OPERATION MANUAL IC55

0988520EN-00

OPERATION MANUAL

IC55

KATO

SERIAL NUMBER
CE004011 ~

0988520EN-00

KATO WORKS CO., LTD.

CONTENTS

FOREWORD

This manual contains safety, operation, maintenance, and adjustment information.
The procedures are designed to provide the best performance of the machine in an effective and economical way. In order to obtain it, remember the next basic rules.

- This manual should be stored in the operator's compartment in the literature holder or seat back literature storage area.

- Before inspection, maintenance or operating the machine, read and understand this manual completely.

- Since all of the explanations in this manual may not be thoroughly understood at first, repeat reading it until abilities as an operator are obtained and developed for proper operation.

- Further abilities as an operator outside of descriptions in this manual can be obtained from the experience during normal operations and under proper supervision.

- The illustrations in this manual are used first of all to let you pay attention. They do not show all of illustrations in this manual. Because of continuing improvement and advancement of product design, the shape of machine in the illustrations may be partly different from your machine. Please understand it. Whenever a question arises regarding your machine, or this publication, please consult our distributor for the latest available information.

SAFETY INFORMATION

Read and understand the operation manual, safety signs and labels before using or maintaining this machine.

The safety alert symbol is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.
The signal words used with the safety alert symbol indicate a specific level of severity of the potential hazard. All are used as attention-getting devices throughout this manual as well as on labels fixed to the machine to assist in potential hazard recognition and prevention.

⚠ DANGER	This safety alert symbol and signal word indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠ WARNING	This safety alert symbol and signal word indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	This safety alert symbol and signal word indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury or serious damages of the machine.
NOTICE	This signal word indicates a potentially hazardous situation which, if not avoided, could result in damages of the machine or reduction of the service life.

We have made every effort for you to prevent accidents during operation; however, we cannot be held responsible for predicting every kind of danger in all operating conditions.
It is the owner or user of the machine who is responsible for always paying attention to operate the machine, as well as reading and understanding this manual enough to obtain the essential knowledge and skills fundamental to correct machine operation.

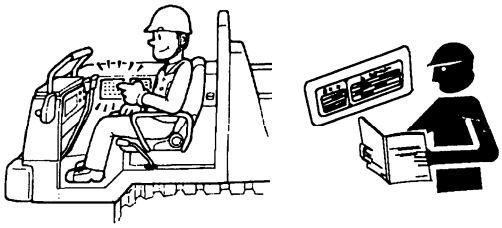
SAFETY

Read the SAFETY section without fail. It describes the basic instructions about safety.

Most accidents occur during works when preventive measures against danger are neglected or basic safety instructions are not observed.
Such accidents may be avoided by paying careful attention in advance.
This manual describes the basic safety instructions to be observed in daily operation, inspection and maintenance of the machine.
Observe these instructions carefully for safety.
Check the safety with great care for any other matters not described in this manual.

PRECAUTIONS BEFORE OPERATION

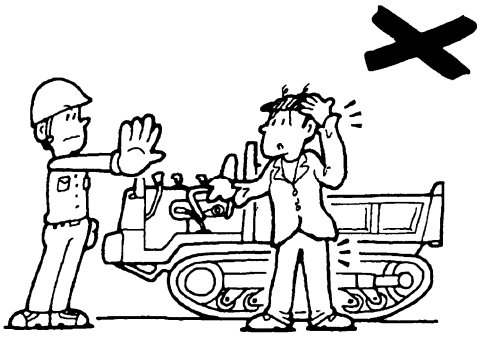
READ AND UNDERSTAND THE WARNINGS SIGNS AND LABELS


CA-C100010

- There are several specific safety signs on your machine. Please take the time to familiarize yourself with these safety signs.
  Make sure that you can read all safety signs.
- You must replace a label if it is damaged, missing or cannot be read. If a label is on a part that is replaced, make sure a new label is installed on the replaced part.

OPERATION SHOULD BE IN GOOD HEALTH

Operator should be physically and mentally alert, which is one of the best insurance against an accident.
NEVER operate the machine under the influence of alcohol, medication, or intoxication.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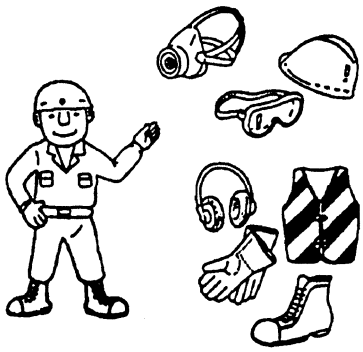
WEAR PROPER WORKING CLOTHES

- For the sake of safety during driving, wear clothes that match your body. The sleeves of sloppy clothes can get caught in the machine and can cause unforeseen accidents.
- Always wear protective cap and safety boots.
  Wear a hard hat, protective glasses and other protective equipment as required by job conditions.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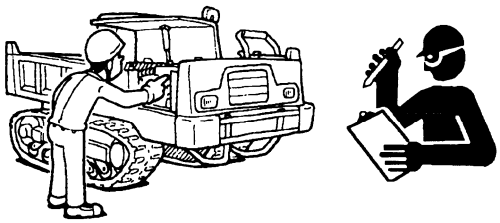
PERFORM “WALK-AROUND” INSPECTION

Walk around the machine to check safety guards, plates, and other related parts are set in place. Do not attempt to operate the machine when any unsafe condition is detected.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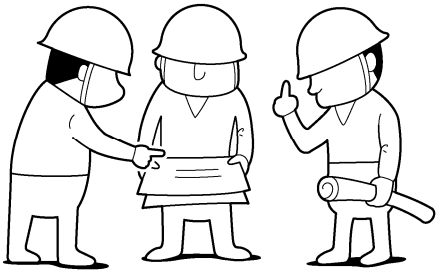
MAKE A WORK PLAN

- Start the work only after discussing with the person in charge at the site the rules and precautions inside the work place as well as the work procedure.
- When working together with other persons, determine the signals and who is to give those signals.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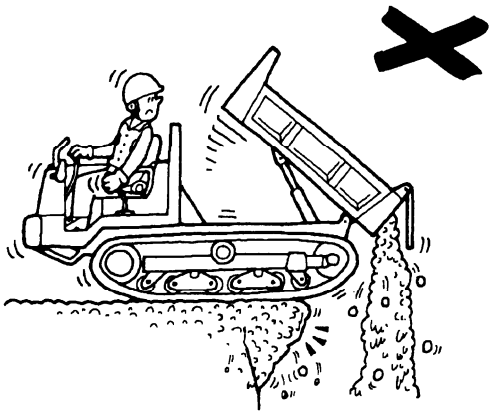
CHECK THE JOB SITE

- Confirm in advance if there are any dangerous locations where the land collapses or where machine can fall off a cliff, etc.
- Take measures necessary for safety in dangerous locations.



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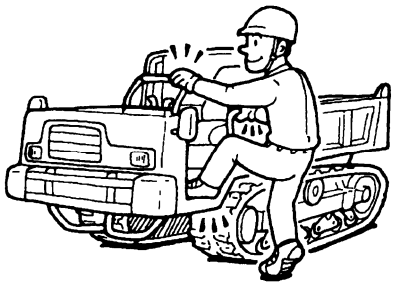
CAREFULLY GET ON AND OFF. THE MACHINE

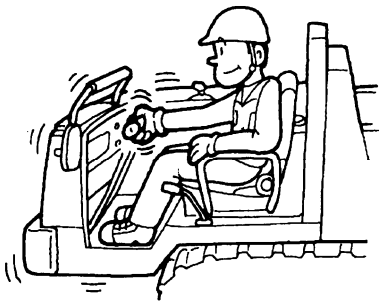
- Maintain a three point contact (Two feet and one hand or one foot and two hands contact) with the steps and handholds.
- Do not use any controls as handholds when entering or leaving the operator's station.
- When any oil or other slippery substance has got adhered to hand rails or steps, wipe them off clean.



CA-C100060

START THE ENGINE WHILE SITTING IN THE OPERATOR SEAT

If the engine is started from a position other than sitting in the operator seat, there is the danger that the machine starts moving suddenly.
Start the engine only after carrying out checks while sitting in the operator seat.



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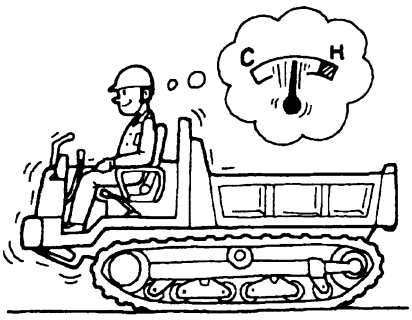
CONDUCT WARM-UP BEFORE OPERATION

If the machine is operated without carrying out sufficient warming up operation, it can lead to movements not intended by the operator, and can lead to accidents.
Always carry out sufficient warming up operation.

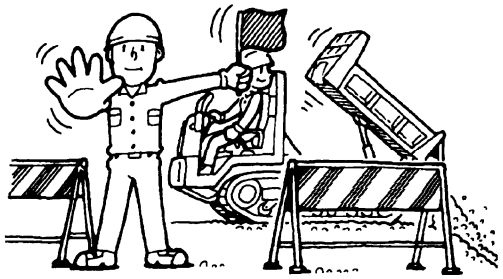


CA-C100080

PRECAUTIONS DURING OPERATION

CLEAR ALL PERSONNEL FROM THE MACHINE AND AREA

Be sure to barricade the job site to prevent entry of the unauthorized. Confirm that there is no one around the machine before starting the engine or operating the machine.



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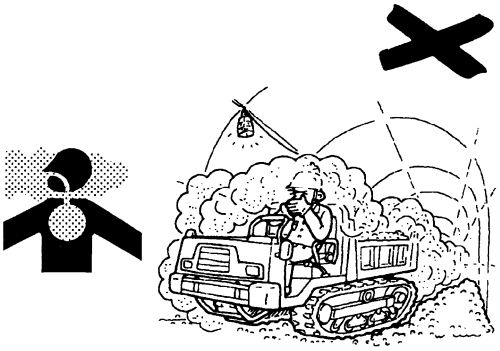
MAINTAIN GOOD VENTILATION

Diesel engine exhaust contains products of combustion which may be harmful to your health. Always start and operate the engine in a well ventilated area. If in an enclosed area, vent the exhaust to the outside.



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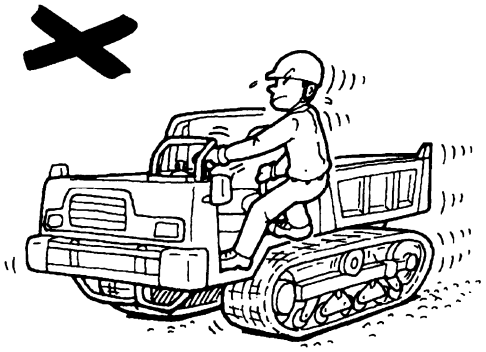
STAY SEATED WHILE OPERATING

There is the danger of making wrong operations if the operating is done from a position other than the operator seat or while standing.

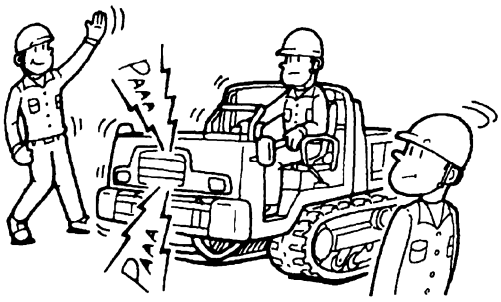
Operate the machine only while seated and with the seat belt fastened.



CA-C100110

PREVENT ACCIDENTS WHILE MOVING

- Always sound the horn to signal others nearby that you are moving the machine. Check that no one is within the working area of the machine before attempting to move it.
- Position a guiding person to guide and check when necessary or when the field of view is bad.

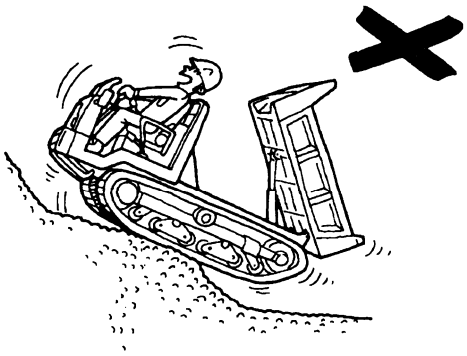


CA-C100120

DO NOT TRAVEL WITH THE VESSEL IN DUMP POSITION

Traveling with the vessel in dump position not only makes the machine unstable but limits operator visibility causing hazardous situations.

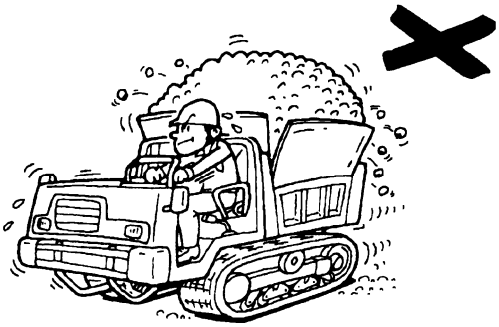
Never attempt to travel with the vessel in dump position.



CA-C100130

DO NOT OVERLOAD

- Working with loads exceeding the performance of the machine can cause loss of safety or reduction in the functionality or life of the machine.
- Never exceed the maximum load limits.
- Never place a load onto the sideracks.



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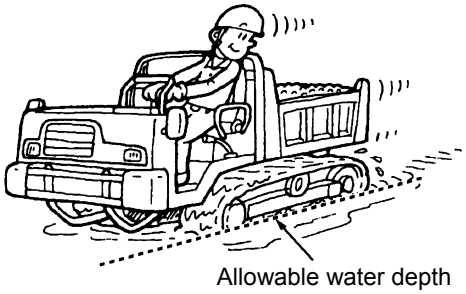
DO NOT EXCEED THE WATER DEPTH LIMIT

- The acceptable water limit is up to the lower roller. Check the water depth, foundation and strength of water current and other safety factors before operating. Do not place the machine in locations exceeding the lower frame of the machine.
- If the machine goes into water in a descending posture on a steep slope, water may splash on the radiator and peripheral parts, resulting in damages of the radiator fan. Be careful.



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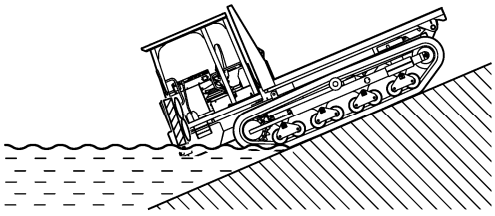

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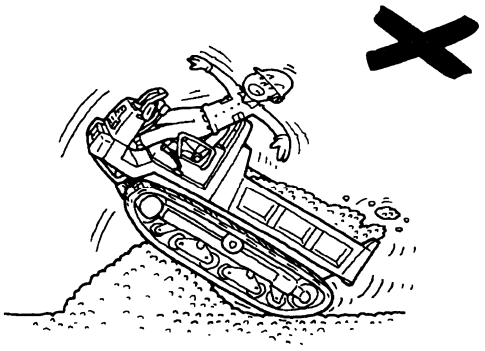
DO NOT TRY TO TRAVEL OVER OBSTRUCTIONS

Trying to travel over obstacles could cause the machine to lose its balance and topple over.

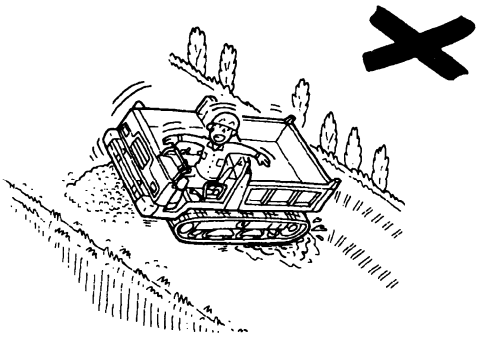
Avoid potential obstacles in your path.



CA-C100160

DO NOT CHANGE DIRECTIONS WHILE ON A SLOPE

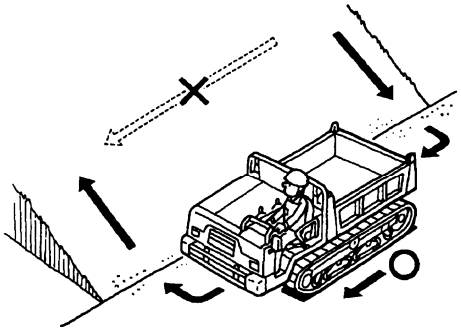
Avoid changing the direction of travel on a slope, which could result in tipping or side slipping of the machine.
When it is inevitable to change the direction, carry it out in a hard ground where the slope is gradual.



CA-C100170

MOVE UP AND DOWN SLOPES DIRECTLY NOT SIDEWAYS

Moving sideways or parallel to the slope while on it may cause the machine to slide and fall over.
To prevent such accidents, only move up and down slopes at a direct angle.

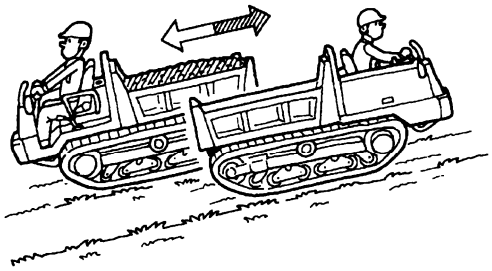


CA-C100180

WATCH THE MACHINE POSITION WHILE TRAVELING ON SLOPES

The machine center of gravity tends to quickly change while traveling on sloping surfaces.
This can create hazardous situations where the machine may tip over.
Observe the following points regarding machine position:

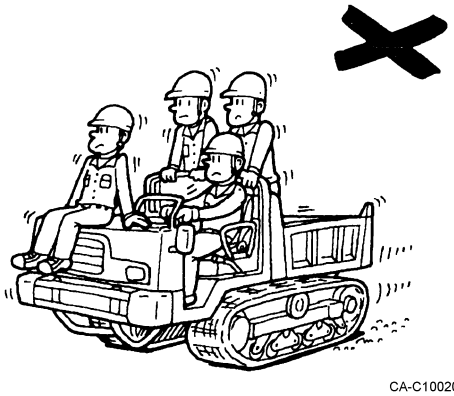
- Go forward up the hill and back down the hill WHEN NO CARRYING A LOAD.
- Reverse up the hill and go forward down the hill WHEN CARRYING A LOAD.



CA-C100190

NEVER ALLOW PERSONNEL RIDE ON THE MACHINE OTHER THAN OPERATOR

Any person riding as a passenger can fall off and suffer injury. In addition, such a passenger also obstructs the driving by the Operator.
Only operator is authorized to be on the machine during operation. Never let unauthorized personnel ride on the machine.



CA-C100200

PRECAUTIONS AFTER OPERATION

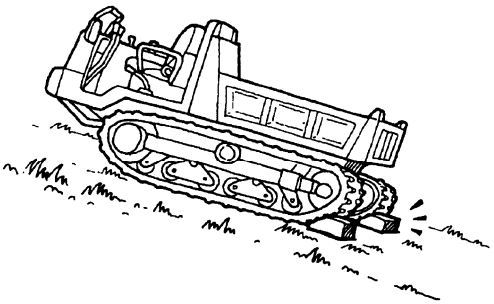
PARK IN A SAFE PLACE

For parking, select a flat ground with good foothold and where there is no danger of land or mud slides, and also, near a river, select a place which is safe even if the river water level becomes high.

CA-C100210

DO NOT PARK THE MACHINE ON A SLOPE

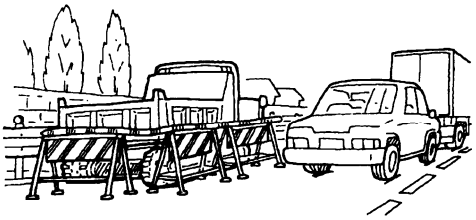
There is the danger of the machine running off wild when stopped or parked on a sloping land.
When it is unavoidable to stop or park on a slopping land, Place stopper blocks on the downhill side under both crawlers.



CA-C100220

OBSERVE PRECAUTIONS WHEN PARKING THE MACHINE ON THE ROAD

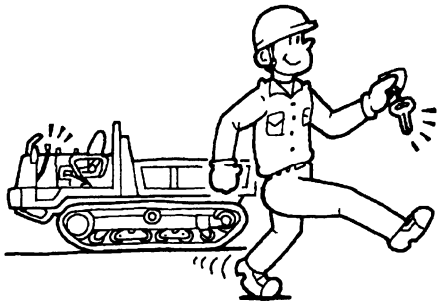
If you have to park the machine on the road, use appropriate flags, barriers, flares, and warning signals.



CA-C100230

OPERATOR LEAVING MACHINE

- Lower the vessel completely.
- Apply the parking brake.
- Set the left lever unit to the lock position.
- Stop the engine and take out the ignition key.
- Lock the cover and all other lockable parts.



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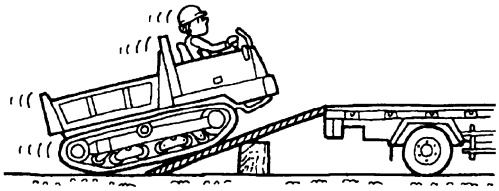
Leave the operator’s seat after taking the above measures.

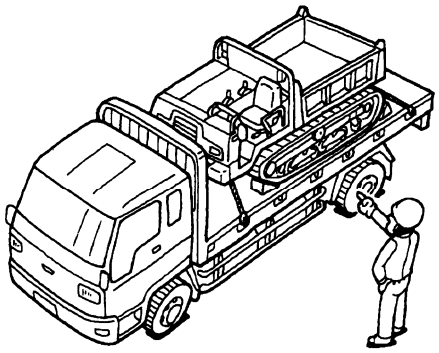
PRECAUTIONS AT TRANSPORTING

CAREFULLY LOAD AND UNLOAD THE MACHINE


CA-C100250

- ALWAYS load and unload the machine on the level ground.
- Use a ramp that has sufficient strength, width, length, and thickness.
- Remove ice, snow, or slippery material from the ramp and truck deck before loading.
- NEVER make a turn on a ramp.

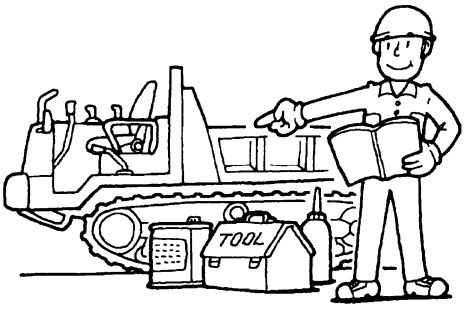
OBSERVE PRECAUTIONS ON TRANSPORTATION


CA-C100260

- Blocks tracks and secure the machine to the truck before transporting.
- Securely fix the machine to the platform using a wire rope, etc.
- Transport safely strictly following the concerned laws.

PRECAUTIONS AT MAINTENANCE

KEEP ROUTINE MAINTENANCE

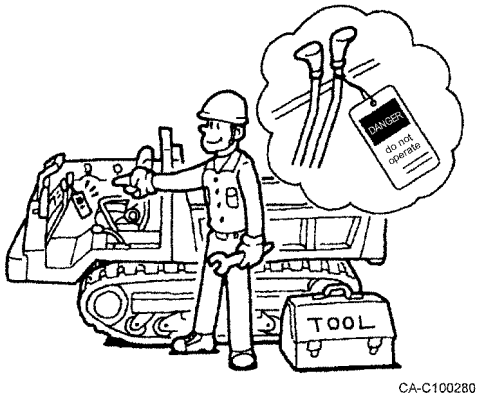


CA-C100270

- Wrong maintenance not only causes damage to the machine but also has the danger of causing accidents that involve injury to humans.
- You must read and understand the warnings and instructions contained in this manual, before performing any operation or maintenance procedures.

INDICATIONS DURING INSPECTION AND MAINTENANCE

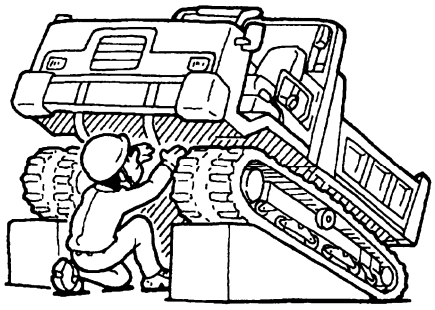
Hang a warning board saying “Under Inspection / Maintenance” at an easy to see location of the operation lever so that novessel other than the concerned persons touches it.



CA-C100280

WHEN WORKING UNDER TRACKS

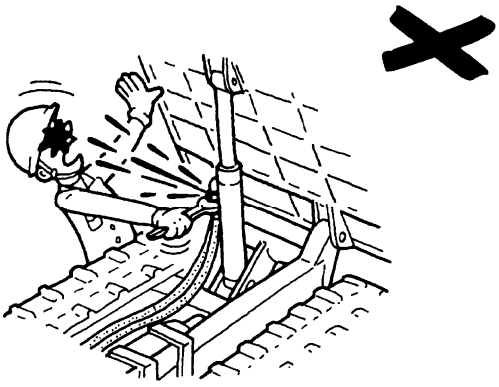
There is the danger of an accident of being caught under the machine if the machine comes down.
Place supporting pillars or blocks under the crawler and make sure that it is supported firmly.



CA-C100290

ALWAYS RELEASE PRESSURE BEFORE DISCONNECTING HYDRAULIC LINES

There is the danger of high pressure oil jetting out if a piping or a hose is removed without releasing the internal pressure of the hydraulic system. Start the work only after completely releasing the internal pressure.



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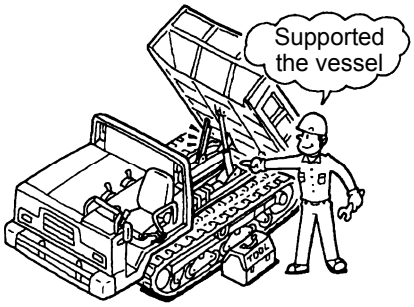
SUPPORTING THE VESSEL

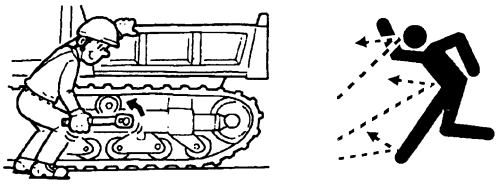
If replacement or repair of couplings or hoses is made with the vessel in the raised condition, there is the possibility that the vessel drops down.
Be sure to support the vessel using the safety bar.



CA-C100310

DO NOT WATCH THE CHECK VALVE WHEN ADJUSTING TRACKS

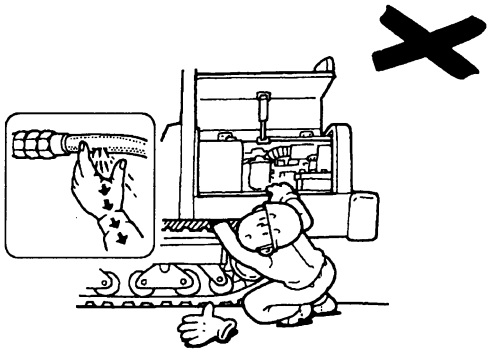
- Track adjusting grease is under high pressure. Grease coming out of the check valve under pressure can penetrate the body causing injury or death.
- Watch the track or track adjustment cylinder to see if the track is being loosened. Loosen the check valve one turn only.
- Do not put your face, hand, foot, or body in front of the check valve.



CA-C100320

PRECAUTIONS AGAINST HIGH PRESSURE OIL

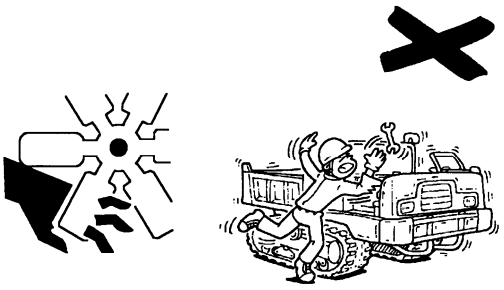
- It is very dangerous if the high pressure oil enters your skin or eyes.
- Use a thick sheet of paper or a wooden piece to test for the leakage of high pressure oil, and never test with your hands.
  Wear protective goggles for protecting your eyes.
- If oil enters your skin, immediately go to a doctor and get medical attention.



CA-C100330

NEVER CARRY OUT MAINTENANCE WITH THE ENGINE RUNNING

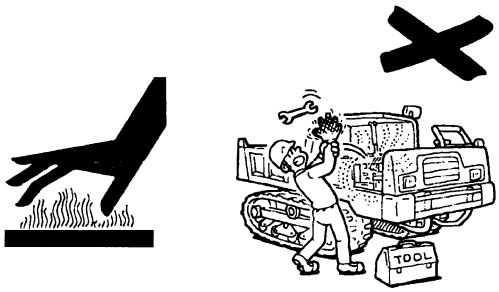
Touching a rotating or moving part such as the fan belt, etc., can get your hand crushed by the machine and there is the danger of your hand being cut off.
Always carry out maintenance work with the engine switched off.



CA-C100340

BE CAREFUL TO HOT ENGINE AFTER THE MACHINE STOPS

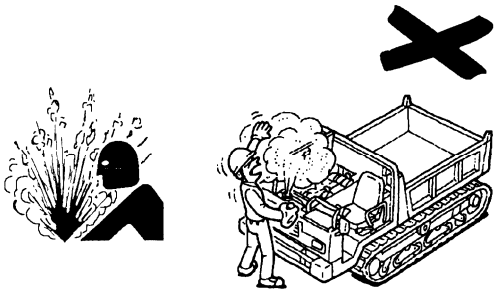
Do not touch the engine or muffler right after the machine is stopped. It is very hot and causes burns.
Start inspection and maintenance only after the temperatures of the different parts have gone down sufficiently,



CA-C100350

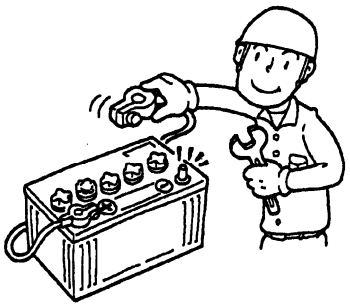
NEVER OPEN THE RADIATOR CAP OR COOLANT TANK CAP WHEN THEY ARE HOT

Removing the radiator cap or coolant tank cap when the temperature of the coolant is high can cause high temperature steam to spurt out, resulting in burns. After the coolant temperature has gone down, gradually loosen the cap to release the pressure.



CA-C100360

HANDLING BATTERY



CA-C100370

- When maintaining the electrical system or when carrying out welding, remove the lead connected to the negative terminal (-) of the battery.
- A battery can generate flammable gases and there is the danger of the gases catching fire and exploding. Also, dilute sulfuric acid is being used for the battery liquid. Take sufficient care while handling.

FIRE PREVENTION

CA-C100380

- Do not leave burnable items such as oily rags, dry leaves, paper, etc., near the engine. Since these can cause fire hazards, constantly check and remove them.
- Stop the engine during refueling, and take care not to bring sparks or fire near the fuel.
- Inspect for leakage of fuel, oil, and hydraulic oil and repair if there is any defect, and wipe off all oil that has leaked.
- Make sure where a fire extinguisher is placed and know how to use it.

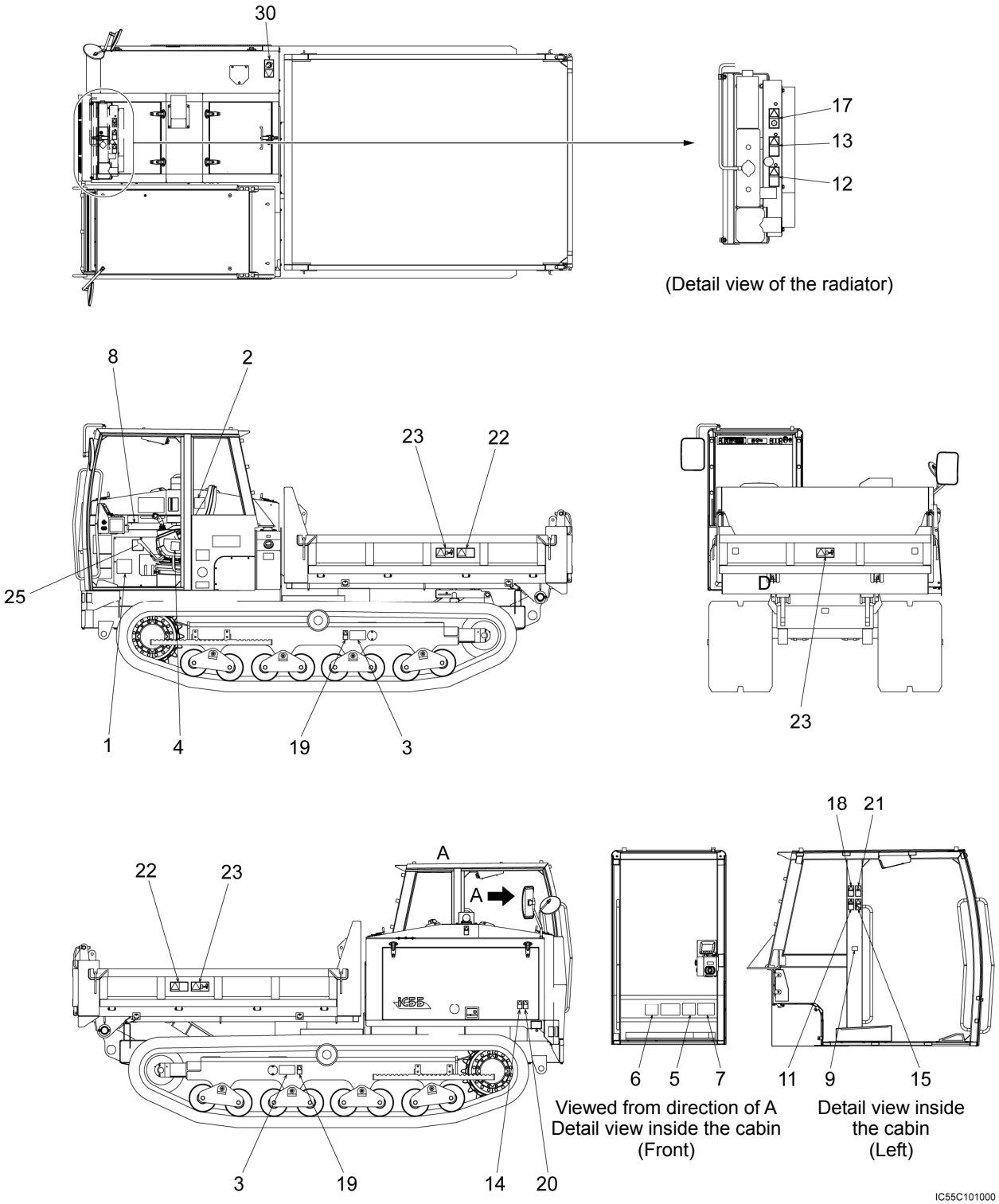
WARNING SIGNS AND LABELS

There are several specific safety signs ⚠ on your machine.

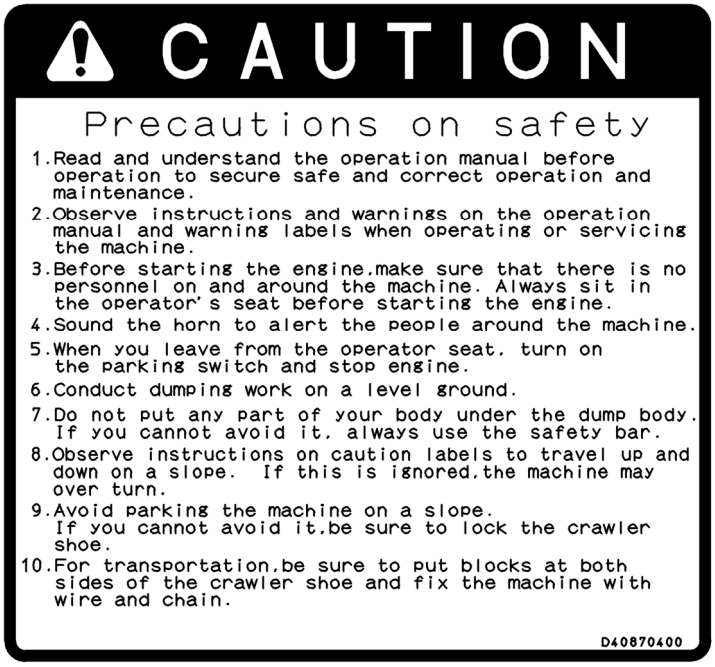
Make sure that you can read all safety signs. Clean or replace these if you cannot read the words.

Check the part number for the safety sign against this manual or the actual object before placing an order.

Where the warning Signs and Labels are stuck

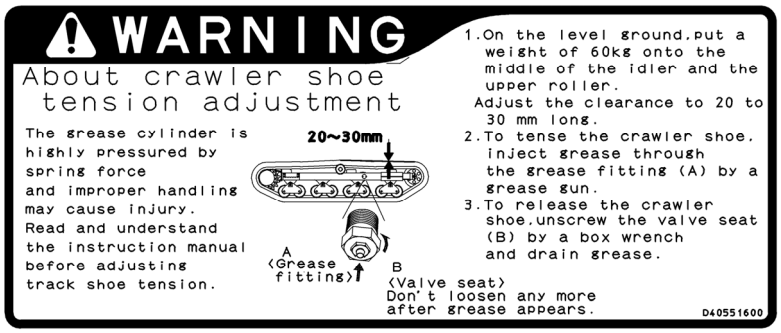


1. Precautions on safety
(D408 704 00)

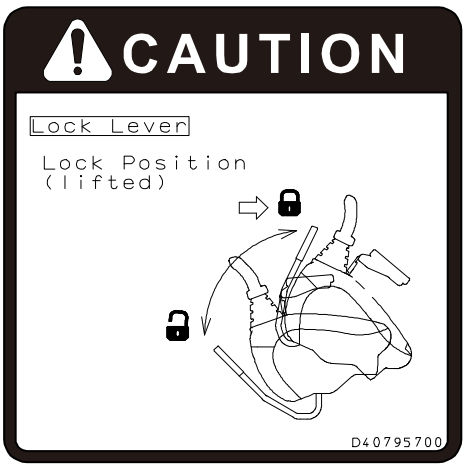


2. Precaution for working under the raised vessel
(4448 816 00)

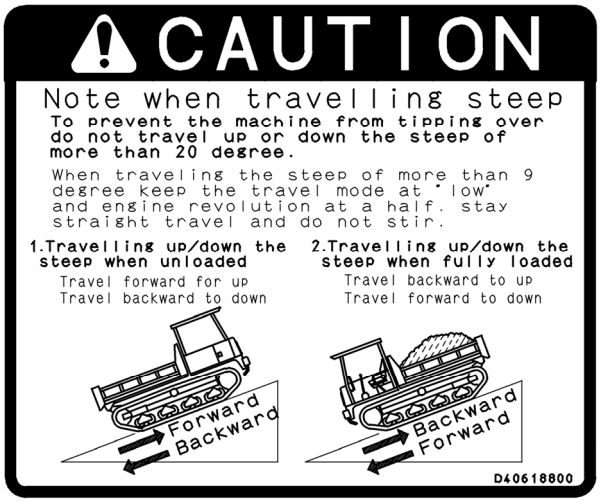
3. Crawler shoe tension adjustment
(D405 516 00)



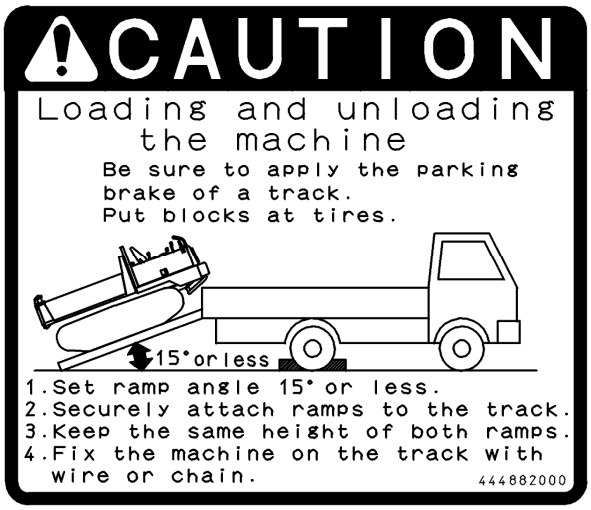
4. Lock lever
(D407 957 00)



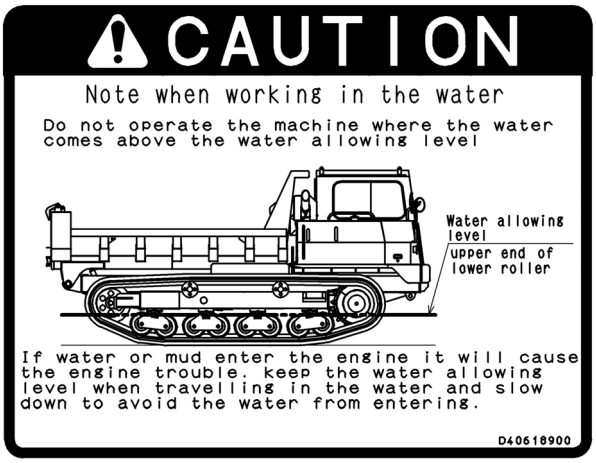
5. Traveling on a slope
(D406 188 00)



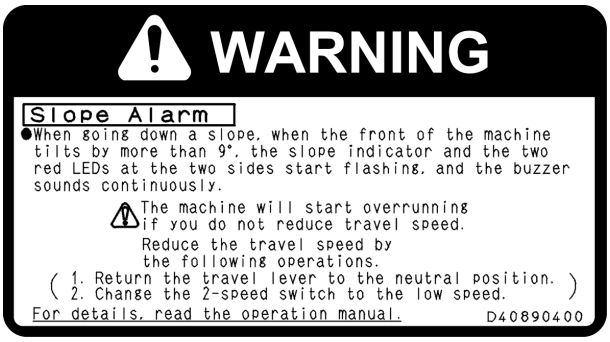
6. Loading and unloading the machine
(D448 820 00)



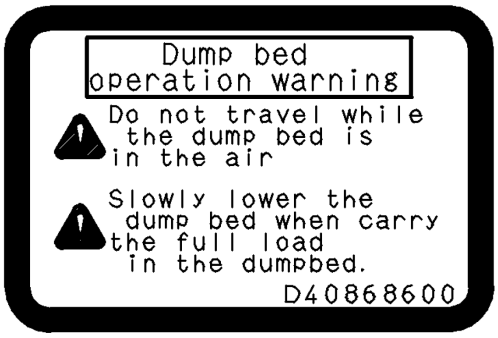
7. Under-water works
(D406 189 00)



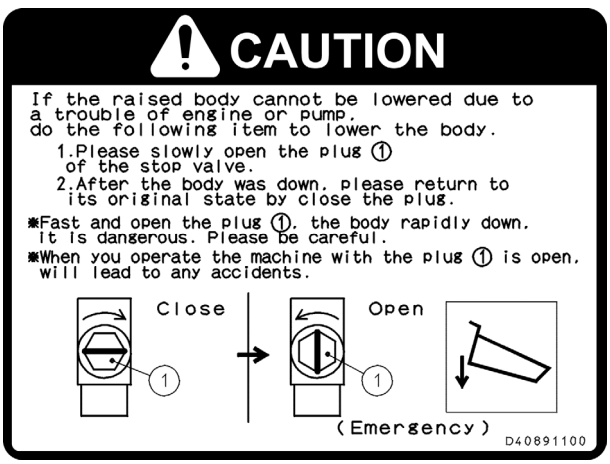
8. Safety alarm
(D408 904 00)



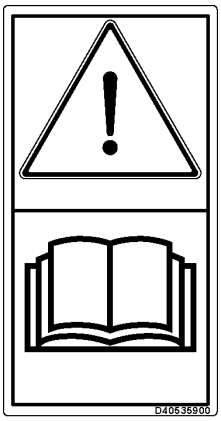
9. Vessel operation warning
(D408 686 00)



10. How to lower vessel in case of emergency
(D408 911 00)



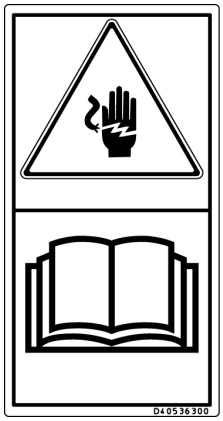
11. Warning!
    Read manual before operation, maintenance, disassembly, assembly and transportation.
    (D405 359 00)



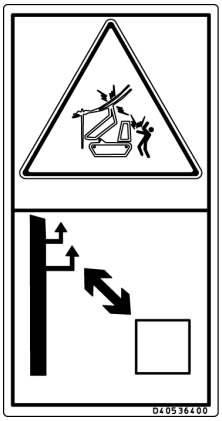
12. Sign indicates a burn hazard from spurting hot water or oil if radiator or hydraulic tank is uncapped while hot.
    Allow radiator or hydraulic tank to cool before removing cap.
    (D405 476 00)

13. Sign indicates a burn hazard from touching heated parts, such as engine, motor, or muffler during or right after operation. Never touch when hot.
    (D405 477 00)

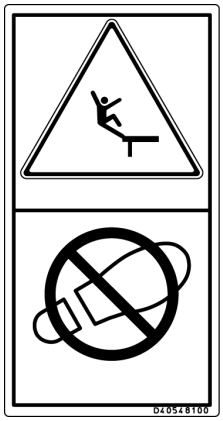
14. Sign indicates an electrical hazard from handling the cable.
    Read manual for safe and proper handling.
    (D405 363 00)



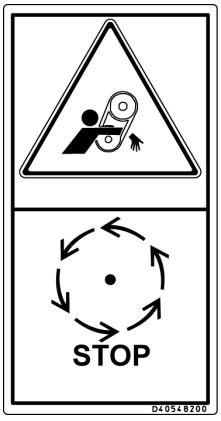
15. Sign indicates an electrocution hazard if machine is brought too near electric power lines.
    Keep a safe distance from electric power lines.
    (D405 364 00)



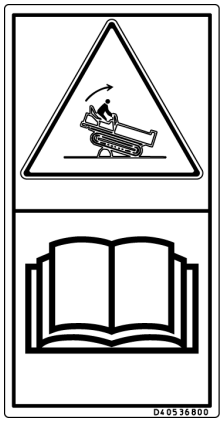
16. Sign indicates a hazard of falling.
    Do not stand on this place.
    (D405 481 00)



17. Sign indicates a hazard of rotating parts, such as belt.
    Turn off before inspection and maintenance.
    (D405 482 00)



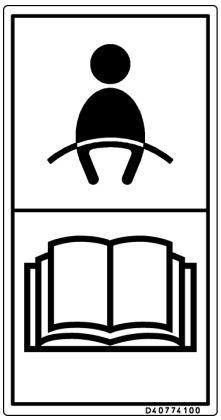
18. Sign indicates a hazard of falling out when machine goes over an obstacle.
    Read manual and follow instructions for safe and proper operation.
    (D405 368 00)



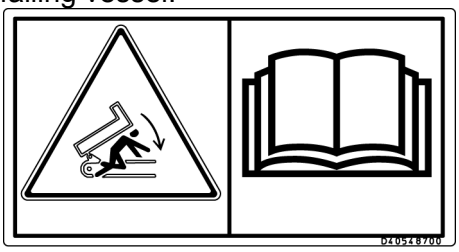
19. Sign indicates a hazard of a flying plug from track adjuster that could cause injury.
    Read manual before adjusting track for safe and proper handling.
    (D405 485 00)

20. Sign indicates an explosion hazard. Never drill, cut with gas, hit or disassemble. Also, keep open flame away.
    (D405 362 00)

21. Sign indicates the necessity of fastening the seat belt.
    Always keep the seat belt fastened while operating the machine to minimize danger caused by accidents such as falling down.
    (D407 774 00)

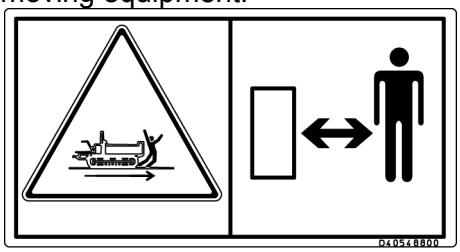


22. Sign indicates a crush hazard from falling vessel.



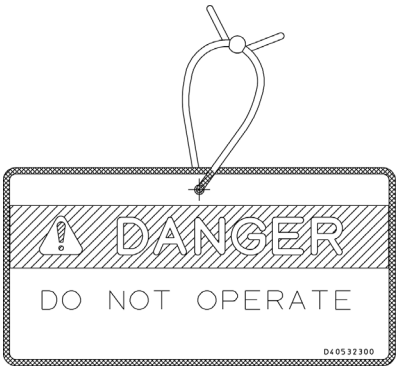
    Read manual and follow safety instructions when holding the vessel in a raised position.
    (D405 487 00)

23. Sign indicates a hazard of being run over by moving equipment.



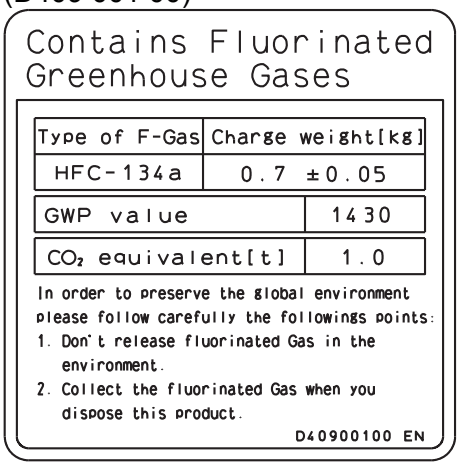
    Keep away from equipment when it is moving.
    (D405 488 00)

24.



    Attach a DO NOT OPERATE warning tag to start switch or controls before servicing or repairing the machine.
    Do not start the engine or move any of the controls if there is DO NOT OPERATE or similar warning tag attached to the start switch or controls.
    Keep the DO NOT OPERATE warning tag on a bookshelf or at a specified place when not using it.
    (D405 323 00)

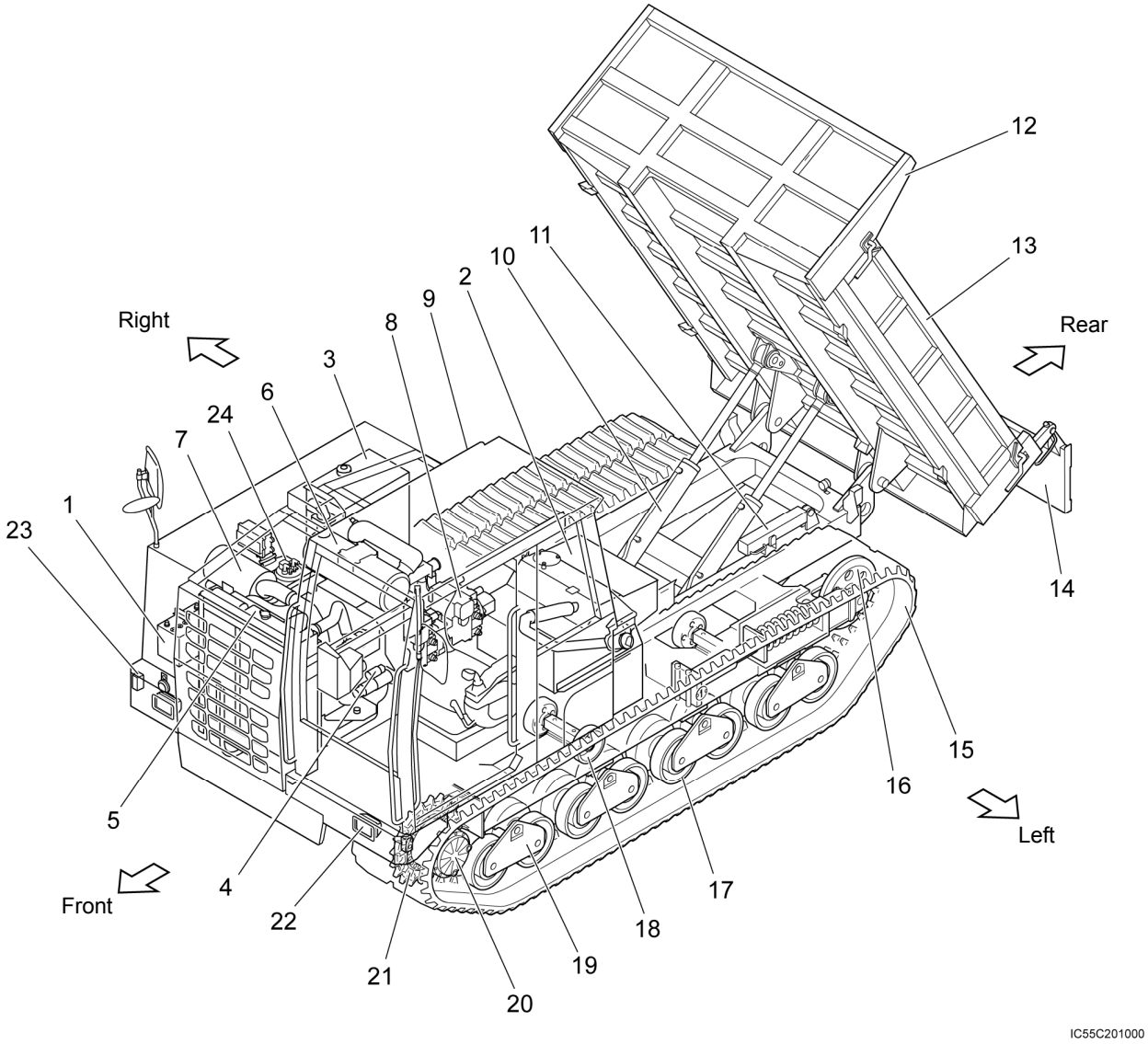
25. Contains Flourinated Greenhouse Gases
(Only for air conditioner equipped machine)
(D409 001 00)



CONTROLS

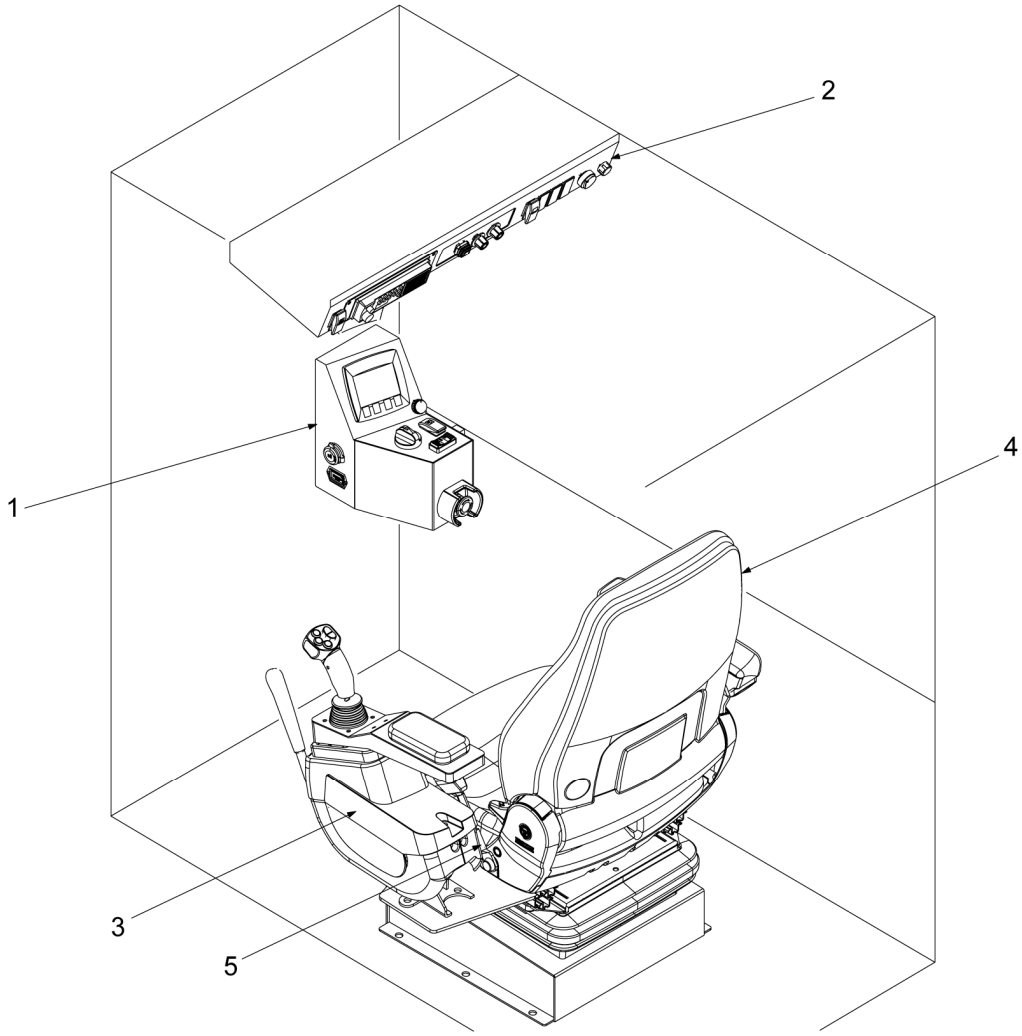
This section describes the functions of the devices needed to operate this machine and the proper operation procedures. Understand them sufficiently and operate the machine in safe.

NAMES OF COMPONENTS



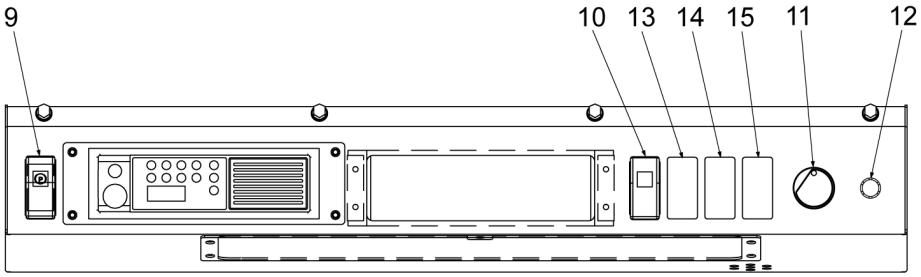
No.	Name	No.	Name	No.	Name
1	Battery	9	Canopy	17	Lower roller
2	Fuel tank	10	Dump cylinder	18	Upper roller
3	Hydraulic tank	11	Safety bar	19	Oscillating link
4	Engine	12	Vessel	20	Travel device
5	Radiator, oil cooler	13	Side gate	21	Drive sprocket
6	Post-processing unit	14	Rear gate	22	Headlight
7	Air cleaner	15	Rubber crawler	23	Direction indicator lamp
8	Hydraulic pump	16	Idle tumbler	24	DEF tank

CONTROLS AND INSTRUMENTS

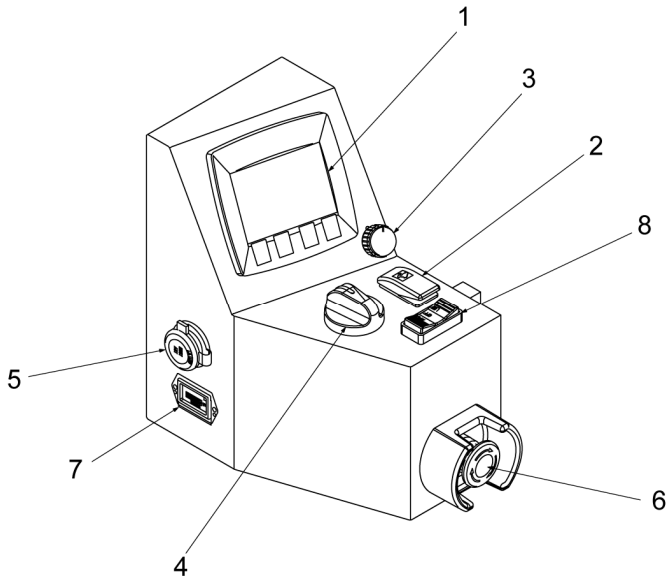


No.	Name	No.	Name
1	Instrument panel	4	Operator seat
2	Upper switch box	5	Seat belt
3	Left lever unit		

INSTRUMENT PANEL



Upper switch box



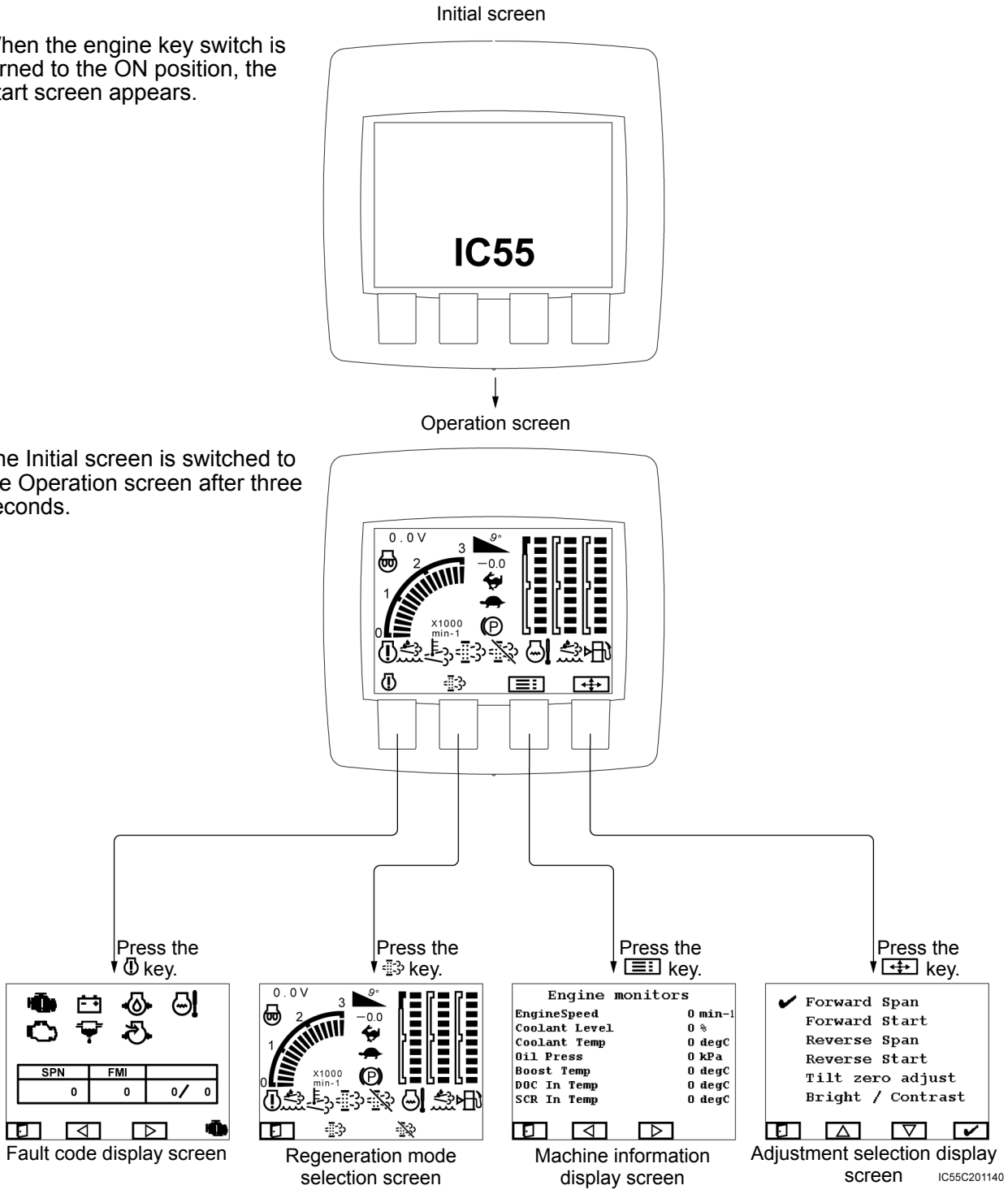
Instrument panel

IC55C201020

No.	Name	No.	Name
1	Display	9	Parking switch
2	Travel speed select switch	10	Head light switch
3	Engine speed control dial	11	Engine key switch
4	Travel speed control dial	12	Wiper switch (With cabin specification)
5	12V socket	13	Cabin's upper light switch (option)
6	Emergency engine stop switch	14	Backlight switch (option)
7	Hour meter	15	Heater switch (option)
8	Turn signal switch		

Display Screen System

When the engine key switch is turned to the ON position, the Start screen appears.



The Initial screen is switched to the Operation screen after three seconds.

The "Fault code display screen", "Machine information display screen" and "Adjustment selection display screen" are used by our serviceman when a trouble occurs in the machine or engine.
The screen returns to the "Operation screen" when the key is pressed.

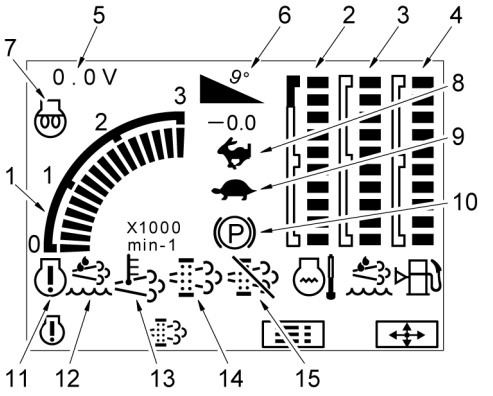
Explanation of Screen Displays

1. Display

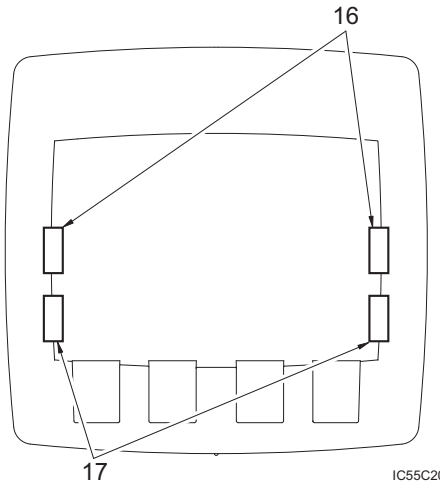
Operation Screen

The operation screen is the basic screen displayed on the display.

To operate the machine, display this screen under normal circumstances.



CA-C201150

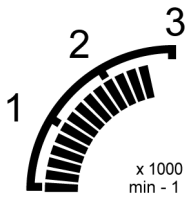


IC55C202000

No.	Name
1	Engine tachometer
2	Coolant thermometer
3	DEF gauge
4	Fuel gauge
5	Battery voltage
6	Slope warning indicator
7	Preheat indicator
8	High speed
9	Low speed
10	Parking brake indicator
11	Engine error indicator
12	Diesel Exhaust Fluid (DEF) level warning indicator
13	DPF regeneration indicator
14	DPF warning indicator
15	DPF regeneration stop indicator
16	Yellow LED indicator lamps
17	Red LED indicator lamps

1. Engine tachometer

This meter indicates the number of engine revolutions.



JA-C301060

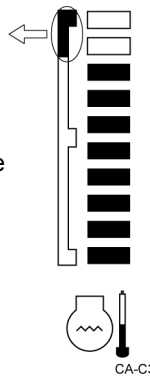
2. Coolant thermometer

Indicates the coolant temperature.

⚠ CAUTION

If the coolant temperature stays high, the yellow LED indicator lamp illuminates and a trouble code is displayed. If this state continues, the red LED indicator lamp illuminates and the engine protection function is activated to stop the engine.

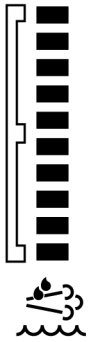
If the coolant temperature rises up to this range, stop the machine, decrease the engine revolution to cool down the machine. Also, perform engine maintenance as needed.



CA-C300830

3. DEF gauge

Indicates the DEF (Diesel Exhaust Fluid) level.



CA-C201450

> **⚠ CAUTION**
>
> If the DEF level gets too low, the yellow LED indicator lamp illuminates and a trouble code is displayed. If this state continues, the red LED indicator lamp illuminates and the engine protection function is activated to stop the engine

4. Fuel gauge

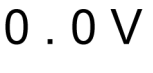
Indicates the fuel level.

FM-C300840

> **⚠ CAUTION**
>
> The fuel level may change if the machine is tilted.
>
> Be sure to measure the fuel level in the non-tilted position.

5. Battery voltage

Indicates the current battery voltage.



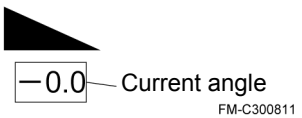
FM-C300900

6. Slope warning indicator

Indicates the inclination angle of the machine.

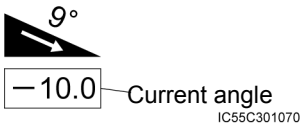
If travelling operation is carried out when the inclination angle is 9 degrees or more, the buzzer sounds for 5 seconds.

Display when the inclination angle is less than 9°



FM-C300811

Display when the inclination angle is 9° or more



IC55C301070

7. Preheat indicator

The preheat indicator comes on in accordance with the coolant temperature when the engine key switch is turned to the ON position.

The water temperature sensor senses the water temperature, the engine is preheated automatically, and the indicator lamp goes off when preheating is completed.

Do not start the engine while the preheat indicator lamp is on.

FM-C300850

8. High speed

CA-C201200

This is displayed when the high speed mode is selected.

9. Low speed

CA-C201210

This is displayed when the low speed mode is selected. Also, if the low speed mode is activated automatically by the Automatic Low speed function when the load of travel gets large while in the high speed mode, this indicator flashes and the buzzer (intermittent sound) sounds.

10. Parking brake indicator

FM-C300970

This indicator comes on when the parking brake is activated.
It flashes when the parking brake is activated while the parking brake switch is OFF. (See item 3 on page 2-12)

11. Engine error indicator

FM-C300930

This indicator comes on when some kind of engine problem occurs.
When an engine error is indicated, immediately contact our sales service dealer.

12. Diesel Exhaust Fluid (DEF) level warning indicator

CA-C201220

This indicator comes on when the DEF (Diesel Exhaust Fluid) level gets low.

13. DPF regeneration indicator

CA-C201230

The indicator lamp is on during DPF regeneration.

14. DPF warning indicator

CA-C201240

The indicator comes on when manual DPF regeneration is required.

15. DPF regeneration stop indicator

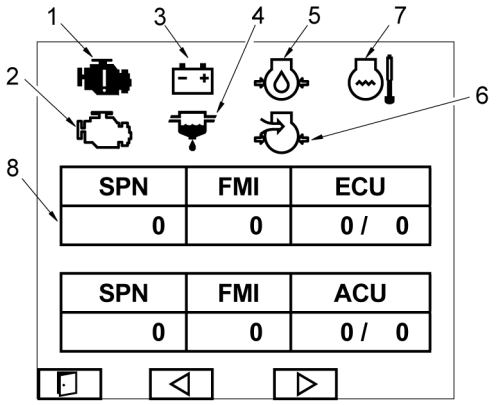
CA-C201250

The indicator lamp is on during the stop of DPF regeneration.

For more information about DPF handling, see the article on "DPF Handling" in the OPERATION section.
For more information about manual DPF regeneration, see the article on "DPF Manual Regenerating" in the OPERATION section.

Trouble Code Display Screen

No.	Name
1	Engine stop indicator
2	Engine system warning indicator
3	Battery charge warning indicator
4	Water separator warning indicator
5	Engine oil pressure warning indicator
6	Air cleaner clogging warning indicator
7	Coolant temperature warning indicator
8	Trouble code display



IC55C201160

1. Engine stop indicator


CA-C201260

- This indicator flashes when an imminent abnormality is detected and the engine automatically stops.
- This indicator comes on when a post-processing unit or engine failure is detected while the engine is running.

When the engine stop indicator flashes comes on or flashes, move to a safe area and stop the engine immediately.
Repair is required once the engine is stopped. Please contact our sales service dealer.

2. Engine system warning indicator


CA-C201270

This indicator comes on when an abnormality is detected in the post-processing unit or the engine when the engine is running. Stop the engine and inspect it.
Also, please report the contents of the trouble code display to our sales service dealer.

3. Battery charge warning indicator

FM-C300890

This indicator comes on when an abnormality is found in the charge system while the engine is running. If this indicator comes on while the engine is running, loose fan belt may be the cause. Stop the engine and check the fan belt tension.

4. Water separator warning indicator


IC55C201290

This indicator comes on when water accumulates up to the designated level of the water separator. When this comes on, stop the engine and drain the water from the water separator.

5. Engine oil pressure warning indicator

FM-C300940

This indicator comes on when the pressure of the lubricating oil that lubricates inside the engine drops while the engine is running. If this indicator comes on while the engine is running, stop the engine and check for oil leak and oil levels of the lubricating oil system.

6. Air cleaner clogging warning indicator

CA-C201300

This indicator comes on when the air cleaner is clogged while the engine is running. If the indicator comes on while the engine is running, stop the engine and clean the air cleaner elements, or replace them if necessary.

7. Coolant temperature warning indicator

CA-C201310

This indicator comes on when the coolant's temperature rises abnormally. If the indicator comes on while the engine is running, stop the operation such as traveling, and then stop the engine after gradually cooling it down by performing cold operation such as idling for five minutes or more.

8. Trouble code display

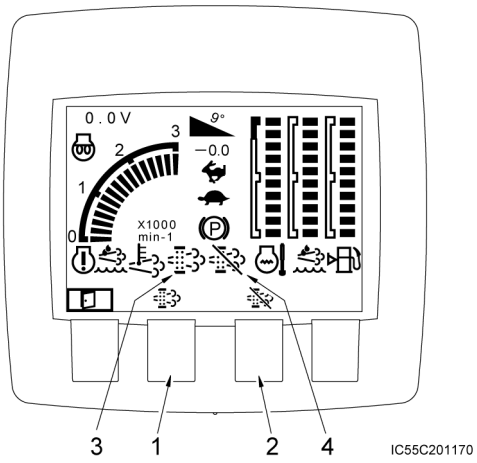
The display shows the trouble code.
It indicates the contents of the engine trouble.
For details on the contents of the engine trouble that appears on the display, contact our sales service dealer.

SPN	FMI	ECU
0	0	0 / 0

SPN	FMI	ACU
0	0	0 / 0

Regeneration Mode Selection Screen

This screen display is used to select the DPF regeneration operation of the post-processing unit.



No.	Name
1	DPF regeneration switch
2	DPF regeneration disabled switch

1. DPF regeneration switch

DPF is regenerated manually.

Operate this switch when the DPF warning indicator (3) is blinking.

2. DPF regeneration disabled switch

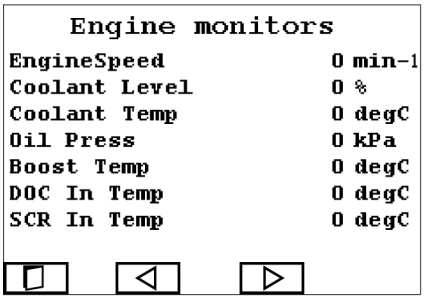
The automatic DPF regeneration function is disabled.

The automatic regeneration function is enabled by pressing this switch again.

When the DPF regeneration function is disabled, the DPF regeneration stop indicator lamp (4) is on.

Machine Information Display Screen

This screen is used by our serviceman to check the status of the machine.

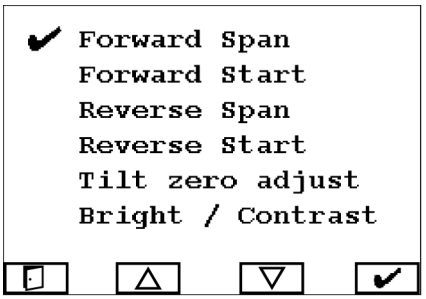


CA-C201180

Adjustment Selection Display Screen

This screen is used to adjust the travel speed, the inclination angle of the machine, the brightness of screen display, etc.
Using [△] and [▽], select an item you want to adjust and confirm with [レ].

Forward Span:	Do not change these items. Doing so will reduce travel speeds, cause meandering and generate shock at the time of gear change and stopping.
Forward Start:	
Reverse Span:	
Reverse Start:	
Tilt zero adjust:	
Bright / Contrast:	Adjusts the brightness and contrast of the display.



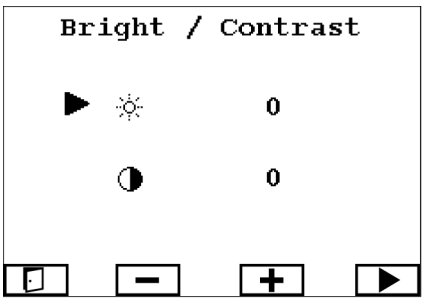
CA-C201190

⚠ CAUTION

These screen display items have already been adjusted at the time of shipment.
Especially, changing the values of the four items, from "Forward Span" to "Reverse Start," will reduce travel speeds, cause meandering and generate shock at the time of gear change and stopping. If the devices related to foot (hydraulic pump, travel motor and rubber crawler) have been changed and thus adjustments are required, please request for adjustment to any of the designated service locations.

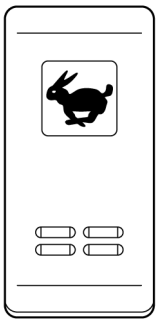
Bright/Contrast
(Brightness and Contrast Adjustment Screen)

Bright (Brightness)
Pressing the [+] key makes the screen display brighter and pressing the [-] key makes it darker.
Contrast
Pressing the [+] key makes the contrast higher and pressing the [-] key makes it lower.



CA-C201400

2. Travel Speed Select Switch

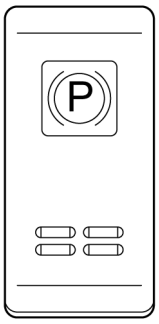

IC55C200180

This switch changes the travel speed between two modes.

High speed travel: Press the mark side. The mark indicator lamp goes on and the high speed mode (automatic low speed) is set.

Low speed travel: Press the side without the mark. The mark indicator lamp goes off and the low speed mode is set.

3. Parking switch



IC55C200190

This switch activates/deactivates the parking brake.

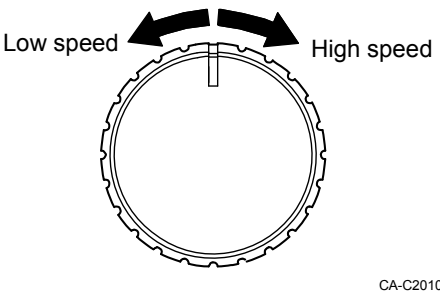
Brake ON: Press the P mark side. The mark indicator lamp comes on and the parking brake is activated.

Brake OFF: Press the side without the mark. The mark indicator lamp goes off and the parking brake is deactivated.

The parking brake safety function is provided to prevent erroneous travel after the engine key switch is turned ON. After the engine key switch is turned ON, the parking brake is always active even if the parking switch is set to the brake OFF side.

In order to deactivate the parking brake, operate the parking switch to set it to the brake ON side, and then set it back to the brake OFF side.

4. Engine speed control dial



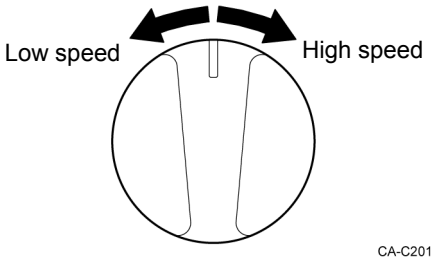
CA-C201040

Adjust the minimum engine speed.

High speed: Rotate the dial clockwise.

Low speed: Rotate the dial counterclockwise.

5. Travel speed control dial



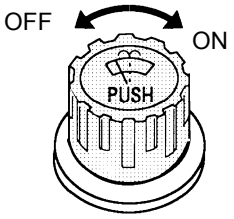
CA-C201050

This mode adjusts the travel speed of the machine.

High speed: Rotate the dial clockwise.

Low speed: Rotate the dial counterclockwise.

6. Wiper switch (With cabin specification)



CA-C200230

This switch can be used when the engine key switch is at the ON position.

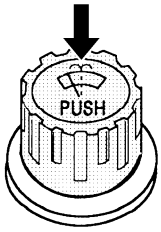
- Wiper

  Rotate the dial. OFF: Stop
  ON: Operate

- Window washer

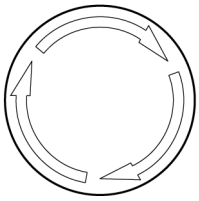
  Push down the knob.

  Washer fluid jets out from the nozzle while the knob is pushed down.



CA-C200240

7. Emergency engine stop switch


CA-C201060

Use this switch to activate emergency engine stop.

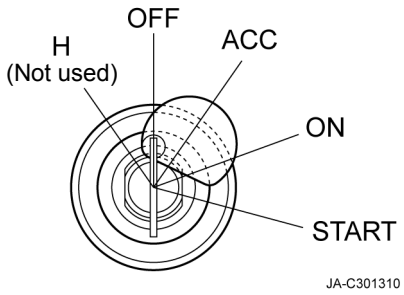
Stop: When this switch is pressed, the engine stops. The engine cannot be started while this switch is locked.

Release: When this switch is turned clockwise, the lock is released and the engine can be started.

8. Engine key switch

Use this switch to start and stop the engine.

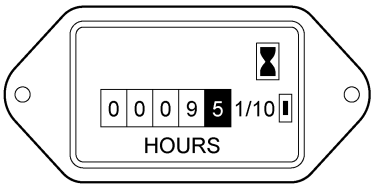
- OFF (Stop)
  The key can be inserted and removed. All power to the electrical system turns OFF and the running engine stops.
- ACC
  While the engine is stopped, the radio and the room light can be used.
- ON (Run)
  The power to the electrical system turns ON.
- START
  This is the engine start position.
  After checking that the preheat indicator lamp on the display is off, turn the key to the start position.
  When the engine starts, immediately release your hand from the key.
  The key returns to the ON position automatically.



JA-C301310

9. Hour meter

- This meter indicates the total operating hours of the machine.
  The smallest digit shows 1/10 of an hour (6 minutes).
- The meter advances as long as the engine is running even if the machine does not move.
- The total operating hours are used as the guideline for inspection and maintenance time.



CJ-C200081

10. Turn signal switch

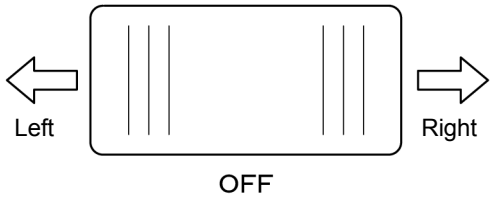
This switch can be used when the engine key switch is at the ON position.

Use the switch to operate the direction indicator lamps.

⇨: The right direction indicator lamp flashes.

OFF: The direction indicator lamps go OFF.

⇦: The left direction indicator lamp flashes.



IC55C200160

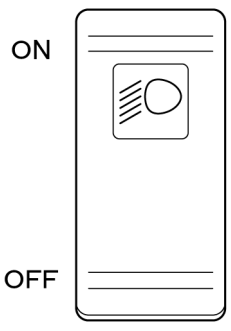
11. Head light switch

Use this switch to operate the head light.

The lamp comes on when the engine key switch is turned to the ON position, and the head light switch can be used.

Head light ON: Press the mark side.

Head light OFF: Press the no-mark side.

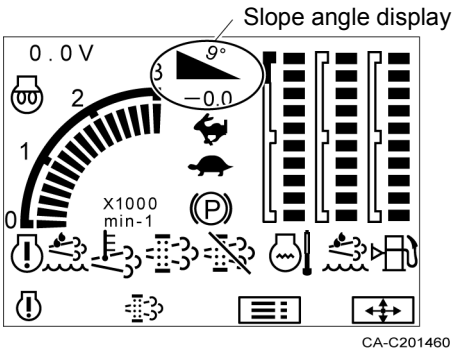


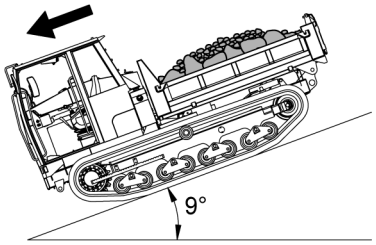
IC55C200150

Safety Warning Devices

Slope warning indicator

The slope angle of the machine is indicated on the display. When the machine travels down a slope of 9° or more, the alarm buzzer sounds for five seconds.

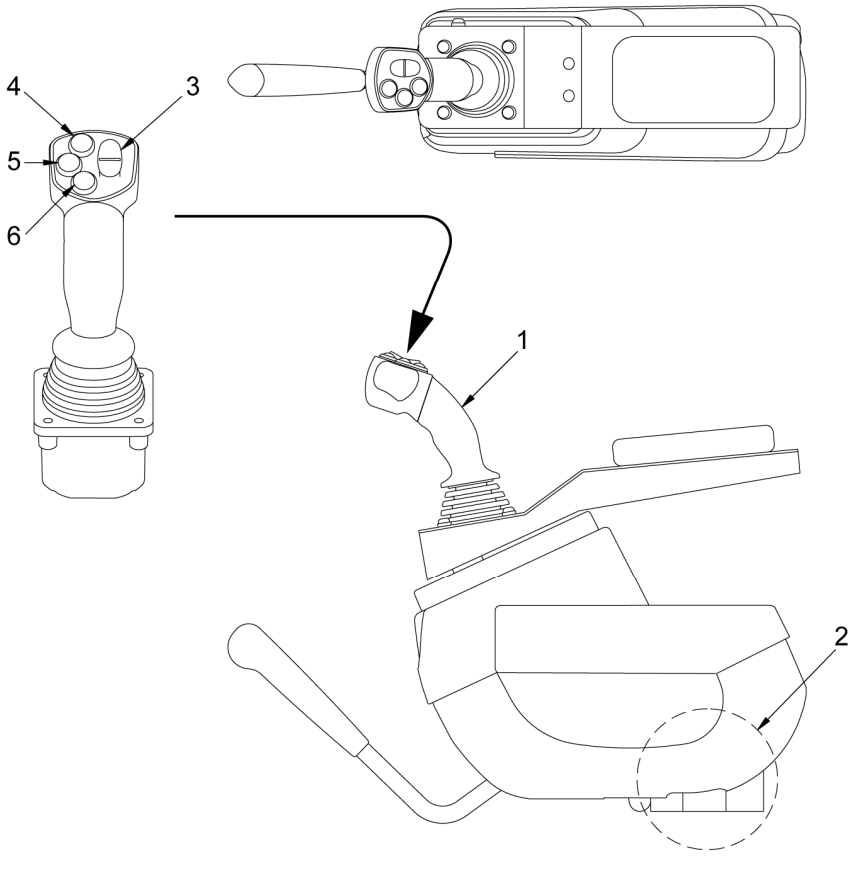




The posture at which the safety warning devices are activated

IC55C301160

LEFT LEVER UNIT



No.	Name	No.	Name
1	Joystick lever	4	Engine start/stop button
2	Lever lock switch	5	Horn button
3	Dump operation switch	6	Spin turn button

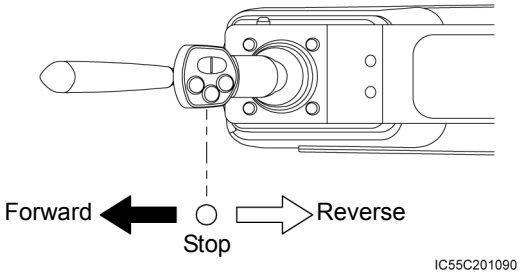
Joystick lever

Use this lever to control the travel operation of the machine.

Forward: Push the lever forward.

Stop: Return the lever to the neutral position.

Backward: Pull the lever backward.



For more information about travel operation, see the article on "REGARDING TRAVEL MODES" in the OPERATION section.

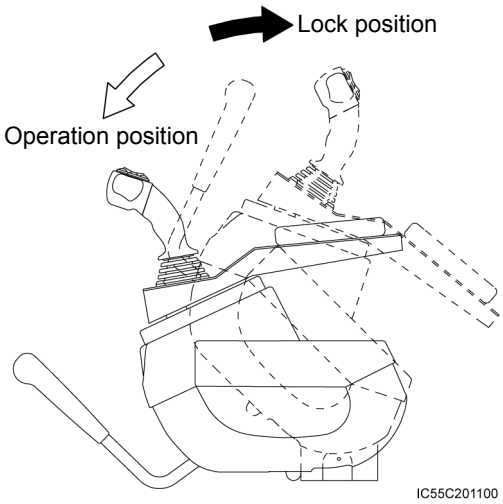
Lever lock switch

This switch is used to prevent erroneous operation if you accidentally touch the joystick when getting on or off the operator seat.

The lever lock switch can be operated by pulling up and down the left lever unit.

Lock: Pull up the left lever unit. The joystick is disabled at the lock position.

Release: Pull down the left lever unit to the operation position.



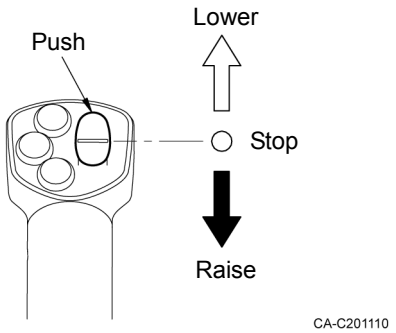
Dump operation switch

Press the right switch on the joystick lever to start dump operation.

Raise: Push the lower part of the switch to raise the vessel.

Stop: Release the switch to stop the vessel.

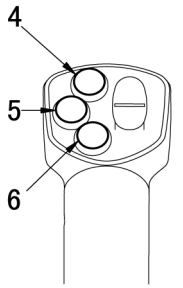
Lower: Push the upper part of the switch to lower the vessel.



For more information about dump operation, see the article on "DUMP OPERATION" in the OPERATION section.

Engine start/stop button (4)

The engine can be started by pressing the switch button (4) while the engine key switch is at the ON position.
The engine can be stopped by holding down this button while the engine is running.



CA-C201120

Horn button (5)

You can sound the horn by pressing the horn button (5).

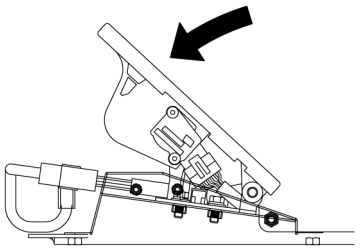
Spin turn button (6)

Spin turn operation can be performed by operating the joystick laterally while holding down the switch button (6).
Turning ON the engine key switch while holding down the spin turn button switches the mode to the spin turn mode.
For more information about spin turn operation, see the article on "Steering control" in the OPERATION section.

Accelerator pedal (option)

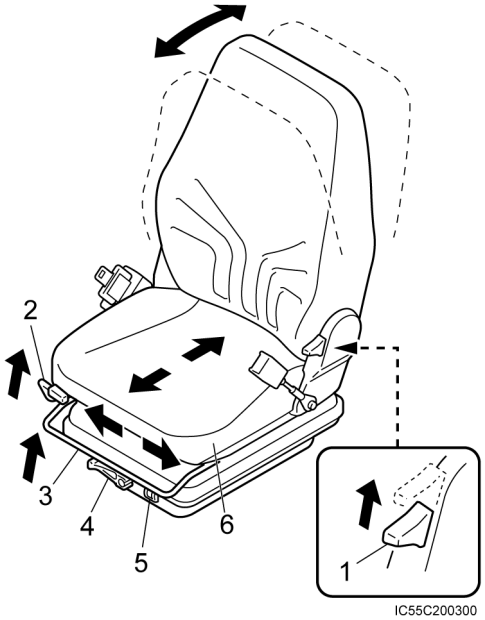
This mode adjusts the travel speed of the machine.

For more information about accelerator pedal operation, see the article on "TRAVEL MODES" in the OPERATION section.

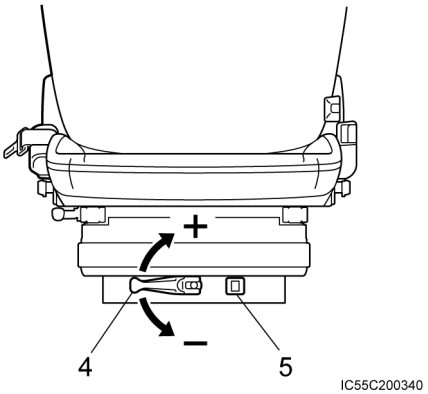

IC55C201130

OPERATOR SEAT

The operator seat is of the double sliding type.
The distance from the lever to the seat and the position of the whole seat can be adjusted.
Sit on the seat and adjust it to allow free lever operations.



- Adjusting tilt
  Move the seat back while pulling the lever (1) to adjust the angle of the seat back.
- Adjusting the distance between the seat and lever
  Move the seat forward or backward while pulling the lever (2) upward to adjust the distamce between the seat and the lever.
- Adjusting the back-and-forth position
  Move the seat forward or backward while pulling the lever (3) upward to adjust the back-and-forth position.
- Adjusting suspension
  Raise the lever (4) and turn it to adjust suspension.
  The appropriate body weight is displayed on the display (5).
- Adjusting the seat height
  When the seat is lifted from the bottom of the seat (6), the seat height is raised by 30 mm (a maximum of 60 mm).
  To return the seat to the original height, lift the seat from the bottom of the seat to the maximum height, lift it again and then lower it.

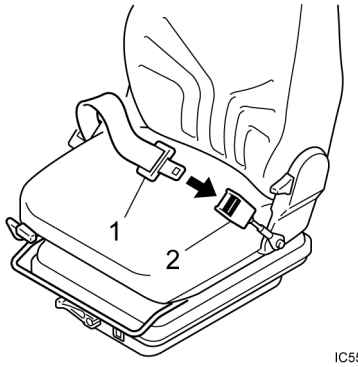


⚠ CAUTION

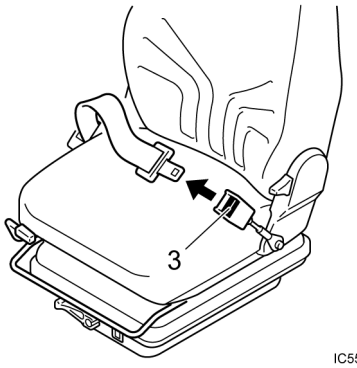
- Do not adjust the seat while driving. Sudden seat movement can cause operating errors or unforeseen accidents.
- Shake the seat back and forth lightly and check if the seat is fixed firmly after adjusting it. If the seat is not fixed, it may move suddenly and cause unforeseen accidents.

SEAT BELT

1. Adjust the seat belt length according to your body size.
2. Confirm that the seat belt is not twisted and put the plate (1) into the buckle (2) securely.
3. Slightly pull the belt and confirm the belt is locked.
4. Press the button (3) of the buckle to unfasten seat belt.



IC55C200400



IC55C200410

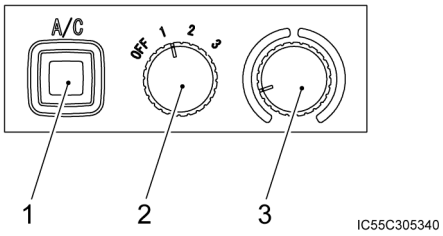
⚠ CAUTION

- ALWAYS fasten the seat belt while operating the machine.
- ALWAYS check the condition of the seat belt and mounting hardware before operating the machine.
  Replace the seat belt at least once every three years, regardless of appearance.

AIR CONDITIONER (OPTION)

The air conditioner control panel is in the overhead switch box. The air conditioner itself is at the rear of the operator seat in the cabin.

Operate this for adjusting the temperature inside the cabin.



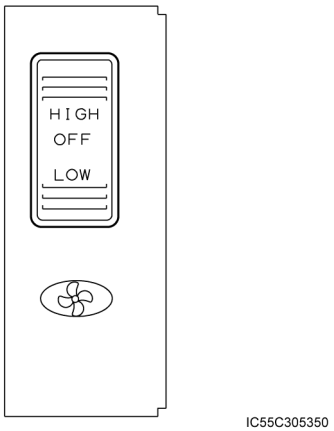
1. **Air conditioner switch**
   Pressing the switch starts the air conditioner. The indicator blinks when this switch is ON.

2. **Fan speed controlling knob**
   This knob is for switching ON or OFF the fan and for adjusting the air flow speed.
   The air flow rate is controlled by three levels

3. **Temperature control knob**
   This knob is for controlling the temperature of the air coming out of the air blow outlets.

Heater (Option)

The heater control switch is in the overhead switch box. The heater itself is at the rear of the operator seat in the cabin.
Operate this for heating inside the cabin.



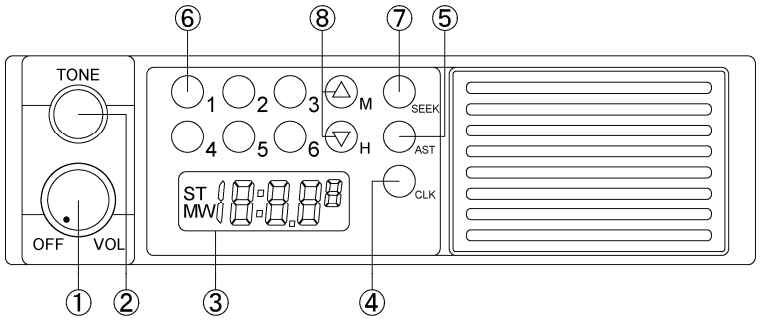
- "LOW" or "HIGH"
  Starts the fan and blows warm air into the cabin.
  The air flow rate of the fan can be selected by putting this switch to the "LOW" or the "HIGH" side.

- "OFF"
  Stops the fan.

AM RADIO (OPTION)

⚠ CAUTION

- If water enters the speaker case and/or the radio, unexpected accidents may occur, so be careful not to expose these units to water. Close the windows especially when raining and washing the machine.
- Do not wipe the scale panel and the knobs with benzene, thinner and similar solvent.
- Wipe with a soft dry cloth.
- Do not disassemble the radio.



CA-C200370

① Power switch/VOL control
When this knob is rotated clockwise, you will hear a clicking sound and the power is turned ON. Rotating this knob further clockwise adjusts the speaker volume.

② TONE control knob
Rotating this know clockwise emphasizes high-pitched tone. Rotating this know counterclockwise attenuates high-pitched tone.

③ Display
The clock, radio reception frequency and operation mode are displayed.

④ CLK (clock button)
Pressing this button changes the display to show the clock. Pressing it one more time shows the frequency.

⑤ AST
Pressing this button calls up preset stations in sequence. Press this button again when the desired broadcasting station appears on the display; the station display stops. When this button is held down for the duration of 2 seconds, auto memory is activated.

⑥ Preset buttons
One AM station can be preset to each button. (For the preset procedure, see the item on "How to Preset.")

⑦ Seek
When the SEEK switch is pressed, songs that can be received will automatically be sought and the seeking will stop when a song is received.

⑧ Tuning buttons
When the tuning ▲ button is pressed, the broadcasting station frequency increases. Pressing the ▼ button lowers the frequency. When this button is held down continuously, frequencies change in succession.

To listen to the radio
(1) Turn ON the starter switch to turn ON the power to the radio.
(2) Select a station using the preset buttons or the tuning buttons.
(3) Adjust the volume and sound quality as desired.
  • Be sure to listen to the radio at an appropriate volume level in order to secure safe operation.
(4) To turn OFF the radio, rotate the VOL know counterclockwise until you hear a clicking sound.

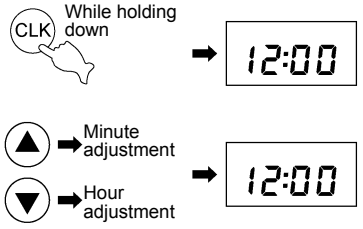
Regarding seek (automatic) station selection
When the SEEK switch is pressed, station selection starts toward higher frequency broadcasting stations. When a receivable broadcasting station is sought, the seeking stops automatically.

Regarding manual station selection
When the tuning ▲ button is pressed, the broadcasting station frequency increases; when the tuning ▼ button is pressed, the broadcasting station frequency decreases. When this button is held down continuously, frequencies change in succession.

To preset broadcasting stations
(1) Select a station you want to preset.
Select the frequency of that broadcasting station with the tuning buttons.
(2) When you hold down the button to which you want to preset the broadcasting station for 2 seconds, the same number as that of the button appears on the display and preset completes.
- To store another broadcasting station to an already preset switch, repeat steps (1) and (2) above.
- If the power is turned OFF for battery change, for example, the preset settings will be erased. In such a case, preset again.
- A total of six AM (MW) stations can be stored.

Regarding auto memory
When the AST button is held down for 2 seconds, broadcasting stations that are receivable at the current location are called up in sequence and they are automatically stored in the preset memory.

To set the clock (see the figure below)
(1) Turn ON the starter switch to turn ON the power to the radio.
If the display shows the frequency, press the CLK button to change to the clock display.
(2) Pressing the ▼ button while holding down the CLK button sets the hour and the ▲ button sets the minute.



CA-C200380

OPERATION

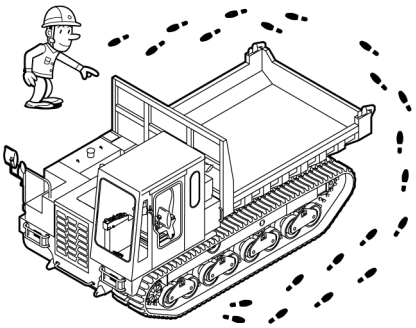
This section describes the proper operation procedures of this machine.
Always look to the safety and observe the given operation instructions and cautions to carry out works safely.

BEFORE STARTING OPERATION

The operator of the machine must carry out these inspections before starting the engine at the beginning of daily works.
Be sure to carry out them to prevent accidents in advance.

Walk-around inspection

Look around and under the machine and check the items shown below.
Repair defective parts before starting operation.


CA-C301311

- Check oil leak from the hydraulic devices, hydraulic oil tank, hose, joints, etc.
- Check damages of the fuel line and hose.
- Check damages, cracks, wear, backlash and loose bolts of the shoes, idle tumblers and sprockets.
- Remove excess soil and sand from the components on the lower section of the machine.
- Check oil leak and water leak from the engine.
- Remove dust and foreign matters from the engine, radiator and peripheral parts.
- Check for leaks from and damages to the intake and exhaust pipes around the air cleaner and the post-processing unit.
  If flammable objects touch the exhaust pipe or the like, a fire may break out. Make sure that there is no withered grass, paper trash or other flammable objects near the exhaust pipe.
- Check loose terminals of the electrical cables.

Start-up inspection

Refer to [MAINTENANCE] for details.

- Check the coolant level. Refill if necessary.
- Check the engine oil level. Refill if necessary.
- Check the fuel level. Refill if necessary.
- Check the hydraulic oil level. Refill if necessary.
- Check the DEF level. Refill if necessary.

BEFORE STARTING THE ENGINE

1. Sit on the seat, adjust it to allow free lever operations, and fasten the seat belt.

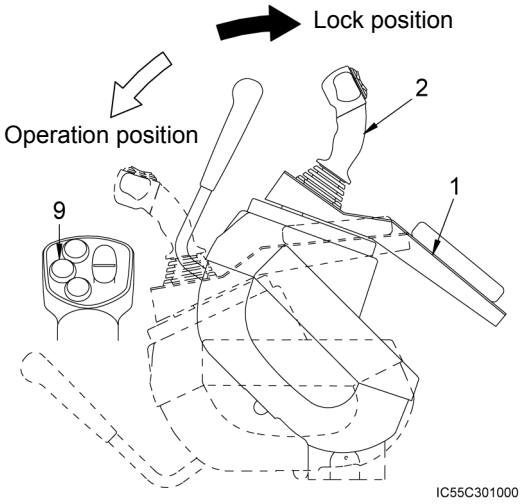
2. Make sure that the left lever unit (1) is set at the lock position.

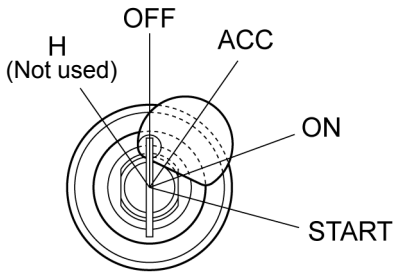
3. Make sure that the joystick lever (2) is set at the neutral positions.

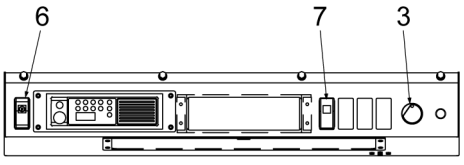
4. Insert the key into the engine key switch (3), turn it to the ON position, and check the following:

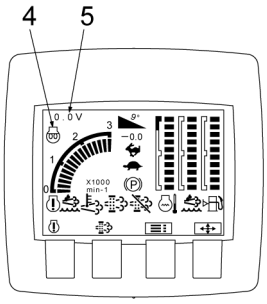
   - The display turns on. Make sure that the model name is correct.
   - Engine preheating starts automatically. Make sure that the preheat lamp (4) is lit and goes out then. The lighting time of the preheat lamp varies with the water temperature.
   - Make sure that the battery voltage display (5) is normal (approximately 12 V).
   - Turn on the parking switch and make sure that the mark lamp of the parking switch (6) is on.
   - Operate the headlight switch (7) and make sure that the headlights go on.
   - Operate the turn signal switch (8) and make sure that the turn signal lamps flashes.
   - Push down the horn button (8) of the joystick and make sure that the horn sounds.

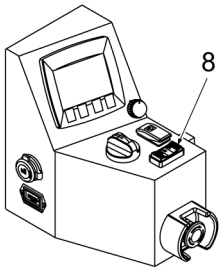
Ask our sales service dealer for repair services, if some abnormality is found in the above check.











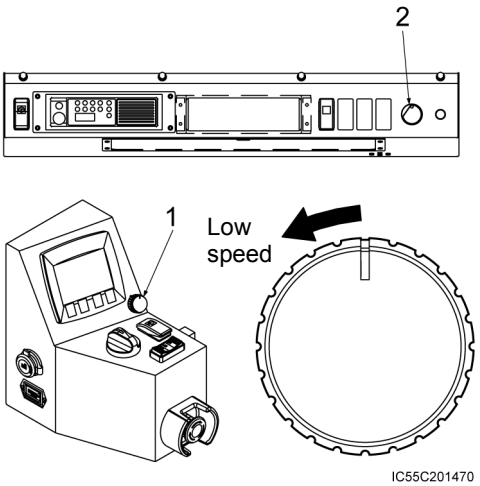
ENGINE STARTING

⚠ CAUTION

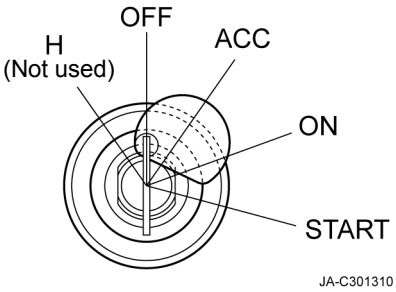
- Make sure that there are no persons or obstacles around the machine and sound the horn before starting the engine.
- Be sure to sit on the seat when starting the engine.

NOTICE

Do not turn on the starter motor for 30 seconds or more. If the engine does not start, return the key switch to OFF, wait for at least 2 minutes and restart the engine.



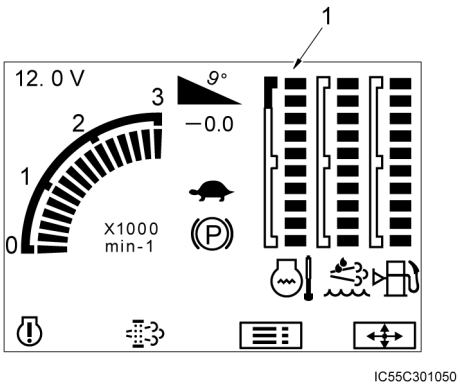
1. To prevent unexpected behavior of the machine, set the engine speed control dial (1) to the low position.
2. Make sure that the preheat lamp on the display is off. Turn the key (2) to the START position. The engine starts.
3. Release the hand from the key when the engine starts. The key returns to the ON position automatically.
4. Set the left lever unit to the operation position when starting operation.



AFTER STARTING THE ENGINE

NOTICE

- Never race the engine immediately after starting it. Racing after starting may cause breakdown of the engine.
- Do not accelerate the engine quickly or apply loads to it when the engine water temperature gauge (1) shows low temperature.
- If some abnormality is found, stop the engine immediately, find the cause and repair the defective part.



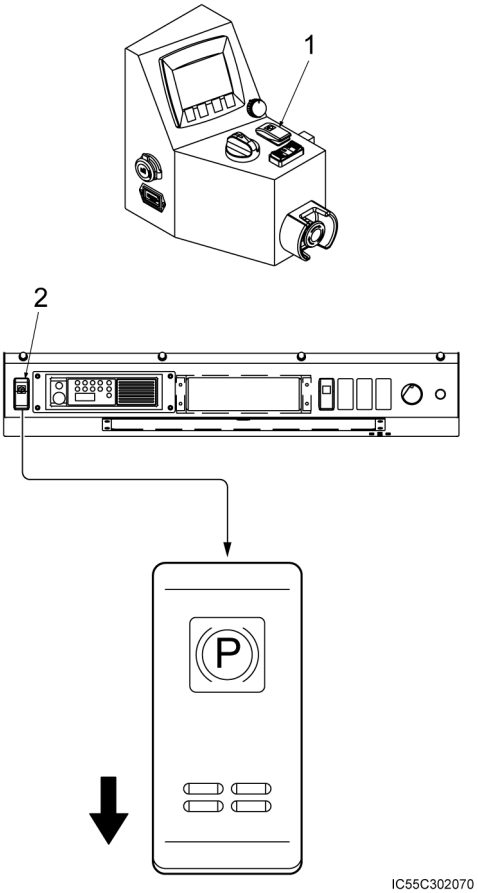
1. Make sure that all alarm lamps on the display are off.
2. Check if engine exhaust color, sound and vibrations are not abnormal.
3. After the engine has started, perform a warm-up operation (described later).

BASIC OPERATION

Start-Travel-Stop

⚠ WARNING

- When traveling, lower the vessel completely. **If a travel operation is performed while the vessel is in a raised positon, the buzzer sounds and the travel speed is restricted.**
- Lock the rear gate and side gates firmly.
- Make sure that no persons are around the machine. Sound the horn before starting.



IC55C302070

1. Adjust the traveling speed properly with the travel speed select switch (1).

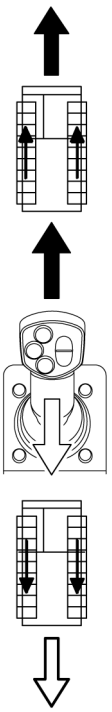
2. Push down on the no-mark position of the parking switch (2) to deactivate the brake.
   Make sure that the mark lamp is off.

   The parking switch (2) is equipped with the parking brake safety function for preventing erroneous travel after turning ON the engine key switch.
   After the engine key switch is turned ON, the machine cannot travel unless the parking switch (2) is turned ON once and then OFF.

Joystick Lever Operation Procedure

Use the joystick lever as shown below.

Forward: Push the joystick forward.
Stop: Set the travel joystick lever to the neutral position.
Backward: Pull the joystick lever backward.


IC55C301080

⚠ CAUTION

When traveling backward, be careful with the bouncing of the joystick lever.

Steering Control

⚠ WARNING

Never change the travel direction quickly on a slope. Quick direction change may cause turnover or slip.

If it is necessary to change the travel direction quickly, move to a solid ground with a gentle slope and change the direction.

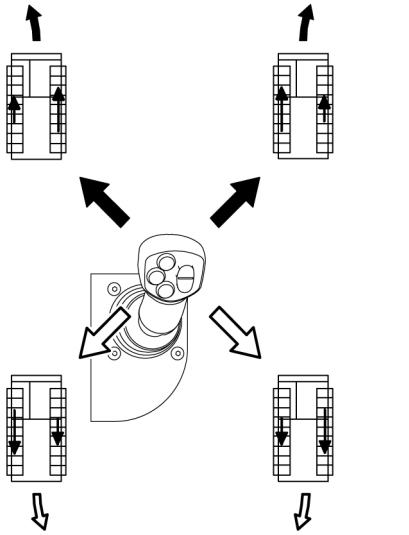
Turn

Left turn and forward: Push the joystick lever in the left forward direction.

Right turn and forward: Push the joystick lever in the right forward direction.

Left turn and backward: Pull the joystick lever in the right backward direction.

Right turn and backward: Pull the joystick lever in the left backward direction.



CA-C301300

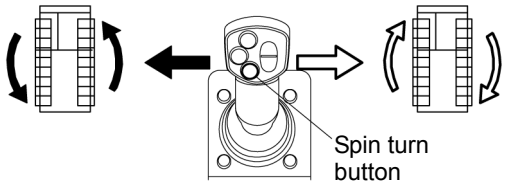
Spin Turn

Normal mode

Operate the joystick while holding down the spin turn button.

Left spin turn: Turn the joystick lever to the left.

Right spin turn: Turn the joystick lever to the right.



IC55C301090

⚠ CAUTION

Do not press the spin turn button with the joystick lever turned when there is low load (e.g., empty load) on the machine. Doing so can cause a hazardous situation due to too fast spinning.

Press the spin turn button when the joystick lever is at the neutral position, and operate the joystick lever.

Spin turn mode

Turning ON the engine key switch while holding down the spin turn button switches the mode to the "spin turn mode."

Once the "spin turn mode" is activated, spin turn operation is enabled without pressing the spin turn button.

The spin turn mode is deactivated when the engine key switch is turned OFF.

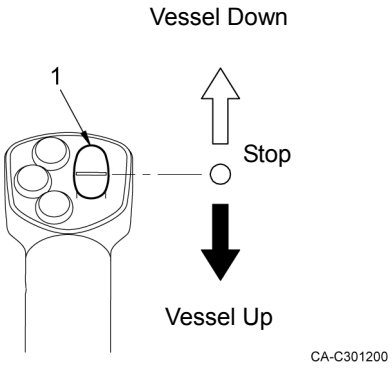
Dump Operation

⚠ DANGER

Never go under the raised vessel.
Keep the vessel with the safety bar.
If you touch the dump lever with the vessel raised, the vessel moves down even though the engine is stopping.

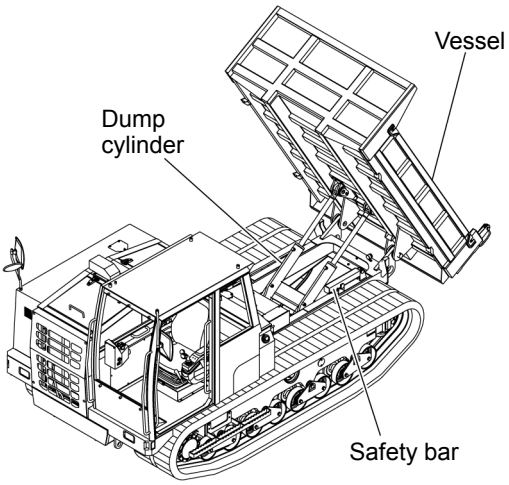
Procedure of dump operation

1. Stop the machine and confirm safety of a dumping place.
2. Raise or lower the vessel with the dump operation switch (1).
   Vessel Up: Slide the switch backward.
   Stop: Return the switch to the neutral position.
   Vessel Down: Slide the switch forward.
3. Adjust the dumping speed by the engine revolution and the amount of sliding the dump operation switch.
4. The rear gate of the vessel opens or closes automatically as the vessel moves up or down.



Caution of dump operation

1. If dumping is carried out on a slope, uneven ground or soft ground, the center of gravity may move and the machine may turn over.
   Carry out dumping on flat and solid grounds where the machine may be maintained as horizontally as possible.
2. Avoid dumping on cliffs or near ditches in danger of falling.
   If it is necessary to carry out dumping in such places, use buffers or post a guide as the necessity requires. Be sure to observe instructions of the guide.
3. When dumping bigger stones, operate dumping slowly. If there is a too big object to be dumped through the rear gate, remove the gate in advance.
4. The vessel cannot be lowered while the safety bar is actuated. When lowering the vessel, make sure that the safety bar is disengaged.
5. Make sure that the vessel has lowered completely before starting the machine.
6. While the vessel is in a raised positon, the buzzer sounds and the travel speed is restricted. The buzzer sounds continuously for travel operation conducted in this state.
   Raise or lower the vessel only when the machine is stopped.
   Raising/lowering the vessel during machine operation can cause a machine failure or breakage.



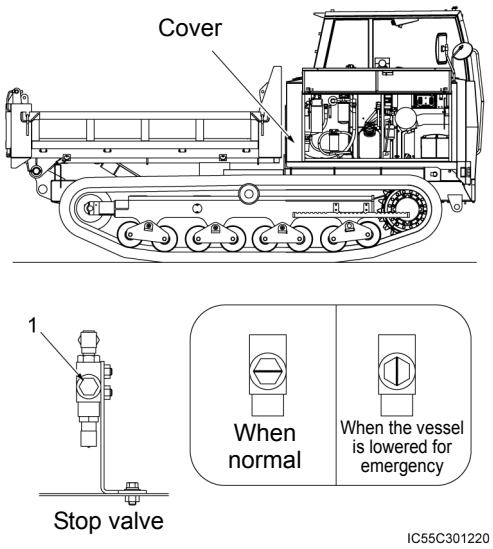
Dump at a level and stable place.

How to Lower Vessel in Case of Emergency

⚠ CAUTION

- Lower the vessel by using the stop valve plug only when a trouble occurs.
- If the plug is loosened quickly, the vessel moves down at speed, which is very dangerous. Loosen the plug slowly.
- Tighten the plug completely after lowering the vessel.

If a trouble occurs in the engine or pump in the condition where the vessel is raised and it cannot be lowered, it is possible to lower the vessel by loosening the stop valve plug (1) behind the operator's cabin.



1. Make sure that there are no persons under or around the vessel.

2. Open the cover.

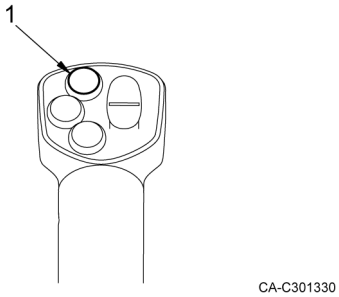
3. The vessel begins to lower when the plug is set as shown in the right figure "When the vessel is lowered for emergency."

4. Tighten the plug firmly after vessel has lowered completely.

Engine Start/Stop Button

The engine can be started or stopped by operating the engine start/stop button on the joystick lever.

1. Holding down the engine start/stop button (1) while the engine is running stops the engine and the engine key switch is turned ON.
2. Pressing the engine start/stop button while the engine key switch is ON starts the engine.

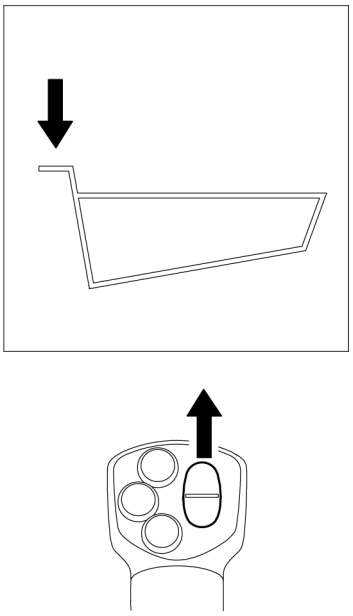


CA-C301330

The use of the engine start/stop button on the joystick lever is for temporary operation.
When the engine is stopped by this method, the engine key switch is in ON position and the battery is consumed. Therefore, when away from the machine for an extended period of time, be sure to stop the engine using the engine key switch (described later).

WARMING UP THE MACHINE

NOTICE
Do not increase the engine speed quickly when hydraulic oil is cool (below 20°). The proper hydraulic oil temperature is approximately 50°C to 80°C. If you should carry out works at low temperature, warm up the engine until the hydraulic oil temperature rises to approximately 20°C before starting works.



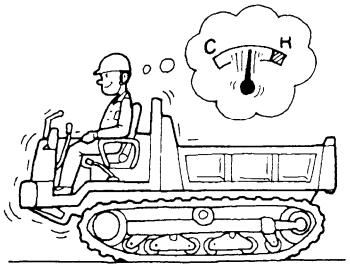
CA-C301060

1. When the temperature of the engine cooling water is low, the warm-up mode is activated. While in the warm-up mode, the idling engine speed increases; however, when the water temperature rises, the warm-up mode is automatically deactivated.
2. Idle the engine for approximately 5 minutes to warm it up after starting it.
3. If the hydraulic oil temperature is low, continue warming up for approximately 3 to 5 minutes with the dump lever to the "Lower" position to increase the hydraulic oil temperature, when it is low.
4. Move the machine forward and backward and raise and lower the vessel several times to warm up the mechanisms.

"BREAK-IN" OPERATION

NOTICE
If a new machine is used in severe conditions, its performances are deteriorated early and the service life becomes shorter. Break in a new machine for about 100 hours first.

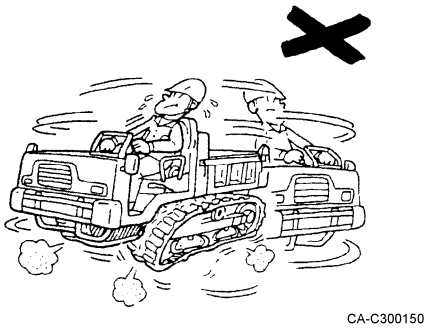
Warm-up operation



CA-C300130

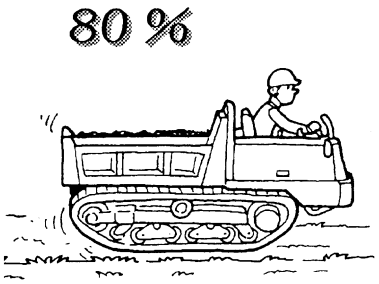
Pay attention to the following when breaking in a new machine.

- Warm up the machine sufficiently.
- Do not start or accelerate quickly or stop unnecessarily. Do not change the direction quickly.



CA-C300150

- Do not apply heavy loads to the machine or run it at high speed.
  Run the machine at approximately 80% of the maximum engine speed.
  Place loads of approximately 80% of the maximum loading capacity.



CA-C300140

CHARACTERISTICS OF TRAVEL OPERATION

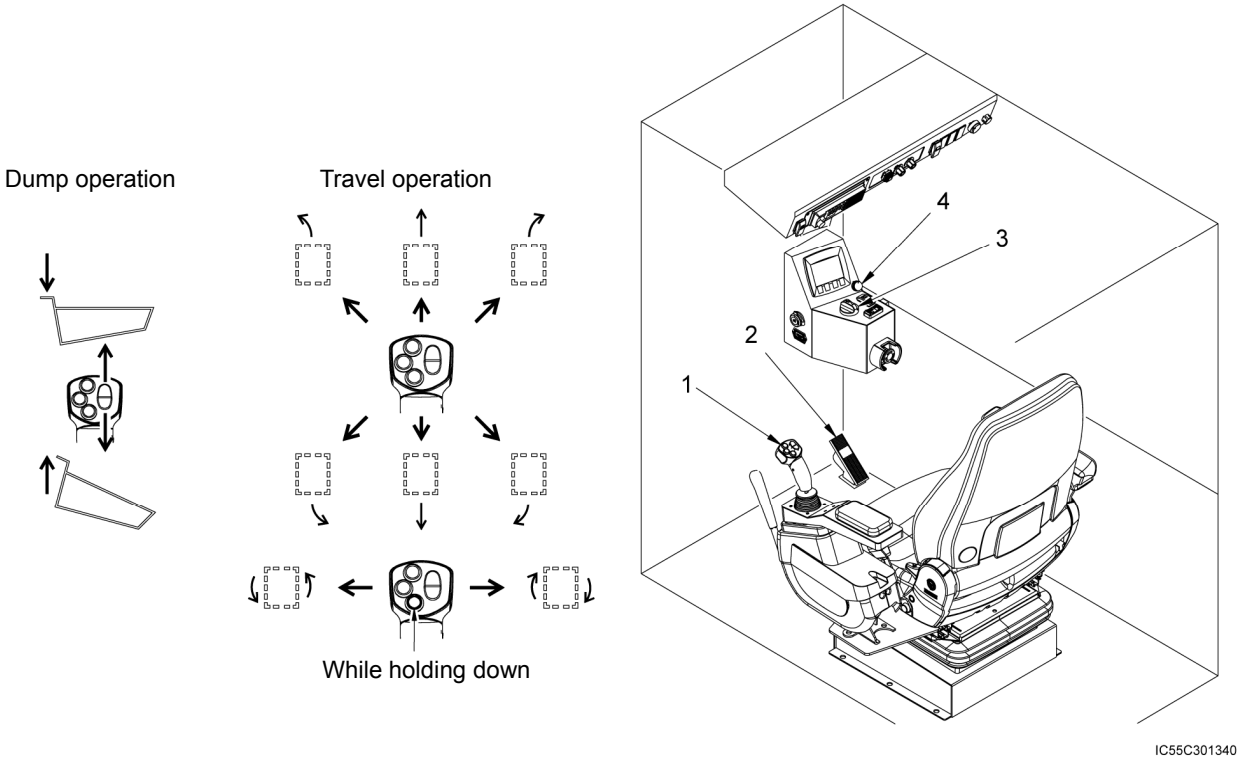
The operations of the joystick and the accelerator pedal (option) are linked with the engine revolutions and the hydraulic pump; thereby automatically controlling the oil pressure and the amount of discharge, stable travel speeds are achieved even with varied ground condition and loads.

In automatic mode, the operator can concentrate on steering operation and drive feeling similar to driving an automobile.

1. Joystick

The joystick is used to perform travel operation and dump operation.

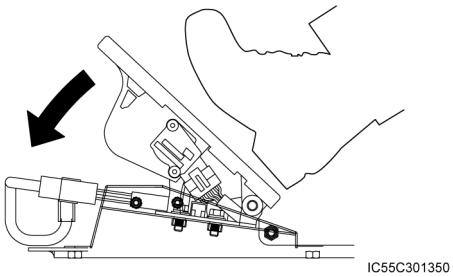
The engine revolutions are automatically linked according to the amount of each operation.



2. Accelerator pedal (option)

Combined with the joystick, the accelerator pedal adjusts the travel speed of the machine.

When using the accelerator pedal, tilt the joystick lever all the way toward the direction of travel and adjust the travel speed with the amount of step on the accelerator pedal; thereby the operator can operate the machine with the feeling of driving an automobile. (see page 3-13)



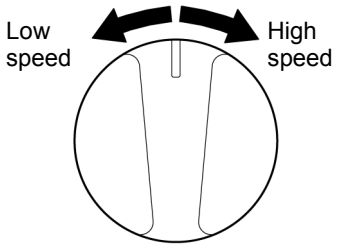
3. Travel speed control dial

This adjusts the speed of travel operated with the joystick.

Low speed End : 0 ~ Very slow speed

High speed End ：0 ~ Maximum Speed

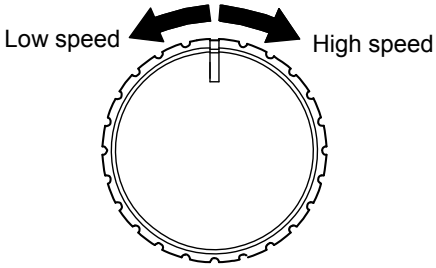
When you want to travel a narrow course, for instance, setting the dial at the low speed side makes it easier to travel.



CA-C201050

4. Engine speed control dial

This adjusts the lowest speed of the engine.

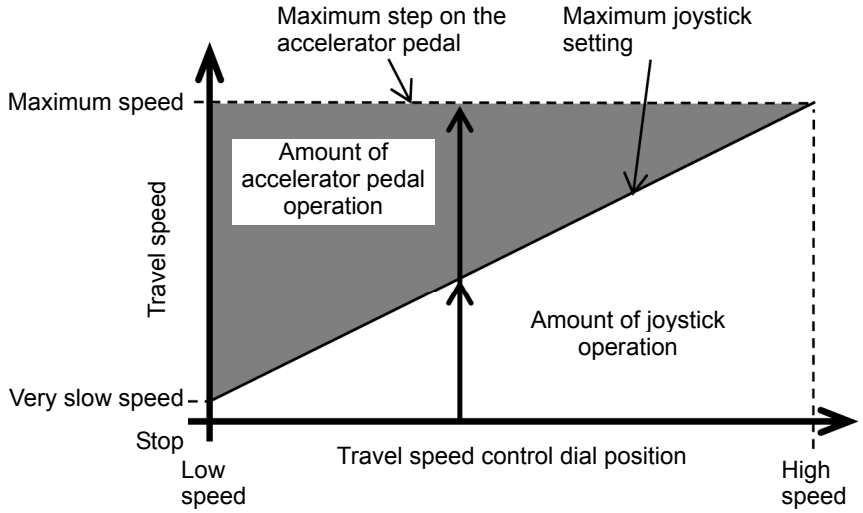


CA-C201040

Details of Travel Operation

The travel speed of the machine is determined by the engine revolutions and the hydraulic pump discharge amount (pump tilt angle), which is also affected by ground condition such as uphill and downhill, road surface conditions, load of travel such as the presence of loads on the vessel. Stable travel speeds are achieved by linked control of the number of engine revolutions and the hydraulic pump according to the travel speed command entered using the joystick and also by changing them automatically according to travel load.

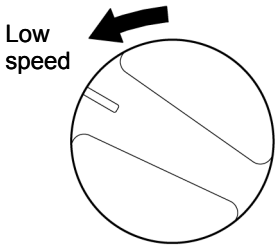
- **Relationships between the joystick and the accelerator pedal (option)**



CA-C301390

When the travel speed control dial is at the lowest speed position

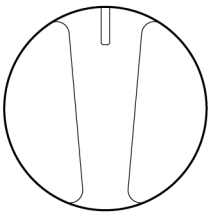
- Operating the joystick travels the machine at a speed range from stop to very slow.
- Operating the accelerator pedal (option) can adjust the speed of travel from very slow to the maximum.



CA-C301360

When the travel speed control dial is at the intermediate speed position

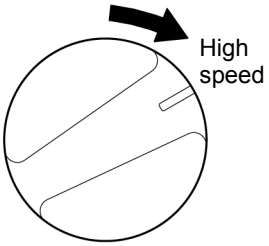
- In addition to the travel speed range that can be adjusted with the joystick, the accelerator pedal (option) can be used to adjust to the maximum speed.



CA-C301370

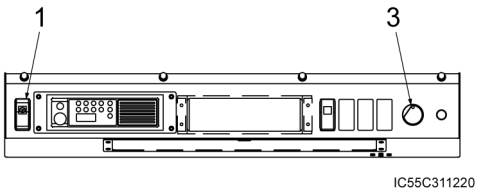
When the travel speed control dial is at the highest speed position

- Operating the joystick adjusts the travel speed in a range from stop to the maximum.
- The operation of the accelerator pedal (option) is disabled.



CA-C301380

STOPPING THE ENGINE



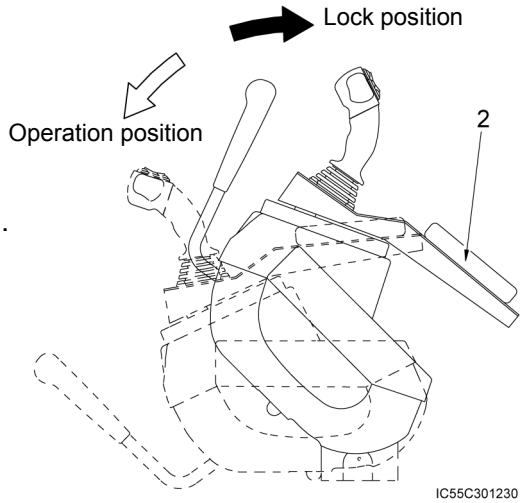
IC55C311220

⚠ WARNING

- Be sure to move down the vessel, stop the engine and pull out the key before leaving the operator seat.
- Do not park the machine on a slope. If it is necessary to park on a slope, use buffers on the lower side of the crawler.

Stopping the machine

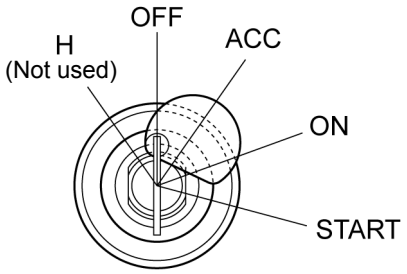
1. Stop the machine on a flat and rigid ground.
2. Set the parking switch (1) to the brake ON position.
3. Make sure that the vessel is lowered completely.
4. Check if the left lever unit (2) is set to the lock position.



IC55C301230

Stopping the engine

1. Keep the engine idling for approximately 5 minutes to lower the temperature of the engine.
2. Set the engine key switch (3) to the OFF position to stop the engine.
3. Pull out the key from the engine key switch.



JA-C301310

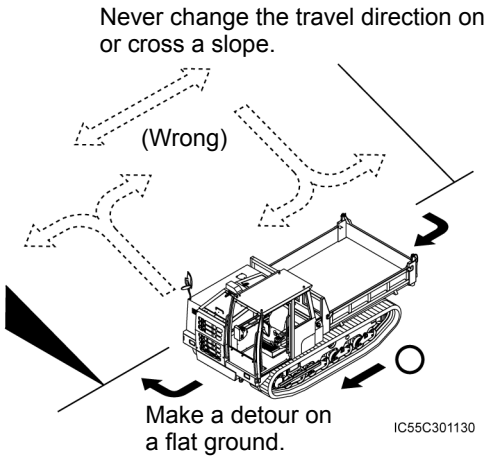
Inspection and locking after stopping the engine

1. Check necessary parts for oil leak and damages. Repair defective parts if oil leak or damages are found.
2. Fill the fuel tank with fuel and urea aqueous solution.
3. Remove soil and sand from the vessel and traveling mechanisms, in particular.
4. Lock the fuel filling port, engine hood and all other lockable parts.

CAUTION OF TRAVEL ON A STEEP SLOPE

⚠ DANGER

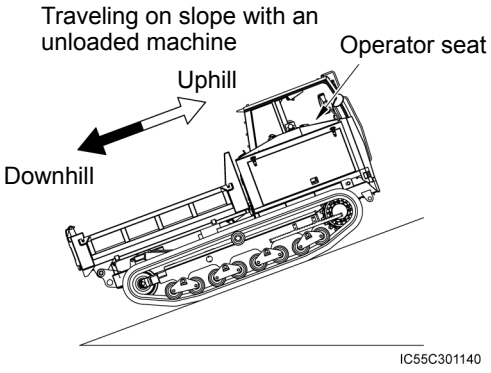
- Do not travel on slopes over 20° in order to avoid turnover.
- On steep slopes over 9°, travel the machine at low travel speed and middle or lower engine speed.
- Never change the travel direction on steep slopes or cross such slopes. Such operation may cause turnover or slip. Move down to a flat ground once and make a detour. Be sure to drive safely.

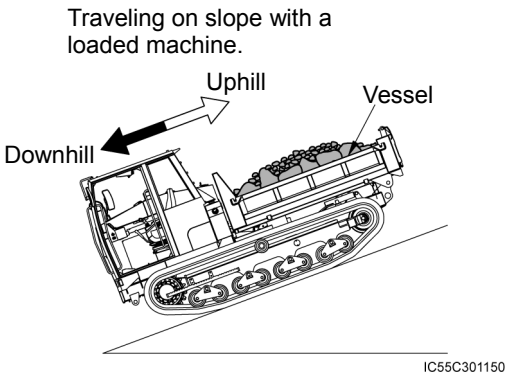


Cautions

Travel in the proper postures shown below.

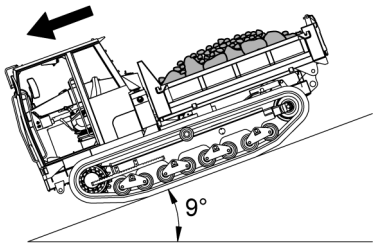
- Drive the machine with the cabin upper side of a slope when the vessel is empty. This posture ensures stable driving, since the center of gravity is located on the cabin side.
- Drive the machine with the vessel upper side of a slope when the vessel is full. This posture ensures stable driving, since the center of gravity is located on the vessel side.
- When driving over an obstacle, reduce the speed and drive safely with care not to turn over.
- Do not accelerate or decelerate the speed or stop suddenly.





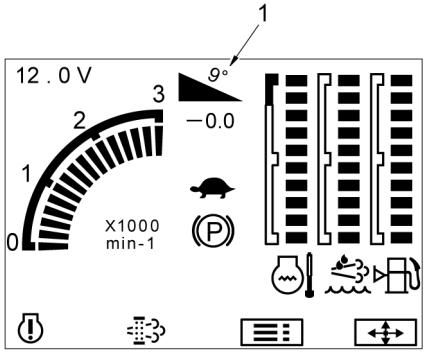
Slope Warning

Slope alarm mark (1) is displayed and blinks on the display if the machine inclines forward by 9° or more when it is descending on a slope.
At the same time, the buzzer sounds for five seconds.
On a slope of an angle over 9°, set the travel speed select switch (2) to the Low position.



The posture at which the safety warning devices are activated IC55C301160

If the machine travels without dropping the speed, there is a danger of overrun.

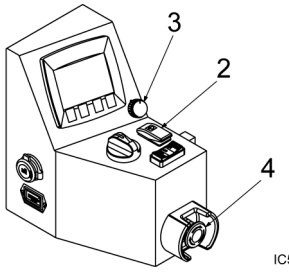


IC55C301170

Overrun avoidance operation

Carry out the following operations immediately to reduce the speed:

1. Return the joystick lever to the neutral position.
2. Reduce the engine speed control dial (3) down to the low speed.



IC55C301180

⚠ WARNING

The cause of overrun is over-loading. Never over-load the machine.

Emergency Engine Stop Switch

The engine can be stopped forcibly by pressing the emergency engine stop switch (4).

⚠ WARNING

- When the emergency engine stop switch is pressed while traveling, the machine stops immediately as the travel driving unit is locked. When using the emergency engine stop switch, be prepared for shock to your body.
- Avoid using the emergency engine stop switch while traveling at high speed.
  Otherwise, it will not only cause the machine to turn over and/or malfunction, but also become dangerous to the operator.

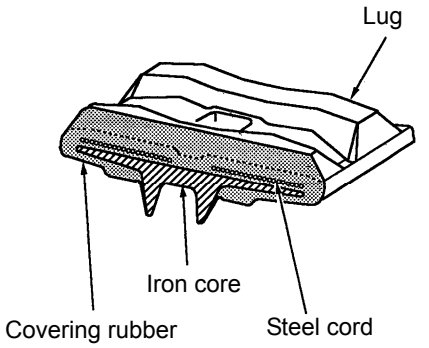
PRECAUTION ON USE OF RUBBER CRAWLER SHOE

⚠ CAUTION

The rubber crawler shoe may be damaged or worn faster depending on working conditions. Perform working operation properly according to working site conditions and machine operation. Be sure to observe the prohibitions and instructions shown below.

Structure of Rubber Crawler Shoe

As shown in the right figure, the rubber crawler shoe consists of steel cord to sustain tension, iron core to support it, and covering rubber to cover them.



CJ-C300440

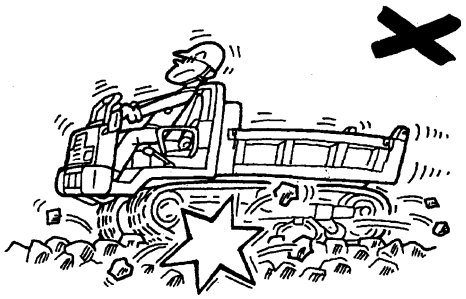
NOTICE

If a crack reaches the steel cord, it may be rusted and cut off by moisture. When any crack is detected, immediate repair is essential. Please contact our local dealer.

Cautions while working and traveling

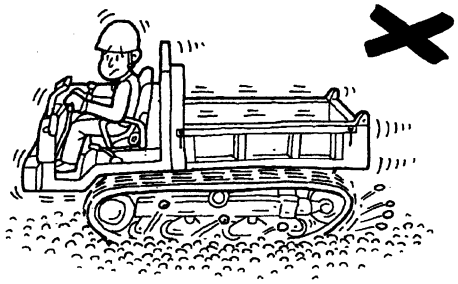
DO NOT TRAVEL OR WORK ON STONE FOUNDATIONS OR SHARP ROCKS

This wears down the lug and causes the steel cord to break.


CA-C300450

DO NOT TRAVEL OR WORK ON SURFACES WITH MANY STONES SUCH AS RIVER BEDS

This causes damage or wear on the rubber crawler and they may slip off.


CA-C300460

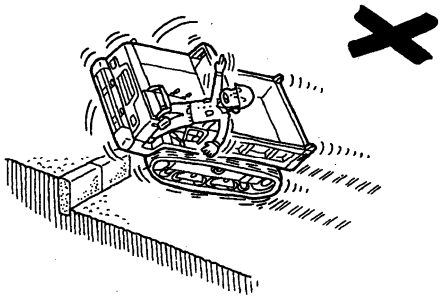
DO NOT TRAVEL OR WORK ON STEEL OR SCRAP MATERIAL

This wears down the lug and causes the steel cord to break.

CA-C300470

DO NOT TRAVEL OR WORK ON LARGE STEPS SUCH AS STONE STAIRS

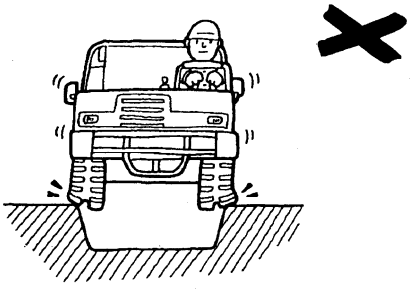
- Move slowly directly up steps.
- While moving up the steps, avoid places where the road surface changes.



CA-C300480

DO NOT TRAVEL OR WORK WHILE SPANNING A DITCH ETC

- This wears down the lug and breaks the iron core.
- The carrier might fall or topple over.

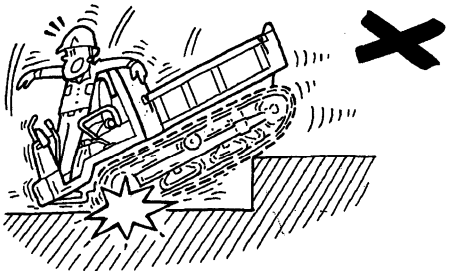


CA-C300490

AVOID LOCATIONS WHERE THE CARRIER MIGHT FALL

Do not let the carrier fall from locations like large stone steps.

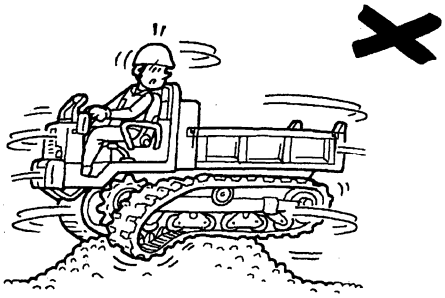
This might damage or break the iron core.



CA-C300500

AVOID TRAVELING OVER LARGE RUTS OR PROTRUSIONS ON THE ROAD

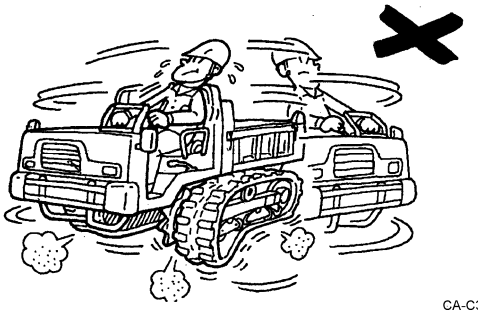
- Travel slowly and take care not to let the crawlers come off the rollers.
- Do not change directions when the crawlers may have lost tension at the high and low parts of ruts and protrusions. This may cause the crawlers to come off.



CA-C300510

AVOID SUDDEN CHANGES IN DIRECTION WHEN STEERING

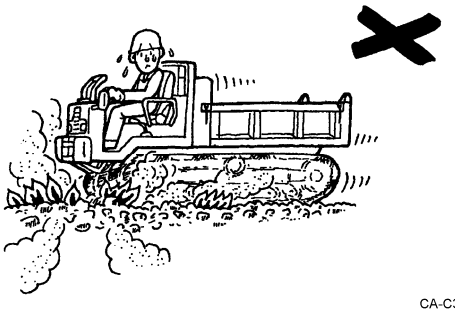
- Make direction changes in several smaller steering movements.
- Avoid sudden changes in direction.
  This causes early wear on the lug and may cause the crawlers to slip off.



CA-C300520

DO NOT TRAVEL OVER HIGH HEAT LOCATIONS

Do not try to travel over place subjected to high heat such as steel plate that was placed in bonfires or under scorching heat, asphalt or floorboards etc.
This causes serious abrasion or damage and breakage of the lug.

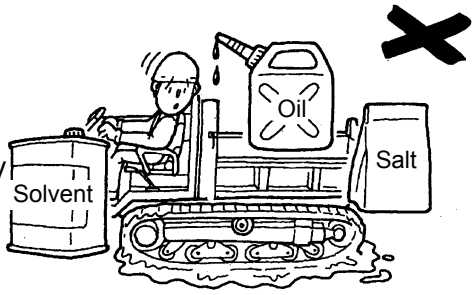


CA-C300530

OTHER ITEMS FOR CAUTION

DO NOT LET OIL – SOLVENTS OR SALT ADHERE TO THE RUBBER CRAWLERS

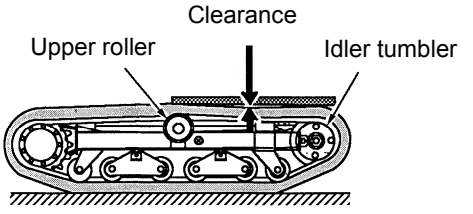
- If fuel, transmission fluid, urea aqueous solution or paint should adhere to the rubber crawlers wipe it away quickly.
- Wash away with water after working in locations with a large salt content. Salt can cause the iron core to rust or peel.



CA-C300540

ALWAYS USE CORRECT TENSION ON THE SHOE

Attempting to change directions on terrain with different levels or steps while the rubber crawler is still slack may damage the rubber crawlers or cause them to come off the rollers.
Use of the shoes very highly tensioned may also damage the components on the lower section of the machine.

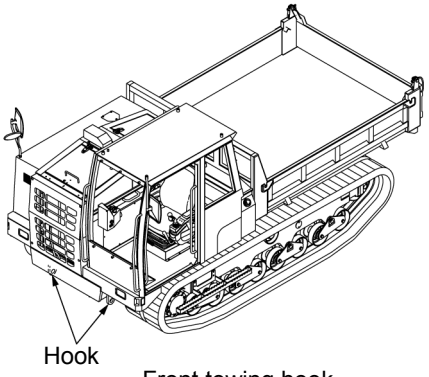


CA-C300550

TOWING

⚠ WARNING

- Use wire ropes and shackles for towing that are strong enough for the towing weight.
- It is very dangerous if the wire rope is disentangled during towing. Do not stand between the towing machine and the towed machine.

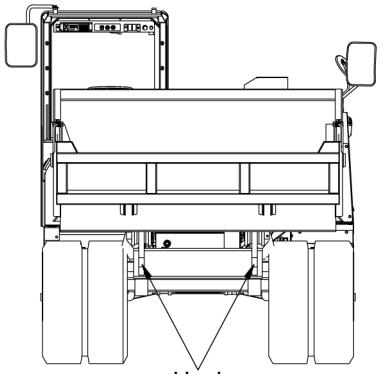


Front towing hook

IC55C301250

Towing the carrier

When the carrier gets stuck for instance in mud and cannot escape under its own power it must be towed by another machine. In such cases attach a shackle to a wire rope and attach this to the front or rear hook. The carrier can now be towed.



Rear towing hook

IC55C301260

1. Start the engine.
2. Select the low speed mode with the travel speed select switch.
3. Set the parking brake to the OFF position.
4. Move the joystick lever in the travel direction slowly when towing starts.

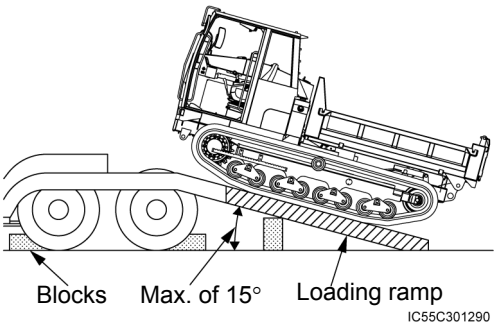
NOTICE

When the engine is broken and will not start, the parking brake will not release. The parking brake will prevent the crawler shoe from rotating so the carrier cannot be towed.

TRANSPORT

Observe the loading and unloading methods and the anchoring method for transportation as well as the laws and regulations concerned when transporting the machine.

Loading and Unloading the Machine



⚠ WARNING

- Move the machine forward when loading. Move it back when unloading.
- Be sure to select Low speed travel with the Travel speed select switch to reduce the engine speed before loading or unloading.
- Be sure to use loading ramps or loading tables for loading or unloading.
- Use loading ramps of adequate width, length and thickness that allow safe loading and unloading.
- Carry out loading or unloading on a flat and solid ground.
- Remove dirt and soil from the crawlers to prevent slippage. Remove grease, oil, water and other adherent matters from the loading ramps.
- Never make a turn on the loading ramps to avoid turnover. To make a turn, return to the load carrying platform or road.
- Warm up the machine sufficiently before load or unload it in cold weather.

1. Apply the trailer brake firmly. Fix the trailer wheels with blocks to prevent them from moving.
2. Adjust the center line of the machine to the center line of the trailer. Adjust the loading ramp interval to the crawler width.
3. Maintain the slope of loading ramps within 15°.
4. Set a half or smaller opening for the travel speed control dial, and gradually drive the machine at low speed.
5. Maintain the machine balance point while traveling over the loading ramp joint areas.
6. Load the machine properly at the specified position on the trailer.

Fixation at Transport

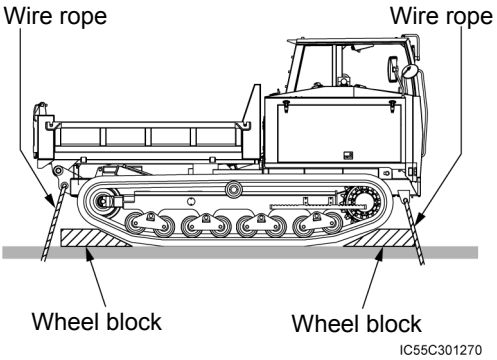
⚠ CAUTION

It is very dangerous if the machine moves during transportation.

Fix it firmly on the load carrying platform of the trailer with wheel blocks and wire ropes.

Apply wheel blocks in front of and behind the rubber crawlers to fix the machine.

Finally, make sure that the machine is loaded properly and fixed completely.

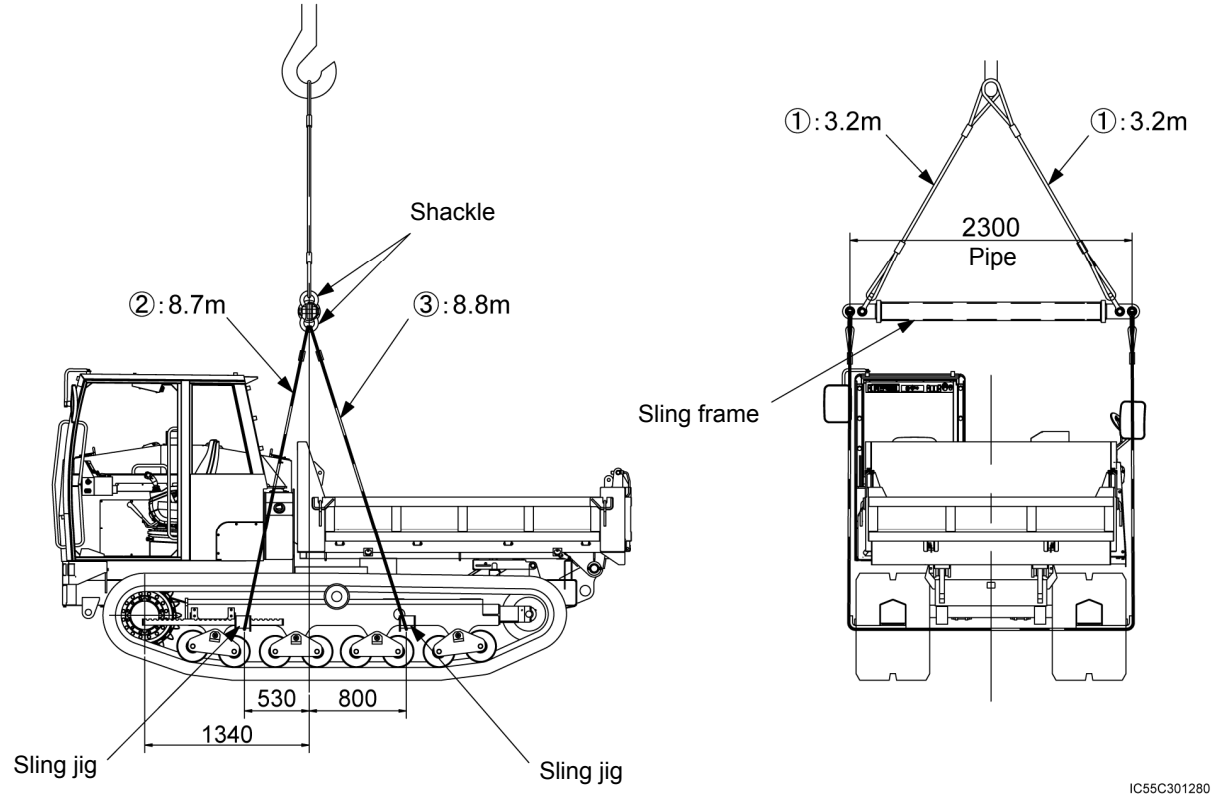


Lifting the Machine

⚠ WARNING

- ALWAYS lift the machine on the level ground.
- NEVER lift the machine loaded with any personnel.
- Make sure the lifting cables and other lifting devices are strong enough to support the machine.
- Use guide or tag lines to prevent the machine from swinging or turning.

Weight on lifting the machine: 6440 kg



1. Prepare strong enough wire ropes, shackles, sling frame and sling jigs.
2. Fix the sling jigs at the positions of the crawler frame shown above and pass the wire rope through them.
3. Install the wire rope to the sling frame with the shackle.
4. Install the wire rope to the crane hooks and lift upward so the crawler is a little bit above the ground, then stop lifting.
5. If the balance is good continue slowing lifting the machine.

Maximum machine mass	Wire breaking load
6440 kg	①: 40.7t (reference wire diameter: ϕ26)
	②, ③: 19.5t (reference wire diameter: ϕ18)

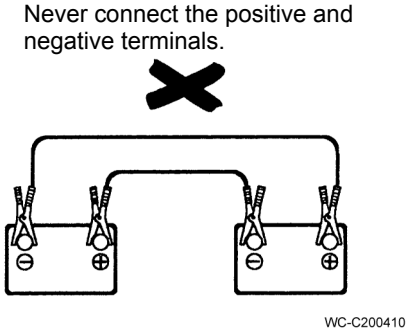
STARTING WITH JUMPER CABLES

⚠ WARNING

- If the jumper cables are connected improperly, the batteries are short-circuited, resulting in a dangerous accident. Never connect the positive and negative terminals.
- The battery produces inflammable hydrogen gas. It is explosive. Never bring fire close to the battery or strike a spark near it.

NOTICE

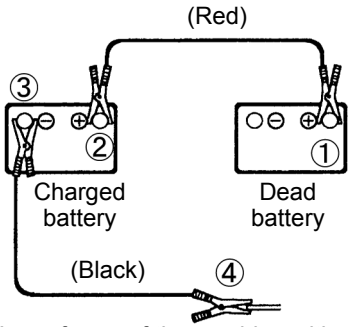
The electrical system of this machine runs on 12 V. Use a 12 V auxiliary battery.



WC-C200410

Connecting the jumper cables

1. Set to off the starter switch of a machine with a charged battery and the machine with a dead battery.
2. Connect the clip of the (red) jumper cable to the positive terminal of the dead battery. Connect the other clip to the positive terminal of the charged battery.
3. Connect the clip of the (black) jumper cable to the negative terminal of the charged battery. Connect the other clip to the upper frame of the machine with the dead battery.



Upper frame of the machine with an exhausted battery

Order of connecting the jumper cables

①→②→③→④

WC-C200420

Starting the engine

1. Make sure that the cable clips are connected with the battery terminals and upper frame properly.
2. Start the engine of the machine with the charged battery and keep it running at high speed.
3. Start the engine of the machine with the dead battery.

Disconnecting the jumper cables

1. Disconnect the clip of the black cable from the upper frame first. Disconnect the clip from the negative terminal of the charged battery then.
2. Disconnect the clip of the red cable from the positive terminal of the charged battery first. Disconnect the clip from the positive terminal of the dead battery then.

Order of disconnecting the jumper cables

④→③→②→①

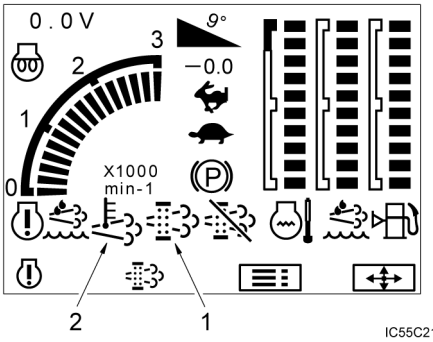
CA-C300120

DPF Handling

⚠ CAUTION

- Perform adequate ventilation, when performing the DPF regenerating under poor ventilation such as in a building.
- Take away flammable waste, etc., from around the DPF before performing the DPF regenerating.
- The DPF is hot during a regenerating operation and immediately after that. Do not touch it to avoid possible burns.

The DPF system collects soot (particulate matter) in exhaust gas on a filter in the muffler. When the soot collects more than a level, an automatic regenerating (removal by combustion) is performed (DPF automatic regenerating) during the machine is operating.
The automatic regenerating may not be completed when the rotation speed of the engine is low such as in a light-load work.
In such a case, it is necessary to stop the machine and perform the regenerating manually (DPF manual regenerating).
The DPF warning indicator (1) on the OK monitor blinks when the manual regenerating is necessary.
Stop the machine at a safe place and perform a manual regenerating, if the DPF warning indicator is blinking.

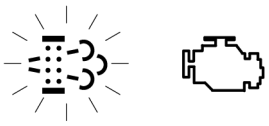


IC55C216070

- **When the DPF warning indicator is lit**
  Perform the manual regenerating at your earliest convenience.
  The engine warning indicator may turn on if you continue your work with the DPF warning indicator still on.


CA-C201240

- **When the DPF warning indicator is blinking and the Engine system warning indicator is lit**
  Stop your work and immediately perform the manual regenerating.
  It becomes impossible to perform the manual regenerating if you still continue your work in this state.
  If the DPF regeneration indicator (2) is not lit even when you operate the manual regeneration switch, contact our sales and service shop.

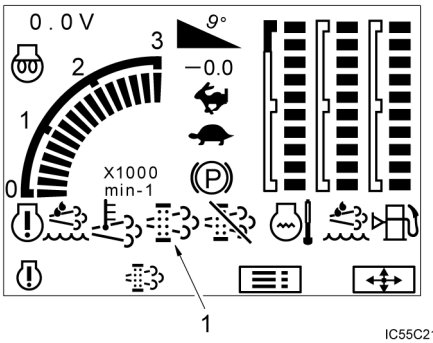

IC55C206090

- **When the Engine warning indicator is lit**
  The manual regenerating cannot be performed. Or you have some engine trouble not related to the DPF.
  The engine stops.
  The engine becomes impossible to be restarted.
  Contact our sales and service shop.


CA-C201260

DPF Manual Regenerating

Perform the DPF manual regenerating when the DPF warning indicator (1) on the OK monitor is blinking.

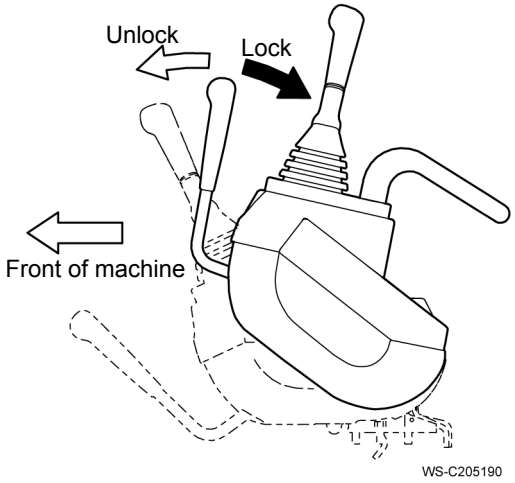


IC55C216070

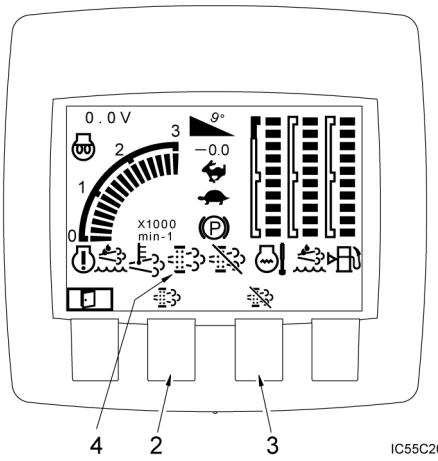
⚠ CAUTION

- Perform adequate ventilation, when performing the DPF regenerating under poor ventilation such as in a building.
- Take away flammable waste, etc., from around the DPF before performing the DPF regenerating.
- The DPF is hot during a regenerating operation and immediately after that. Do not touch it to avoid possible burns.

1. Stopping the machine
   Stop the machine at a safe place. Make sure no flammable material exists around the muffler, as the exhaust gas becomes hot during the regenerating.
2. When the water temperature is low, perform the warming up operation till the hand of the water temperature gauge points around the middle position.
3. Run the engine in the idling mode.
4. Set the control lock lever at the locked position.
5. Press the DPF regenerating switch (2).
6. When the DPF regeneration indicator is lit, DPF is being regenerated.
   The period of the manual regenerating, becoming longer or shorter depending on the temperature of the manual regenerating and the accumulated amount of soot, is 30 to 40 minutes.
   The DPF warning indicator turns off when the manual regenerating is completed.



WS-C205190



IC55C206130

• Stopping manual DPF regeneration before its completion

1. Stop the engine, and operate the DPF regeneration stop switch (3), or unlock and operate the lever, then the manual DPF regeneration is stopped.
2. Once DPF regeneration is stopped, it is not completed. The DPF warning indicator (4) blinks. Perform manual regeneration again.

MAINTENANCE

Proper maintenance is needed to maintain the machine performances for long and prevent damages and troubles in advance.
This section describes the proper maintenance procedures of this machine. Carry out maintenance safely and properly in accordance with the maintenance procedures described below.

PRECAUTION ON MAINTENANCE

Maintenance intervals

Determine the maintenance intervals in accordance with the time of the hour meter and certain period of time.

This section shows the maintenance intervals on the assumption that the machine is used in normal running conditions. Carry out maintenance earlier if the work environments are bad or severe.

Preparation for maintenance

- Place the machine in a flat and rigid ground.
- For normal maintenance, lower the vessel completely.
  To carry out maintenance with the vessel raised, raise the vessel fully and apply the safety lever.
- Set the parking switch to the brake ON position and the left lever unit to the locked position, stop the engine, and then remove the key from the engine key switch.
- Hang a tag indicating that inspection and maintenance are in progress at an easily visible location on the engine key switch or the left lever unit.

Cautions for repair works requiring welding

- Turn off power. (Disconnect the cable from the negative terminal of the battery.)
- Do not put any seals, bearings or the like between the weld zone and GND.
- Do not connect the GND wire to the pin of the vessel or hydraulic cylinder. It is the best way to connect the GND wire at or near the object to be welded.

Use genuine parts.

Be sure to use the genuine parts.

Use oil and grease of viscosity appropriate to the temperature.

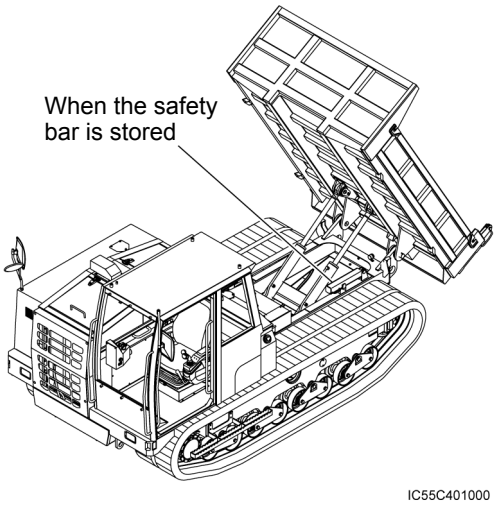
Ask our sales service dealer for important maintenance.

Ask our sales service dealer for important maintenance works such as replacement of electronic parts, adjustment of the hydraulic pressure and so forth that require professional knowledge and technique.

USE OF SAFETY BAR

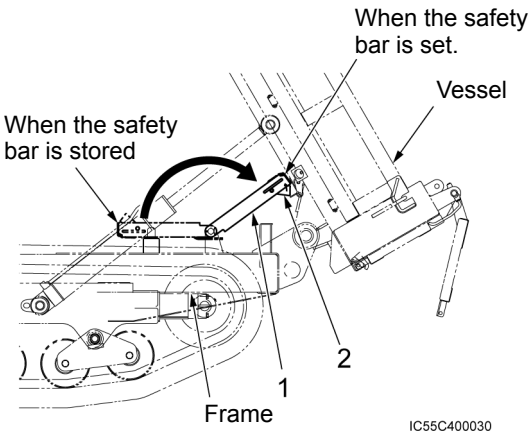
⚠ DANGER

ALWAYS use the safety bar to prevent personal injury or death, when maintenance under the raised vessel. Use the safety bar when underneath the vessel which has been raised.



Setting the safety bar

1. Raise the vessel completely.
2. Raise the safety bar (1) and set it to the bracket under the vessel.
3. Set the safety bar (1) until the safety bar switch (2) is firmly pressed down.



⚠ CAUTION

The vessel cannot be lowered while the safety bar is not in the stored position, such as when it is actuated. Before lowering the vessel, be sure to check that the safety bar is in the stored position.

Removing the safety bar

1. Raise the vessel completely.
2. Remove the safety bar from the bracket and store the bar onto the frame.

PERIODICAL REPLACEMENT OF THE IMPORTANT PARTS

Carry out periodical maintenance of the parts shown below having great concern with safety and fire, in particular.

These parts are subject to changes of materials, wear and deterioration as they are used long. It is difficult to judge the service life by checking the appearance of these parts. Replace them periodically, even though they do not have apparent defects.

Fuel Hose

Parts to be replaced periodically	Q'ty	Replace interval
Fuel hose (between fuel tank and fuel pre-filter)	1	Every 2 years
Fuel hose (between fuel pre-filter and electromagnetic fuel pump)	1	
Fuel hose (between electromagnetic fuel pump and fuel main filter)	1	
Fuel hose (between fuel main filter and engine)	1	
Fuel hose (between engine and fuel cooler)	1	
Fuel hose (between fuel cooler and fuel tank)	1	

Hydraulic Hose

Parts to be replaced periodically	Q'ty	Replace interval
Hydraulic hose (between pump and right travel motor, main line)	2	Every 2 years
Hydraulic hose (between pump and left travel motor, main line)	2	
Hydraulic hose (between pump, CV and dump cylinder)	5	

SCR Piping Hose

Parts to be replaced periodically	Q'ty	Replace interval
DEF hose (DEF tank OUT to supply module IN)	1	Every 2 years
DEF hose (supply module BACK to DEF tank IN)	1	
DEF hose (supply module OUT to DRT)	1	

Repair or replace these parts immediately if some abnormalities or defects are found in them even before the replacement periods.

Also check the fuel hoses and hydraulic hoses in daily check, monthly check and yearly check.

MAINTENANCE INTERVALS

Inspection and maintenance location		Description of inspection and maintenance	Interval of inspection and maintenance								
			Daily	Every 50 hours	Every 150 hours	Every 250 hours	Every 500 hours	Every 1000 hours	Every 1500 hours	Every 3000 hours	Irregular
Pins around vessel		Grease		○							
Oscillating link pins of lower rollers		Grease		○							
Rubber crawlers		Check for wear and cracks.	○								
		Inspect and adjust shoe tension.	○								
Bolt tightening locations		Inspect and tighten.		First time ○		○					
Travel reduction gear		Inspect lubricant level and replenish.					○				
		Change lubricant.			First time ○			○			
Hydraulic system	Hydraulic oil tank	Inspect hydraulic oil level and replenish.	○								
		Drain		○							
		Change hydraulic oil						○			
	Suction strainer	Clean						○			
	Return filter	Change cartridge		First time ○			○				
	Line filter	Change cartridge		First time ○			○				
	Hoses, pipes	Inspect for leaks and damages.	○								
Engine oil system	Engine oil	Inspect engine oil level and replenish.	○								
		Change engine oil.					○				
	Engine oil filter	Change cartridge					○				
Cooling system	Subtank	Inspect coolant level and replenish.	○								
	Coolant	Inspect antifreeze solution density.					○				
		Change coolant.							○ or every year		
	Fan belt	Inspect.	○								
		Adjust the belt tension				○					
		Change					○				
	Fan	Inspect for cracks and deformation.	○								
	Radiator hose	Inspect for leaks and damages.	○								

Inspection and maintenance location		Description of inspection and maintenance	Interval of inspection and maintenance								
			Daily	Every 50 hours	Every 150 hours	Every 250 hours	Every 500 hours	Every 1000 hours	Every 1500 hours	Every 3000 hours	Irregular
Fuel system	Fuel tank	Check fuel level and replenish.	○								
		Drain		○							
	Water separator	Inspect and drain	○	○							
		Clean					○				
	Fuel filter	Change cartridge					○				
	Fuel hose	Inspect for fuel leaks and damages.	○								
Air intake and exhaust system	Air cleaner	Inspect clogging warning lamp.	○								
		Clean element				○					
		Change element									Cleaning: 6 times
	Air intake and exhaust (SCR) pipes	Inspect for leaks and damages.	○								
Electrical system	Battery	Inspect battery fluid and replenish.		○							
		Clean terminals.					○				
	Fuses	Change.									○
	Fusible link	Change.									○
Engine and others	Oil separator element	Change.							○		
	DPF	Clean.								●	
	Diesel Exhaust Fluid (DEF)	Check DEF level and replenish.	○								
		Clean and change the DEF pump filter.								●	

- For more information about the engine, also refer to the Engine Operation Manual.
- Inquire of our sales service dealer about the maintenance items with ● marks.

RECOMMENDED LUBRICATION TABLE

Lubrication points	Oil type	Grade	Temp. & application -30 -20 -10 0 10 20 30 40	Q'ty required
Engine oil pan	Engine oil	API-CJ-4 or JASO-DH-2	SAE10W-30 * SAE15W-40	H: 13.2 L L: 8.8 L (System-wide: 19.2 L)
Hydraulic oil tank	Hydraulic oil	Abrasion-resistant	* ISO-VG46 * ISO-VG32	System-wide: 100 L Tank level: 70.5 L
Travel reduction gear	Gear oil	API GL-4	* SAE90	3.2 L
Fuel tank	Diesel fuel	JIS	* JIS No. 2 JIS No. 3 JIS special No. 3	150 L
Cooling system	Coolant	LLC	Make a 50% addition of long-life coolant (LLC).	15.3 L
DEF system	DEF (Diesel Exhaust Fluid)	AdBlue®	Use the product conforming to the JIS or ISO standard.	18 L

The oils and fluids marked with an asterisk (*) are used at the time of shipment from the factory.

GREASING

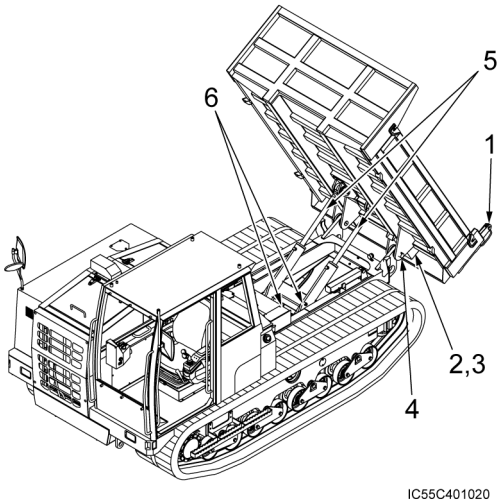
Refill the grease nipples with grease using a grease gun.

Remove oozed old grease after refilling.

Vessel

⚠ WARNING

Be sure to set the safety bars under the vessel when lubricating with the vessel raised.



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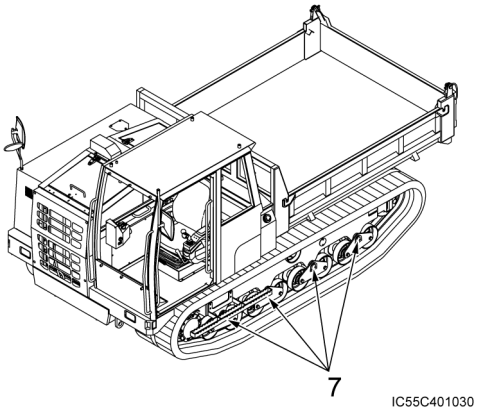
- Hinge pins of the vessel rear gate (1) 2 positions
- Lock pins of the vessel rear gate (2) 2 positions
- Control springs of the vessel rear gate (3) 2 positions
- Vessel joint pins (4) 2 positions
- Dump cylinder rod pins (5) 2 positions
- Dump cylinder foot pins (6) 2 positions

Oscillating Link

- Oscillating link pins (7) 8 positions

NOTICE

Grease the link pins everyday before starting works if the machine is used on damp grounds or in mud.



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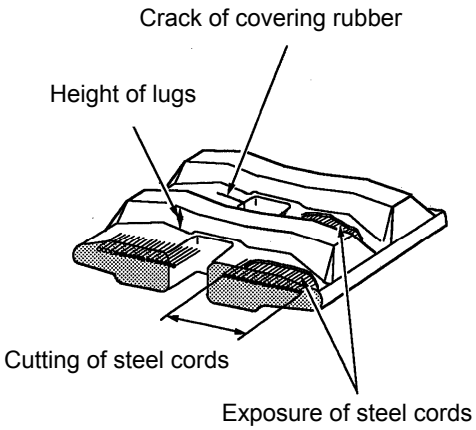
RUBBER CRAWLER

Rubber Crawler Shoe Maintenance

Rubber crawler shoe should be repaired or exchanged under the next conditions.
If it is necessary to repair or replace it, contact our dealer.

- **Height of Lugs**

The rubber crawler can be used even if it is worn, however, if it is excessively worn, the crawler shoe is likely to be slippery and more travel force is required. If the remaining lug is less than 5 mm (approx. 0.2 in.) high, exchange it with brand-new one.



- **Exposure of Steel Cords**

If steel cord is exposed because of weary rubber or damage, exchange it with brand-new one.

- **Cutting of Steel Cords of Rubber Crawler Shoes**

When cutting of steel cord is detected, exchange it immediately. If you leave it as it is, the rubber crawler shoes can be cut off without expectation, which causes a serious accident.

- **Crack of Covering Rubber**

If a crack is 30 mm (1.2 in.) or more long and 8 mm (0.32 in.) or more deep, repair the cover immediately. If steel cord appears even if a crack is small, repair it immediately. Otherwise, water may come into a crack, which rusts steel cords and cuts off the rubber crawler shoe.

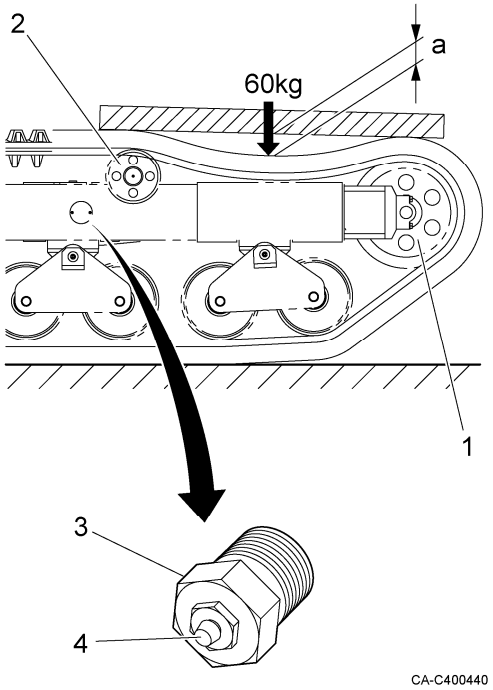
- **Dislocation of the rubber crawler cores**

Exchange the rubber crawler with a new crawler if one or more cores are dislocated from it.

Track Adjustment

Checking tension of the rubber crawlers

1. Place the carrier on a flat and rigid ground.
2. Put a timber of approximately 1.5 meters long on the rubber crawler shoe above the idle tumbler (1) and upper roller (2) and check the clearance between the timber and the crawler when a person (of 60kg in weight) gets on the center of crawler between the tumbler and the upper roller.
   The proper clearance is 20 to 30 mm.



Tensioning the rubber crawlers

1. Fill grease through the grease nipple (4) of the check valve (3) until the rubber crawler shoe are tensioned properly.
2. Rotate the rubber crawlers forward and backward and check tension. Re-adjust it if necessary.

NOTICE
• Adjust the right and left rubber crawlers evenly. • If the rubber crawlers are not tensioned properly, the cylinders may be defective. Ask our sales service dealer for repair services.

Loosening the rubber crawlers

1. Remove dirt and soil from around the idle tumblers.
2. Loosen the check valve until grease is discharged (by a maximum of one turn) little by little. Do not loosen it when grease is discharged.
3. Rotate the rubber crawlers forward and backward slightly if grease is hardly discharged.
4. Tighten the check valve when the rubber crawlers are tensioned properly.
   Tightening torque: 59 to 69 N·m (6 to 7 kgf·m)

NOTICE
Be careful not to over-tighten the check valve.

5. Rotate the rubber crawlers forward and backward and check tension. Re-adjust it if necessary.

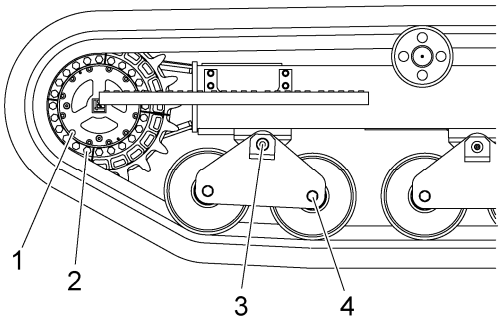
⚠ WARNING
• When the rubber crawlers are tensioned intensely, the internal pressure in the grease cylinder is very high. Do not remove any parts before the pressure is zeroed. • To relief the pressure, loosen the check valve gradually. Do not loosen it when grease is discharged. (It should be loosened by a maximum of one turn.) • Grease may spout out at high pressure. Never loosen the grease nipple. • Do not bring your face or hand close to the check valve during adjustment.

FIXED BOLT TORQUE

Tighten the bolts and nuts as shown in the table below.
If loose bolts and nuts are found in daily check, tighten them. If lacking bolts and/or nuts are found, be sure to replace new parts with lacking parts.
When a new machine is used, check the bolts and nuts when first 50 hours have past. Tighten loose bolts and nuts.

Special Torque Specifications

The bolts and nuts shown in the table below bear large forces. Tighten them at the torques shown in the table. When these bolts and nuts are replaced, apply the locktite to the threads and tighten them at the specified torques.



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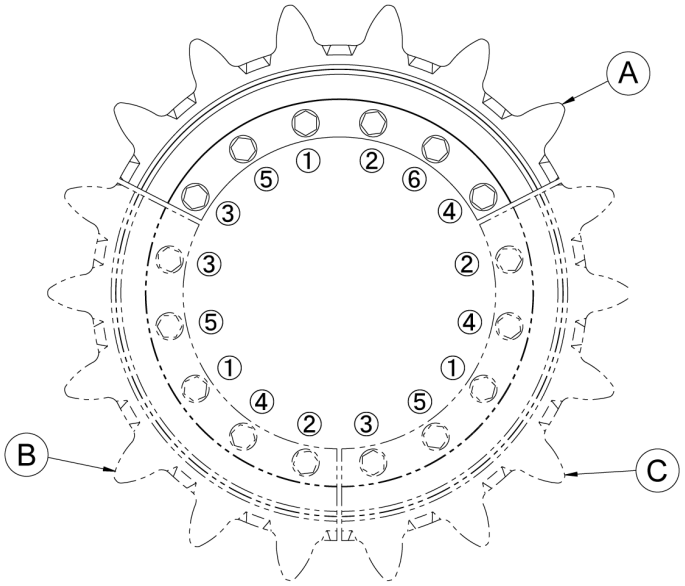
Traveling-rated

No.	Special tightening	Thread size	Wrench size (mm)	Tightening torque	
				N·m	kgf·m
1	Travel reduction gear	M16	24	241	24.6
2	Drive sprocket	M16	22	156	15.9
3	Oscillating link	M30	46	980	100
4	Lower roller	M24	30	476	48.6

Notes on attaching drive sprocket

Observe the following procedures when attaching the drive sprocket.

(1) Bring the inner surface of the sprocket into close contact with the motor spigot when attaching the sprocket.
(2) Tighten all of six bolts with the locktite applied at a torque of 98 to 156.9 N·m first.
(3) Then, tighten the bolts in the order shown on the right at the specified torque of 156 N·m. Tighten the bolts quickly since screw locking agent is applied to them.



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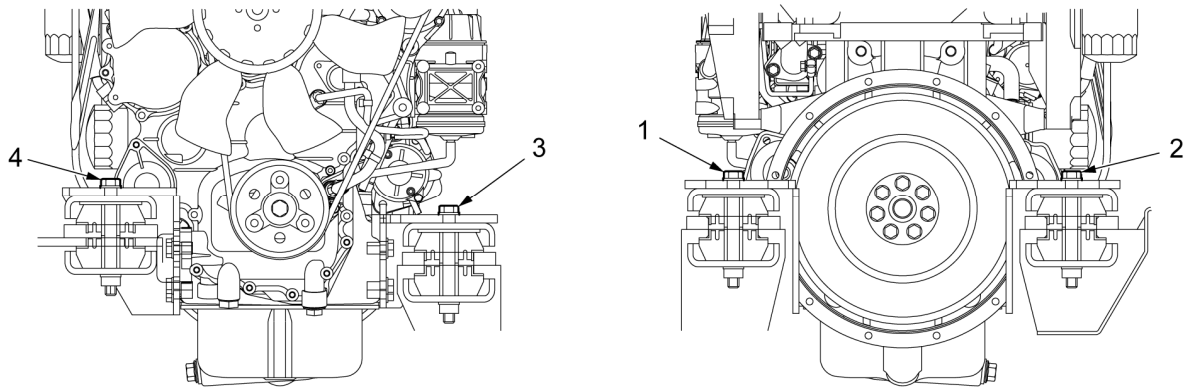
Engine



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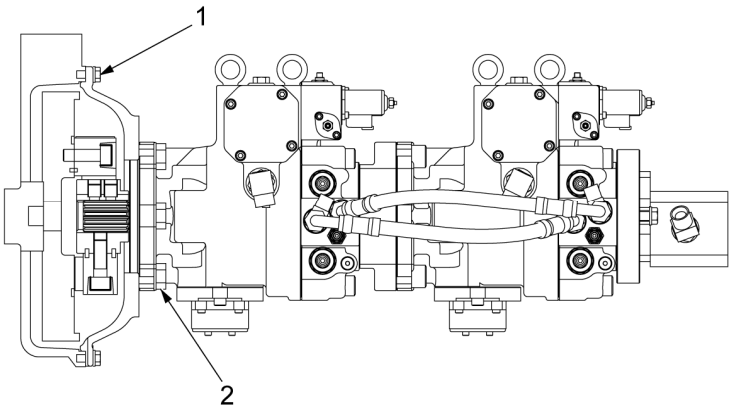
No.	Special tightening	Thread size	Wrench size (mm)	Tightening torque	
				N·m	kgf·m
1	Engine and bracket (rear)	M12	19	97	9.9
2	Bracket and frame (rear)	M16	24	241	24.6
3	Engine and bracket (front)	M12	19	97	9.9
4	Bracket and frame (front)	M16	24	241	24.6

Hydraulic pump



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No.	Tightening position	Bolt size	Wrench required (mm)	Tightening torque	
				(N·m)	(kgf·m)
1	Engine and pump housing	M10	17	59	6.0
2	Pump housing and hydraulic pump	M20	30	476	48.6

General Torque Specifications (10T Bolt)

Tighten bolts and nuts not shown above at the torques shown in the table below.

Bolt size	Wrench size (mm)	Tightening torque			
		Metric coarse thread heat-processed bolt		Metric fine thread heat-processed bolt	
		(N·m)	(kgf·m)	(N·m)	(kgf·m)
M8	13	23	2.3	25	2.5
M10	17	47	4.8	50	5.1
M12	19	83	8.5	91	9.3
M14	22	134	13.7	135	13.8
M16	24	208	21.2	221	22.5
M20	30	411	41.9	452	46.1
M24	36	715	72.9	811	82.7

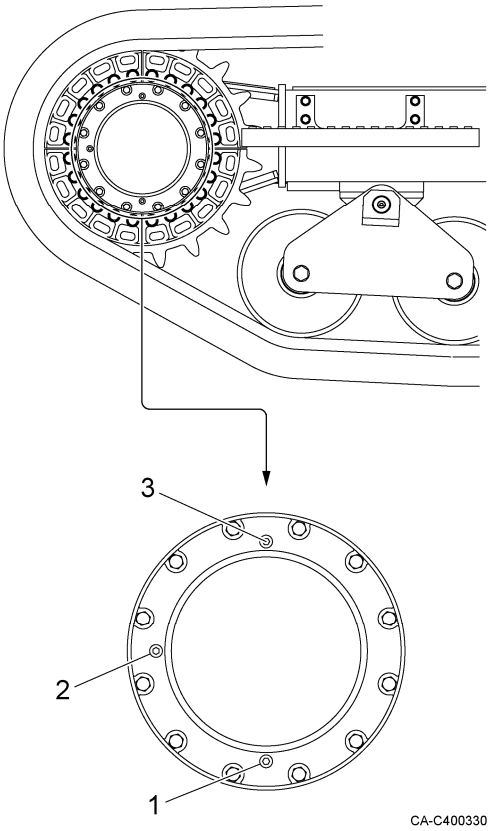
High-pressure hose union nut		
Hose size (inch)	Tightening torque	
	(N·m)	(kgf·m)
1/4"	25	2.5
3/8"	49	5.0
1/2"	59	6.0
3/4"	118	12.0
1"	137	14.0
1-1/4"	167	17.0

TRAVEL REDUCTION GEAR

Check the Travel Reduction Oil Level

⚠ WARNING

- Immediately after traveling, the gear case, oil, etc. are hot. Start work after they have cooled down.
- If pressure remains in the case, oil or plug may jump out. Loosen the plug slowly to reduce the pressure.



1. The drain port (1) must be located at the lowest position. The level port (2) must be located on the lateral side.
2. Remove the level plug. It is OK if the oil level is near the bottom of the plug hole.
3. Refill oil through the filler port (3) if oil is insufficient.
4. After check and refilling, clean the plugs and attach them.

Change the Travel Reduction Oil

1. The drain port must be located at the lowest position. The level port must be located on the lateral side.
2. Put the container under the drain port.
3. Remove the 3 plugs to discharge oil.
4. Attach the drain plug.
5. Fill the specified quantity of gear oil through the filler port.
6. Attach the level plug when oil is discharged through the level port.

HYDRAULIC SYSTEM

Check the Hydraulic Oil Level

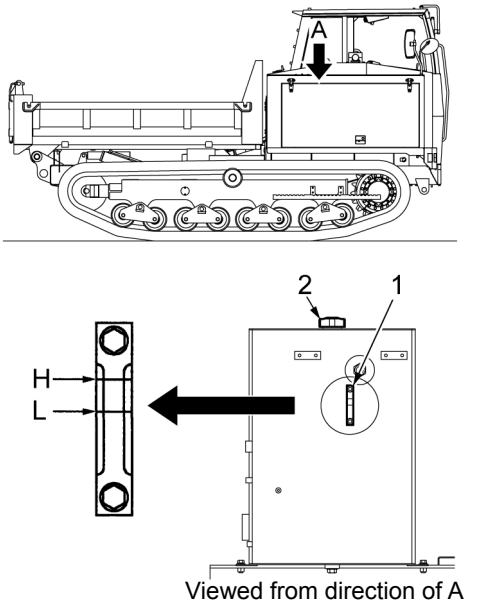
1. Place the machine on a flat and rigid ground and bring it into the posture for checking the hydraulic oil. Stop the engine.

2. Check the oil level gauge (1). If the oil level is between H and L, it is proper.
   The oil level differs with the oil temperature. The following shows the standard.

   - Near the L level before starting operation (Oil temperature: 10 to 30°C)
   - Near the H level during operation (Oil temperature: 50 to 80°C)

3. If the oil level is below the L level, refill hydraulic oil through the filler port (2).

Posture for checking the hydraulic oil



Drain the Hydraulic Oil Tank

⚠ WARNING

Oil is hot immediately after operation. You may get burnt if you touch oil.
Start work after oil has cooled down.

1. Loosen the drain plug under the hydraulic oil tank to discharge water and sediment into the container.
2. Close the drain plug when clean hydraulic oil is only discharged.
3. Check the hydraulic oil level. Refill oil if insufficient.

Change the Hydraulic Oil and Clean the Strainer

⚠ WARNING

- Be sure to set the safety bars under the vessel before starting works with the vessel raised.
- Oil is hot immediately after operation. You may get burnt if you touch oil. Start work after oil has cooled down.

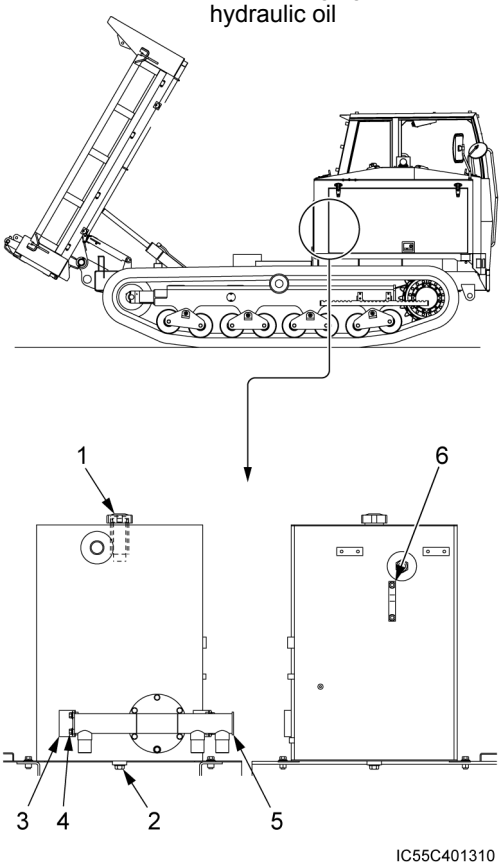
⚠ CAUTION

Change hydraulic oil at regular intervals, and change it even before the arrival of the next change time if oil deterioration is observed.

Hydraulic oil used with a rough terrain dumper is subjected to significant load, and the deteriorated hydraulic oil can cause damage to the hydraulic equipment.

1. Place the machine on a flat and rigid ground and bring it into the posture for changing hydraulic oil. Stop the engine.
2. Discharge hydraulic oil through the filler port (1) into an empty drum with an oil pump.
3. Put the container under the drain plug (2) at the bottom of the hydraulic oil tank, and remove the drain plug to discharge residual oil.
   Tighten the drain plug after discharging oil.
4. Disconnect the hose from the tube (3). Remove the bolt (4) and take out the strainer (5).
5. Clean the strainer (5) to remove dust and foreign matters.
6. Attach the strainer in the reverse order to step 4.
7. Fill the tank with hydraulic oil through the filler port up to the L level of the level gauge (6). Tighten the filler port plug.
8. Store the safety bars and start the engine. Keep the engine running with no load for approximately 5 minutes. Travel the machine and move the dump cylinder slowly several times. Bring the machine into the posture for checking the hydraulic oil level. Stop the engine.
9. Make sure that the hydraulic oil level is within the proper range. Refill hydraulic oil if insufficient.

Posture for changing the hydraulic oil



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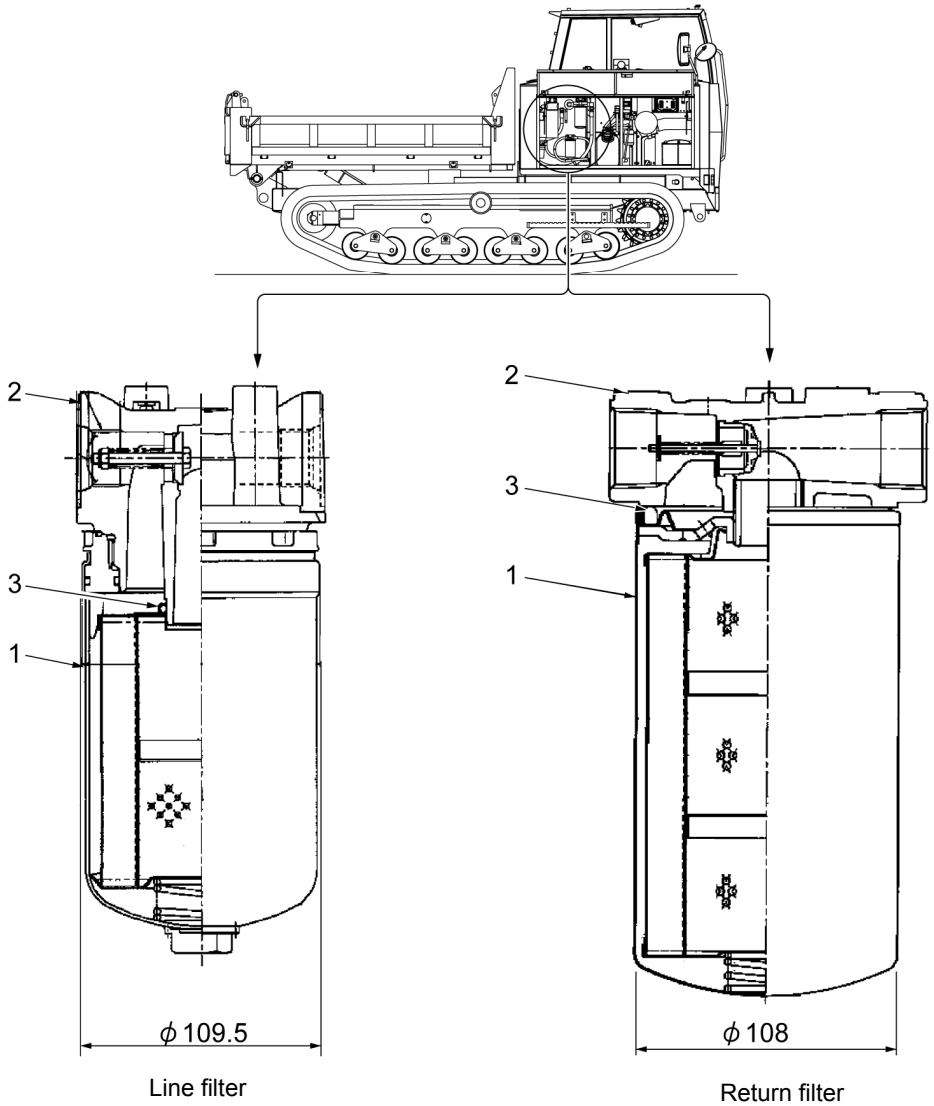
Replace the Line Filter Cartridge and Return Filter Cartridge

⚠ WARNING

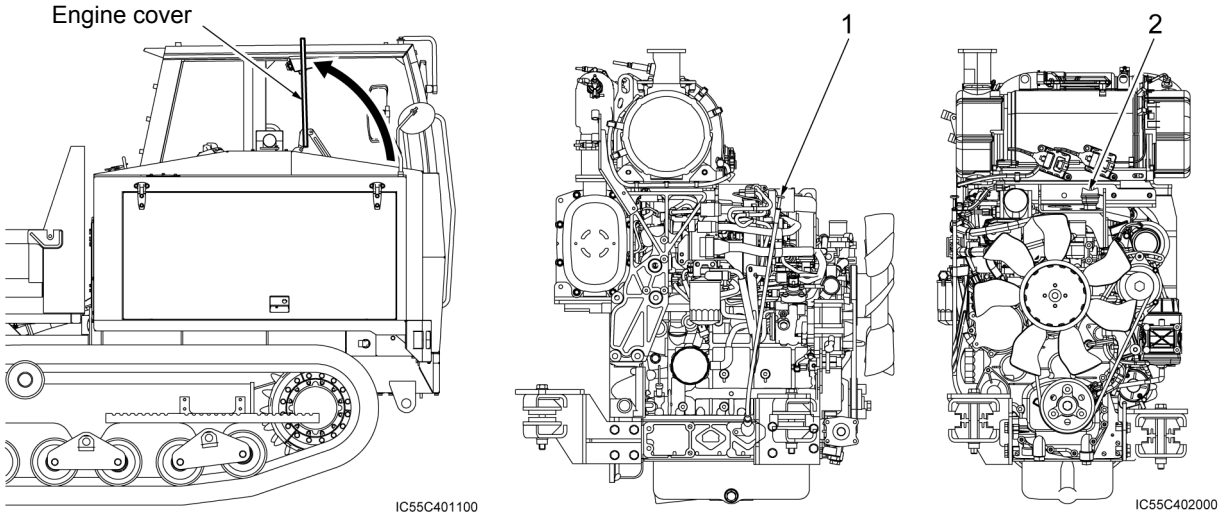
- Be sure to set the safety bars under the vessel when starting work with the vessel raised.
- Oil is hot immediately after operation. You may get burnt if you touch oil. Start work after oil has cooled down.

1. Remove the filter cartridge (1) with the filter wrench.
2. Clean the filter mounting position of the filter head (2). Apply hydraulic oil to the O ring (3) of a new filter cartridge.
3. Attach the filter cartridge and tighten it with the filter wrench.
   Tighten it until the O ring is crushed and the top of the cartridge is brought into contact with the head.
4. Start the engine. Make sure that no oil leaks from the mounting position of the filter cartridge.
5. Store the safety bars, lower the vessel and check the oil level in the hydraulic oil tank.
   It is OK if the oil level is between the H and L positions of the level gauge.
   Refill hydraulic oil if insufficient.

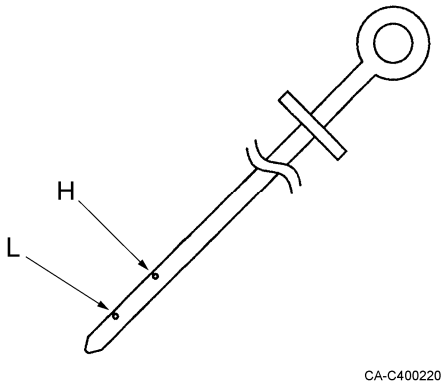


ENGINE OIL SYSTEM

Check the Engine Oil Level



1. Open the engine cover, pull out the dipstick (1), and remove oil with waste cloth.
2. Insert the dipstick fully into the oil level pipe and pull it out.
3. The oil level is proper if oil on the oil level gauge reaches between the H and L positions.
4. Refill engine oil through the filler port (2) if the oil level is below the L level. Wait for approximately 15 minutes after refilling, and check the oil level.
5. If the oil level is proper, close the lubrication port firmly and close the engine cover.
6. Too much engine oil may cause engine troubles. Be careful.



⚠ CAUTION

Using improper engine oil promotes sticking of the piston ring, seizure of the piston and cylinder, and wear of sliding parts. Furthermore, it may cause increase of oil consumption, reduction of the engine output, and damage to the engine.

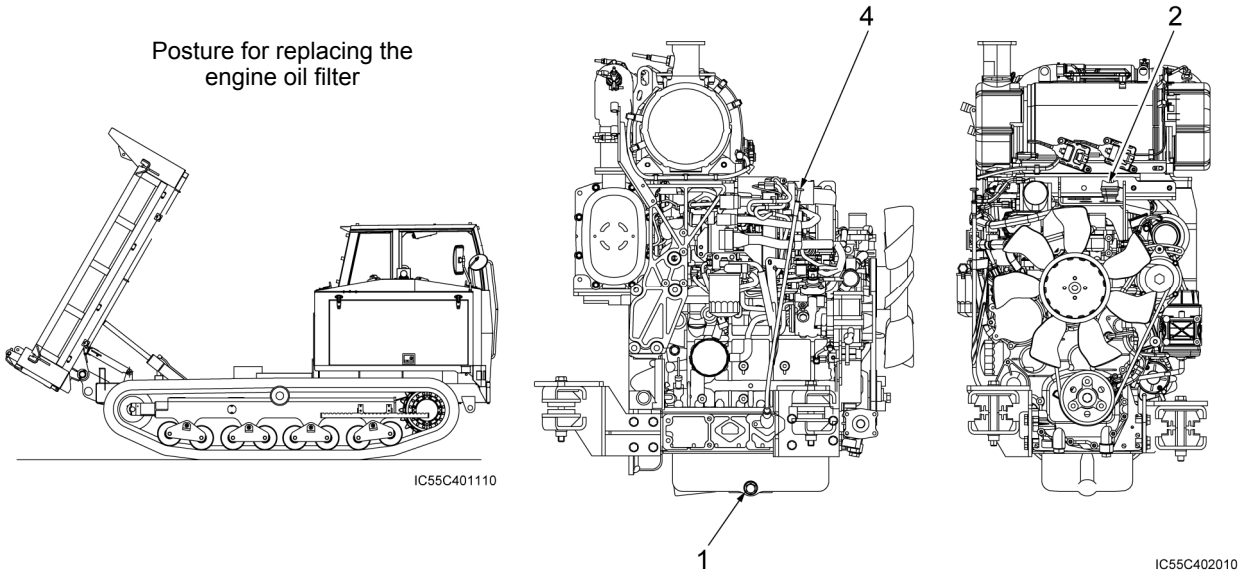
Troubles and accidents caused by using improper engine oil are exempted from the warranty.

Replace the Engine Oil and Engine Oil Filter

⚠ WARNING

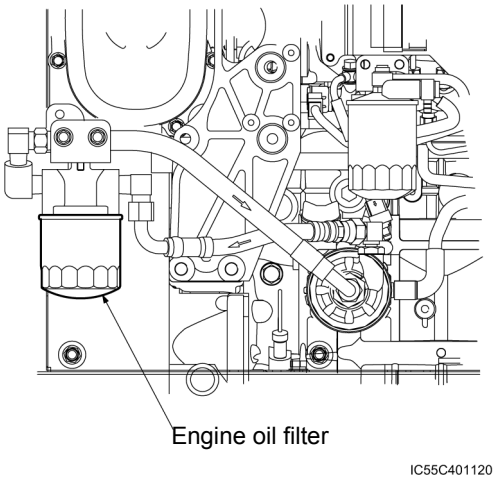
- Be sure to set the safety bars under the vessel before starting works with the vessel raised.
- Oil is hot immediately after operation. You may get burnt if you touch oil. Start work after oil has cooled down.

Place the machine on a flat and rigid ground and bring it into the posture for replacing the engine oil filter. Stop the engine.



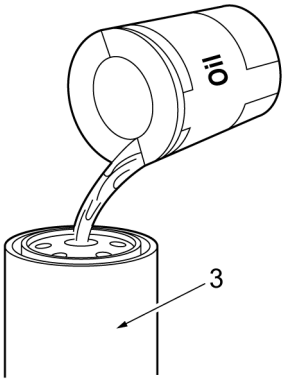
Discharge the engine oil

1. Put the container just under the drain plug (1) of the engine.
2. Clean the periphery of the filler port (2) to prevent foreign matters from entering. Remove the filler port cap.
3. Remove the drain plug slowly so that oil will not splash on you. Discharge oil then.
4. Check drain oil. Contact our sales service dealer if it contains much metallic powder, foreign matters, etc.
5. Change the packing of the drain plug with a new one.
6. Tighten the drain plug.



Replace the oil filter

1. Remove the filter cartridge (3) with the filter wrench.
2. Clean the seal surface of the filter head, and apply engine oil thinly to the gasket surface of a new filter cartridge (3).
3. Pour fresh engine oil into the new filter cartridge.
4. Screw the filter cartridge by hand until the gasket is brought into contact with the seal surface of the filter head.
5. Tighten the filter cartridge by one turn from this condition with the filter wrench.



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Fill the engine oil

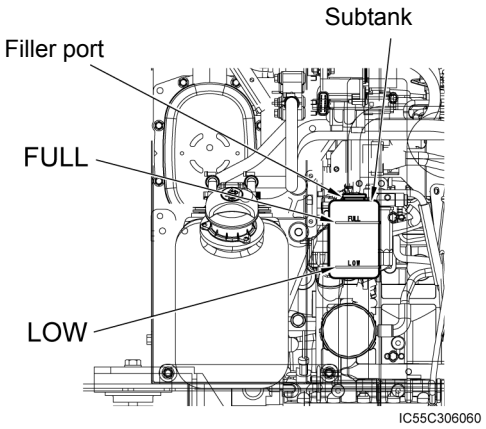
1. Fill engine oil through the filler port (2) up to a point between the H and L levels of the level gauge (4).
2. Run the engine idle for a mean while and check if no oil leaks.
3. Check the oil level again after 15 minutes or more have passed since the engine stops. Refill the engine with engine oil if it is insufficient.

COOLING SYSTEM

Check the Coolant Level and Refill

⚠ CAUTION

Do not open the radiator cap normally. Check coolant in the subtank when the engine is cool.



1. Open the right cover and check if the coolant level in the subtank is between the LOW and FULL levels. Refill the subtank with coolant through the filler port up to the FULL level.
   Close the cap firmly after refilling.
2. If the subtank is empty, stop the engine, check for water leak, check the water level in the radiator, and refill the radiator and subtank with coolant.

Change the Coolant

⚠ WARNING

- Coolant is hot immediately after stopping the engine. If coolant is discharged immediately, you may get burnt. Change coolant after the engine cools down.
- Do not remove the cap when the coolant is hot. Hot water may spout out. Rotate the cap slowly to relief the pressure after the coolant temperature lowers.

1. Anti-freezing solution

- A new machine is filled with coolant containing long life coolant (LLC). This coolant has effects of preventing freezing and corrosion.
  It has long-term effects and may be used in all seasons.
- Change coolant every year (in autumn every year).
- Use LLC when changing coolant.

⚠ WARNING

- The Long-Life-Coolant is toxic.
- If someone should shallow it by mistake, make him/her vomit it immediately and consult a doctor.
- If it is put into eyes, wash the eyes with water sufficiently immediately and consult a doctor.
- If it is necessary to store it, use a container with an antifreeze mark, cap it and store it in a place inaccessible by children.

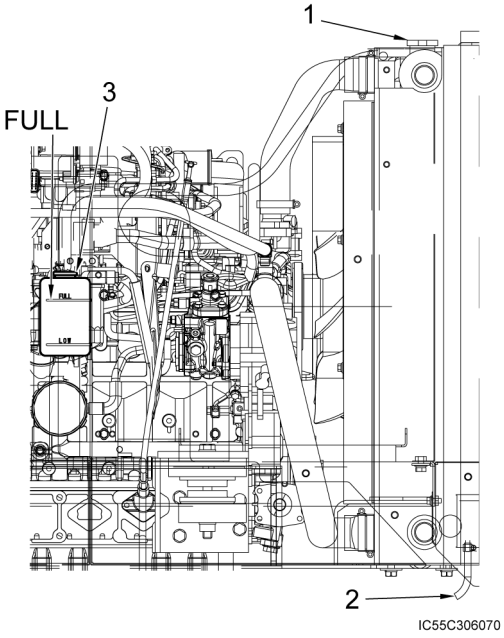
2. Mixing ratio of coolant

The freezing temperature of the long life coolant varied depending on the ratio of mixing it with water.
In this machine, irrespective of the outdoor temperature, the long life coolant is mixed with water with a mixing ratio of 50% at the time of shipment in order to maintain the rust prevention effect of the cooling system.
In all areas and throughout the year, keep the mixing ratio of the long life coolant at 50%.
Further, use commercial tap water for mixing.

Minimum outdoor temperature (°C)		-35
Mixing ratio (%)		50
Mixing volume (L)	Amount of LLC (L)	7.7
	Amount of water (L)	7.6
Total amount of coolant: 15.3L		Engine: 4.0 L Radiator, etc.: 10.5 L Reserve tank: 0.8 L

3. Coolant Replacement Instructions

1) Stop the engine.
2) Remove the radiator cap (1).
3) Open the drain cock (2) at the bottom of the radiator and drain the water.
4) Close the drain cocks at the two locations, pour tap water and cleaning agent (radiator cleaner), and run the engine for about 10 minutes at slightly higher speed than low idling.
5) Stop the engine, open the drain cocks at the two locations, and drain the water.
6) After draining the water completely, pour tap water and clean until the drained water becomes clean.
7) Close the drain cocks at the two locations, pour the coolant which is a mixture of tap water and LLC up to the mouth of the radiator water inlet opening.
8) Run the engine at low idling for about 5 minutes and stop the engine.
   Since the water level decreases because the air inside gets released, replenish coolant up to the mouth of the radiator water inlet opening, and close the cap.
9) Drain the cooling water in the supplementary tank (3), clean the inside of the tank, and pour the coolant up to the "FULL" mark.



Check and Adjust the Fan Belt Tension

⚠ WARNING

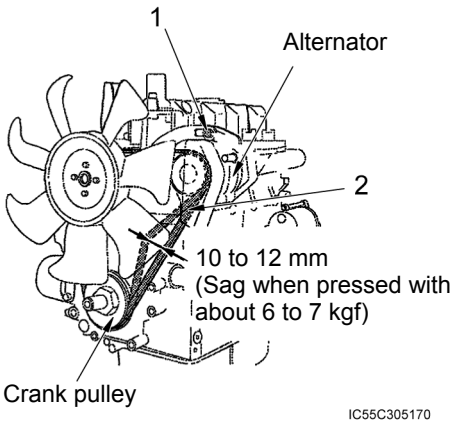
- The engine is hot immediately after stopping it. You may get burnt if you touch the engine. Wait until each part cools down.
- Stop the engine and keep the key of the starter switch in safe.

NOTICE

- If belt tension is excessive, the bearings and belt will be damaged earlier.
- Replace the bolt if it has elongated and the adjustment margin is lost.
- Run the engine at high speed for 30 minutes after the belt is replaced. Check and adjust belt tension then.

1. Check

1) Push a point in the middle of the clank pulley and alternator pulley at approximately 6 to 7 kgf. The belt tension is proper if the belt slacks by approximately 10 to 12 mm.



2) Replace the belt if the belt has cracks.

2. Adjustment

1) Loosen the bolts (1) and (2).

2) Adjust the adjust bolt so that the belt slacks approximately 10 to 12 mm with a pushing force of about 6 to 7 kgf of the belt tension, and move the alternator.

3) Tighten the bolts.

4) Replace the bolt if it has elongated and the adjustment margin is lost.

INSPECTION OF DEF LEVEL AND REPLENISHMENT

Regarding the urea SCR system

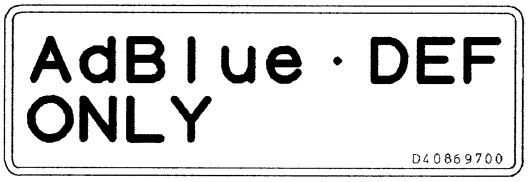
- The urea SCR (Selective Catalytic Reduction) system reduces the amount of toxic nitrogen oxides (NOx) present in exhaust gas by decomposing NOx into water and nitrogen inside the post-processing unit by means of the emission of DEF into exhaust gas.

Regarding DEF

- The fluids that are effective in reducing NOx present inside the post-processing unit are collectively referred to as DEF (Diesel Exhaust Fluid).
- DEF is an aqueous urea and is commonly referred to as AdBlue® mainly in Europe. AdBlue® is a registered trade mark of the German Association of the Automotive Industry (VDA: Verband der Automobilindustrie).

Regarding specified DEF

- As for DEF, use the one that conforms to the Japanese Industrial Standards (JIS K 2247-1) or the International Organization for Standardization (ISO 22241-4). Never replenish other fluids than the specified DEF. Also, never replenish DEF diluted with water. (The new machine is shipped with about 10 L of AdBlue® in its tank.)



- DEF must be stored in an airtight container in a well-ventilated location not exposed to direct sunlight.

⚠ CAUTION

DEF freezes at -11°C. If DEF freezes inside a container, it may rapture the container by volume expansion.

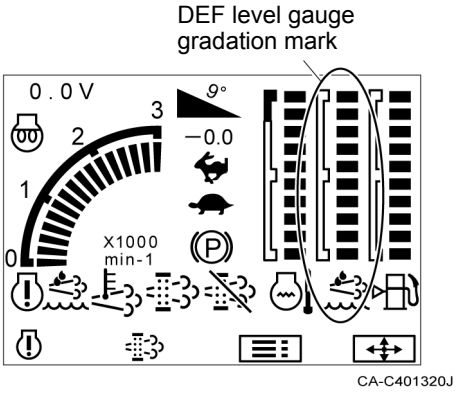
- If a fluid other than DEF (AdBlue®) or DEF diluted with water is pured into the tank, it may cause the DEF pump and/or the DEF injector to fail. If a fluid other than the specified DEF is pured into the tank by mistake, do not turn the starter key to the "ON" position and immediately contact our sales service dealer for proper instructions.

⚠ CAUTION

- In the urea SCR system, the pump returns DEF to the tank even after the engine has stopped. Never disconnect the battery immediately after the engine has stopped or remove the connectors including the harnesses. Similarly, never remove the DEF pipe immediately after the machine has stopped. When conducting maintenance and other related work, be sure to allocate ample time before starting such work.

Replenishment of DEF

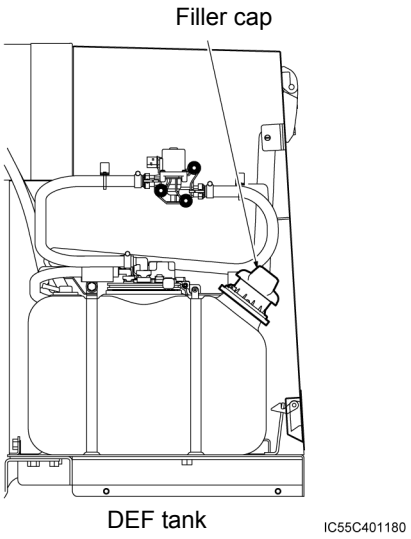
When the DEF level on the display gets low or the DEF mark flashes (replenishment of DEF required), replenish DEF.



1. Remove the filler cap.

2. Slowly replenish the specified DEF. (The tank capacity of this machine is 18 L.)

3. Securely close the filler cap.



⚠ CAUTION

- If there is DEF leak, wipe off with a dry cloth or similar object. If DEF is not wiped off, it will crystallize and whiten.
- When replenishing, be careful not to introduce dust and other foreign objects into the DEF tank. They will cause clogging in the DEF pump, DEF pipe and DEF injector.

Changing the DEF pump filter

As a maintenance item of the DEF pipe, it is necessary to change the DEF pump filter (post-processing DEF dosing filter).

Regarding the above filter change, please refer to the Engine Operation Manual that comes with this machine and implement it as an inspection and maintenance item of specified period.
(Refer to Page 30 of Kubota Engine's Instruction Manual V3 800=TIEF4.)

FUEL SYSTEM

Applicable Fuel

The following advantages are required for diesel fuel:

1) Must be free from minute dust particles.
2) Must have adequate viscosity.
3) Must have a high cetane number.
4) Must have high fluidity at low temperature.
5) Must have low sulfur content.
6) Must have little residual carbon.

Use light oil for normal diesel cars that meets the above requirements.

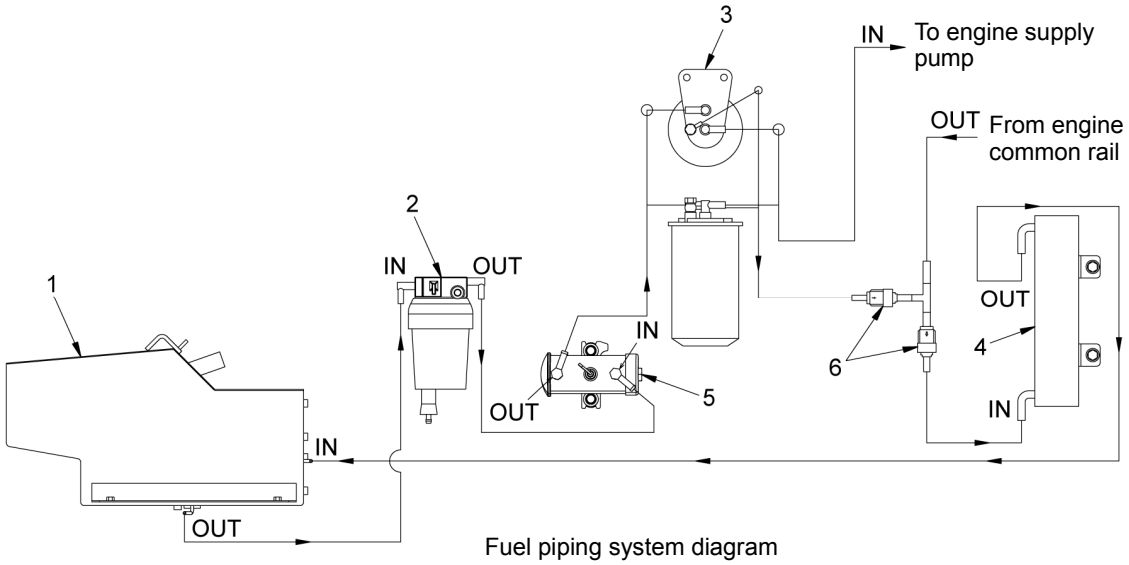
⚠ CAUTION

The functions or performance of parts of the fuel injection system or the engine may be lost or the engine may break down if any other fuel than light oil is used. Never use any other fuel than light oil.

Damages or troubles caused by using fuel other than light oil are not covered by the warranty.

EPA REGULATION

USE ULTRA LOW SULFUR FUEL ONLY



Fuel piping system diagram

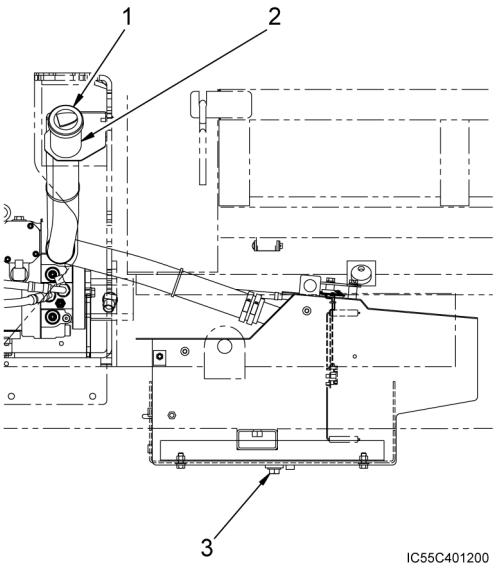
IC55C401190

No.	Name	No.	Name
1	Fuel pump	4	Fuel cooler
2	Water separator	5	Fuel pump
3	Fuel filter	6	Check valve

Check the Fuel Level

1. Turn the engine key switch to the ON position and check the quantity of remaining fuel with the fuel gauge shown on the display. Refill the tank with fuel through the filler port (1) if fuel is insufficient.

2. Close the cap of the filler port firmly after refilling.



⚠ WARNING

- Overflowed or spilt fuel may cause a fire. Wipe it off completely if it overflows or spills.
- Do not replenish from a drum and plastic container. Replenish from a tank track to prevent water and impurities from being mixed.
- Removing the strainer (2) to refill fuel may cause engine troubles. Do not remove it.
- Do not fill the tank with fuel up to the top.

Drain the Fuel Tank

1. Loosen the drain plug (3) at the bottom of the fuel tank to discharge water and sediment into the container.

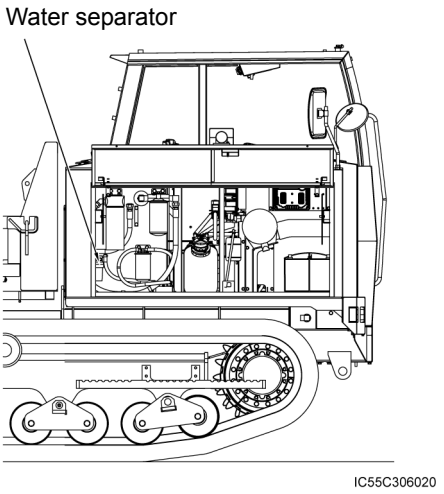
2. Close the drain plug when clean fuel is only discharged.

Check and Clean Water Separator and Replace Element

Check and Discharging Water

If the float (1) of the water separator is floating, water reaches the bottom of the float.
When the water separator warning indicator on the OK monitor turns on, the water separator contains the specified amount of water.
Discharge the water.

1. Close the fuel cock (3).
2. Open the drain plug (4) to discharge water and foreign matters to the container.
3. Close the drain plug.
4. Open the fuel cock as before.
5. Discharge air from the water separator.
6. Make sure that no fuel leaks.



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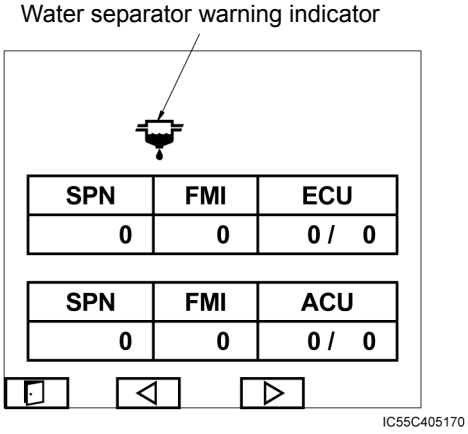
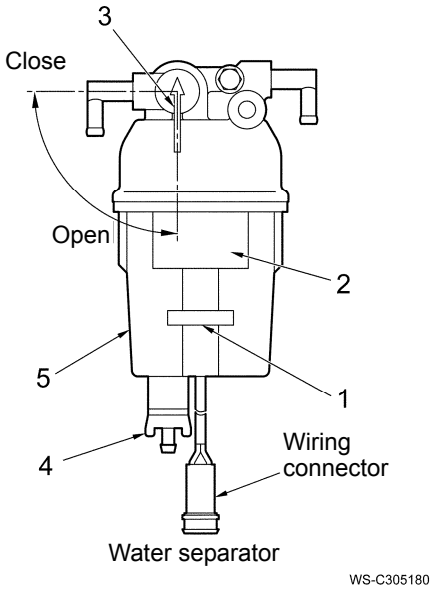


IC55C405170

Cleaning and Replacing

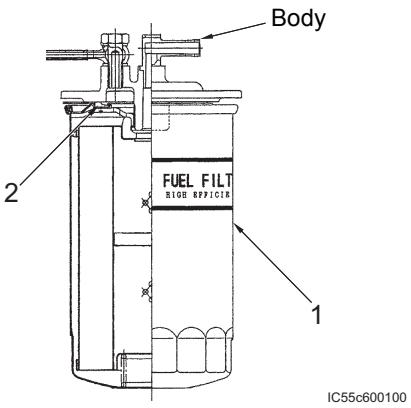
1. Close the fuel cock (3).
2. Disconnect the wiring connector.
3. Open the drain plug (4) to discharge water and foreign matters to the container.
4. Turn the cup (5) counterclockwise to detach it.
5. Take out the float (1) from inside of the cup.
6. Discharge water and sediment from inside of the cup into the container.
7. Clean the element (2) and inside of the cup completely with fresh fuel. Replace the element if it is flawed or damaged.
8. Attach the element and O-ring to the body.
   If the O-ring is damaged, replace it with a new one.
9. Put the float in the cup.
10. Turn the cup clockwise to attach it to the body. Be sure to tighten it by hand.
11. Close the drain plug.
12. Connect the wiring connector.
13. Open the fuel cock as before.
14. Discharge air from the water separator.
15. Make sure that no fuel leaks.



WS-C305180

Replace Fuel Filter

1. Turn the filter (1) counterclockwise with the filter wrench to detach it.
2. Thinly coat fuel oil on the gasket (2) of the new filter, and tighten sufficiently by hand without using a filter wrench.
3. Discharge air after replacing the filter.
4. Make sure that no fuel leaks.



How To Discharge Air

Discharge air after maintenance of the fuel filter or water separator is carried out or the fuel tank is emptied.

1. Fill the fuel tank full with fuel.
2. Turn the engine key switch to the ON position and keep it at that position for a short period.
   When this is done, the air is automatically bled, and it becomes possible to start the engine.

⚠ CAUTION

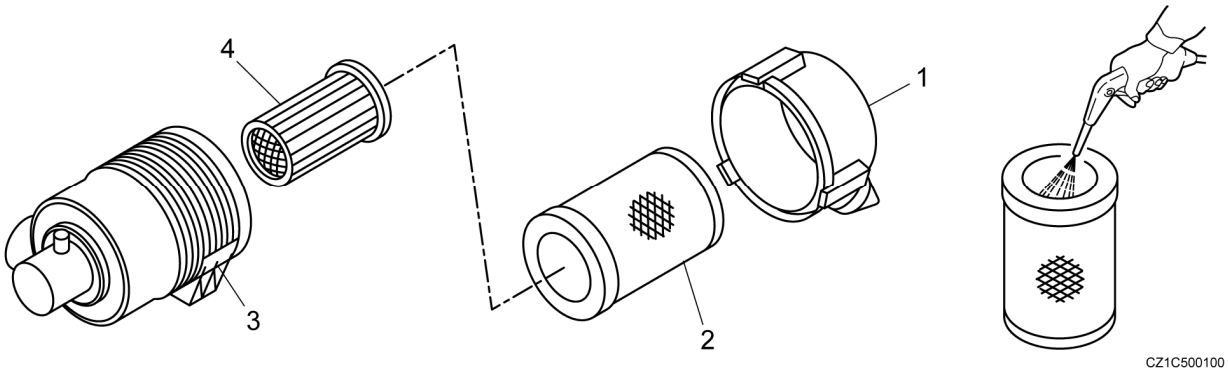
- Fuel is hot immediately after stopping the engine. Carry out the work after the fuel temperature has become lower.
- Do not bring fire close to the engine.
- Wipe off spilt fuel completely. If it is left as is, it may cause a fire.

AIR INTAKE SYSTEM

Inspect and Clean Air Cleaner Element

If the air cleaner clogging lamp on the instrument panel is lit, the element is clogged.

Clean or replace the element.



1. Stop the engine.
2. Remove the cover (1), and take out the outer element (2).
   Do not remove the inner element (4).
3. Clean the inside of the cover and the body (3).
4. From the inside of the element, directly blow dry compressed air (0.29 to 0.49 MPa (3 to 5 kgf/cm^2)) above and below along the crimp of the filter. Maintain an appropriate spacing (about 50 cm) between the tip of the nozzle and the filter.
5. Emit light (white light) from the inside of the element and inspect for damage to the filter. Do not use the filter if the filter is damaged, or has pin holes, or has particularly thin portions, or if the seal portion is damaged.
6. After the cleaning is completed, affix the element again.
7. Attach with the arrow mark (↑) is towards the up direction, and fix with a fixing metal catch.

NOTICE

- Replace the element with a new one, regardless of the replacement interval, if it is dirty with lamp soot, soot or oil.
- Do not pat, hit or drop the element.

Replace Air Cleaner Element

Disassemble the air cleaner in the same manner as inspection and cleaning procedures and replace the element with a new one.

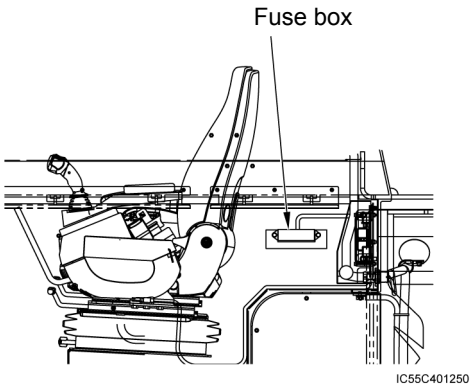
⚠ CAUTION

- Be sure to stop the engine before cleaning or changing the air cleaner. If it is cleaned or changed while the engine is running, dust is sucked in, causing engine damages.
- Put on protective goggles when cleaning the element using compressed air. Otherwise, dust may be put in your eyes, which is dangerous.

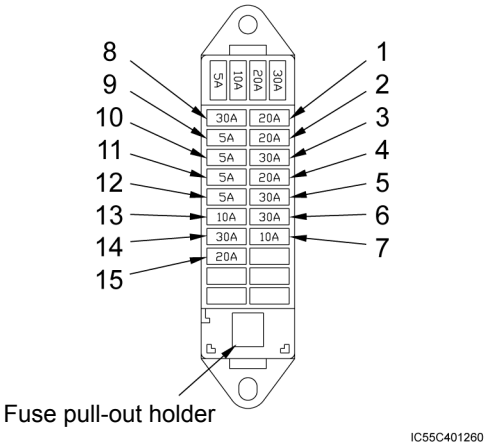
ELECTRIC SYSTEM

Change the Fuses

NOTICE
• Before changing fuses, be sure to always set the starter switch key at the "OFF" position and disconnect the battery terminals. • Do not use wires, silver foils, etc. instead of fuses. If such materials are used, the wires may overheat and burn, resulting in a fire.



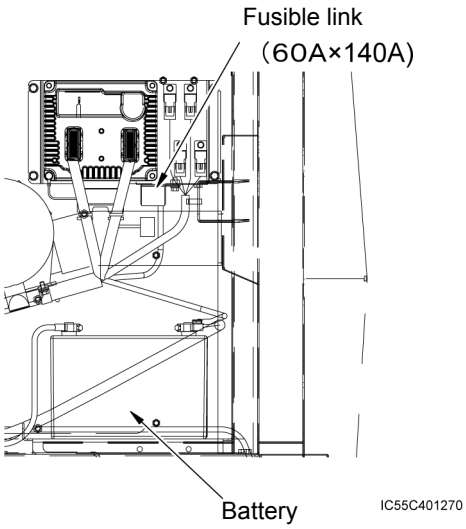
1. Set the starter switch key to the OFF position.
2. Take off the fuse cover.
3. Replace the blown fuse with a new fuse of the same capacity using the fuse pull-out holder set in the fuse box.



	Fuse capacity	Circuit name
1	20 A	Solenoids, display, joystick, service
2	20 A	Air conditioner, heater
3	30 A	Working light
4	20 A	Horn, display, cabin
5	30 A	Backlight, cabin's upper light
6	30 A	Radio
7	10 A	Back monitor
8	30 A	Sedimenter, fuel pump, sensor
9	5 A	Engine start
10	5 A	ECU start switch
11	5 A	Emergency stop switch, engine service tool
12	5 A	EGR valve
13	10 A	NOx sensor, SCR tank sensor
14	30 A	ACU heater relay
15	20 A	ACU COMP relay

Change the Fusible Link

If power is not turned on even though the starter switch is set to the ON position, the fusible link (60A) between the battery and the key switch circuit may have blown out. Detach and check the fusible link. Replace it with a new fusible link, if it has blown out.



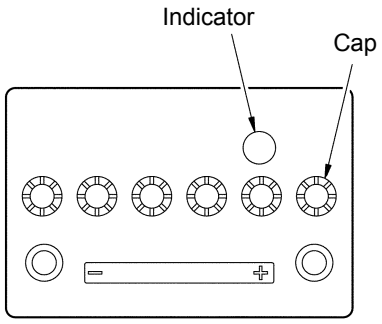
Handle the Battery

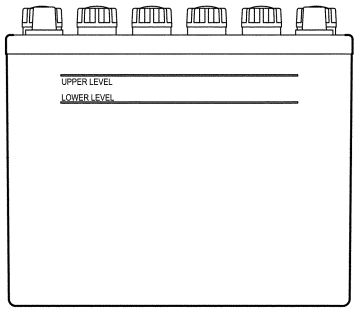
⚠ WARNING

- The battery produces inflammable hydrogen gas. It ignites or explodes if fire is nearby. Never bring fire close to the battery or strike a spark near it.
- Never place any tool, metallic object or inflammable matter on or near the battery. The battery may possibly ignite and explode if it short-circuits.
- The battery liquid (diluted sulfuric acid) may cause loss of eyesight or burning. If it is put into the eyes or on the skin or clothes, wash with much water immediately and consult a doctor.
- Be sure to put on protective goggles when handing the battery.
- Be sure to check the handle and handle-mounting location conditions when mounting/removing the battery, and lift the battery up.

Refill battery liquid

Check the liquid level on the side surface of the battery. If the liquid level has dropped to "LOWER LEVEL," remove the cap of each cell, and refill the battery with the specified liquid, up to "UPPER LEVEL." Do not supply the battery liquid exceeding "UPPER LEVEL".
Also supply the battery liquid if <Liquid Insufficient> is indicated when checking the indicator.





Indication of indicator

The standard recharging conditions and liquid levels are as shown below.

Good	(Blue)
Needs recharging	(White)
Liquid insufficient	(Red)

WS-C305270

Clean the battery terminals

IMPORTANT

- Be sure to keep the engine stopping during work.
- Be careful during work not to short-circuit the positive and negative terminals of the battery with a tool, etc.
- Disconnect the battery cable from the negative terminal first. Connect it to the negative terminal last.
- Tighten the terminals firmly.

1. Clean the terminals if they are dirty or corroded. (Pour warm water onto the terminals and wipe them if they are corroded and white powder sticks on them.)
2. Detach the terminals and polish them with a wire brush or sandpaper if they are corroded remarkably.
3. Apply grease, etc. thinly to the terminals after cleaning and tightening.

HANDLING IN COLD REGIONS

At low temperature, the engine hardly starts and coolant is subject to freezing. Make preparation for cold weather as shown below.

Fuel

In winter in cold regions, fuel may be frozen and it may be difficult to start the engine.
Use fuel (light oil) appropriate for the temperature.
Freezing temperature of light oil (as specified in JIS K2204)

Light oil type	Freezing point	Remark
No. 1	-5ºC or less	For normal use
No. 2	-10ºC or less	
No. 3	-20ºC or less	For cold regions
Special No. 3	-30ºC or less	

Coolant

Long-Life-Coolant (LLC) has been mixed in coolant of this machine before shipment.
The ratio of mixing anti-freezing solution is 50% in all regions.
Replace the long life coolant every 2000 hours or two years.

Lubricant and grease

Exchange engine oil and hydraulic oil with proper oil having viscosity appropriate for the outer temperature. Refer to RECOMMENDED LUBRICATION TABLE for the specified viscosity.

Battery

In cold seasons, larger discharge current flows when starting the engine and the battery performance is also reduced. If the battery is almost discharged, battery liquid may be frozen. Recharge the battery almost fully and keep it warm to start the engine free from troubles next morning.

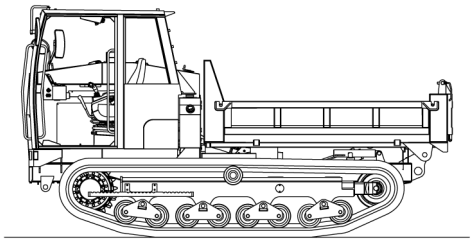
Precautions when finishing work

- Remove mud and water and water from the cylinder rod to prevent the cylinder rod seals from being damaged.
- Put plates on dry and solid ground and park the machine on them in order to prevent the crawlers and around them from freezing.
- Discharge water from the fuel tank to prevent fuel from freezing.

LONG TERM STORAGE

Before Storage

NOTICE
Move the vessel down to the lowest position while storing in order to protect the cylinder rod from rust.



Position for long term storage IC55C401290

To store the machine from long term, follow the next procedures.

1. Clean parts of the machine.
2. Be sure to perform fill the fuel, lubrication, and oil change.
3. Select a well-drained, dry and well-ventilated flat place. Put plates on the ground.
4. Store the battery after remove the negative terminal and covering it or dismounting the battery from the machine.

During Storage

⚠ WARNING
If you have to operate the machine indoors to prevent rust, keep good ventilation and gas poisoning by window or entrance.

1. During storage, operate the machine once a month to maintain films of oil at the lubrication section and charge the battery at the same time.
2. Before starting the engine, always crank the engine with the starter and check that the engine oil pressure warning lamp is OFF on the Trouble Code display.
3. After starting the engine, let it idle for about 5 minutes.

After Storage

Before using the machine after long-term storage, lubricate or grease every necessary parts, check the coolant and DEF levels, and replenish them if necessary,

TROUBLESHOOTING

Regarding to actions marked with *, contact the distributor or service personnel.

SYMPTOM	PROBABLE CAUSE	REMEDY
Machine does not travel fast and powerfully.	• Short of hydraulic oil	• Supply oil up to specified level.
	• Lowered pressure set for relief valve	• Repair or replace parts.*
	• Defect of motor or reduction gear	• Repair or replace parts.*
	• Defect of pump	• Repair or replace parts.*
	• Over-tensed crawler	• Adjust both right and left tension to regular value.
Speed does not change even if changing selectors.	• Discontinuity or disconnection of electric wires.	• Repair or replace parts.*
	• Defect of solenoid valve for speed selection	• Repair or replace parts.*
Machine curves during travel.	• Tangled obstacle	• Remove obstacle
	• Unequal tension of right and left	• Adjust tension of right and left to regular value.
Machine does not travel smoothly.	• Tangled stone and obstacle	• Remove obstacle.
	• Over-tensed crawler	• Adjust tension of right and left to regular value.
	• Short of hydraulic oil	• Supply oil to specified level.
	• Defect of motor or reduction gear	• Repair or replace parts.*
	• Defect of pump	• Repair or replace parts.*

PARTS LIST

This parts list contains the consumable parts of the main vessel and engine of the machine.
Regarding parts not listed in this parts list, please contact our sales service dealer.
When ordering any of the parts listed below, please notify the model, serial number, part name and quantity.

Consumable Parts List

Part Name	Part No.	Quantity/Unit	Remarks
Fuel filter cartridge	IK947-43171	1	Kubota
Water separator element	223005-1100	1	
Engine oil filter cartridge	IC020-3243	1	Kubota
Air cleaner element	59700-26112	1	Kubota
Air cleaner element (inner)	55231-26150	1	Kubota
Hydraulic oil return filter cartridge	49023-1000	1	
Hydraulic oil line filter element	49098-1002	1	
Fuse 5A	0830 107 12	5	
Fuse 10A	0830 107 06	3	
Fuse 20A	0830 107 08	5	
Fuse 30A	0830 107 10	6	
Fusible link 60A	0830 106 00	1	
Fusible link 140A	0830 106 03	1	
Headlight	0854 010 29	2	
Headlight bulb	0853 012 67	2	
Direction indicator lamp	0854 520 UA	2	
Direction indicator lamp bulb	–	2	12V 23W
Direction indicator lamp lens	0854 520 03	2	

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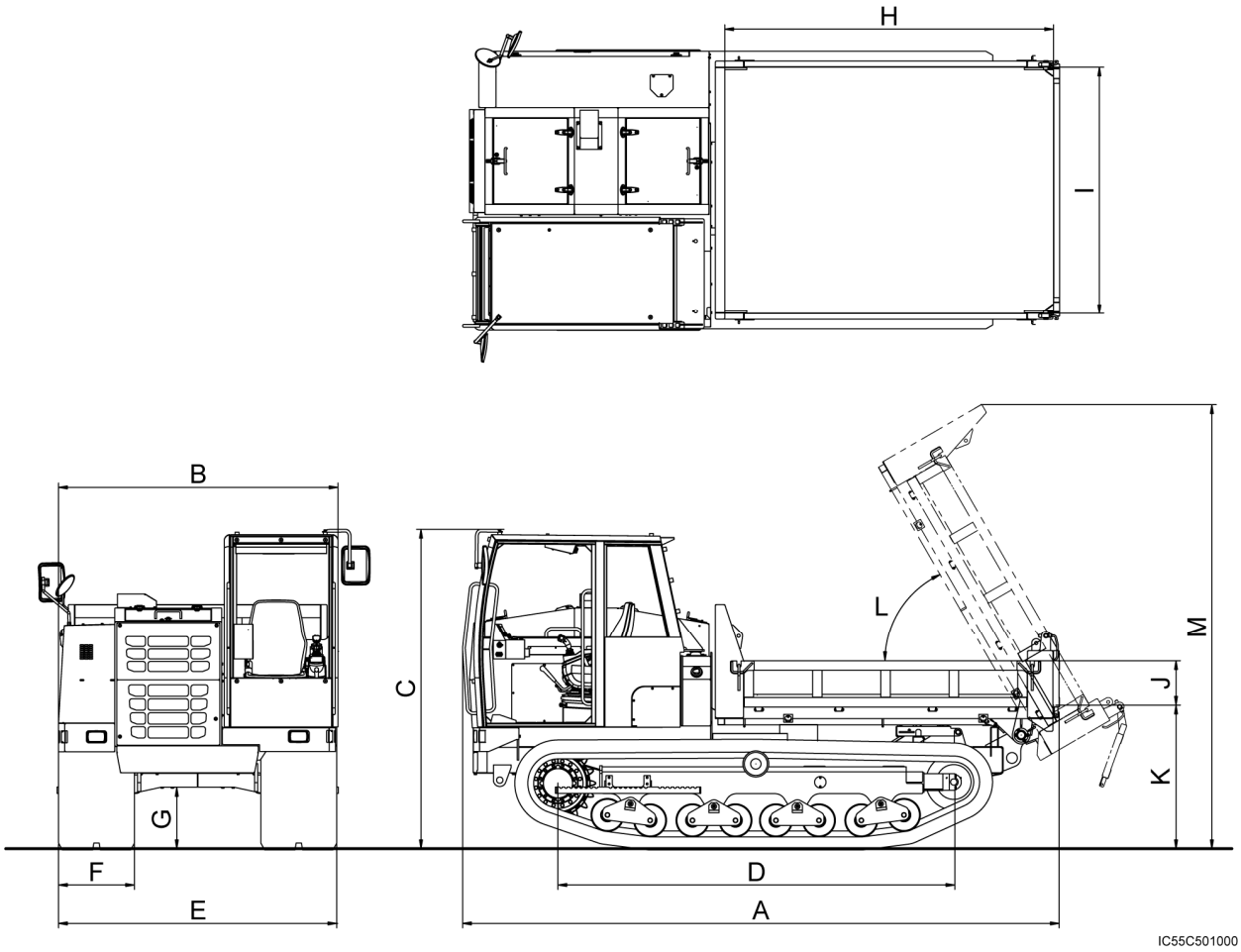
SPECIFICATIONS

SPECIFICATIONS AND DIMENSIONS



			STD
Loading capacity		kg	5000
Machine weight		kg	6440
Travel speed Low/High		km/h	10.0/12.0
Engine	Model	-	Kubota V3800
	Cylinder-total displacement	CC	4-3769
	Rated output	kW /min^{-1}	78.3/2400
Ground pressure	Empty	kPa	22.4
	Loaded	kPa	40.1
Vessel capacity	Fully loaded	m^3	3
	Flat loaded	m^3	1.8
A	Overall length	mm	4720
B	Overall width	mm	2210
C	Overall height	mm	2530
D	Tumbler center distance	mm	3130
E	Overall crawler width	mm	2200
F	Crawler width	mm	600
G	Minimum height from ground	mm	495
H	Vessel length	mm	2600
I	Inner vessel width	mm	1950
J	Vessel height	mm	350
K	Vessel floor height from ground	mm	1140
L	Maximum dumping angle	°	60
M	Maximum height in dumping	mm	3510

2018 年 2 月　初版発行
First Edition, February 2018

IC55

取　扱　説　明　書
OPERATION MANUAL

編集及び発行所

株式会社 加藤製作所

プロダクトサポート G

Editing & Publishing Office.

KATO WORKS CO., LTD.

Product Support Group

〒140-0011 品川区東大井 1-9-37

9-37, Higashi-ohi 1-chome,Shinagawa-ku, Tokyo 140-0011