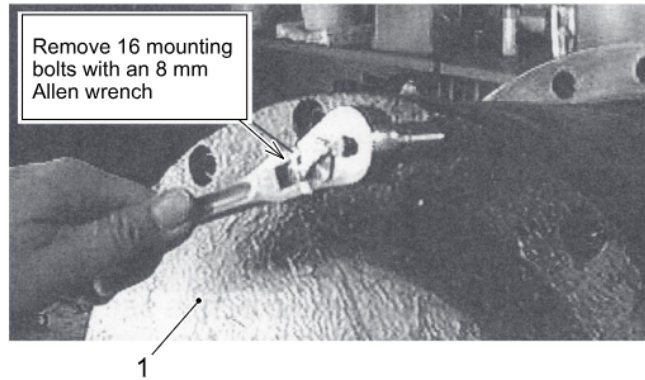


5. Place the container for drain oil under the drain plug of travel motor and remove the drain plug from the travel motor.

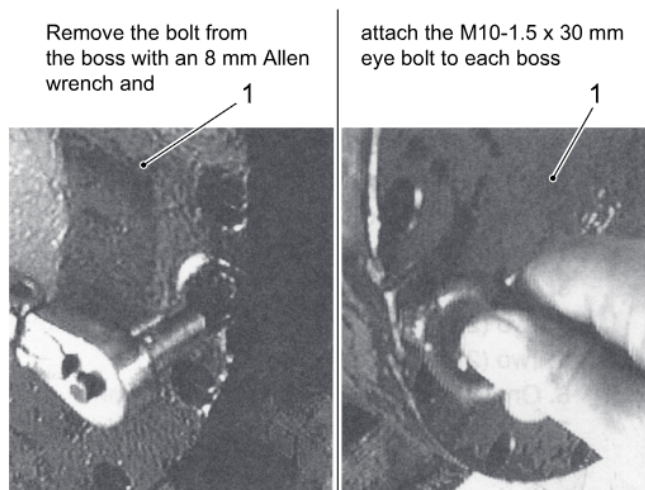


[9. SPECIAL PROCEDURES]

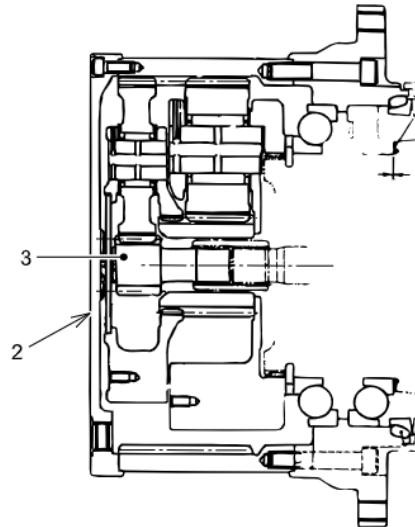
- Remove the bolts (16 places) from cover (1) of the travel reduction unit.



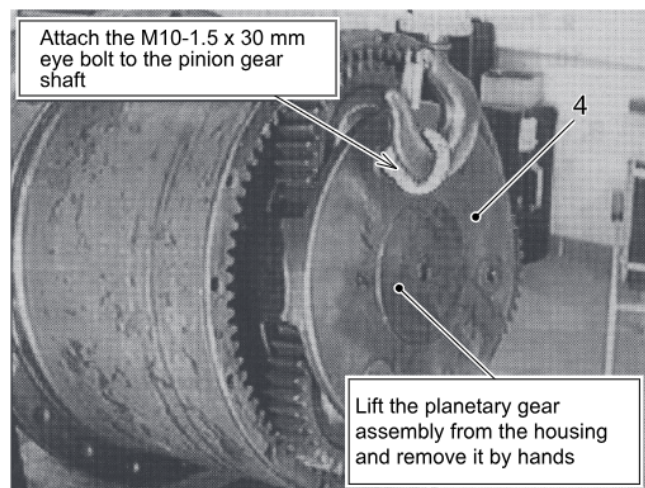
- Remove the bolts (2 places) from the boss part of cover (1) and attach the eye bolt to each hole.
- Attach the sling to the eye bolt and remove slack of the chain or cable.
- Strike the end of the cover lightly with a plastic mallet and remove cover (1).



- Remove thrust plate (2) and drive gear (3).



- Attach the eye bolt to planetary gear assembly (4).
- Attach the sling to the eye bolt and remove slack of the chain or cable.
- Remove planetary gear assembly (4) from the housing.
- With planetary gear assembly (4) removed, attach cover (1) to the housing by tightening bolts (16 places).
- Refill the oil from the hole of the fill plug.



16. Perform the above procedures to the right and left travel reduction units and move the machine to a place where it can be repaired.
-



WARNING

MOVING MACHINE TO PLACE FOR REPAIRING

The machine is in a very dangerous condition because it can move unintentionally due to release of the parking brake.

Check that the area around the machine is clear of people and then start moving the machine.

After moving the machine, chock the front and rear of the crawlers.

17. After completing repair of the machine, reinstall the removed parts in the reverse procedure.
 - Tightening torque
 - Cover mounting bolt: 70 to 77N·m(52 to 57ft·lbf)
 - Plug: 149 to 165N·m(110 to 122ft·lbf)

9.4 RELEASING SWING BRAKES

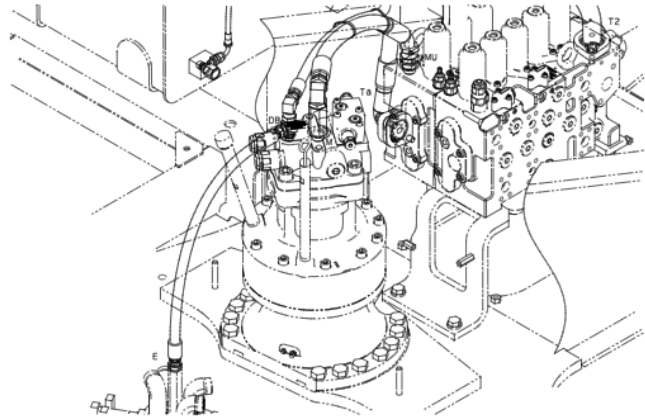


CHOCKING THE CRAWLER

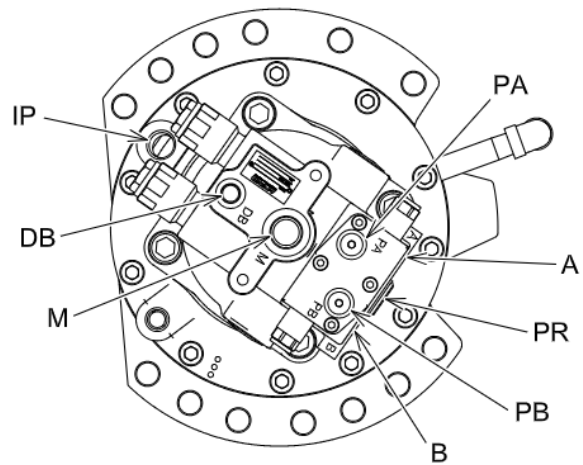
When releasing the brakes of the travel motor and the swing motor, chock the front and rear of the crawlers. See "LOWERING ATTACHMENT TO GROUND" in Chapter 9 to lower the attachment to the ground. On the slope or soft ground, the upper structure and the machine may move unintentionally and is therefore very dangerous.

9.4.1 SWING BRAKE RELEASE PROCEDURE WITH HYDRAULIC HAND PUMP

1. See "LOWERING ATTACHMENT TO GROUND" in Chapter 9 to lower the attachment to the ground.
2. Prepare a suitable hand pump to release the swing brake.
3. Remove all the hoses and connectors connected to the swing motor.



4. Attach the connector of a proper size for the hydraulic hand pump to the PR port of the swing motor and connect the PR port with the hydraulic hand pump.
5. Apply a pressure of 3.1 MPa using the hydraulic hand pump and release the swing brake.



Symbol	Name	Size	Torque N·m (lbt·ft)
A,B	Main port	PF3/4	157(116)
M	Make-up port	PF3/4	167(123)
DB	Drain port	PF3/8	74(55)
PR	Break release port	PF1/4	36(27)
IP	Gear oil filler port	PT3/4	98(72)
PA,PB	Pressure measurement port PF1/4	PF1/4	36(27)

6. Swing the machine.

7. After completing repair, reinstall the removed parts in place.

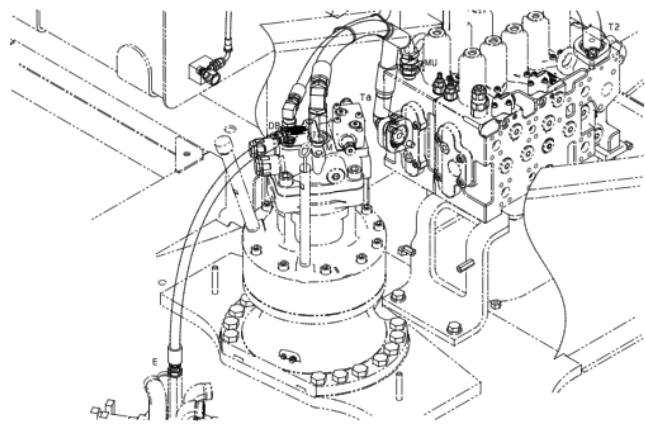
9.4.2 SWING BRAKE RELEASE PROCEDURE BY DISASSEMBLY

When the hydraulic hand pump cannot be prepared, release the swing brake in the following procedure.

TOOLS

- Allen wrench:1 pc.(14mm)
- Eye bolt:2 pcs.(M12:1.75x22mm)
- Lifting device(100 kg or more)
- Torque wrench:320N·m(236ft·lbf)
- Plastic mallet or soft mallet
- Waste cloth or paper towel
- Plug and cap
- Tools to remove/install hoses, tubes, and connectors.

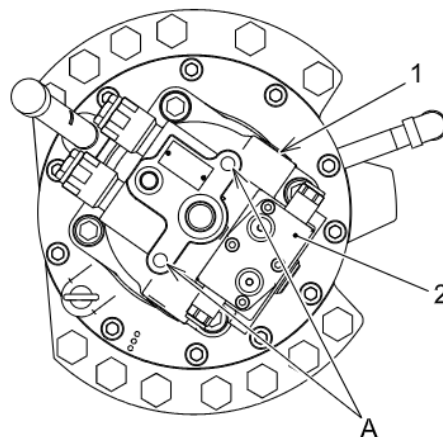
1. See "LOWERING ATTACHMENT TO GROUND" in Chapter 9 to lower the attachment to the ground.
2. Remove all the hoses and connectors connected to the swing motor.



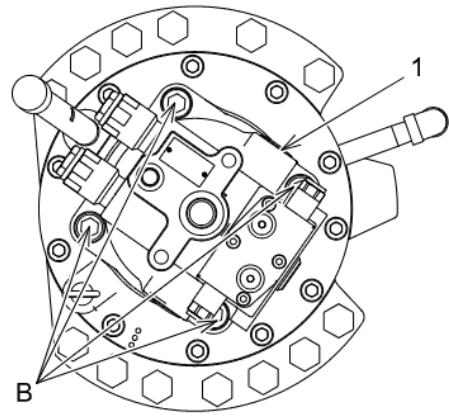
3. Attach the plugs or caps to the hoses, tubes, and connectors.



4. Attach the eye bolt to lifting position (A) of valve casing (1).
5. Loosen the mounting bolts (4 places) of antireaction casing (2) and remove anti-reaction casing (2) from valve casing (1).



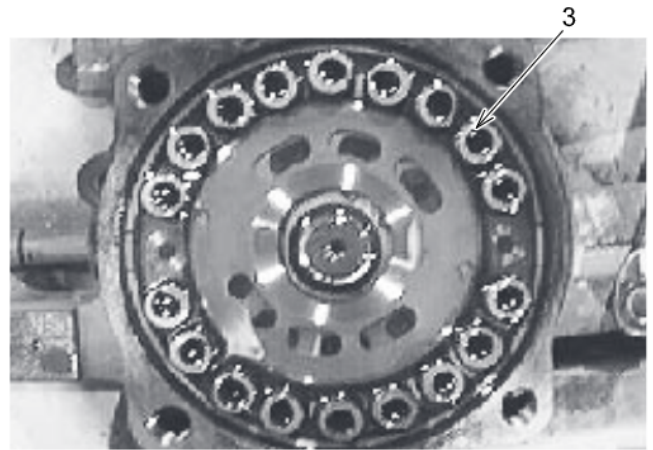
6. Remove two mounting bolts (B) of valve casing (1) facing each other from the diagonally opposite side, among four mounting bolts (B).
7. Attach the sling to the eye bolt and remove slack of the chain or cable.
8. Remove the remaining two mounting bolts from valve casing (1) slowly.



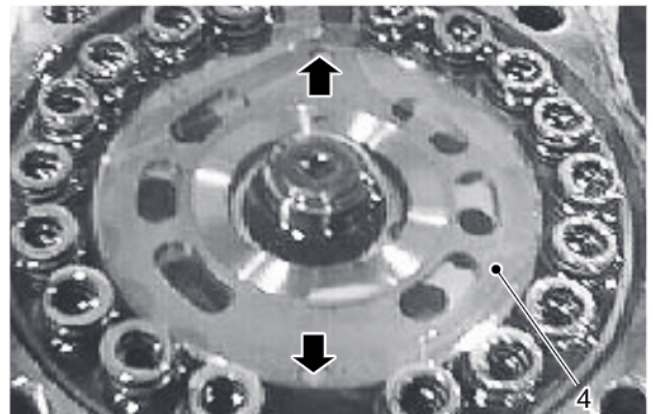
Note

When the remaining two mounting bolts are removed, the valve casing comes up by the spring pressure. Releasing the spring pressure may cause the machine to move.

9. Using the lifting device, remove valve casing (1) slowly.
10. Remove spring (3) inside the swing motor and put it 3 in the container filled with new hydraulic oil. To prevent contamination of the container, put the cap to the container.

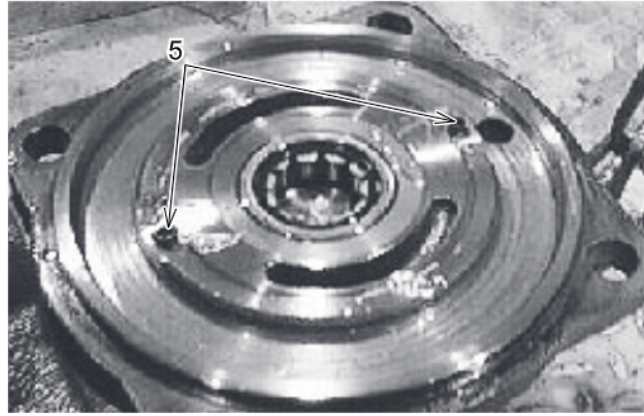


11. Align the holes of valve plate (4) in the swing motor to the front and rear of the housing of the swing motor.



[9. SPECIAL PROCEDURES]

12. Put valve casing (1) on top of the swing motor so that positioning pins (5) of valve casing (1) match the holes of valve plate (4).
13. Push valve casing (1) into the swing motor by hand and fix it with the mounting bolts (4 positions).
14. Swing the machine.



WARNING

SWINGING MACHINE

The machine is in a very dangerous condition because it can move unintentionally due to release of the swing brake.

Check that the swing radius of the machine is clear of people and then start swinging the machine.

15. After completing repair of the machine, reinstall the removed parts in place.
-

CAUTION

- Do not damage the valve casing. Not following this may cause oil leakage.
 - Prevent contamination of the removed parts. Intrusion of dust may cause a failure of the machine.
-